

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003441423-01	OBS	No	1.805107	132.300794	107.0	11.412	10.9	7.7	0.84	5508	0.88	712.94
003441423-02	OBS	No	85.856457	168.046199	4465.8	10.500	62.4	-1.0	0.84	5508	5.51	4.14
003441423-03	OBS	No	64.780176	148.035133	1187.9	5.446	19.7	6.4	0.84	5508	3.09	6.02
003441423-04	OBS	No	59.862756	155.930613	2330.1	19.940	15.5	7.0	0.84	5508	7.79	6.69
003441423-05	OBS	No	231.147707	136.281517	15336.4	74.391	15.3	9.6	0.84	5508	12.94	1.10
003441423-06	OBS	No	77.133913	201.287993	1339.7	10.736	14.3	6.9	0.84	5508	4.00	4.77
003441423-07	OBS	No	66.961236	148.930850	971.1	0.969	13.8	4.0	0.84	5508	2.97	5.76
003441423-08	OBS	No	42.934940	141.414459	485.7	7.500	9.0	-1.0	0.84	5508	1.82	10.42
003441423-09	OBS	No	62.622117	157.133901	1581.0	10.114	8.5	7.6	0.84	5508	4.34	6.30
003441423-10	OBS	No	55.642936	159.899113	432.0	1.032	9.4	2.2	0.84	5508	1.98	7.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003441423-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
003441423-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

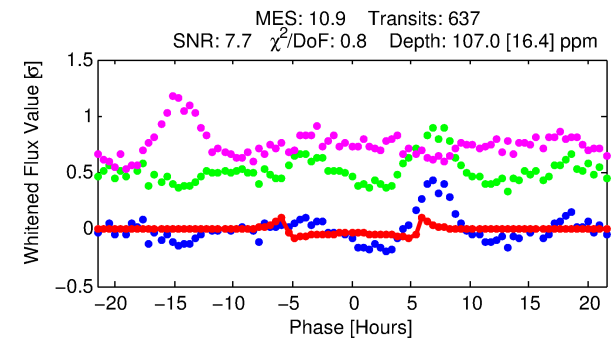
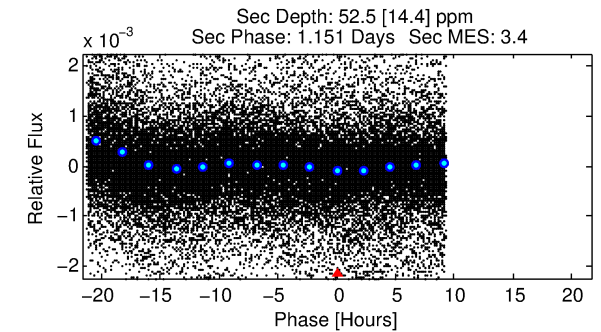
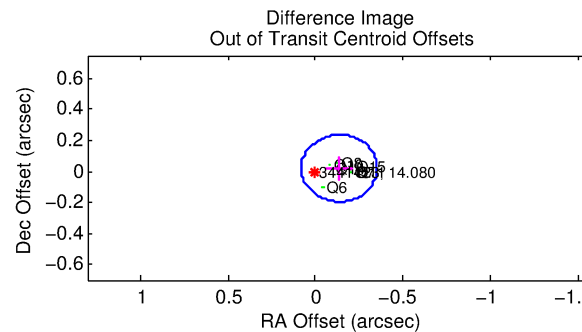
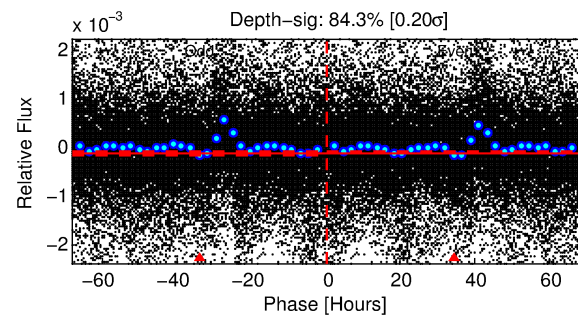
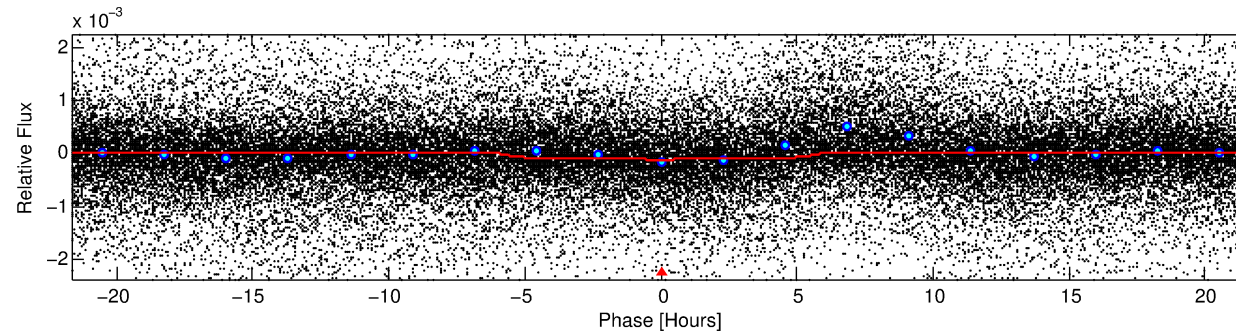
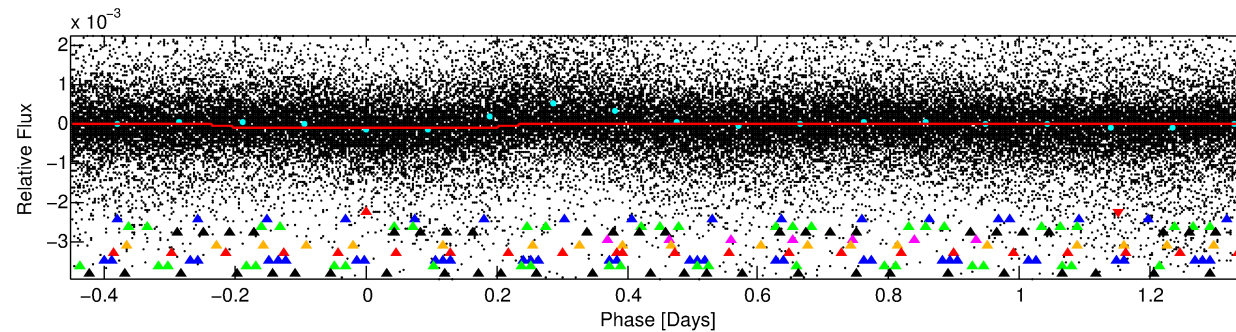
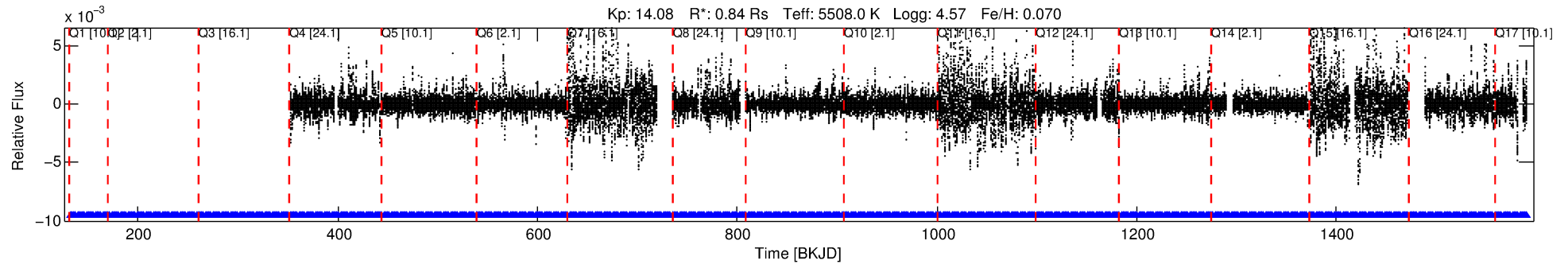
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003441423-01

No Significant Match Found

# DV One-Page Summary

KIC: 3441423 Candidate: 1 of 10 Period: 1.805 d



## DV Fit Results:

Period = 1.80511 [0.00002] d  
Epoch = 132.3008 [0.0033] BKJD  
Rp/R\* = 0.0096 [0.0040]  
a/R\* = 1.30 [0.90]  
b = 0.48 [2.80]  
Seff = 712.94 [121.92]  
Teq = 1318 [56] K  
Rp = 0.88 [0.38] Re  
a = 0.0286 [0.0029] AU  
Ag = 30.45 [27.37] [1.08 $\sigma$ ]  
Teffp = 4786 [1060] K [3.27 $\sigma$ ]

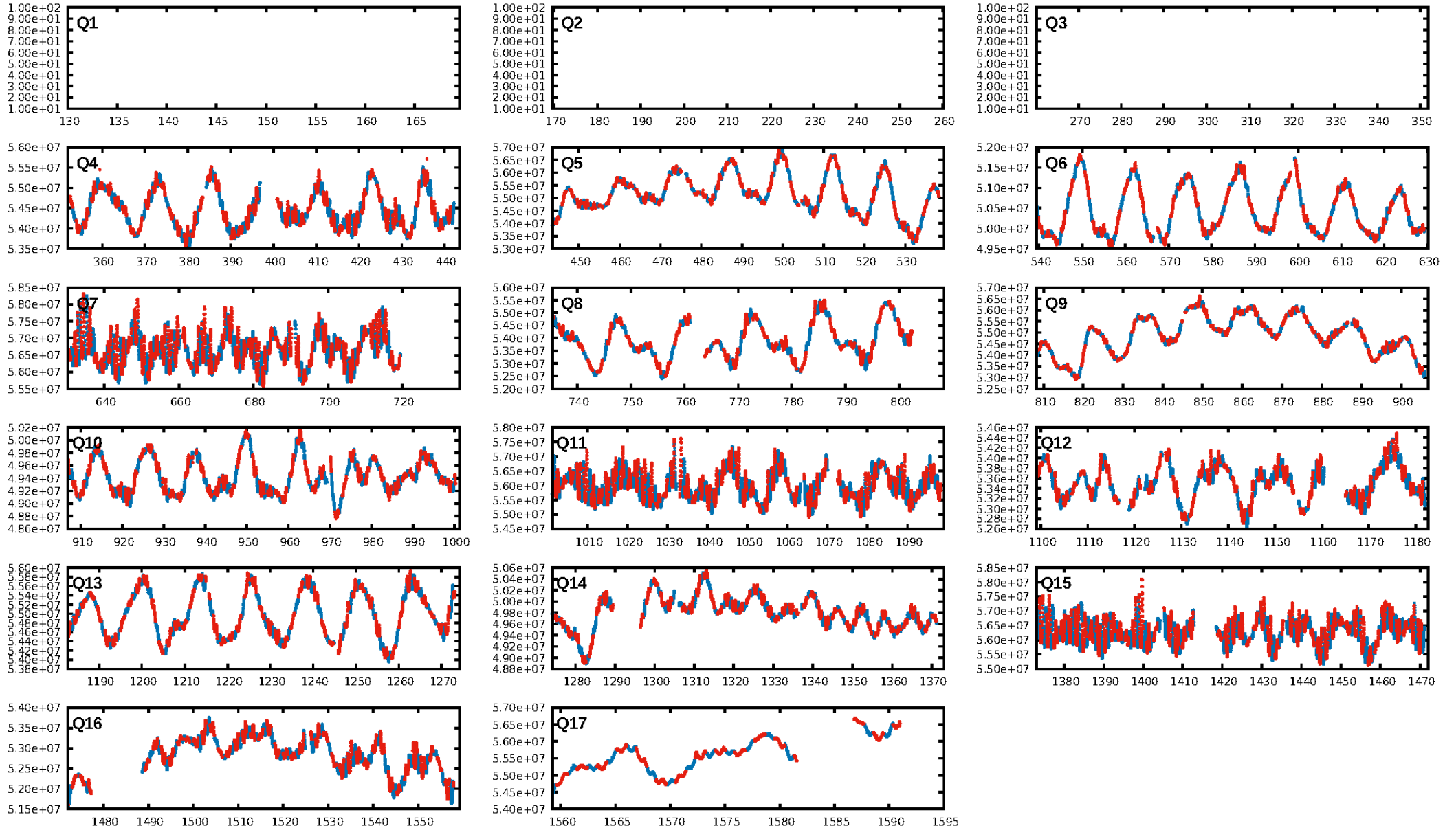
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [72.28 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.16e-14  
RollingBand-fgt: 1.00 [621/621]  
GhostDiagnostic-chr: -0.1808  
Centroid-sig: 47.8%  
Centroid-so: 3.019 arcsec [1.33 $\sigma$ ]  
OotOffset-rm: 0.136 arcsec [1.89 $\sigma$ ]  
OotOffset-st: 3/3/1/0 [7]  
KicOffset-rm: 9.350 arcsec [99.15 $\sigma$ ]  
KicOffset-st: 3/3/1/0 [7]  
DiffImageQuality-fgm: 1.00 [7/7]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:20:03 Z

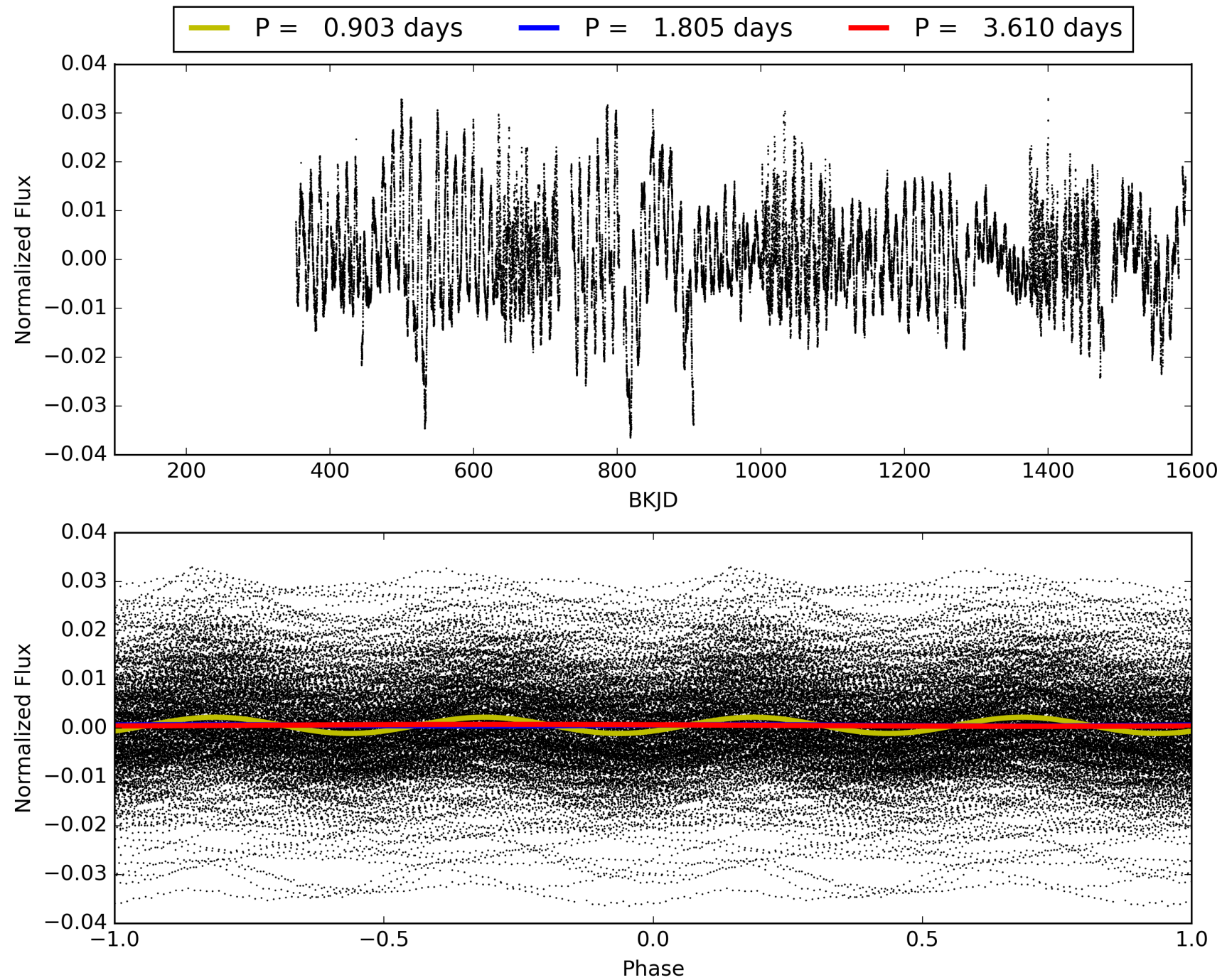
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003441423-01, PDC Light Curves



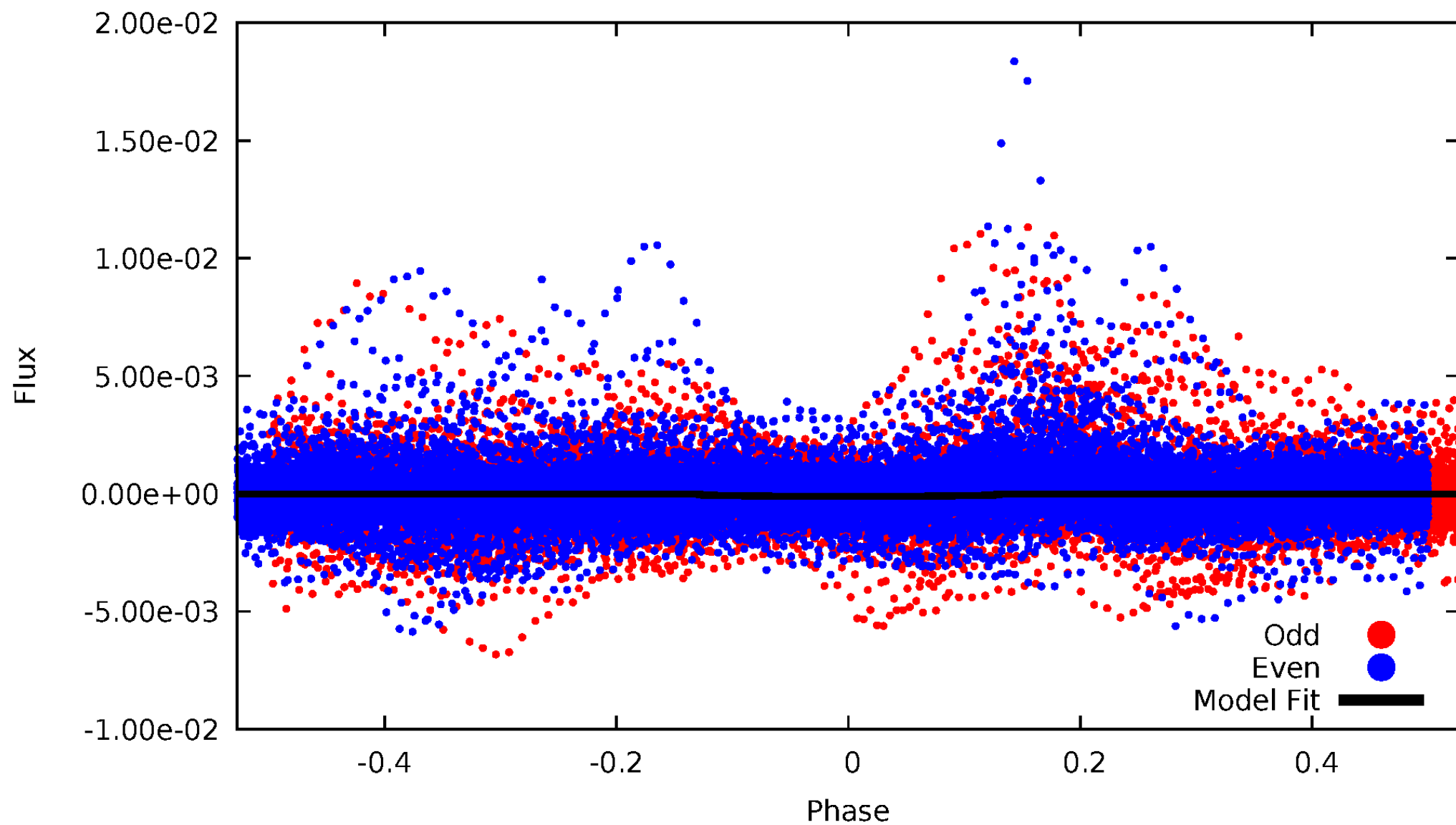


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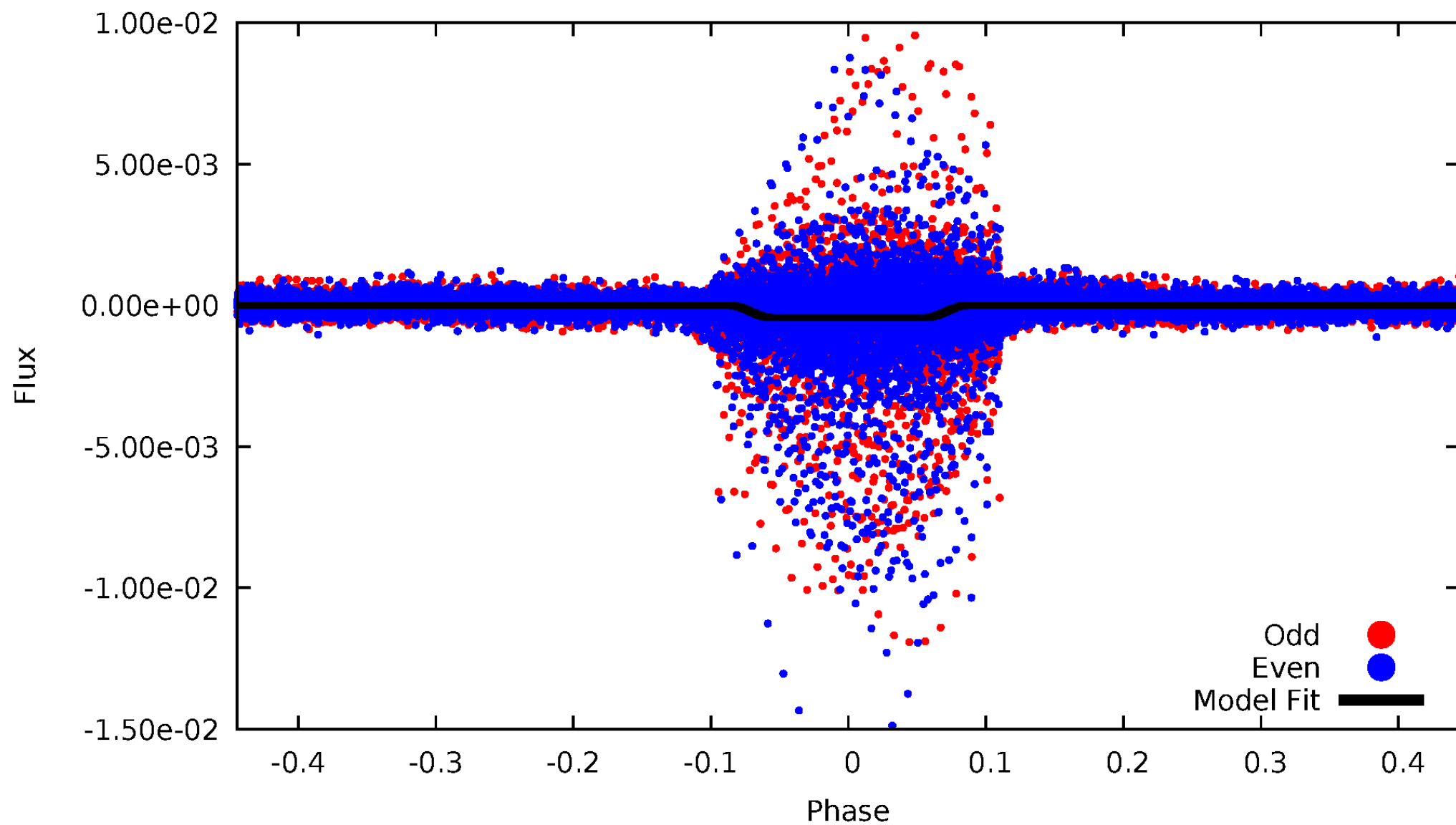
# DV Odd/Even

TCE 003441423-01



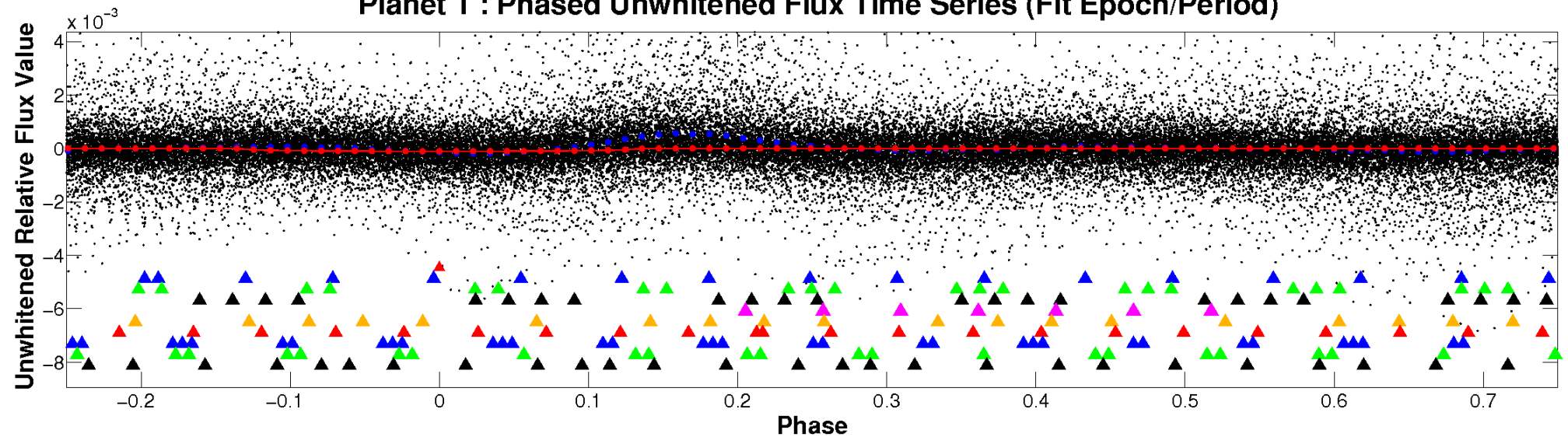
# ALT Odd/Even

TCE 003441423-01

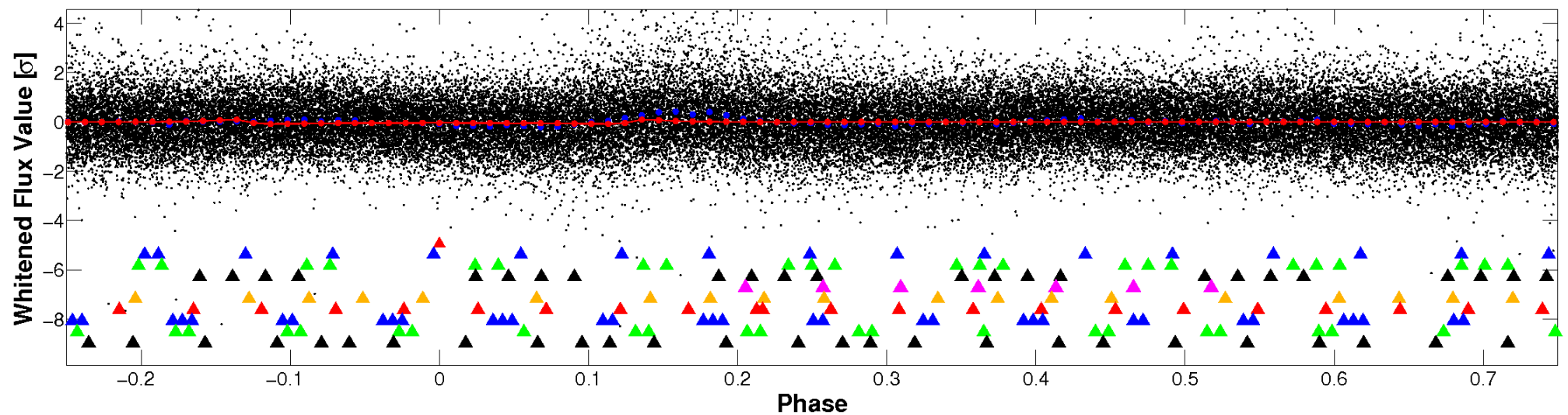


# Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



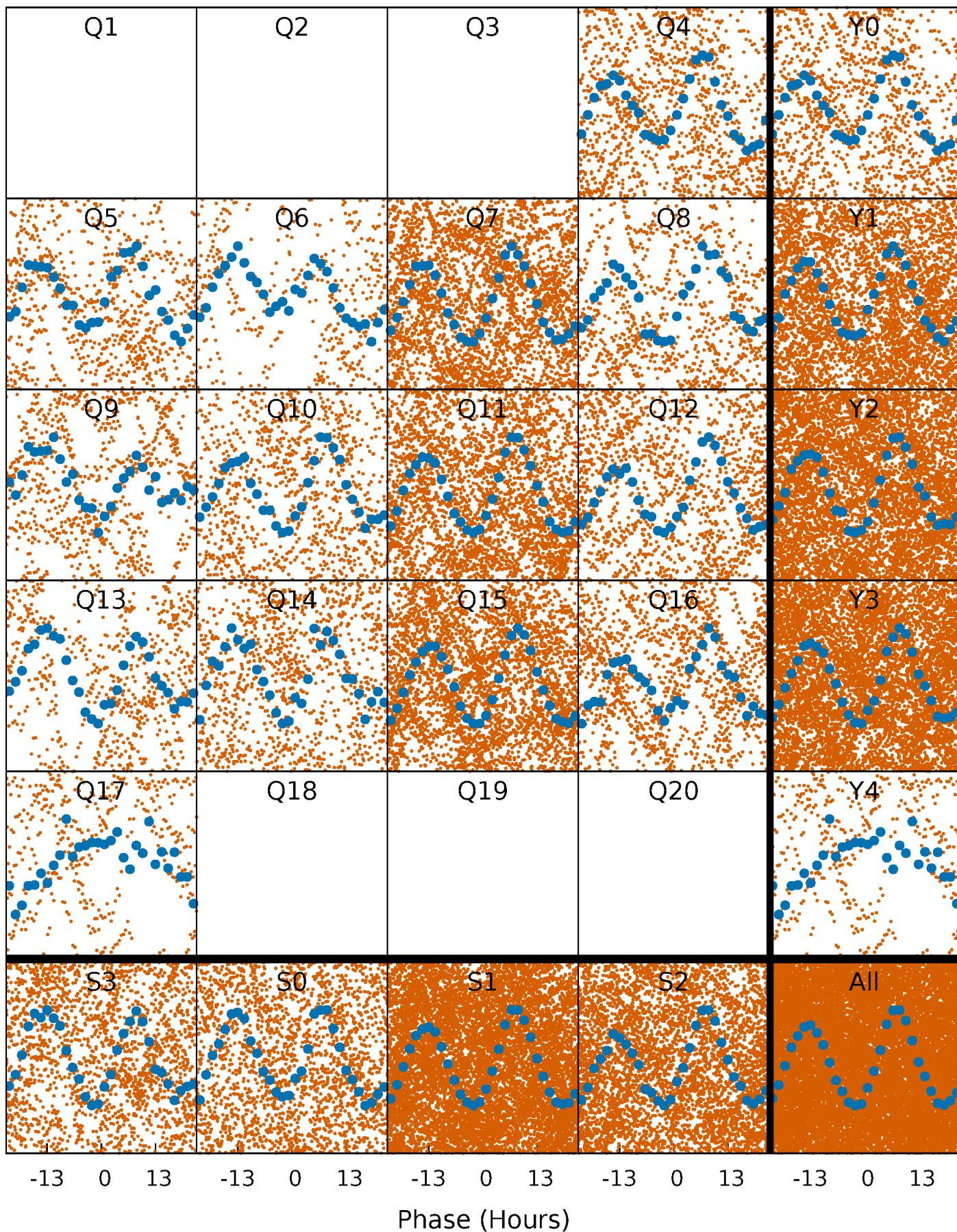
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





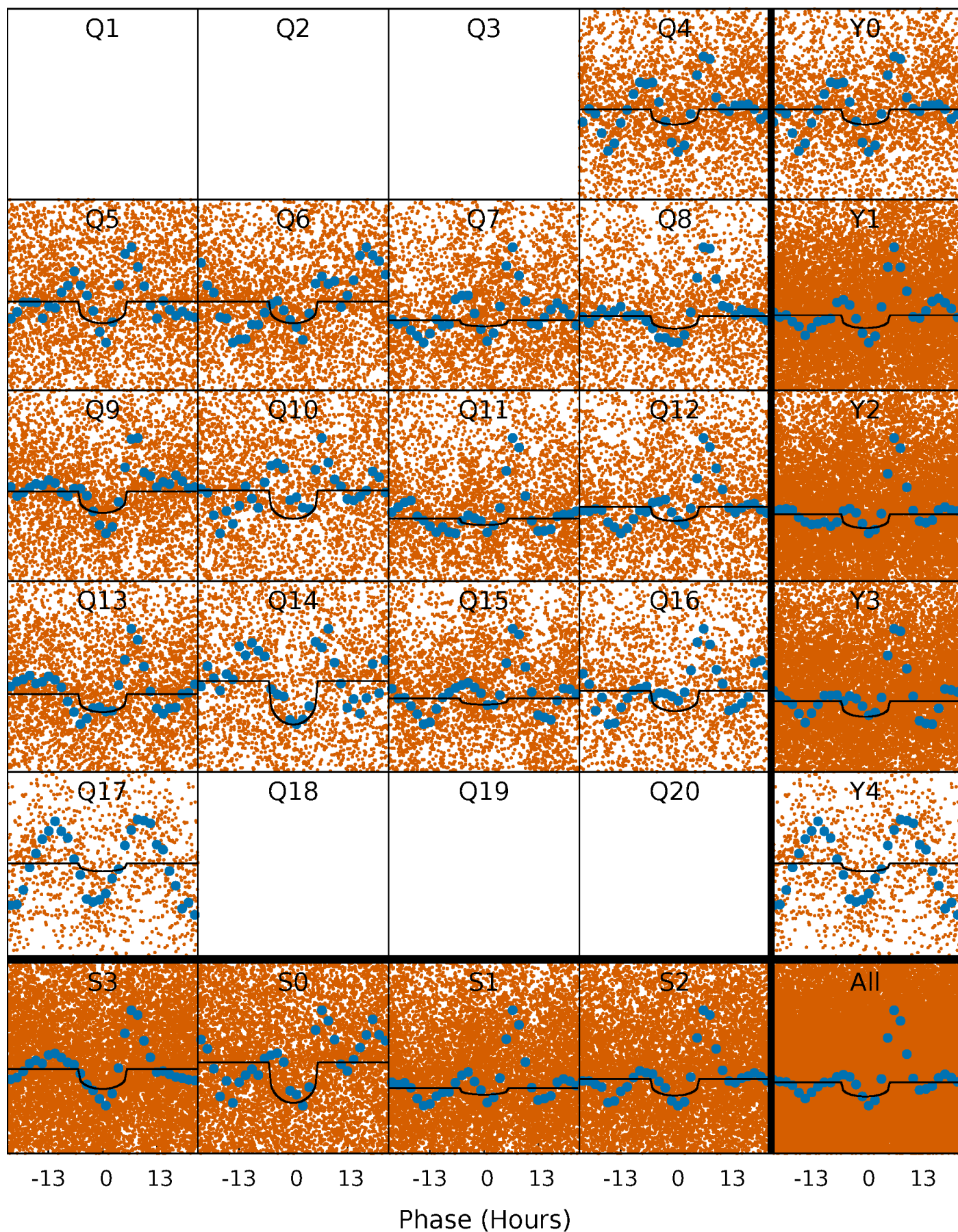
# PDC Quarter-Phased Transit Curves

TCE 003441423-01 P= 1.805107 Days  $T_0=132.300794$  (BKJD)



# DV Quarter-Phased Transit Curves

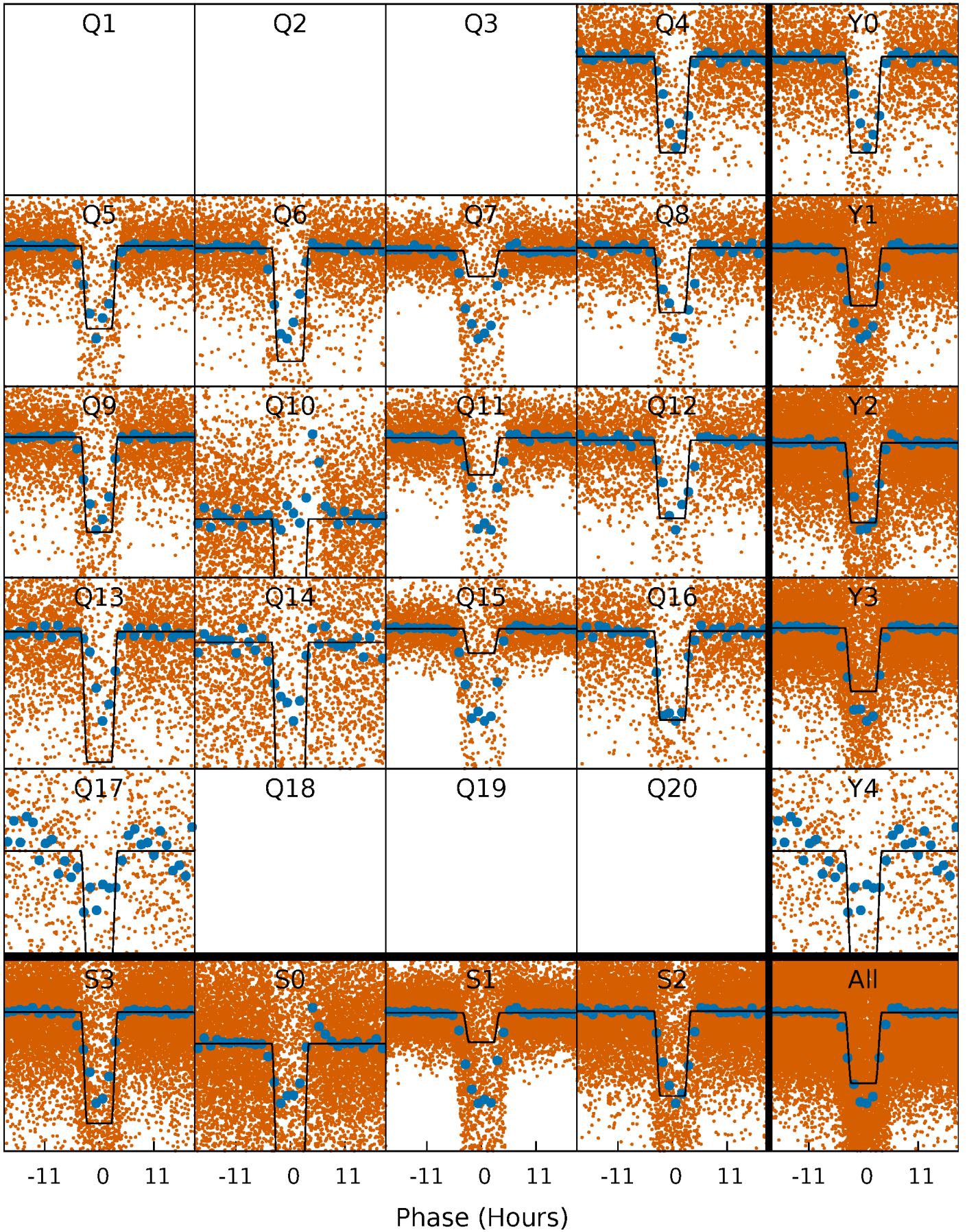
TCE 003441423-01 P= 1.805107 Days  $T_0=132.300794$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

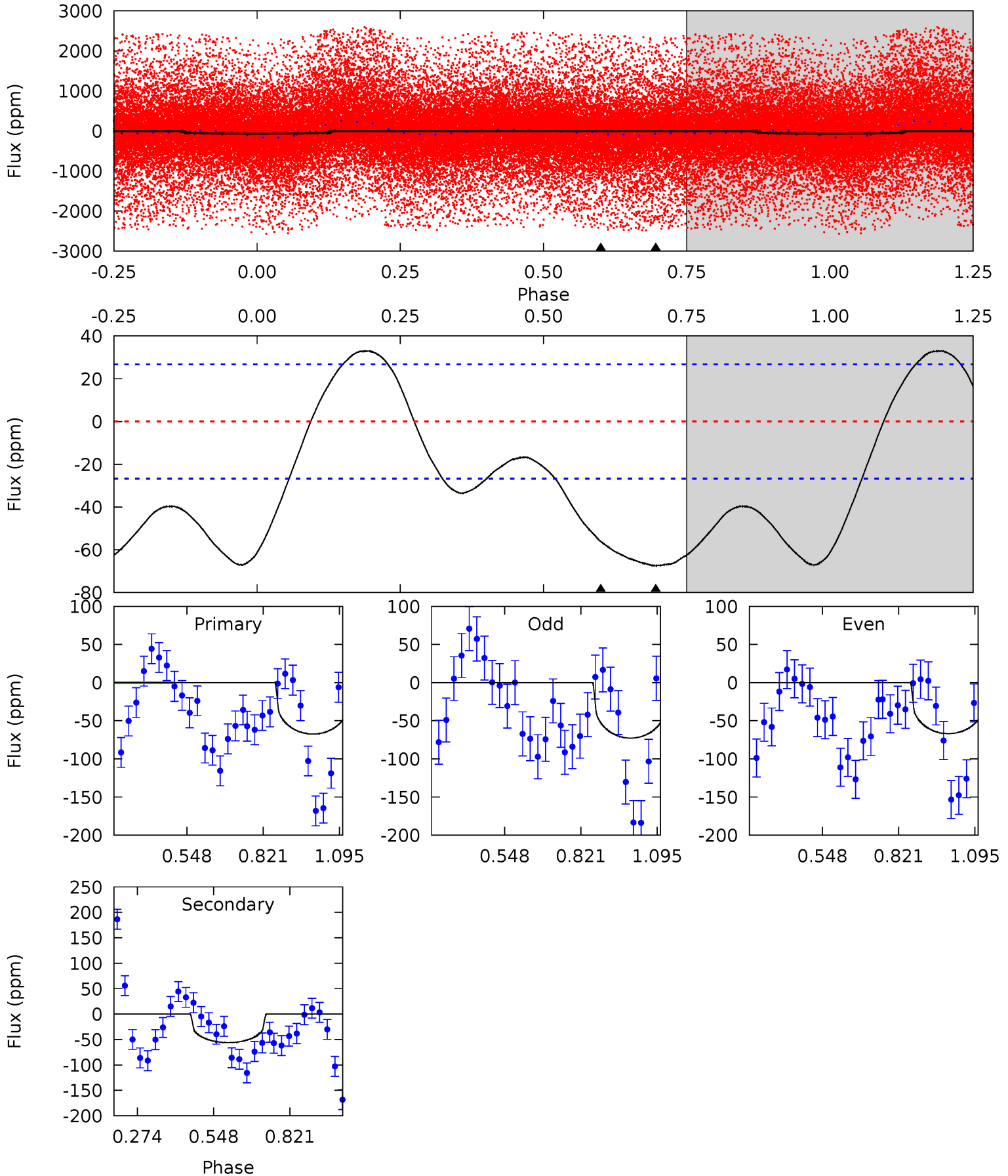
TCE 003441423-01 P= 1.805194 Days  $T_0=132.317927$  (BKJD)



# DV Model-Shift Uniqueness Test

003441423-01, P = 1.805107 Days, E = 132.300794 Days

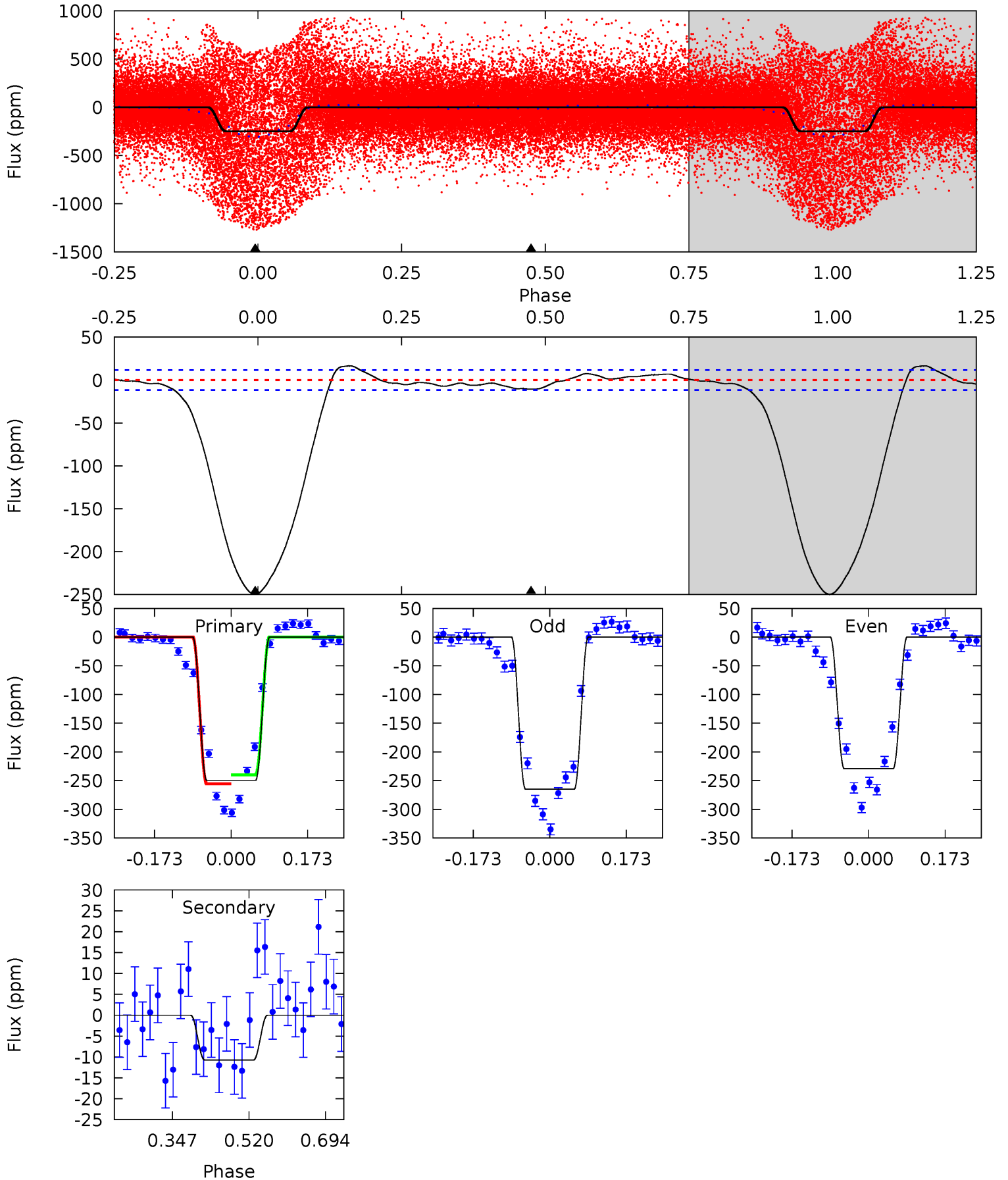
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	9.12	0	0	4.35	1.09	5.24	11.0	11.0	9.12	9.12	0.49	1.00	0.33	4.39



# Alt Model-Shift Uniqueness Test

003441423-01, P = 1.805194 Days, E = 132.317927 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
95.5	4.10	0	0	4.45	1.36	1.86	95.5	95.5	4.10	4.10	6.74	1.85	0.06	0



### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-56 \pm 6$	$0.90^{+0.36}_{-0.37}$	$1866^{+50}_{-38}$	$4942^{+1395}_{-669}$	$31^{+59}_{-16}$
Alt.	$-11 \pm 3$	$1.94^{+0.39}_{-0.41}$	$1866^{+53}_{-41}$	$2794^{+247}_{-236}$	$1.281^{+0.828}_{-0.492}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

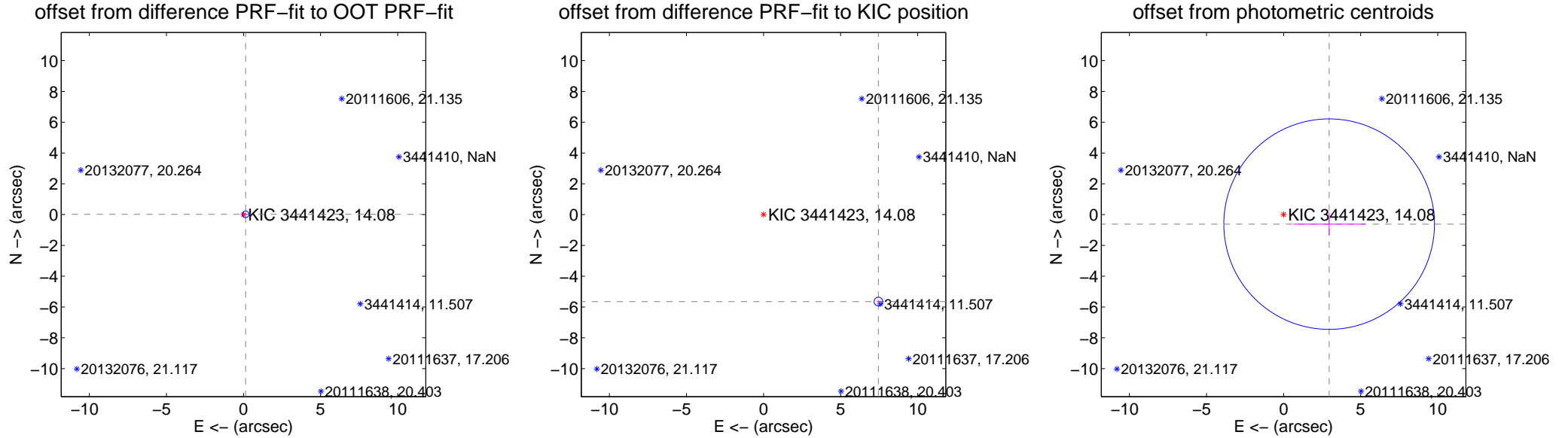
## DV Centroid Data

Supplemental centroid analysis for 003441423-01. Kepler magnitude: 14.08. Transit SNR 7.71

There are 7 quarters with good PRF difference image offsets

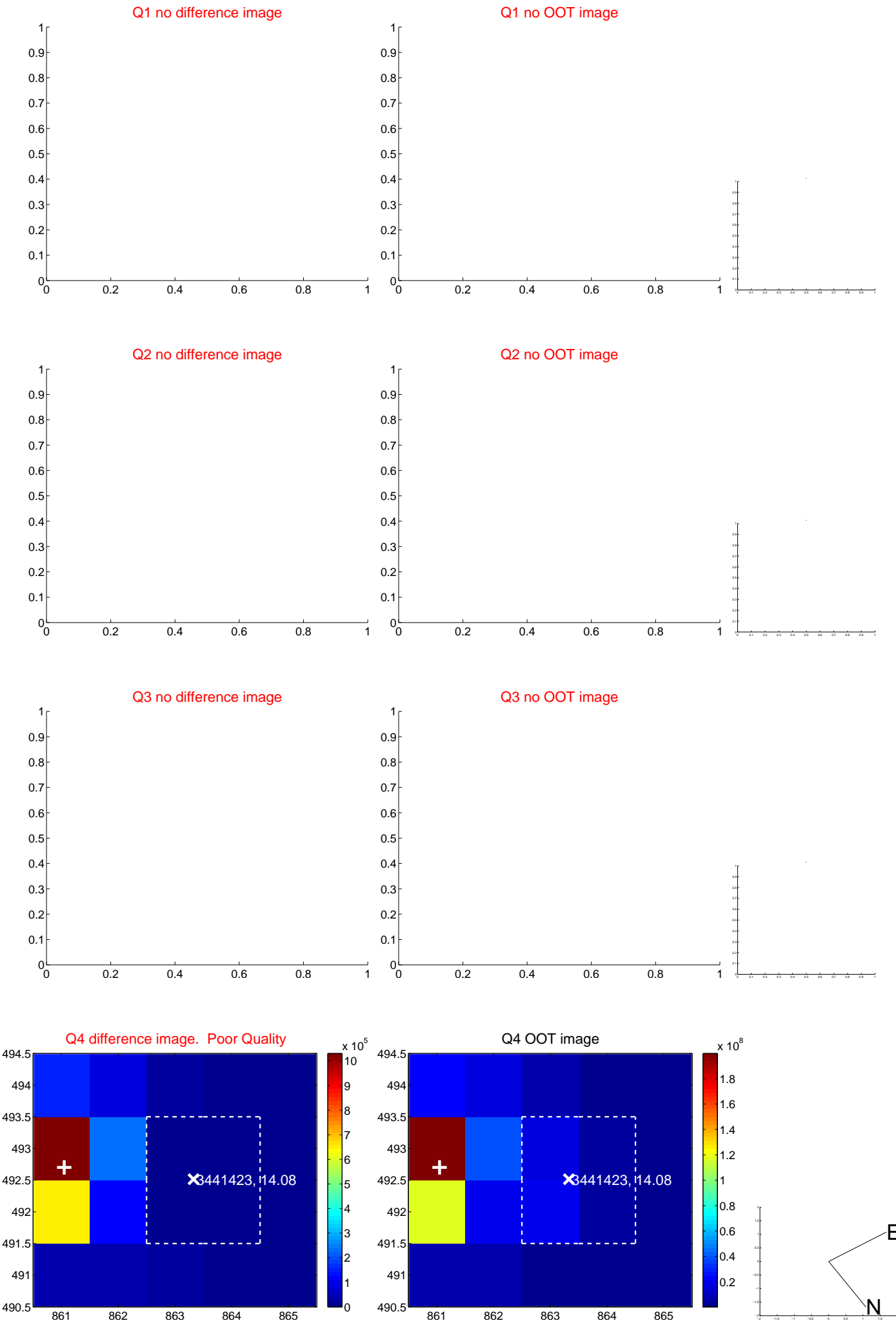
The OOT PRF centroid is offset from the target star catalog position by about 9.38 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.136 \pm 0.072$	1.89	$-0.135 \pm 0.072$	$0.021 \pm 0.068$
PRF-fit source offset from KIC position	$9.350 \pm 0.094$	99.15	$-7.452 \pm 0.085$	$-5.647 \pm 0.080$
photometric centroid source offset	$3.02 \pm 2.28$	1.33	$-2.96 \pm 2.32$	$-0.62 \pm 0.74$



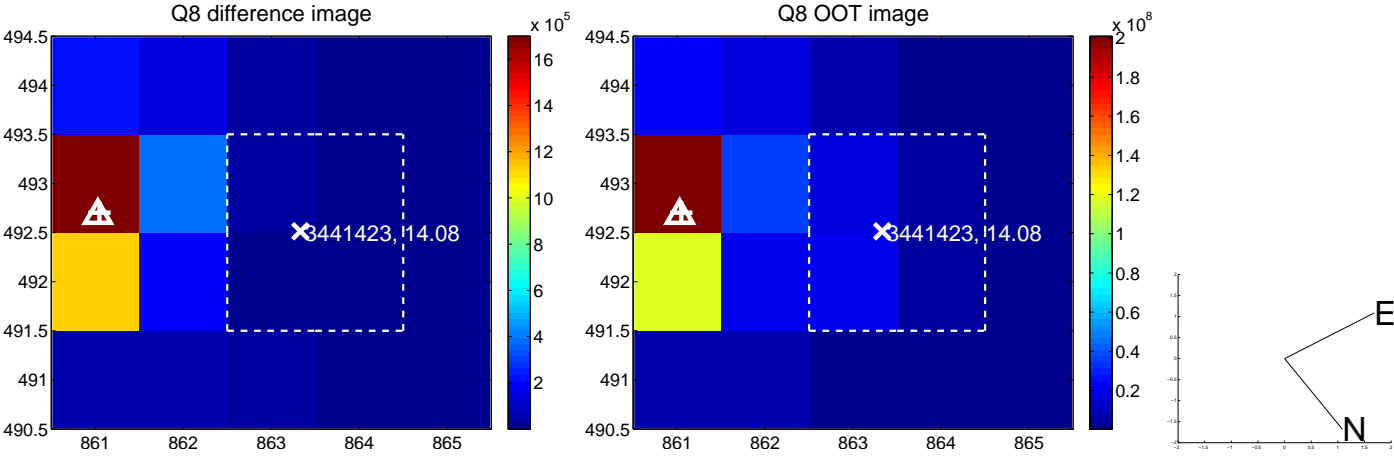
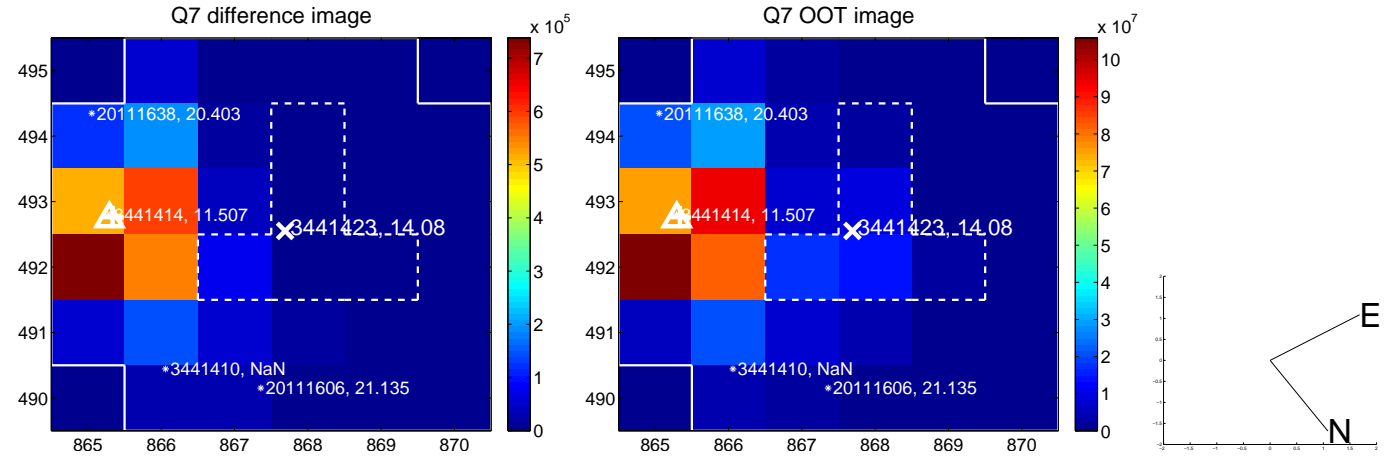
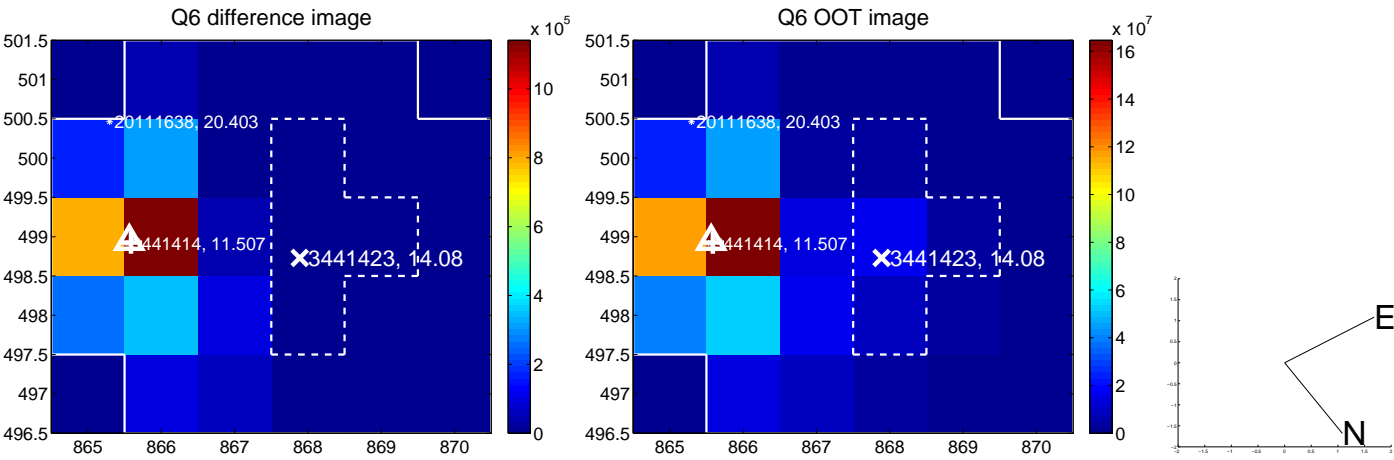
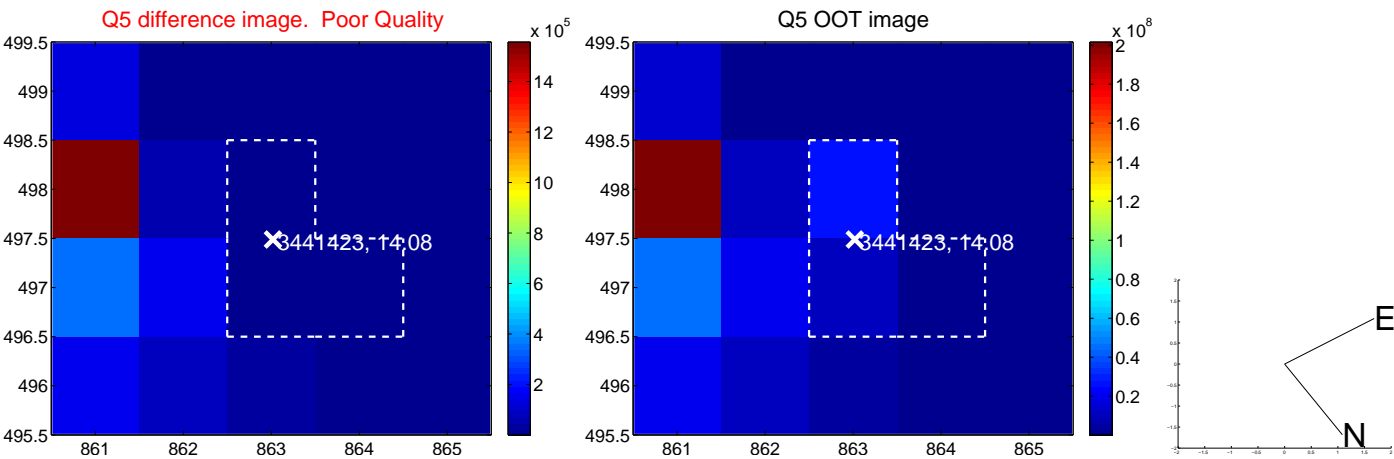
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

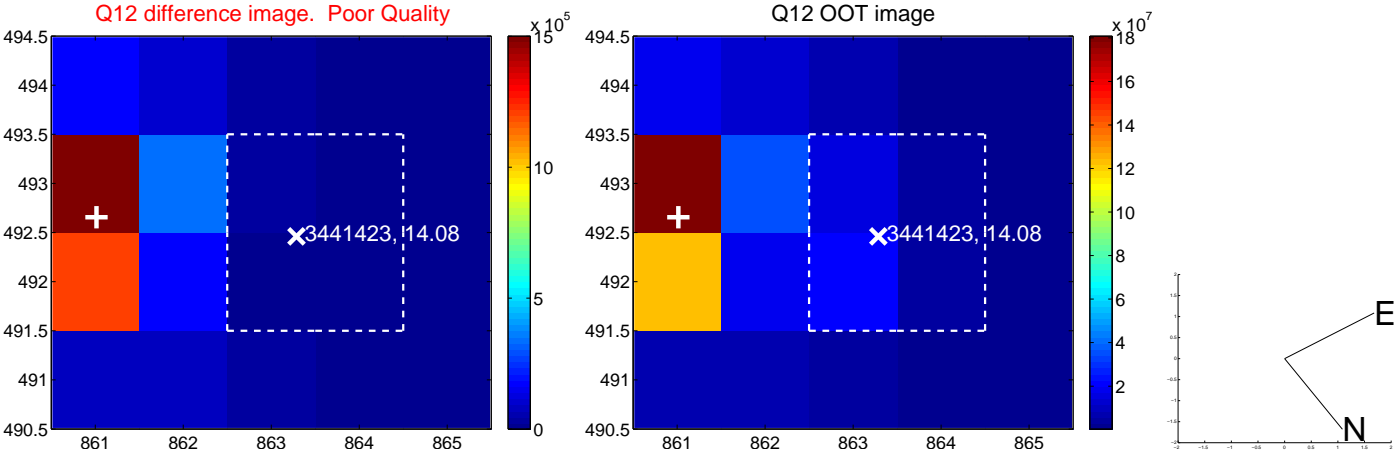
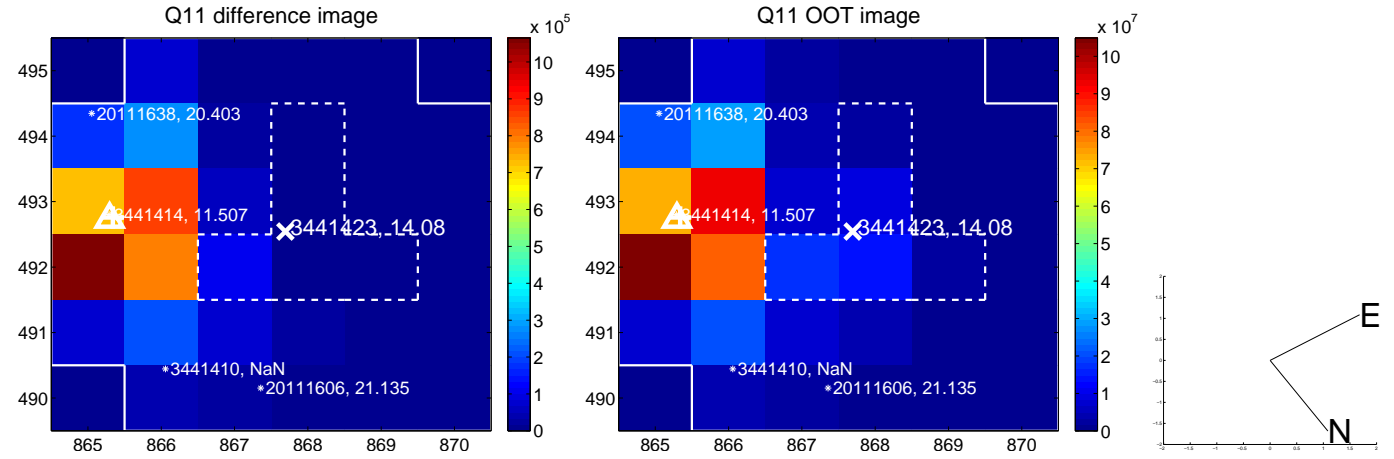
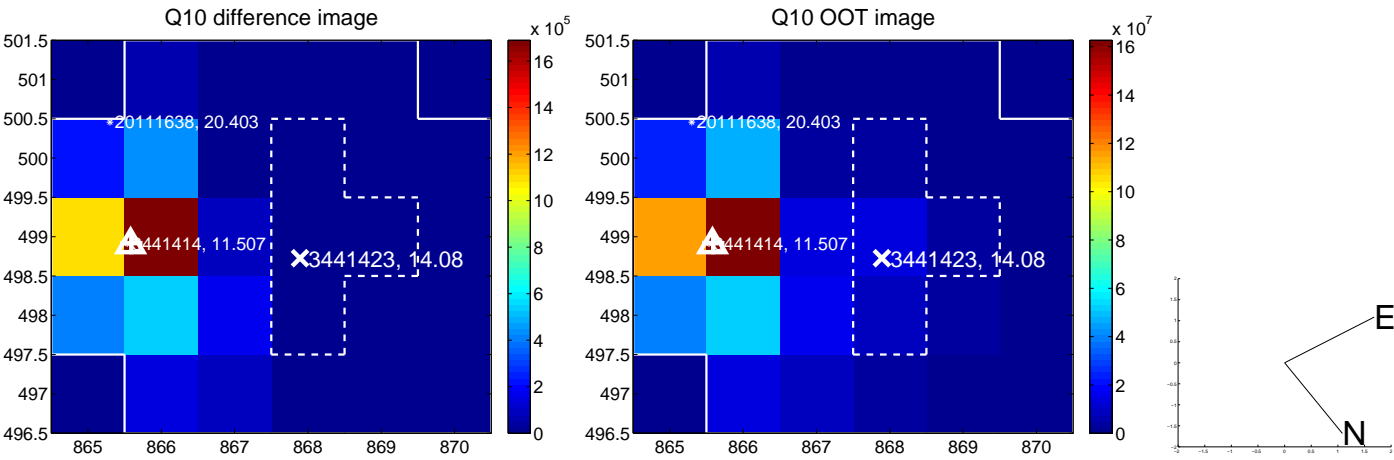
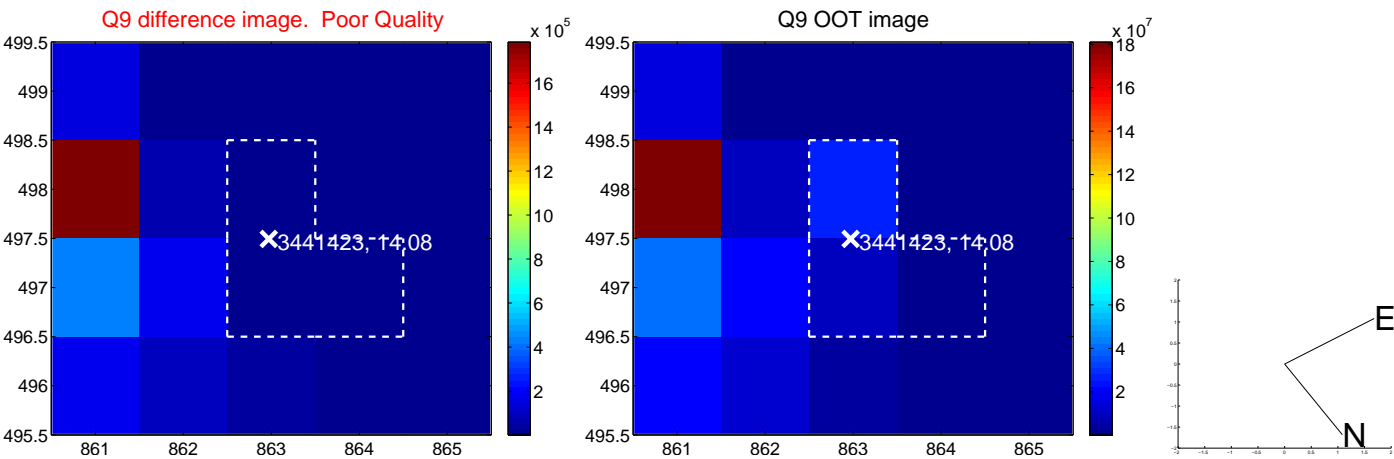




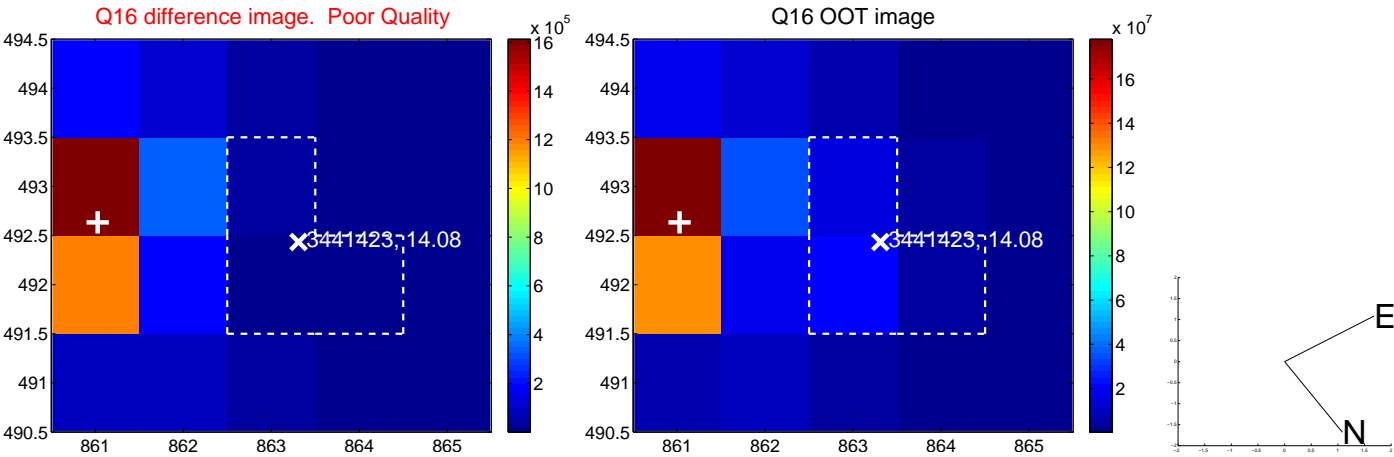
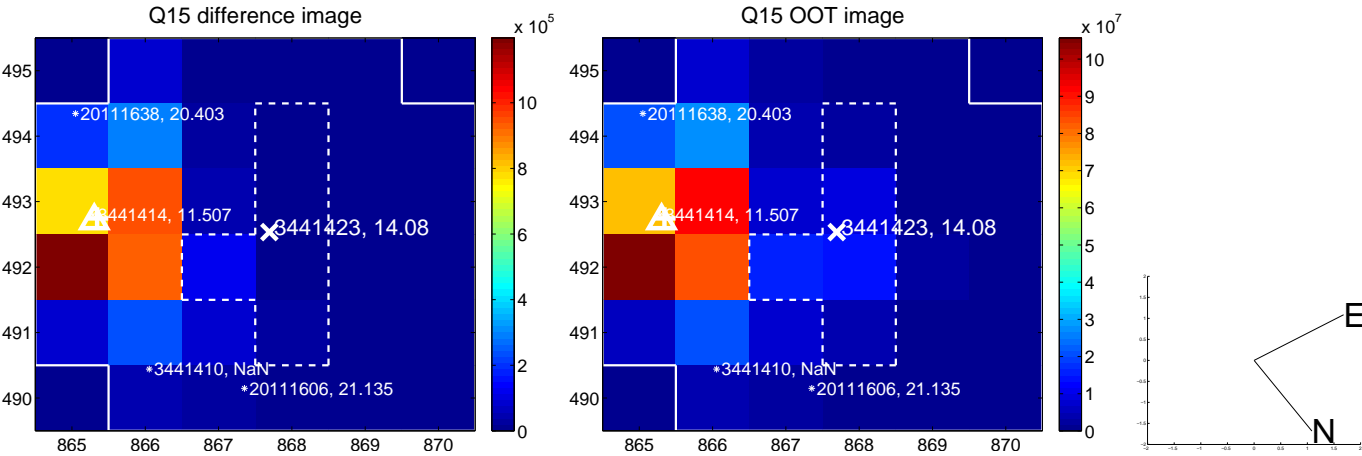
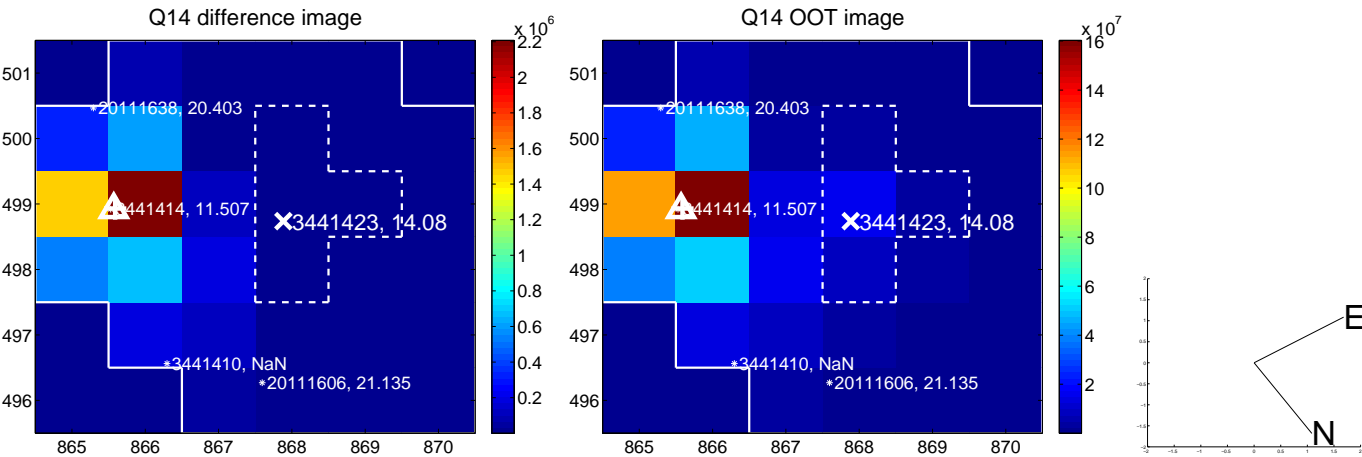
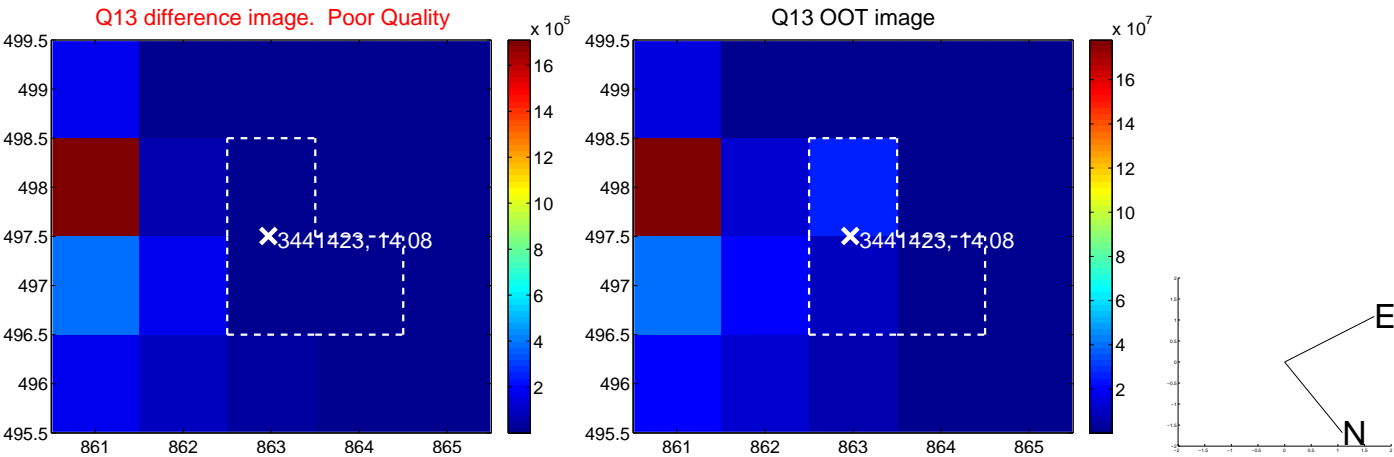
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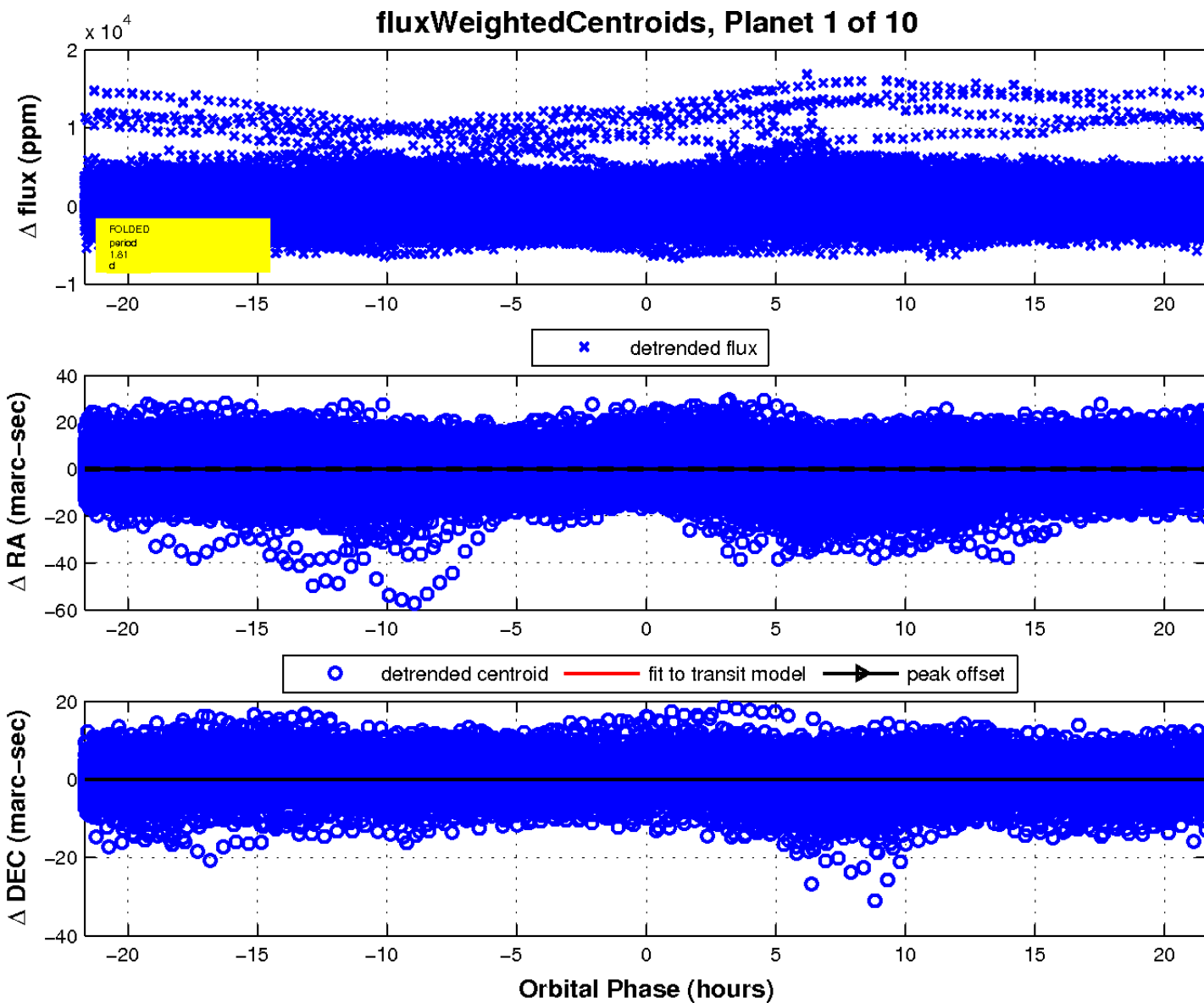
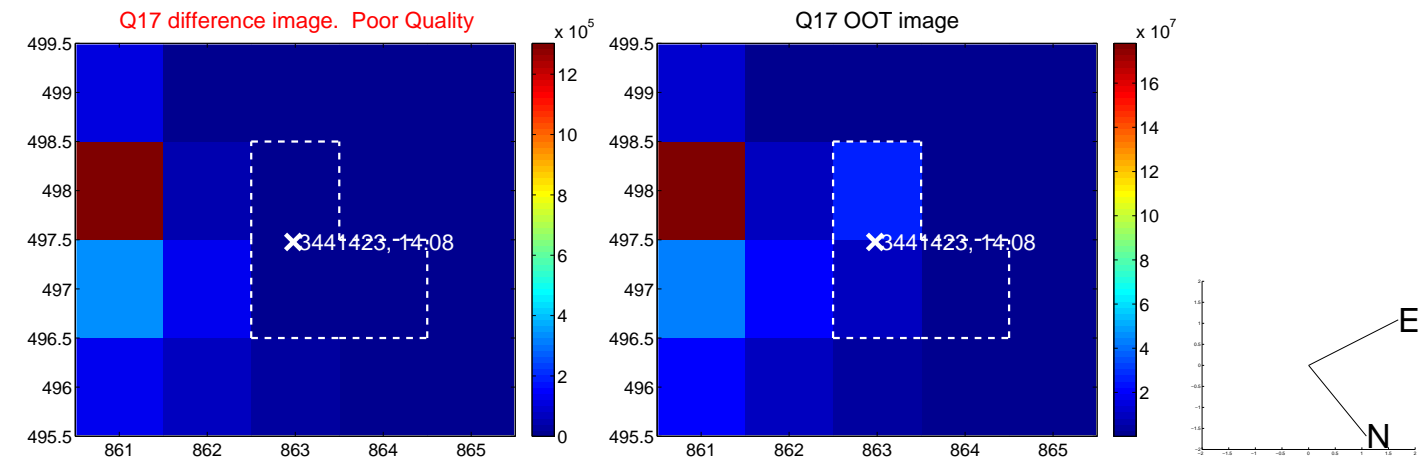
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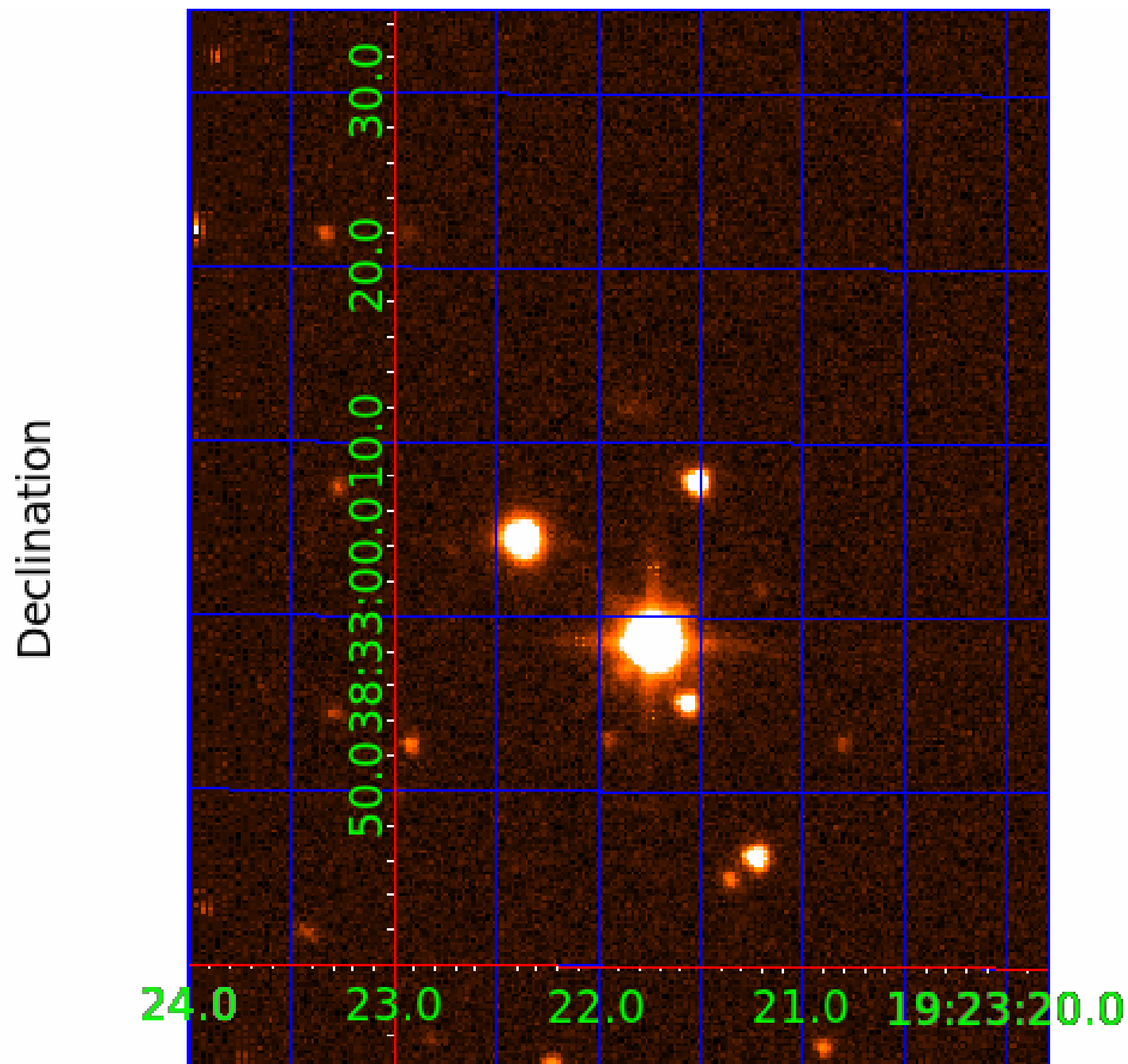
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UKIRT Image



## KIC 003441423

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003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

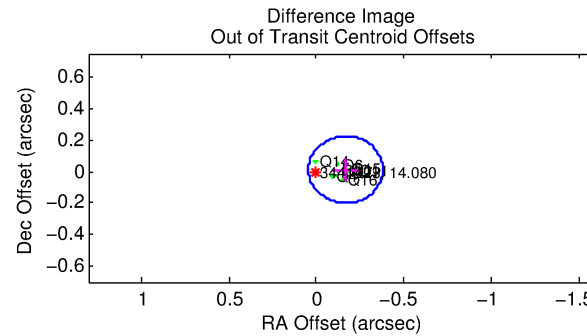
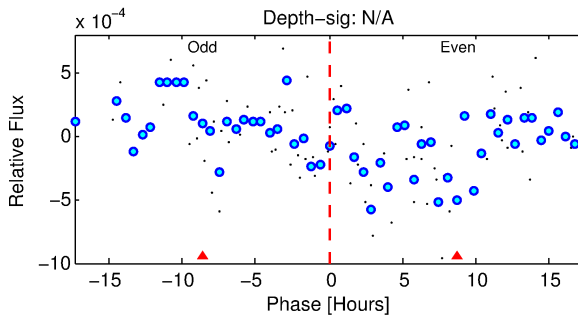
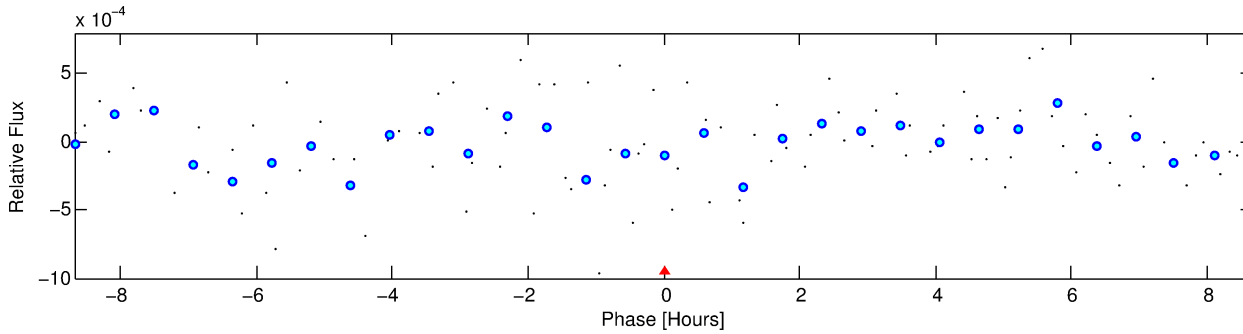
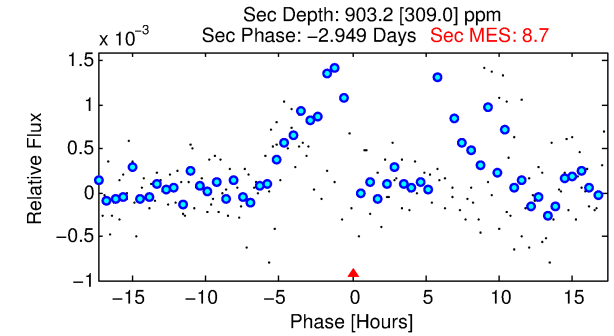
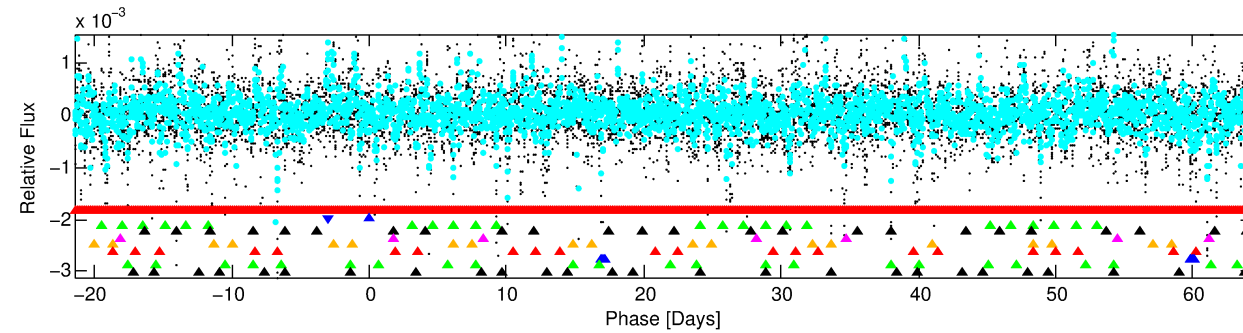
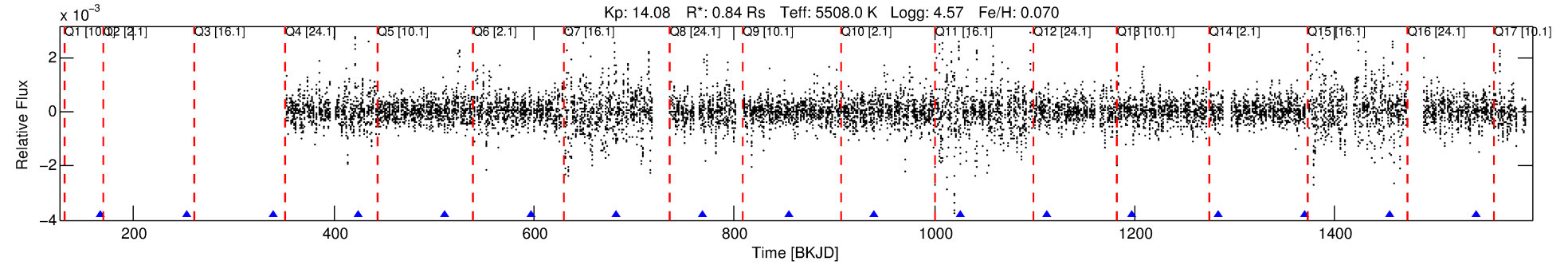


Ephemeris Match Information For 003441423-02

No Significant Match Found

# DV One-Page Summary

KIC: 3441423 Candidate: 2 of 10 Period: 85.856 d



## TPS TCE Results:

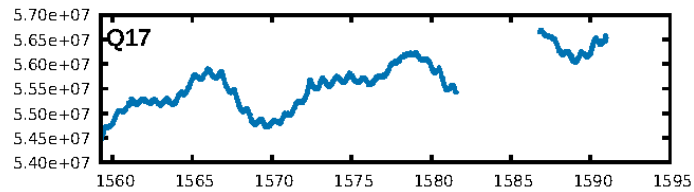
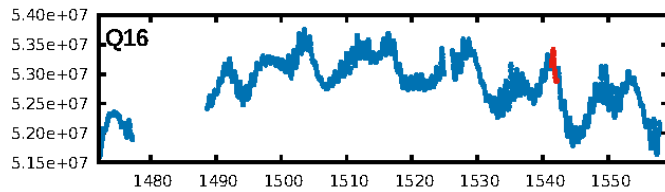
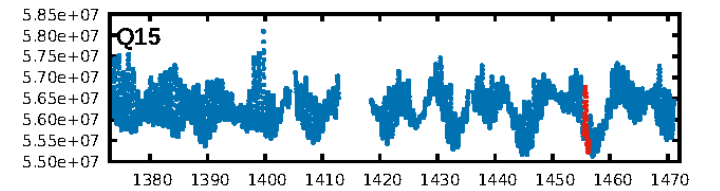
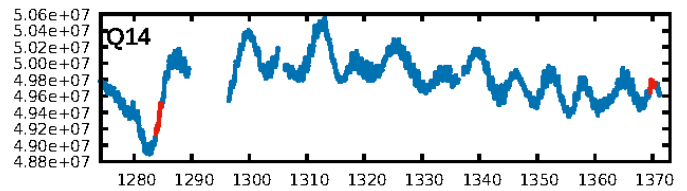
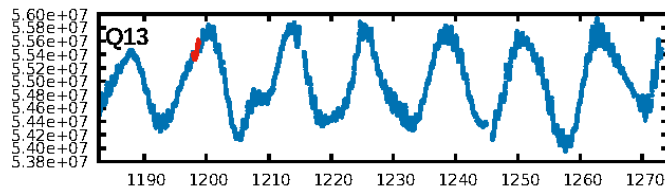
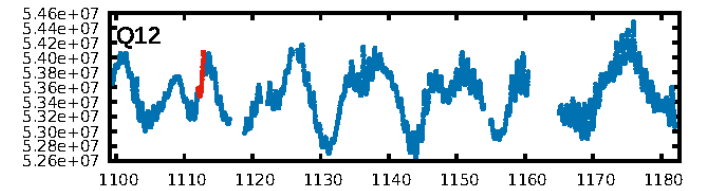
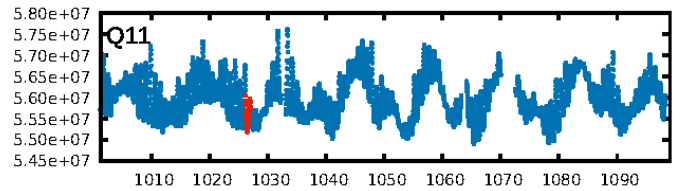
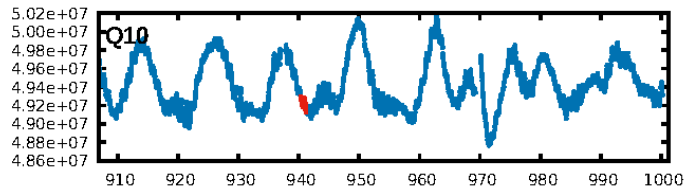
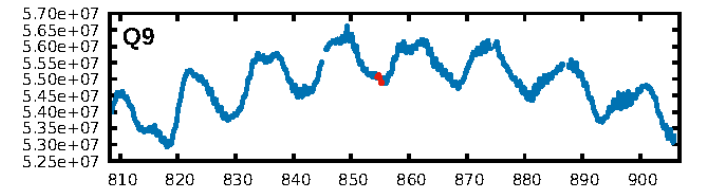
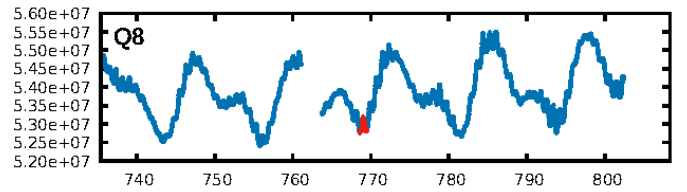
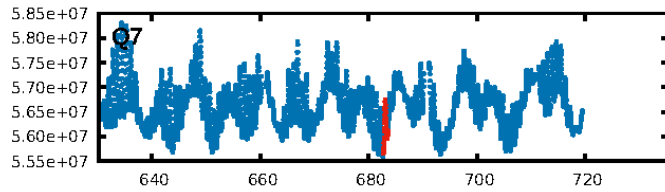
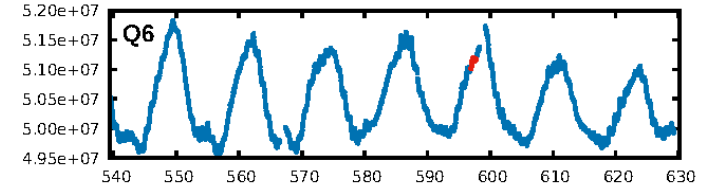
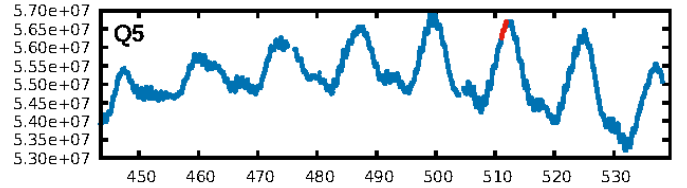
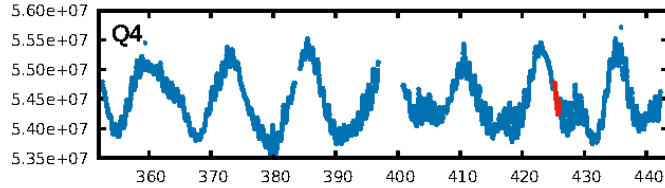
Period = 85.85646 d  
Epoch = 168.0462 BKJD

DV fit results are unavailable

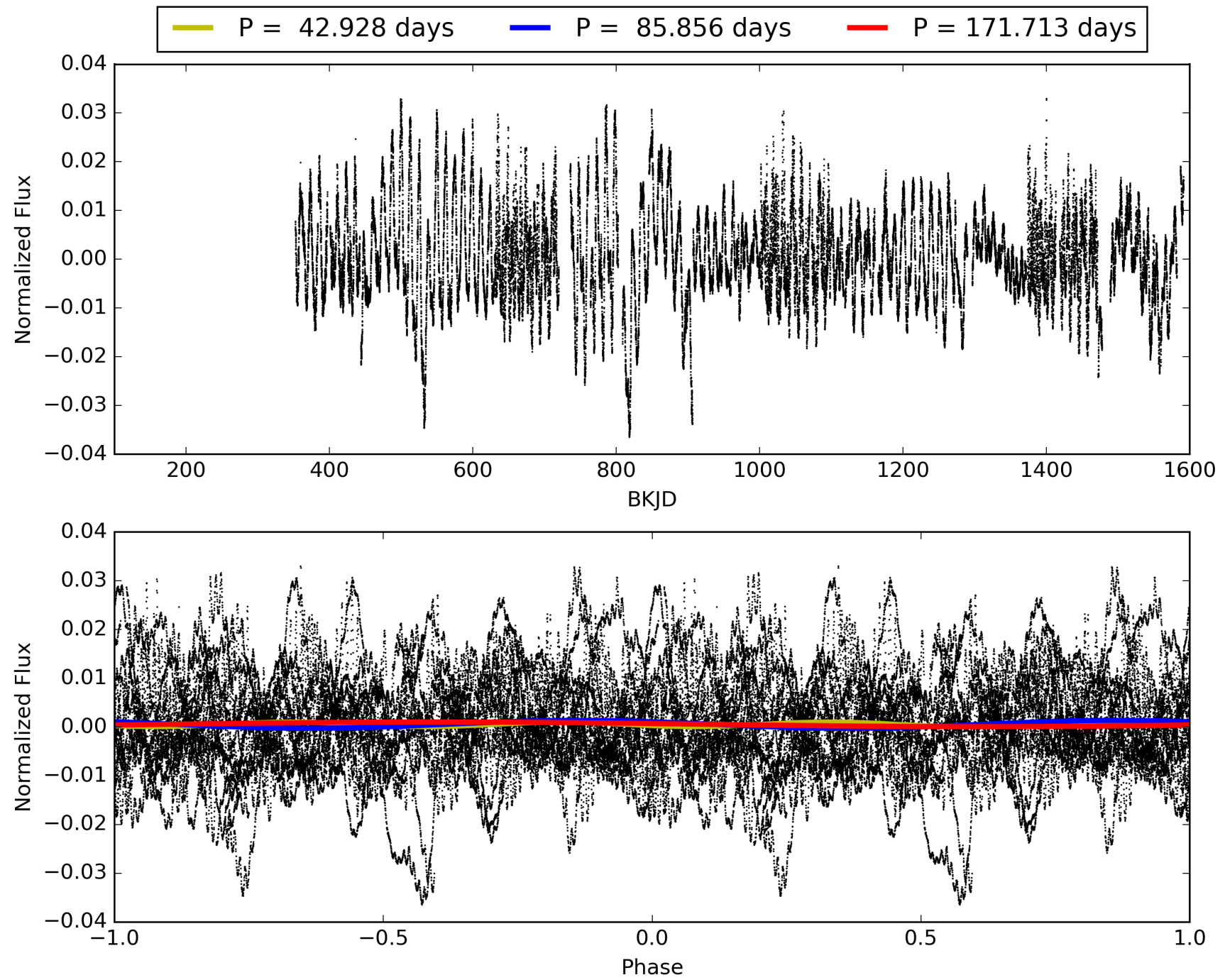
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [13.94 $\sigma$ ]  
LongPeriod-sig: 100.0% [46.41 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.40e-285  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -7.055  
Centroid-sig: 53.5%  
Centroid-so: 3.937 arcsec [1.33 $\sigma$ ]  
OotOffset-rm: 0.167 arcsec [2.36 $\sigma$ ]  
**KicOffset-rm: 9.456 arcsec [114.22 $\sigma$ ]**  
KicOffset-st: 3/3/2/0 [8]  
KicOffset-st: 3/3/2/0 [8]  
DiffImageQuality-fgm: 0.62 [5/8]  
DiffImageOverlap-fno: 0.31 [4/13]

# TCE 003441423-02, PDC Light Curves

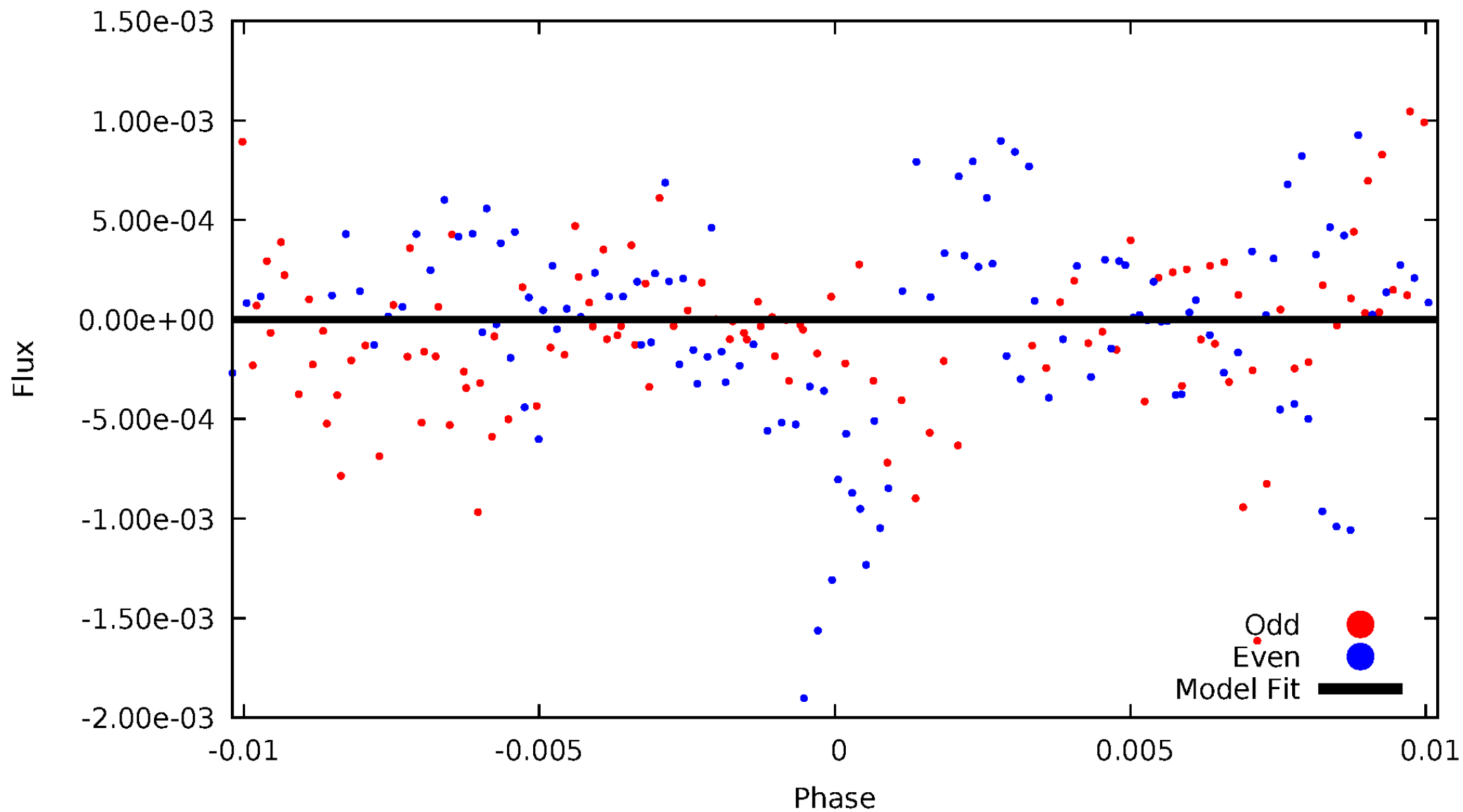


TCE 003441423-02



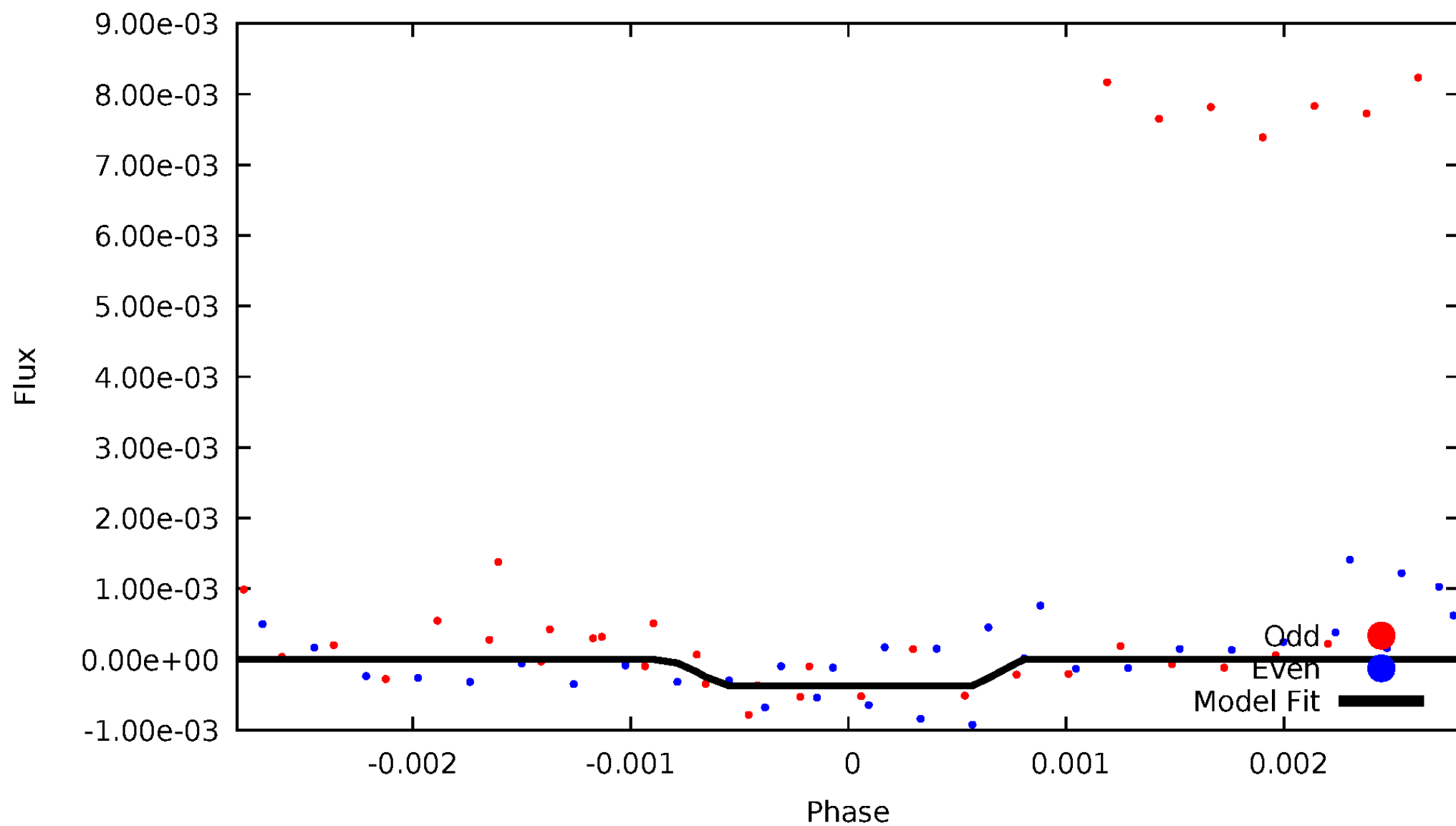
# DV Odd/Even

TCE 003441423-02



# ALT Odd/Even

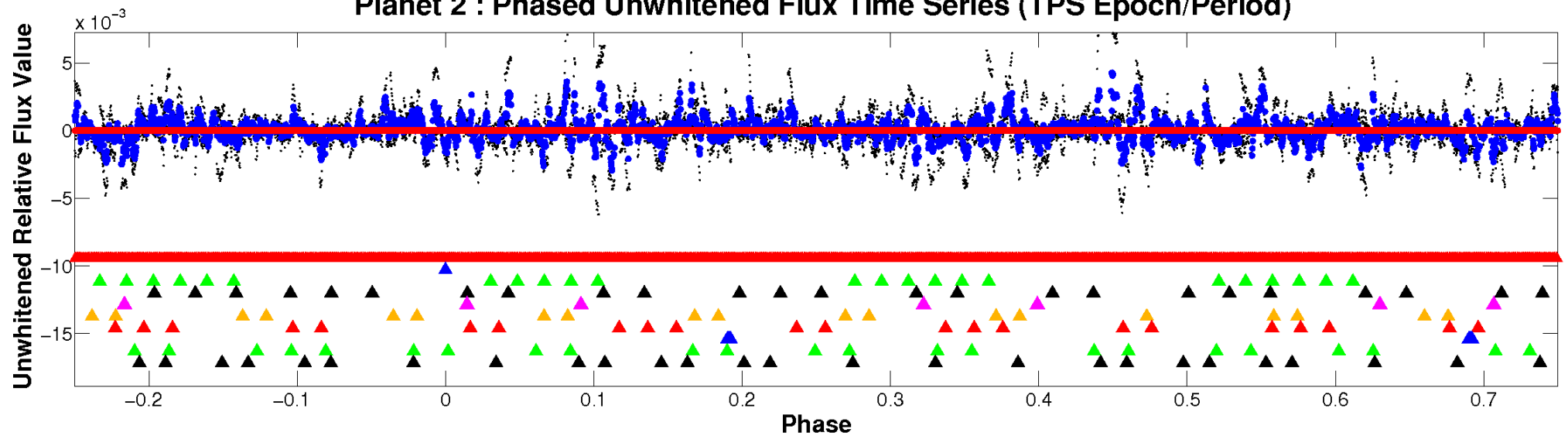
TCE 003441423-02



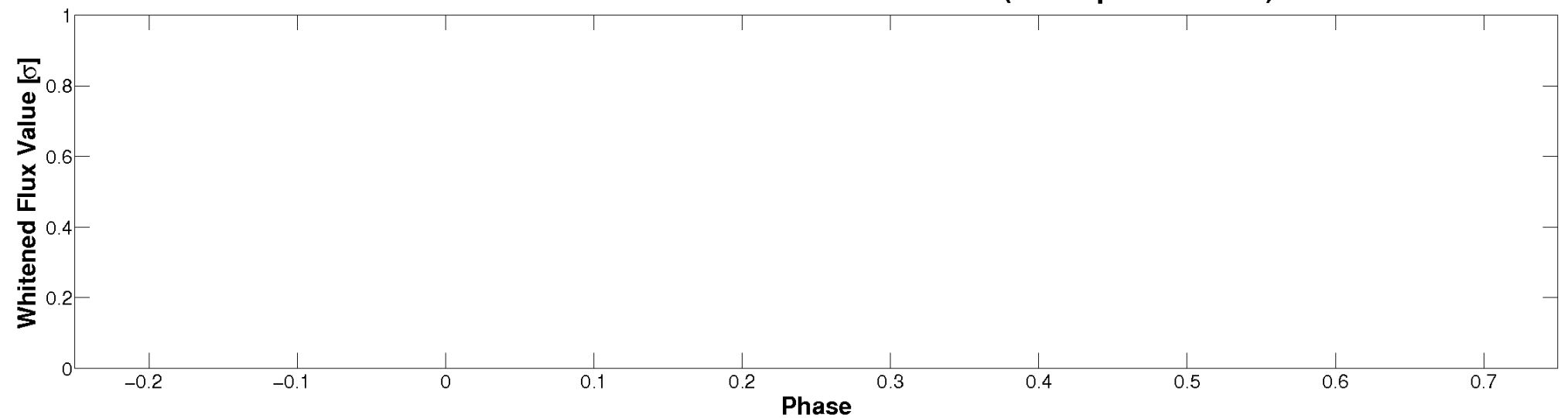


# Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)

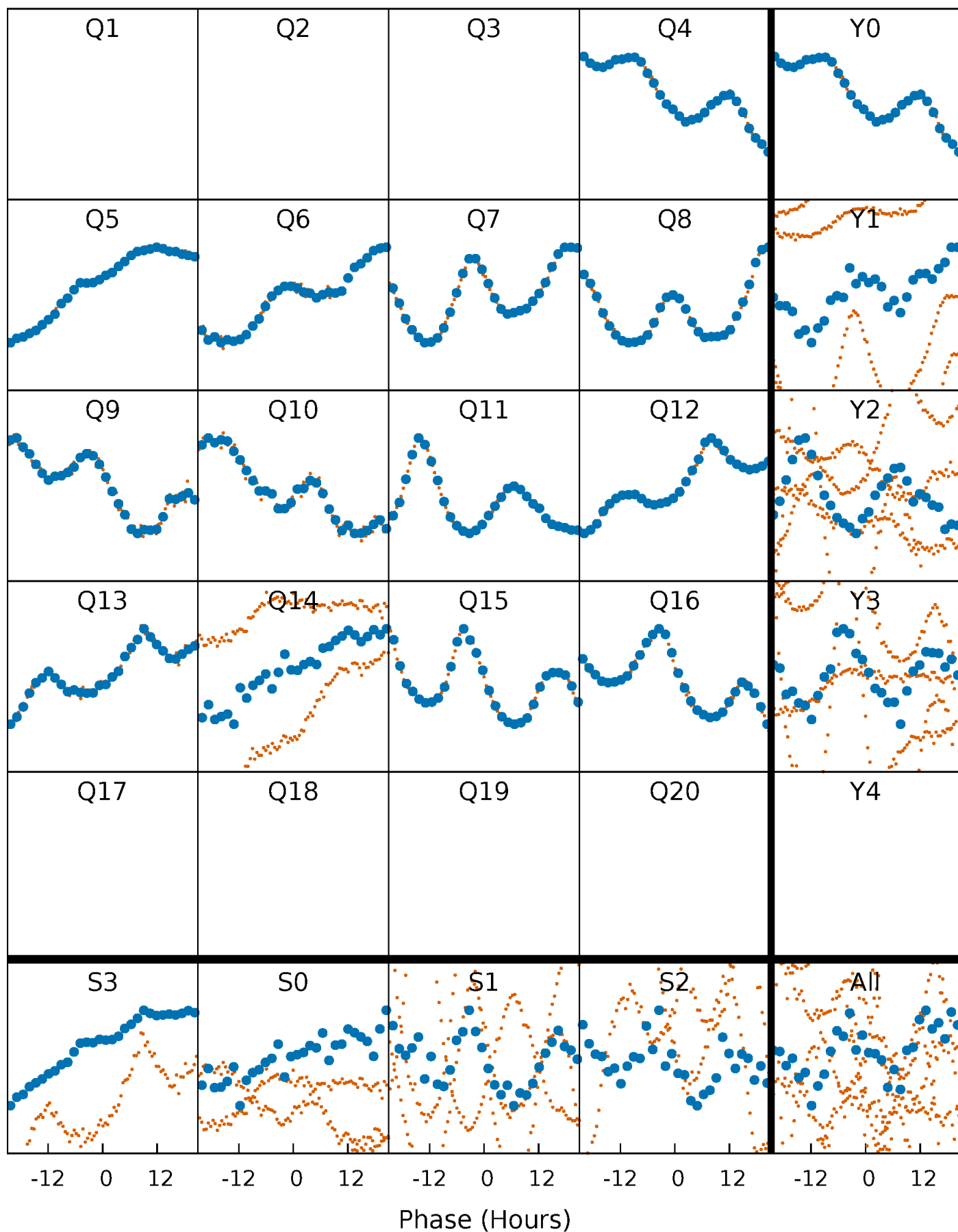


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



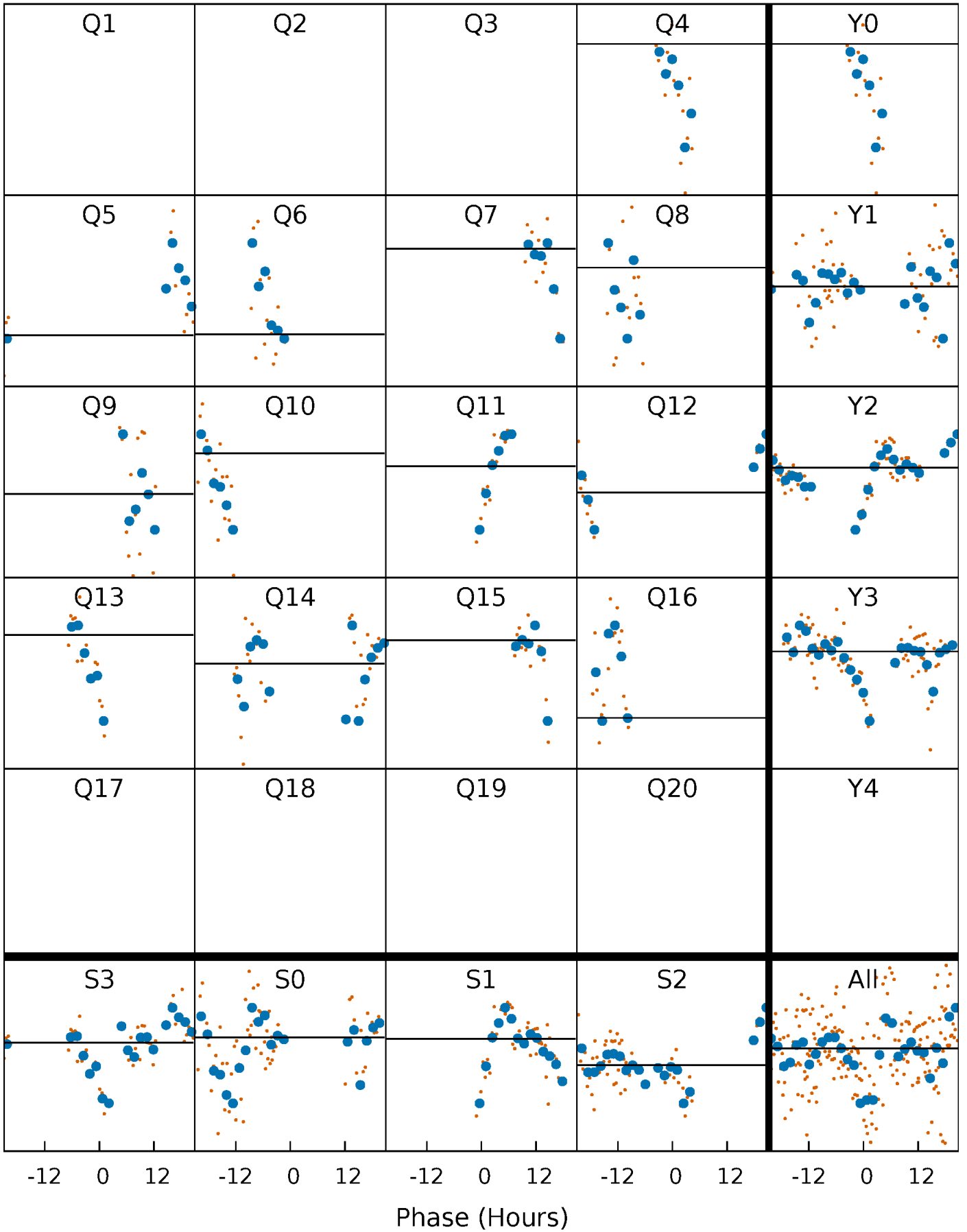
# PDC Quarter-Phased Transit Curves

TCE 003441423-02 P= 85.856457 Days  $T_0=168.046199$  (BKJD)



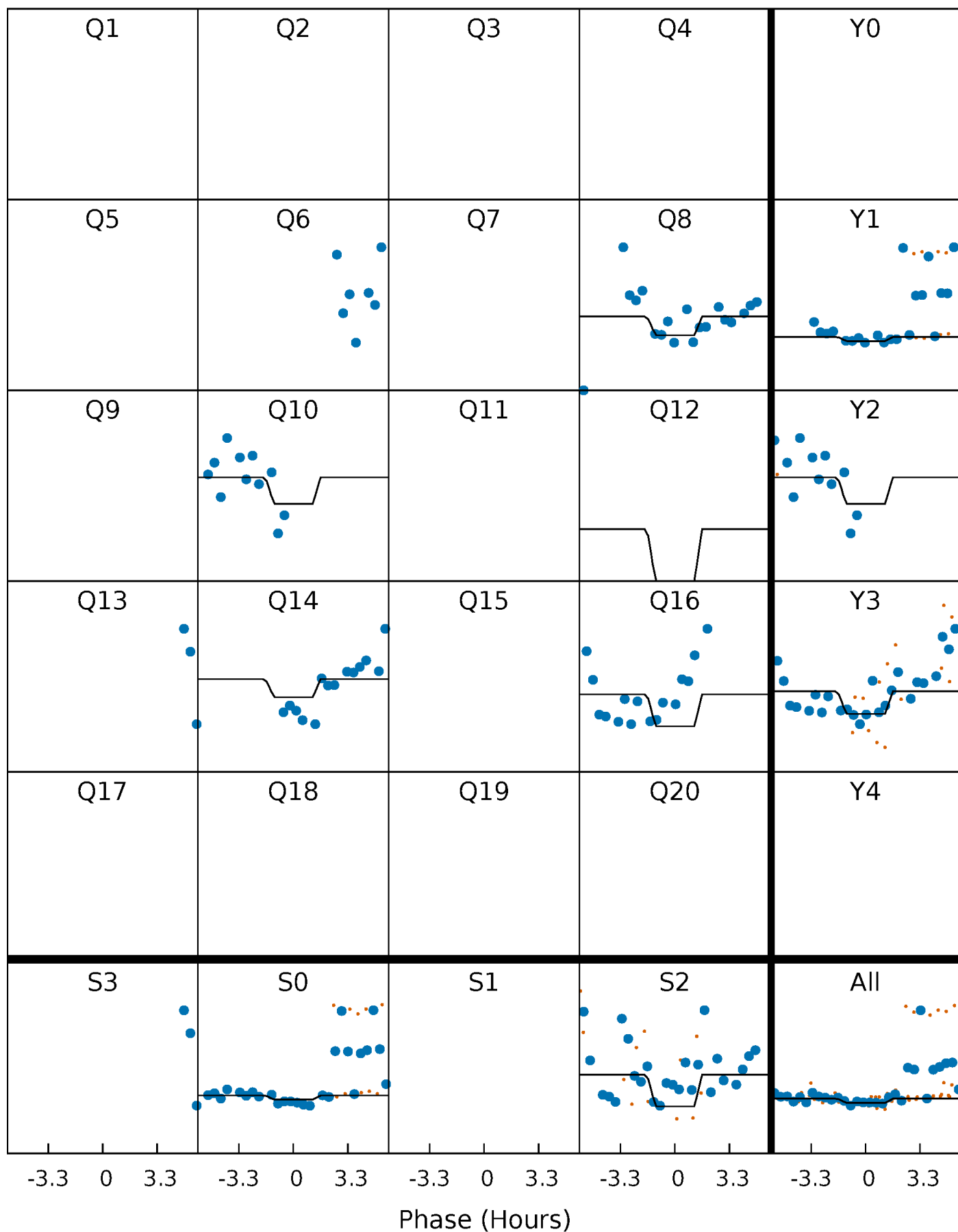
# DV Quarter-Phased Transit Curves

TCE 003441423-02   P= 85.856457 Days    $T_0=168.046199$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

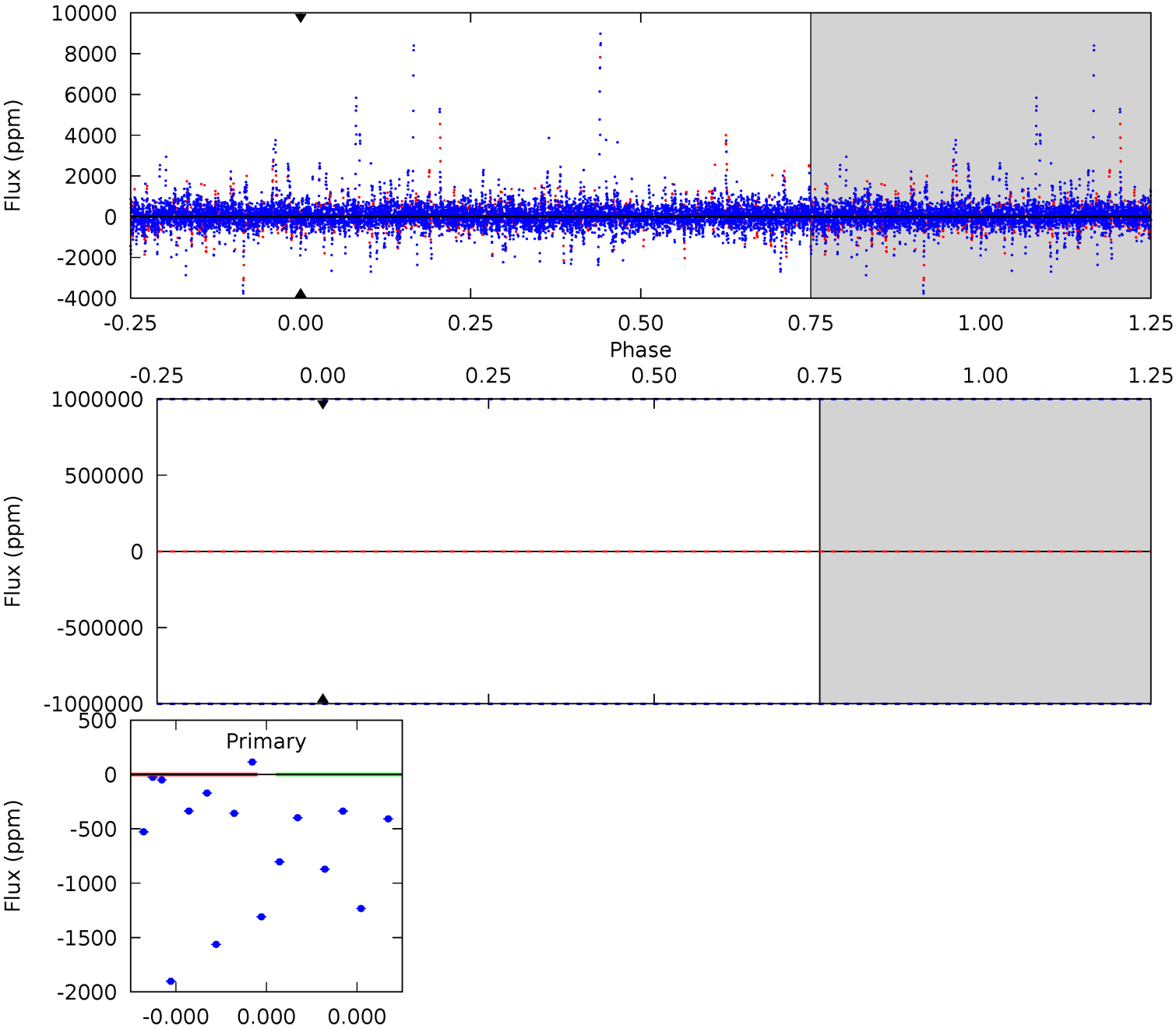
TCE 003441423-02 P= 85.856457 Days  $T_0=167.566898$  (BKJD)



# DV Model-Shift Uniqueness Test

003441423-02, P = 85.856457 Days, E = 168.046199 Days

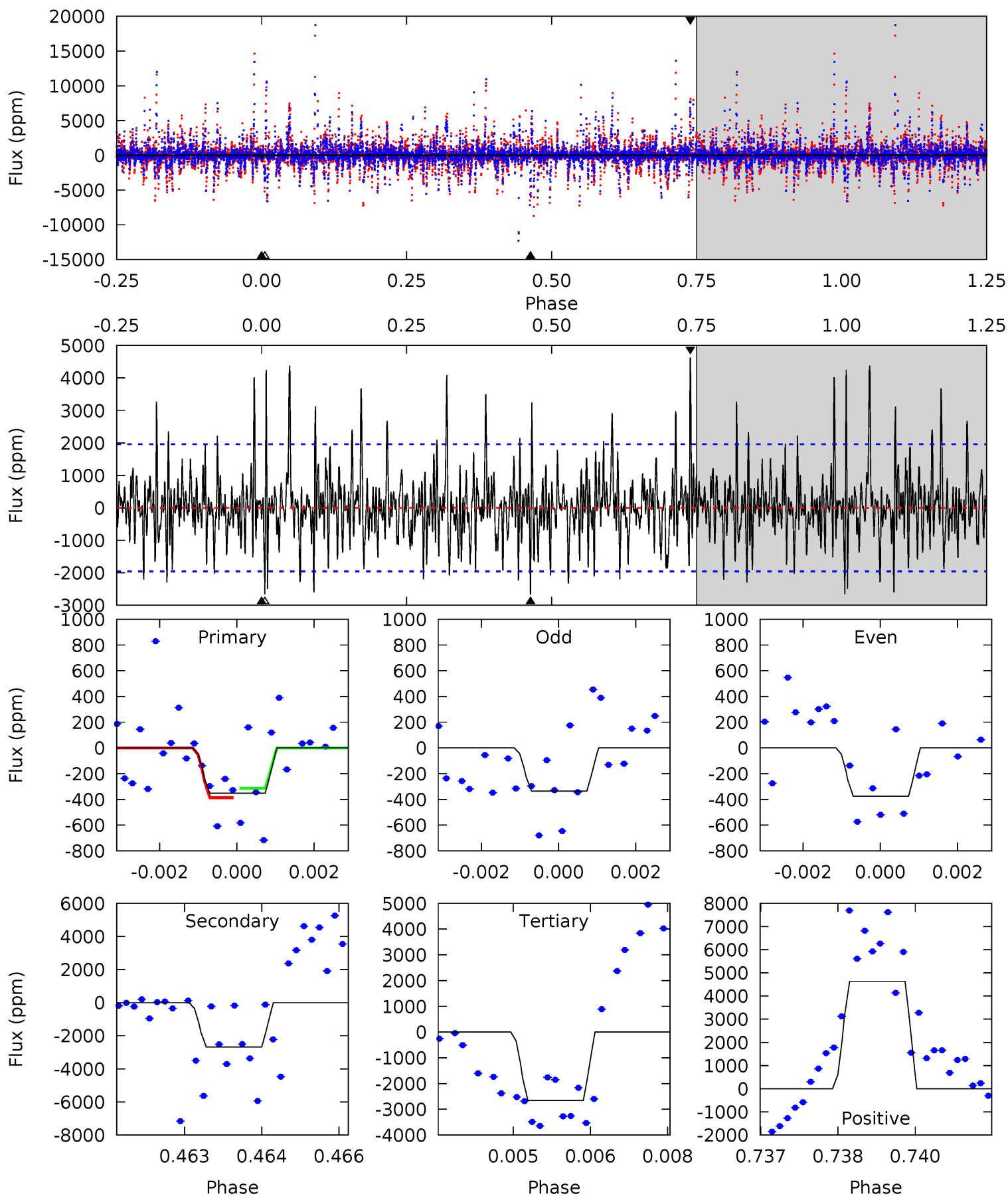
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

003441423-02, P = 85.856457 Days, E = 167.566898 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.97	7.36	7.29	12.7	5.37	3.16	2.37	-6.33	-11.7	0.06	-5.35	0.04	0.91	0.63	0.10





### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$9.02^{+7.86}_{-5.90}$	$516^{+14}_{-11}$	$-4651^{+18897}_{-10708}$	$-3668.247^{+149868.094}_{-171137.525}$
Alt.	$-2680 \pm 364$	$7.57^{+7.88}_{-5.40}$	$515^{+14}_{-11}$	$4511^{+4150}_{-971}$	$3452^{+41508}_{-2583}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

## DV Centroid Data

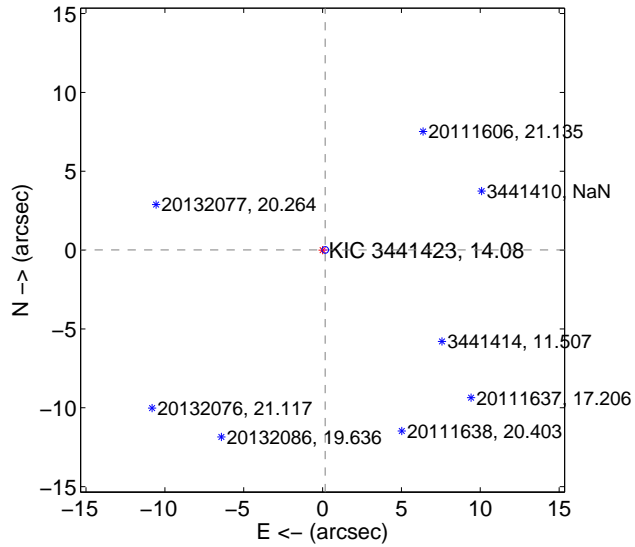
Supplemental centroid analysis for 003441423-02. Kepler magnitude: 14.08. Transit SNR -1.00

There are 5 quarters with good PRF difference image offsets

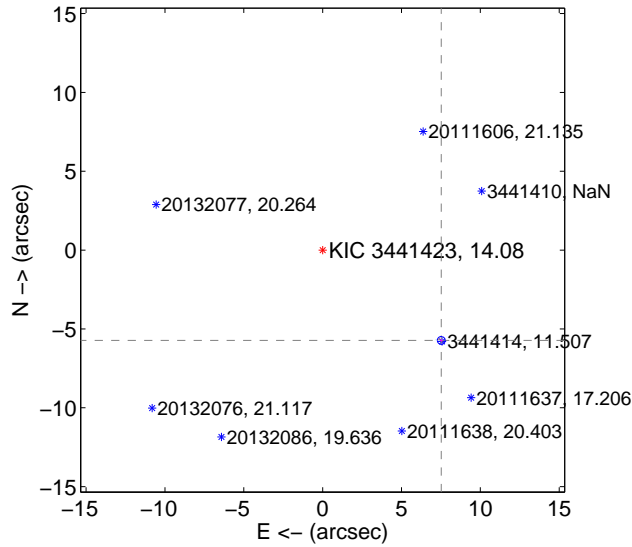
The OOT PRF centroid is offset from the target star catalog position by about 9.20 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.167 \pm 0.071$	2.36	$-0.166 \pm 0.071$	$0.013 \pm 0.068$
PRF-fit source offset from KIC position	$9.456 \pm 0.083$	114.22	$-7.523 \pm 0.082$	$-5.729 \pm 0.071$
photometric centroid source offset	$3.94 \pm 2.95$	1.33	$-3.54 \pm 3.22$	$-1.73 \pm 1.30$

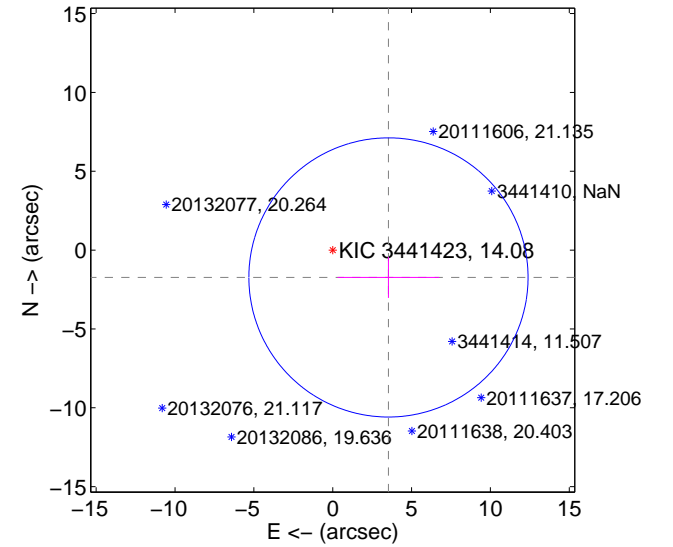
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

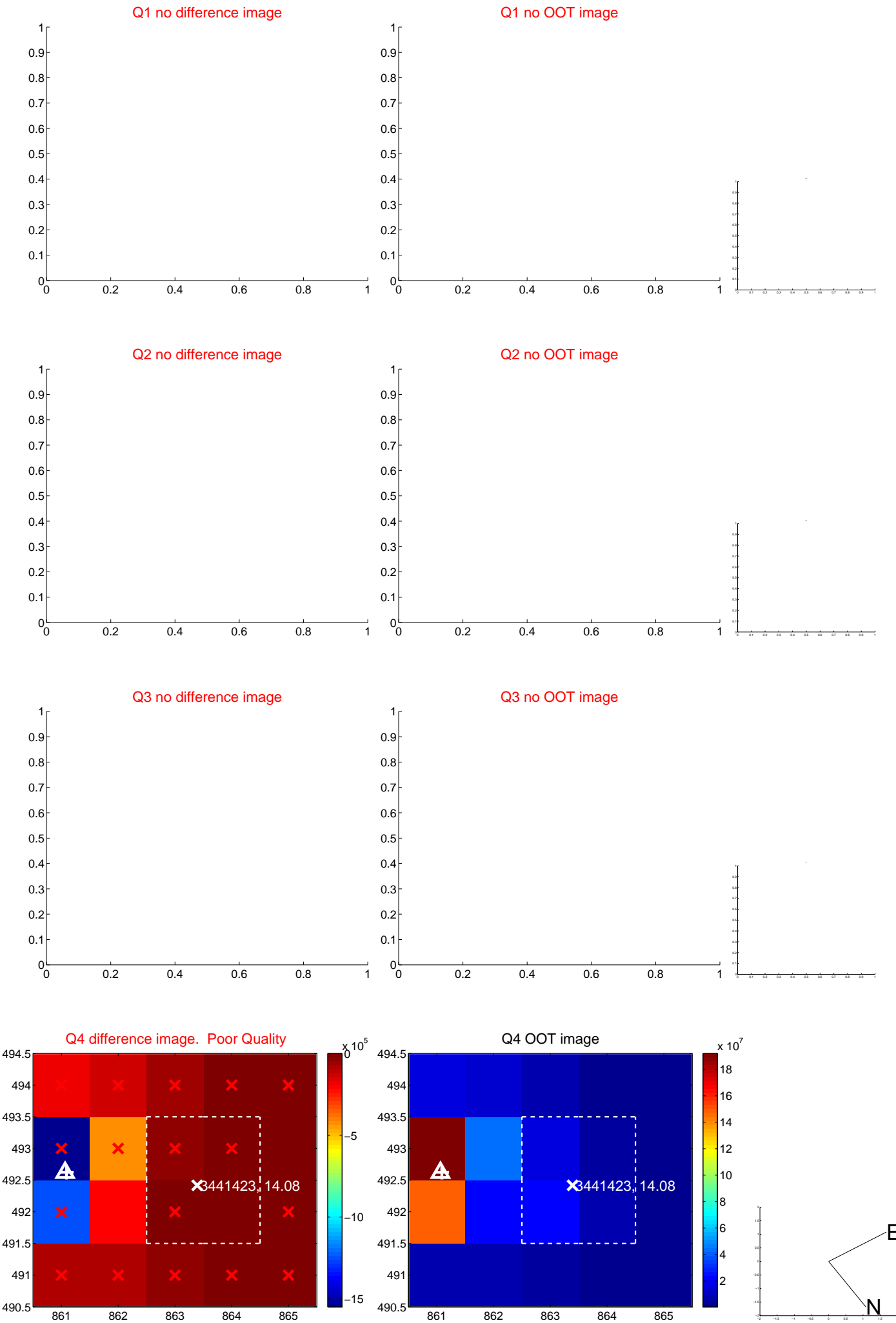


offset from photometric centroids

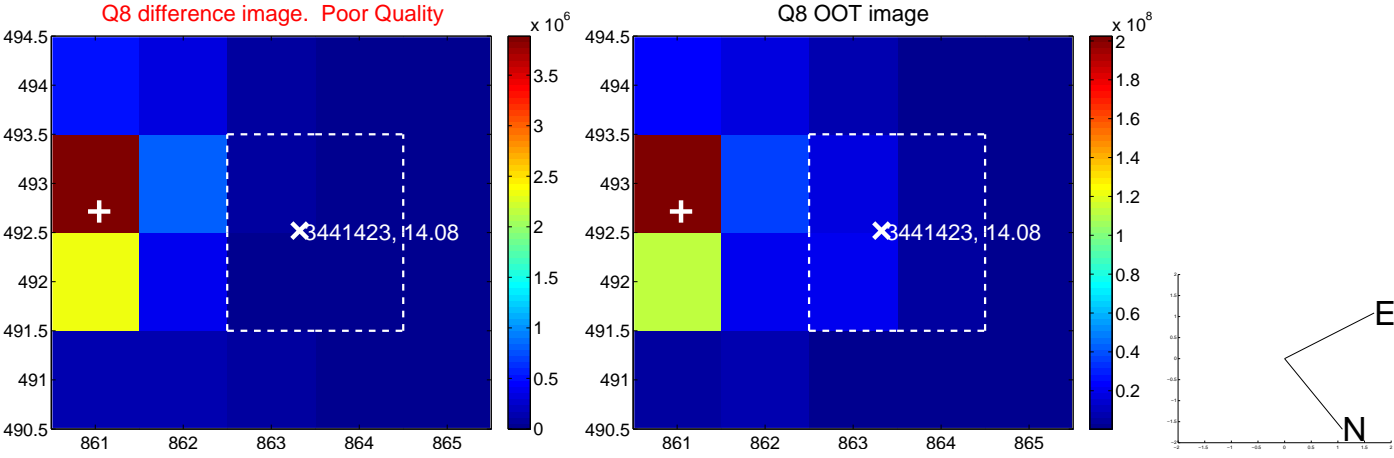
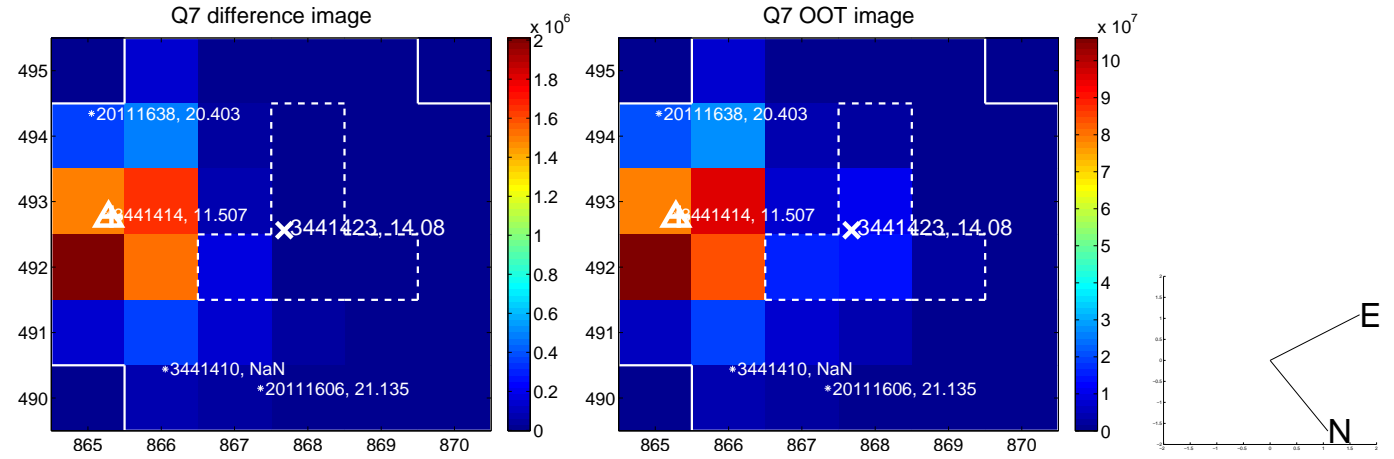
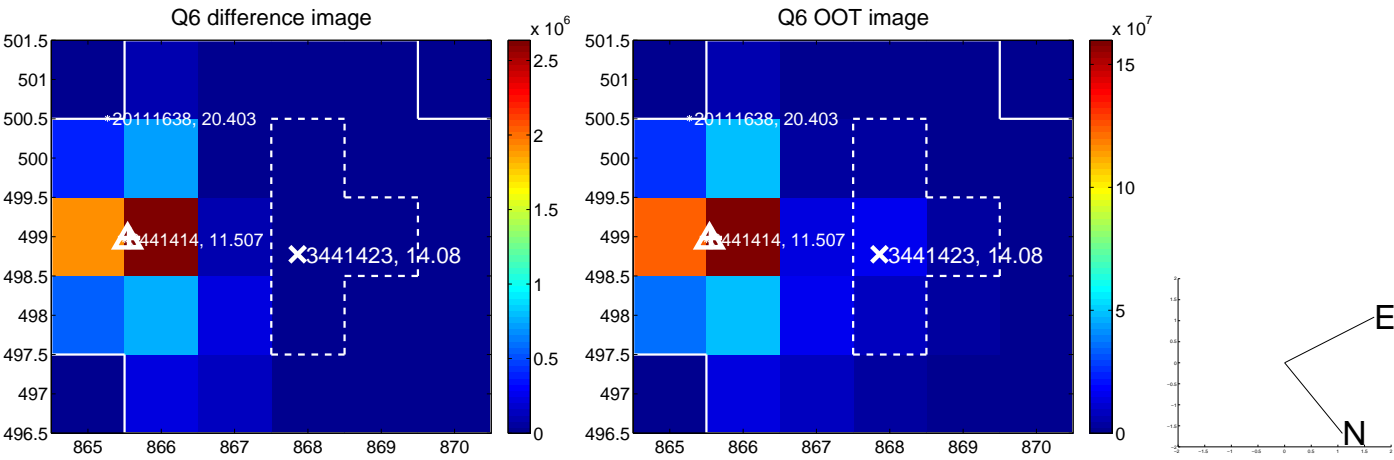
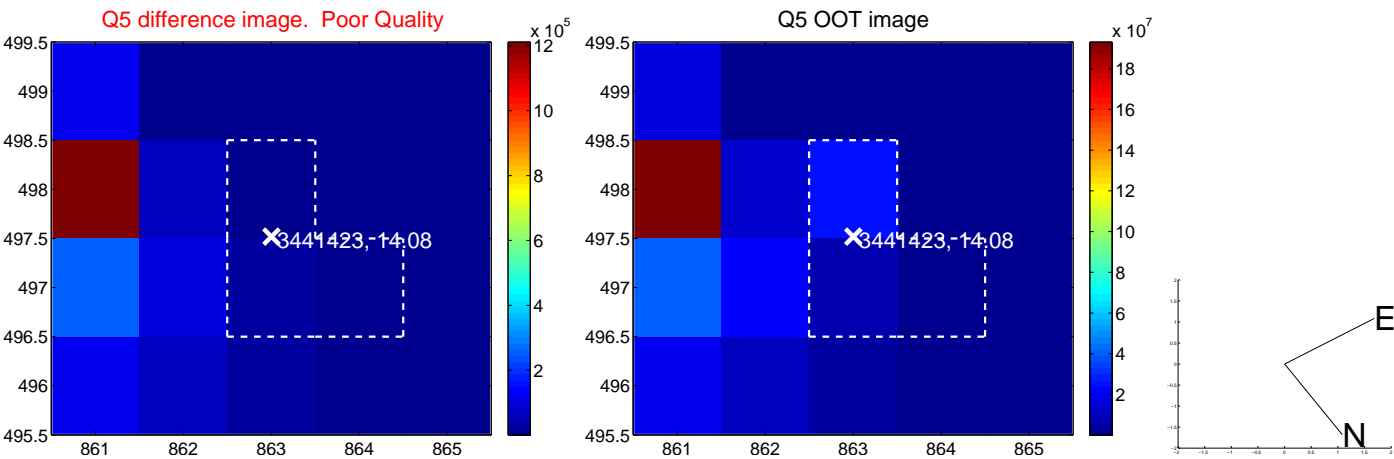


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

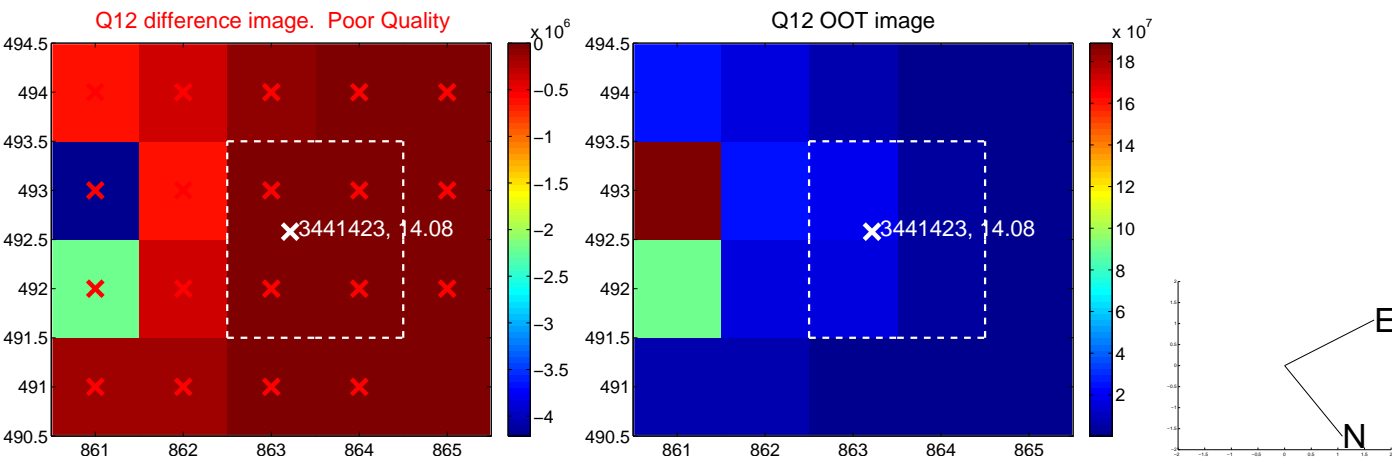
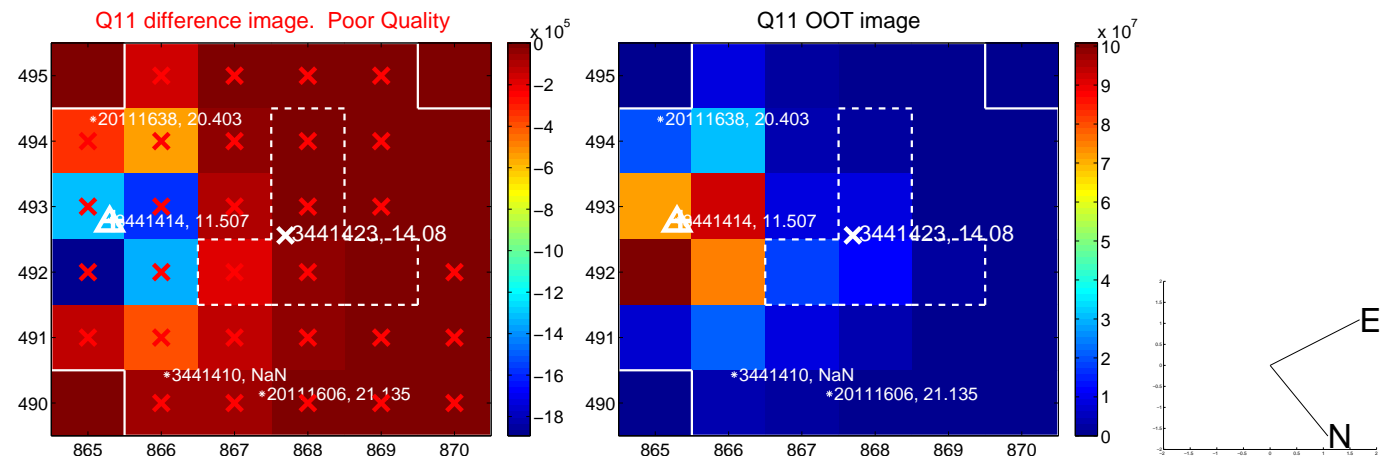
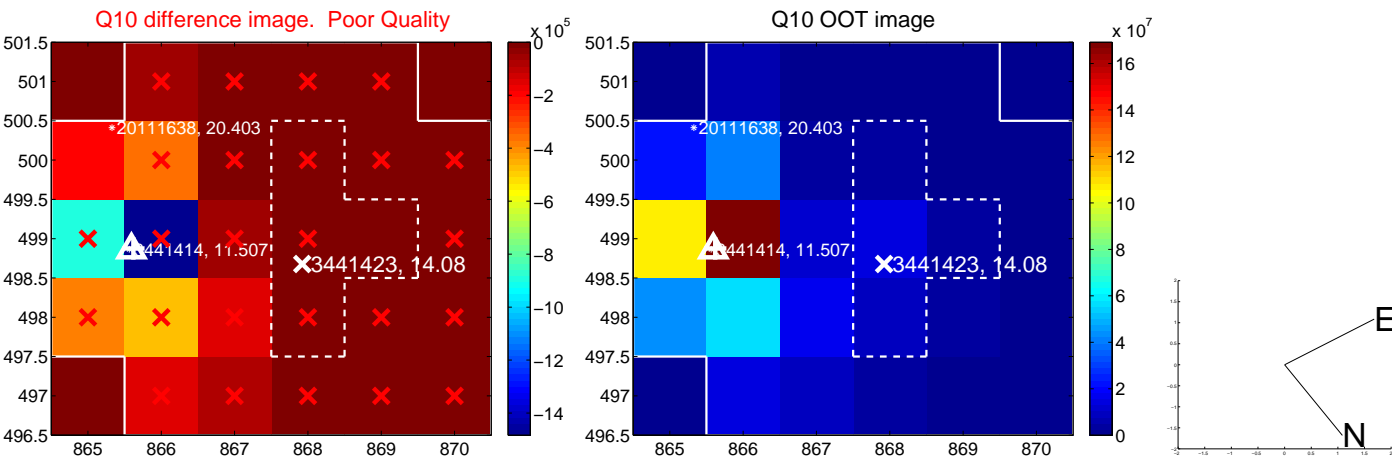
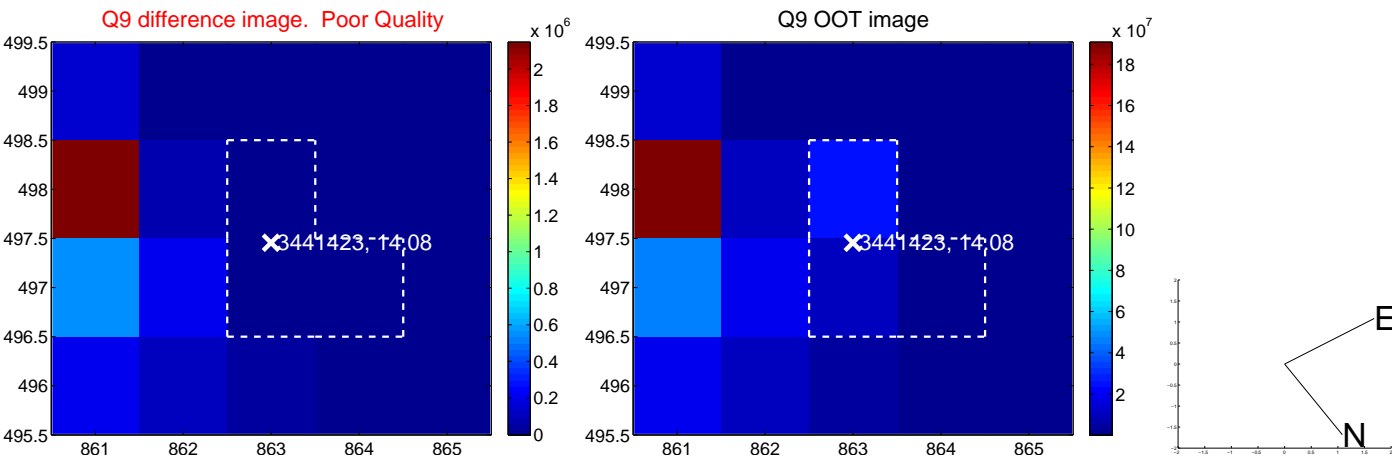
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



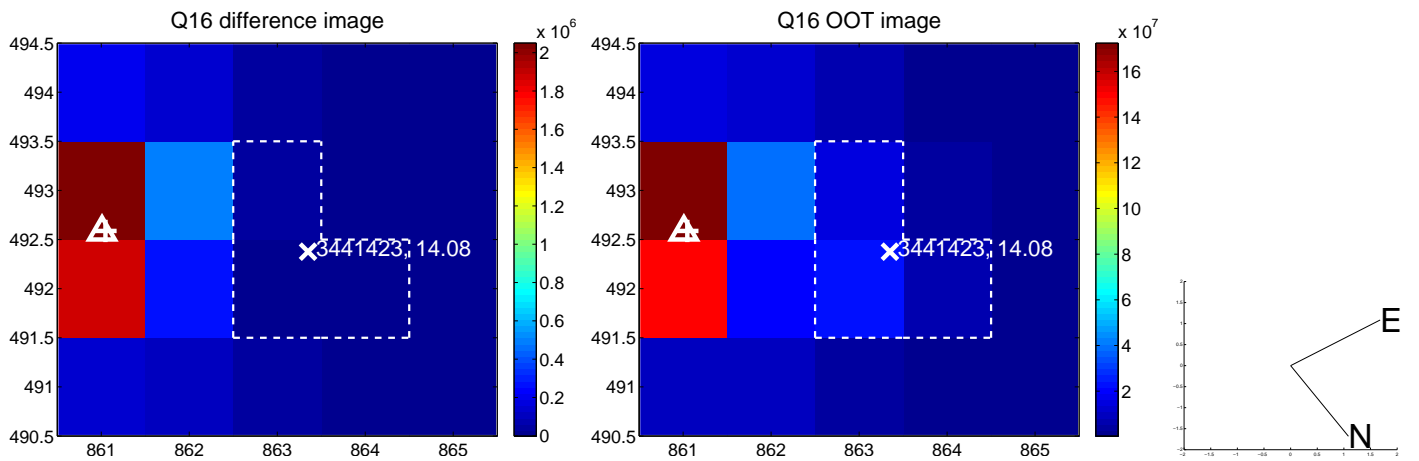
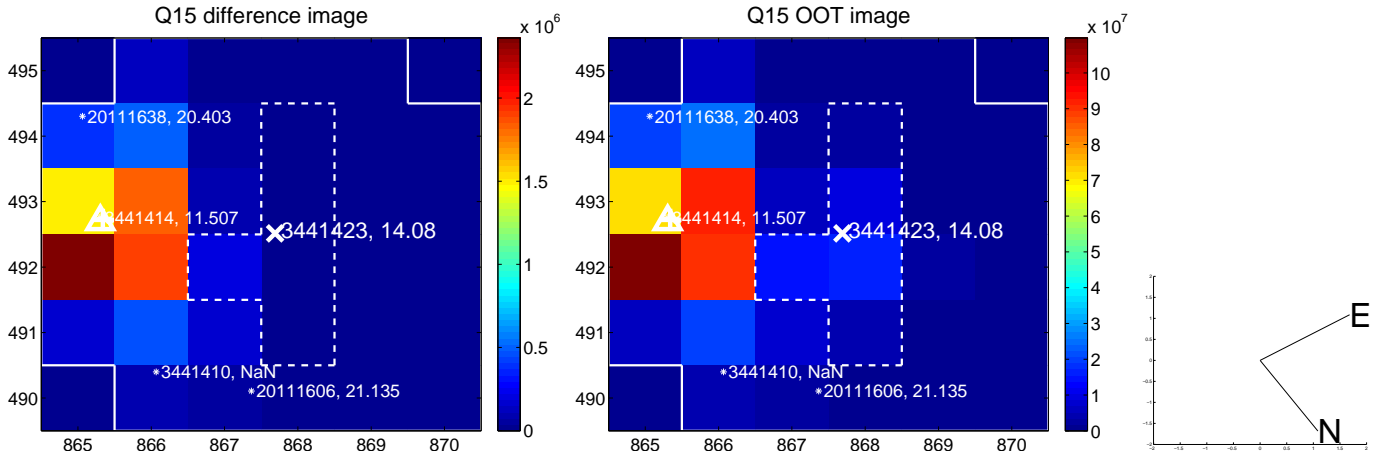
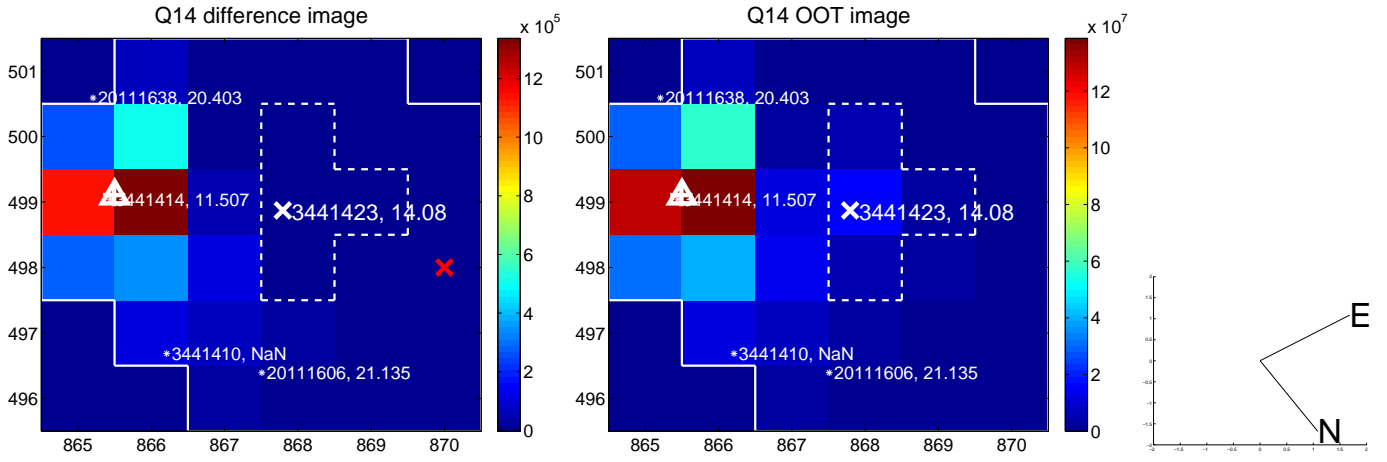
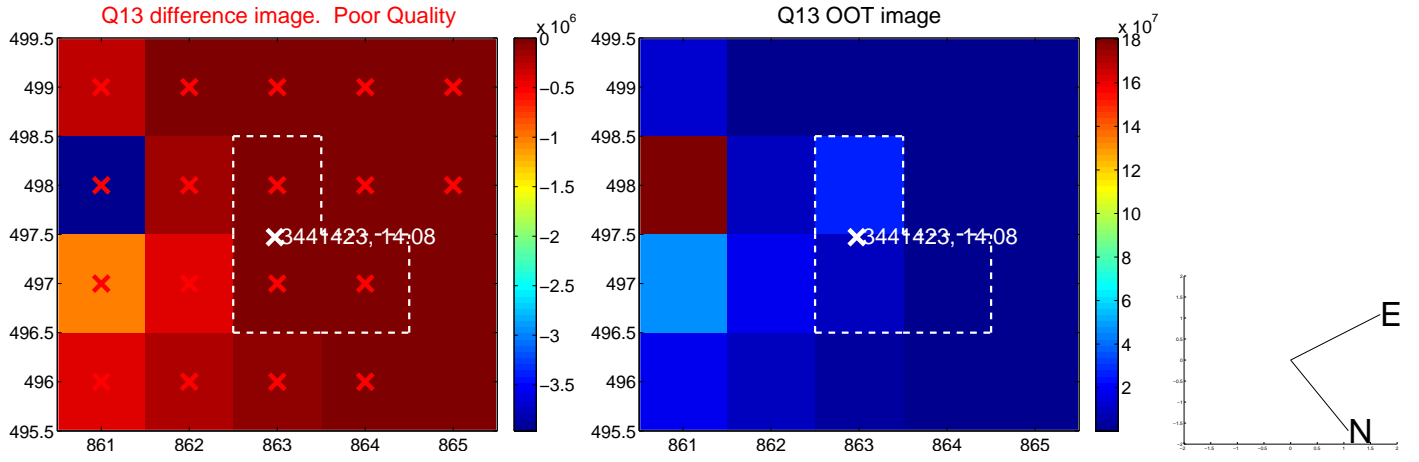
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

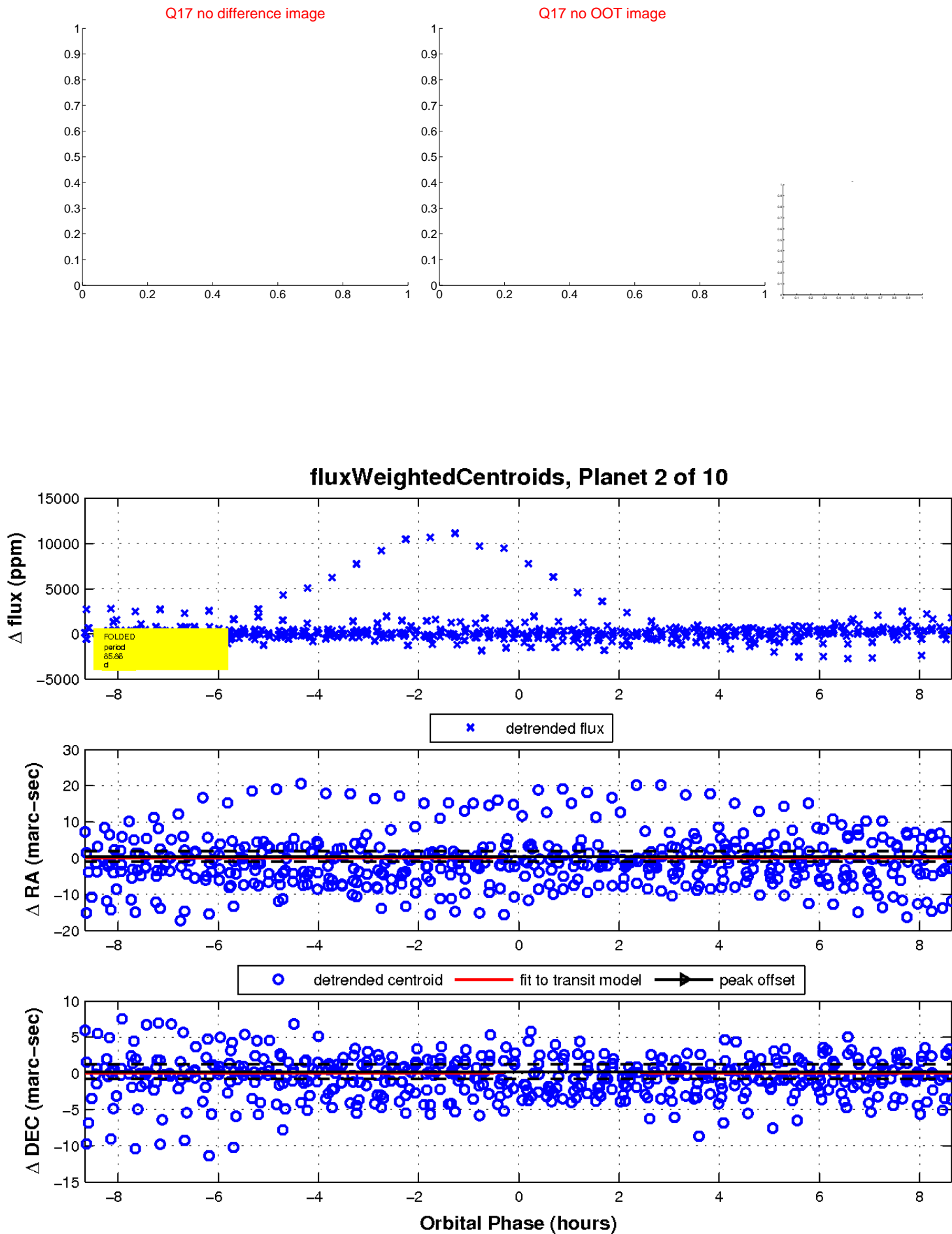


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

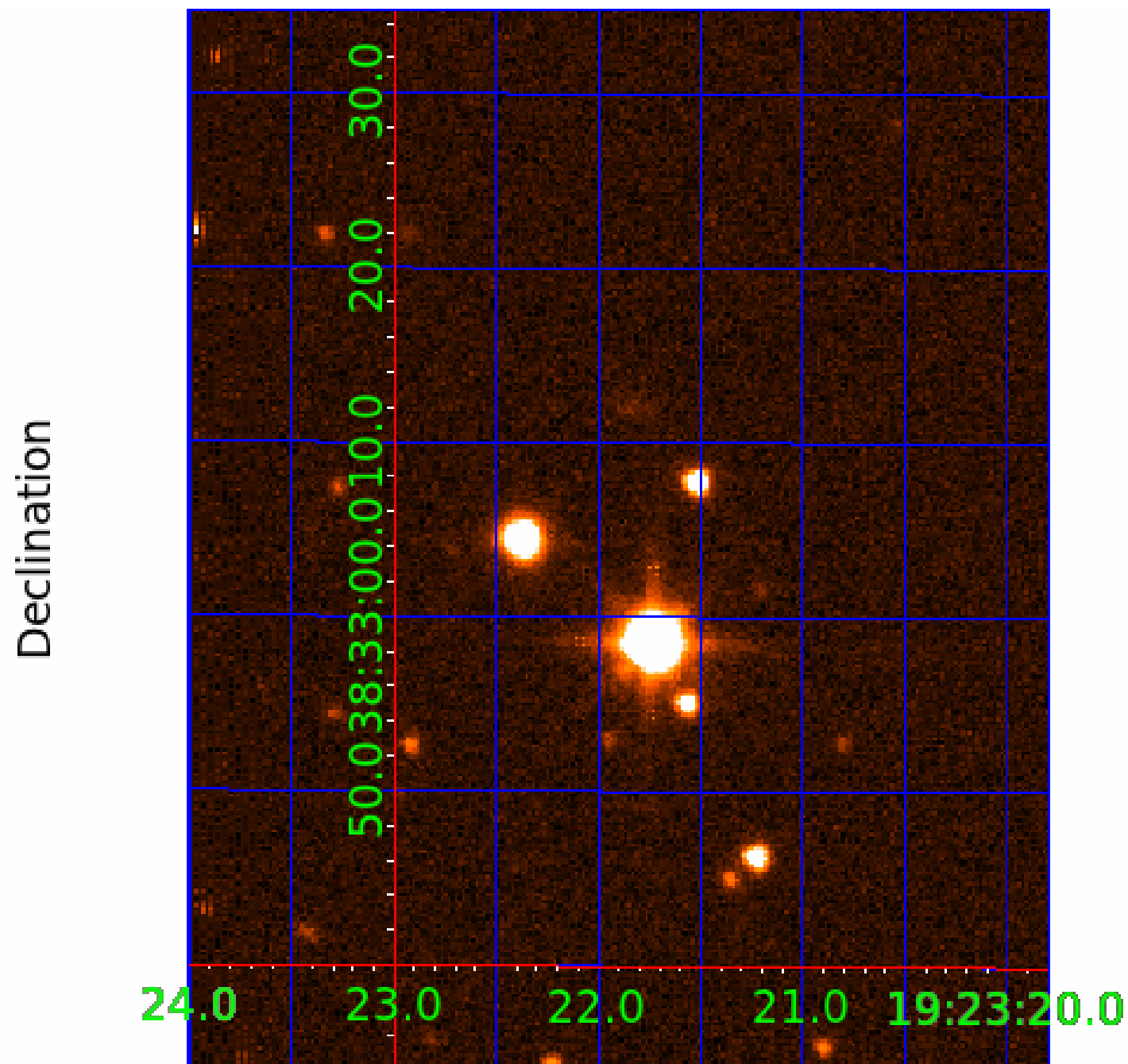




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003441423-01	OBS	No	1.805107	132.300794	107.0	11.412	10.9	7.7	0.84	5508	0.88	712.94
003441423-02	OBS	No	85.856457	168.046199	4465.8	10.500	62.4	-1.0	0.84	5508	5.51	4.14
003441423-03	OBS	No	64.780176	148.035133	1187.9	5.446	19.7	6.4	0.84	5508	3.09	6.02
003441423-04	OBS	No	59.862756	155.930613	2330.1	19.940	15.5	7.0	0.84	5508	7.79	6.69
003441423-05	OBS	No	231.147707	136.281517	15336.4	74.391	15.3	9.6	0.84	5508	12.94	1.10
003441423-06	OBS	No	77.133913	201.287993	1339.7	10.736	14.3	6.9	0.84	5508	4.00	4.77
003441423-07	OBS	No	66.961236	148.930850	971.1	0.969	13.8	4.0	0.84	5508	2.97	5.76
003441423-08	OBS	No	42.934940	141.414459	485.7	7.500	9.0	-1.0	0.84	5508	1.82	10.42
003441423-09	OBS	No	62.622117	157.133901	1581.0	10.114	8.5	7.6	0.84	5508	4.34	6.30
003441423-10	OBS	No	55.642936	159.899113	432.0	1.032	9.4	2.2	0.84	5508	1.98	7.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003441423-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
003441423-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

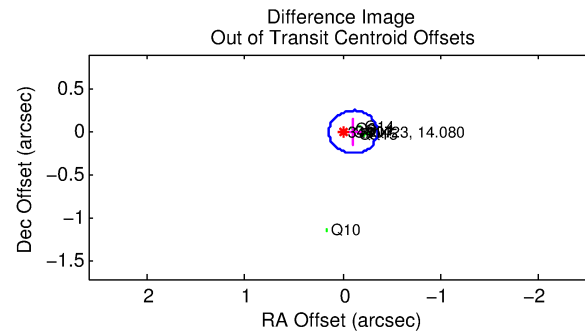
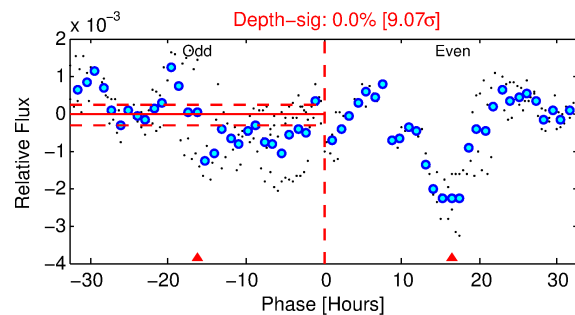
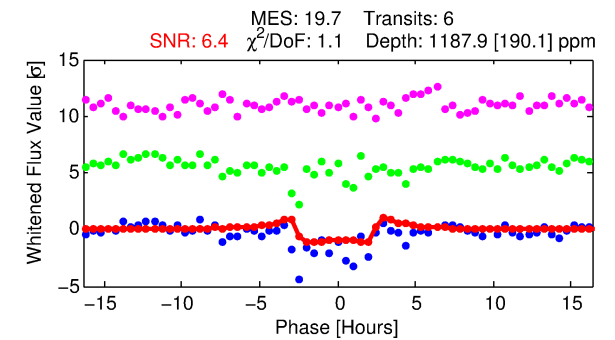
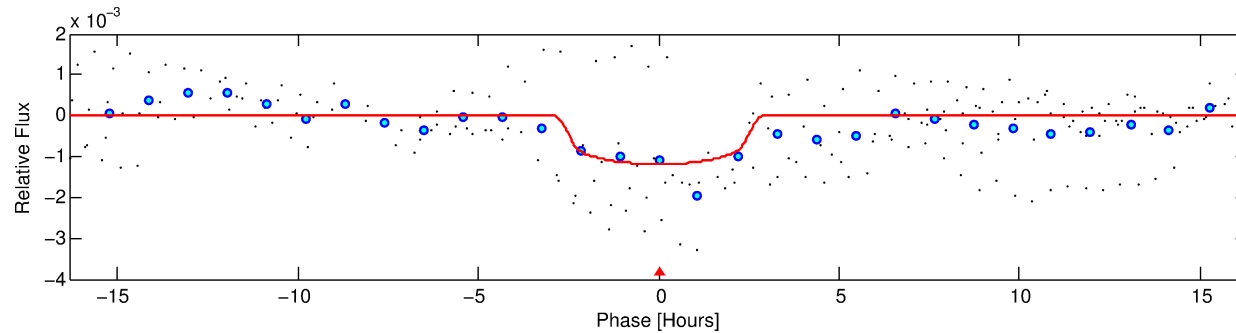
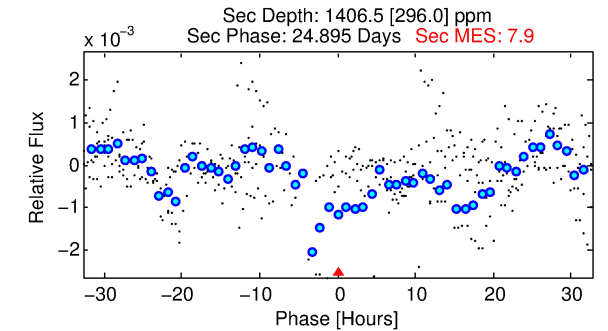
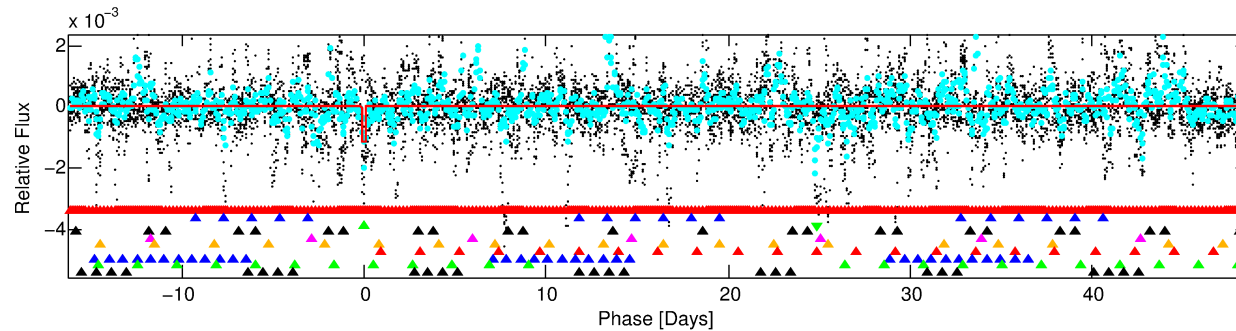
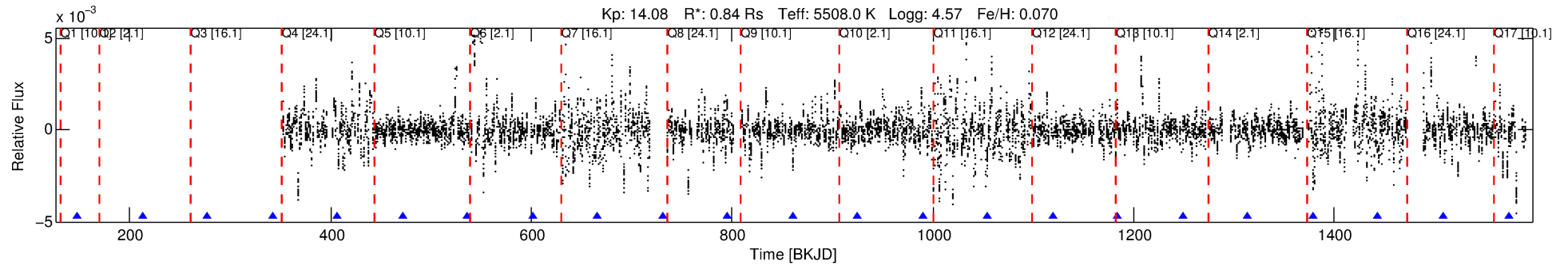
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003441423-03

No Significant Match Found

# DV One-Page Summary

KIC: 3441423 Candidate: 3 of 10 Period: 64.780 d



## DV Fit Results:

Period = 64.78018 [0.00110] d  
Epoch = 148.0351 [0.0166] BKJD  
Rp/R\* = 0.0337 [0.0169]  
a/R\* = 69.18 [132.57]  
b = 0.70 [1.42]  
Seff = 6.02 [1.03]  
Teq = 399 [17] K  
Rp = 3.09 [1.58] Re  
a = 0.3108 [0.0312] AU  
Ag = 7836.44 [8113.04] [0.97σ]  
**Teff = 5811 [1488] K [3.64σ]**

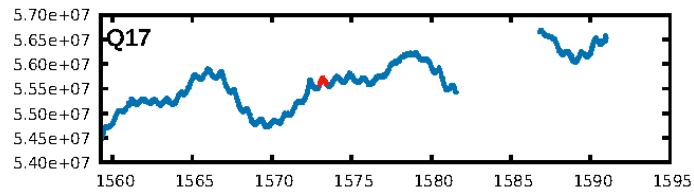
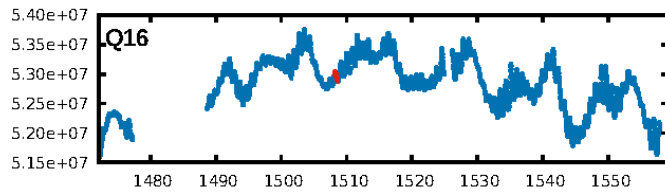
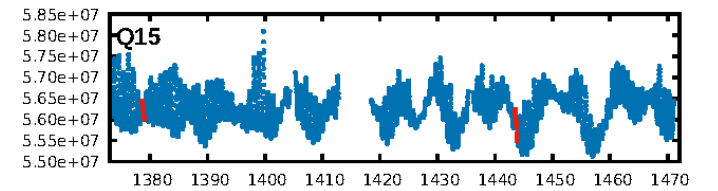
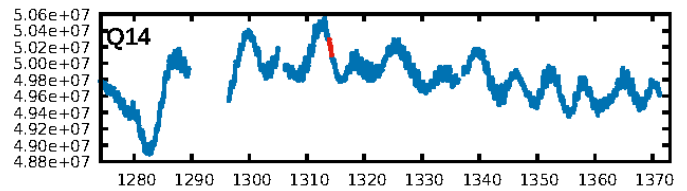
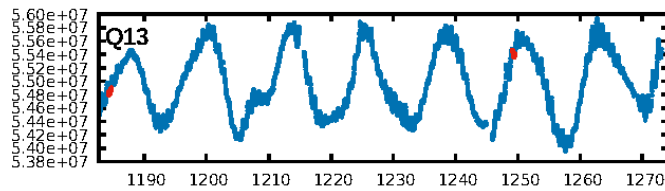
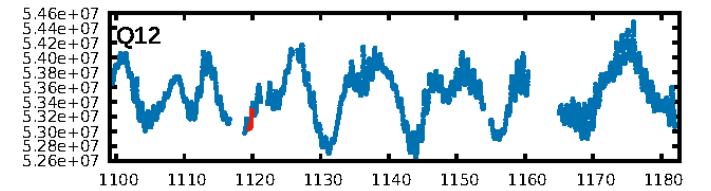
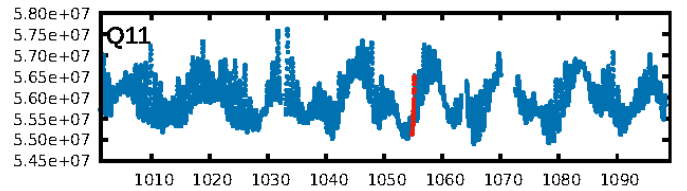
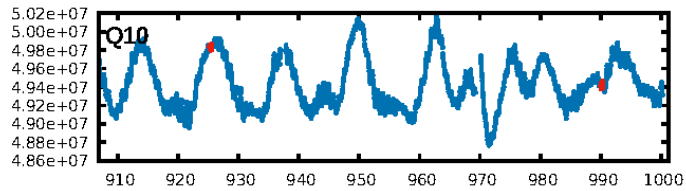
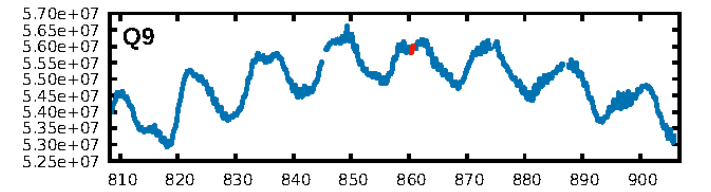
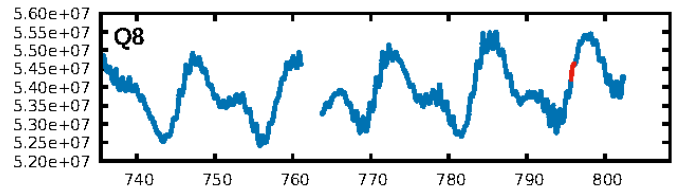
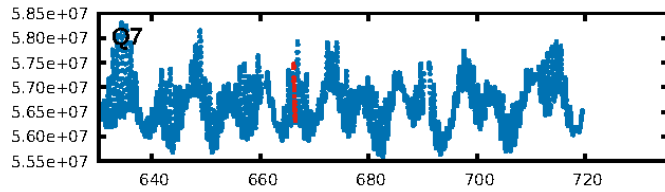
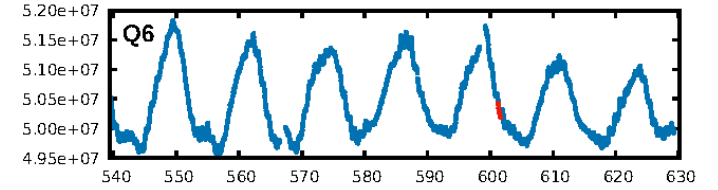
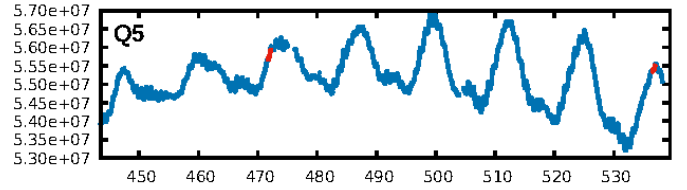
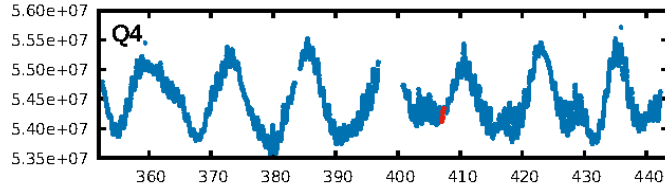
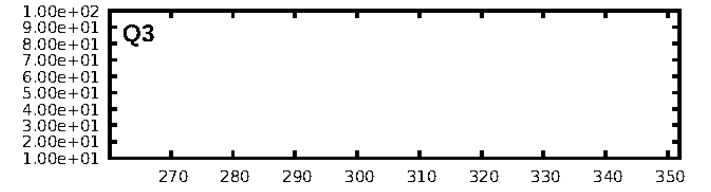
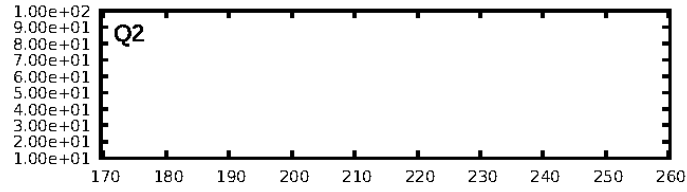
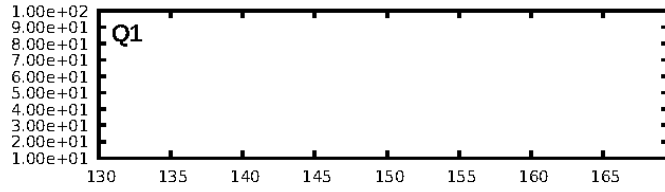
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.51σ]  
LongPeriod-sig: 100.0% [9.46σ]  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 99.5%  
Bootstrap-pfa: 1.63e-33  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -0.4662  
Centroid-sig: 22.6%  
**Centroid-so: 3.499 arcsec [3.14σ]**  
OotOffset-rm: 0.107 arcsec [1.29σ]  
**KicOffset-rm: 9.288 arcsec [92.20σ]**  
OotOffset-st: 3/3/2/0 [8]  
KicOffset-st: 3/3/2/0 [8]  
DiffImageQuality-fgm: 0.38 [3/8]  
DiffImageOverlap-fno: 0.21 [3/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:20:17 Z

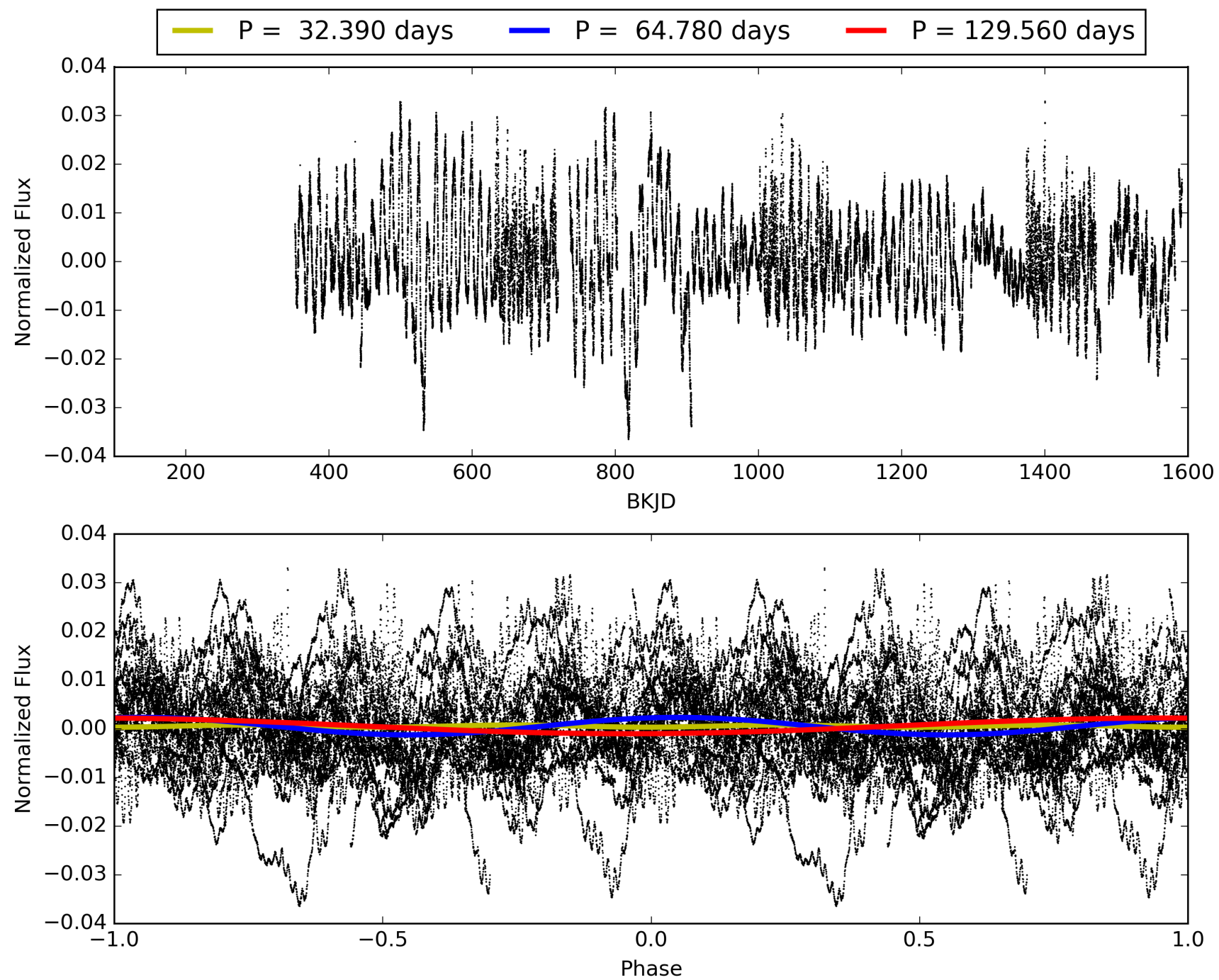
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003441423-03, PDC Light Curves



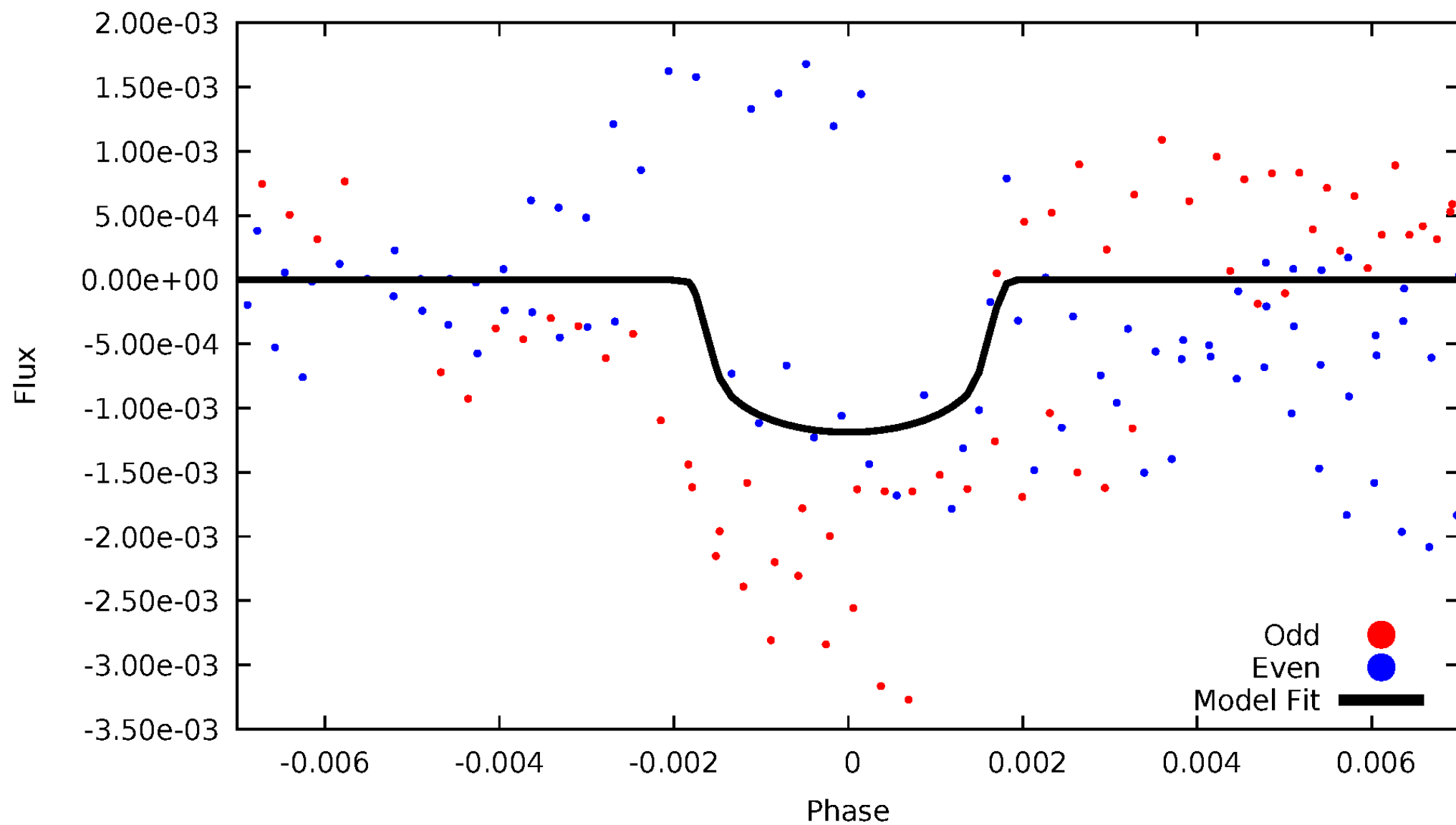


TCE 003441423-03



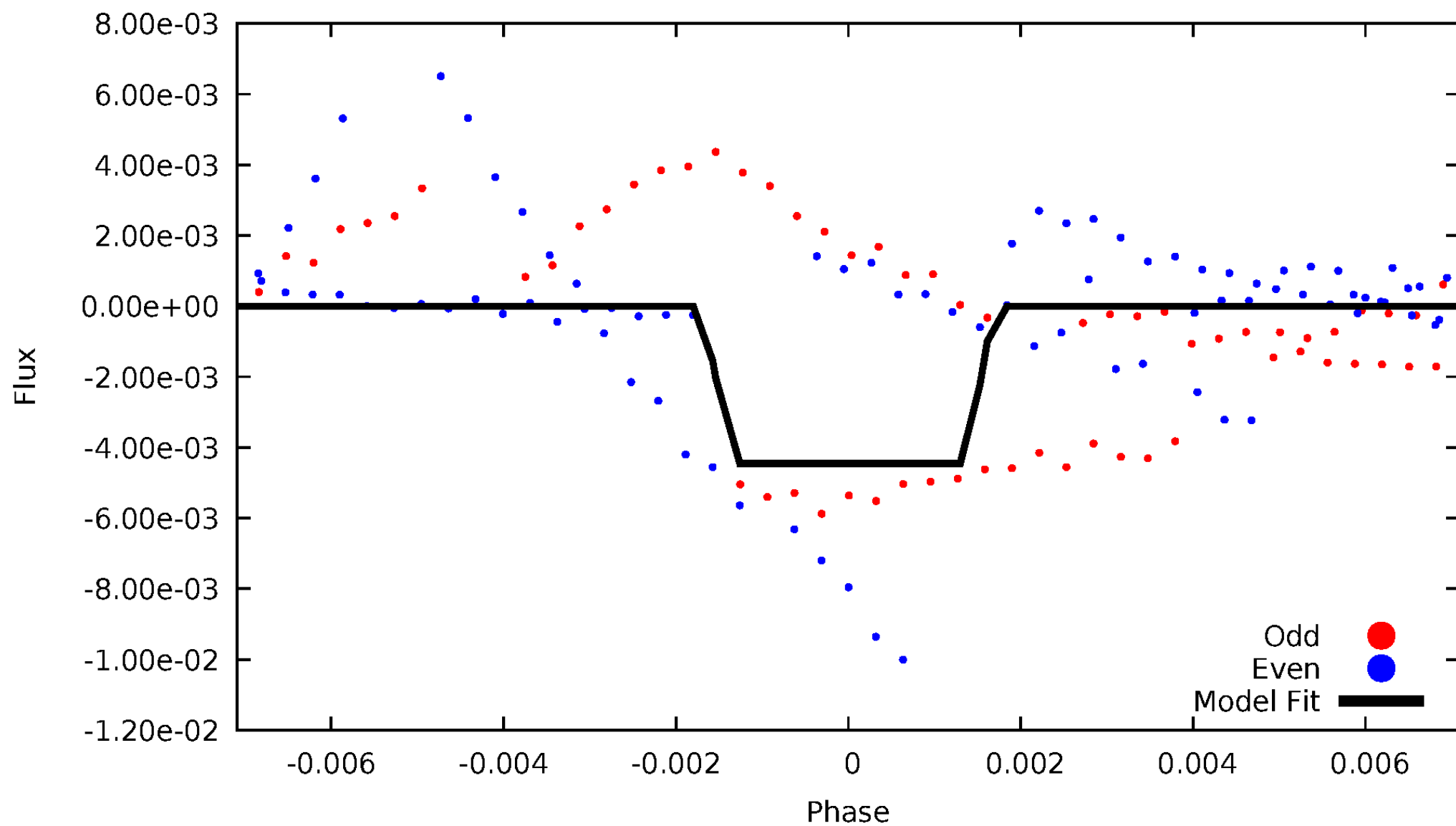
# DV Odd/Even

TCE 003441423-03



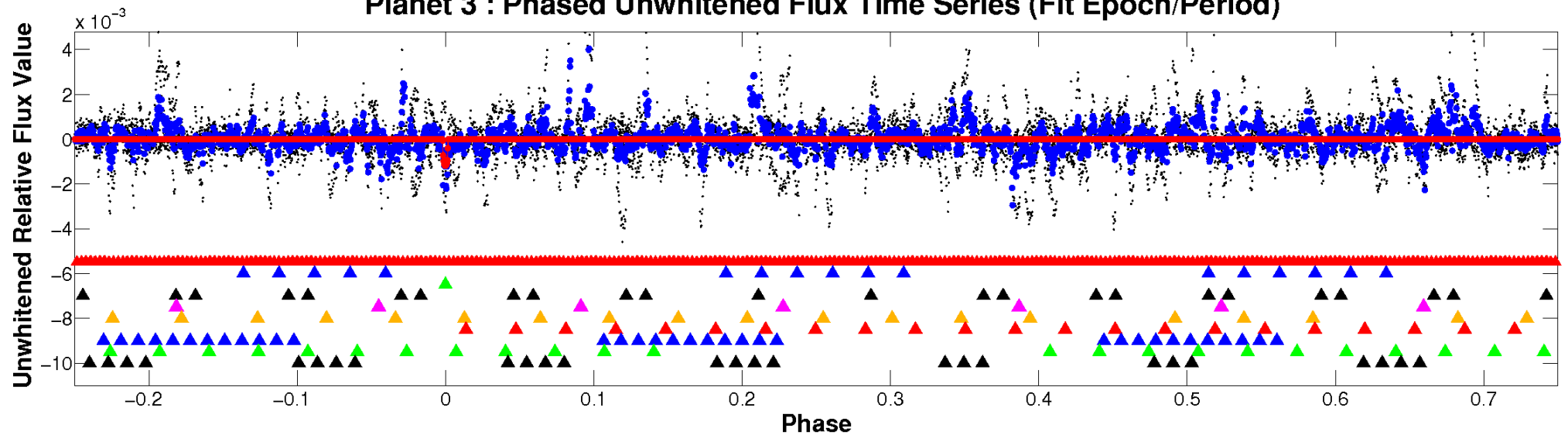
# ALT Odd/Even

TCE 003441423-03

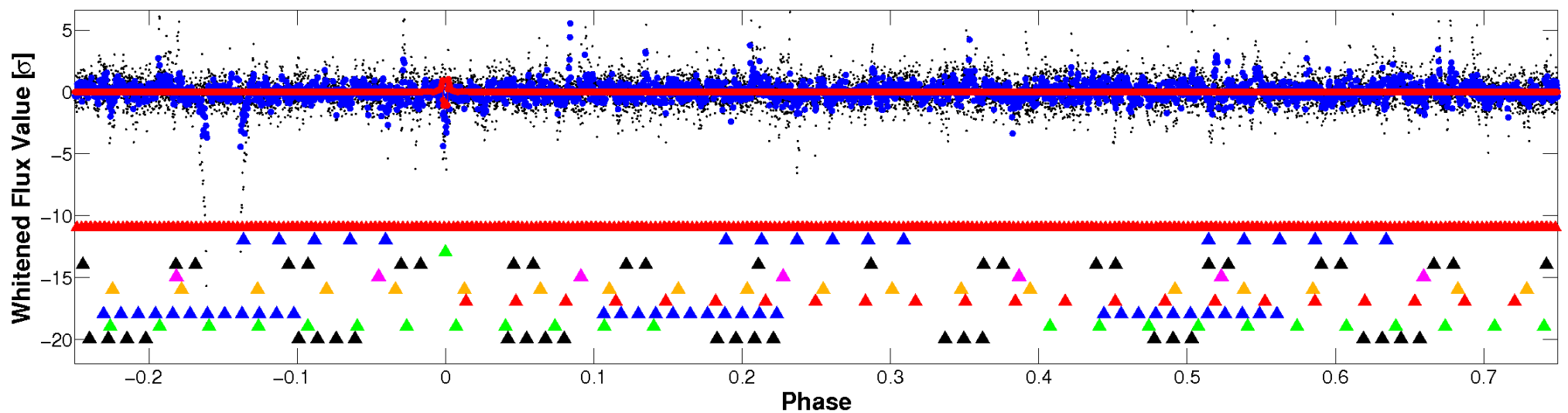


# Non-Whitened Vs. Whitened Light Curve

## Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

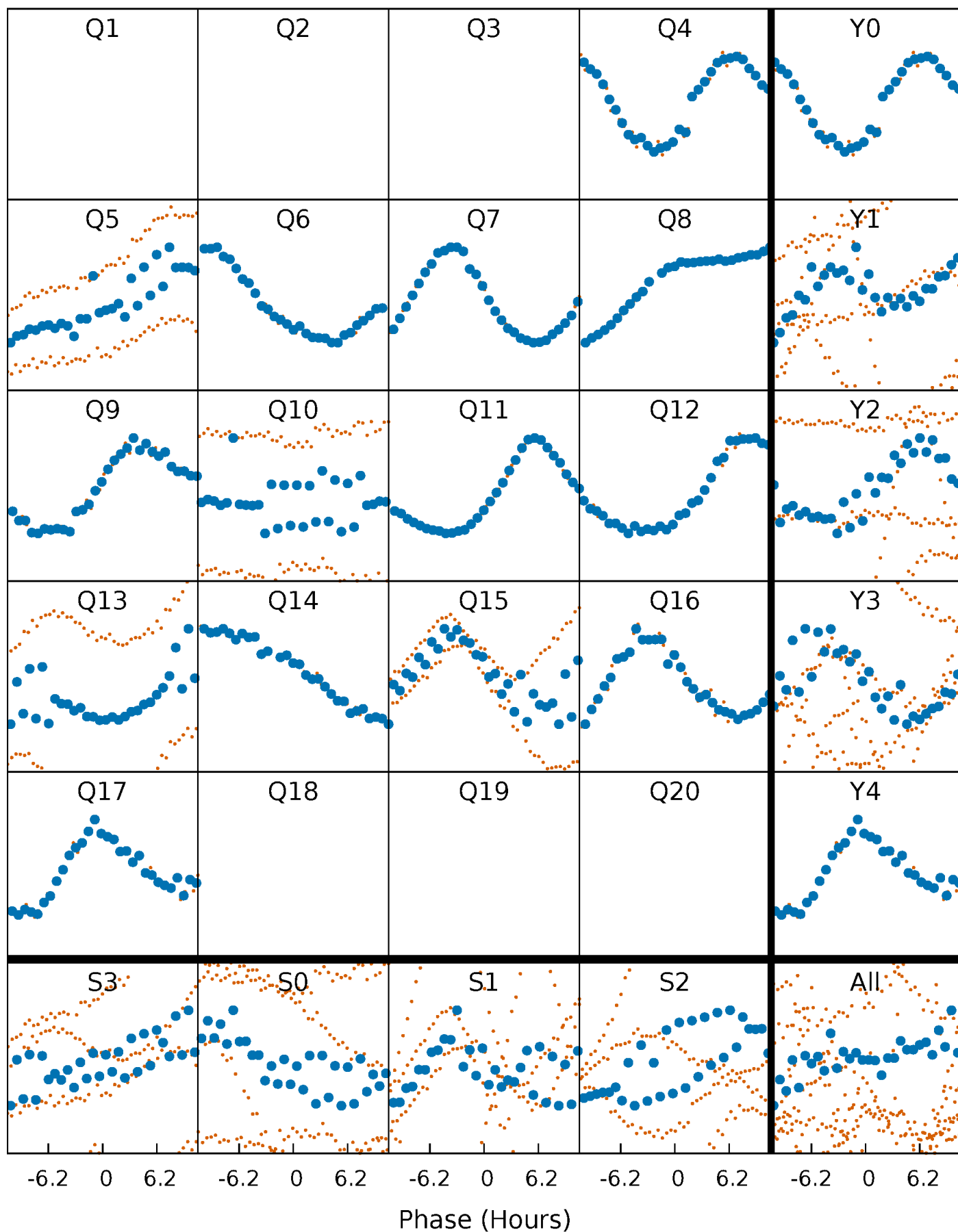


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



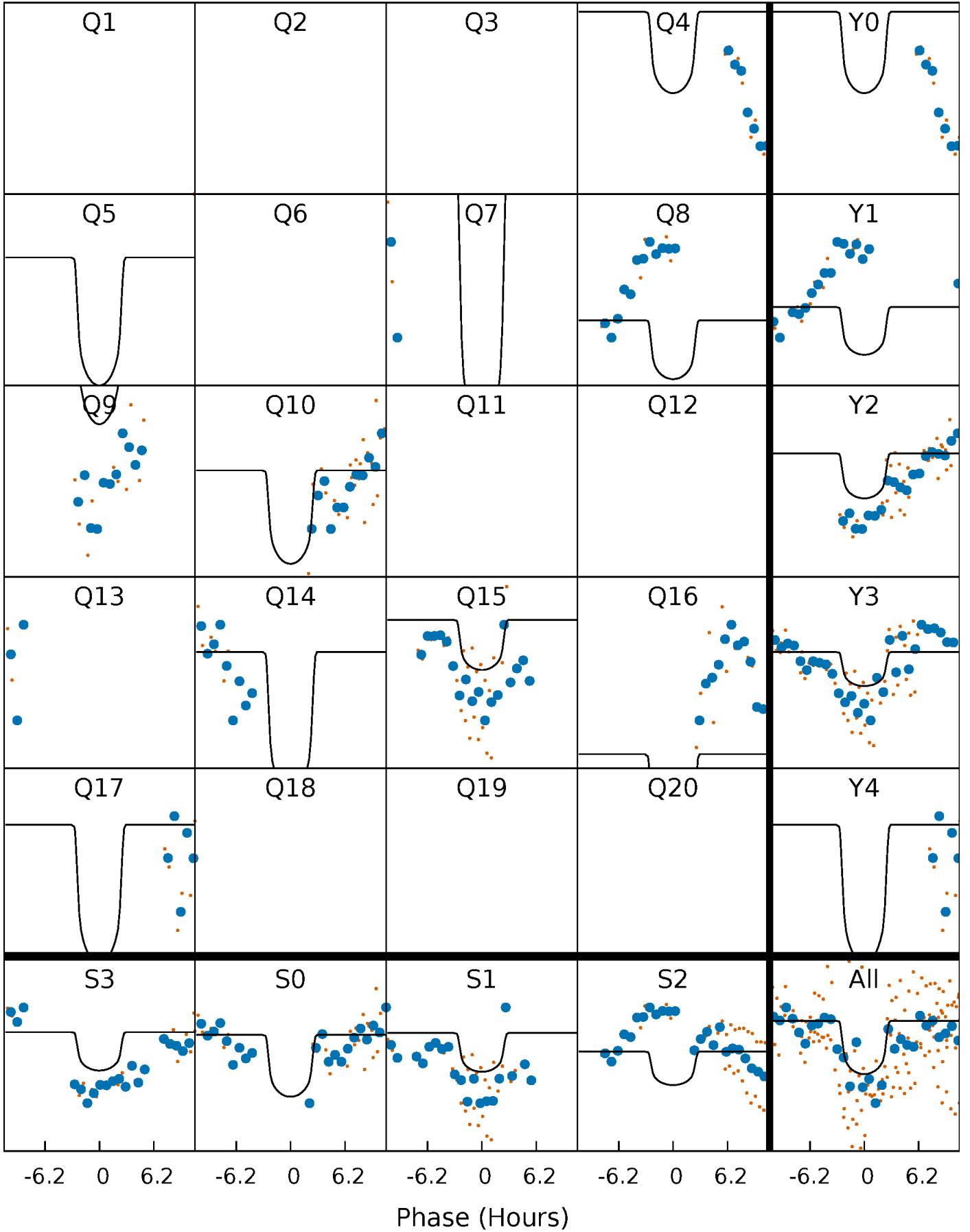
# PDC Quarter-Phased Transit Curves

TCE 003441423-03 P= 64.780176 Days  $T_0=148.035133$  (BKJD)



# DV Quarter-Phased Transit Curves

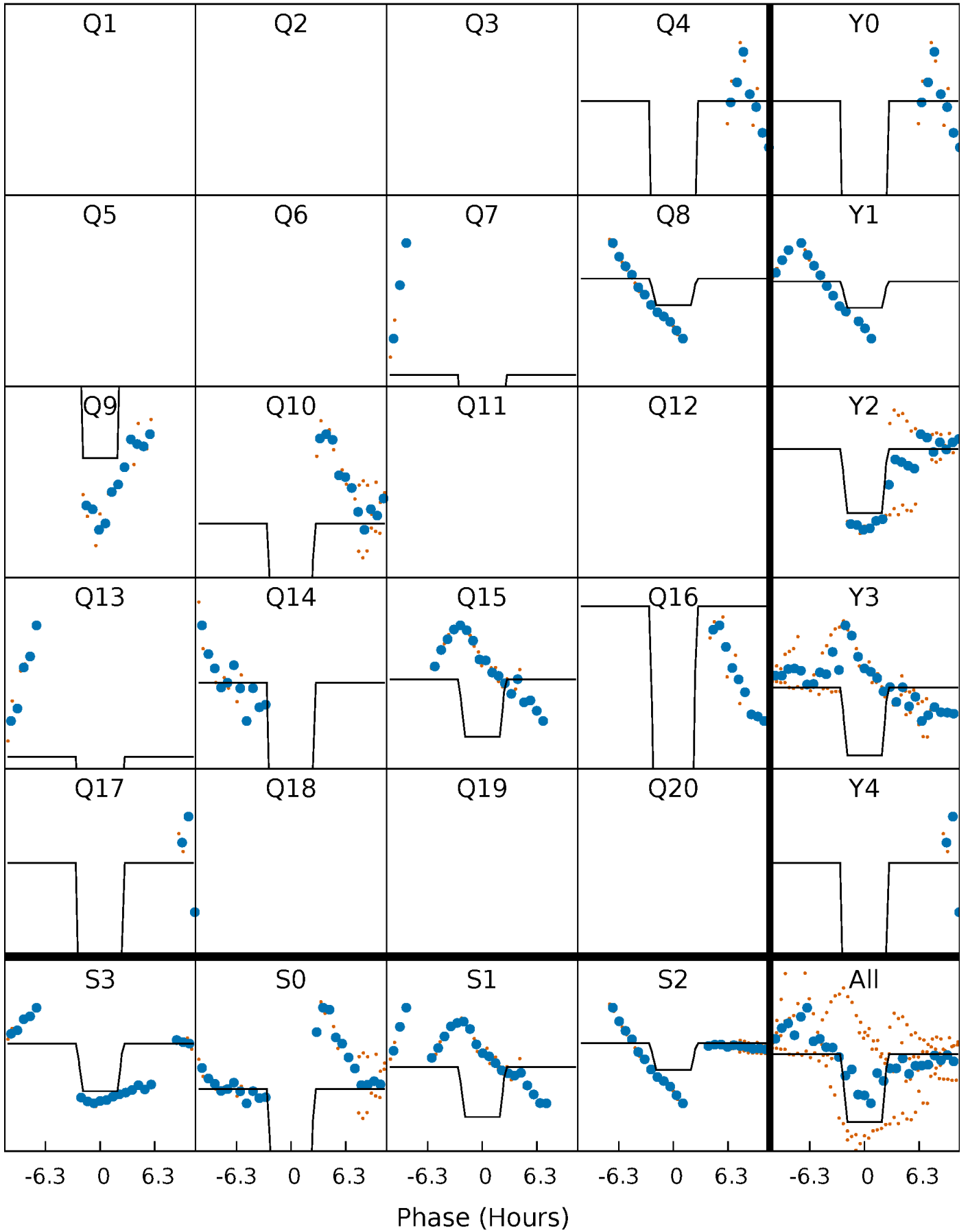
TCE 003441423-03   P= 64.780176 Days    $T_0=148.035133$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

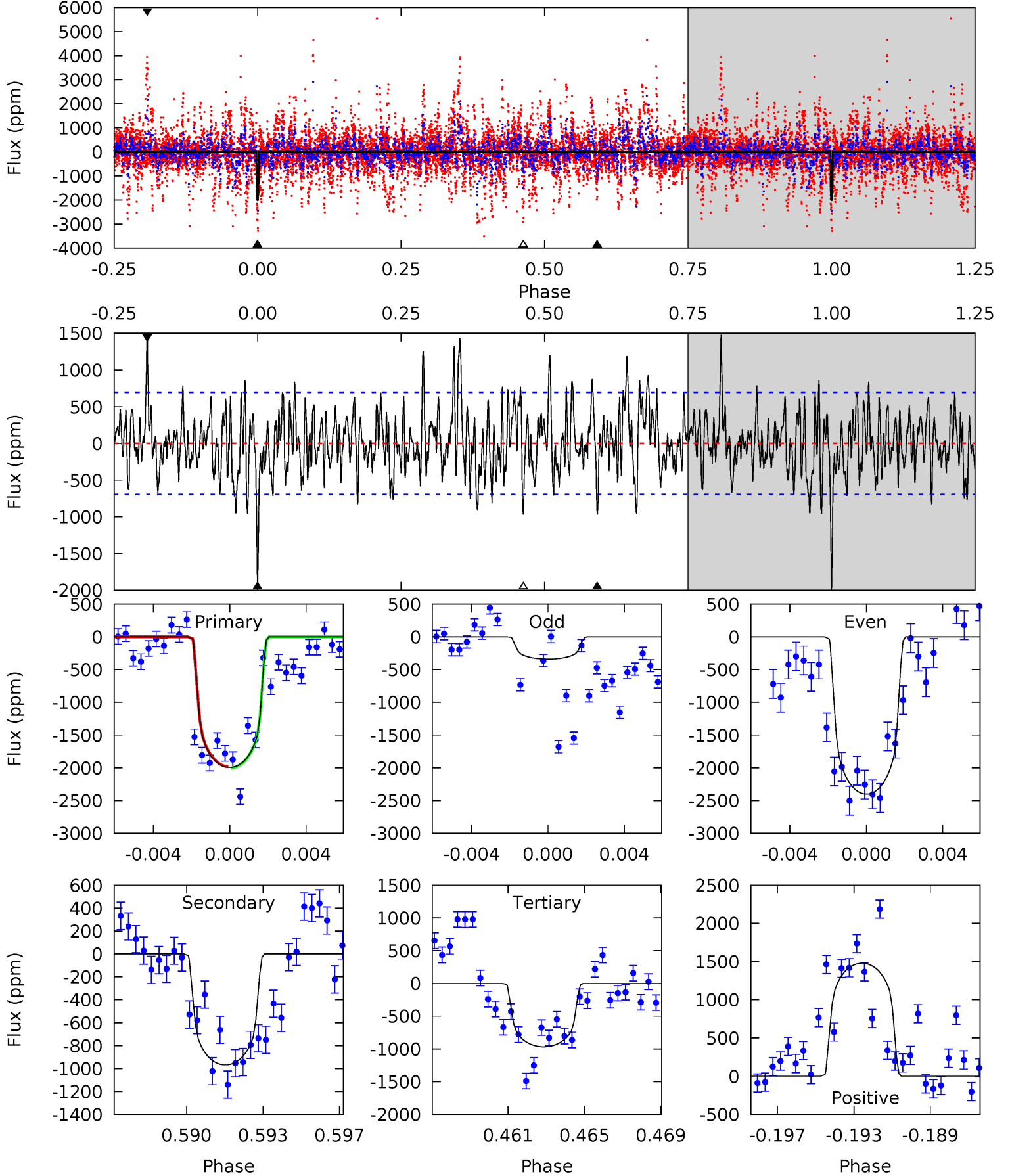
TCE 003441423-03     $P = 64.777027$  Days     $T_0 = 148.035082$  (BKJD)



# DV Model-Shift Uniqueness Test

003441423-03, P = 64.780176 Days, E = 148.035133 Days

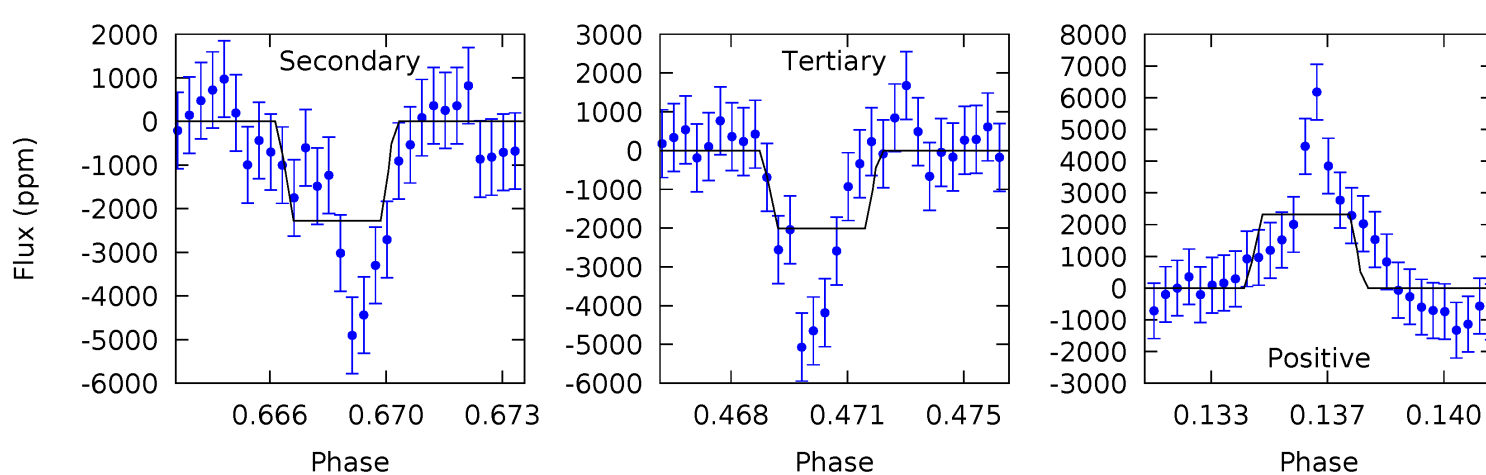
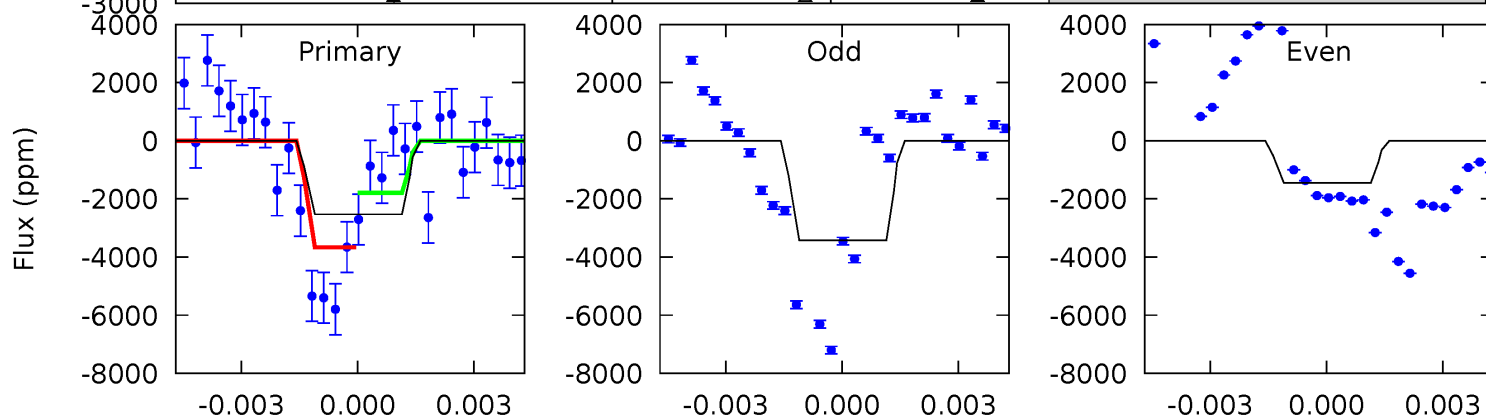
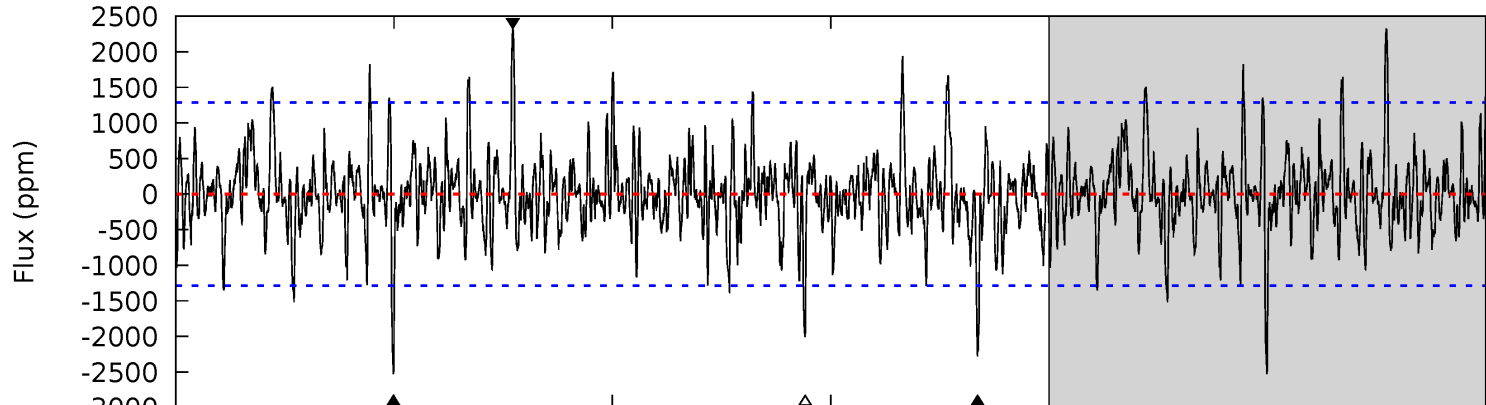
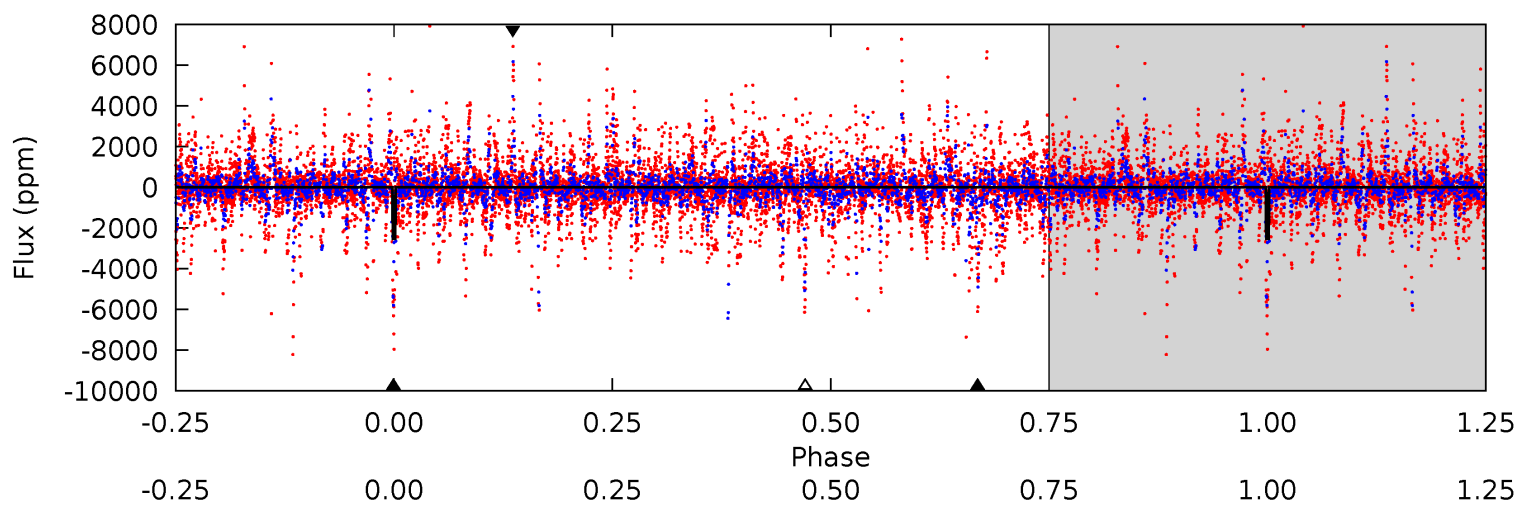
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	7.26	7.26	11.1	5.21	2.90	2.80	7.70	3.87	0.00	-3.82	7.07	0.82	0.43	0.07



# Alt Model-Shift Uniqueness Test

003441423-03, P = 64.777027 Days, E = 148.035082 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	9.25	8.15	9.43	5.23	2.93	1.85	2.12	0.84	1.11	-0.18	2.99	1.11	0.48	3.40



### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-968 \pm 133$	$3.24^{+1.44}_{-1.44}$	$565^{+17}_{-11}$	$5275^{+1811}_{-788}$	$4892^{+10945}_{-2678}$
Alt.	$-2280 \pm 246$	$6.24^{+1.59}_{-1.54}$	$565^{+15}_{-12}$	$4771^{+585}_{-426}$	$3034^{+2217}_{-1098}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

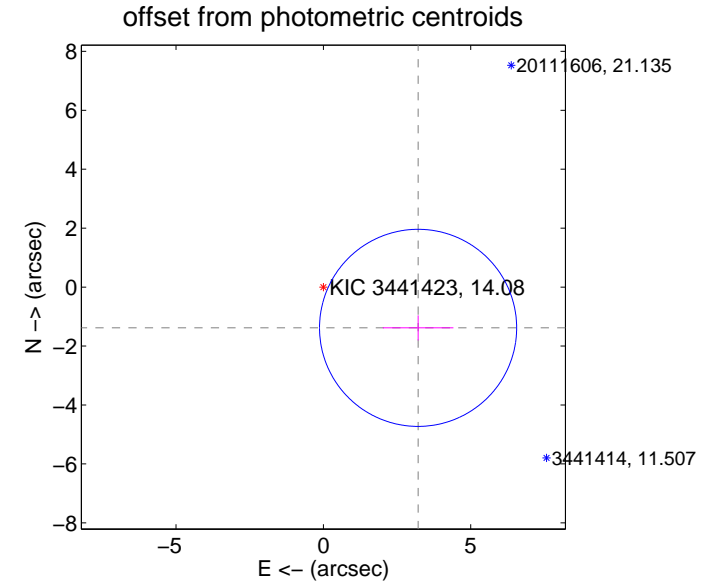
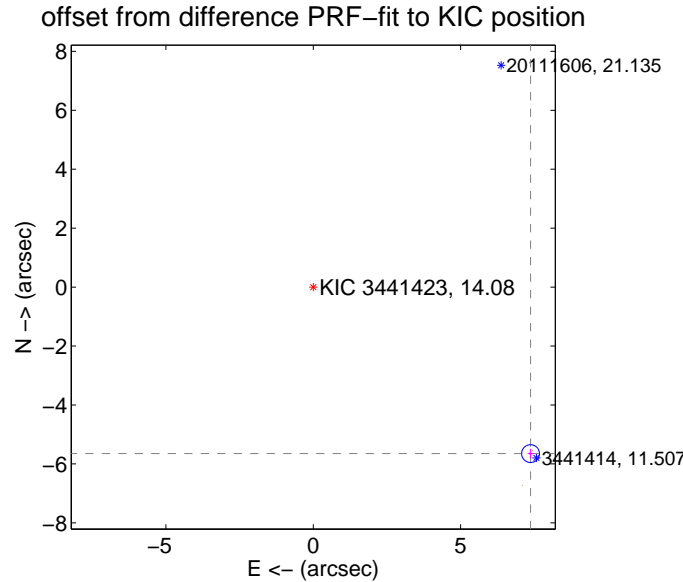
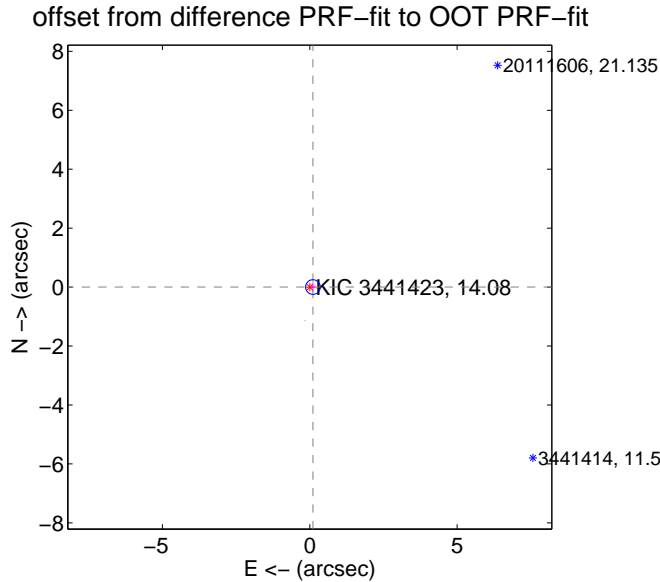
## DV Centroid Data

Supplemental centroid analysis for 003441423-03. Kepler magnitude: 14.08. Transit SNR 6.41

There are 3 quarters with good PRF difference image offsets

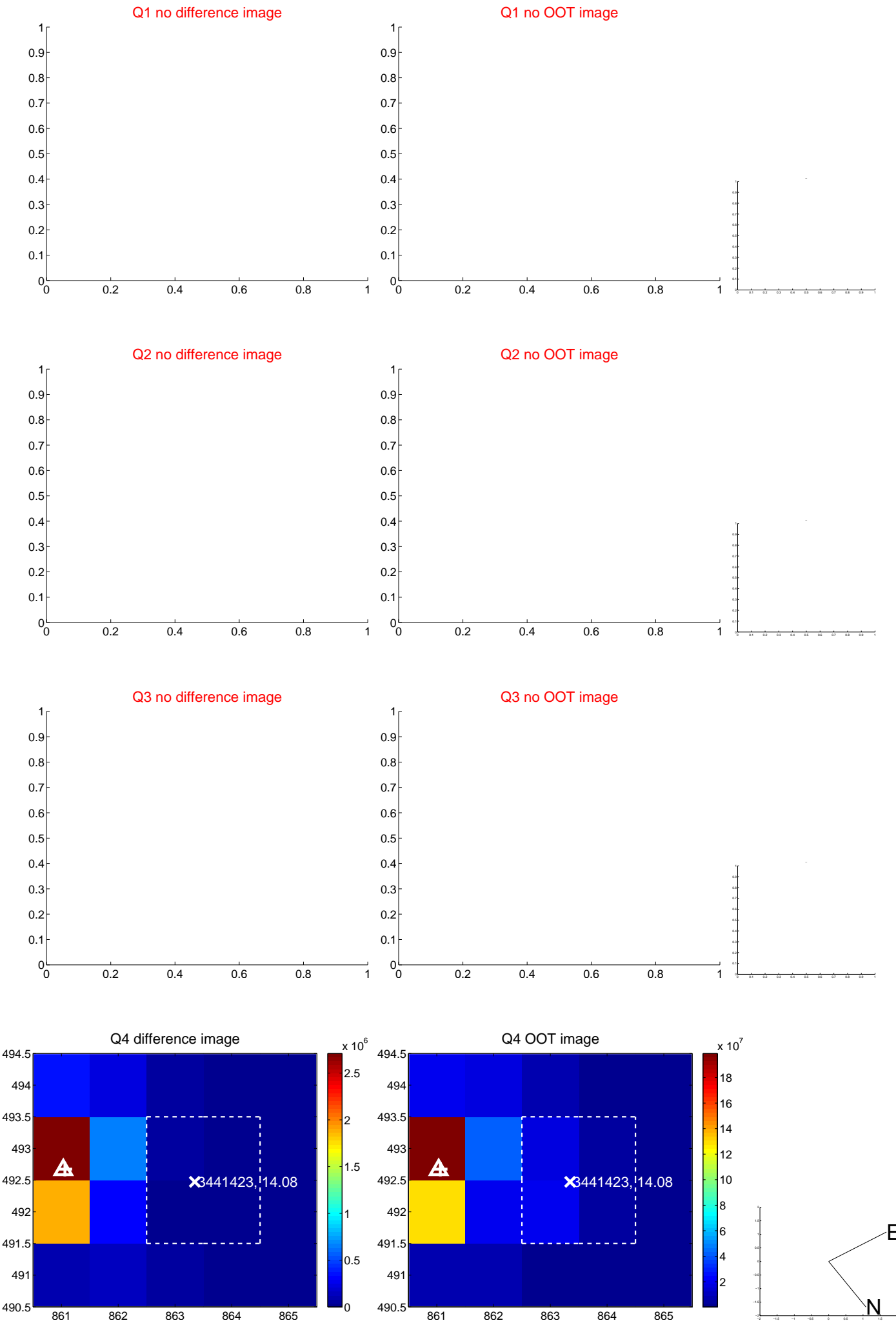
The OOT PRF centroid is offset from the target star catalog position by about 9.39 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.107 \pm 0.083$	1.29	$-0.107 \pm 0.082$	$0.002 \pm 0.154$
PRF-fit source offset from KIC position	$9.288 \pm 0.101$	92.20	$-7.372 \pm 0.098$	$-5.650 \pm 0.159$
photometric centroid source offset	$3.50 \pm 1.11$	3.14	$-3.21 \pm 1.20$	$-1.38 \pm 0.43$

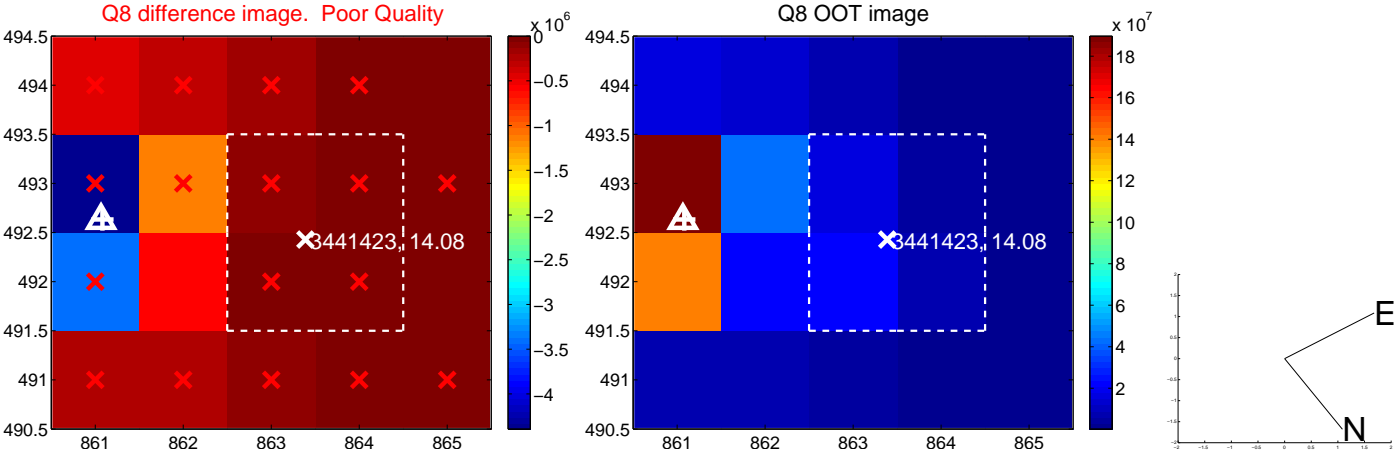
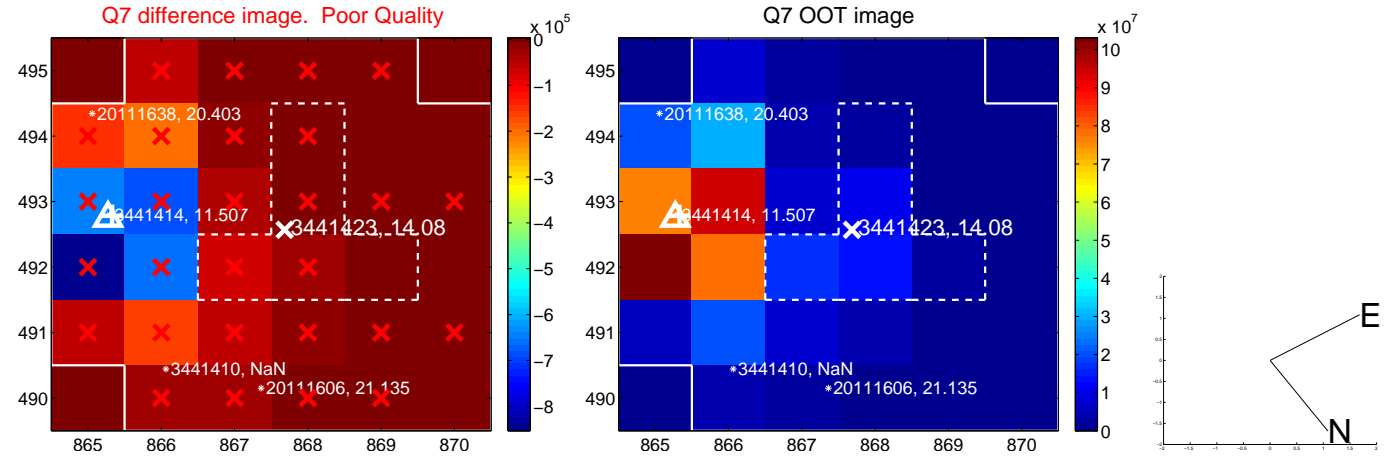
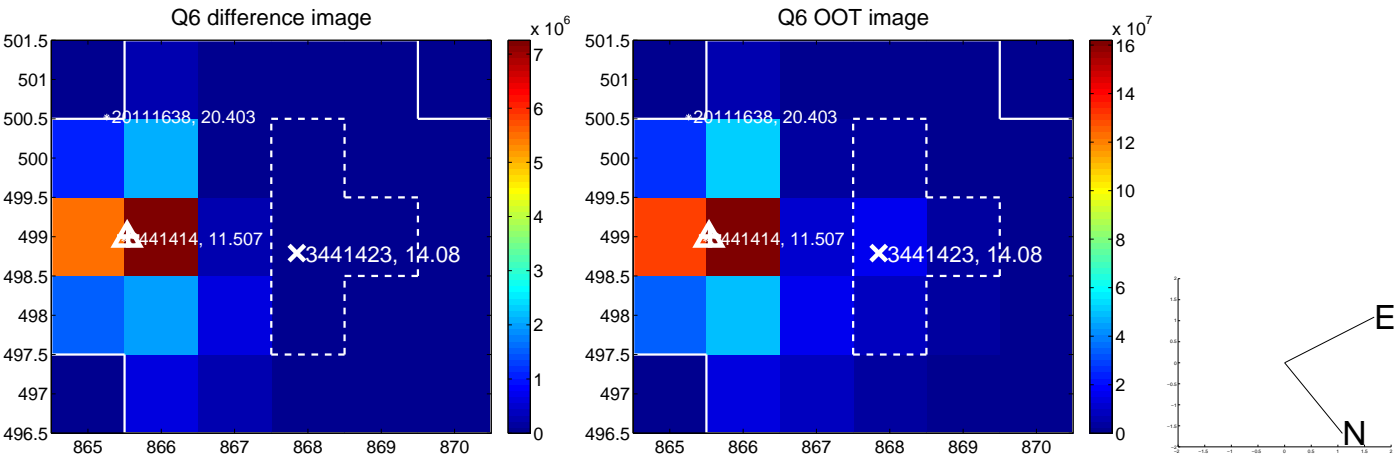
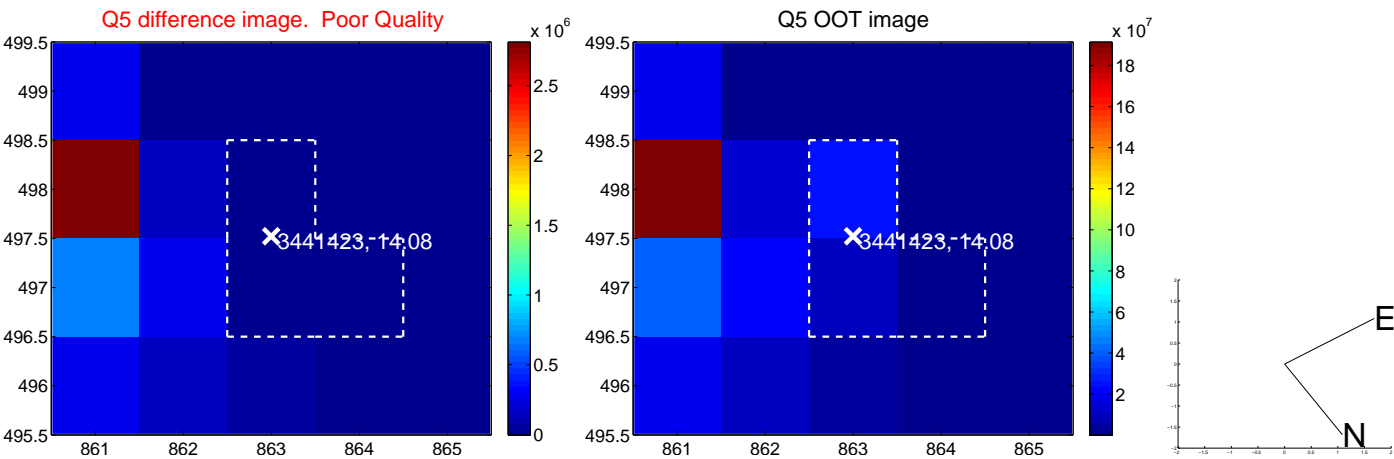


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

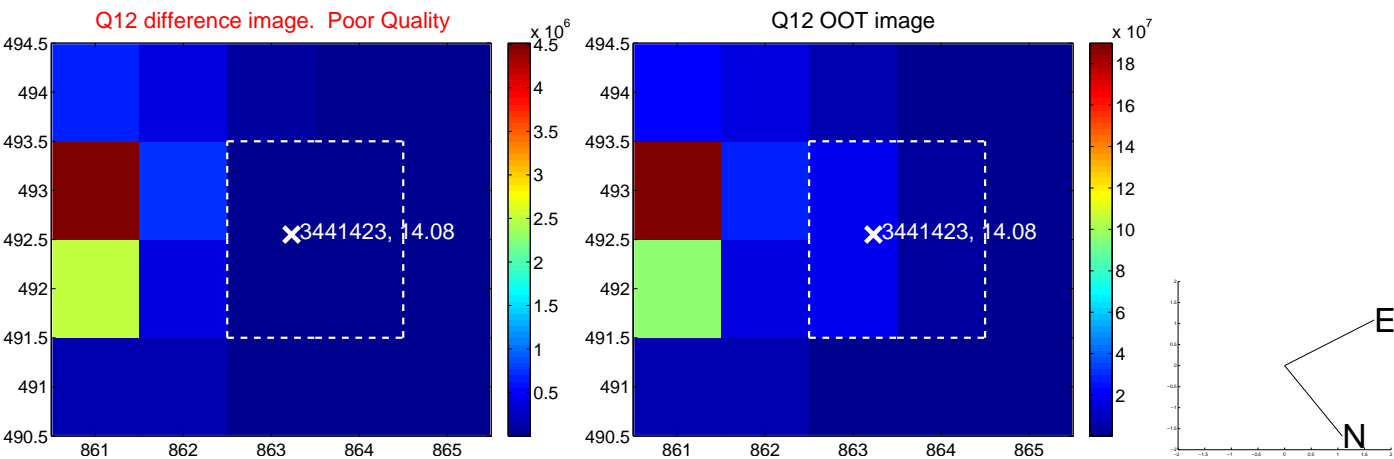
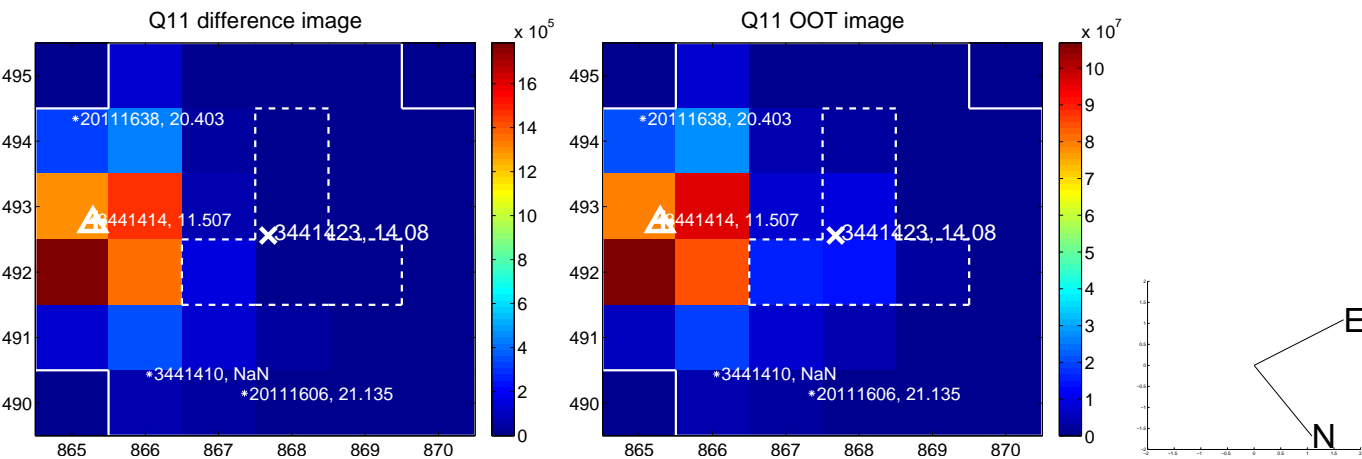
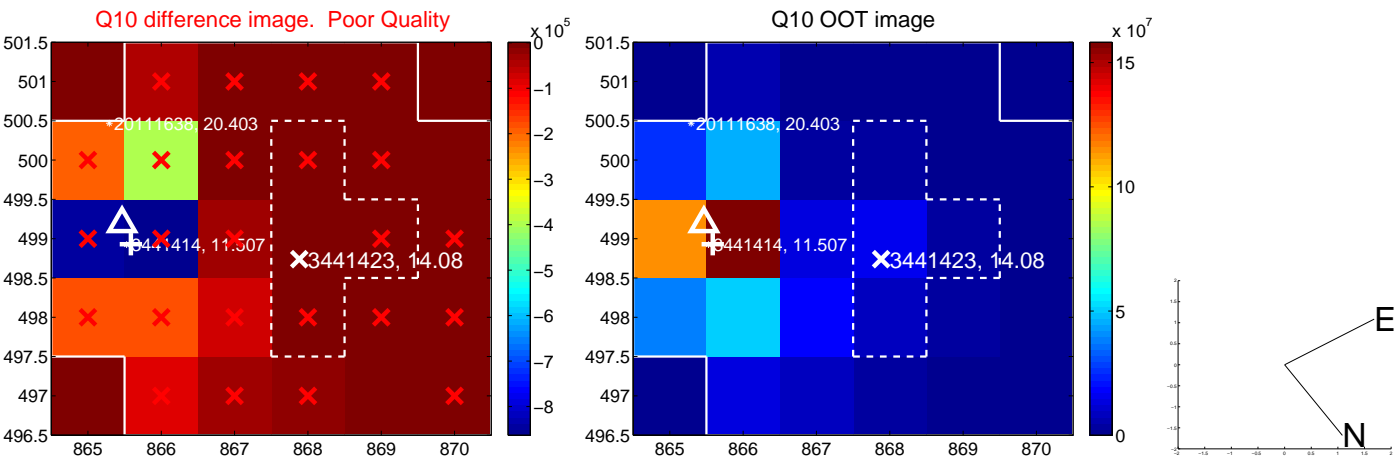
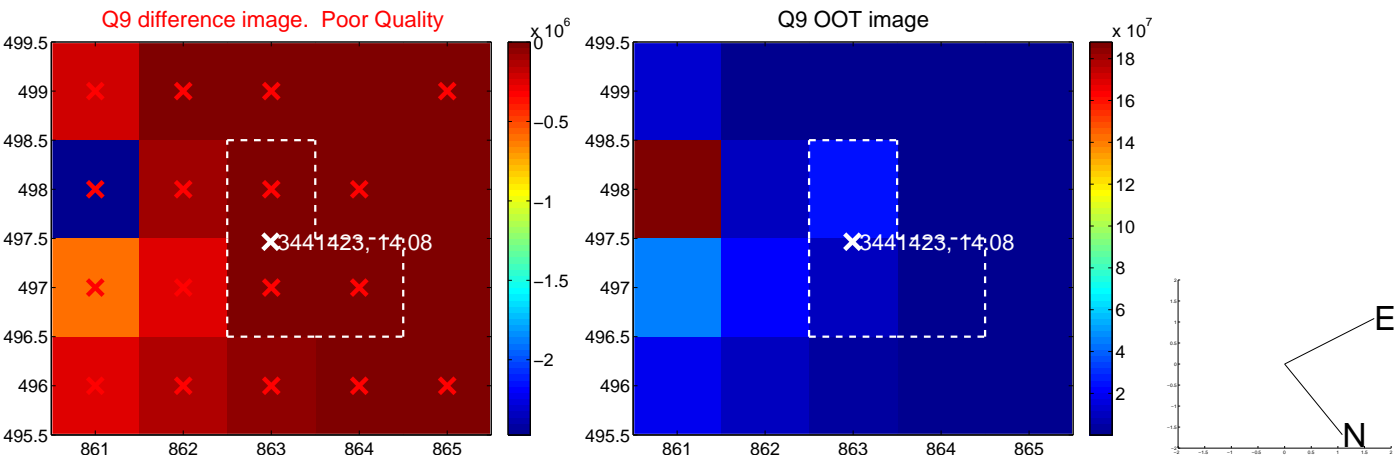


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

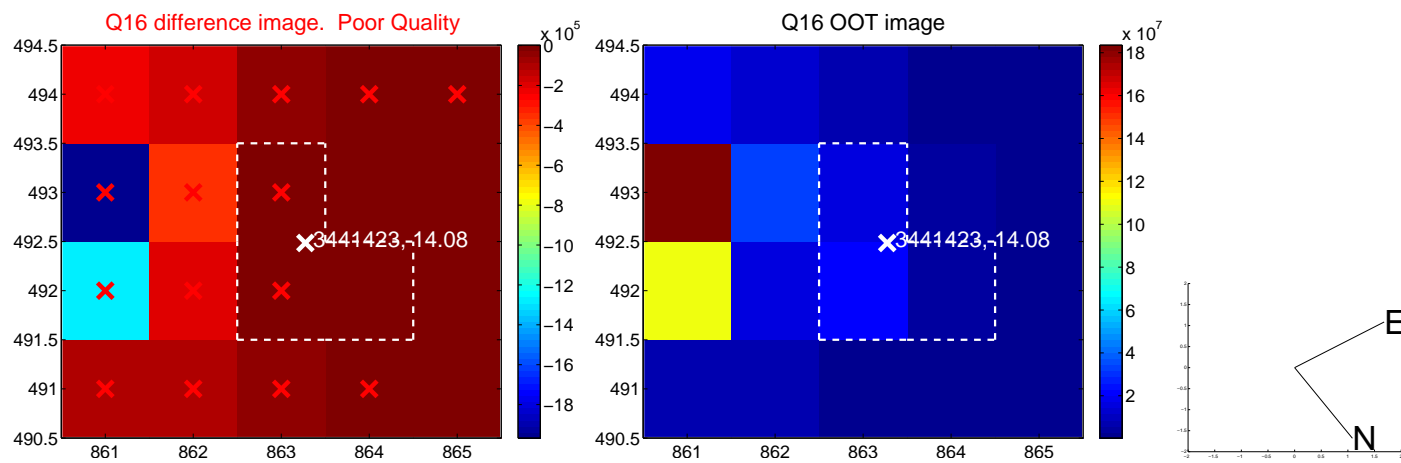
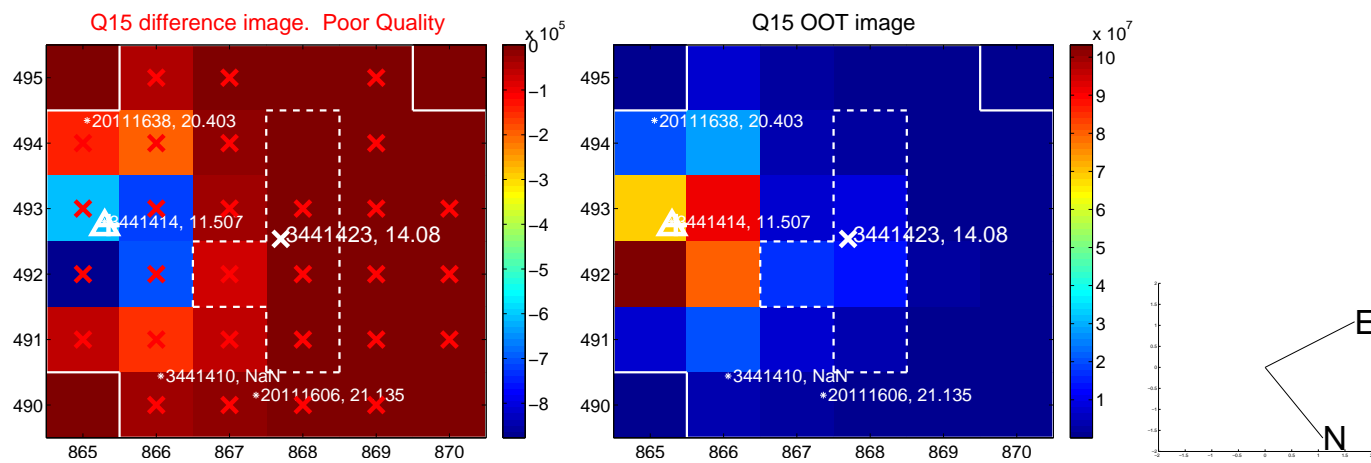
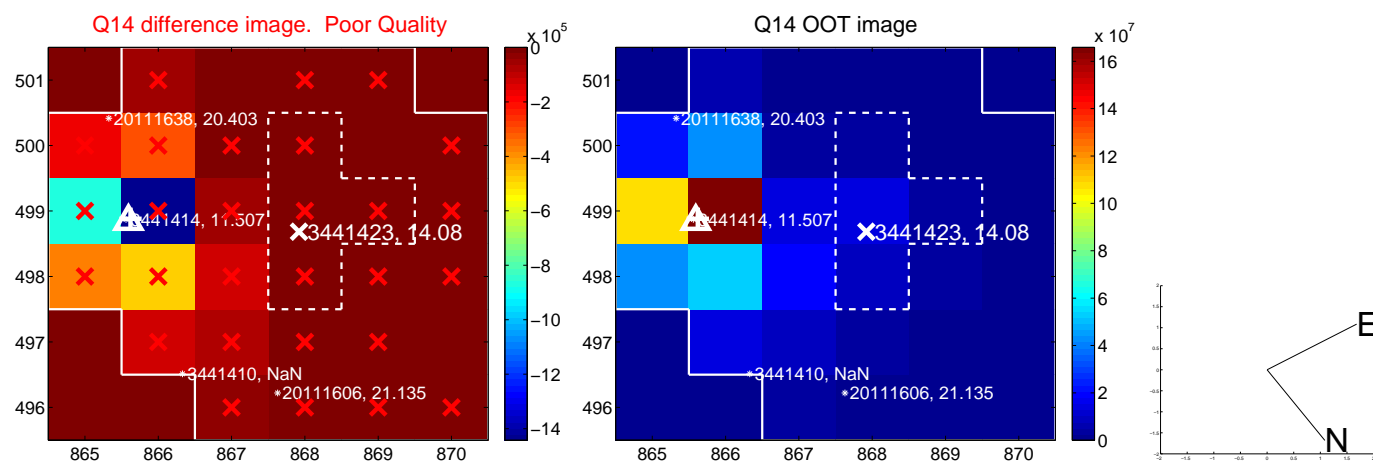
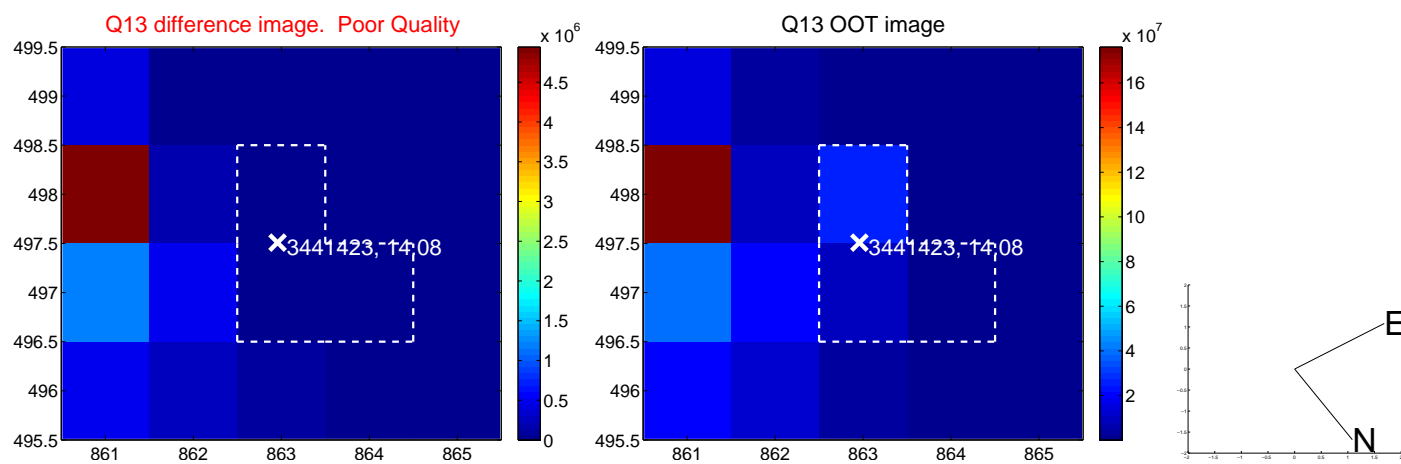




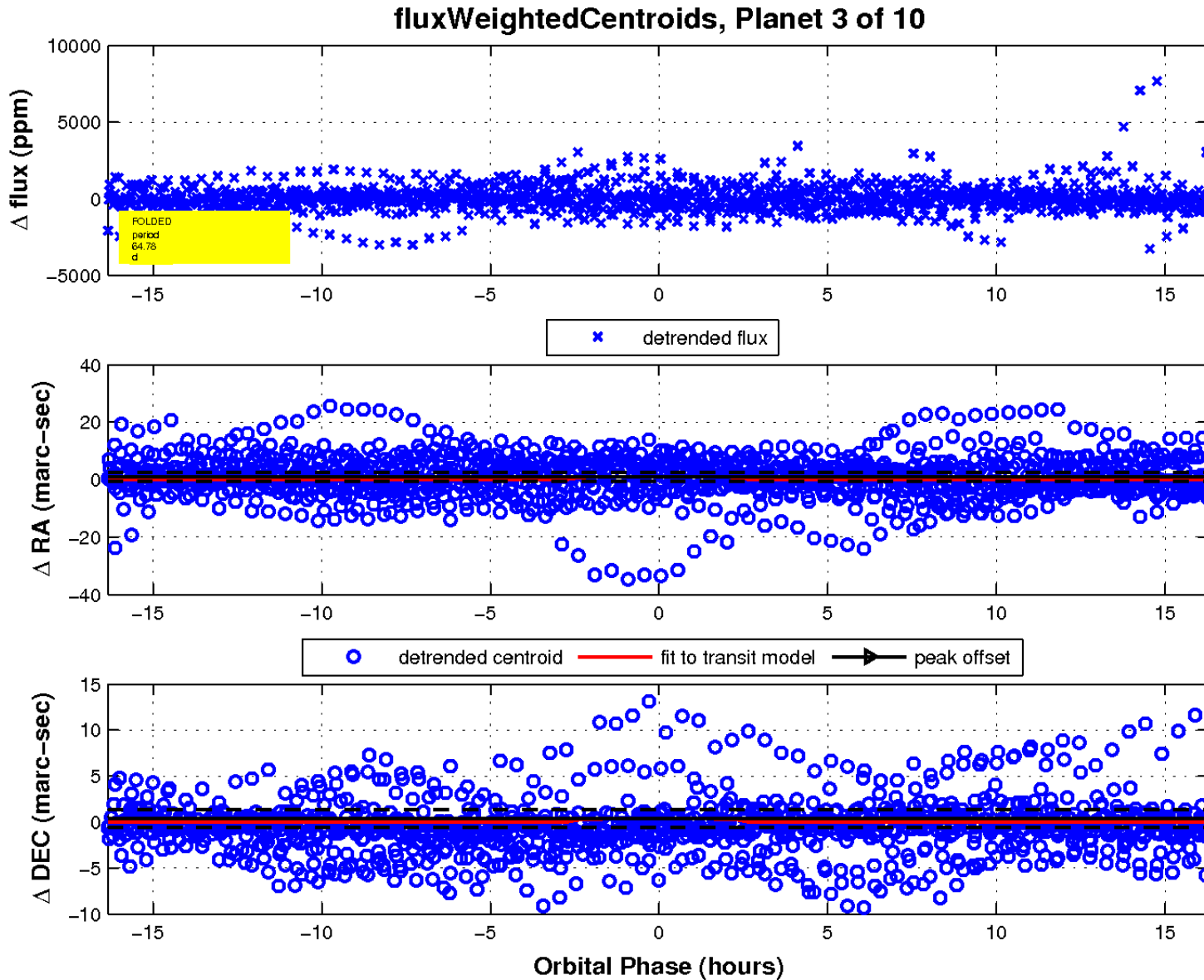
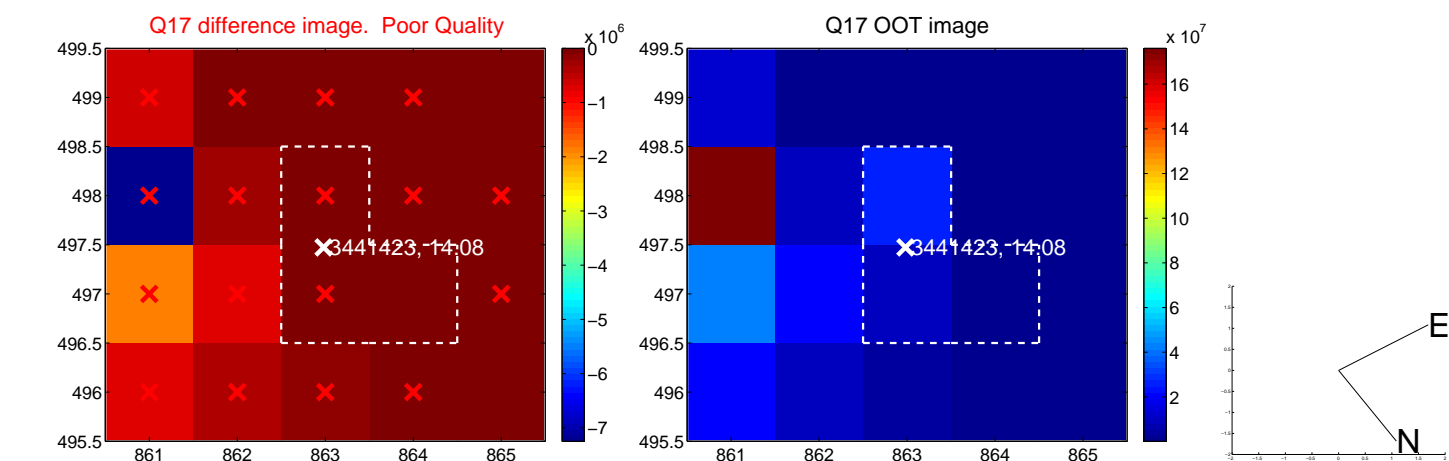
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



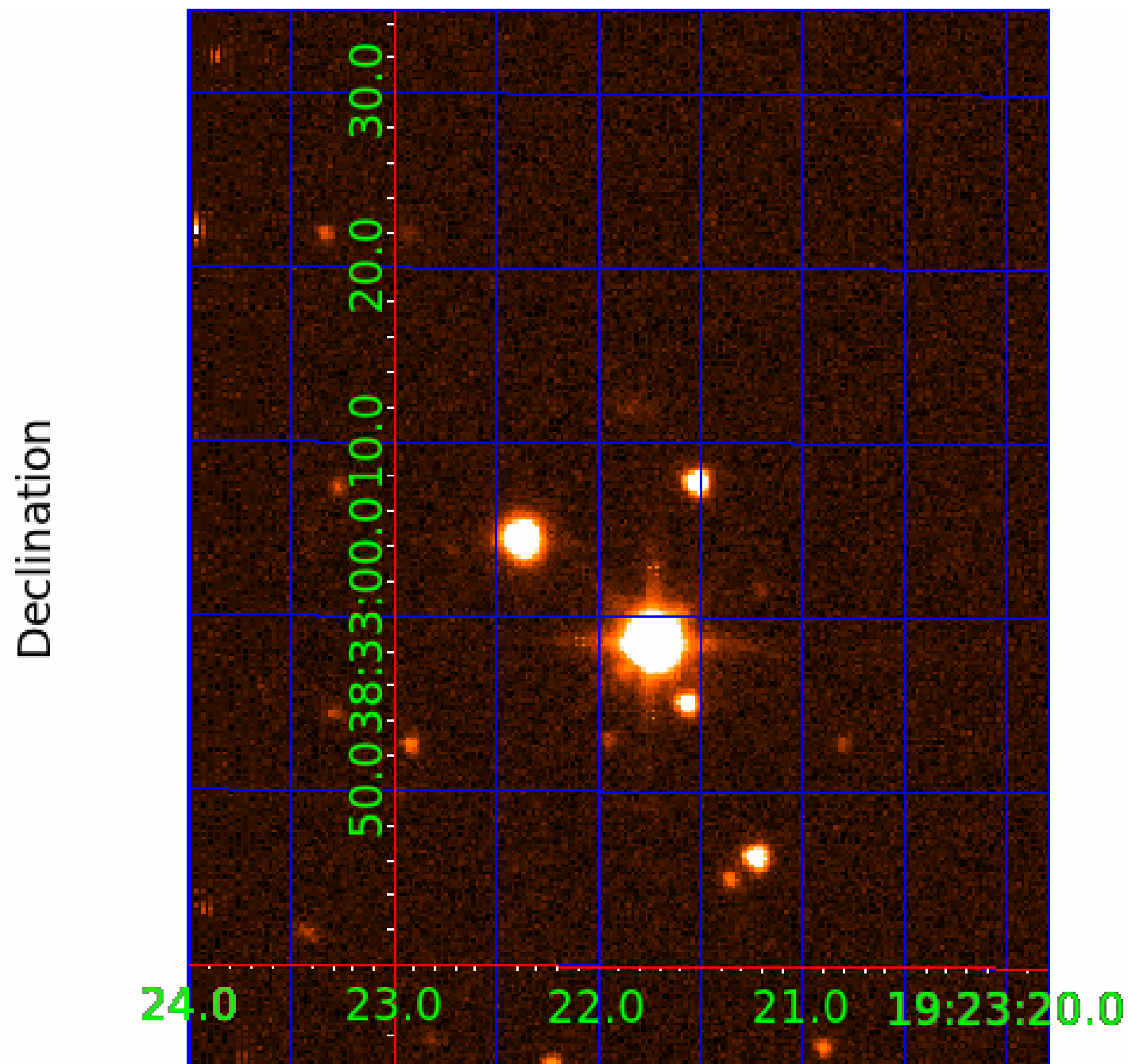
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003441423-01	OBS	No	1.805107	132.300794	107.0	11.412	10.9	7.7	0.84	5508	0.88	712.94
003441423-02	OBS	No	85.856457	168.046199	4465.8	10.500	62.4	-1.0	0.84	5508	5.51	4.14
003441423-03	OBS	No	64.780176	148.035133	1187.9	5.446	19.7	6.4	0.84	5508	3.09	6.02
003441423-04	OBS	No	59.862756	155.930613	2330.1	19.940	15.5	7.0	0.84	5508	7.79	6.69
003441423-05	OBS	No	231.147707	136.281517	15336.4	74.391	15.3	9.6	0.84	5508	12.94	1.10
003441423-06	OBS	No	77.133913	201.287993	1339.7	10.736	14.3	6.9	0.84	5508	4.00	4.77
003441423-07	OBS	No	66.961236	148.930850	971.1	0.969	13.8	4.0	0.84	5508	2.97	5.76
003441423-08	OBS	No	42.934940	141.414459	485.7	7.500	9.0	-1.0	0.84	5508	1.82	10.42
003441423-09	OBS	No	62.622117	157.133901	1581.0	10.114	8.5	7.6	0.84	5508	4.34	6.30
003441423-10	OBS	No	55.642936	159.899113	432.0	1.032	9.4	2.2	0.84	5508	1.98	7.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003441423-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
003441423-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

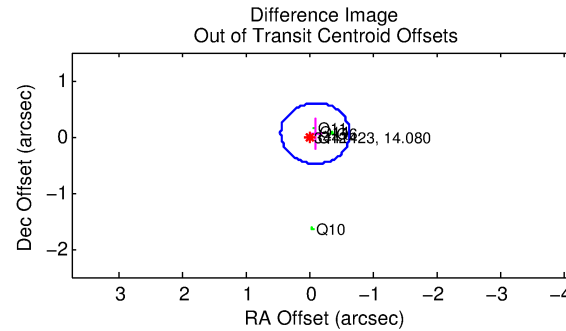
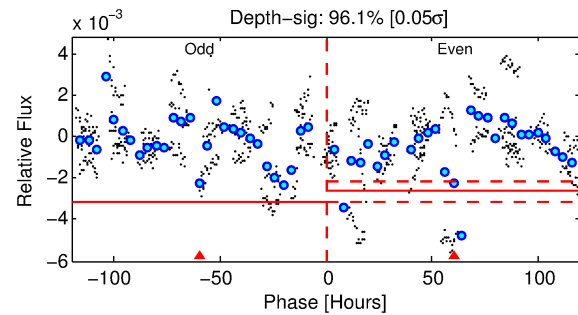
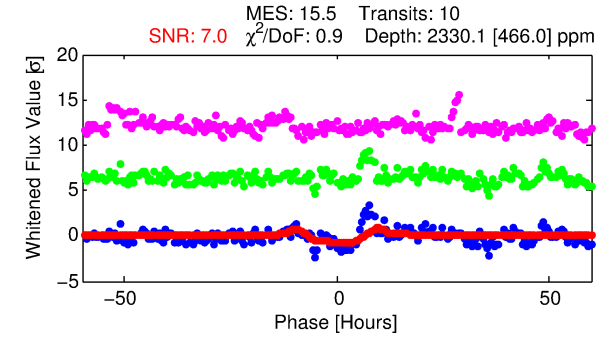
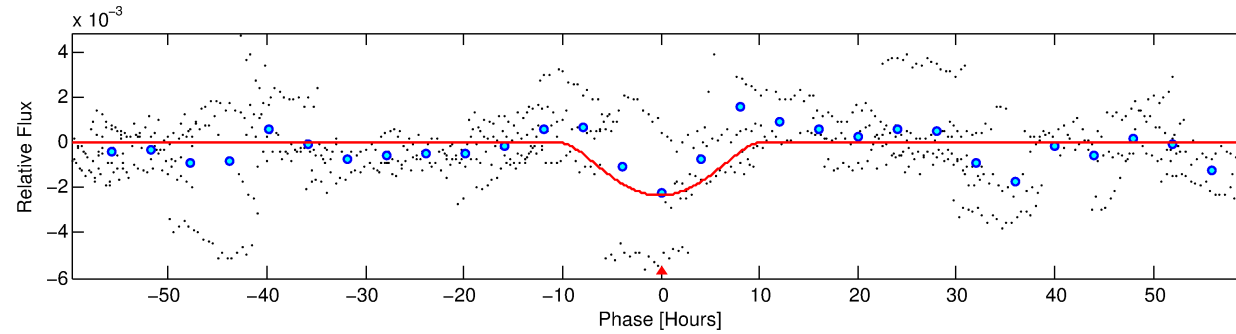
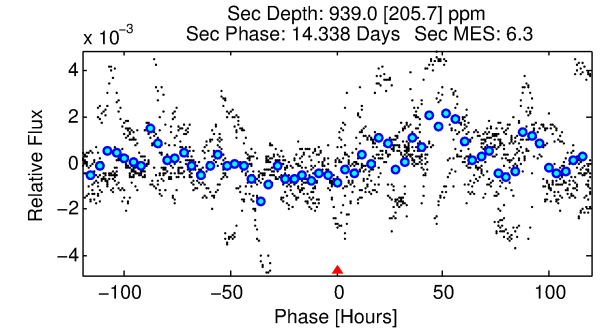
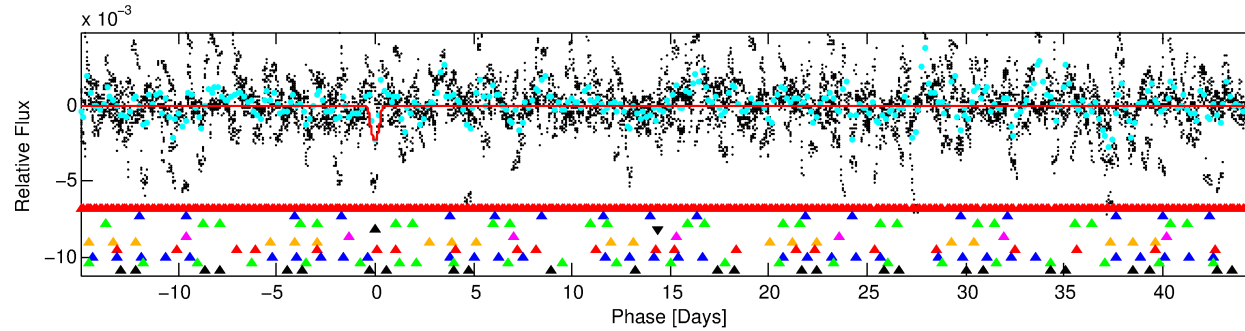
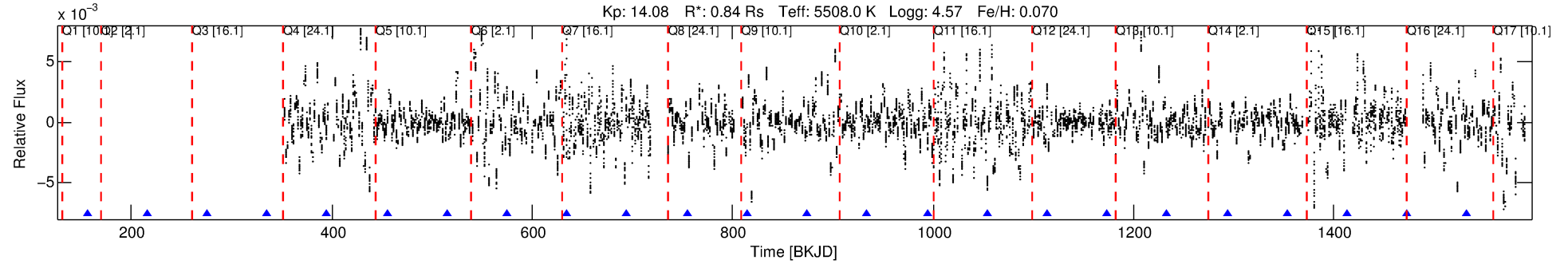
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003441423-04

No Significant Match Found

# DV One-Page Summary

KIC: 3441423 Candidate: 4 of 10 Period: 59.863 d



## DV Fit Results:

Period = 59.86276 [0.00323] d  
Epoch = 155.9306 [0.0468] BKJD  
Rp/R\* = 0.0849 [0.1469]  
a/R\* = 9.72 [3.11]  
b = 1.00 [0.22]  
Seff = 6.69 [1.14]  
Teq = 410 [18] K  
Rp = 7.79 [13.49] Re  
a = 0.2949 [0.0296] AU  
Ag = 740.98 [2570.25] [0.29σ]  
Teffp = 3308 [2866] K [1.01σ]

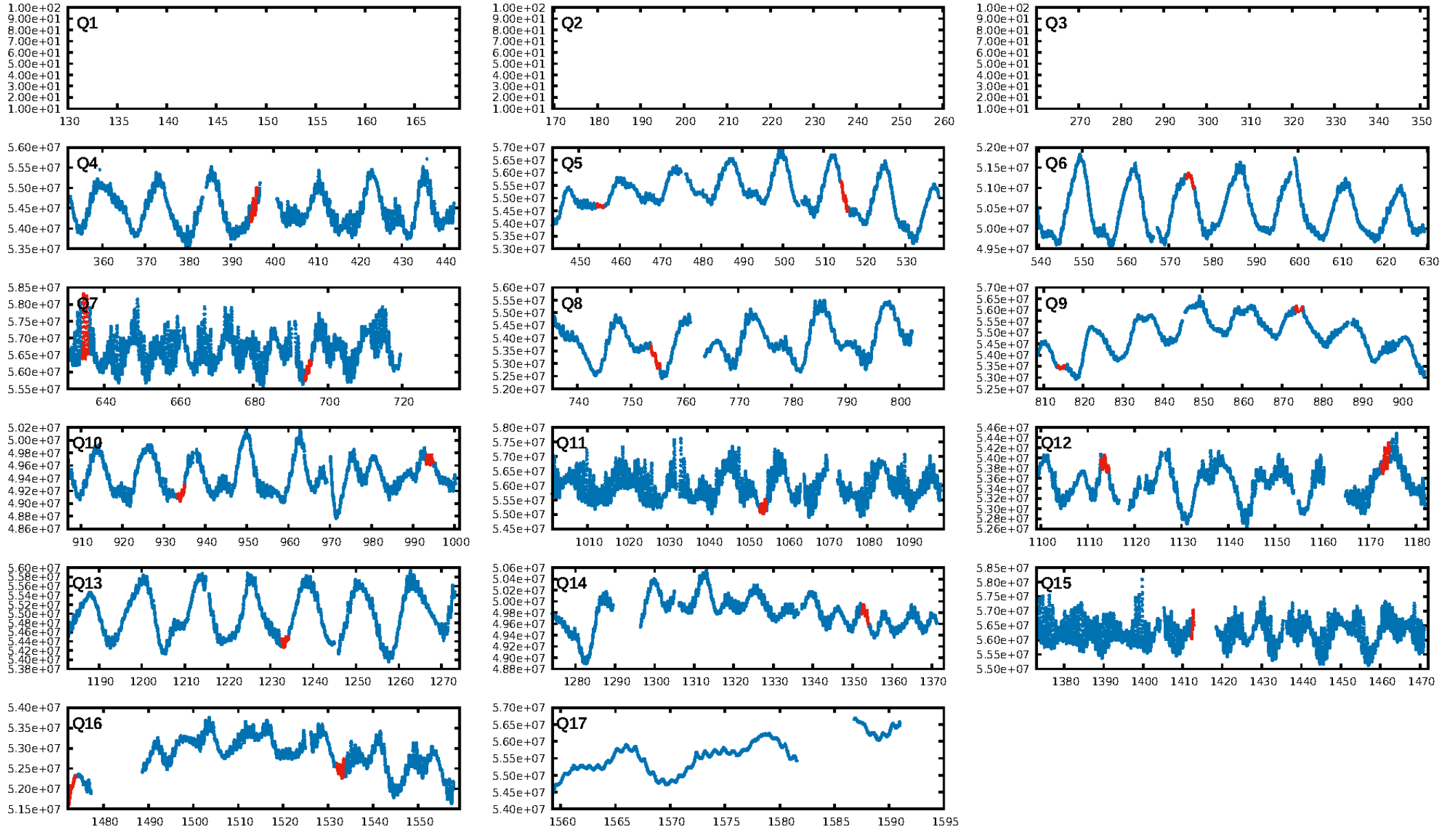
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.07σ]  
LongPeriod-sig: 99.7% [2.96σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.74e-19  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: 1.546  
Centroid-sig: 2.9%  
Centroid-so: 1.237 arcsec [3.28σ]  
OotOffset-rm: 0.101 arcsec [0.56σ]  
KicOffset-rm: 9.223 arcsec [45.27σ]  
OotOffset-st: 3/1/1/0 [5]  
KicOffset-st: 3/1/1/0 [5]  
DiffImageQuality-fgm: 0.80 [4/5]  
DiffImageOverlap-fno: 0.00 [0/11]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:20:21 Z

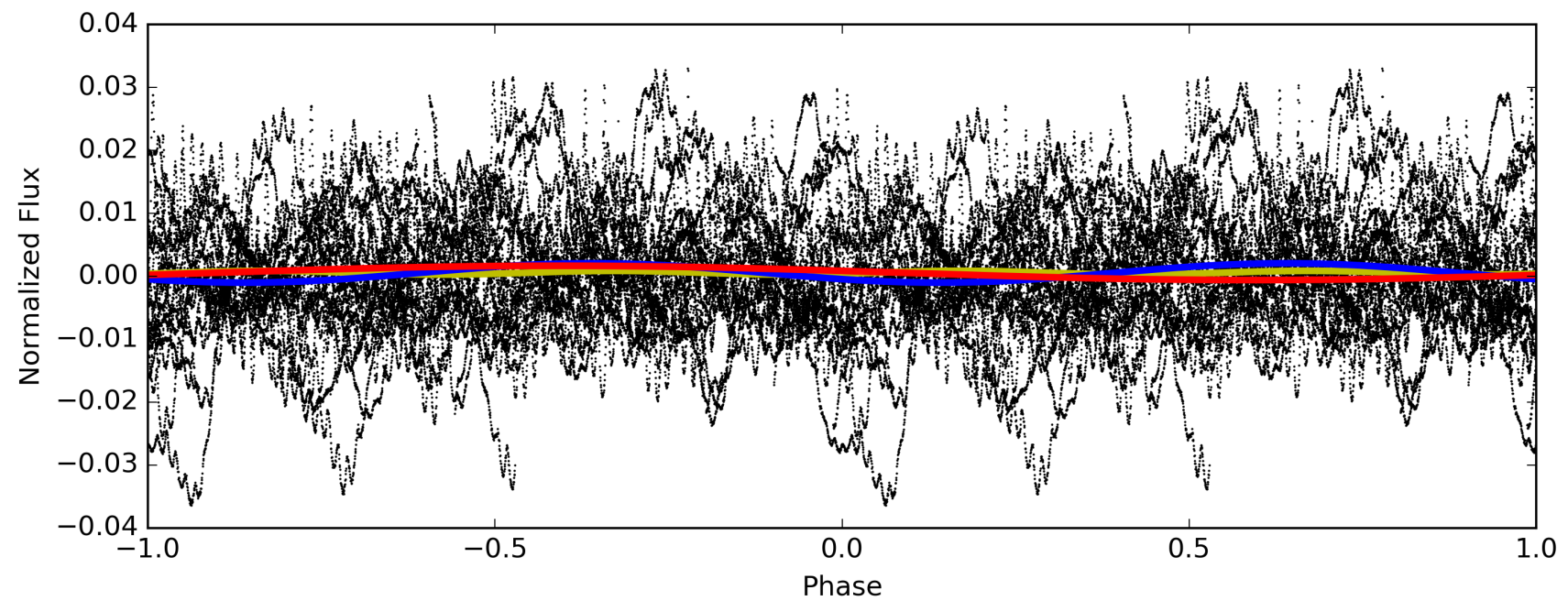
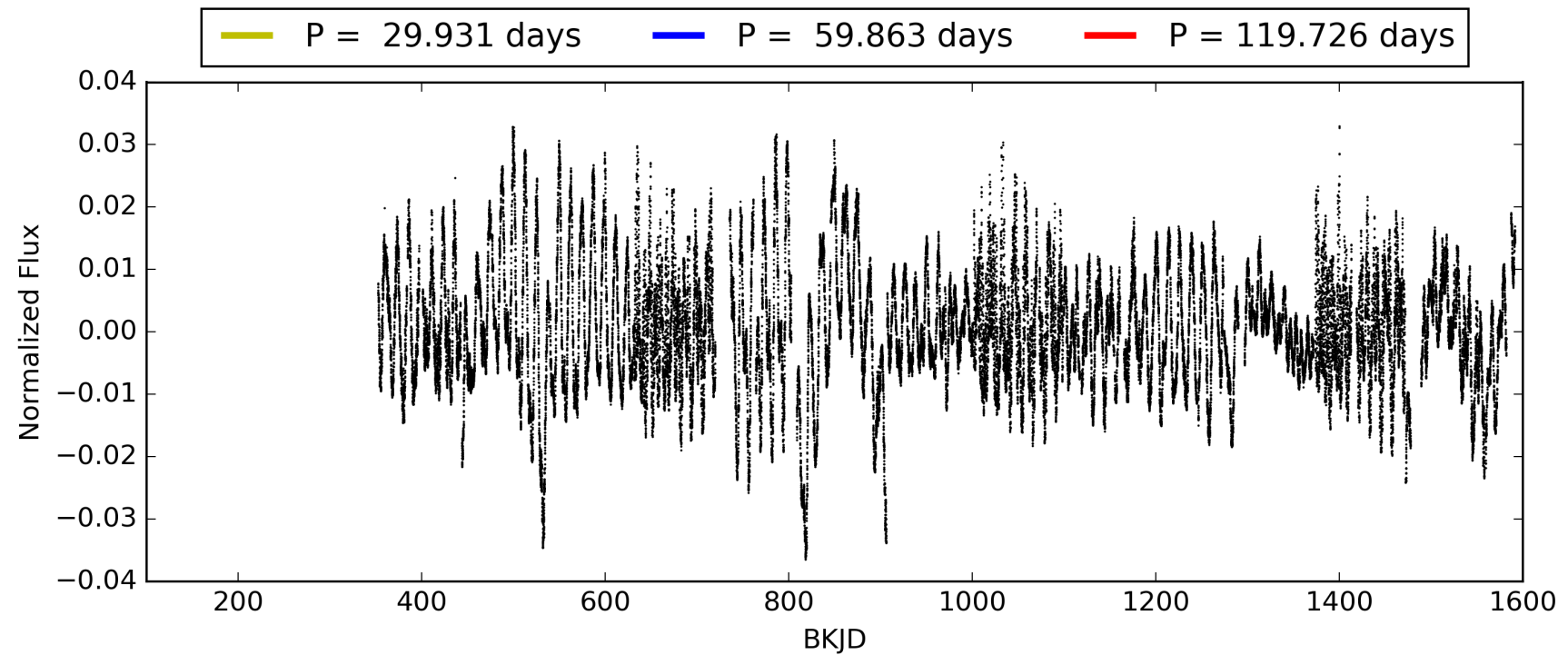
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003441423-04, PDC Light Curves



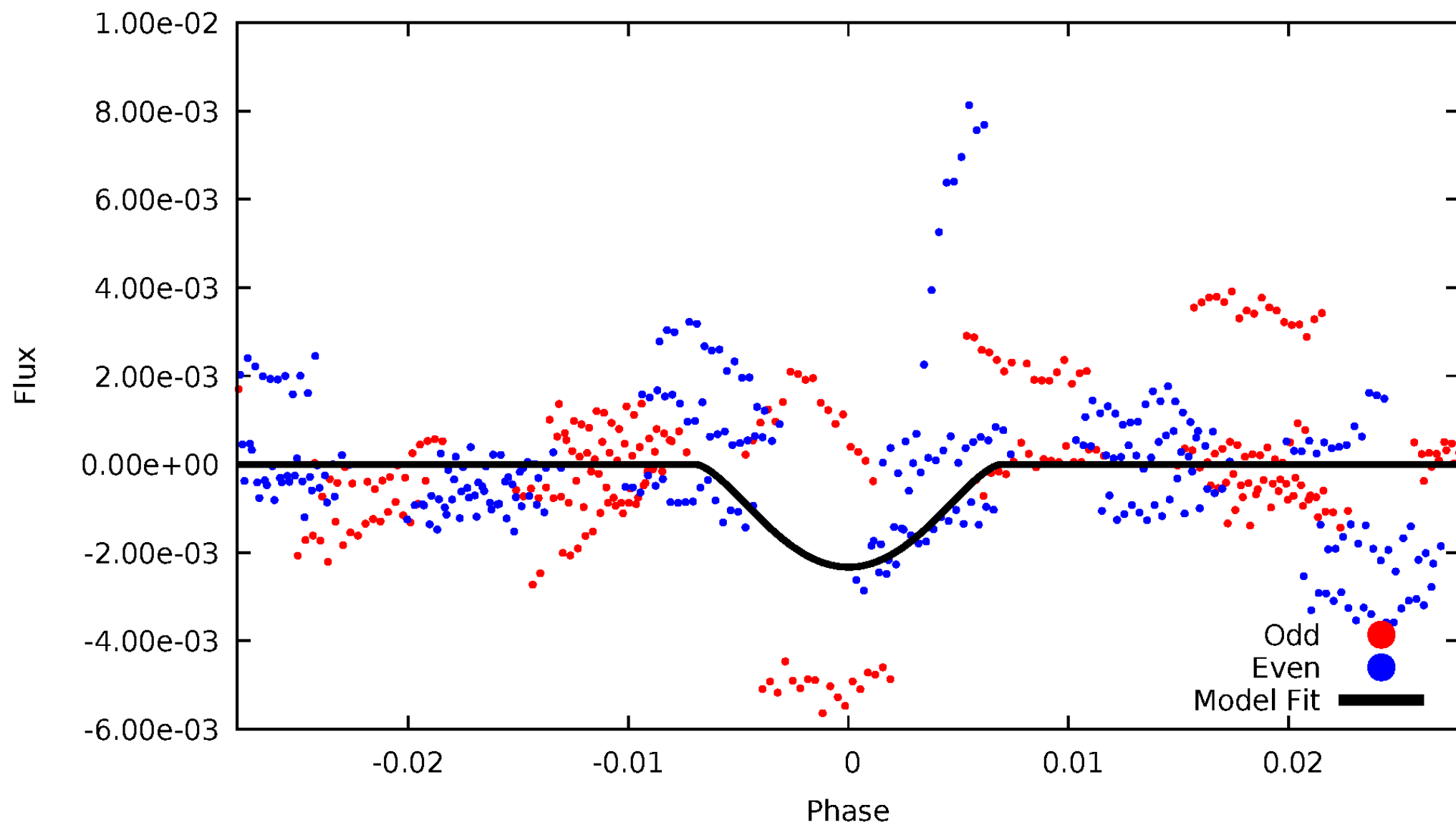


TCE 003441423-04



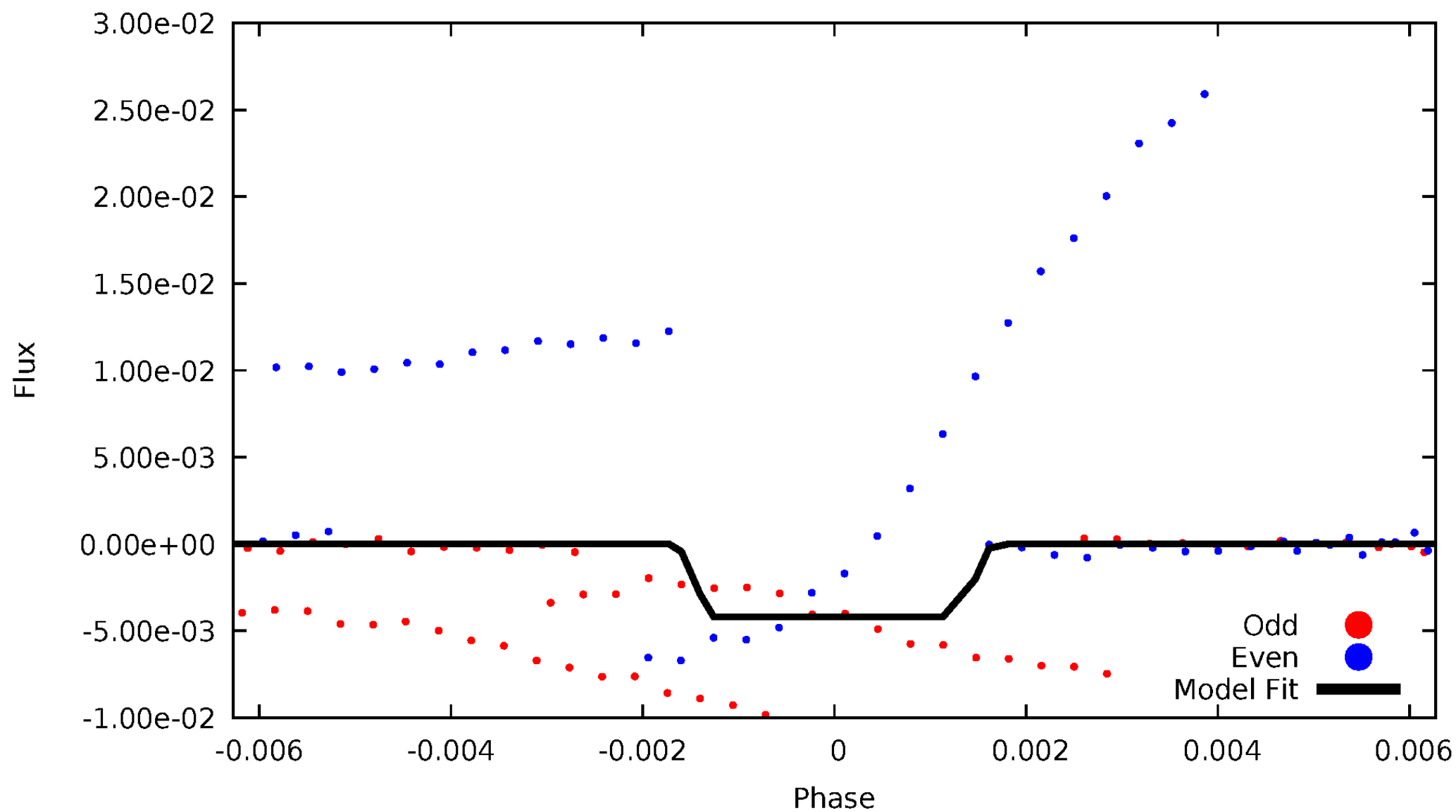
# DV Odd/Even

TCE 003441423-04



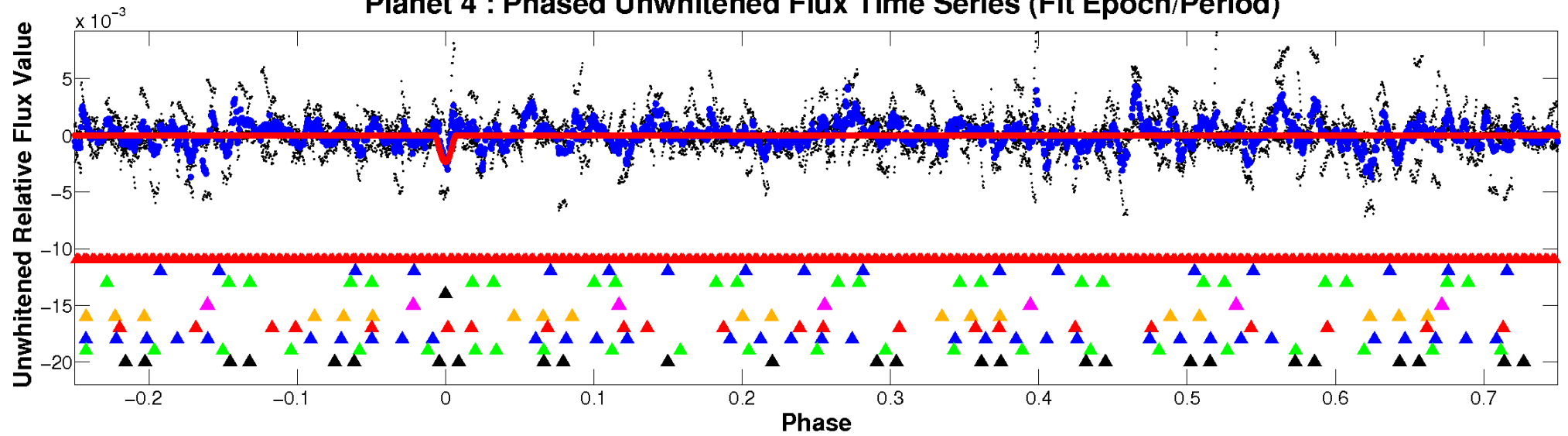
# ALT Odd/Even

TCE 003441423-04

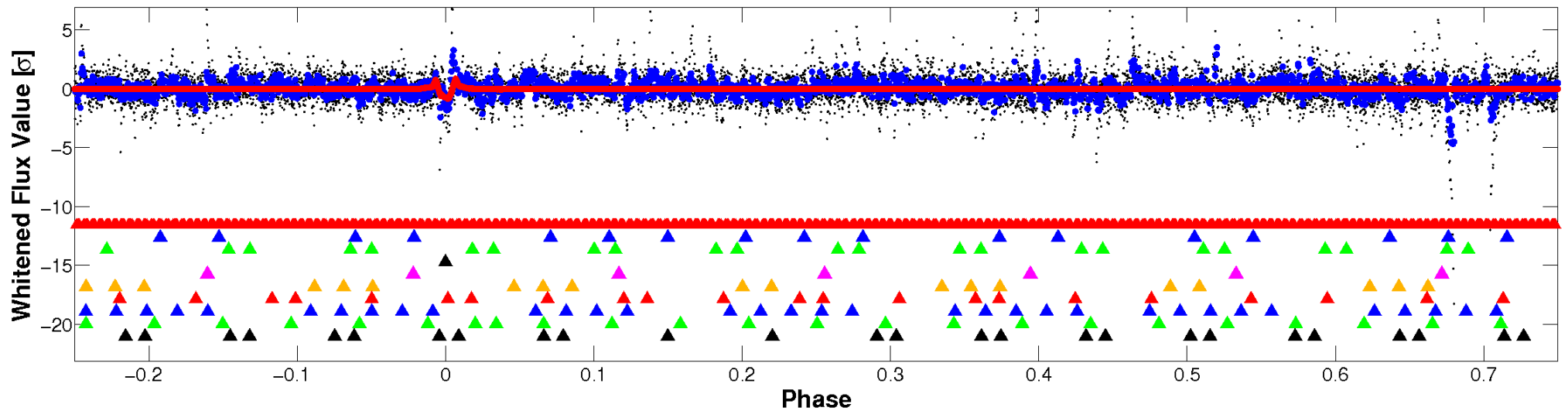


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

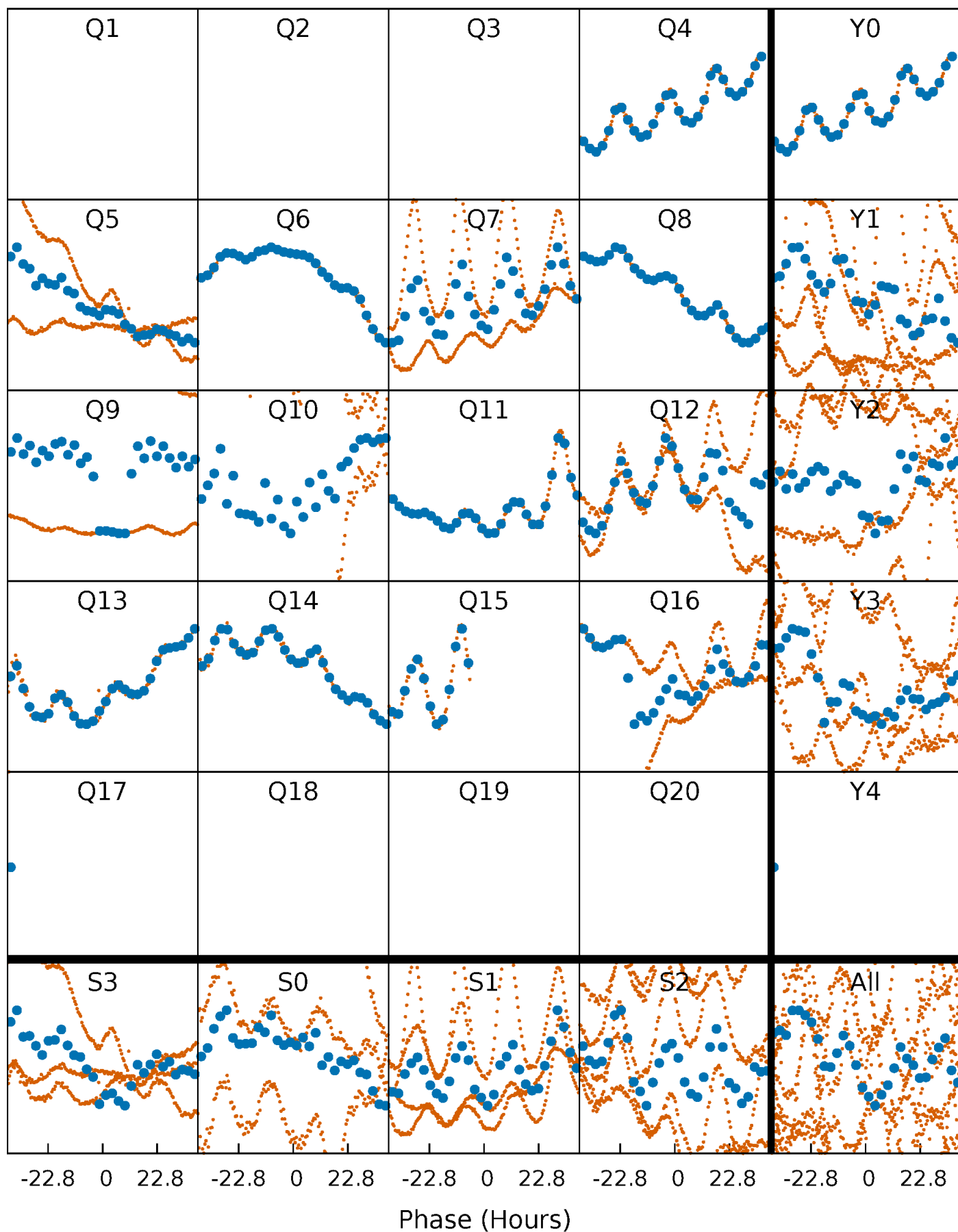


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



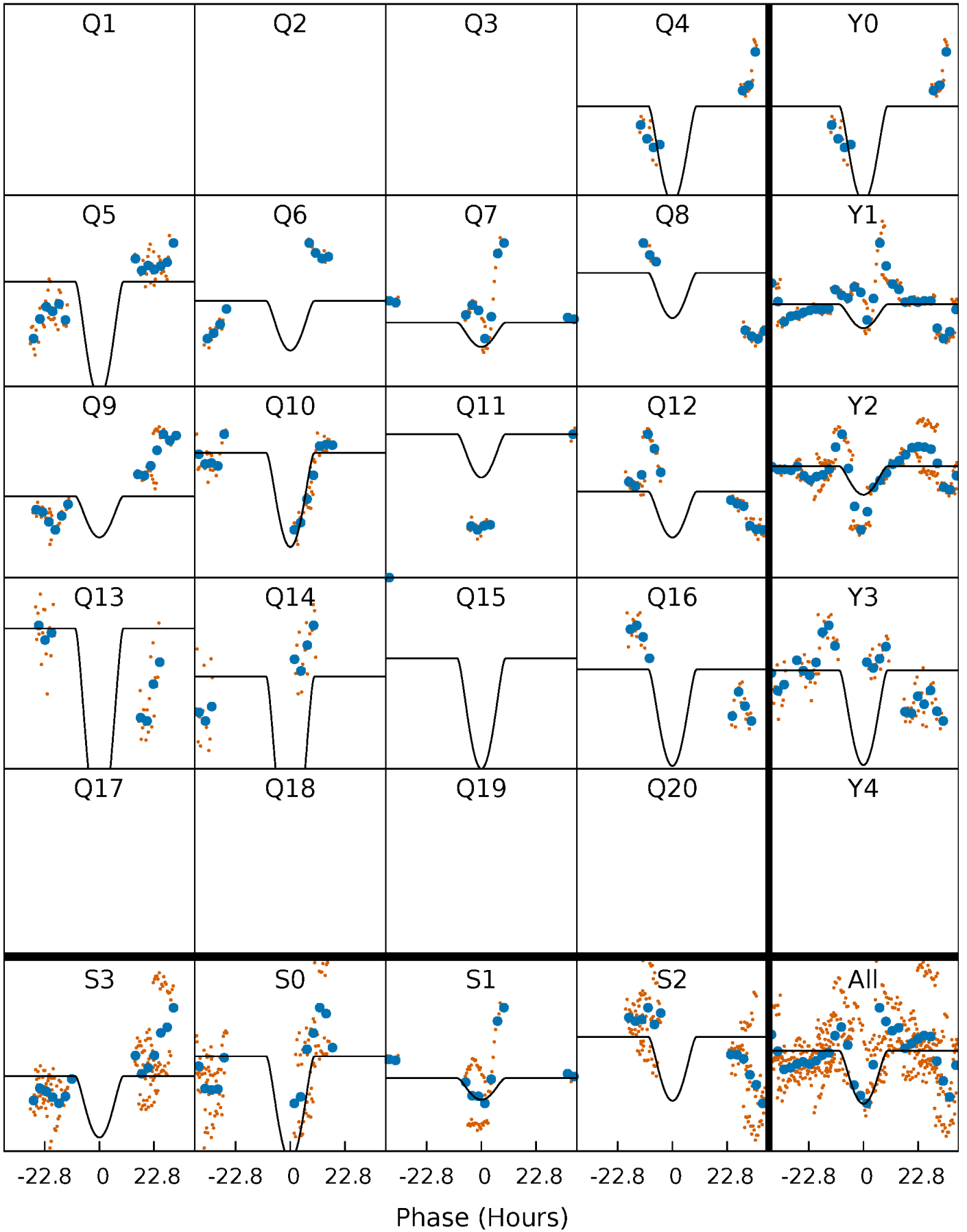
# PDC Quarter-Phased Transit Curves

TCE 003441423-04   P= 59.862756 Days    $T_0=155.930613$  (BKJD)



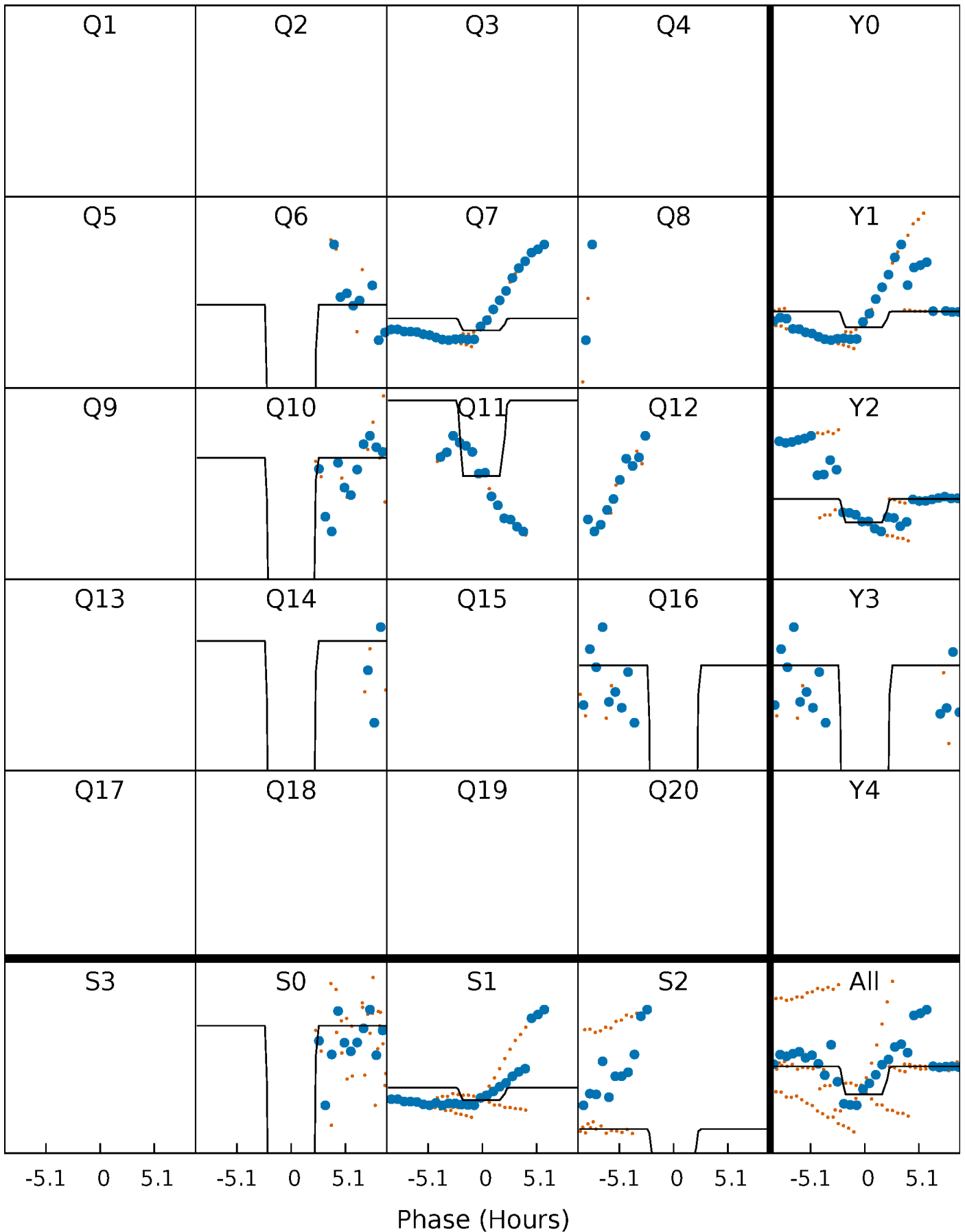
# DV Quarter-Phased Transit Curves

TCE 003441423-04     $P = 59.862756$  Days     $T_0 = 155.930613$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

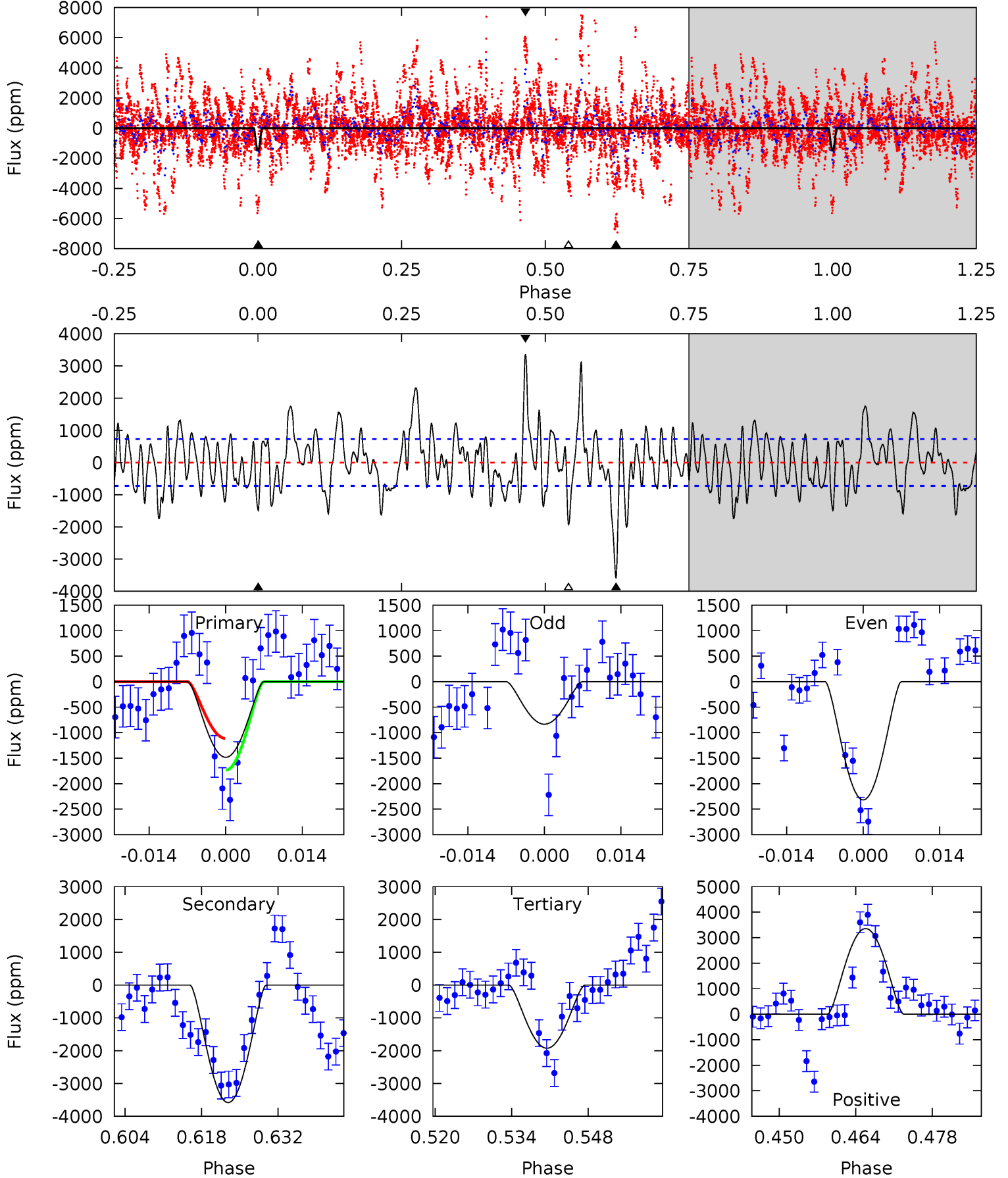
TCE 003441423-04   P= 59.835048 Days    $T_0=156.290362$  (BKJD)



# DV Model-Shift Uniqueness Test

003441423-04, P = 59.862756 Days, E = 155.930613 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	24.4	13.1	22.9	4.96	2.46	5.36	-3.02	-12.8	11.3	1.54	4.86	2.68	0.48	2.14

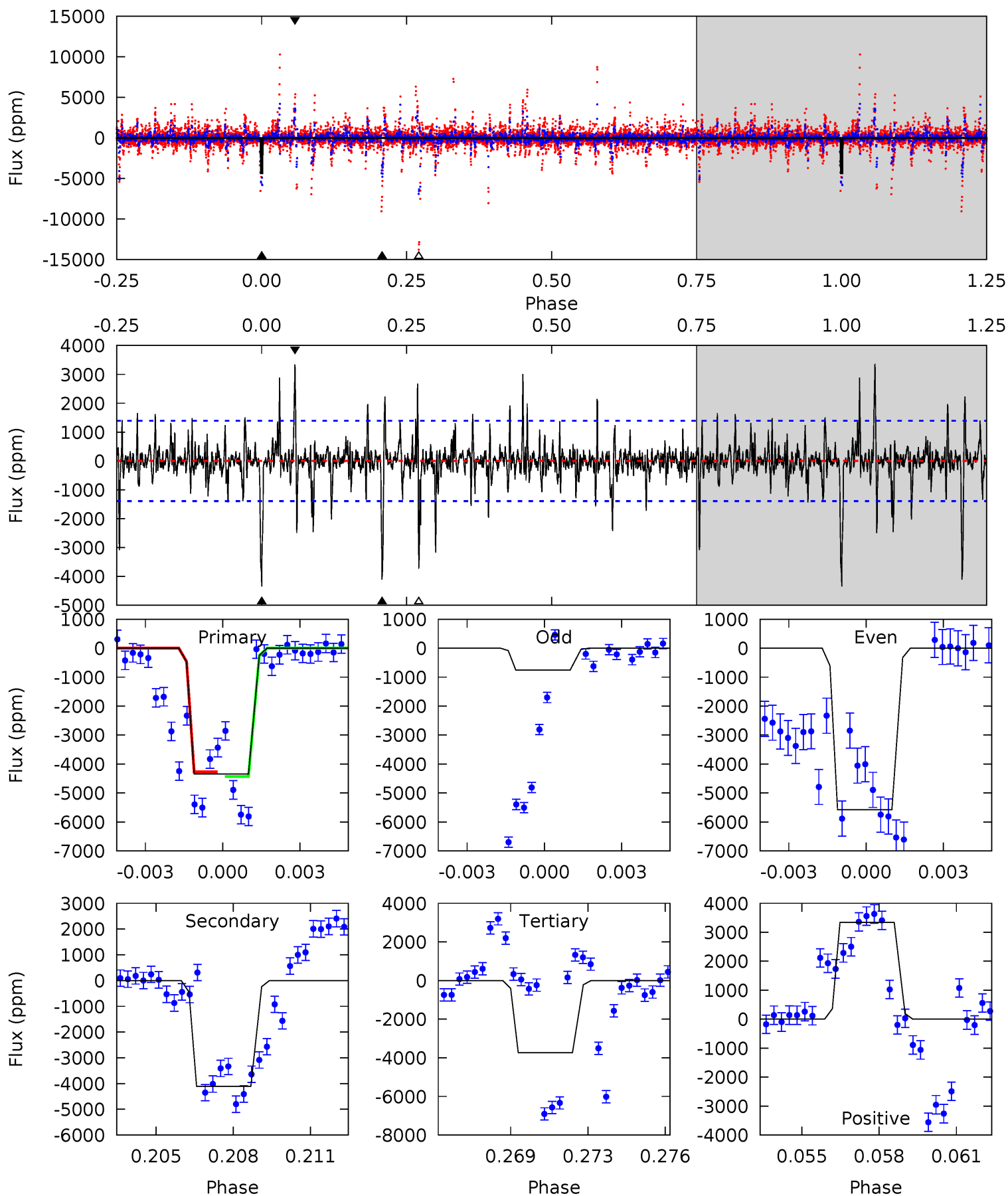




# Alt Model-Shift Uniqueness Test

003441423-04, P = 59.835048 Days, E = 156.290362 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	15.5	14.0	12.6	5.23	2.93	1.82	2.30	3.76	1.43	2.89	5.94	1.18	0.43	0.31



### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-3582 \pm 147$	$13.02^{+12.61}_{-7.91}$	$581^{+15}_{-12}$	$3951^{+1816}_{-769}$	$1004^{+5456}_{-744}$
Alt.	$-4111 \pm 266$	$11.73^{+11.13}_{-7.62}$	$580^{+15}_{-12}$	$4189^{+2437}_{-858}$	$1400^{+9990}_{-1035}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

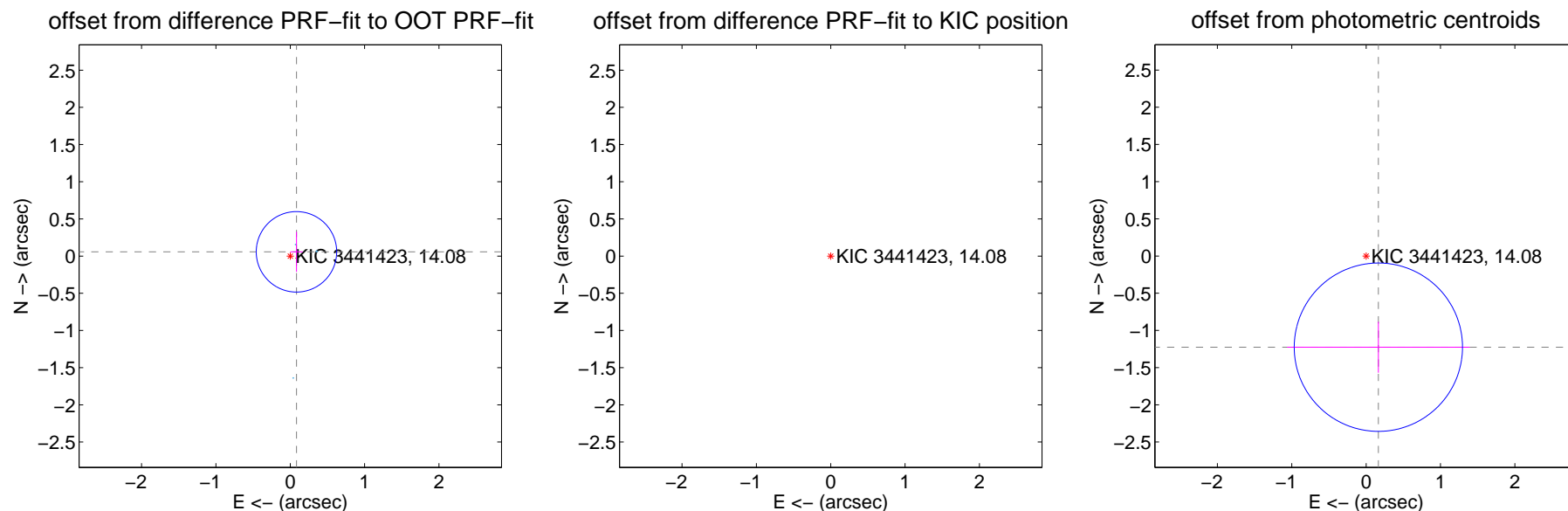
## DV Centroid Data

Supplemental centroid analysis for 003441423-04. Kepler magnitude: 14.08. Transit SNR 6.96

There are 4 quarters with good PRF difference image offsets

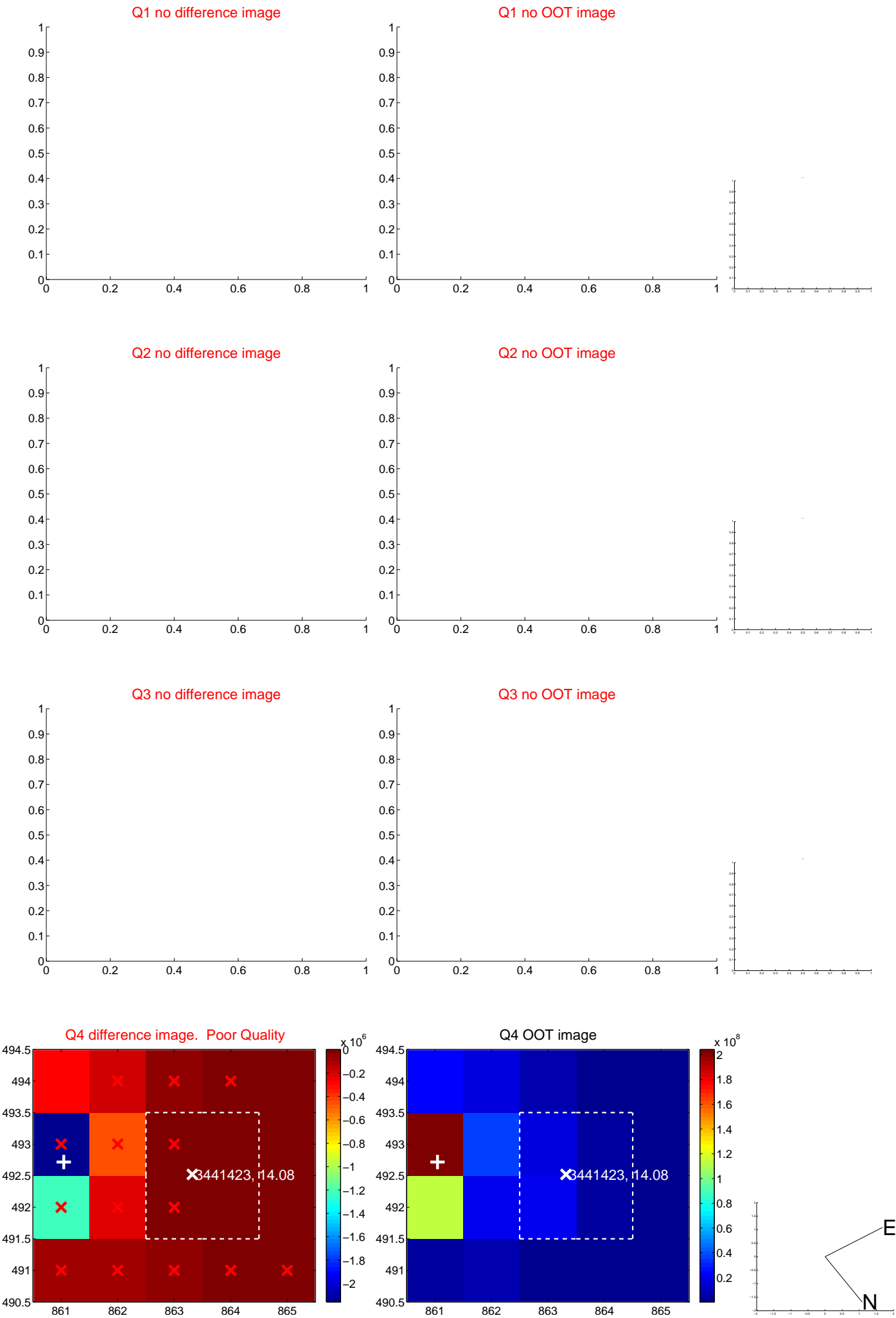
The OOT PRF centroid is offset from the target star catalog position by about 9.17 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.101 \pm 0.180$	0.56	$-0.083 \pm 0.083$	$0.057 \pm 0.270$
PRF-fit source offset from KIC position	$9.223 \pm 0.204$	45.27	$-7.306 \pm 0.082$	$-5.630 \pm 0.333$
photometric centroid source offset	$1.24 \pm 0.38$	3.28	$-0.16 \pm 1.23$	$-1.23 \pm 0.34$

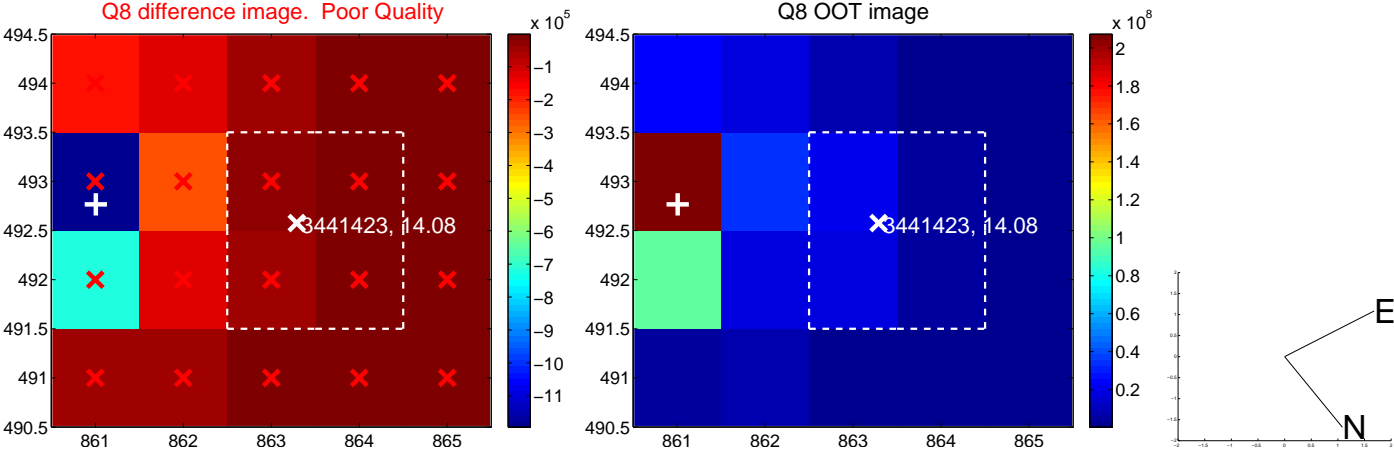
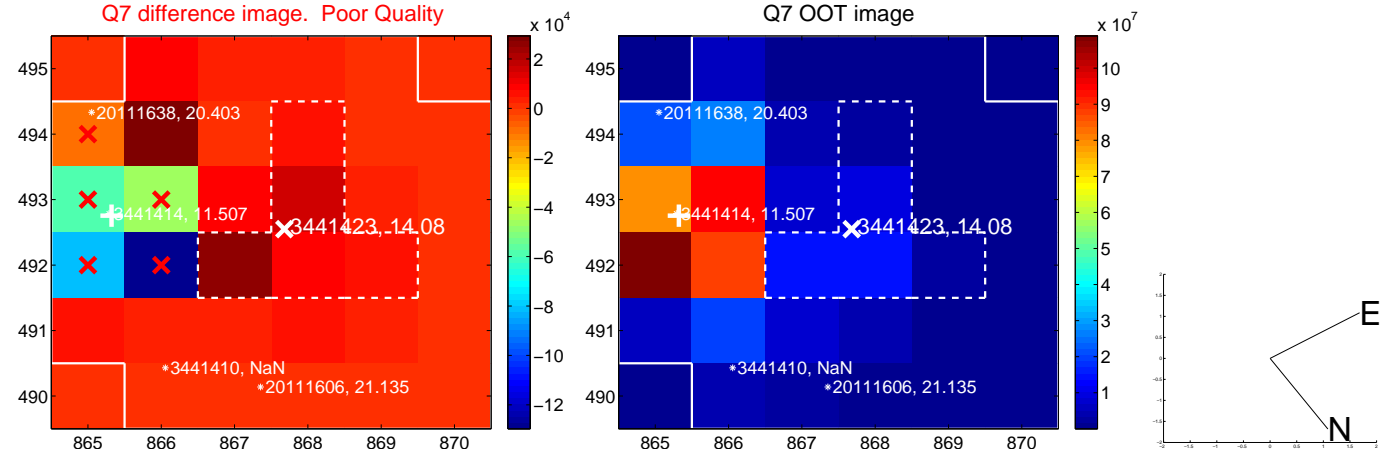
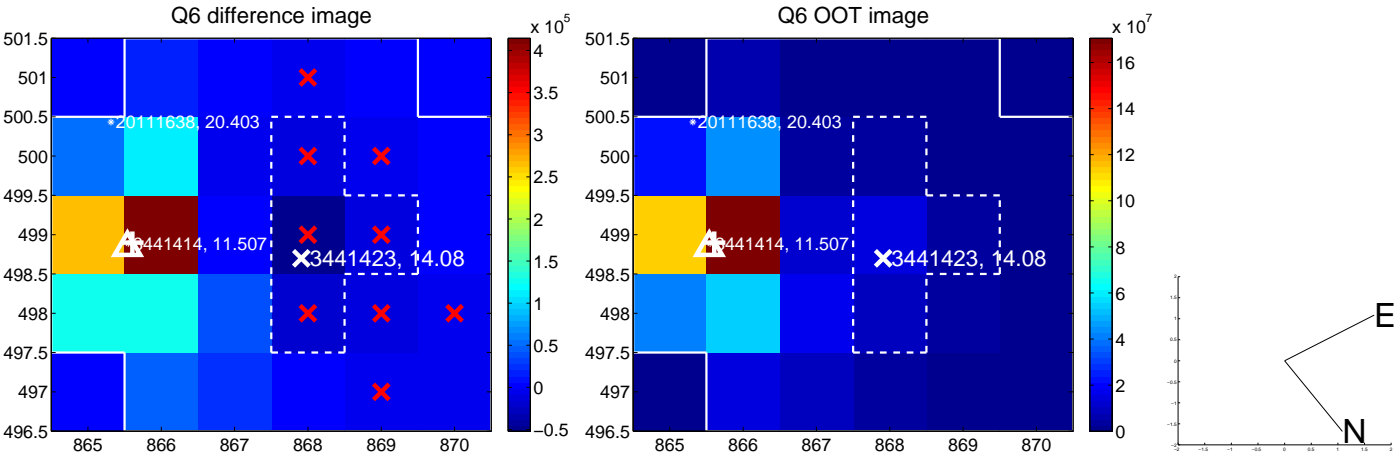
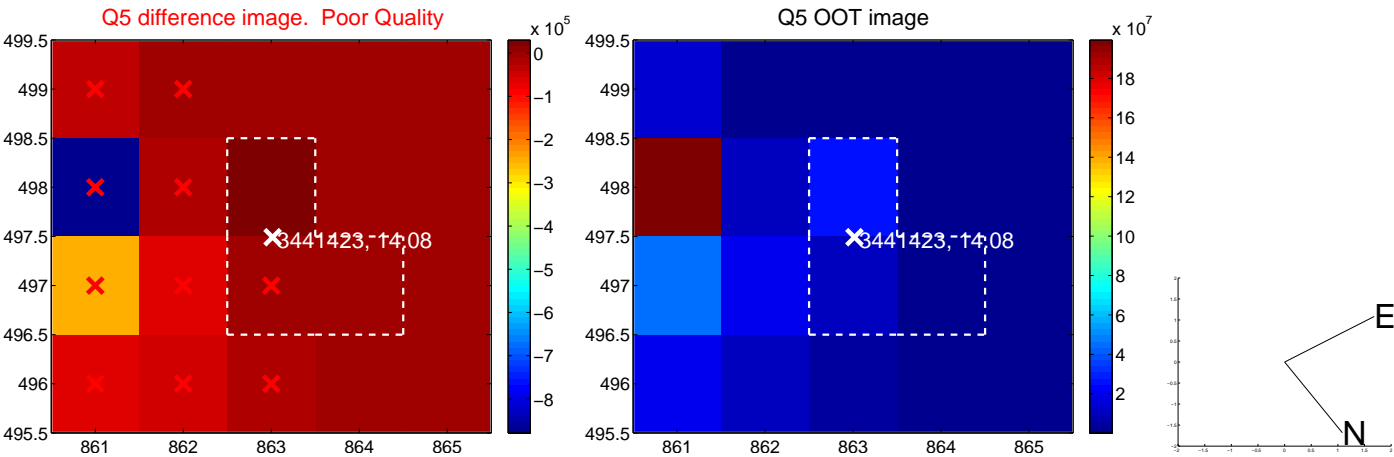


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

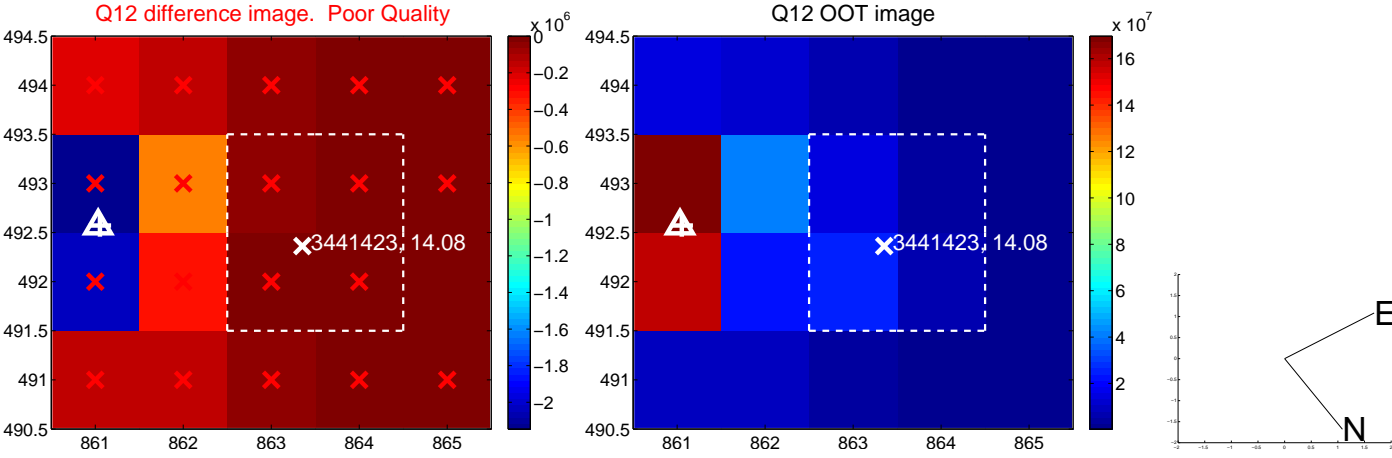
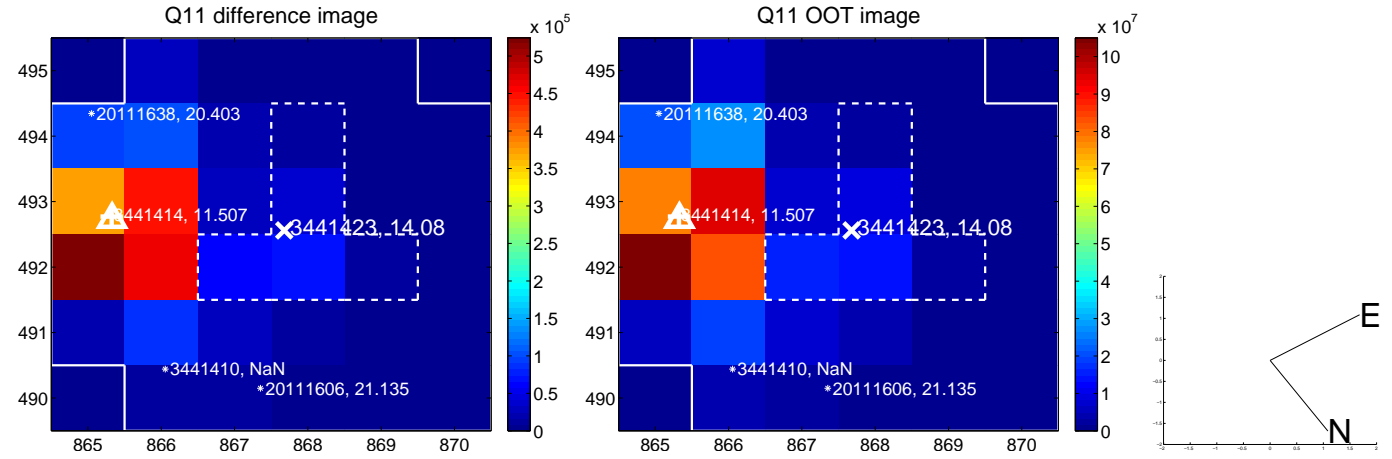
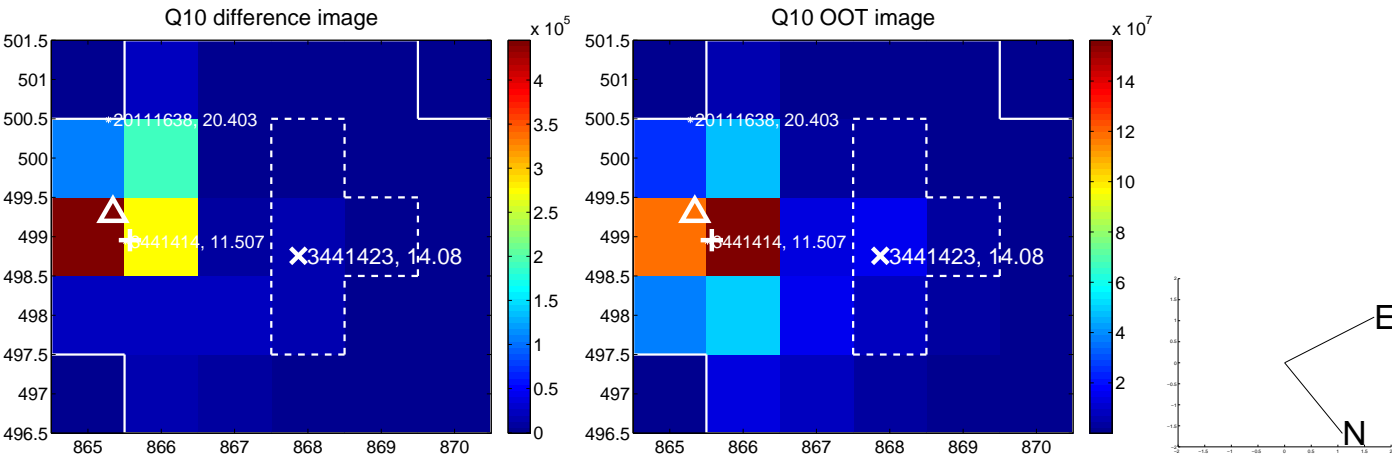
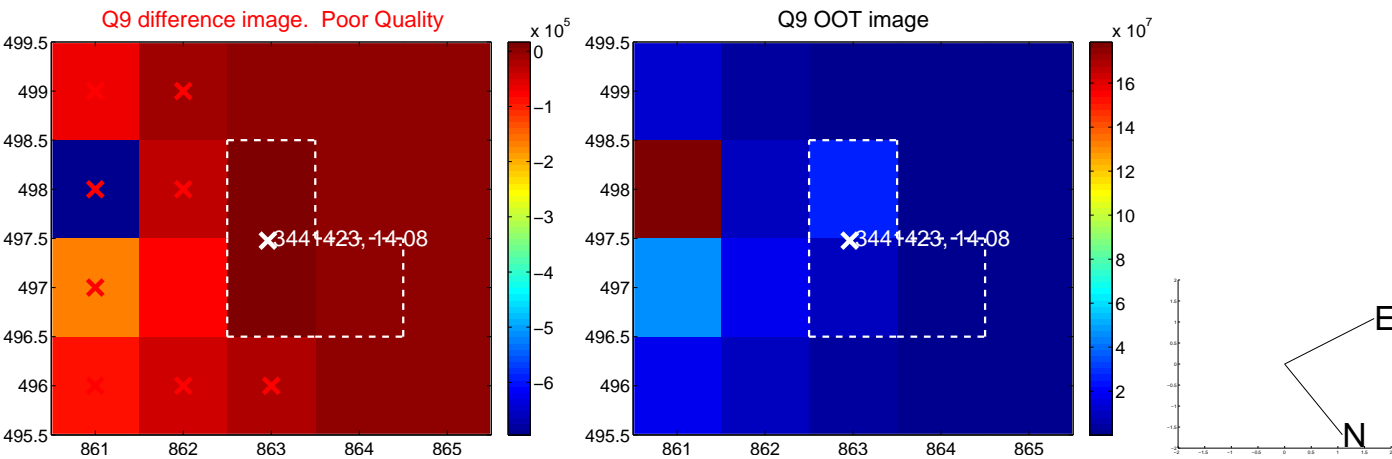
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



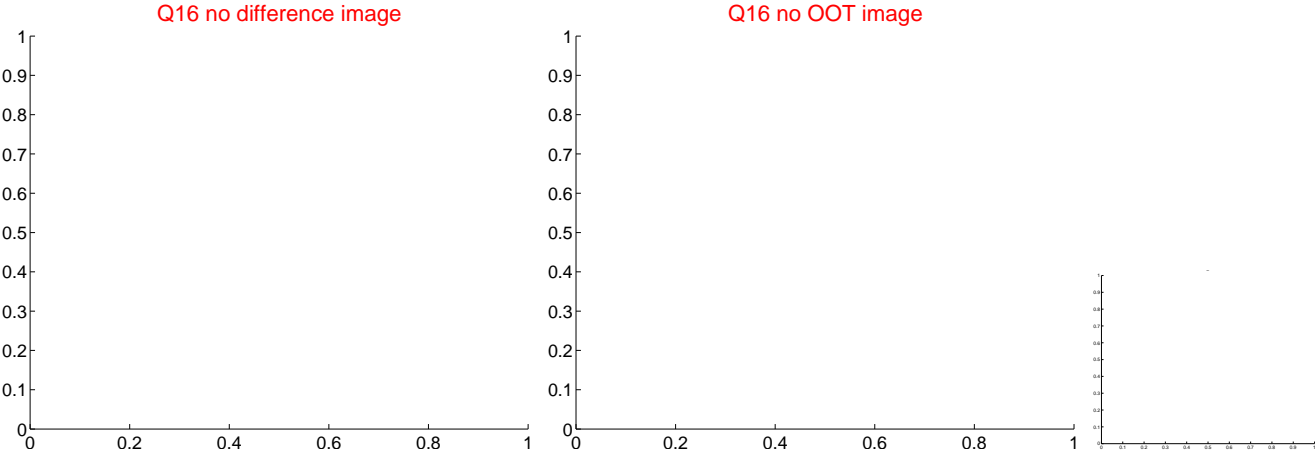
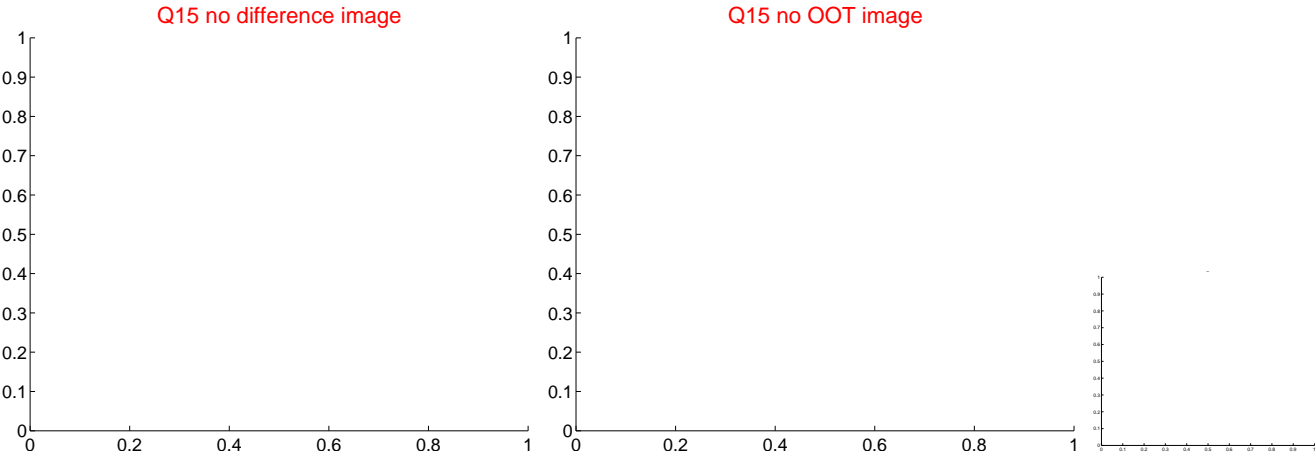
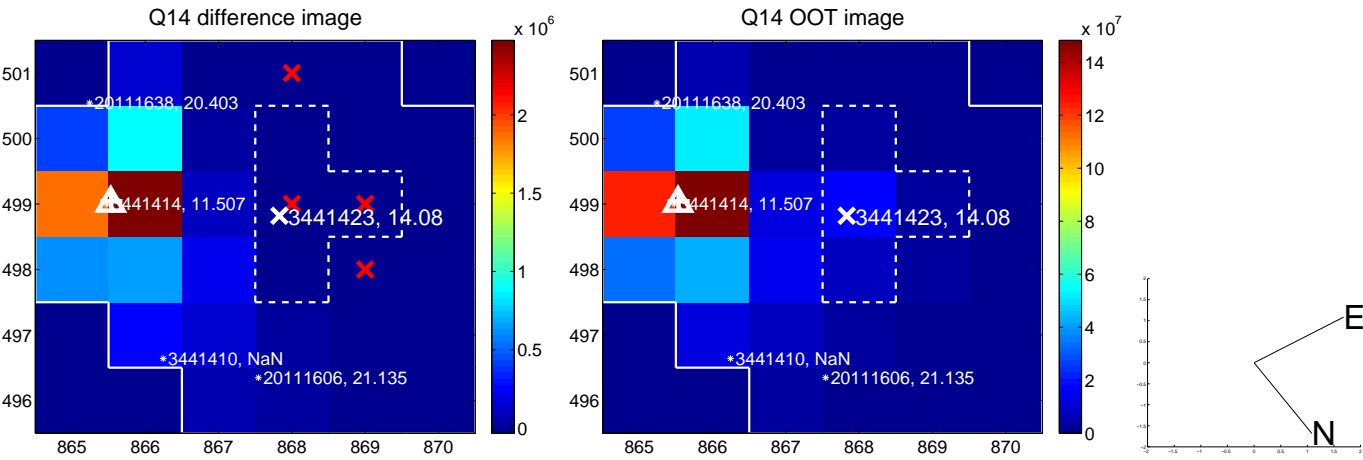
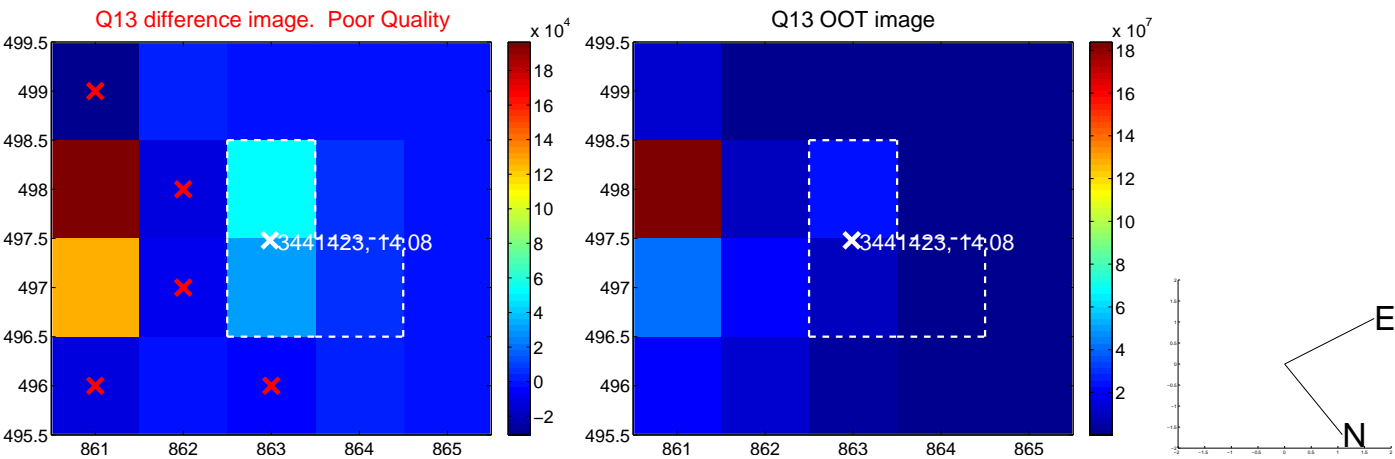
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



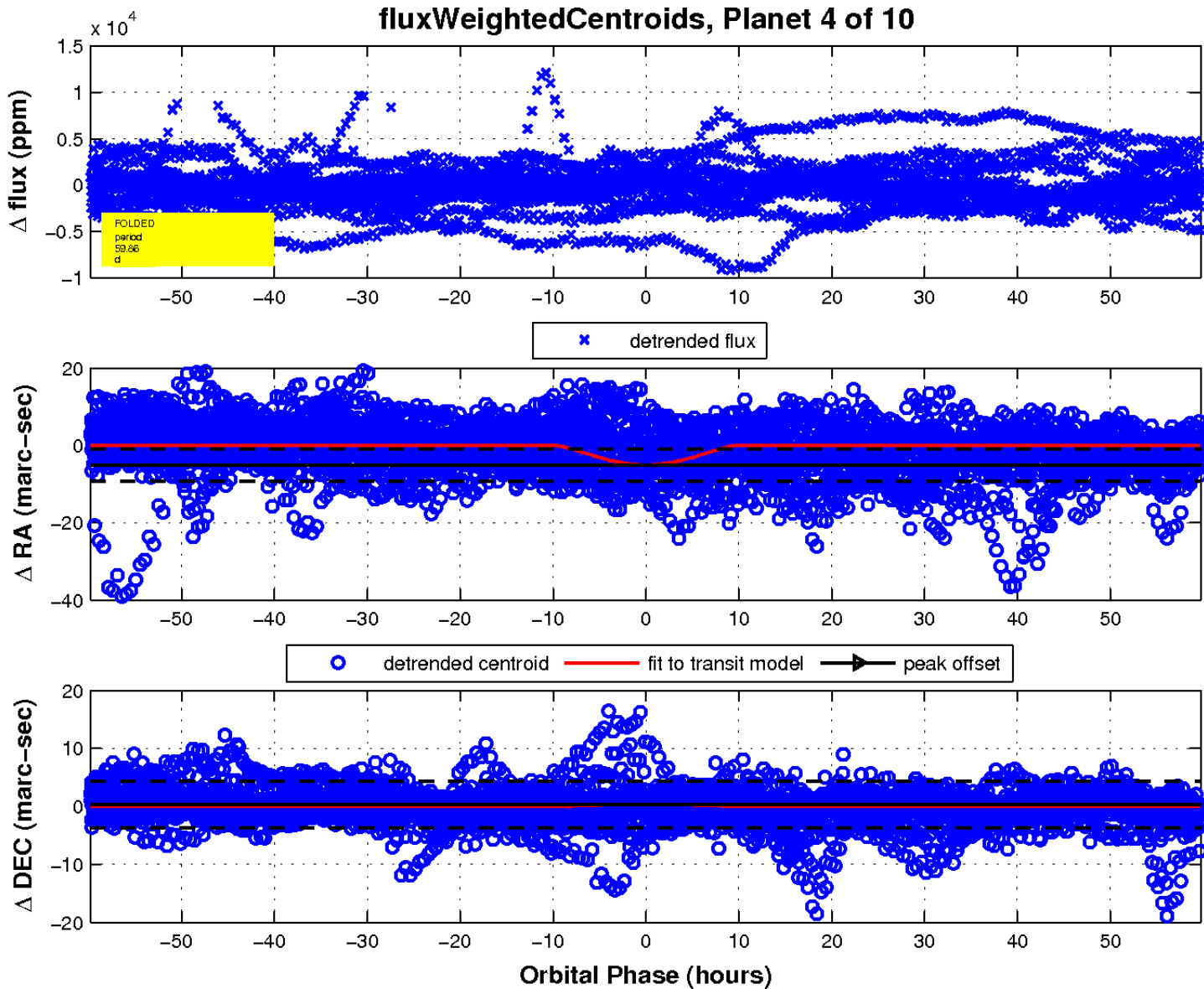
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

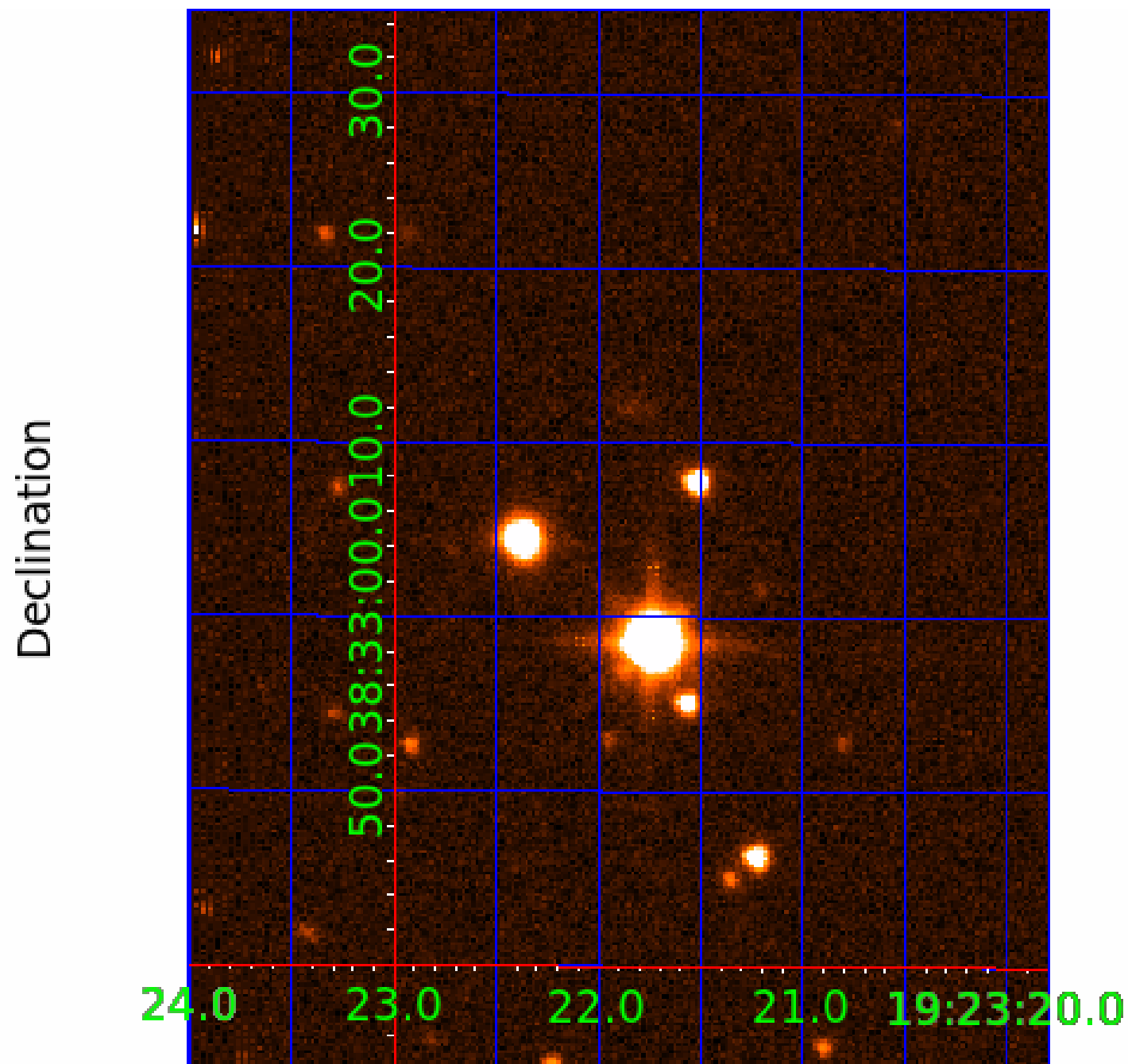
Q17 no difference image

Q17 no OOT image





UKIRT Image



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003441423-01	OBS	No	1.805107	132.300794	107.0	11.412	10.9	7.7	0.84	5508	0.88	712.94
003441423-02	OBS	No	85.856457	168.046199	4465.8	10.500	62.4	-1.0	0.84	5508	5.51	4.14
003441423-03	OBS	No	64.780176	148.035133	1187.9	5.446	19.7	6.4	0.84	5508	3.09	6.02
003441423-04	OBS	No	59.862756	155.930613	2330.1	19.940	15.5	7.0	0.84	5508	7.79	6.69
003441423-05	OBS	No	231.147707	136.281517	15336.4	74.391	15.3	9.6	0.84	5508	12.94	1.10
003441423-06	OBS	No	77.133913	201.287993	1339.7	10.736	14.3	6.9	0.84	5508	4.00	4.77
003441423-07	OBS	No	66.961236	148.930850	971.1	0.969	13.8	4.0	0.84	5508	2.97	5.76
003441423-08	OBS	No	42.934940	141.414459	485.7	7.500	9.0	-1.0	0.84	5508	1.82	10.42
003441423-09	OBS	No	62.622117	157.133901	1581.0	10.114	8.5	7.6	0.84	5508	4.34	6.30
003441423-10	OBS	No	55.642936	159.899113	432.0	1.032	9.4	2.2	0.84	5508	1.98	7.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003441423-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
003441423-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

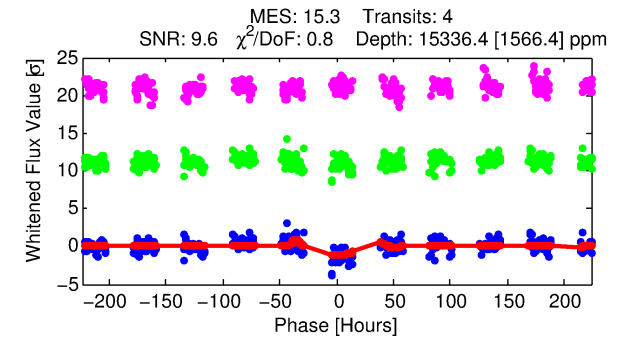
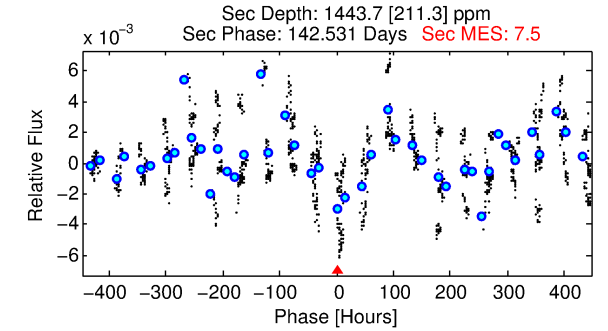
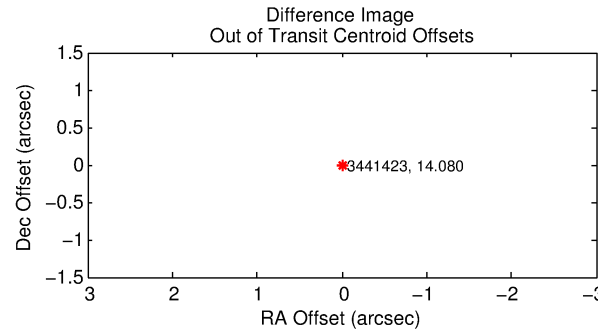
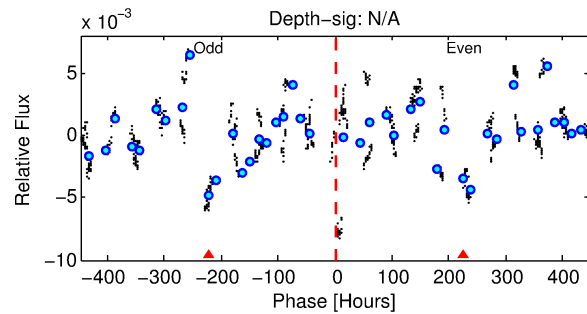
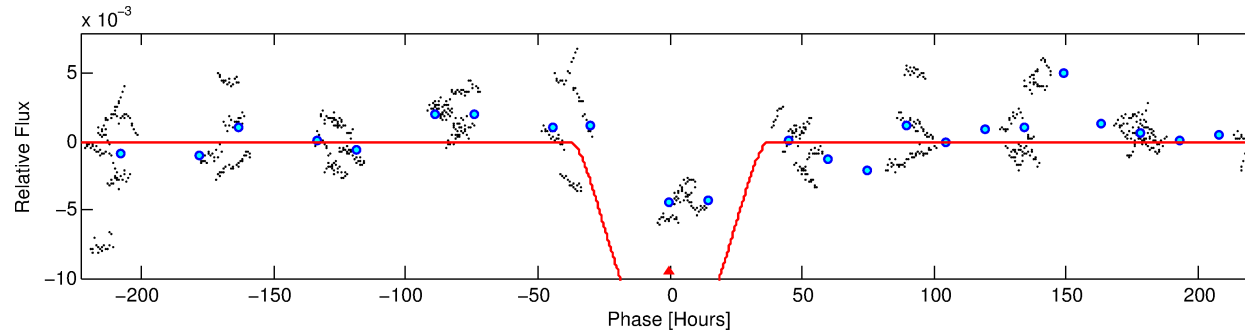
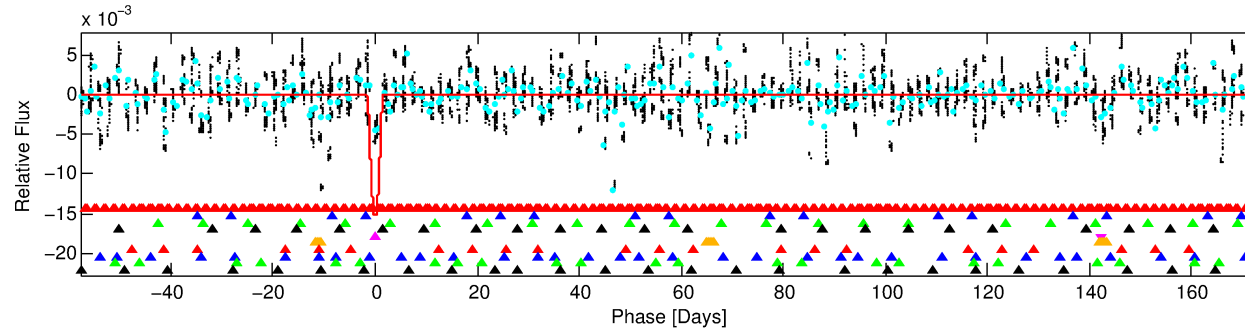
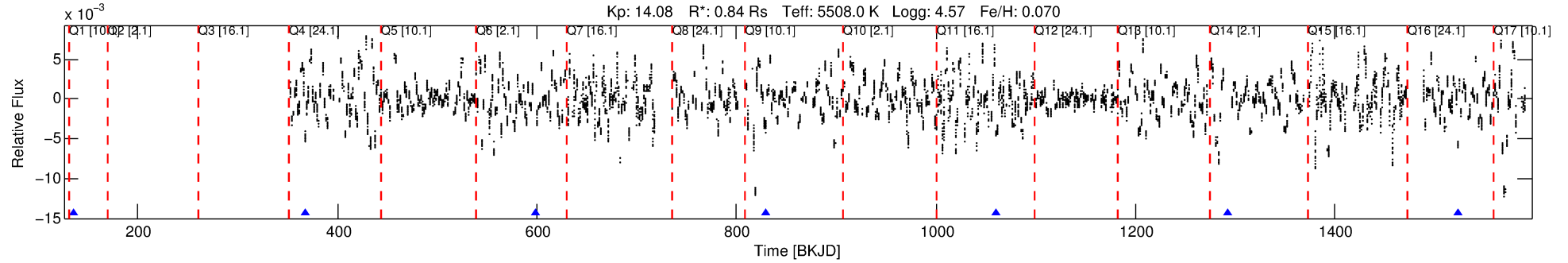
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003441423-05

No Significant Match Found

# DV One-Page Summary

KIC: 3441423 Candidate: 5 of 10 Period: 231.148 d



## DV Fit Results:

Period = 231.14771 [0.03422] d  
Epoch = 136.2815 [0.1600] BKJD  
Rp/R\* = 0.1412 [0.0199]  
a/R\* = 16.95 [1.41]  
b = 0.89 [0.06]  
Seff = 1.10 [0.19]  
Teq = 261 [11] K  
Rp = 12.94 [2.27] Re  
a = 0.7258 [0.0729] AU  
Ag = 2497.09 [888.24] [2.81σ]  
Teffp = 2857 [231] K [11.24σ]

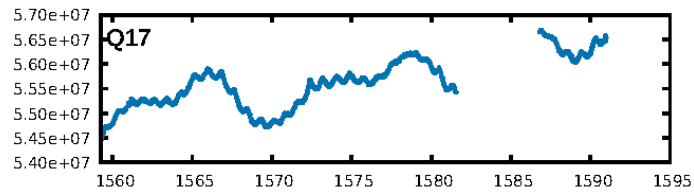
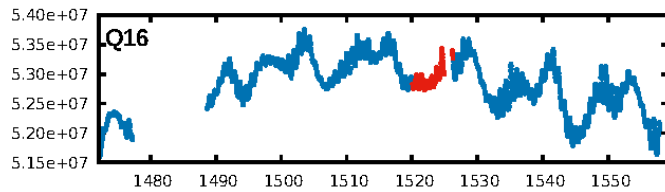
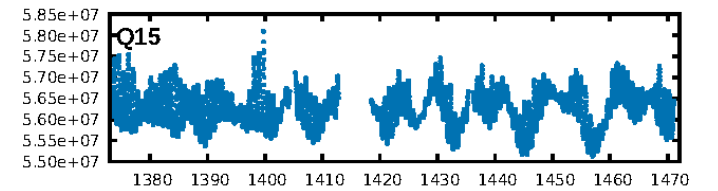
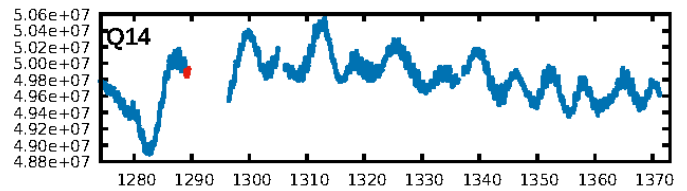
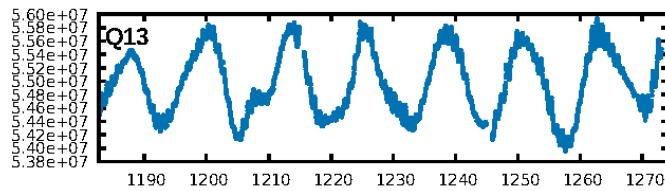
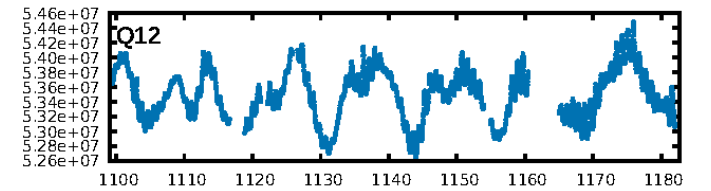
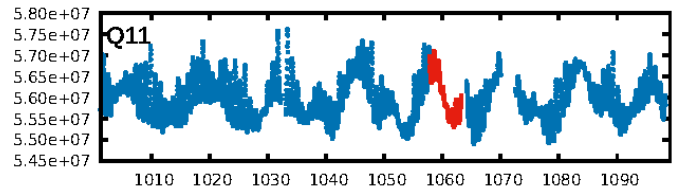
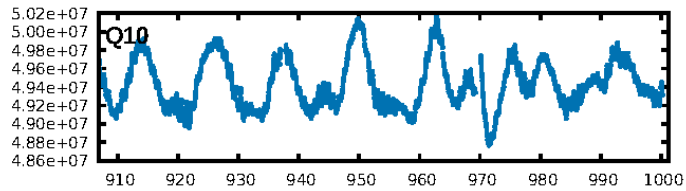
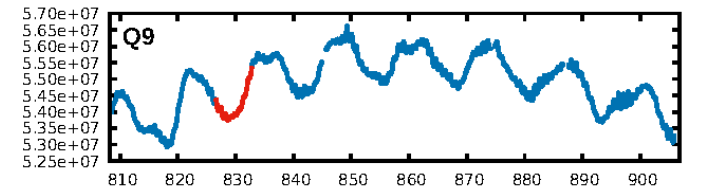
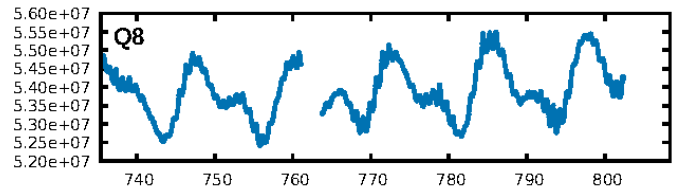
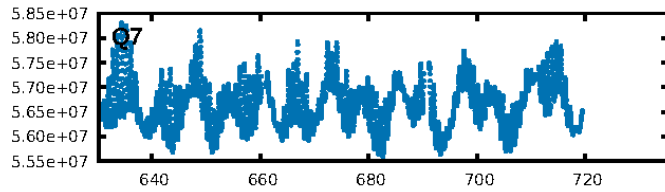
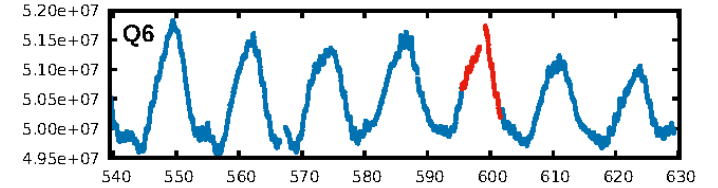
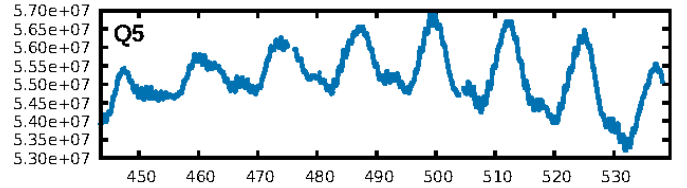
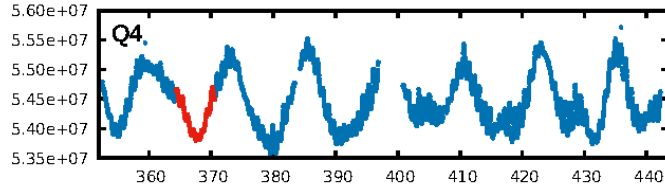
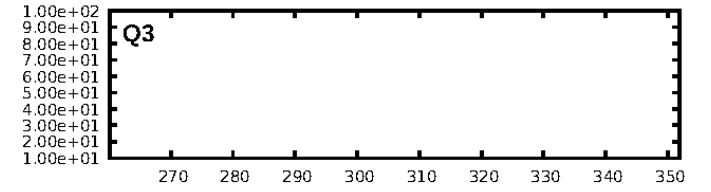
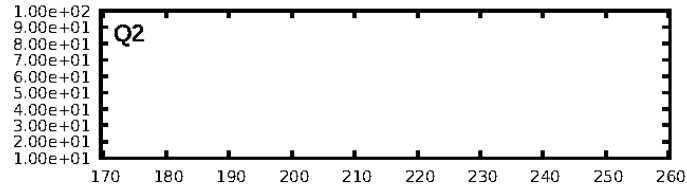
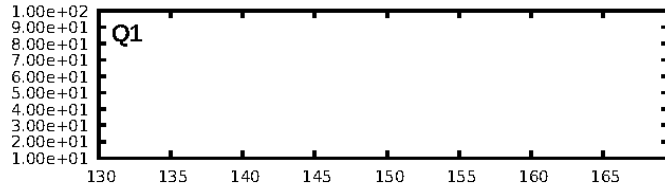
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [46.41σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.65e-18  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.04333  
Centroid-sig: 1.5%  
Centroid-so: 2.186 arcsec [10.97σ]  
OotOffset-rm: N/A  
KicOffset-rm: 7.740 arcsec [15.62σ]  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 0.00 [0/2]

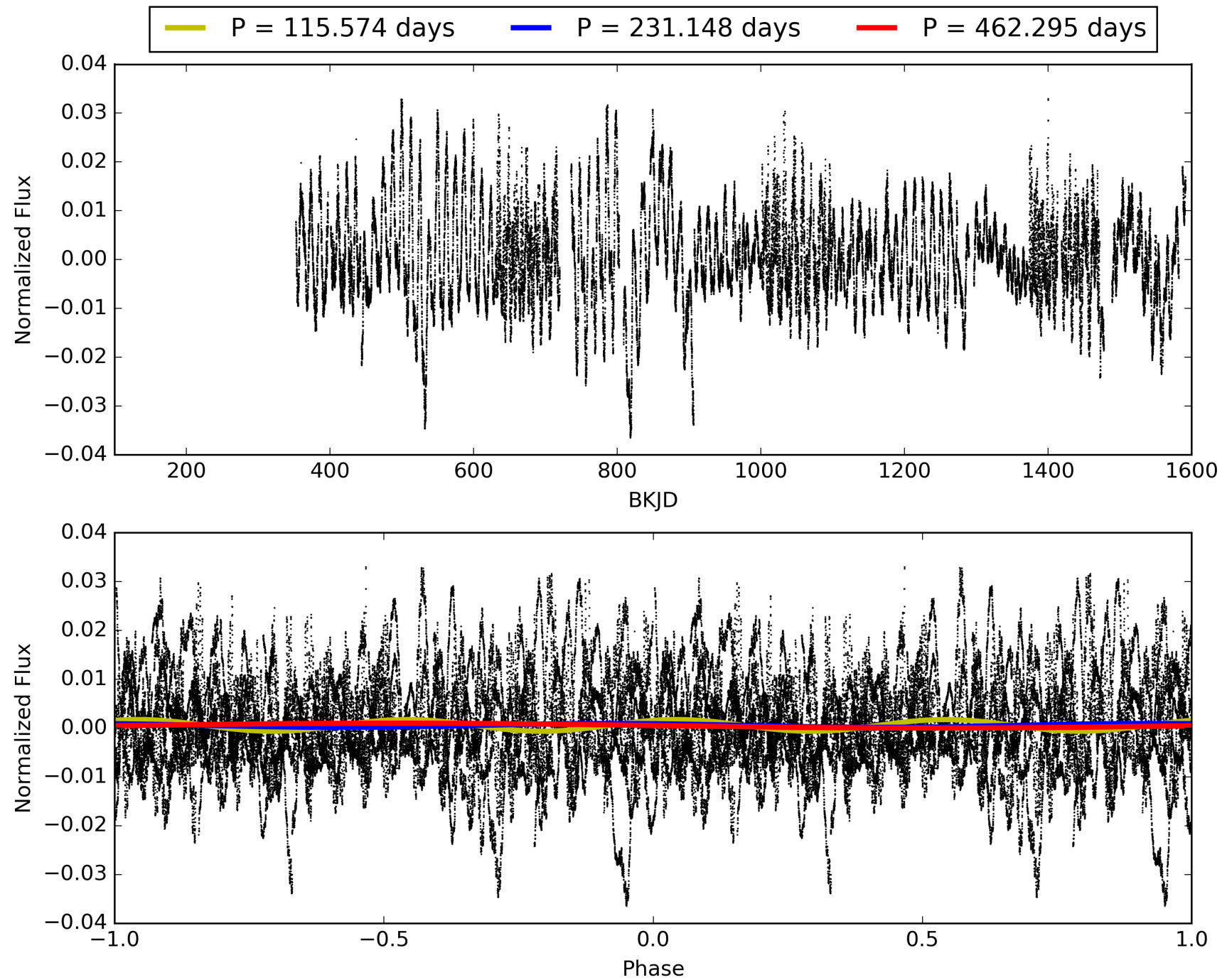
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:20:27 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003441423-05, PDC Light Curves

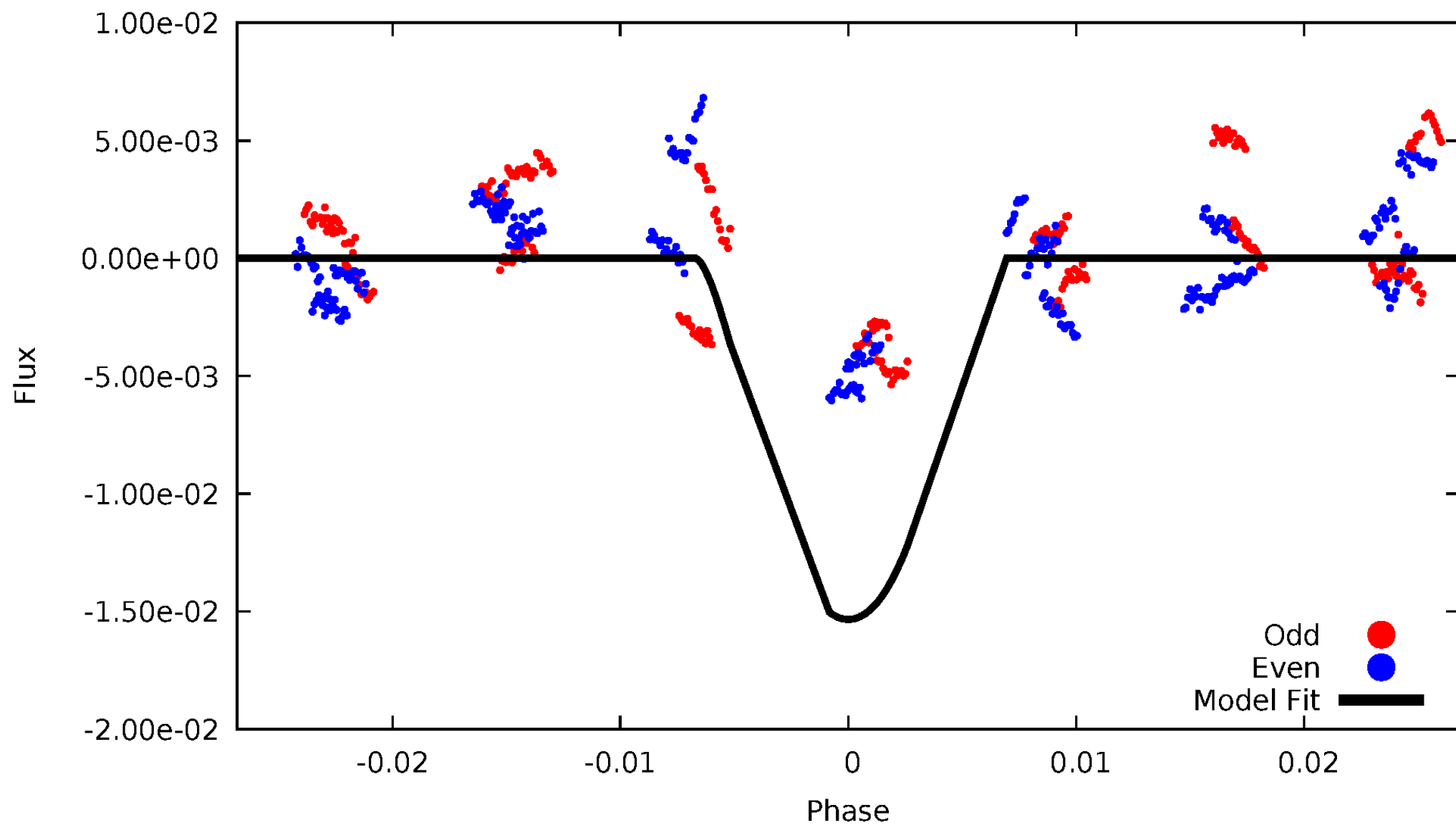


TCE 003441423-05



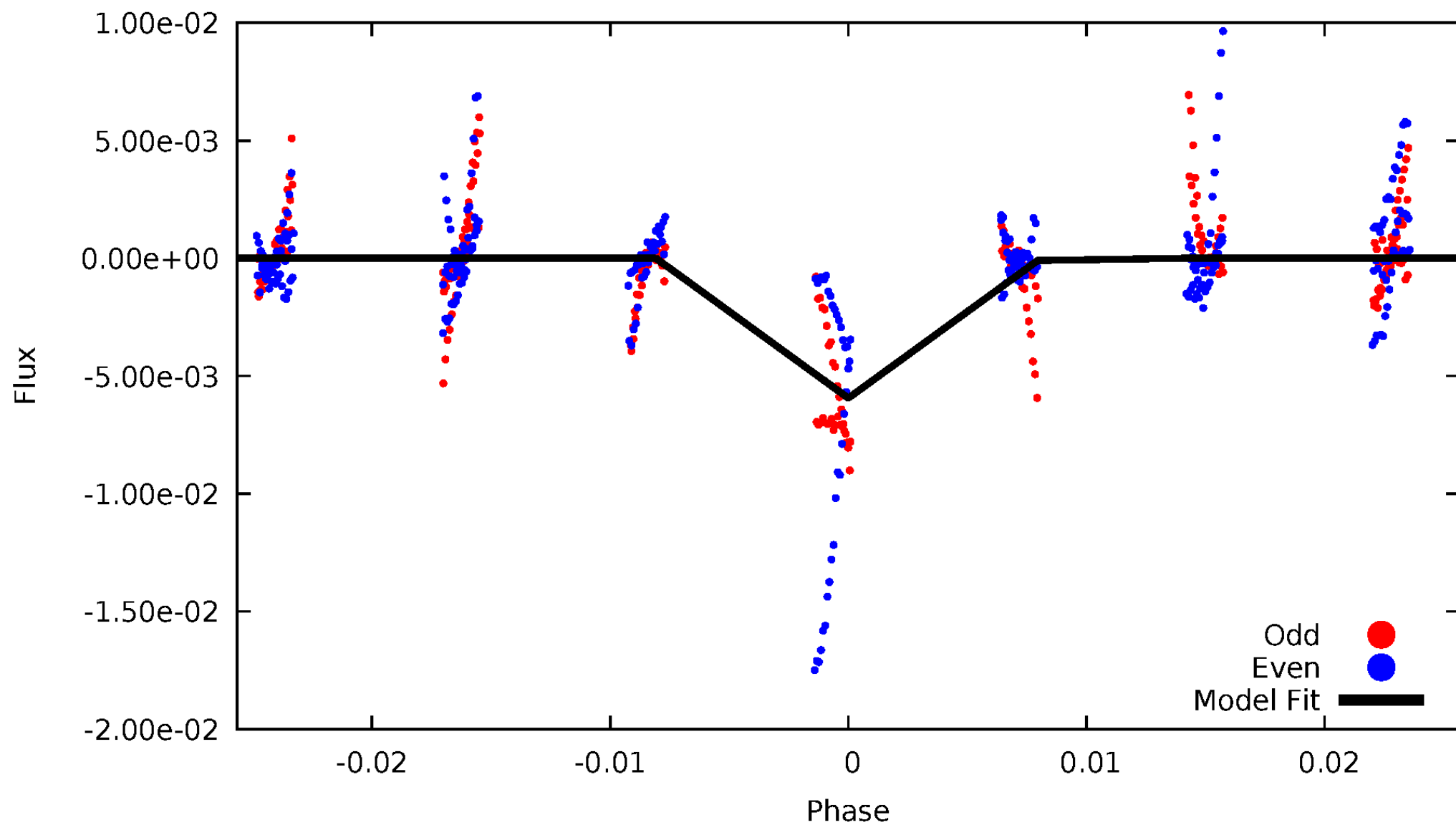
# DV Odd/Even

TCE 003441423-05



# ALT Odd/Even

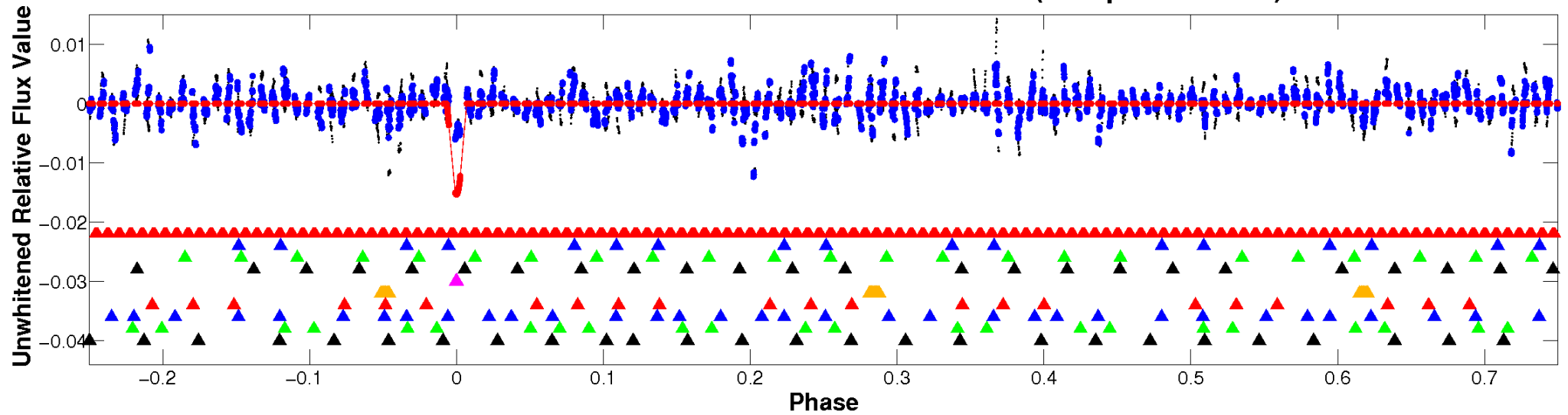
TCE 003441423-05



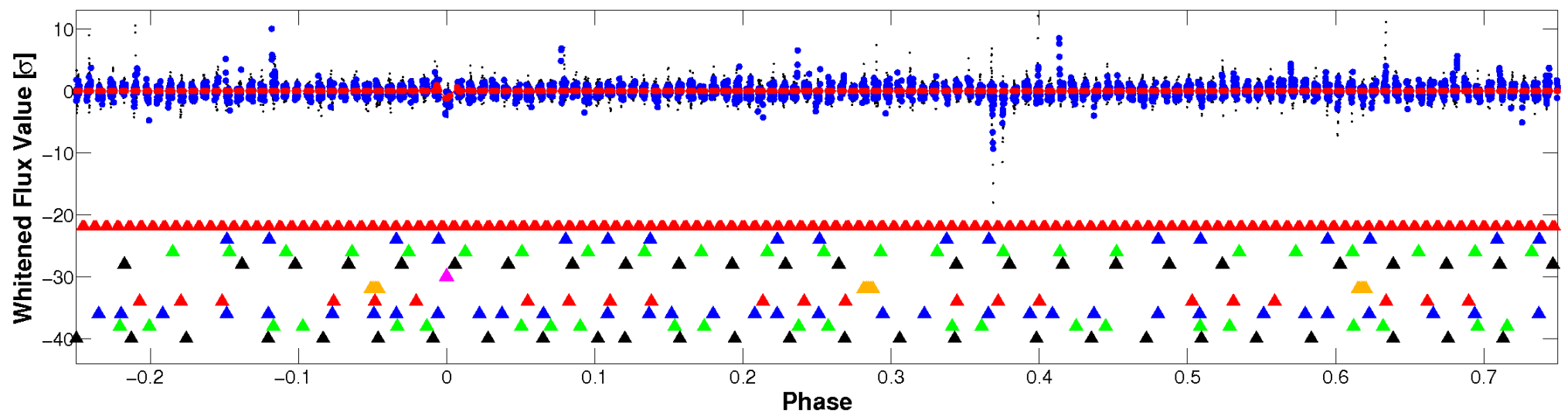


# Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

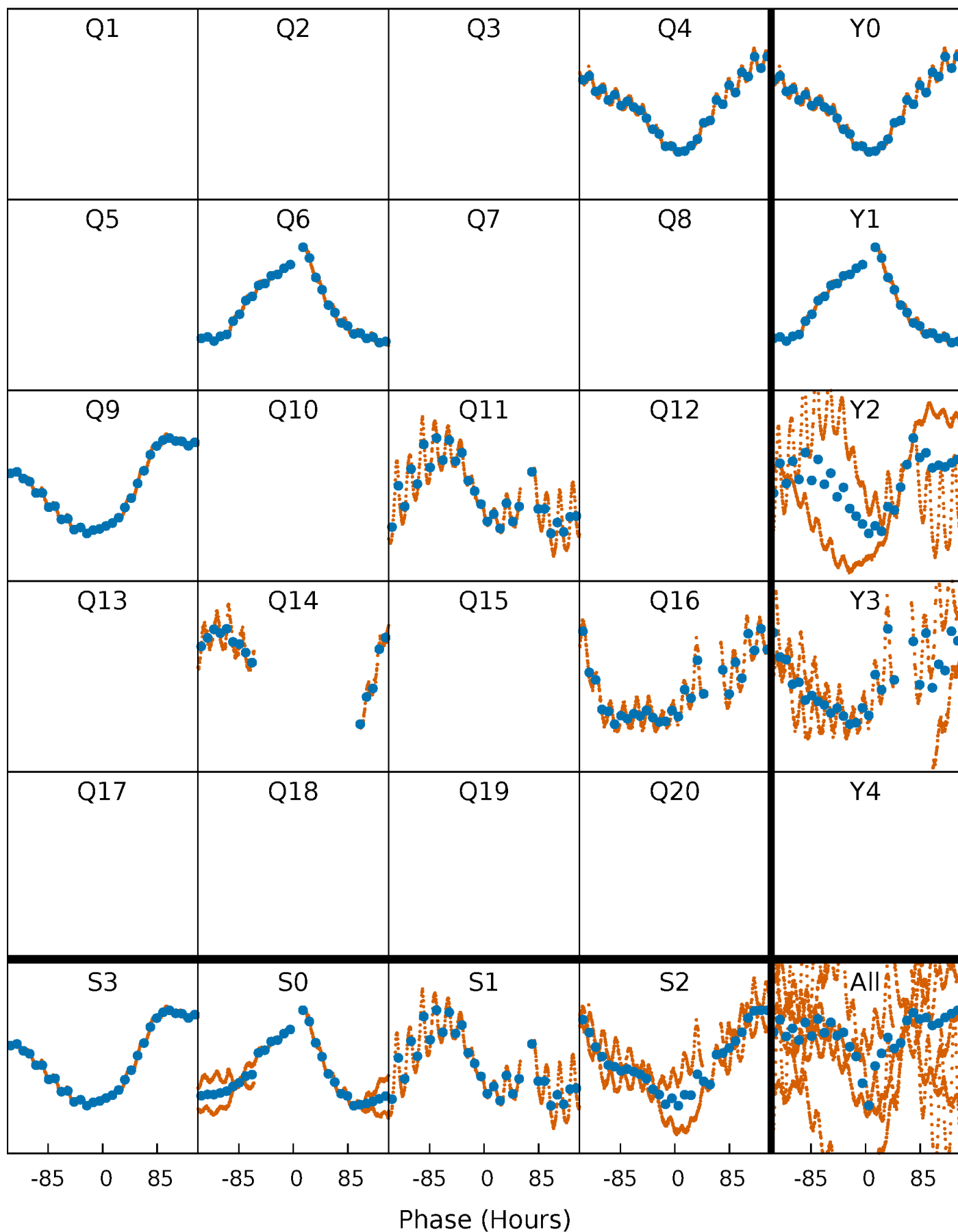


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



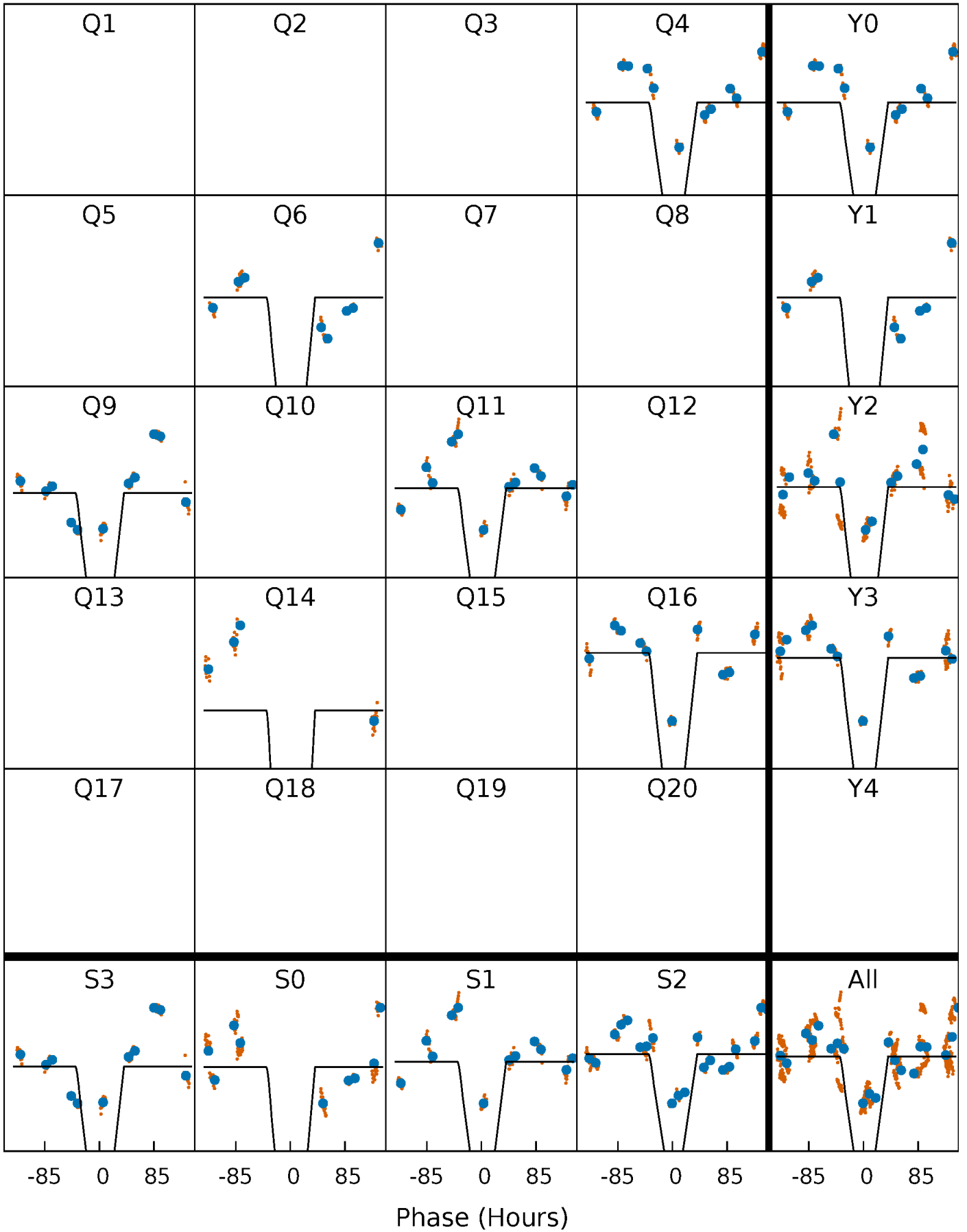
# PDC Quarter-Phased Transit Curves

TCE 003441423-05     $P=231.147706$  Days     $T_0=136.281517$  (BKJD)



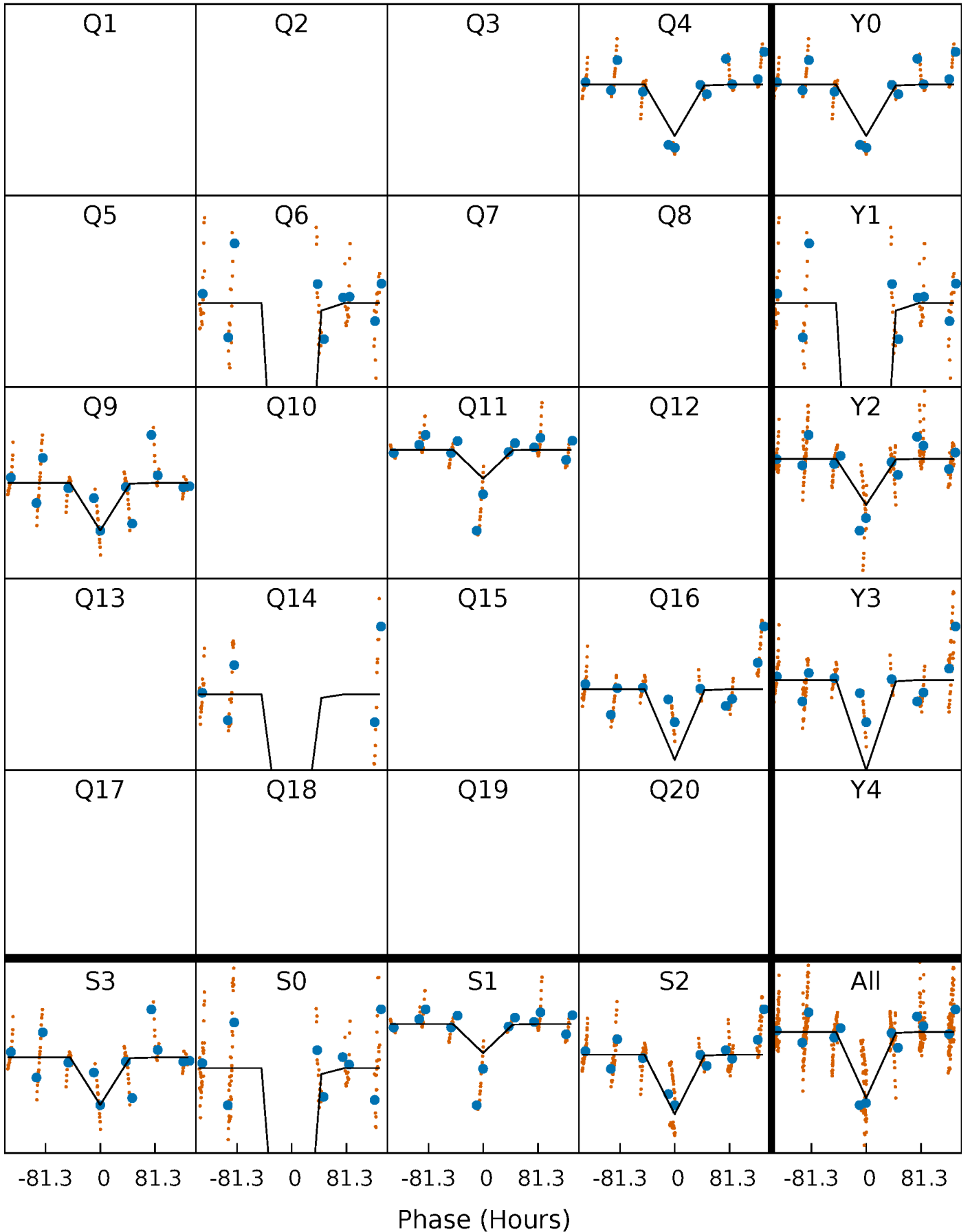
# DV Quarter-Phased Transit Curves

TCE 003441423-05     $P=231.147706$  Days     $T_0=136.281517$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

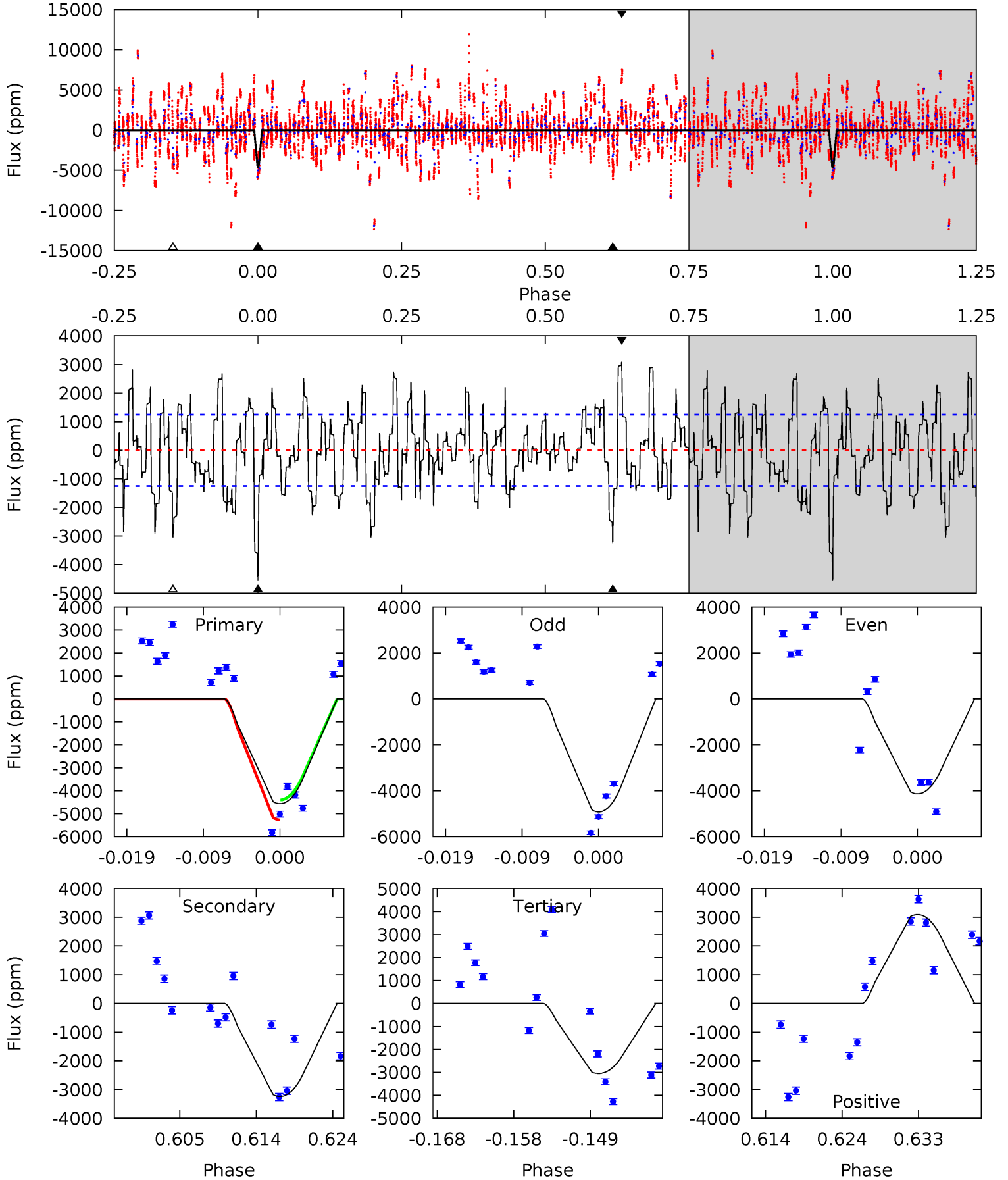
TCE 003441423-05 P=231.056703 Days  $T_0=136.951526$  (BKJD)



# DV Model-Shift Uniqueness Test

003441423-05, P = 231.147706 Days, E = 136.281517 Days

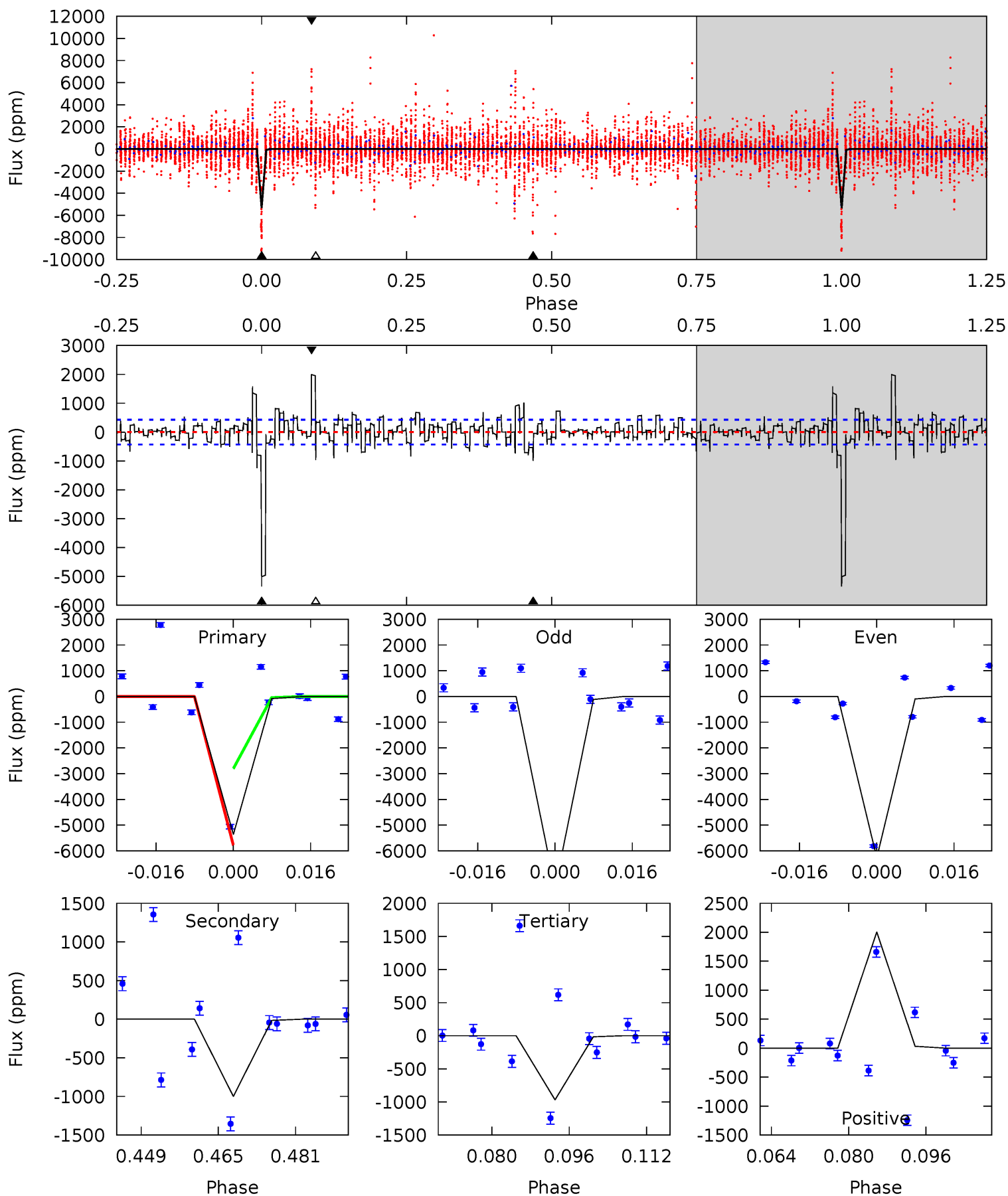
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.4	13.1	12.3	12.5	5.04	2.60	4.55	6.12	5.94	0.78	0.61	1.57	0.99	0.40	1.74



# Alt Model-Shift Uniqueness Test

003441423-05, P = 231.056703 Days, E = 136.951526 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
61.2	11.4	11.1	22.9	4.93	2.41	3.39	50.1	38.3	0.36	-11.5	5.21	0.95	0.27	17.2



### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-3244 \pm 247$	$13.33^{+1.99}_{-1.96}$	$370^{+11}_{-8}$	$3853^{+205}_{-190}$	$5226^{+1928}_{-1297}$
Alt.	$-998 \pm 87$	$7.79^{+1.87}_{-1.93}$	$370^{+11}_{-7}$	$3773^{+410}_{-254}$	$4711^{+3593}_{-1697}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

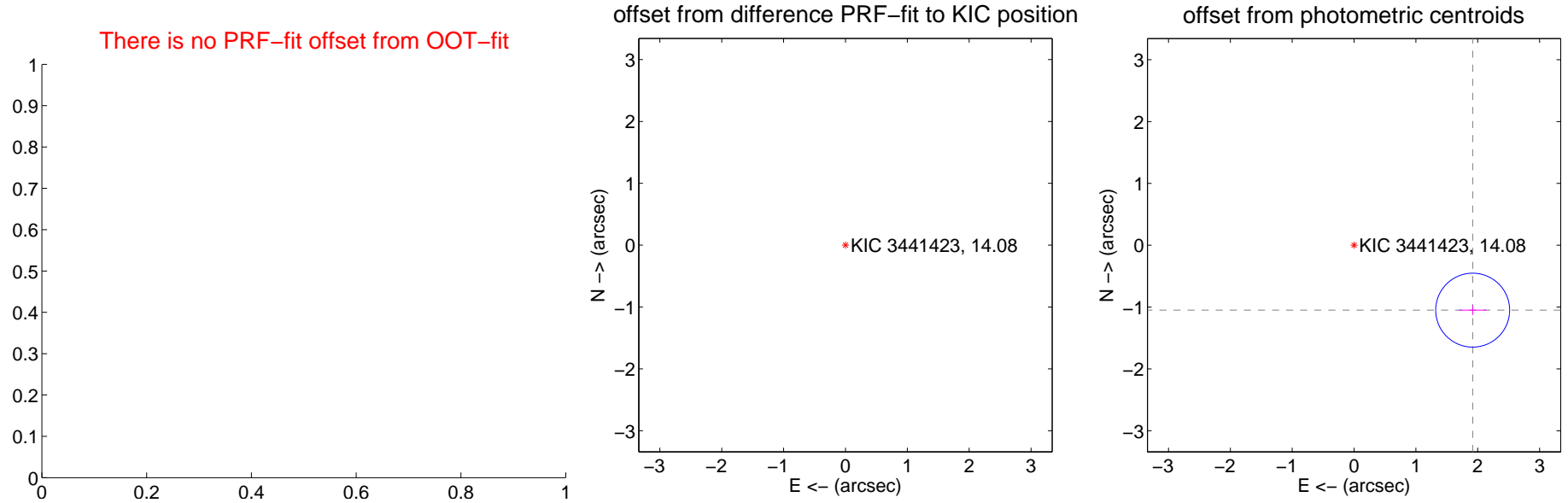
## DV Centroid Data

Supplemental centroid analysis for 003441423-05. Kepler magnitude: 14.08. Transit SNR 9.56

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

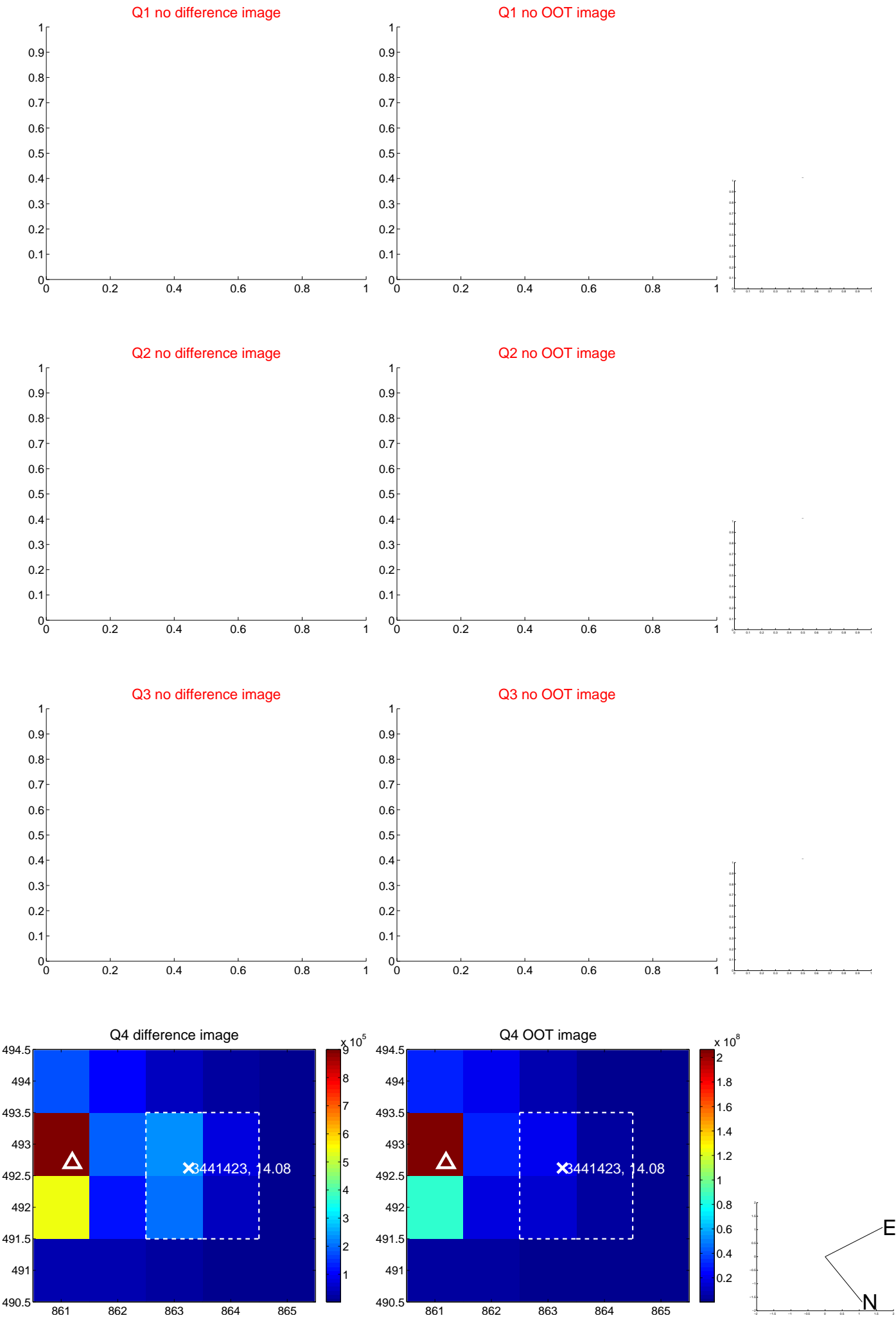
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	$7.740 \pm 0.495$	15.62	$-6.219 \pm 0.606$	$-4.609 \pm 0.155$
photometric centroid source offset	$2.19 \pm 0.20$	10.97	$-1.92 \pm 0.22$	$-1.05 \pm 0.08$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.



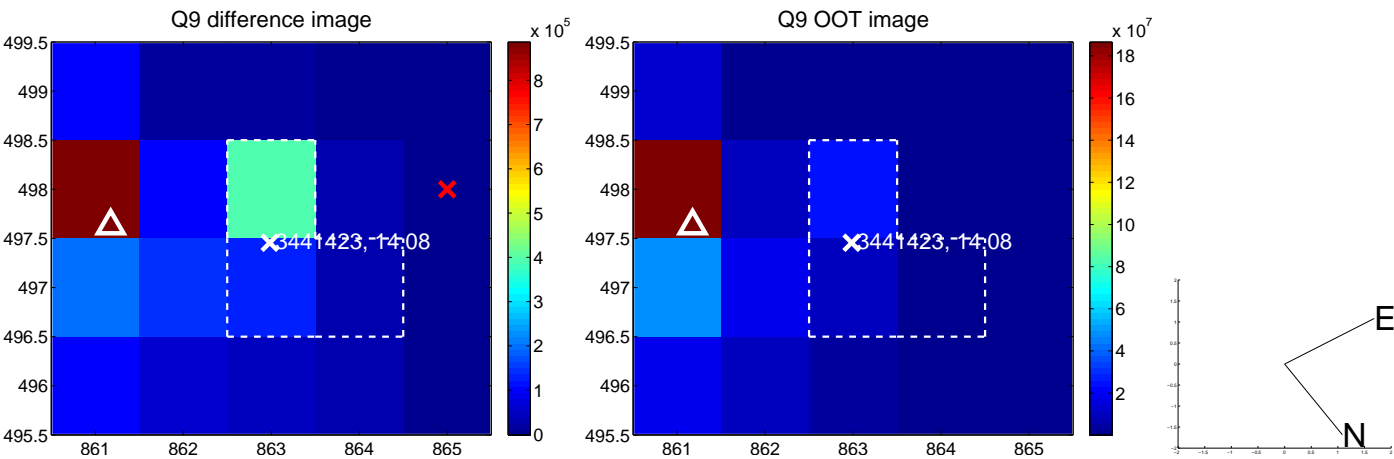
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



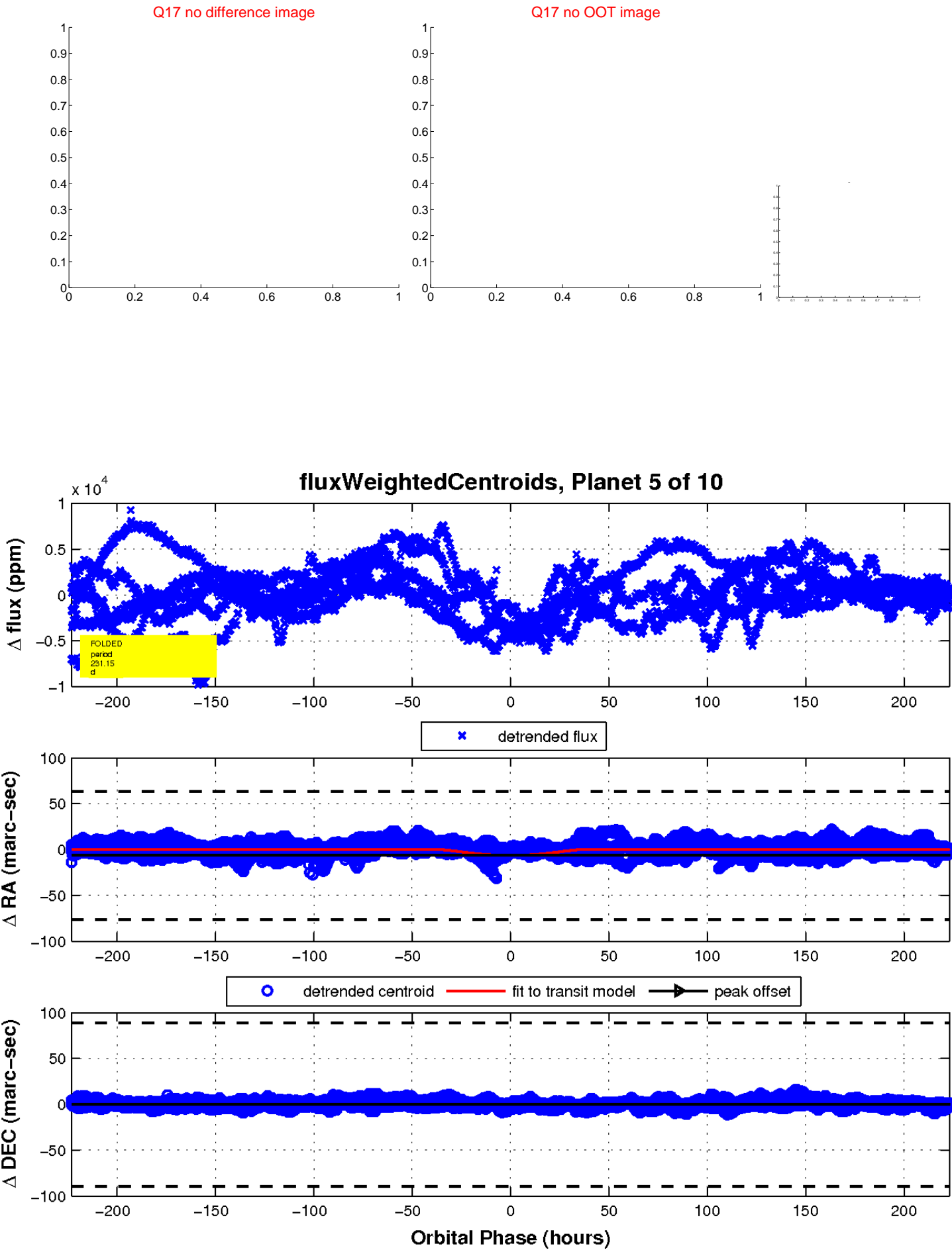
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



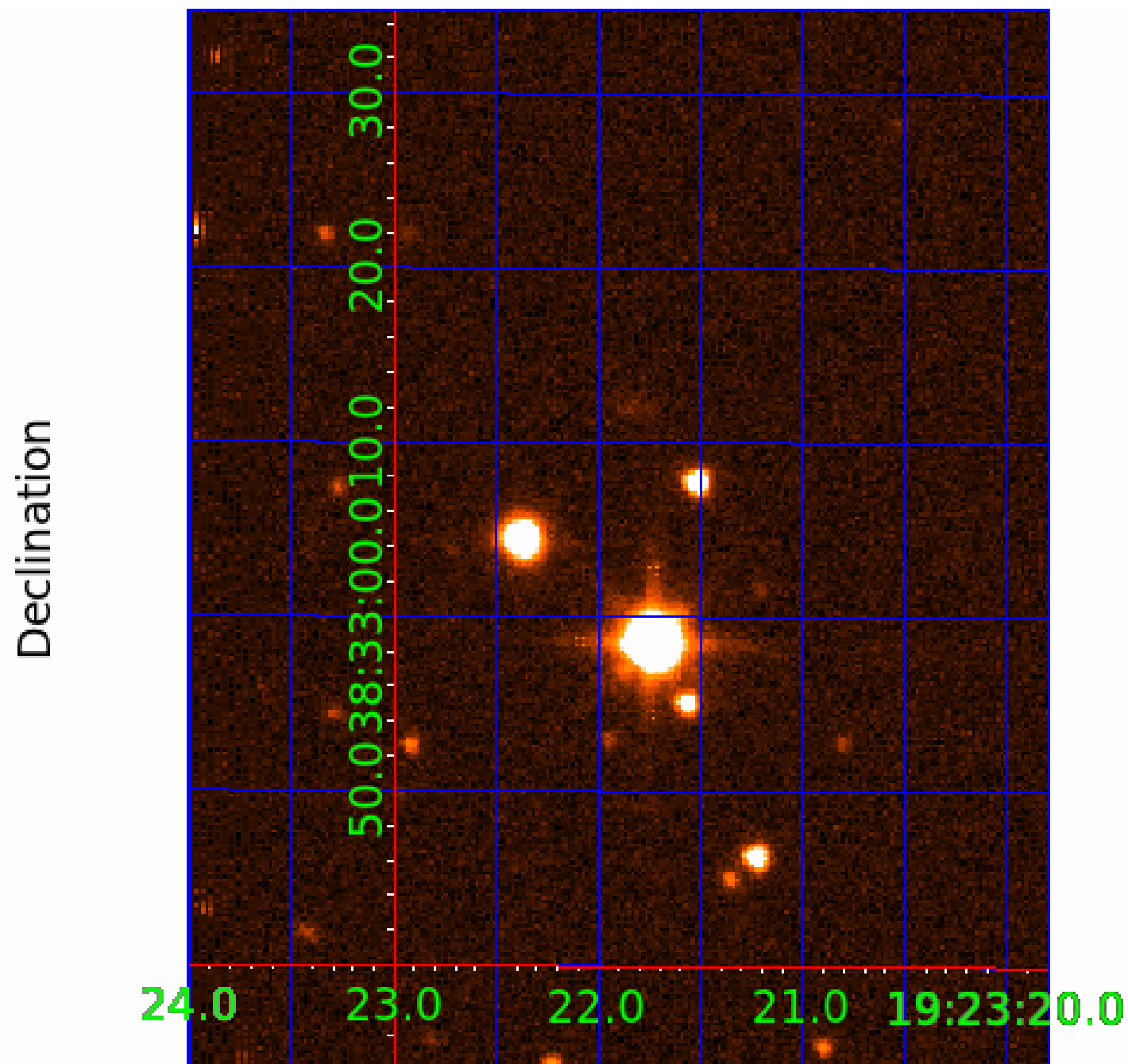
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



## KIC 003441423

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003441423-01	OBS	No	1.805107	132.300794	107.0	11.412	10.9	7.7	0.84	5508	0.88	712.94
003441423-02	OBS	No	85.856457	168.046199	4465.8	10.500	62.4	-1.0	0.84	5508	5.51	4.14
003441423-03	OBS	No	64.780176	148.035133	1187.9	5.446	19.7	6.4	0.84	5508	3.09	6.02
003441423-04	OBS	No	59.862756	155.930613	2330.1	19.940	15.5	7.0	0.84	5508	7.79	6.69
003441423-05	OBS	No	231.147707	136.281517	15336.4	74.391	15.3	9.6	0.84	5508	12.94	1.10
003441423-06	OBS	No	77.133913	201.287993	1339.7	10.736	14.3	6.9	0.84	5508	4.00	4.77
003441423-07	OBS	No	66.961236	148.930850	971.1	0.969	13.8	4.0	0.84	5508	2.97	5.76
003441423-08	OBS	No	42.934940	141.414459	485.7	7.500	9.0	-1.0	0.84	5508	1.82	10.42
003441423-09	OBS	No	62.622117	157.133901	1581.0	10.114	8.5	7.6	0.84	5508	4.34	6.30
003441423-10	OBS	No	55.642936	159.899113	432.0	1.032	9.4	2.2	0.84	5508	1.98	7.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003441423-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
003441423-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

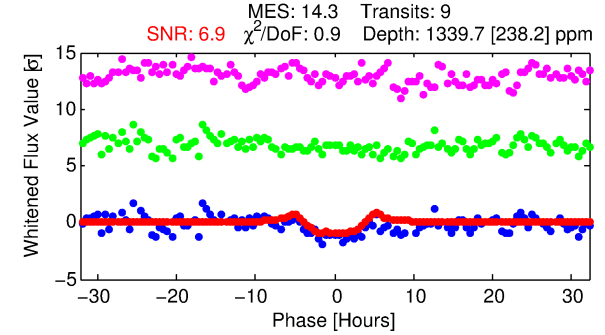
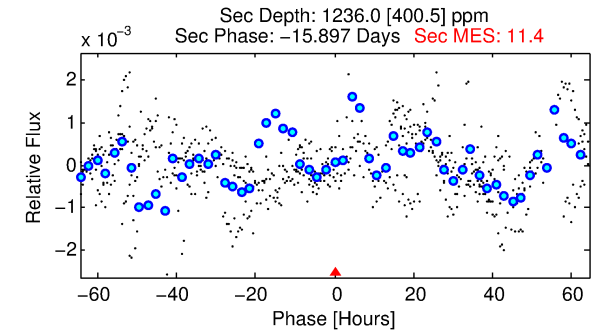
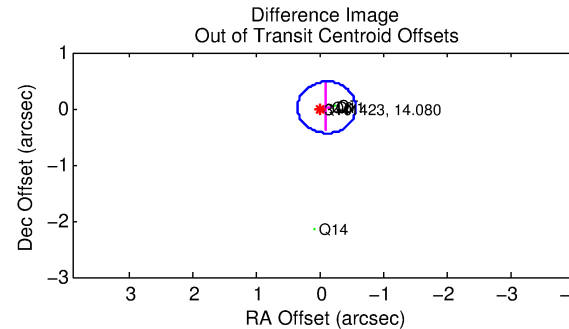
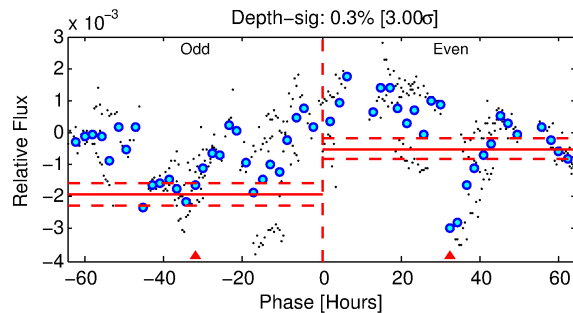
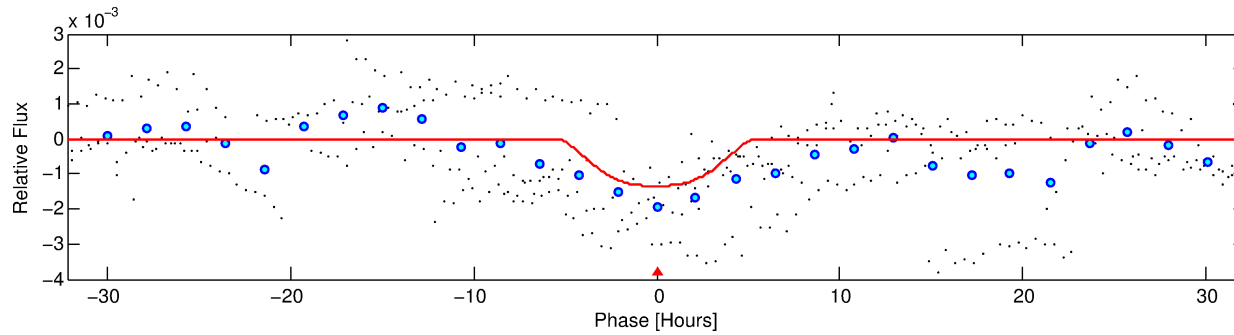
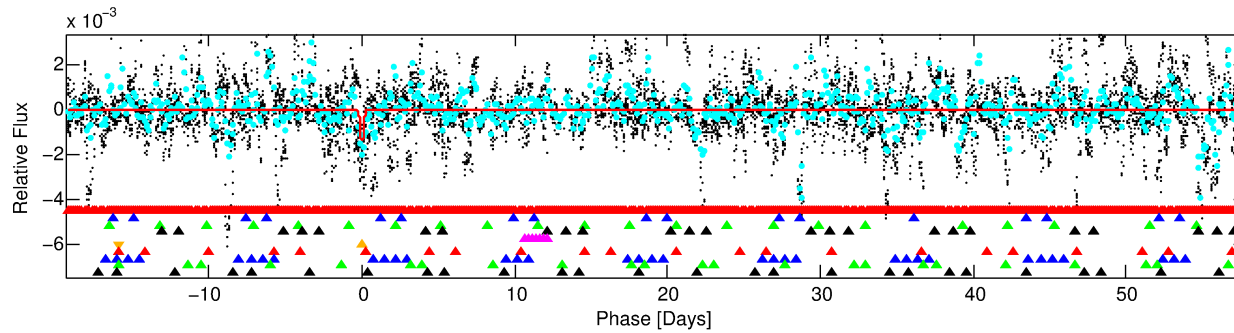
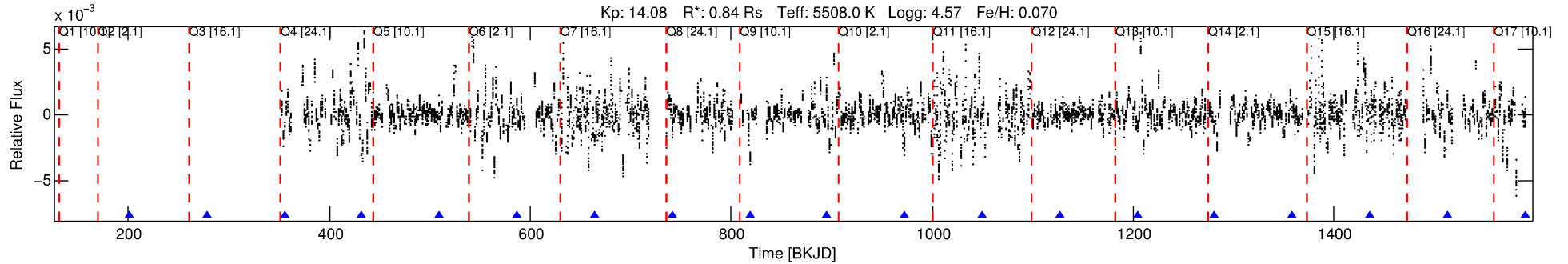
Ephemeris Match Information For 003441423-06

No Significant Match Found



# DV One-Page Summary

KIC: 3441423 Candidate: 6 of 10 Period: 77.134 d



## DV Fit Results:

Period = 77.13391 [0.00206] d  
Epoch = 201.2880 [0.0244] BKJD  
Rp/R\* = 0.0436 [0.0046]  
a/R\* = 23.52 [2.63]  
b = 0.95 [0.01]  
Seff = 4.77 [0.82]  
Teq = 377 [16] K  
Rp = 4.00 [0.59] Re  
a = 0.3492 [0.0351] AU  
Ag = 5185.53 [2171.45] [2.39 $\sigma$ ]  
Teff = 4945 [484] K [9.44 $\sigma$ ]

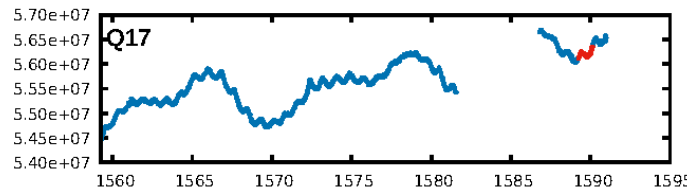
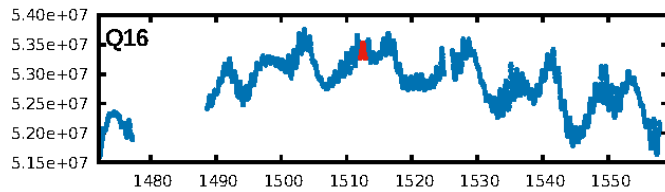
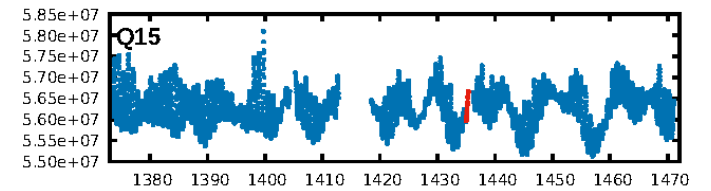
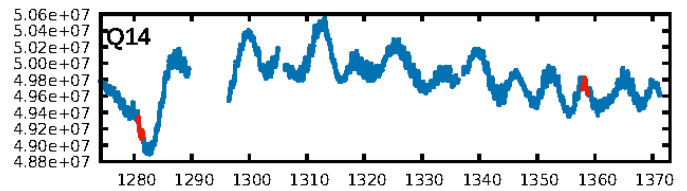
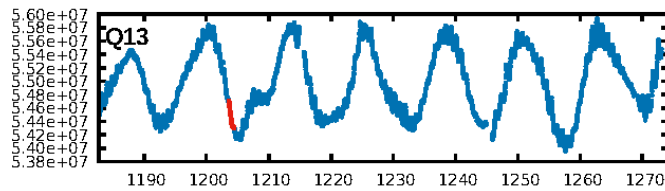
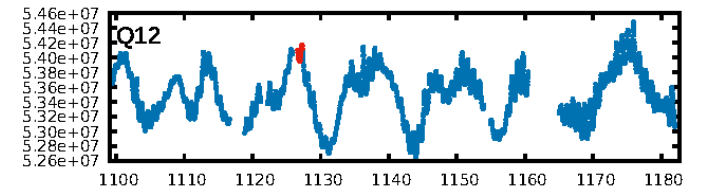
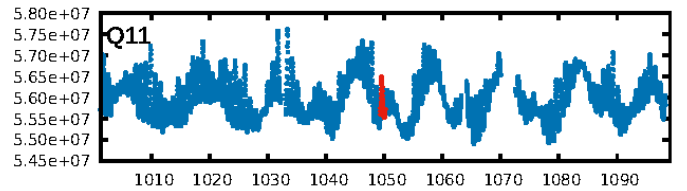
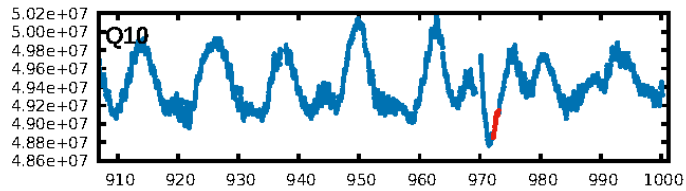
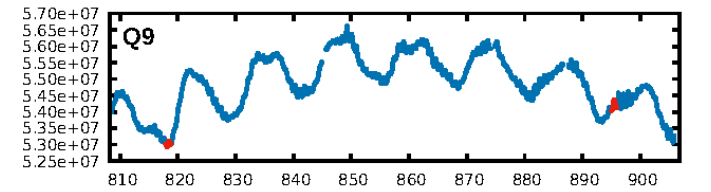
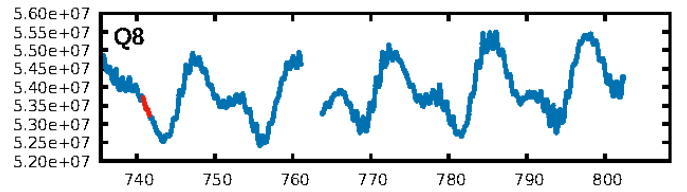
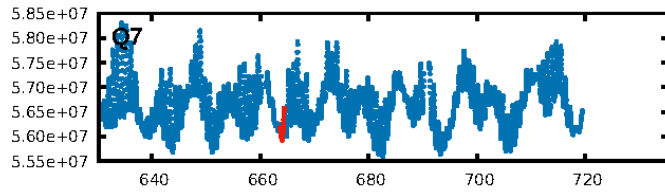
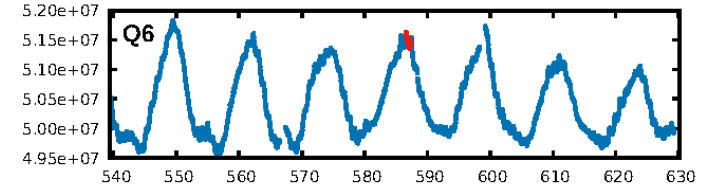
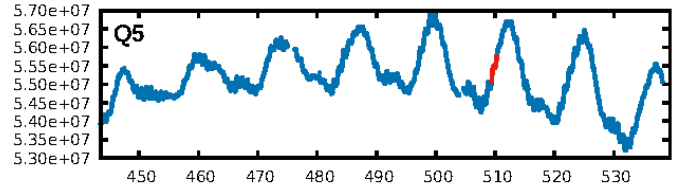
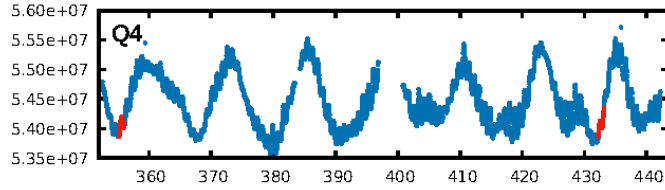
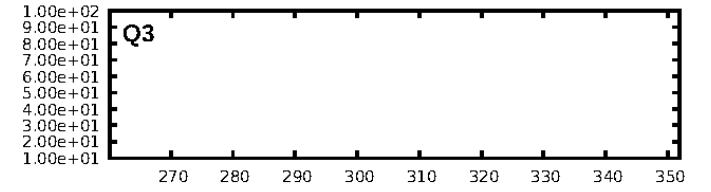
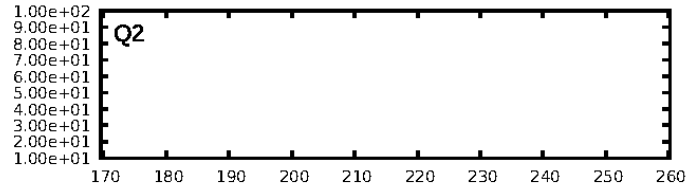
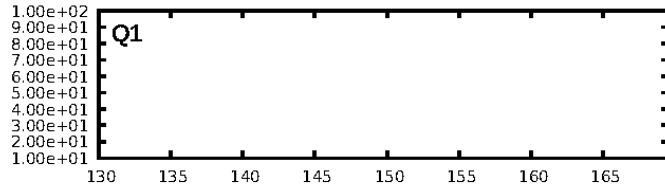
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [22.65 $\sigma$ ]  
LongPeriod-sig: 100.0% [13.94 $\sigma$ ]  
ModelChiSquare2-sig: 9.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 8.75e-17  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: 0.496  
Centroid-sig: 1.8%  
Centroid-so: 2.662 arcsec [1.98 $\sigma$ ]  
OotOffset-rm: 0.095 arcsec [0.62 $\sigma$ ]  
OotOffset-st: 3/2/0/0 [5]  
KicOffset-rm: 9.319 arcsec [49.70 $\sigma$ ]  
KicOffset-st: 3/2/0/0 [5]  
DiffImageQuality-fgm: 0.40 [2/5]  
DiffImageOverlap-fno: 0.00 [0/12]

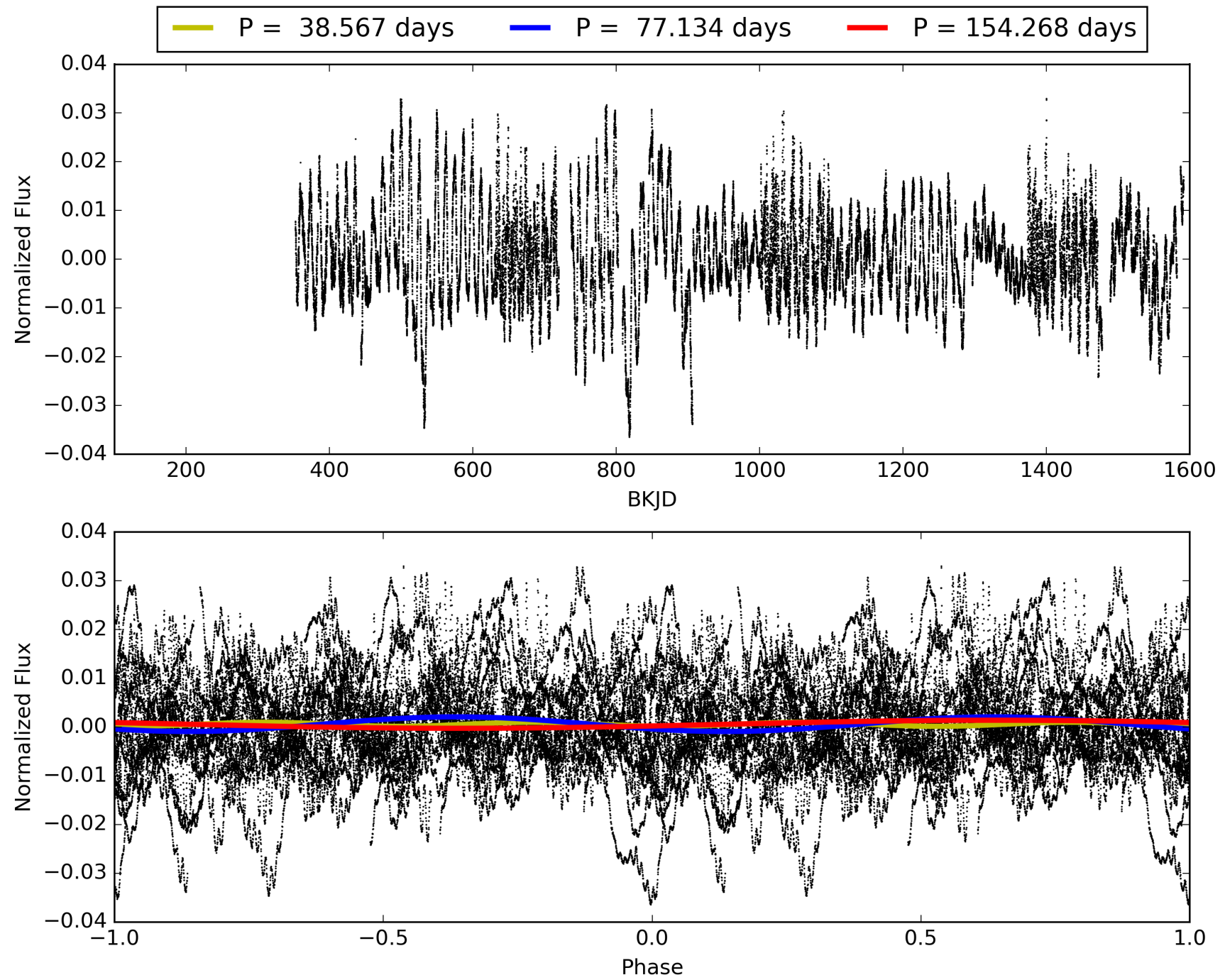
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:20:31 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003441423-06, PDC Light Curves

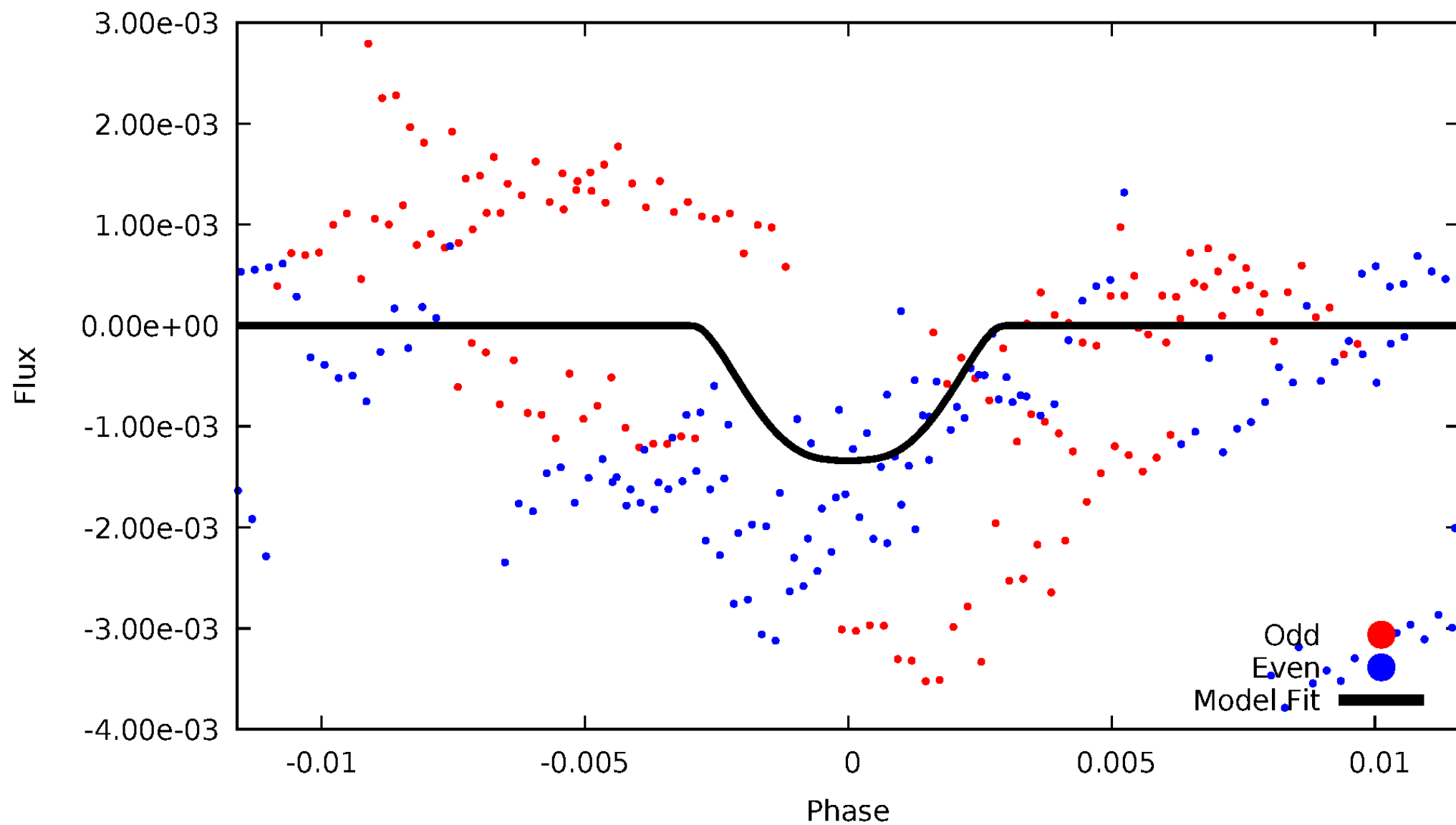


TCE 003441423-06



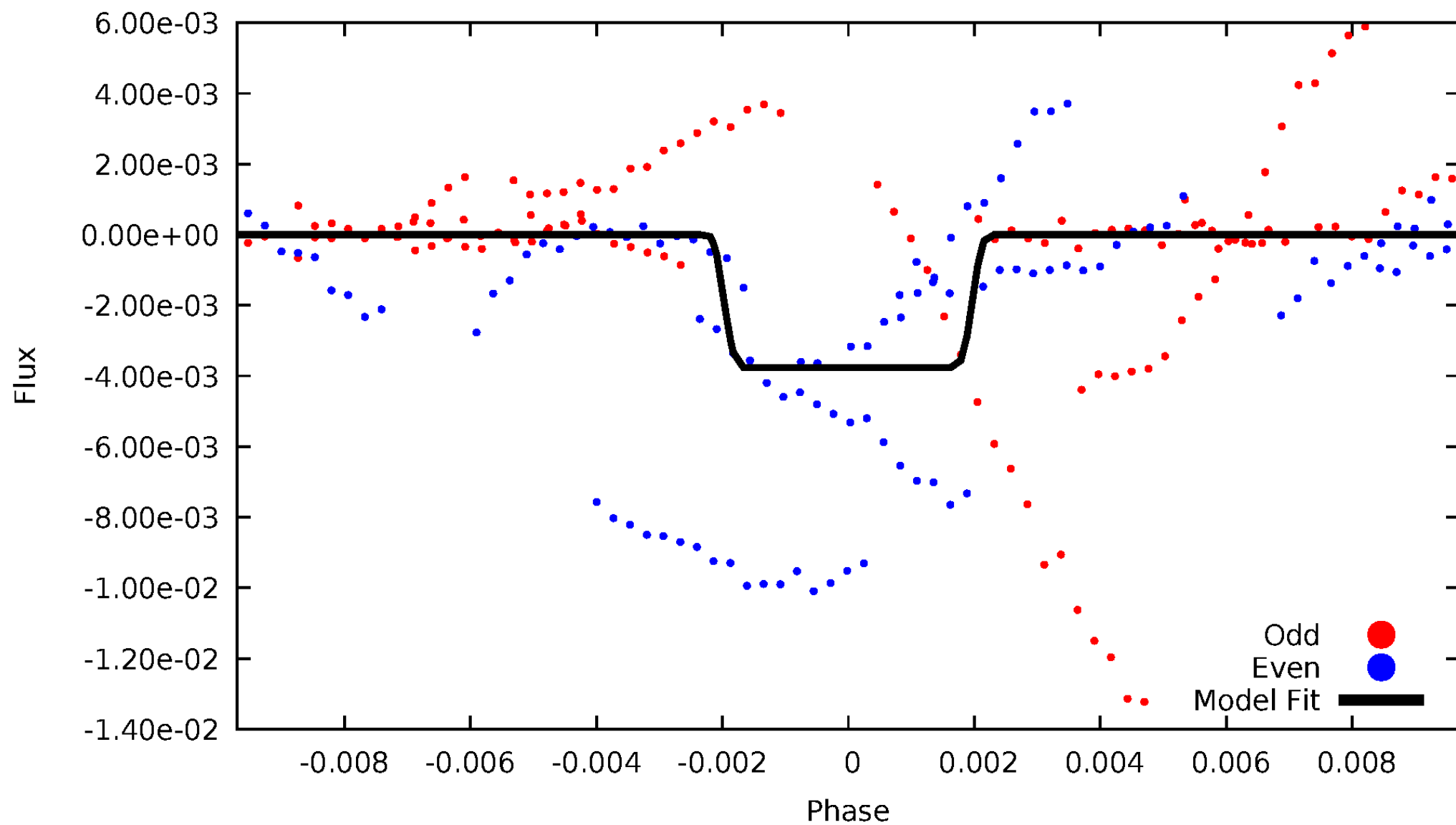
# DV Odd/Even

TCE 003441423-06



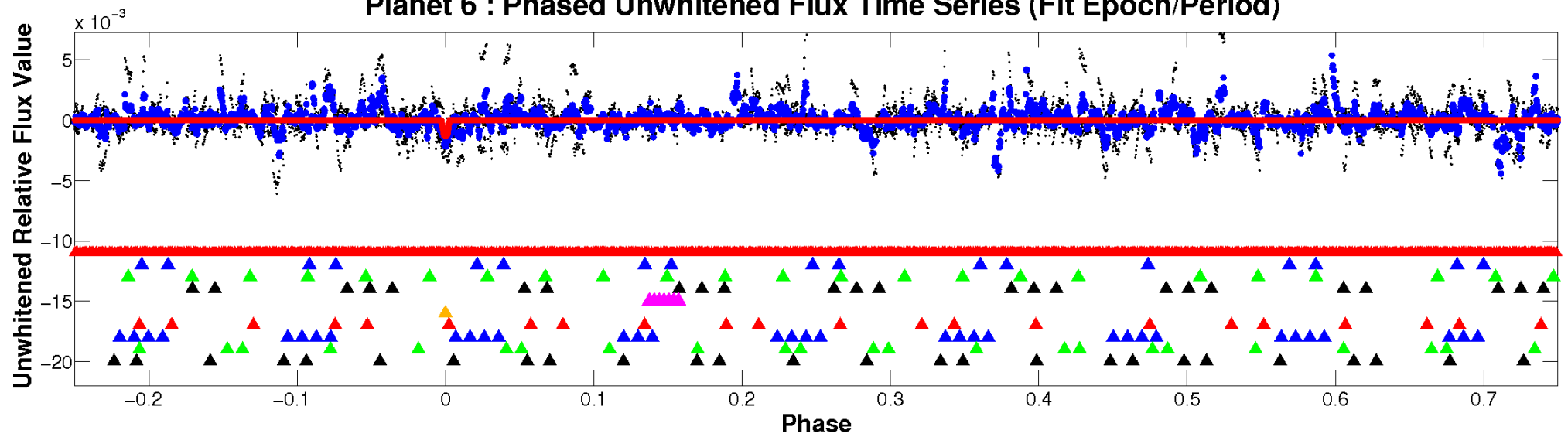
# ALT Odd/Even

TCE 003441423-06

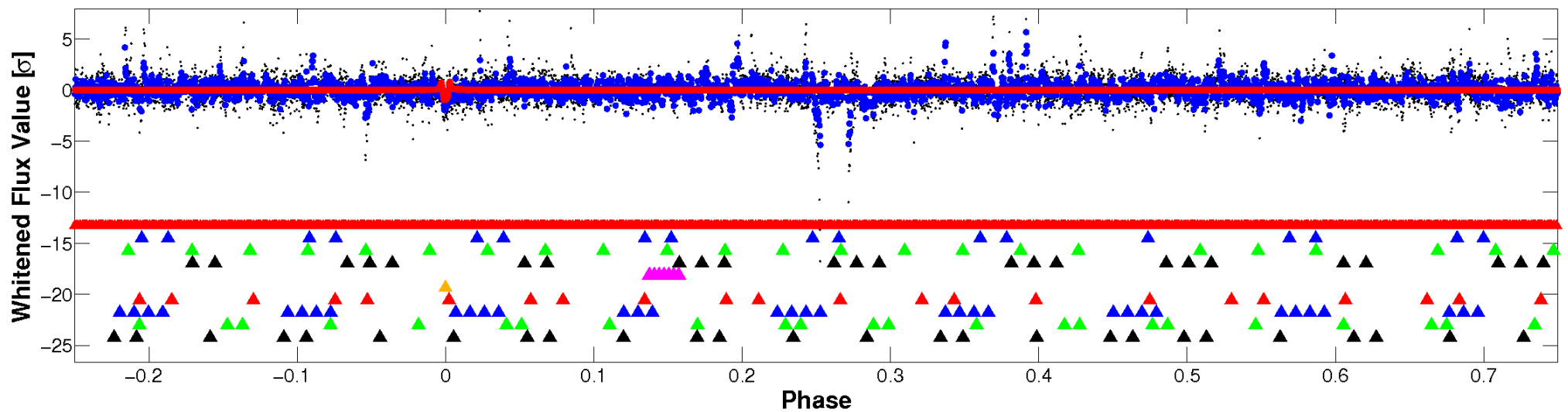


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

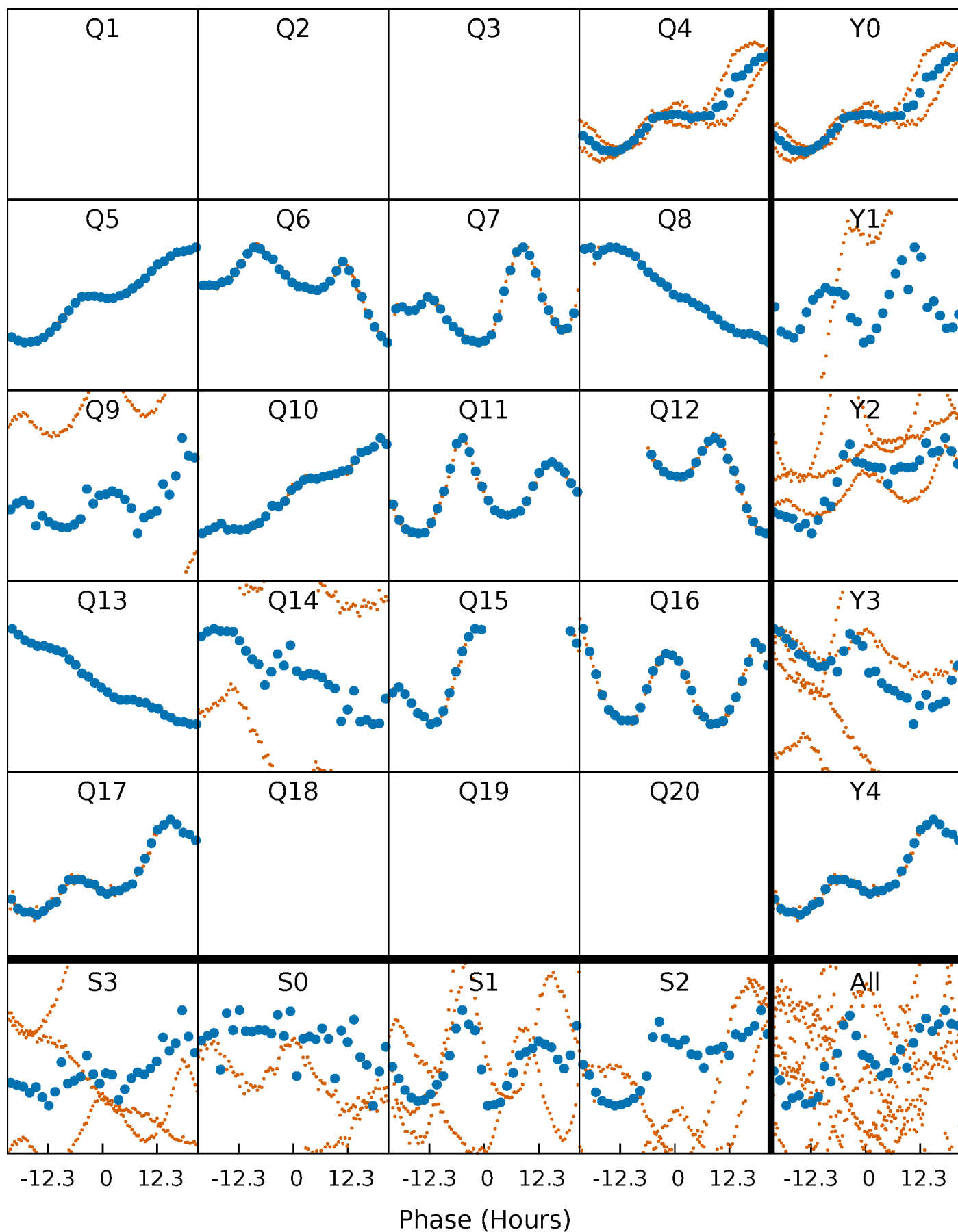


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



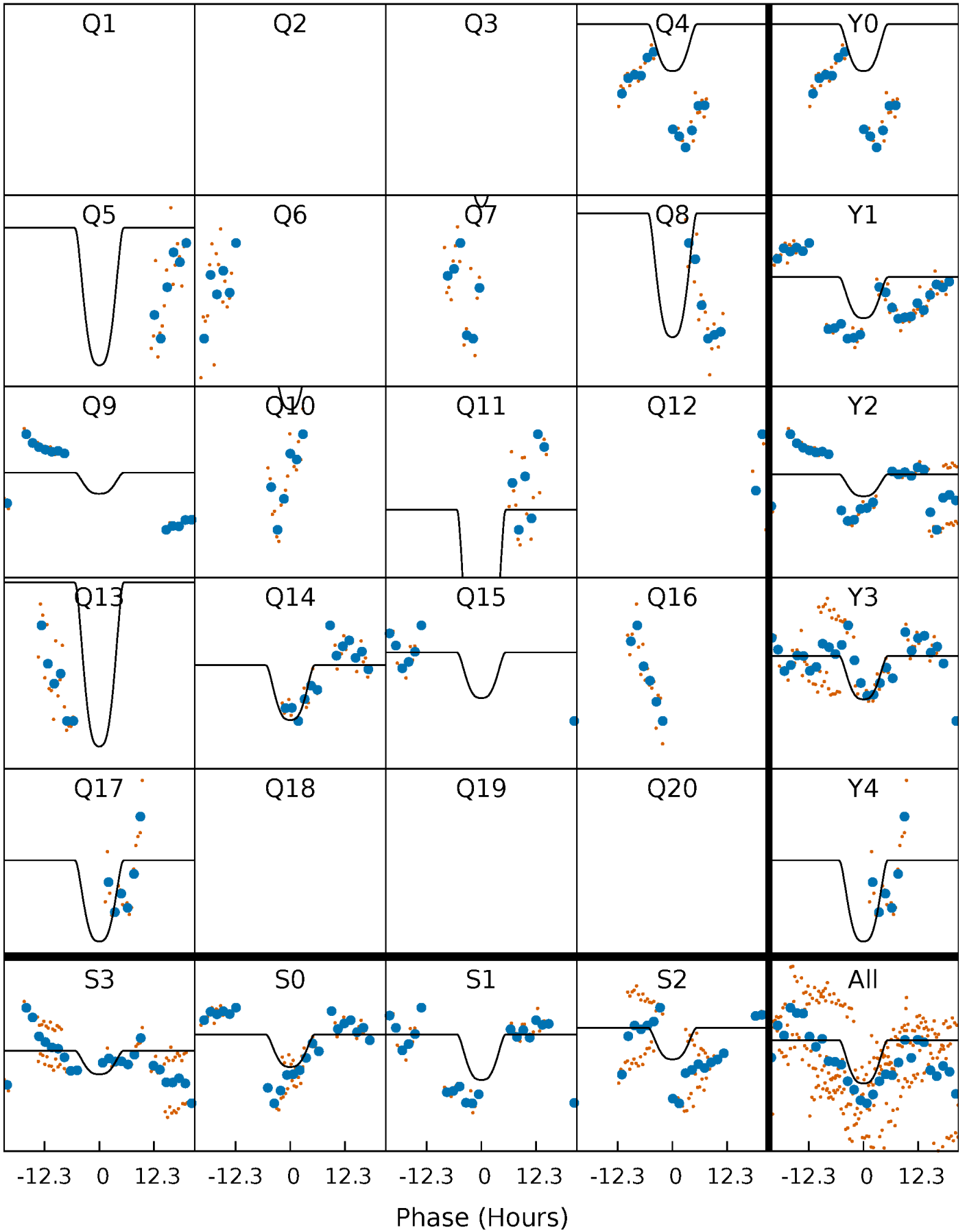
# PDC Quarter-Phased Transit Curves

TCE 003441423-06 P= 77.133913 Days  $T_0=201.287993$  (BKJD)



# DV Quarter-Phased Transit Curves

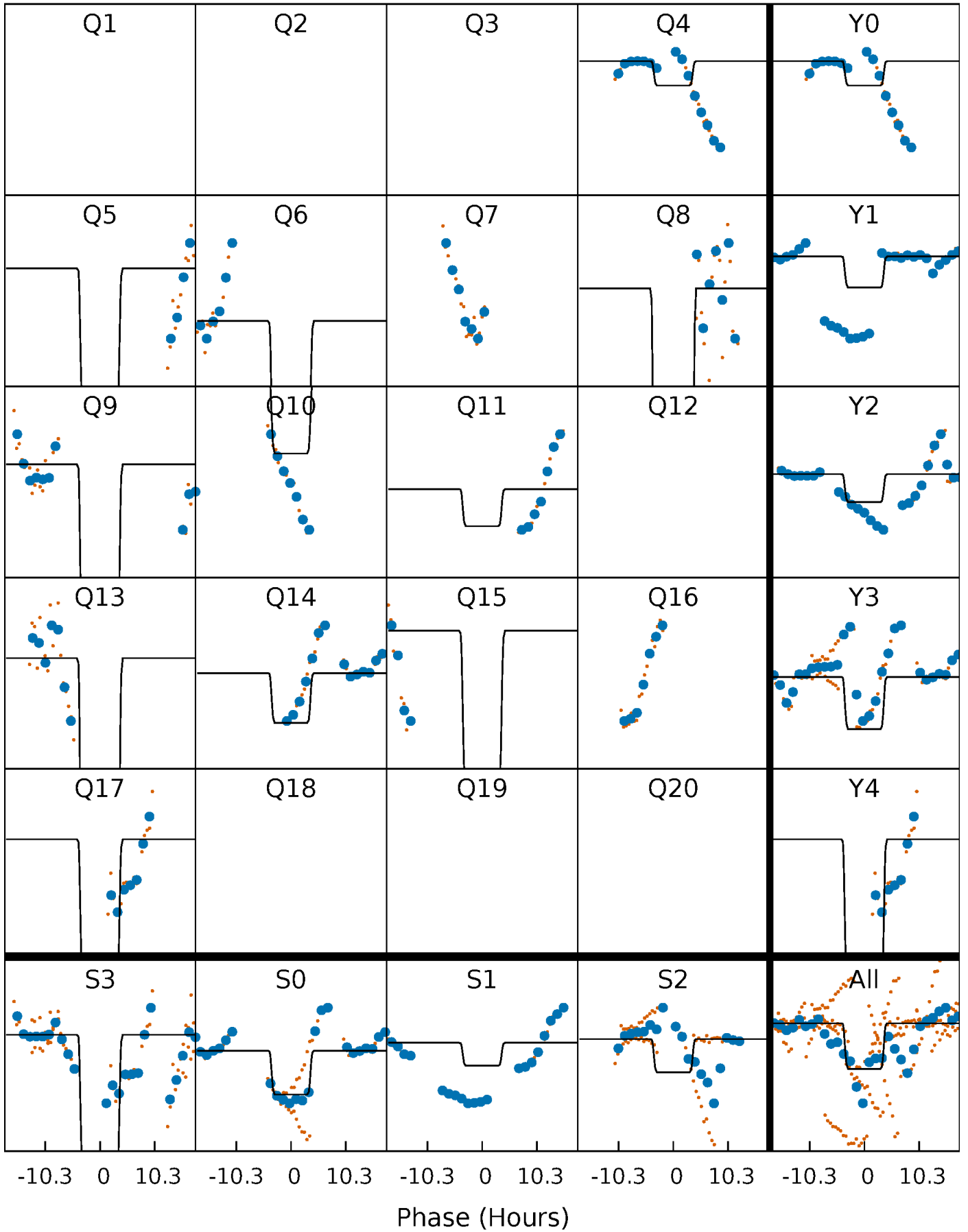
TCE 003441423-06 P= 77.133913 Days  $T_0=201.287993$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

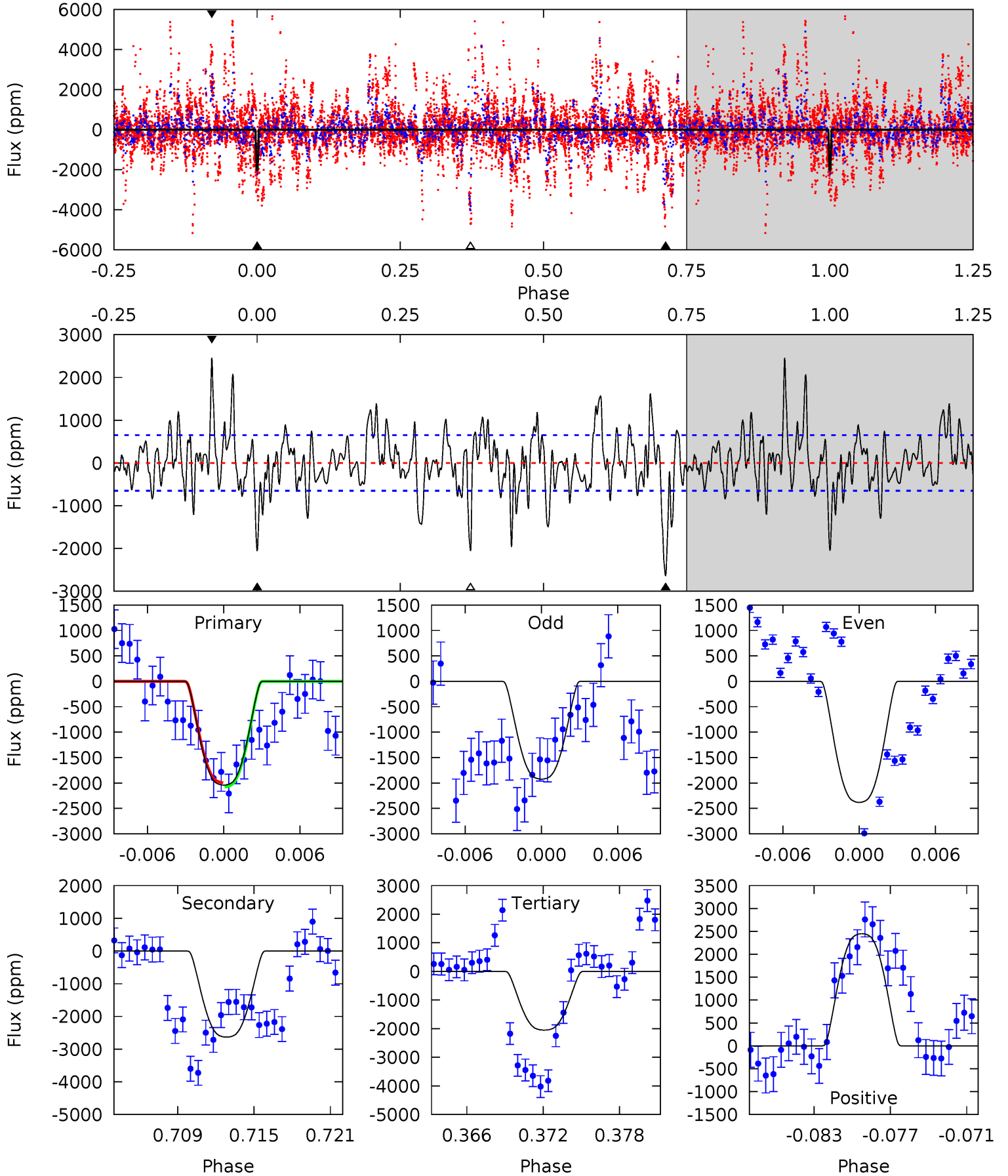
TCE 003441423-06   P= 77.136488 Days    $T_0=201.235335$  (BKJD)



# DV Model-Shift Uniqueness Test

003441423-06, P = 77.133913 Days, E = 201.287993 Days

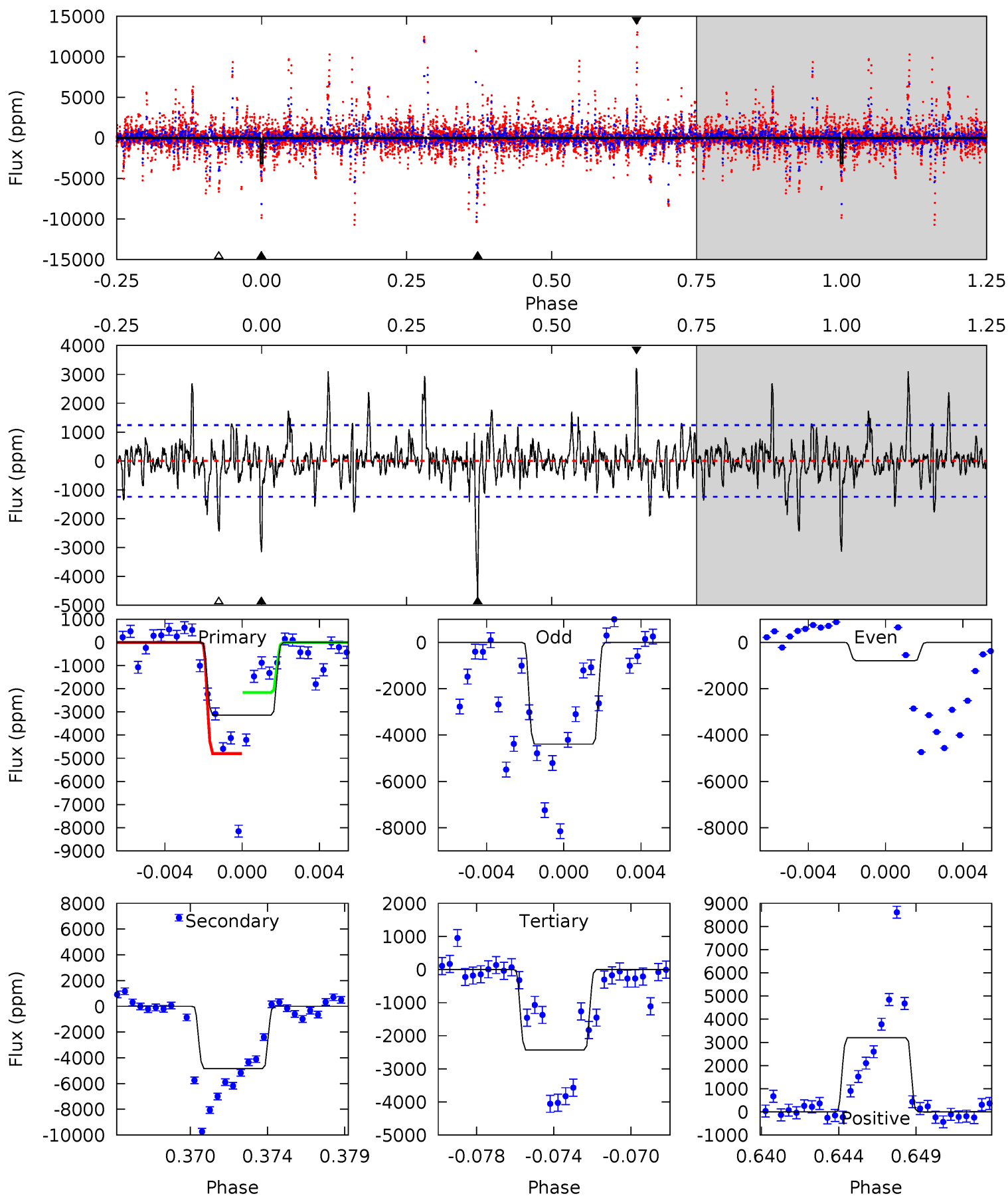
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	20.8	16.2	19.3	5.13	2.75	4.58	-0.07	-3.23	4.61	1.45	1.43	0.95	0.48	0.35



# Alt Model-Shift Uniqueness Test

003441423-06, P = 77.136488 Days, E = 201.235335 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.1	20.2	10.2	13.4	5.18	2.85	2.41	2.97	-0.29	10.1	6.81	5.37	1.82	0.40	5.43



### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2634 \pm 127$	$4.09^{+0.54}_{-0.45}$	$534^{+16}_{-11}$	$5945^{+371}_{-300}$	$10361^{+2863}_{-2176}$
Alt.	$-4833 \pm 239$	$5.73^{+0.54}_{-0.45}$	$533^{+14}_{-10}$	$5849^{+254}_{-240}$	$9604^{+1919}_{-1459}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

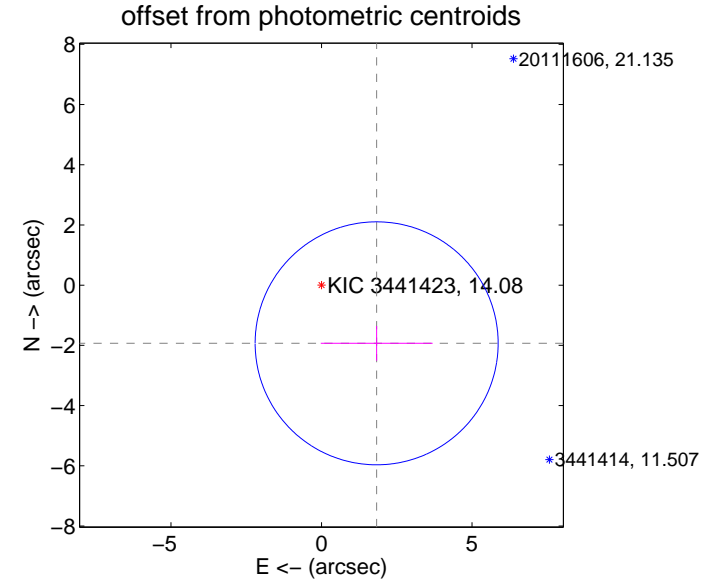
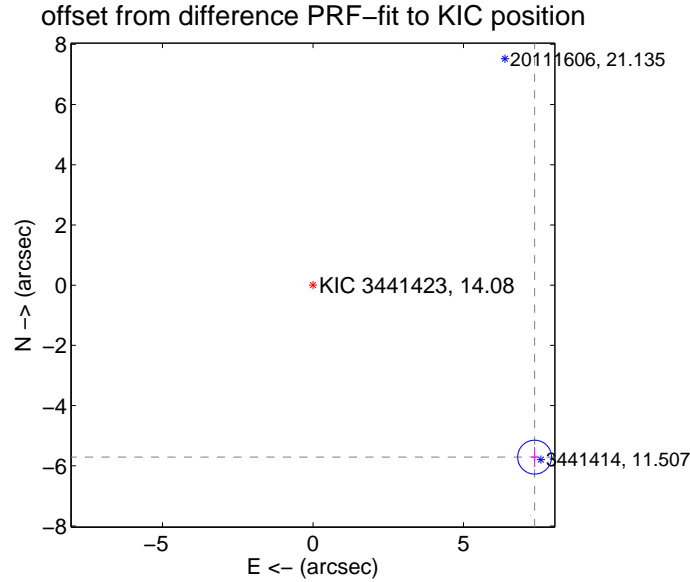
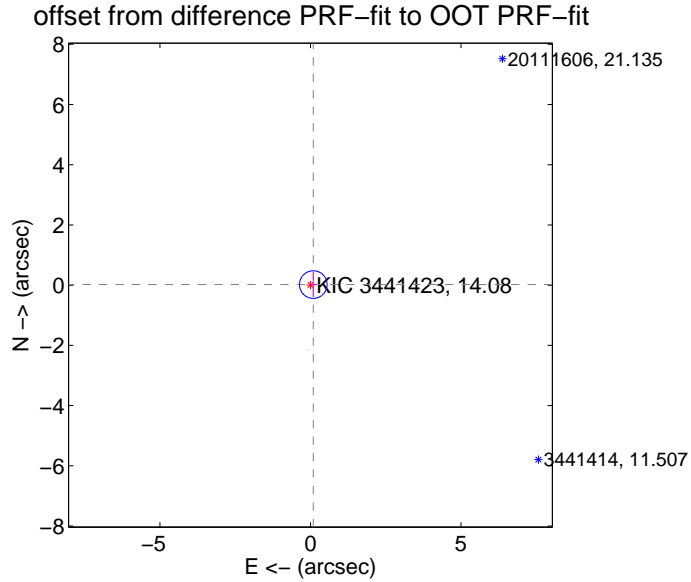
## DV Centroid Data

Supplemental centroid analysis for 003441423-06. Kepler magnitude: 14.08. Transit SNR 6.88

There are 2 quarters with good PRF difference image offsets

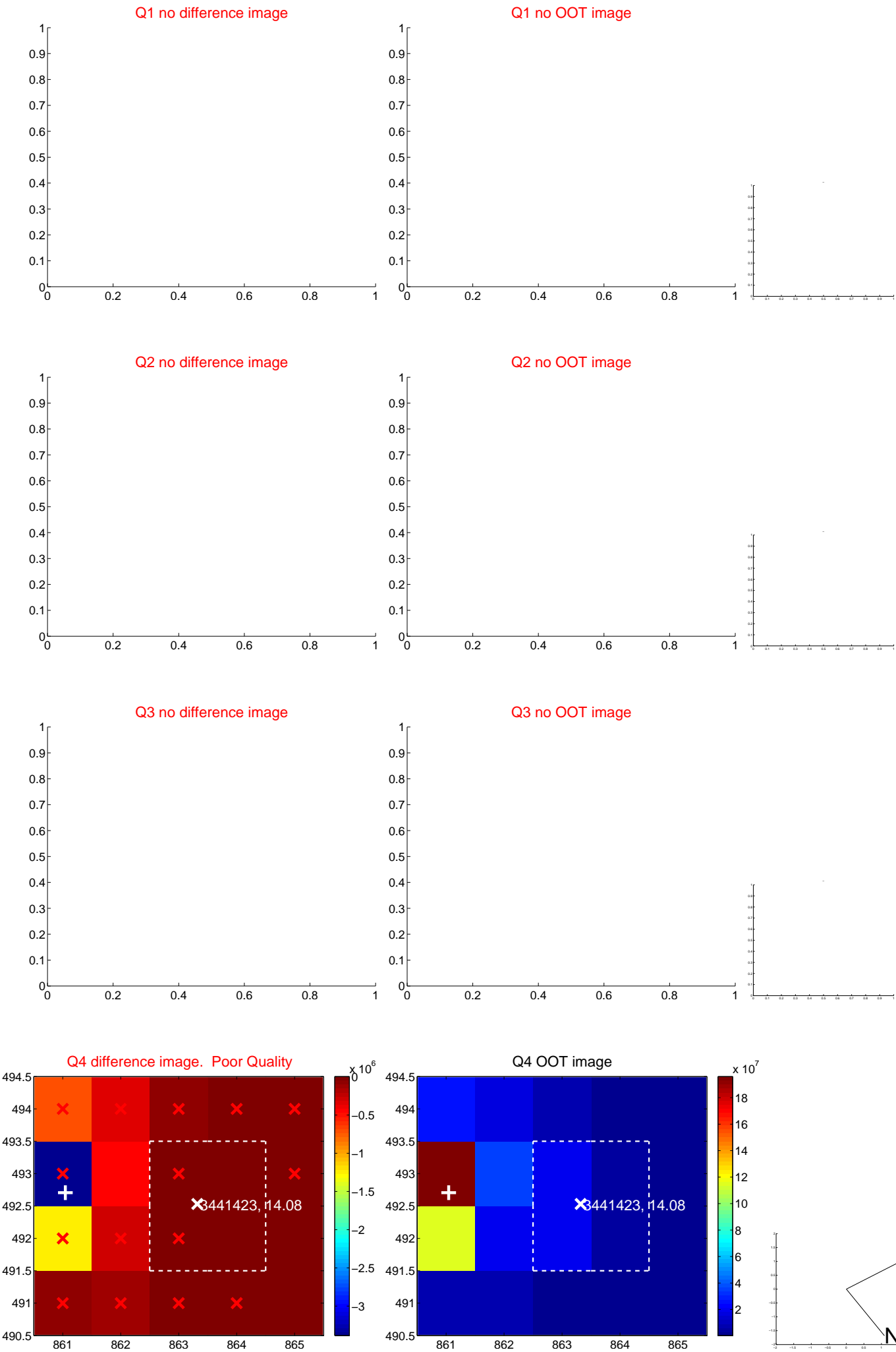
The OOT PRF centroid is offset from the target star catalog position by about 9.14 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.095 \pm 0.153$	0.62	$-0.093 \pm 0.091$	$0.019 \pm 0.416$
PRF-fit source offset from KIC position	$9.319 \pm 0.188$	49.70	$-7.362 \pm 0.121$	$-5.713 \pm 0.329$
photometric centroid source offset	$2.66 \pm 1.35$	1.98	$-1.83 \pm 1.86$	$-1.93 \pm 0.58$

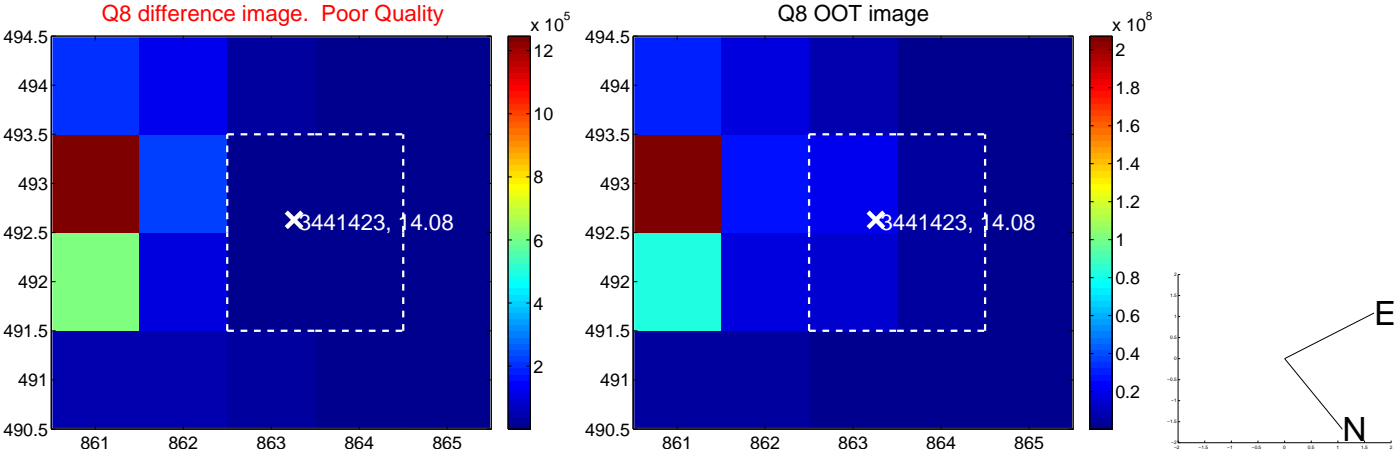
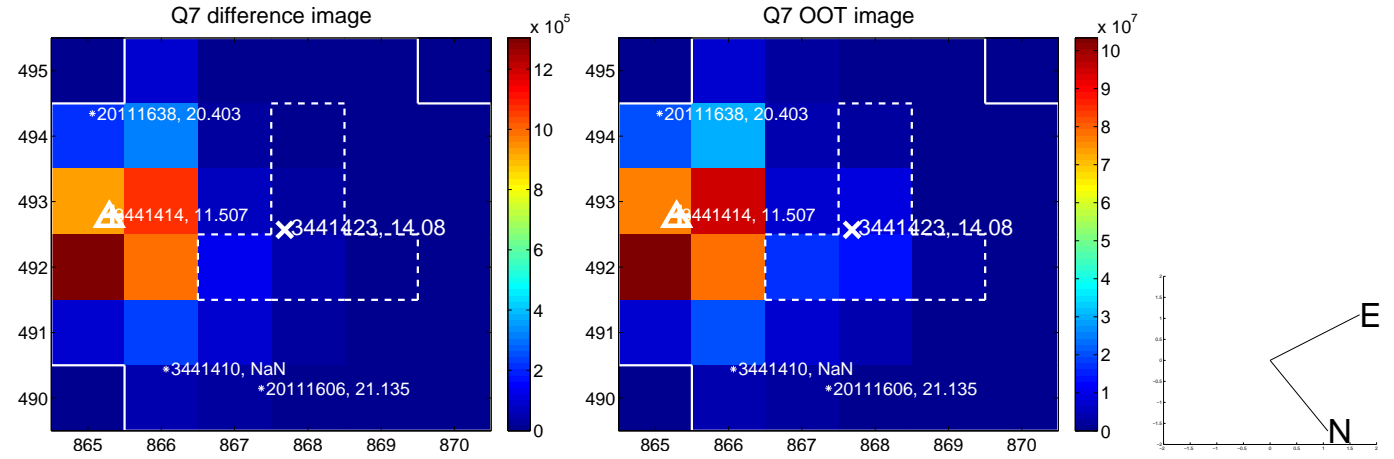
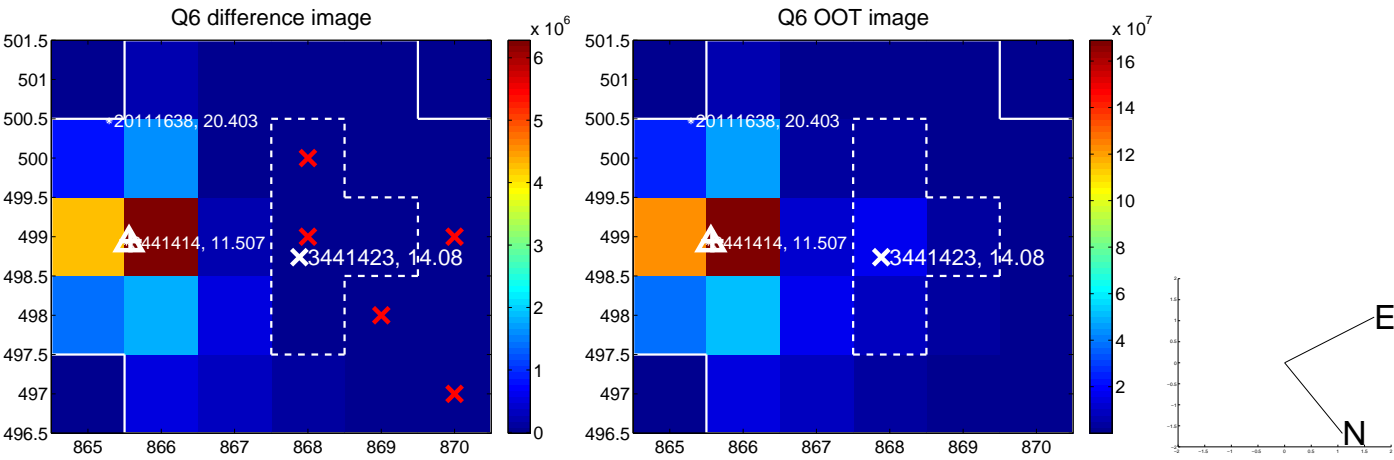
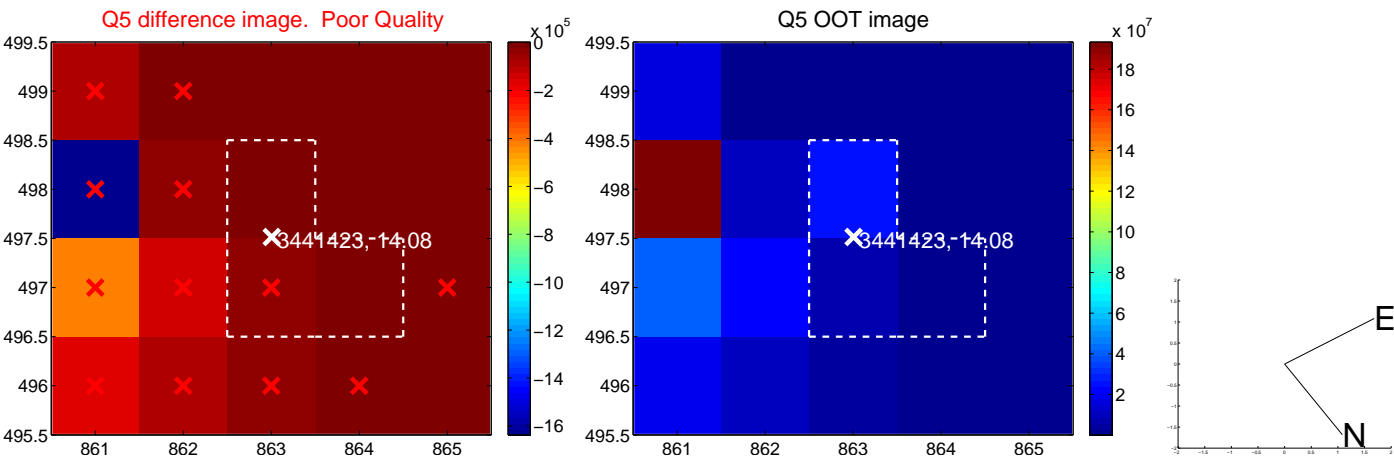


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

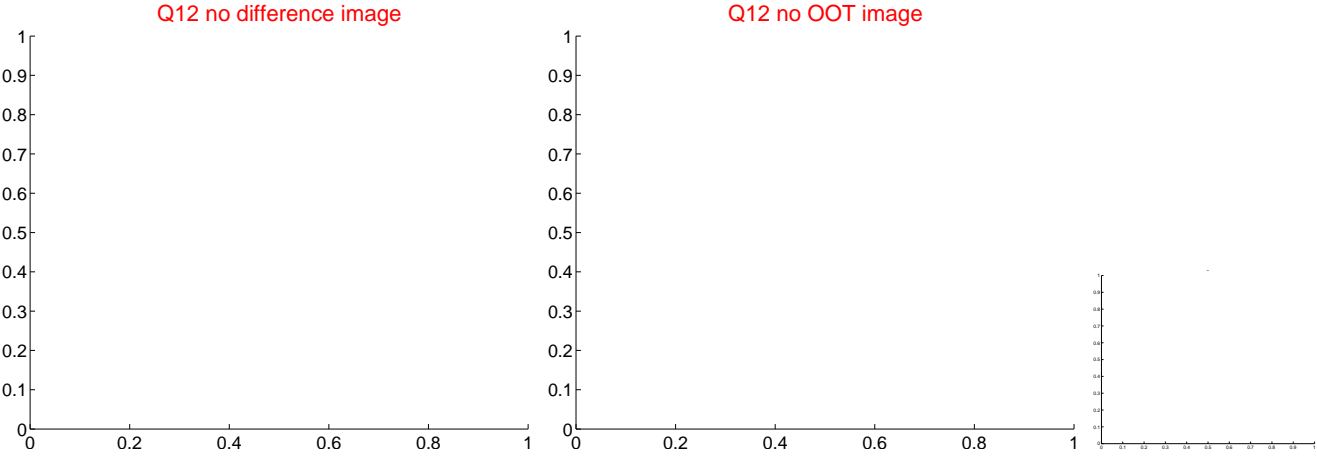
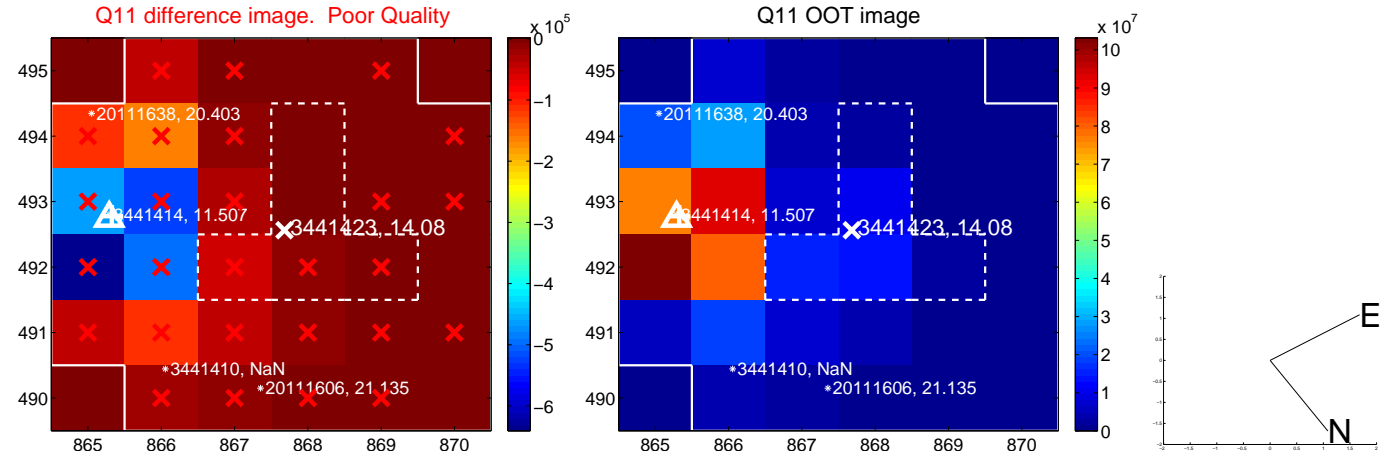
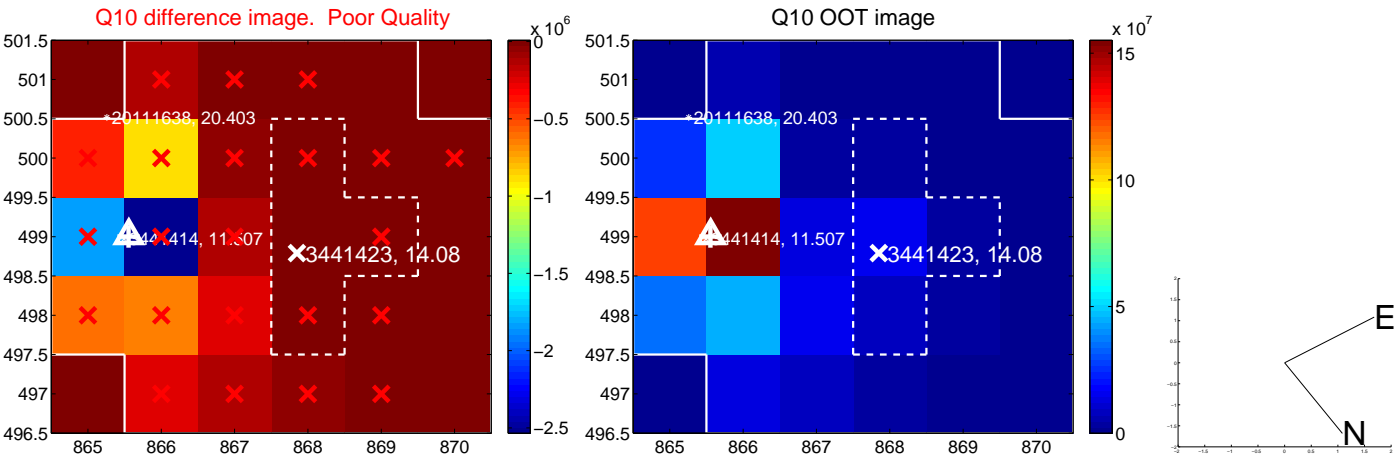
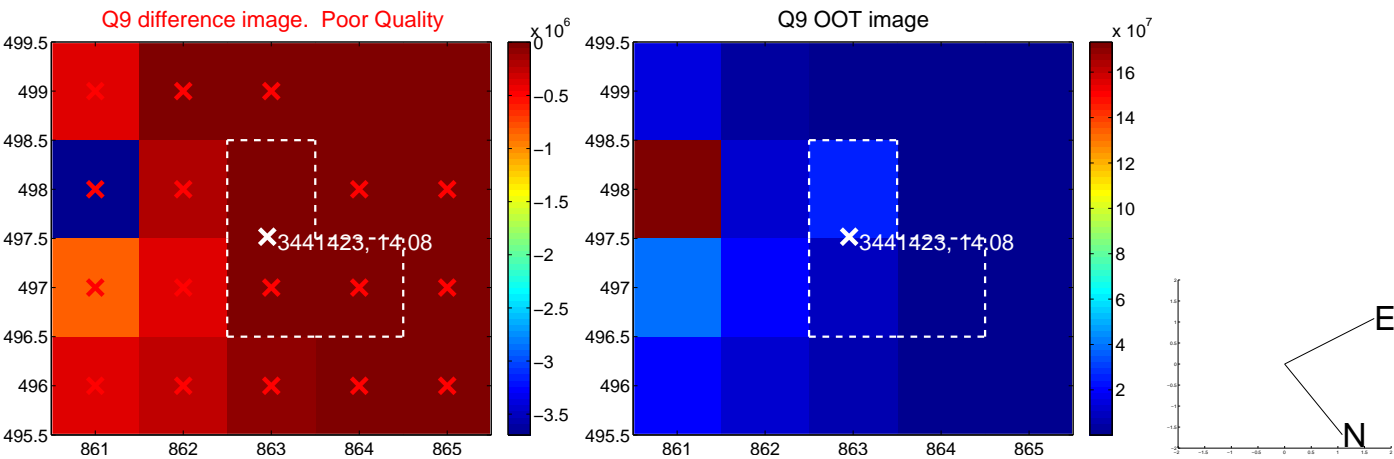
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

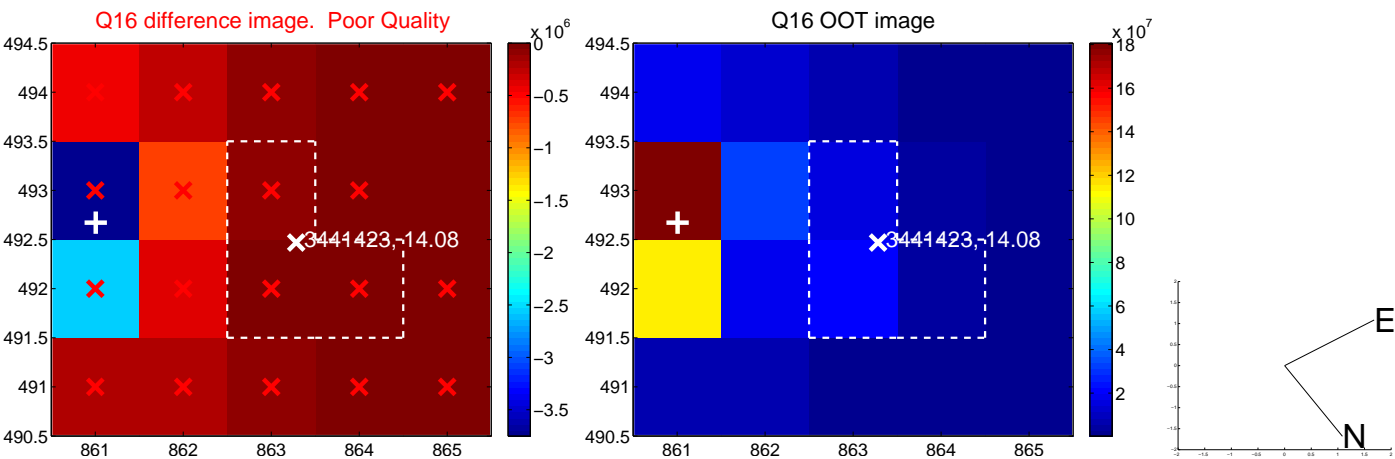
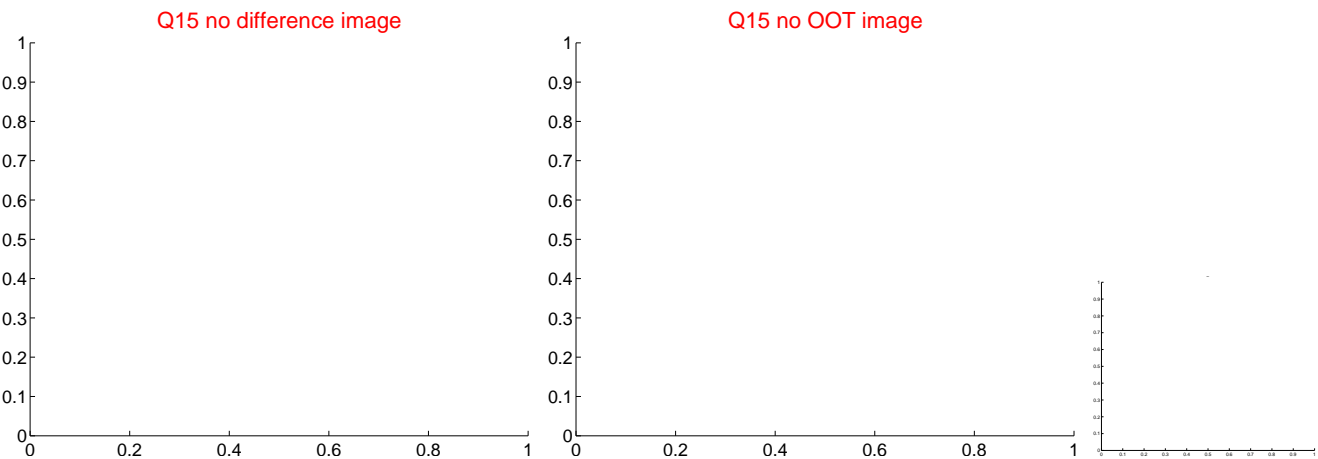
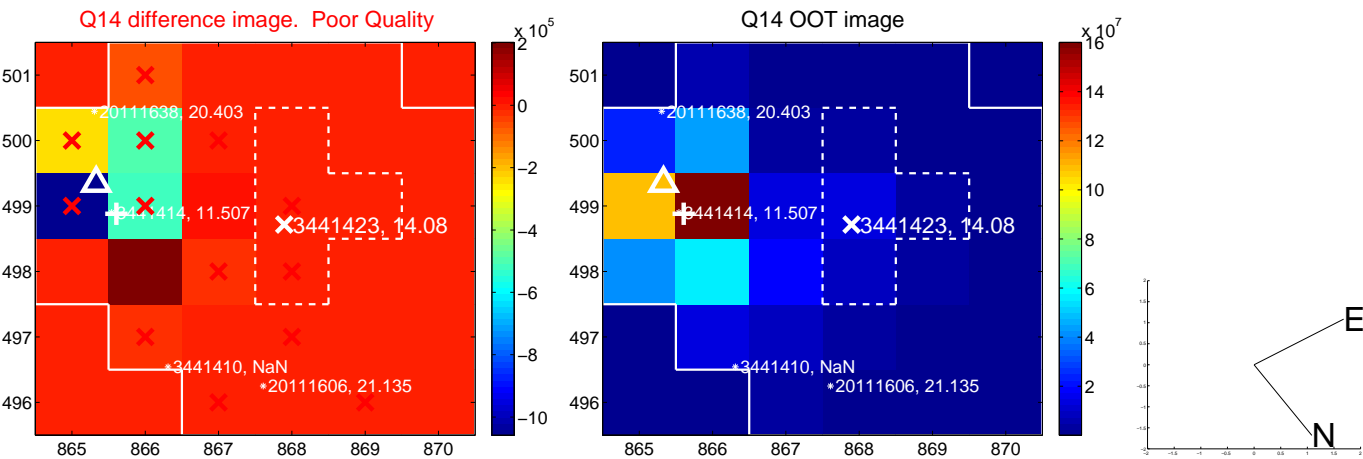
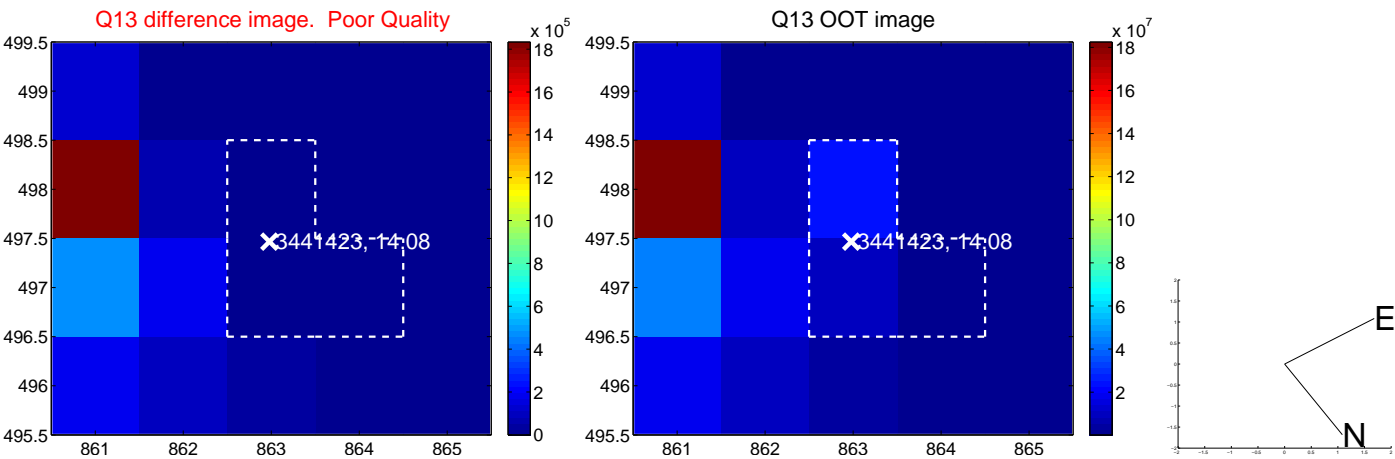


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

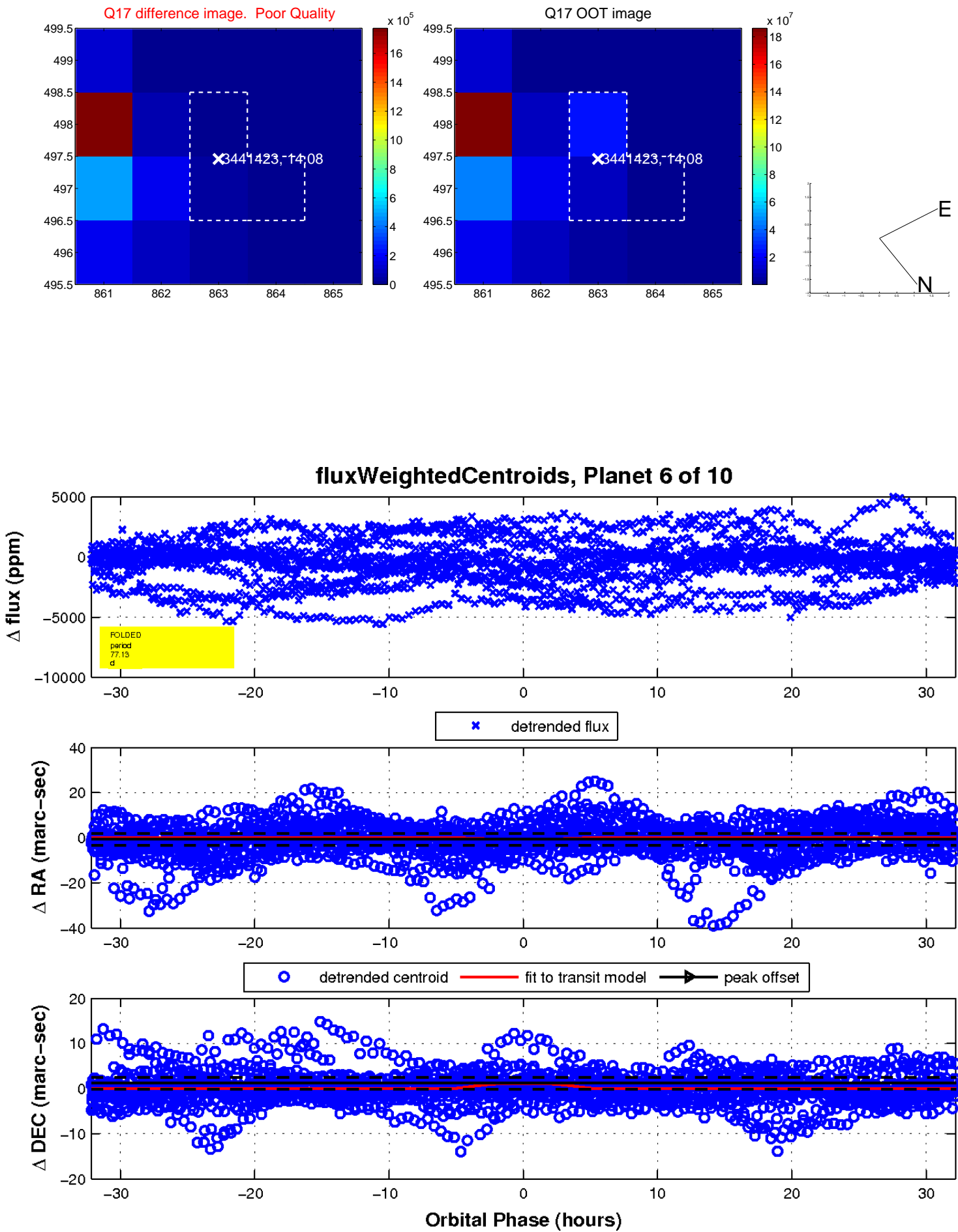




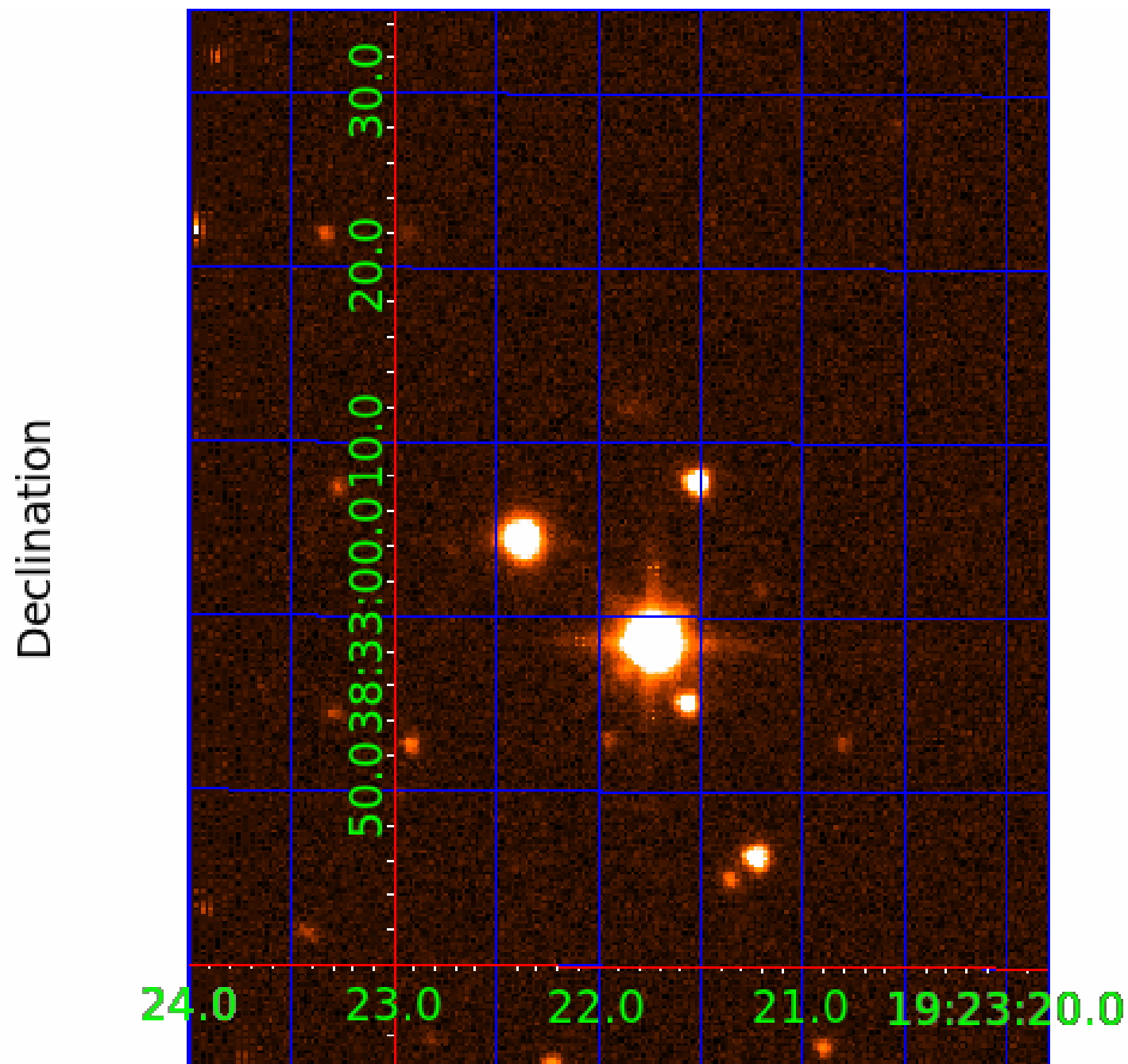
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003441423-01	OBS	No	1.805107	132.300794	107.0	11.412	10.9	7.7	0.84	5508	0.88	712.94
003441423-02	OBS	No	85.856457	168.046199	4465.8	10.500	62.4	-1.0	0.84	5508	5.51	4.14
003441423-03	OBS	No	64.780176	148.035133	1187.9	5.446	19.7	6.4	0.84	5508	3.09	6.02
003441423-04	OBS	No	59.862756	155.930613	2330.1	19.940	15.5	7.0	0.84	5508	7.79	6.69
003441423-05	OBS	No	231.147707	136.281517	15336.4	74.391	15.3	9.6	0.84	5508	12.94	1.10
003441423-06	OBS	No	77.133913	201.287993	1339.7	10.736	14.3	6.9	0.84	5508	4.00	4.77
003441423-07	OBS	No	66.961236	148.930850	971.1	0.969	13.8	4.0	0.84	5508	2.97	5.76
003441423-08	OBS	No	42.934940	141.414459	485.7	7.500	9.0	-1.0	0.84	5508	1.82	10.42
003441423-09	OBS	No	62.622117	157.133901	1581.0	10.114	8.5	7.6	0.84	5508	4.34	6.30
003441423-10	OBS	No	55.642936	159.899113	432.0	1.032	9.4	2.2	0.84	5508	1.98	7.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003441423-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
003441423-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

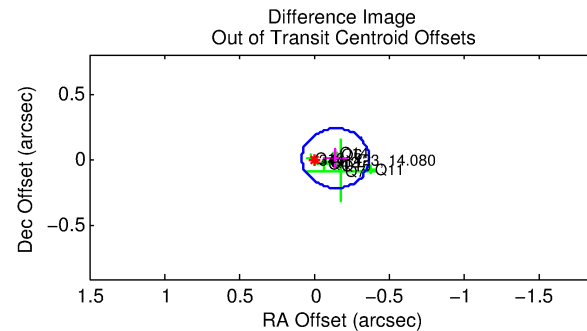
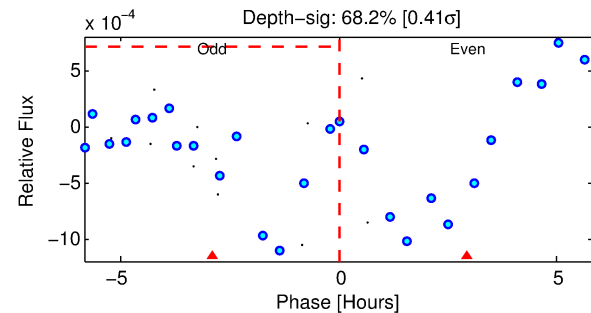
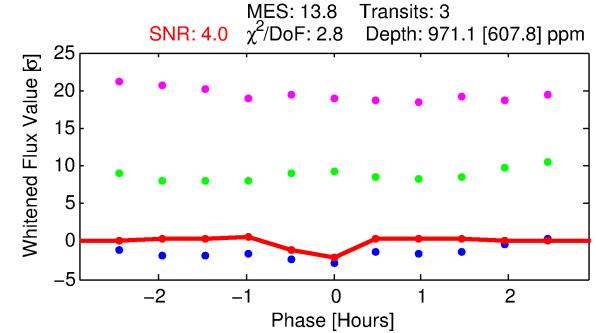
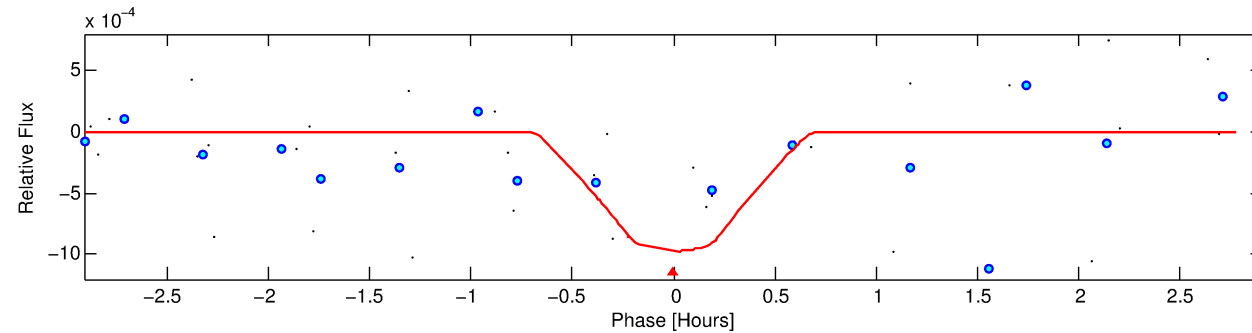
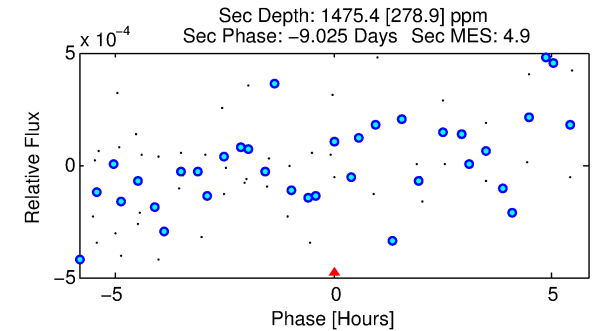
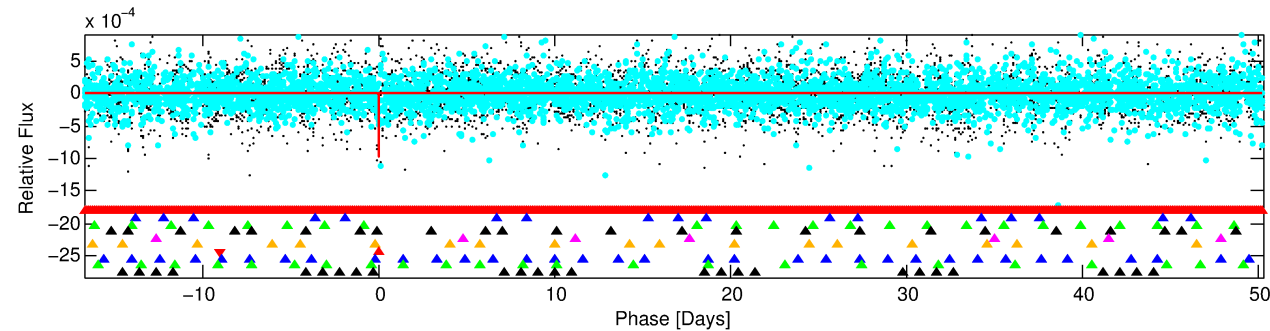
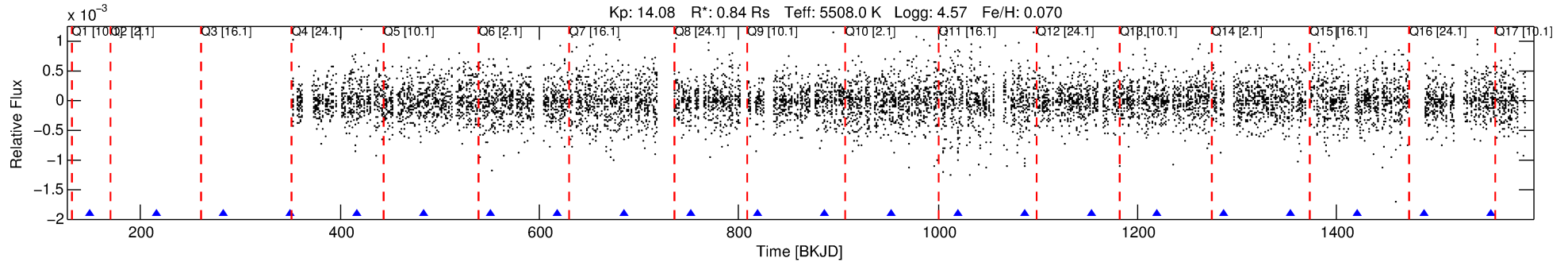
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003441423-07

No Significant Match Found

# DV One-Page Summary

KIC: 3441423 Candidate: 7 of 10 Period: 66.961 d



## DV Fit Results:

Period = 66.96124 [0.00238] d  
Epoch = 148.9308 [0.0253] BKJD  
Rp/R\* = 0.0324 [0.1862]  
a/R\* = 338.43 [7745.51]  
b = 0.81 [10.09]  
Seff = 5.76 [0.99]  
Teq = 395 [17] K  
Rp = 2.97 [17.07] Re  
a = 0.3178 [0.0319] AU  
Ag = 9290.66 [106776.24] [0.09σ]  
Teffp = 5997 [17229] K [0.33σ]

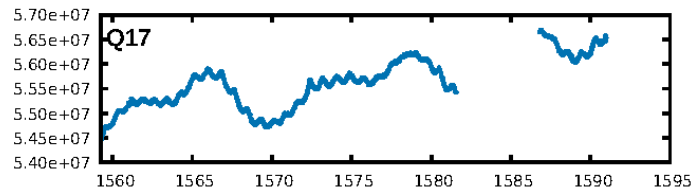
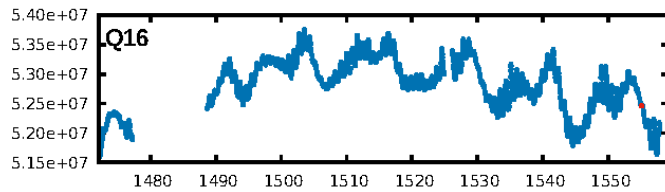
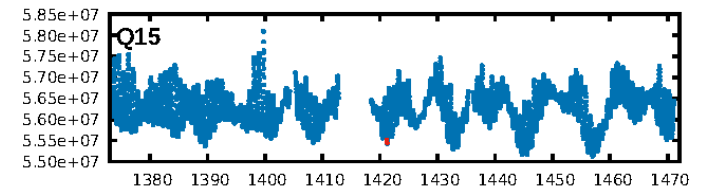
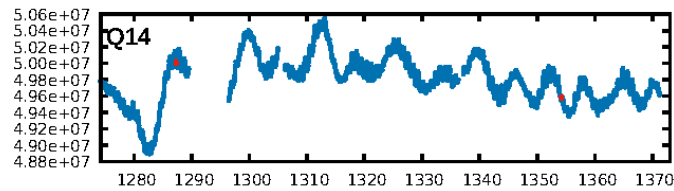
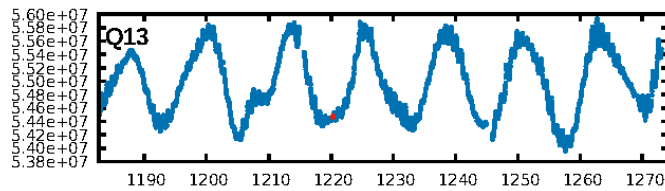
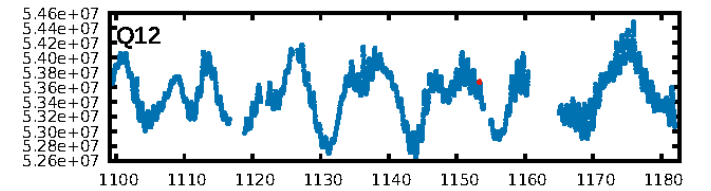
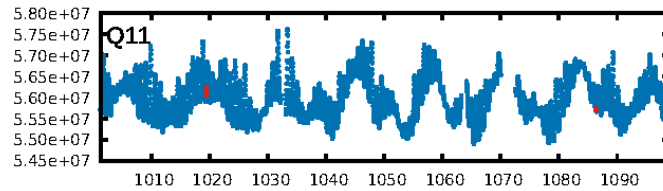
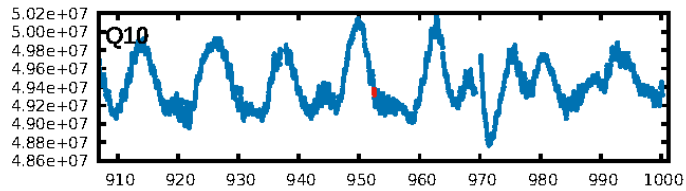
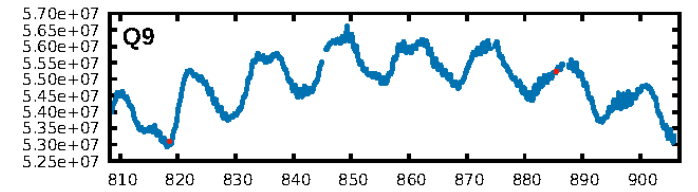
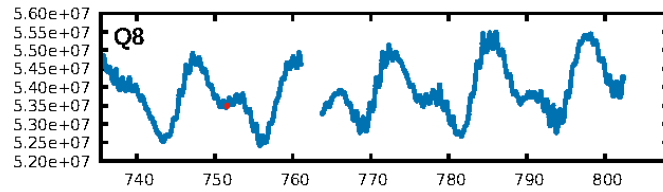
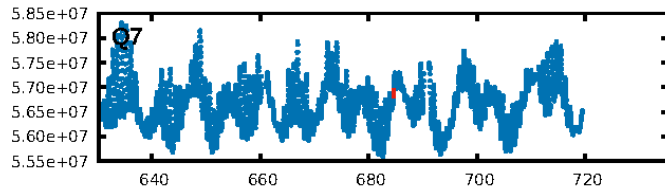
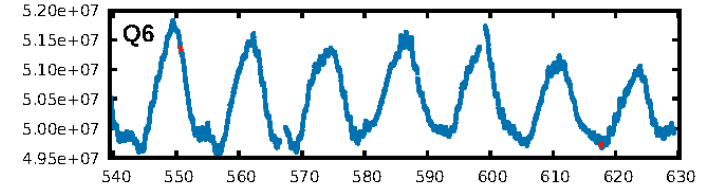
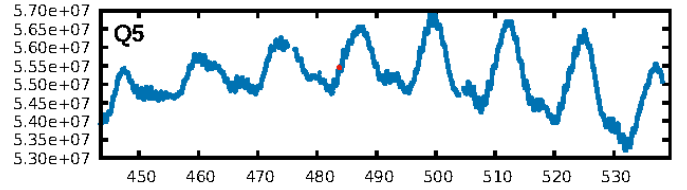
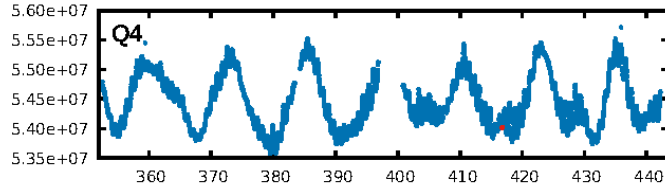
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [9.46σ]  
LongPeriod-sig: 100.0% [22.65σ]  
ModelChiSquare2-sig: 17.6%  
ModelChiSquareGof-sig: 40.8%  
Bootstrap-pfa: 2.84e-15  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.2242  
Centroid-sig: 84.4%  
Centroid-so: 2.173 arcsec [1.89σ]  
OotOffset-rm: 0.146 arcsec [1.95σ]  
OotOffset-st: 3/3/2/0 [8]  
KicOffset-rm: 9.307 arcsec [93.68σ]  
KicOffset-st: 3/3/2/0 [8]  
DiffImageQuality-fgm: 0.88 [7/8]  
DiffImageOverlap-fno: 0.54 [7/13]

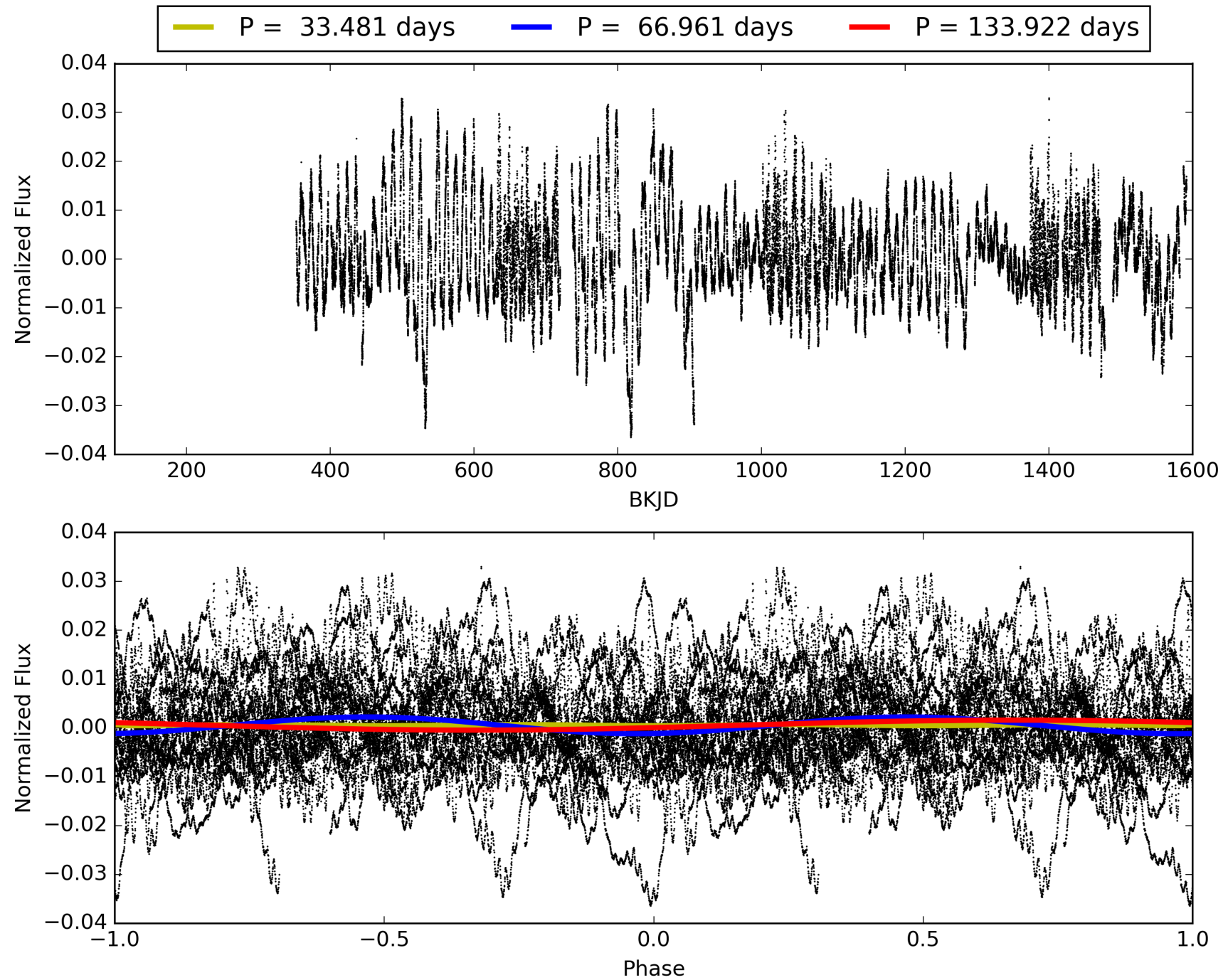
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:20:35 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003441423-07, PDC Light Curves



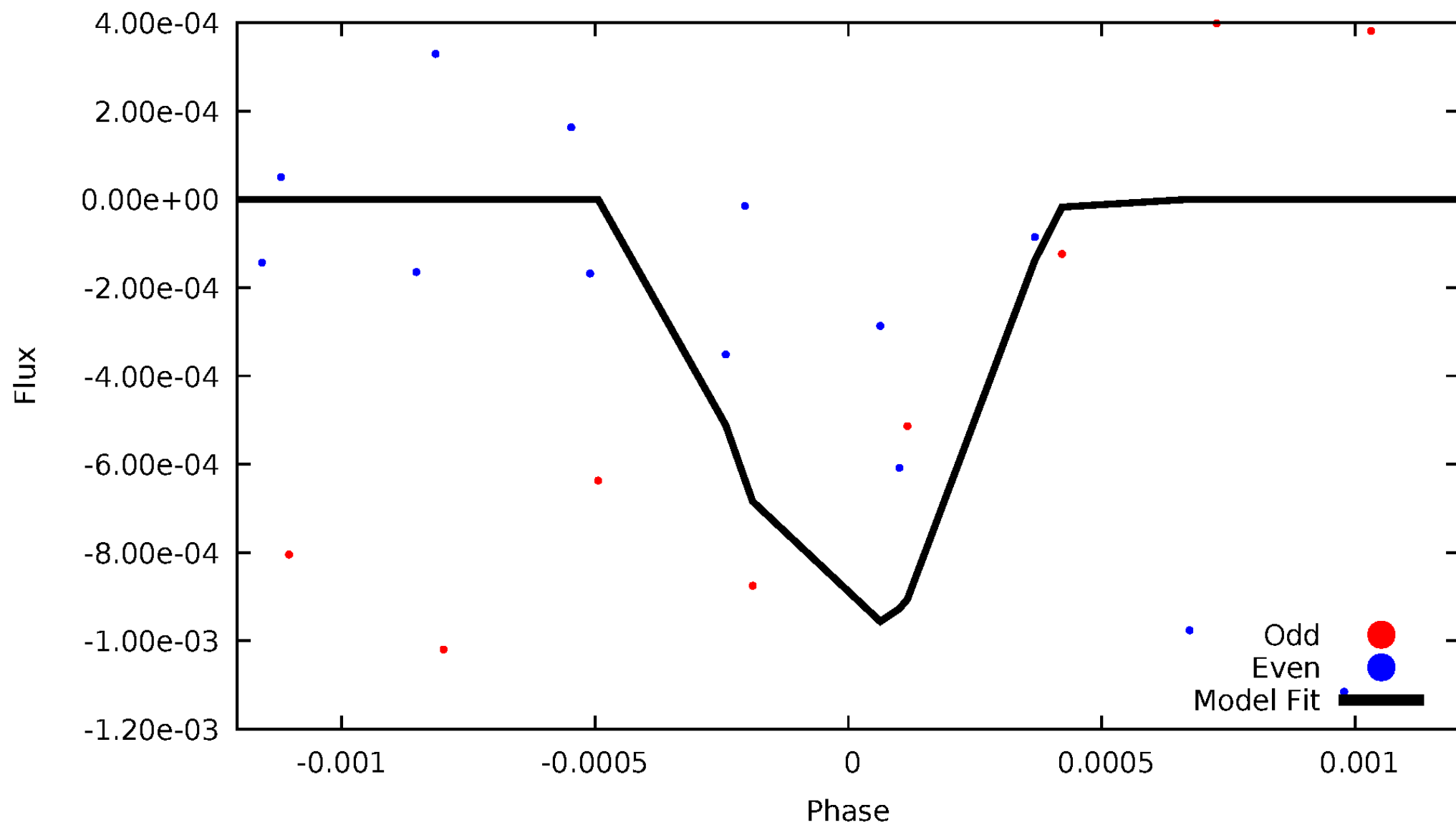
TCE 003441423-07





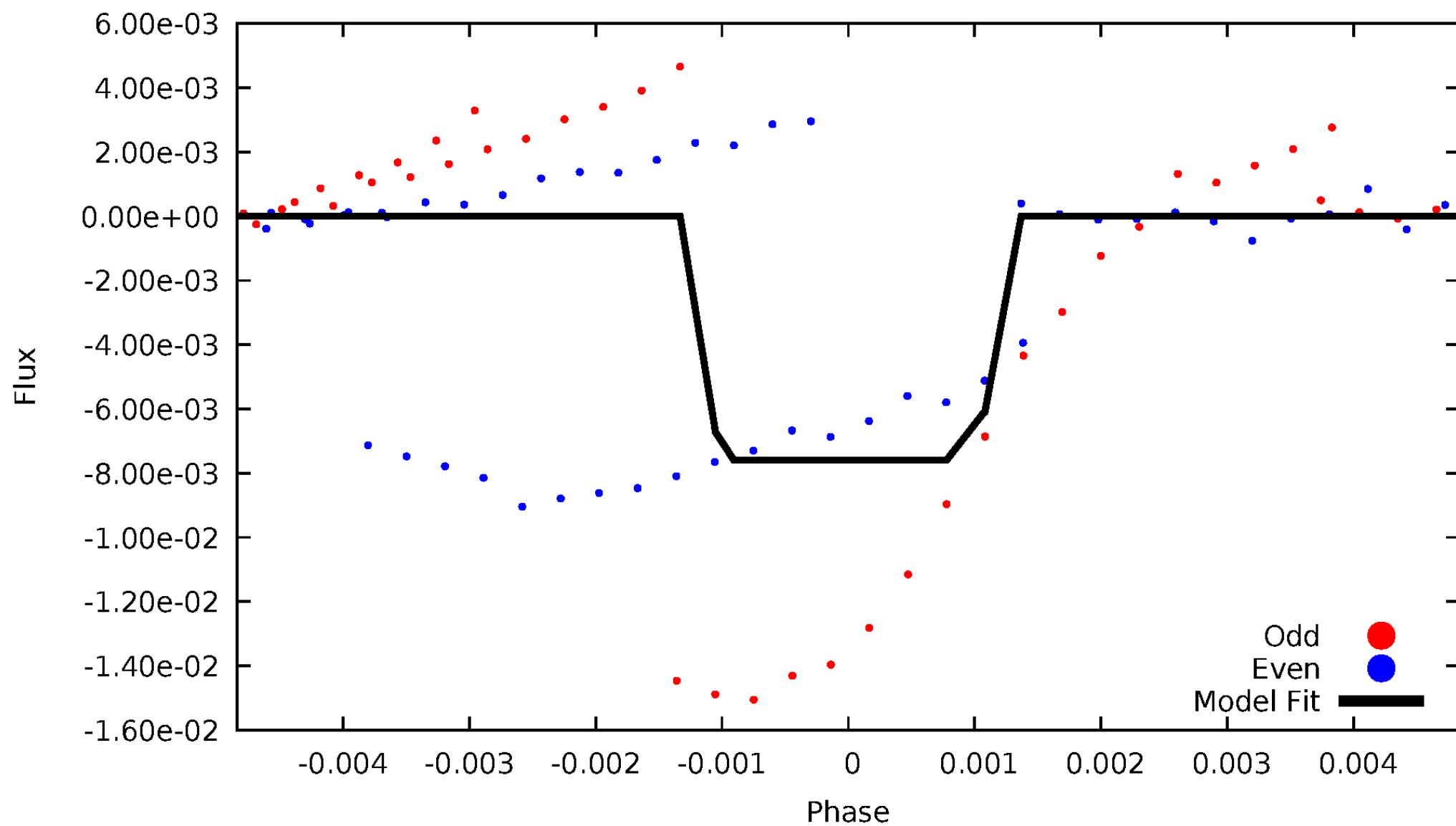
# DV Odd/Even

TCE 003441423-07



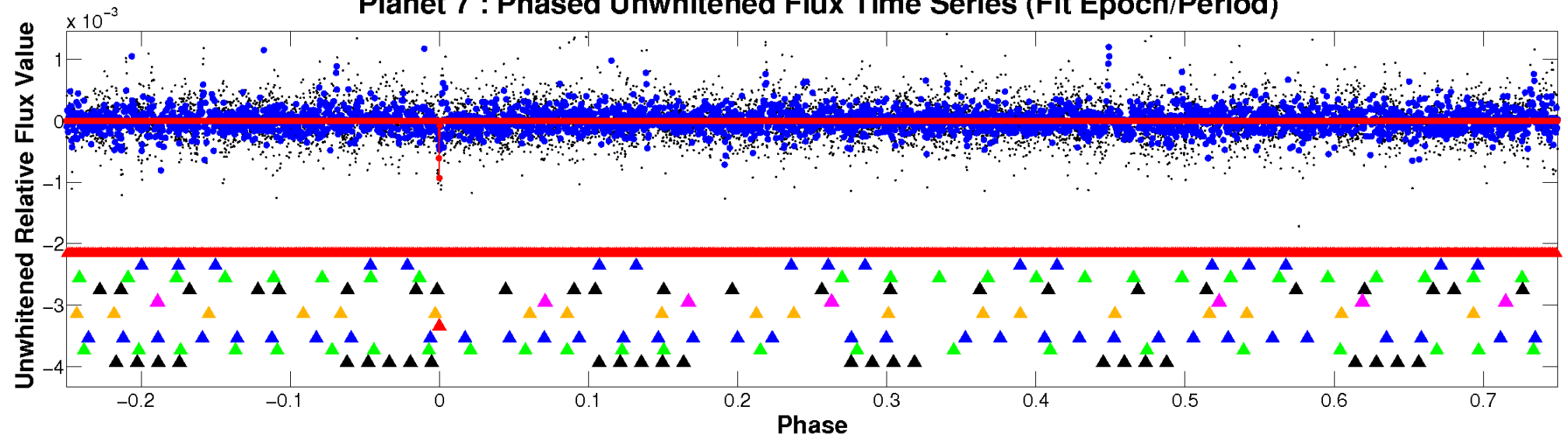
# ALT Odd/Even

TCE 003441423-07

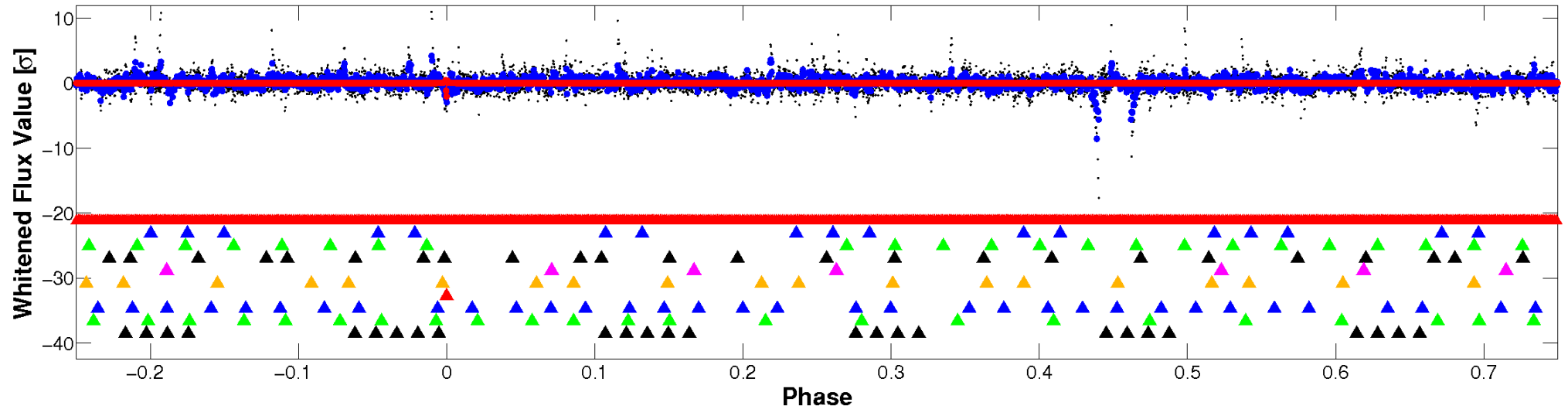


# Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

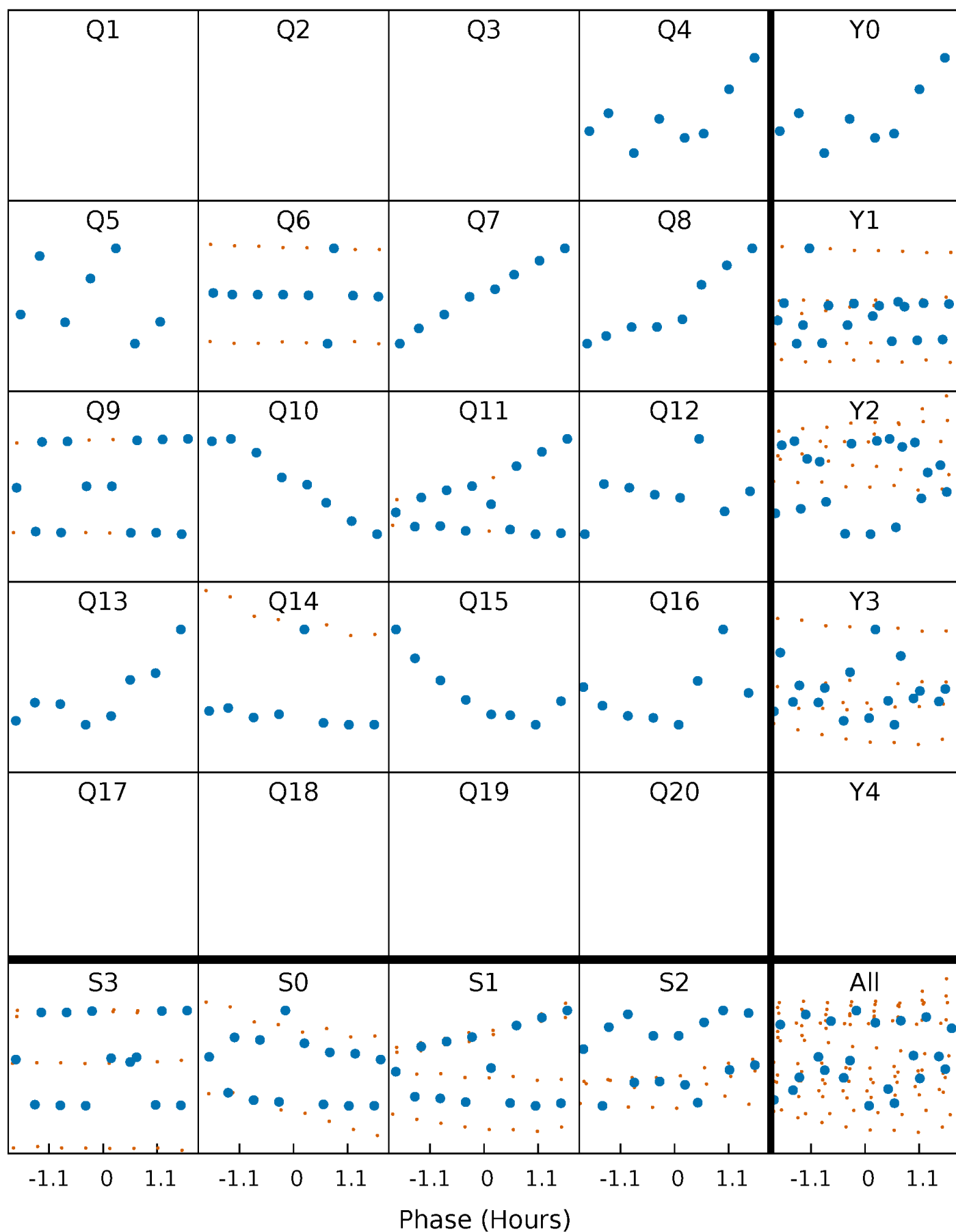


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



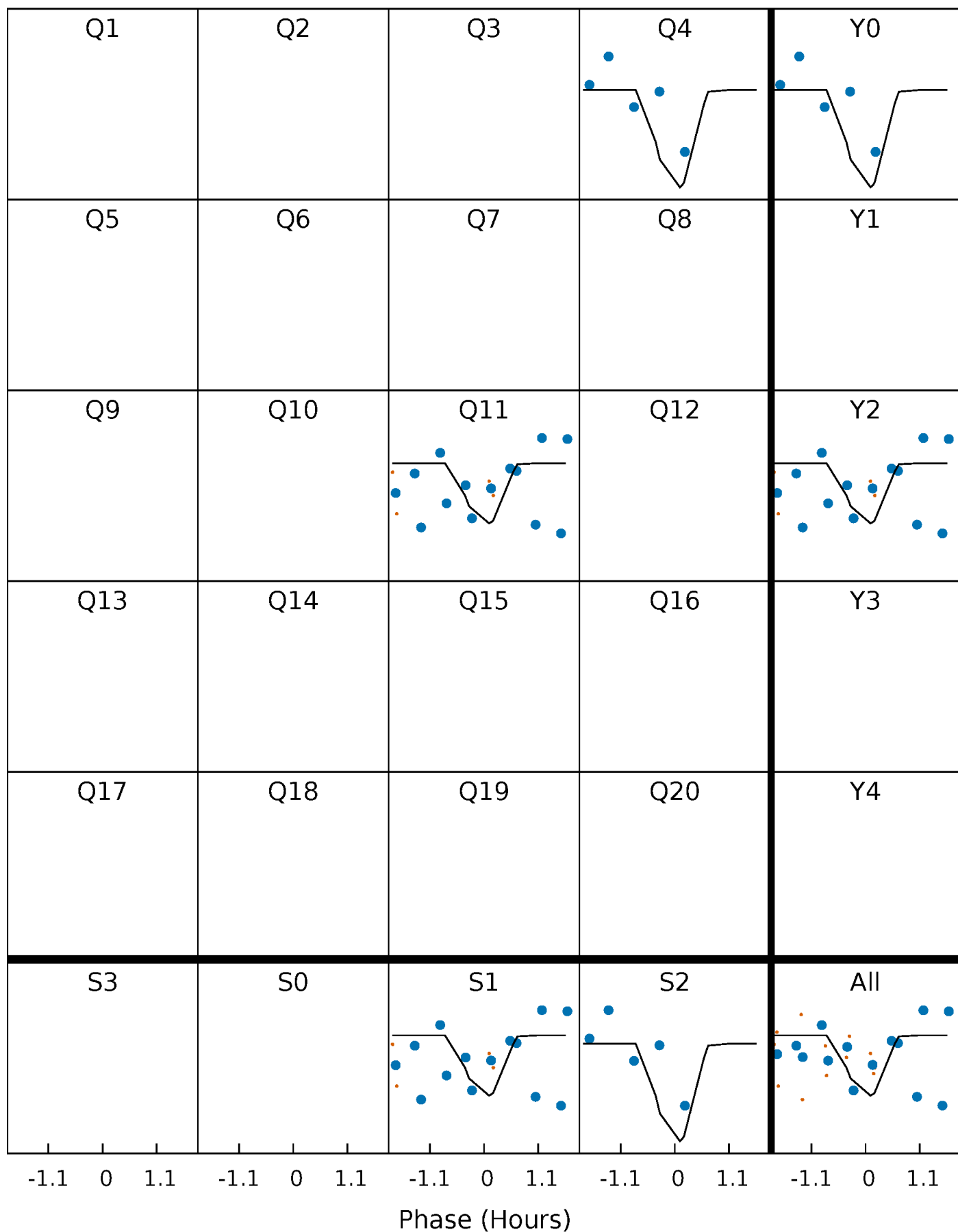
## PDC Quarter-Phased Transit Curves

TCE 003441423-07    P= 66.961236 Days     $T_0=148.930850$  (BKJD)



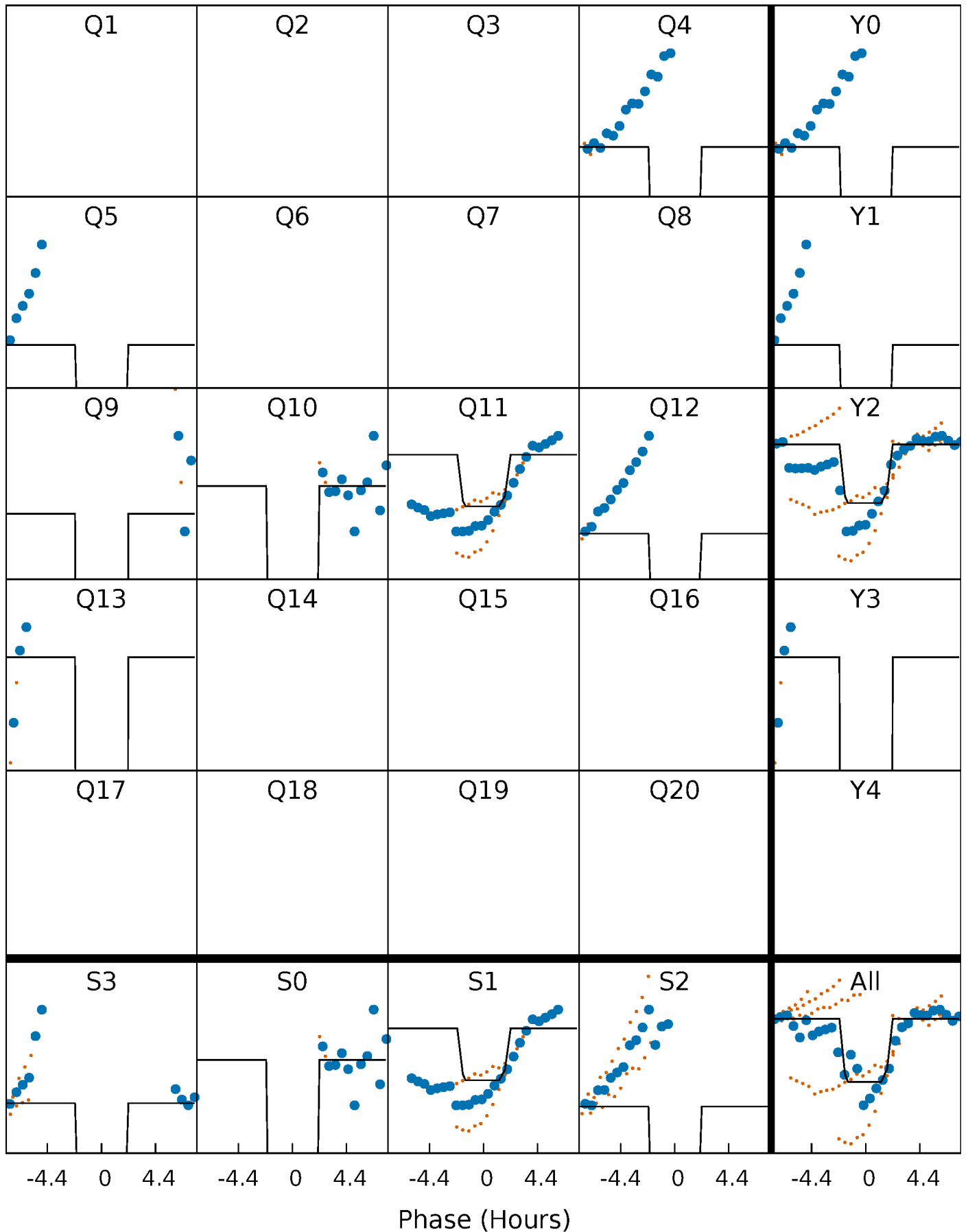
# DV Quarter-Phased Transit Curves

TCE 003441423-07   P= 66.961236 Days    $T_0=148.930850$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

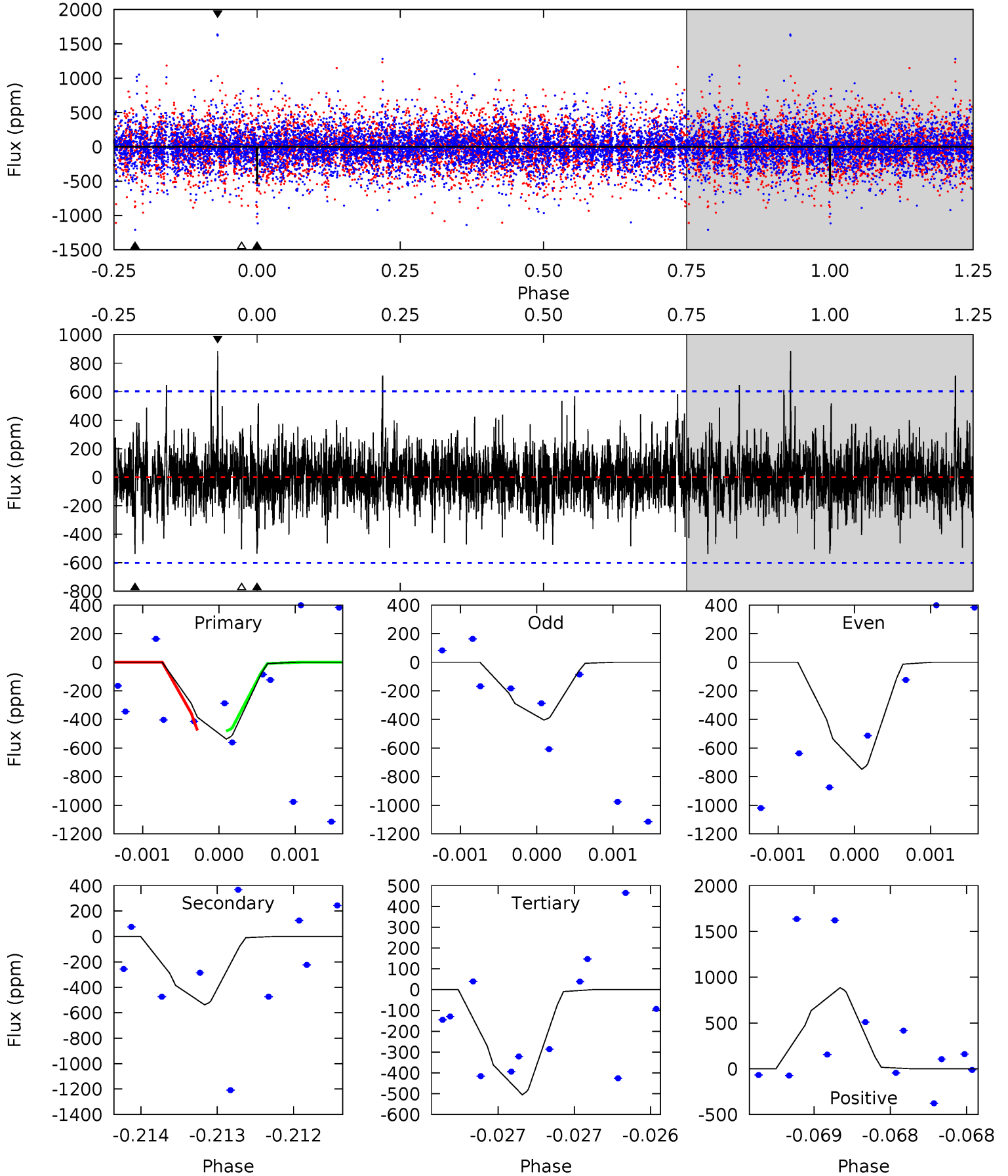
TCE 003441423-07     $P = 66.957909$  Days     $T_0 = 148.970723$  (BKJD)



# DV Model-Shift Uniqueness Test

003441423-07, P = 66.961236 Days, E = 148.930850 Days

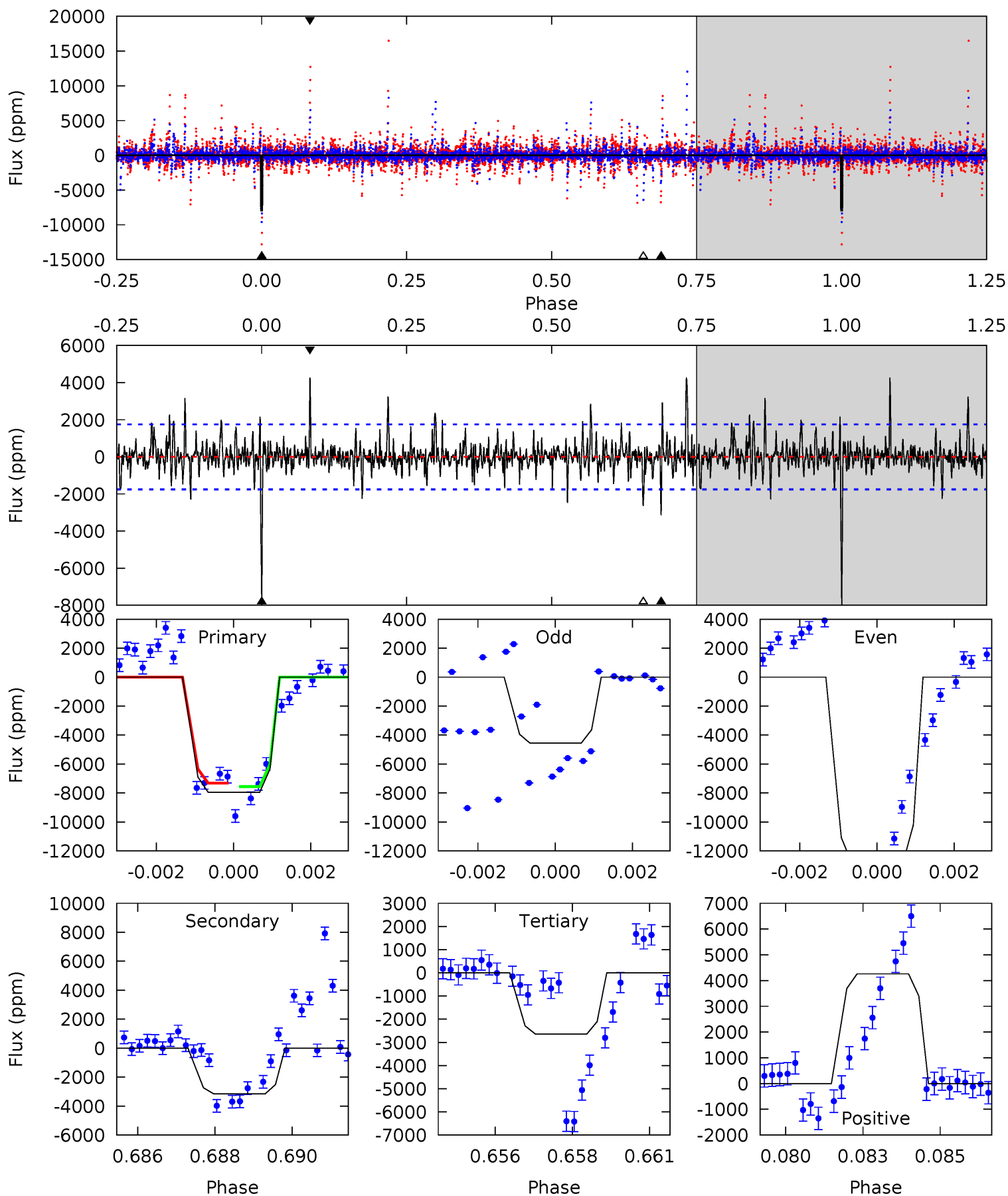
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.93	4.94	4.64	8.13	5.52	3.40	1.23	0.29	-3.19	0.29	-3.19	1.48	1.23	0.62	0.03



# Alt Model-Shift Uniqueness Test

003441423-07, P = 66.957909 Days, E = 148.970723 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.1	9.53	7.98	12.9	5.30	3.05	1.73	16.1	11.2	1.55	-3.34	10.6	0.83	0.35	0





### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-538 \pm 109$	$12.30^{+13.40}_{-8.45}$	$560^{+16}_{-12}$	$2983^{+1338}_{-538}$	$191^{+1839}_{-148}$
Alt.	$-3153 \pm 331$	$14.84^{+14.88}_{-10.05}$	$560^{+16}_{-12}$	$3694^{+2034}_{-705}$	$780^{+6458}_{-585}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

## DV Centroid Data

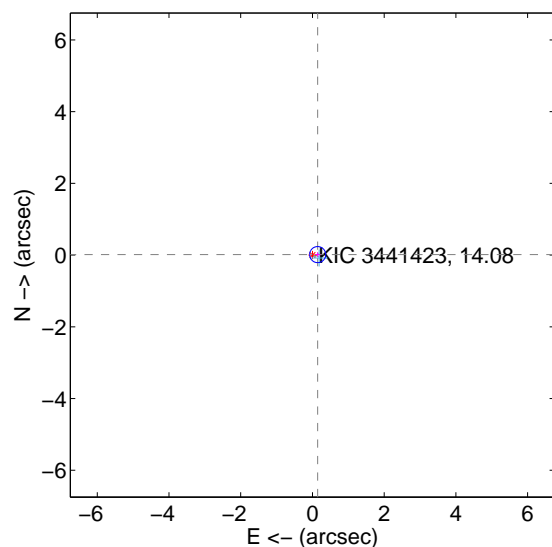
Supplemental centroid analysis for 003441423-07. Kepler magnitude: 14.08. Transit SNR 3.99

There are 7 quarters with good PRF difference image offsets

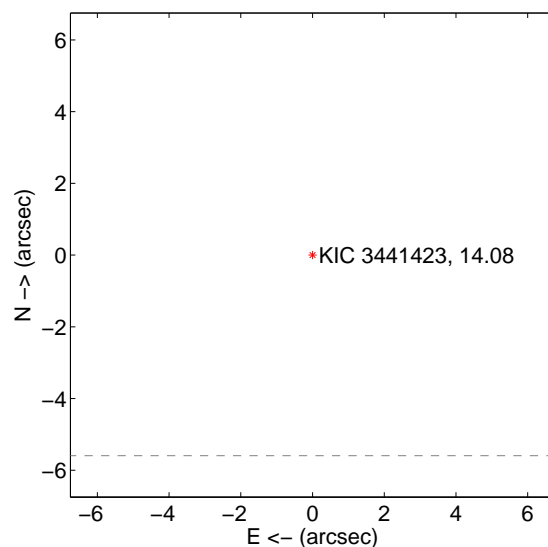
The OOT PRF centroid is offset from the target star catalog position by about 9.40 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.146 \pm 0.075$	1.95	$-0.145 \pm 0.075$	$0.014 \pm 0.069$
PRF-fit source offset from KIC position	$9.307 \pm 0.099$	93.68	$-7.437 \pm 0.089$	$-5.597 \pm 0.083$
photometric centroid source offset	$2.17 \pm 1.15$	1.89	$-1.87 \pm 1.29$	$-1.10 \pm 0.57$

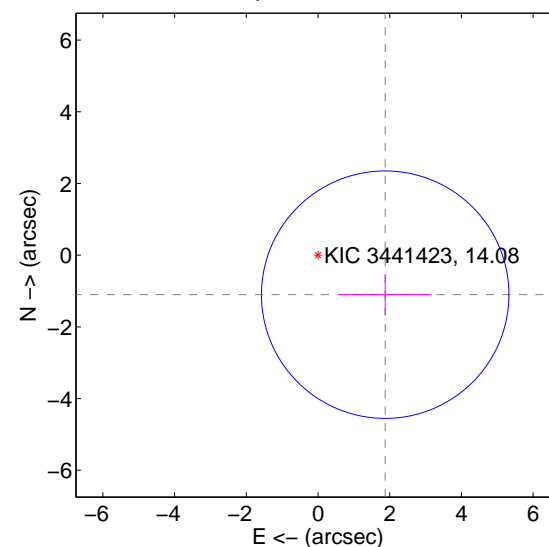
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

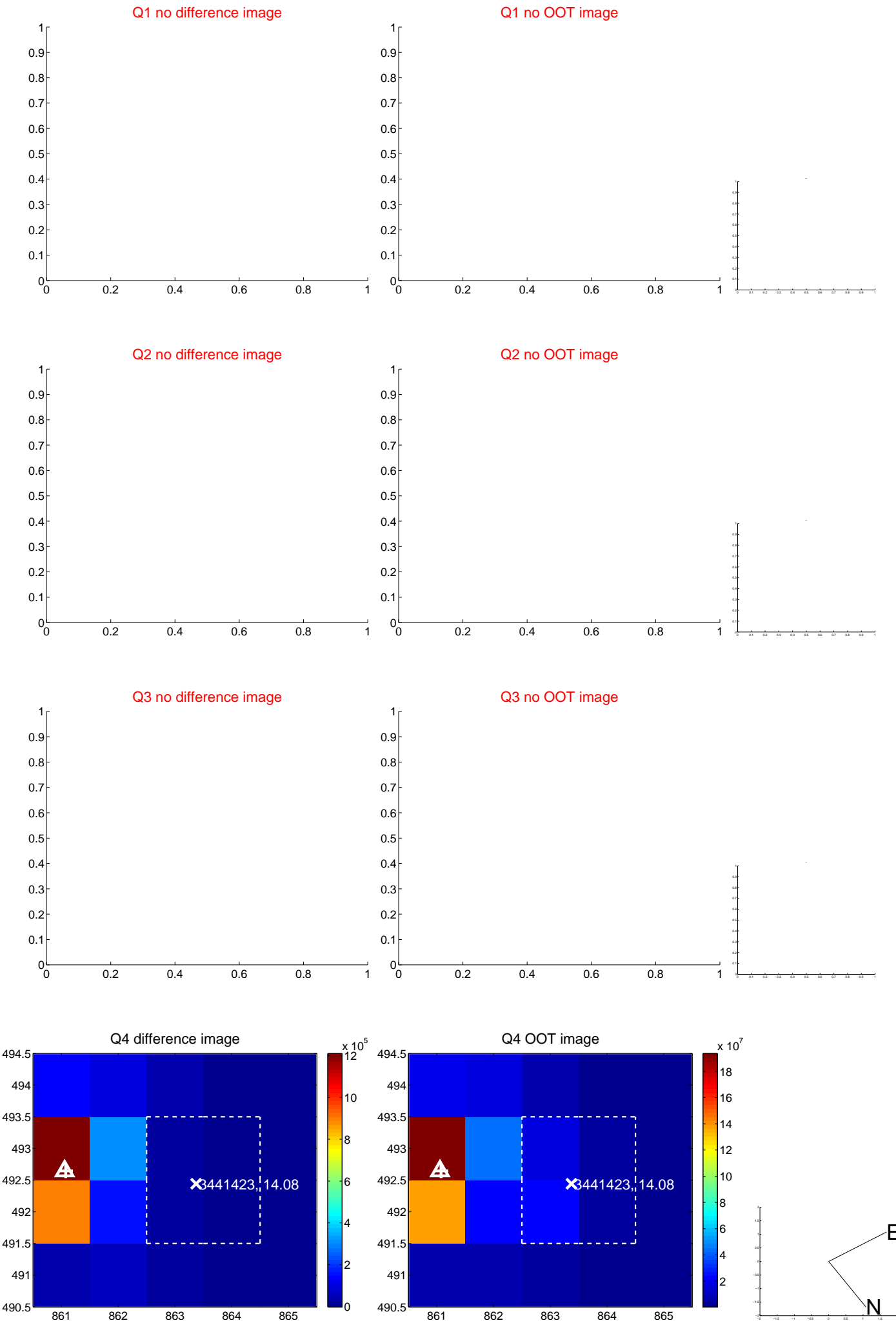


offset from photometric centroids



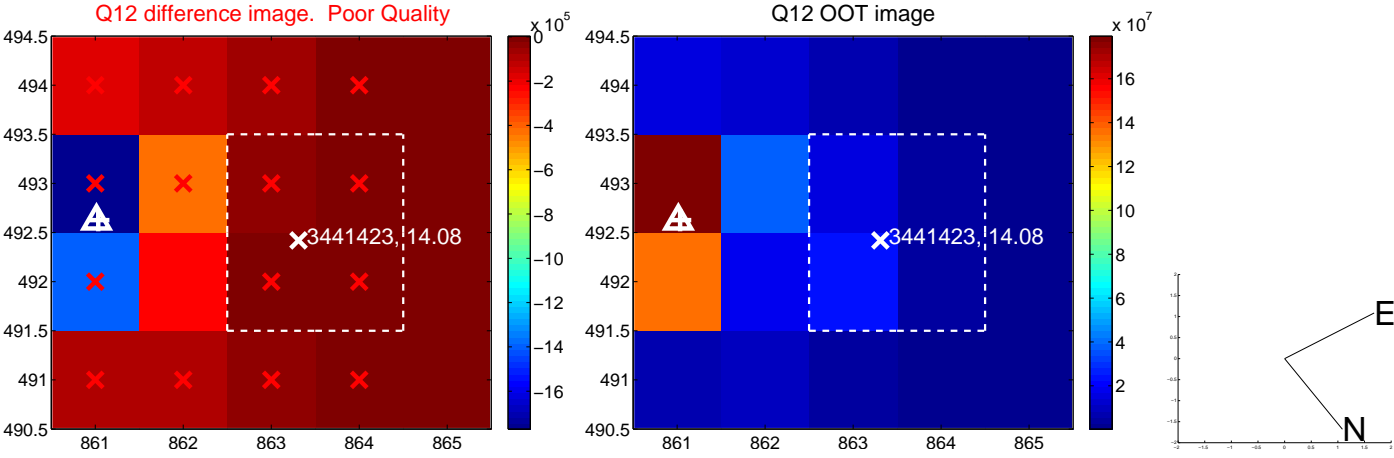
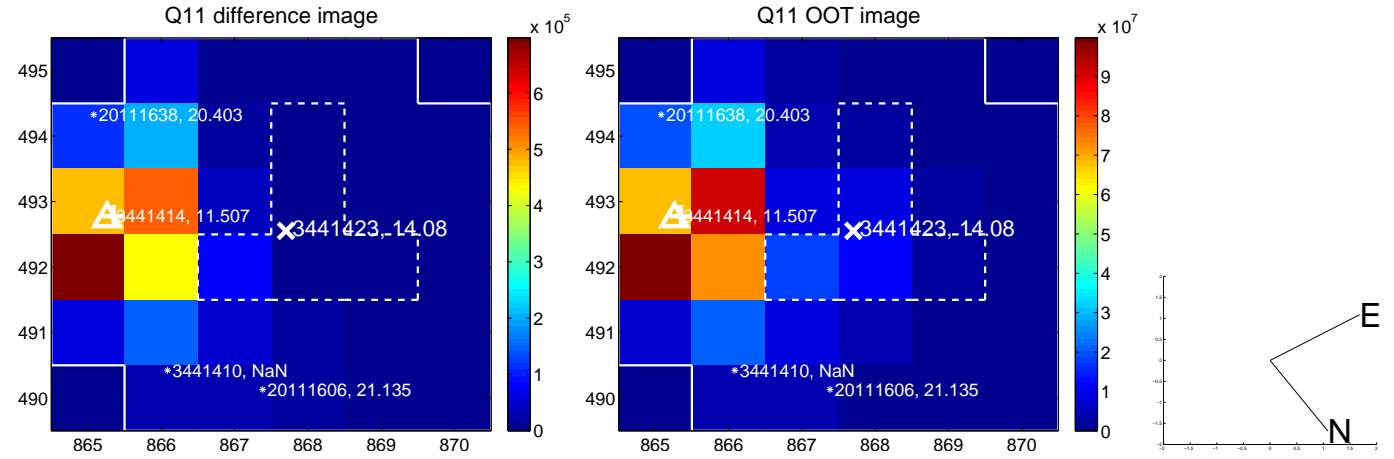
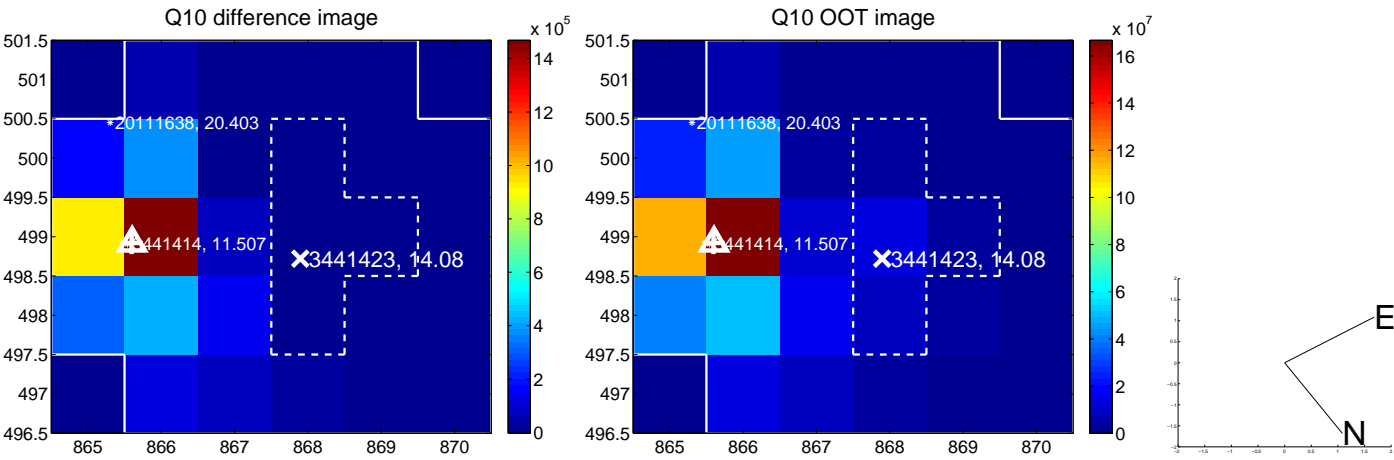
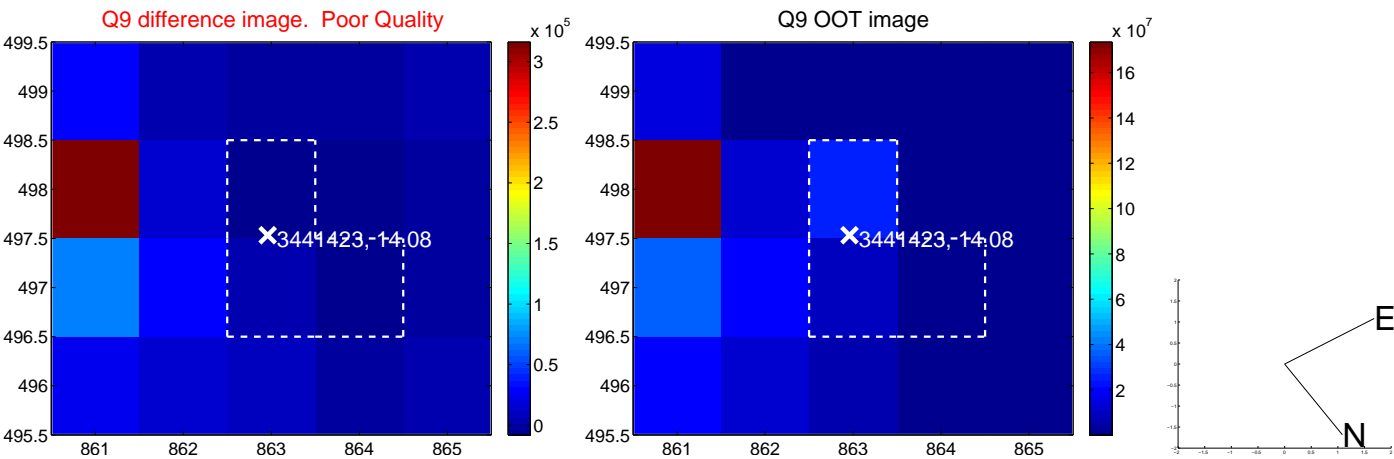
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

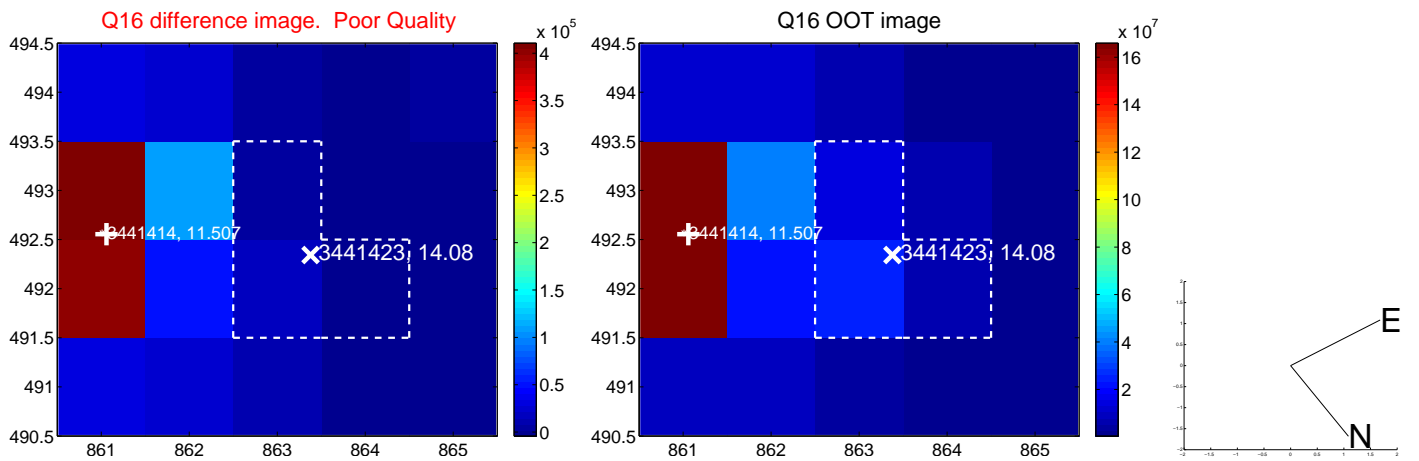
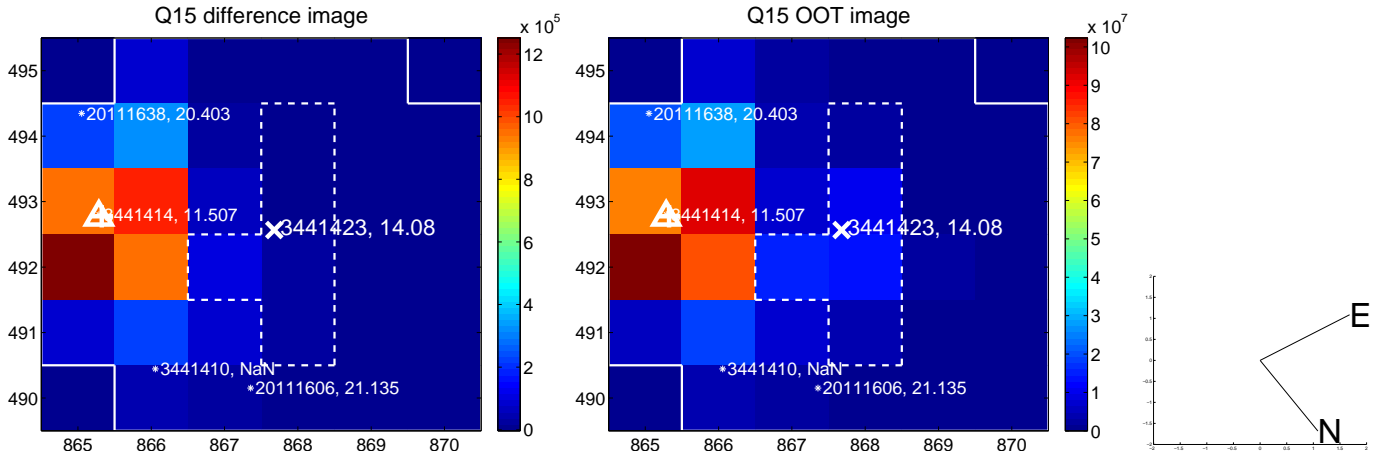
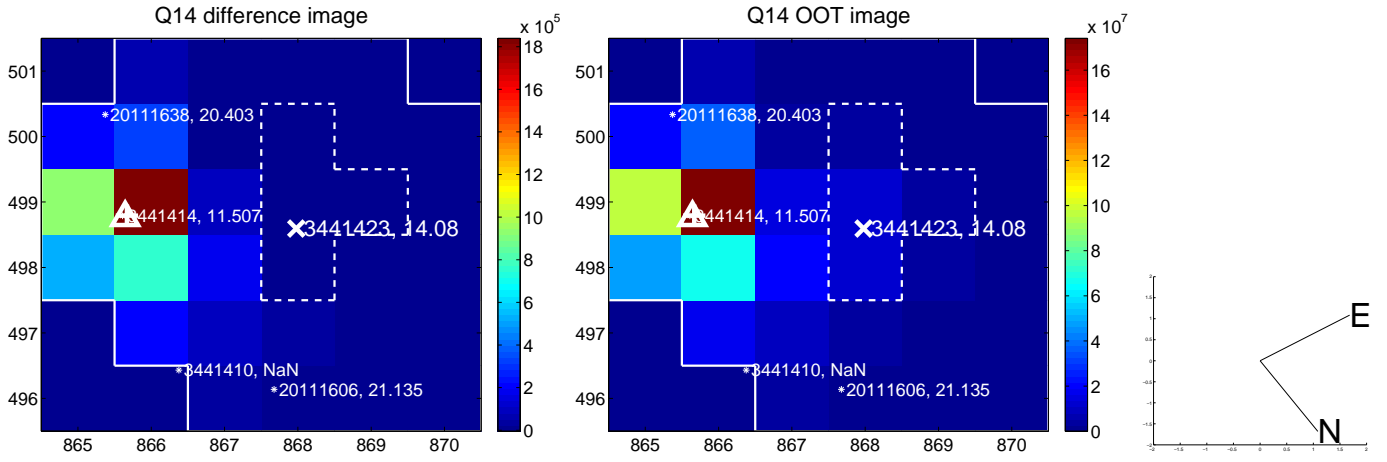
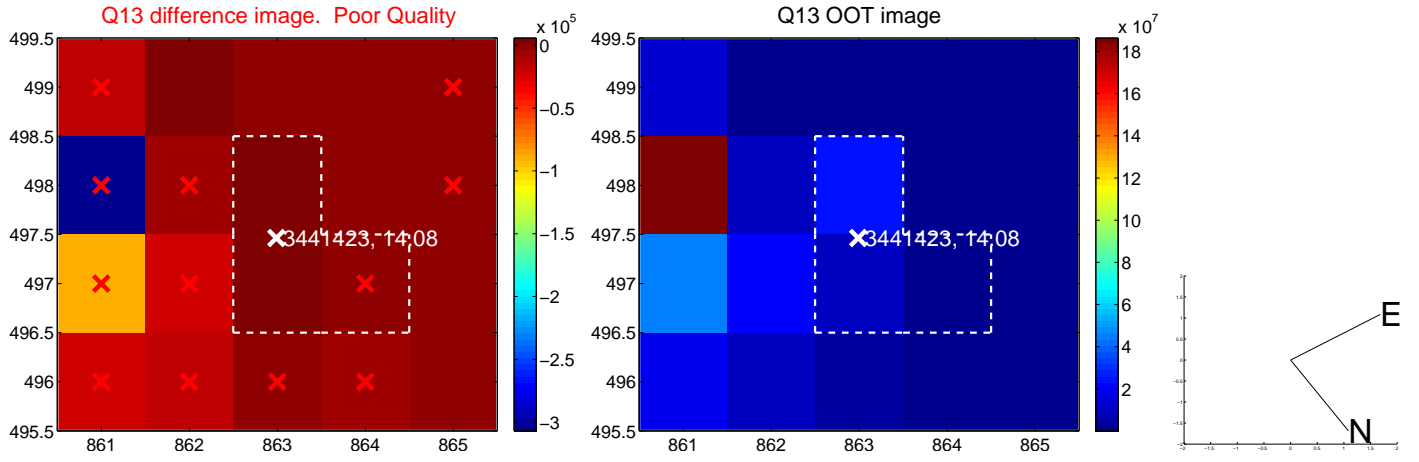




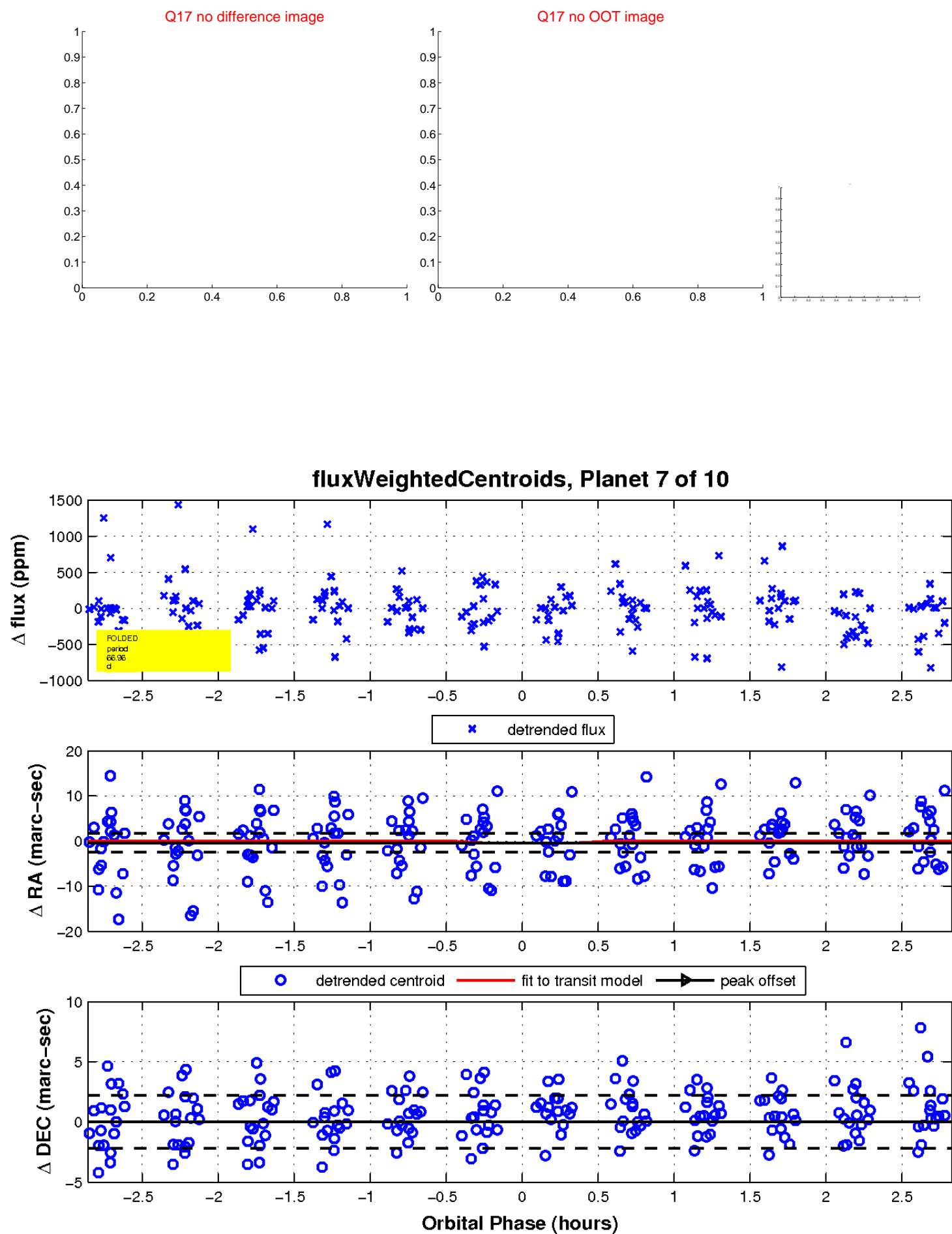
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



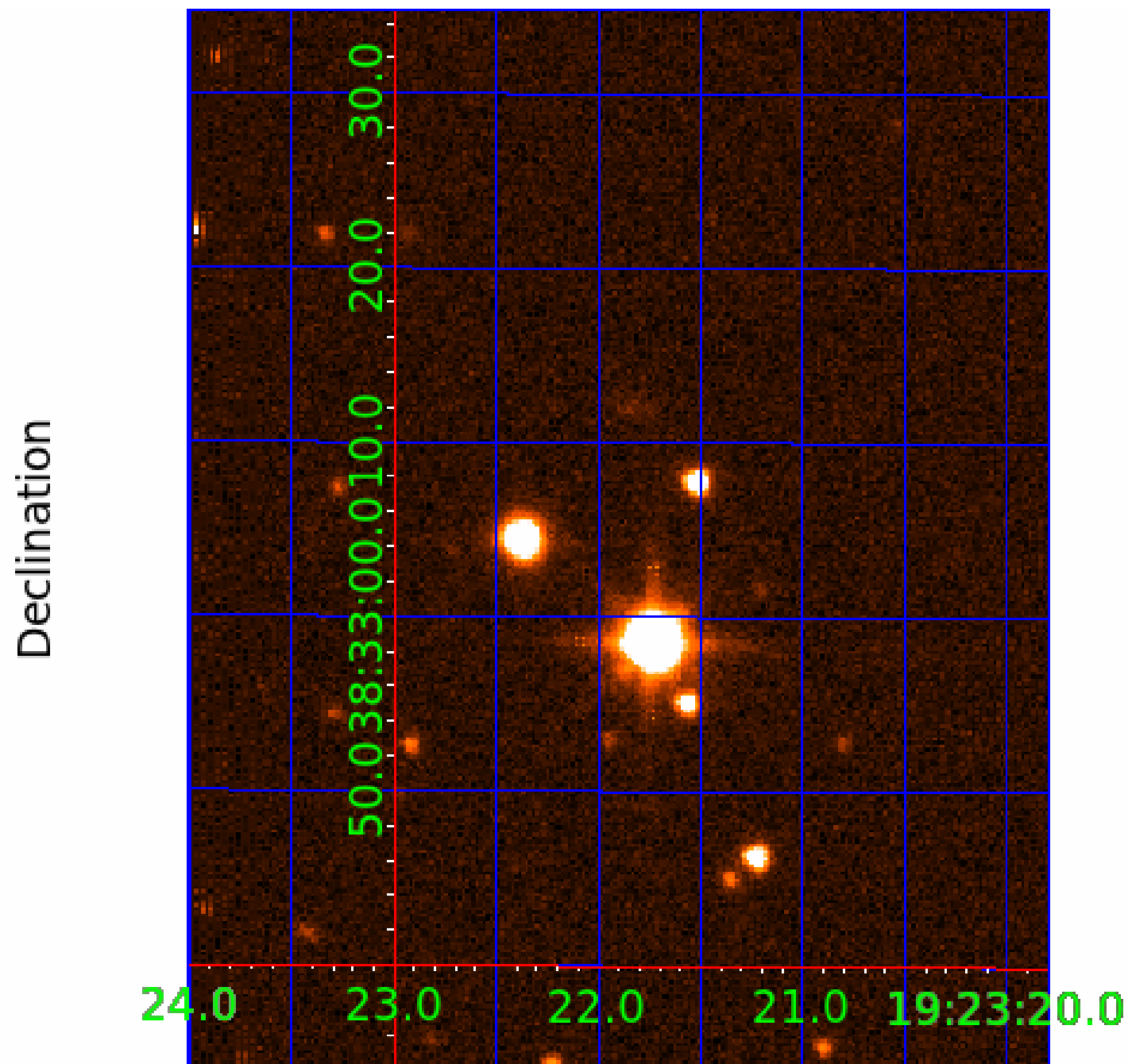
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image





## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003441423-01	OBS	No	1.805107	132.300794	107.0	11.412	10.9	7.7	0.84	5508	0.88	712.94
003441423-02	OBS	No	85.856457	168.046199	4465.8	10.500	62.4	-1.0	0.84	5508	5.51	4.14
003441423-03	OBS	No	64.780176	148.035133	1187.9	5.446	19.7	6.4	0.84	5508	3.09	6.02
003441423-04	OBS	No	59.862756	155.930613	2330.1	19.940	15.5	7.0	0.84	5508	7.79	6.69
003441423-05	OBS	No	231.147707	136.281517	15336.4	74.391	15.3	9.6	0.84	5508	12.94	1.10
003441423-06	OBS	No	77.133913	201.287993	1339.7	10.736	14.3	6.9	0.84	5508	4.00	4.77
003441423-07	OBS	No	66.961236	148.930850	971.1	0.969	13.8	4.0	0.84	5508	2.97	5.76
003441423-08	OBS	No	42.934940	141.414459	485.7	7.500	9.0	-1.0	0.84	5508	1.82	10.42
003441423-09	OBS	No	62.622117	157.133901	1581.0	10.114	8.5	7.6	0.84	5508	4.34	6.30
003441423-10	OBS	No	55.642936	159.899113	432.0	1.032	9.4	2.2	0.84	5508	1.98	7.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003441423-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
003441423-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

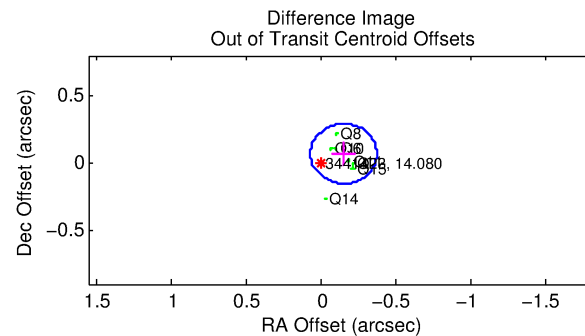
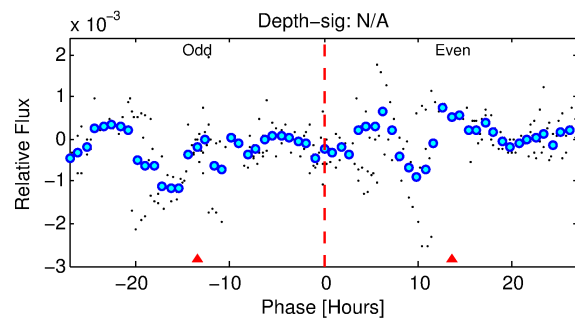
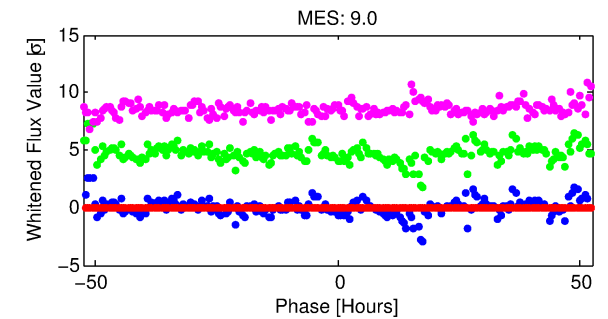
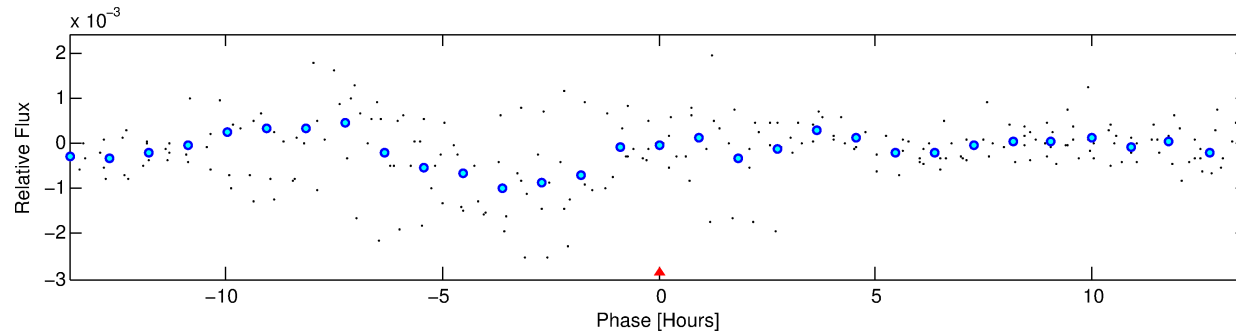
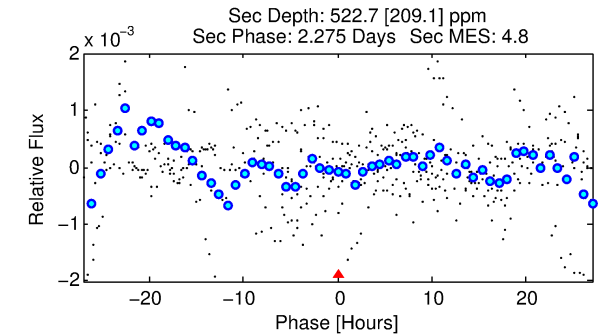
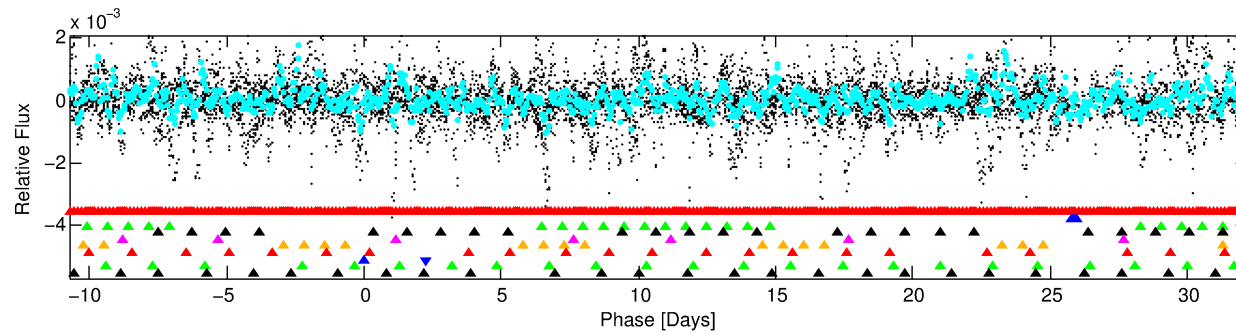
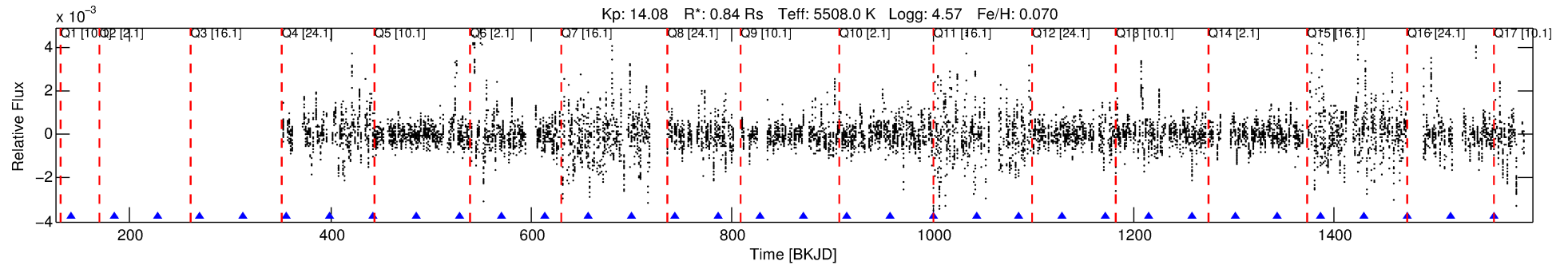
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003441423-08

No Significant Match Found

# DV One-Page Summary

KIC: 3441423 Candidate: 8 of 10 Period: 42.935 d



## TPS TCE Results:

Period = 42.93494 d  
Epoch = 141.4145 BKJD

DV fit results are unavailable

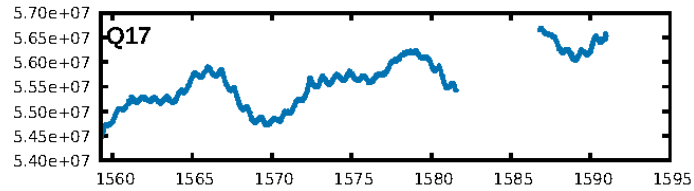
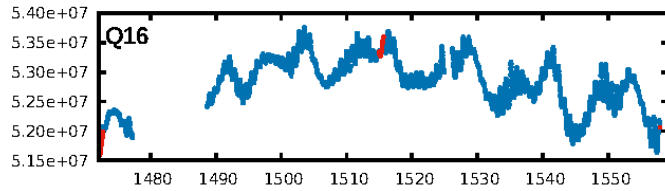
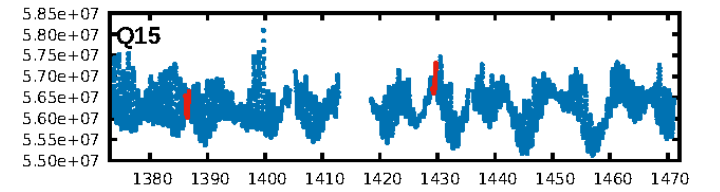
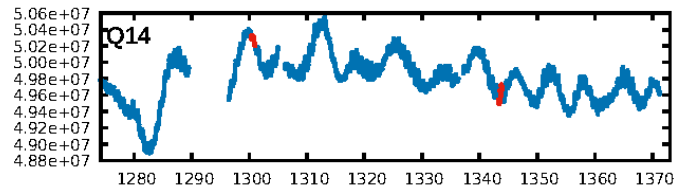
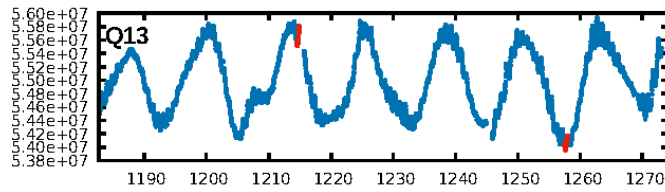
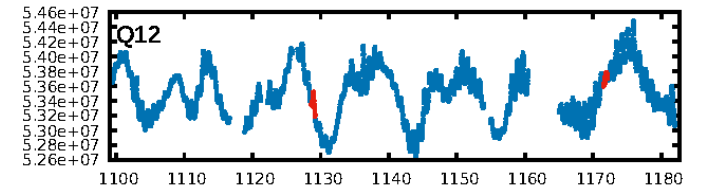
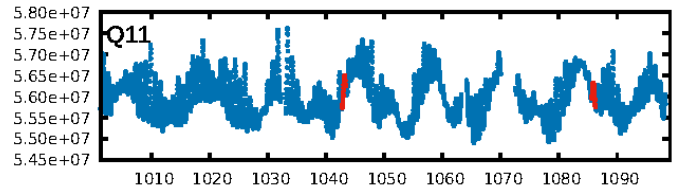
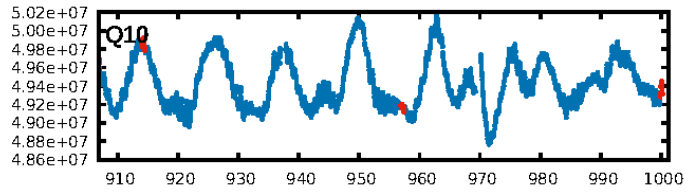
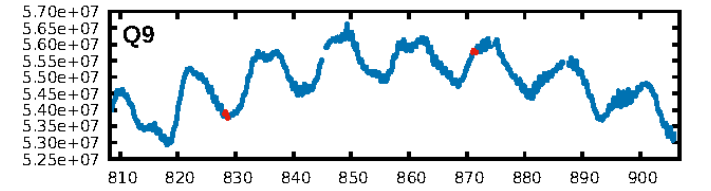
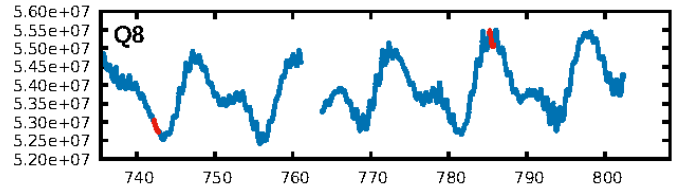
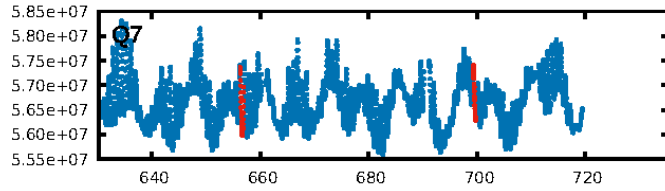
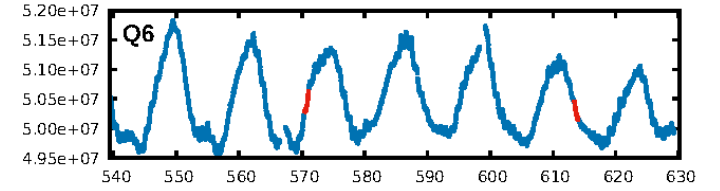
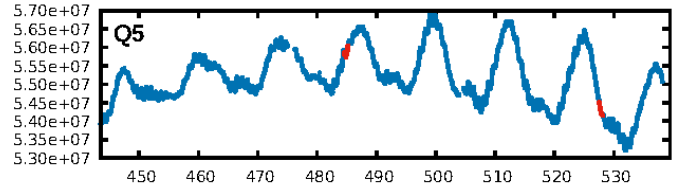
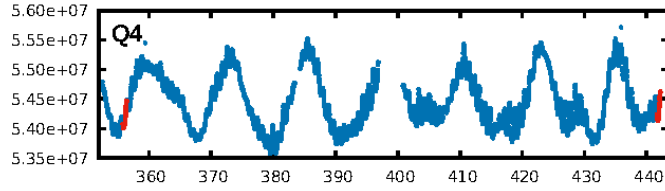
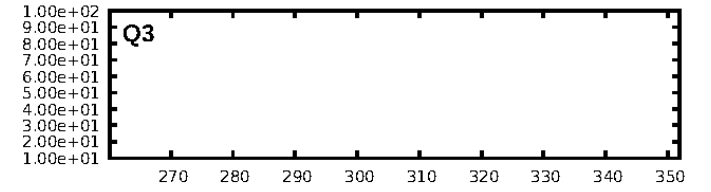
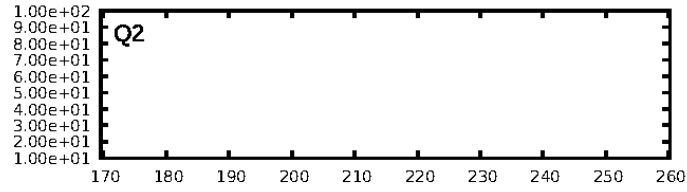
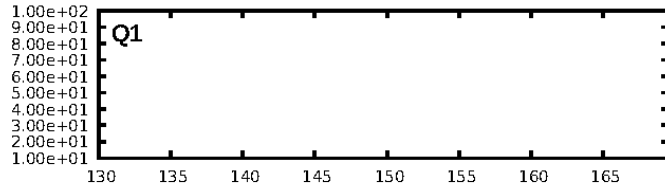
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [72.28σ]  
LongPeriod-sig: 100.0% [40.29σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.44e-08  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: -1.944  
Centroid-sig: 0.1%  
Centroid-so: 2.779 arcsec [6.00σ]  
OotOffset-rm: 0.170 arcsec [2.30σ]  
KicOffset-rm: 9.369 arcsec [95.09σ]  
OotOffset-st: 3/3/1/0 [7]  
KicOffset-st: 3/3/1/0 [7]  
DiffImageQuality-fgm: 0.57 [4/7]  
DiffImageOverlap-fno: 0.38 [5/13]

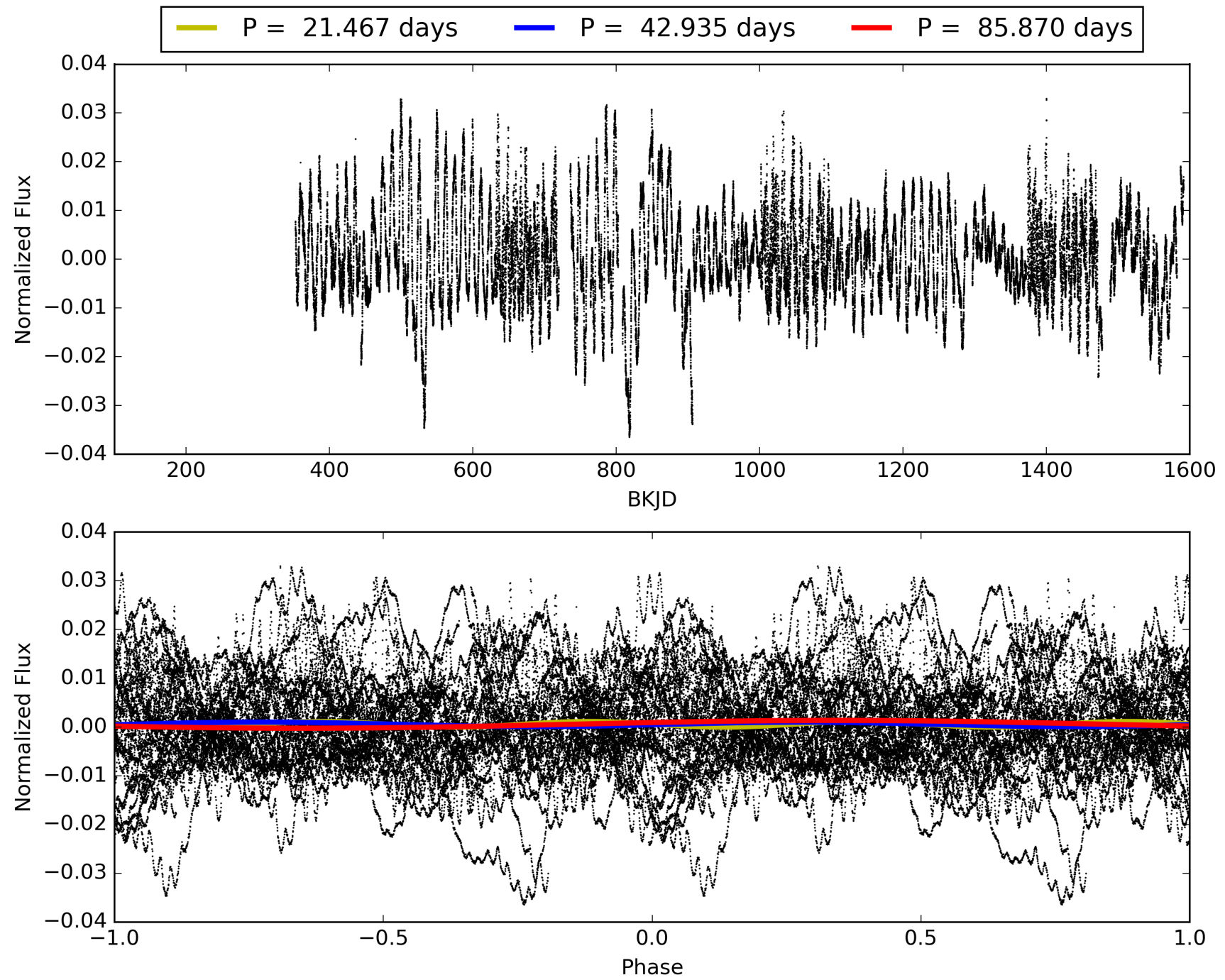
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:20:39 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003441423-08, PDC Light Curves

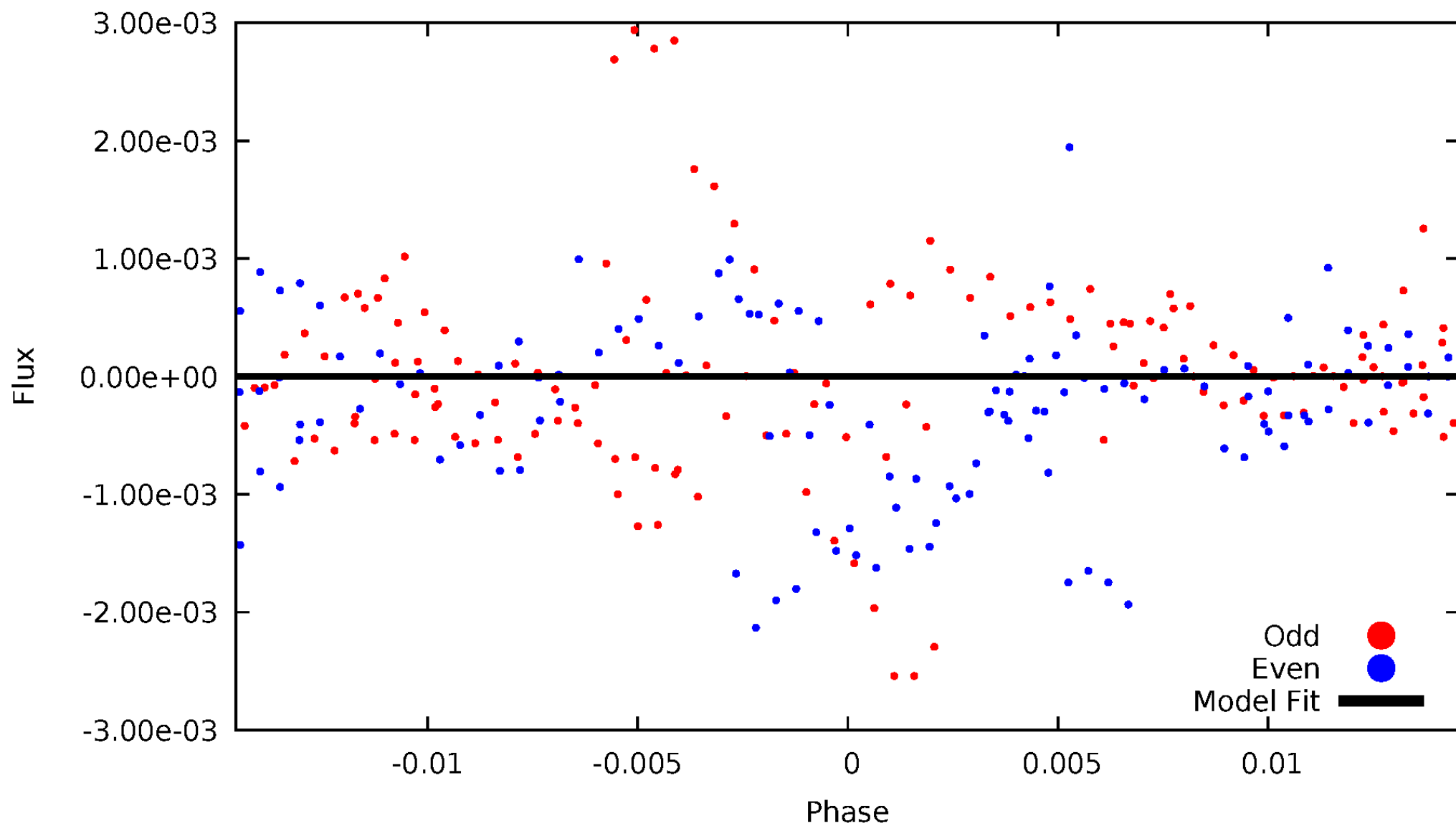


TCE 003441423-08



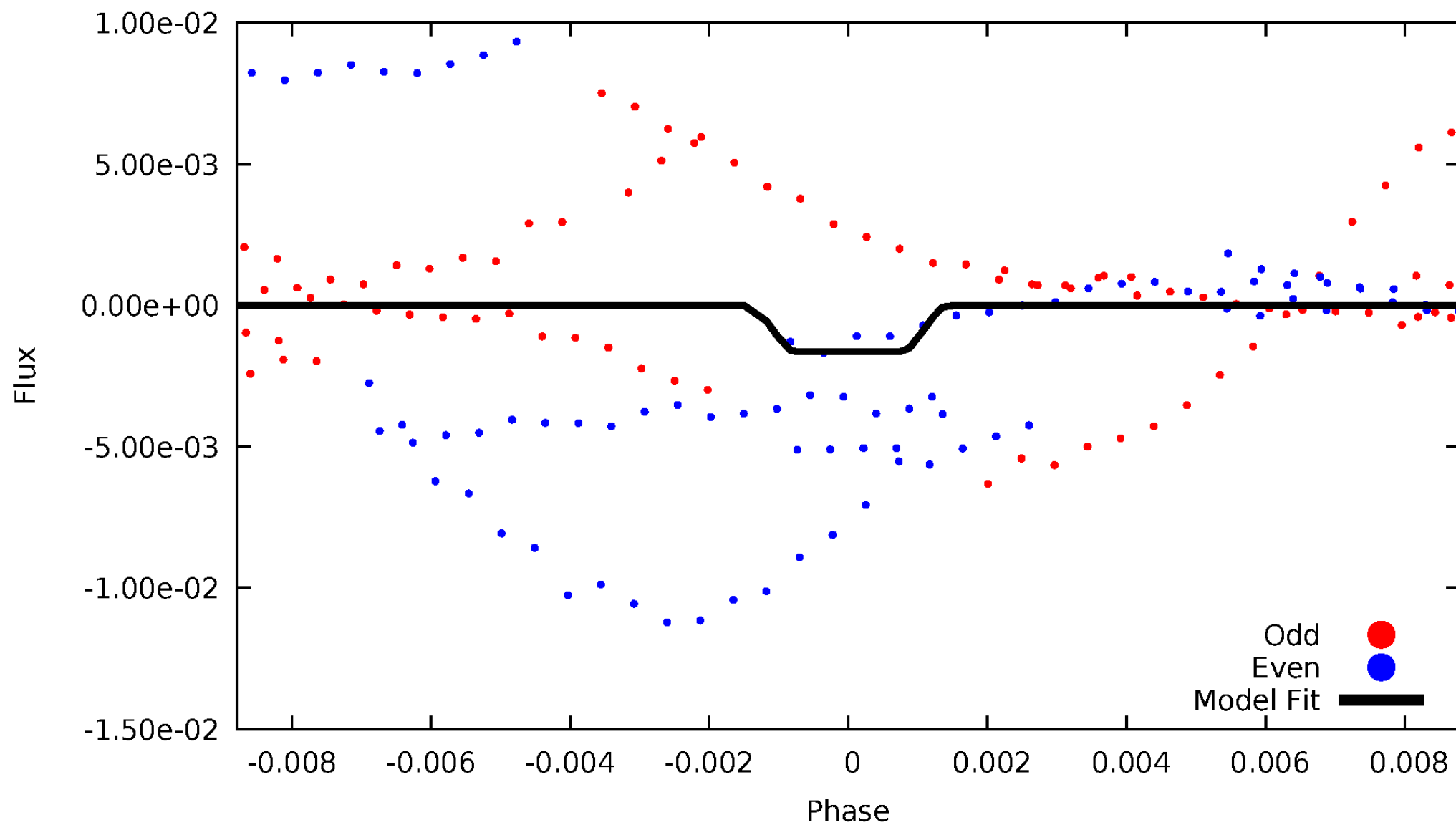
# DV Odd/Even

TCE 003441423-08



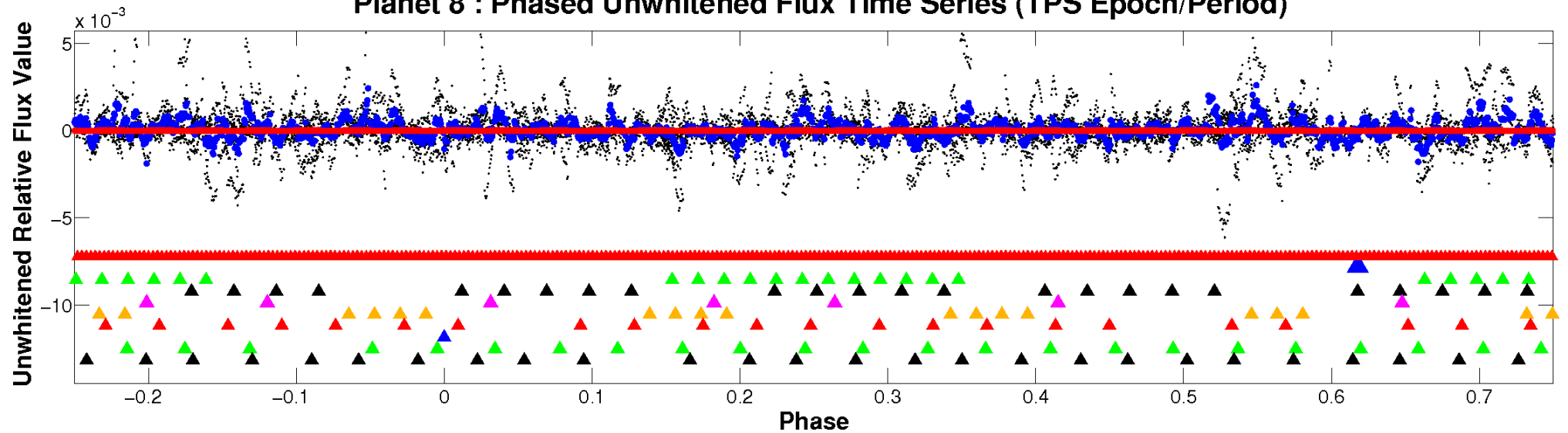
# ALT Odd/Even

TCE 003441423-08

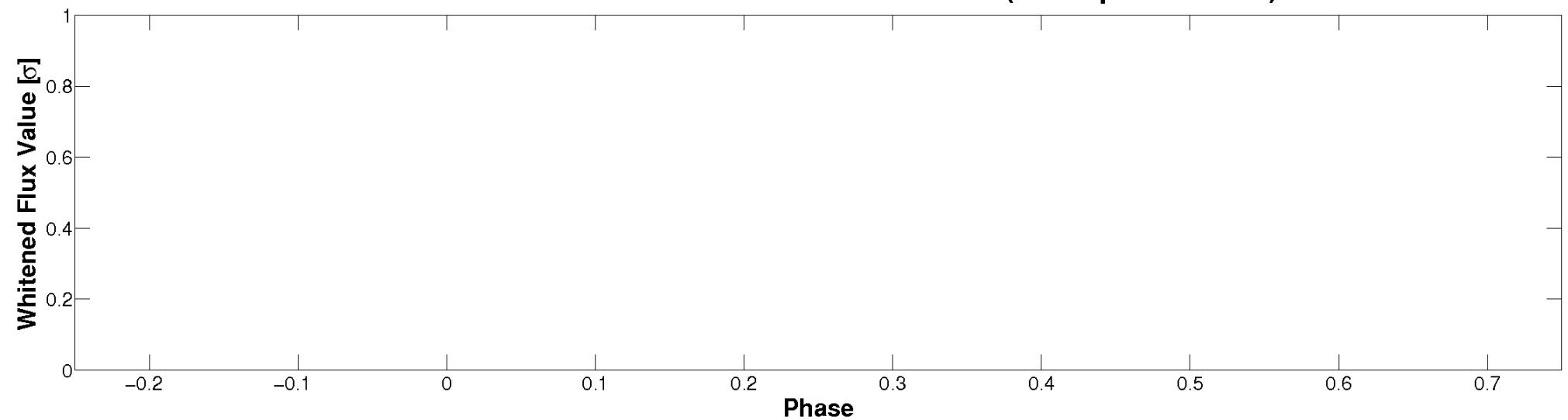


# Non-Whitened Vs. Whitened Light Curve

**Planet 8 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**



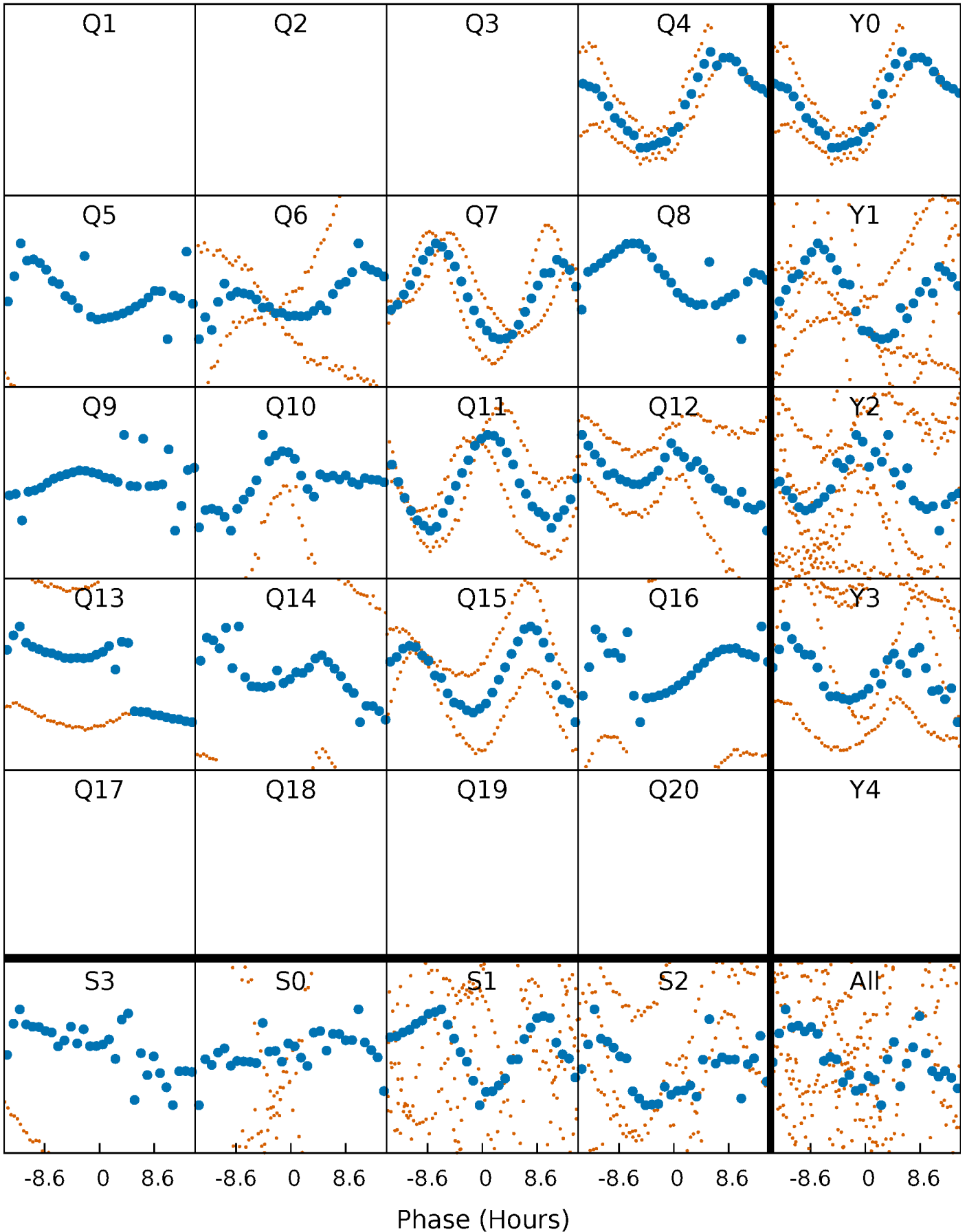
**Planet 8 : Phased Whitened Flux Time Series (TPS Epoch/Period)**





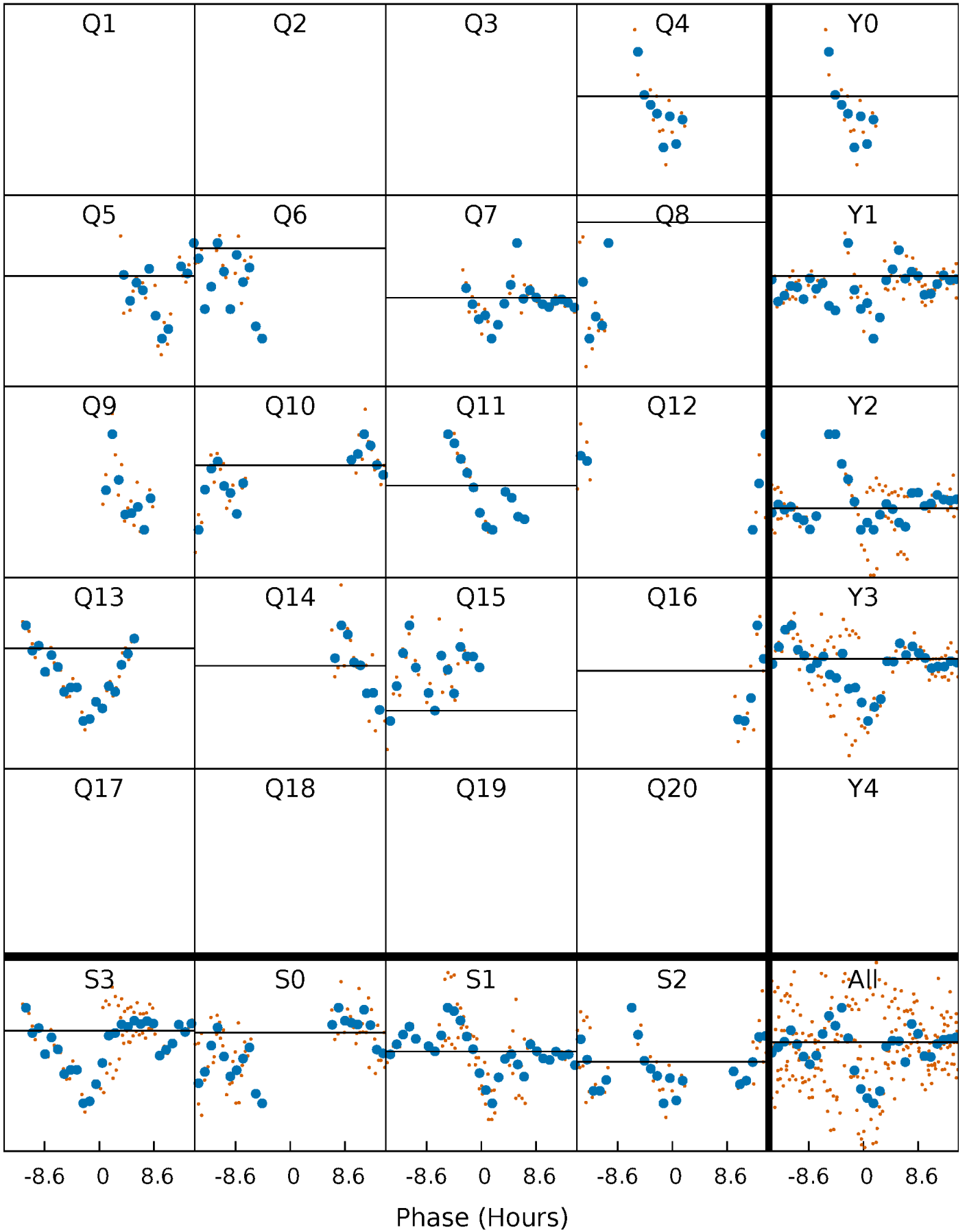
# PDC Quarter-Phased Transit Curves

TCE 003441423-08   P= 42.934940 Days    $T_0=141.414459$  (BKJD)



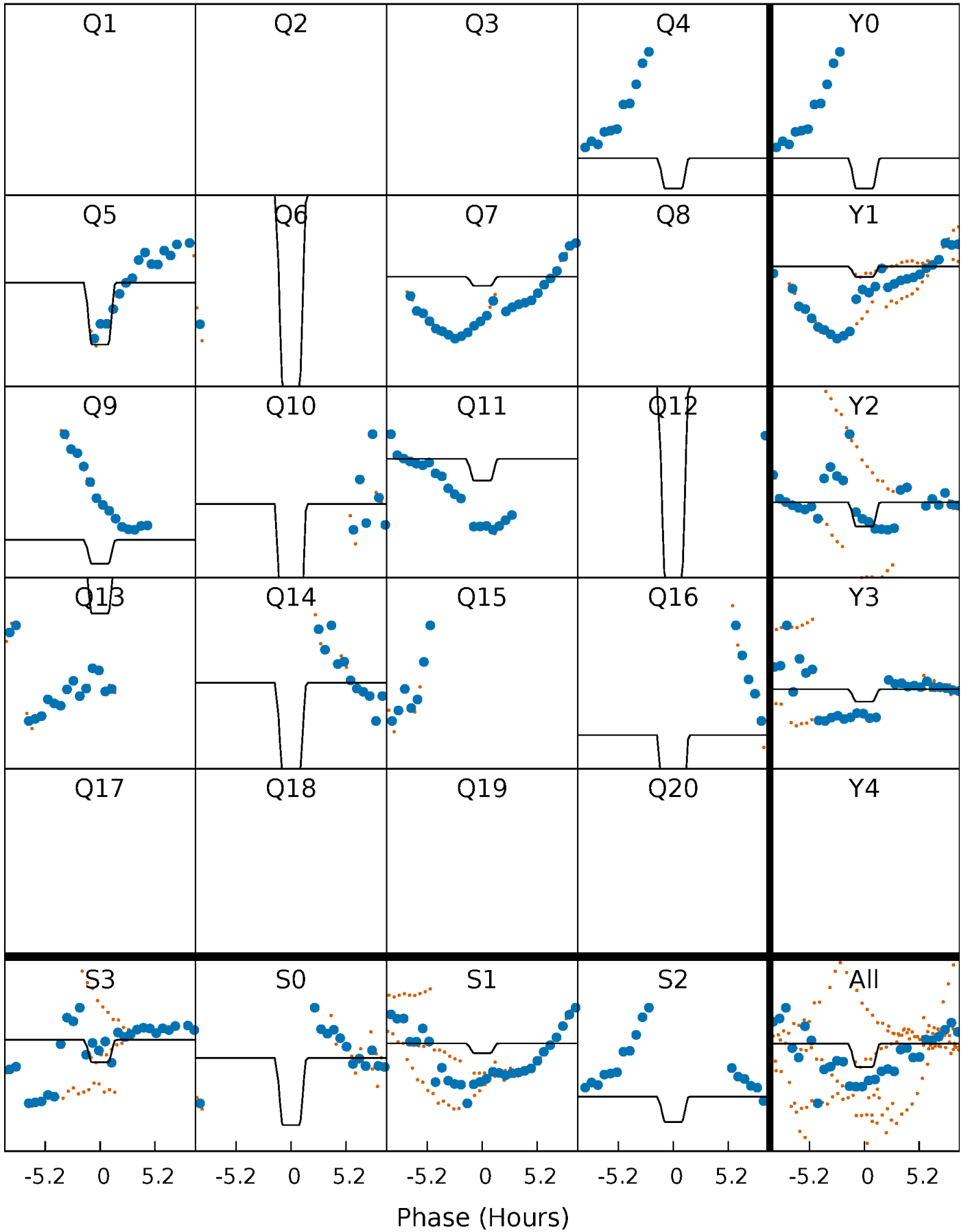
# DV Quarter-Phased Transit Curves

TCE 003441423-08     $P = 42.934940$  Days     $T_0 = 141.414459$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

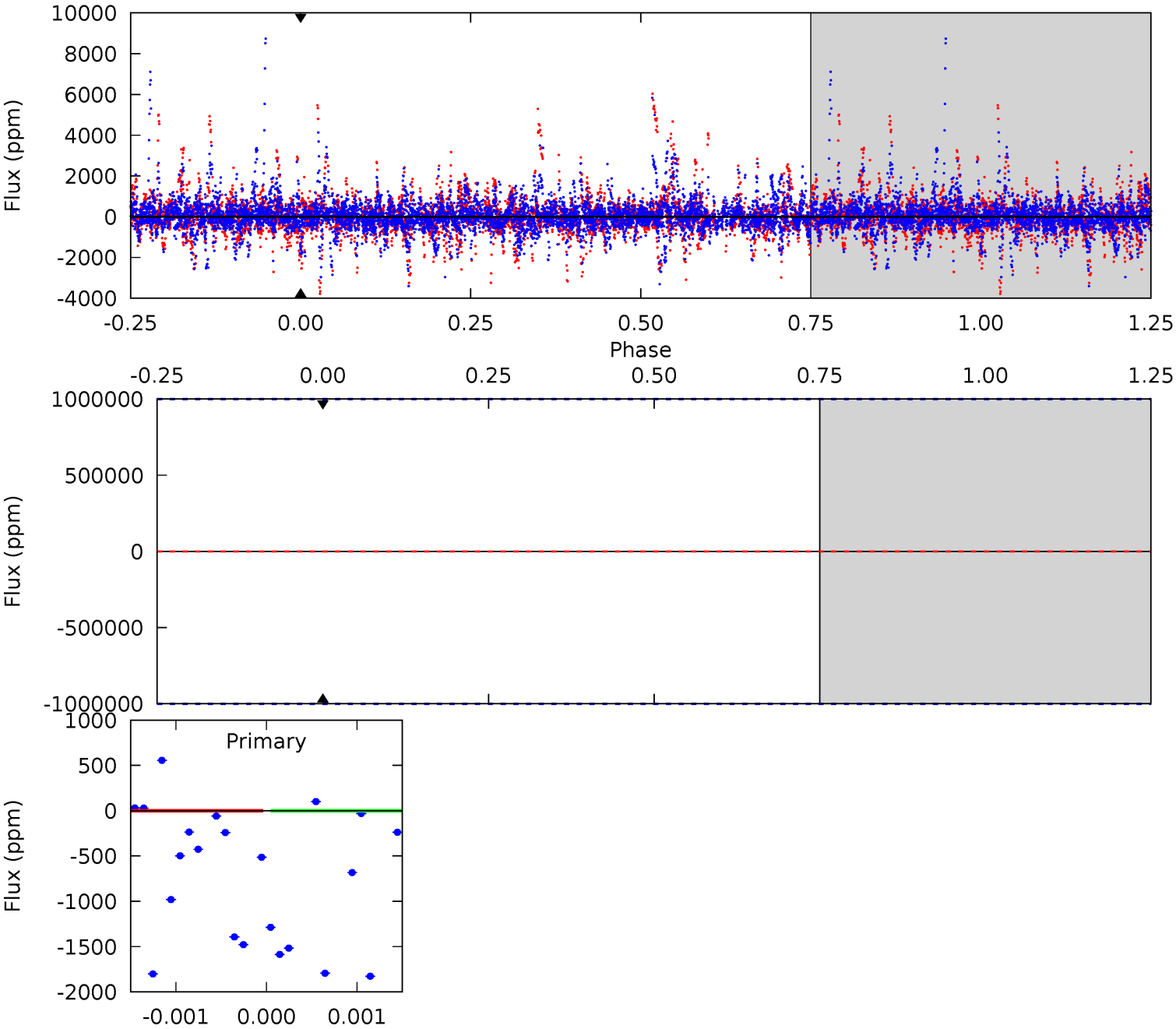
TCE 003441423-08 P= 42.934940 Days  $T_0=141.589616$  (BKJD)



# DV Model-Shift Uniqueness Test

003441423-08, P = 42.934940 Days, E = 141.414459 Days

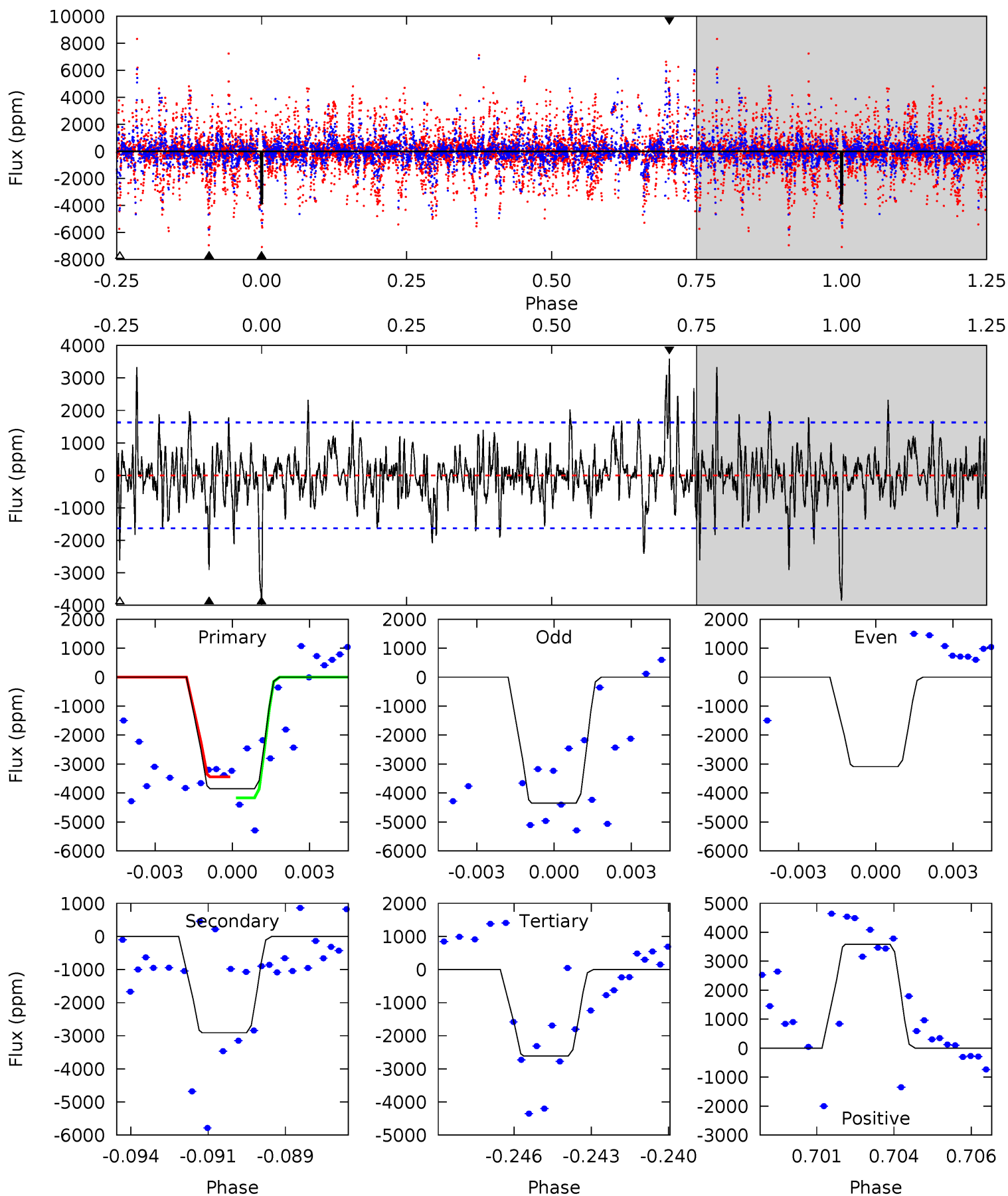
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

003441423-08, P = 42.934940 Days, E = 141.589616 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	9.43	8.48	11.6	5.28	3.02	2.12	4.03	0.86	0.95	-2.22	1.20	0.82	0.48	1.13



### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$7.20^{+7.46}_{-5.09}$	$649^{+20}_{-13}$	$-4827^{+22494}_{-13097}$	$-1819.862^{+100353.789}_{-101174.416}$
Alt.	$-2907 \pm 308$	$7.73^{+7.76}_{-5.06}$	$649^{+17}_{-14}$	$4605^{+3114}_{-1023}$	$1467^{+11214}_{-1103}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

## DV Centroid Data

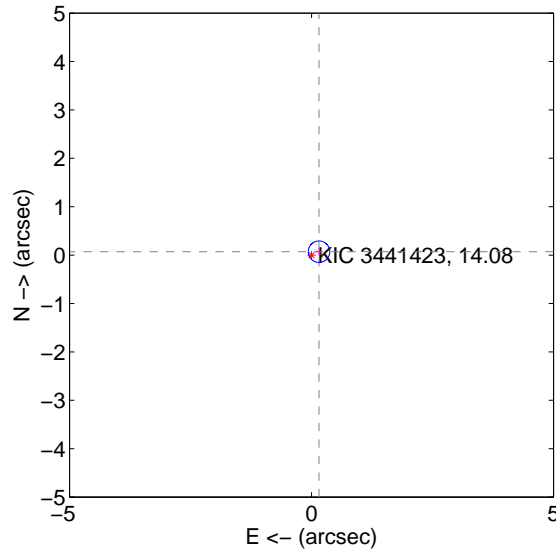
Supplemental centroid analysis for 003441423-08. Kepler magnitude: 14.08. Transit SNR -1.00

There are 4 quarters with good PRF difference image offsets

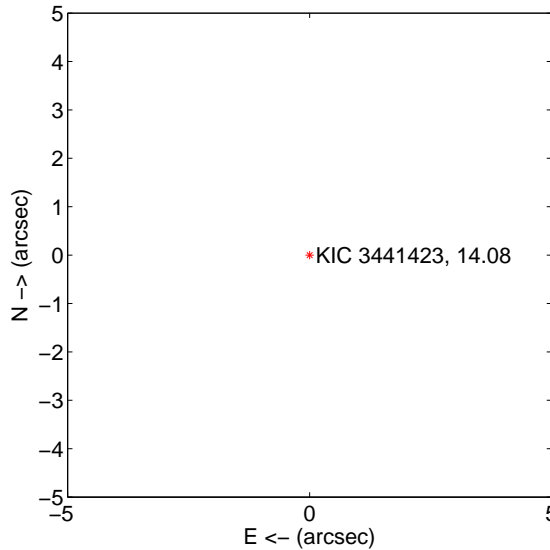
The OOT PRF centroid is offset from the target star catalog position by about 9.38 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.170 \pm 0.074$	2.30	$-0.156 \pm 0.073$	$0.070 \pm 0.078$
PRF-fit source offset from KIC position	$9.369 \pm 0.099$	95.09	$-7.411 \pm 0.093$	$-5.731 \pm 0.107$
photometric centroid source offset	$2.78 \pm 0.46$	6.00	$-2.28 \pm 0.54$	$-1.58 \pm 0.22$

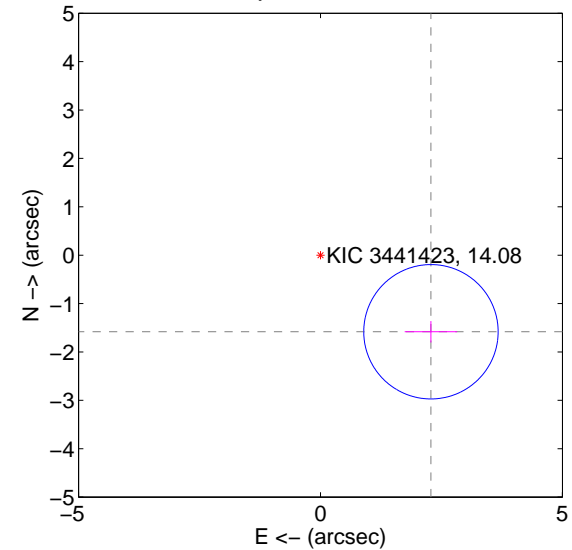
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

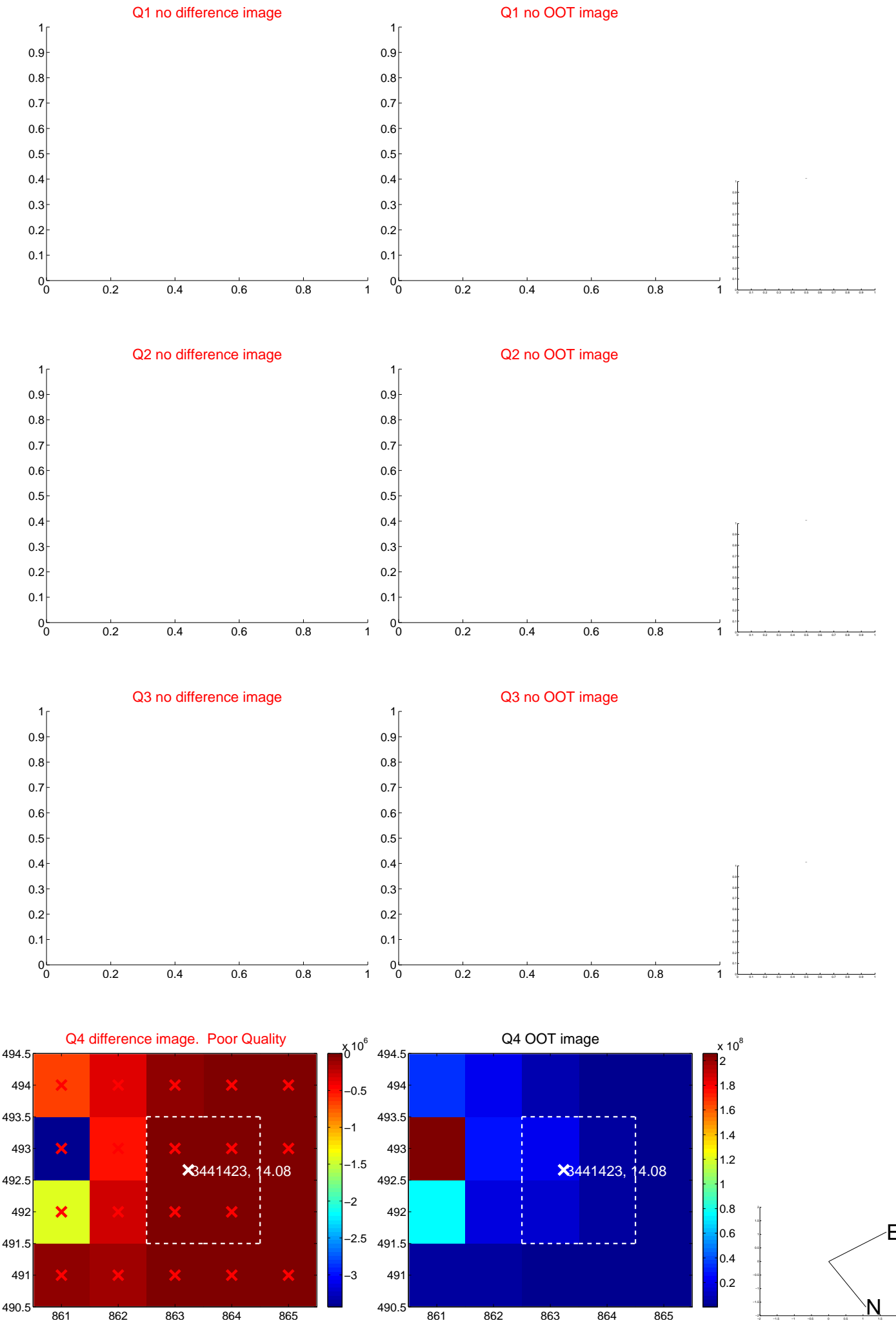


offset from photometric centroids



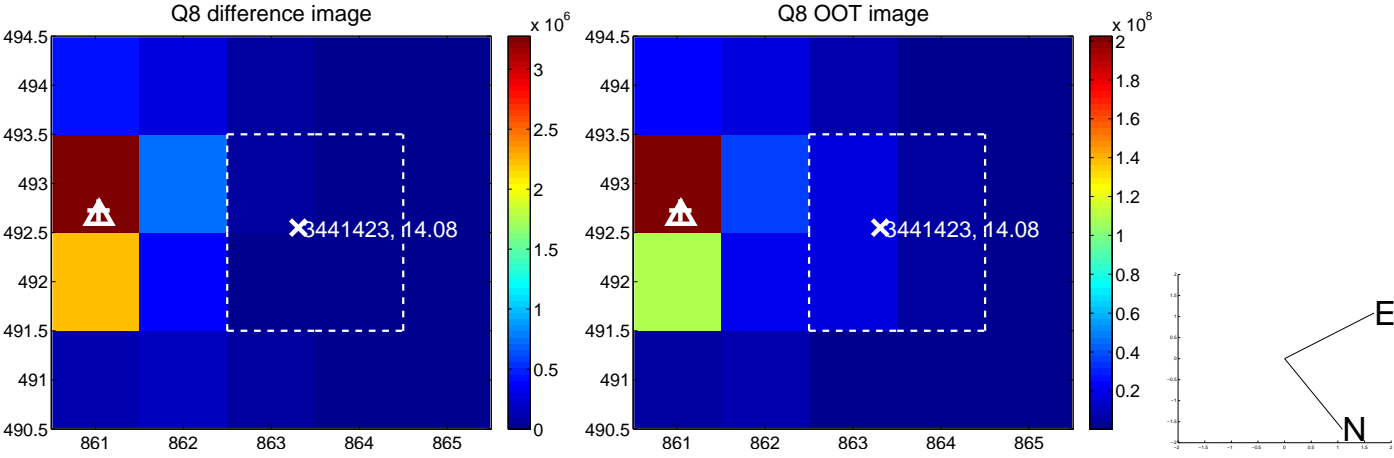
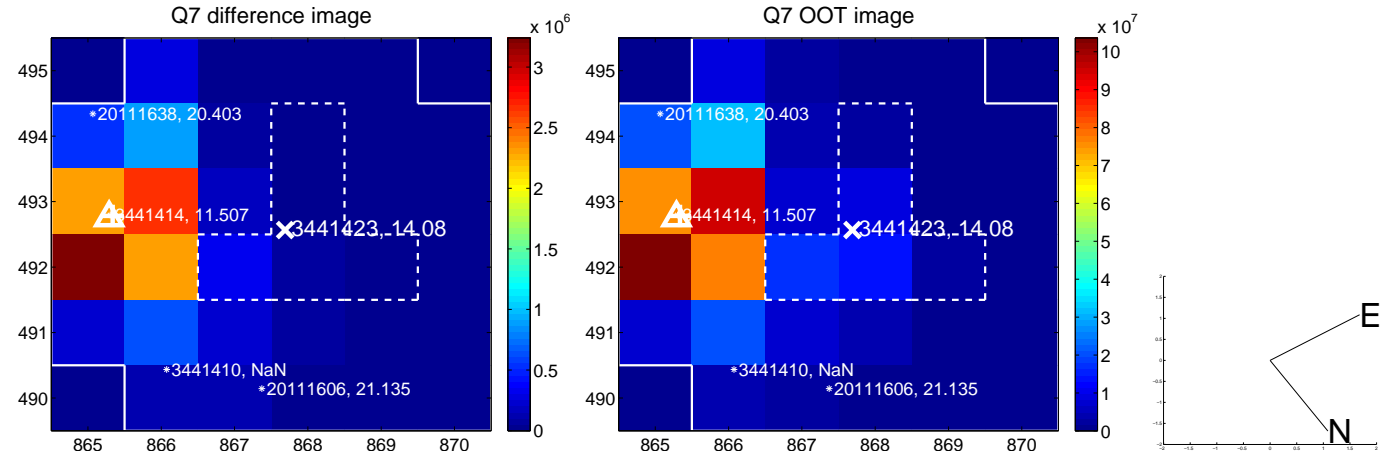
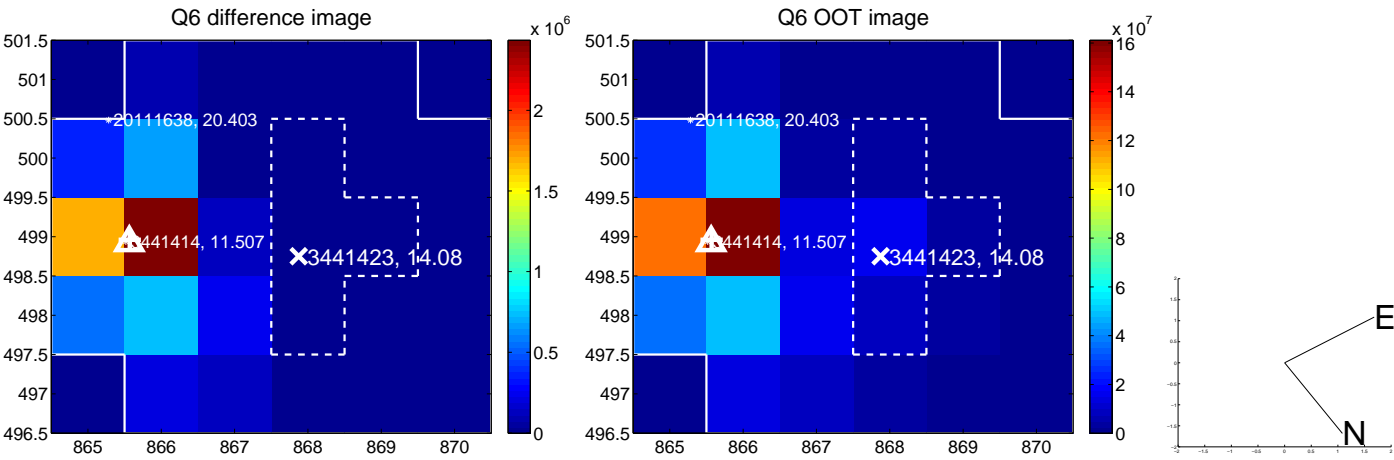
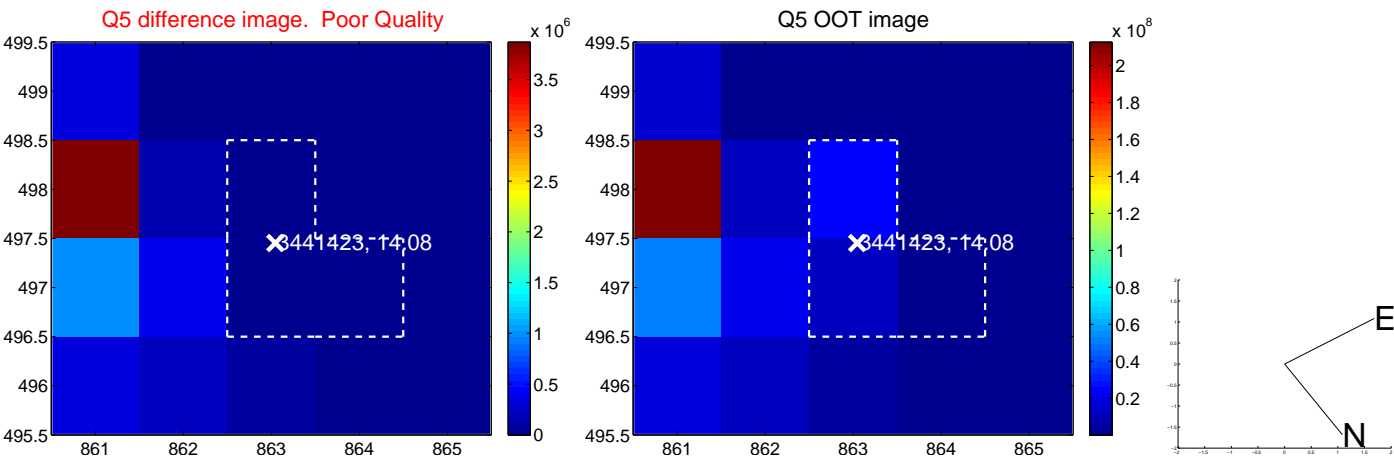
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

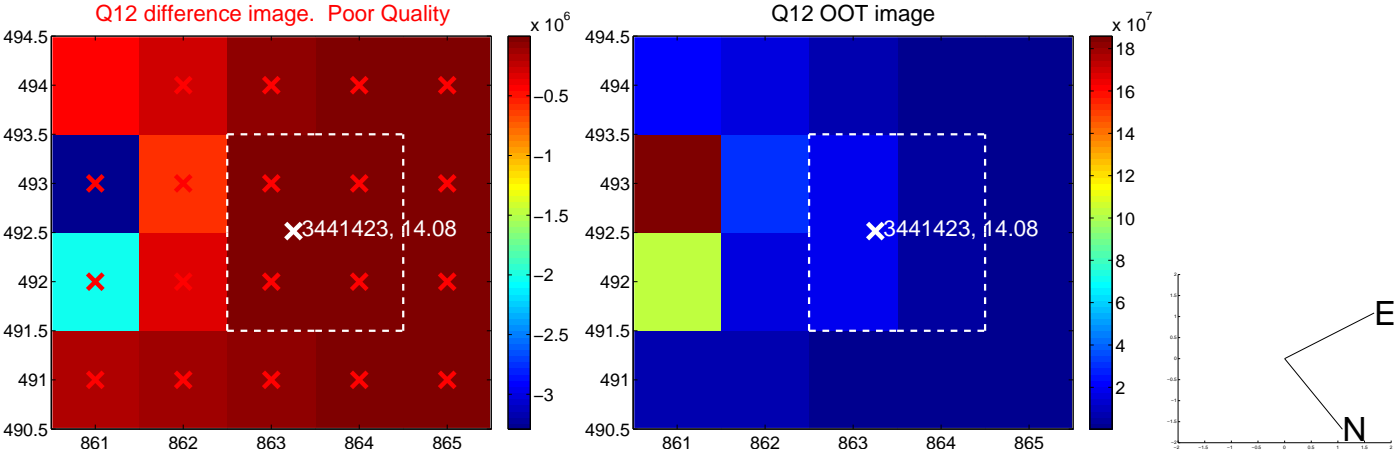
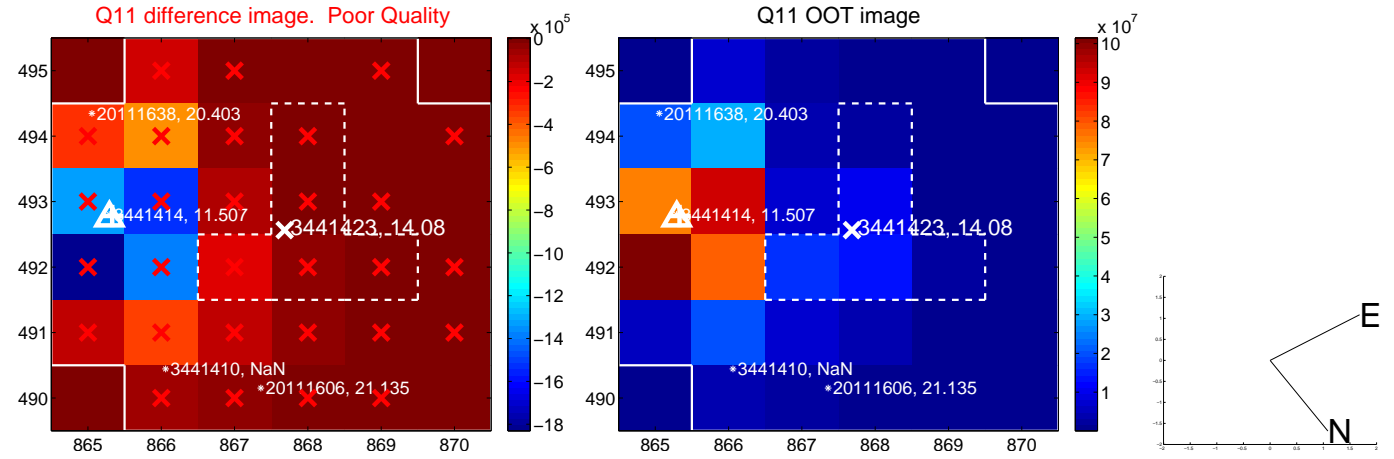
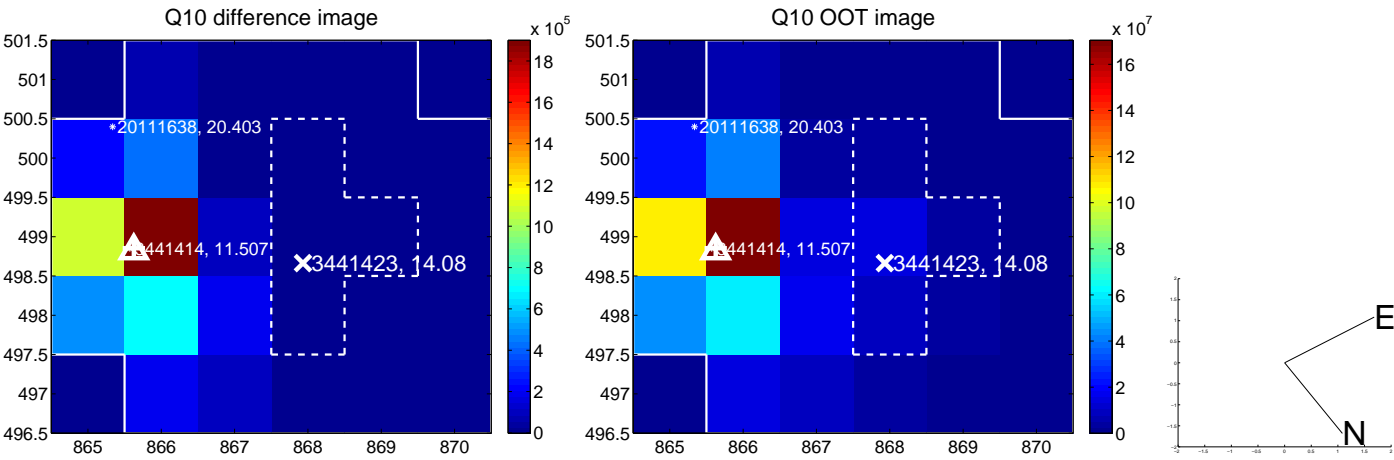
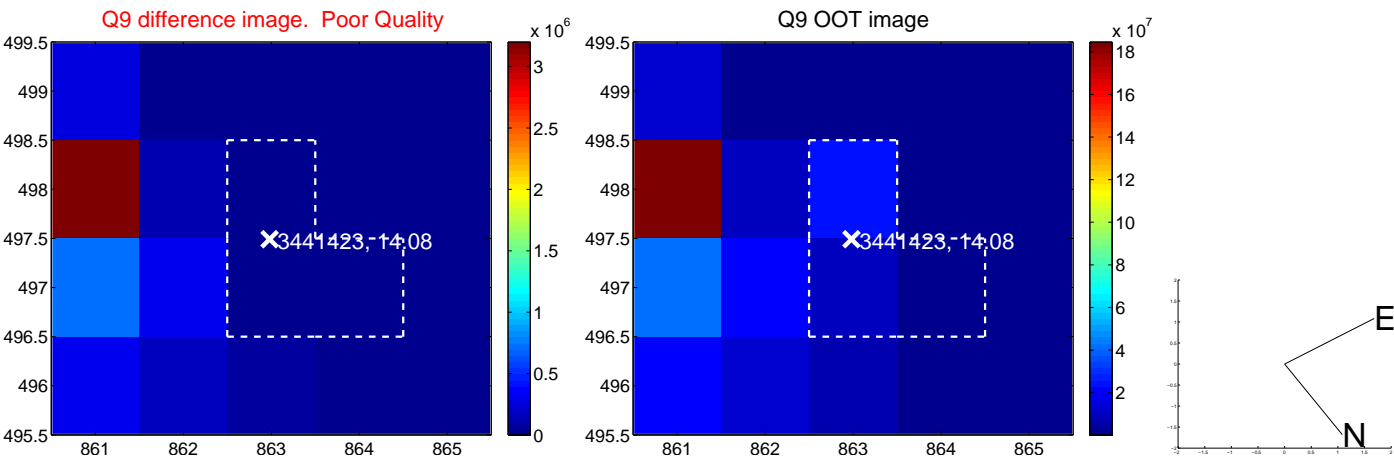




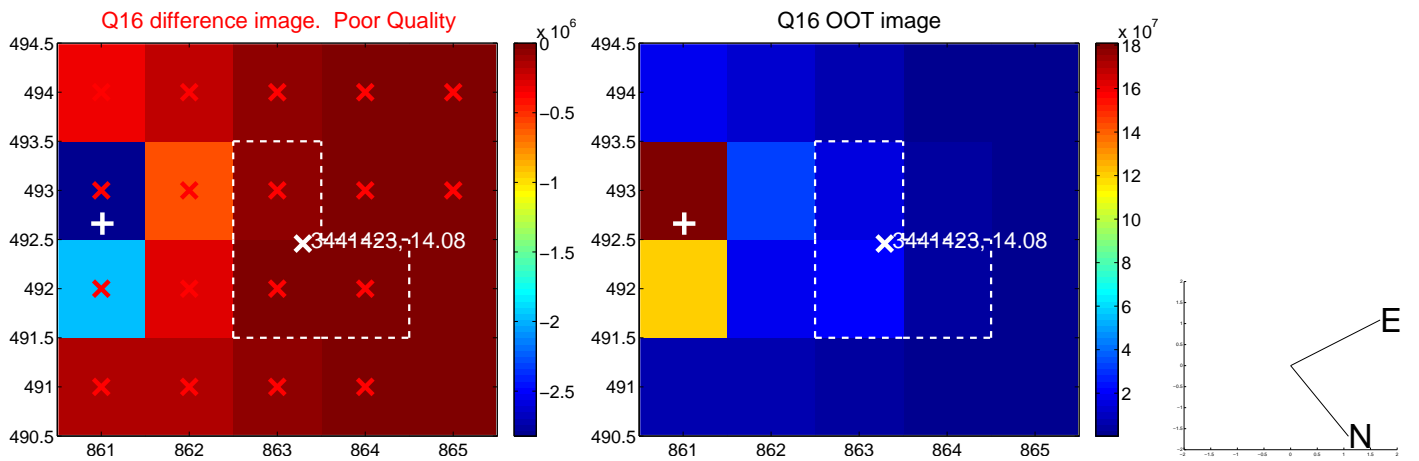
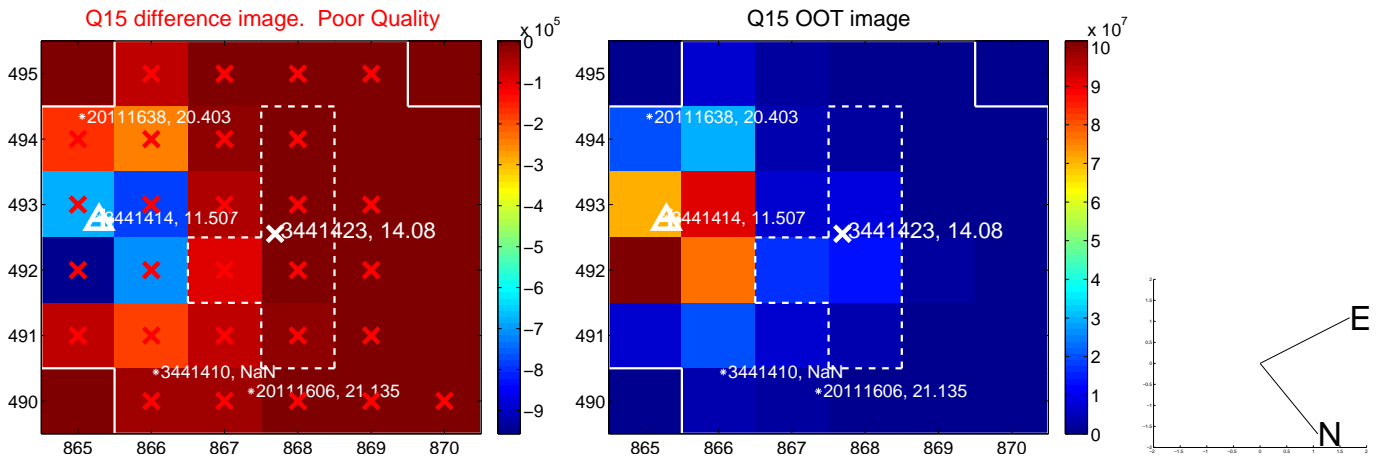
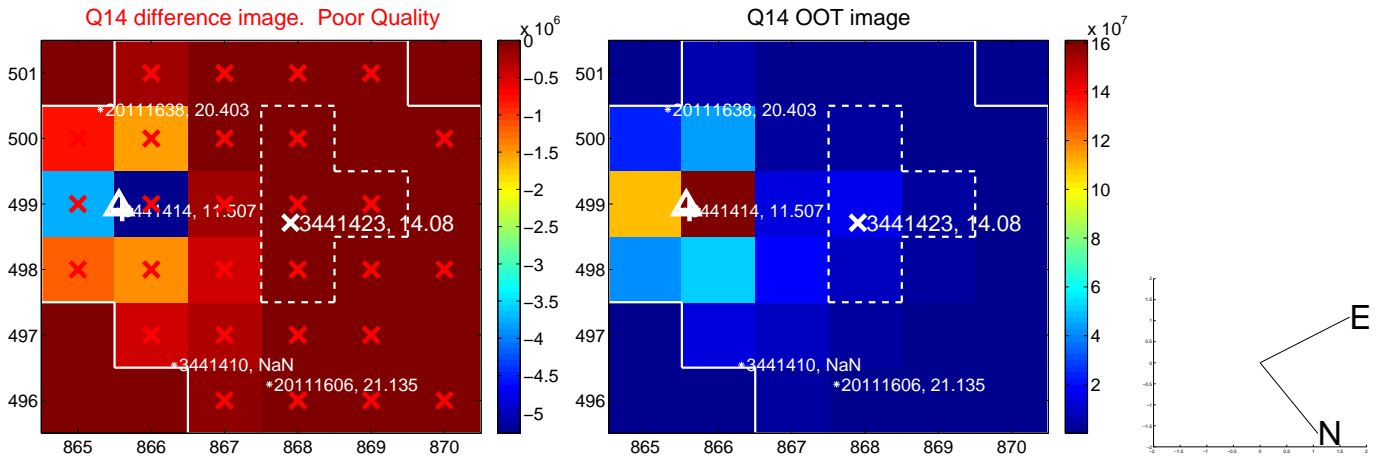
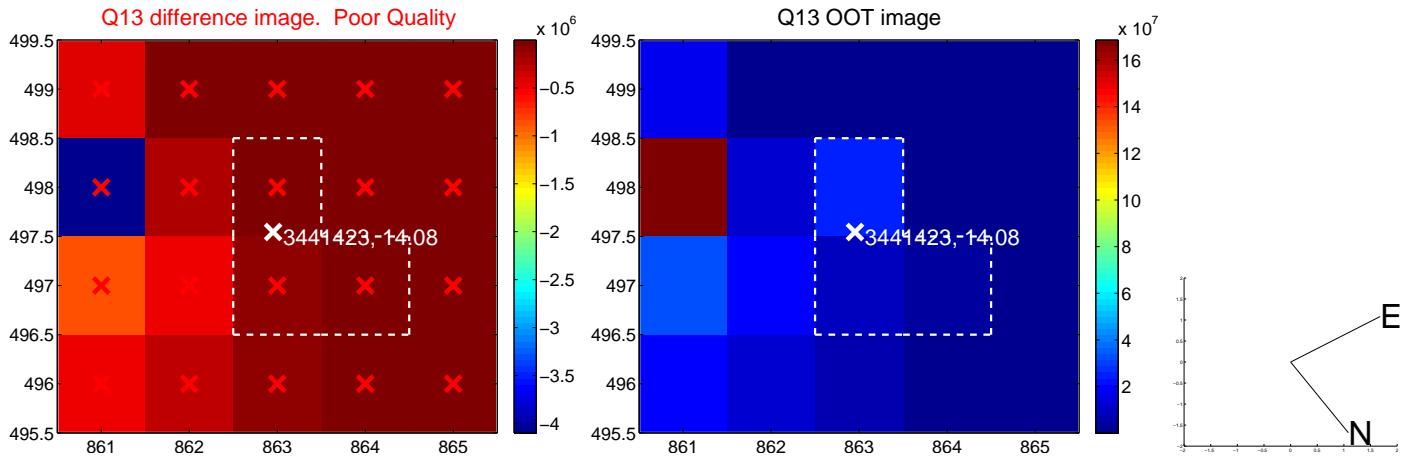
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



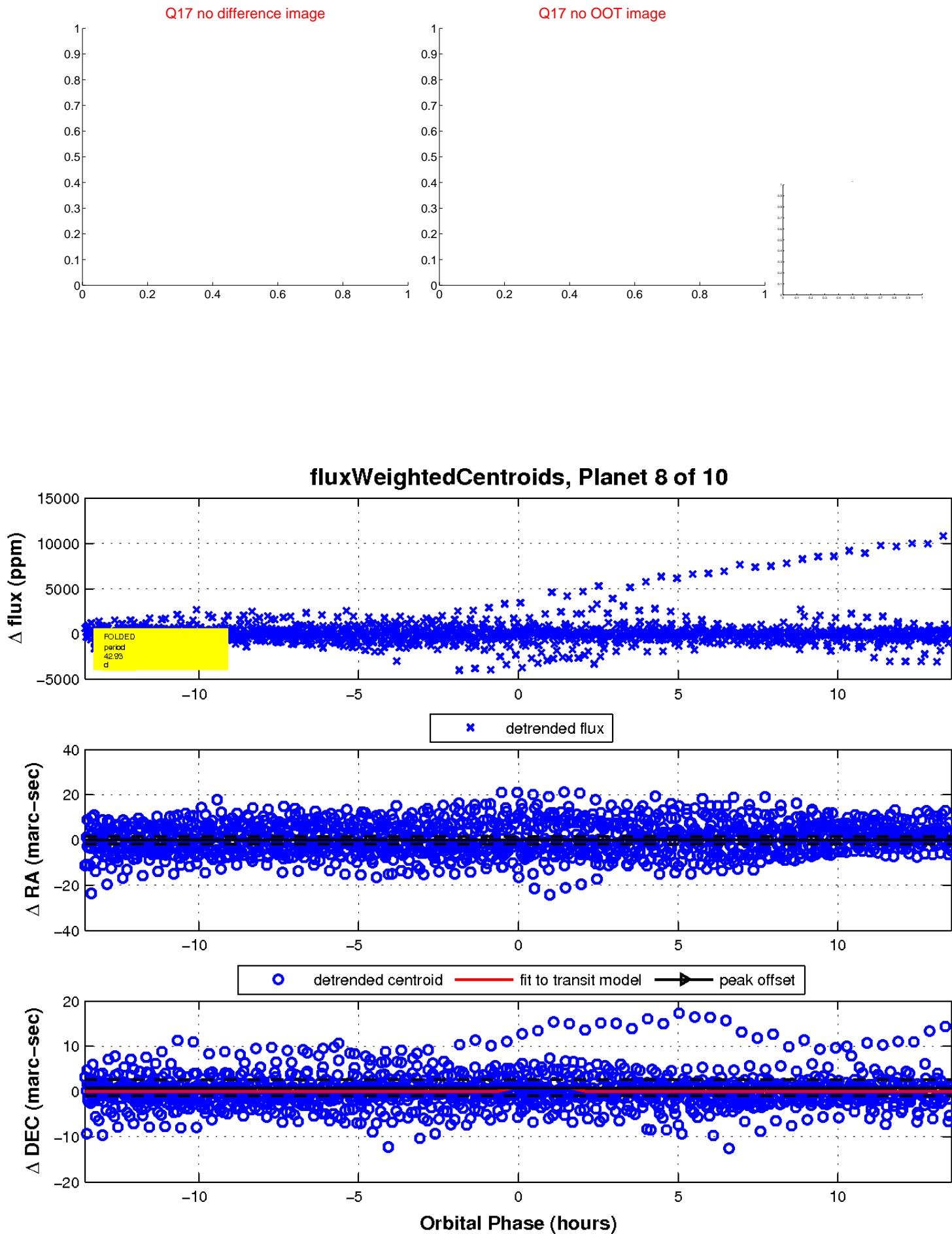
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



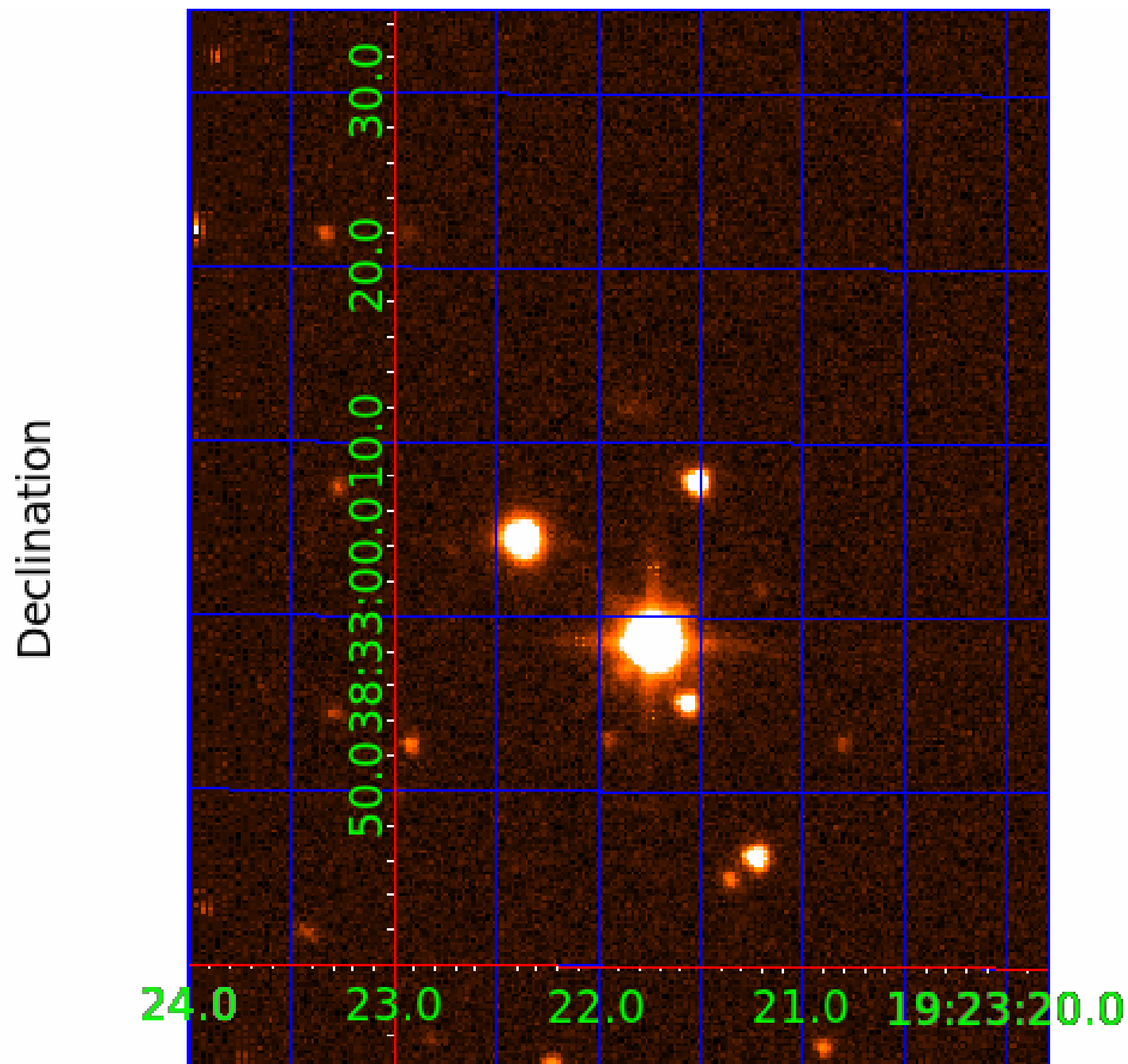
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003441423-01	OBS	No	1.805107	132.300794	107.0	11.412	10.9	7.7	0.84	5508	0.88	712.94
003441423-02	OBS	No	85.856457	168.046199	4465.8	10.500	62.4	-1.0	0.84	5508	5.51	4.14
003441423-03	OBS	No	64.780176	148.035133	1187.9	5.446	19.7	6.4	0.84	5508	3.09	6.02
003441423-04	OBS	No	59.862756	155.930613	2330.1	19.940	15.5	7.0	0.84	5508	7.79	6.69
003441423-05	OBS	No	231.147707	136.281517	15336.4	74.391	15.3	9.6	0.84	5508	12.94	1.10
003441423-06	OBS	No	77.133913	201.287993	1339.7	10.736	14.3	6.9	0.84	5508	4.00	4.77
003441423-07	OBS	No	66.961236	148.930850	971.1	0.969	13.8	4.0	0.84	5508	2.97	5.76
003441423-08	OBS	No	42.934940	141.414459	485.7	7.500	9.0	-1.0	0.84	5508	1.82	10.42
003441423-09	OBS	No	62.622117	157.133901	1581.0	10.114	8.5	7.6	0.84	5508	4.34	6.30
003441423-10	OBS	No	55.642936	159.899113	432.0	1.032	9.4	2.2	0.84	5508	1.98	7.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003441423-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
003441423-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

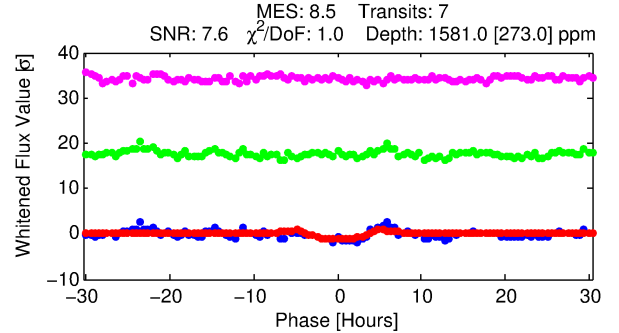
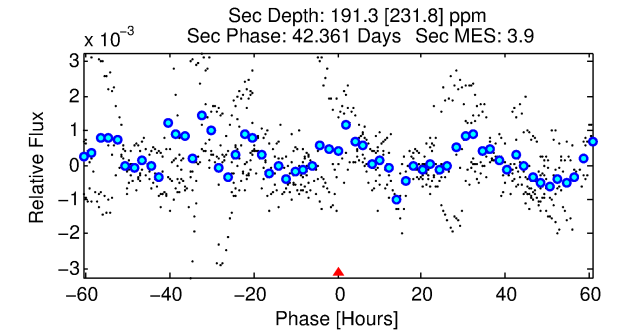
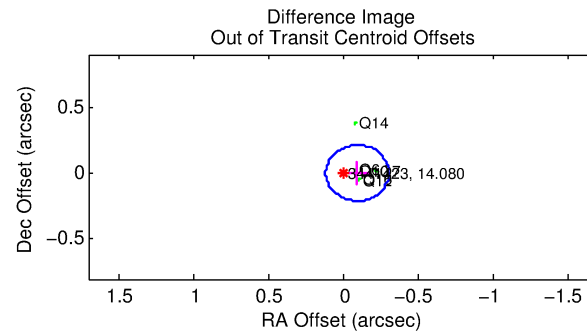
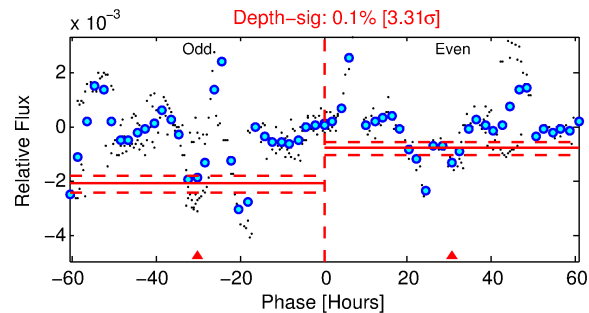
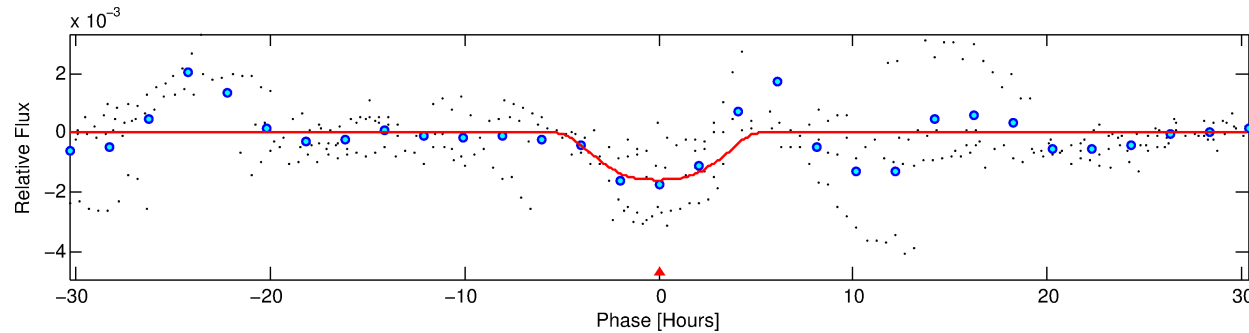
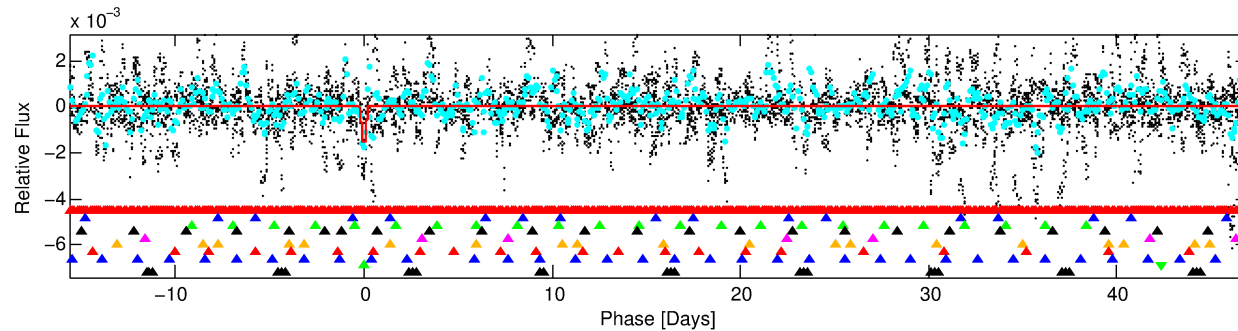
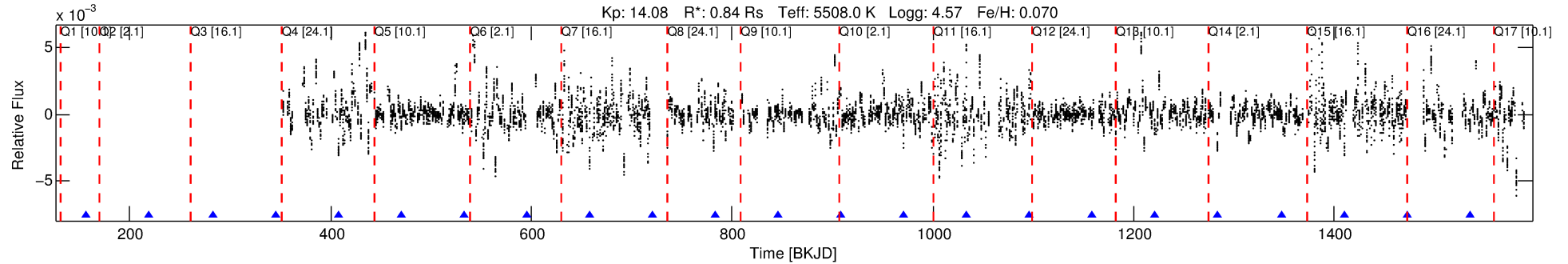
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003441423-09

No Significant Match Found

# DV One-Page Summary

KIC: 3441423 Candidate: 9 of 10 Period: 62.622 d



## DV Fit Results:

Period = 62.62212 [0.00285] d  
Epoch = 157.1339 [0.0400] BKJD  
Rp/R\* = 0.0474 [0.0051]  
a/R\* = 20.79 [2.58]  
b = 0.95 [0.02]  
Seff = 6.30 [1.08]  
Teq = 404 [17] K  
Rp = 4.34 [0.65] Re  
a = 0.3039 [0.0305] AU  
Ag = 514.85 [639.03] [0.80σ]  
Teffp = 2975 [917] K [2.80σ]

## DV Diagnostic Results:

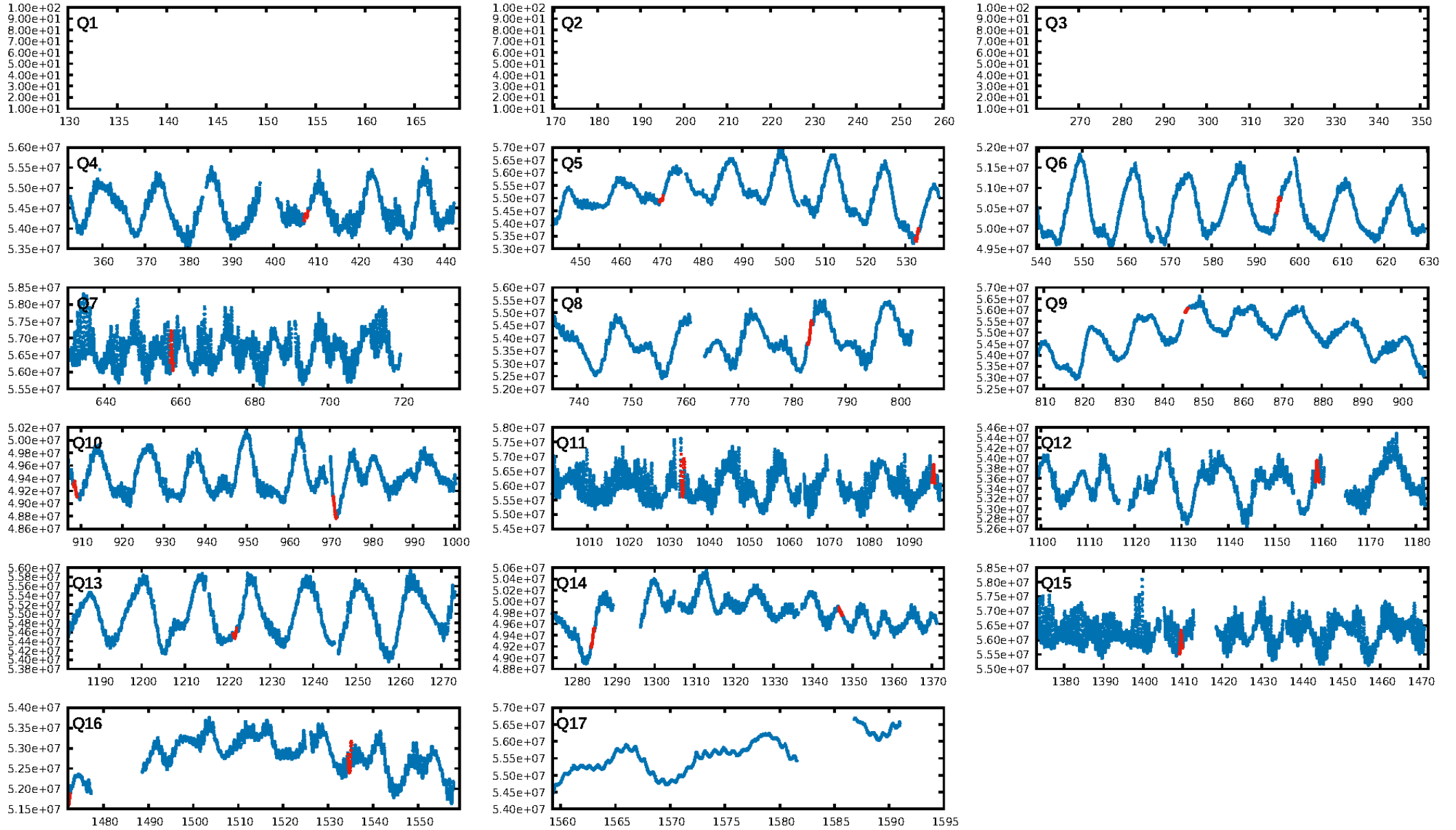
ShortPeriod-sig: 99.7% [2.96σ]  
LongPeriod-sig: 100.0% [4.51σ]  
ModelChiSquare2-sig: 1.8%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.46e-07**  
RollingBand-fgt: 1.00 [7/7]  
**GhostDiagnostic-chr: -1.07**  
Centroid-sig: 0.0%  
Centroid-so: 4.504 arcsec [3.23σ]  
OotOffset-rm: 0.097 arcsec [1.39σ]  
OotOffset-st: 3/1/2/0 [6]  
KicOffset-rm: 9.267 arcsec [88.50σ]  
KicOffset-st: 3/1/2/0 [6]  
DiffImageQuality-fgm: 0.33 [2/6]  
DiffImageOverlap-fno: 0.00 [0/10]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:20:43 Z

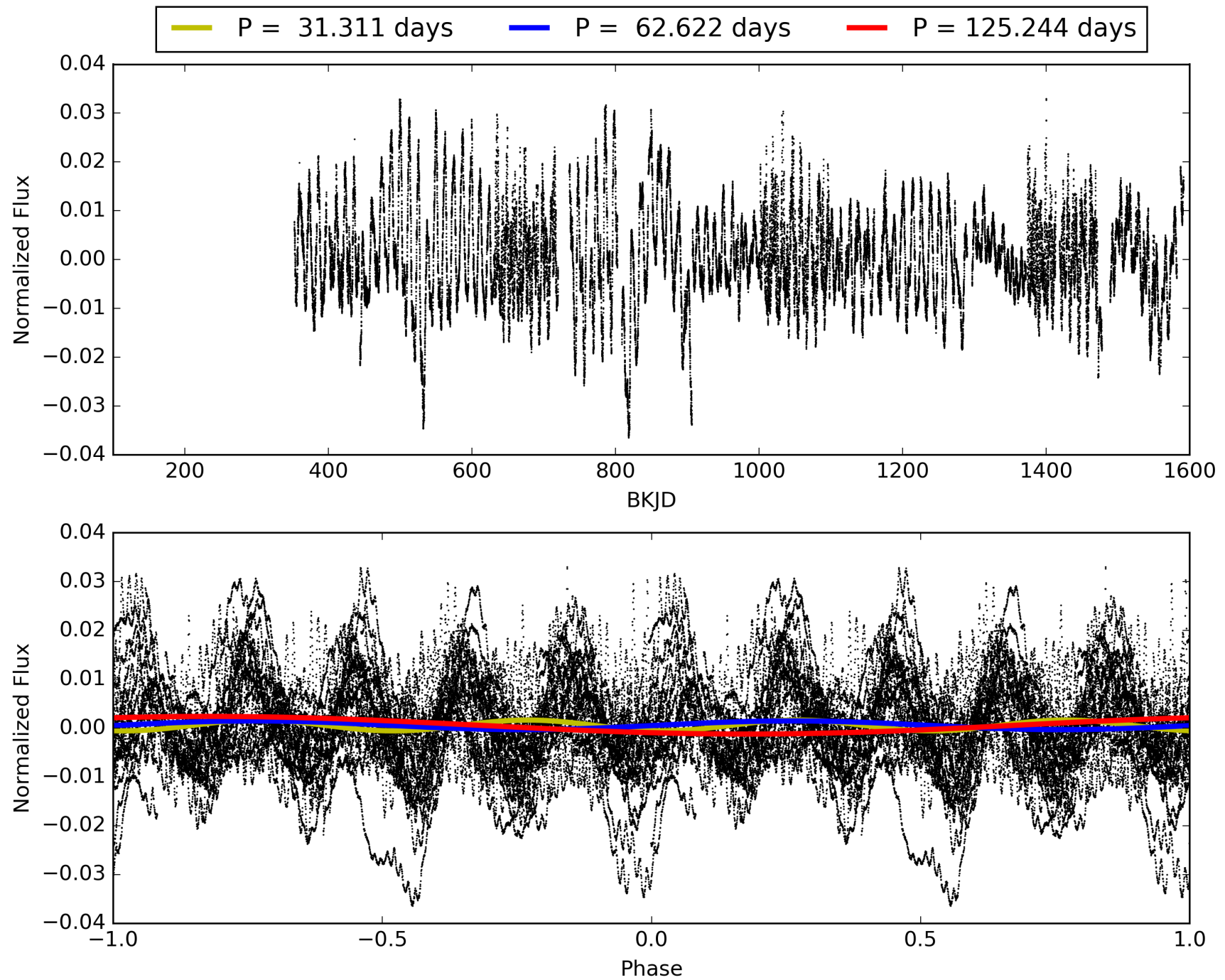
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 003441423-09, PDC Light Curves

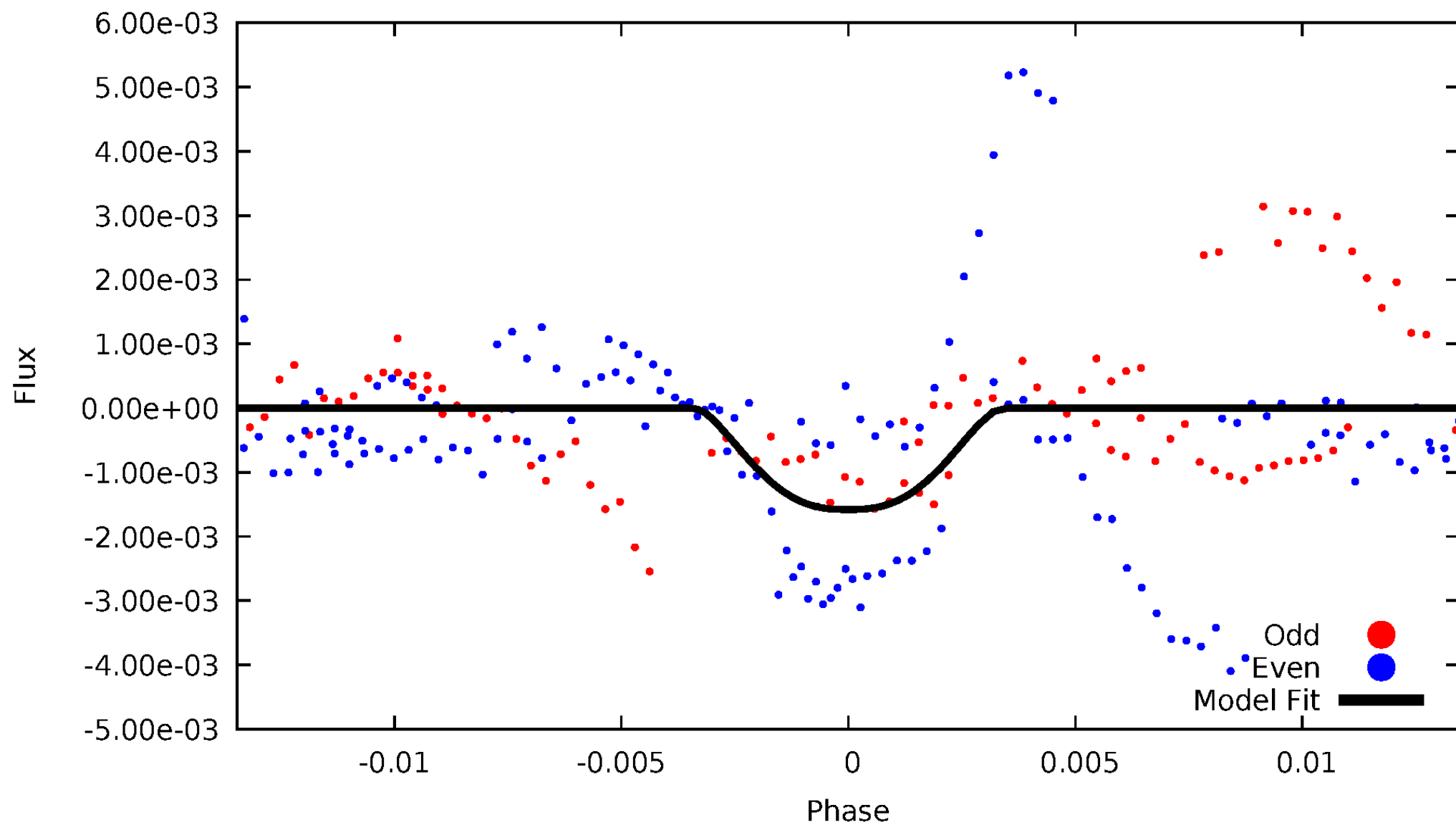


TCE 003441423-09



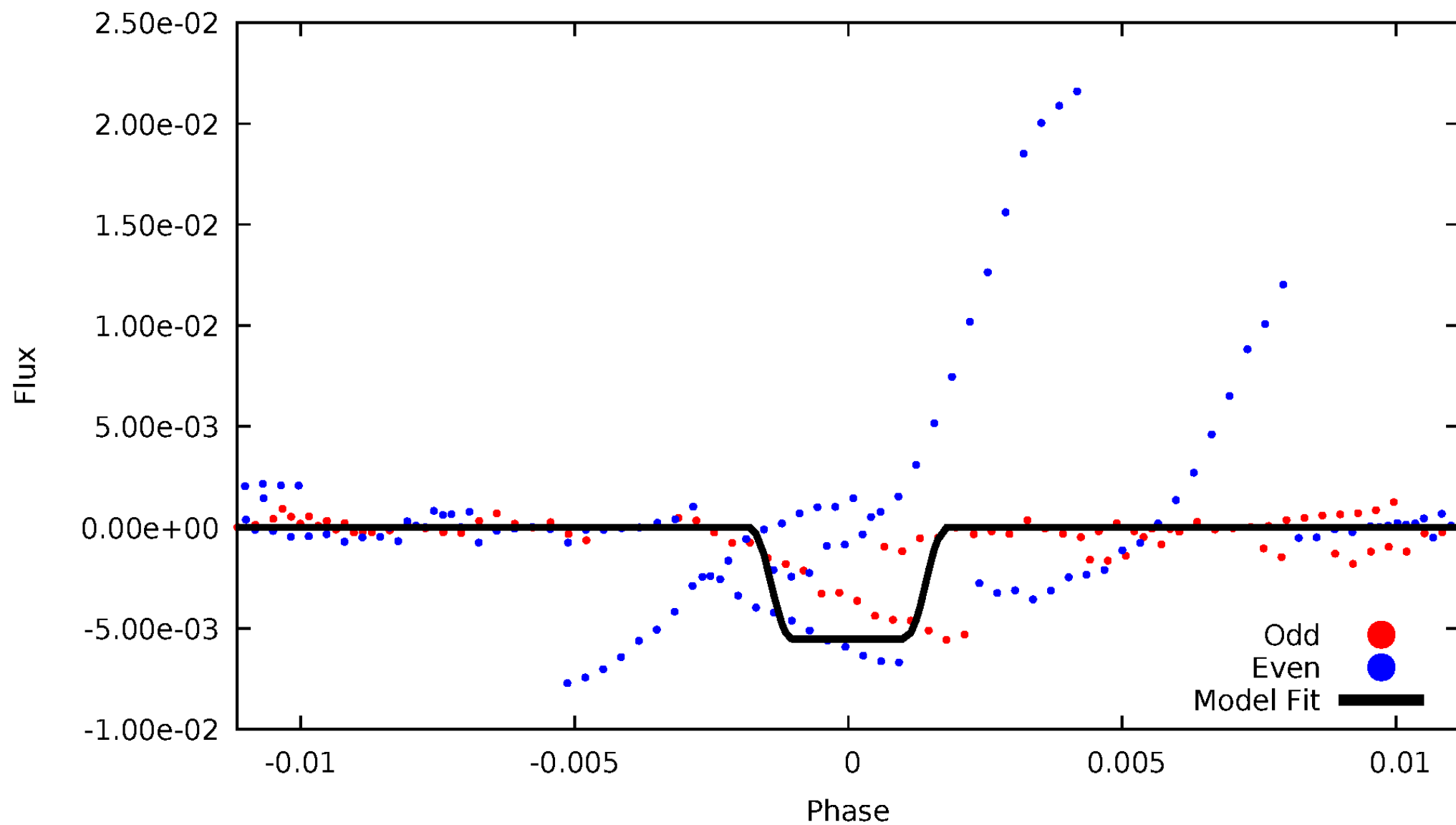
# DV Odd/Even

TCE 003441423-09



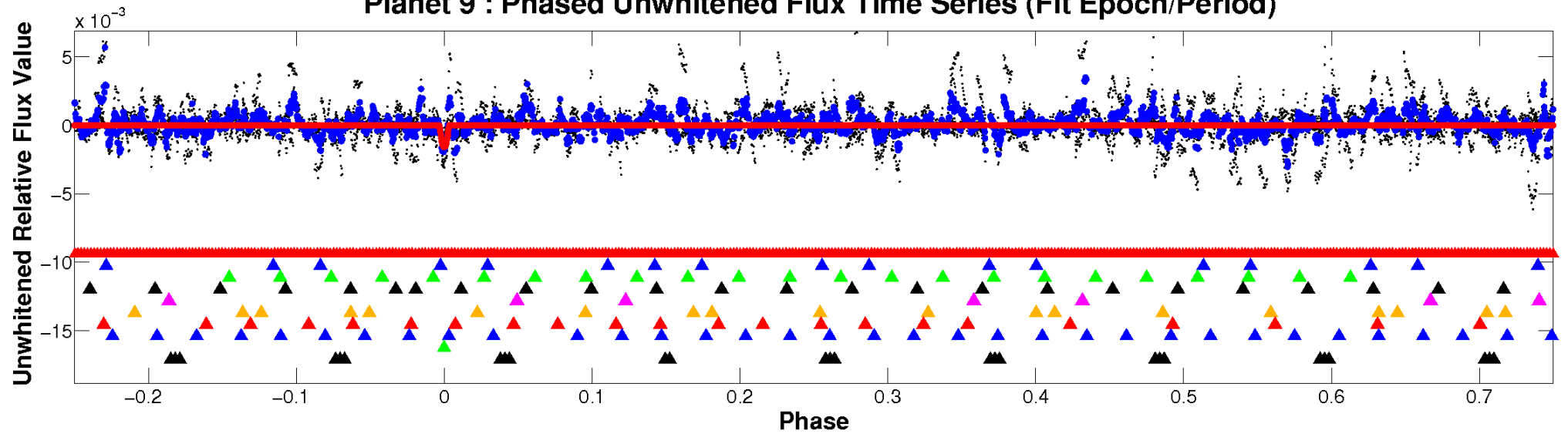
# ALT Odd/Even

TCE 003441423-09

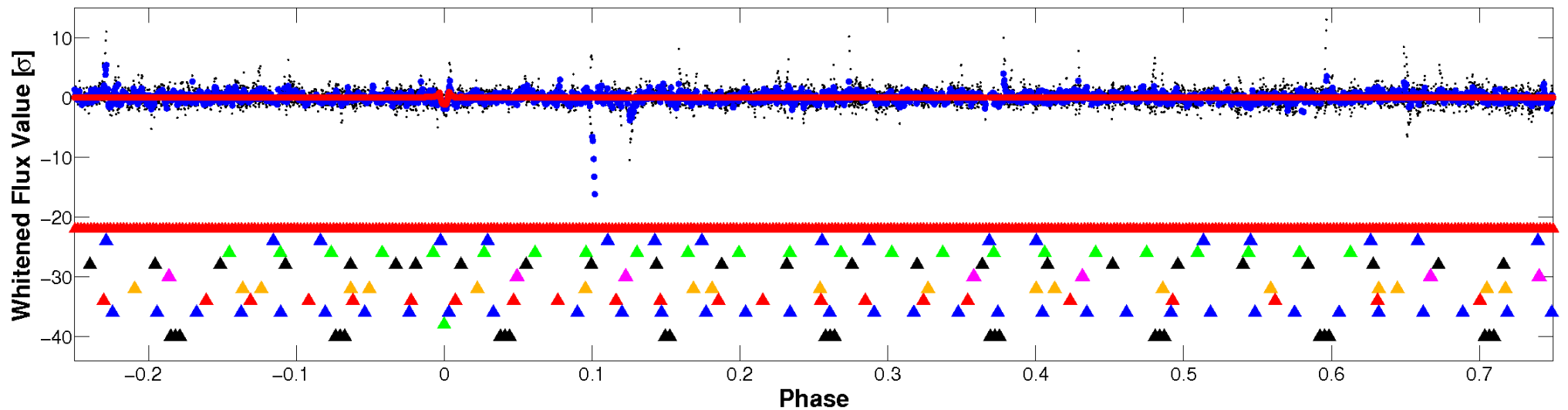


# Non-Whitened Vs. Whitened Light Curve

## Planet 9 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

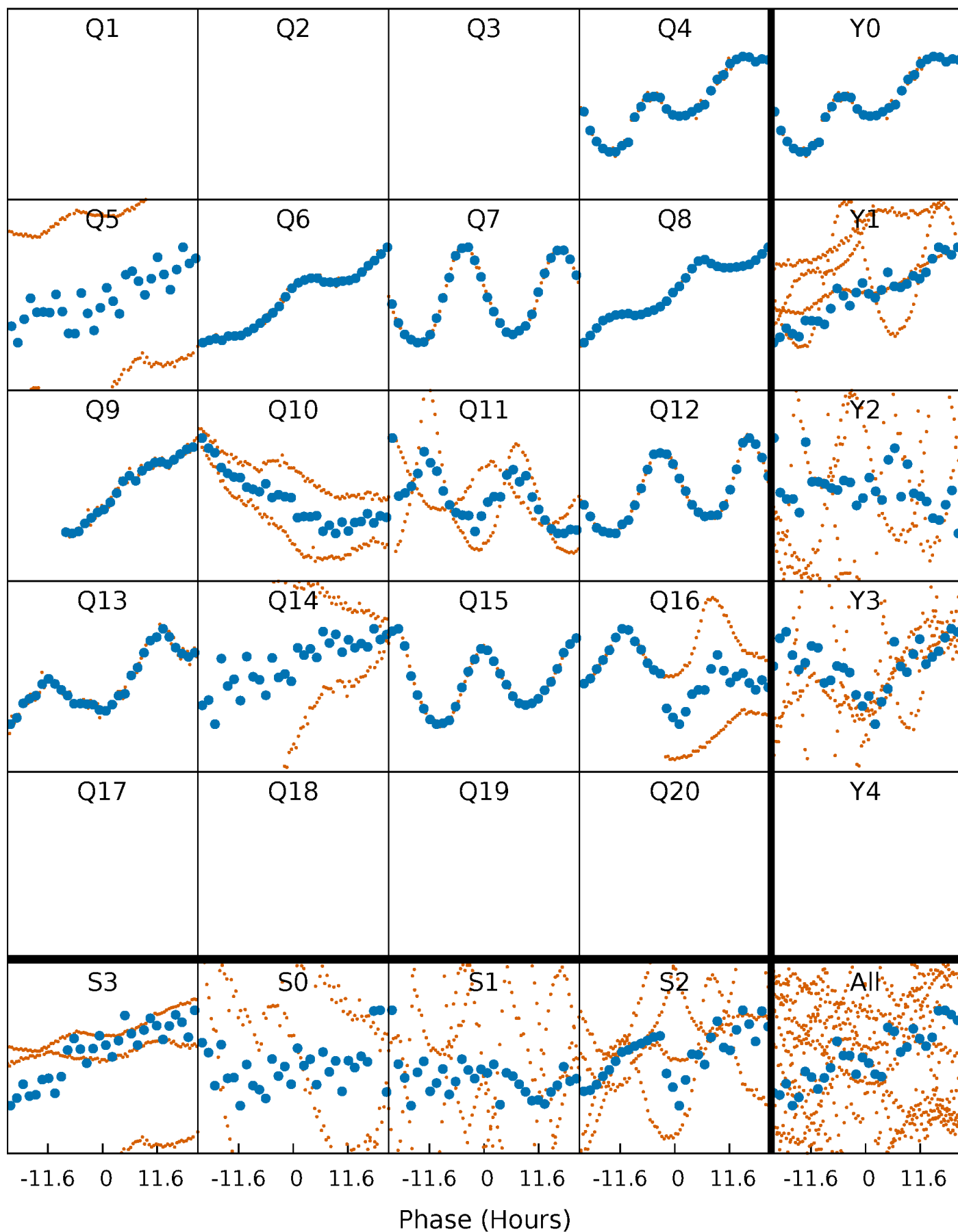


## Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)



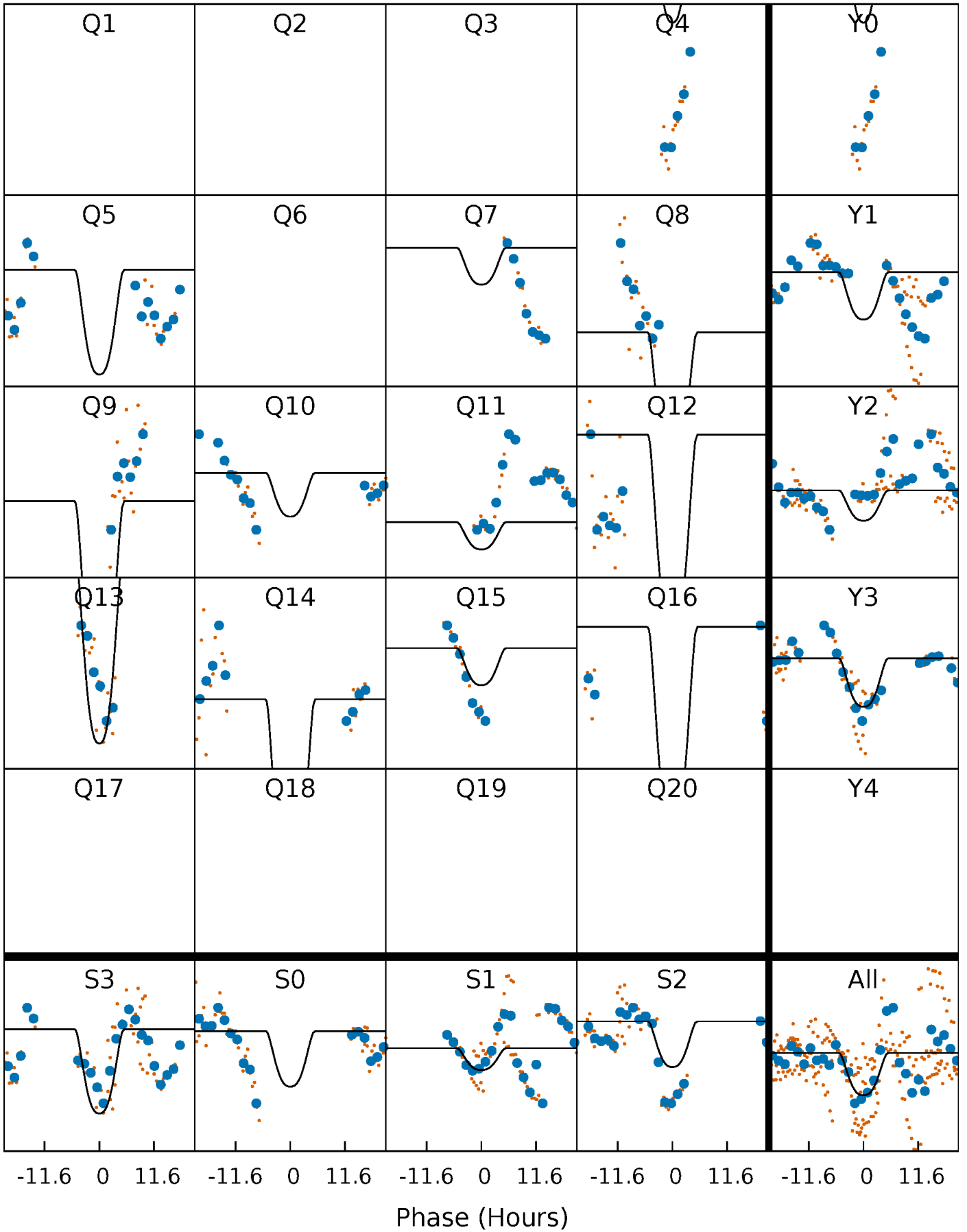
# PDC Quarter-Phased Transit Curves

TCE 003441423-09   P= 62.622117 Days    $T_0=157.133901$  (BKJD)



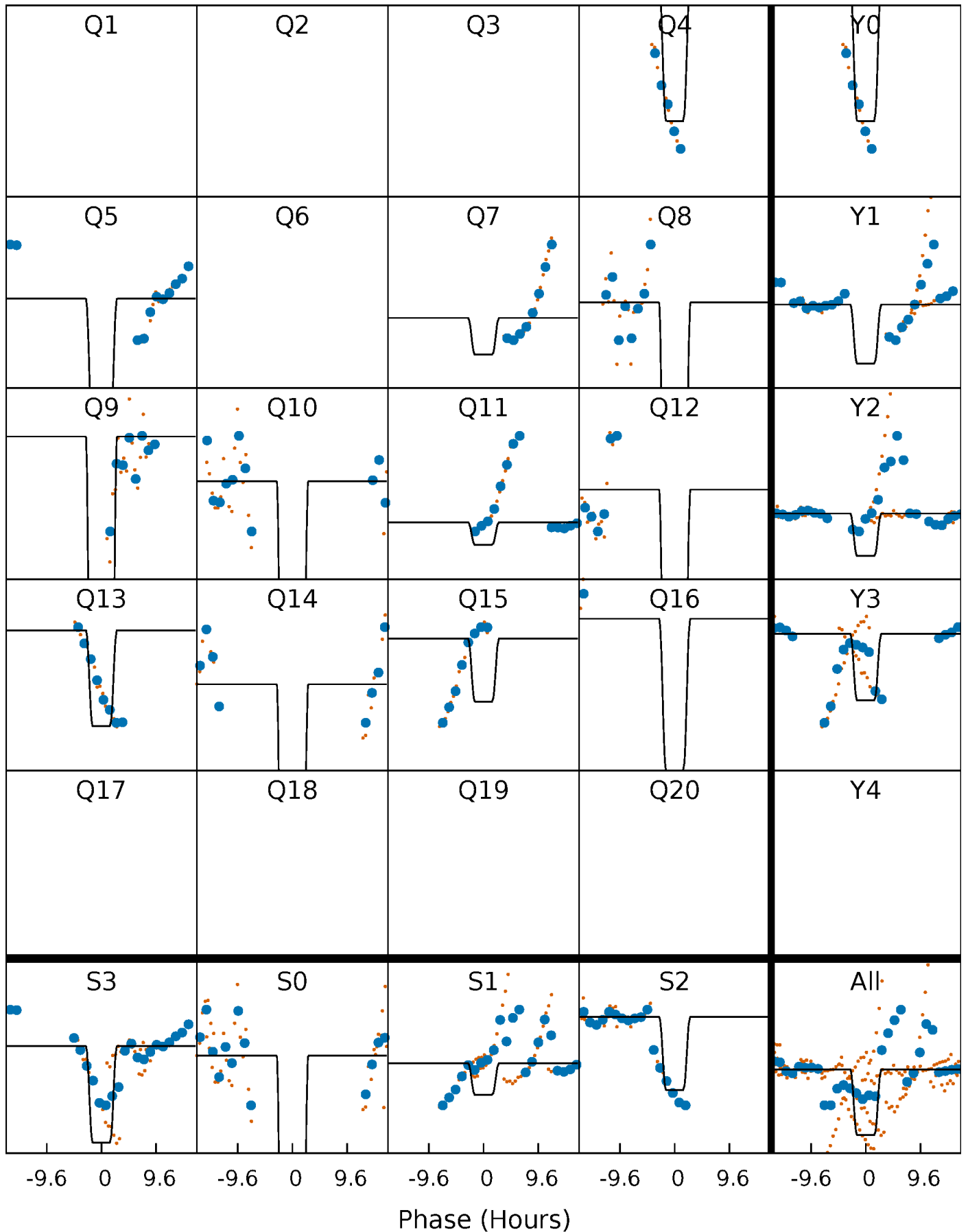
# DV Quarter-Phased Transit Curves

TCE 003441423-09 P= 62.622117 Days  $T_0=157.133901$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003441423-09   P= 62.617132 Days    $T_0=157.224277$  (BKJD)

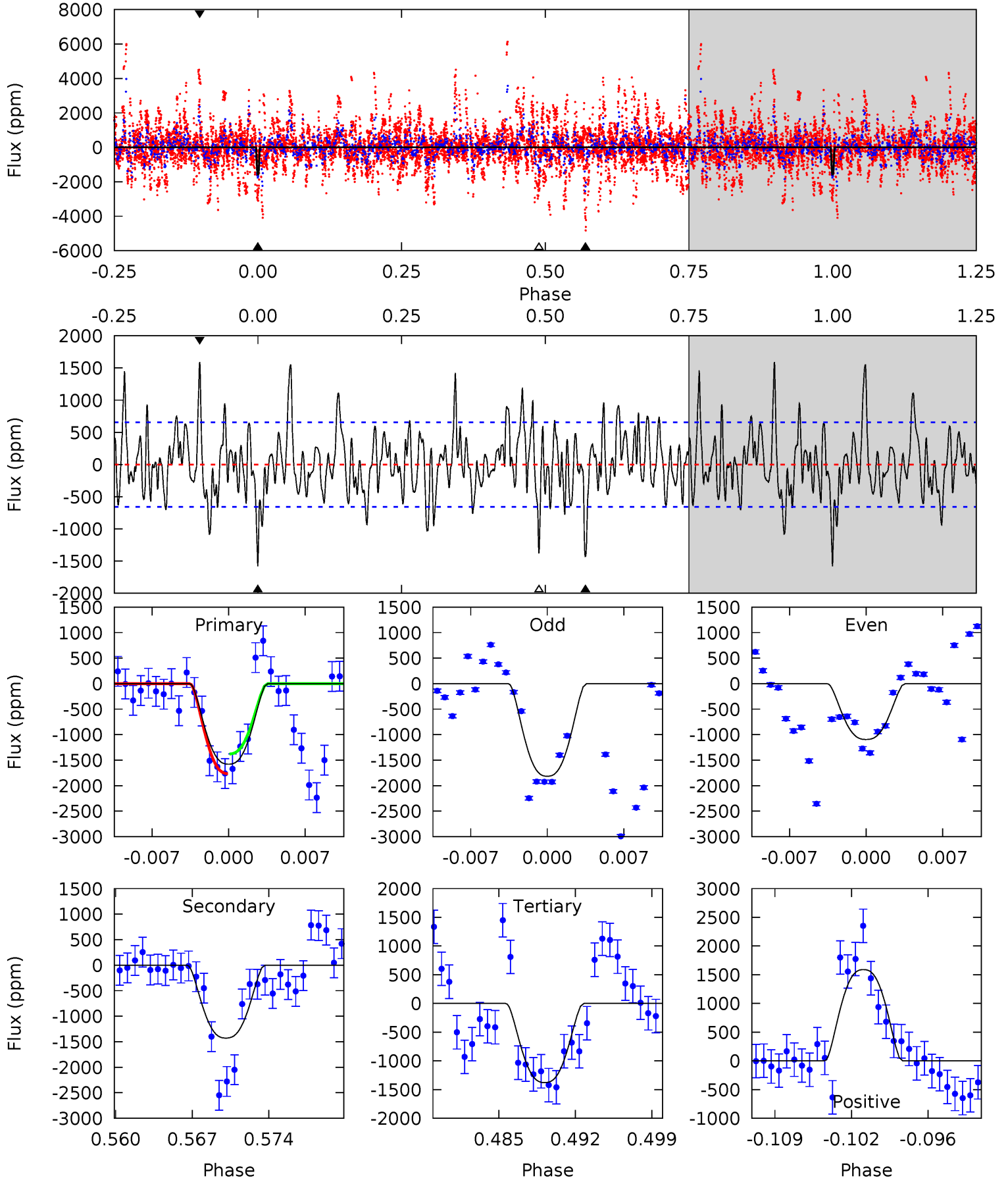




# DV Model-Shift Uniqueness Test

003441423-09, P = 62.622117 Days, E = 157.133901 Days

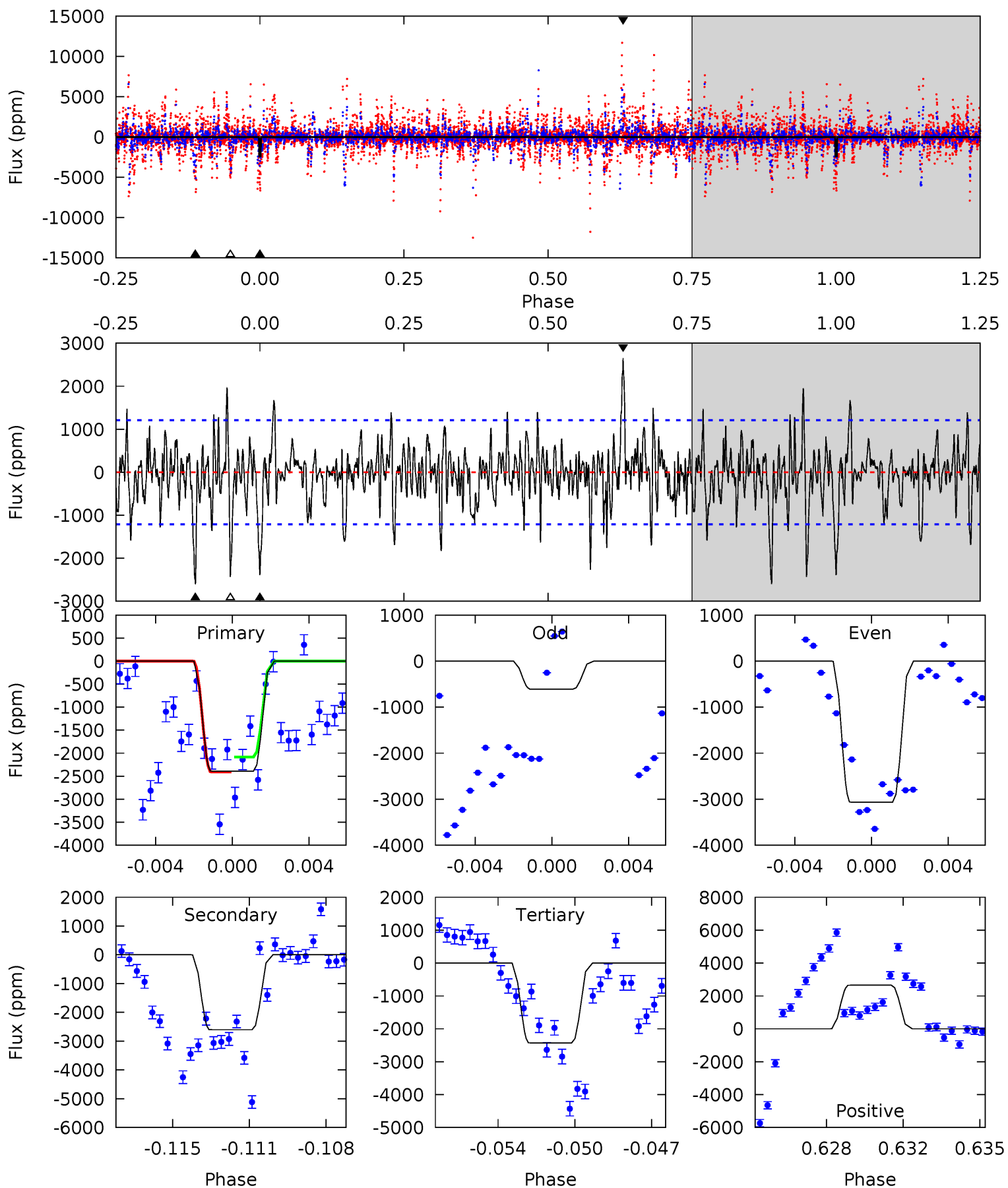
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	11.1	10.7	12.4	5.10	2.71	3.40	1.56	-0.08	0.39	-1.26	2.48	1.63	0.50	1.54



# Alt Model-Shift Uniqueness Test

003441423-09, P = 62.617132 Days, E = 157.224277 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	11.2	10.5	11.4	5.22	2.91	2.34	-0.17	-1.13	0.74	-0.23	4.06	1.97	0.50	0.71



### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1428 \pm 129$	$4.45^{+0.52}_{-0.49}$	$572^{+17}_{-11}$	$4980^{+282}_{-224}$	$3588^{+1025}_{-747}$
Alt.	$-2602 \pm 232$	$7.00^{+0.60}_{-0.55}$	$572^{+15}_{-12}$	$4671^{+181}_{-157}$	$2648^{+564}_{-486}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming A=0.3)

$A_{obs}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

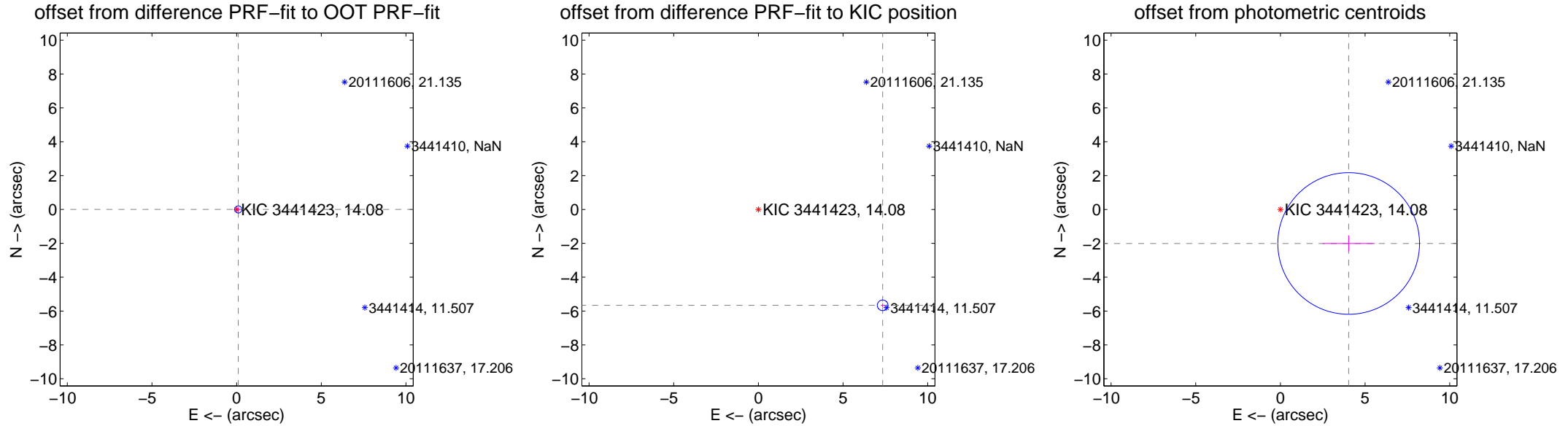
## DV Centroid Data

Supplemental centroid analysis for 003441423-09. Kepler magnitude: 14.08. Transit SNR 7.60

There are 2 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 9.17 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.097 \pm 0.070$	1.39	$-0.097 \pm 0.070$	$0.001 \pm 0.089$
PRF-fit source offset from KIC position	$9.267 \pm 0.105$	88.50	$-7.337 \pm 0.077$	$-5.660 \pm 0.130$
photometric centroid source offset	$4.50 \pm 1.39$	3.23	$-4.03 \pm 1.54$	$-2.01 \pm 0.47$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q1 no difference image



Q1 no OOT image



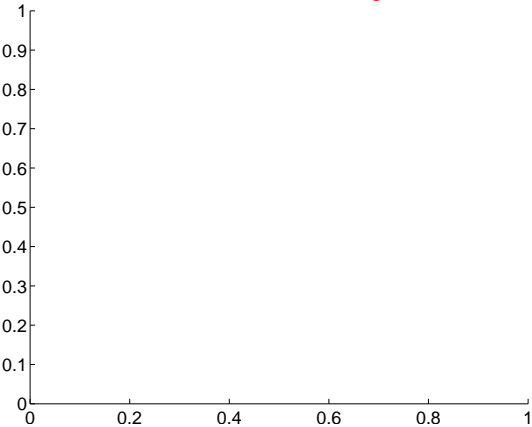
Q2 no difference image



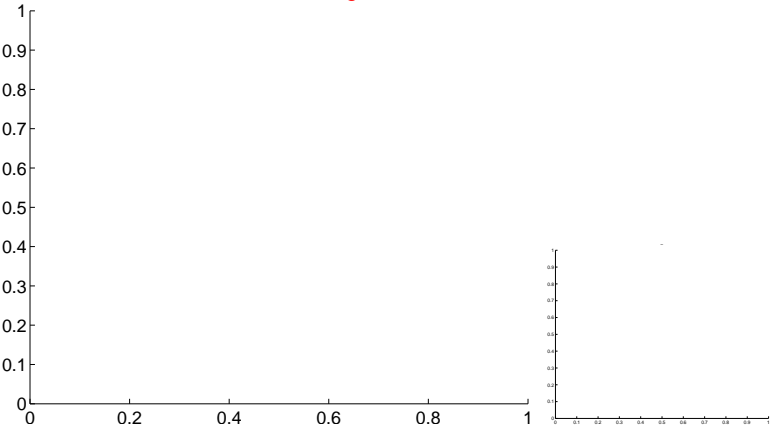
Q2 no OOT image



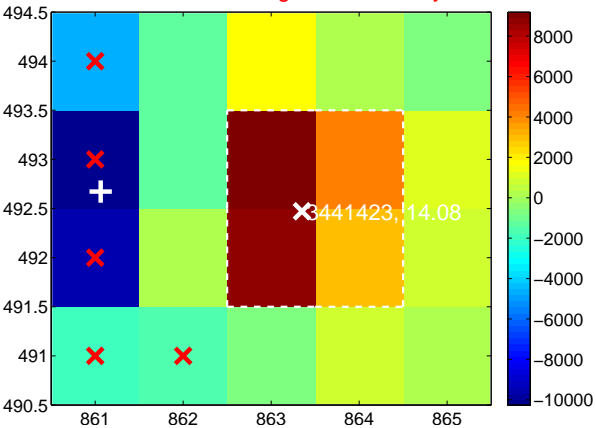
Q3 no difference image



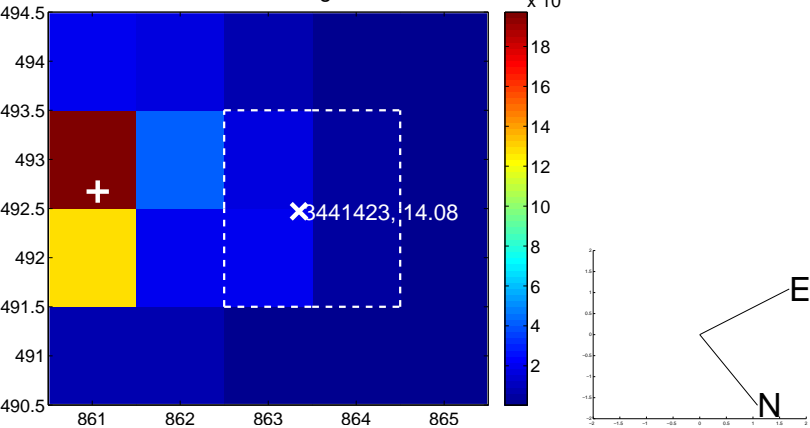
Q3 no OOT image



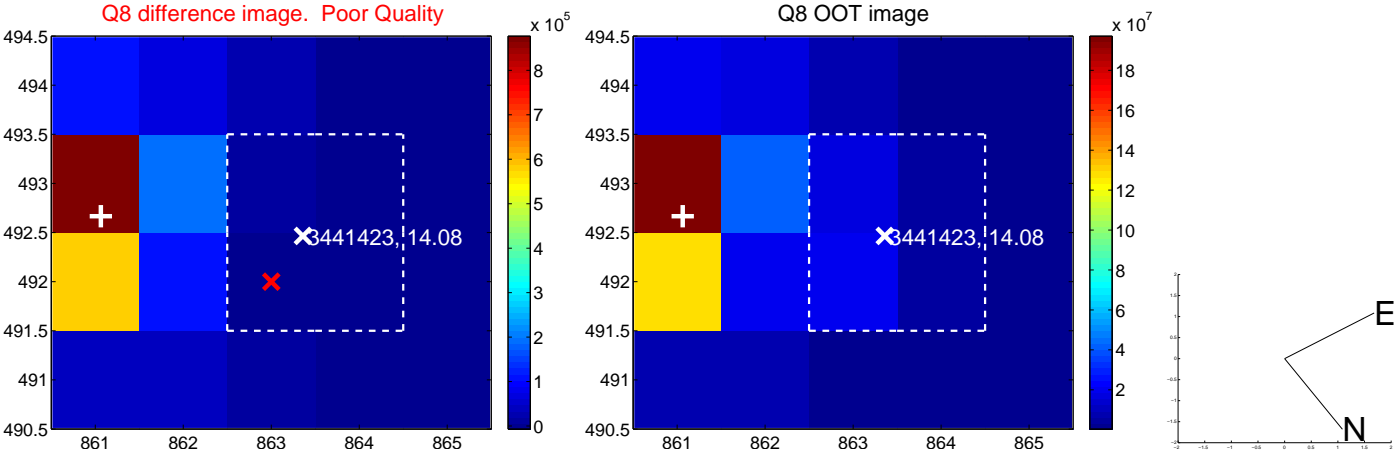
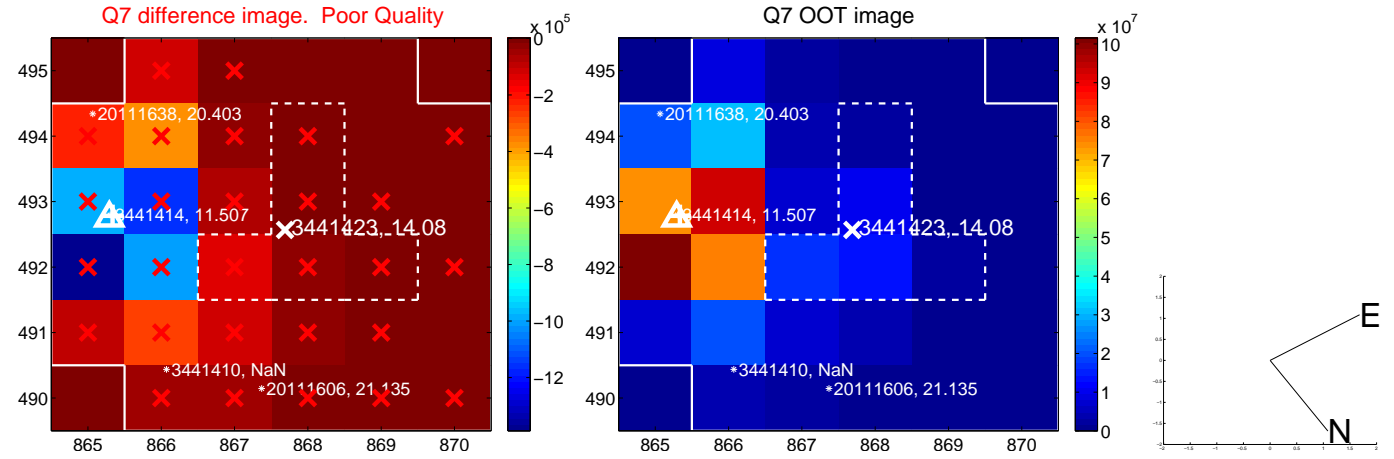
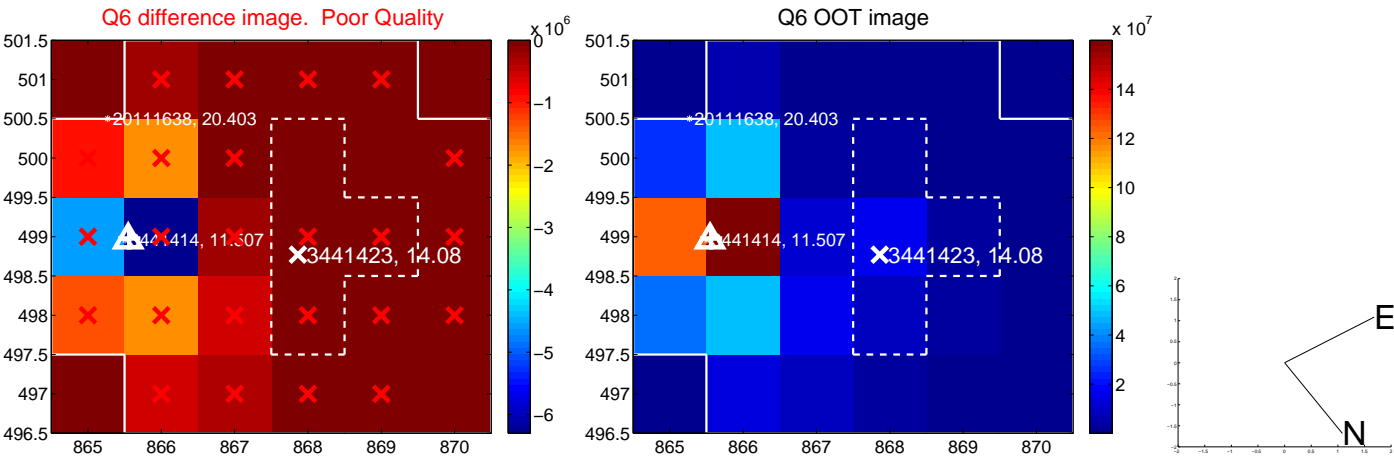
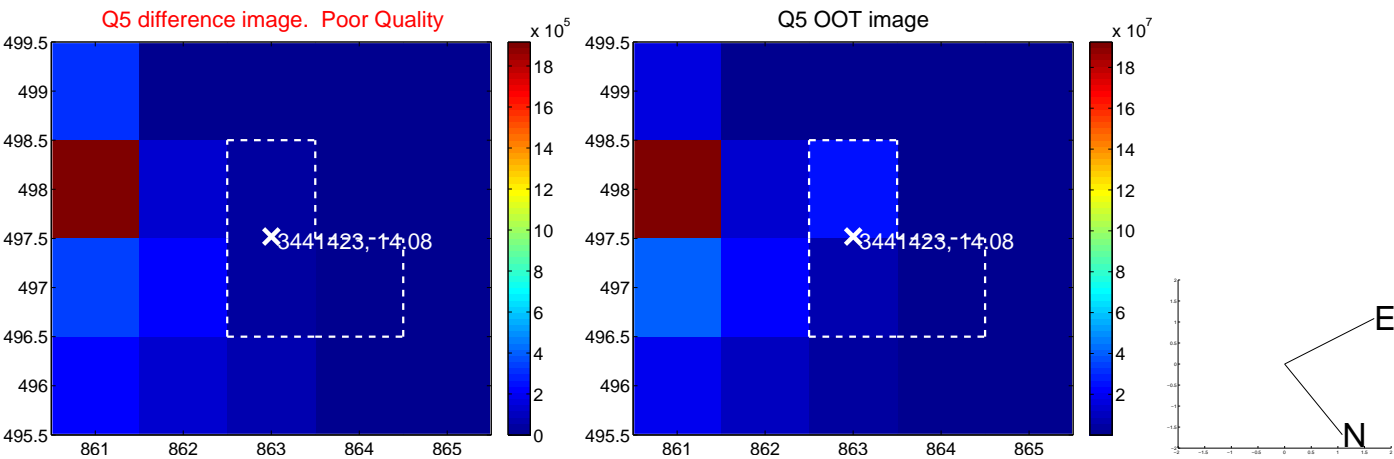
Q4 difference image. Poor Quality



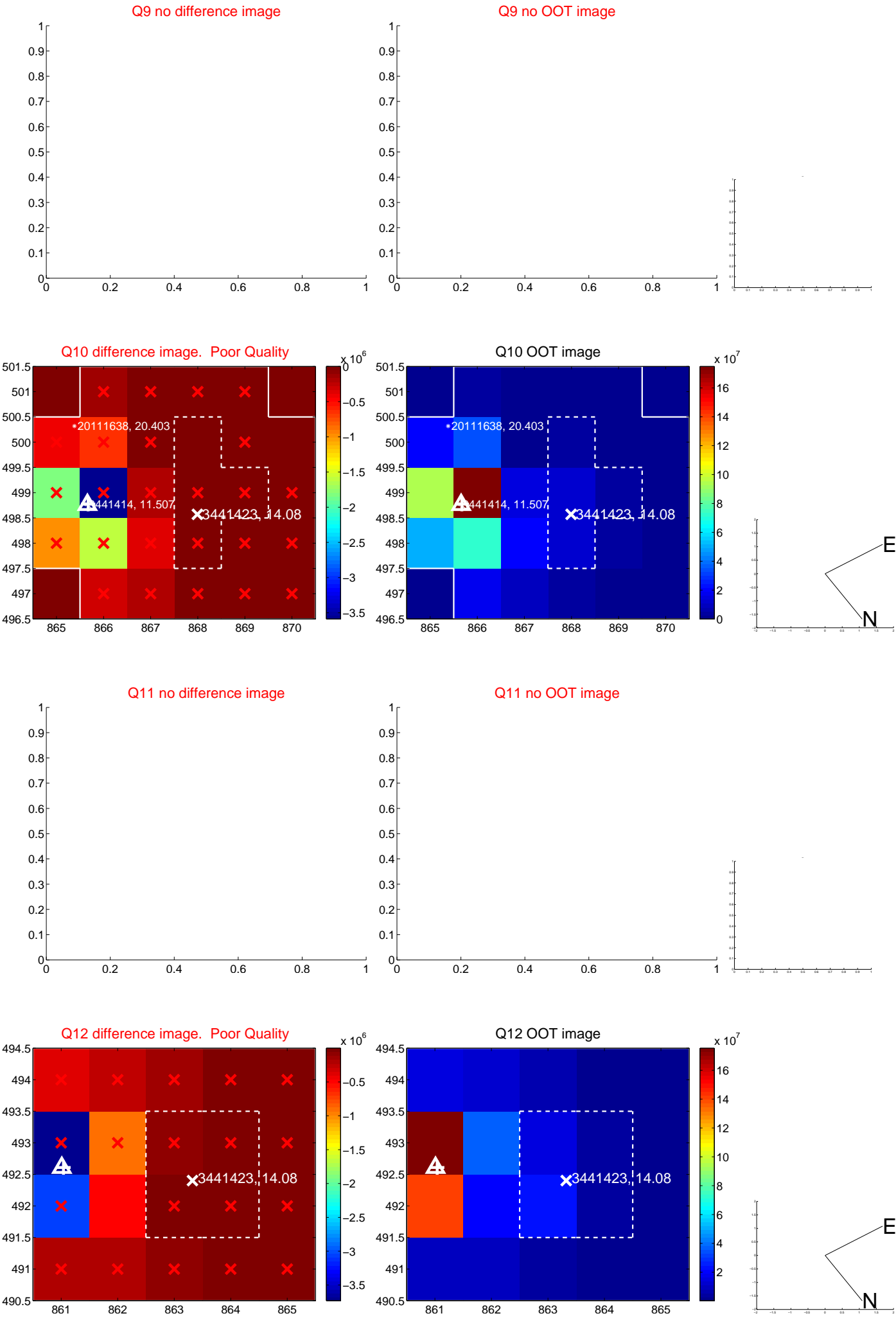
Q4 OOT image



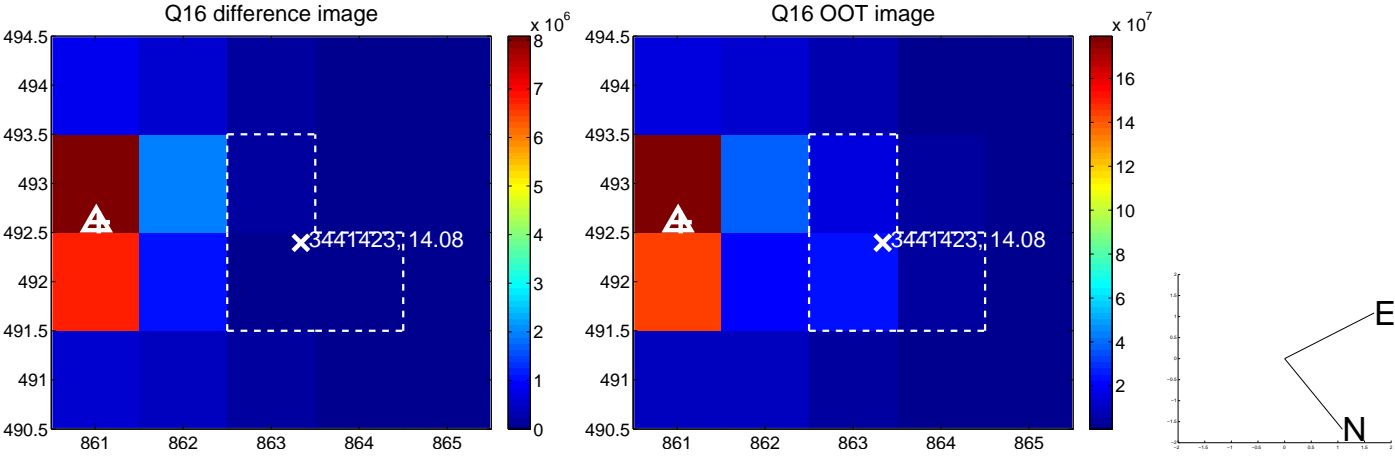
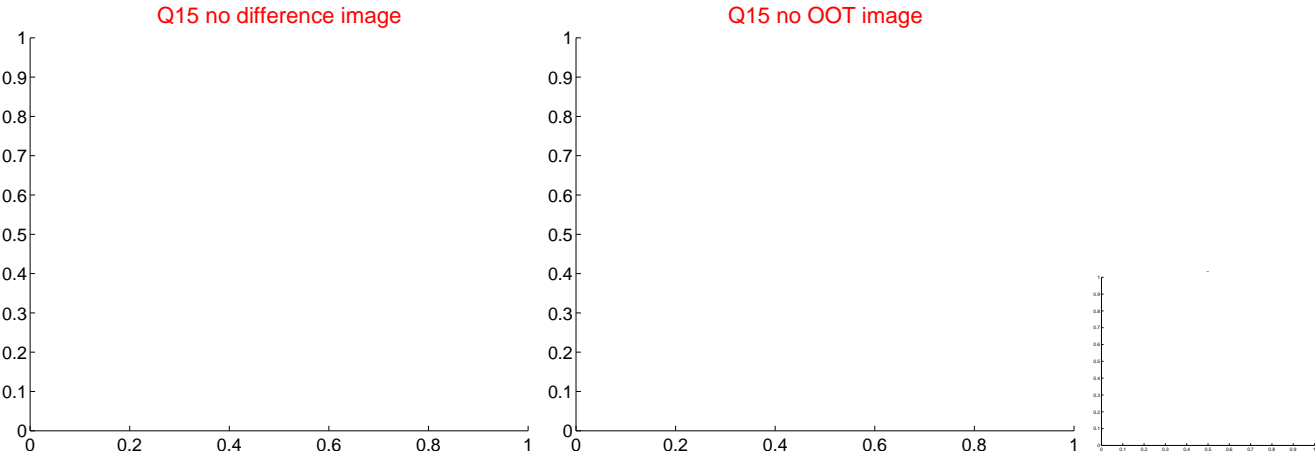
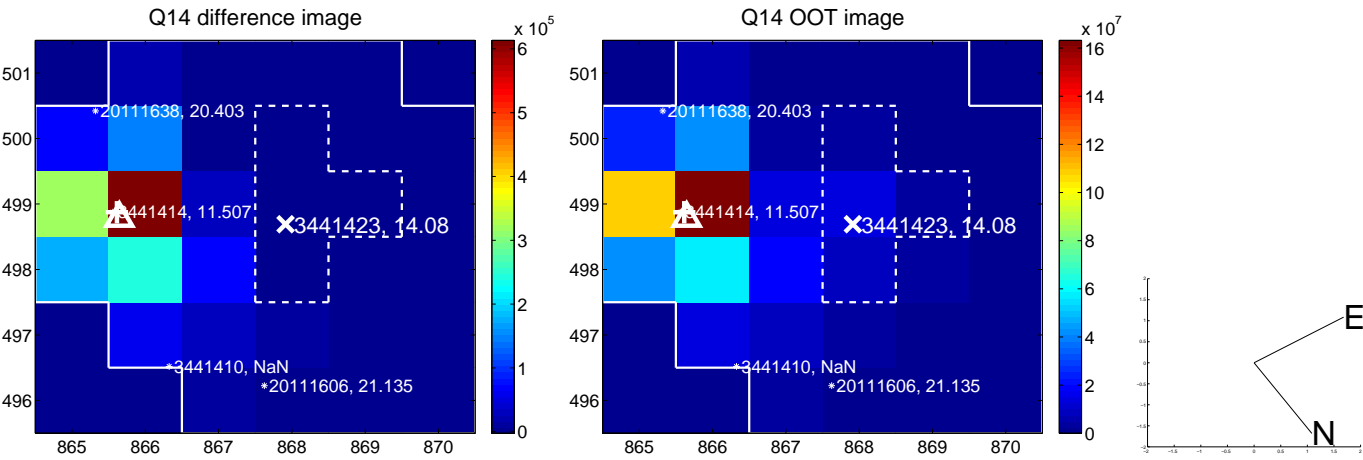
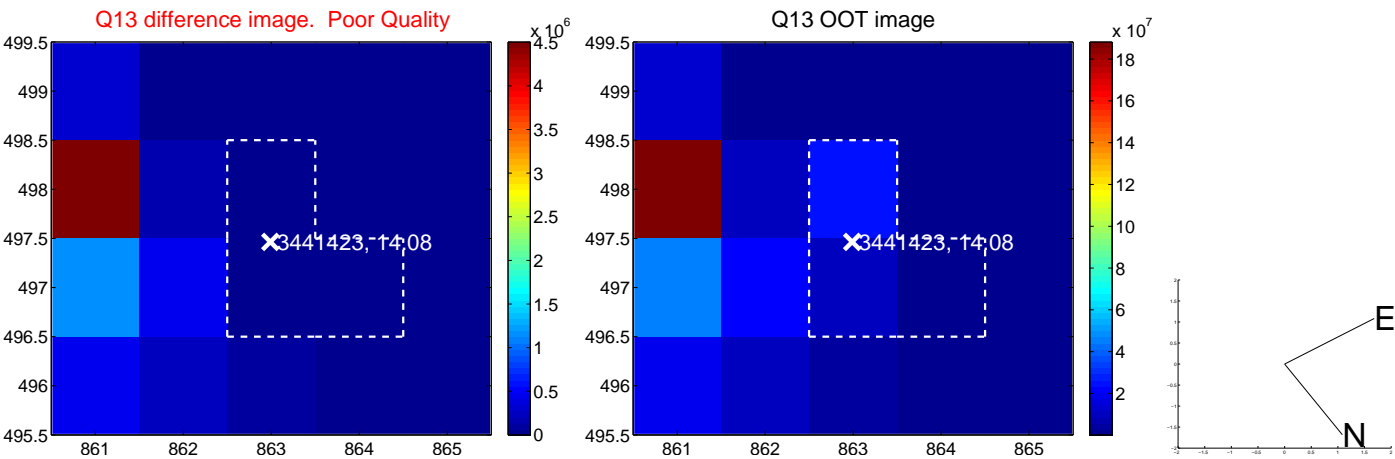
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

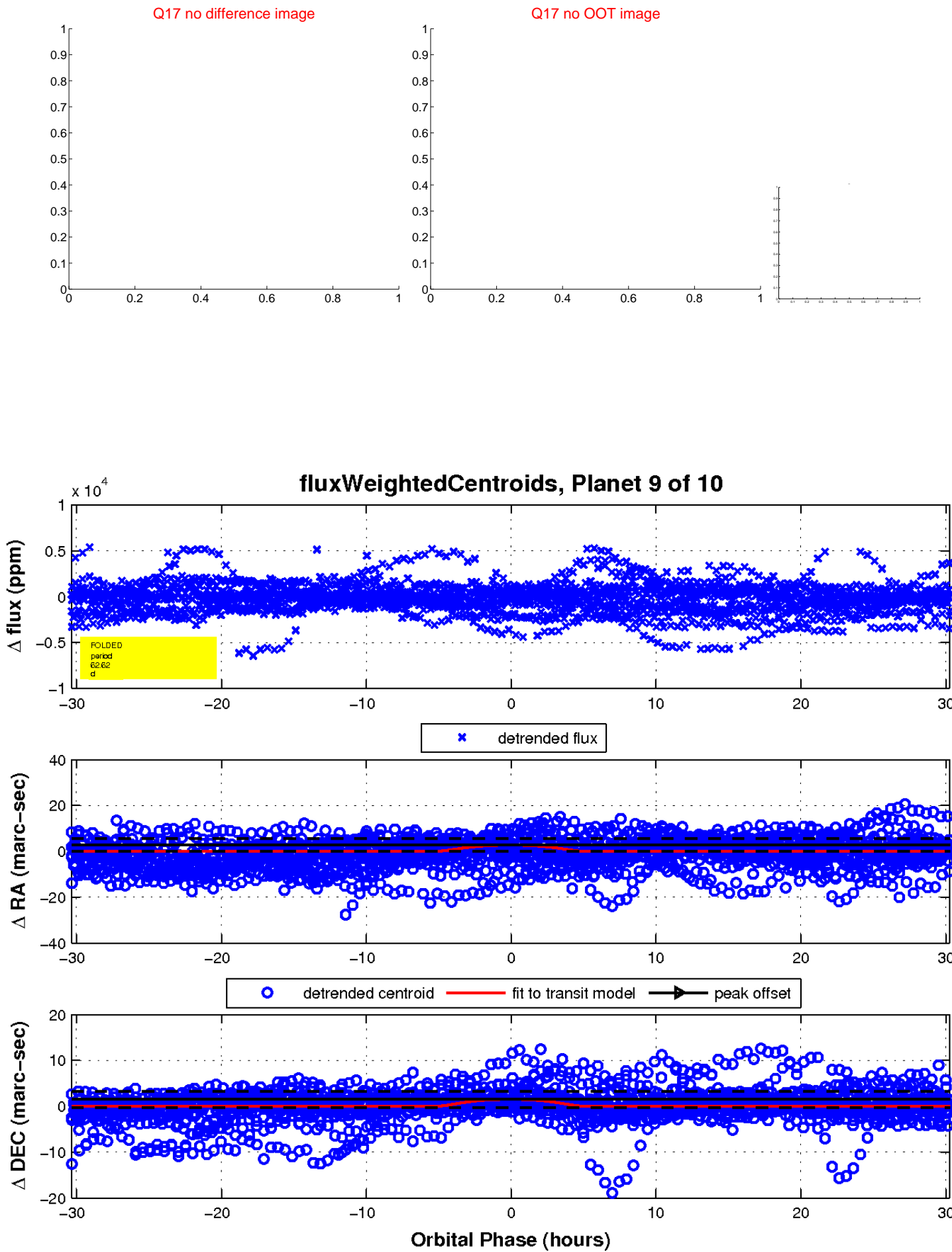


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

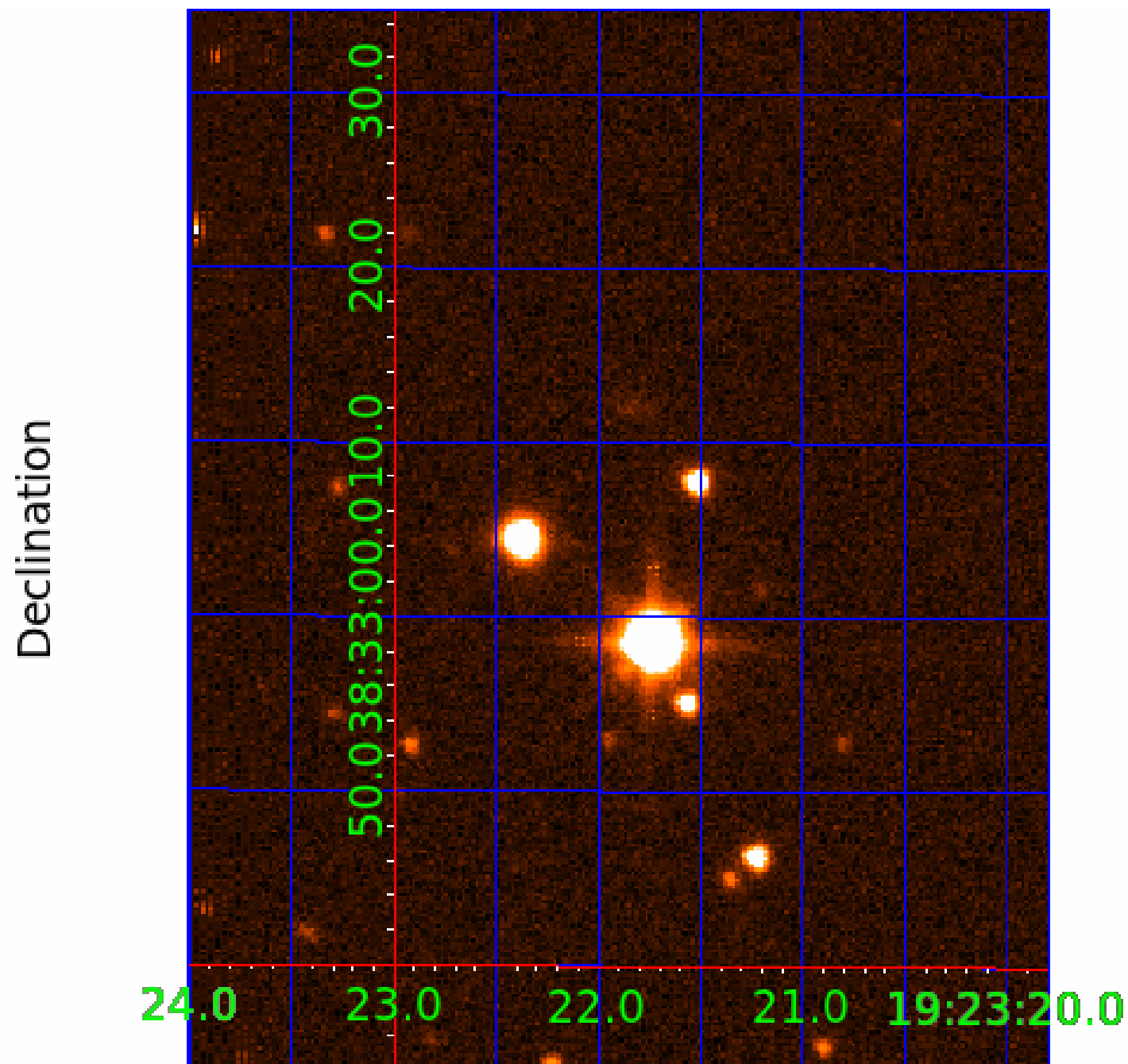




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003441423-01	OBS	No	1.805107	132.300794	107.0	11.412	10.9	7.7	0.84	5508	0.88	712.94
003441423-02	OBS	No	85.856457	168.046199	4465.8	10.500	62.4	-1.0	0.84	5508	5.51	4.14
003441423-03	OBS	No	64.780176	148.035133	1187.9	5.446	19.7	6.4	0.84	5508	3.09	6.02
003441423-04	OBS	No	59.862756	155.930613	2330.1	19.940	15.5	7.0	0.84	5508	7.79	6.69
003441423-05	OBS	No	231.147707	136.281517	15336.4	74.391	15.3	9.6	0.84	5508	12.94	1.10
003441423-06	OBS	No	77.133913	201.287993	1339.7	10.736	14.3	6.9	0.84	5508	4.00	4.77
003441423-07	OBS	No	66.961236	148.930850	971.1	0.969	13.8	4.0	0.84	5508	2.97	5.76
003441423-08	OBS	No	42.934940	141.414459	485.7	7.500	9.0	-1.0	0.84	5508	1.82	10.42
003441423-09	OBS	No	62.622117	157.133901	1581.0	10.114	8.5	7.6	0.84	5508	4.34	6.30
003441423-10	OBS	No	55.642936	159.899113	432.0	1.032	9.4	2.2	0.84	5508	1.98	7.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003441423-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
003441423-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003441423-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
003441423-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
003441423-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
003441423-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
003441423-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

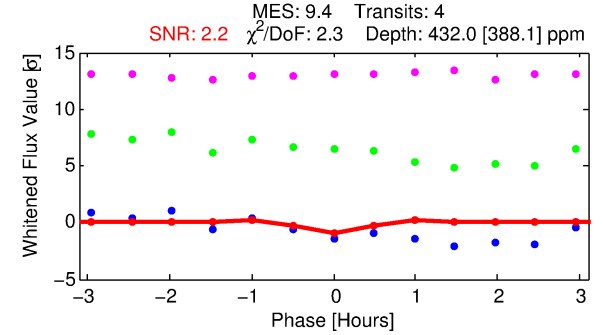
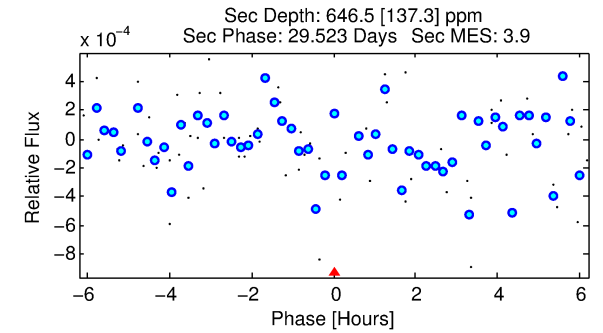
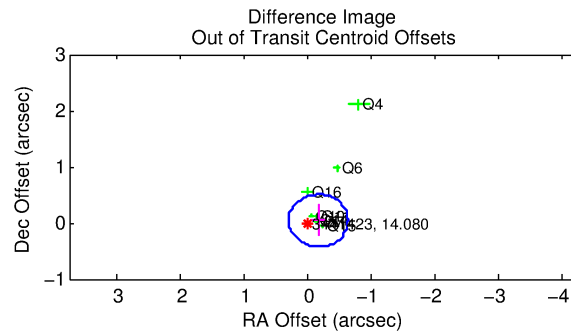
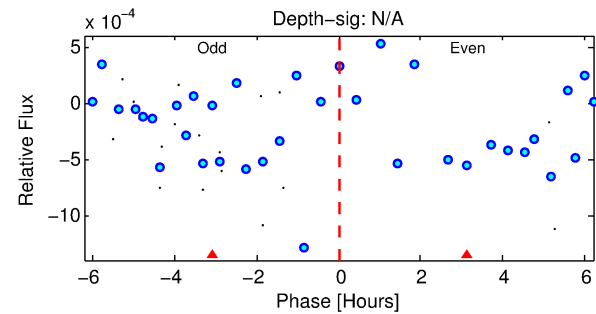
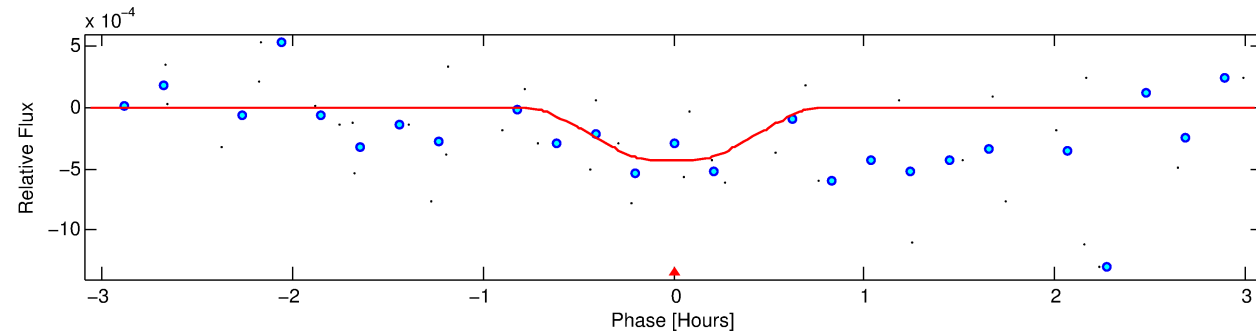
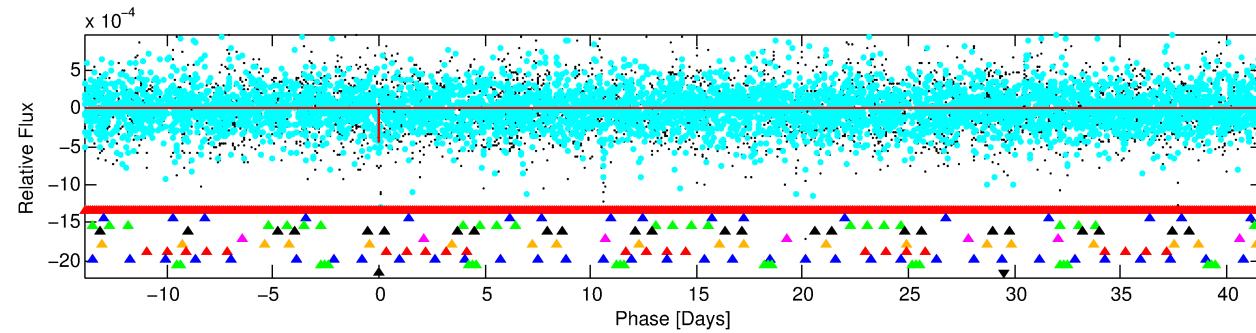
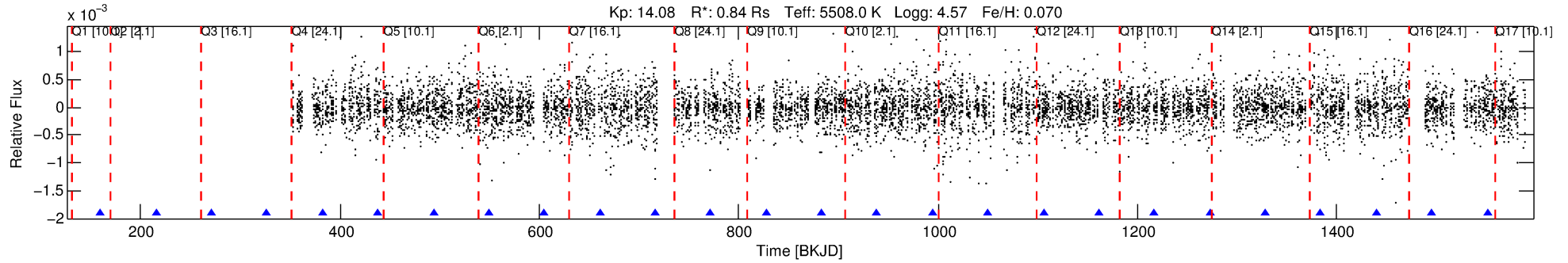
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003441423-10

No Significant Match Found

# DV One-Page Summary

KIC: 3441423 Candidate: 10 of 10 Period: 55.643 d



## DV Fit Results:

Period = 55.64294 [0.00190] d  
Epoch = 159.8991 [0.0210] BKJD  
Rp/R\* = 0.0216 [0.3687]  
a/R\* = 253.08 [17445.99]  
b = 0.82 [29.41]  
Seff = 7.38 [1.26]  
Teq = 420 [18] K  
Rp = 1.98 [33.79] Re  
a = 0.2809 [0.0282] AU  
Ag = 7139.12 [243388.14] [0.03σ]  
Teffp = 5972 [50901] K [0.11σ]

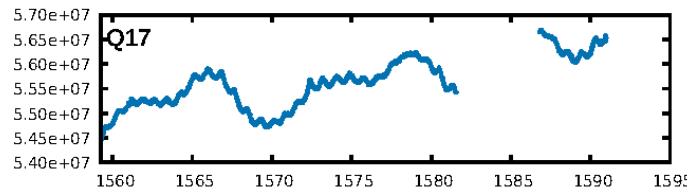
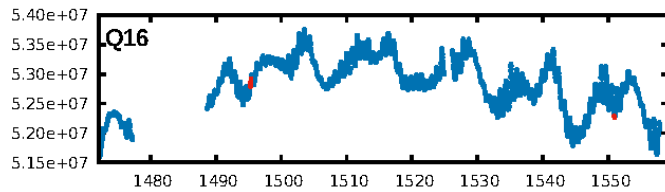
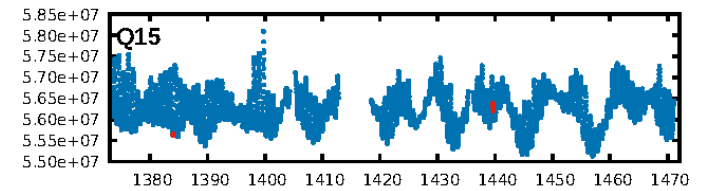
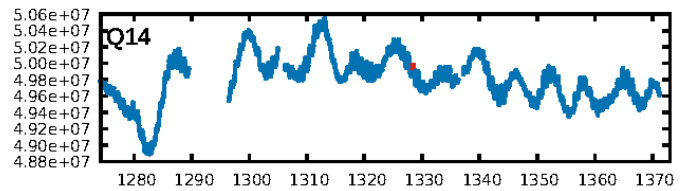
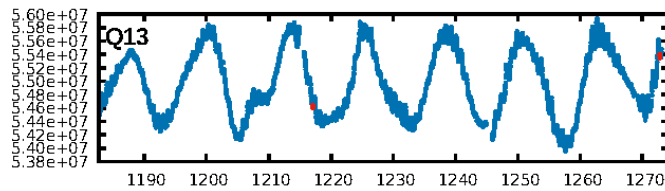
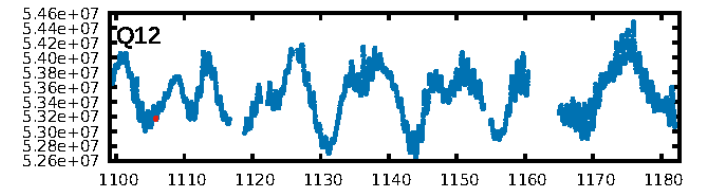
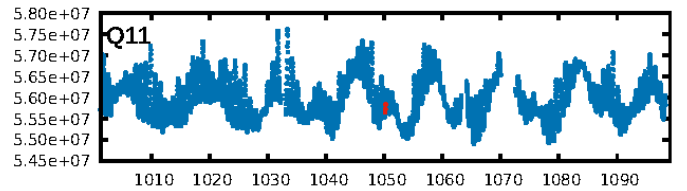
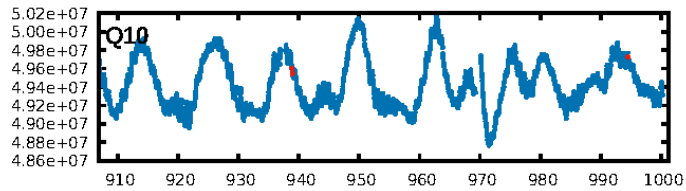
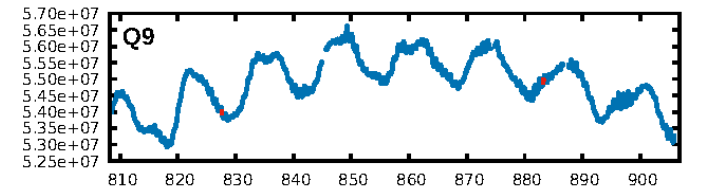
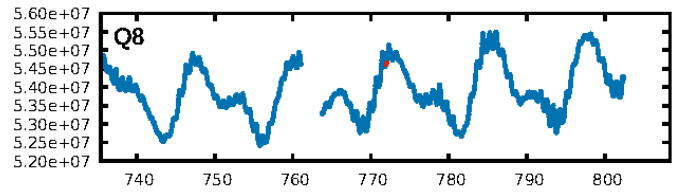
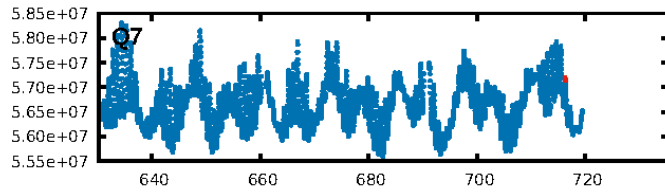
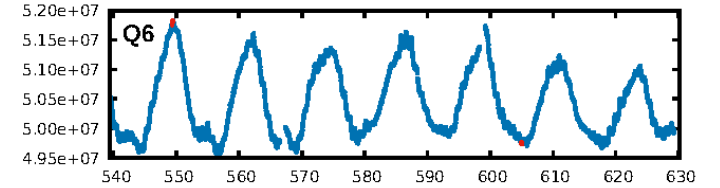
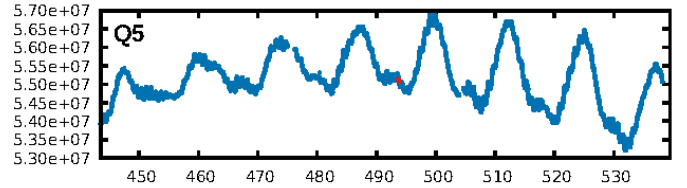
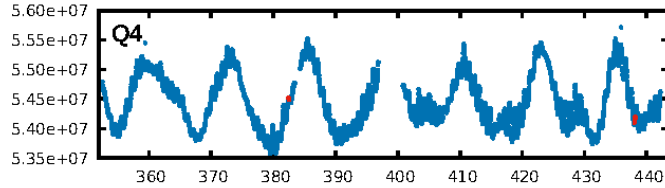
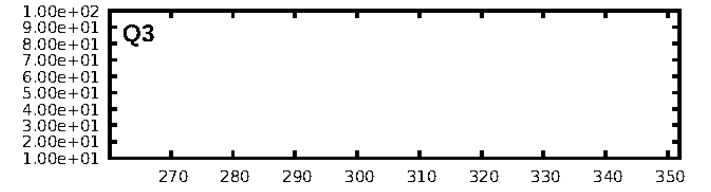
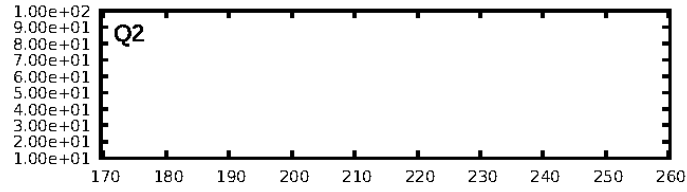
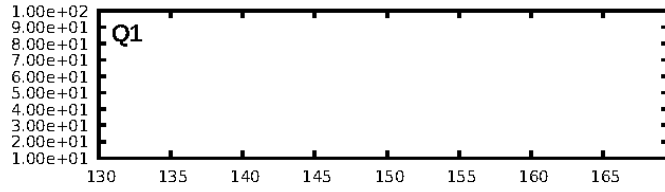
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [40.29σ]  
LongPeriod-sig: 100.0% [5.07σ]  
ModelChiSquare2-sig: 26.9%  
ModelChiSquareGof-sig: 88.5%  
Bootstrap-pfa: 1.28e-09  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.439  
Centroid-sig: 90.0%  
Centroid-so: 2.323 arcsec [1.05σ]  
OotOffset-rm: 0.171 arcsec [1.10σ]  
OotOffset-st: 3/3/2/0 [8]  
KicOffset-rm: 9.456 arcsec [61.01σ]  
KicOffset-st: 3/3/2/0 [8]  
DiffImageQuality-fgm: 0.50 [4/8]  
DiffImageOverlap-fno: 0.46 [6/13]

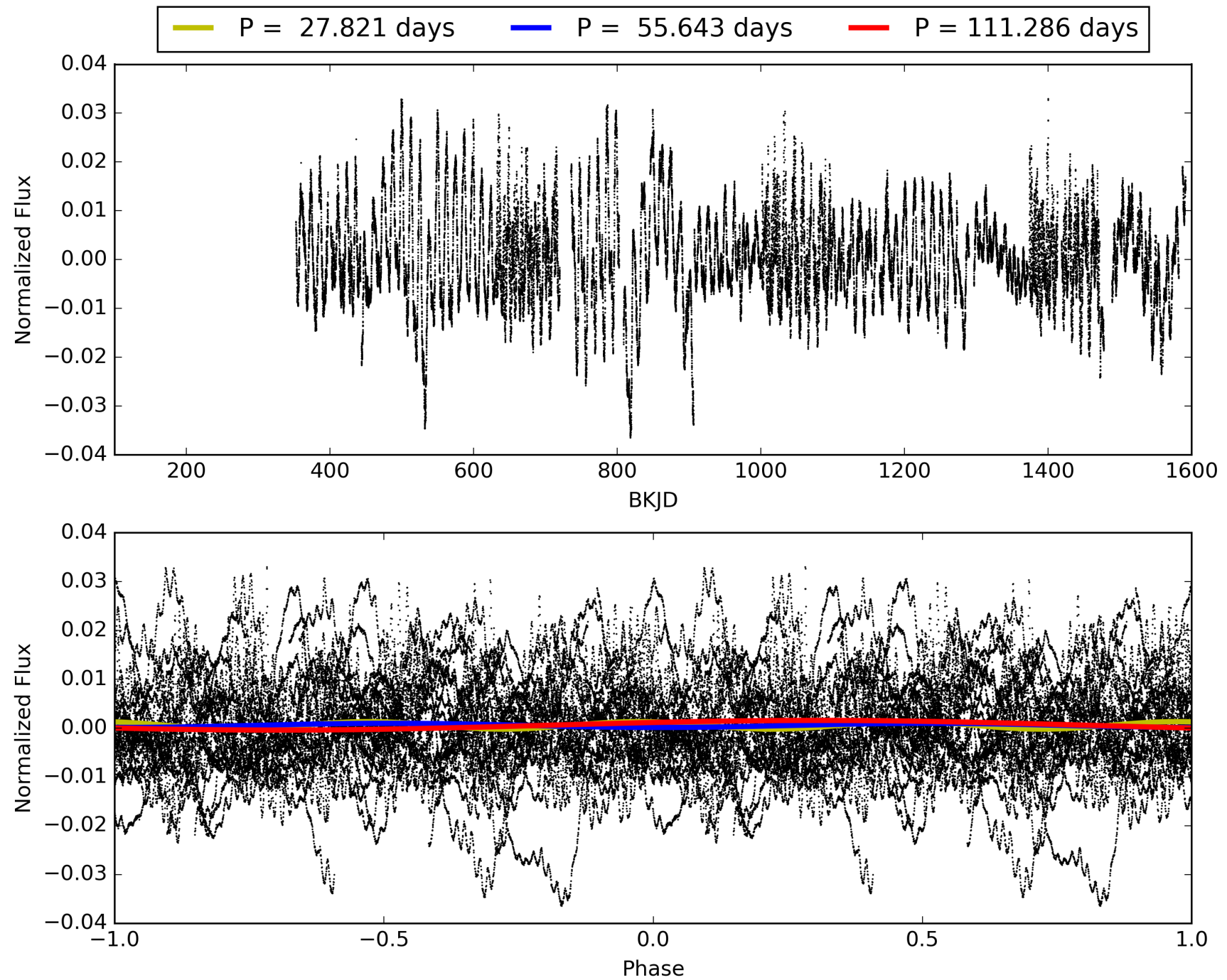
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:20:47 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003441423-10, PDC Light Curves

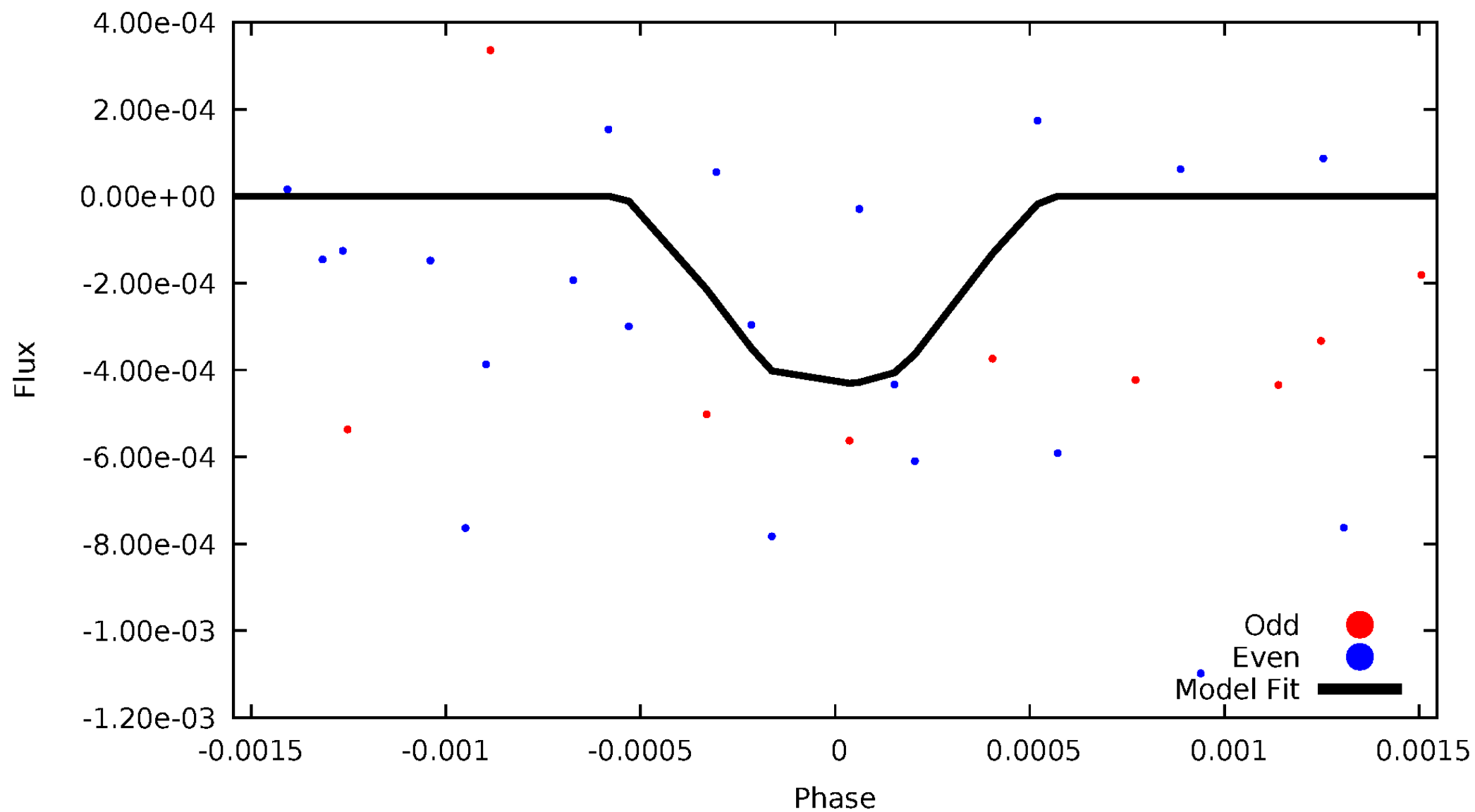


TCE 003441423-10



# DV Odd/Even

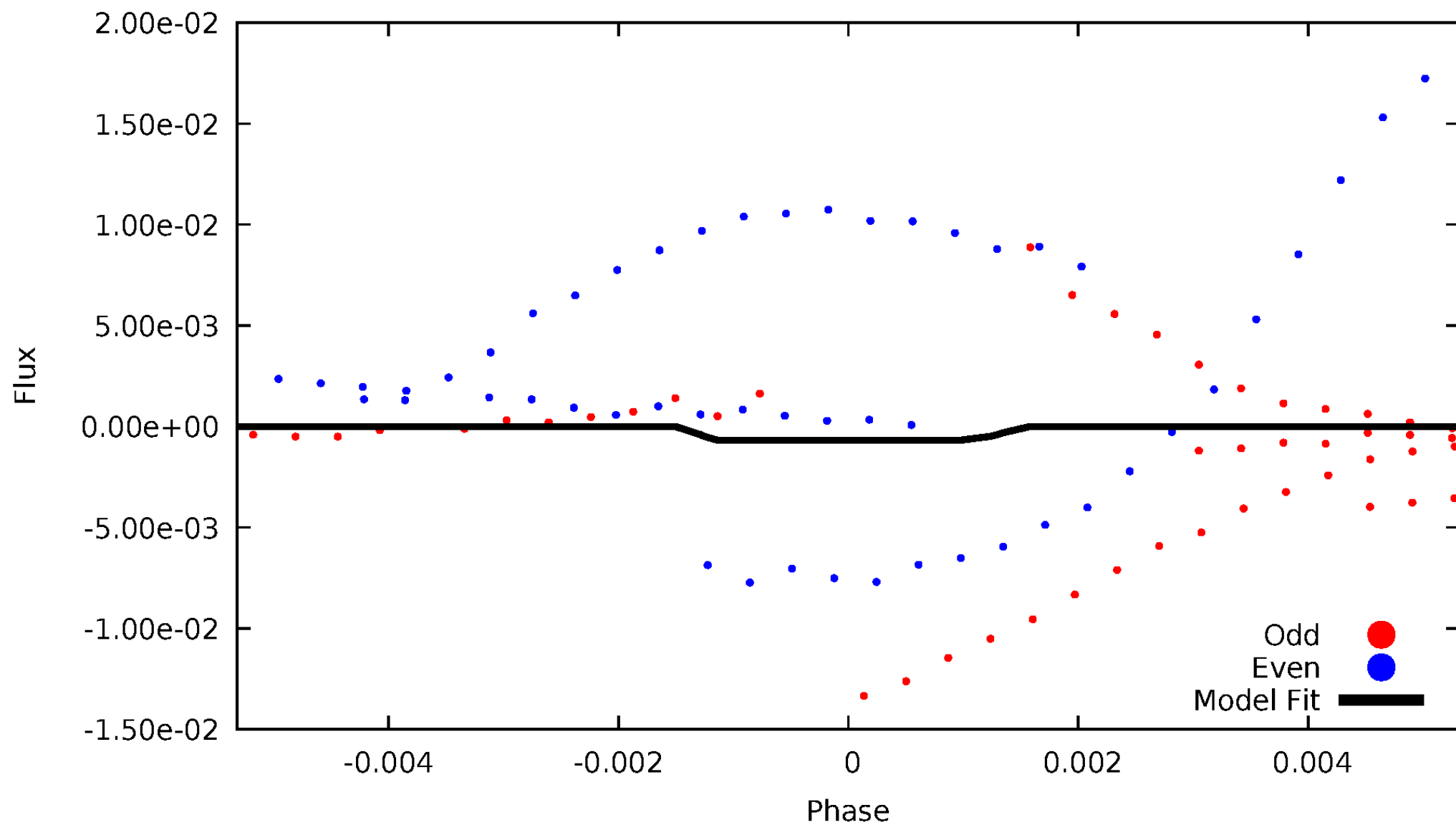
TCE 003441423-10





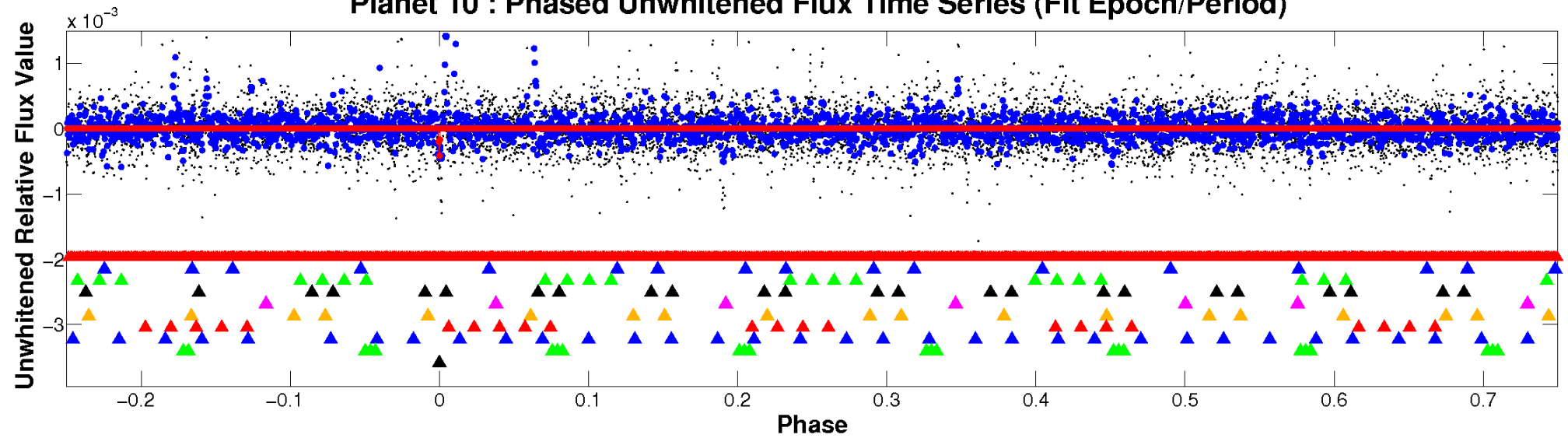
# ALT Odd/Even

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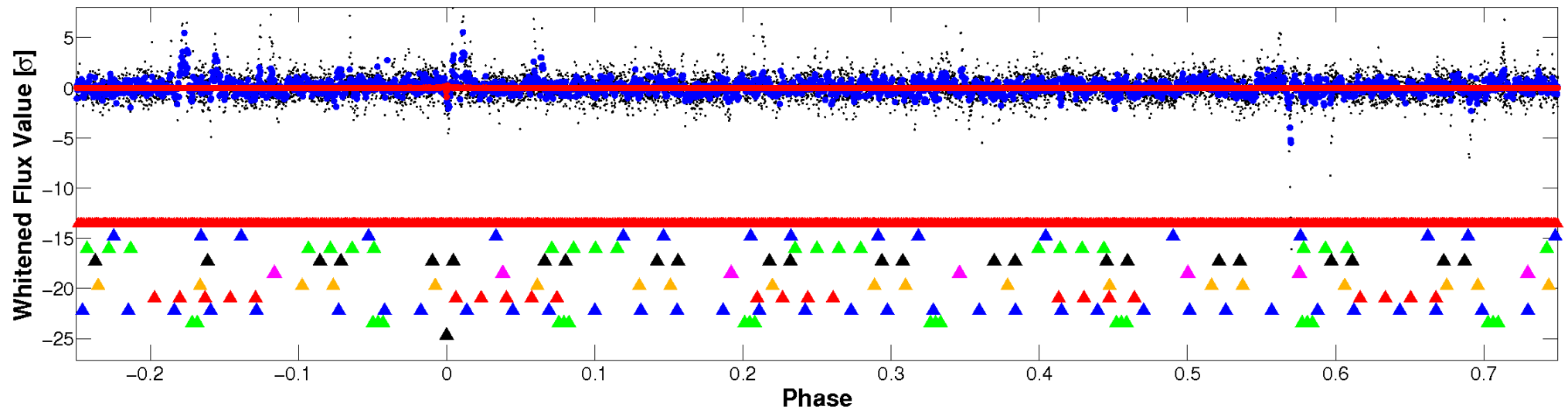


# Non-Whitened Vs. Whitened Light Curve

Planet 10 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

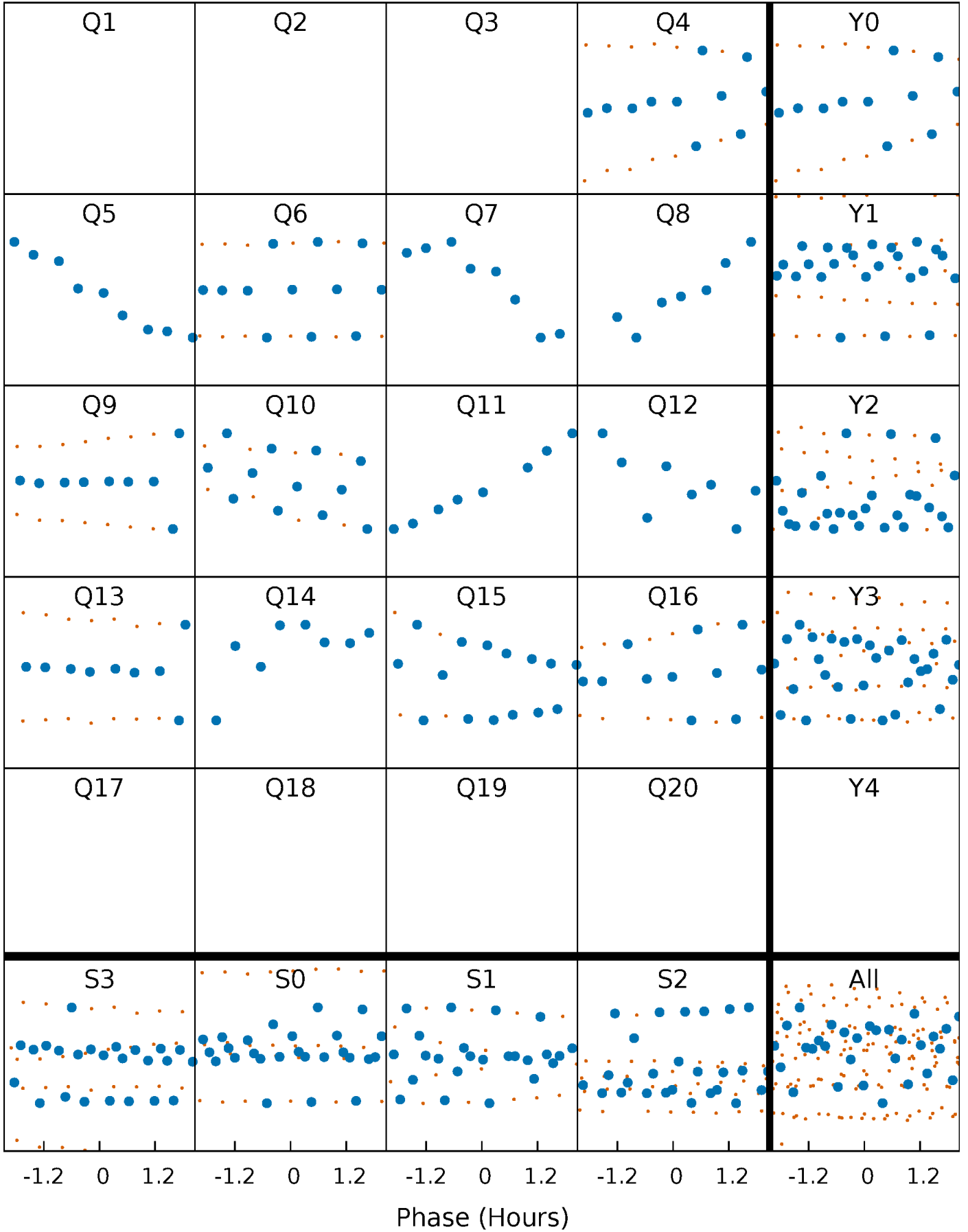


Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)



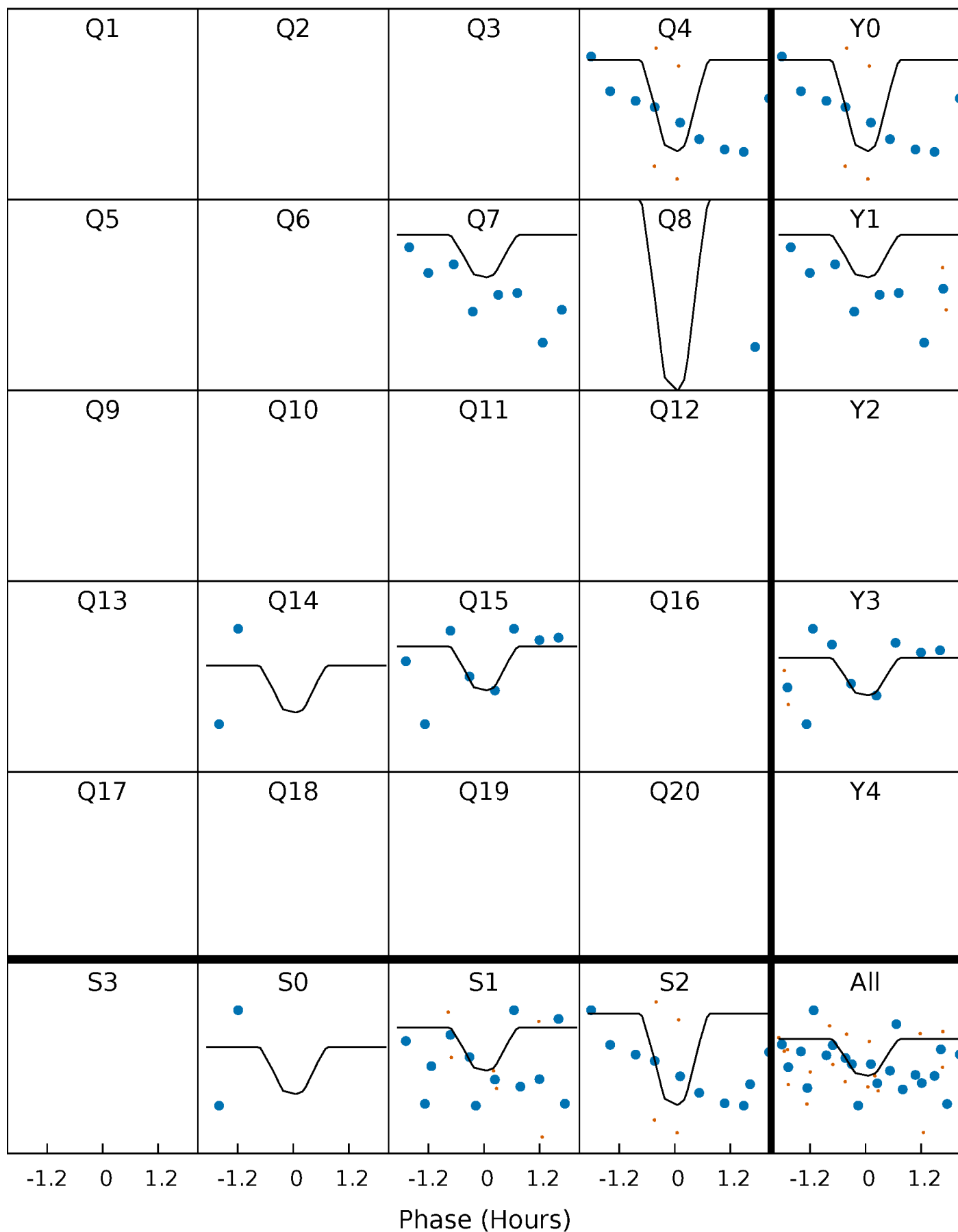
# PDC Quarter-Phased Transit Curves

TCE 003441423-10   P= 55.642936 Days    $T_0=159.899113$  (BKJD)



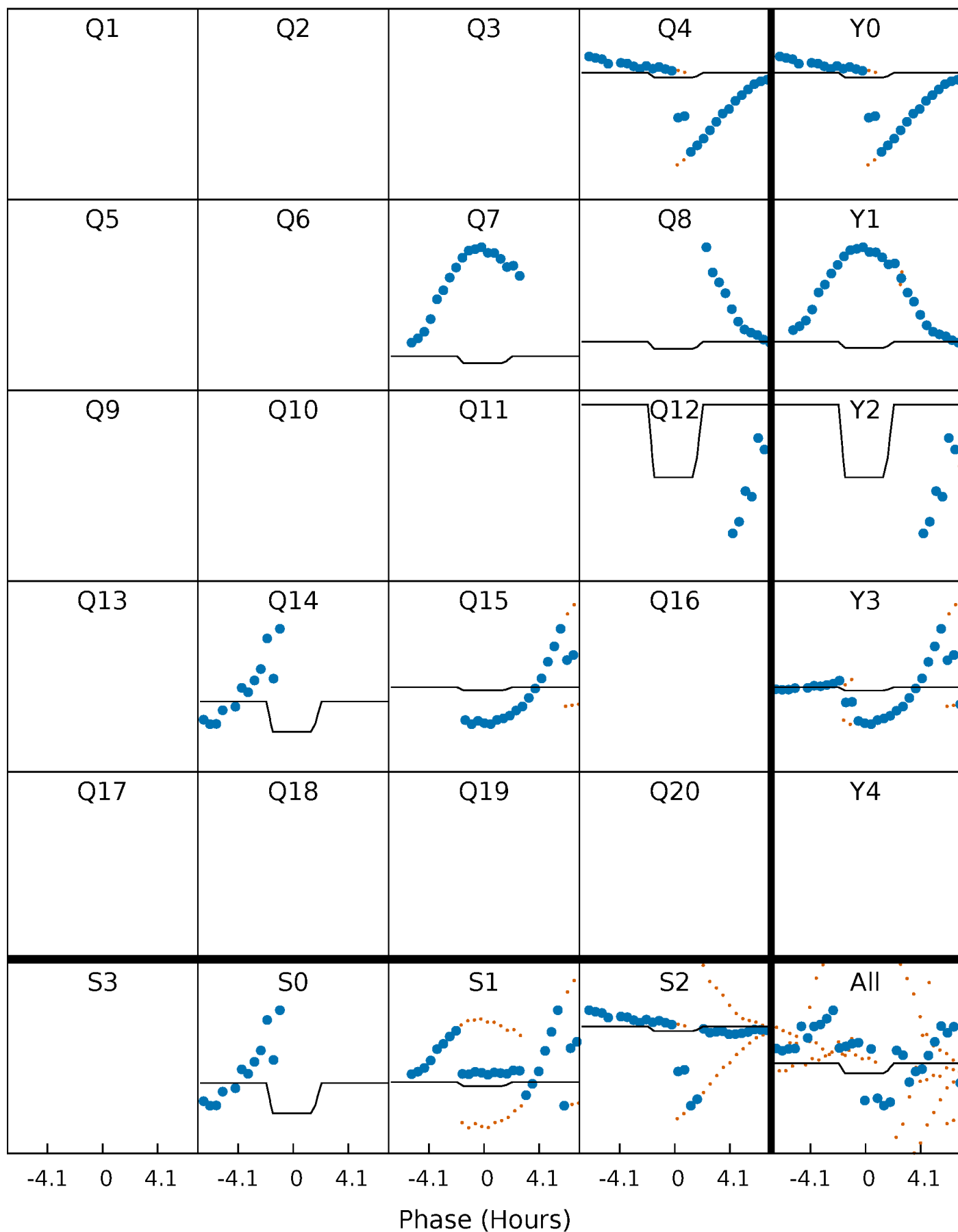
# DV Quarter-Phased Transit Curves

TCE 003441423-10 P= 55.642936 Days  $T_0=159.899113$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

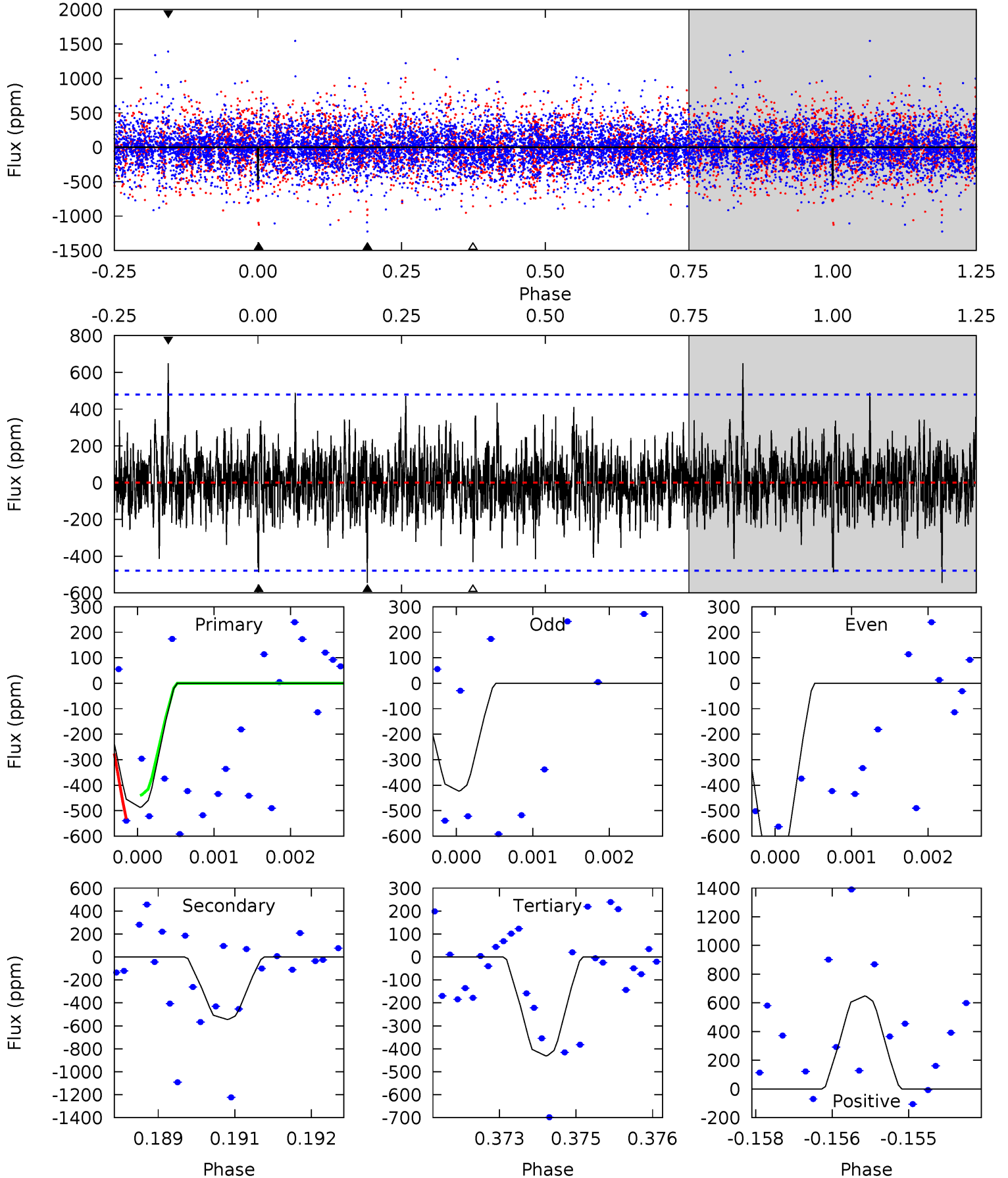
TCE 003441423-10 P= 55.644157 Days  $T_0=159.867108$  (BKJD)



# DV Model-Shift Uniqueness Test

003441423-10, P = 55.642936 Days, E = 159.899113 Days

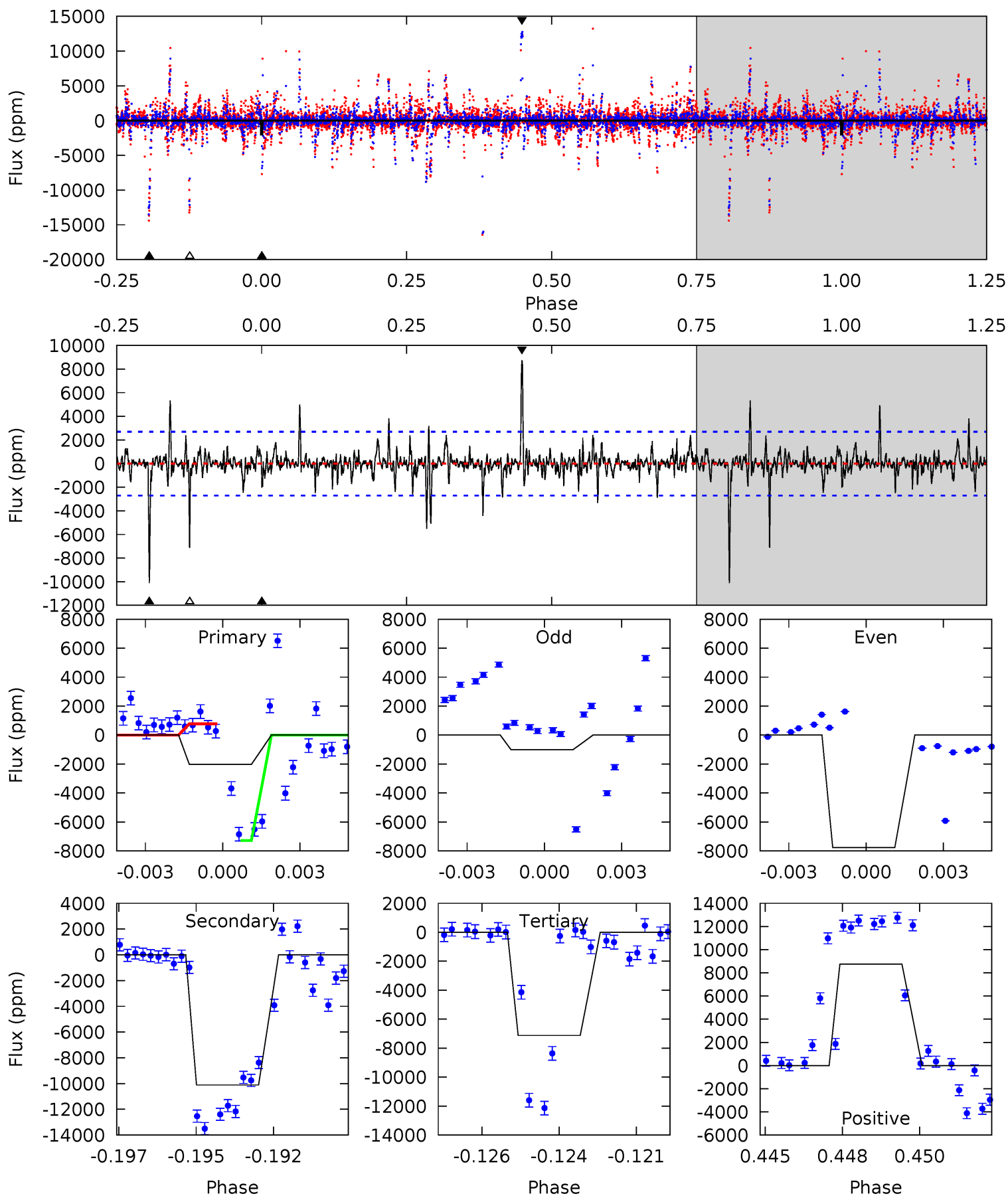
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.53	6.18	4.90	7.36	5.43	3.26	1.38	0.63	-1.83	1.28	-1.18	1.27	0.86	0.54	0.52



# Alt Model-Shift Uniqueness Test

003441423-10, P = 55.644157 Days, E = 159.867108 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.95	19.8	13.9	17.1	5.28	3.01	1.53	-9.96	-13.1	5.84	2.68	5.02	-3.55	0.46	0



### Stellar Parameters For KIC 003441423

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5508^{+74}_{-82}$	$4.569^{+0.011}_{-0.094}$	$0.070^{+0.150}_{-0.150}$	$0.840^{+0.088}_{-0.035}$	$0.955^{+0.034}_{-0.078}$	$2.266^{+0.185}_{-0.612}$
	+1%/-1%	+0%/-2%	+214%/-214%	+10%/-4%	+4%/-8%	+8%/-27%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003441423-10 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-545 \pm 88$	$24.74^{+24.66}_{-16.63}$	$596^{+15}_{-13}$	$2485^{+905}_{-383}$	$39^{+319}_{-30}$
Alt.	$-10112 \pm 512$	$24.62^{+25.36}_{-16.81}$	$595^{+17}_{-13}$	$3774^{+2263}_{-742}$	$721^{+6307}_{-547}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$



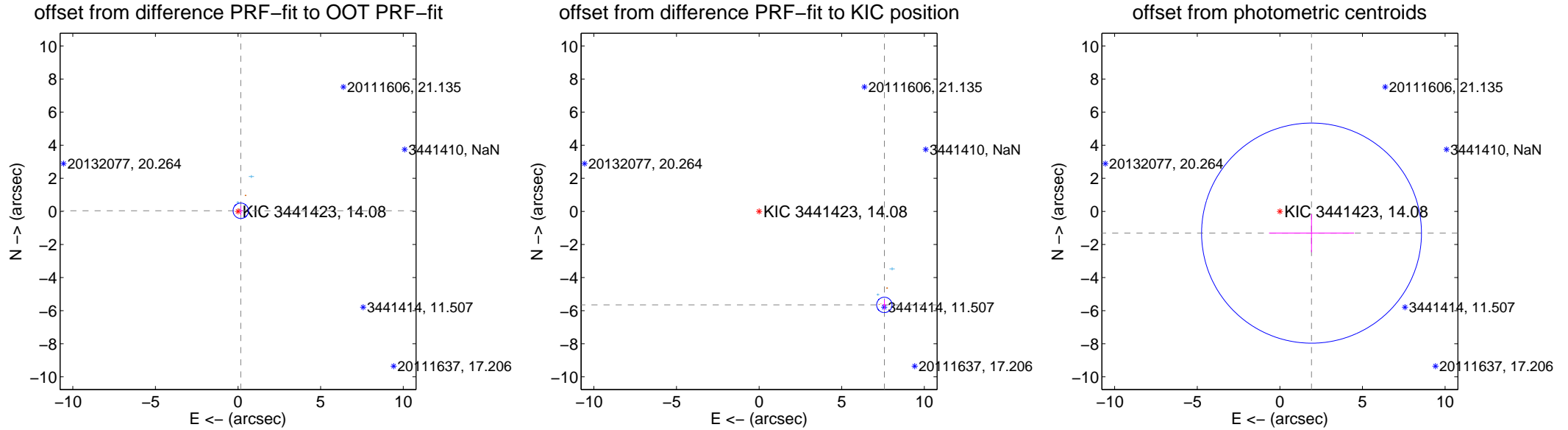
## DV Centroid Data

Supplemental centroid analysis for 003441423-10. Kepler magnitude: 14.08. Transit SNR 2.24

There are 4 quarters with good PRF difference image offsets

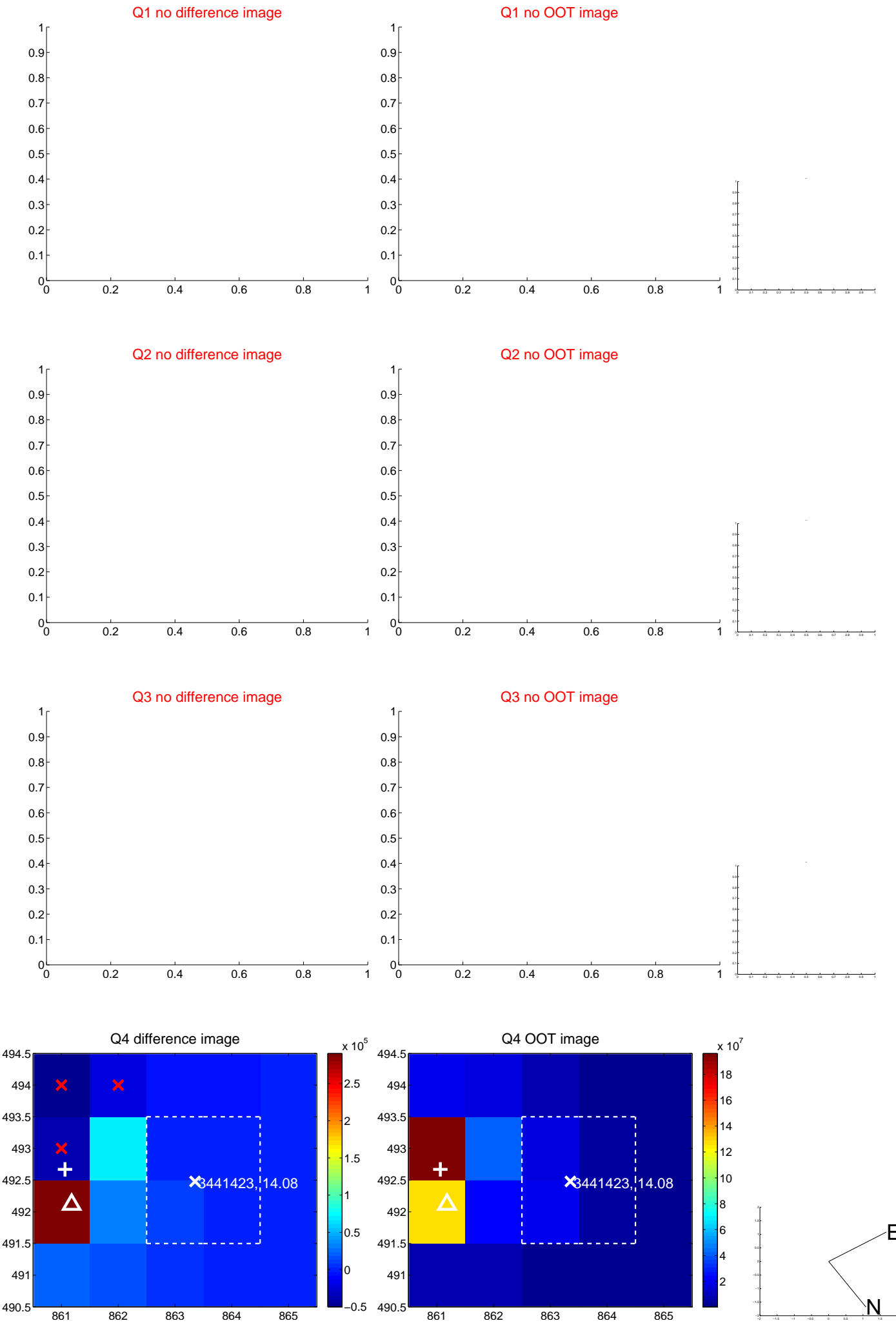
The OOT PRF centroid is offset from the target star catalog position by about 9.11 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.171 \pm 0.156$	1.10	$-0.167 \pm 0.113$	$0.037 \pm 0.264$
PRF-fit source offset from KIC position	$9.456 \pm 0.155$	61.01	$-7.581 \pm 0.109$	$-5.652 \pm 0.307$
photometric centroid source offset	$2.32 \pm 2.22$	1.05	$-1.92 \pm 2.57$	$-1.31 \pm 1.15$

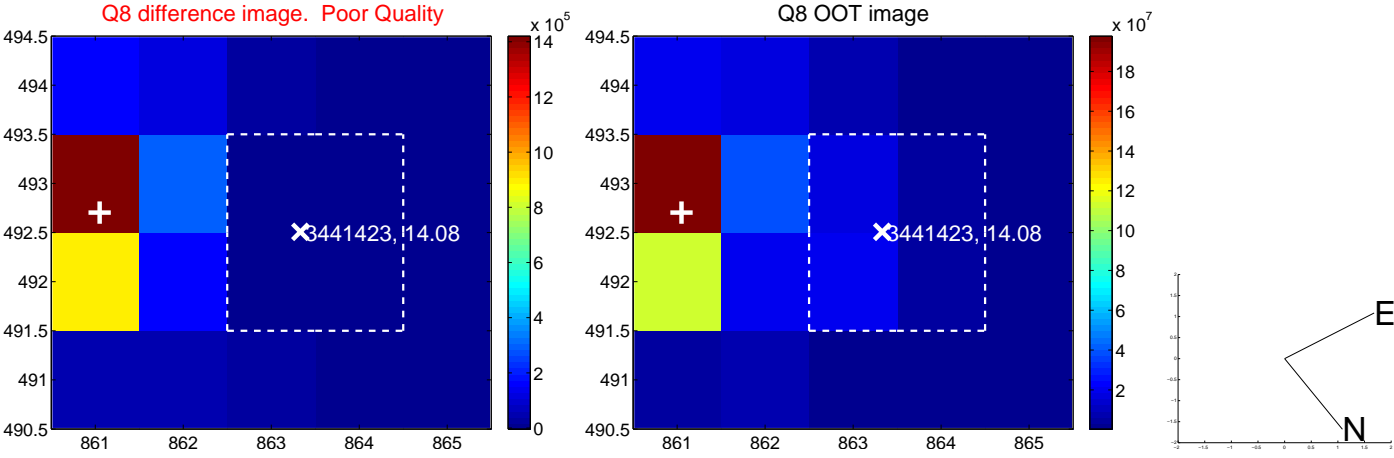
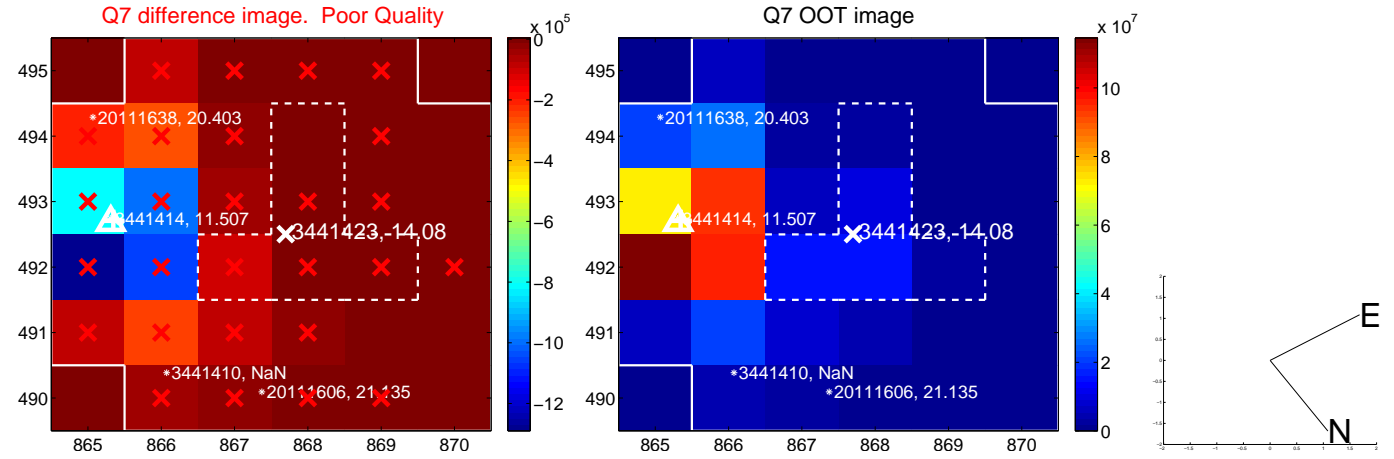
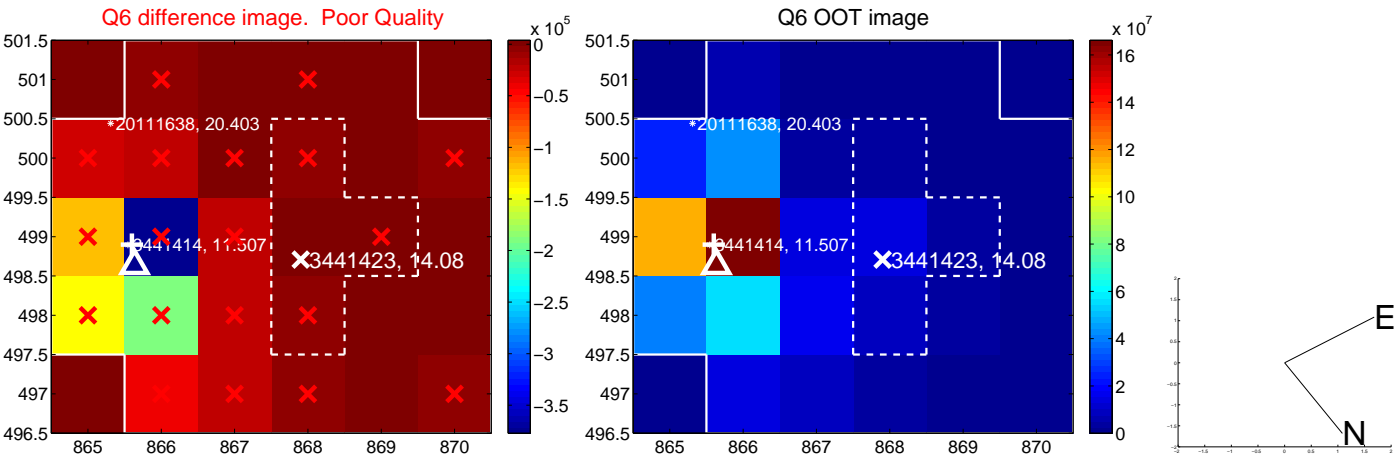
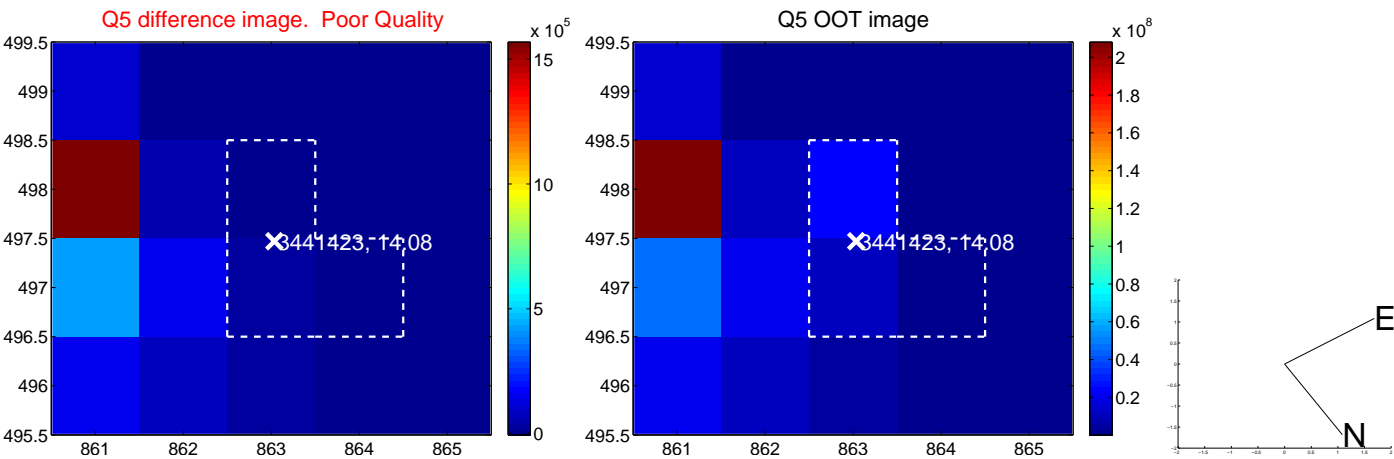


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

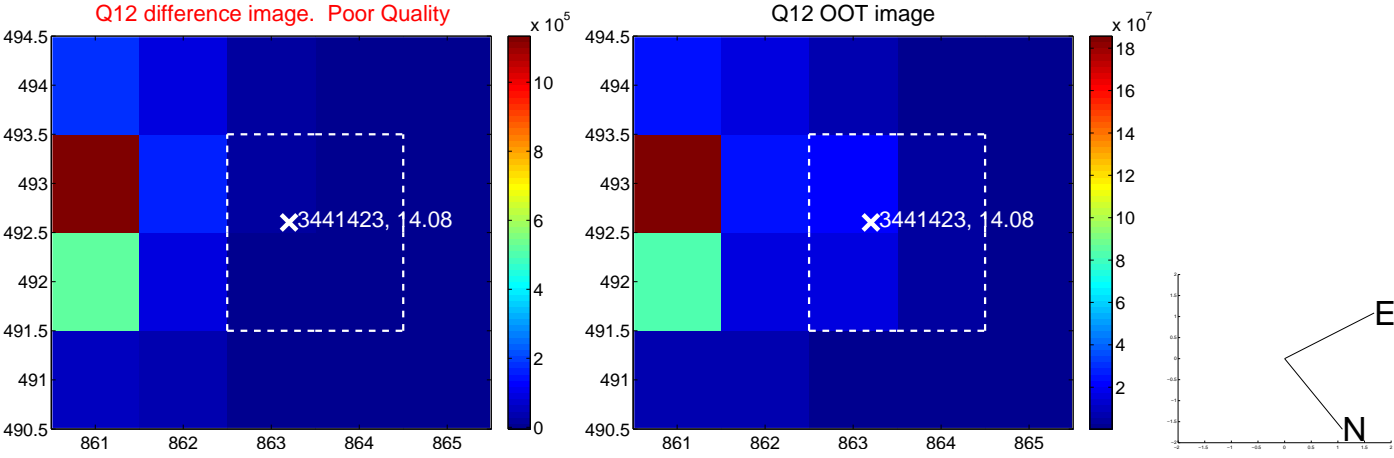
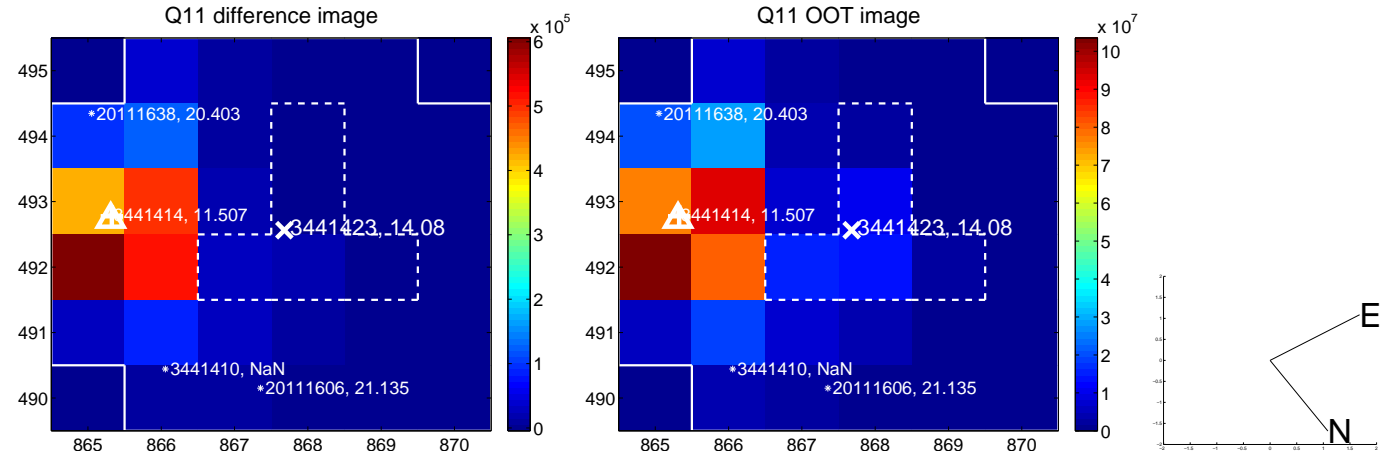
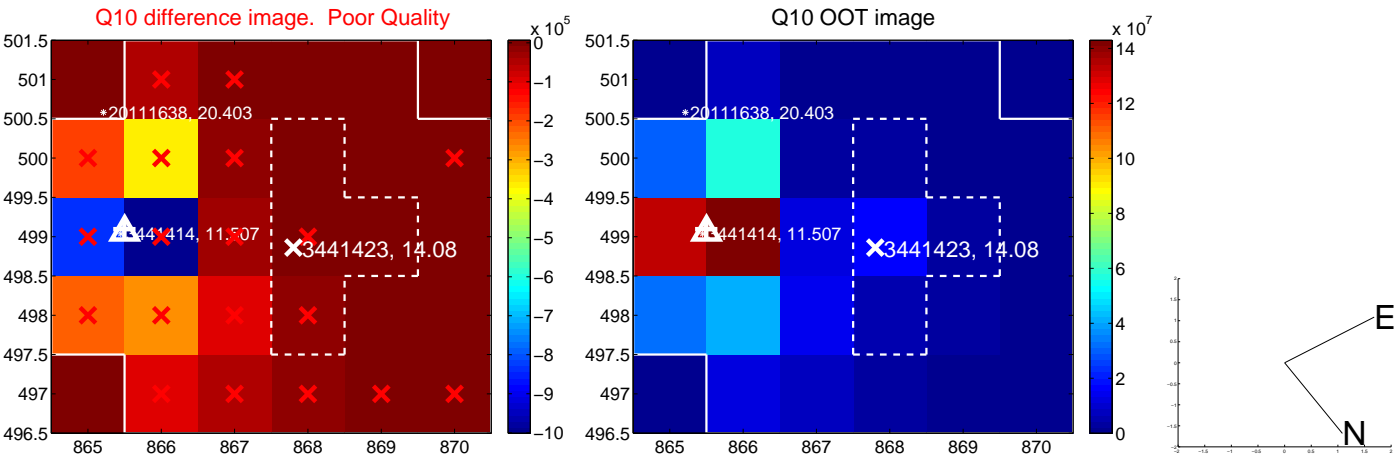
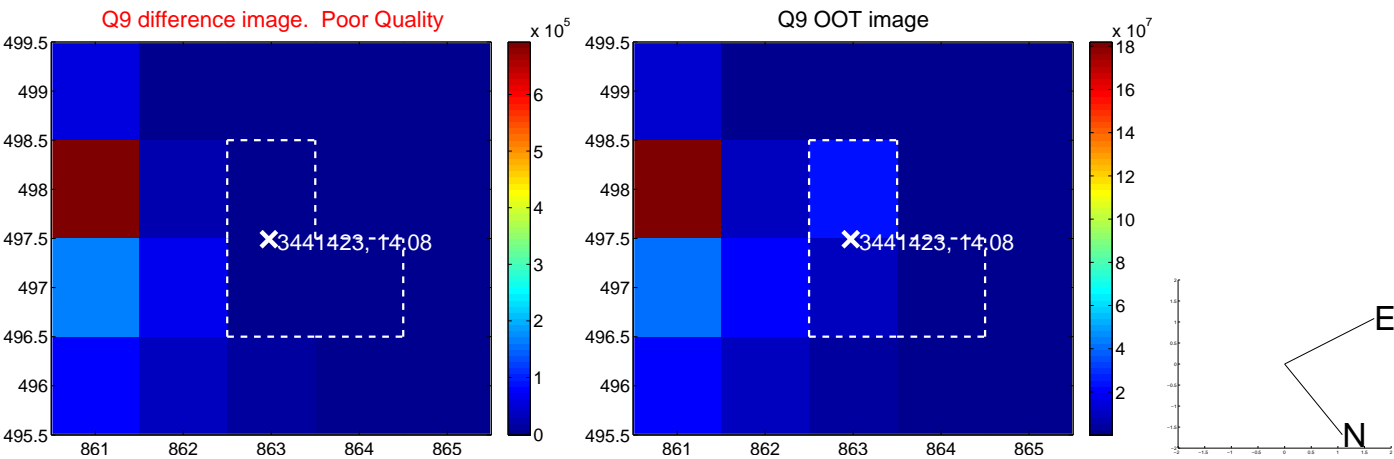
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



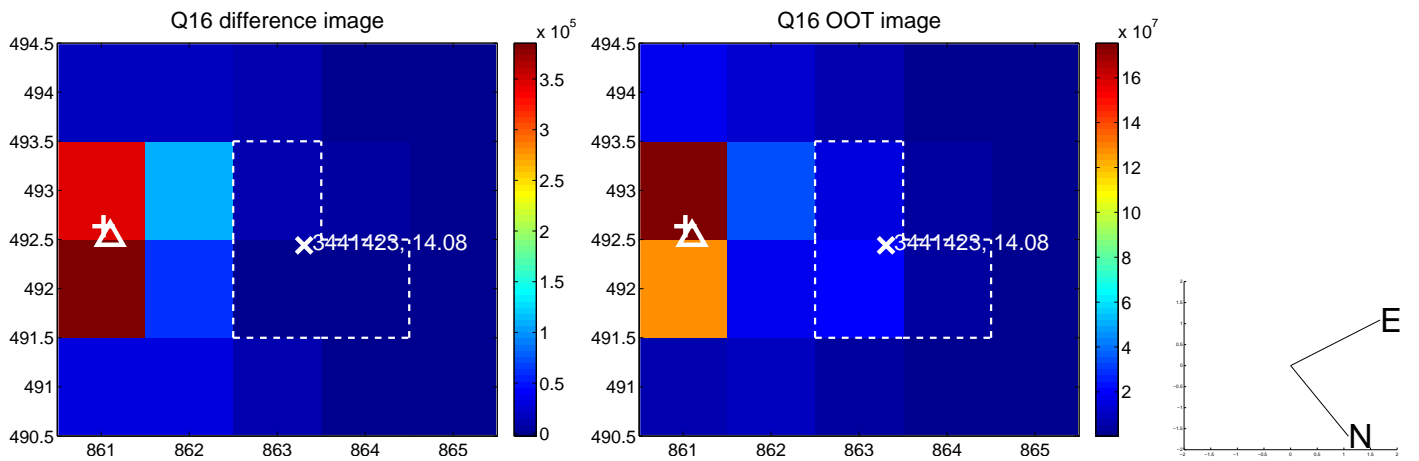
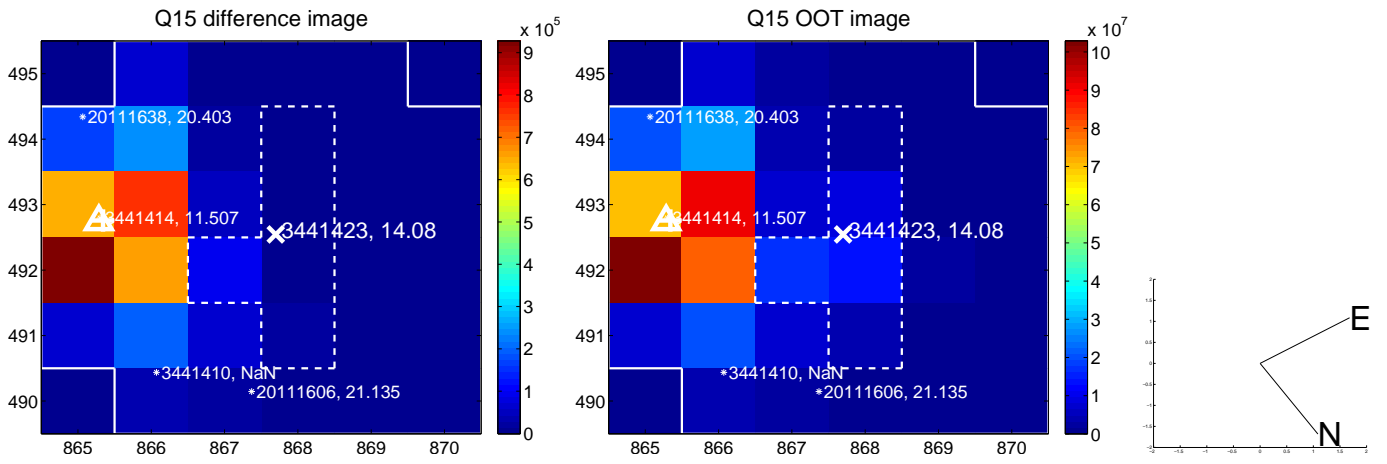
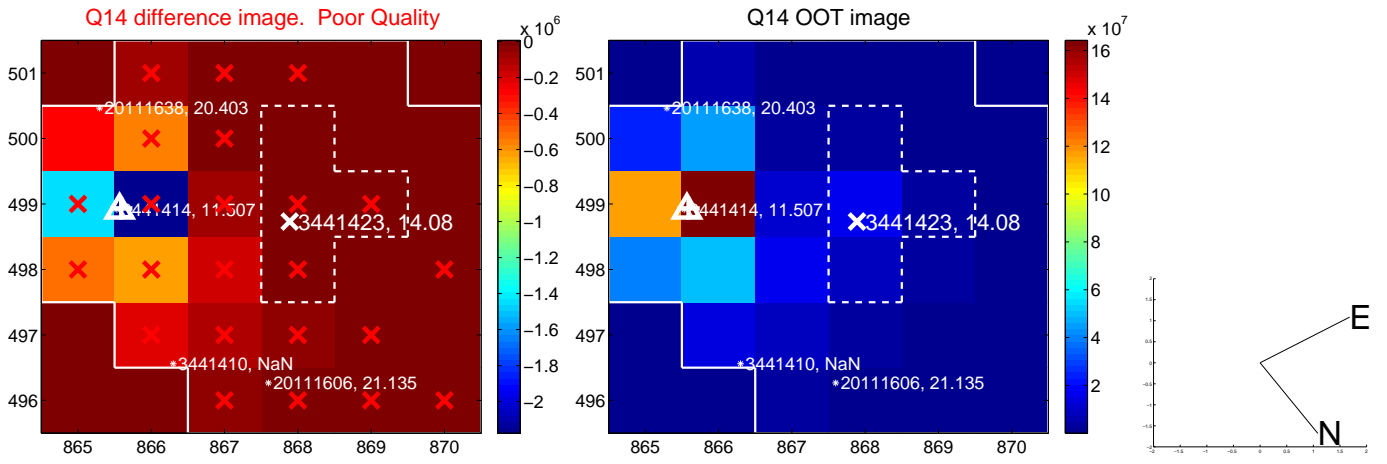
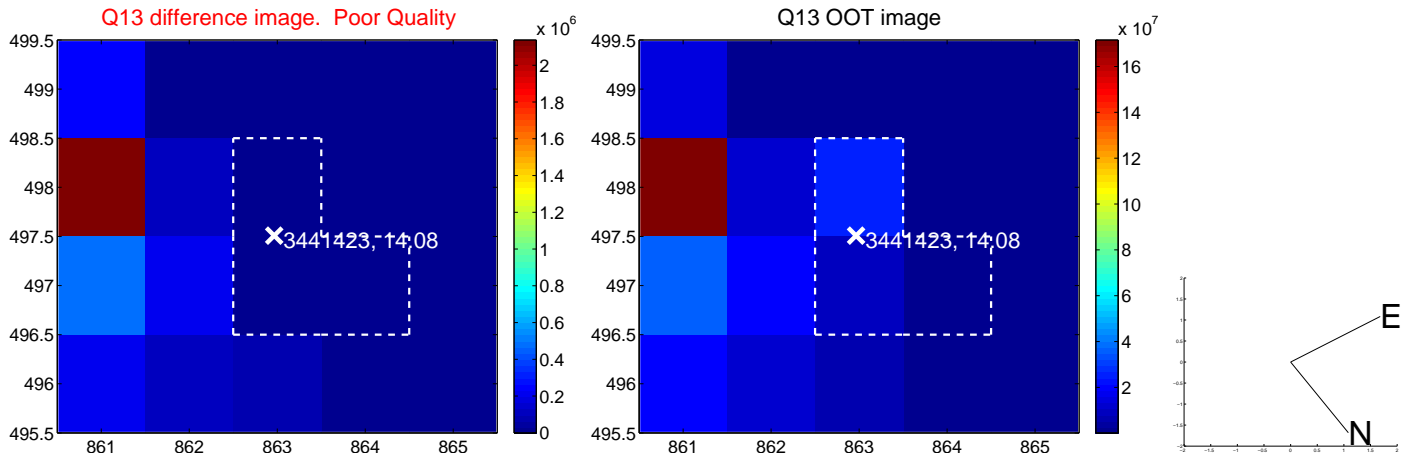
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



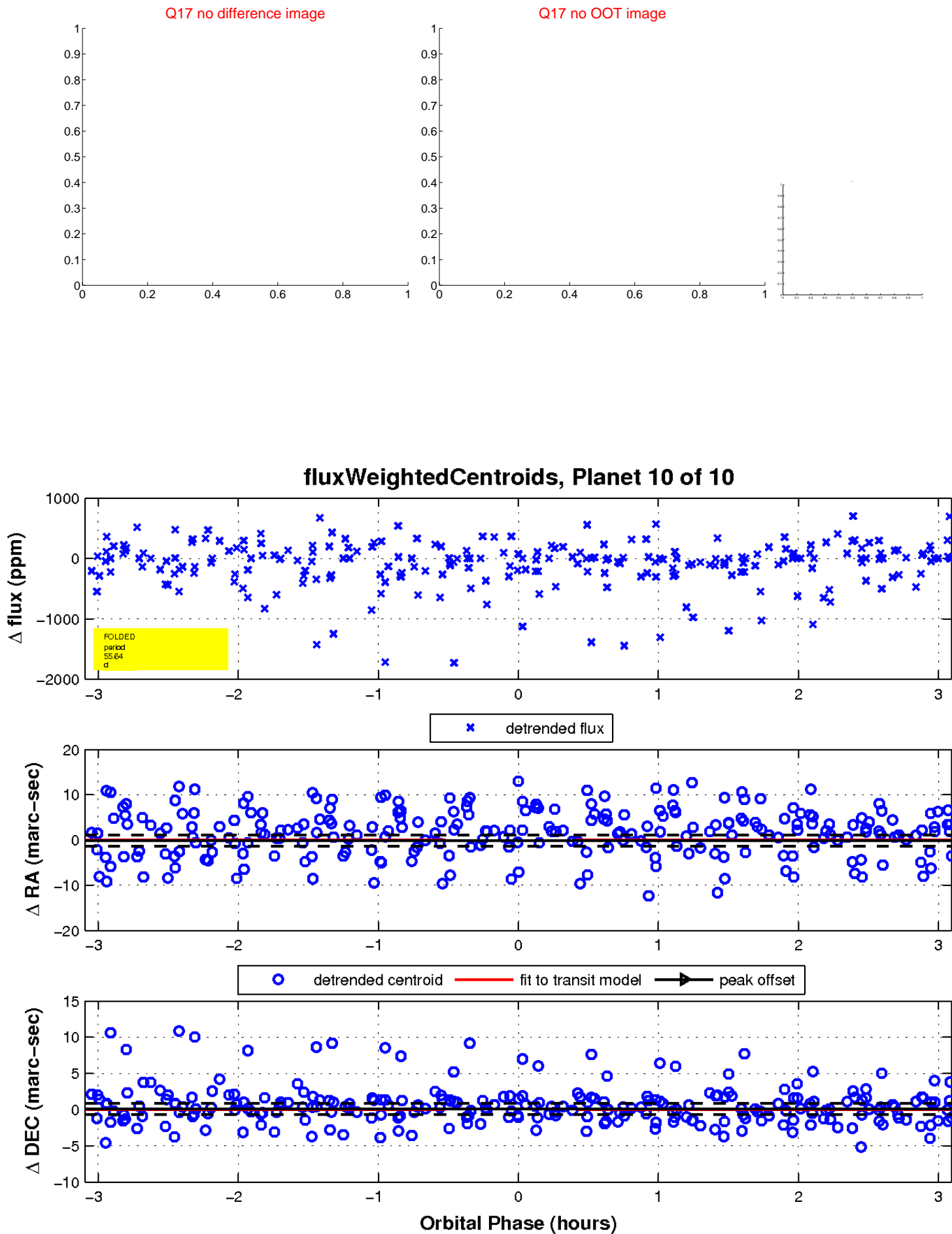
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

