

# KIC 004641419

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004641419-01	OBS	No	1.743581	132.209016	22.6	10.456	8.2	8.1	1.17	6601	0.58	2571.13
004641419-02	OBS	No	98.906941	157.479211	259.7	11.874	8.9	8.6	1.17	6601	2.04	11.80
004641419-03	OBS	No	127.532745	194.155465	362.1	3.179	8.7	8.2	1.17	6601	2.46	8.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004641419-01	OBS	FP	0.00	1	0	0	0	LPP_DV
004641419-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004641419-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

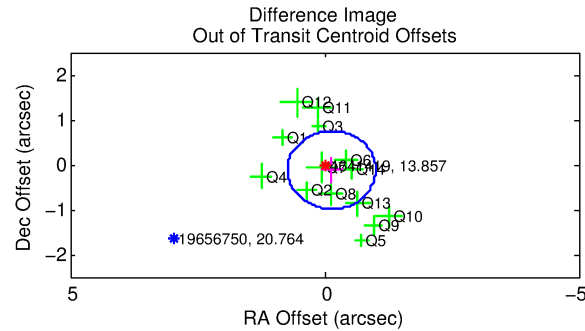
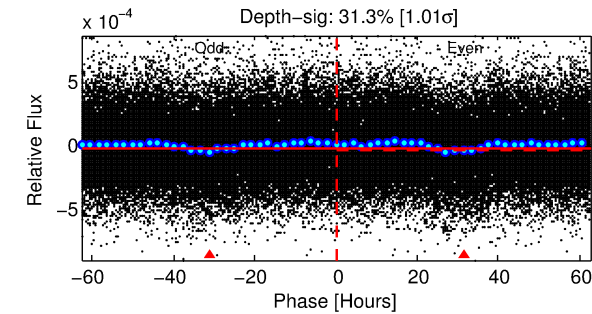
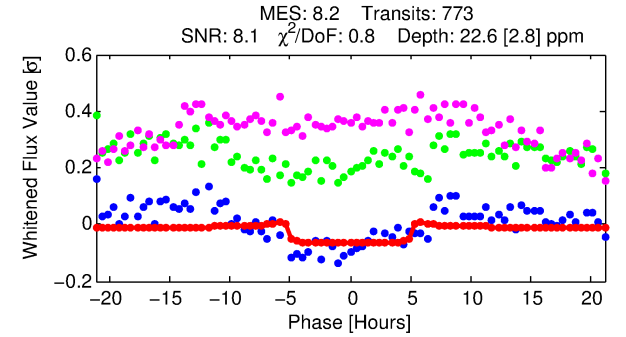
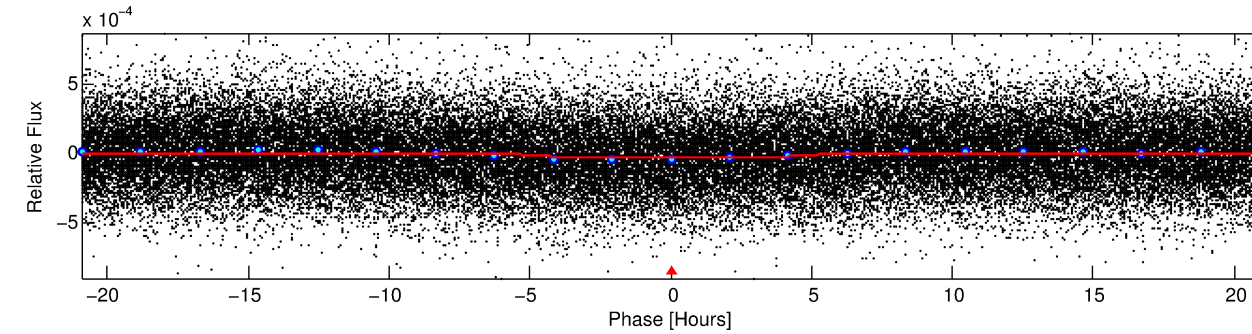
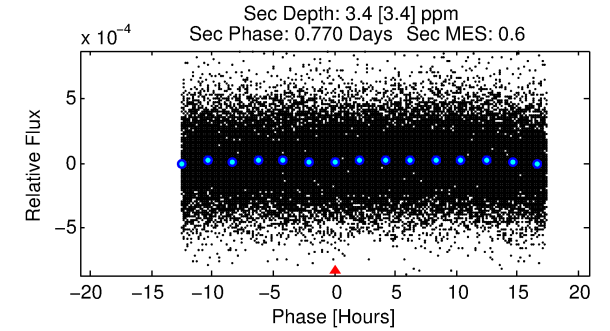
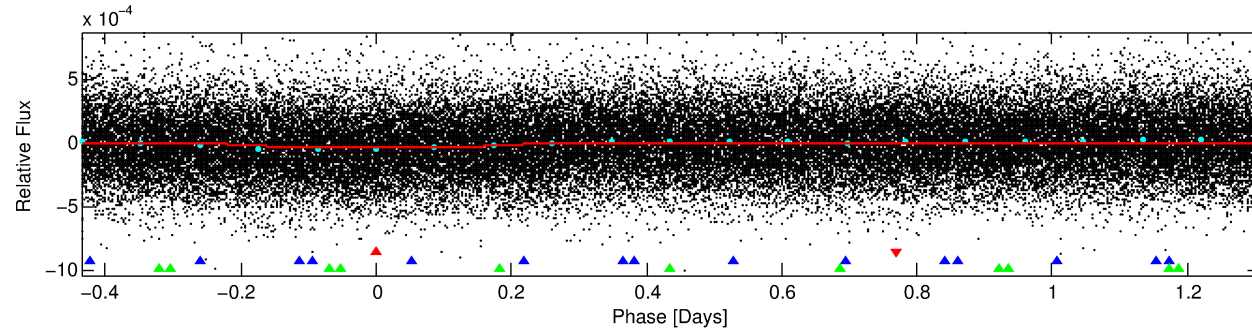
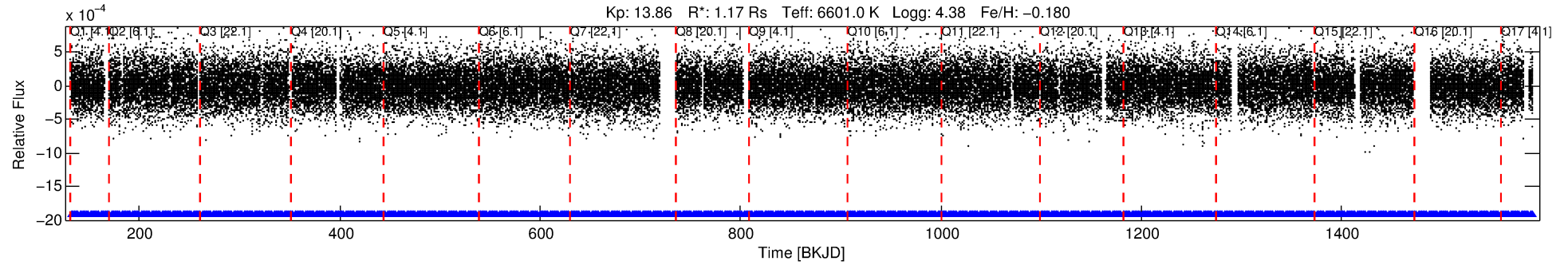
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004641419-01

No Significant Match Found

# DV One-Page Summary

KIC: 4641419 Candidate: 1 of 3 Period: 1.744 d



## DV Fit Results:

Period = 1.74358 [0.00003] d  
Epoch = 132.2090 [0.0089] BKJD  
Rp/R\* = 0.0045 [0.0029]  
a/R\* = 1.30 [1.88]  
b = 0.57 [4.24]  
Seff = 2571.13 [1041.49]  
Teq = 1816 [184] K  
Rp = 0.58 [0.41] Re  
a = 0.0300 [0.0080] AU  
Ag = 5.09 [8.40] [0.49σ]  
Teffp = 4217 [1698] K [1.41σ]

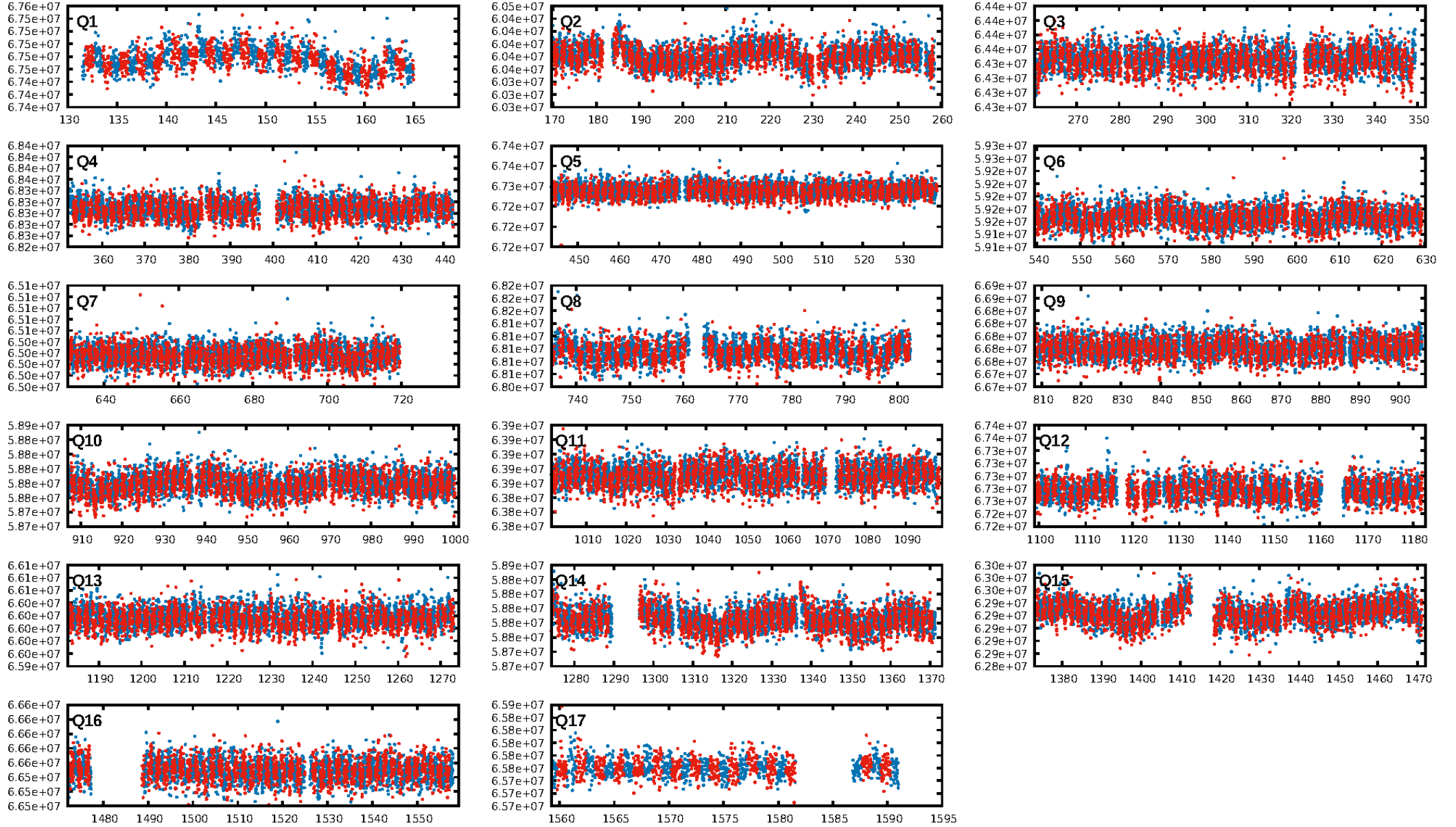
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [147.39σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 5.51e-10**  
RollingBand-fgt: 1.00 [739/739]  
GhostDiagnostic-chr: 2.154  
Centroid-sig: 52.2%  
Centroid-so: 0.583 arcsec [0.63σ]  
OotOffset-rm: 0.180 arcsec [0.62σ]  
KicOffset-rm: 0.111 arcsec [0.49σ]  
OotOffset-st: 4/3/3/4 [14]  
KicOffset-st: 4/3/3/4 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [17/17]

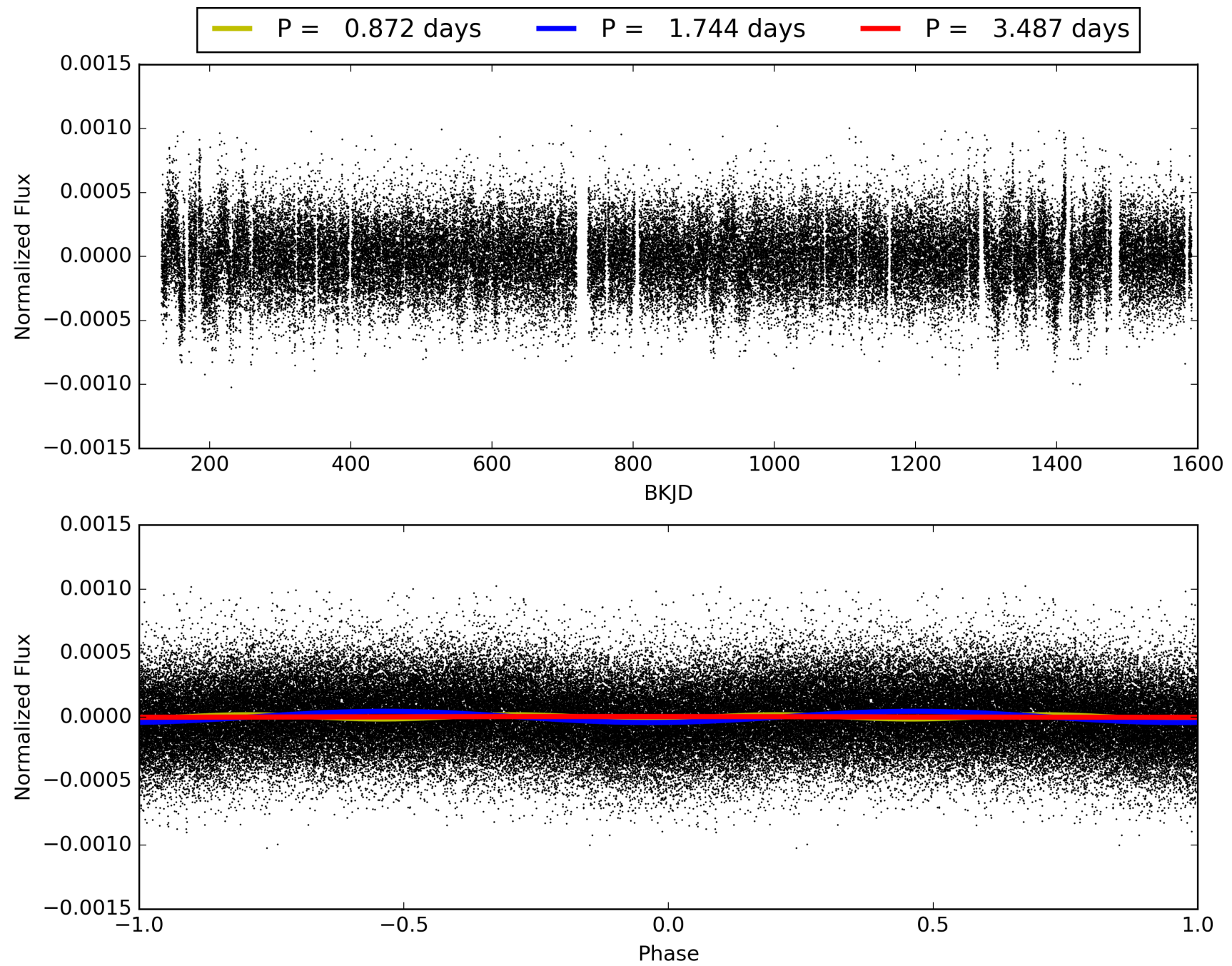
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:52:28 Z

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

# TCE 004641419-01, PDC Light Curves



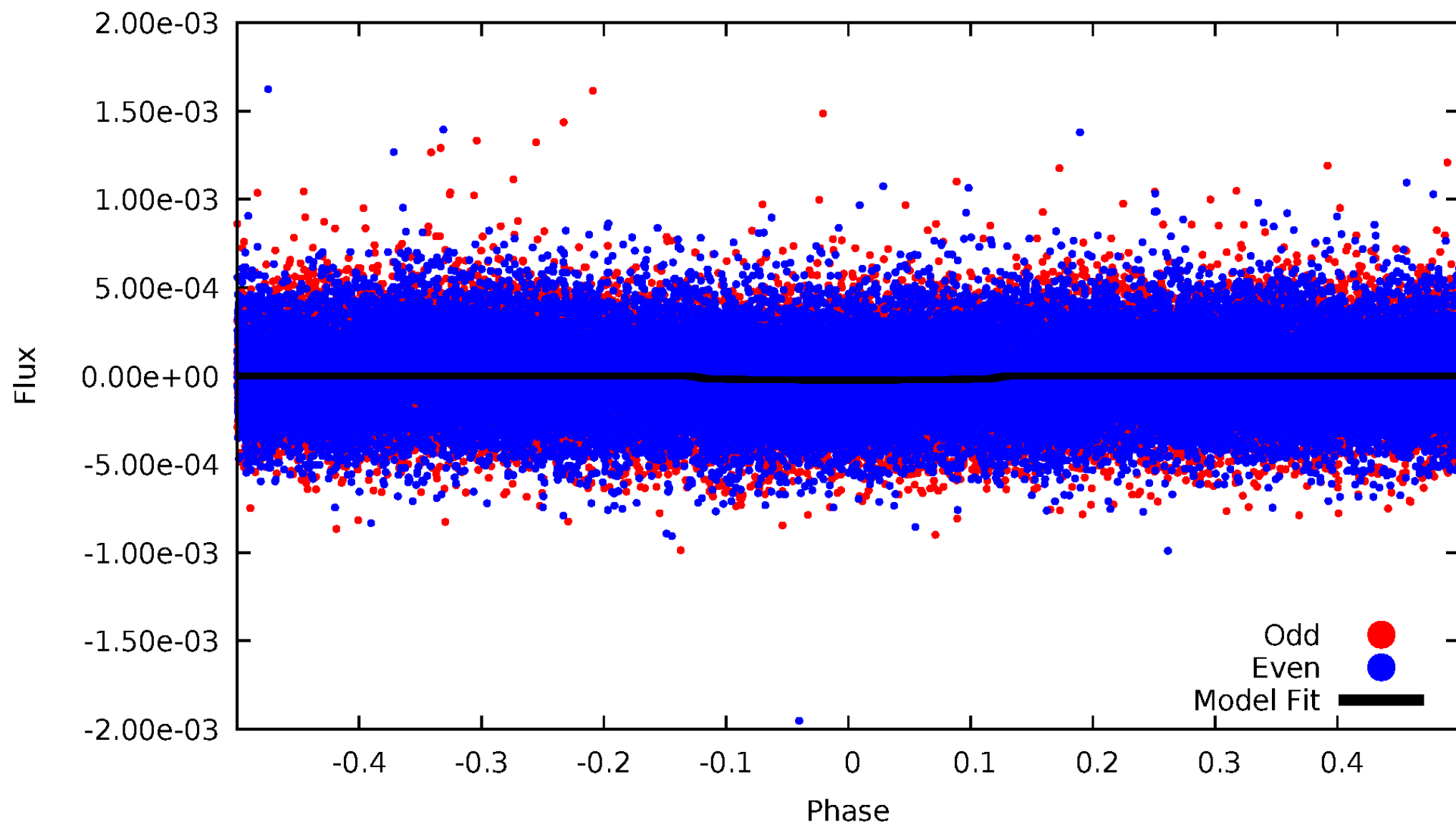
TCE 004641419-01





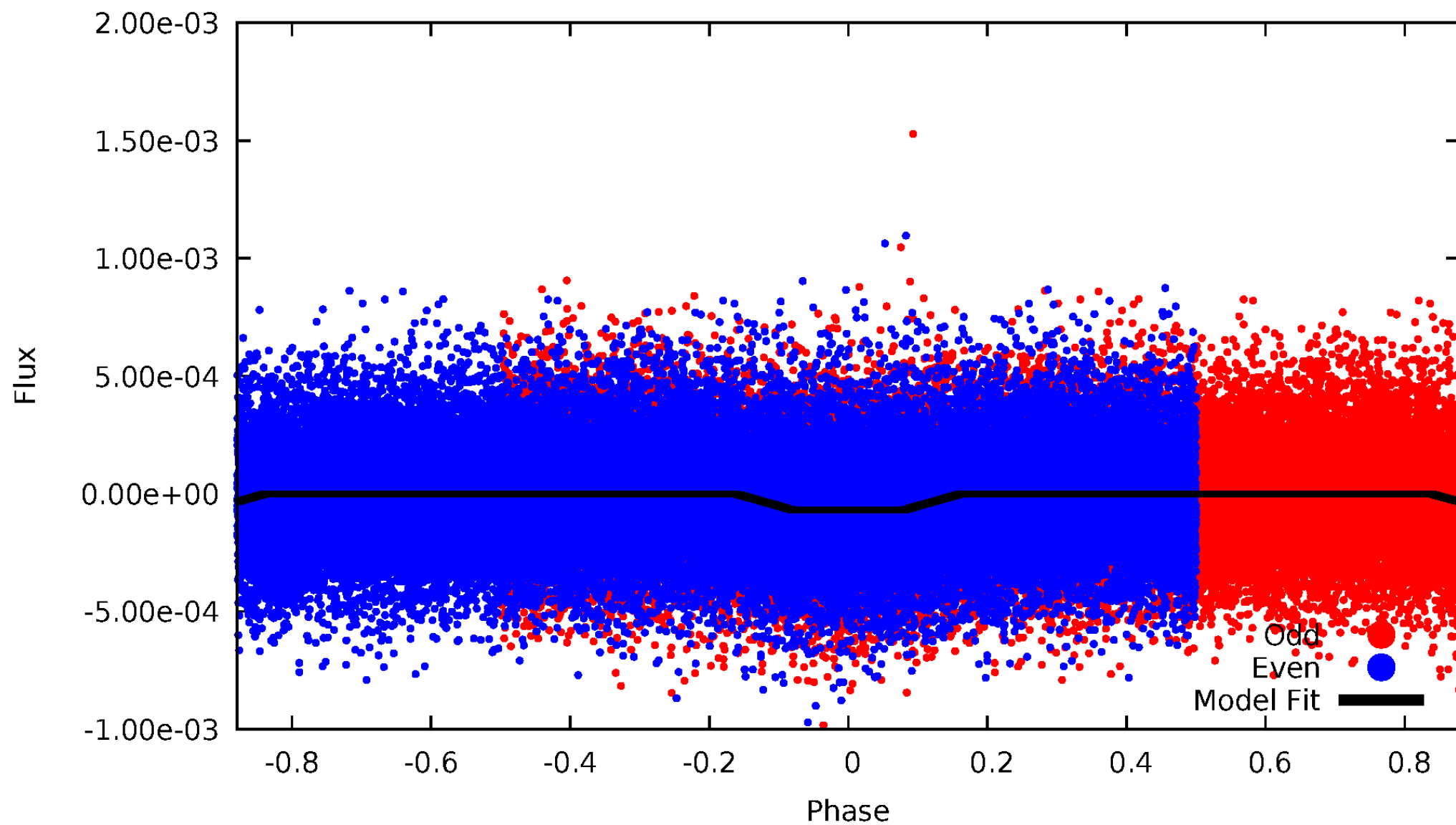
# DV Odd/Even

TCE 004641419-01

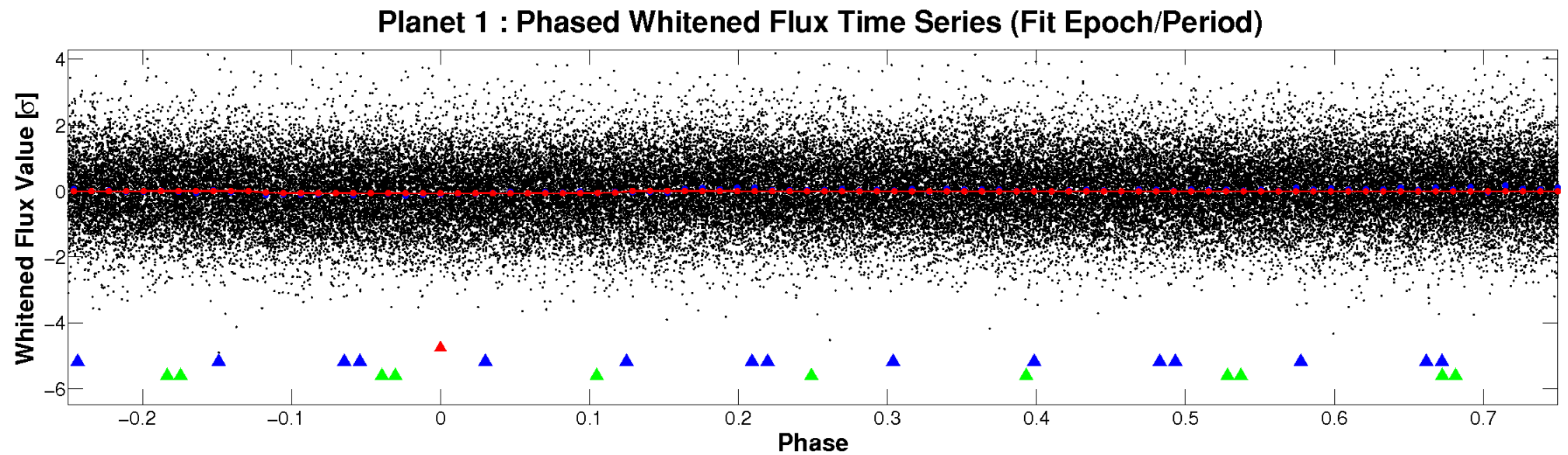
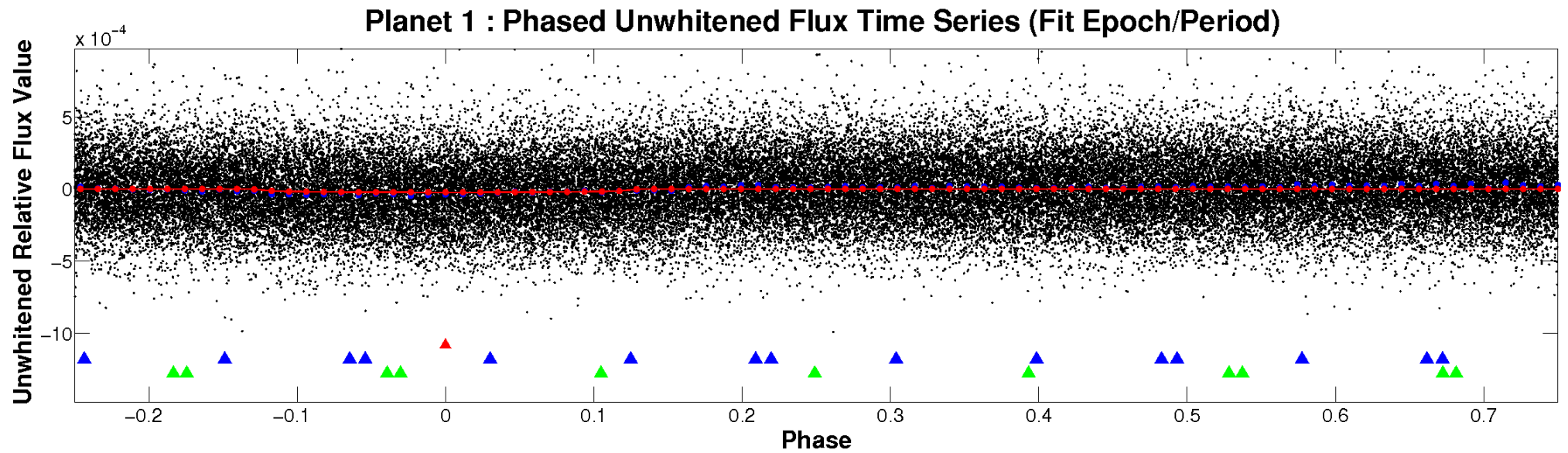


# ALT Odd/Even

TCE 004641419-01

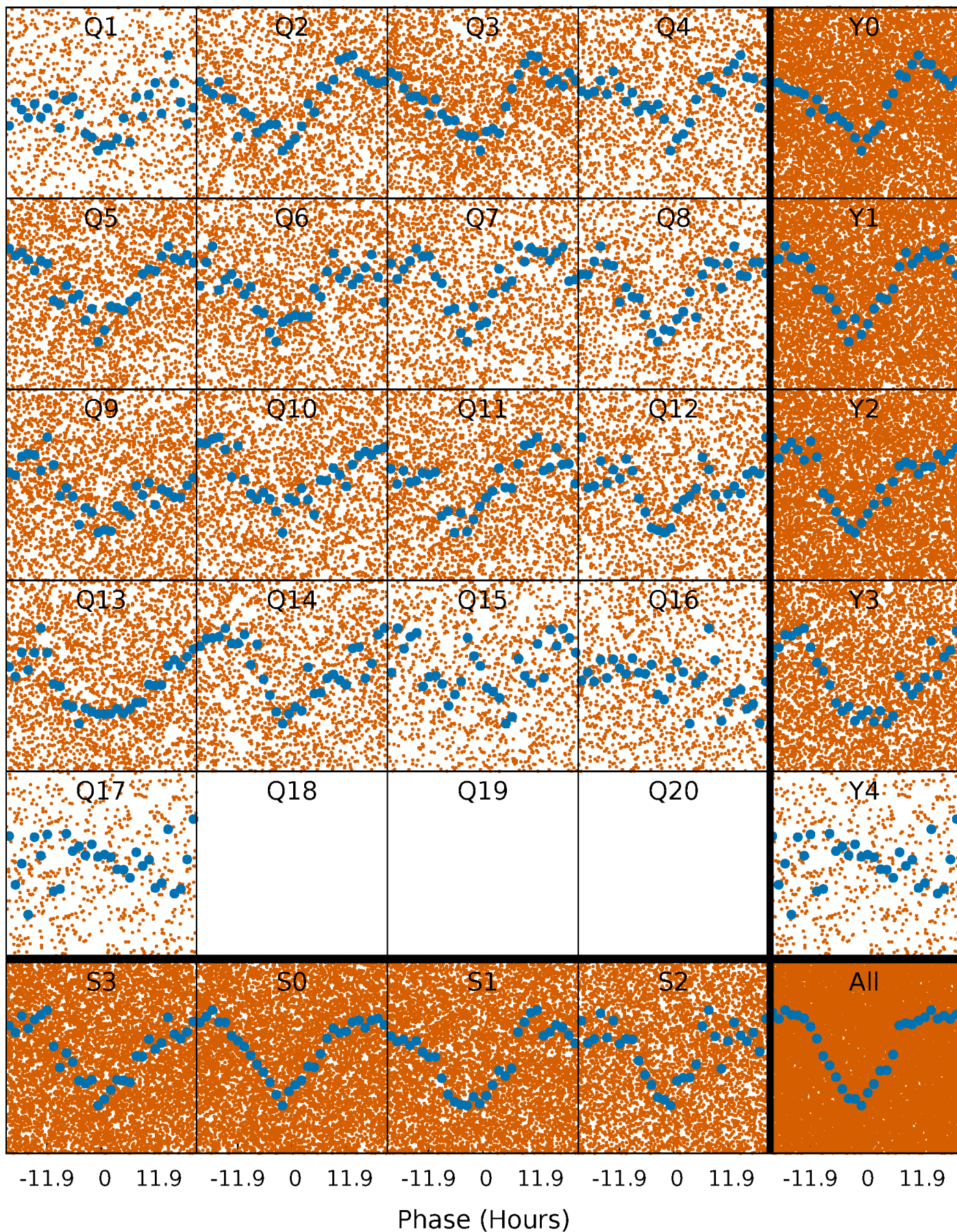


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

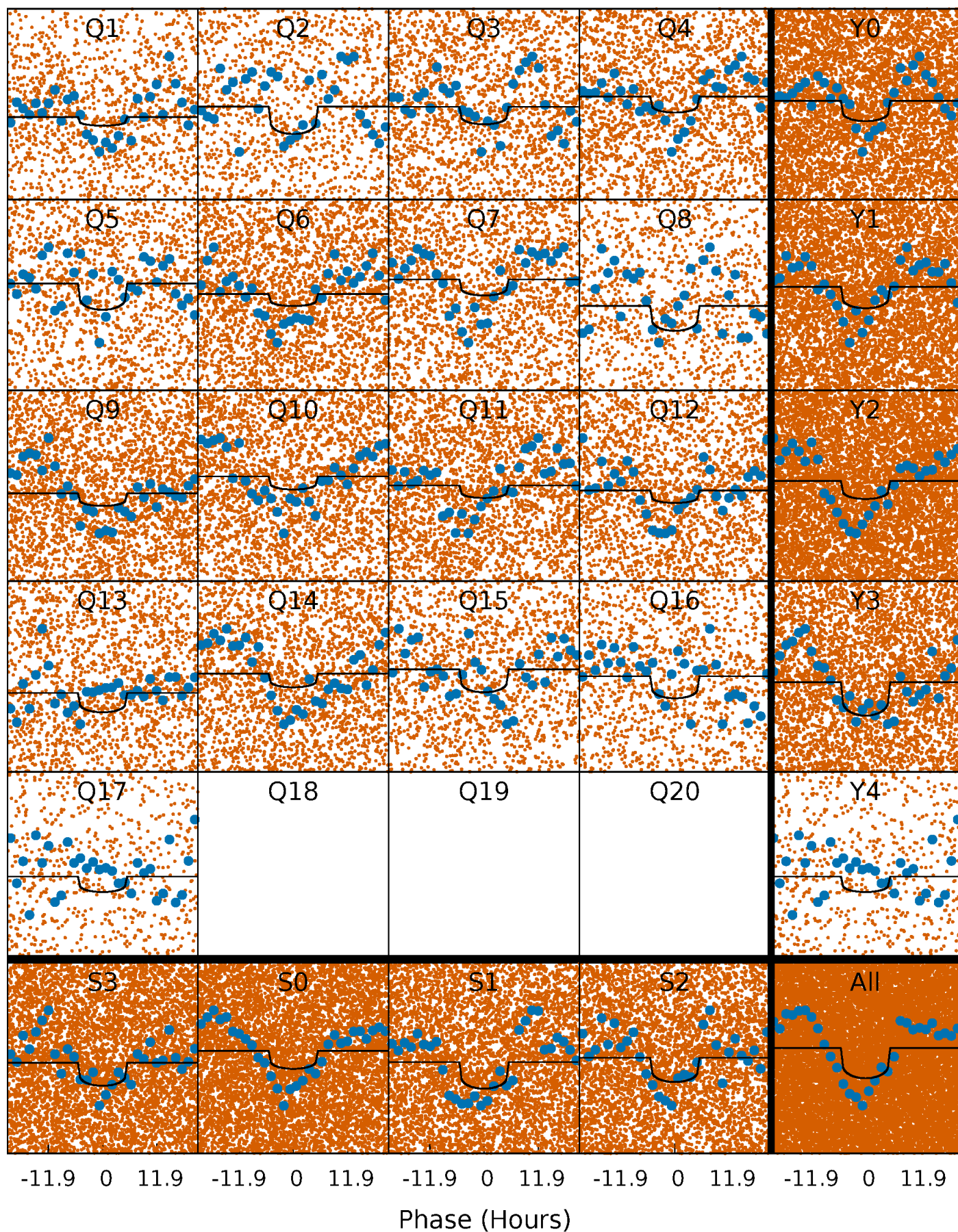
TCE 004641419-01 P= 1.743581 Days  $T_0=132.209016$  (BKJD)





# DV Quarter-Phased Transit Curves

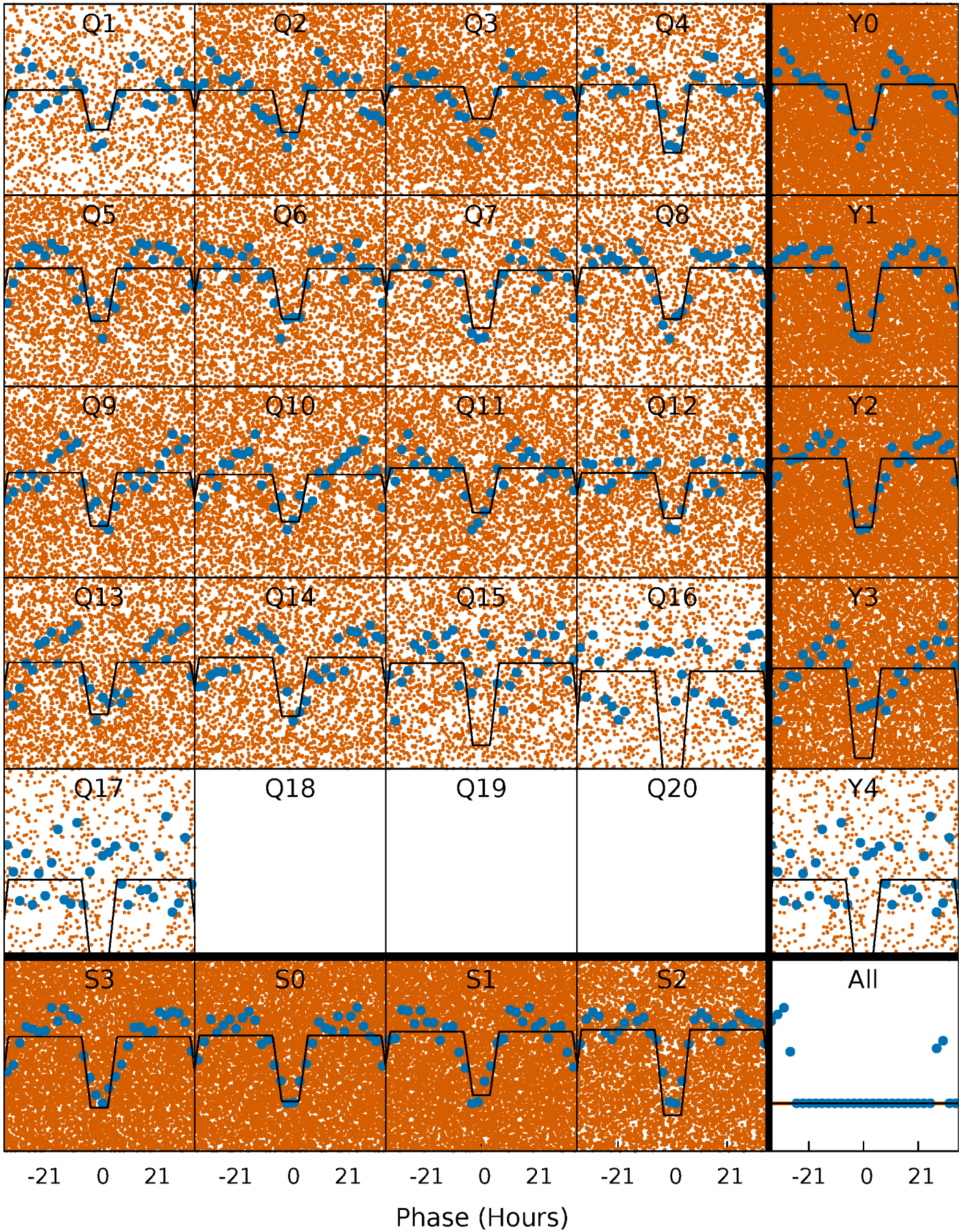
TCE 004641419-01 P= 1.743581 Days  $T_0=132.209016$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

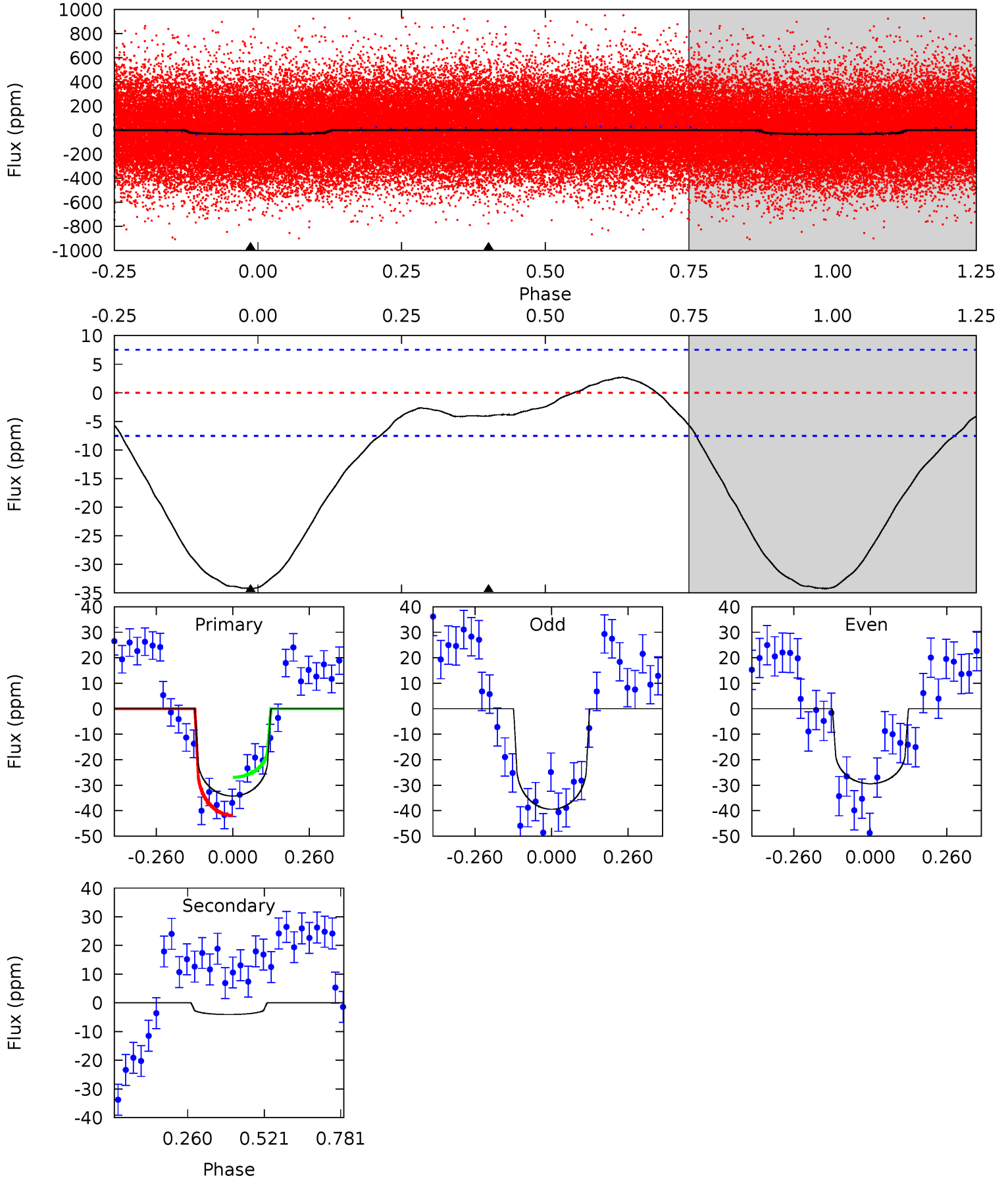
TCE 004641419-01 P= 1.743302 Days  $T_0=132.239553$  (BKJD)



# DV Model-Shift Uniqueness Test

004641419-01, P = 1.743581 Days, E = 130.465435 Days

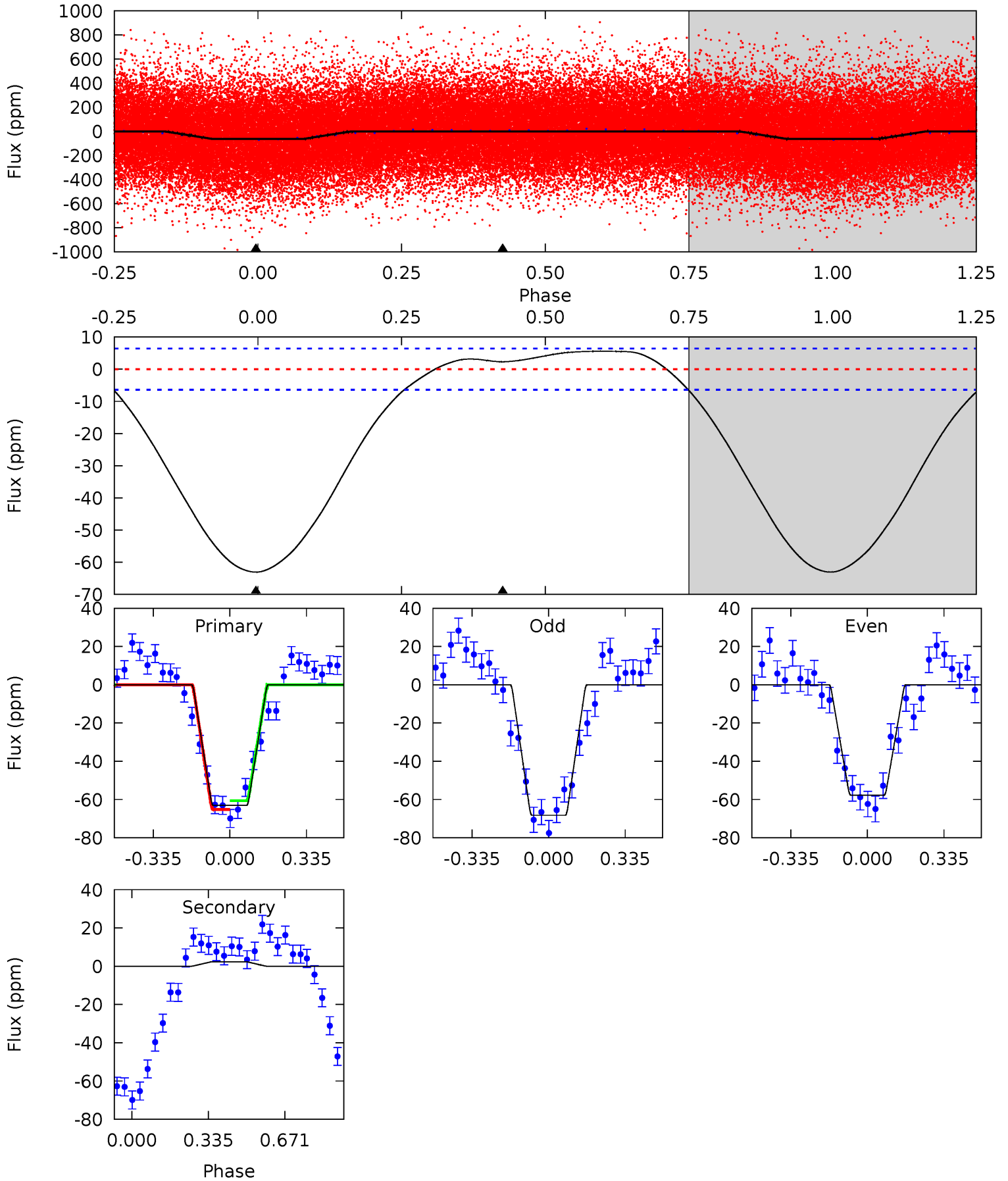
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.8	2.35	0	0	4.36	1.13	1.33	19.8	19.8	2.35	2.35	2.93	1.24	0.07	4.32



# Alt Model-Shift Uniqueness Test

004641419-01, P = 1.743302 Days, E = 130.496251 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
42.5	-1.55	0	0	4.30	0.96	2.79	42.5	42.5	-1.55	-1.55	3.57	0.85	0.08	1.53





### Stellar Parameters For KIC 004641419

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6601^{+149}_{-215}$	$4.378^{+0.065}_{-0.208}$	$-0.180^{+0.250}_{-0.300}$	$1.167^{+0.372}_{-0.133}$	$1.190^{+0.175}_{-0.158}$	$1.053^{+0.299}_{-0.551}$
	+2%/-3%	+1%/-5%	+139%/-167%	+32%/-11%	+15%/-13%	+28%/-52%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004641419-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-4 \pm 2$	$0.63^{+0.40}_{-0.32}$	$2566^{+197}_{-114}$	$4416^{+1659}_{-916}$	$5.016^{+15.493}_{-3.530}$
Alt.	$2 \pm 1$	$1.09^{+0.43}_{-0.38}$	$2576^{+178}_{-117}$	$-3488^{+362}_{-529}$	$-0.908^{+0.648}_{-1.522}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

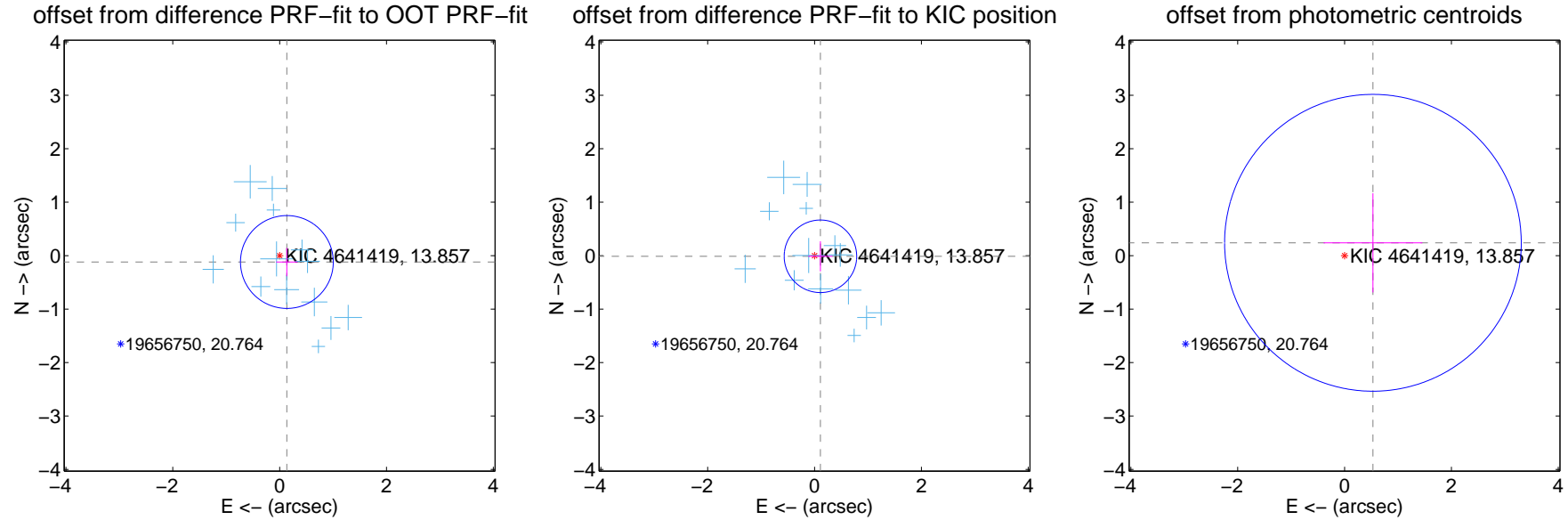
## DV Centroid Data

Supplemental centroid analysis for 004641419-01. Kepler magnitude: 13.86. Transit SNR 8.07

There are 14 quarters with good PRF difference image offsets

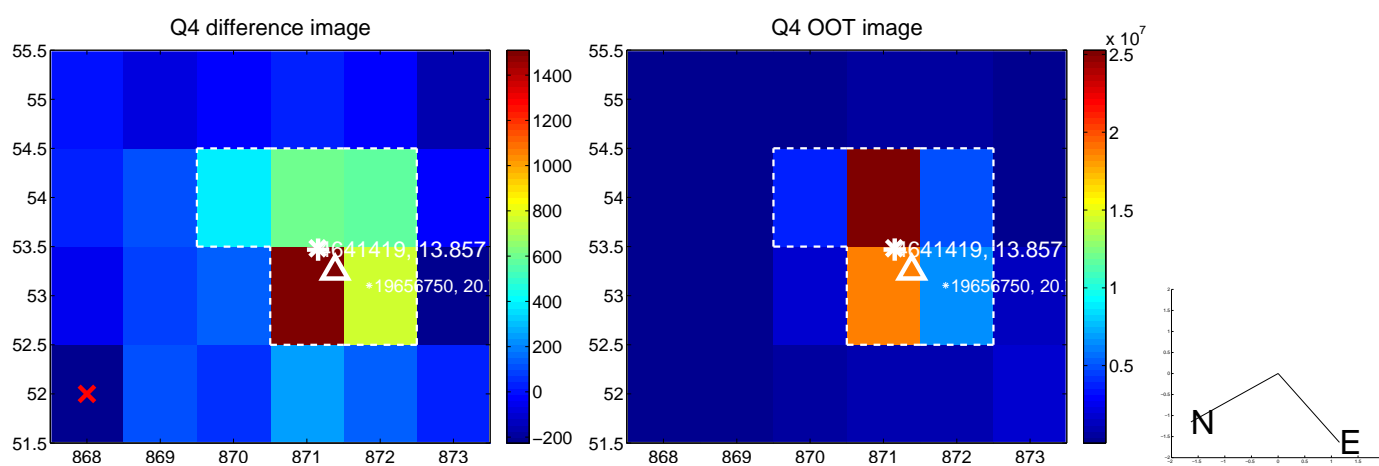
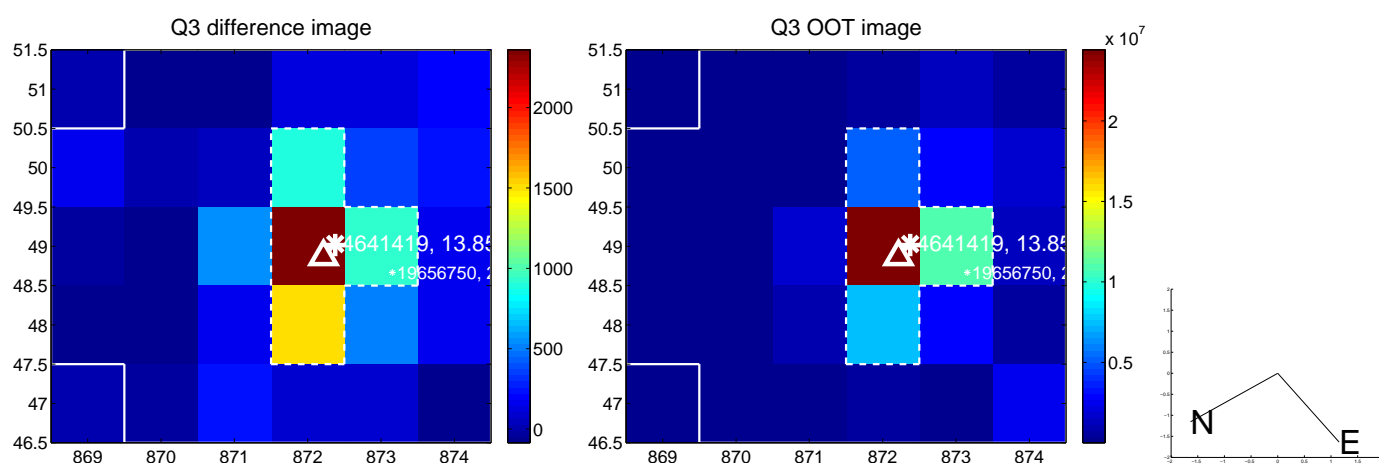
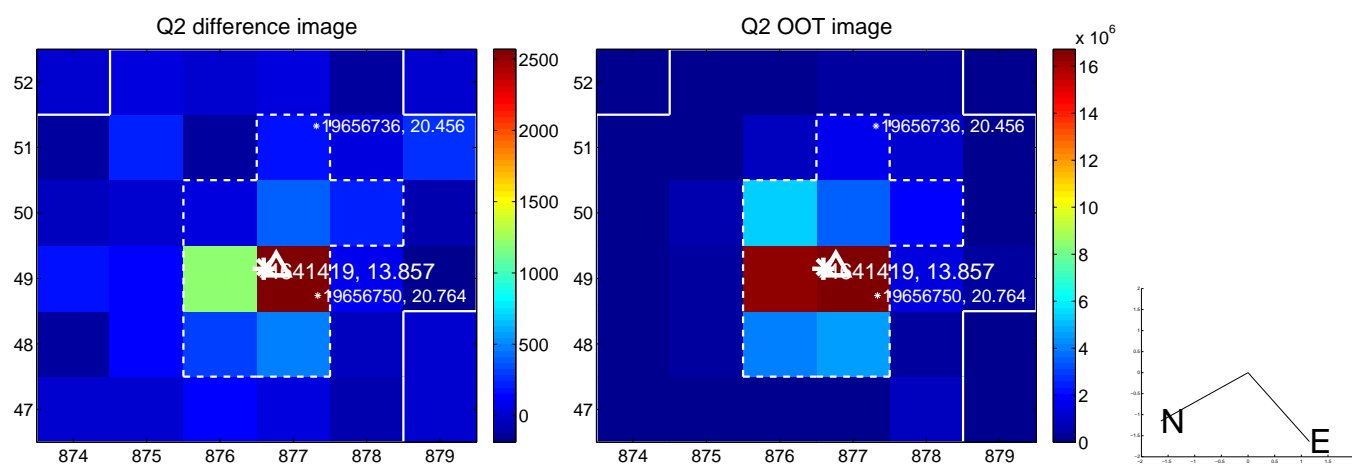
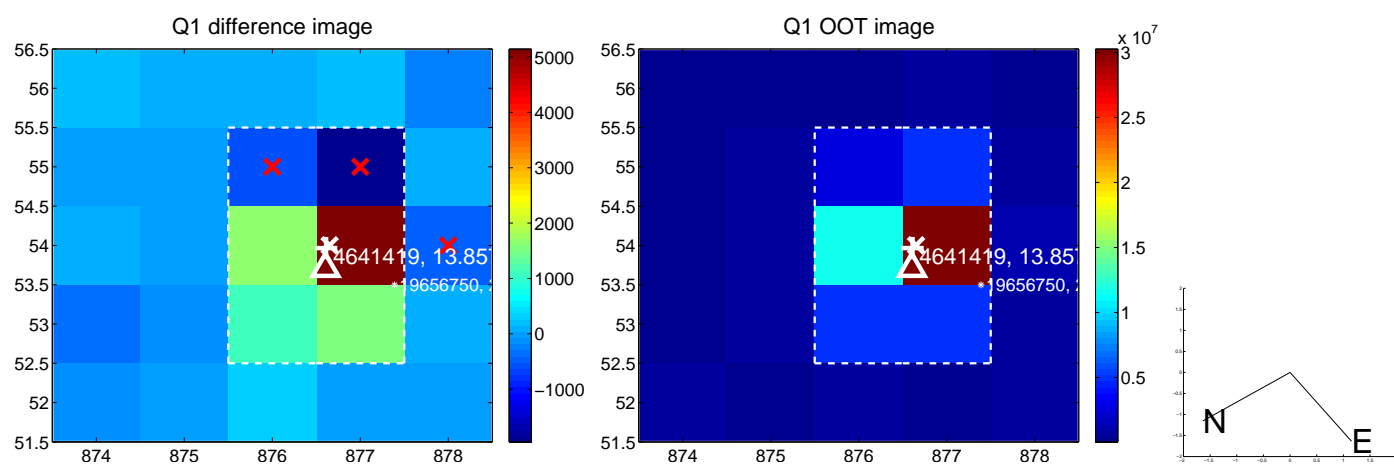
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.180 \pm 0.290$	0.62	$-0.135 \pm 0.200$	$-0.119 \pm 0.265$
PRF-fit source offset from KIC position	$0.111 \pm 0.226$	0.49	$-0.110 \pm 0.225$	$-0.012 \pm 0.283$
photometric centroid source offset	$0.58 \pm 0.93$	0.63	$-0.53 \pm 0.93$	$0.24 \pm 0.93$

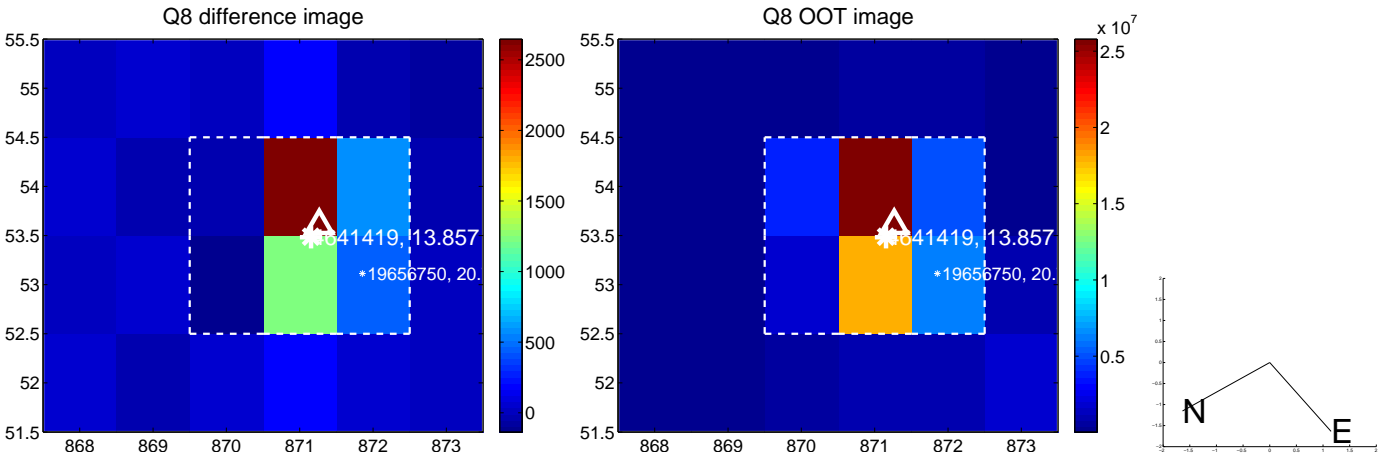
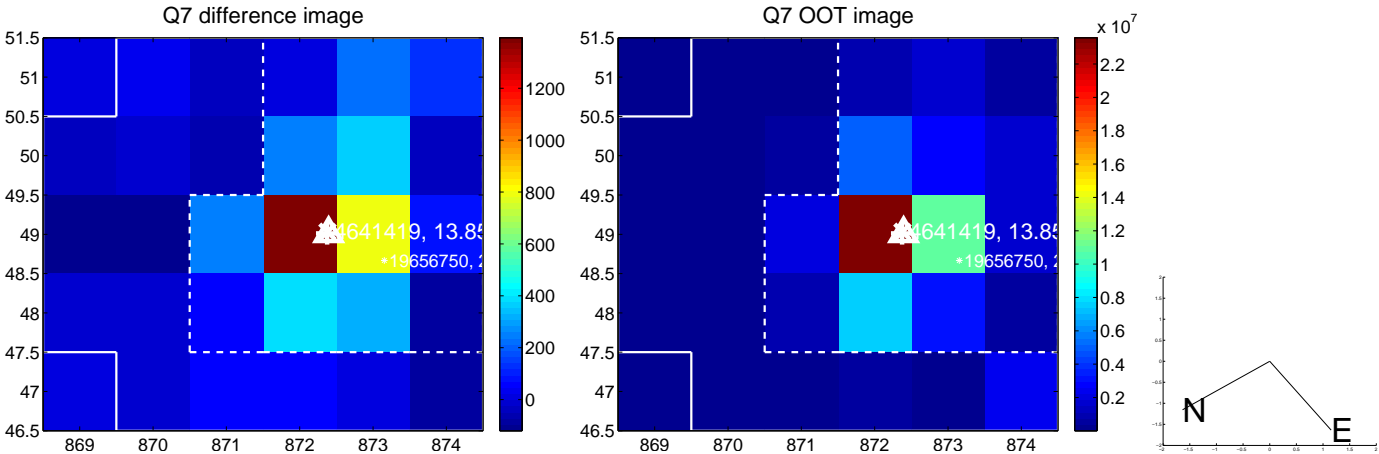
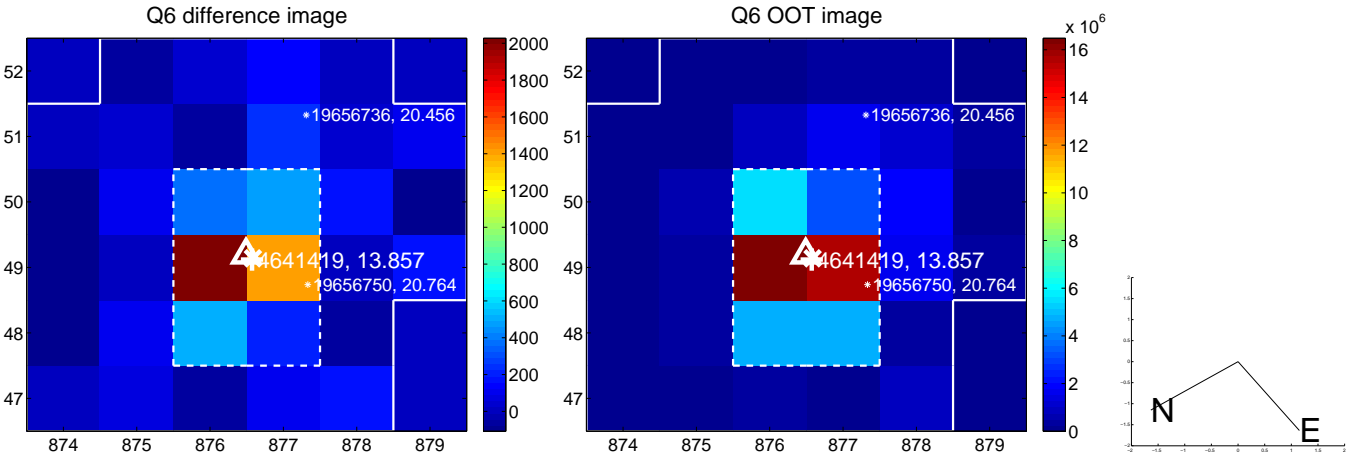
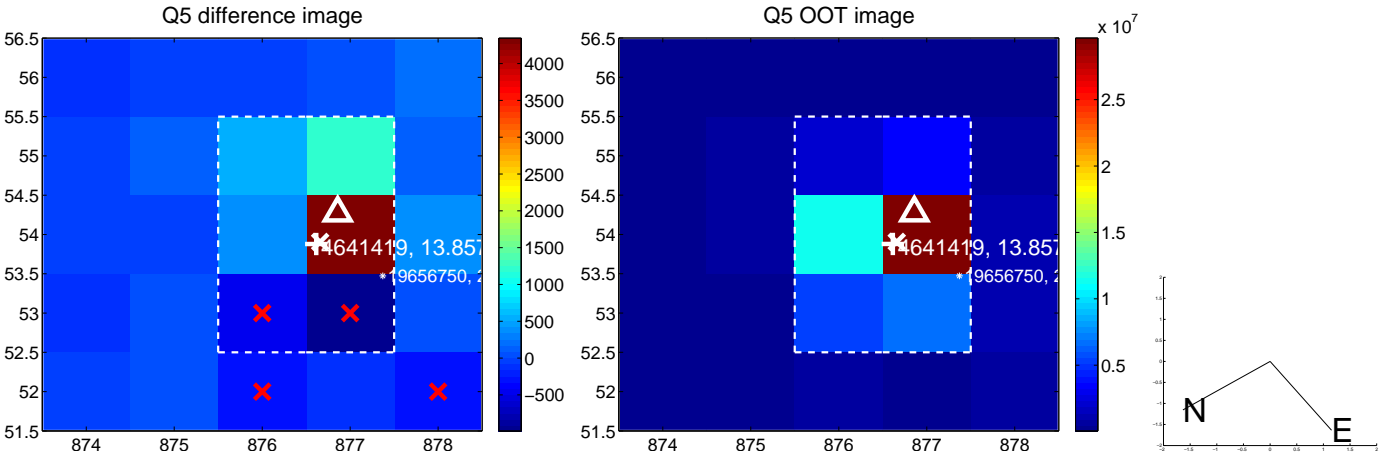


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: 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.

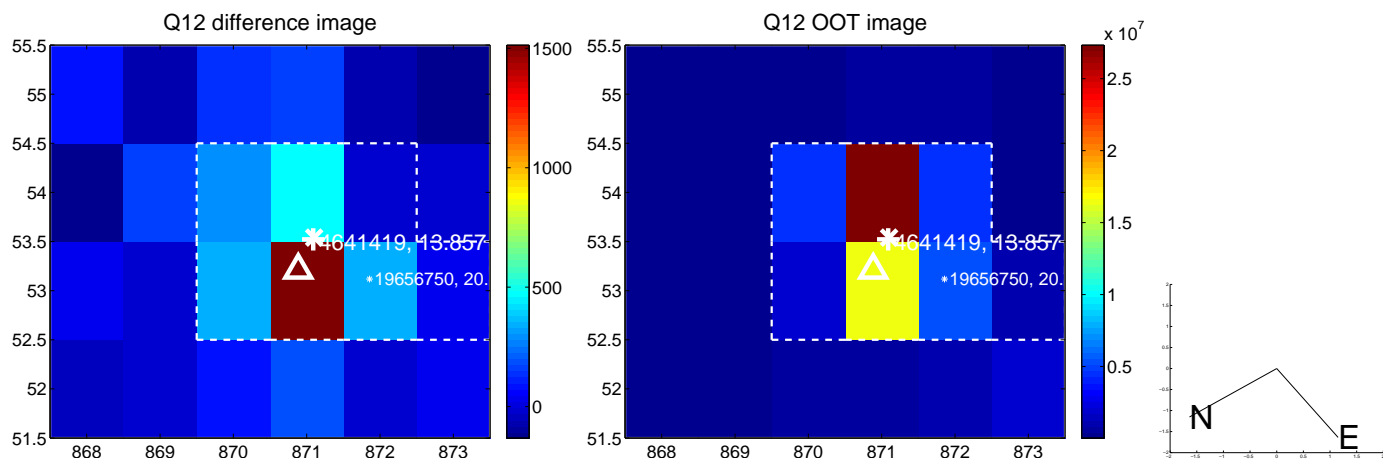
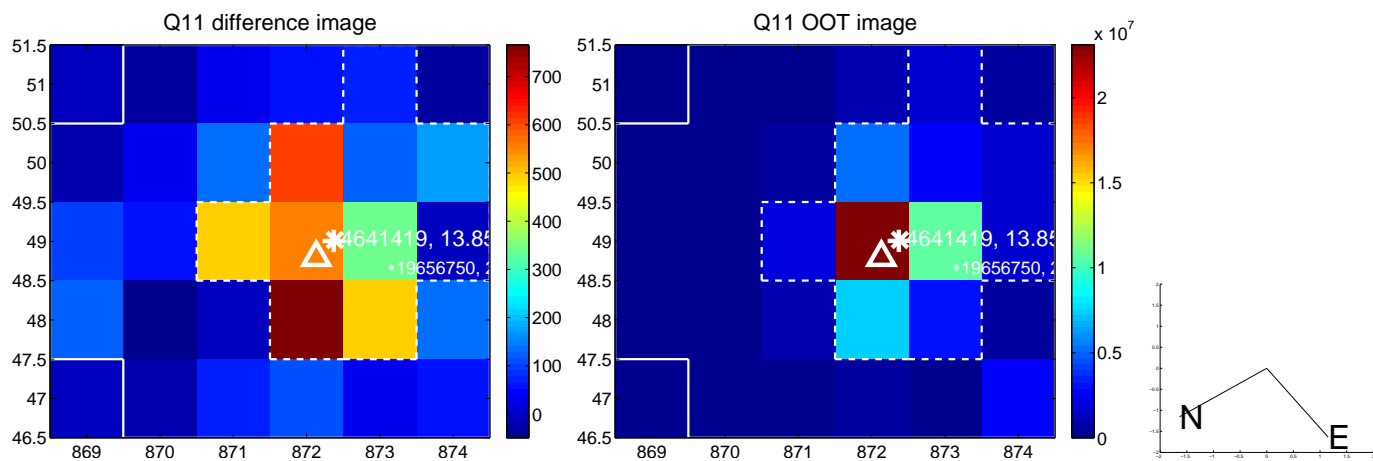
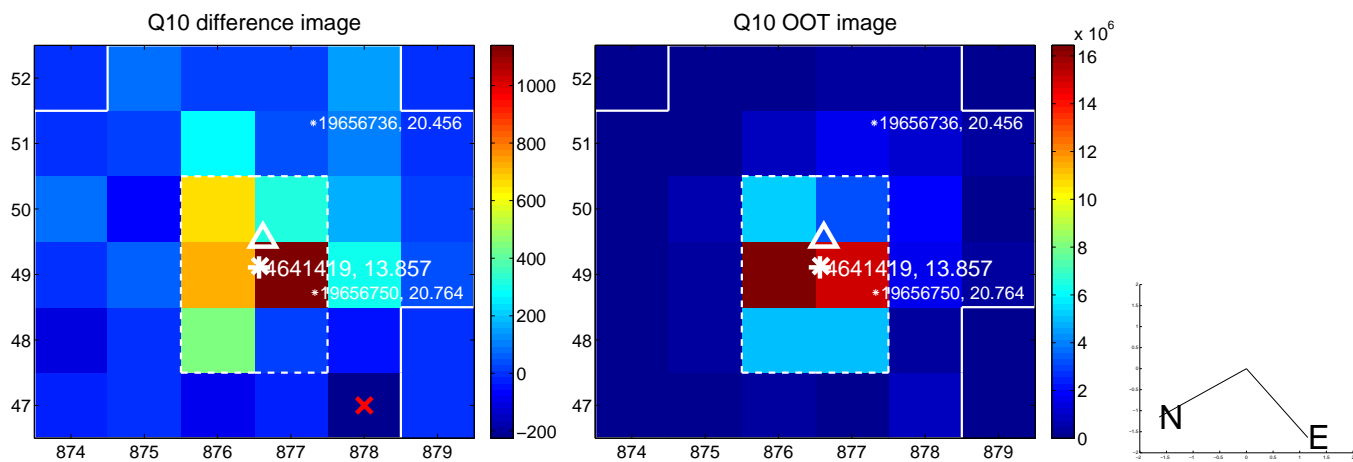
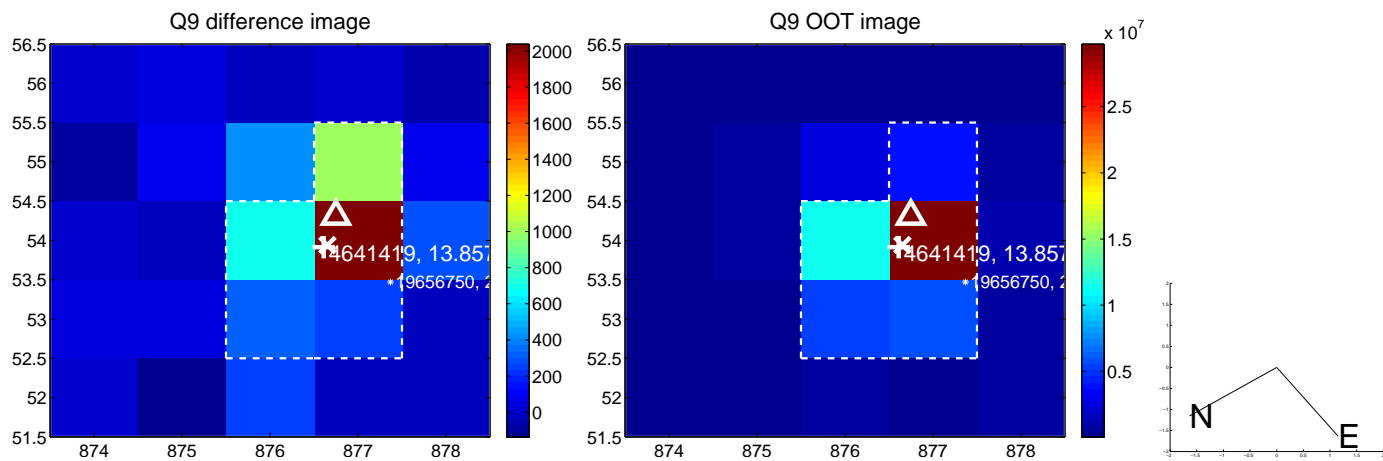


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

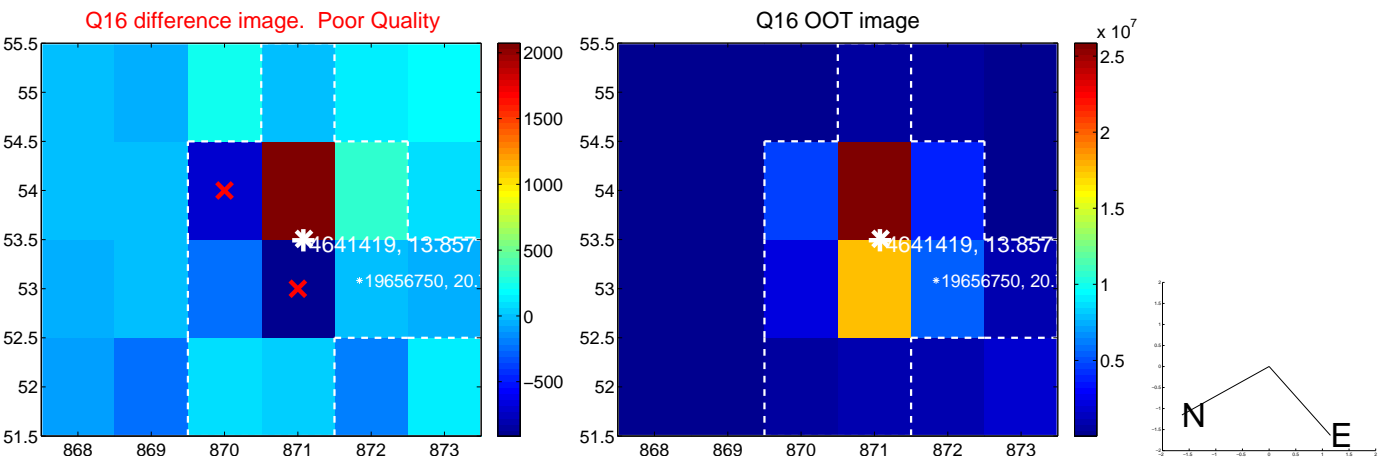
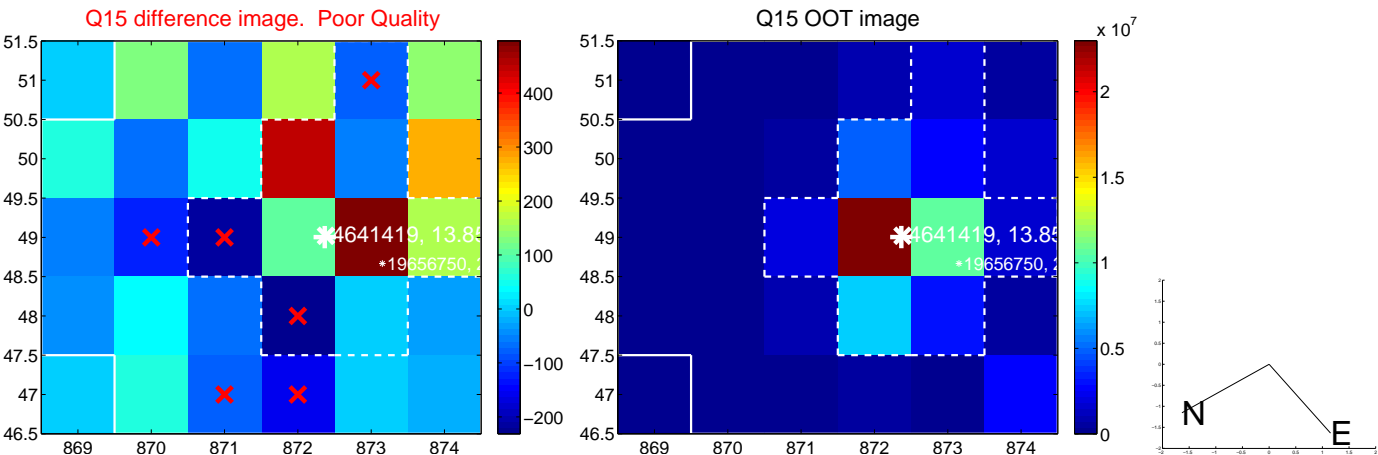
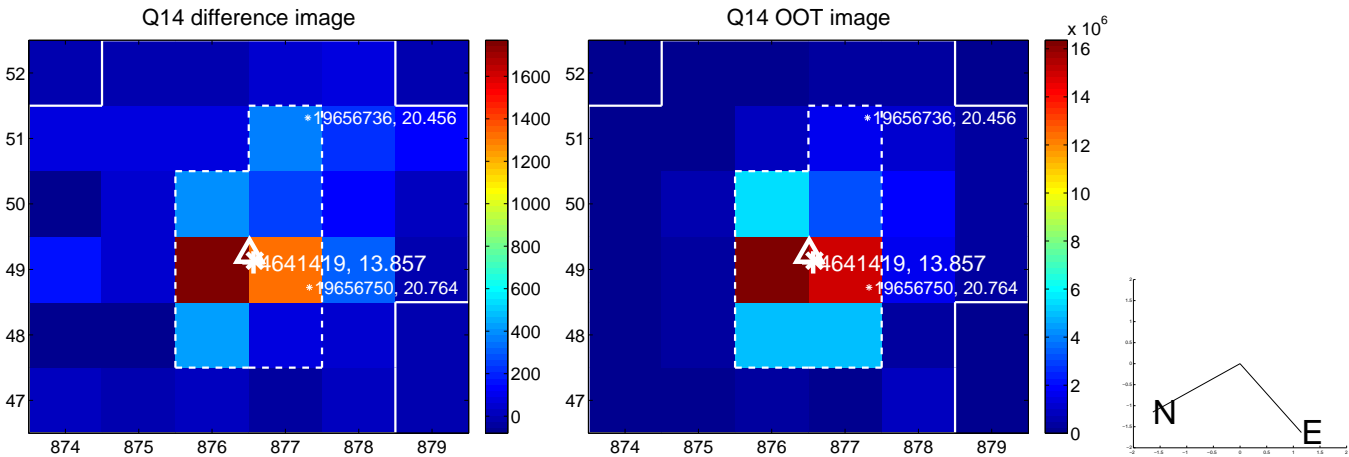
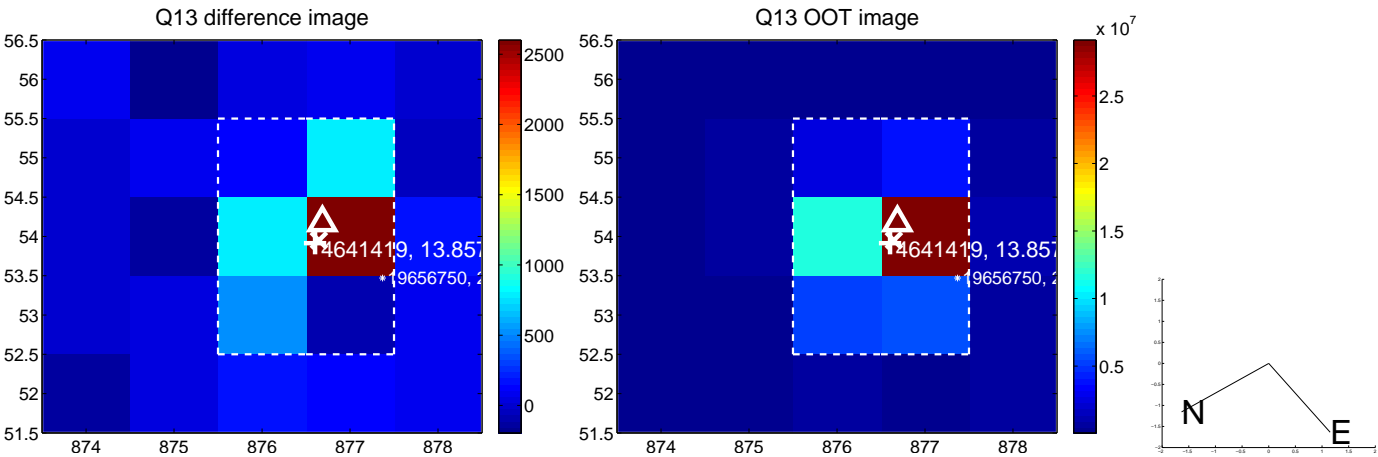




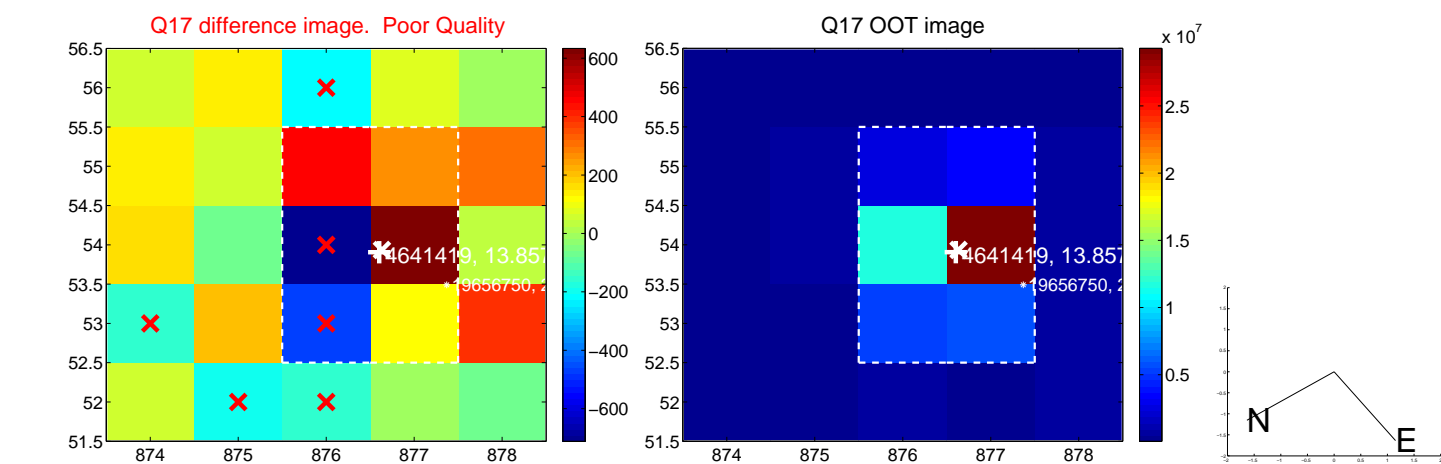
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



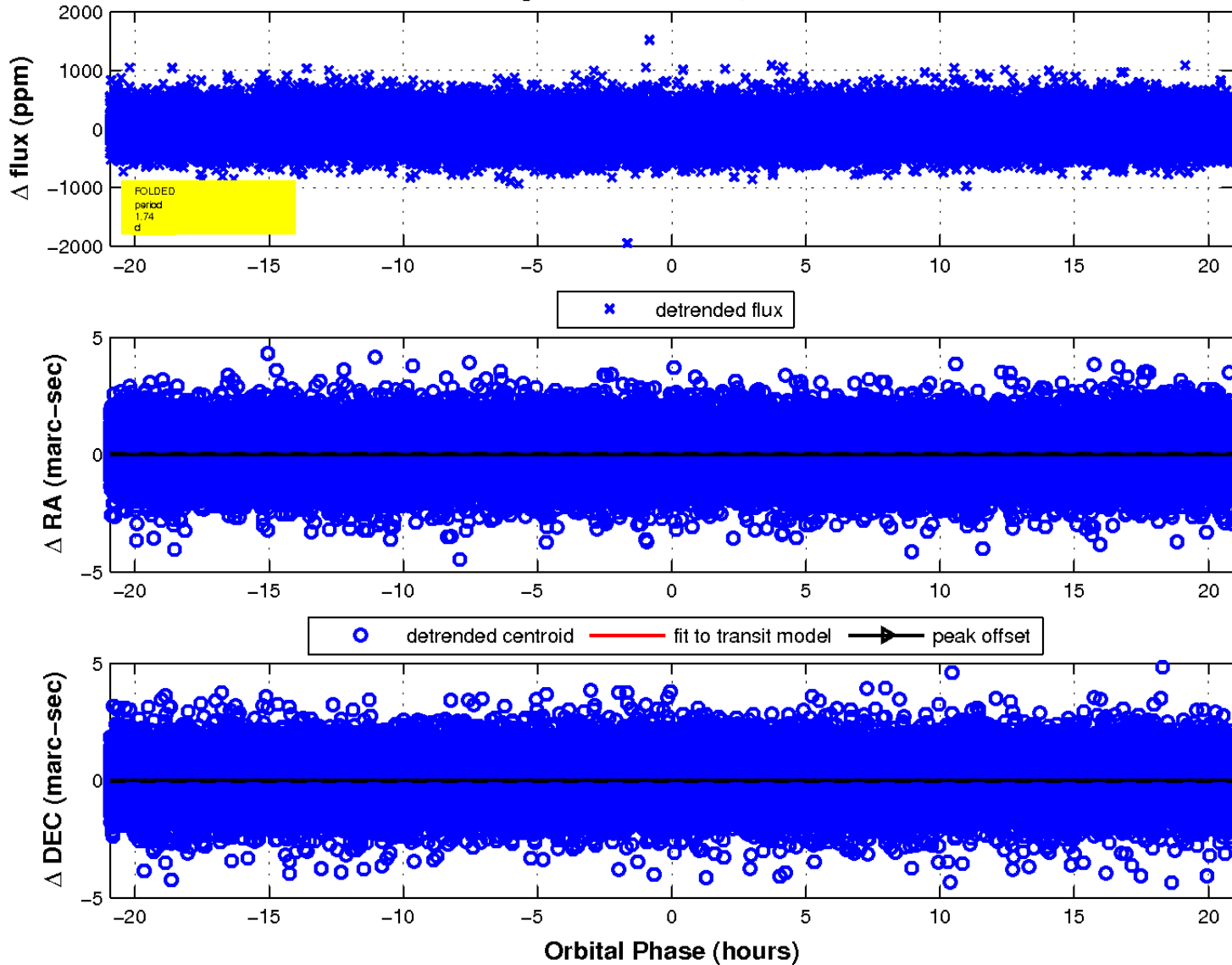
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

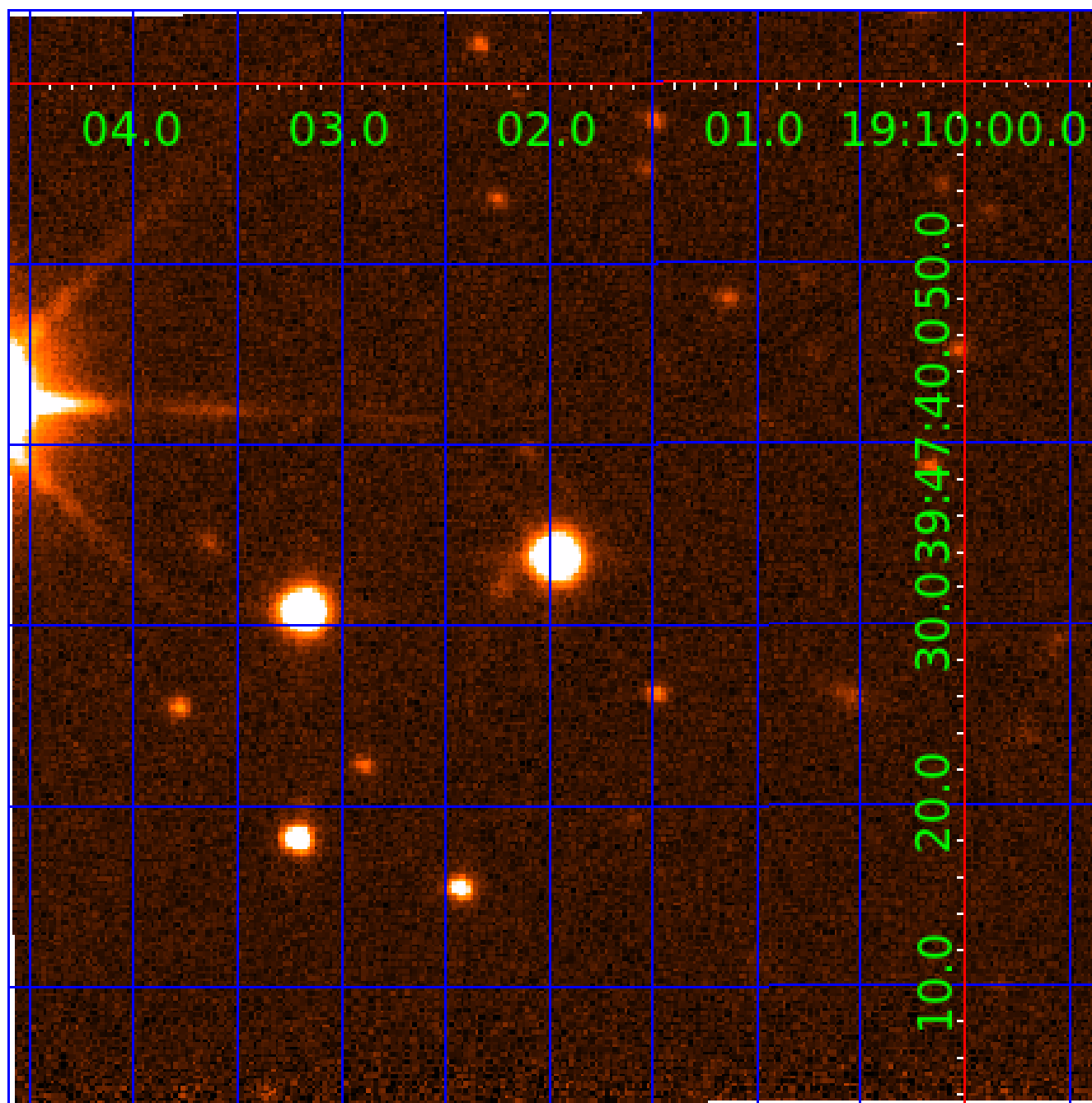


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 004641419

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004641419-01	OBS	No	1.743581	132.209016	22.6	10.456	8.2	8.1	1.17	6601	0.58	2571.13
004641419-02	OBS	No	98.906941	157.479211	259.7	11.874	8.9	8.6	1.17	6601	2.04	11.80
004641419-03	OBS	No	127.532745	194.155465	362.1	3.179	8.7	8.2	1.17	6601	2.46	8.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004641419-01	OBS	FP	0.00	1	0	0	0	LPP_DV
004641419-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004641419-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

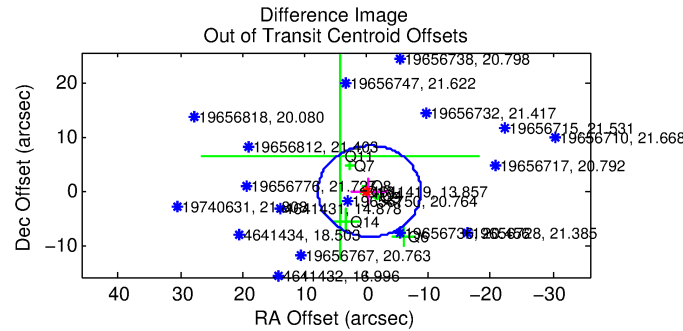
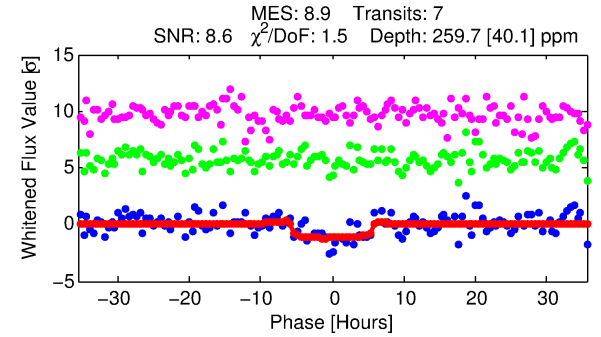
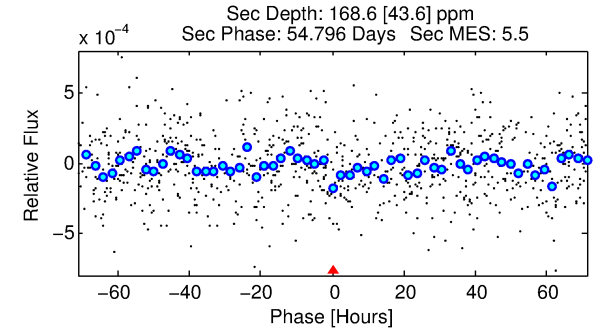
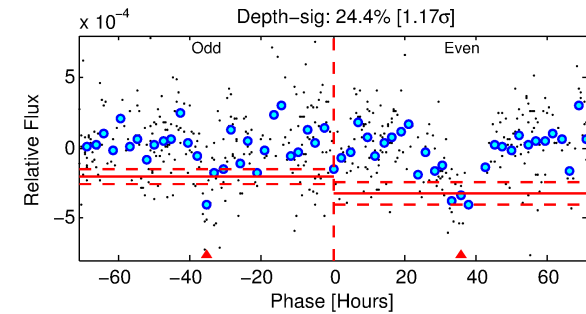
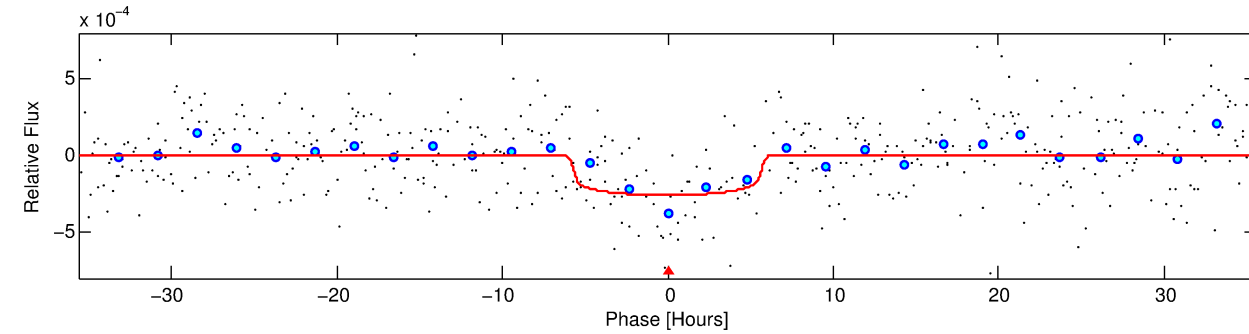
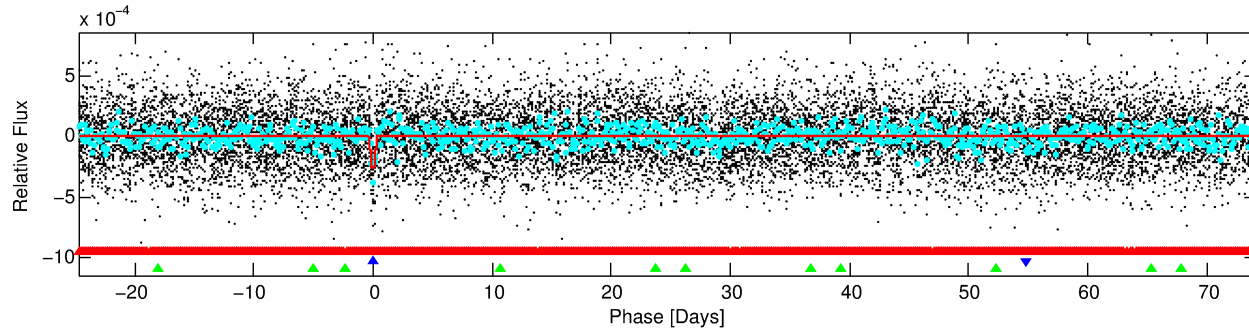
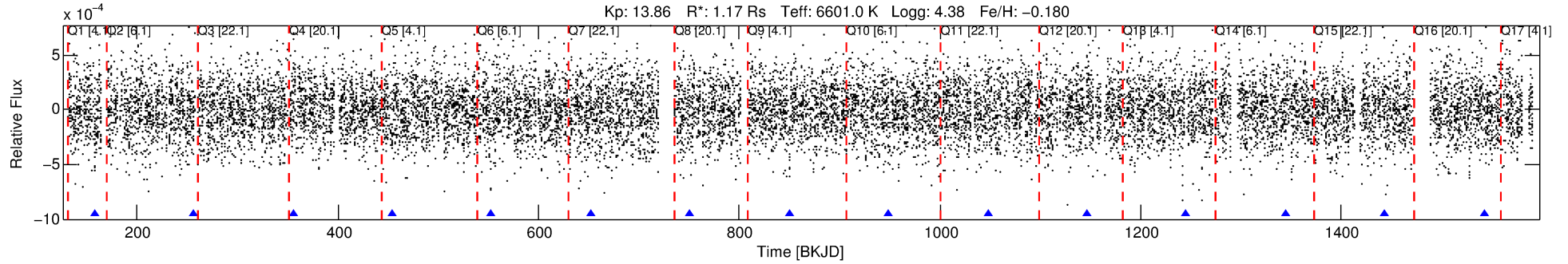
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004641419-02

No Significant Match Found

# DV One-Page Summary

KIC: 4641419 Candidate: 2 of 3 Period: 98.907 d



## DV Fit Results:

Period = 98.90694 [0.00324] d  
Epoch = 157.4792 [0.0270] BKJD  
Rp/R\* = 0.0160 [0.0064]  
a/R\* = 43.40 [93.75]  
b = 0.75 [1.25]  
Seff = 11.80 [4.78]  
Teq = 473 [48] K  
Rp = 2.04 [1.04] Re  
a = 0.4432 [0.1178] AU  
Ag = 4366.19 [4014.48] [1.09 $\sigma$ ]  
Teffp = 5939 [1256] K [4.35 $\sigma$ ]

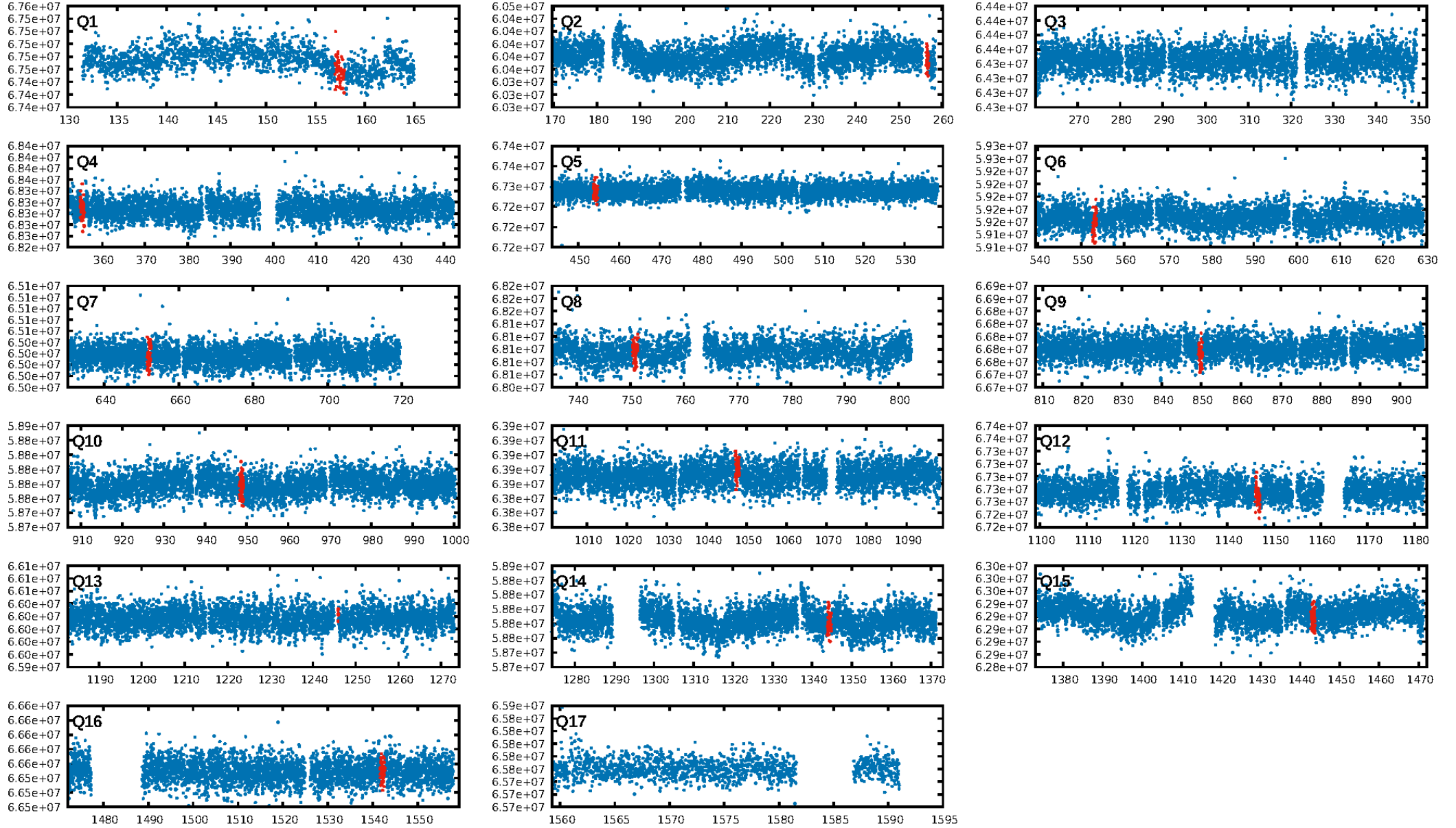
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [147.39 $\sigma$ ]  
LongPeriod-sig: 100.0% [55.89 $\sigma$ ]  
ModelChiSquare2-sig: 18.7%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.09e-10**  
RollingBand-fgt: 1.00 [6/6]  
**GhostDiagnostic-chr: -0.9986**  
Centroid-sig: 6.6%  
Centroid-so: 0.865 arcsec [1.44 $\sigma$ ]  
OotOffset-rm: 0.449 arcsec [0.16 $\sigma$ ]  
OotOffset-st: 3/2/2/1 [8]  
KicOffset-rm: 0.466 arcsec [0.17 $\sigma$ ]  
KicOffset-st: 3/2/2/1 [8]  
DiffImageQuality-fgm: 0.38 [3/8]  
DiffImageOverlap-fno: 0.00 [0/13]

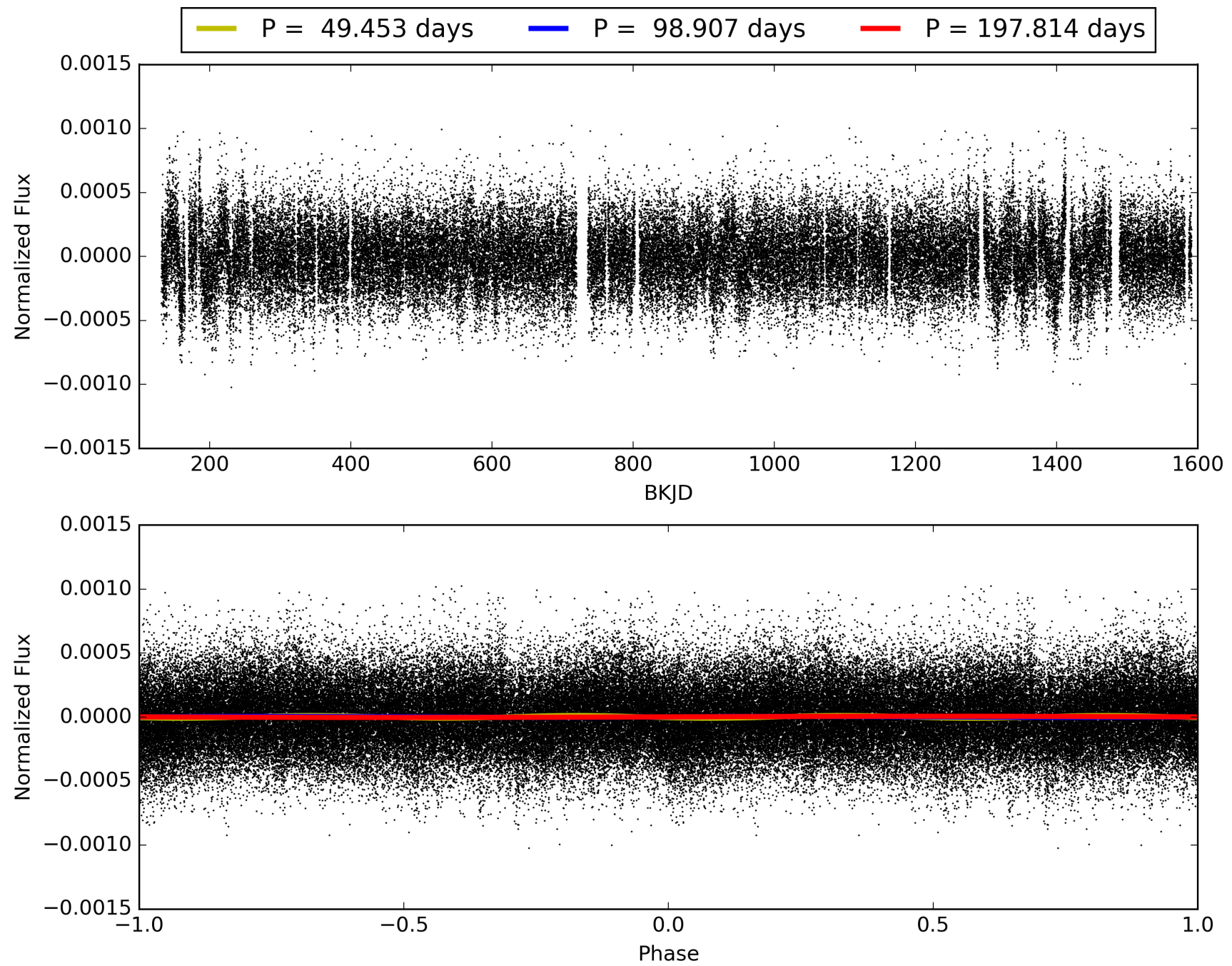
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:52:40 Z

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

# TCE 004641419-02, PDC Light Curves



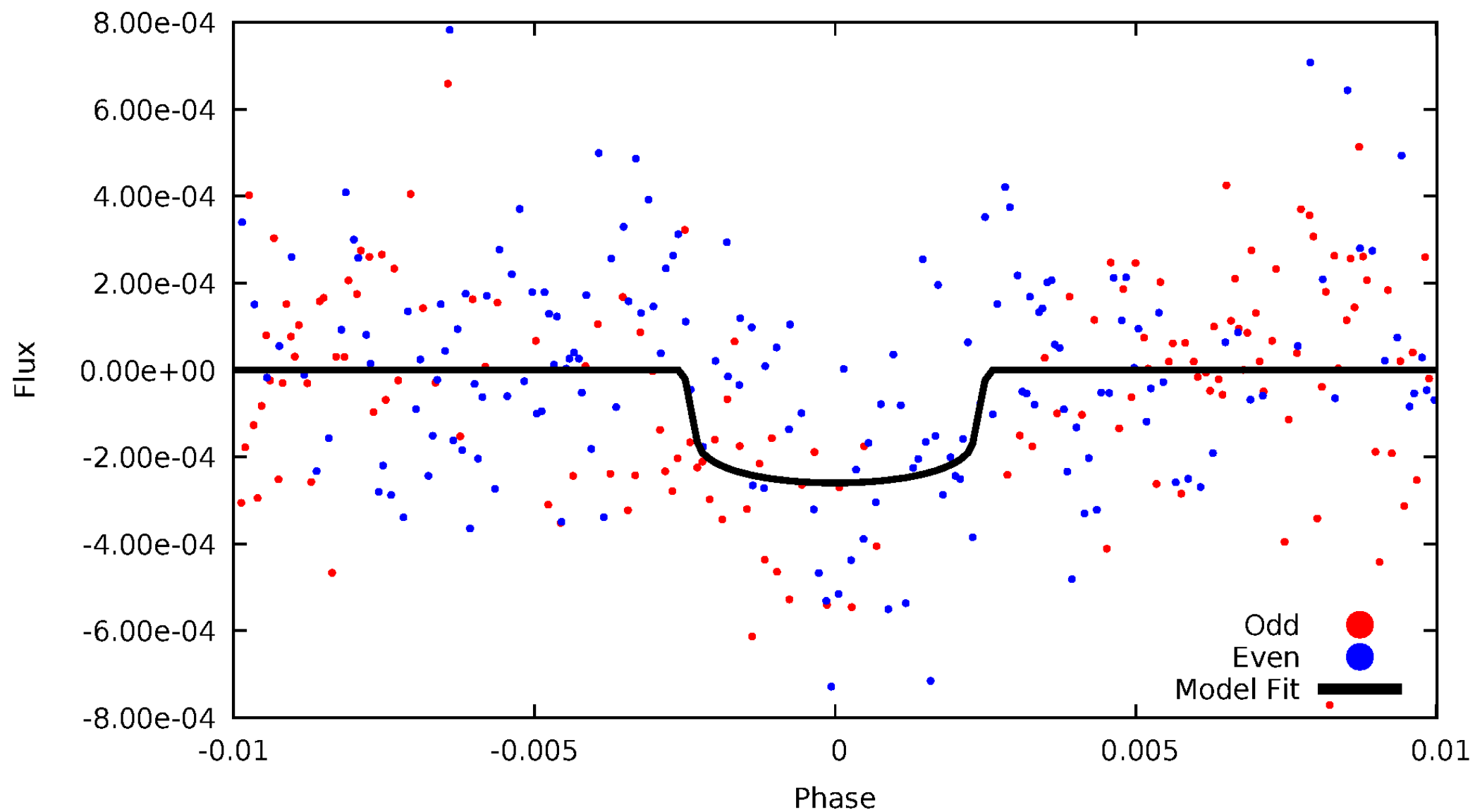
TCE 004641419-02





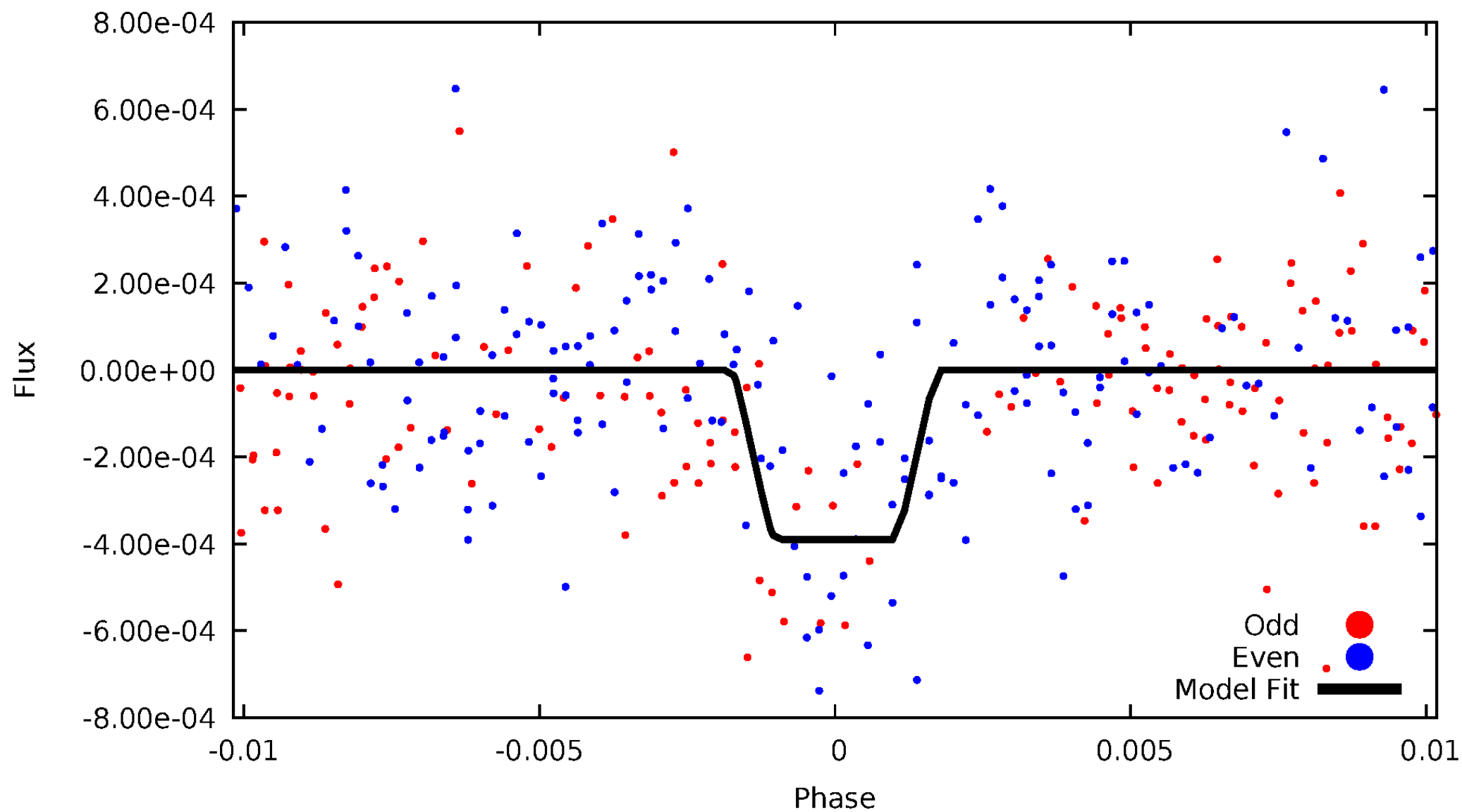
# DV Odd/Even

TCE 004641419-02



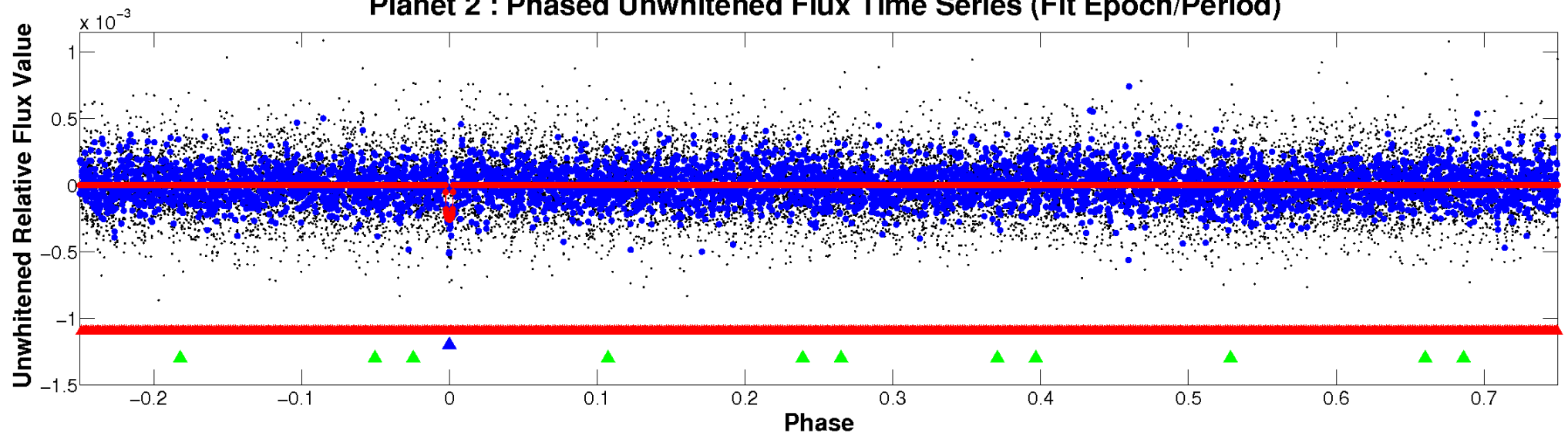
# ALT Odd/Even

TCE 004641419-02

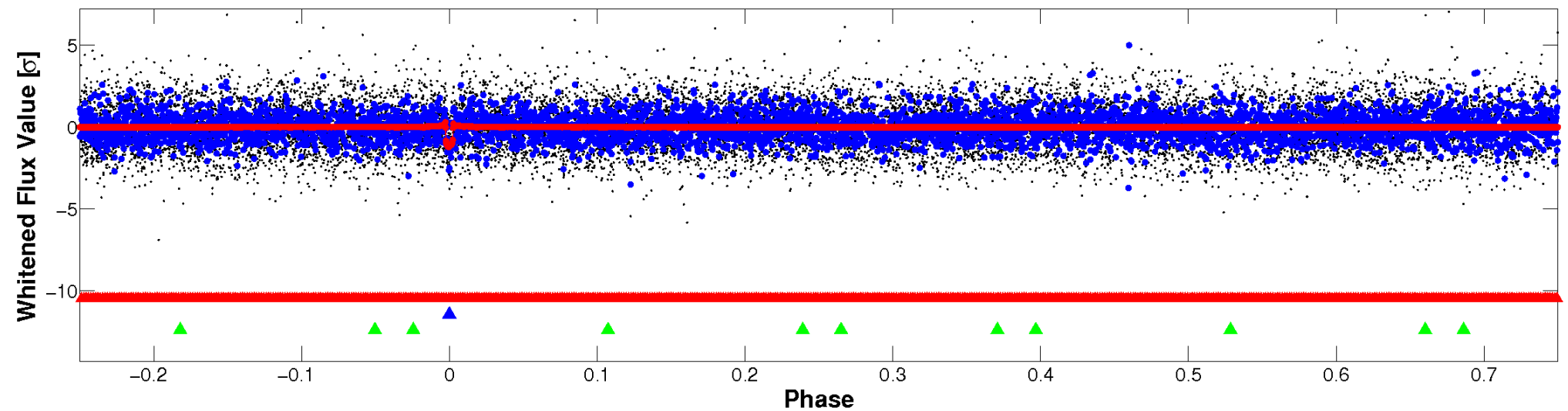


# Non-Whitened Vs. Whitened Light Curve

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

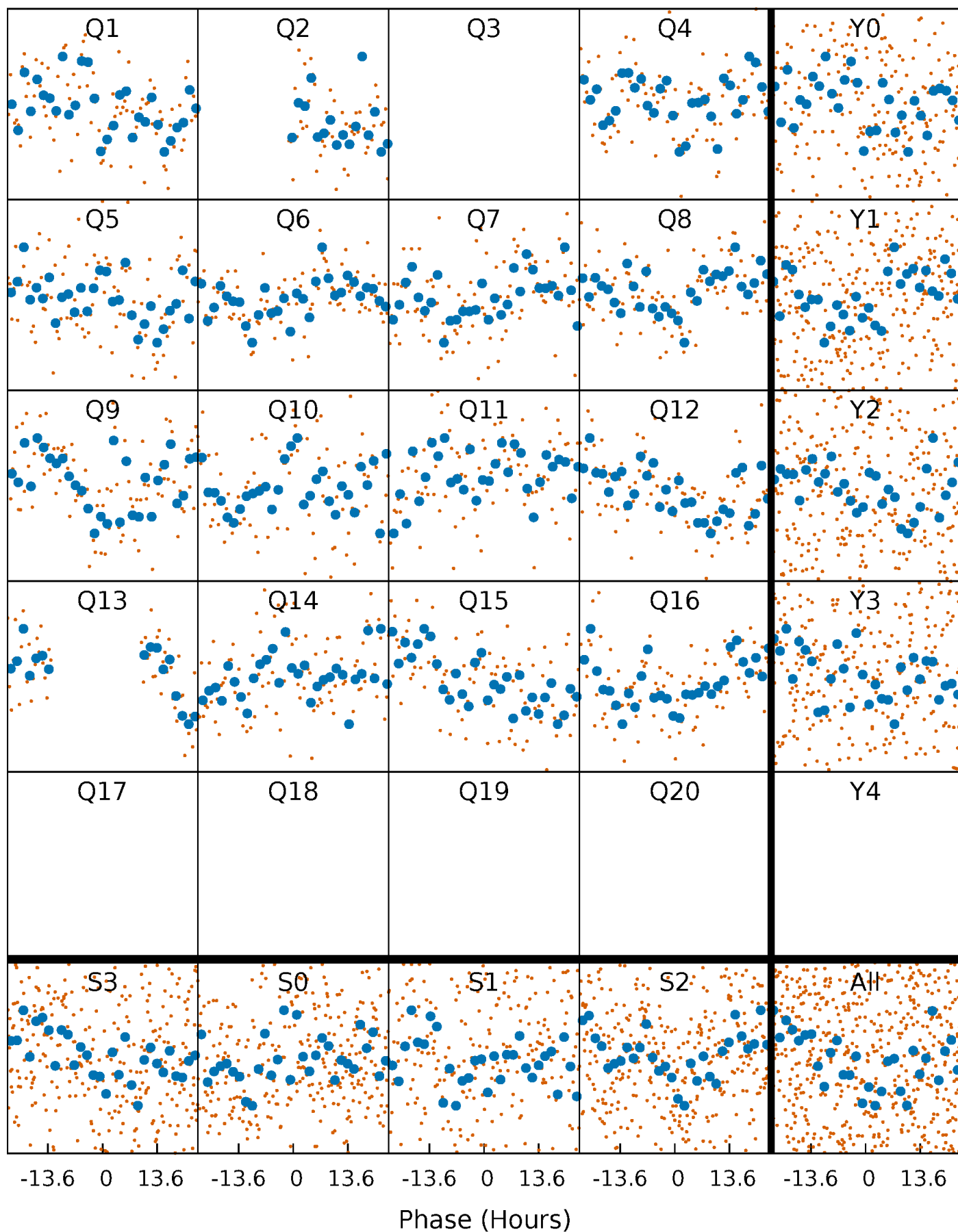


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

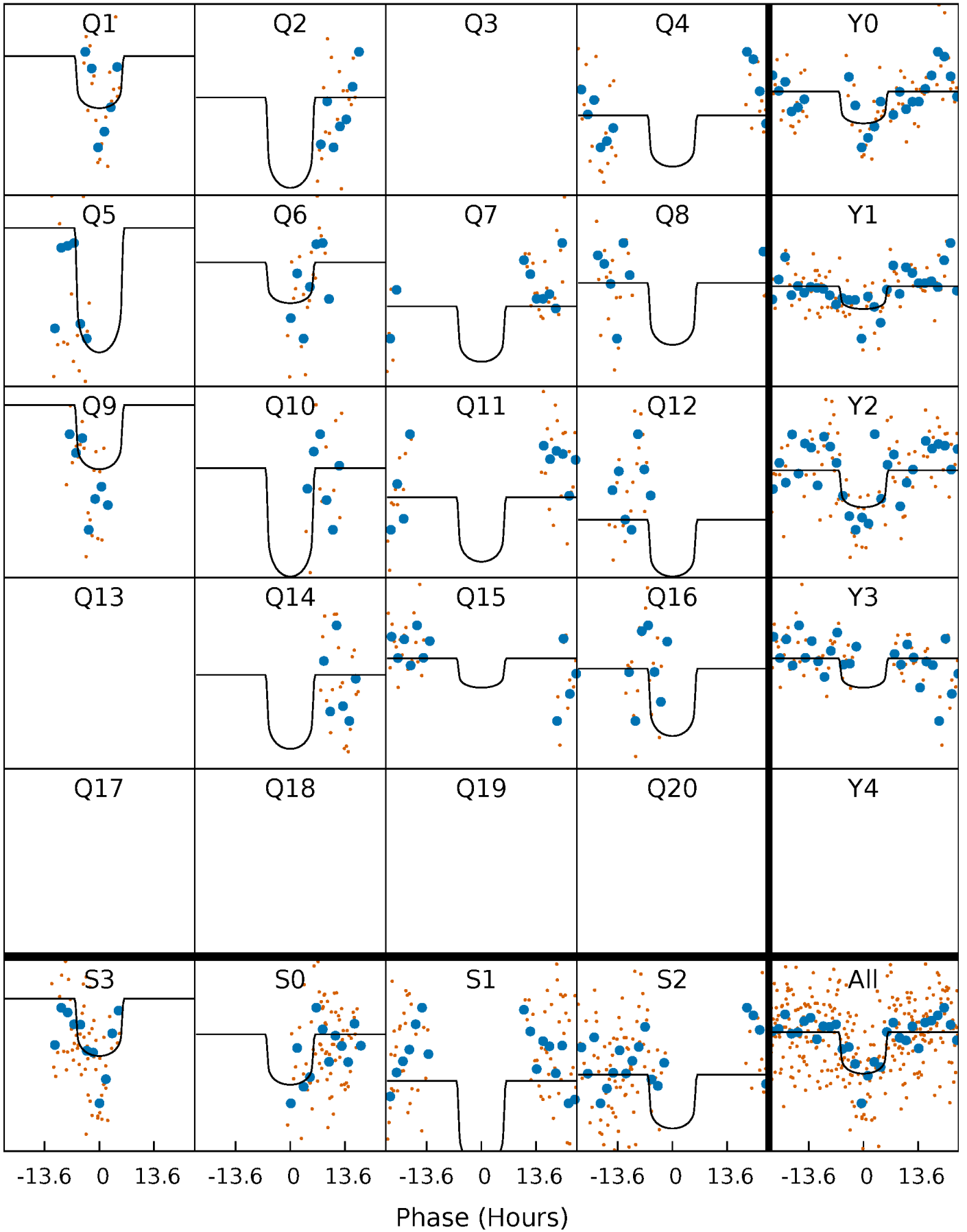
TCE 004641419-02 P= 98.906941 Days  $T_0=157.479211$  (BKJD)





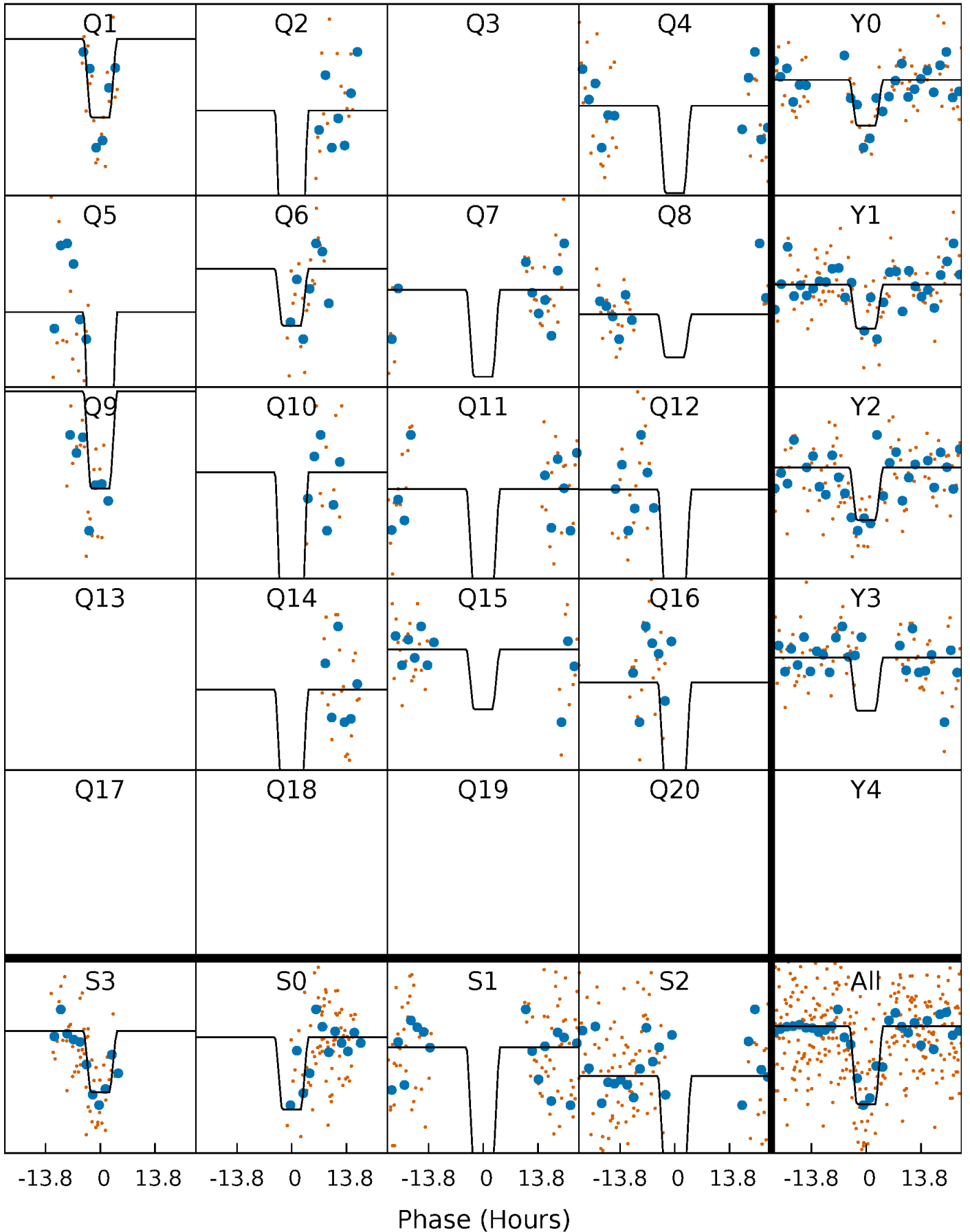
# DV Quarter-Phased Transit Curves

TCE 004641419-02 P= 98.906941 Days  $T_0=157.479211$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

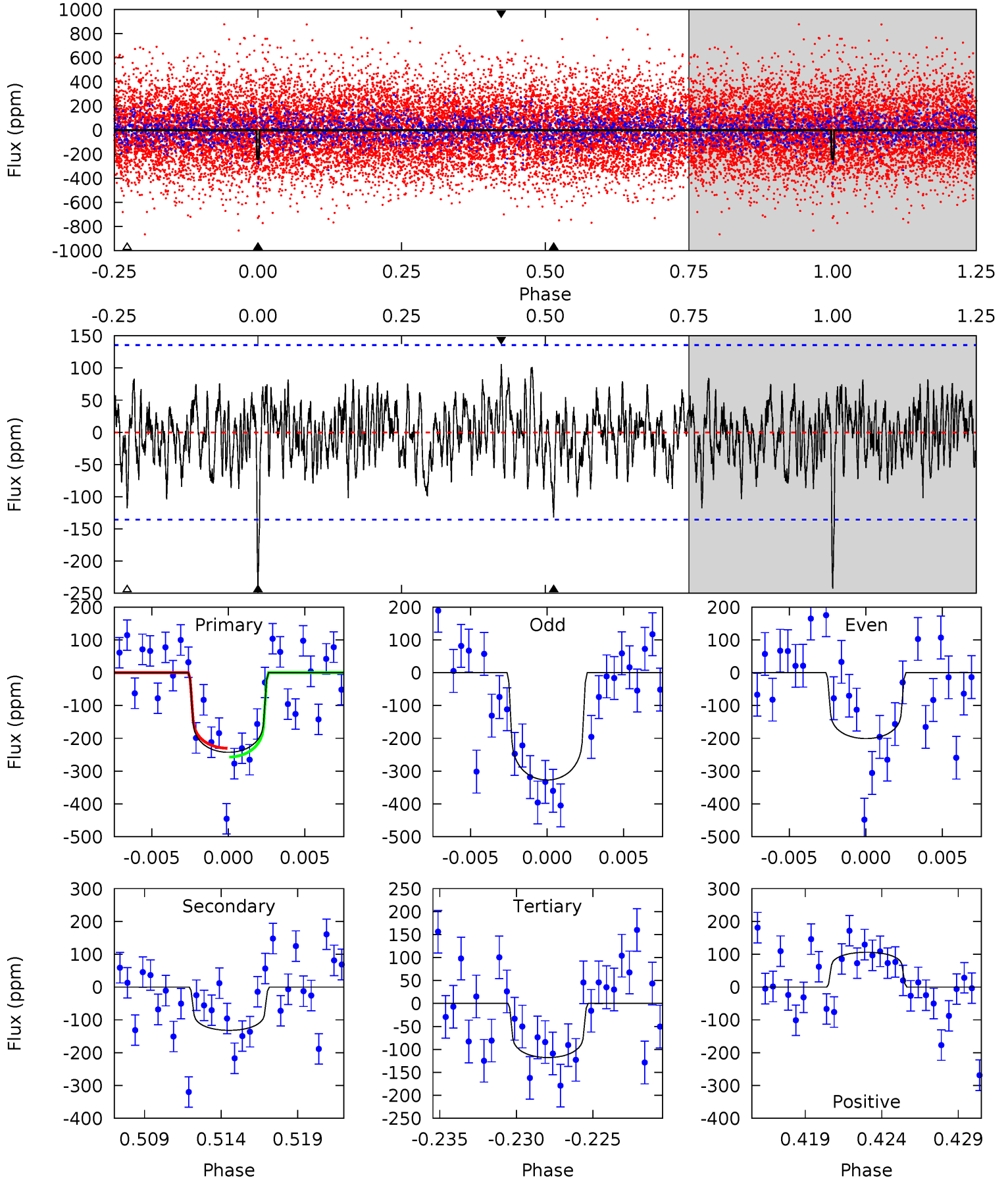
TCE 004641419-02 P= 98.903776 Days  $T_0=157.511585$  (BKJD)



# DV Model-Shift Uniqueness Test

004641419-02, P = 98.906941 Days, E = 58.572270 Days

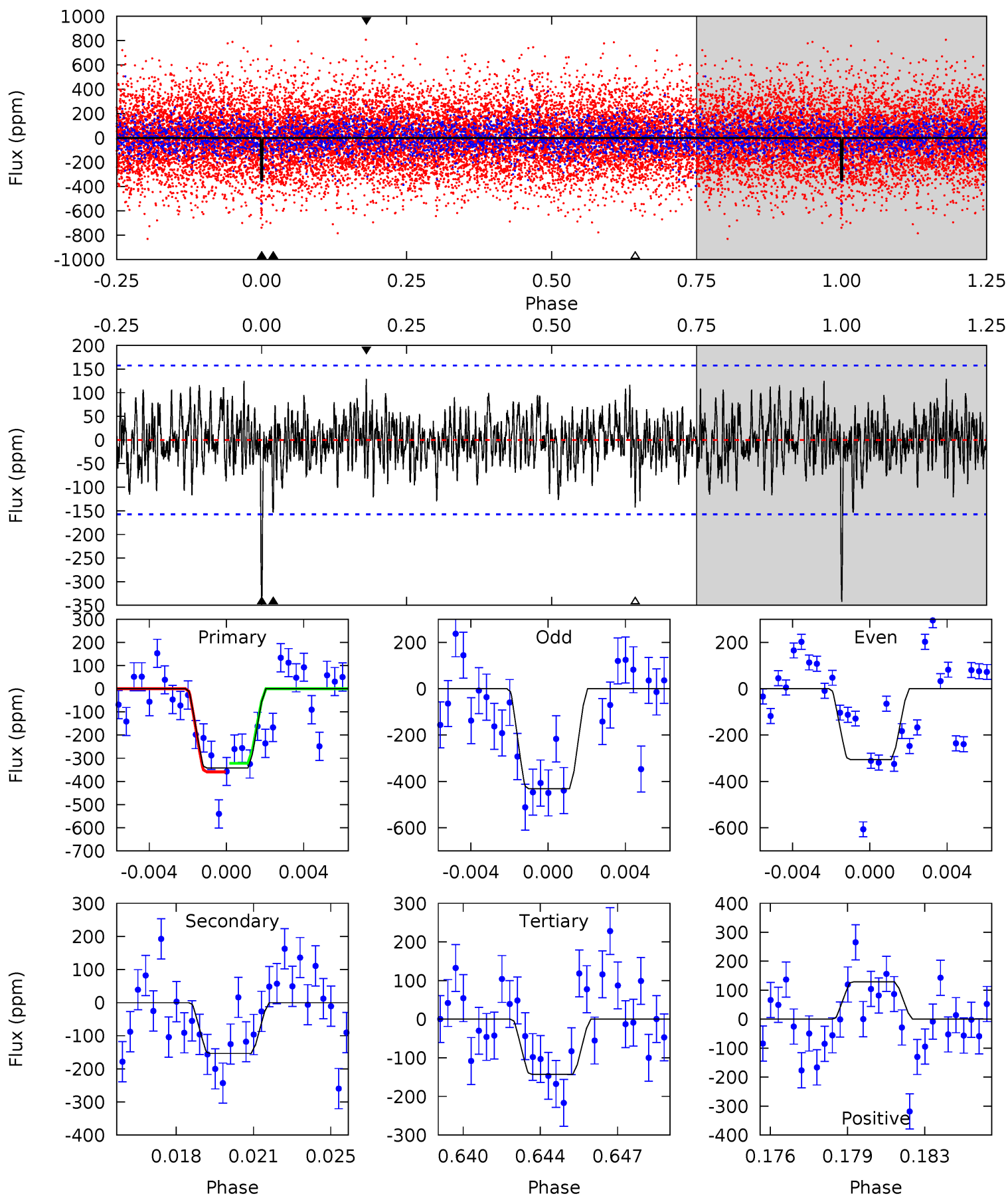
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.23	5.02	4.48	4.03	5.16	2.81	1.43	4.75	5.20	0.54	0.99	2.27	0.94	0.30	0.51



# Alt Model-Shift Uniqueness Test

004641419-02, P = 98.903776 Days, E = 58.607809 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
11.3	5.09	4.73	4.27	5.22	2.92	1.40	6.62	7.08	0.36	0.82	1.93	0.79	0.27	0.62





### Stellar Parameters For KIC 004641419

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6601^{+149}_{-215}$	$4.378^{+0.065}_{-0.208}$	$-0.180^{+0.250}_{-0.300}$	$1.167^{+0.372}_{-0.133}$	$1.190^{+0.175}_{-0.158}$	$1.053^{+0.299}_{-0.551}$
	+2%/-3%	+1%/-5%	+139%/-167%	+32%/-11%	+15%/-13%	+28%/-52%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004641419-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-132 \pm 26$	$2.12^{+0.99}_{-0.76}$	$673^{+49}_{-34}$	$5553^{+1587}_{-805}$	$3132^{+4478}_{-1743}$
Alt.	$-154 \pm 30$	$2.57^{+1.03}_{-0.87}$	$668^{+48}_{-32}$	$5289^{+1166}_{-707}$	$2436^{+3474}_{-1232}$

$T_{\text{max}}$  = 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  $A_{\text{obs}} \gg 1.0$

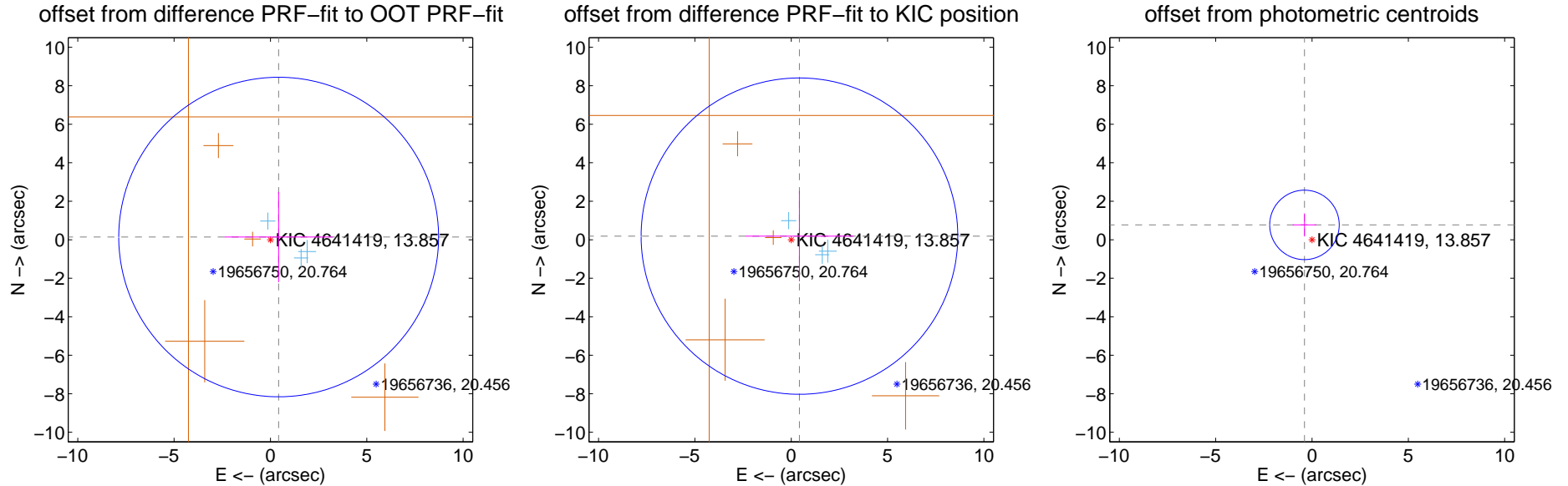
## DV Centroid Data

Supplemental centroid analysis for 004641419-02. Kepler magnitude: 13.86. Transit SNR 8.61

There are 3 quarters with good PRF difference image offsets

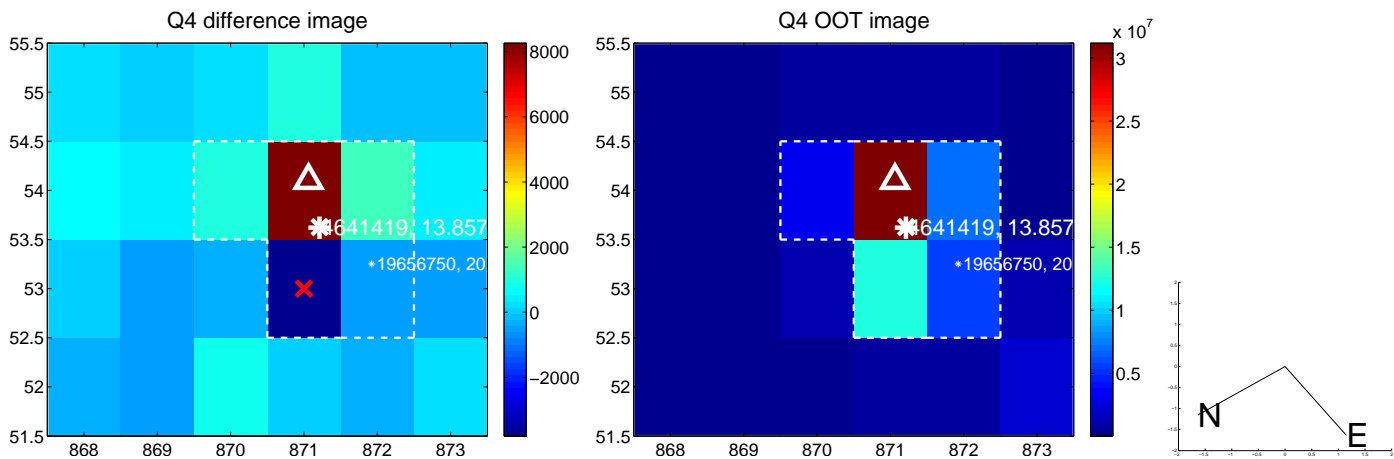
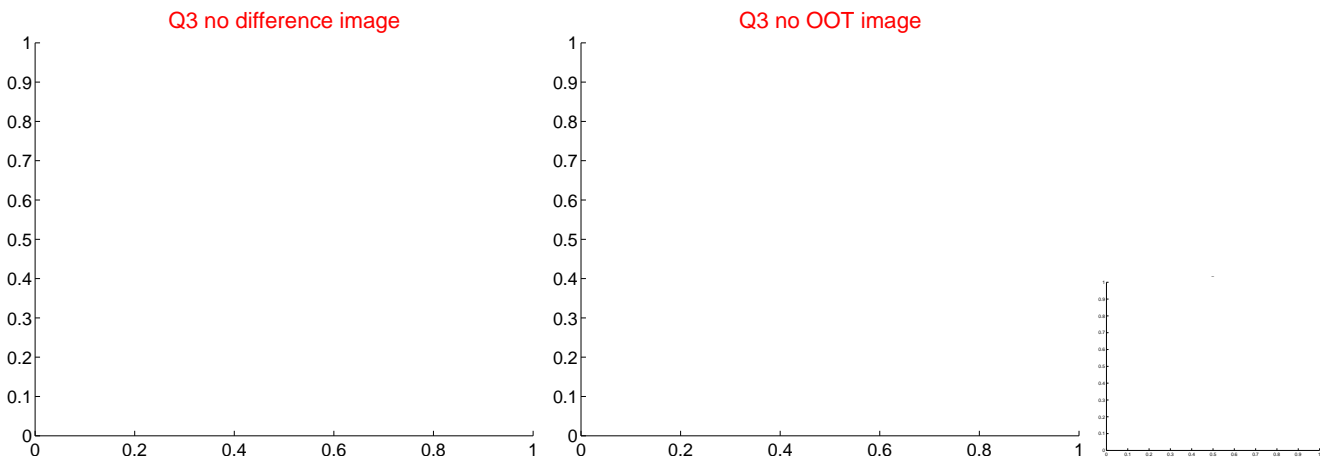
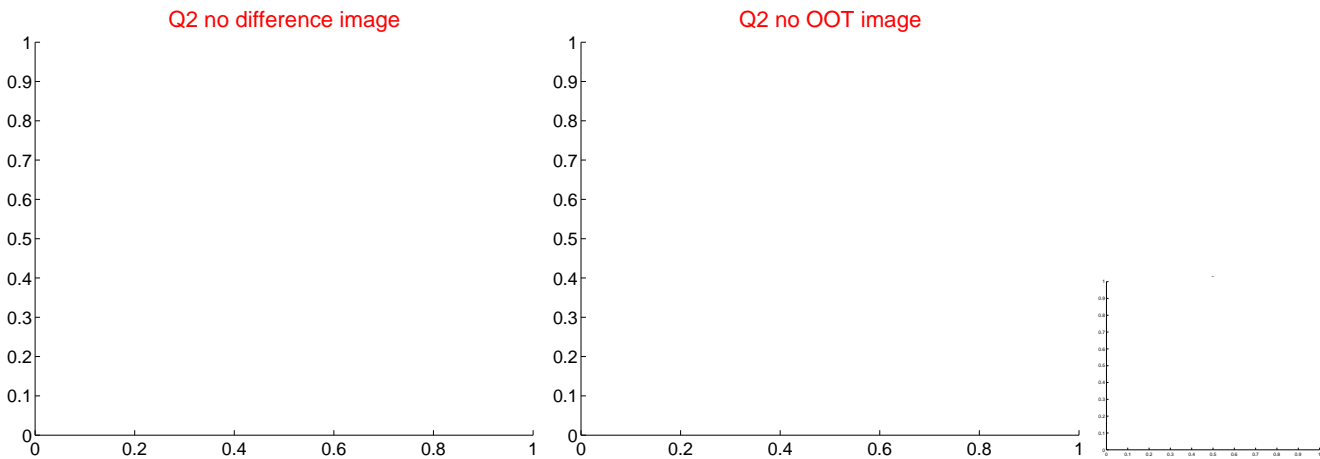
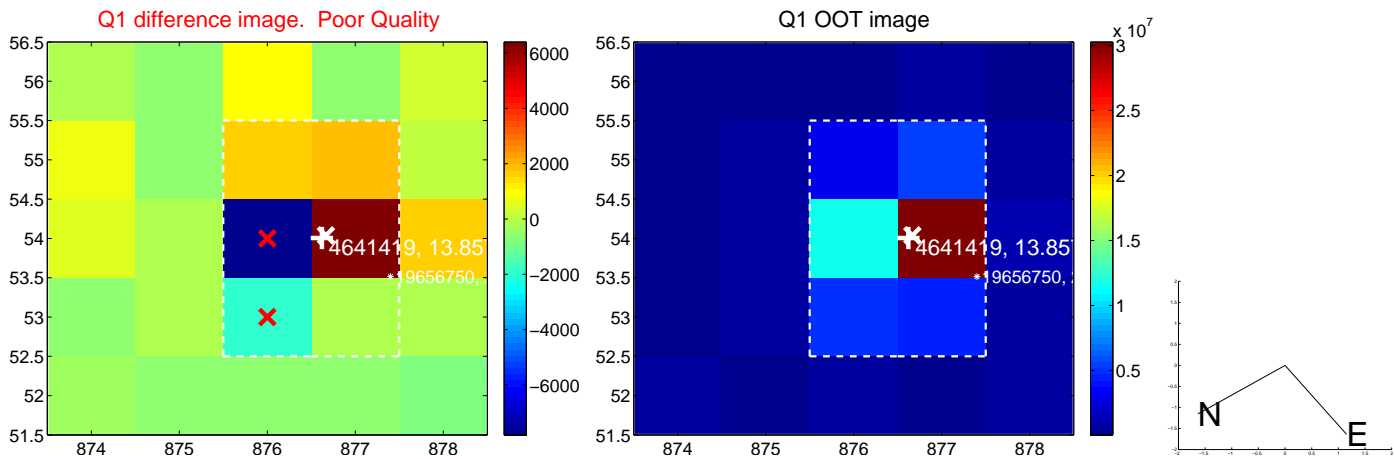
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.449 \pm 2.767$	0.16	$-0.426 \pm 2.809$	$0.142 \pm 2.348$
PRF-fit source offset from KIC position	$0.466 \pm 2.739$	0.17	$-0.426 \pm 2.809$	$0.188 \pm 2.348$
photometric centroid source offset	$0.87 \pm 0.60$	1.44	$0.39 \pm 0.61$	$0.77 \pm 0.60$

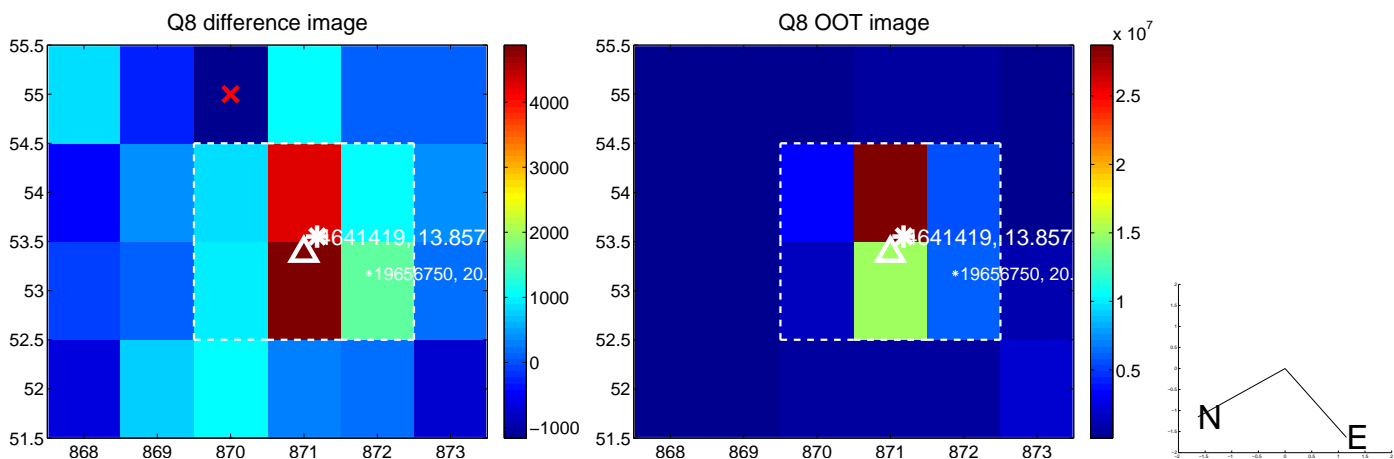
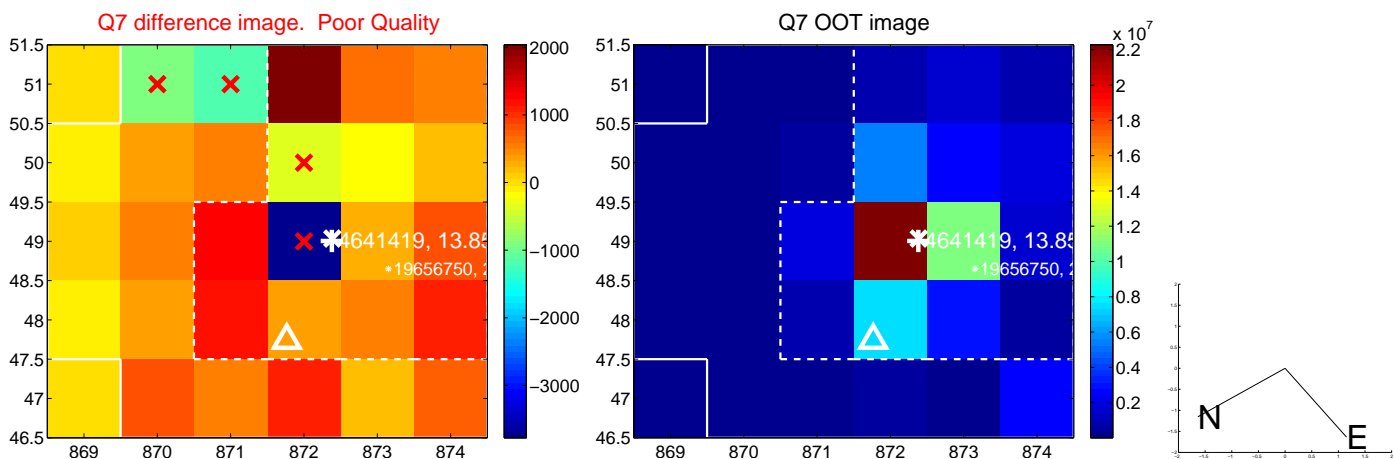
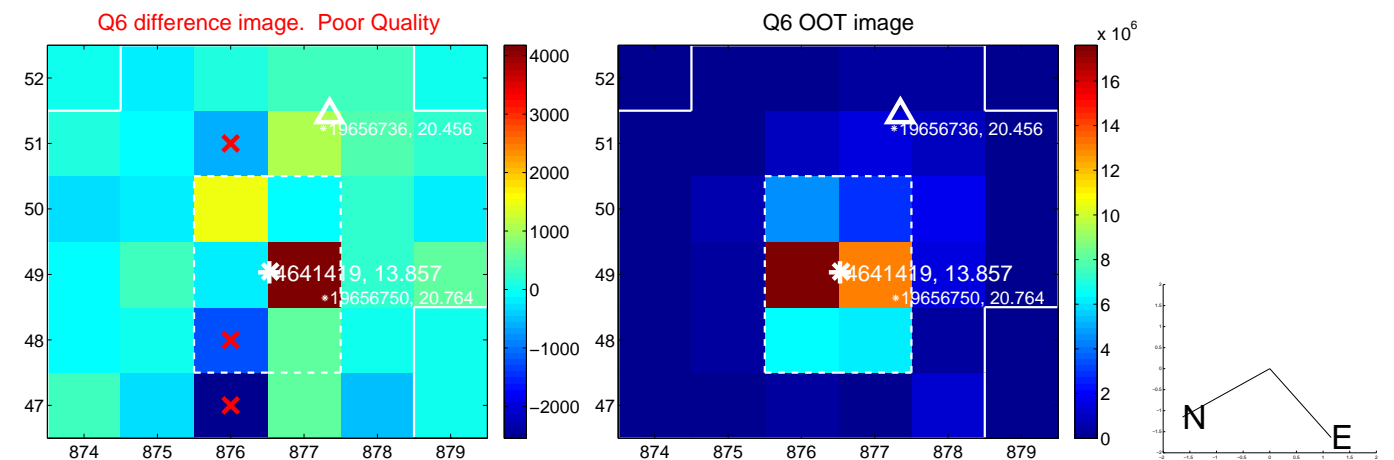
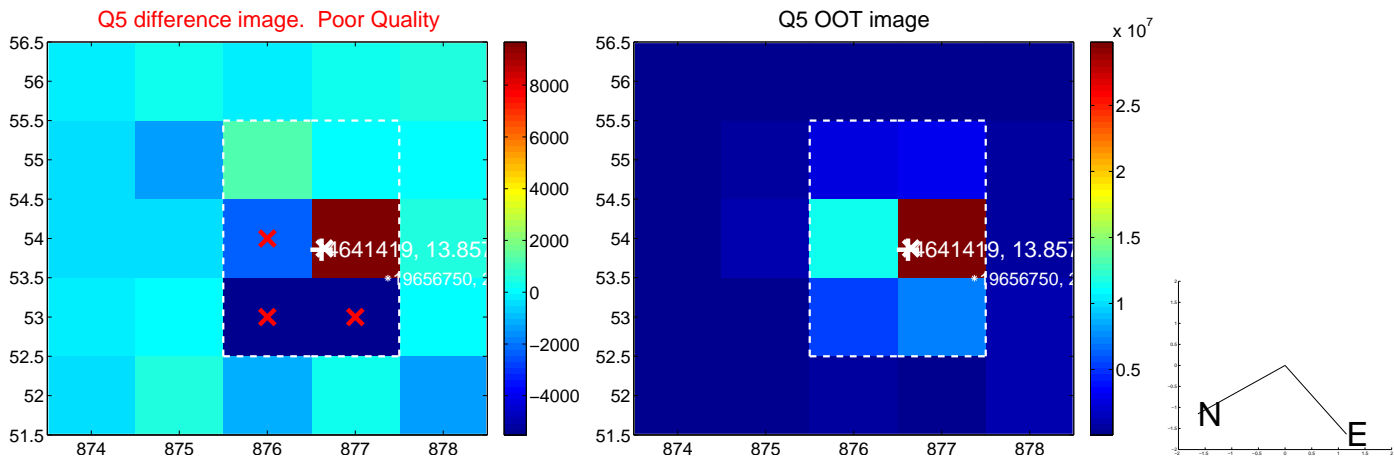


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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.

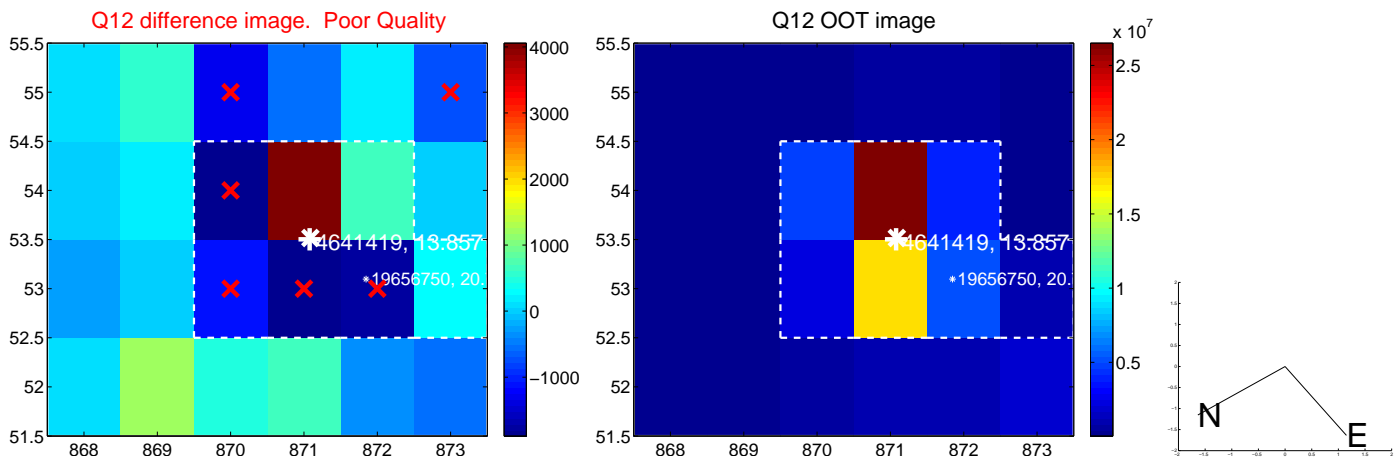
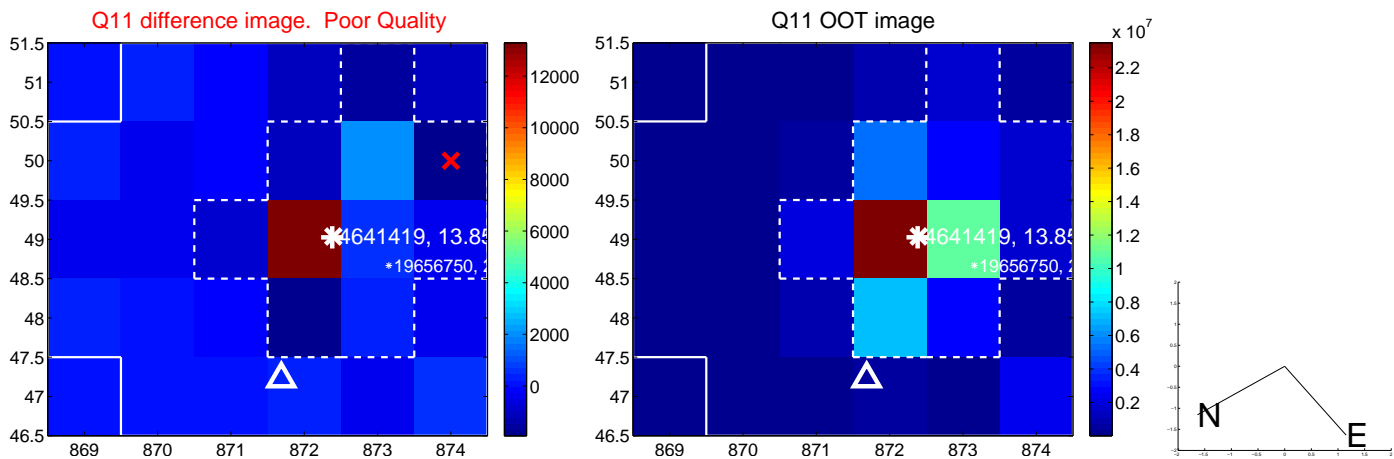
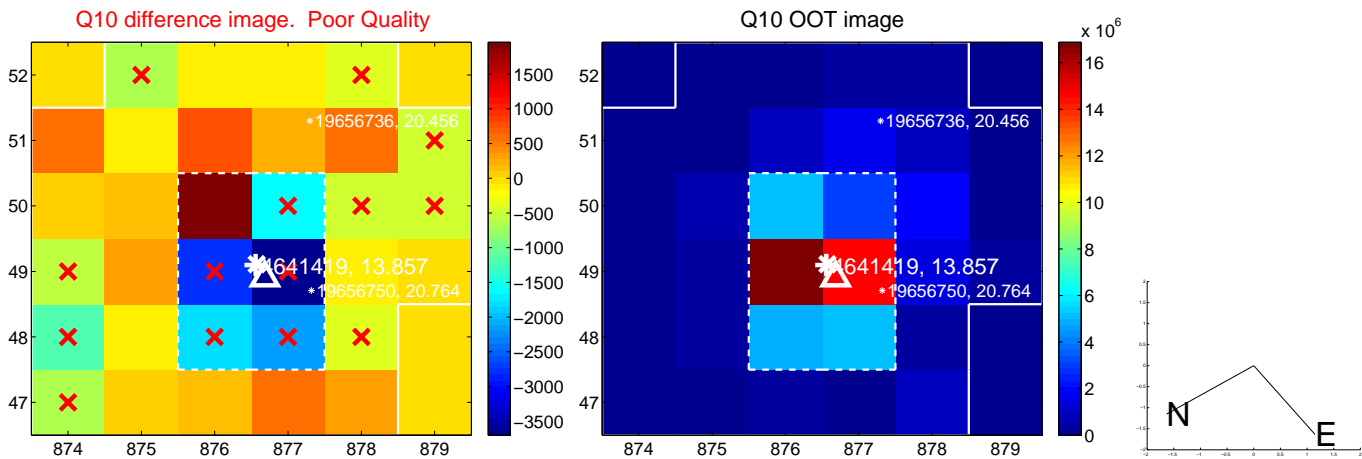
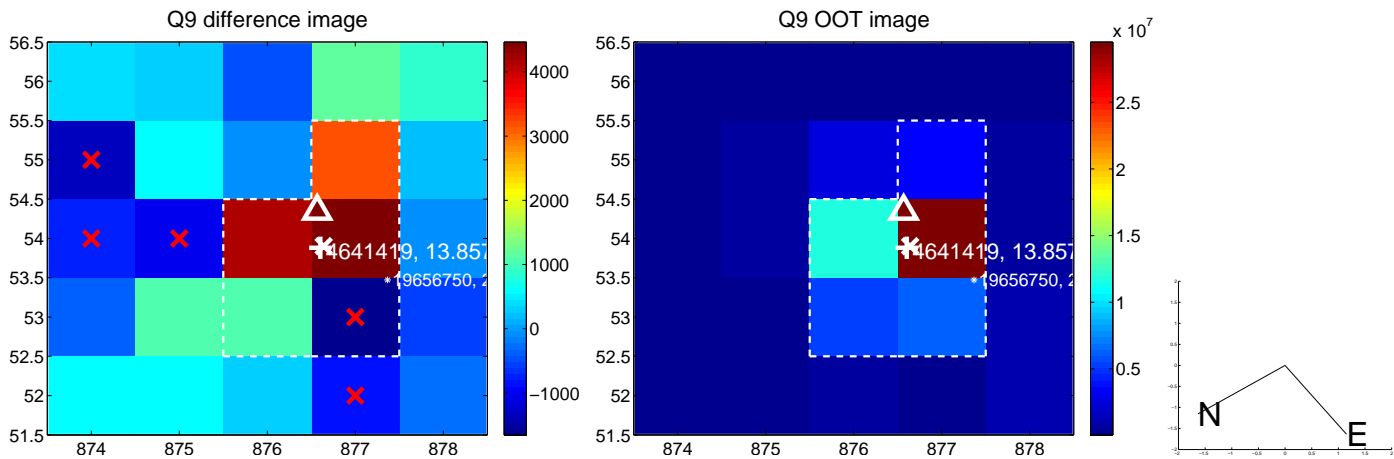
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

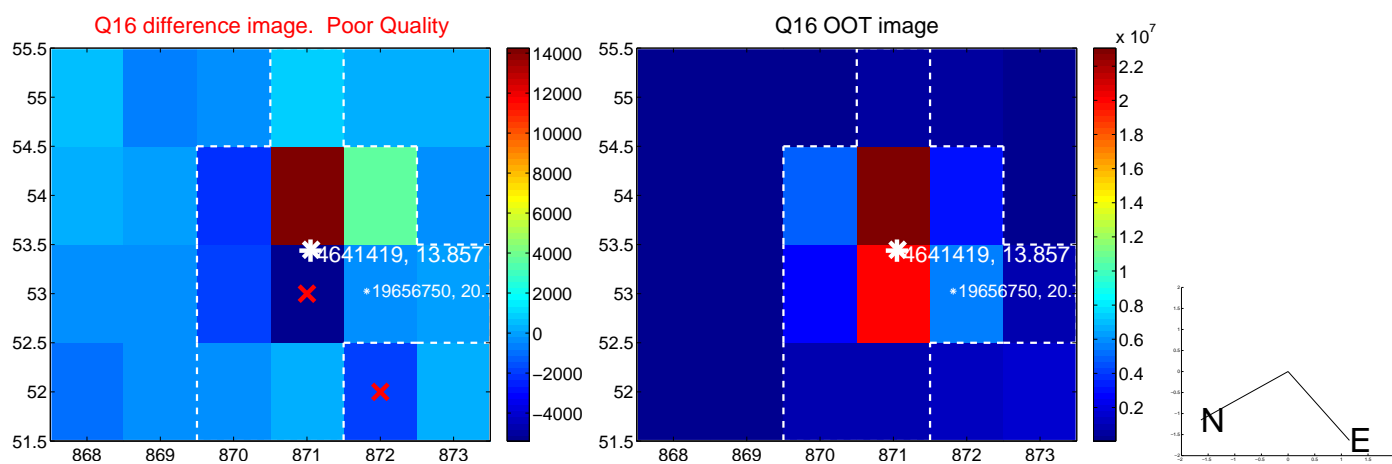
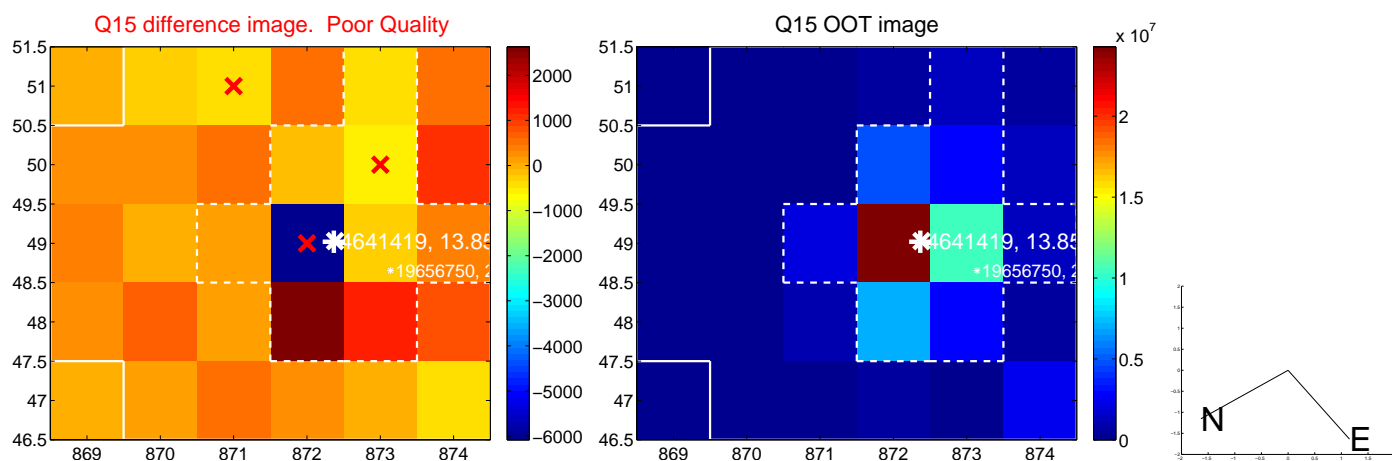
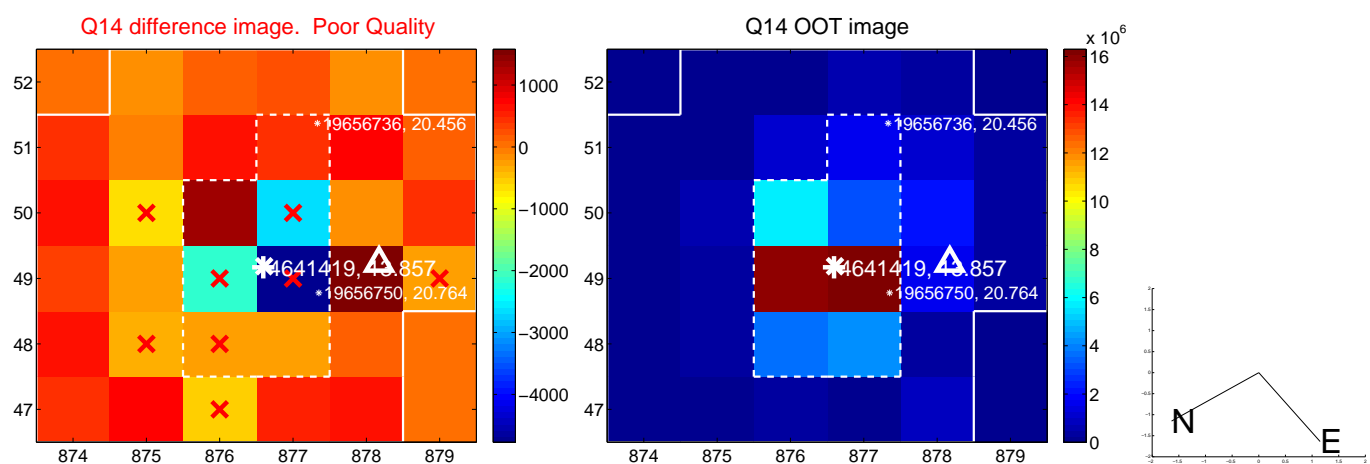
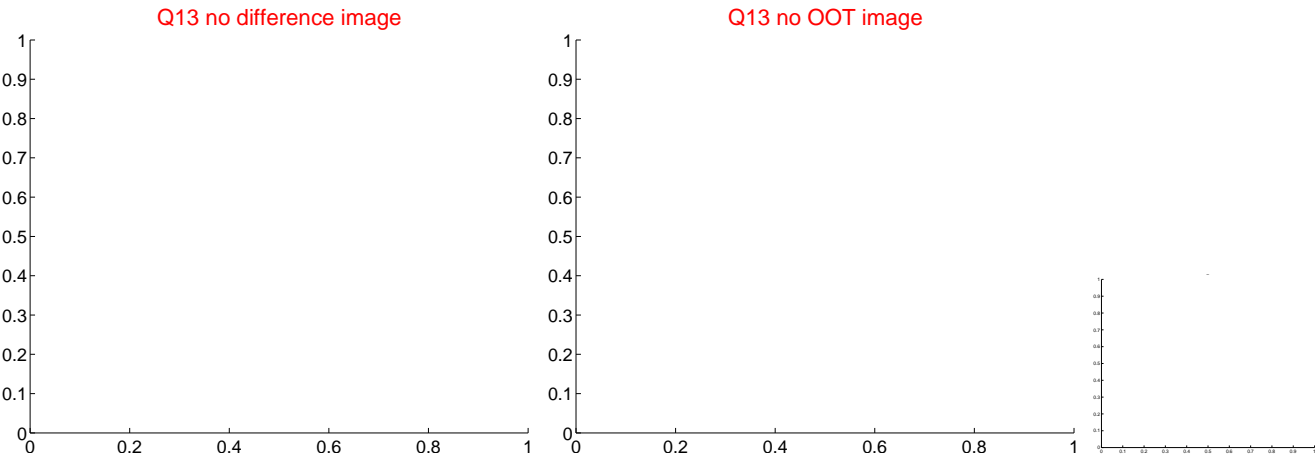


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

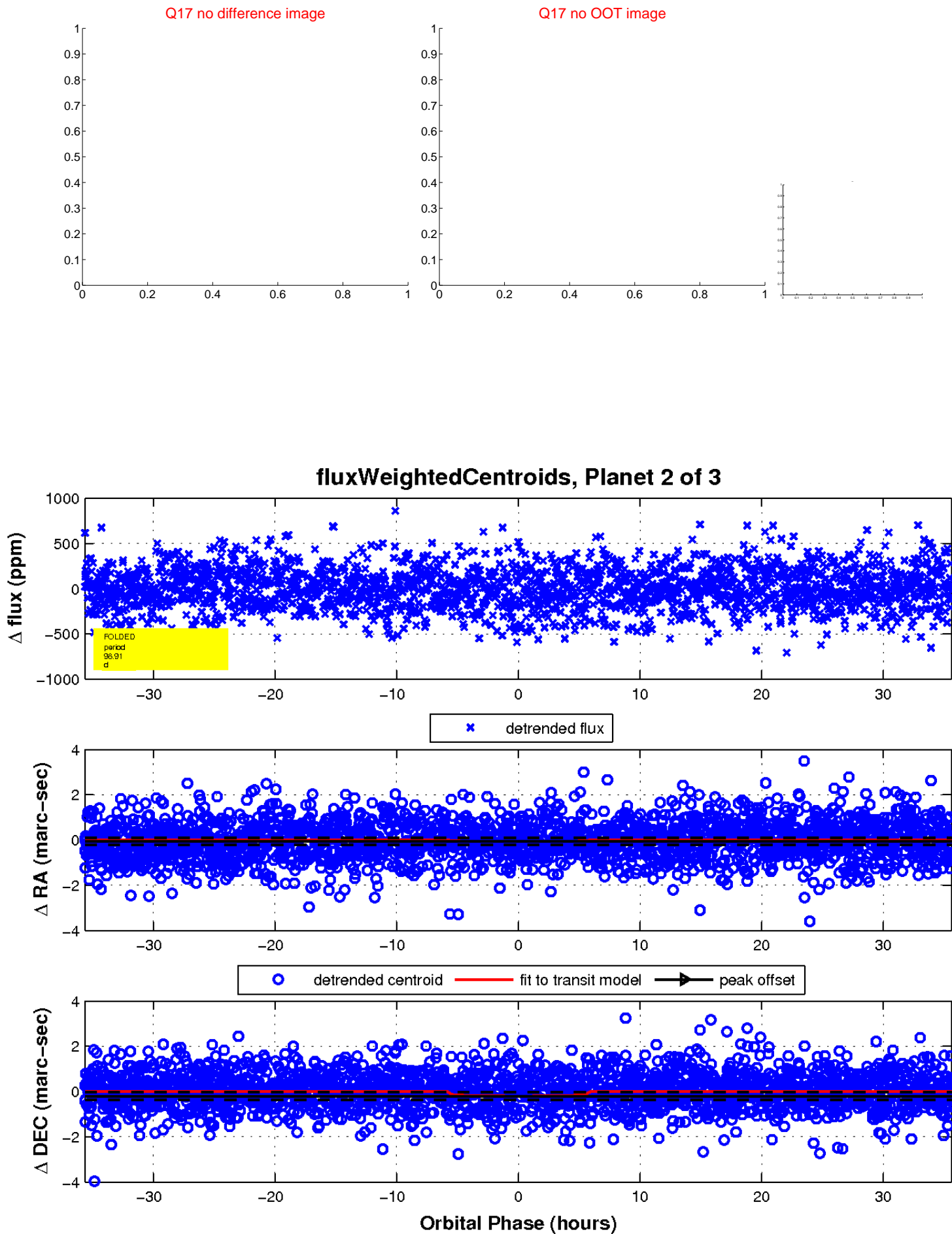




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

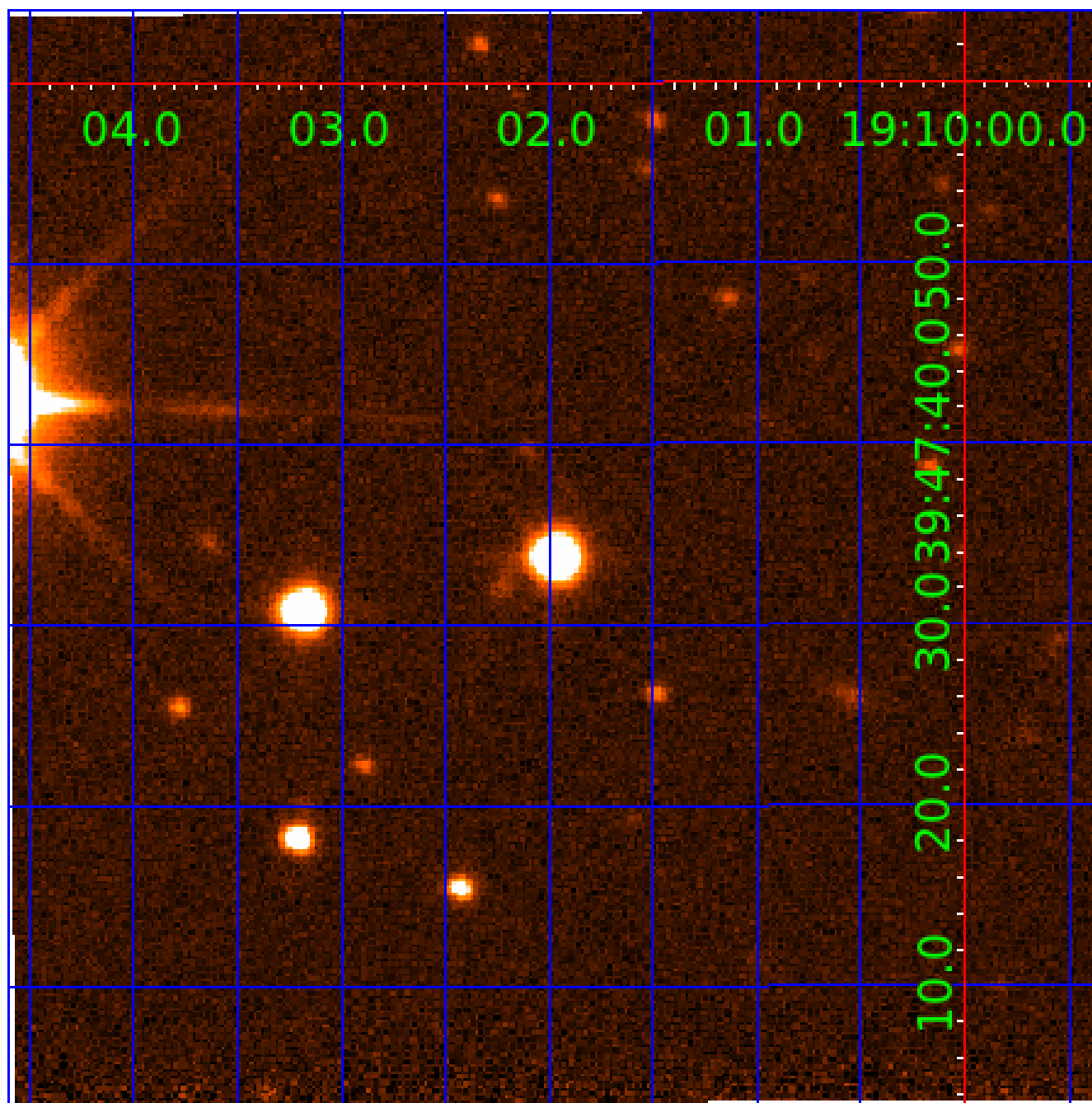


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 004641419

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004641419-01	OBS	No	1.743581	132.209016	22.6	10.456	8.2	8.1	1.17	6601	0.58	2571.13
004641419-02	OBS	No	98.906941	157.479211	259.7	11.874	8.9	8.6	1.17	6601	2.04	11.80
004641419-03	OBS	No	127.532745	194.155465	362.1	3.179	8.7	8.2	1.17	6601	2.46	8.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004641419-01	OBS	FP	0.00	1	0	0	0	LPP_DV
004641419-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004641419-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

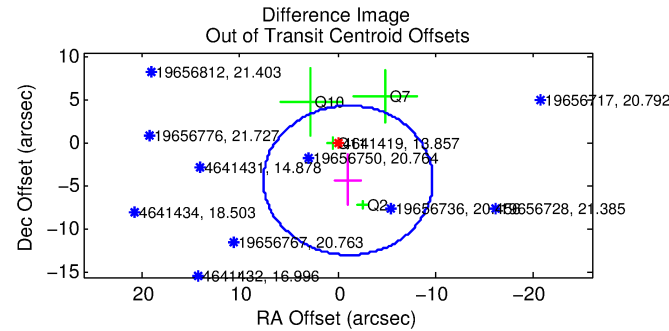
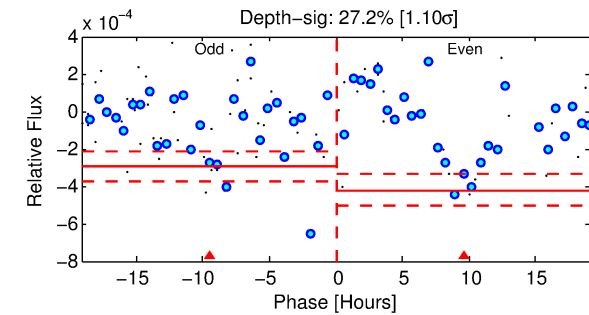
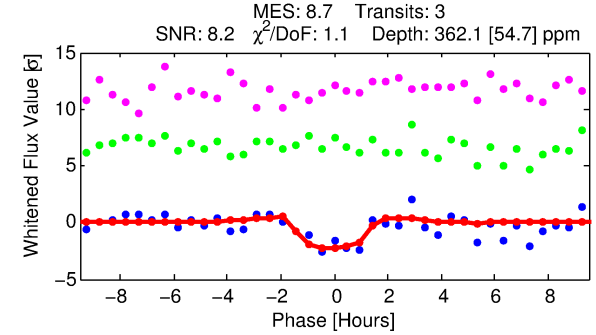
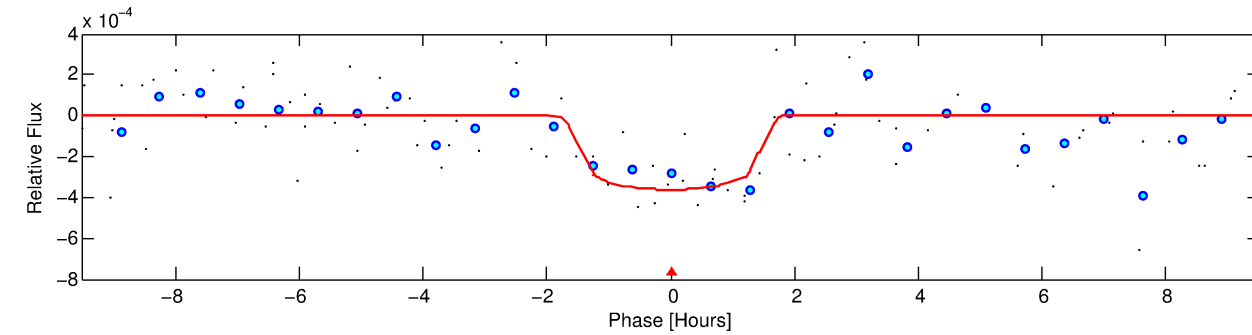
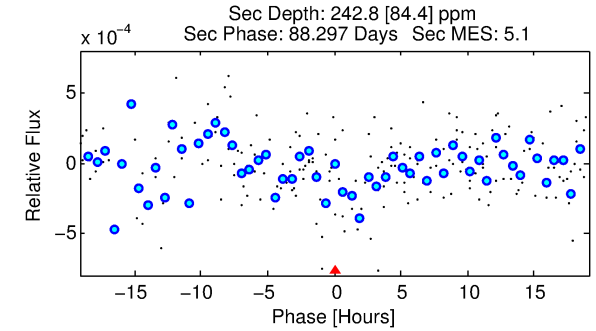
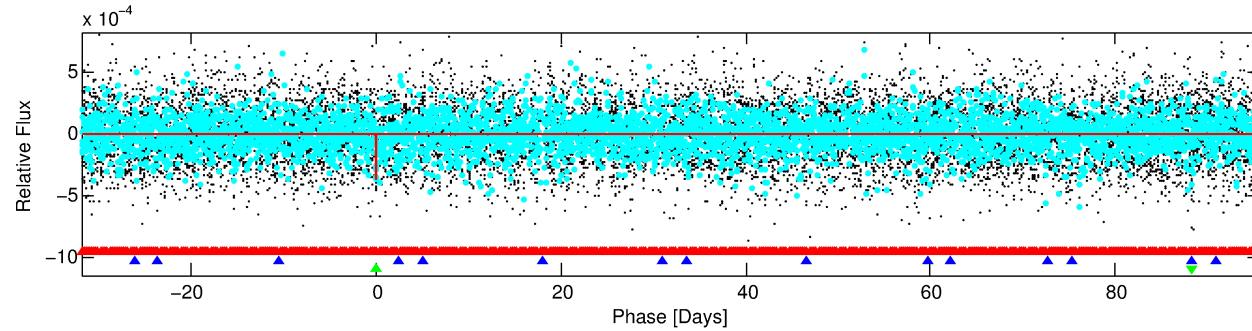
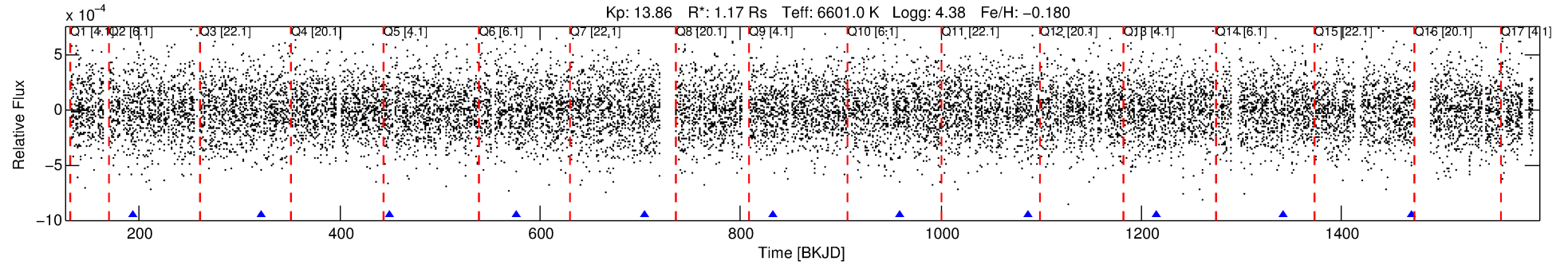
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004641419-03

No Significant Match Found

# DV One-Page Summary

KIC: 4641419 Candidate: 3 of 3 Period: 127.533 d



## DV Fit Results:

Period = 127.53275 [0.00194] d  
Epoch = 194.1555 [0.0127] BKJD  
Rp/R\* = 0.0193 [0.0220]  
a/R\* = 192.34 [1229.57]  
b = 0.80 [2.85]  
Seff = 8.41 [3.40]  
Teq = 434 [44] K  
Rp = 2.46 [2.91] Re  
a = 0.5250 [0.1395] AU  
Ag = 6100.16 [14273.42] [0.43σ]  
Teff = 5933 [3429] K [1.60σ]

## DV Diagnostic Results:

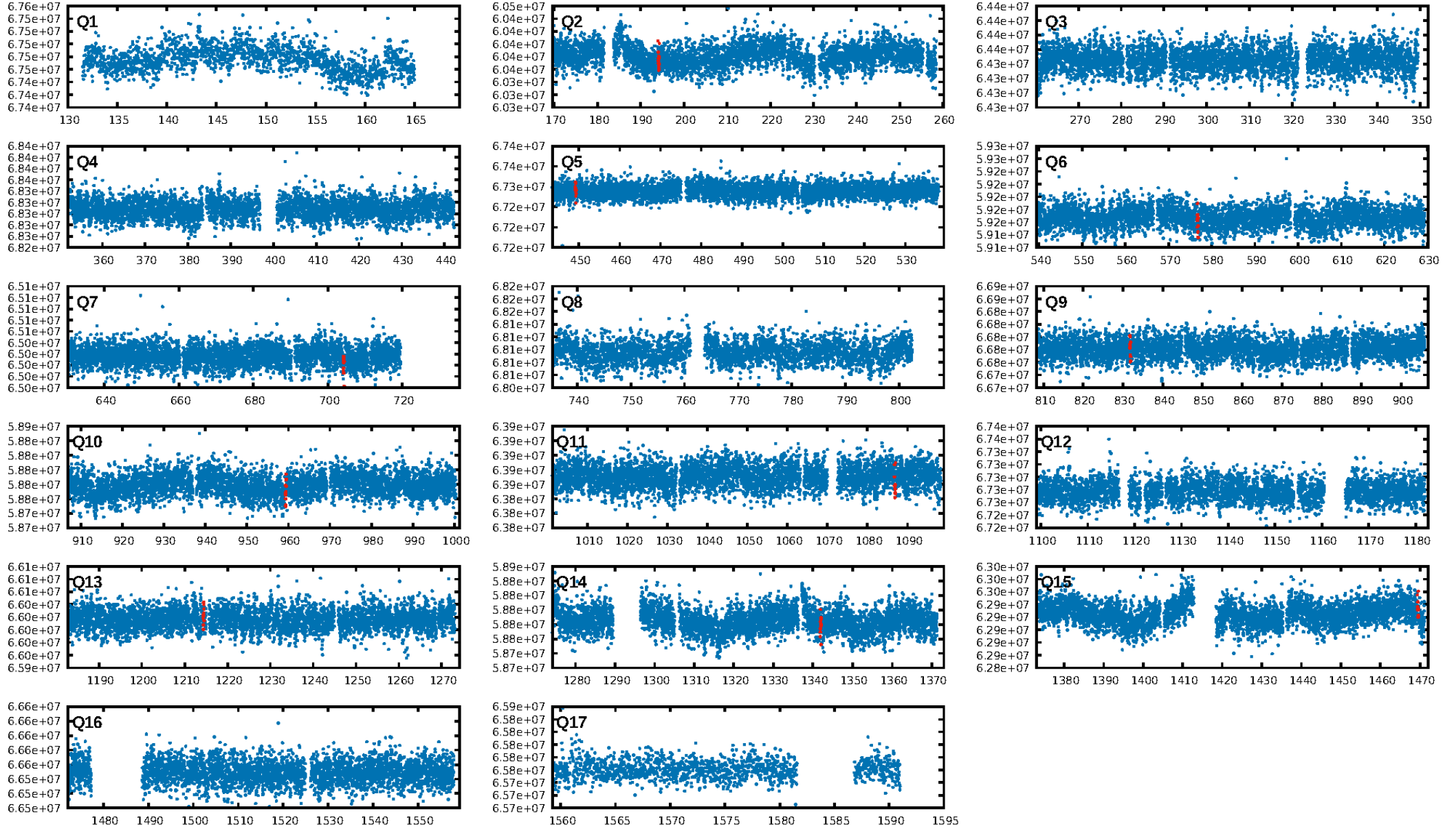
ShortPeriod-sig: 100.0% [55.89σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 12.9%  
ModelChiSquareGof-sig: 96.5%  
**Bootstrap-pfa: 4.42e-09**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 1.049**  
Centroid-sig: 28.5%  
Centroid-so: 1.084 arcsec [1.18σ]  
OotOffset-rm: 4.453 arcsec [1.55σ]  
OotOffset-st: 2/2/0/0 [4]  
KicOffset-rm: 4.373 arcsec [1.44σ]  
KicOffset-st: 2/2/0/0 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.40 [4/10]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:52:44 Z

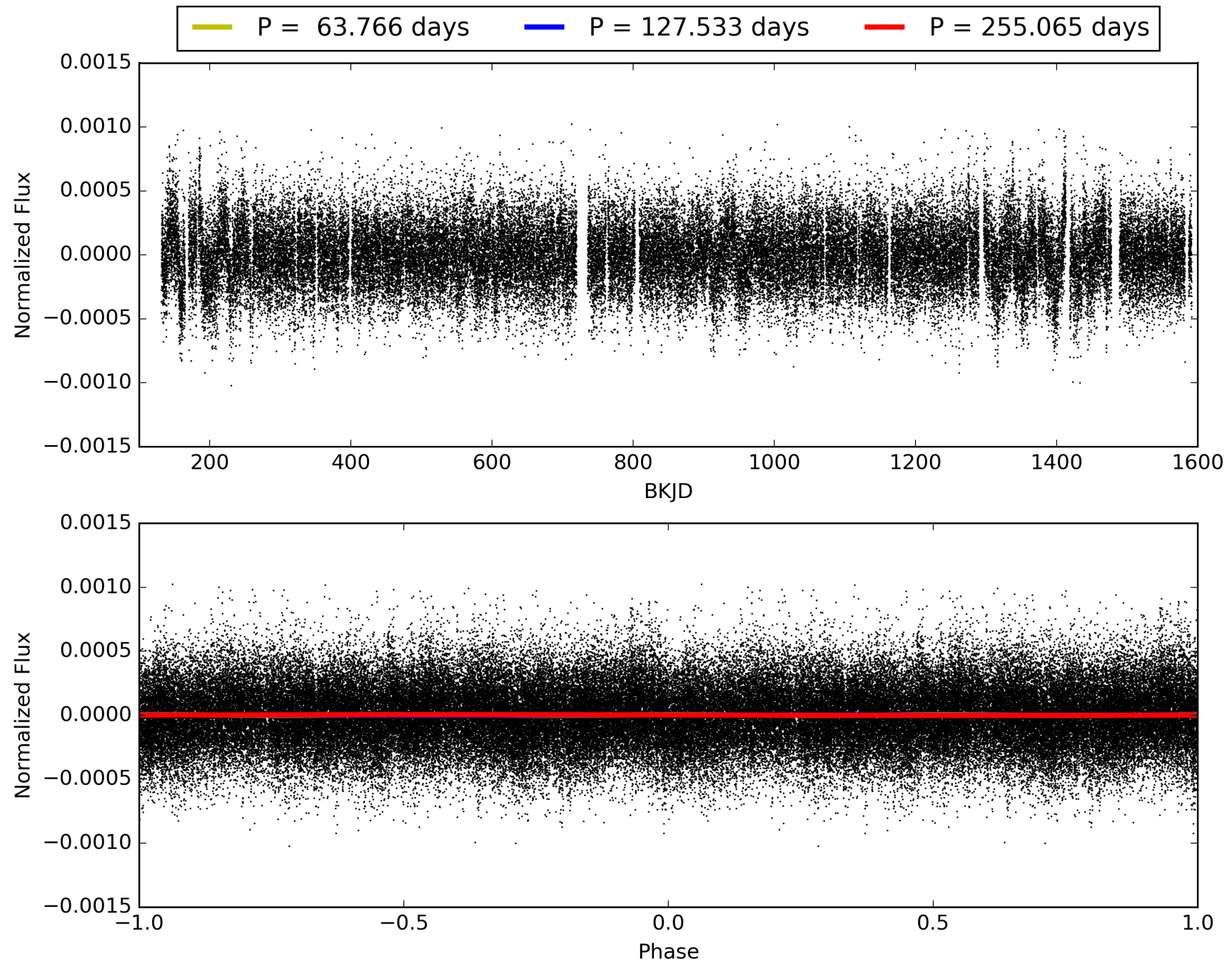
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 004641419-03, PDC Light Curves

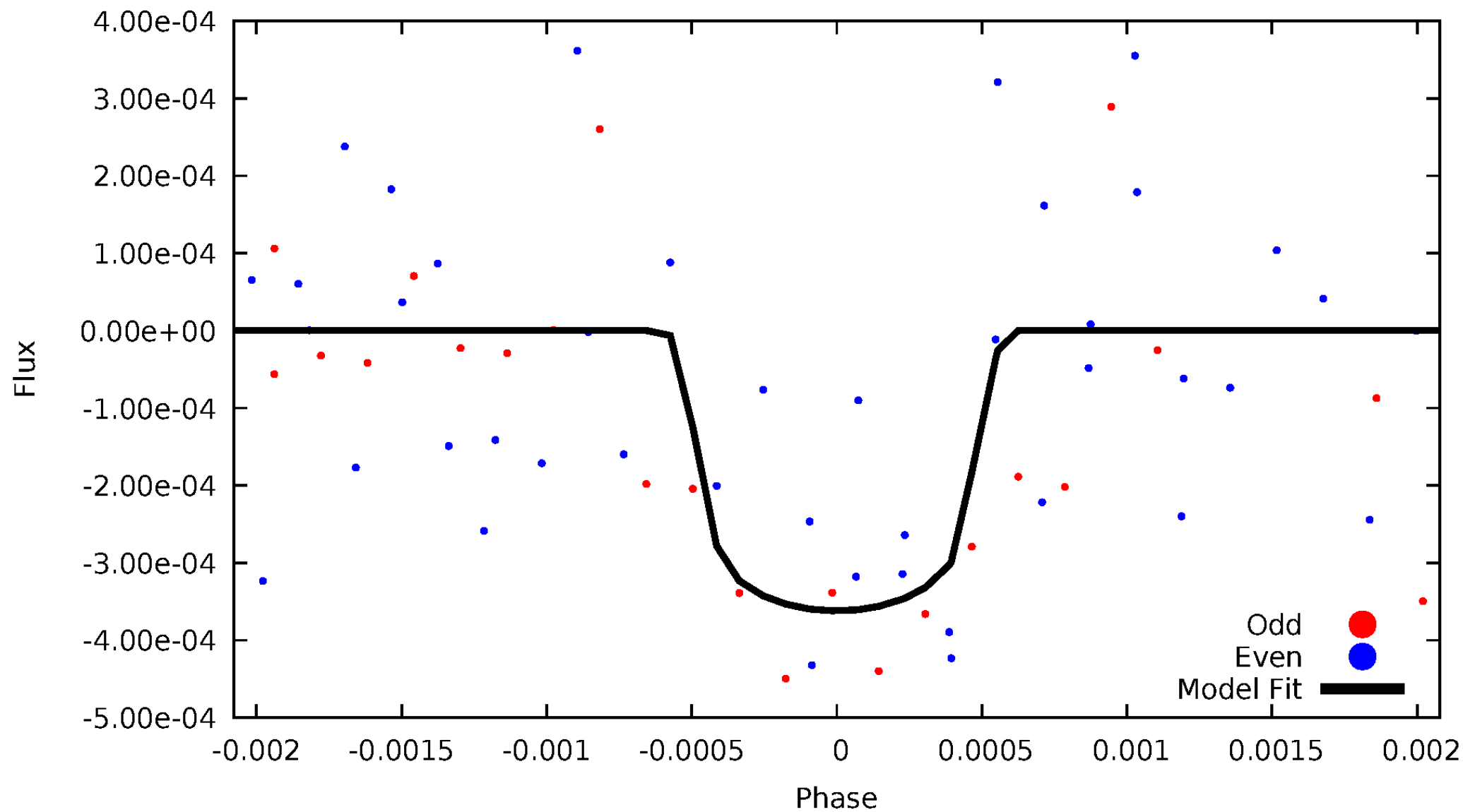


TCE 004641419-03



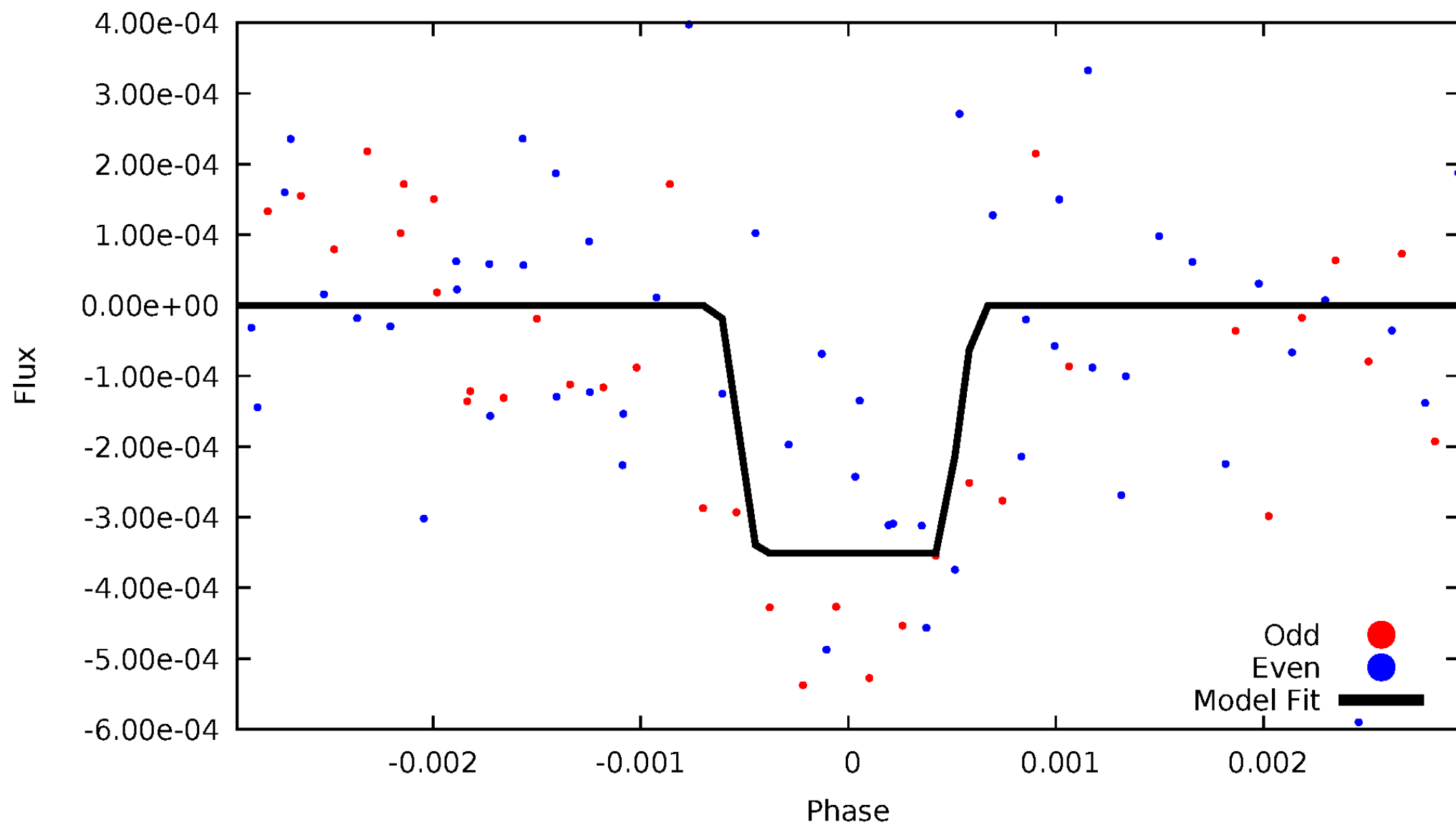
# DV Odd/Even

TCE 004641419-03

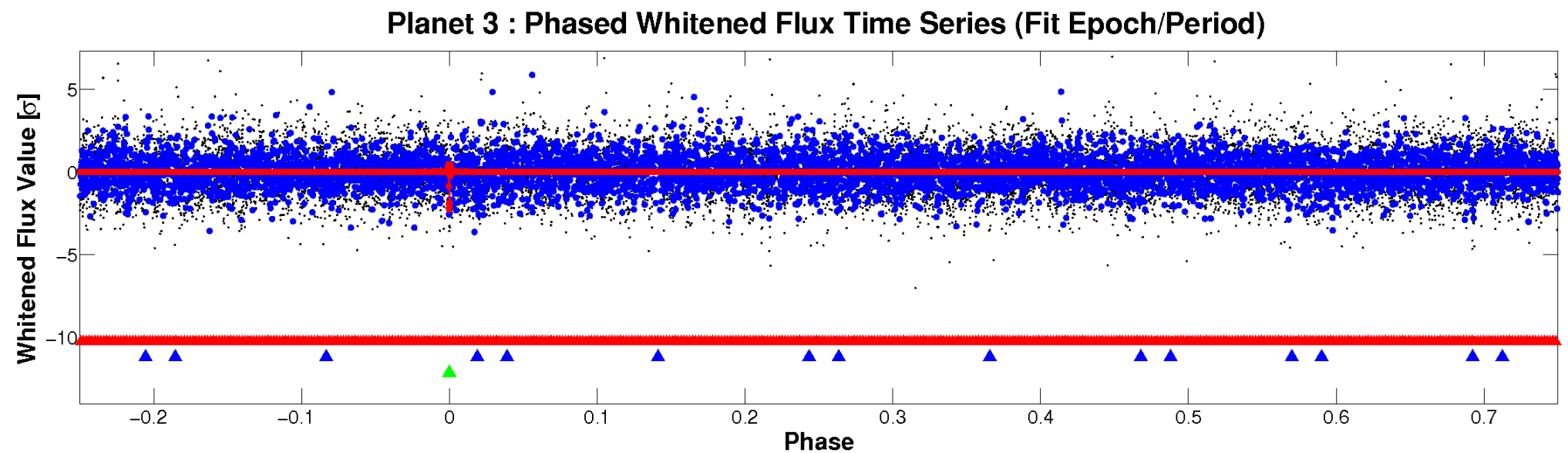
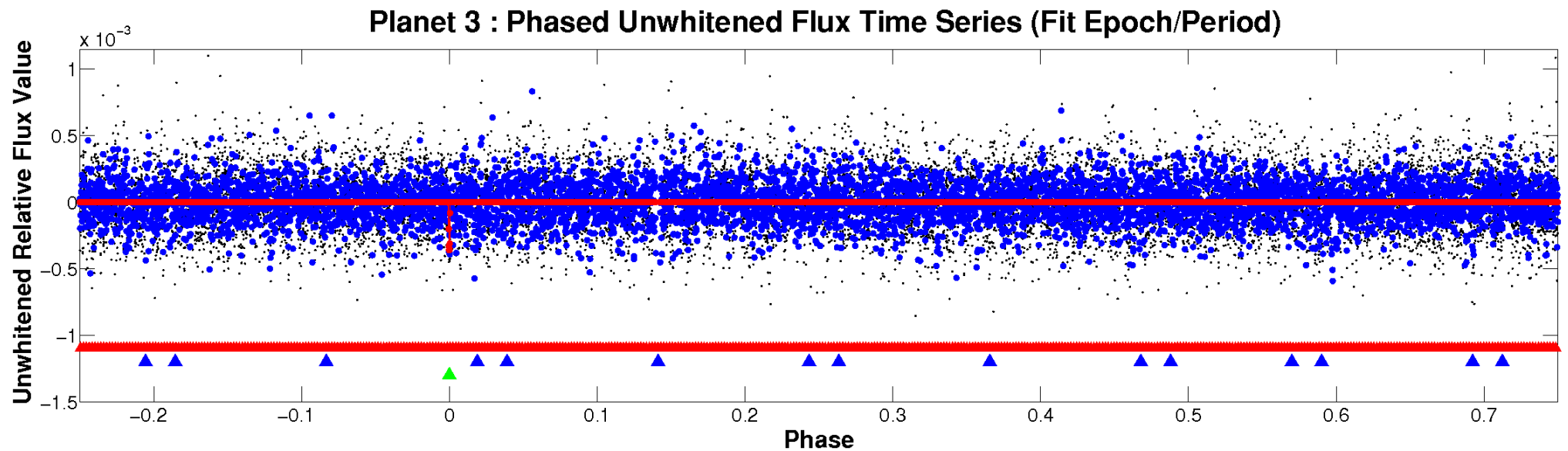


# ALT Odd/Even

TCE 004641419-03



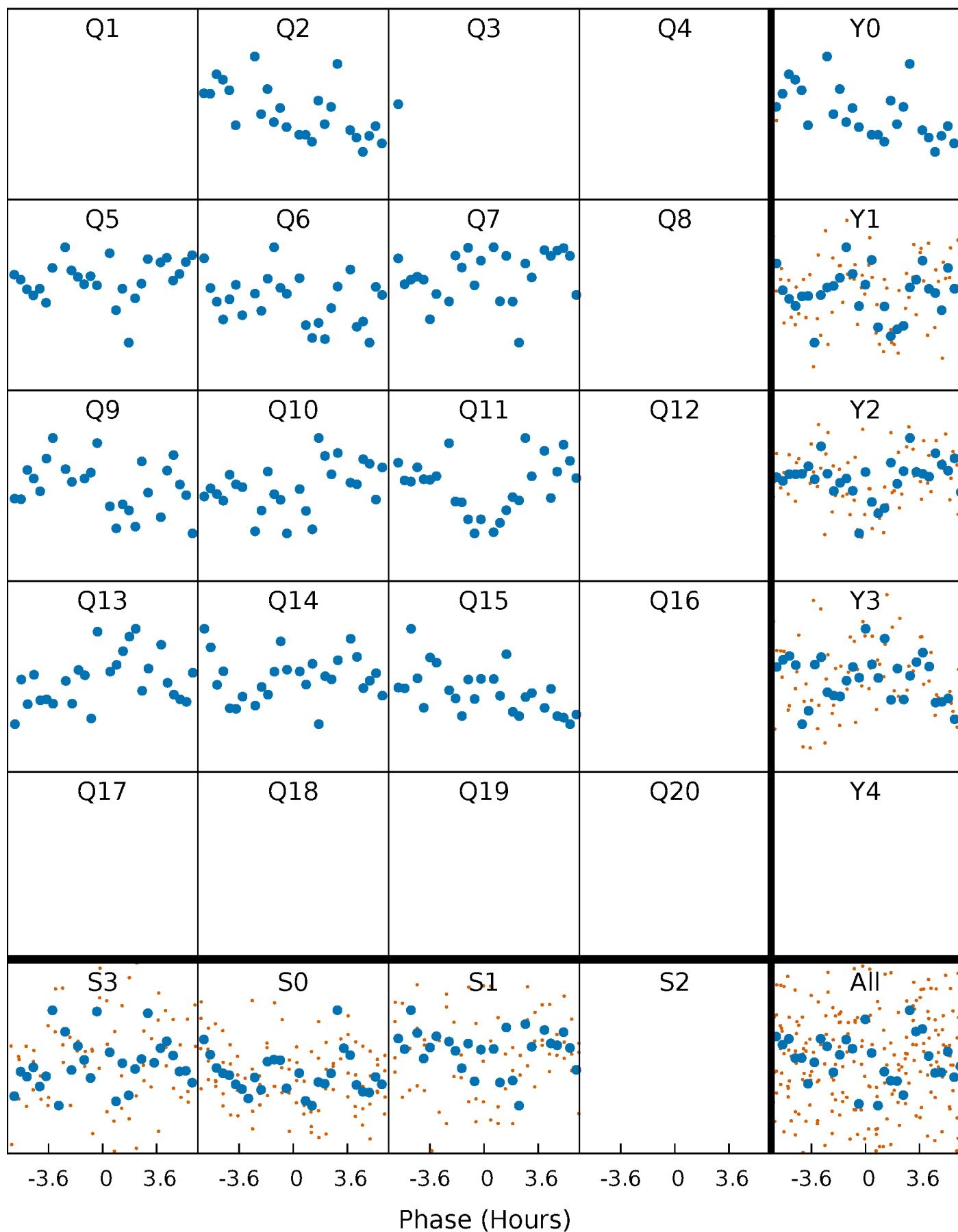
# Non-Whitened Vs. Whitened Light Curve





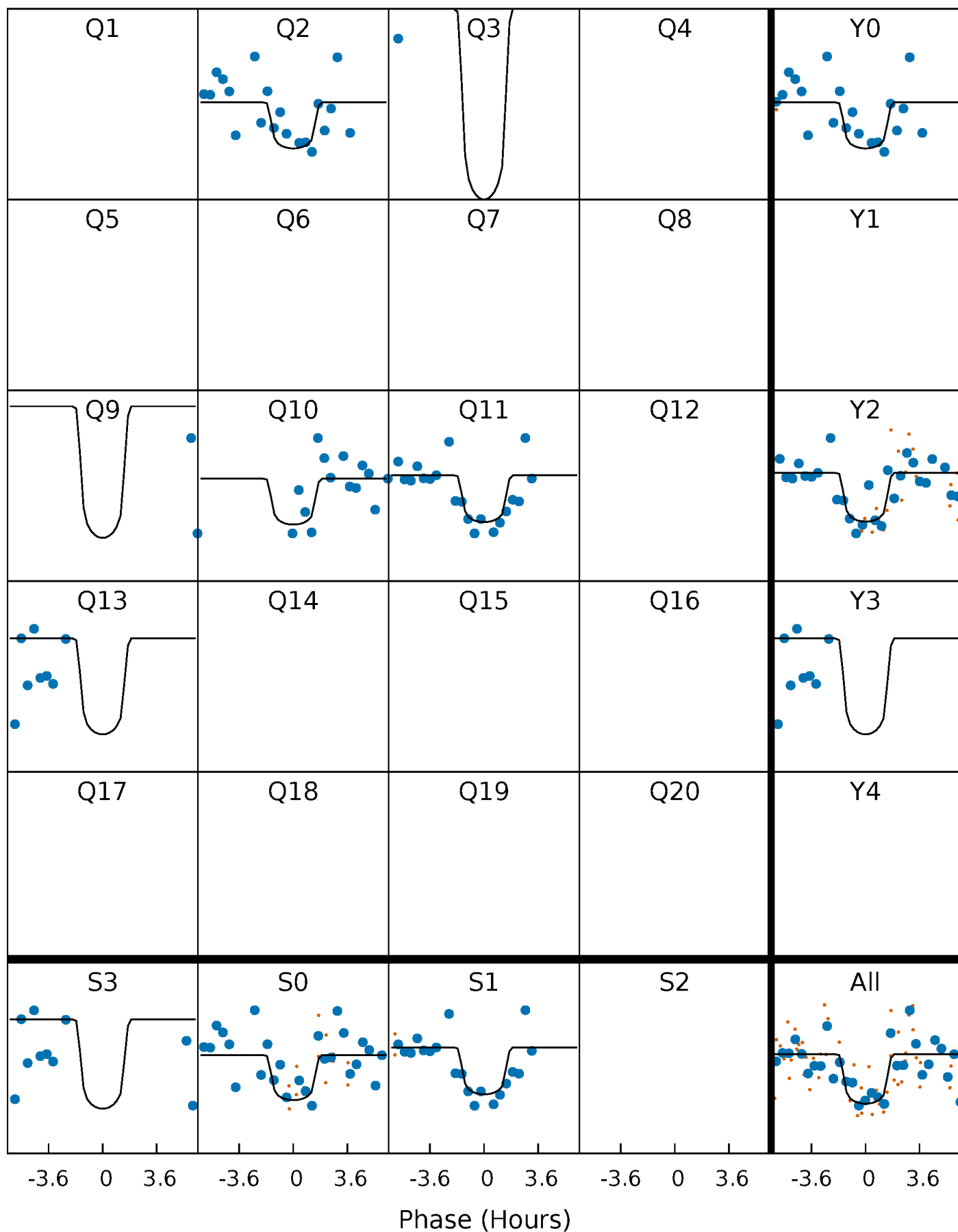
# PDC Quarter-Phased Transit Curves

TCE 004641419-03 P=127.532745 Days  $T_0=194.155465$  (BKJD)



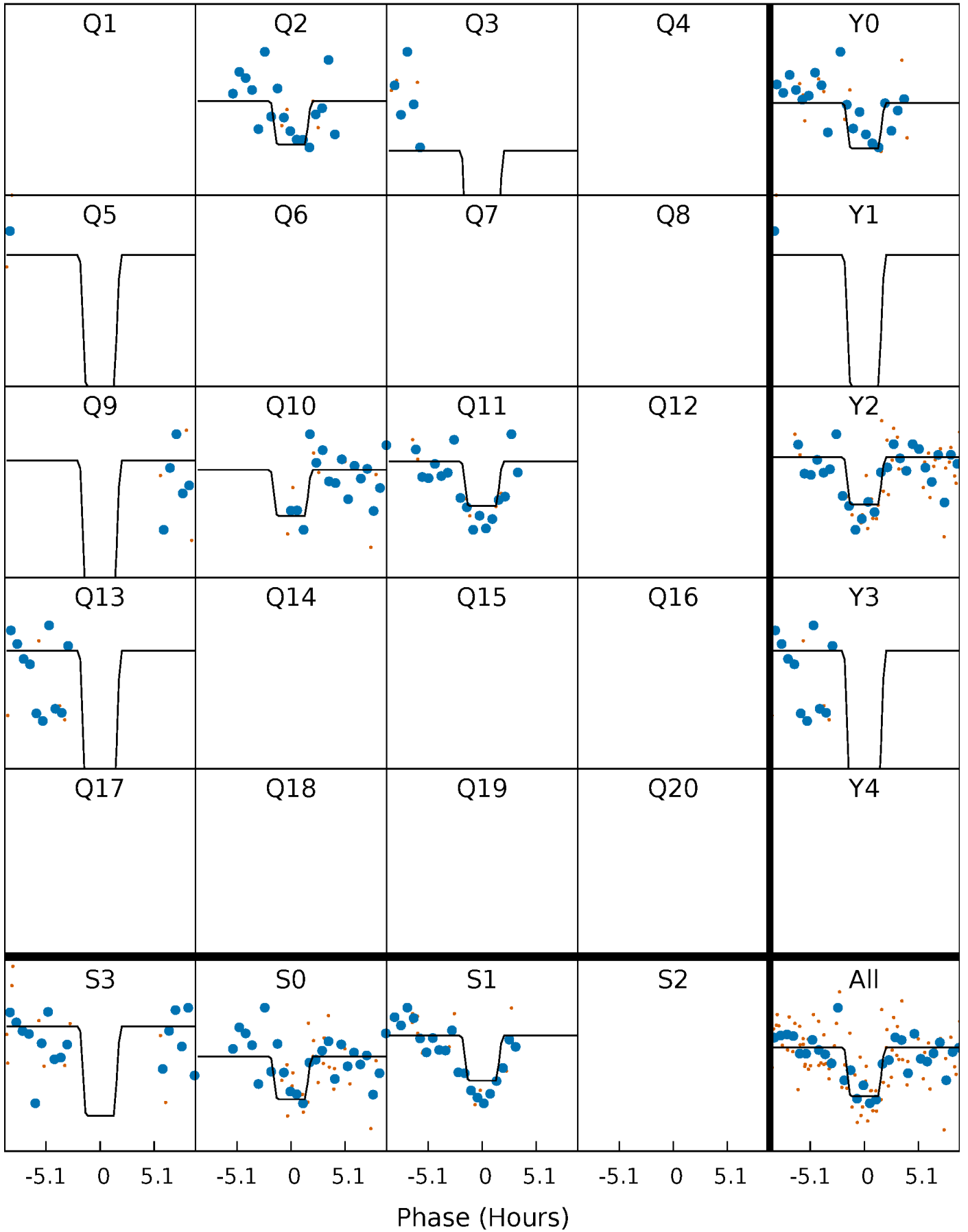
# DV Quarter-Phased Transit Curves

TCE 004641419-03 P=127.532745 Days  $T_0=194.155465$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

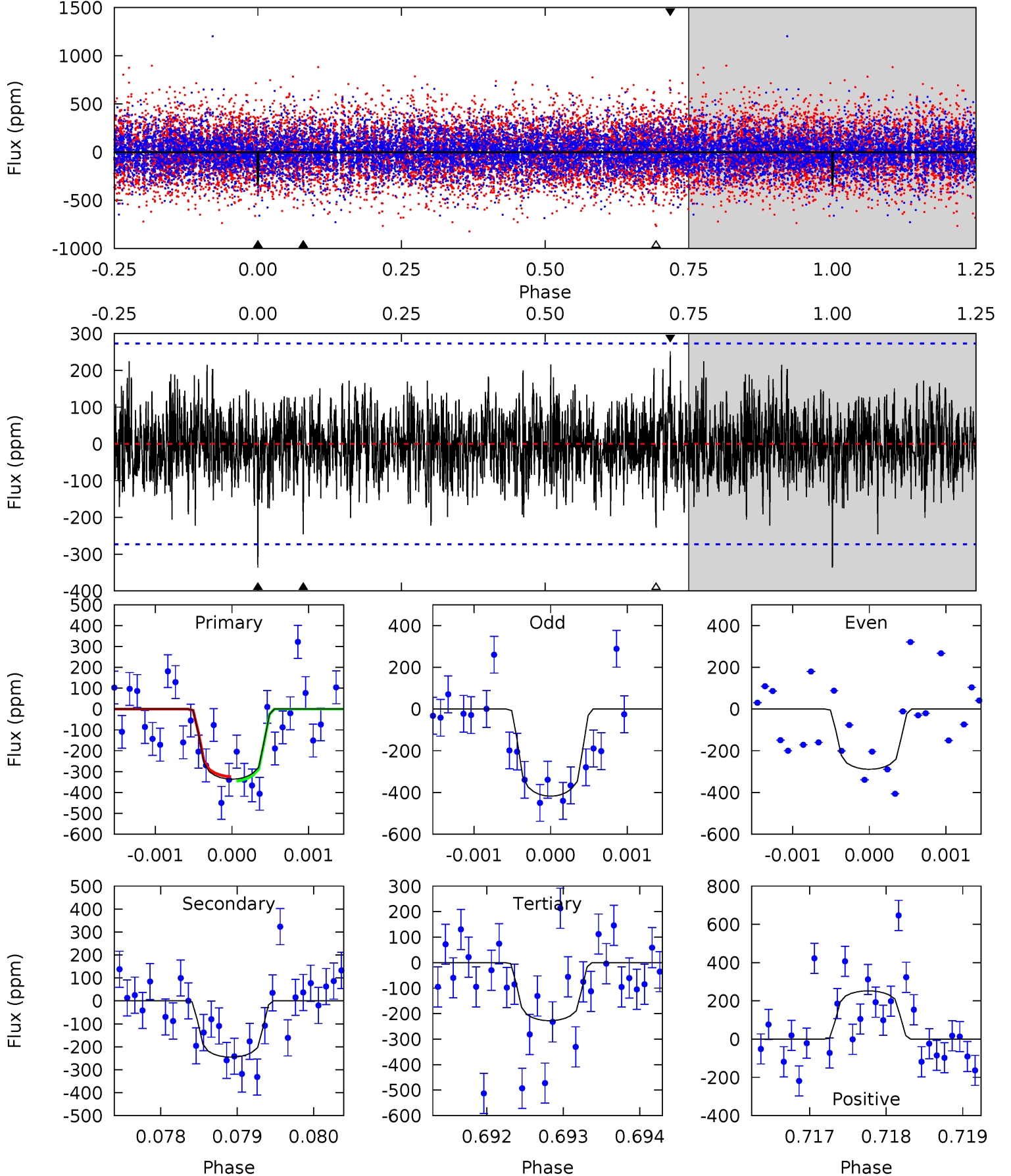
TCE 004641419-03 P=127.535840 Days  $T_0=194.139322$  (BKJD)



# DV Model-Shift Uniqueness Test

004641419-03, P = 127.532745 Days, E = 66.622720 Days

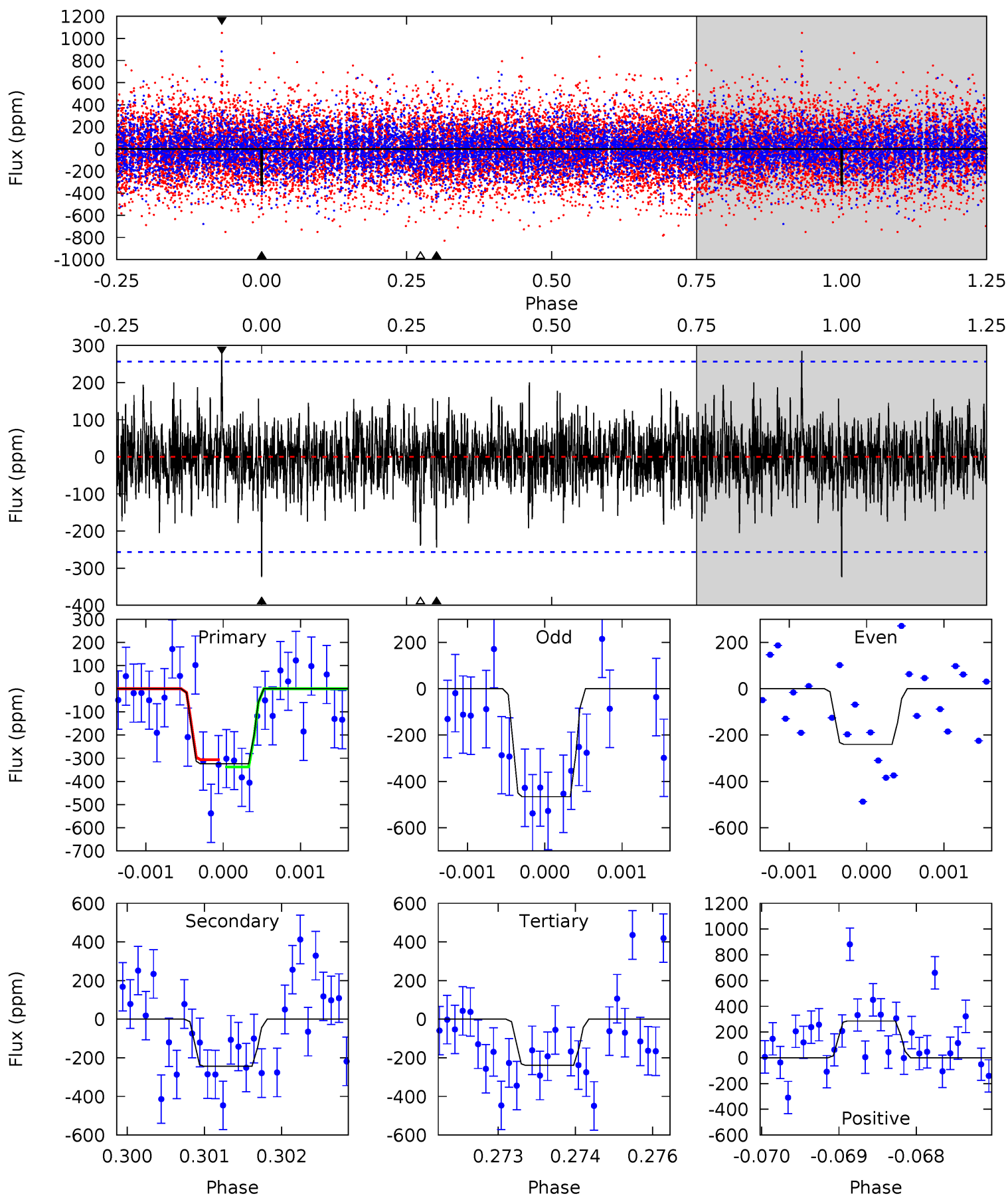
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.68	4.87	4.53	5.01	5.43	3.26	1.35	2.15	1.66	0.35	-0.14	1.26	1.09	0.43	0.22



# Alt Model-Shift Uniqueness Test

004641419-03, P = 127.535840 Days, E = 66.603482 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
6.83	5.14	5.04	6.02	5.41	3.22	1.26	1.79	0.81	0.10	-0.88	2.39	1.08	0.47	0.32





### Stellar Parameters For KIC 004641419

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6601^{+149}_{-215}$	$4.378^{+0.065}_{-0.208}$	$-0.180^{+0.250}_{-0.300}$	$1.167^{+0.372}_{-0.133}$	$1.190^{+0.175}_{-0.158}$	$1.053^{+0.299}_{-0.551}$
	+2%/-3%	+1%/-5%	+139%/-167%	+32%/-11%	+15%/-13%	+28%/-52%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004641419-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-245 \pm 50$	$3.20^{+2.81}_{-2.14}$	$617^{+41}_{-31}$	$5305^{+4477}_{-1210}$	$3477^{+26563}_{-2518}$
Alt.	$-244 \pm 47$	$3.11^{+2.59}_{-1.93}$	$618^{+46}_{-30}$	$5386^{+4012}_{-1184}$	$3722^{+23412}_{-2664}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

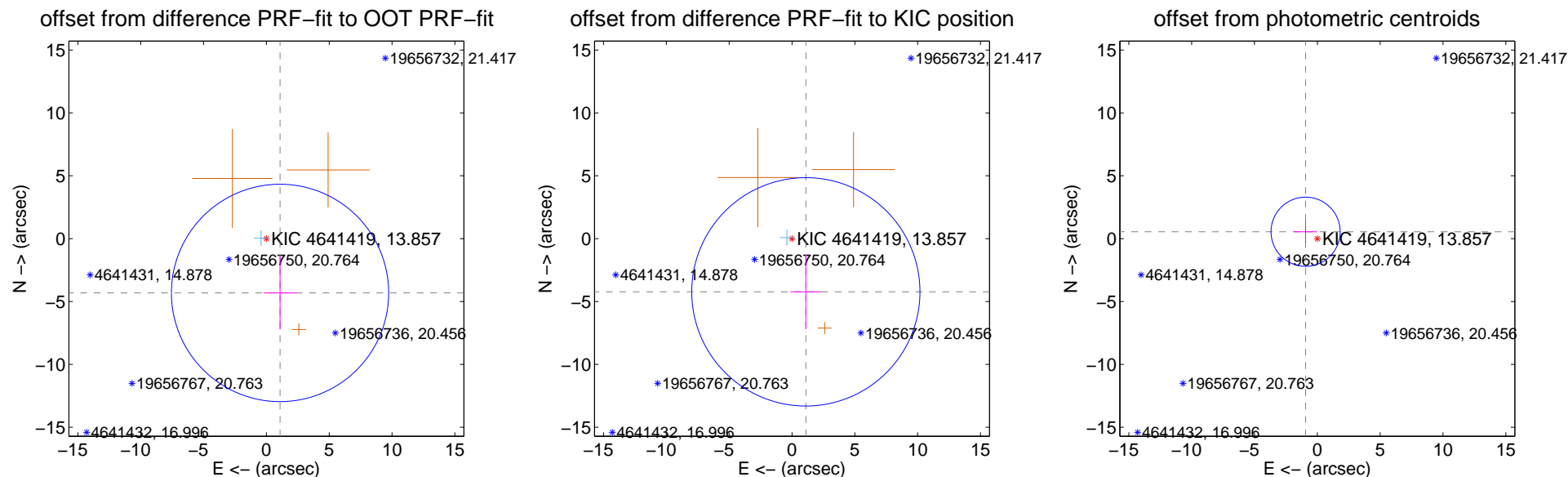
## DV Centroid Data

Supplemental centroid analysis for 004641419-03. Kepler magnitude: 13.86. Transit SNR 8.19

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.453 \pm 2.882$	1.55	$-1.088 \pm 1.318$	$-4.318 \pm 2.902$
PRF-fit source offset from KIC position	$4.373 \pm 3.027$	1.44	$-1.101 \pm 1.242$	$-4.232 \pm 2.970$
photometric centroid source offset	$1.08 \pm 0.92$	1.18	$0.93 \pm 0.92$	$0.55 \pm 0.91$



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.

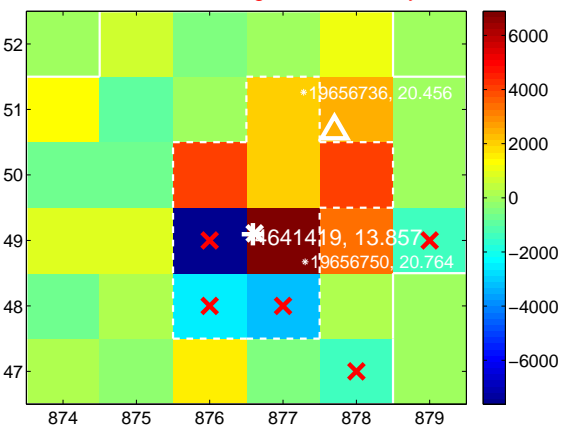
Q1 no difference image



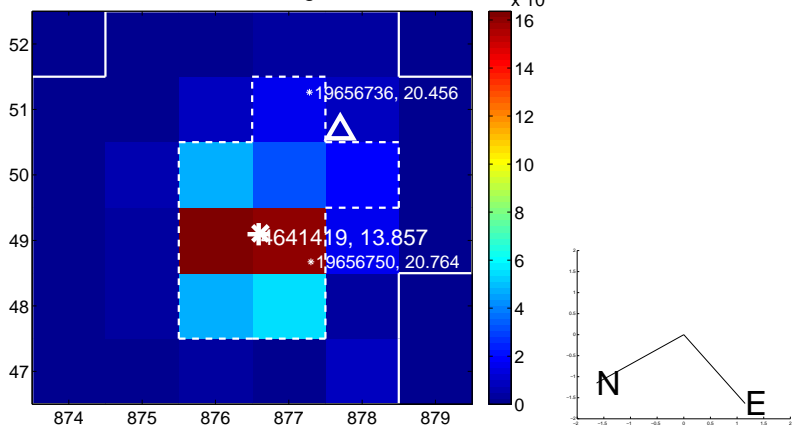
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



Q3 no difference image



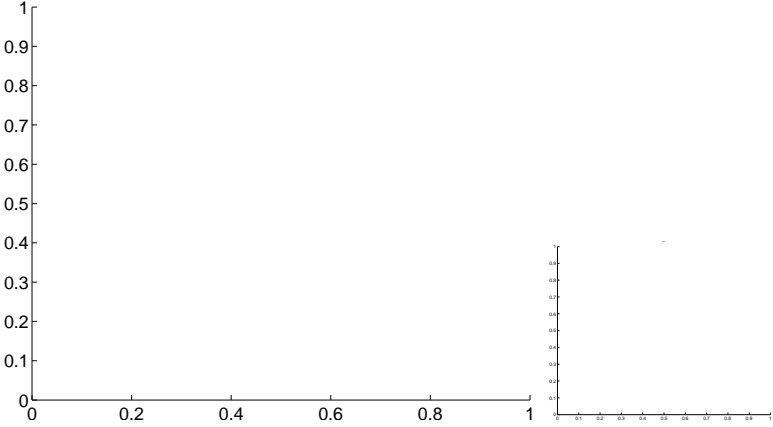
Q3 no OOT image



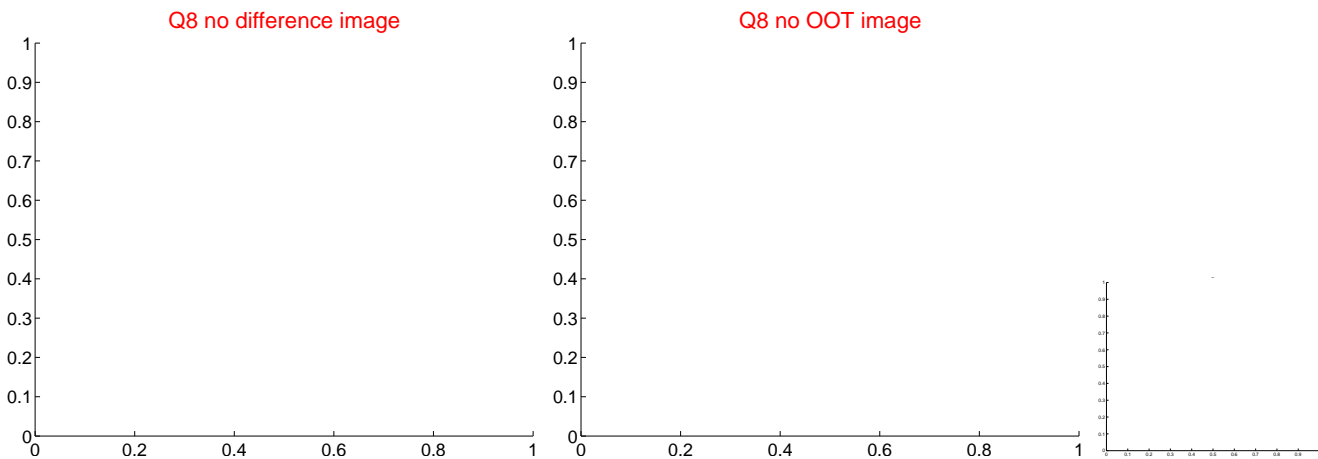
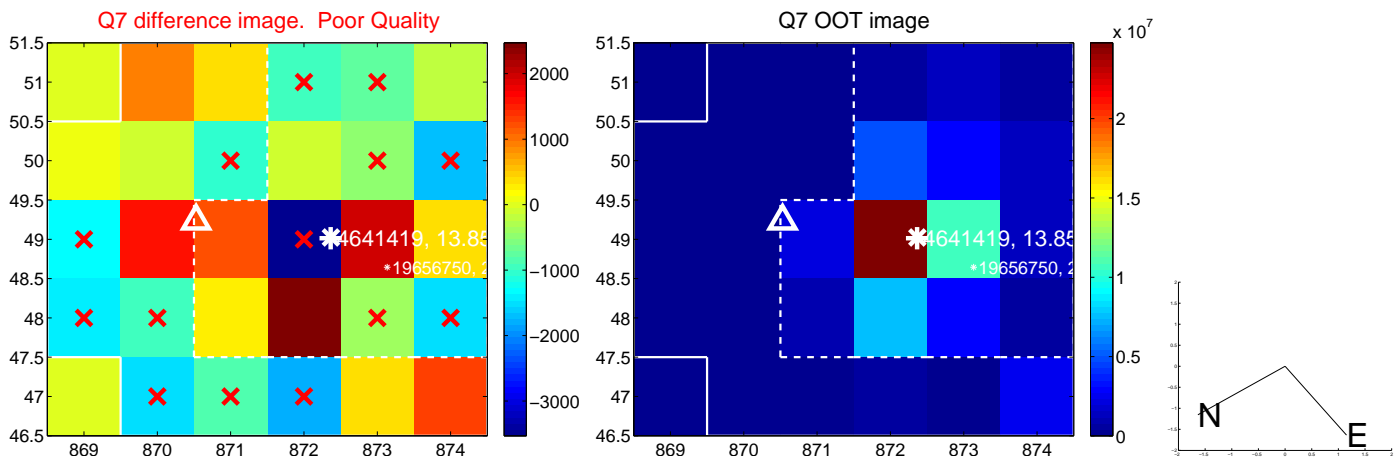
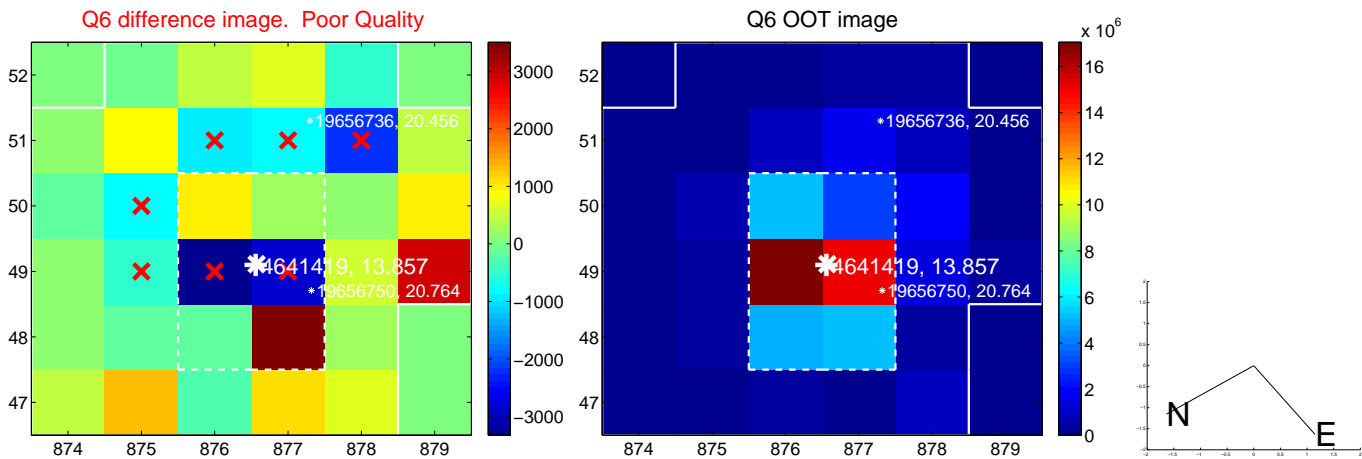
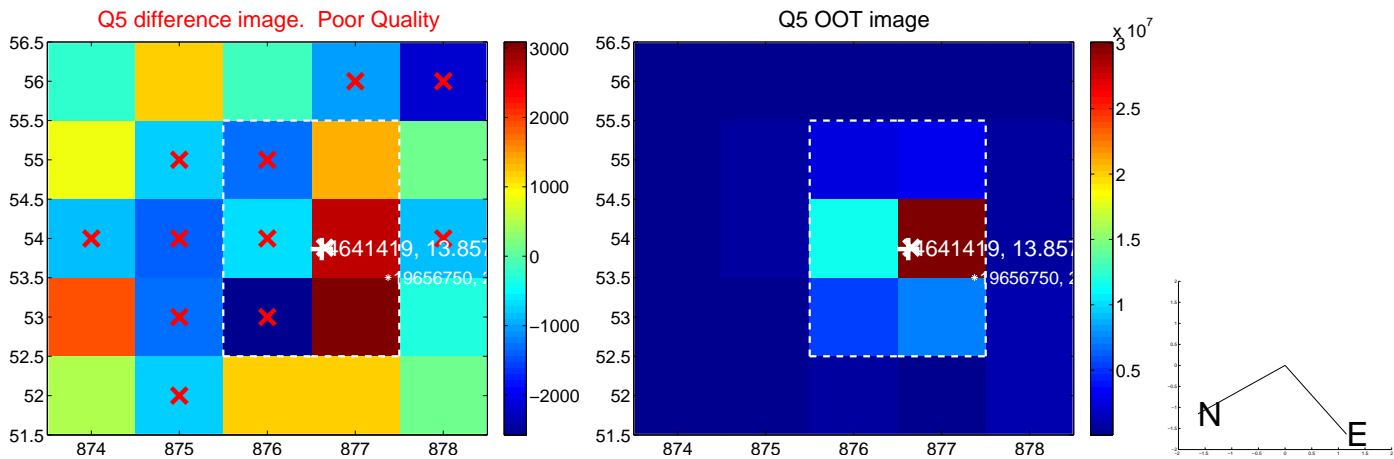
Q4 no difference image



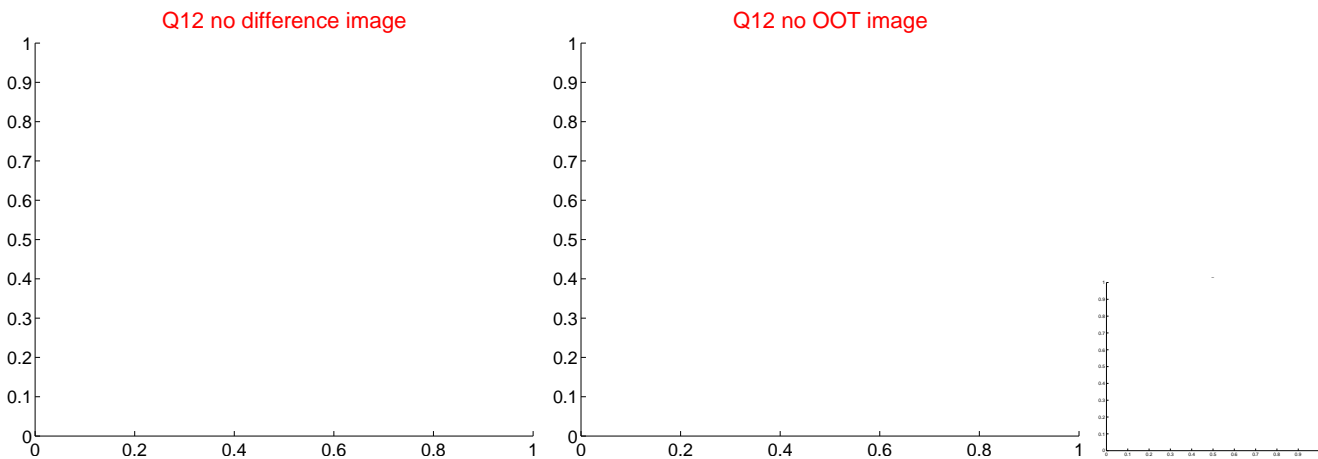
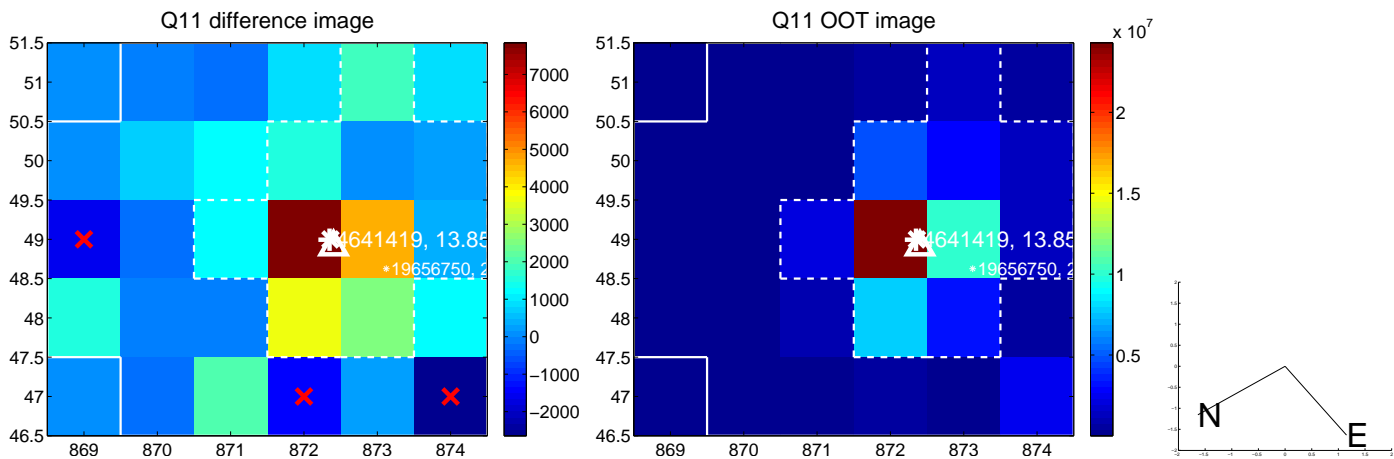
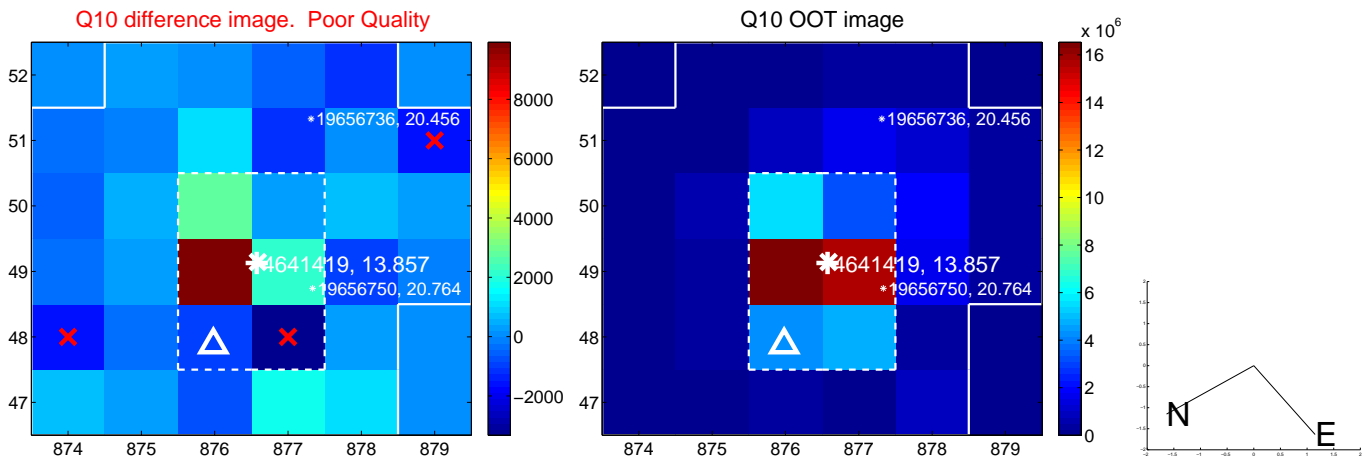
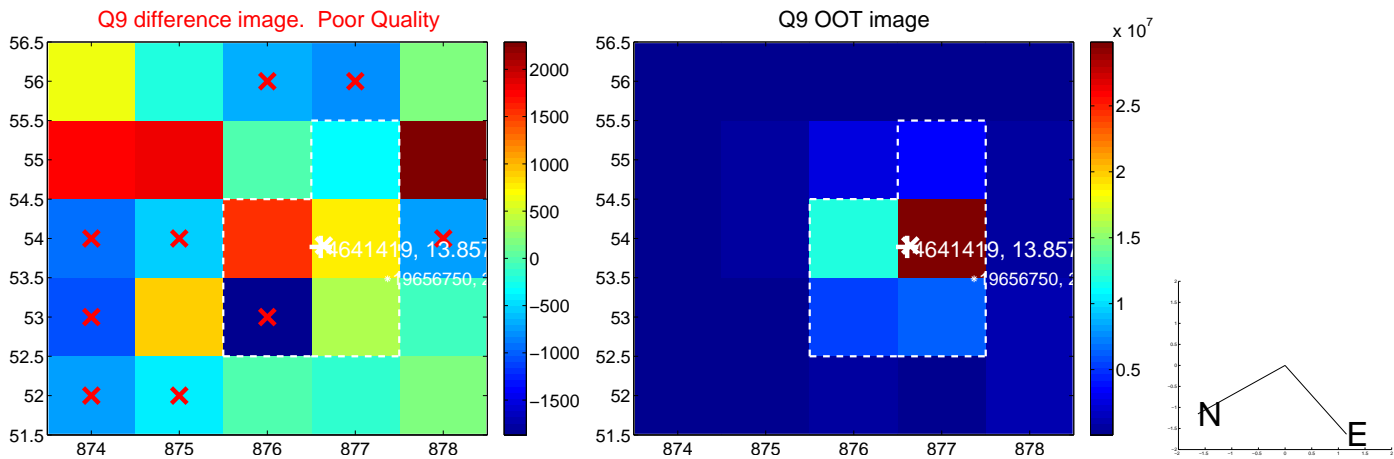
Q4 no OOT image



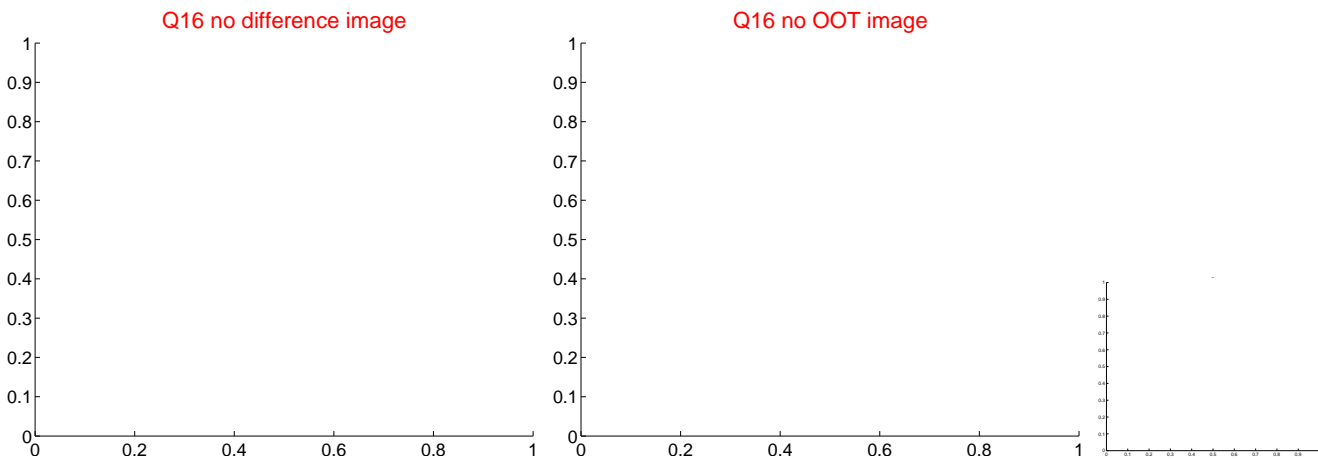
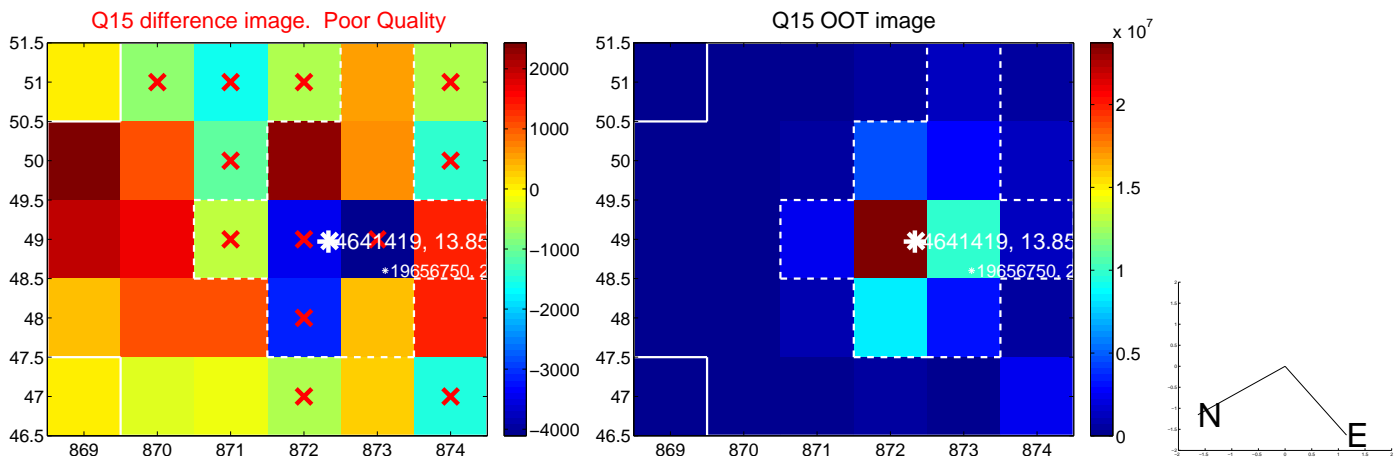
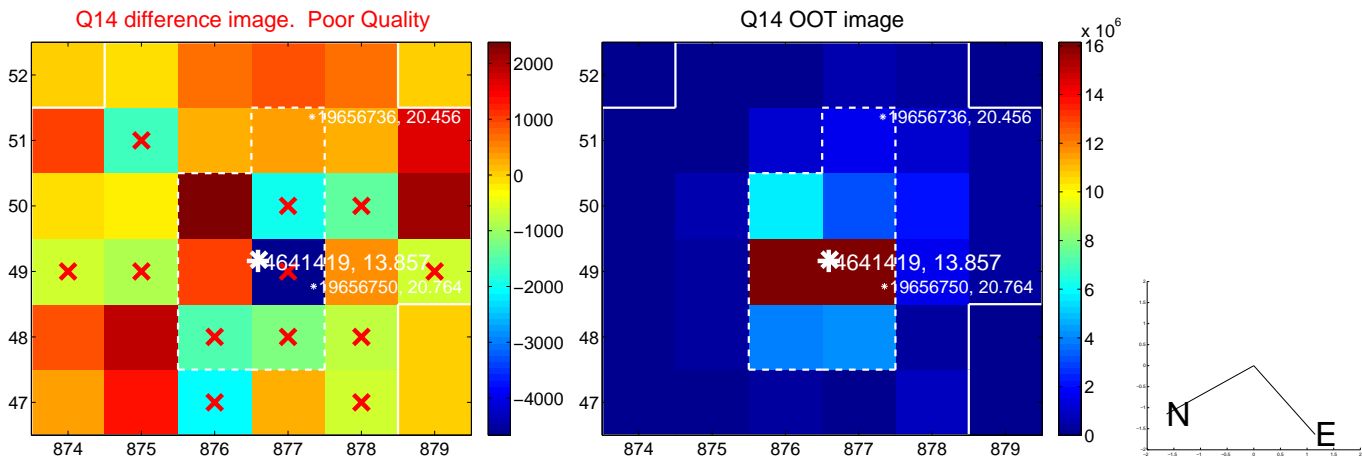
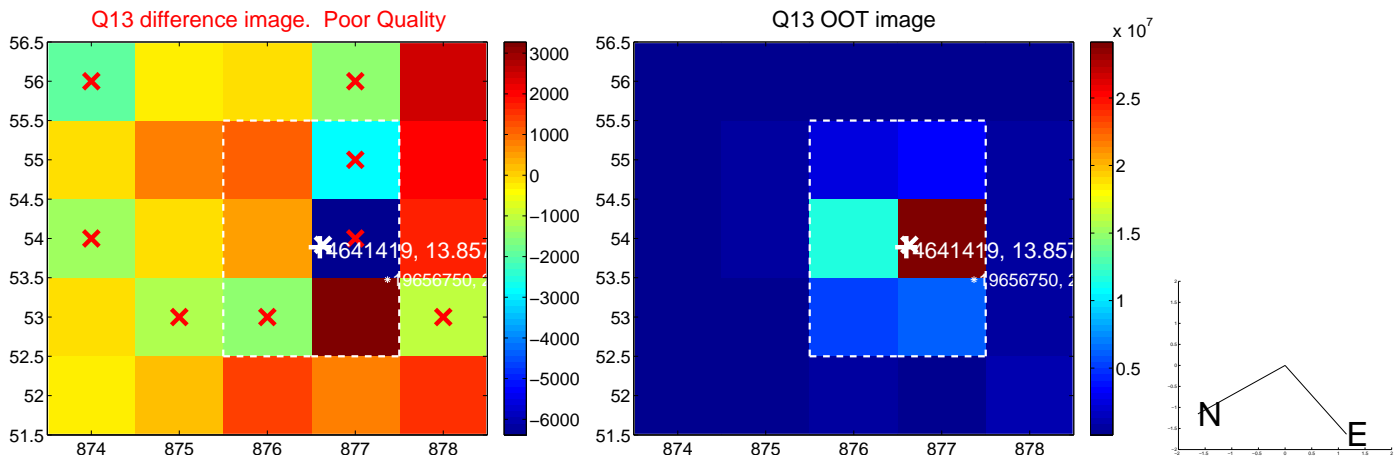
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

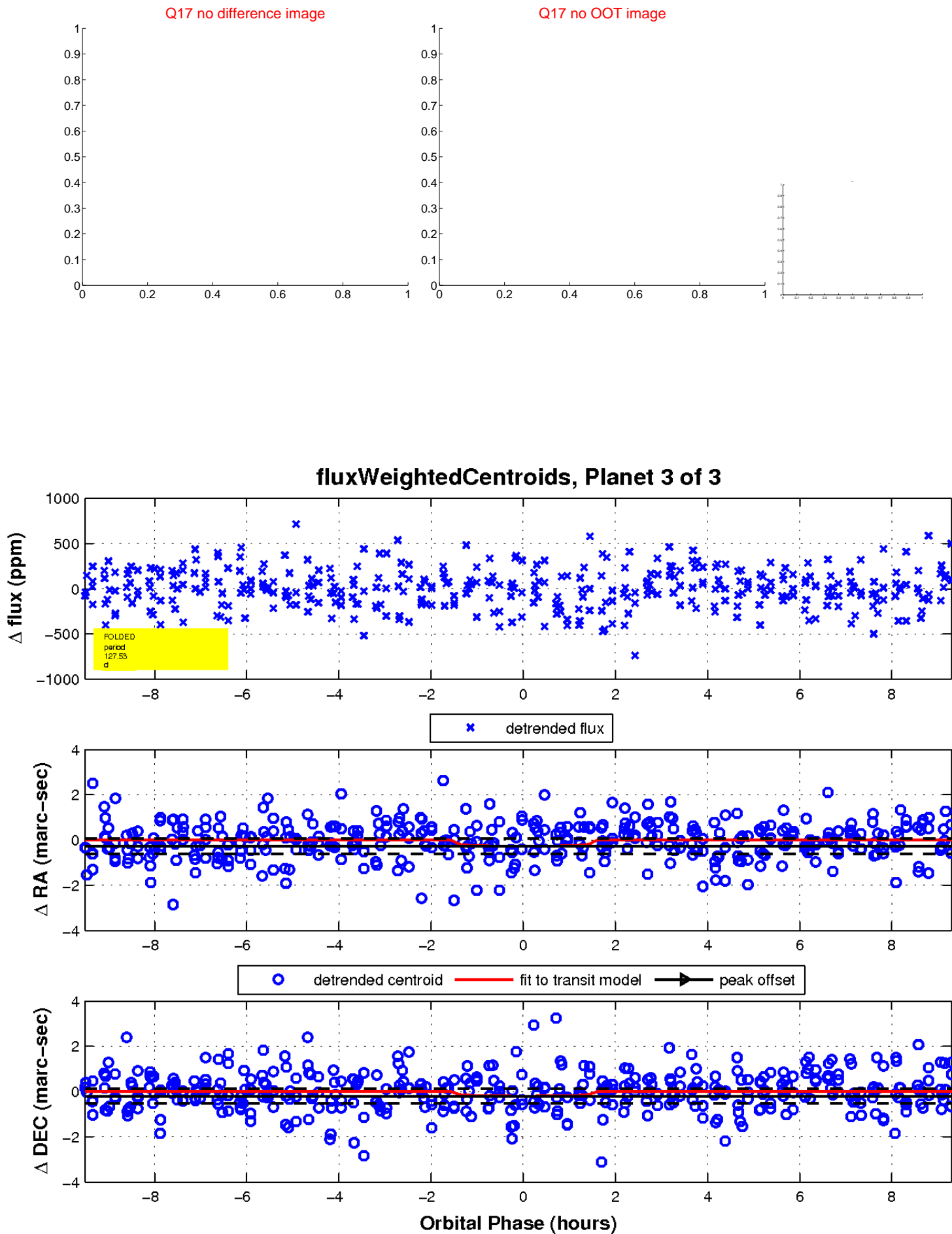


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

