

# KIC 005201676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005201676-01	OBS	No	0.507258	131.778963	21.4	3.394	7.5	6.9	0.83	5313	0.38	3650.72
005201676-02	OBS	No	64.752245	158.383778	557.4	2.087	10.6	7.3	0.83	5313	2.03	5.68
005201676-03	OBS	No	44.064164	170.009561	569.7	1.908	9.1	8.9	0.83	5313	1.95	9.49
005201676-04	OBS	No	41.127838	159.376060	585.6	2.659	10.2	8.3	0.83	5313	2.16	10.40
005201676-05	OBS	No	38.492105	162.554544	447.3	2.494	10.4	7.1	0.83	5313	1.86	11.36
005201676-06	OBS	No	48.833715	136.979224	902.2	1.143	10.3	8.2	0.83	5313	2.47	8.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005201676-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
005201676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
005201676-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST

**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.

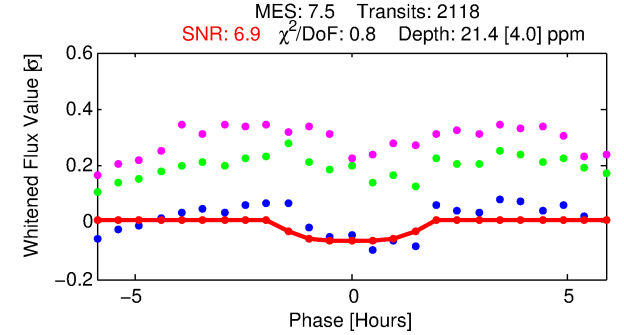
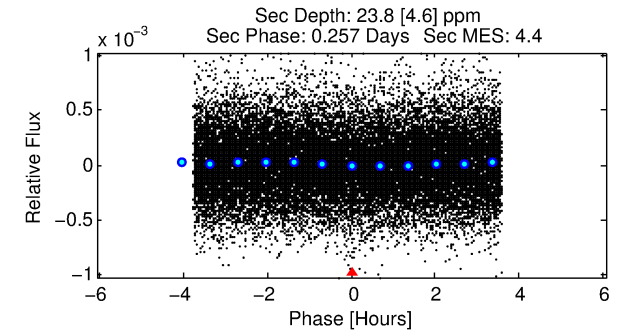
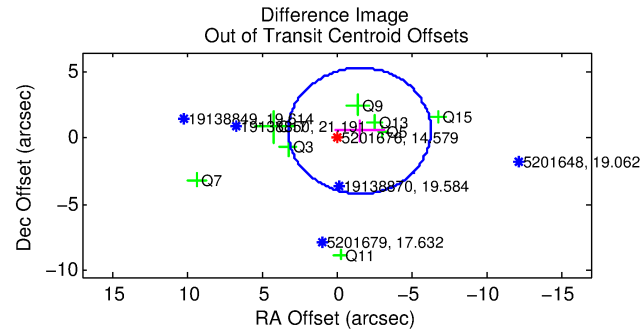
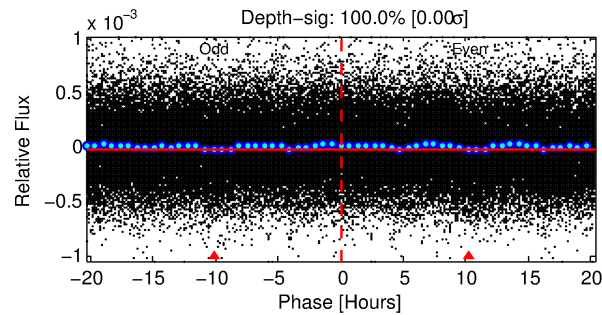
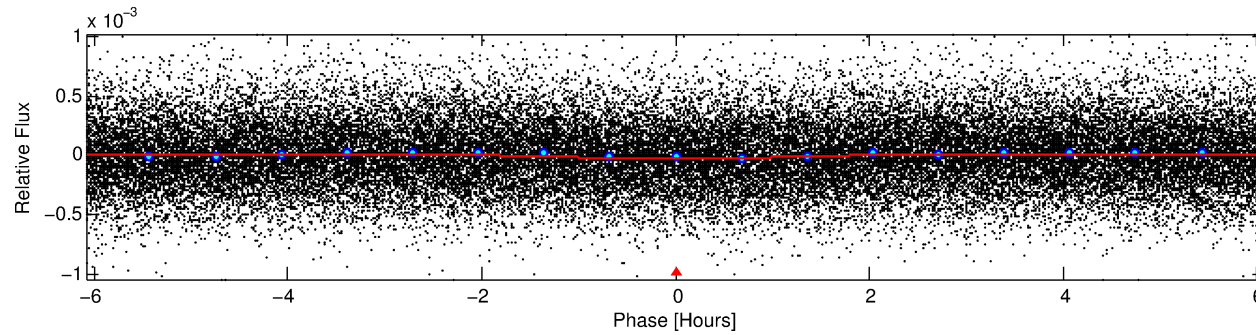
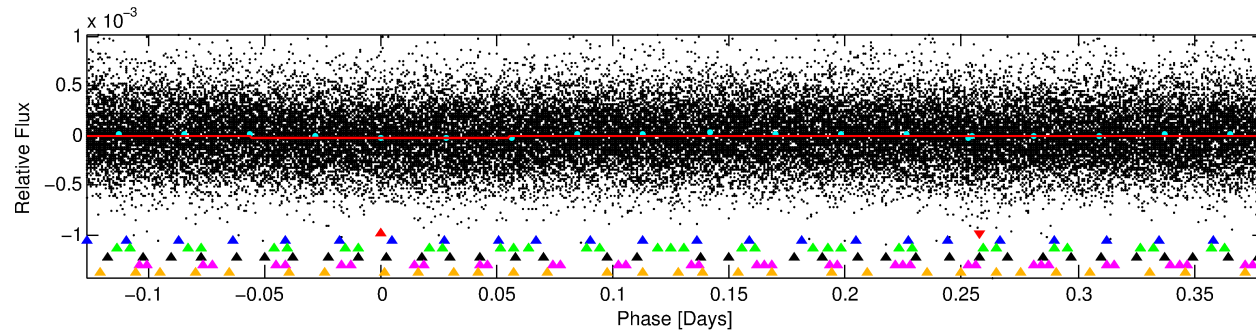
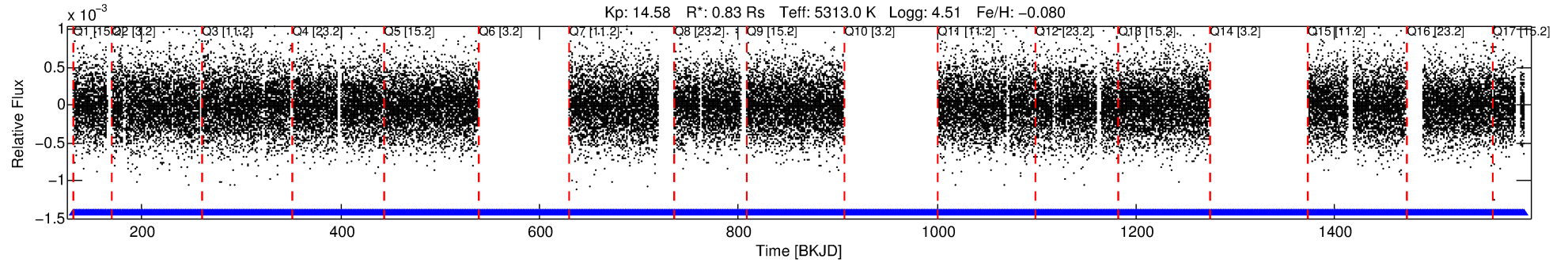
## Ephemeris Match Information For 005201676-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
005201676-01	5201676	005201619-pri	5201619	1:1	57.4	14	-1	13.05	14.58	18700.00	Direct-PRF	0	4.33	0.39

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 5201676 Candidate: 1 of 6 Period: 0.507 d



## DV Fit Results:

Period = 0.50726 [0.00001] d  
Epoch = 131.7790 [0.0056] BKJD  
Rp/R\* = 0.0041 [0.0066]  
a/R\* = 1.31 [3.31]  
b = 0.00 [3841.12]  
Seff = 3650.72 [817.76]  
Teff = 1982 [111] K  
Rp = 0.38 [0.61] Re  
a = 0.0116 [0.0015] AU  
Ag = 12.48 [40.03] [0.29 $\sigma$ ]  
Teffp = 5760 [4613] K [0.82 $\sigma$ ]

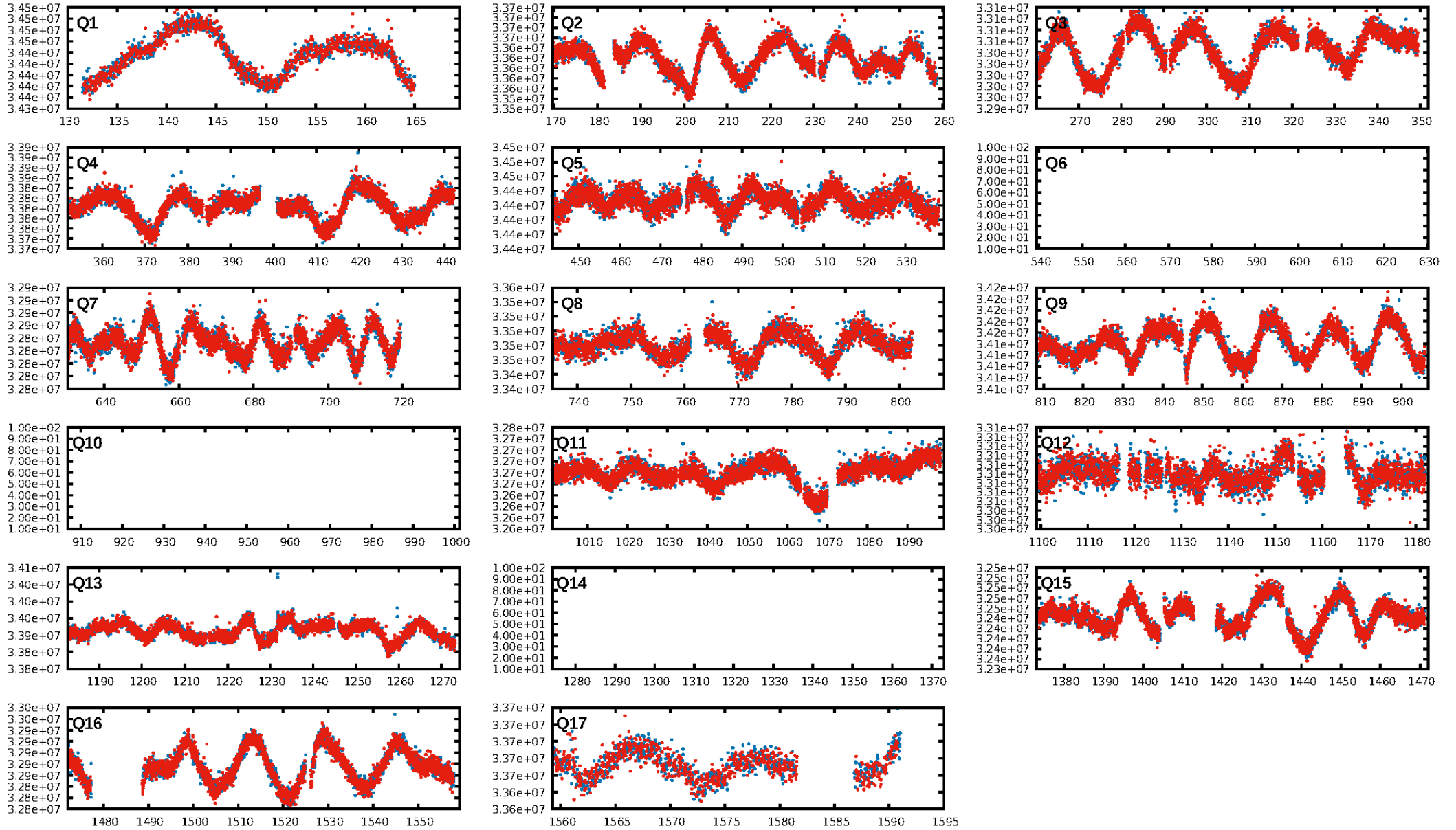
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [216.48 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.52e-07  
RollingBand-fgt: 1.00 [1999/1999]  
GhostDiagnostic-chr: 0.1115  
Centroid-sig: 0.0%  
Centroid-so: 6.415 arcsec [3.64 $\sigma$ ]  
OotOffset-rm: 1.645 arcsec [1.04 $\sigma$ ]  
KicOffset-rm: 1.563 arcsec [0.94 $\sigma$ ]  
OotOffset-st: 0/4/0/4 [8]  
KicOffset-st: 0/4/0/4 [8]  
DiffImageQuality-fgm: 0.00 [0/8]  
DiffImageOverlap-fno: 1.00 [14/14]

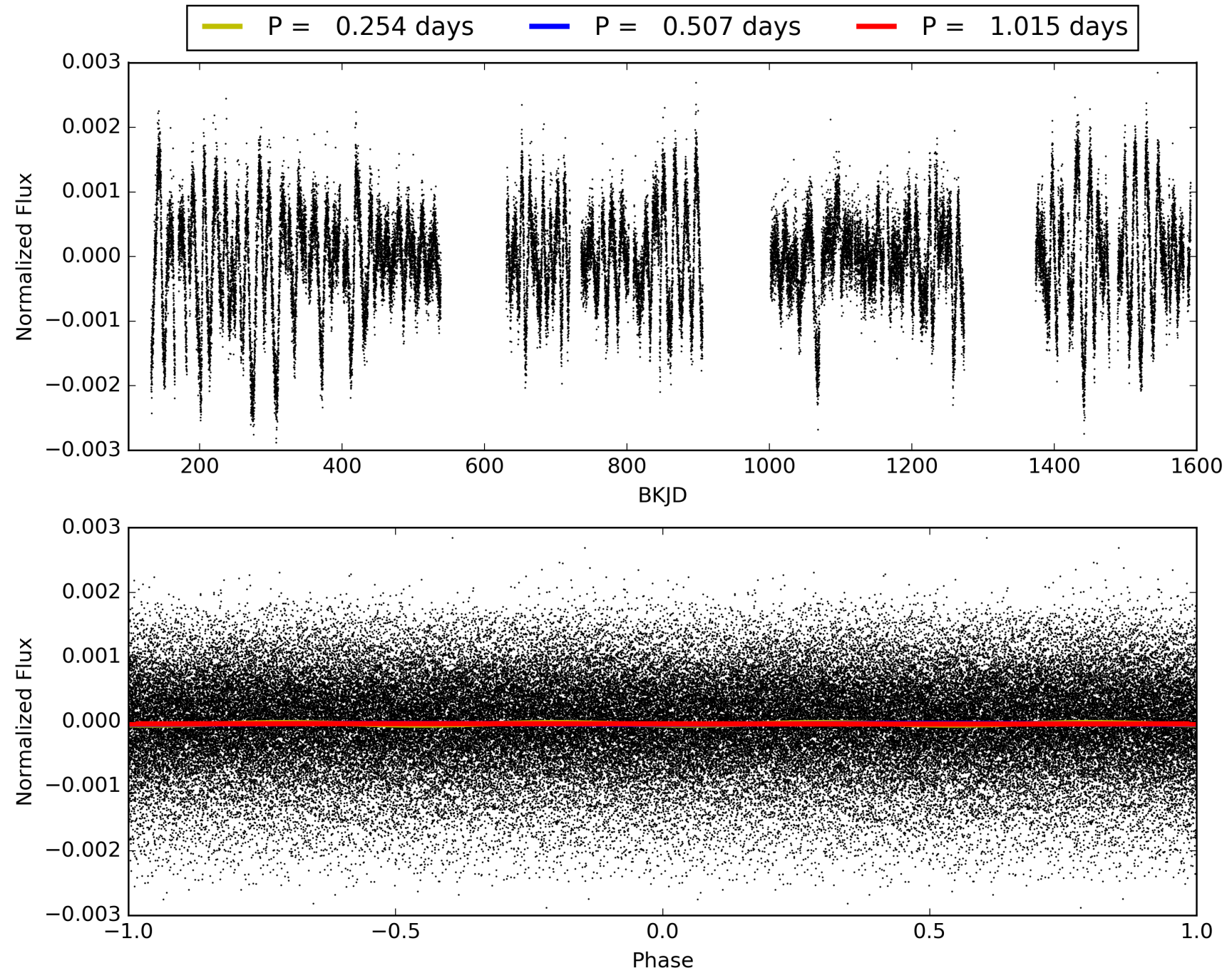
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:15:51 Z

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

# TCE 005201676-01, PDC Light Curves



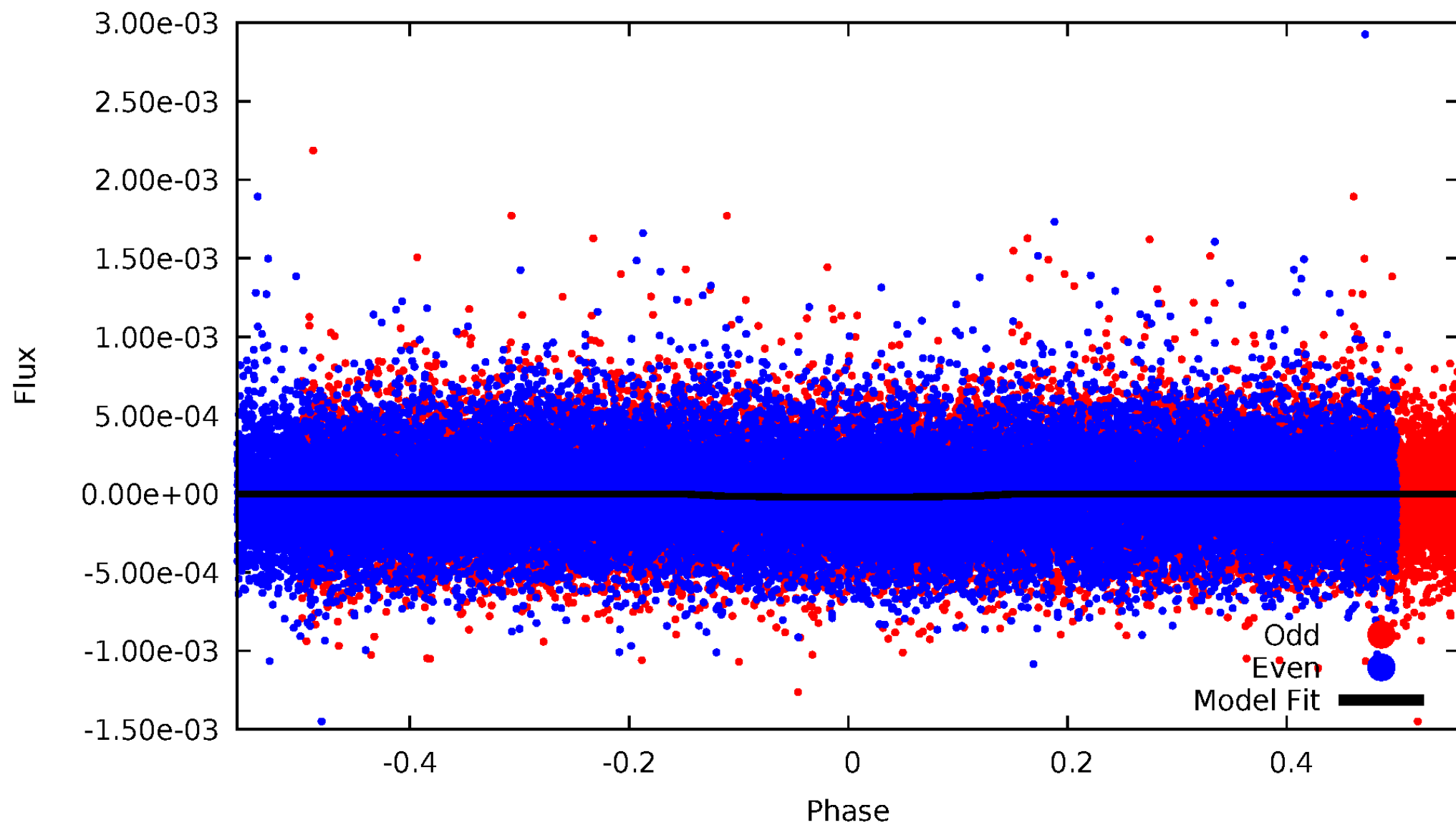
TCE 005201676-01





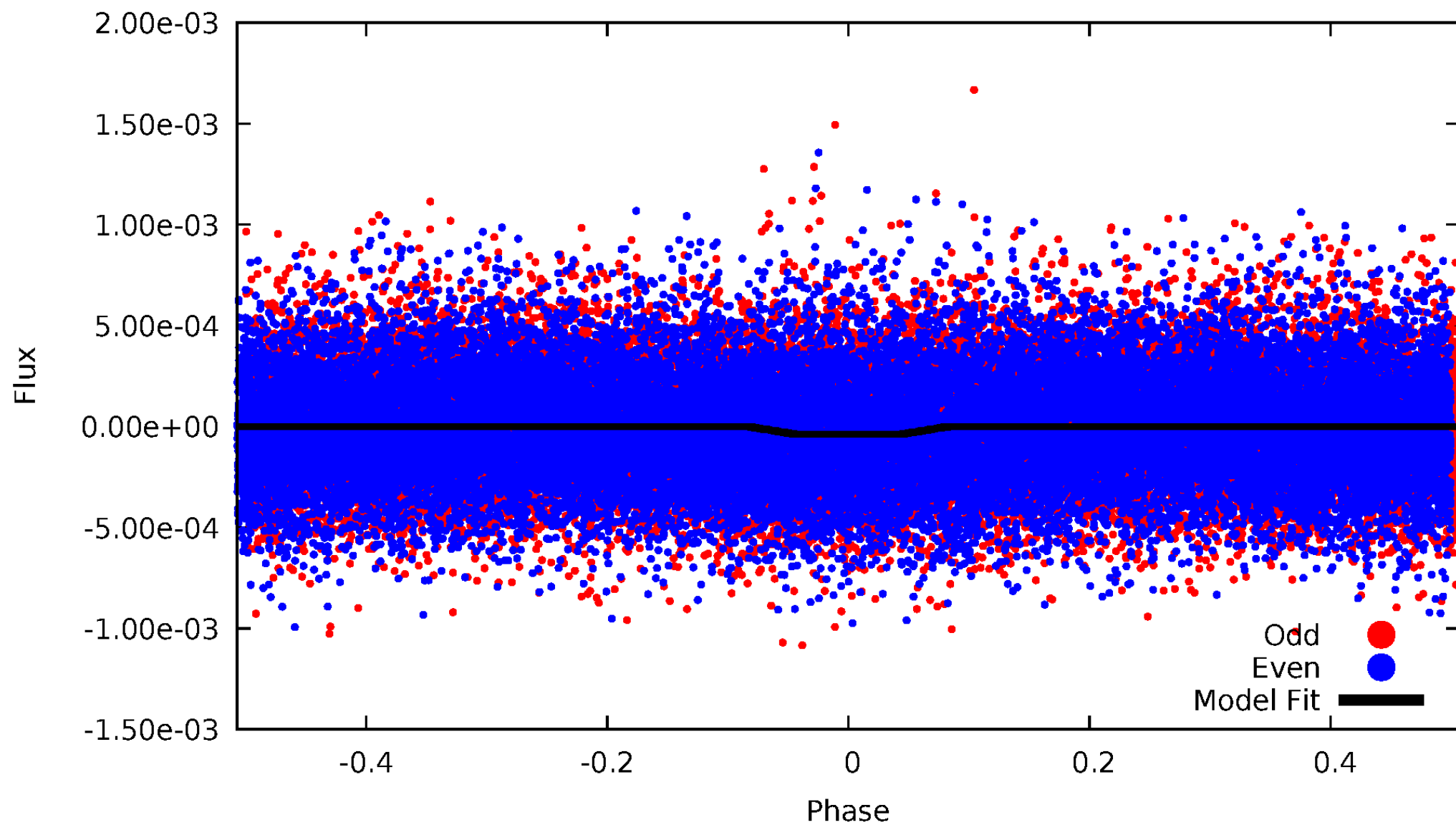
# DV Odd/Even

TCE 005201676-01



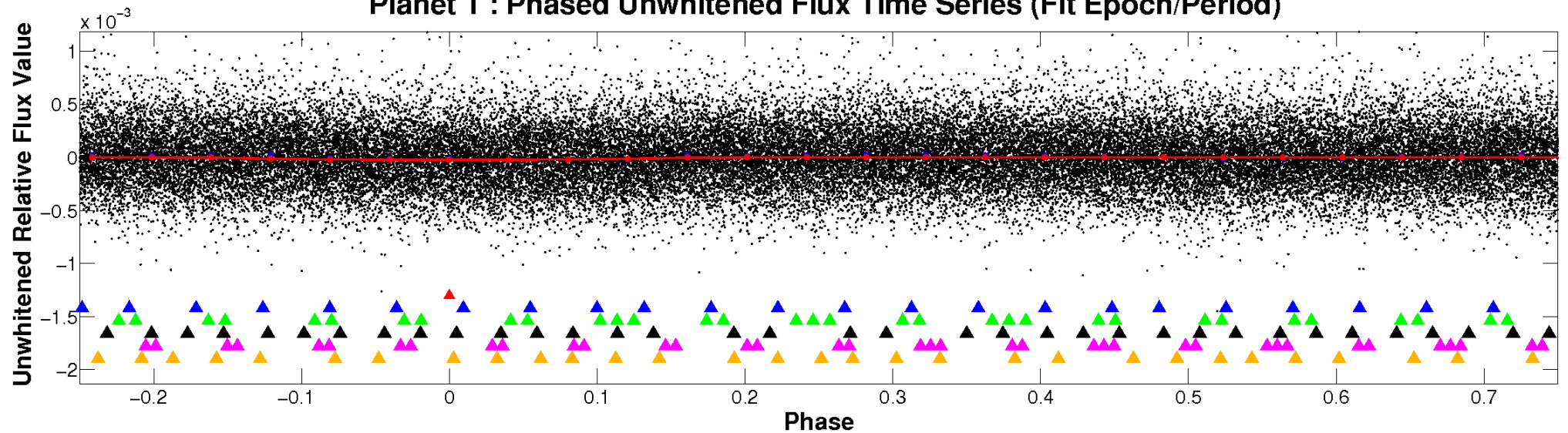
# ALT Odd/Even

TCE 005201676-01

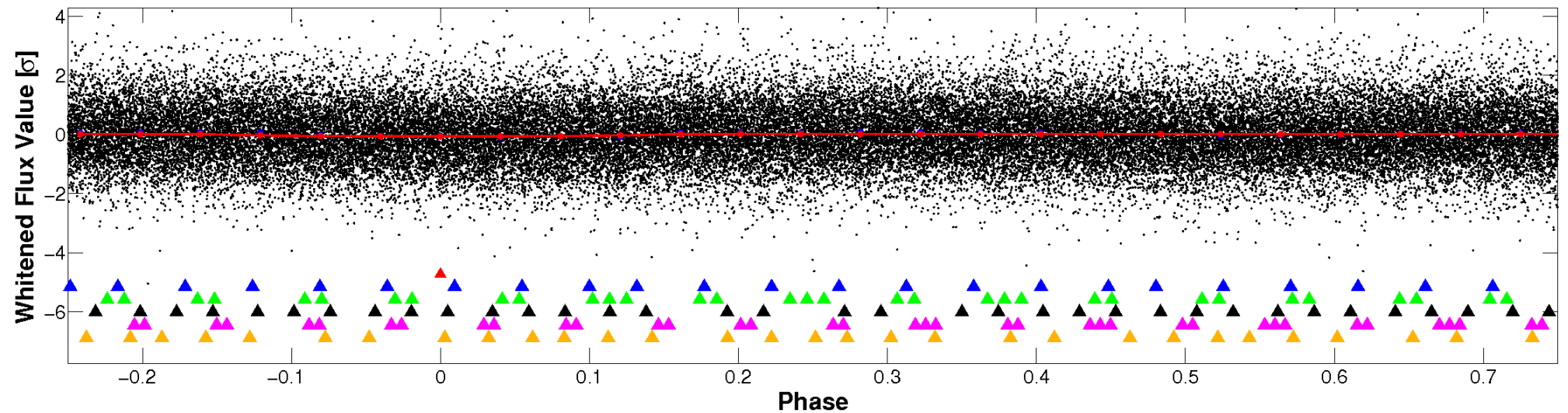


# Non-Whitened Vs. Whitened Light Curve

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

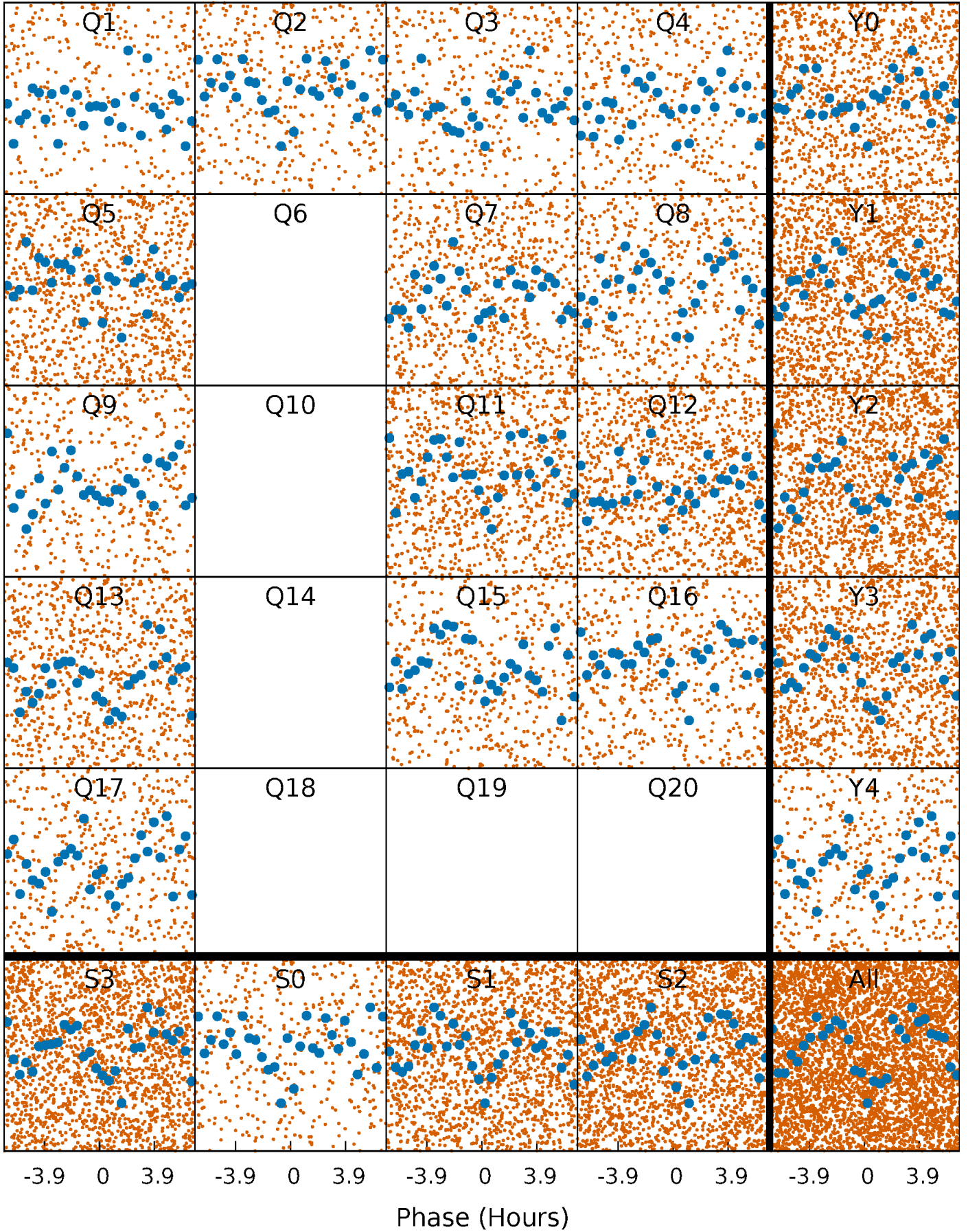


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

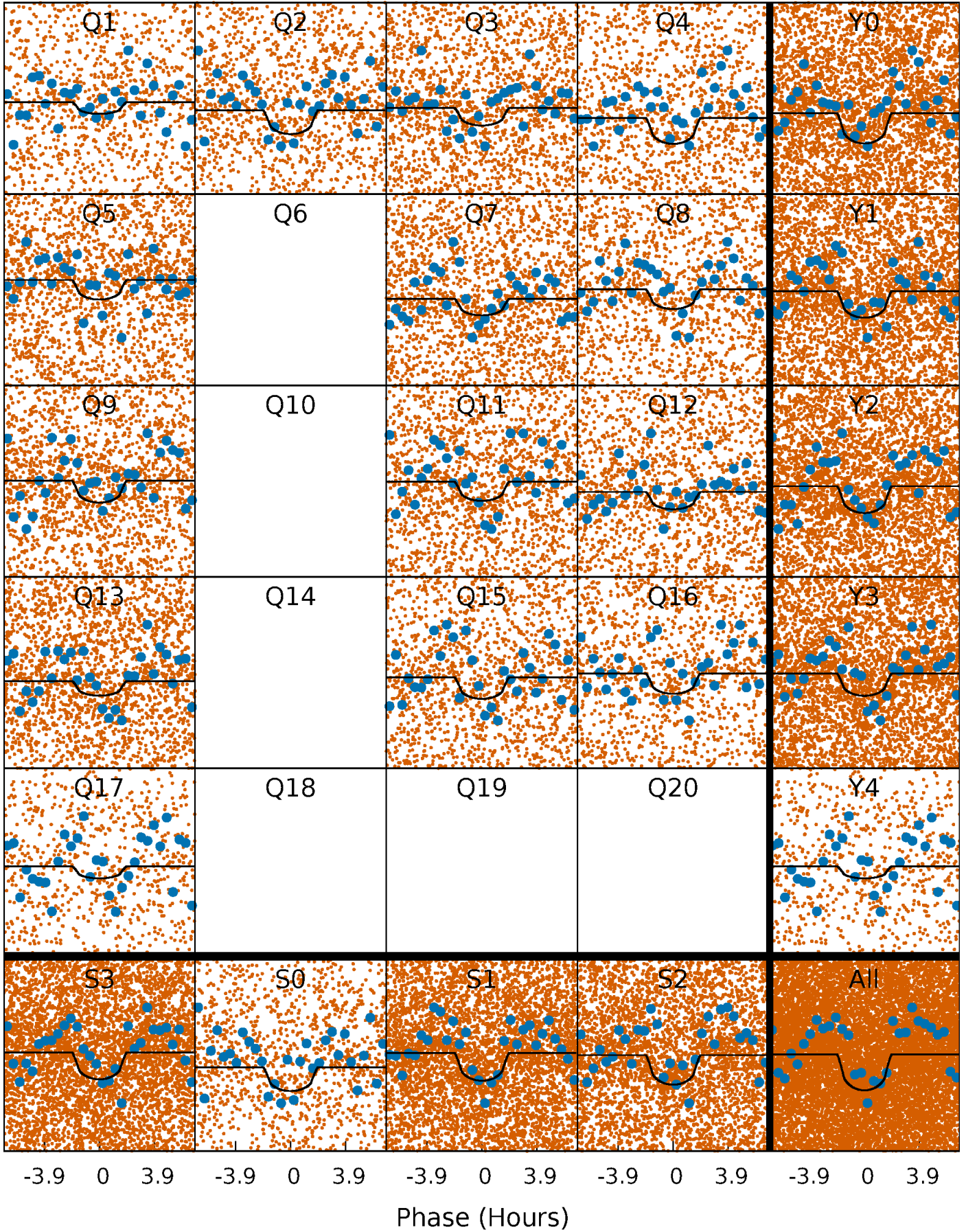
TCE 005201676-01   P= 0.507258 Days    $T_0=131.778963$  (BKJD)





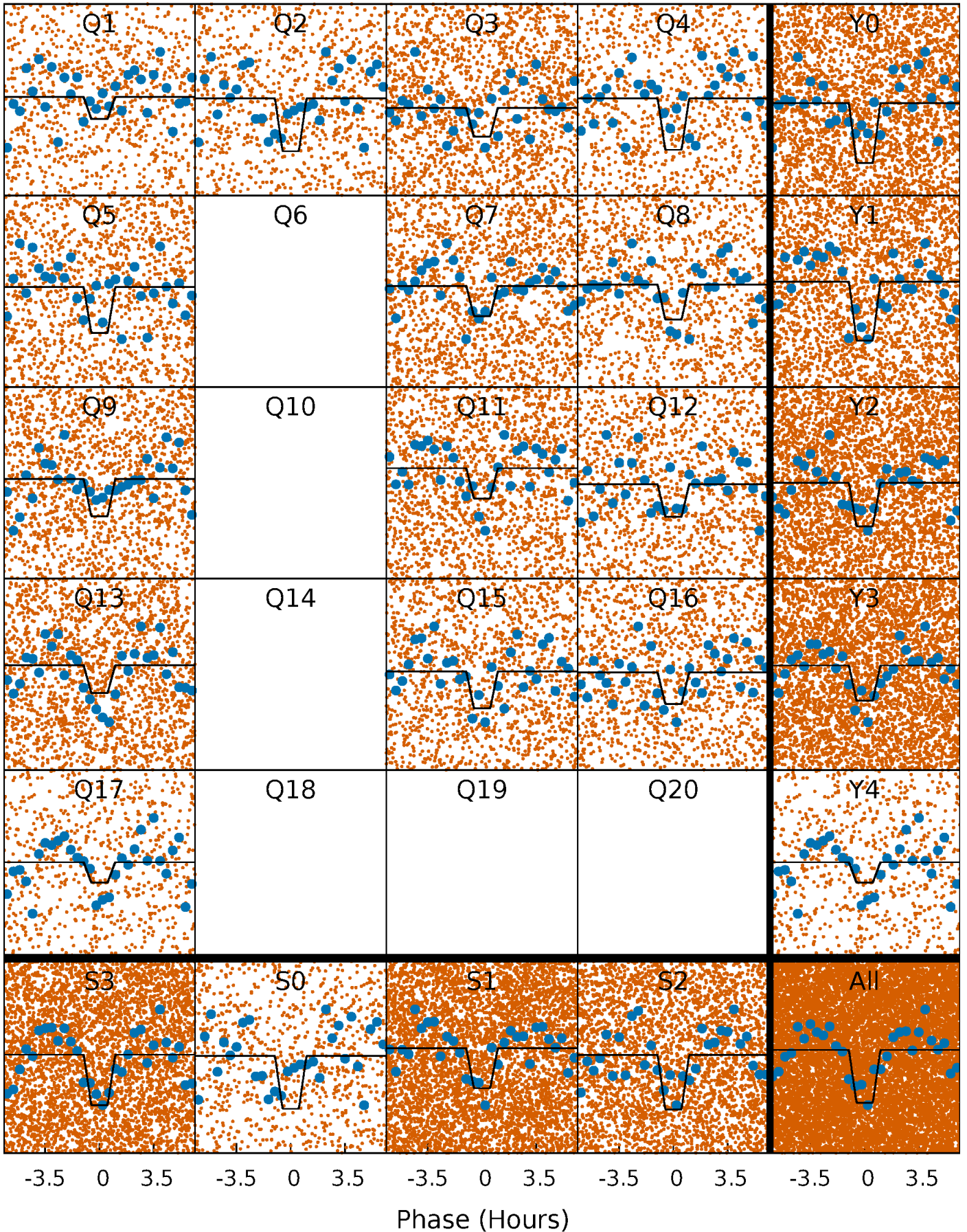
# DV Quarter-Phased Transit Curves

TCE 005201676-01   P= 0.507258 Days    $T_0=131.778963$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005201676-01 P= 0.507275 Days  $T_0=131.771033$  (BKJD)

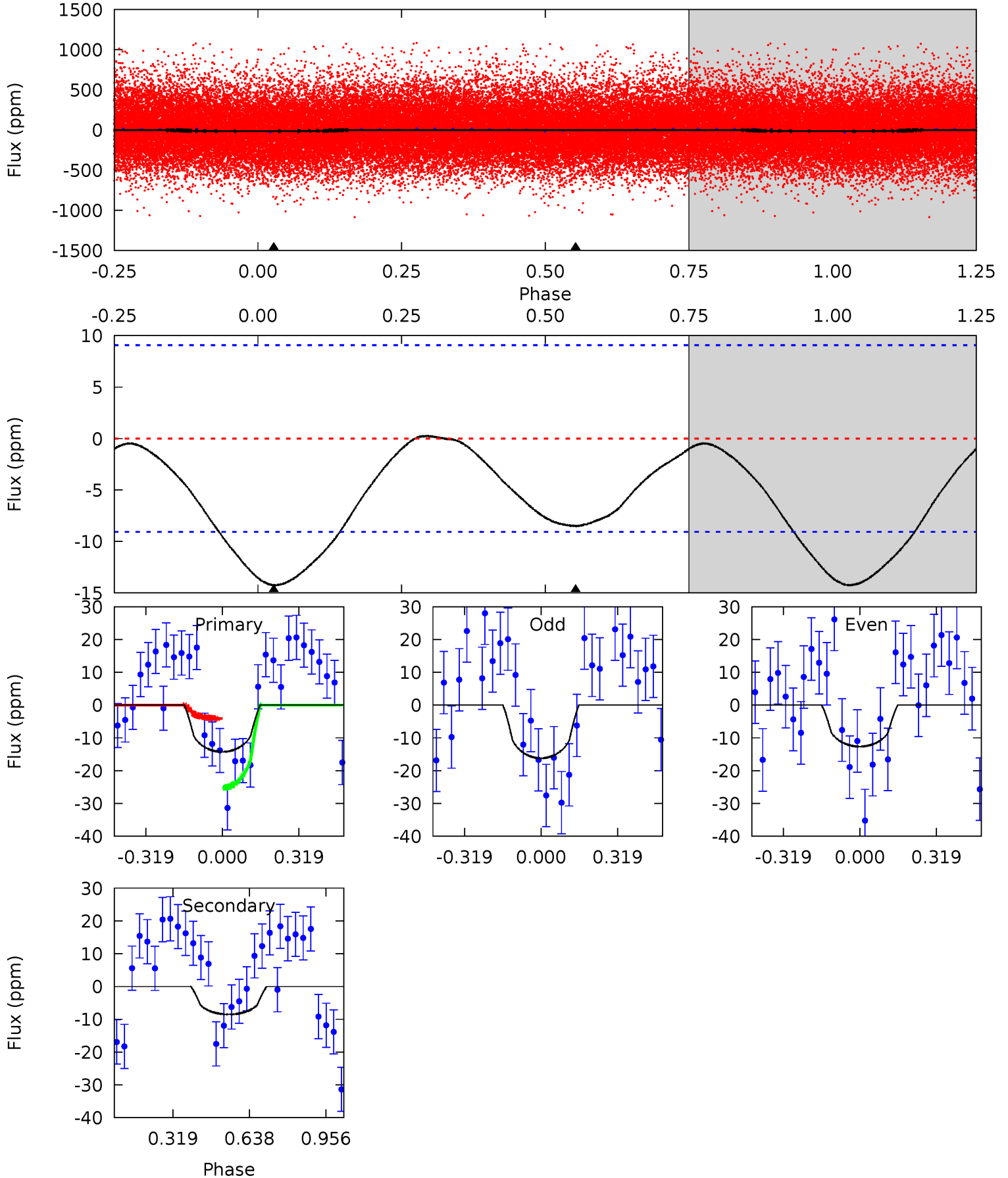




# DV Model-Shift Uniqueness Test

005201676-01, P = 0.507258 Days, E = 131.271705 Days

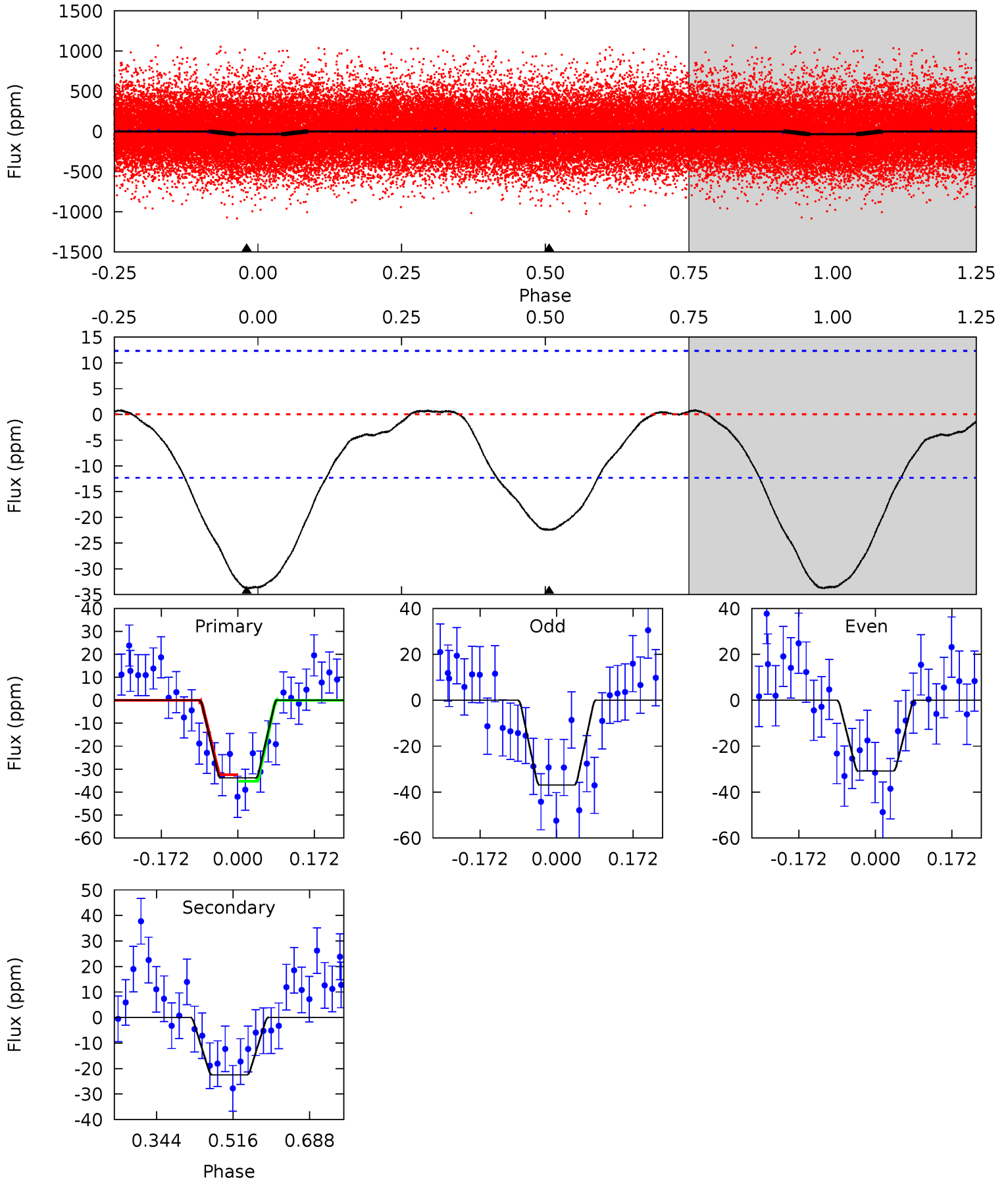
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.79	4.05	0	0	4.32	1.00	0.18	6.79	6.79	4.05	4.05	0.85	0.67	0.02	5.05



# Alt Model-Shift Uniqueness Test

005201676-01, P = 0.507275 Days, E = 131.263758 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
12.2	8.12	0	0	4.45	1.37	0.71	12.2	12.2	8.12	8.12	1.09	1.00	0.02	0.51





### Stellar Parameters For KIC 005201676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5313^{+159}_{-159}$	$4.510^{+0.076}_{-0.102}$	$-0.080^{+0.300}_{-0.300}$	$0.833^{+0.133}_{-0.092}$	$0.820^{+0.096}_{-0.070}$	$1.998^{+0.689}_{-0.604}$
	+3%/-3%	+2%/-2%	+375%/-375%	+16%/-11%	+12%/-9%	+34%/-30%
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 005201676-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-9 \pm 2$	$0.61^{+0.51}_{-0.42}$	$2790^{+125}_{-125}$	$3714^{+2518}_{-941}$	$1.692^{+15.995}_{-1.203}$
Alt.	$-22 \pm 3$	$0.73^{+0.57}_{-0.46}$	$2777^{+128}_{-114}$	$4217^{+2540}_{-877}$	$3.150^{+20.504}_{-2.142}$

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

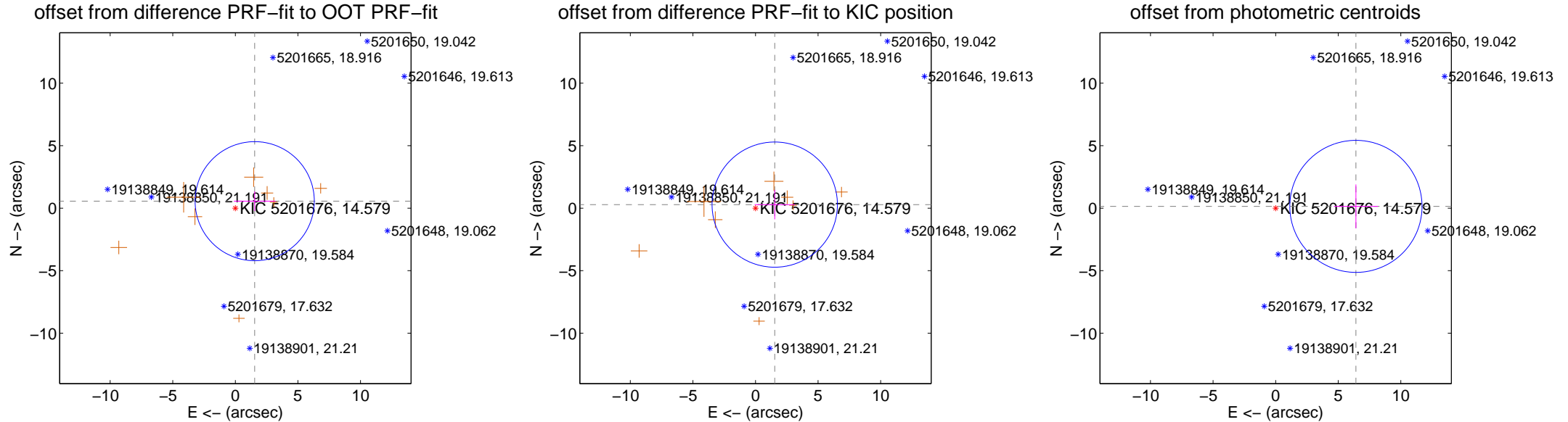
## DV Centroid Data

Supplemental centroid analysis for 005201676-01. Kepler magnitude: 14.58. Transit SNR 6.86

There are 0 quarters with good PRF difference image offsets

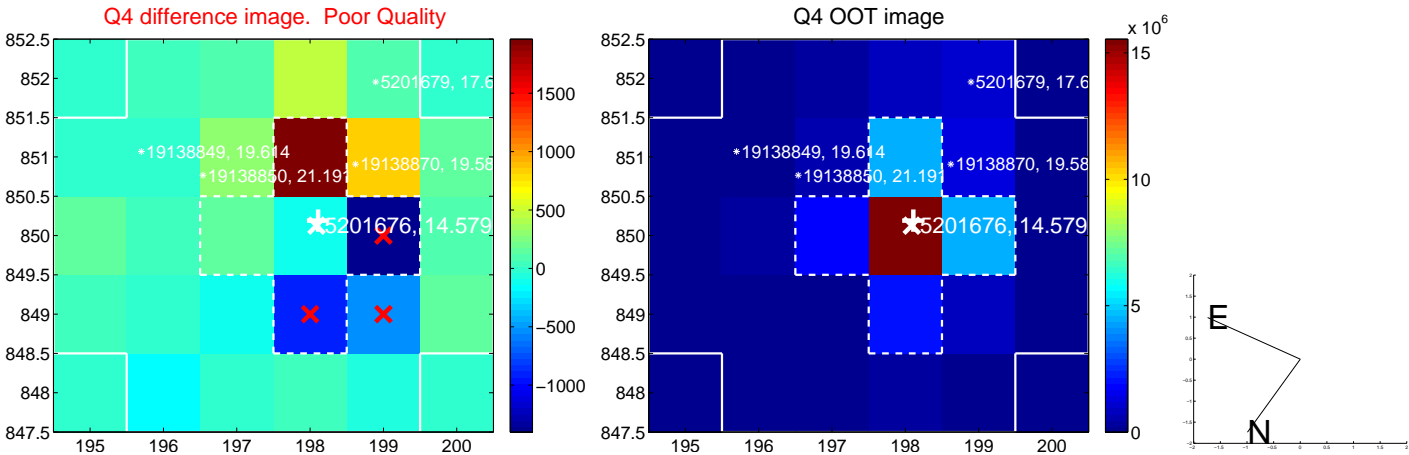
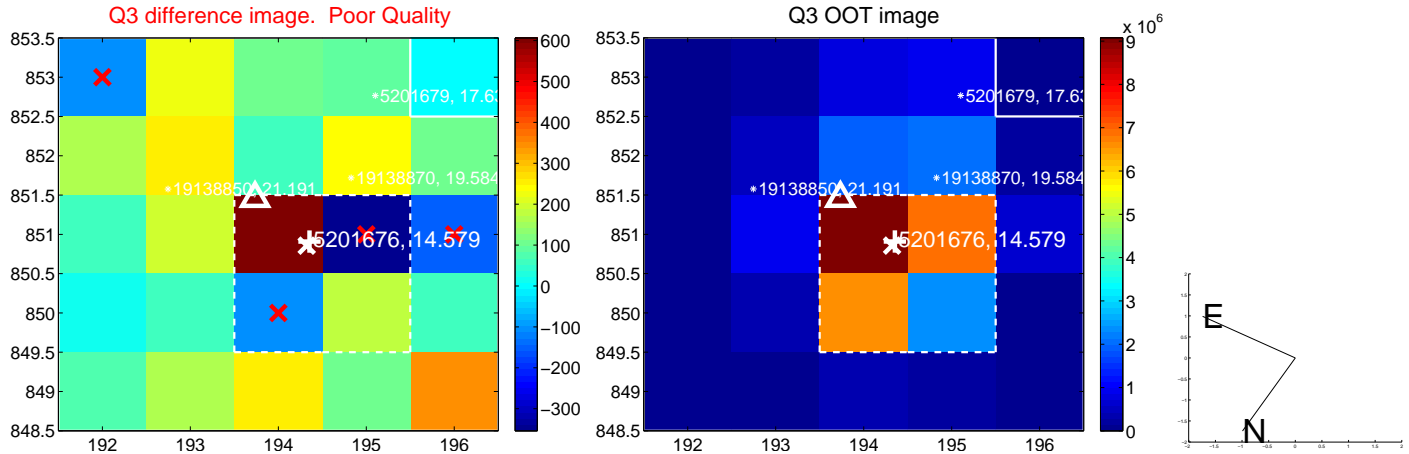
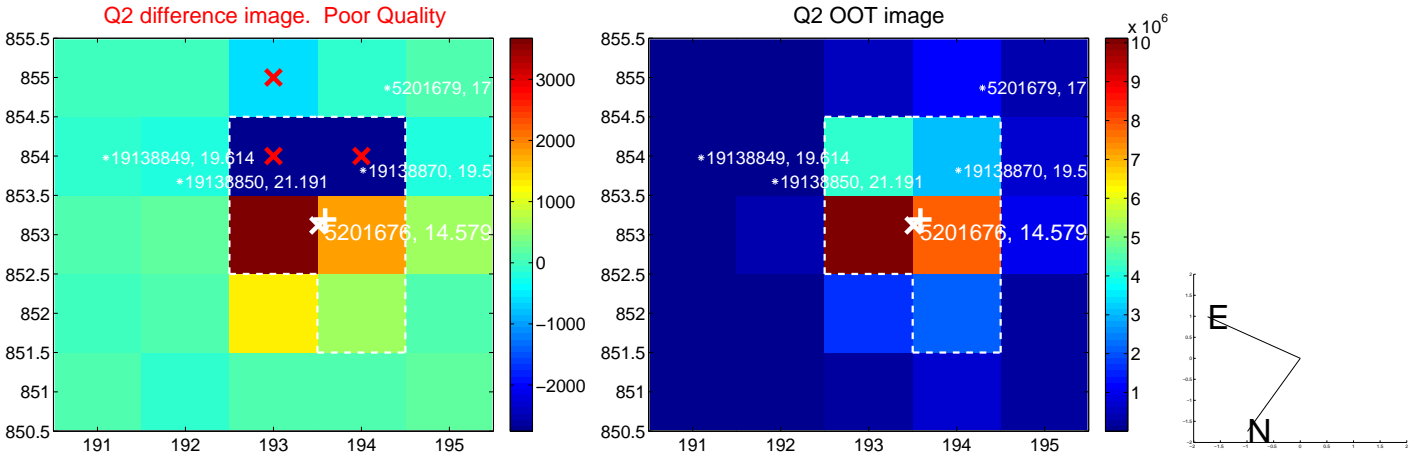
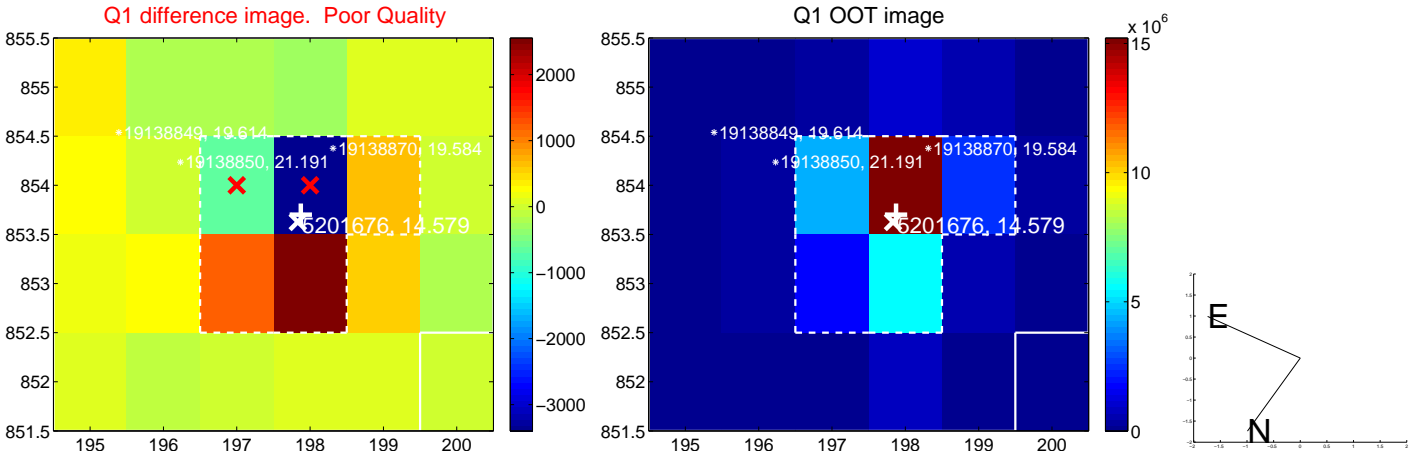
The direct PRF centroid is offset from the target star catalog position by about 0.34 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.645 \pm 1.587$	1.04	$-1.547 \pm 1.663$	$0.559 \pm 0.783$
PRF-fit source offset from KIC position	$1.563 \pm 1.669$	0.94	$-1.537 \pm 1.606$	$0.285 \pm 1.175$
photometric centroid source offset	$6.41 \pm 1.76$	3.64	$-6.41 \pm 1.76$	$0.14 \pm 1.75$

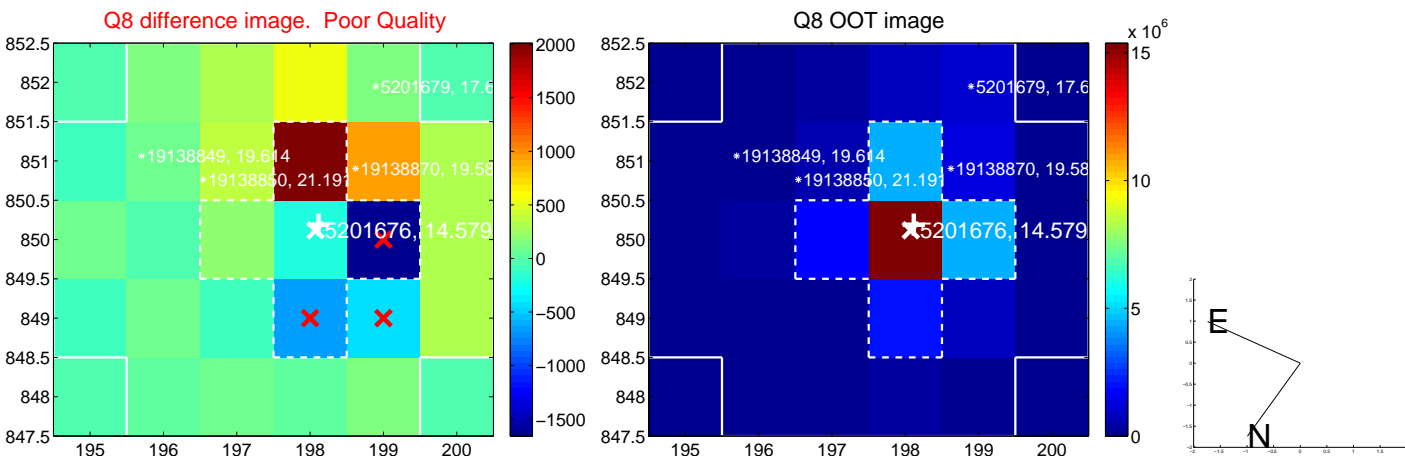
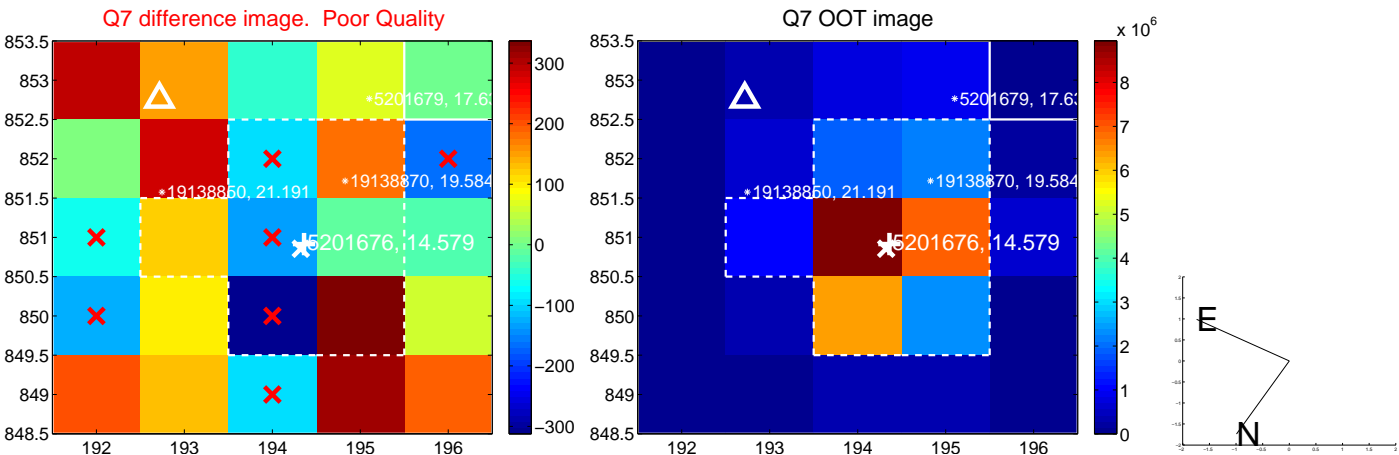
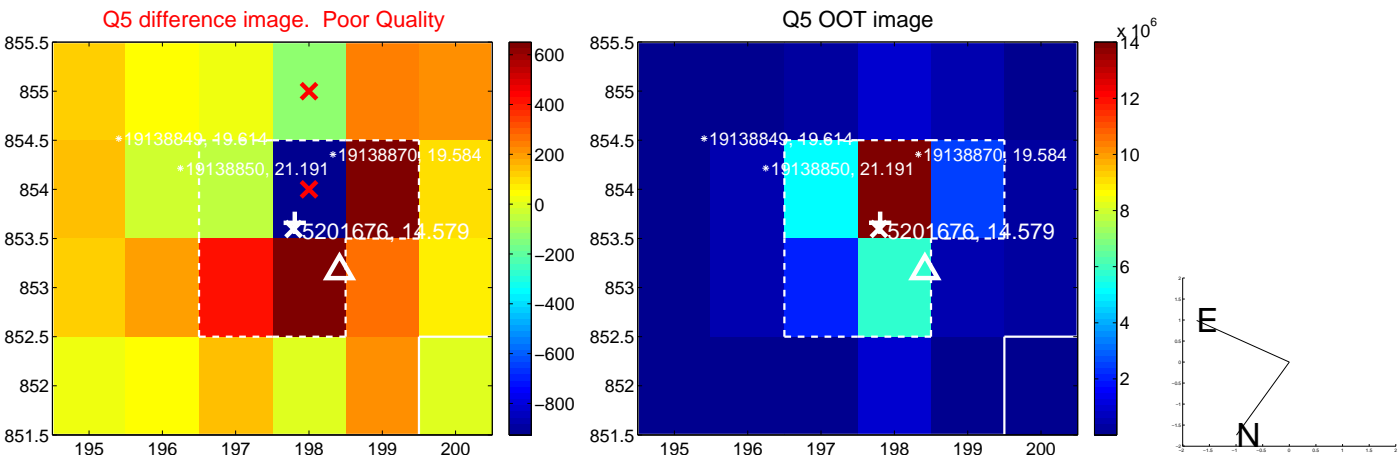


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

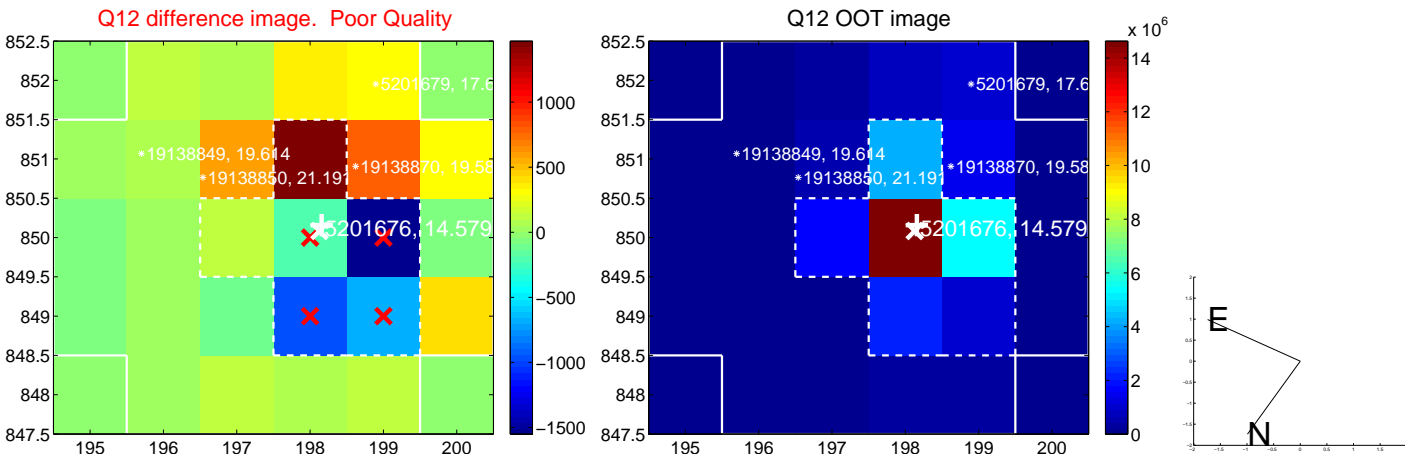
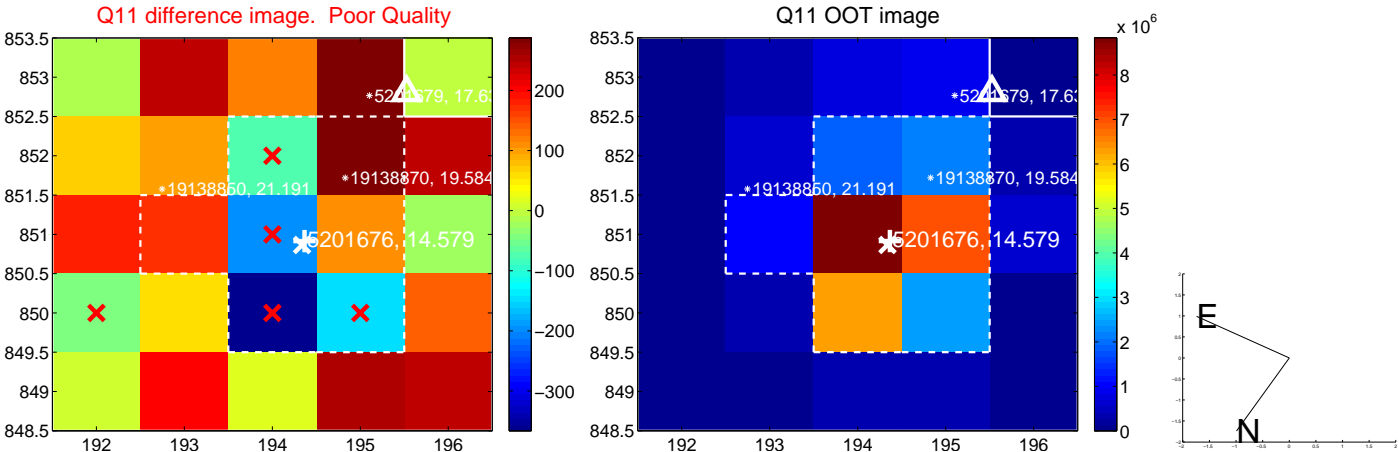
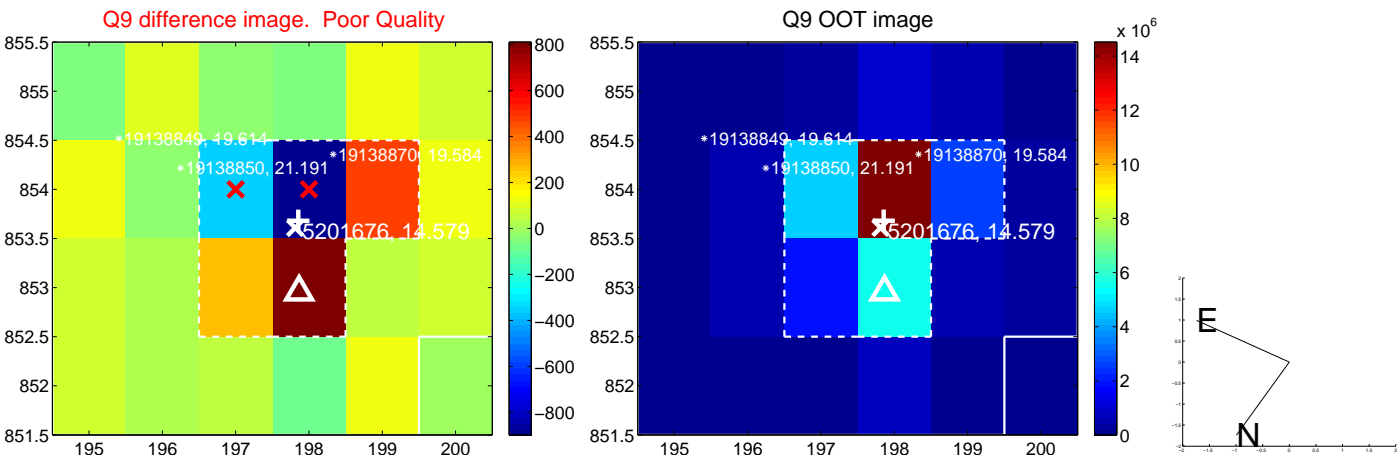


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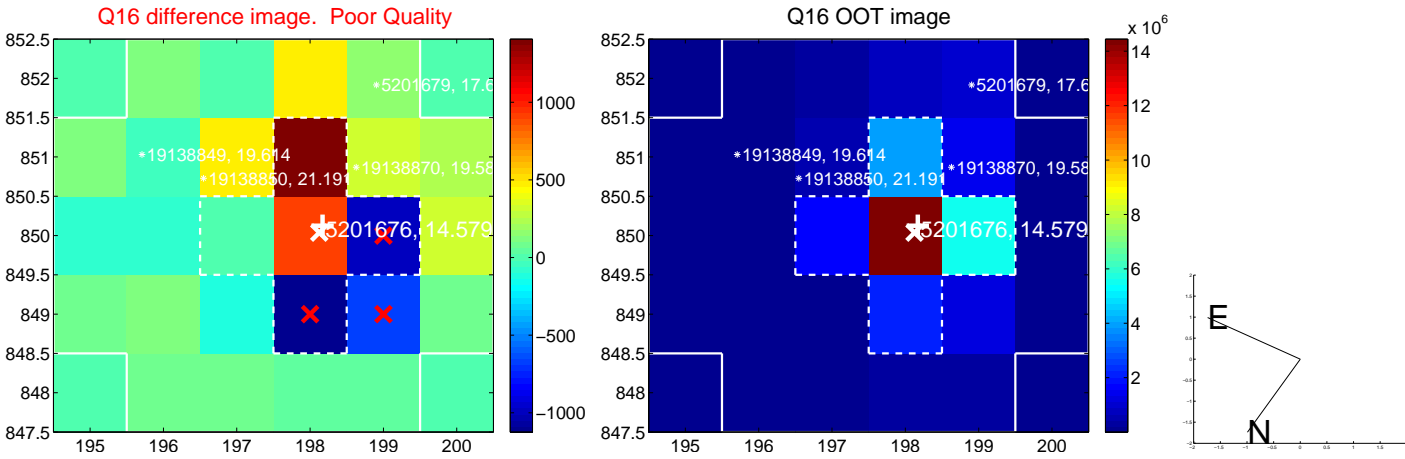
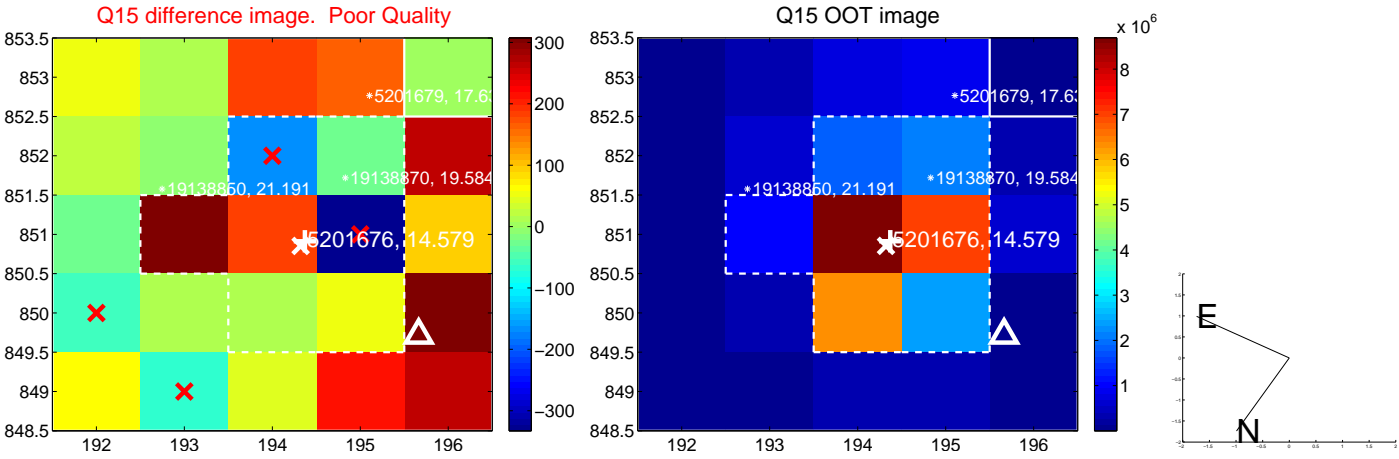
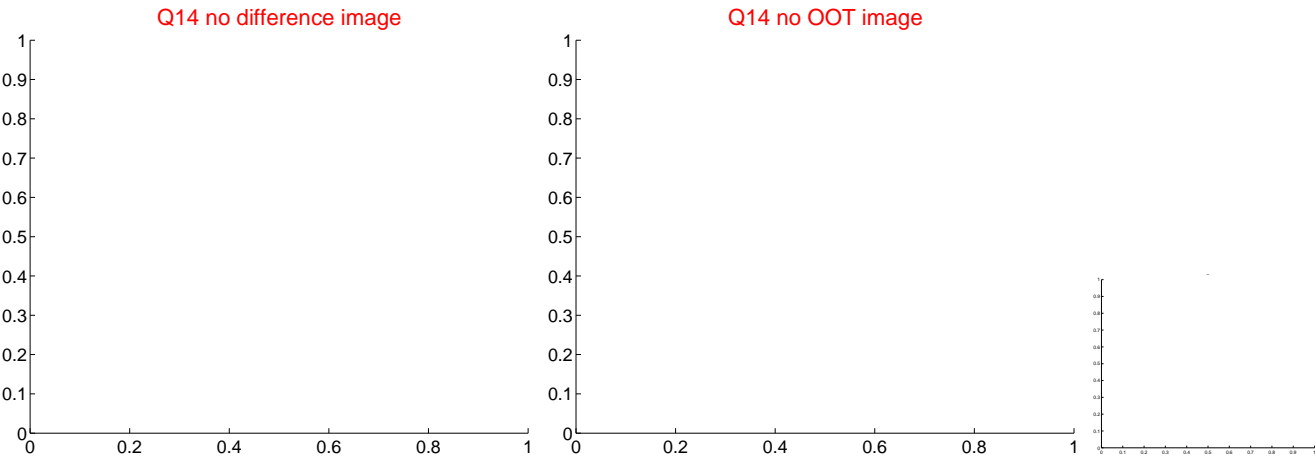
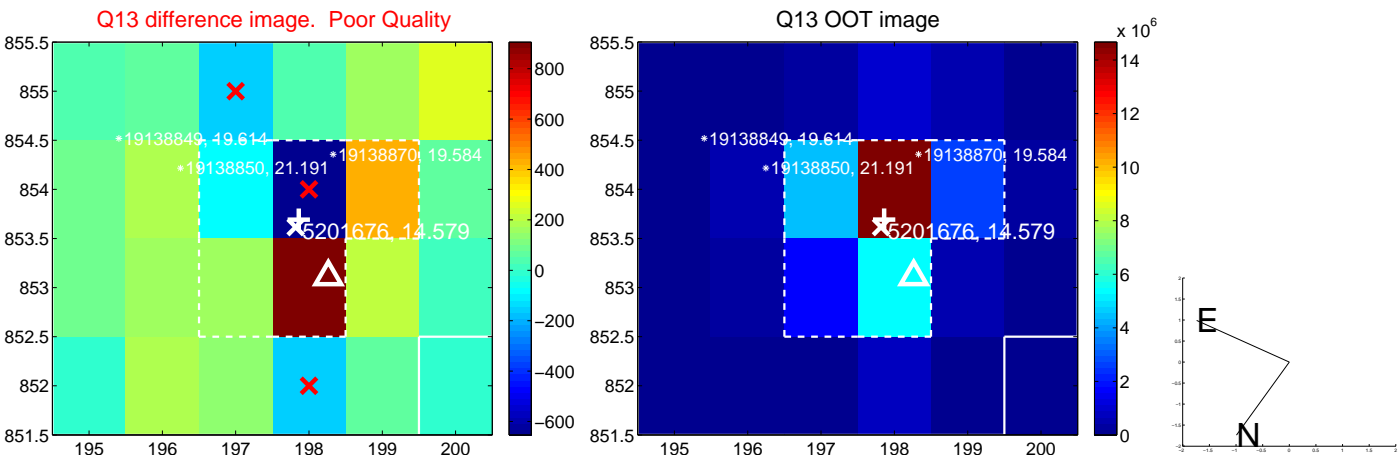




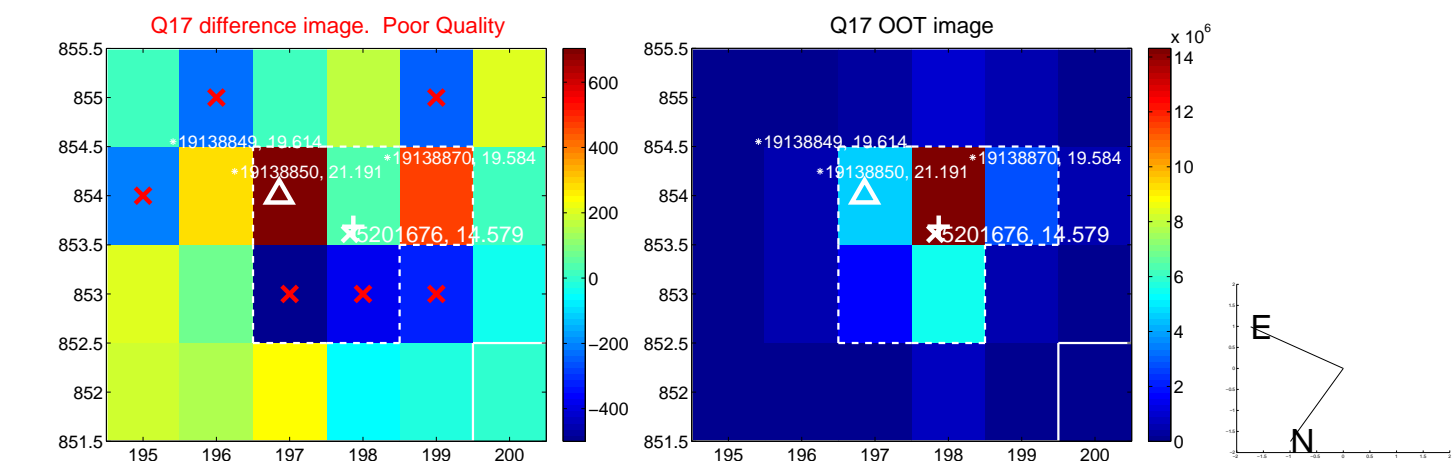
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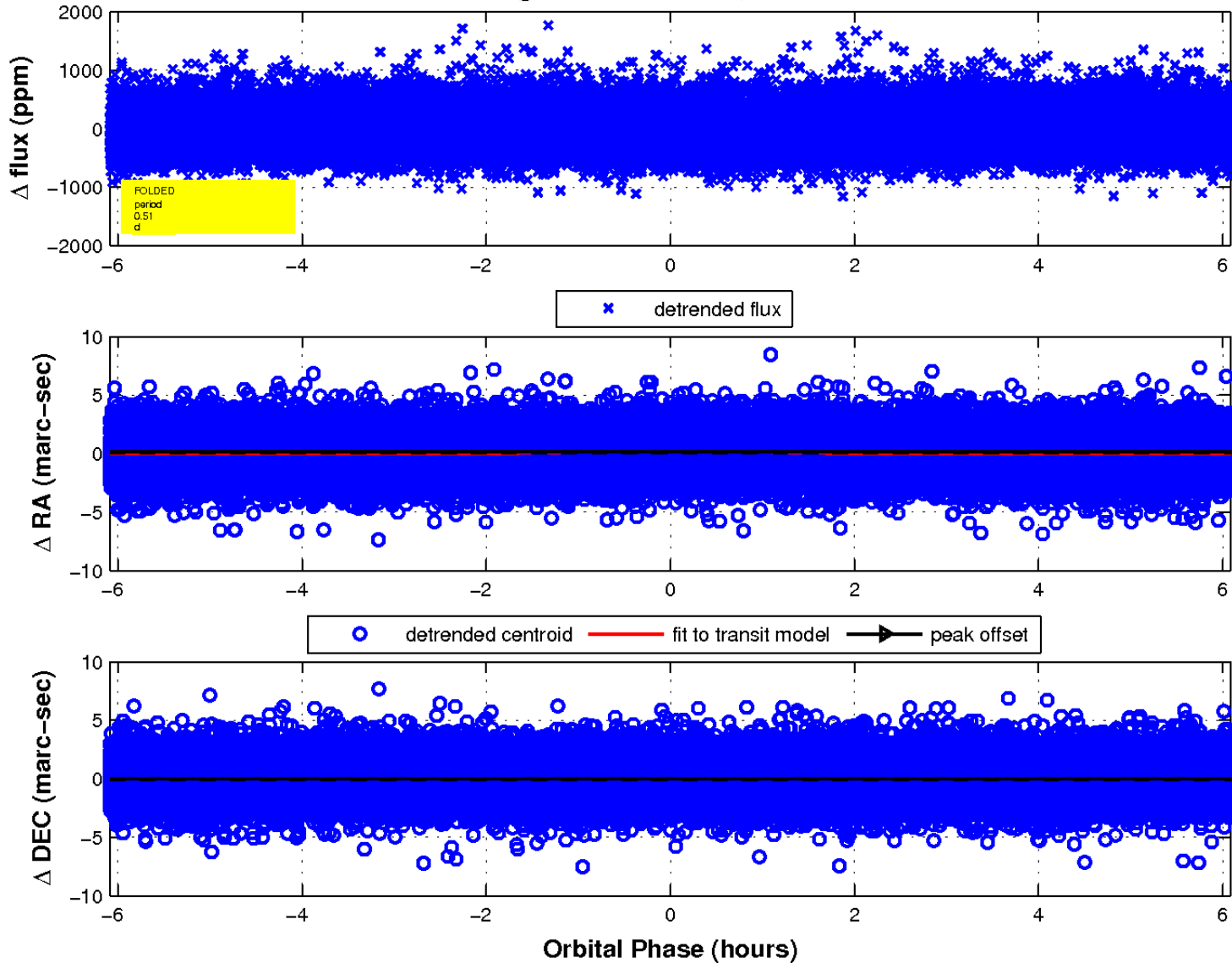
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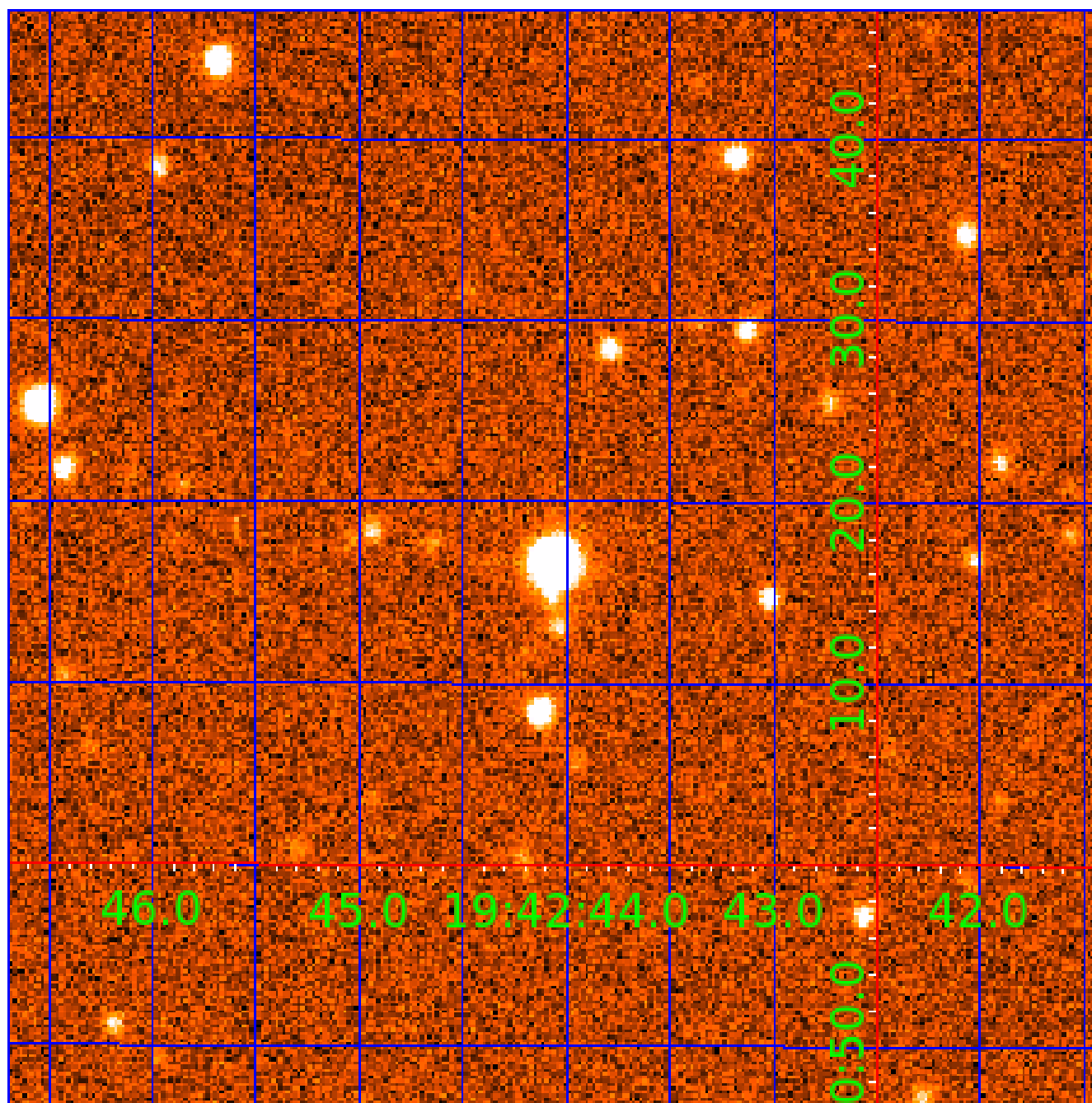


fluxWeightedCentroids, Planet 1 of 6



UKIRT Image

Declination





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005201676-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
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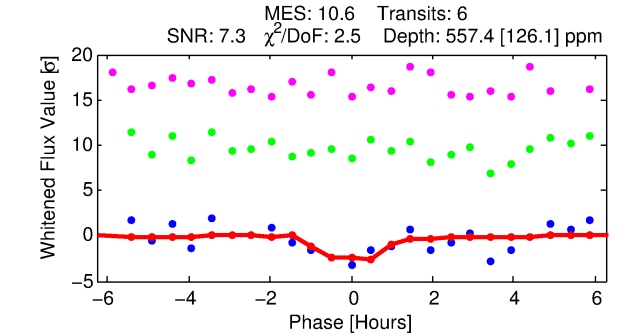
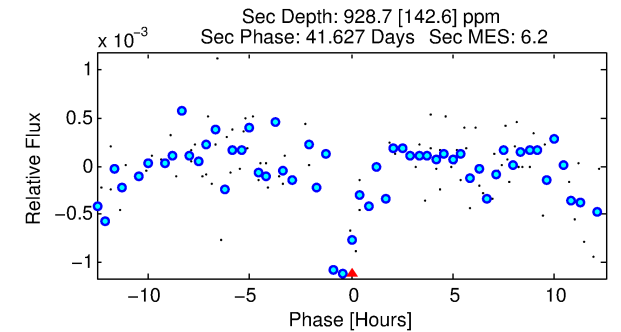
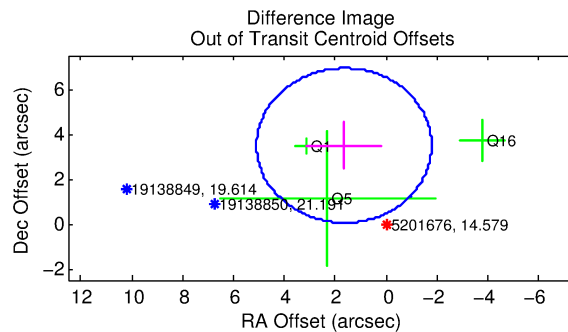
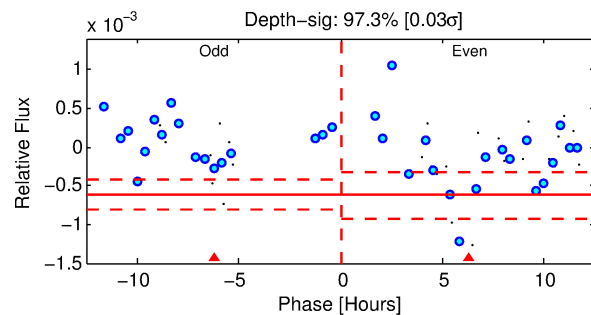
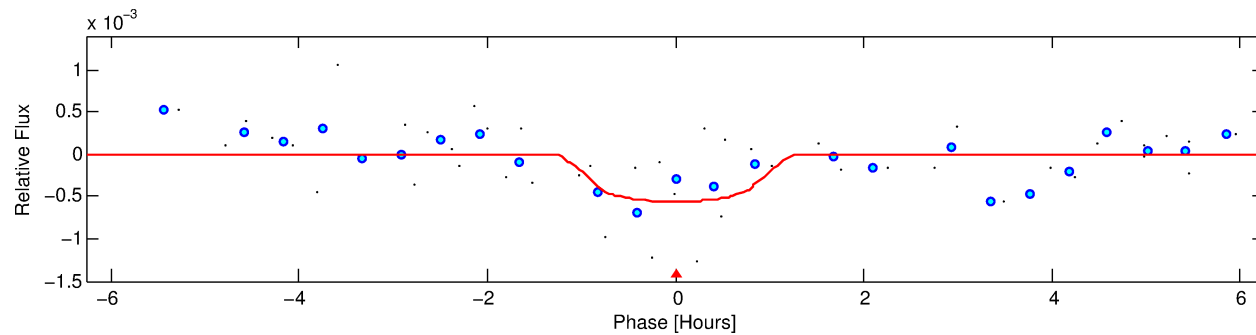
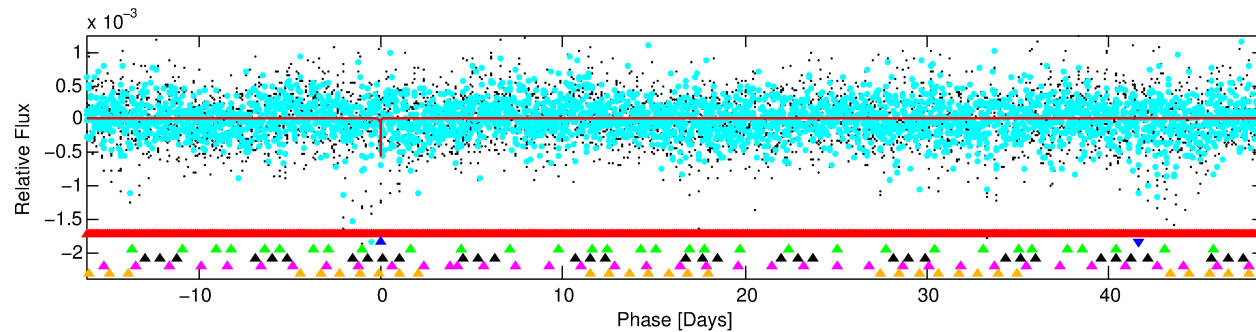
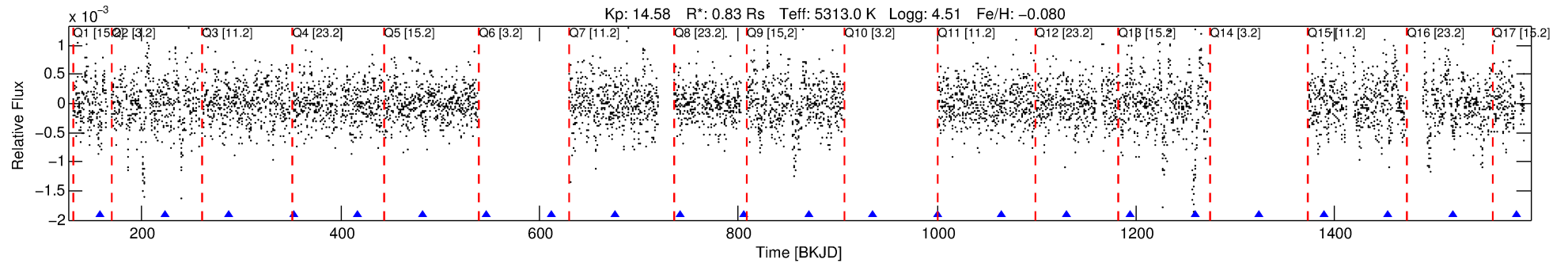
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005201676-02

No Significant Match Found

# DV One-Page Summary

KIC: 5201676 Candidate: 2 of 6 Period: 64.752 d



## DV Fit Results:

Period = 64.75224 [0.00073] d  
Epoch = 158.3838 [0.0089] BKJD  
Rp/R\* = 0.0223 [0.1922]  
a/R\* = 199.69 [6524.77]  
b = 0.58 [38.05]  
Seff = 5.68 [1.27]  
Teq = 394 [22] K  
Rp = 2.03 [17.48] Re  
a = 0.2953 [0.0390] AU  
Ag = 10797.83 [185764.92] [0.06σ]  
Teffp = 6204 [26683] K [0.22σ]

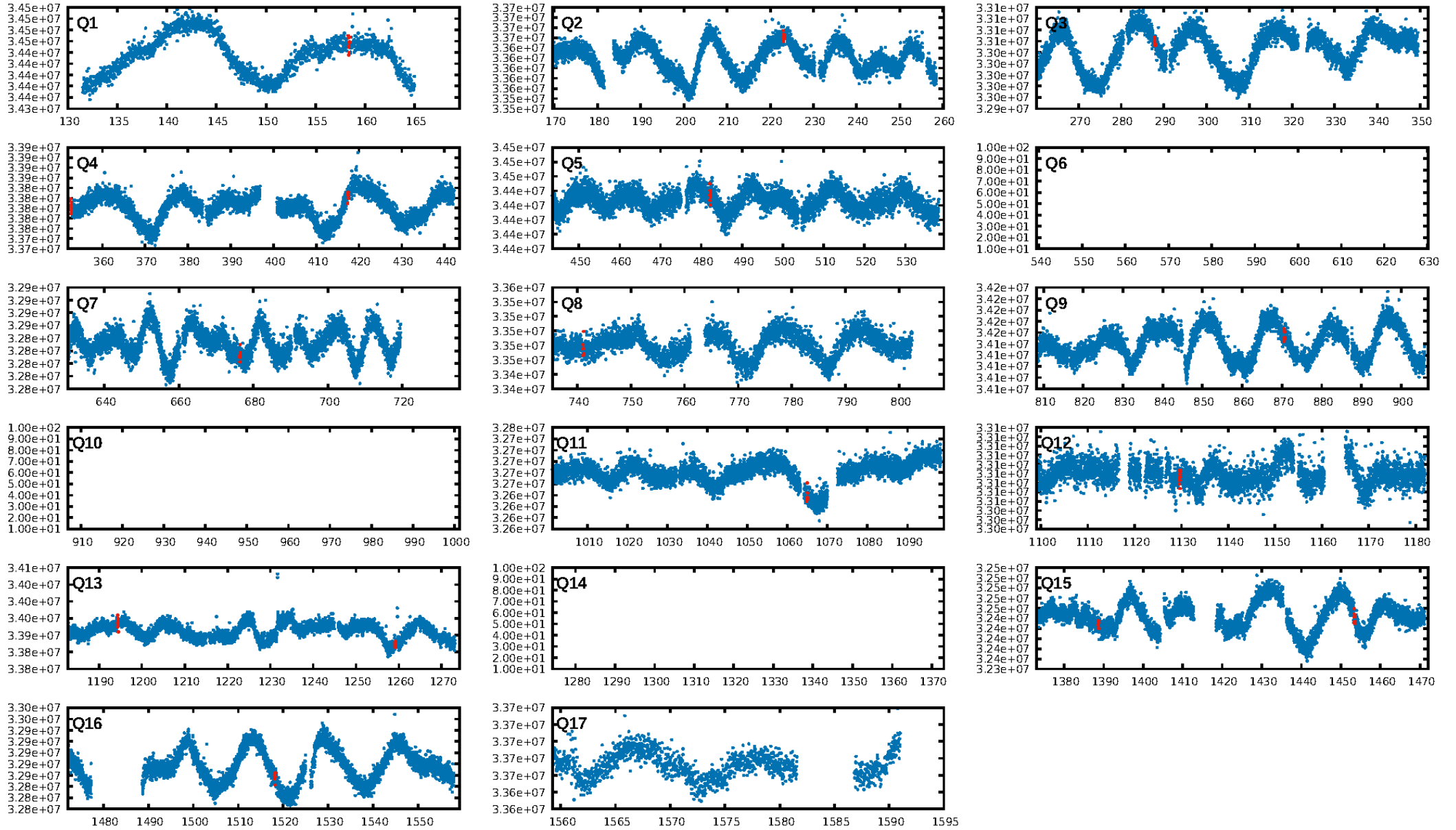
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [160.58σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 83.8%  
Bootstrap-pfa: 2.80e-13  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 4.957  
Centroid-sig: 1.8%  
Centroid-so: 2.061 arcsec [2.05σ]  
OotOffset-rm: 3.857 arcsec [3.36σ]  
KicOffset-rm: 3.529 arcsec [3.04σ]  
OotOffset-st: 0/0/1/2 [3]  
KicOffset-st: 0/0/1/2 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.00 [0/12]

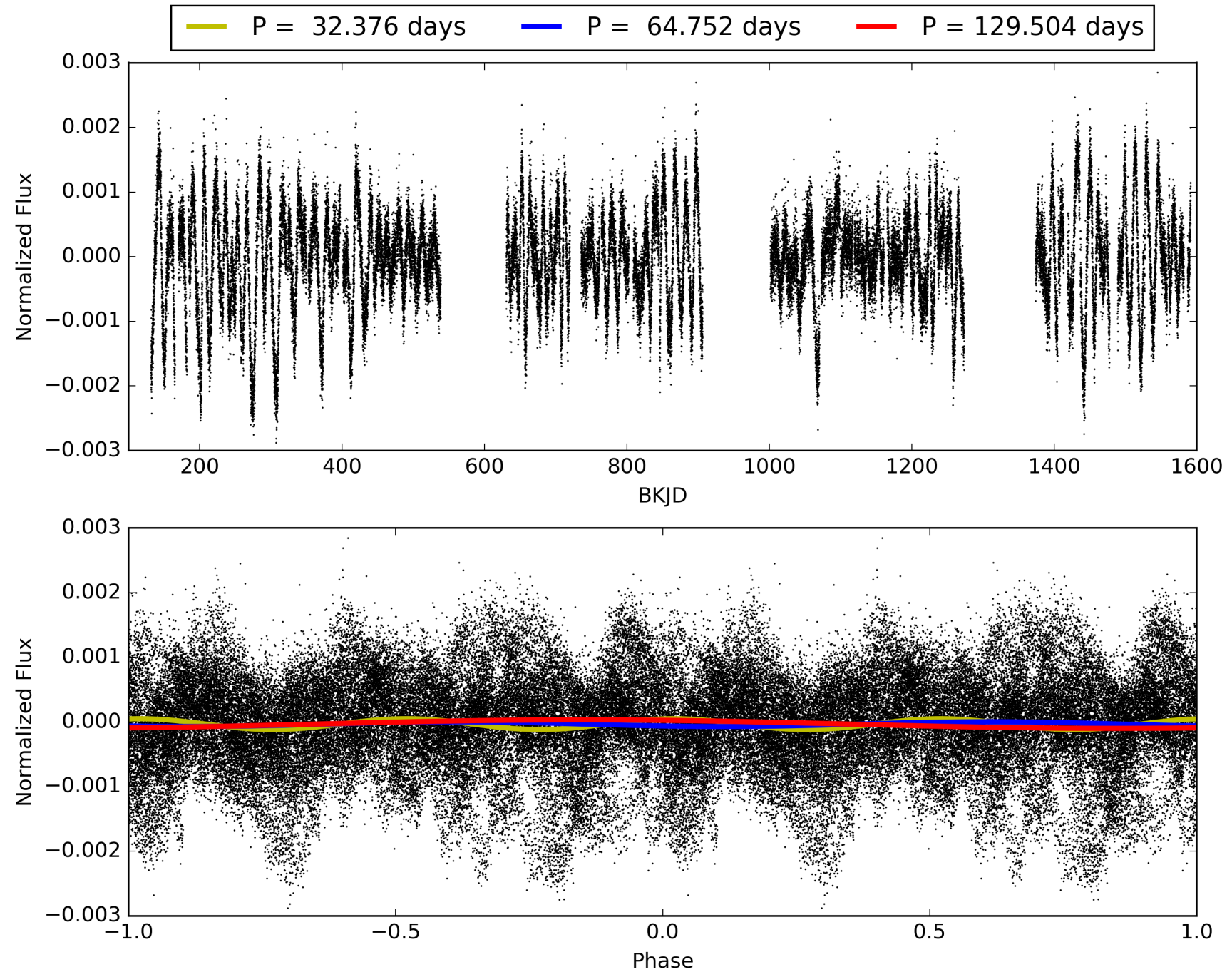
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:16:02 Z

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

# TCE 005201676-02, PDC Light Curves

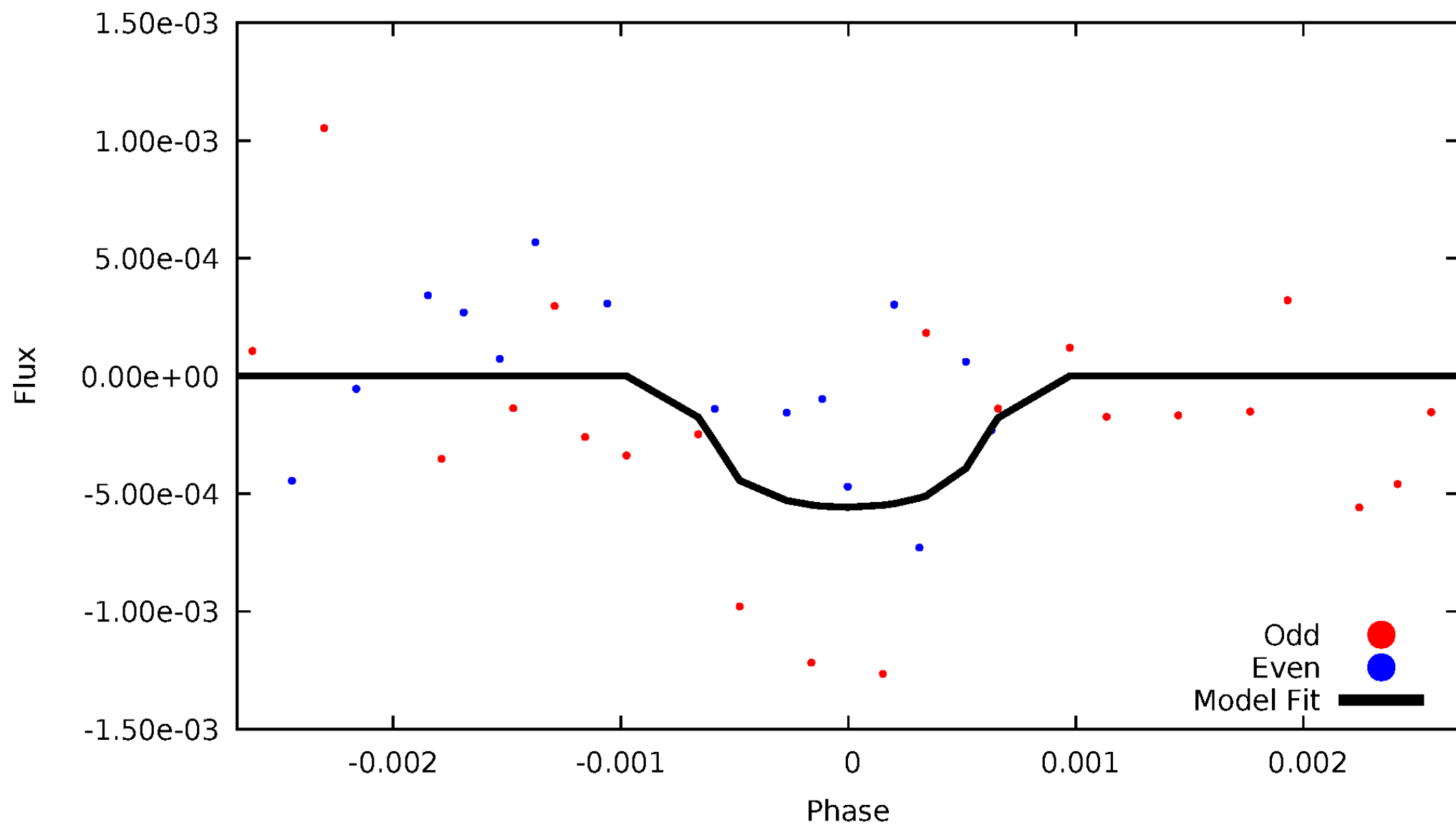


# TCE 005201676-02



# DV Odd/Even

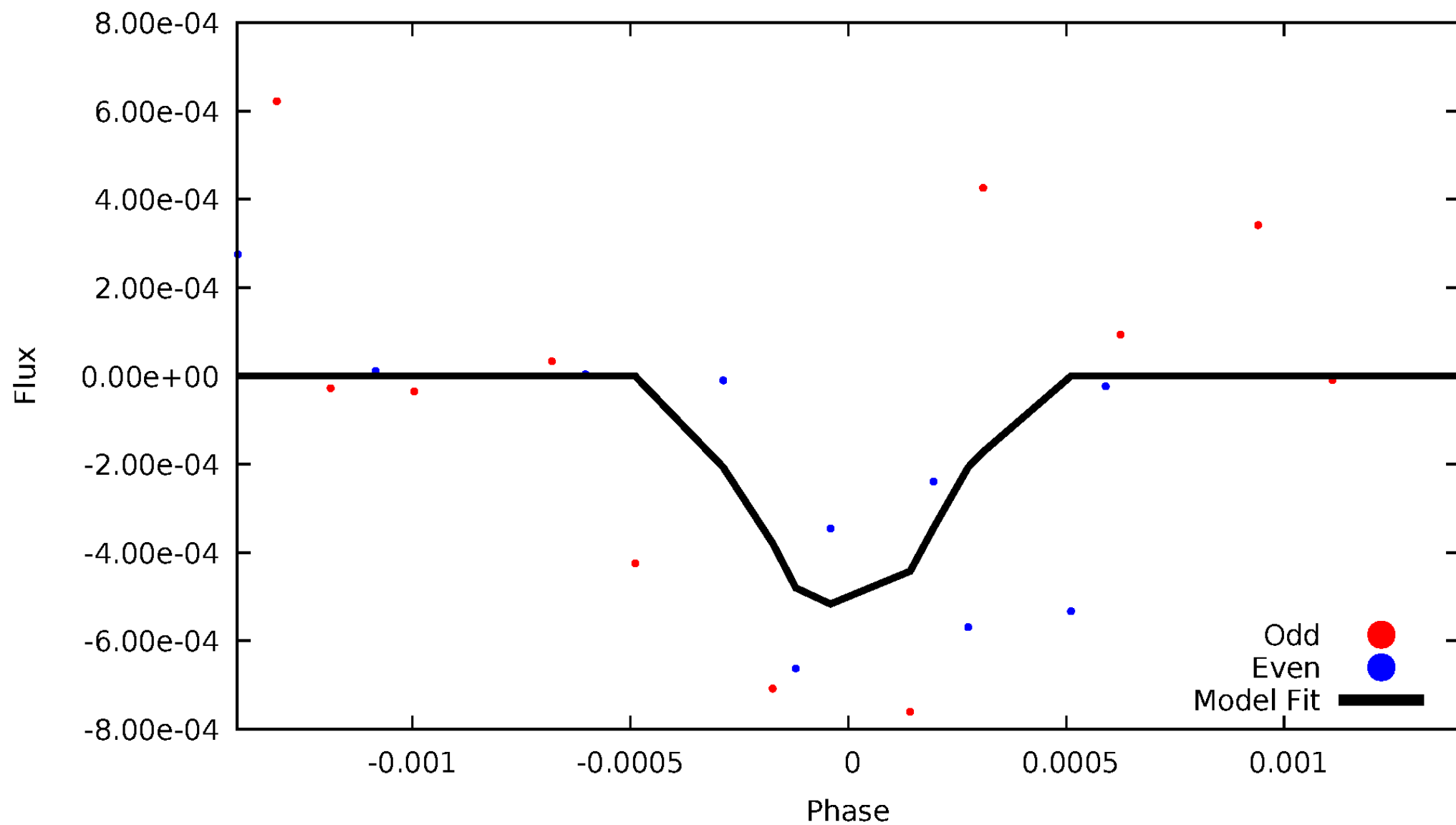
TCE 005201676-02





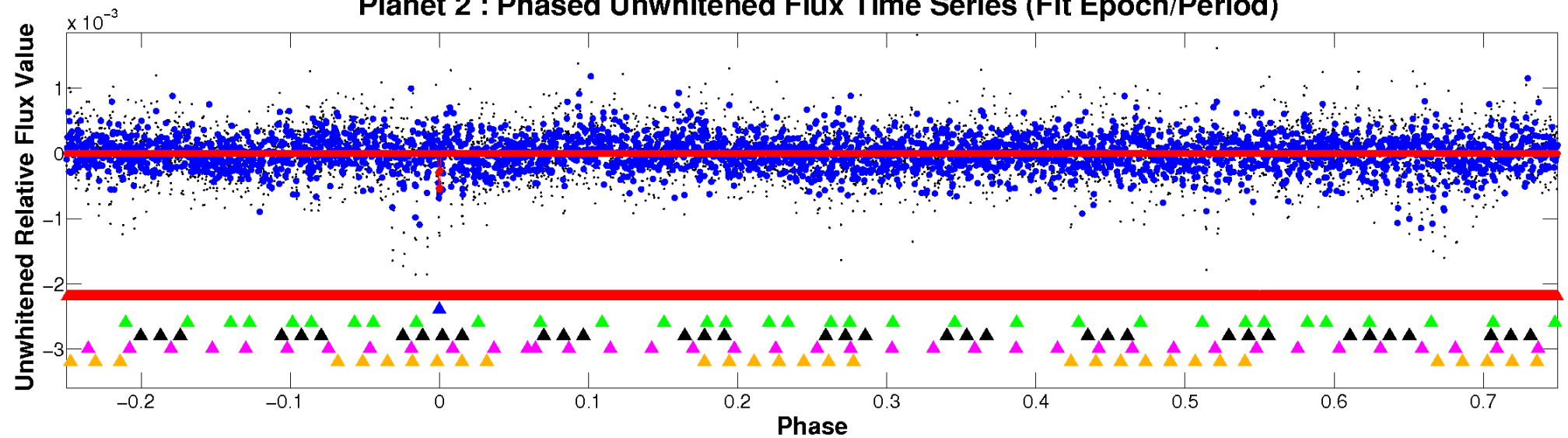
# ALT Odd/Even

TCE 005201676-02

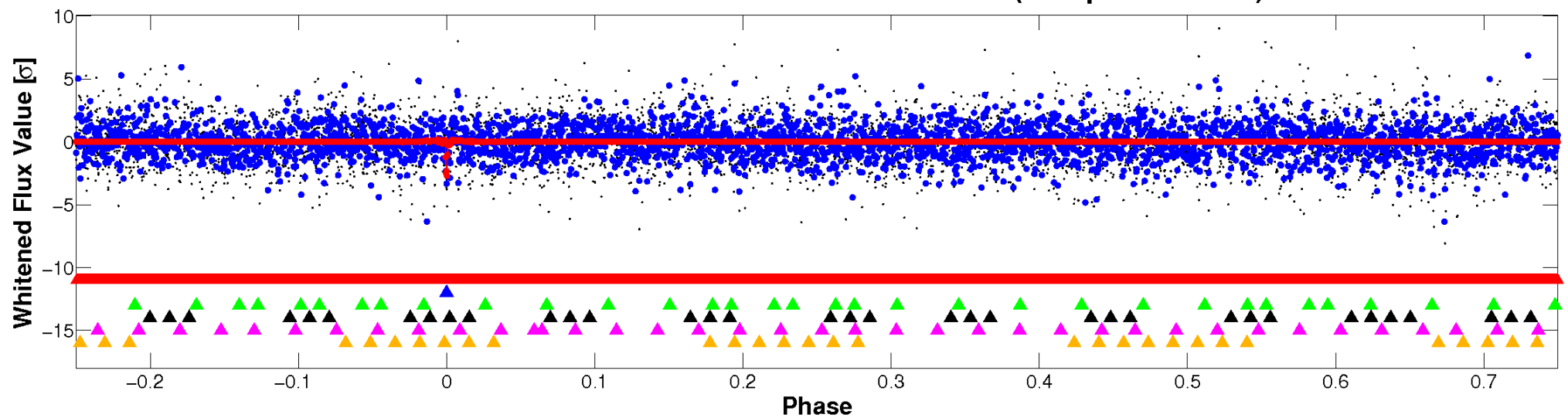


# Non-Whitened Vs. Whitened Light Curve

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

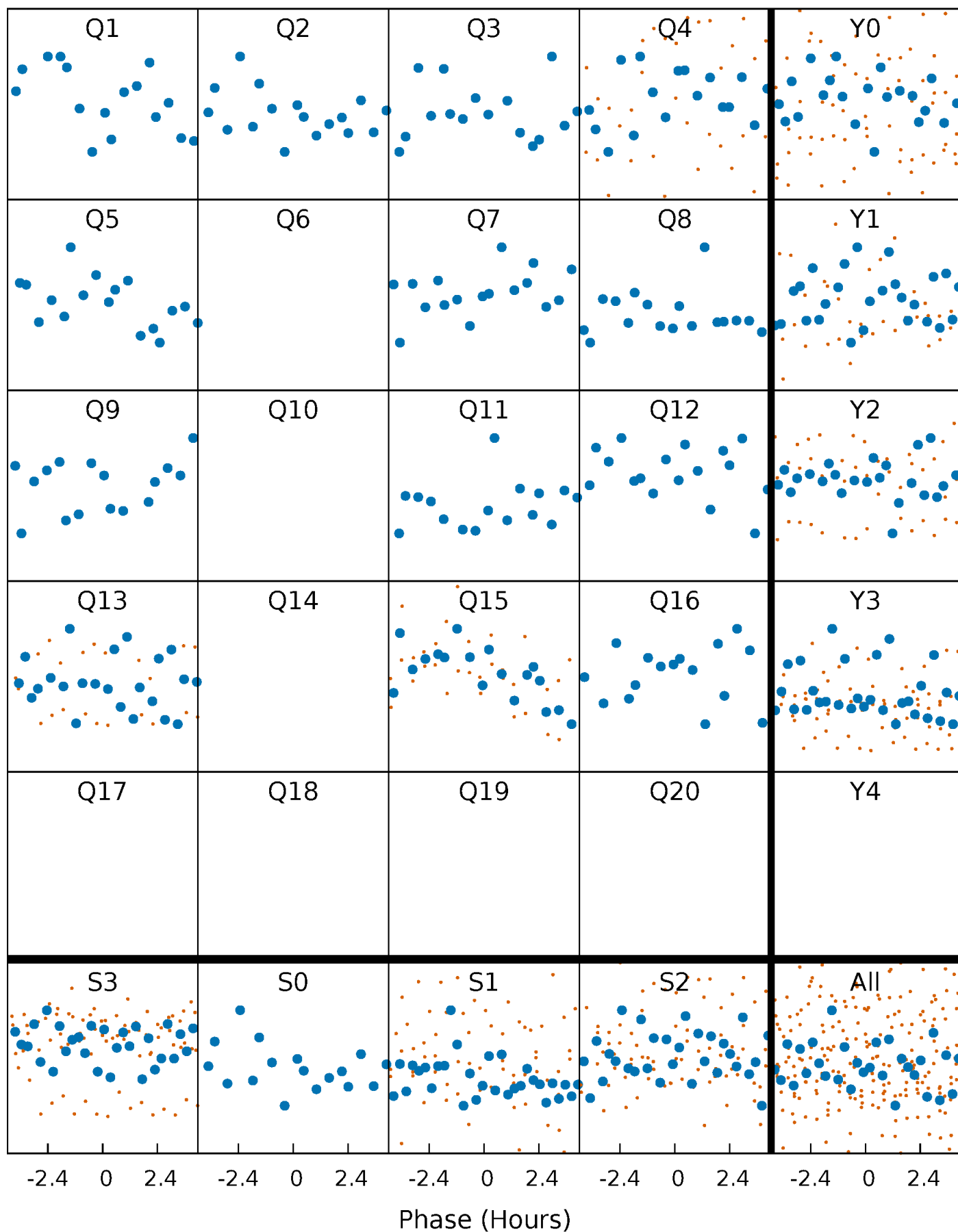


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



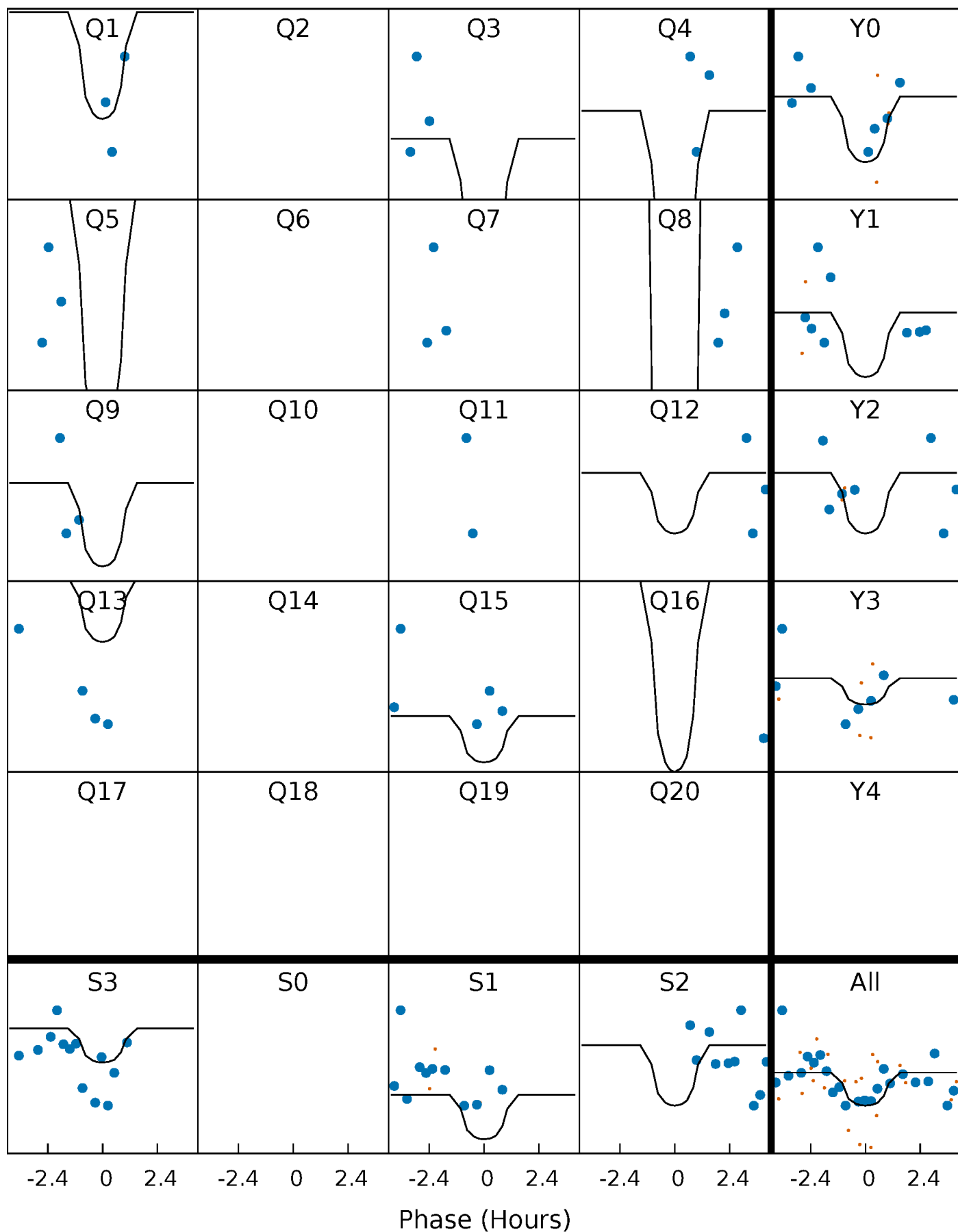
# PDC Quarter-Phased Transit Curves

TCE 005201676-02   P= 64.752245 Days    $T_0=158.383778$  (BKJD)



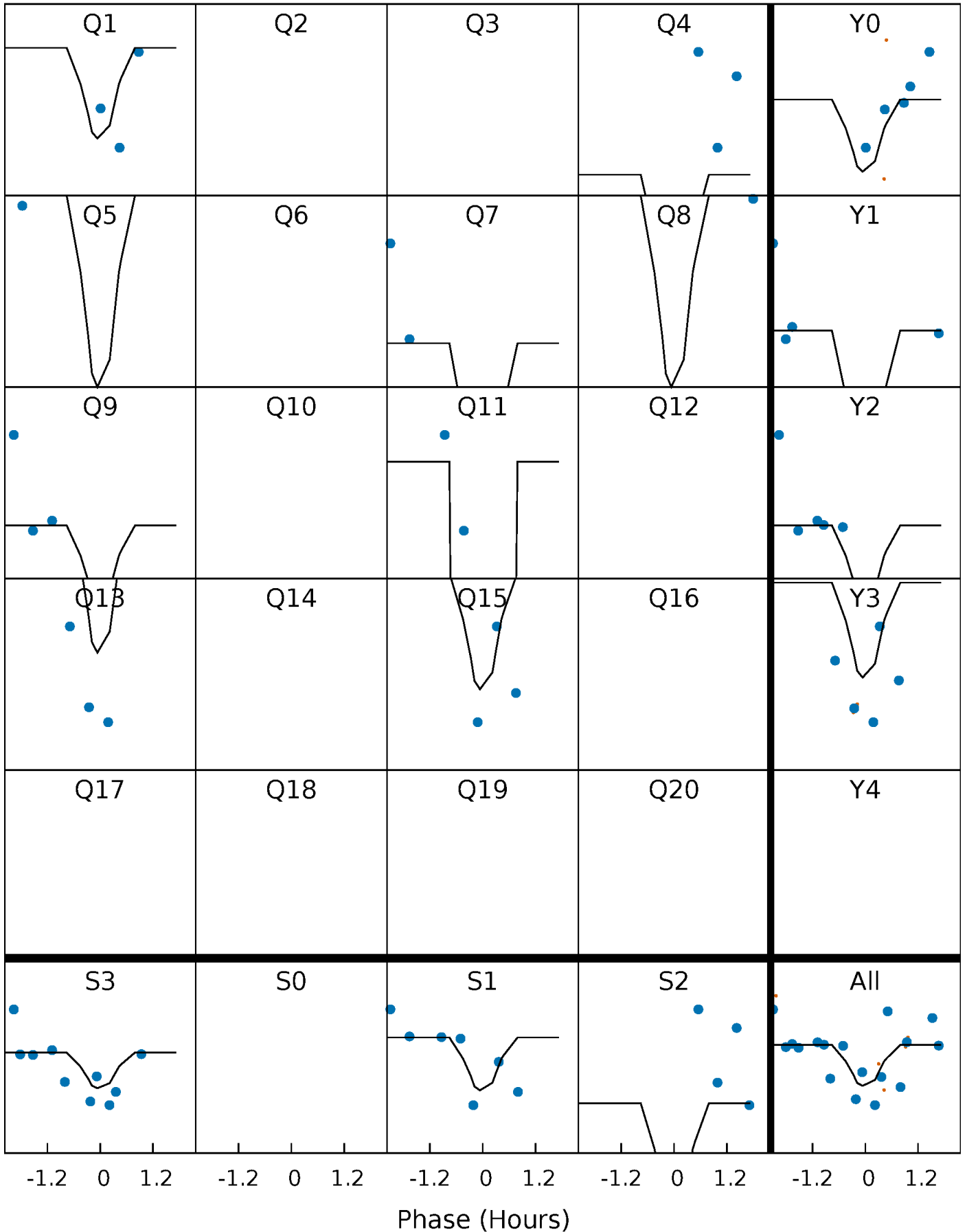
# DV Quarter-Phased Transit Curves

TCE 005201676-02 P= 64.752245 Days  $T_0=158.383778$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

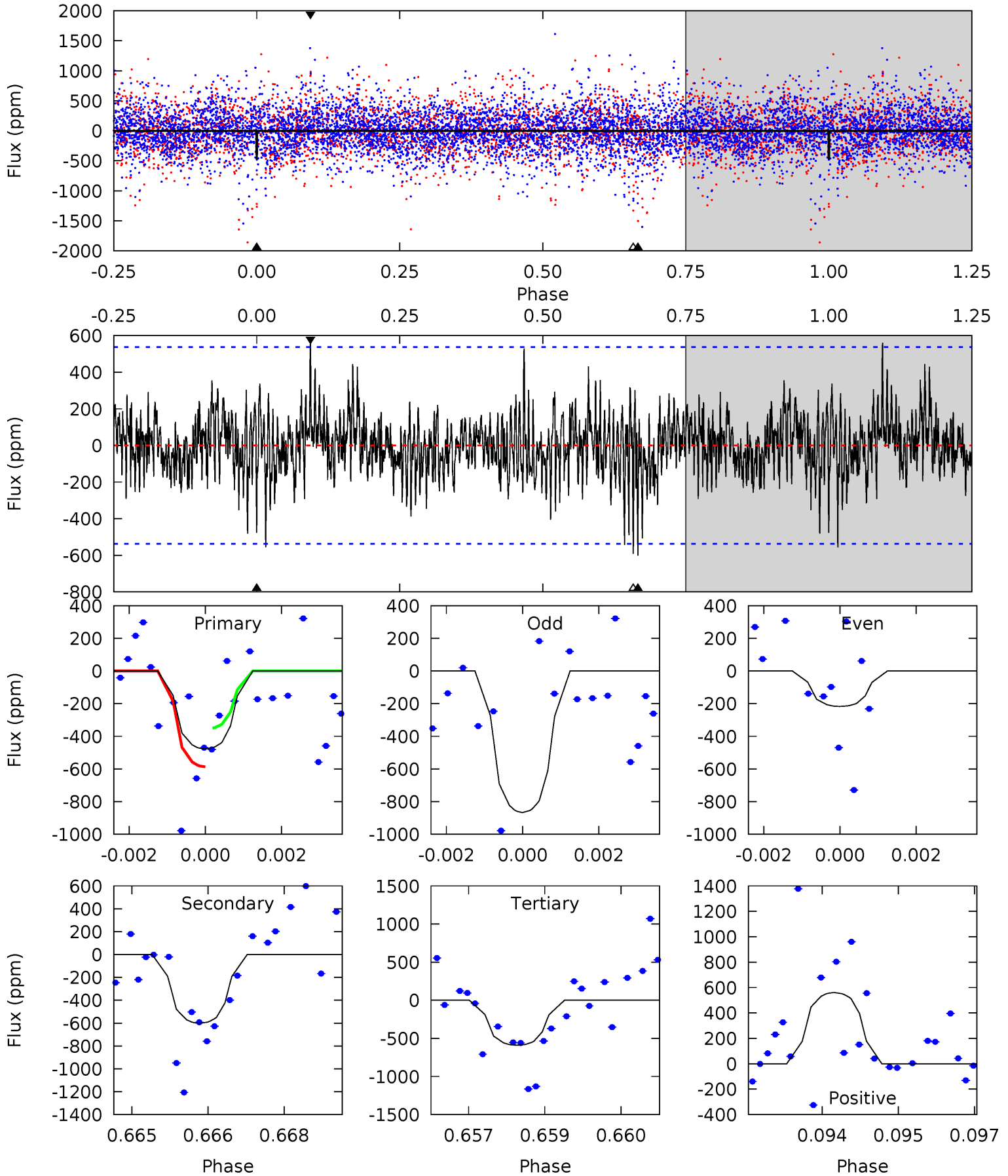
TCE 005201676-02 P= 64.752142 Days  $T_0=158.386232$  (BKJD)



# DV Model-Shift Uniqueness Test

005201676-02, P = 64.752245 Days, E = 93.631533 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
4.77	6.01	5.90	5.60	5.37	3.16	1.41	-1.13	-0.83	0.11	0.41	3.14	1.93	0.48	1.17

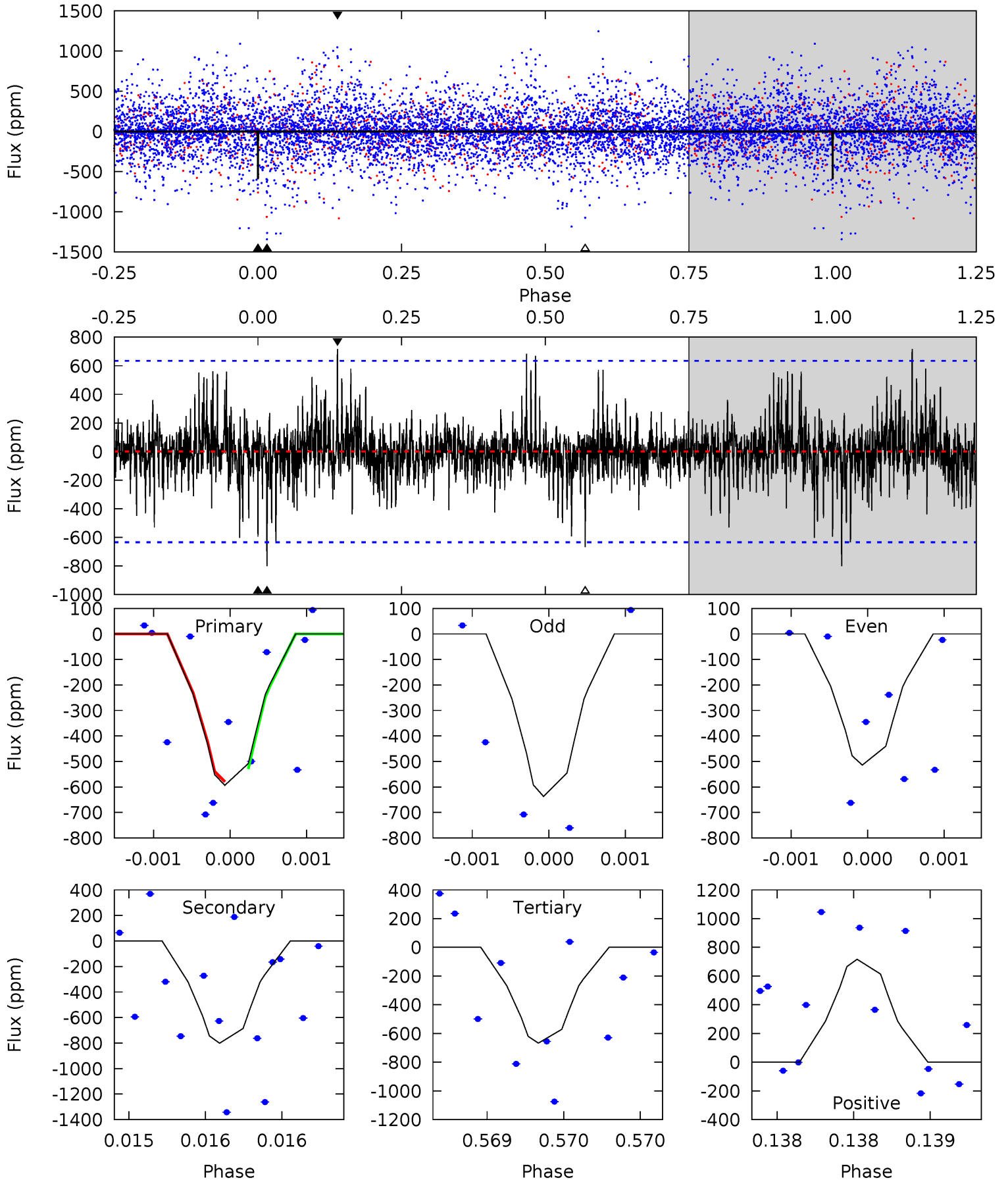




# Alt Model-Shift Uniqueness Test

005201676-02, P = 64.752142 Days, E = 93.634090 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
5.19	7.01	5.83	6.27	5.54	3.43	1.27	-0.64	-1.08	1.17	0.74	0.49	1.13	0.47	0.22



### Stellar Parameters For KIC 005201676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5313^{+159}_{-159}$	$4.510^{+0.076}_{-0.102}$	$-0.080^{+0.300}_{-0.300}$	$0.833^{+0.133}_{-0.092}$	$0.820^{+0.096}_{-0.070}$	$1.998^{+0.689}_{-0.604}$
	+3%/-3%	+2%/-2%	+375%/-375%	+16%/-11%	+12%/-9%	+34%/-30%
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 005201676-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-602 \pm 100$	$12.44^{+12.55}_{-8.92}$	$552^{+28}_{-26}$	$2941^{+1440}_{-511}$	$187^{+2006}_{-142}$
Alt.	$-801 \pm 114$	$12.33^{+12.47}_{-8.73}$	$553^{+25}_{-24}$	$3091^{+1513}_{-554}$	$258^{+2636}_{-197}$

$T_{max}$  = 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

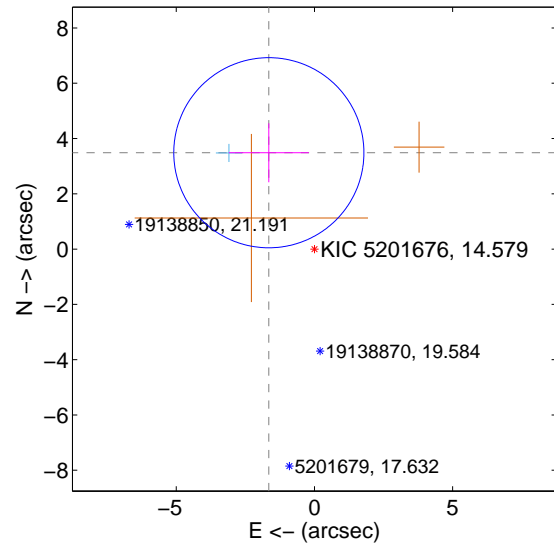
Supplemental centroid analysis for 005201676-02. Kepler magnitude: 14.58. Transit SNR 7.32

There are 1 quarters with good PRF difference image offsets

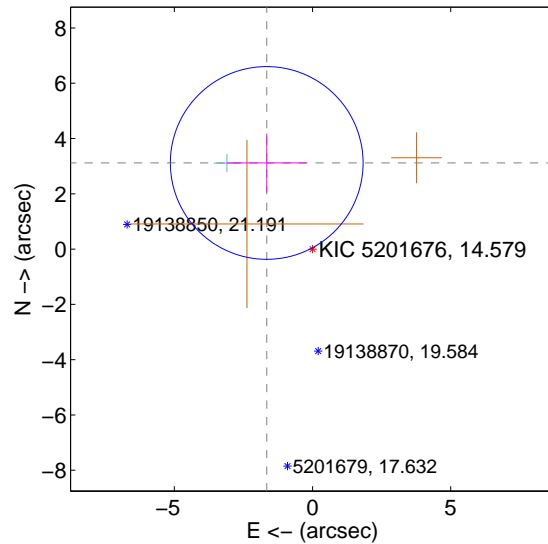
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.857 \pm 1.146$	3.36	$1.649 \pm 1.449$	$3.486 \pm 1.067$
PRF-fit source offset from KIC position	$3.529 \pm 1.162$	3.04	$1.657 \pm 1.449$	$3.116 \pm 1.067$
photometric centroid source offset	$2.06 \pm 1.00$	2.05	$2.05 \pm 1.00$	$-0.16 \pm 0.97$

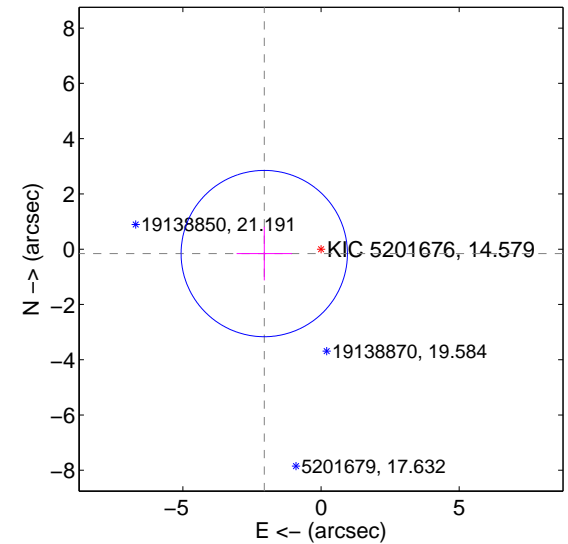
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

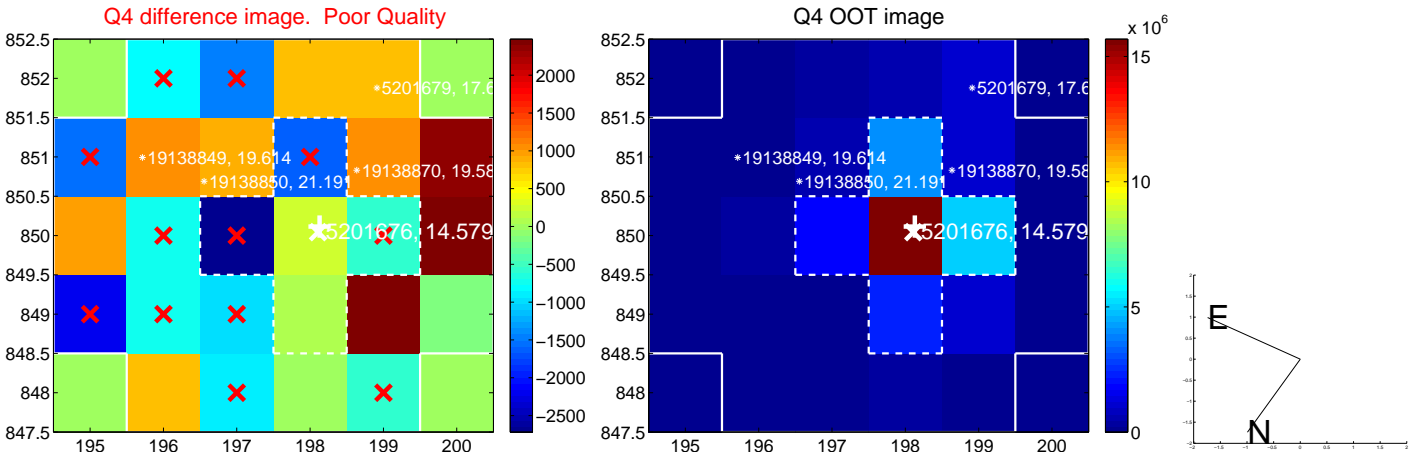
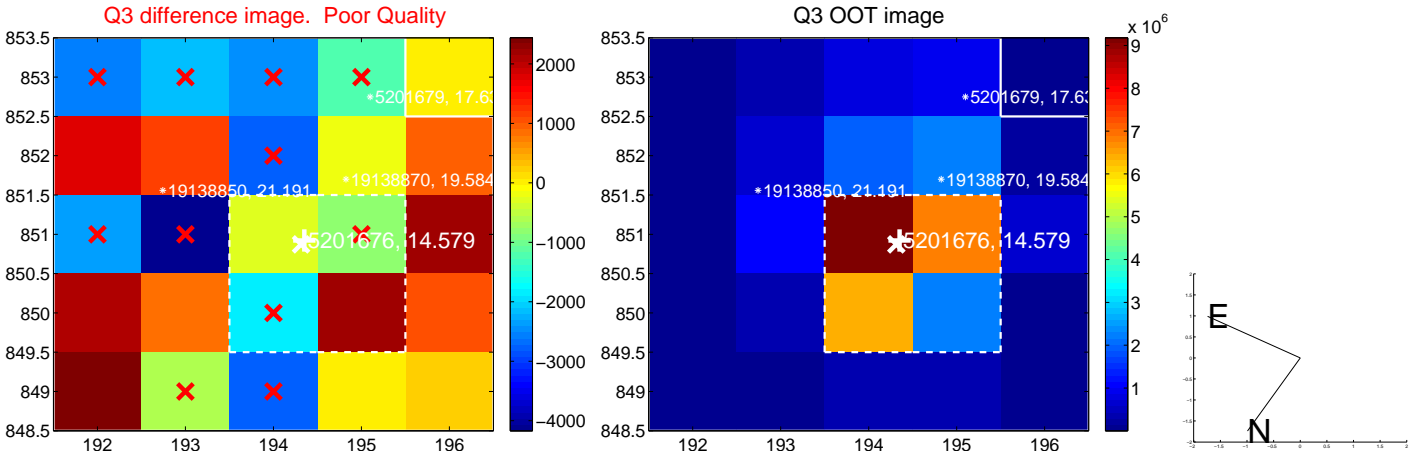
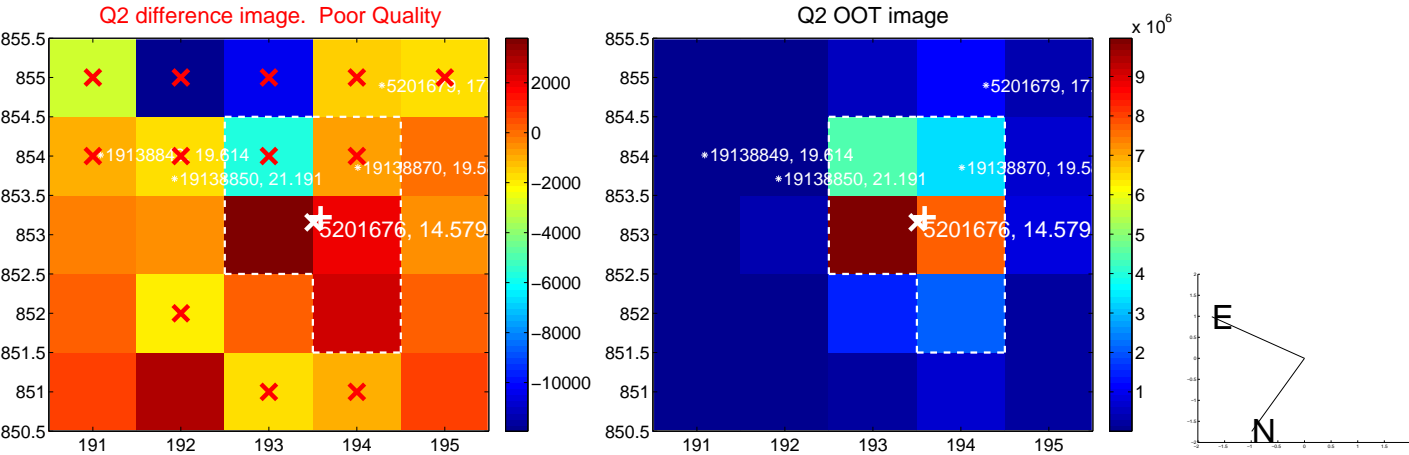
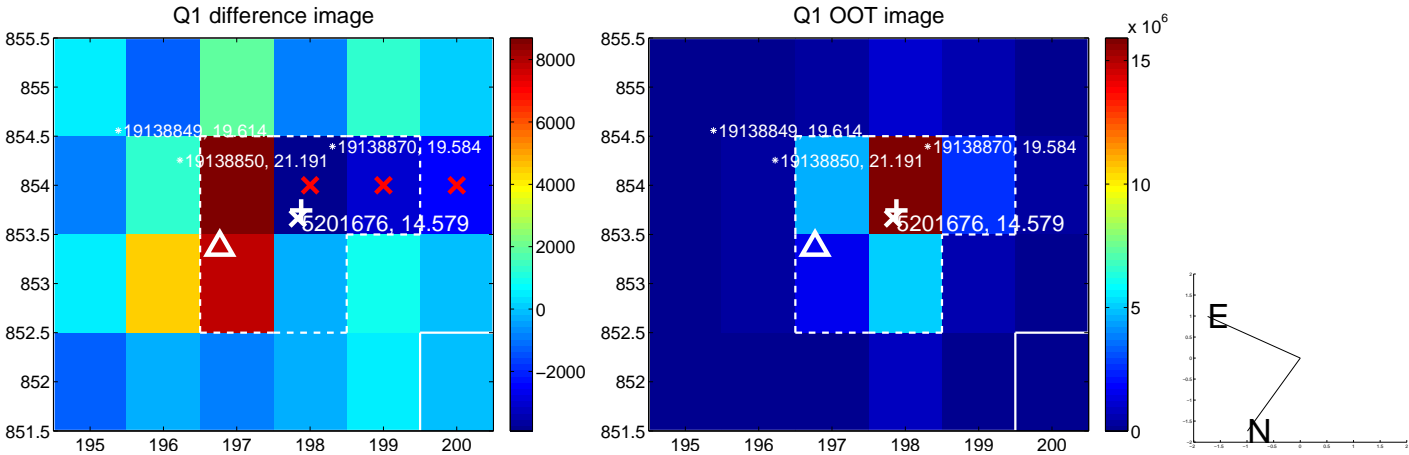


offset from photometric centroids

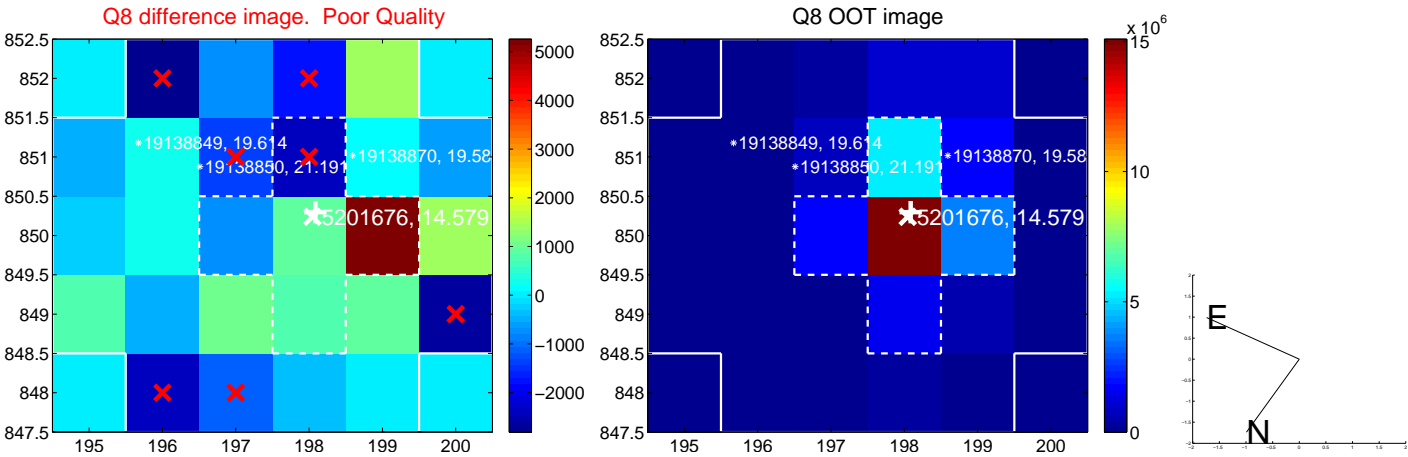
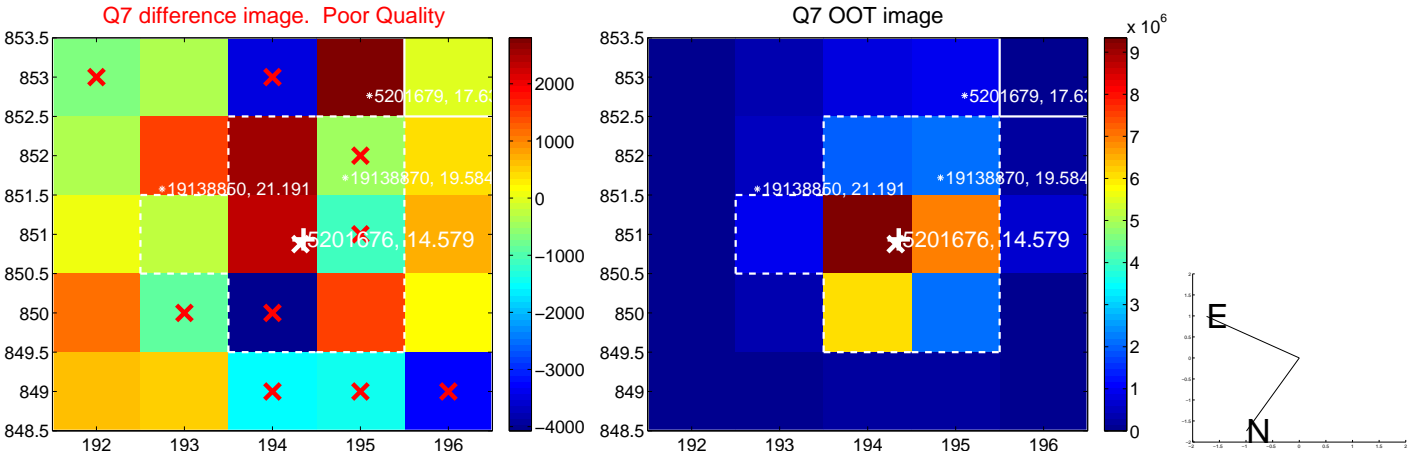
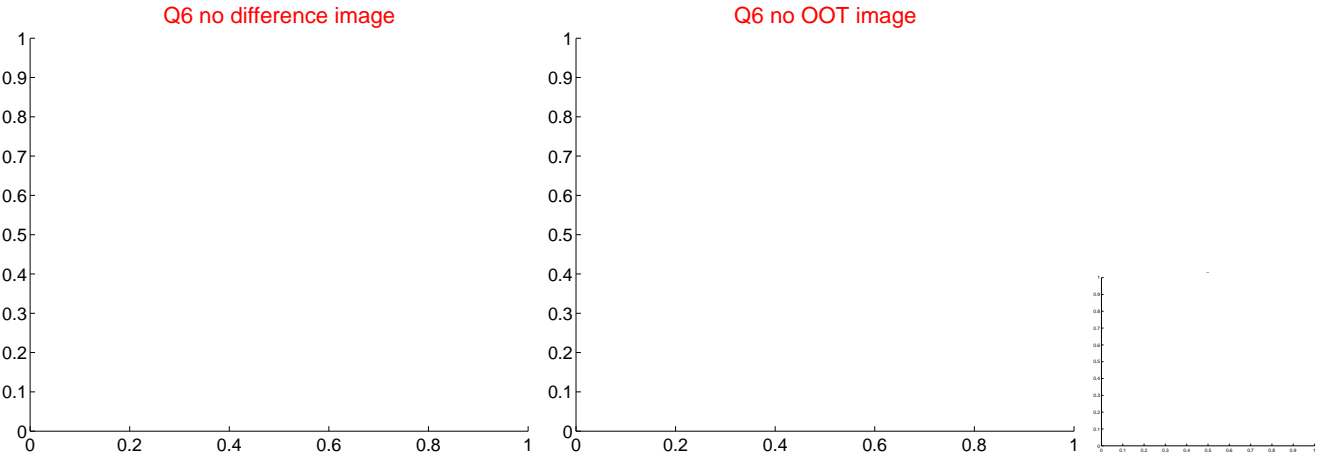
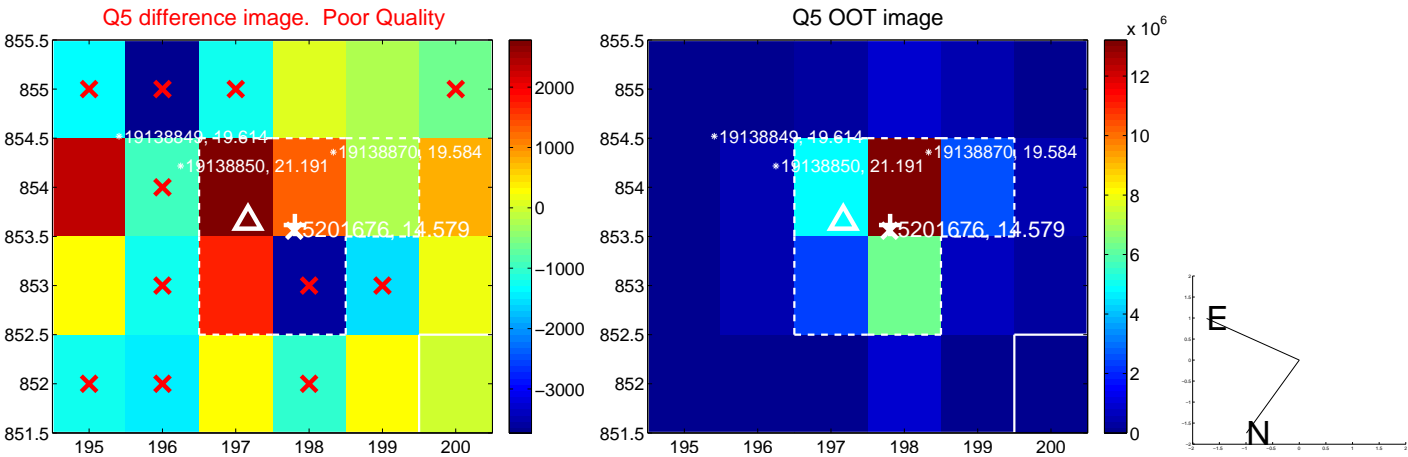


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

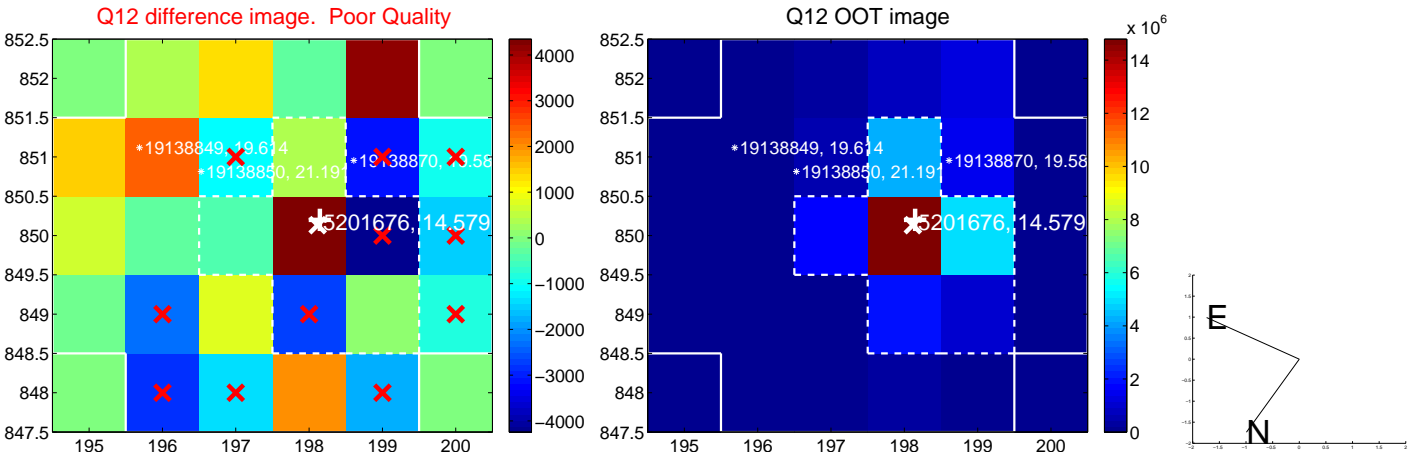
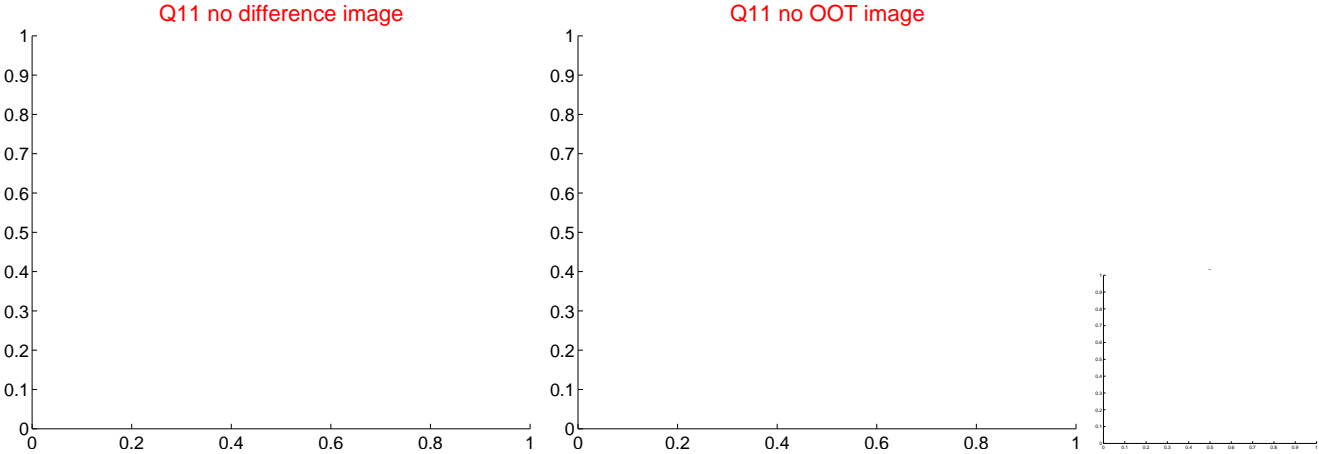
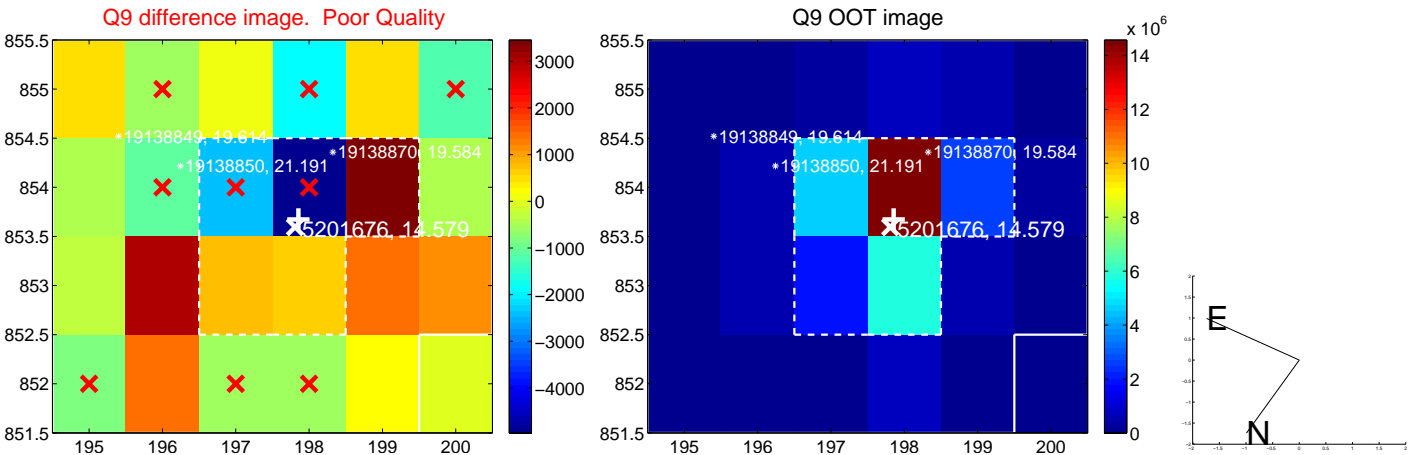
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

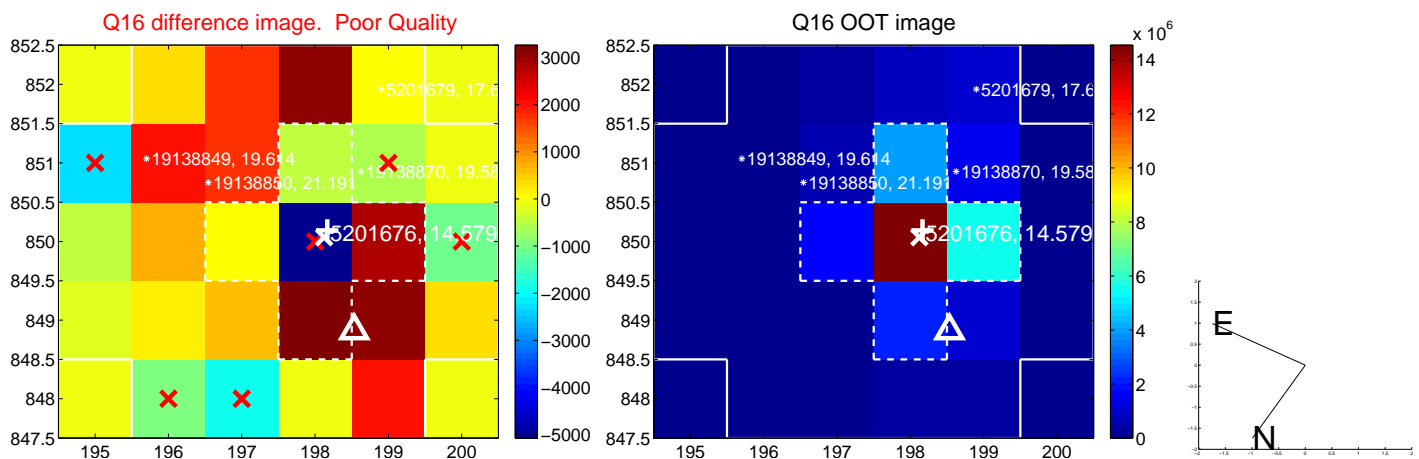
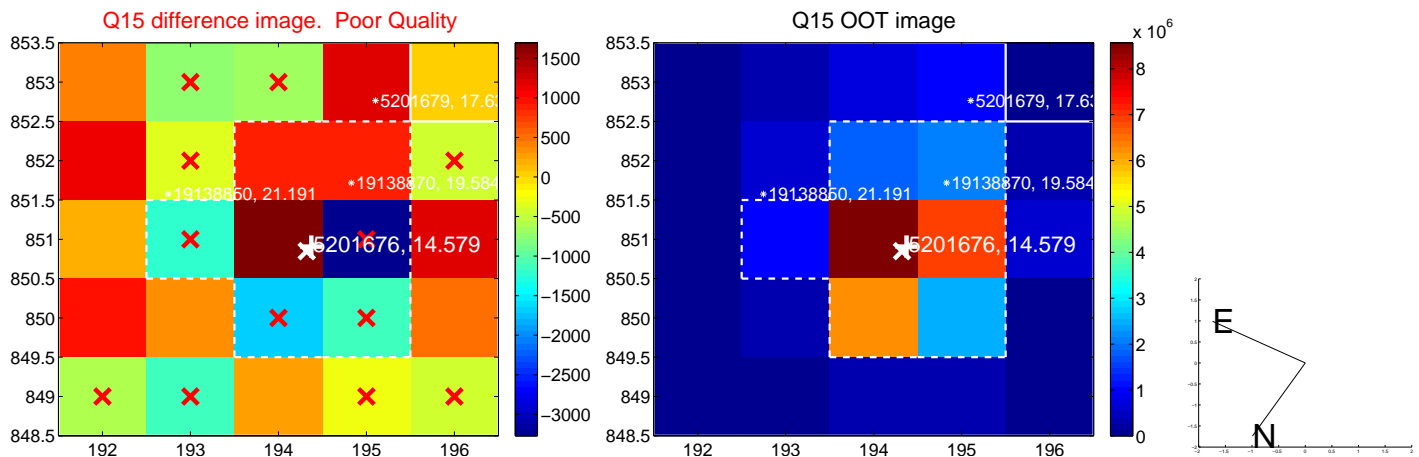
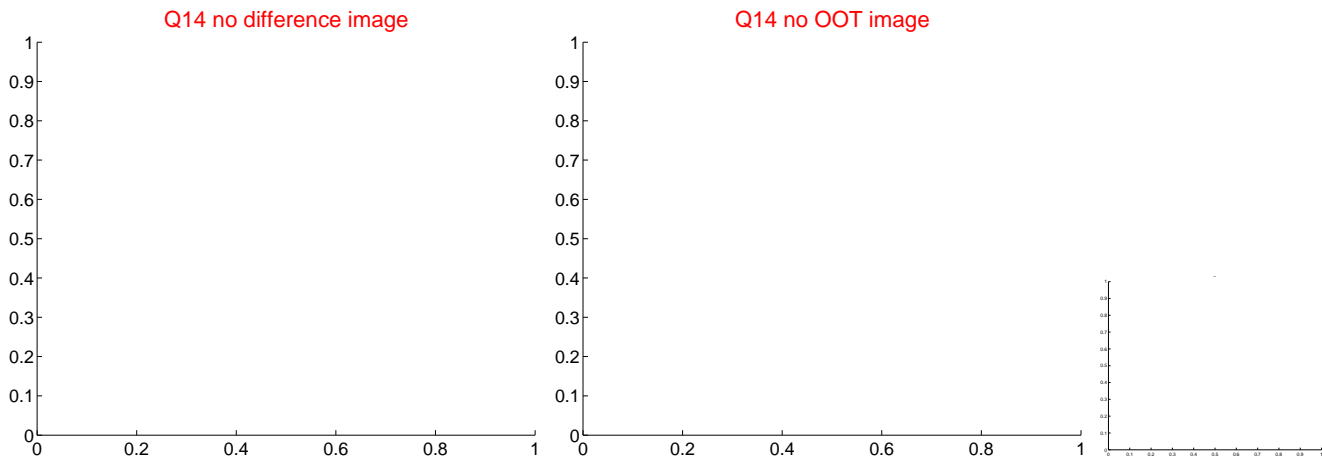
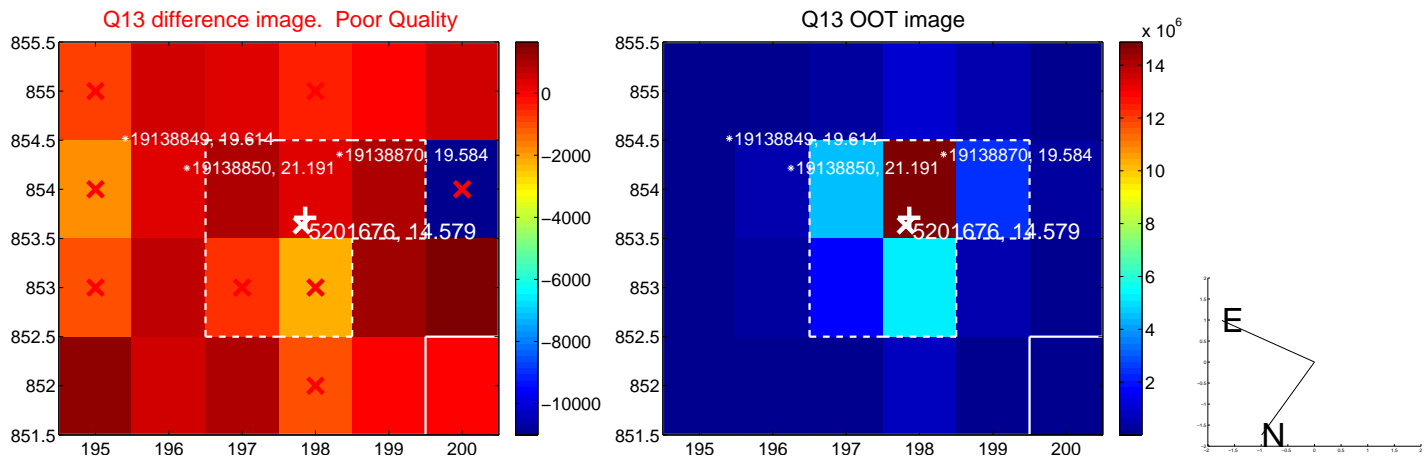


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

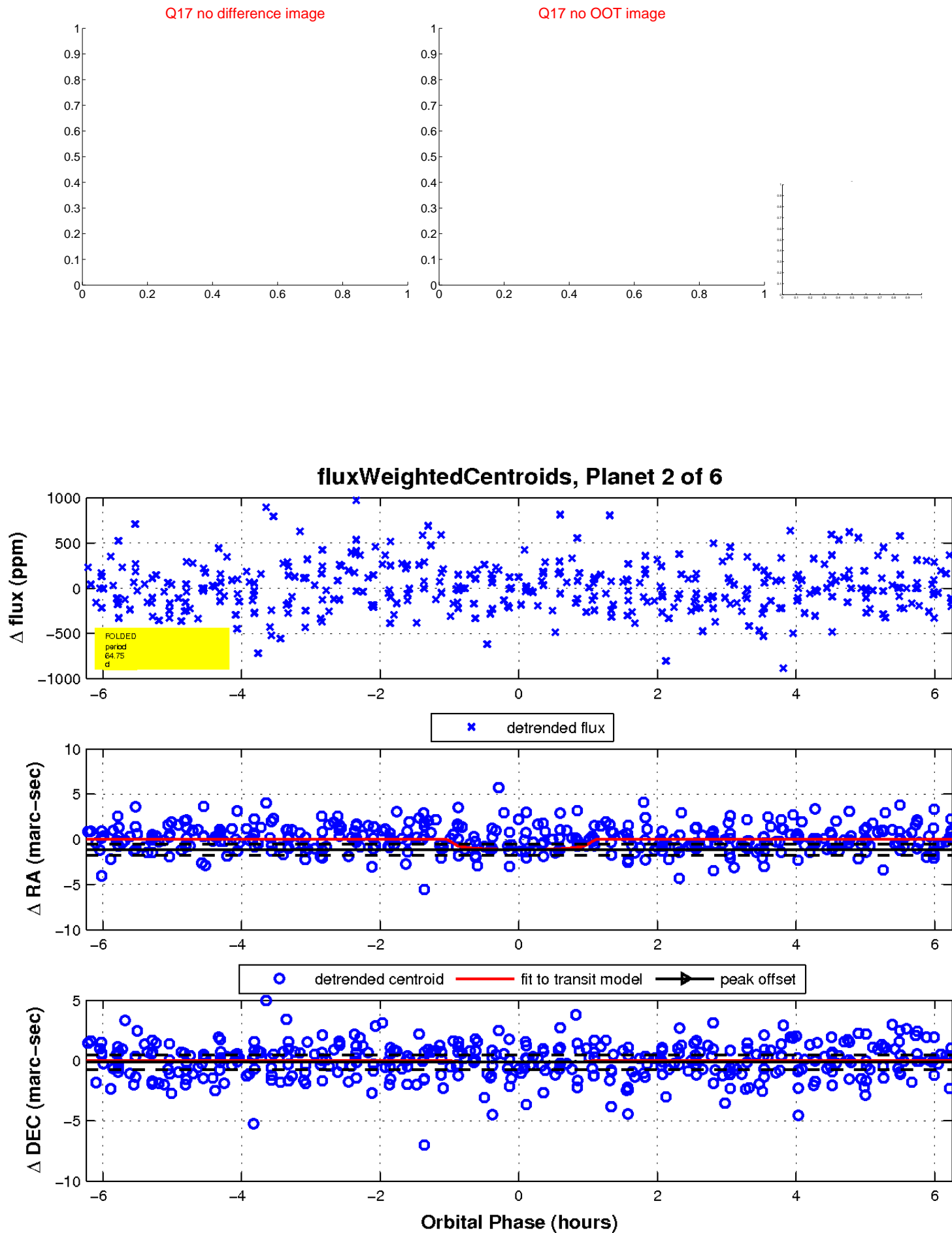




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

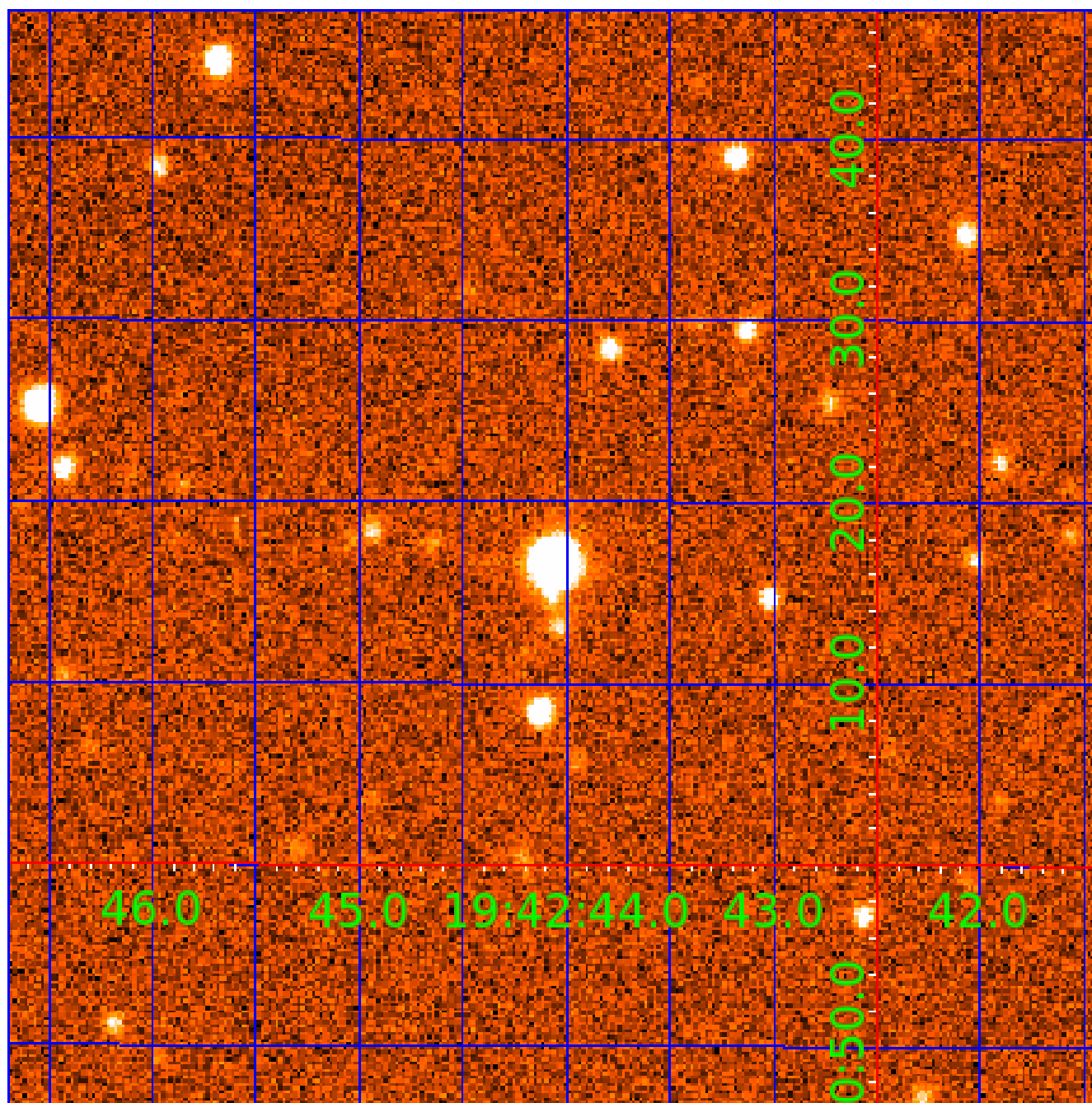


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005201676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005201676-01	OBS	No	0.507258	131.778963	21.4	3.394	7.5	6.9	0.83	5313	0.38	3650.72
005201676-02	OBS	No	64.752245	158.383778	557.4	2.087	10.6	7.3	0.83	5313	2.03	5.68
005201676-03	OBS	No	44.064164	170.009561	569.7	1.908	9.1	8.9	0.83	5313	1.95	9.49
005201676-04	OBS	No	41.127838	159.376060	585.6	2.659	10.2	8.3	0.83	5313	2.16	10.40
005201676-05	OBS	No	38.492105	162.554544	447.3	2.494	10.4	7.1	0.83	5313	1.86	11.36
005201676-06	OBS	No	48.833715	136.979224	902.2	1.143	10.3	8.2	0.83	5313	2.47	8.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005201676-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
005201676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
005201676-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

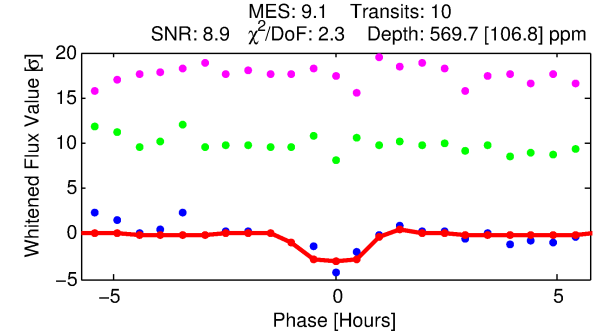
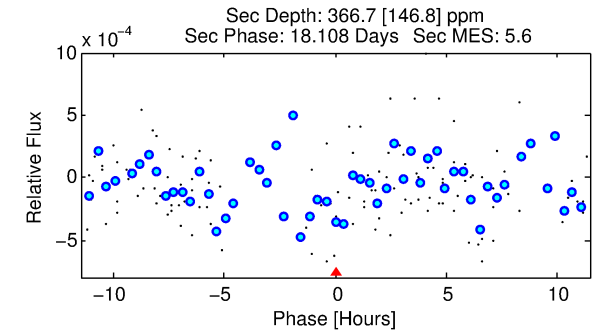
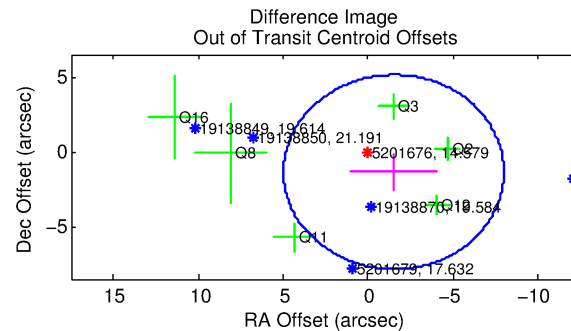
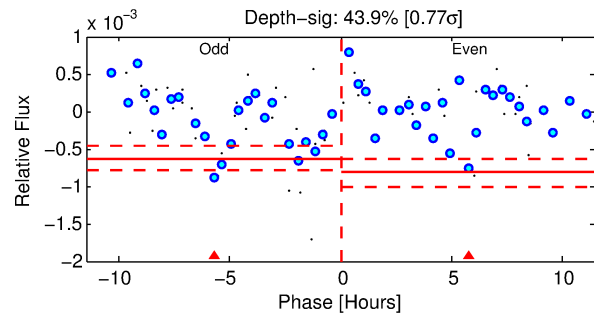
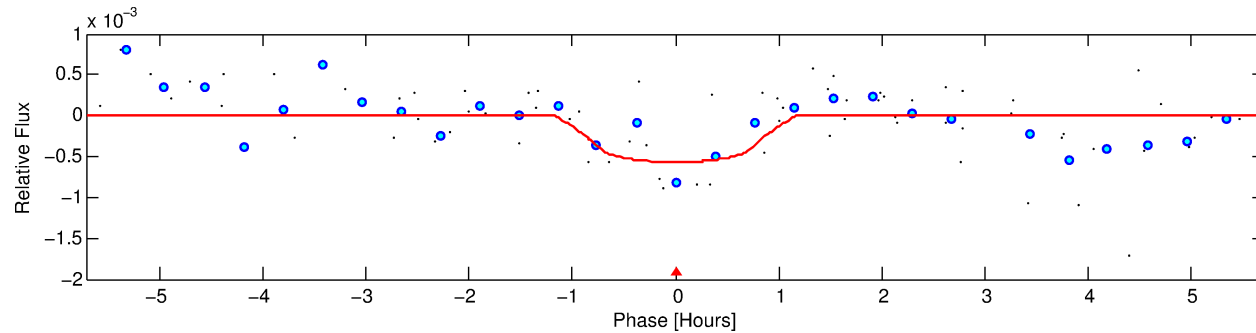
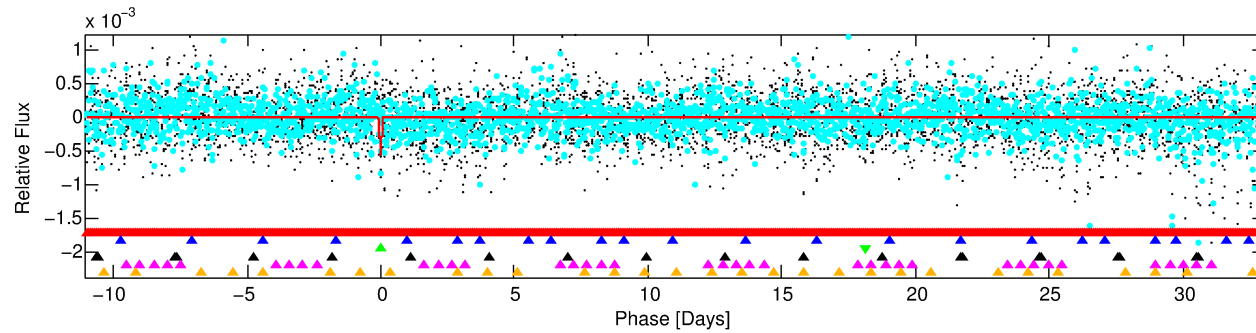
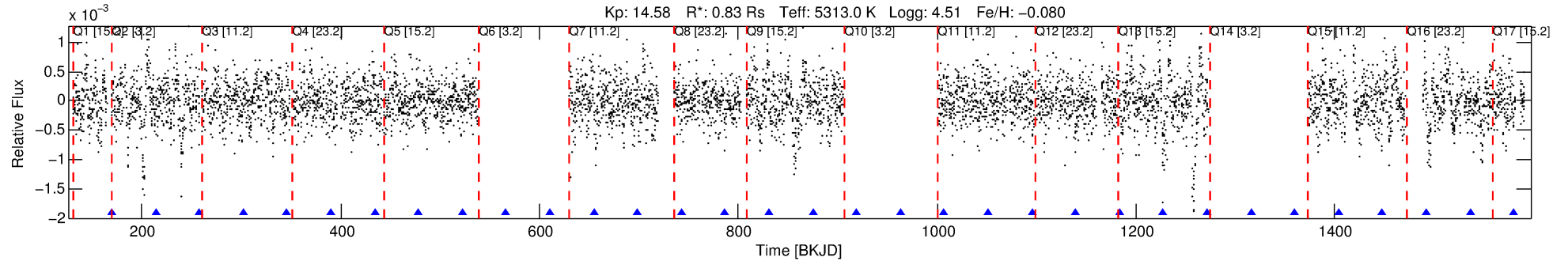
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005201676-03

No Significant Match Found

# DV One-Page Summary

KIC: 5201676 Candidate: 3 of 6 Period: 44.064 d



## DV Fit Results:

Period = 44.06416 [0.00048] d  
Epoch = 170.0096 [0.0082] BKJD  
Rp/R\* = 0.0214 [0.0674]  
a/R\* = 180.19 [2155.47]  
b = 0.00 [8110.12]  
Seff = 9.49 [2.13]  
Teff = 448 [25] K  
Rp = 1.95 [6.14] Re  
a = 0.2285 [0.0302] AU  
Ag = 2774.14 [17497.85] [0.16σ]  
Teffp = 5022 [7917] K [0.58σ]

## DV Diagnostic Results:

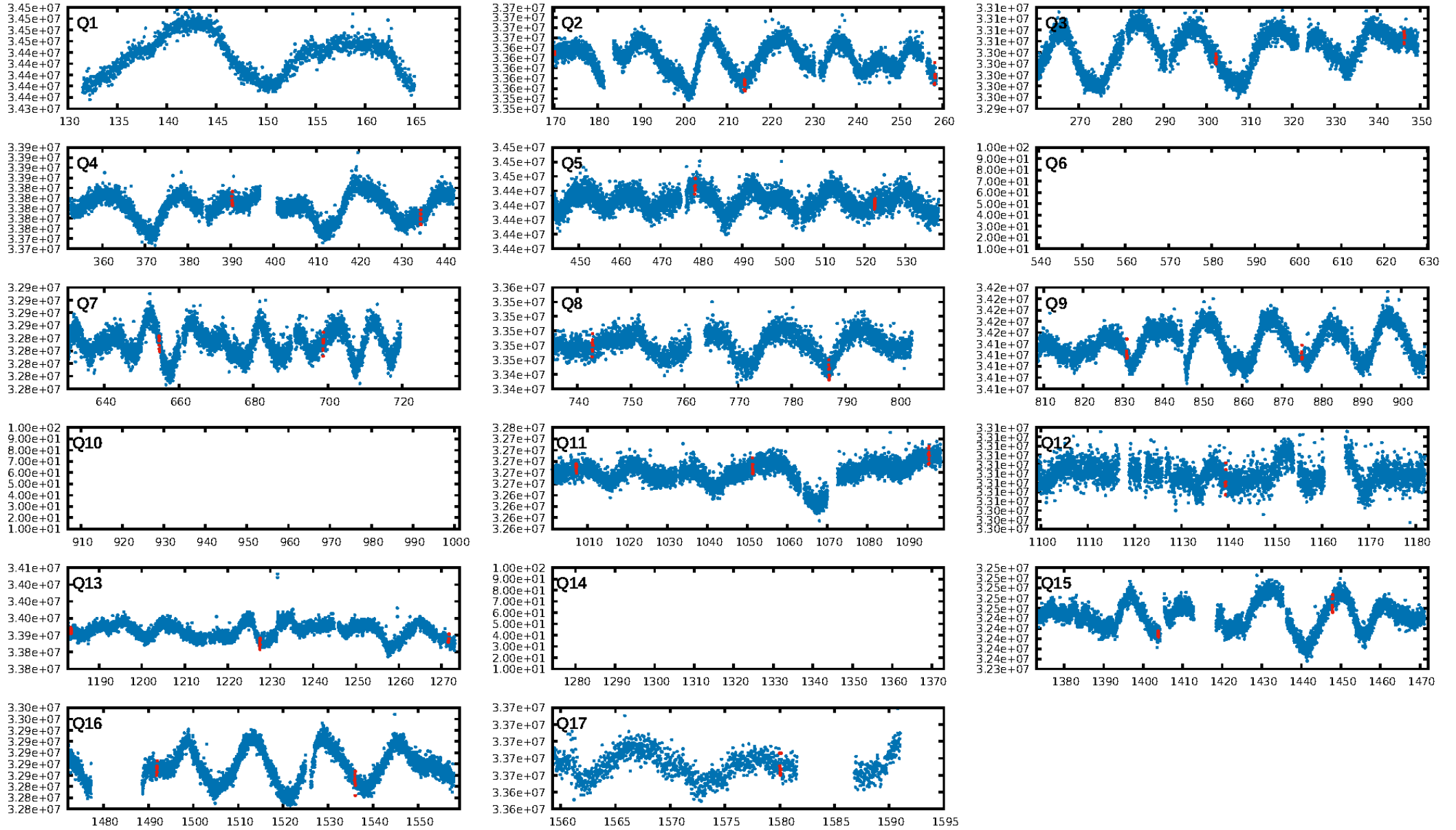
ShortPeriod-sig: 100.0% [21.53σ]  
LongPeriod-sig: 100.0% [51.47σ]  
ModelChiSquare2-sig: 2.5%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 6.67e-09**  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: -0.5718  
Centroid-sig: 27.5%  
Centroid-so: 0.676 arcsec [0.89σ]  
OotOffset-rm: 2.046 arcsec [0.95σ]  
KicOffset-rm: 2.289 arcsec [1.04σ]  
OotOffset-st: 1/2/3/0 [6]  
KicOffset-st: 1/2/3/0 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 0.00 [0/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:16:05 Z

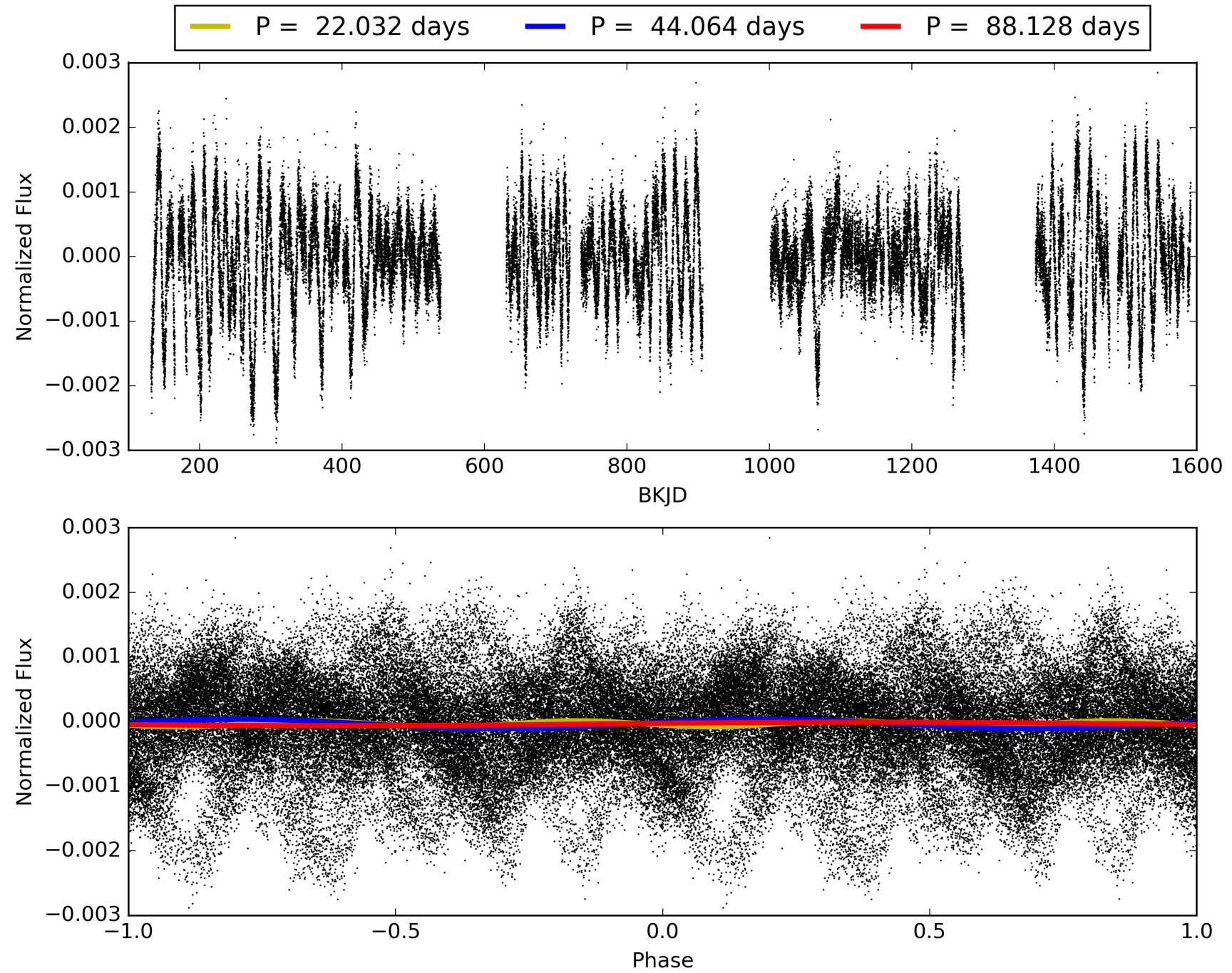
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005201676-03, PDC Light Curves

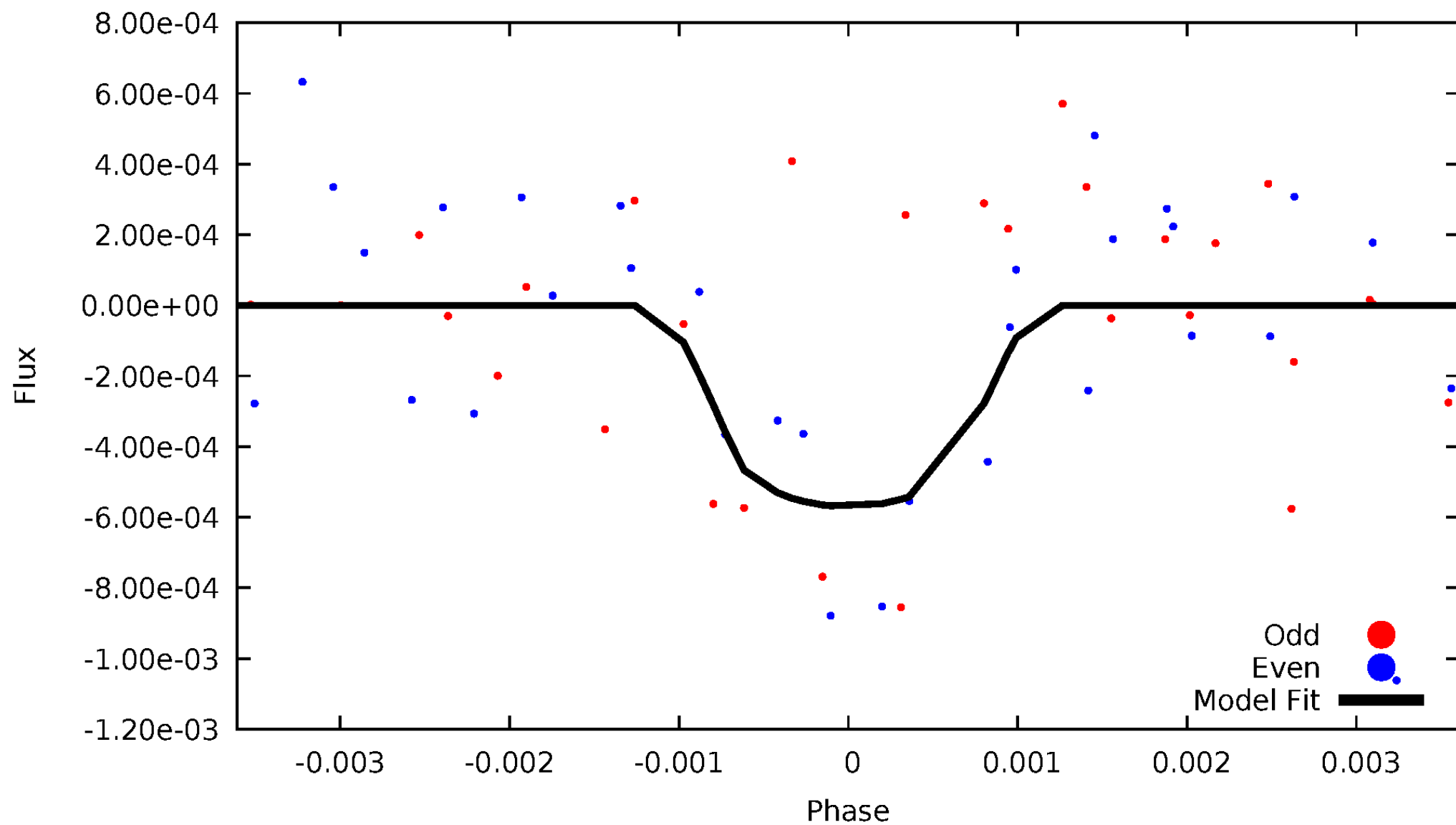


TCE 005201676-03



# DV Odd/Even

TCE 005201676-03



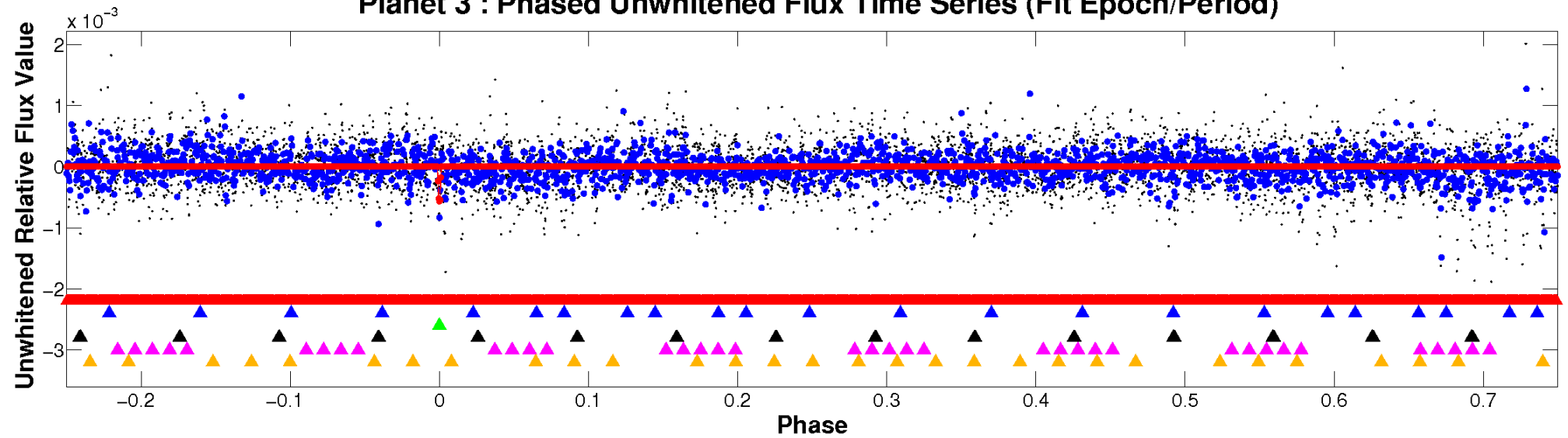


ALT Odd/Even

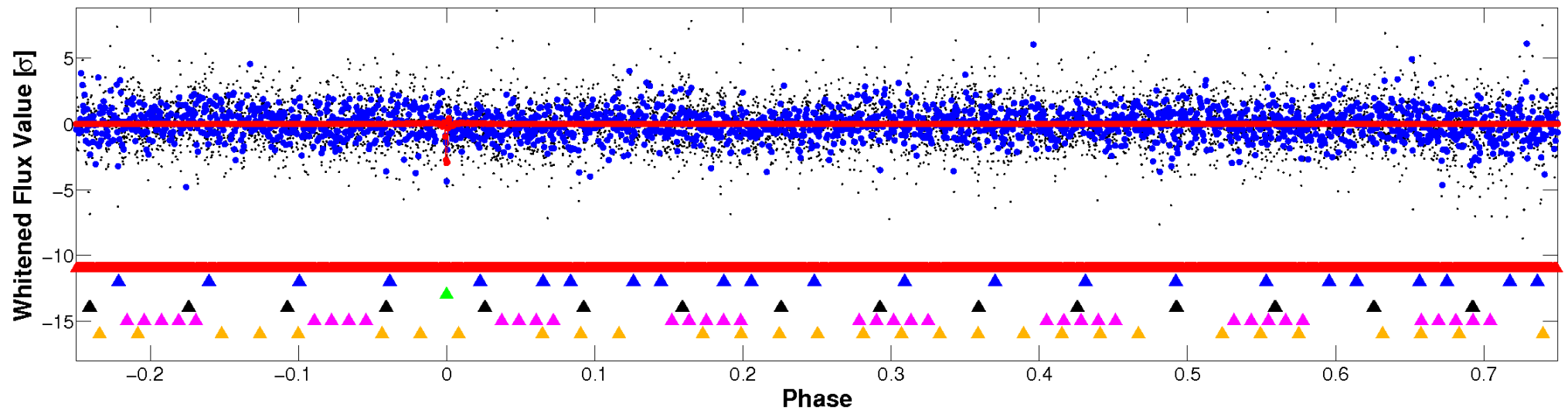
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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



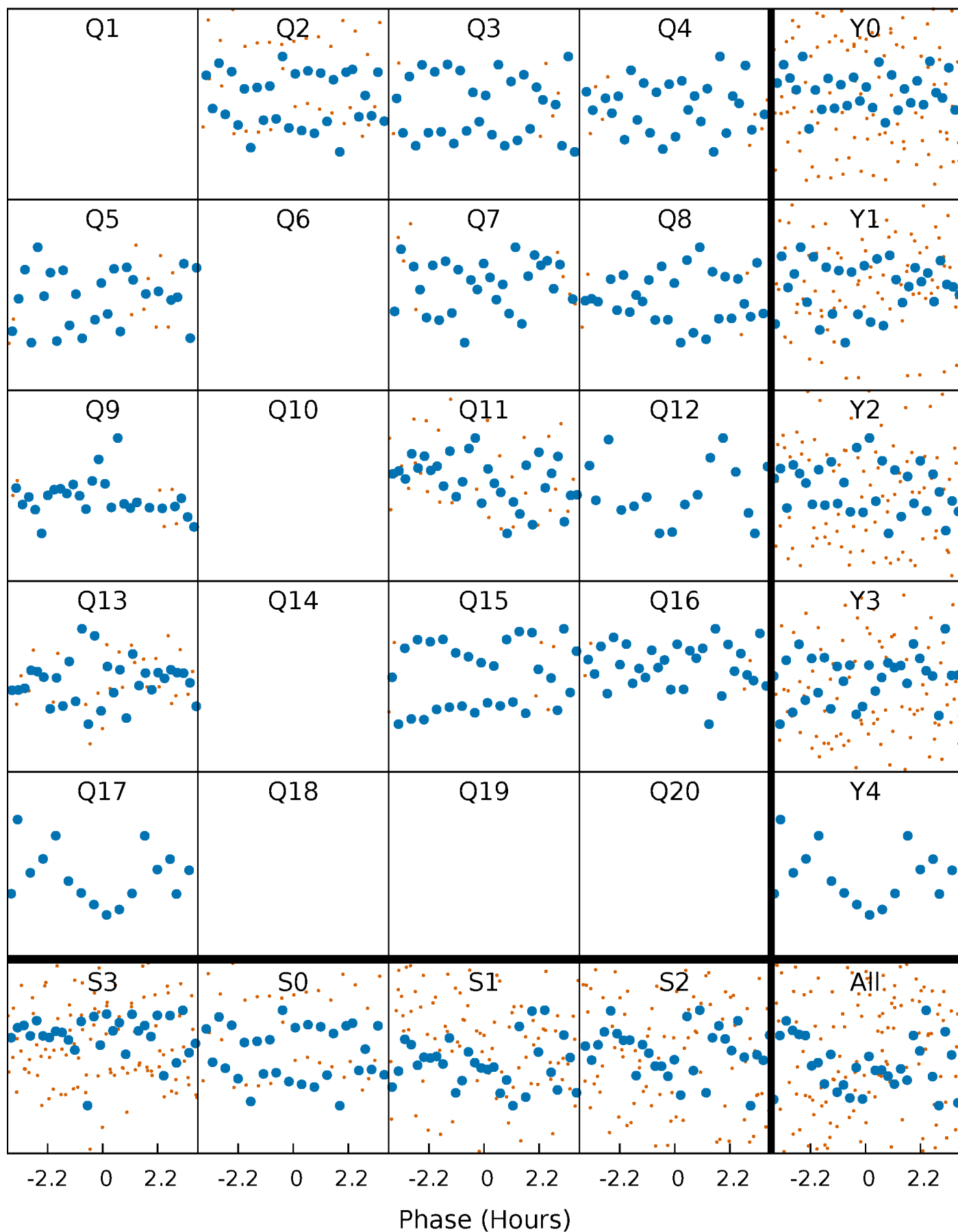
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





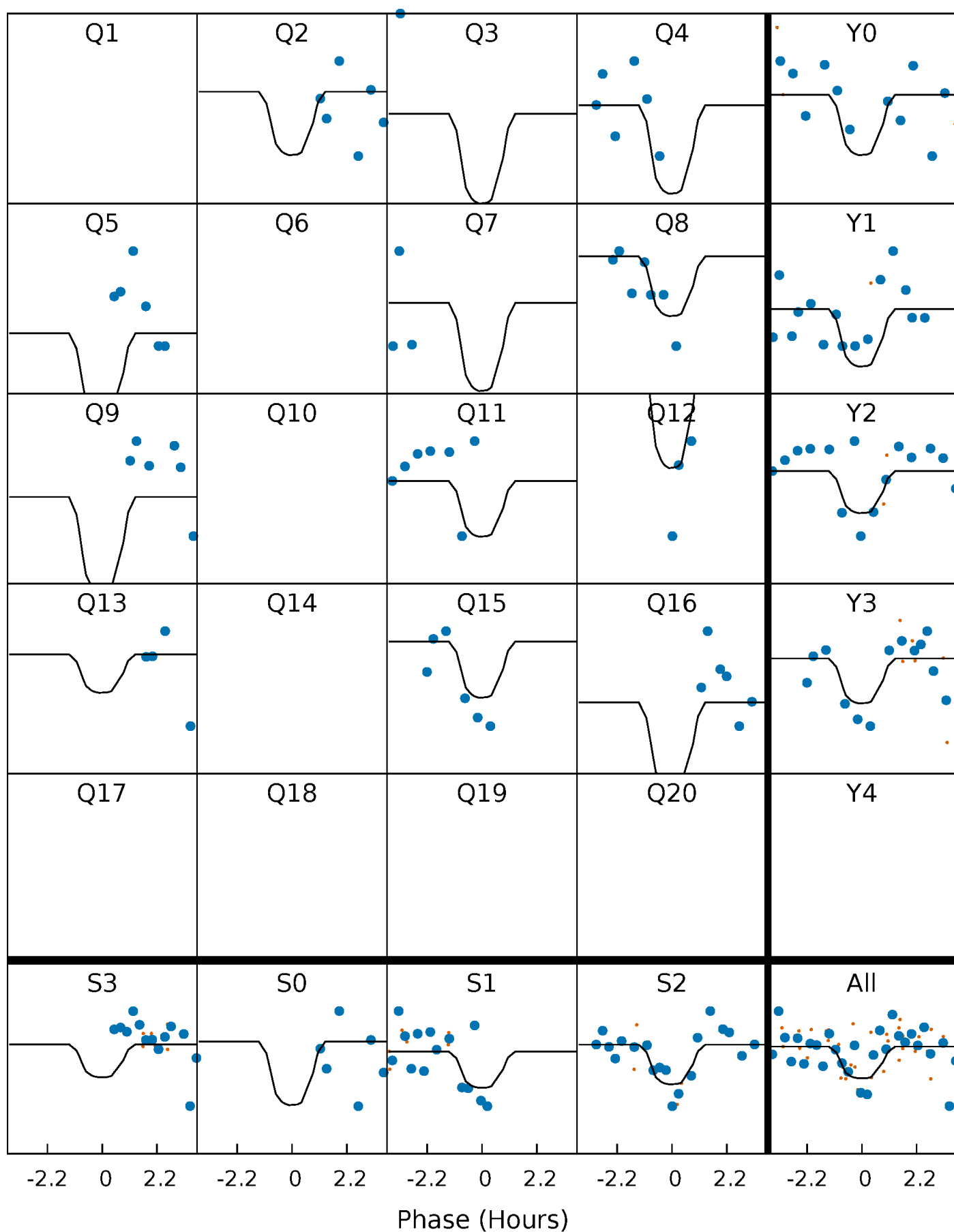
# PDC Quarter-Phased Transit Curves

TCE 005201676-03 P= 44.064164 Days  $T_0=170.009561$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005201676-03 P= 44.064164 Days  $T_0=170.009561$  (BKJD)

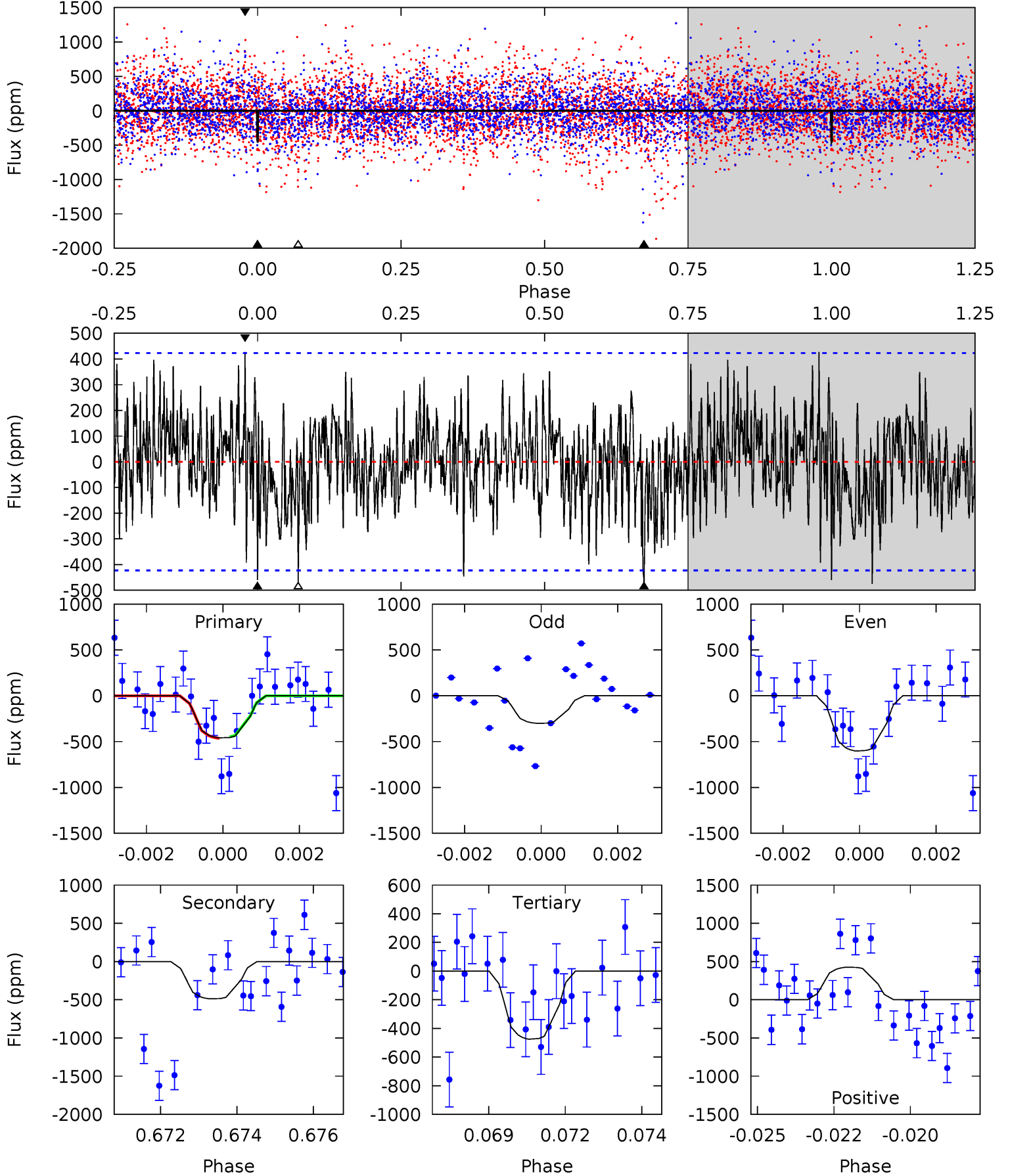


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005201676-03, P = 44.064164 Days, E = 125.945397 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
5.77	6.13	5.96	5.36	5.31	3.06	1.72	-0.19	0.41	0.17	0.77	1.86	0.75	0.47	0.10



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005201676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5313^{+159}_{-159}$	$4.510^{+0.076}_{-0.102}$	$-0.080^{+0.300}_{-0.300}$	$0.833^{+0.133}_{-0.092}$	$0.820^{+0.096}_{-0.070}$	$1.998^{+0.689}_{-0.604}$
	+3%/-3%	+2%/-2%	+375%/-375%	+16%/-11%	+12%/-9%	+34%/-30%
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 005201676-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-489 \pm 80$	$4.94^{+5.19}_{-3.51}$	$629^{+29}_{-25}$	$3786^{+2564}_{-752}$	$581^{+6585}_{-443}$
Alt.	N/A	N/A	N/A	N/A	N/A

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



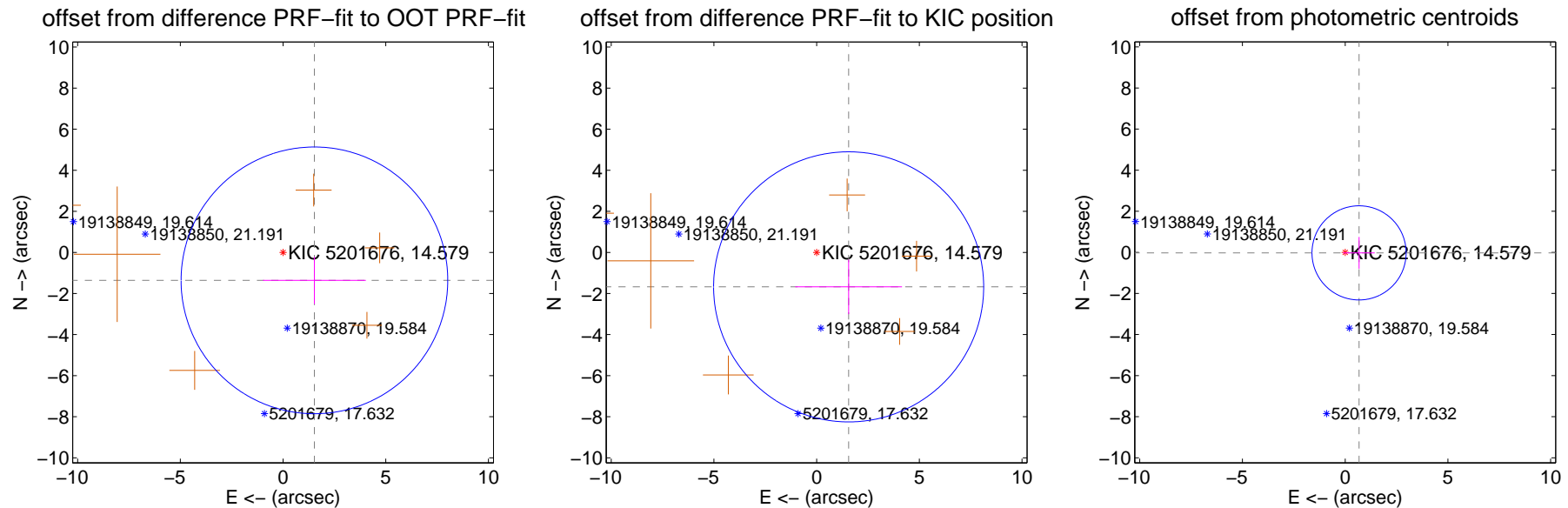
## DV Centroid Data

Supplemental centroid analysis for 005201676-03. Kepler magnitude: 14.58. Transit SNR 8.89

There are 0 quarters with good PRF difference image offsets

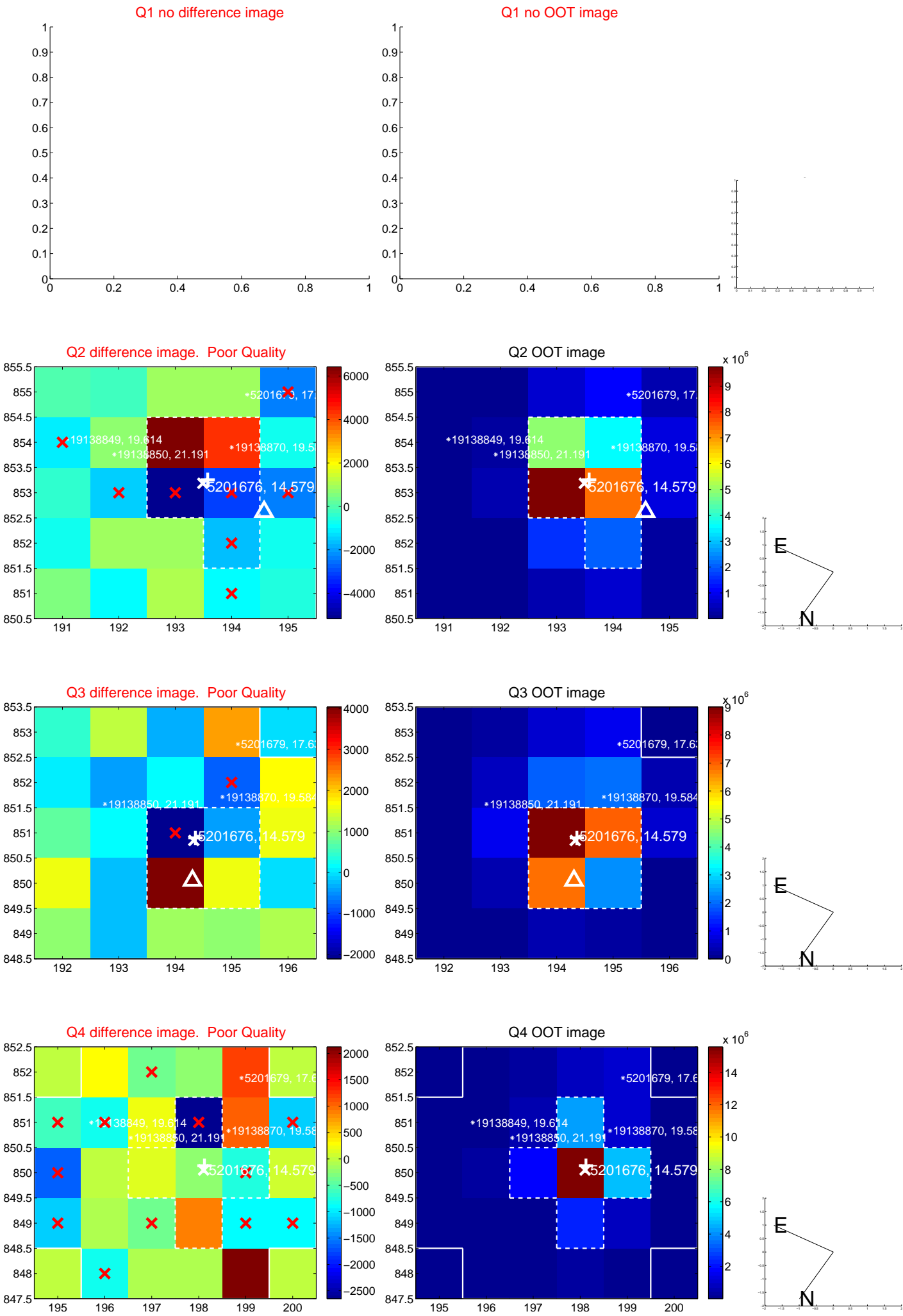
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.046 \pm 2.164$	0.95	$-1.527 \pm 2.504$	$-1.361 \pm 1.152$
PRF-fit source offset from KIC position	$2.289 \pm 2.192$	1.04	$-1.559 \pm 2.601$	$-1.677 \pm 1.328$
photometric centroid source offset	$0.68 \pm 0.76$	0.89	$-0.68 \pm 0.76$	$-0.03 \pm 0.77$

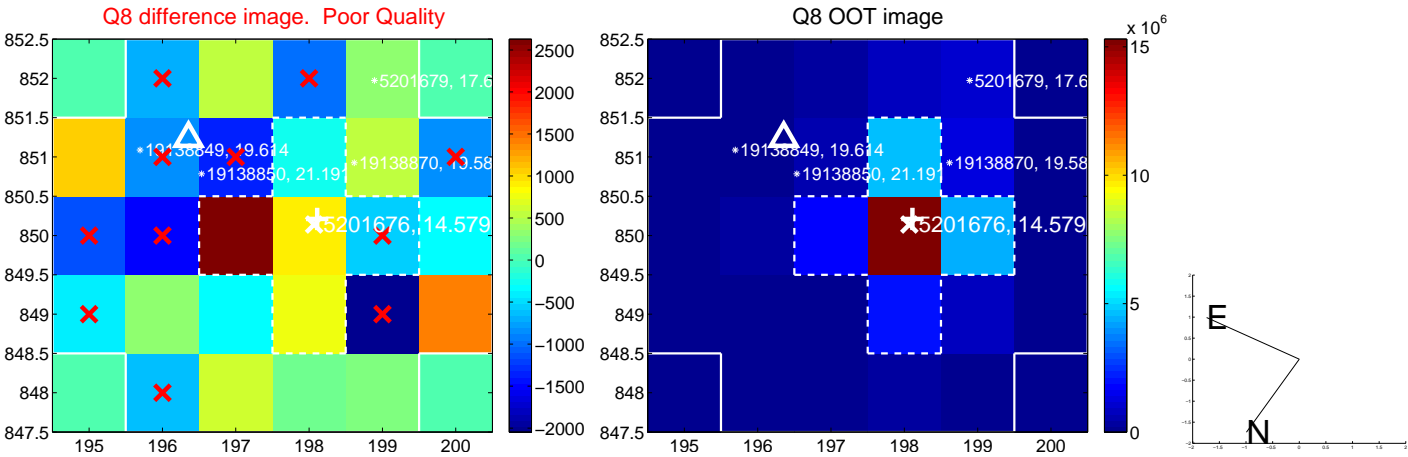
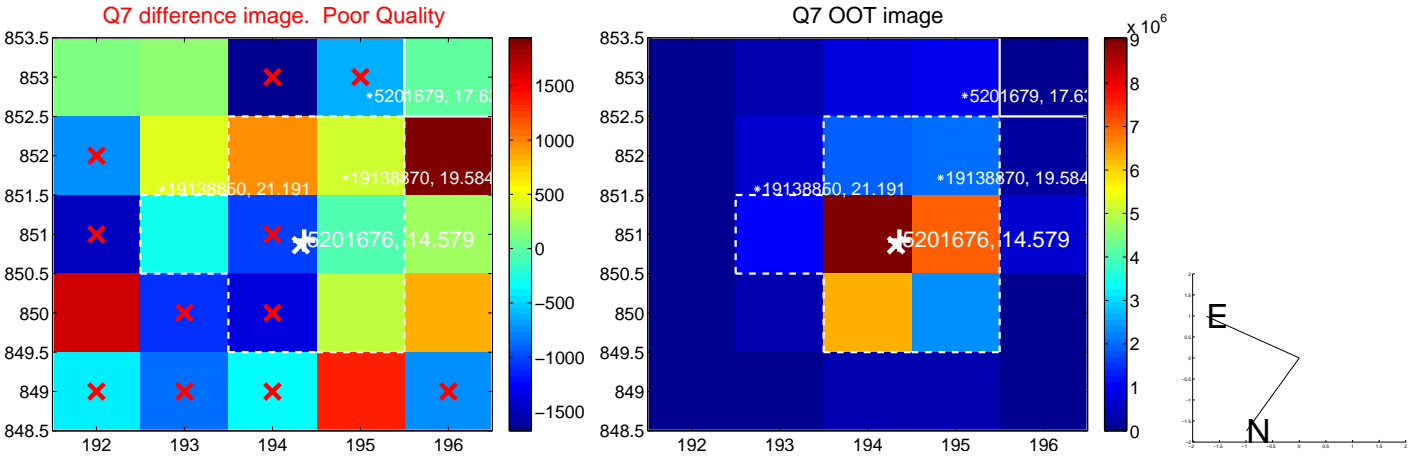
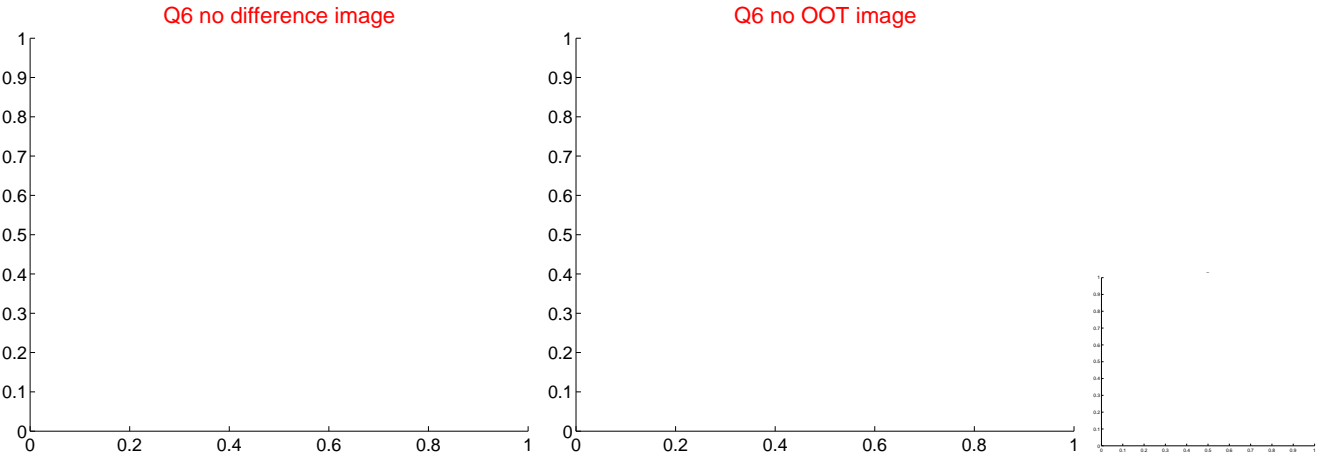
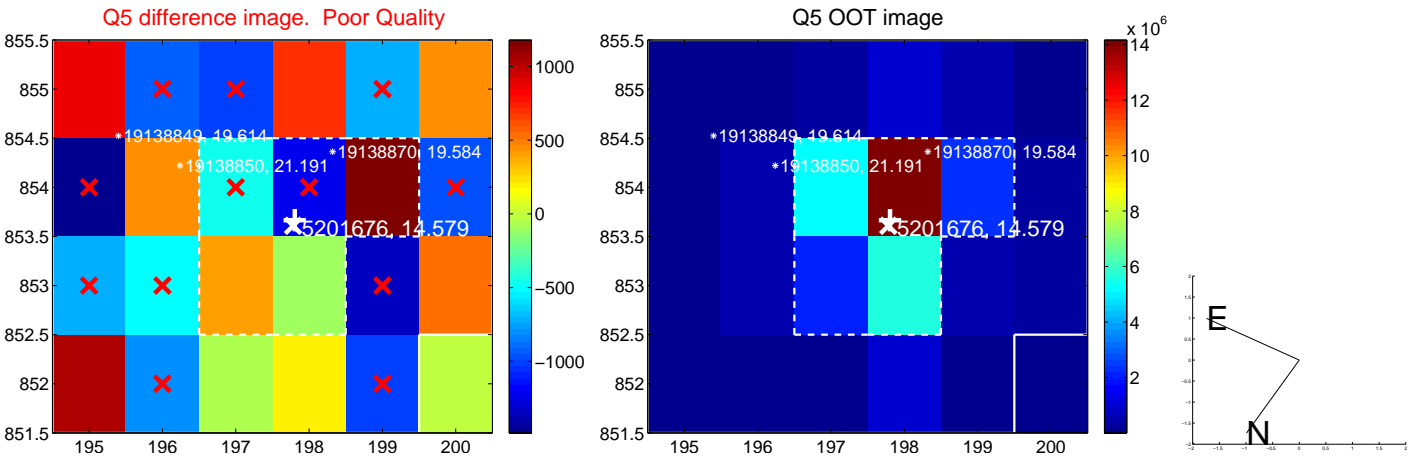


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

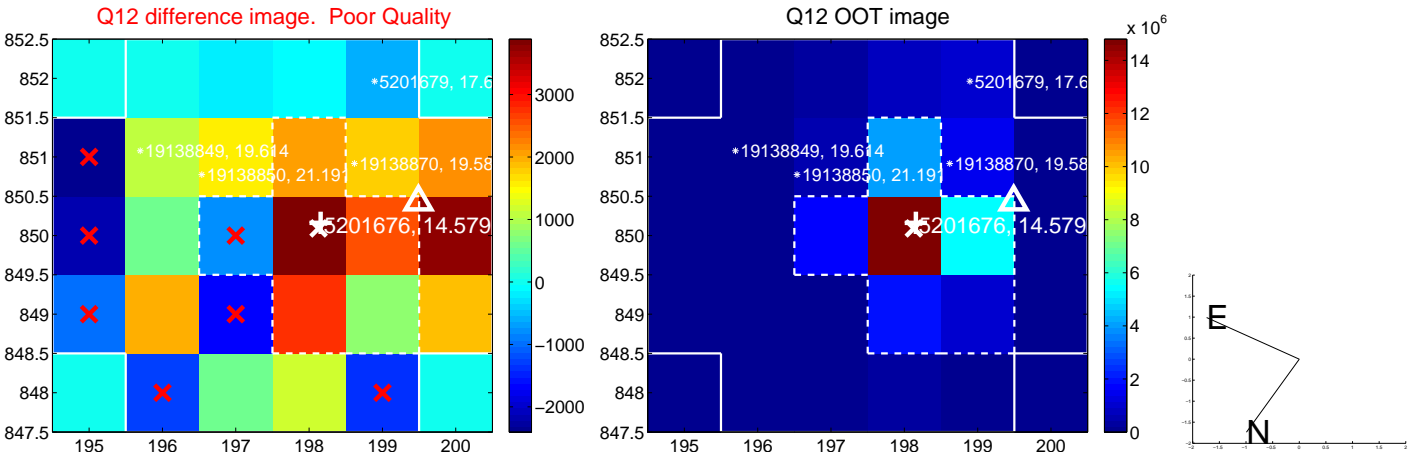
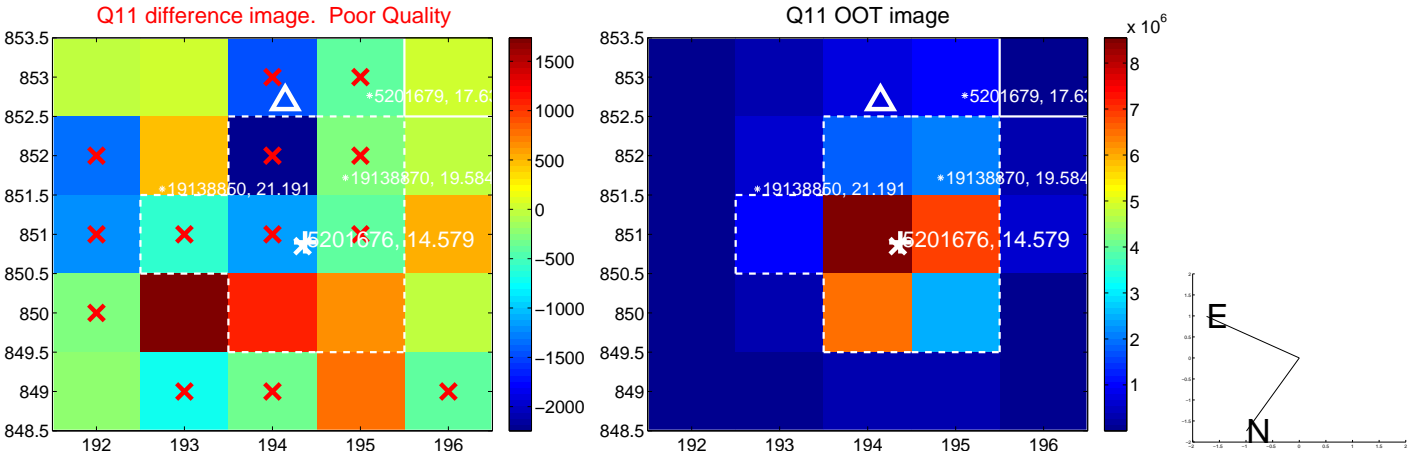
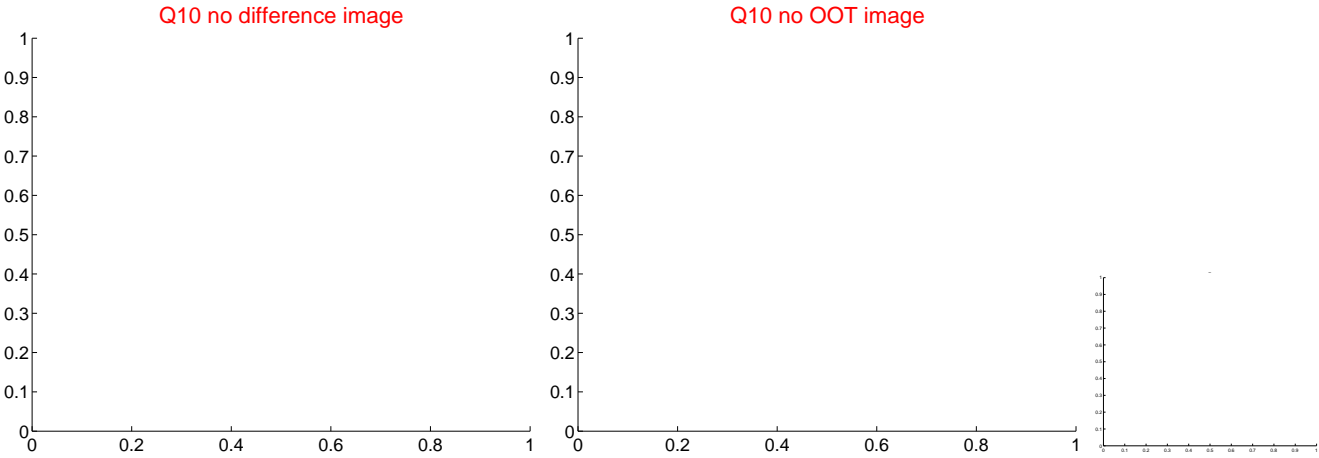
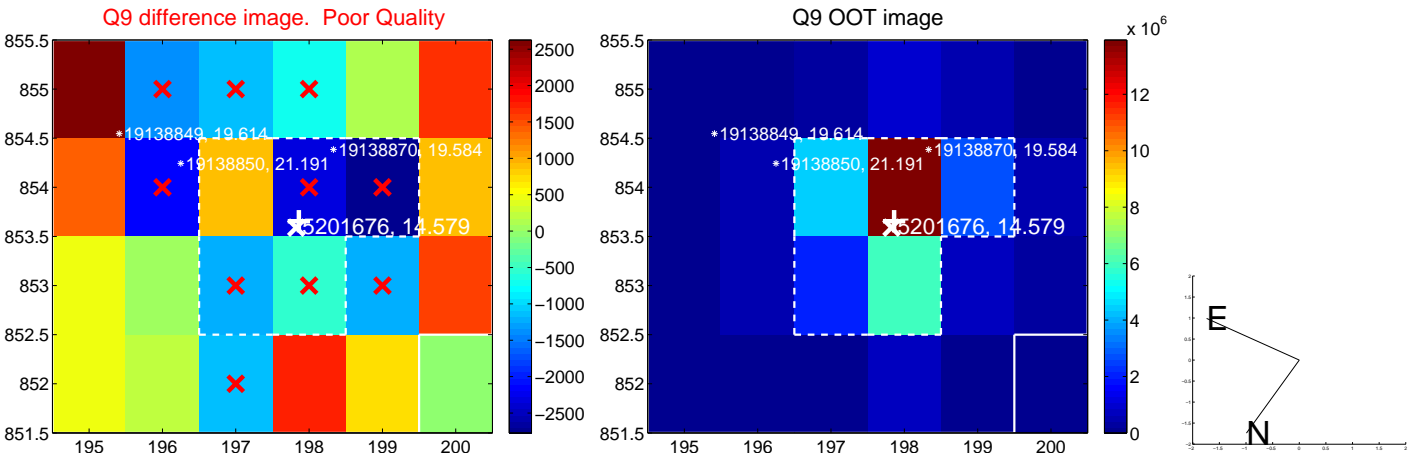
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



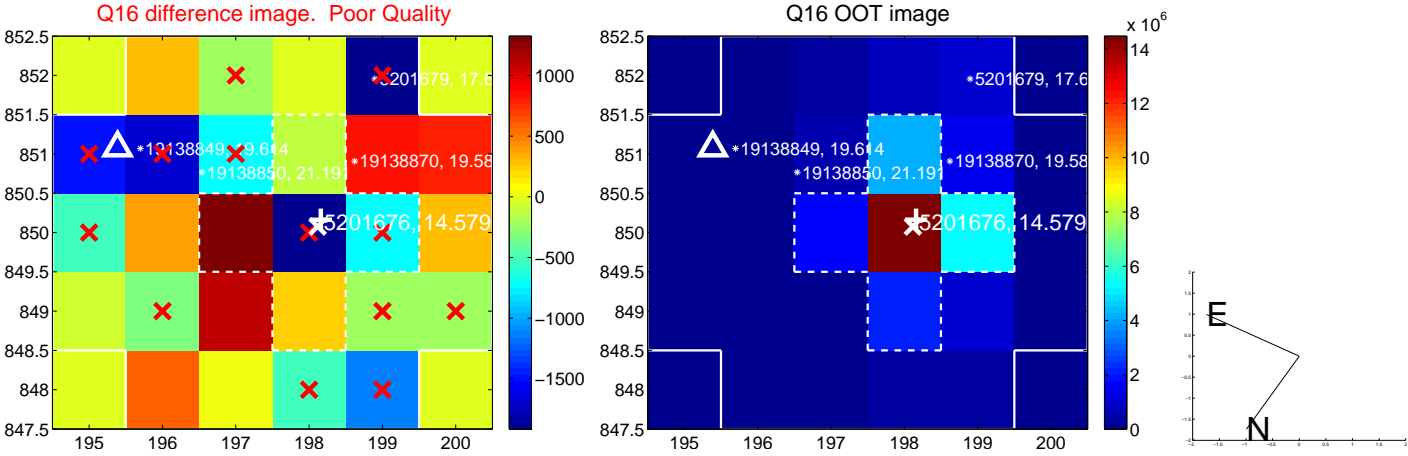
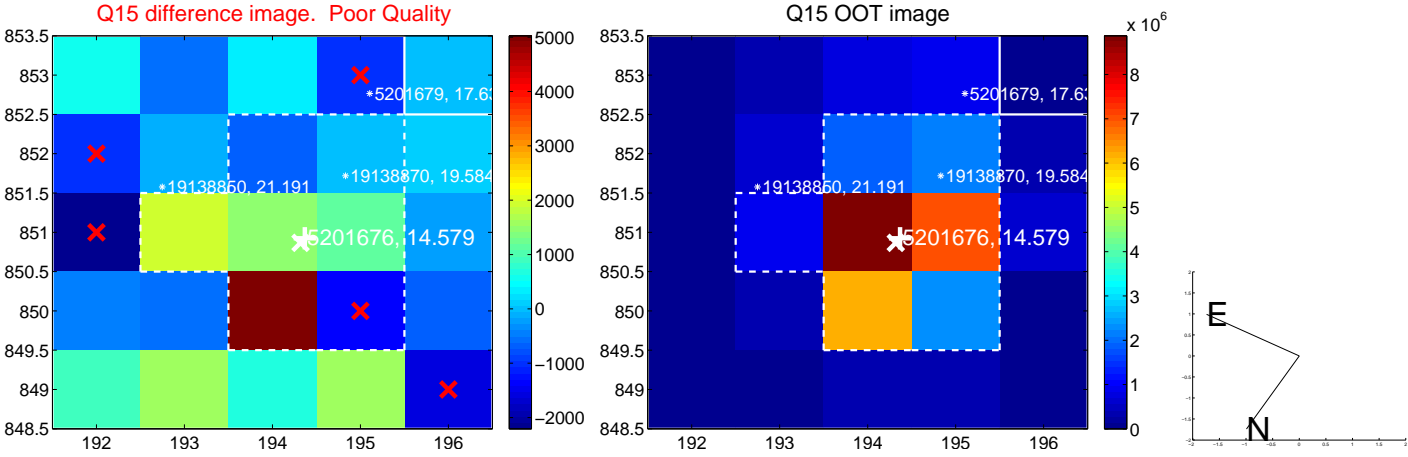
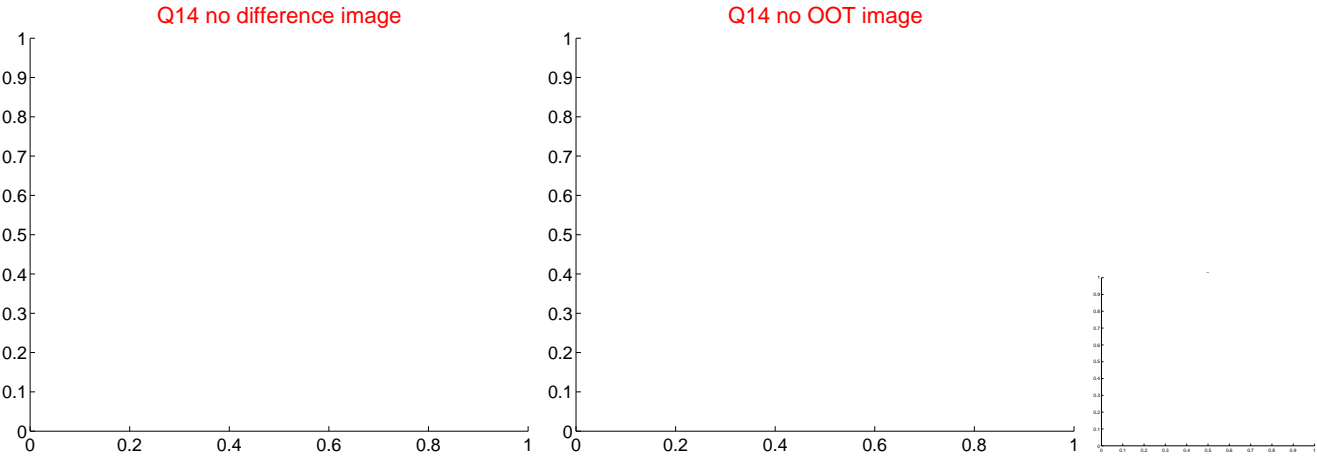
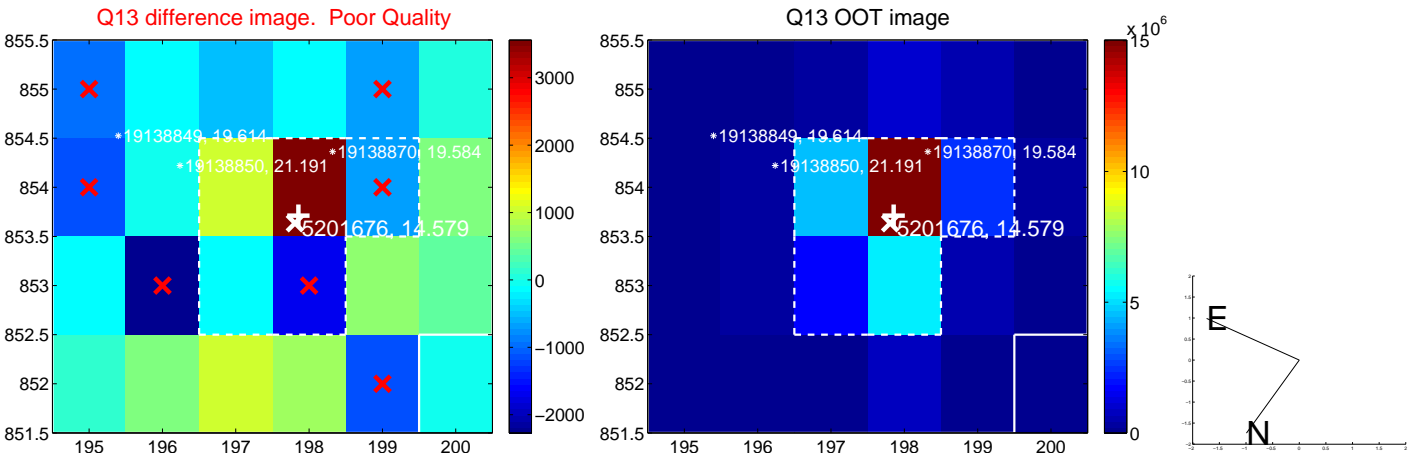
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



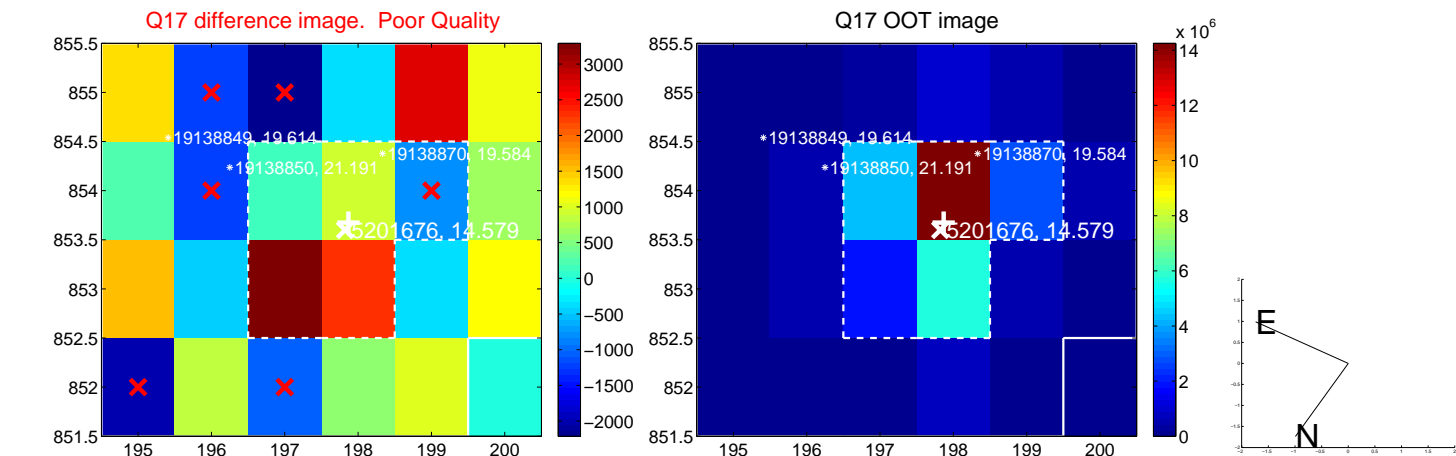
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



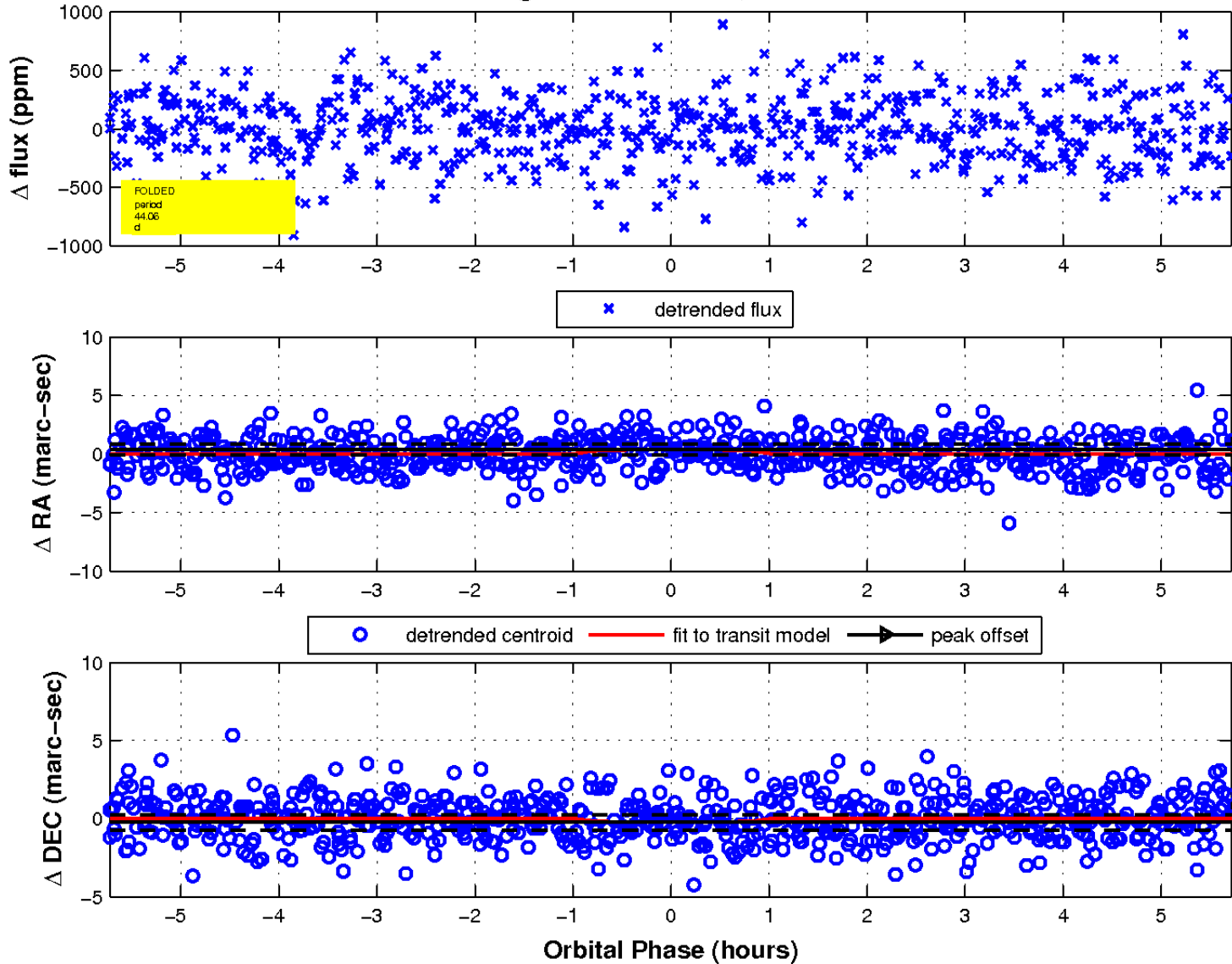
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



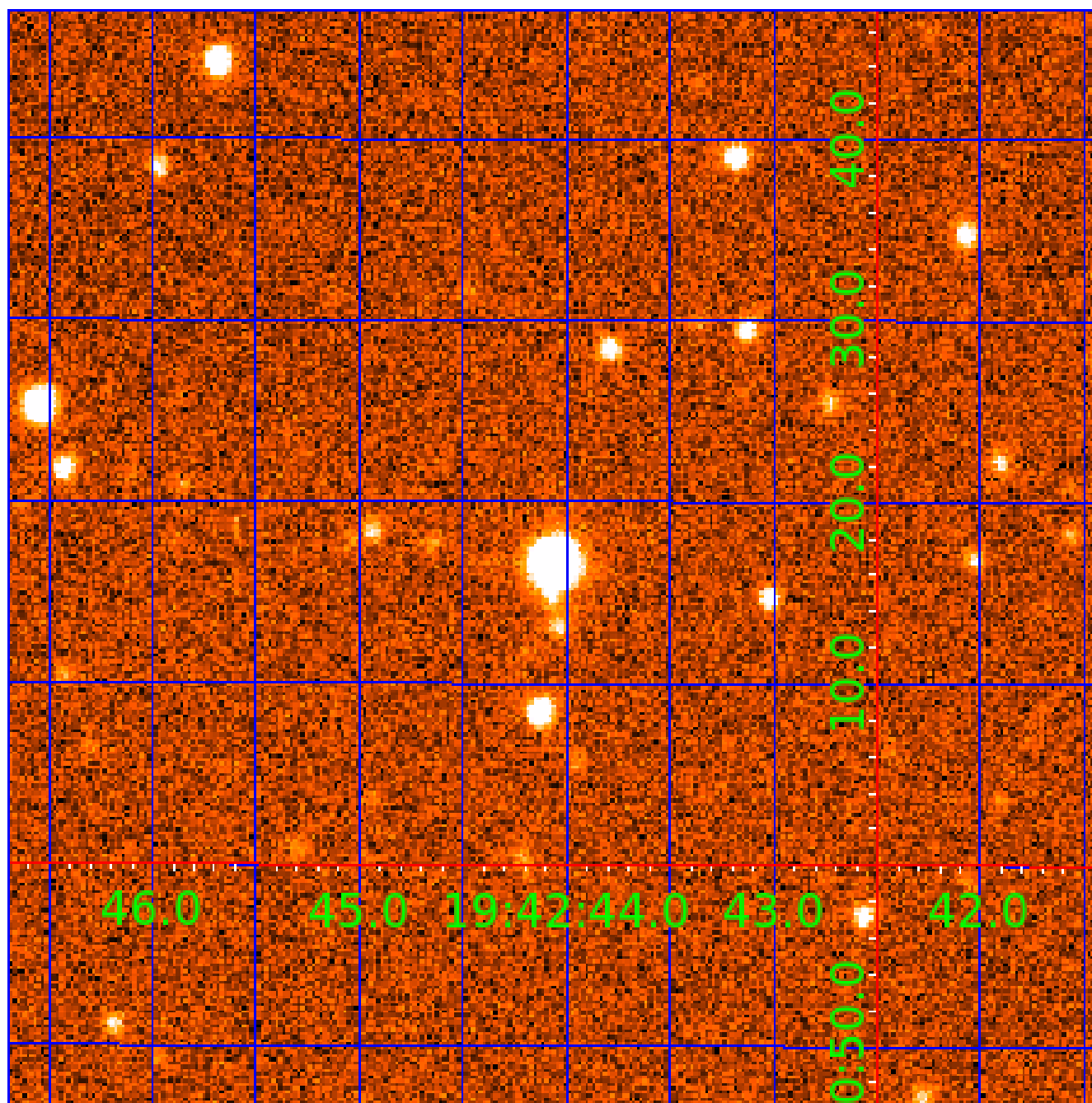
fluxWeightedCentroids, Planet 3 of 6





UKIRT Image

Declination



# KIC 005201676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005201676-01	OBS	No	0.507258	131.778963	21.4	3.394	7.5	6.9	0.83	5313	0.38	3650.72
005201676-02	OBS	No	64.752245	158.383778	557.4	2.087	10.6	7.3	0.83	5313	2.03	5.68
005201676-03	OBS	No	44.064164	170.009561	569.7	1.908	9.1	8.9	0.83	5313	1.95	9.49
005201676-04	OBS	No	41.127838	159.376060	585.6	2.659	10.2	8.3	0.83	5313	2.16	10.40
005201676-05	OBS	No	38.492105	162.554544	447.3	2.494	10.4	7.1	0.83	5313	1.86	11.36
005201676-06	OBS	No	48.833715	136.979224	902.2	1.143	10.3	8.2	0.83	5313	2.47	8.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005201676-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
005201676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
005201676-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

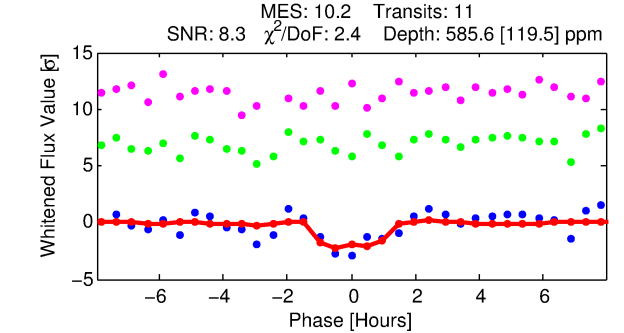
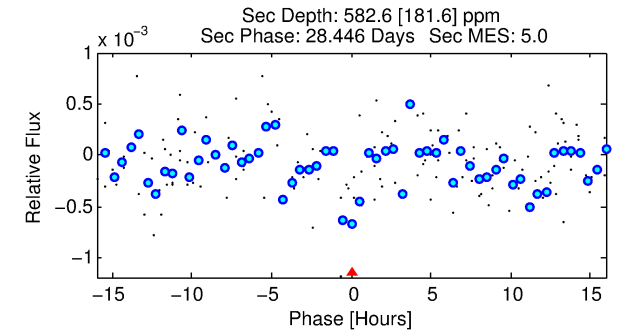
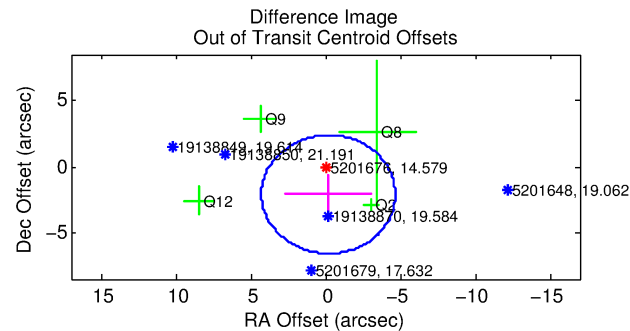
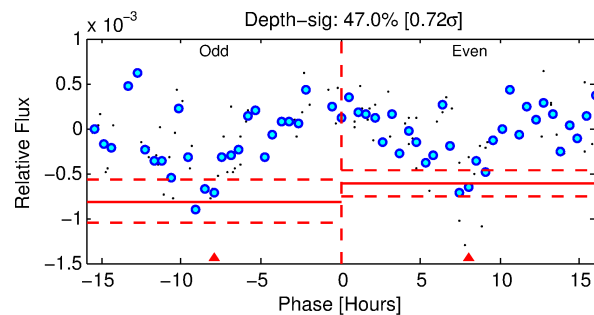
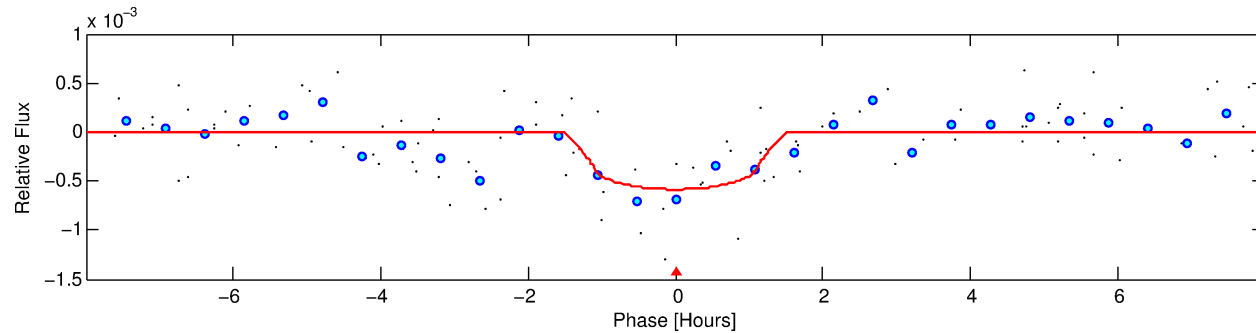
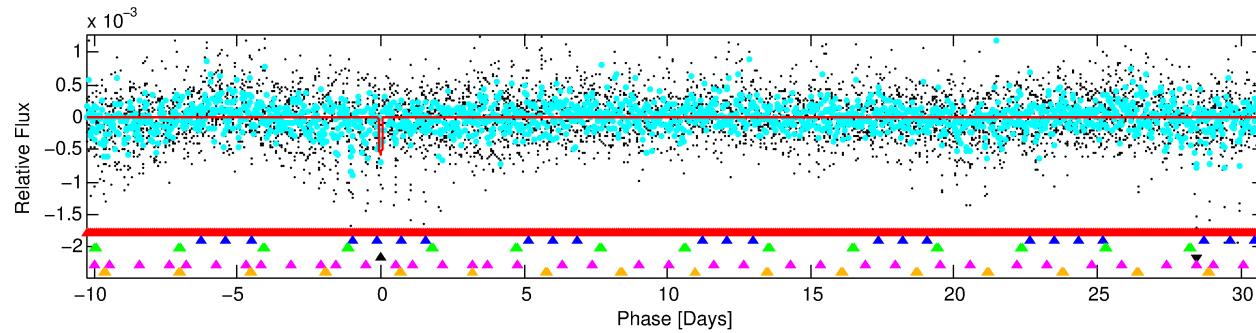
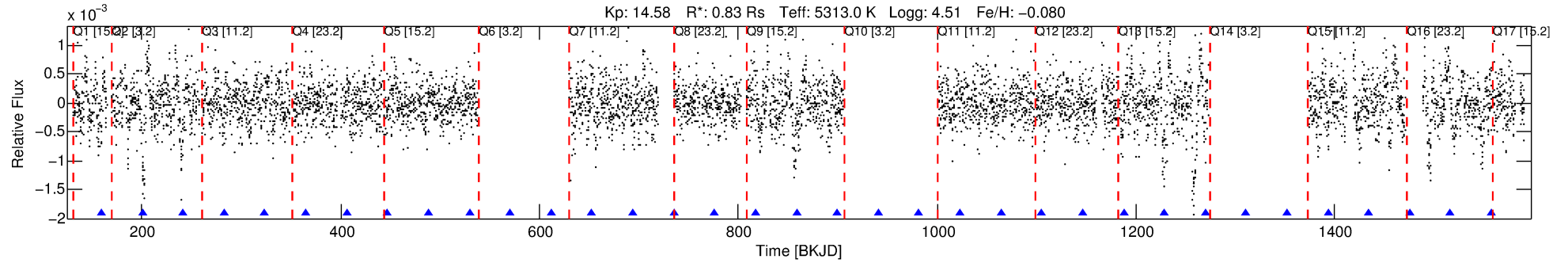
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005201676-04

No Significant Match Found

# DV One-Page Summary

KIC: 5201676 Candidate: 4 of 6 Period: 41.128 d



## DV Fit Results:

Period = 41.12784 [0.00060] d  
Epoch = 159.3761 [0.0108] BKJD  
Rp/R\* = 0.0237 [0.0609]  
a/R\* = 87.84 [865.54]  
b = 0.70 [7.20]  
Seff = 10.40 [2.33]  
Teff = 458 [26] K  
Rp = 2.16 [5.55] Re  
a = 0.2182 [0.0288] AU  
Ag = 3283.99 [16903.74] [0.19σ]  
Teffp = 5360 [6895] K [0.71σ]

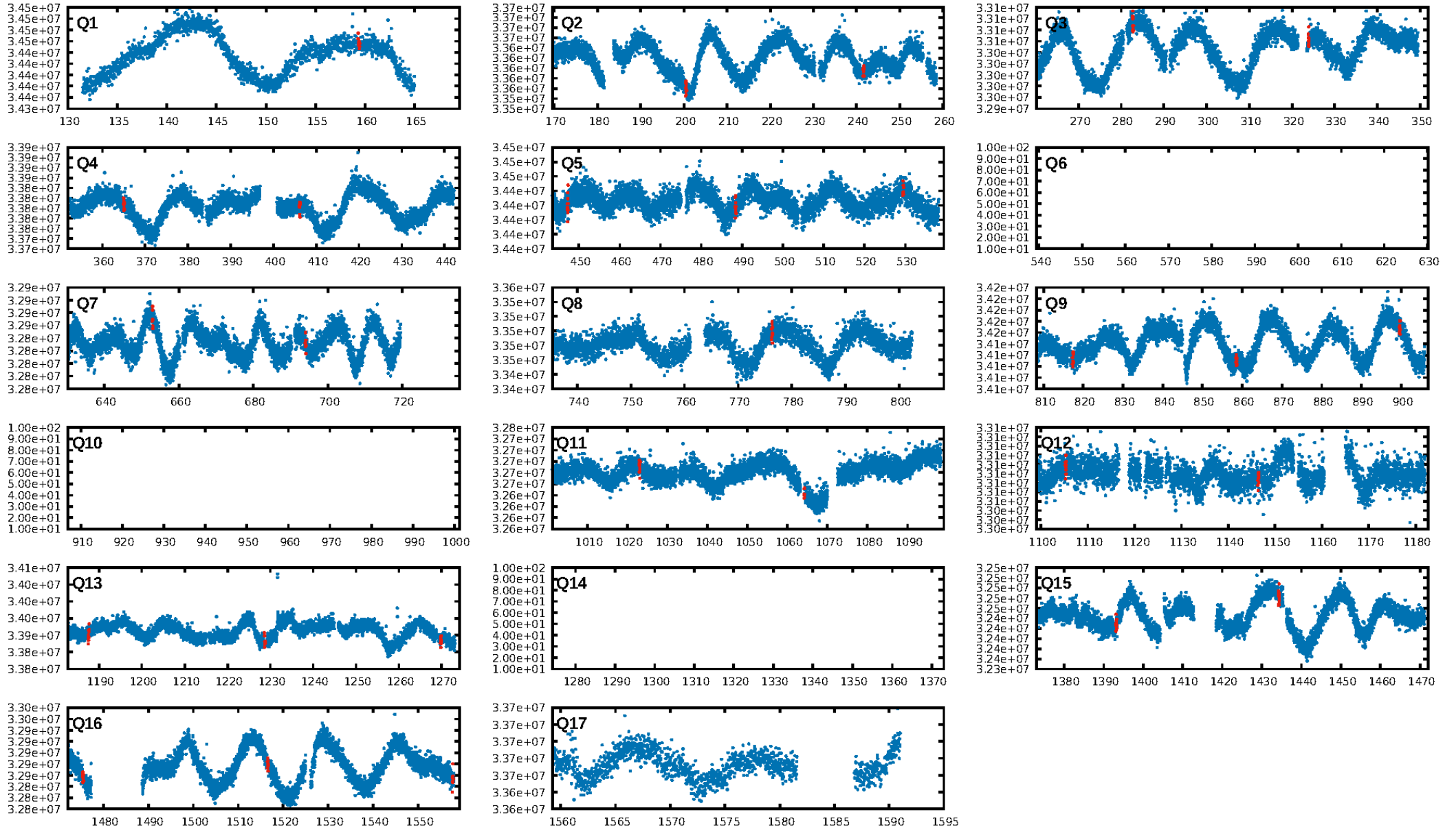
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.35σ]  
LongPeriod-sig: 100.0% [21.53σ]  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 97.1%  
Bootstrap-pfa: 1.15e-13  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: 5.058  
Centroid-sig: 13.1%  
Centroid-so: 0.715 arcsec [1.11σ]  
OotOffset-rm: 2.110 arcsec [1.42σ]  
KicOffset-rm: 2.470 arcsec [1.63σ]  
OotOffset-st: 1/0/2/1 [4]  
KicOffset-st: 1/0/2/1 [4]  
DiffImageQuality-fgm: 0.00 [0/4]  
DiffImageOverlap-fno: 0.00 [0/13]

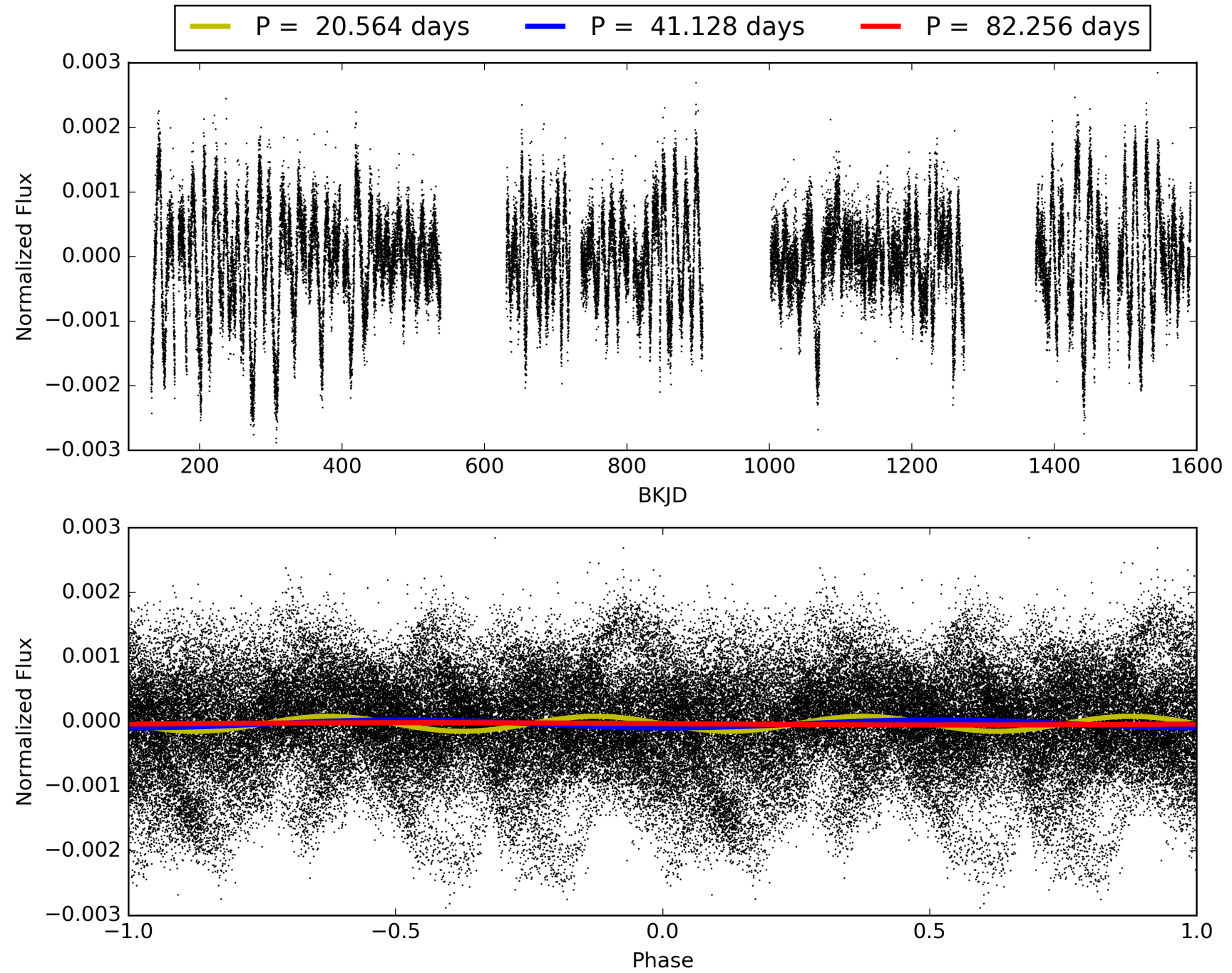
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:16:09 Z

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

# TCE 005201676-04, PDC Light Curves

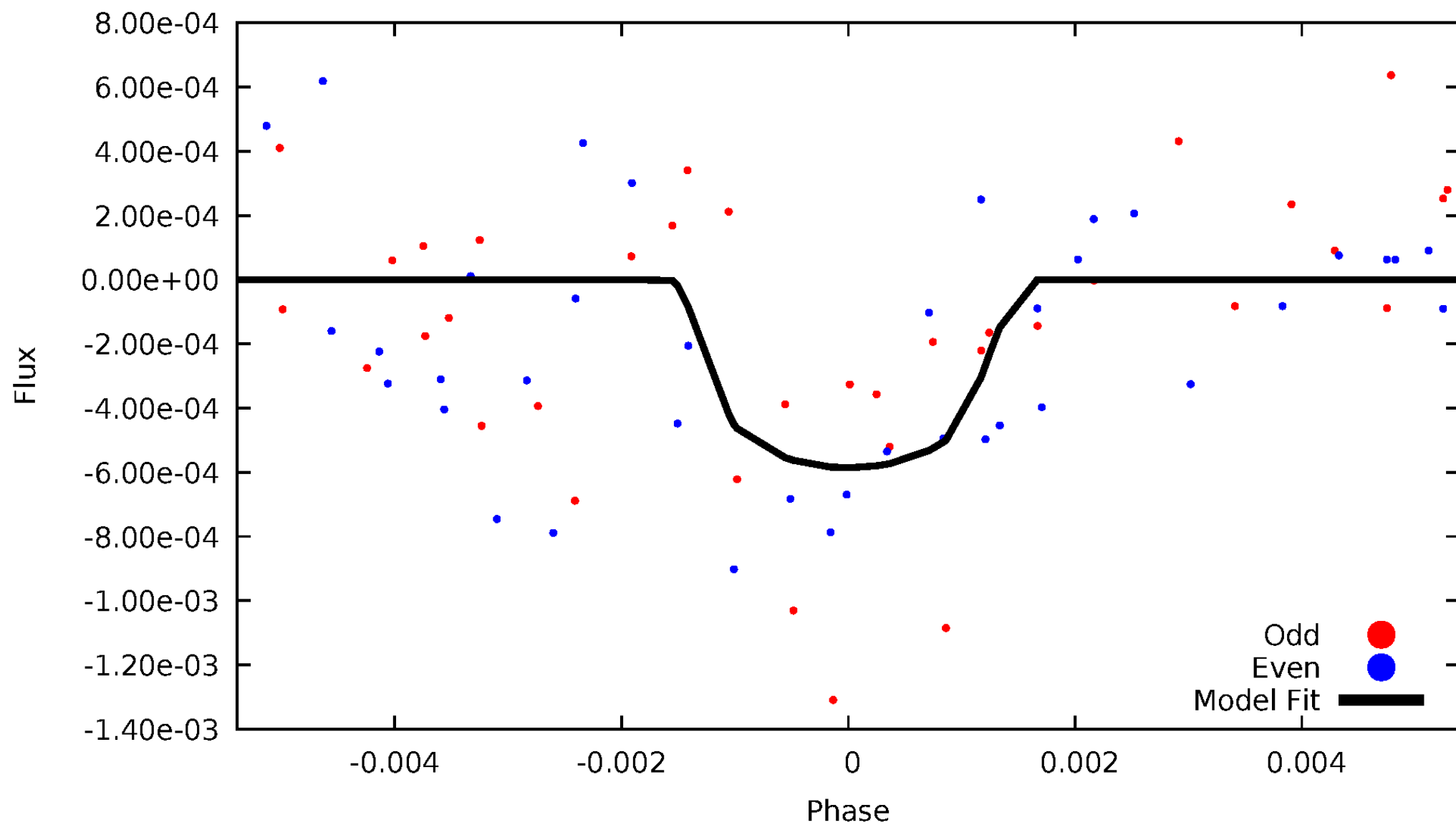


TCE 005201676-04



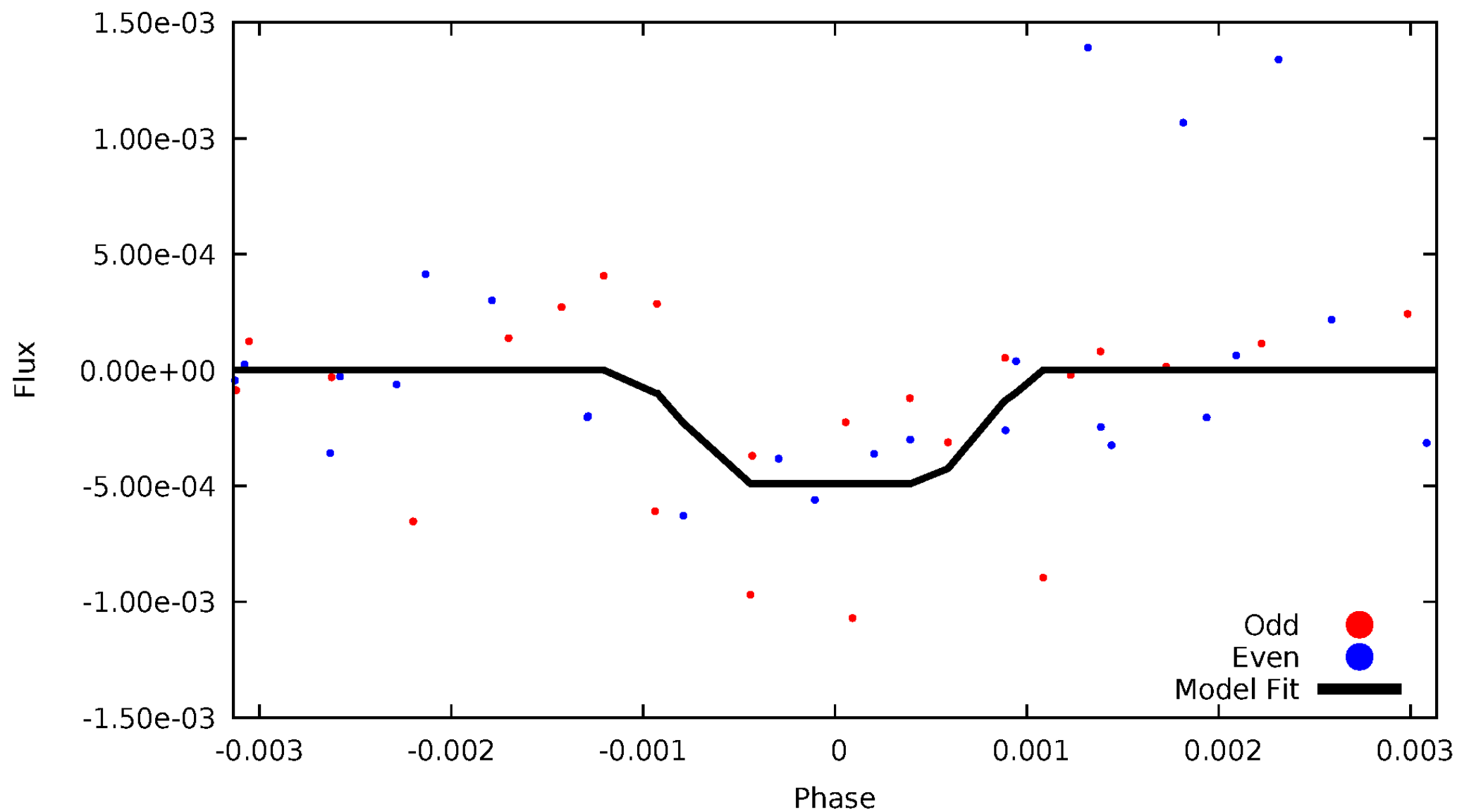
# DV Odd/Even

TCE 005201676-04



# ALT Odd/Even

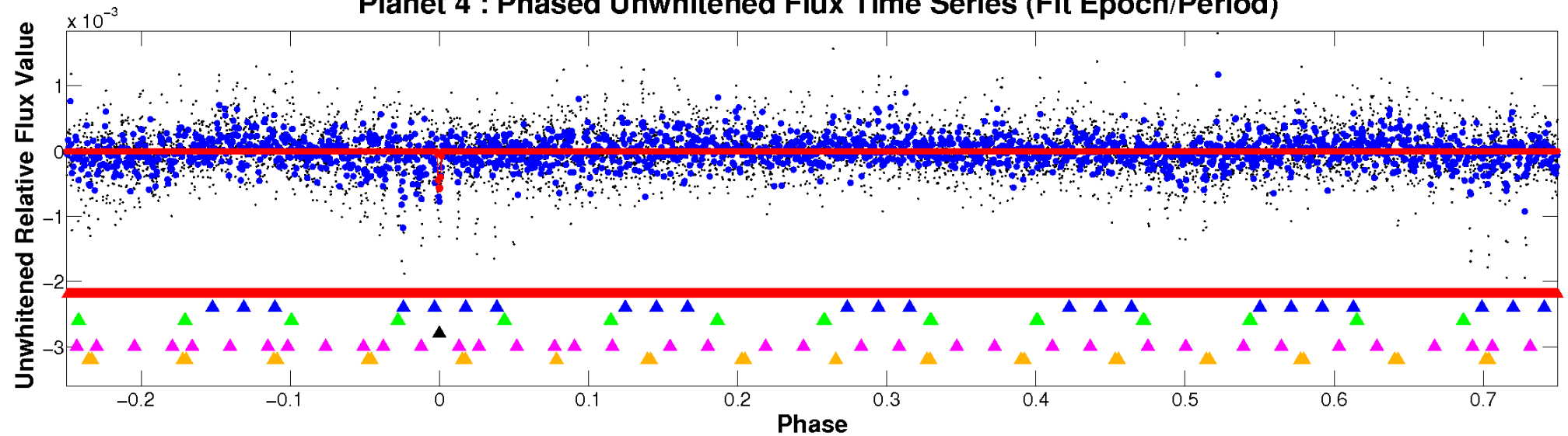
TCE 005201676-04



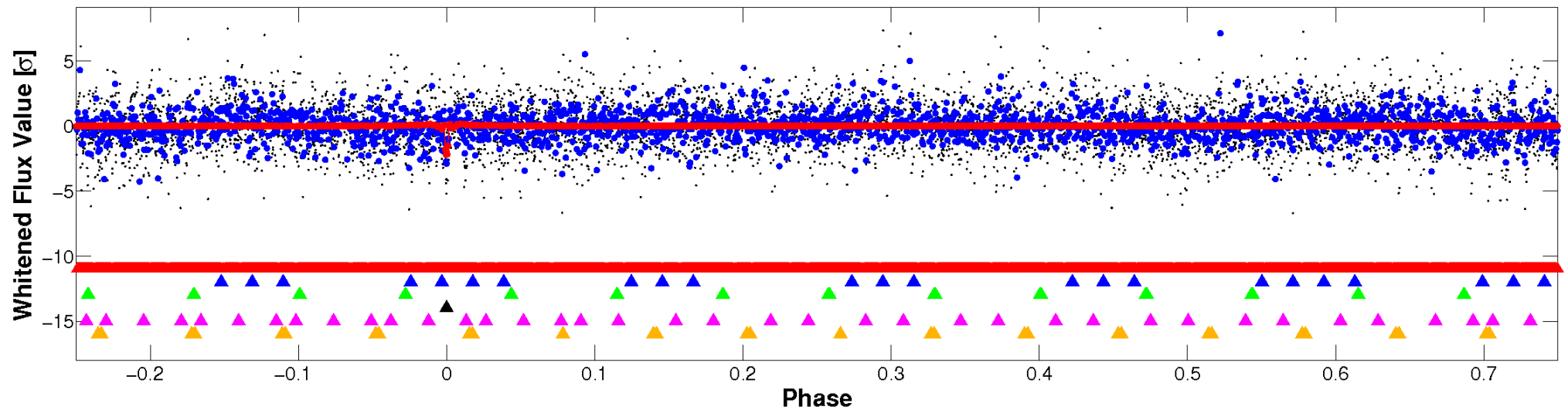


# Non-Whitened Vs. Whitened Light Curve

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

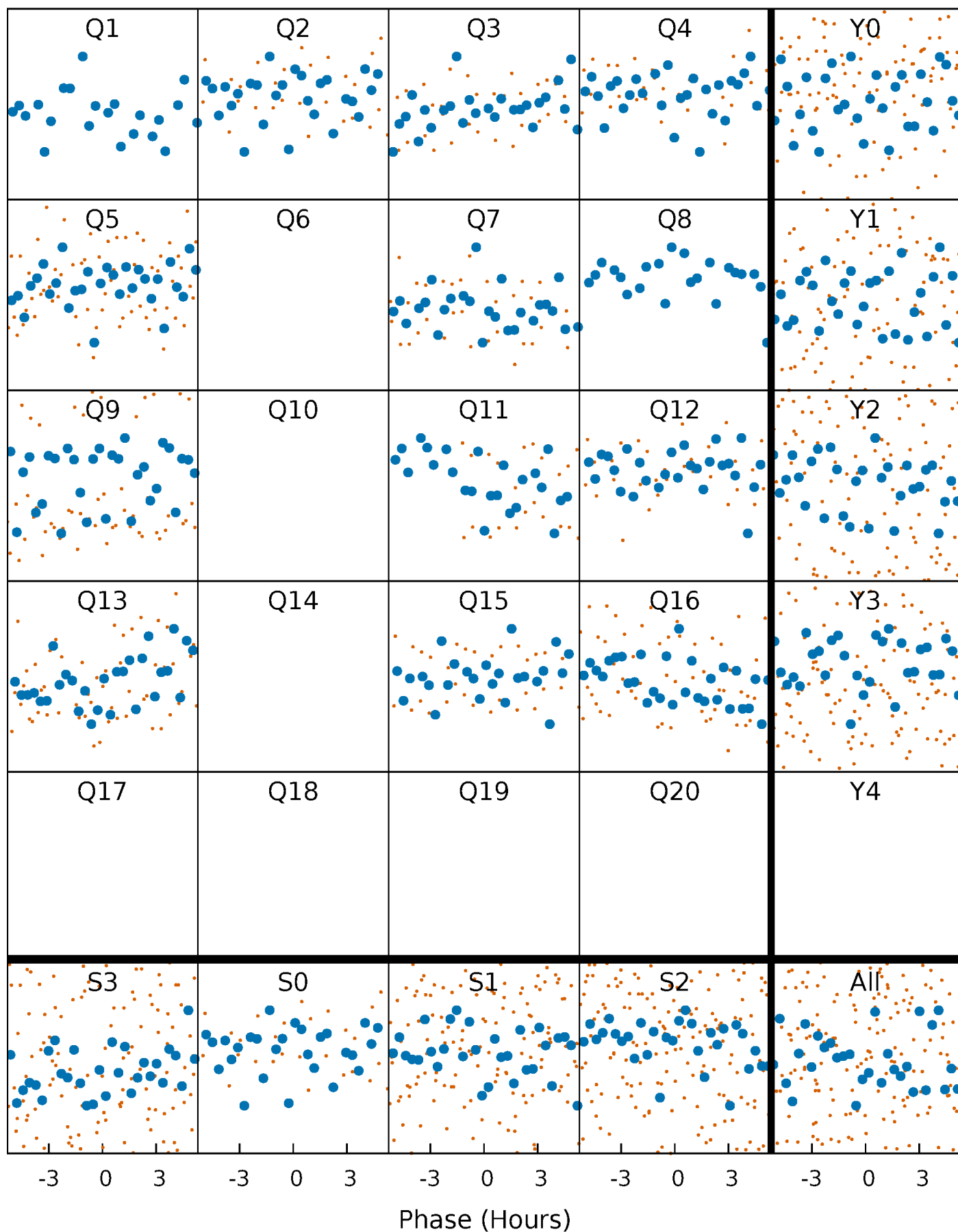


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



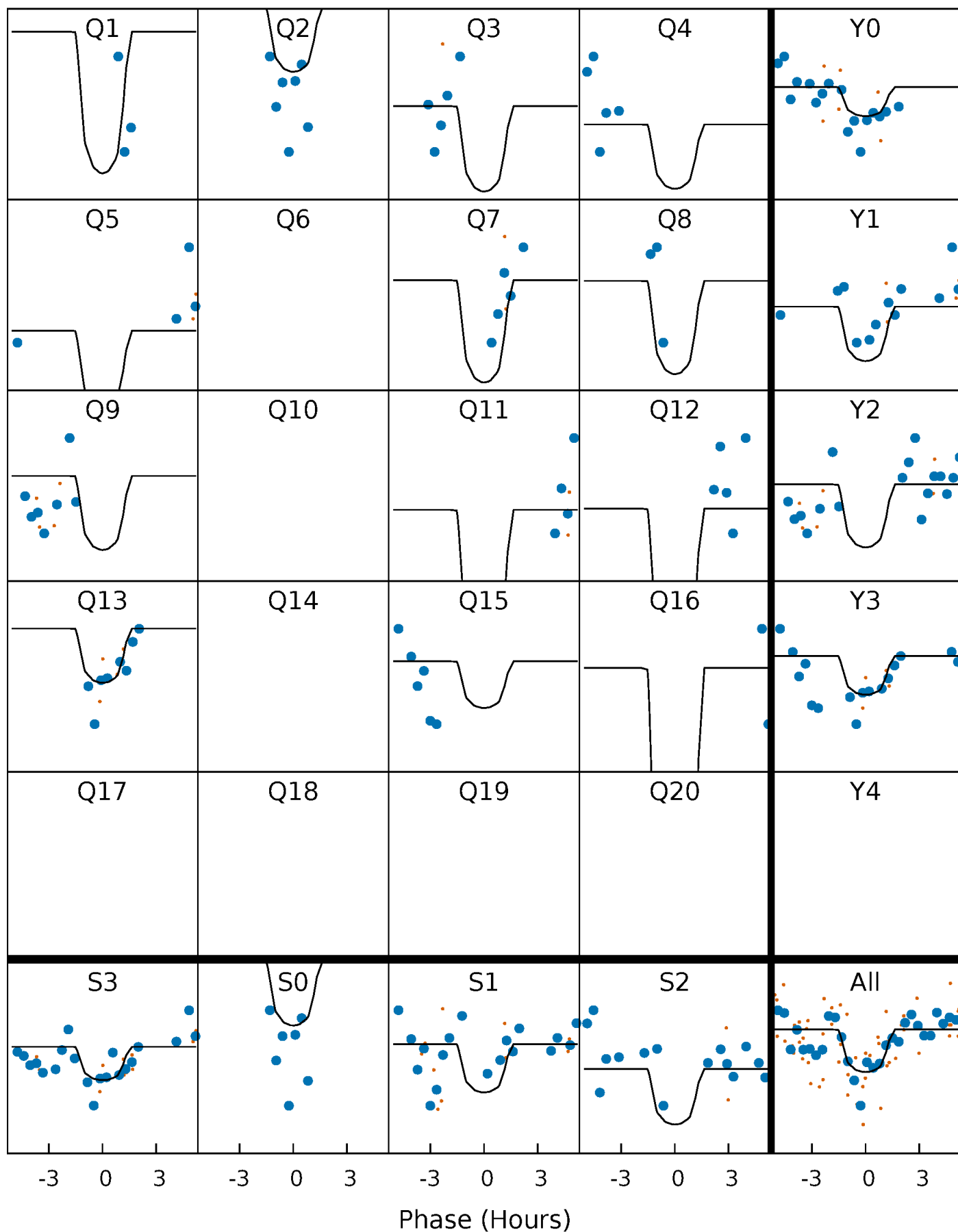
# PDC Quarter-Phased Transit Curves

TCE 005201676-04 P= 41.127838 Days  $T_0=159.376060$  (BKJD)



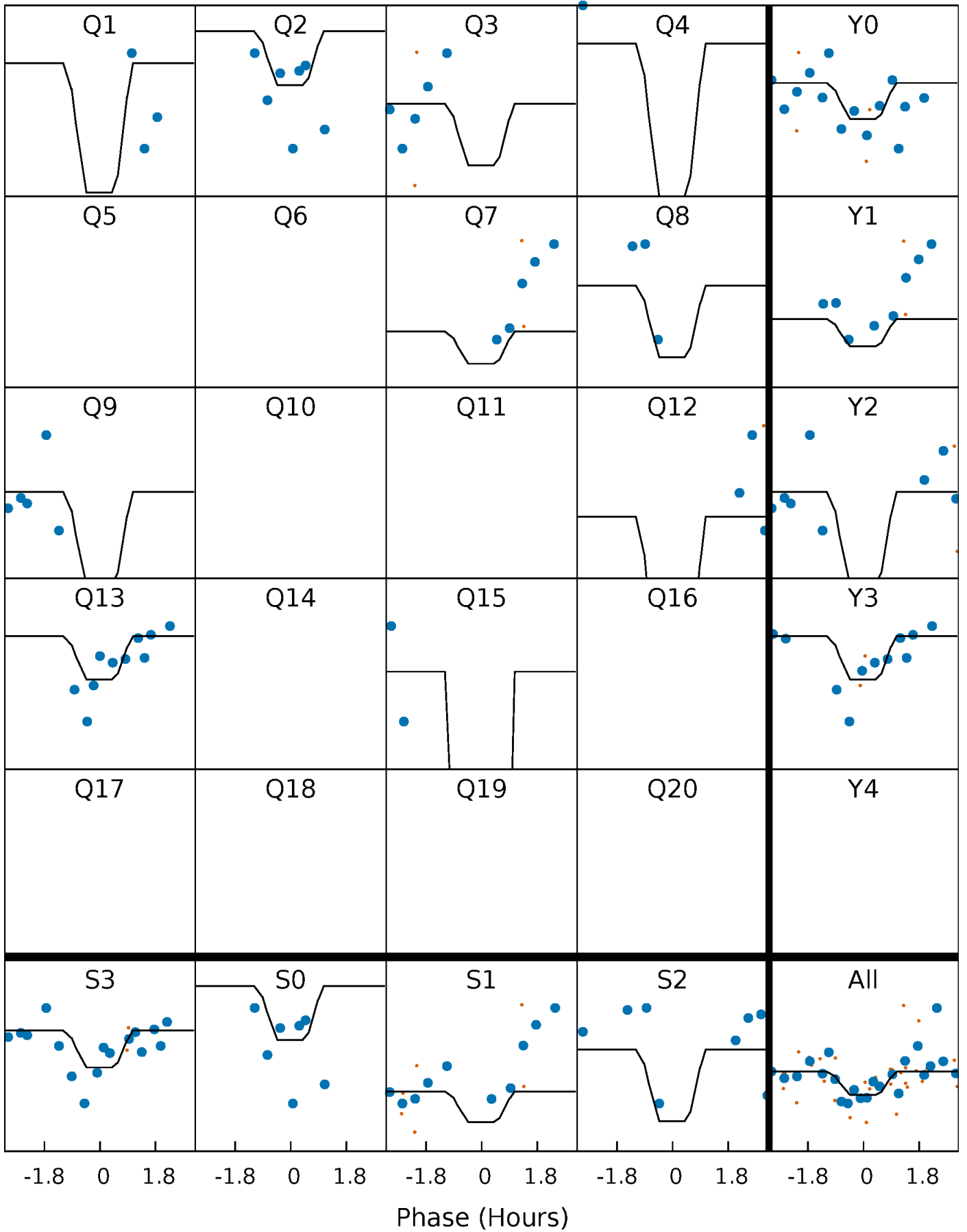
# DV Quarter-Phased Transit Curves

TCE 005201676-04   P= 41.127838 Days    $T_0=159.376060$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

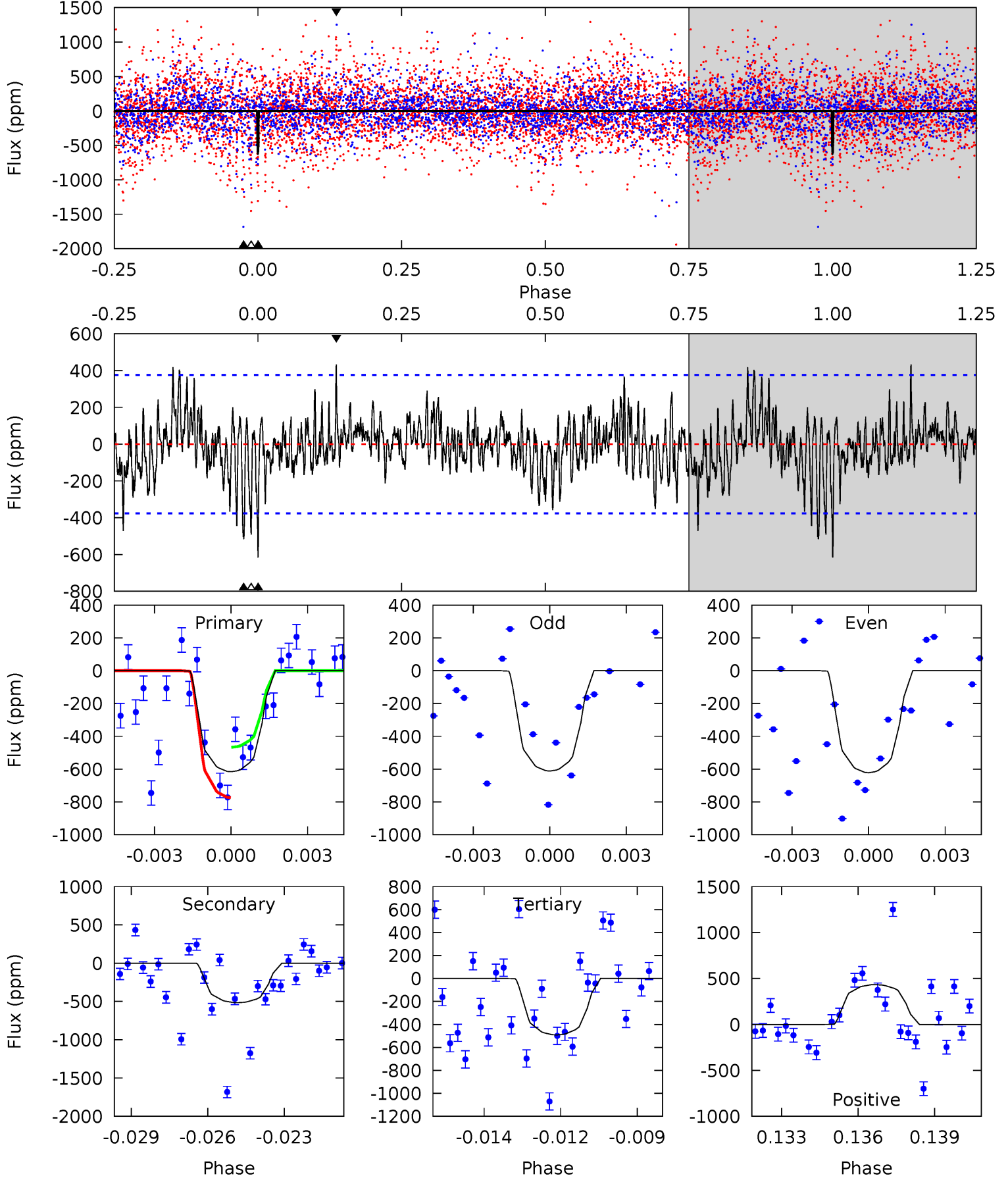
TCE 005201676-04 P= 41.128126 Days  $T_0=159.366492$  (BKJD)



# DV Model-Shift Uniqueness Test

005201676-04, P = 41.127838 Days, E = 118.248222 Days

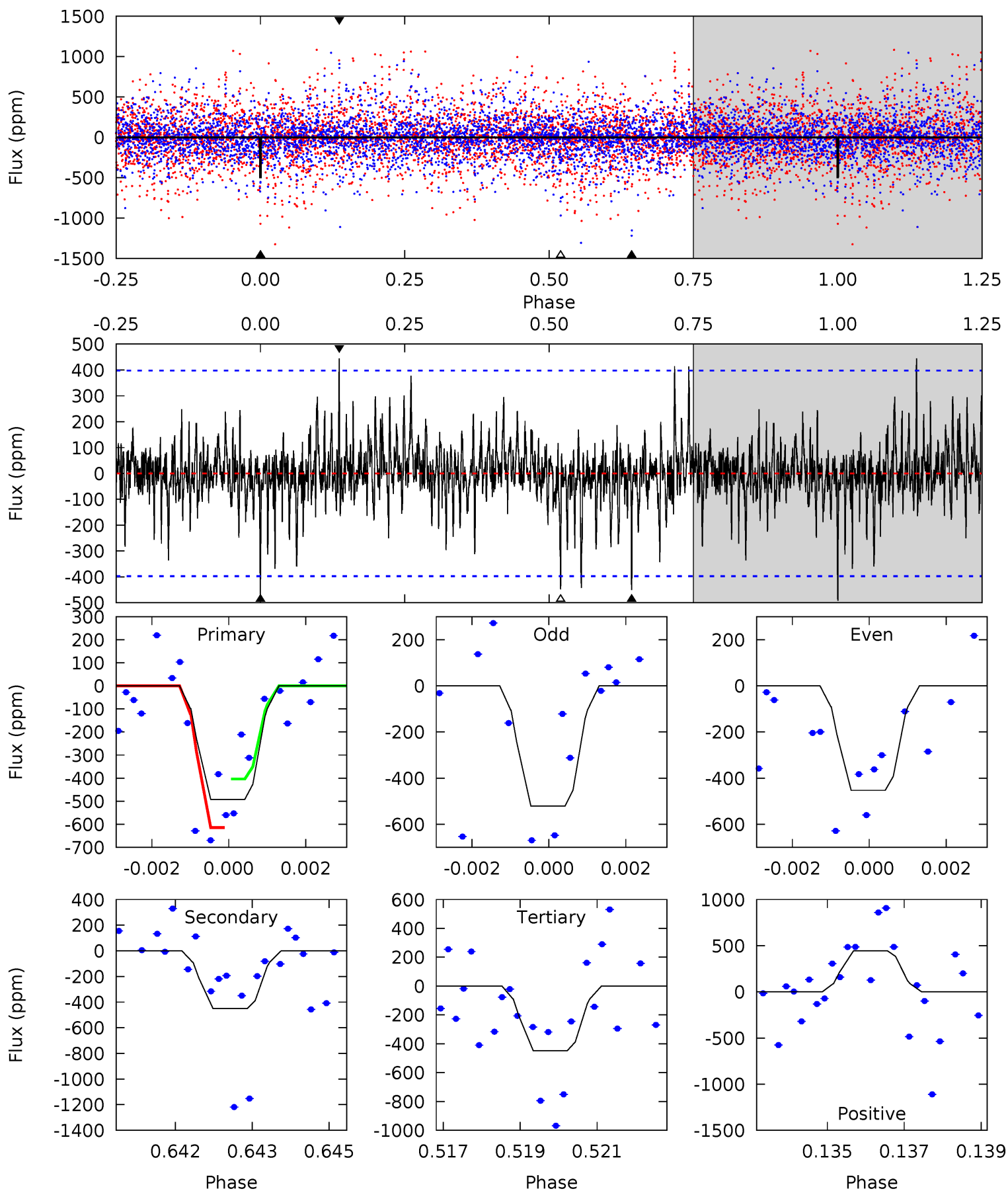
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.60	7.20	6.86	6.05	5.26	2.98	1.76	1.74	2.55	0.34	1.15	0.07	0.85	0.41	2.15



# Alt Model-Shift Uniqueness Test

005201676-04, P = 41.128126 Days, E = 118.238366 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
6.62	6.05	6.02	5.97	5.34	3.11	1.33	0.60	0.65	0.04	0.09	0.44	0.99	0.47	1.43



### Stellar Parameters For KIC 005201676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5313^{+159}_{-159}$	$4.510^{+0.076}_{-0.102}$	$-0.080^{+0.300}_{-0.300}$	$0.833^{+0.133}_{-0.092}$	$0.820^{+0.096}_{-0.070}$	$1.998^{+0.689}_{-0.604}$
	+3%/-3%	+2%/-2%	+375%/-375%	+16%/-11%	+12%/-9%	+34%/-30%
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 005201676-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-516 \pm 72$	$4.63^{+4.51}_{-3.17}$	$644^{+28}_{-26}$	$3886^{+2426}_{-757}$	$612^{+5603}_{-452}$
Alt.	$-450 \pm 74$	$4.47^{+4.63}_{-3.08}$	$643^{+32}_{-30}$	$3827^{+2307}_{-751}$	$597^{+5486}_{-460}$

$T_{max}$  = 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

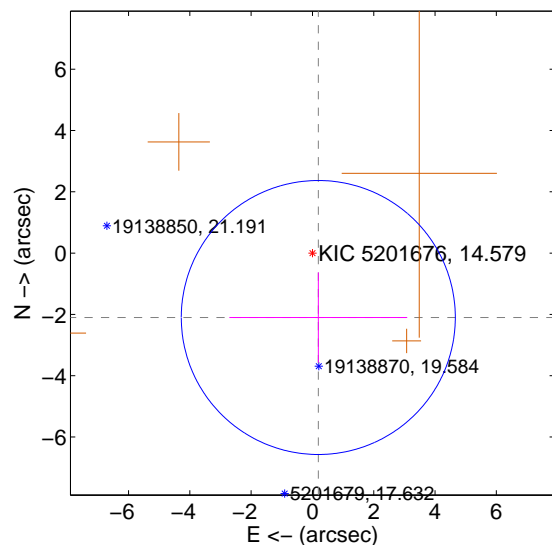
Supplemental centroid analysis for 005201676-04. Kepler magnitude: 14.58. Transit SNR 8.25

There are 0 quarters with good PRF difference image offsets

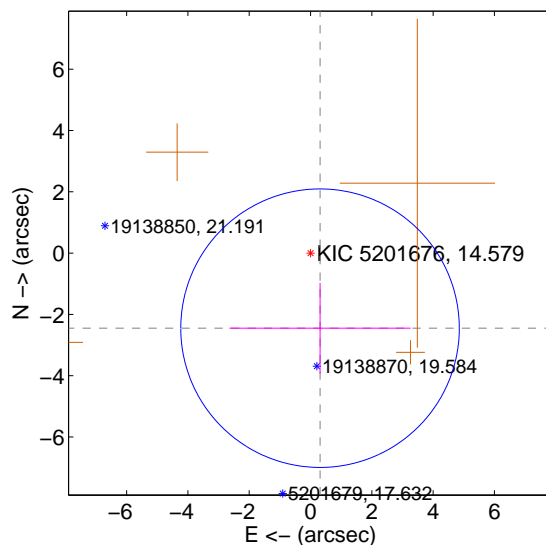
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.110 \pm 1.490$	1.42	$-0.191 \pm 2.902$	$-2.102 \pm 1.473$
PRF-fit source offset from KIC position	$2.470 \pm 1.515$	1.63	$-0.310 \pm 2.959$	$-2.451 \pm 1.480$
photometric centroid source offset	$0.72 \pm 0.65$	1.11	$-0.71 \pm 0.65$	$0.05 \pm 0.64$

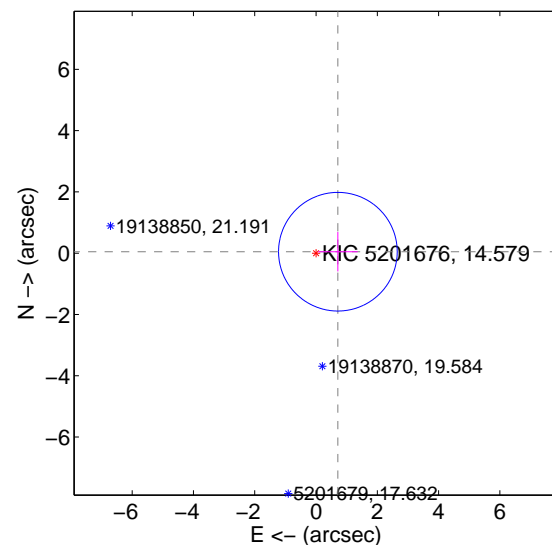
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



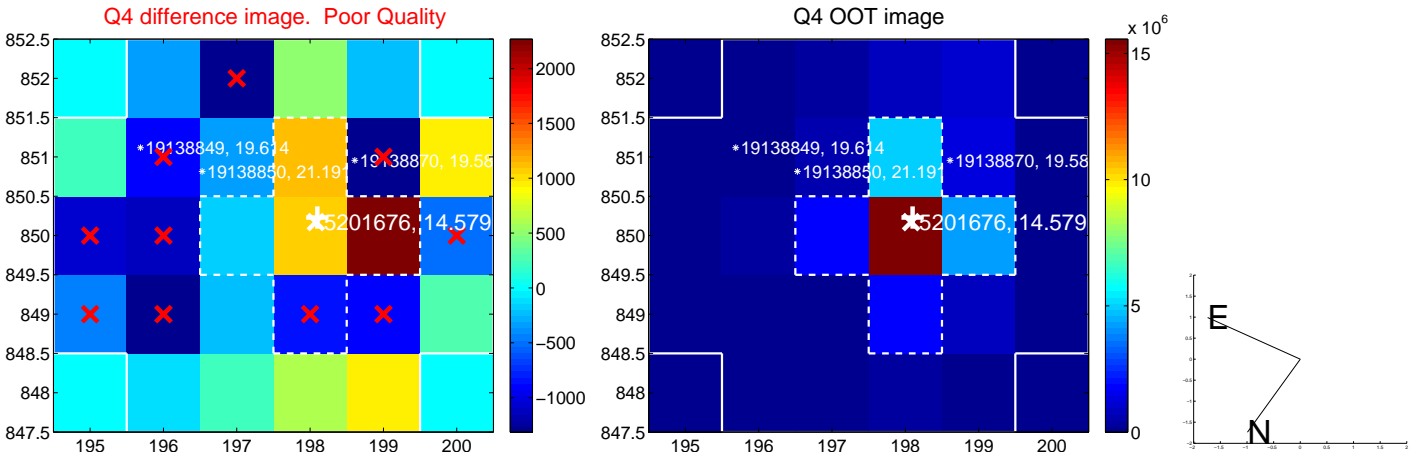
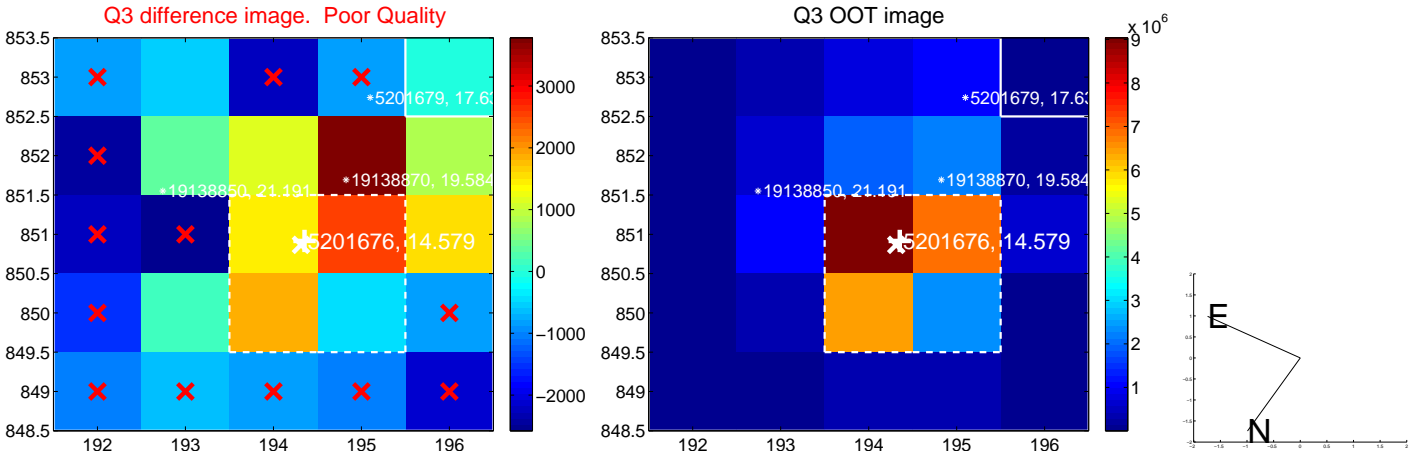
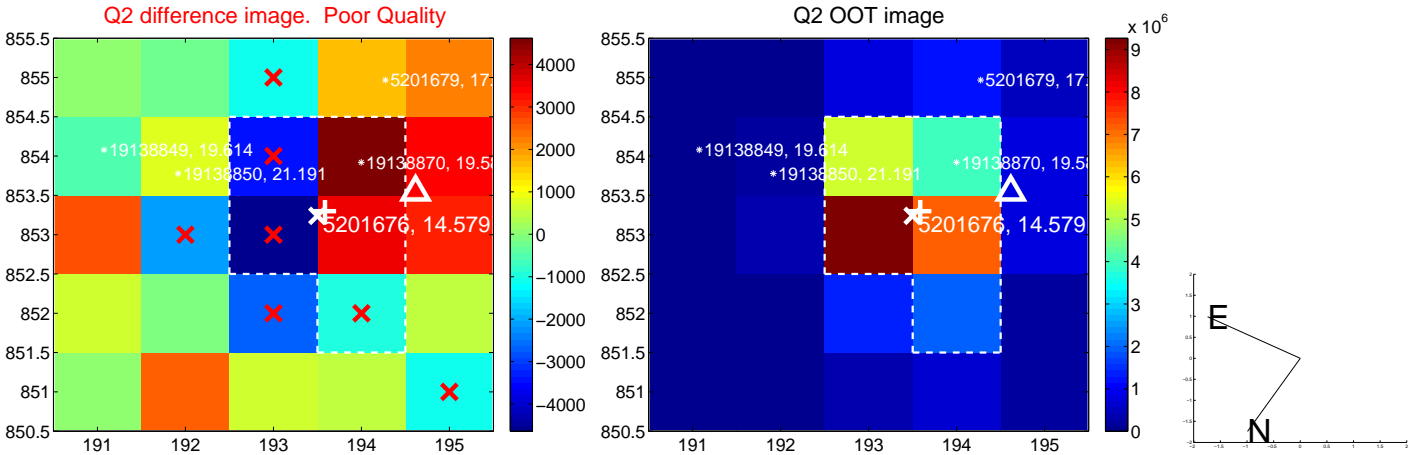
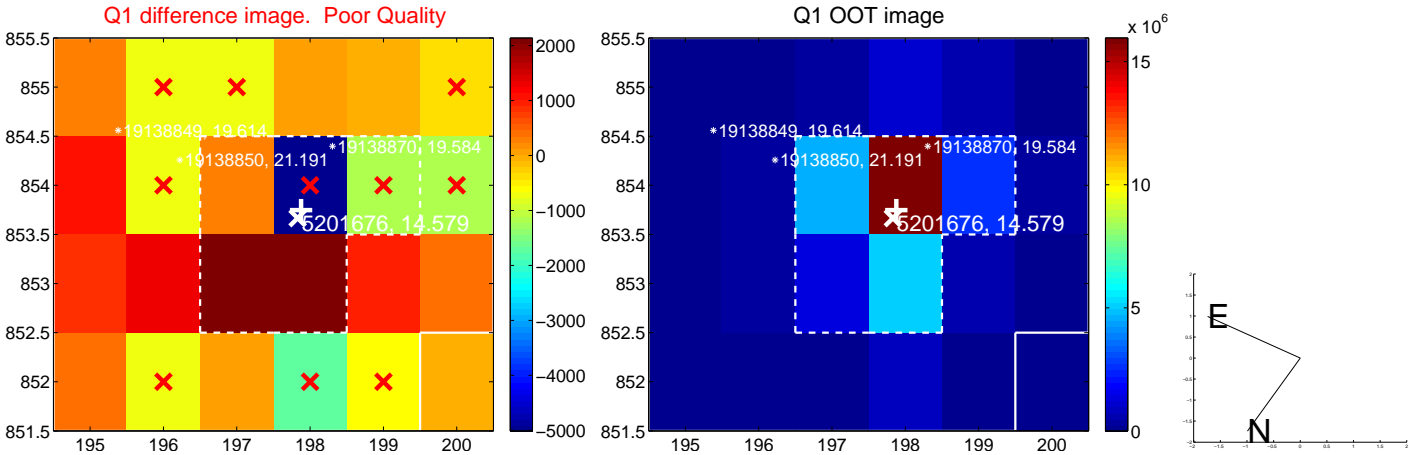
offset from photometric centroids



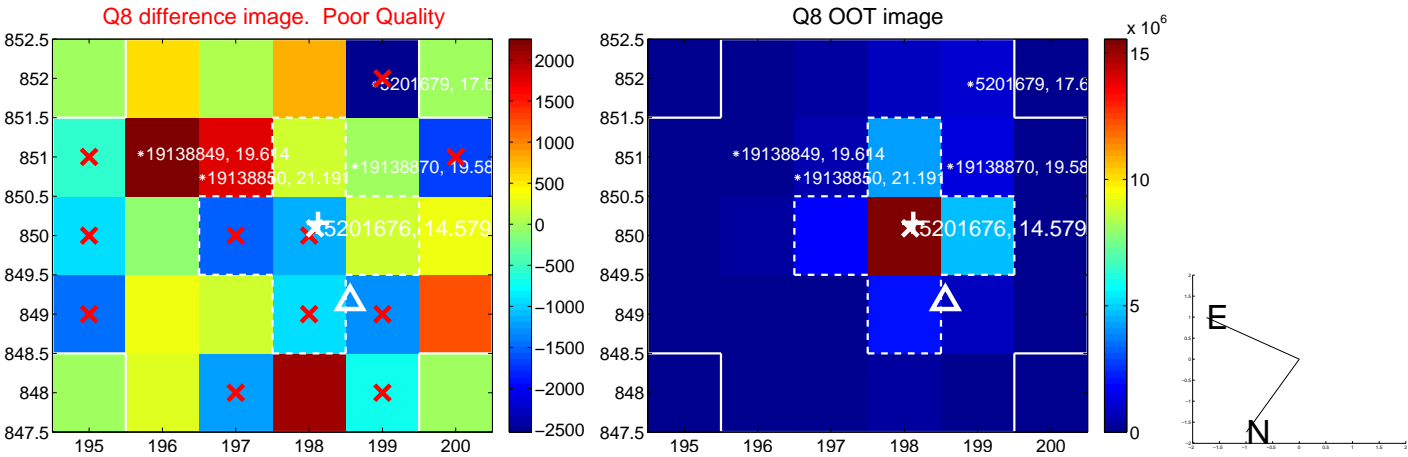
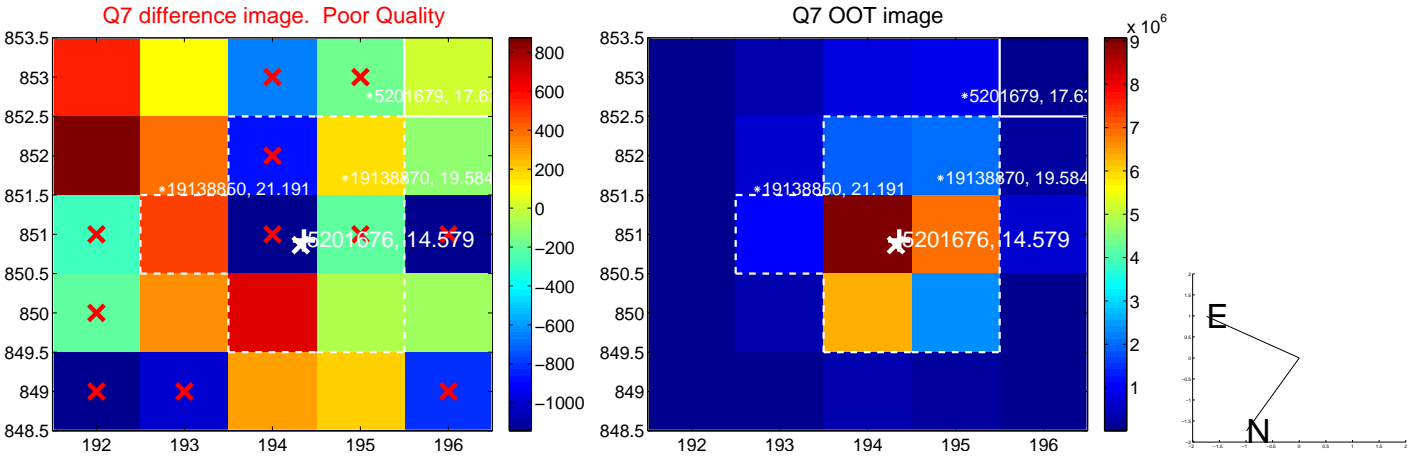
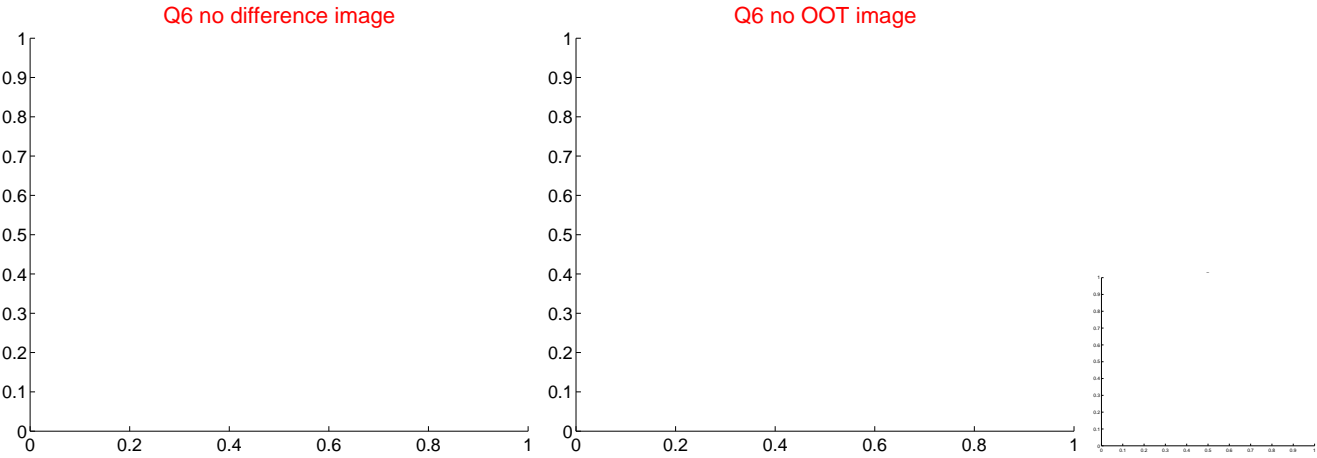
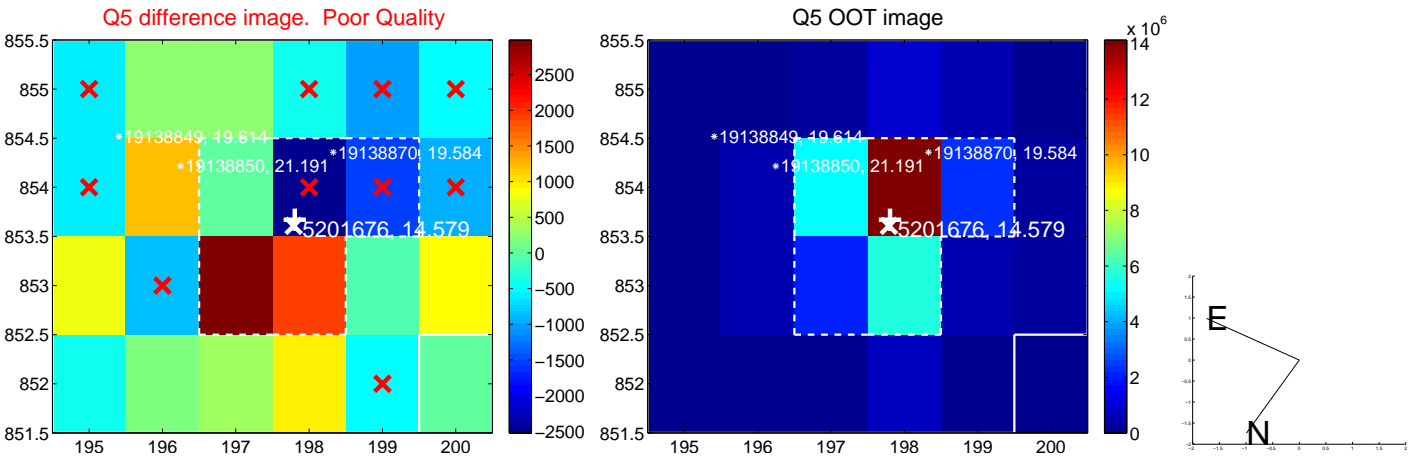
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



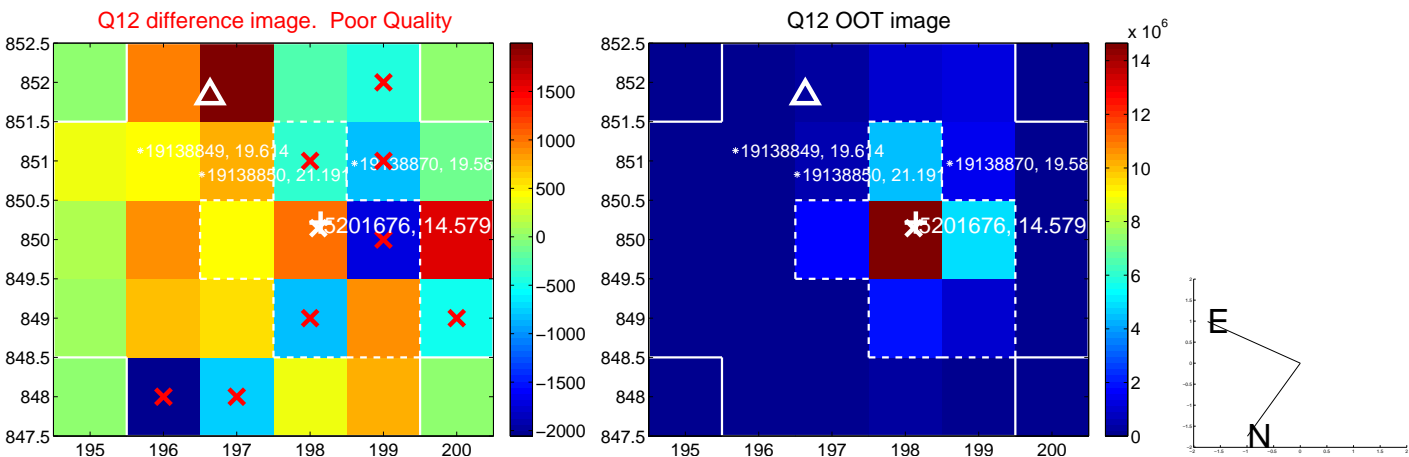
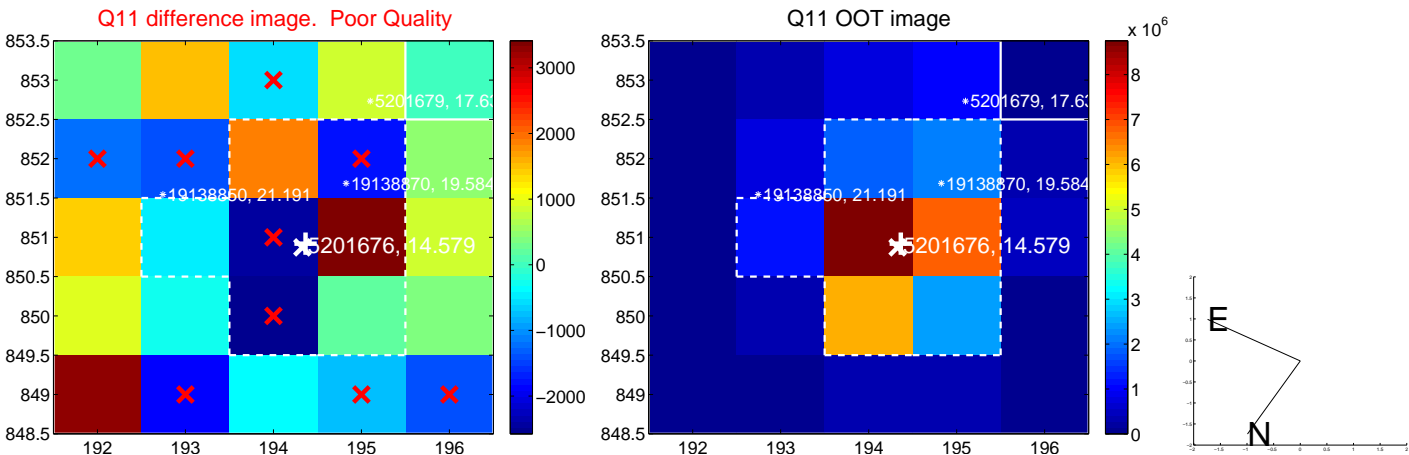
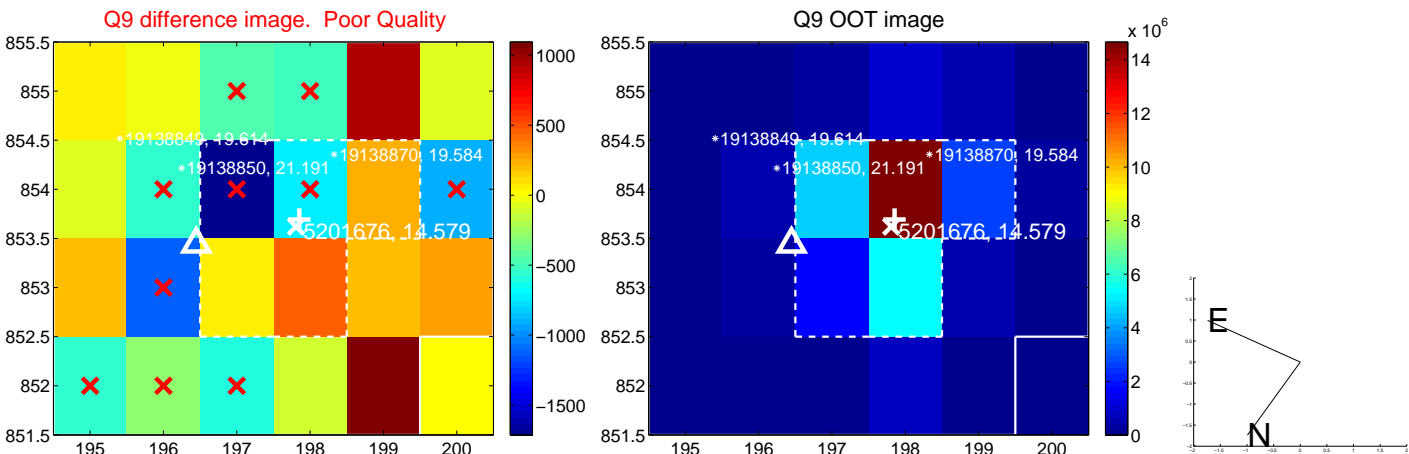
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



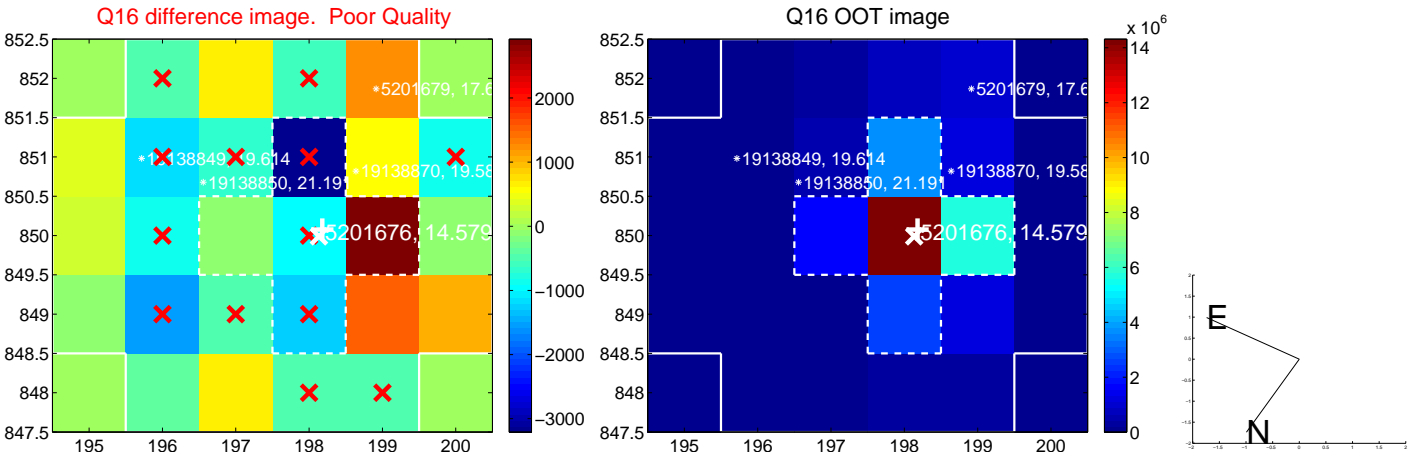
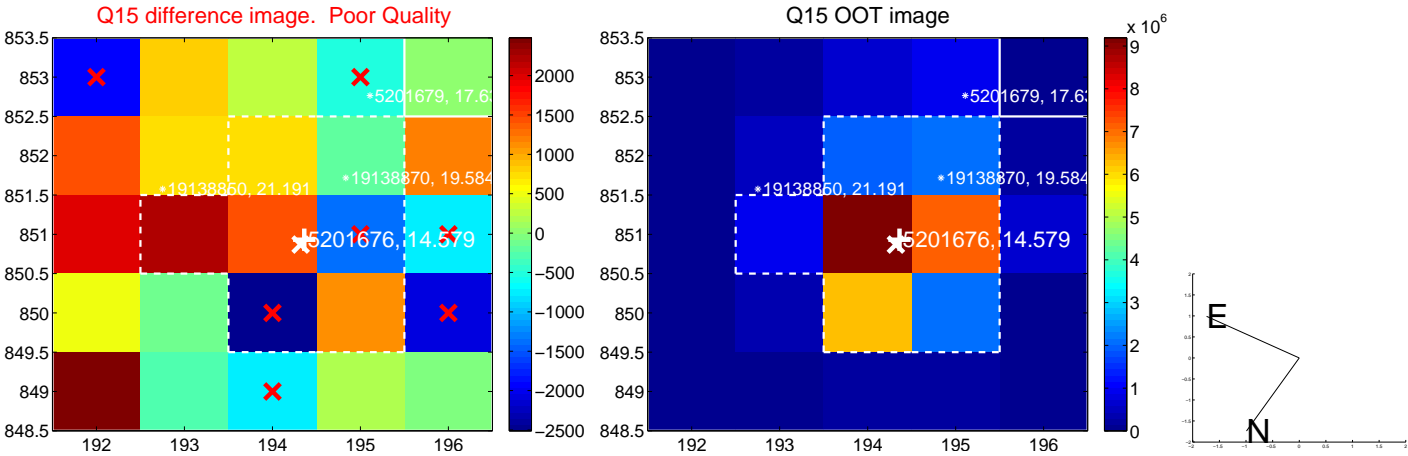
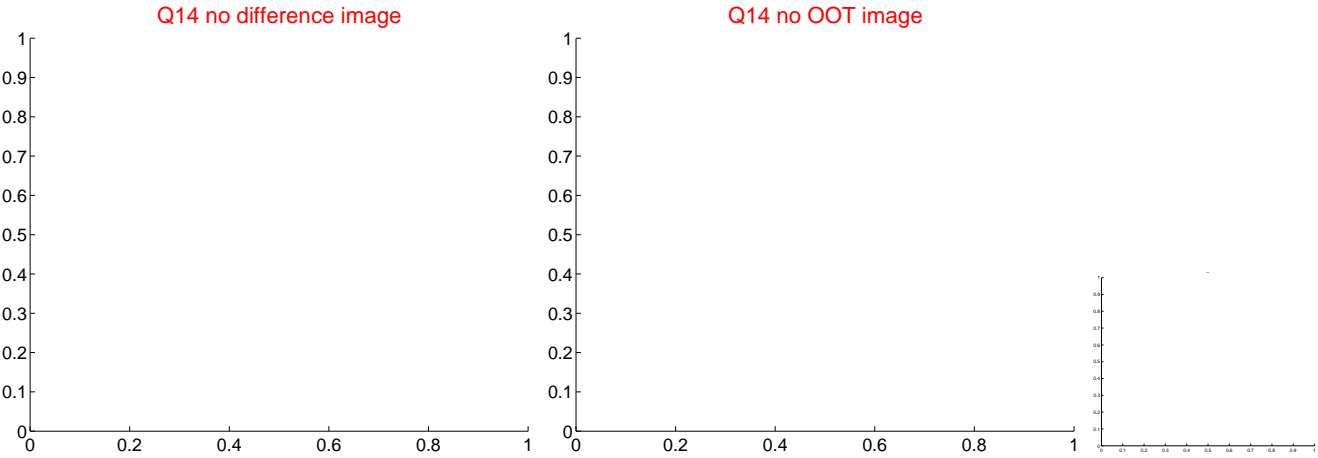
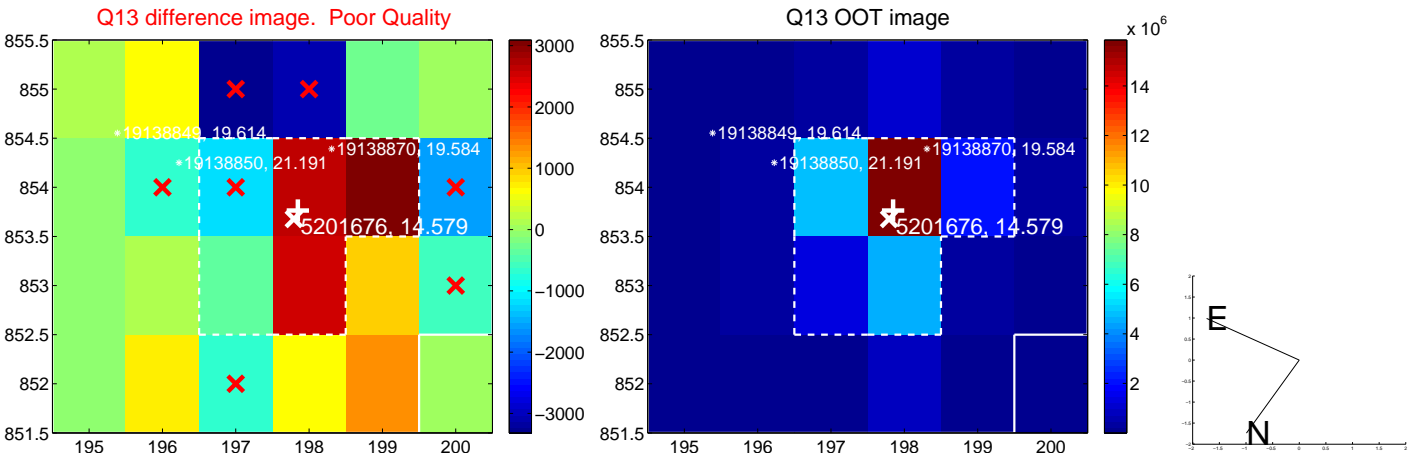
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



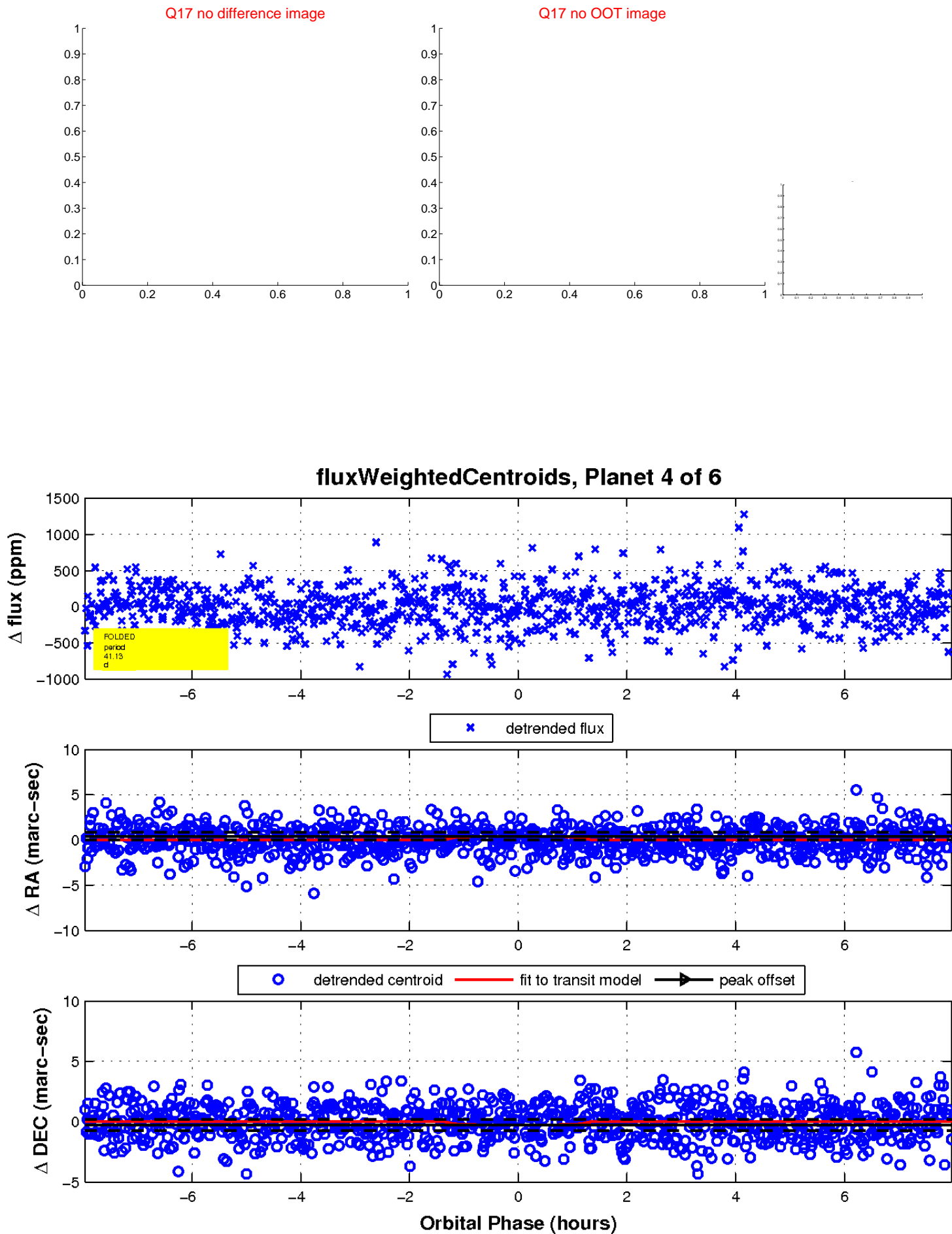
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

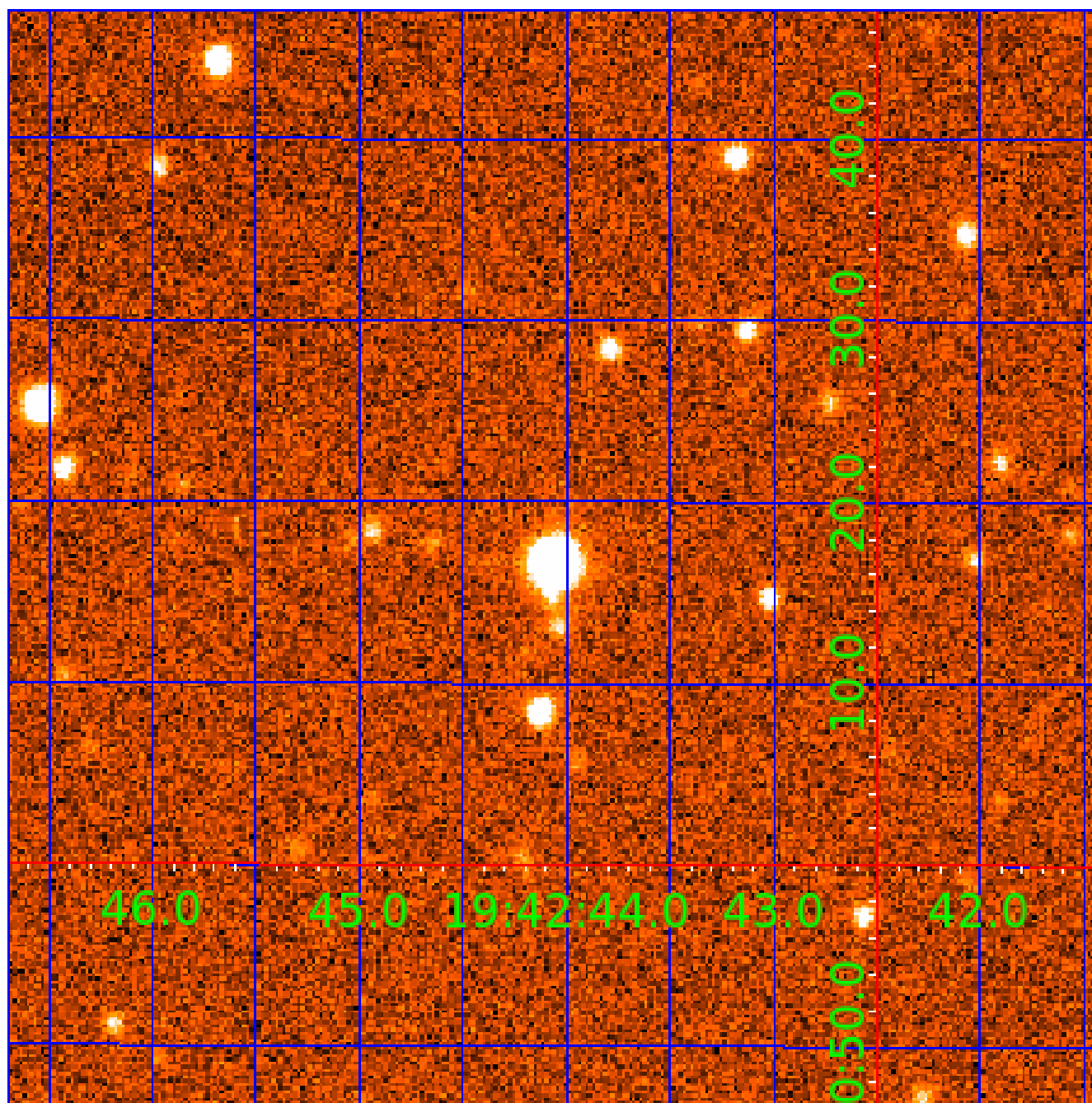


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005201676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005201676-01	OBS	No	0.507258	131.778963	21.4	3.394	7.5	6.9	0.83	5313	0.38	3650.72
005201676-02	OBS	No	64.752245	158.383778	557.4	2.087	10.6	7.3	0.83	5313	2.03	5.68
005201676-03	OBS	No	44.064164	170.009561	569.7	1.908	9.1	8.9	0.83	5313	1.95	9.49
005201676-04	OBS	No	41.127838	159.376060	585.6	2.659	10.2	8.3	0.83	5313	2.16	10.40
005201676-05	OBS	No	38.492105	162.554544	447.3	2.494	10.4	7.1	0.83	5313	1.86	11.36
005201676-06	OBS	No	48.833715	136.979224	902.2	1.143	10.3	8.2	0.83	5313	2.47	8.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005201676-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
005201676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
005201676-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

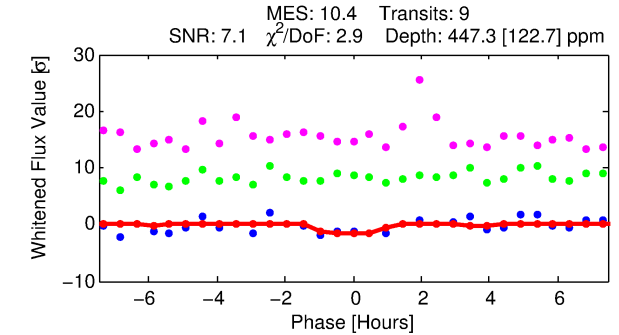
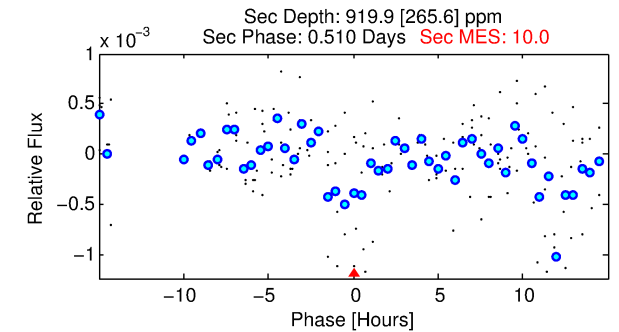
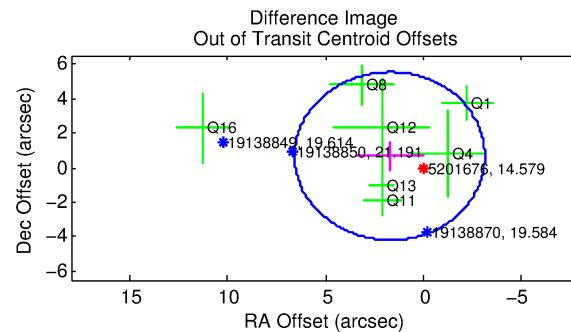
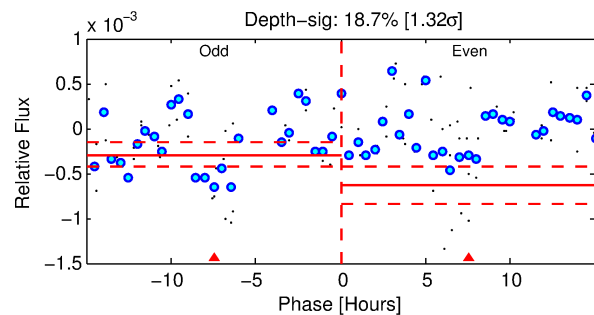
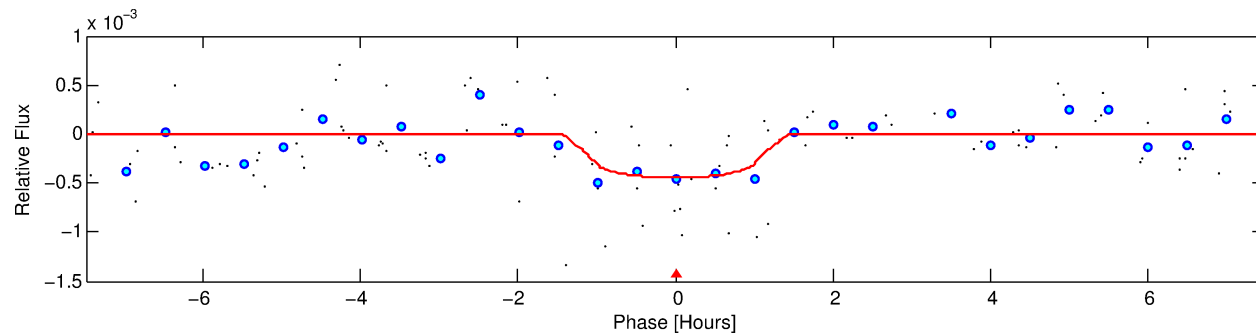
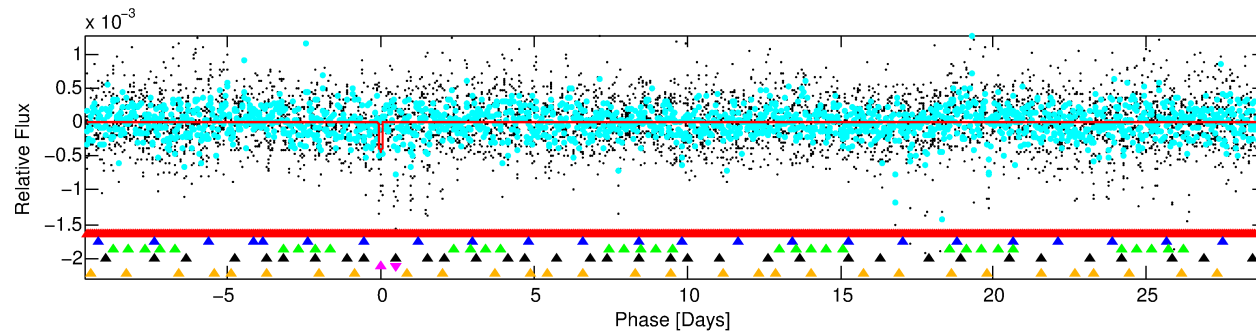
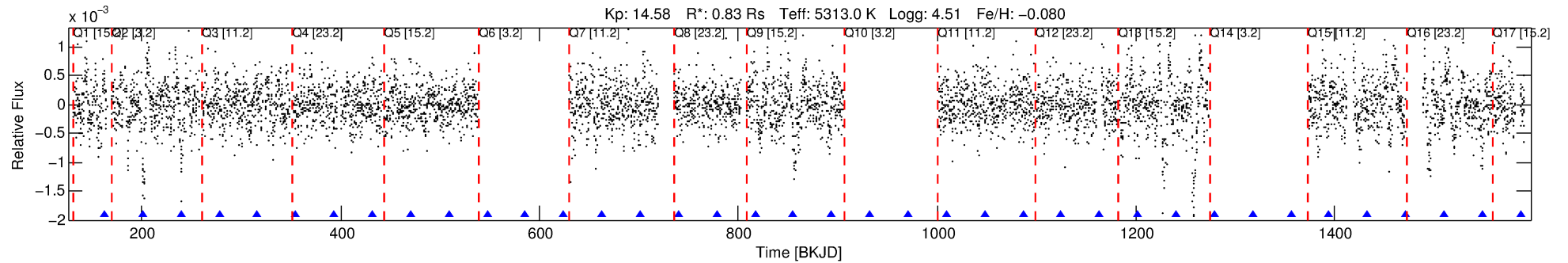
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005201676-05

No Significant Match Found

# DV One-Page Summary

KIC: 5201676 Candidate: 5 of 6 Period: 38.492 d



## DV Fit Results:

Period = 38.49211 [0.00060] d  
Epoch = 162.5545 [0.0137] BKJD  
Rp/R\* = 0.0204 [0.0856]  
a/R\* = 92.04 [1471.88]  
b = 0.66 [14.09]  
Seff = 11.36 [2.55]  
Teq = 468 [26] K  
Rp = 1.86 [7.78] Re  
a = 0.2088 [0.0276] AU  
Ag = 6405.39 [53726.51] [0.12σ]  
Teffp = 6476 [13577] K [0.44σ]

## DV Diagnostic Results:

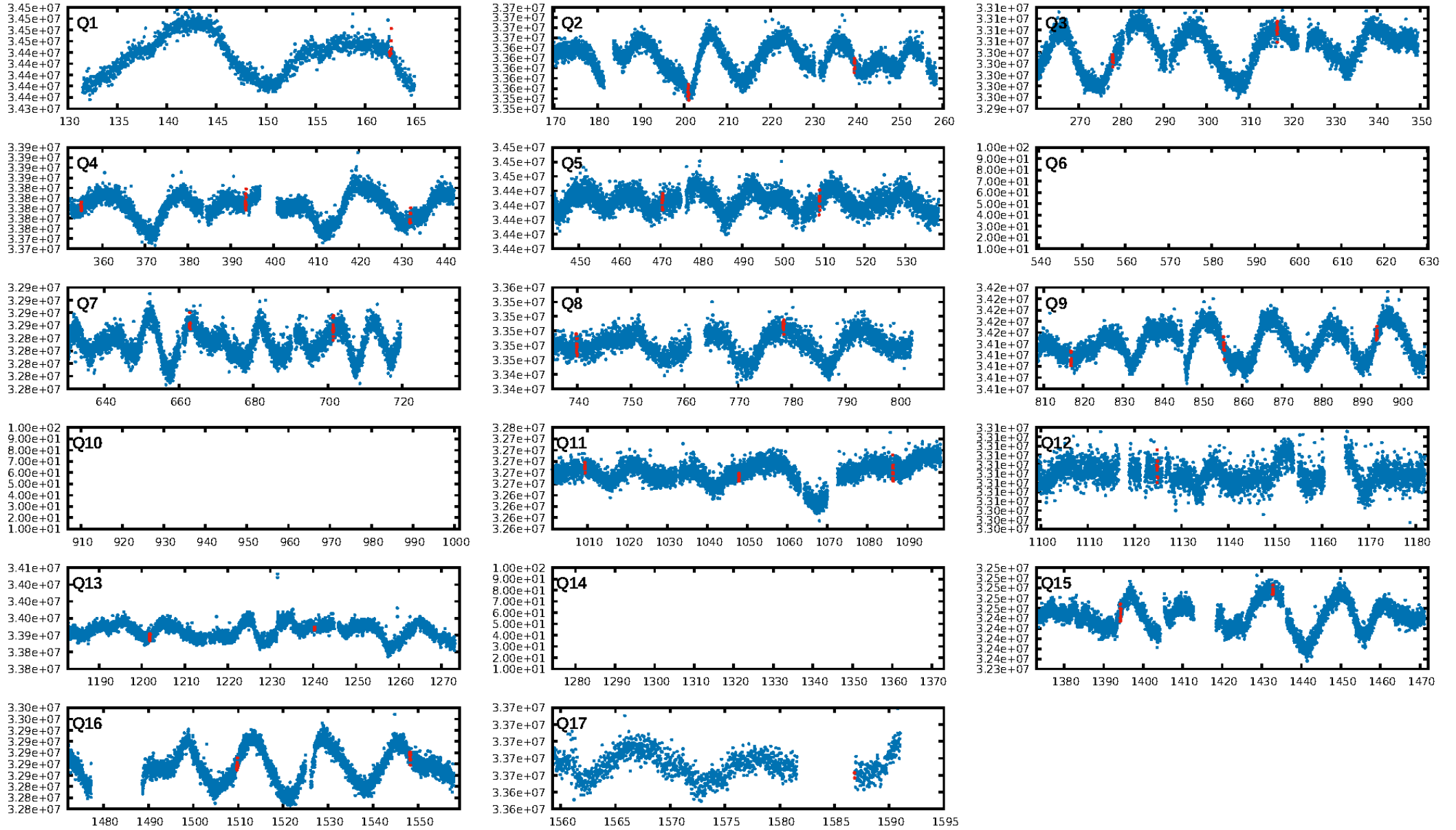
ShortPeriod-sig: 100.0% [216.48σ]  
LongPeriod-sig: 100.0% [17.35σ]  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 75.8%  
Bootstrap-pfa: 6.10e-13  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: -3.168  
Centroid-sig: 98.9%  
Centroid-so: 0.404 arcsec [0.47σ]  
OotOffset-rm: 1.838 arcsec [1.13σ]  
OotOffset-st: 0/1/4/2 [7]  
KicOffset-rm: 1.765 arcsec [1.05σ]  
KicOffset-st: 0/1/4/2 [7]  
DiffImageQuality-fgm: 0.00 [0/7]  
DiffImageOverlap-fno: 0.00 [0/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:16:13 Z

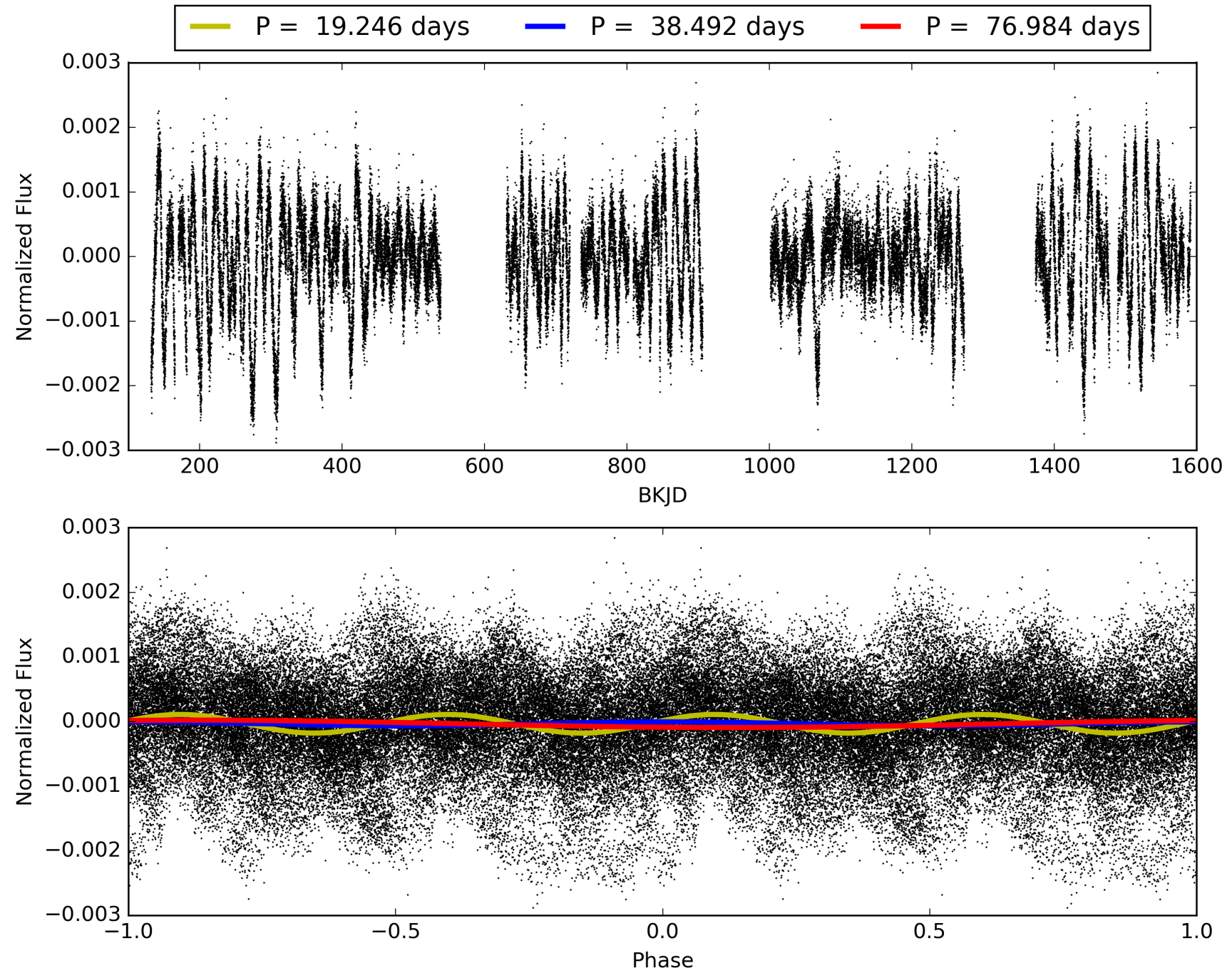
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005201676-05, PDC Light Curves

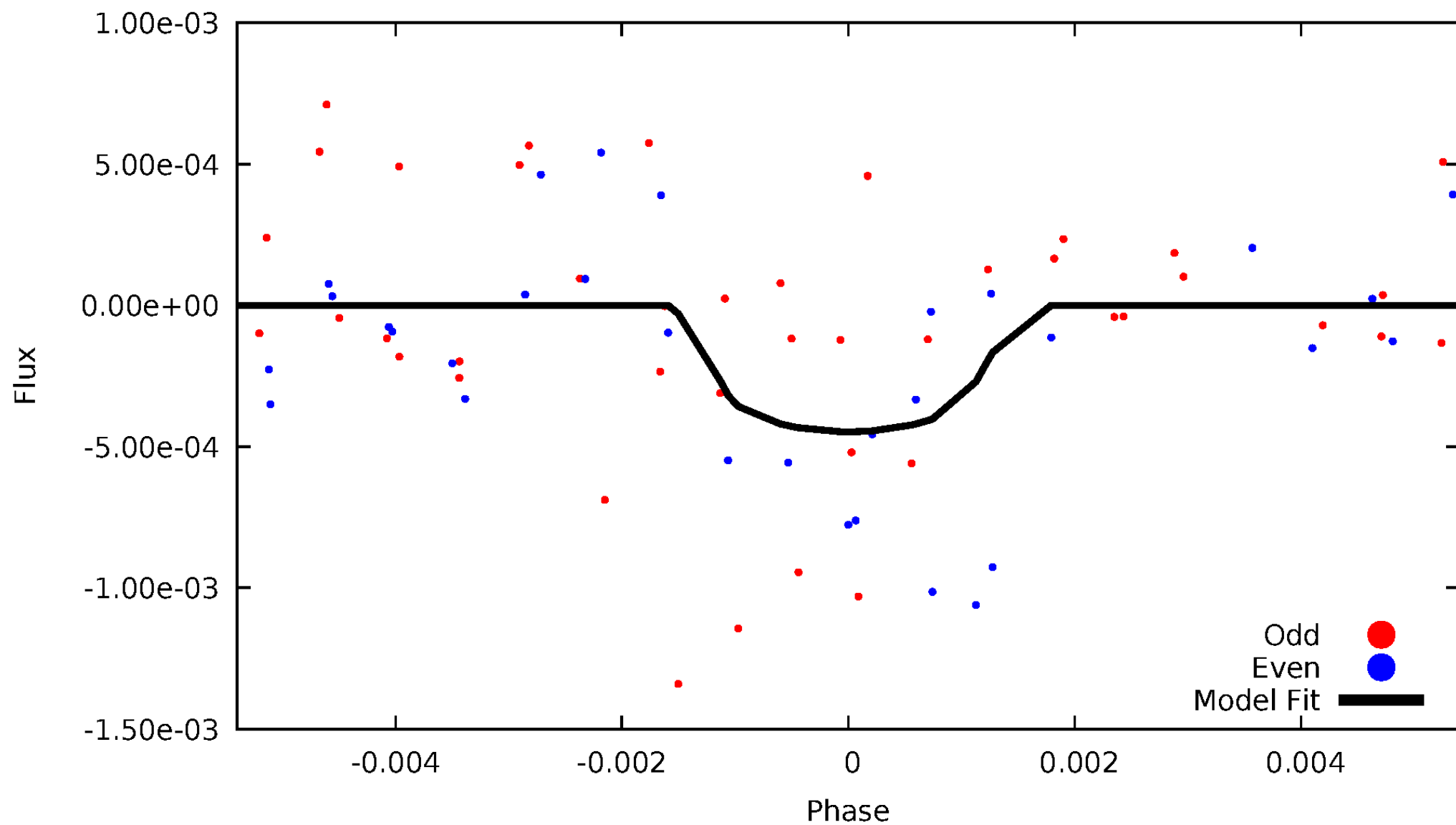


TCE 005201676-05



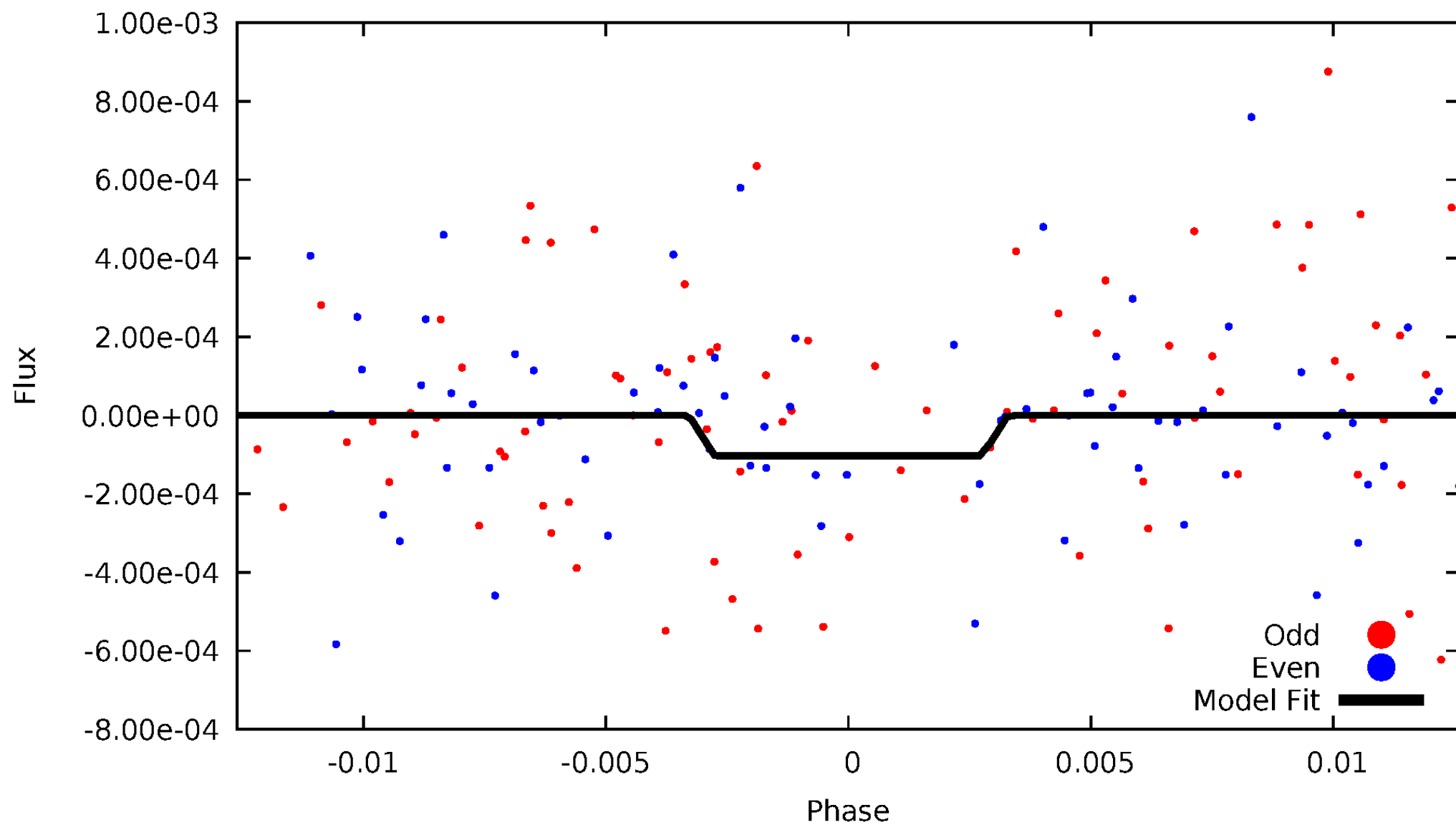
# DV Odd/Even

TCE 005201676-05



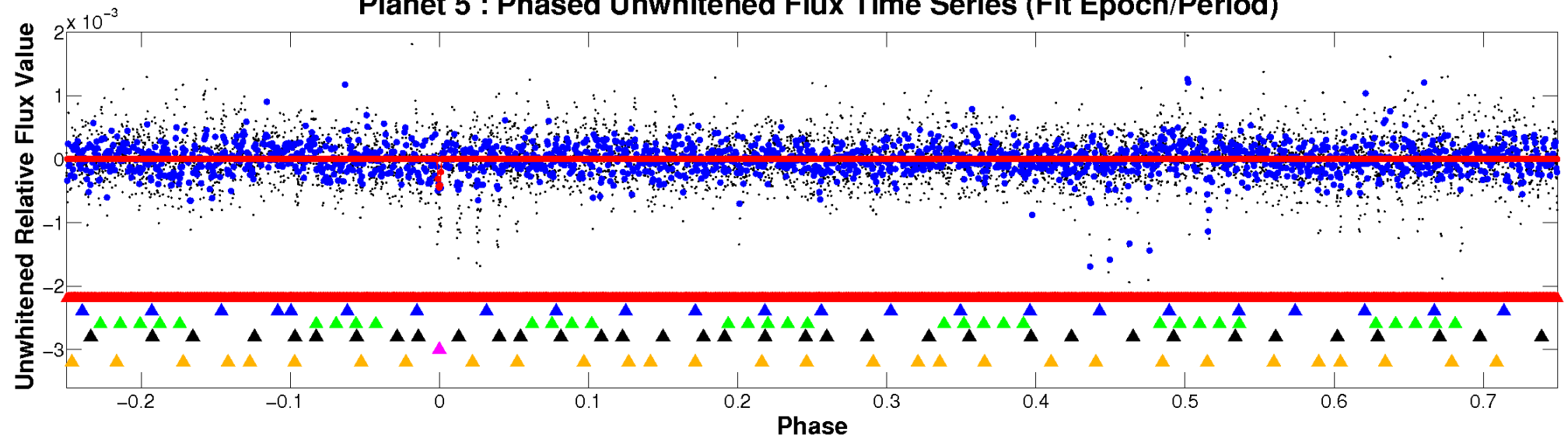
# ALT Odd/Even

TCE 005201676-05

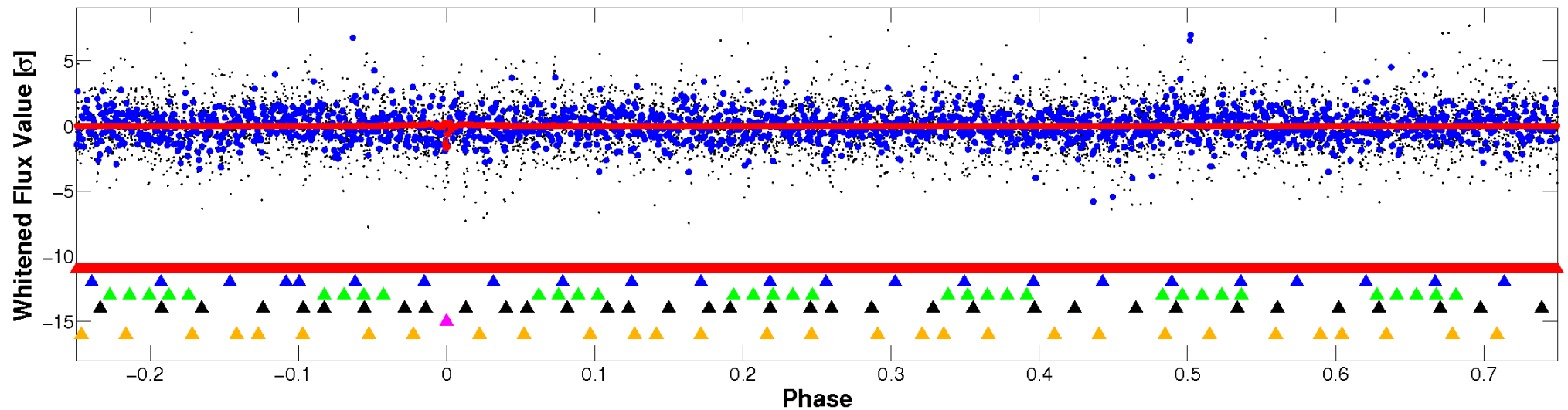


# Non-Whitened Vs. Whitened Light Curve

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

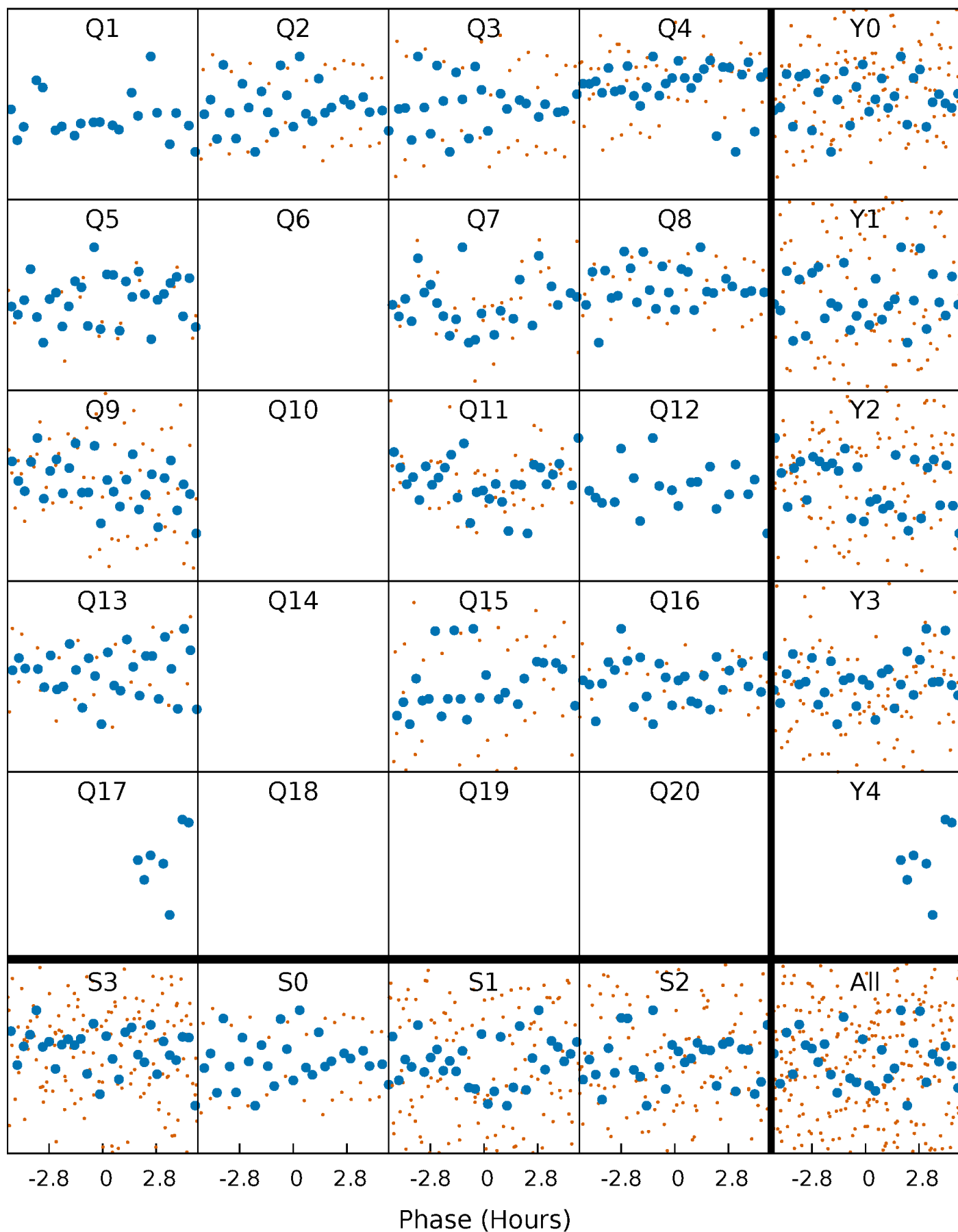


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



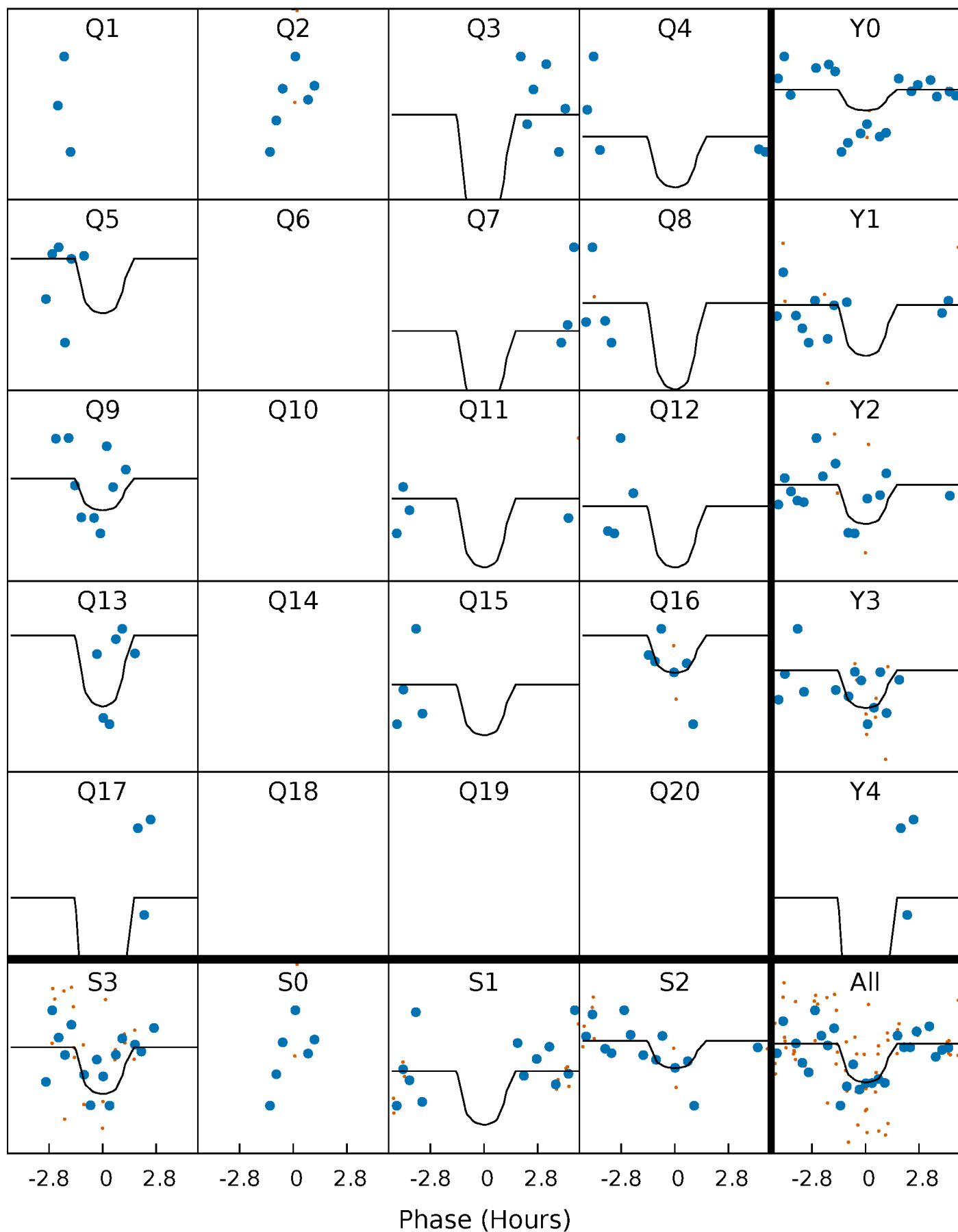
# PDC Quarter-Phased Transit Curves

TCE 005201676-05     $P = 38.492105$  Days     $T_0 = 162.554544$  (BKJD)



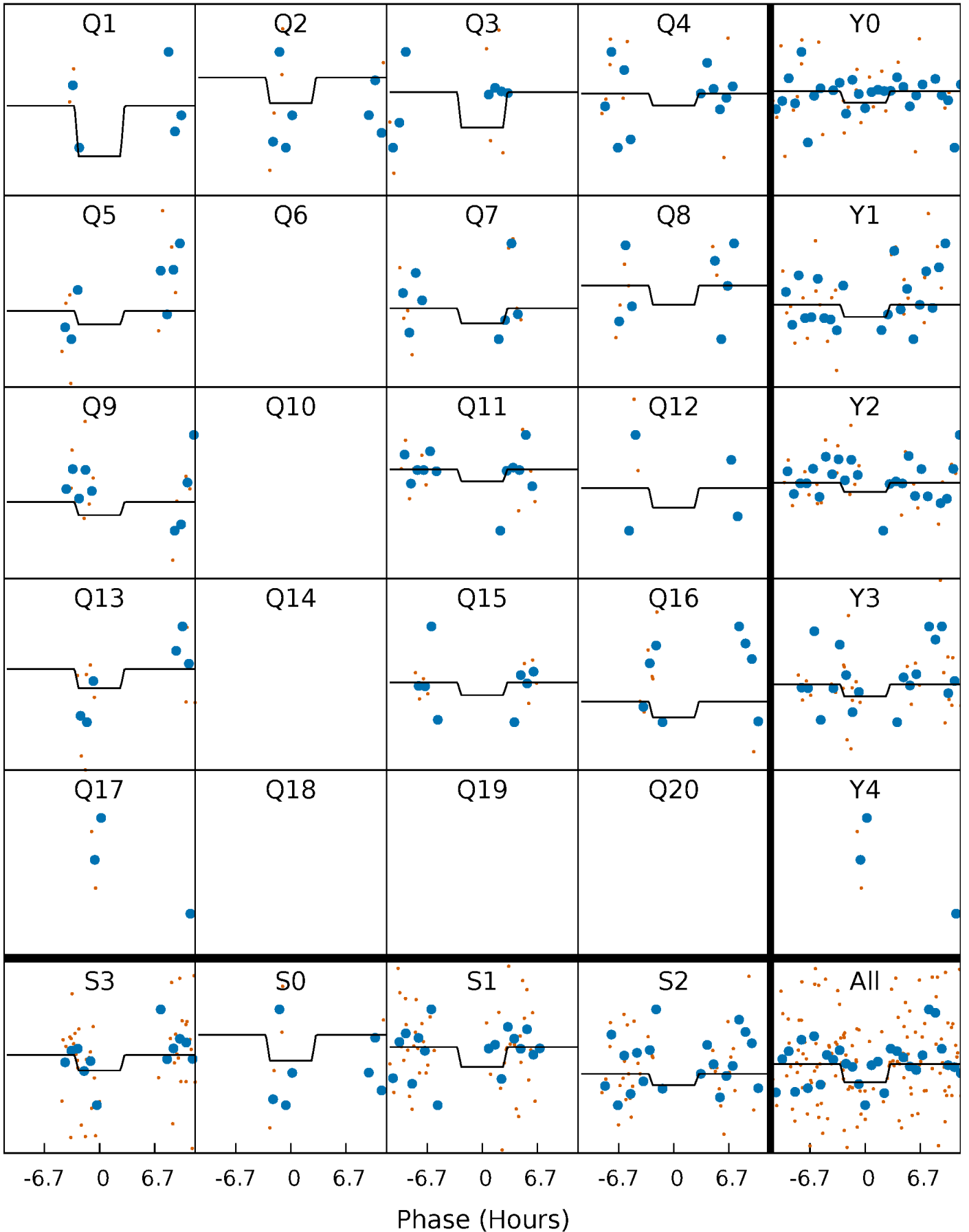
# DV Quarter-Phased Transit Curves

TCE 005201676-05   P= 38.492105 Days    $T_0=162.554544$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005201676-05     $P = 38.493822$  Days     $T_0 = 162.601295$  (BKJD)

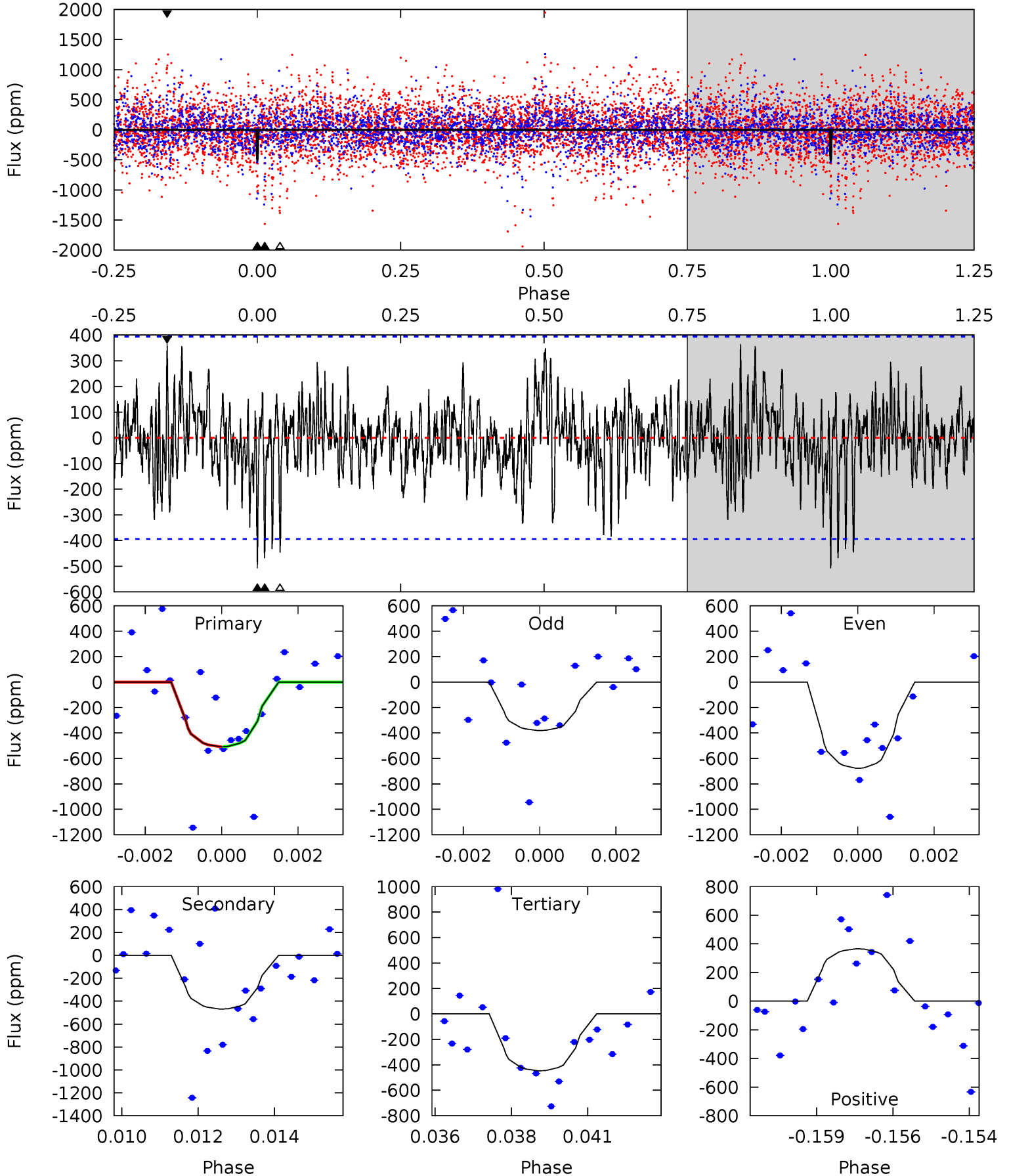




# DV Model-Shift Uniqueness Test

005201676-05, P = 38.492105 Days, E = 124.062439 Days

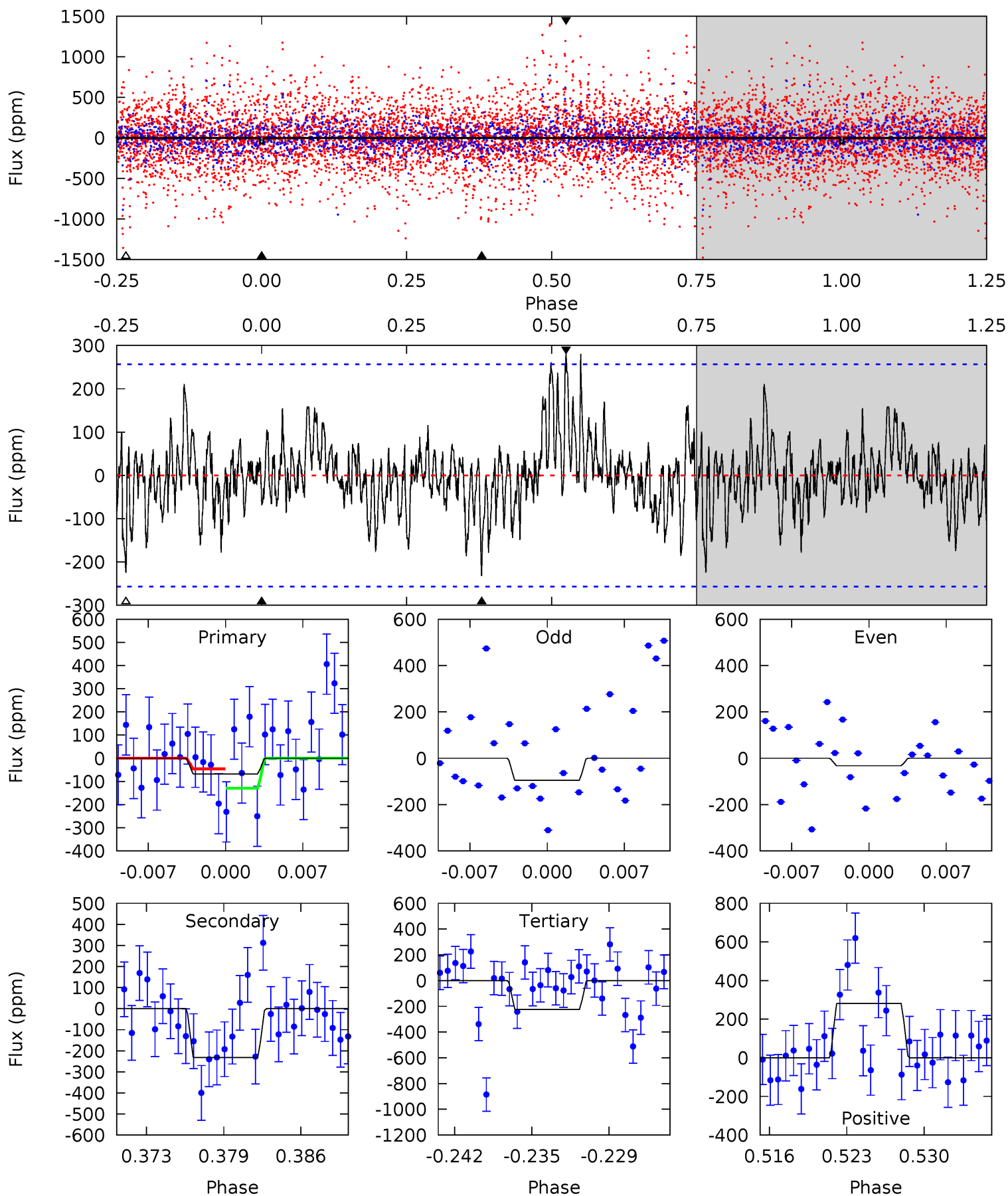
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.83	6.30	6.00	4.91	5.29	3.04	1.57	0.82	1.92	0.29	1.39	1.97	0.85	0.42	0.00



# Alt Model-Shift Uniqueness Test

005201676-05, P = 38.493822 Days, E = 124.107473 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
1.34	4.62	4.46	5.60	5.11	2.72	1.42	-3.12	-4.25	0.15	-0.98	0.59	1.60	0.55	0.81



### Stellar Parameters For KIC 005201676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5313^{+159}_{-159}$	$4.510^{+0.076}_{-0.102}$	$-0.080^{+0.300}_{-0.300}$	$0.833^{+0.133}_{-0.092}$	$0.820^{+0.096}_{-0.070}$	$1.998^{+0.689}_{-0.604}$
	+3%/-3%	+2%/-2%	+375%/-375%	+16%/-11%	+12%/-9%	+34%/-30%
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 005201676-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-469 \pm 74$	$6.01^{+5.69}_{-4.21}$	$655^{+31}_{-27}$	$3517^{+1981}_{-636}$	$313^{+3147}_{-231}$
Alt.	$-232 \pm 50$	$5.69^{+6.08}_{-4.15}$	$658^{+31}_{-27}$	$3214^{+1782}_{-616}$	$175^{+1980}_{-138}$

$T_{max}$  = 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

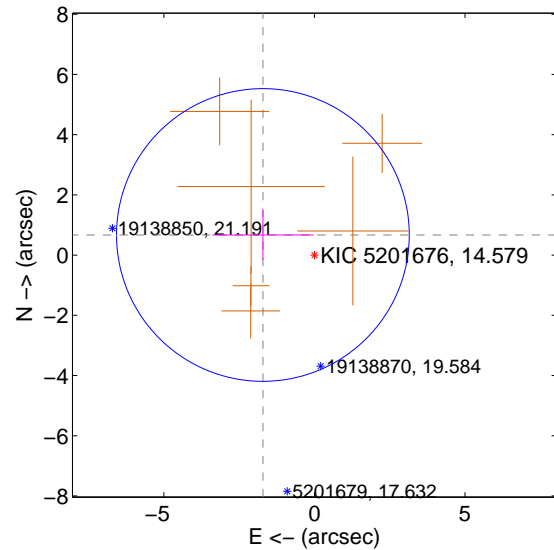
Supplemental centroid analysis for 005201676-05. Kepler magnitude: 14.58. Transit SNR 7.13

There are 0 quarters with good PRF difference image offsets

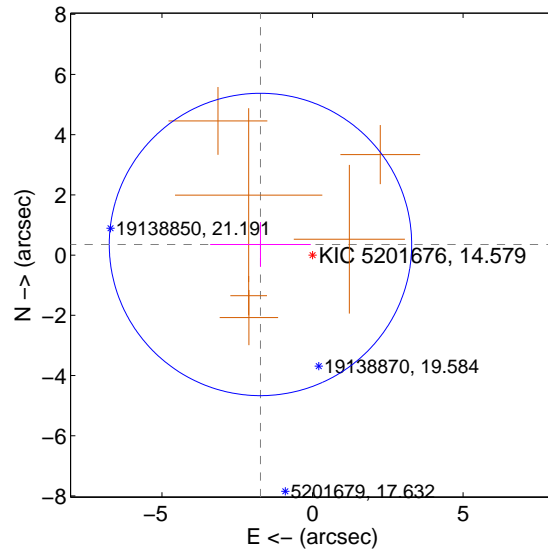
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.838 \pm 1.621$	1.13	$1.712 \pm 1.685$	$0.668 \pm 0.822$
PRF-fit source offset from KIC position	$1.765 \pm 1.674$	1.05	$1.729 \pm 1.672$	$0.353 \pm 0.744$
photometric centroid source offset	$0.40 \pm 0.87$	0.47	$-0.09 \pm 0.85$	$-0.39 \pm 0.87$

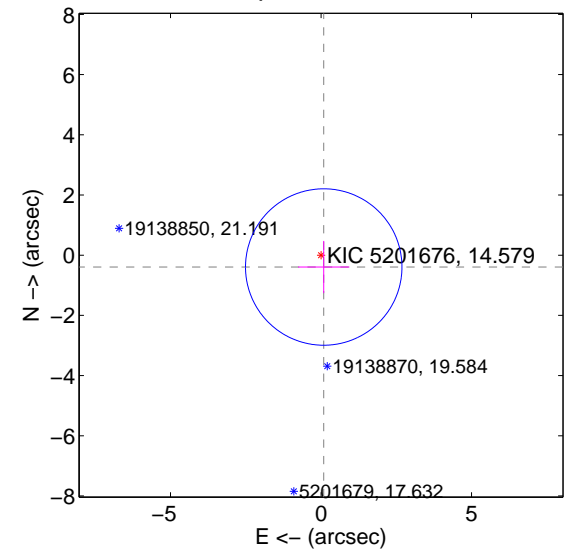
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

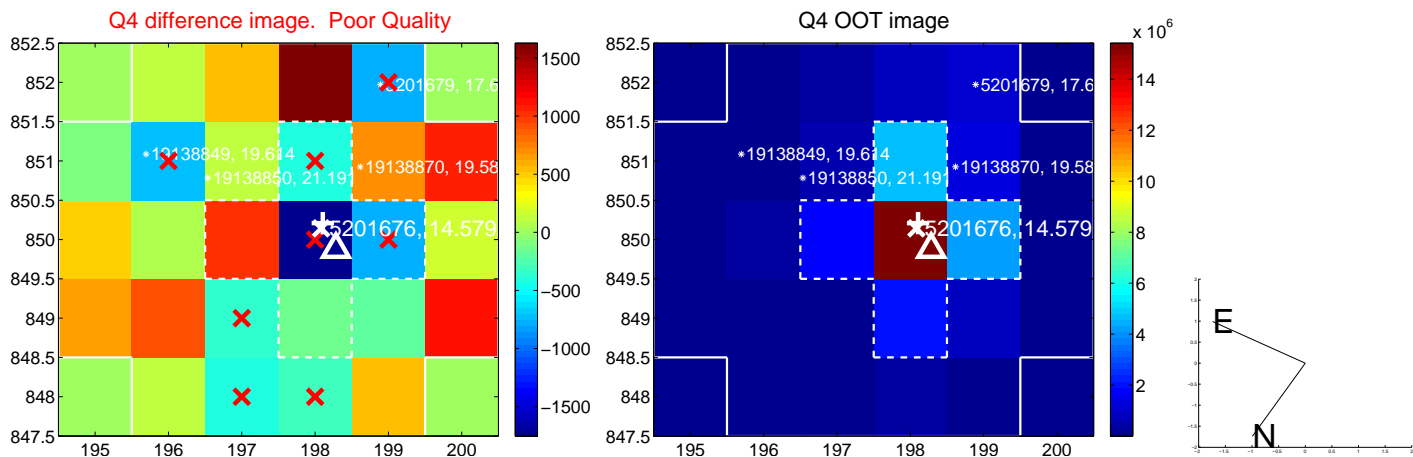
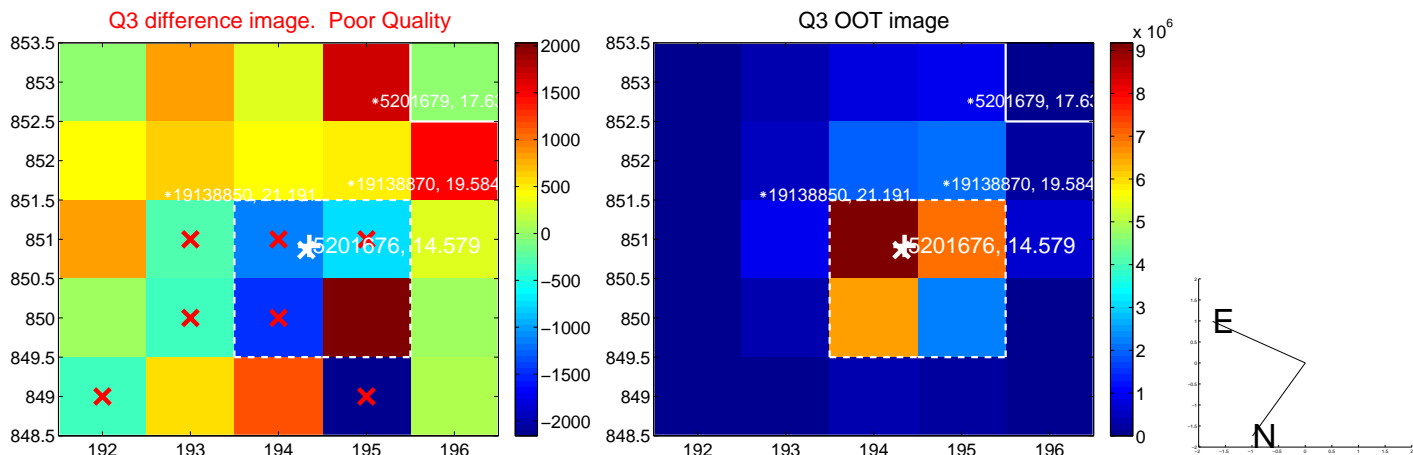
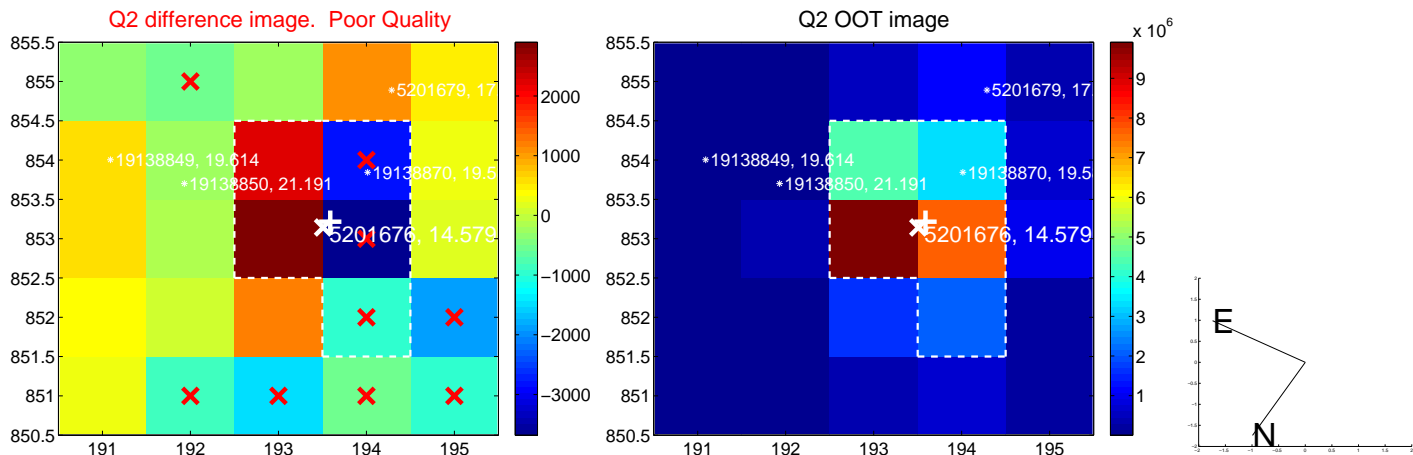
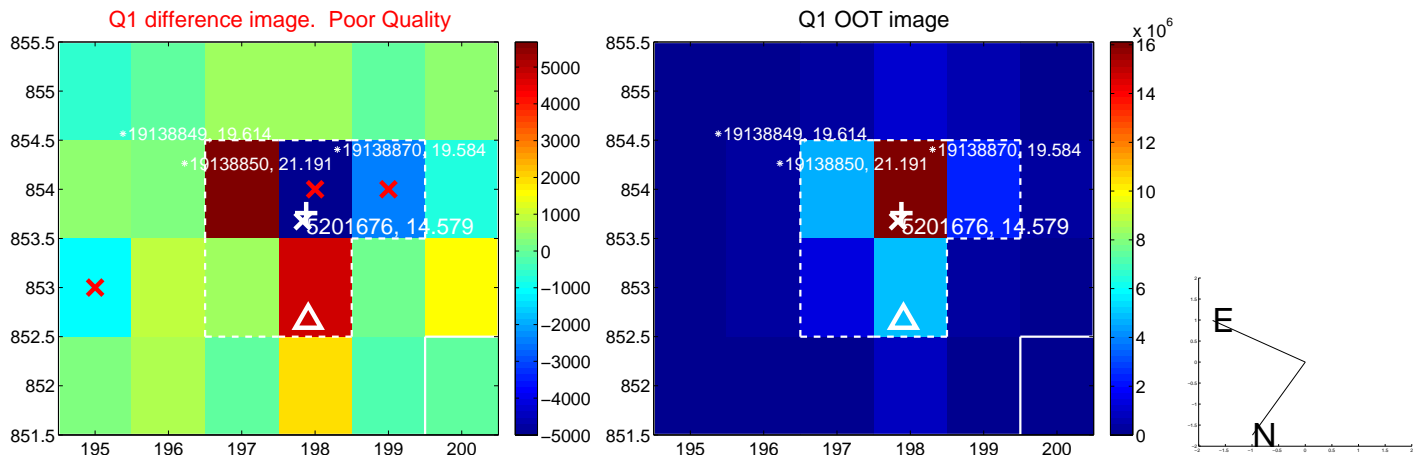


offset from photometric centroids

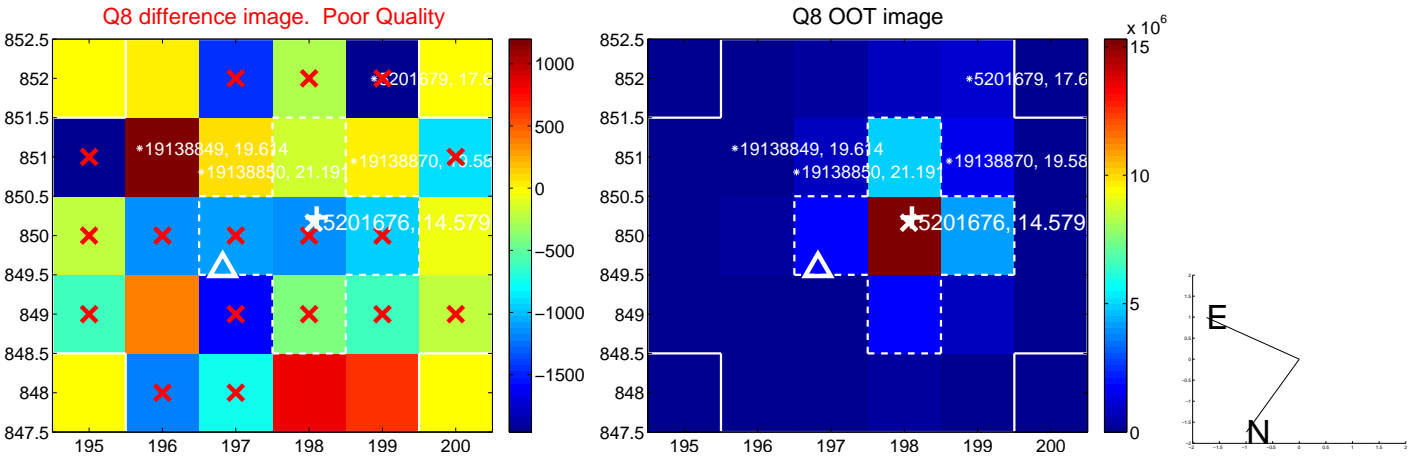
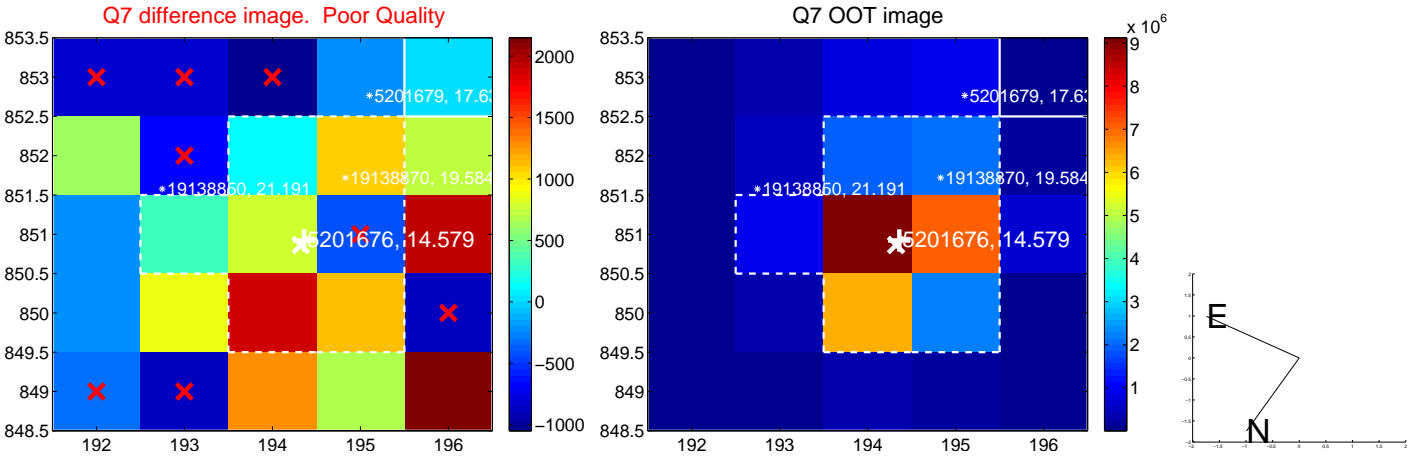
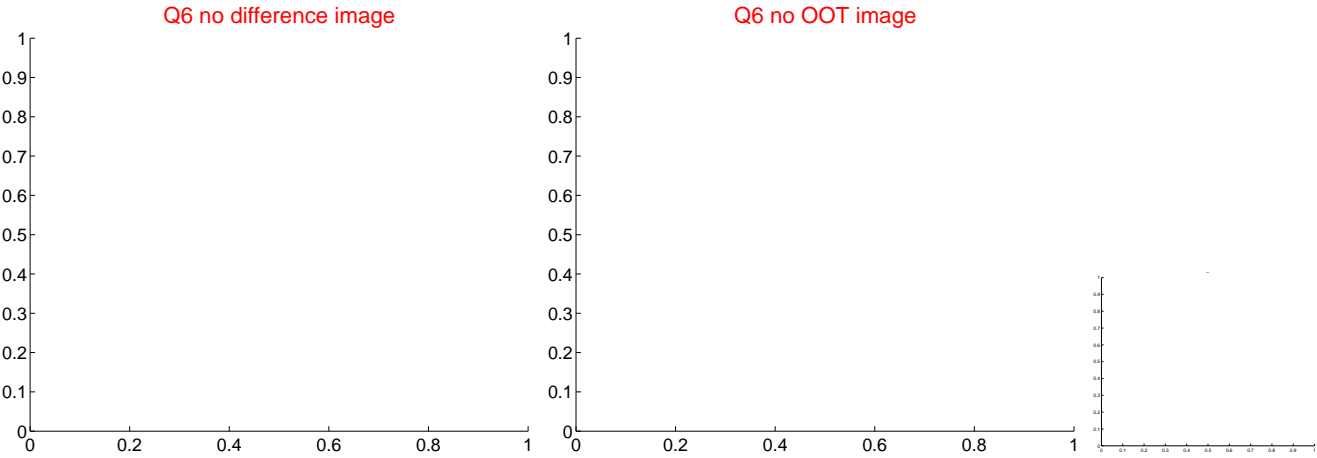
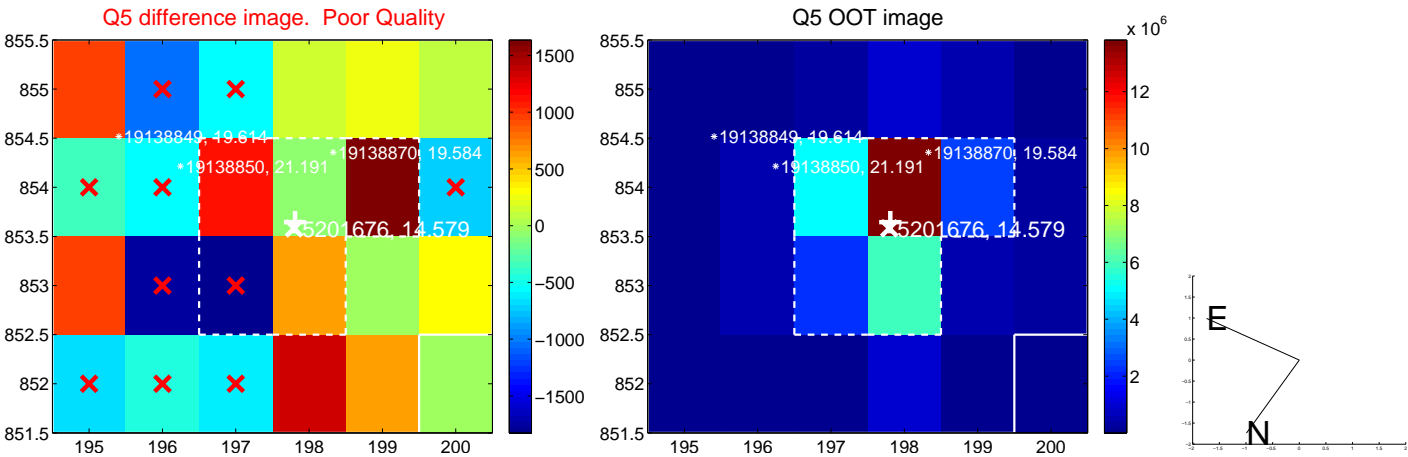


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

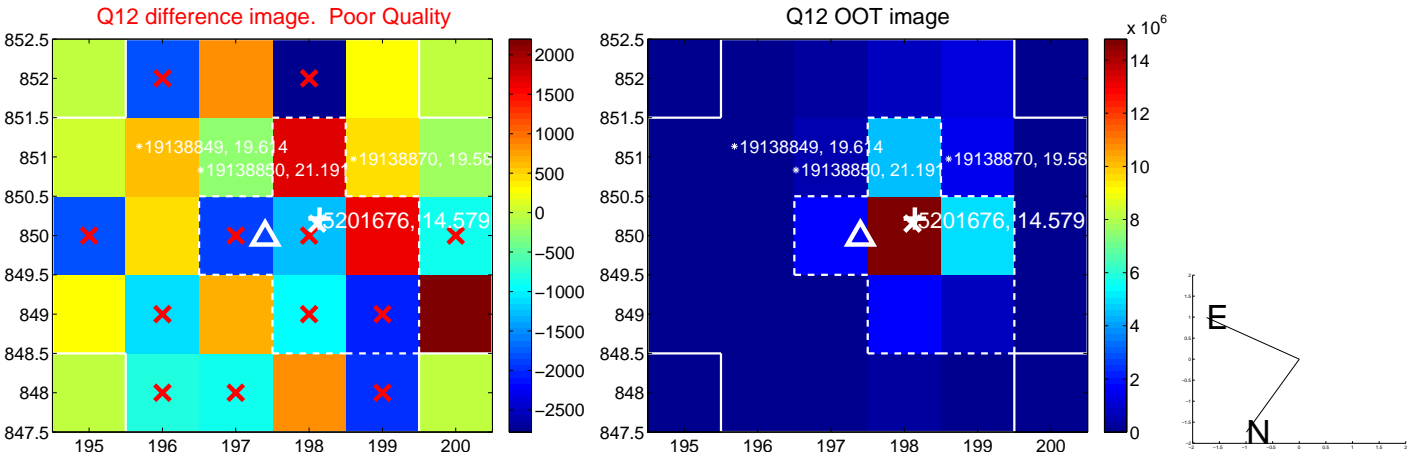
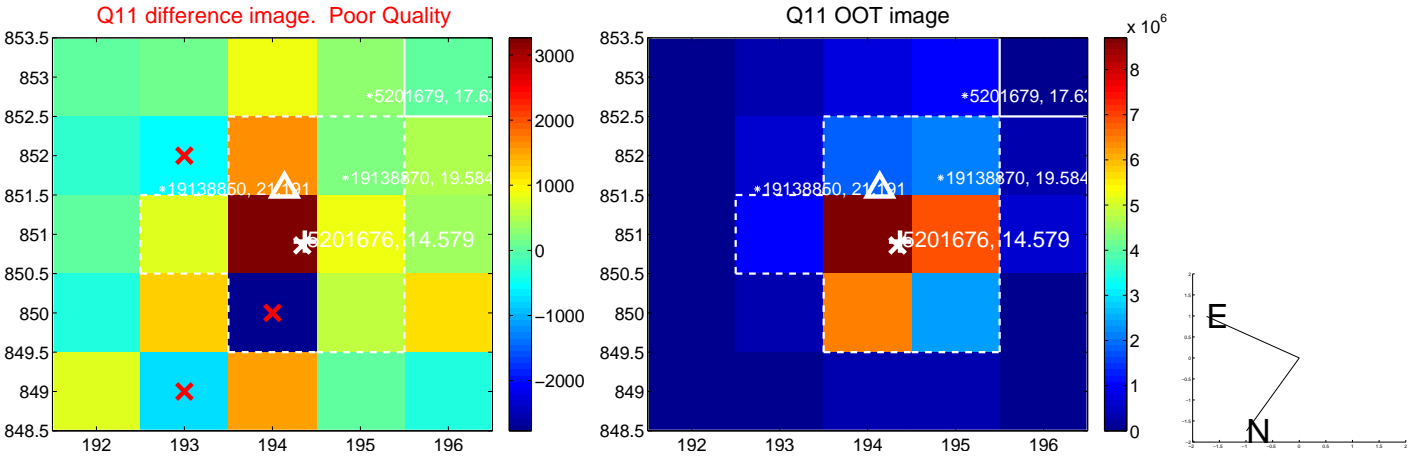
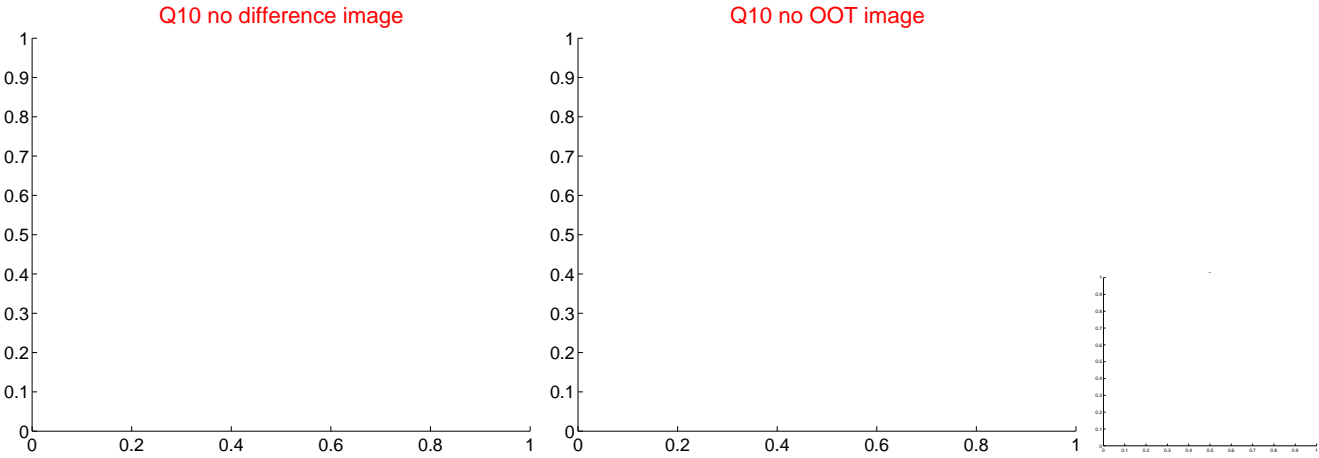
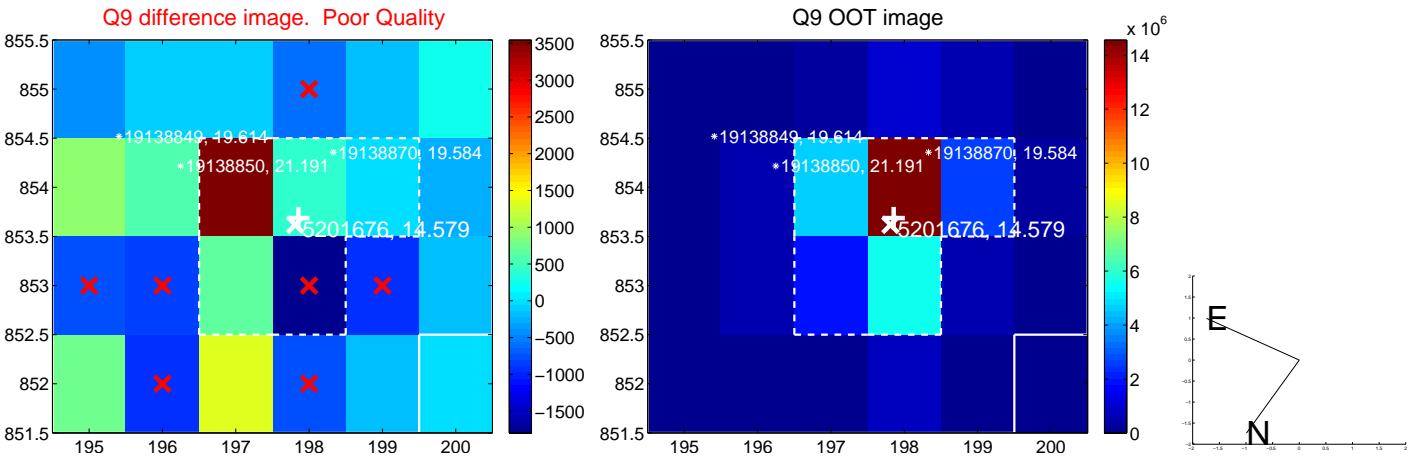
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



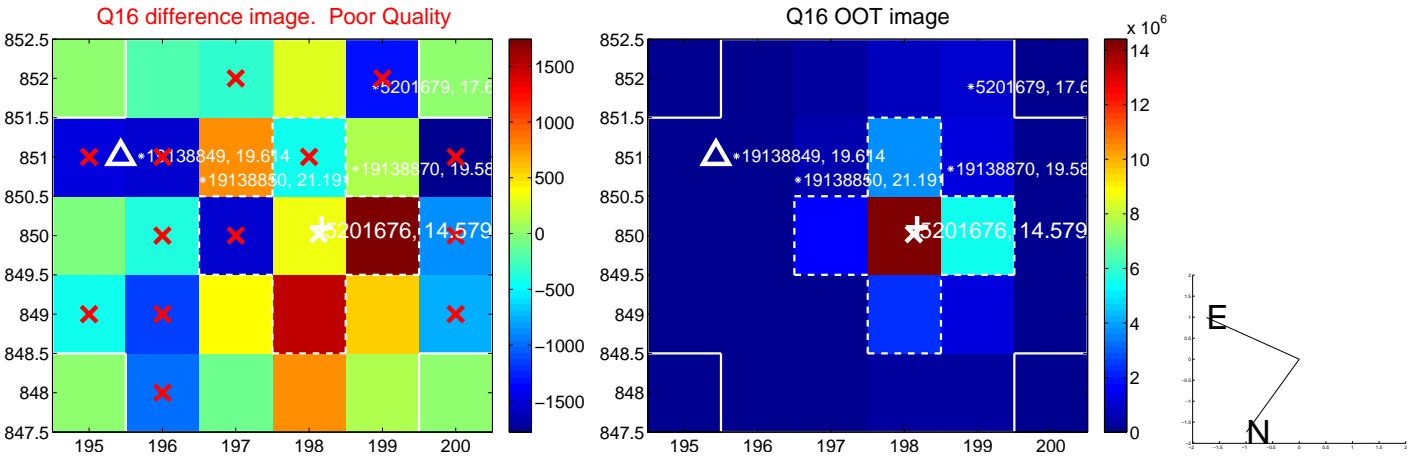
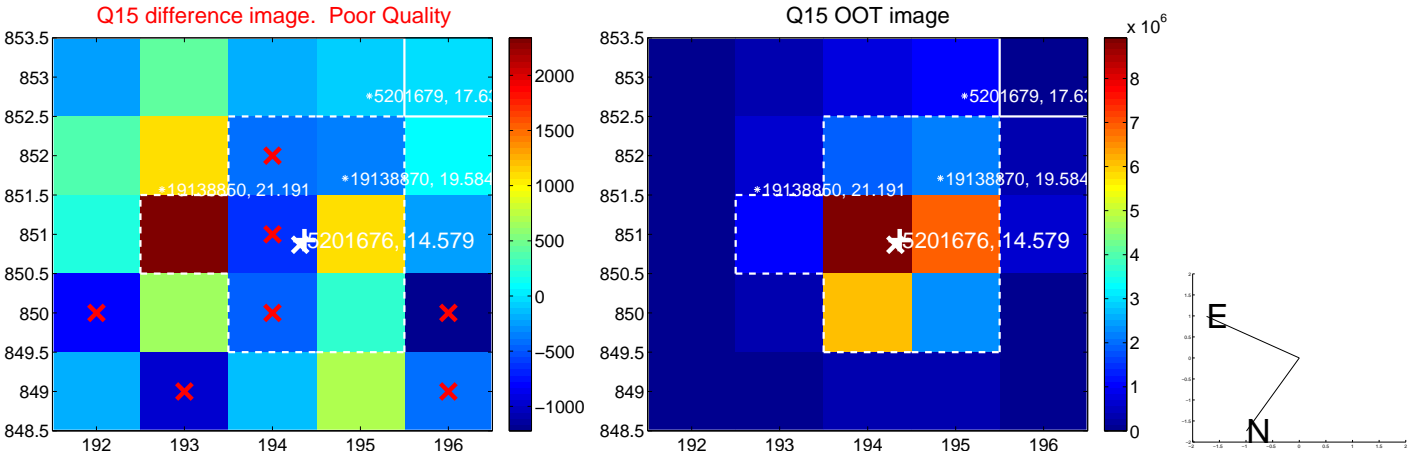
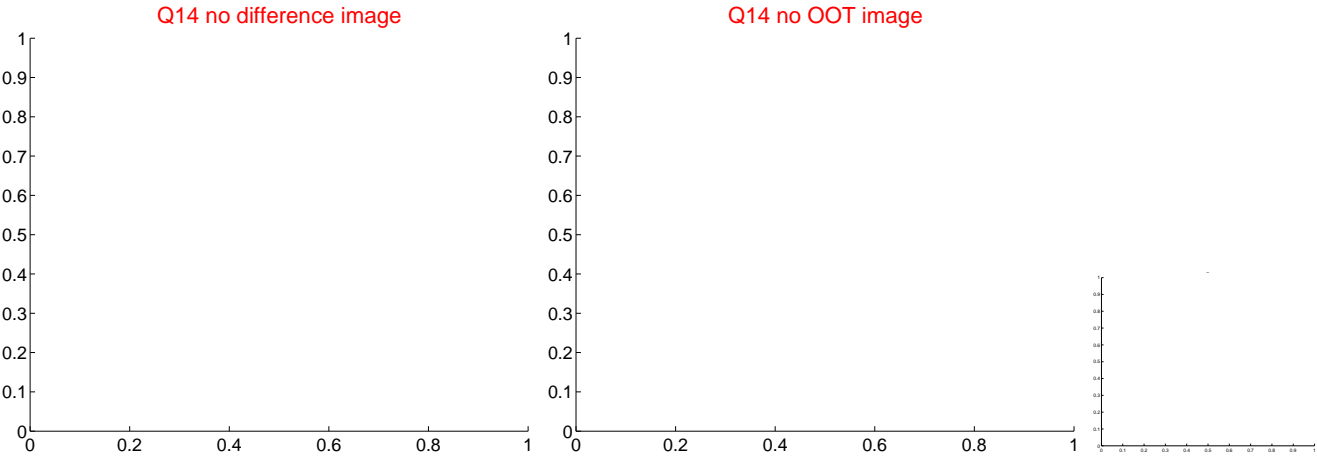
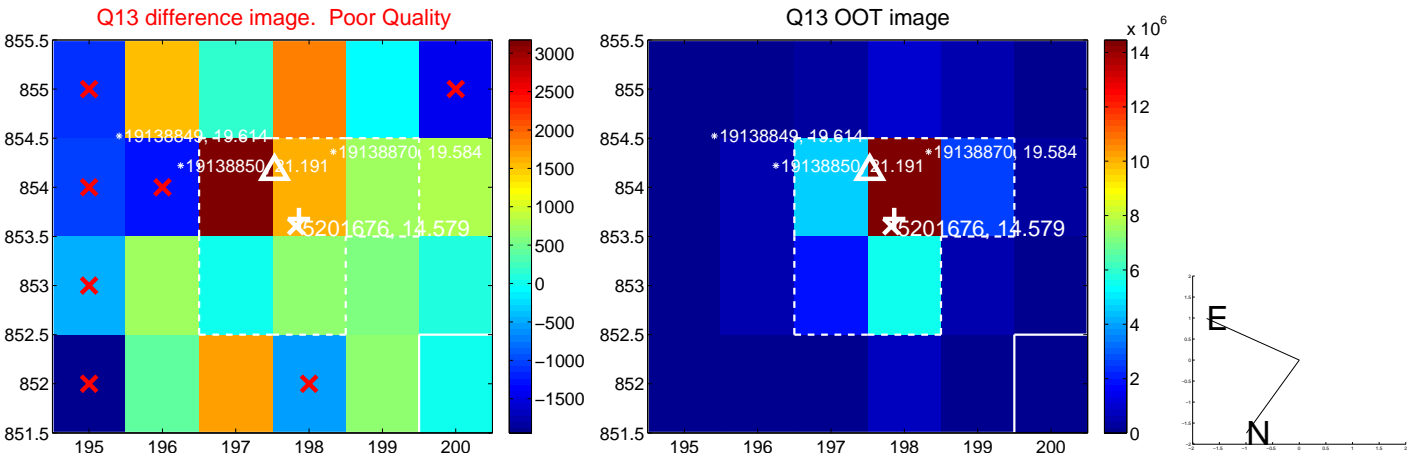
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

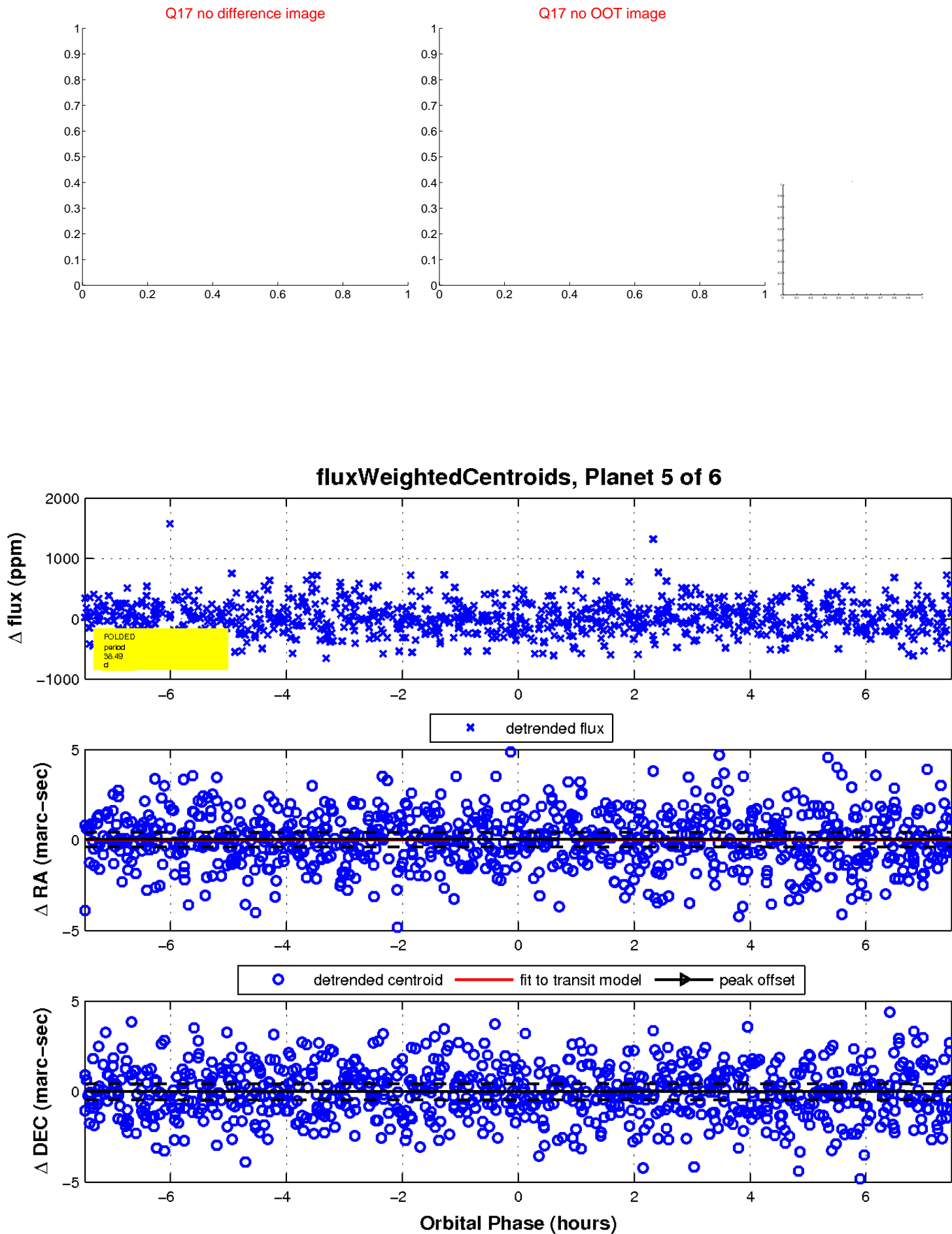


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



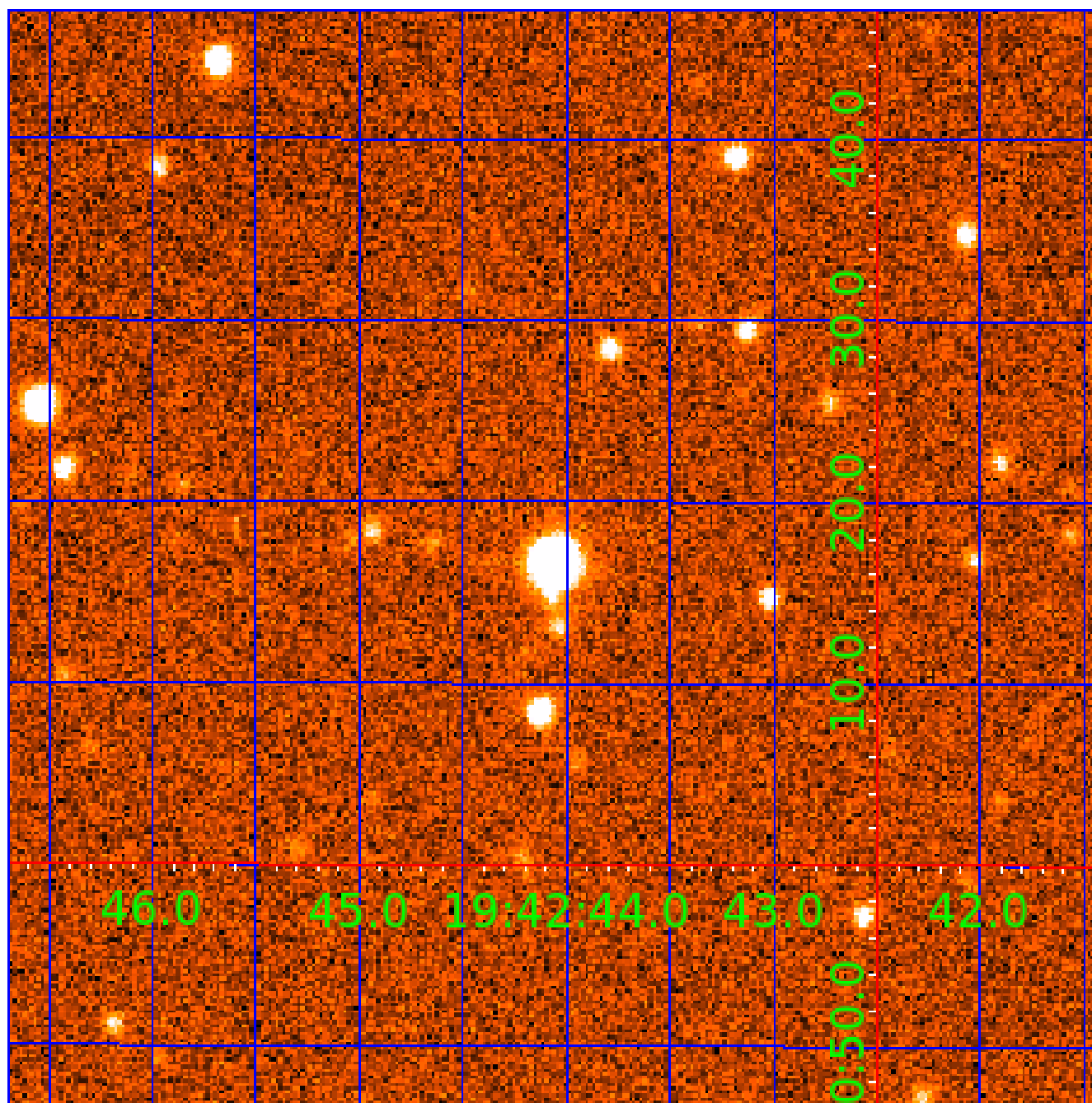


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005201676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005201676-01	OBS	No	0.507258	131.778963	21.4	3.394	7.5	6.9	0.83	5313	0.38	3650.72
005201676-02	OBS	No	64.752245	158.383778	557.4	2.087	10.6	7.3	0.83	5313	2.03	5.68
005201676-03	OBS	No	44.064164	170.009561	569.7	1.908	9.1	8.9	0.83	5313	1.95	9.49
005201676-04	OBS	No	41.127838	159.376060	585.6	2.659	10.2	8.3	0.83	5313	2.16	10.40
005201676-05	OBS	No	38.492105	162.554544	447.3	2.494	10.4	7.1	0.83	5313	1.86	11.36
005201676-06	OBS	No	48.833715	136.979224	902.2	1.143	10.3	8.2	0.83	5313	2.47	8.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005201676-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
005201676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
005201676-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005201676-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

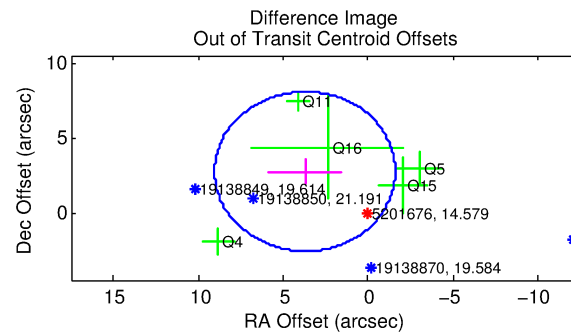
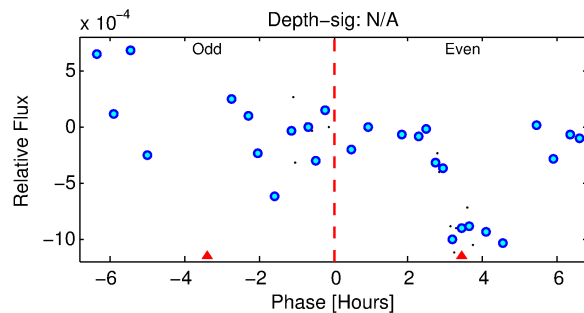
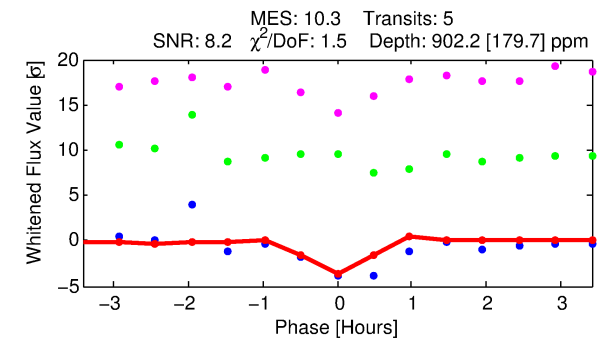
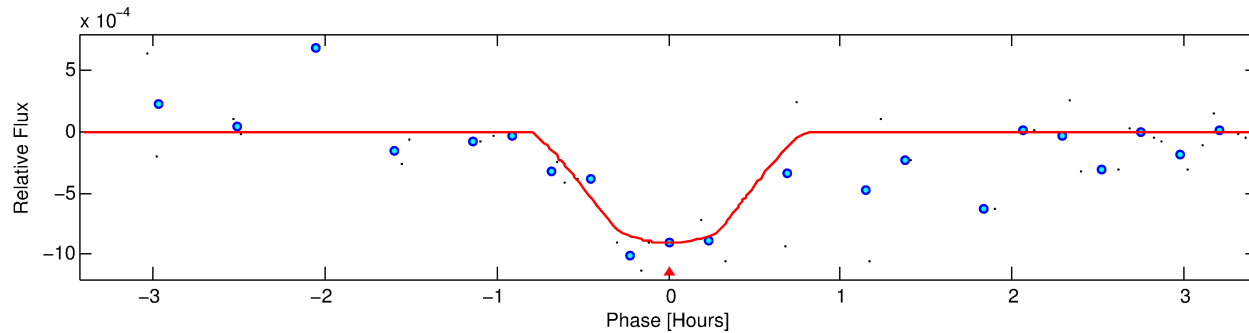
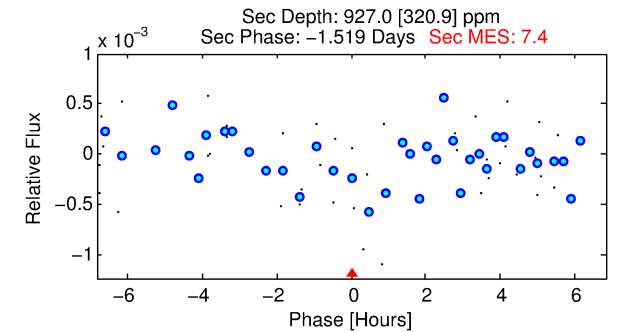
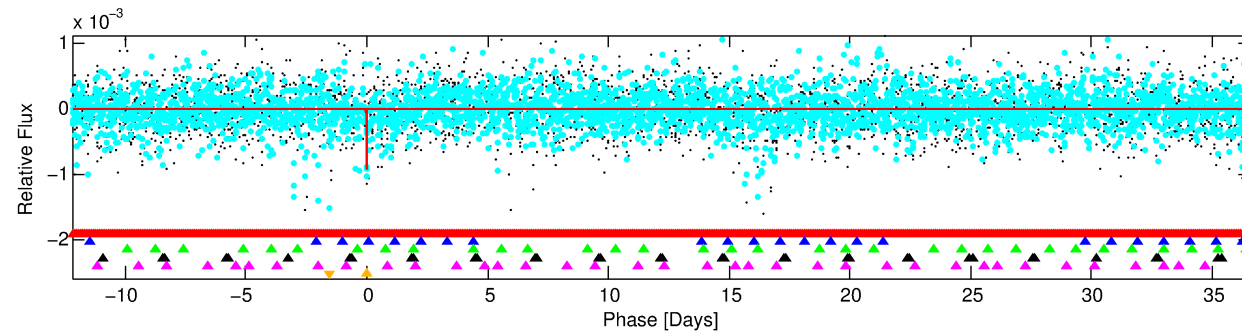
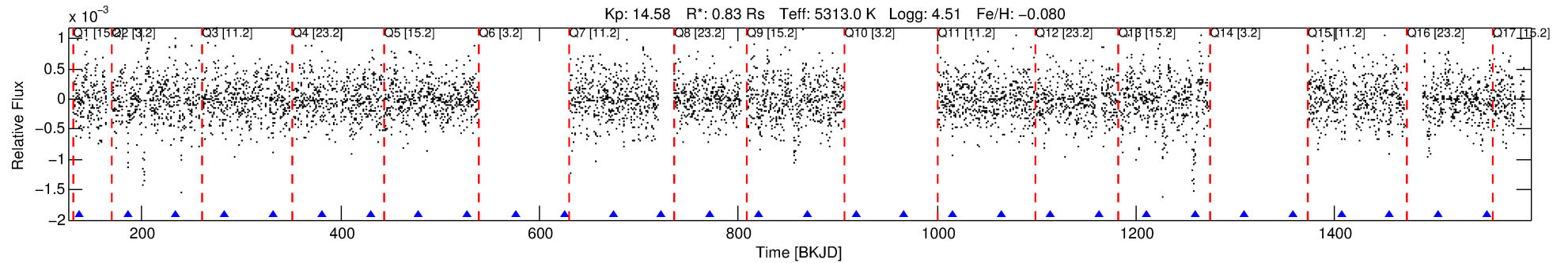
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005201676-06

No Significant Match Found

# DV One-Page Summary

KIC: 5201676 Candidate: 6 of 6 Period: 48.834 d



## DV Fit Results:

Period = 48.83371 [0.00030] d  
Epoch = 136.9792 [0.0049] BKJD  
Rp/R\* = 0.0271 [0.0628]  
a/R\* = 335.18 [2932.61]  
b = 0.03 [284.19]  
Seff = 8.27 [1.85]  
Teq = 432 [24] K  
Rp = 2.47 [5.73] Re  
a = 0.2447 [0.0323] AU  
Ag = 5019.10 [23329.87] [0.22 $\sigma$ ]  
Teff = 5628 [6537] K [0.79 $\sigma$ ]

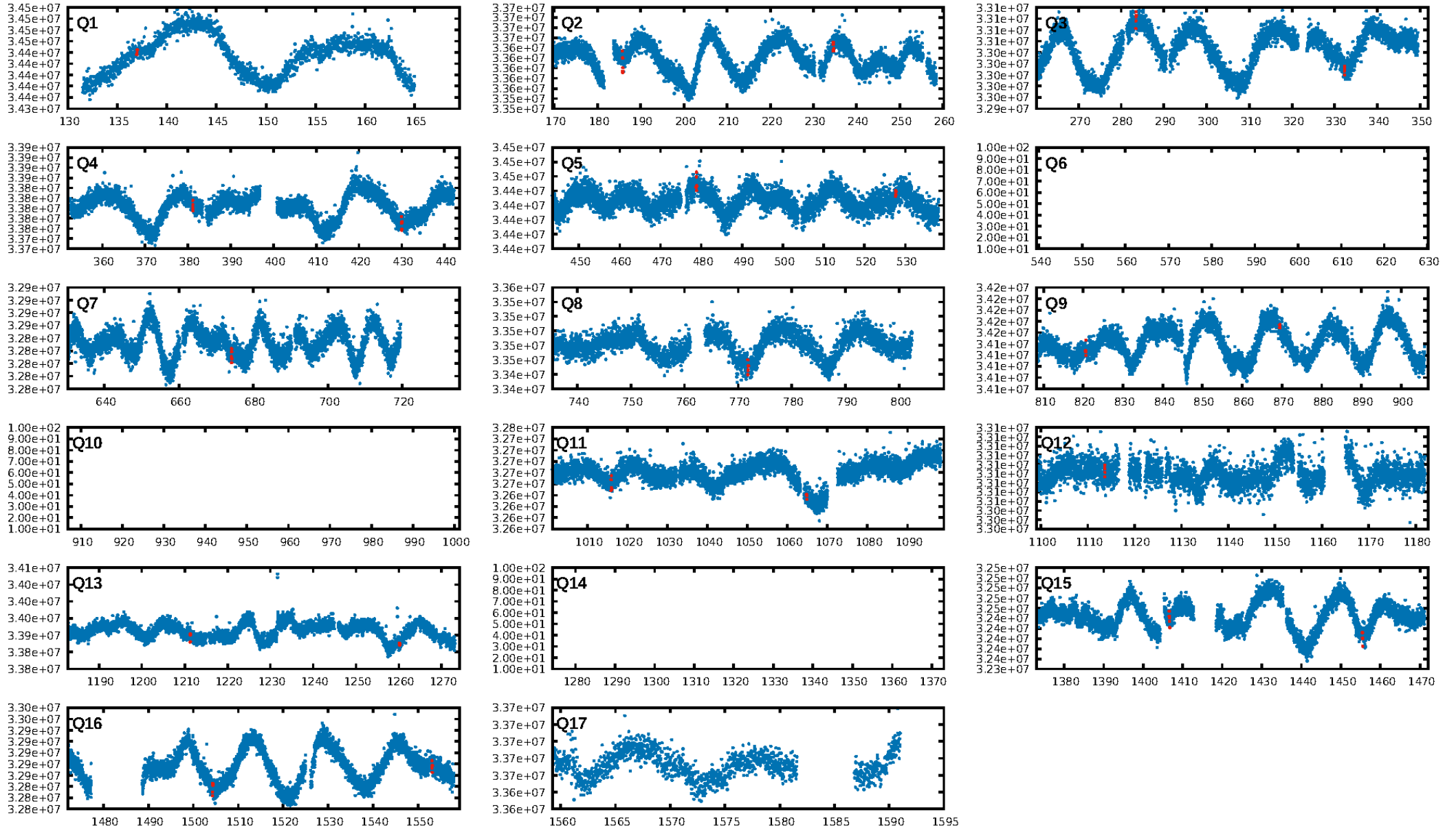
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [51.47 $\sigma$ ]  
LongPeriod-sig: 100.0% [160.58 $\sigma$ ]  
ModelChiSquare2-sig: 62.7%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.08e-10**  
RollingBand-fgt: 1.00 [5/5]  
**GhostDiagnostic-chr: -0.2433**  
Centroid-sig: 30.2%  
Centroid-so: 0.934 arcsec [1.32 $\sigma$ ]  
OotOffset-rm: 4.613 arcsec [2.60 $\sigma$ ]  
KicOffset-rm: 4.443 arcsec [2.43 $\sigma$ ]  
OotOffset-st: 0/2/2/1 [5]  
KicOffset-st: 0/2/2/1 [5]  
DiffImageQuality-fgm: 0.00 [0/5]  
DiffImageOverlap-fno: 0.00 [0/13]

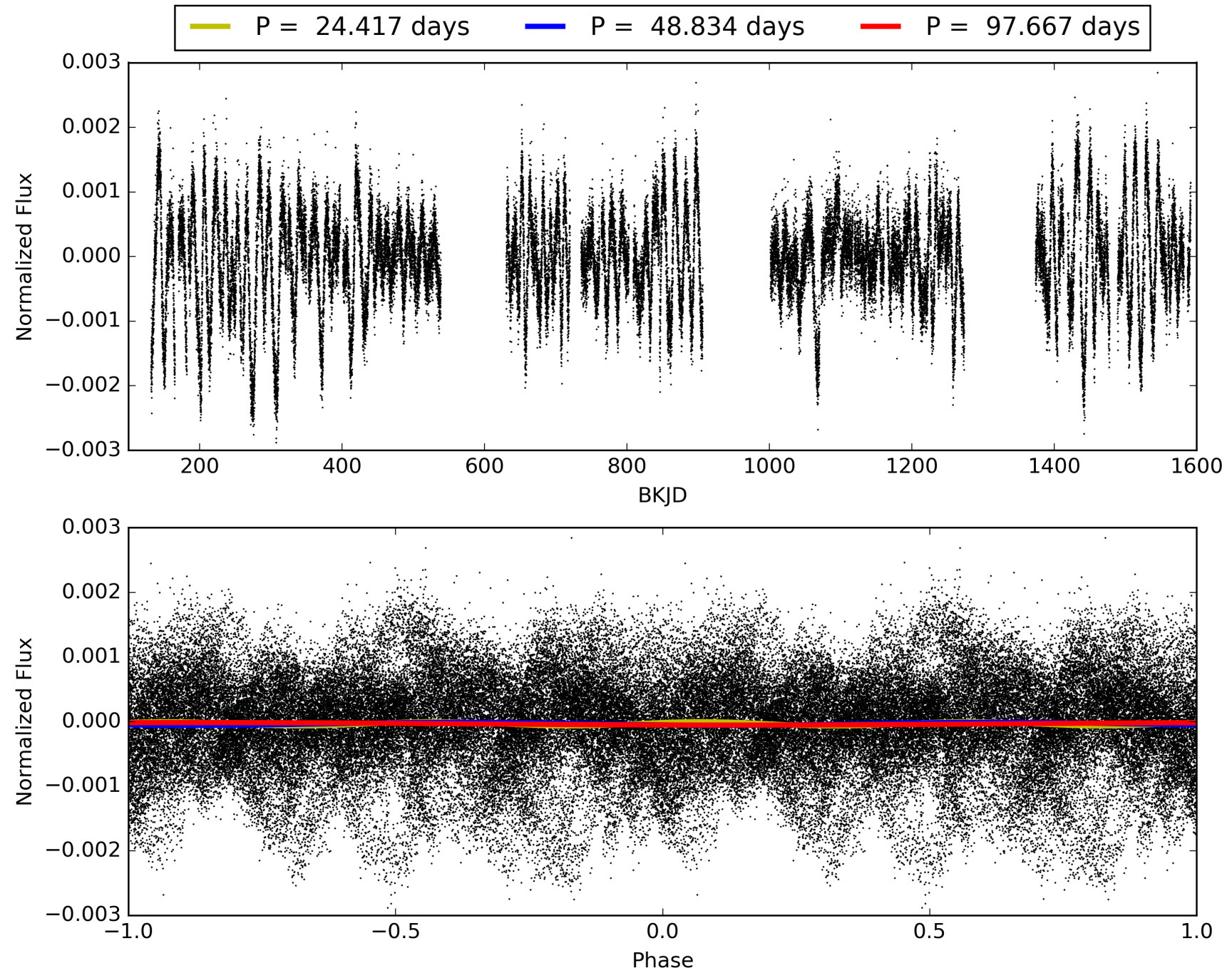
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:16:16 Z

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

# TCE 005201676-06, PDC Light Curves

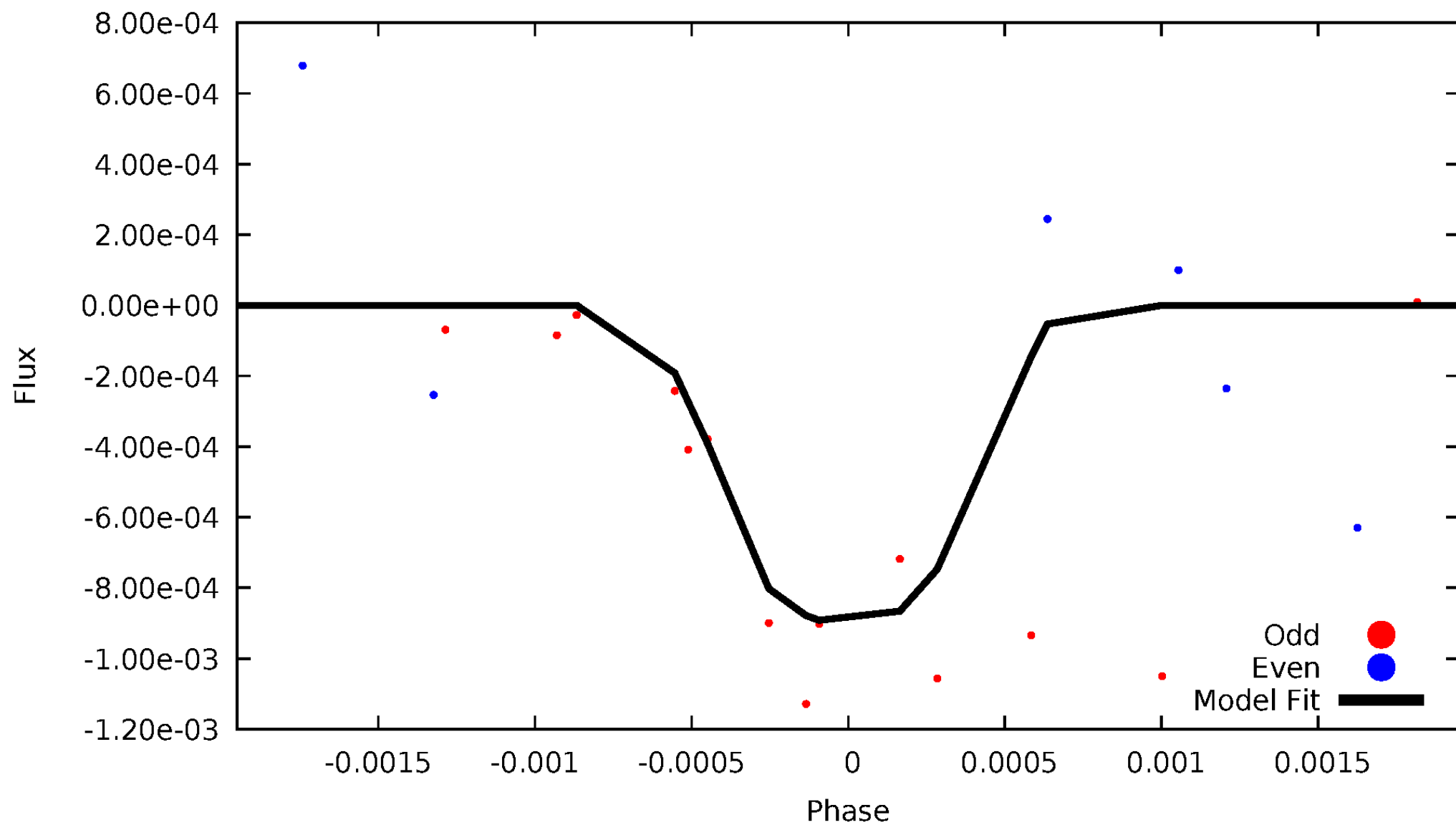


TCE 005201676-06



# DV Odd/Even

TCE 005201676-06





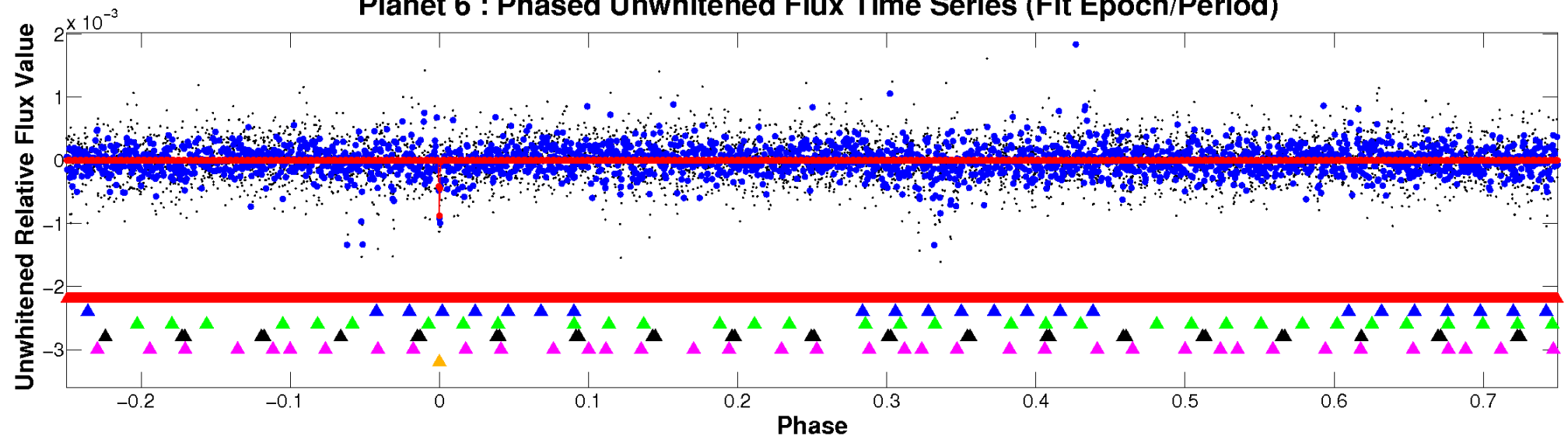


ALT Odd/Even

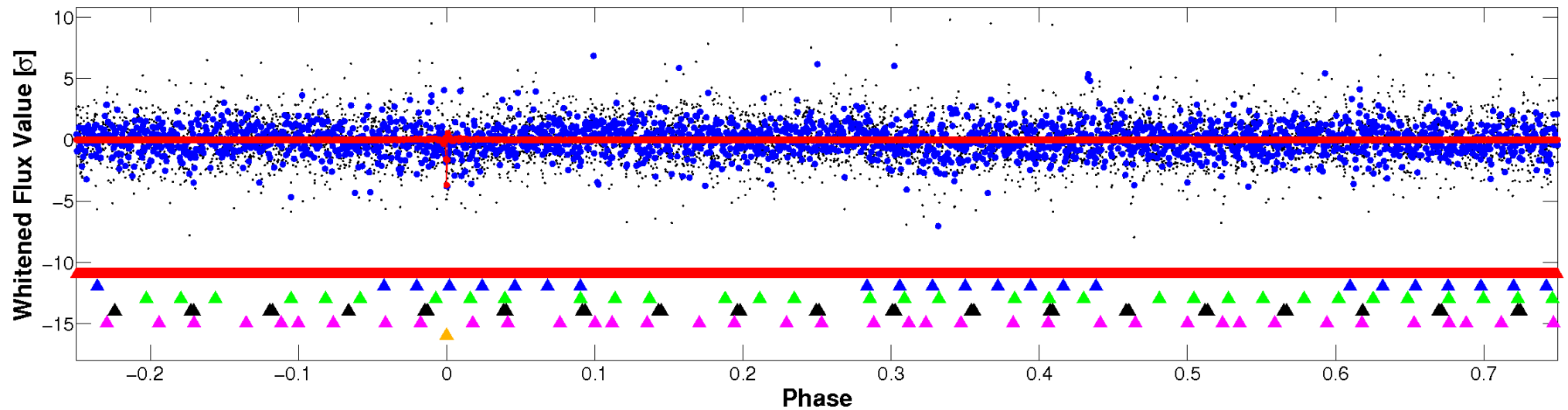
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

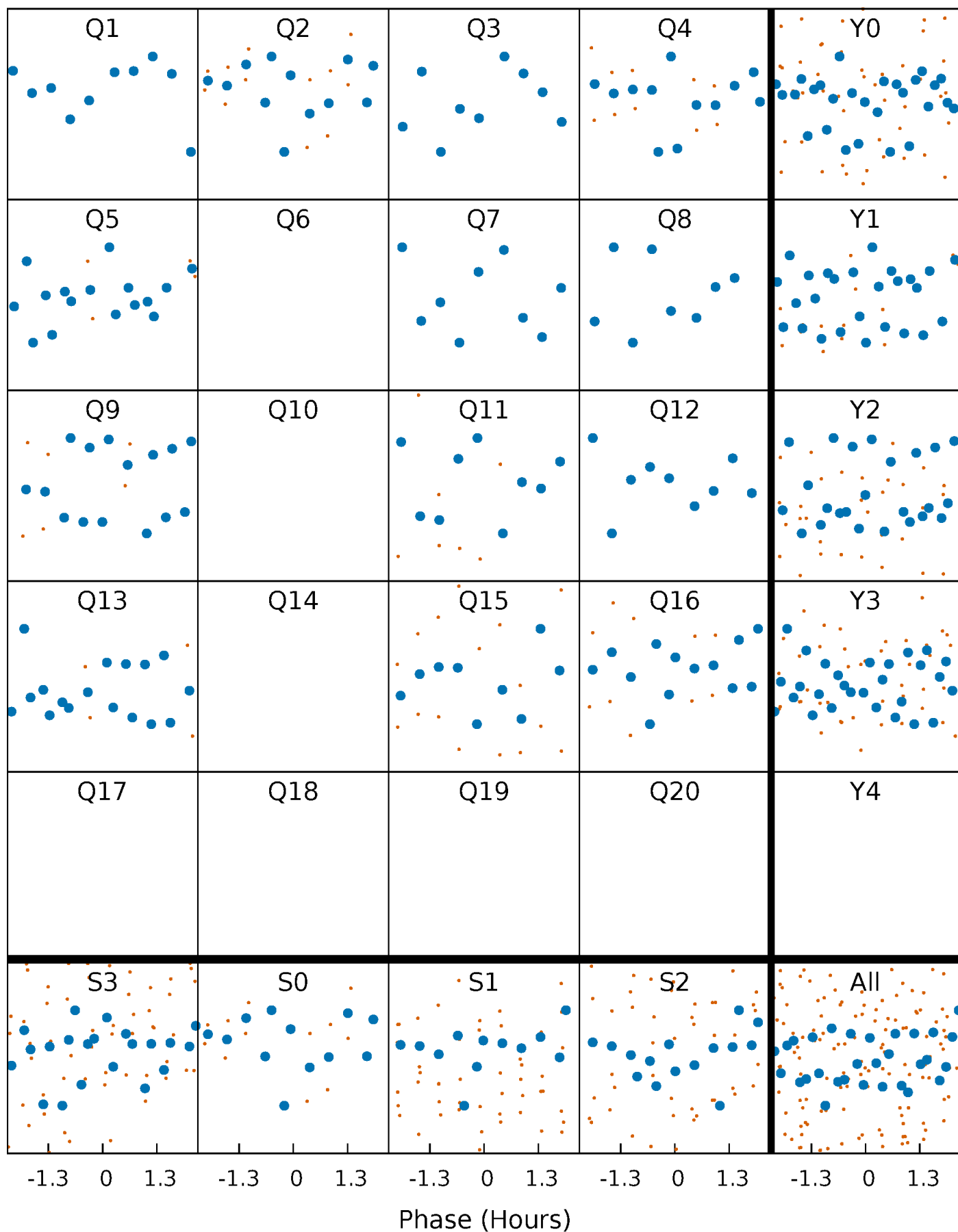


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



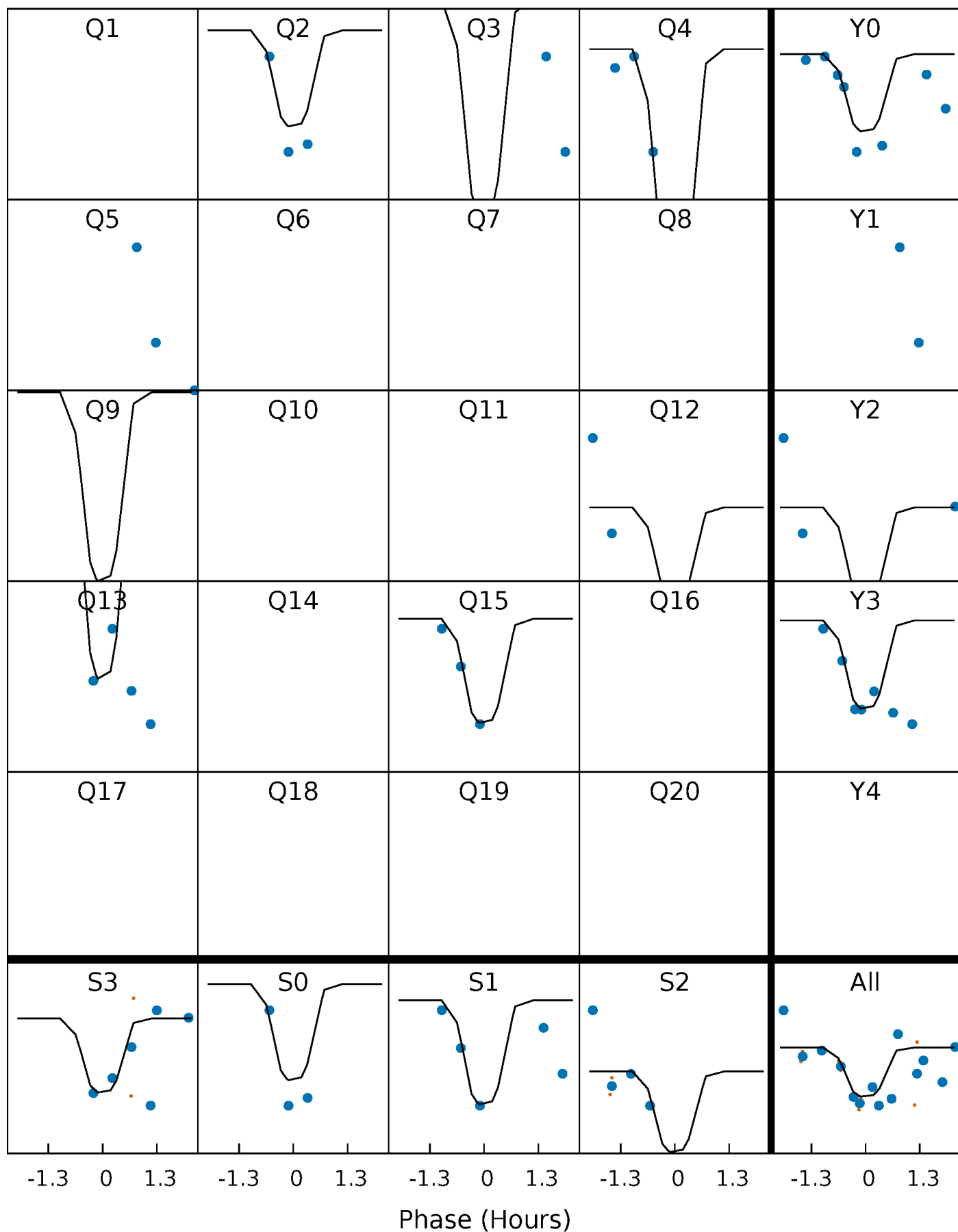
# PDC Quarter-Phased Transit Curves

TCE 005201676-06   P= 48.833715 Days    $T_0=136.979224$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005201676-06 P= 48.833715 Days  $T_0=136.979224$  (BKJD)

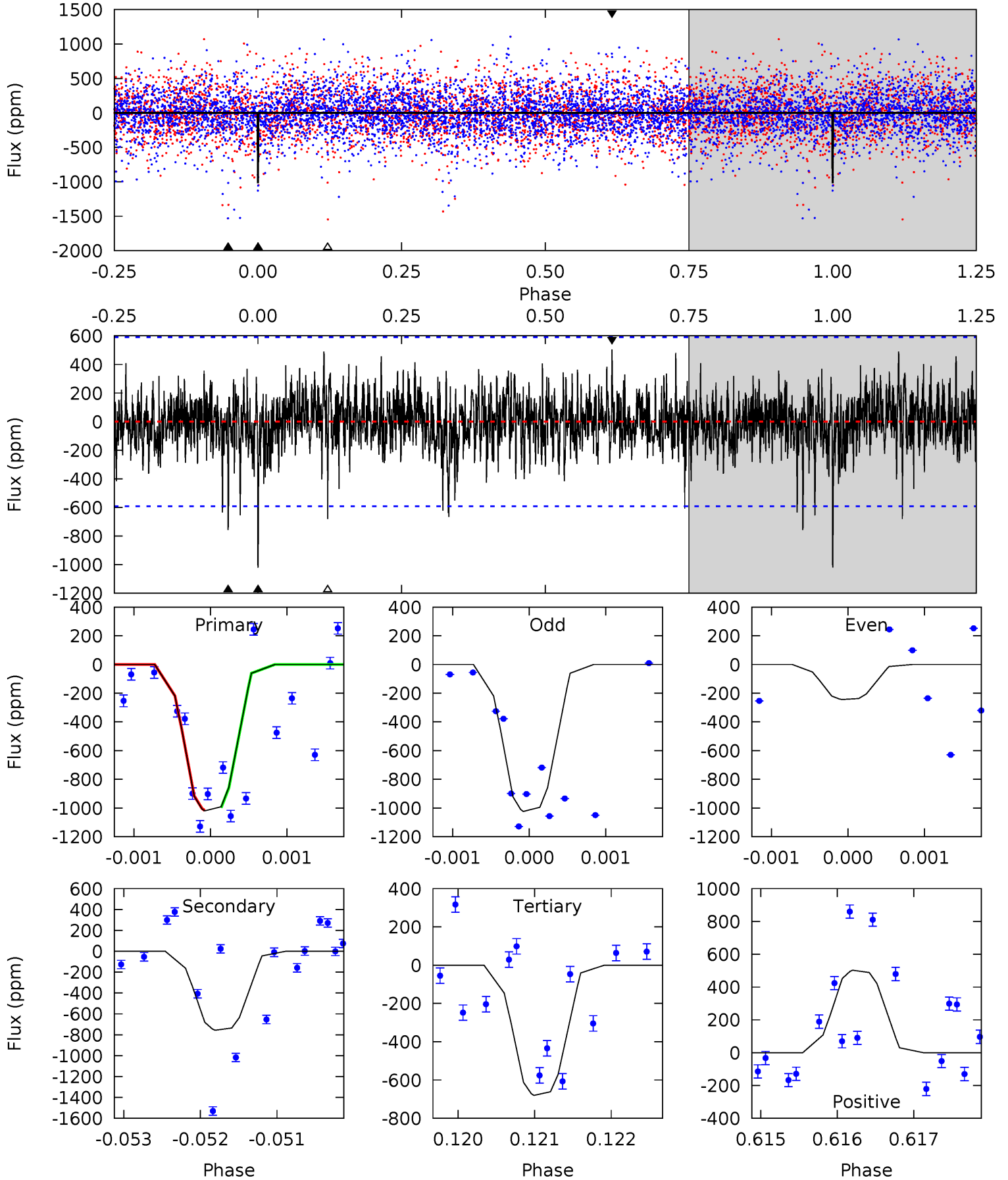


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005201676-06, P = 48.833715 Days, E = 88.145509 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
9.36	6.94	6.24	4.61	5.42	3.24	1.38	3.12	4.75	0.70	2.33	5.03	1.09	0.33	0.09



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005201676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5313^{+159}_{-159}$	$4.510^{+0.076}_{-0.102}$	$-0.080^{+0.300}_{-0.300}$	$0.833^{+0.133}_{-0.092}$	$0.820^{+0.096}_{-0.070}$	$1.998^{+0.689}_{-0.604}$
	+3%/-3%	+2%/-2%	+375%/-375%	+16%/-11%	+12%/-9%	+34%/-30%
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 005201676-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-756 \pm 109$	$4.81^{+5.20}_{-3.33}$	$605^{+29}_{-27}$	$4090^{+2849}_{-860}$	$1034^{+10438}_{-775}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{max}$  = 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

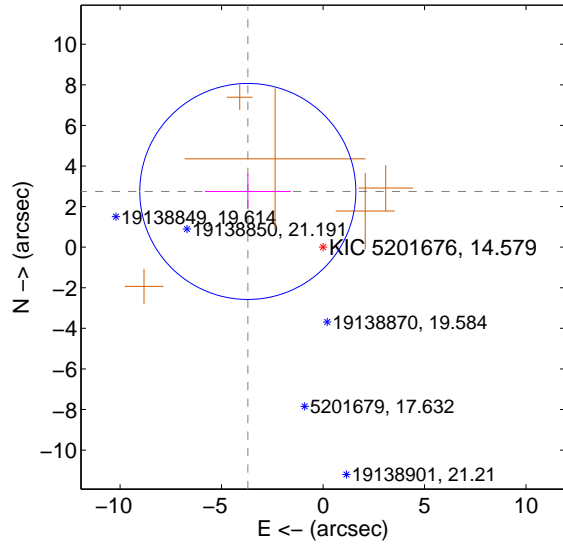
Supplemental centroid analysis for 005201676-06. Kepler magnitude: 14.58. Transit SNR 8.17

There are 0 quarters with good PRF difference image offsets

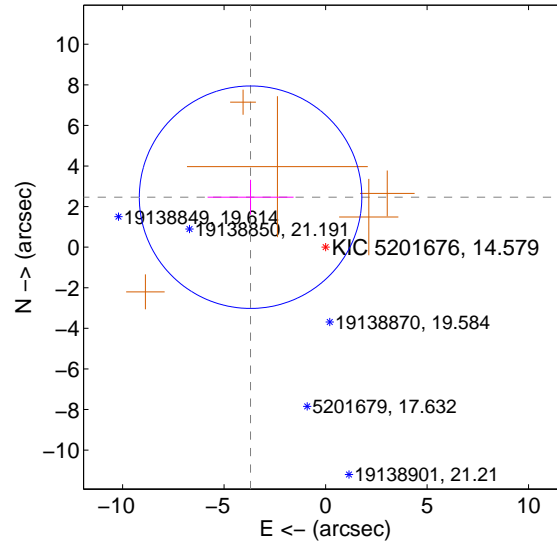
The direct PRF centroid is offset from the target star catalog position by about 0.38 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.613 \pm 1.774$	2.60	$3.707 \pm 2.114$	$2.745 \pm 0.859$
PRF-fit source offset from KIC position	$4.443 \pm 1.827$	2.43	$3.697 \pm 2.120$	$2.463 \pm 0.859$
photometric centroid source offset	$0.93 \pm 0.71$	1.32	$0.76 \pm 0.71$	$-0.54 \pm 0.71$

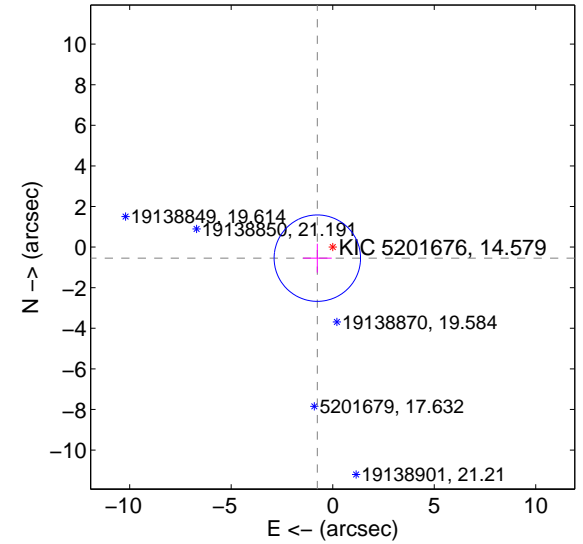
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

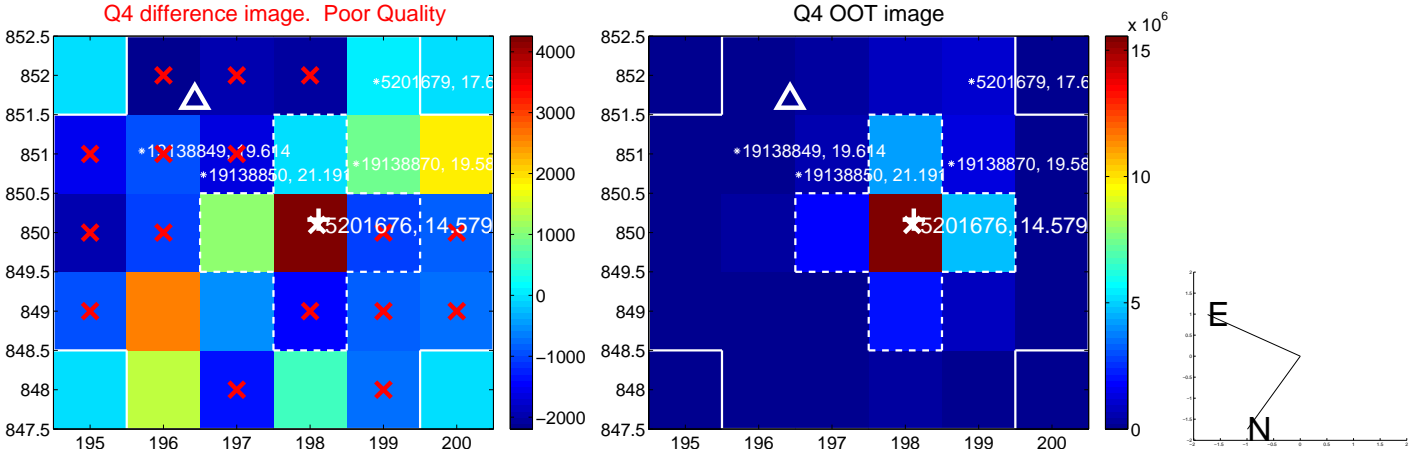
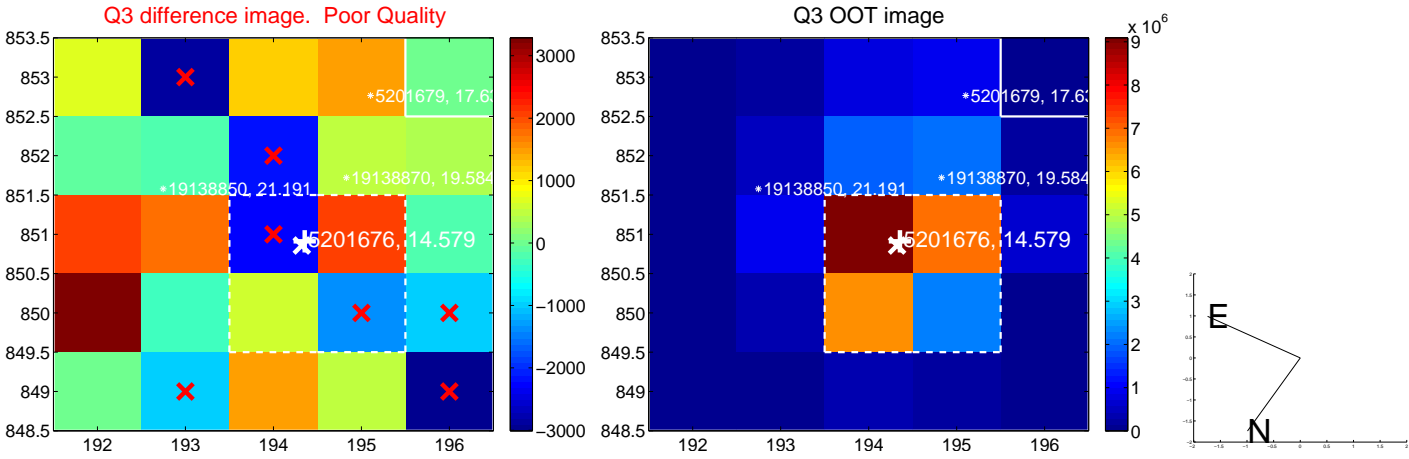
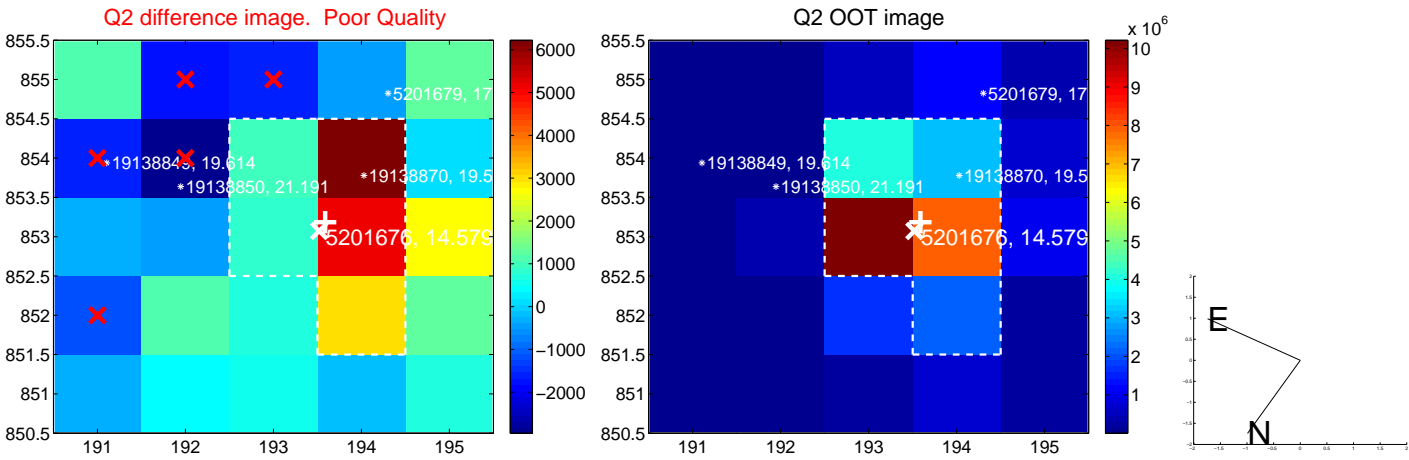
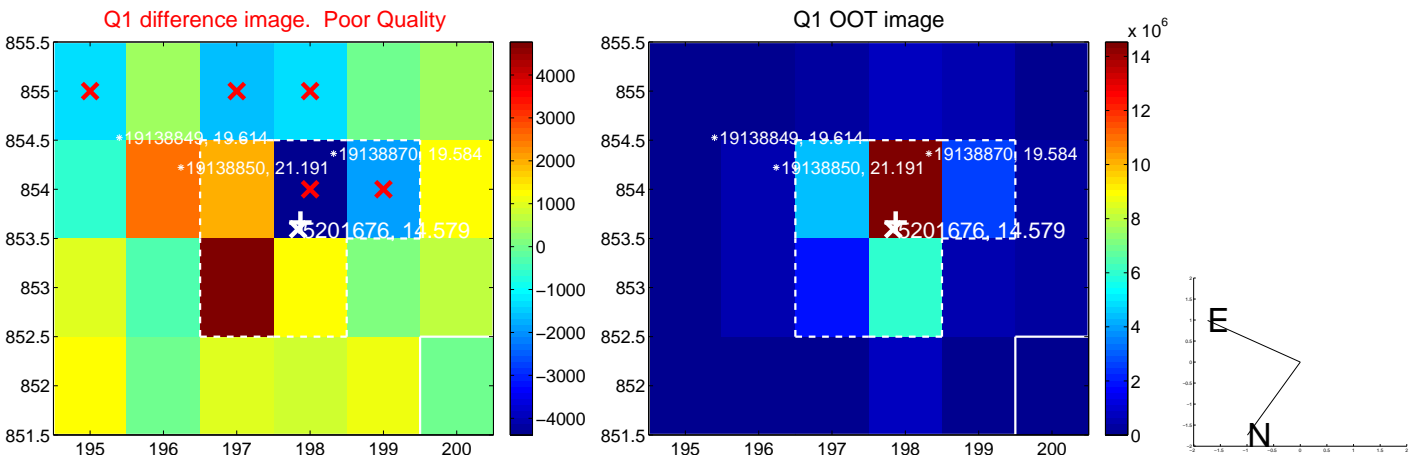


offset from photometric centroids

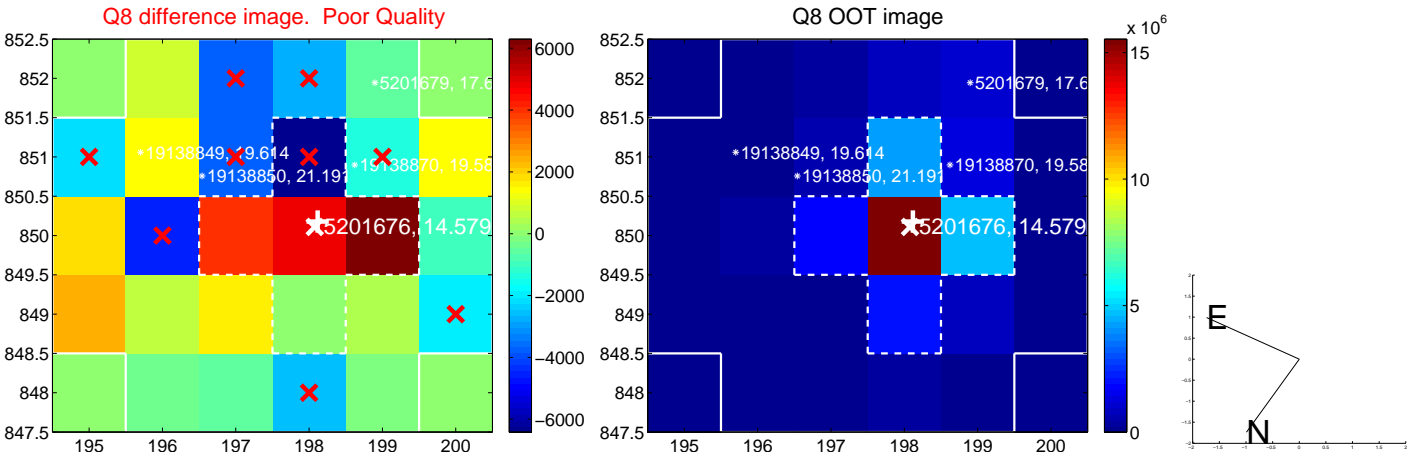
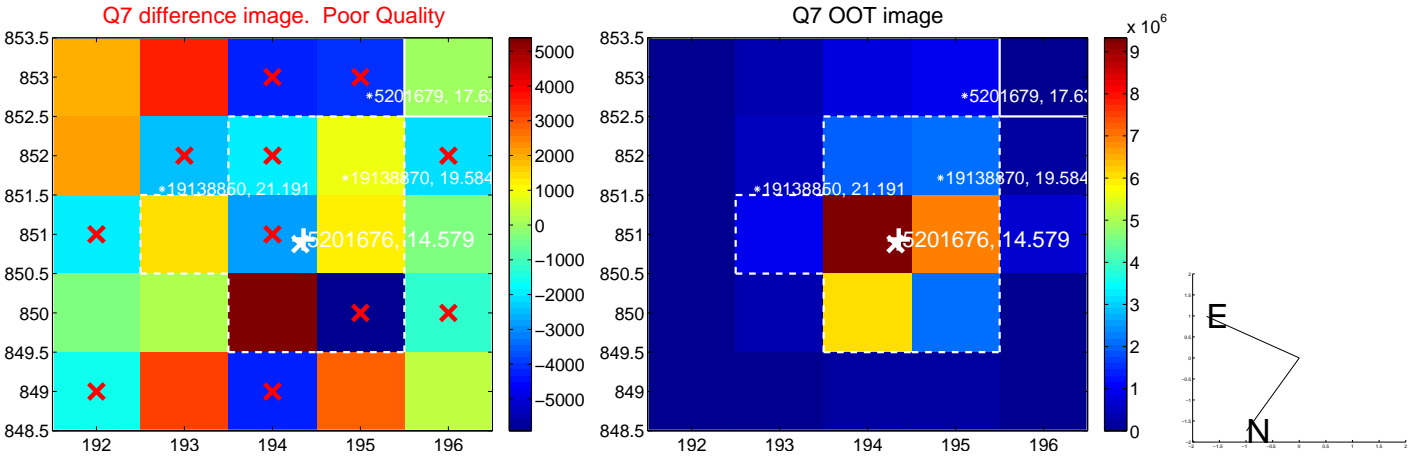
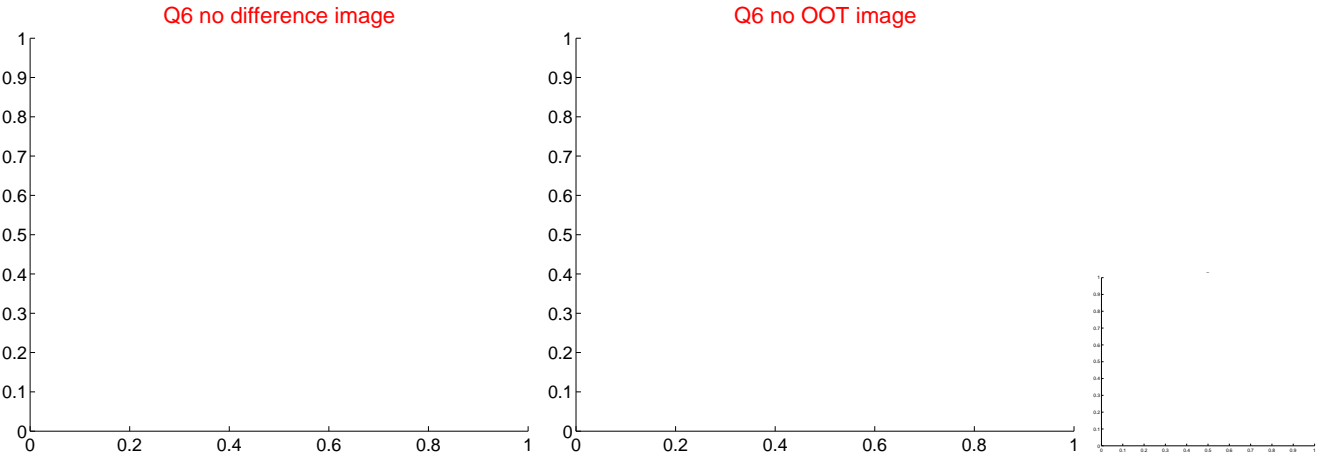
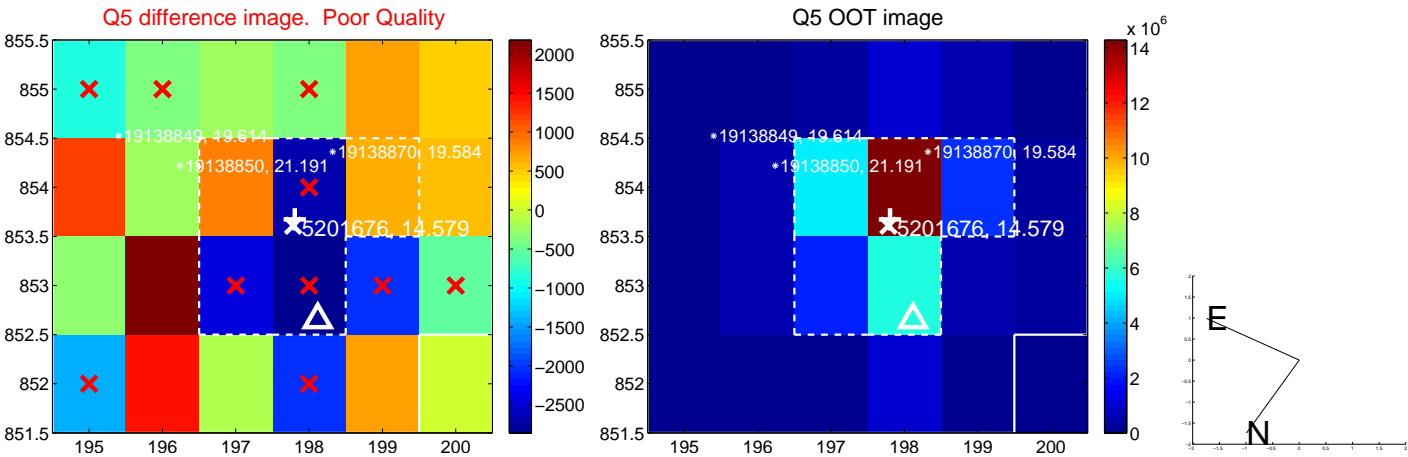


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

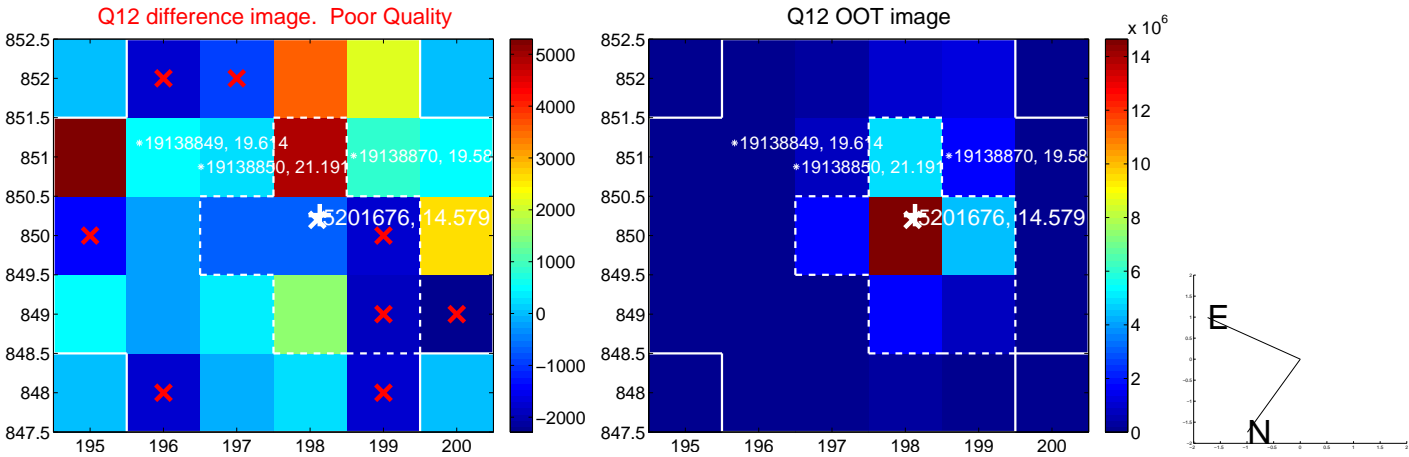
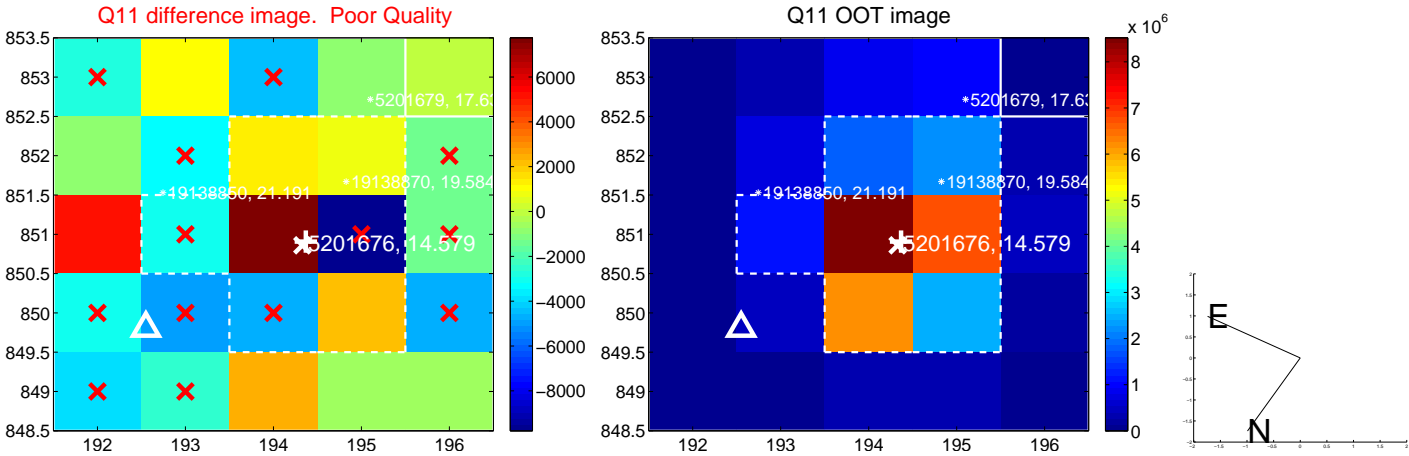
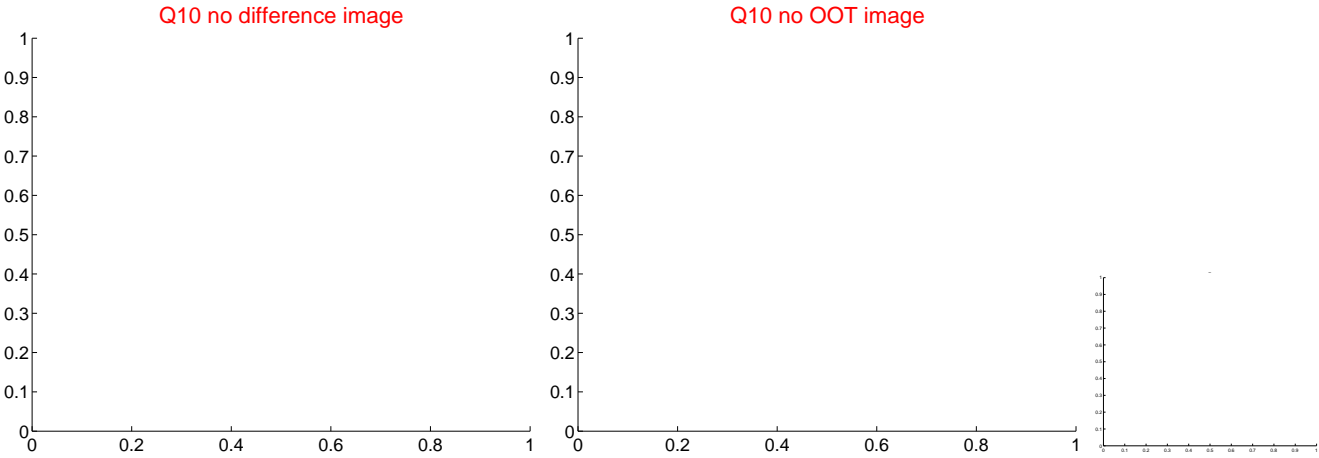
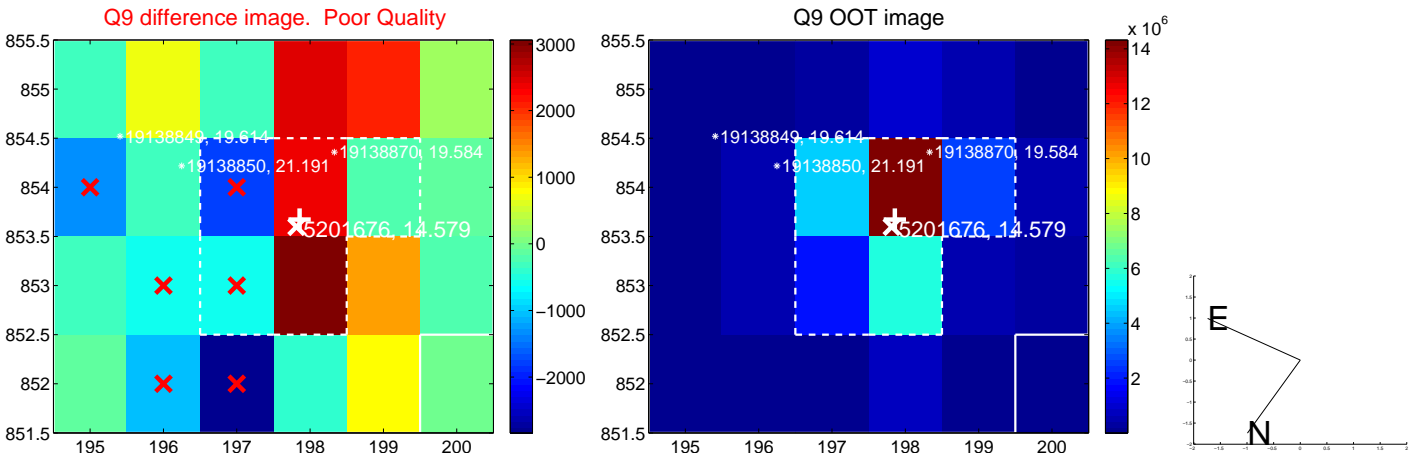
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



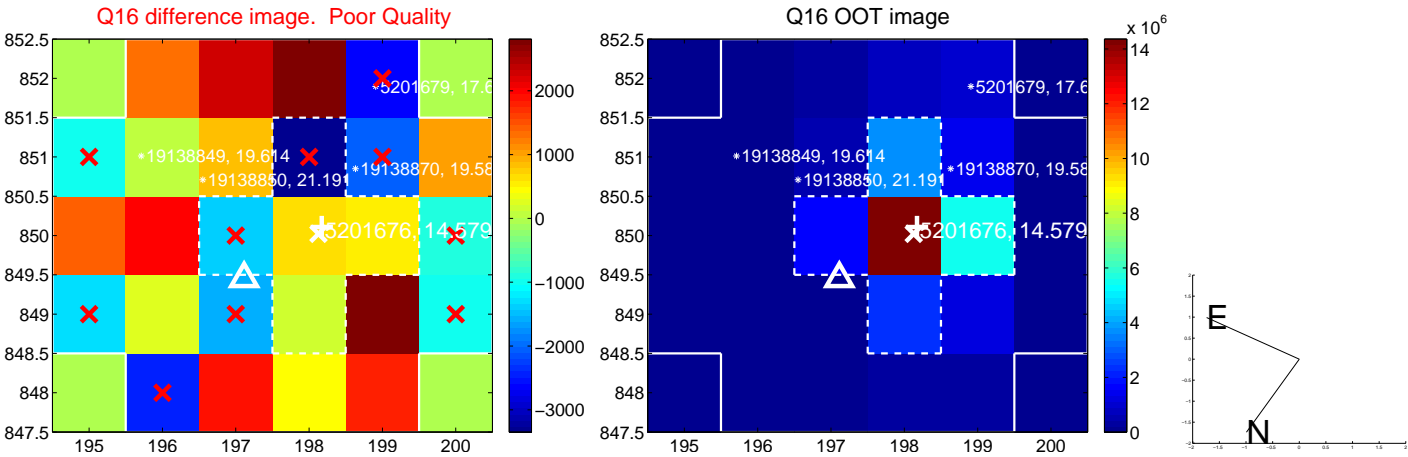
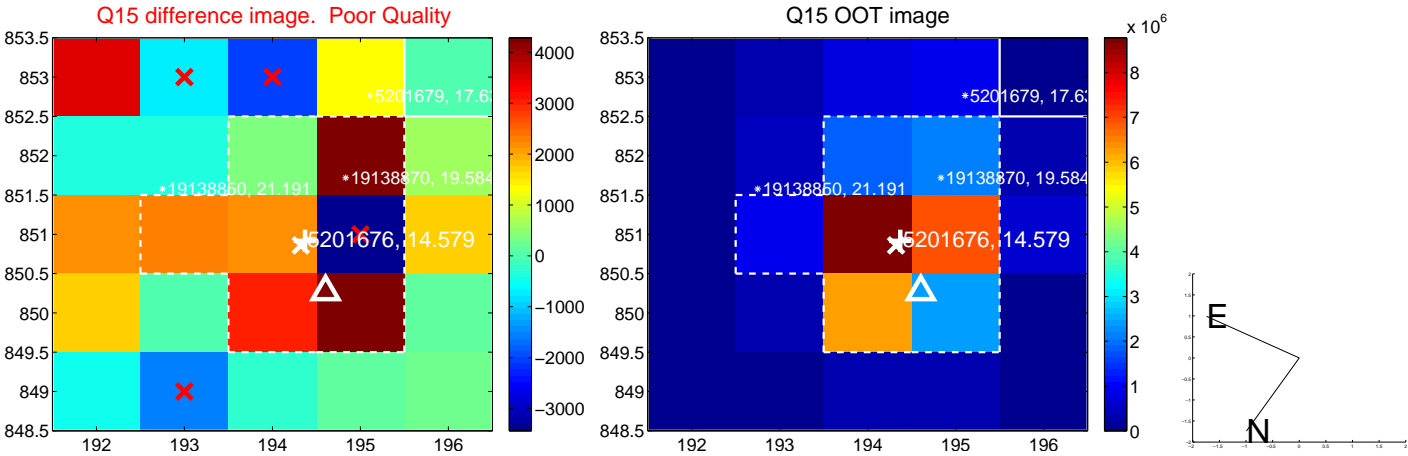
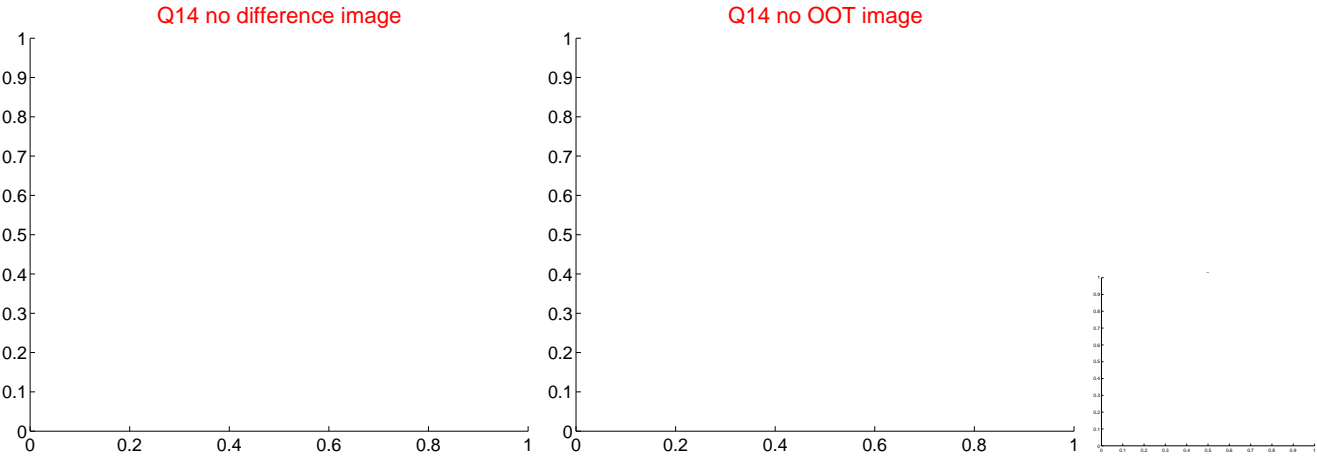
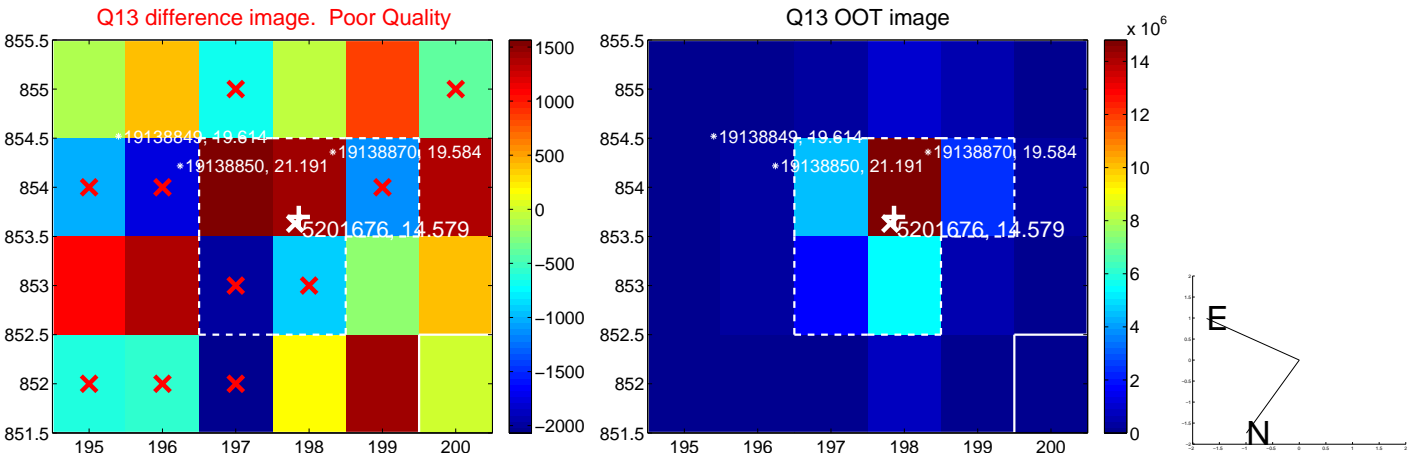
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



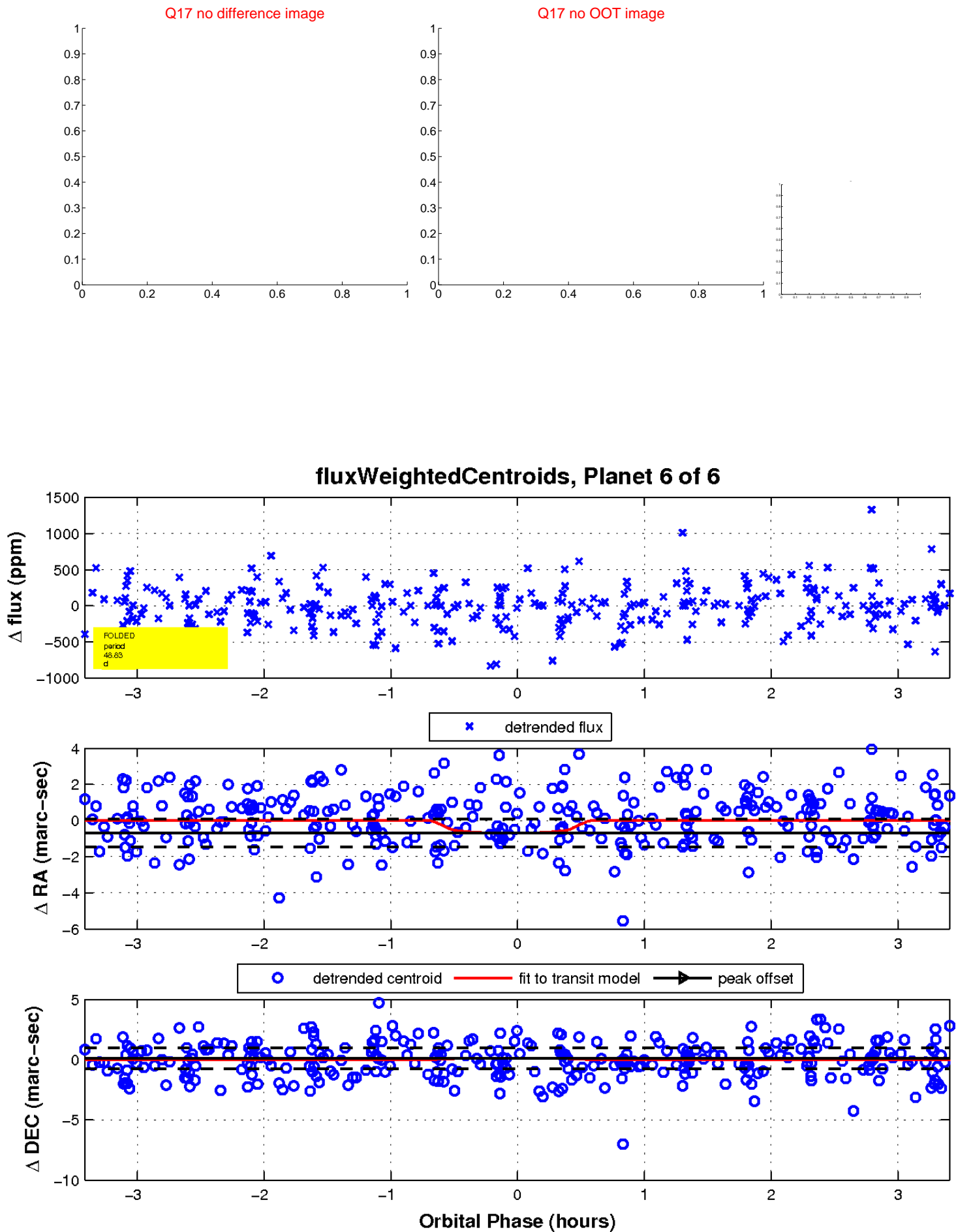
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

Declination

