

# KIC 007032388

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007032388-01	OBS	No	0.566819	131.798441	14.8	3.451	9.5	9.5	1.07	6476	0.42	9324.79
007032388-02	OBS	No	119.755269	202.334890	369.9	1.454	7.9	7.7	1.07	6476	2.25	7.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007032388-01	OBS	FP	0.00	1	0	1	1	LPP_DV—MOD_NONUNIQ_ALT—HALO_GHOST—EPHEM_MATCH
007032388-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—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

**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.

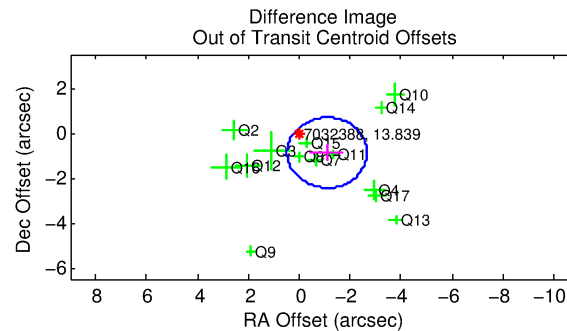
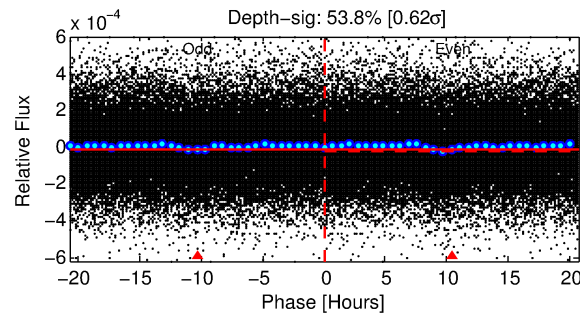
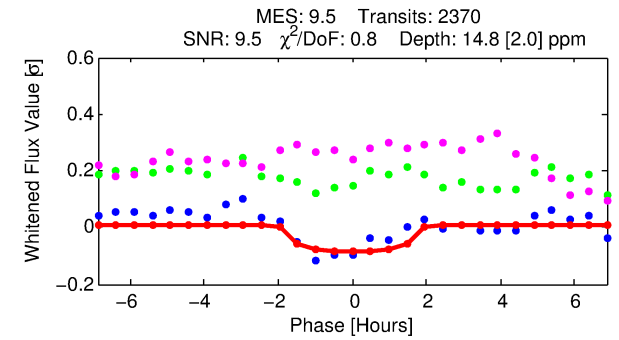
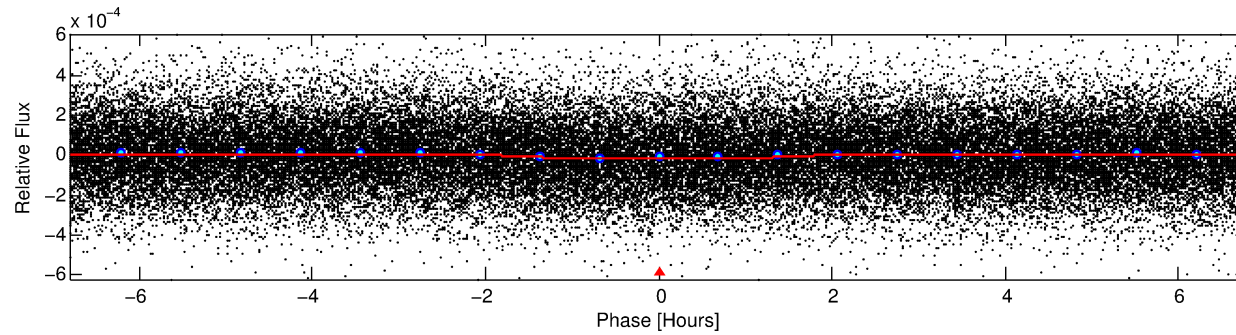
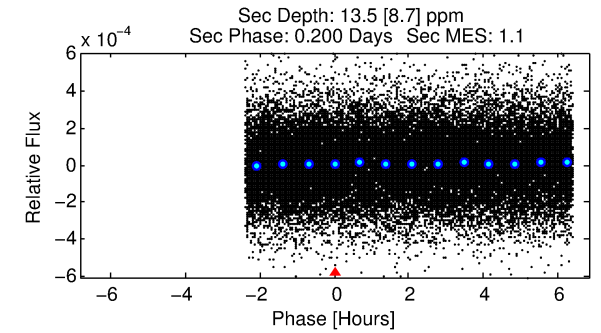
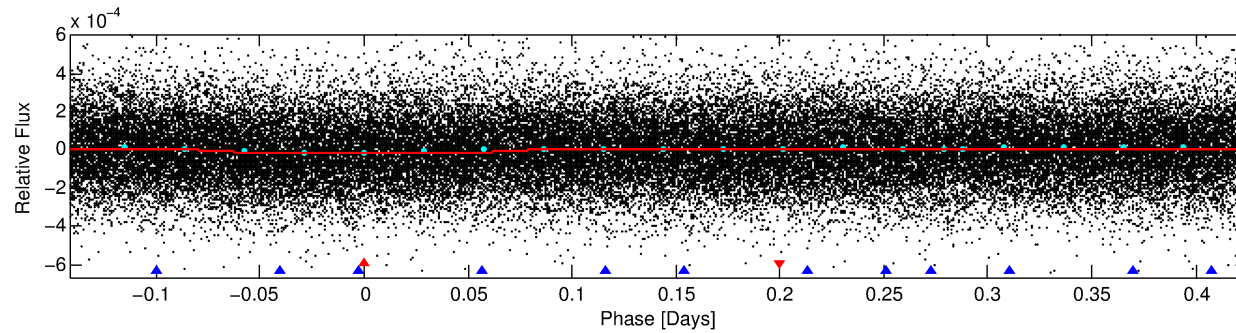
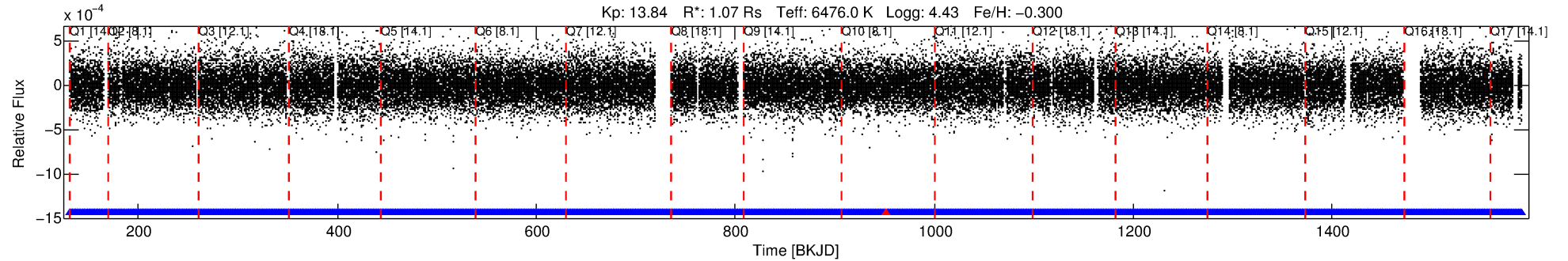
## Ephemeris Match Information For 007032388-01

TCE (1)	KIC	Parent (2)	Parent KIC	P <sub>1</sub> :P <sub>2</sub>	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	m <sub>2</sub>	m <sub>1</sub>	D <sub>2</sub> /D <sub>1</sub>	Mechanism	Flag	$\sigma_P$	$\sigma_T$
007032388-01	7032388	RR-Lyr-pri	7198959	1:1	900.7	204	-98	7.86	13.84	41553.00	Direct-PRF	0	1.85	23.04

**Notes:** P<sub>1</sub>:P<sub>2</sub> 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<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> 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: 7032388 Candidate: 1 of 2 Period: 0.567 d



## DV Fit Results:

Period = 0.56682 [0.00001] d  
Epoch = 131.7984 [0.0041] BKJD  
Rp/R\* = 0.0037 [0.0019]  
a/R\* = 1.31 [1.55]  
b = 0.52 [4.01]  
Seff = 9324.79 [3862.48]  
Teq = 2506 [259] K  
Rp = 0.43 [0.26] Re  
a = 0.0139 [0.0038] AU  
Ag = 7.92 [10.31] [0.67σ]  
Teffp = 6500 [2023] K [1.96σ]

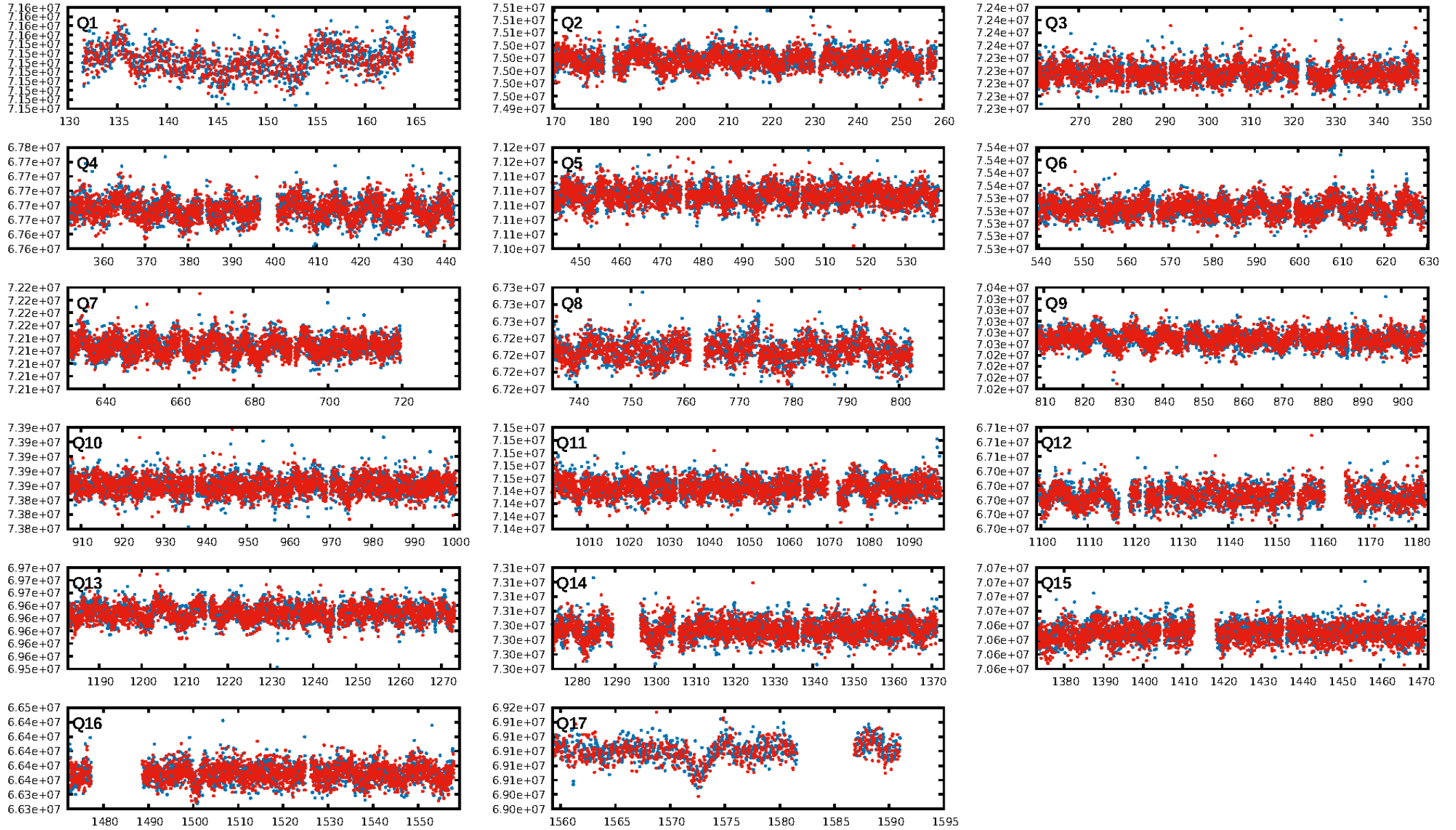
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [763.79σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.33e-13  
RollingBand-fgt: 1.00 [2263/2264]  
**GhostDiagnostic-chr: 0.1163**  
**Centroid-sig: 0.0%**  
Centroid-so: 2.755 arcsec [2.17σ]  
OotOffset-rm: 1.400 arcsec [2.68σ]  
KicOffset-rm: 1.269 arcsec [2.30σ]  
OotOffset-st: 3/4/4/3 [14]  
KicOffset-st: 3/4/4/3 [14]  
DiffImageQuality-fgm: 0.29 [4/14]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:46:52 Z

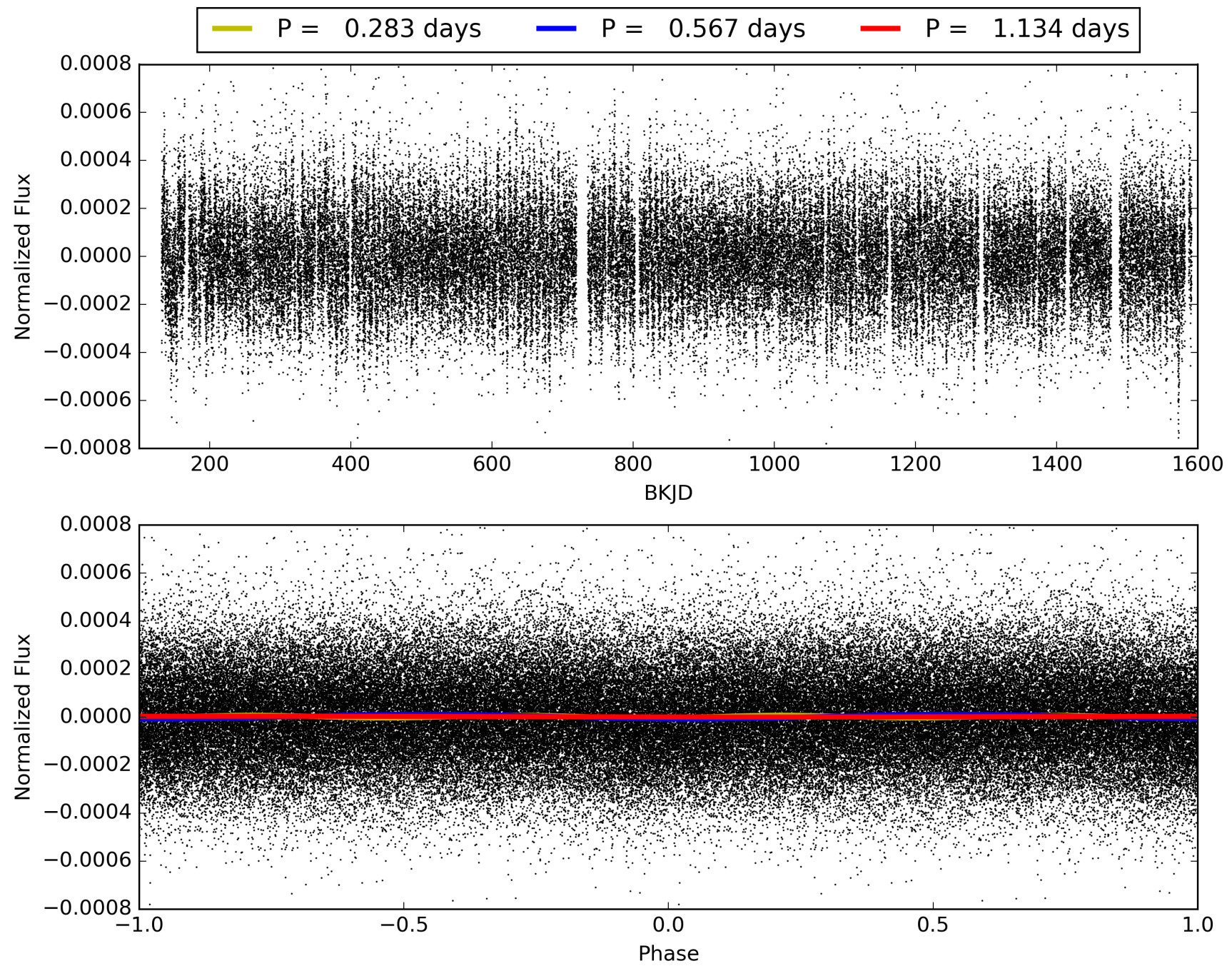
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007032388-01, PDC Light Curves



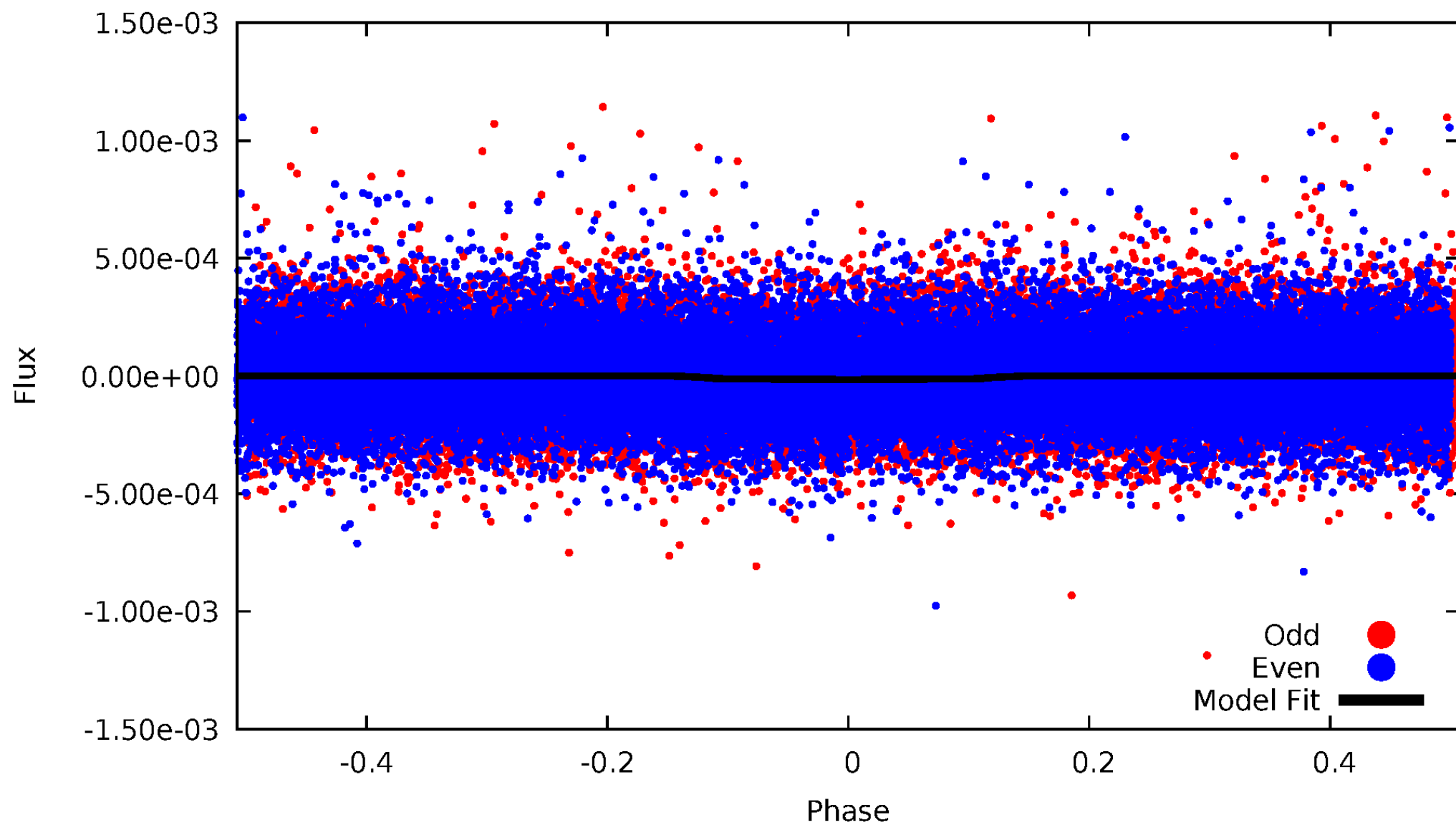


TCE 007032388-01



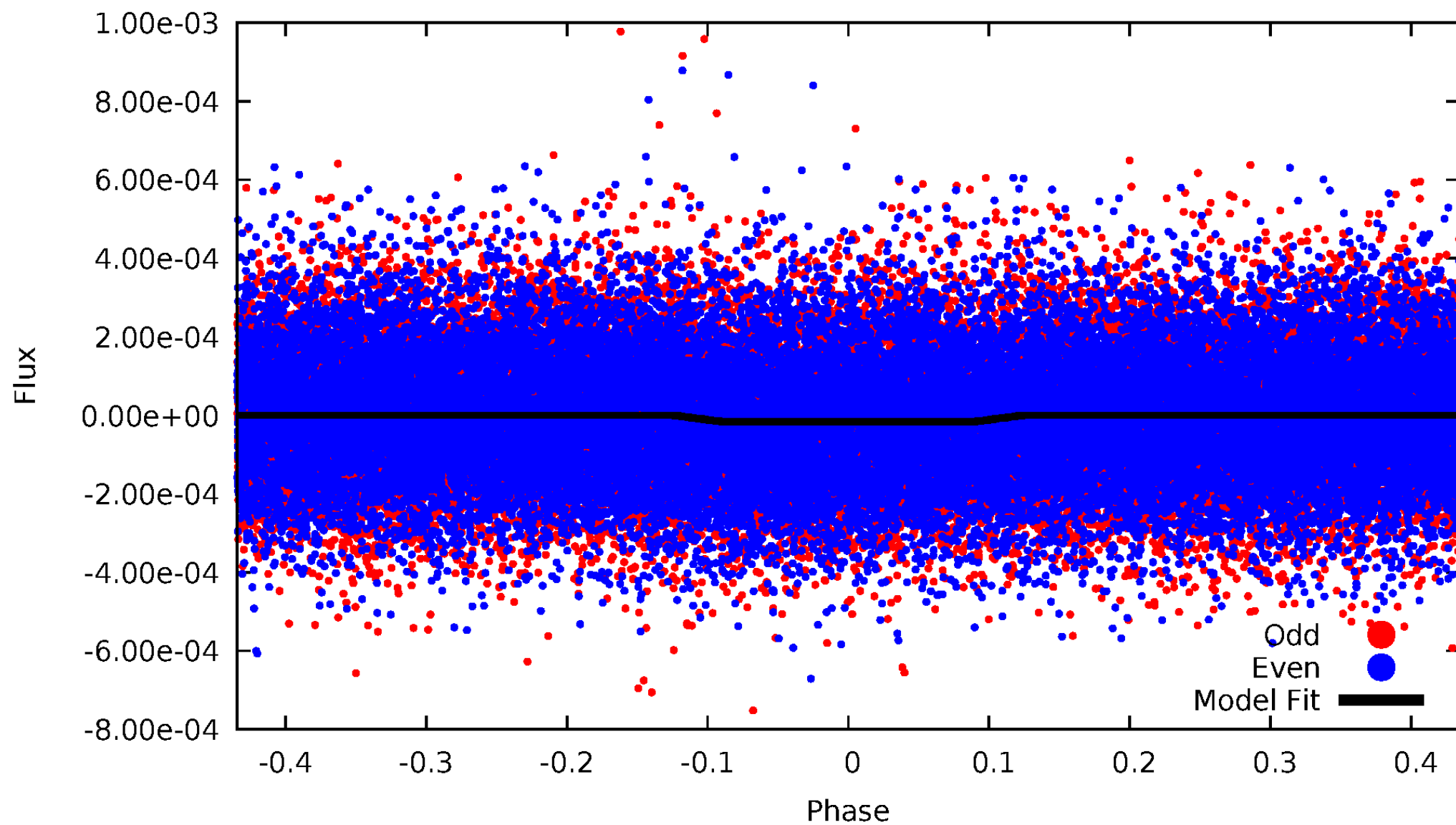
# DV Odd/Even

TCE 007032388-01



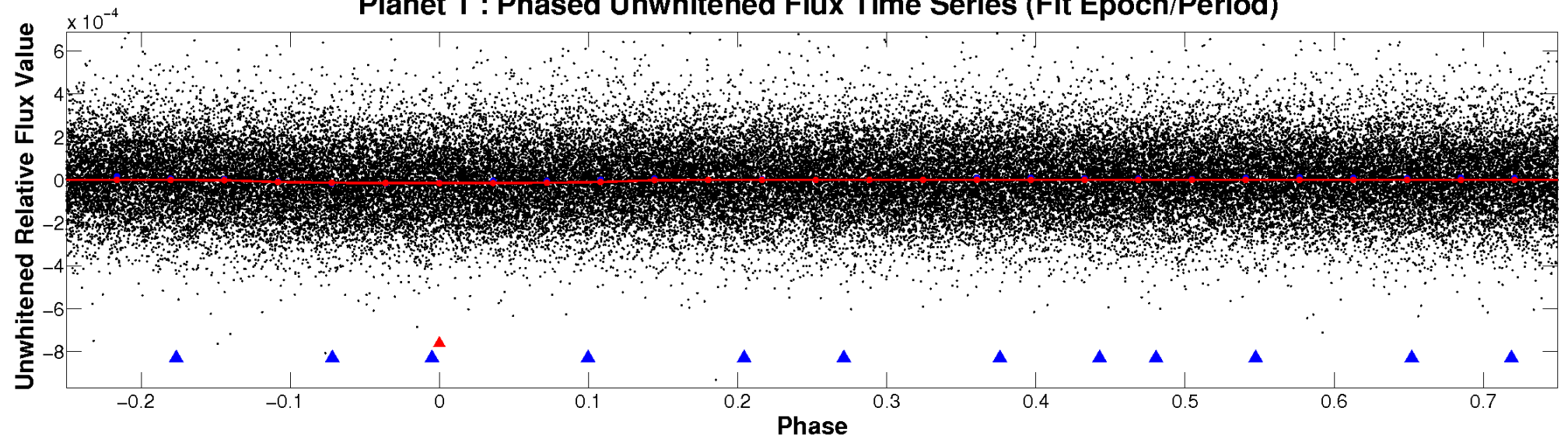
# ALT Odd/Even

TCE 007032388-01

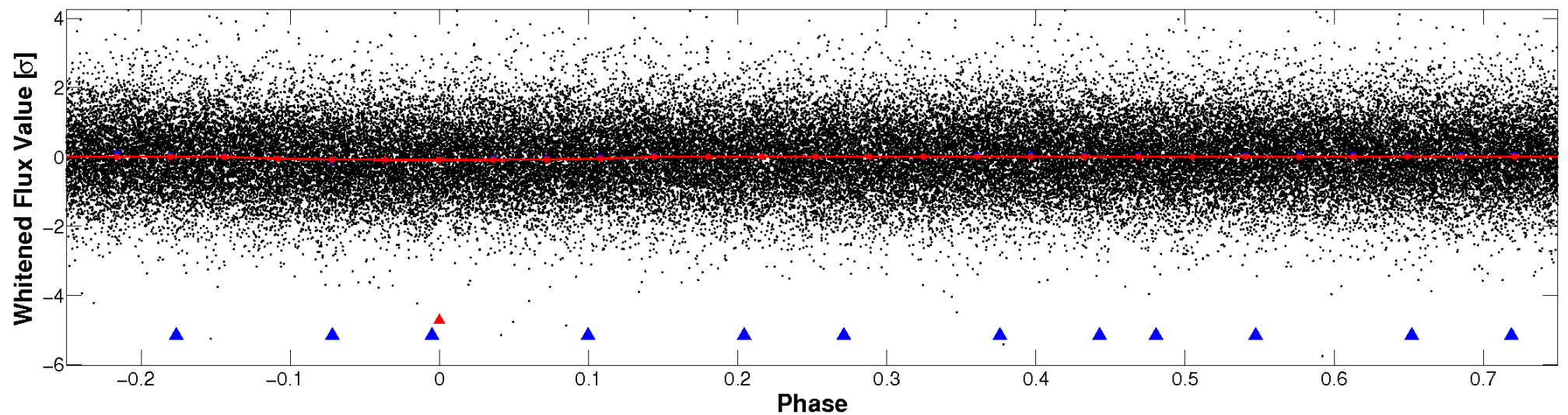


# Non-Whitened Vs. Whitened Light Curve

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



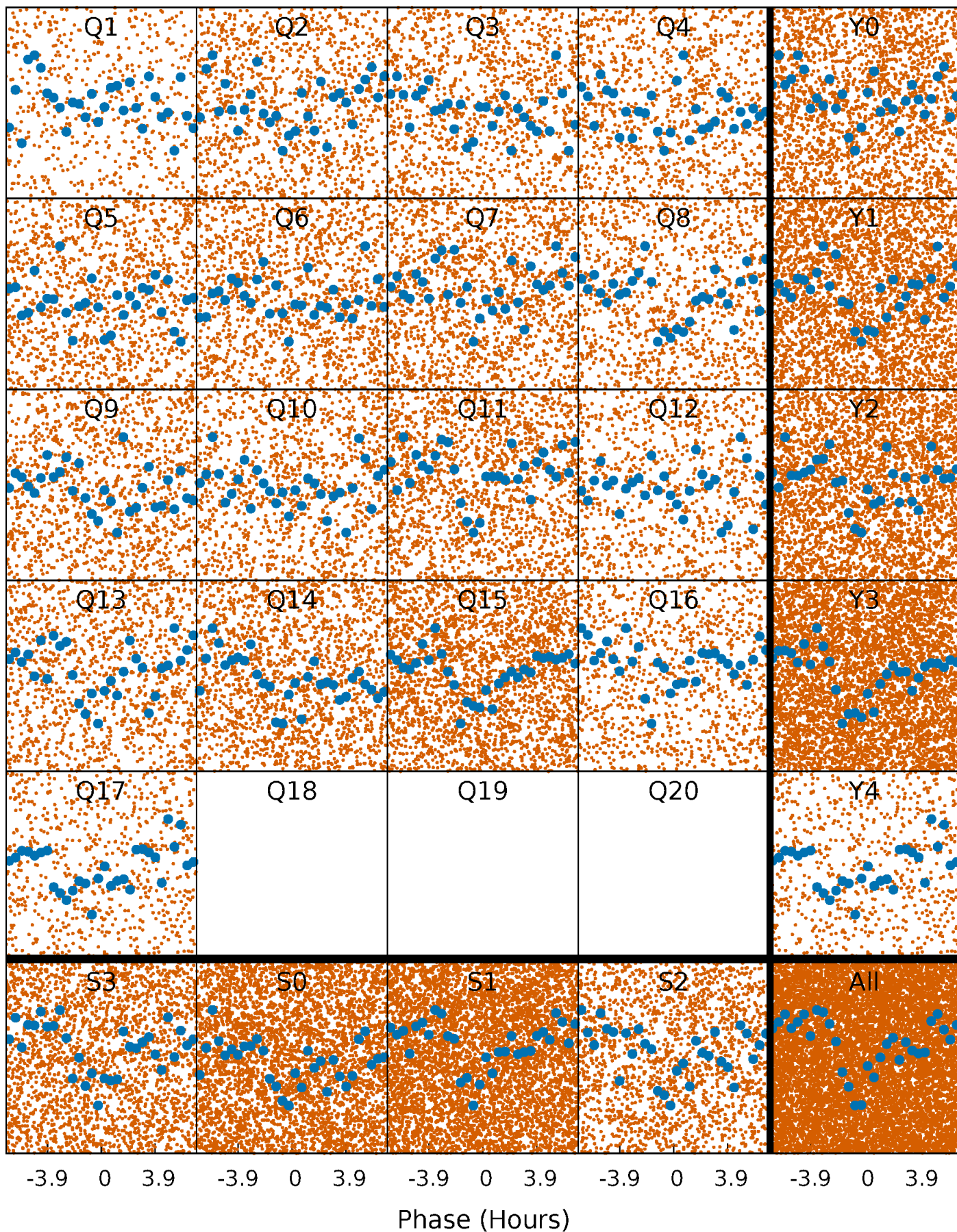
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

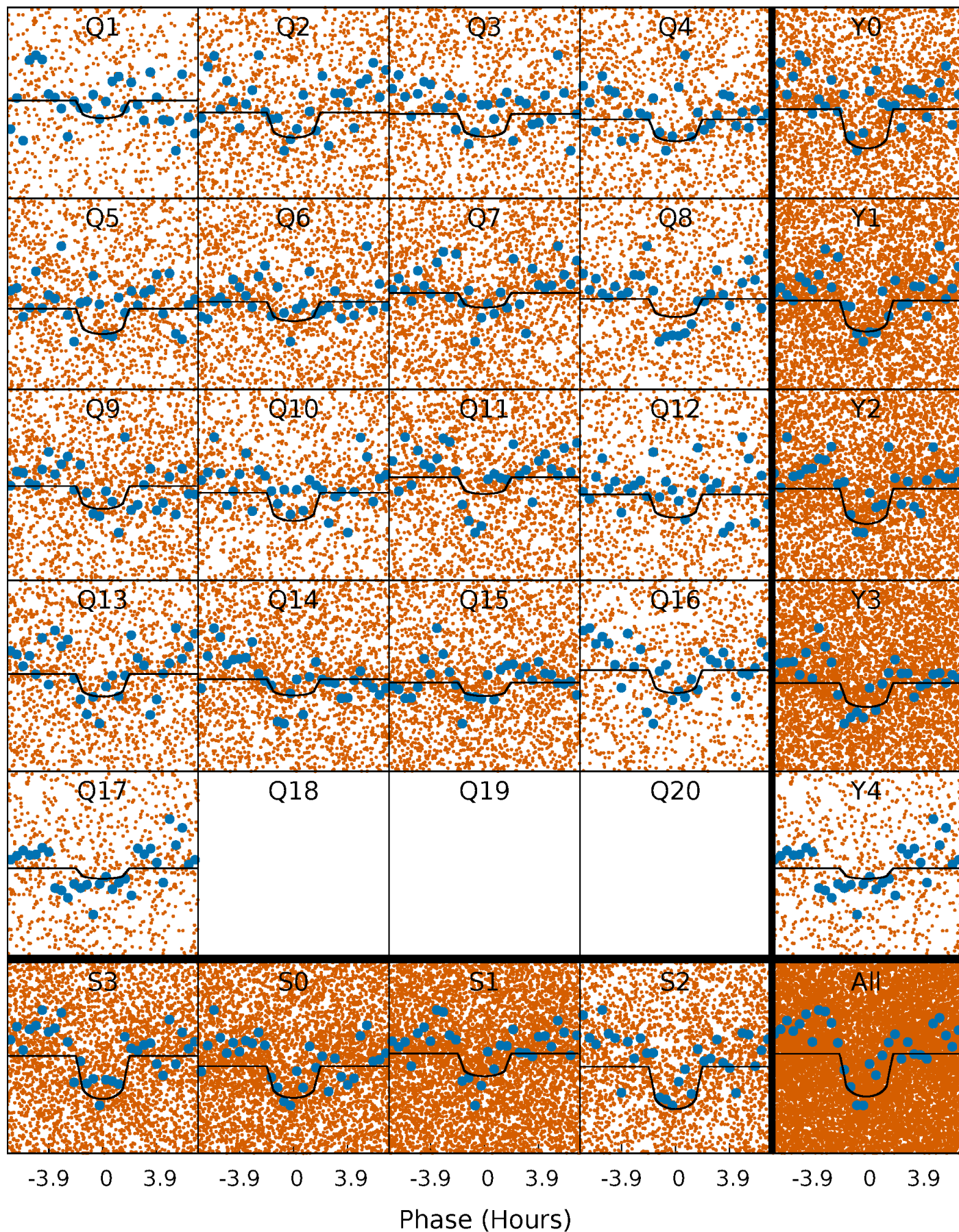
TCE 007032388-01 P= 0.566819 Days  $T_0=131.798441$  (BKJD)





# DV Quarter-Phased Transit Curves

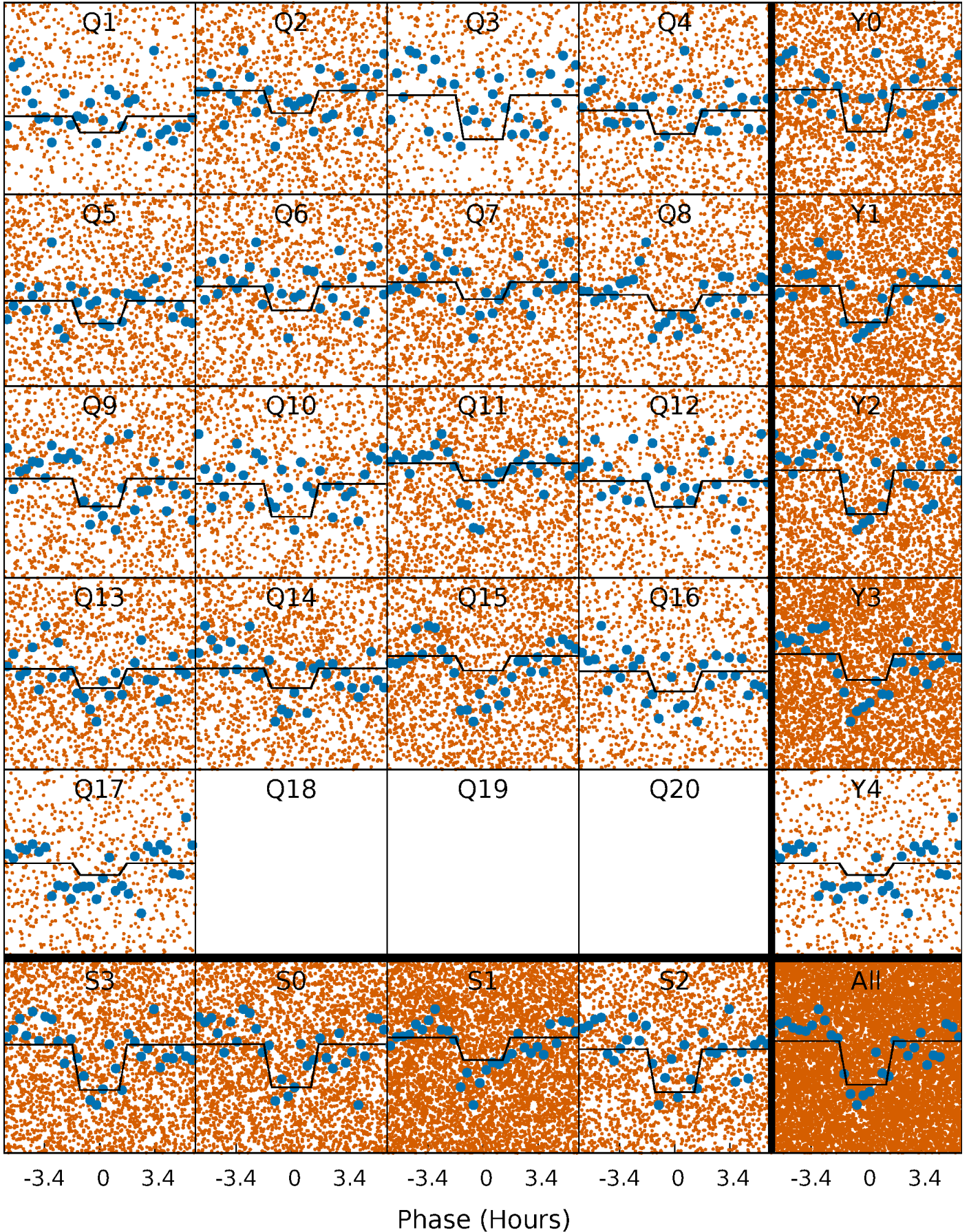
TCE 007032388-01 P= 0.566819 Days  $T_0=131.798441$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

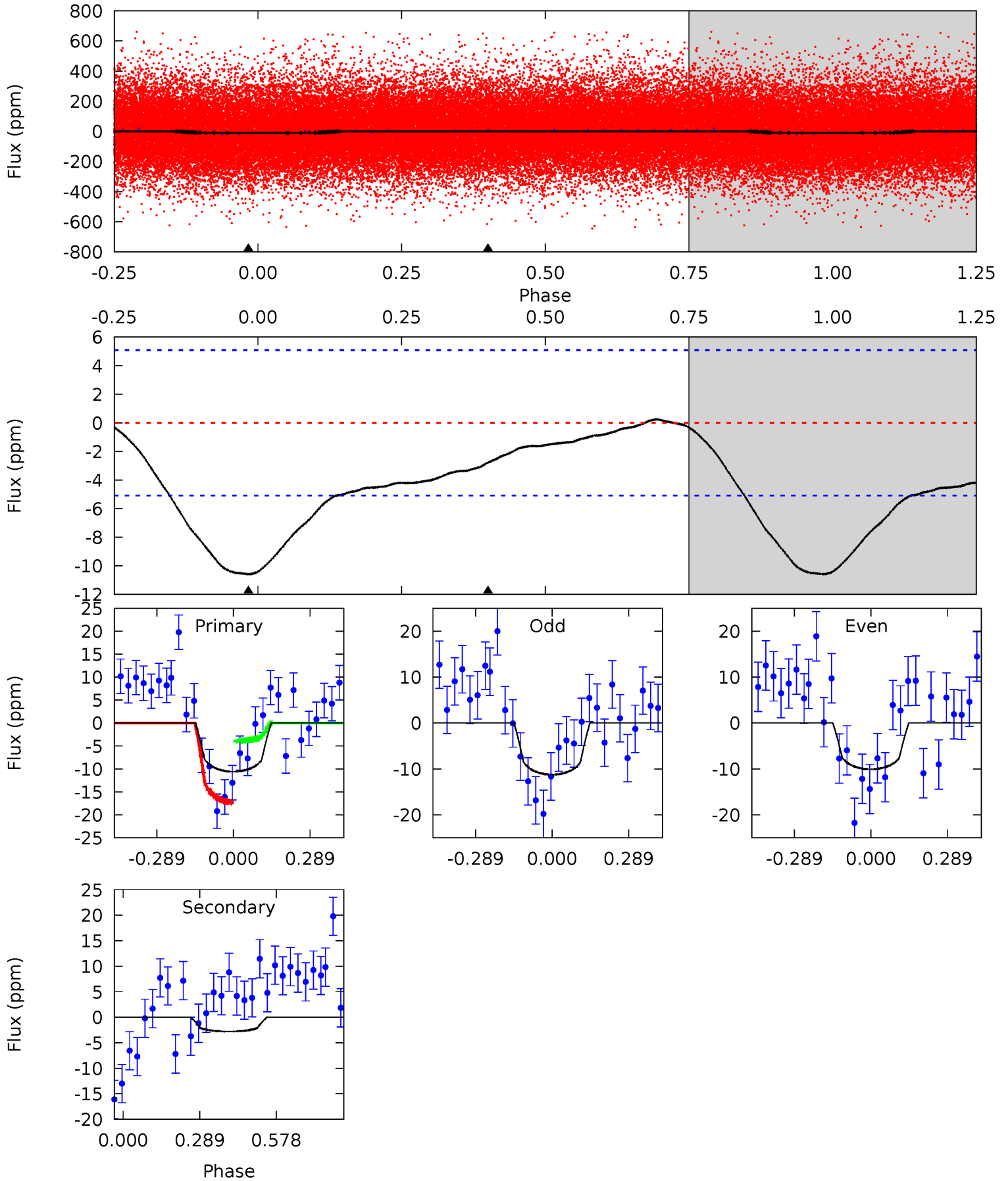
TCE 007032388-01 P= 0.566808 Days  $T_0=131.807512$  (BKJD)



# DV Model-Shift Uniqueness Test

007032388-01, P = 0.566819 Days, E = 131.231622 Days

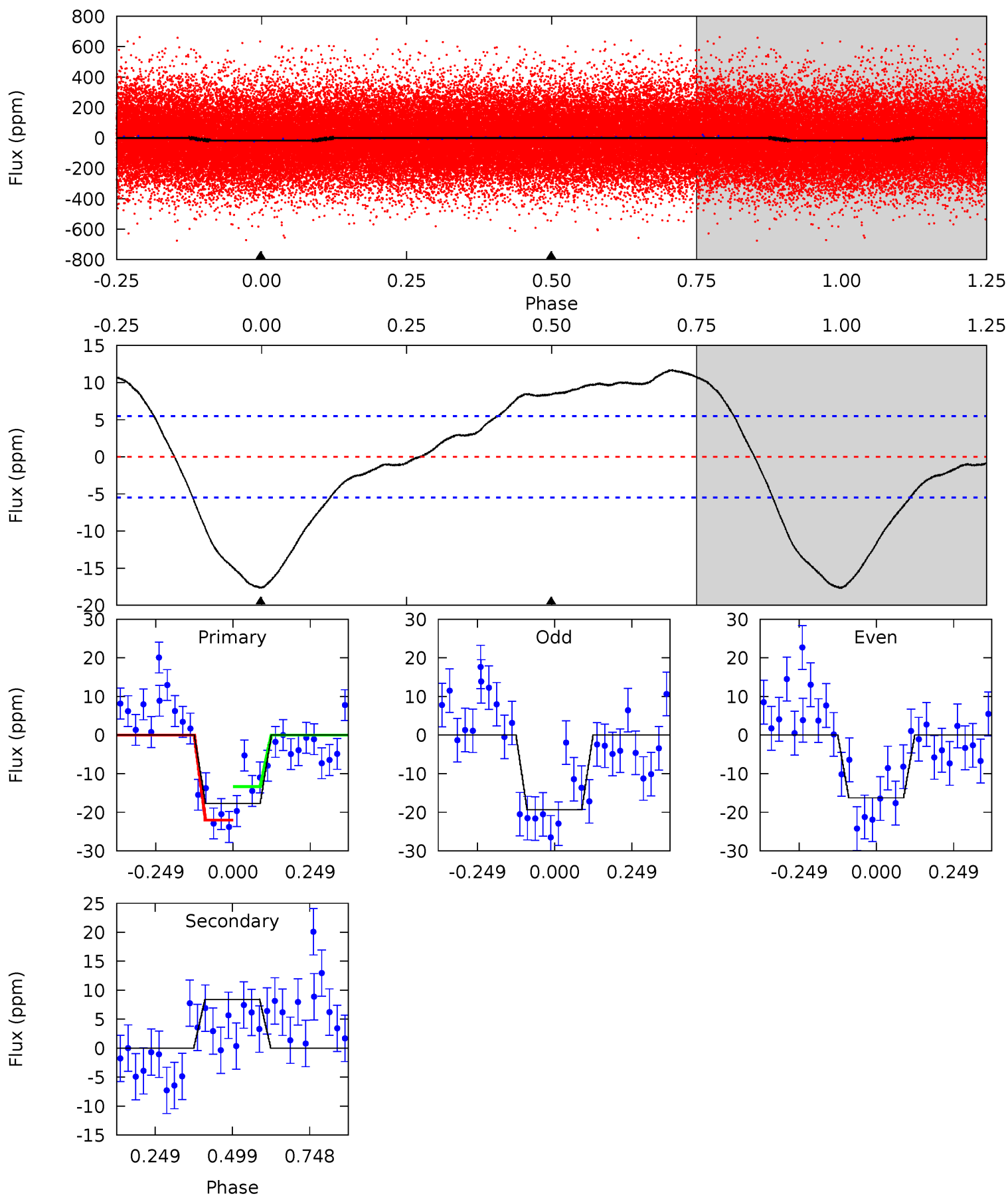
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.05	2.38	0	0	4.34	1.06	0.15	9.05	9.05	2.38	2.38	0.51	0.95	0.02	5.75



# Alt Model-Shift Uniqueness Test

007032388-01, P = 0.566808 Days, E = 131.240704 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
14.1	-6.66	0	0	4.37	1.15	4.56	14.1	14.1	-6.66	-6.66	1.21	0.93	0.40	3.44





### Stellar Parameters For KIC 007032388

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6476^{+146}_{-194}$	$4.426^{+0.054}_{-0.216}$	$-0.300^{+0.250}_{-0.300}$	$1.067^{+0.348}_{-0.116}$	$1.105^{+0.161}_{-0.146}$	$1.282^{+0.367}_{-0.677}$
	+2%/-3%	+1%/-5%	+83%/-100%	+33%/-11%	+15%/-13%	+29%/-53%
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 007032388-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-3 \pm 1$	$0.46^{+0.23}_{-0.23}$	$3569^{+253}_{-161}$	$4234^{+1810}_{-1034}$	$1.320^{+4.268}_{-0.837}$
Alt.	$8 \pm 1$	$0.53^{+0.25}_{-0.24}$	$3593^{+258}_{-172}$	$-5444^{+710}_{-1838}$	$-3.108^{+1.647}_{-7.493}$

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

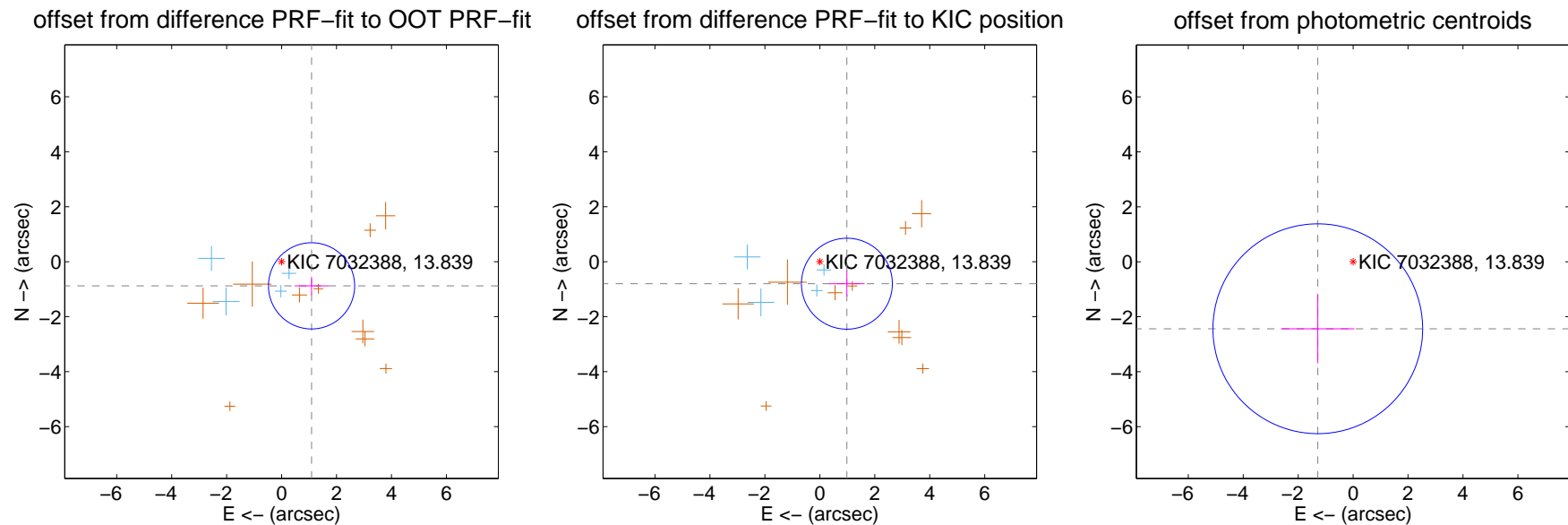
## DV Centroid Data

Supplemental centroid analysis for 007032388-01. Kepler magnitude: 13.84. Transit SNR 9.46

There are 4 quarters with good PRF difference image offsets

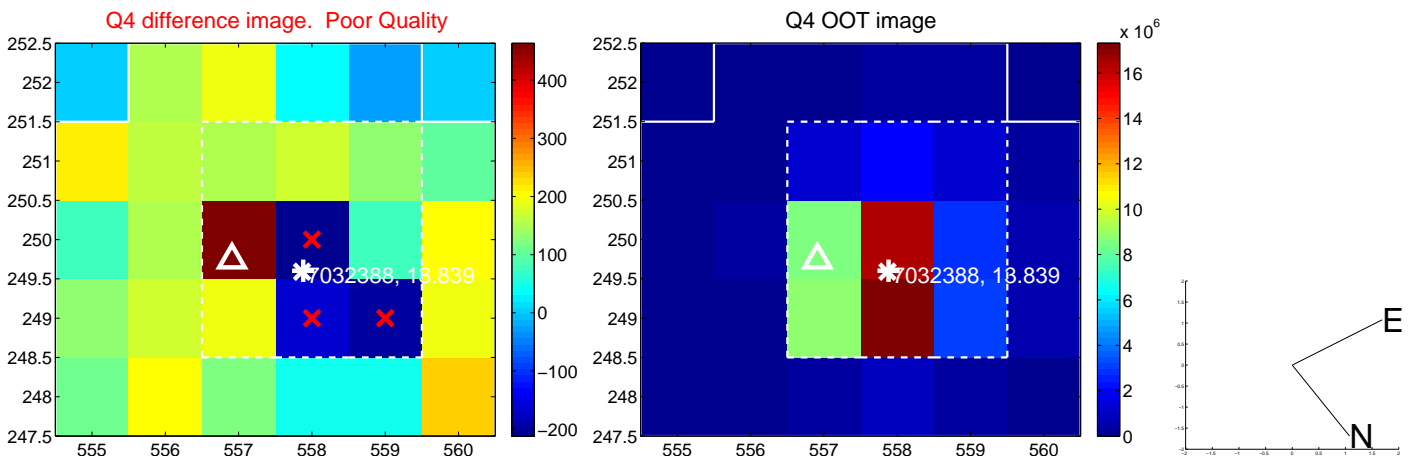
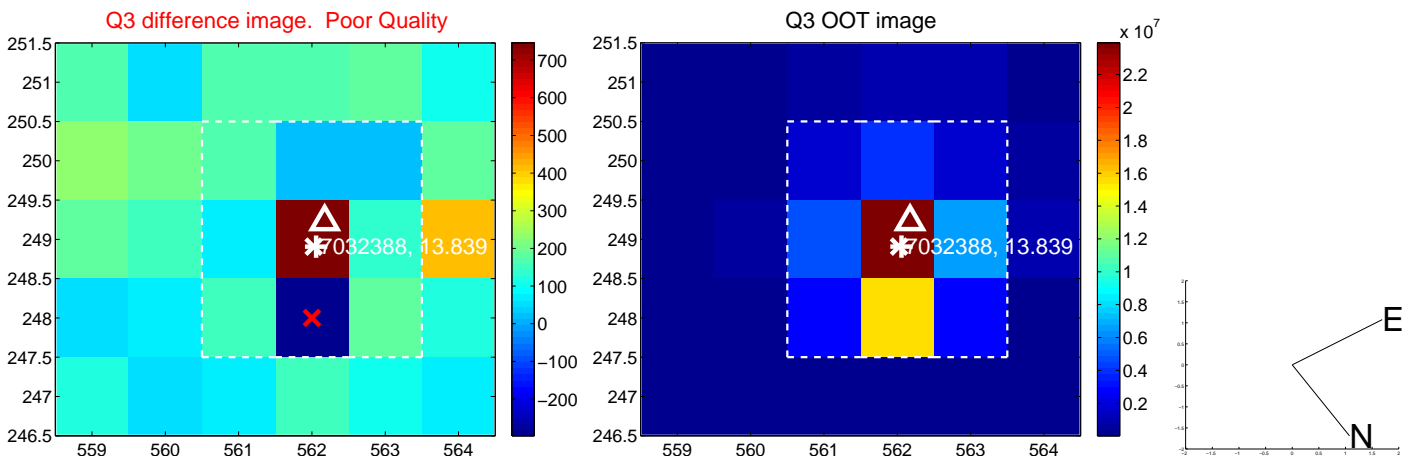
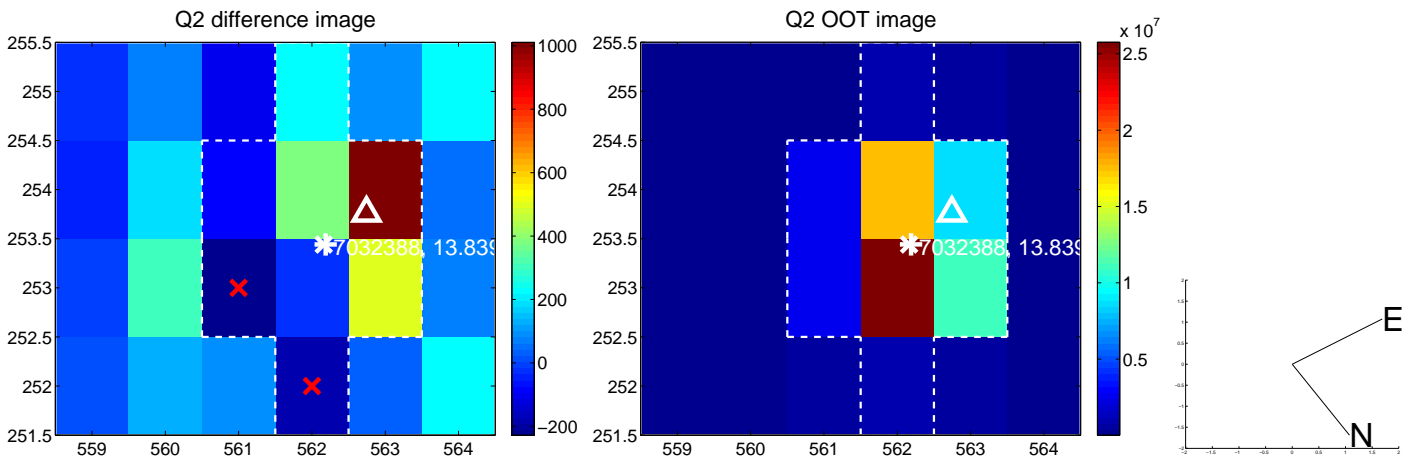
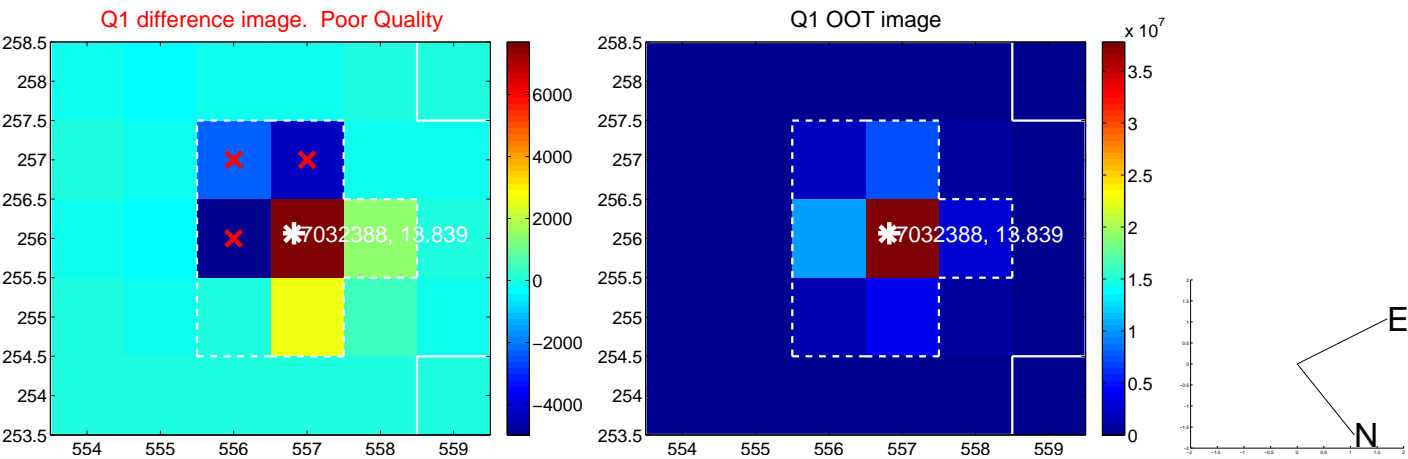
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.400 \pm 0.523$	2.68	$-1.090 \pm 0.616$	$-0.878 \pm 0.332$
PRF-fit source offset from KIC position	$1.269 \pm 0.551$	2.30	$-0.985 \pm 0.644$	$-0.800 \pm 0.465$
photometric centroid source offset	$2.75 \pm 1.27$	2.17	$1.29 \pm 1.34$	$-2.44 \pm 1.25$

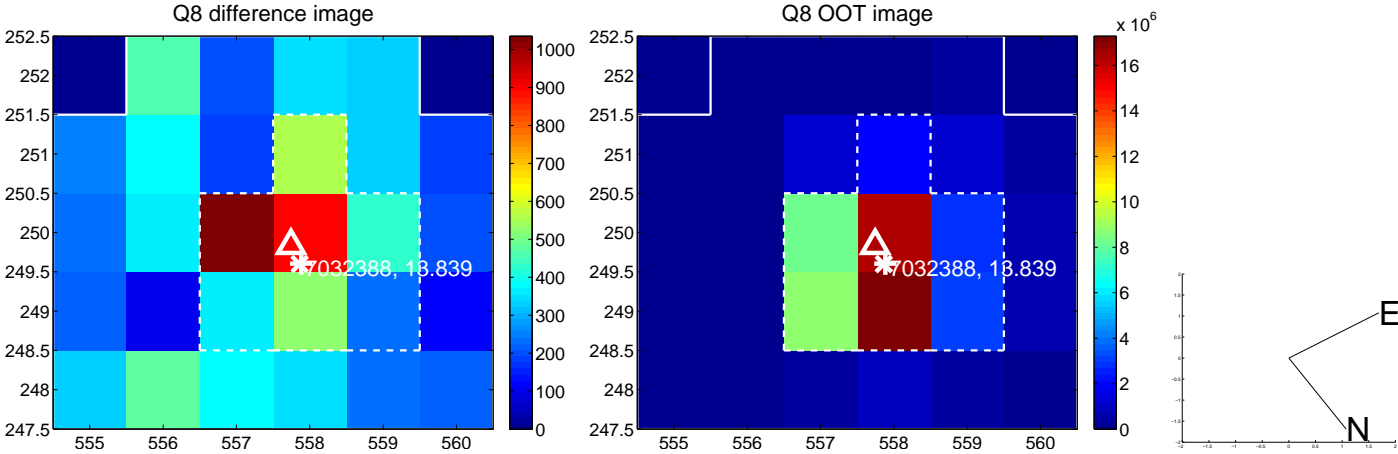
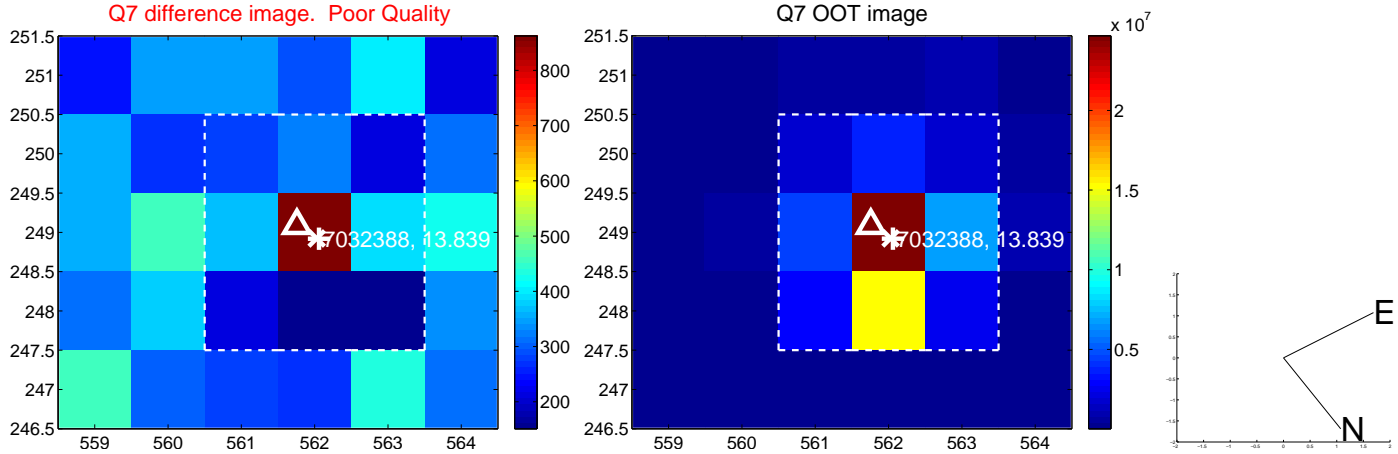
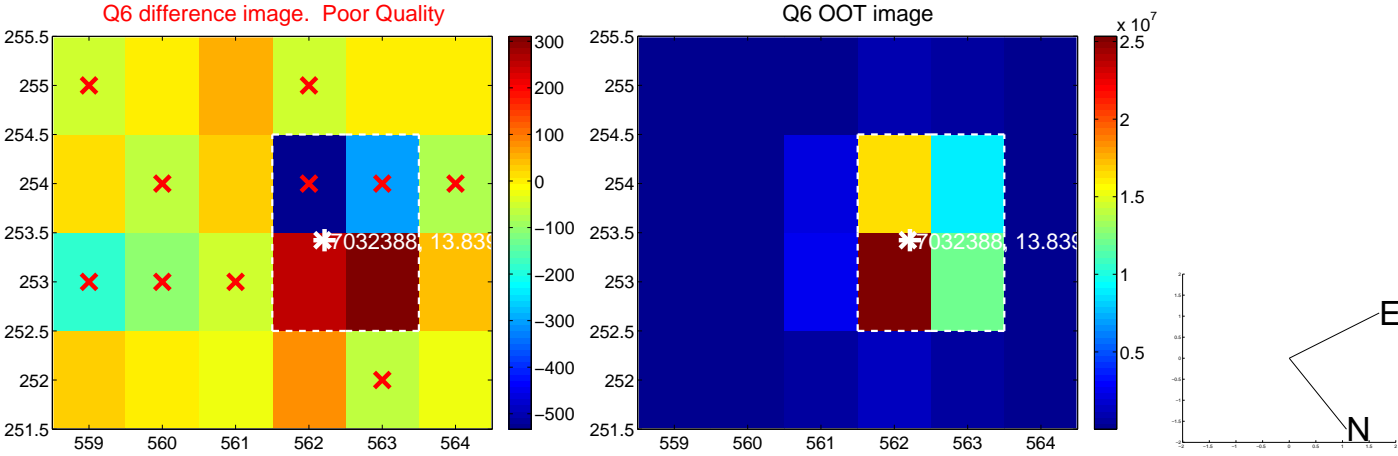
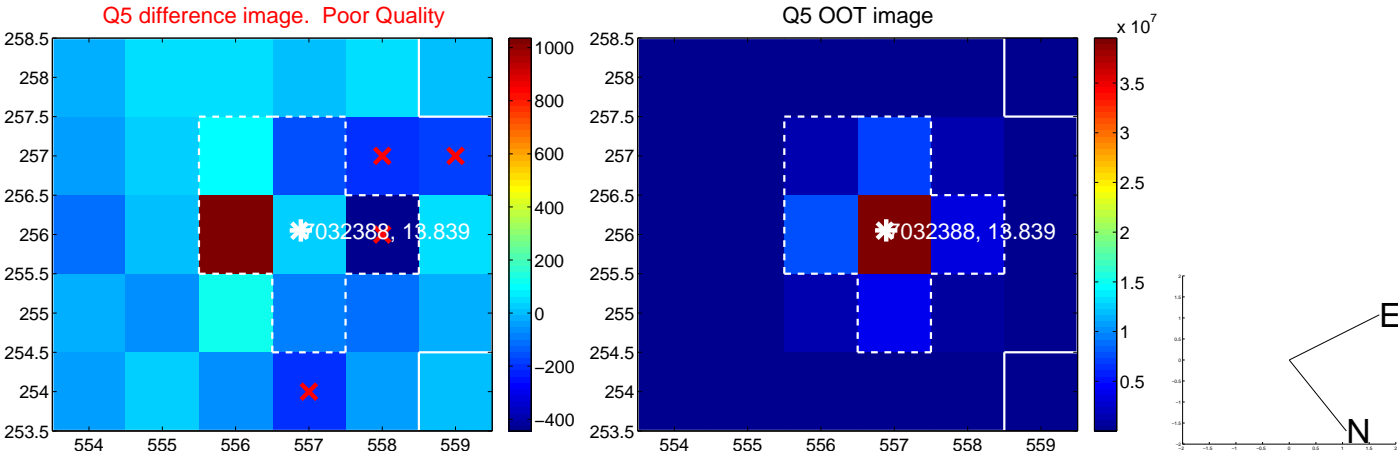


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

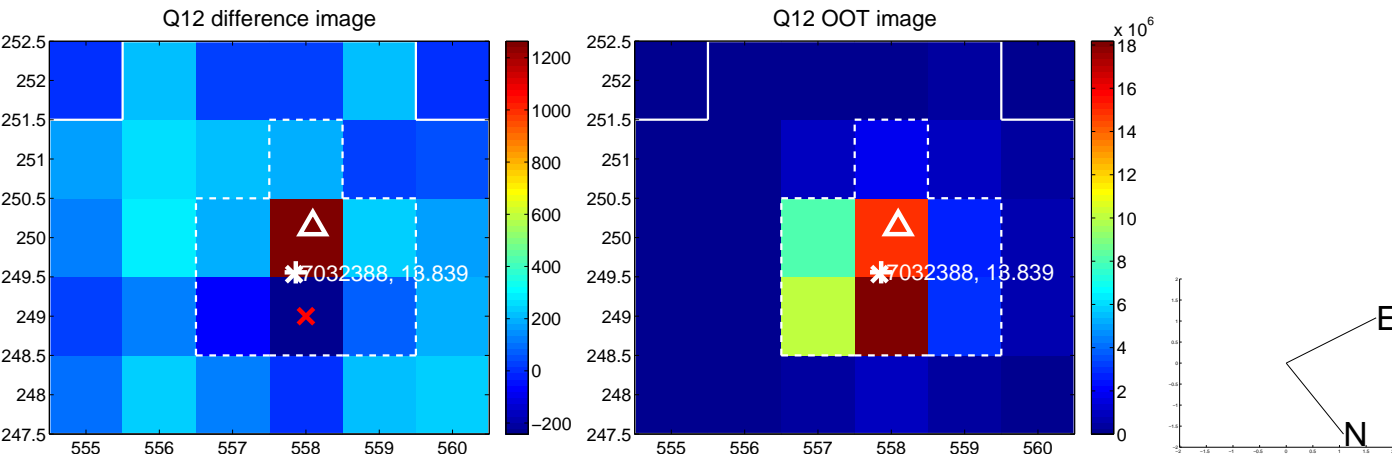
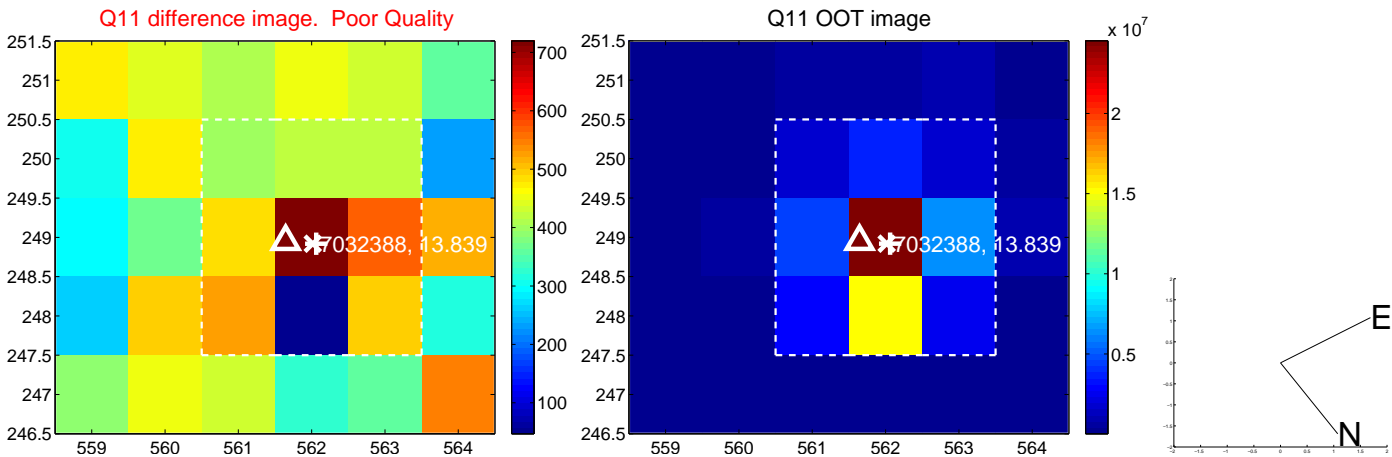
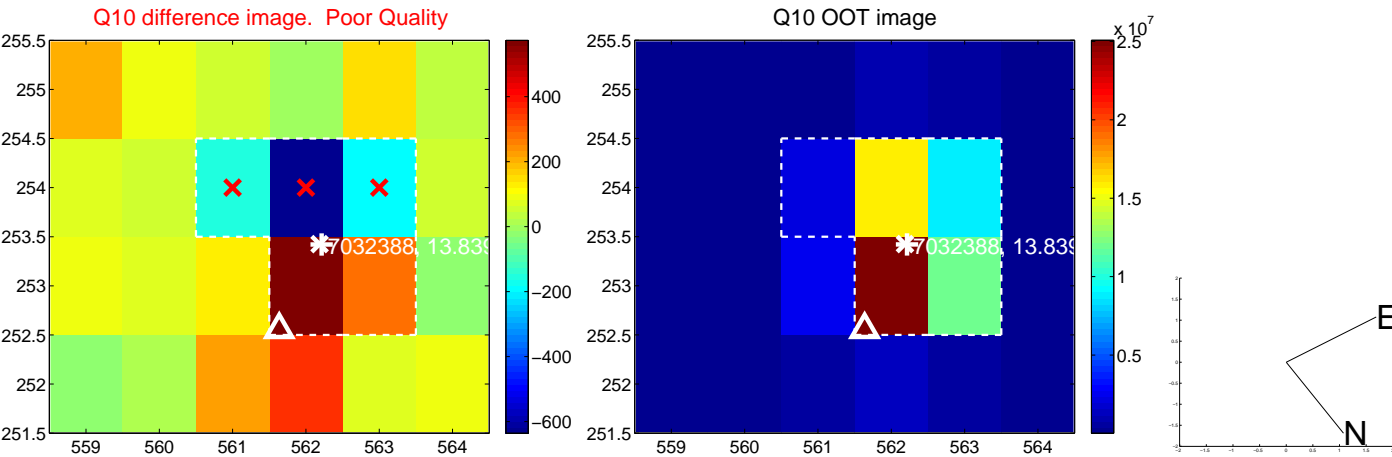
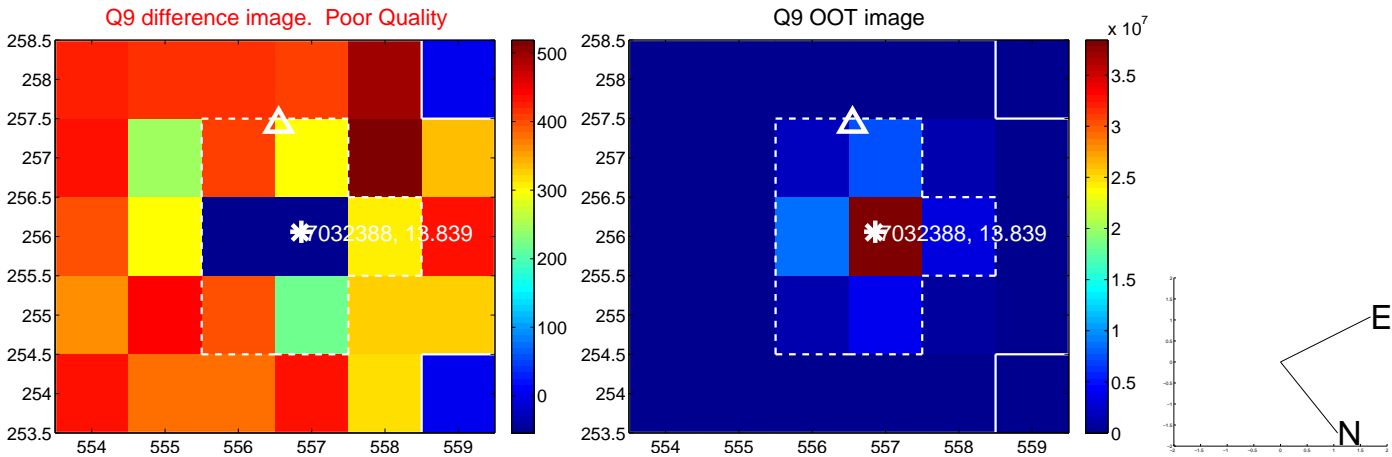


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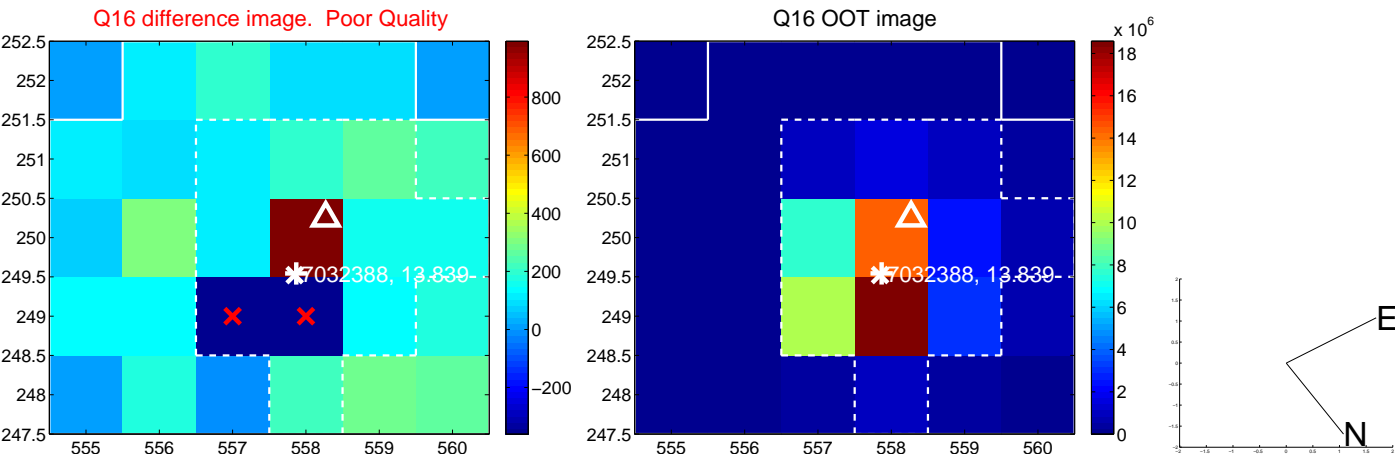
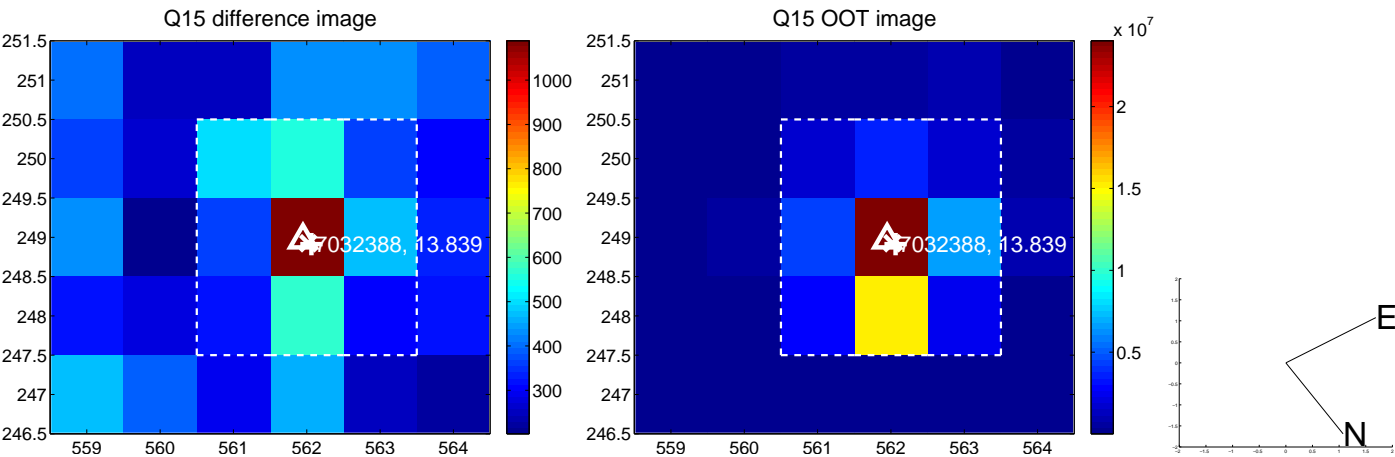
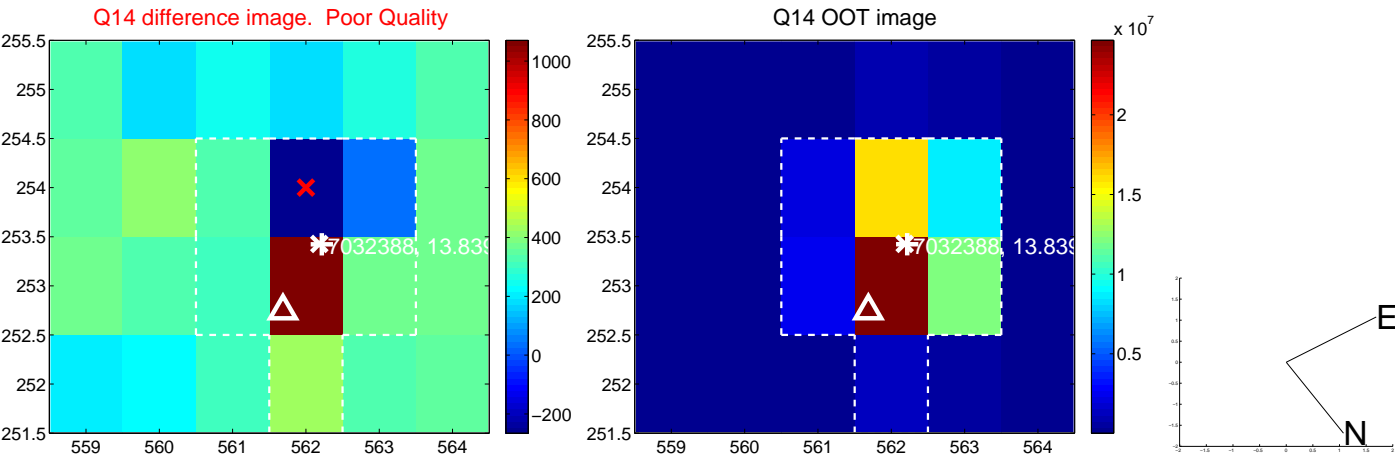
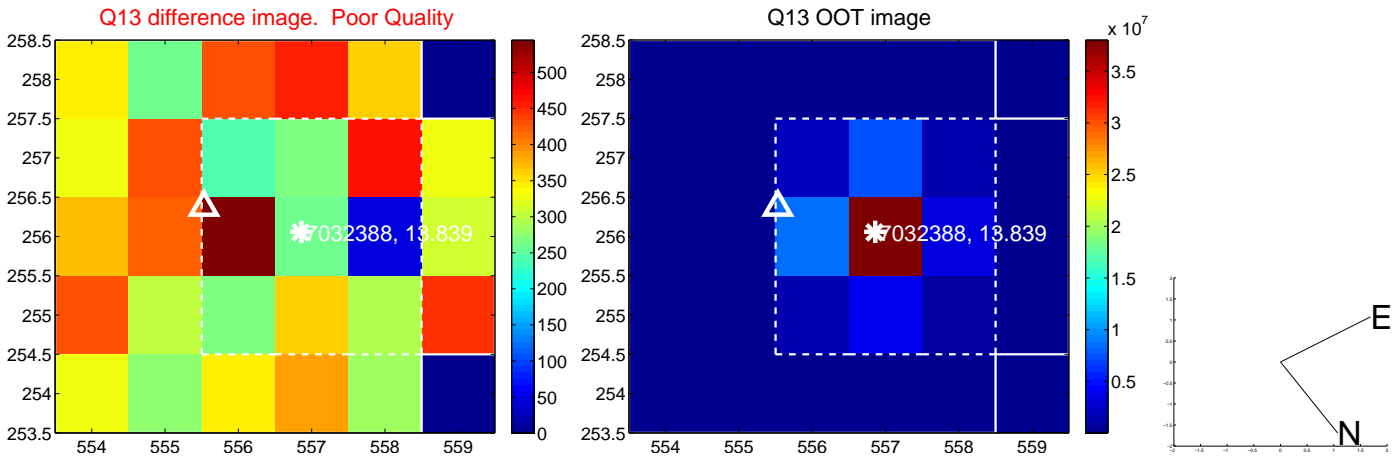




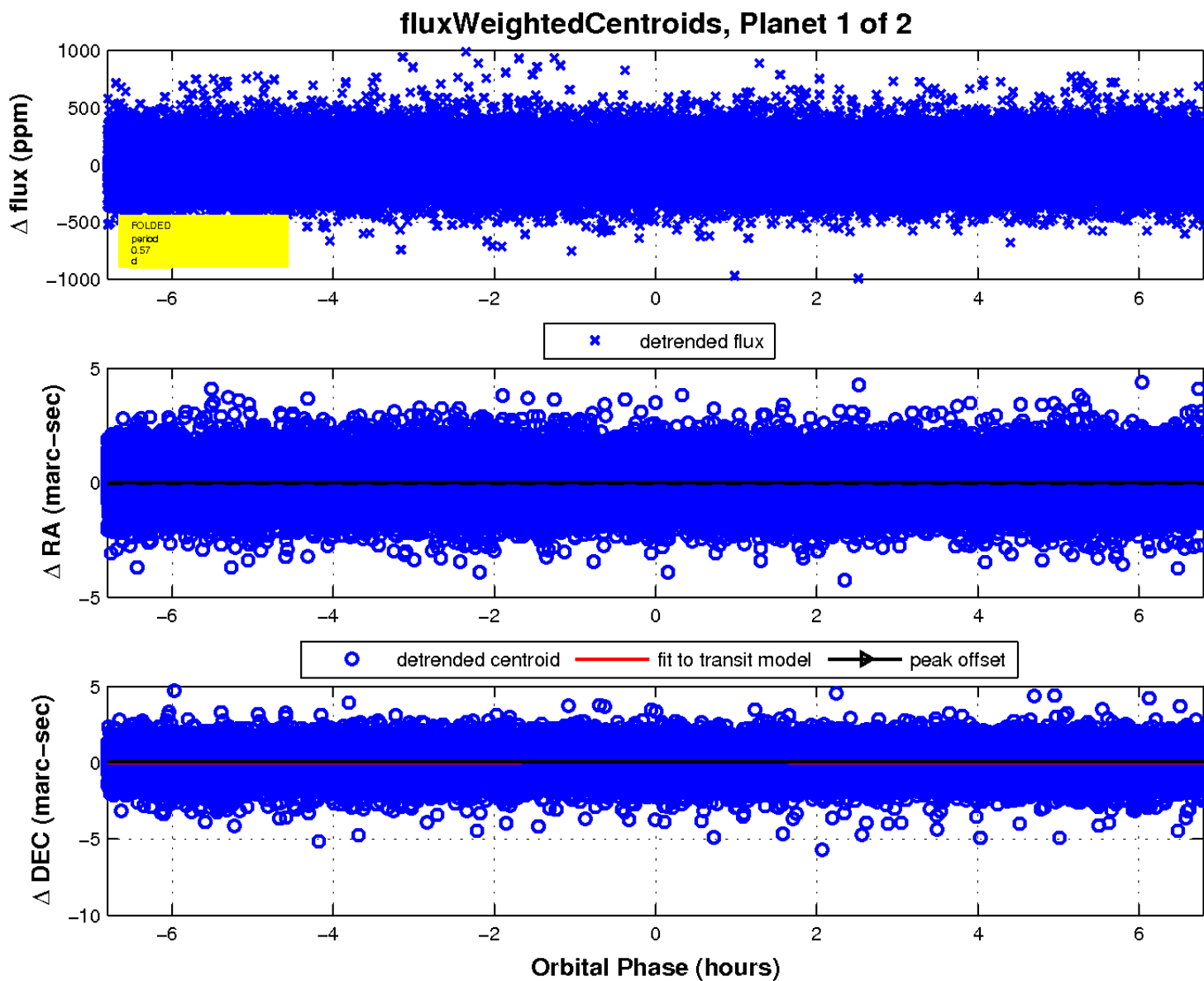
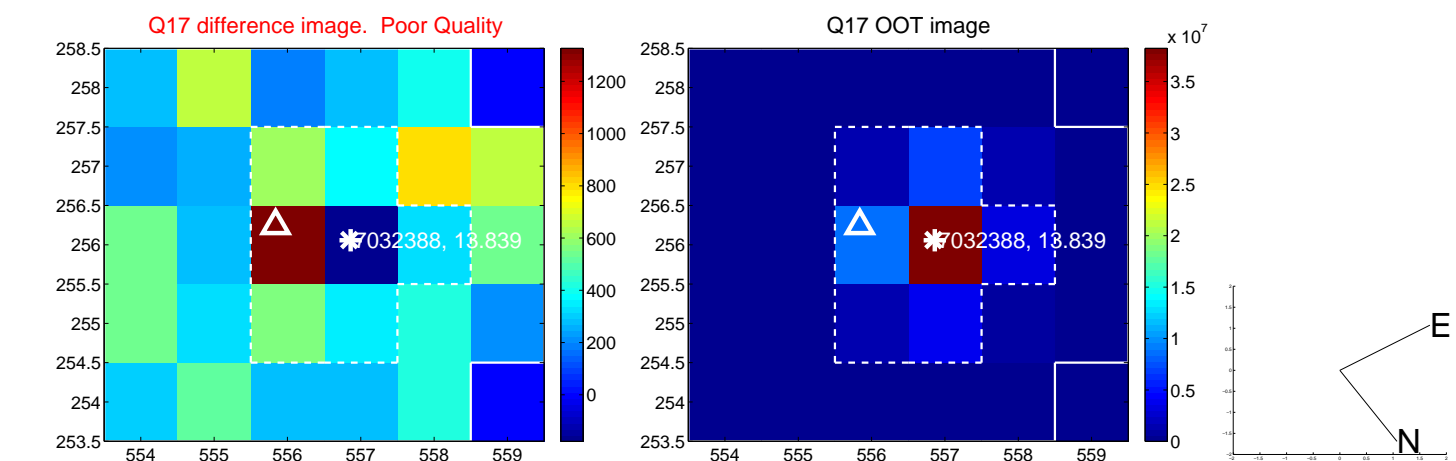
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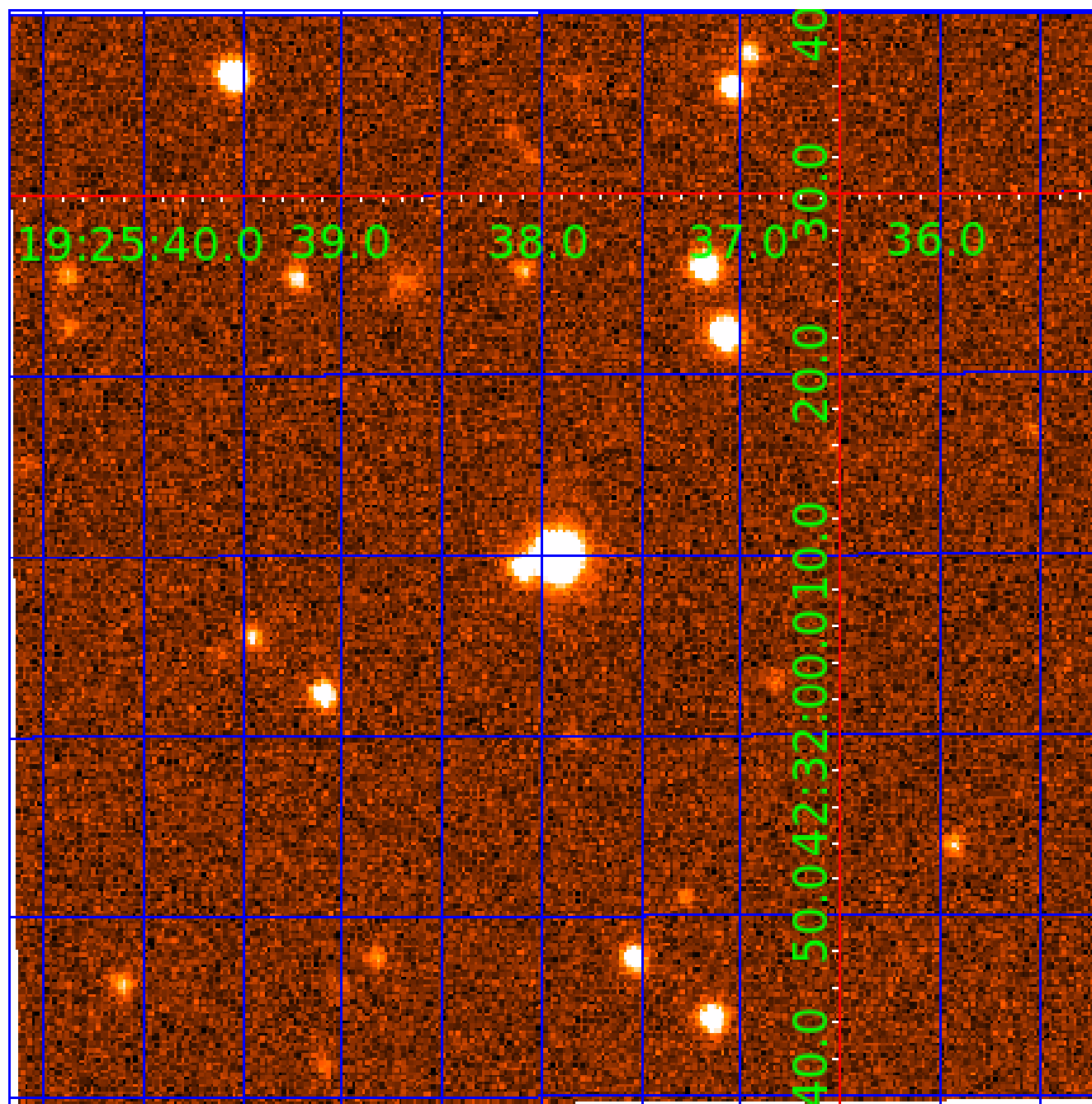


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007032388

## Q1-17 DR25 TCE Parameters

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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007032388-01	OBS	FP	0.00	1	0	1	1	LPP_DV—MOD_NONUNIQ_ALT—HALO_GHOST—EPHEM_MATCH
007032388-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—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

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

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

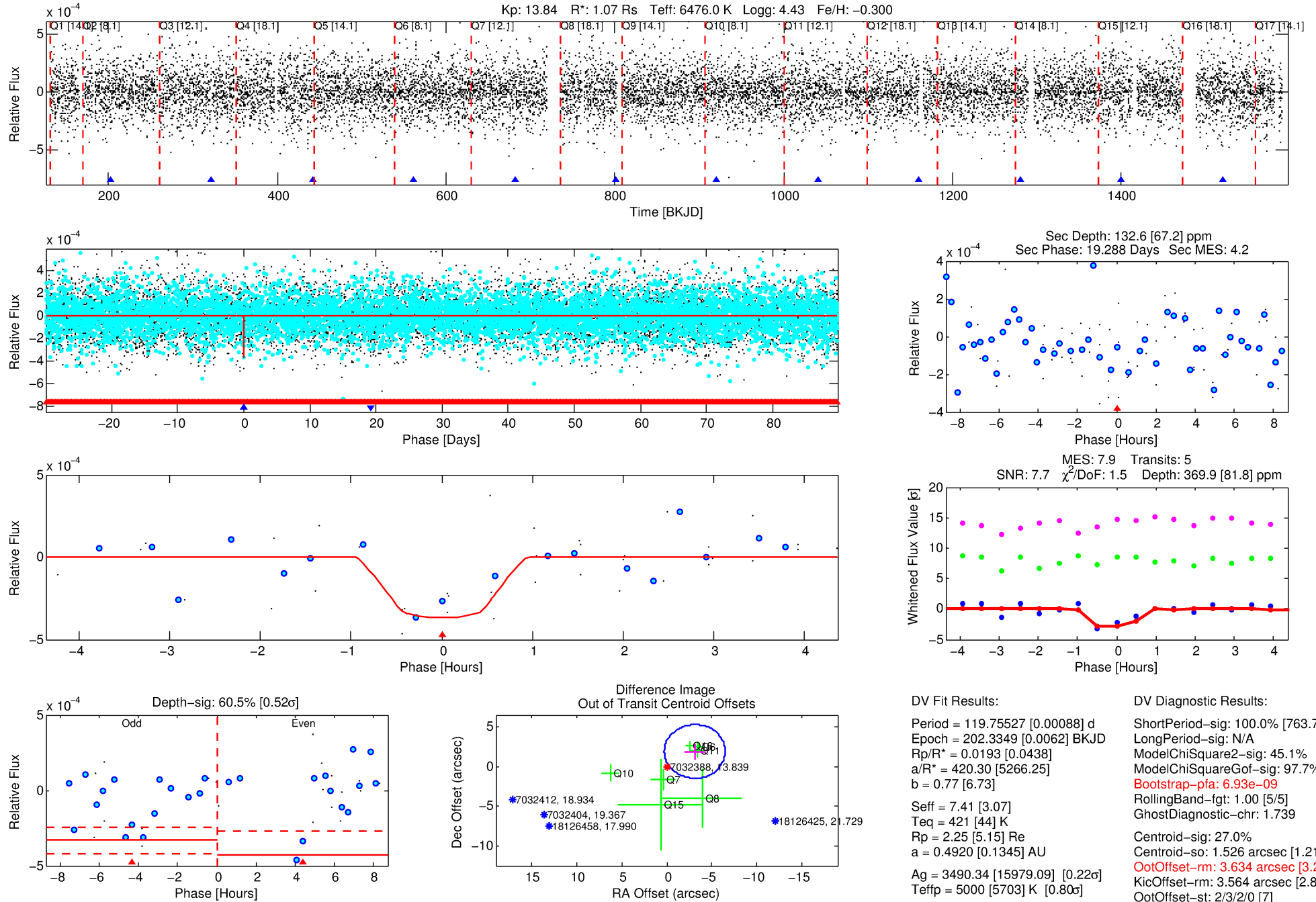
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007032388-02

No Significant Match Found

# DV One-Page Summary

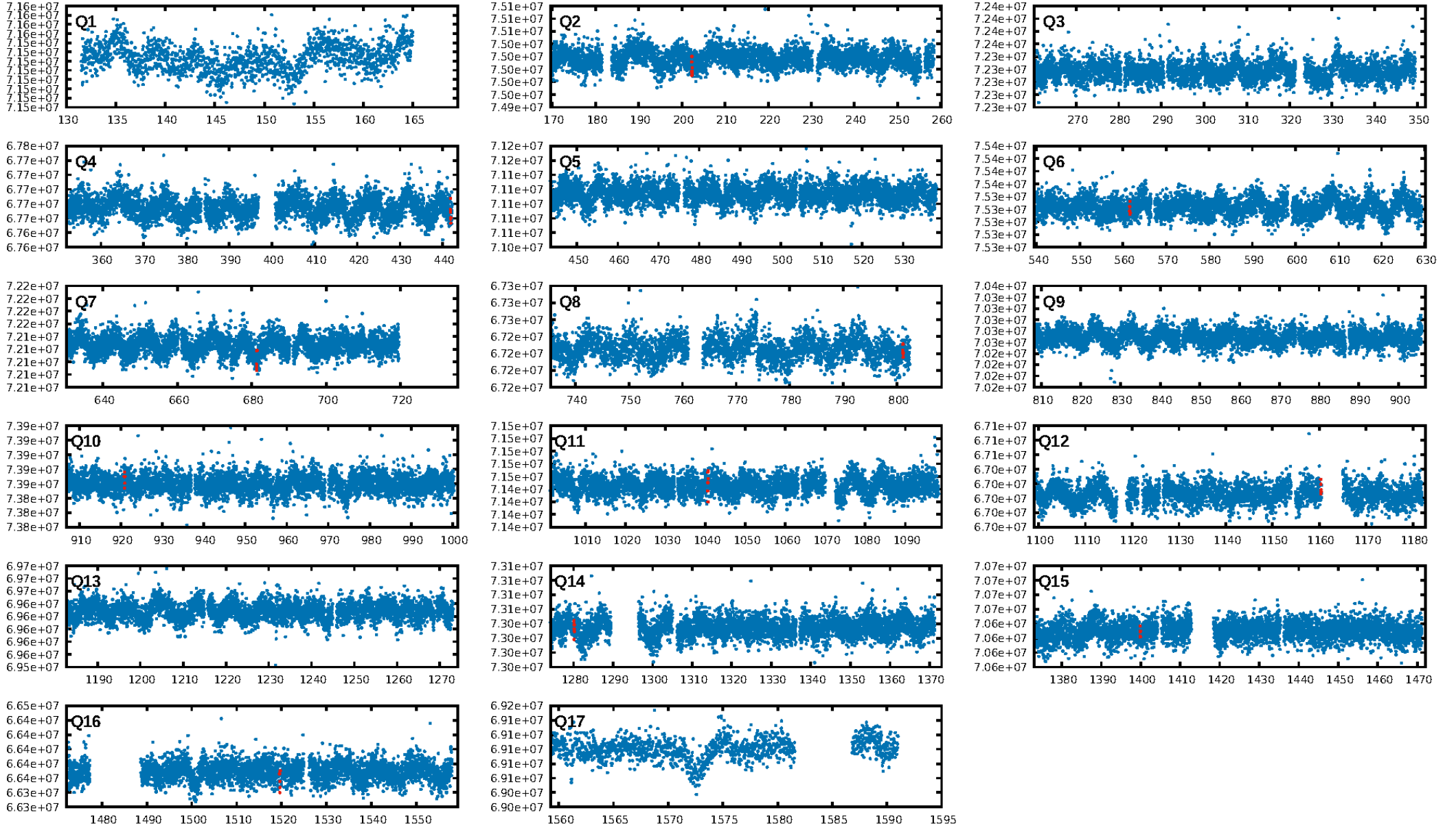
KIC: 7032388 Candidate: 2 of 2 Period: 119.755 d



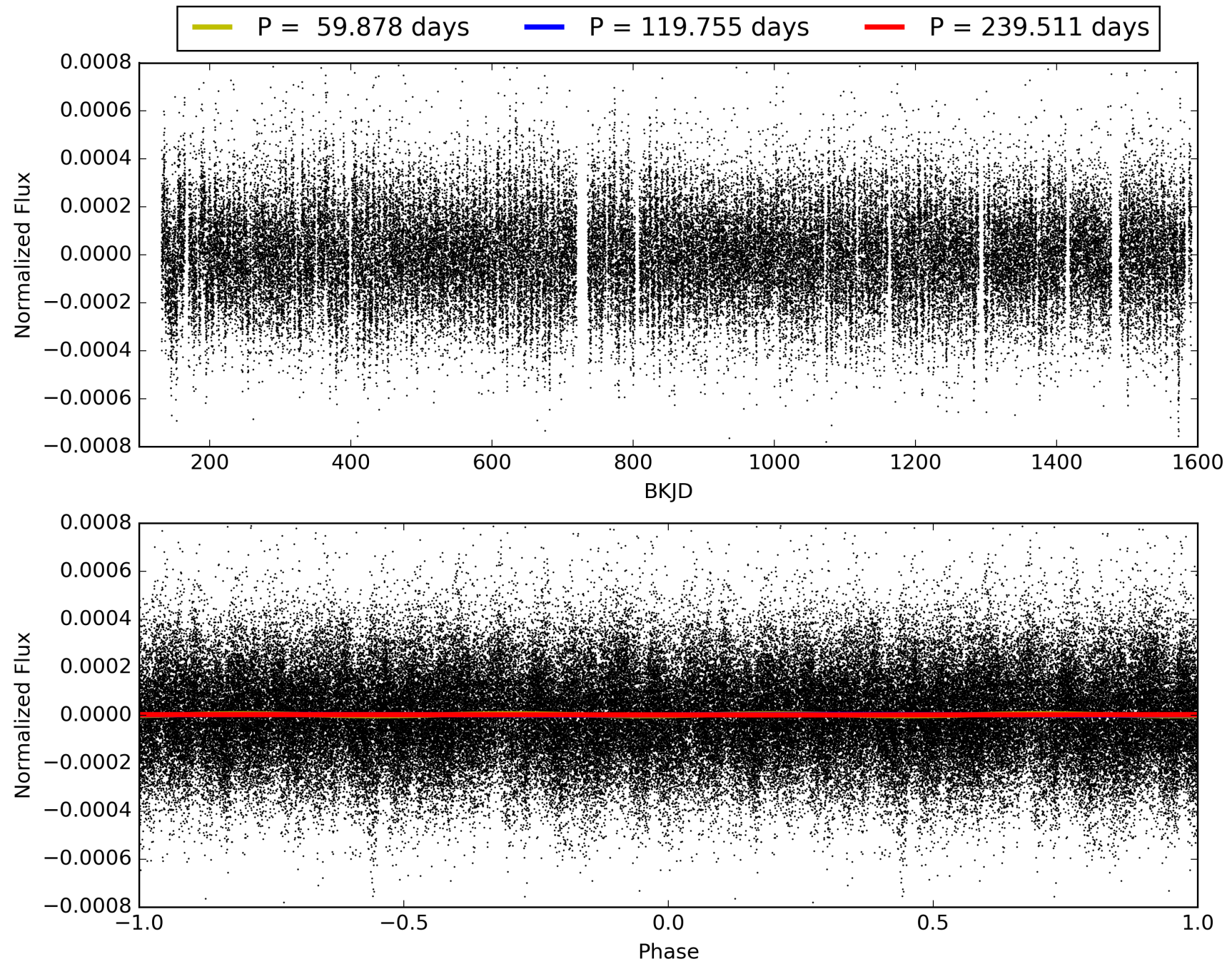
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:47:05 Z

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

# TCE 007032388-02, PDC Light Curves

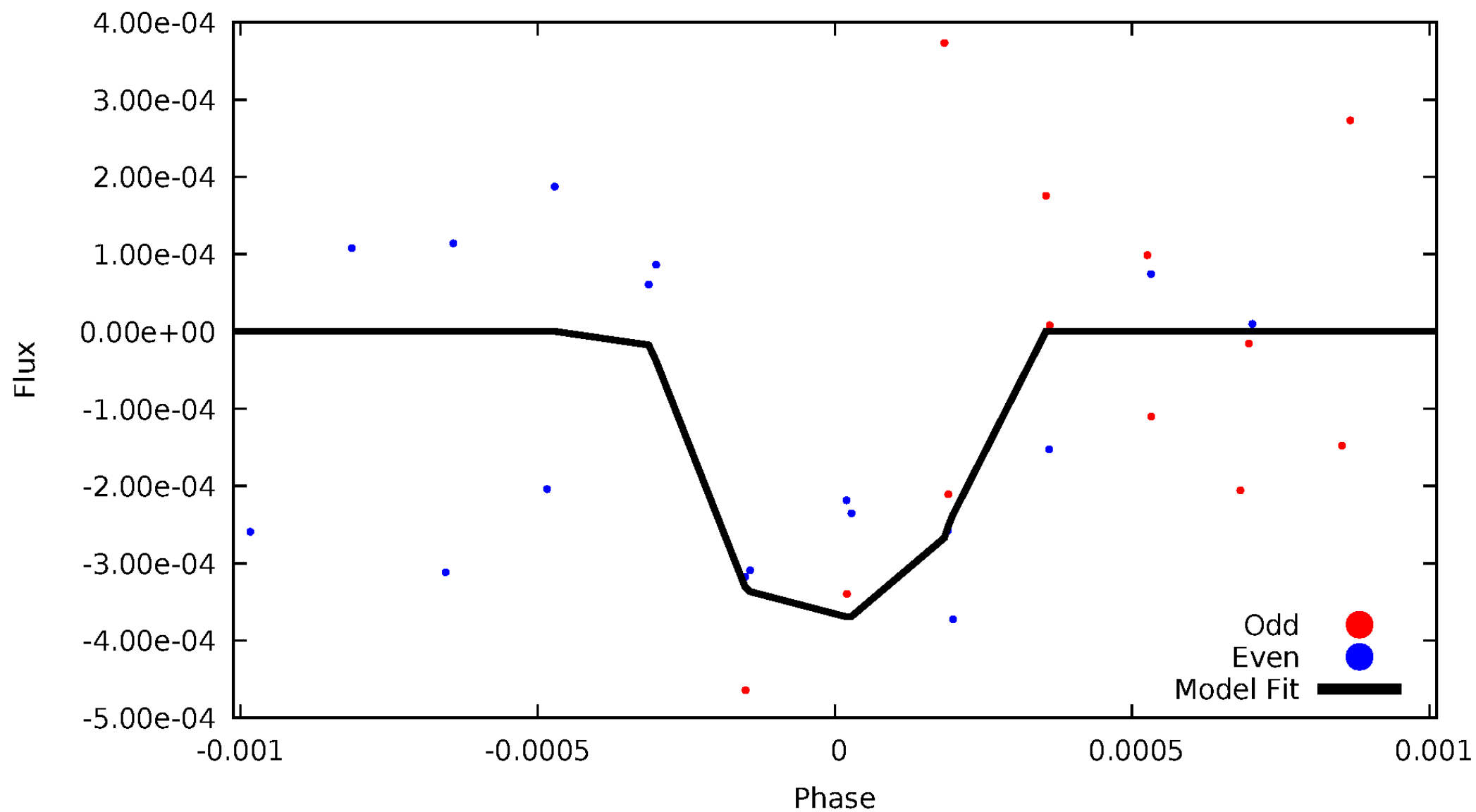


TCE 007032388-02



# DV Odd/Even

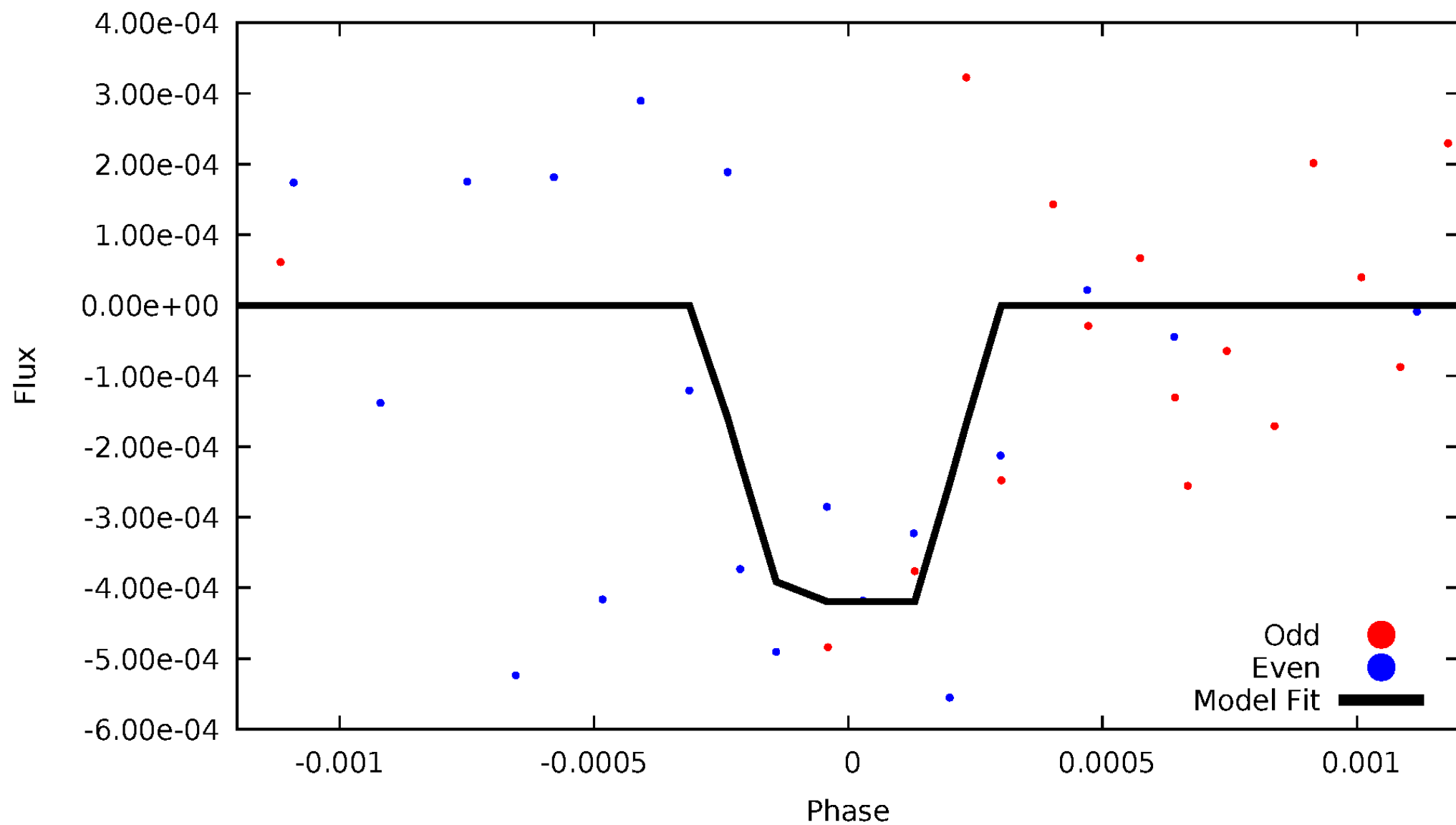
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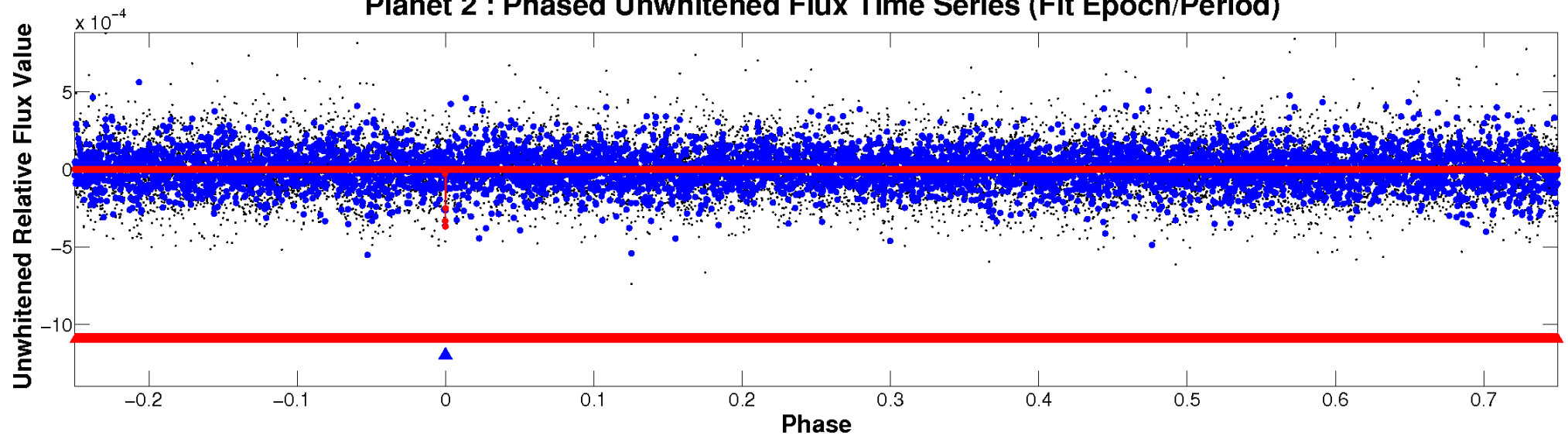
# ALT Odd/Even

TCE 007032388-02

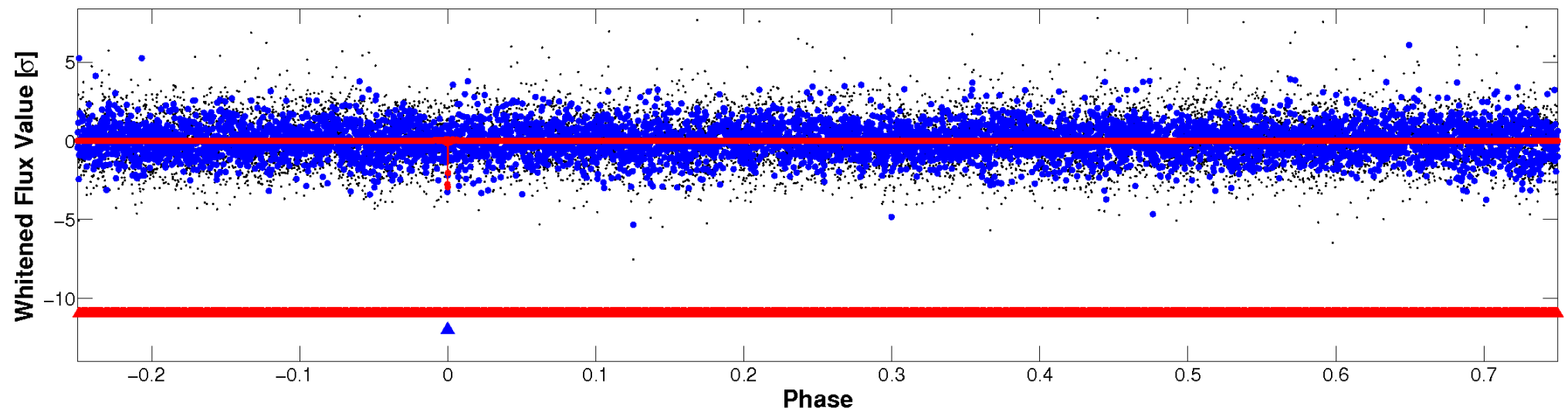


# Non-Whitened Vs. Whitened Light Curve

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

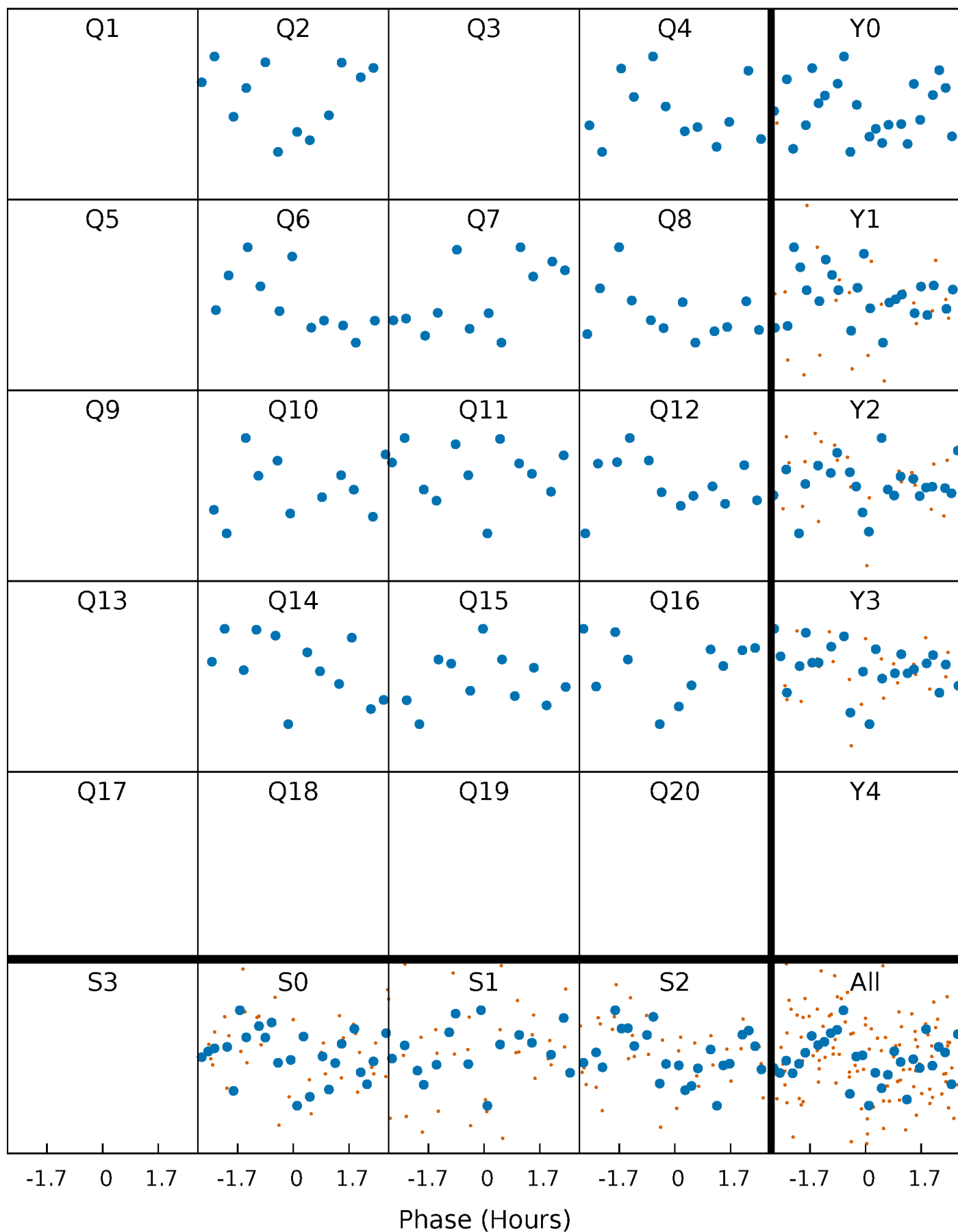


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



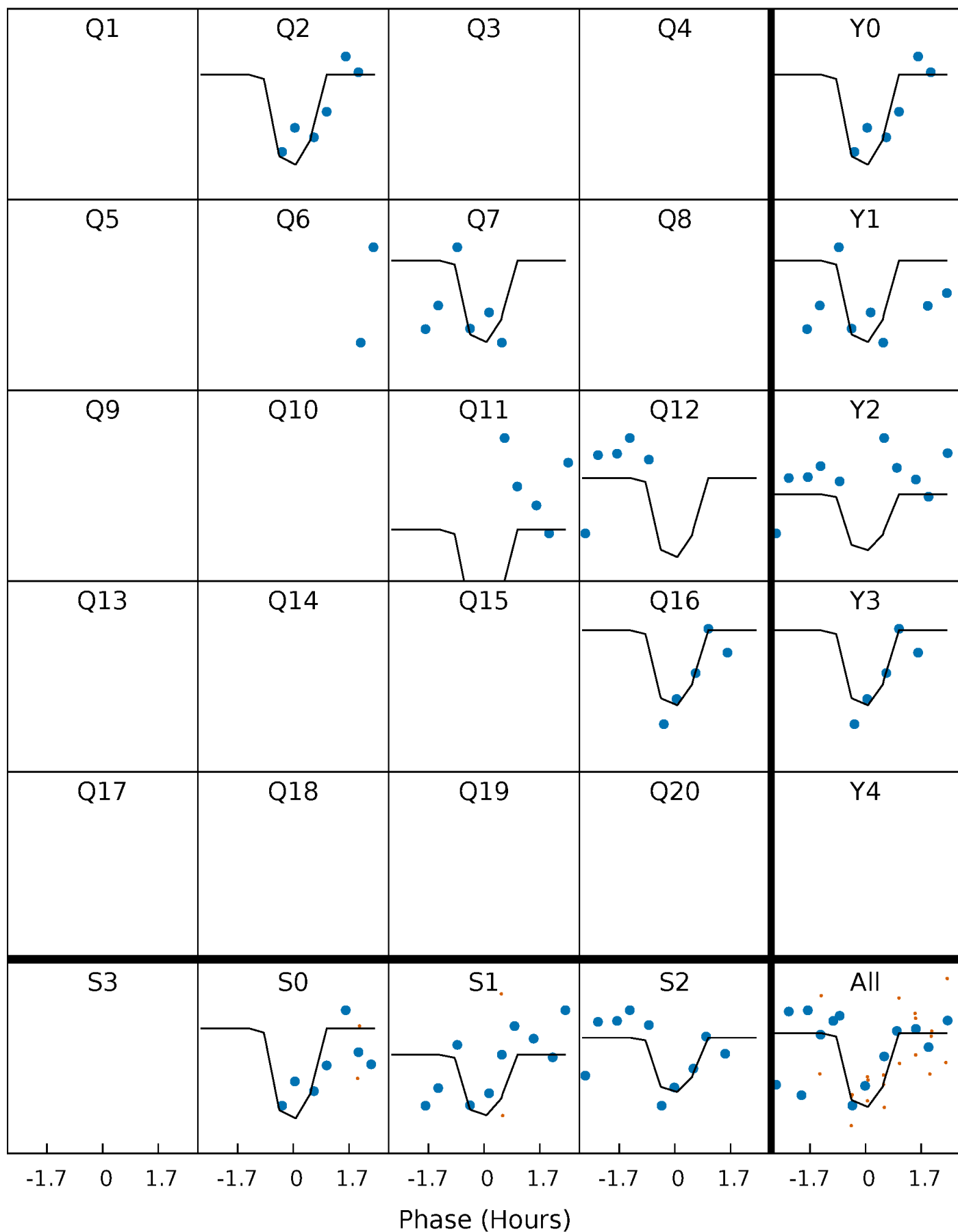
# PDC Quarter-Phased Transit Curves

TCE 007032388-02 P=119.755269 Days  $T_0=202.334890$  (BKJD)



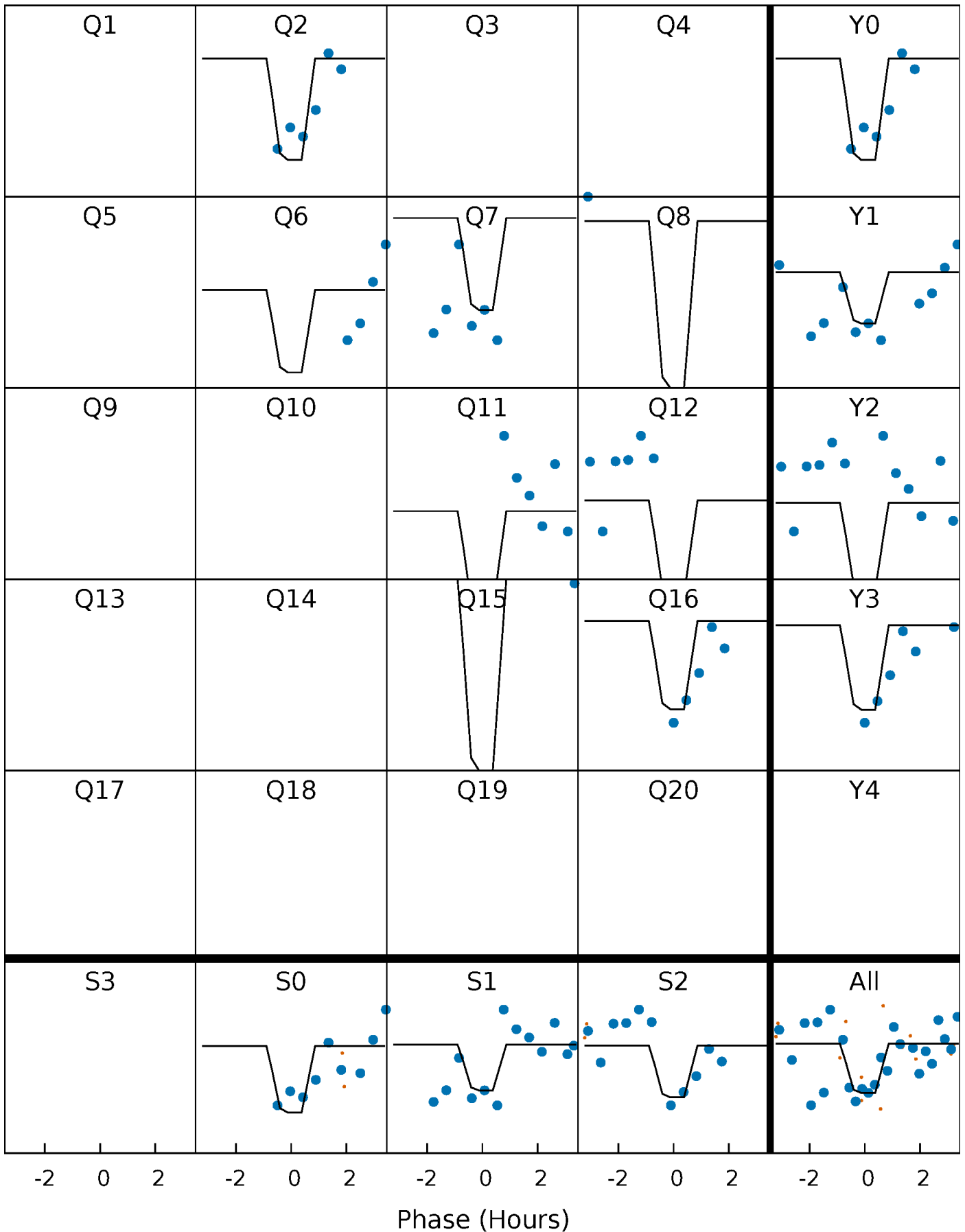
# DV Quarter-Phased Transit Curves

TCE 007032388-02 P=119.755269 Days  $T_0=202.334890$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007032388-02 P=119.753397 Days  $T_0=202.342265$  (BKJD)

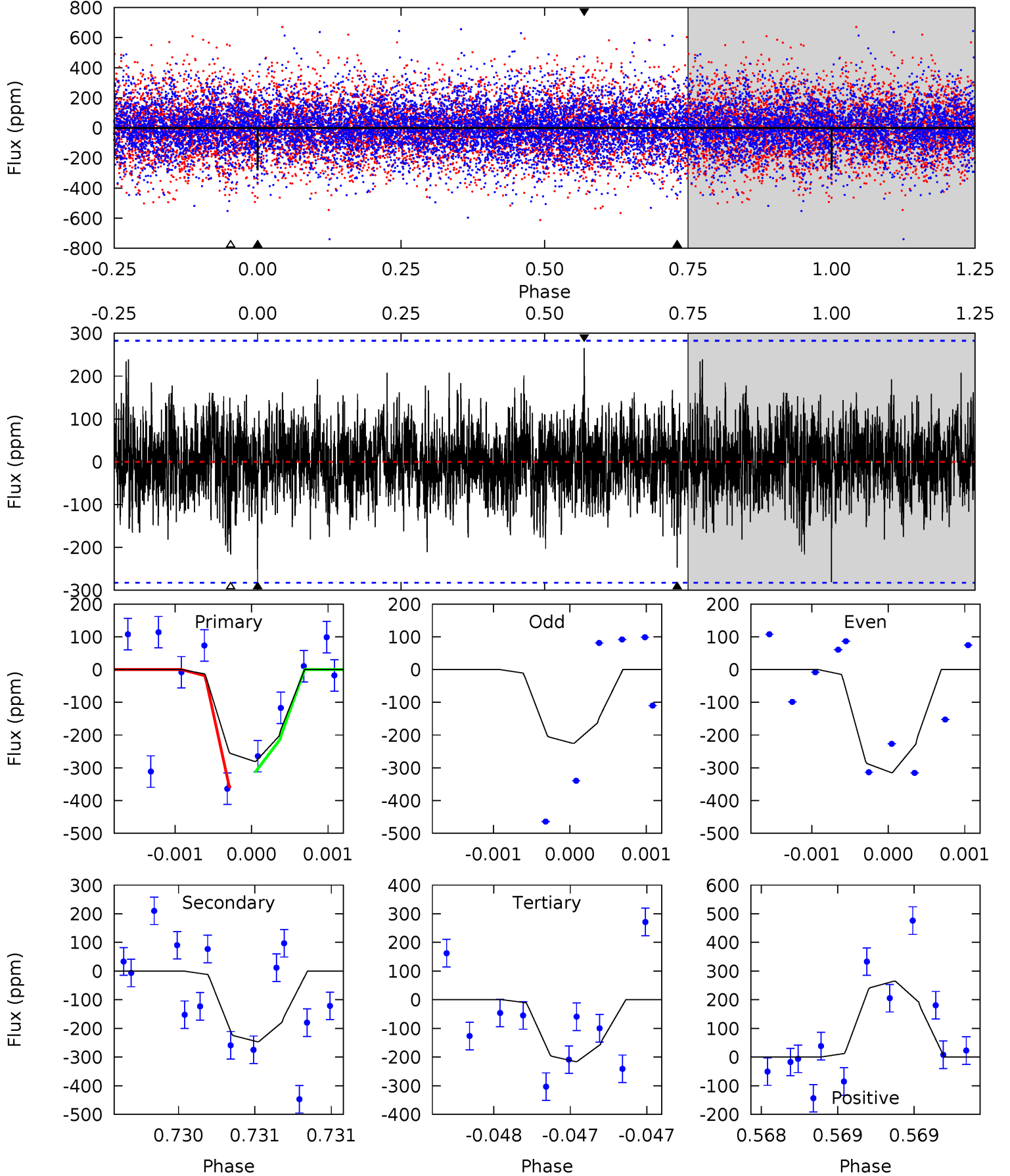




# DV Model-Shift Uniqueness Test

007032388-02, P = 119.755269 Days, E = 82.579621 Days

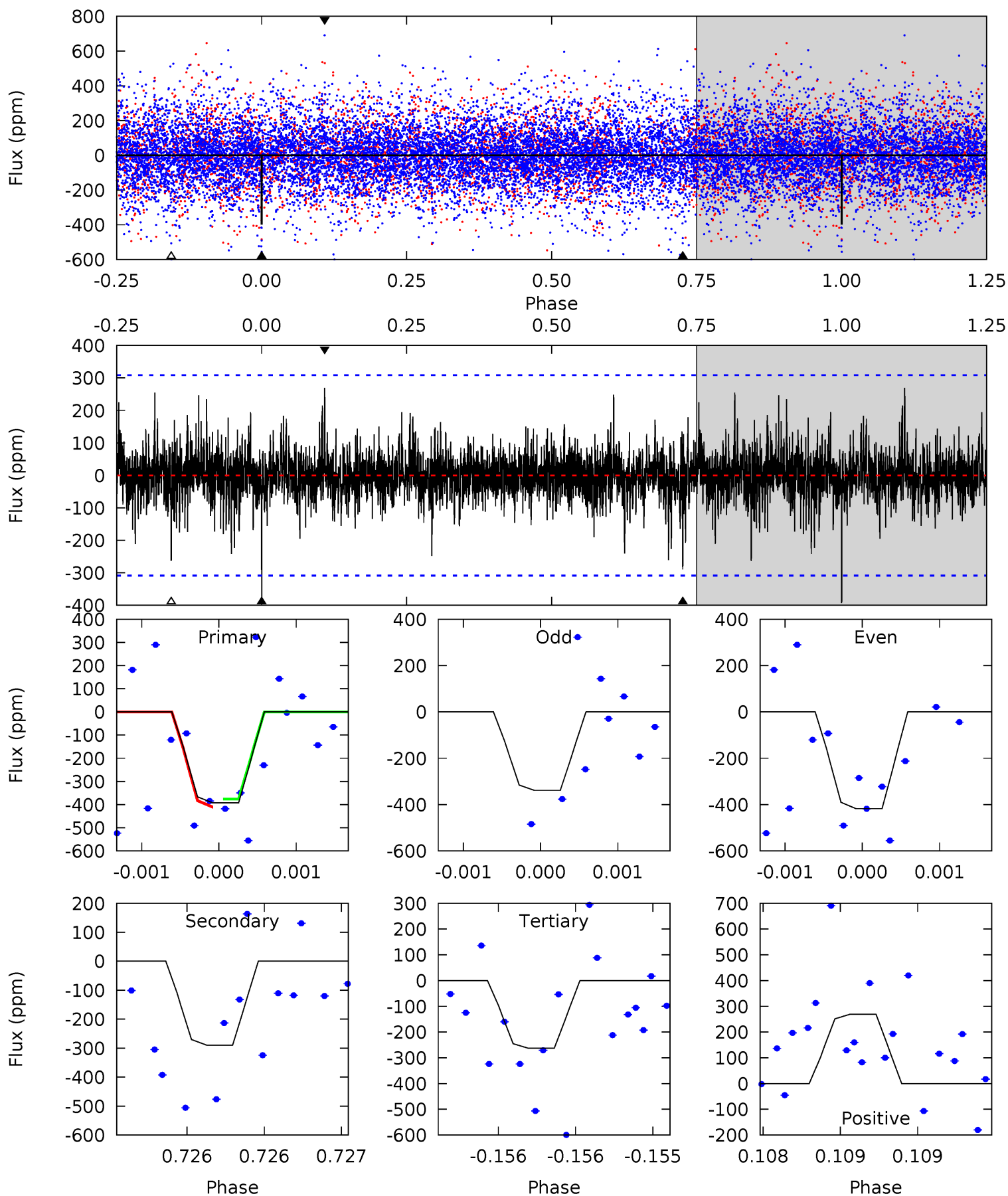
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.54	4.86	4.26	5.23	5.57	3.47	1.21	1.28	0.31	0.61	-0.36	0.86	1.02	0.49	0.46



# Alt Model-Shift Uniqueness Test

007032388-02, P = 119.753397 Days, E = 82.588868 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
7.09	5.23	4.74	4.86	5.57	3.47	1.07	2.34	2.23	0.48	0.37	0.69	1.03	0.41	0.30



### Stellar Parameters For KIC 007032388

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6476^{+146}_{-194}$	$4.426^{+0.054}_{-0.216}$	$-0.300^{+0.250}_{-0.300}$	$1.067^{+0.348}_{-0.116}$	$1.105^{+0.161}_{-0.146}$	$1.282^{+0.367}_{-0.677}$
	+2%/-3%	+1%/-5%	+83%/-100%	+33%/-11%	+15%/-13%	+29%/-53%
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 007032388-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-247 \pm 51$	$4.83^{+4.62}_{-3.39}$	$601^{+46}_{-28}$	$4281^{+3497}_{-845}$	$1375^{+15239}_{-1018}$
Alt.	$-290 \pm 55$	$4.96^{+4.98}_{-3.32}$	$602^{+46}_{-28}$	$4418^{+3022}_{-957}$	$1518^{+11769}_{-1160}$

$T_{max}$  = 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

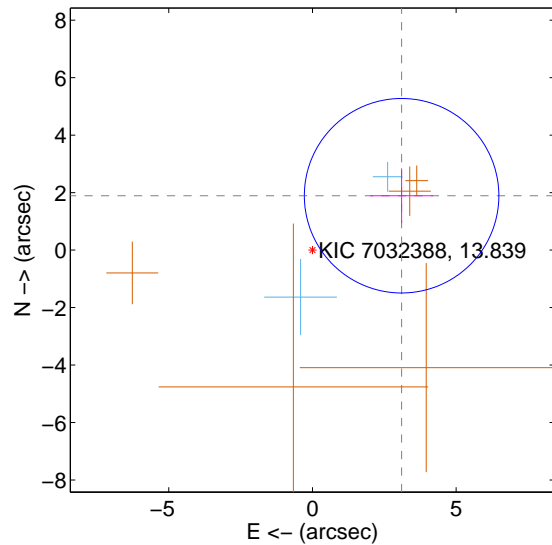
Supplemental centroid analysis for 007032388-02. Kepler magnitude: 13.84. Transit SNR 7.68

There are 2 quarters with good PRF difference image offsets

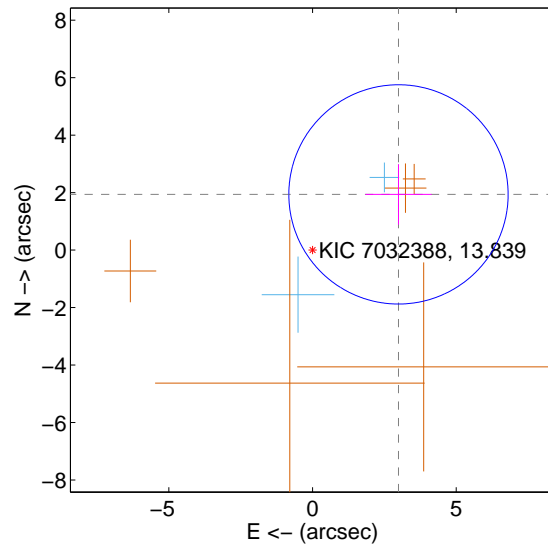
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.634 \pm 1.128$	3.22	$-3.102 \pm 1.096$	$1.892 \pm 0.953$
PRF-fit source offset from KIC position	$3.564 \pm 1.272$	2.80	$-2.991 \pm 1.152$	$1.938 \pm 1.053$
photometric centroid source offset	$1.53 \pm 1.26$	1.21	$1.42 \pm 1.27$	$0.56 \pm 1.16$

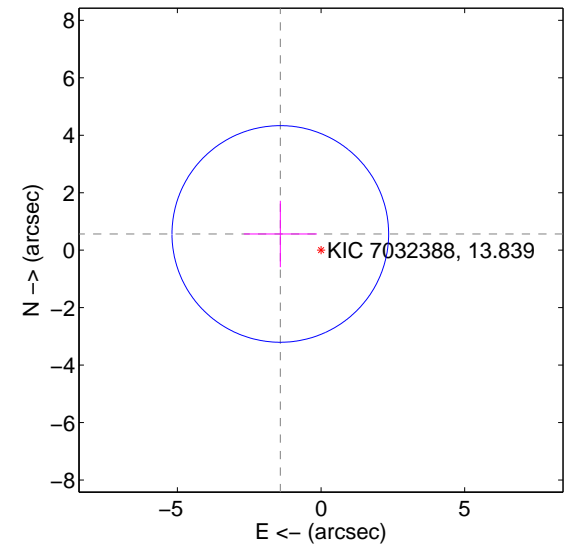
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

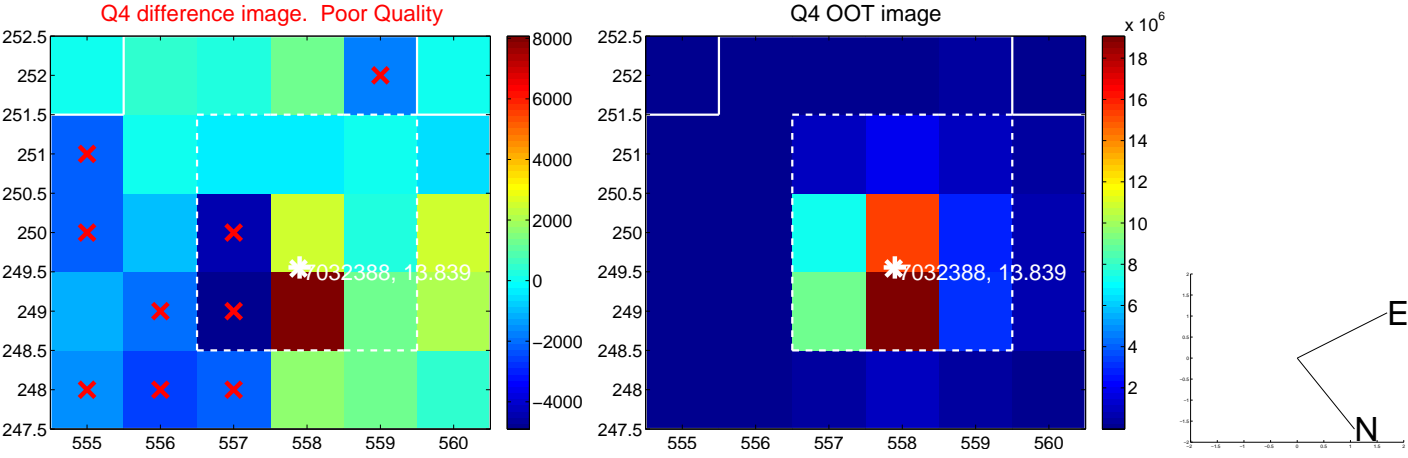
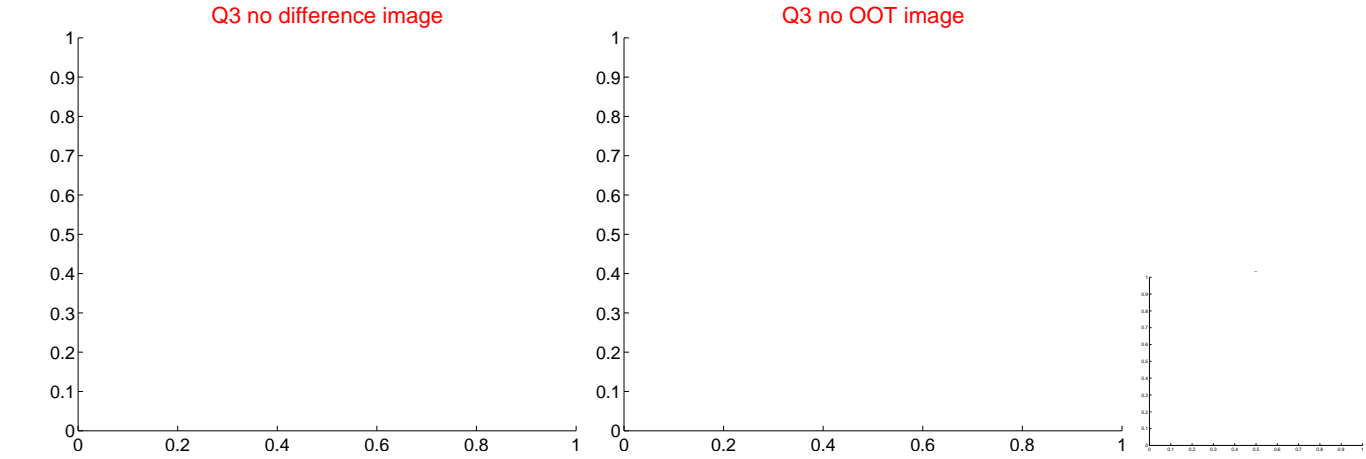
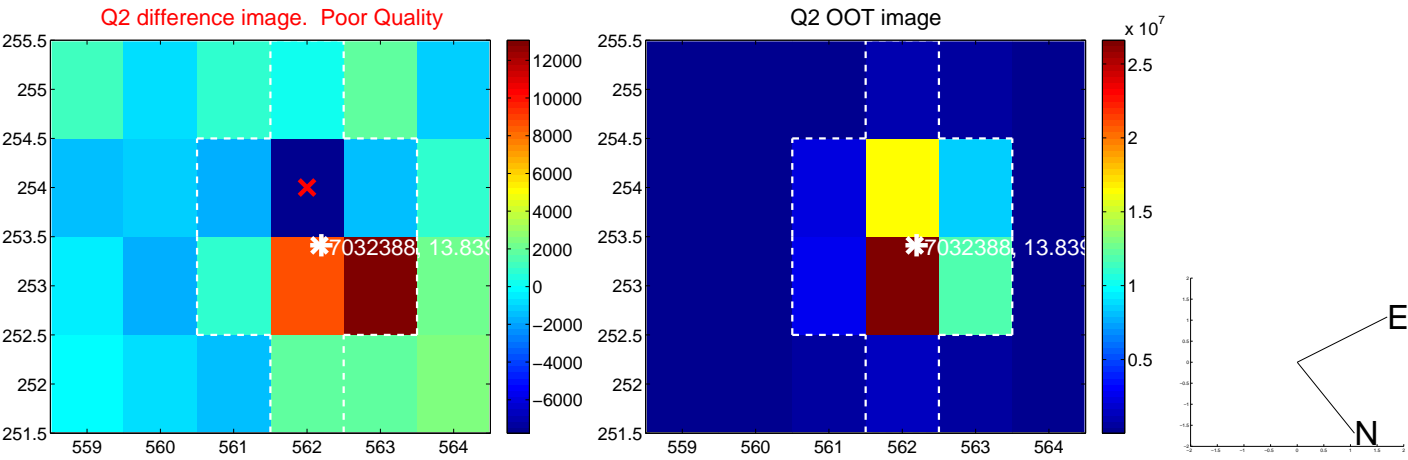
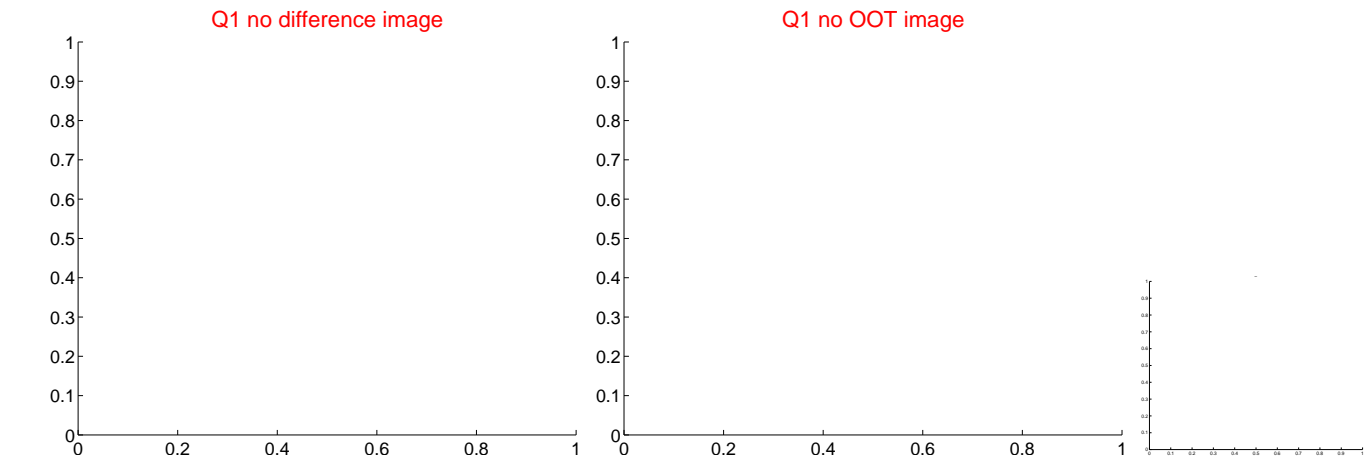


offset from photometric centroids



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.





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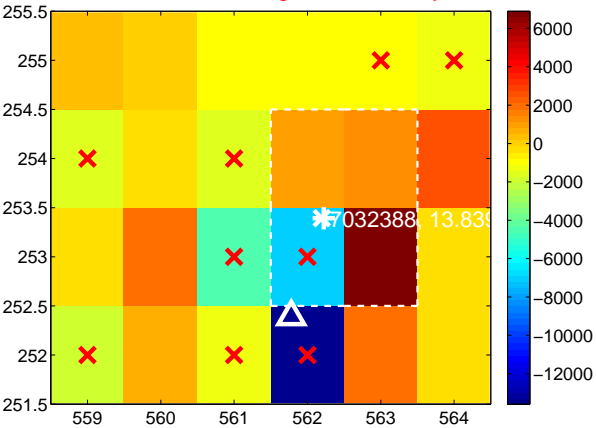
Q5 no difference image



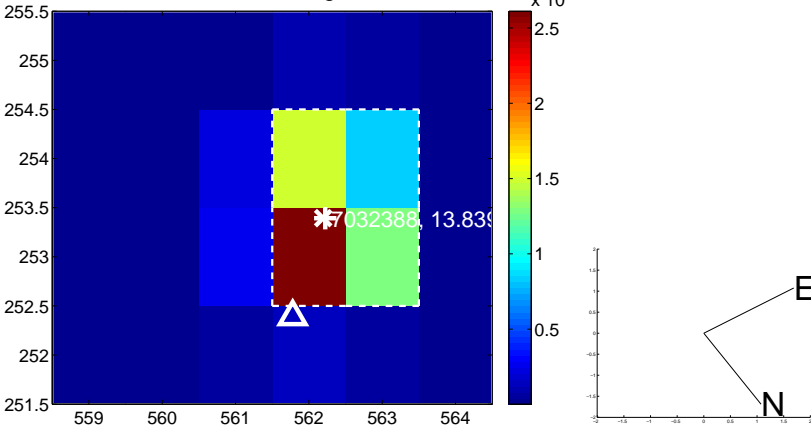
Q5 no OOT image



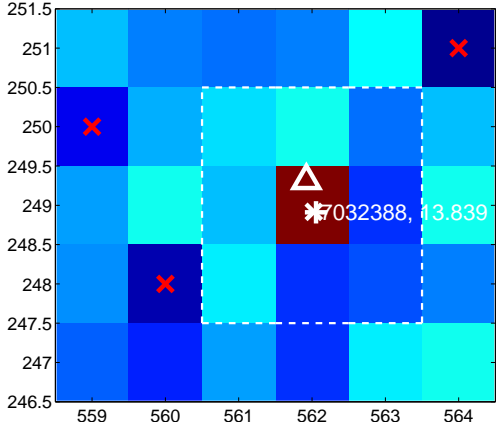
Q6 difference image. Poor Quality



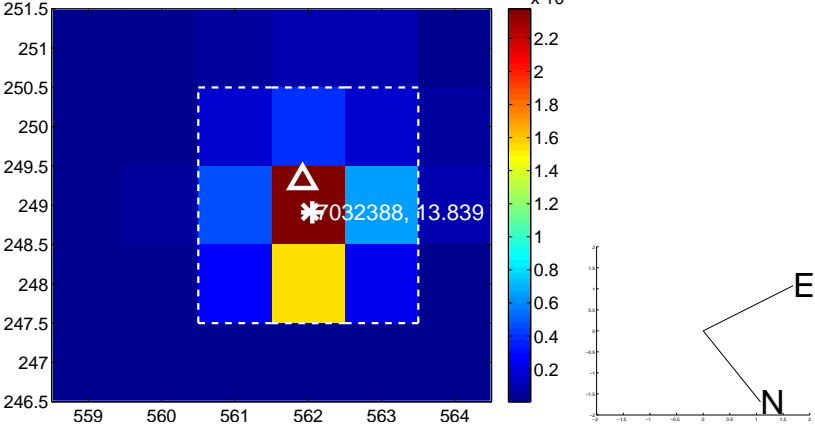
Q6 OOT image



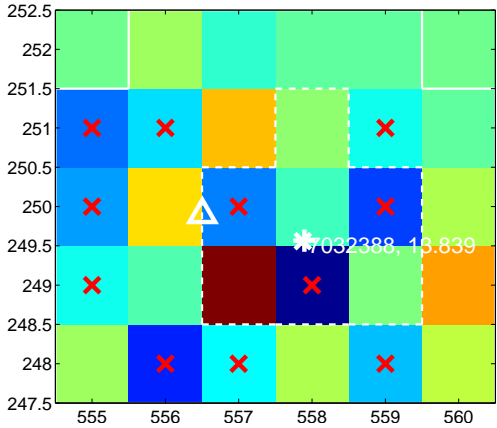
Q7 difference image



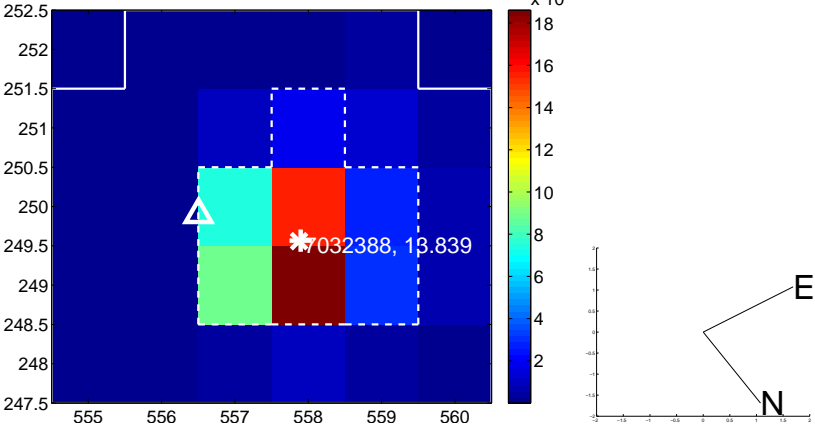
Q7 OOT image



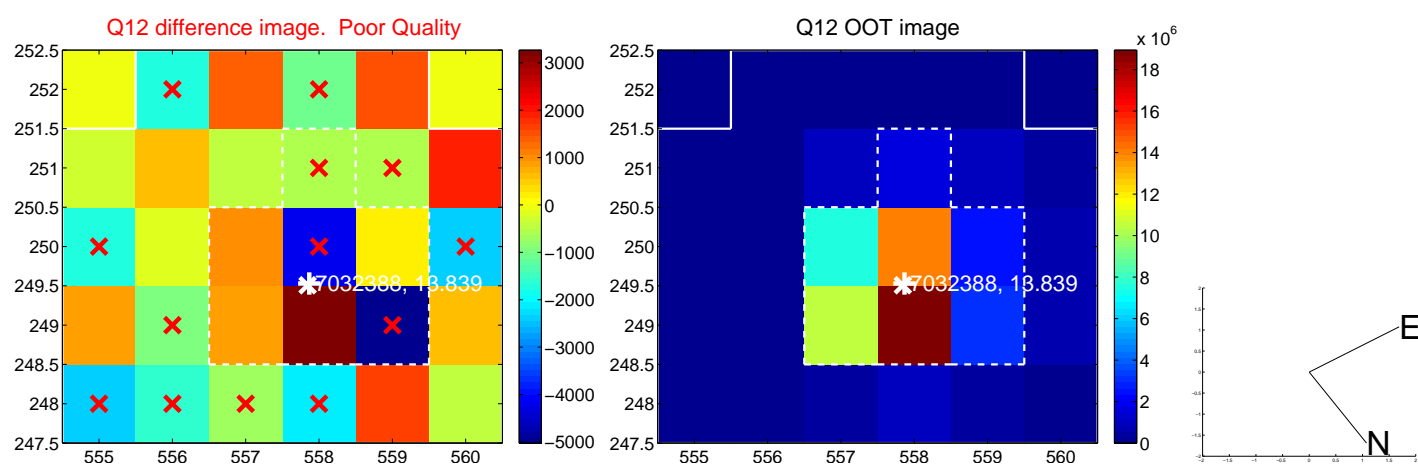
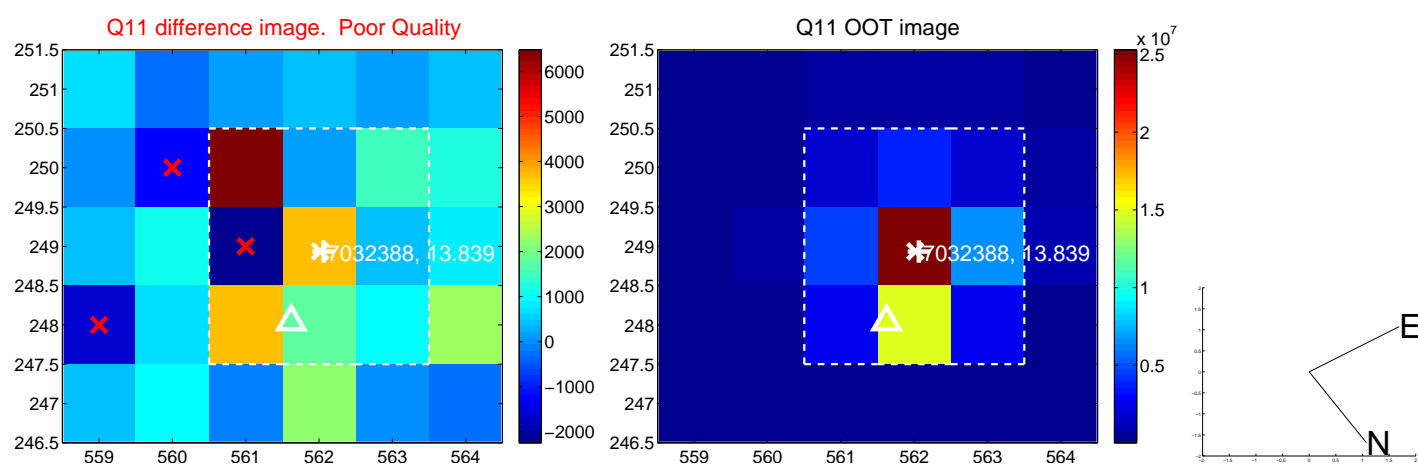
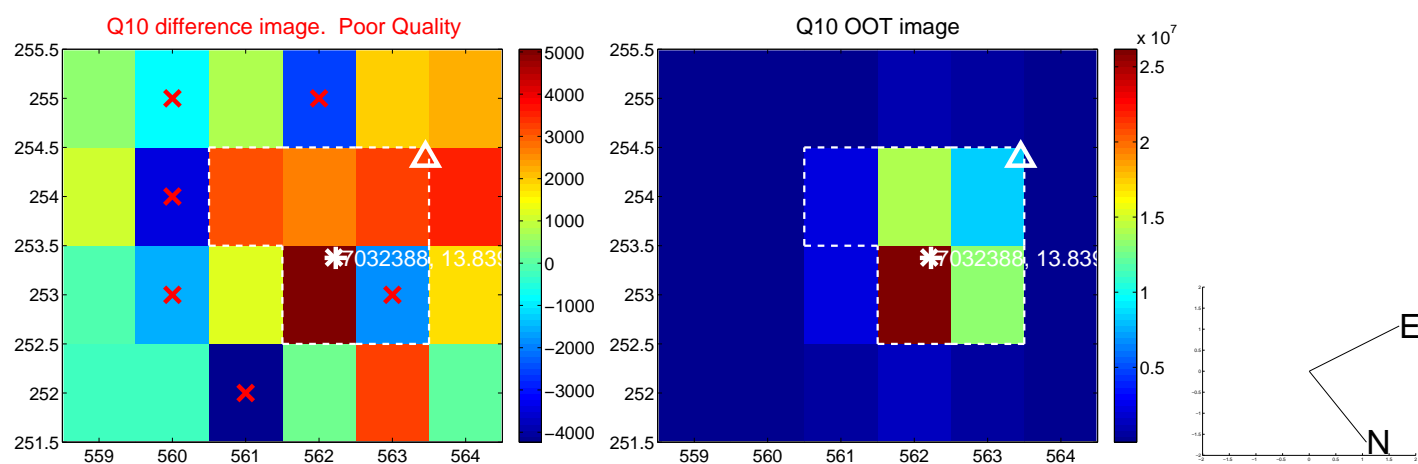
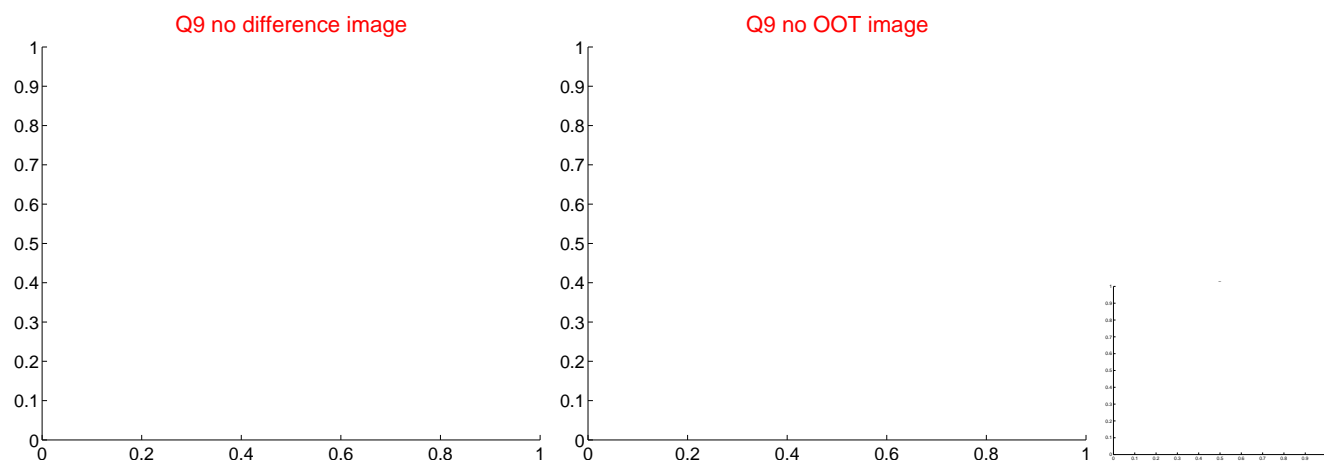
Q8 difference image. Poor Quality



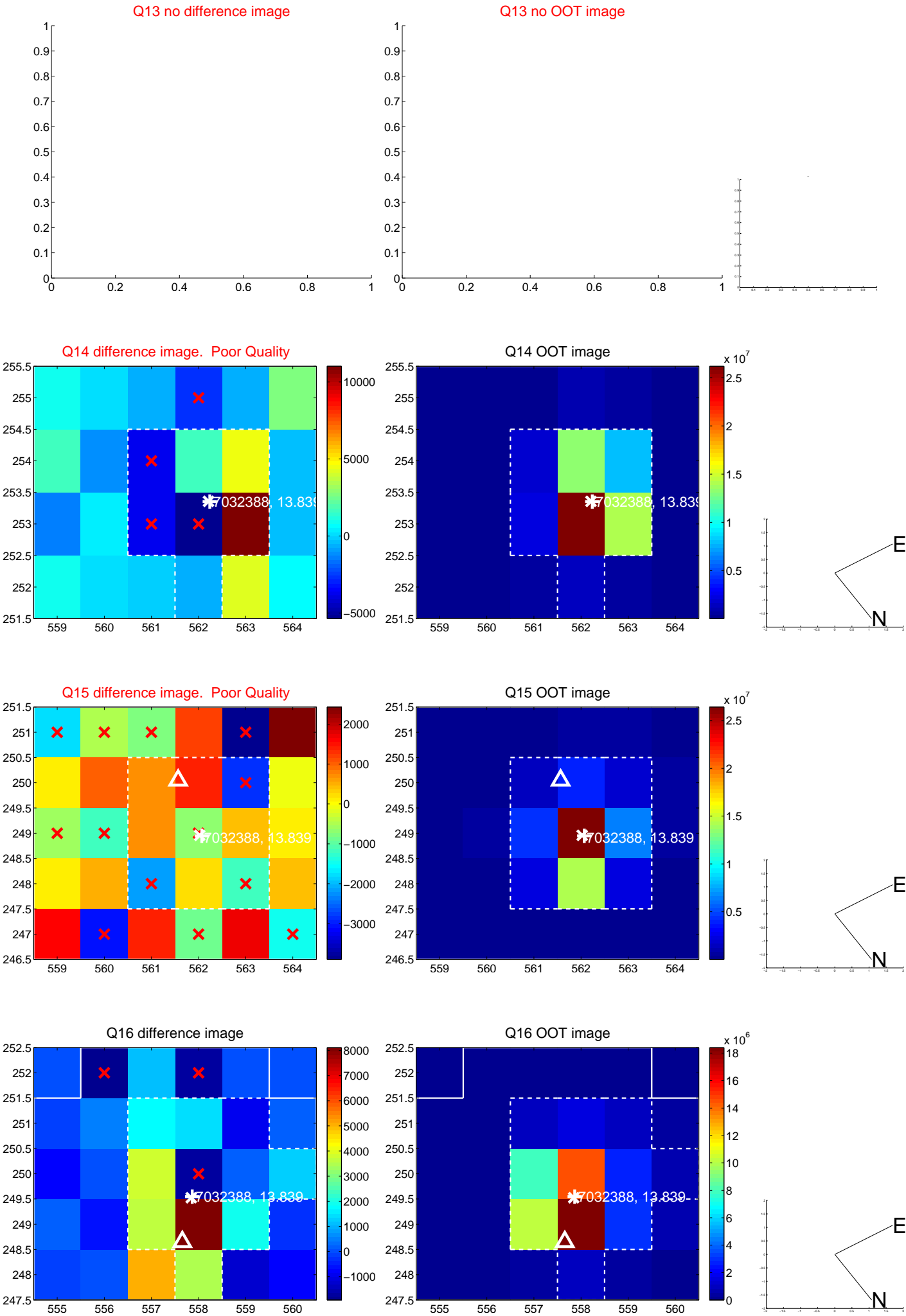
Q8 OOT image



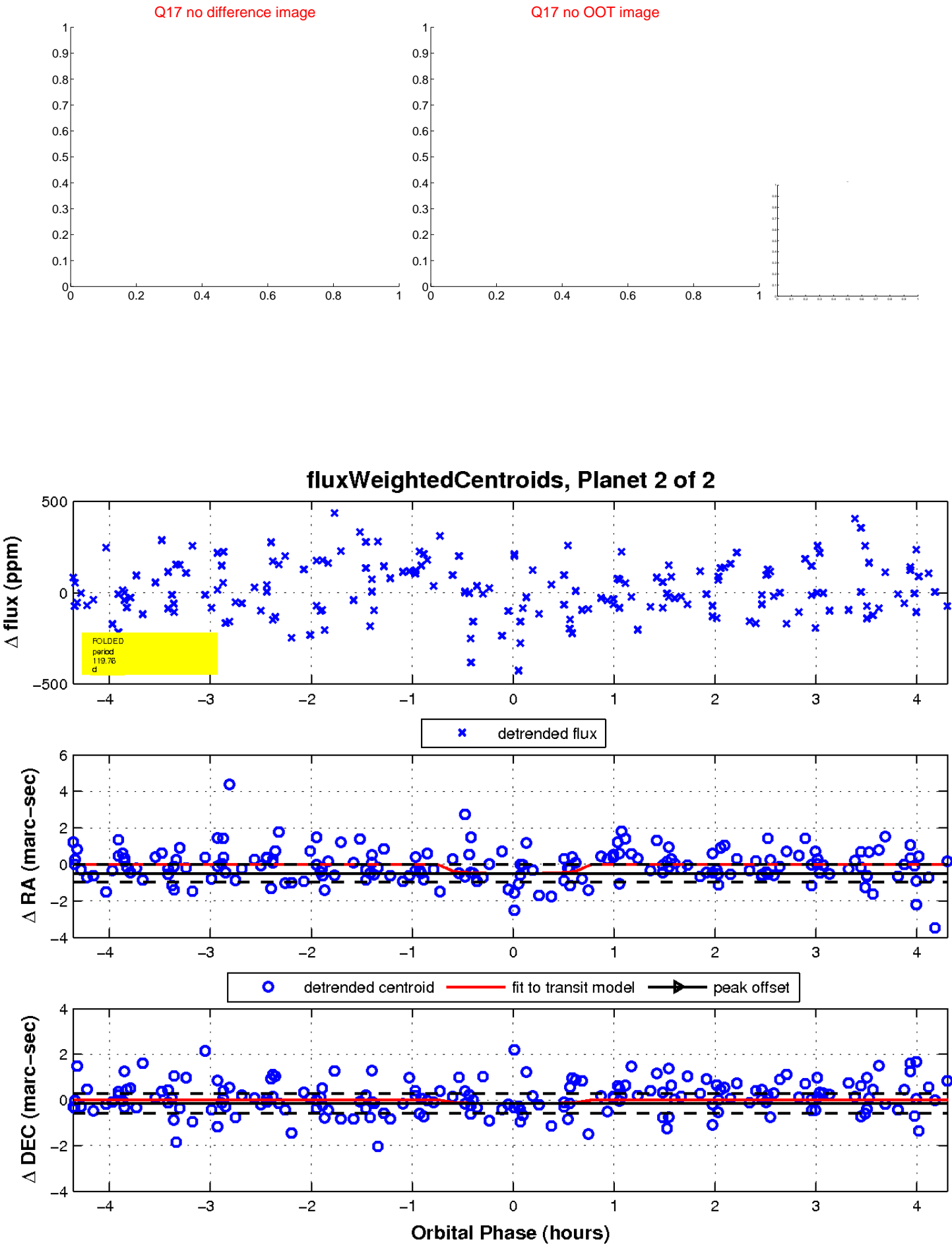
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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.



UKIRT Image

Declination

