

# KIC 009159265

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009159265-01	OBS	3877.01	3.044736	132.445754	204.9	7.828	34.7	41.1	0.82	5627	1.71	380.57

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009159265-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_ALT—CENT_RESOLVED_OFFSET—EPHEM_MATCH

**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.

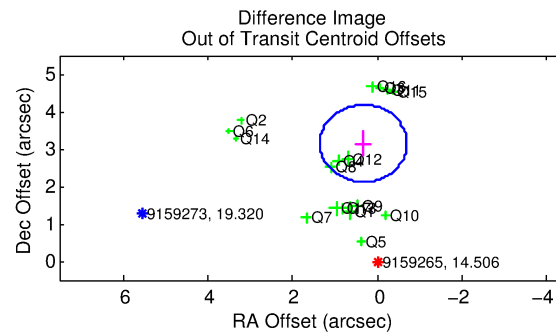
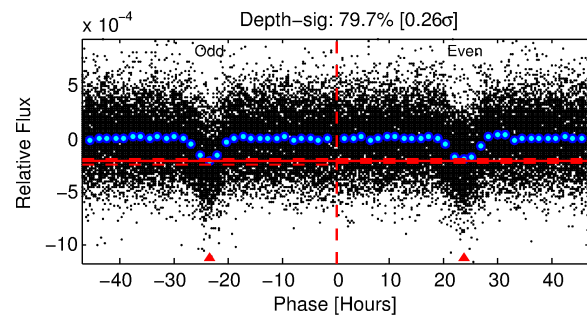
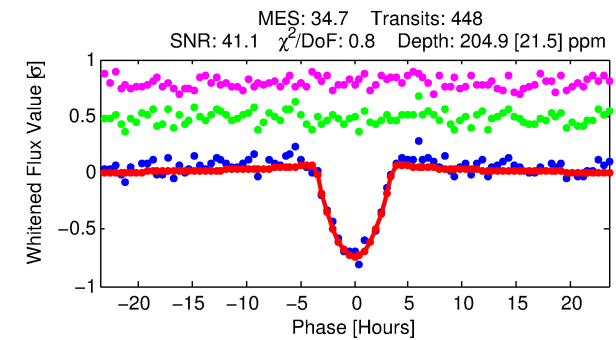
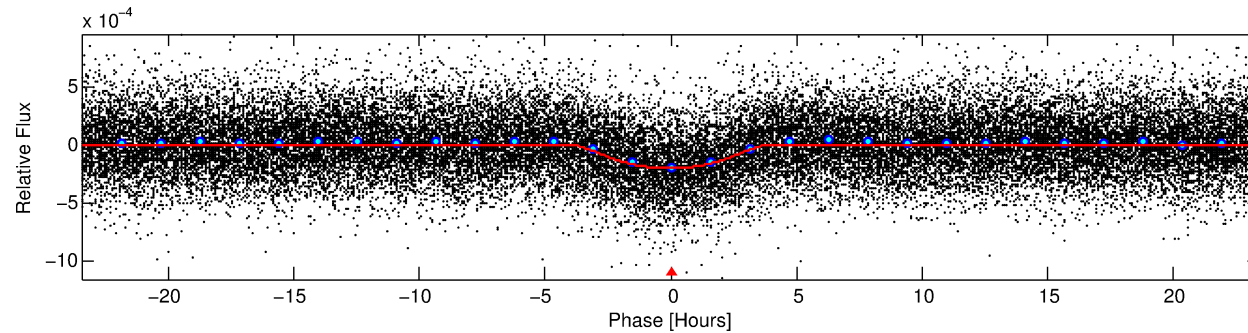
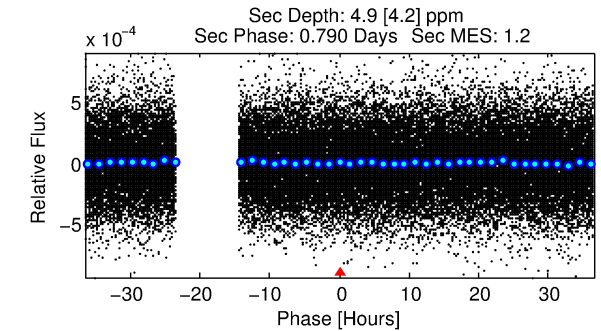
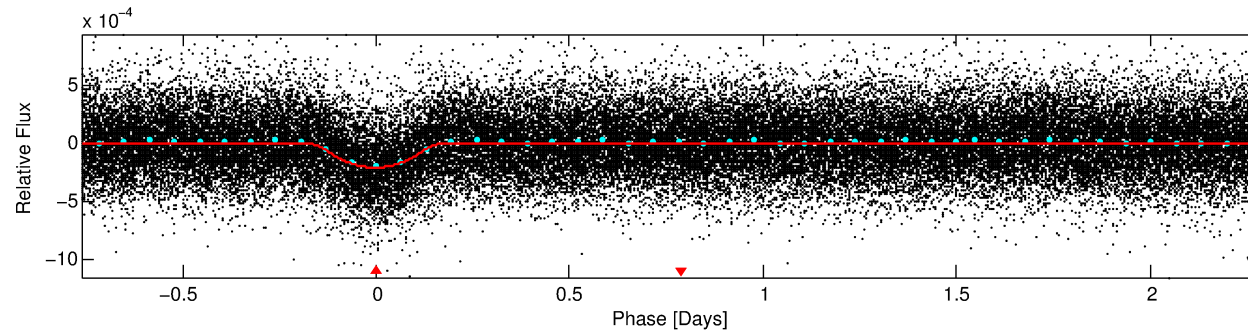
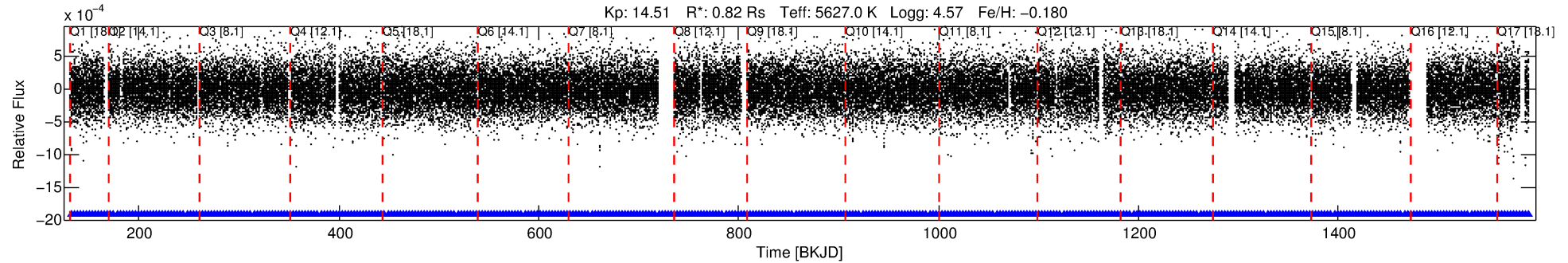
## Ephemeris Match Information For 009159265-01

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	$\sigma_P$	$\sigma_T$
009159265-01	9159265	009159301-pri	9159301	1:1	34.5	-9	-1	12.15	14.51	2384.40	Direct-PRF	0	0.68	0.42

**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: 9159265 Candidate: 1 of 1 Period: 3.045 d  
KOI: K03877.01 Corr: 0.886



## DV Fit Results:

Period = 3.04474 [0.00002] d  
Epoch = 132.4458 [0.0039] BKJD  
Rp/R\* = 0.0192 [0.0023]  
a/R\* = 1.26 [0.04]  
b = 0.99 [0.01]  
Seff = 380.57 [120.62]  
Teq = 1126 [89] K  
Rp = 1.71 [0.48] Re  
a = 0.0397 [0.0083] AU  
Ag = 1.45 [1.36] [0.33σ]  
Teffp = 1912 [427] K [1.80σ]

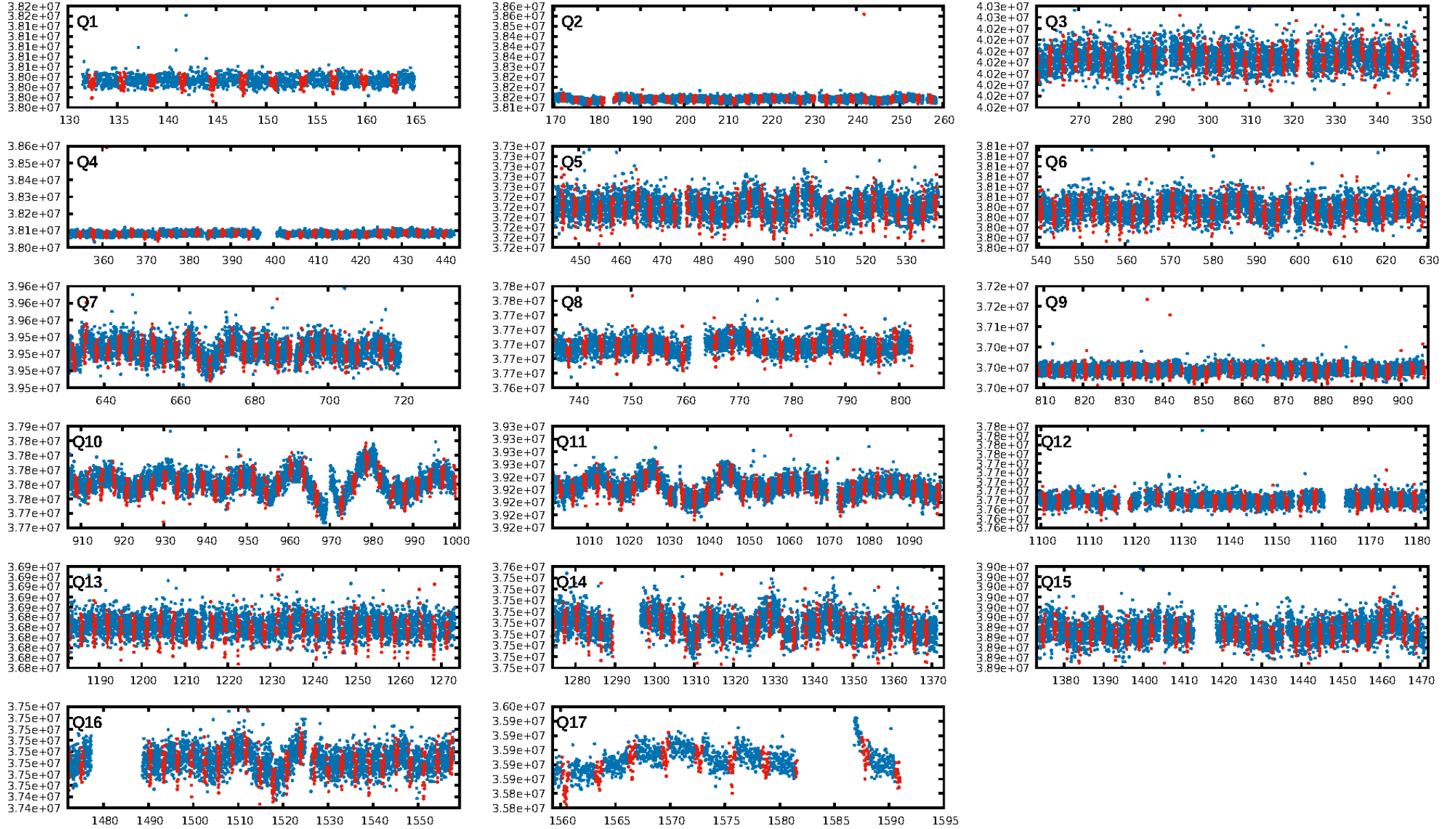
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.25e-245  
RollingBand-fgt: 1.00 [427/427]  
GhostDiagnostic-chr: 0.27  
Centroid-sig: 0.0%  
Centroid-so: 4.834 arcsec [17.22σ]  
OotOffset-rm: 3.163 arcsec [9.23σ]  
KicOffset-rm: 3.151 arcsec [8.66σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.18 [3/17]  
DiffImageOverlap-fno: 1.00 [17/17]

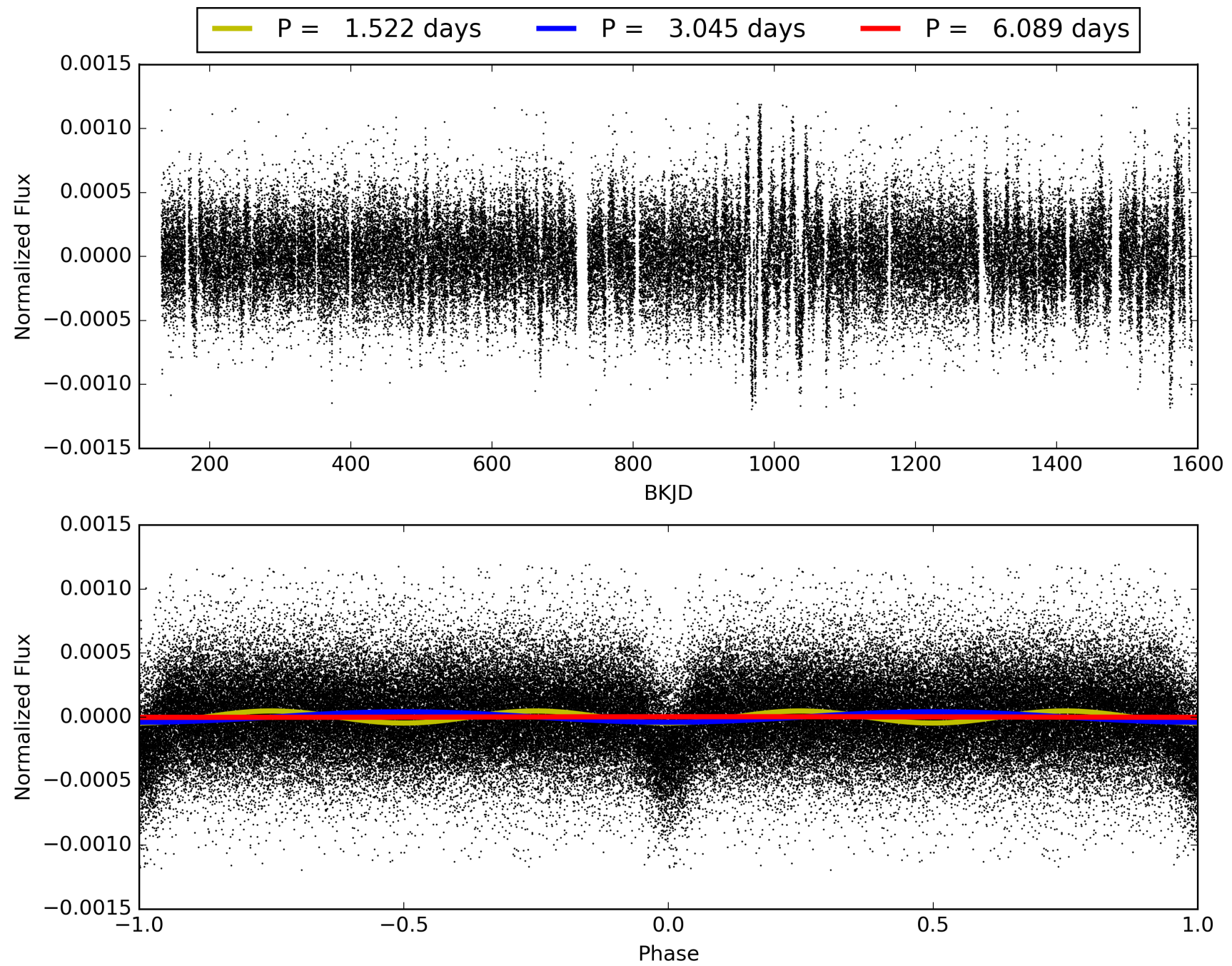
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:04:33 Z

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

# TCE 009159265-01, PDC Light Curves

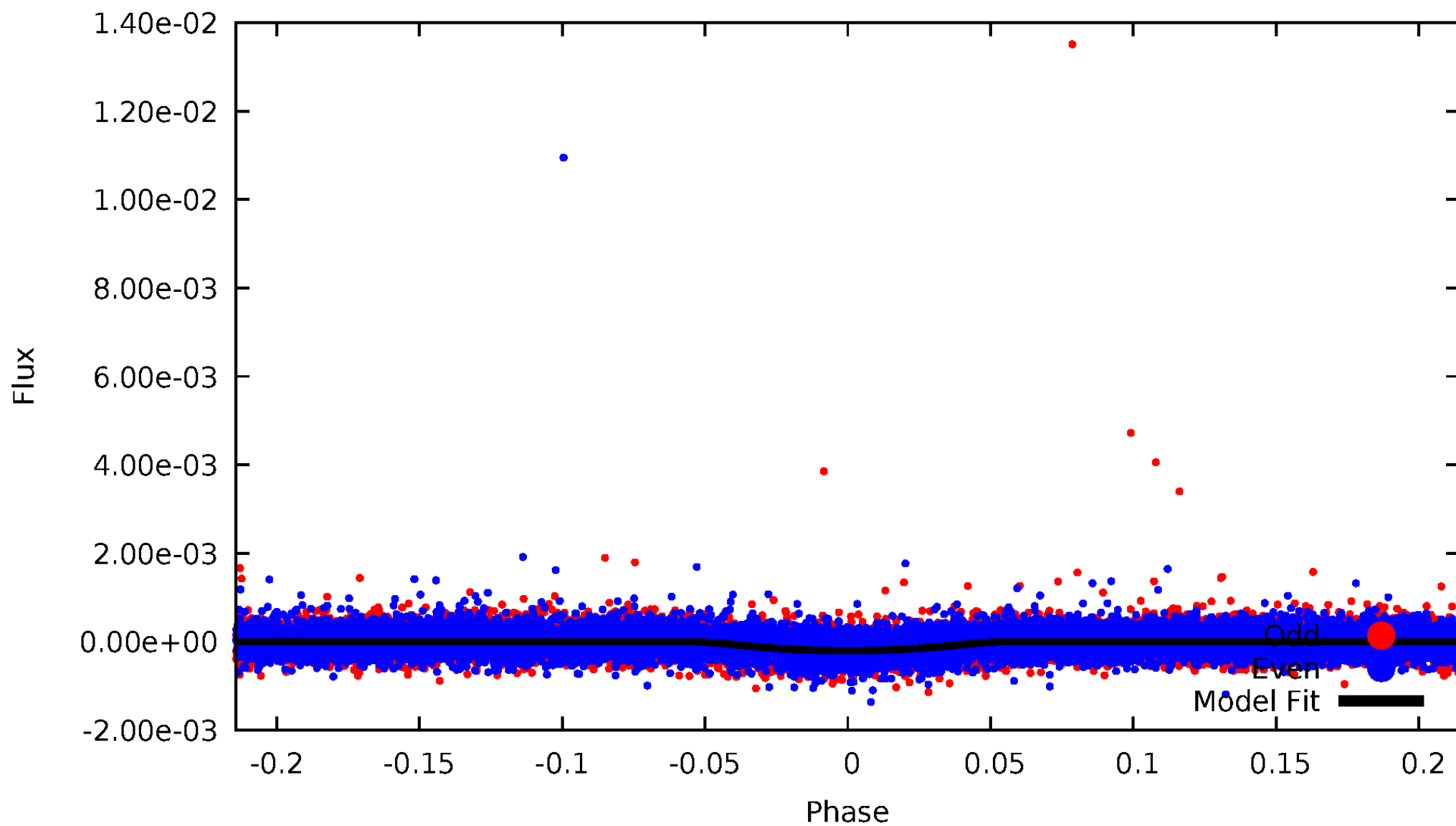


TCE 009159265-01



# DV Odd/Even

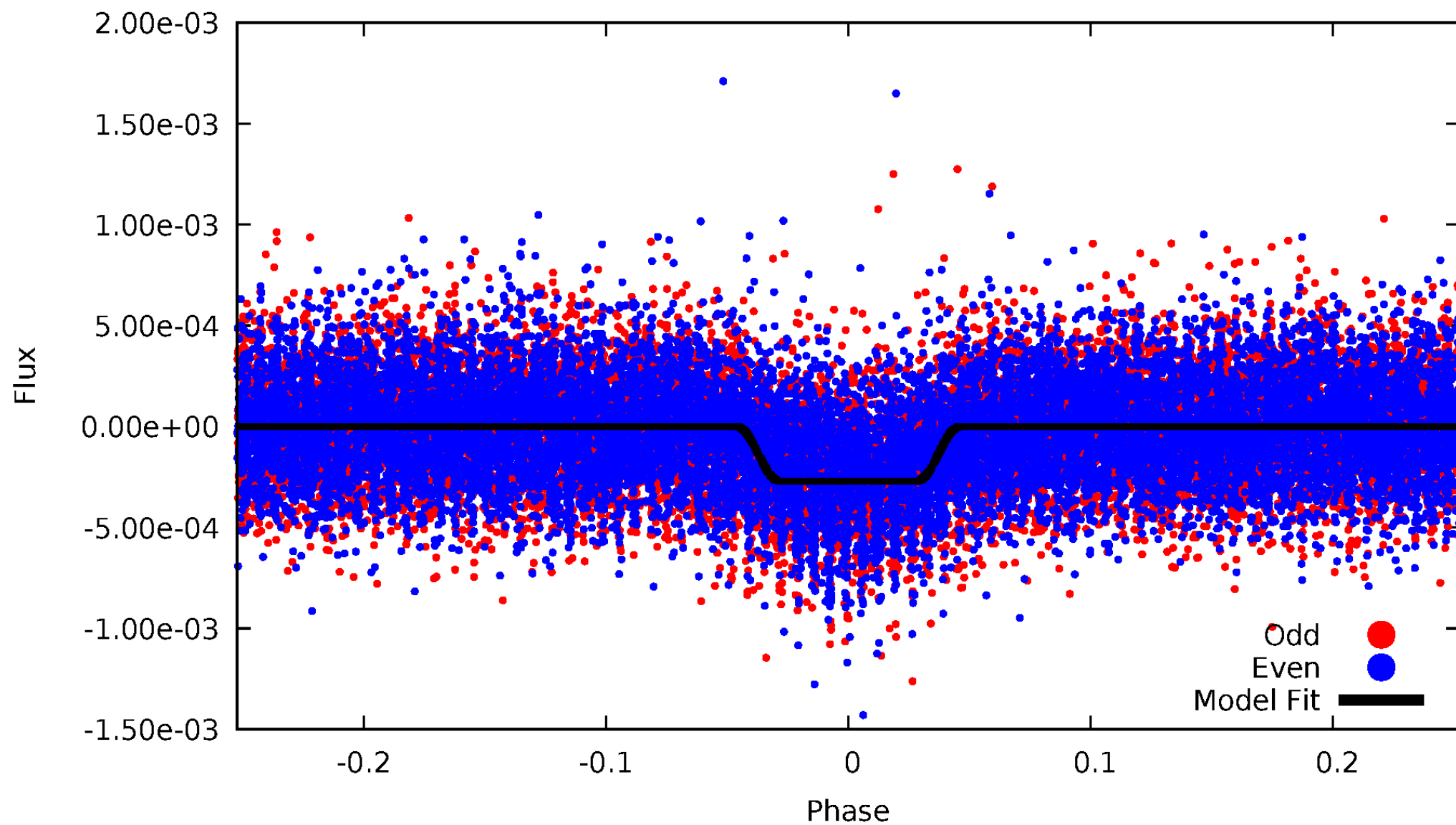
TCE 009159265-01





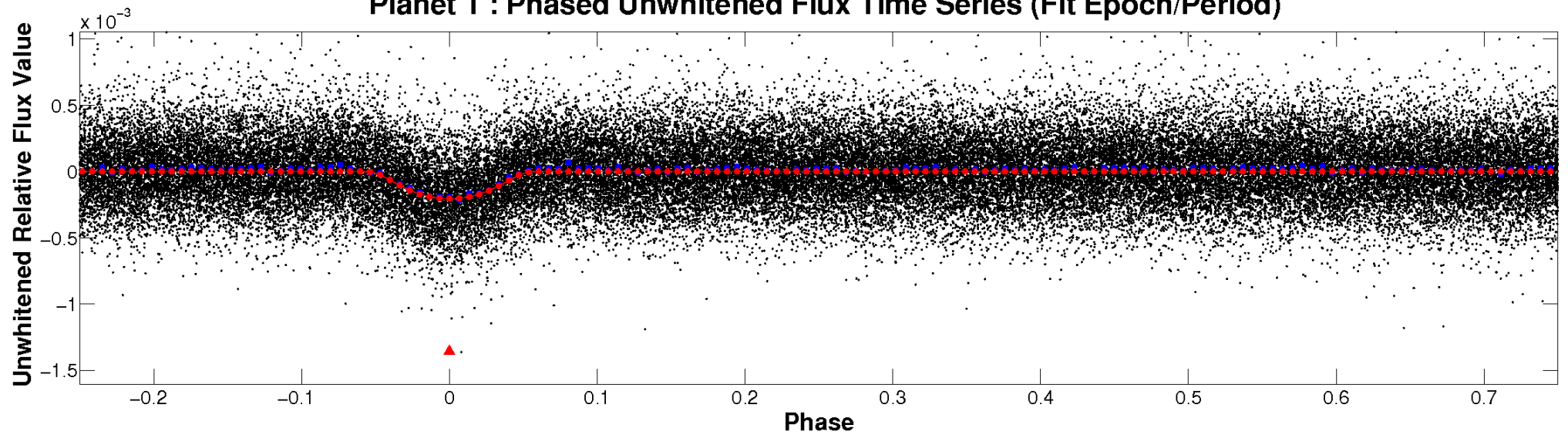
# ALT Odd/Even

TCE 009159265-01

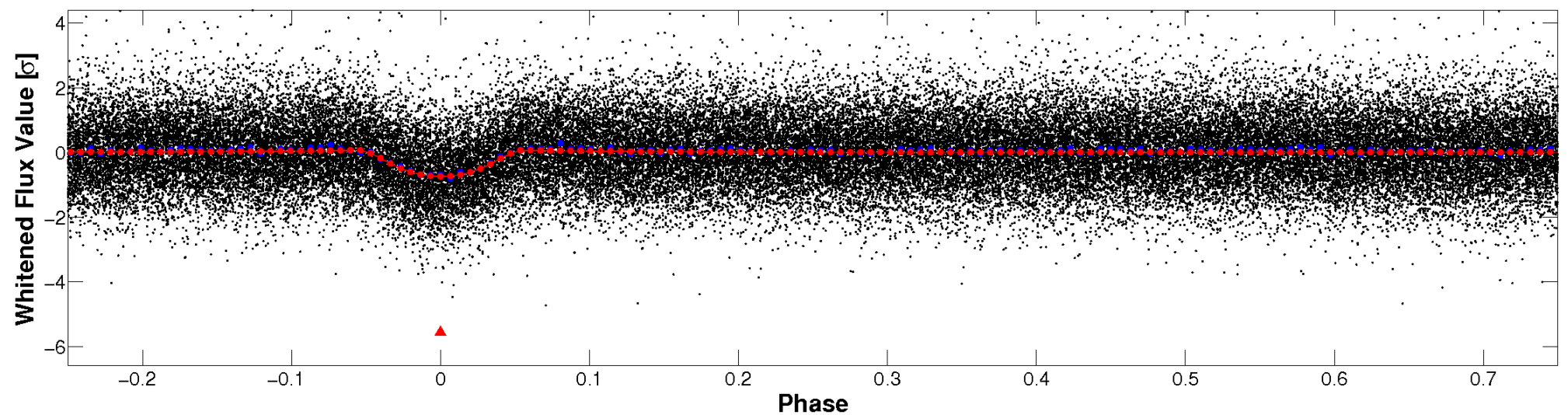


# Non-Whitened Vs. Whitened Light Curve

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

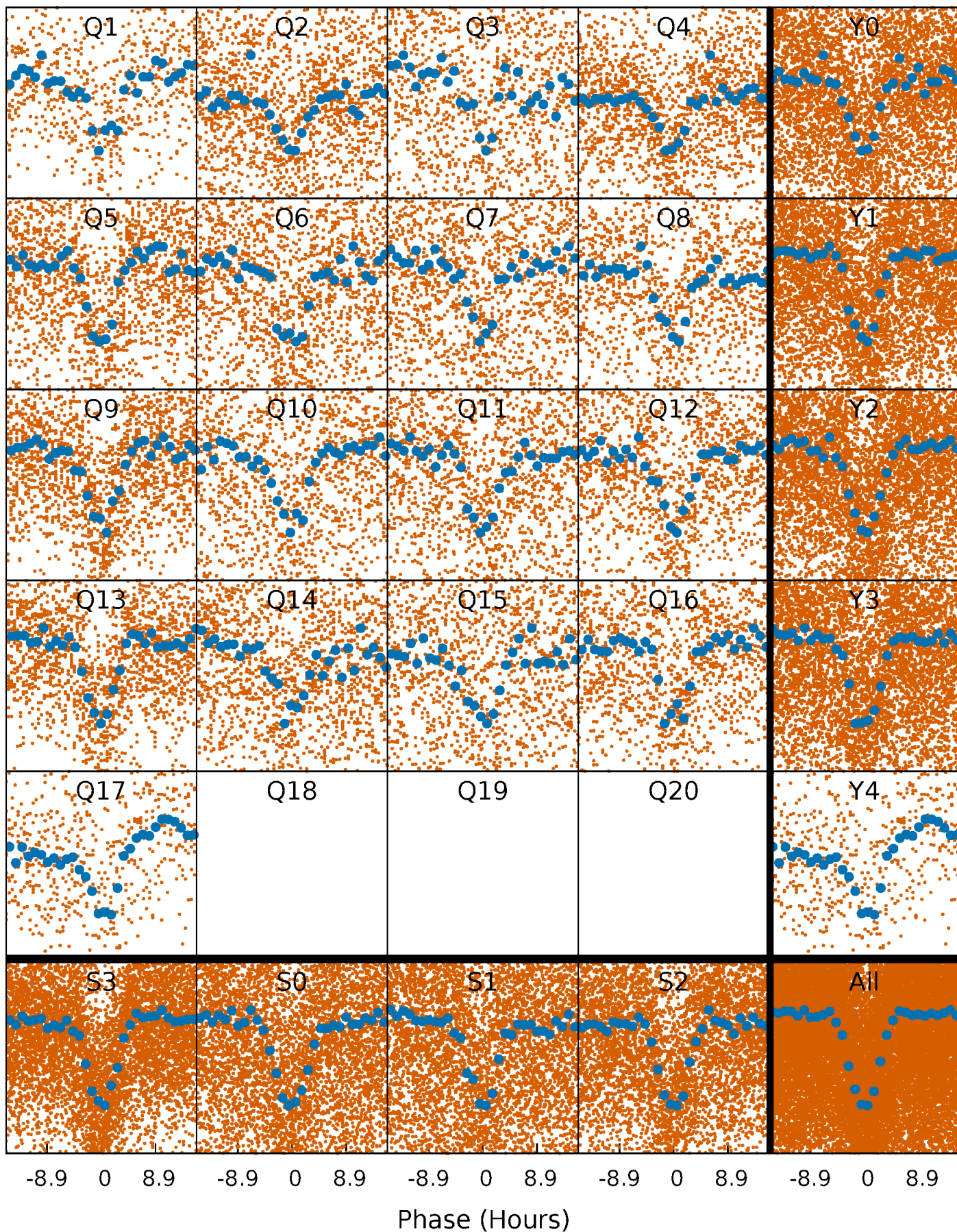


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

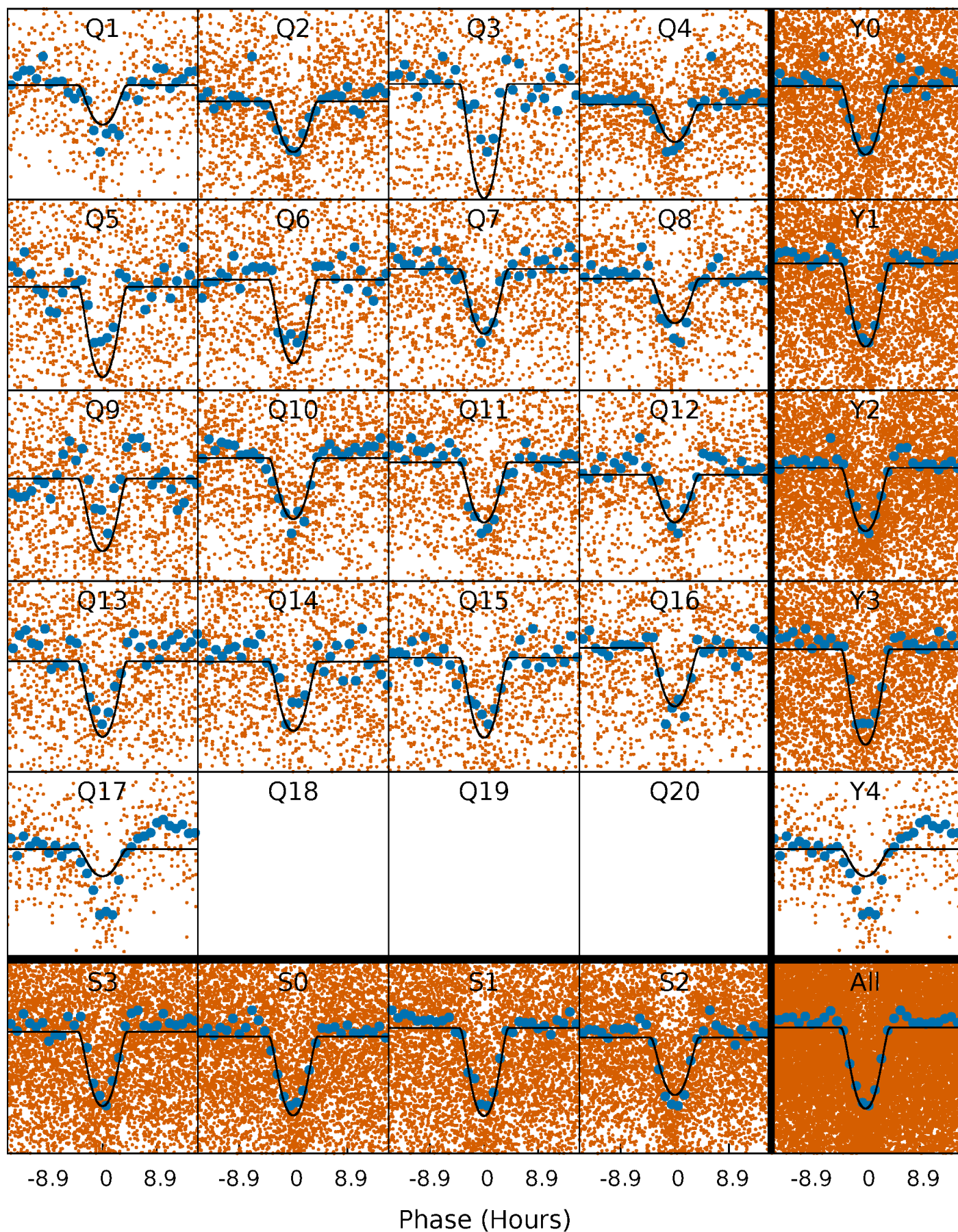
TCE 009159265-01   P= 3.044736 Days    $T_0=132.445753$  (BKJD)





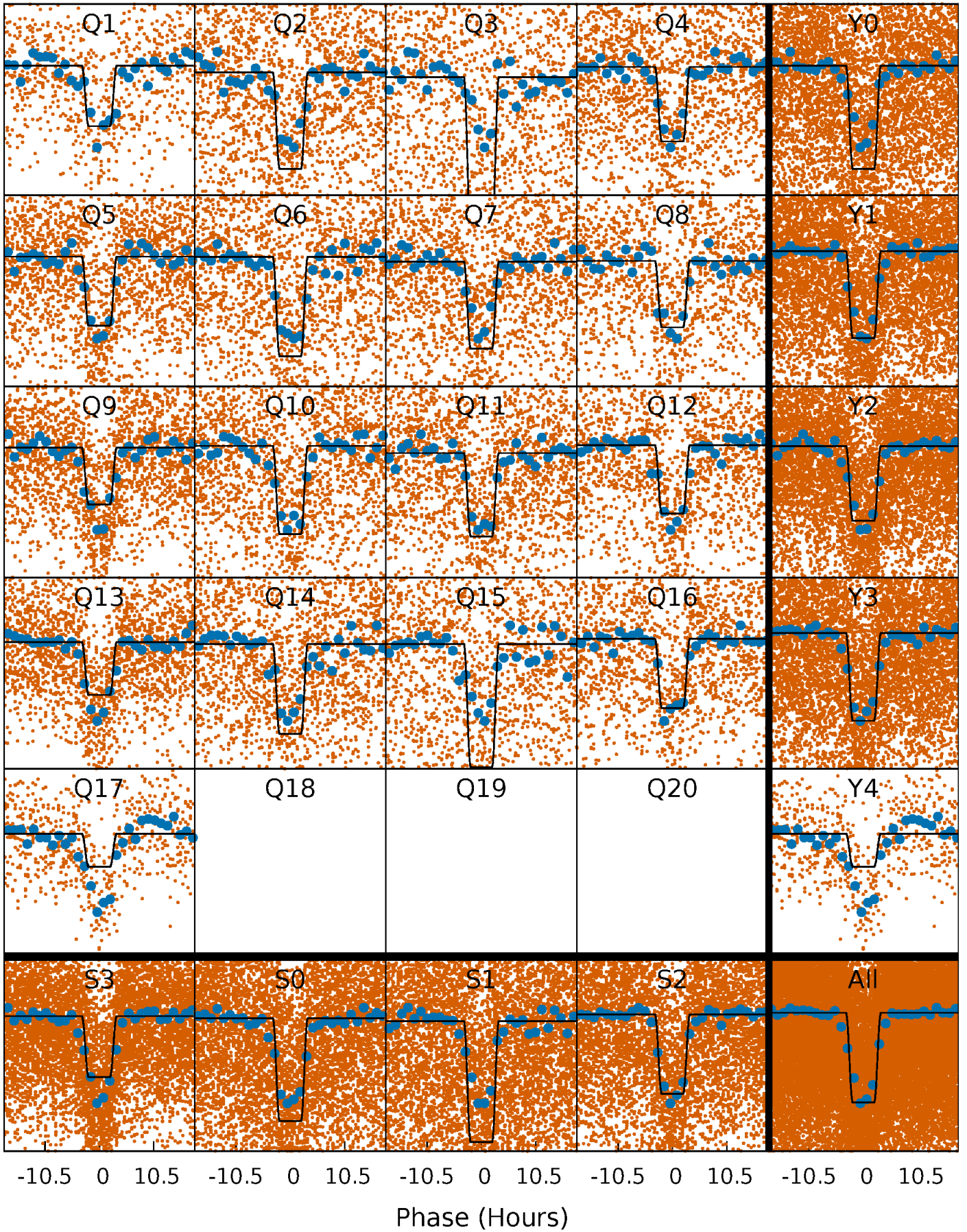
# DV Quarter-Phased Transit Curves

TCE 009159265-01 P= 3.044736 Days  $T_0=132.445753$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009159265-01 P= 3.044769 Days  $T_0=132.436231$  (BKJD)

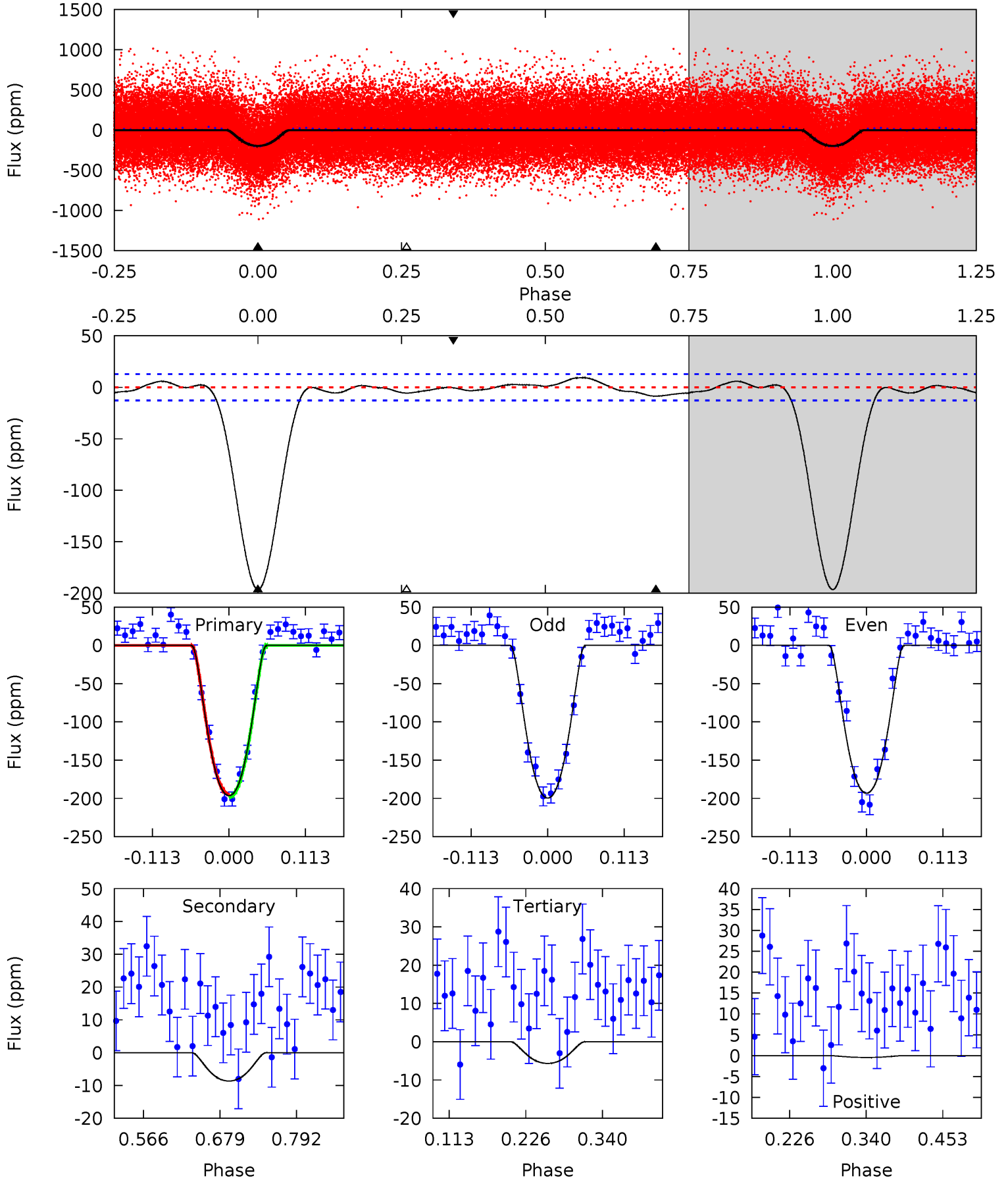




# DV Model-Shift Uniqueness Test

009159265-01, P = 3.044736 Days, E = 129.401017 Days

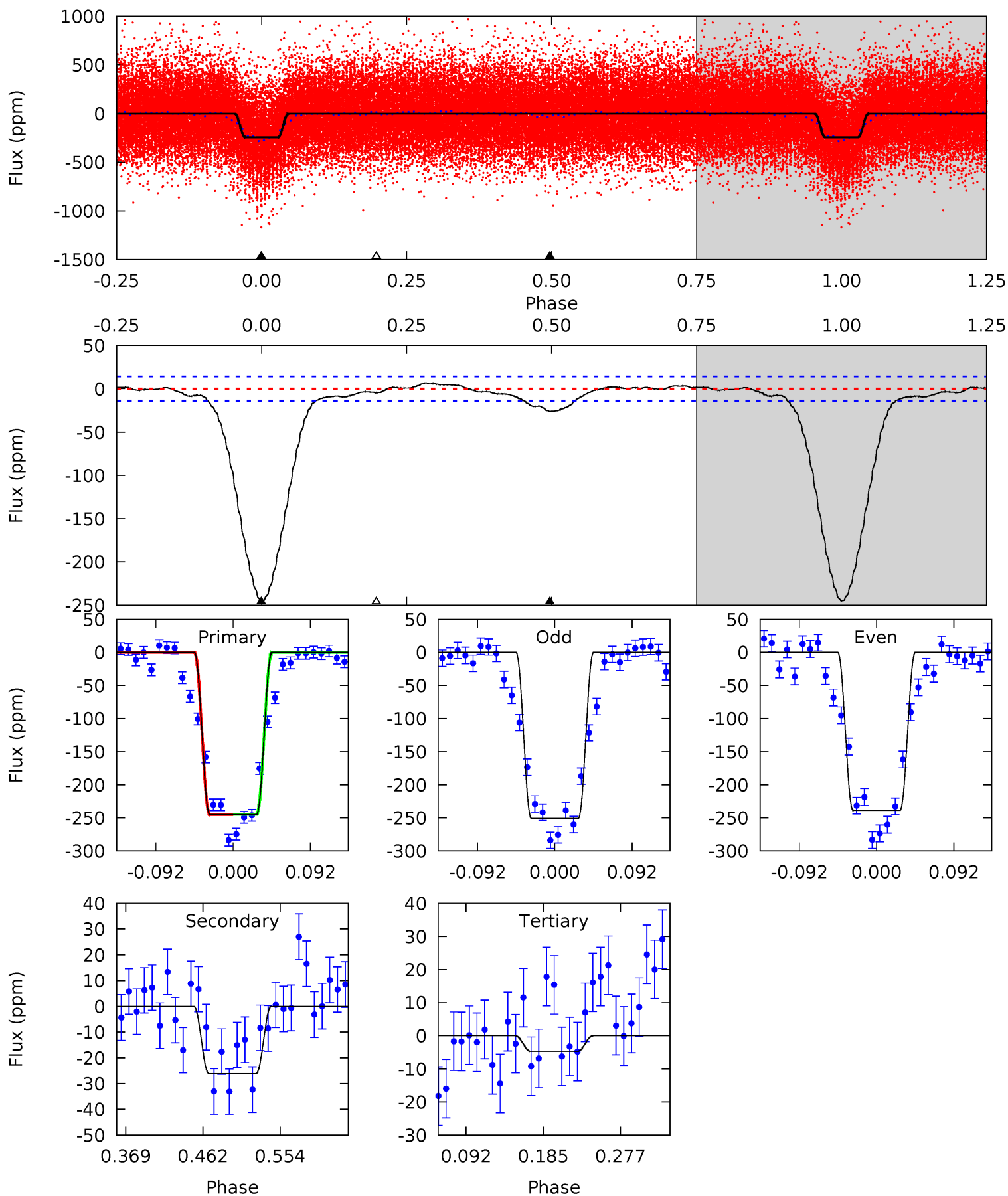
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
69.7	3.06	2.01	-0.15	4.54	1.58	1.34	67.7	69.9	1.05	3.22	1.13	1.01	0.05	0.65



# Alt Model-Shift Uniqueness Test

009159265-01, P = 3.044769 Days, E = 129.391462 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
80.2	8.57	1.53	0	4.58	1.68	1.51	78.7	80.2	7.04	8.57	1.99	1.02	0.03	0.07





### Stellar Parameters For KIC 009159265

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5627^{+152}_{-152}$	$4.568^{+0.040}_{-0.160}$	$-0.180^{+0.300}_{-0.300}$	$0.818^{+0.207}_{-0.069}$	$0.910^{+0.083}_{-0.104}$	$2.341^{+0.392}_{-1.086}$
	+3%/-3%	+1%/-4%	+167%/-167%	+25%/-8%	+9%/-11%	+17%/-46%
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 009159265-01 / KOI 3877.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-9 \pm 3$	$1.77^{+0.28}_{-0.23}$	$1602^{+88}_{-63}$	$2846^{+185}_{-209}$	$2.294^{+1.172}_{-0.857}$
Alt.	$-26 \pm 3$	$1.53^{+0.27}_{-0.23}$	$1604^{+91}_{-64}$	$3565^{+210}_{-174}$	$9.572^{+3.895}_{-2.833}$

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

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

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

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

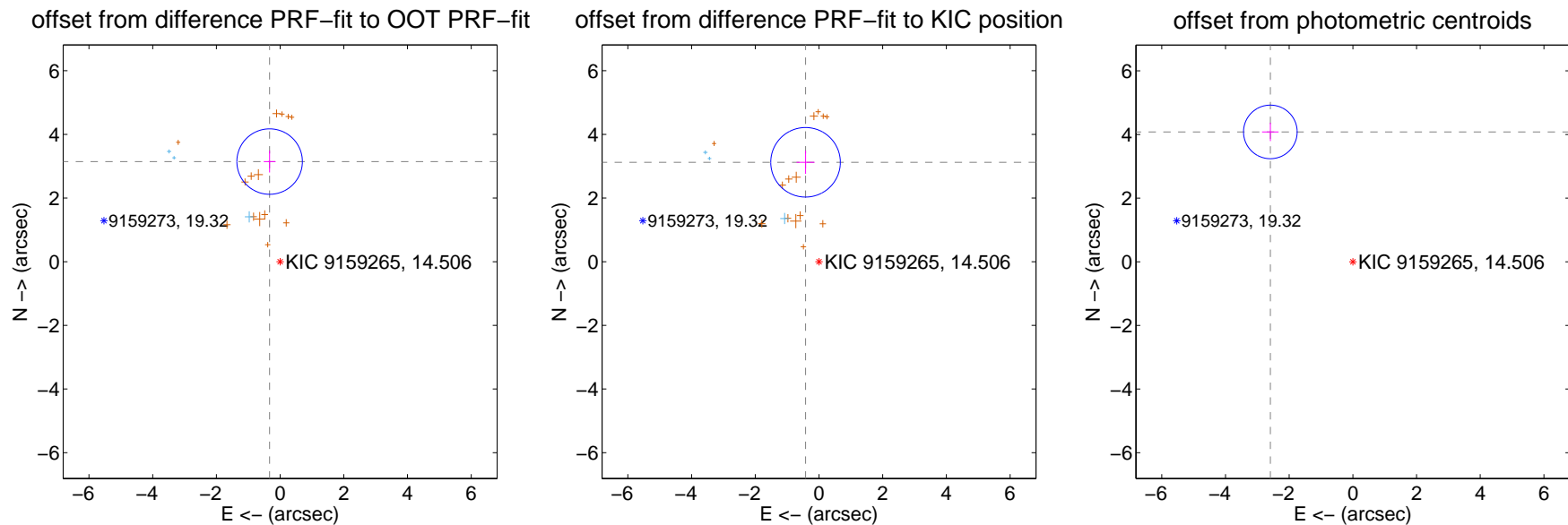
## DV Centroid Data

Supplemental centroid analysis for 009159265-01. Kepler magnitude: 14.51. Transit SNR 41.10

There are 3 quarters with good PRF difference image offsets

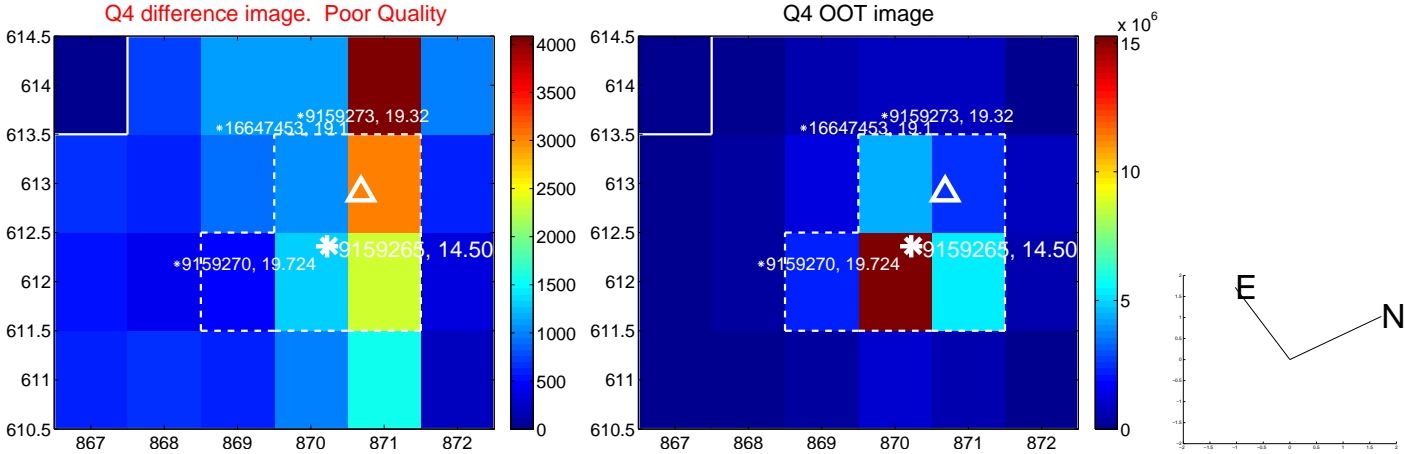
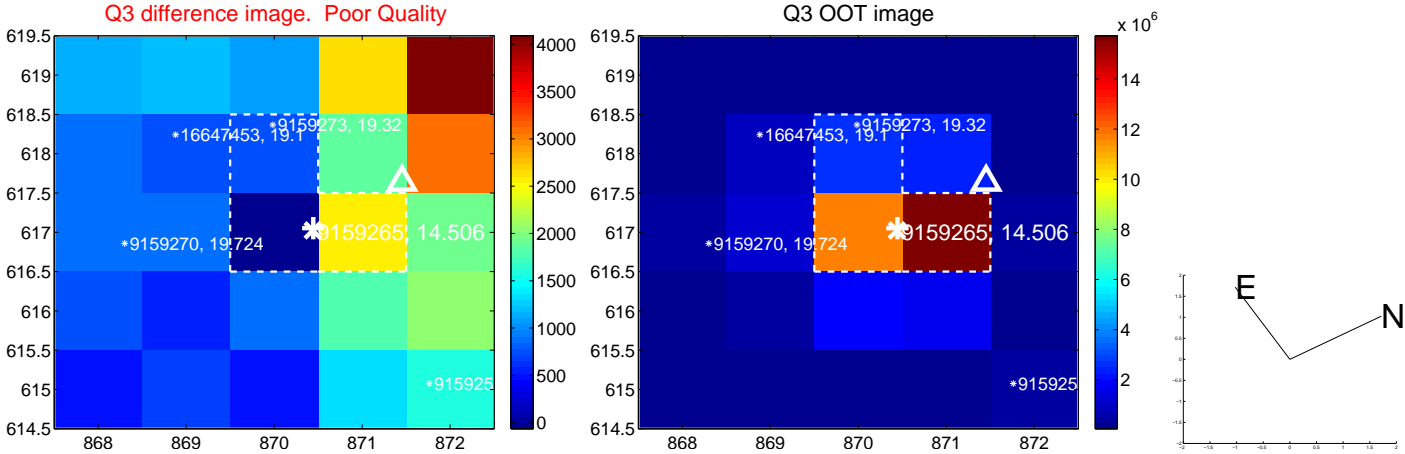
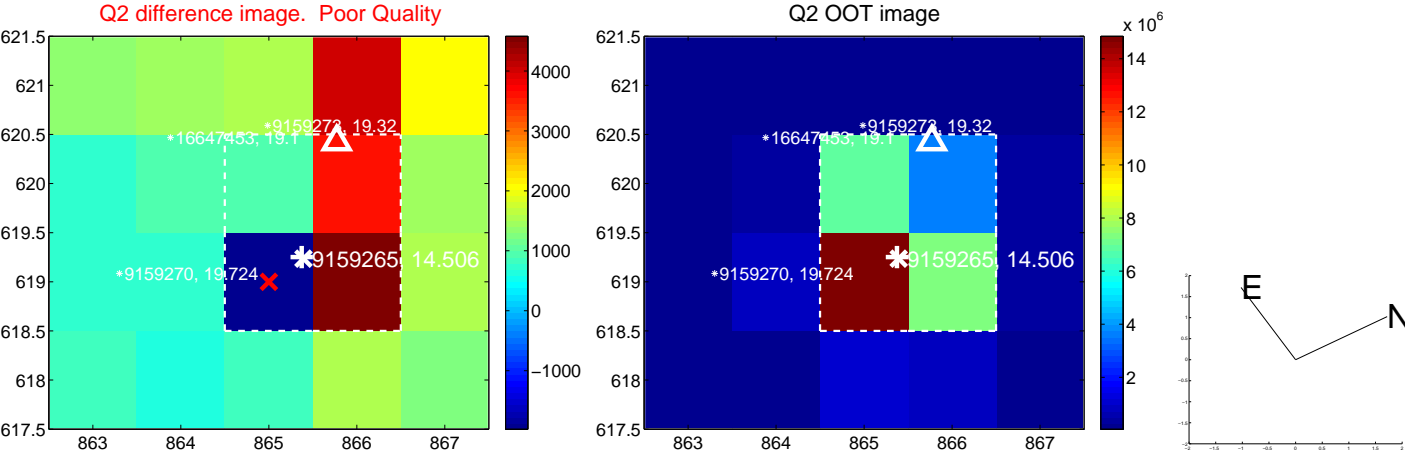
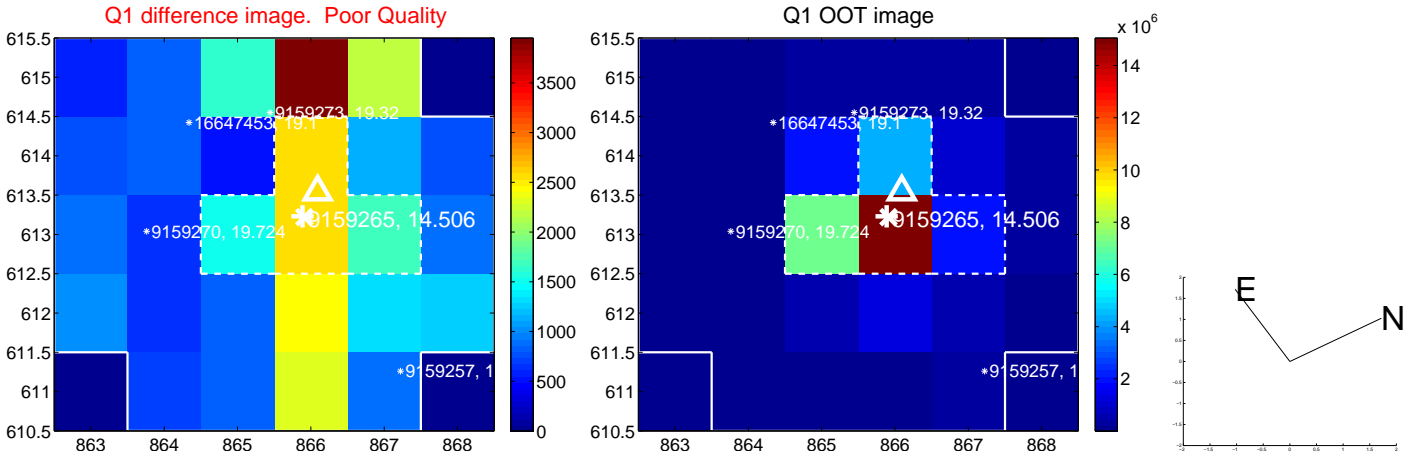
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.163 \pm 0.343$	9.23	$0.329 \pm 0.185$	$3.146 \pm 0.344$
PRF-fit source offset from KIC position	$3.151 \pm 0.364$	8.66	$0.422 \pm 0.283$	$3.123 \pm 0.365$
photometric centroid source offset	$4.83 \pm 0.28$	17.22	$2.59 \pm 0.26$	$4.08 \pm 0.29$

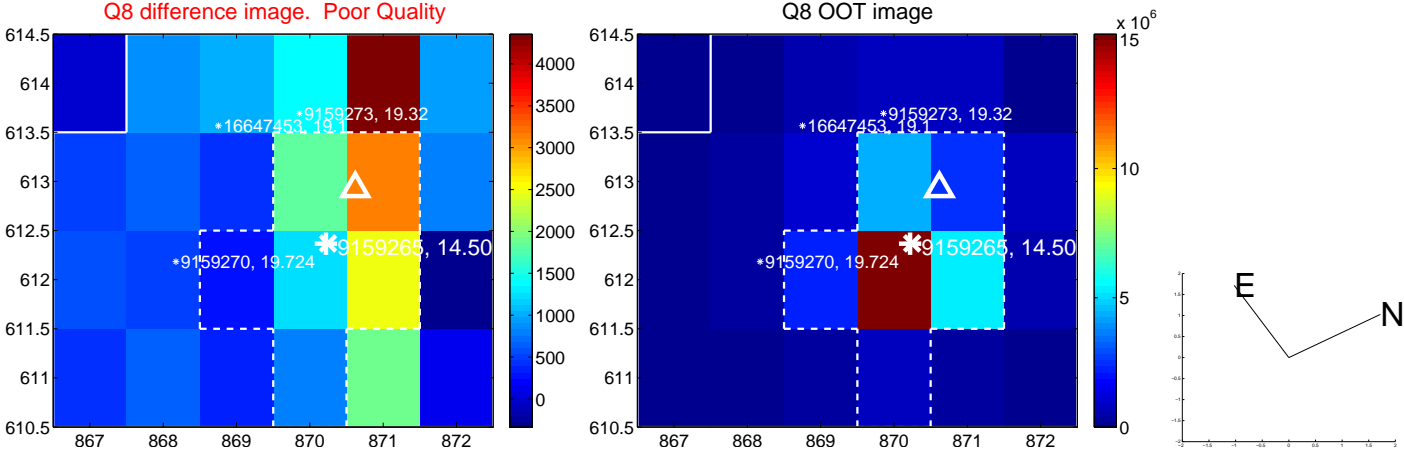
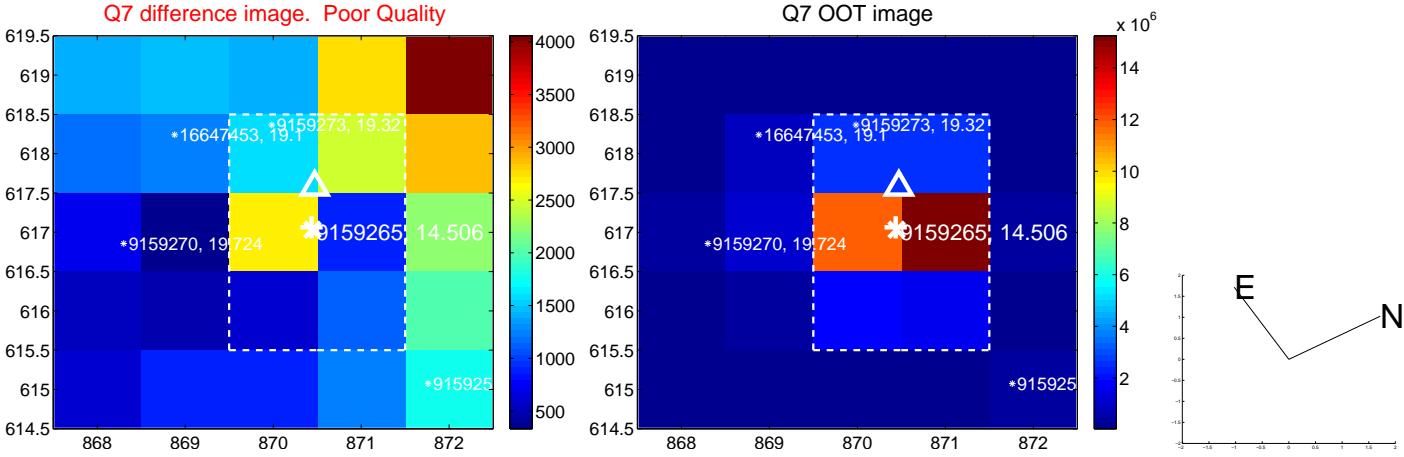
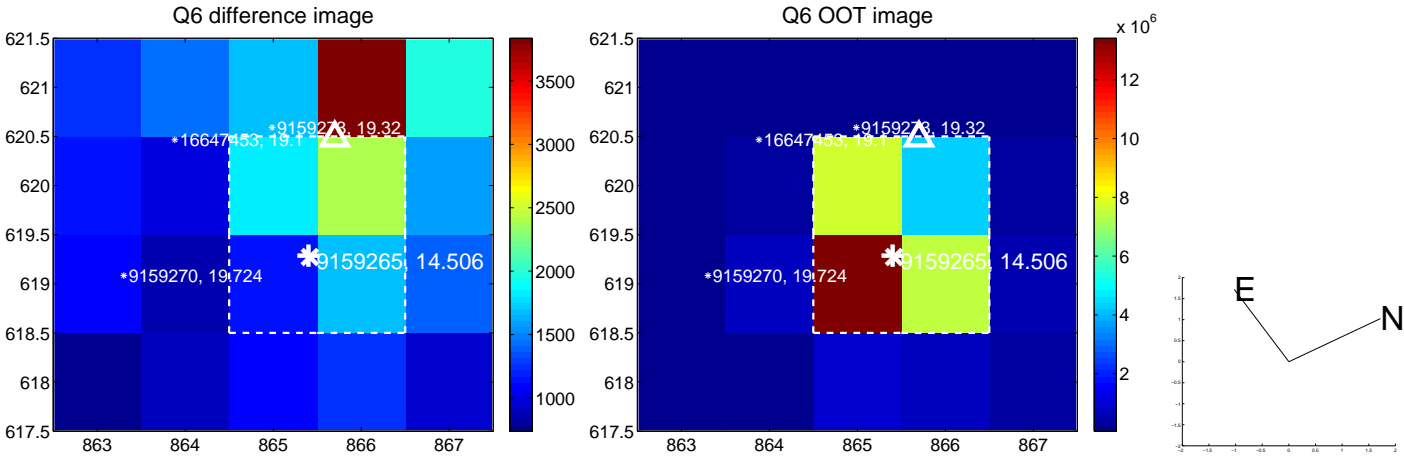
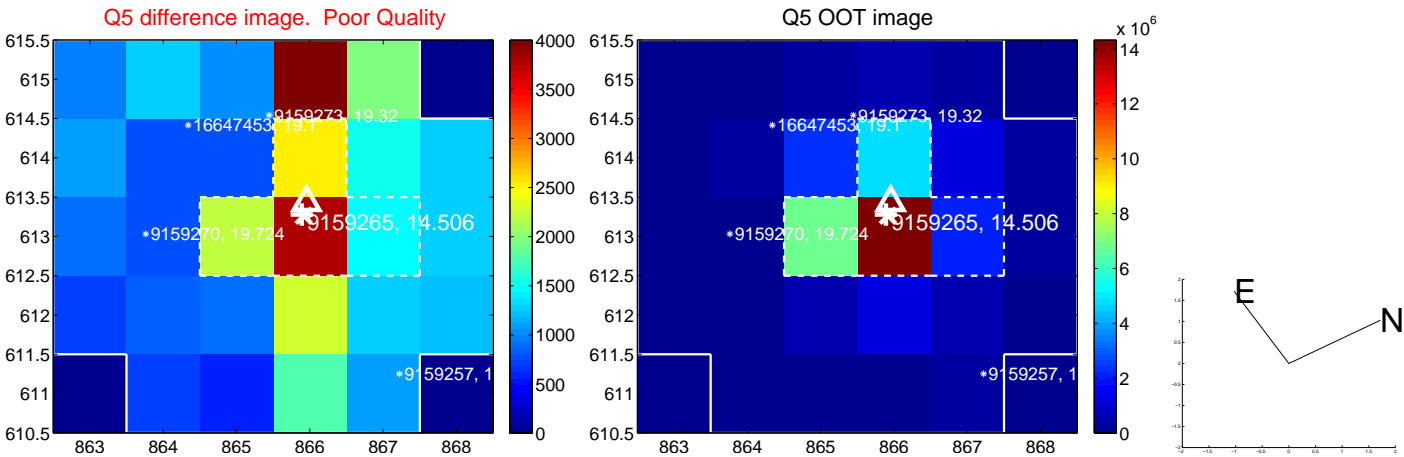


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

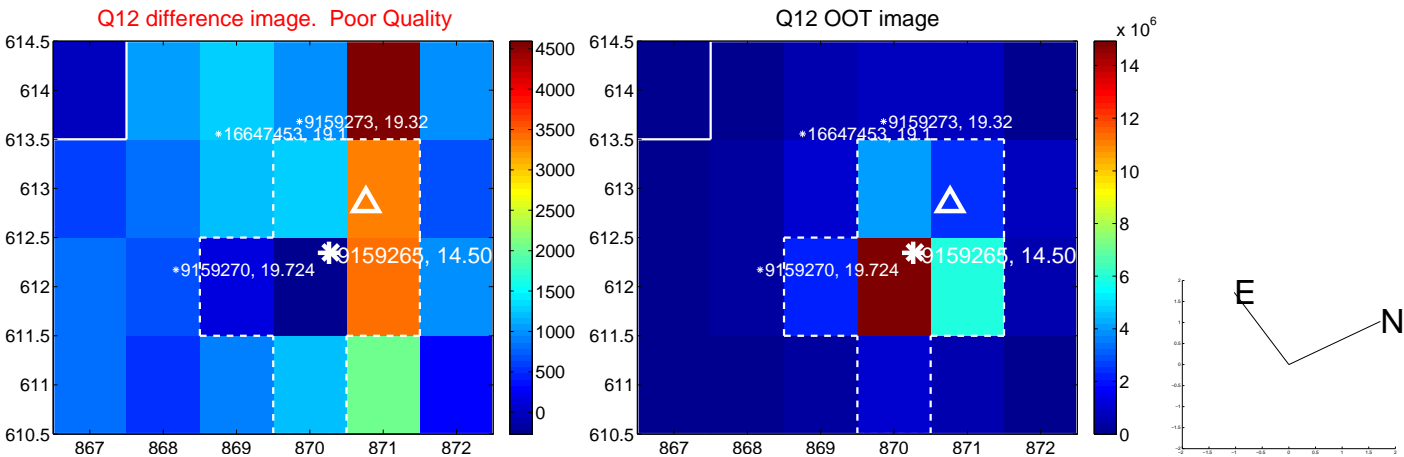
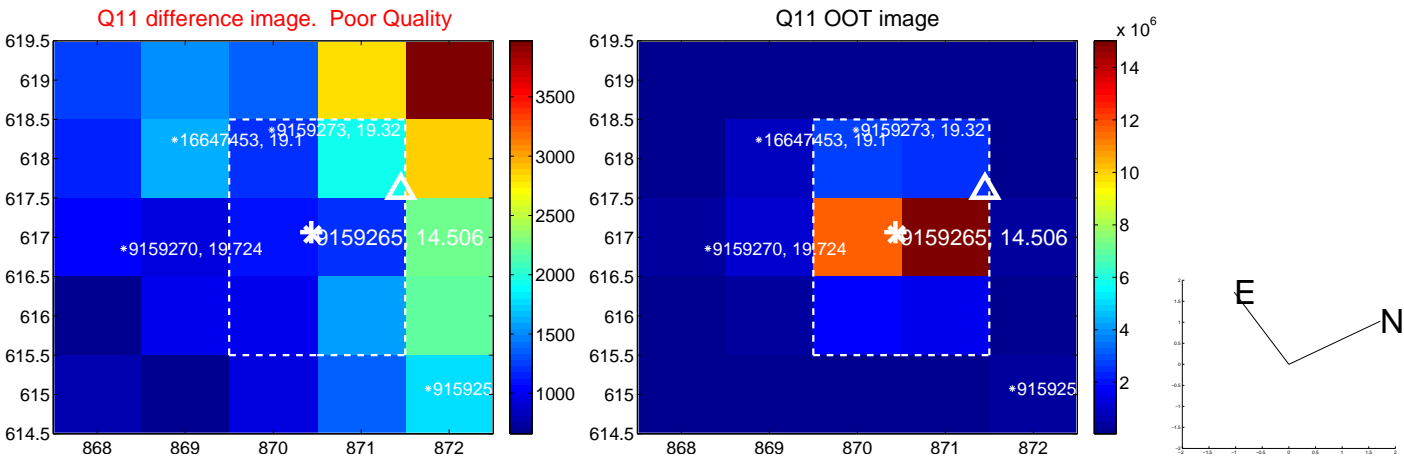
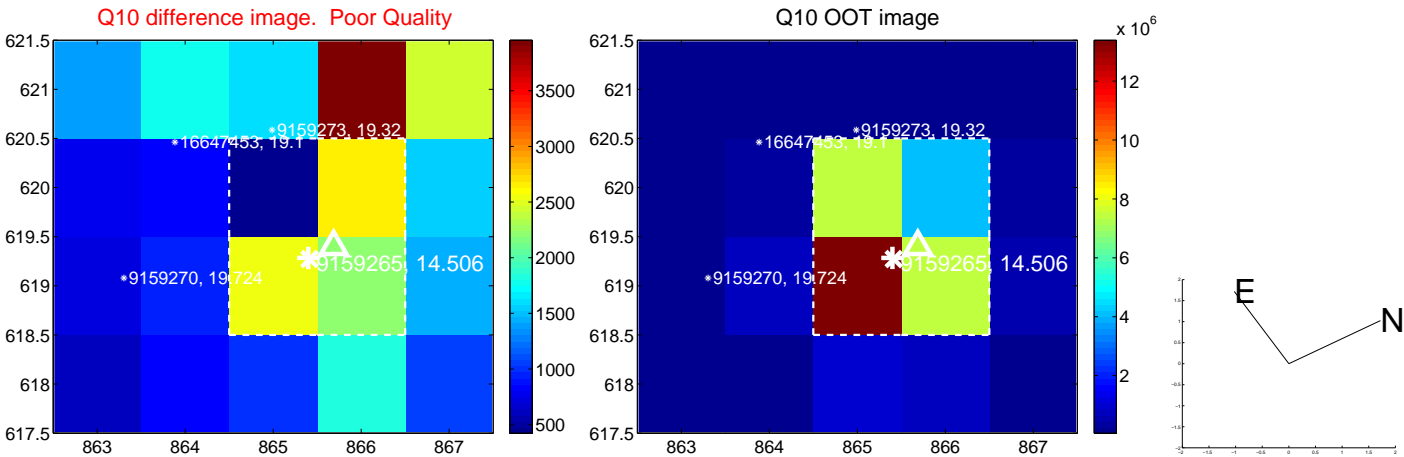
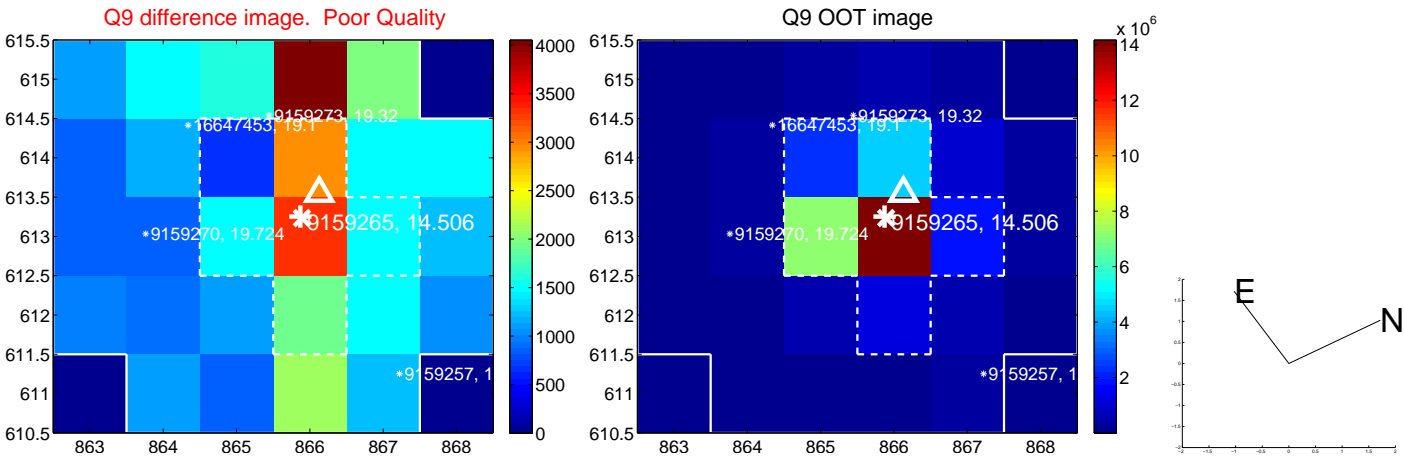


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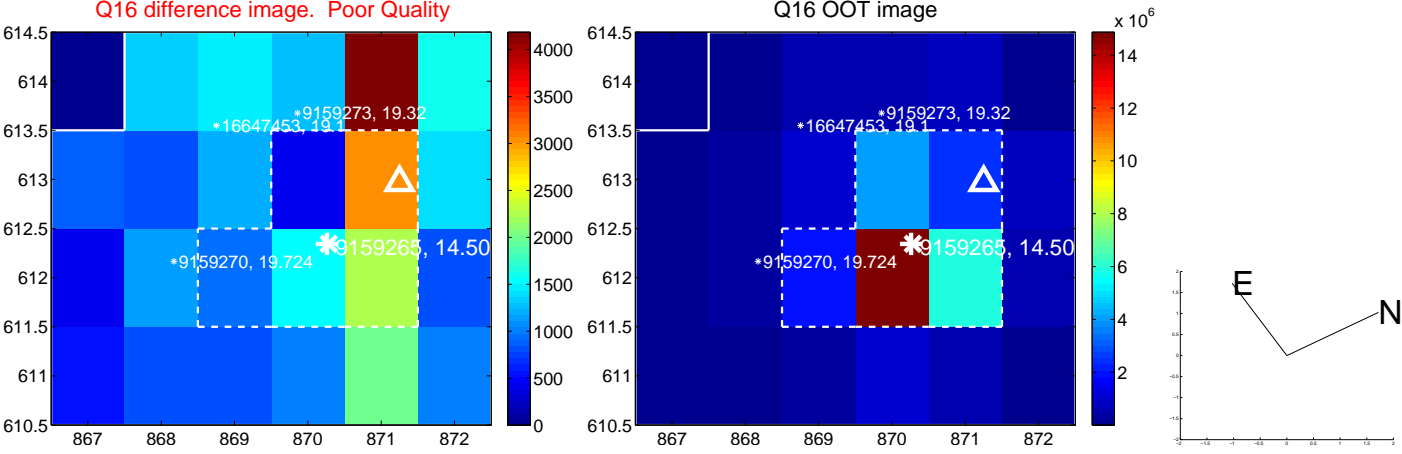
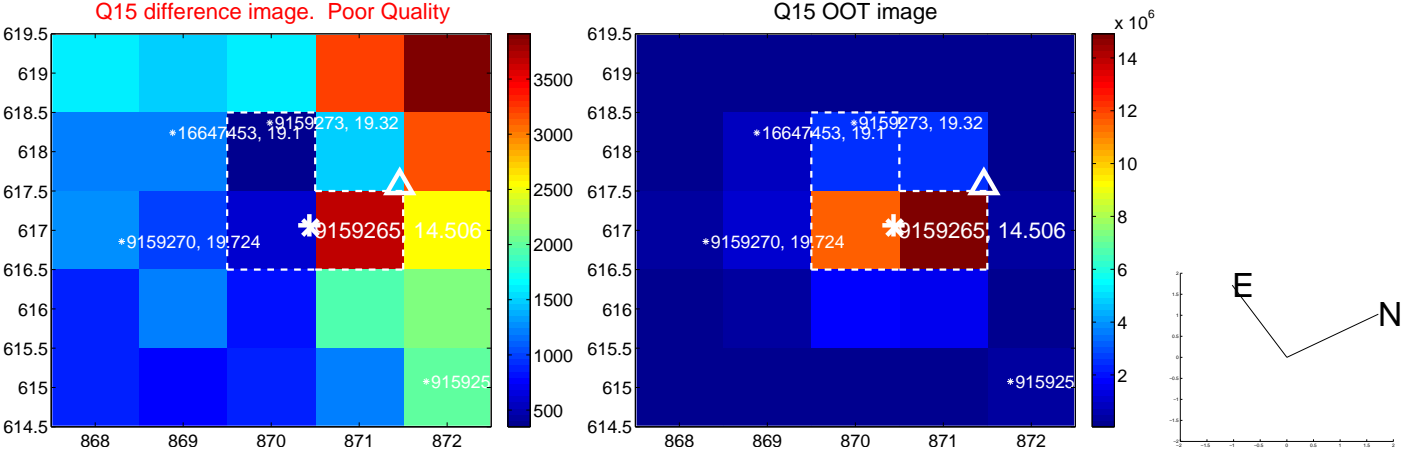
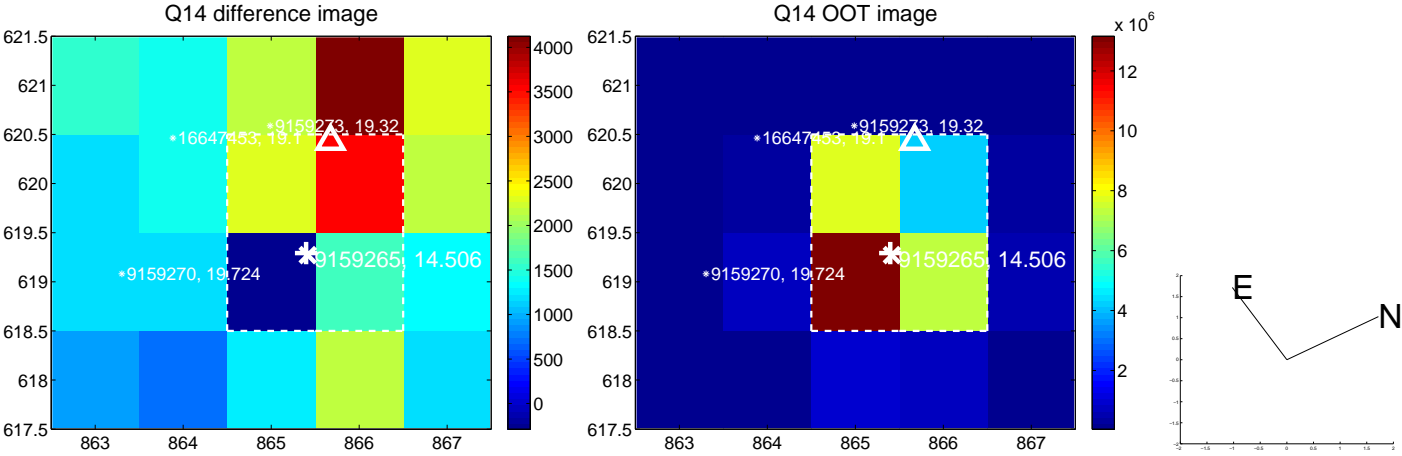
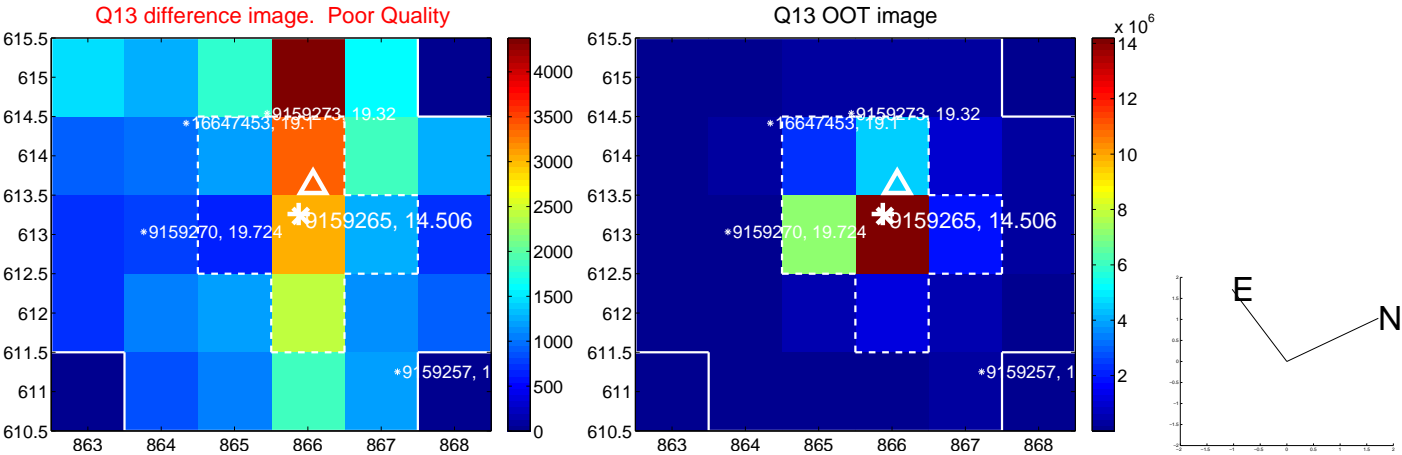




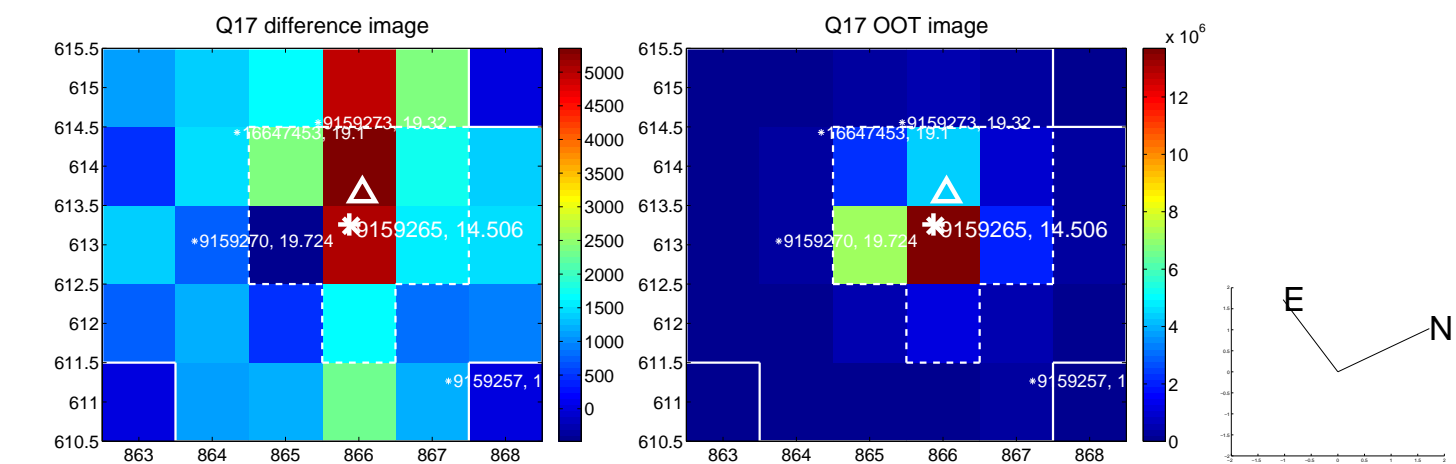
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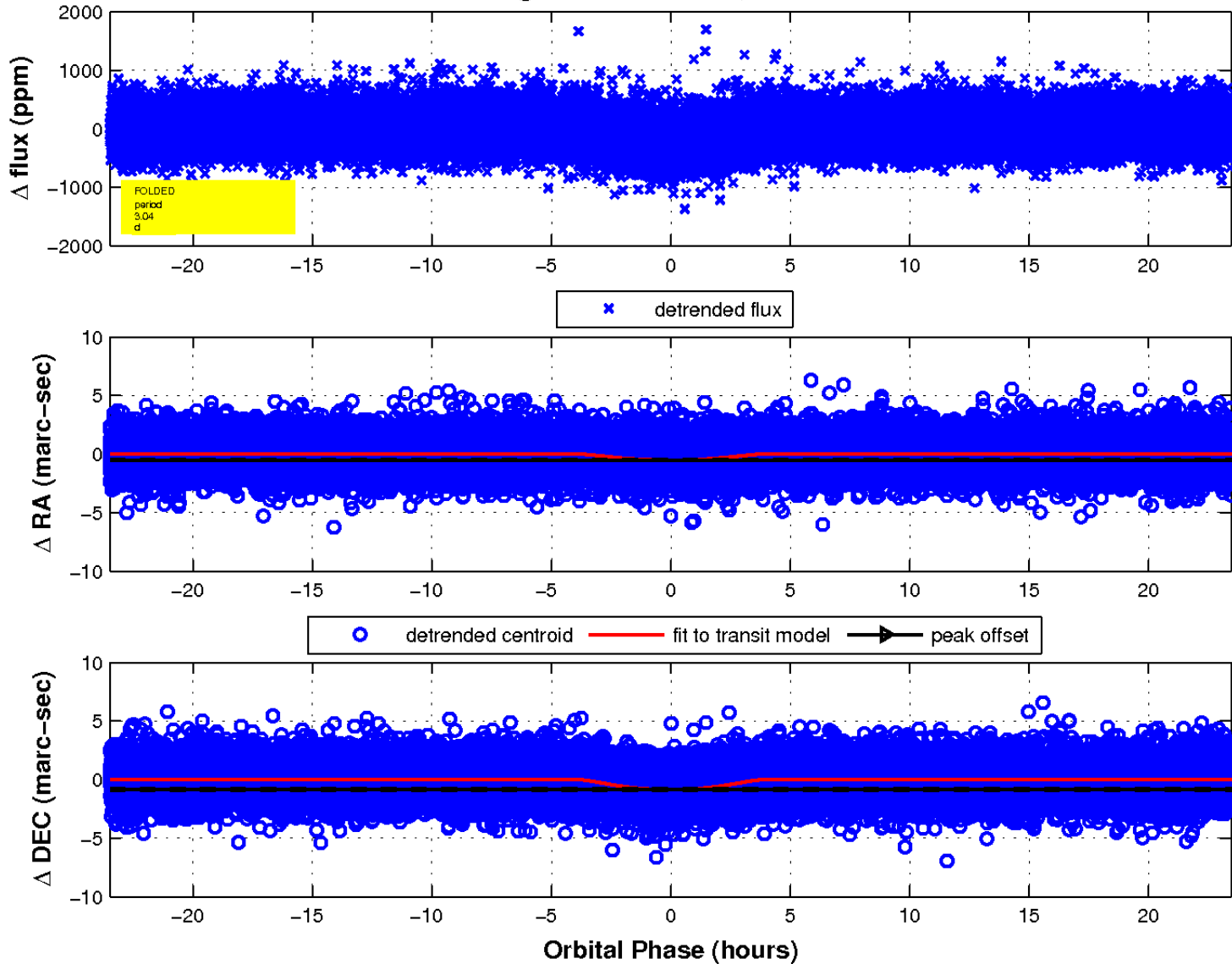
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

