

# KIC 002707916

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002707916-01	OBS	4950.01	1.891302	132.662401	464.0	5.738	15.0	16.7	0.59	4615	2.55	226.63

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002707916-01	OBS	FP	0.00	0	0	0	1	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.

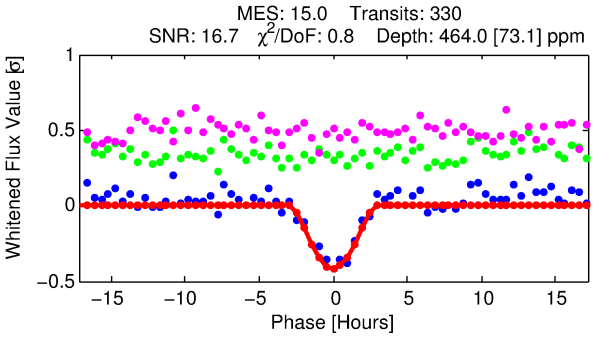
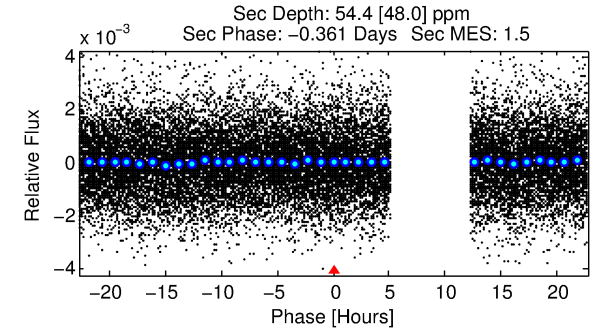
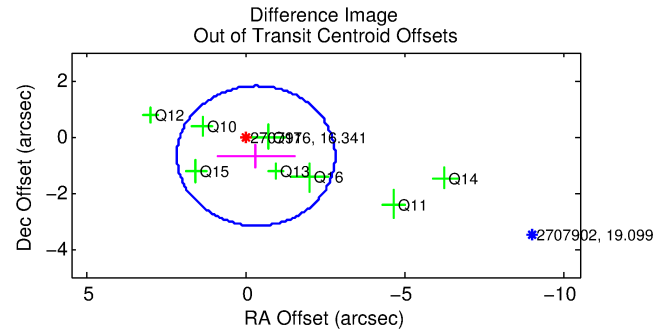
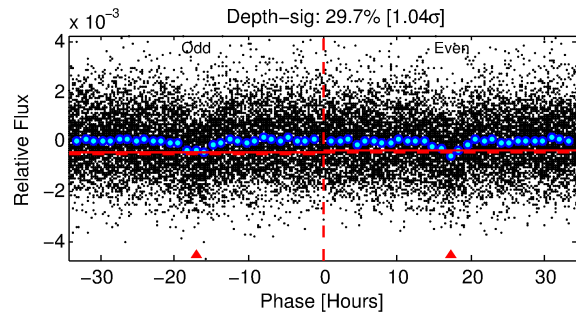
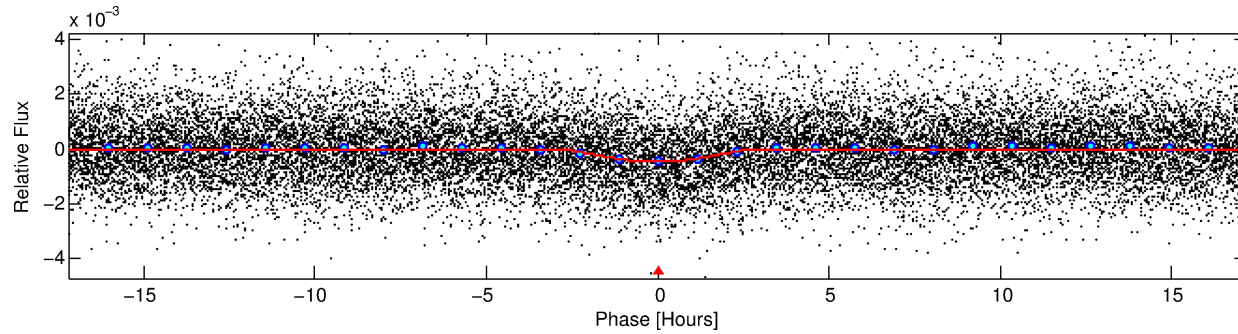
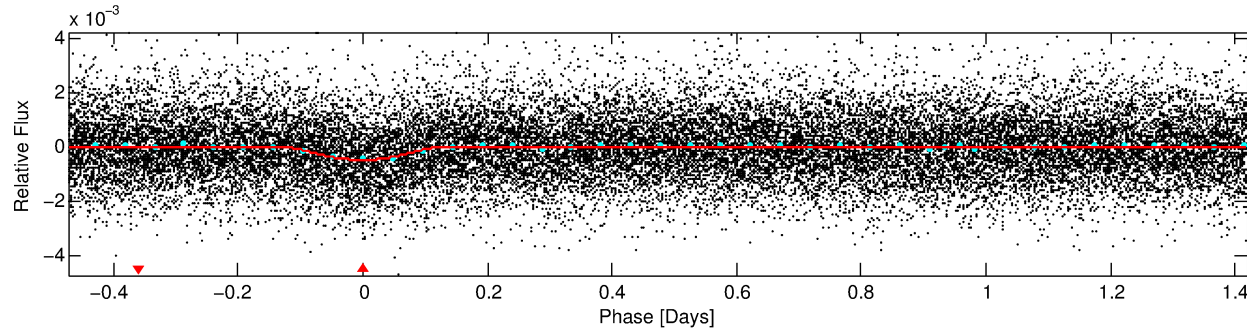
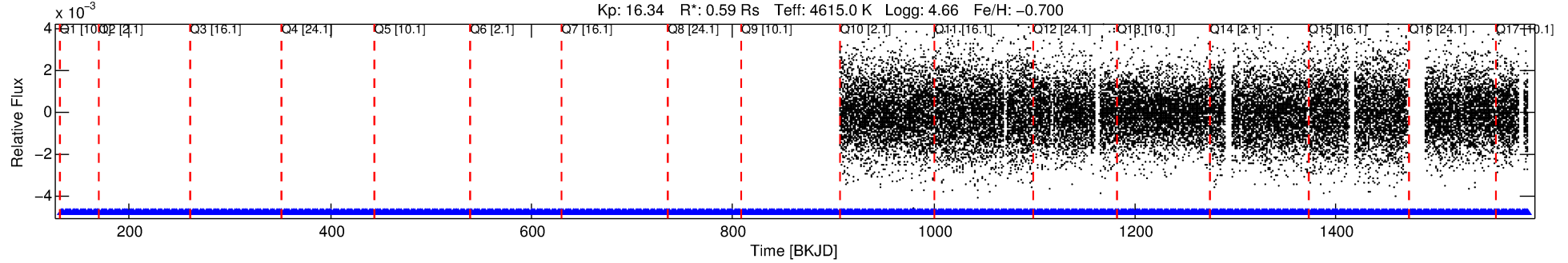
## Ephemeris Match Information For 002707916-01

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	$\sigma_P$	$\sigma_T$
002707916-01	2707916	6286.01	2708156	1:1	168.8	0	-42	10.67	16.34	1381.30	Direct-PRF	0	1.29	1.21

**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: 2707916 Candidate: 1 of 1 Period: 1.891 d  
KOI: K04950.01 Corr: 0.902



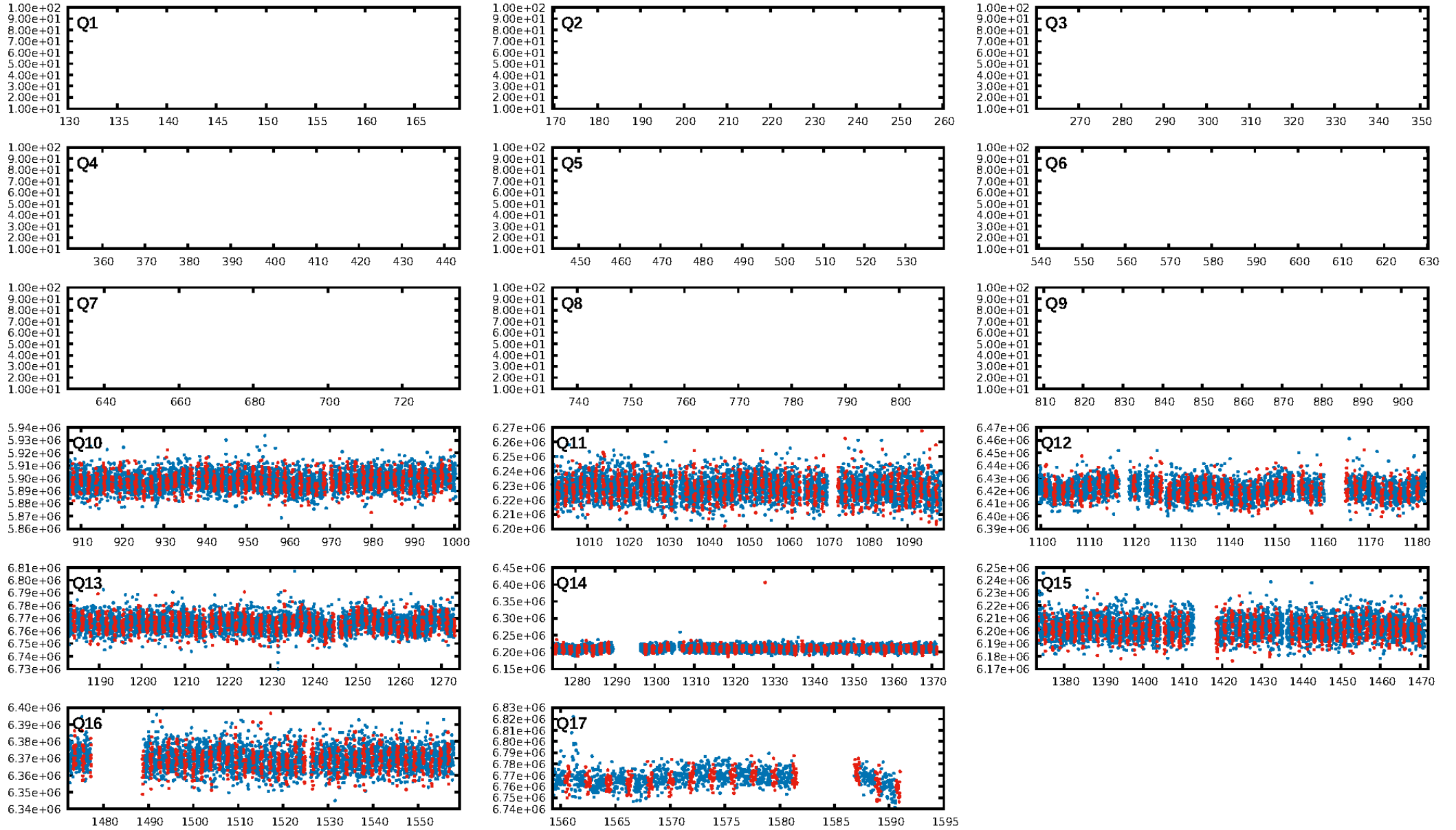
## DV Fit Results:

Period = 1.89130 [0.00002] d  
Epoch = 132.6624 [0.0094] BKJD  
Rp/R\* = 0.0397 [0.0888]  
a/R\* = 1.25 [0.18]  
b = 1.00 [0.14]  
Seff = 226.63 [40.69]  
Teq = 989 [44] K  
Rp = 2.55 [5.71] Re  
a = 0.0249 [0.0018] AU  
Ag = 2.86 [13.03] [0.14 $\sigma$ ]  
Teffp = 1989 [2268] K [0.44 $\sigma$ ]

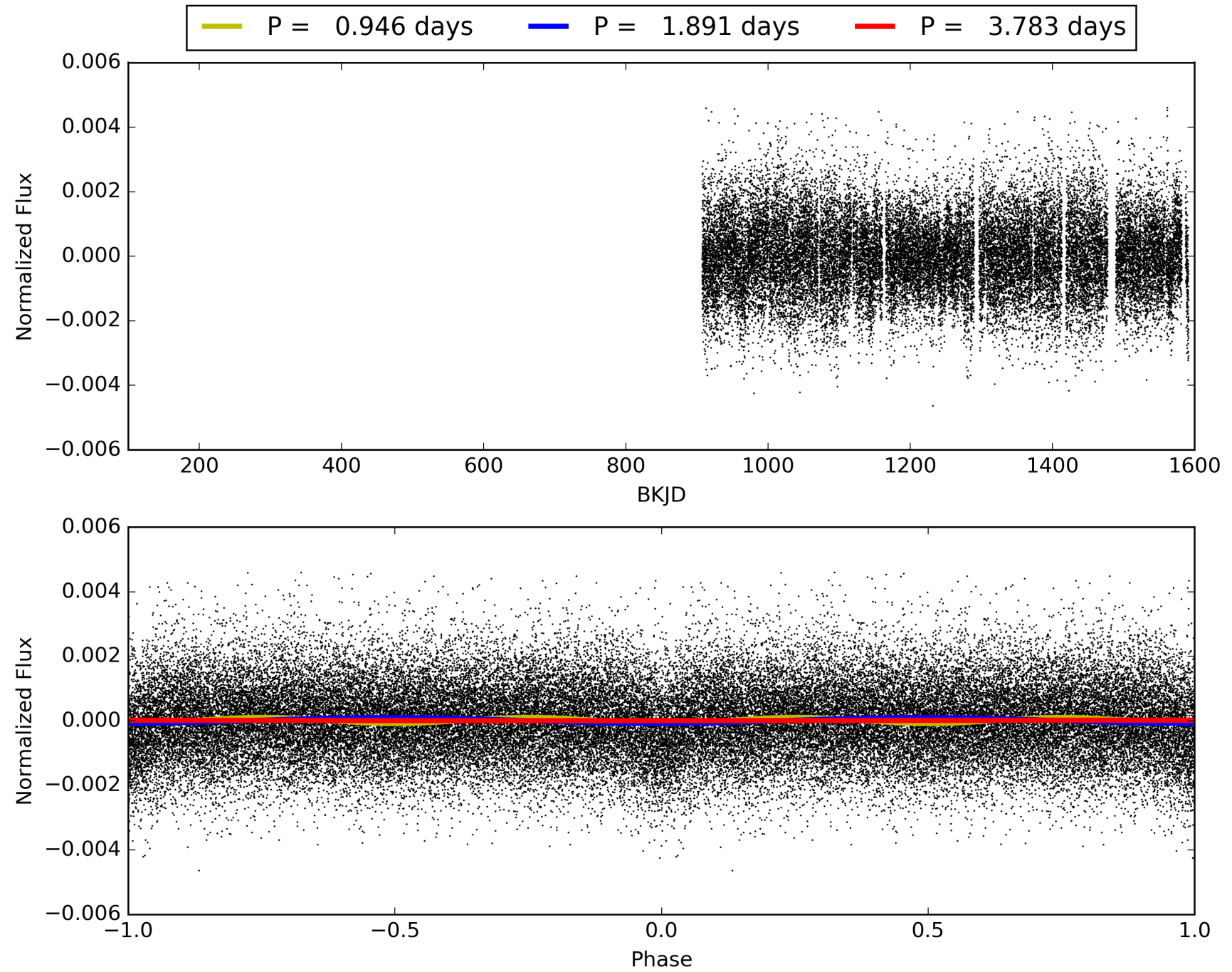
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.96e-49  
RollingBand-fgt: 1.00 [315/315]  
**GhostDiagnostic-chr: 0.2619**  
Centroid-sig: 2.3%  
Centroid-so: 1.725 arcsec [2.07 $\sigma$ ]  
OotOffset-rm: 0.756 arcsec [0.91 $\sigma$ ]  
OotOffset-st: 2/2/2/2 [8]  
KicOffset-rm: 0.918 arcsec [1.56 $\sigma$ ]  
KicOffset-st: 2/2/2/2 [8]  
DiffImageQuality-fgm: 0.00 [0/8]  
DiffImageOverlap-fno: 1.00 [8/8]

# TCE 002707916-01, PDC Light Curves

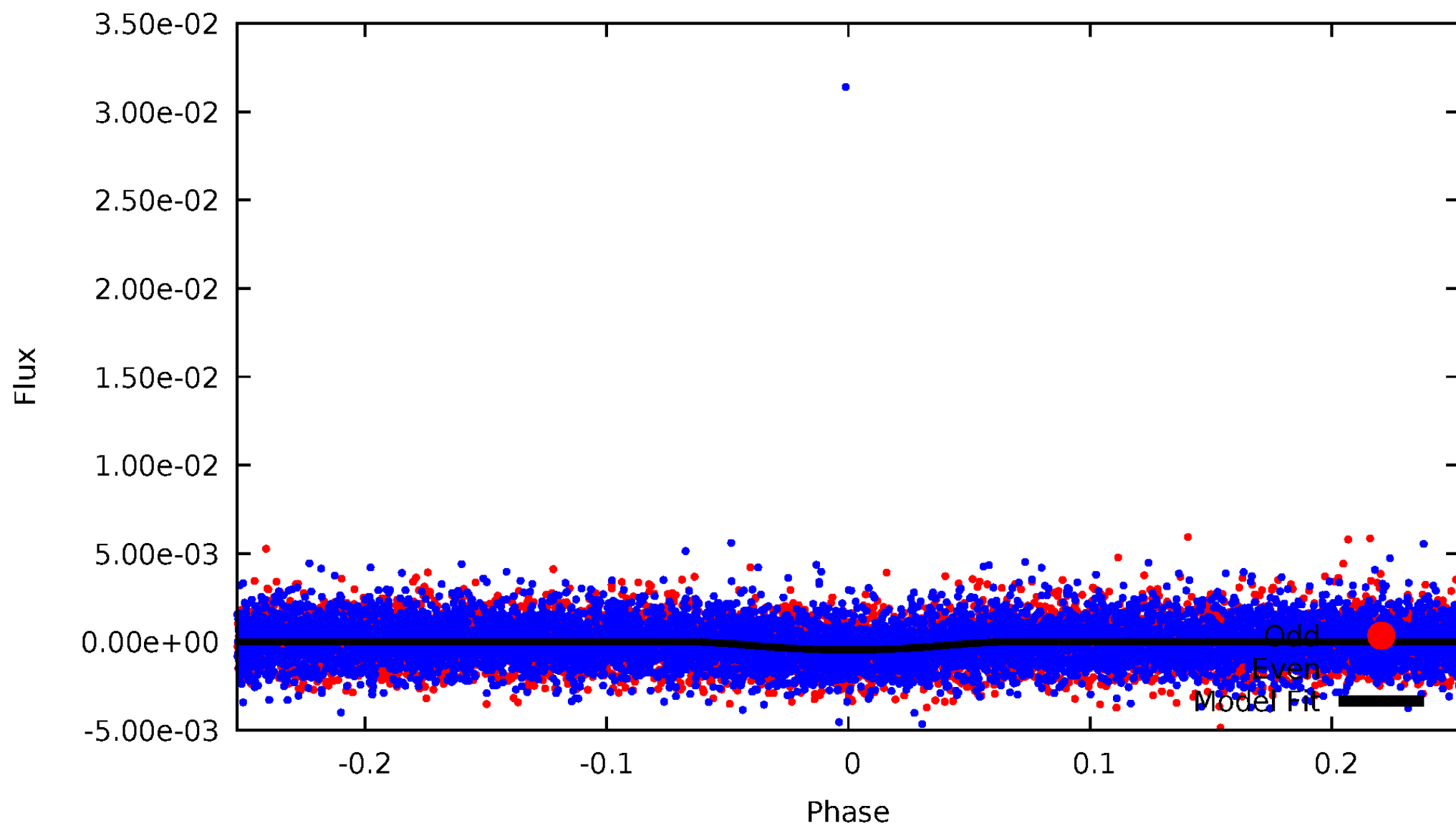


# TCE 002707916-01



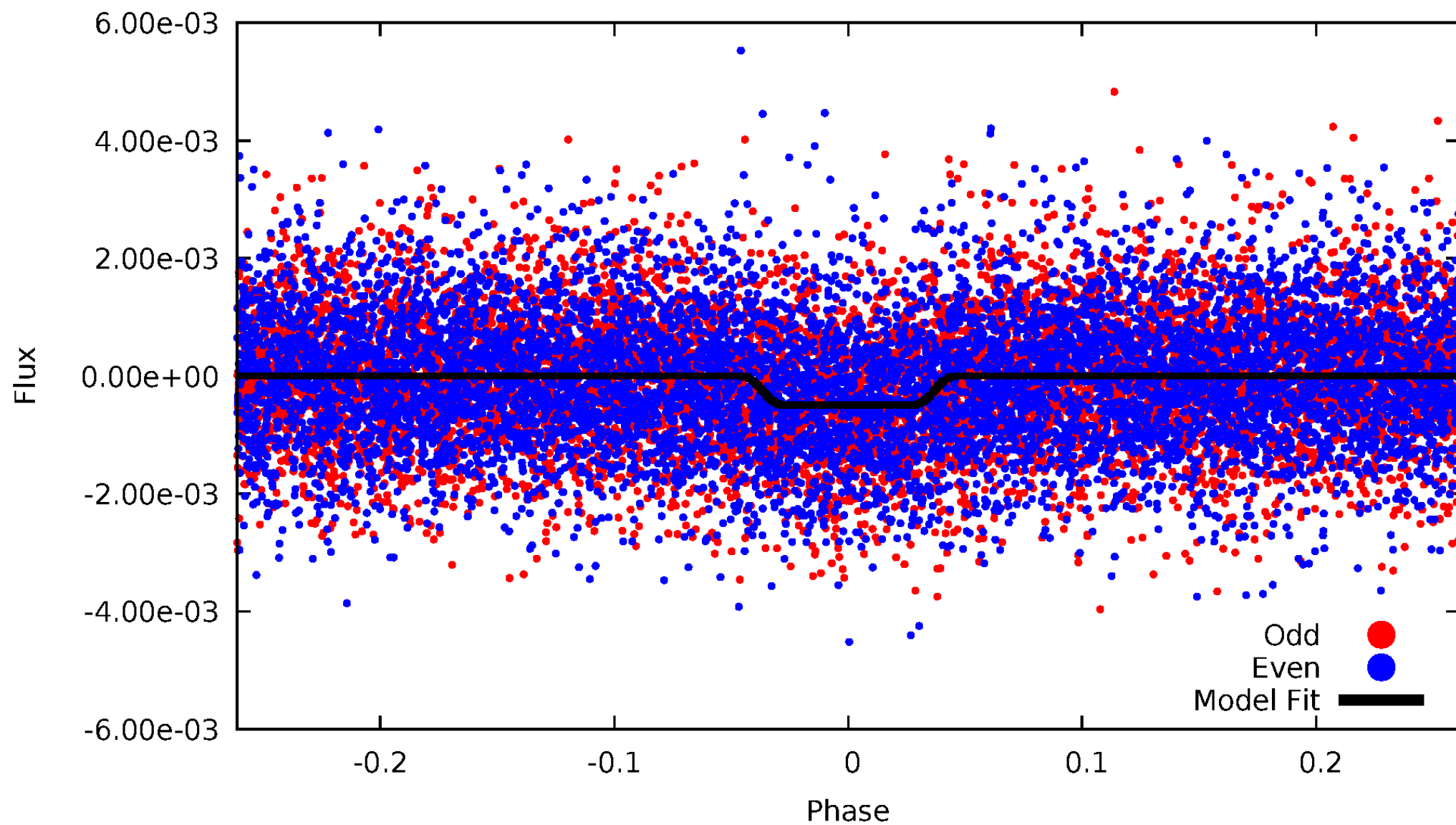
# DV Odd/Even

TCE 002707916-01



# ALT Odd/Even

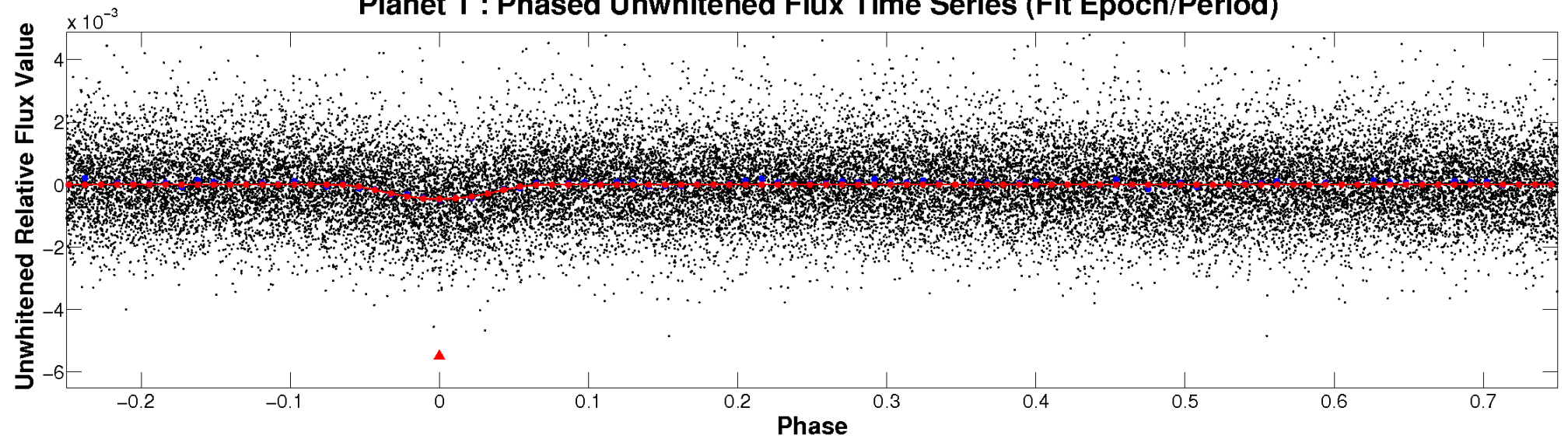
TCE 002707916-01



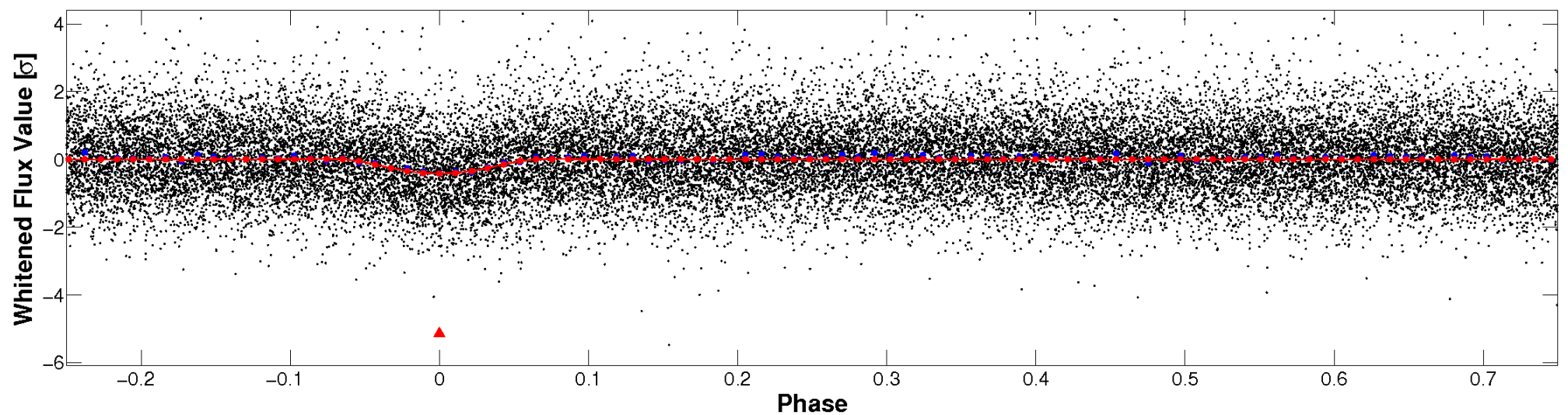


# Non-Whitened Vs. Whitened Light Curve

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

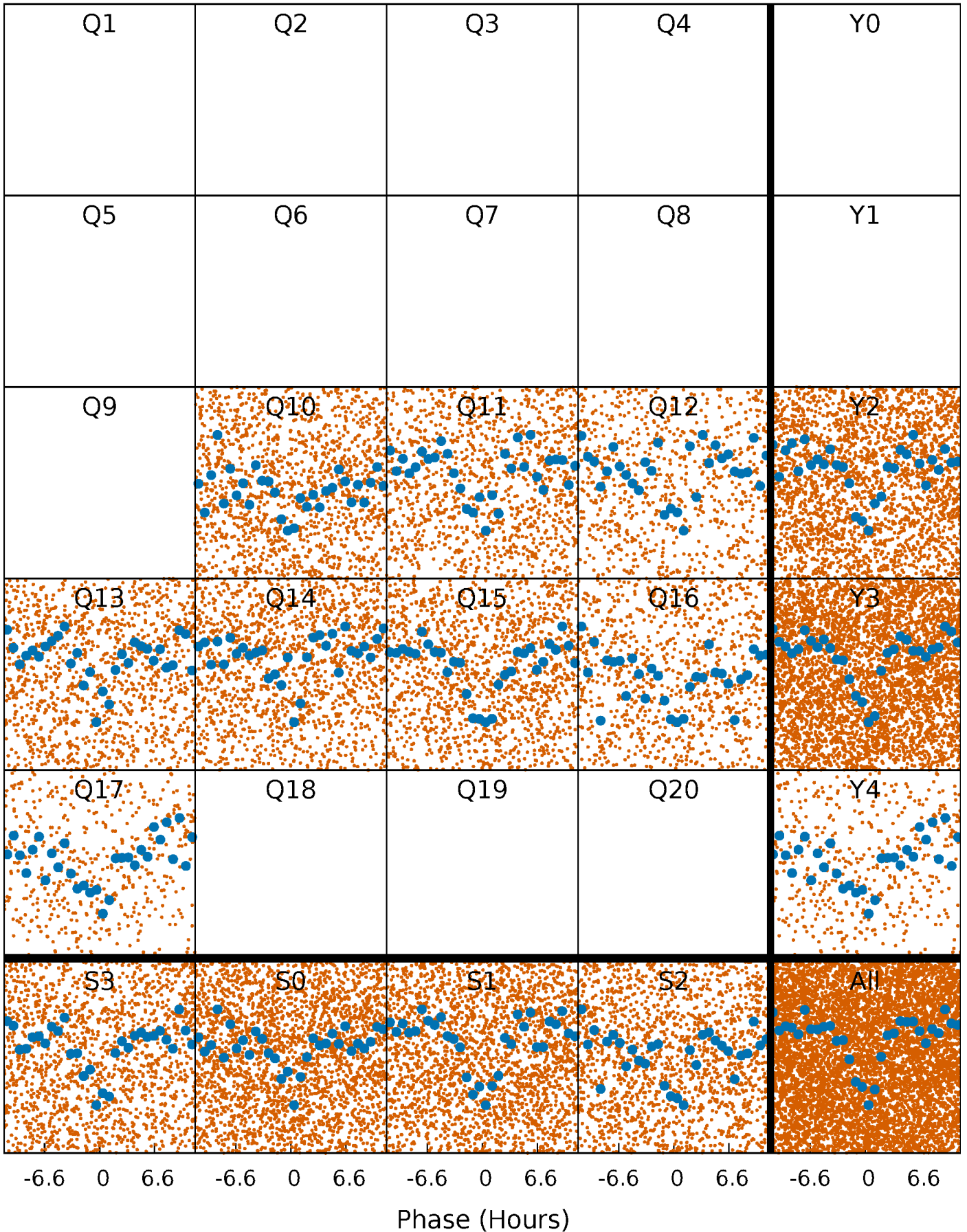


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

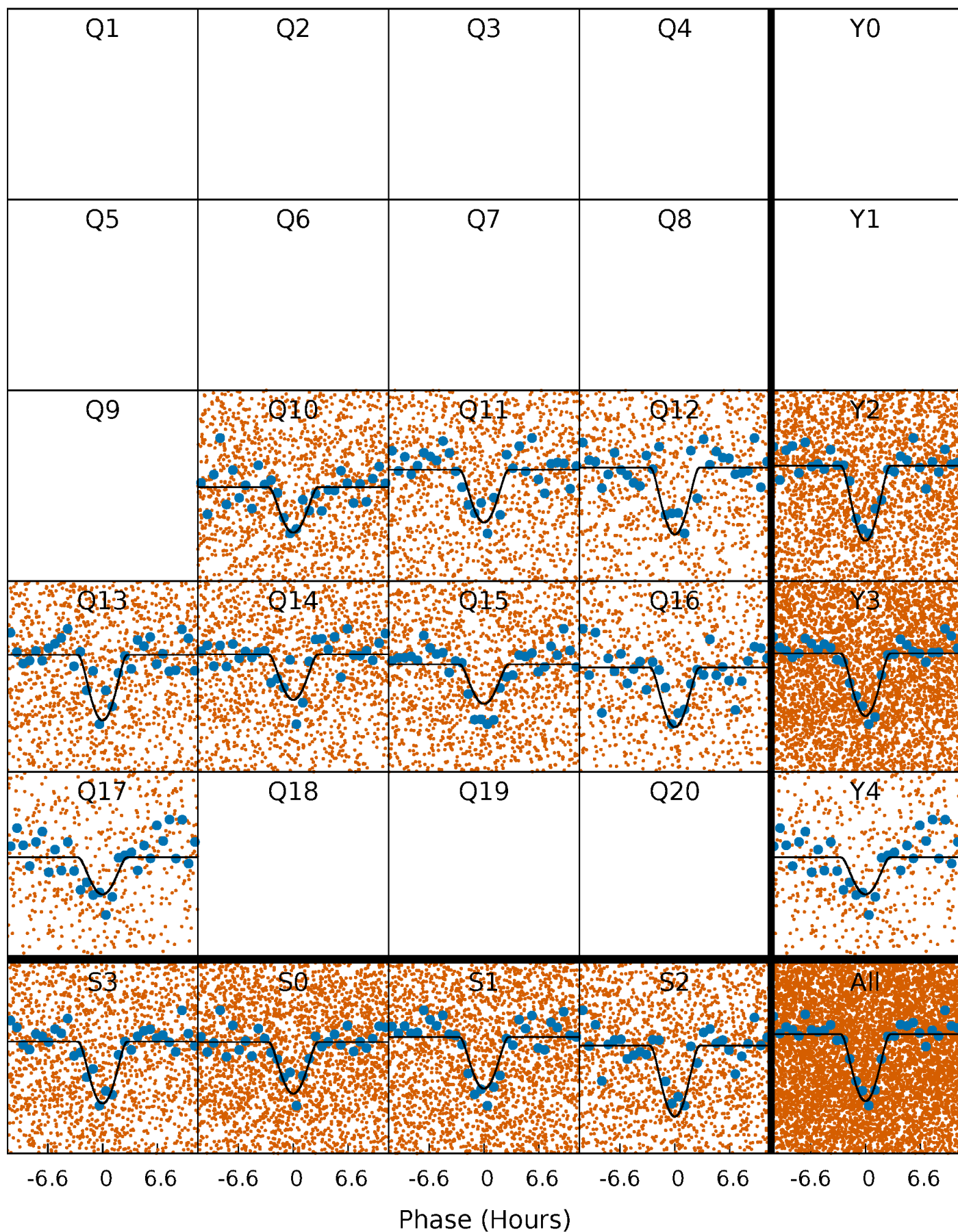
TCE 002707916-01   P= 1.891302 Days    $T_0=132.662401$  (BKJD)





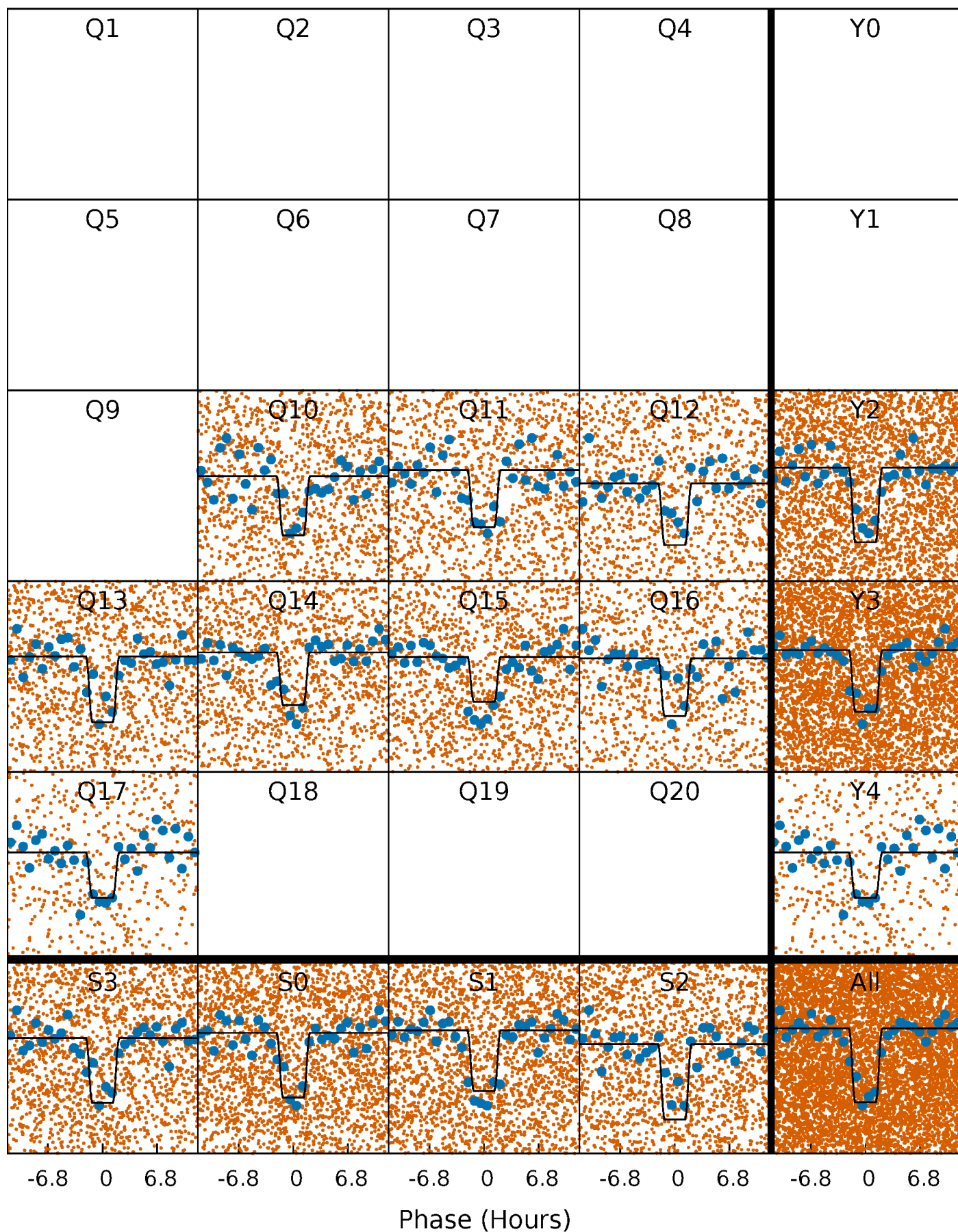
# DV Quarter-Phased Transit Curves

TCE 002707916-01 P= 1.891302 Days  $T_0=132.662401$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

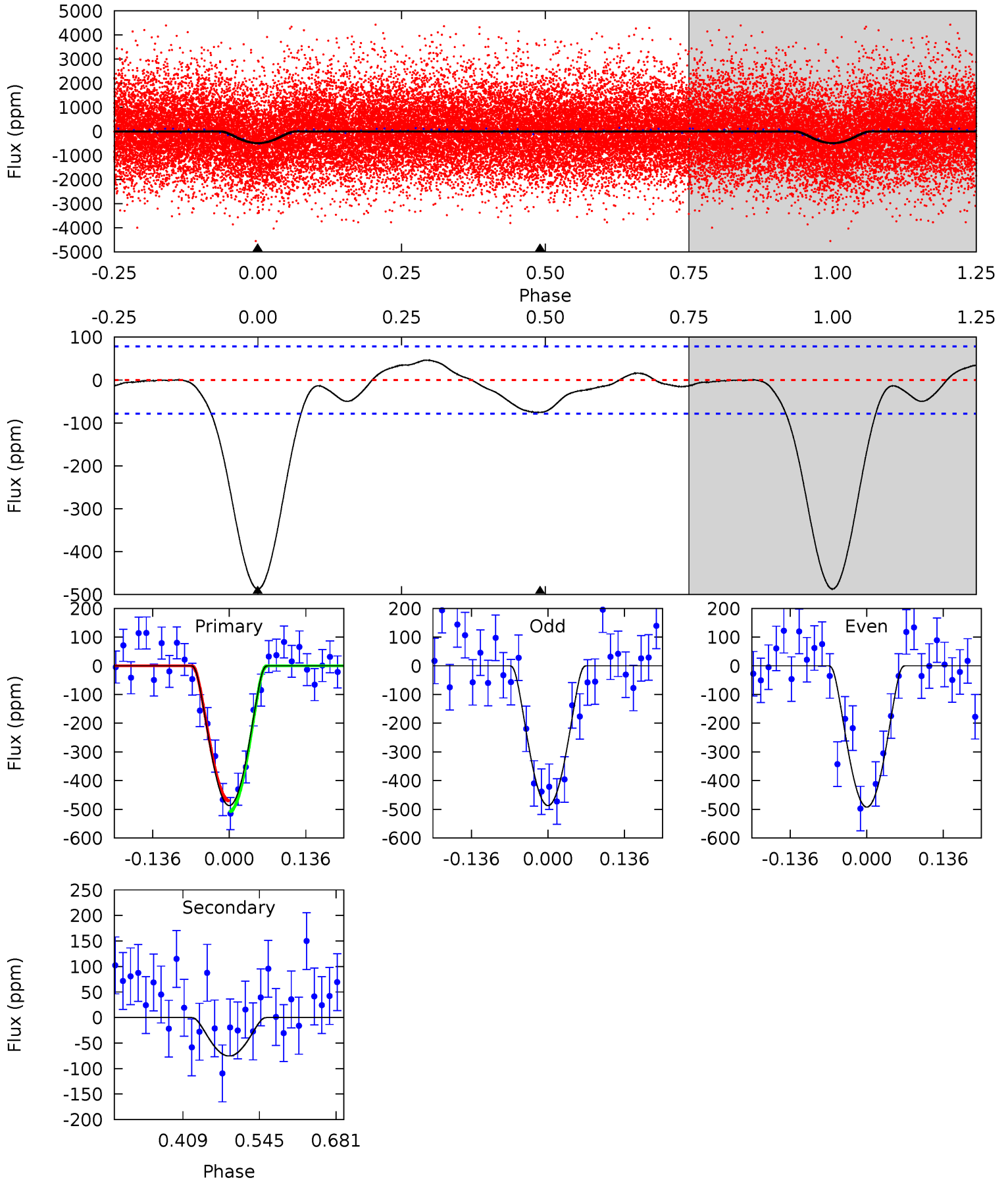
TCE 002707916-01 P= 1.891366 Days  $T_0=132.625781$  (BKJD)



# DV Model-Shift Uniqueness Test

002707916-01, P = 1.891302 Days, E = 132.662401 Days

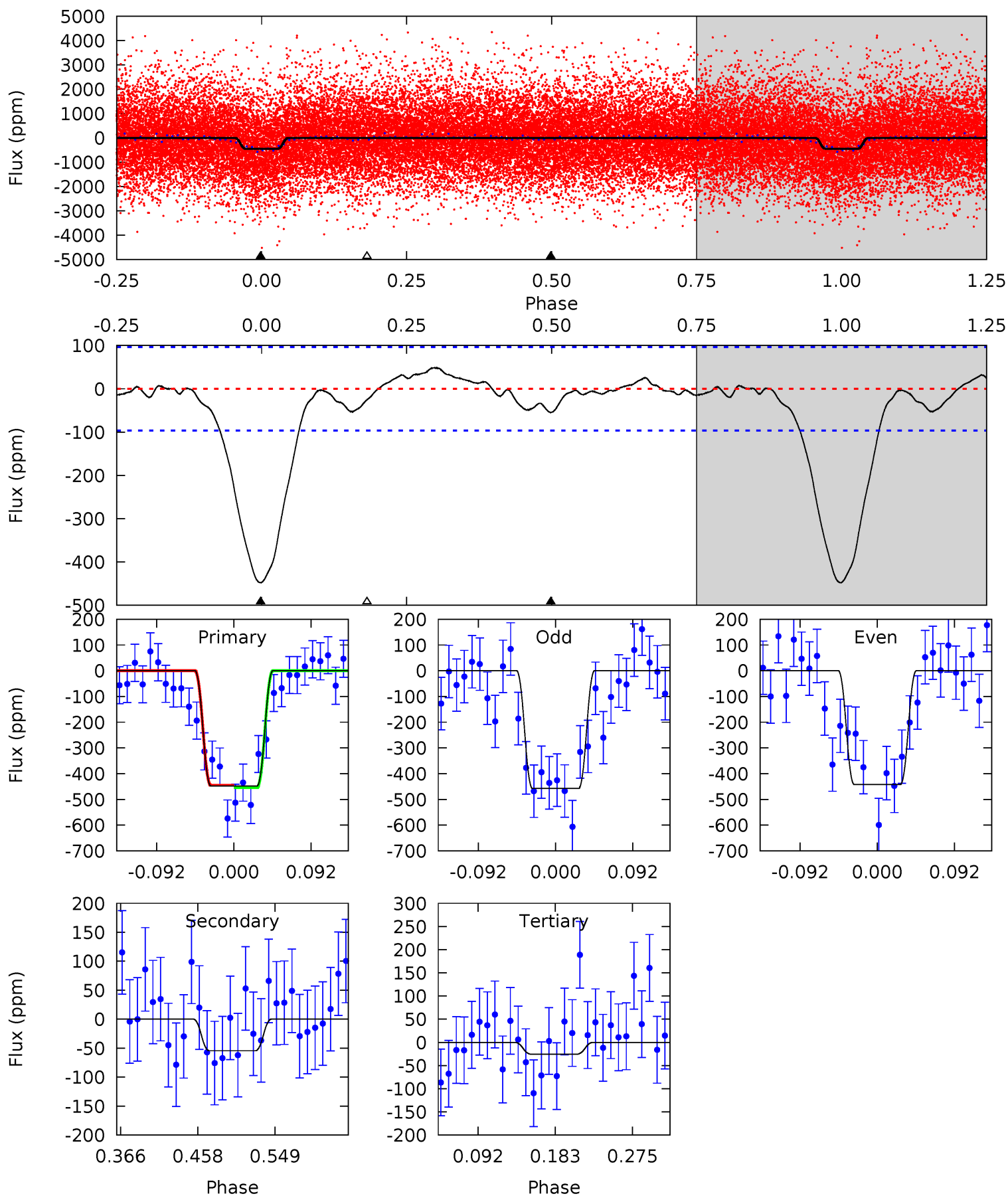
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.9	4.32	0	0	4.50	1.49	1.38	27.9	27.9	4.32	4.32	0.16	0.98	0.09	1.08



# Alt Model-Shift Uniqueness Test

002707916-01, P = 1.891366 Days, E = 132.625781 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
21.3	2.59	1.21	0	4.58	1.69	1.05	20.1	21.3	1.38	2.59	0.37	1.06	0.10	0.20



### Stellar Parameters For KIC 002707916

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4615^{+166}_{-166}$	$4.660^{+0.059}_{-0.032}$	$-0.700^{+0.300}_{-0.300}$	$0.589^{+0.046}_{-0.051}$	$0.579^{+0.060}_{-0.037}$	$3.985^{+0.982}_{-0.544}$
	+4%/-4%	+1%/-1%	+43%/-43%	+8%/-9%	+10%/-6%	+25%/-14%
Source	KIC0	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 002707916-01 / KOI 4950.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-75 \pm 17$	$4.93^{+4.69}_{-3.39}$	$1378^{+57}_{-57}$	$2310^{+890}_{-3966}$	$1.115^{+9.235}_{-0.845}$
Alt.	$-54 \pm 21$	$4.36^{+4.80}_{-2.96}$	$1370^{+59}_{-52}$	$2242^{+917}_{-4108}$	$0.934^{+8.475}_{-0.751}$

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



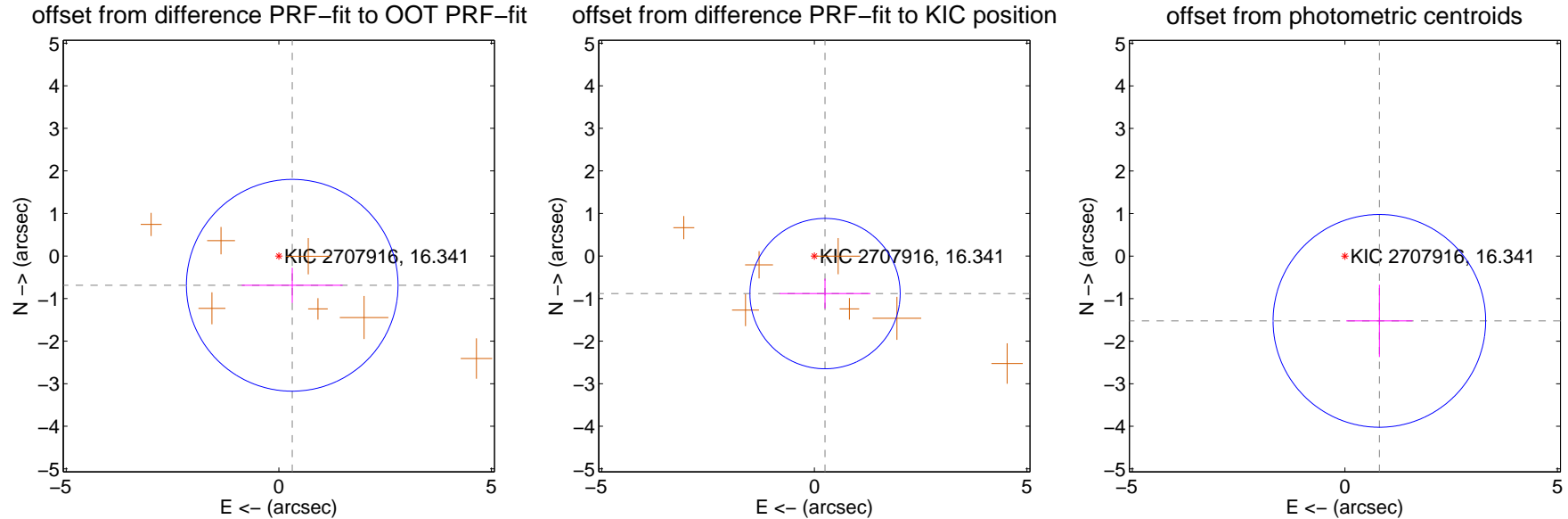
## DV Centroid Data

Supplemental centroid analysis for 002707916-01. Kepler magnitude: 16.34. Transit SNR 16.70

There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.756 \pm 0.829$	0.91	$-0.315 \pm 1.187$	$-0.688 \pm 0.413$
PRF-fit source offset from KIC position	$0.918 \pm 0.589$	1.56	$-0.252 \pm 1.066$	$-0.883 \pm 0.351$
photometric centroid source offset	$1.73 \pm 0.83$	2.07	$-0.81 \pm 0.78$	$-1.52 \pm 0.85$



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.

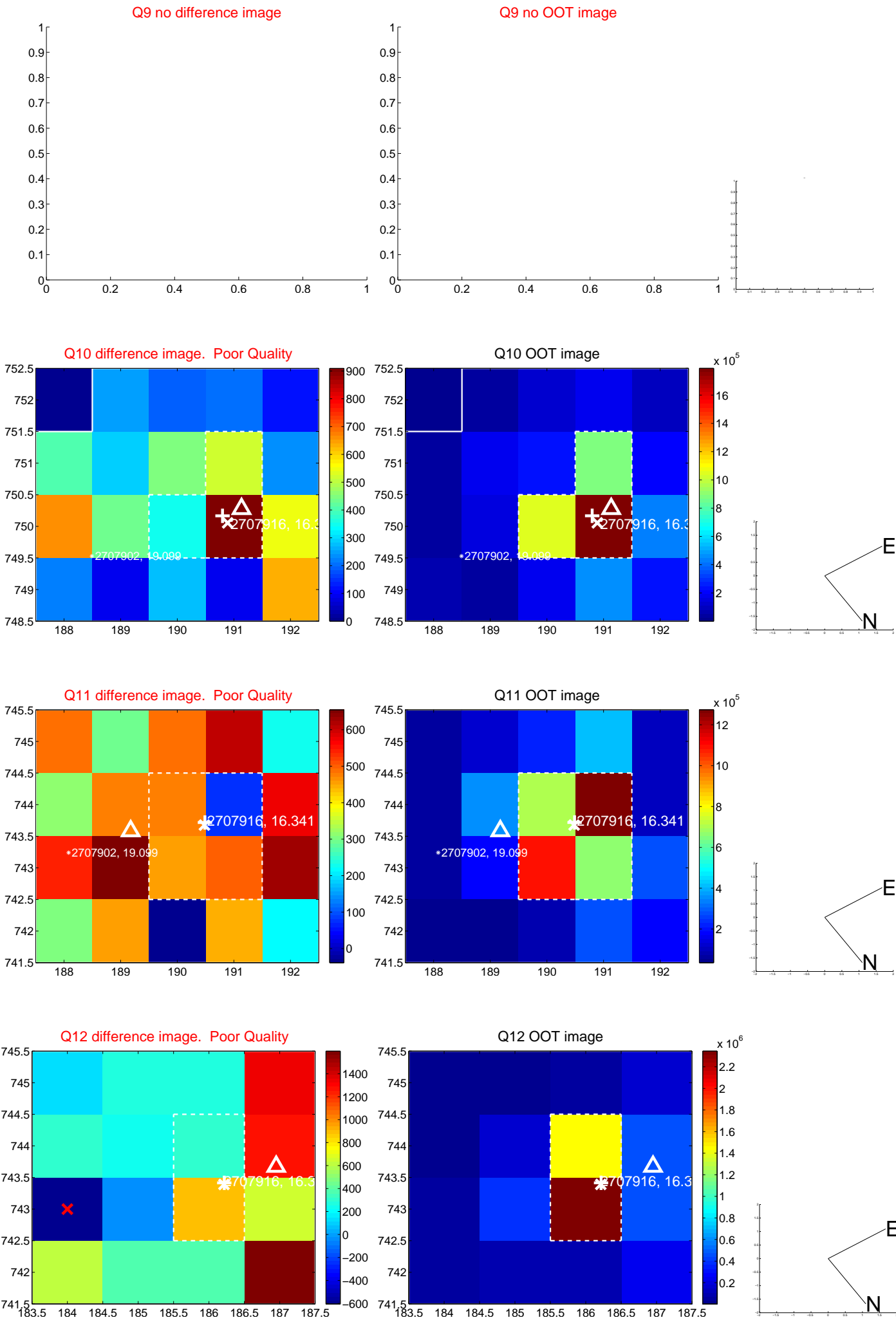
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



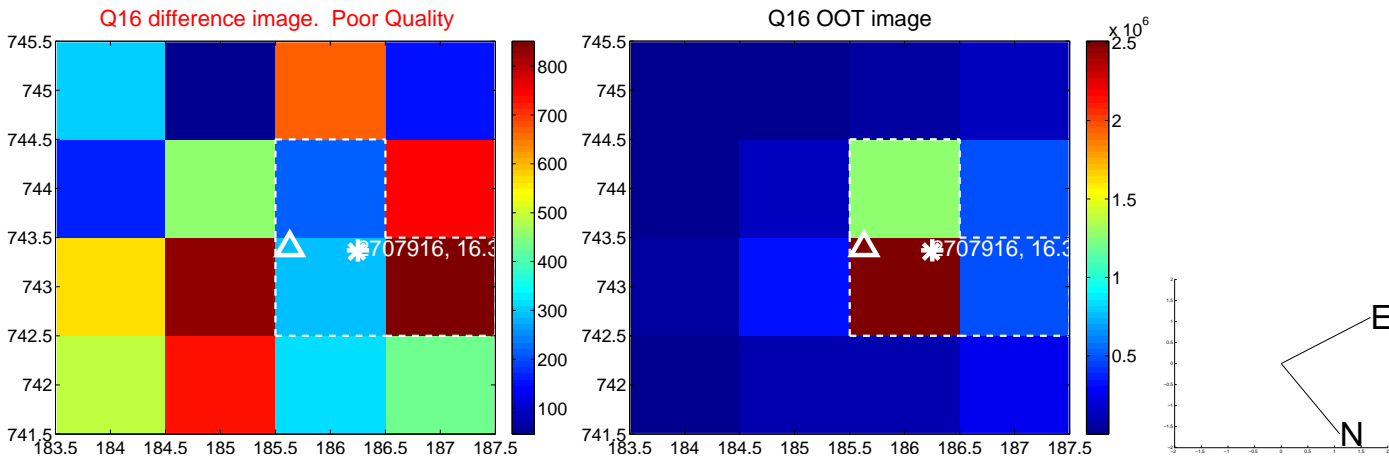
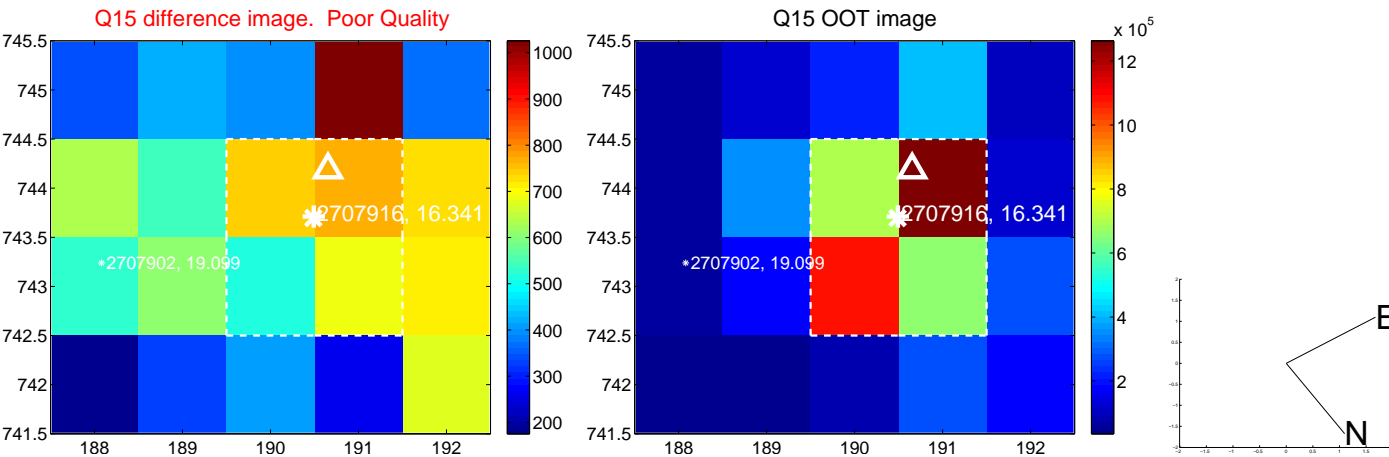
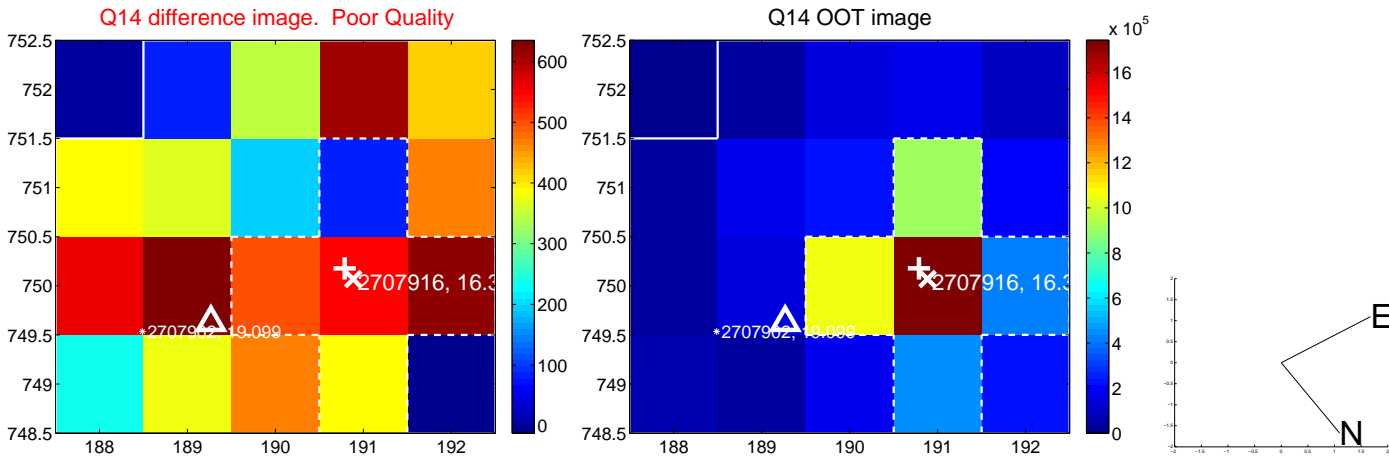
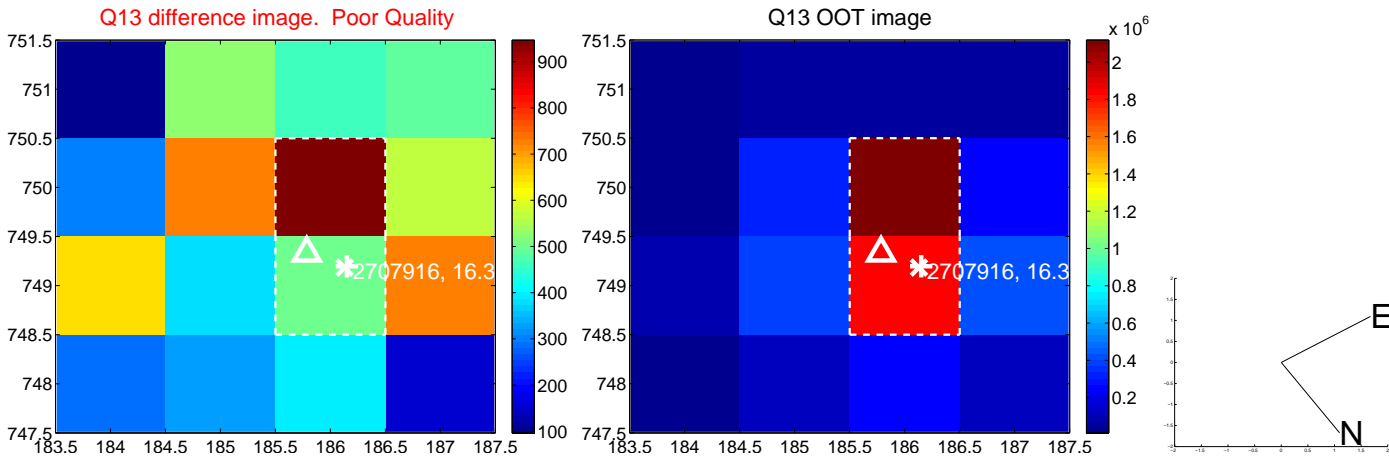
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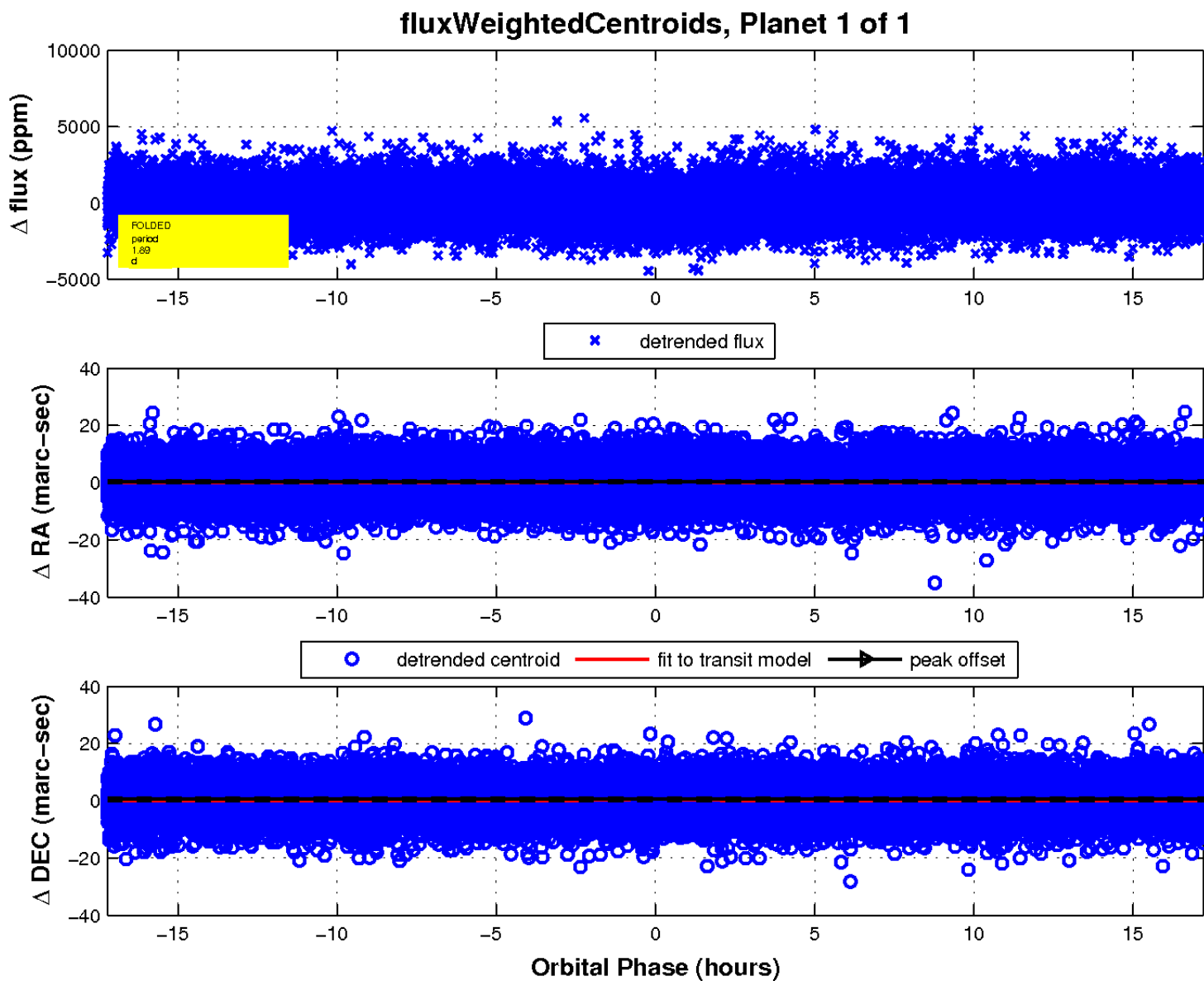
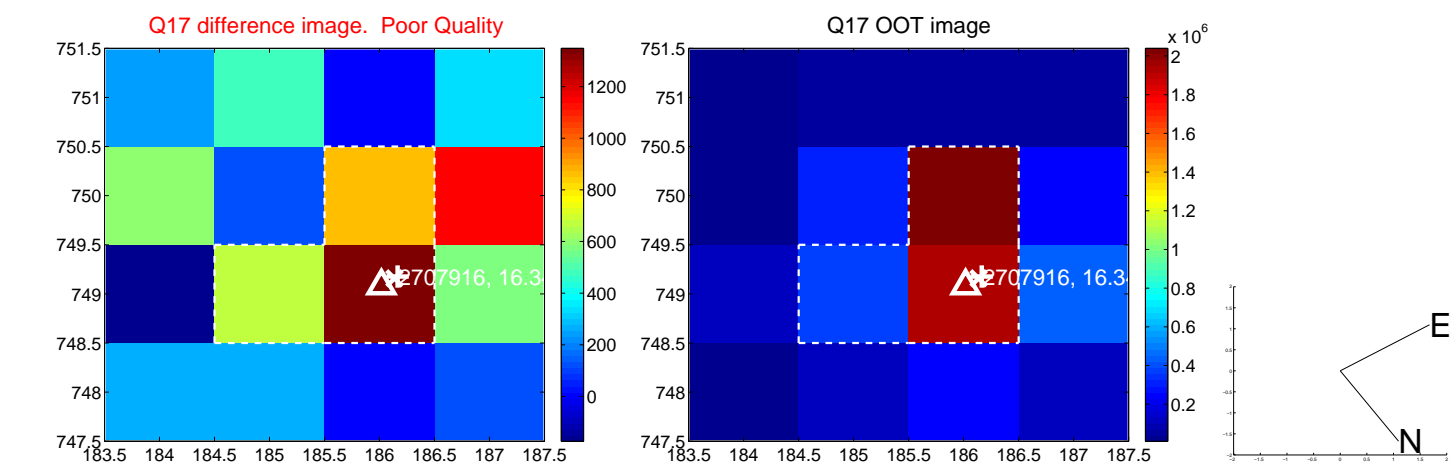


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

