

# KIC 007107561

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007107561-01	OBS	3100.01	0.812583	131.565327	56.3	1.033	14.5	18.9	1.88	6143	1.45	12909.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007107561-01	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 007107561-01

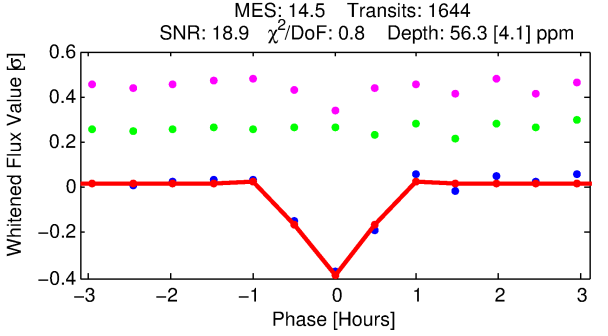
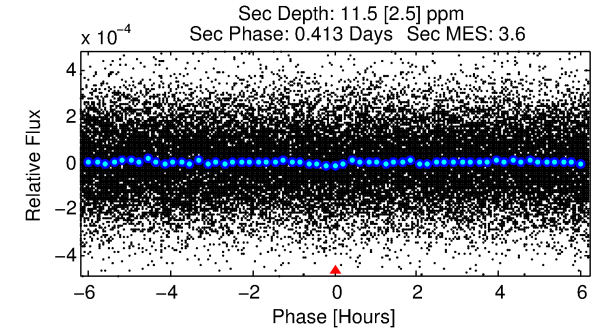
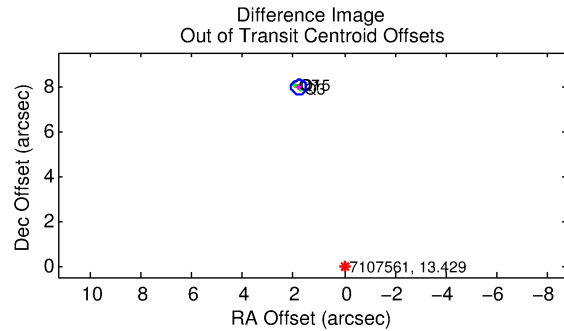
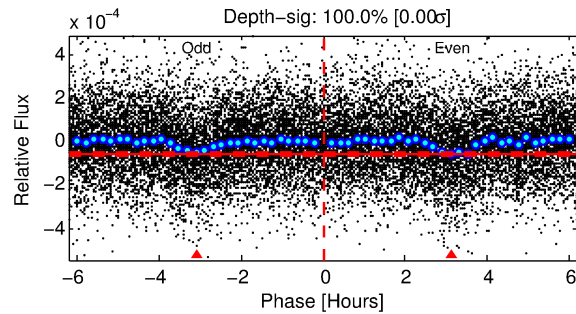
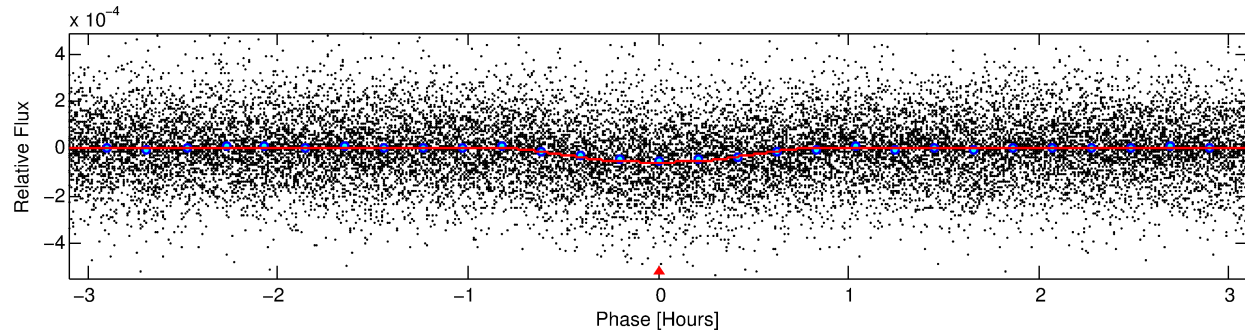
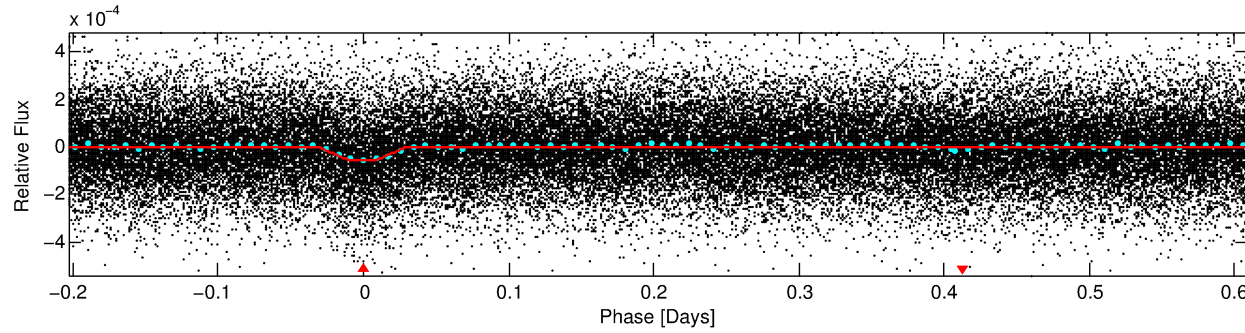
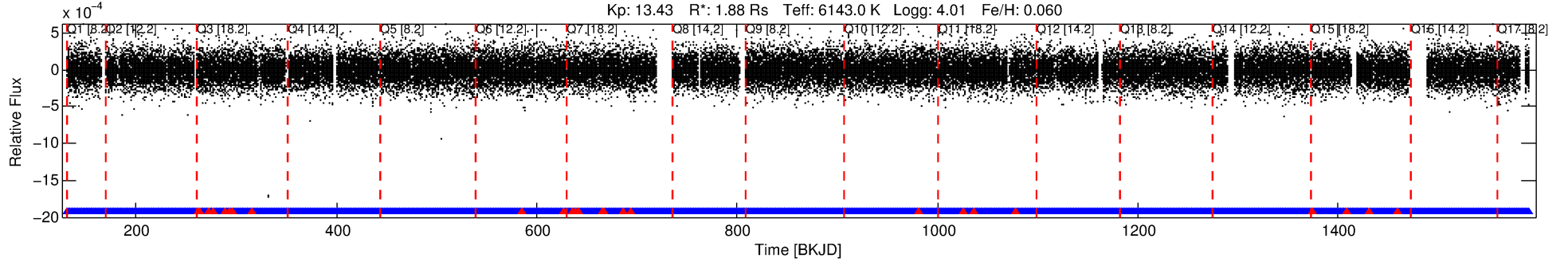
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
007107561-01	7107561	5353.01	7107567	1:1	13.0	3	-1	14.23	13.42	127.29	Direct-PRF	0	1.20	0.72

**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: 7107561 Candidate: 1 of 1 Period: 0.813 d  
KOI: K03100.01 Corr: 0.923

Kp: 13.43 R\*: 1.88 Rs Teff: 6143.0 K Logg: 4.01 Fe/H: 0.060



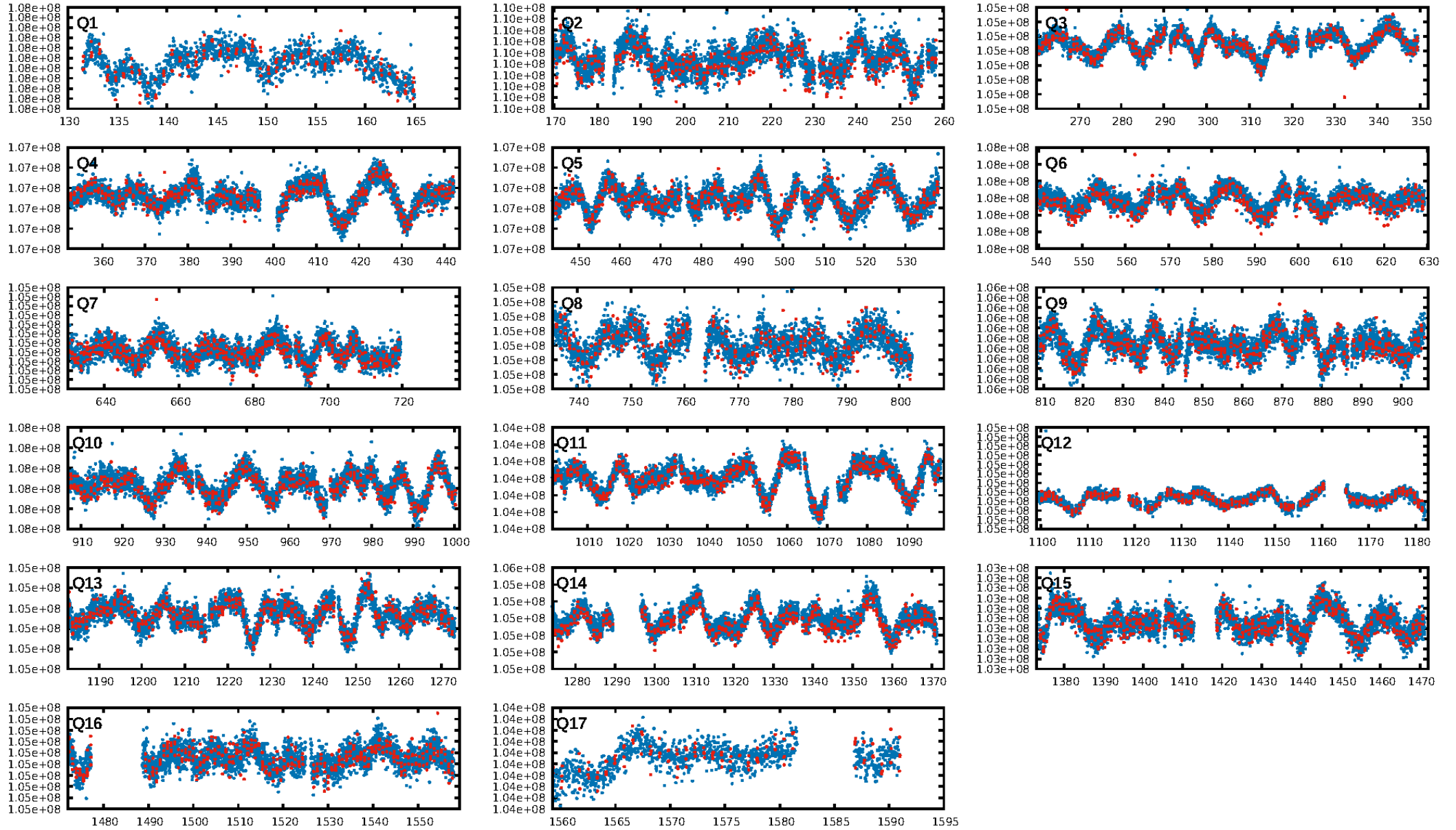
## DV Fit Results:

Period = 0.81258 [0.00001] d  
Epoch = 131.5653 [0.0009] BKJD  
Rp/R\* = 0.0071 [0.0018]  
a/R\* = 5.39 [6.54]  
b = 0.47 [2.08]  
Seff = 12909.29 [5978.08]  
Teq = 2718 [315] K  
Rp = 1.45 [0.58] Re  
a = 0.0187 [0.0053] AU  
Ag = 1.04 [0.75] [0.06σ]  
Teffp = 4248 [612] K [2.2σ]

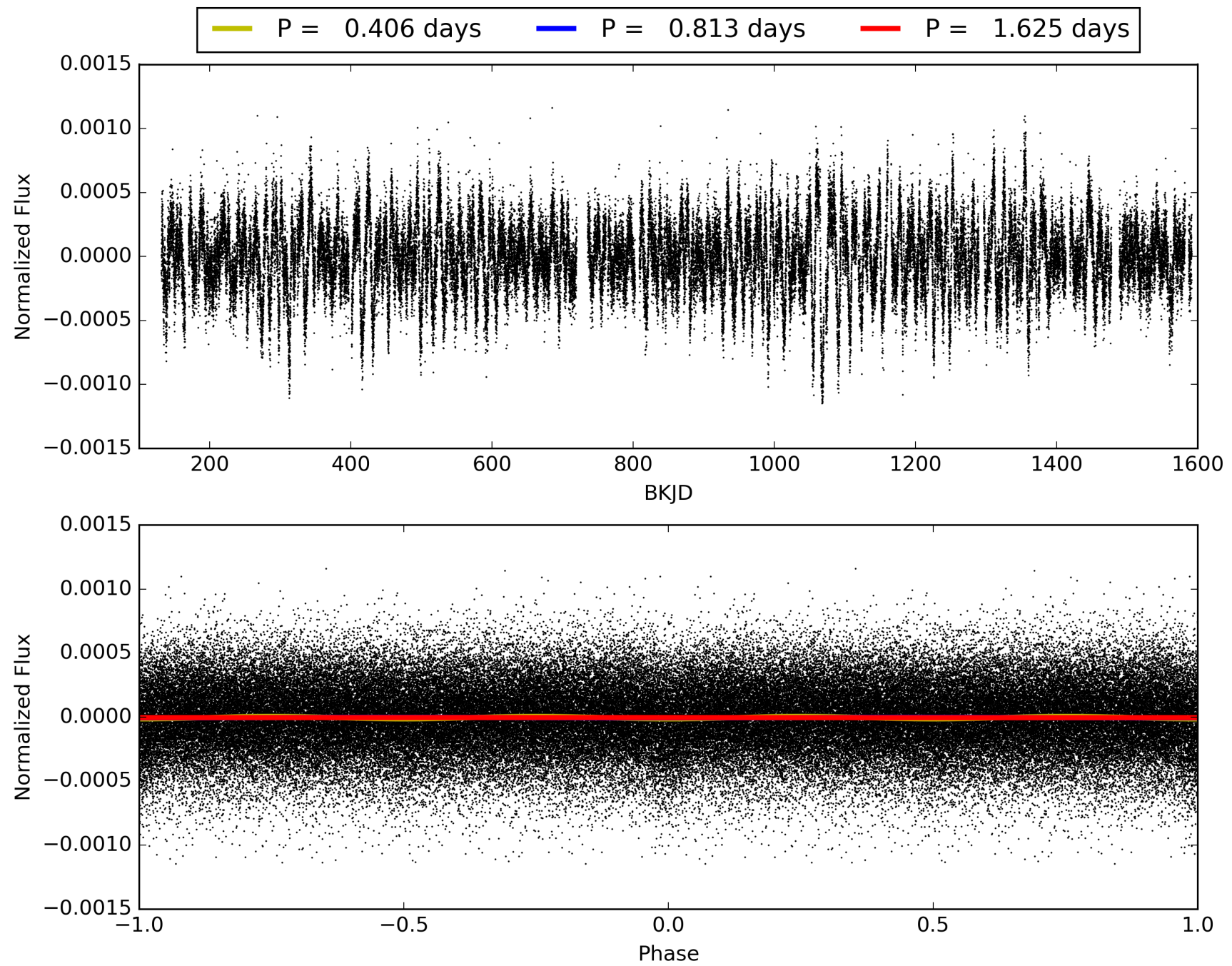
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.13e-44  
RollingBand-fgt: 0.98 [1544/1569]  
GhostDiagnostic-chr: -0.9037  
Centroid-sig: N/A  
Centroid-so: 44.320 arcsec [72.04σ]  
OotOffset-rm: 8.144 arcsec [78.31σ]  
KicOffset-rm: 8.274 arcsec [79.52σ]  
OotOffset-st: 0/3/0/0 [3]  
KicOffset-st: 0/3/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007107561-01, PDC Light Curves

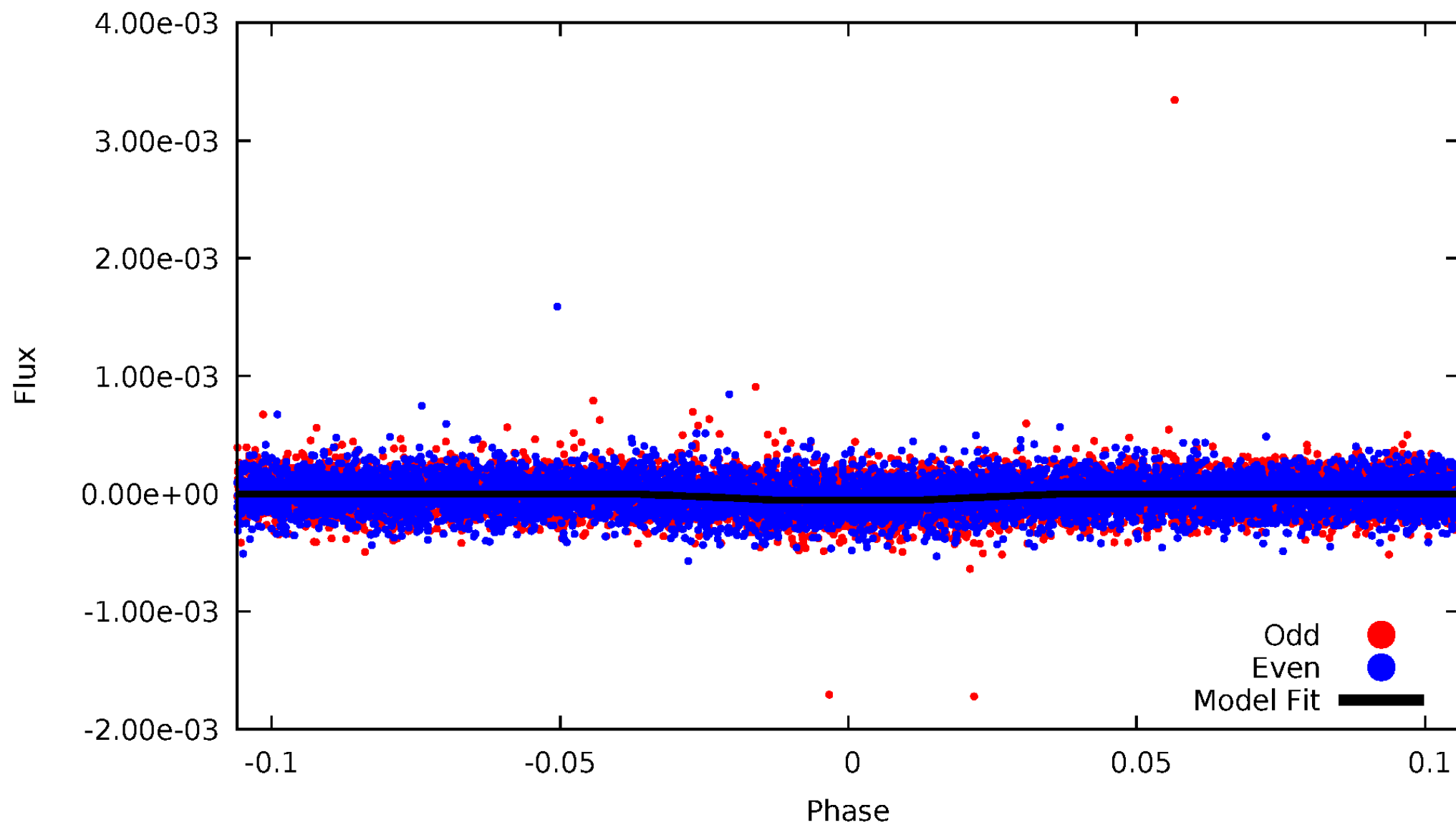


TCE 007107561-01



# DV Odd/Even

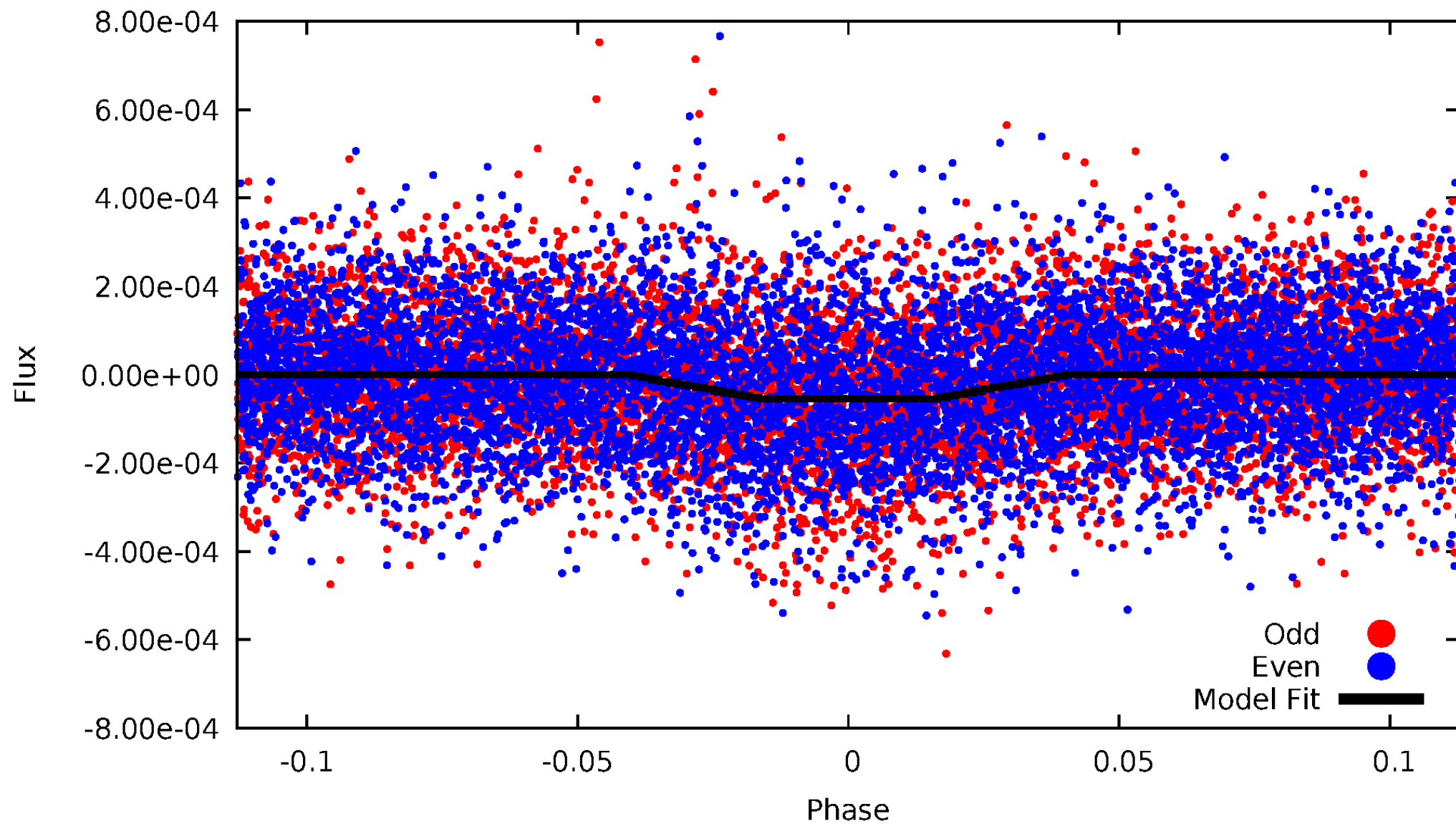
TCE 007107561-01





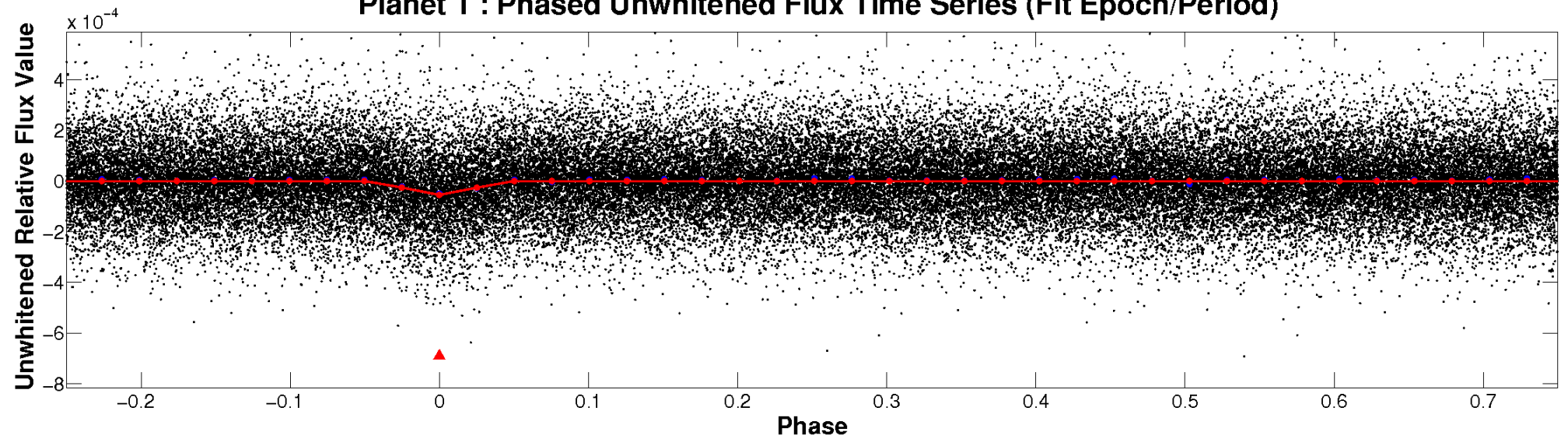
# ALT Odd/Even

TCE 007107561-01

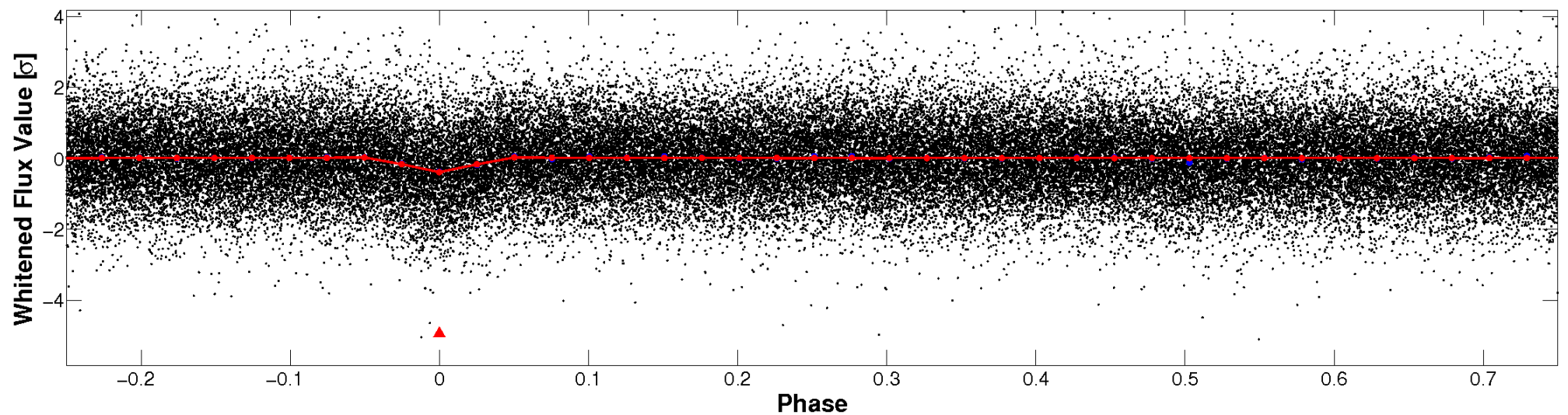


# Non-Whitened Vs. Whitened Light Curve

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

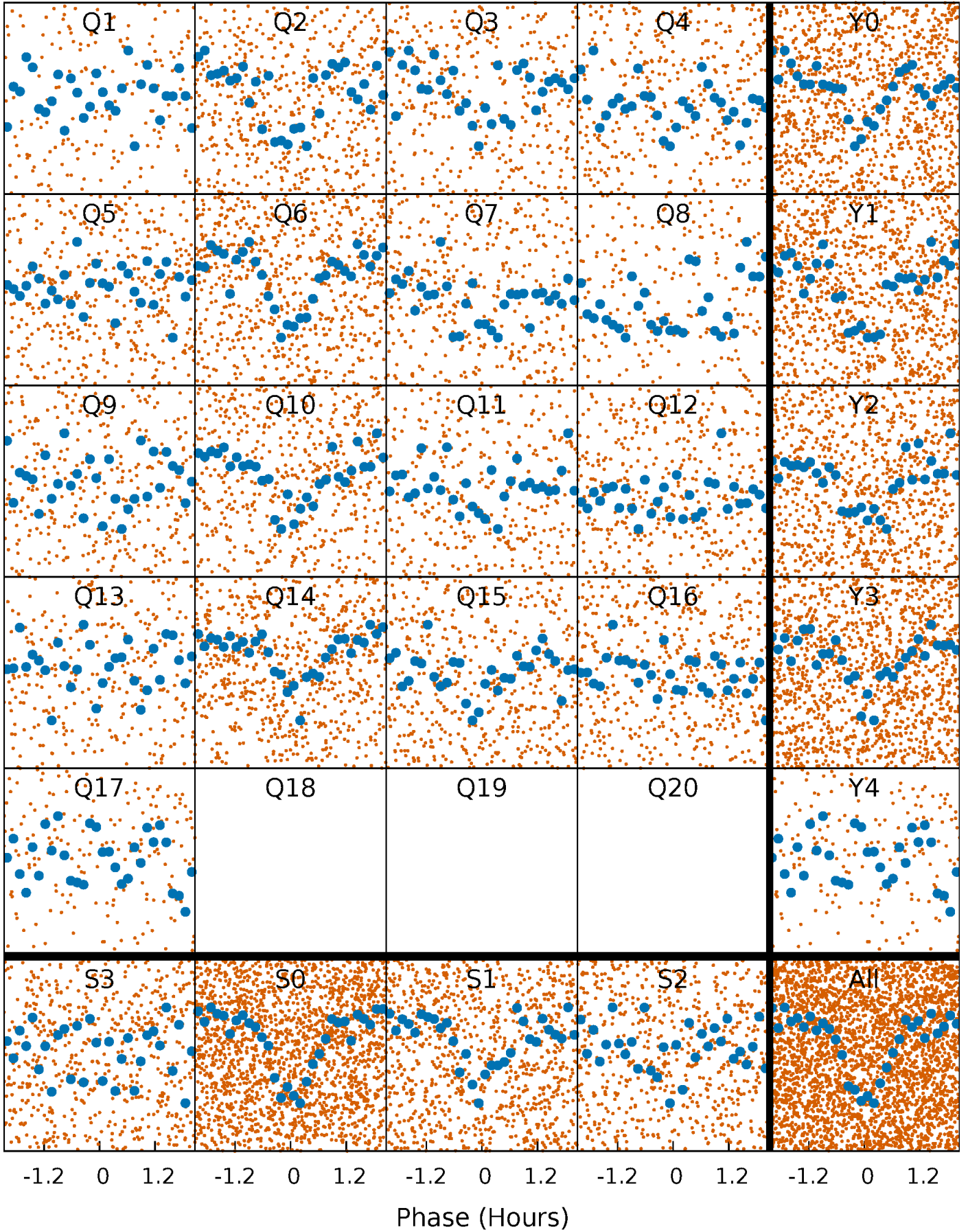


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

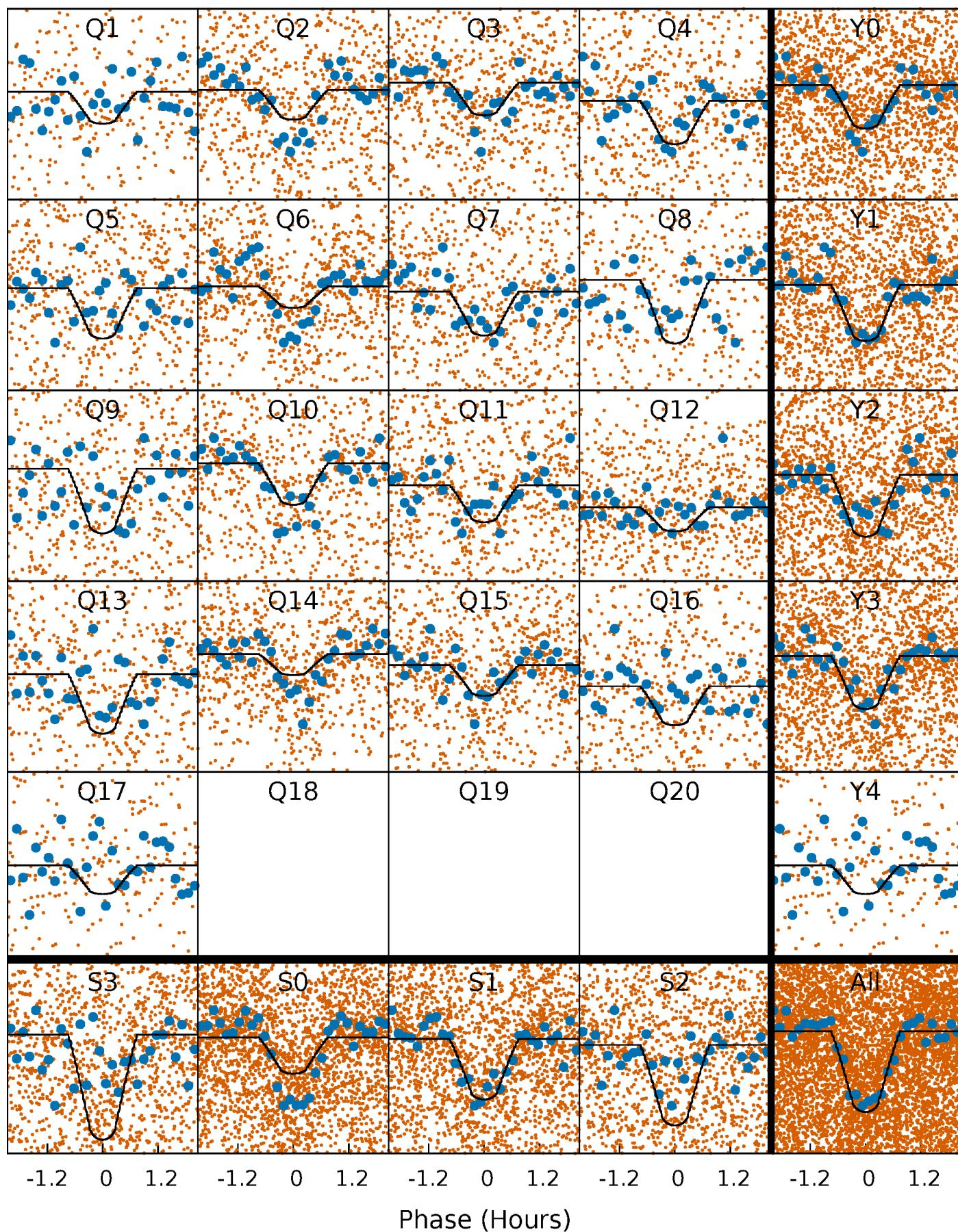
TCE 007107561-01   P= 0.812583 Days    $T_0=131.565327$  (BKJD)





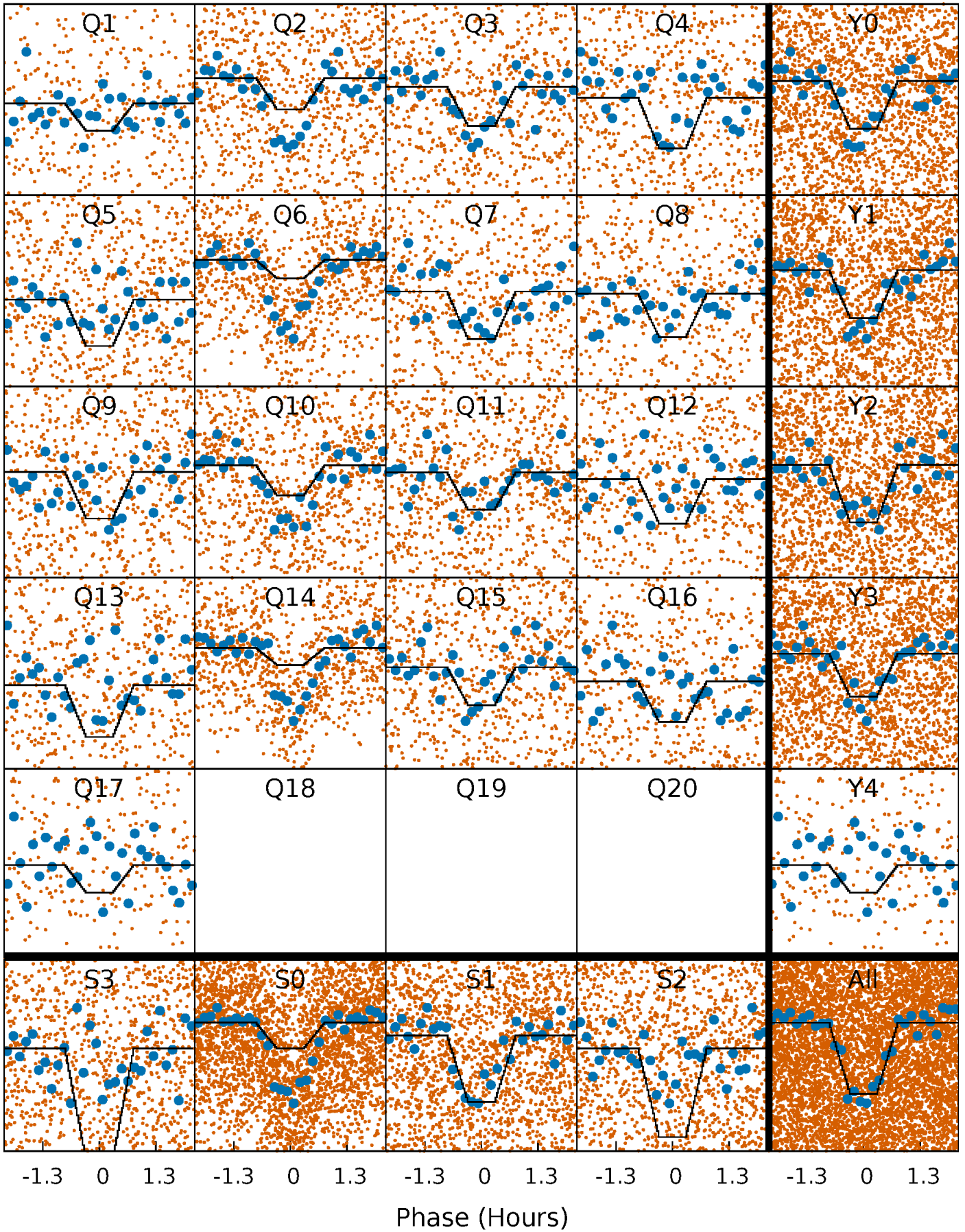
# DV Quarter-Phased Transit Curves

TCE 007107561-01 P= 0.812583 Days  $T_0=131.565327$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

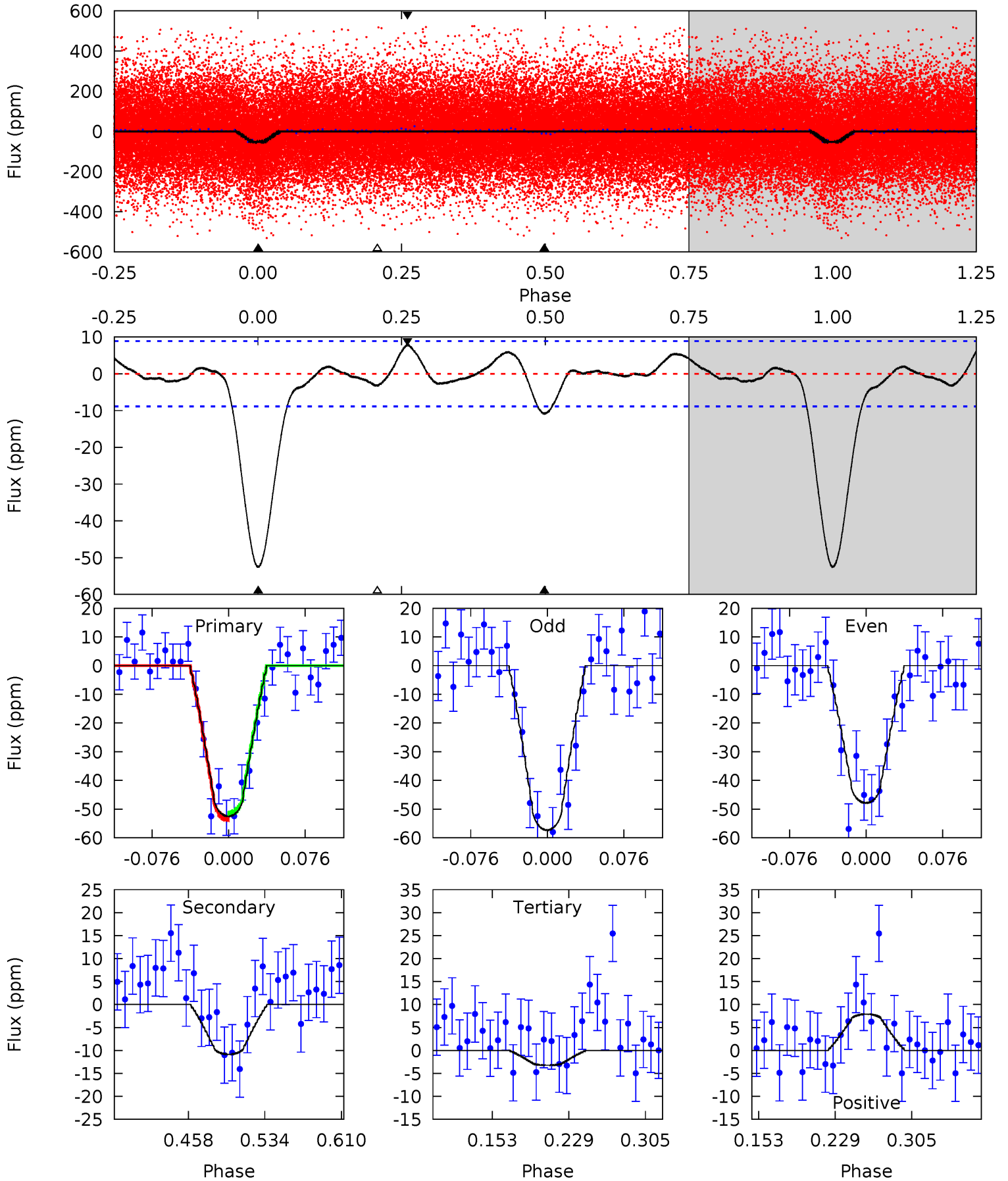
TCE 007107561-01 P= 0.812584 Days  $T_0=131.565986$  (BKJD)



# DV Model-Shift Uniqueness Test

007107561-01, P = 0.812583 Days, E = 130.752744 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
27.3	5.65	1.68	4.11	4.62	1.77	1.27	25.7	23.2	3.97	1.54	2.47	1.06	0.13	0.47

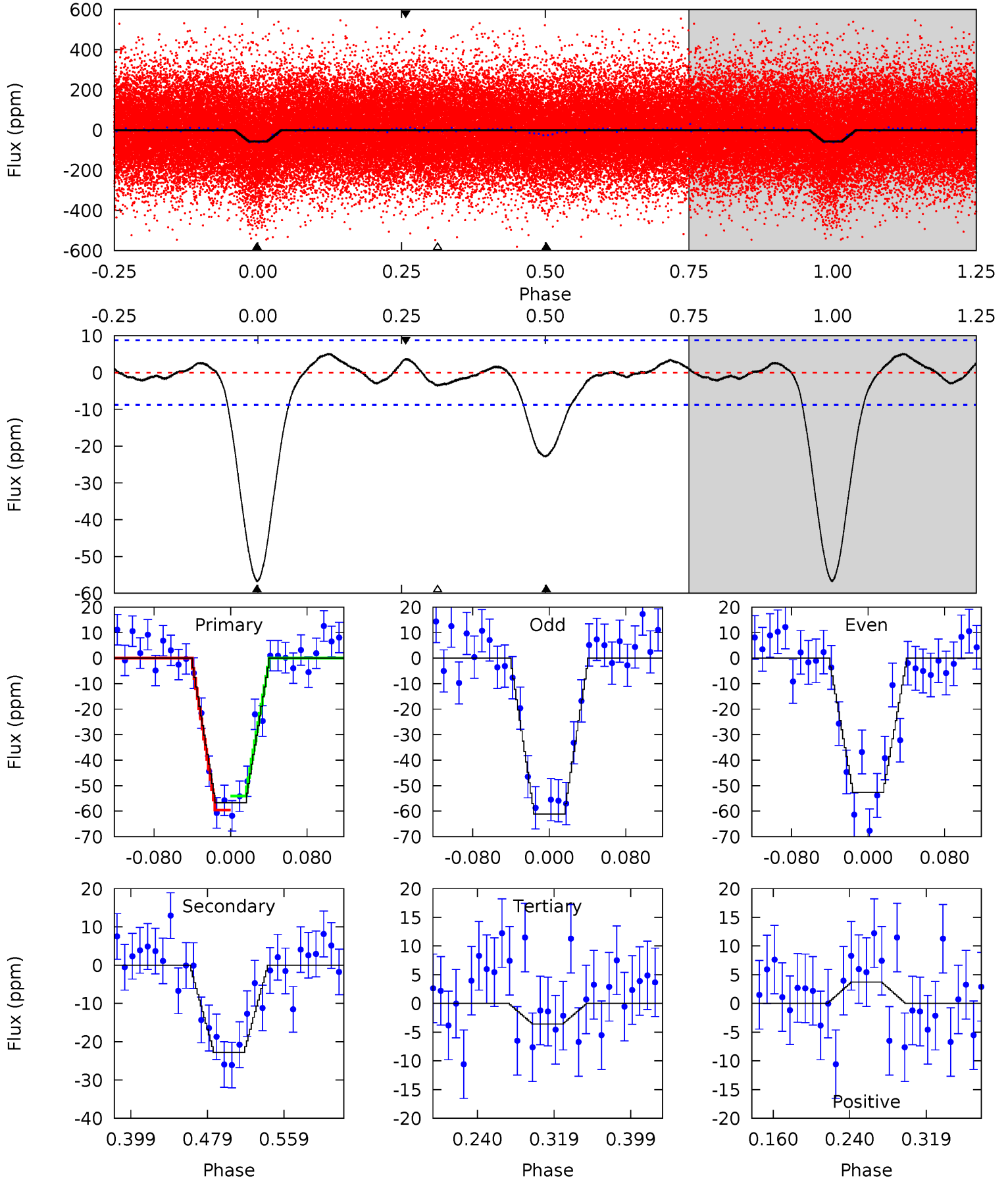




# Alt Model-Shift Uniqueness Test

007107561-01, P = 0.812584 Days, E = 130.753402 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
29.7	11.9	1.88	1.95	4.61	1.75	1.05	27.9	27.8	10.1	9.99	2.22	1.05	0.08	1.44





### Stellar Parameters For KIC 007107561

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6143^{+167}_{-186}$	$4.009^{+0.259}_{-0.111}$	$0.060^{+0.250}_{-0.250}$	$1.877^{+0.383}_{-0.575}$	$1.312^{+0.159}_{-0.238}$	$0.280^{+0.441}_{-0.092}$
	+3%/-3%	+6%/-3%	+417%/-417%	+20%/-31%	+12%/-18%	+158%/-33%
Source	PHO1	FLK73	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 007107561-01 / KOI 3100.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-11 \pm 2$	$1.40^{+0.46}_{-0.43}$	$3740^{+237}_{-298}$	$4123^{+651}_{-550}$	$1.062^{+1.101}_{-0.454}$
Alt.	$-23 \pm 2$	$1.45^{+0.46}_{-0.41}$	$3734^{+252}_{-292}$	$4832^{+808}_{-510}$	$2.111^{+1.835}_{-0.889}$

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

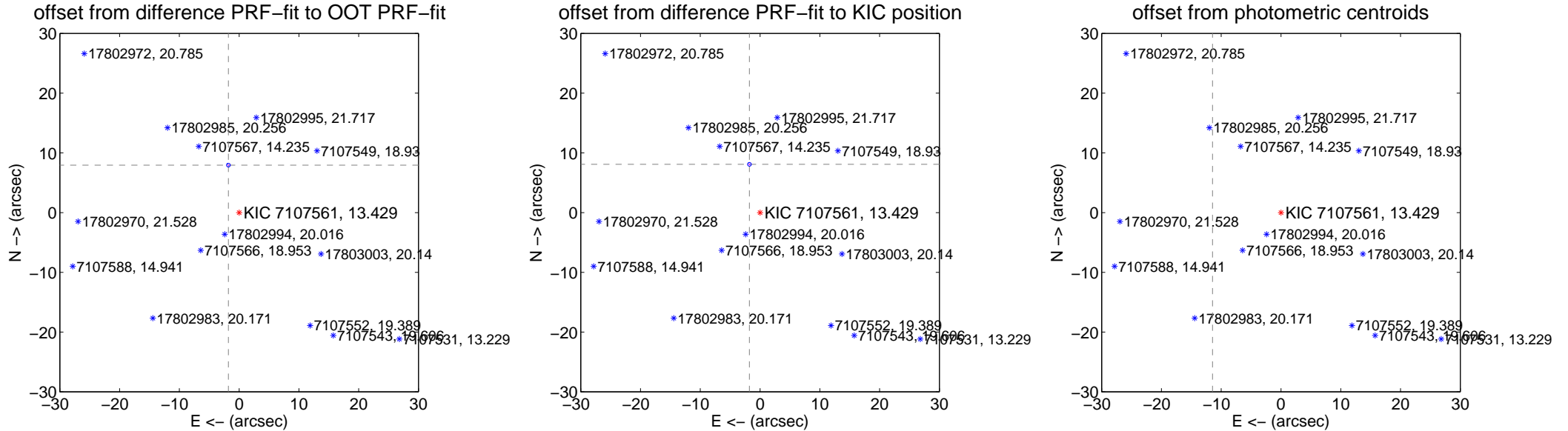
## DV Centroid Data

Supplemental centroid analysis for 007107561-01. Kepler magnitude: 13.43. Transit SNR 18.89

There are 3 quarters with good PRF difference image offsets

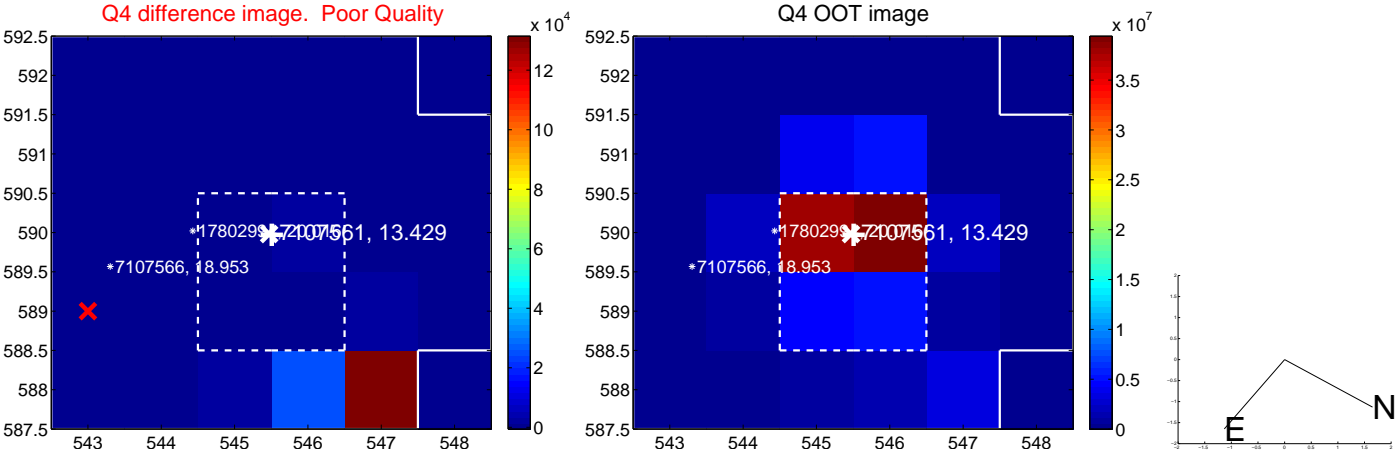
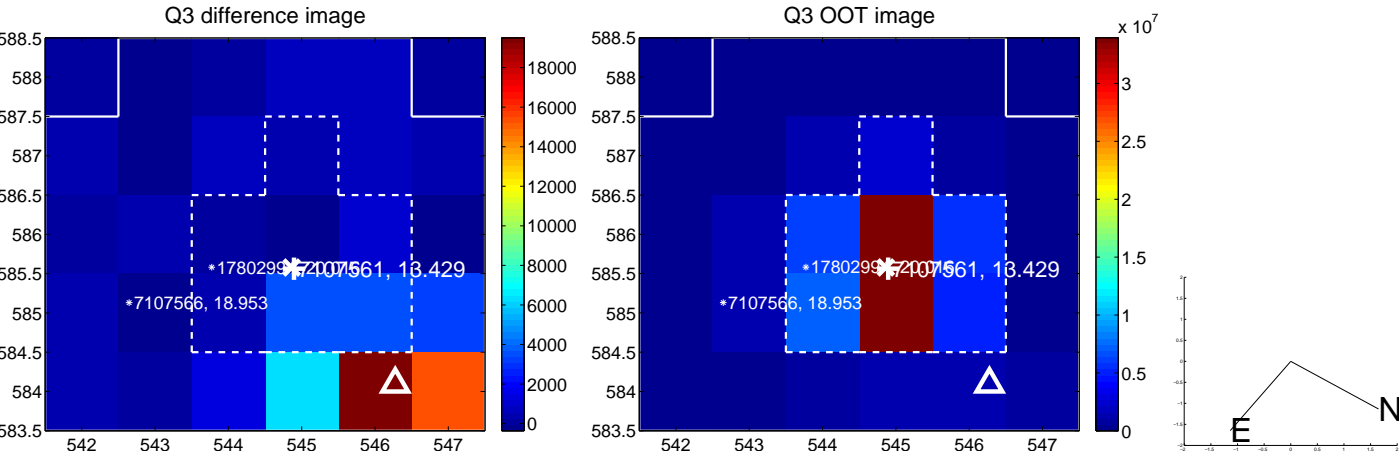
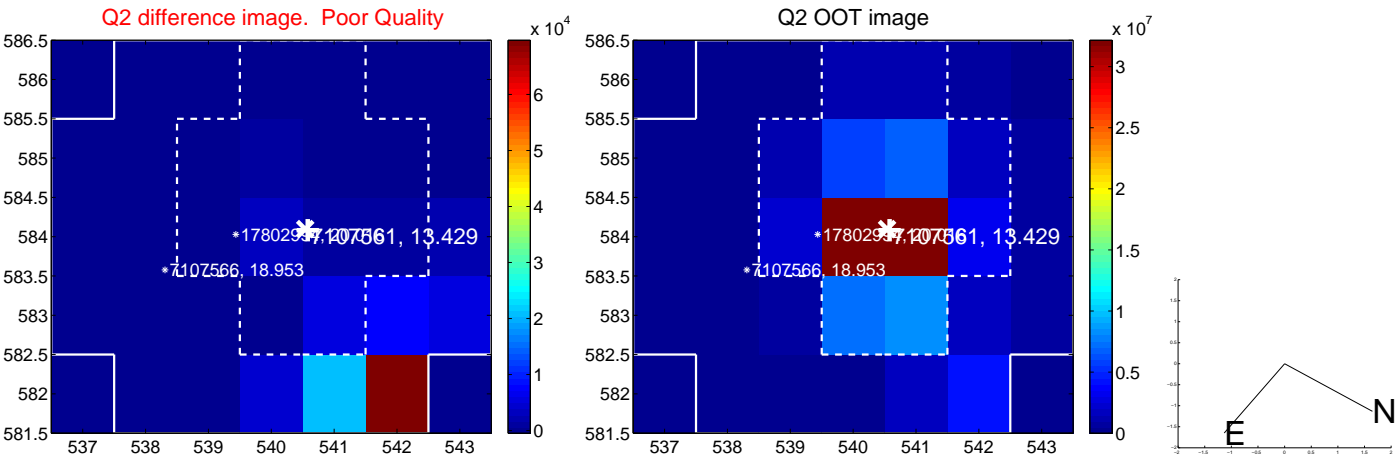
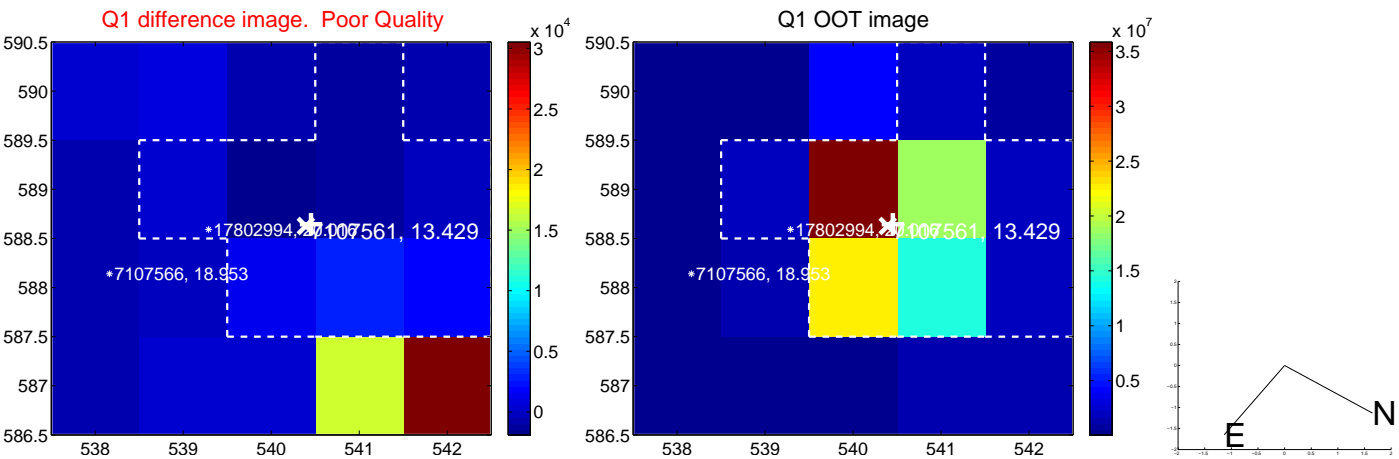
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	8.144 $\pm$ 0.104	78.31	1.796 $\pm$ 0.103	7.944 $\pm$ 0.104
PRF-fit source offset from KIC position	8.274 $\pm$ 0.104	79.52	1.778 $\pm$ 0.106	8.081 $\pm$ 0.104
photometric centroid source offset	44.32 $\pm$ 0.62	72.04	11.46 $\pm$ 0.54	42.81 $\pm$ 0.62

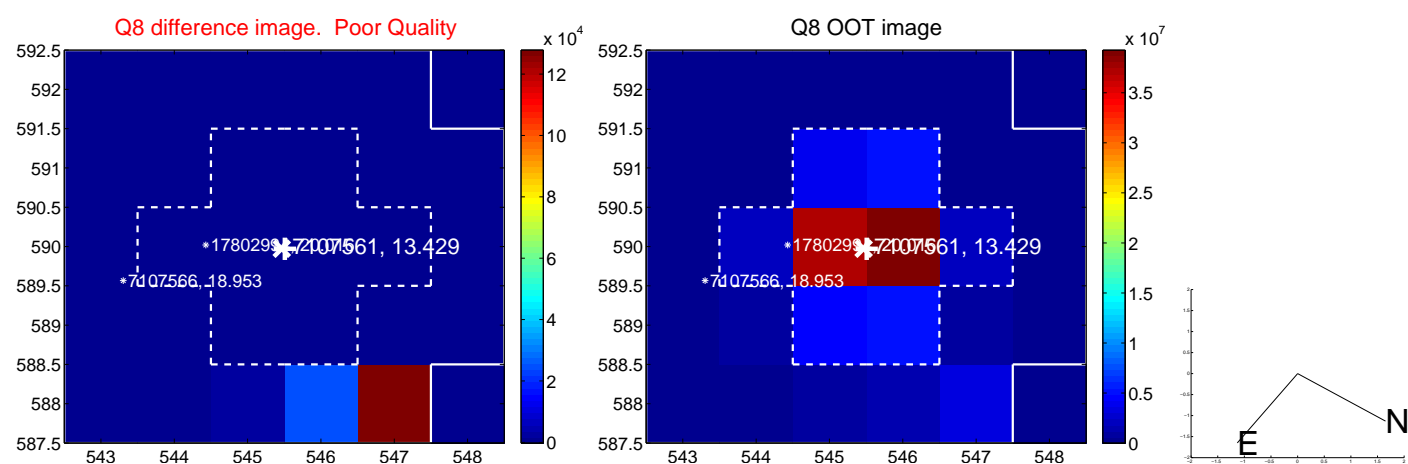
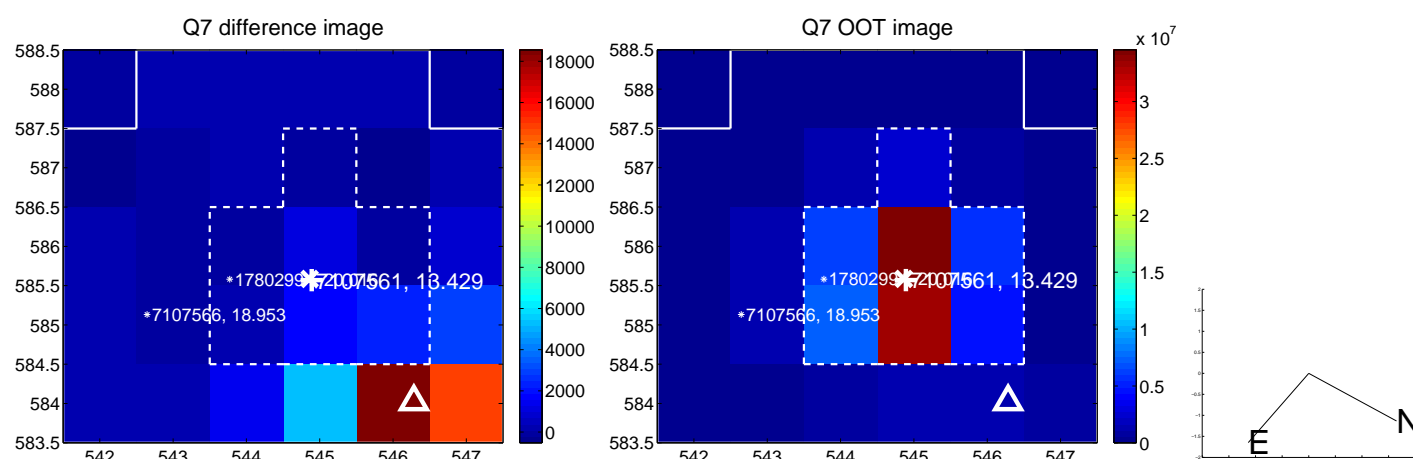
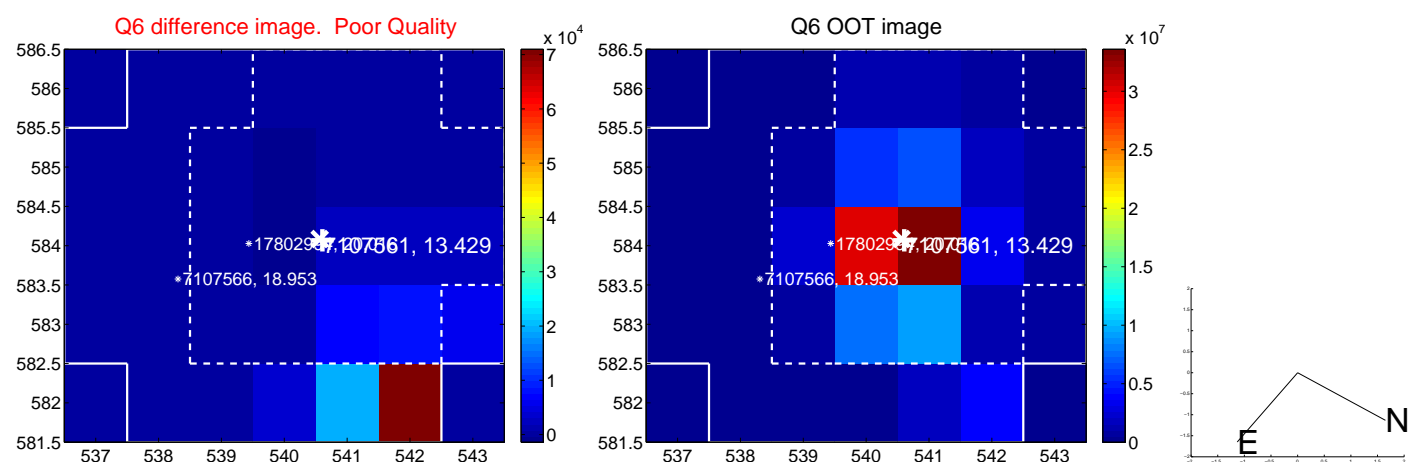
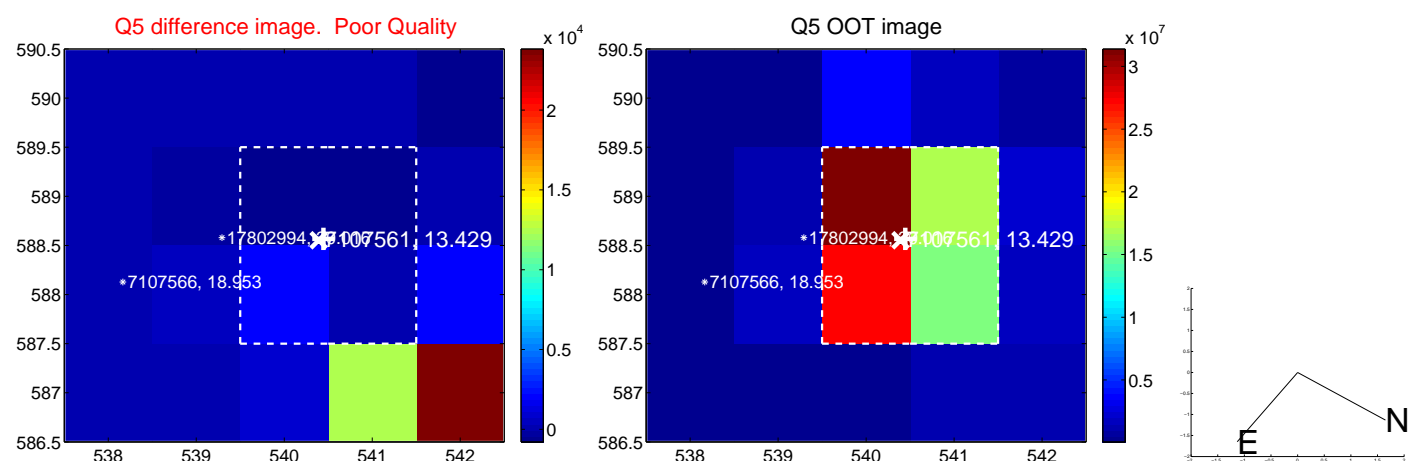


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

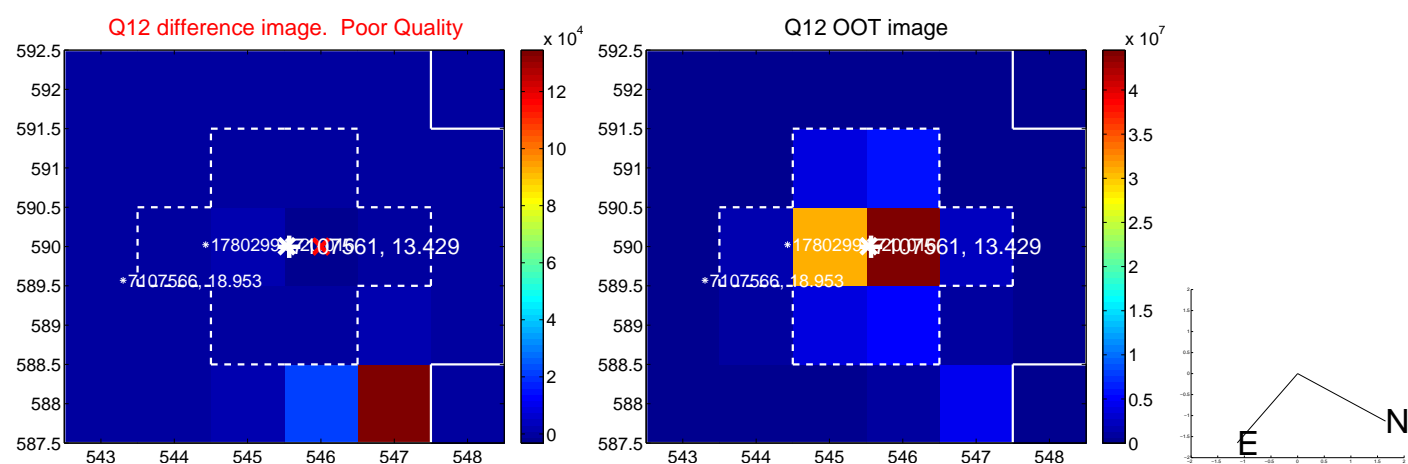
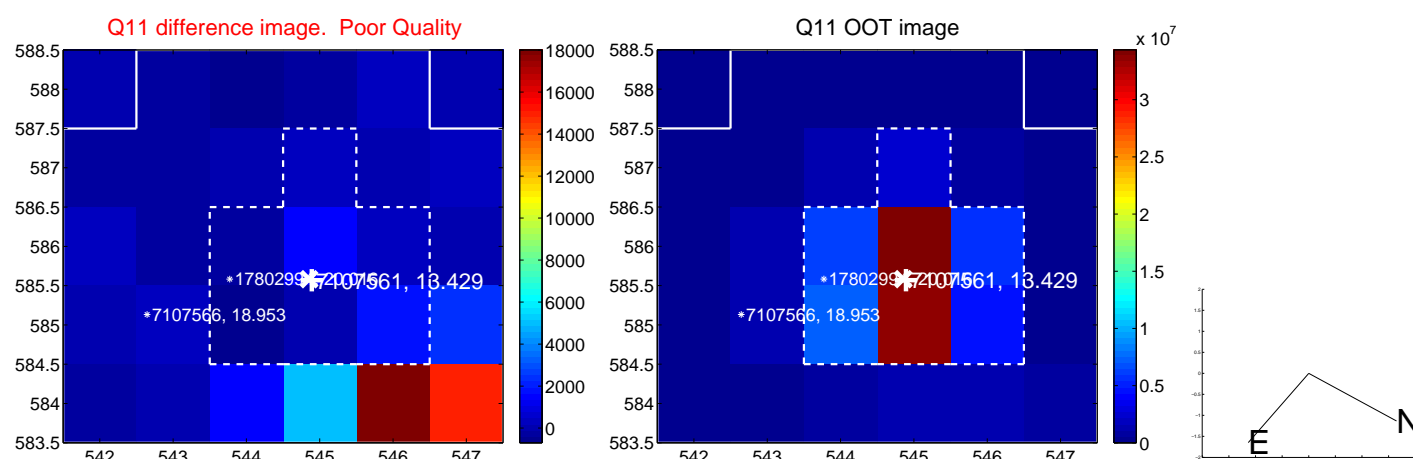
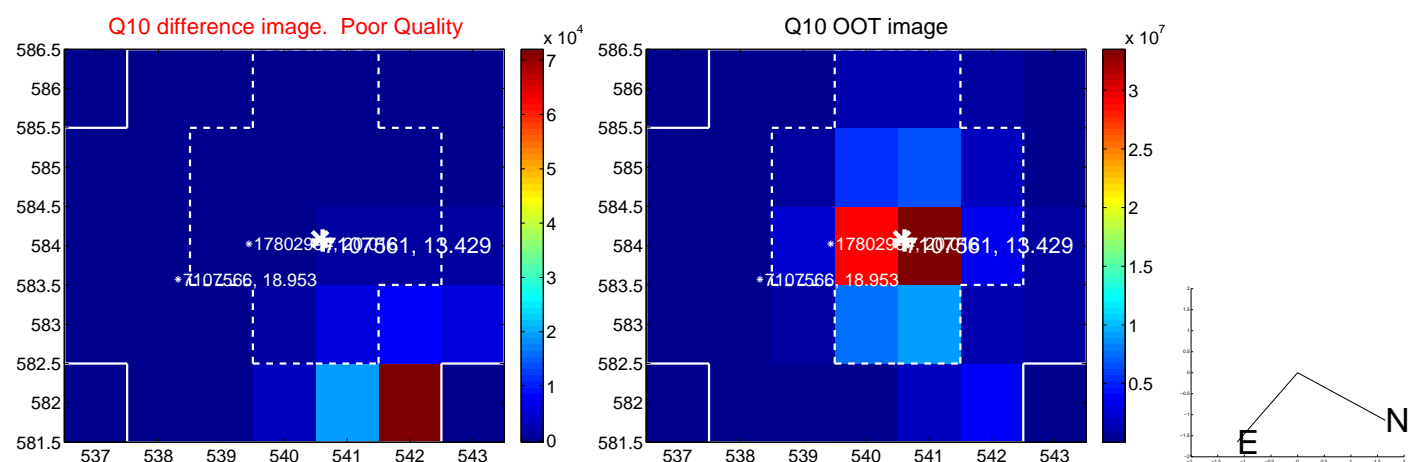
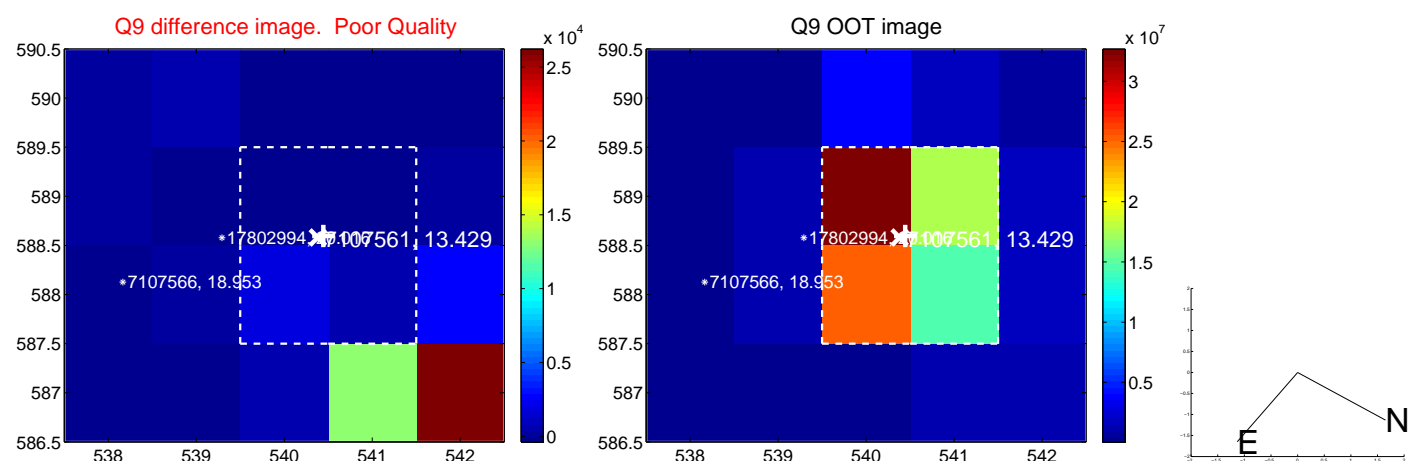


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

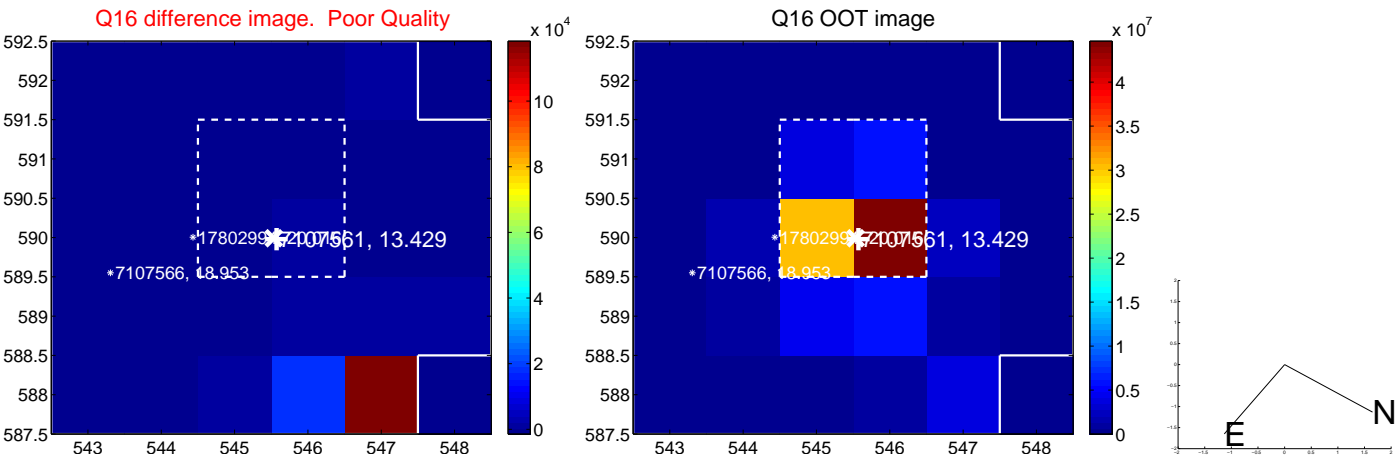
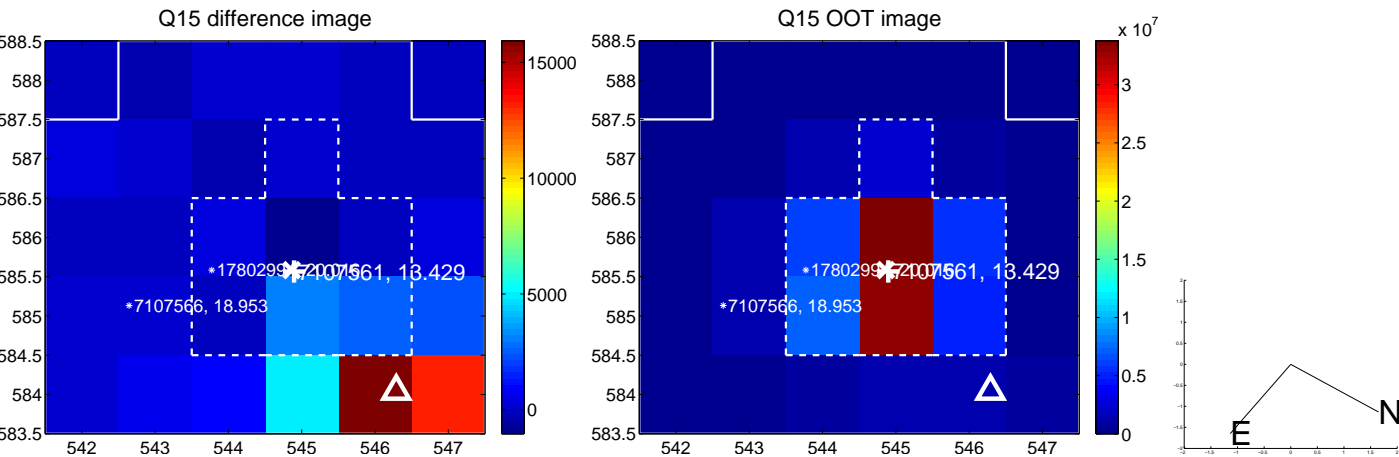
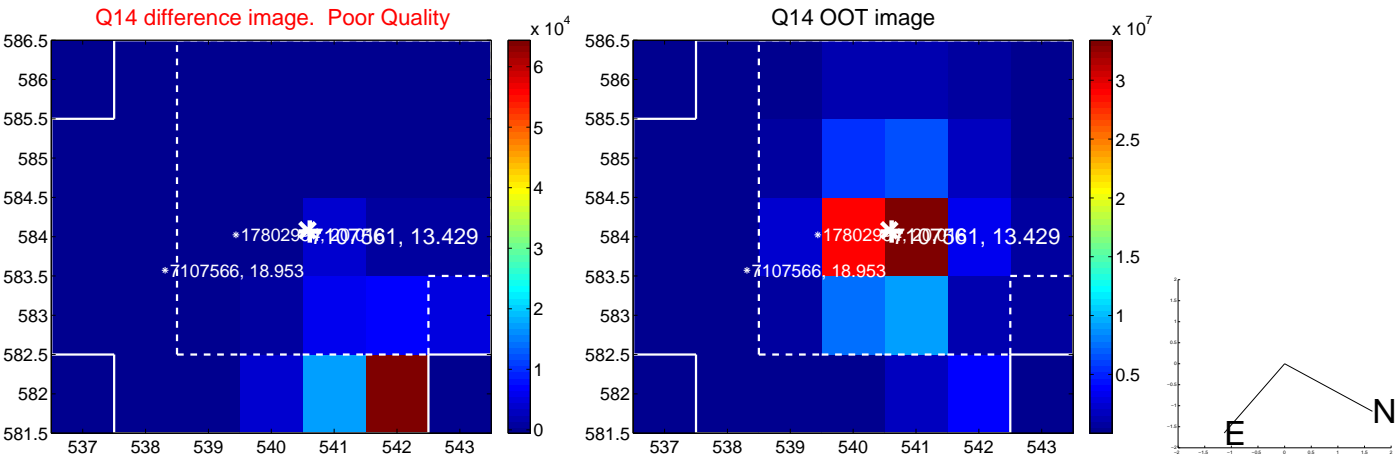
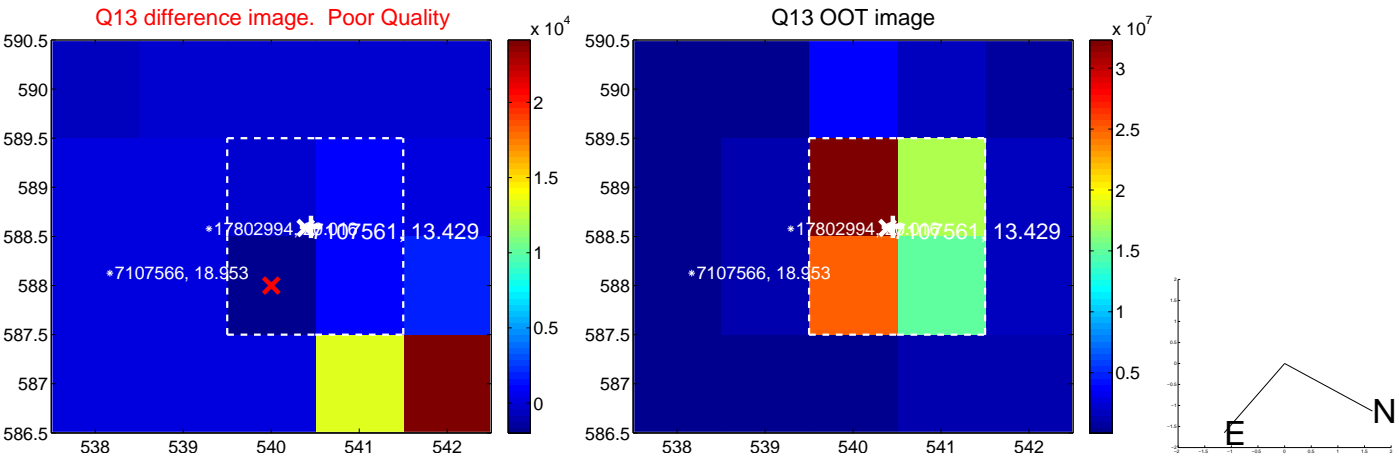




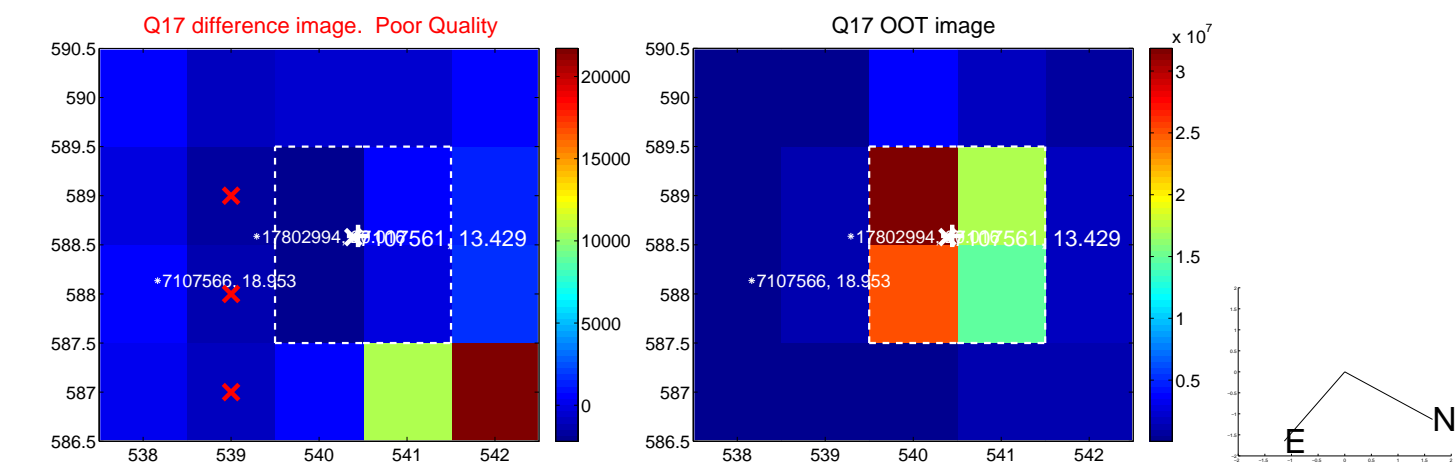
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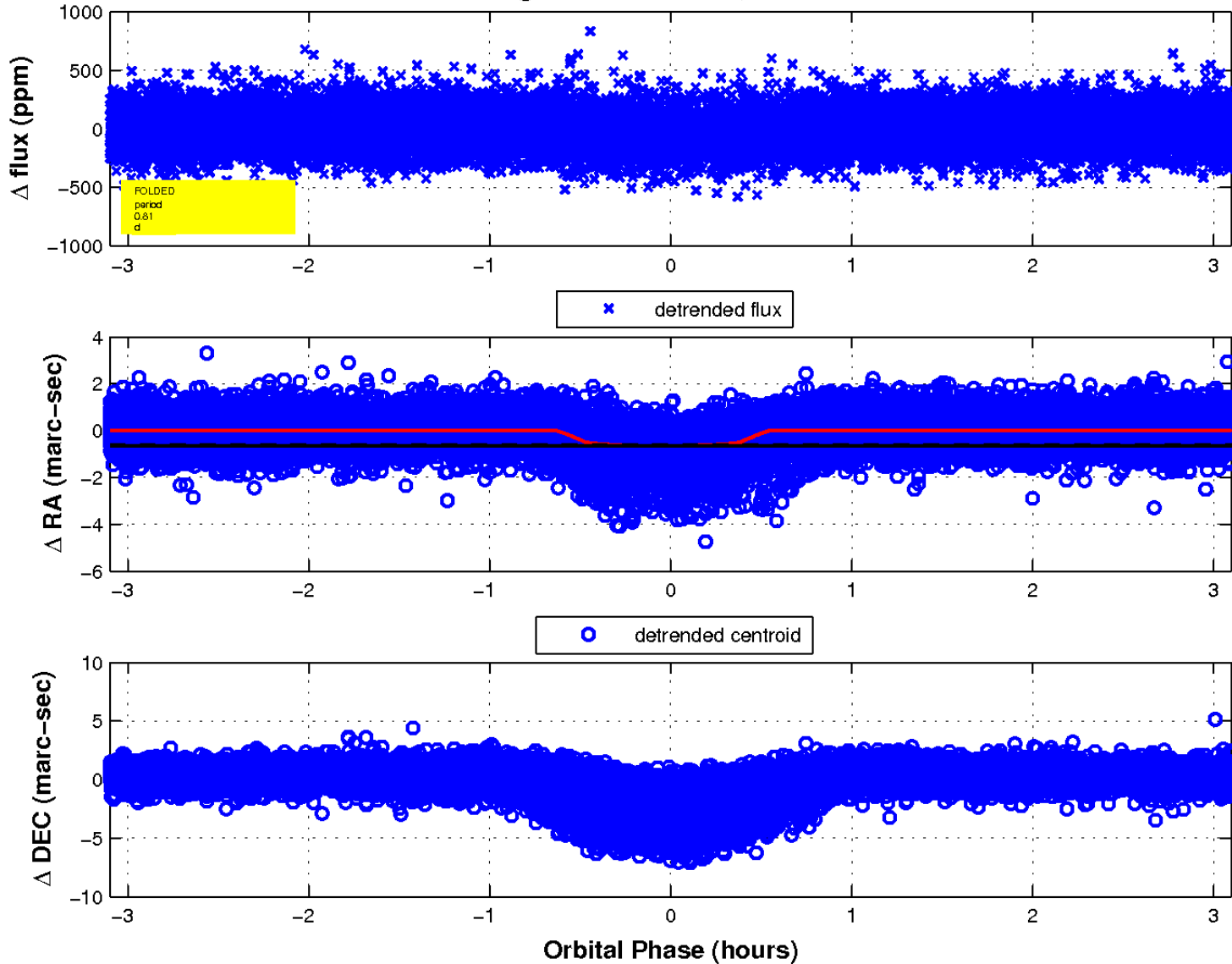
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

