

# KIC 010220950

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010220950-01	OBS	4544.01	158.350724	260.260542	812.4	9.726	15.7	17.3	1.28	6521	5.65	6.63

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010220950-01	OBS	FP	0.00	0	0	1	0	CENT_UNRESOLVED_OFFSET

**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.

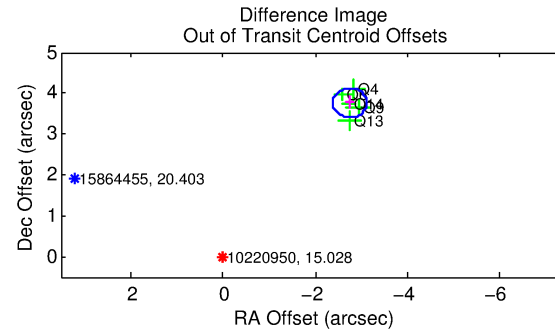
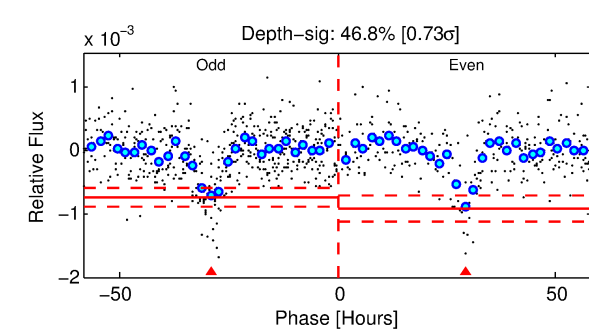
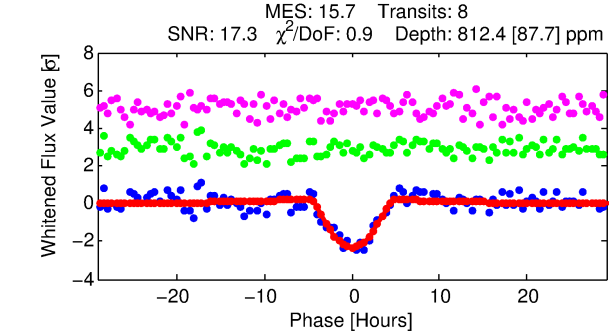
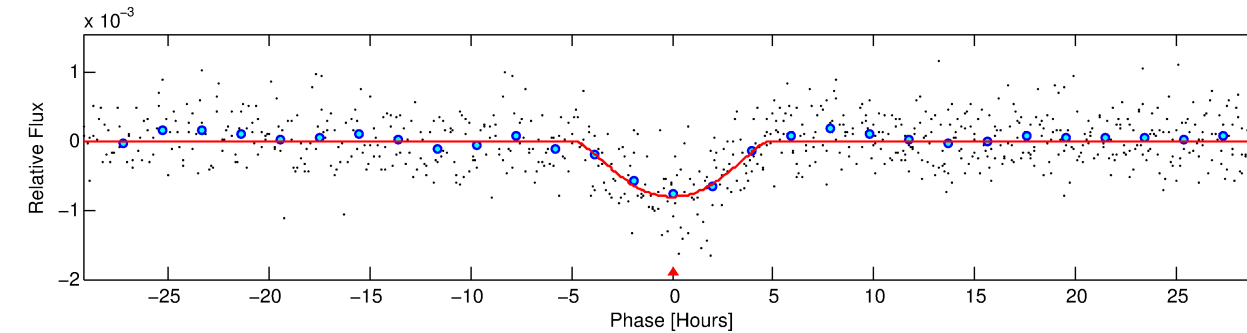
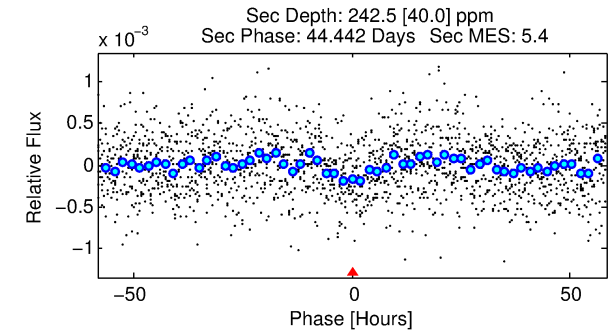
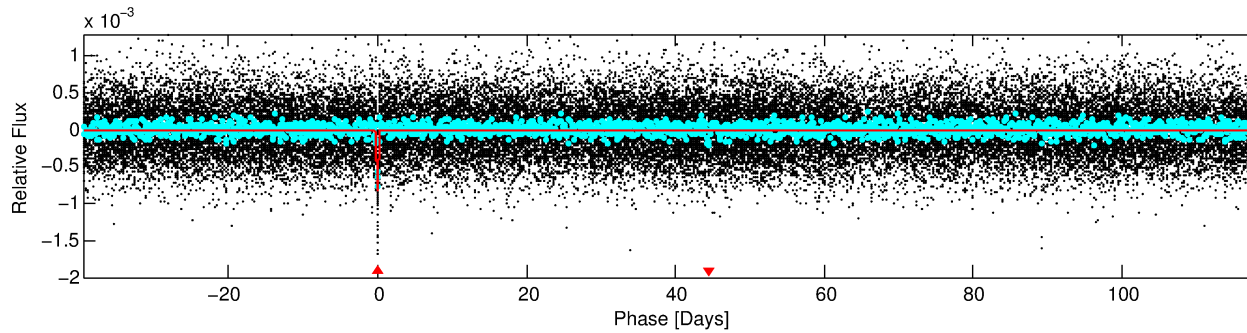
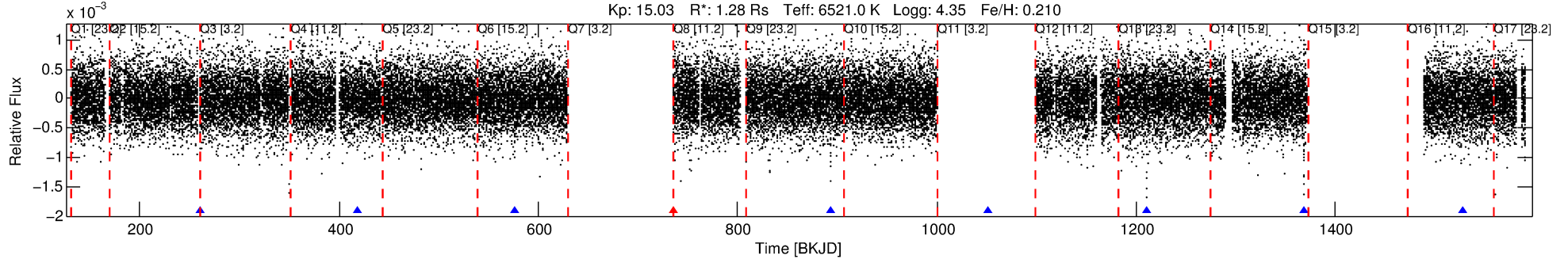
## Ephemeris Match Information For 010220950-01

No Significant Match Found

# DV One-Page Summary

KIC: 10220950 Candidate: 1 of 1 Period: 158.351 d  
KOI: K04544.01 Corr: 0.843

Kp: 15.03 R\*: 1.28 Rs Teff: 6521.0 K Logg: 4.35 Fe/H: 0.210



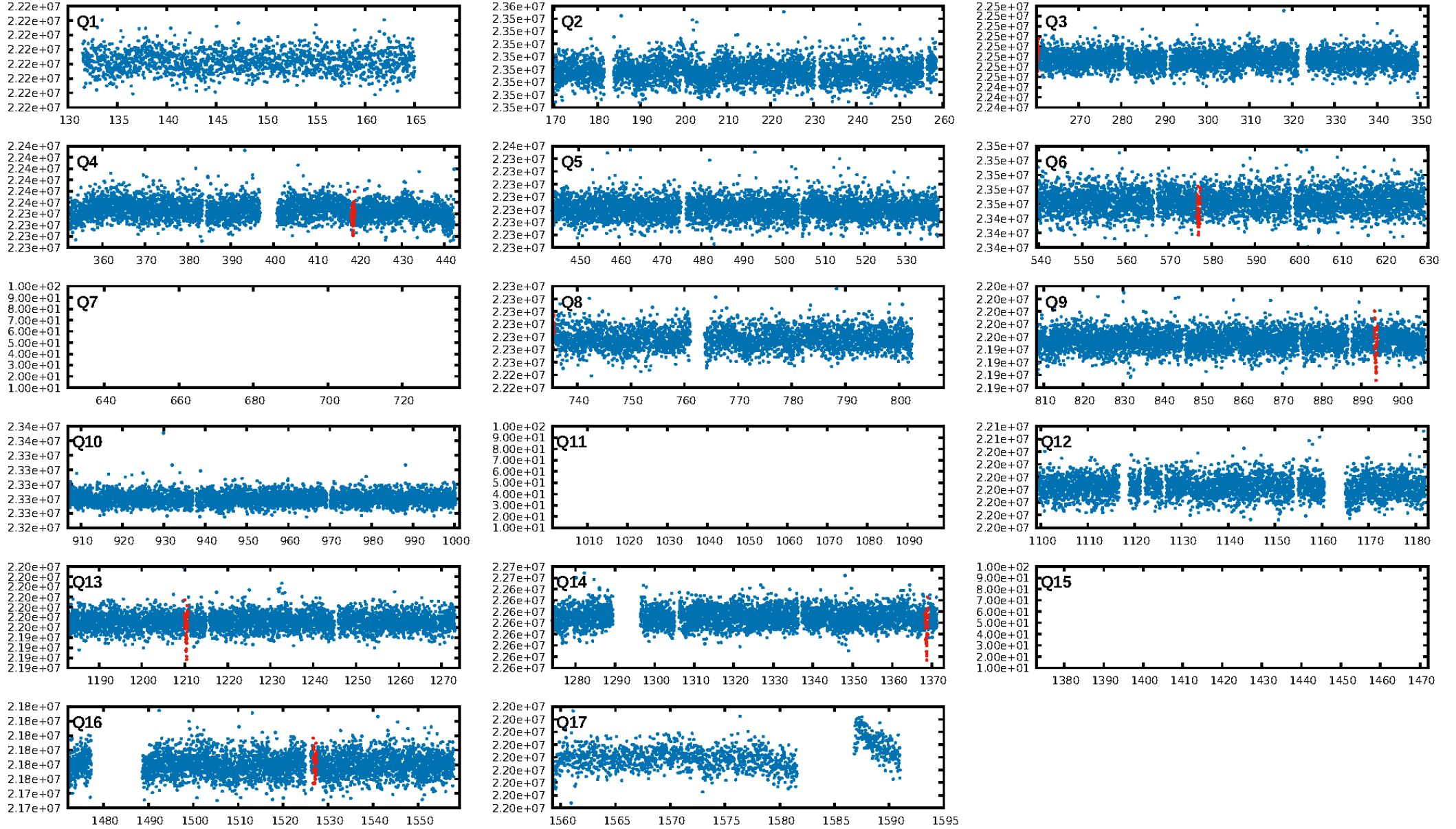
## DV Fit Results:

Period = 158.35072 [0.00240] d  
Epoch = 260.2605 [0.0124] BKJD  
Rp/R\* = 0.0406 [0.0372]  
a/R\* = 41.86 [14.00]  
b = 0.98 [0.07]  
Seff = 6.63 [2.33]  
Teq = 409 [36] K  
Rp = 5.65 [5.41] Re  
a = 0.6310 [0.1426] AU  
Ag = 1663.20 [3107.16] [0.53σ]  
Teffp = 4039 [1864] K [1.95σ]

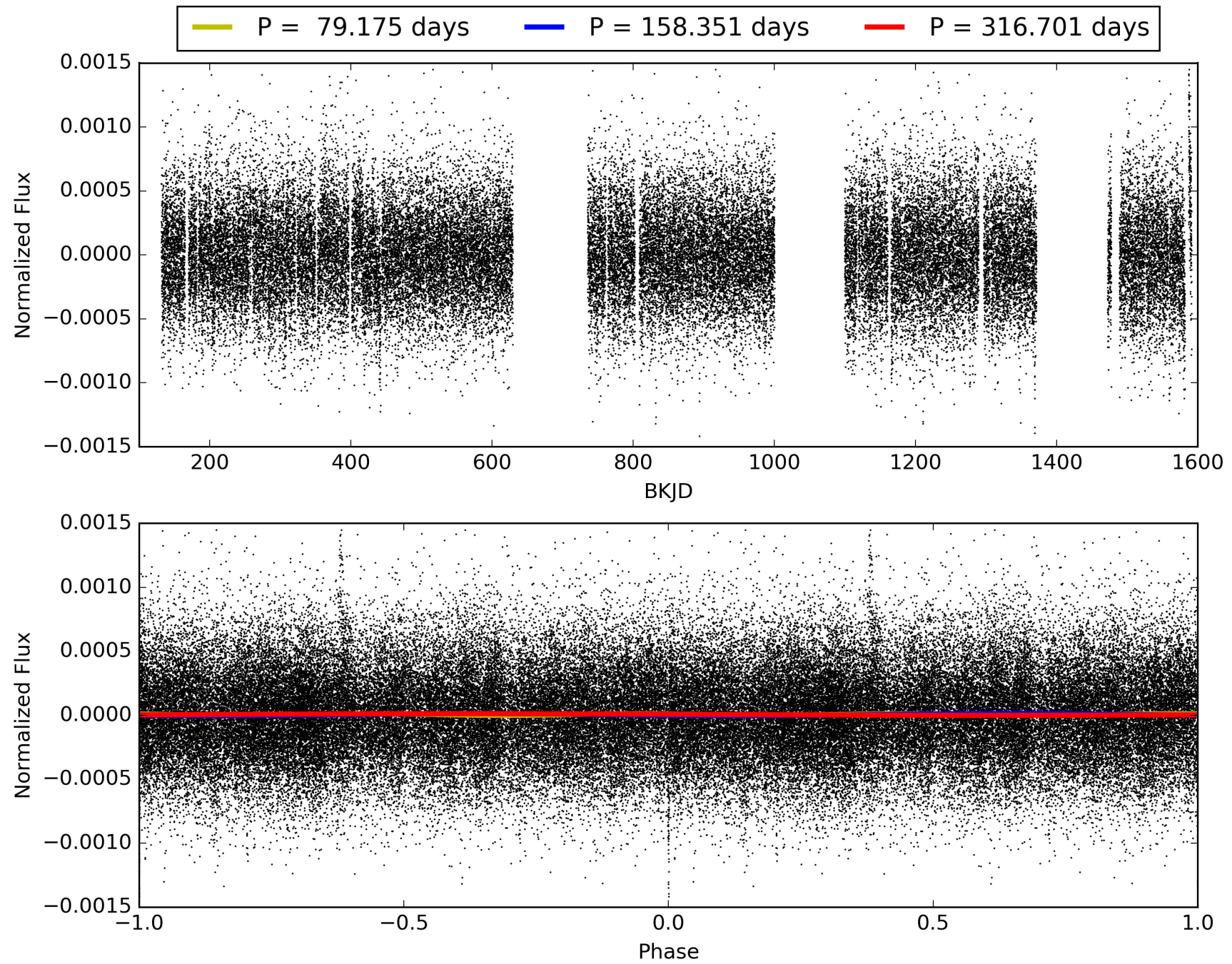
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 9.83e-60  
RollingBand-ftg: 0.88 [7/8]  
GhostDiagnostic-chr: 0.6268  
Centroid-sig: 0.0%  
Centroid-so: 7.816 arcsec [9.09σ]  
OotOffset-rm: 4.663 arcsec [39.05σ]  
KicOffset-rm: 4.828 arcsec [43.32σ]  
OotOffset-st: 2/0/1/2 [5]  
KicOffset-st: 2/0/1/2 [5]  
DiffImageQuality-fgm: 1.00 [5/5]  
DiffImageOverlap-fno: 1.00 [5/5]

# TCE 010220950-01, PDC Light Curves

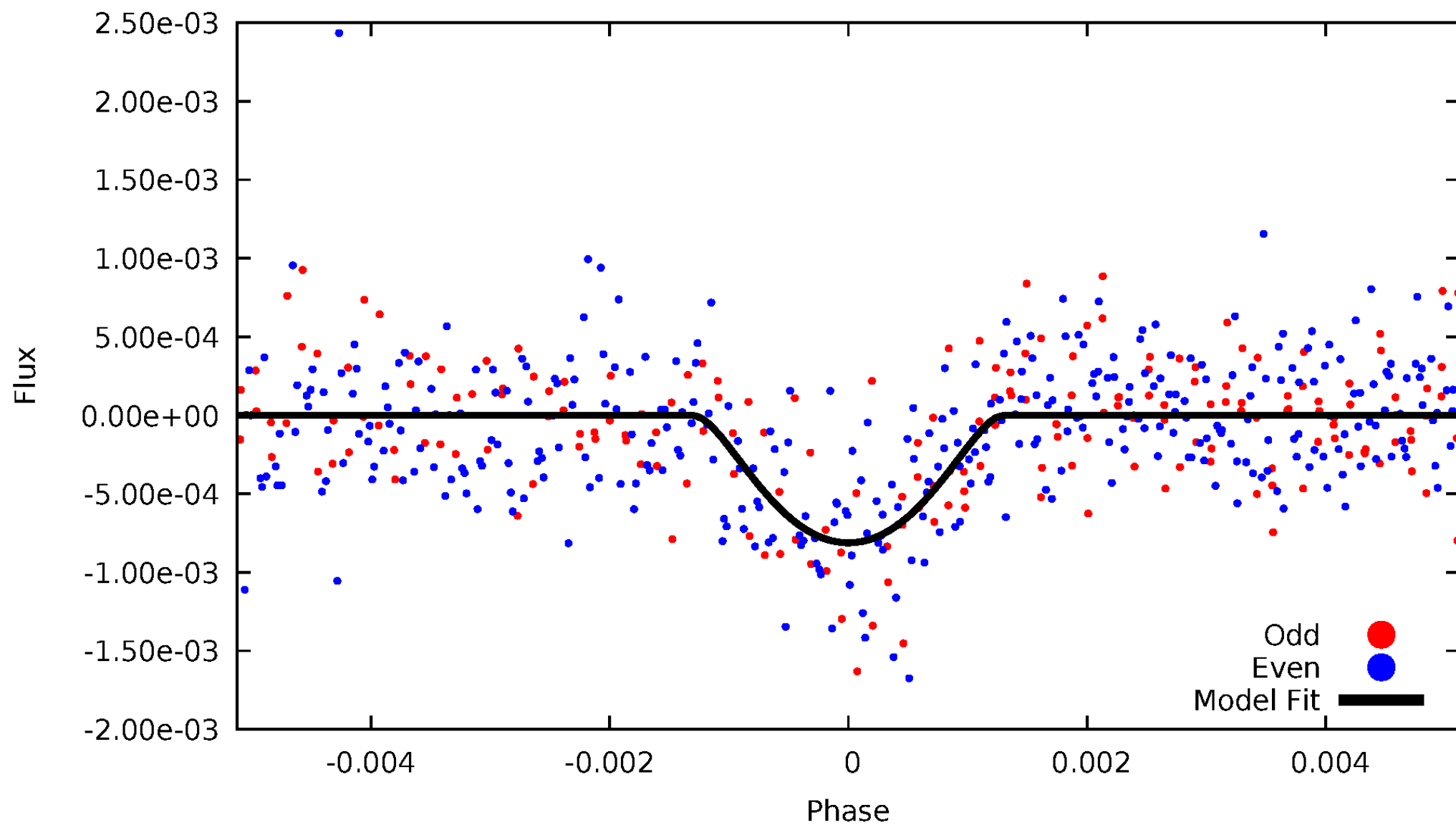


TCE 010220950-01



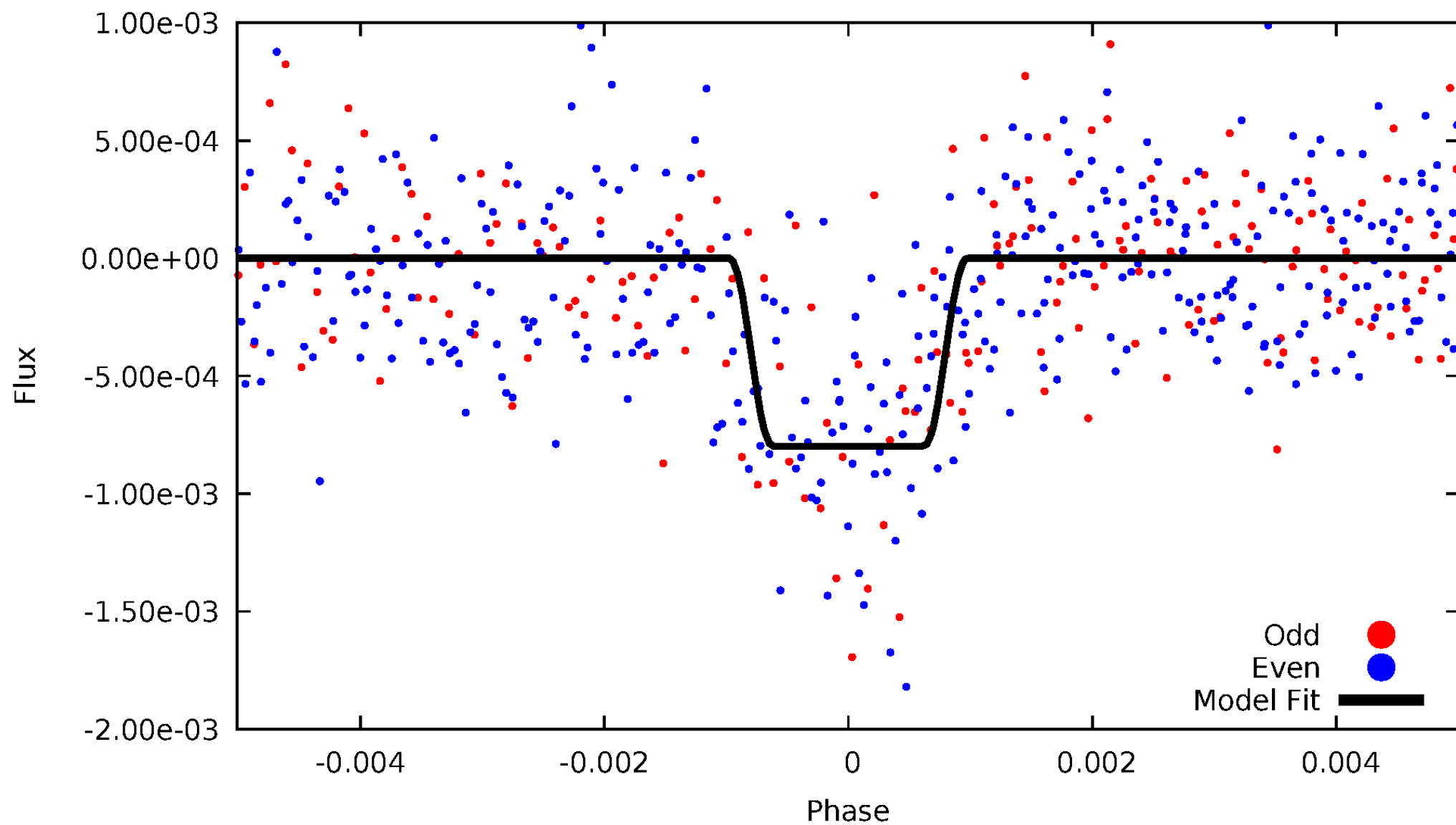
# DV Odd/Even

TCE 010220950-01



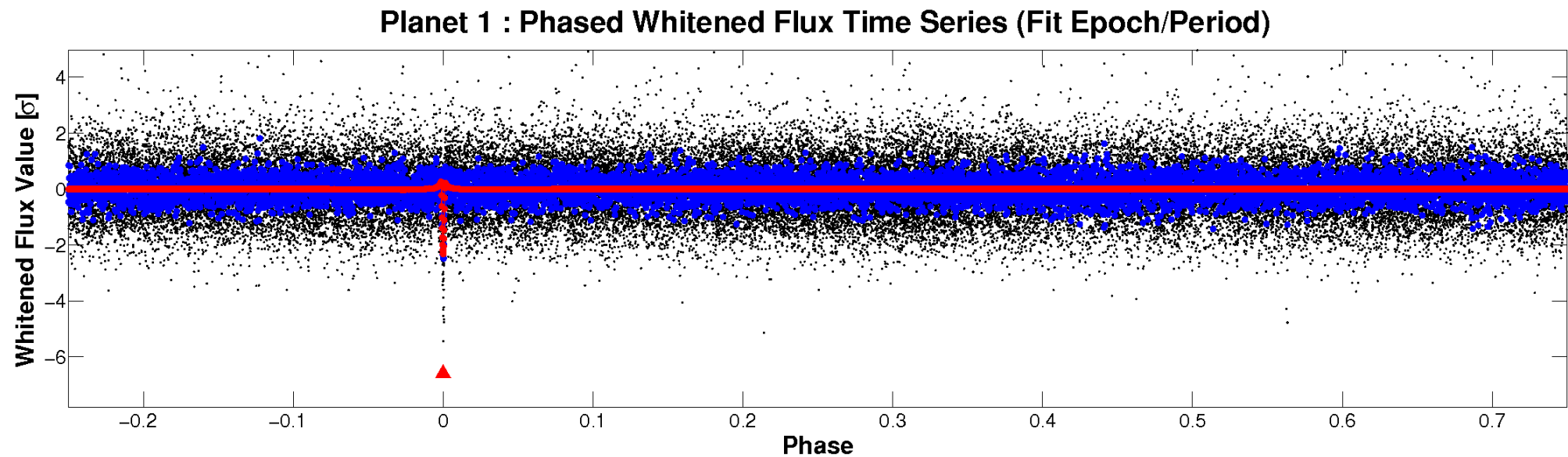
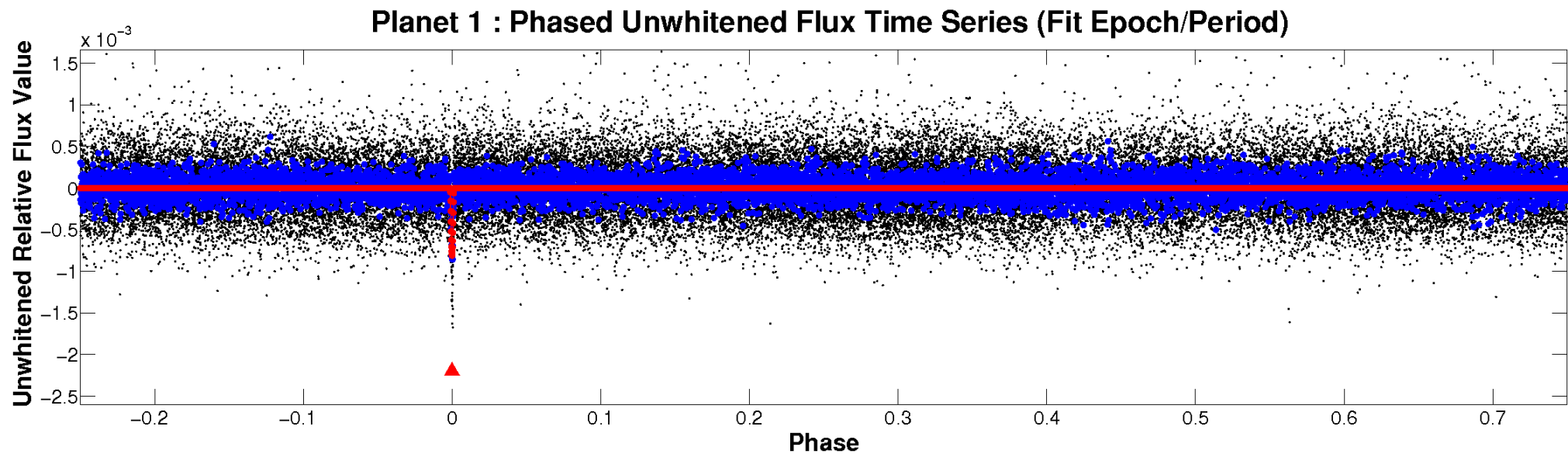
# ALT Odd/Even

TCE 010220950-01



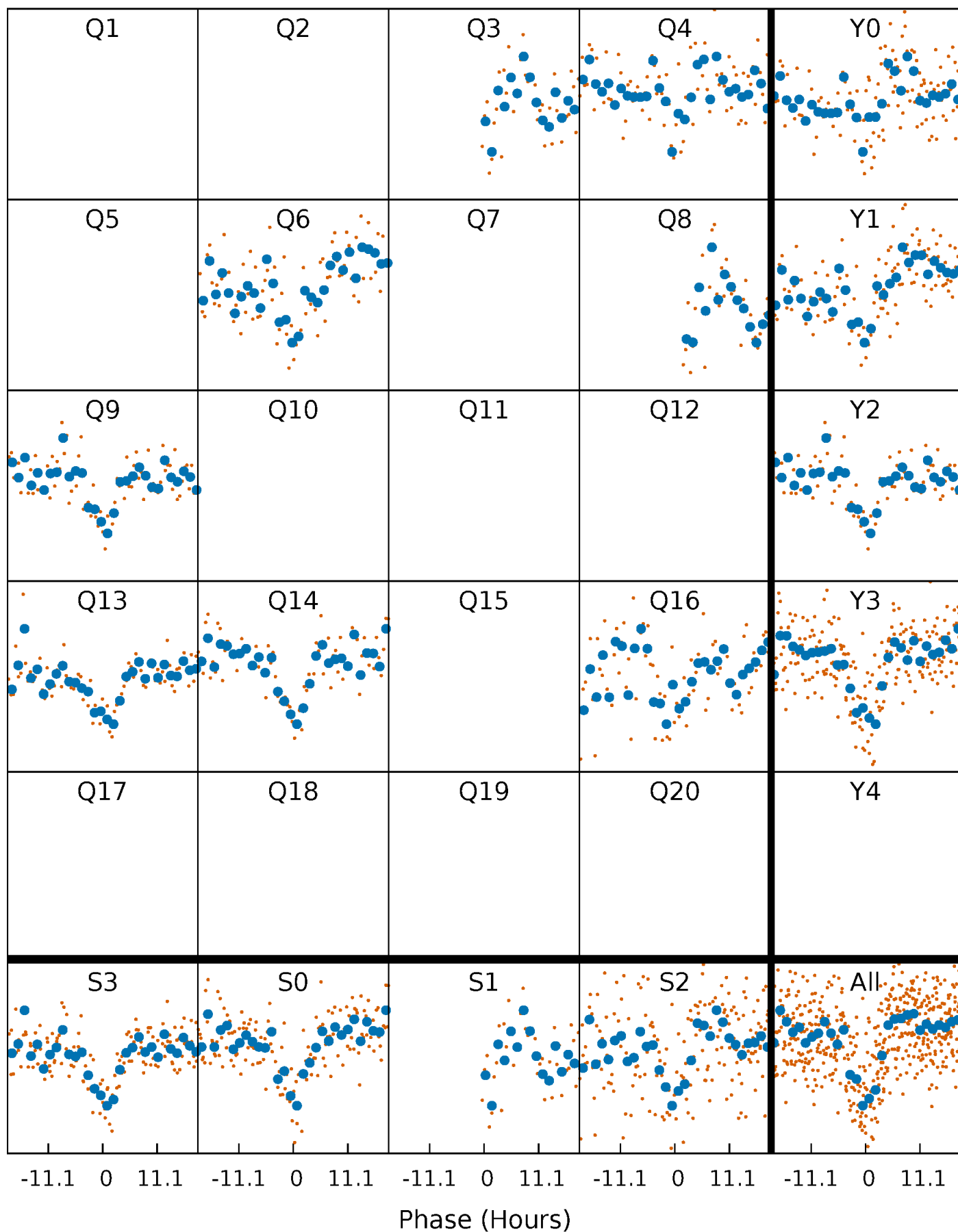


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

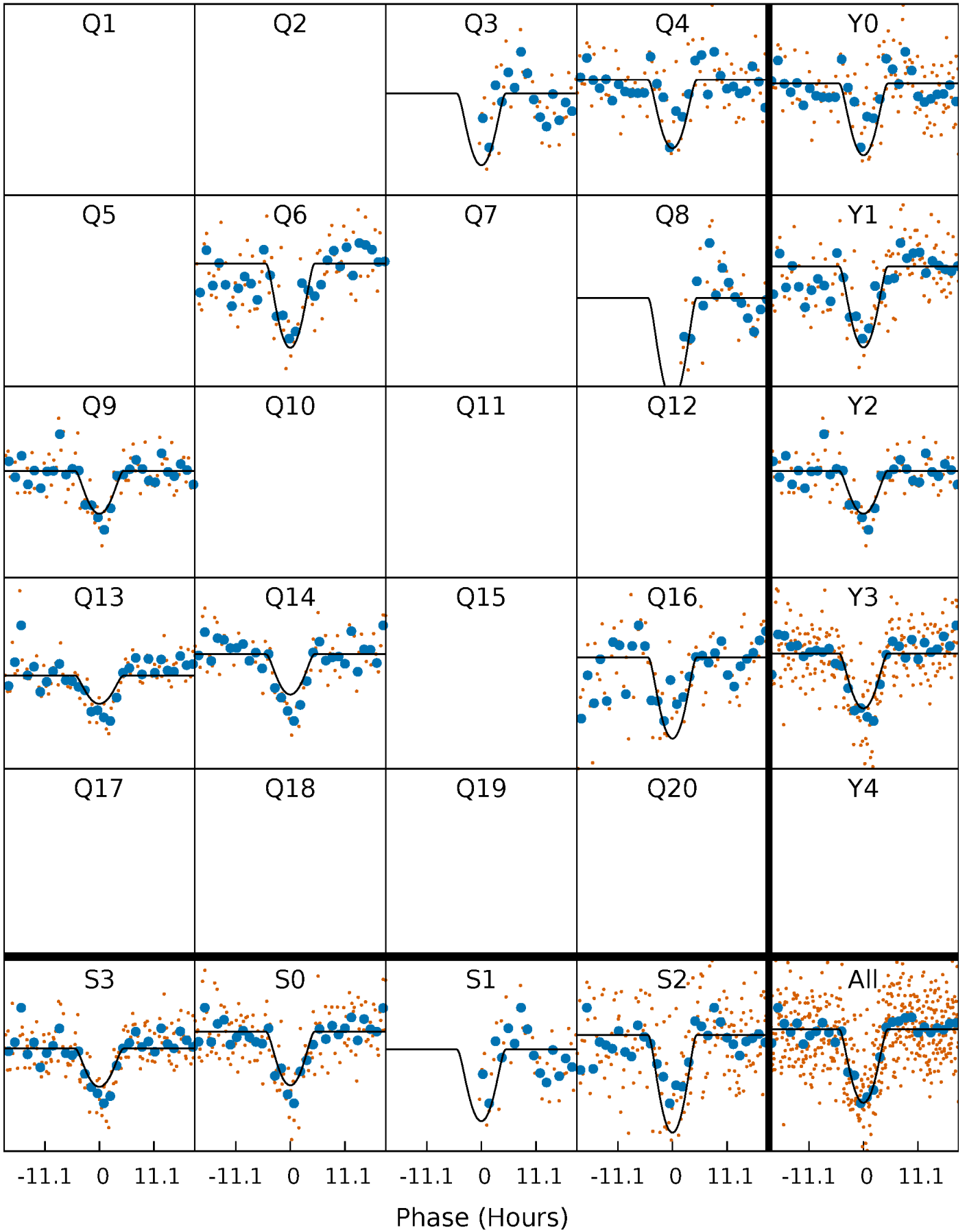
TCE 010220950-01 P=158.350724 Days  $T_0=260.260542$  (BKJD)





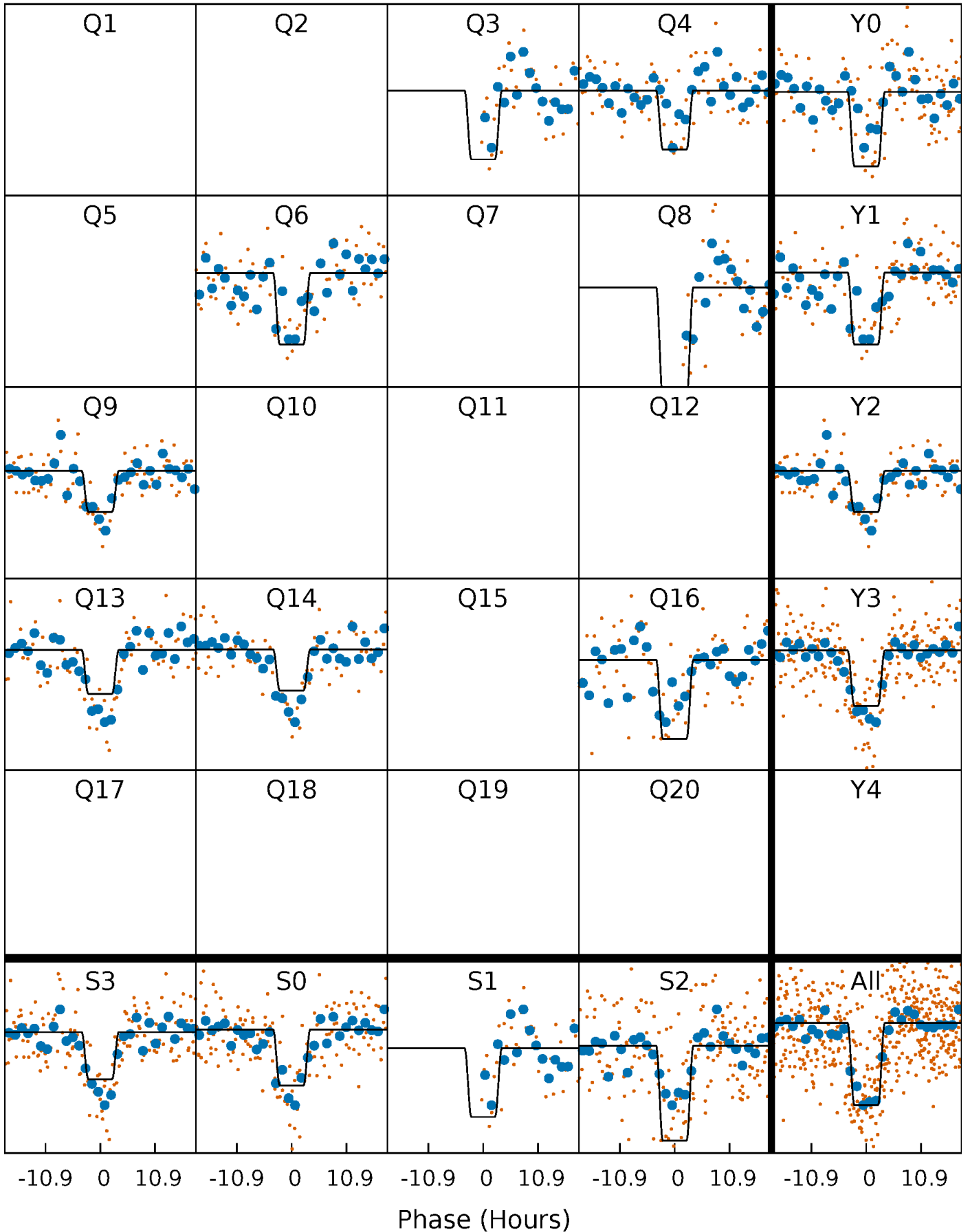
# DV Quarter-Phased Transit Curves

TCE 010220950-01     $P=158.350724$  Days     $T_0=260.260542$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

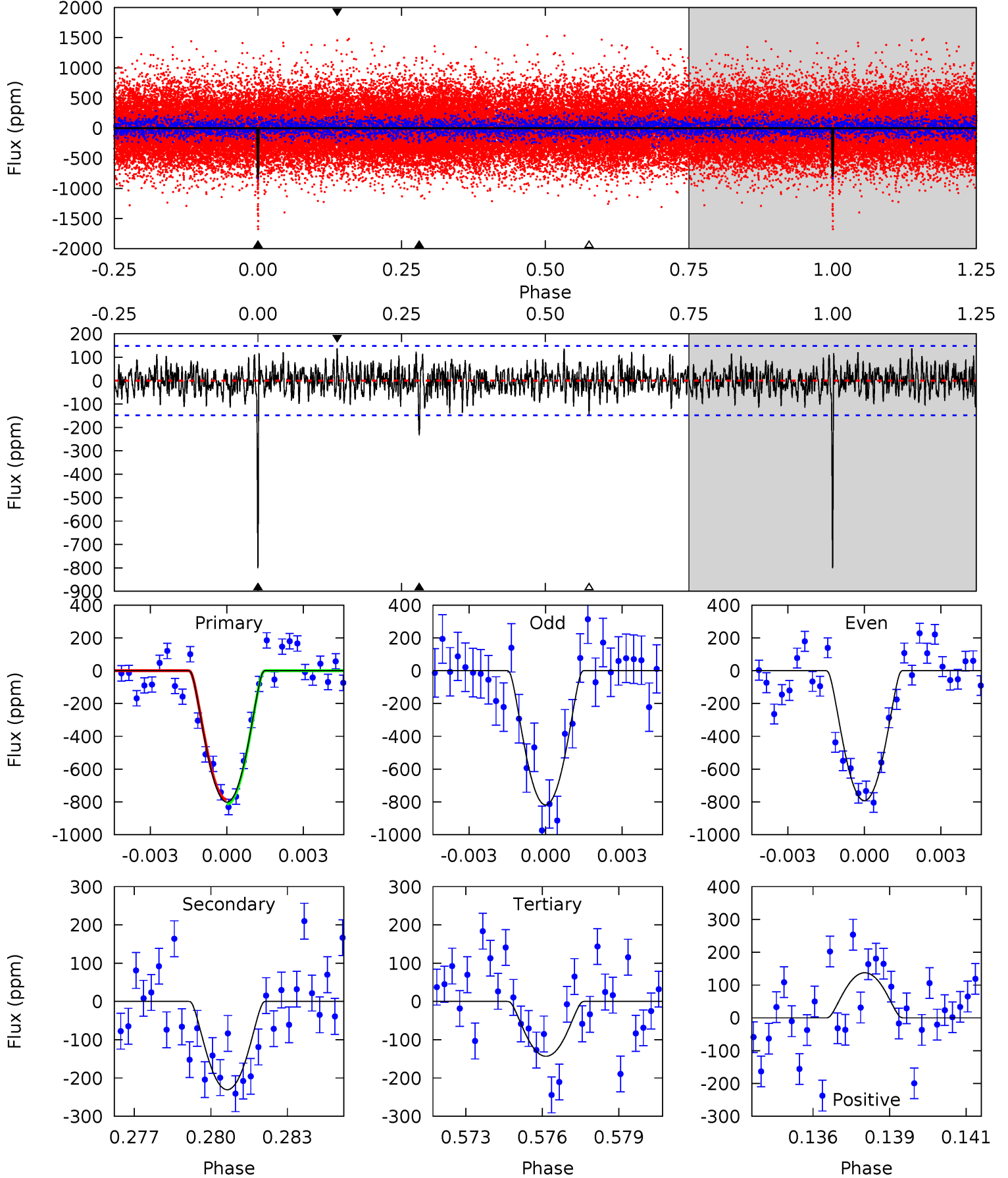
TCE 010220950-01 P=158.352282 Days  $T_0=260.256526$  (BKJD)



# DV Model-Shift Uniqueness Test

010220950-01, P = 158.350724 Days, E = 101.909818 Days

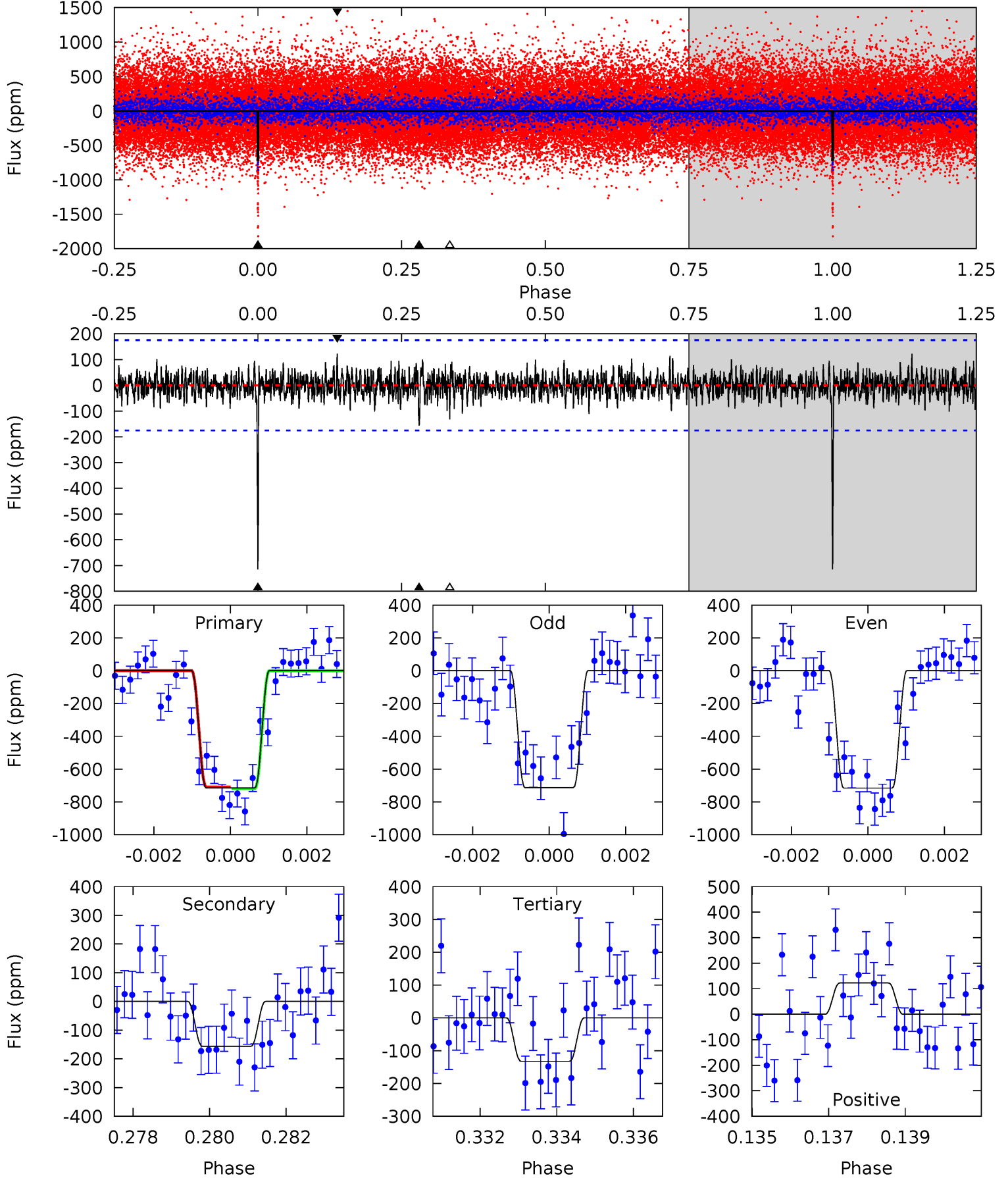
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.5	8.21	5.10	4.89	5.27	3.00	1.50	23.4	23.6	3.11	3.31	0.44	1.25	0.15	0.49



# Alt Model-Shift Uniqueness Test

010220950-01, P = 158.352282 Days, E = 101.904244 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
21.8	4.76	4.03	3.73	5.33	3.10	1.04	17.7	18.0	0.72	1.02	0.04	1.38	0.15	0.15



### Stellar Parameters For KIC 010220950

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6521^{+155}_{-232}$	$4.352^{+0.057}_{-0.172}$	$0.210^{+0.200}_{-0.350}$	$1.276^{+0.351}_{-0.151}$	$1.334^{+0.138}_{-0.207}$	$0.905^{+0.283}_{-0.449}$
	+2%/-4%	+1%/-4%	+95%/-167%	+28%/-12%	+10%/-16%	+31%/-50%
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 010220950-01 / KOI 4544.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-231 \pm 28$	$6.89^{+4.85}_{-4.14}$	$581^{+36}_{-30}$	$4009^{+1694}_{-682}$	$1082^{+5390}_{-750}$
Alt.	$-156 \pm 33$	$5.49^{+5.06}_{-3.44}$	$580^{+37}_{-29}$	$3983^{+2072}_{-742}$	$1090^{+7250}_{-805}$

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

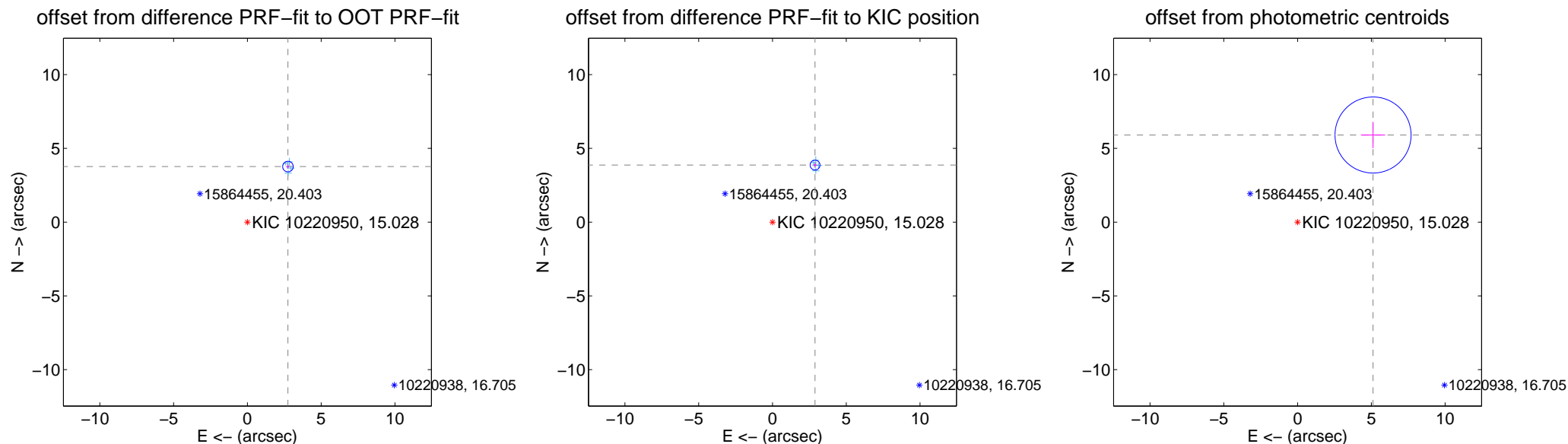
## DV Centroid Data

Supplemental centroid analysis for 010220950-01. Kepler magnitude: 15.03. Transit SNR 17.33

There are 5 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

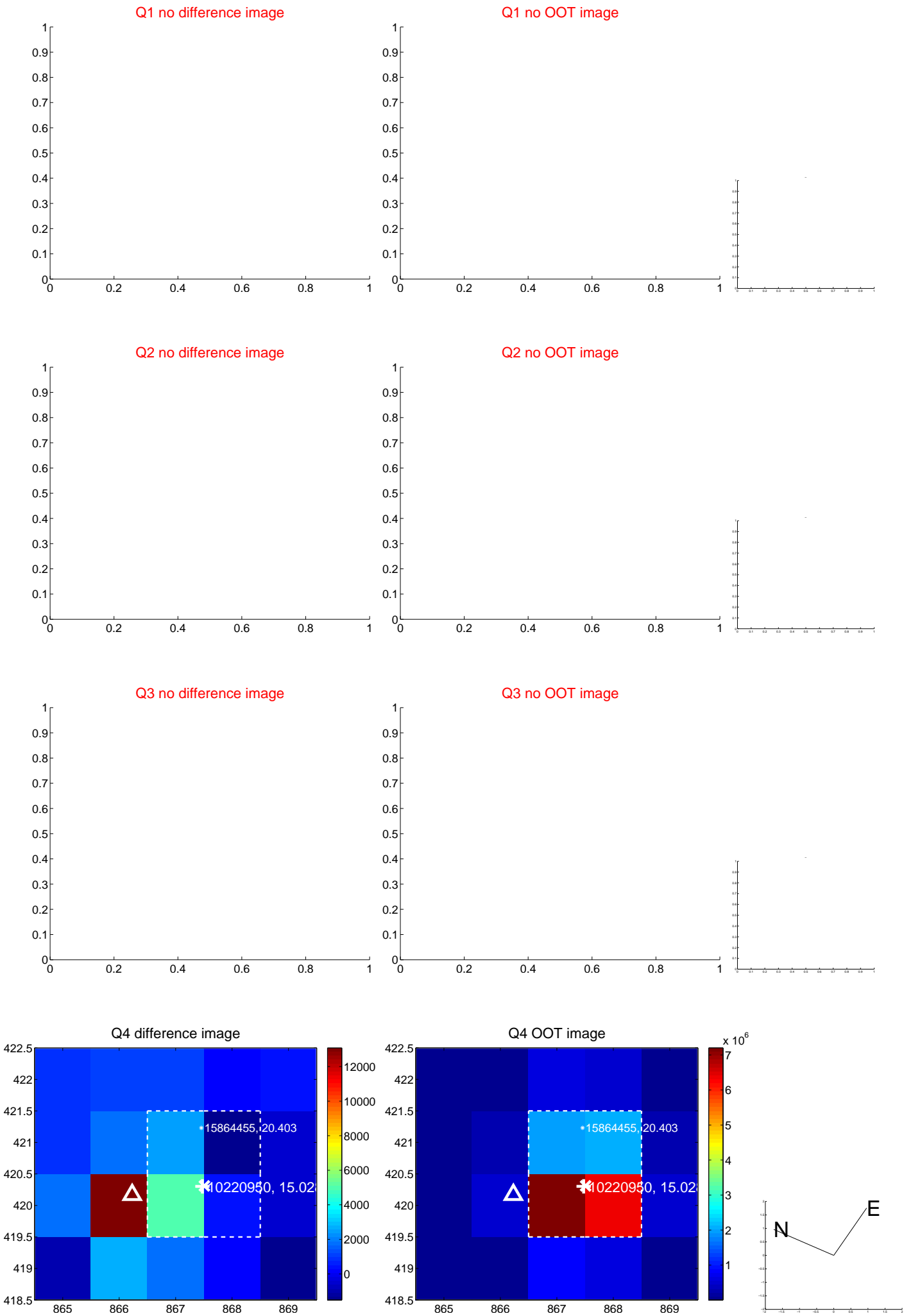
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	4.663 $\pm$ 0.119	39.05	-2.749 $\pm$ 0.087	3.767 $\pm$ 0.133
PRF-fit source offset from KIC position	4.828 $\pm$ 0.111	43.32	-2.886 $\pm$ 0.097	3.870 $\pm$ 0.119
photometric centroid source offset	7.82 $\pm$ 0.86	9.09	-5.12 $\pm$ 0.82	5.91 $\pm$ 0.89



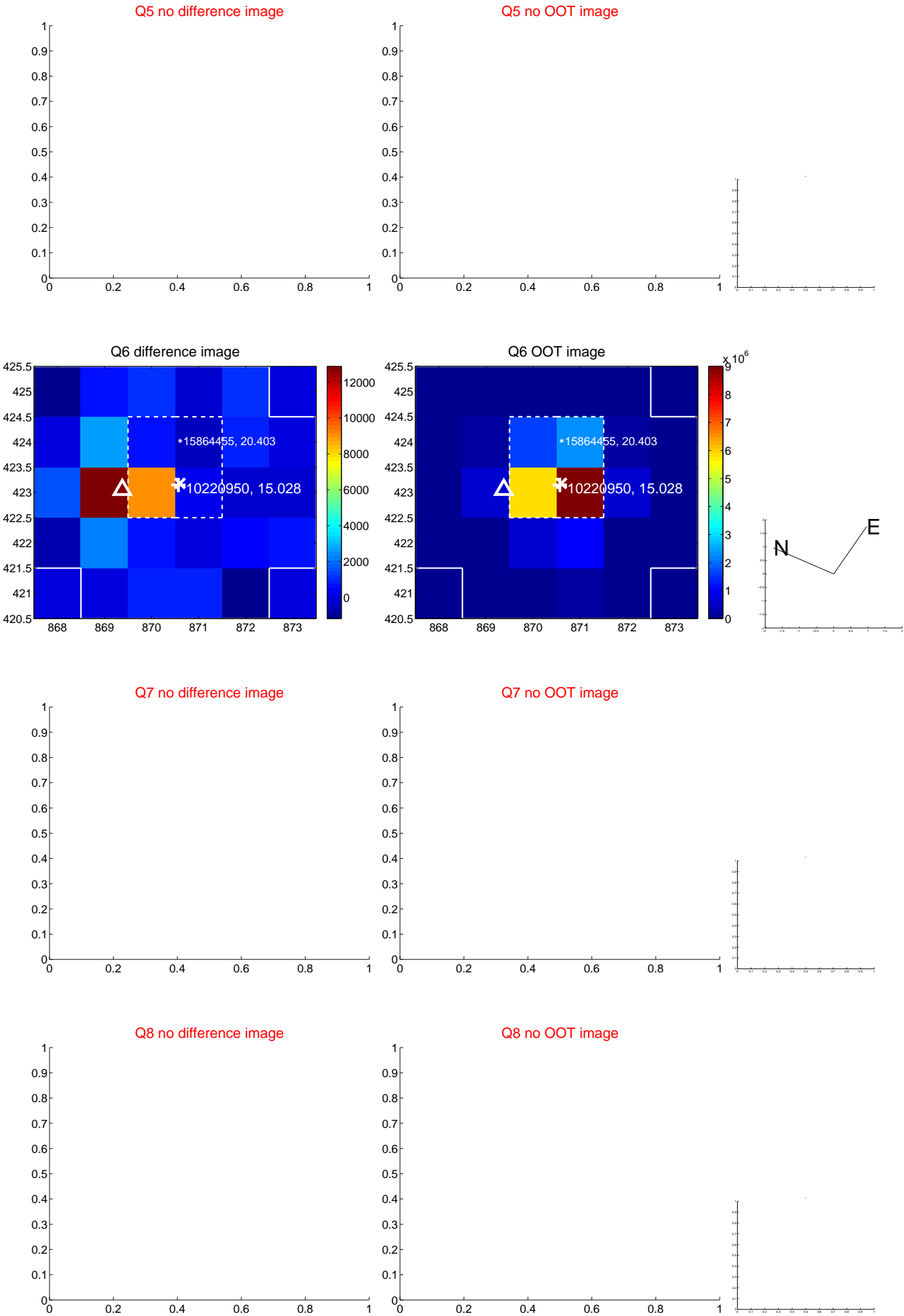
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



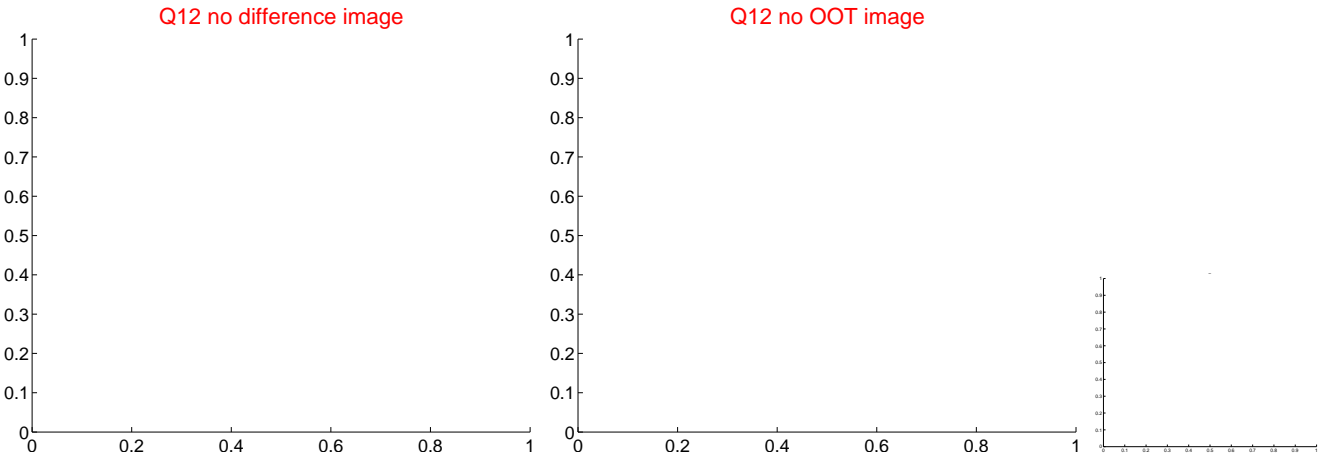
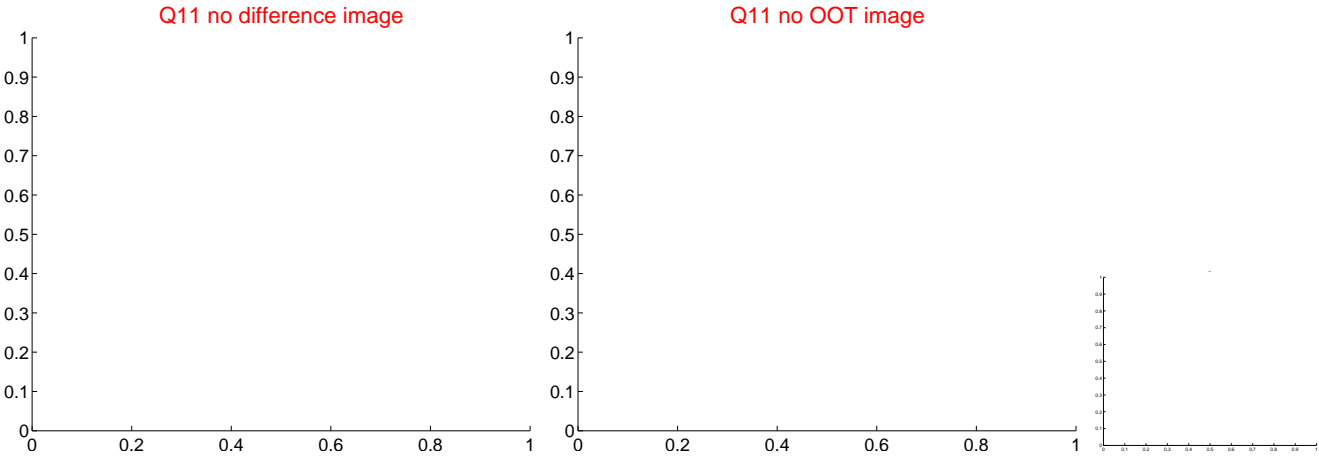
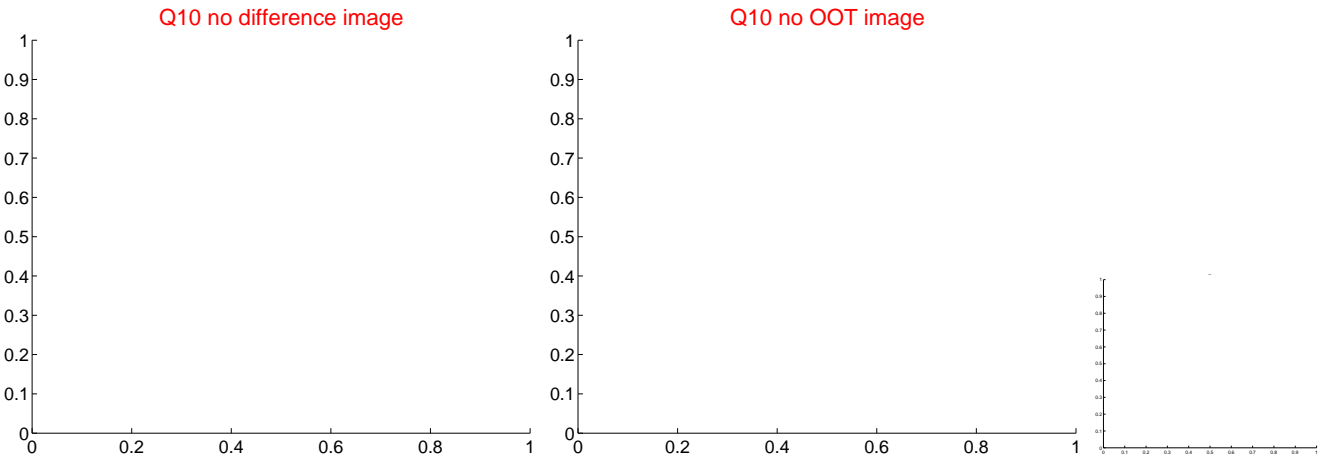
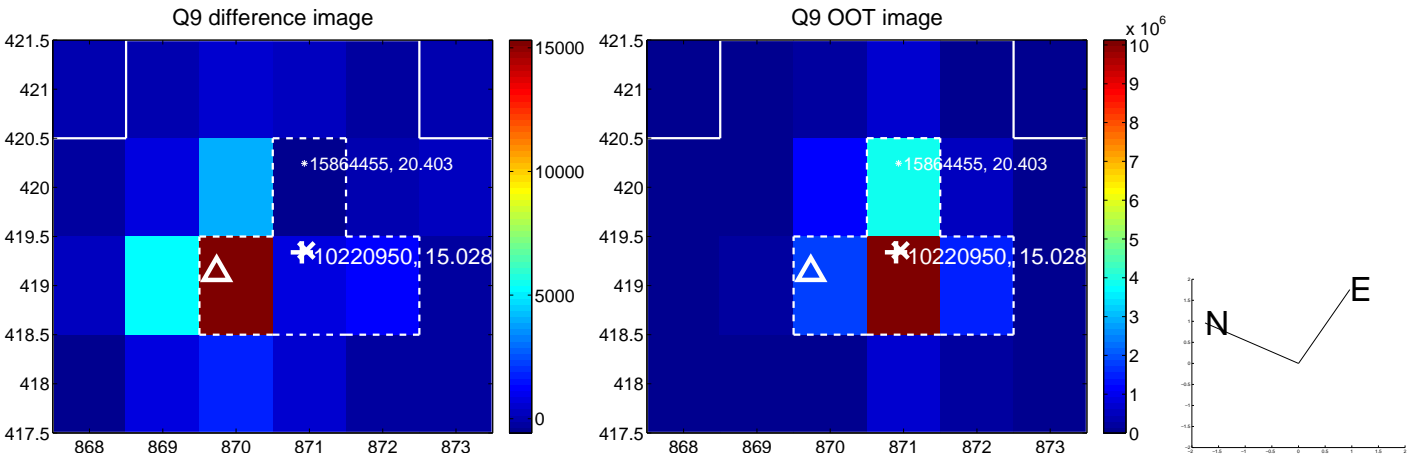
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



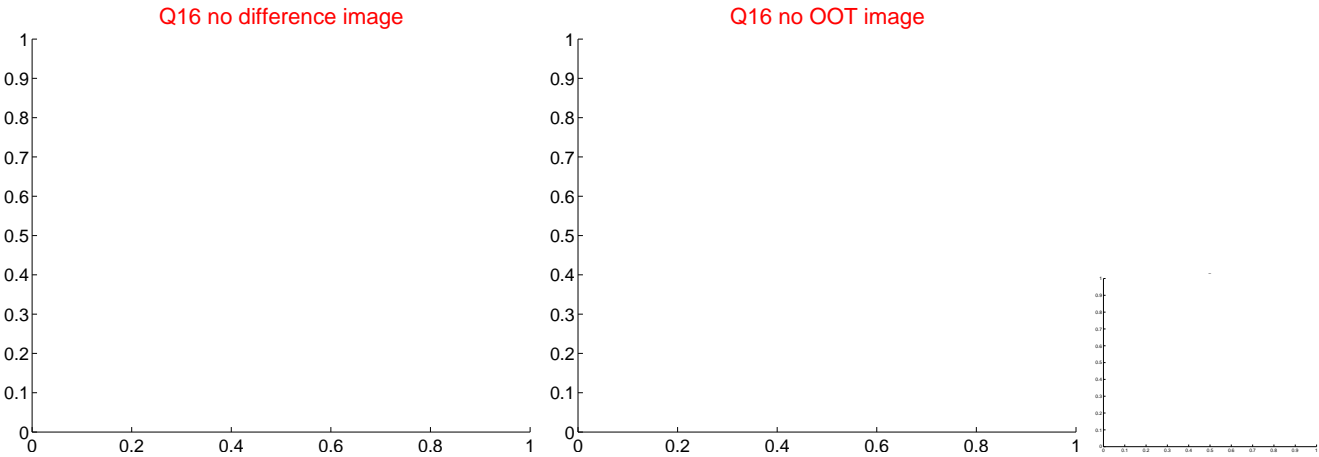
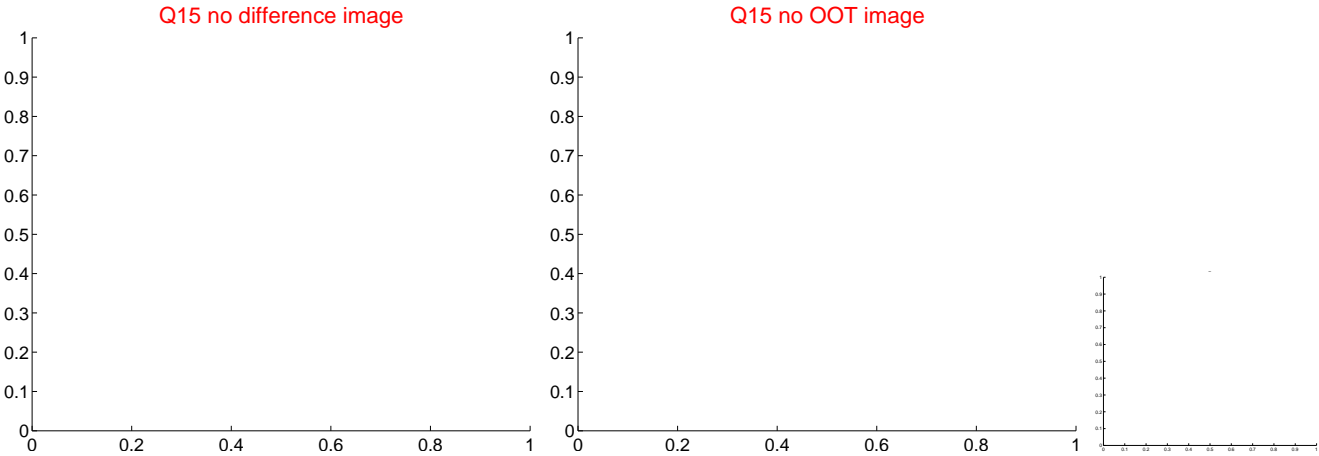
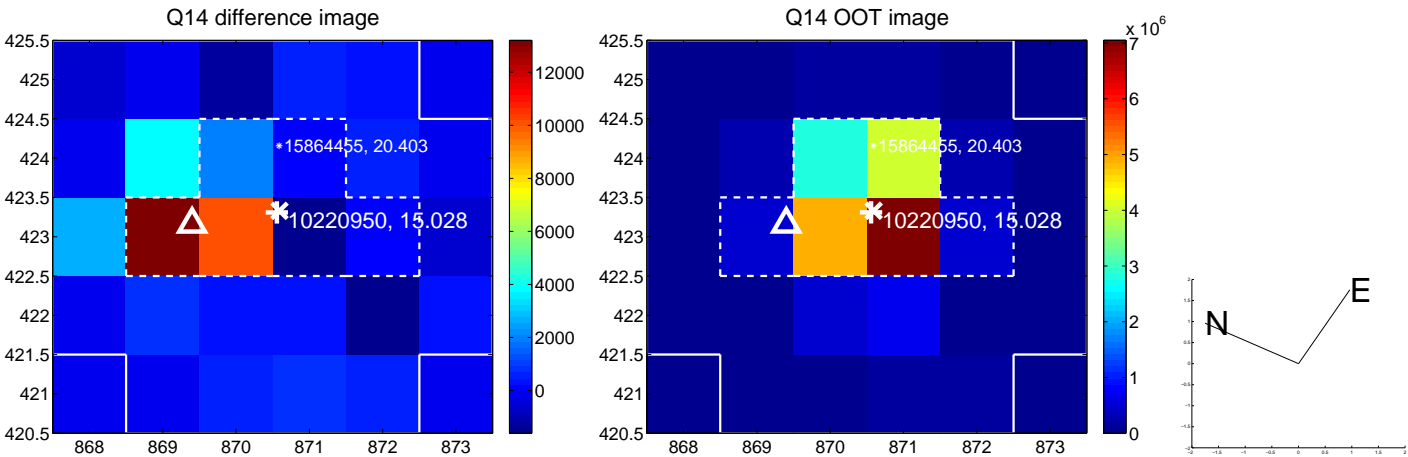
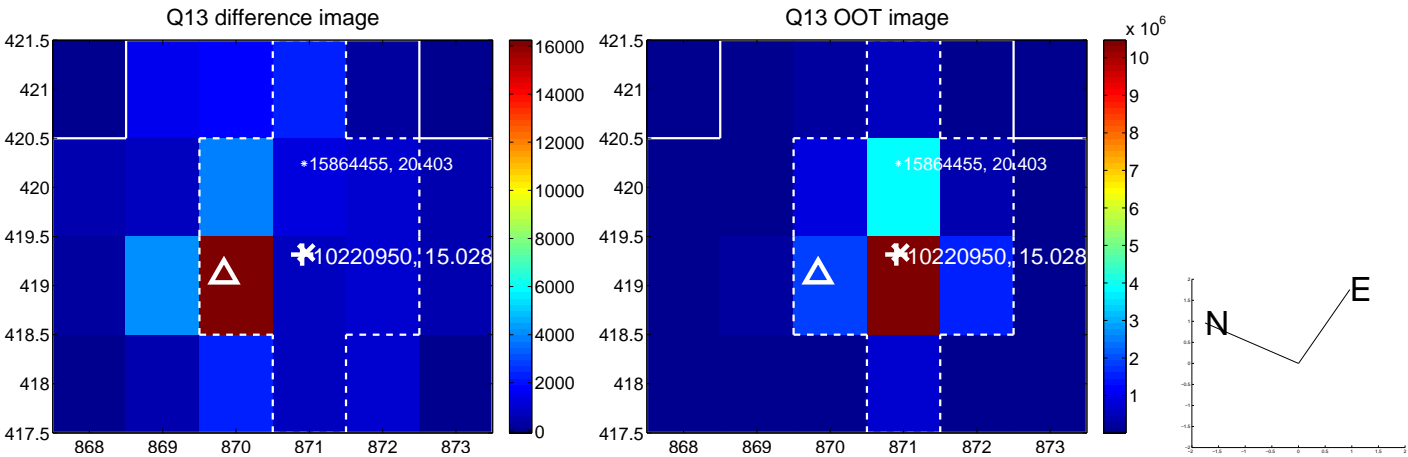
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



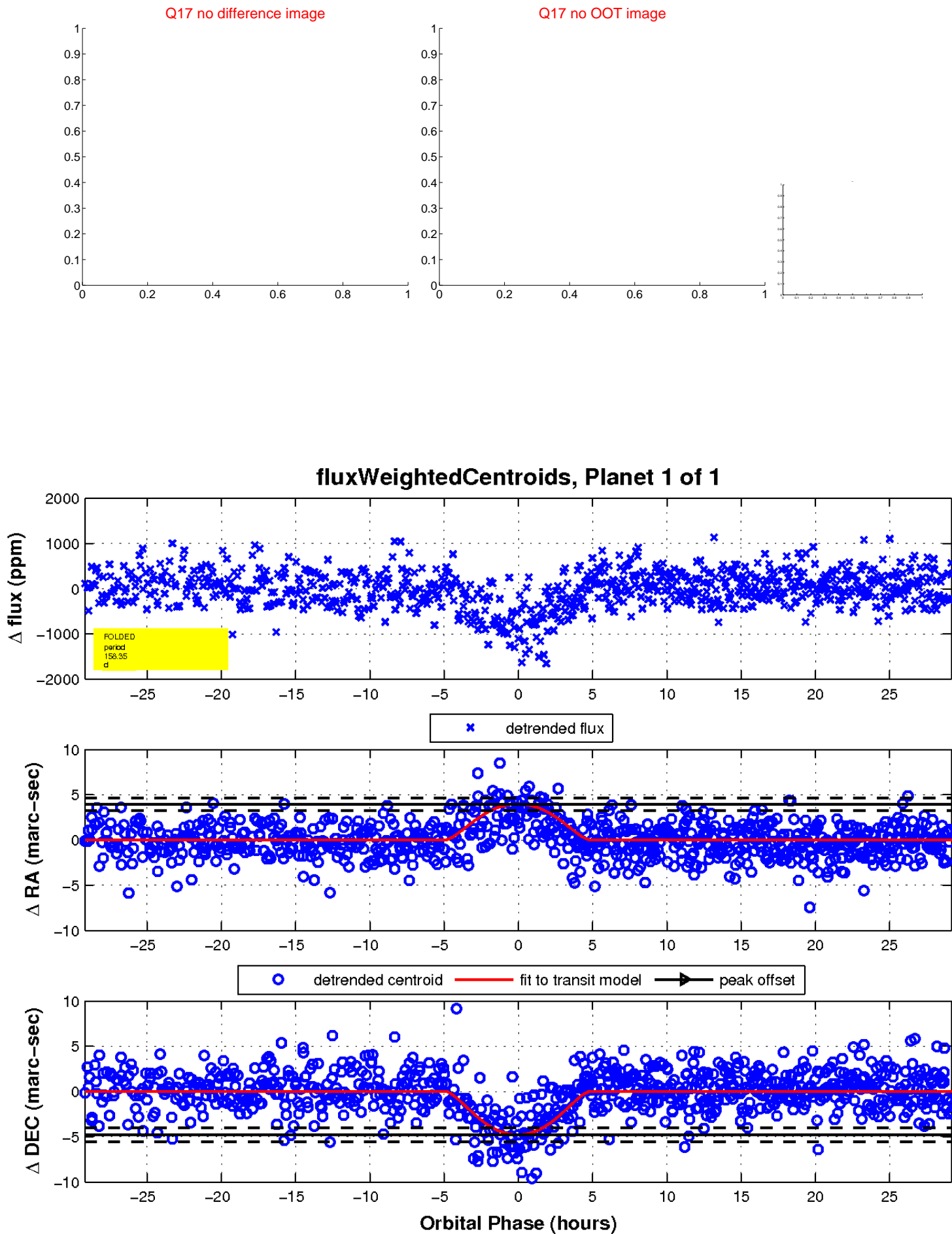
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

