

# KIC 003749978

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003749978-01	OBS	2308.01	28.505744	132.923745	701.7	6.870	17.6	18.7	0.87	5712	2.73	22.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003749978-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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.

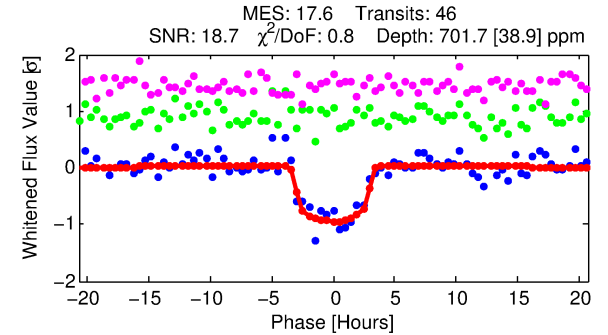
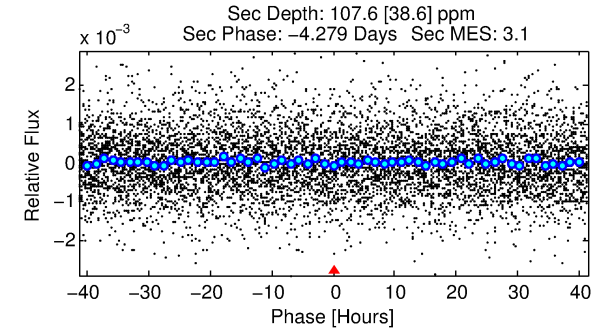
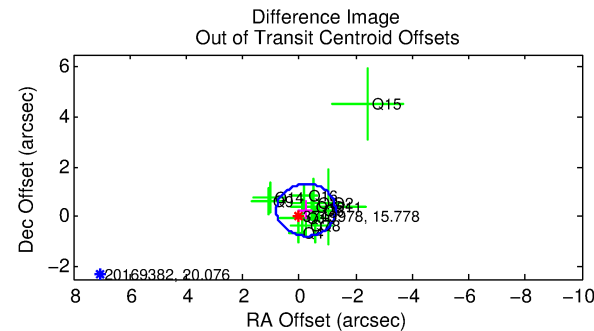
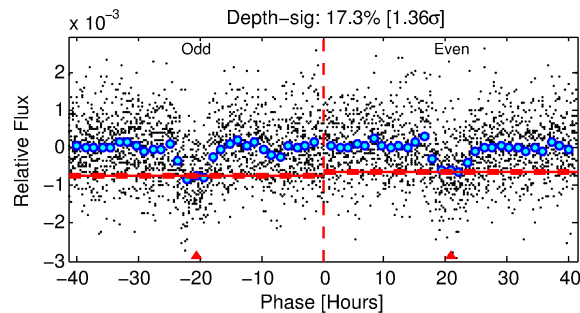
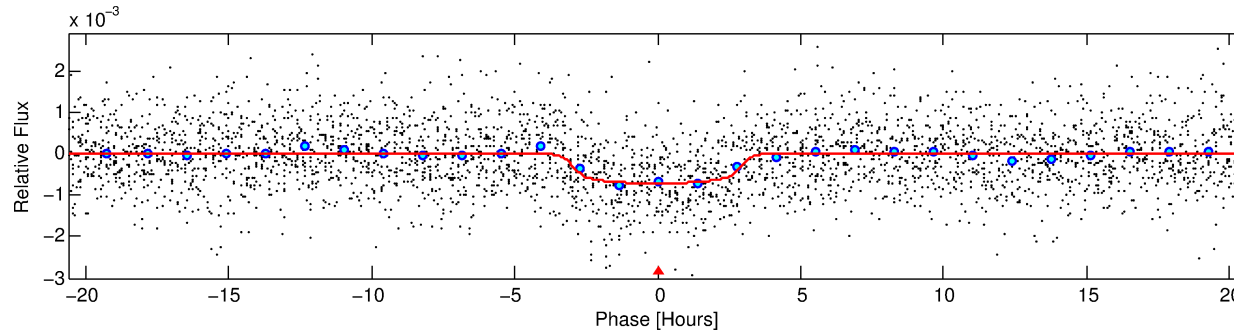
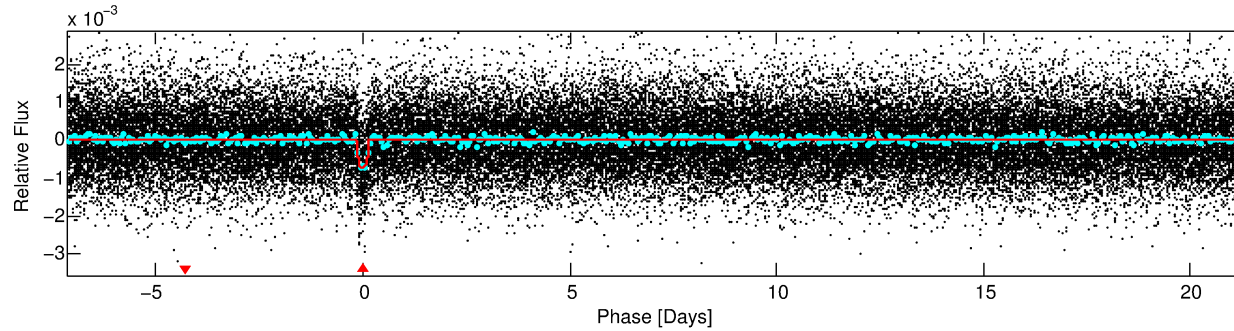
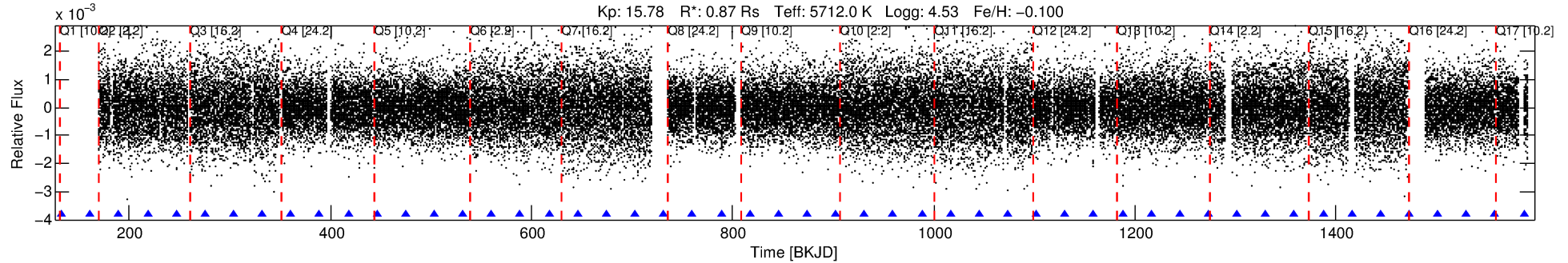
## Ephemeris Match Information For 003749978-01

No Significant Match Found

# DV One-Page Summary

KIC: 3749978 Candidate: 1 of 1 Period: 28.506 d

KOI: K02308.01 Corr: 0.954



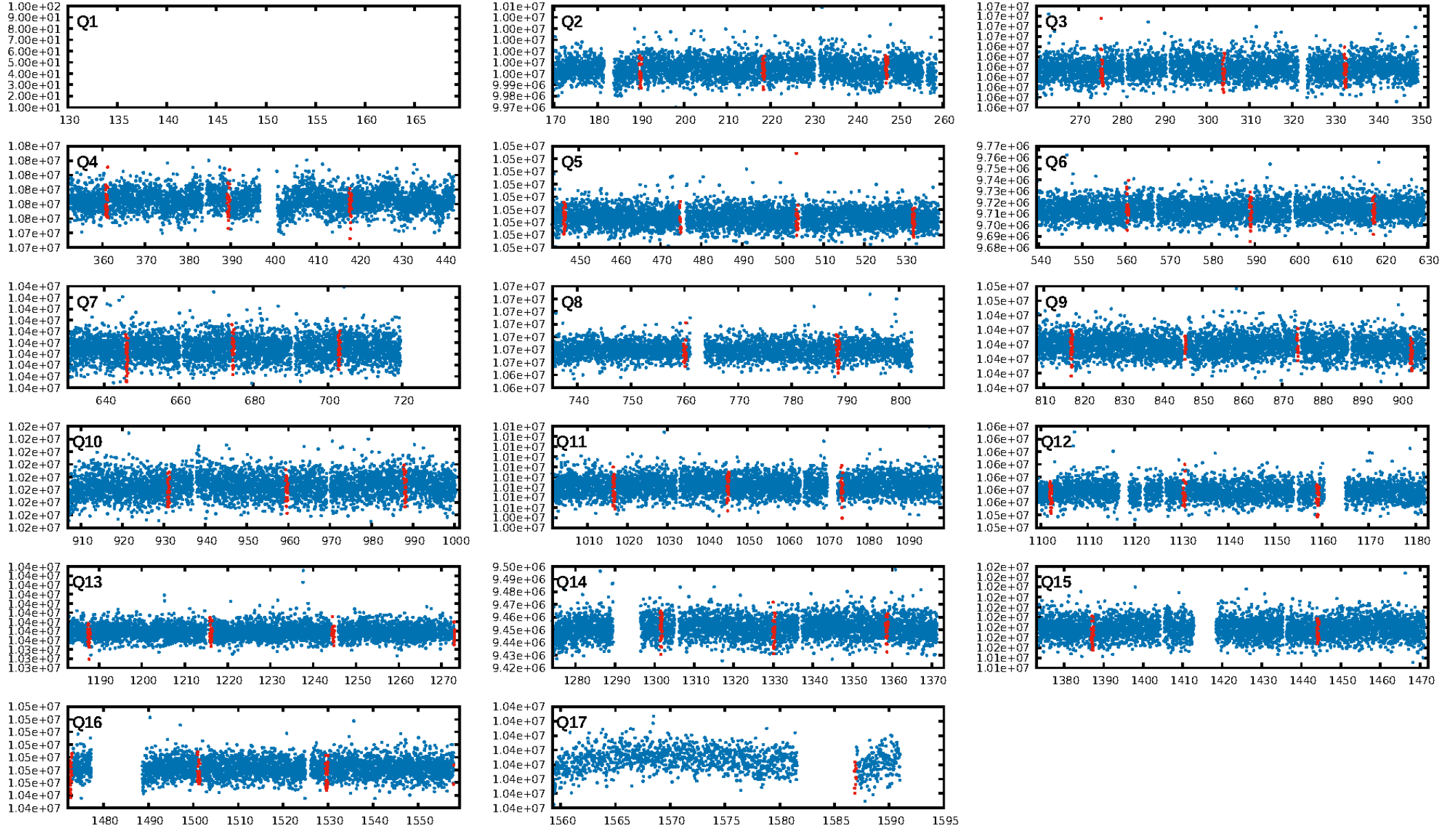
## DV Fit Results:

Period = 28.50574 [0.00028] d  
Epoch = 132.9237 [0.0083] BKJD  
Rp/R\* = 0.0287 [0.0023]  
a/R\* = 16.14 [5.33]  
b = 0.89 [0.08]  
Seff = 22.48 [8.42]  
Teq = 555 [52] K  
Rp = 2.73 [0.84] Re  
a = 0.1792 [0.0443] AU  
Ag = 255.73 [135.42] [1.88 $\sigma$ ]  
Teffp = 3433 [352] K [8.09 $\sigma$ ]

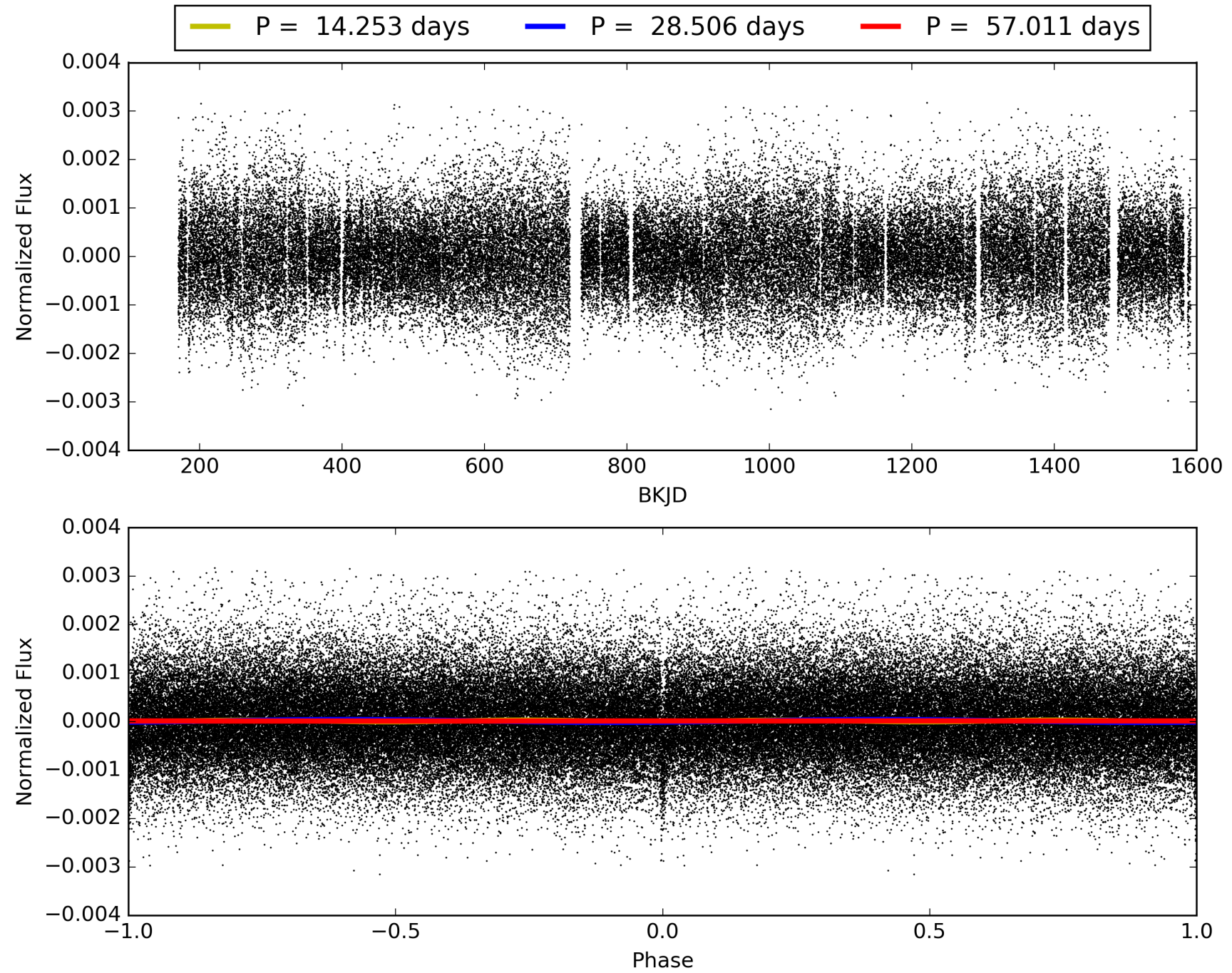
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 97.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.05e-69  
RollingBand-fgt: 1.00 [45/45]  
GhostDiagnostic-chr: 6.111  
Centroid-sig: 72.3%  
Centroid-so: 0.619 arcsec [0.77 $\sigma$ ]  
OotOffset-rm: 0.352 arcsec [1.01 $\sigma$ ]  
KicOffset-rm: 0.398 arcsec [1.09 $\sigma$ ]  
OotOffset-st: 4/4/4/1 [13]  
KicOffset-st: 4/4/4/1 [13]  
DiffImageQuality-fgm: 0.69 [9/13]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 003749978-01, PDC Light Curves

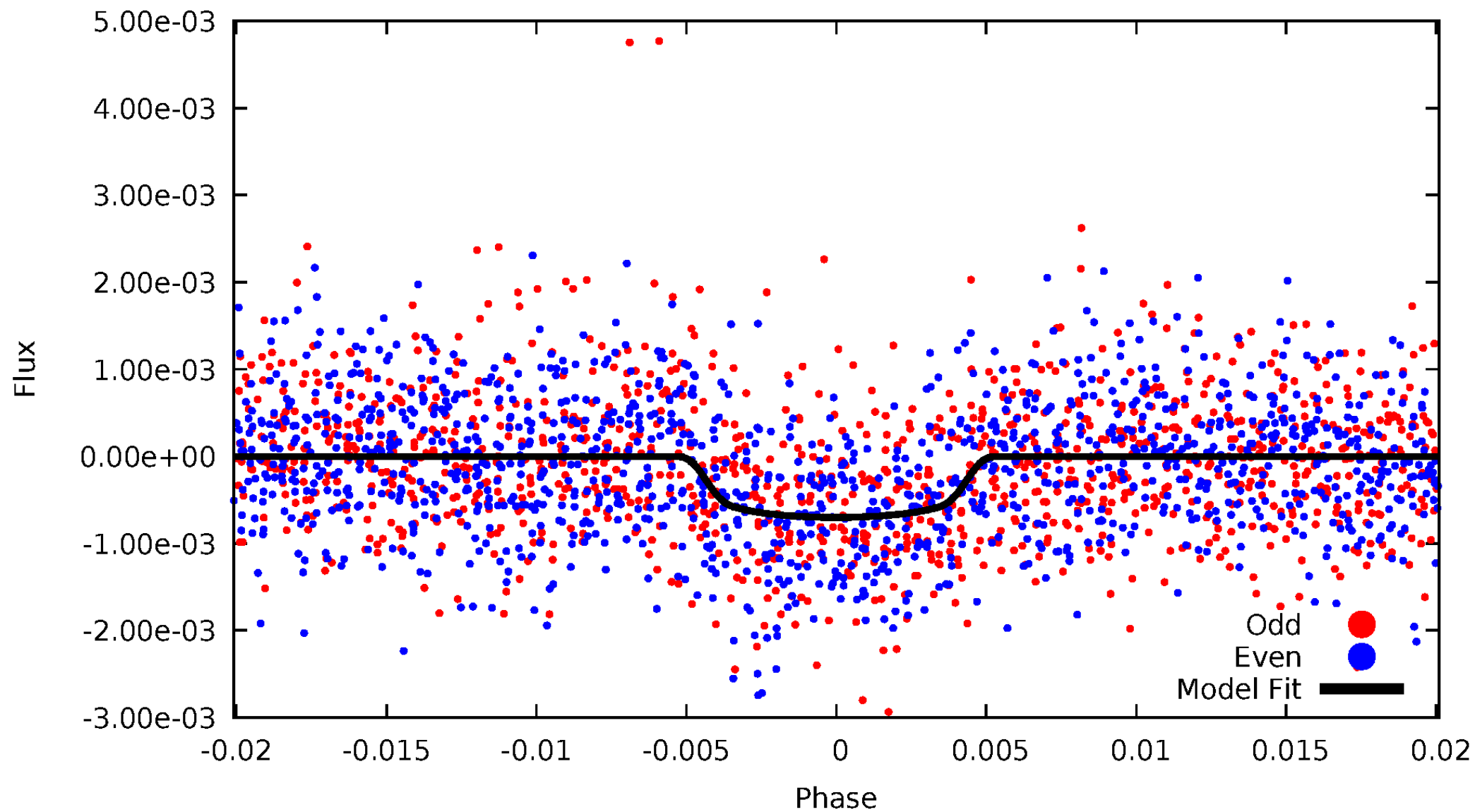


TCE 003749978-01



# DV Odd/Even

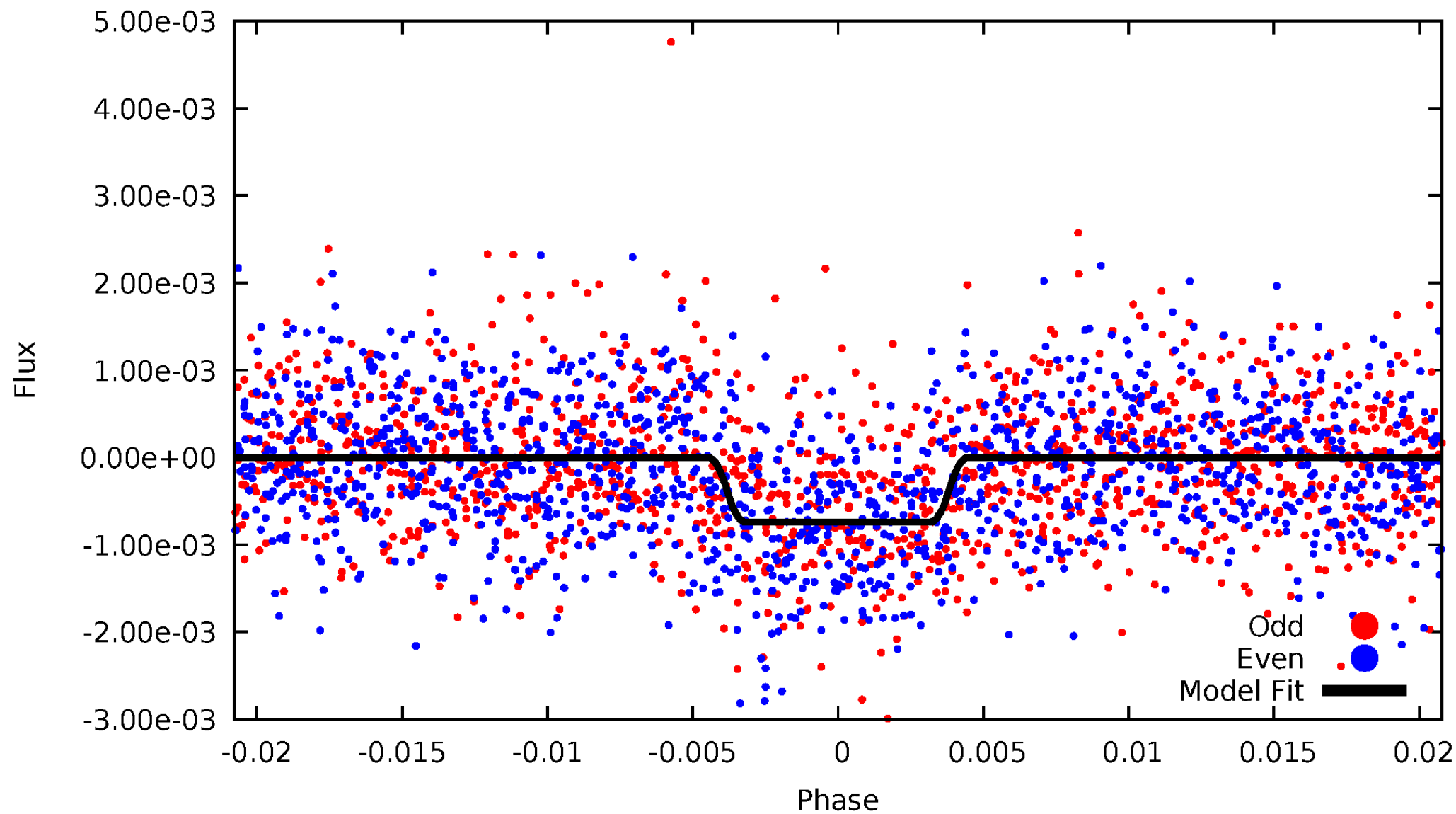
TCE 003749978-01





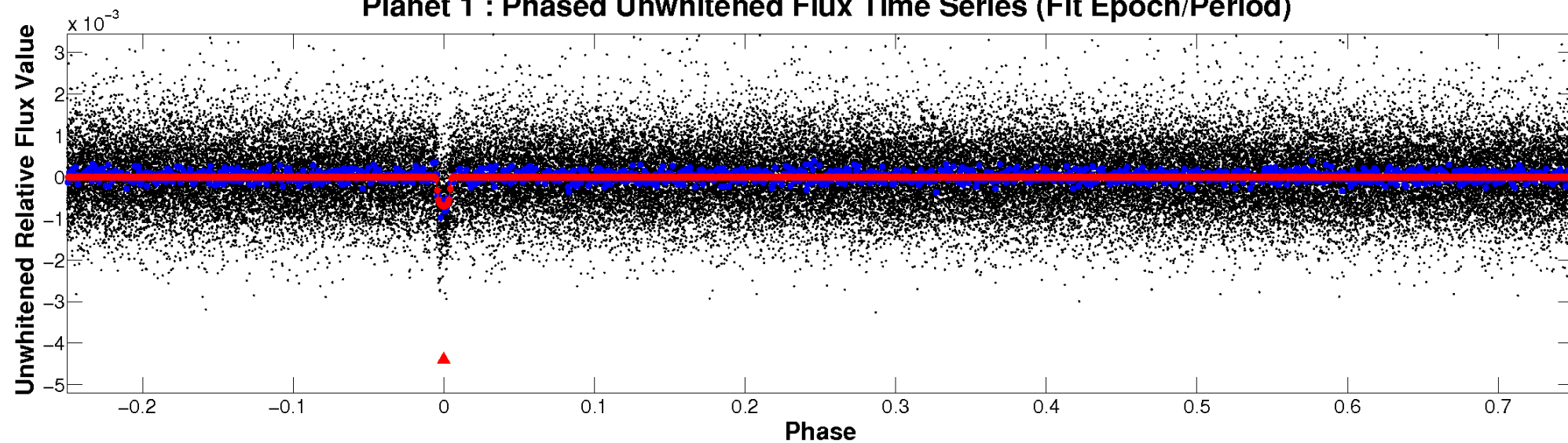
# ALT Odd/Even

TCE 003749978-01

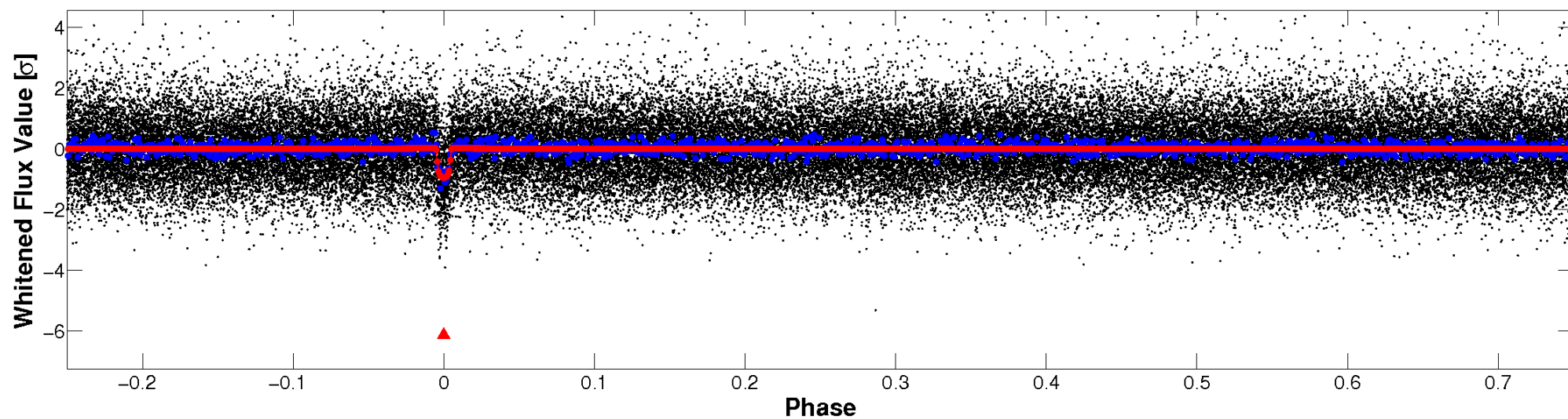


# Non-Whitened Vs. Whitened Light Curve

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

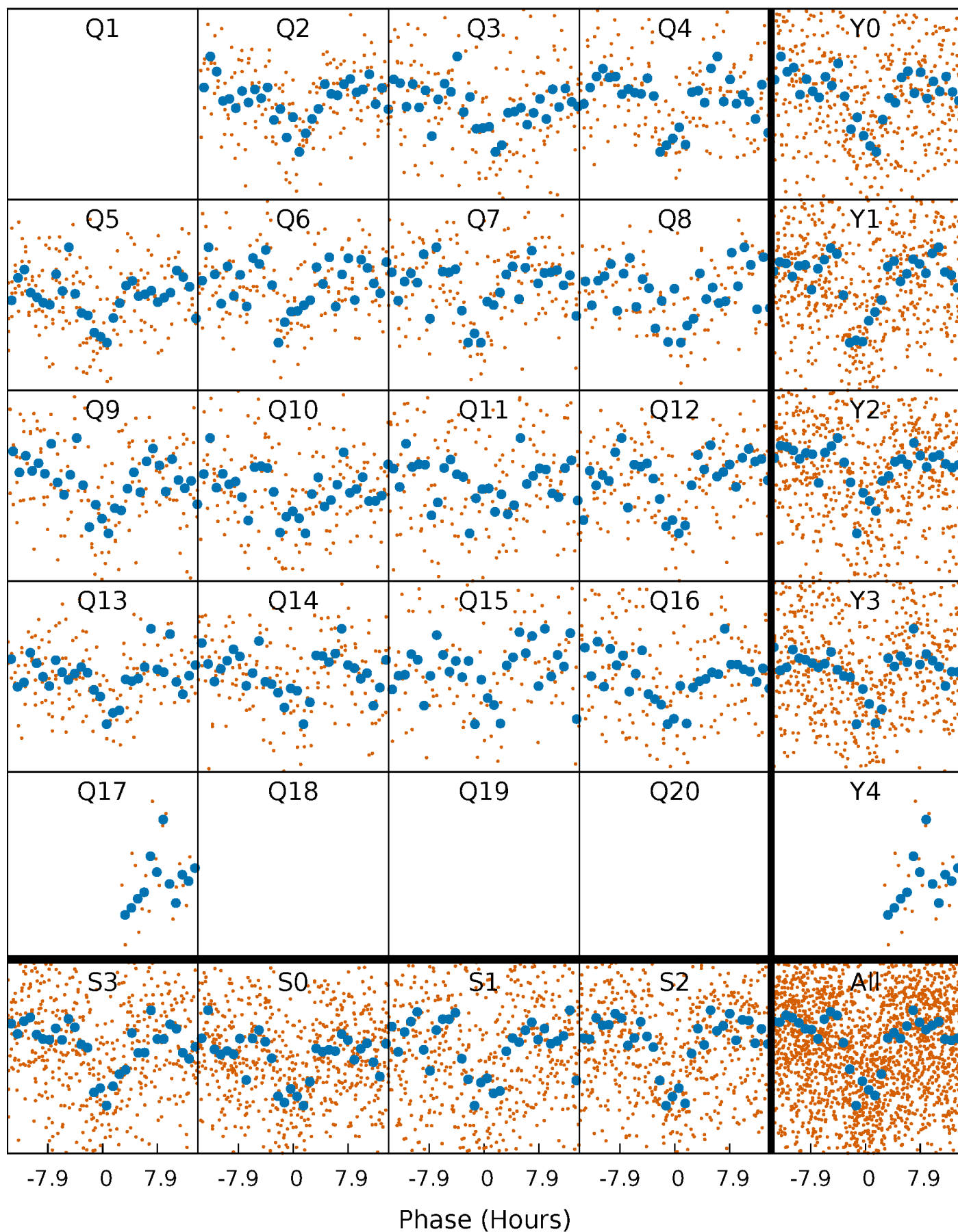


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

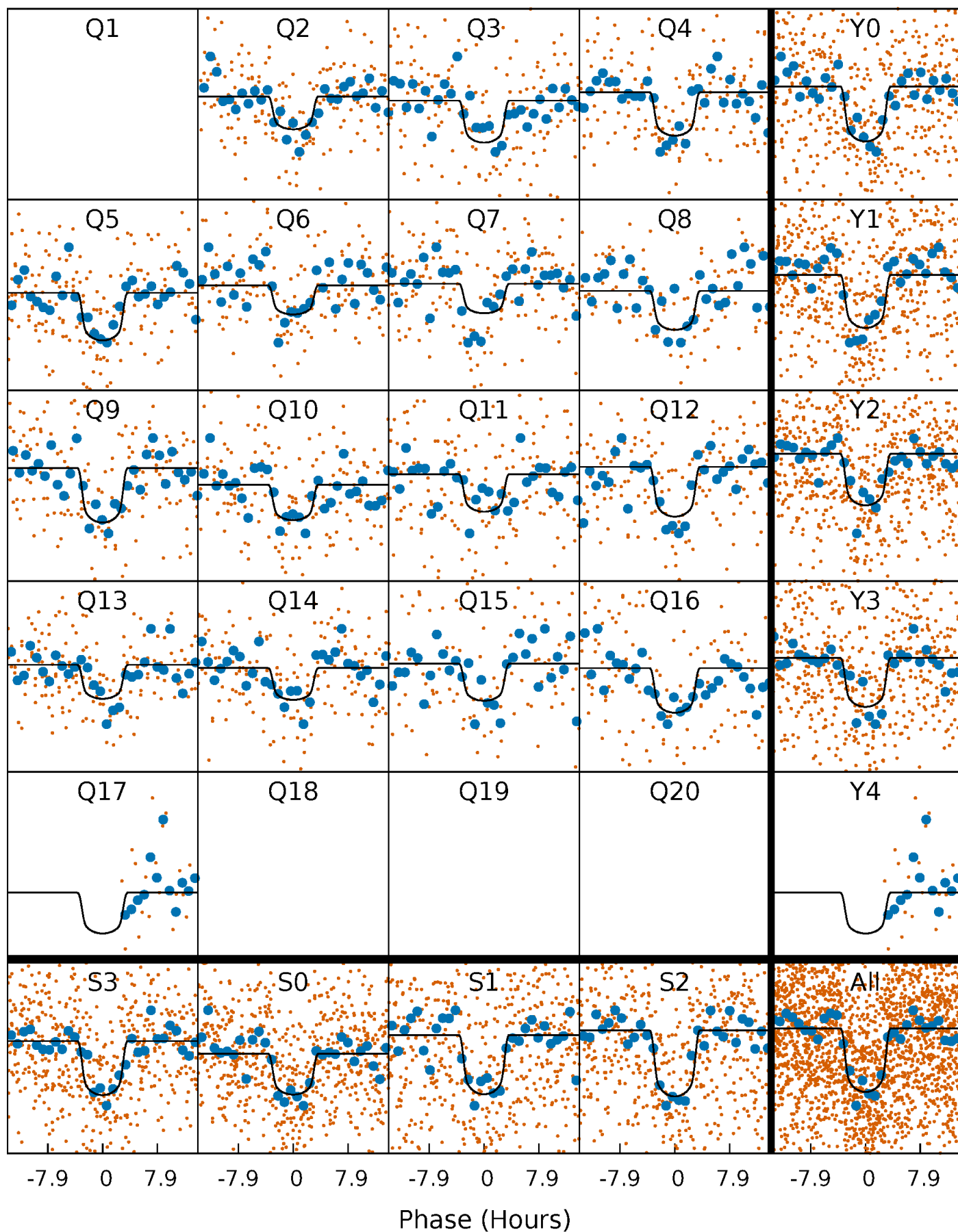
TCE 003749978-01 P= 28.505744 Days  $T_0=132.923744$  (BKJD)





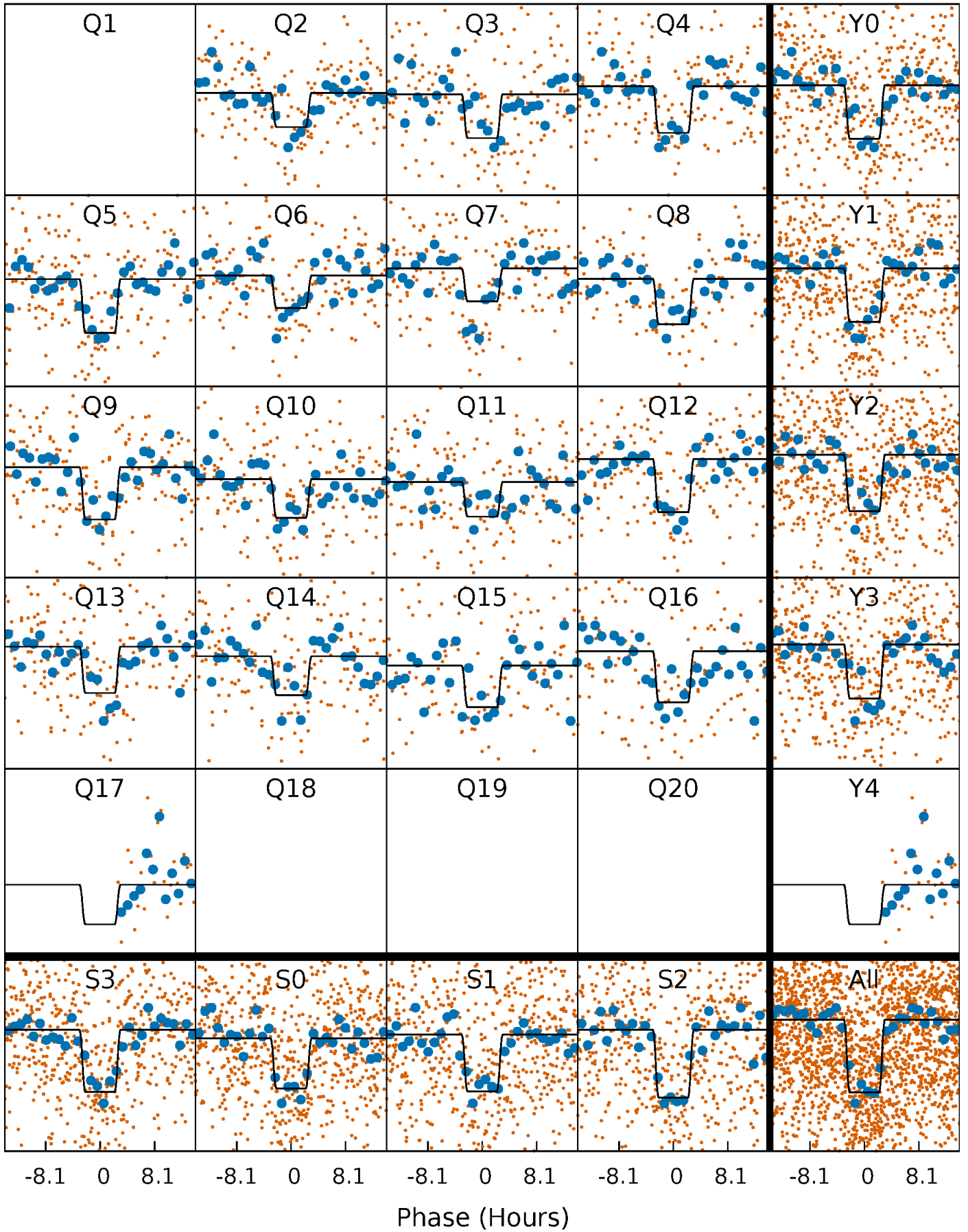
# DV Quarter-Phased Transit Curves

TCE 003749978-01 P= 28.505744 Days  $T_0=132.923744$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

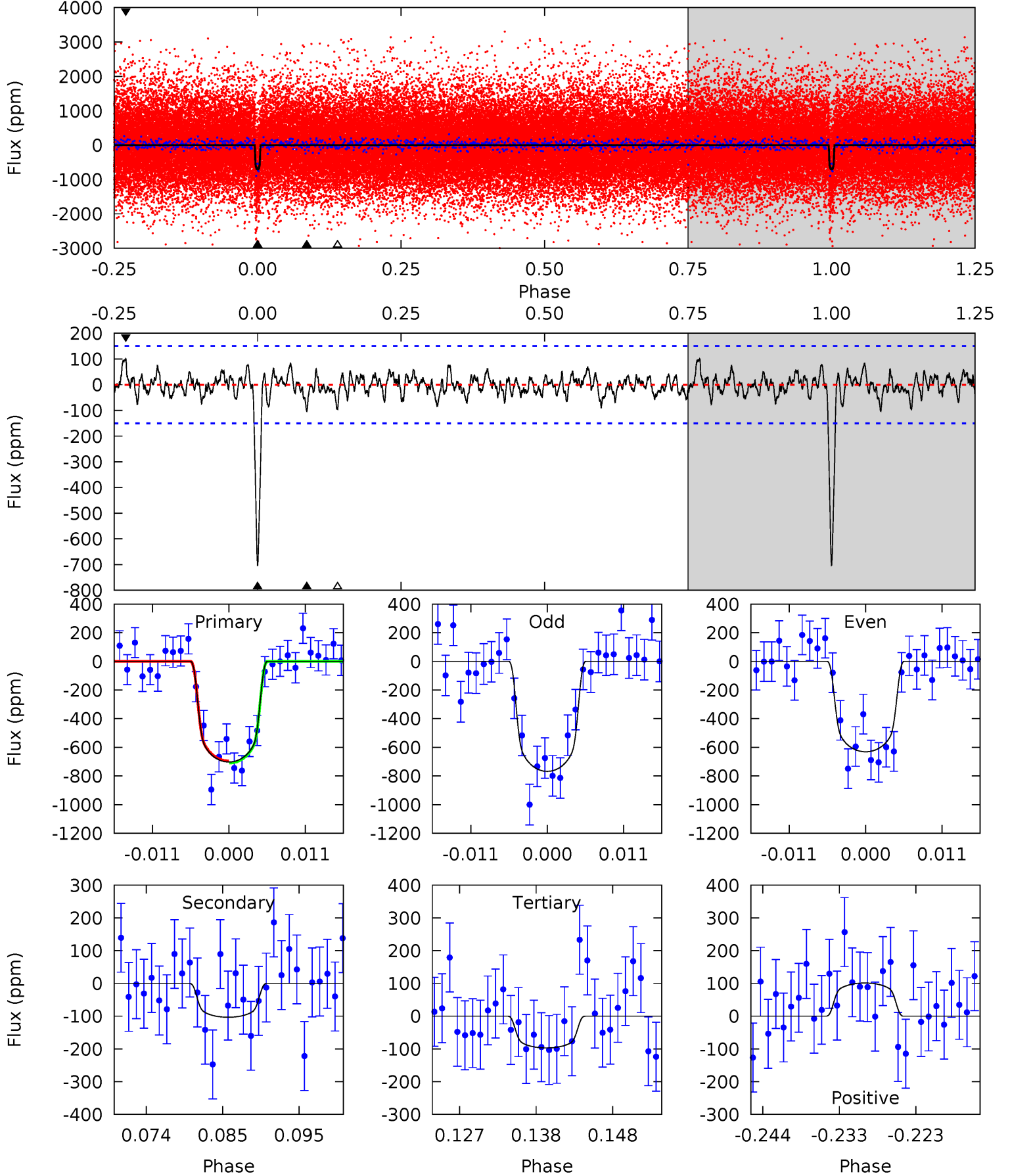
TCE 003749978-01 P= 28.505929 Days  $T_0=132.918284$  (BKJD)



# DV Model-Shift Uniqueness Test

003749978-01, P = 28.505744 Days, E = 132.923744 Days

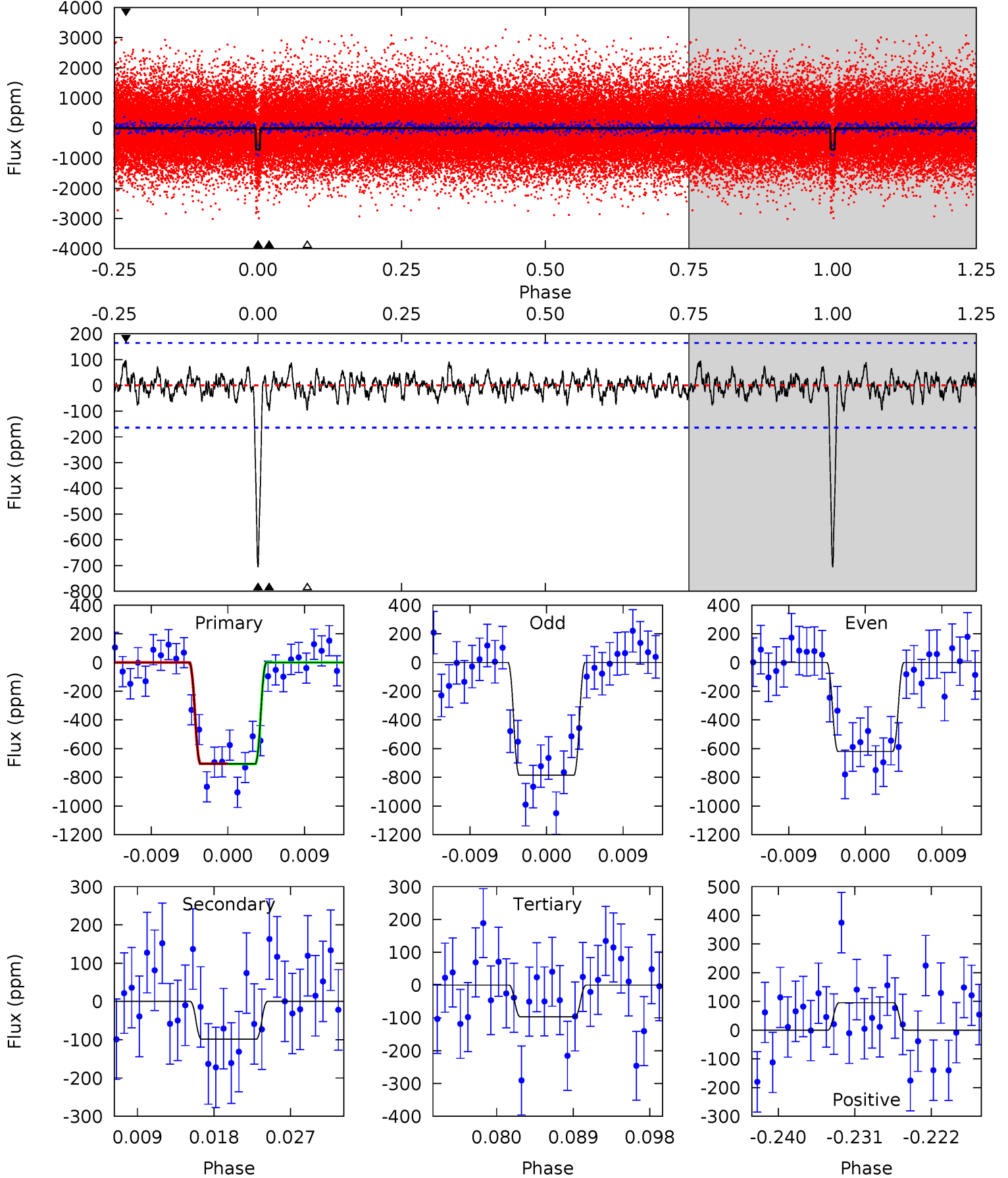
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.4	3.44	3.24	3.37	5.02	2.56	1.06	20.2	20.0	0.21	0.08	2.28	0.98	0.13	0.22



# Alt Model-Shift Uniqueness Test

003749978-01, P = 28.505929 Days, E = 132.918284 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
21.7	3.03	2.98	2.94	5.05	2.62	0.92	18.7	18.8	0.05	0.10	2.55	0.96	0.12	0.03



### Stellar Parameters For KIC 003749978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5712^{+169}_{-169}$	$4.534^{+0.048}_{-0.192}$	$-0.100^{+0.300}_{-0.300}$	$0.870^{+0.259}_{-0.086}$	$0.944^{+0.104}_{-0.104}$	$2.021^{+0.498}_{-0.969}$
	+3%/-3%	+1%/-4%	+300%/-300%	+30%/-10%	+11%/-11%	+25%/-48%
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 003749978-01 / KOI 2308.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-103 \pm 30$	$2.84^{+0.44}_{-0.33}$	$794^{+56}_{-37}$	$3764^{+234}_{-225}$	$216^{+89}_{-79}$
Alt.	$-99 \pm 33$	$2.69^{+0.47}_{-0.32}$	$793^{+56}_{-37}$	$3801^{+264}_{-248}$	$231^{+109}_{-89}$

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



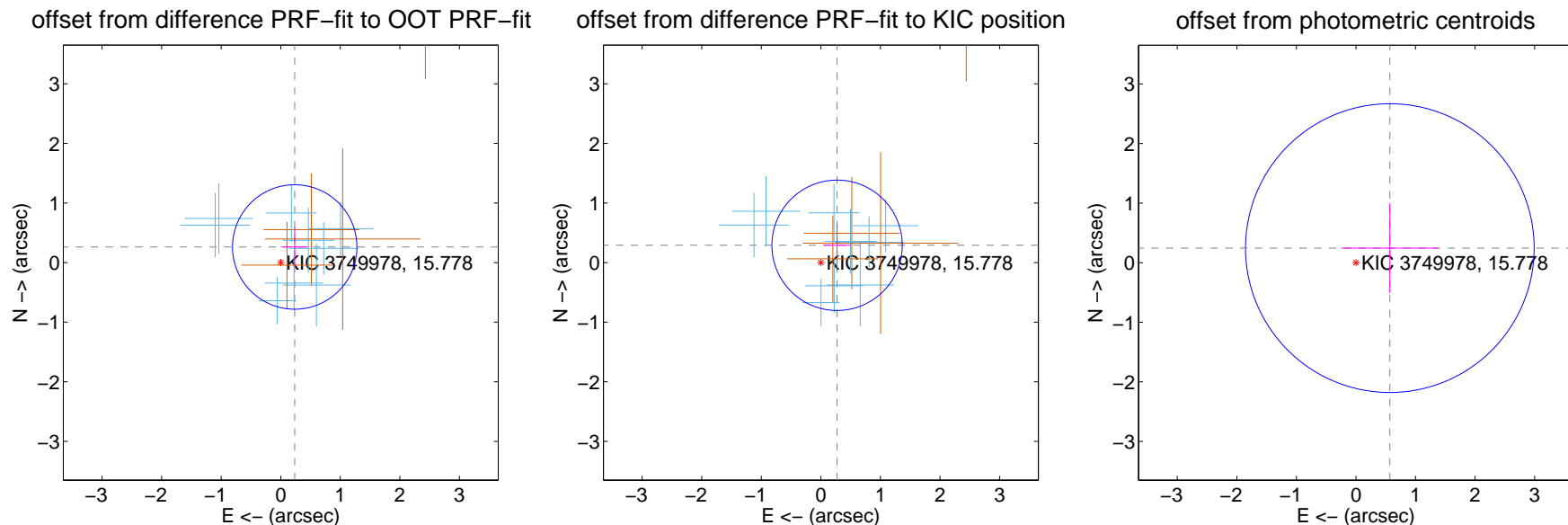
## DV Centroid Data

Supplemental centroid analysis for 003749978-01. Kepler magnitude: 15.78. Transit SNR 18.68

There are 9 quarters with good PRF difference image offsets

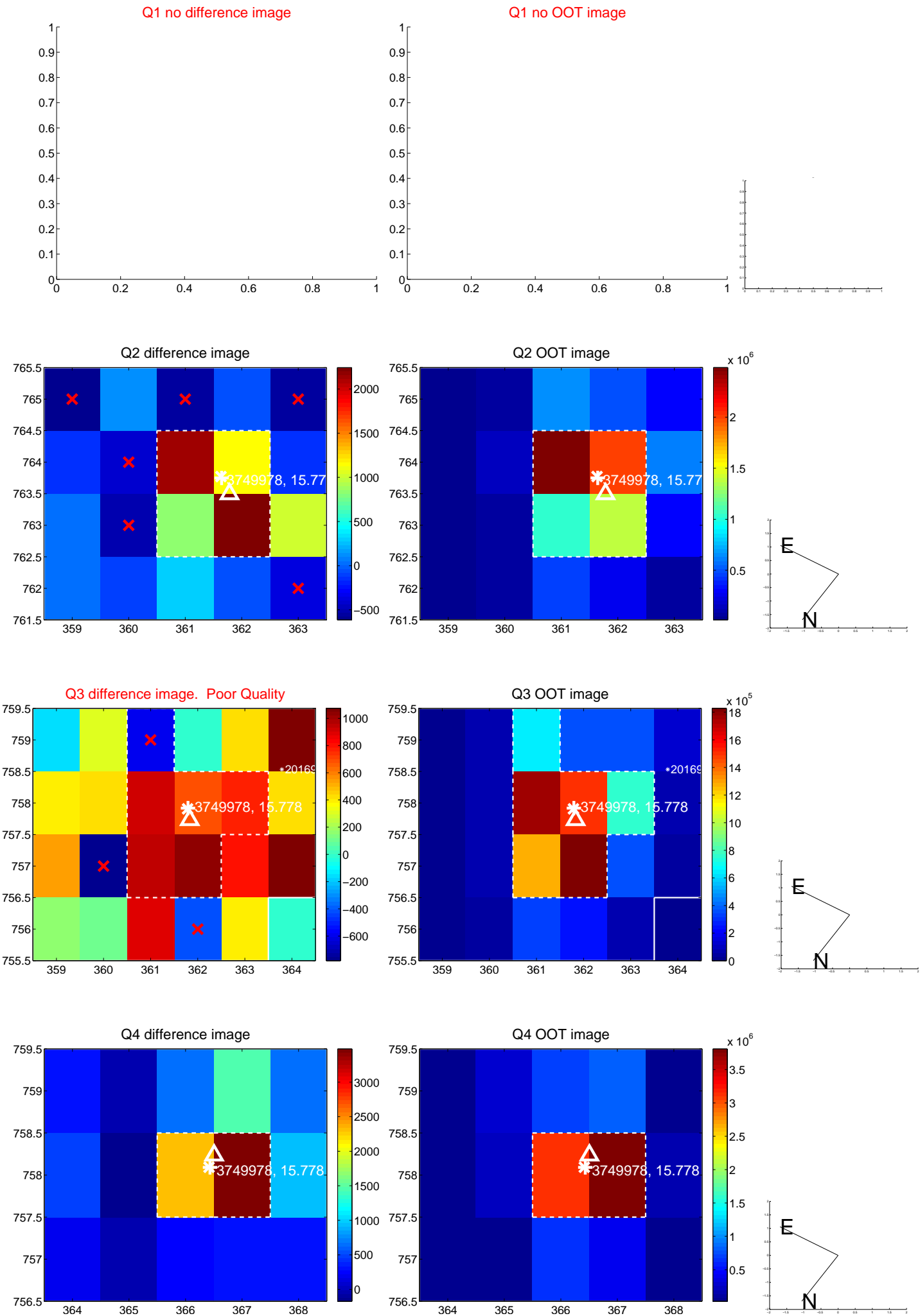
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.352 \pm 0.348$	1.01	$-0.234 \pm 0.229$	$0.262 \pm 0.336$
PRF-fit source offset from KIC position	$0.398 \pm 0.365$	1.09	$-0.272 \pm 0.227$	$0.290 \pm 0.347$
photometric centroid source offset	$0.62 \pm 0.81$	0.77	$-0.57 \pm 0.82$	$0.24 \pm 0.76$

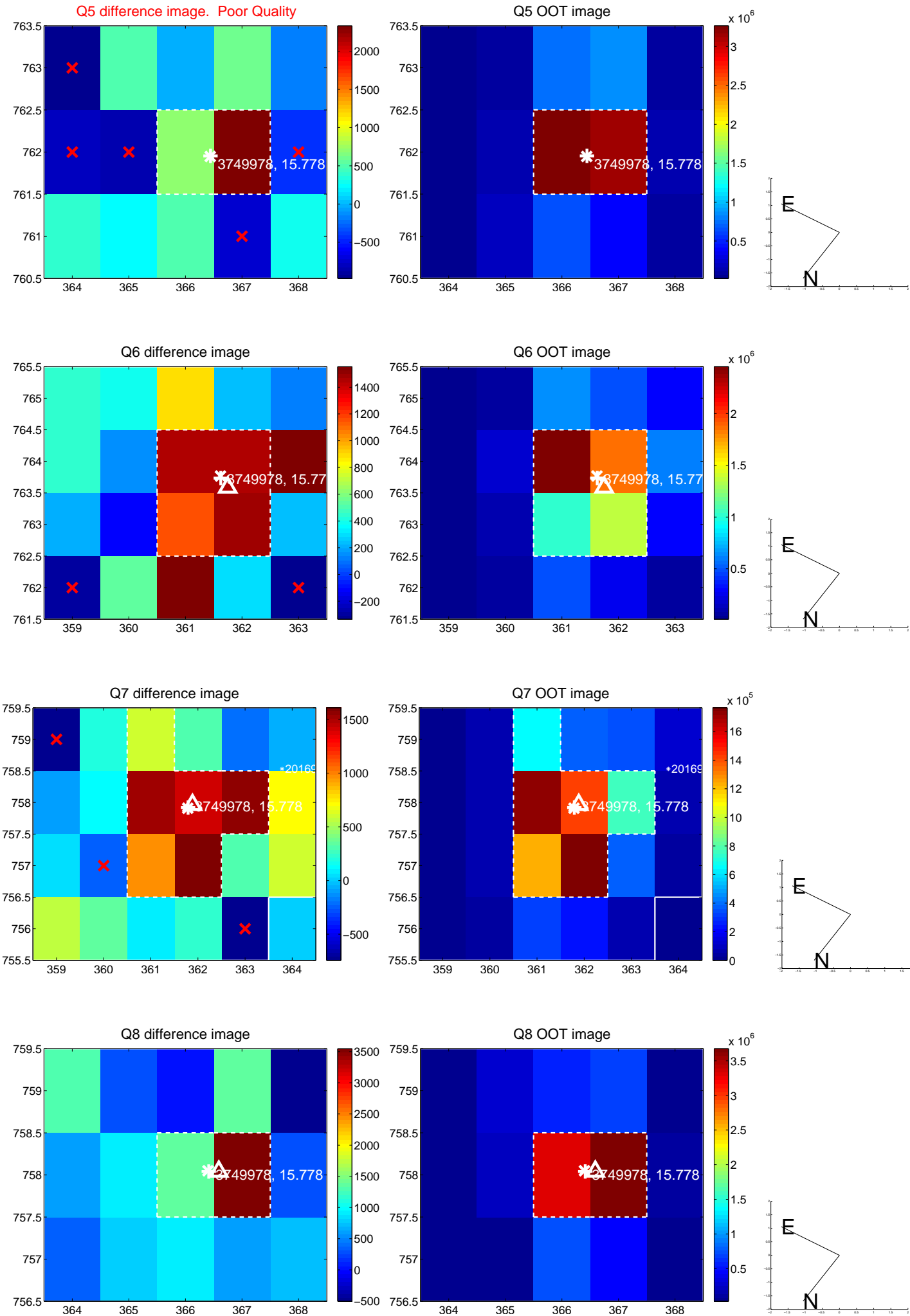


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

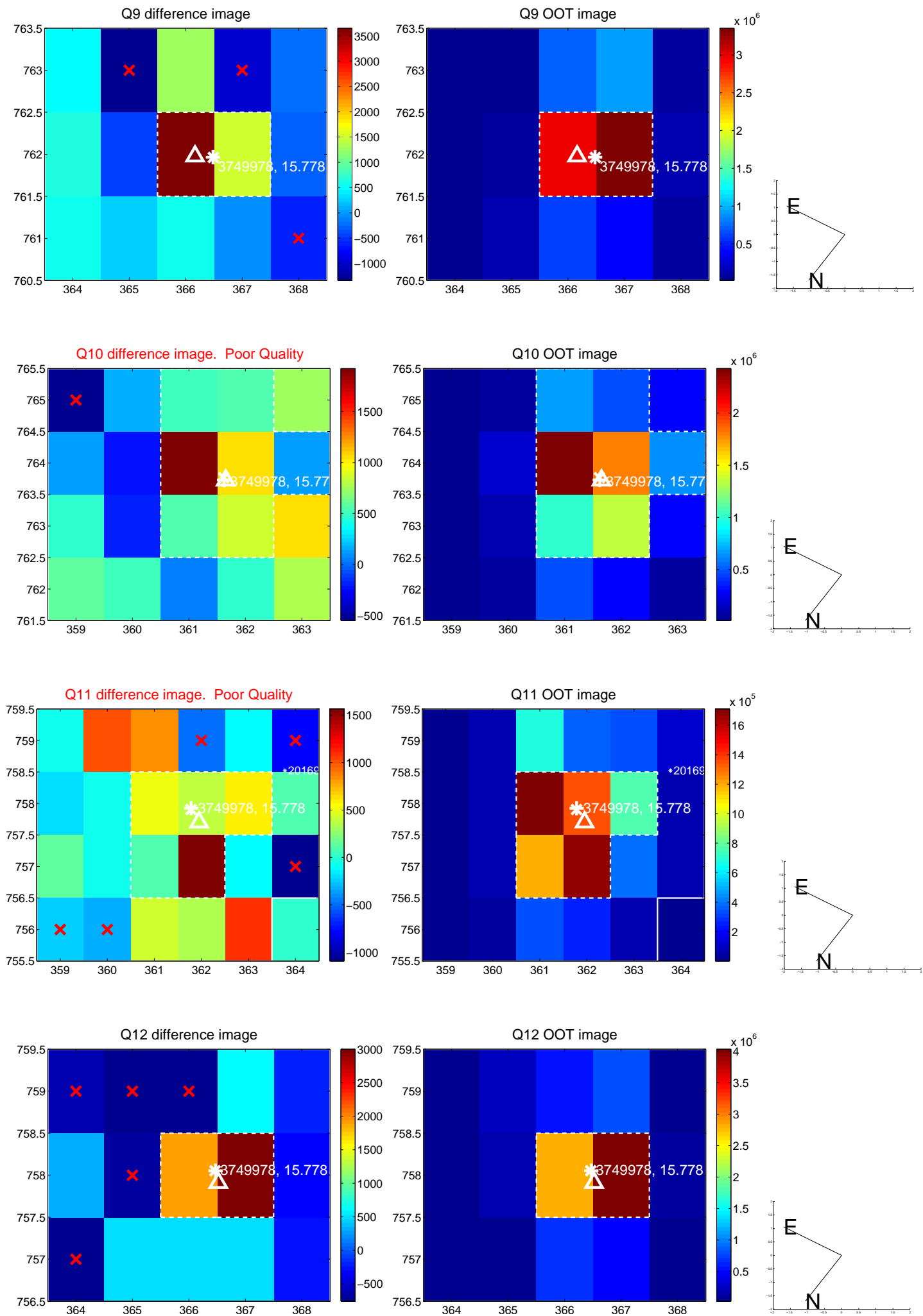
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

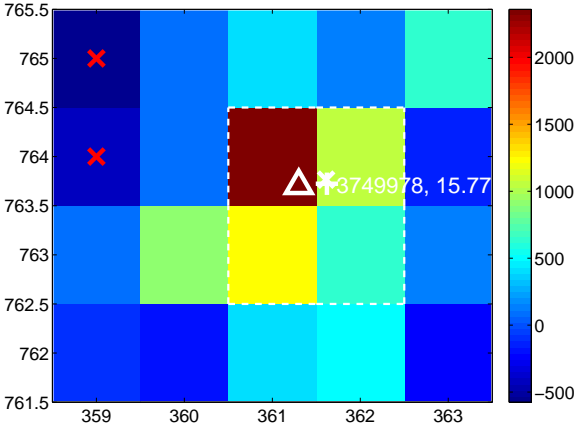
Q13 no difference image



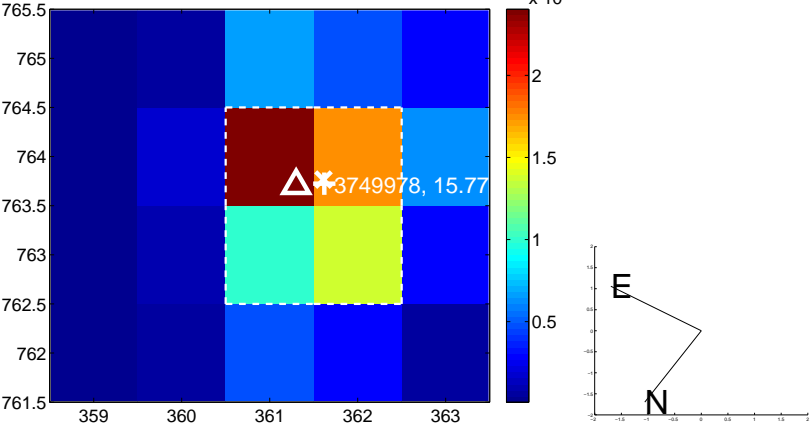
Q13 no OOT image



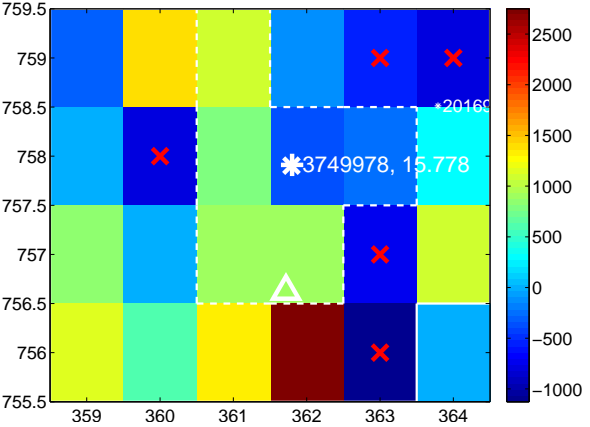
Q14 difference image



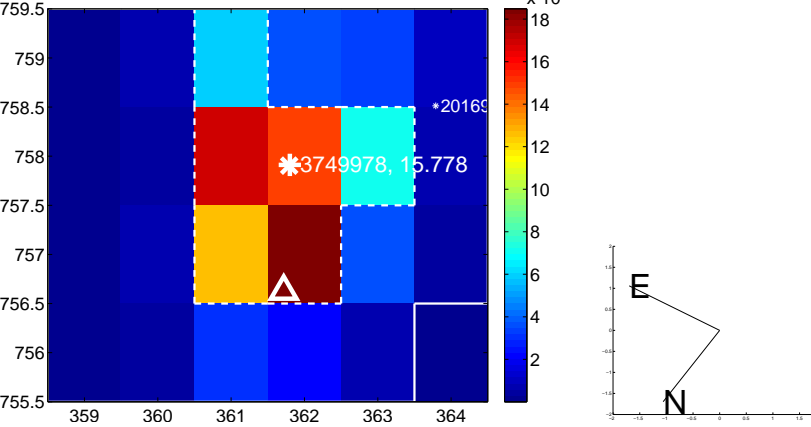
Q14 OOT image



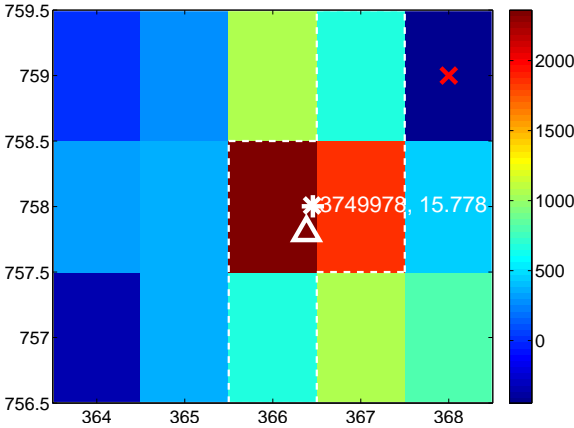
Q15 difference image. Poor Quality



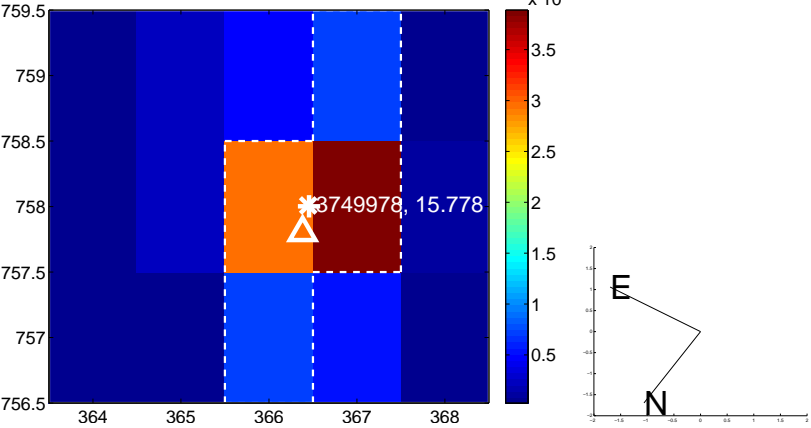
Q15 OOT image



Q16 difference image

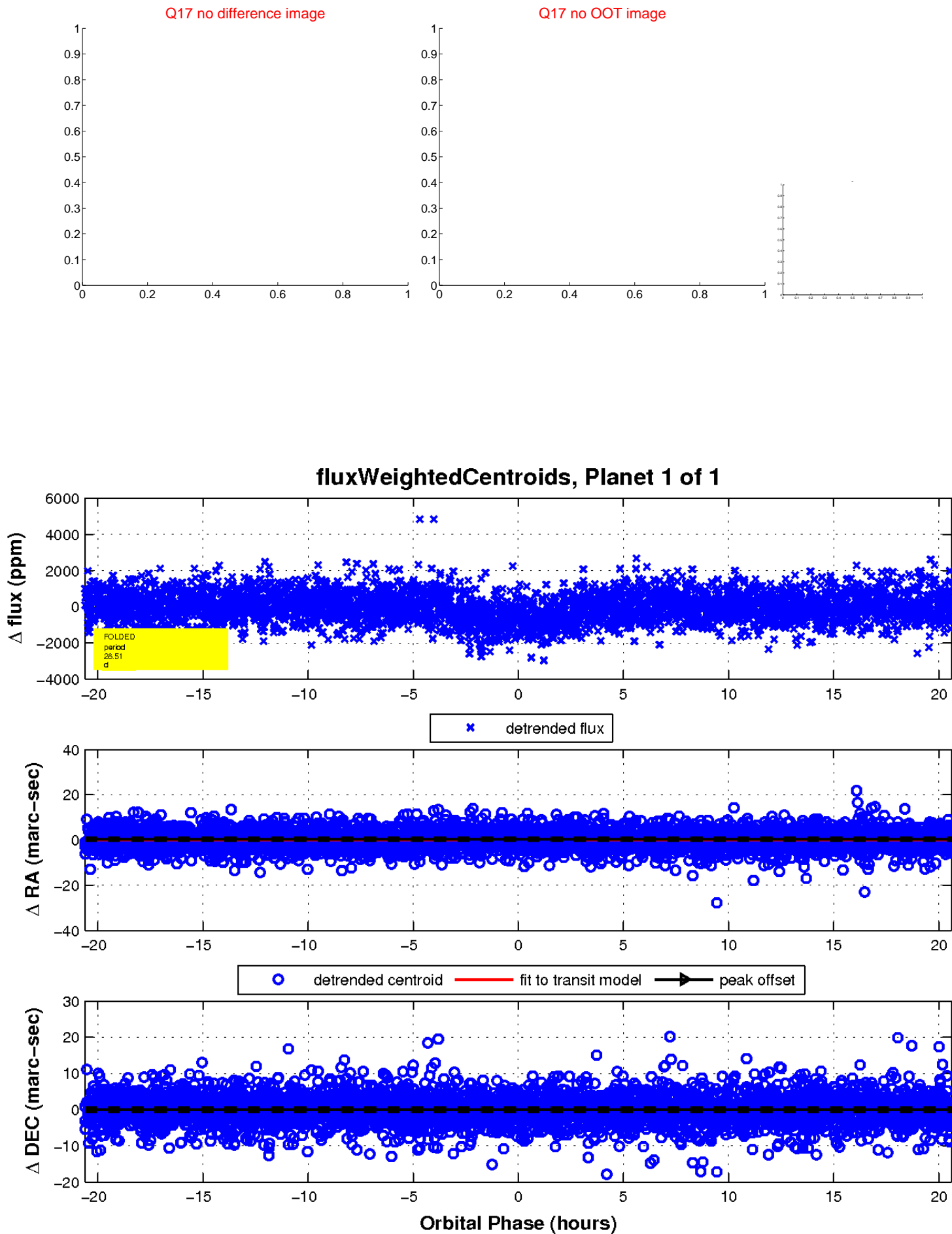


Q16 OOT image





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



UKIRT Image

Declination

