

# KIC 004060229

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004060229-01	OBS	4570.01	35.017488	139.851416	297.1	3.799	11.7	12.9	1.12	5944	2.25	34.39

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004060229-01	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.

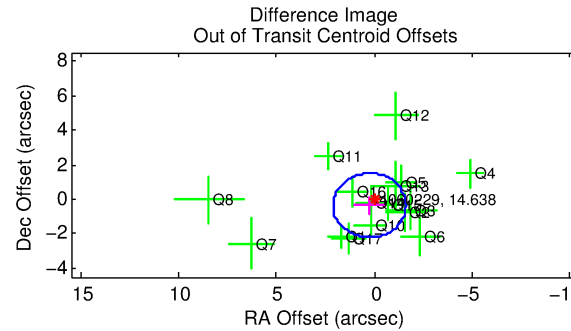
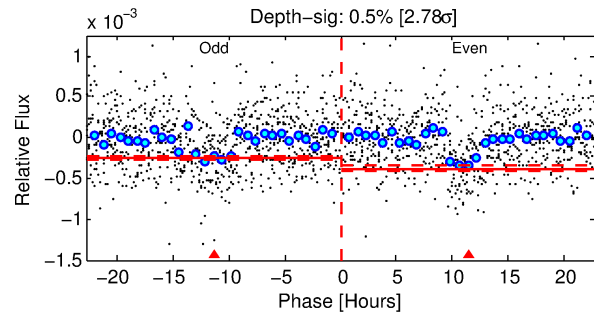
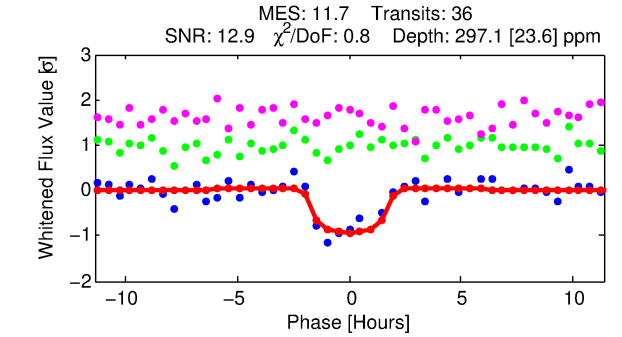
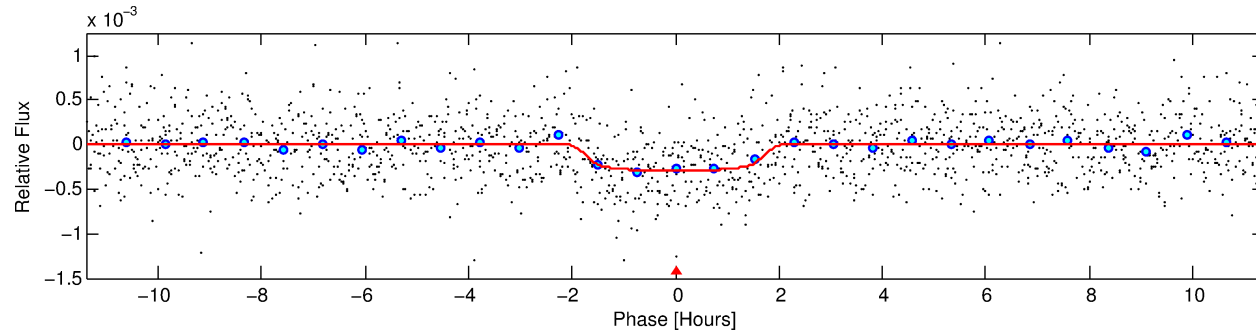
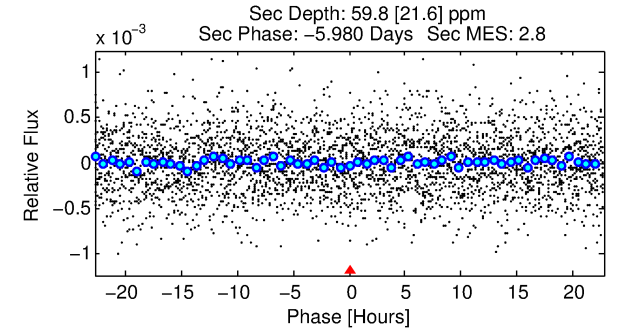
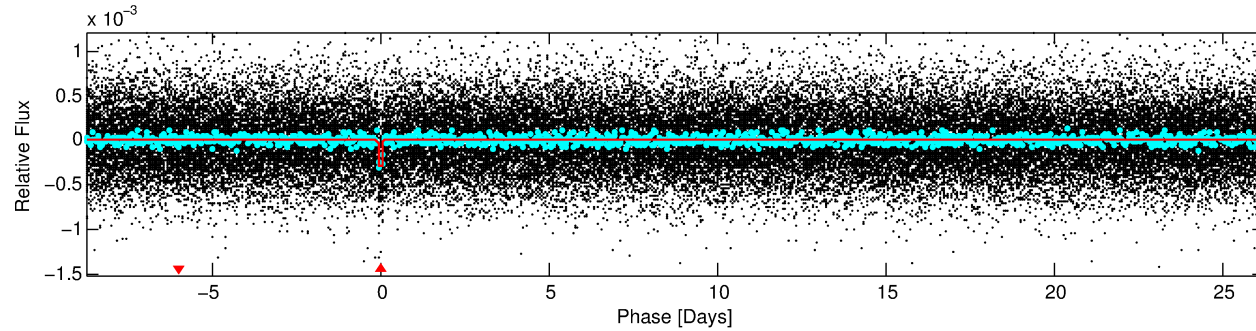
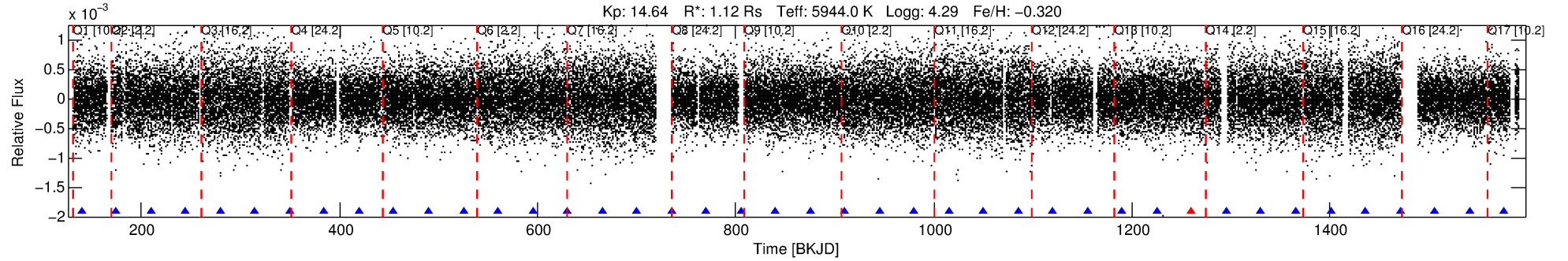
## Ephemeris Match Information For 004060229-01

No Significant Match Found

# DV One-Page Summary

KIC: 4060229 Candidate: 1 of 1 Period: 35.017 d

KOI: K04570.01 Corr: 0.968



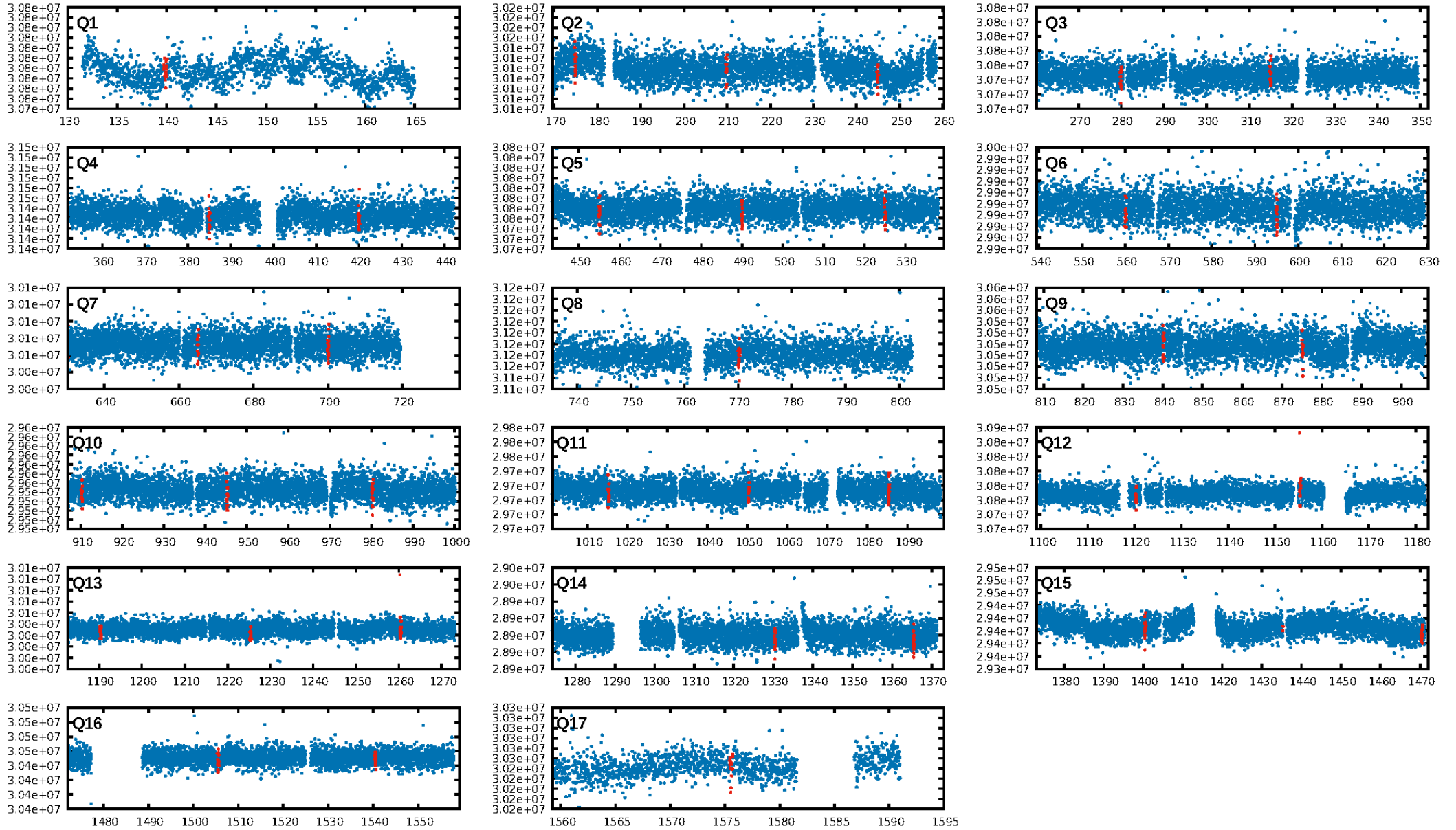
## DV Fit Results:

Period = 35.01749 [0.00026] d  
Epoch = 139.8514 [0.0065] BKJD  
Rp/R\* = 0.0183 [0.0066]  
a/R\* = 36.04 [65.87]  
b = 0.88 [0.47]  
Seff = 34.39 [9.29]  
Teff = 617 [42] K  
Rp = 2.24 [0.90] Re  
a = 0.2025 [0.0333] AU  
Ag = 267.92 [227.57] [1.17 $\sigma$ ]  
Teffp = 3863 [781] K [4.15 $\sigma$ ]

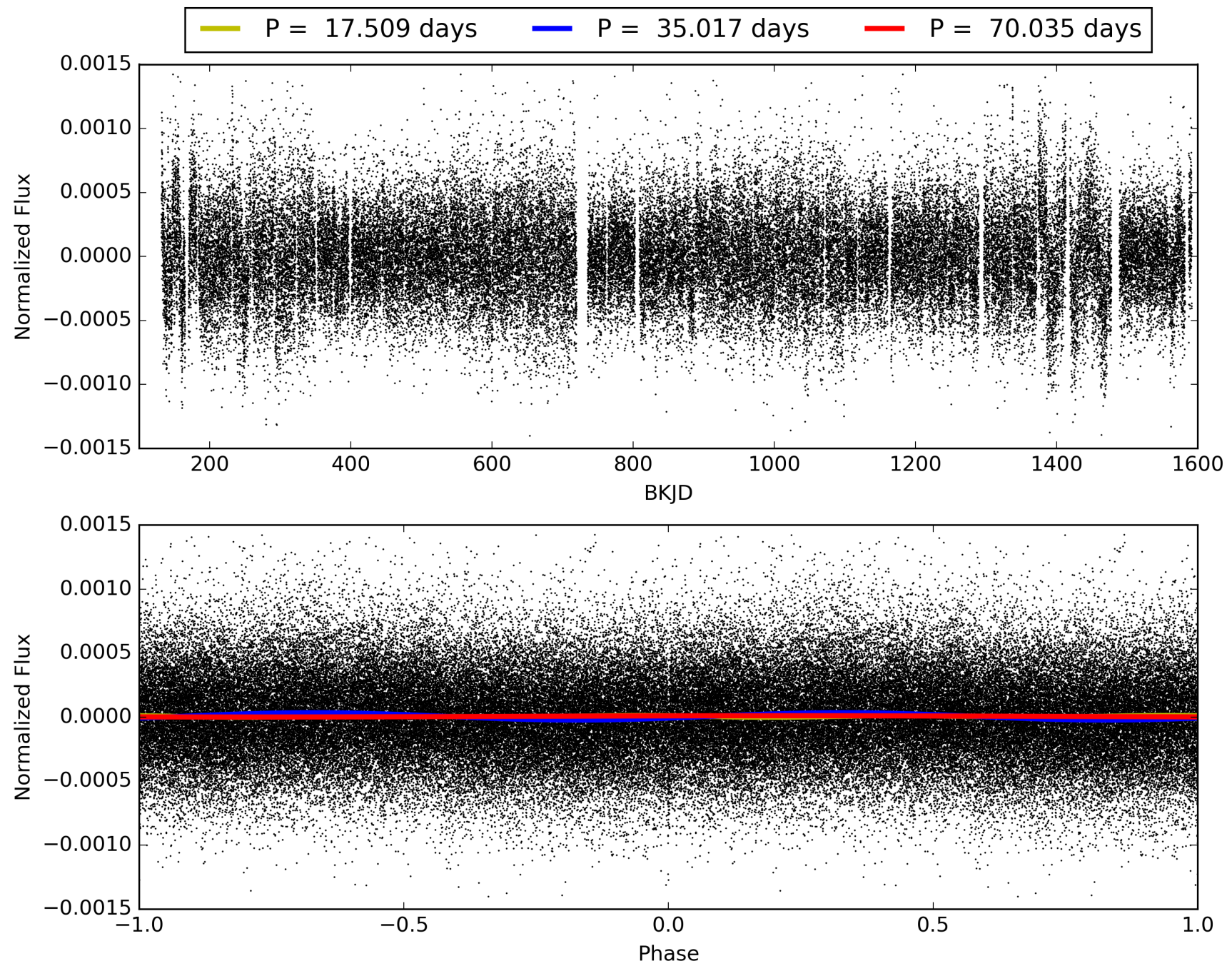
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.28e-31  
RollingBand-fgt: 0.97 [33/34]  
GhostDiagnostic-chr: -3.289  
Centroid-sig: 92.1%  
Centroid-so: 0.159 arcsec [0.13 $\sigma$ ]  
OotOffset-rm: 0.438 arcsec [0.71 $\sigma$ ]  
KicOffset-rm: 0.362 arcsec [0.51 $\sigma$ ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.31 [5/16]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 004060229-01, PDC Light Curves

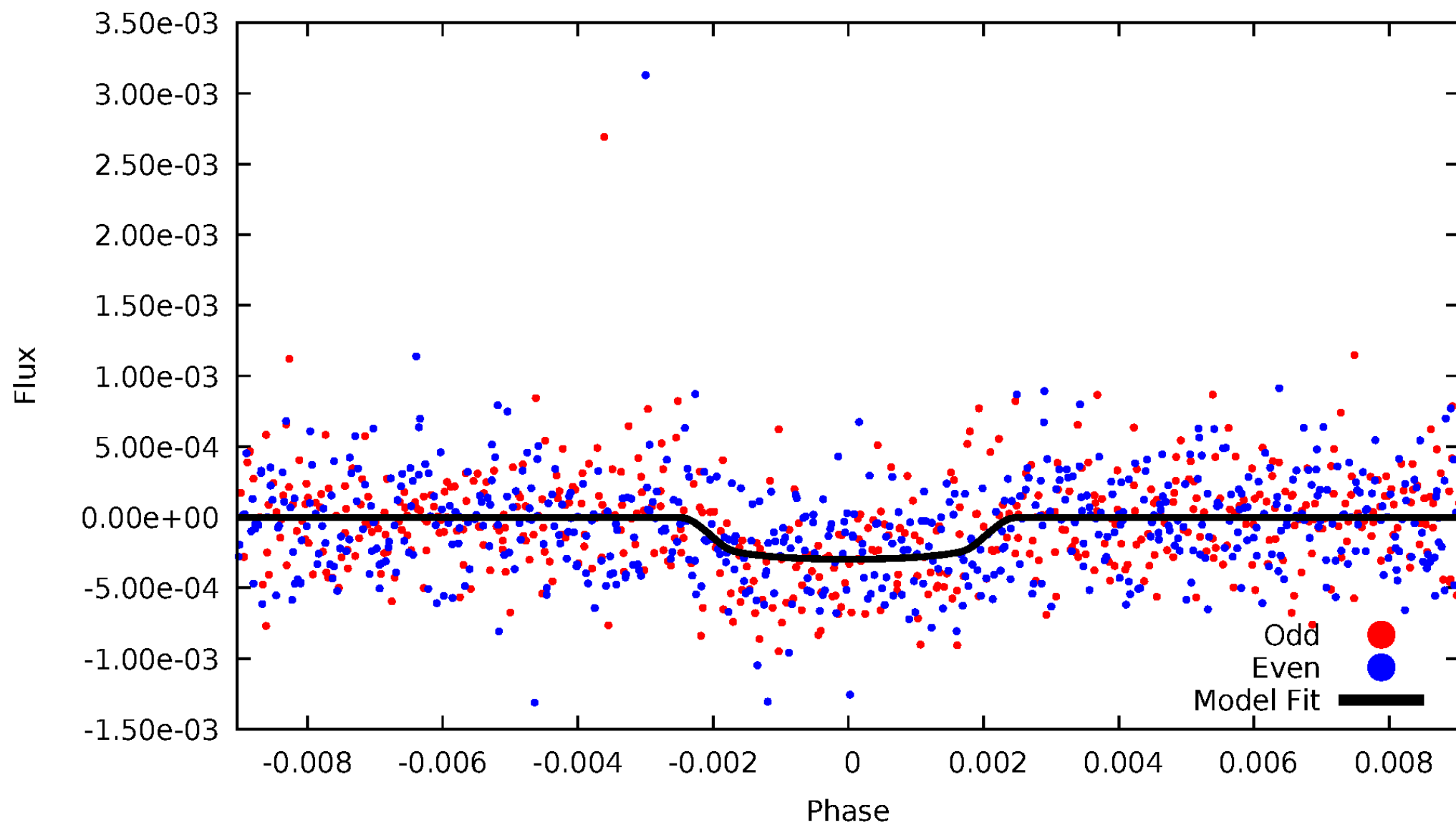


TCE 004060229-01



# DV Odd/Even

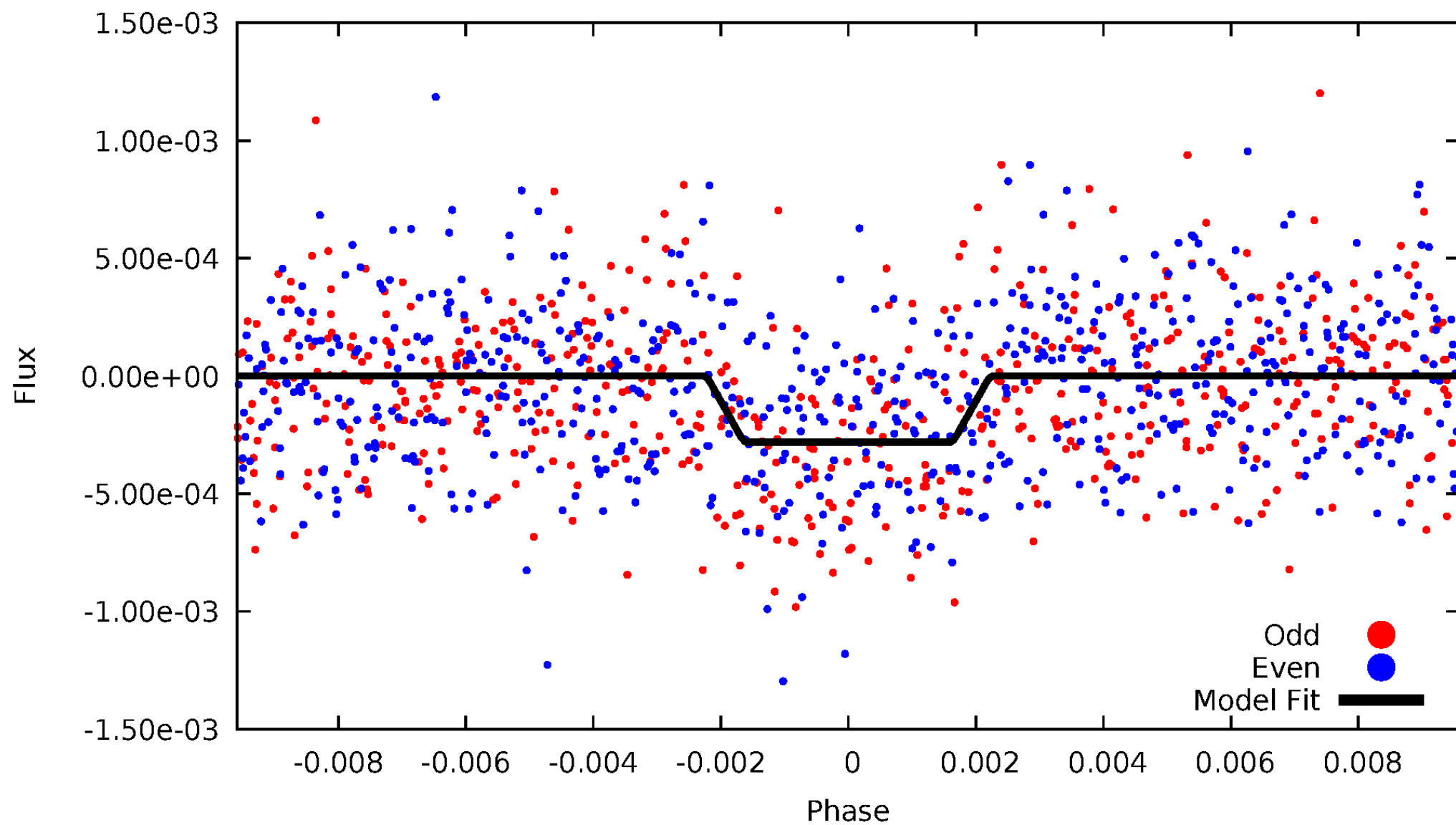
TCE 004060229-01



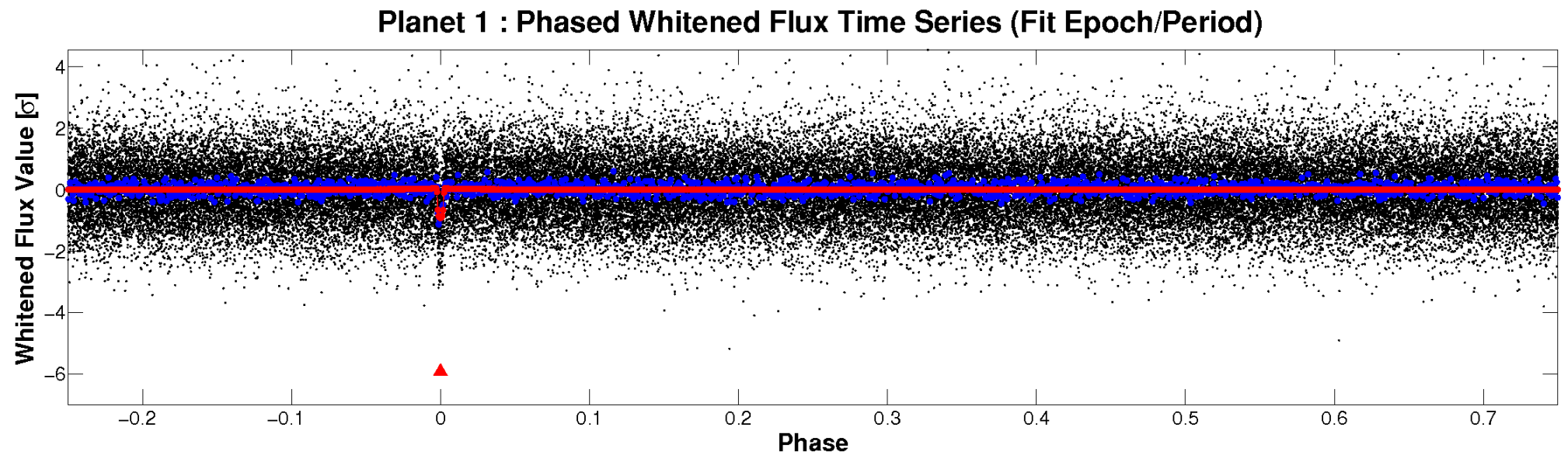
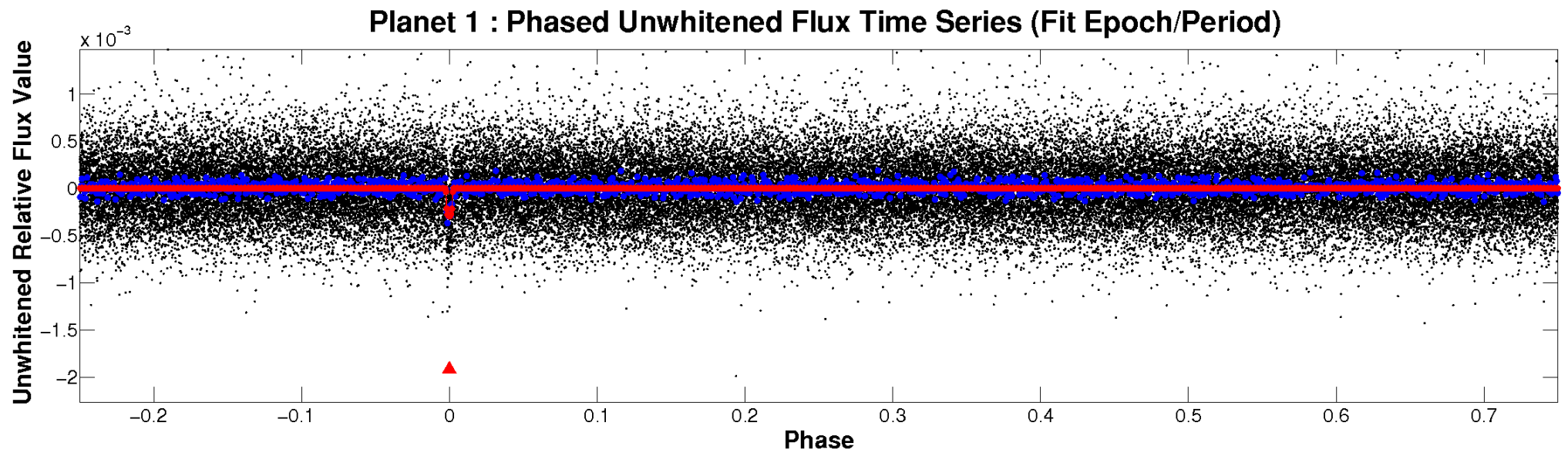


# ALT Odd/Even

TCE 004060229-01

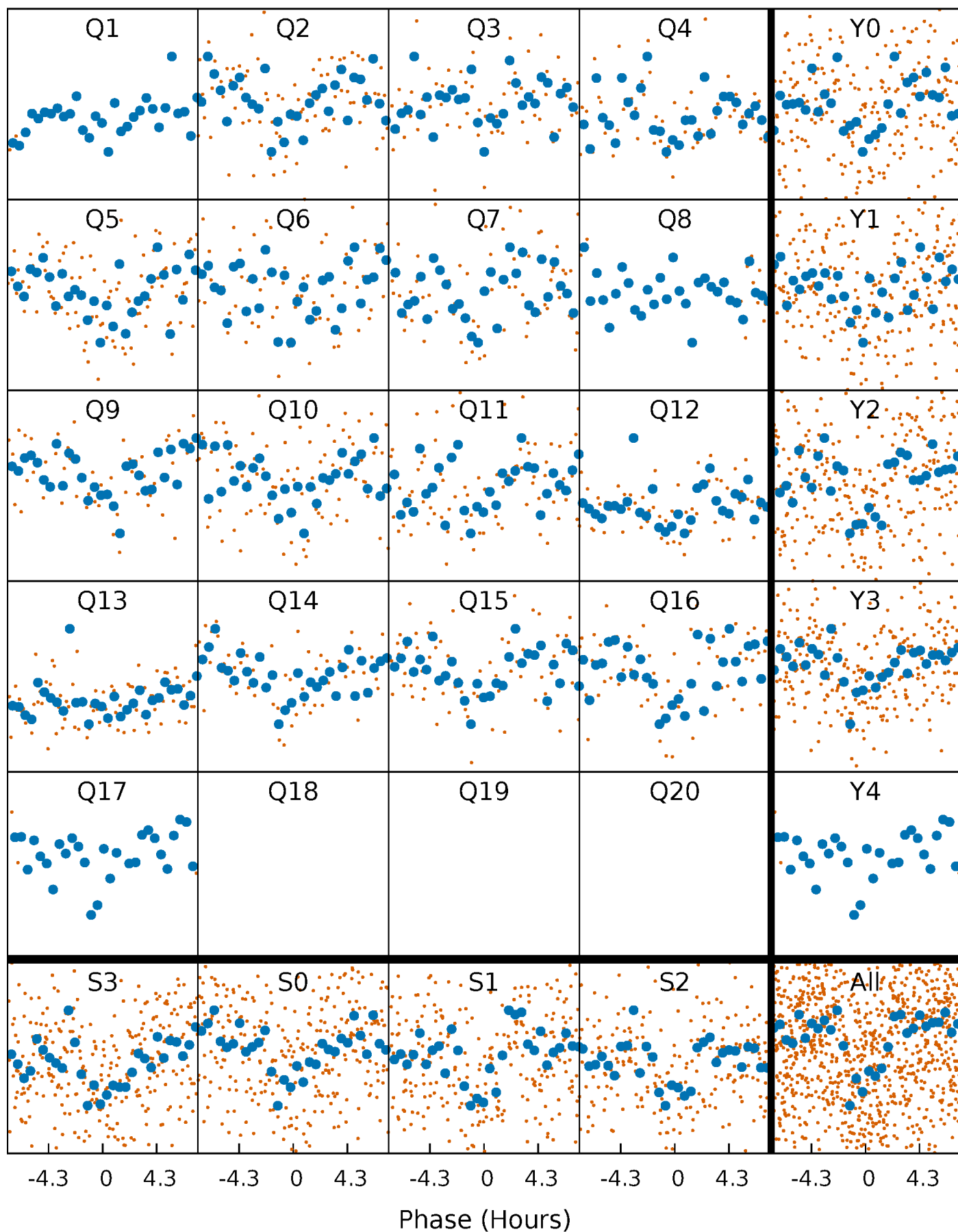


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

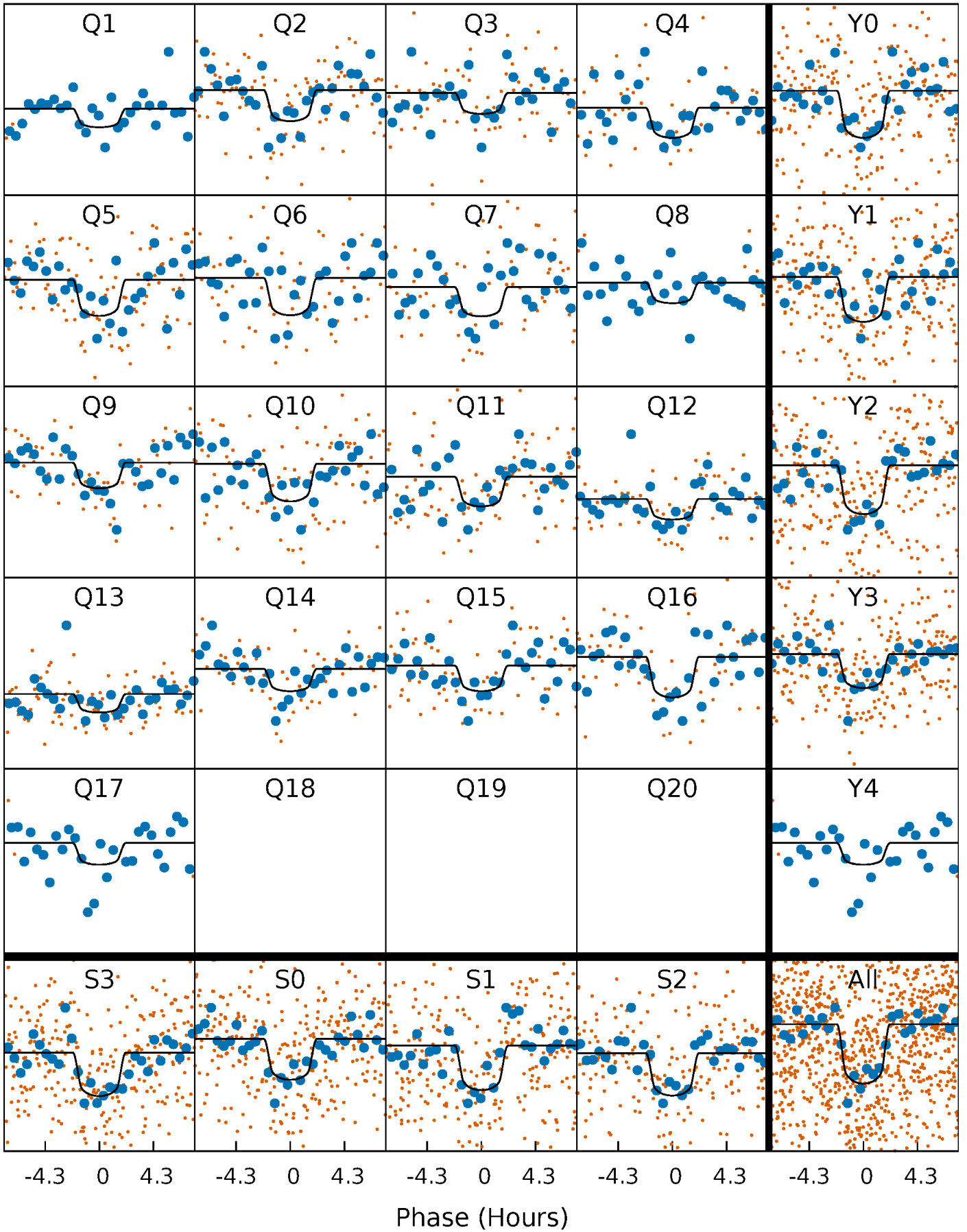
TCE 004060229-01 P= 35.017488 Days  $T_0=139.851416$  (BKJD)





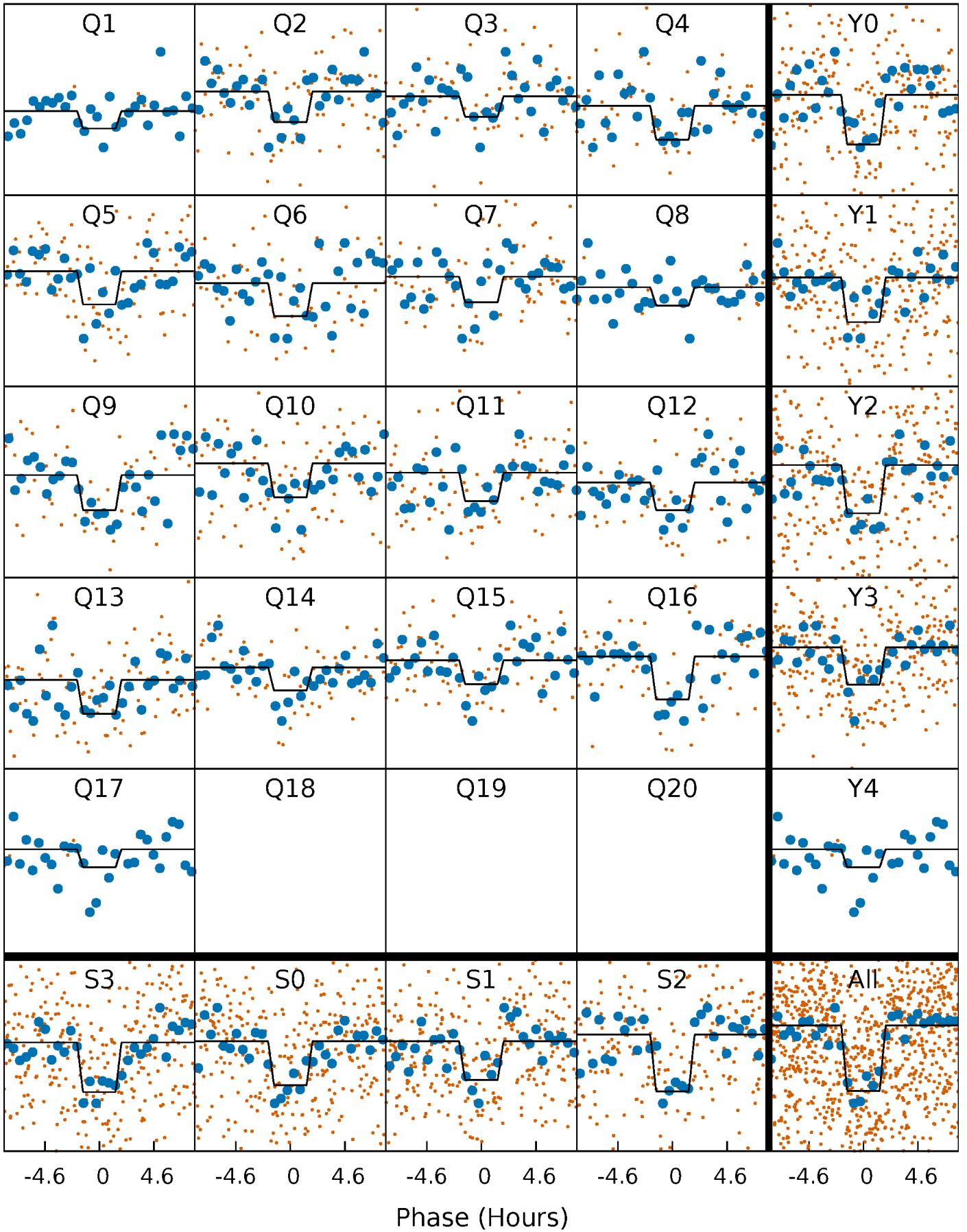
# DV Quarter-Phased Transit Curves

TCE 004060229-01 P= 35.017488 Days  $T_0=139.851416$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

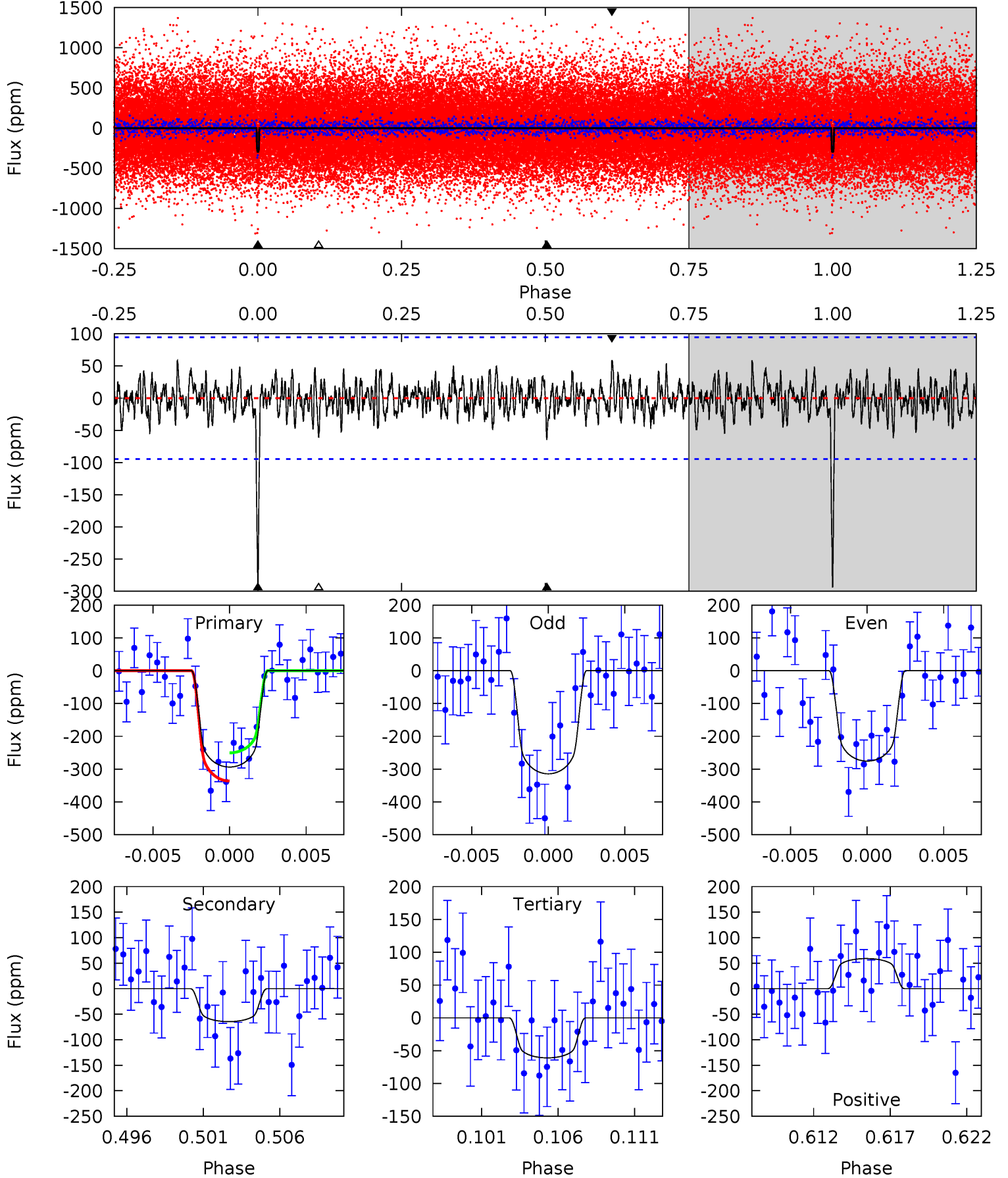
TCE 004060229-01 P= 35.017220 Days  $T_0=139.855229$  (BKJD)



# DV Model-Shift Uniqueness Test

004060229-01,  $P = 35.017488$  Days,  $E = 104.833928$  Days

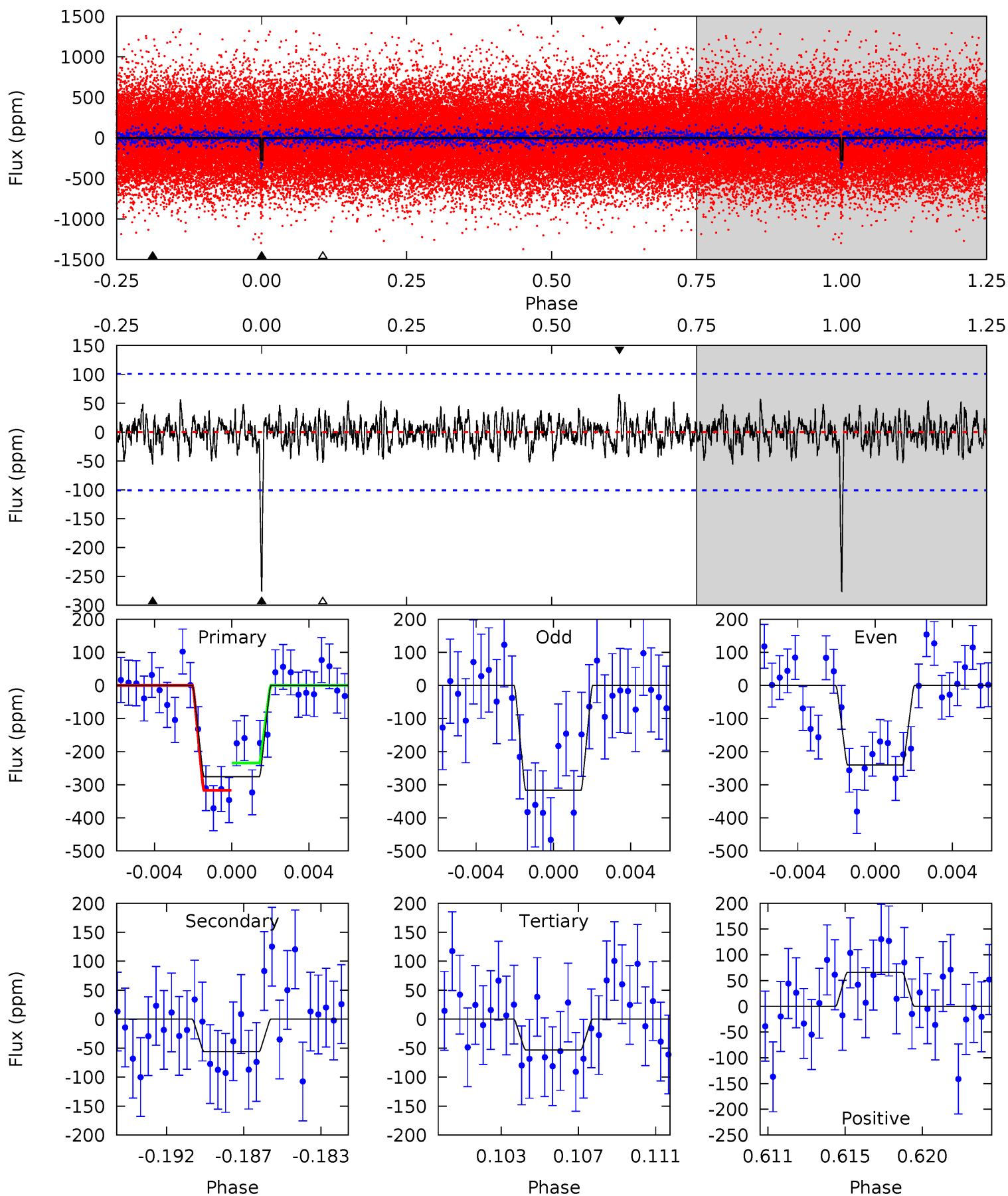
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	3.52	3.33	3.22	5.16	2.80	1.08	12.7	12.8	0.19	0.30	1.06	1.04	0.17	2.35



# Alt Model-Shift Uniqueness Test

004060229-01,  $P = 35.017220$  Days,  $E = 104.838009$  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
14.2	2.88	2.72	3.38	5.18	2.84	0.99	11.5	10.8	0.15	-0.51	1.96	1.06	0.19	2.12



### Stellar Parameters For KIC 004060229

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5944^{+71}_{-80}$	$4.293^{+0.156}_{-0.104}$	$-0.320^{+0.150}_{-0.150}$	$1.123^{+0.173}_{-0.190}$	$0.905^{+0.063}_{-0.051}$	$0.899^{+0.651}_{-0.272}$
	+1%/-1%	+4%/-2%	+47%/-47%	+15%/-17%	+7%/-6%	+72%/-30%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 004060229-01 / KOI 4570.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-65 \pm 18$	$2.26^{+0.83}_{-0.84}$	$858^{+35}_{-41}$	$4169^{+816}_{-510}$	$280^{+469}_{-146}$
Alt.	$-56 \pm 19$	$1.99^{+0.87}_{-0.82}$	$861^{+37}_{-46}$	$4235^{+985}_{-537}$	$316^{+575}_{-180}$

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



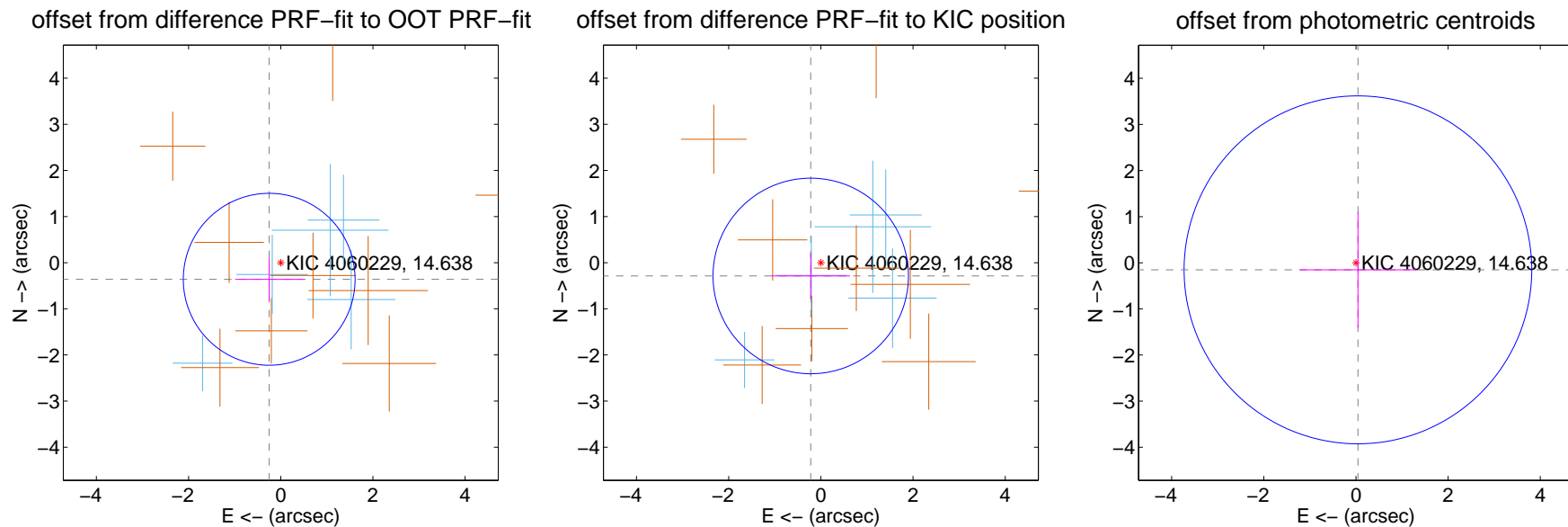
## DV Centroid Data

Supplemental centroid analysis for 004060229-01. Kepler magnitude: 14.64. Transit SNR 12.86

There are 5 quarters with good PRF difference image offsets

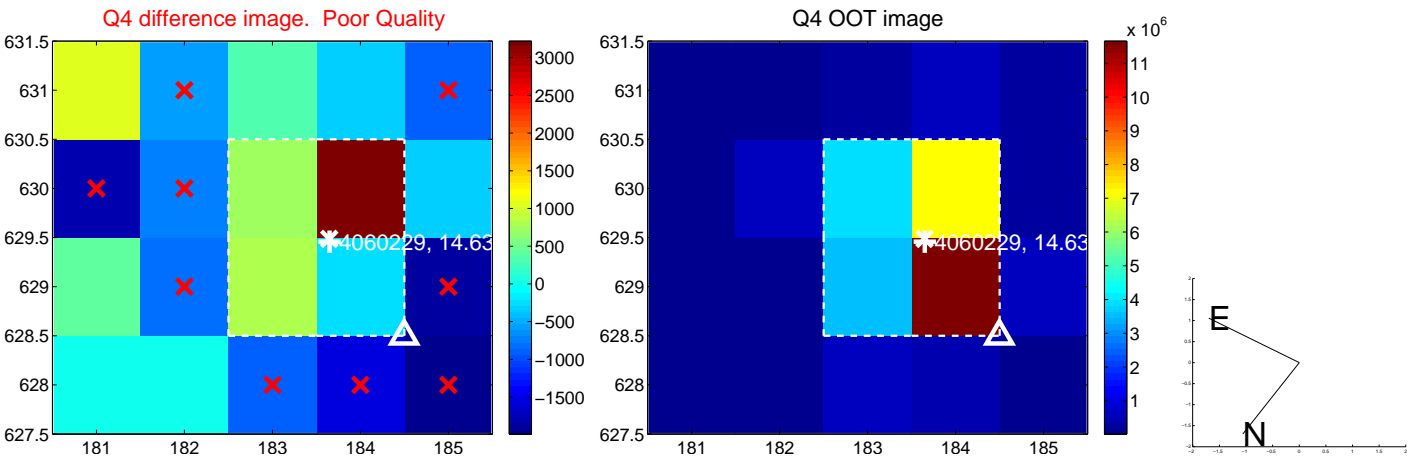
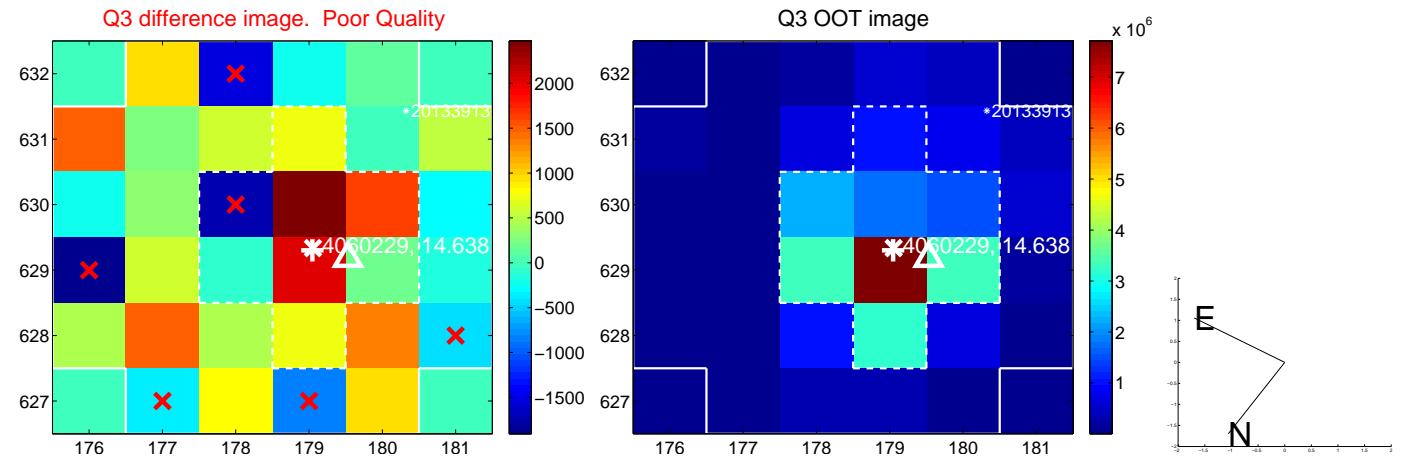
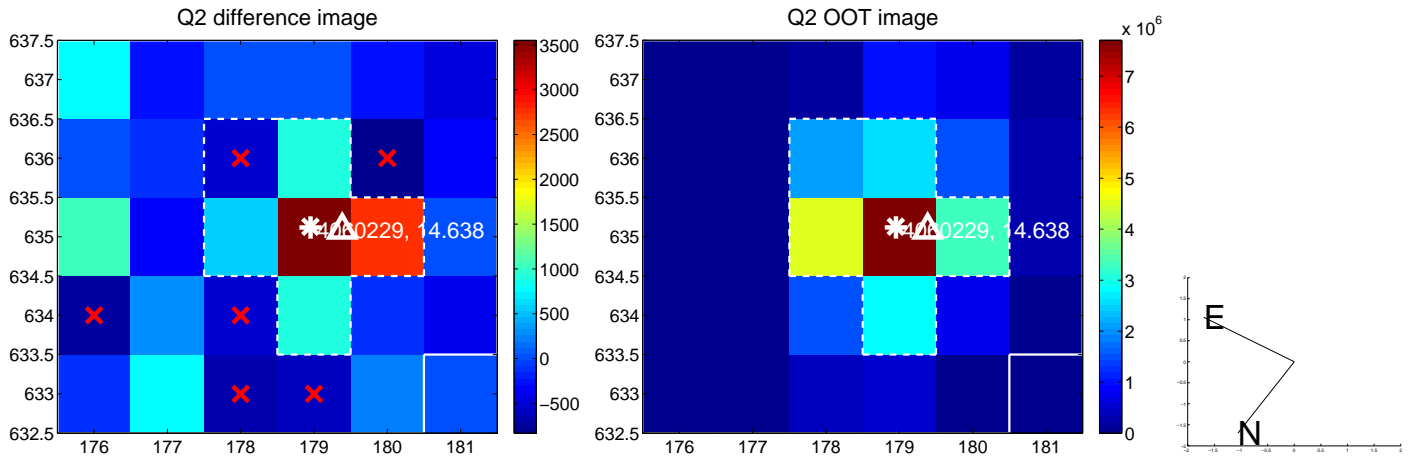
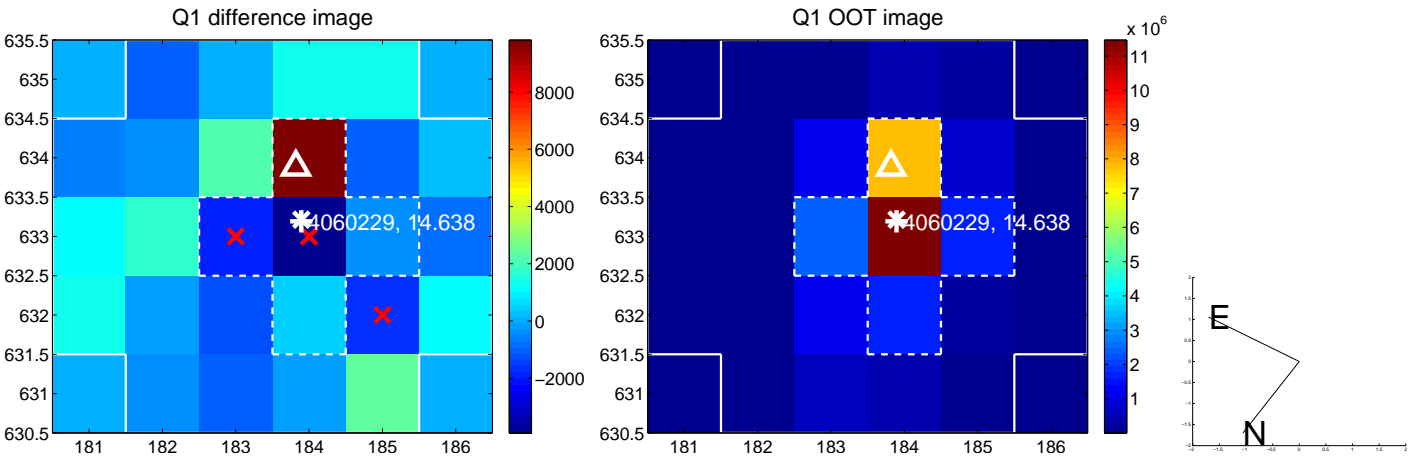
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.438 \pm 0.621$	0.71	$0.251 \pm 0.738$	$-0.360 \pm 0.469$
PRF-fit source offset from KIC position	$0.362 \pm 0.706$	0.51	$0.220 \pm 0.853$	$-0.287 \pm 0.502$
photometric centroid source offset	$0.16 \pm 1.26$	0.13	$-0.04 \pm 1.26$	$-0.15 \pm 1.26$

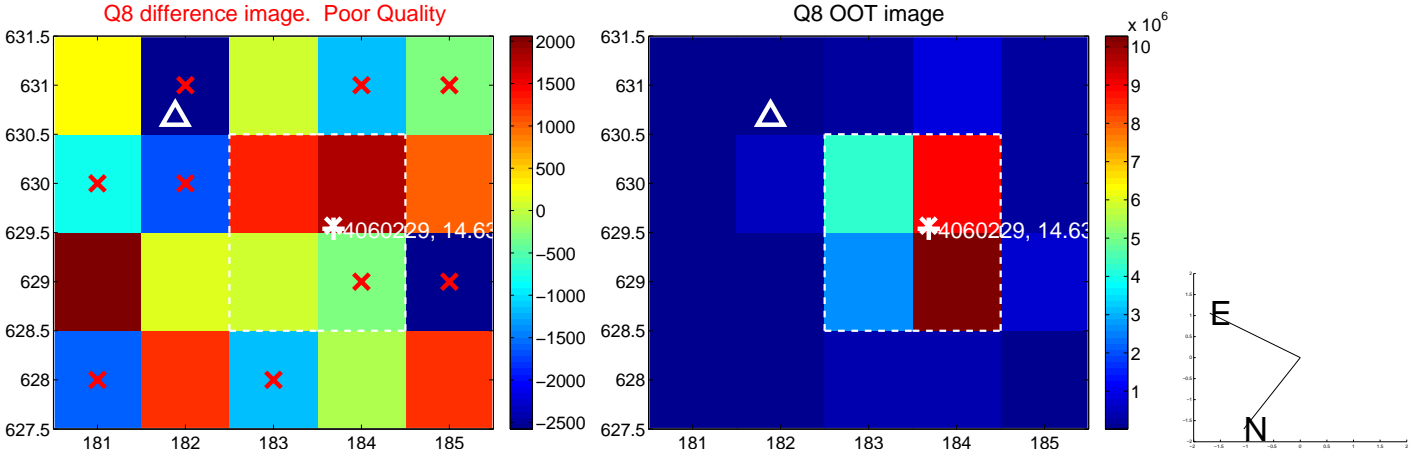
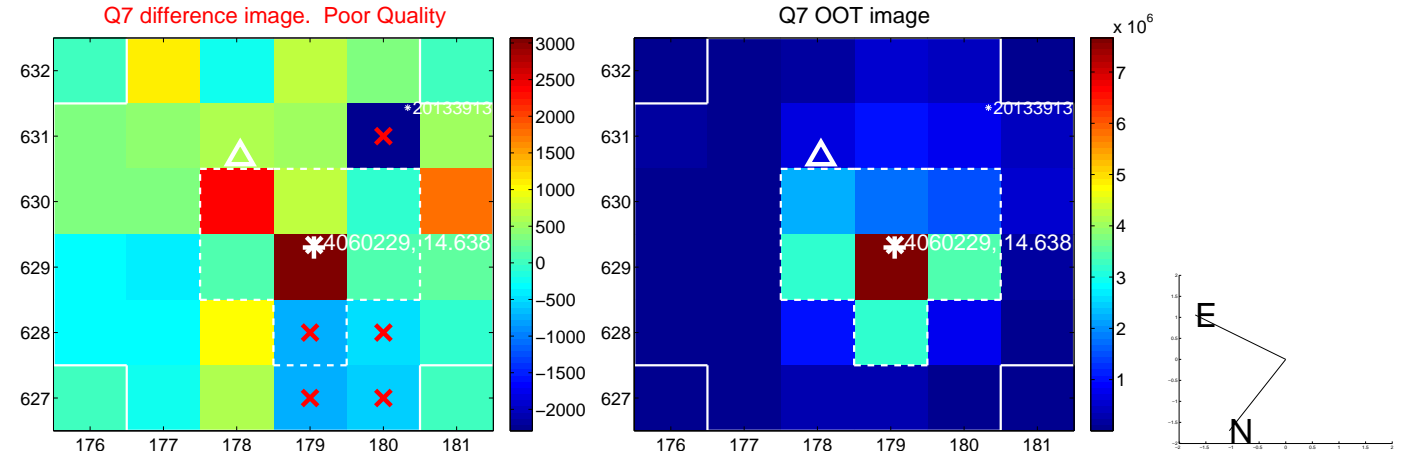
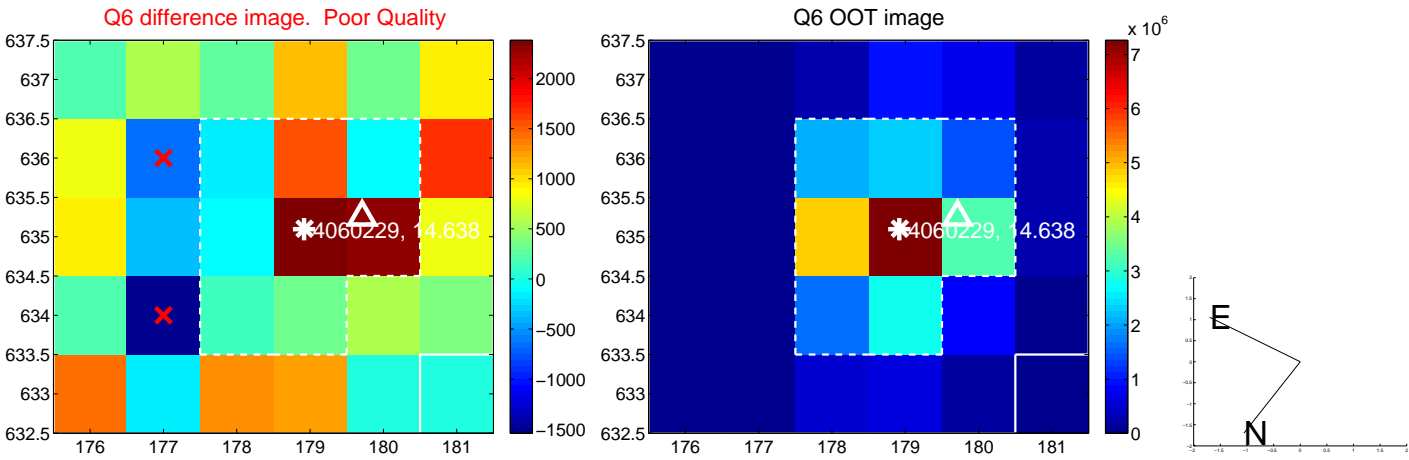
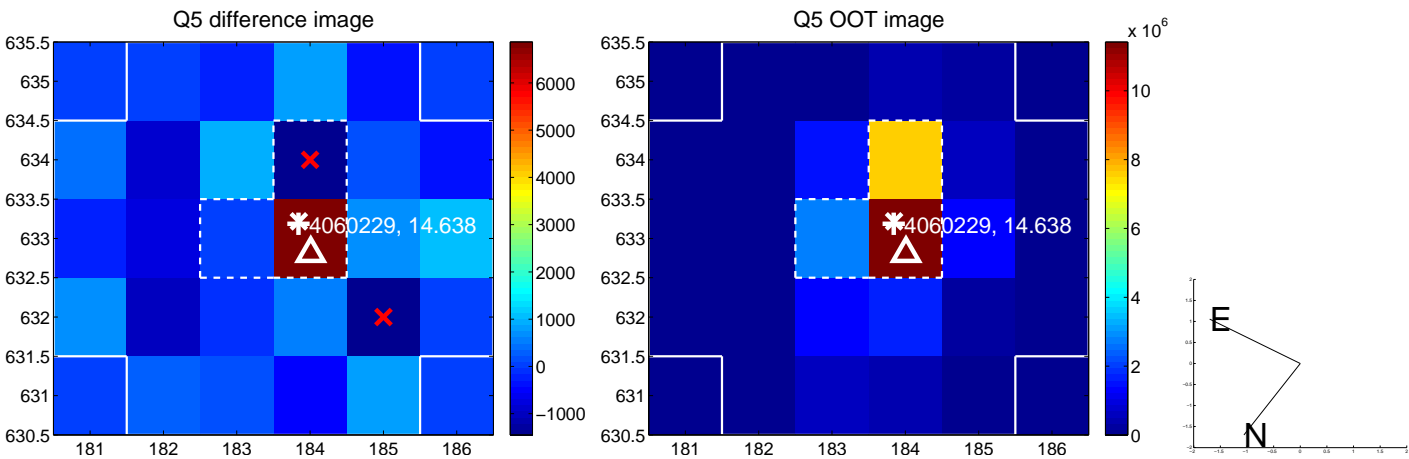


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

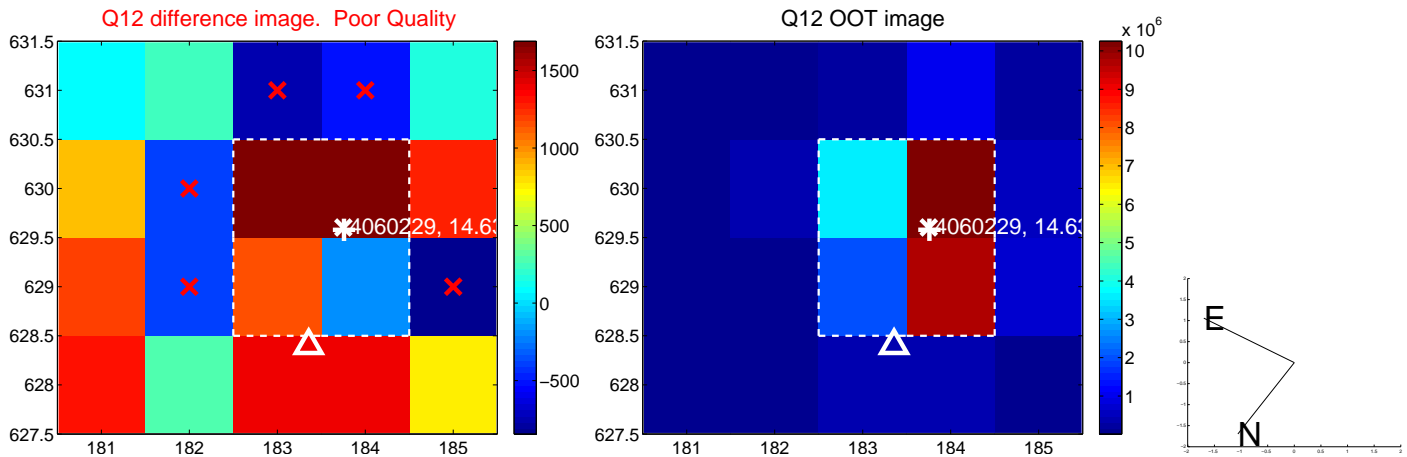
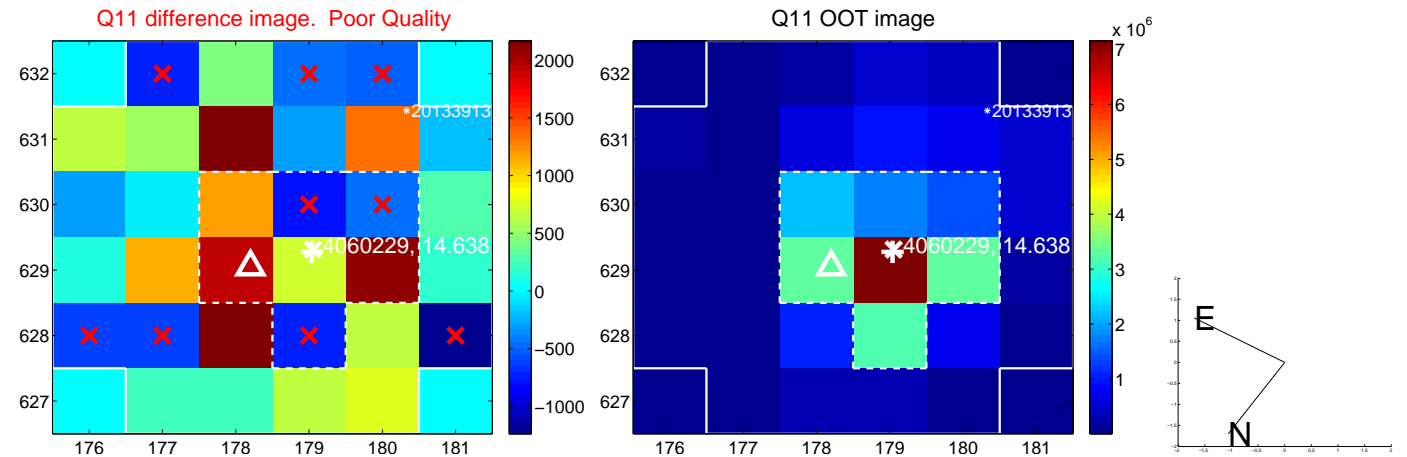
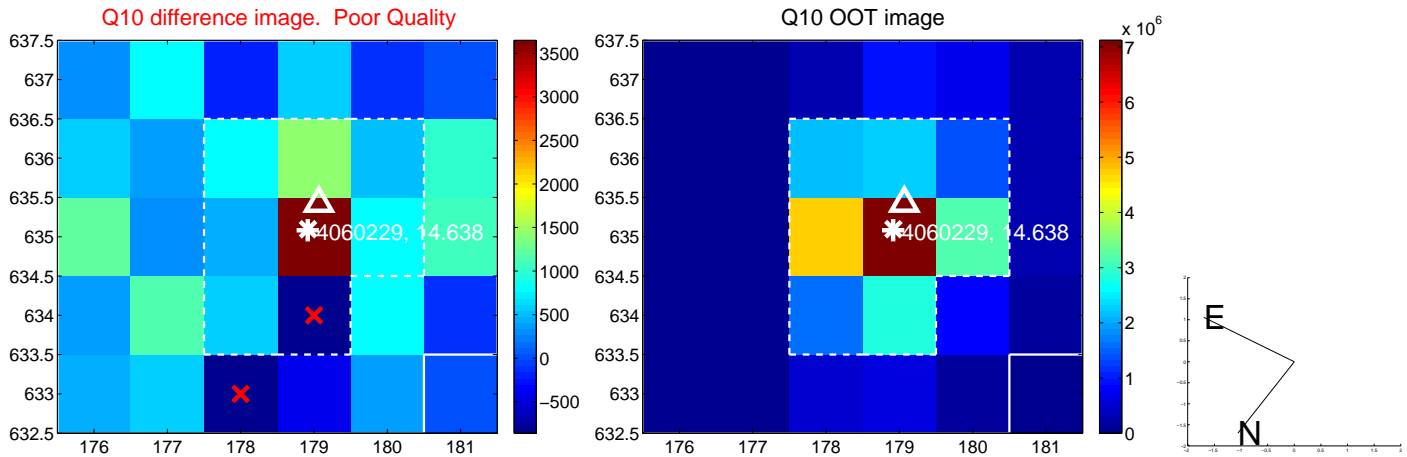
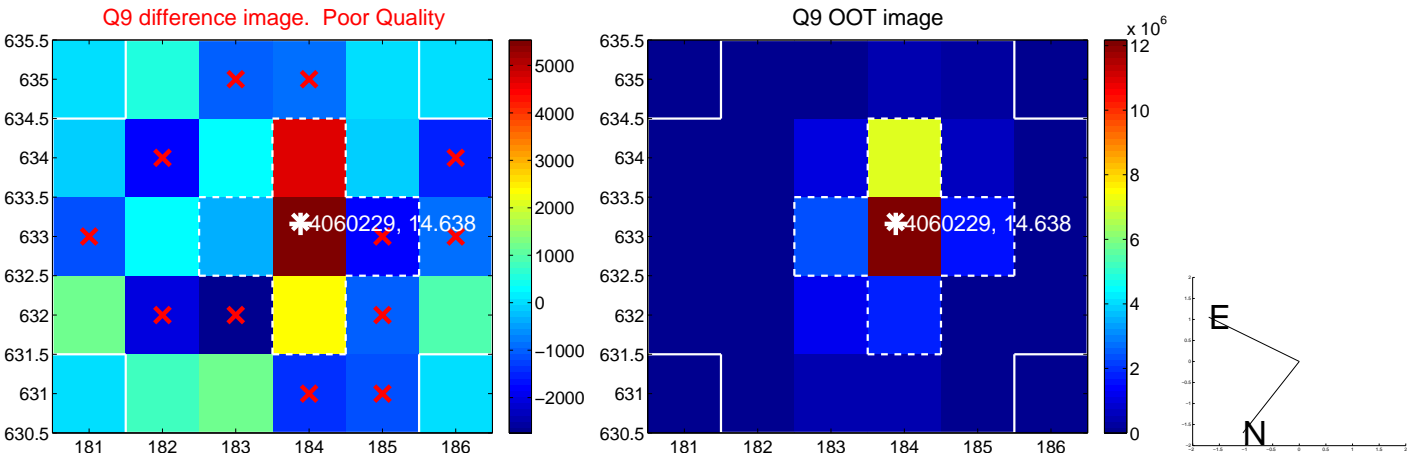
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



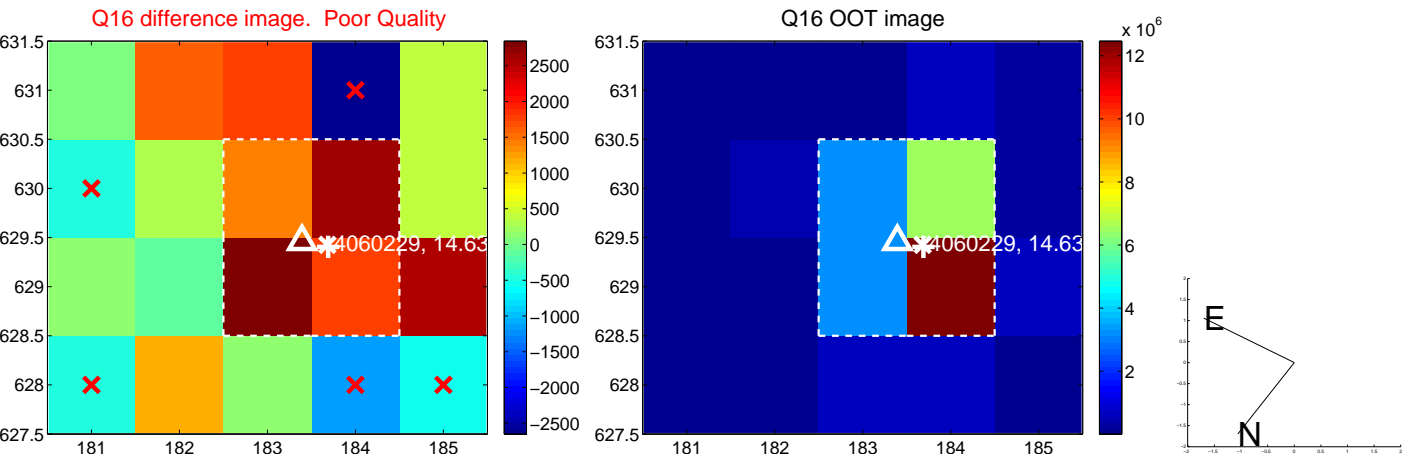
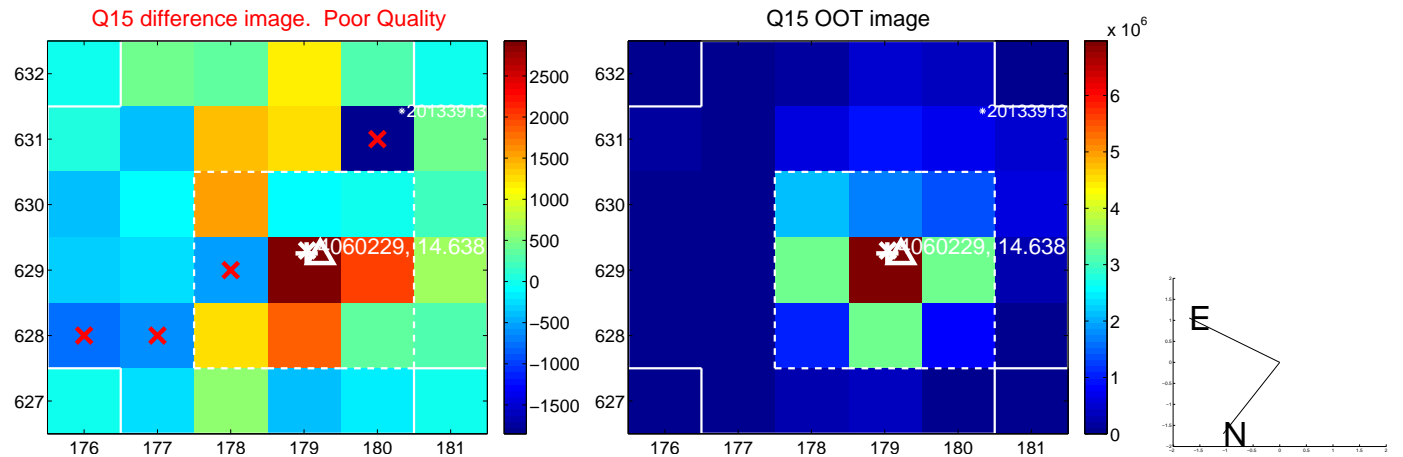
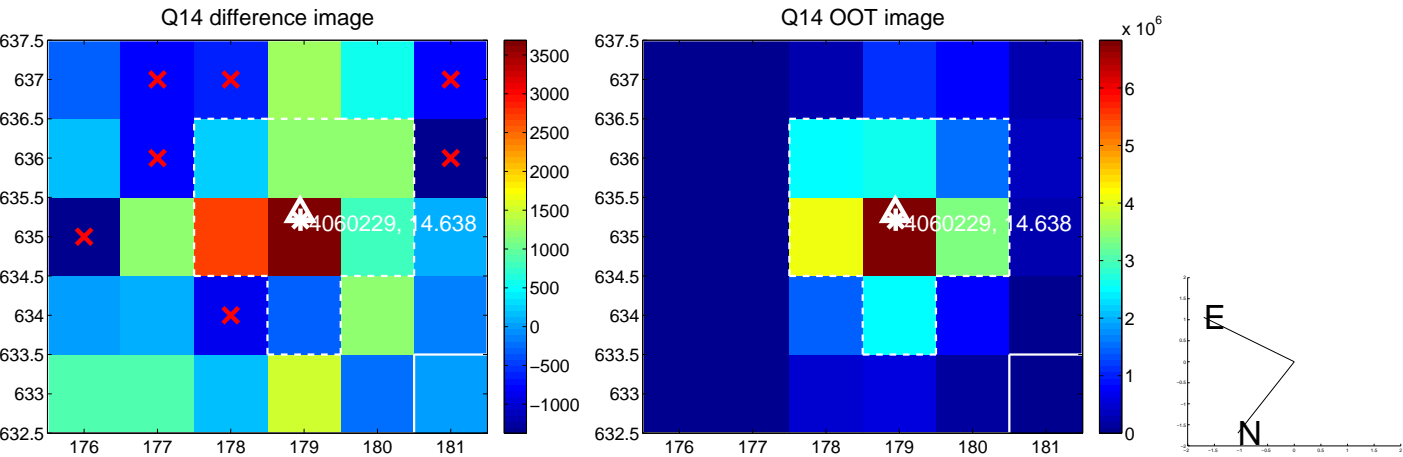
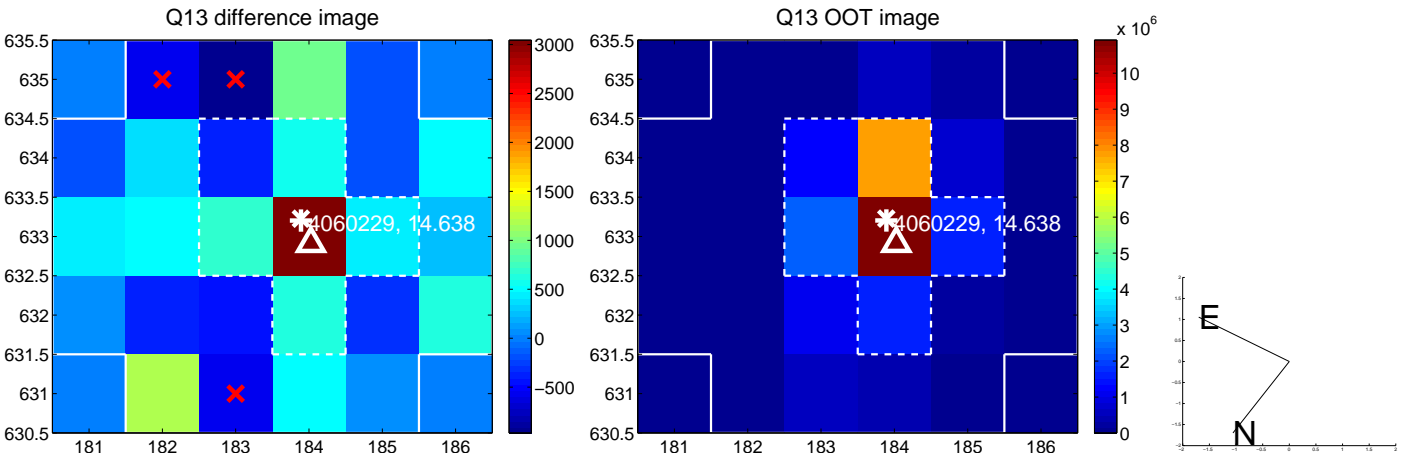
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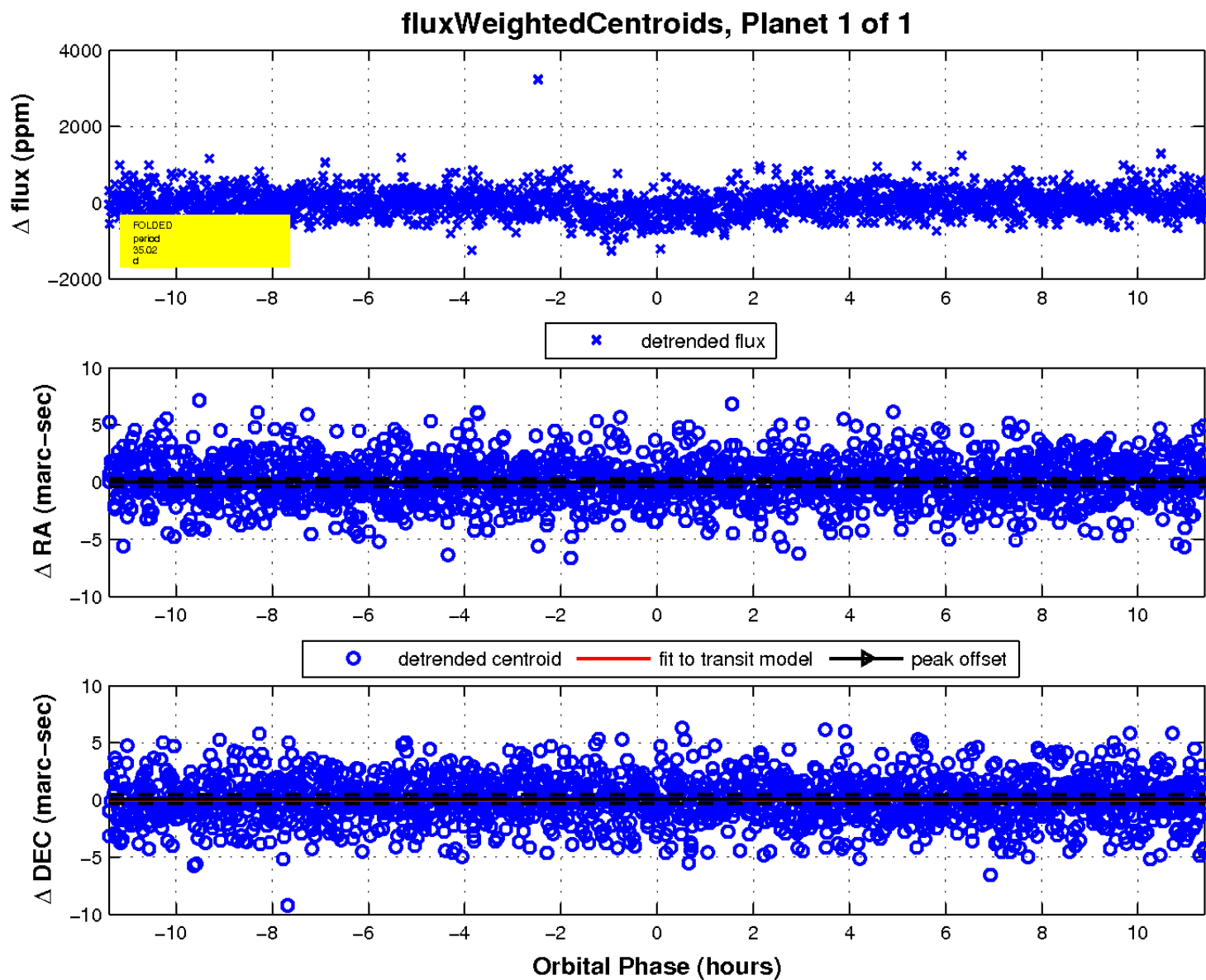
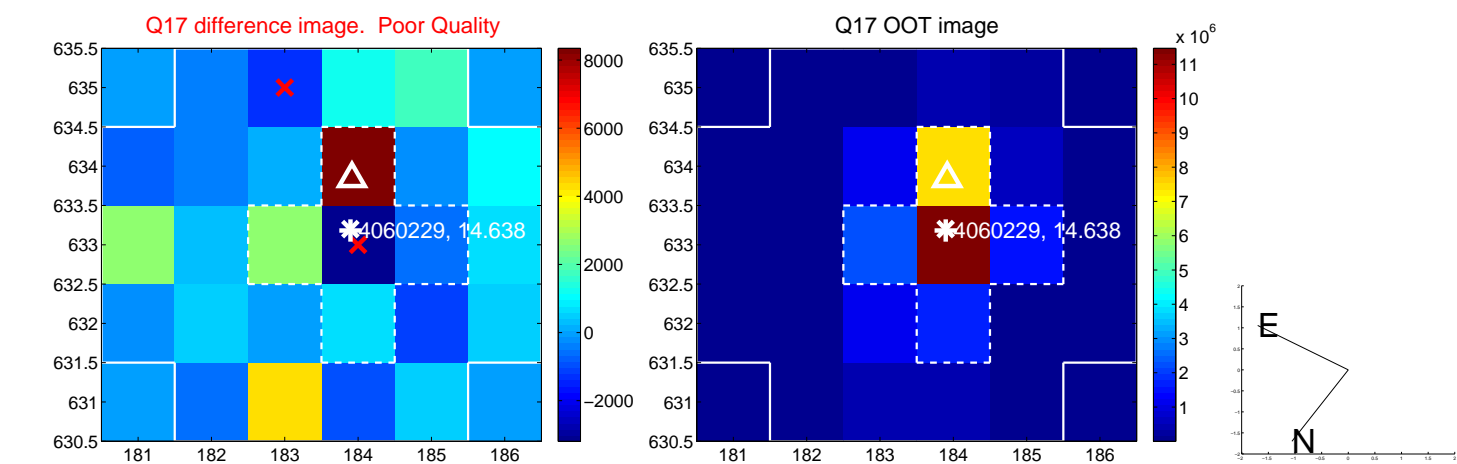


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

