

# KIC 011199438

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011199438-01	OBS	No	585.339433	187.236839	11795.1	16.060	13.1	25.7	1.00	6025	19.18	0.60
011199438-02	OBS	No	581.934591	191.508334	2707.2	1.106	30.9	5.3	1.00	6025	5.22	0.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011199438-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011199438-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

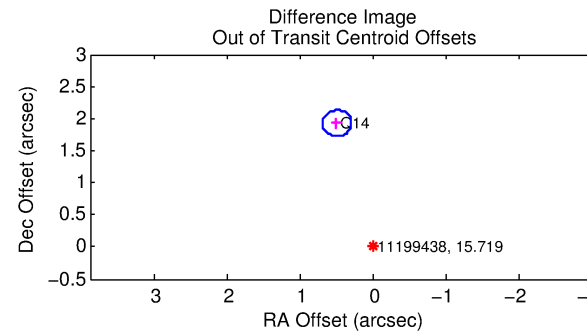
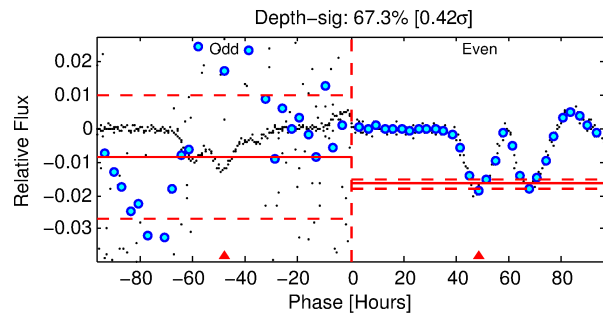
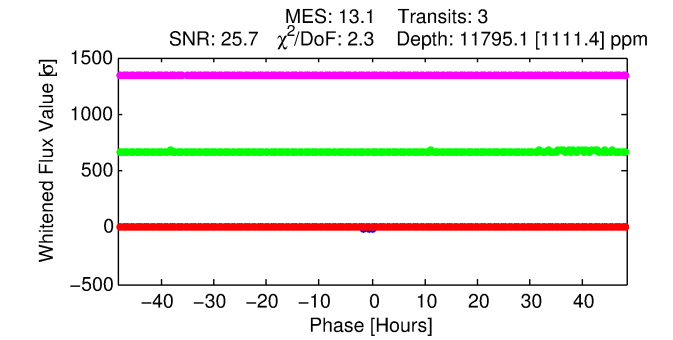
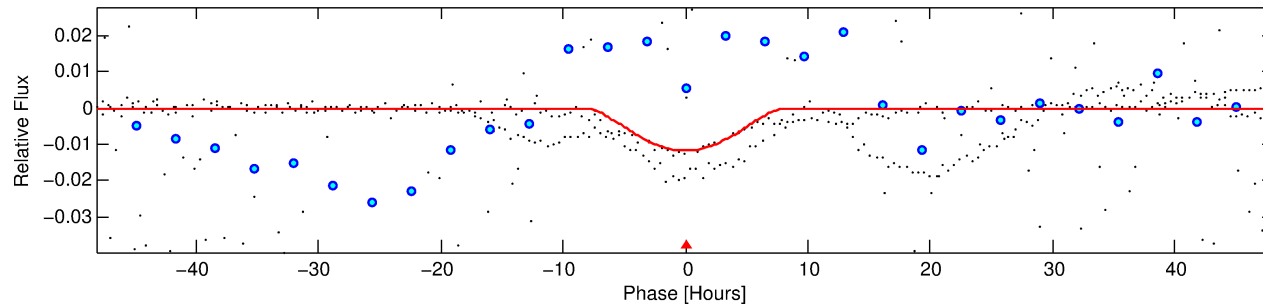
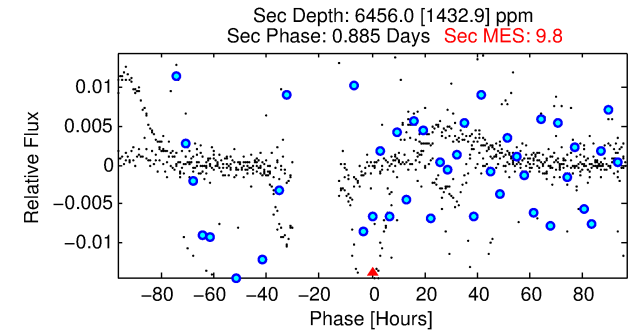
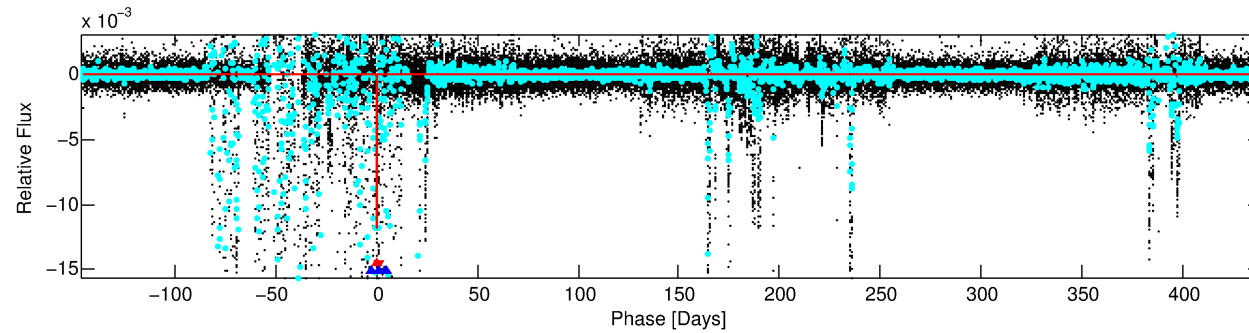
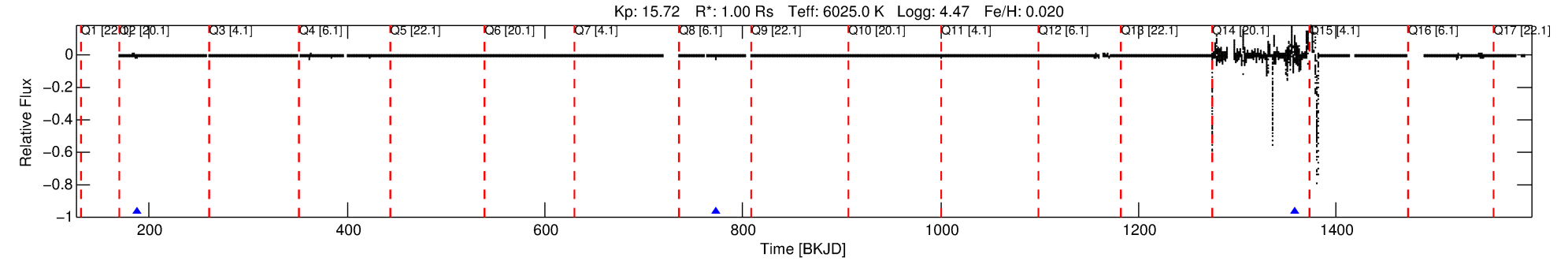
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011199438-01

No Significant Match Found

# DV One-Page Summary

KIC: 11199438 Candidate: 1 of 2 Period: 585.339 d



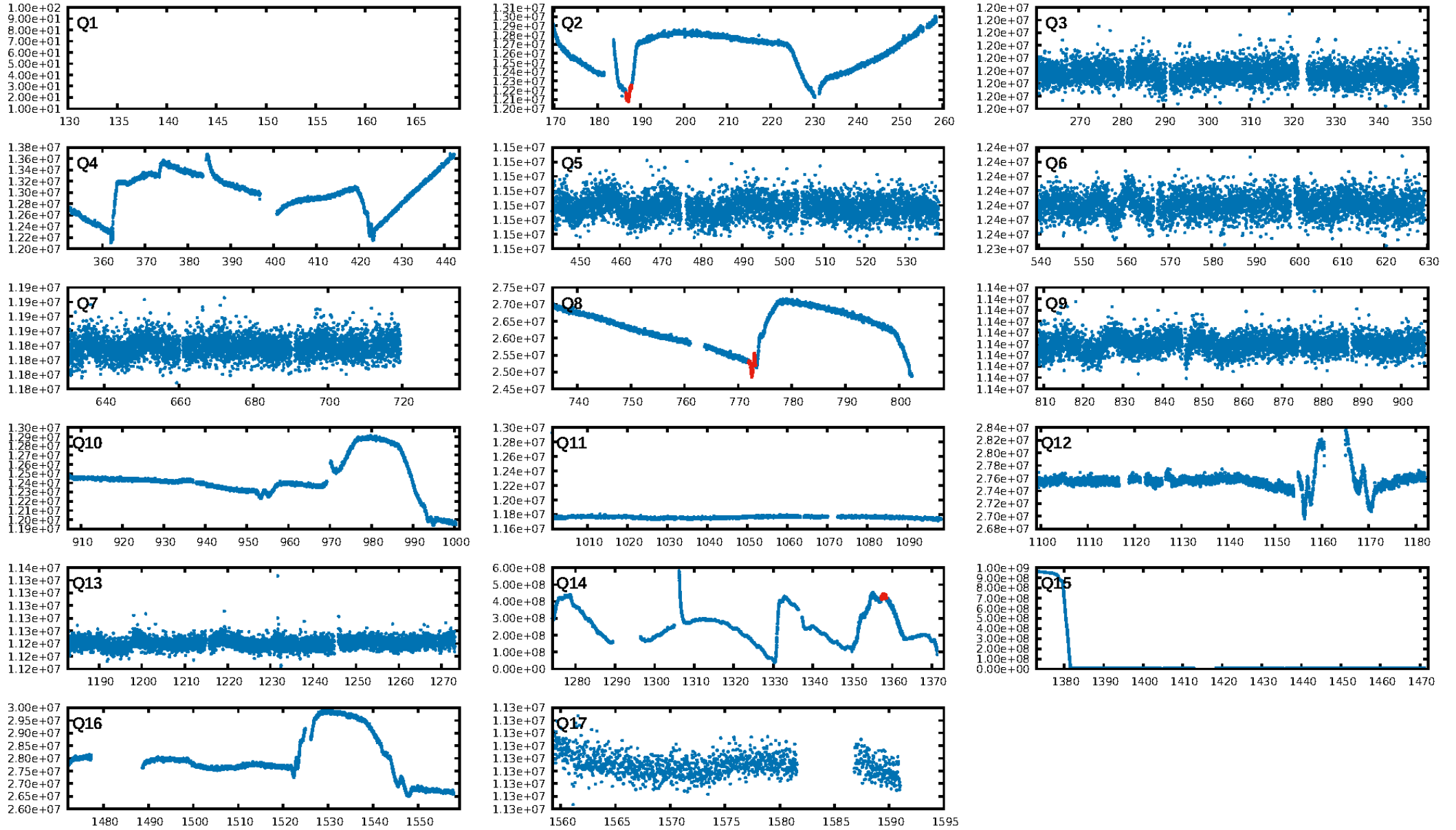
## DV Fit Results:

Period = 585.33943 [0.01917] d  
Epoch = 187.2368 [0.0129] BKJD  
Rp/R\* = 0.1759 [0.3200]  
a/R\* = 173.20 [43.84]  
b = 1.00 [0.46]  
Seff = 0.60 [0.25]  
Teq = 224 [23] K  
Rp = 19.17 [35.34] Re  
a = 1.4050 [0.3568] AU  
Ag = 19069.16 [69880.58] [0.27σ]  
Teffp = 4072 [3715] K [1.04σ]

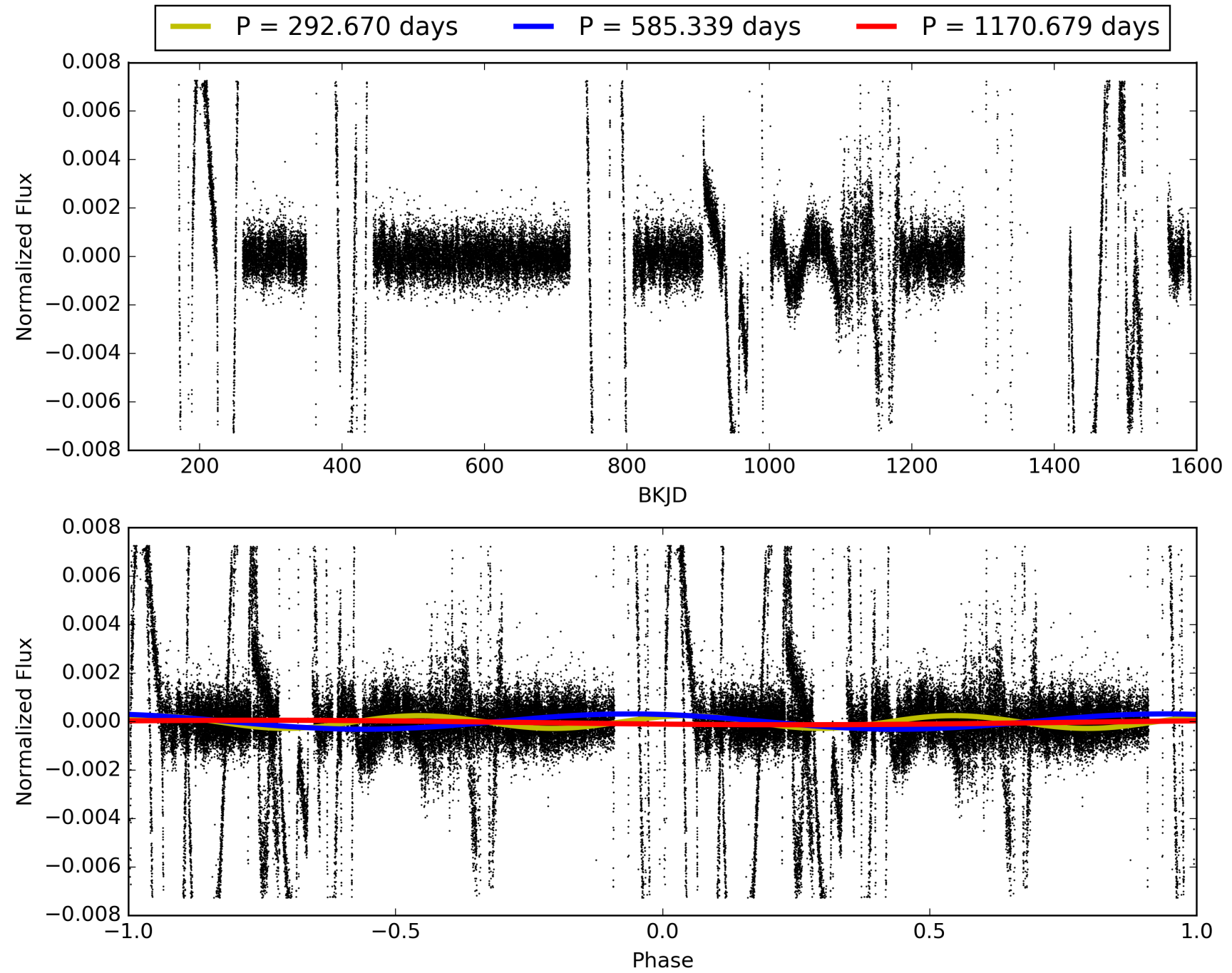
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.08σ]  
LongPeriod-sig: N/A  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 24.7%  
**Bootstrap-pfa: 3.76e-05**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: -0.09733**  
Centroid-sig: N/A  
Centroid-so: 6.681 arcsec [0.92σ]  
**OotOffset-rm: 1.991 arcsec [29.79σ]**  
**KicOffset-rm: 4.268 arcsec [63.88σ]**  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.67 [2/3]

# TCE 011199438-01, PDC Light Curves

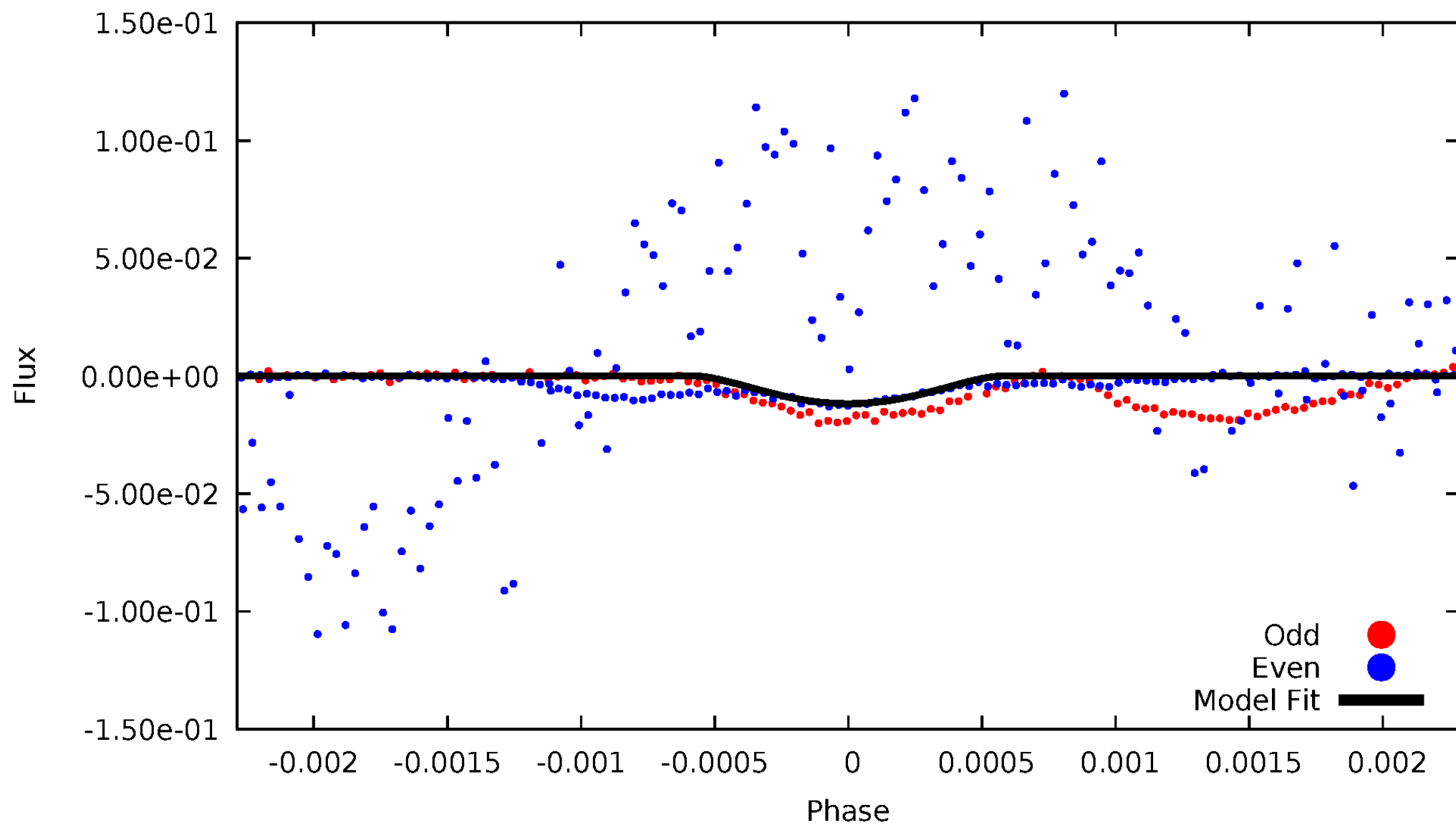


# TCE 011199438-01



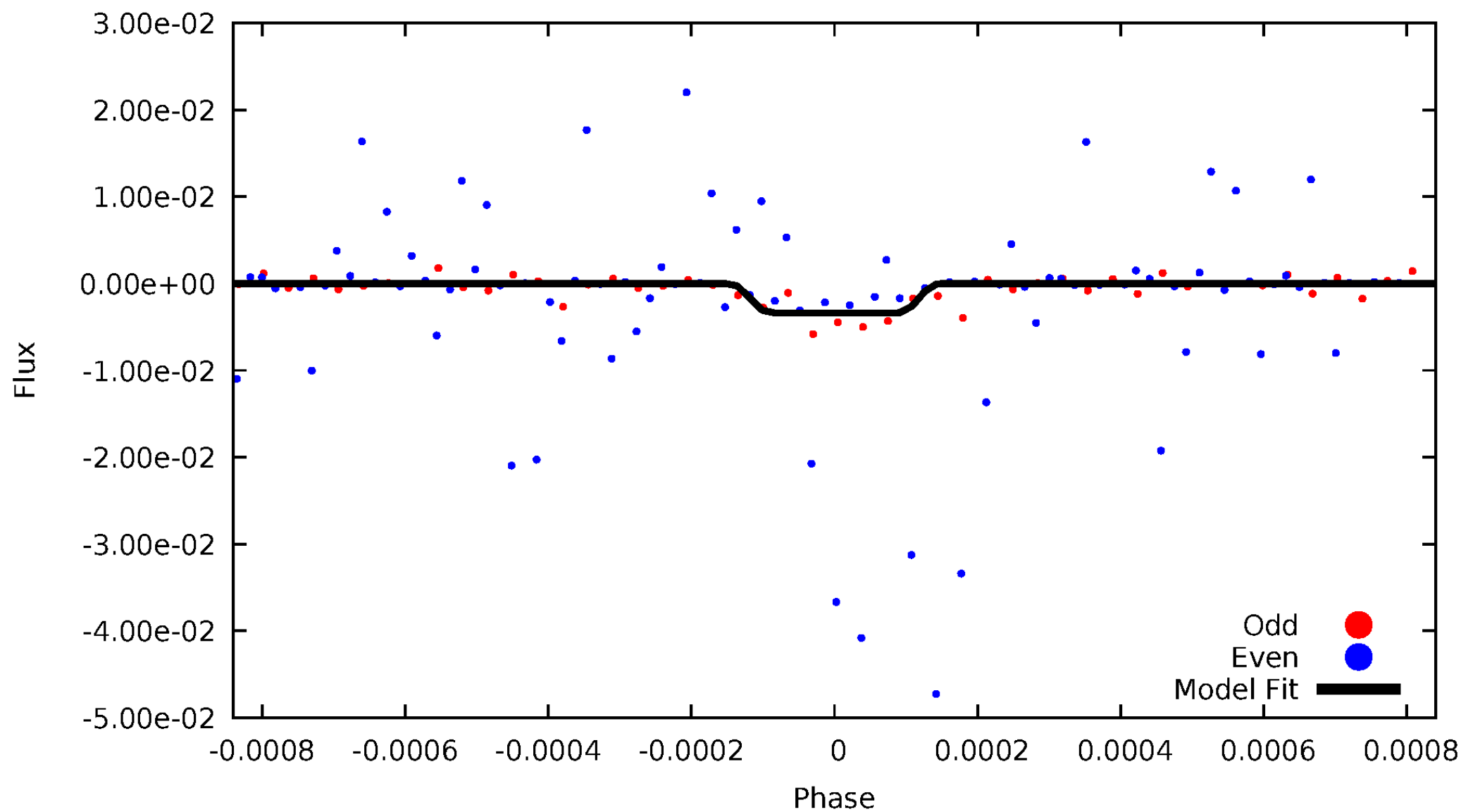
# DV Odd/Even

TCE 011199438-01



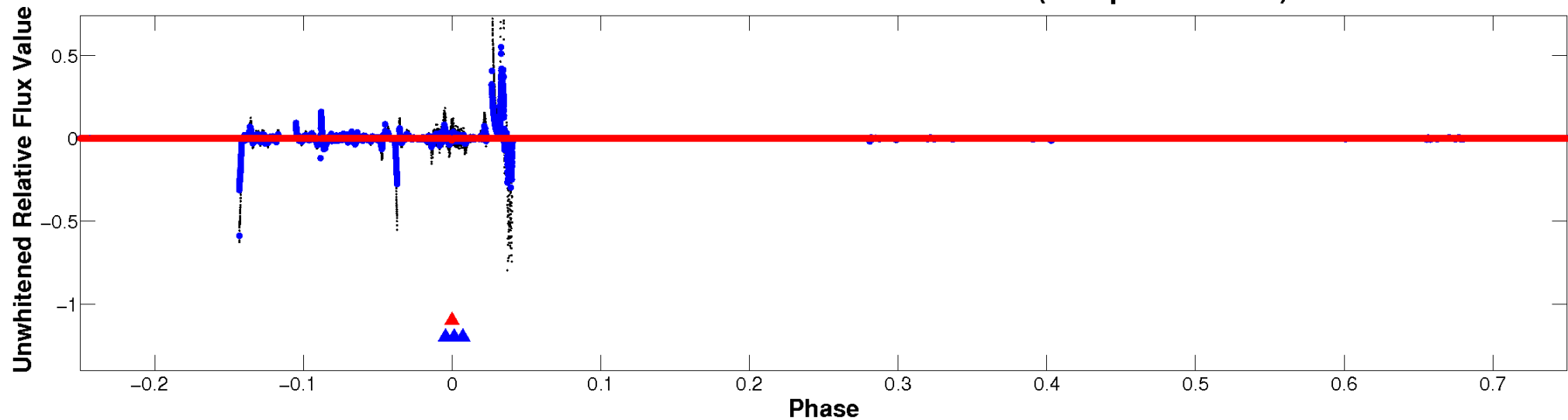
# ALT Odd/Even

TCE 011199438-01

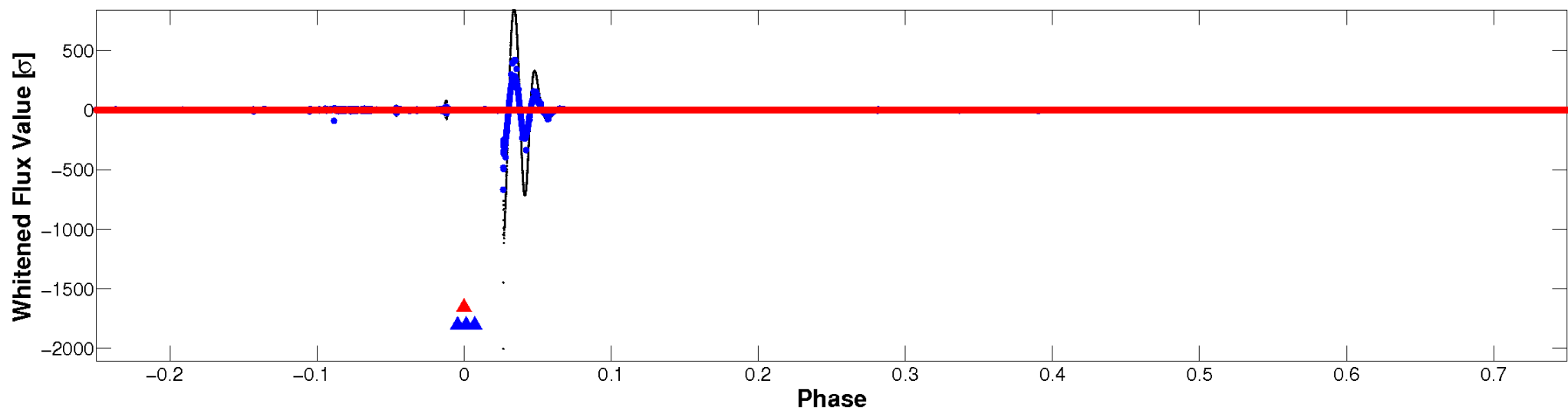


# Non-Whitened Vs. Whitened Light Curve

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

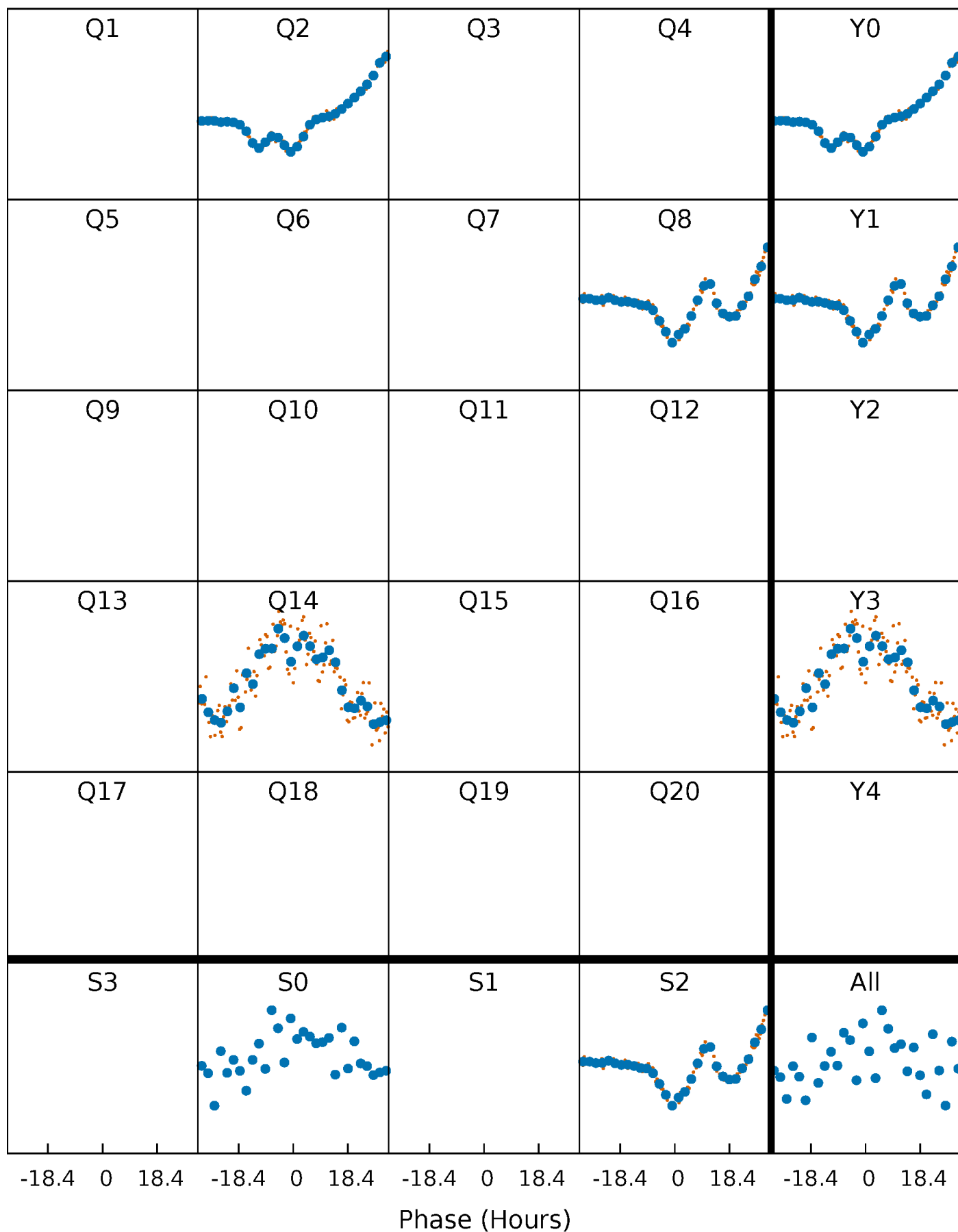


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

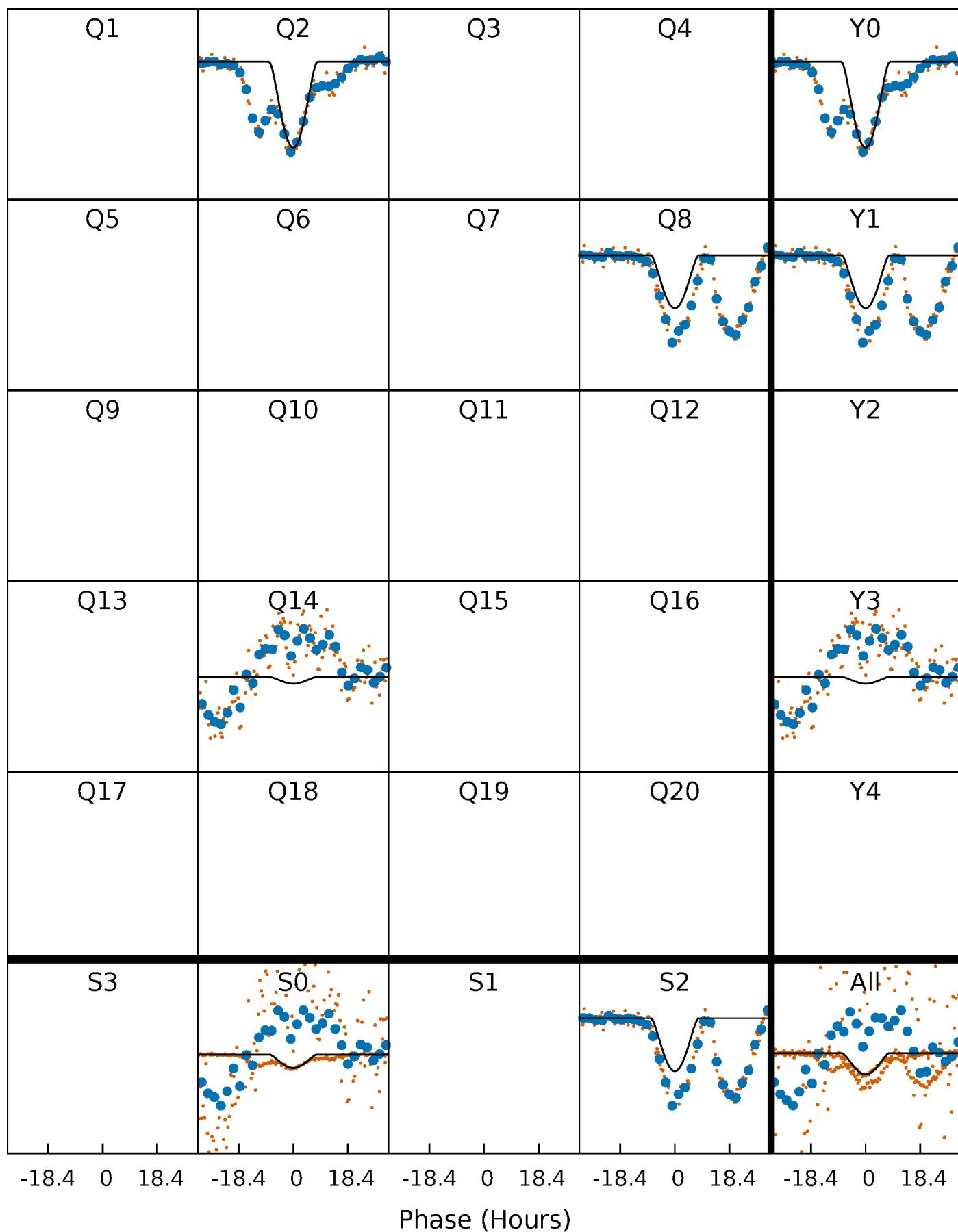
TCE 011199438-01 P=585.339433 Days  $T_0=187.236839$  (BKJD)





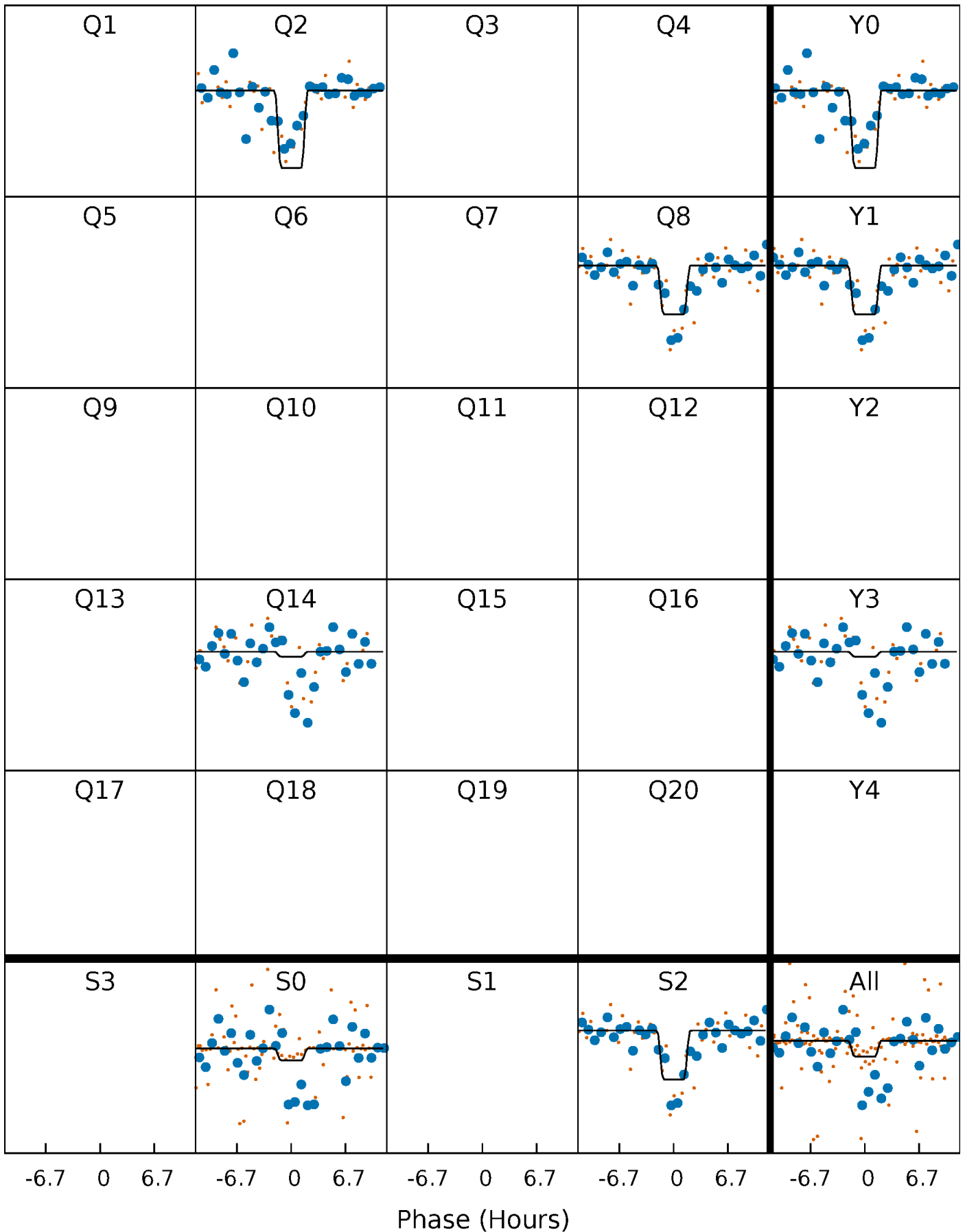
# DV Quarter-Phased Transit Curves

TCE 011199438-01 P=585.339433 Days  $T_0=187.236839$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

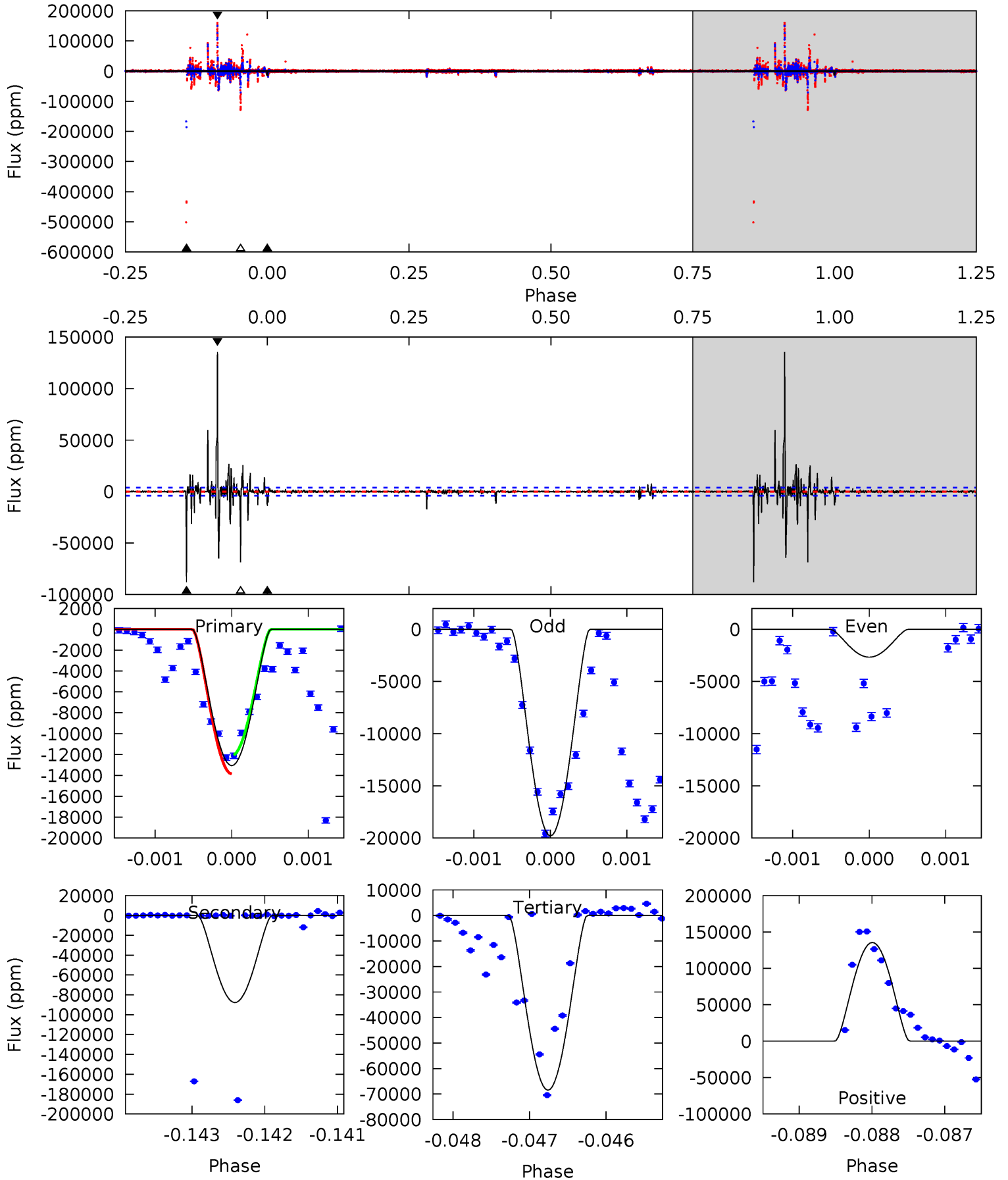
TCE 011199438-01 P=585.305704 Days  $T_0=187.223360$  (BKJD)



# DV Model-Shift Uniqueness Test

011199438-01, P = 585.339433 Days, E = 187.236839 Days

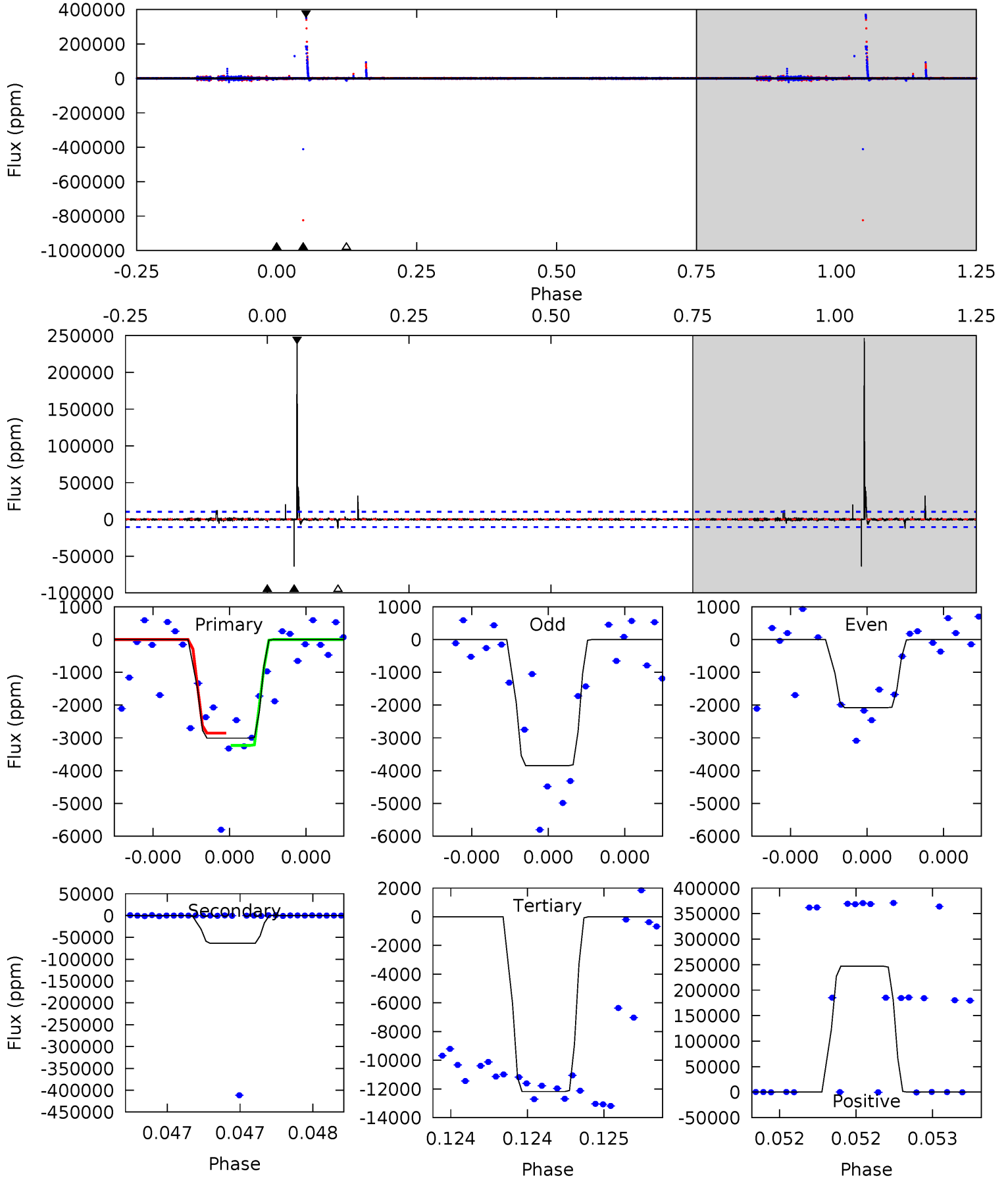
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.3	123.1	96.0	190.1	5.43	3.26	5.69	-77.7	-171.7	27.0	-67.0	4.45	-1.45	0.61	1.23



# Alt Model-Shift Uniqueness Test

011199438-01, P = 585.305704 Days, E = 187.223360 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
1.63	34.6	6.62	134.1	5.67	3.63	2.60	-4.98	-132.4	28.0	-99.4	0.06	1.97	0.79	0.11



### Stellar Parameters For KIC 011199438

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6025^{+217}_{-265}$	$4.472^{+0.052}_{-0.208}$	$0.020^{+0.250}_{-0.300}$	$0.999^{+0.296}_{-0.127}$	$1.080^{+0.130}_{-0.145}$	$1.524^{+0.427}_{-0.797}$
	+4%/-4%	+1%/-5%	+1250%/-1500%	+30%/-13%	+12%/-13%	+28%/-52%
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 011199438-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-87790 \pm 713$	$33.68^{+31.03}_{-22.42}$	$321^{+24}_{-19}$	$6176^{+6567}_{-1558}$	$93630^{+686499}_{-69332}$
Alt.	$-63678 \pm 1840$	$26.86^{+29.22}_{-18.89}$	$321^{+23}_{-20}$	$6268^{+8200}_{-1715}$	$99838^{+1121056}_{-76786}$

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

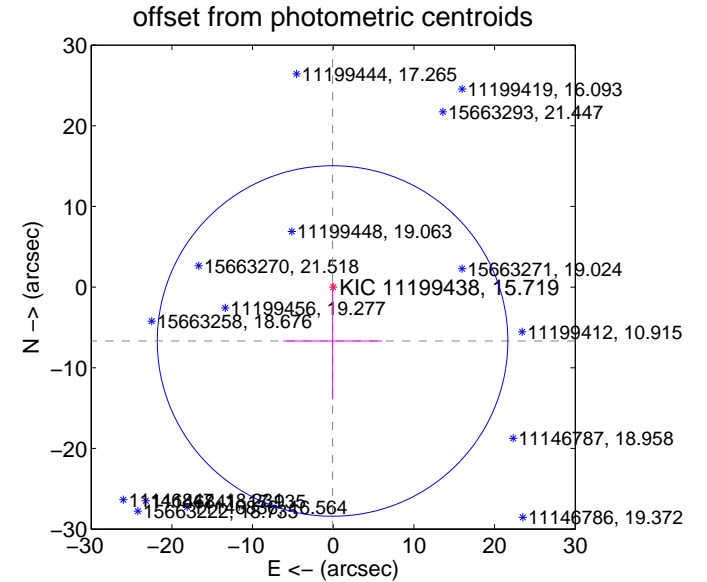
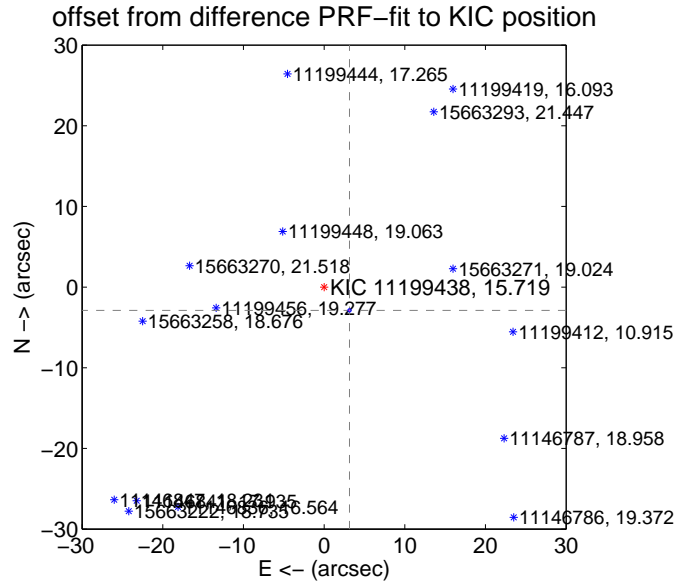
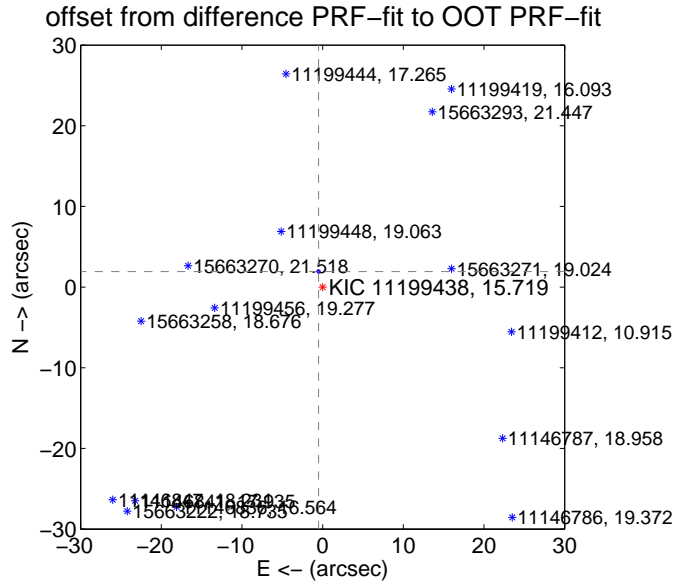
## DV Centroid Data

Supplemental centroid analysis for 011199438-01. Kepler magnitude: 15.72. Transit SNR 25.74

There are 0 quarters with good PRF difference image offsets

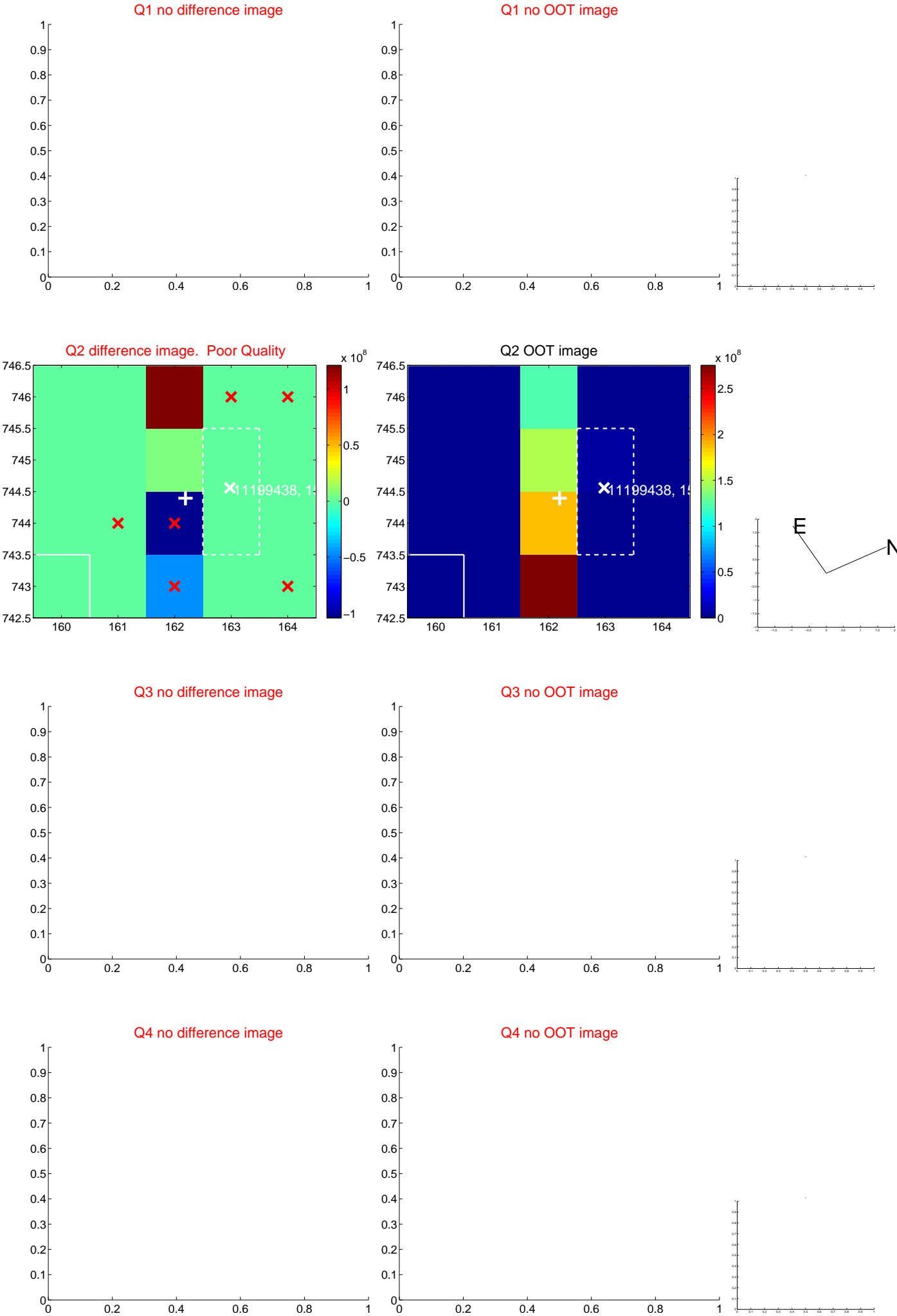
The OOT PRF centroid is offset from the target star catalog position by about 6.04 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.991 \pm 0.067$	29.79	$0.504 \pm 0.067$	$1.926 \pm 0.067$
PRF-fit source offset from KIC position	$4.268 \pm 0.067$	63.88	$-3.144 \pm 0.067$	$-2.887 \pm 0.067$
photometric centroid source offset	$6.68 \pm 7.24$	0.92	$0.08 \pm 6.12$	$-6.68 \pm 7.24$

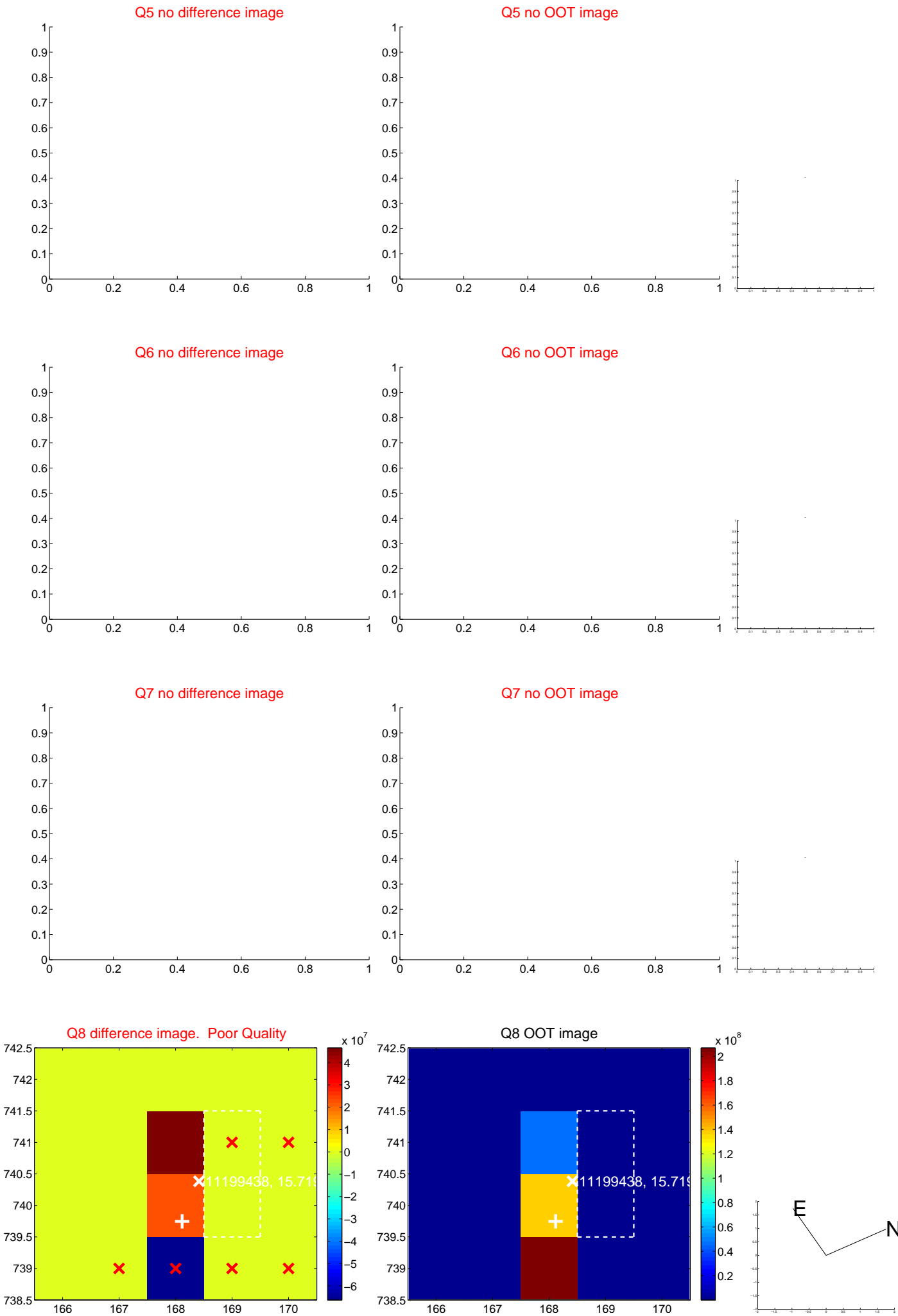


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

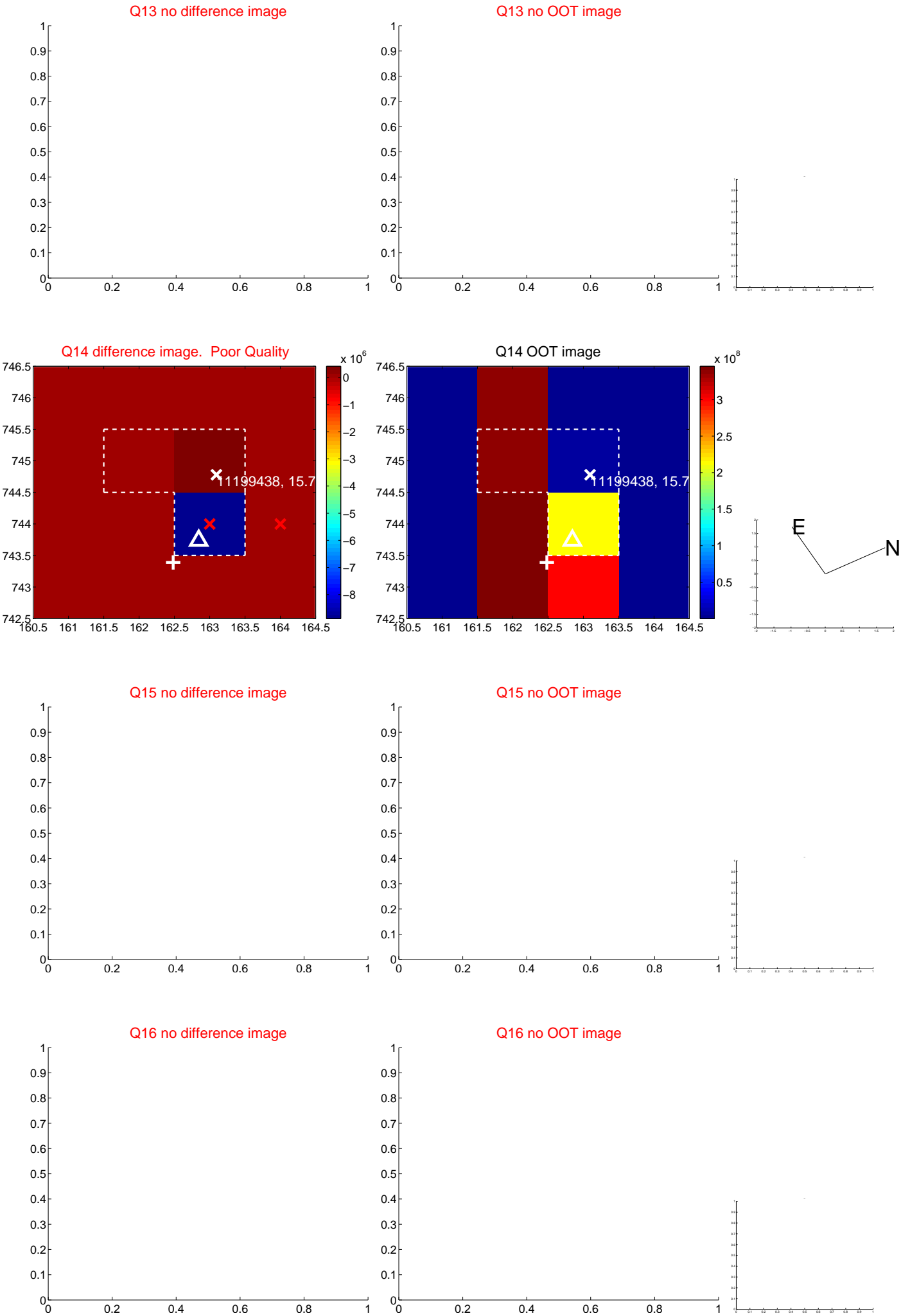




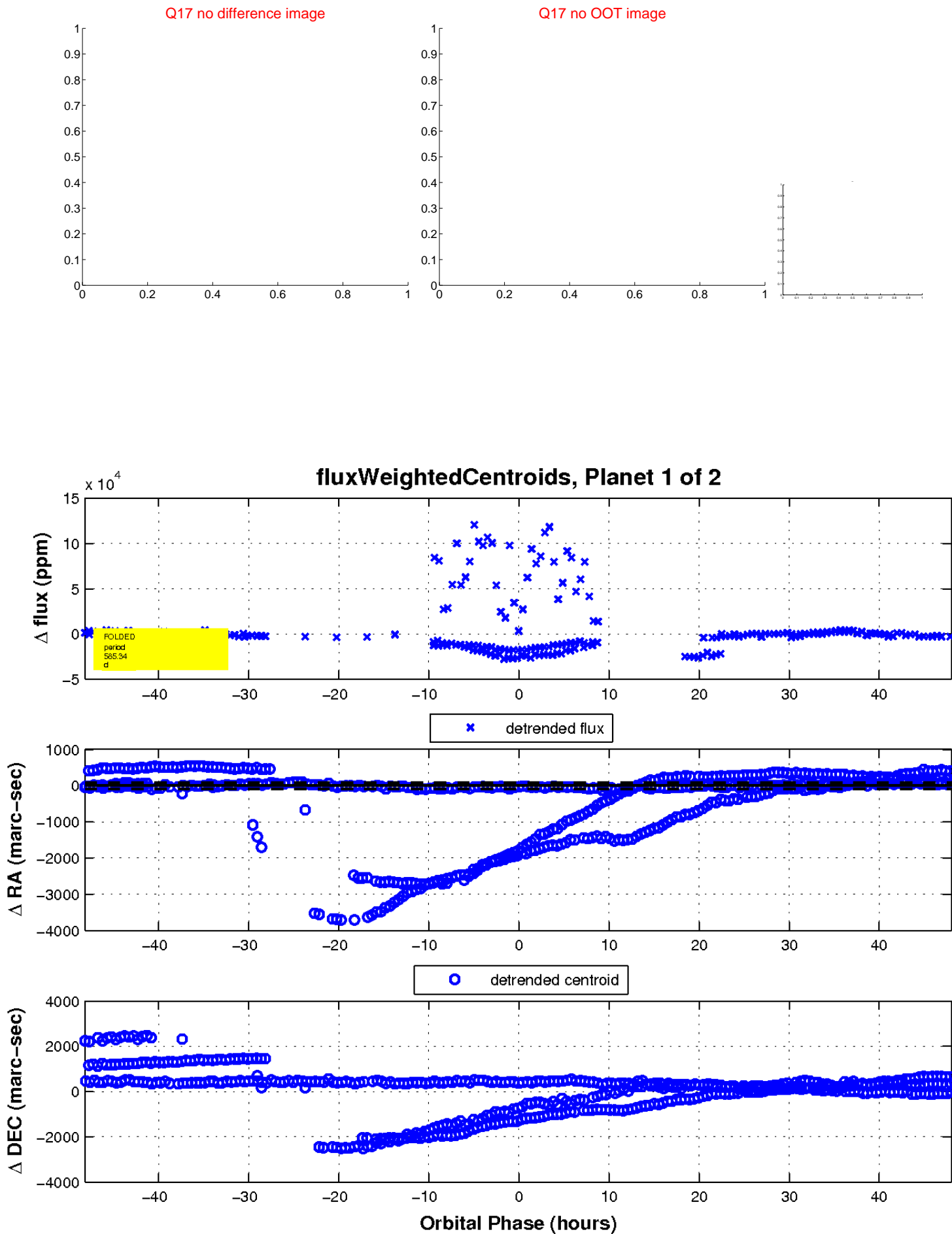
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



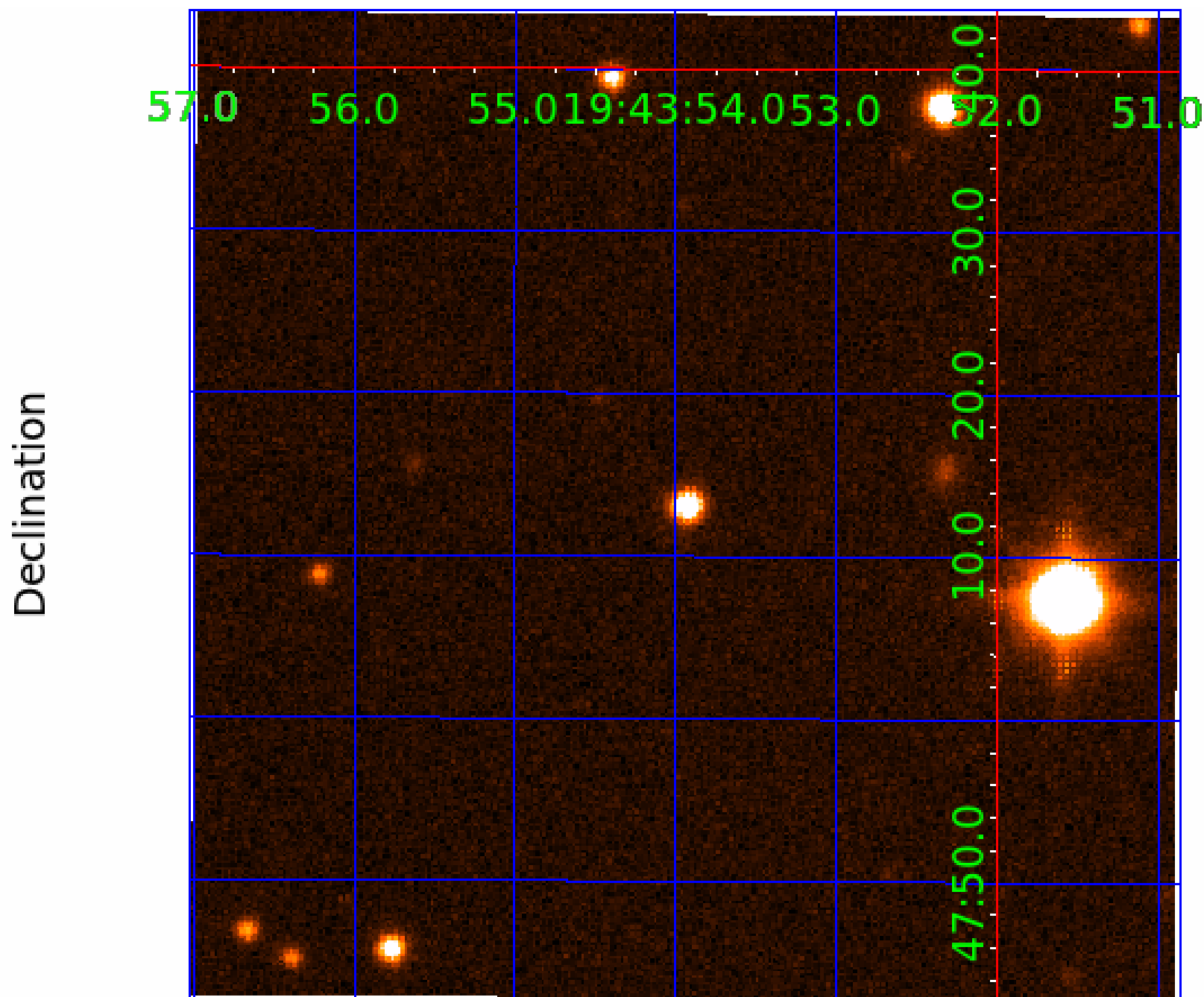
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 011199438

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011199438-01	OBS	No	585.339433	187.236839	11795.1	16.060	13.1	25.7	1.00	6025	19.18	0.60
011199438-02	OBS	No	581.934591	191.508334	2707.2	1.106	30.9	5.3	1.00	6025	5.22	0.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011199438-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011199438-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

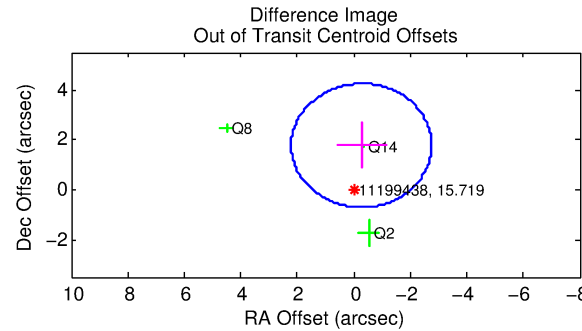
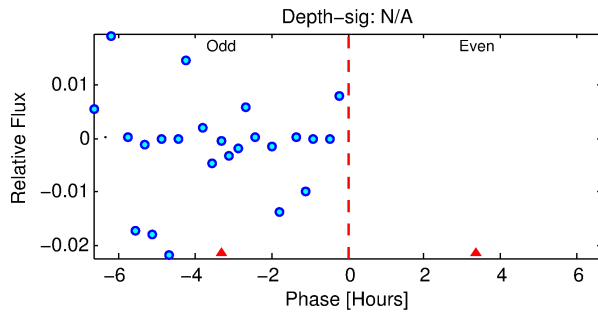
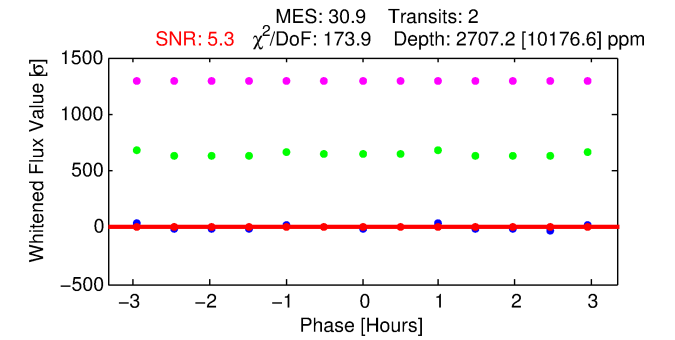
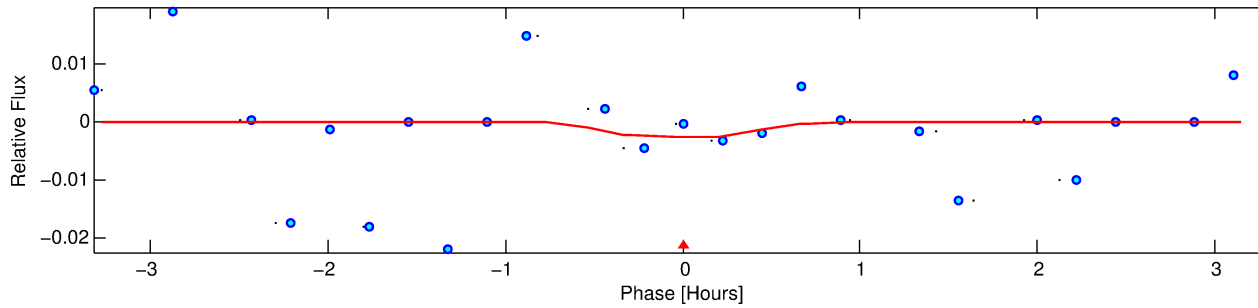
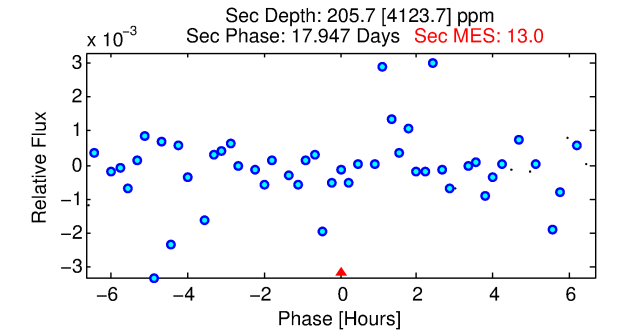
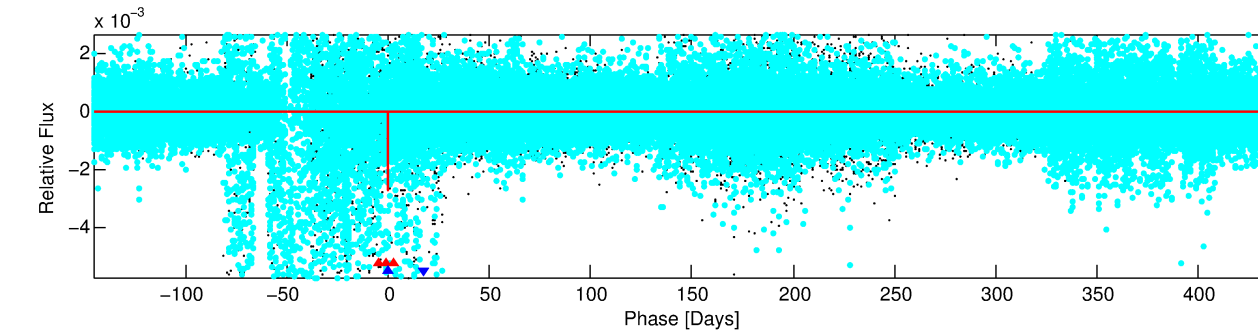
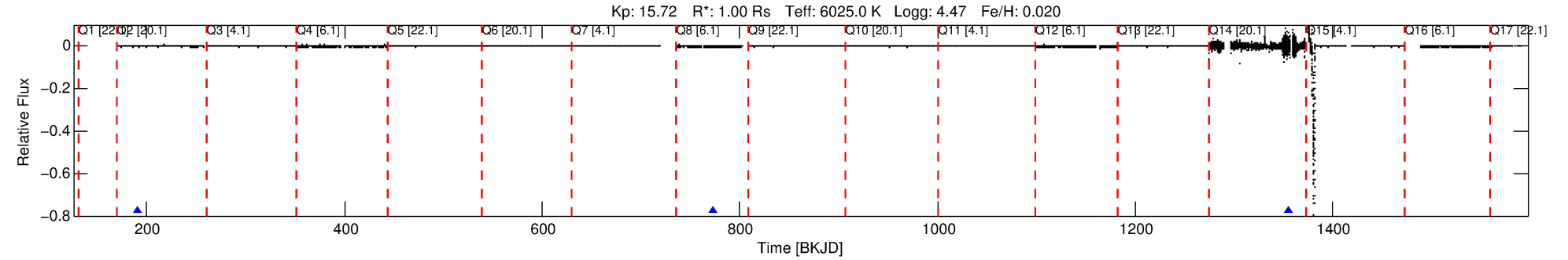
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011199438-02

No Significant Match Found

# DV One-Page Summary

KIC: 11199438 Candidate: 2 of 2 Period: 581.935 d



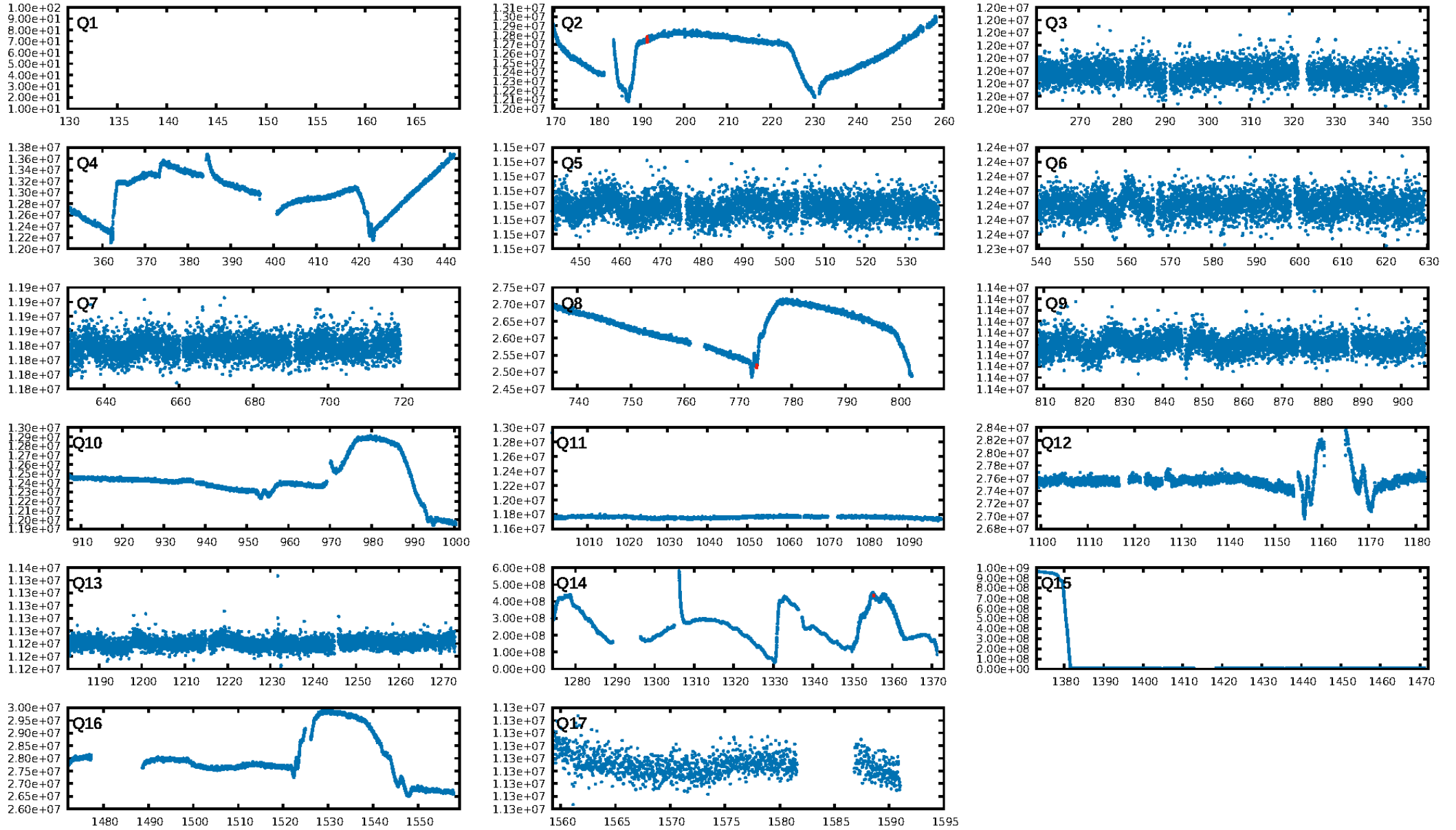
## DV Fit Results:

Period = 581.93459 [0.05506] d  
Epoch = 191.5083 [0.0832] BKJD  
Rp/R\* = 0.0478 [1.8960]  
a/R\* = 4209.53 [787988.11]  
b = 0.02 [9317.97]  
Seff = 0.60 [0.25]  
Teq = 225 [23] K  
Rp = 5.22 [206.69] Re  
a = 1.3996 [0.3555] AU  
Ag = 8148.75 [666170.36] [0.01σ]  
Teffp = 3299 [67420] K [0.05σ]

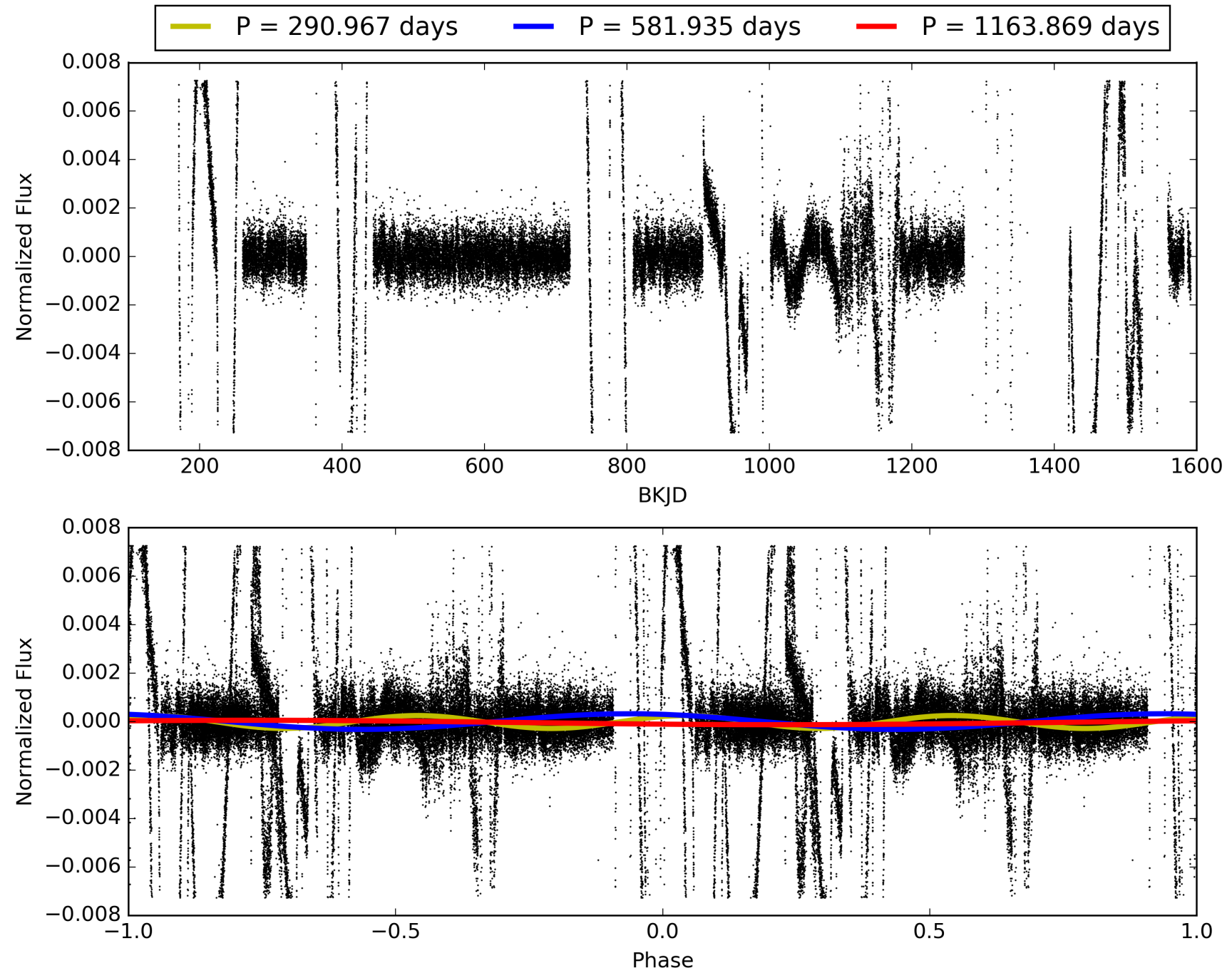
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [5.08σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 3.01e-09  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 17.95  
Centroid-sig: N/A  
Centroid-so: 12.546 arcsec [0.68σ]  
OotOffset-rm: 1.786 arcsec [2.16σ]  
KicOffset-rm: 4.768 arcsec [1.54σ]  
OotOffset-st: 2/0/1/0 [3]  
KicOffset-st: 2/0/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 011199438-02, PDC Light Curves



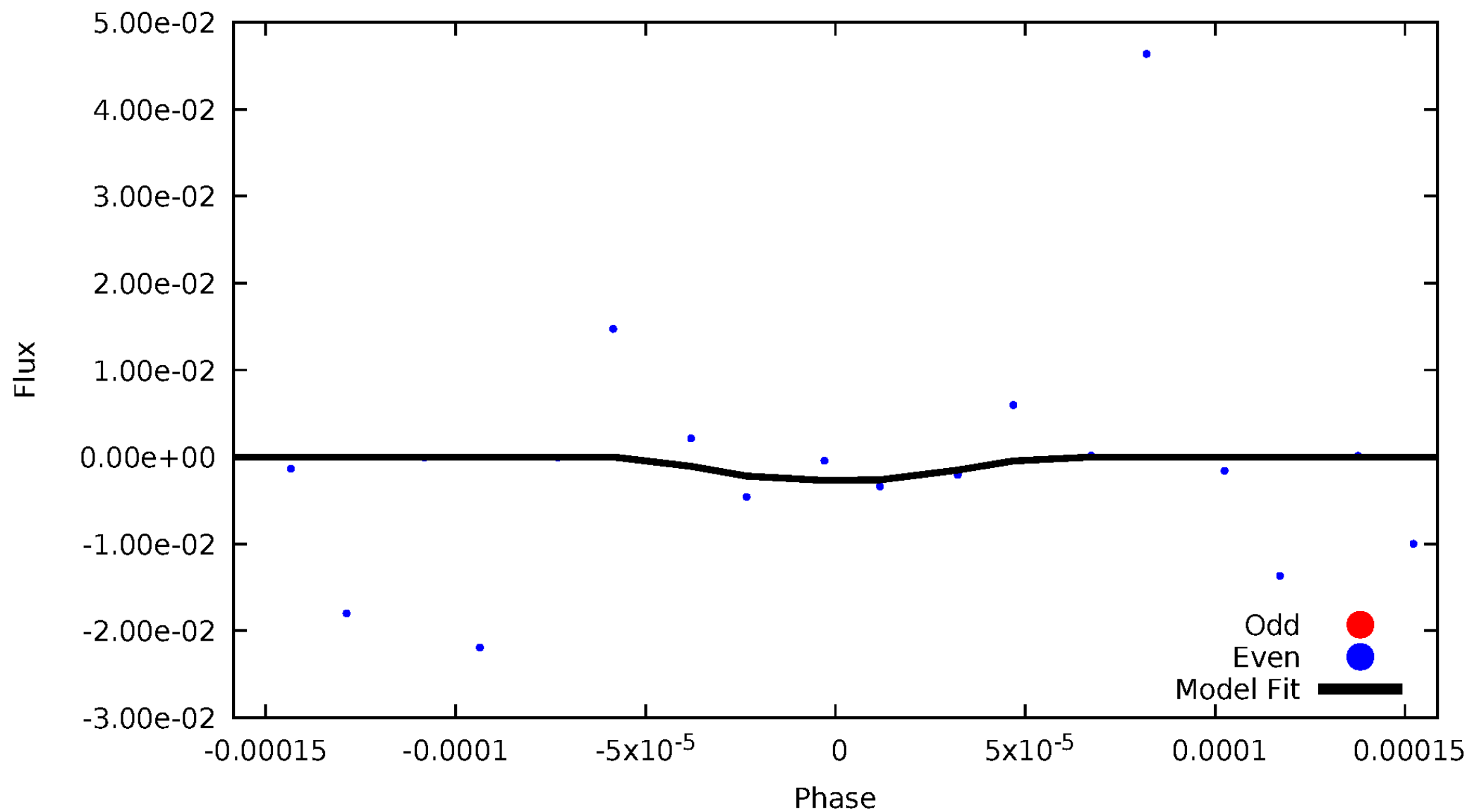
# TCE 011199438-02





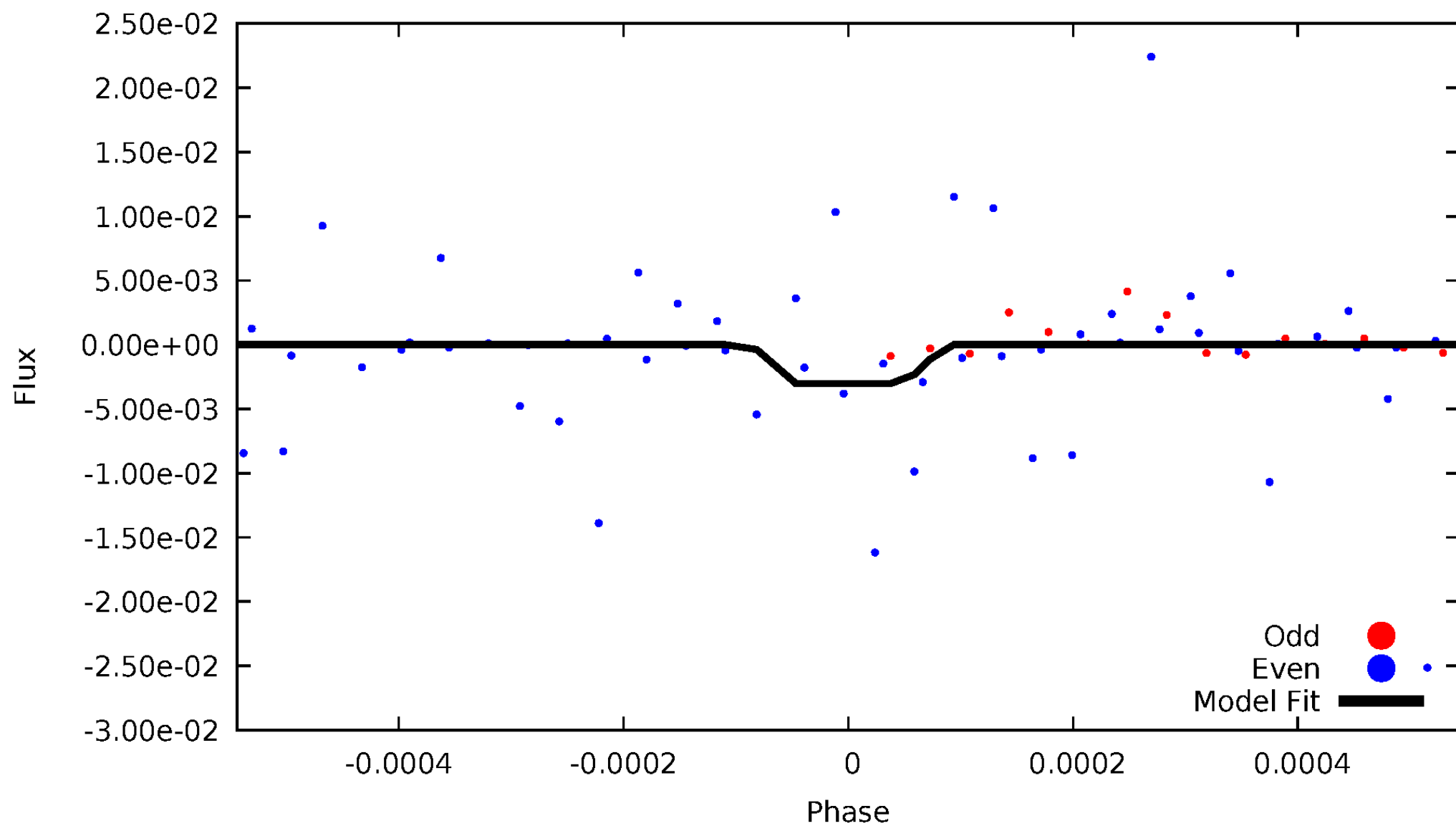
# DV Odd/Even

TCE 011199438-02



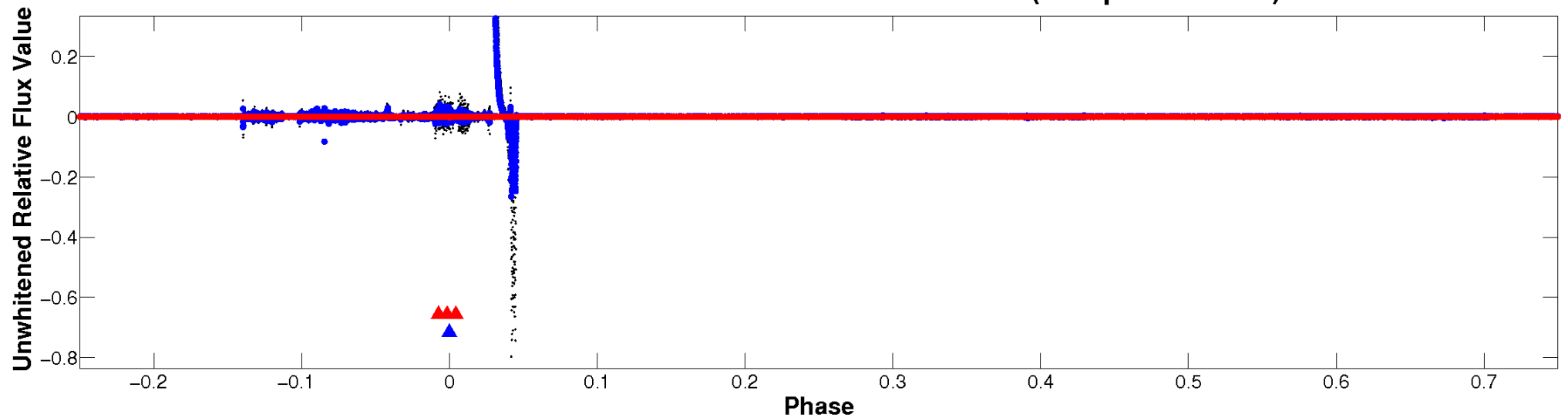
# ALT Odd/Even

TCE 011199438-02

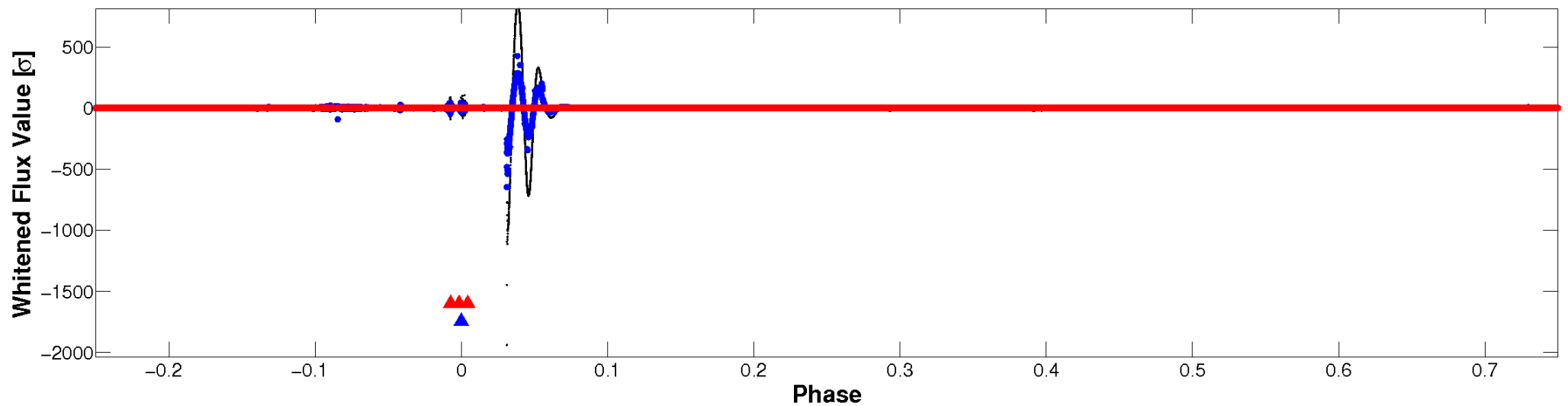


# Non-Whitened Vs. Whitened Light Curve

**Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

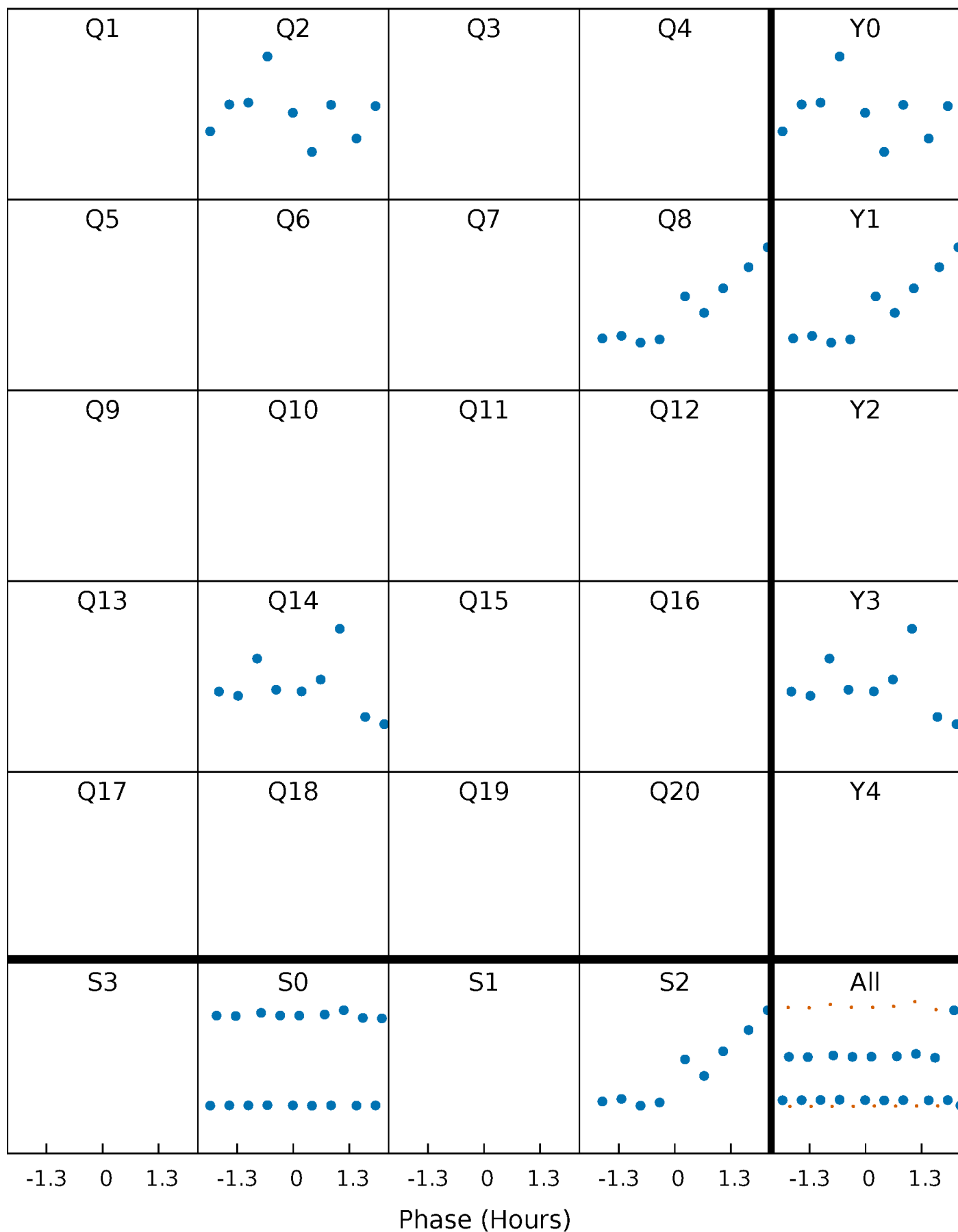


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



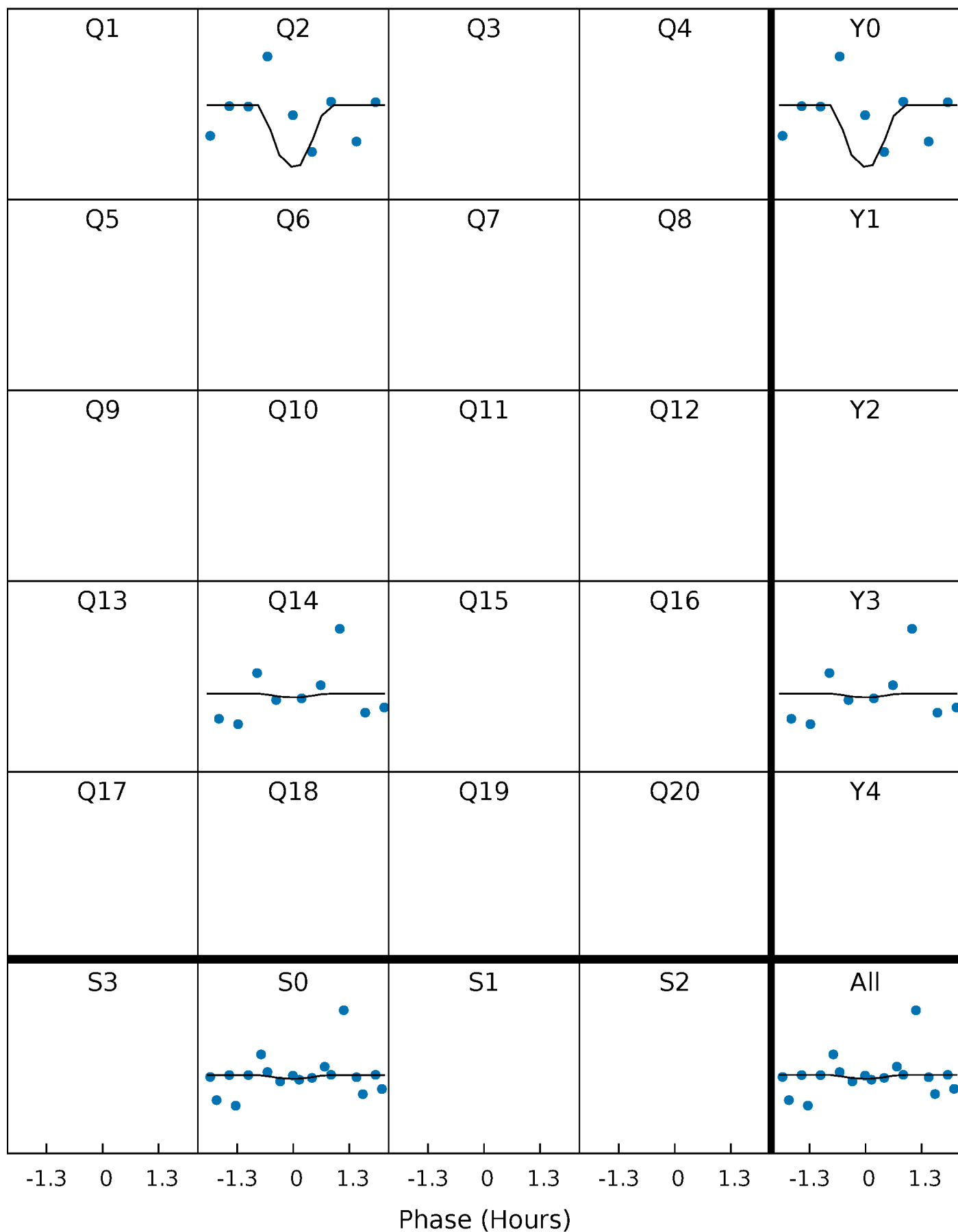
# PDC Quarter-Phased Transit Curves

TCE 011199438-02 P=581.934591 Days  $T_0=191.508334$  (BKJD)



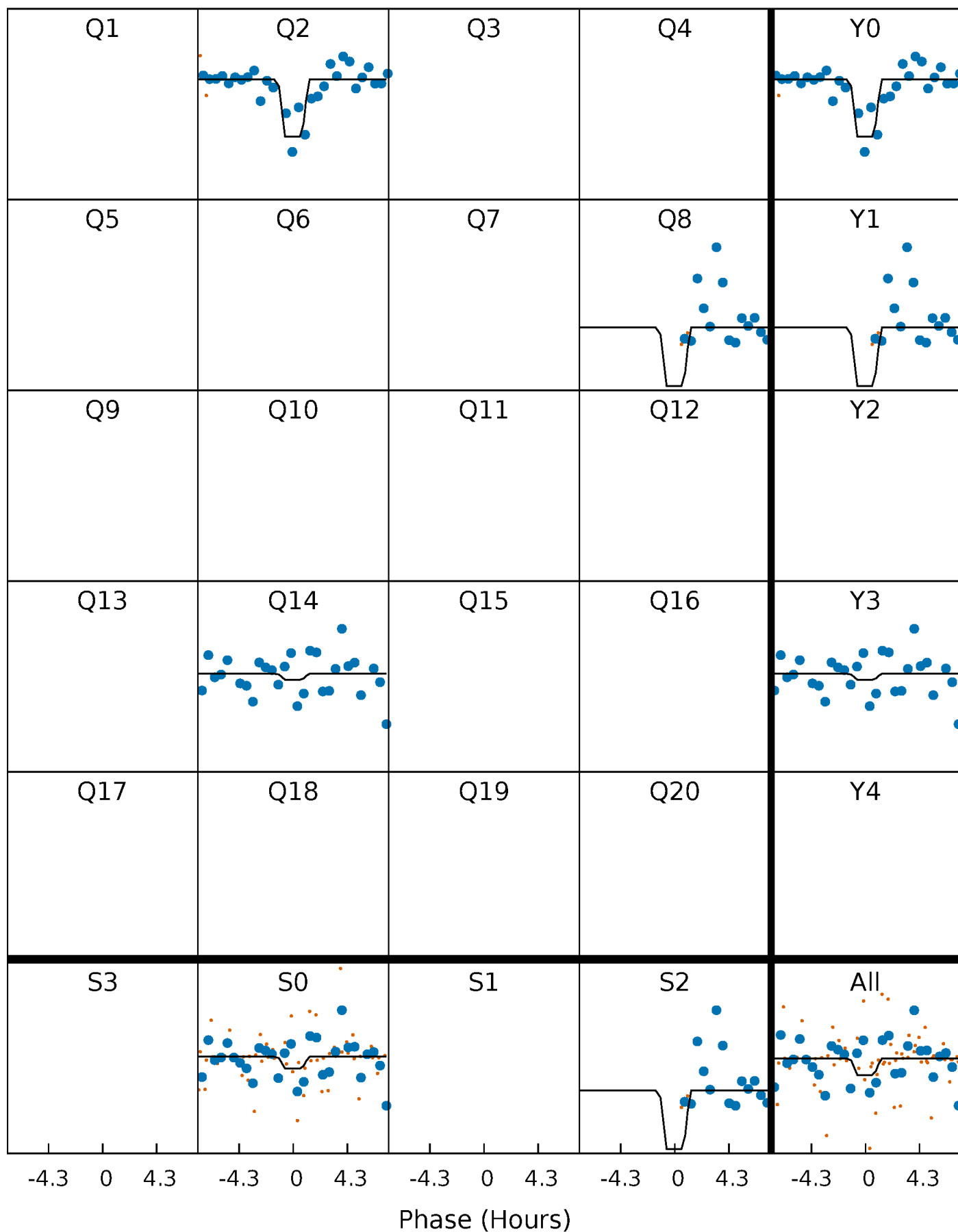
# DV Quarter-Phased Transit Curves

TCE 011199438-02 P=581.934591 Days  $T_0=191.508334$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

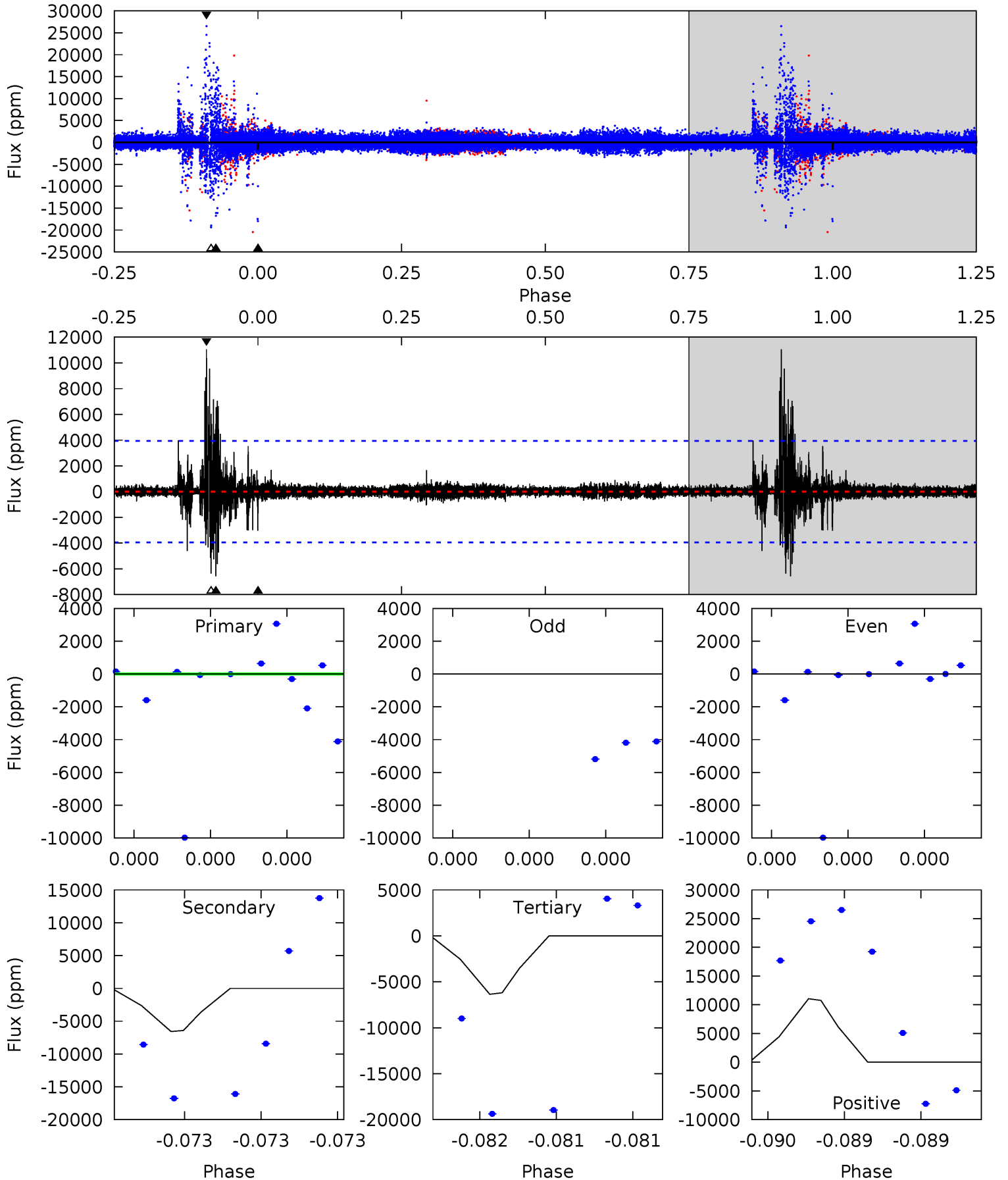
TCE 011199438-02 P=582.043145 Days  $T_0=191.529454$  (BKJD)



# DV Model-Shift Uniqueness Test

011199438-02, P = 581.934591 Days, E = 191.508334 Days

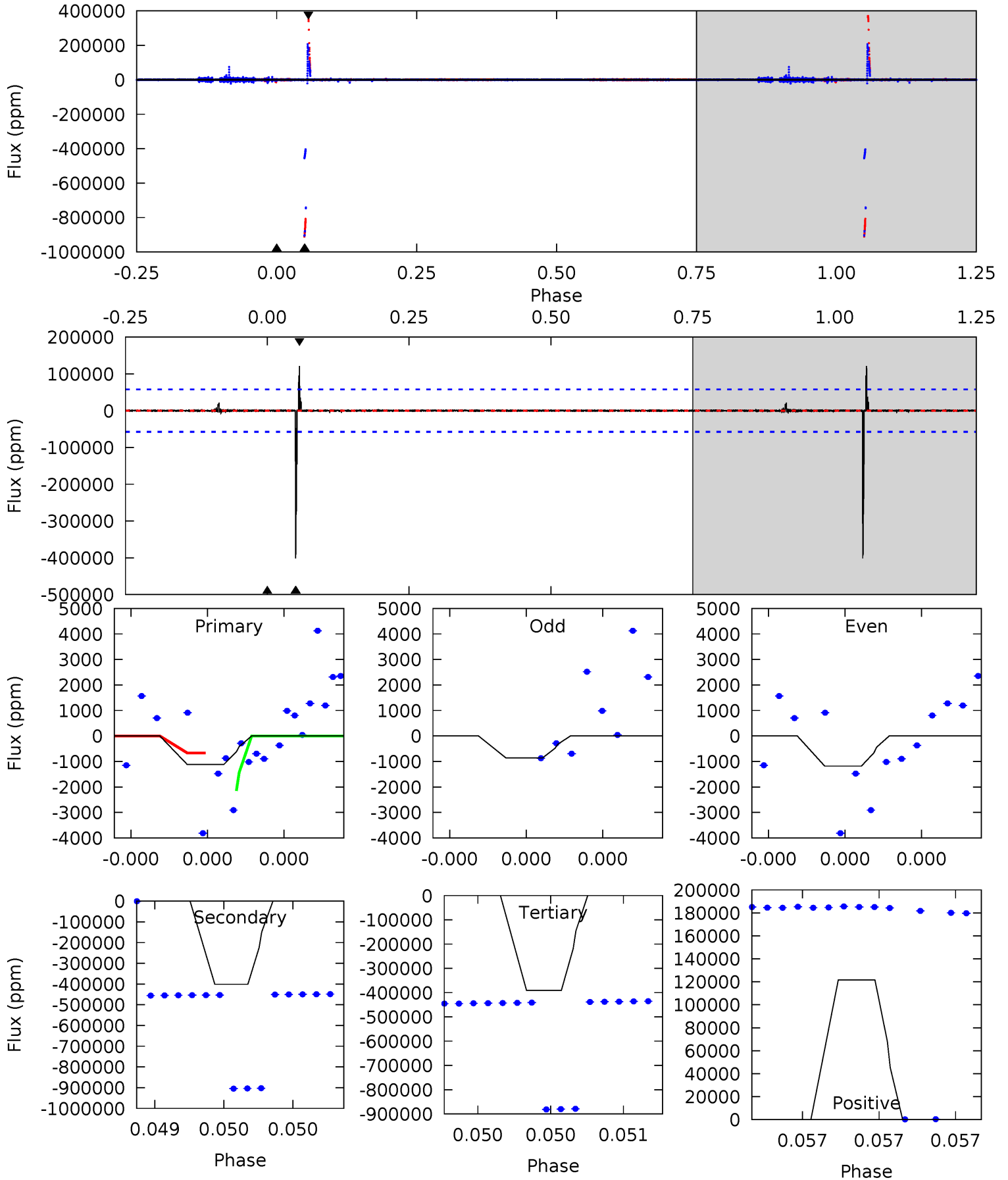
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.48	9.79	9.46	16.4	5.86	3.91	0.57	-6.98	-14.0	0.33	-6.65	0.32	1.00	0.63	1.89



# Alt Model-Shift Uniqueness Test

011199438-02, P = 582.043145 Days, E = 191.529454 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
0.11	40.0	38.9	12.1	5.75	3.75	1.08	-38.8	-12.0	1.06	27.9	0.01	0.81	0.23	0.06





### Stellar Parameters For KIC 011199438

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6025^{+217}_{-265}$	$4.472^{+0.052}_{-0.208}$	$0.020^{+0.250}_{-0.300}$	$0.999^{+0.296}_{-0.127}$	$1.080^{+0.130}_{-0.145}$	$1.524^{+0.427}_{-0.797}$
	+4%/-4%	+1%/-5%	+1250%/-1500%	+30%/-13%	+12%/-13%	+28%/-52%
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 011199438-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-6580 \pm 672$	$155.71^{+154.79}_{-115.51}$	$320^{+25}_{-18}$	$2363^{+1051}_{-330}$	$273^{+4299}_{-202}$
Alt.	$-401105 \pm 10026$	$144.71^{+163.26}_{-98.66}$	$321^{+24}_{-18}$	$4893^{+4224}_{-1159}$	$33549^{+327135}_{-25964}$

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

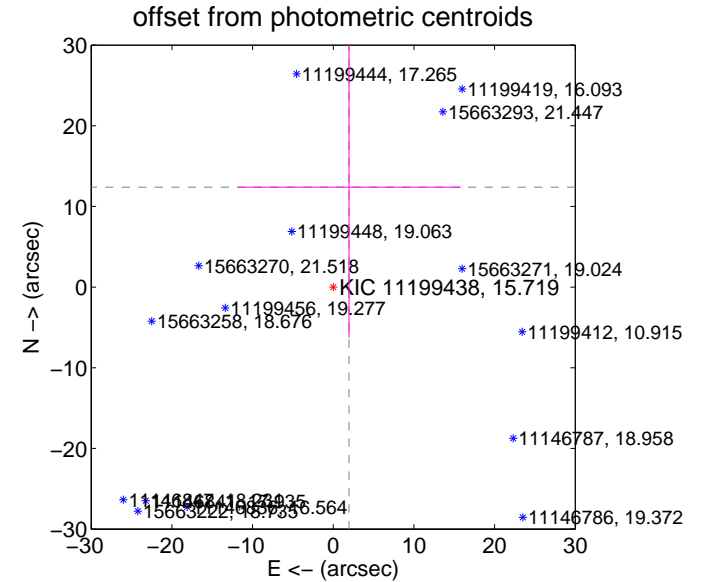
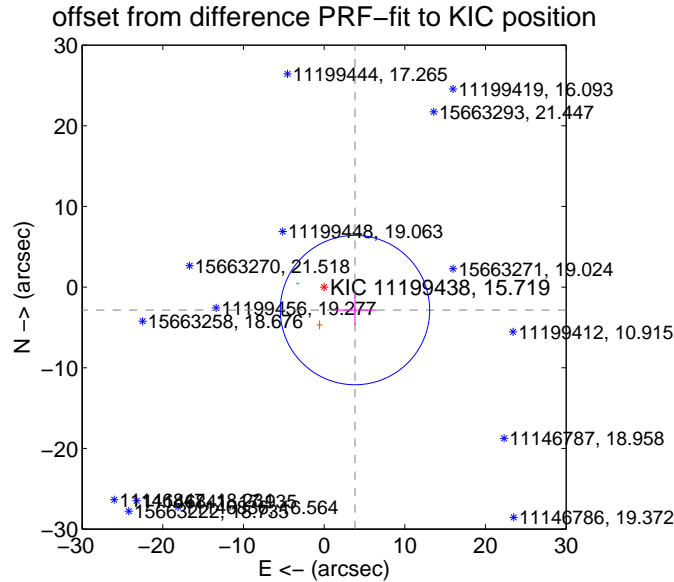
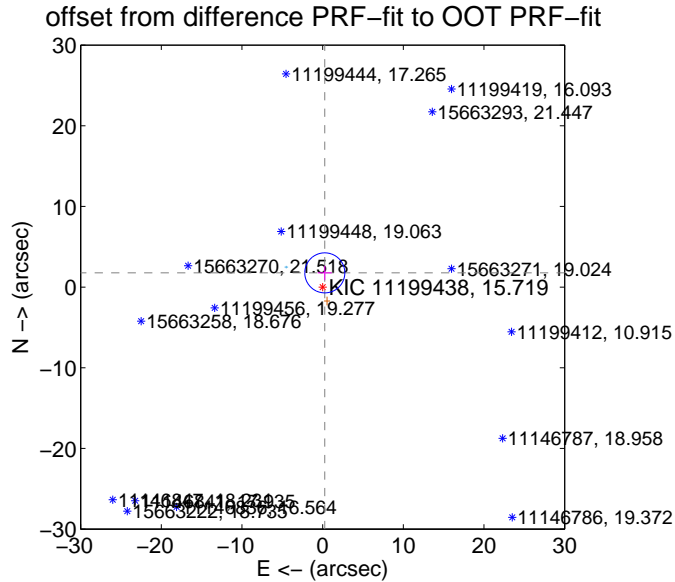
## DV Centroid Data

Supplemental centroid analysis for 011199438-02. Kepler magnitude: 15.72. Transit SNR 5.29

There are 2 quarters with good PRF difference image offsets

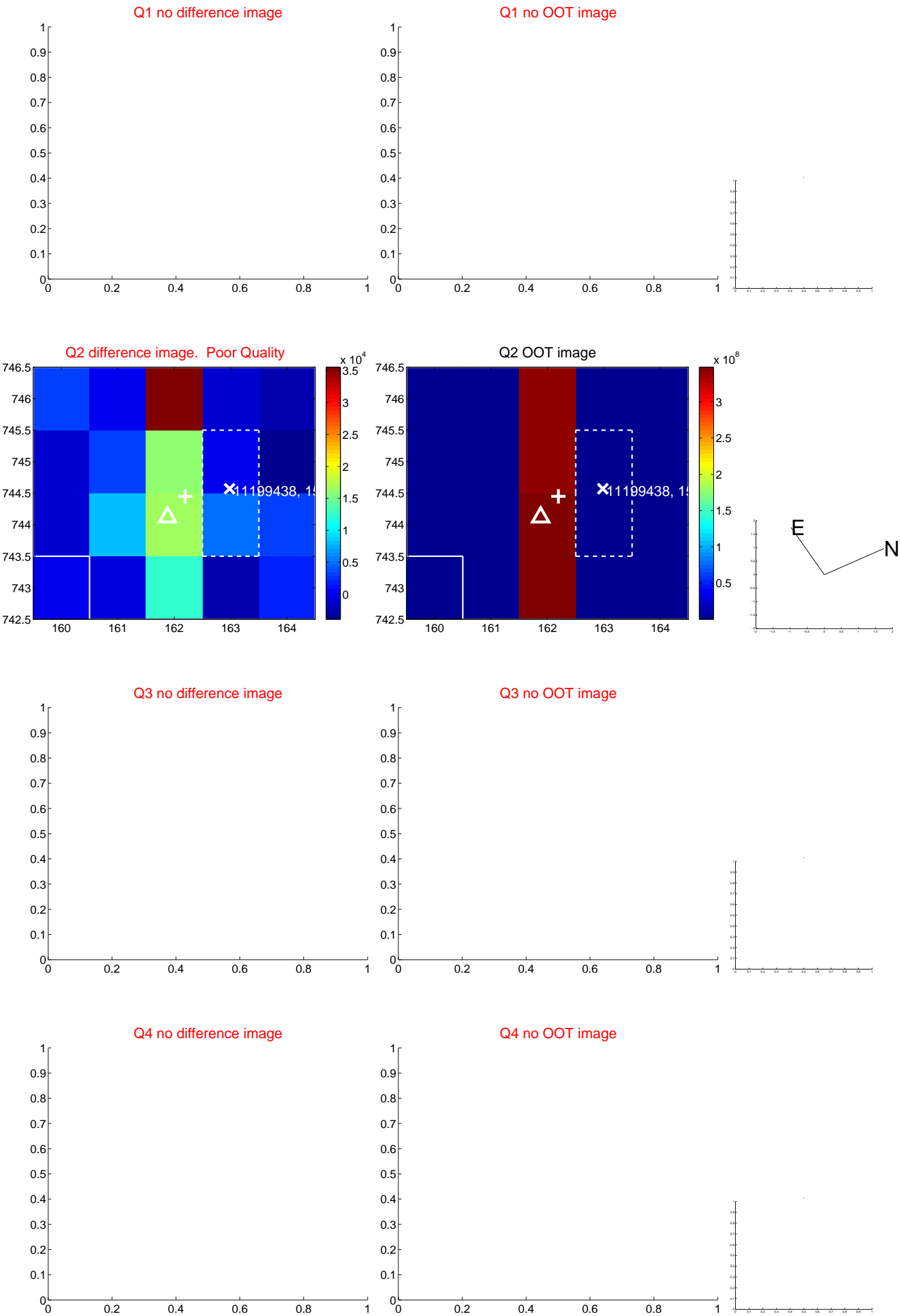
The OOT PRF centroid is offset from the target star catalog position by about 5.97 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.786 \pm 0.827$	2.16	$-0.267 \pm 0.866$	$1.765 \pm 0.886$
PRF-fit source offset from KIC position	$4.768 \pm 3.086$	1.54	$-3.825 \pm 2.629$	$-2.847 \pm 1.848$
photometric centroid source offset	$12.55 \pm 18.53$	0.68	$-1.96 \pm 13.86$	$12.39 \pm 18.63$

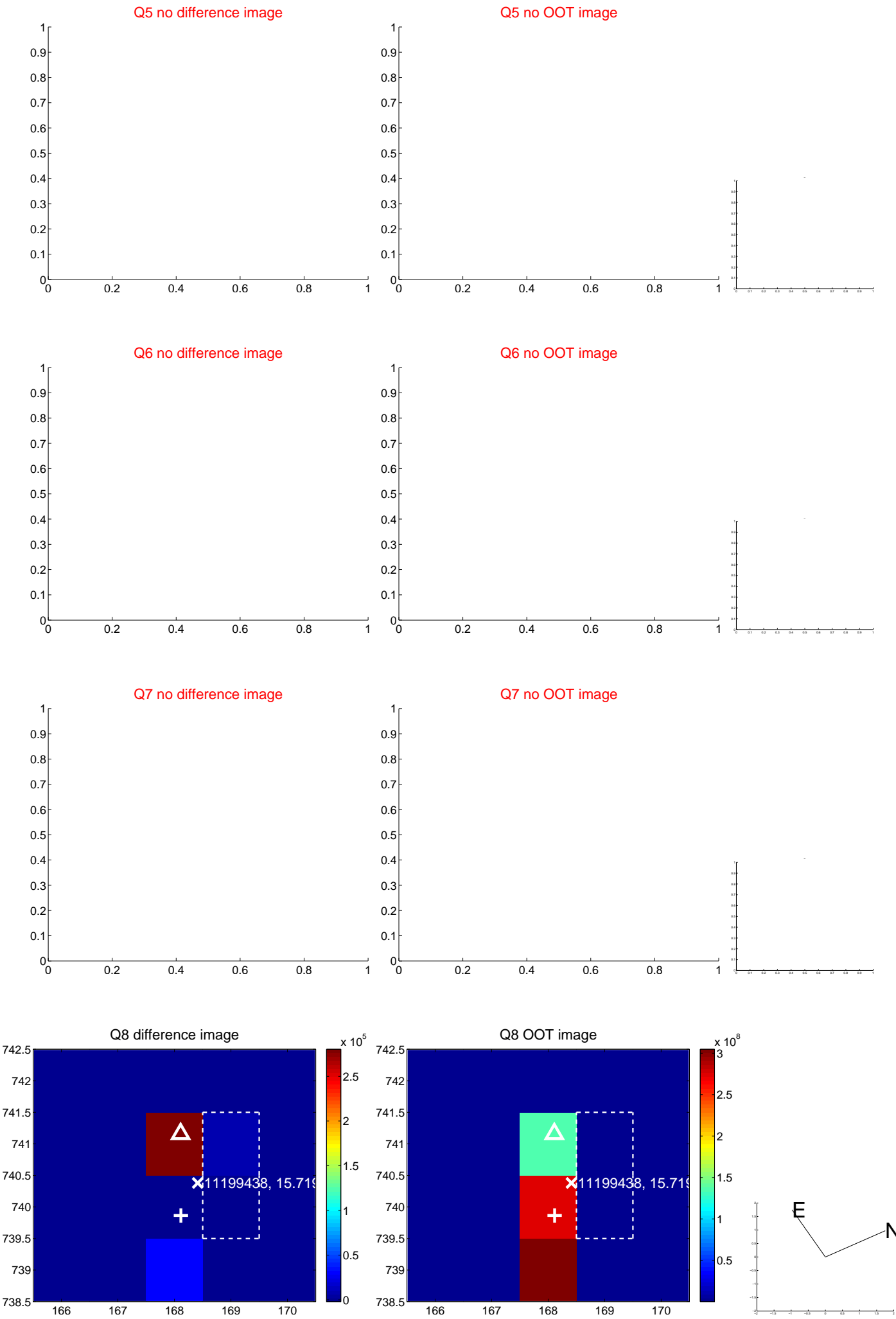


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



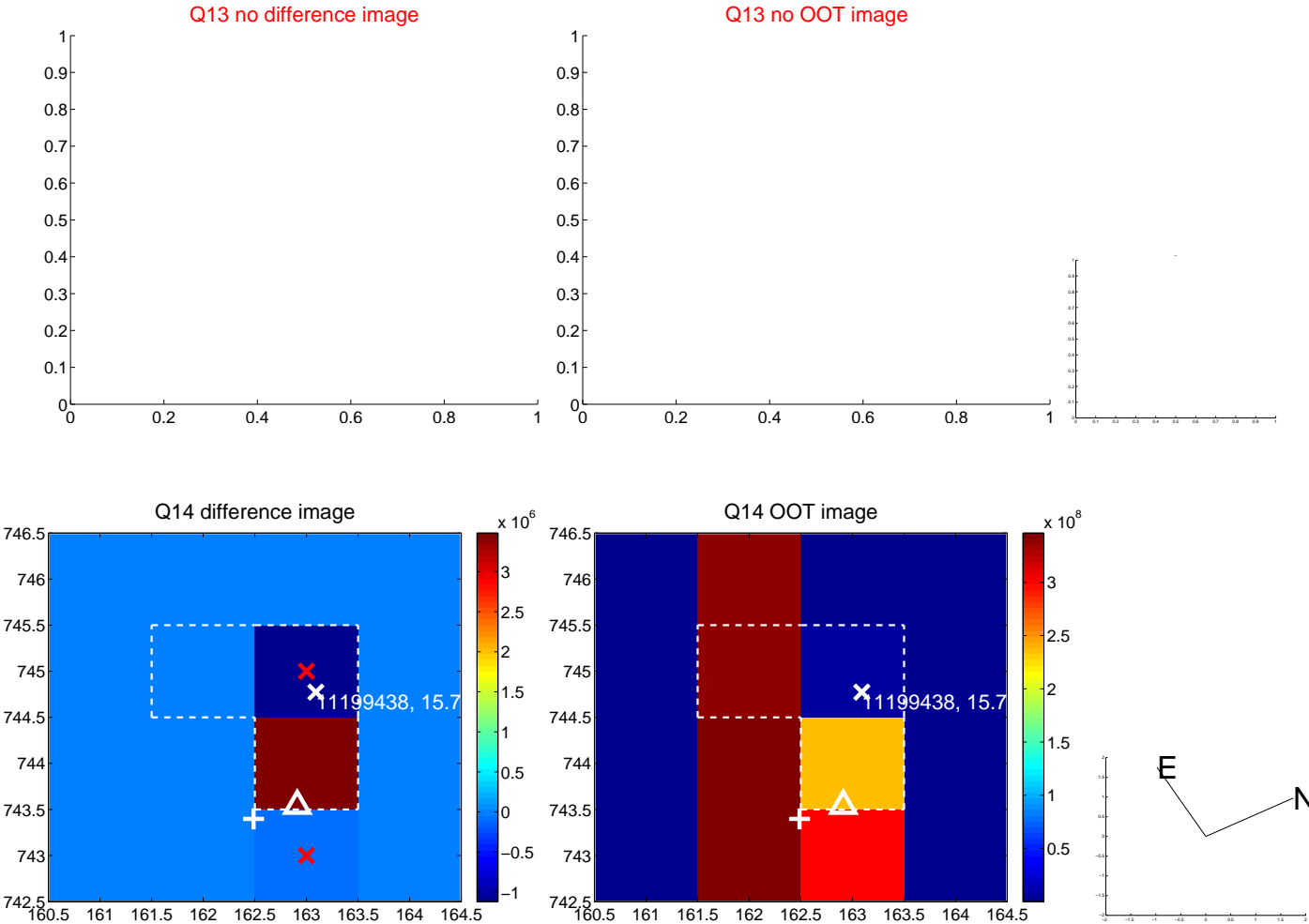
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



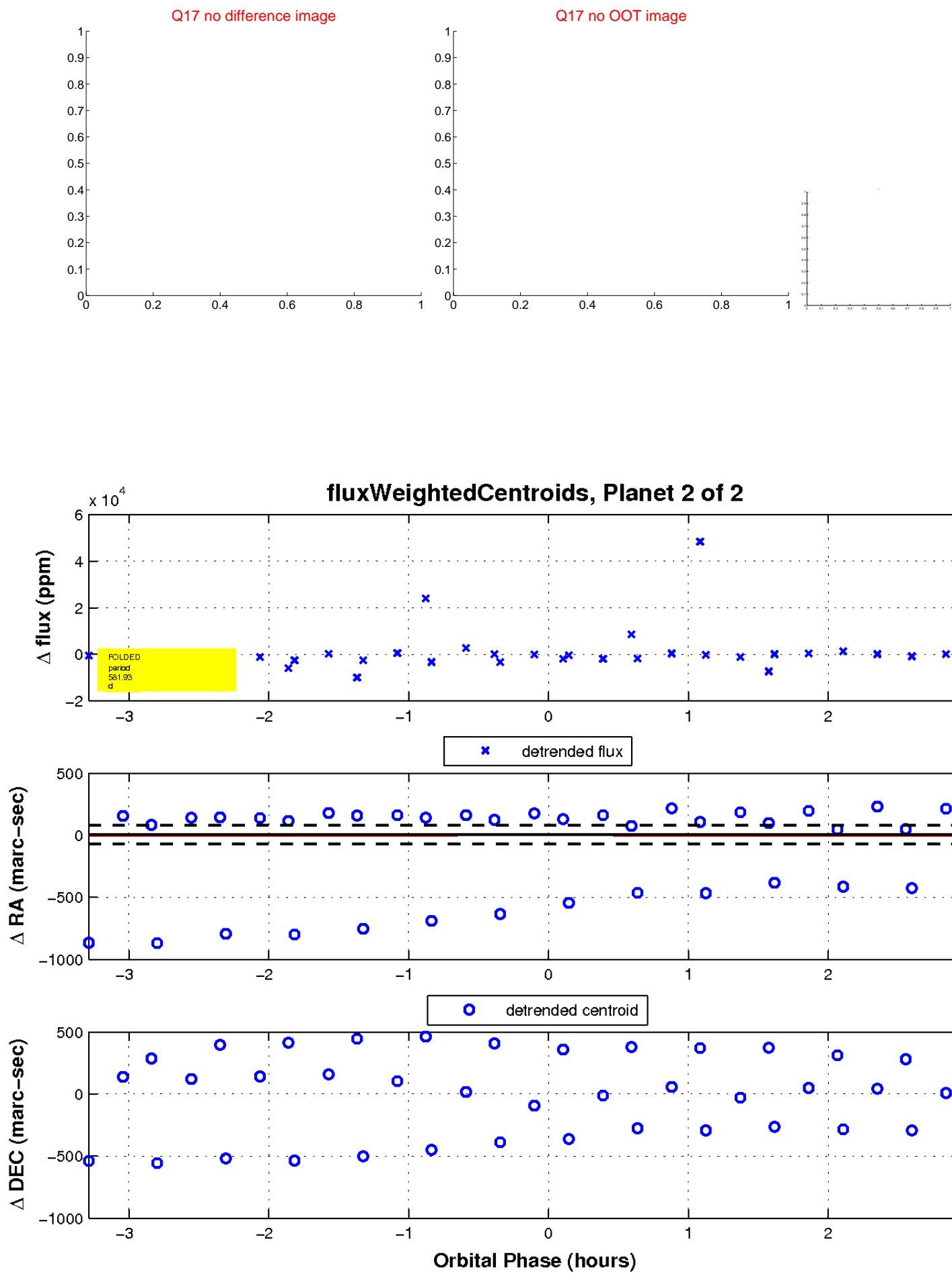
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

