

# KIC 005079590

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005079590-01	OBS	No	292.898148	227.723096	854.9	4.294	12.6	3.1	0.75	4656	2.46	0.39
005079590-02	OBS	No	470.508125	140.768734	1676.8	2.848	10.1	6.5	0.75	4656	2.93	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005079590-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005079590-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

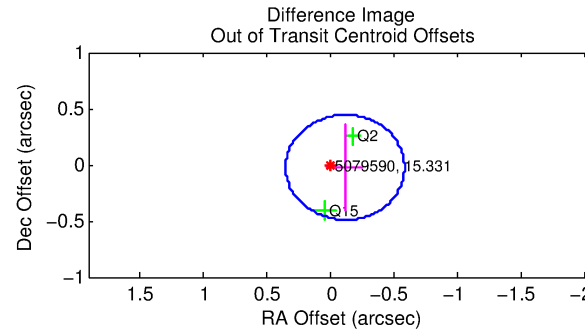
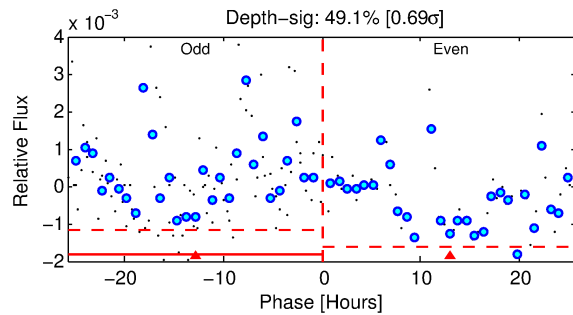
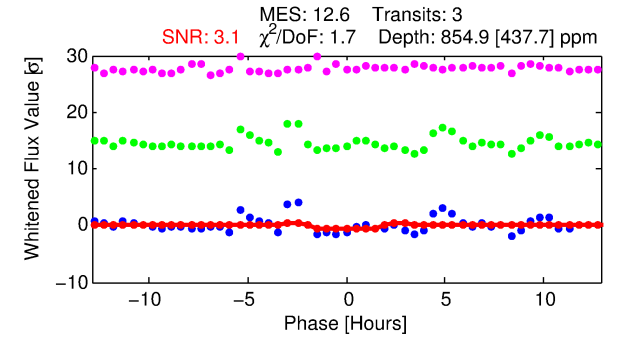
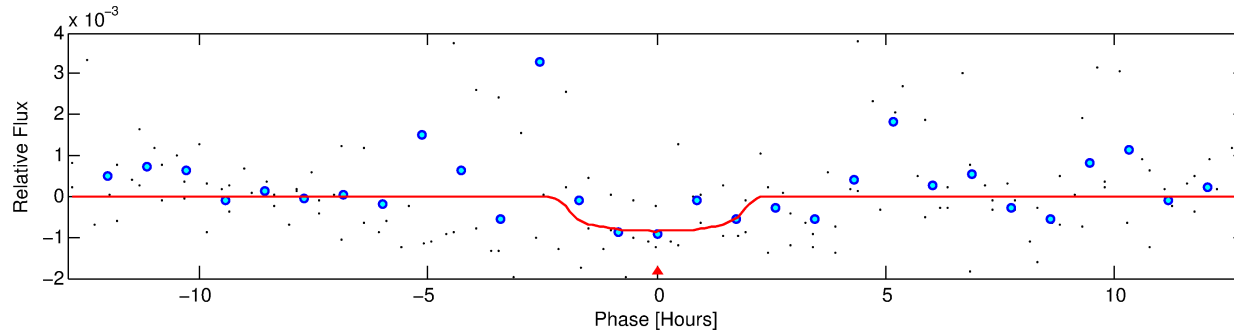
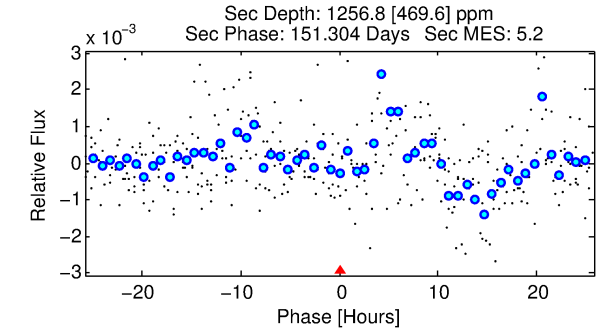
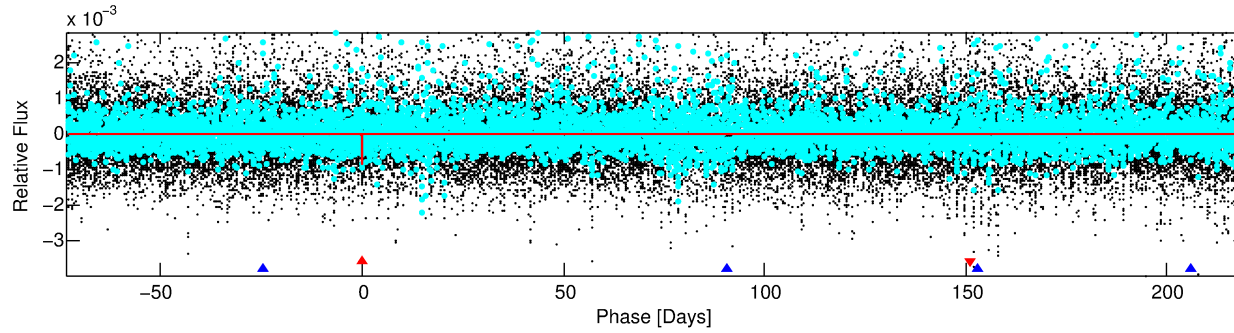
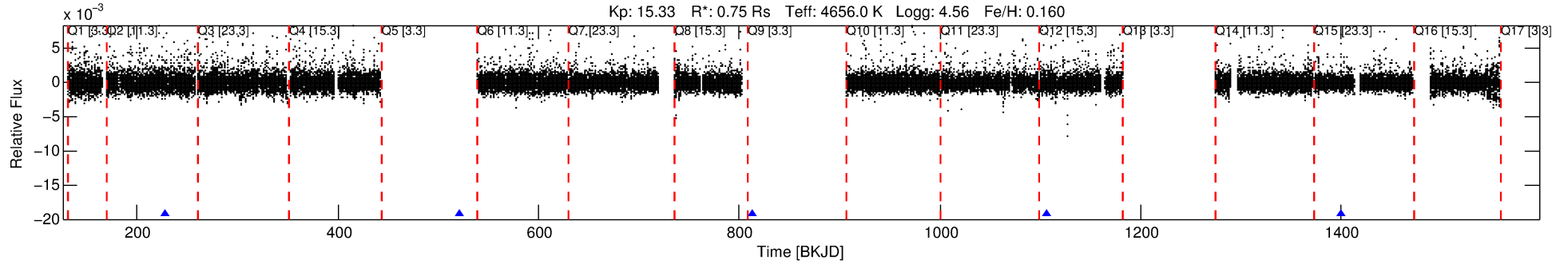
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005079590-01

No Significant Match Found

# DV One-Page Summary

KIC: 5079590 Candidate: 1 of 2 Period: 292.898 d



## DV Fit Results:

Period = 292.89815 [0.01180] d  
Epoch = 227.7231 [0.0380] BKJD  
Rp/R\* = 0.0302 [0.0782]  
a/R\* = 336.60 [2873.43]  
b = 0.80 [3.90]  
Seff = 0.39 [0.07]  
Teq = 201 [9] K  
Rp = 2.46 [6.38] Re  
a = 0.7805 [0.0606] AU  
Ag = 69369.32 [360031.37] [0.19 $\sigma$ ]  
Teffp = 5042 [6543] K [0.74 $\sigma$ ]

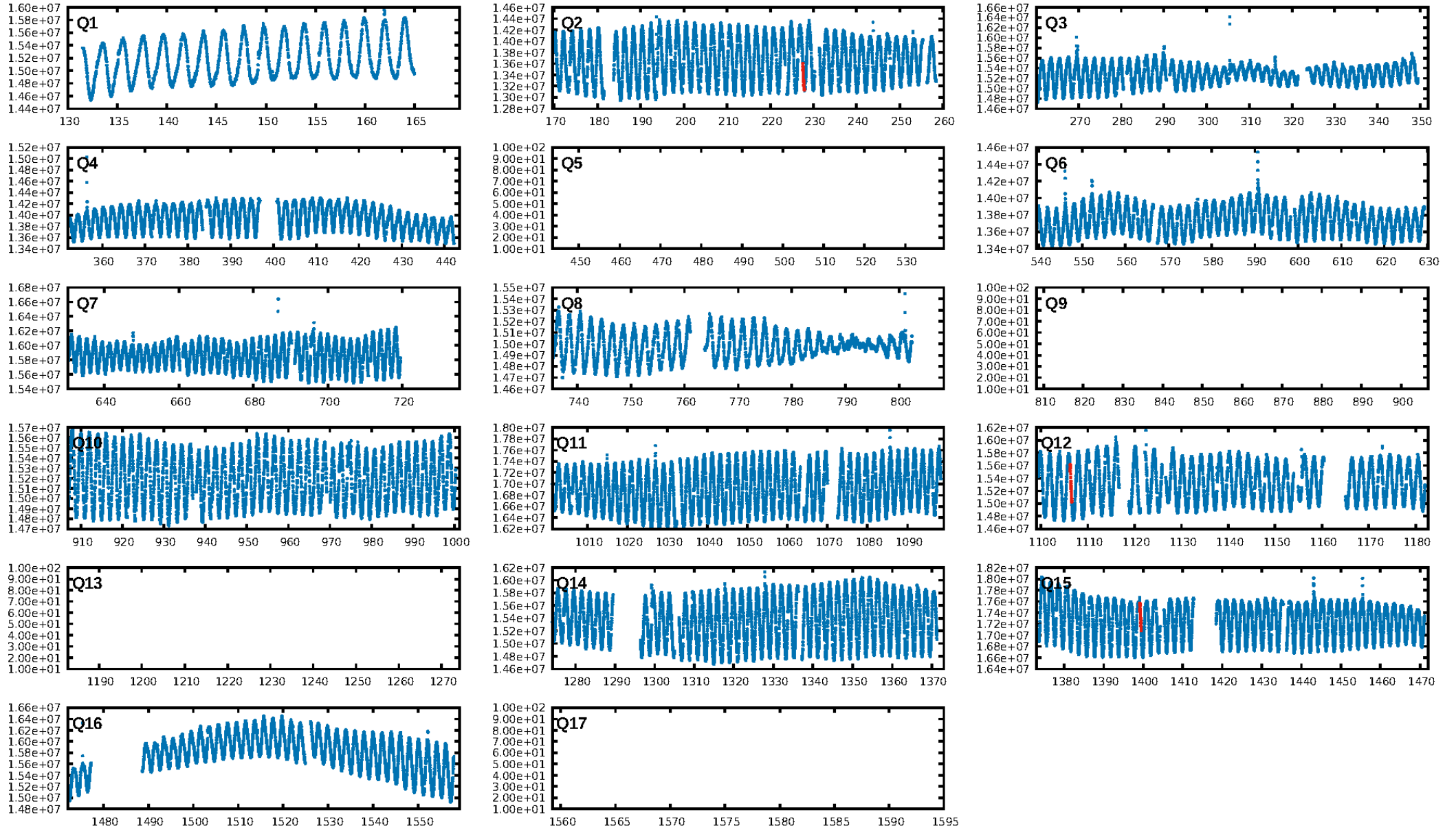
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [827.30 $\sigma$ ]  
ModelChiSquare2-sig: 8.5%  
ModelChiSquareGoF-sig: 88.2%  
Bootstrap-pfa: 8.06e-13  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.9797  
Centroid-sig: 48.1%  
Centroid-so: 1.648 arcsec [0.60 $\sigma$ ]  
OotOffset-rm: 0.122 arcsec [0.78 $\sigma$ ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-rm: 0.368 arcsec [0.92 $\sigma$ ]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

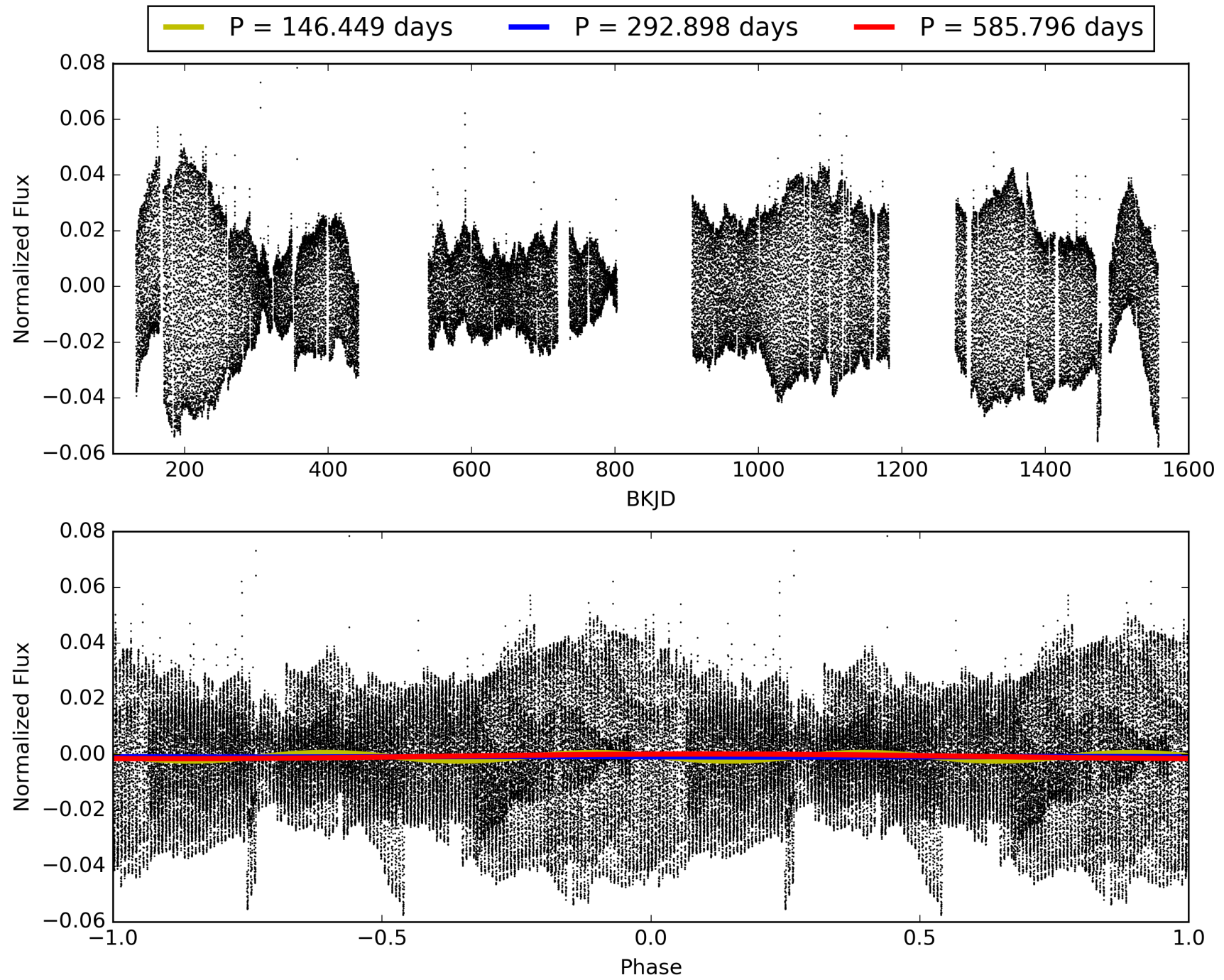
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 03:57:50 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005079590-01, PDC Light Curves

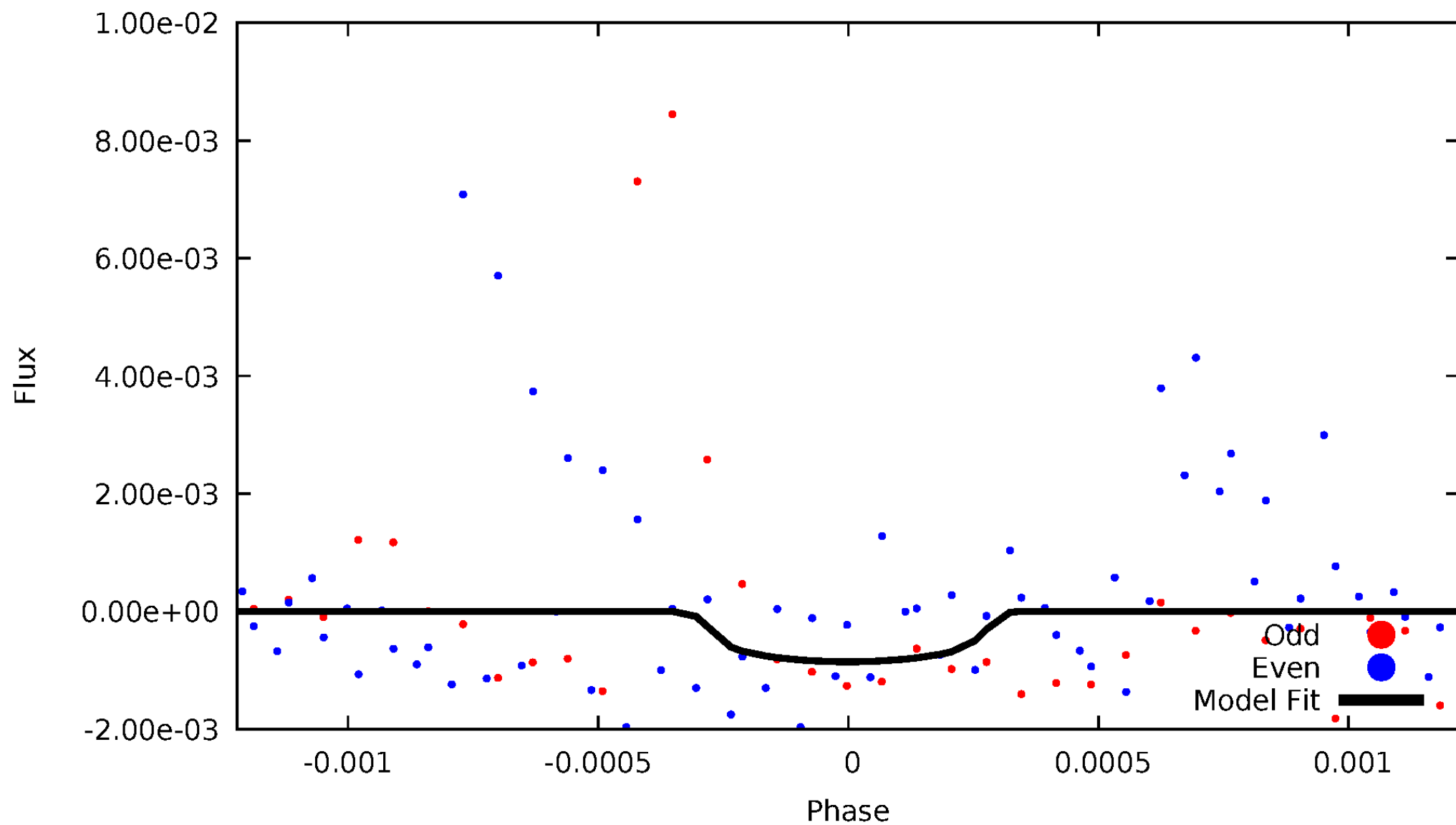


TCE 005079590-01



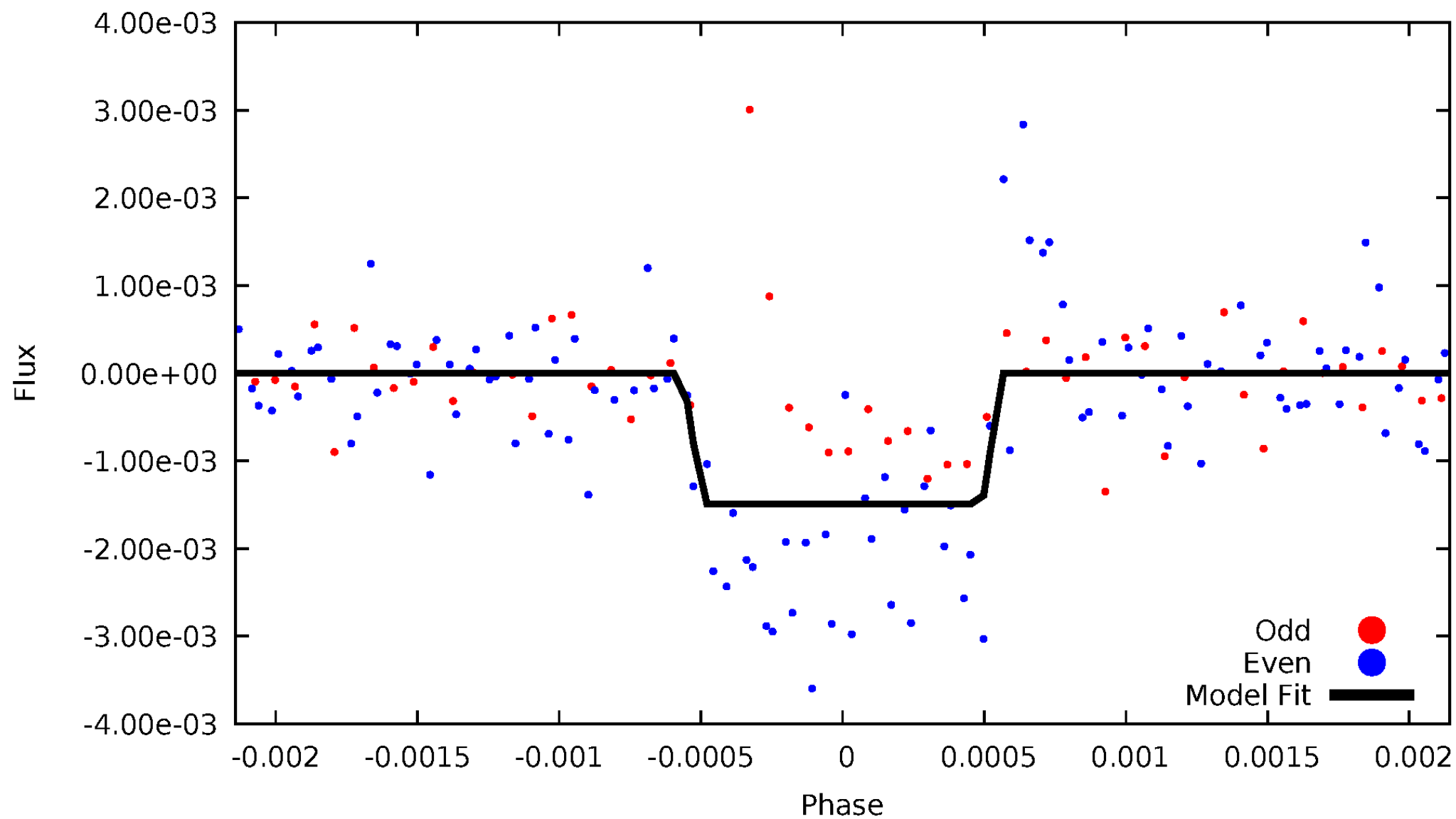
# DV Odd/Even

TCE 005079590-01



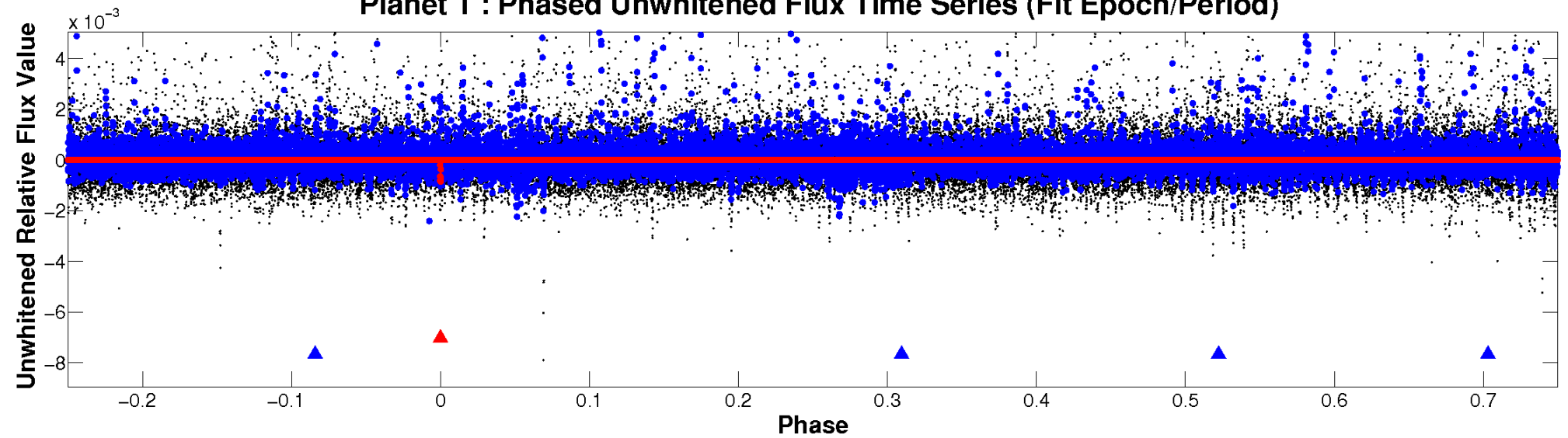
# ALT Odd/Even

TCE 005079590-01

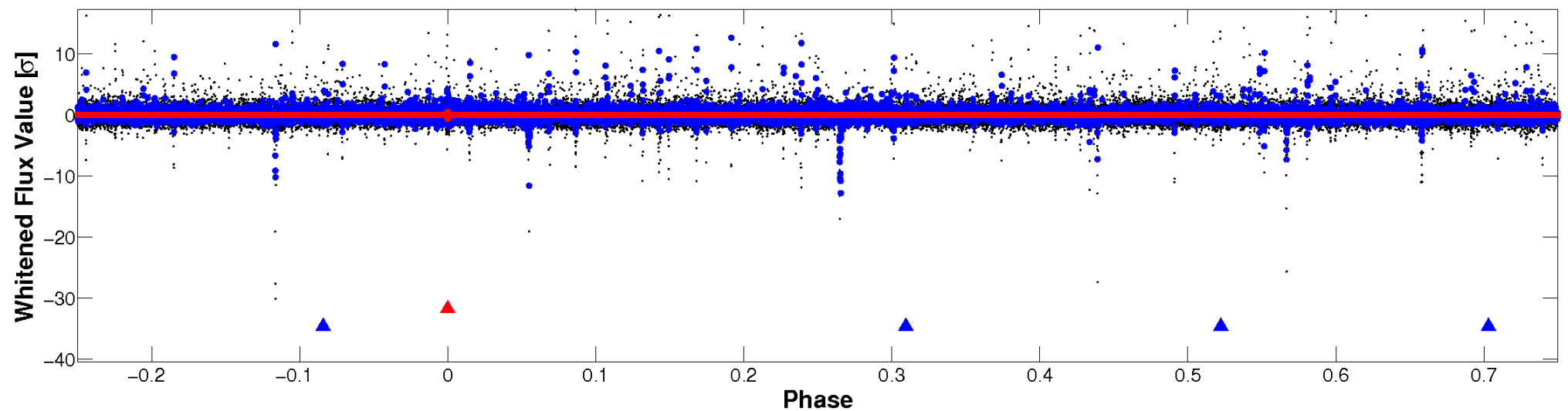


# Non-Whitened Vs. Whitened Light Curve

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

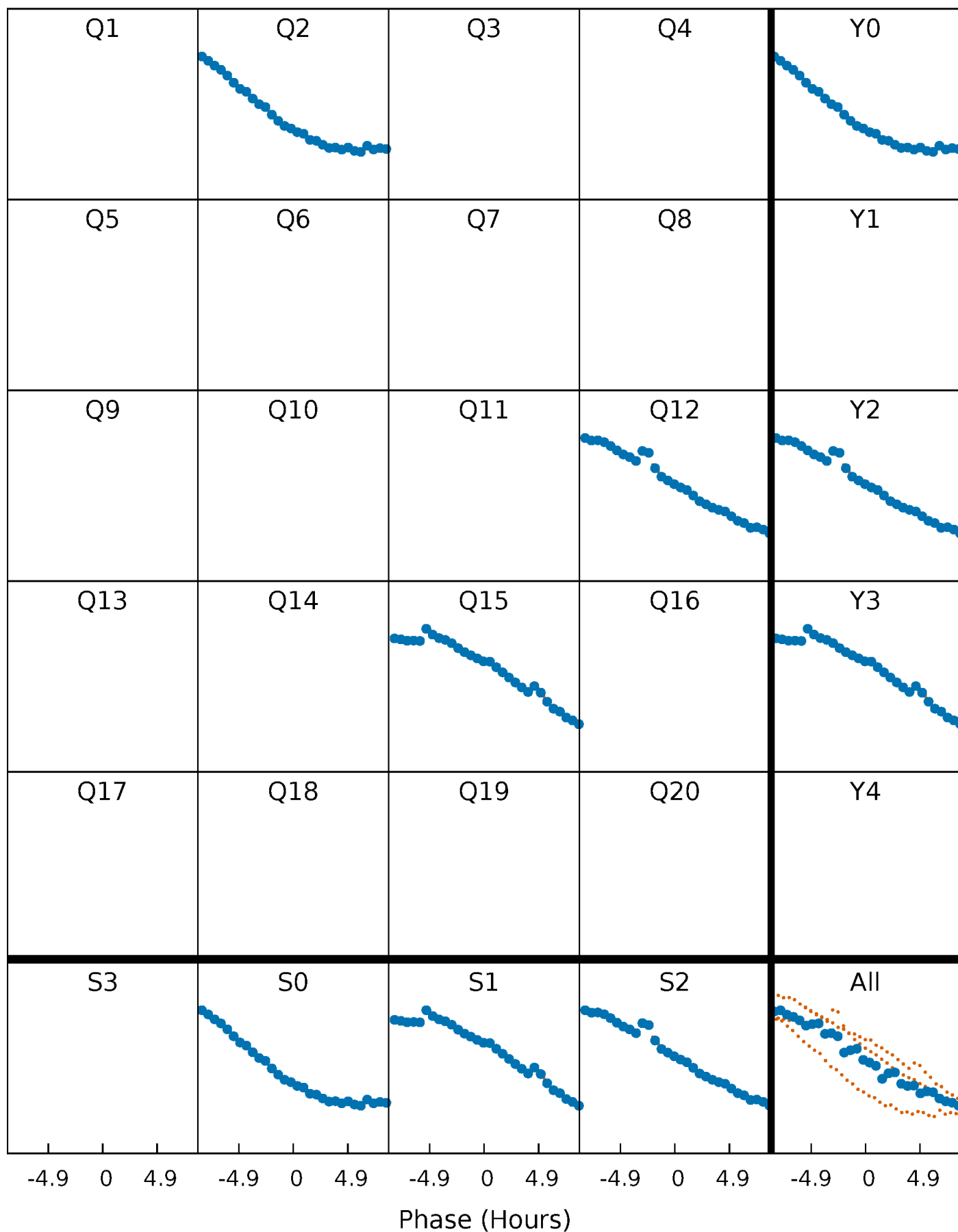


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

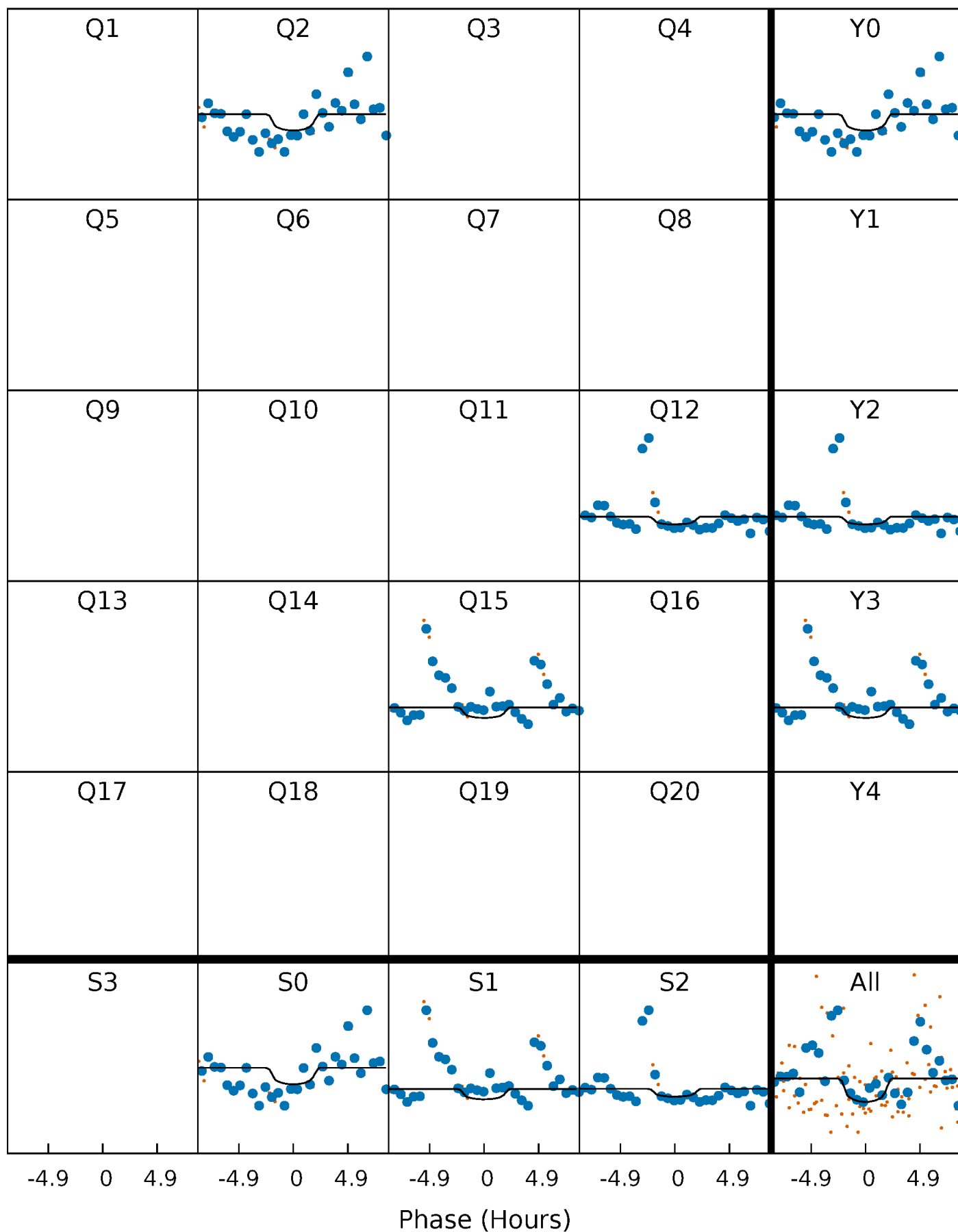
TCE 005079590-01 P=292.898148 Days  $T_0=227.723096$  (BKJD)





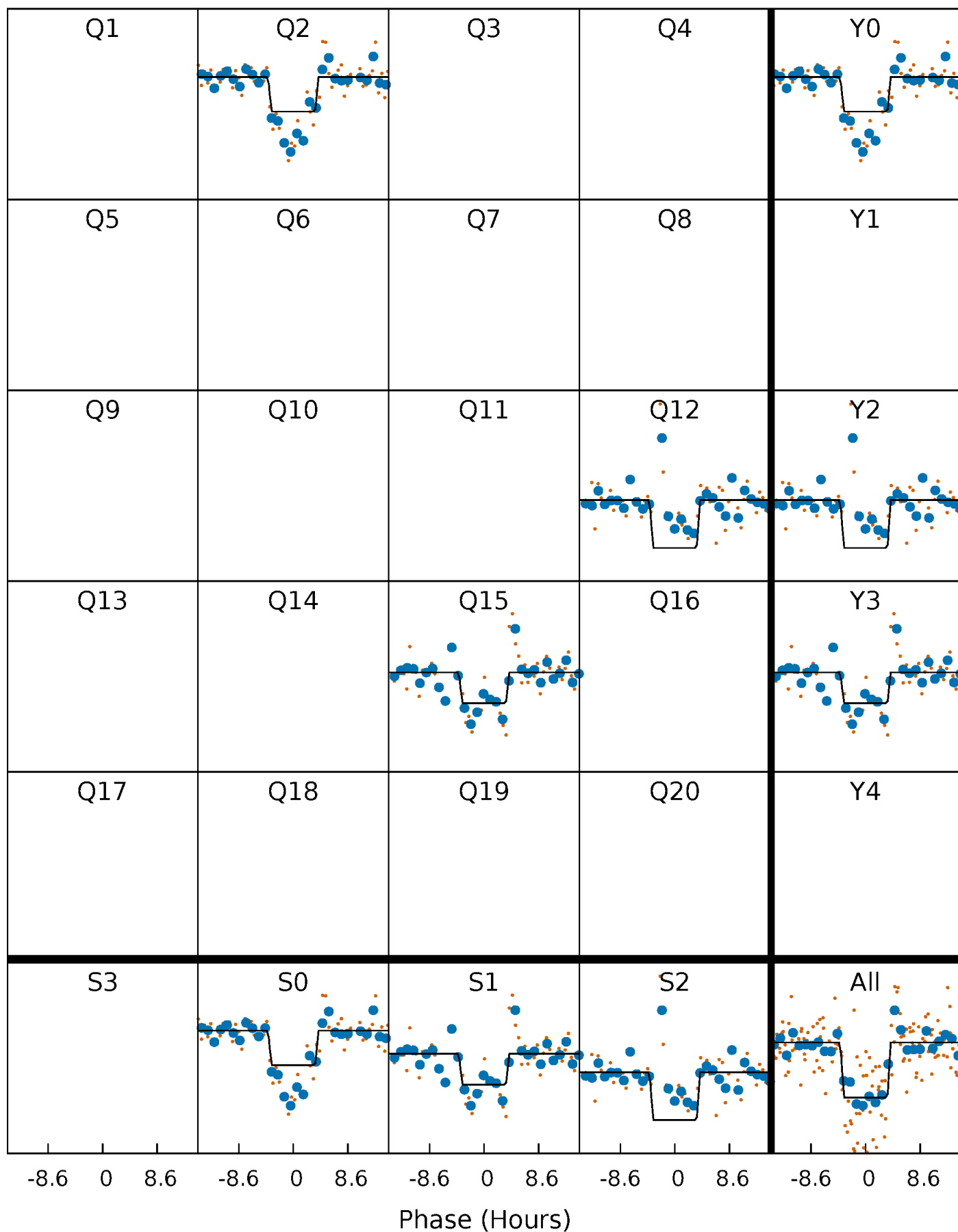
# DV Quarter-Phased Transit Curves

TCE 005079590-01 P=292.898148 Days  $T_0=227.723096$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

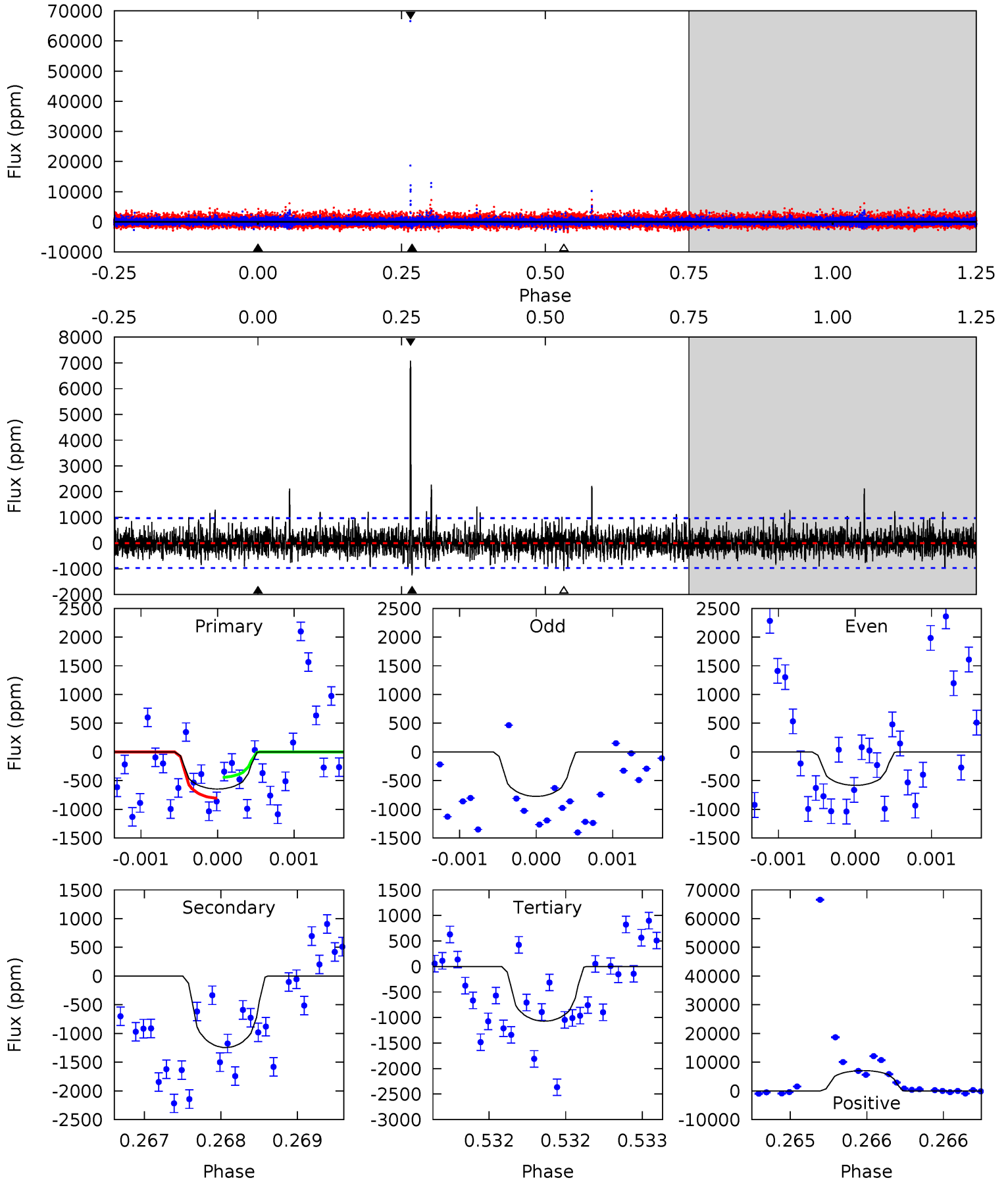
TCE 005079590-01 P=292.901460 Days  $T_0=227.726606$  (BKJD)



# DV Model-Shift Uniqueness Test

005079590-01, P = 292.898148 Days, E = 227.723096 Days

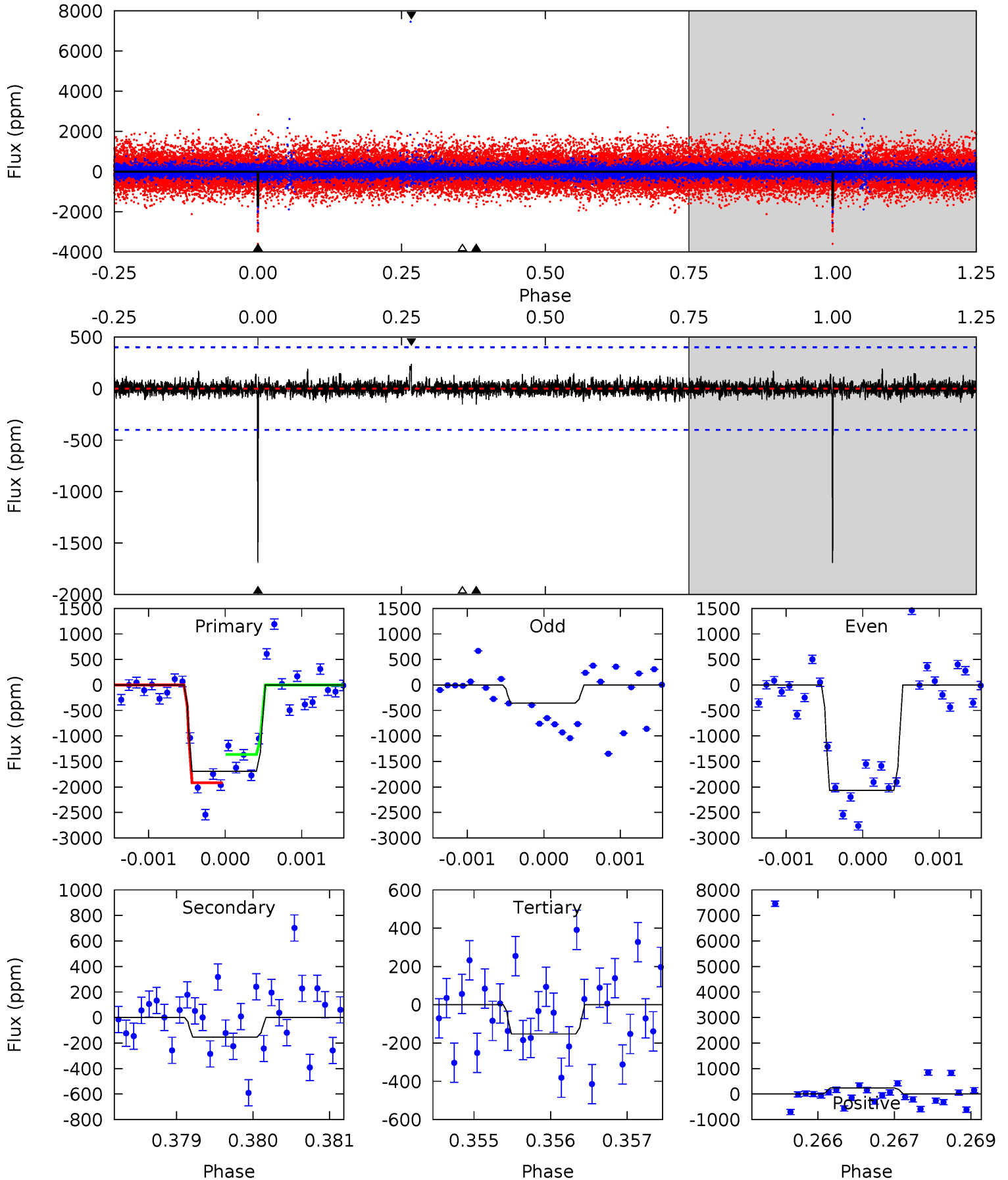
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.70	7.12	6.13	40.4	5.53	3.42	1.93	-2.43	-36.7	0.99	-33.3	0.49	0.83	0.85	1.02



# Alt Model-Shift Uniqueness Test

005079590-01, P = 292.901460 Days, E = 227.726606 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
22.9	2.07	2.07	3.24	5.43	3.26	0.49	20.9	19.7	0.00	-1.17	11.1	0.82	0.12	3.64



### Stellar Parameters For KIC 005079590

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4656^{+168}_{-168}$	$4.560^{+0.063}_{-0.027}$	$0.160^{+0.250}_{-0.300}$	$0.747^{+0.042}_{-0.068}$	$0.740^{+0.063}_{-0.058}$	$2.498^{+0.682}_{-0.284}$
	+4%/-4%	+1%/-1%	+156%/-188%	+6%/-9%	+9%/-8%	+27%/-11%
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 005079590-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1246 \pm 175$	$5.30^{+5.17}_{-3.78}$	$279^{+12}_{-11}$	$3710^{+2397}_{-701}$	$14189^{+164672}_{-10356}$
Alt.	$-153 \pm 74$	$5.77^{+5.24}_{-3.93}$	$278^{+13}_{-11}$	$2655^{+1068}_{-429}$	$1502^{+13962}_{-1148}$

$T_{max}$  = 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

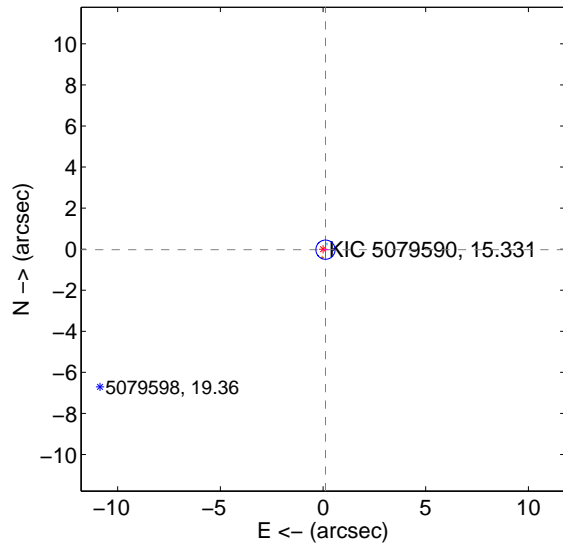
Supplemental centroid analysis for 005079590-01. Kepler magnitude: 15.33. Transit SNR 3.07

There are 1 quarters with good PRF difference image offsets

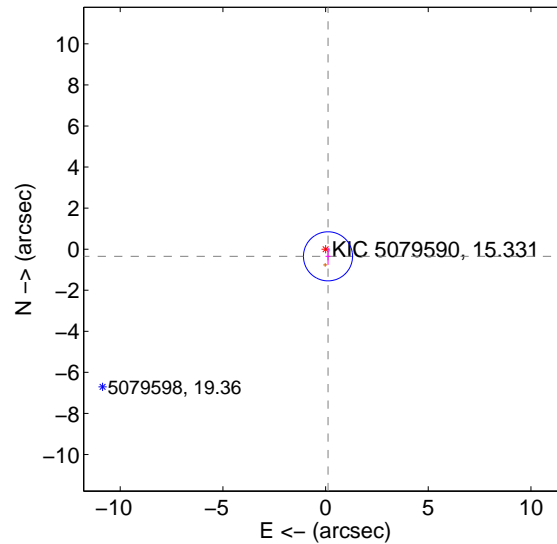
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.122 \pm 0.156$	0.78	$-0.120 \pm 0.138$	$-0.025 \pm 0.387$
PRF-fit source offset from KIC position	$0.368 \pm 0.398$	0.92	$-0.118 \pm 0.122$	$-0.348 \pm 0.419$
photometric centroid source offset	$1.65 \pm 2.72$	0.60	$1.59 \pm 2.71$	$0.42 \pm 2.91$

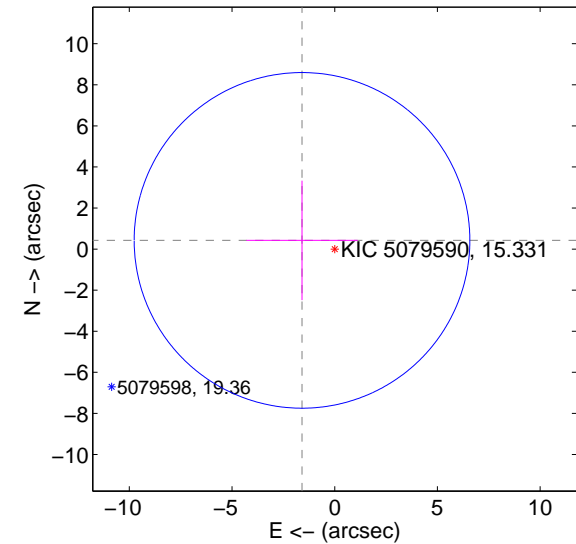
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

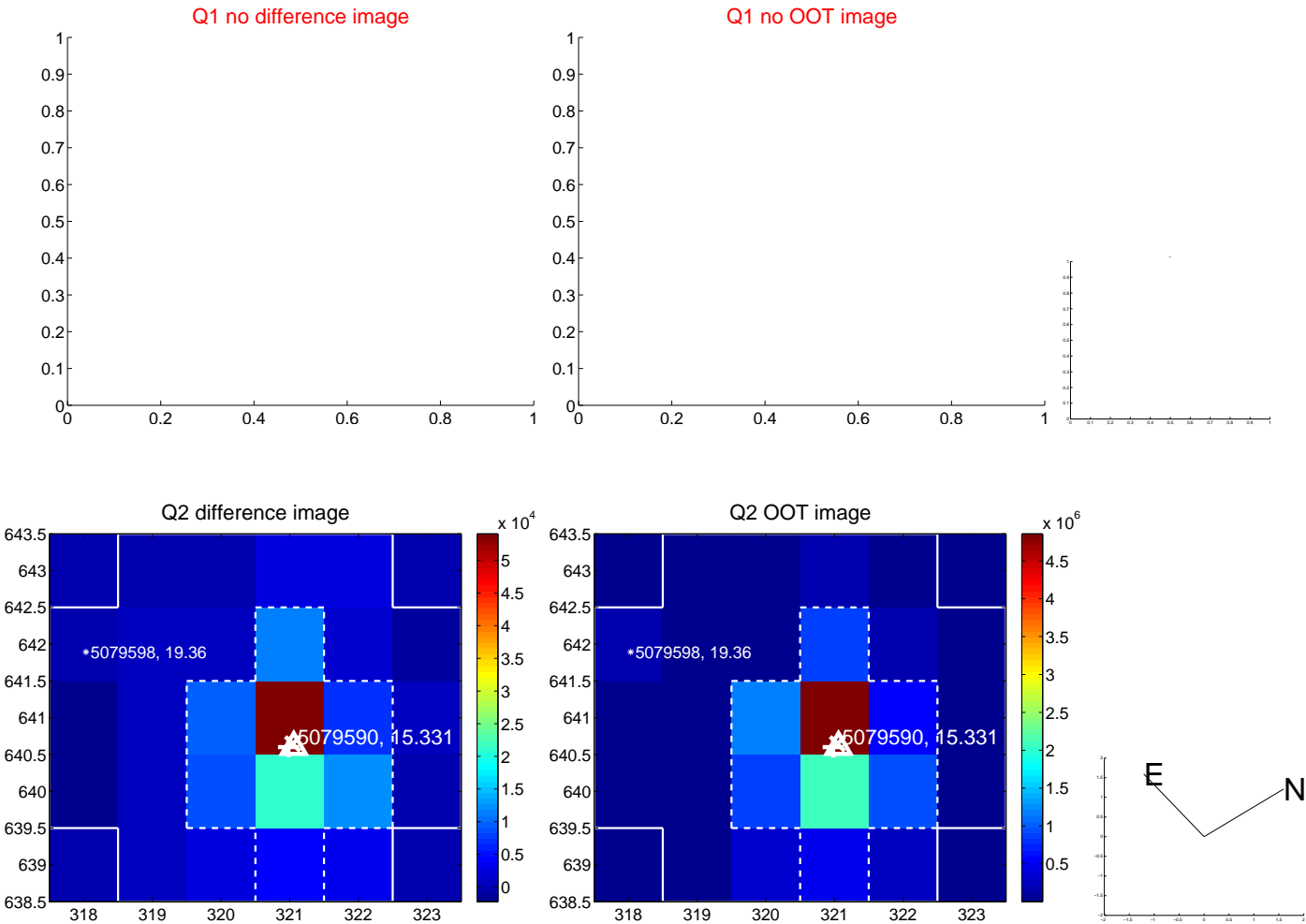


offset from photometric centroids



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.

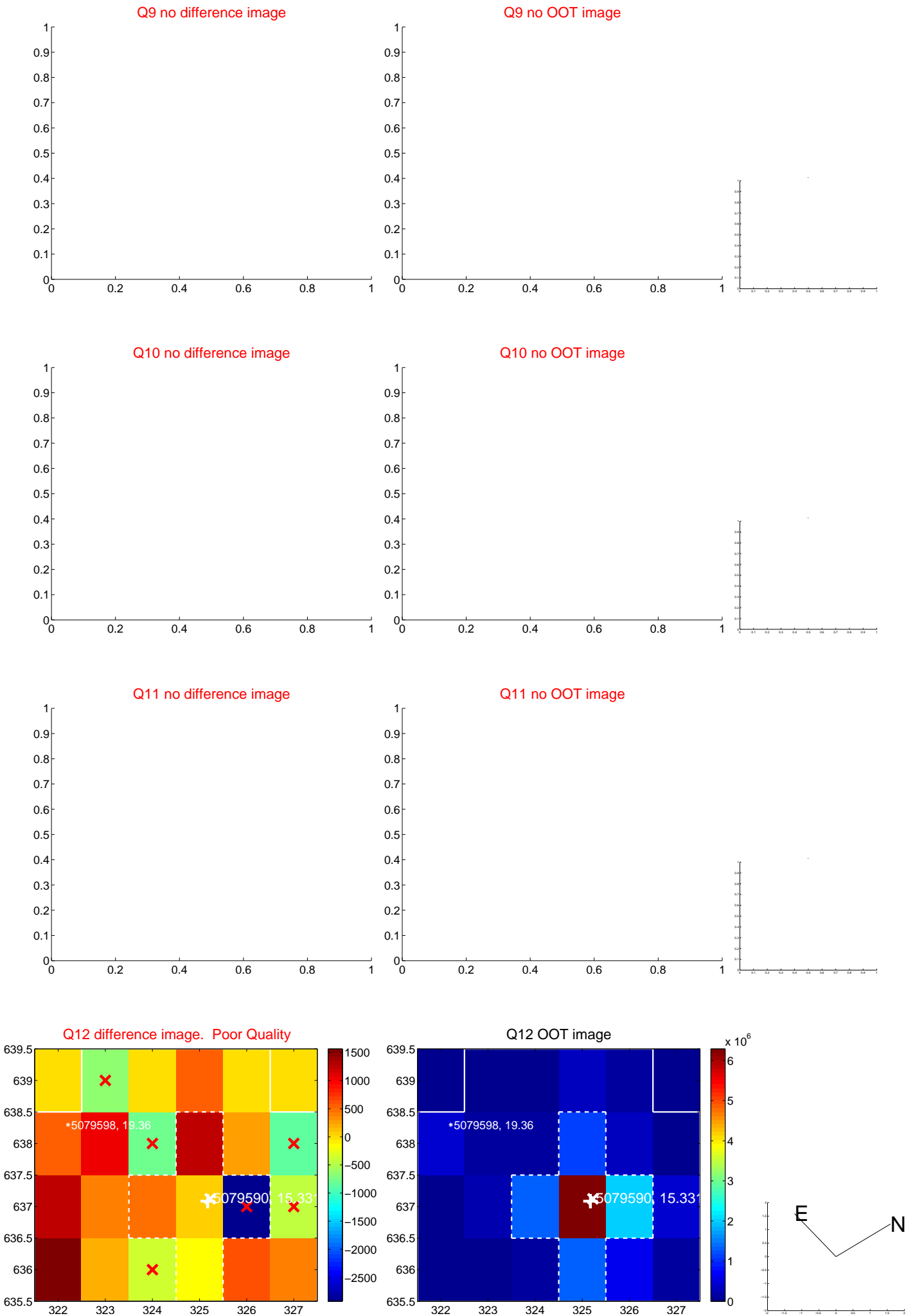


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

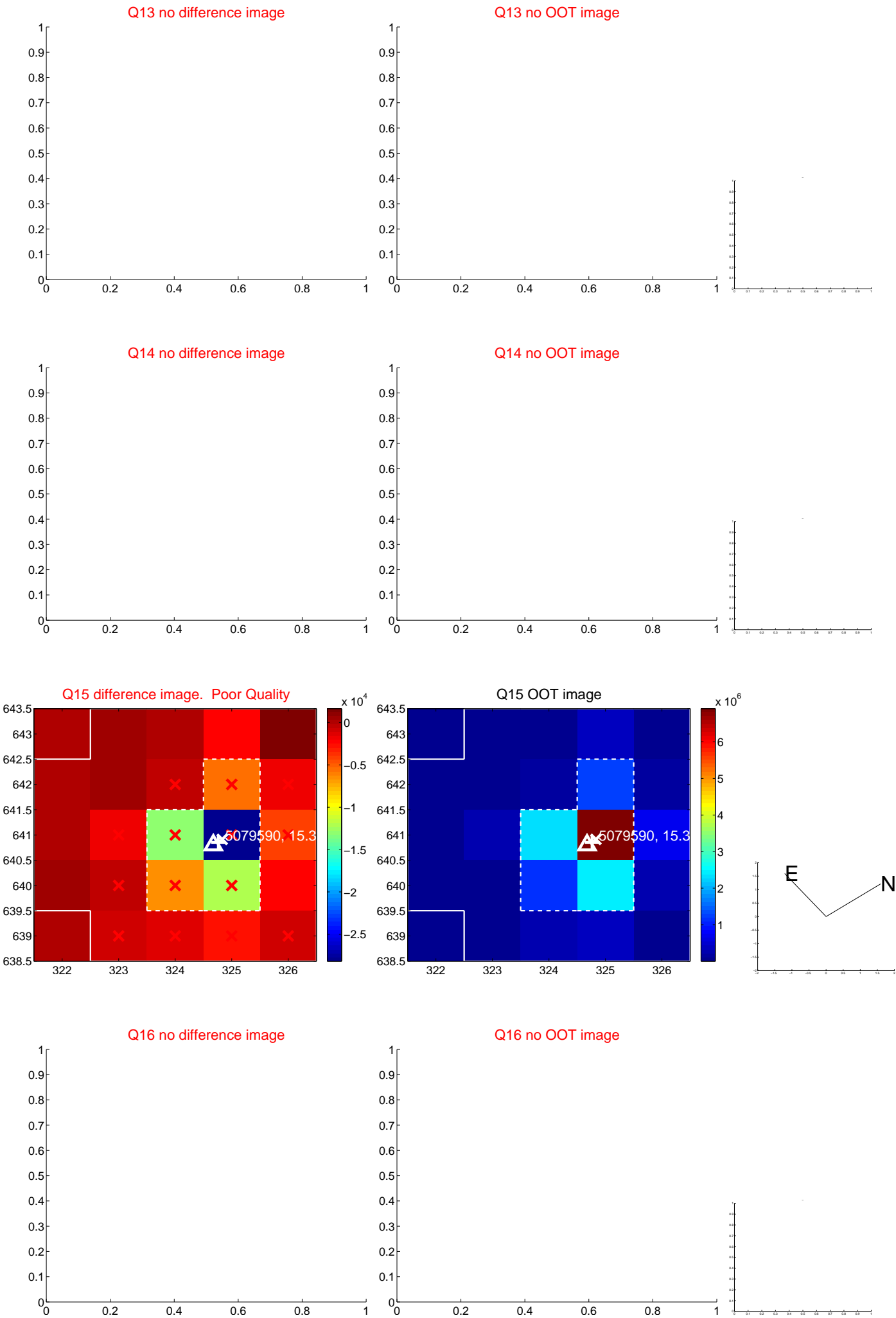




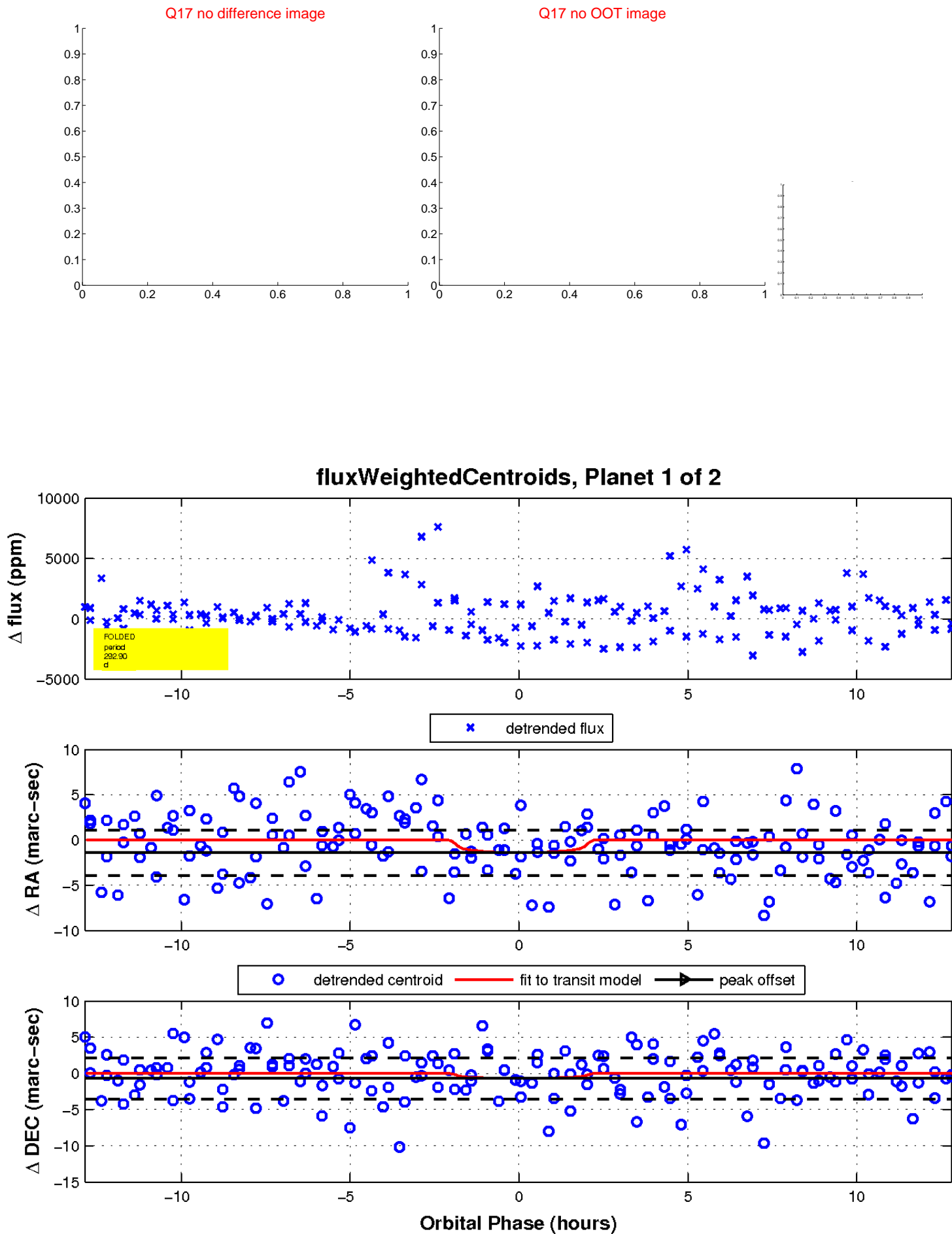
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

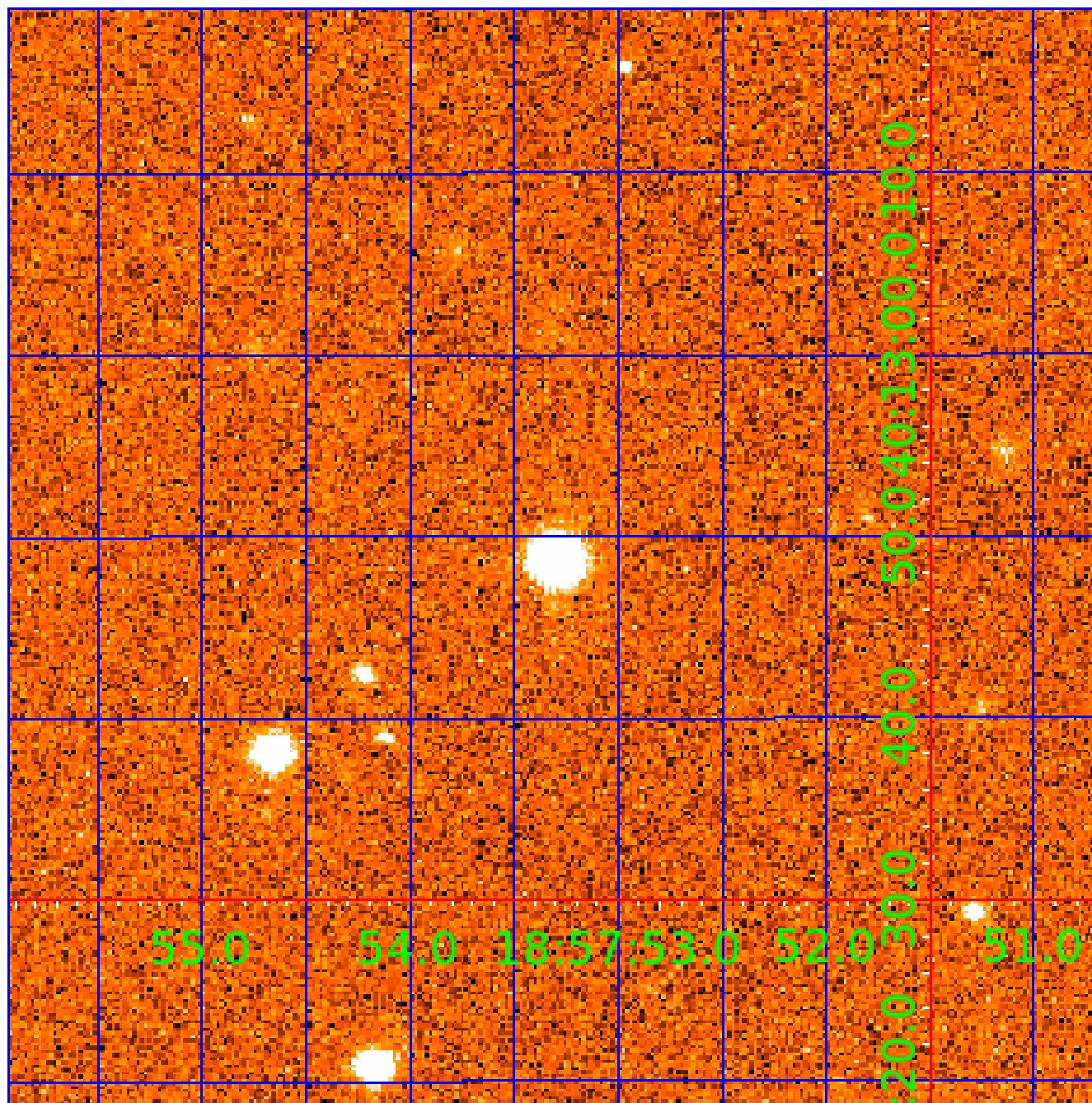


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 005079590

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005079590-01	OBS	No	292.898148	227.723096	854.9	4.294	12.6	3.1	0.75	4656	2.46	0.39
005079590-02	OBS	No	470.508125	140.768734	1676.8	2.848	10.1	6.5	0.75	4656	2.93	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005079590-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005079590-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

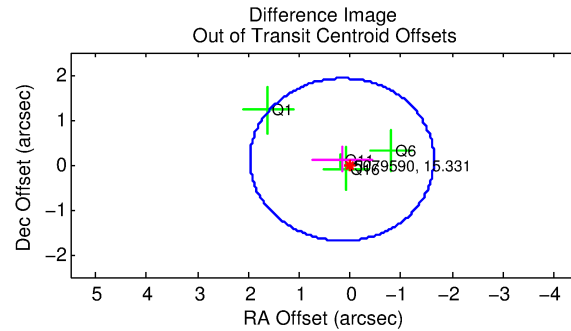
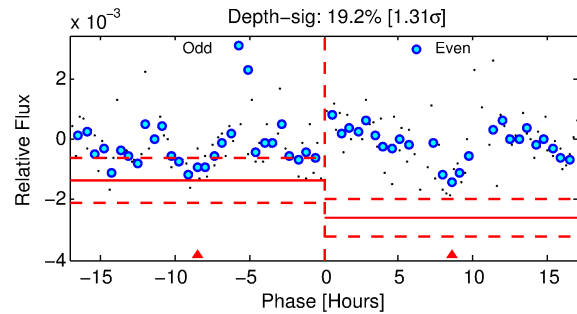
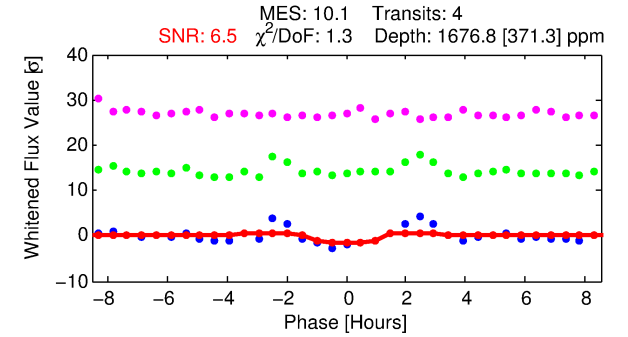
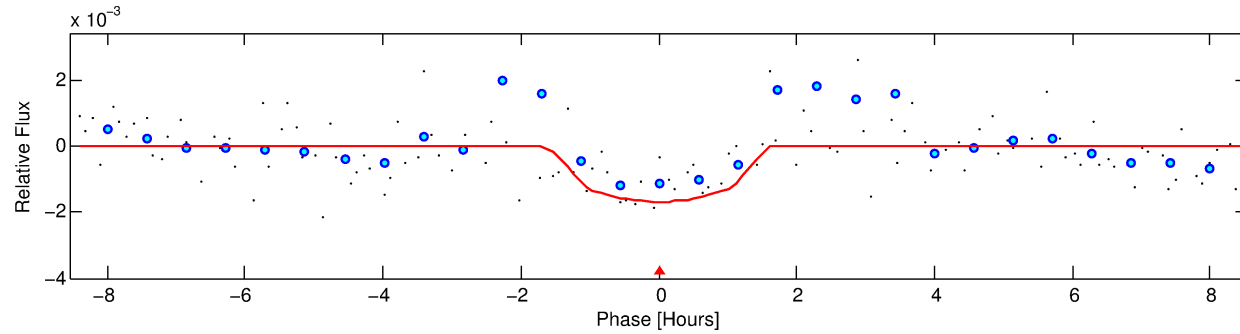
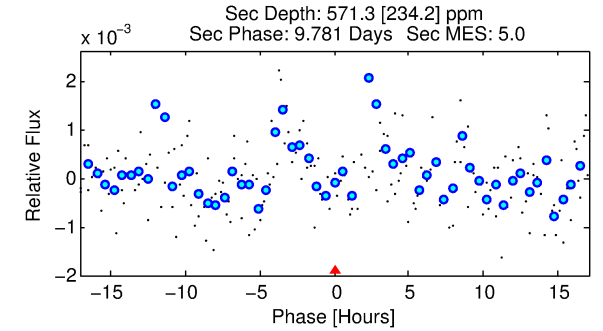
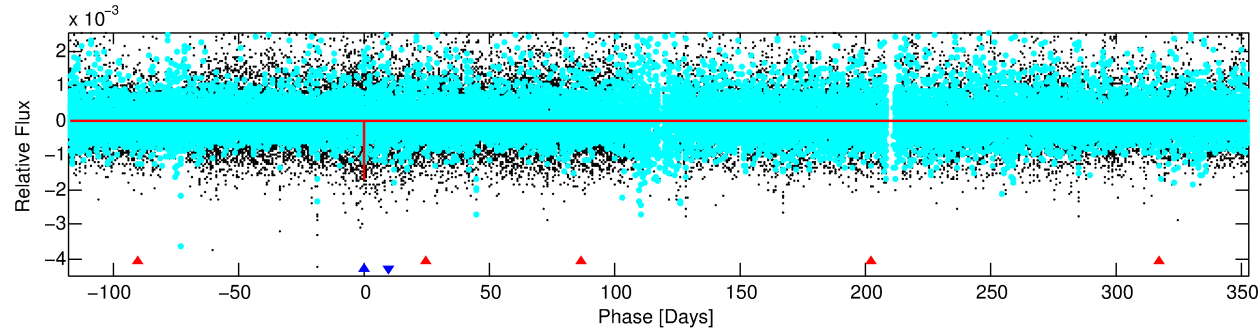
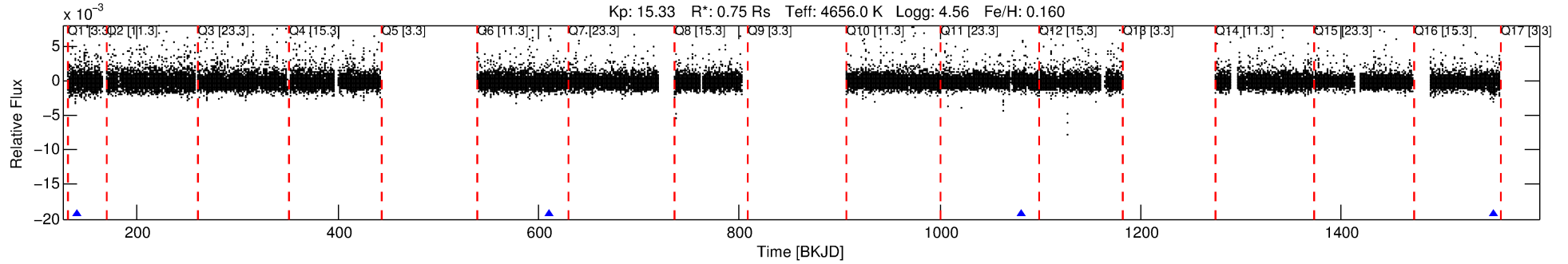
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005079590-02

No Significant Match Found

# DV One-Page Summary

KIC: 5079590 Candidate: 2 of 2 Period: 470.508 d



## DV Fit Results:

Period = 470.50812 [0.00531] d  
Epoch = 140.7687 [0.0106] BKJD  
Rp/R\* = 0.0359 [0.1524]  
a/R\* = 1307.54 [16189.91]  
b = 0.01 [1022.57]  
Seff = 0.20 [0.04]  
Teq = 172 [8] K  
Rp = 2.93 [12.43] Re  
a = 1.0706 [0.0831] AU  
Ag = 42063.72 [357577.51] [0.12 $\sigma$ ]  
Teffp = 3799 [8074] K [0.45 $\sigma$ ]

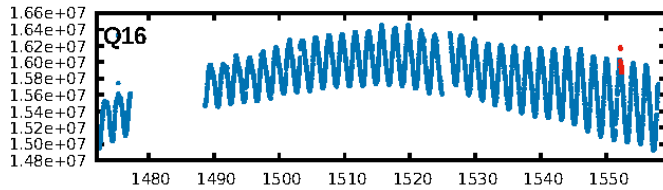
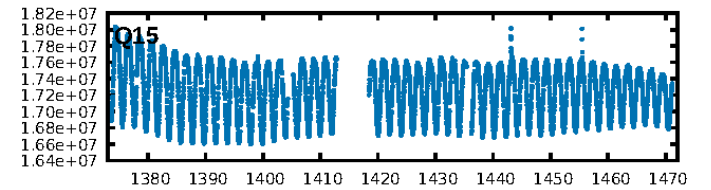
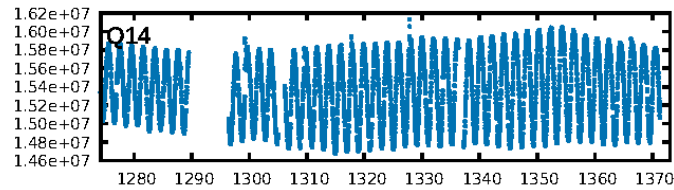
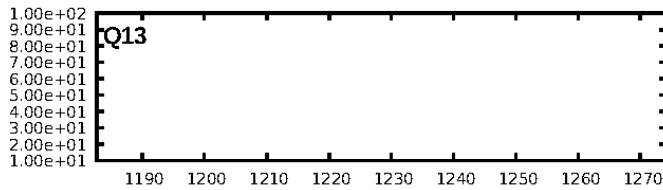
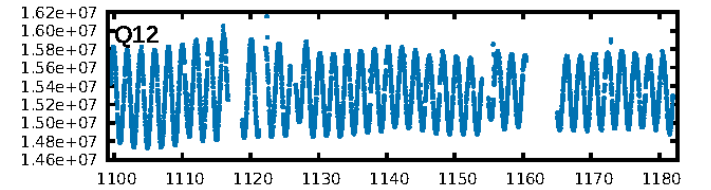
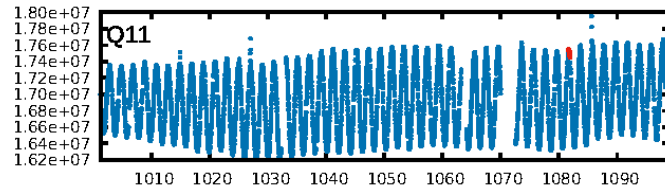
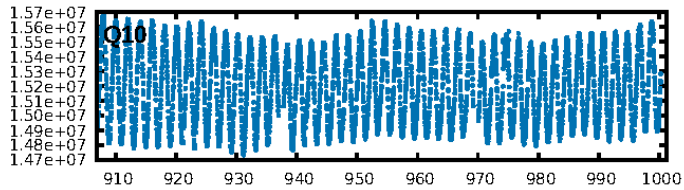
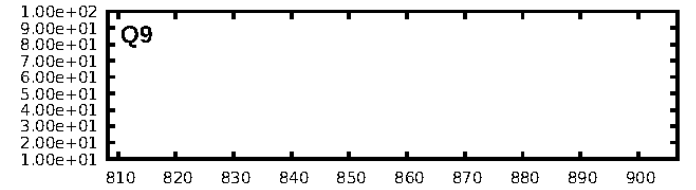
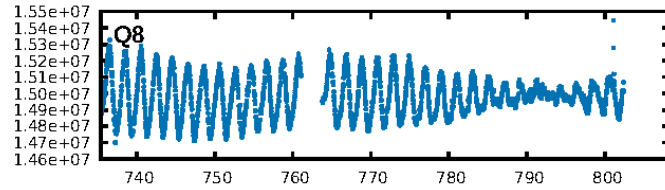
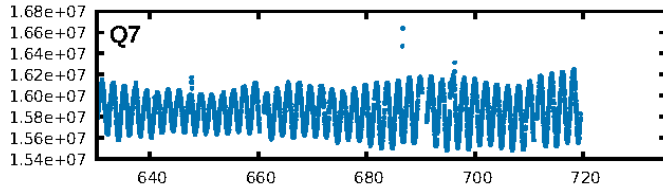
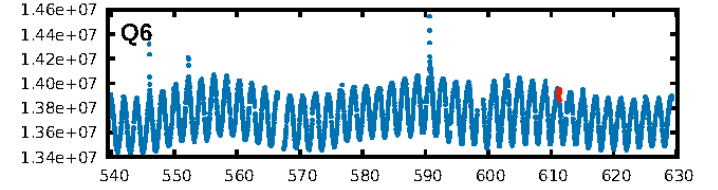
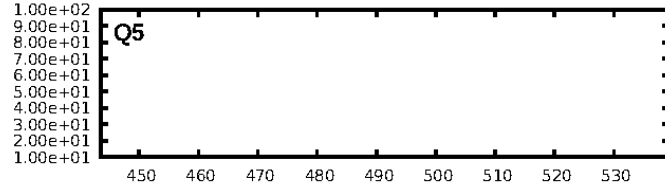
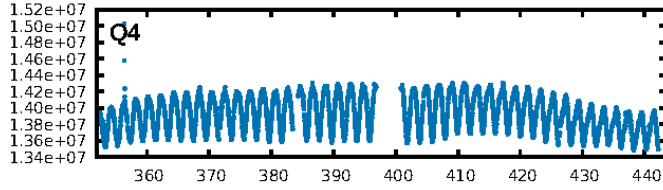
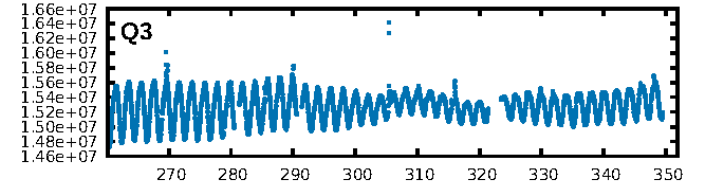
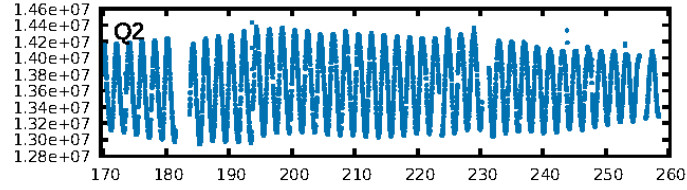
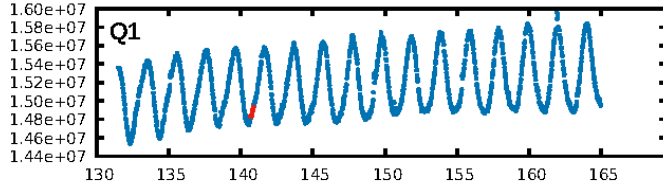
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [827.30 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.7%  
ModelChiSquareGof-sig: 62.4%  
**Bootstrap-pfa: 5.77e-09**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.8815**  
Centroid-sig: 5.3%  
Centroid-so: 2.272 arcsec [1.66 $\sigma$ ]  
OotOffset-rm: 0.194 arcsec [0.32 $\sigma$ ]  
OotOffset-st: 1/1/1/1 [4]  
KicOffset-rm: 0.113 arcsec [0.40 $\sigma$ ]  
KicOffset-st: 1/1/1/1 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 1.00 [4/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 03:58:08 Z

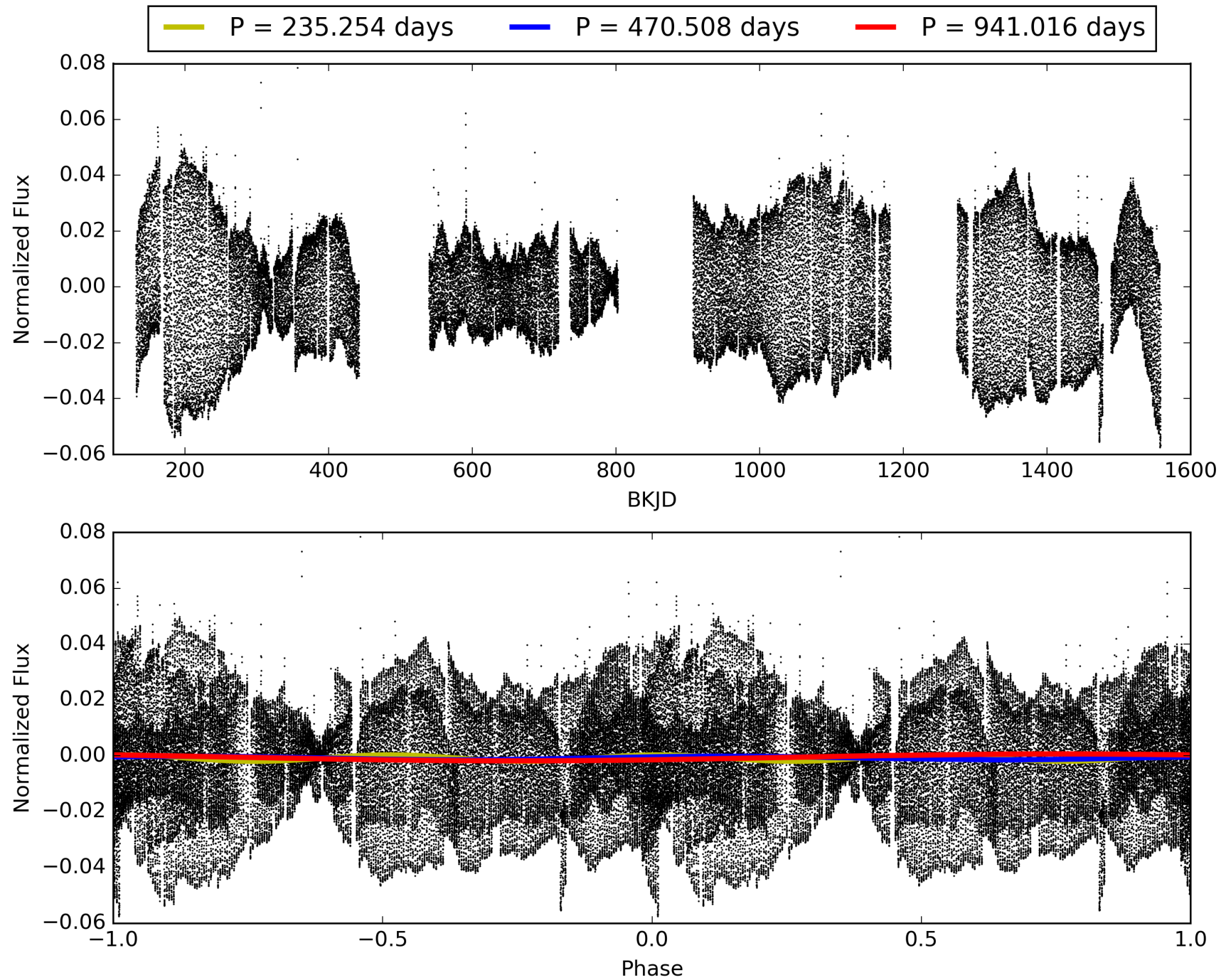
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005079590-02, PDC Light Curves





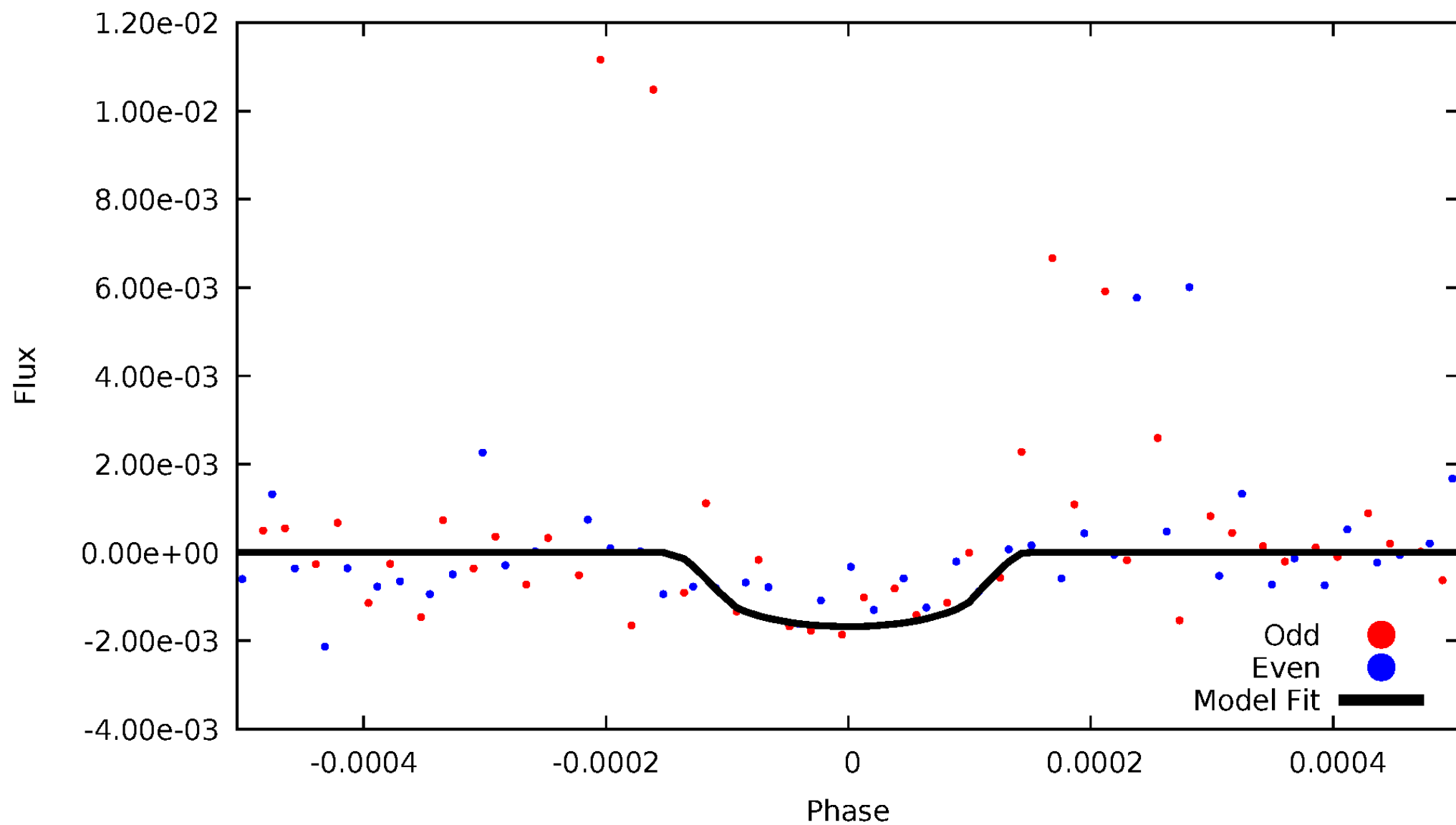
TCE 005079590-02





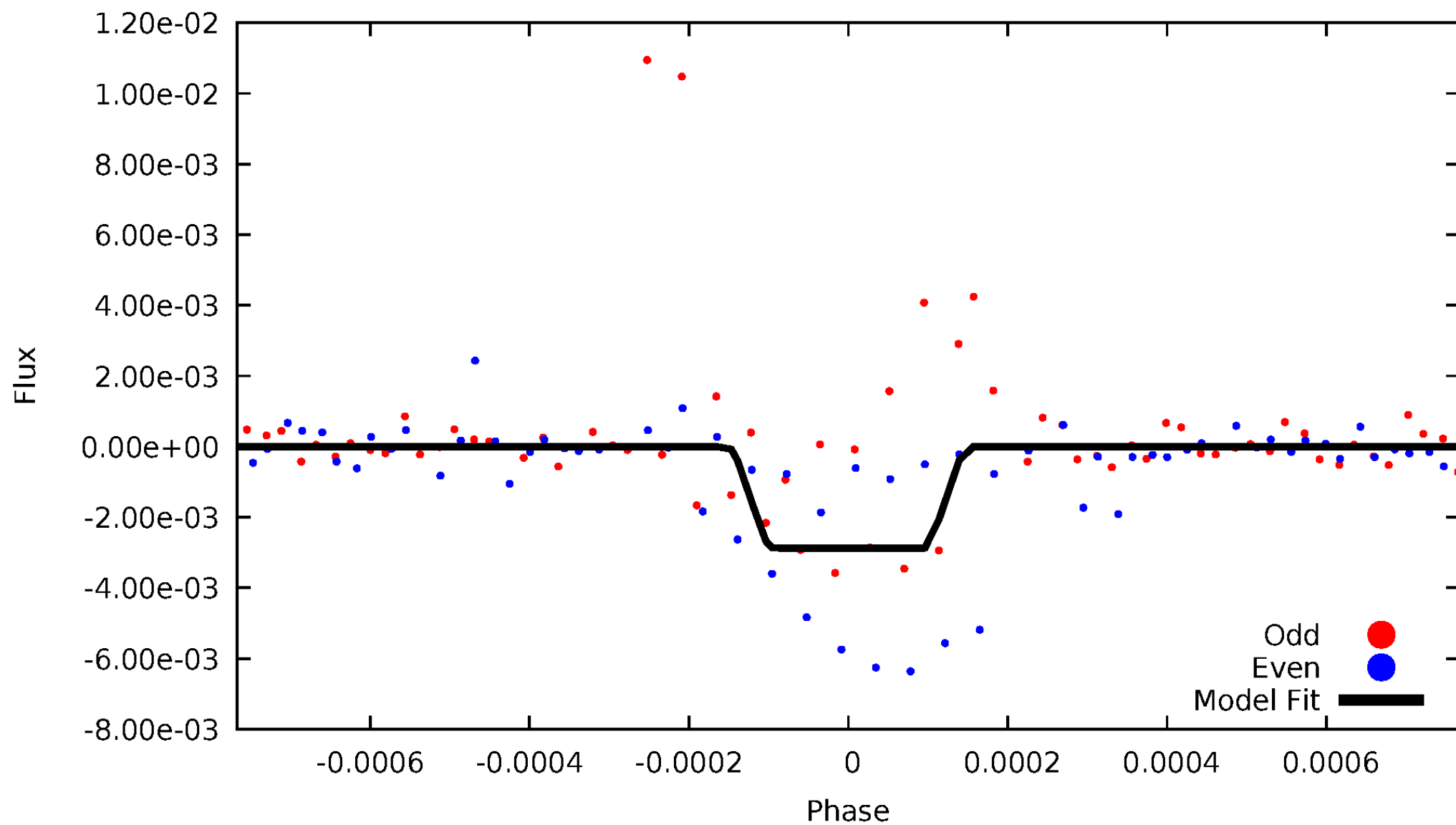
# DV Odd/Even

TCE 005079590-02



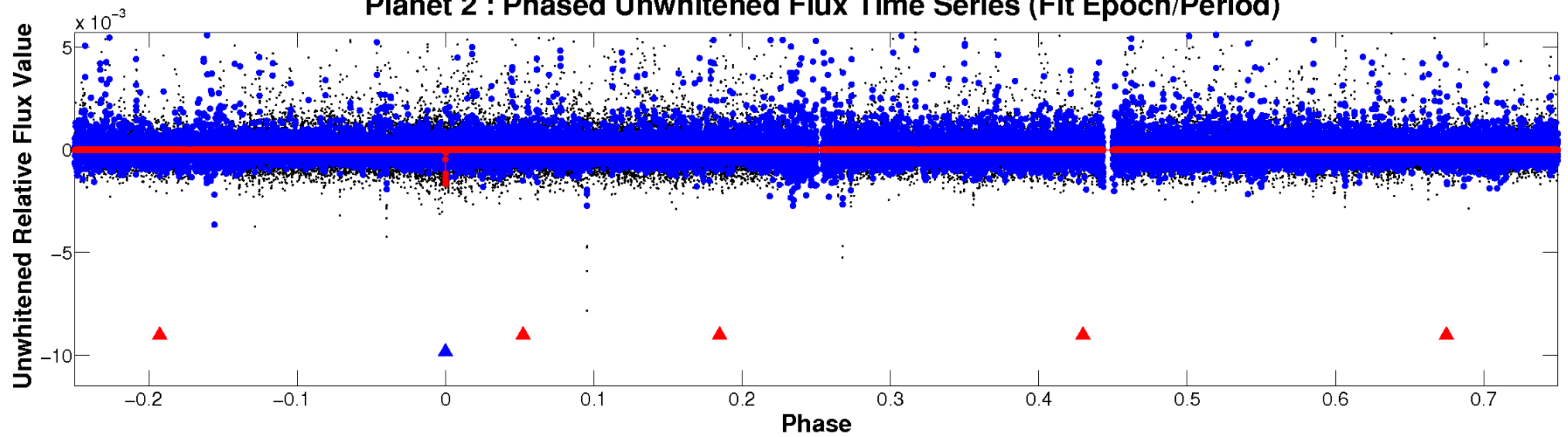
# ALT Odd/Even

TCE 005079590-02

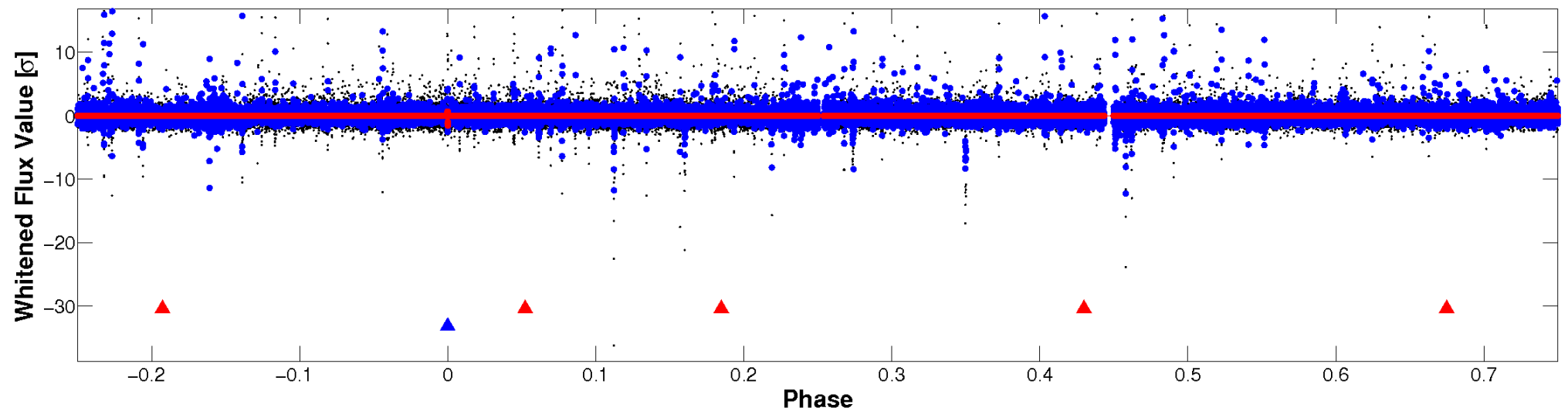


# Non-Whitened Vs. Whitened Light Curve

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

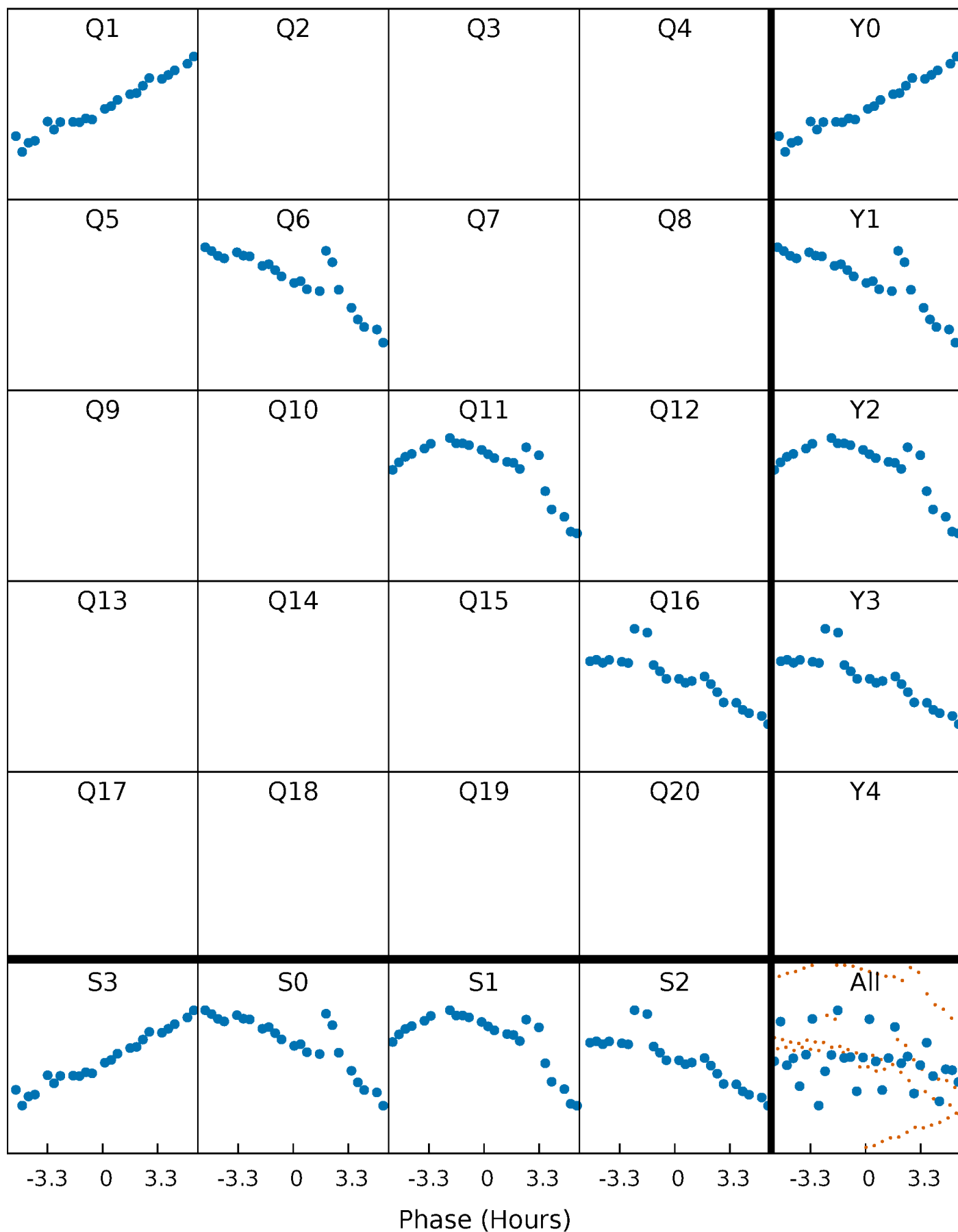


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



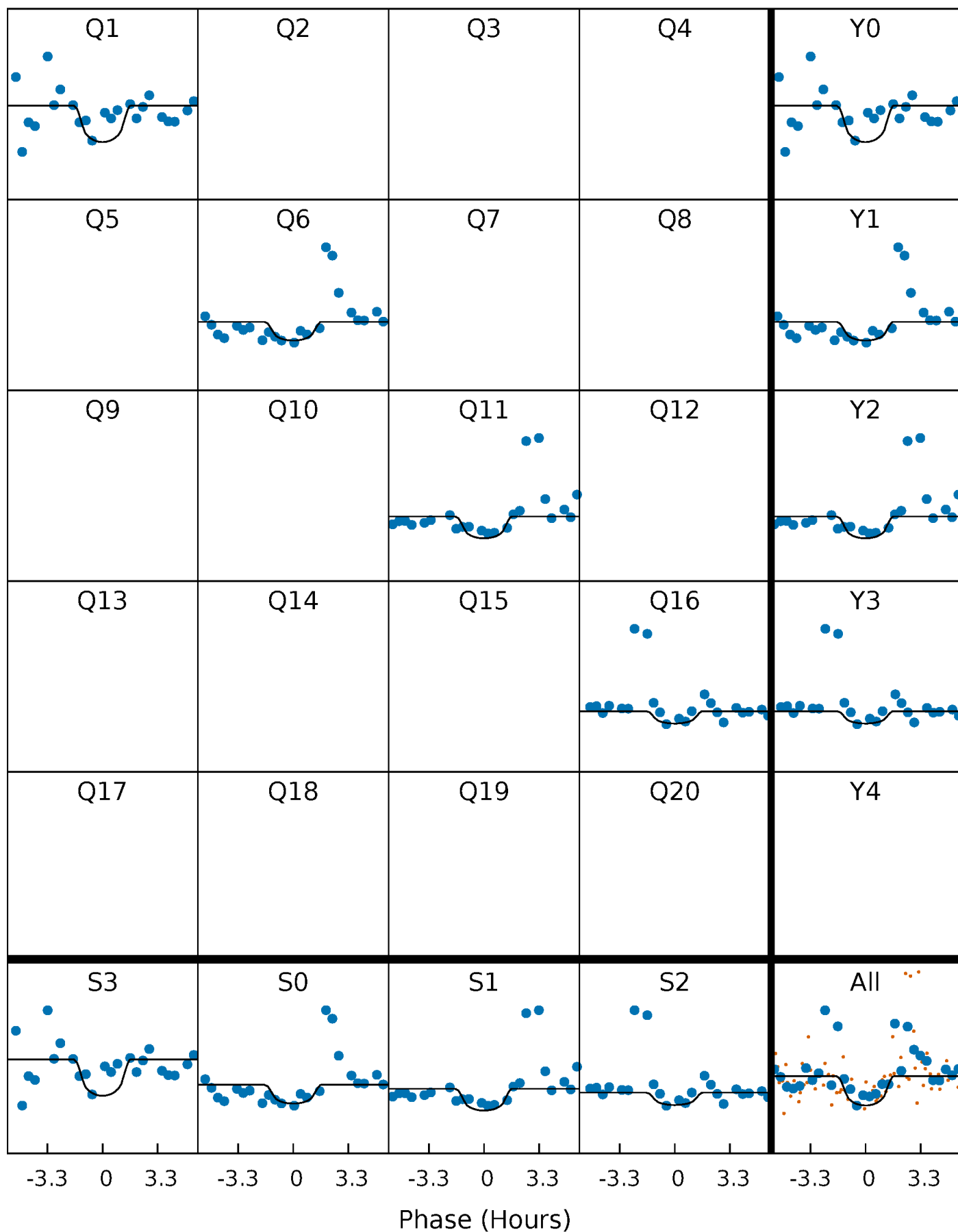
# PDC Quarter-Phased Transit Curves

TCE 005079590-02 P=470.508125 Days  $T_0=140.768734$  (BKJD)



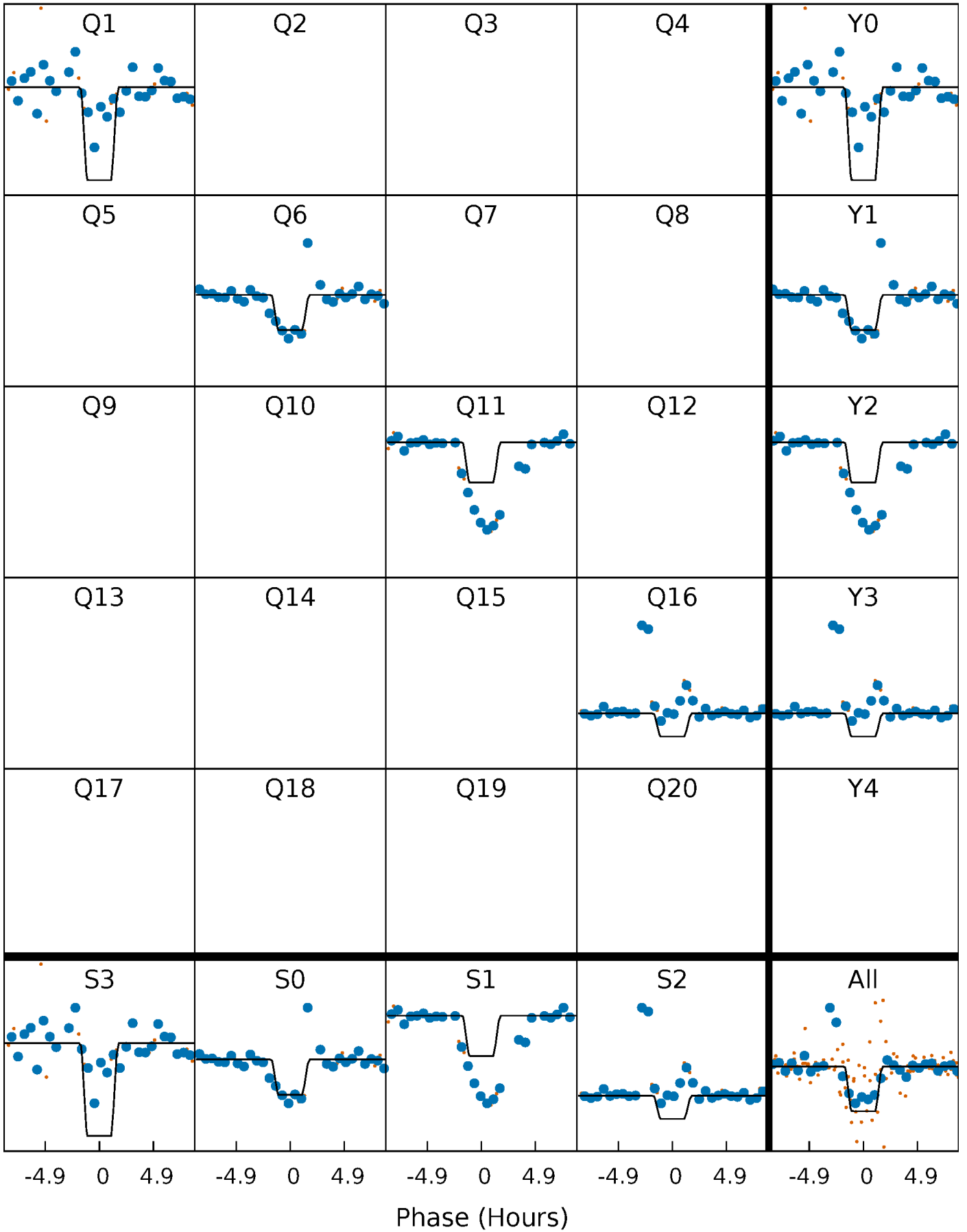
# DV Quarter-Phased Transit Curves

TCE 005079590-02     $P=470.508125$  Days     $T_0=140.768734$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

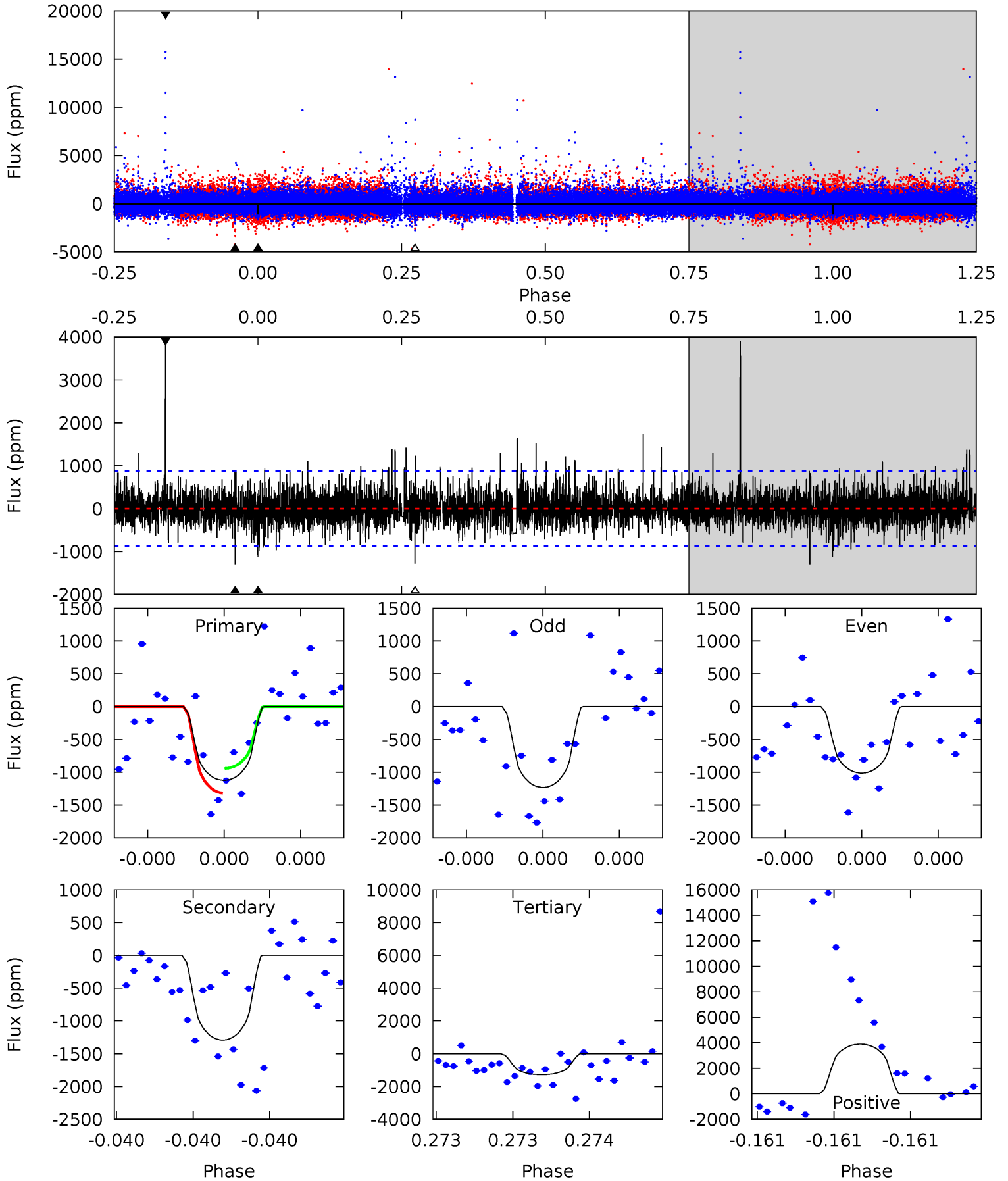
TCE 005079590-02 P=470.516775 Days  $T_0=140.765438$  (BKJD)



# DV Model-Shift Uniqueness Test

005079590-02, P = 470.508125 Days, E = 140.768734 Days

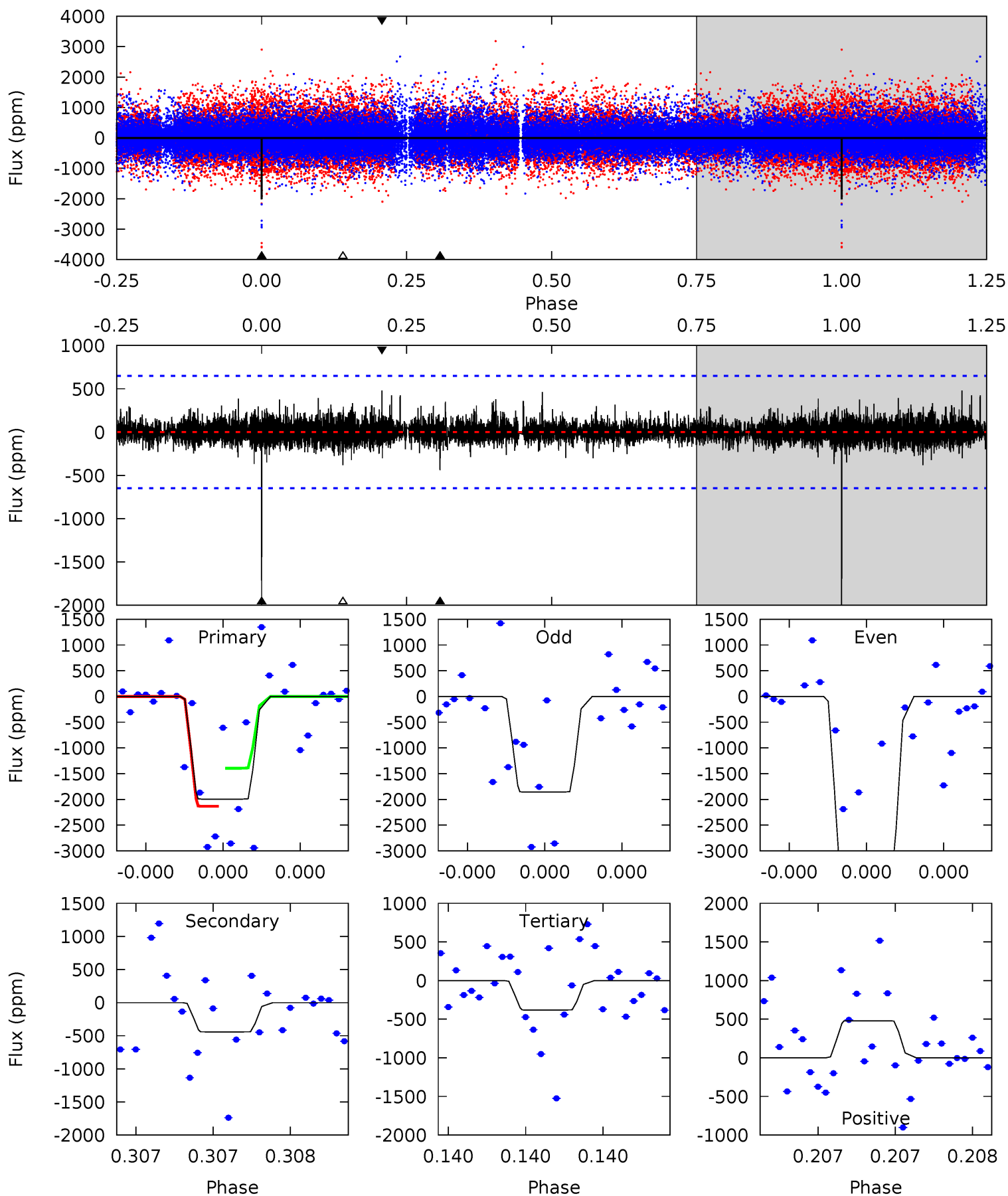
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.33	8.42	8.34	25.4	5.67	3.63	1.89	-1.02	-18.1	0.08	-17.0	0.58	1.04	0.75	1.23



# Alt Model-Shift Uniqueness Test

005079590-02, P = 470.516775 Days, E = 140.765438 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
17.4	3.86	3.33	4.18	5.66	3.62	0.66	14.1	13.3	0.53	-0.32	8.31	1.07	0.19	0





### Stellar Parameters For KIC 005079590

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4656^{+168}_{-168}$	$4.560^{+0.063}_{-0.027}$	$0.160^{+0.250}_{-0.300}$	$0.747^{+0.042}_{-0.068}$	$0.740^{+0.063}_{-0.058}$	$2.498^{+0.682}_{-0.284}$
	+4%/-4%	+1%/-1%	+156%/-188%	+6%/-9%	+9%/-8%	+27%/-11%
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 005079590-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1293 \pm 154$	$9.41^{+9.36}_{-6.52}$	$238^{+10}_{-10}$	$3123^{+1592}_{-529}$	$9493^{+93974}_{-7111}$
Alt.	$-442 \pm 114$	$10.15^{+10.41}_{-7.15}$	$238^{+9}_{-9}$	$2624^{+1137}_{-388}$	$2591^{+28445}_{-1960}$

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

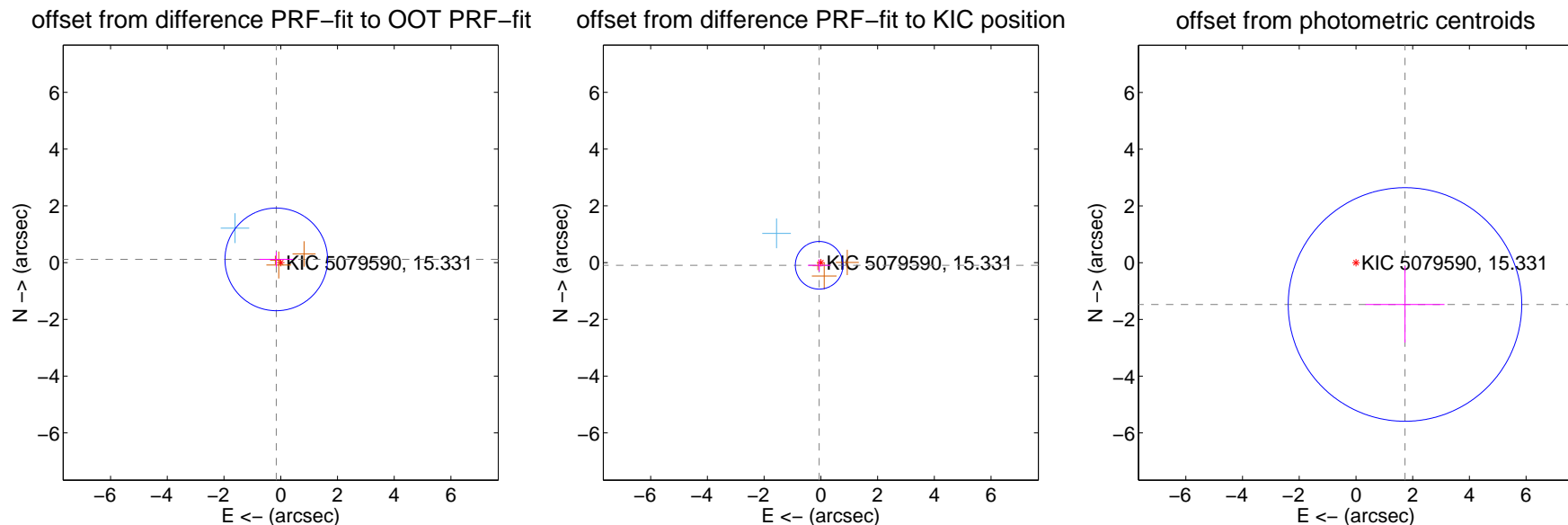
## DV Centroid Data

Supplemental centroid analysis for 005079590-02. Kepler magnitude: 15.33. Transit SNR 6.51

There are 1 quarters with good PRF difference image offsets

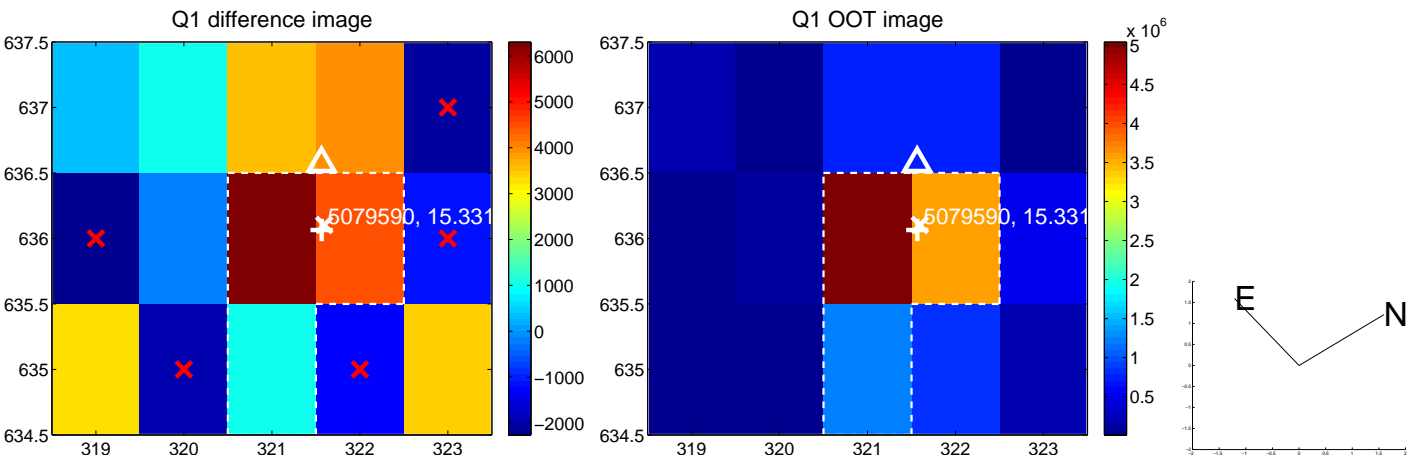
The direct PRF centroid is offset from the target star catalog position by about 0.43 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.194 \pm 0.603$	0.32	$0.158 \pm 0.590$	$0.113 \pm 0.264$
PRF-fit source offset from KIC position	$0.113 \pm 0.280$	0.40	$0.061 \pm 0.397$	$-0.095 \pm 0.214$
photometric centroid source offset	$2.27 \pm 1.37$	1.66	$-1.73 \pm 1.39$	$-1.47 \pm 1.35$

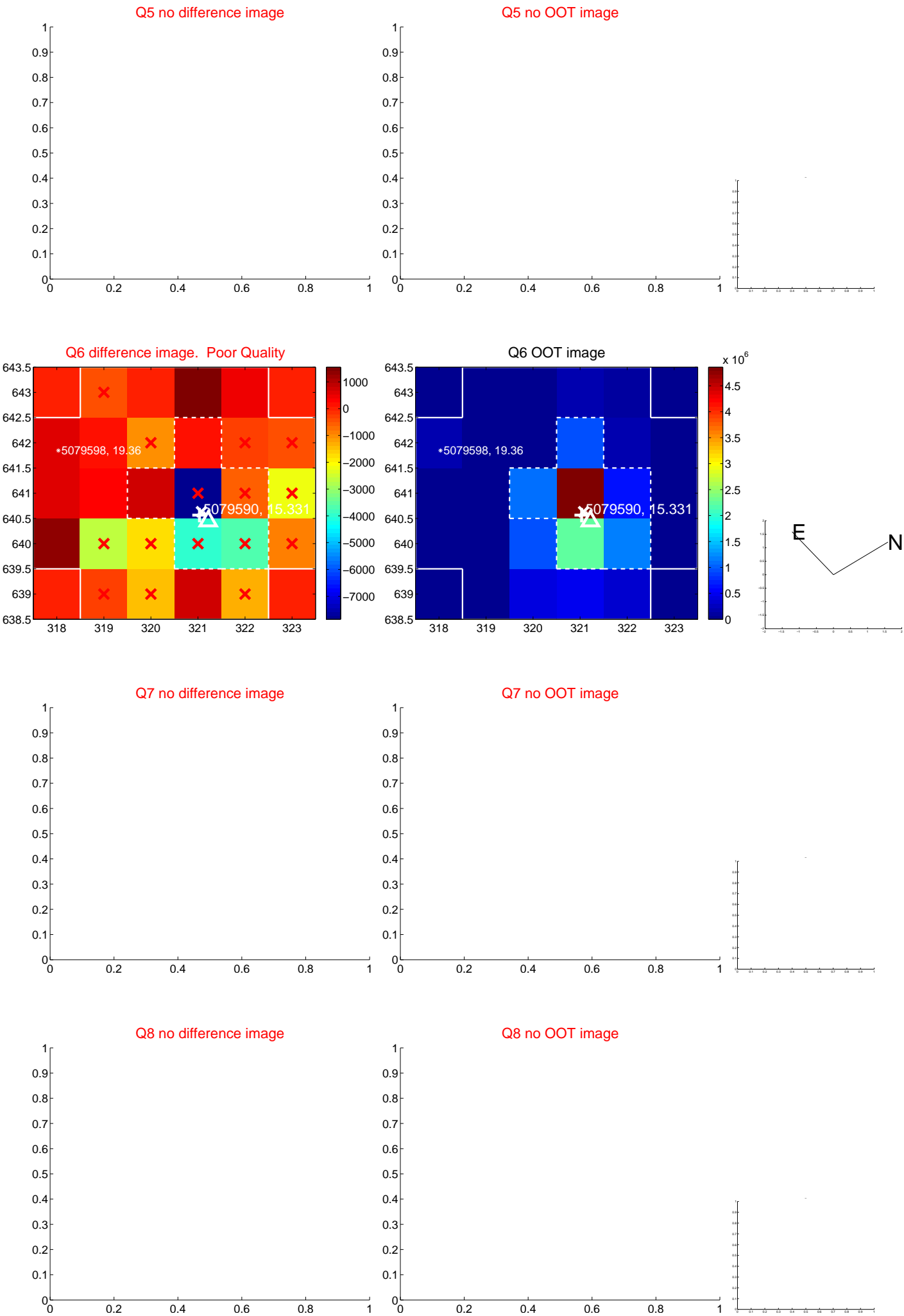


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

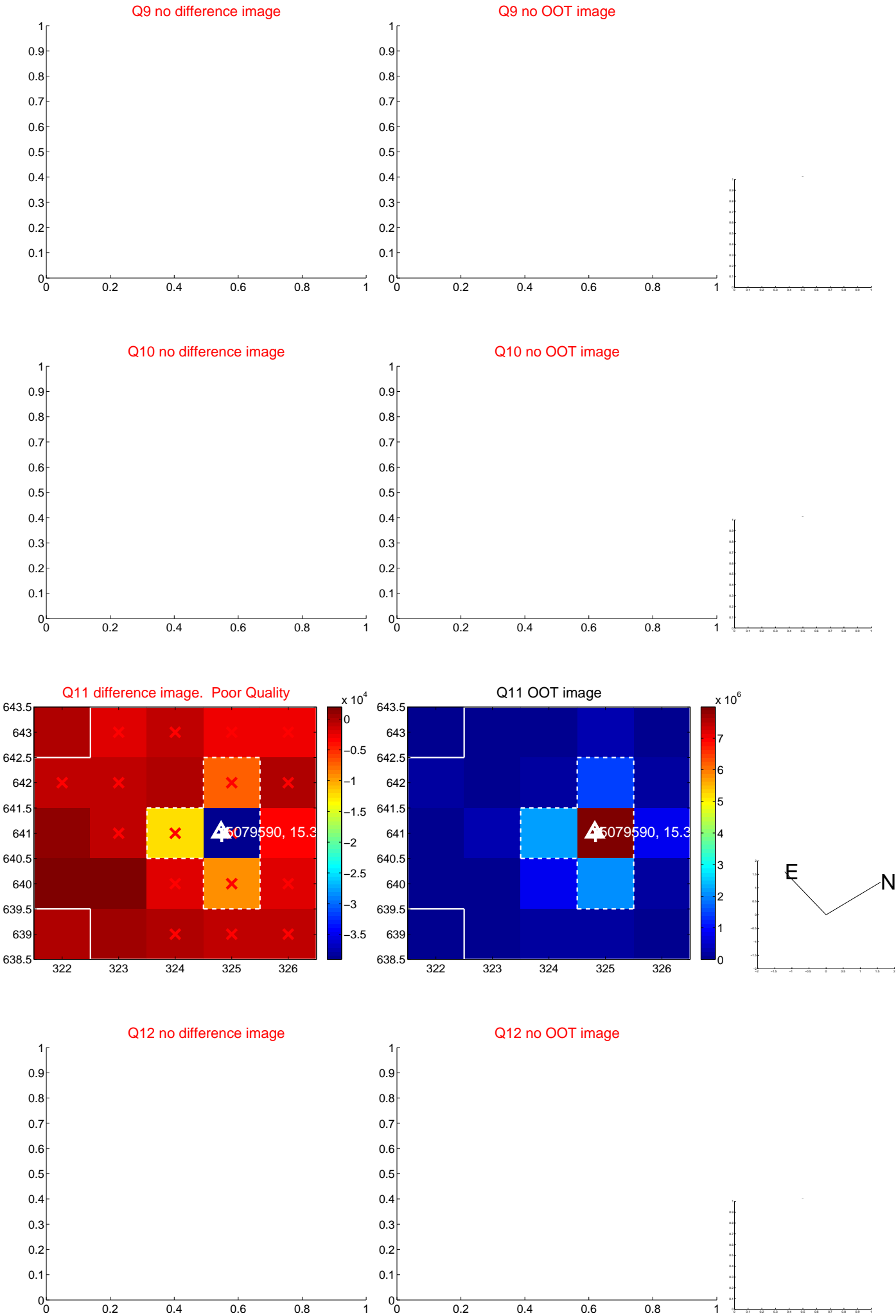
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

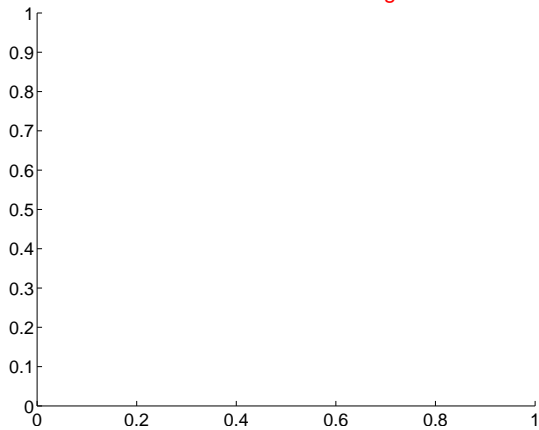


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

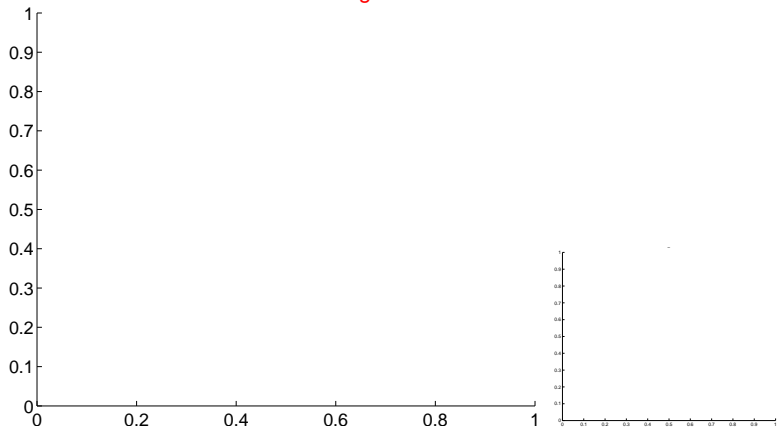


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

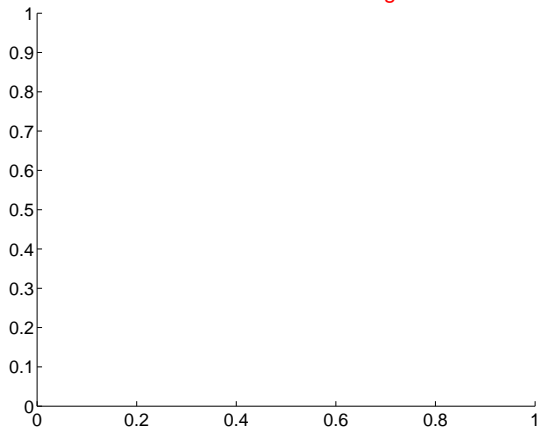
Q13 no difference image



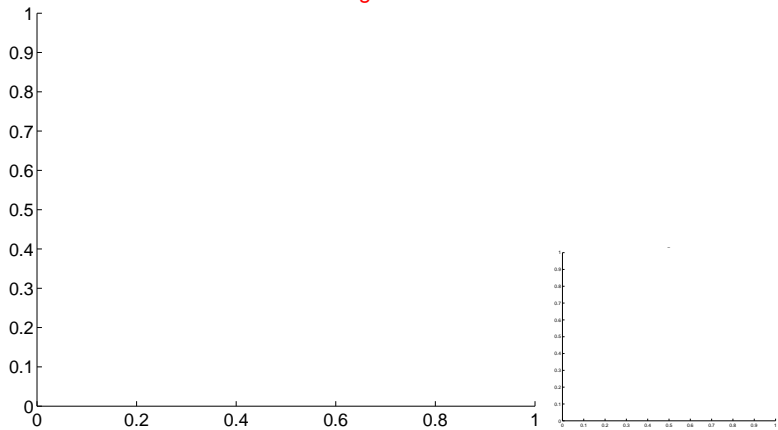
Q13 no OOT image



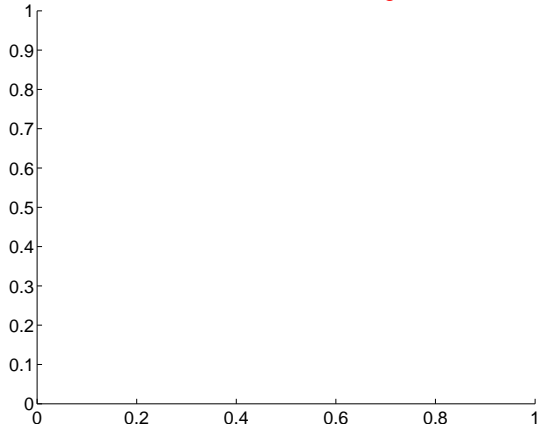
Q14 no difference image



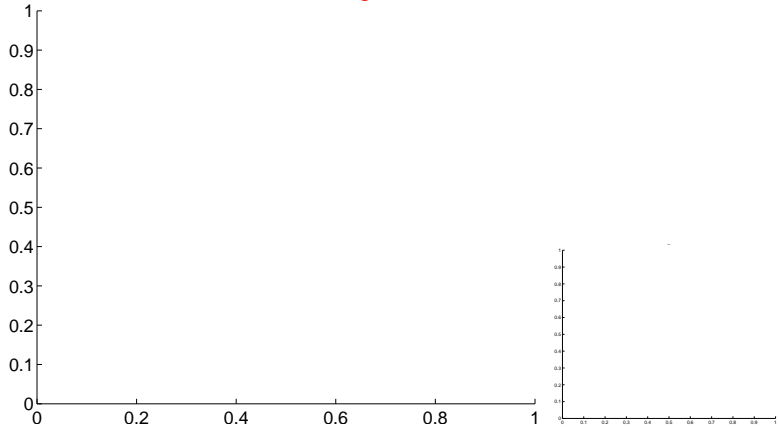
Q14 no OOT image



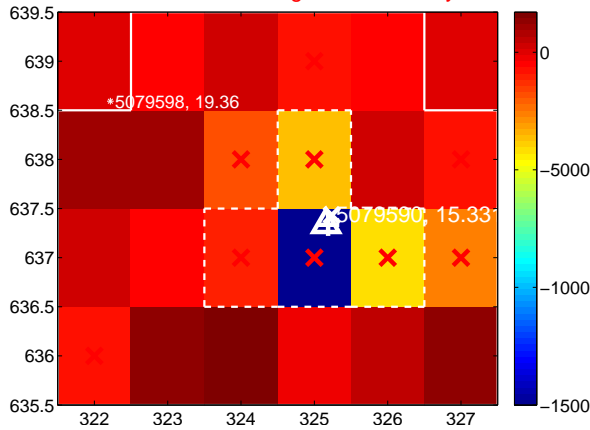
Q15 no difference image



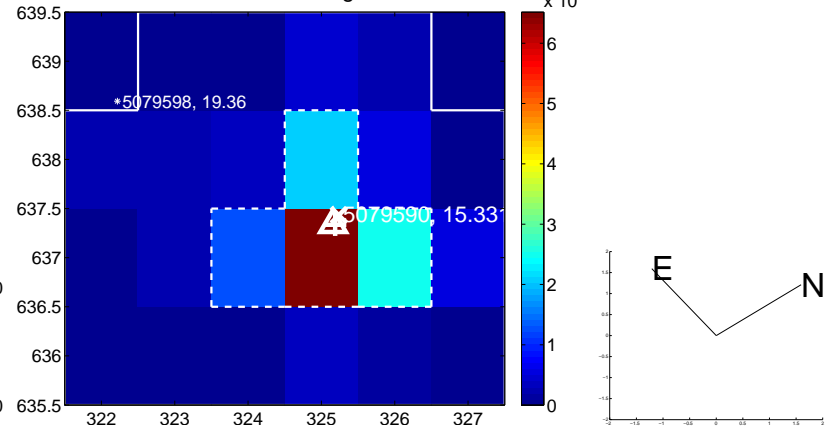
Q15 no OOT image



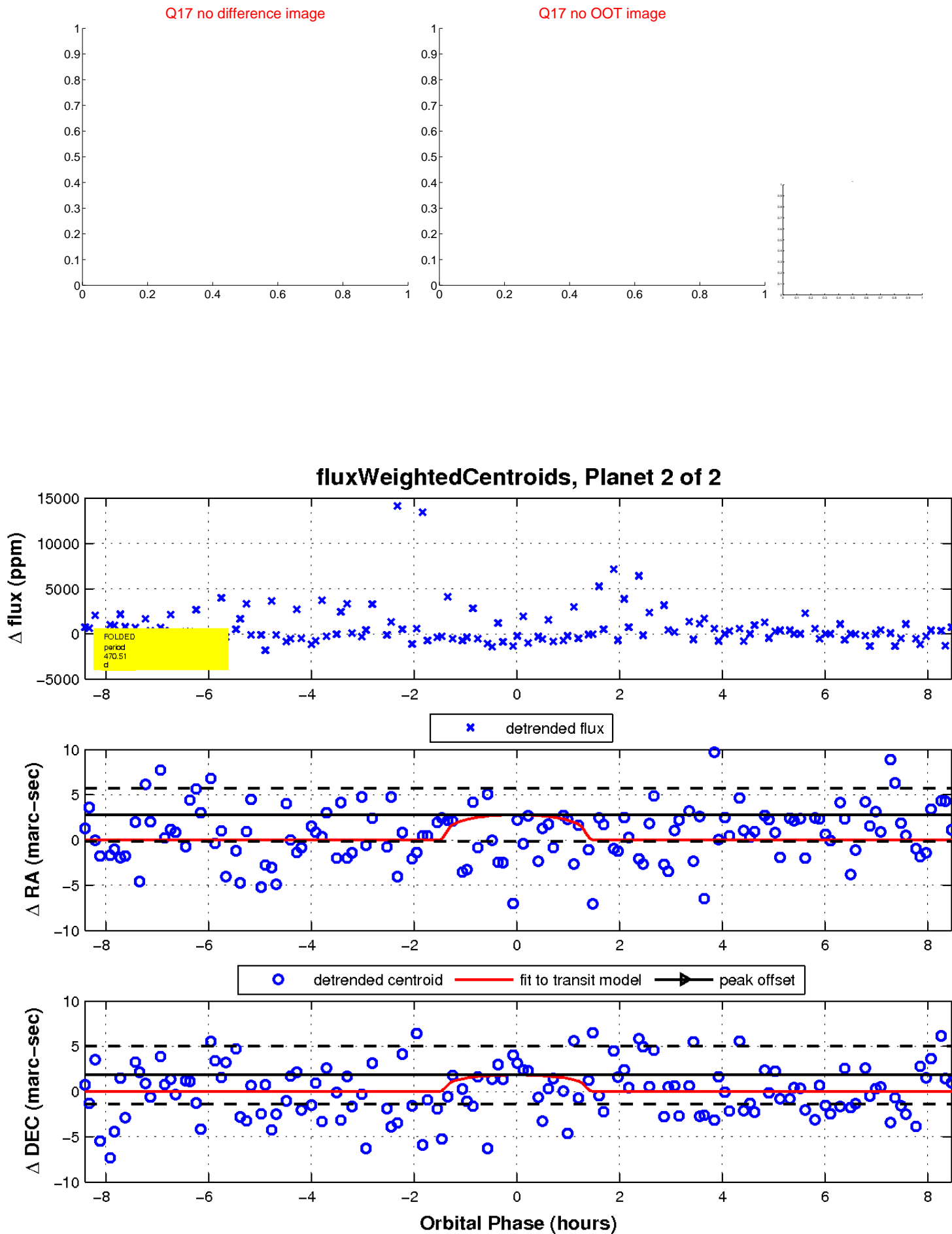
Q16 difference image. Poor Quality



Q16 OOT image



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



# UKIRT Image

Declination

