

# KIC 007958049

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007958049-01	OBS	No	461.293515	469.243754	1253.6	7.927	12.8	7.3	0.94	5802	3.37	0.78
007958049-02	OBS	No	514.137721	270.907942	1091.3	6.023	10.9	6.4	0.94	5802	3.38	0.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007958049-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
007958049-02	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—INCONSISTENT_TRANS

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

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

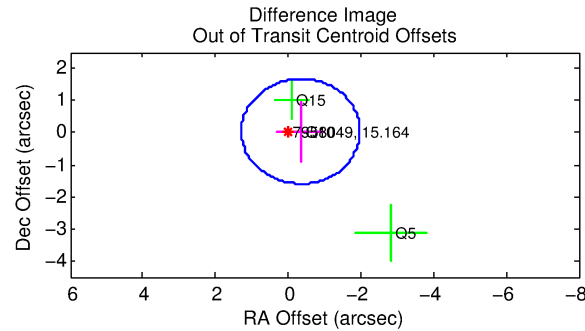
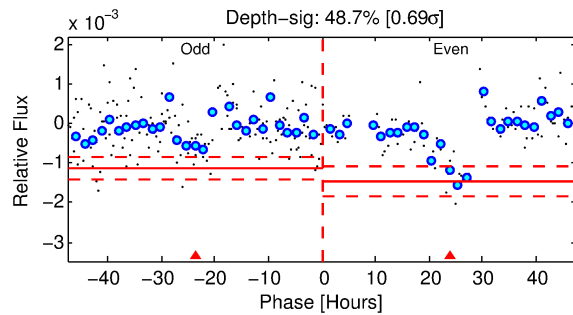
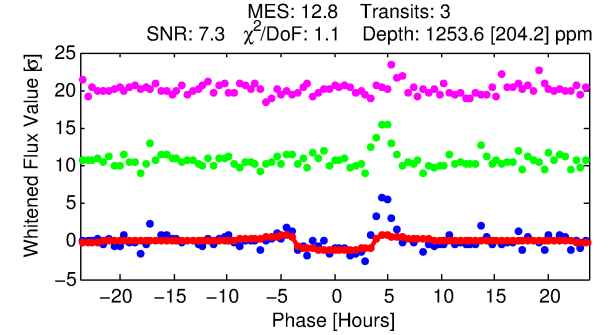
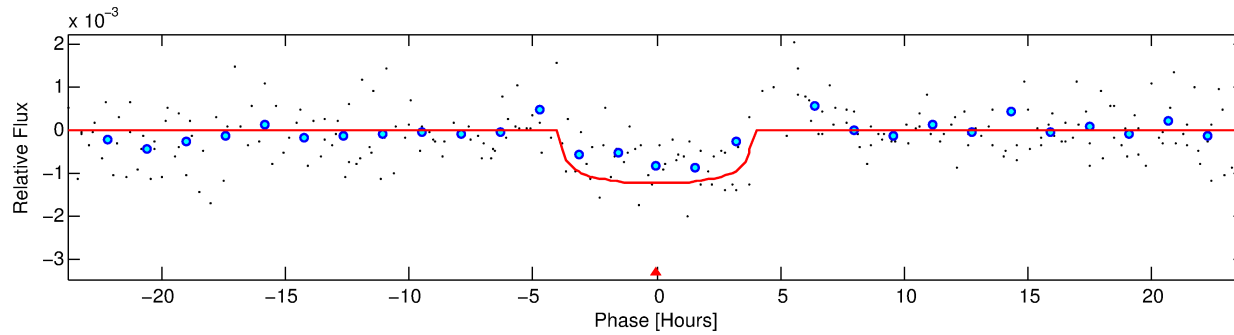
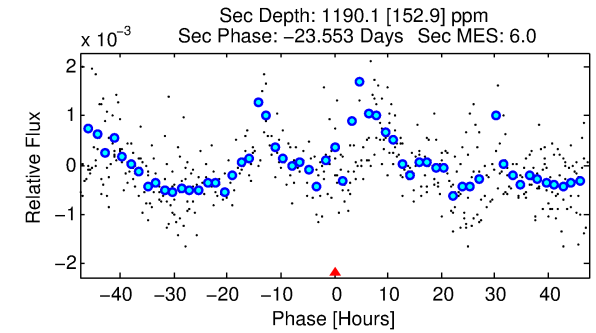
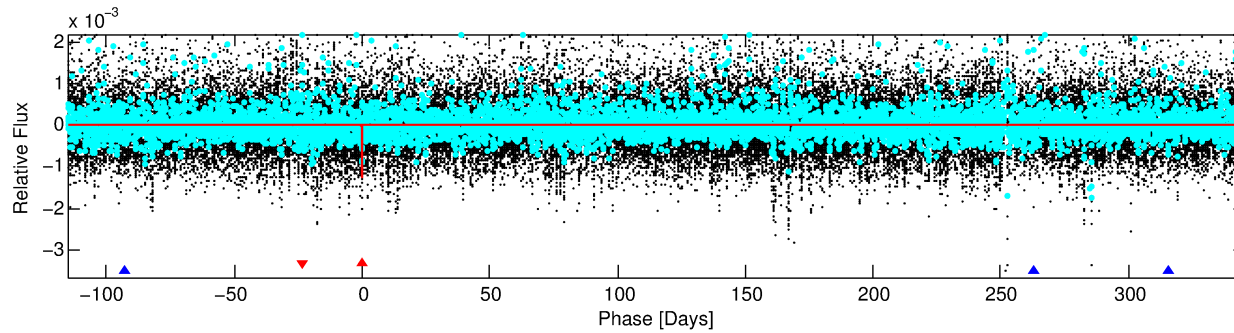
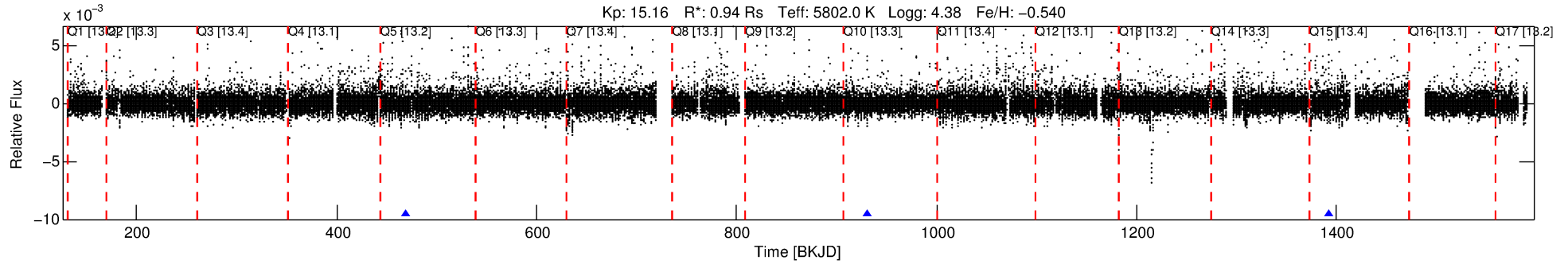
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007958049-01

No Significant Match Found

# DV One-Page Summary

KIC: 7958049 Candidate: 1 of 2 Period: 461.294 d



## DV Fit Results:

Period = 461.29352 [0.00811] d  
Epoch = 469.2438 [0.0101] BKJD  
Rp/R\* = 0.0327 [0.0247]  
a/R\* = 434.22 [1539.95]  
b = 0.34 [9.40]  
Seff = 0.78 [0.29]  
Teq = 239 [22] K  
Rp = 3.37 [2.70] Re  
a = 1.0789 [0.2542] AU  
Ag = 67012.35 [104072.70] [0.64σ]  
Teffp = 5956 [2259] K [2.53σ]

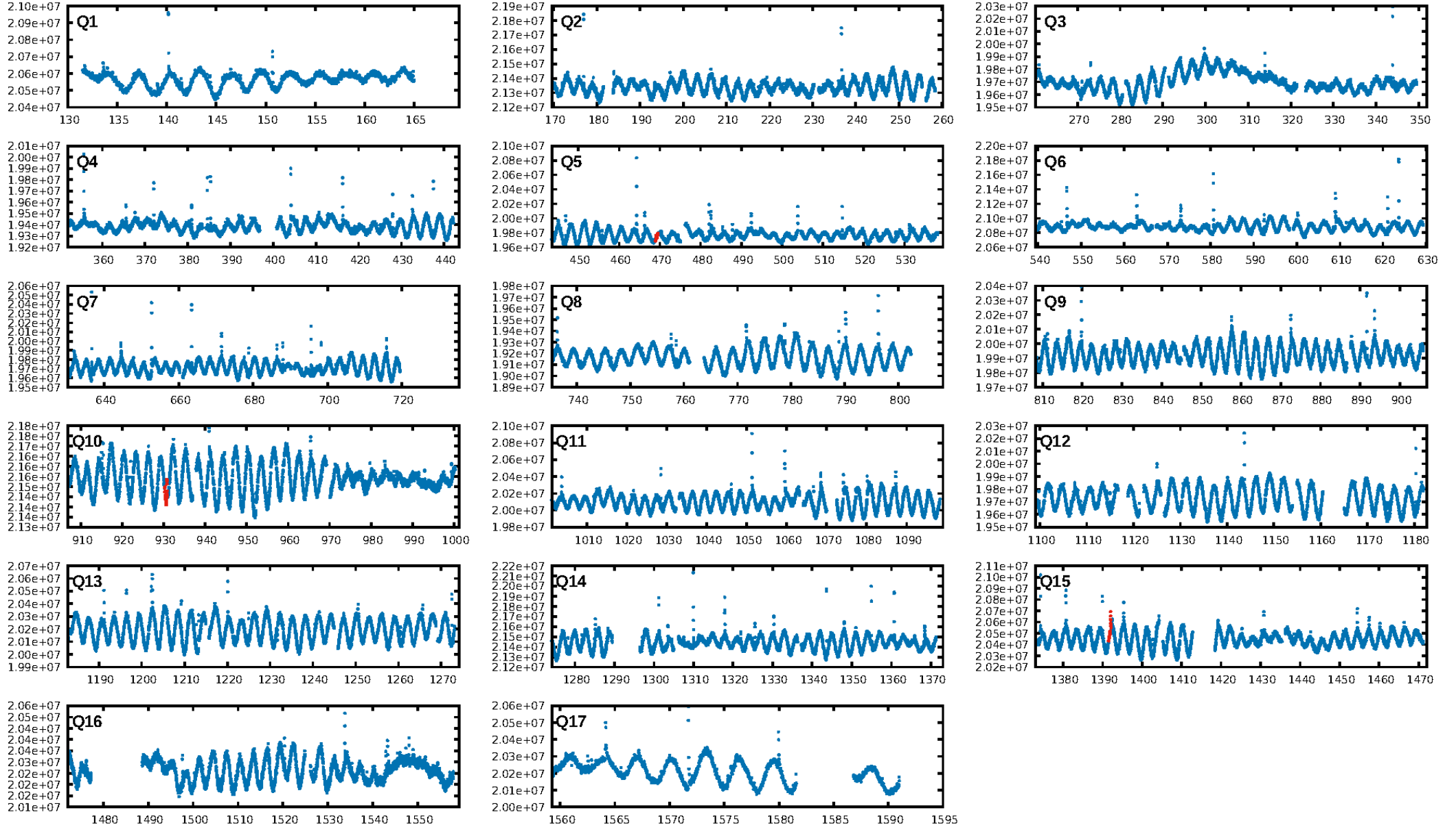
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [127.39σ]  
ModelChiSquare2-sig: 19.9%  
ModelChiSquareGof-sig: 97.6%  
**Bootstrap-pfa: 2.00e-10**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.226  
Centroid-sig: 41.9%  
Centroid-so: 0.734 arcsec [0.81σ]  
OotOffset-rm: 0.341 arcsec [0.63σ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-rm: 0.335 arcsec [0.60σ]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

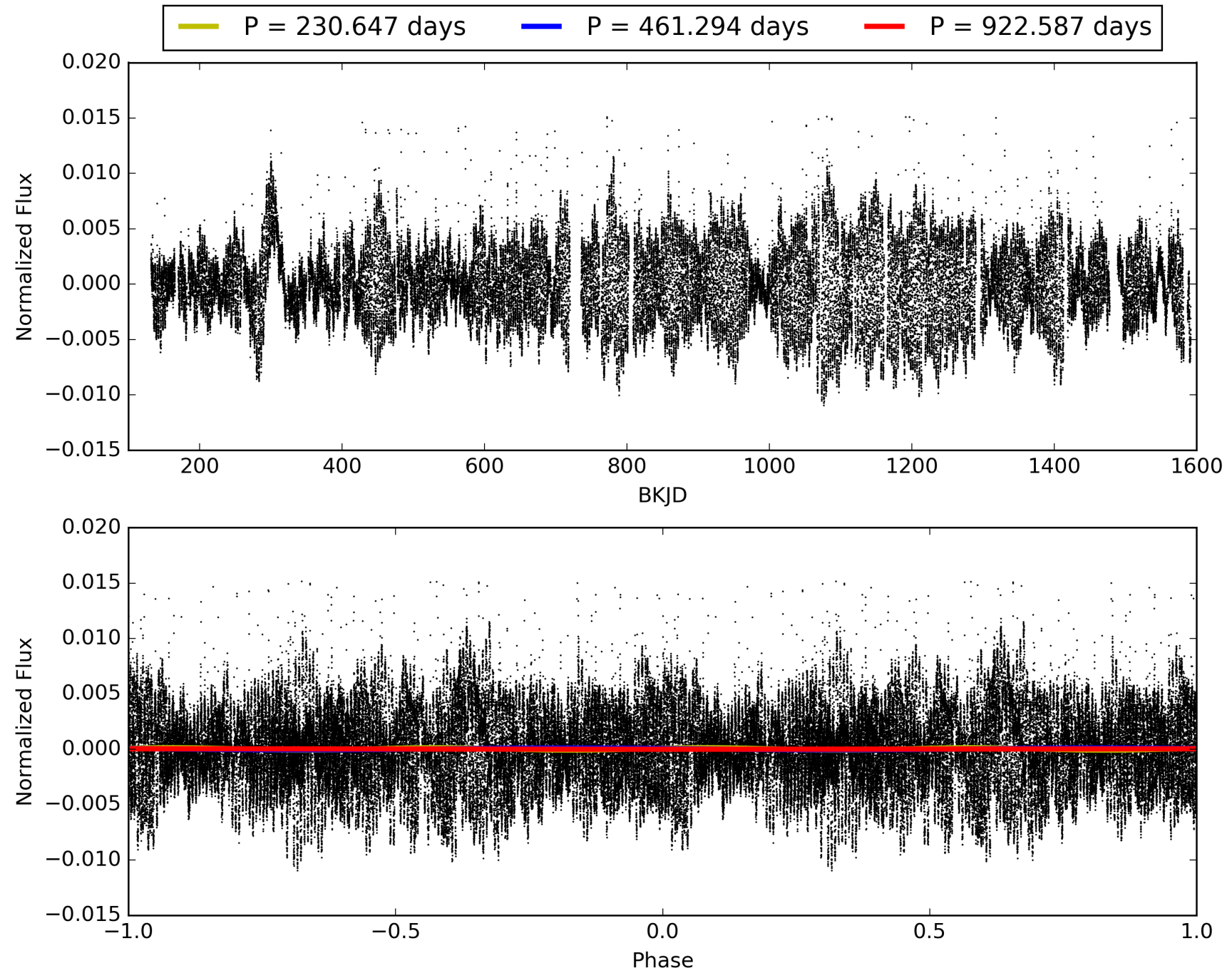
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:47:15 Z

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

# TCE 007958049-01, PDC Light Curves

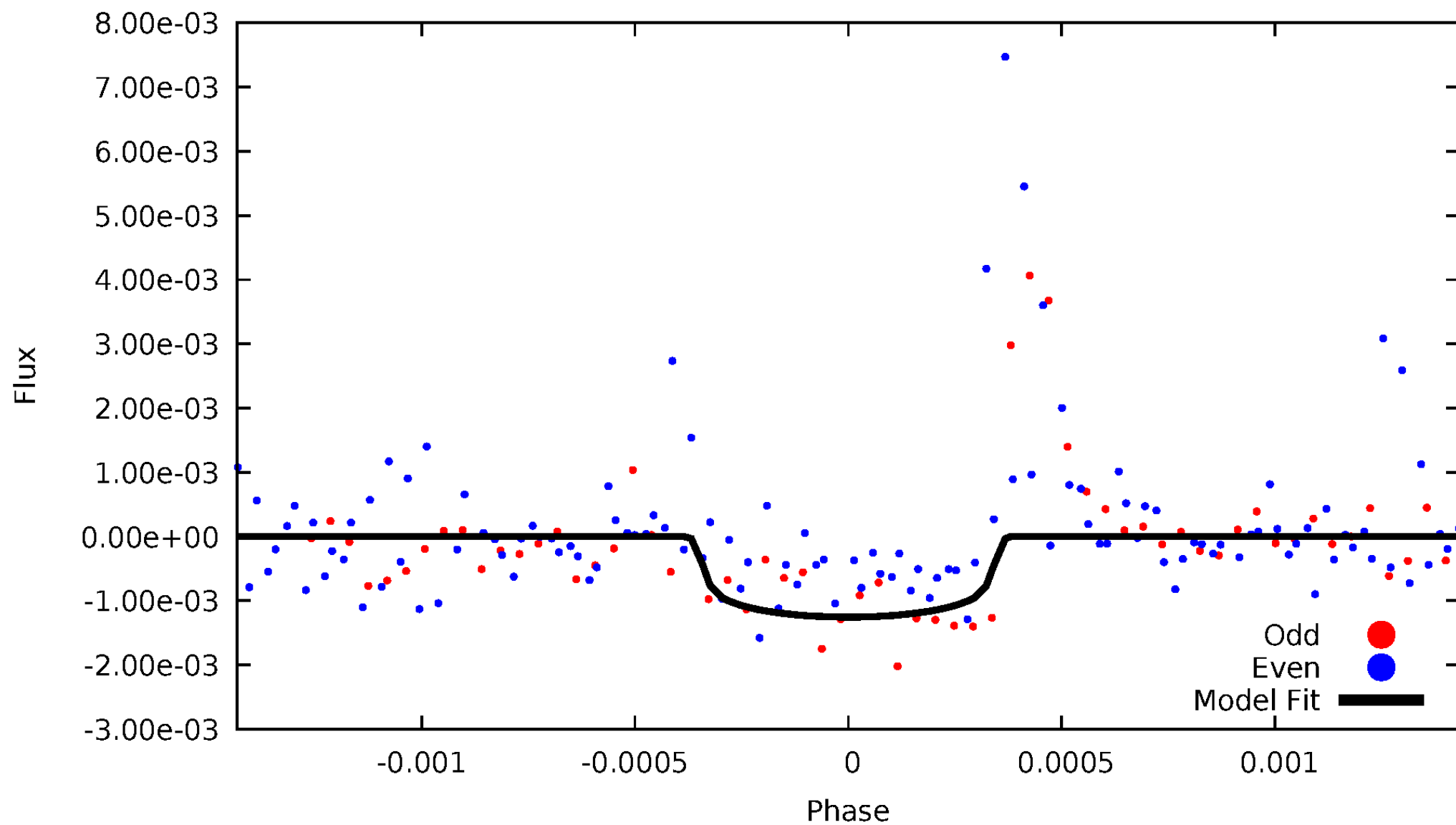


TCE 007958049-01



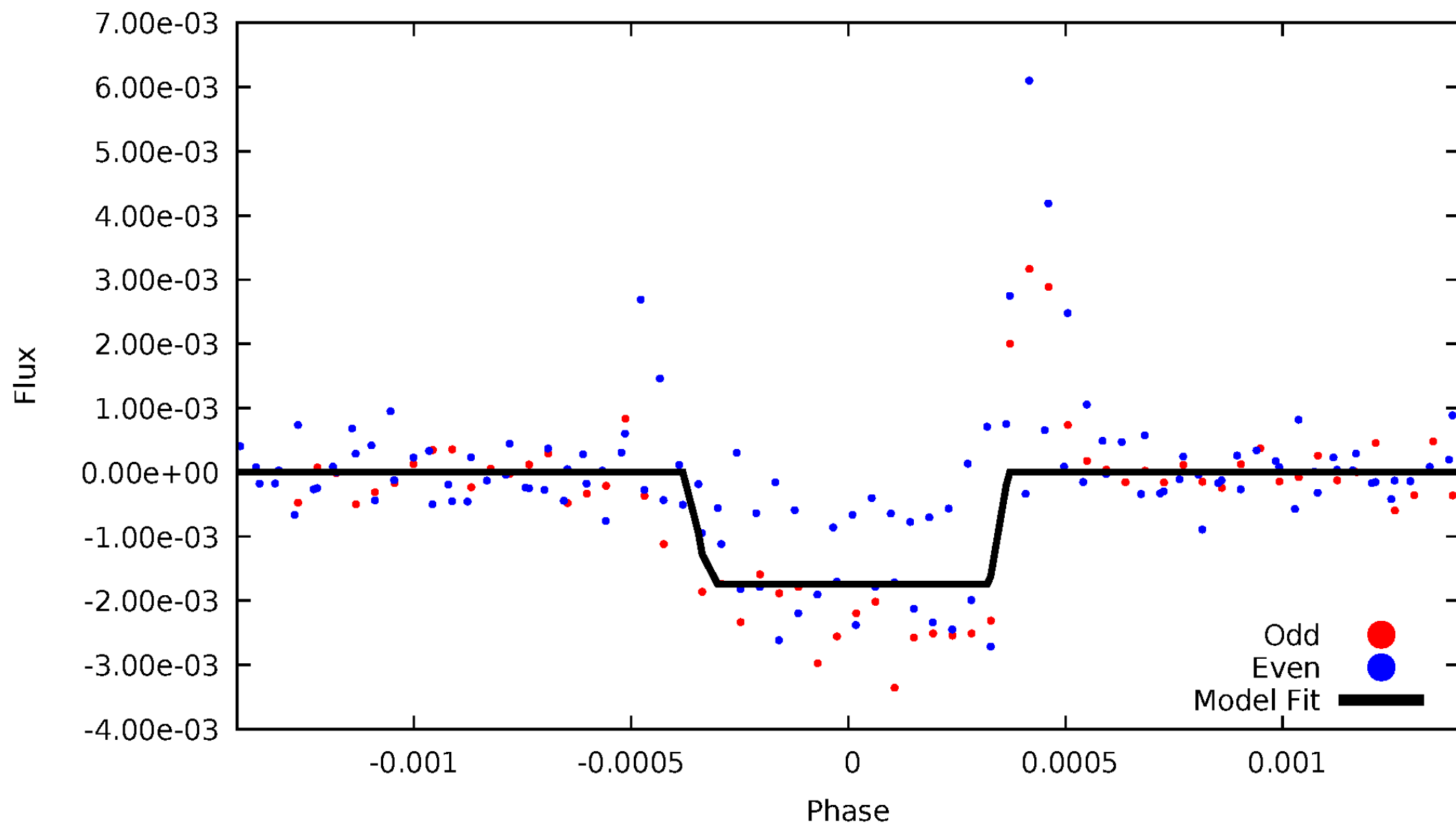
# DV Odd/Even

TCE 007958049-01

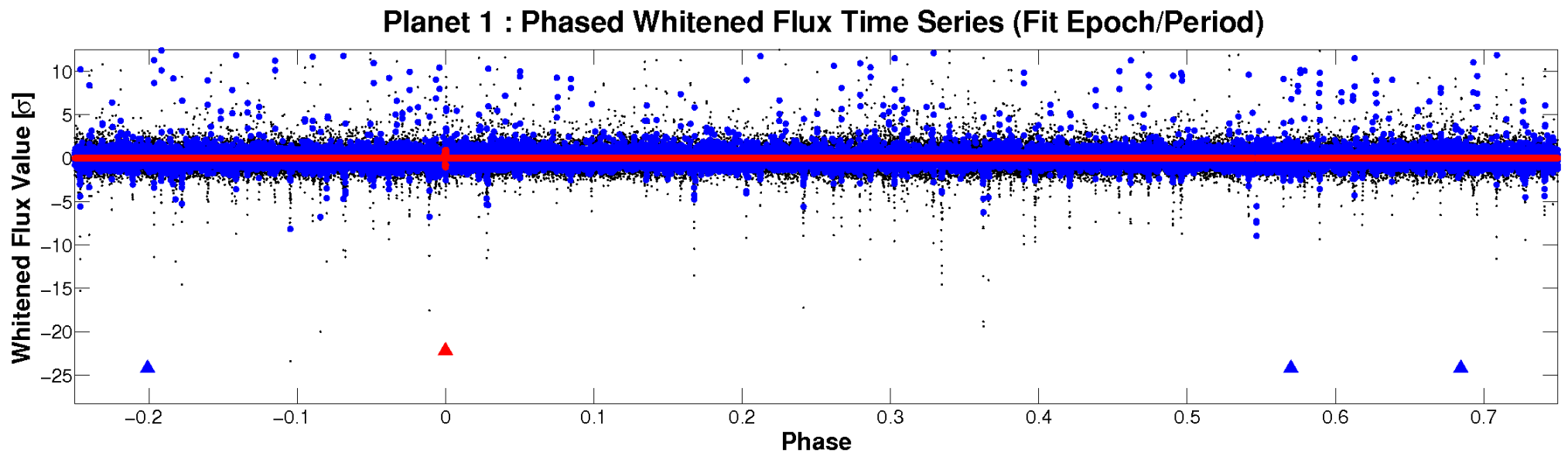
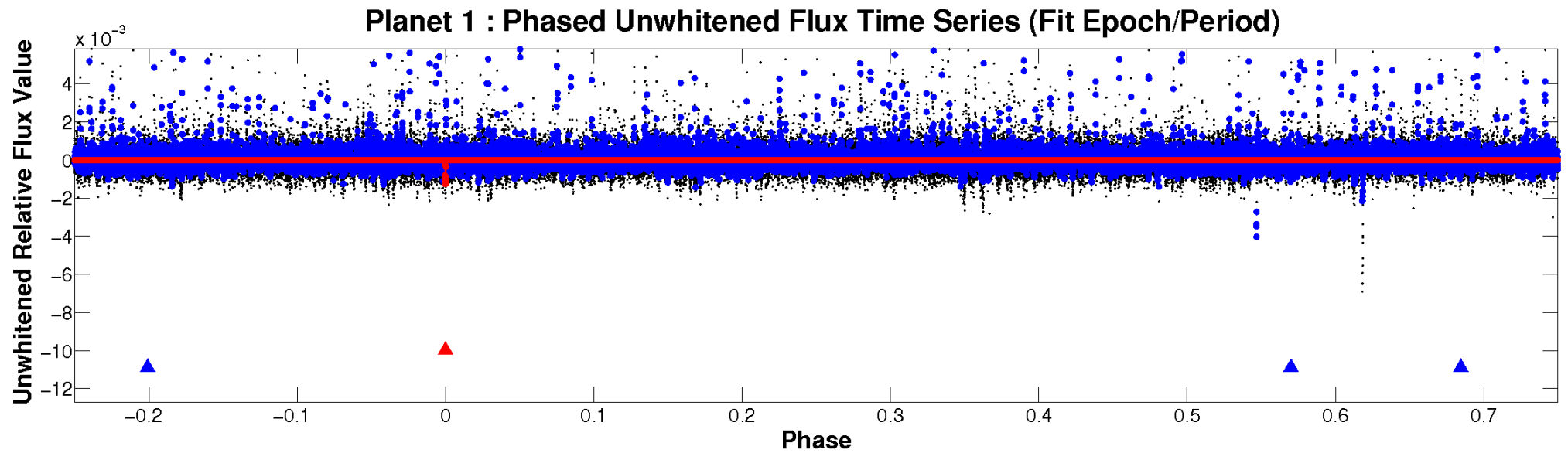


# ALT Odd/Even

TCE 007958049-01

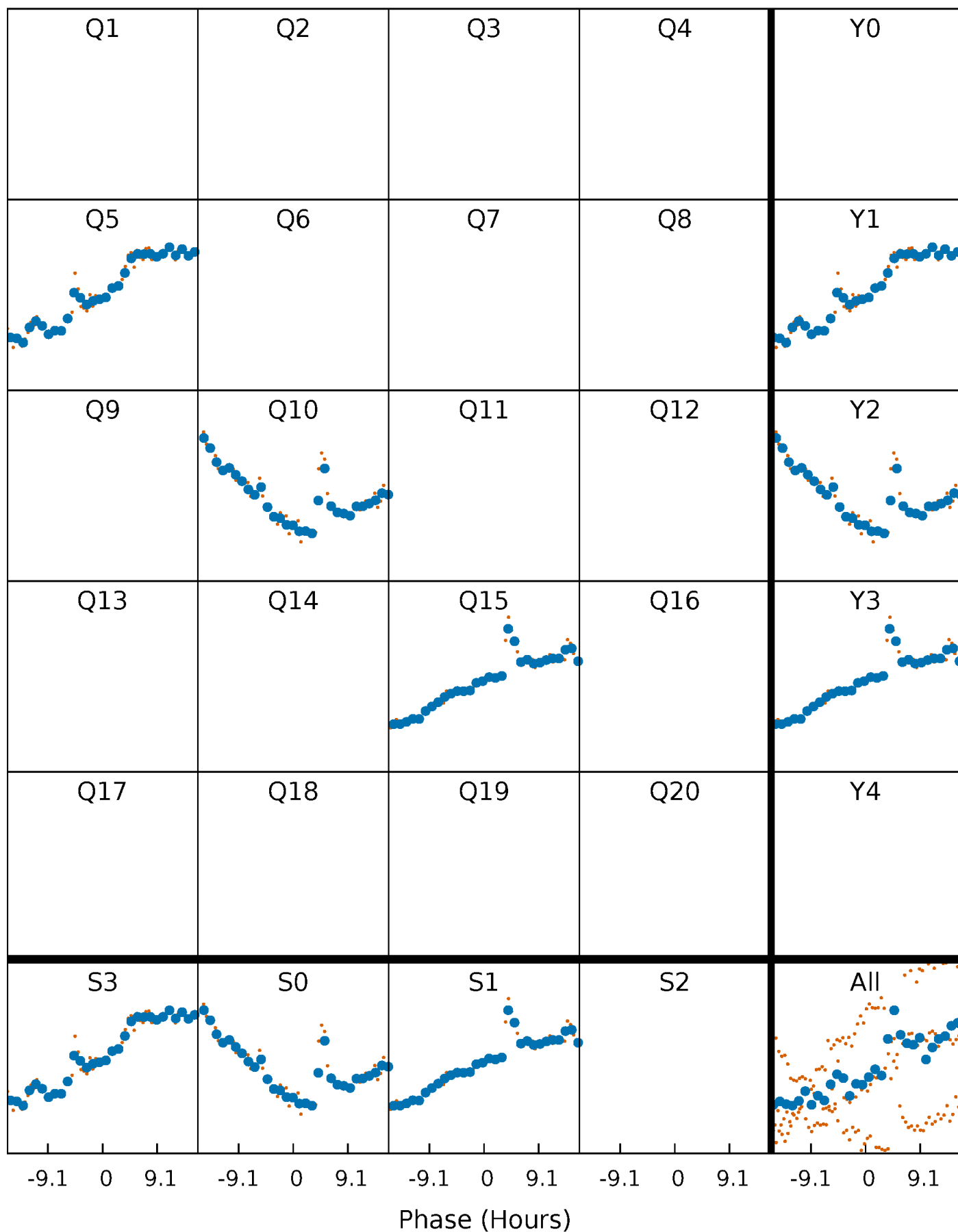


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

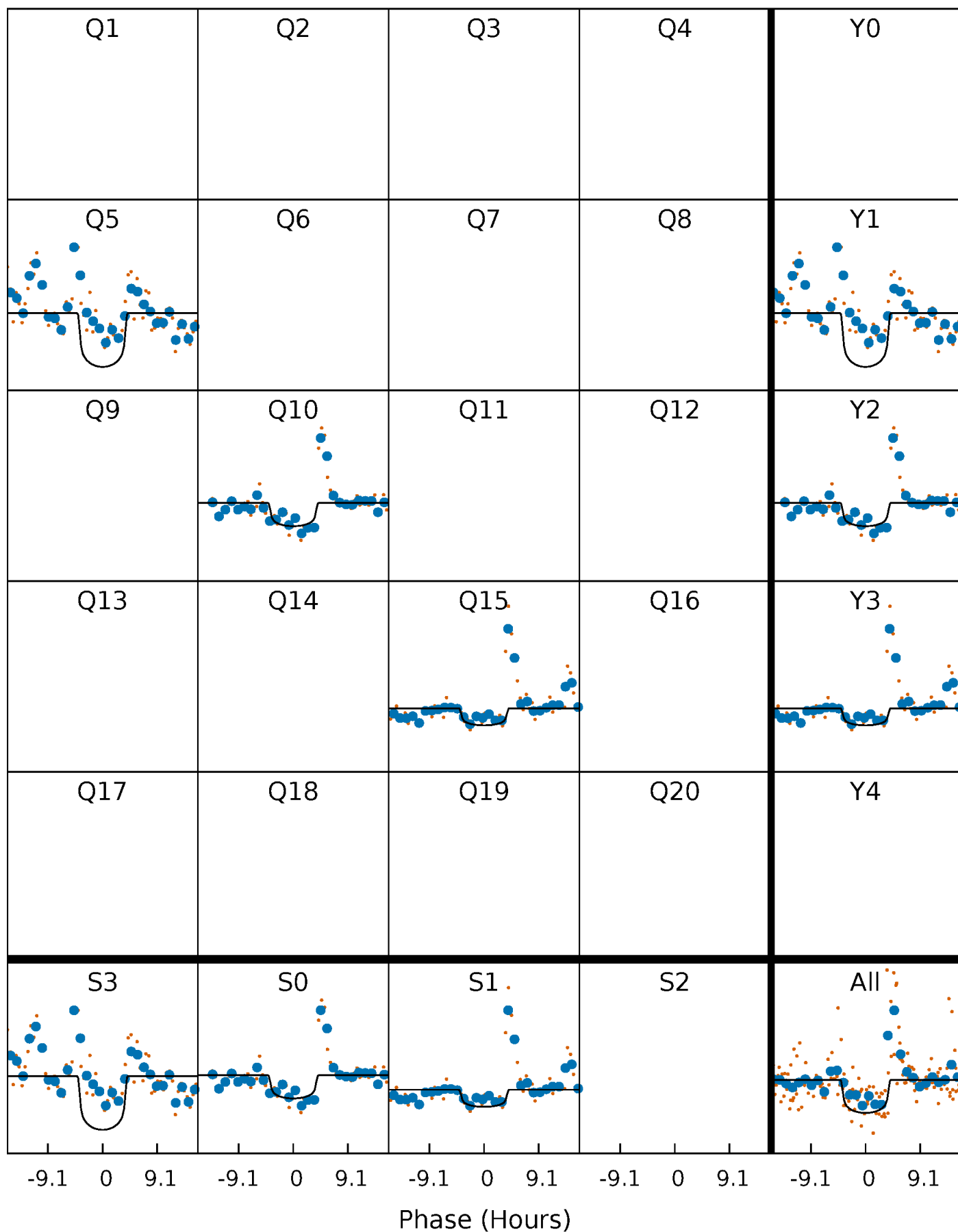
TCE 007958049-01 P=461.293515 Days  $T_0=469.243754$  (BKJD)





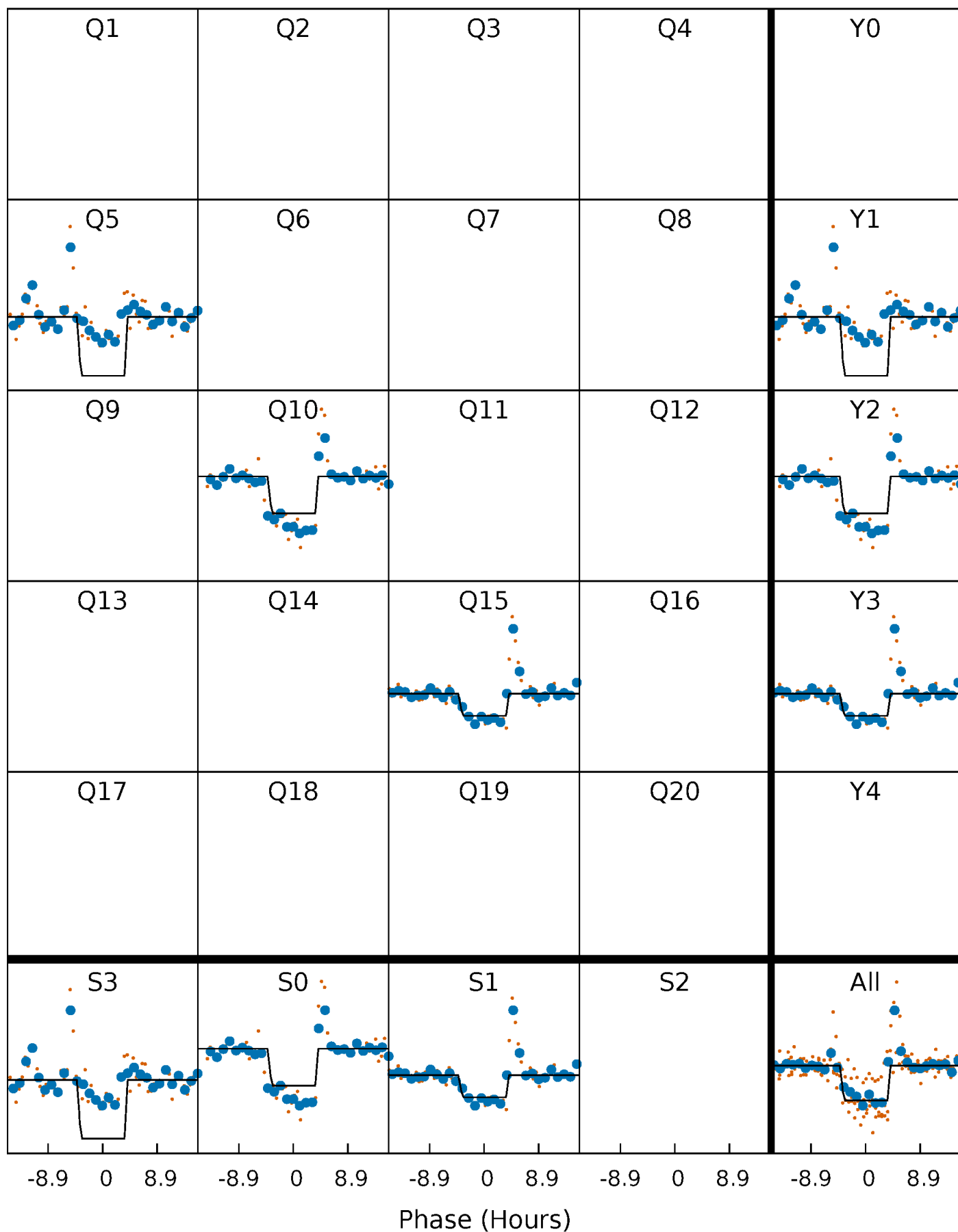
# DV Quarter-Phased Transit Curves

TCE 007958049-01 P=461.293515 Days  $T_0=469.243754$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

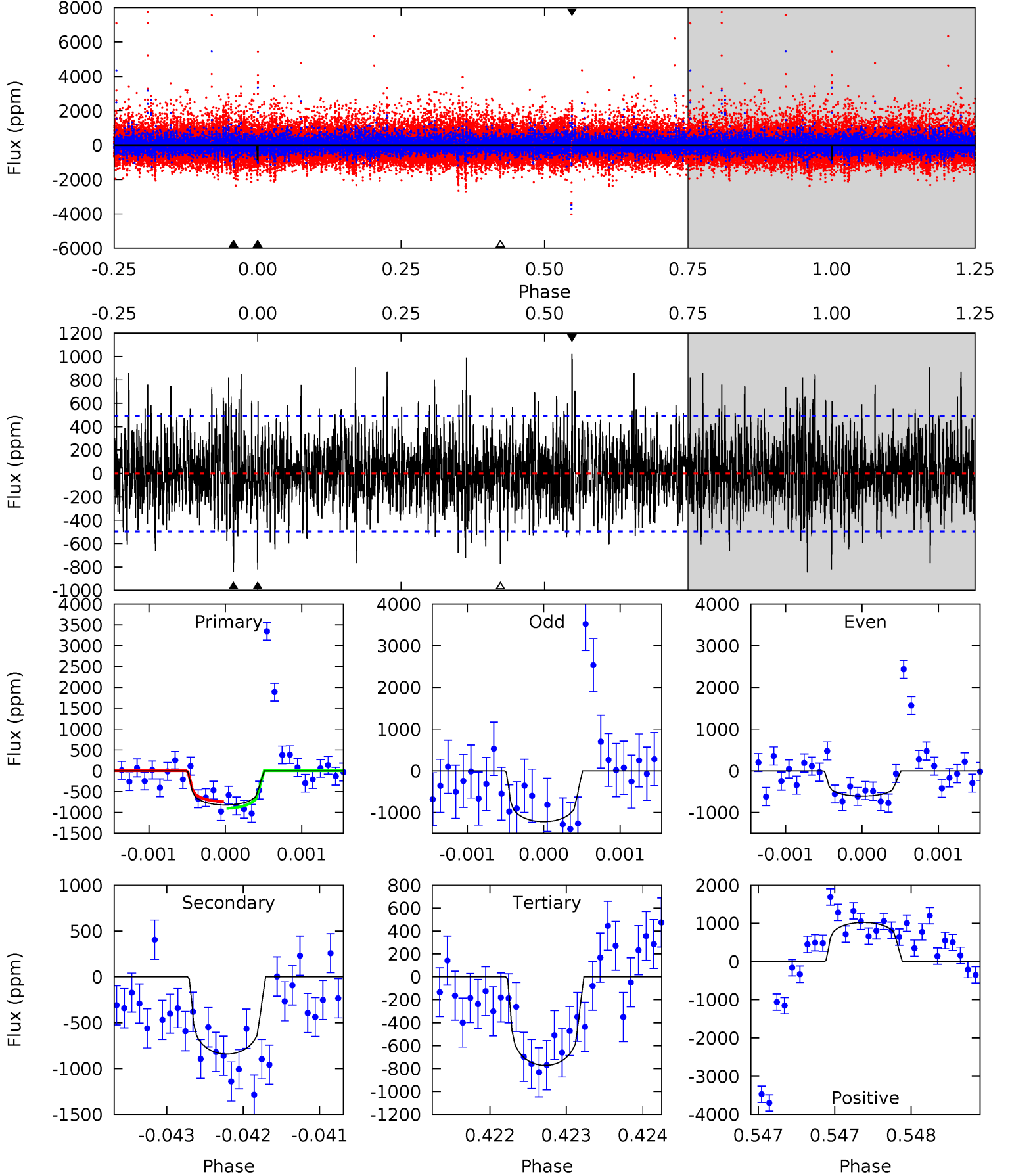
TCE 007958049-01 P=461.267183 Days  $T_0=469.274068$  (BKJD)



# DV Model-Shift Uniqueness Test

007958049-01, P = 461.293515 Days, E = 7.950239 Days

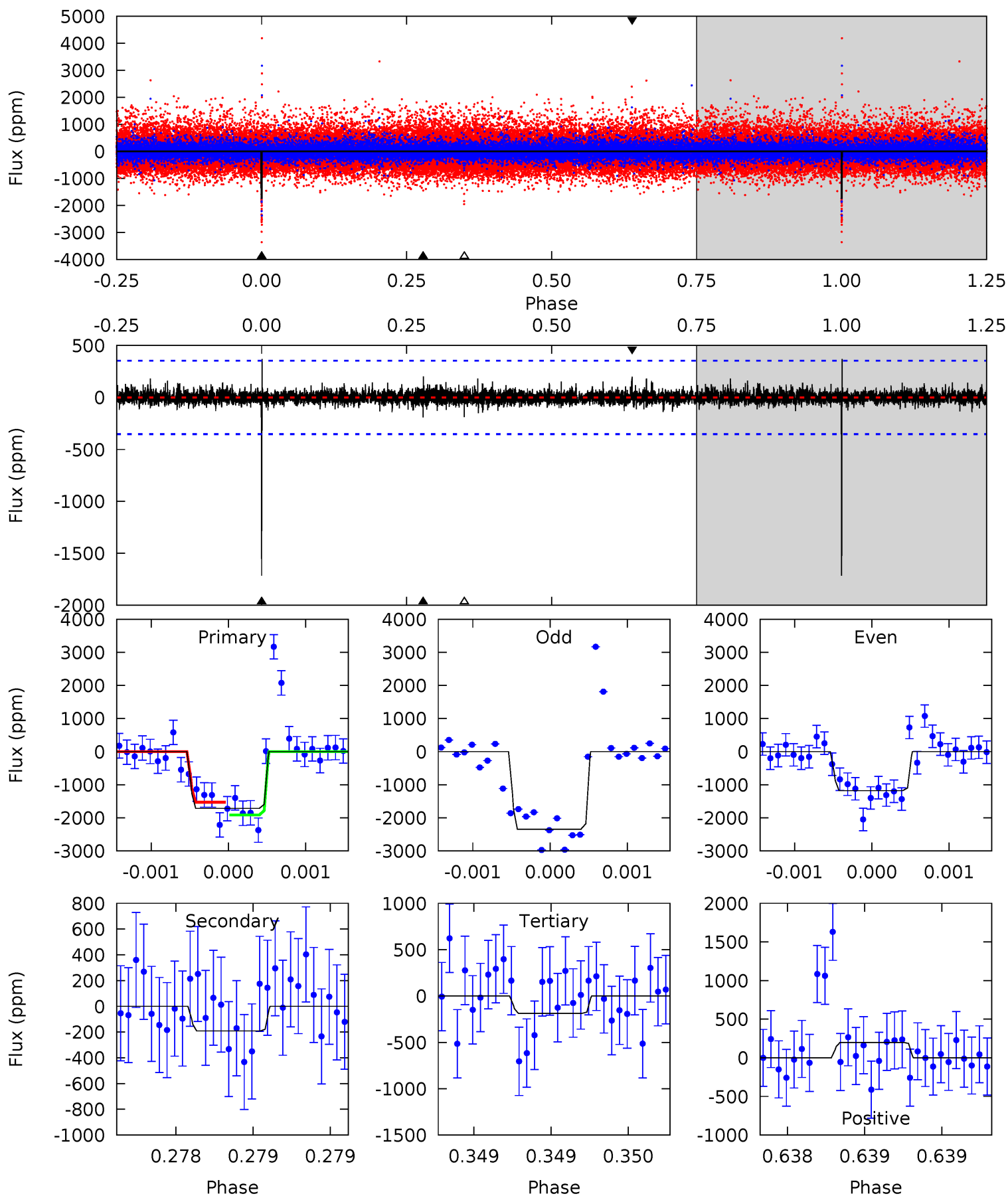
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.10	9.34	8.57	11.3	5.50	3.37	2.54	0.53	-2.23	0.76	-2.00	2.46	1.16	0.55	0.89



# Alt Model-Shift Uniqueness Test

007958049-01, P = 461.267183 Days, E = 8.006885 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
26.7	2.98	2.92	3.11	5.51	3.39	0.57	23.8	23.6	0.06	-0.13	8.96	0.78	0.18	3.03



### Stellar Parameters For KIC 007958049

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5802^{+174}_{-157}$	$4.384^{+0.180}_{-0.198}$	$-0.540^{+0.300}_{-0.300}$	$0.944^{+0.255}_{-0.170}$	$0.785^{+0.121}_{-0.052}$	$1.316^{+1.131}_{-0.642}$
	+3%/-3%	+4%/-5%	+56%/-56%	+27%/-18%	+15%/-7%	+86%/-49%
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 007958049-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-841 \pm 90$	$3.88^{+2.43}_{-2.15}$	$334^{+26}_{-20}$	$5181^{+2545}_{-936}$	$36489^{+150255}_{-22882}$
Alt.	$-191 \pm 64$	$4.54^{+2.66}_{-2.30}$	$335^{+27}_{-21}$	$3667^{+1086}_{-521}$	$5871^{+17206}_{-3758}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

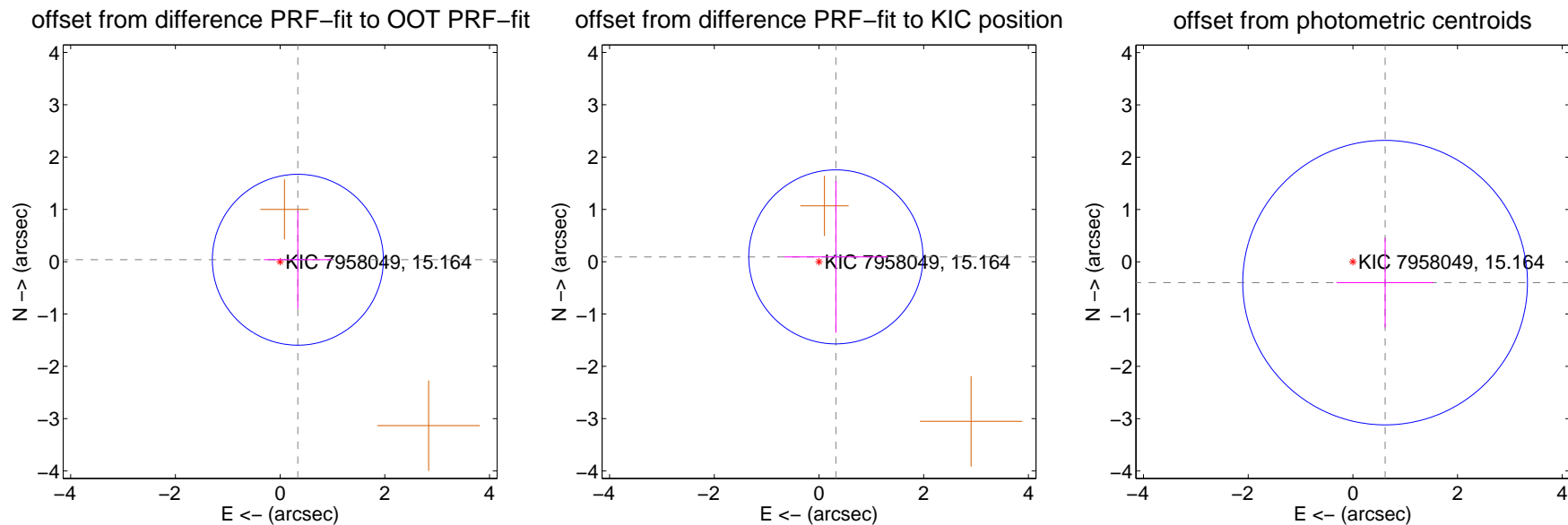
## DV Centroid Data

Supplemental centroid analysis for 007958049-01. Kepler magnitude: 15.16. Transit SNR 7.32

There are 1 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.341 \pm 0.544$	0.63	$-0.339 \pm 0.649$	$0.037 \pm 0.934$
PRF-fit source offset from KIC position	$0.335 \pm 0.554$	0.60	$-0.322 \pm 0.984$	$0.092 \pm 1.451$
photometric centroid source offset	$0.73 \pm 0.91$	0.81	$-0.62 \pm 0.93$	$-0.40 \pm 0.86$

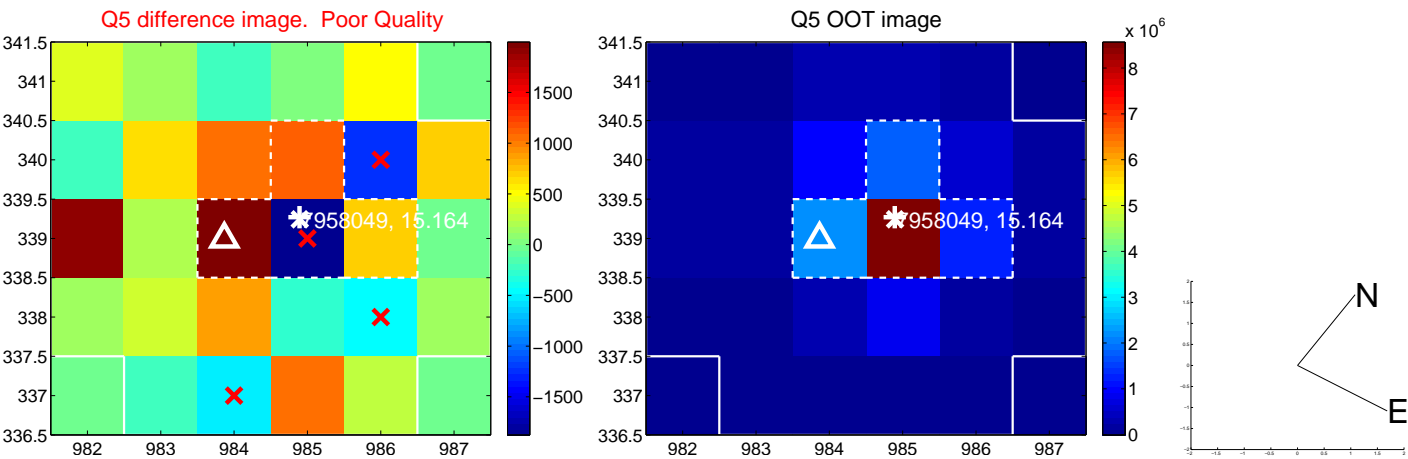


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



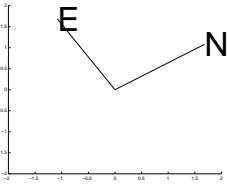
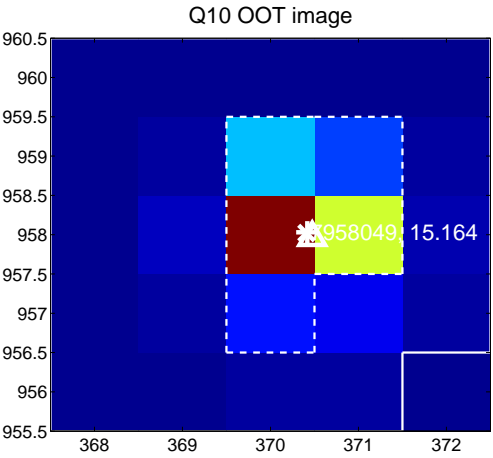
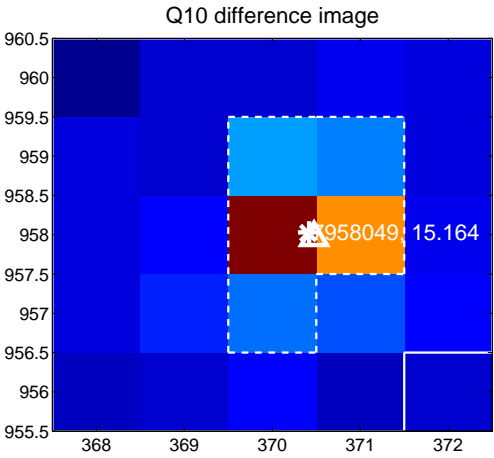


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

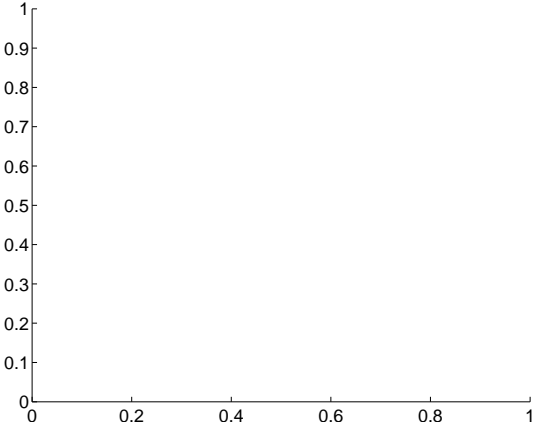
Q9 no difference image



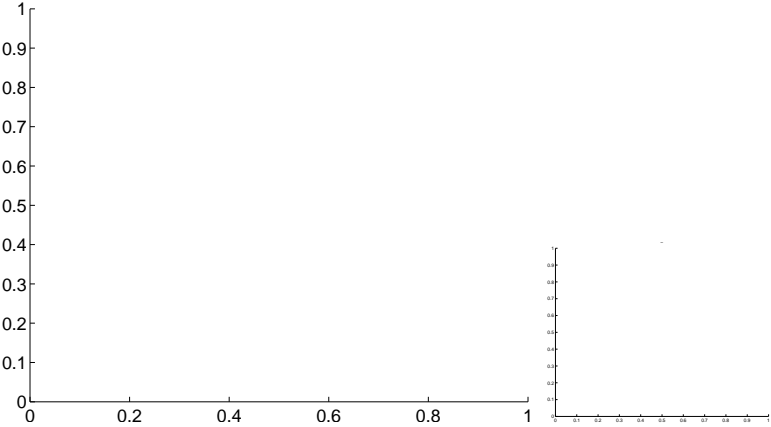
Q9 no OOT image



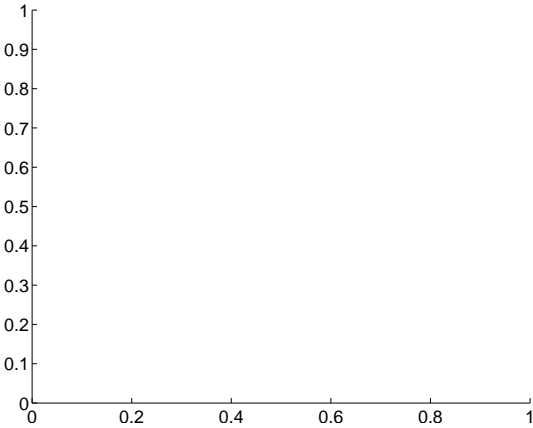
Q11 no difference image



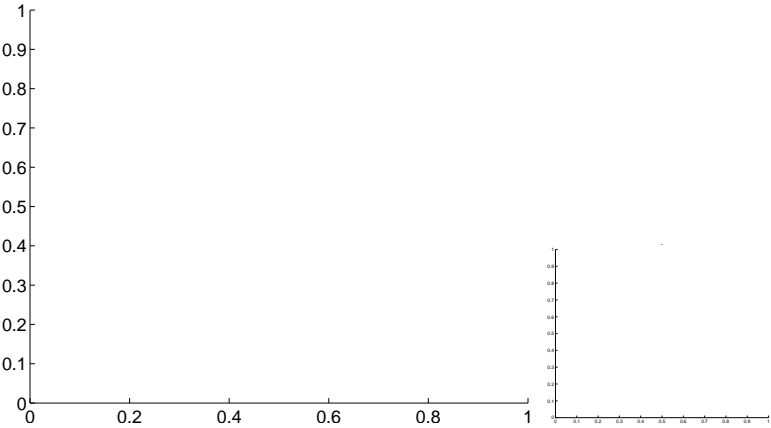
Q11 no OOT image



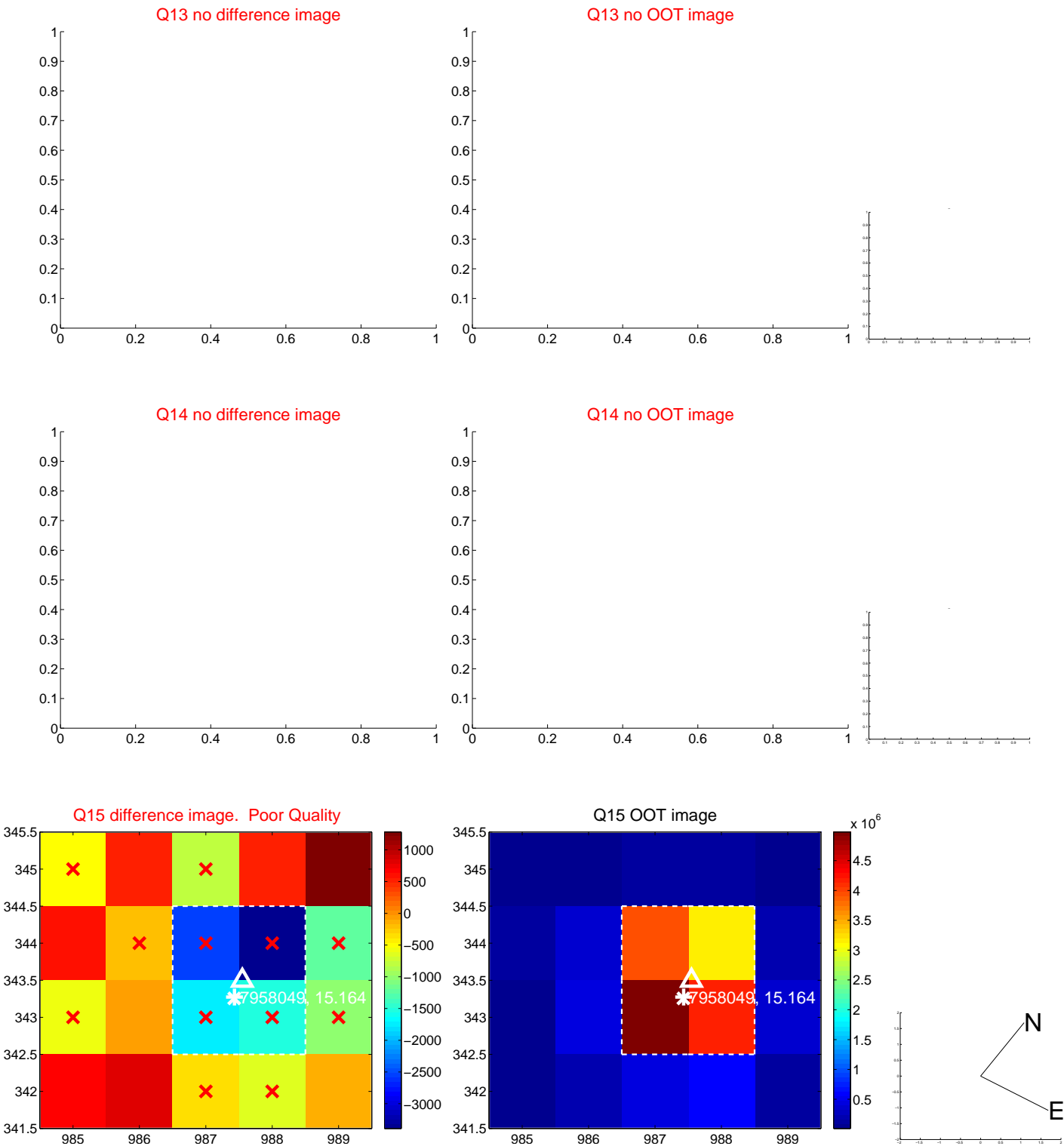
Q12 no difference image



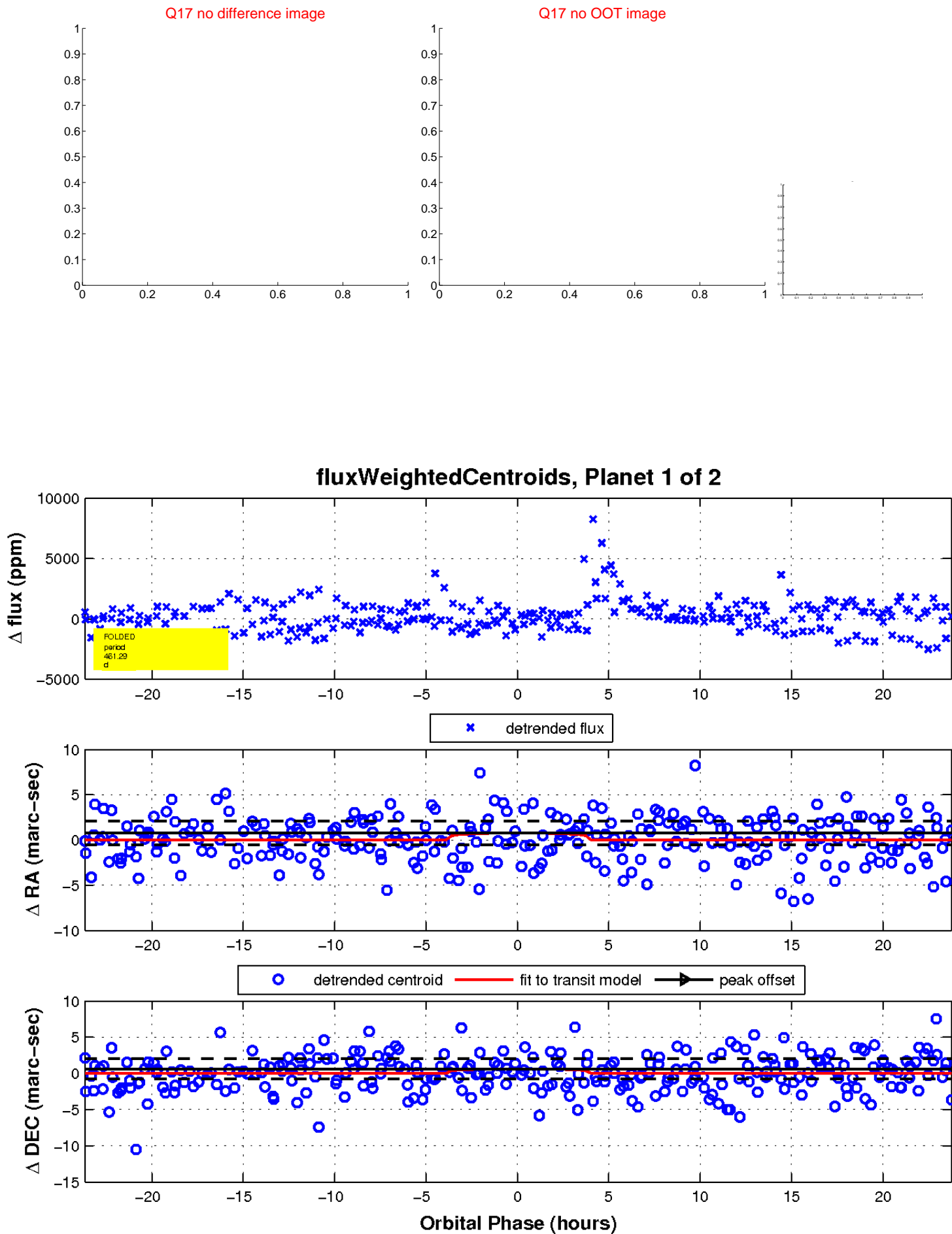
Q12 no OOT image



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

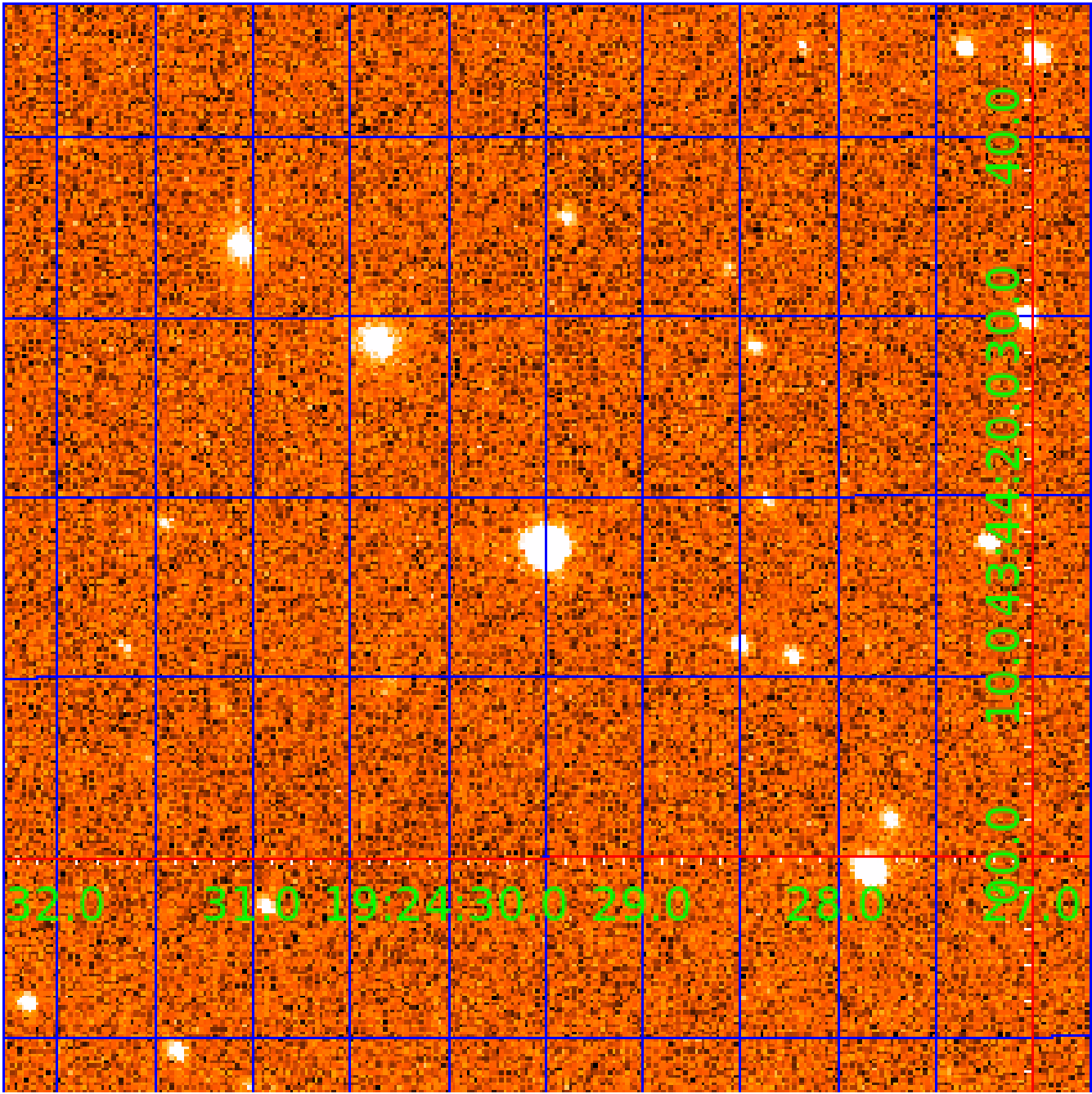


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007958049

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007958049-01	OBS	No	461.293515	469.243754	1253.6	7.927	12.8	7.3	0.94	5802	3.37	0.78
007958049-02	OBS	No	514.137721	270.907942	1091.3	6.023	10.9	6.4	0.94	5802	3.38	0.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007958049-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
007958049-02	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—INCONSISTENT_TRANS

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

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

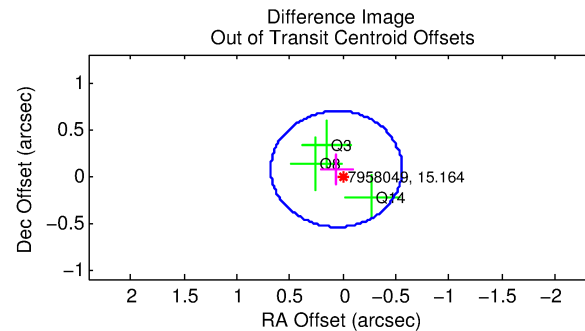
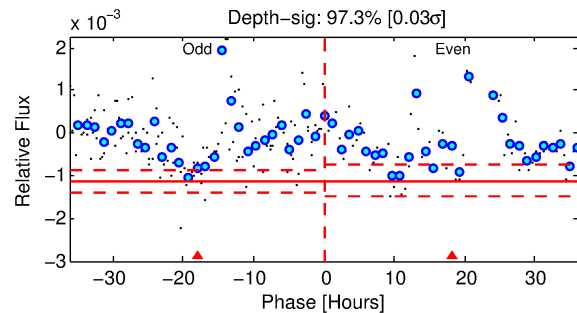
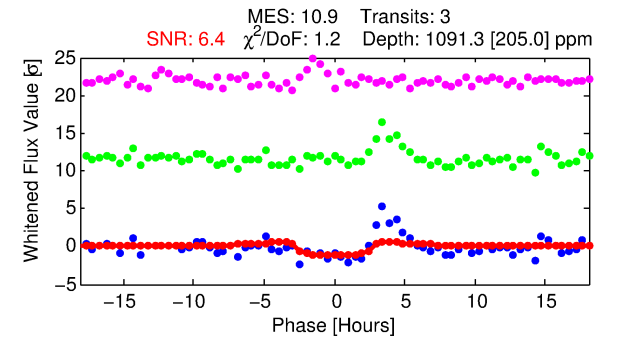
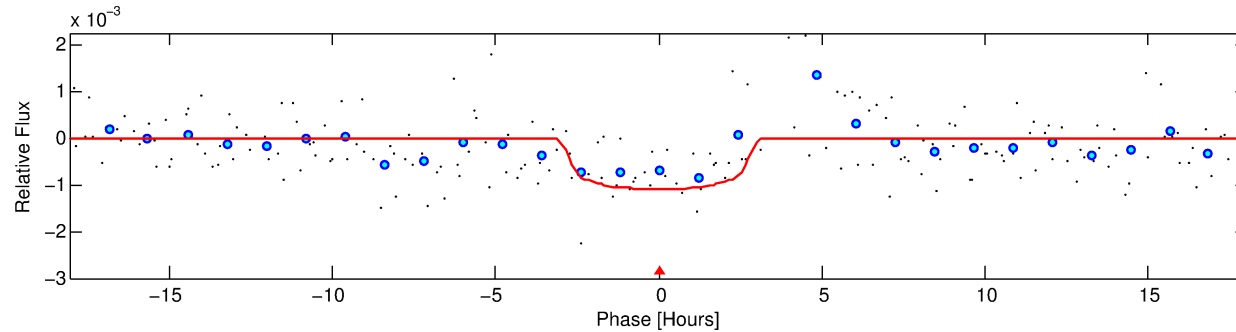
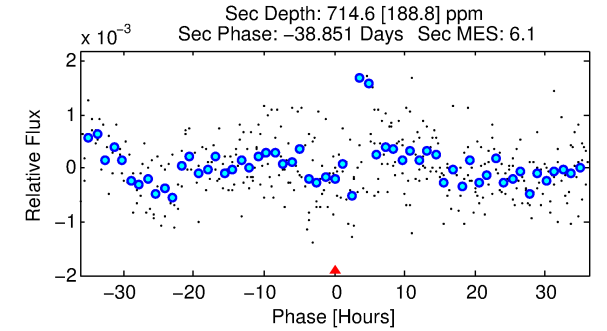
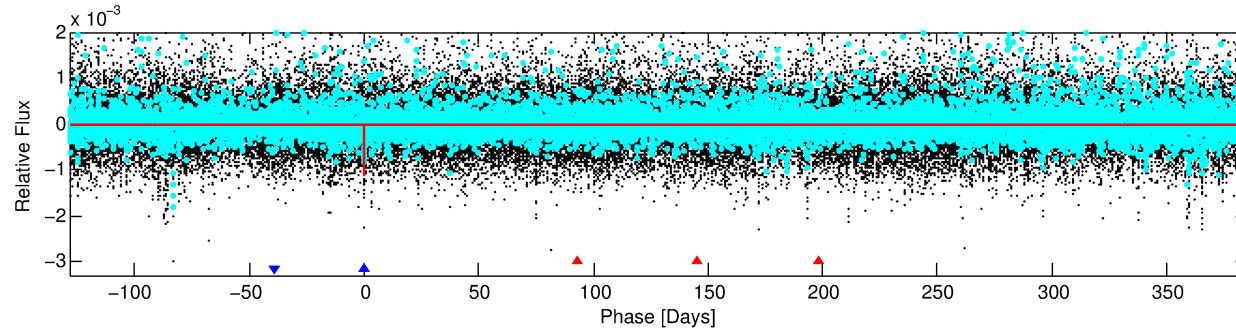
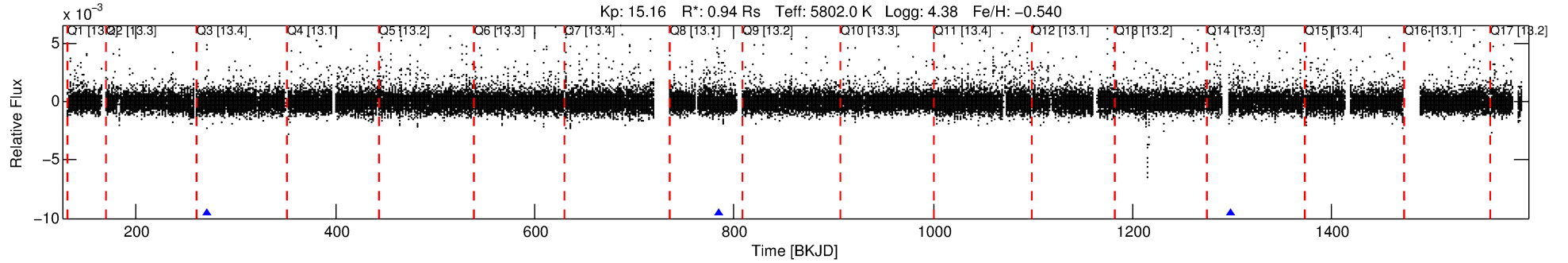
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007958049-02

No Significant Match Found

# DV One-Page Summary

KIC: 7958049 Candidate: 2 of 2 Period: 514.138 d



## DV Fit Results:

Period = 514.13772 [0.00920] d  
Epoch = 270.9079 [0.0124] BKJD  
Rp/R\* = 0.0328 [0.0182]  
a/R\* = 464.97 [1204.76]  
b = 0.75 [1.54]  
Seff = 0.67 [0.25]  
Teq = 231 [22] K  
Rp = 3.38 [2.08] Re  
a = 1.1598 [0.2733] AU  
Ag = 46221.93 [55073.16] [0.84σ]  
Teffp = 5235 [1497] K [3.34σ]

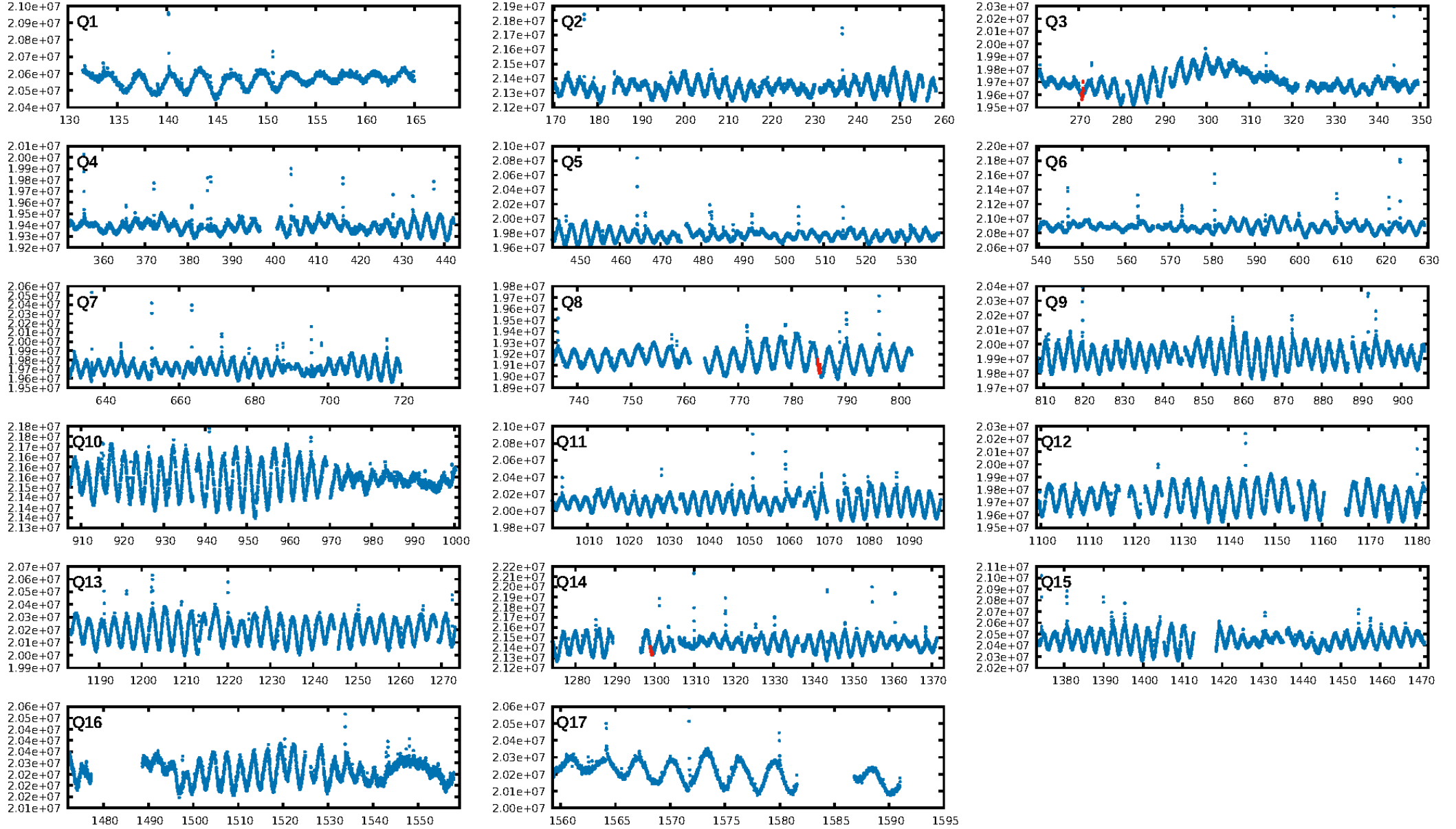
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [127.39σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 37.1%  
ModelChiSquareGof-sig: 95.4%  
**Bootstrap-pfa: 3.39e-09**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -5.71  
Centroid-sig: 1.9%  
Centroid-so: 1.727 arcsec [1.64σ]  
OotOffset-rm: 0.095 arcsec [0.46σ]  
KicOffset-rm: 0.158 arcsec [0.82σ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

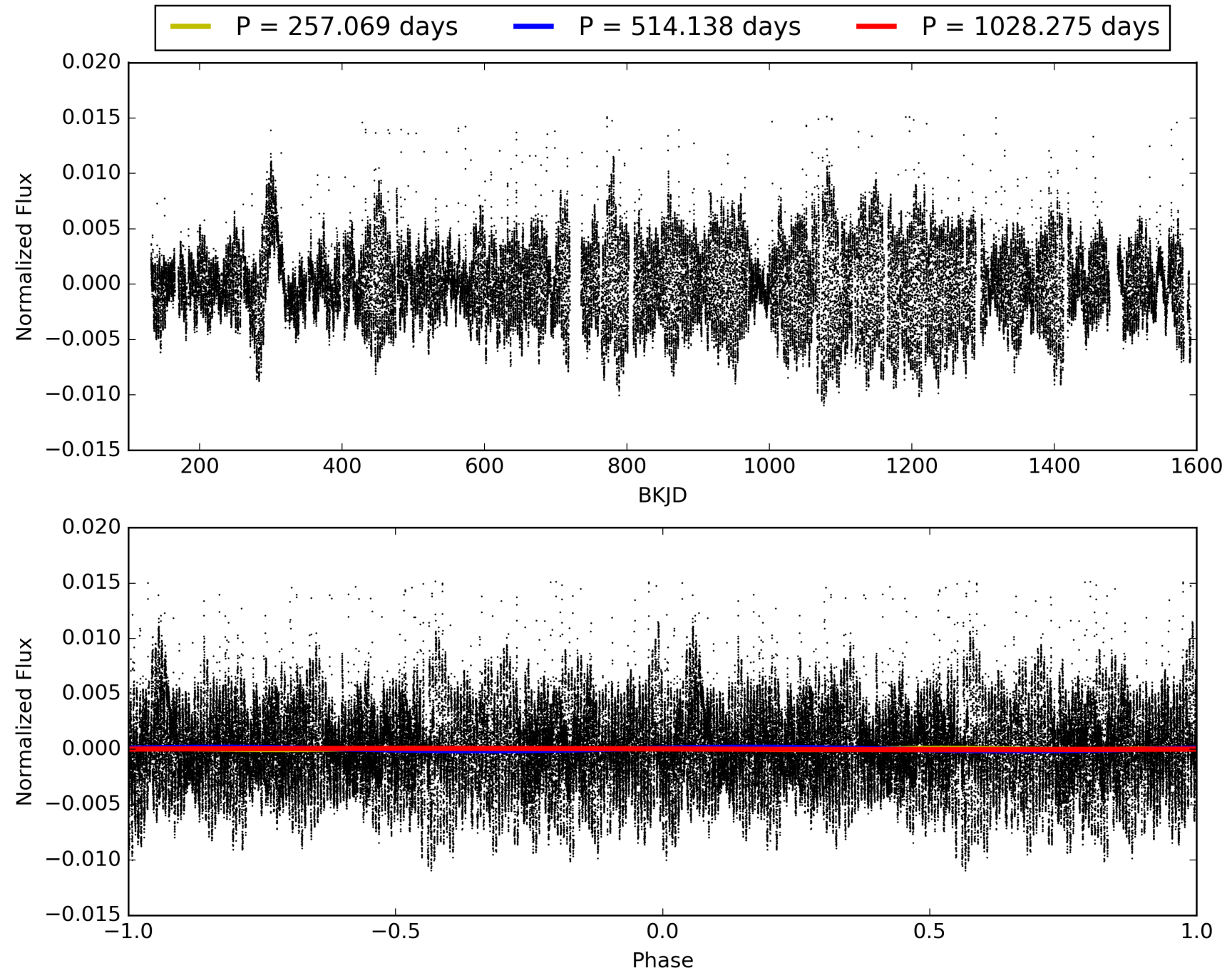
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:47:29 Z

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

# TCE 007958049-02, PDC Light Curves



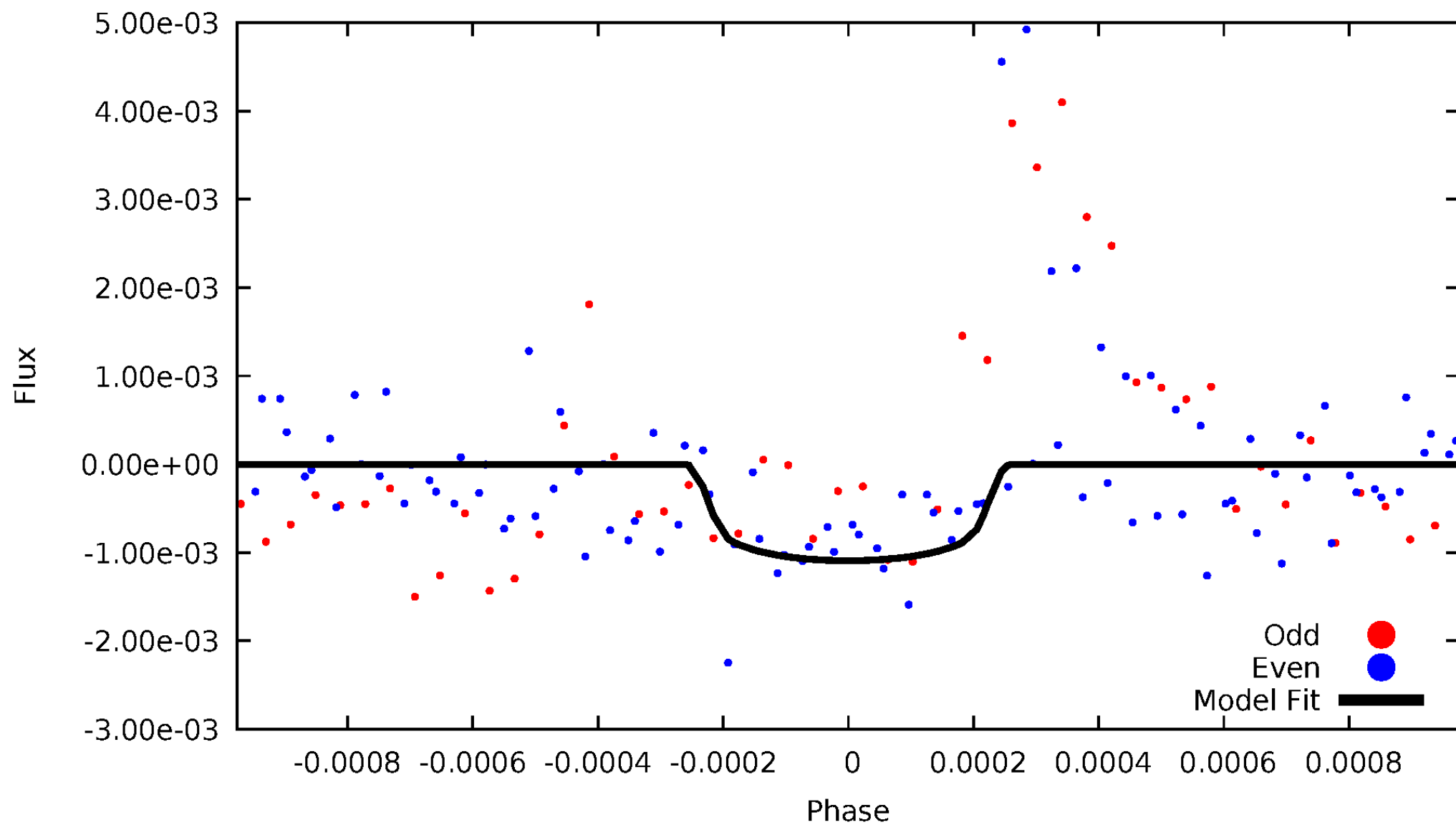
TCE 007958049-02





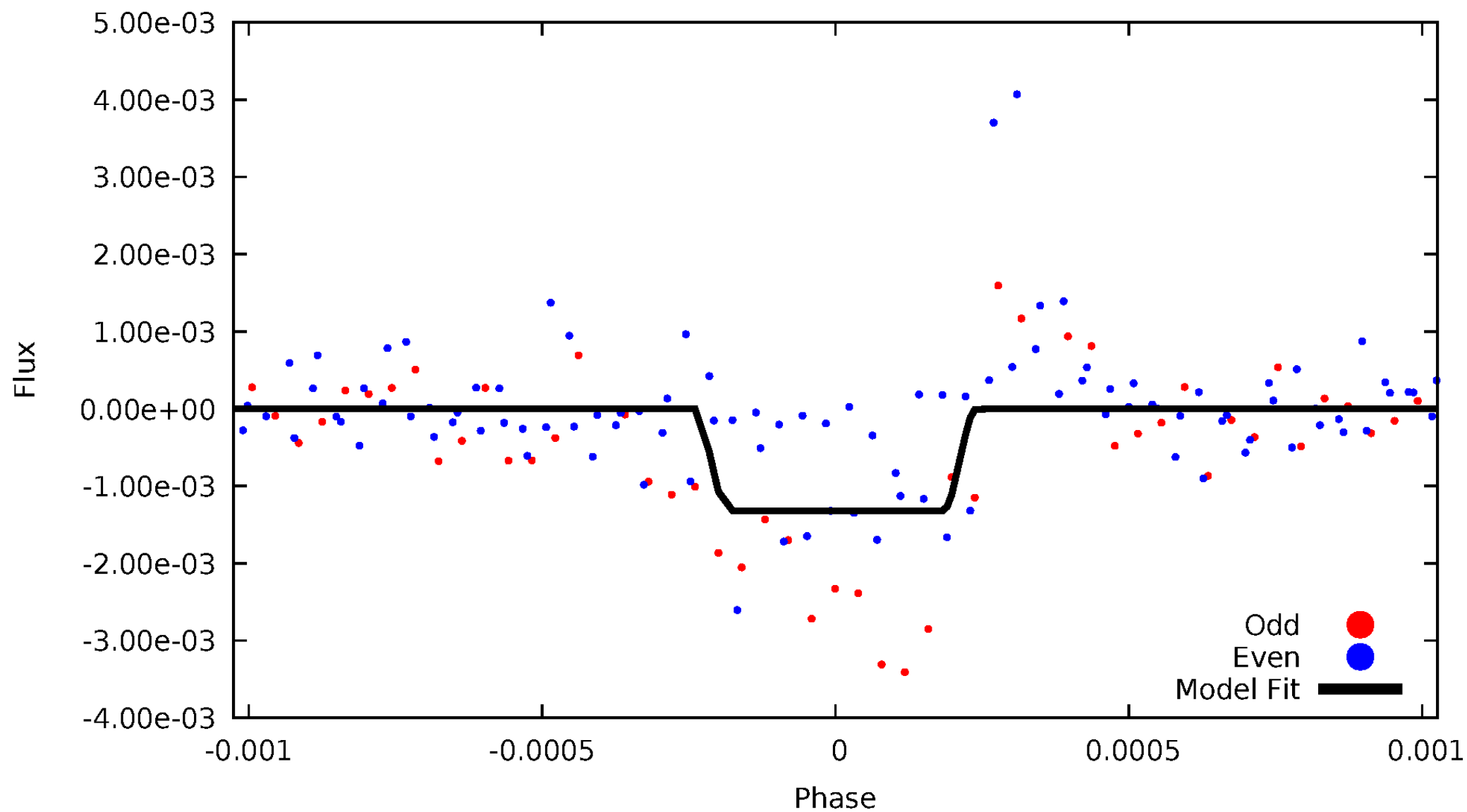
# DV Odd/Even

TCE 007958049-02



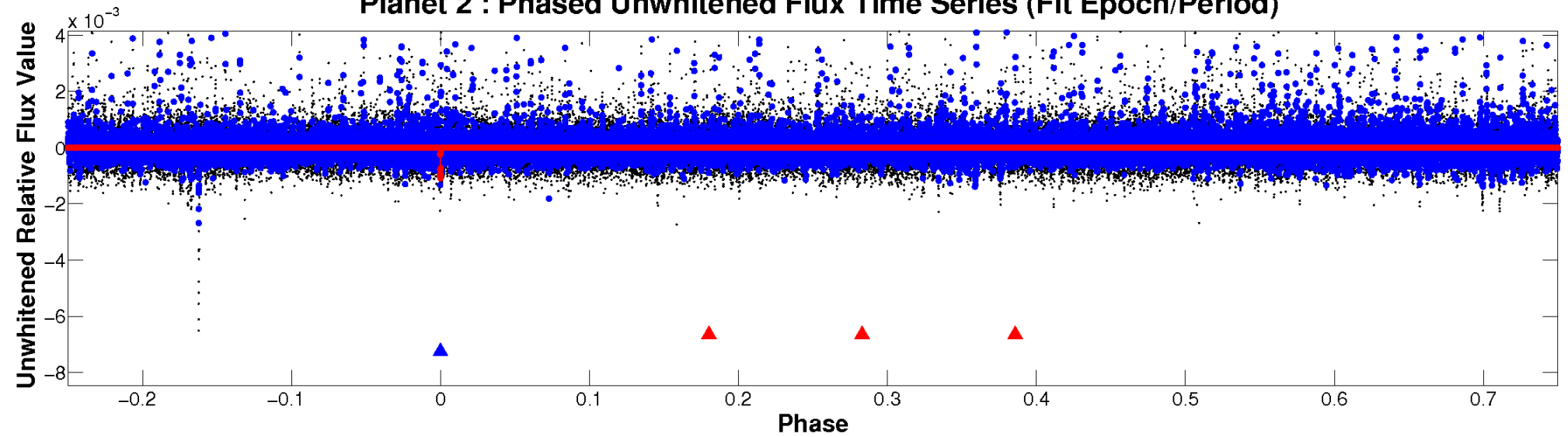
# ALT Odd/Even

TCE 007958049-02

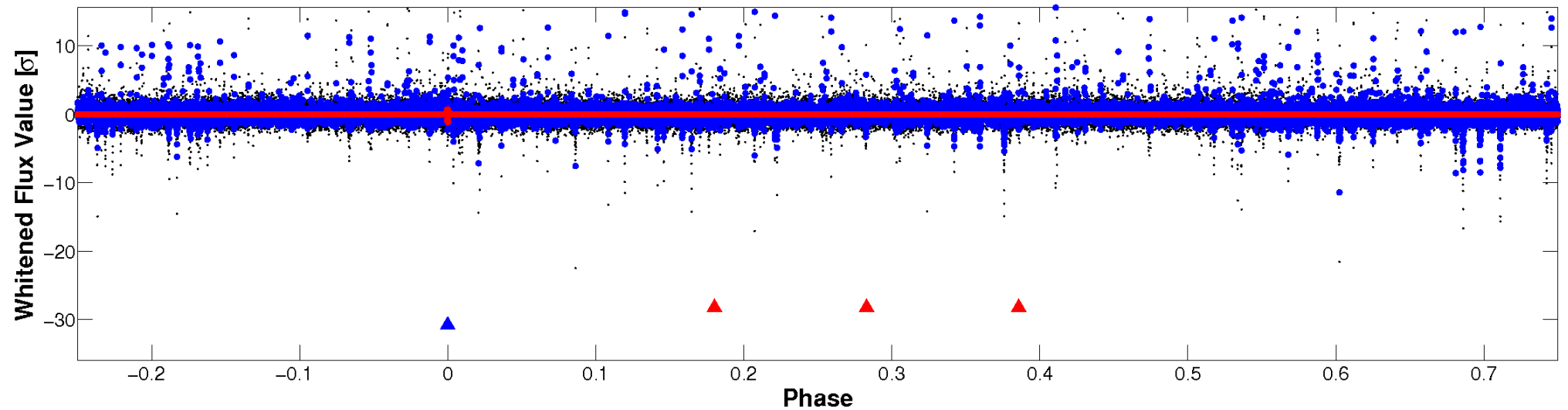


# Non-Whitened Vs. Whitened Light Curve

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

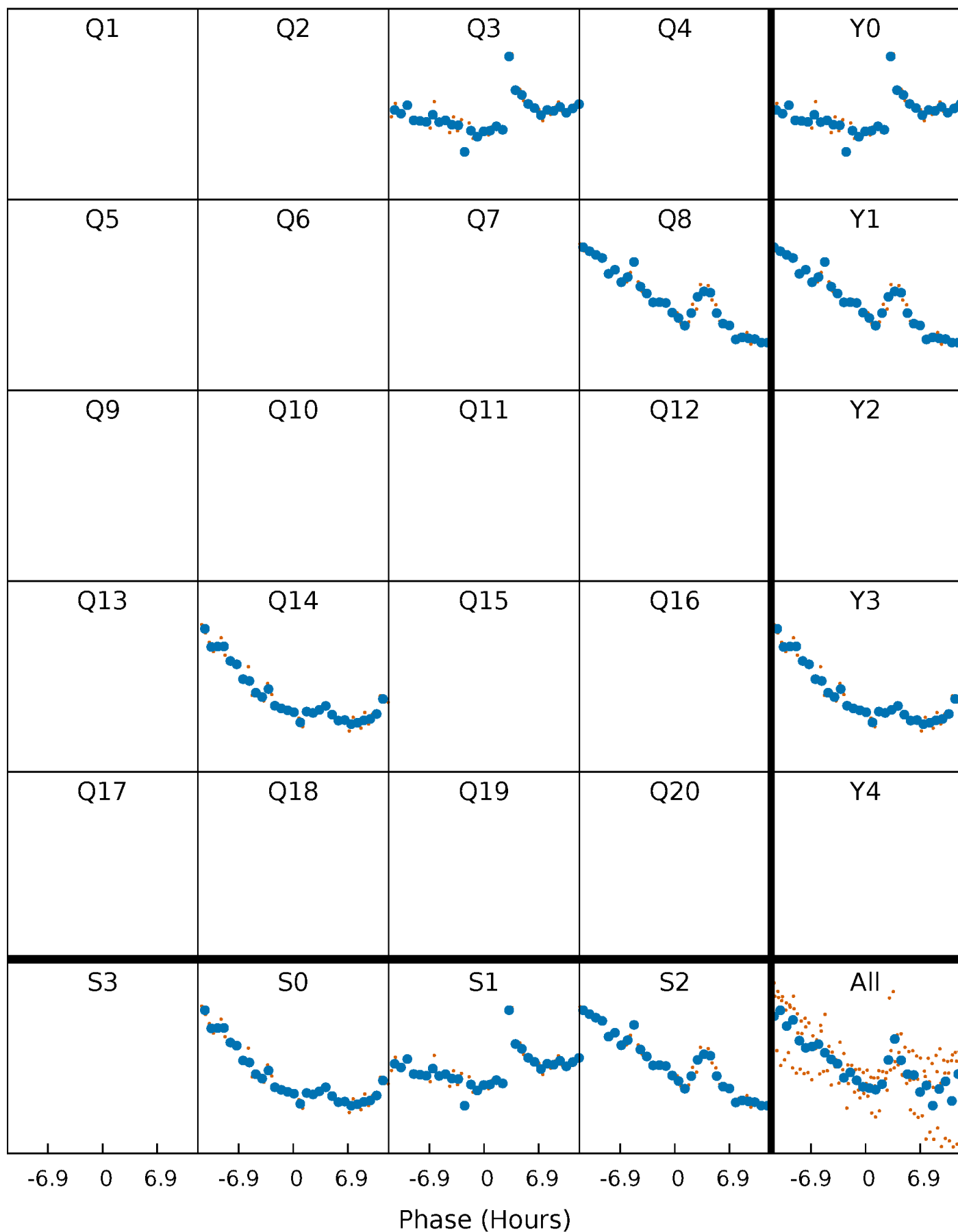


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



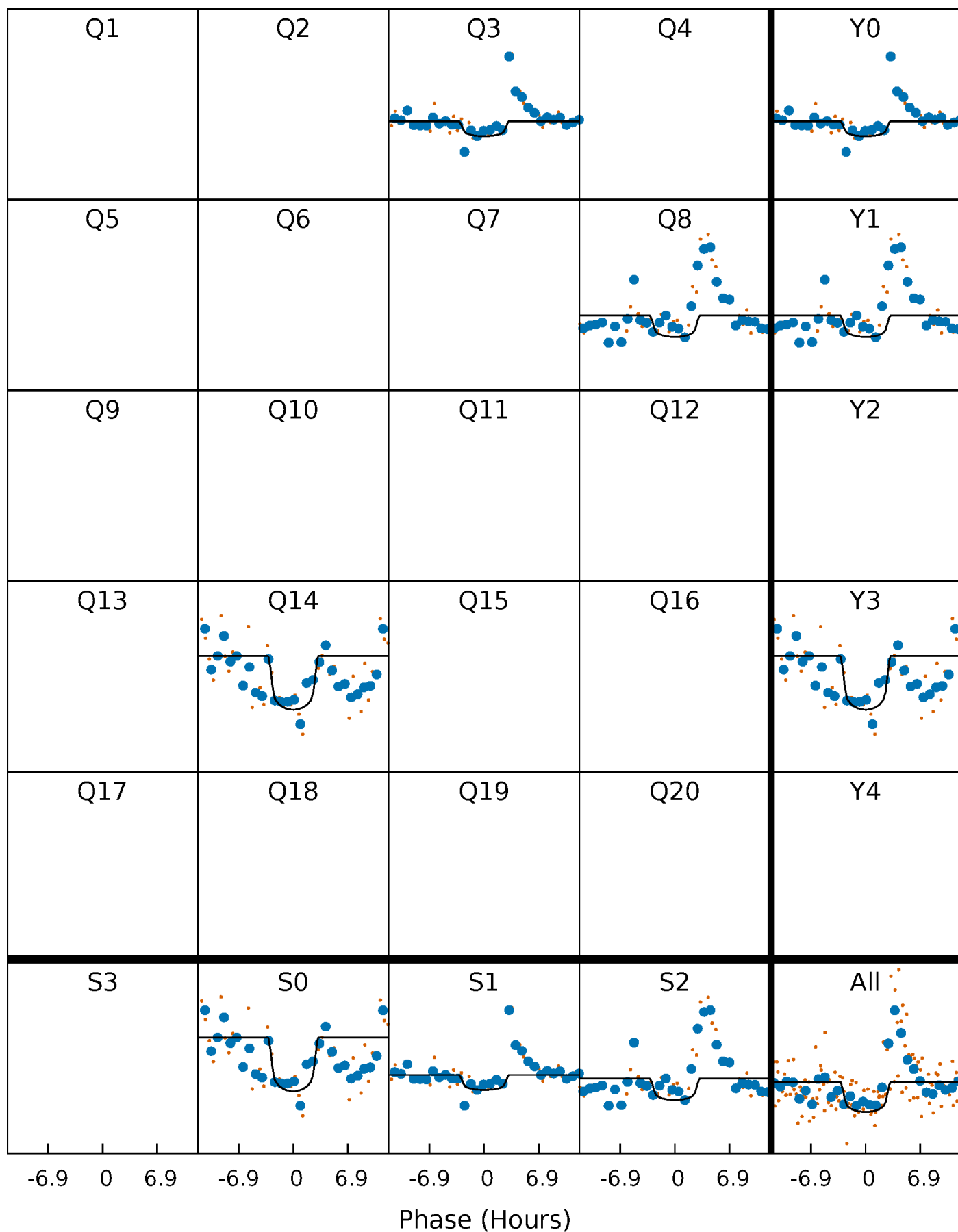
# PDC Quarter-Phased Transit Curves

TCE 007958049-02 P=514.137721 Days  $T_0=270.907941$  (BKJD)



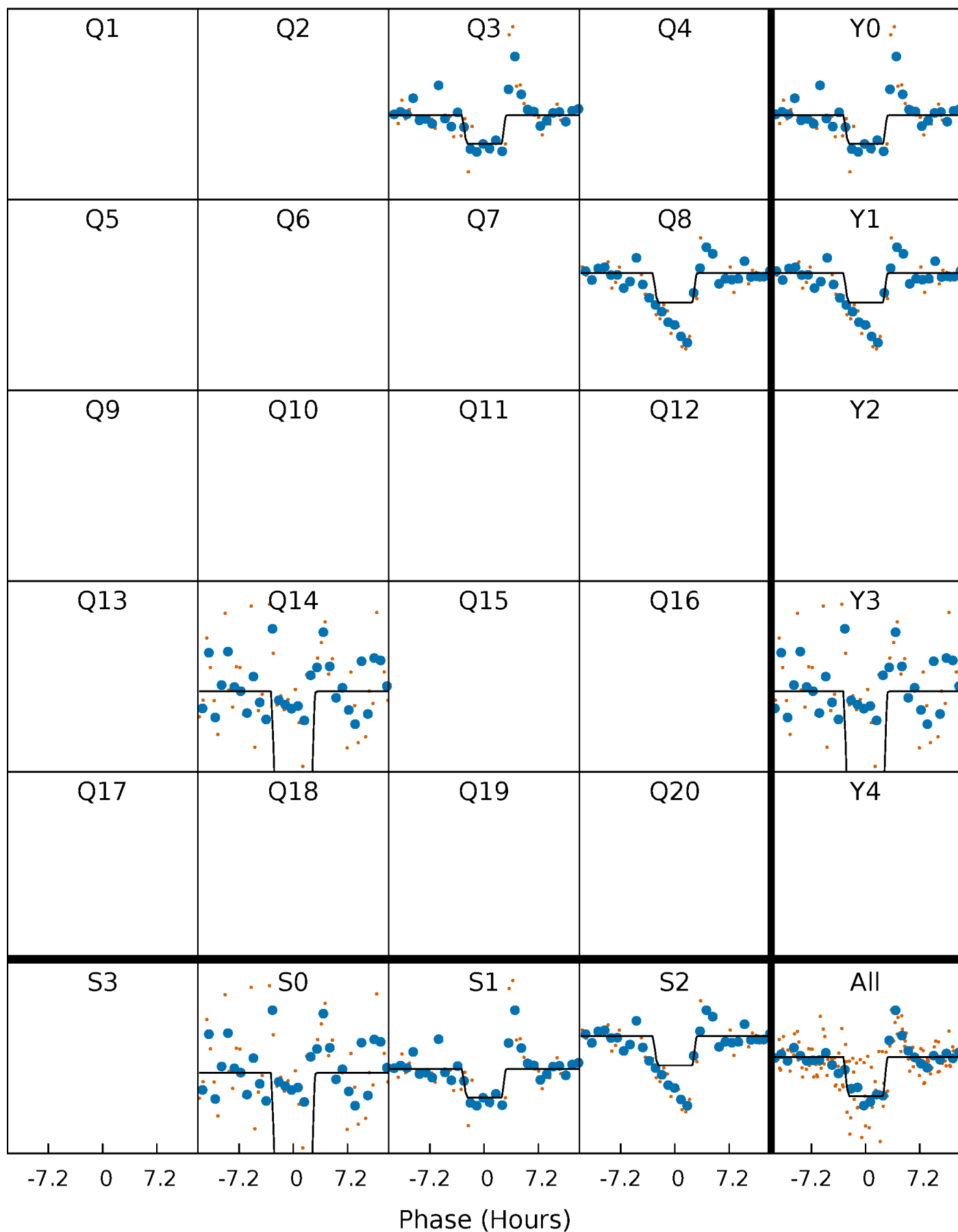
# DV Quarter-Phased Transit Curves

TCE 007958049-02 P=514.137721 Days  $T_0=270.907941$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

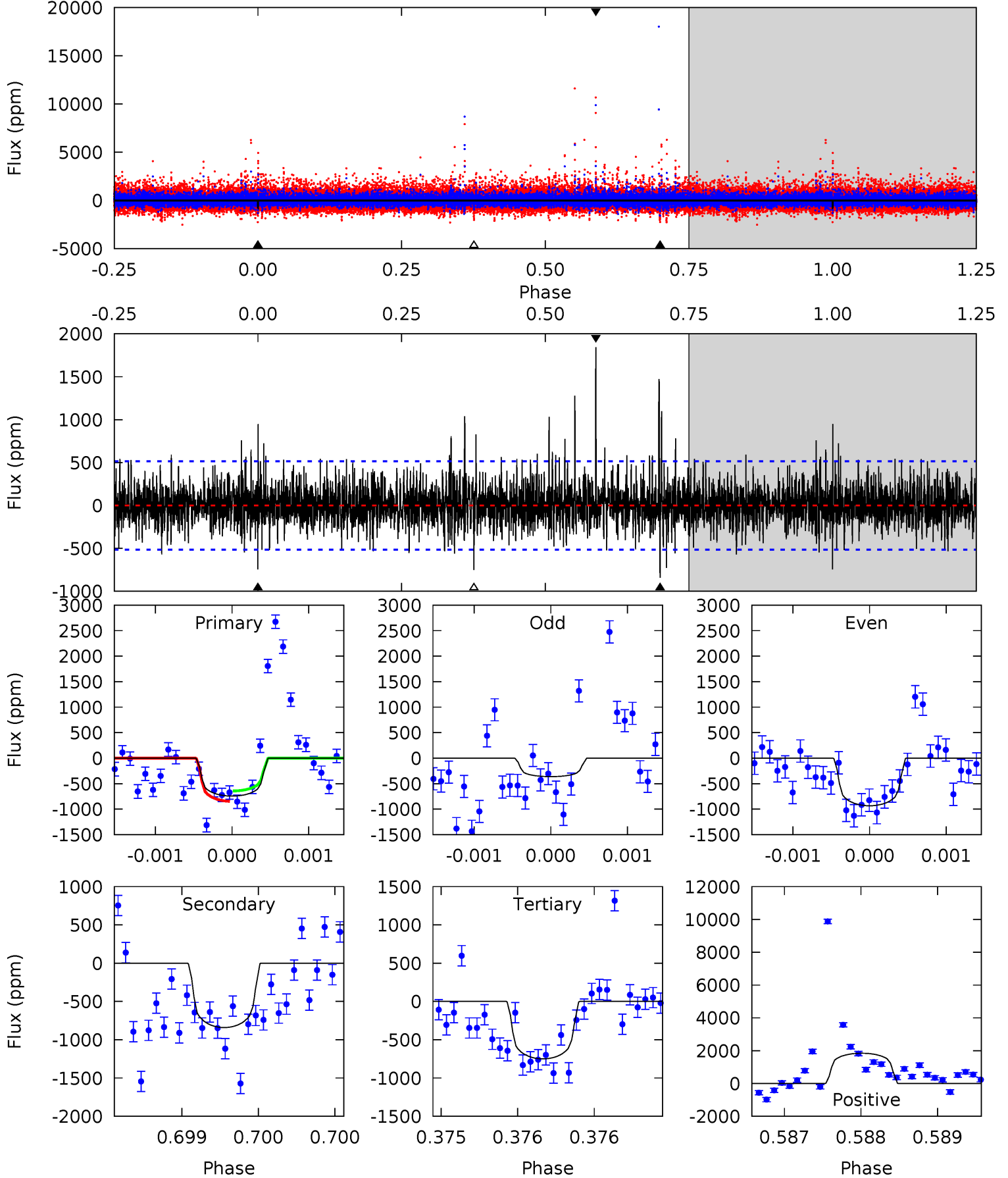
TCE 007958049-02 P=514.142425 Days  $T_0=270.895164$  (BKJD)



# DV Model-Shift Uniqueness Test

007958049-02, P = 514.137721 Days, E = 270.907941 Days

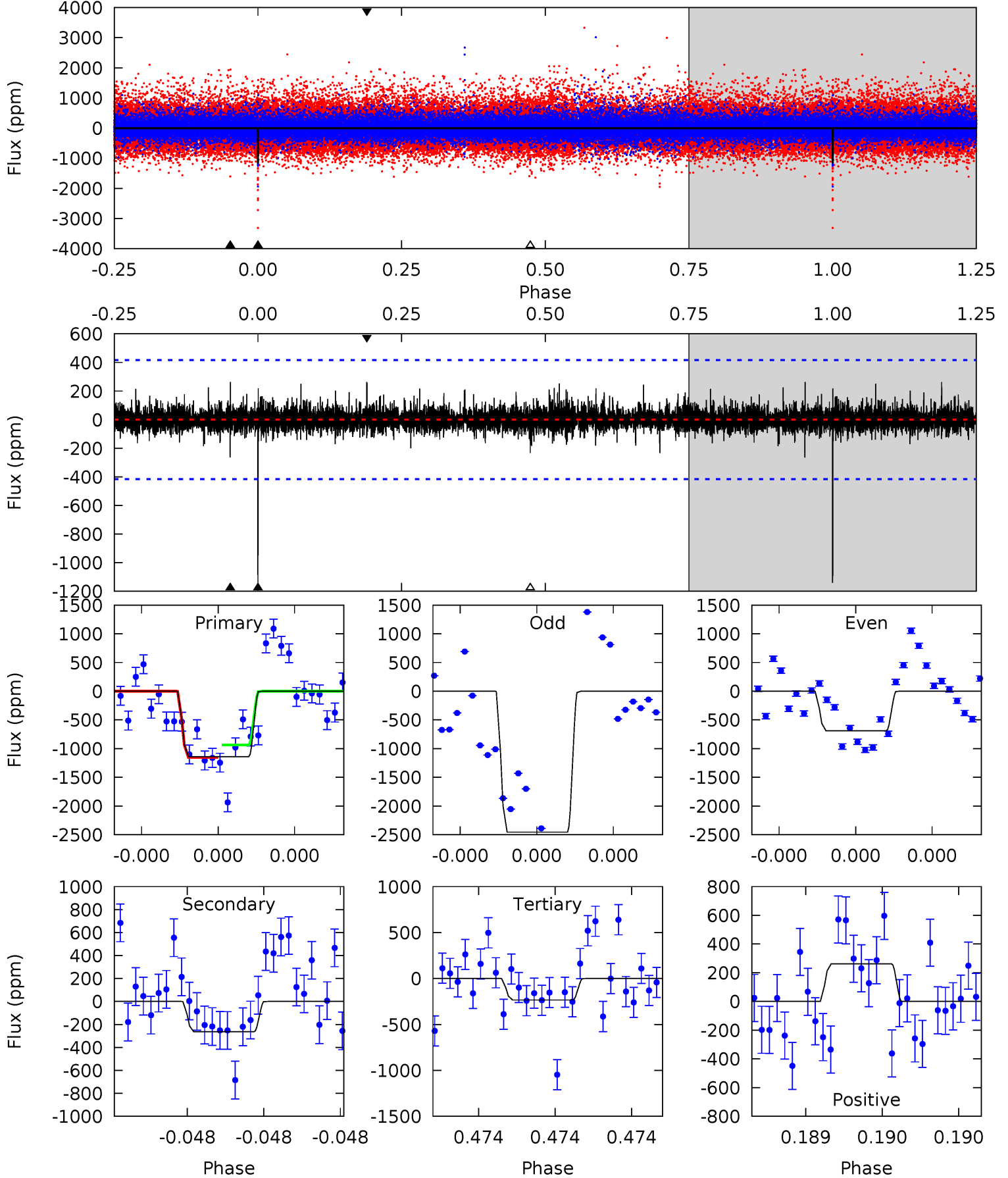
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.01	9.06	8.08	19.9	5.56	3.46	2.04	-0.07	-11.9	0.98	-10.8	1.85	0.88	0.69	1.10



# Alt Model-Shift Uniqueness Test

007958049-02, P = 514.142425 Days, E = 270.895164 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
15.3	3.54	3.14	3.53	5.59	3.51	0.64	12.2	11.8	0.40	0.01	10.8	0.90	0.19	1.43





### Stellar Parameters For KIC 007958049

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5802^{+174}_{-157}$	$4.384^{+0.180}_{-0.198}$	$-0.540^{+0.300}_{-0.300}$	$0.944^{+0.255}_{-0.170}$	$0.785^{+0.121}_{-0.052}$	$1.316^{+1.131}_{-0.642}$
	+3%/-3%	+4%/-5%	+56%/-56%	+27%/-18%	+15%/-7%	+86%/-49%
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 007958049-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-840 \pm 93$	$3.52^{+2.09}_{-1.95}$	$324^{+26}_{-21}$	$5443^{+2706}_{-958}$	$50988^{+199363}_{-30765}$
Alt.	$-263 \pm 74$	$3.83^{+2.10}_{-1.83}$	$323^{+27}_{-20}$	$4144^{+1246}_{-555}$	$13714^{+35740}_{-8203}$

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

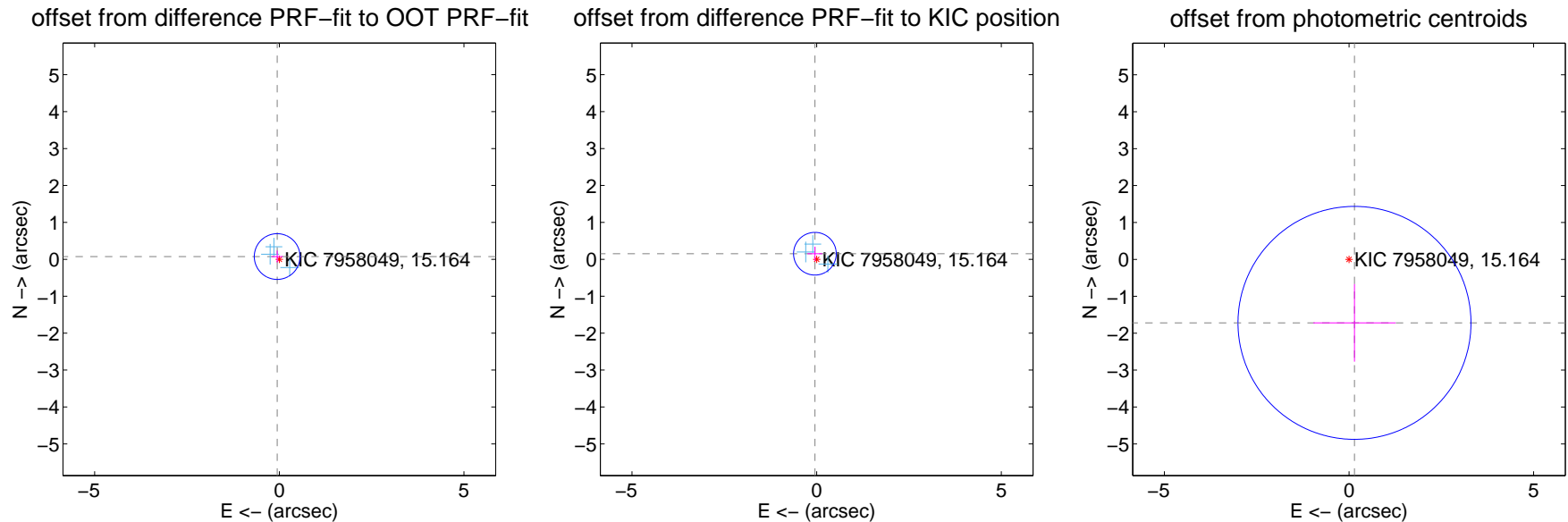
## DV Centroid Data

Supplemental centroid analysis for 007958049-02. Kepler magnitude: 15.16. Transit SNR 6.45

There are 3 quarters with good PRF difference image offsets

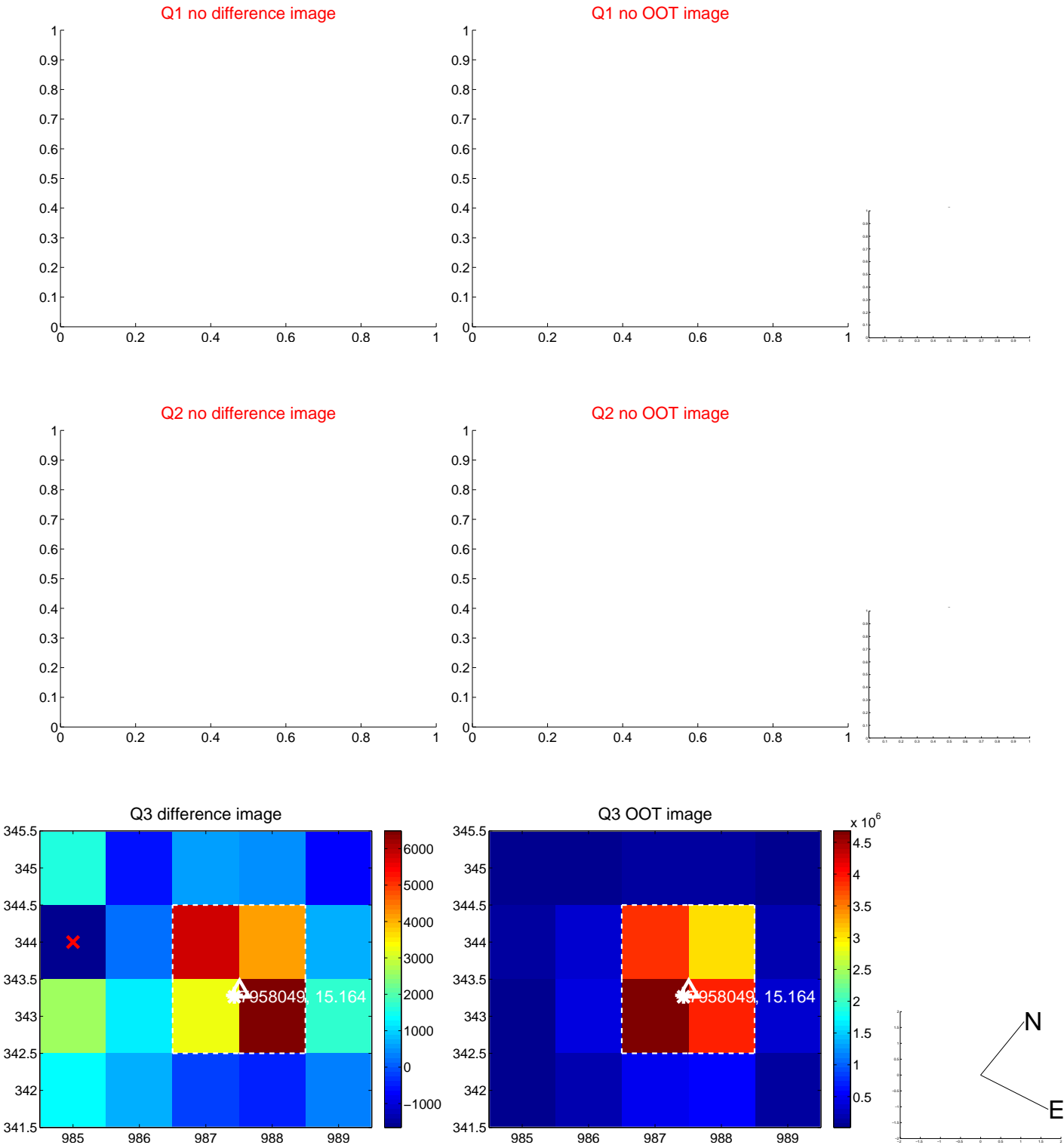
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.095 \pm 0.206$	0.46	$0.058 \pm 0.150$	$0.075 \pm 0.162$
PRF-fit source offset from KIC position	$0.158 \pm 0.193$	0.82	$0.047 \pm 0.201$	$0.151 \pm 0.192$
photometric centroid source offset	$1.73 \pm 1.05$	1.64	$-0.15 \pm 1.12$	$-1.72 \pm 1.05$

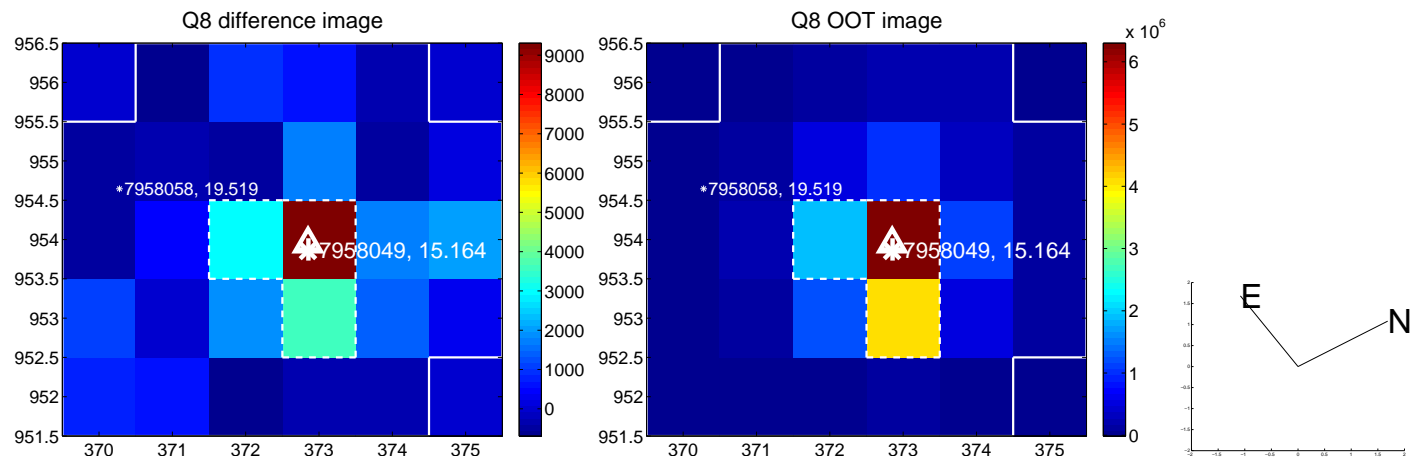
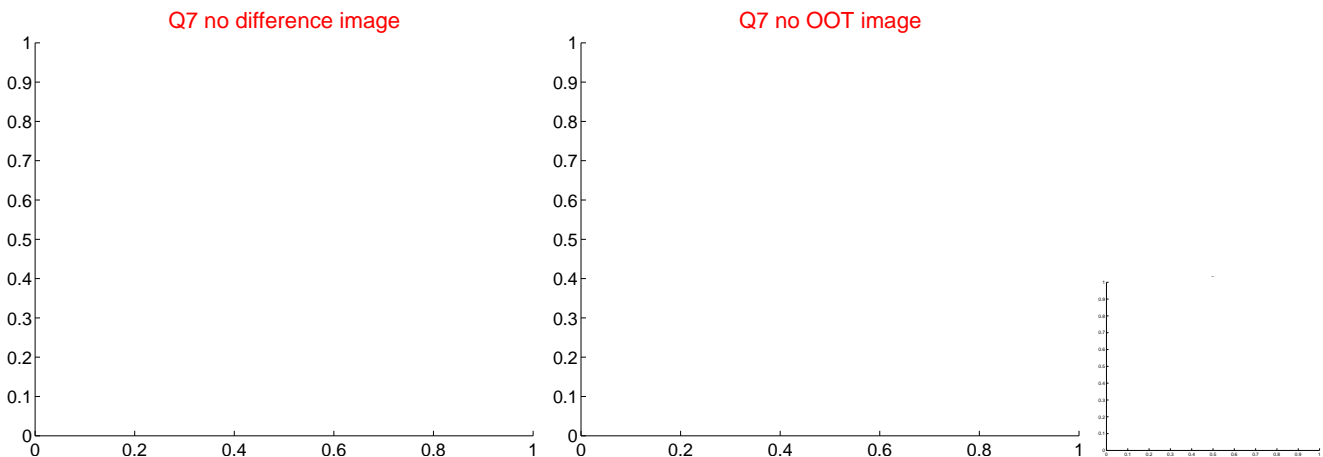
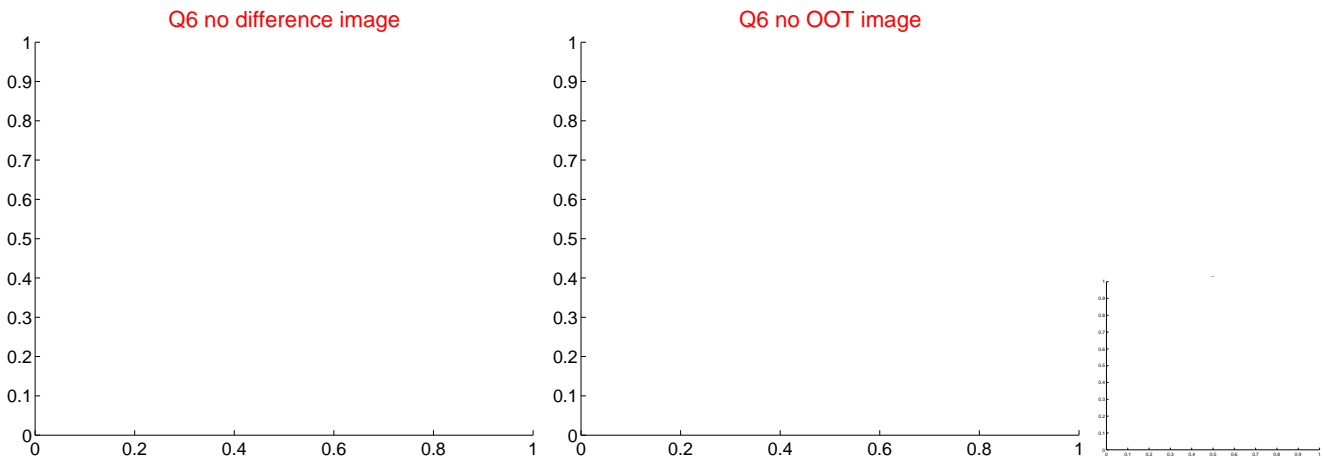
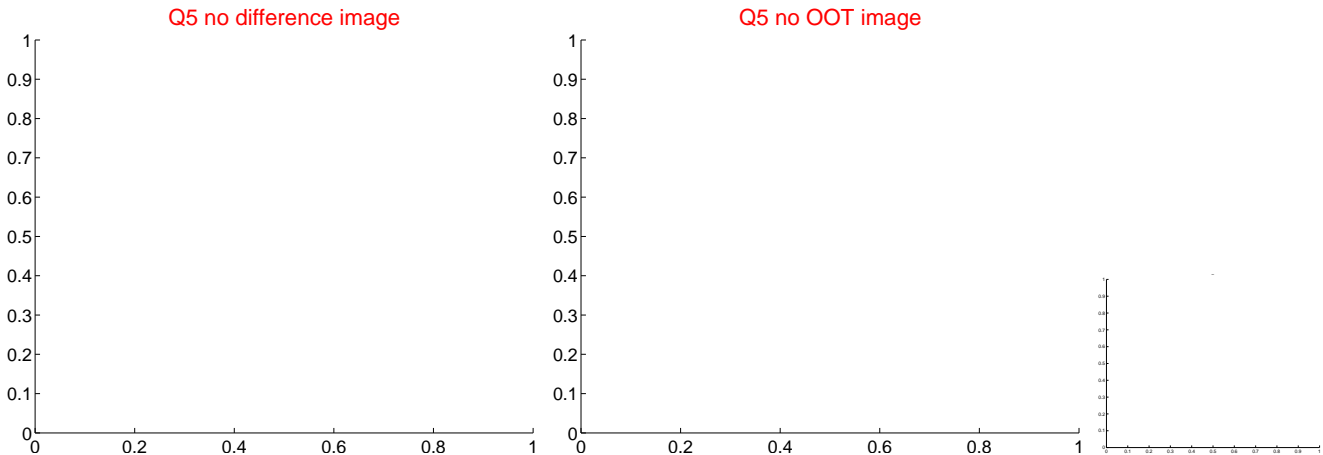


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

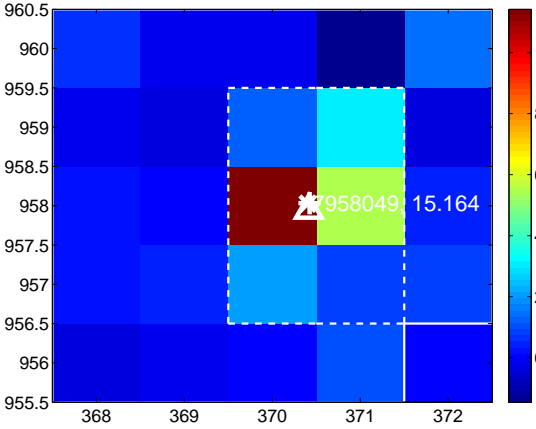
Q13 no difference image



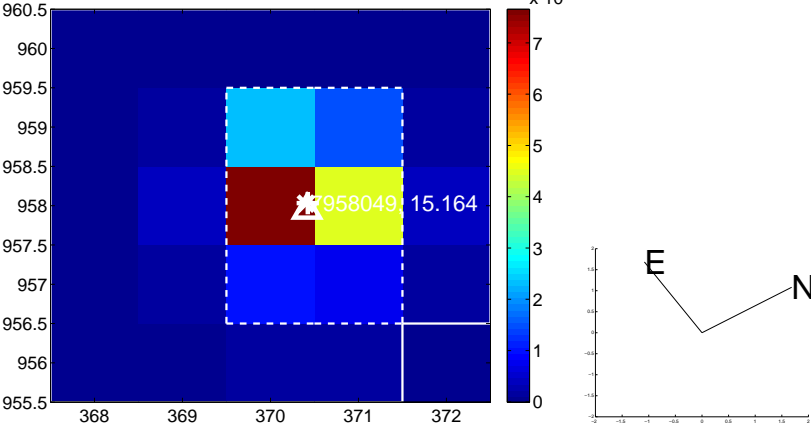
Q13 no OOT image



Q14 difference image



Q14 OOT image



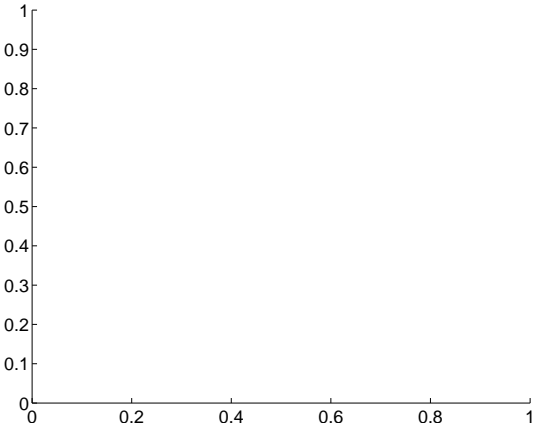
Q15 no difference image



Q15 no OOT image



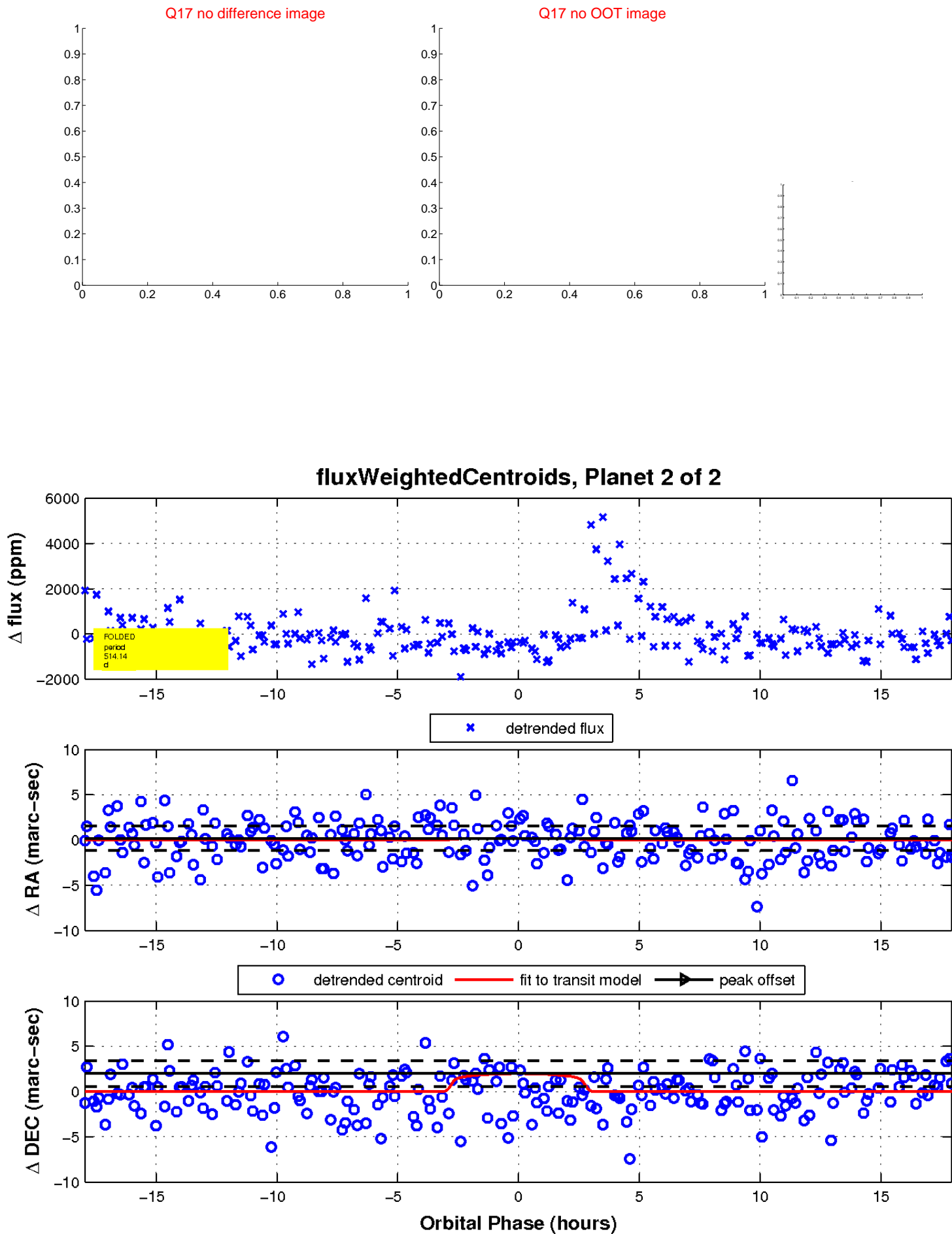
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

