

# KIC 005716508

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005716508-01	OBS	No	80.022023	139.478721	1812.0	6.599	12.4	4.8	180.01	3486	822.92	0.00
005716508-02	OBS	No	128.877360	256.656319	1709.2	4.633	11.2	5.5	180.01	3486	685.84	0.00
005716508-03	OBS	No	4.863178	134.225462	449.5	4.889	8.9	5.7	180.01	3486	533.38	0.00
005716508-04	OBS	No	64.802168	156.846039	2521.1	10.213	11.3	7.5	180.01	3486	830.71	0.00
005716508-05	OBS	No	12.090645	140.492474	829.4	3.280	9.2	6.0	180.01	3486	595.34	0.00
005716508-06	OBS	No	38.495224	157.141282	1910.2	2.390	10.3	9.1	180.01	3486	812.46	0.00
005716508-07	OBS	7737.01	4.753079	134.546213	542.6	2.352	8.9	5.9	180.01	3486	664.20	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005716508-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005716508-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
005716508-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-06	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT

**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.

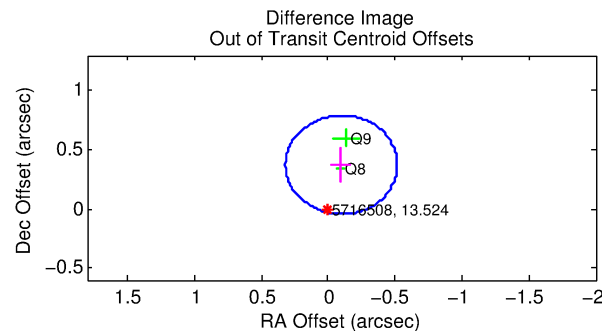
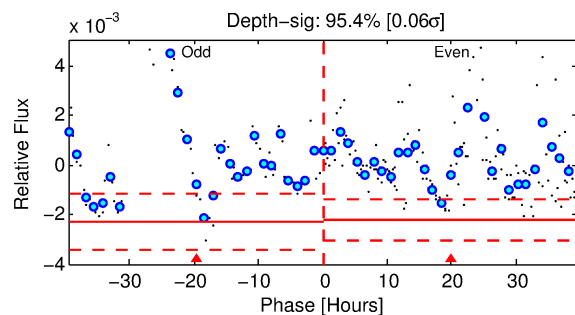
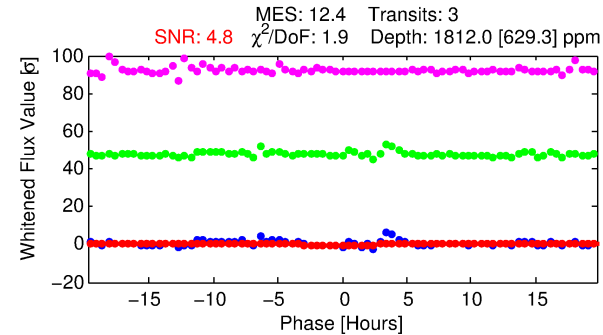
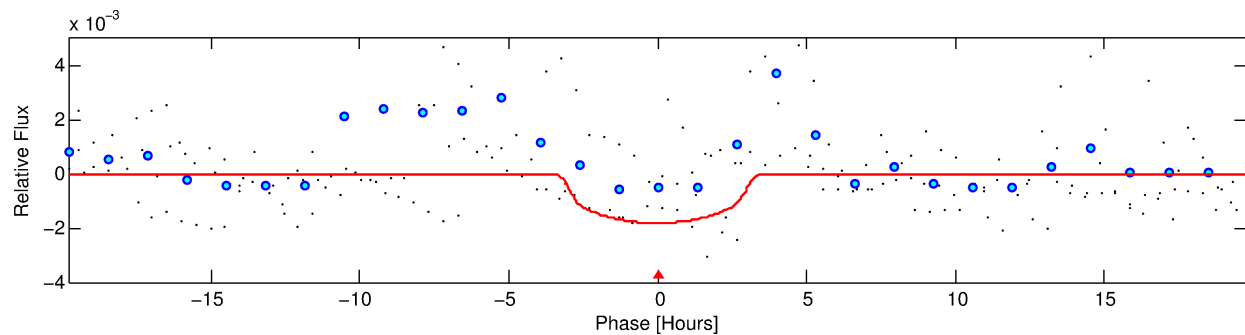
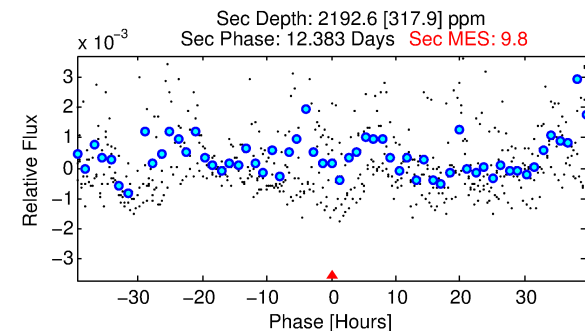
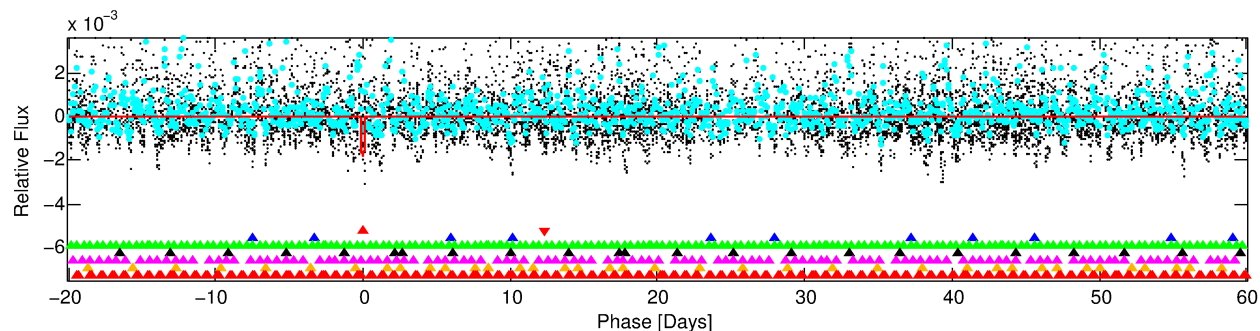
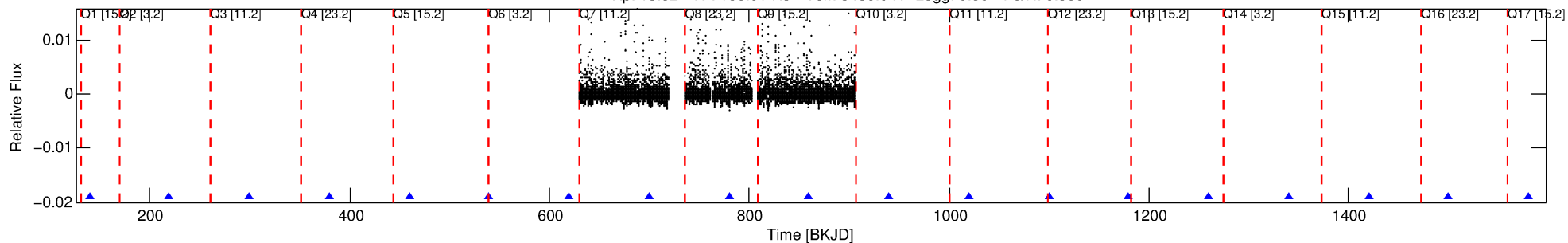
Ephemeris Match Information For 005716508-01

No Significant Match Found

# DV One-Page Summary

KIC: 5716508 Candidate: 1 of 7 Period: 80.022 d

Kp: 13.52 R\*: 180.01 Rs Teff: 3486.0 K Logg: 0.50 Fe/H: 0.360



## DV Fit Results:

Period = 80.02202 [0.01064] d  
Epoch = 139.4787 [0.0854] BKJD  
Rp/R\* = 0.0419 [0.0371]  
a/R\* = 71.10 [151.25]  
b = 0.70 [1.57]  
Seff = N/A  
Teq = N/A  
Rp = 822.92 [869.73] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

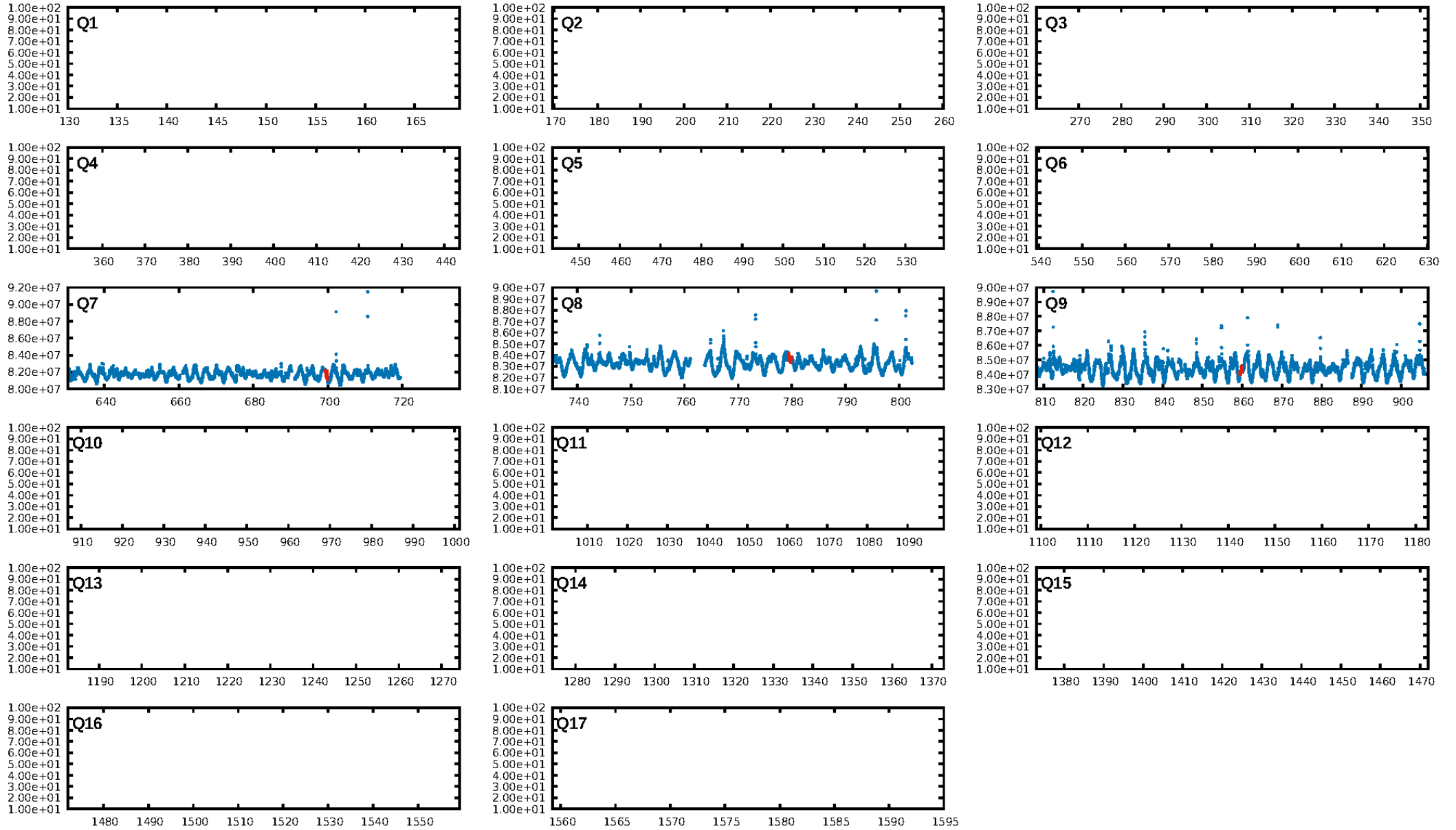
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [30.04σ]  
LongPeriod-sig: 100.0% [145.42σ]  
ModelChiSquare2-sig: 5.5%  
ModelChiSquareGof-sig: 18.6%  
Bootstrap-pfa: 2.59e-15  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.5963  
Centroid-sig: N/A  
Centroid-so: 0.207 arcsec [0.62σ]  
OotOffset-rm: 0.386 arcsec [2.78σ]  
KicOffset-rm: 0.079 arcsec [0.52σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.67 [2/3]

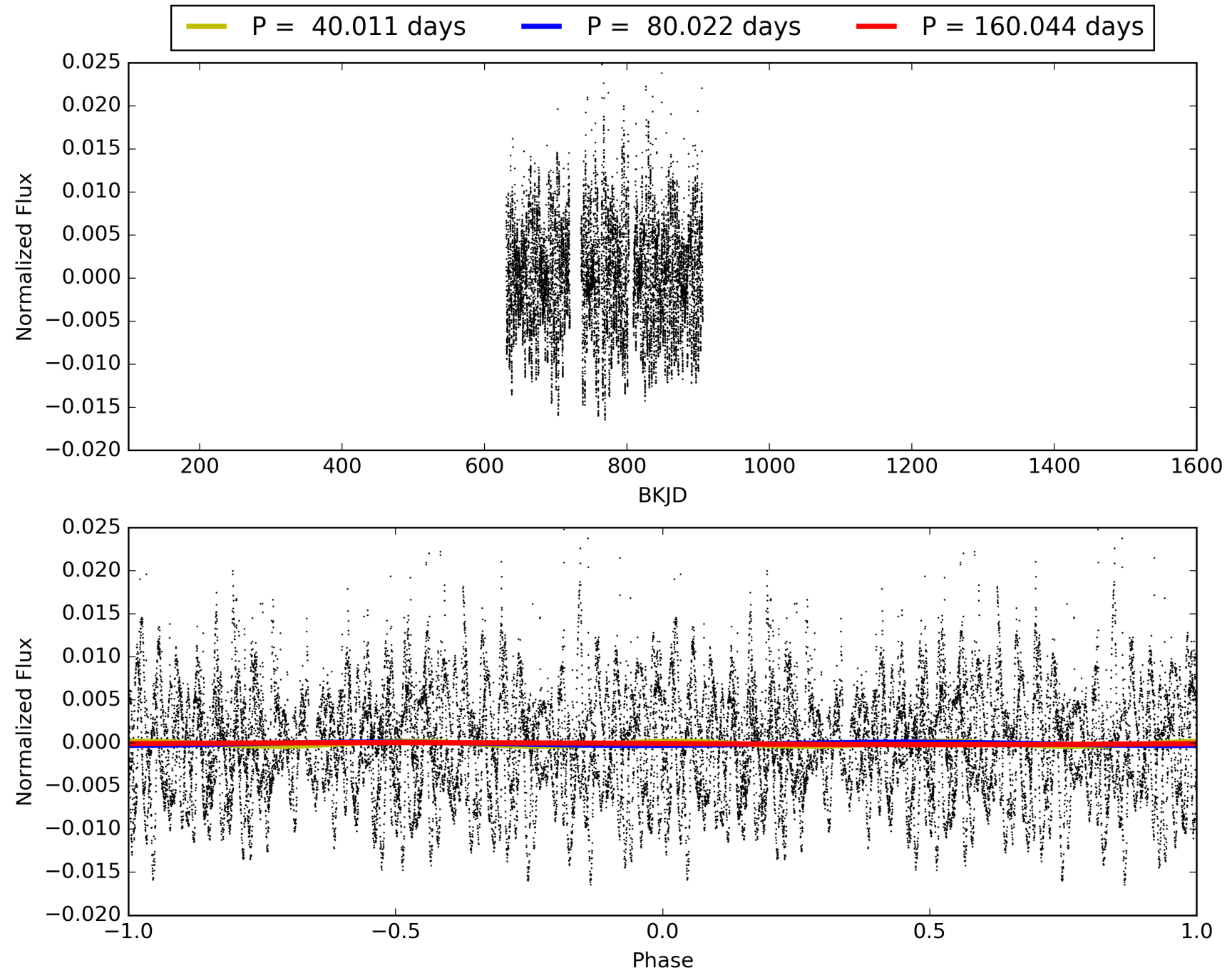
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:49:04 Z

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

# TCE 005716508-01, PDC Light Curves



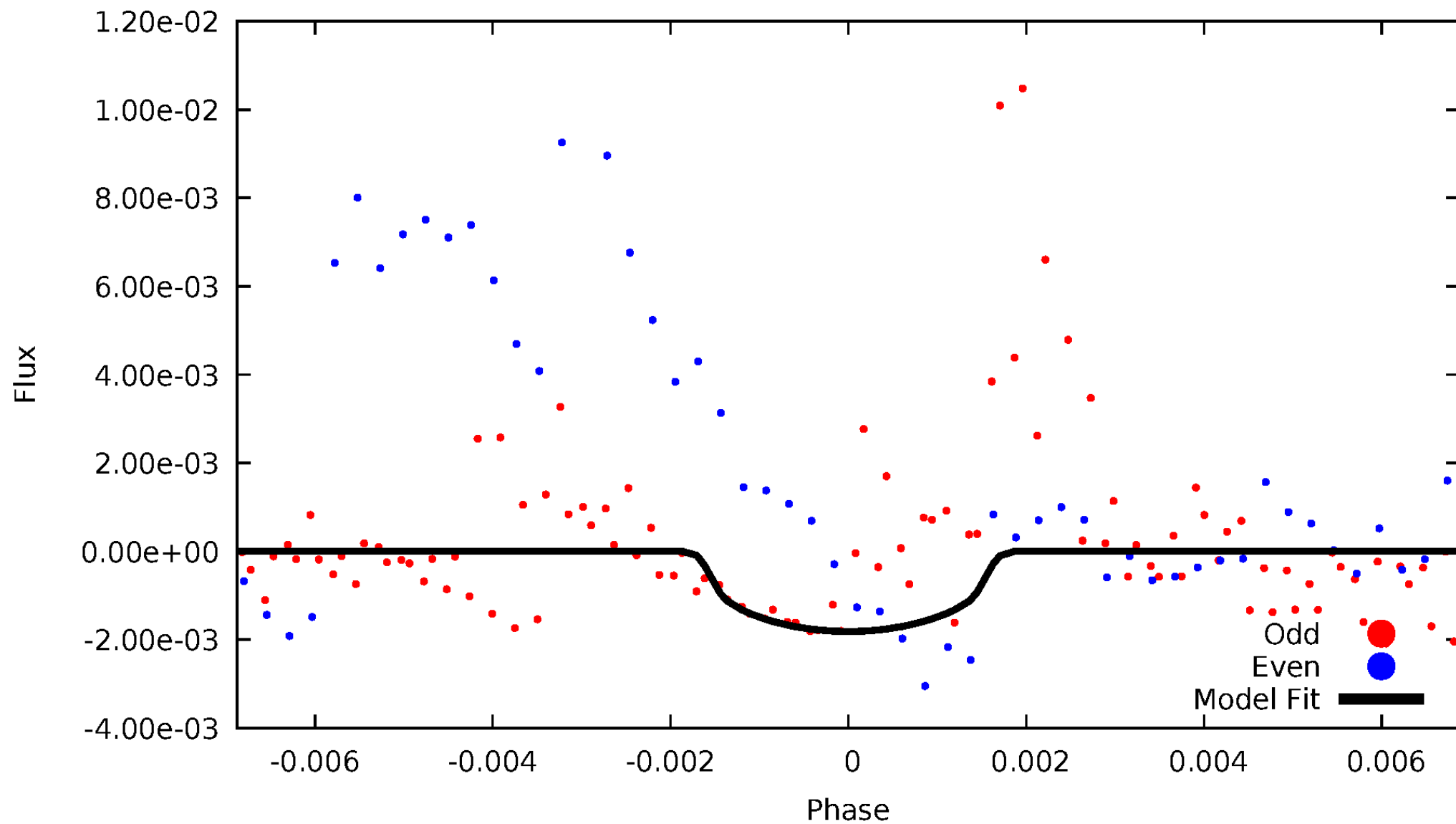
TCE 005716508-01





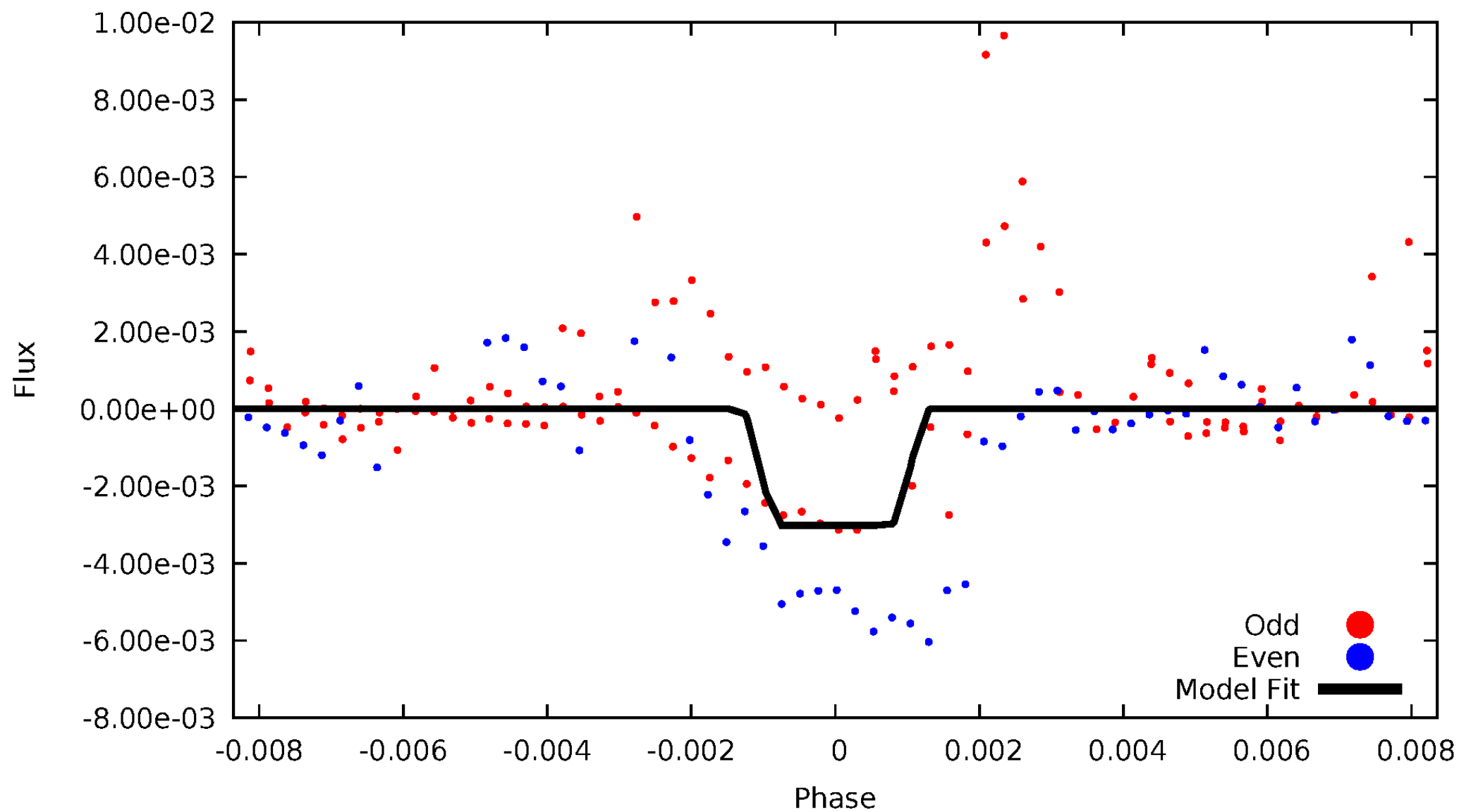
# DV Odd/Even

TCE 005716508-01



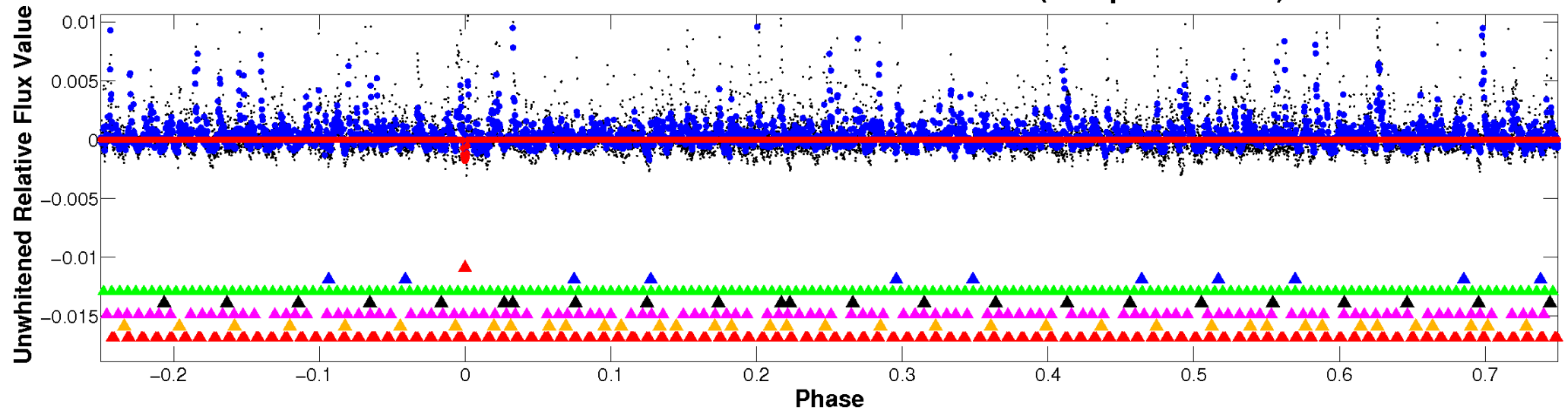
# ALT Odd/Even

TCE 005716508-01

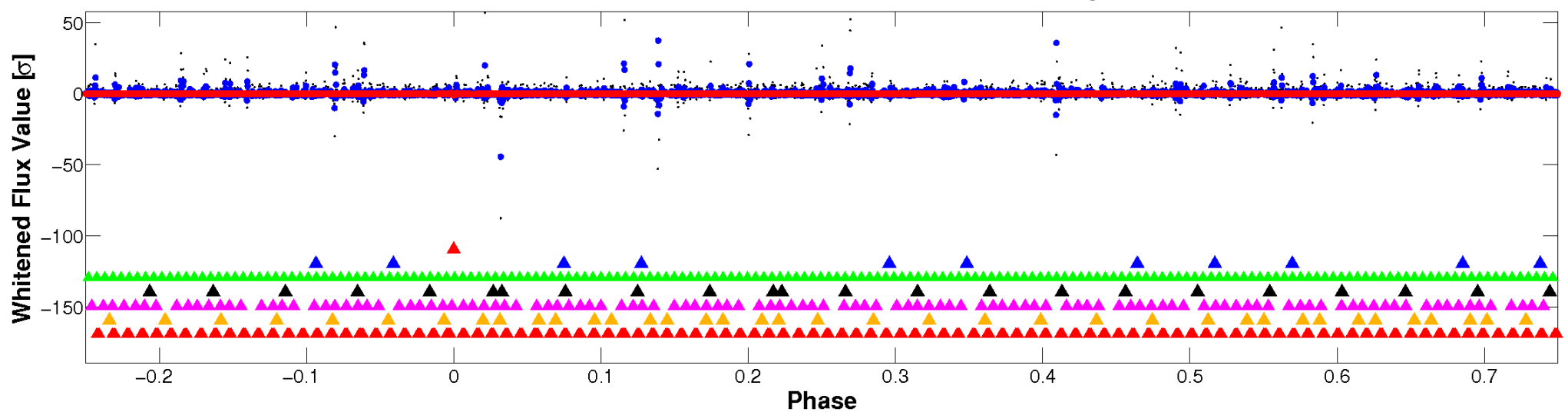


# Non-Whitened Vs. Whitened Light Curve

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

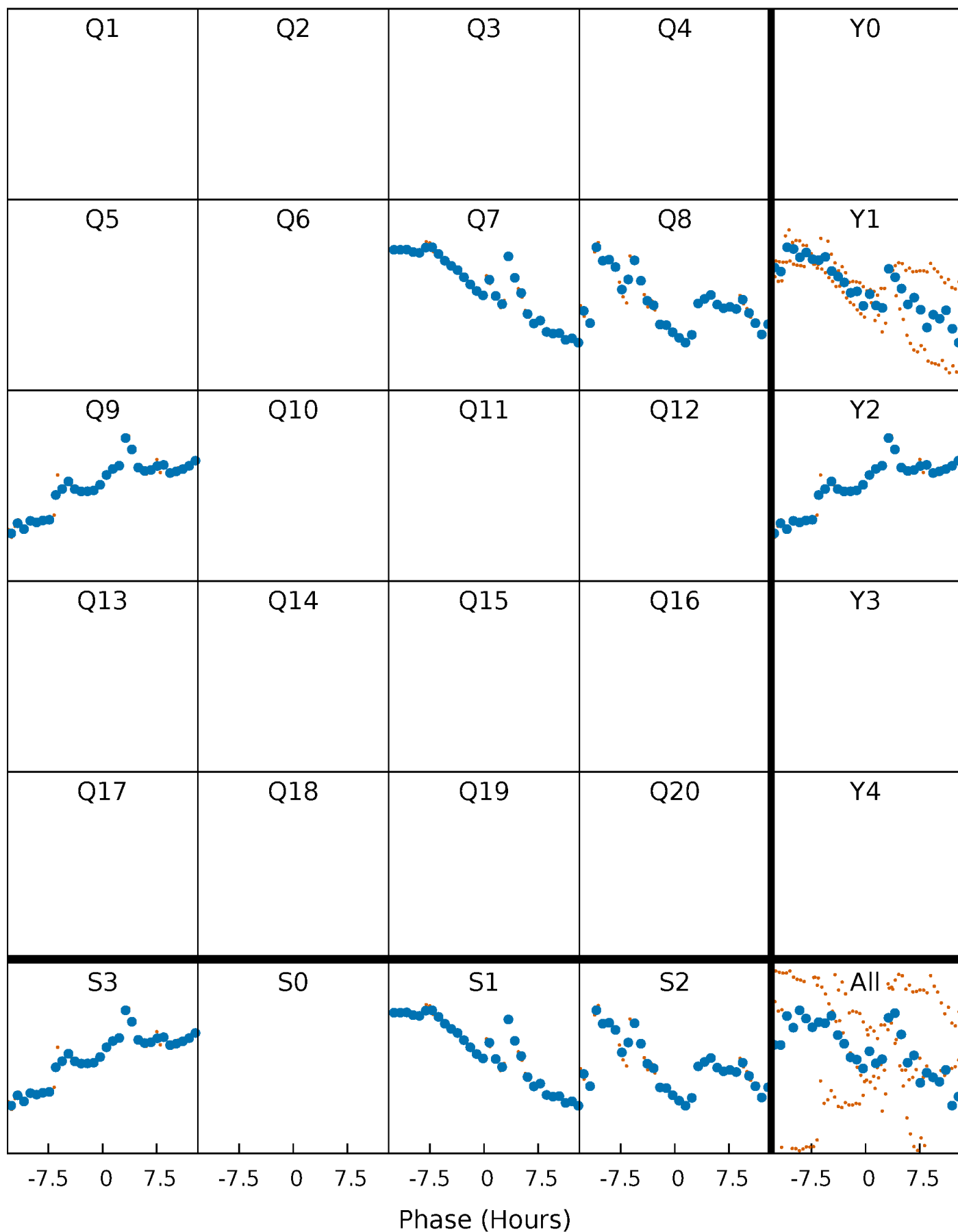


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



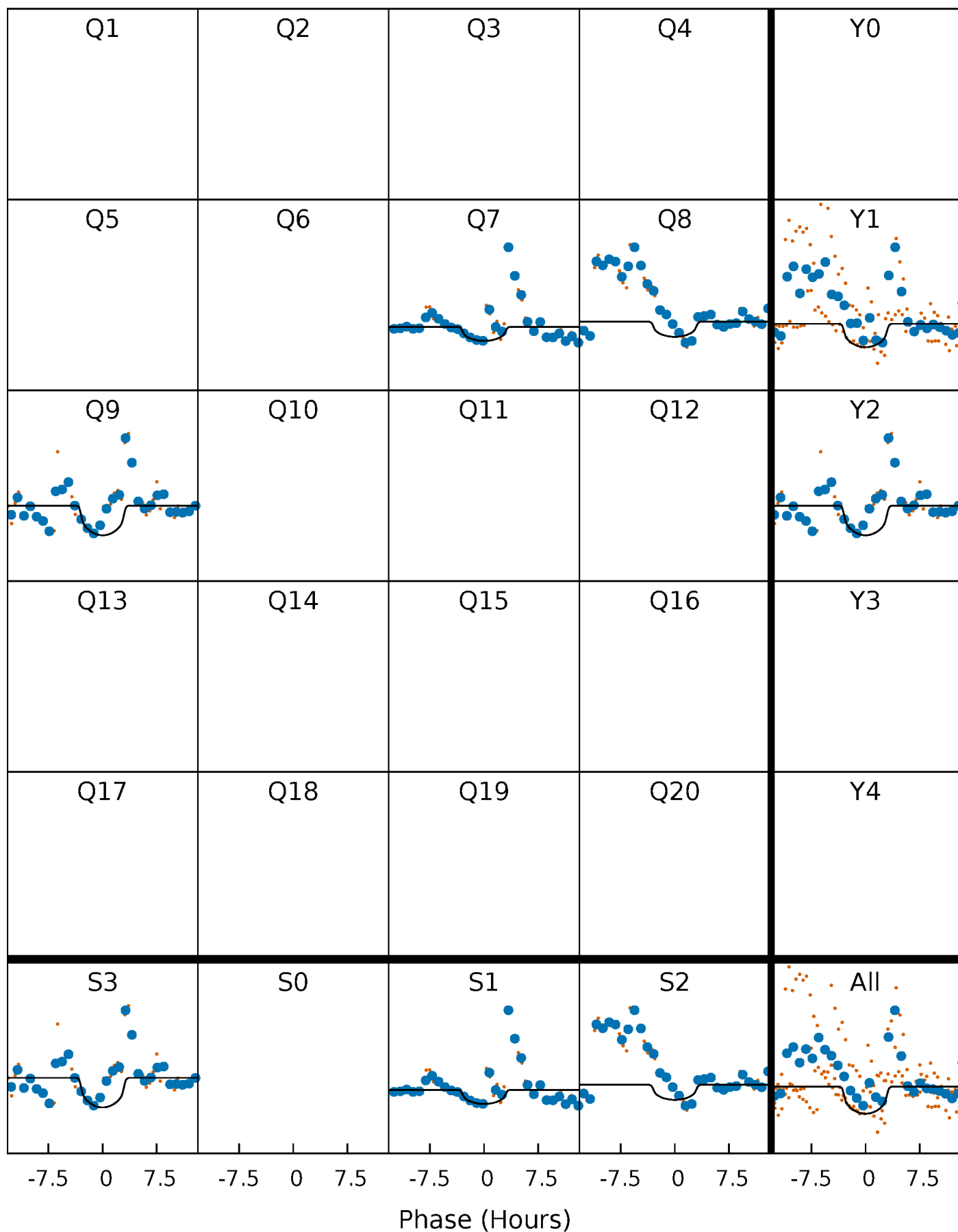
# PDC Quarter-Phased Transit Curves

TCE 005716508-01   P= 80.022023 Days    $T_0=139.478721$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005716508-01   P= 80.022023 Days    $T_0=139.478721$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

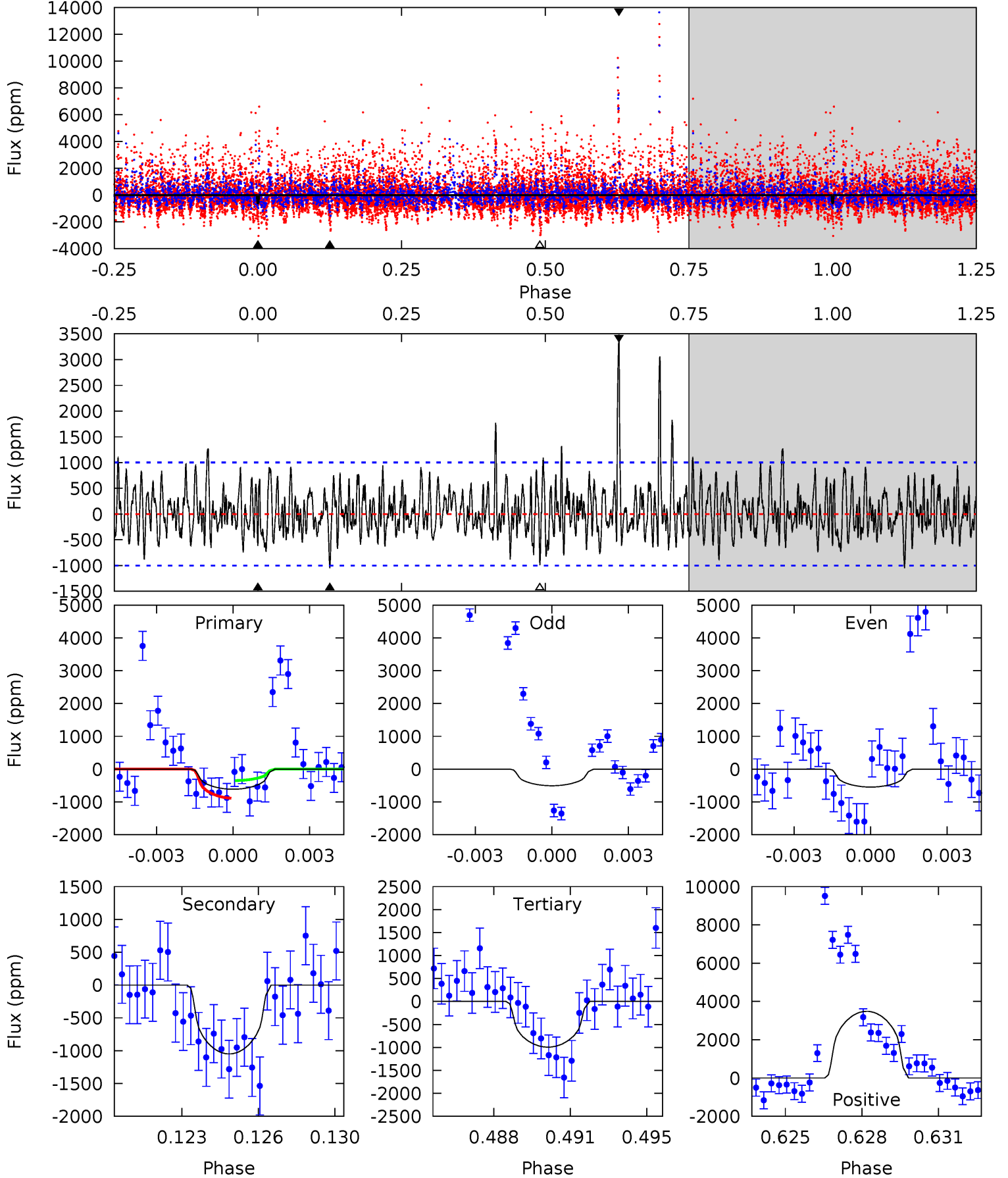
TCE 005716508-01   P= 80.017999 Days    $T_0=139.476186$  (BKJD)



# DV Model-Shift Uniqueness Test

005716508-01, P = 80.022023 Days, E = 139.478721 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
3.21	5.48	5.19	18.2	5.23	2.93	2.30	-1.98	-15.0	0.29	-12.7	0.08	1.01	0.77	1.40

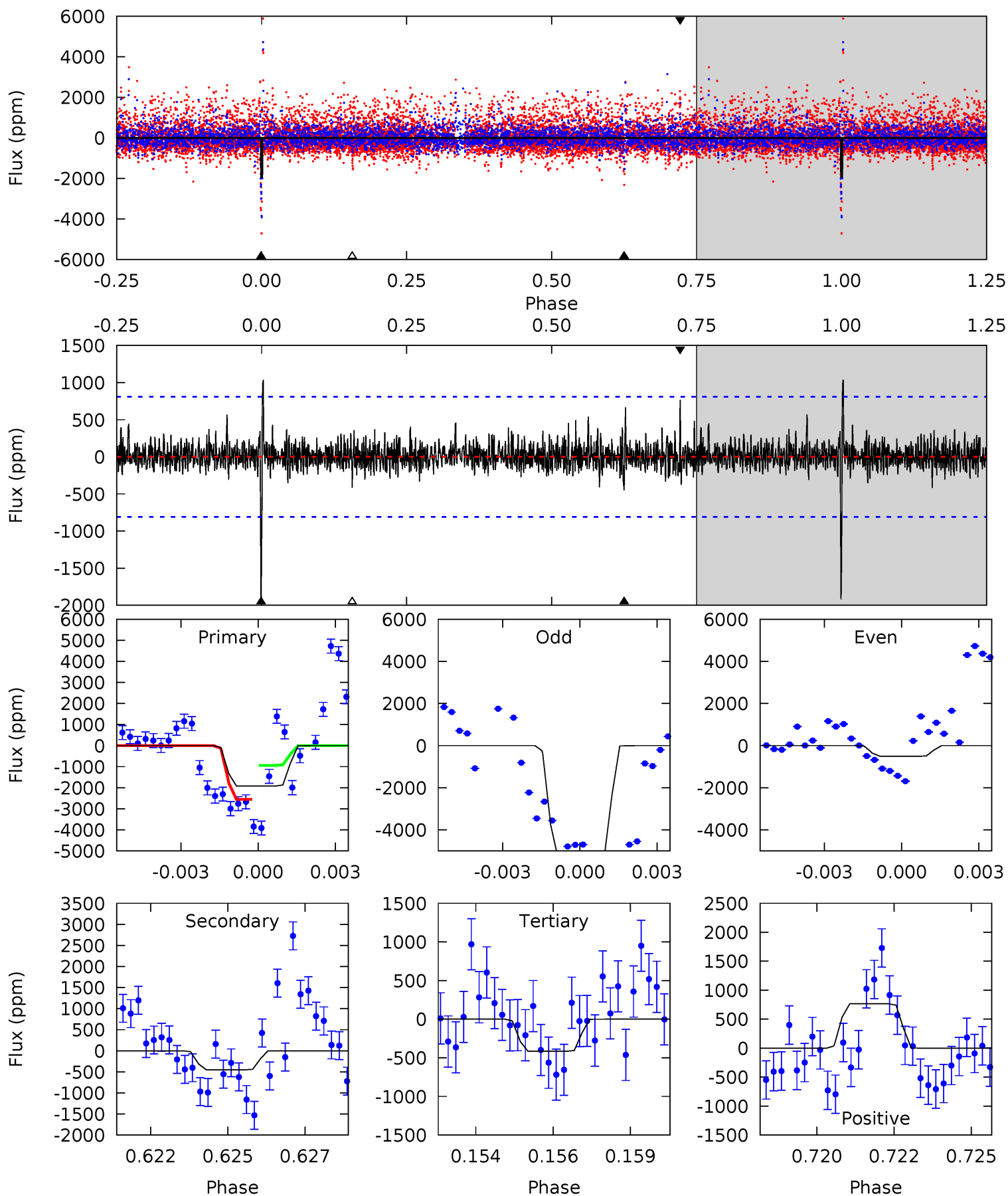




# Alt Model-Shift Uniqueness Test

005716508-01, P = 80.017999 Days, E = 139.476186 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
12.5	2.95	2.71	4.99	5.28	3.02	0.86	9.82	7.55	0.24	-2.04	18.5	1.12	0.35	5.16



### Stellar Parameters For KIC 005716508

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3486^{+112}_{-112}$	$0.500^{+0.338}_{-0.156}$	$0.360^{+0.100}_{-0.250}$	$180.013^{+25.956}_{-103.825}$	$3.735^{+0.075}_{-2.514}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+68%/-31%	+28%/-69%	+14%/-58%	+2%/-67%	+434%/-35%
Source	KIC0	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 005716508-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1049 \pm 191$	$853.34^{+663.12}_{-534.89}$	$3841^{+268}_{-438}$	$-2604^{+6623}_{-571}$	$0.234^{+1.392}_{-0.160}$
Alt.	$-452 \pm 153$	$1043.03^{+762.98}_{-572.21}$	$3851^{+218}_{-394}$	$-3068^{+5292}_{-234}$	$0.067^{+0.251}_{-0.045}$

$T_{max}$  = 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

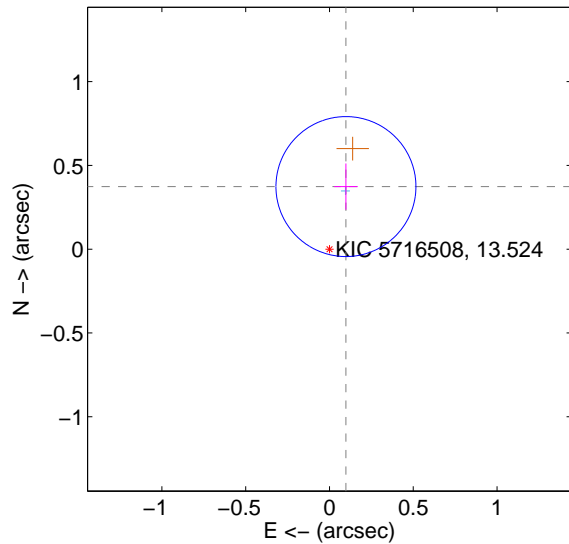
Supplemental centroid analysis for 005716508-01. Kepler magnitude: 13.52. Transit SNR 4.81

There are 1 quarters with good PRF difference image offsets

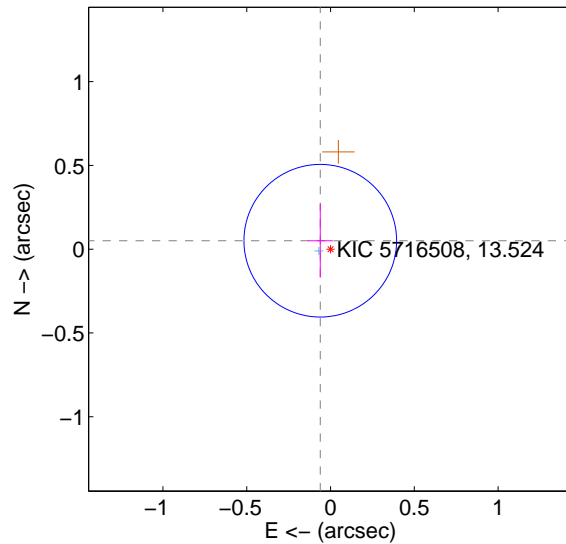
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.386 \pm 0.139$	2.78	$-0.098 \pm 0.070$	$0.373 \pm 0.138$
PRF-fit source offset from KIC position	$0.079 \pm 0.152$	0.52	$0.061 \pm 0.075$	$0.050 \pm 0.220$
photometric centroid source offset	$0.21 \pm 0.33$	0.62	$0.20 \pm 0.33$	$0.04 \pm 0.43$

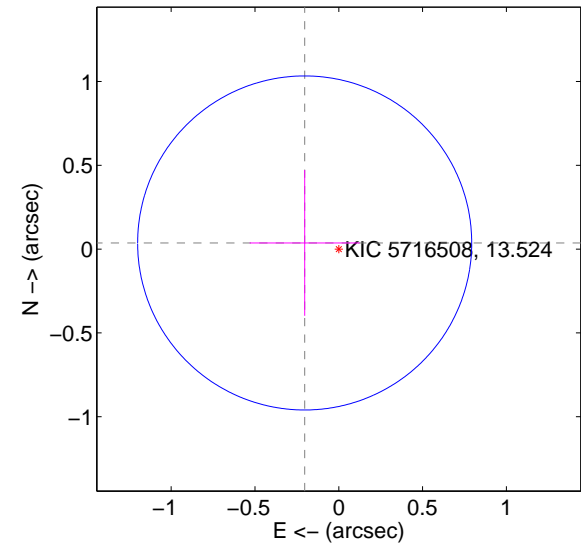
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

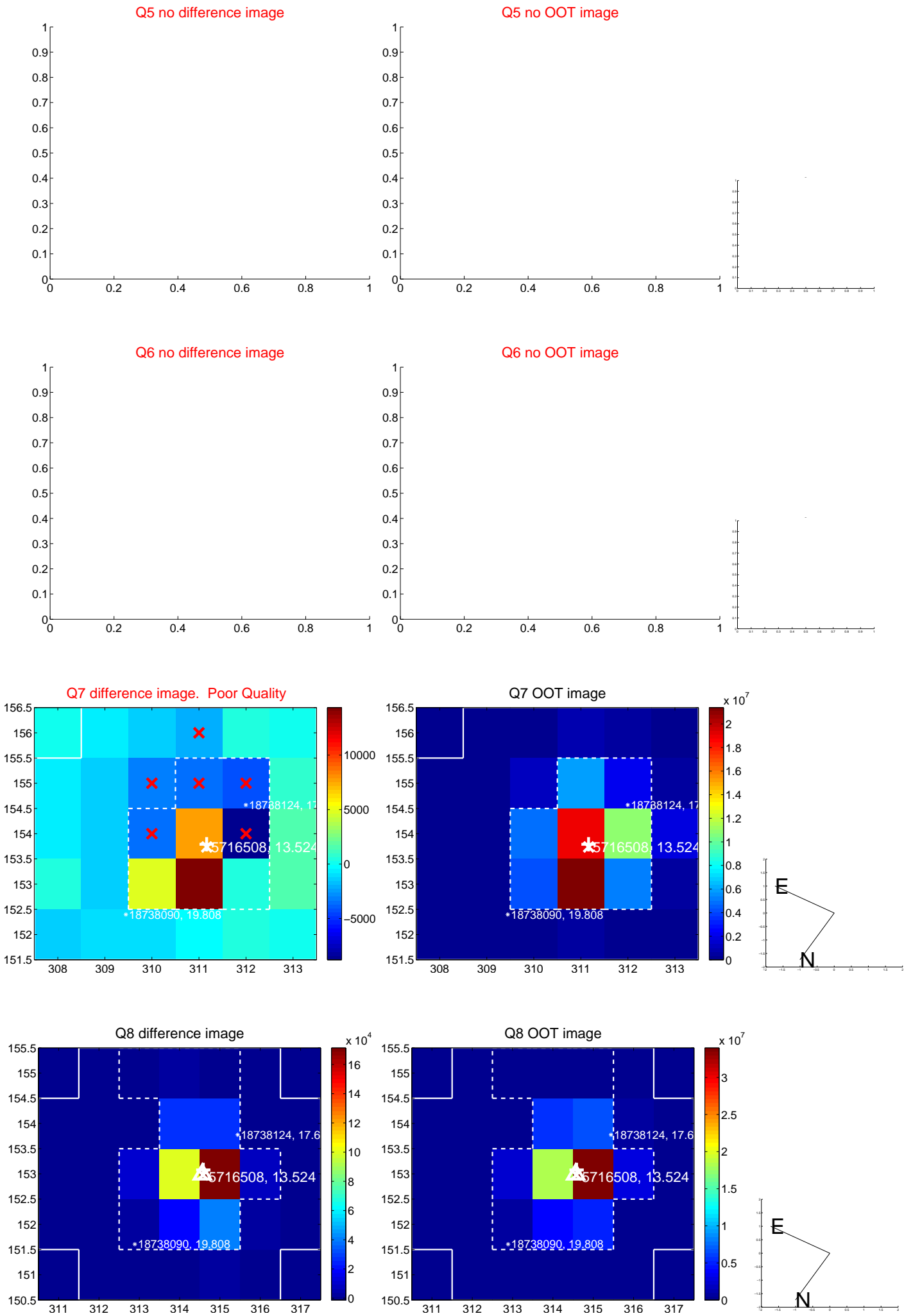


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

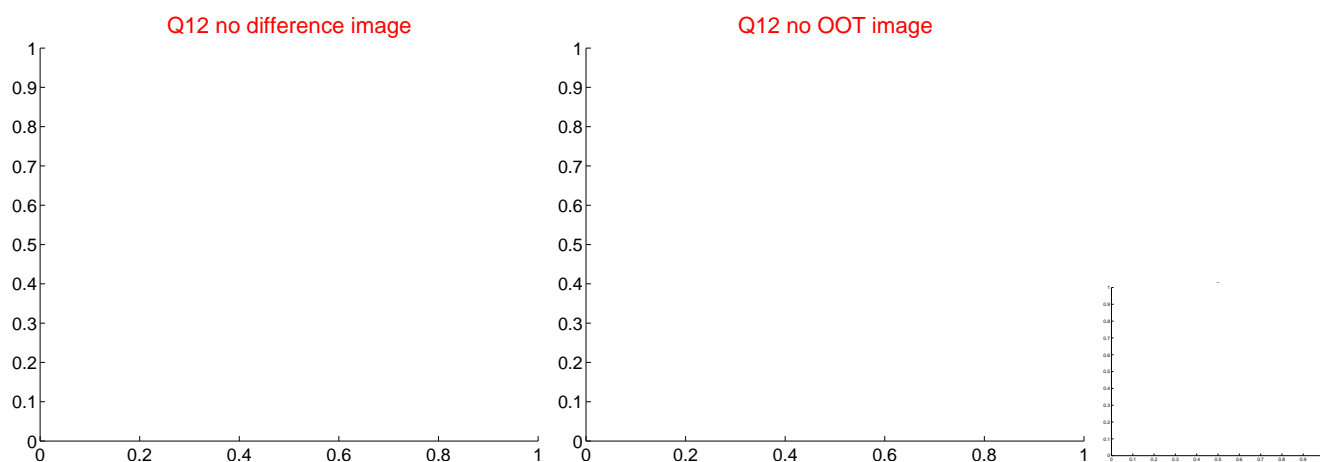
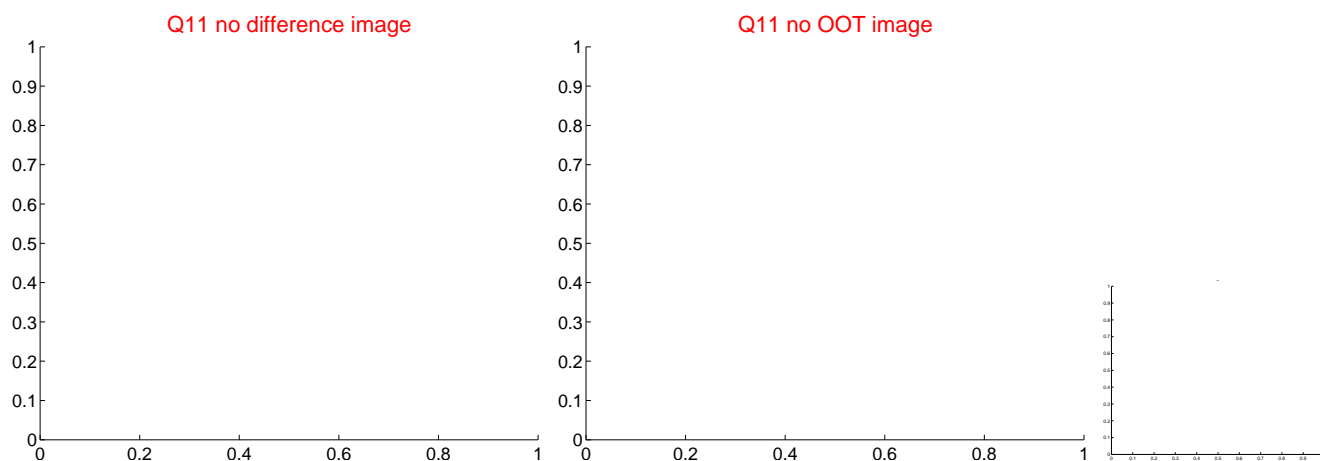
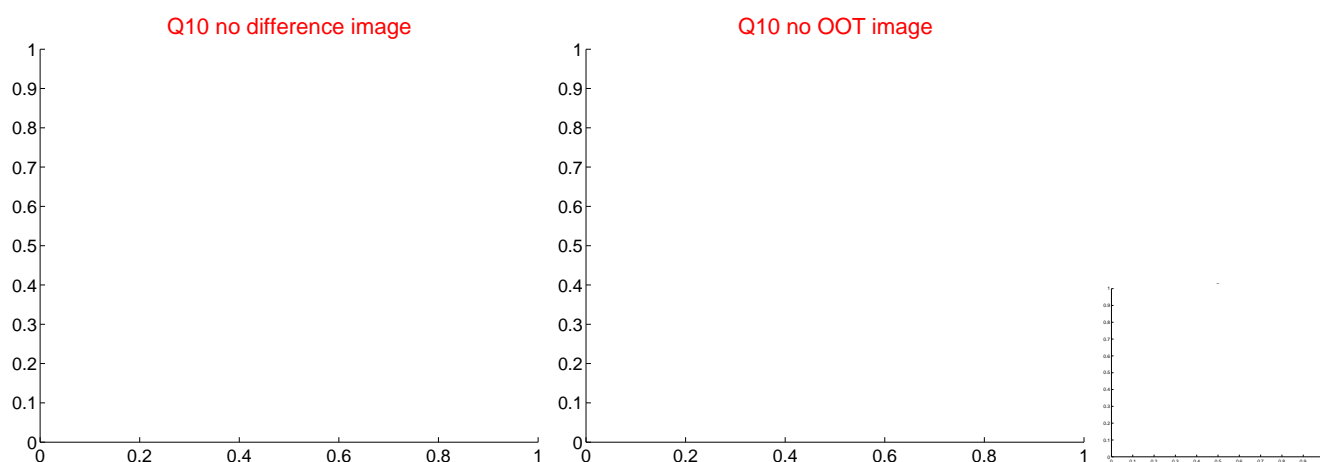
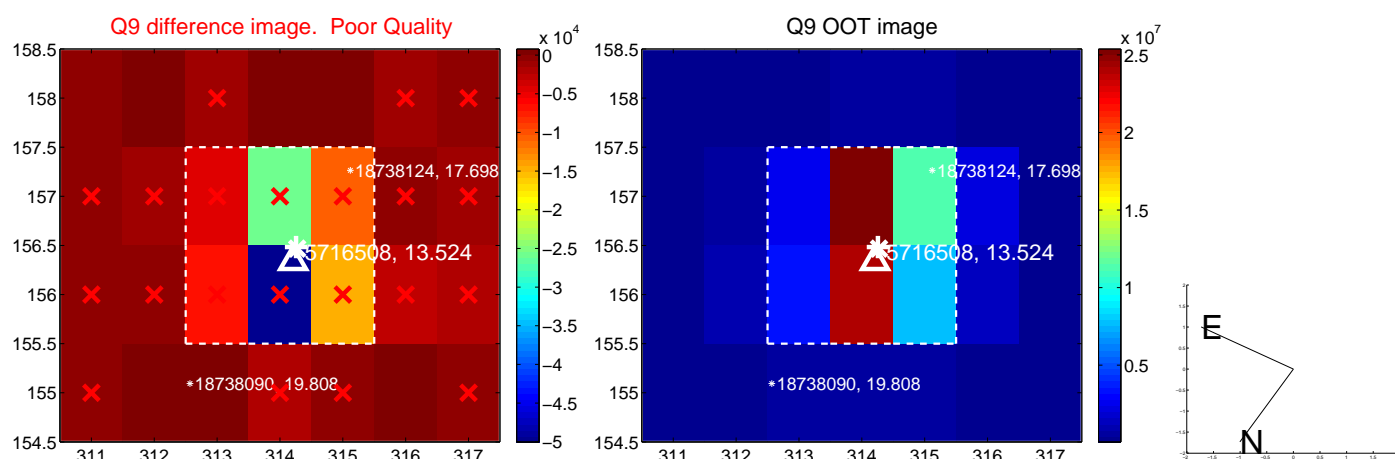
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



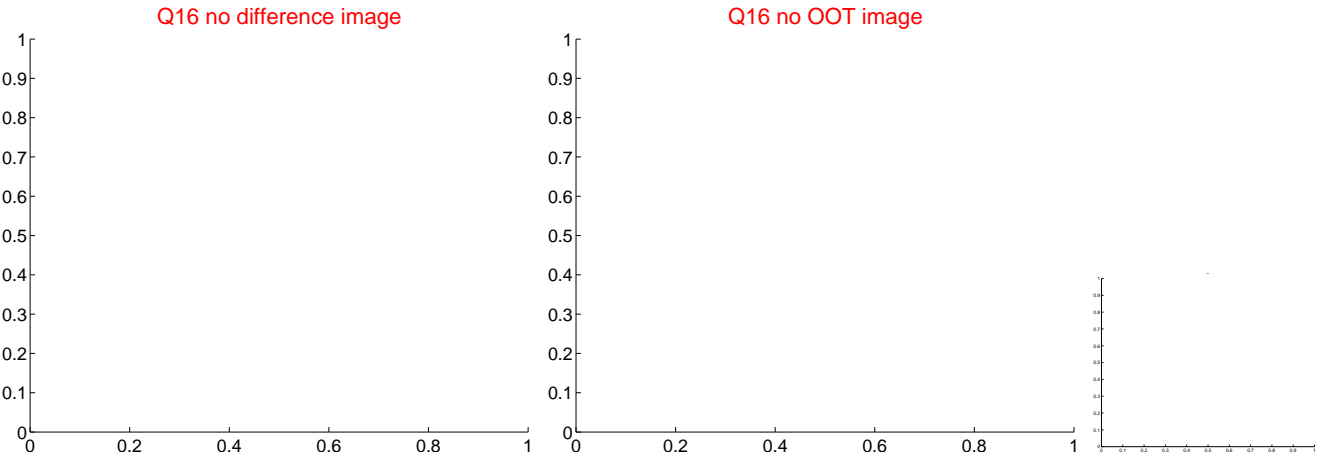
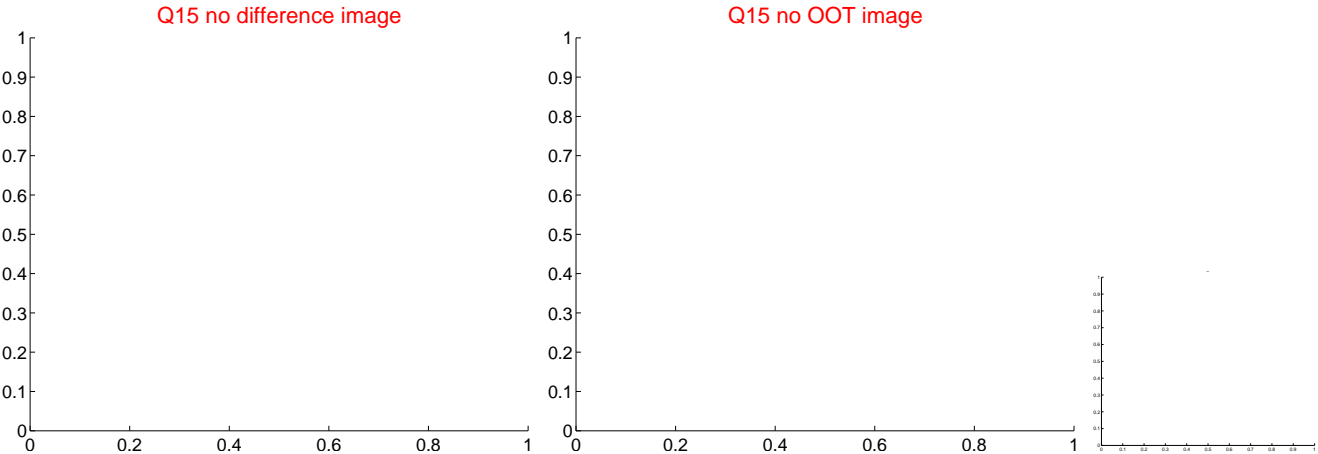
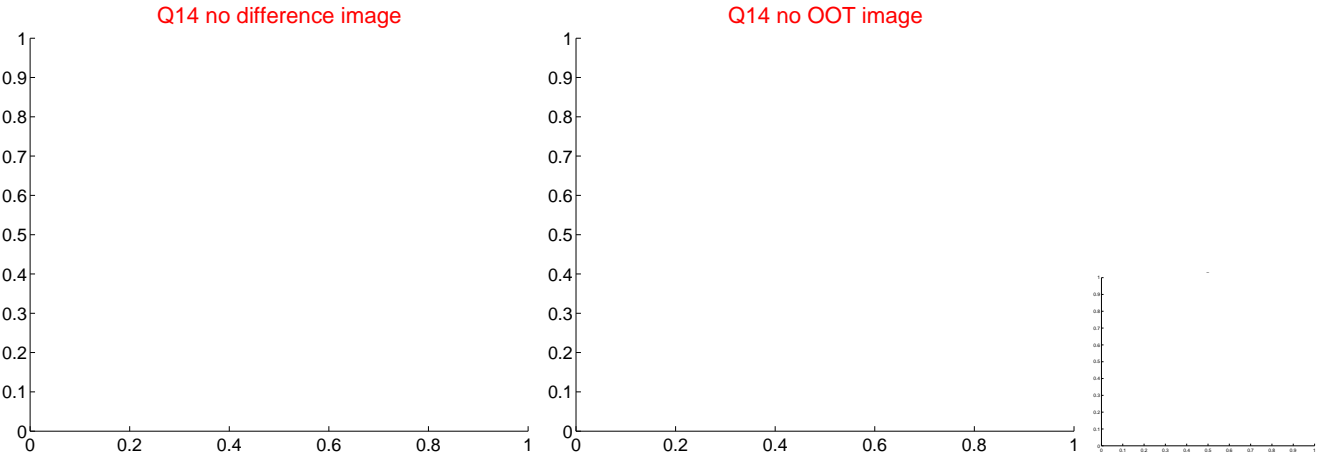
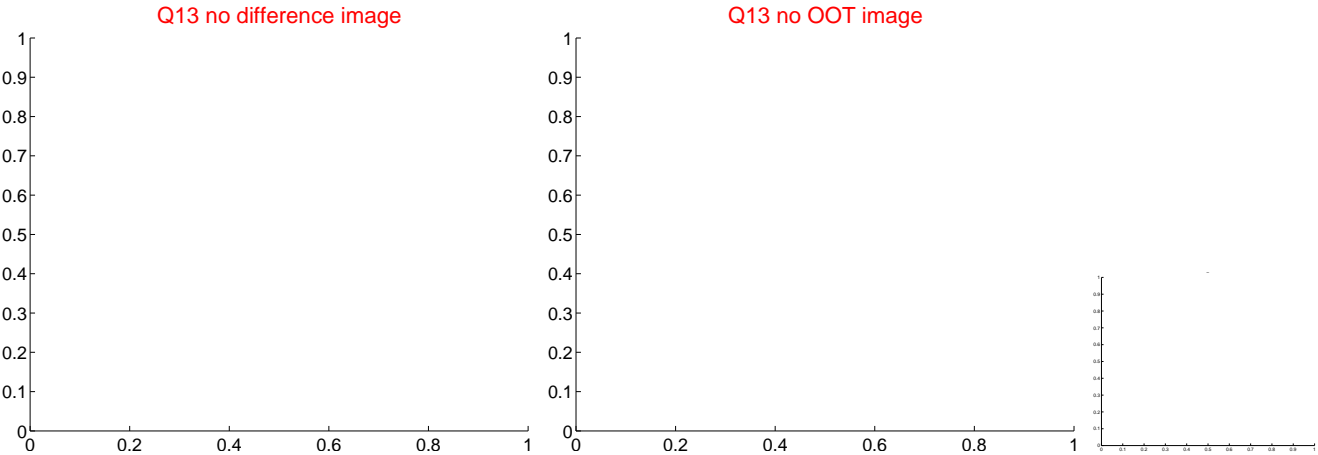
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

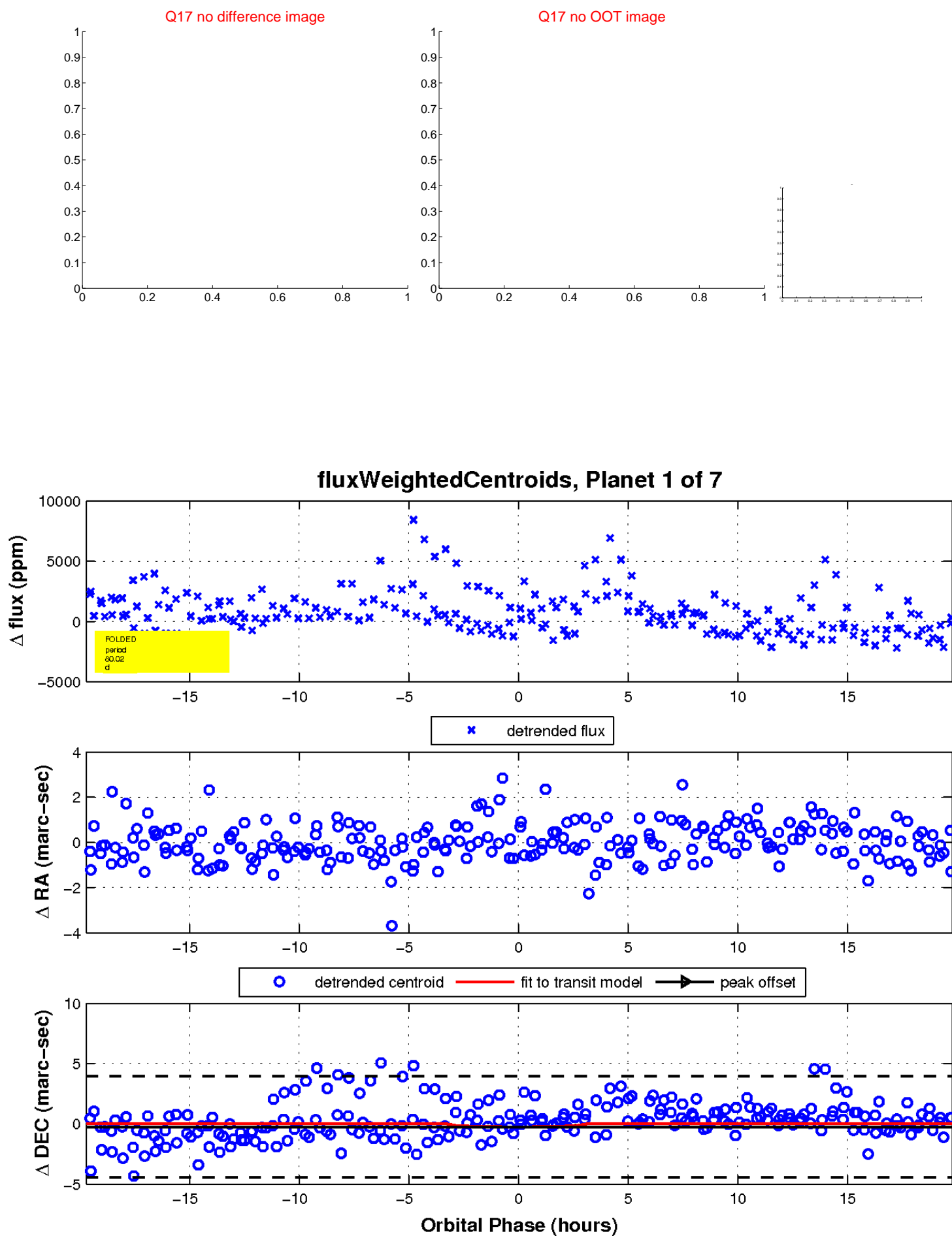


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

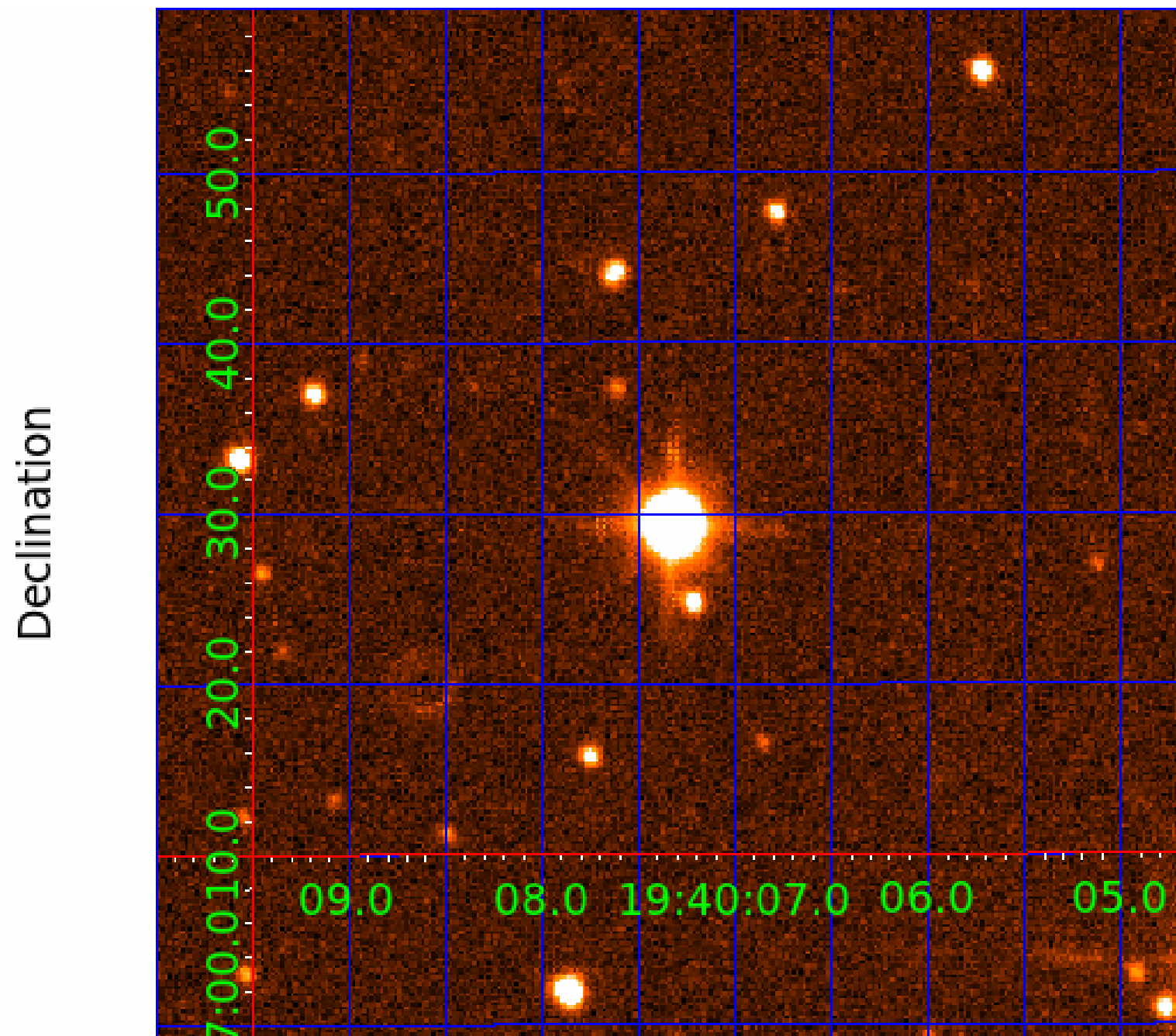




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



# KIC 005716508

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005716508-01	OBS	No	80.022023	139.478721	1812.0	6.599	12.4	4.8	180.01	3486	822.92	0.00
005716508-02	OBS	No	128.877360	256.656319	1709.2	4.633	11.2	5.5	180.01	3486	685.84	0.00
005716508-03	OBS	No	4.863178	134.225462	449.5	4.889	8.9	5.7	180.01	3486	533.38	0.00
005716508-04	OBS	No	64.802168	156.846039	2521.1	10.213	11.3	7.5	180.01	3486	830.71	0.00
005716508-05	OBS	No	12.090645	140.492474	829.4	3.280	9.2	6.0	180.01	3486	595.34	0.00
005716508-06	OBS	No	38.495224	157.141282	1910.2	2.390	10.3	9.1	180.01	3486	812.46	0.00
005716508-07	OBS	7737.01	4.753079	134.546213	542.6	2.352	8.9	5.9	180.01	3486	664.20	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005716508-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005716508-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
005716508-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-06	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT

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

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

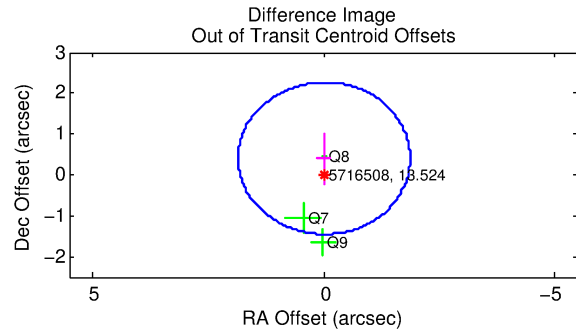
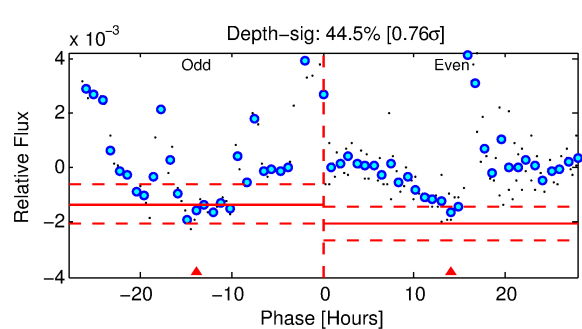
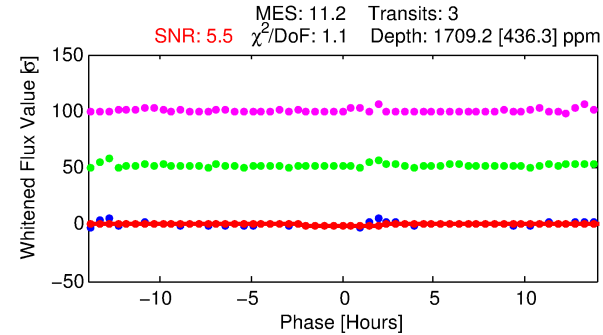
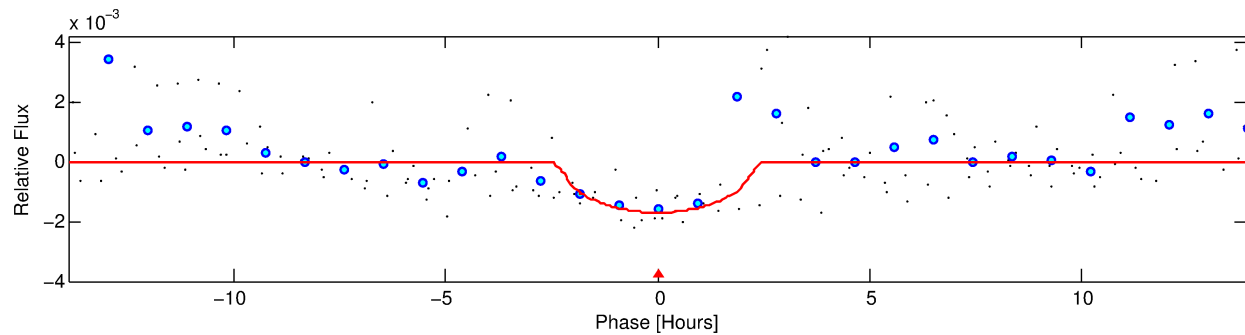
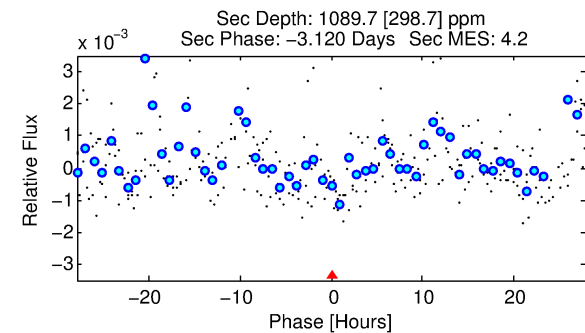
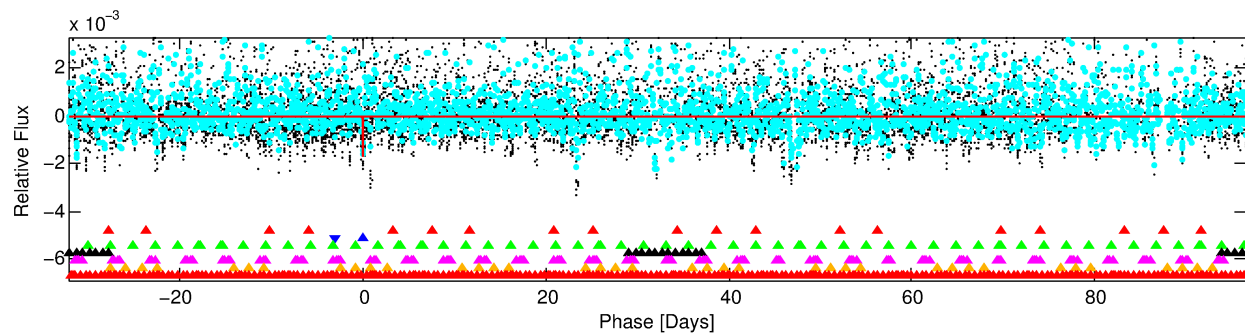
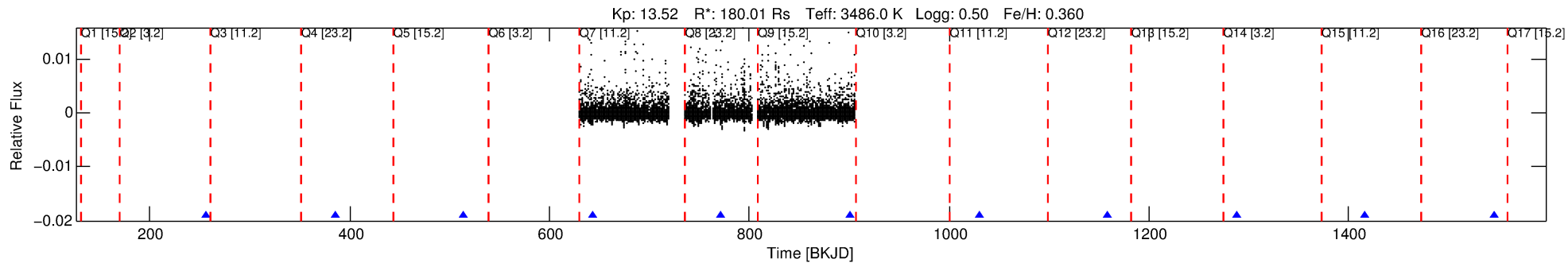
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005716508-02

No Significant Match Found

# DV One-Page Summary

KIC: 5716508 Candidate: 2 of 7 Period: 128.877 d



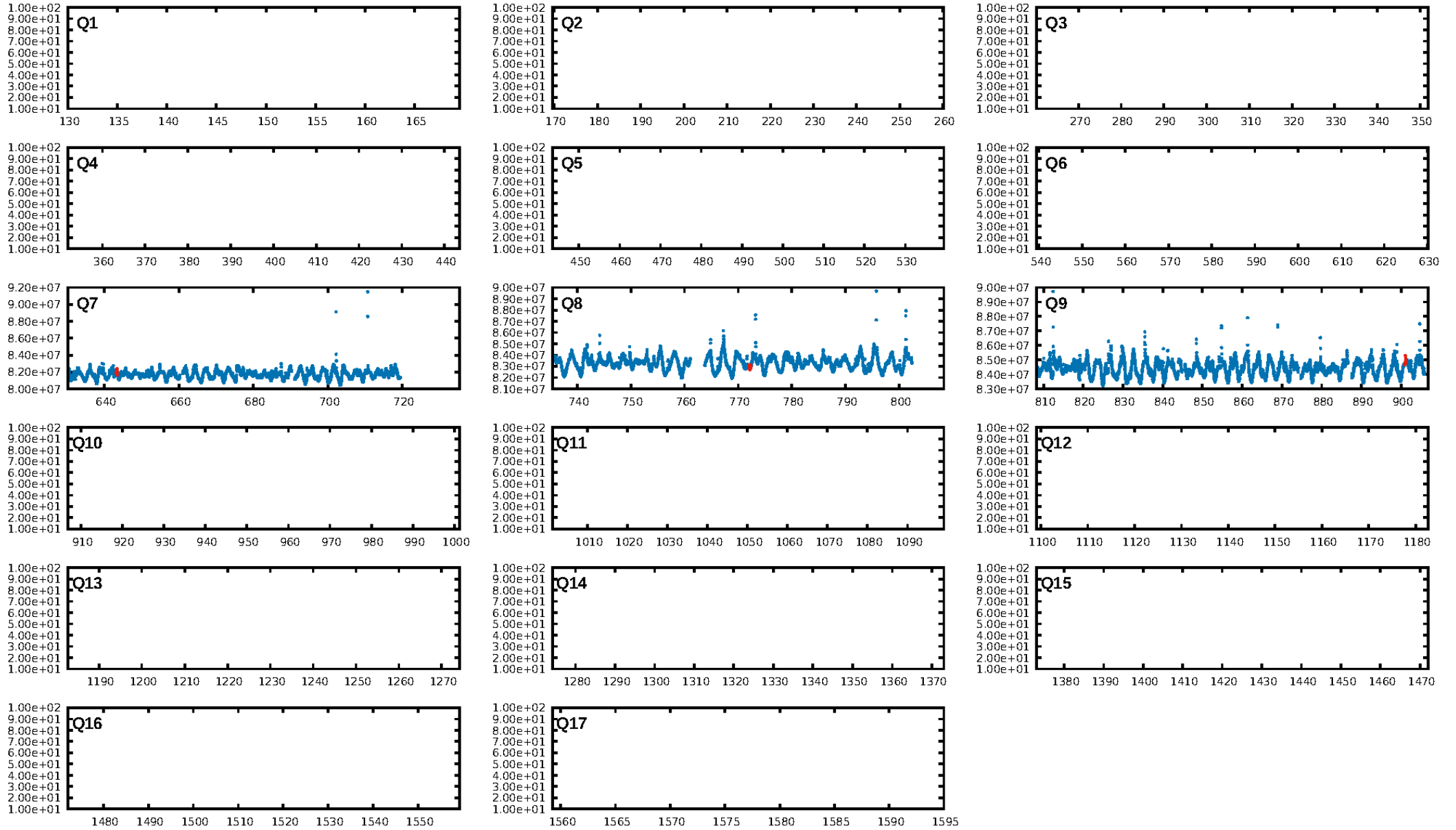
## DV Fit Results:

Period = 128.87736 [0.00771] d  
Epoch = 256.6563 [0.0308] BKJD  
Rp/R\* = 0.0349 [0.0348]  
a/R\* = 217.50 [424.04]  
b = 0.15 [13.11]  
Seff = N/A  
Teq = N/A  
Rp = 685.84 [789.03] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

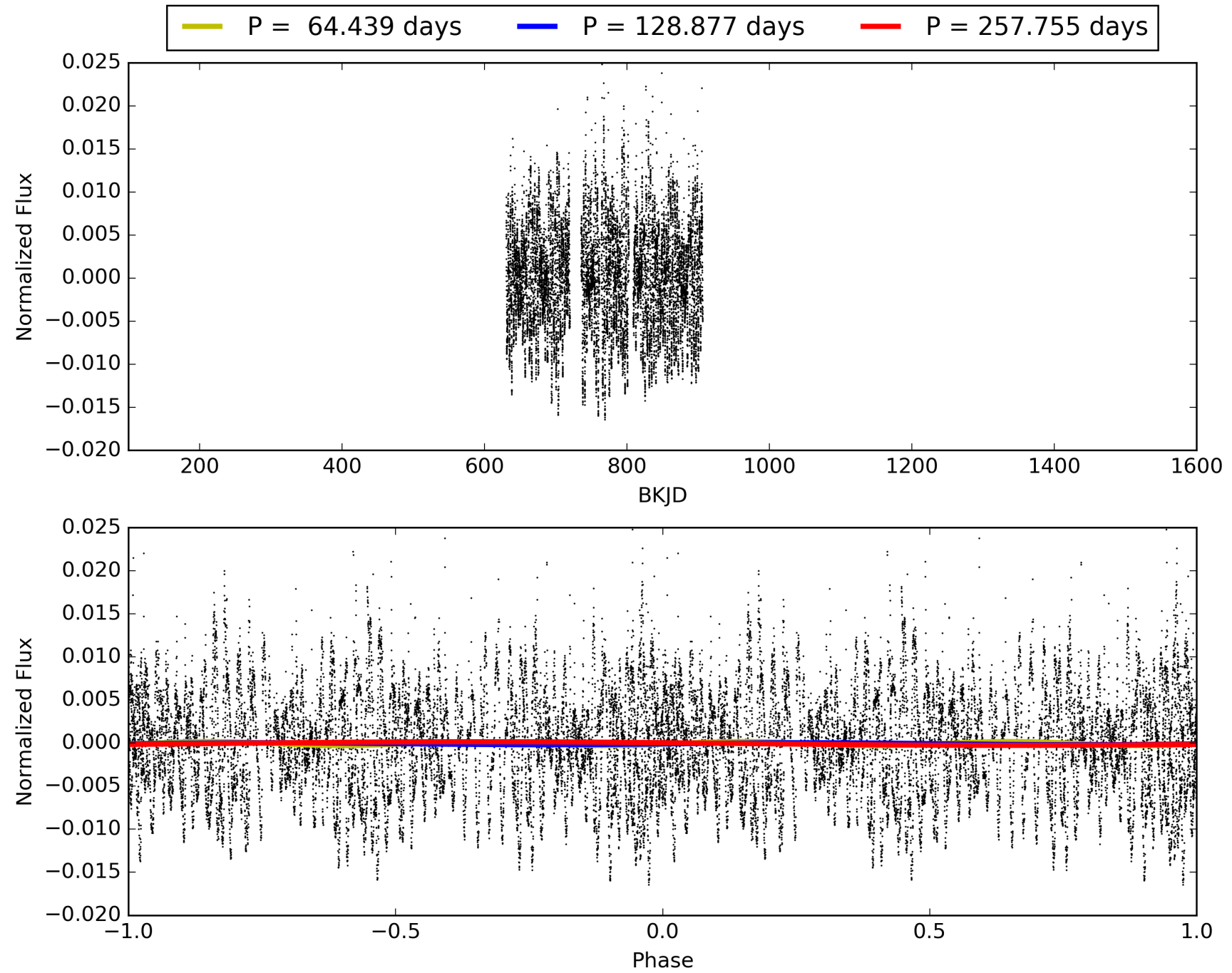
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [145.42σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 21.1%  
ModelChiSquareGof-sig: 95.6%  
Bootstrap-pfa: 2.74e-11  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 20.95  
Centroid-sig: N/A  
Centroid-so: 0.387 arcsec [1.07σ]  
OotOffset-rm: 0.405 arcsec [0.65σ]  
KicOffset-rm: 0.165 arcsec [0.98σ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.67 [2/3]

# TCE 005716508-02, PDC Light Curves

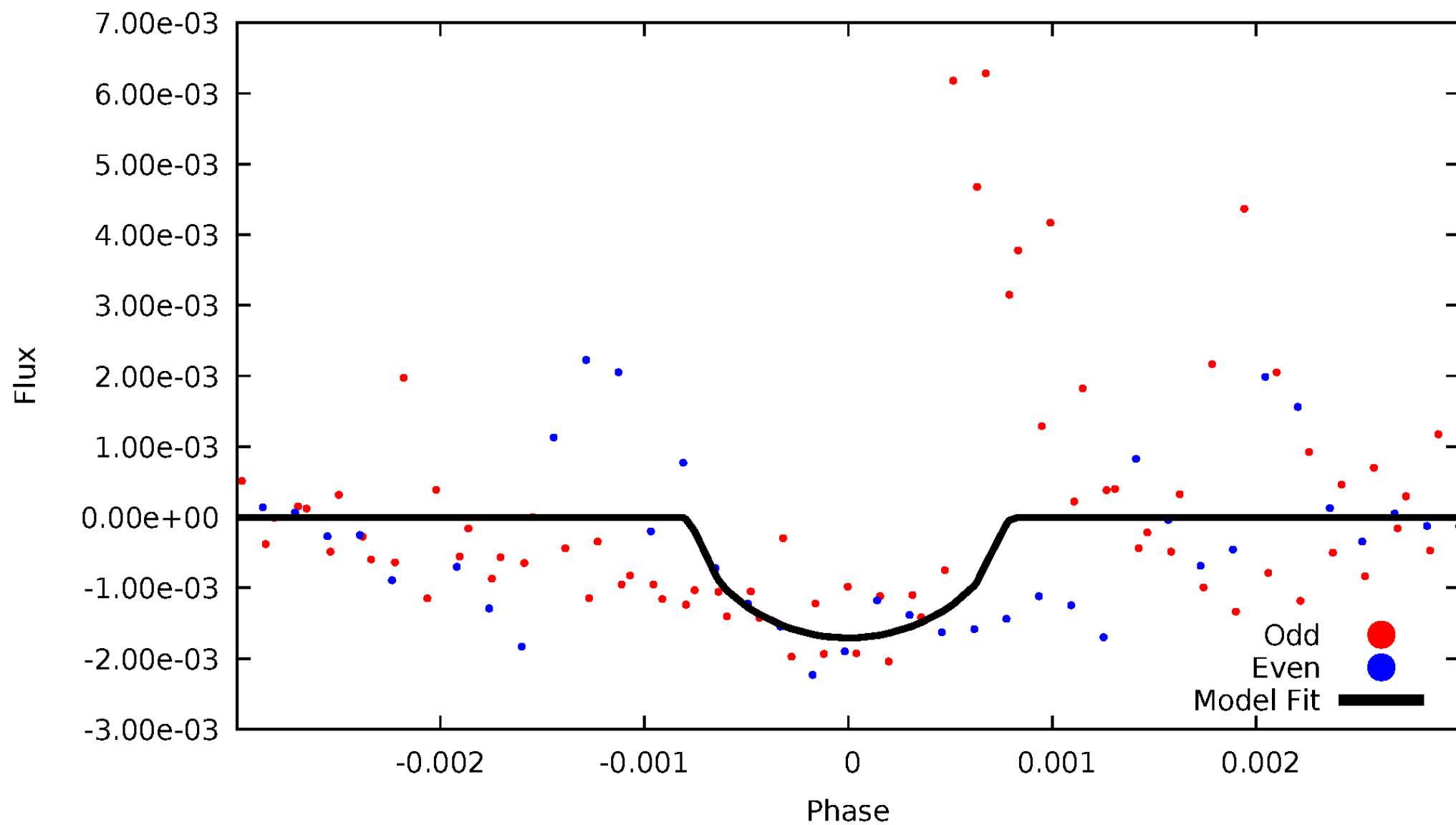


TCE 005716508-02



# DV Odd/Even

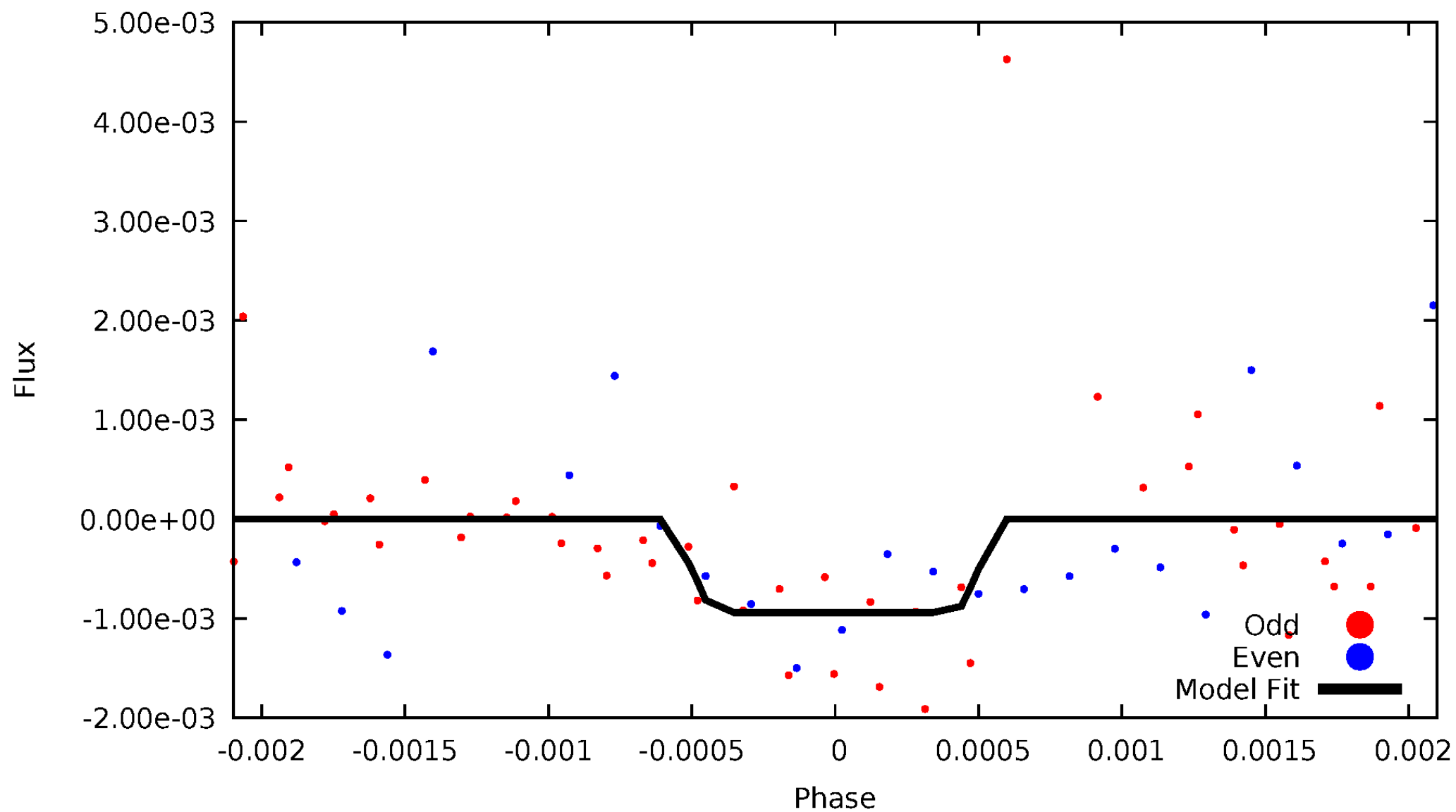
TCE 005716508-02





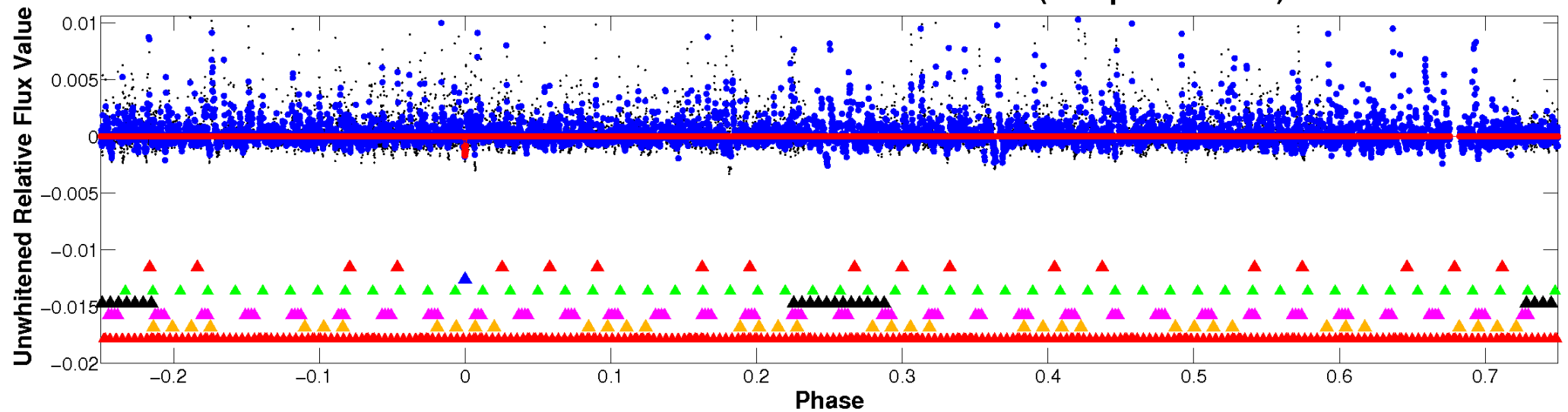
# ALT Odd/Even

TCE 005716508-02

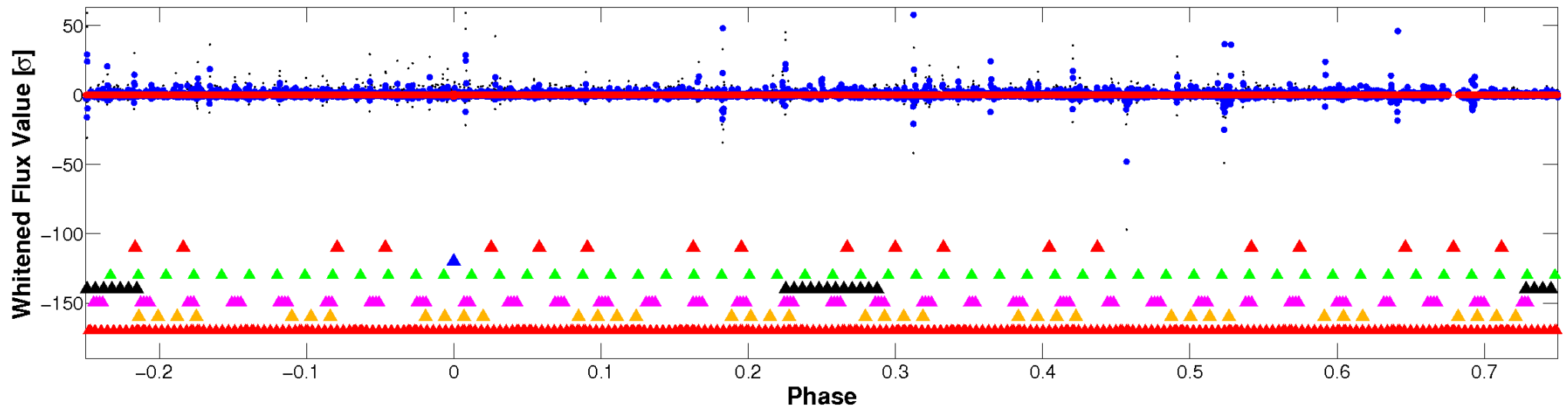


# Non-Whitened Vs. Whitened Light Curve

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

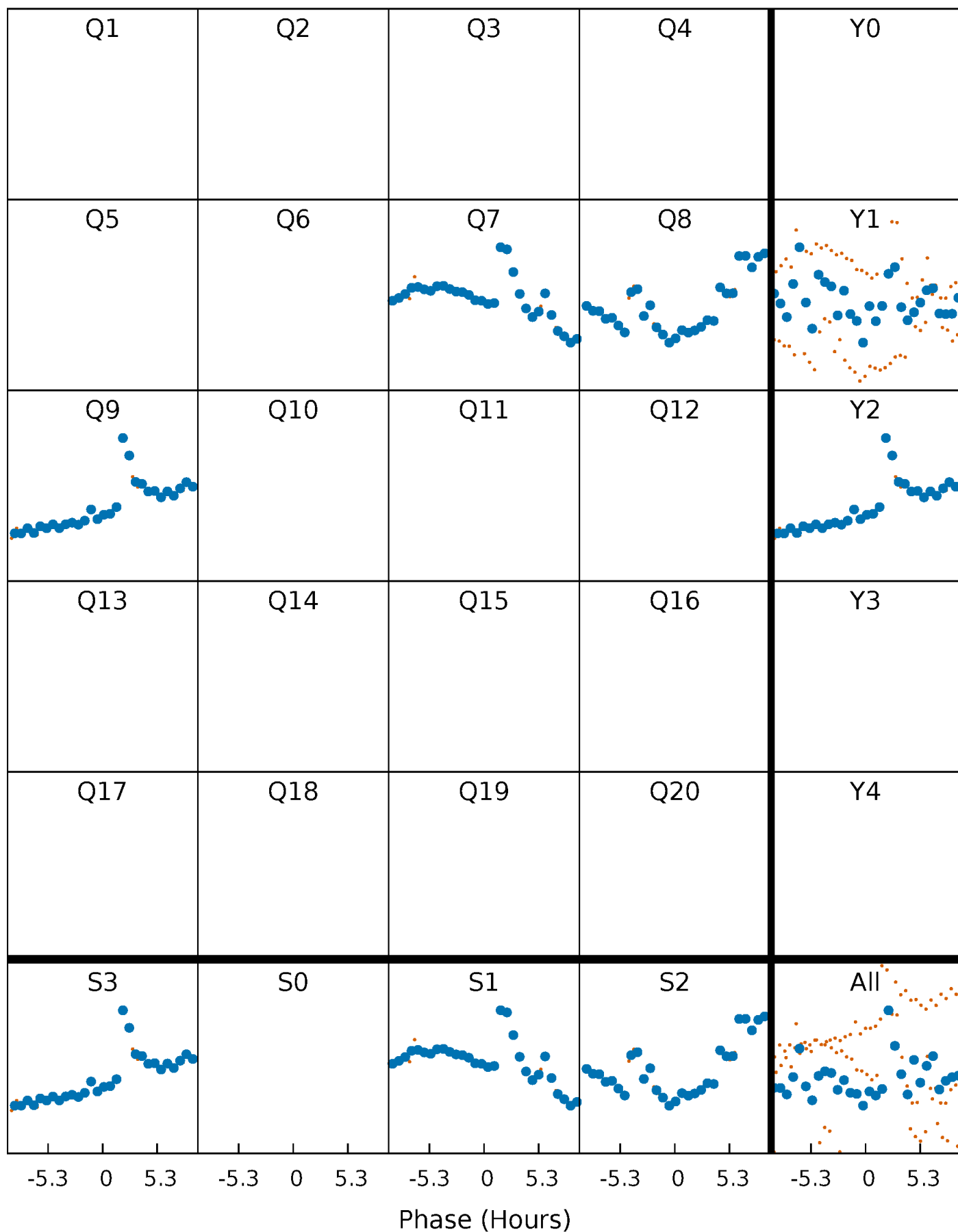


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



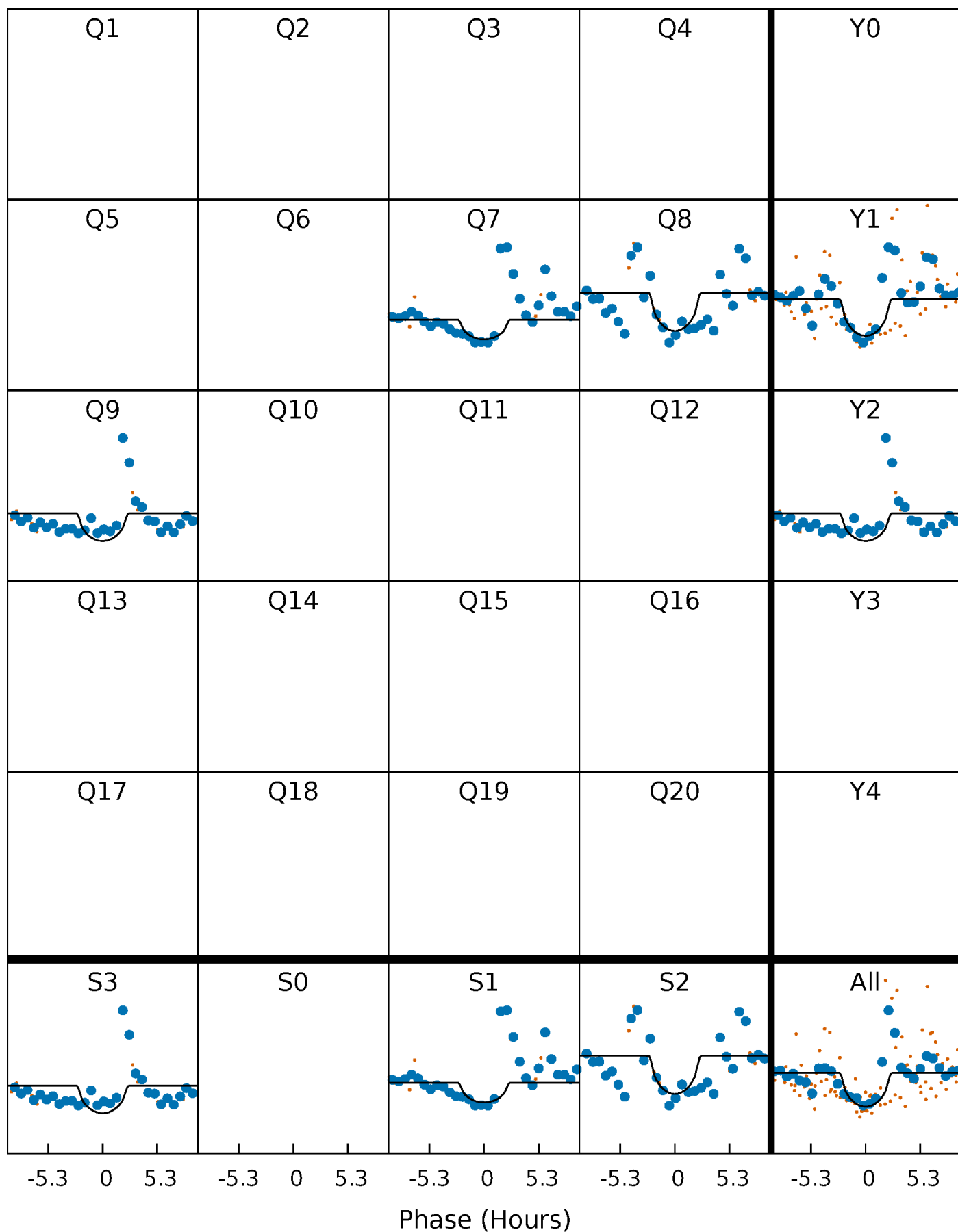
# PDC Quarter-Phased Transit Curves

TCE 005716508-02 P=128.877360 Days  $T_0=256.656319$  (BKJD)



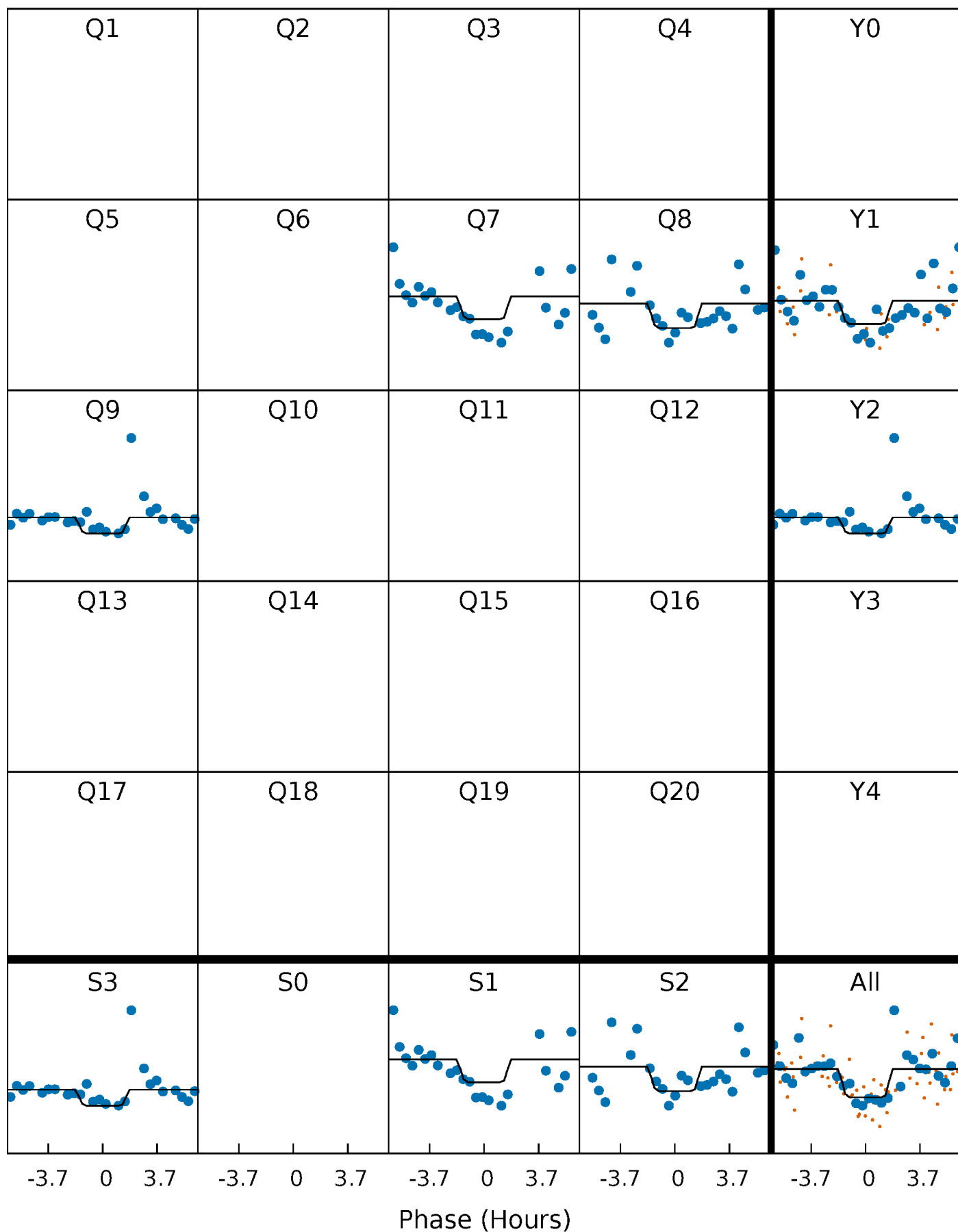
# DV Quarter-Phased Transit Curves

TCE 005716508-02     $P=128.877360$  Days     $T_0=256.656319$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

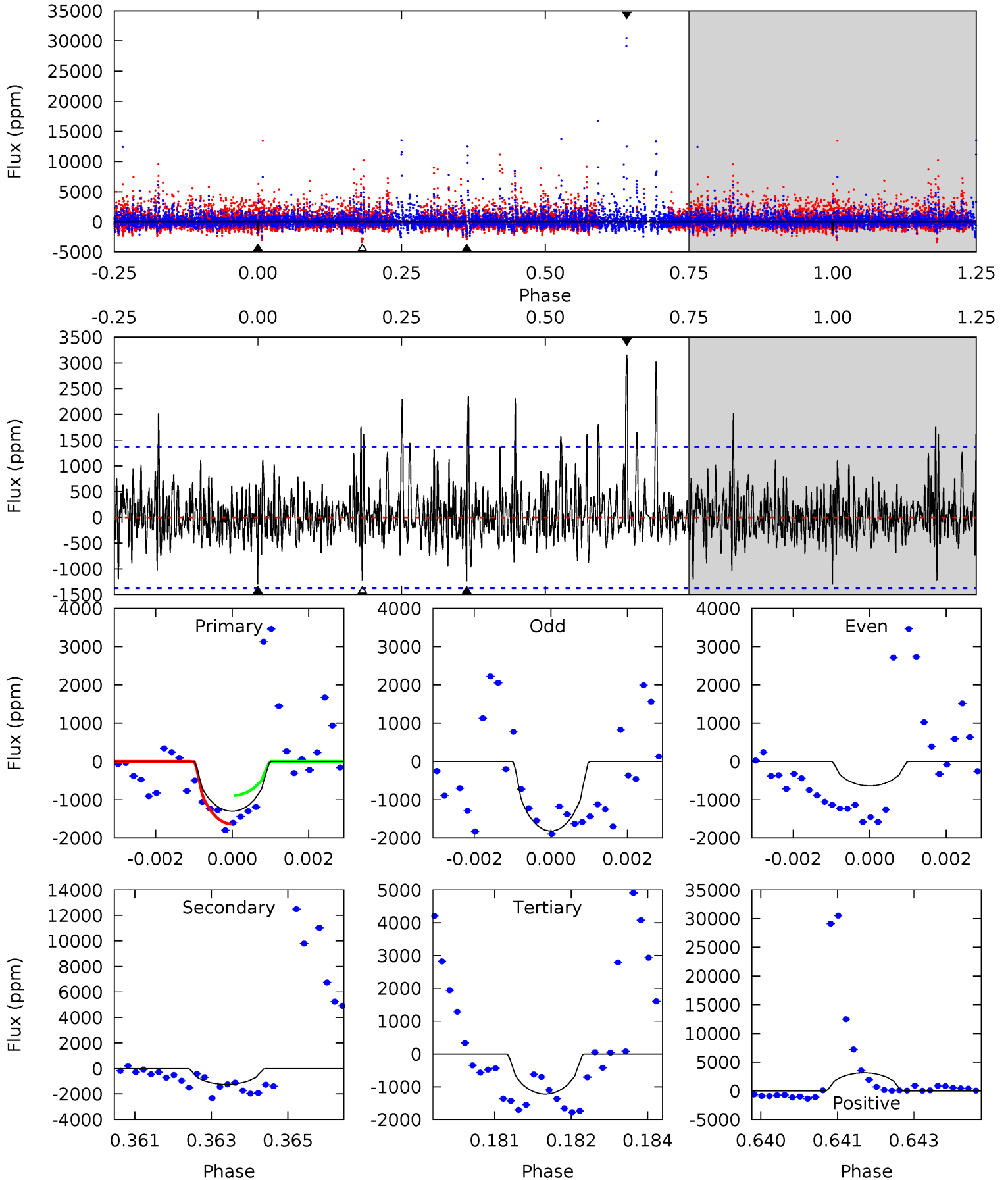
TCE 005716508-02 P=128.886908 Days  $T_0=256.612820$  (BKJD)



# DV Model-Shift Uniqueness Test

005716508-02, P = 128.877360 Days, E = 256.656319 Days

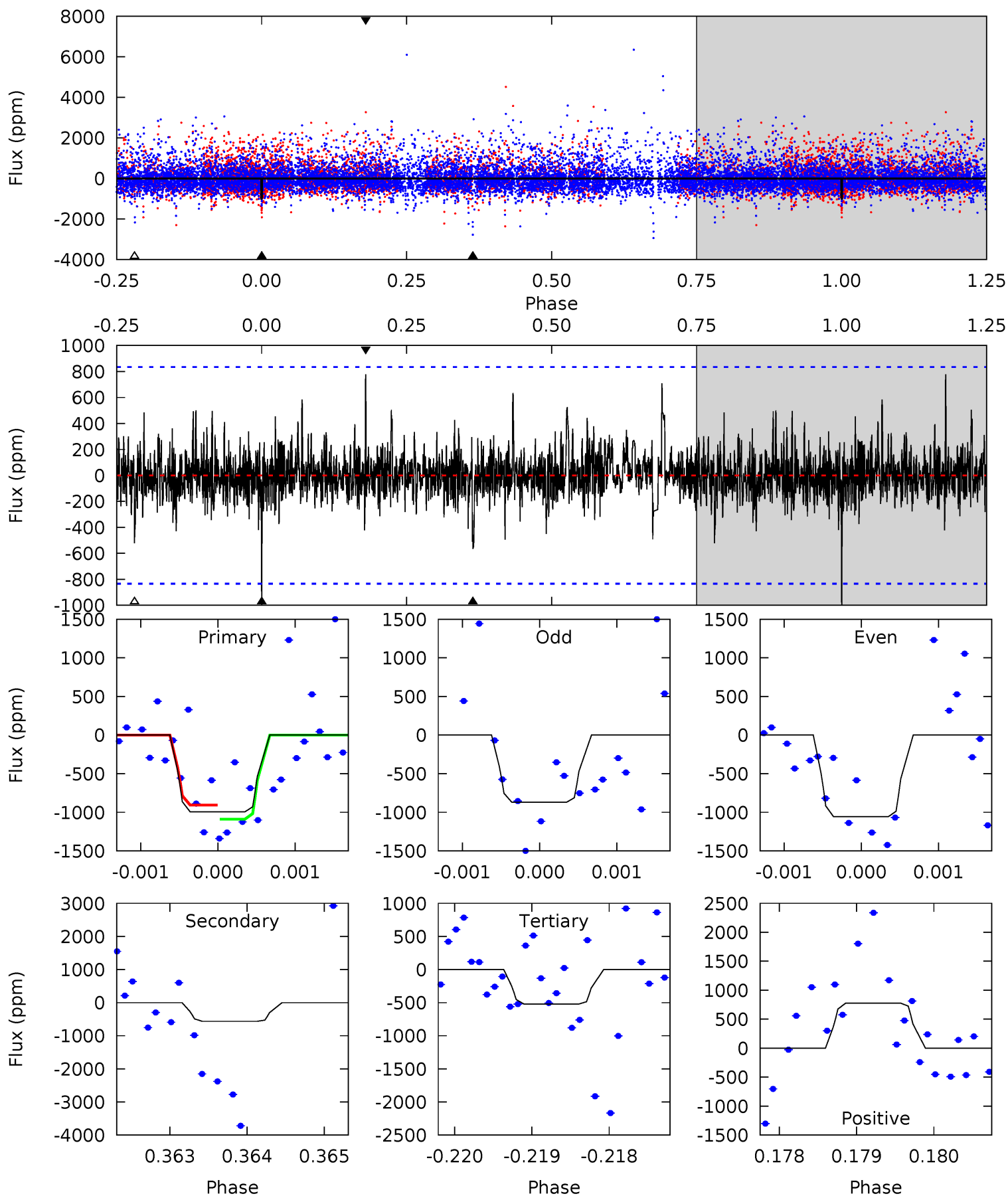
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.08	4.84	4.78	12.3	5.36	3.15	1.74	0.30	-7.24	0.06	-7.48	1.42	1.58	0.71	1.47



# Alt Model-Shift Uniqueness Test

005716508-02, P = 128.886908 Days, E = 256.612820 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
6.51	3.70	3.41	5.09	5.46	3.30	0.91	3.10	1.42	0.29	-1.39	0.50	1.15	0.44	0.60



### Stellar Parameters For KIC 005716508

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3486^{+112}_{-112}$	$0.500^{+0.338}_{-0.156}$	$0.360^{+0.100}_{-0.250}$	$180.013^{+25.956}_{-103.825}$	$3.735^{+0.075}_{-2.514}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+68%/-31%	+28%/-69%	+14%/-58%	+2%/-67%	+434%/-35%
Source	KIC0	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 005716508-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1241 \pm 256$	$757.55^{+667.03}_{-488.82}$	$3288^{+192}_{-344}$	$2992^{+1707}_{-5603}$	$0.688^{+4.783}_{-0.501}$
Alt.	$-565 \pm 153$	$690.92^{+629.07}_{-445.61}$	$3281^{+223}_{-353}$	$2289^{+1755}_{-5135}$	$0.344^{+2.493}_{-0.252}$

$T_{max}$  = 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

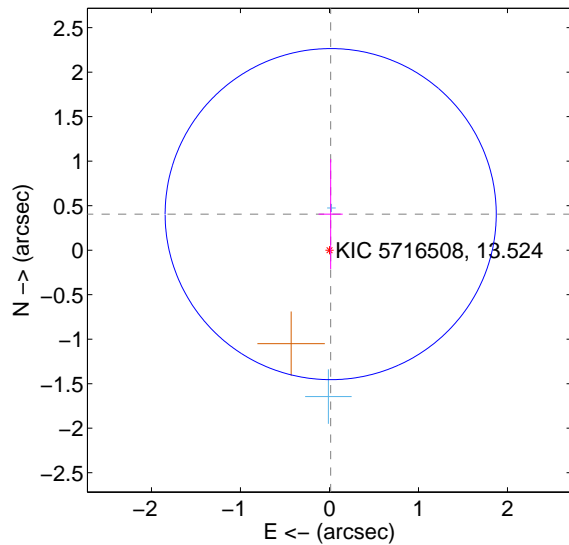
Supplemental centroid analysis for 005716508-02. Kepler magnitude: 13.52. Transit SNR 5.51

There are 2 quarters with good PRF difference image offsets

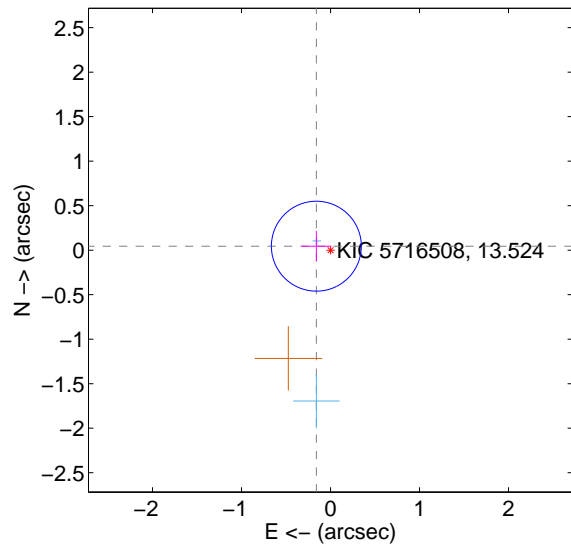
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.405 \pm 0.620$	0.65	$-0.014 \pm 0.135$	$0.405 \pm 0.618$
PRF-fit source offset from KIC position	$0.165 \pm 0.168$	0.98	$0.159 \pm 0.168$	$0.045 \pm 0.172$
photometric centroid source offset	$0.39 \pm 0.36$	1.07	$0.37 \pm 0.35$	$0.11 \pm 0.48$

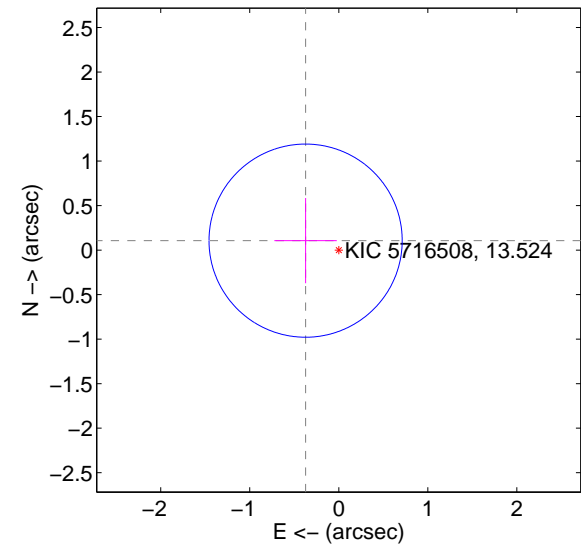
offset from difference PRF-fit to OOT PRF-fit



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.

Q5 no difference image



Q5 no OOT image



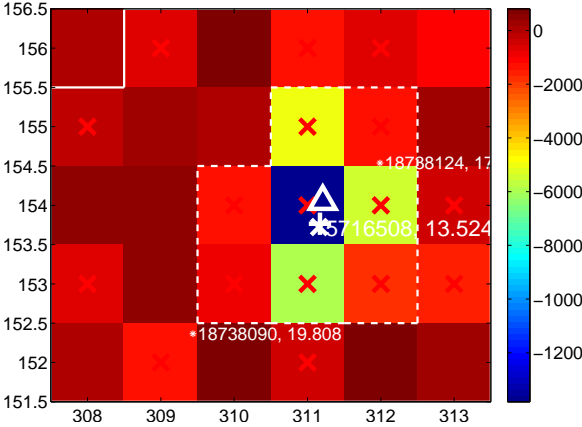
Q6 no difference image



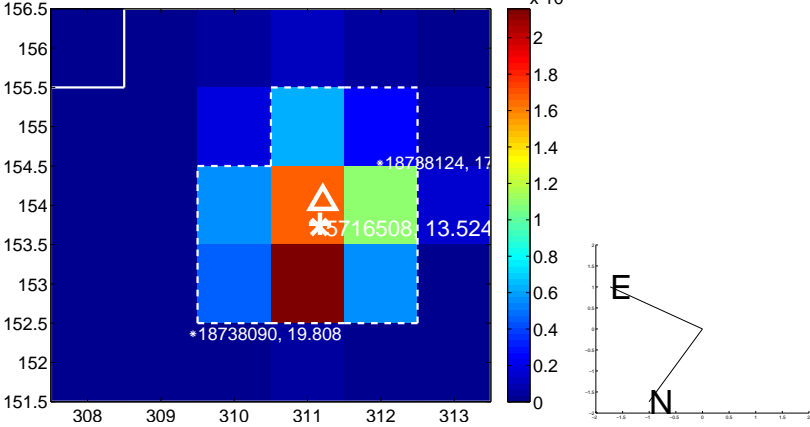
Q6 no OOT image



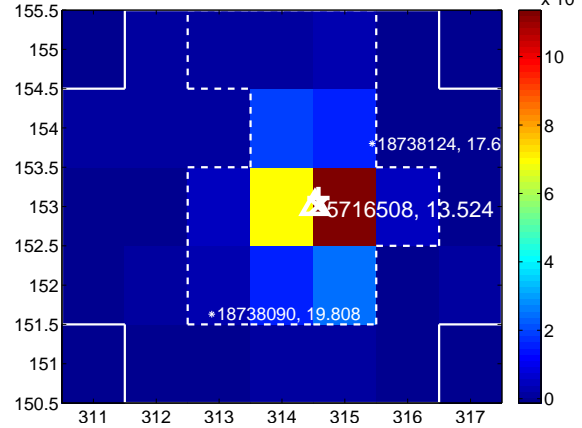
Q7 difference image. Poor Quality



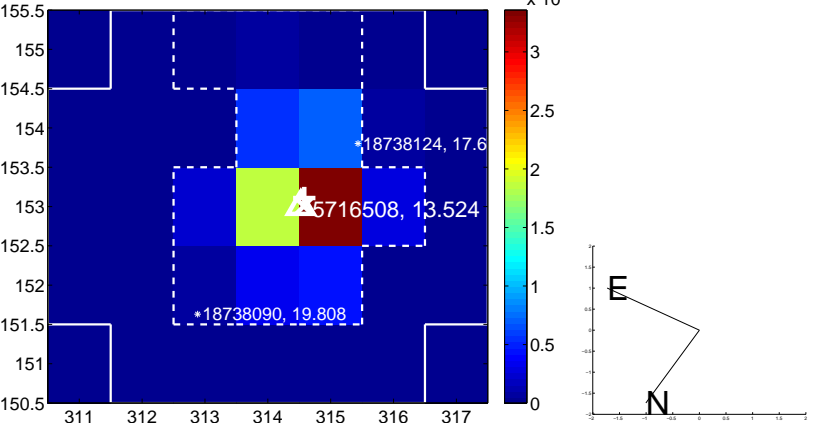
Q7 OOT image



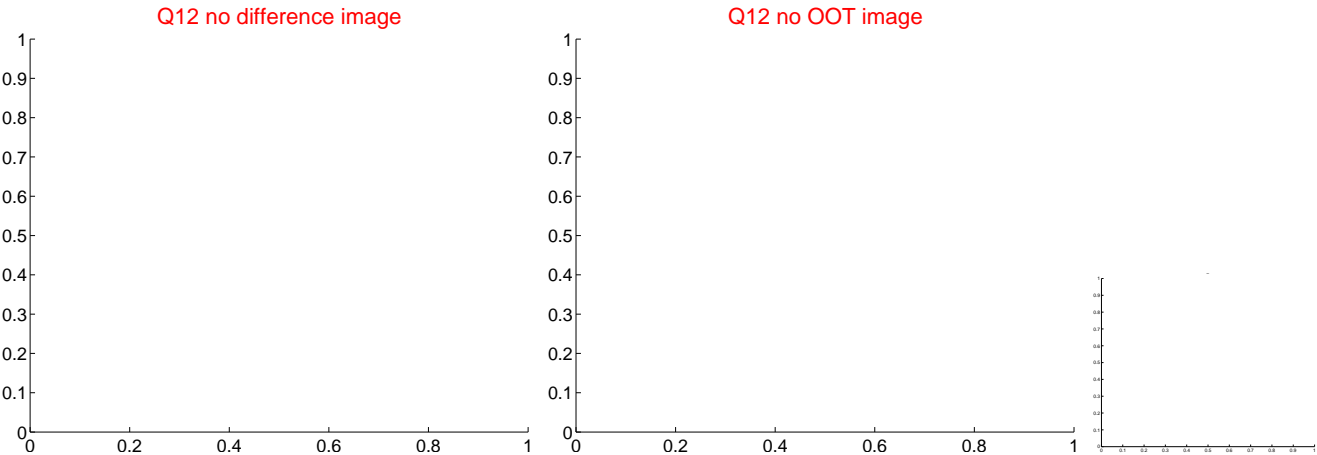
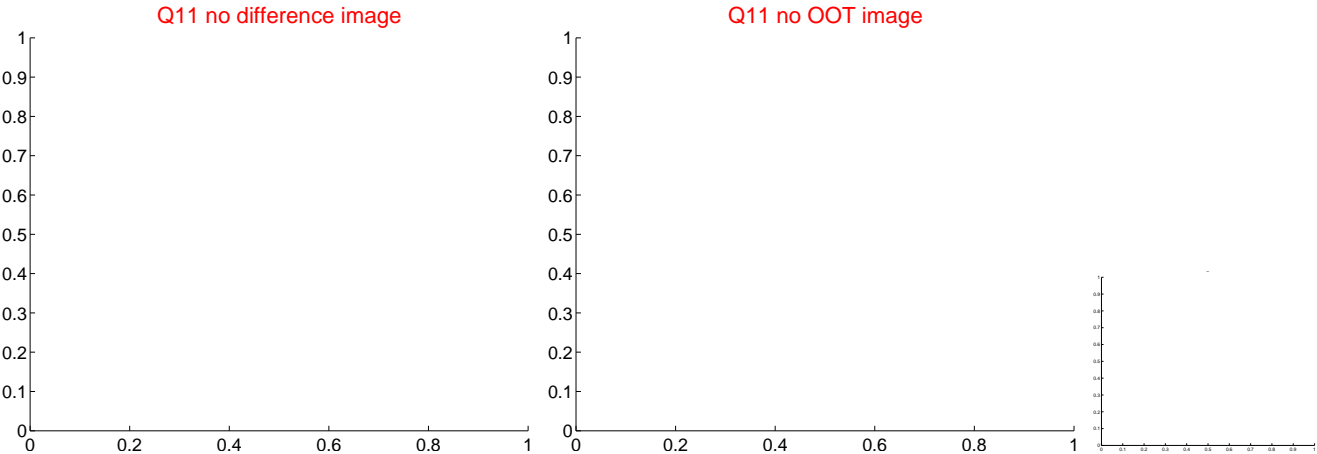
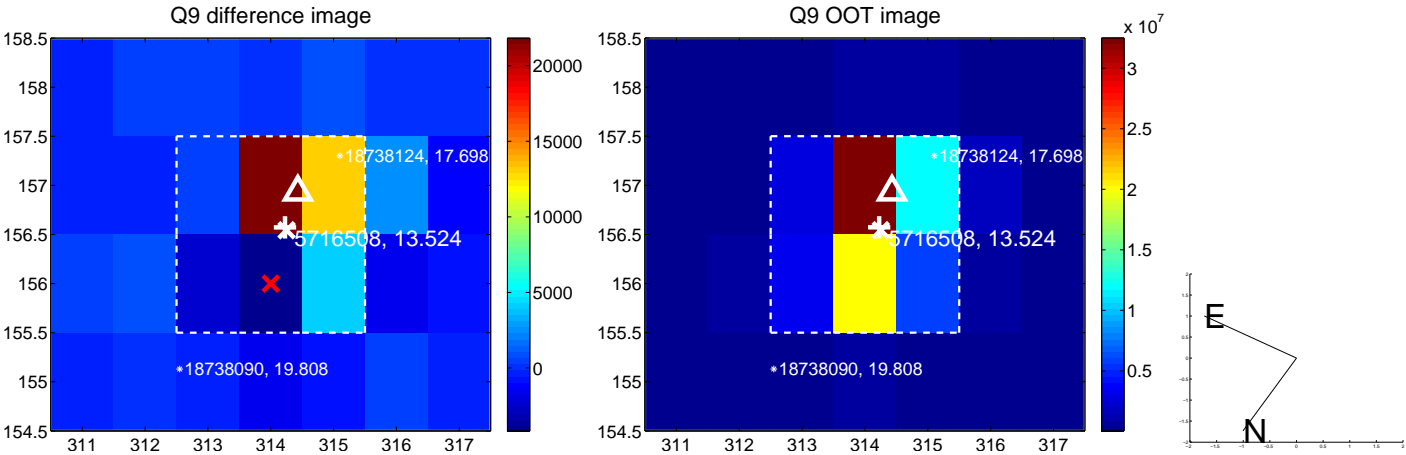
Q8 difference image



Q8 OOT image



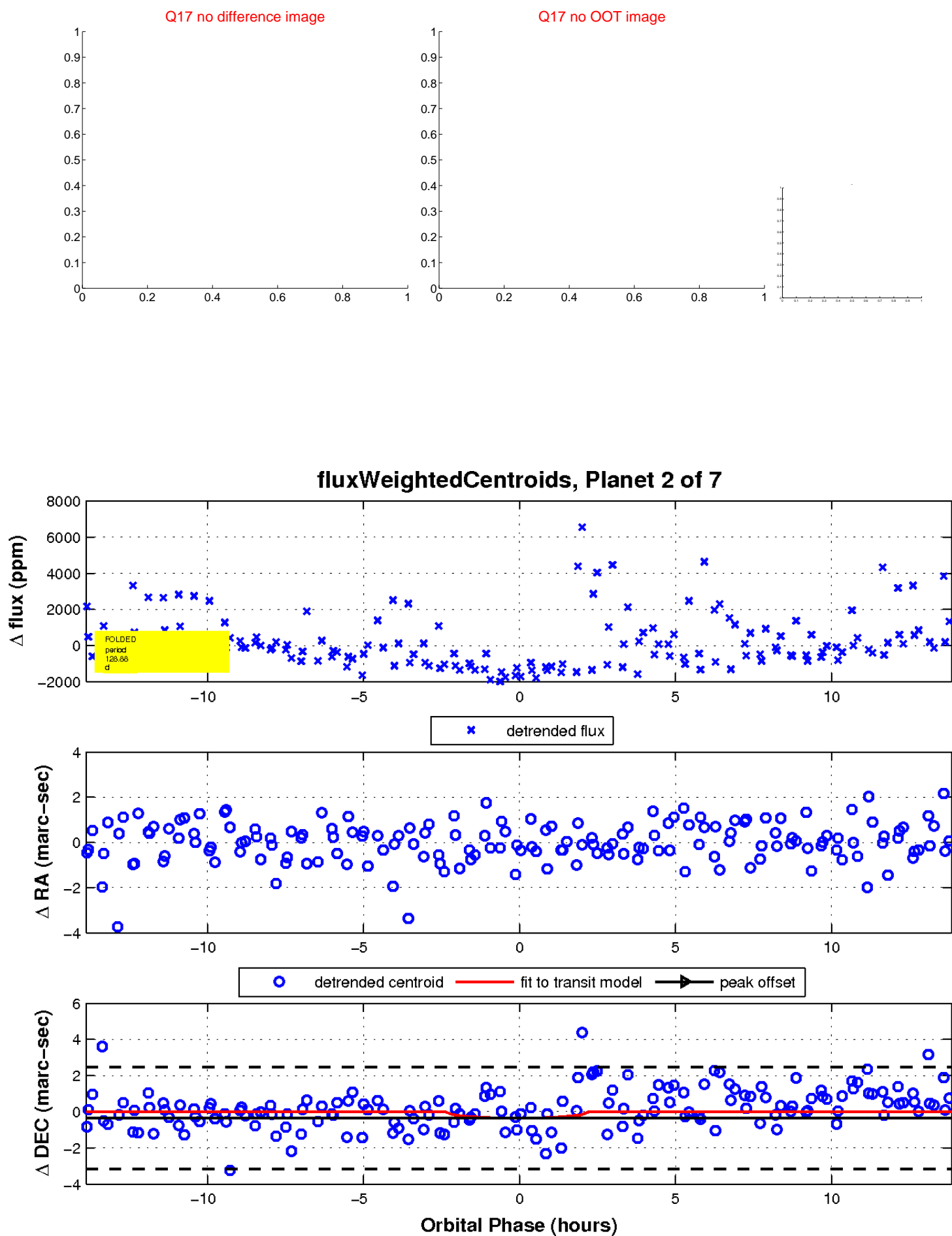
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



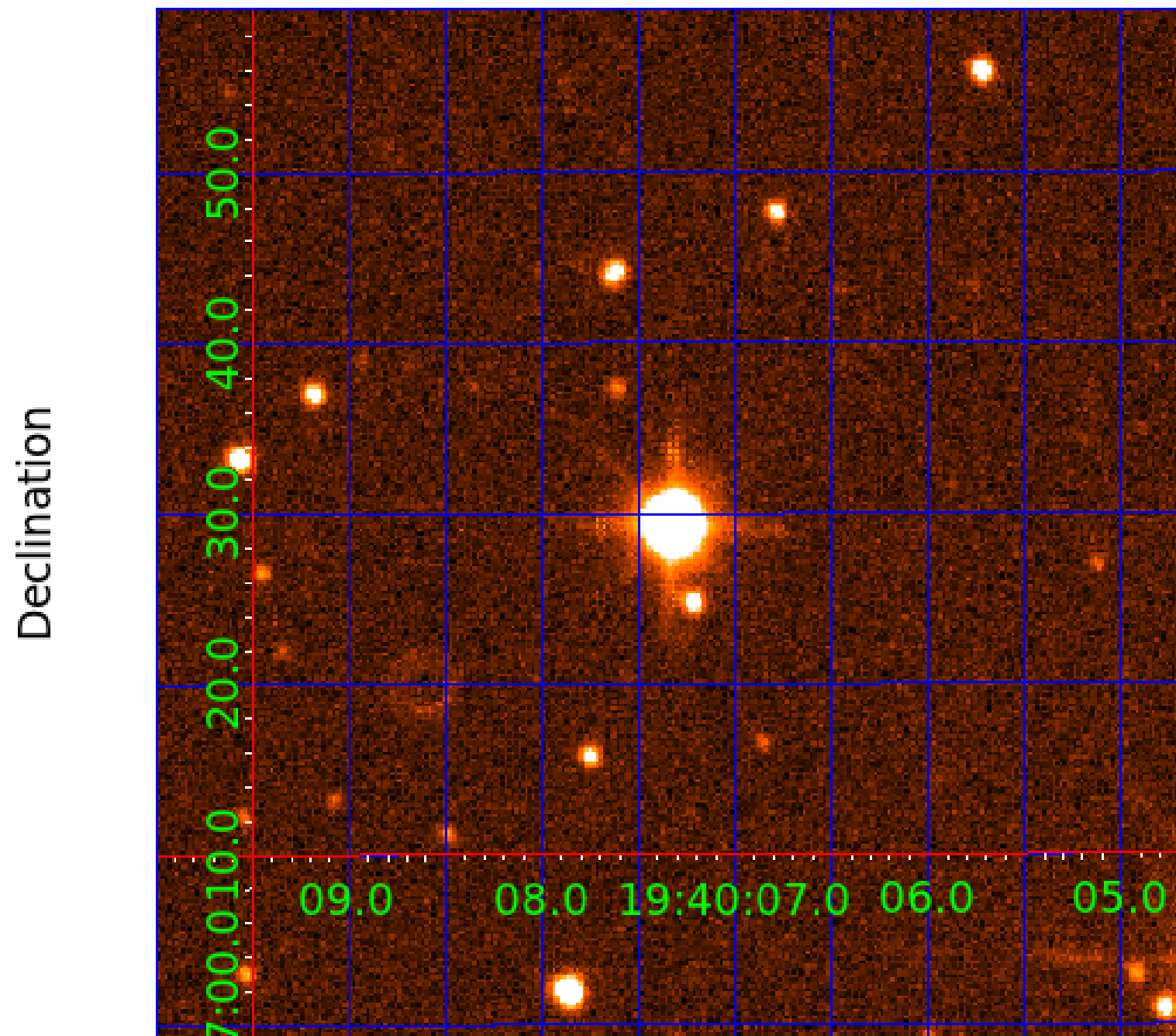
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005716508

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005716508-01	OBS	No	80.022023	139.478721	1812.0	6.599	12.4	4.8	180.01	3486	822.92	0.00
005716508-02	OBS	No	128.877360	256.656319	1709.2	4.633	11.2	5.5	180.01	3486	685.84	0.00
005716508-03	OBS	No	4.863178	134.225462	449.5	4.889	8.9	5.7	180.01	3486	533.38	0.00
005716508-04	OBS	No	64.802168	156.846039	2521.1	10.213	11.3	7.5	180.01	3486	830.71	0.00
005716508-05	OBS	No	12.090645	140.492474	829.4	3.280	9.2	6.0	180.01	3486	595.34	0.00
005716508-06	OBS	No	38.495224	157.141282	1910.2	2.390	10.3	9.1	180.01	3486	812.46	0.00
005716508-07	OBS	7737.01	4.753079	134.546213	542.6	2.352	8.9	5.9	180.01	3486	664.20	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005716508-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005716508-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
005716508-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-06	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT

**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.

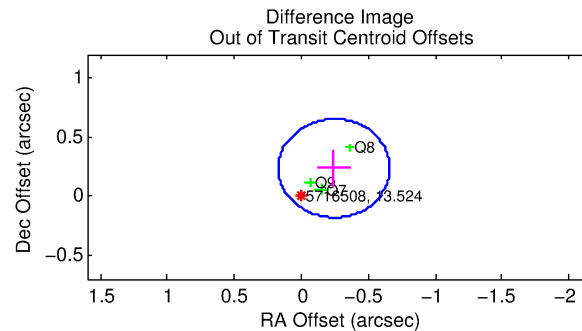
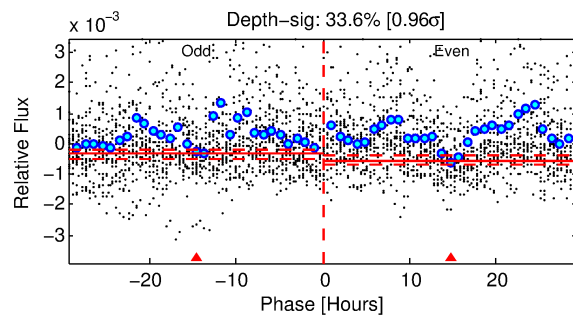
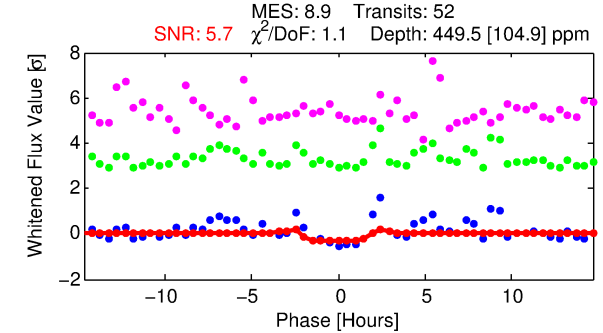
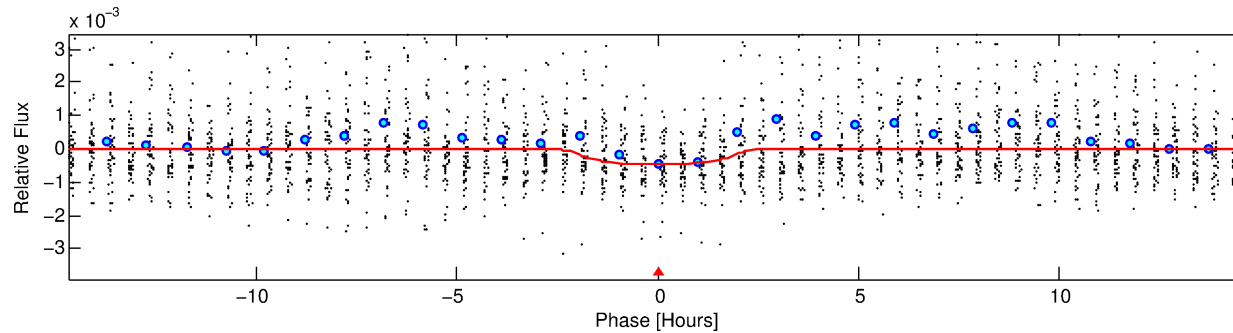
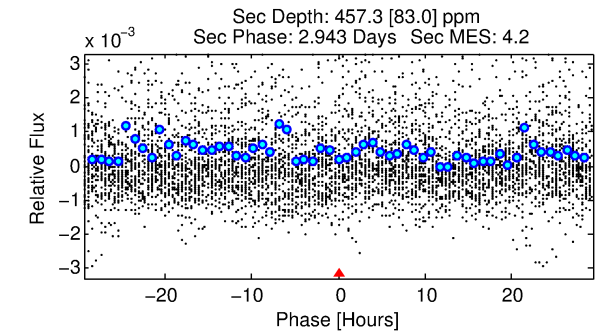
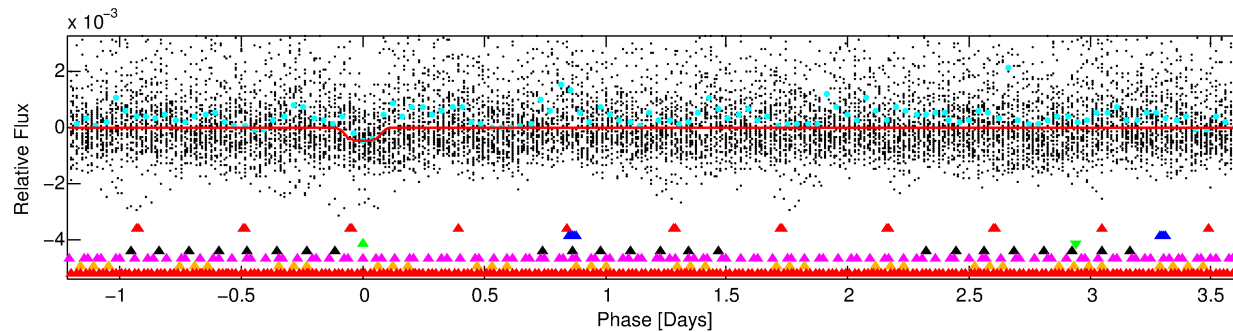
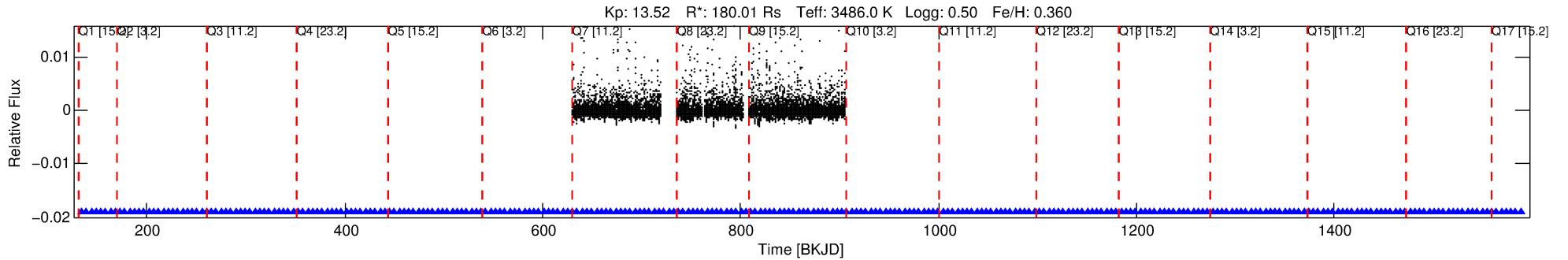
Ephemeris Match Information For 005716508-03

No Significant Match Found



# DV One-Page Summary

KIC: 5716508 Candidate: 3 of 7 Period: 4.863 d



## DV Fit Results:

Period = 4.86318 [0.00026] d  
Epoch = 134.2255 [0.0307] BKJD  
Rp/R\* = 0.0272 [0.0048]  
a/R\* = 3.21 [1.36]  
b = 0.95 [0.06]  
Seff = N/A  
Teq = N/A  
Rp = 533.38 [321.89] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

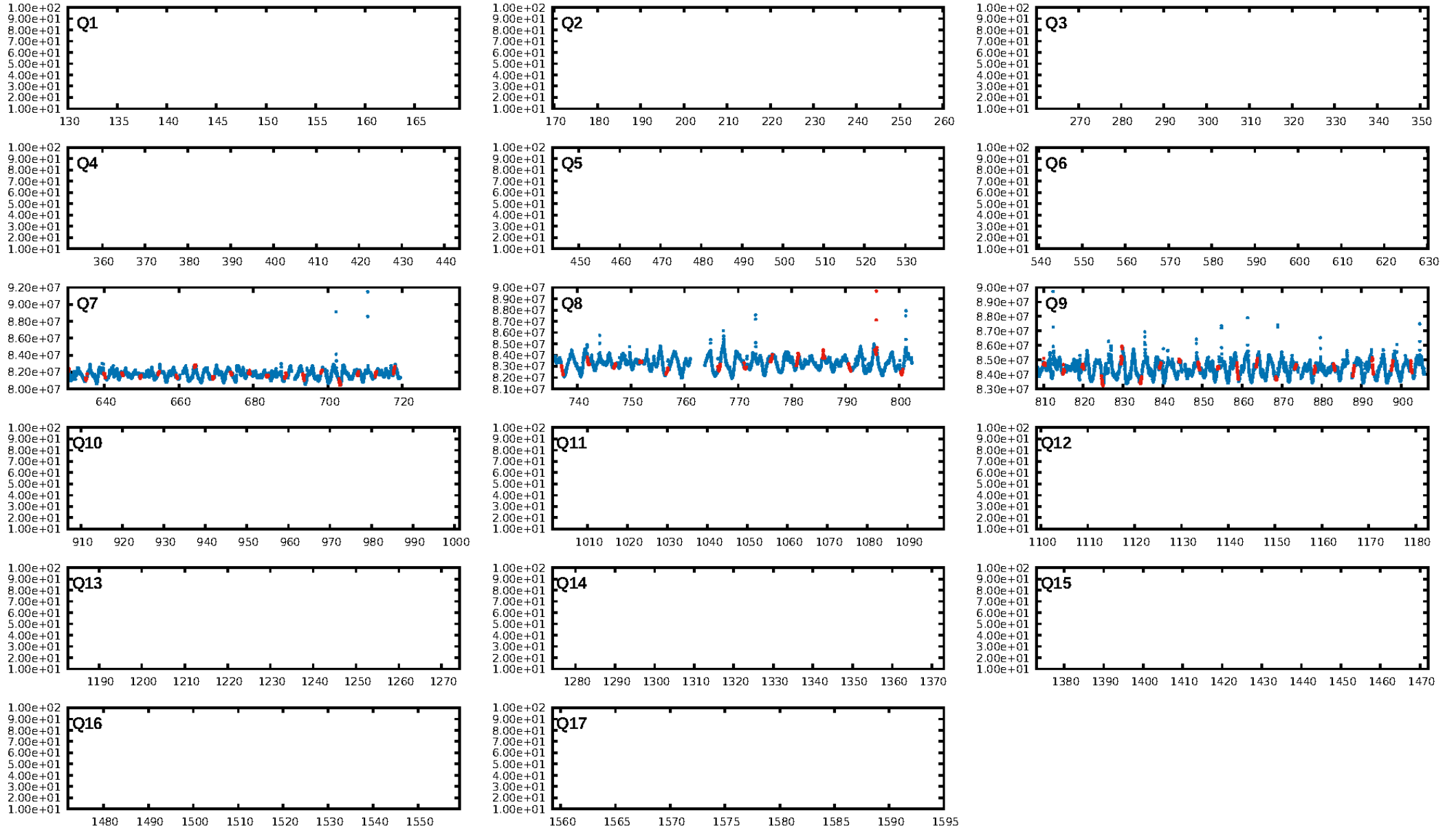
## DV Diagnostic Results:

ShortPeriod-sig: 37.4% [0.49σ]  
LongPeriod-sig: 100.0% [29.46σ]  
ModelChiSquare2-sig: 49.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.47e-09  
RollingBand-fgt: 1.00 [52/52]  
GhostDiagnostic-chr: -7.22  
Centroid-sig: N/A  
Centroid-so: 0.591 arcsec [1.52σ]  
OotOffset-rm: 0.339 arcsec [2.44σ]  
KicOffset-rm: 0.098 arcsec [1.07σ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

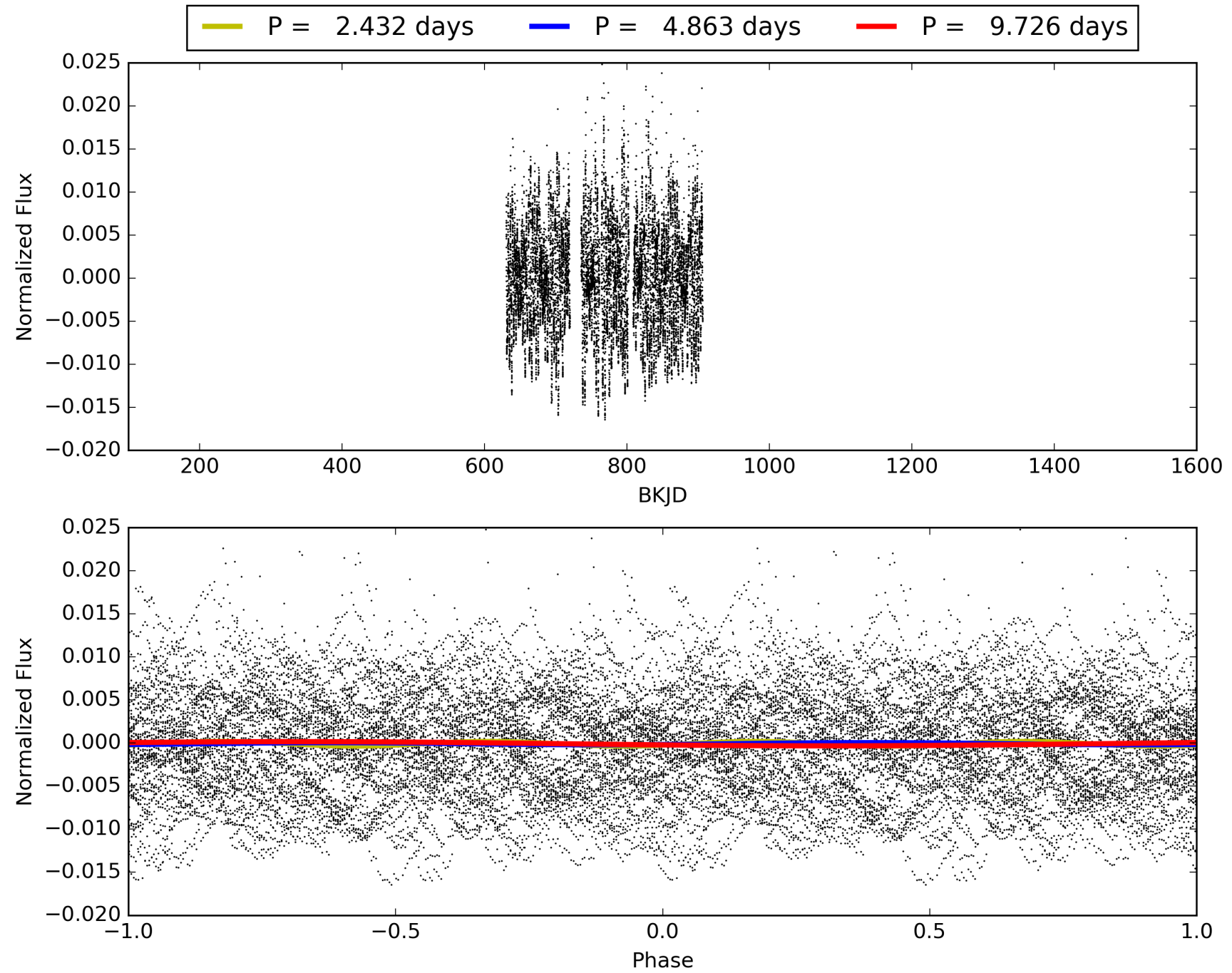
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:49:11 Z

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

# TCE 005716508-03, PDC Light Curves

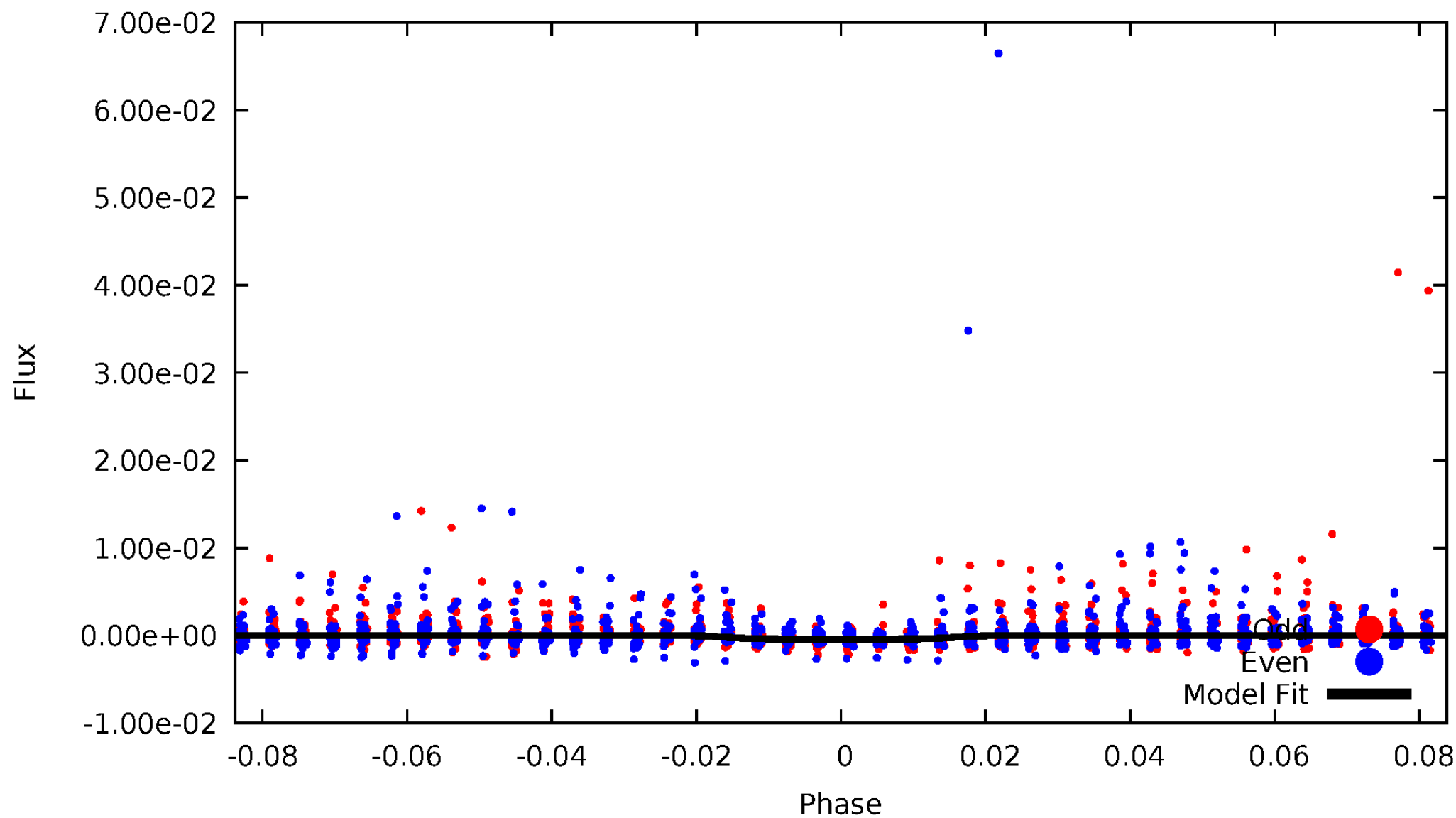


TCE 005716508-03



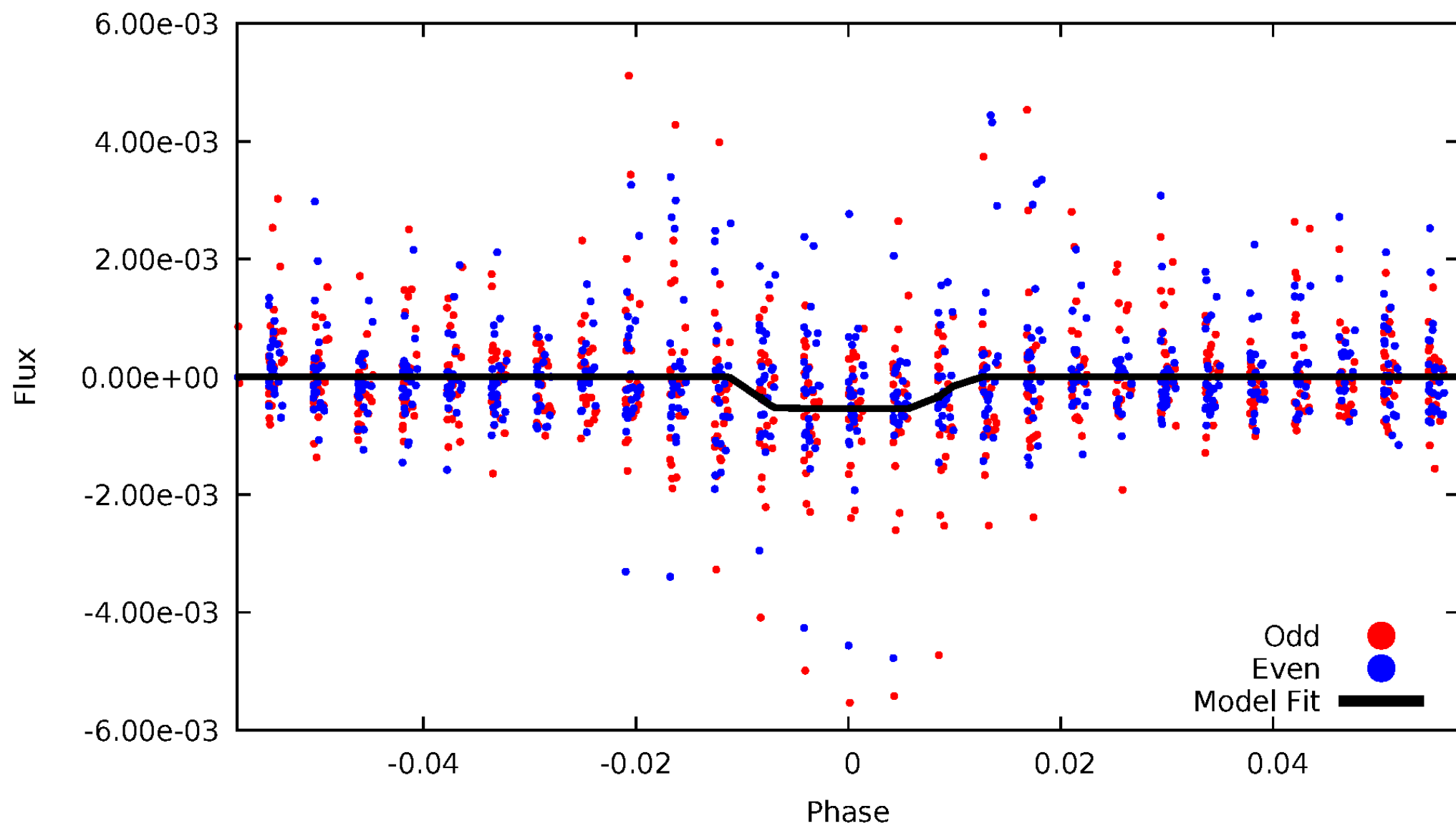
# DV Odd/Even

TCE 005716508-03

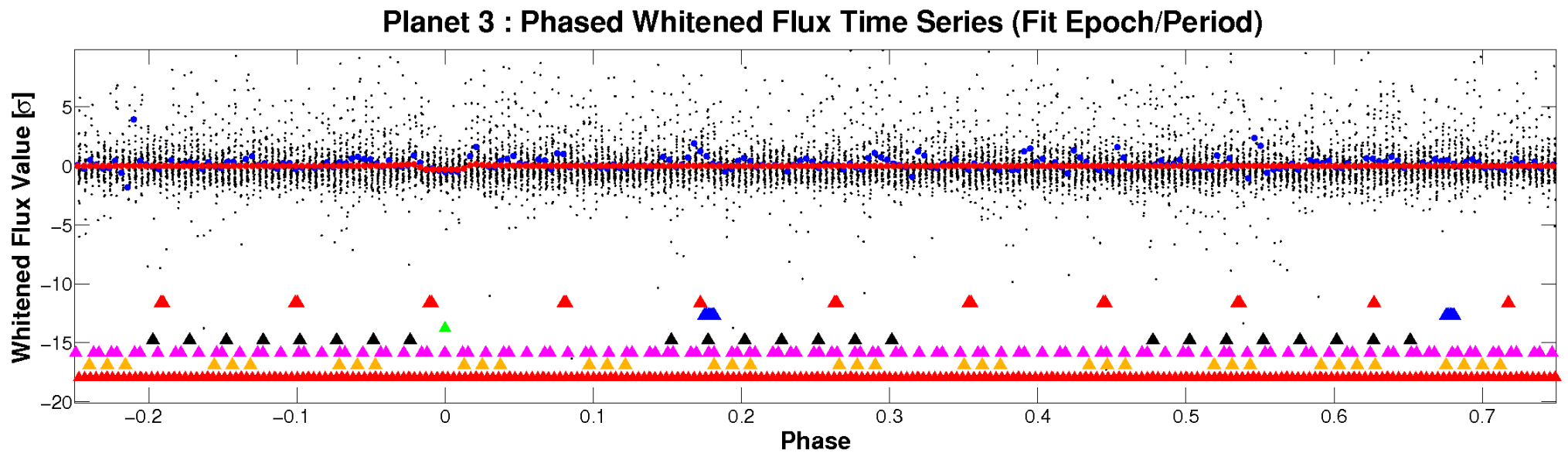
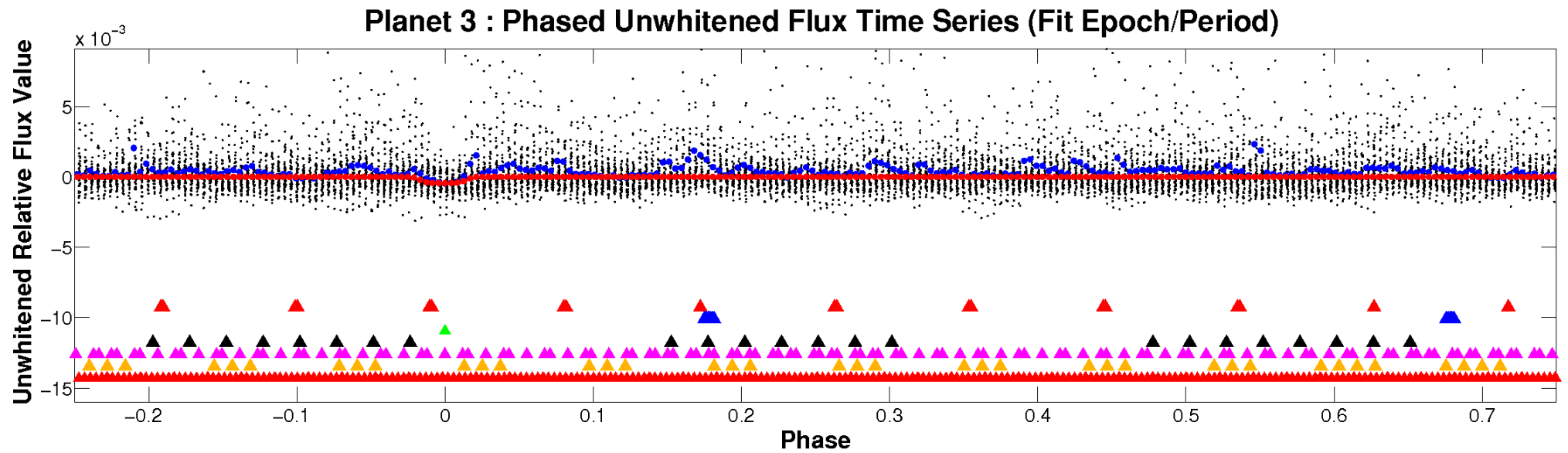


# ALT Odd/Even

TCE 005716508-03

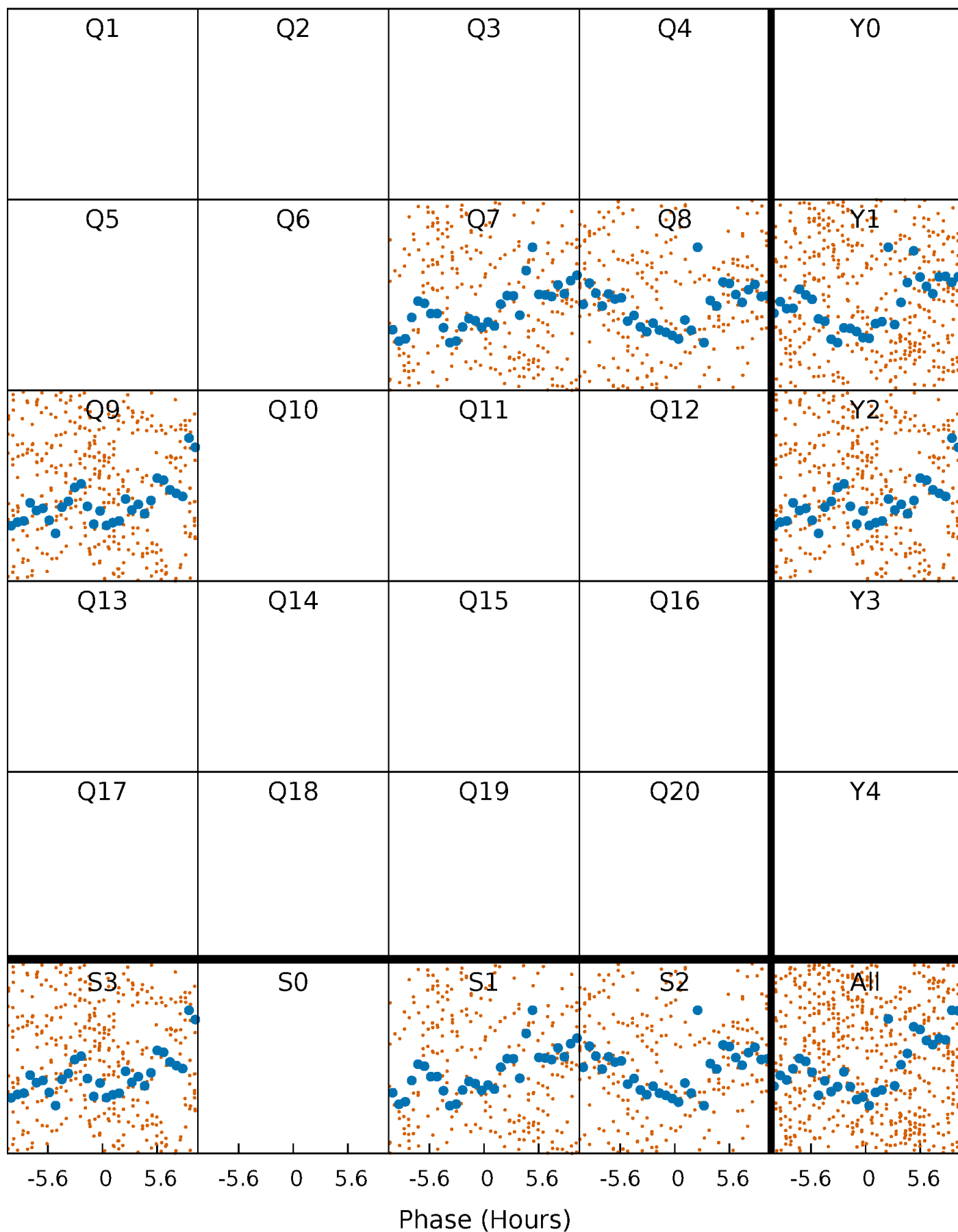


# Non-Whitened Vs. Whitened Light Curve



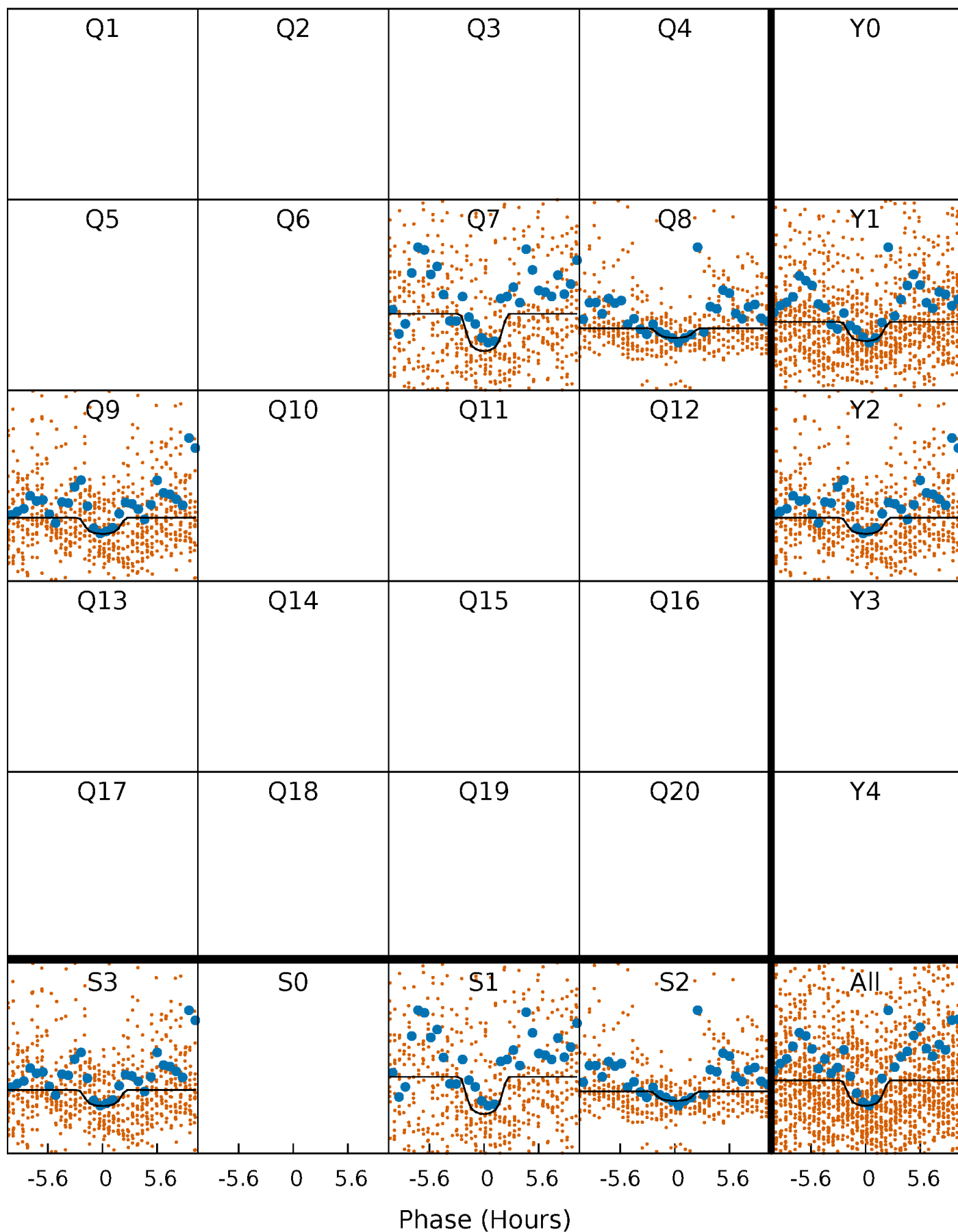
# PDC Quarter-Phased Transit Curves

TCE 005716508-03   P= 4.863178 Days    $T_0=134.225462$  (BKJD)



# DV Quarter-Phased Transit Curves

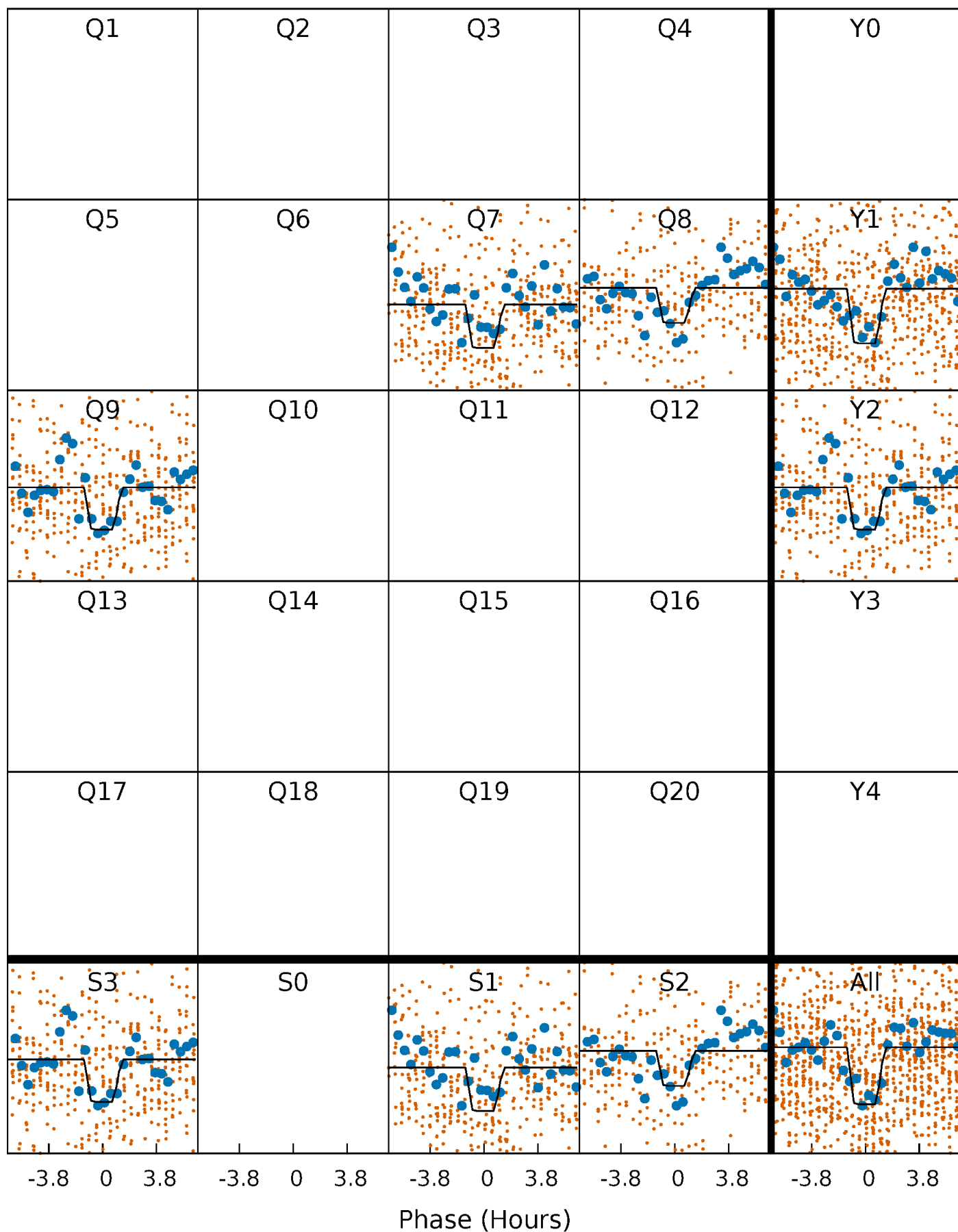
TCE 005716508-03   P= 4.863178 Days    $T_0=134.225462$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

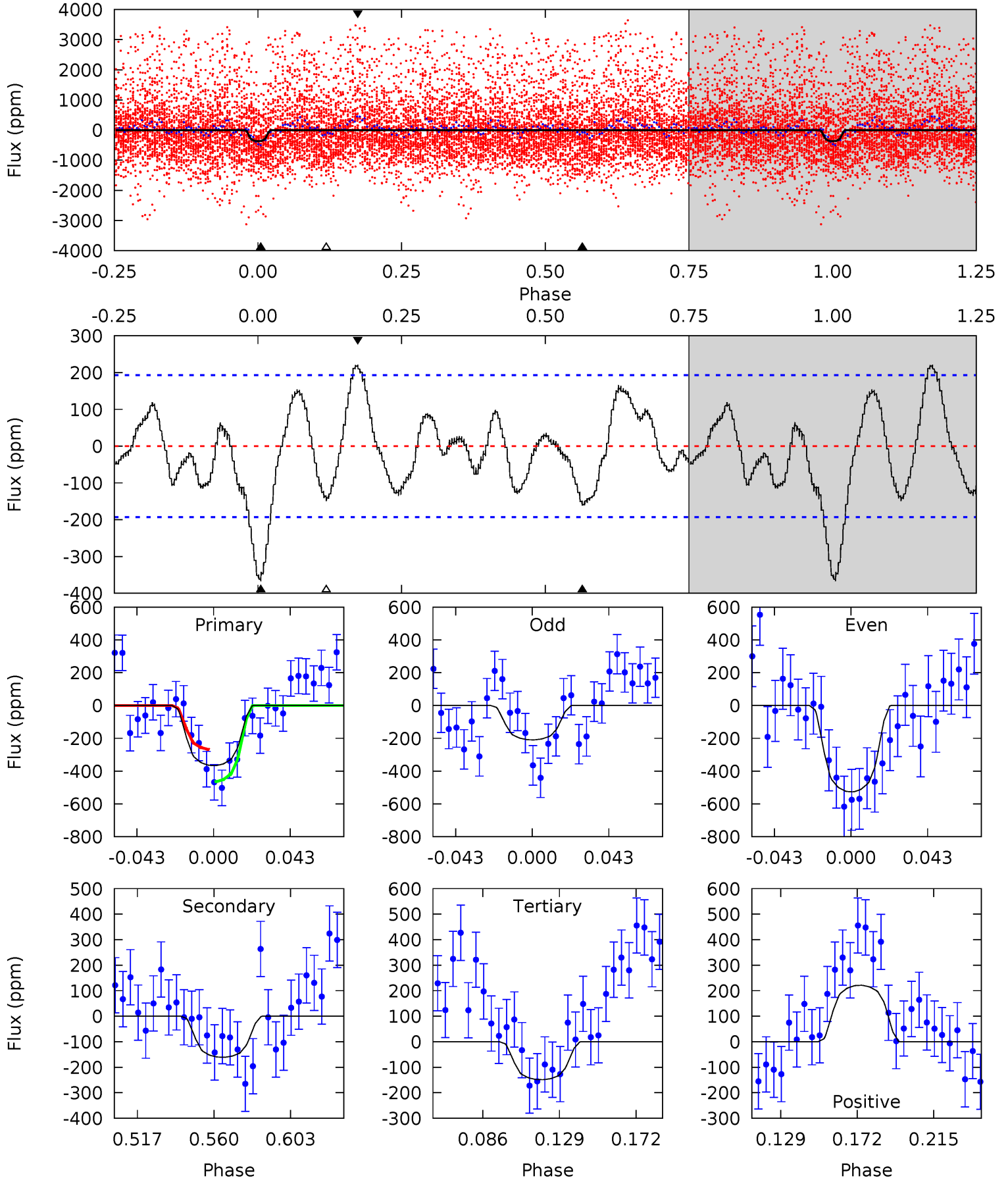
TCE 005716508-03   P= 4.863267 Days    $T_0=134.217193$  (BKJD)



# DV Model-Shift Uniqueness Test

005716508-03, P = 4.863178 Days, E = 134.225462 Days

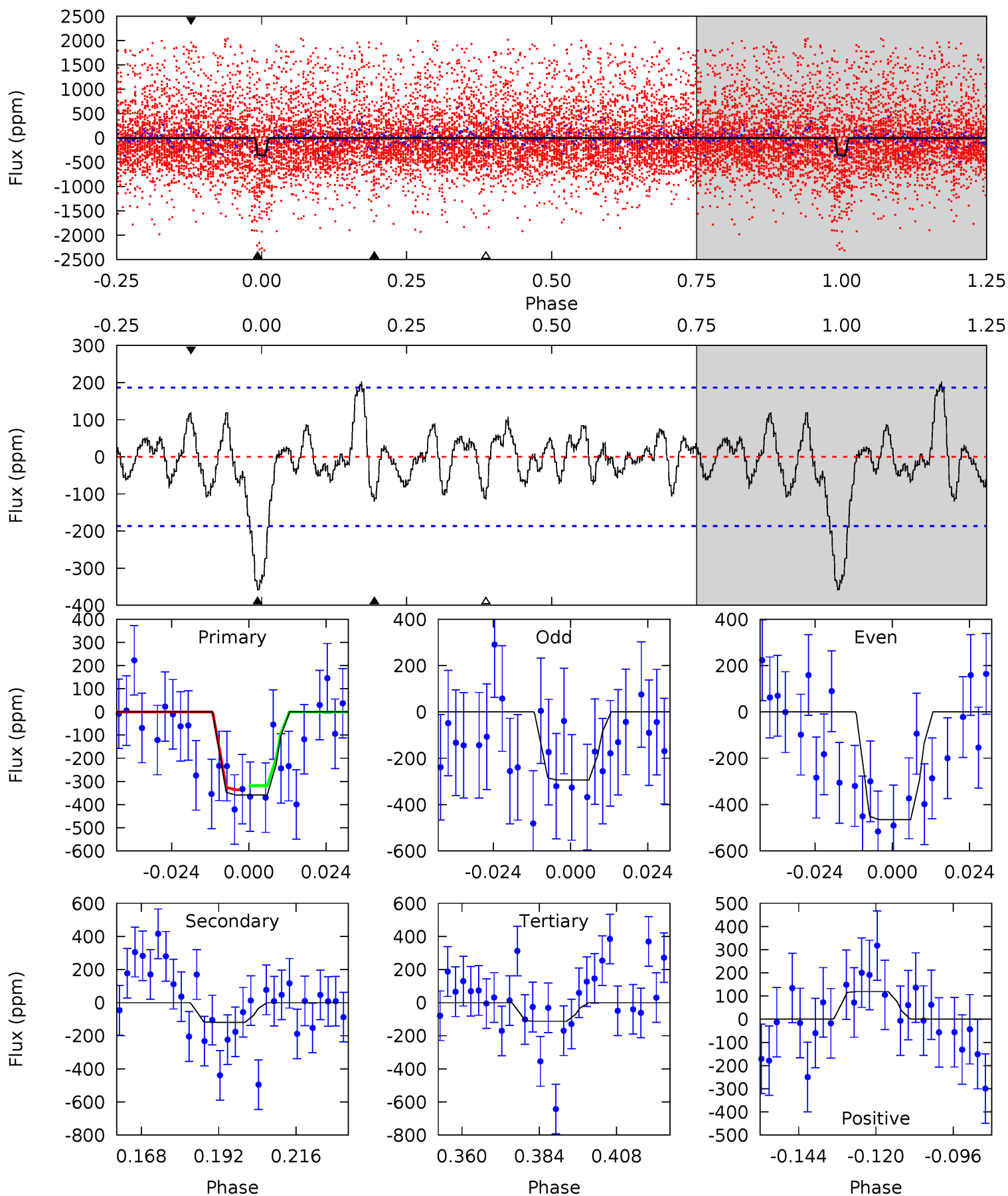
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.00	3.95	3.65	5.43	4.74	2.02	2.01	5.35	3.57	0.30	-1.48	3.96	1.04	0.38	2.47



# Alt Model-Shift Uniqueness Test

005716508-03, P = 4.863267 Days, E = 134.217193 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
9.32	3.12	2.94	3.10	4.86	2.26	1.28	6.38	6.22	0.18	0.02	2.24	2.21	0.36	0.23



### Stellar Parameters For KIC 005716508

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3486^{+112}_{-112}$	$0.500^{+0.338}_{-0.156}$	$0.360^{+0.100}_{-0.250}$	$180.013^{+25.956}_{-103.825}$	$3.735^{+0.075}_{-2.514}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+68%/-31%	+28%/-69%	+14%/-58%	+2%/-67%	+434%/-35%
Source	KIC0	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 005716508-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-161 \pm 41$	$514.42^{+127.54}_{-150.86}$	$9776^{+675}_{-1056}$	$-6855^{+780}_{-667}$	$0.002^{+0.002}_{-0.001}$
Alt.	$-120 \pm 38$	$435.37^{+118.65}_{-119.97}$	$9785^{+637}_{-937}$	$-6881^{+752}_{-641}$	$0.002^{+0.003}_{-0.001}$

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

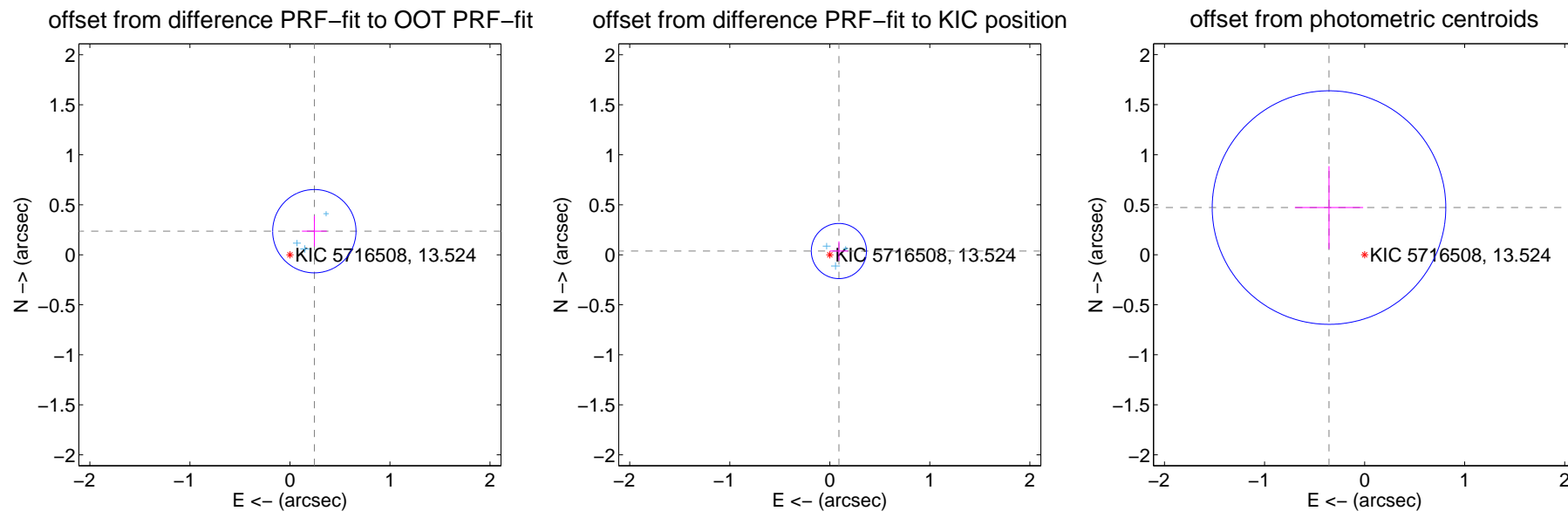
## DV Centroid Data

Supplemental centroid analysis for 005716508-03. Kepler magnitude: 13.52. Transit SNR 5.66

There are 3 quarters with good PRF difference image offsets

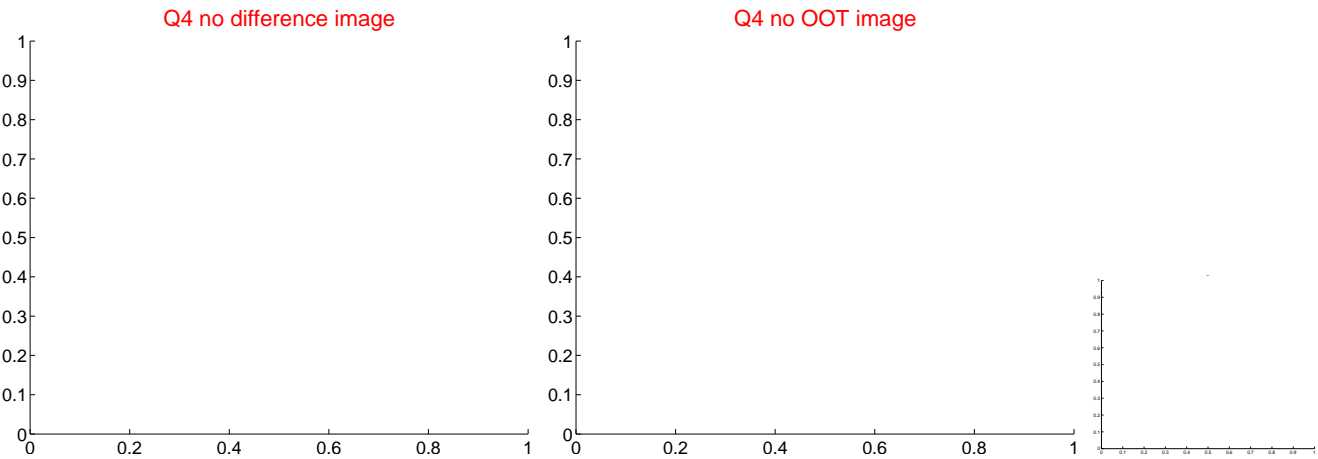
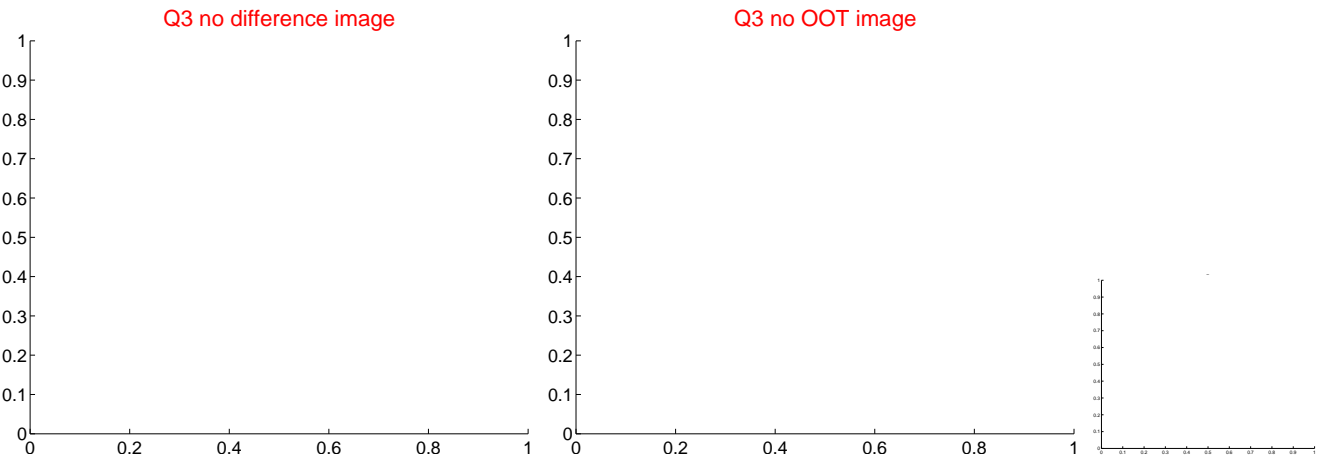
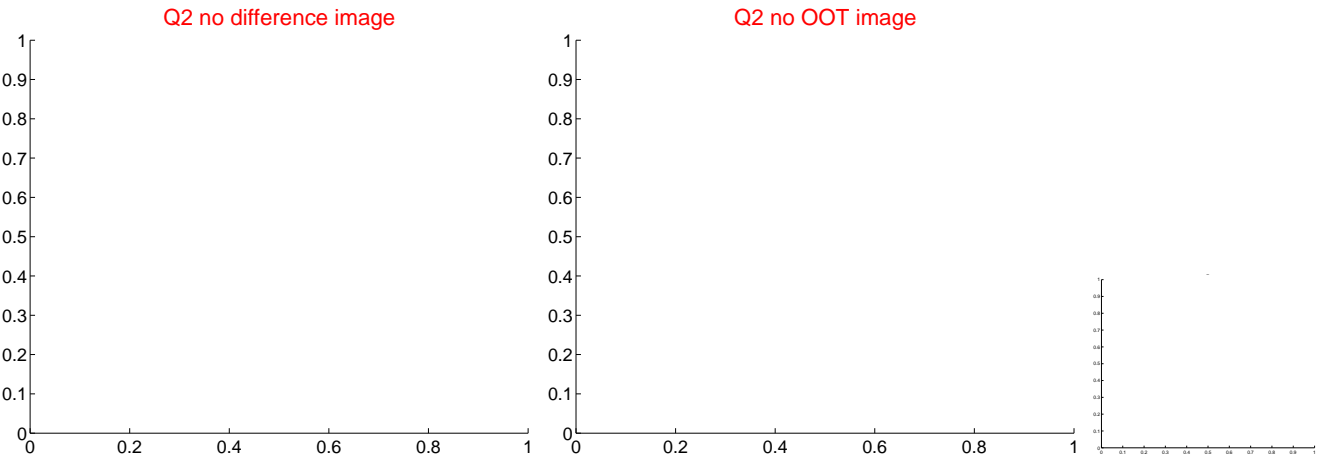
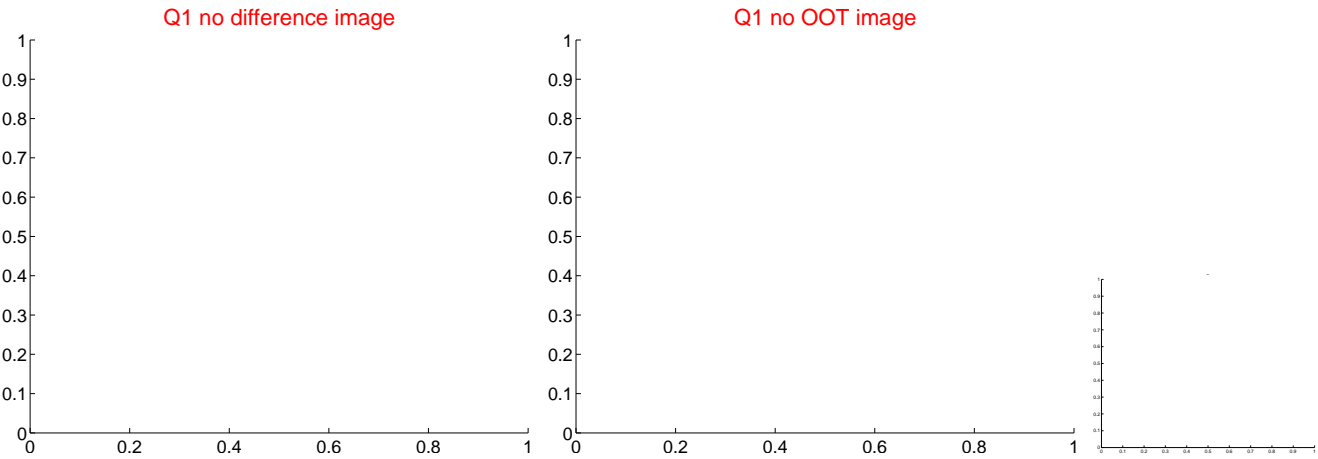
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.339 \pm 0.139$	2.44	$-0.244 \pm 0.123$	$0.236 \pm 0.154$
PRF-fit source offset from KIC position	$0.098 \pm 0.092$	1.07	$-0.091 \pm 0.091$	$0.038 \pm 0.096$
photometric centroid source offset	$0.59 \pm 0.39$	1.52	$0.36 \pm 0.34$	$0.47 \pm 0.41$



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.

Q5 no difference image



Q5 no OOT image



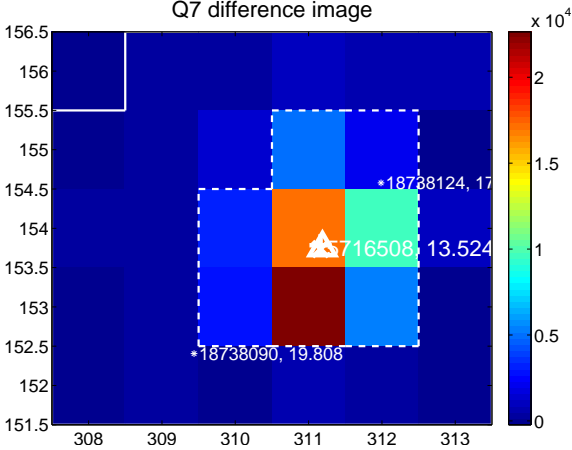
Q6 no difference image



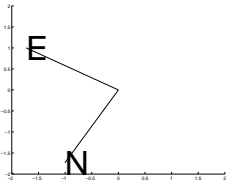
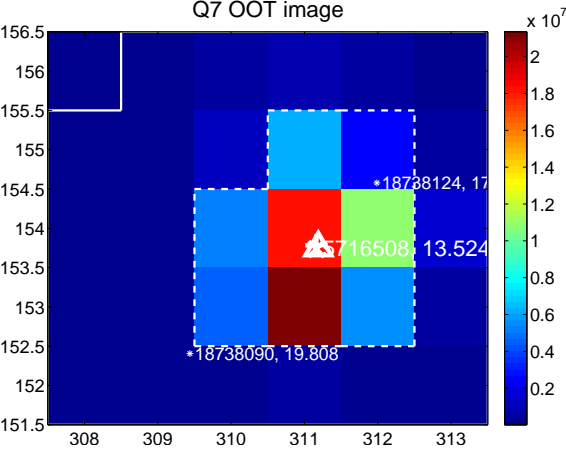
Q6 no OOT image



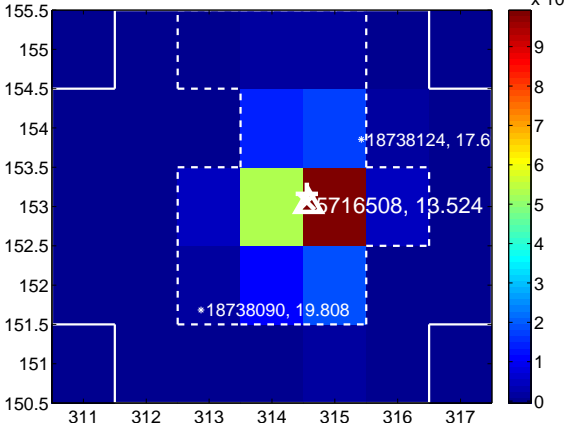
Q7 difference image



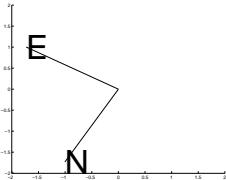
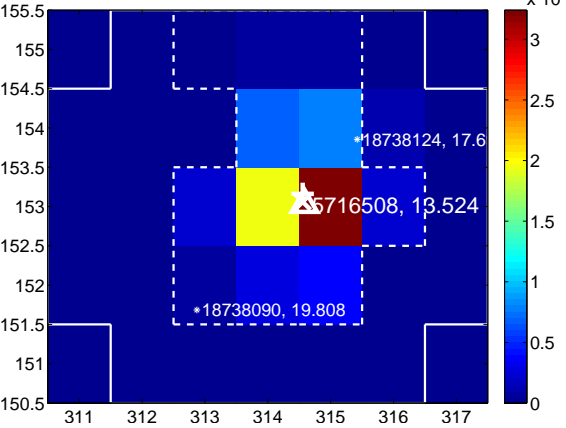
Q7 OOT image



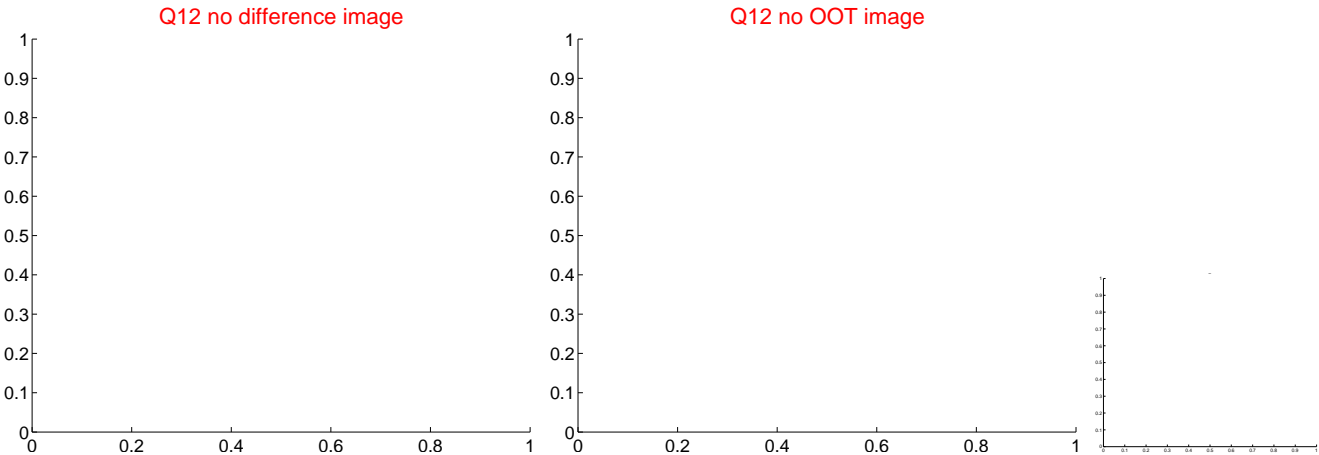
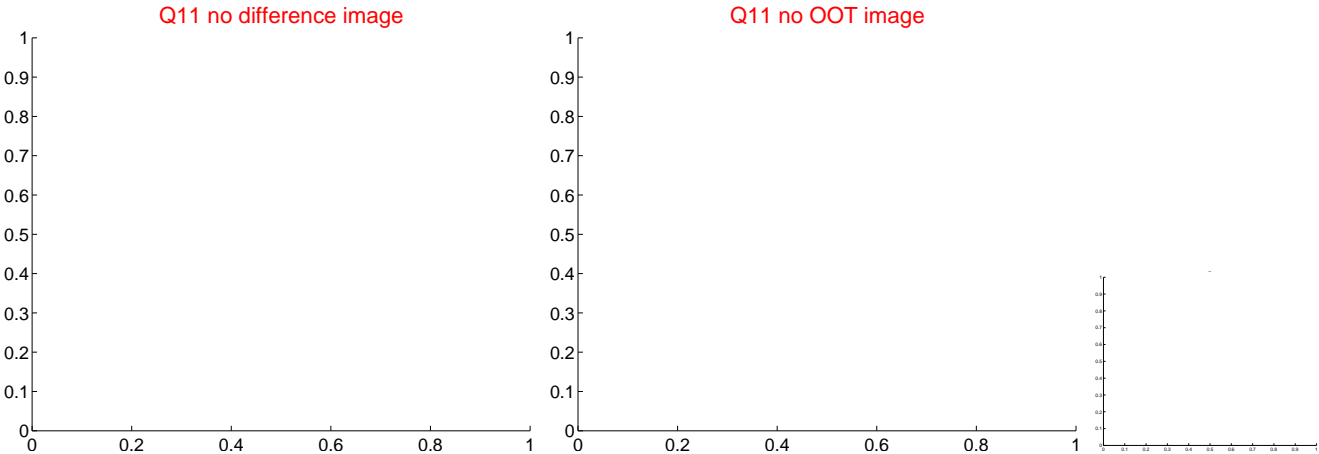
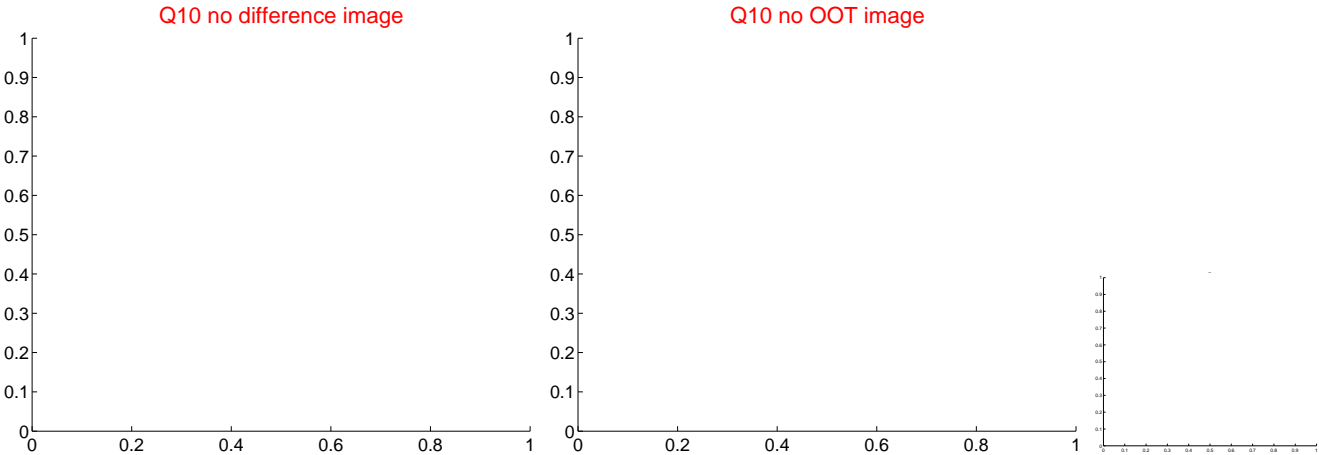
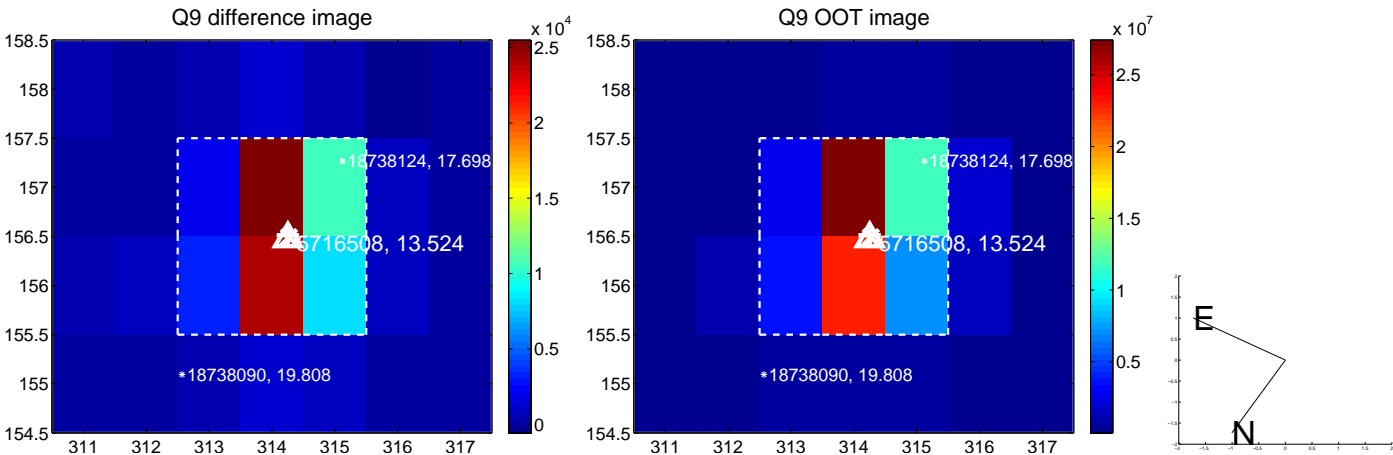
Q8 difference image



Q8 OOT image



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

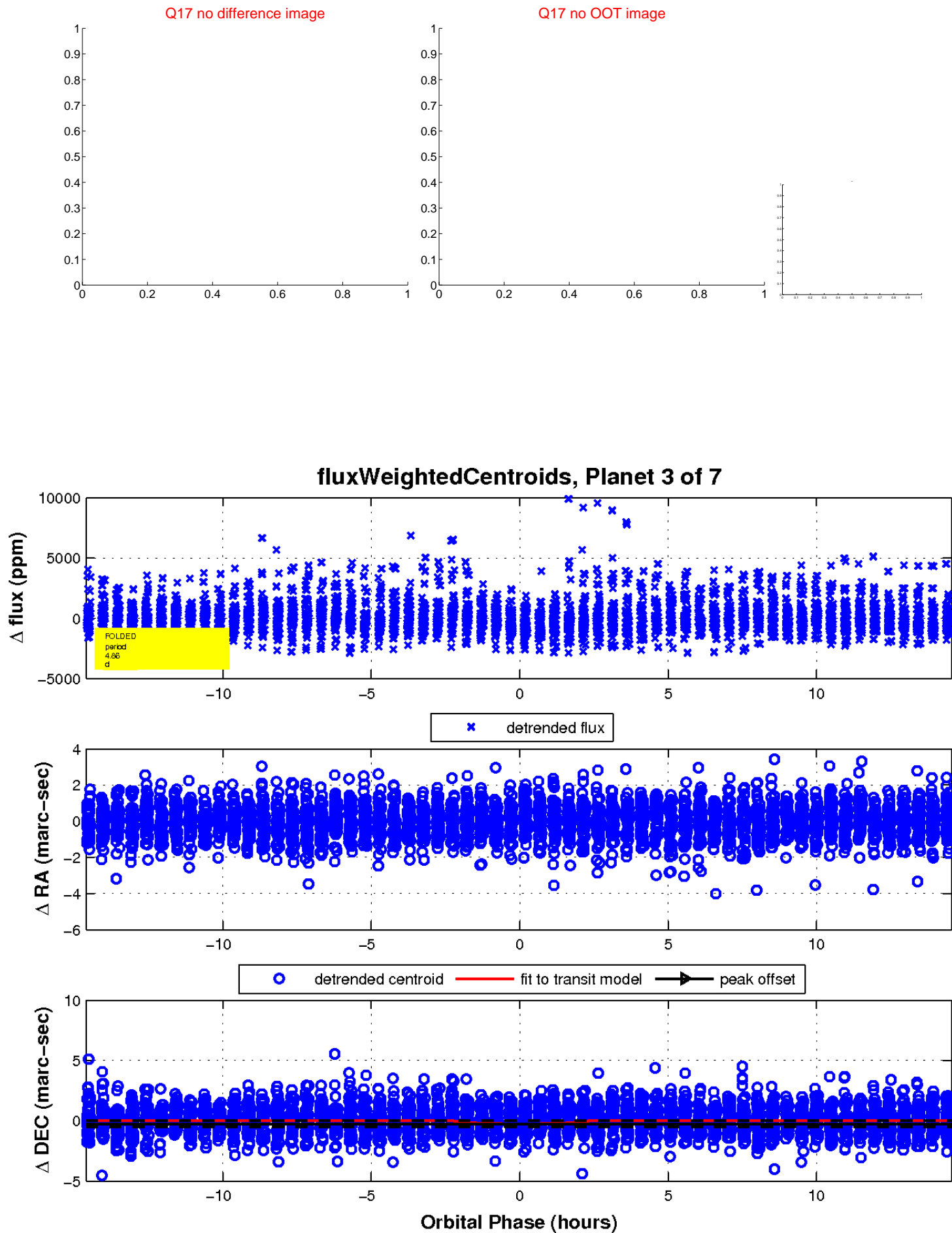




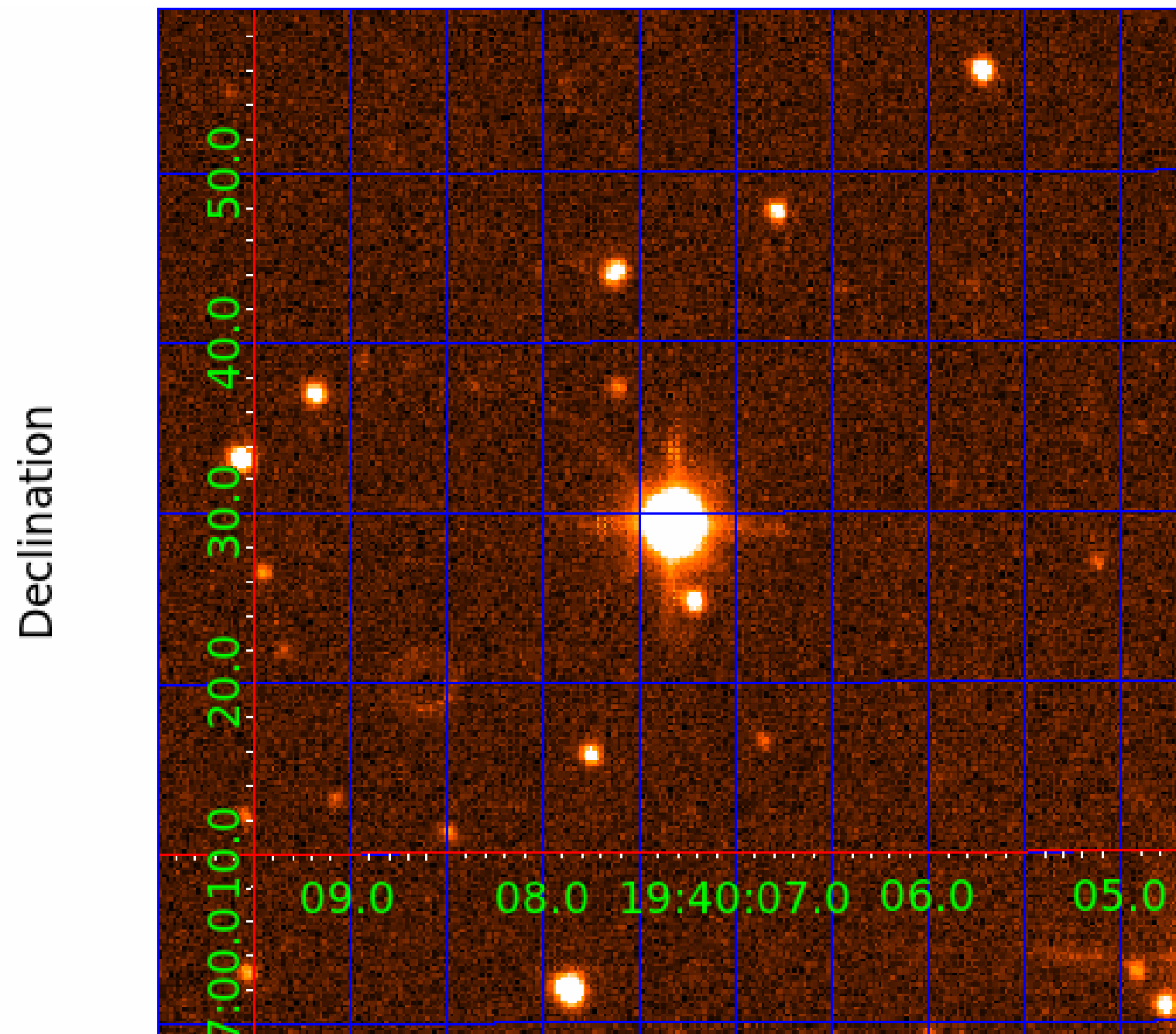
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005716508

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005716508-01	OBS	No	80.022023	139.478721	1812.0	6.599	12.4	4.8	180.01	3486	822.92	0.00
005716508-02	OBS	No	128.877360	256.656319	1709.2	4.633	11.2	5.5	180.01	3486	685.84	0.00
005716508-03	OBS	No	4.863178	134.225462	449.5	4.889	8.9	5.7	180.01	3486	533.38	0.00
005716508-04	OBS	No	64.802168	156.846039	2521.1	10.213	11.3	7.5	180.01	3486	830.71	0.00
005716508-05	OBS	No	12.090645	140.492474	829.4	3.280	9.2	6.0	180.01	3486	595.34	0.00
005716508-06	OBS	No	38.495224	157.141282	1910.2	2.390	10.3	9.1	180.01	3486	812.46	0.00
005716508-07	OBS	7737.01	4.753079	134.546213	542.6	2.352	8.9	5.9	180.01	3486	664.20	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005716508-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005716508-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
005716508-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-06	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT

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

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

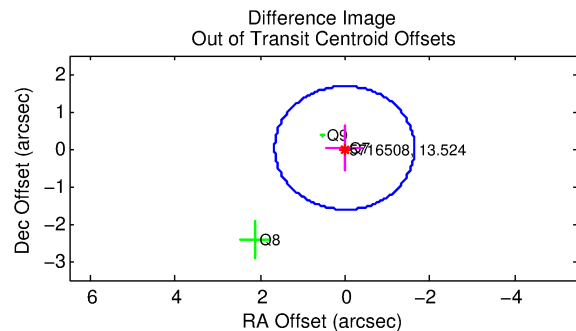
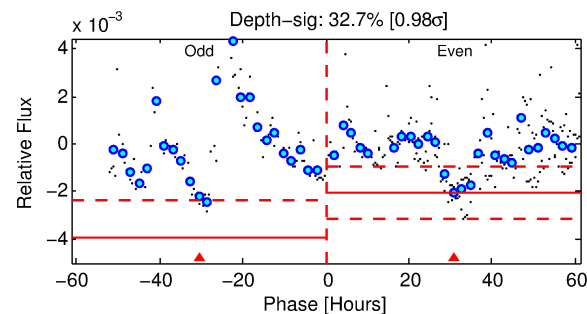
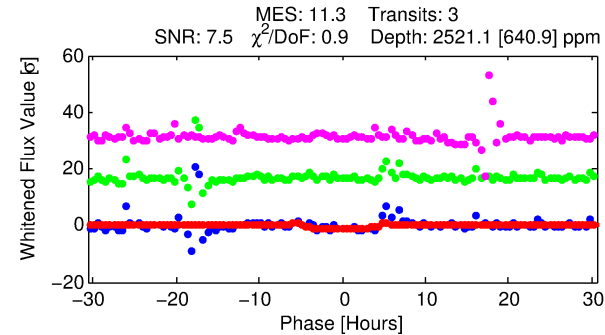
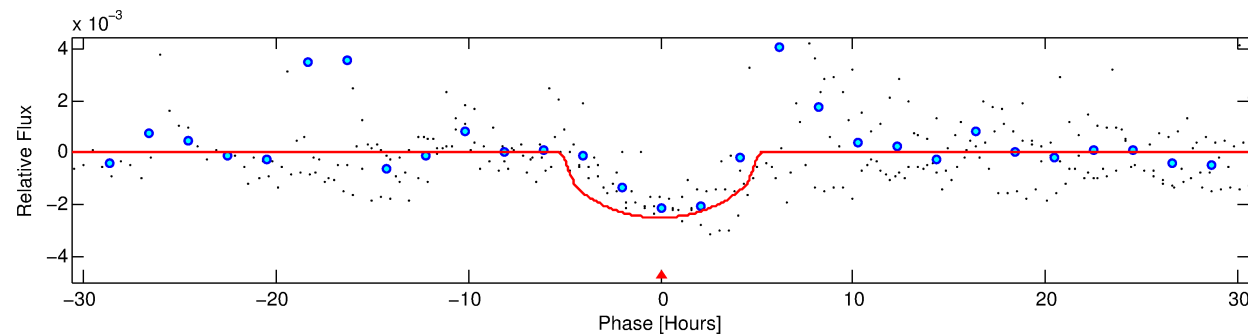
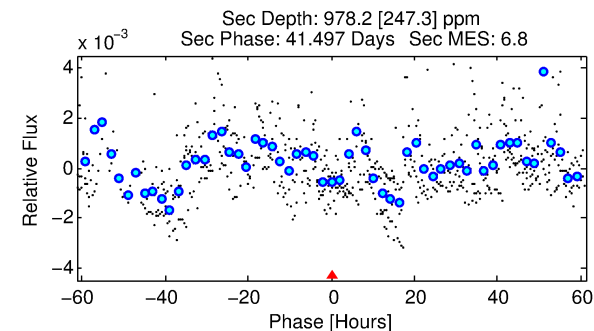
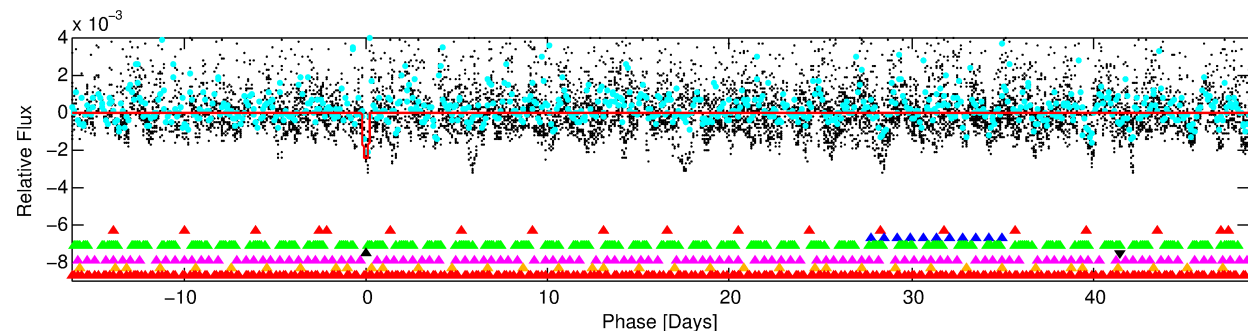
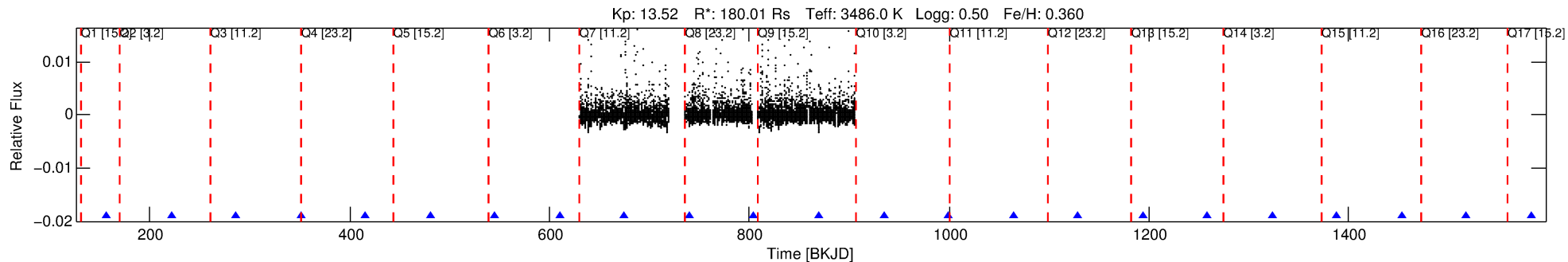
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005716508-04

No Significant Match Found

# DV One-Page Summary

KIC: 5716508 Candidate: 4 of 7 Period: 64.802 d



## DV Fit Results:

Period = 64.80217 [0.00578] d  
Epoch = 156.8460 [0.0546] BKJD  
Rp/R\* = 0.0423 [0.0285]  
a/R\* = 50.16 [68.69]  
b = 0.13 [10.97]  
Seff = N/A  
Teq = N/A  
Rp = 830.71 [736.77] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

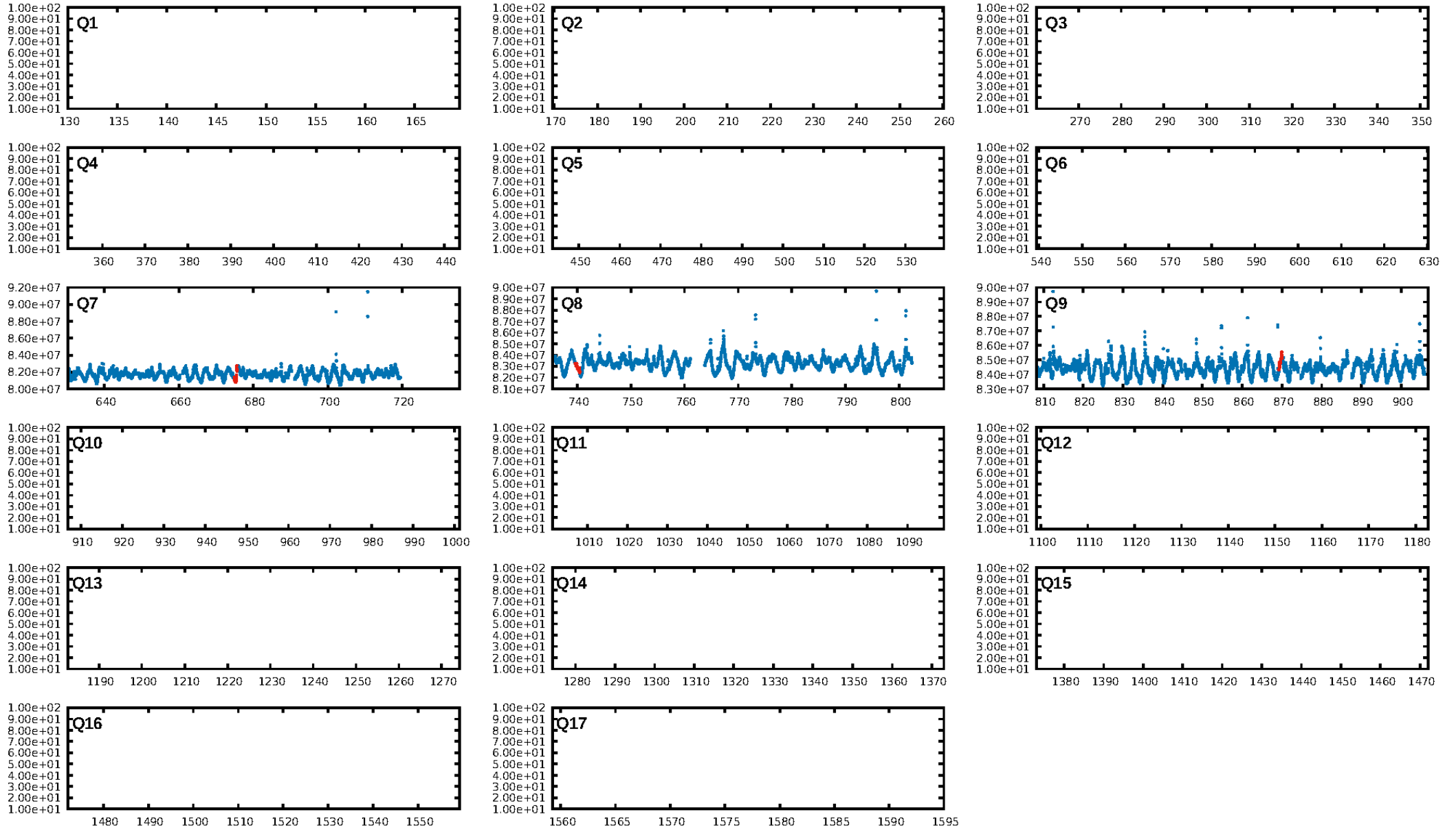
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [60.19σ]  
LongPeriod-sig: 100.0% [30.04σ]  
ModelChiSquare2-sig: 29.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.57e-12  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -22.2  
Centroid-sig: N/A  
Centroid-so: 0.249 arcsec [1.18σ]  
OotOffset-rm: 0.026 arcsec [0.05σ]  
KicOffset-rm: 0.156 arcsec [0.13σ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

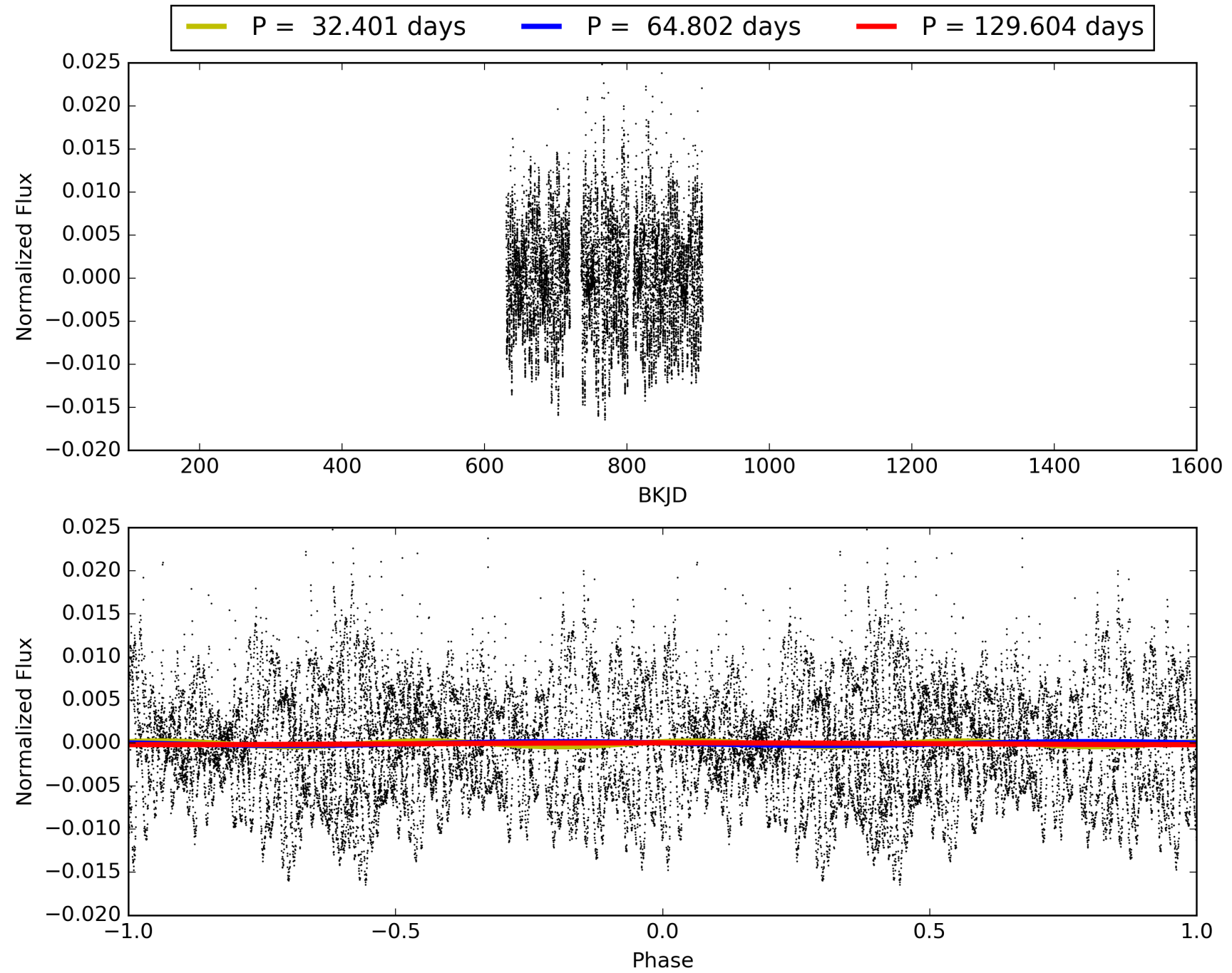
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:49:15 Z

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

# TCE 005716508-04, PDC Light Curves

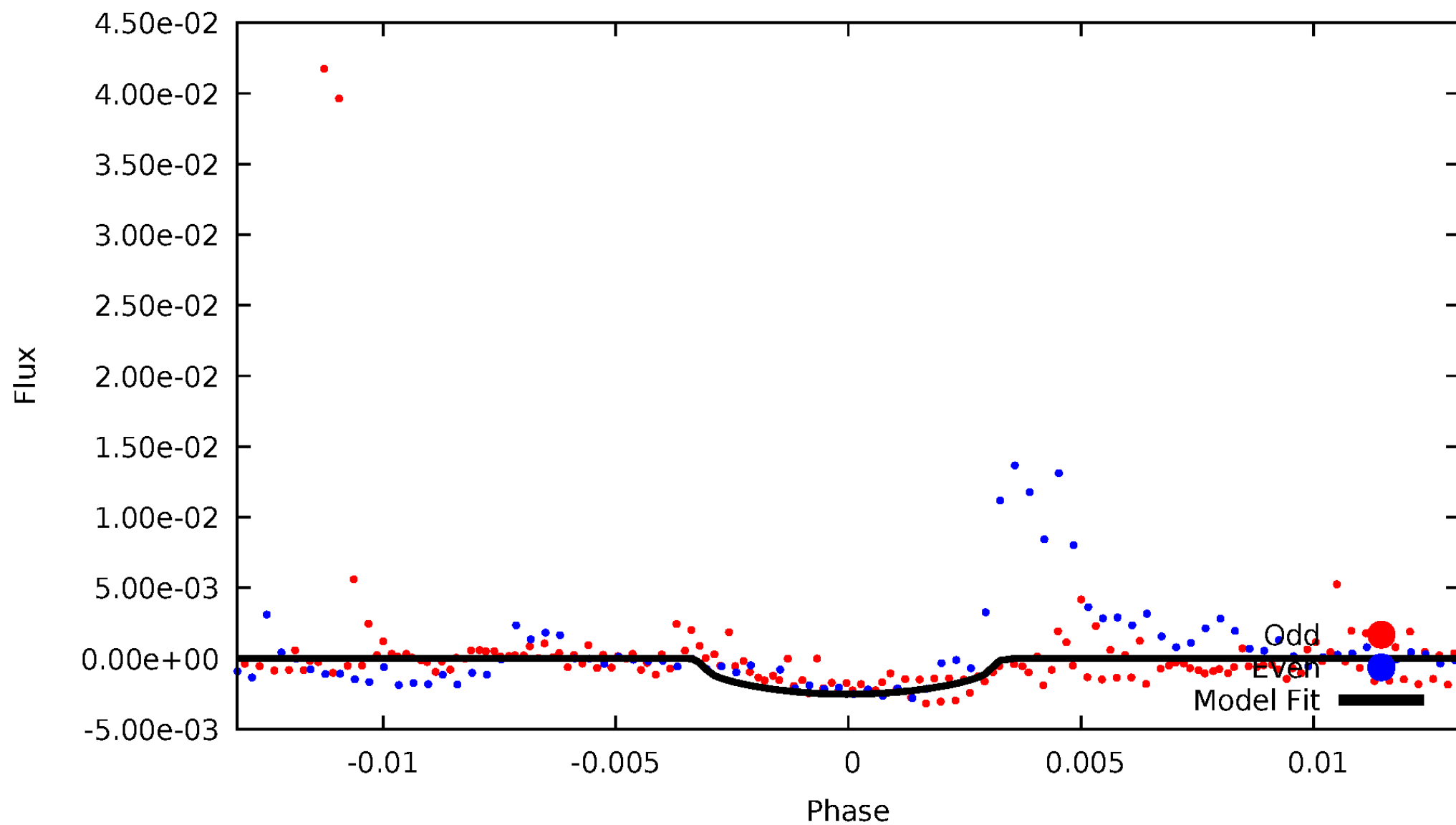


TCE 005716508-04



# DV Odd/Even

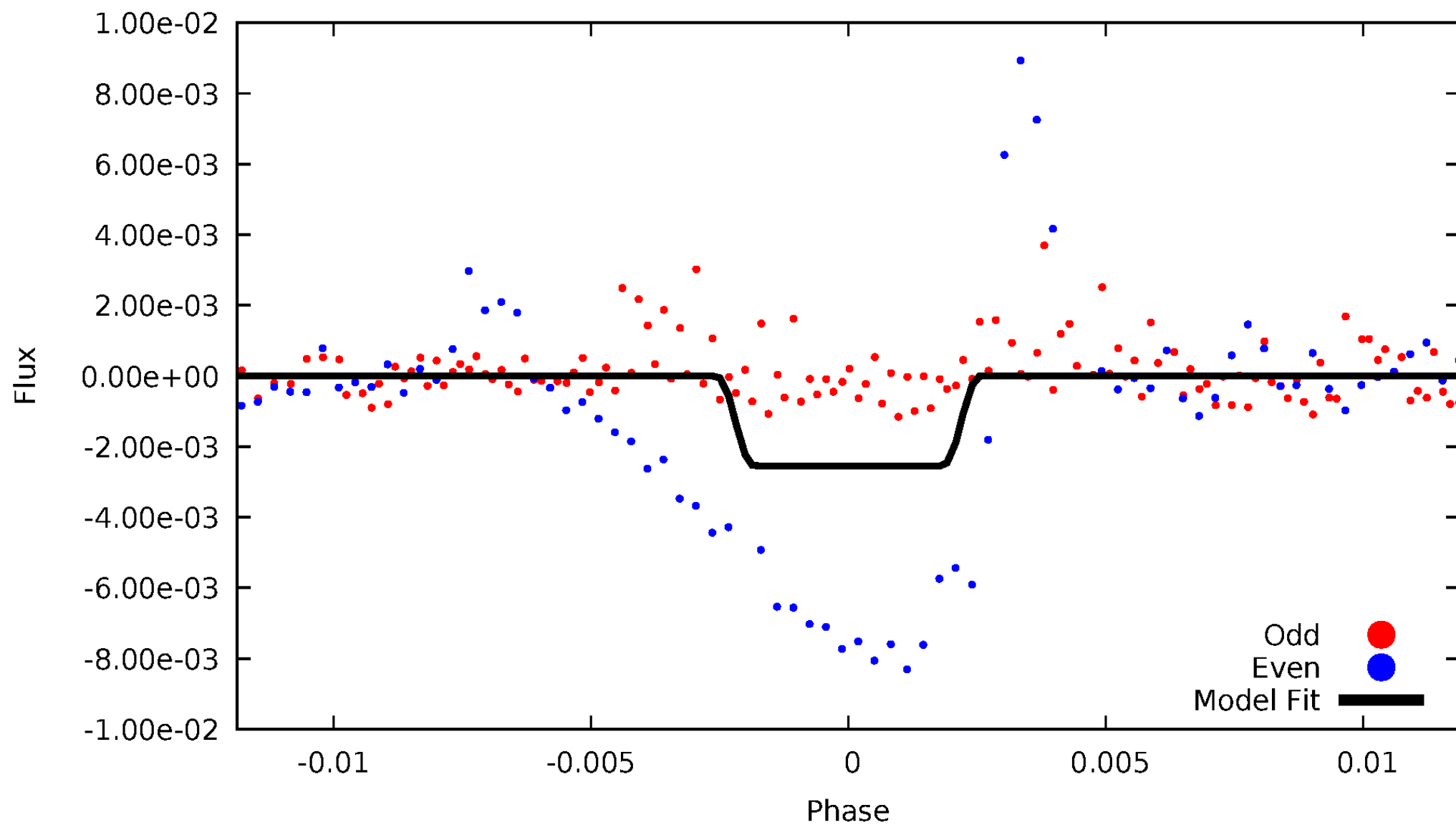
TCE 005716508-04





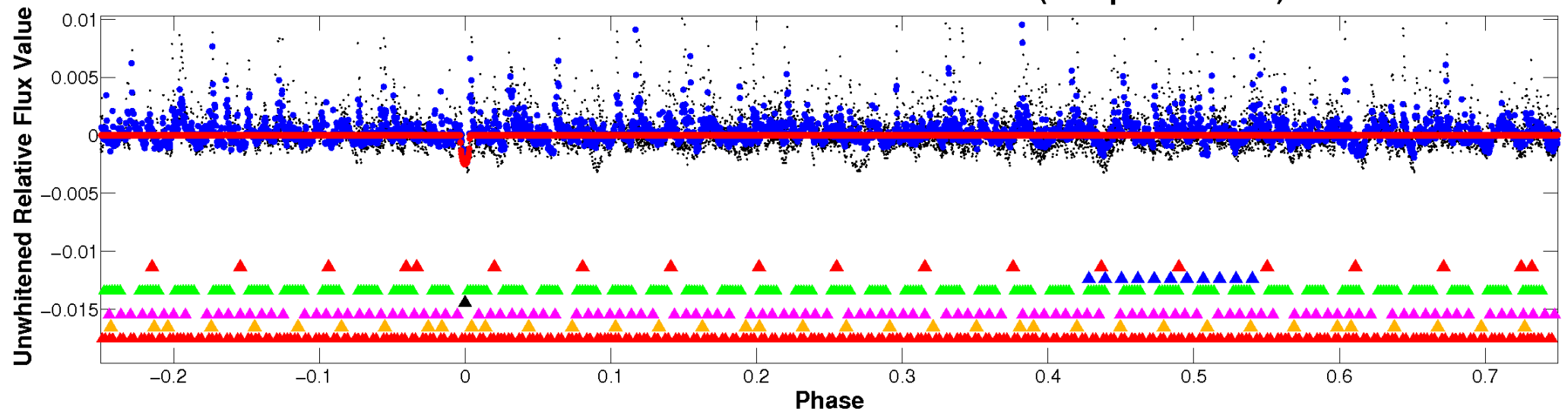
# ALT Odd/Even

TCE 005716508-04

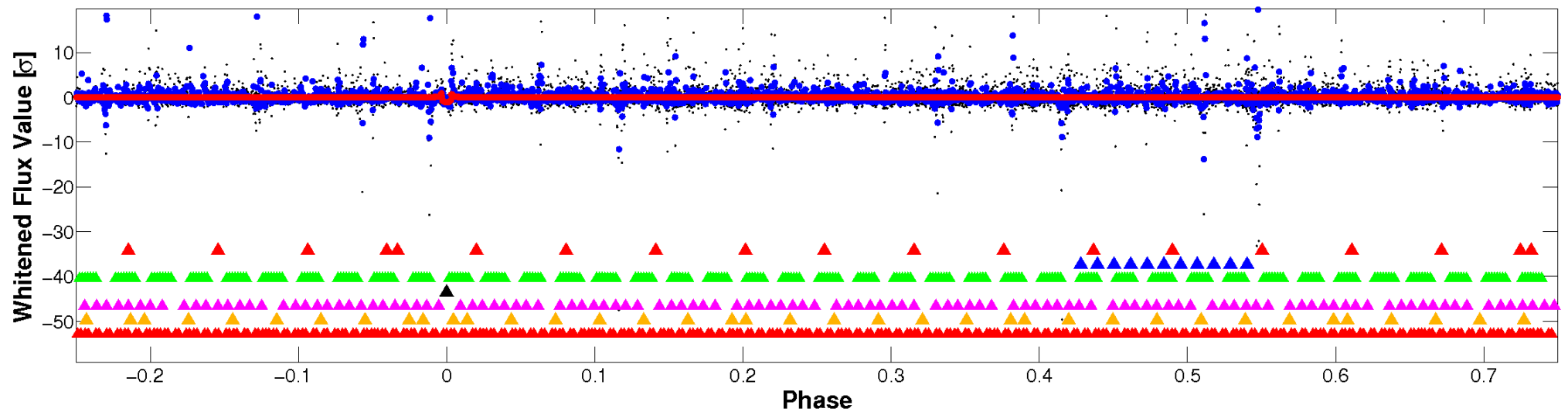


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



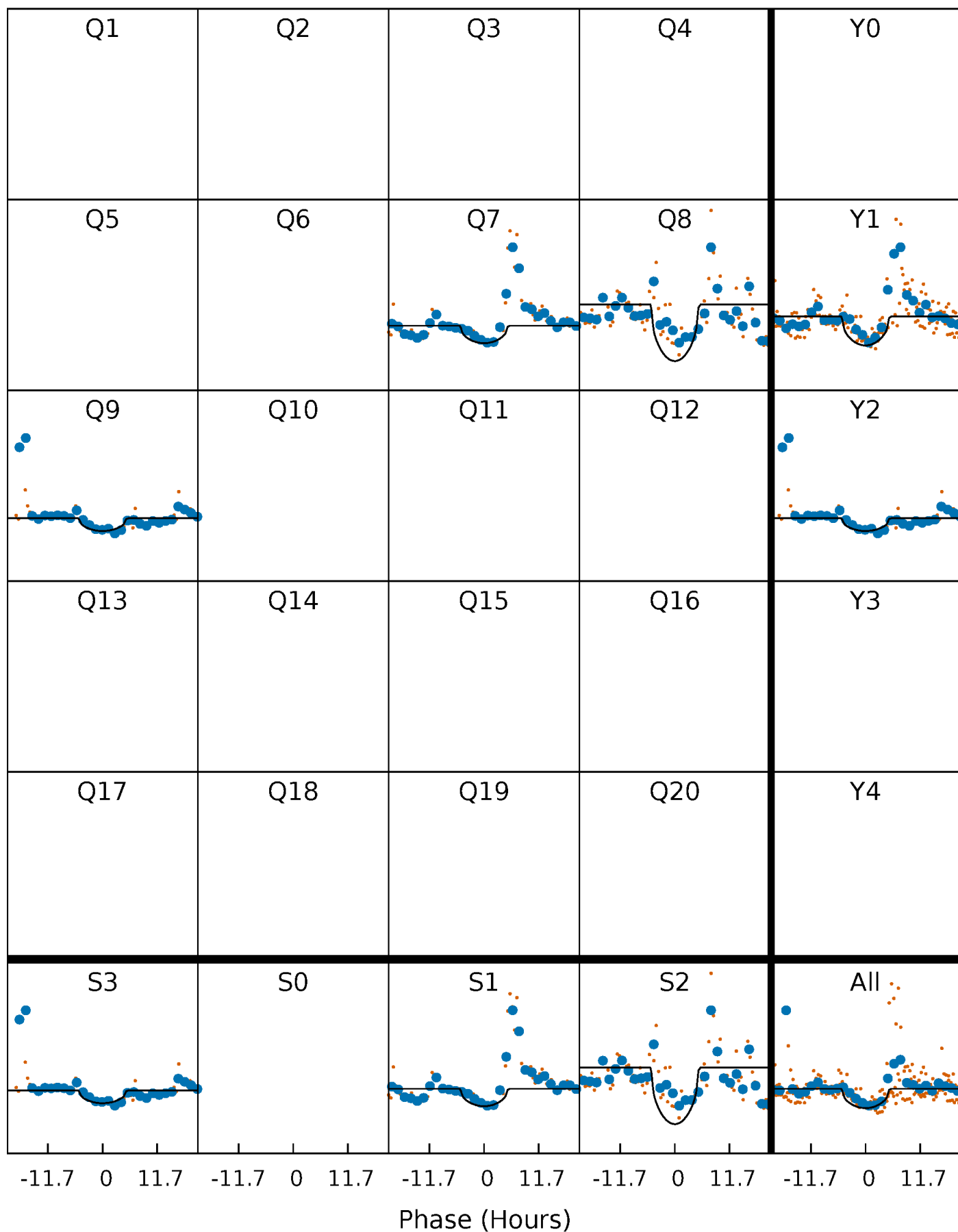
# PDC Quarter-Phased Transit Curves

TCE 005716508-04     $P = 64.802168$  Days     $T_0 = 156.846039$  (BKJD)



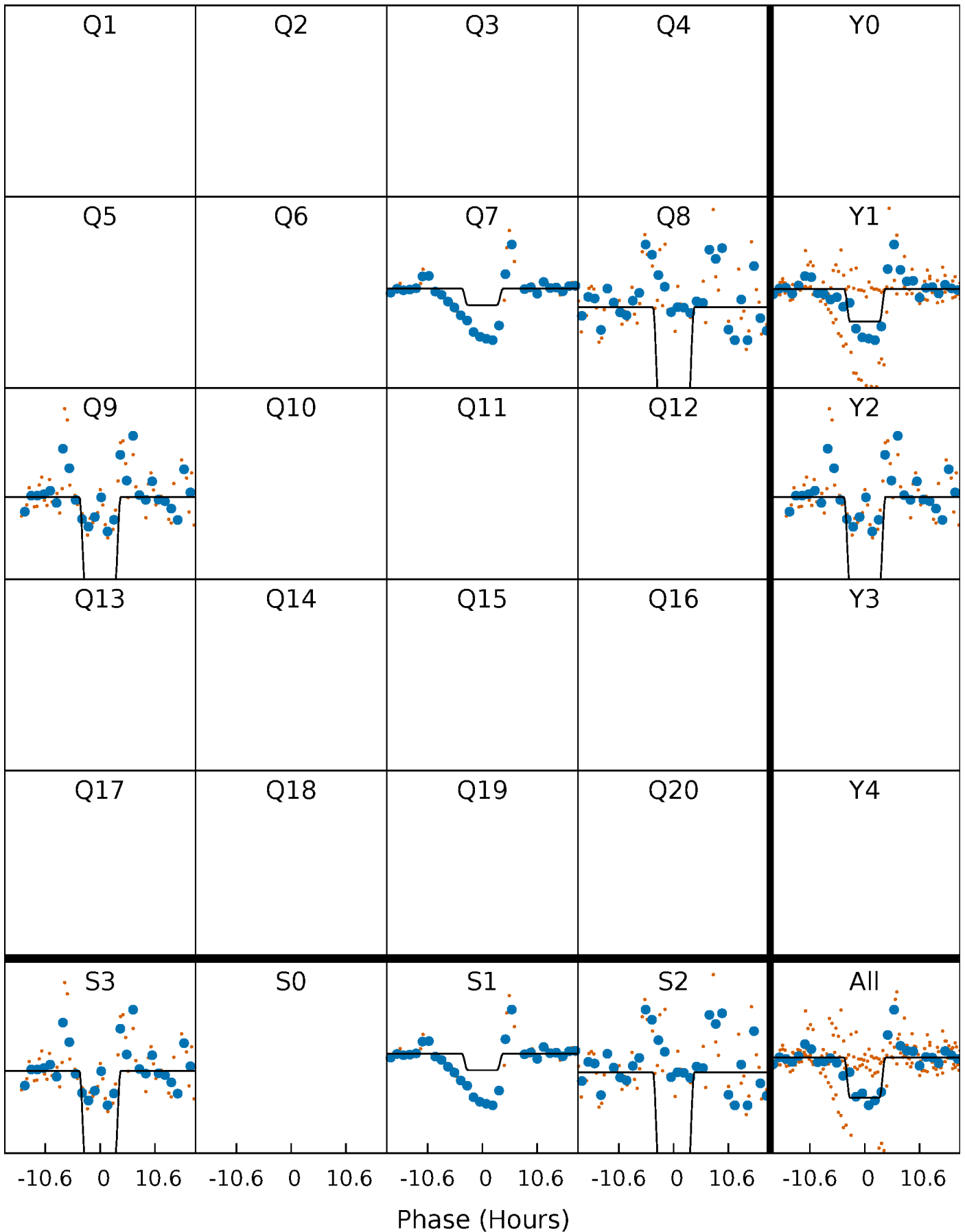
# DV Quarter-Phased Transit Curves

TCE 005716508-04     $P = 64.802168$  Days     $T_0 = 156.846039$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

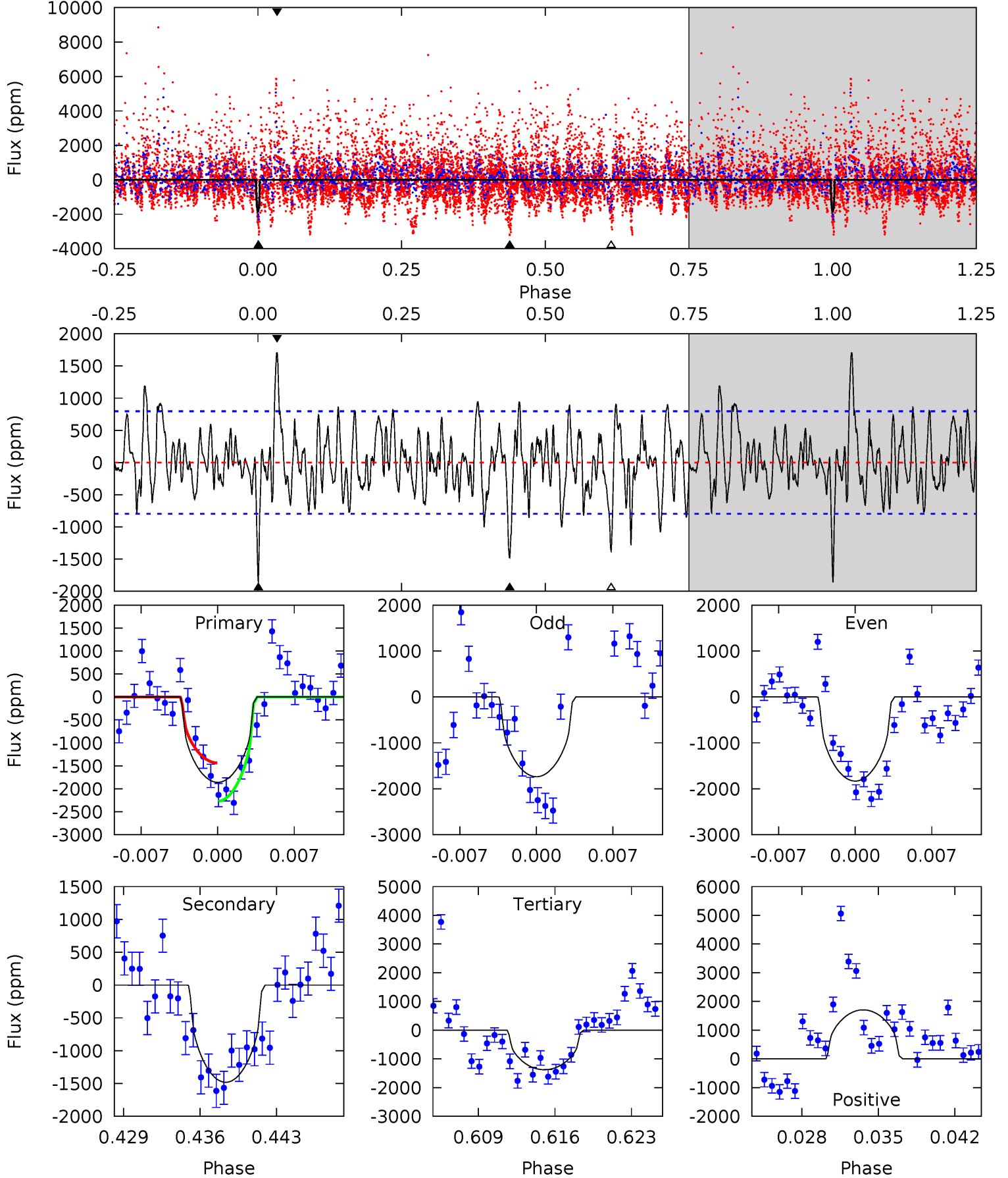
TCE 005716508-04     $P = 64.812173$  Days     $T_0 = 156.781130$  (BKJD)



# DV Model-Shift Uniqueness Test

005716508-04, P = 64.802168 Days, E = 156.846039 Days

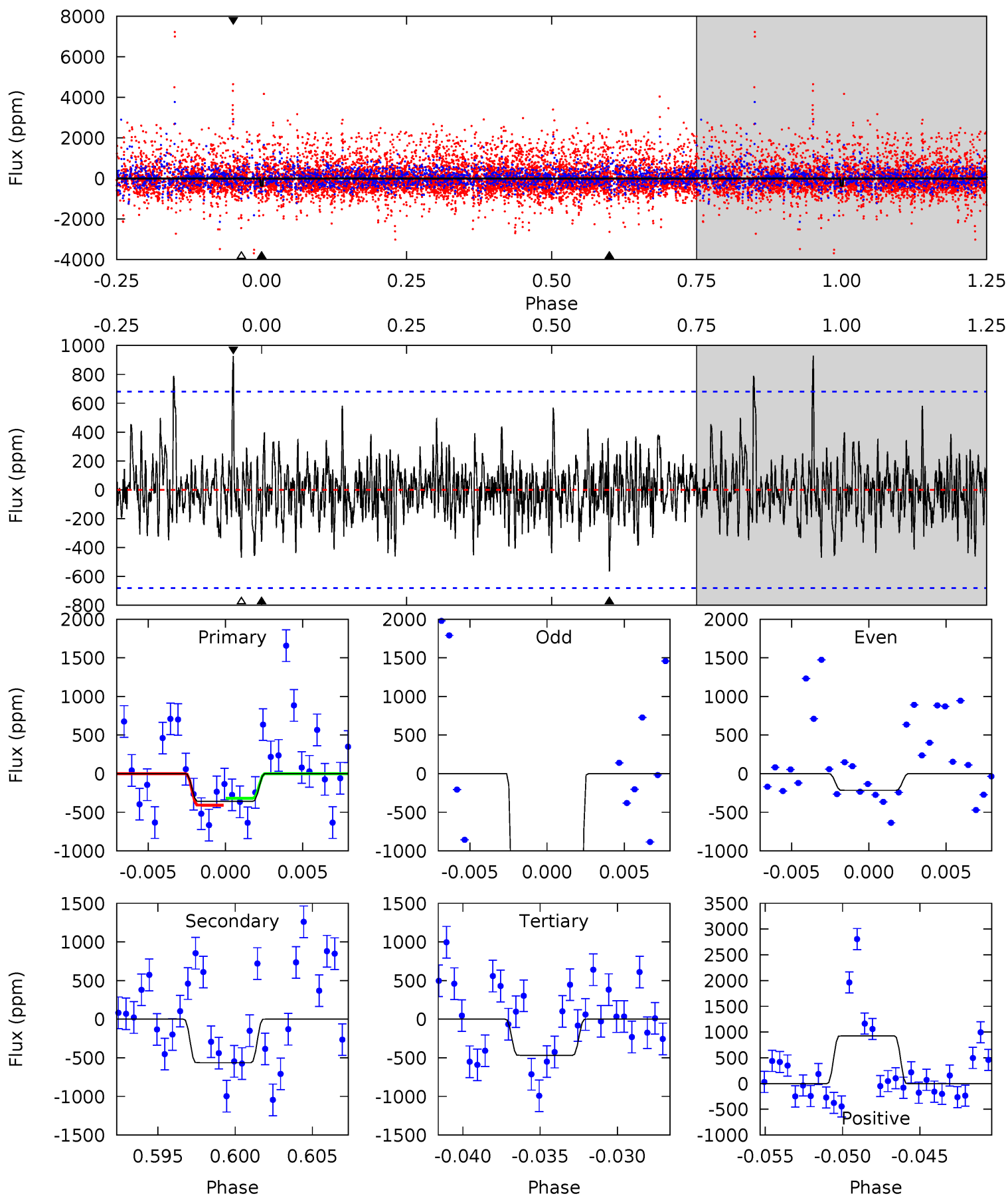
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	9.48	8.82	10.9	5.10	2.70	2.68	3.08	0.97	0.66	-1.44	0.24	1.04	0.48	2.70



# Alt Model-Shift Uniqueness Test

005716508-04, P = 64.812173 Days, E = 156.781130 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
2.72	4.27	3.55	7.03	5.16	2.80	1.22	-0.83	-4.31	0.72	-2.76	24.1	4.04	0.62	0.34



### Stellar Parameters For KIC 005716508

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3486^{+112}_{-112}$	$0.500^{+0.338}_{-0.156}$	$0.360^{+0.100}_{-0.250}$	$180.013^{+25.956}_{-103.825}$	$3.735^{+0.075}_{-2.514}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+68%/-31%	+28%/-69%	+14%/-58%	+2%/-67%	+434%/-35%
Source	KIC0	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 005716508-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1482 \pm 156$	$806.82^{+565.40}_{-469.50}$	$4131^{+283}_{-470}$	$-2187^{+6433}_{-1053}$	$0.290^{+1.259}_{-0.188}$
Alt.	$-564 \pm 132$	$954.88^{+595.18}_{-502.66}$	$4132^{+269}_{-426}$	$-3199^{+5672}_{-247}$	$0.079^{+0.275}_{-0.051}$

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



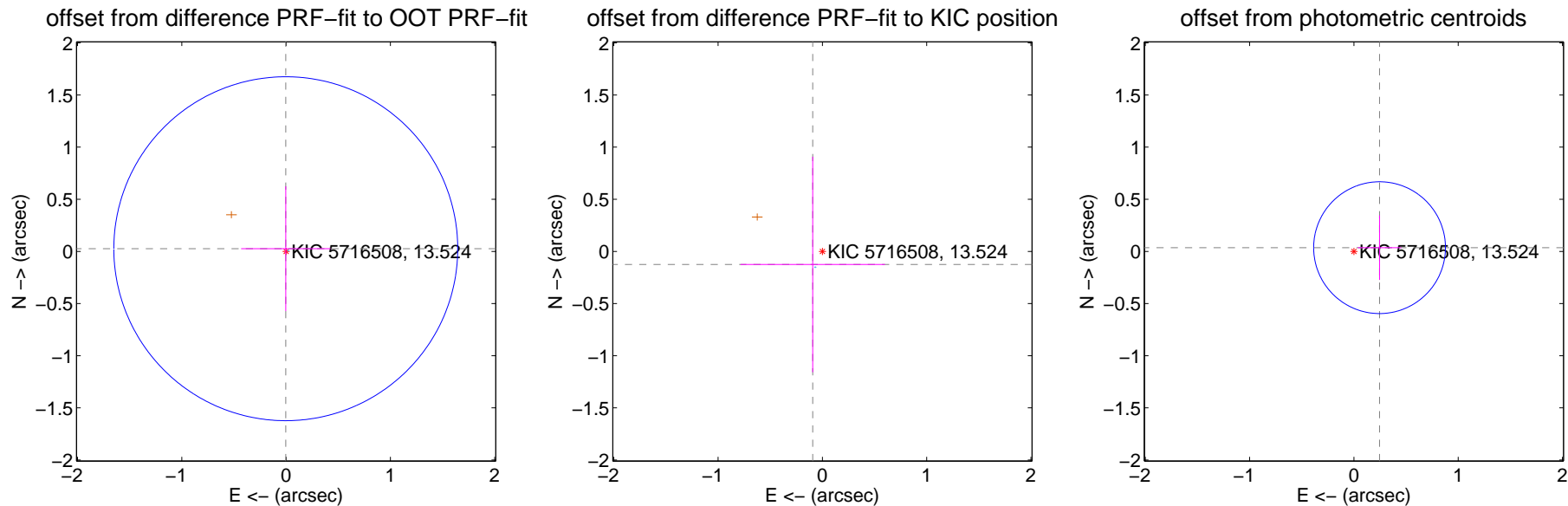
## DV Centroid Data

Supplemental centroid analysis for 005716508-04. Kepler magnitude: 13.52. Transit SNR 7.48

There are 2 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	$0.026 \pm 0.550$	0.05	$0.003 \pm 0.428$	$0.026 \pm 0.598$
PRF-fit source offset from KIC position	$0.156 \pm 1.232$	0.13	$0.093 \pm 0.692$	$-0.125 \pm 1.033$
photometric centroid source offset	$0.25 \pm 0.21$	1.18	$-0.25 \pm 0.21$	$0.04 \pm 0.31$



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.

Q5 no difference image



Q5 no OOT image



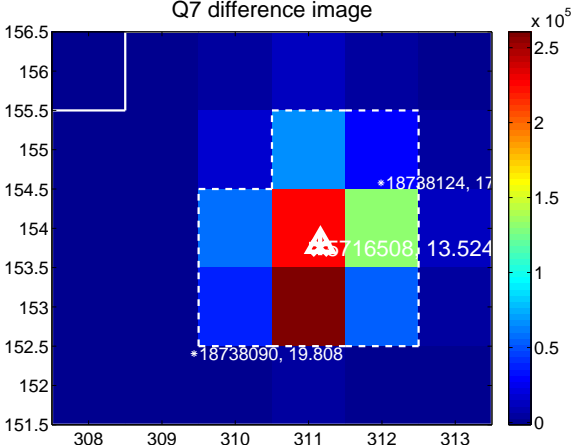
Q6 no difference image



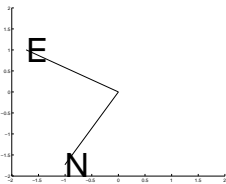
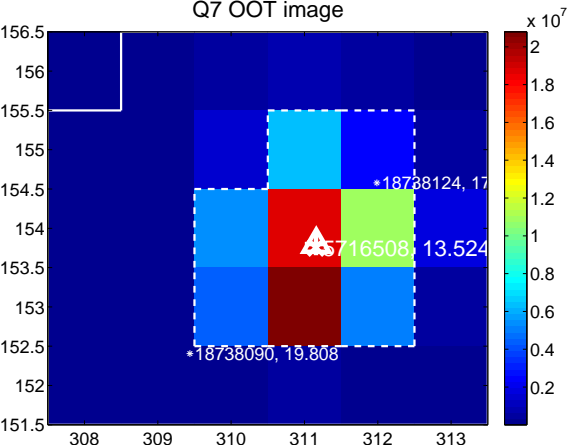
Q6 no OOT image



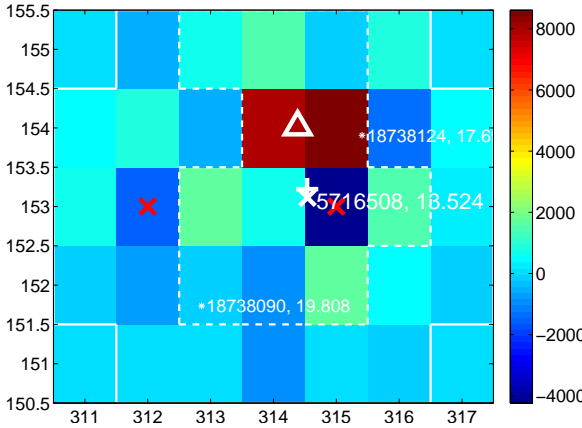
Q7 difference image



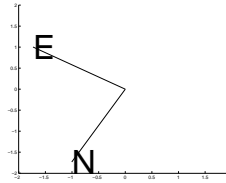
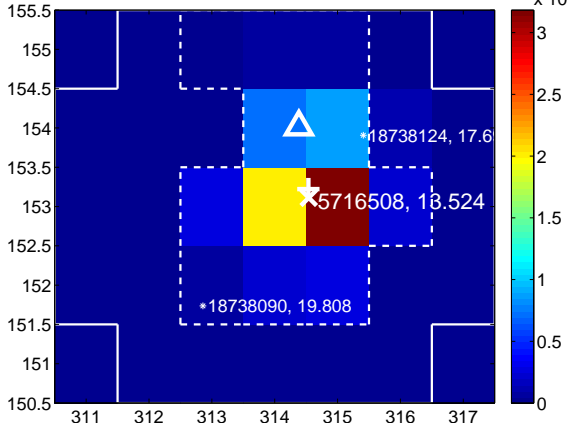
Q7 OOT image



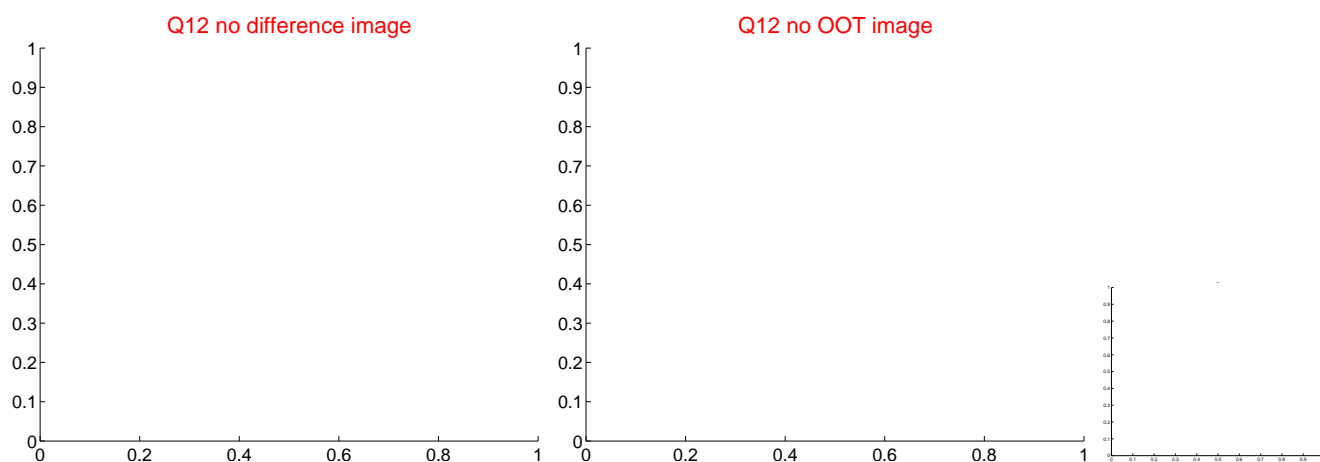
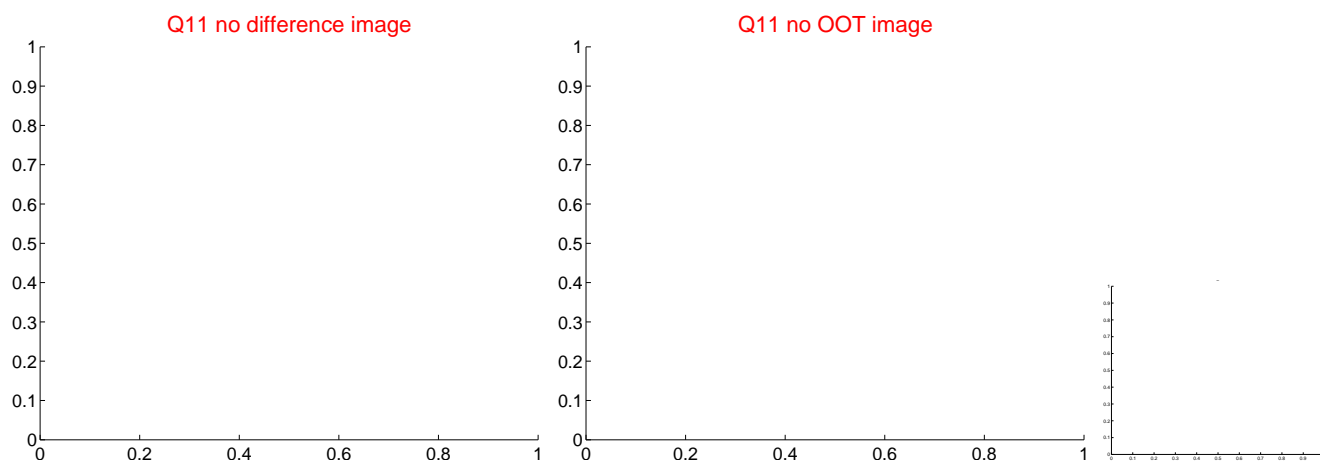
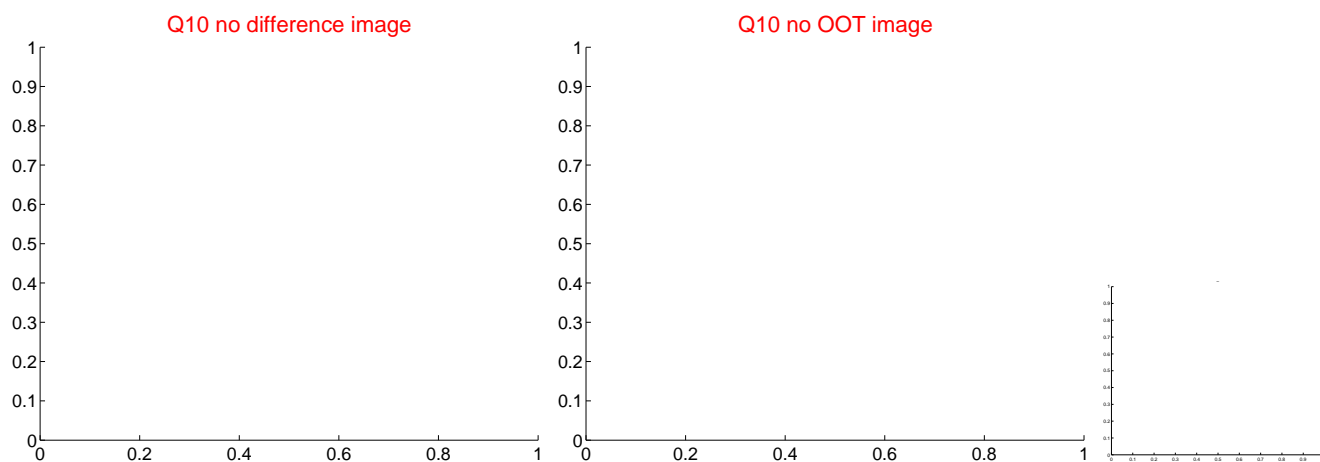
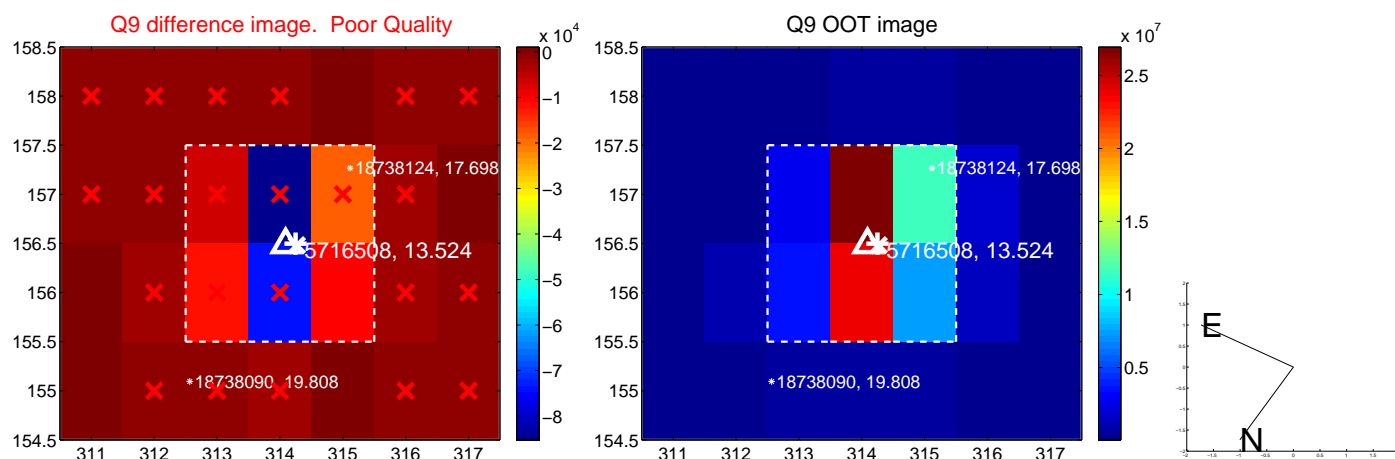
Q8 difference image



Q8 OOT image



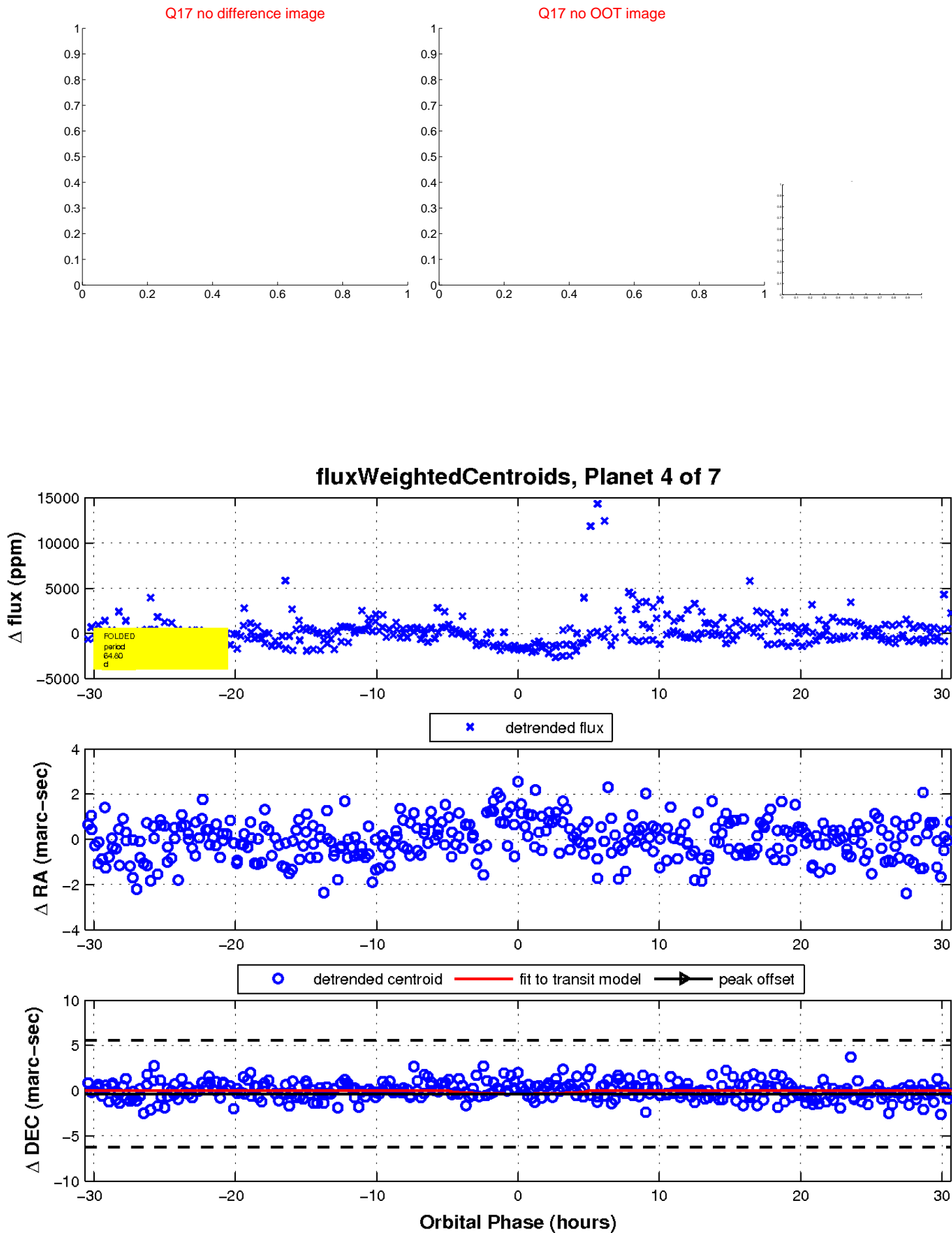
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



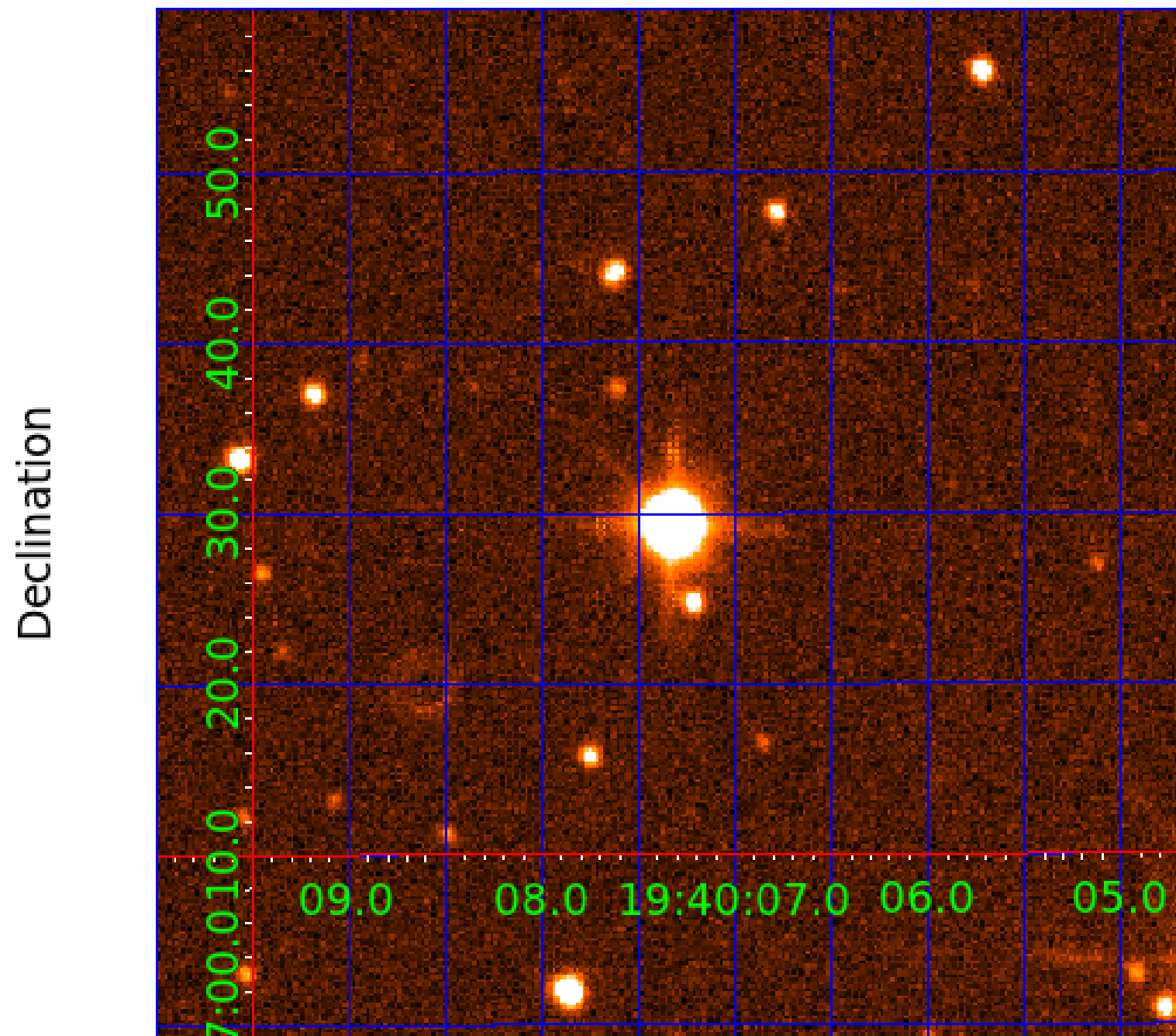
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005716508

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005716508-01	OBS	No	80.022023	139.478721	1812.0	6.599	12.4	4.8	180.01	3486	822.92	0.00
005716508-02	OBS	No	128.877360	256.656319	1709.2	4.633	11.2	5.5	180.01	3486	685.84	0.00
005716508-03	OBS	No	4.863178	134.225462	449.5	4.889	8.9	5.7	180.01	3486	533.38	0.00
005716508-04	OBS	No	64.802168	156.846039	2521.1	10.213	11.3	7.5	180.01	3486	830.71	0.00
005716508-05	OBS	No	12.090645	140.492474	829.4	3.280	9.2	6.0	180.01	3486	595.34	0.00
005716508-06	OBS	No	38.495224	157.141282	1910.2	2.390	10.3	9.1	180.01	3486	812.46	0.00
005716508-07	OBS	7737.01	4.753079	134.546213	542.6	2.352	8.9	5.9	180.01	3486	664.20	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005716508-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005716508-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
005716508-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-06	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT

**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.

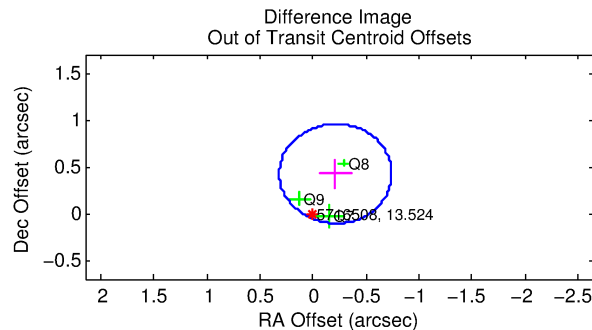
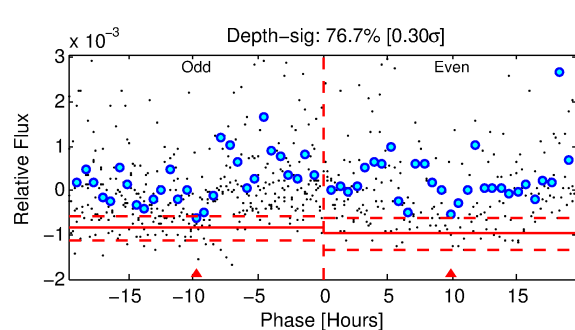
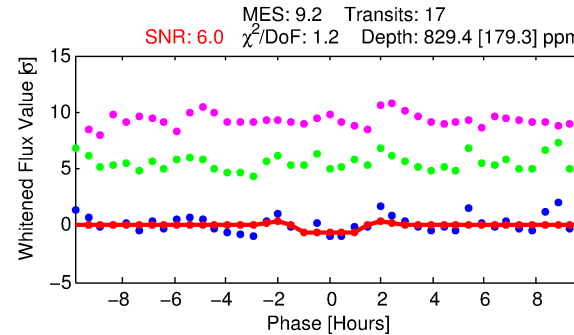
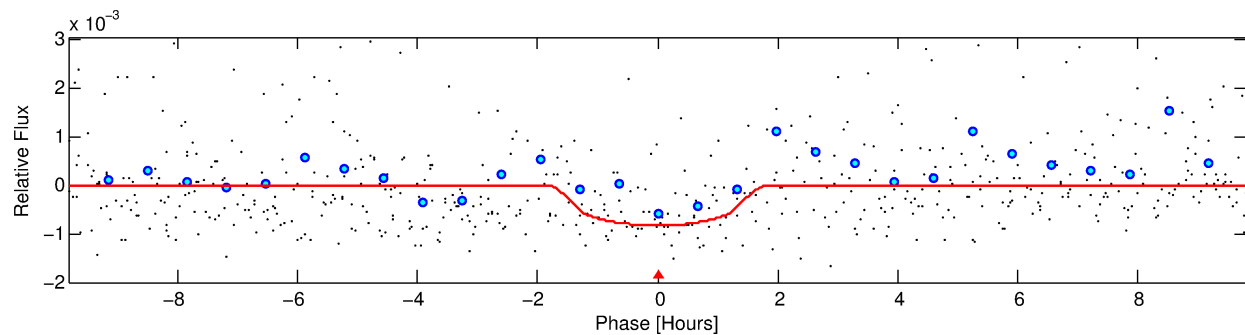
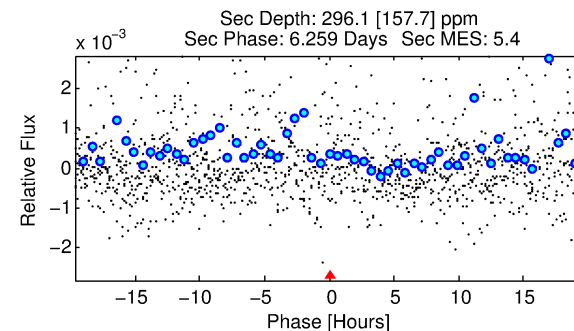
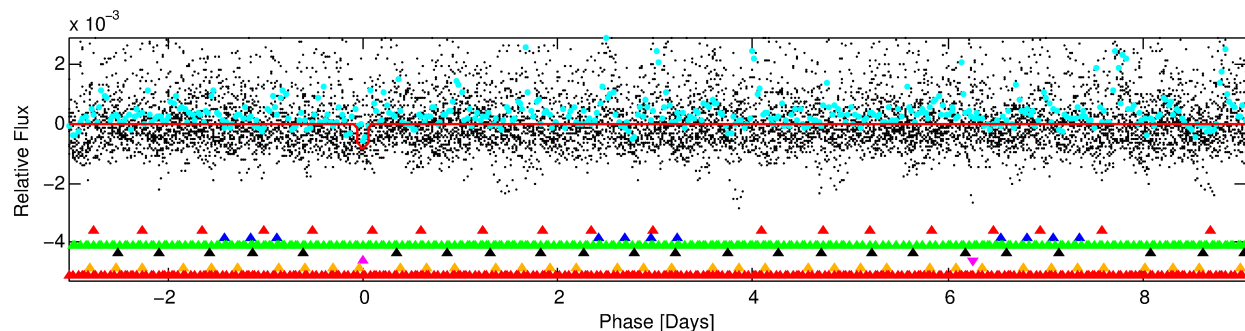
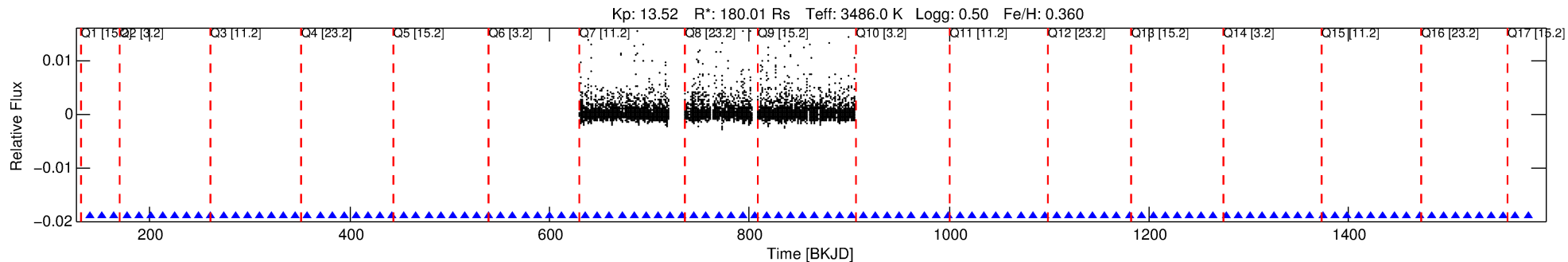
Ephemeris Match Information For 005716508-05

No Significant Match Found



# DV One-Page Summary

KIC: 5716508 Candidate: 5 of 7 Period: 12.091 d



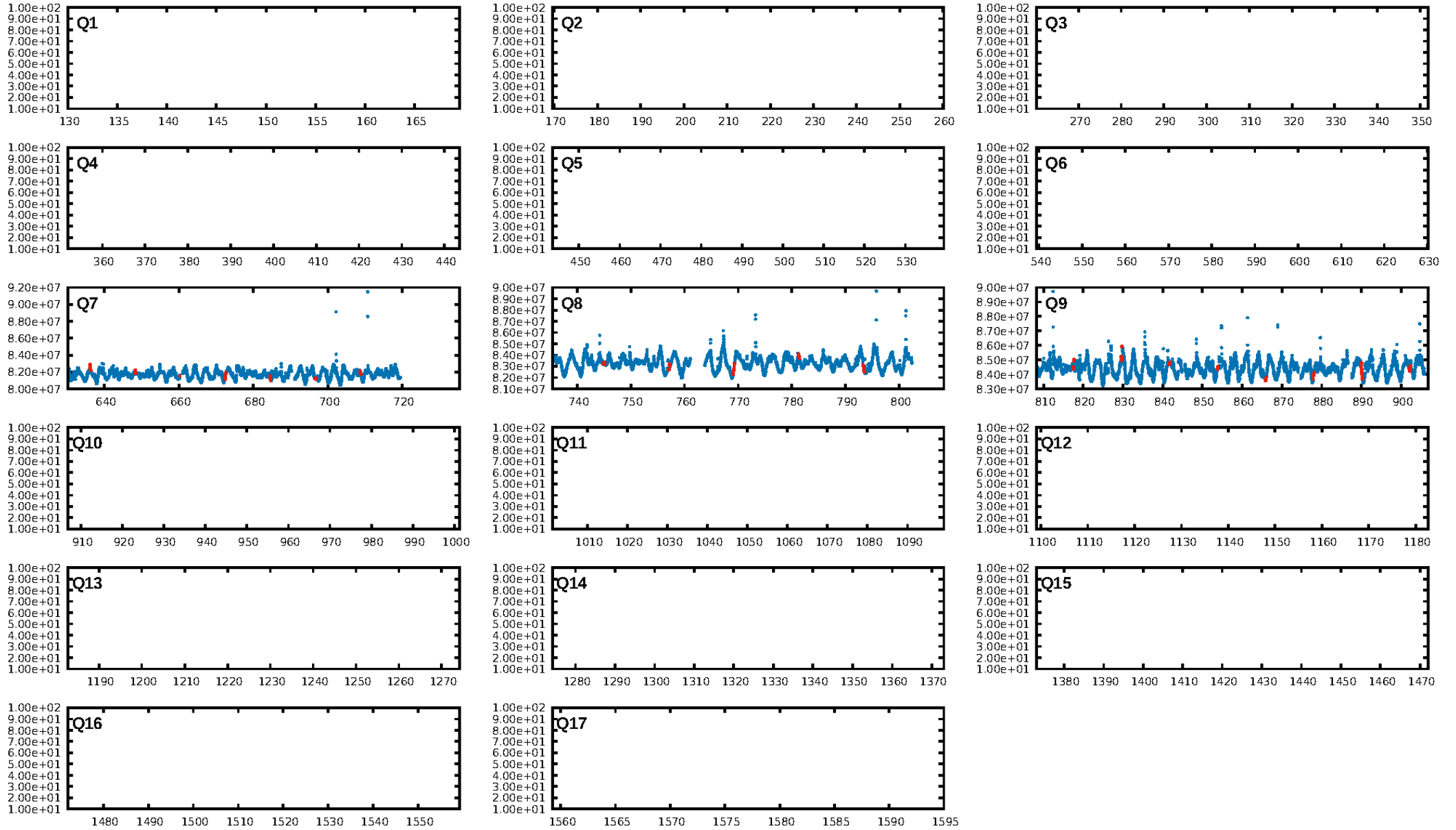
## DV Fit Results:

Period = 12.09065 [0.00064] d  
Epoch = 140.4925 [0.0328] BKJD  
Rp/R\* = 0.0303 [0.0264]  
a/R\* = 18.34 [41.84]  
b = 0.80 [1.08]  
Seff = N/A  
Teq = N/A  
Rp = 595.34 [621.33] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

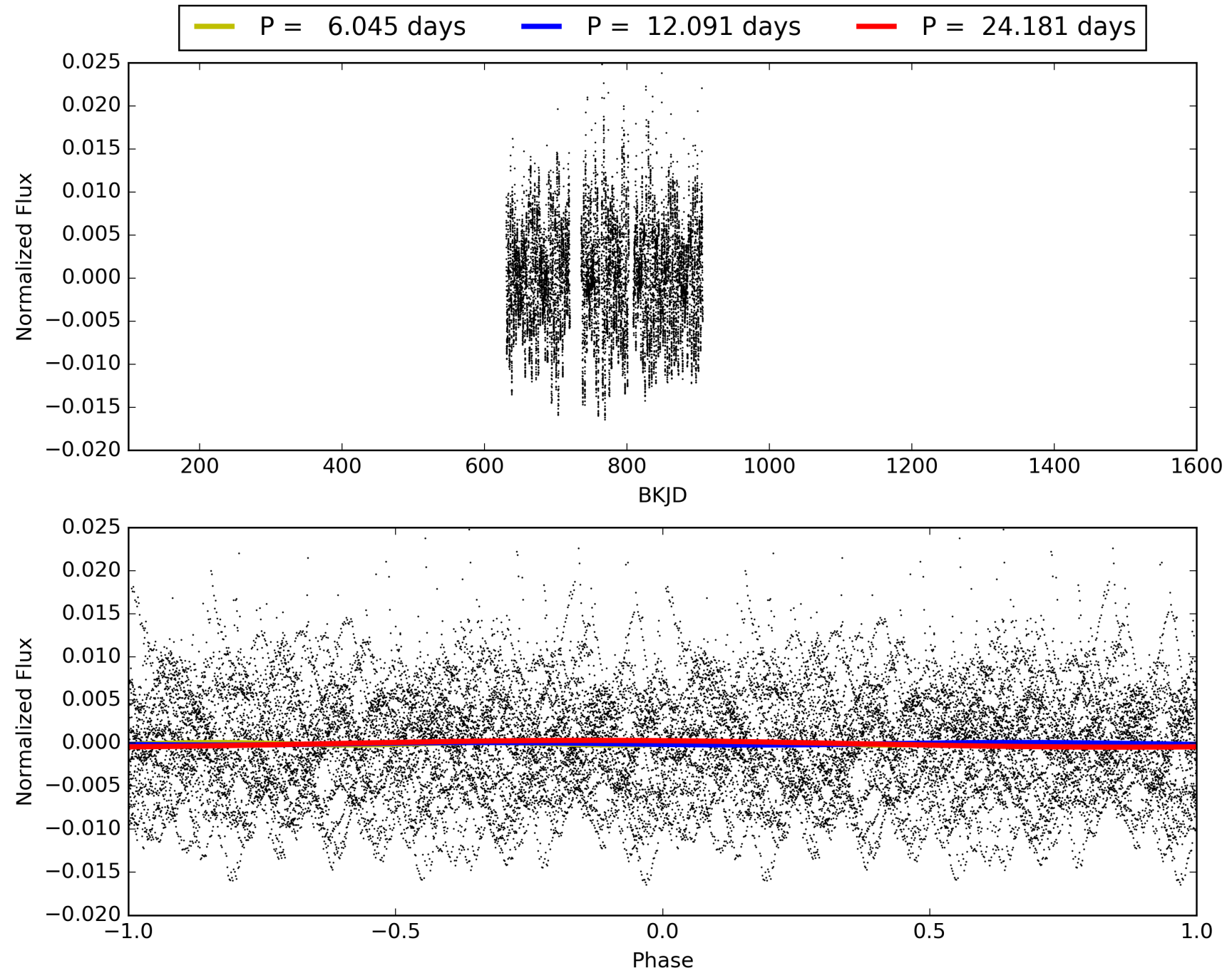
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [29.46σ]  
LongPeriod-sig: 100.0% [156.15σ]  
ModelChiSquare2-sig: 19.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.32e-09  
RollingBand-fgt: 1.00 [17/17]  
GhostDiagnostic-chr: -9.502  
Centroid-sig: N/A  
Centroid-so: 0.206 arcsec [0.56σ]  
OotOffset-rm: 0.474 arcsec [2.68σ]  
KicOffset-rm: 0.177 arcsec [1.44σ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 005716508-05, PDC Light Curves

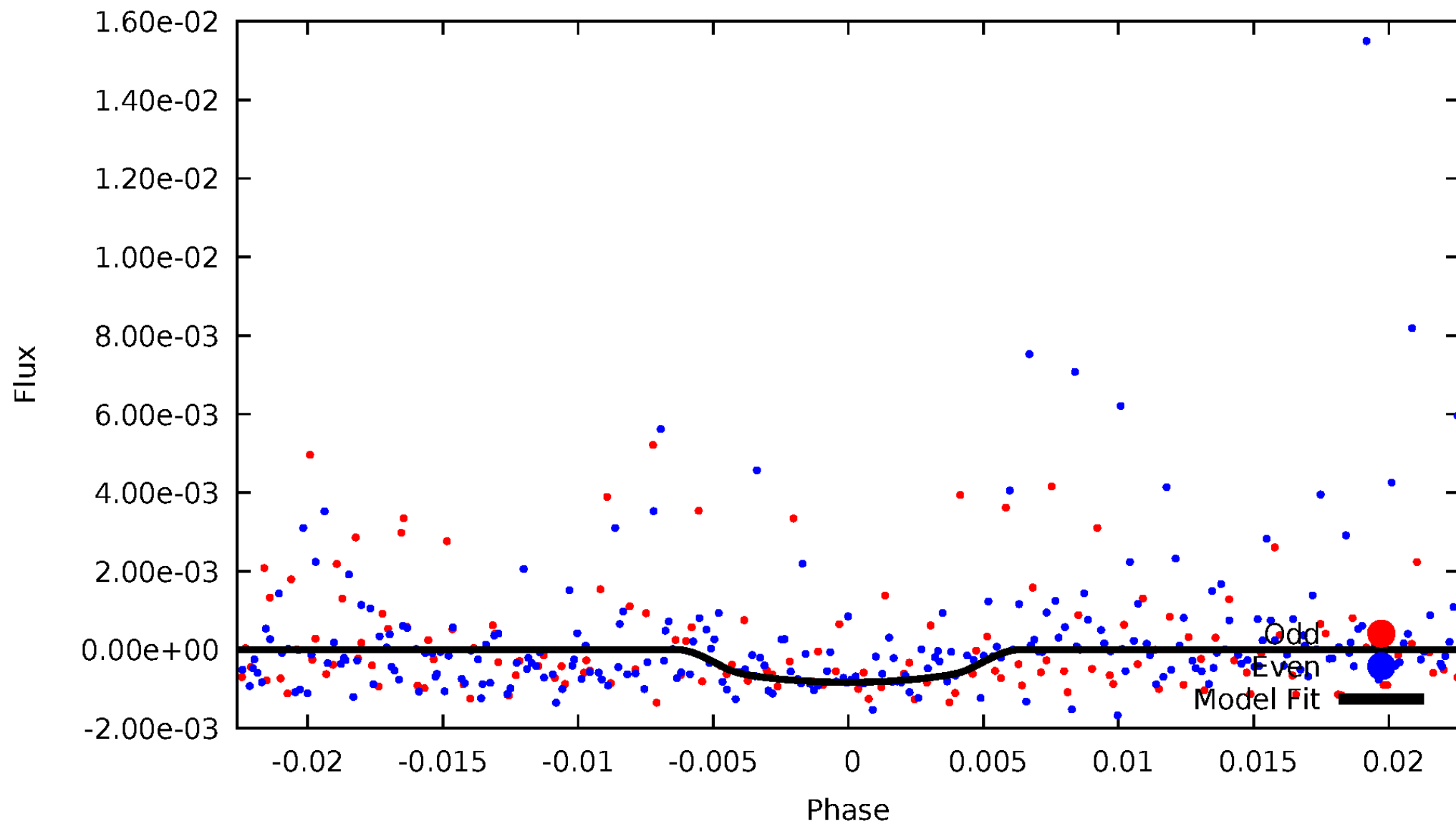


TCE 005716508-05



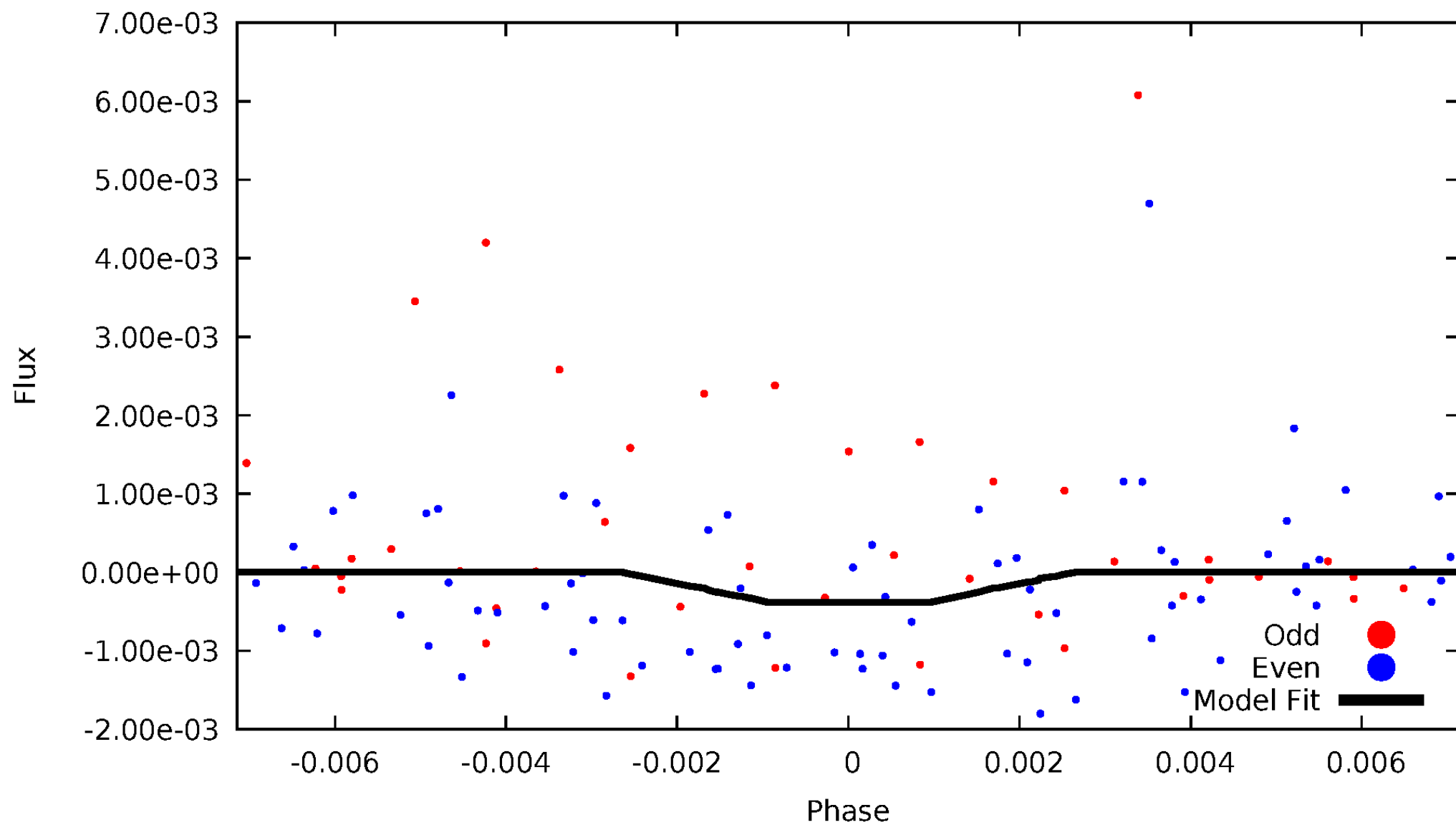
# DV Odd/Even

TCE 005716508-05



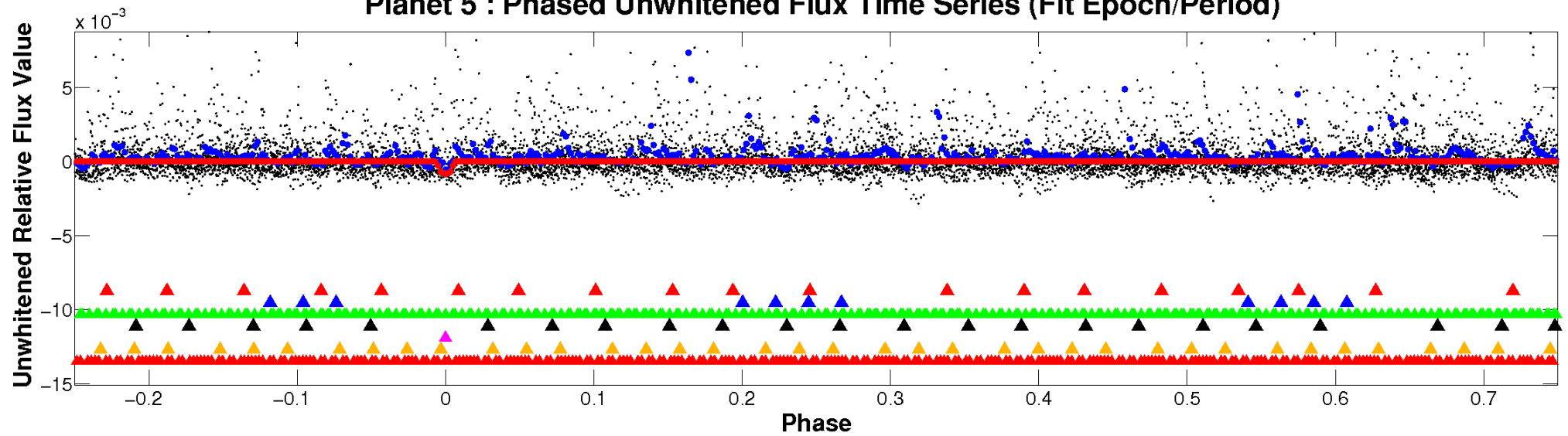
# ALT Odd/Even

TCE 005716508-05

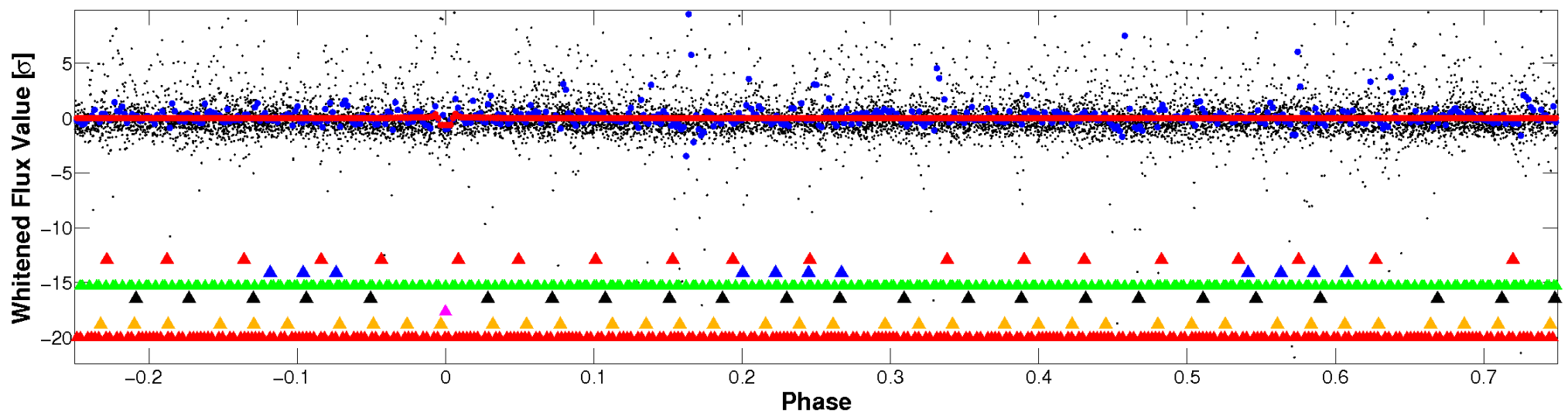


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



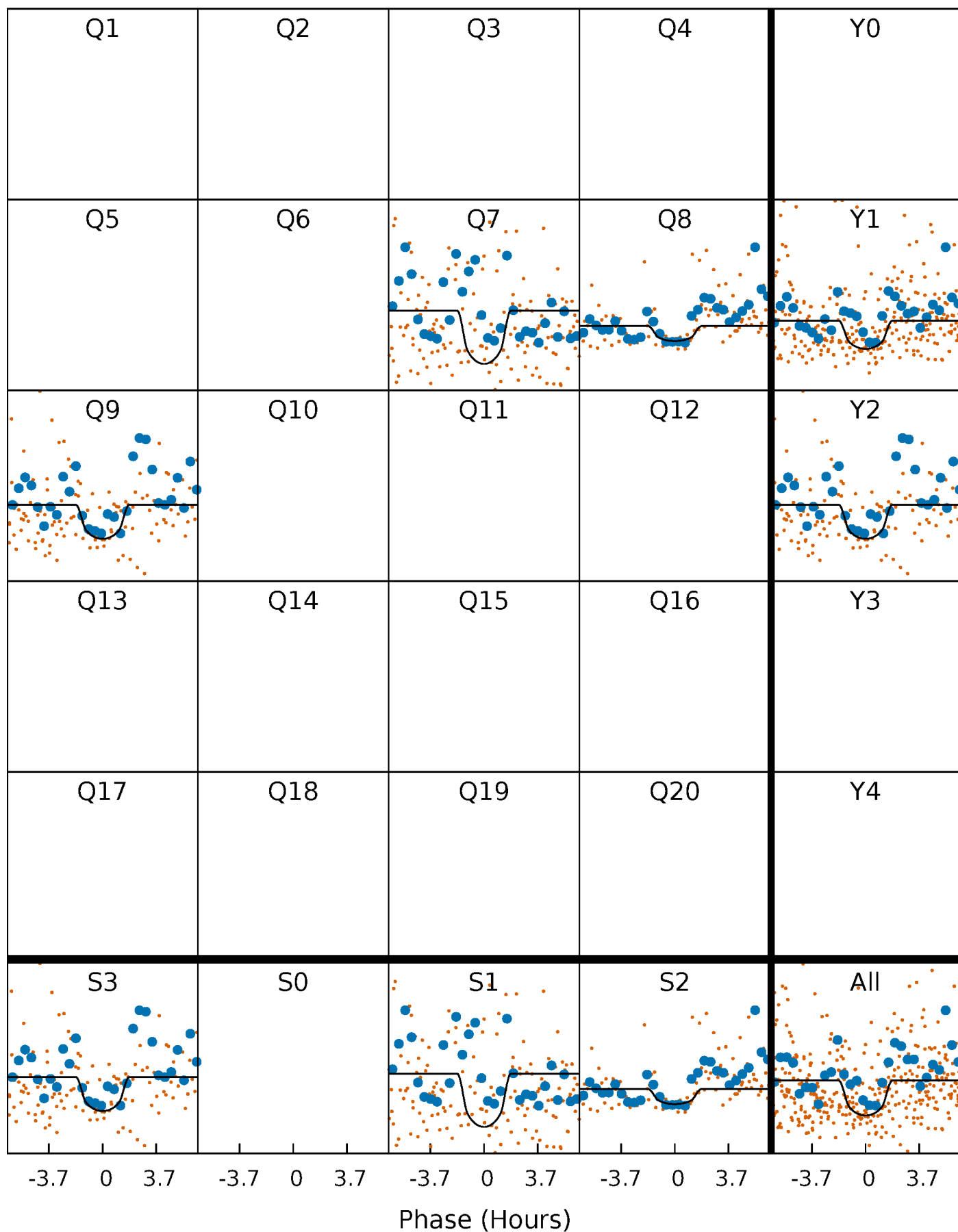
# PDC Quarter-Phased Transit Curves

TCE 005716508-05   P= 12.090645 Days    $T_0=140.492474$  (BKJD)



# DV Quarter-Phased Transit Curves

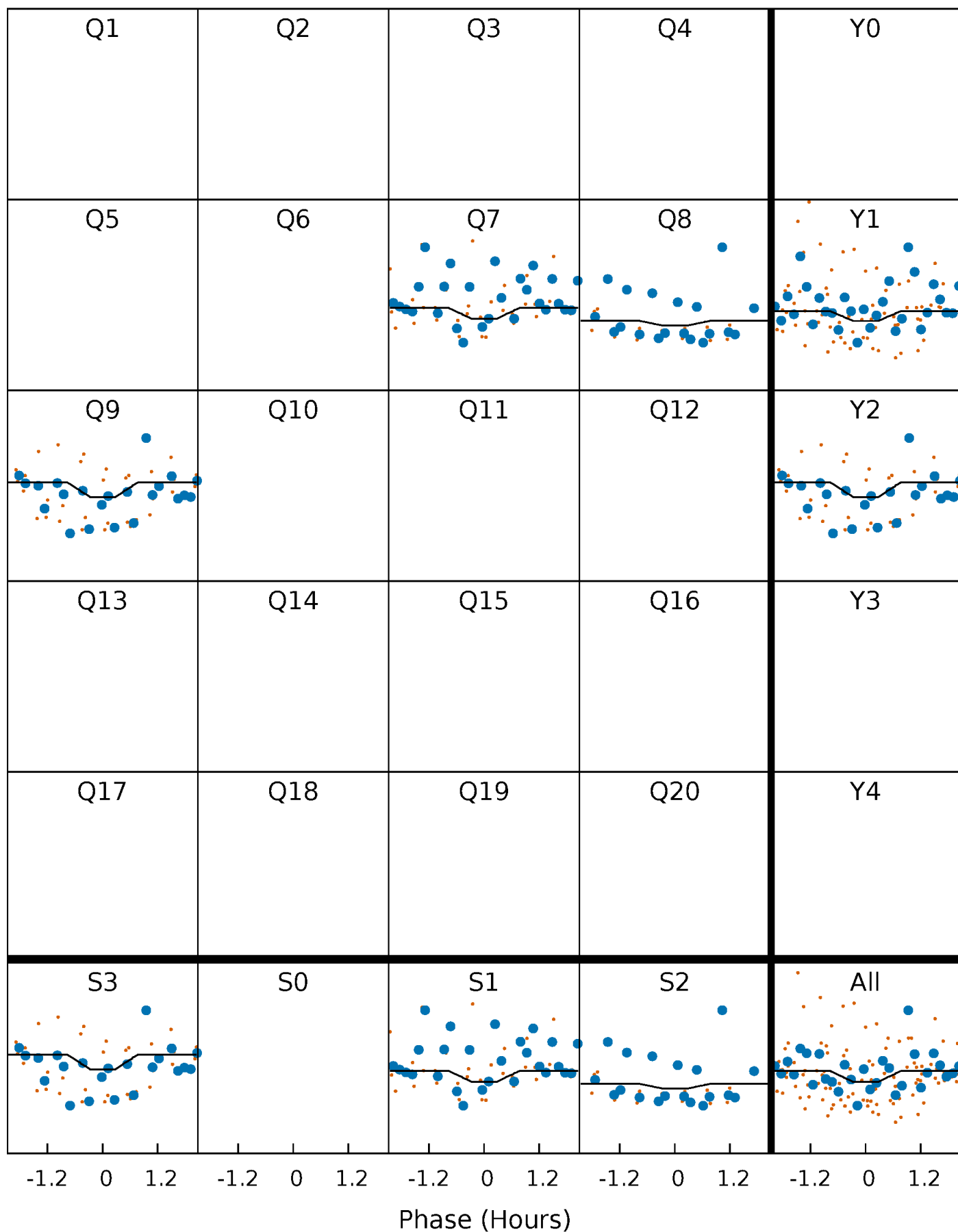
TCE 005716508-05     $P = 12.090645$  Days     $T_0 = 140.492474$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

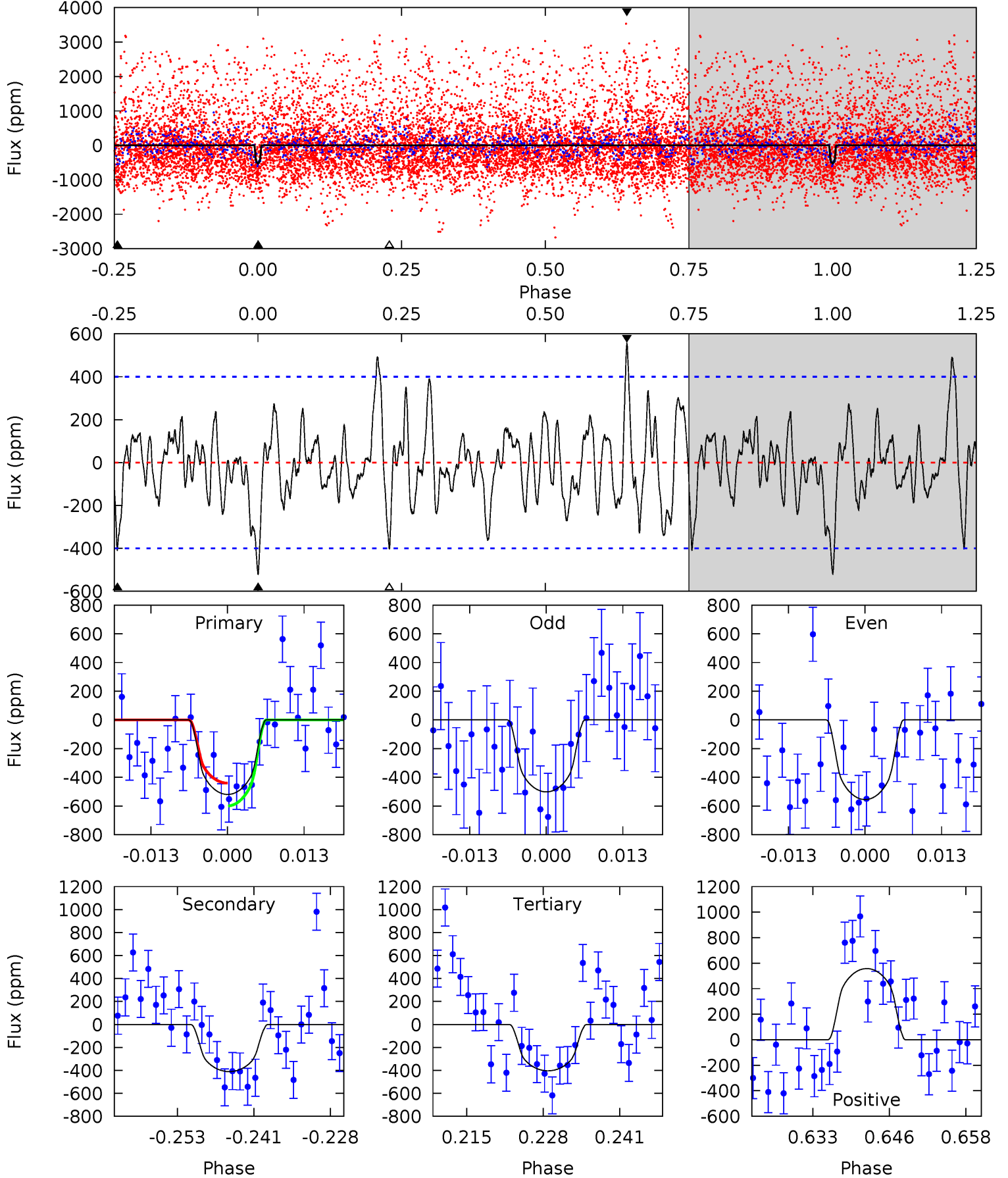
TCE 005716508-05     $P = 12.087707$  Days     $T_0 = 140.651437$  (BKJD)



# DV Model-Shift Uniqueness Test

005716508-05, P = 12.090645 Days, E = 140.492474 Days

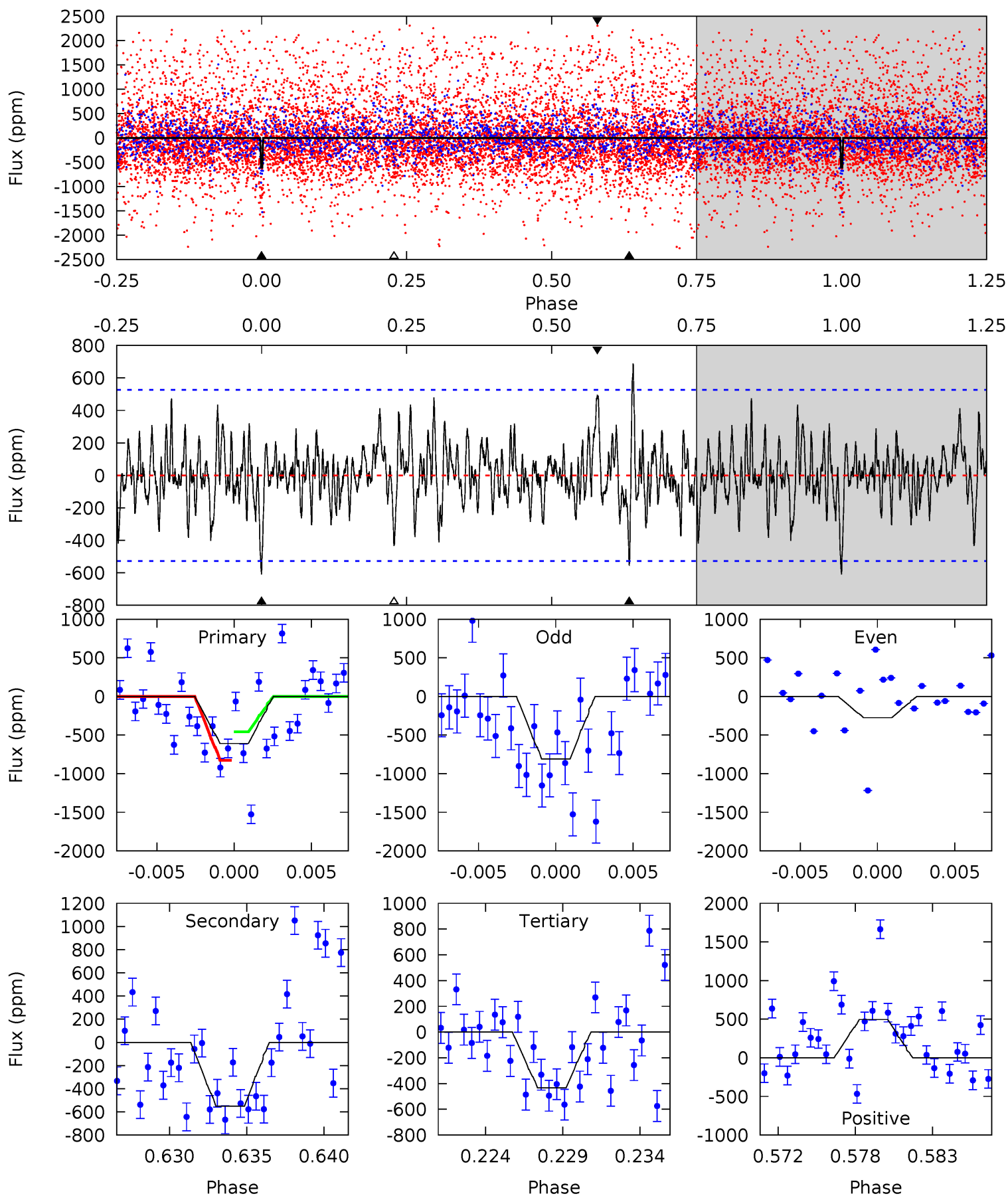
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.47	5.12	5.03	6.94	4.98	2.49	1.90	1.44	-0.48	0.09	-1.83	0.32	0.57	0.52	1.01



# Alt Model-Shift Uniqueness Test

005716508-05, P = 12.087707 Days, E = 140.651437 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
5.95	5.39	4.24	4.84	5.15	2.79	1.50	1.71	1.11	1.15	0.55	2.55	0.61	0.53	1.79



### Stellar Parameters For KIC 005716508

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3486^{+112}_{-112}$	$0.500^{+0.338}_{-0.156}$	$0.360^{+0.100}_{-0.250}$	$180.013^{+25.956}_{-103.825}$	$3.735^{+0.075}_{-2.514}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+68%/-31%	+28%/-69%	+14%/-58%	+2%/-67%	+434%/-35%
Source	KIC0	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 005716508-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	-411 $\pm$ 80	$632.68^{+507.39}_{-374.40}$	$7245^{+455}_{-805}$	$-4998^{+693}_{-416}$	$0.013^{+0.068}_{-0.009}$
Alt.	-552 $\pm$ 102	$480.47^{+441.31}_{-322.91}$	$7226^{+457}_{-830}$	$-4867^{+1701}_{-469}$	$0.030^{+0.236}_{-0.022}$

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

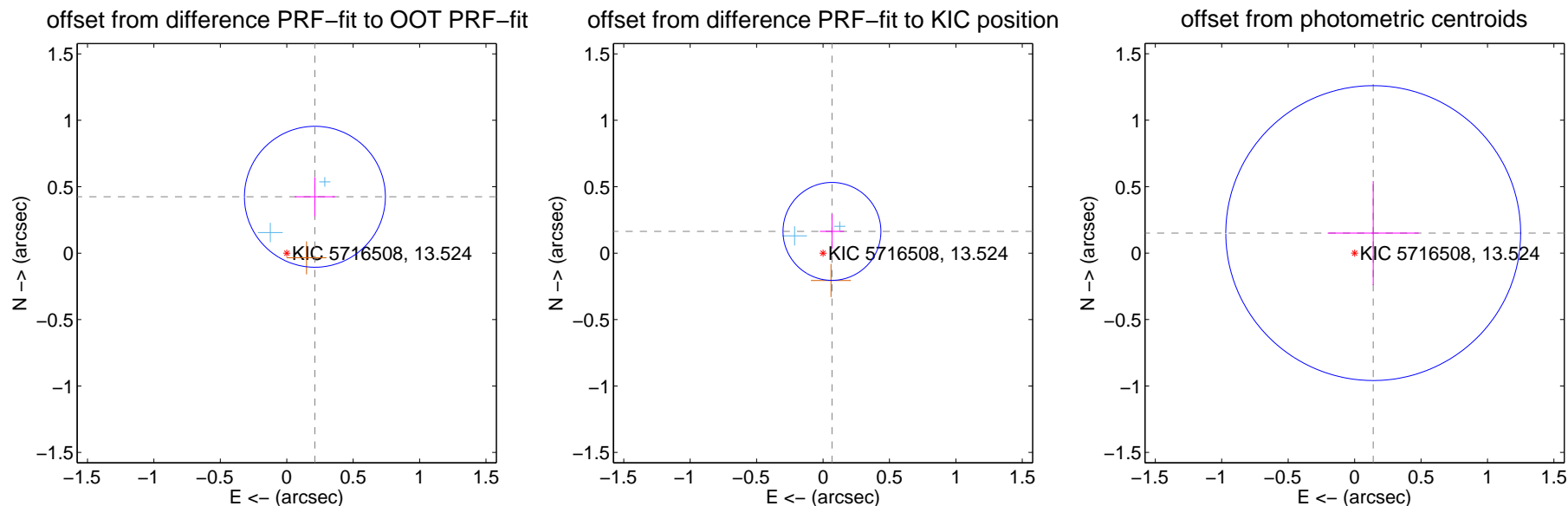
## DV Centroid Data

Supplemental centroid analysis for 005716508-05. Kepler magnitude: 13.52. Transit SNR 5.95

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.474 \pm 0.177$	2.68	$-0.212 \pm 0.152$	$0.424 \pm 0.147$
PRF-fit source offset from KIC position	$0.177 \pm 0.123$	1.44	$-0.067 \pm 0.090$	$0.164 \pm 0.130$
photometric centroid source offset	$0.21 \pm 0.37$	0.56	$-0.14 \pm 0.34$	$0.15 \pm 0.39$

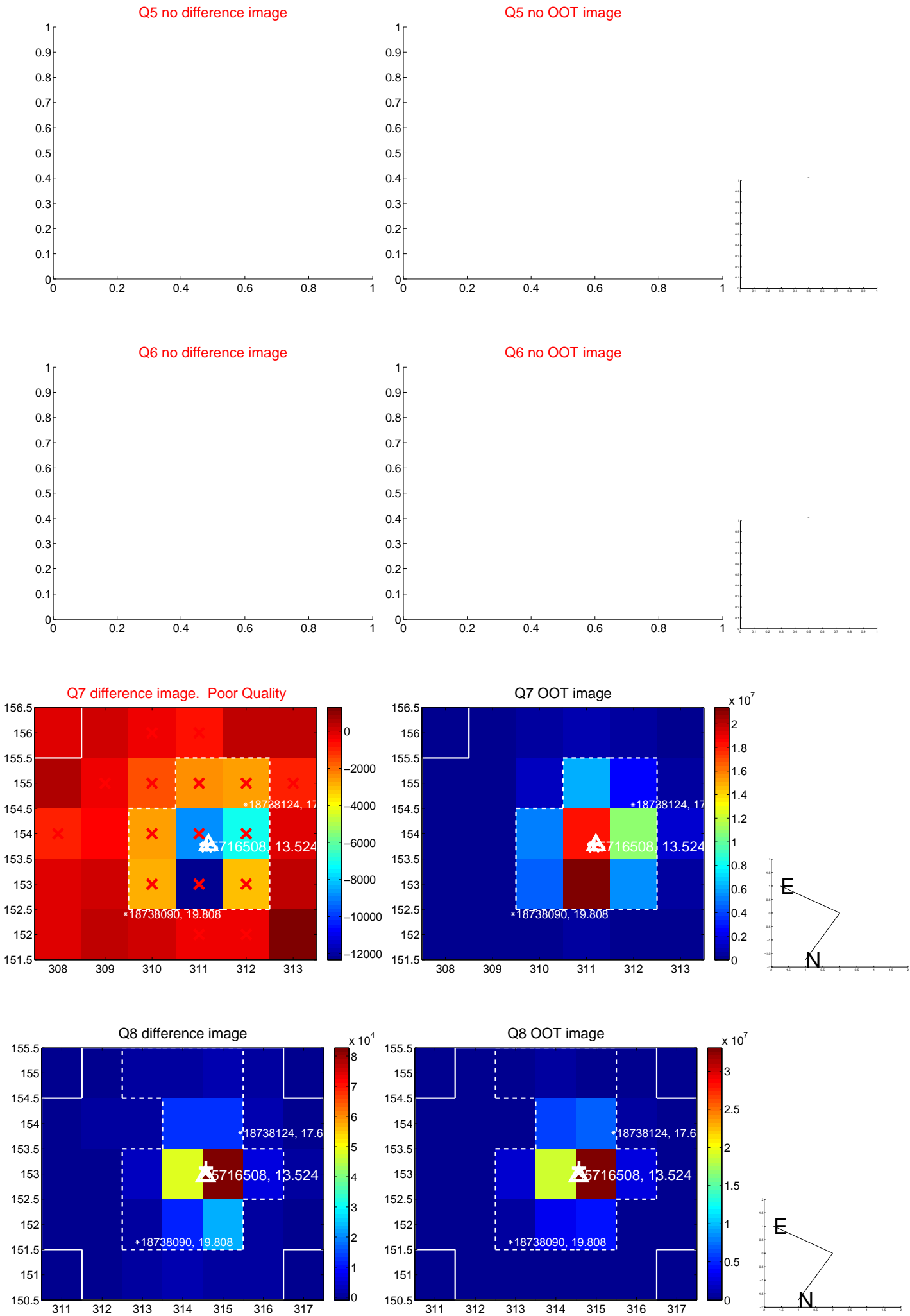


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

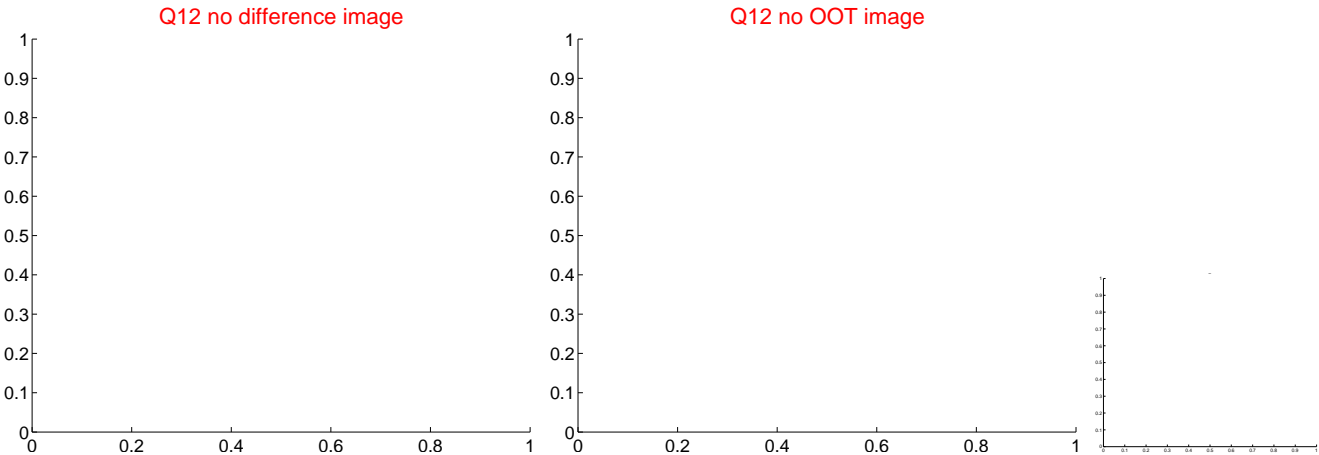
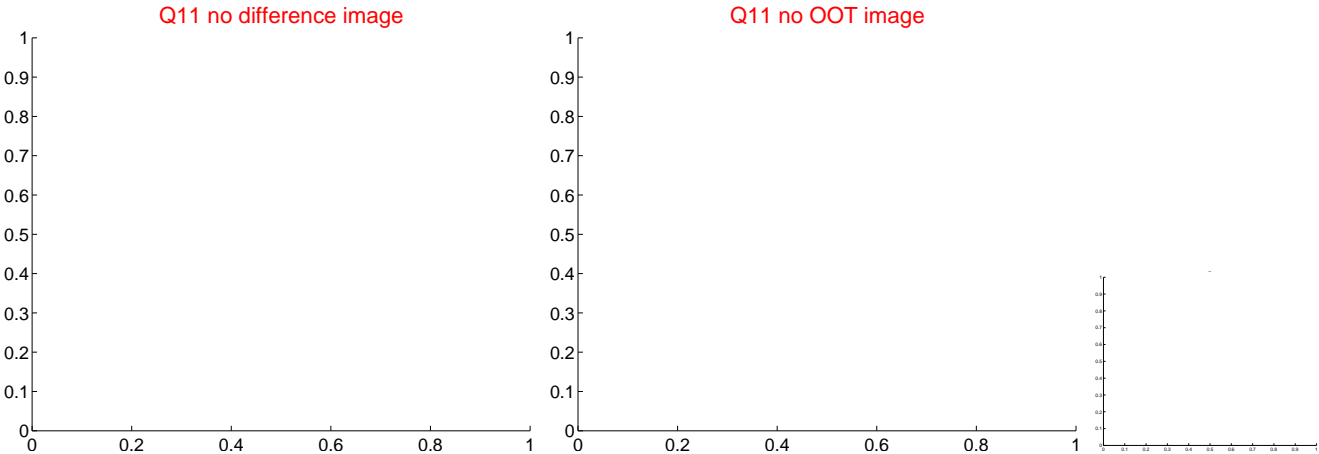
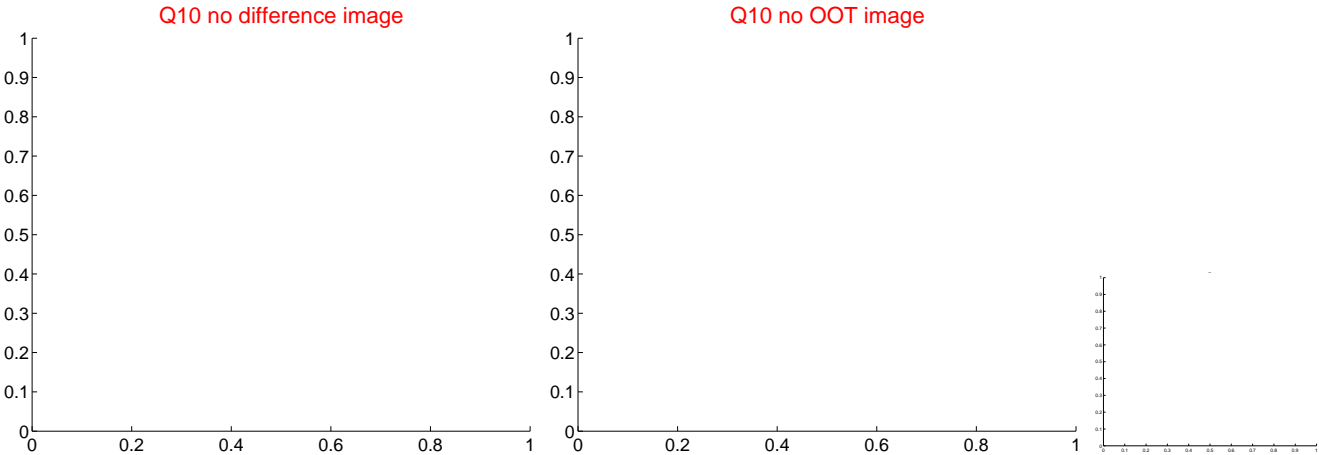
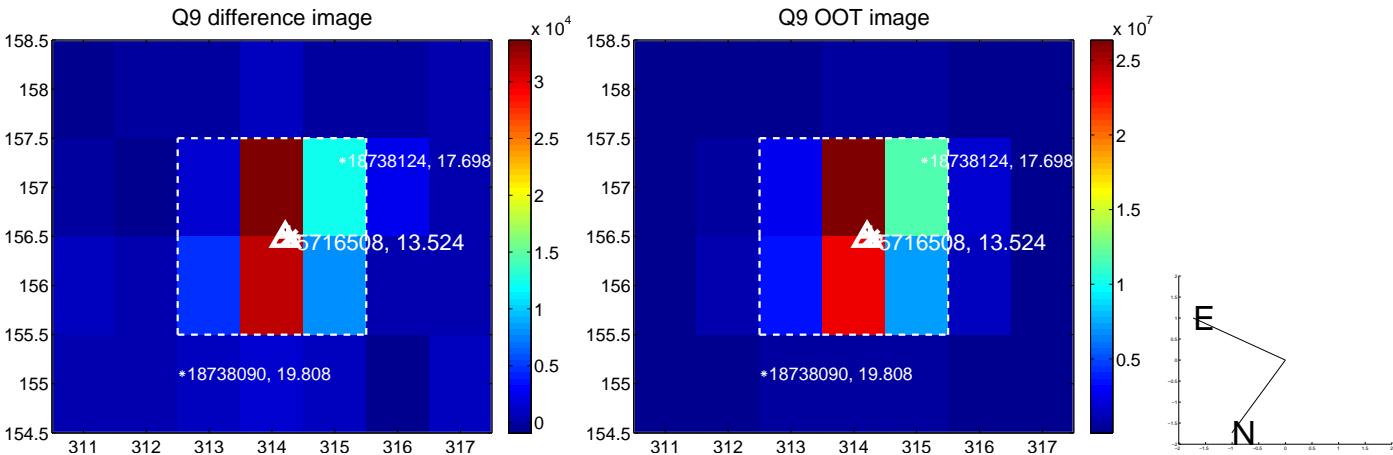
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

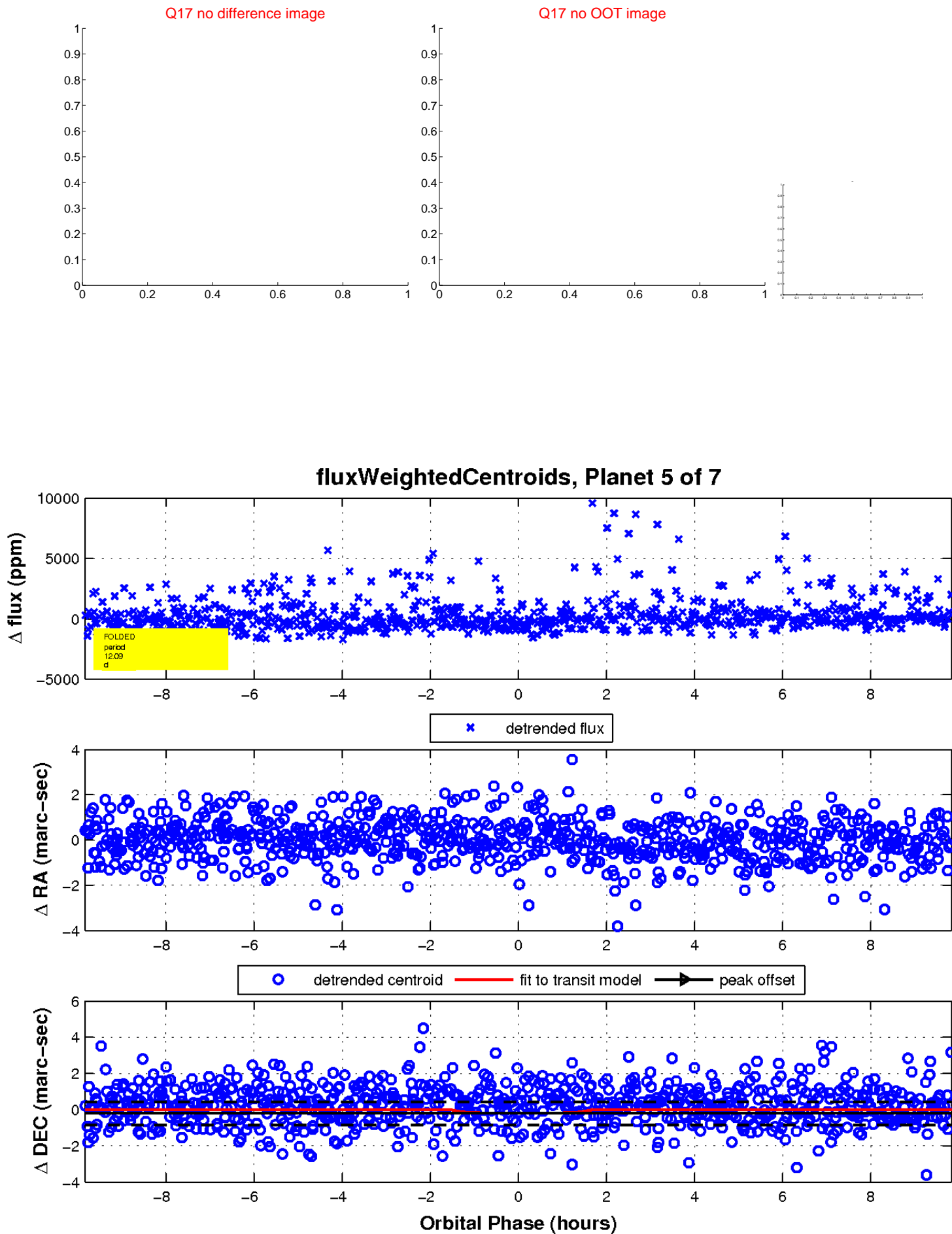




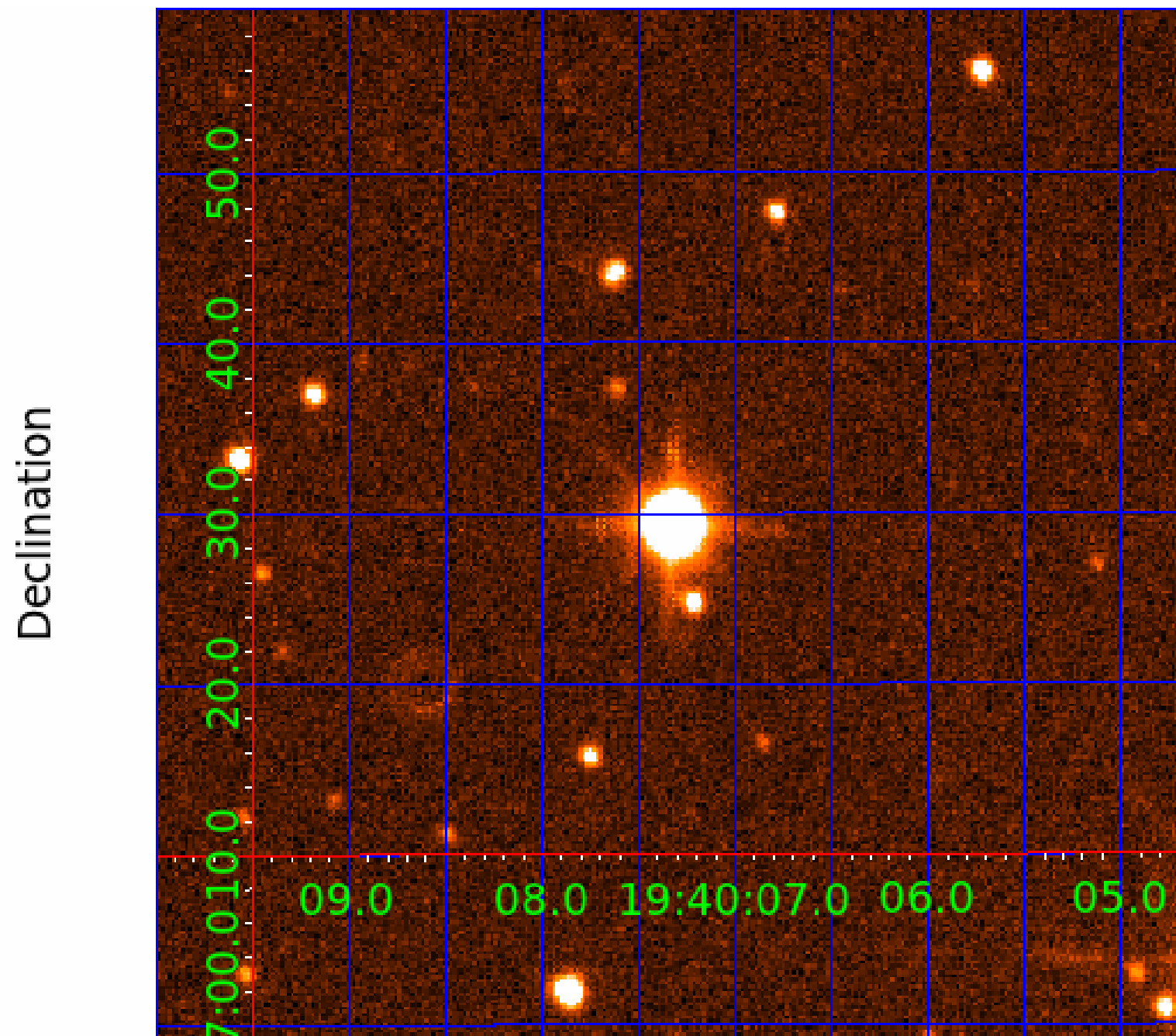
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005716508

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005716508-01	OBS	No	80.022023	139.478721	1812.0	6.599	12.4	4.8	180.01	3486	822.92	0.00
005716508-02	OBS	No	128.877360	256.656319	1709.2	4.633	11.2	5.5	180.01	3486	685.84	0.00
005716508-03	OBS	No	4.863178	134.225462	449.5	4.889	8.9	5.7	180.01	3486	533.38	0.00
005716508-04	OBS	No	64.802168	156.846039	2521.1	10.213	11.3	7.5	180.01	3486	830.71	0.00
005716508-05	OBS	No	12.090645	140.492474	829.4	3.280	9.2	6.0	180.01	3486	595.34	0.00
005716508-06	OBS	No	38.495224	157.141282	1910.2	2.390	10.3	9.1	180.01	3486	812.46	0.00
005716508-07	OBS	7737.01	4.753079	134.546213	542.6	2.352	8.9	5.9	180.01	3486	664.20	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005716508-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005716508-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
005716508-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-06	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT

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

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

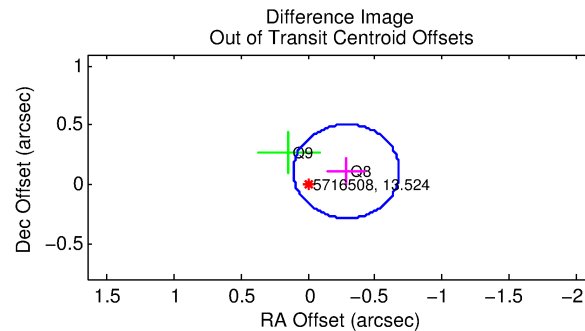
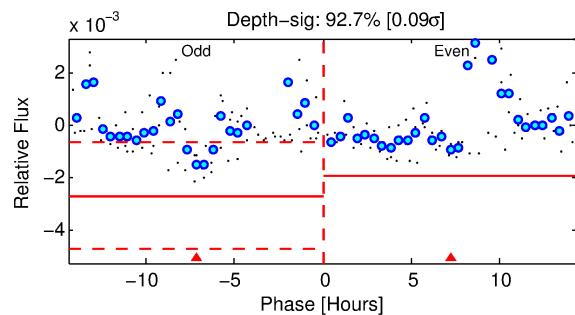
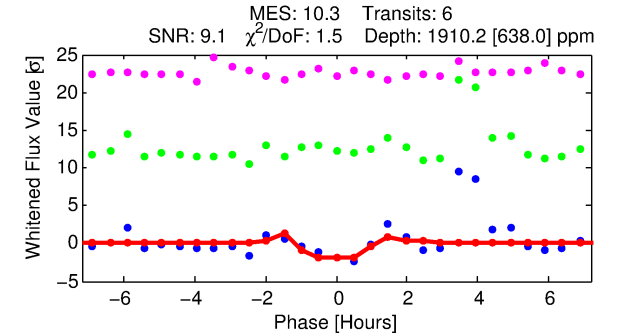
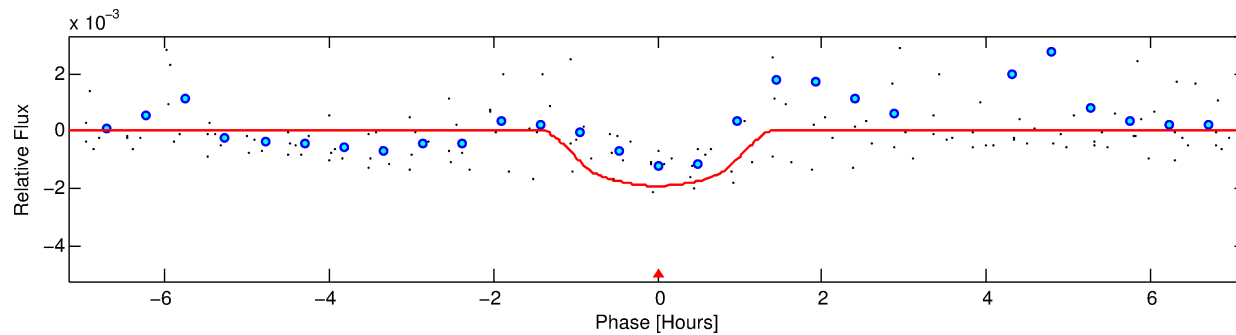
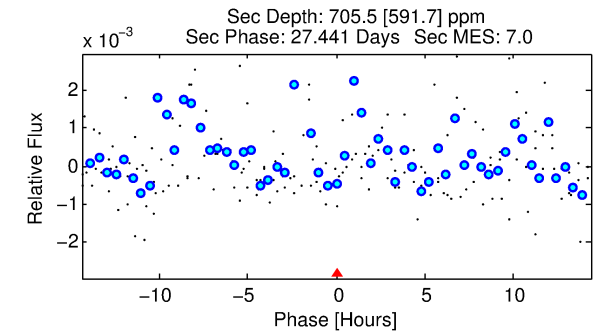
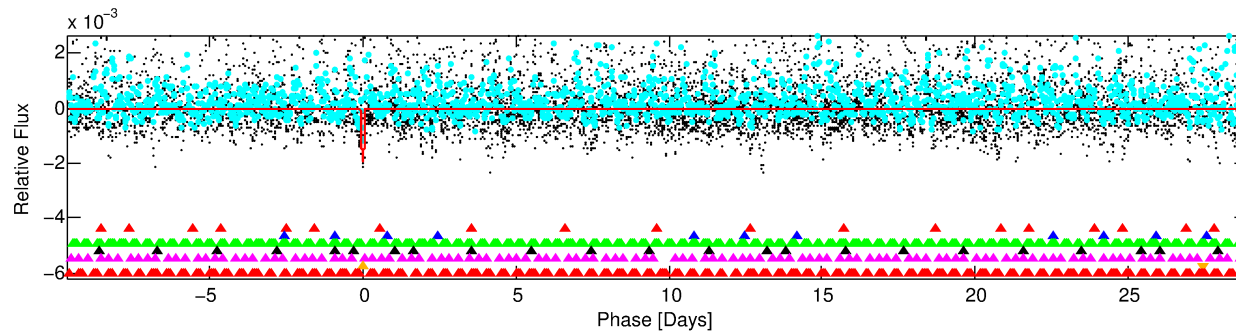
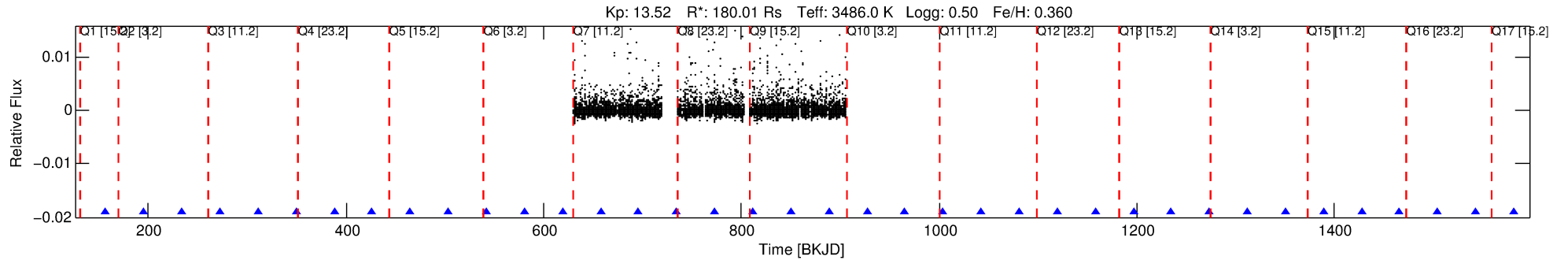
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005716508-06

No Significant Match Found

# DV One-Page Summary

KIC: 5716508 Candidate: 6 of 7 Period: 38.495 d



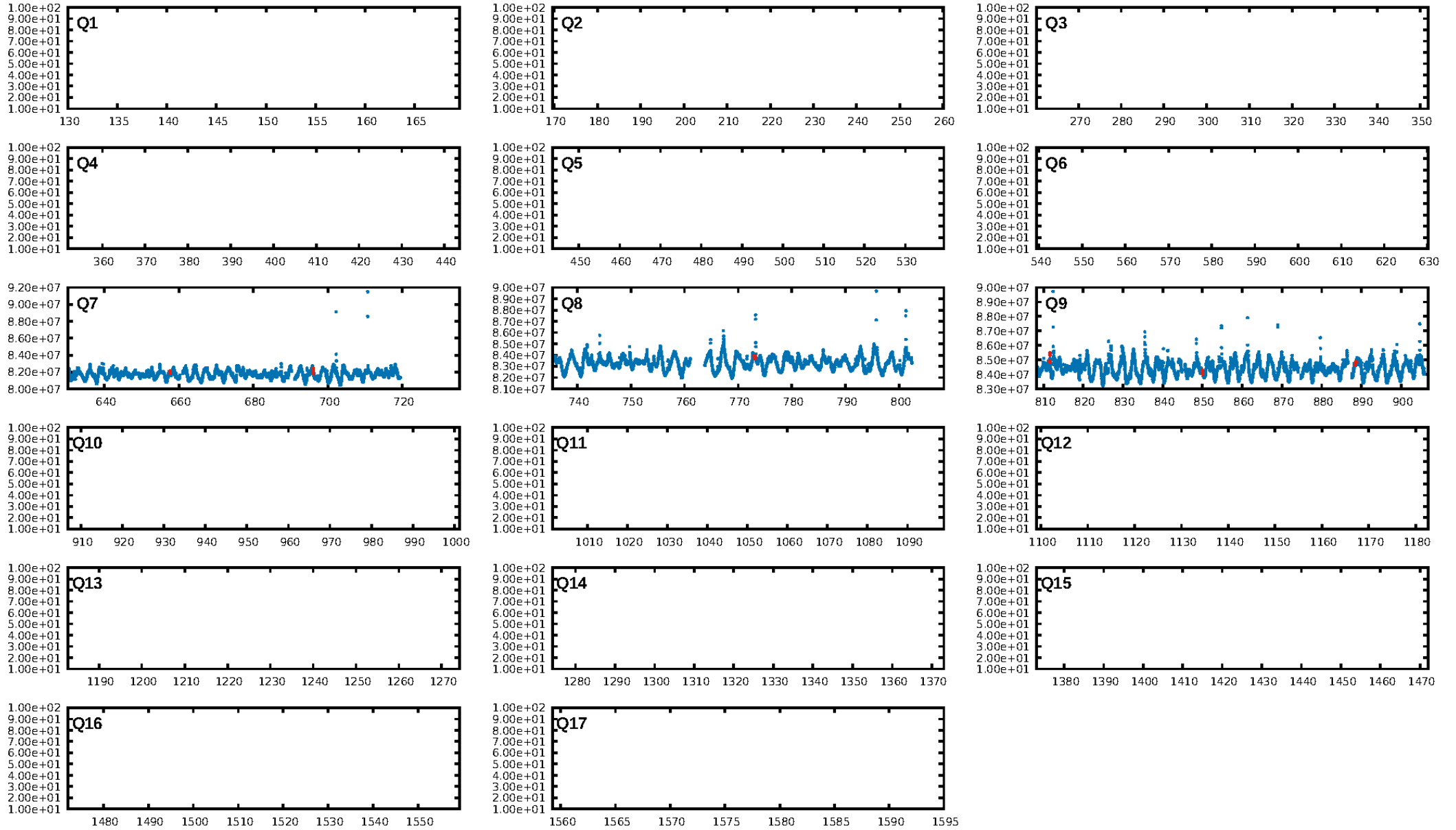
## DV Fit Results:

Period = 38.49522 [0.00260] d  
Epoch = 157.1413 [0.0452] BKJD  
Rp/R\* = 0.0414 [0.0704]  
a/R\* = 102.70 [383.68]  
b = 0.62 [3.90]  
Seff = N/A  
Teq = N/A  
Rp = 812.46 [1459.80] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

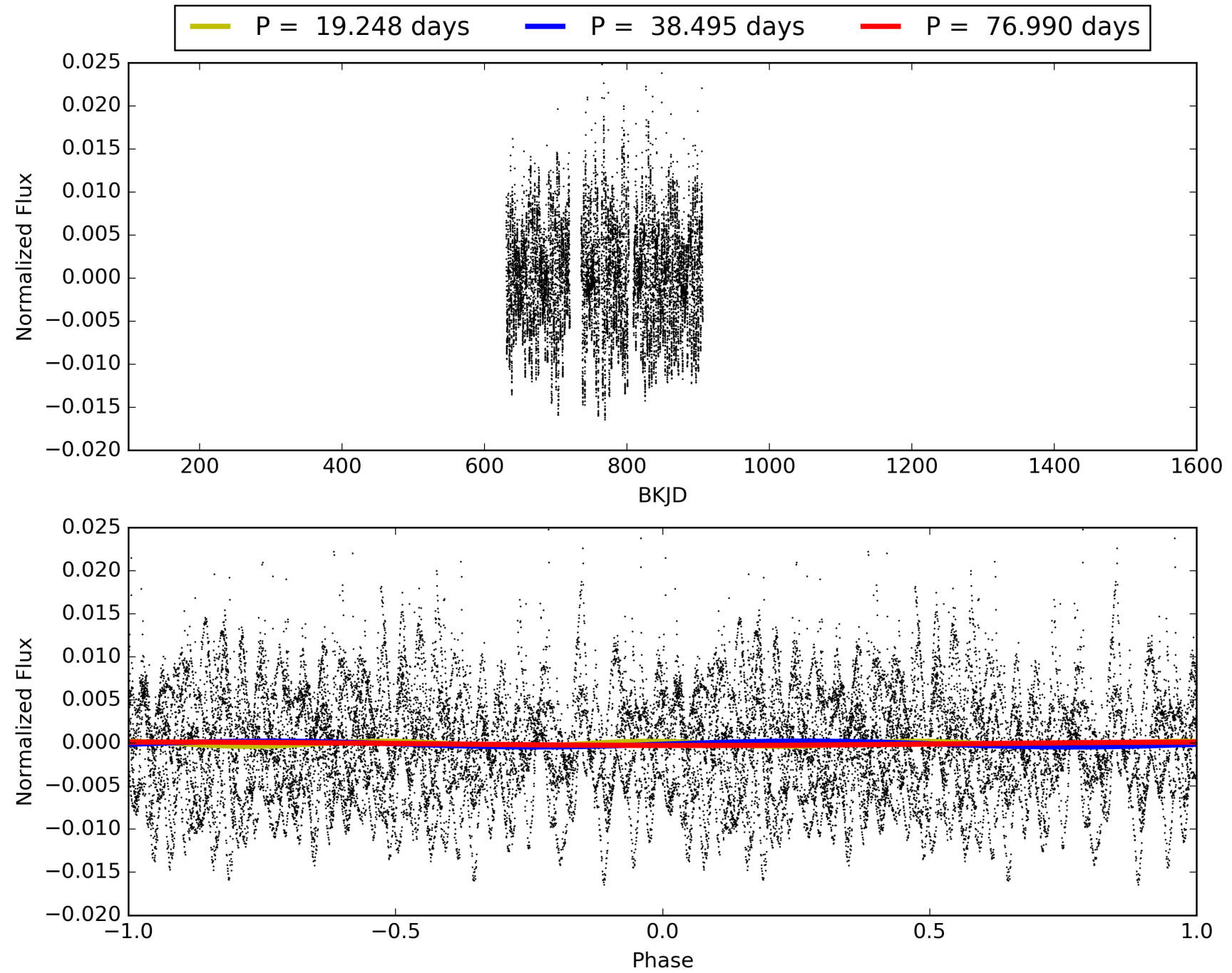
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [156.15σ]  
LongPeriod-sig: 100.0% [60.19σ]  
ModelChiSquare2-sig: 1.1%  
ModelChiSquareGof-sig: 38.2%  
**Bootstrap-pfa: 2.93e-11**  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -0.682  
Centroid-sig: N/A  
Centroid-so: 0.477 arcsec [1.63σ]  
OotOffset-rm: 0.307 arcsec [2.32σ]  
KicOffset-rm: 0.276 arcsec [0.94σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 005716508-06, PDC Light Curves

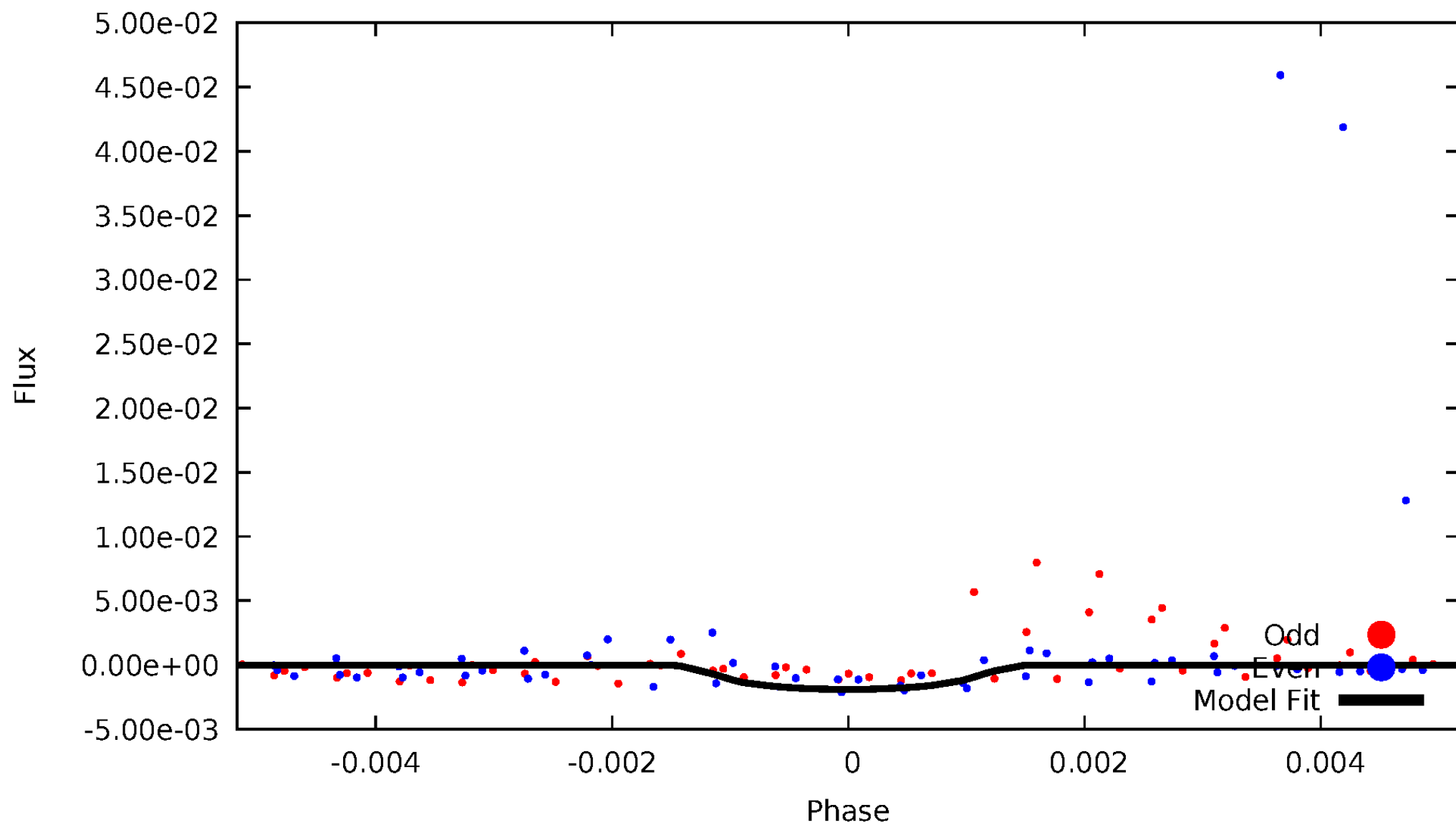


TCE 005716508-06



# DV Odd/Even

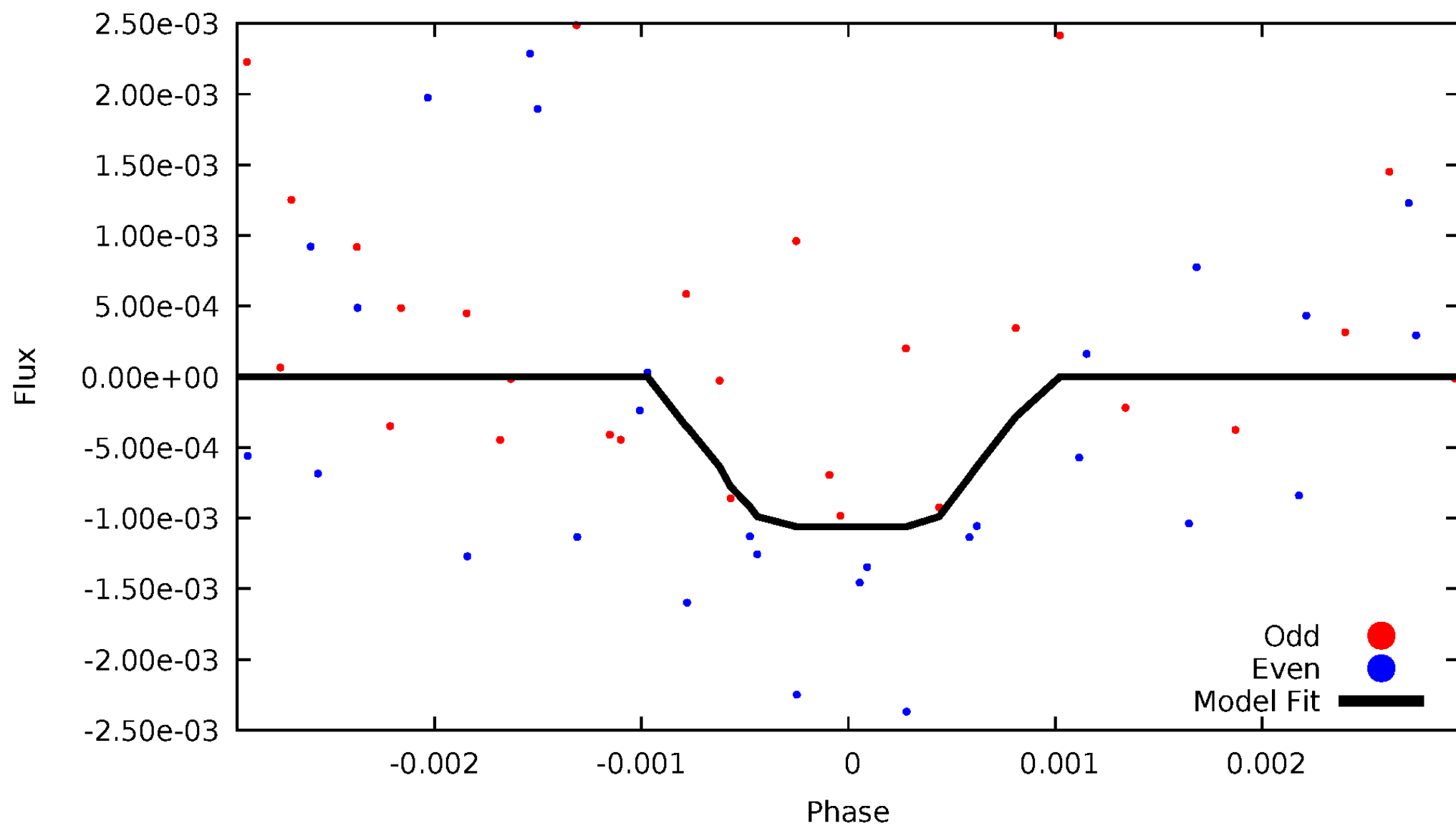
TCE 005716508-06





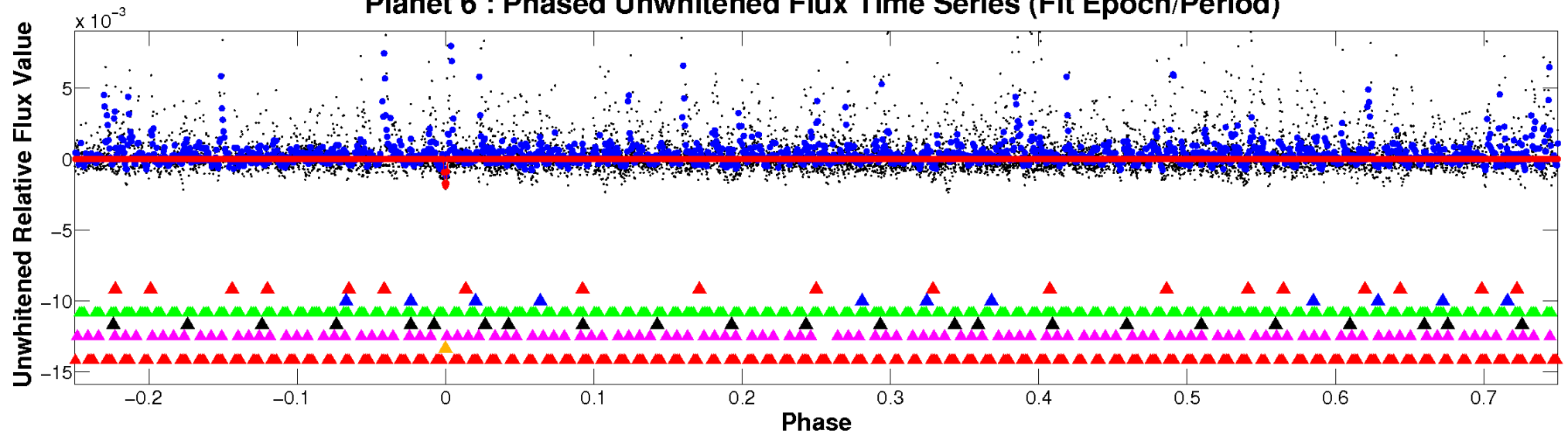
# ALT Odd/Even

TCE 005716508-06

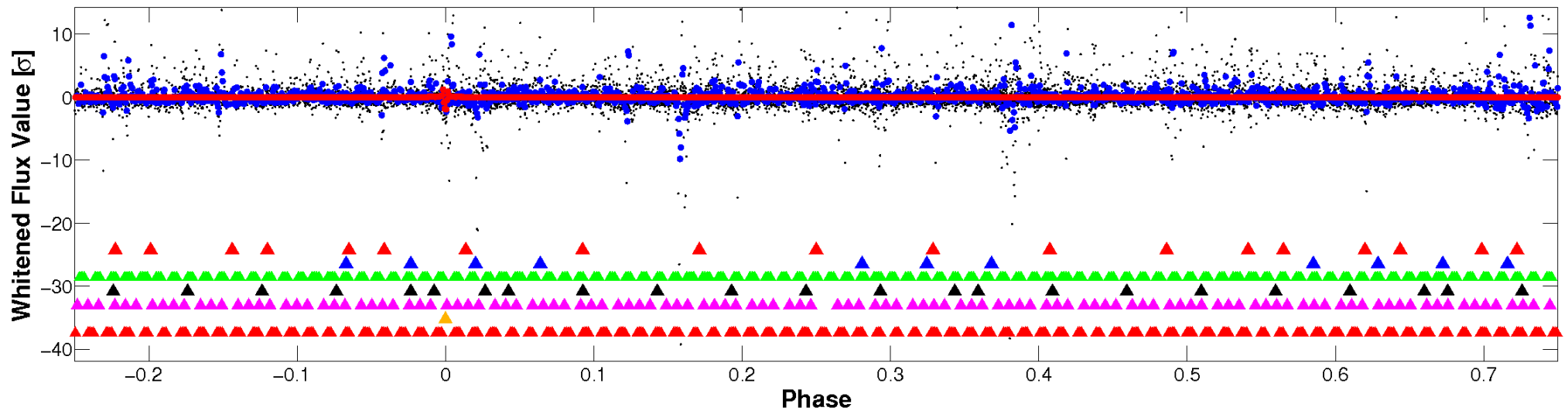


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

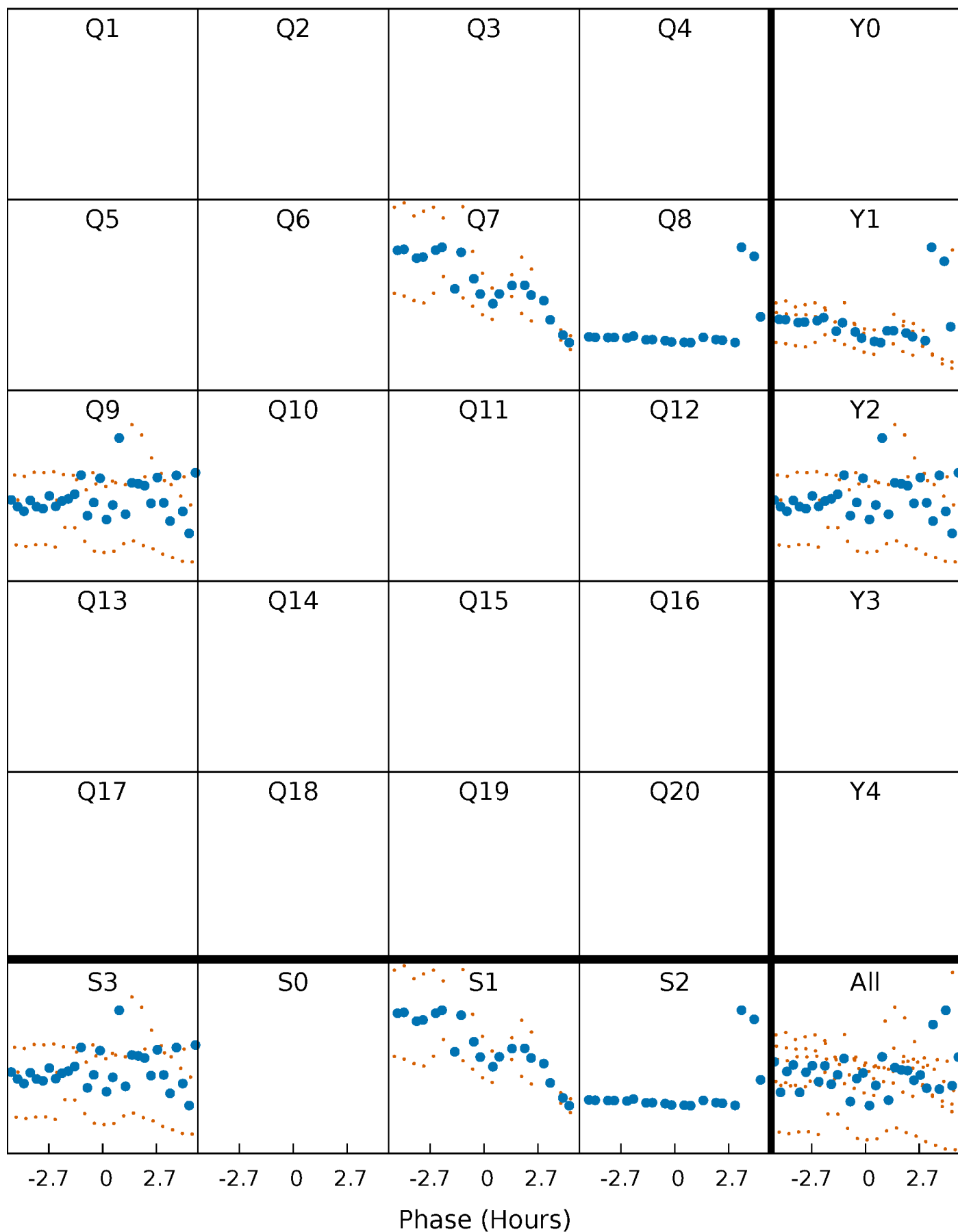


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



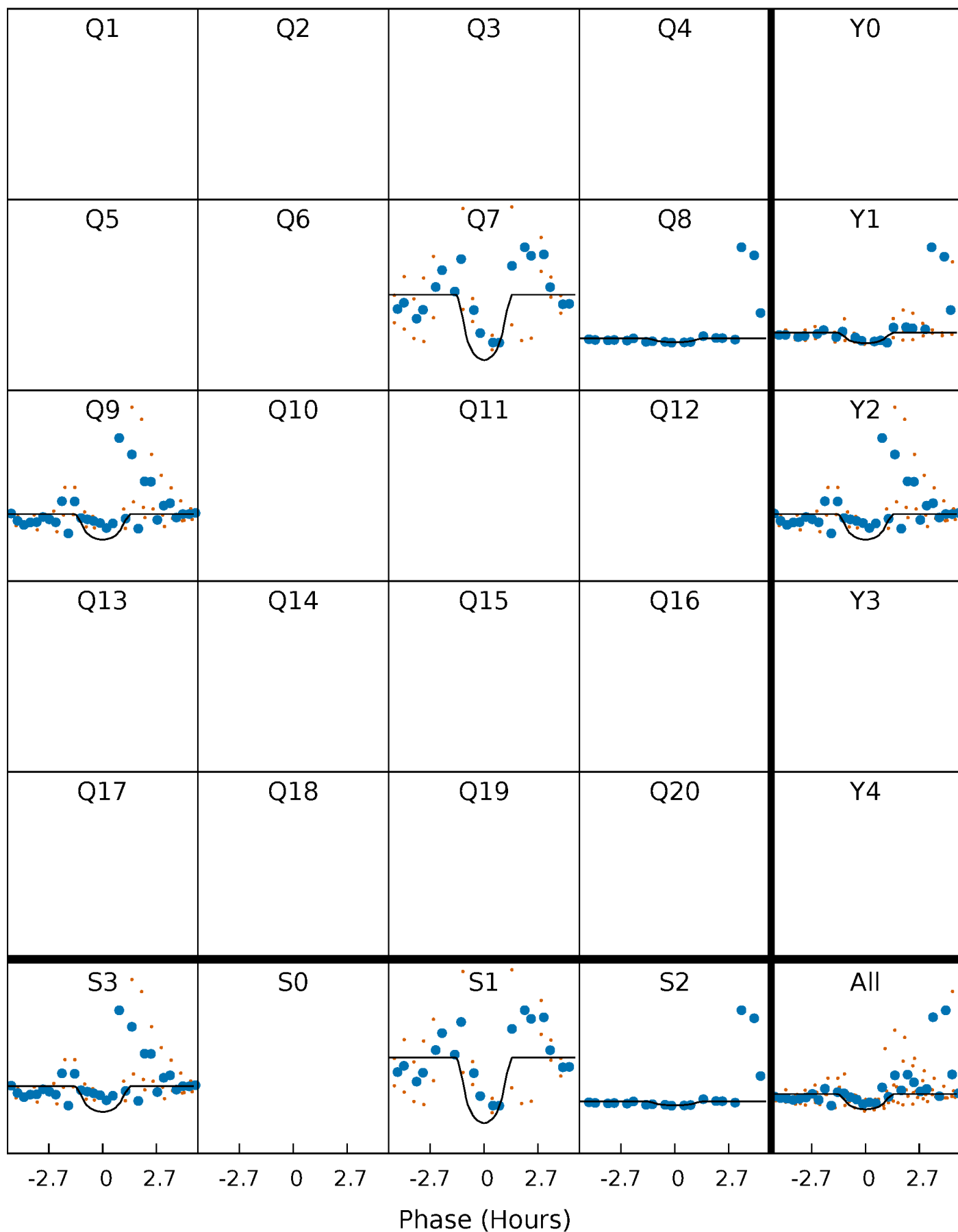
# PDC Quarter-Phased Transit Curves

TCE 005716508-06   P= 38.495224 Days    $T_0=157.141282$  (BKJD)



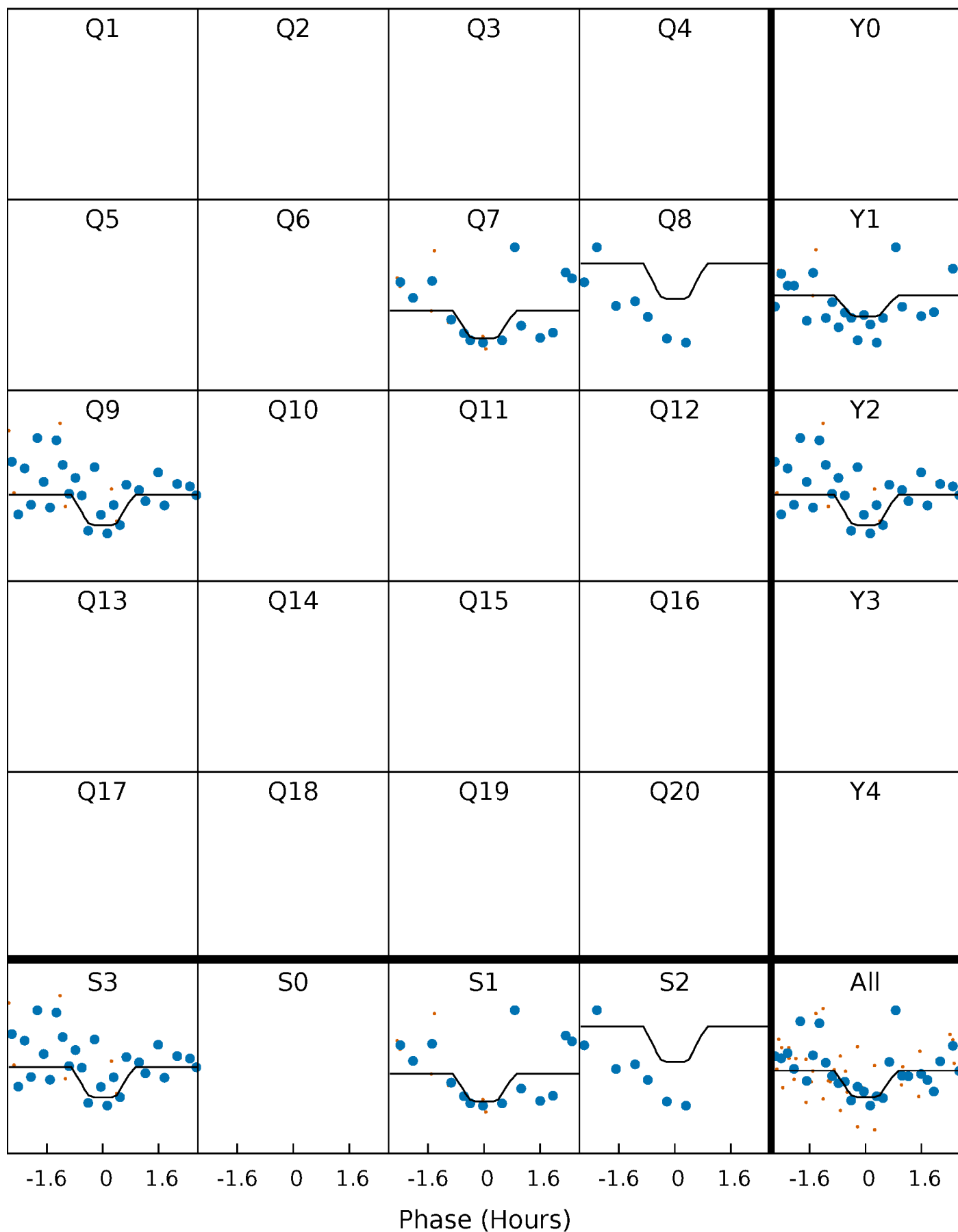
# DV Quarter-Phased Transit Curves

TCE 005716508-06   P= 38.495224 Days    $T_0=157.141282$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

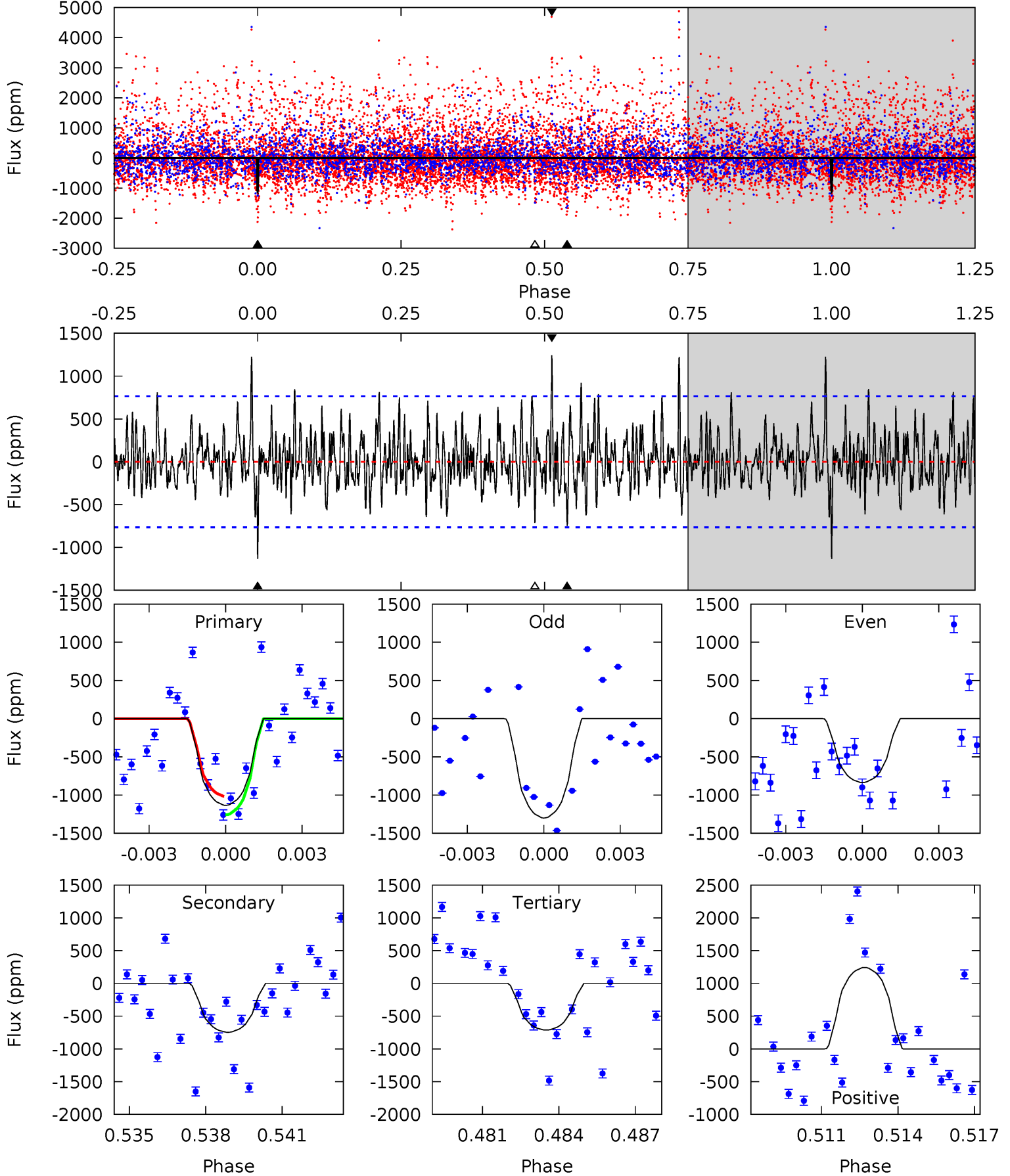
TCE 005716508-06 P= 38.491455 Days  $T_0=157.208949$  (BKJD)



# DV Model-Shift Uniqueness Test

005716508-06, P = 38.495224 Days, E = 157.141282 Days

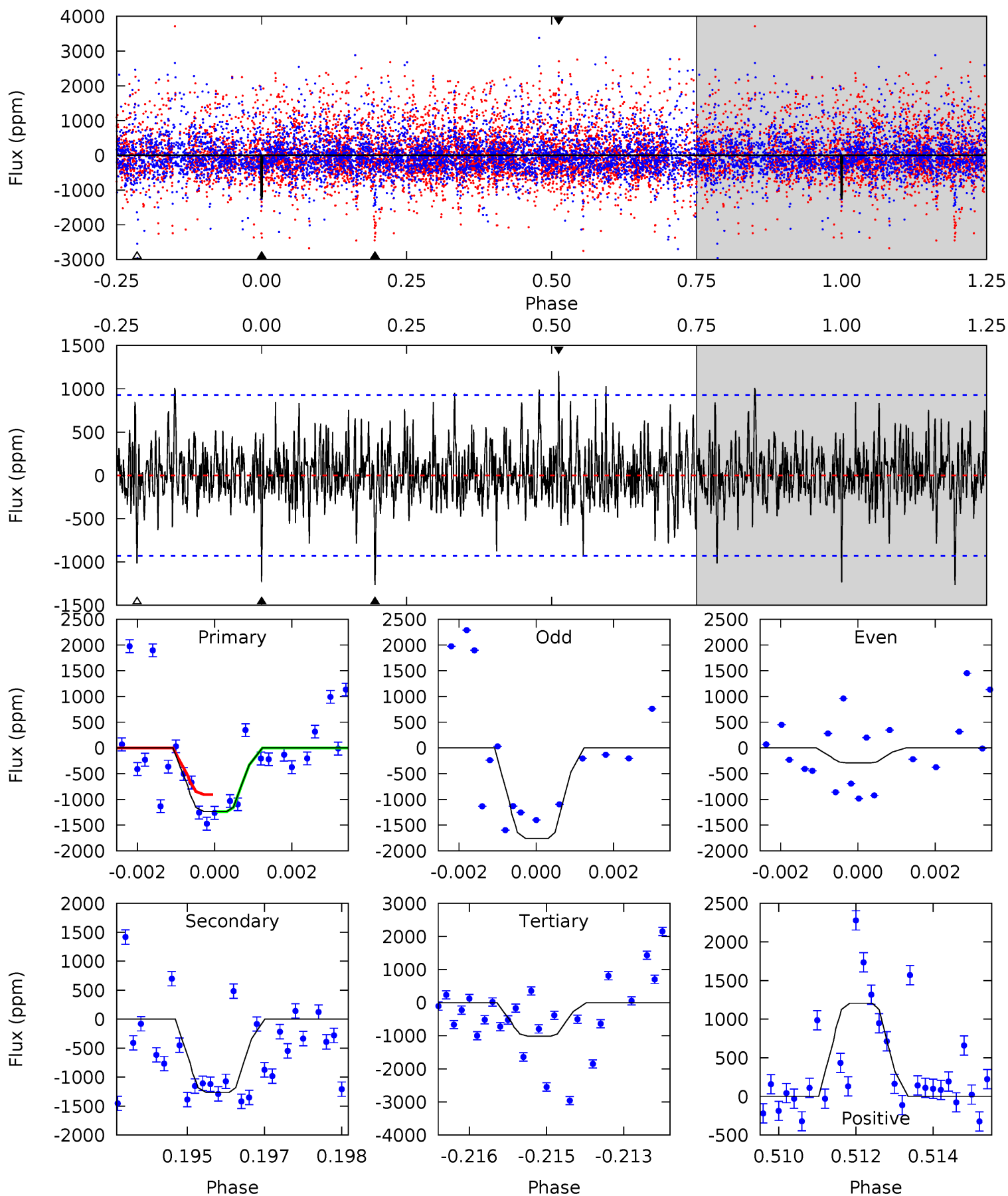
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.77	5.12	4.89	8.52	5.25	2.96	1.89	2.88	-0.75	0.23	-3.40	1.47	1.07	0.52	0.84



# Alt Model-Shift Uniqueness Test

005716508-06, P = 38.491455 Days, E = 157.208949 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
7.10	7.29	5.84	6.94	5.35	3.12	1.59	1.27	0.17	1.45	0.35	4.11	0.87	0.49	1.02



### Stellar Parameters For KIC 005716508

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3486^{+112}_{-112}$	$0.500^{+0.338}_{-0.156}$	$0.360^{+0.100}_{-0.250}$	$180.013^{+25.956}_{-103.825}$	$3.735^{+0.075}_{-2.514}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+68%/-31%	+28%/-69%	+14%/-58%	+2%/-67%	+434%/-35%
Source	KIC0	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 005716508-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-746 \pm 146$	$1146.93^{+1217.04}_{-781.21}$	$4911^{+315}_{-508}$	$-3645^{+6340}_{-284}$	$0.034^{+0.304}_{-0.025}$
Alt.	$-1266 \pm 174$	$1112.95^{+1116.28}_{-771.47}$	$4902^{+304}_{-586}$	$-3535^{+7332}_{-348}$	$0.064^{+0.622}_{-0.048}$

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



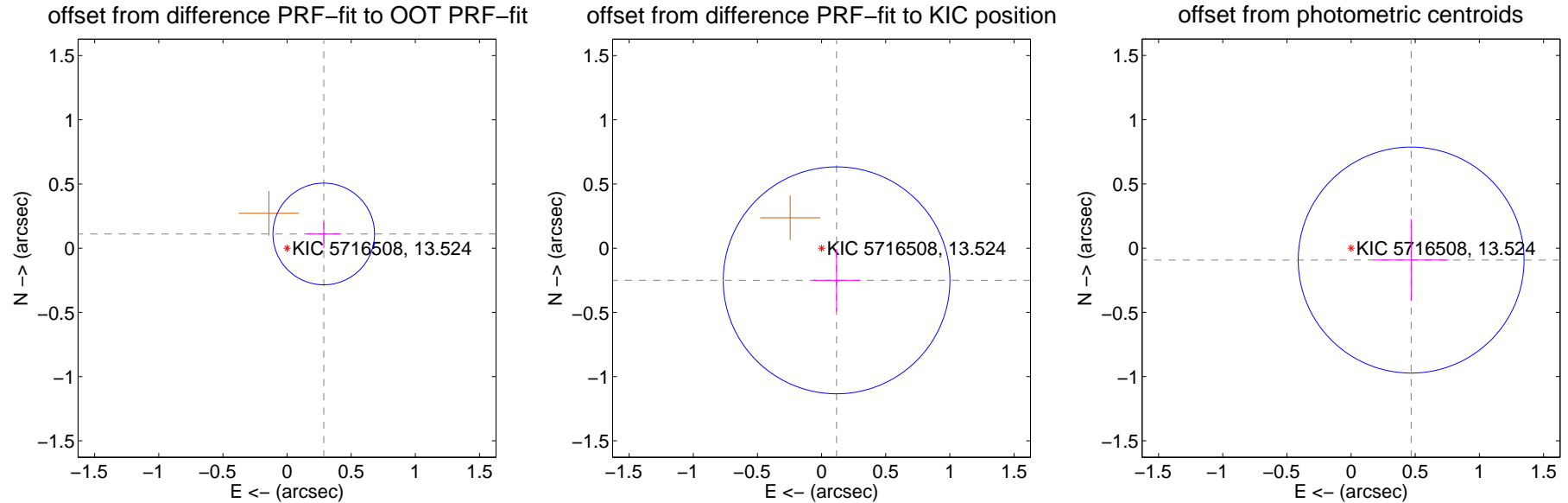
## DV Centroid Data

Supplemental centroid analysis for 005716508-06. Kepler magnitude: 13.52. Transit SNR 9.09

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.307 \pm 0.132$	2.32	$-0.286 \pm 0.135$	$0.111 \pm 0.110$
PRF-fit source offset from KIC position	$0.276 \pm 0.295$	0.94	$-0.117 \pm 0.186$	$-0.250 \pm 0.245$
photometric centroid source offset	$0.48 \pm 0.29$	1.63	$-0.47 \pm 0.29$	$-0.09 \pm 0.32$

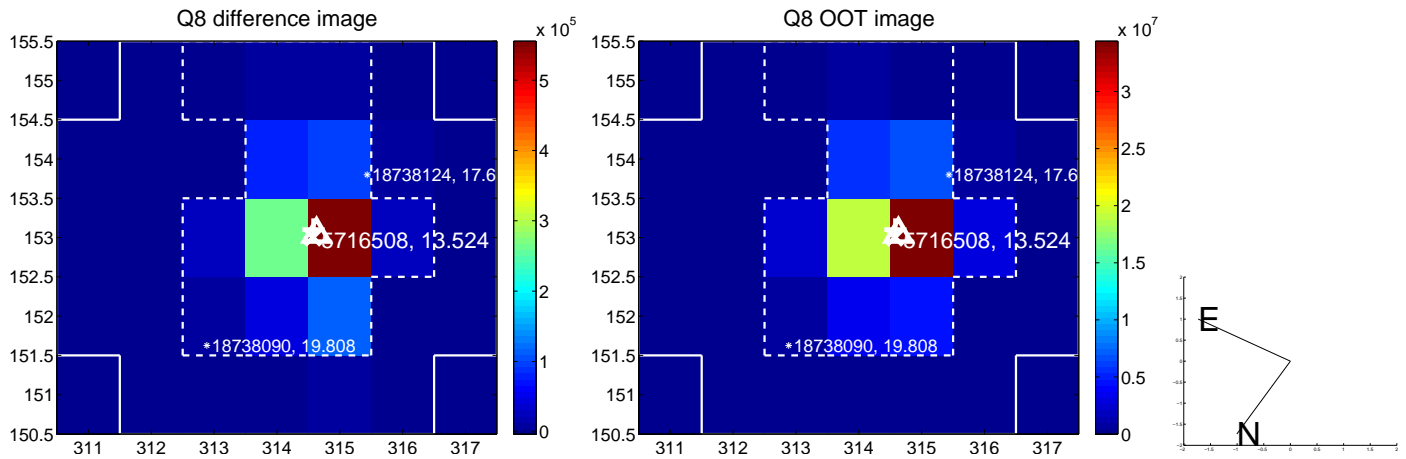
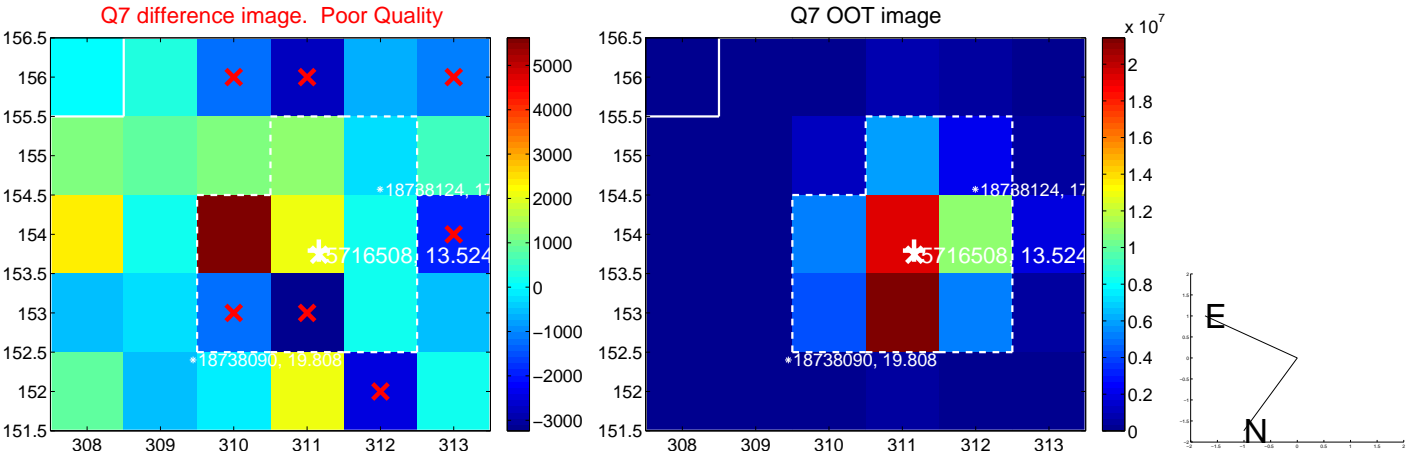
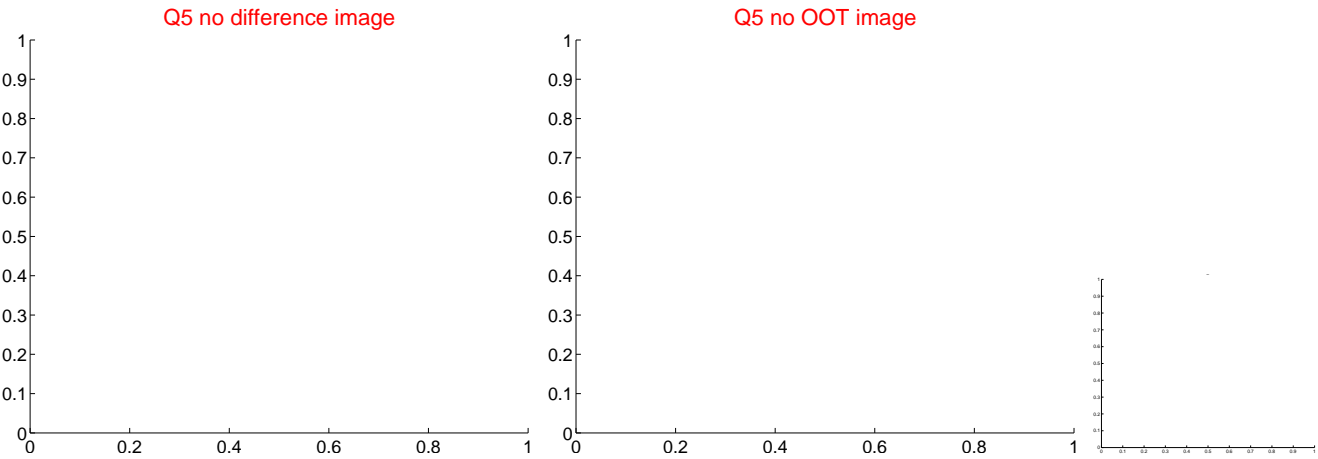


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

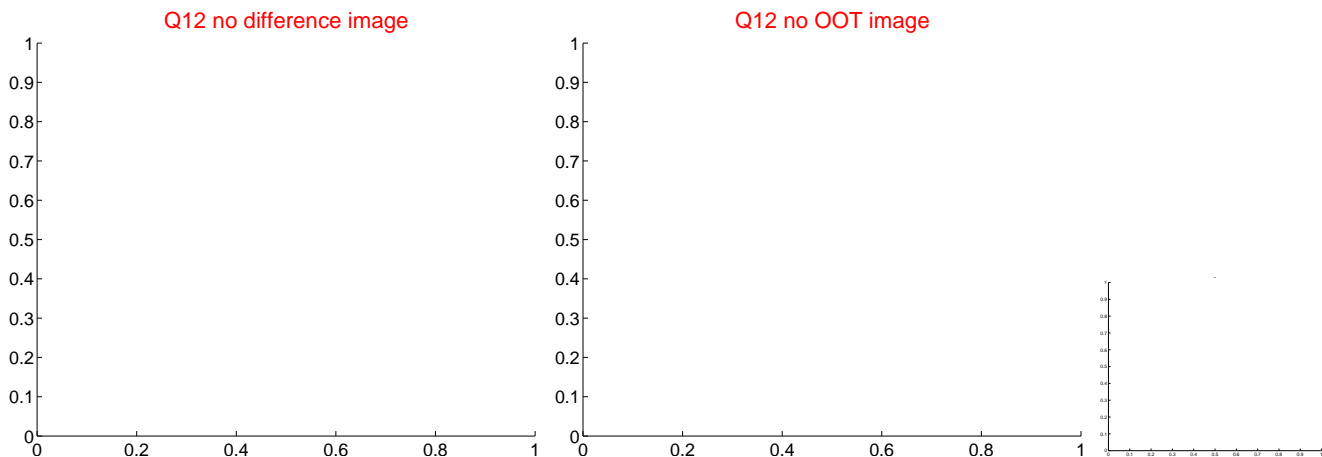
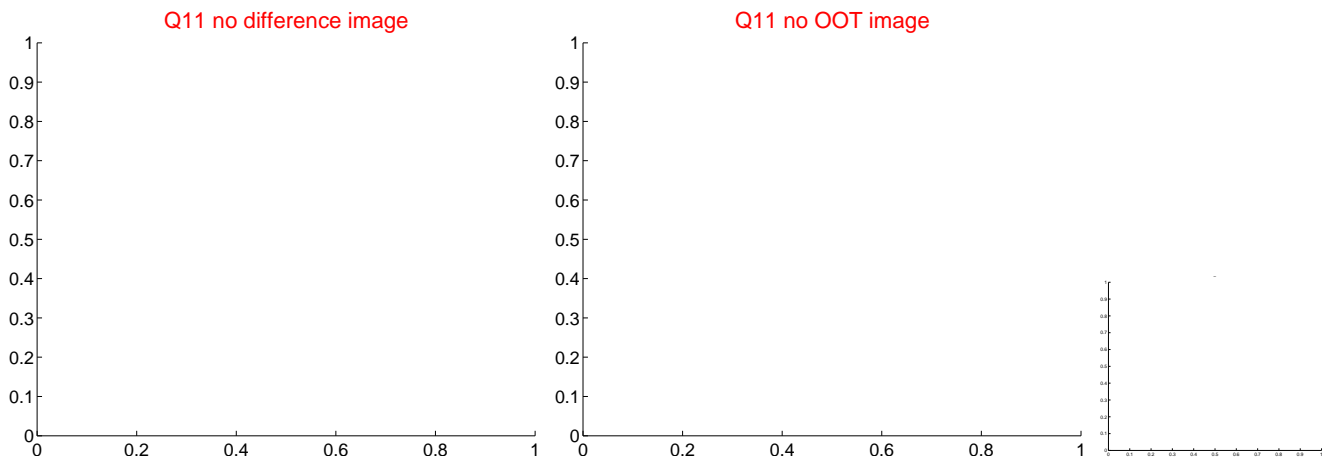
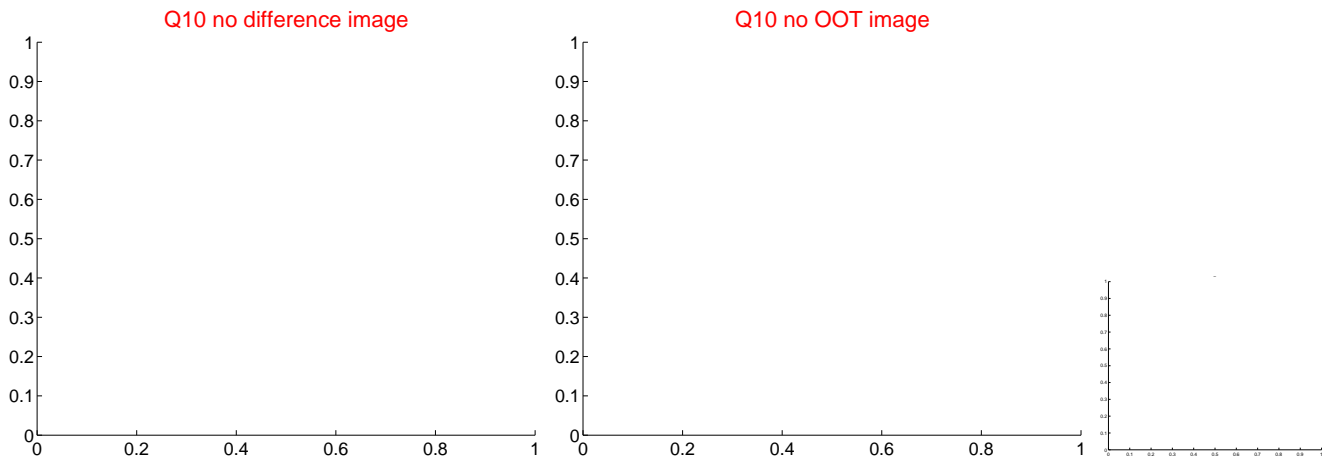
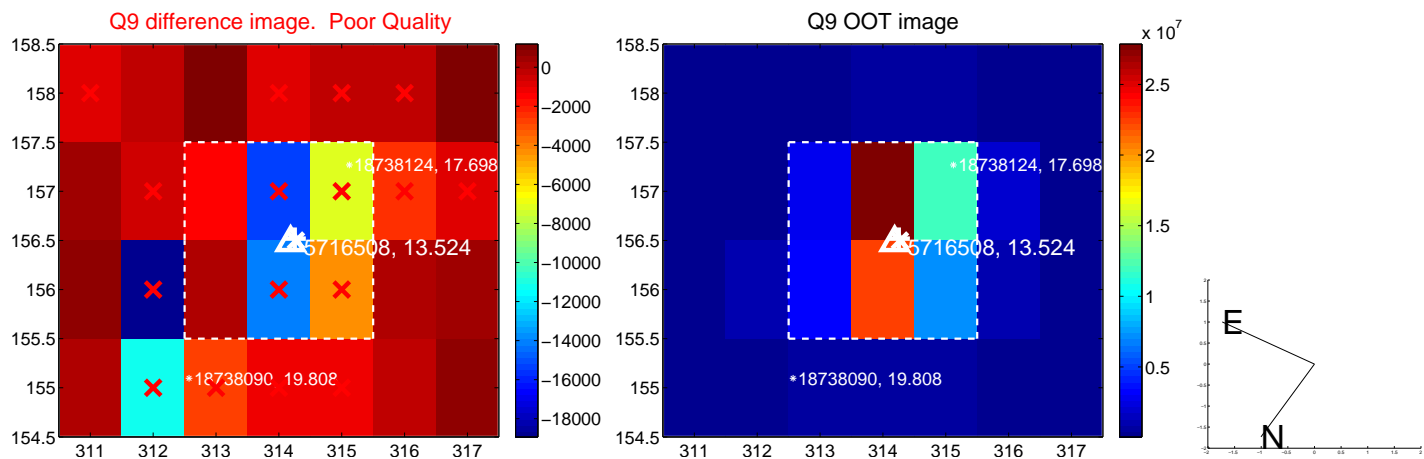
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



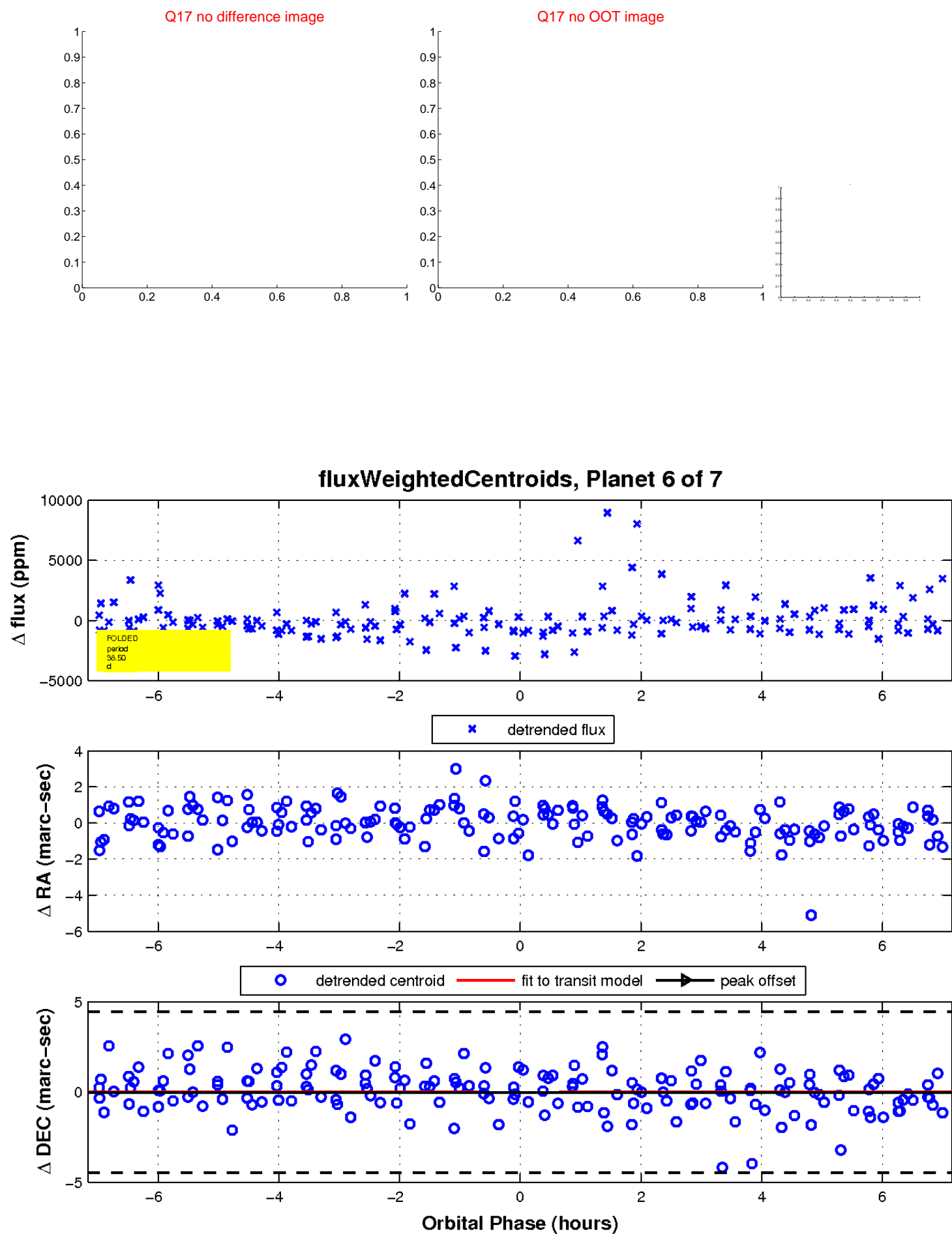
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



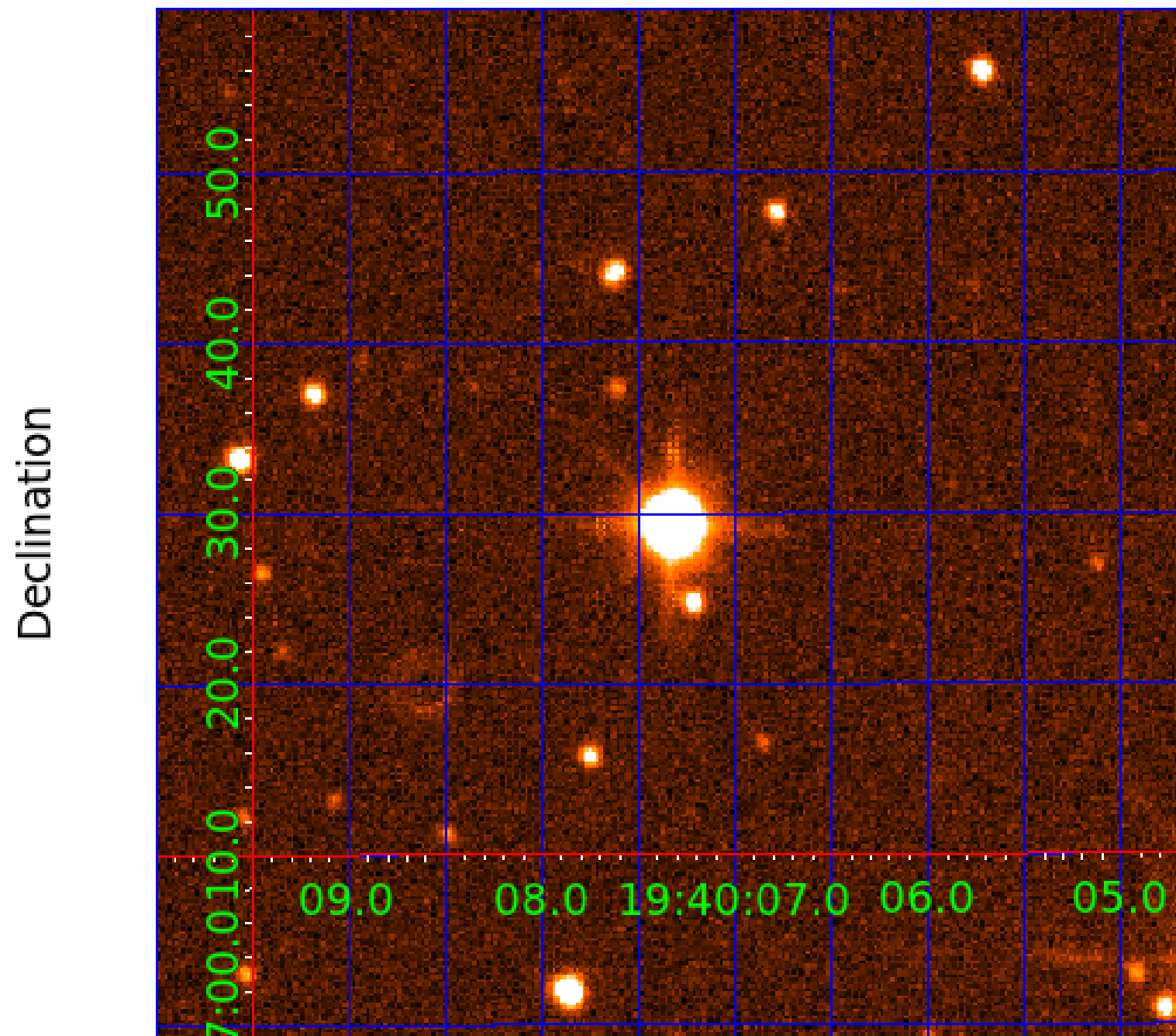
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005716508

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005716508-01	OBS	No	80.022023	139.478721	1812.0	6.599	12.4	4.8	180.01	3486	822.92	0.00
005716508-02	OBS	No	128.877360	256.656319	1709.2	4.633	11.2	5.5	180.01	3486	685.84	0.00
005716508-03	OBS	No	4.863178	134.225462	449.5	4.889	8.9	5.7	180.01	3486	533.38	0.00
005716508-04	OBS	No	64.802168	156.846039	2521.1	10.213	11.3	7.5	180.01	3486	830.71	0.00
005716508-05	OBS	No	12.090645	140.492474	829.4	3.280	9.2	6.0	180.01	3486	595.34	0.00
005716508-06	OBS	No	38.495224	157.141282	1910.2	2.390	10.3	9.1	180.01	3486	812.46	0.00
005716508-07	OBS	7737.01	4.753079	134.546213	542.6	2.352	8.9	5.9	180.01	3486	664.20	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005716508-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005716508-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
005716508-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-06	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005716508-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT

**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.

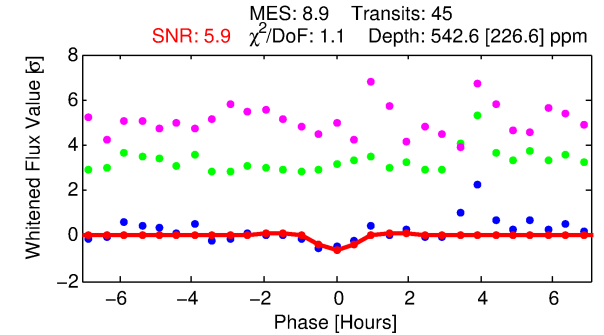
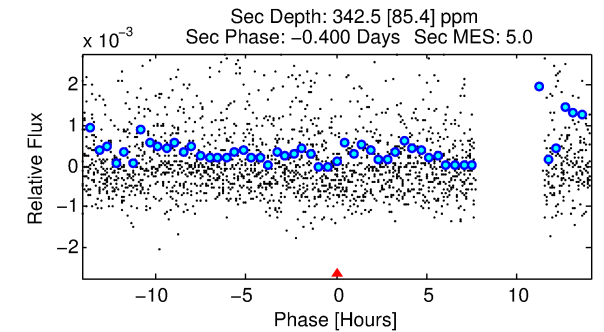
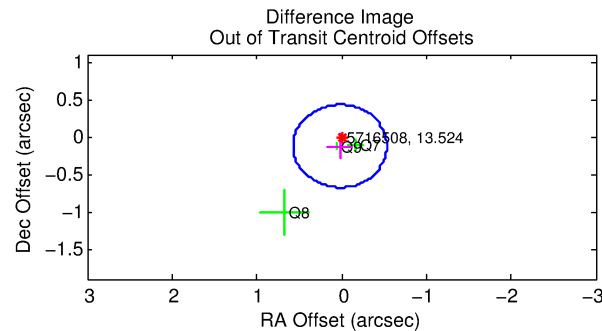
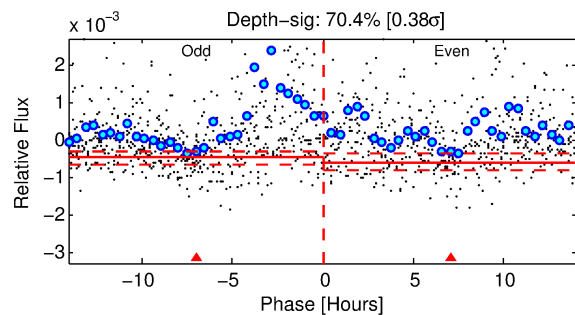
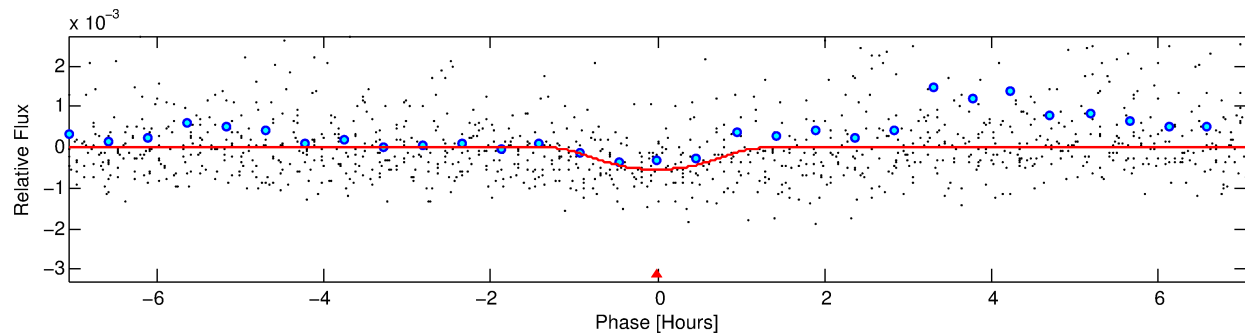
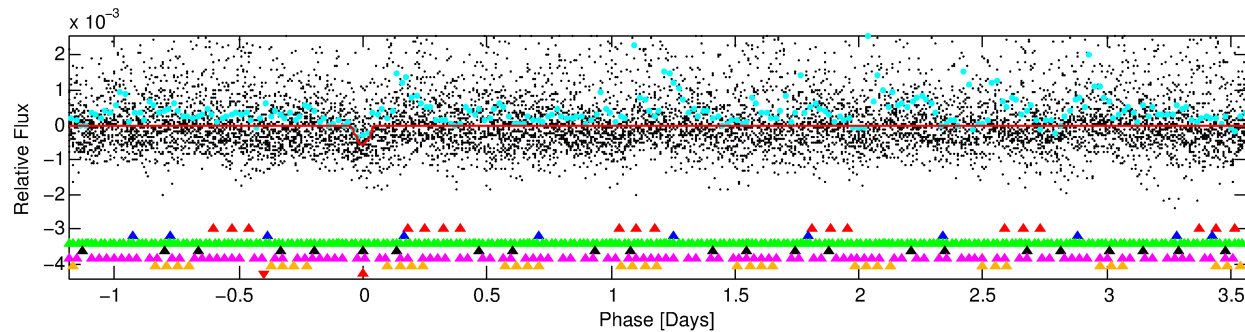
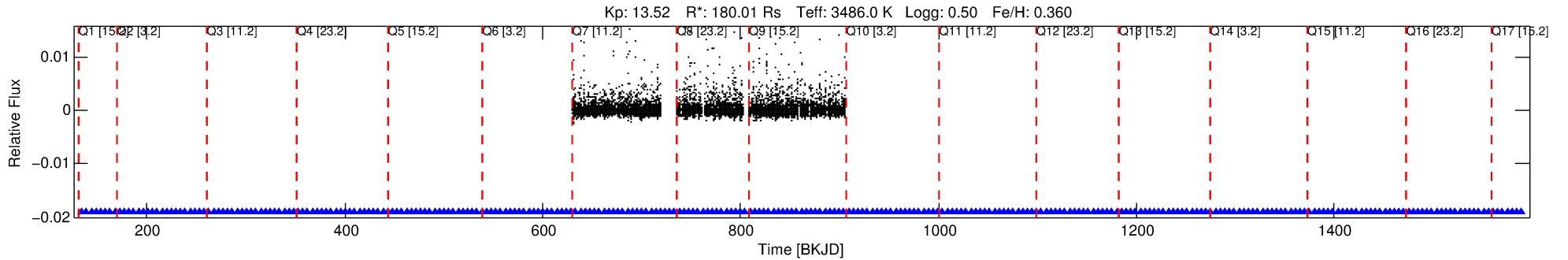
Ephemeris Match Information For 005716508-07

No Significant Match Found



# DV One-Page Summary

KIC: 5716508 Candidate: 7 of 7 Period: 4.753 d



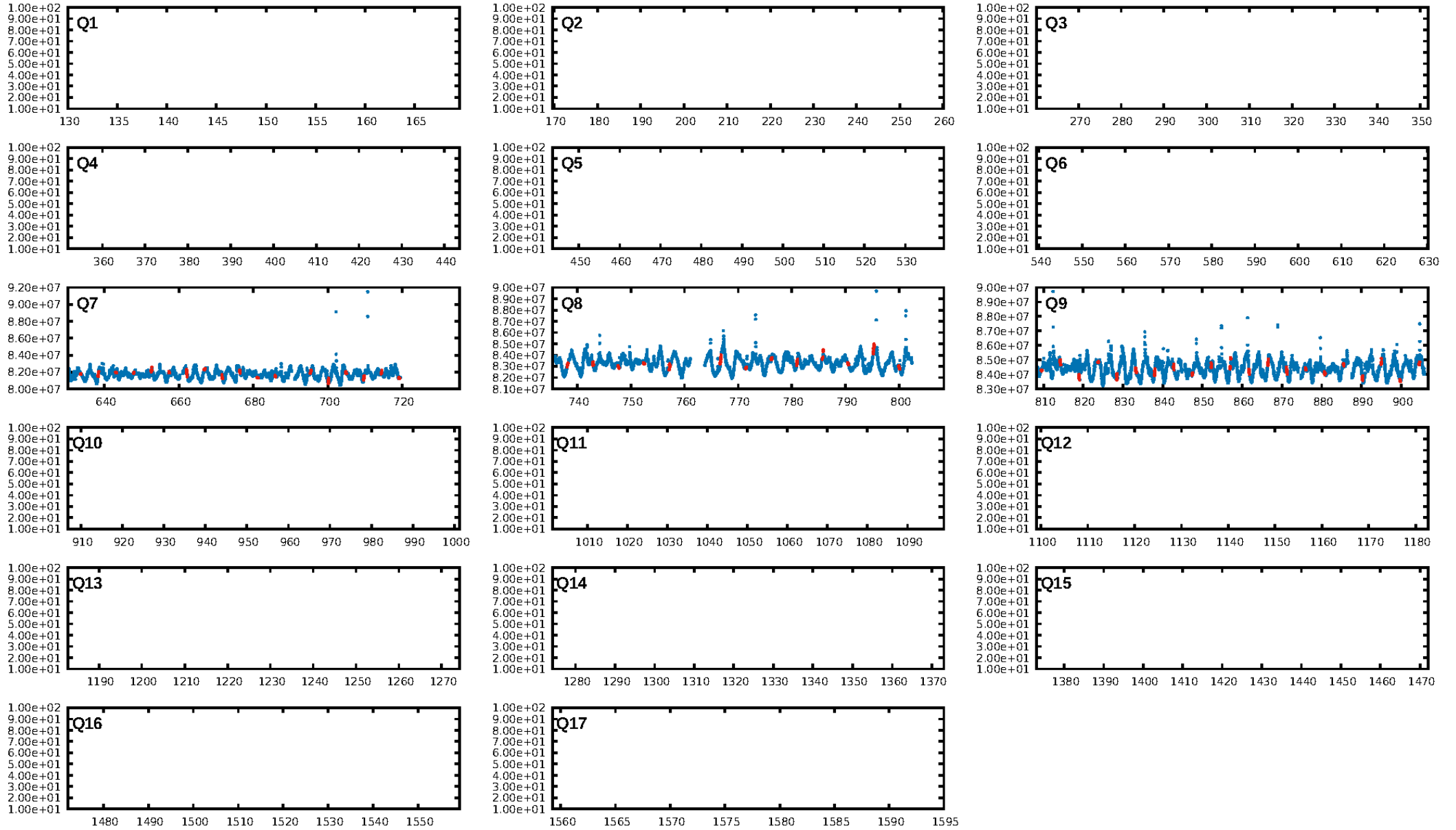
## DV Fit Results:

Period = 4.75308 [0.00015] d  
Epoch = 134.5462 [0.0176] BKJD  
Rp/R\* = 0.0338 [0.0280]  
a/R\* = 5.51 [3.36]  
b = 0.97 [0.08]  
Seff = N/A  
Teq = N/A  
Rp = 664.19 [669.93] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

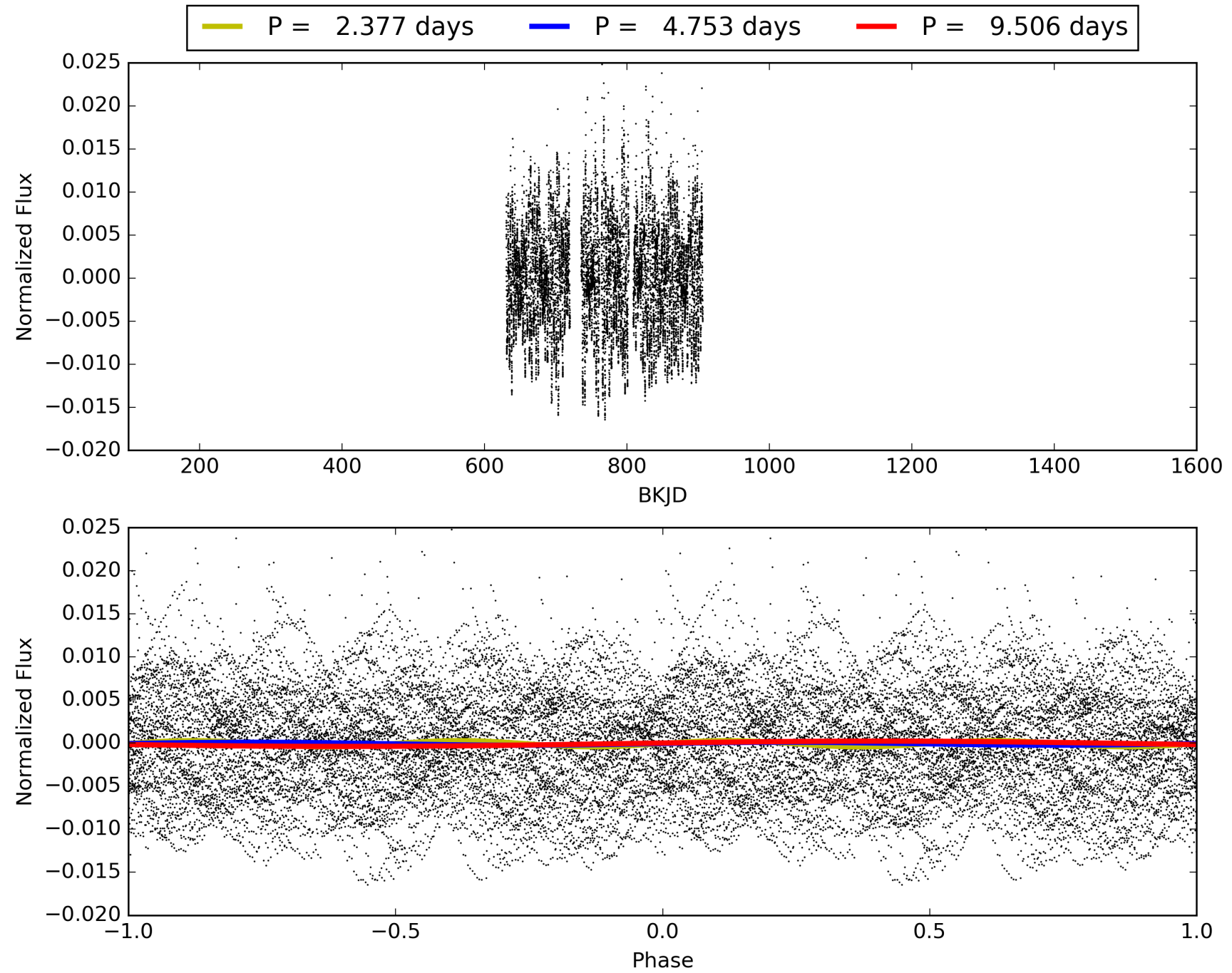
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 37.4% [0.49 $\sigma$ ]  
ModelChiSquare2-sig: 68.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.28e-09  
RollingBand-fgt: 1.00 [45/45]  
GhostDiagnostic-chr: 0.8624  
Centroid-sig: N/A  
Centroid-so: 0.322 arcsec [0.77 $\sigma$ ]  
OotOffset-rm: 0.127 arcsec [0.69 $\sigma$ ]  
KicOffset-rm: 0.239 arcsec [0.72 $\sigma$ ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 005716508-07, PDC Light Curves

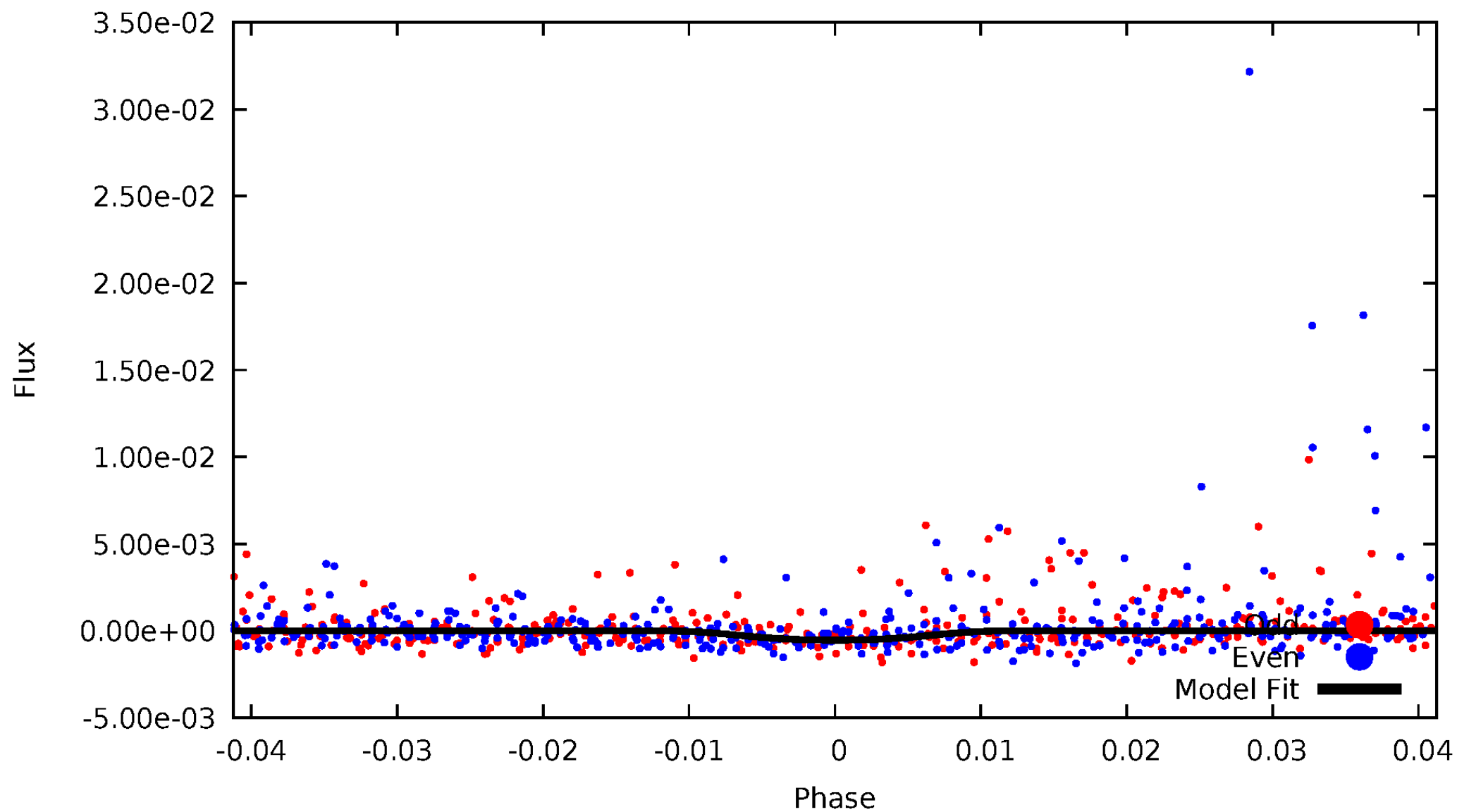


TCE 005716508-07



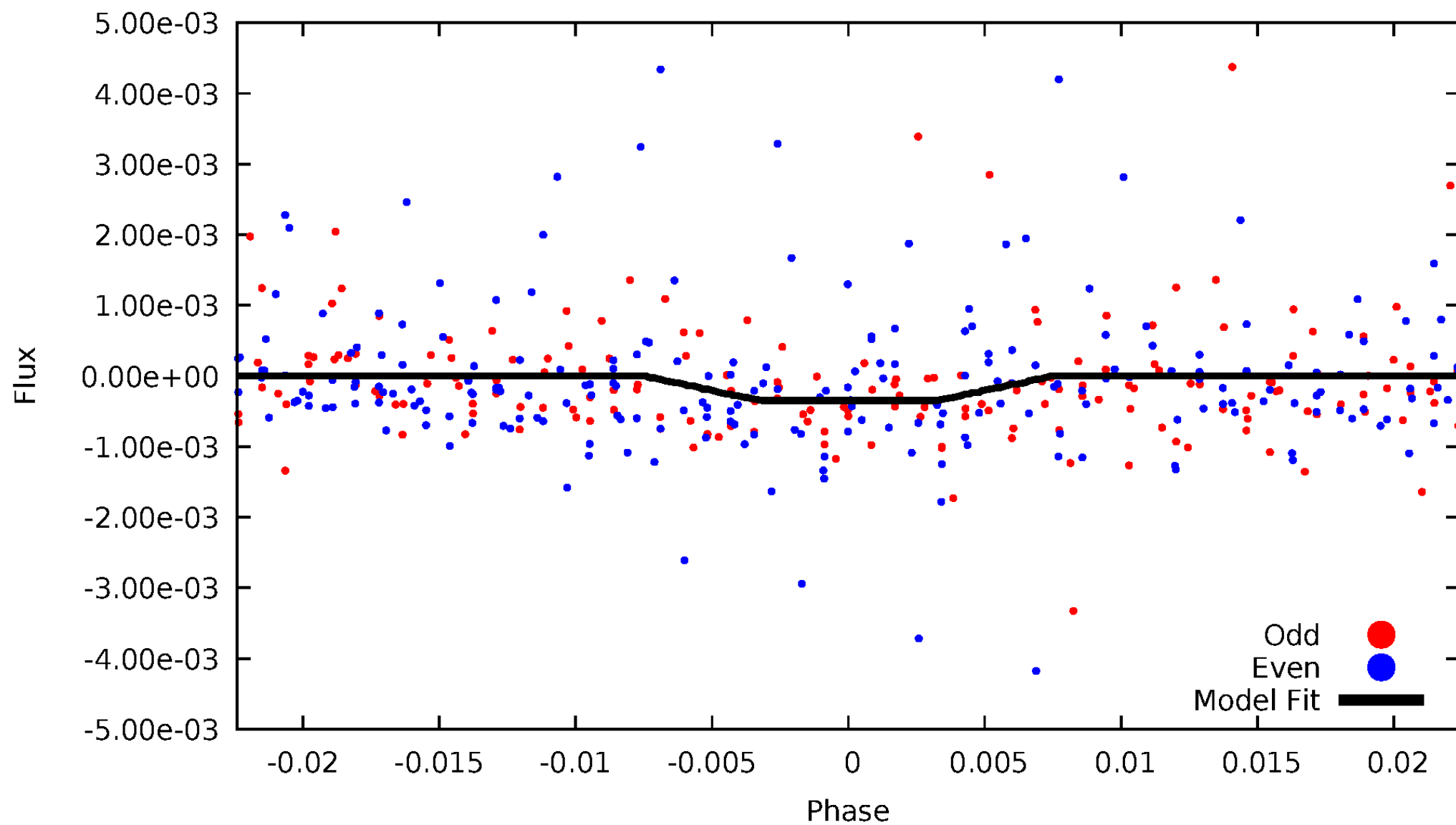
# DV Odd/Even

TCE 005716508-07



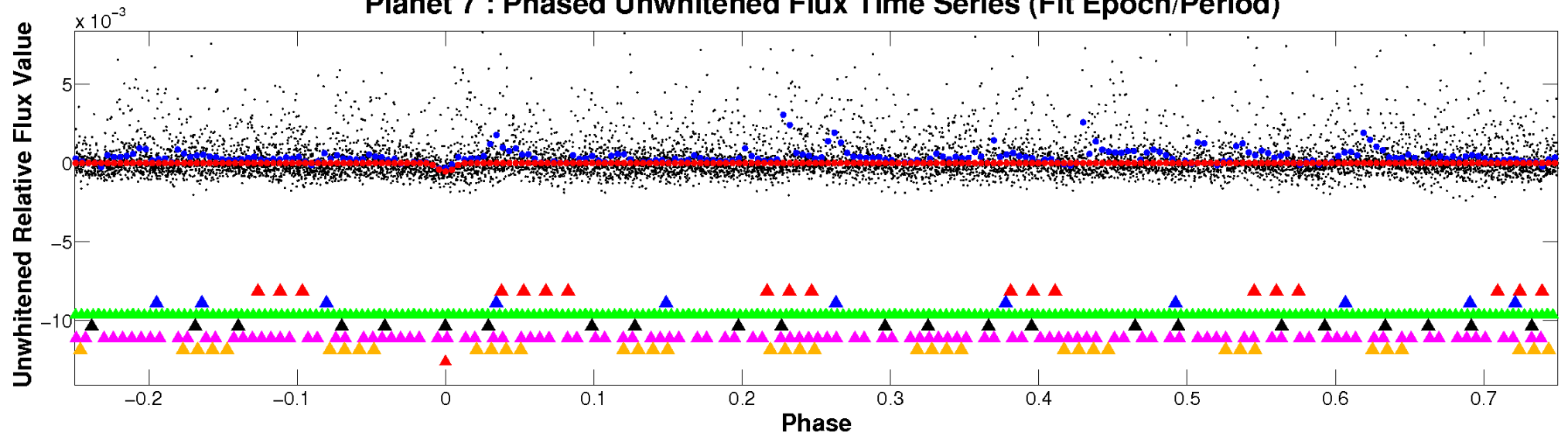
# ALT Odd/Even

TCE 005716508-07

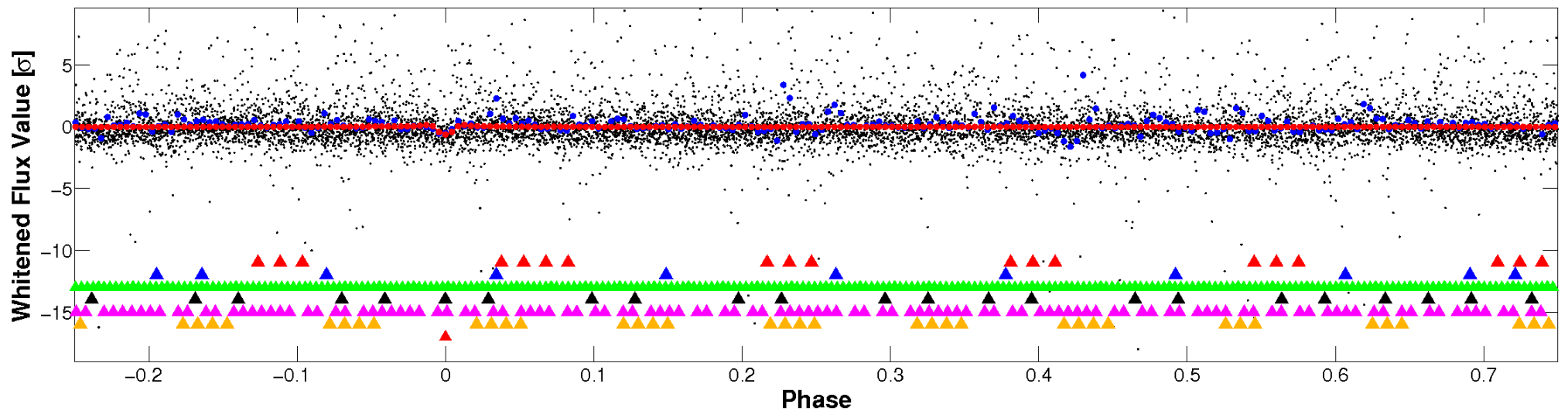


# Non-Whitened Vs. Whitened Light Curve

## Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

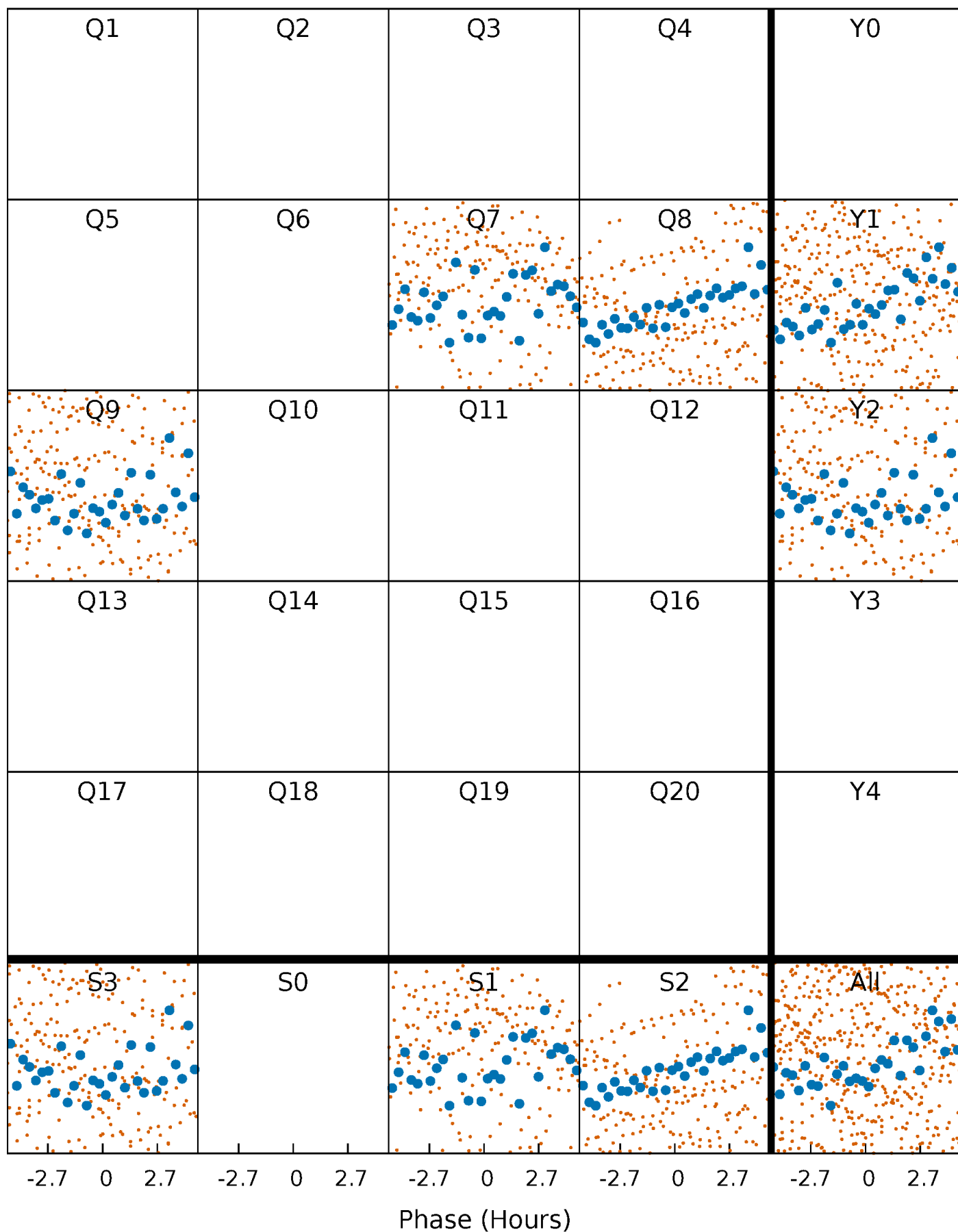


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



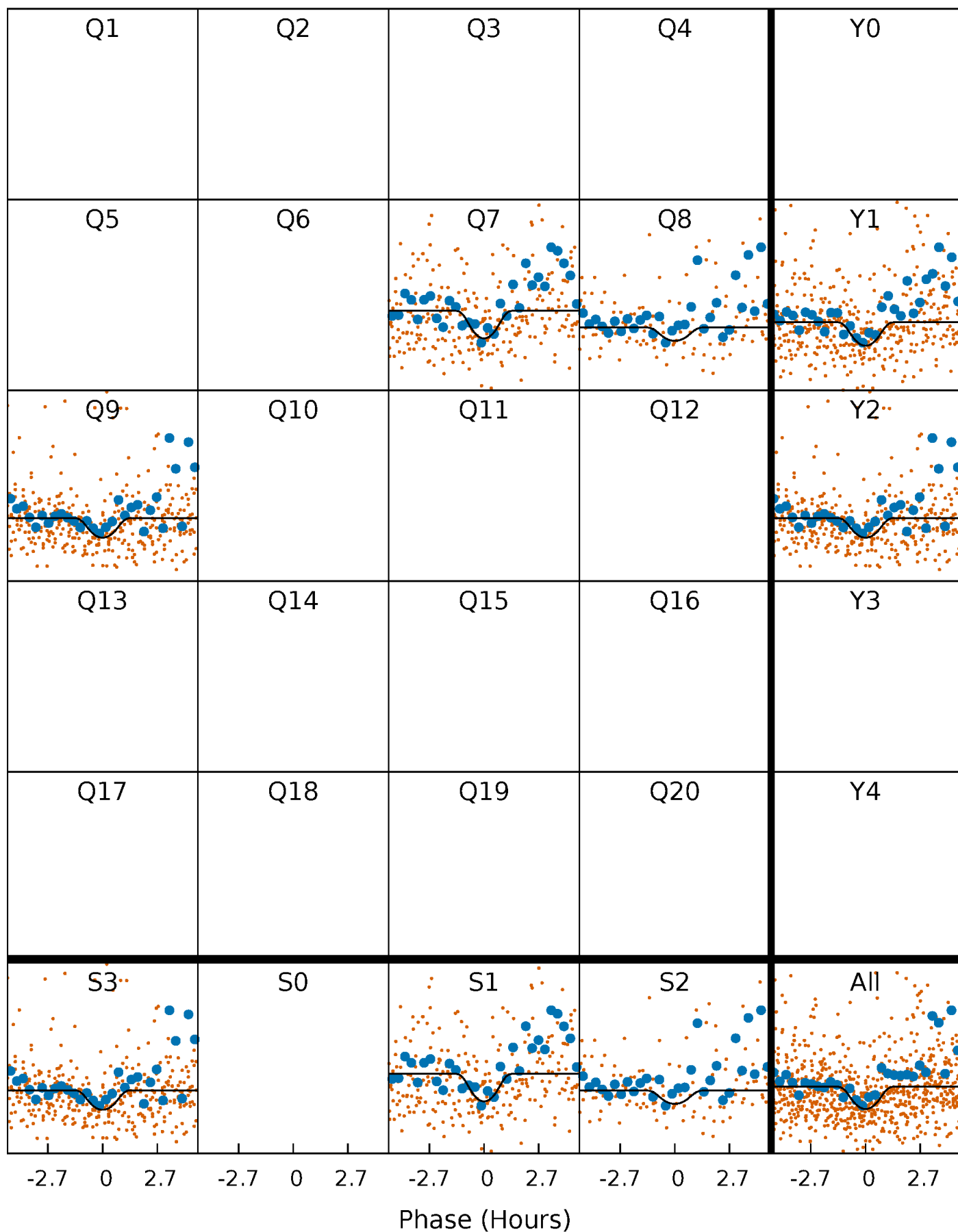
# PDC Quarter-Phased Transit Curves

TCE 005716508-07     $P = 4.753079$  Days     $T_0 = 134.546213$  (BKJD)



# DV Quarter-Phased Transit Curves

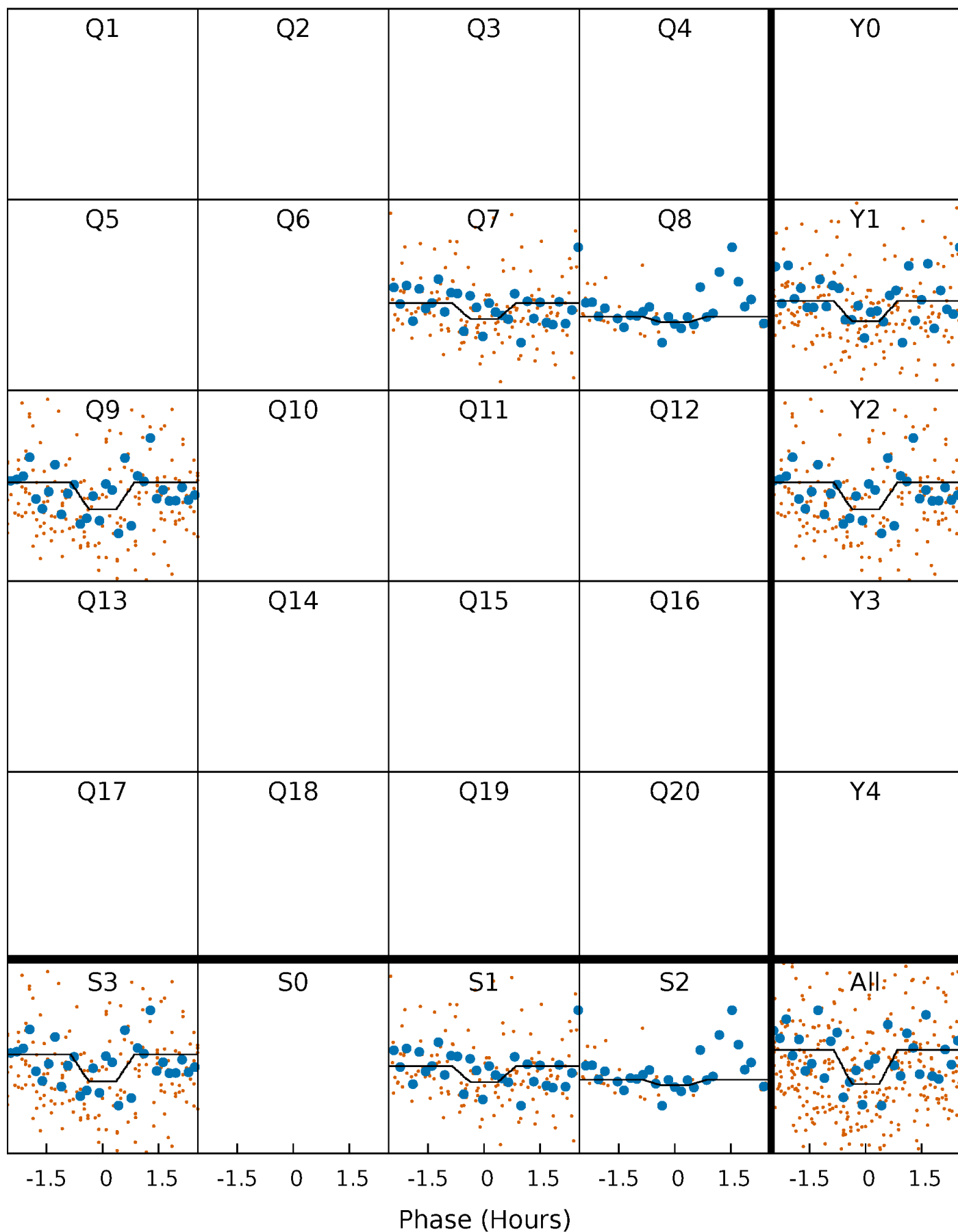
TCE 005716508-07     $P = 4.753079$  Days     $T_0 = 134.546213$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

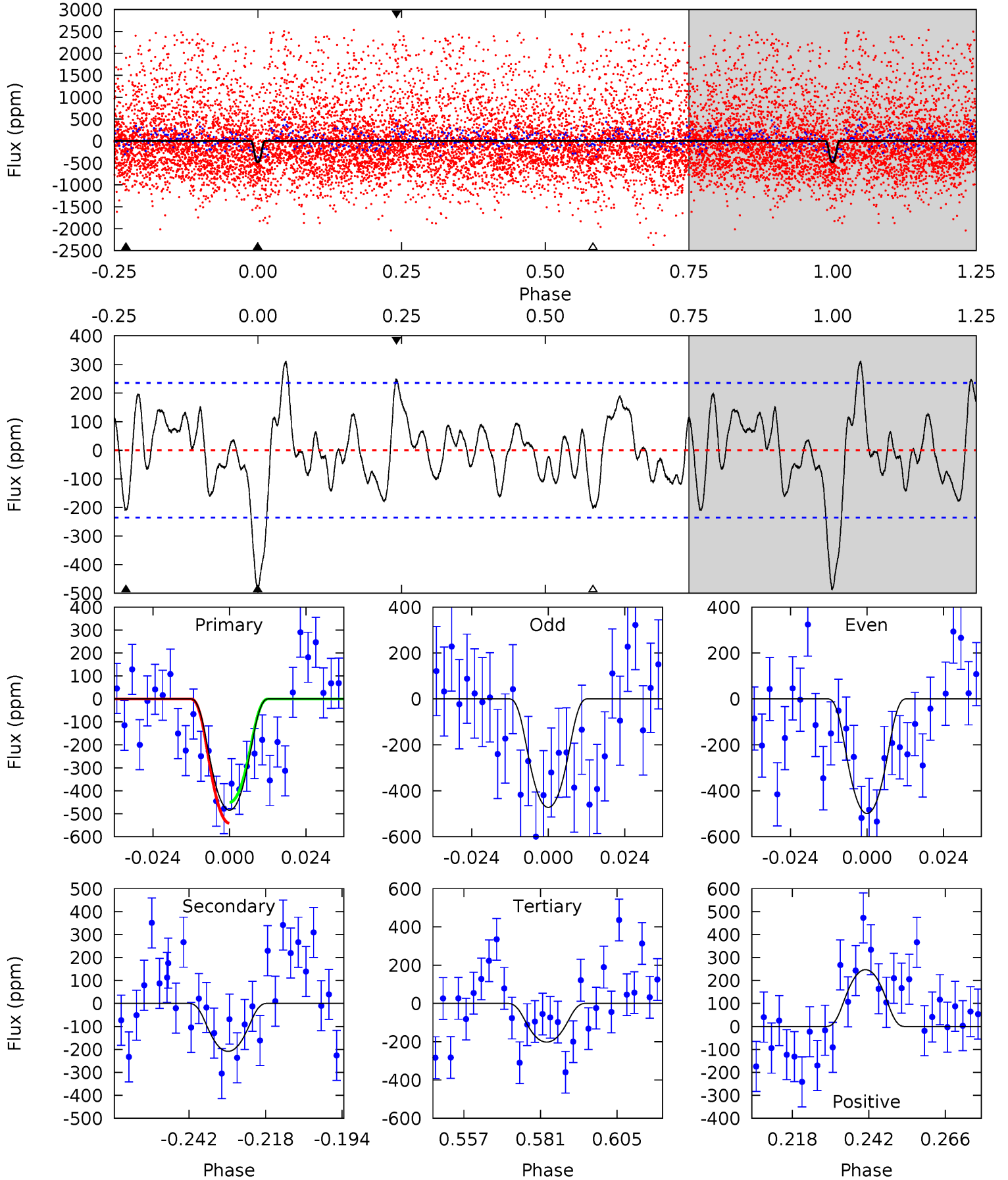
TCE 005716508-07     $P = 4.753072$  Days     $T_0 = 134.543541$  (BKJD)



# DV Model-Shift Uniqueness Test

005716508-07, P = 4.753079 Days, E = 134.546213 Days

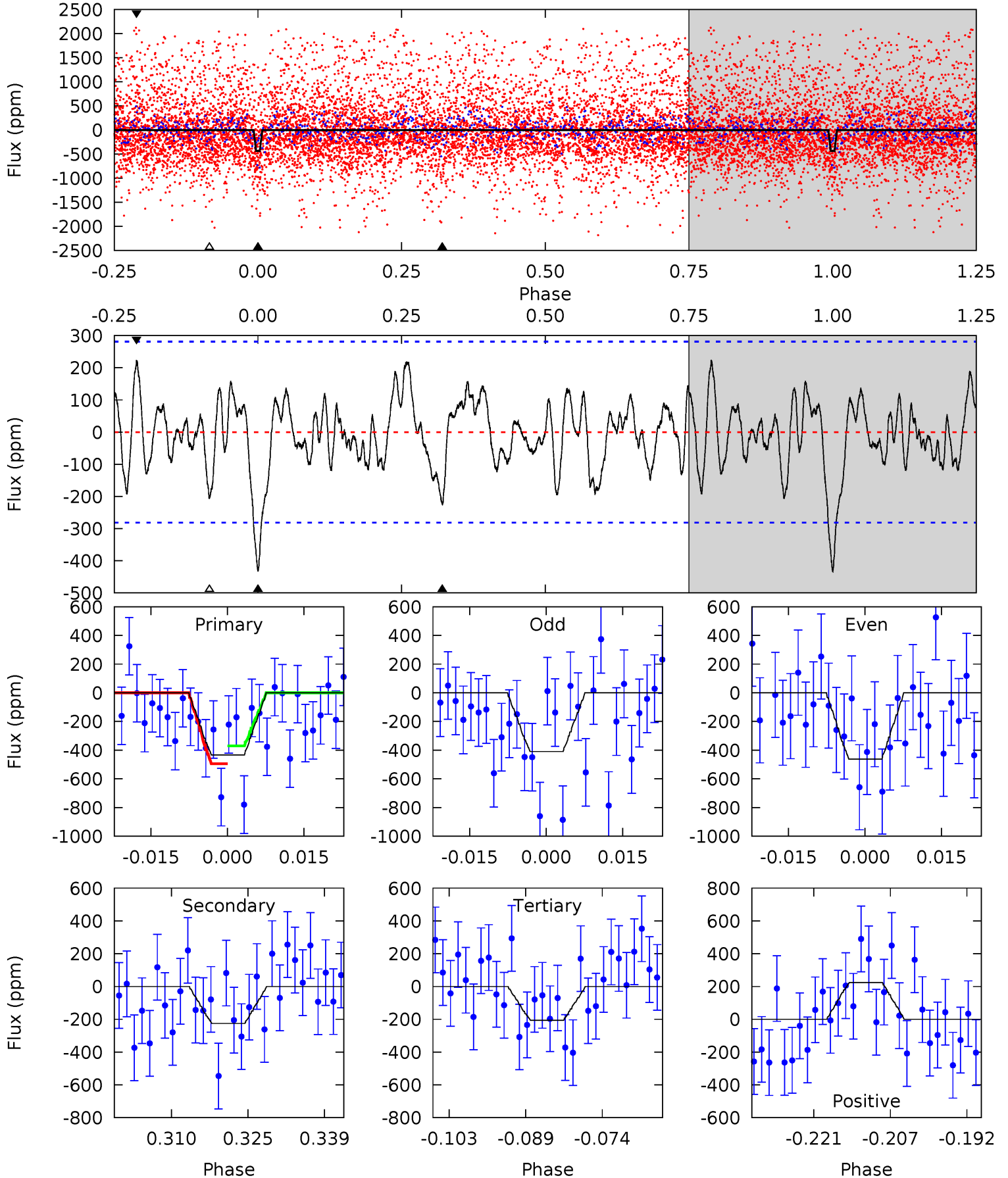
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.00	4.30	4.17	5.10	4.85	2.25	1.97	5.83	4.90	0.13	-0.79	0.28	0.53	0.39	0.95



# Alt Model-Shift Uniqueness Test

005716508-07, P = 4.753072 Days, E = 134.543541 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
7.63	3.97	3.64	3.95	4.95	2.44	1.52	3.99	3.69	0.33	0.02	0.48	0.74	0.34	1.13



### Stellar Parameters For KIC 005716508

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3486^{+112}_{-112}$	$0.500^{+0.338}_{-0.156}$	$0.360^{+0.100}_{-0.250}$	$180.013^{+25.956}_{-103.825}$	$3.735^{+0.075}_{-2.514}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+68%/-31%	+28%/-69%	+14%/-58%	+2%/-67%	+434%/-35%
Source	KIC0	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 005716508-07 / KOI 7737.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-209 \pm 48$	$679.33^{+539.28}_{-415.19}$	$9885^{+647}_{-1149}$	$-6887^{+969}_{-668}$	$0.002^{+0.009}_{-0.001}$
Alt.	$-225 \pm 57$	$480.37^{+500.17}_{-309.59}$	$9822^{+640}_{-1005}$	$-6789^{+952}_{-695}$	$0.004^{+0.026}_{-0.003}$

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

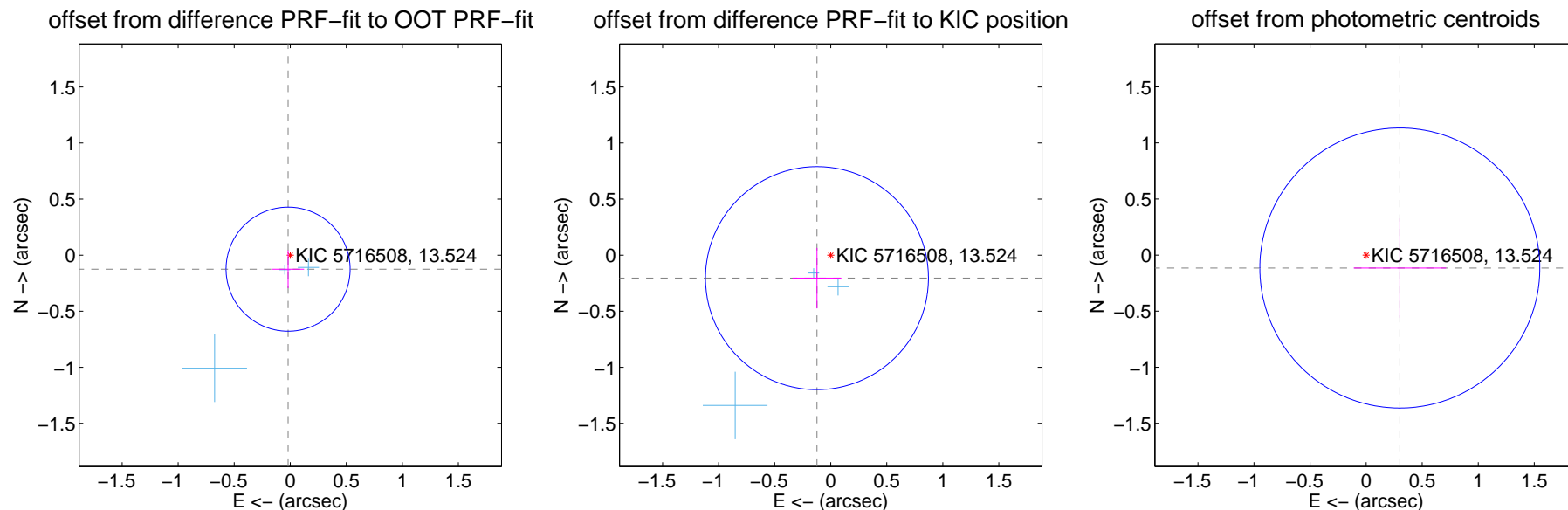
## DV Centroid Data

Supplemental centroid analysis for 005716508-07. Kepler magnitude: 13.52. Transit SNR 5.92

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.127 \pm 0.184$	0.69	$0.019 \pm 0.143$	$-0.125 \pm 0.169$
PRF-fit source offset from KIC position	$0.239 \pm 0.332$	0.72	$0.123 \pm 0.218$	$-0.205 \pm 0.270$
photometric centroid source offset	$0.32 \pm 0.42$	0.77	$-0.30 \pm 0.41$	$-0.12 \pm 0.44$



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.

Q5 no difference image



Q5 no OOT image



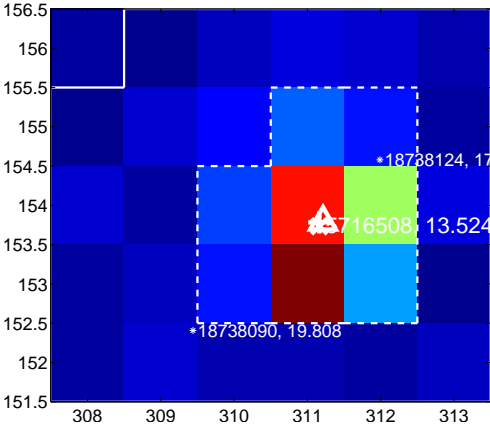
Q6 no difference image



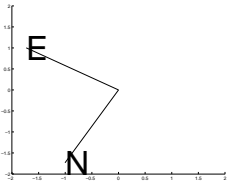
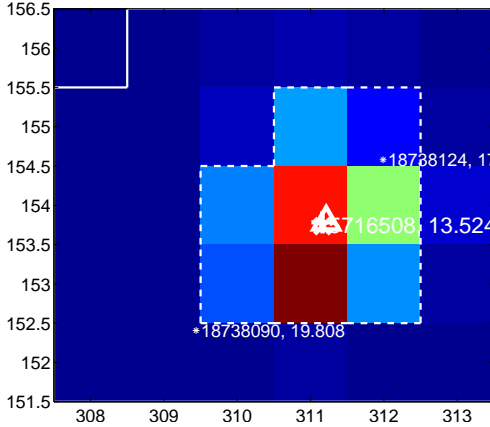
Q6 no OOT image



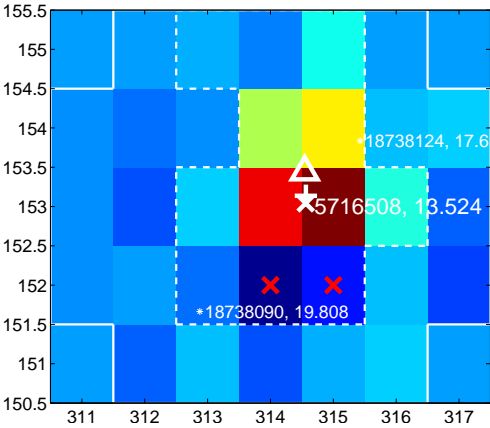
Q7 difference image



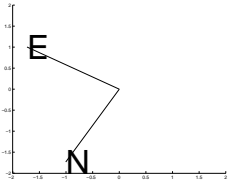
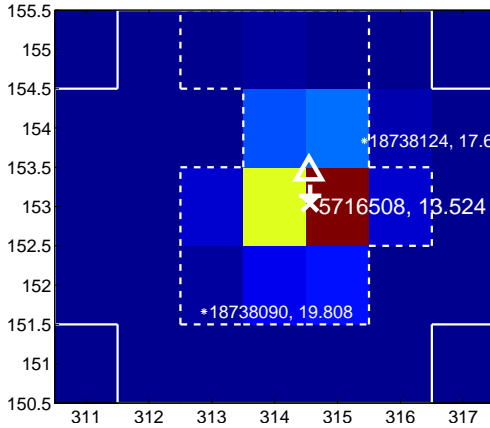
Q7 OOT image



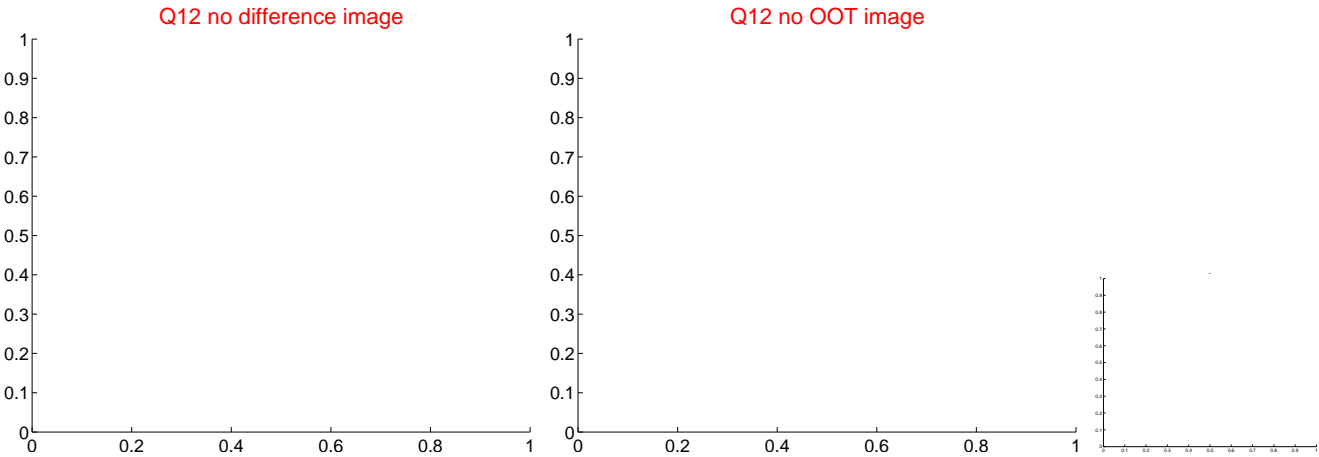
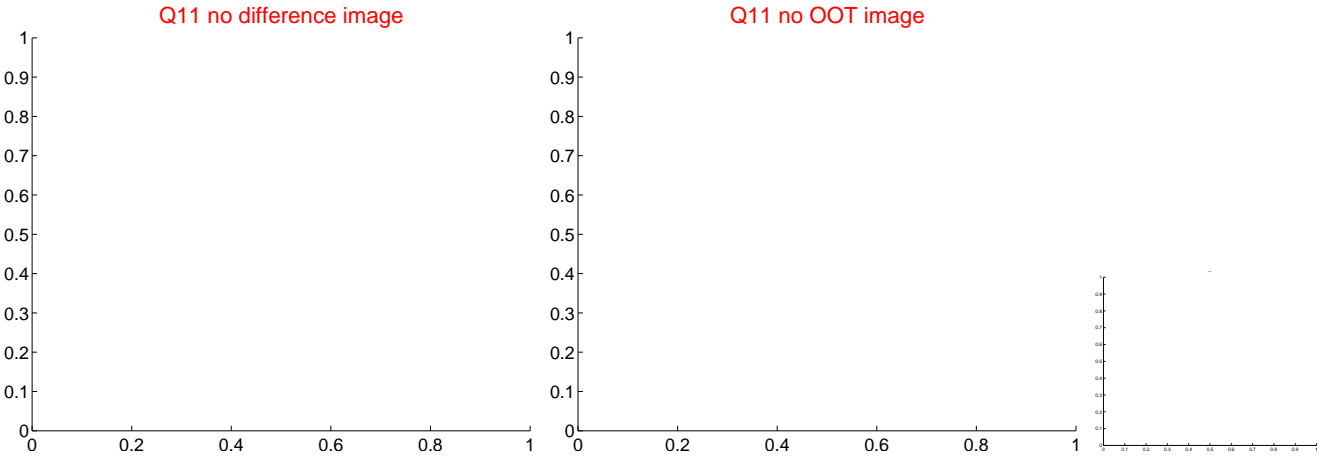
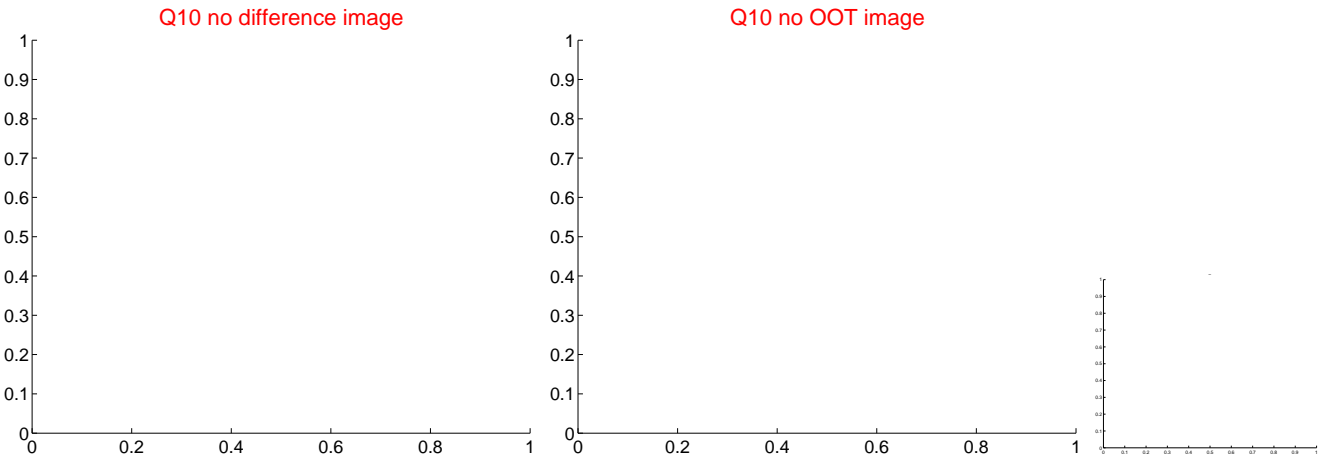
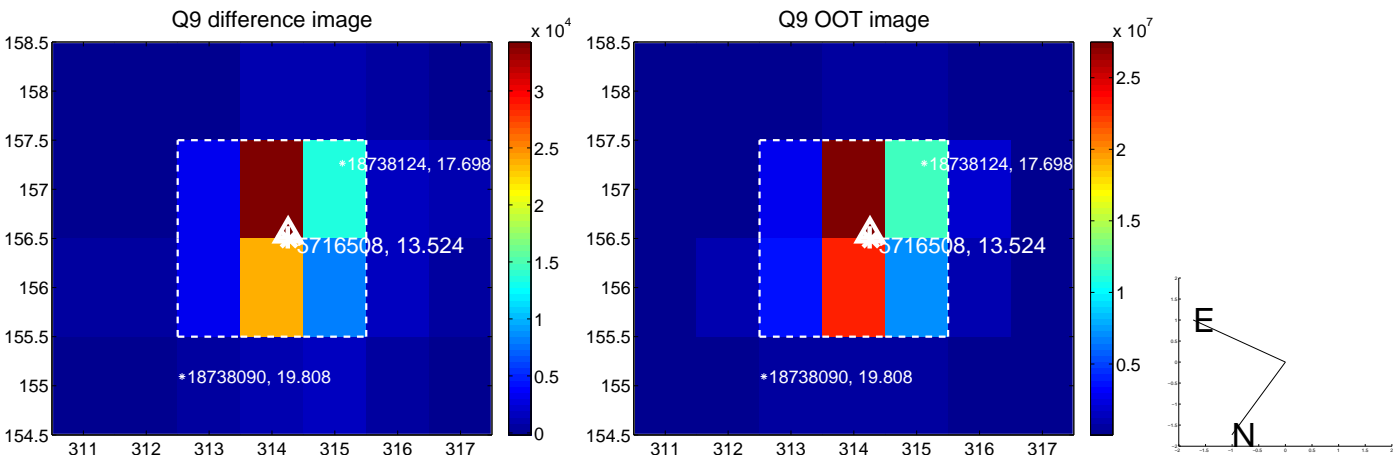
Q8 difference image



Q8 OOT image



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

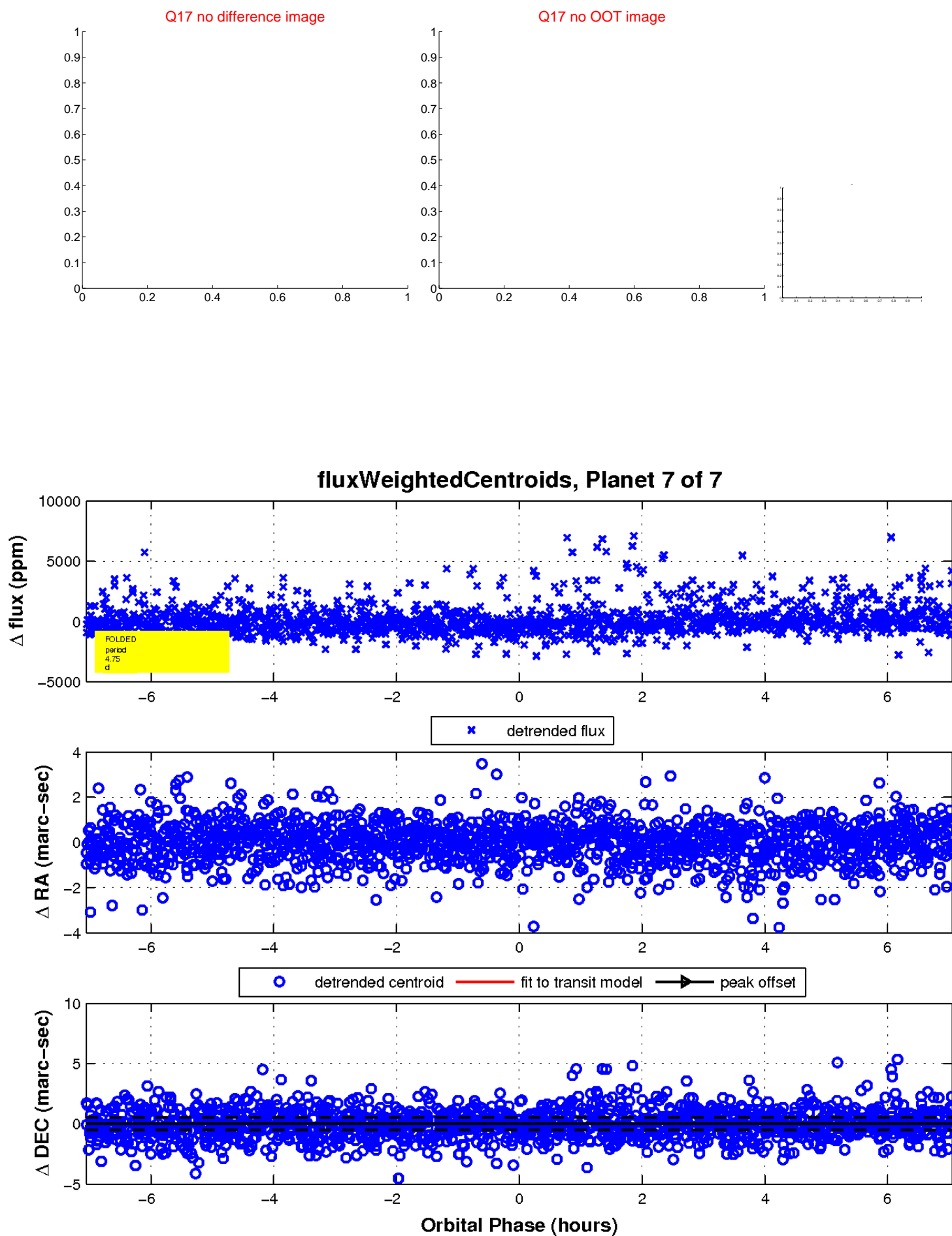




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

