

# KIC 006949412

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006949412-01	OBS	No	559.656830	450.057158	3684.1	2.438	15.6	8.2	0.45	3666	2.75	0.03
006949412-04	OBS	No	550.337297	462.272378	5184.8	5.654	12.9	8.5	0.45	3666	4.79	0.03
006949412-05	OBS	No	576.042798	237.334759	3368.9	3.131	14.8	7.2	0.45	3666	2.67	0.03
006949412-06	OBS	No	220.881063	334.052170	2996.4	3.148	12.4	10.3	0.45	3666	2.54	0.11
006949412-07	OBS	No	426.802577	199.949807	2354.7	8.319	10.5	5.4	0.45	3666	2.47	0.04
006949412-08	OBS	No	445.015692	197.906441	1497.3	7.500	11.4	-1.0	0.45	3666	1.74	0.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006949412-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
006949412-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
006949412-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

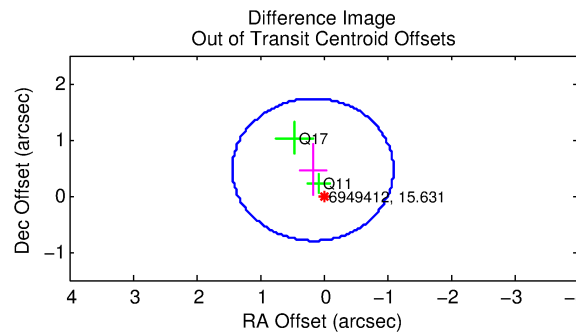
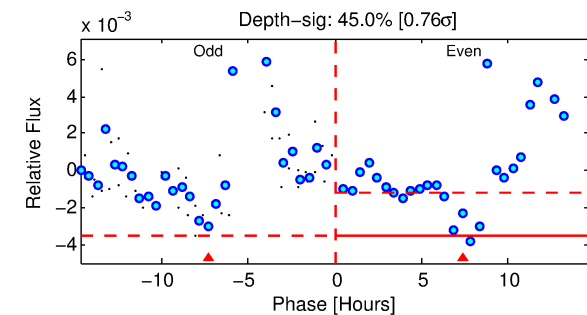
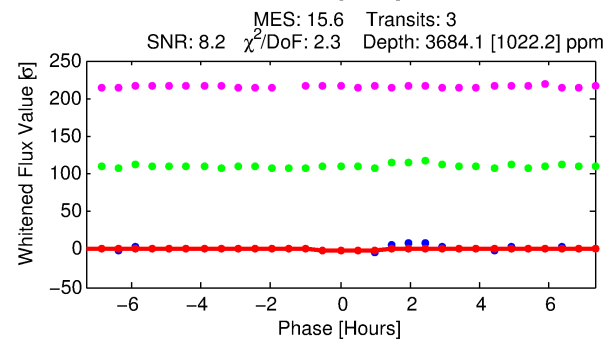
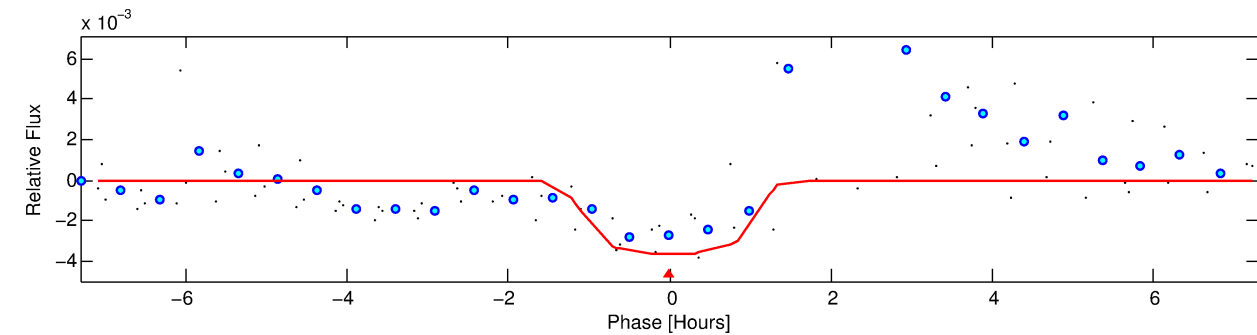
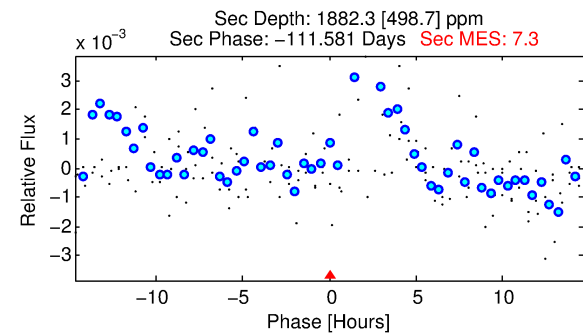
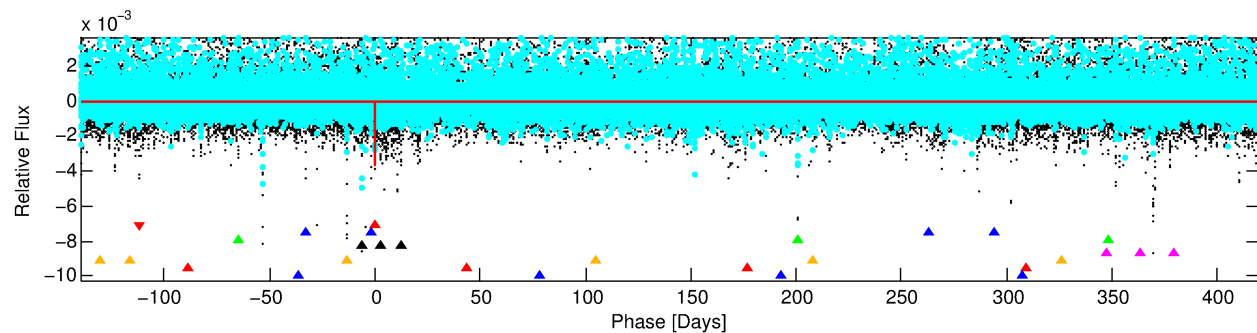
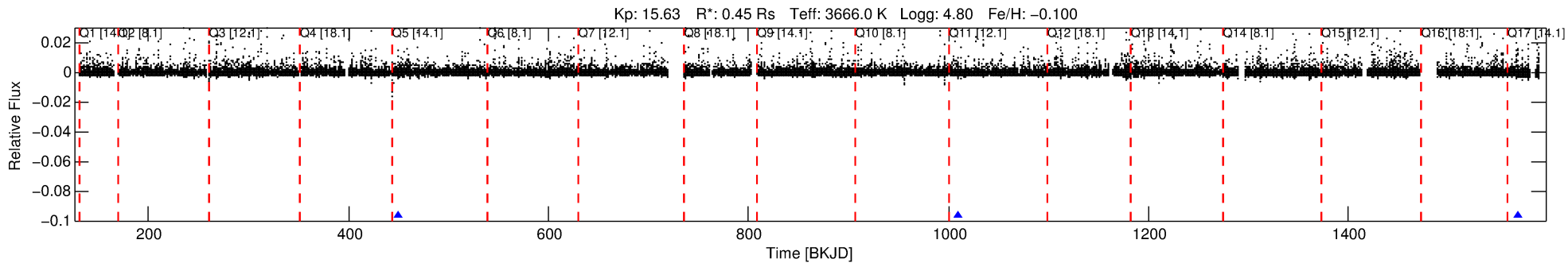
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006949412-01

No Significant Match Found

# DV One-Page Summary

KIC: 6949412 Candidate: 1 of 8 Period: 559.657 d



## DV Fit Results:

Period = 559.65683 [0.00647] d  
Epoch = 450.0572 [0.0091] BKJD  
Rp/R\* = 0.0556 [0.1745]  
a/R\* = 1792.18 [24421.71]  
b = 0.26 [48.54]  
Seff = 0.03 [0.00]  
Teq = 107 [3] K  
Rp = 2.75 [8.63] Re  
a = 1.0329 [0.0602] AU  
Ag = 146261.73 [918989.77] [0.16σ]  
Teffp = 3238 [5087] K [0.62σ]

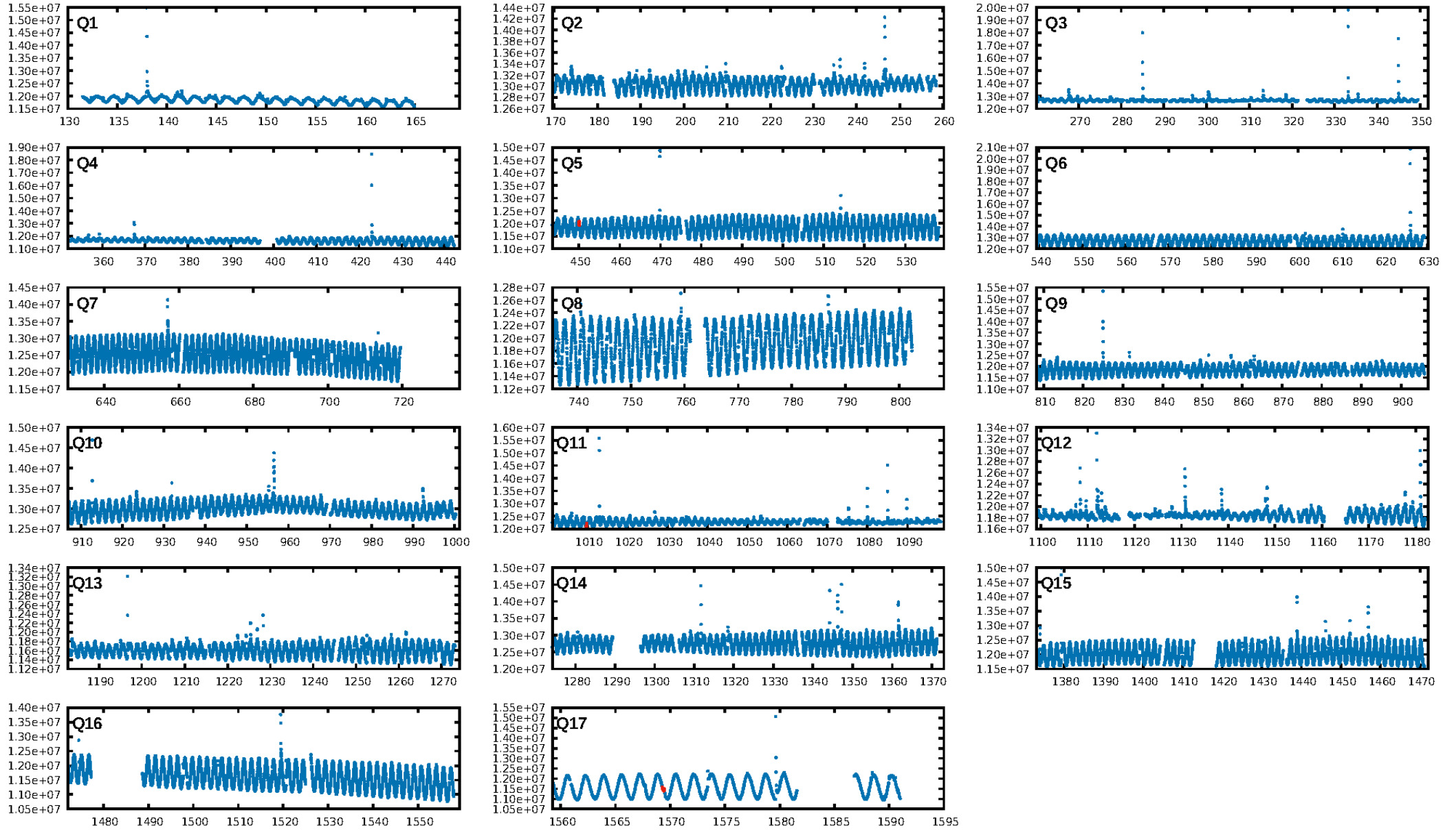
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [36.33σ]  
LongPeriod-sig: 100.0% [99.10σ]  
ModelChiSquare2-sig: 30.7%  
ModelChiSquareGof-sig: 24.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 1.286  
Centroid-sig: 80.2%  
Centroid-so: 0.469 arcsec [0.86σ]  
OotOffset-rm: 0.493 arcsec [1.17σ]  
OotOffset-st: 0/1/0/1 [2]  
KicOffset-rm: 0.722 arcsec [2.03σ]  
KicOffset-st: 0/1/0/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [3/3]

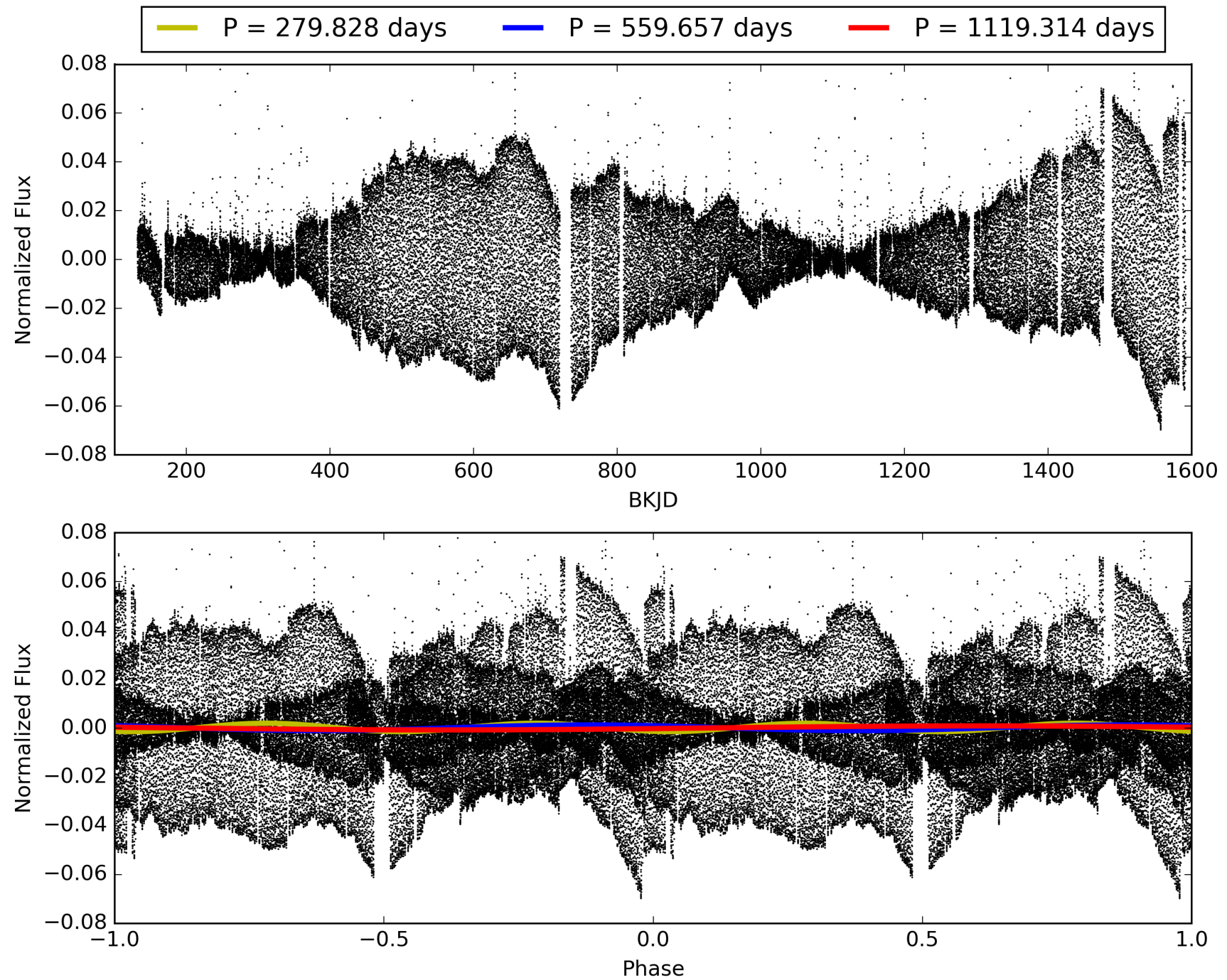
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:09:33 Z

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

# TCE 006949412-01, PDC Light Curves



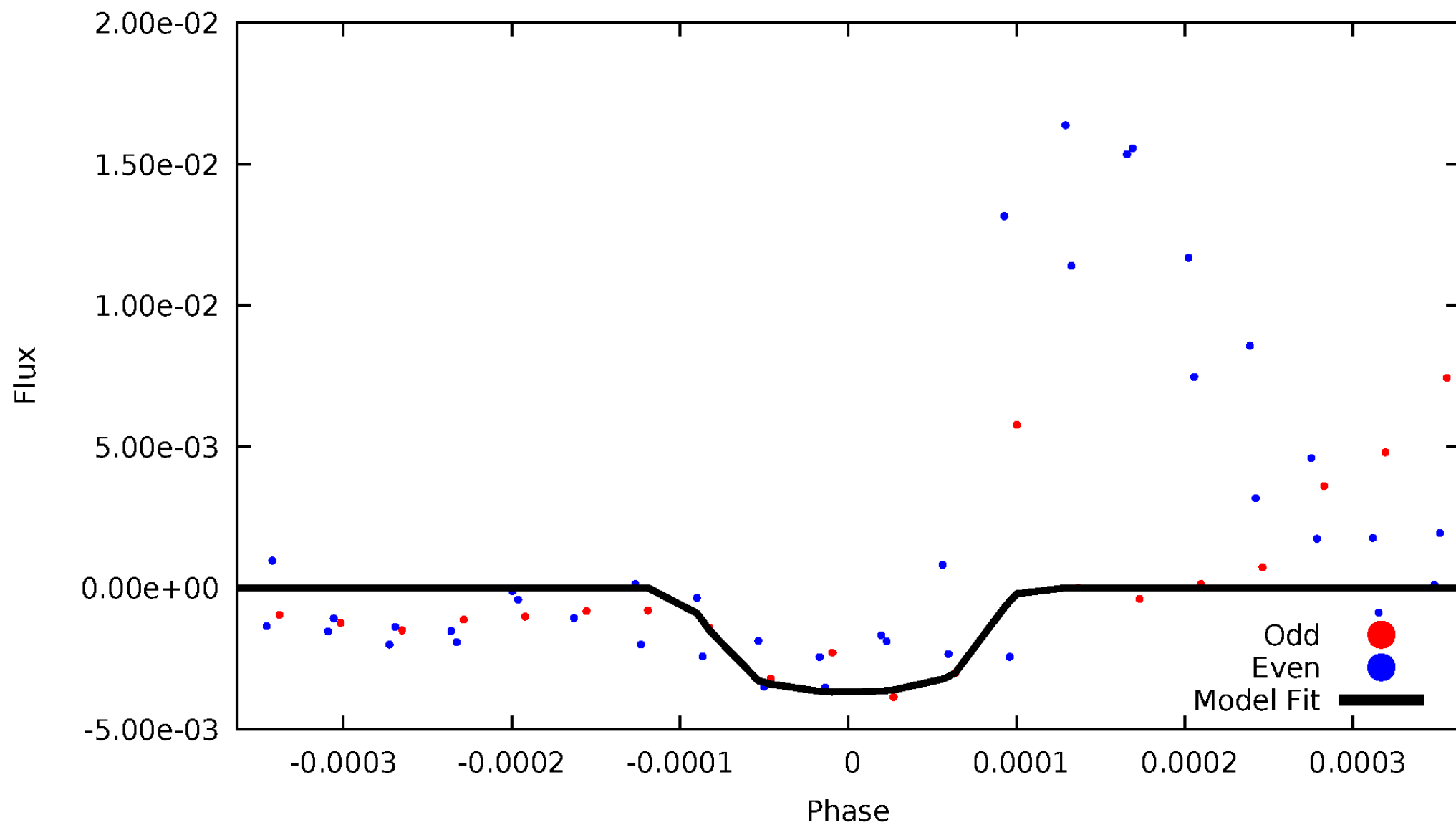
TCE 006949412-01





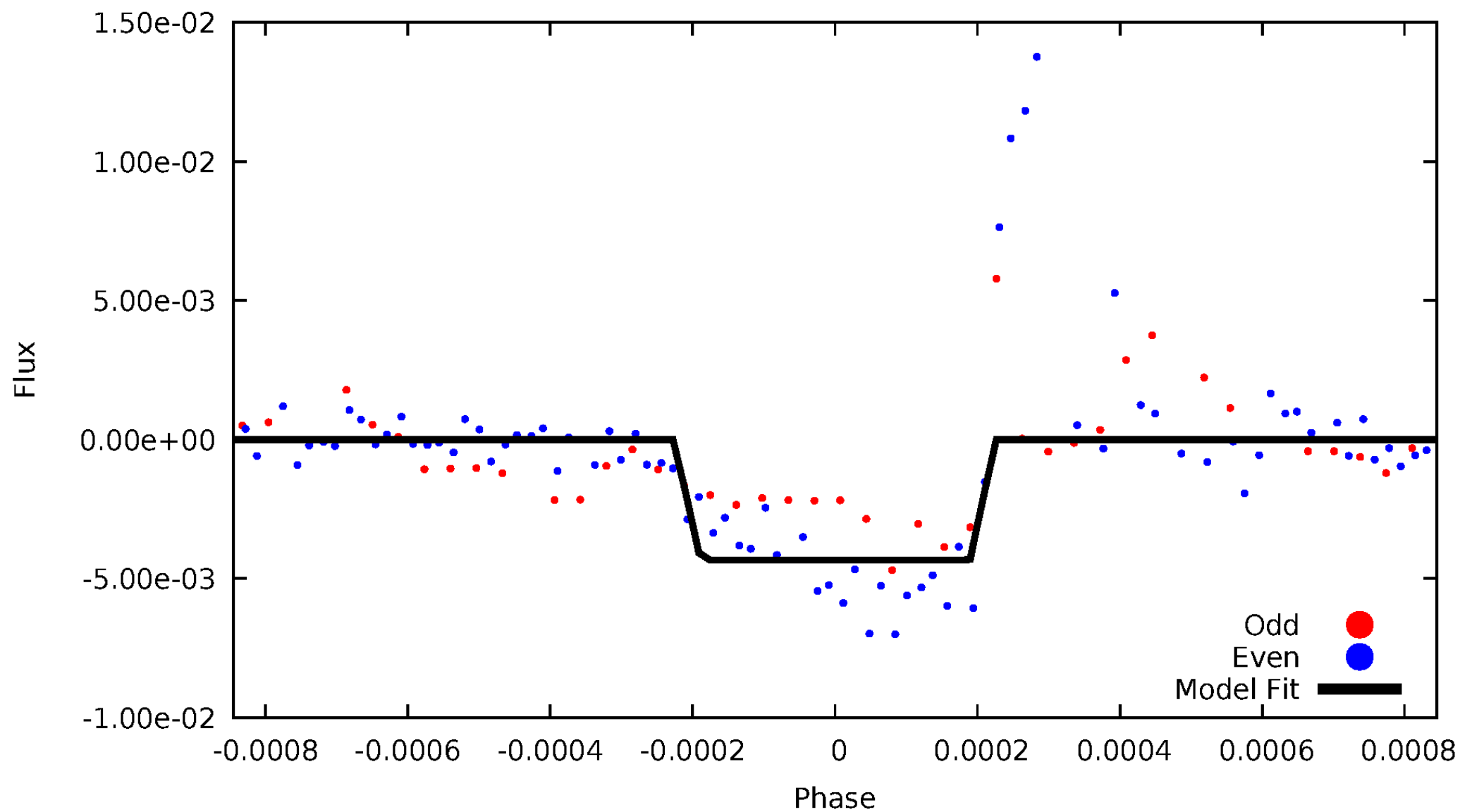
# DV Odd/Even

TCE 006949412-01



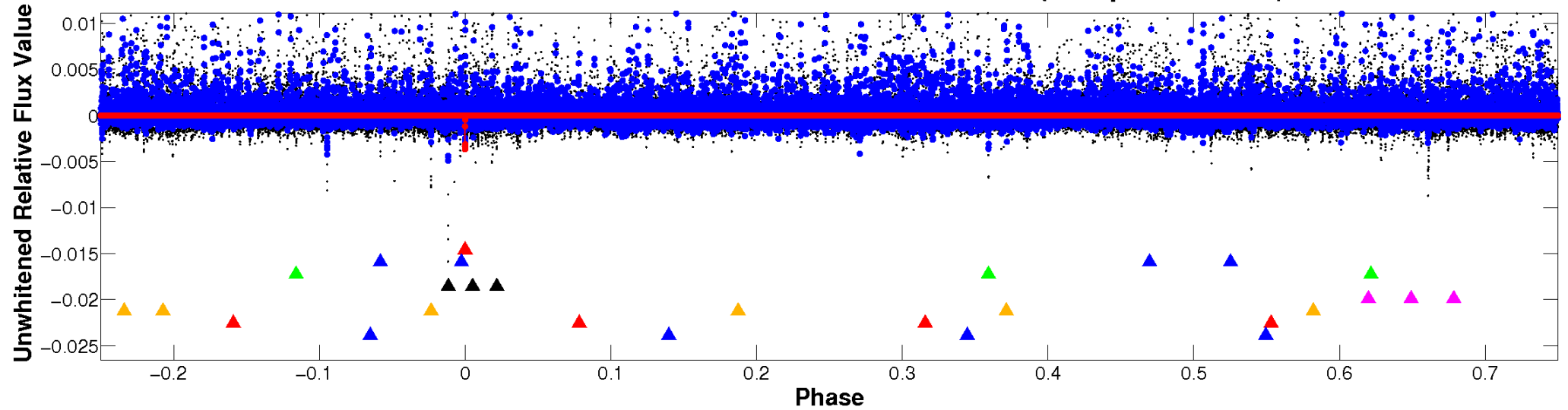
# ALT Odd/Even

TCE 006949412-01

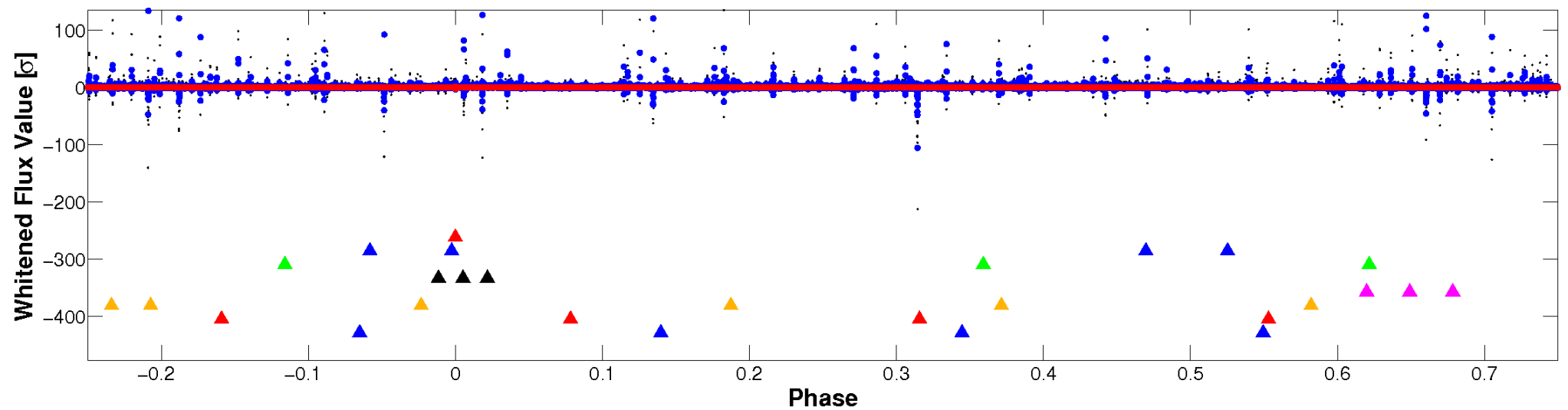


# Non-Whitened Vs. Whitened Light Curve

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

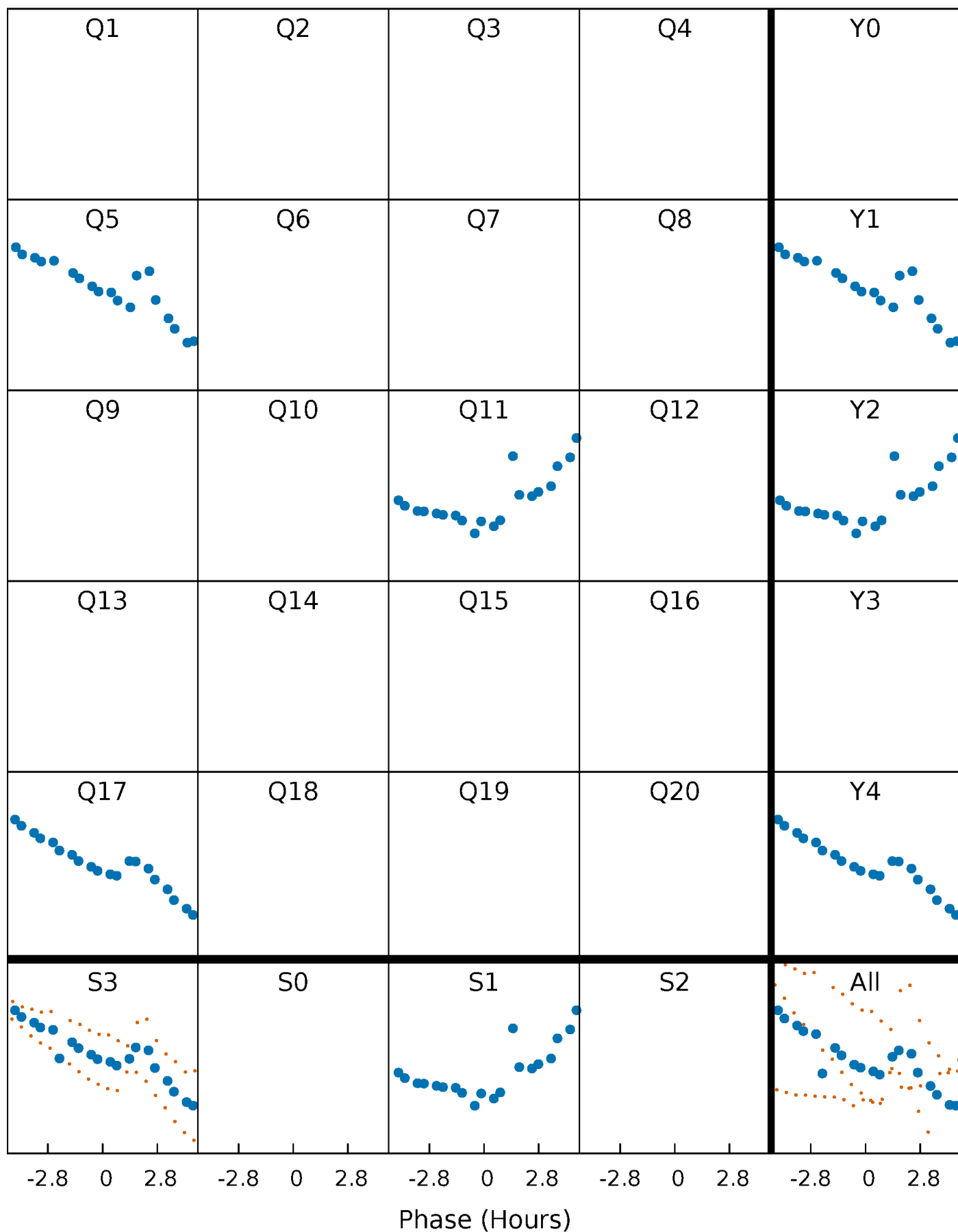


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



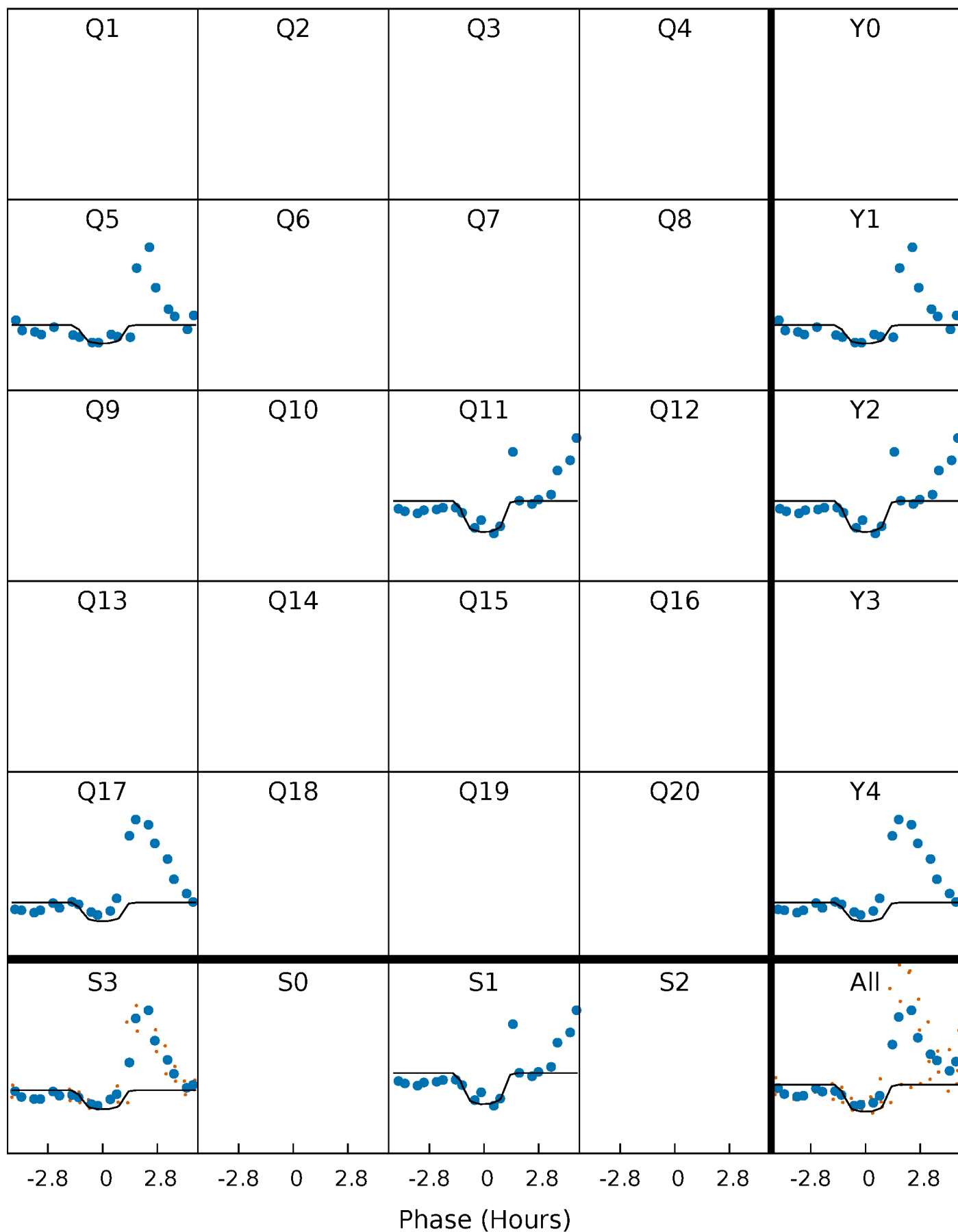
# PDC Quarter-Phased Transit Curves

TCE 006949412-01 P=559.656830 Days  $T_0=450.057158$  (BKJD)



# DV Quarter-Phased Transit Curves

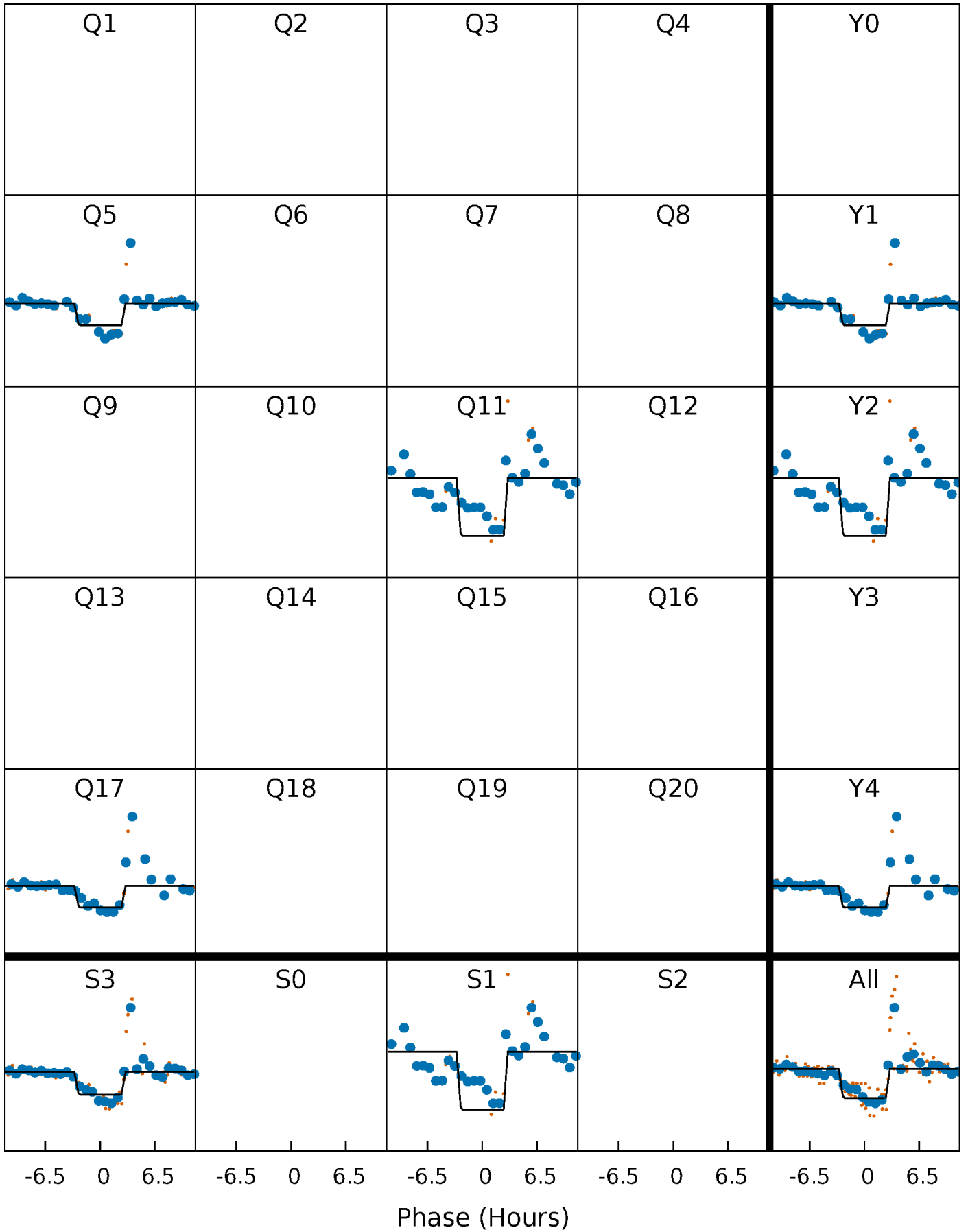
TCE 006949412-01 P=559.656830 Days  $T_0=450.057158$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

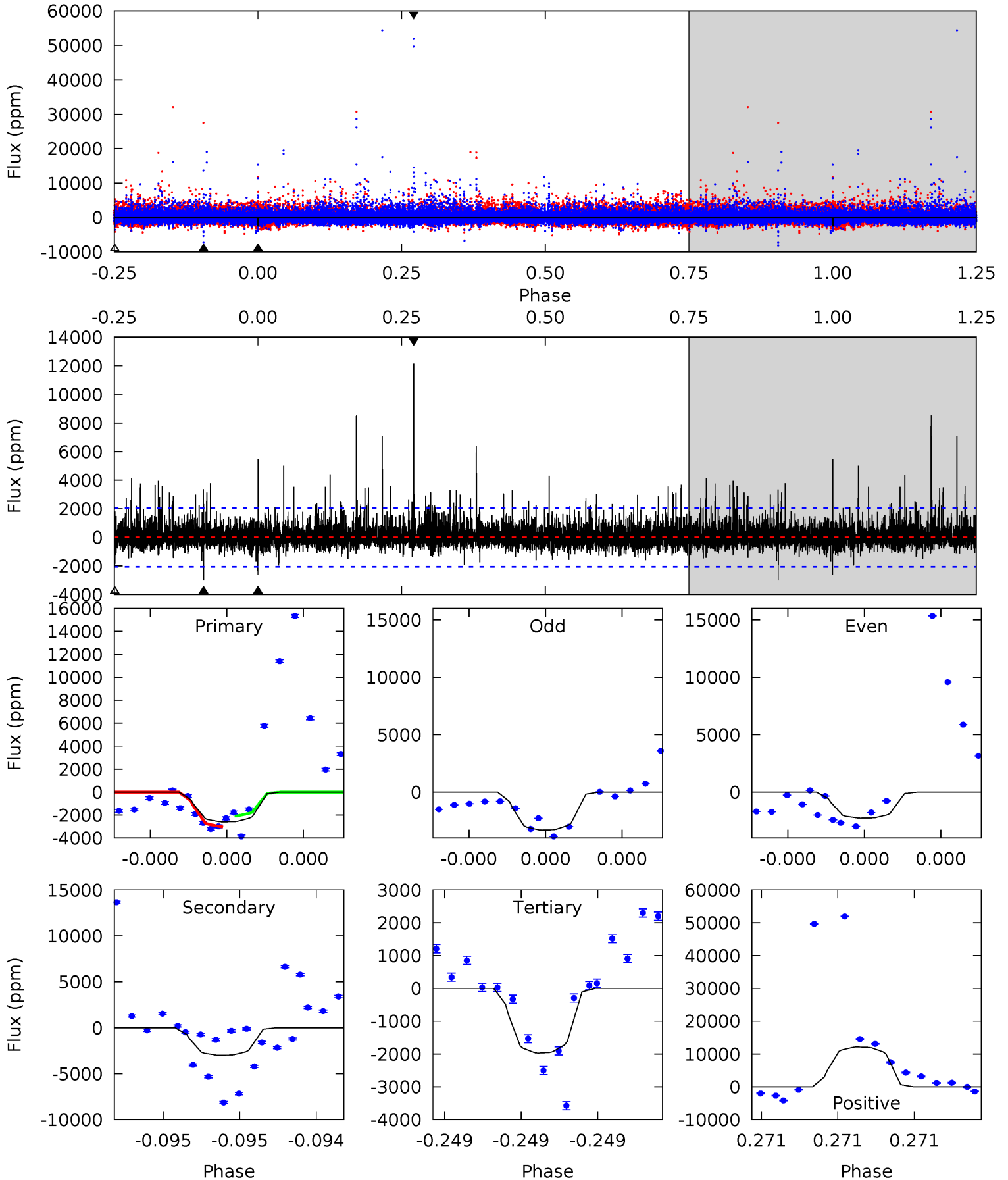
TCE 006949412-01 P=559.641152 Days  $T_0=450.002135$  (BKJD)



# DV Model-Shift Uniqueness Test

006949412-01, P = 559.656830 Days, E = 450.057158 Days

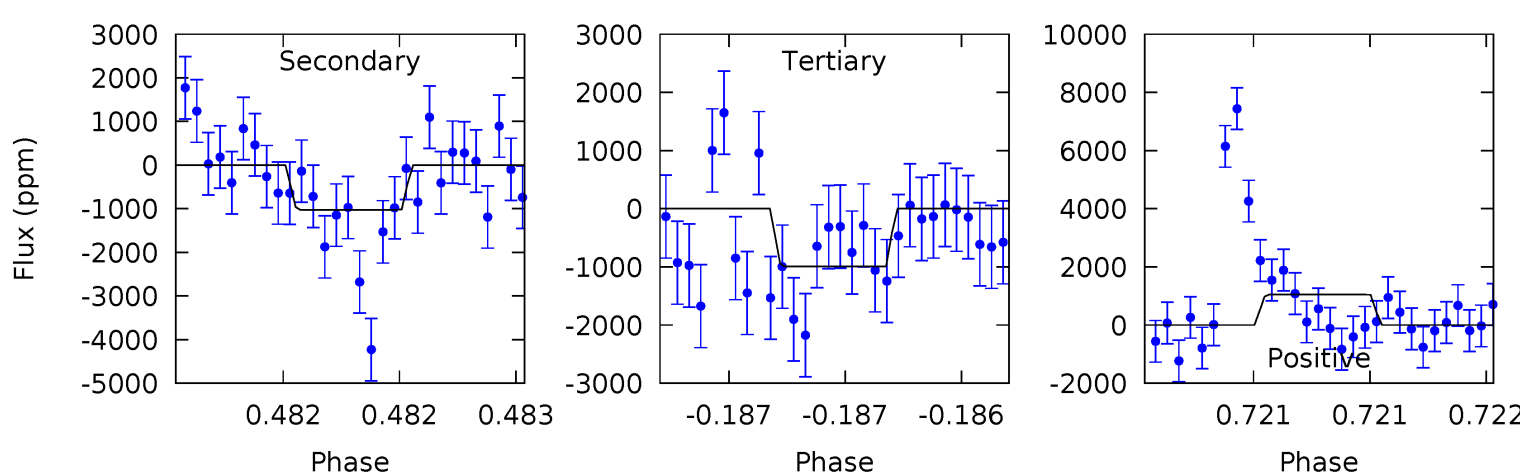
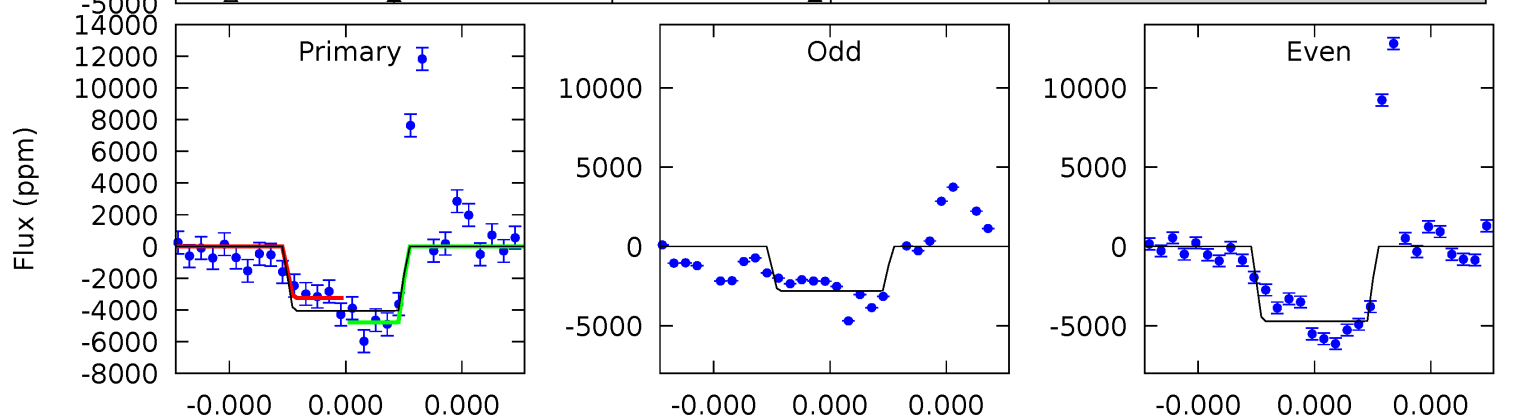
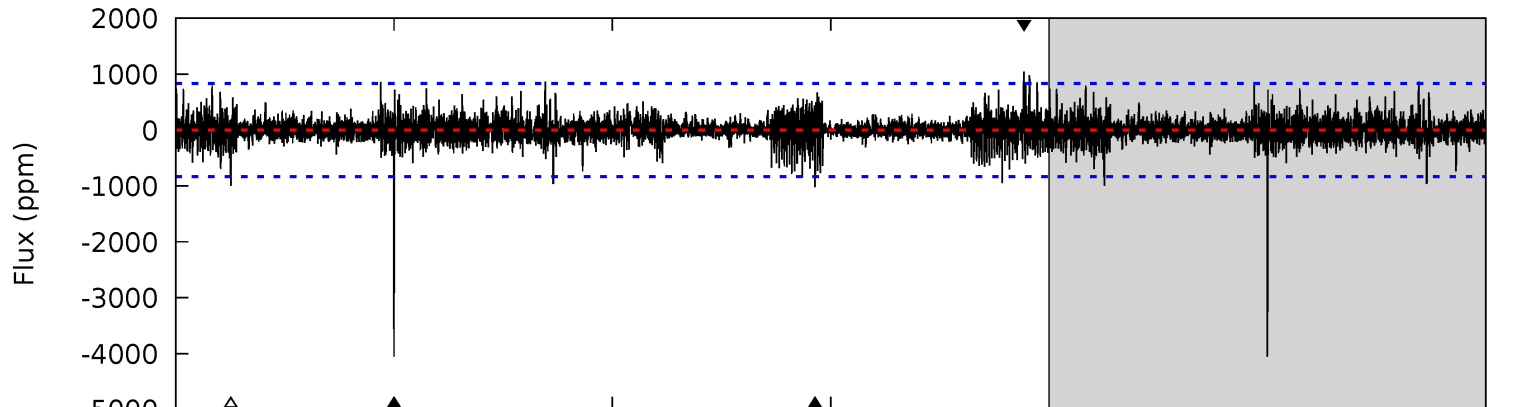
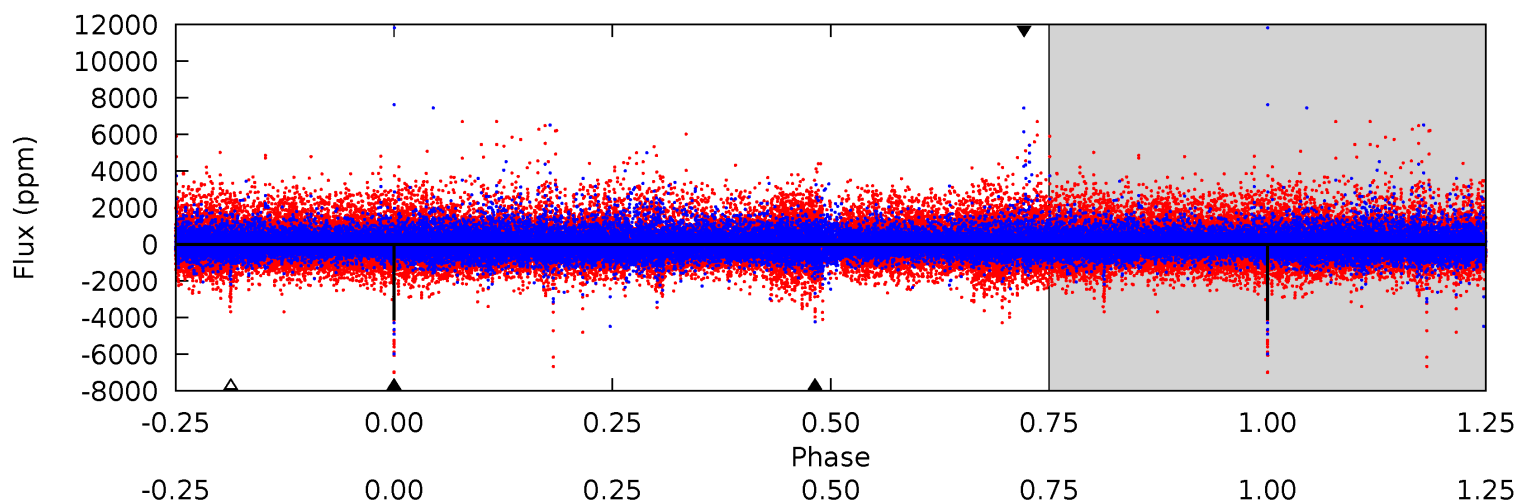
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.25	8.38	5.51	33.9	5.74	3.73	1.73	1.74	-26.7	2.87	-25.5	0.52	0.74	0.80	1.26



# Alt Model-Shift Uniqueness Test

006949412-01, P = 559.641152 Days, E = 450.002135 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
27.2	6.87	6.68	7.02	5.60	3.53	1.16	20.6	20.2	0.19	-0.15	5.32	0.98	0.20	5.21



### Stellar Parameters For KIC 006949412

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3666^{+49}_{-54}$	$4.797^{+0.039}_{-0.028}$	$-0.100^{+0.100}_{-0.100}$	$0.453^{+0.028}_{-0.034}$	$0.468^{+0.026}_{-0.033}$	$7.099^{+1.282}_{-0.744}$
	+1%/-1%	+1%/-1%	+100%/-100%	+6%/-8%	+6%/-7%	+18%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 006949412-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-3003 \pm 358$	$7.18^{+7.01}_{-4.48}$	$149^{+3}_{-3}$	$2752^{+947}_{-428}$	$33192^{+214280}_{-24395}$
Alt.	$-1023 \pm 149$	$7.22^{+6.53}_{-4.99}$	$149^{+3}_{-3}$	$2400^{+931}_{-325}$	$11375^{+111797}_{-8277}$

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

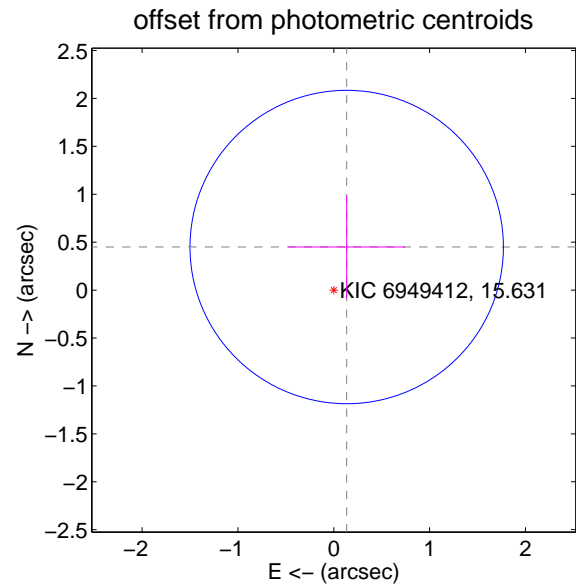
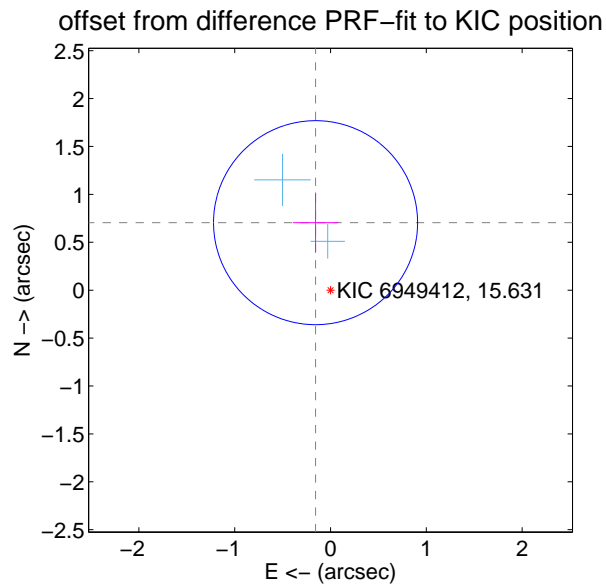
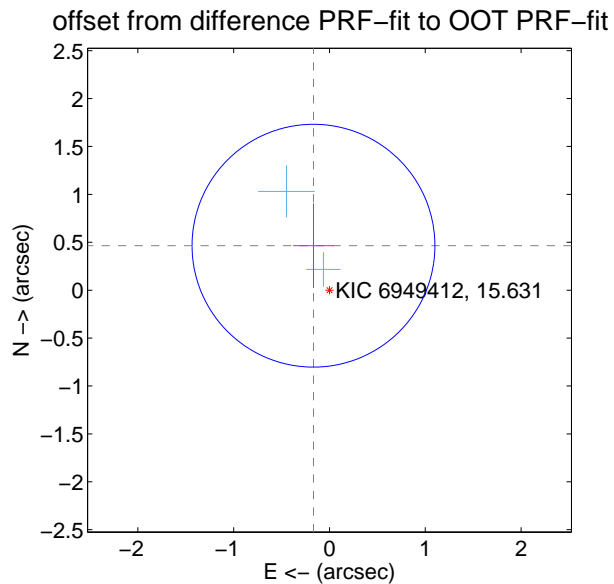
## DV Centroid Data

Supplemental centroid analysis for 006949412-01. Kepler magnitude: 15.63. Transit SNR 8.23

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.493 \pm 0.422$	1.17	$0.167 \pm 0.211$	$0.464 \pm 0.442$
PRF-fit source offset from KIC position	$0.722 \pm 0.355$	2.03	$0.156 \pm 0.236$	$0.705 \pm 0.314$
photometric centroid source offset	$0.47 \pm 0.55$	0.86	$-0.13 \pm 0.61$	$0.45 \pm 0.54$



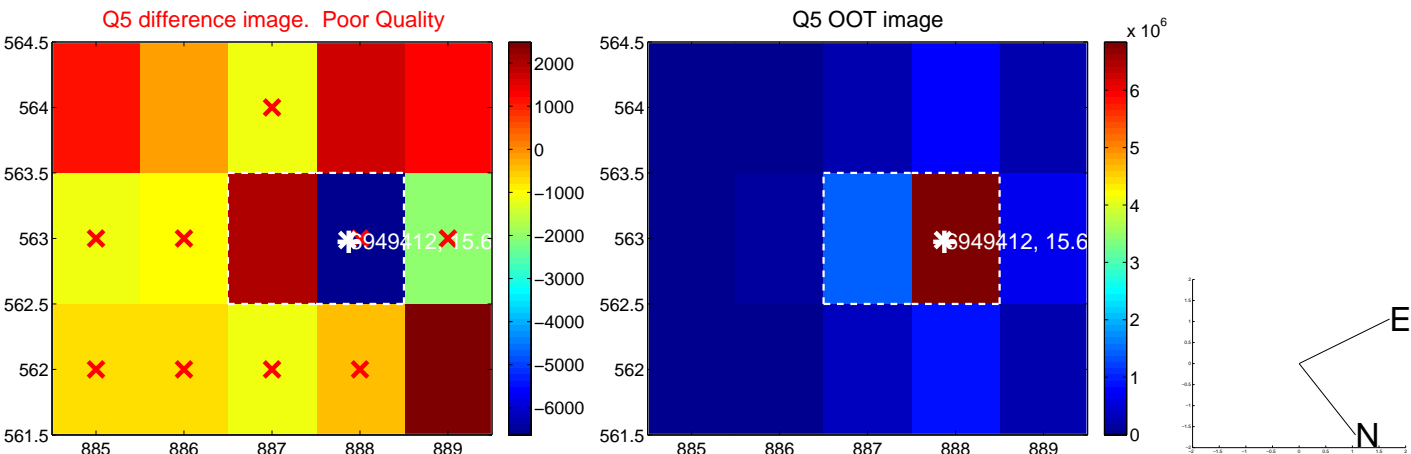
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



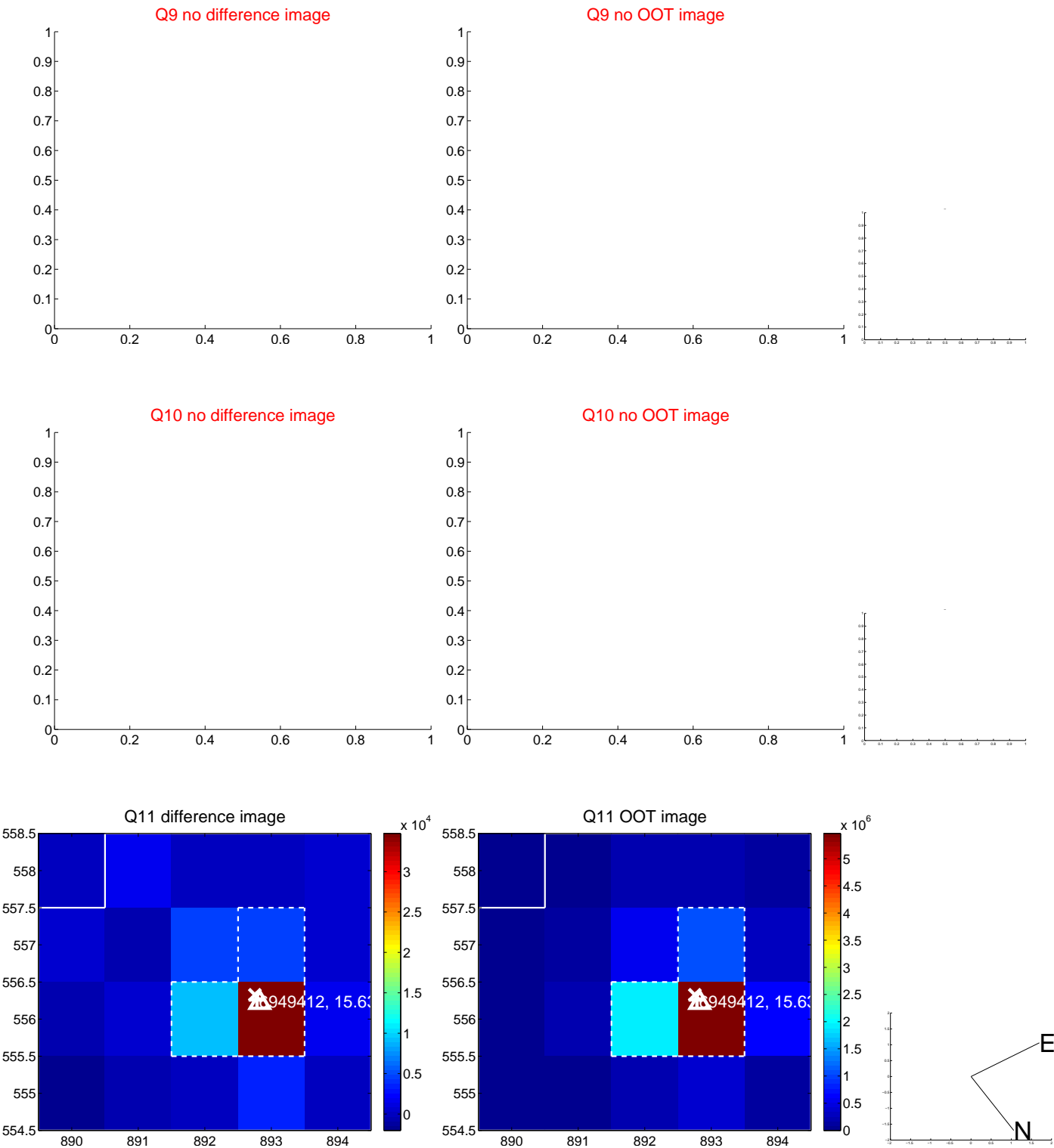
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



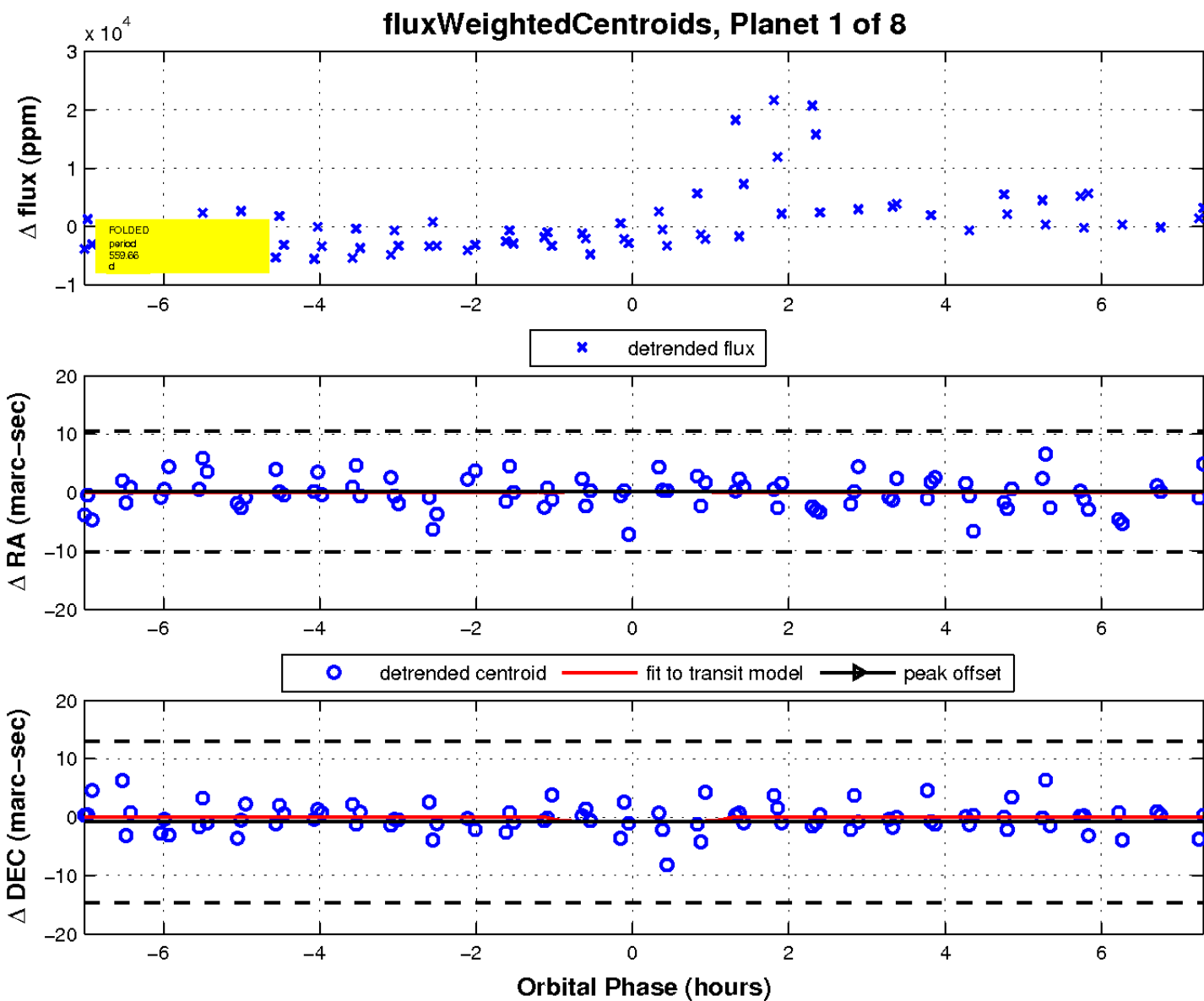
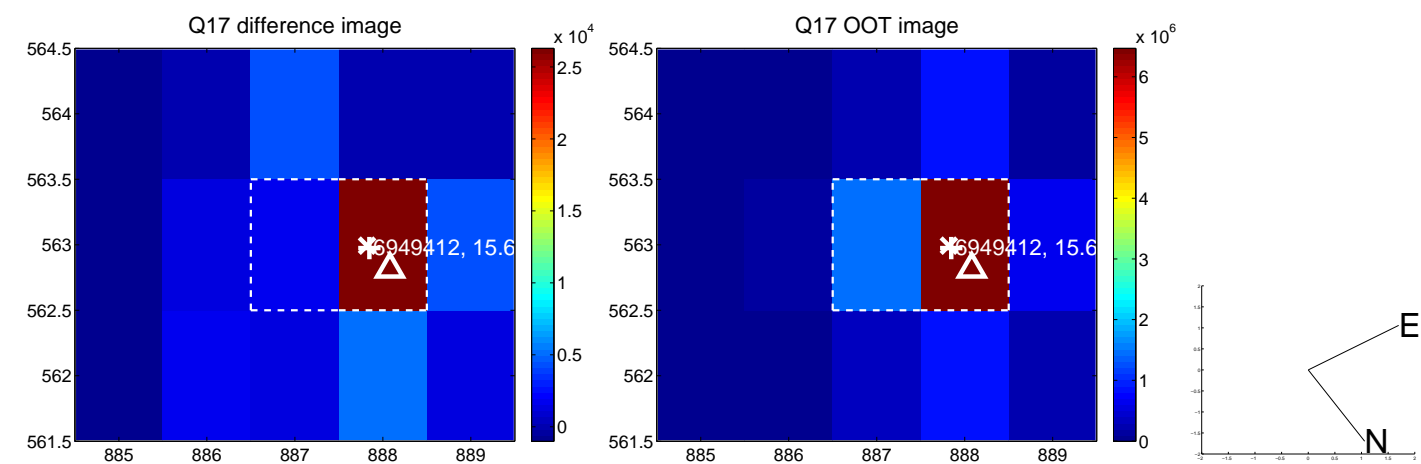
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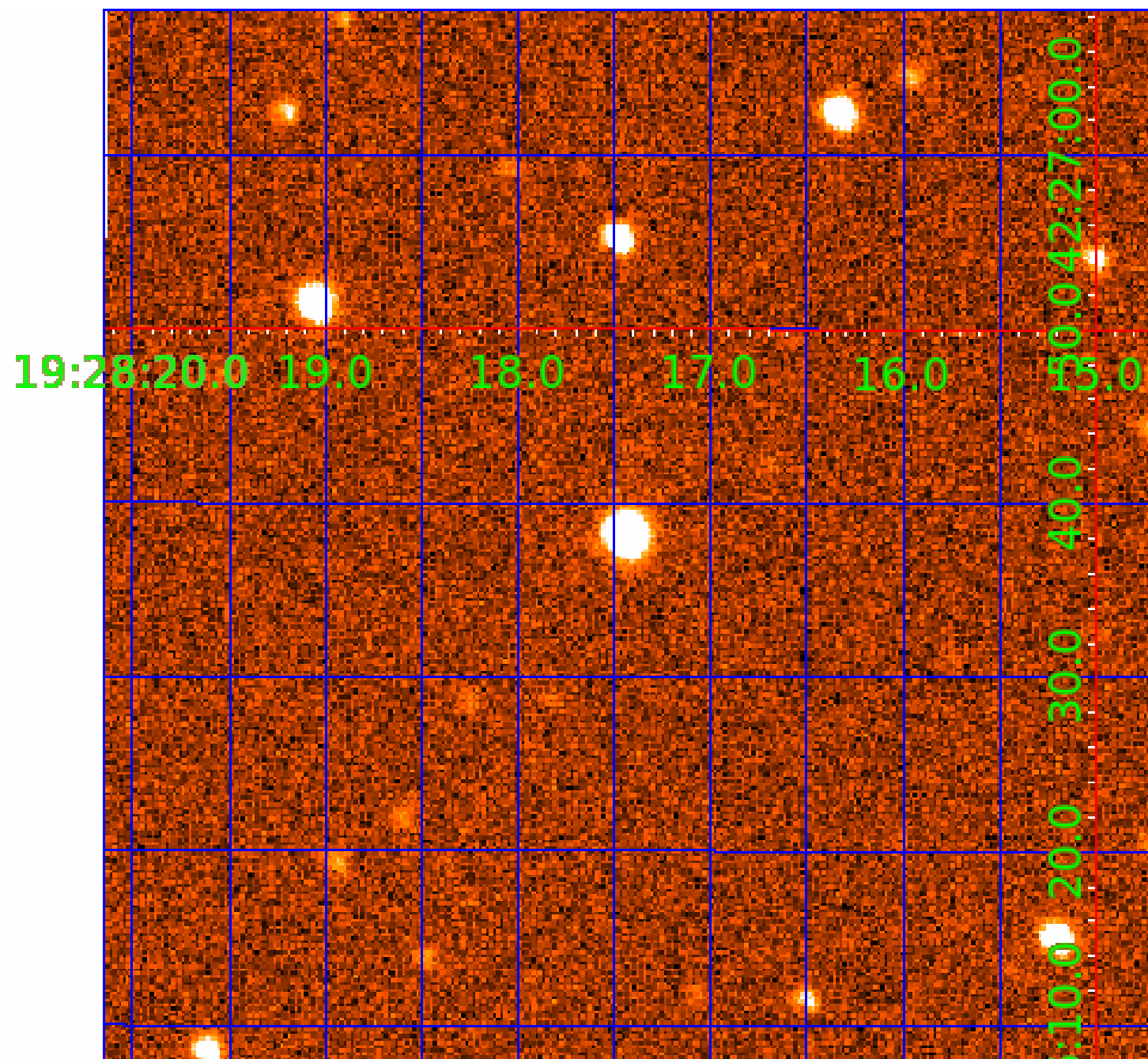
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 006949412

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006949412-01	OBS	No	559.656830	450.057158	3684.1	2.438	15.6	8.2	0.45	3666	2.75	0.03
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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006949412-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
006949412-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

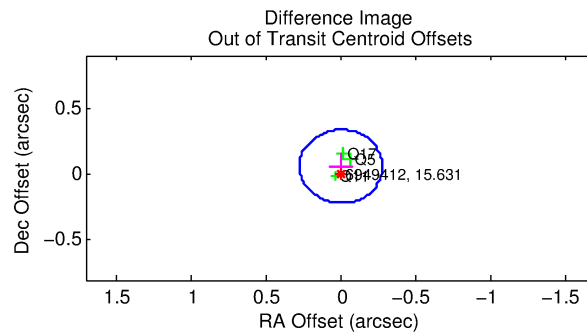
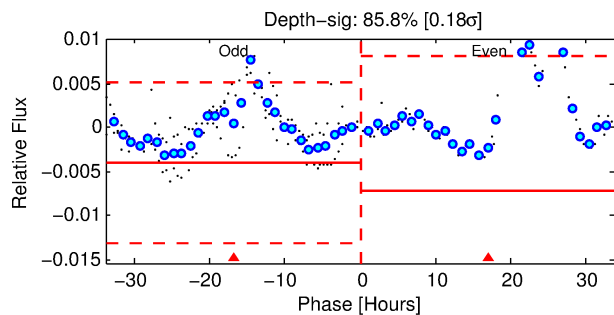
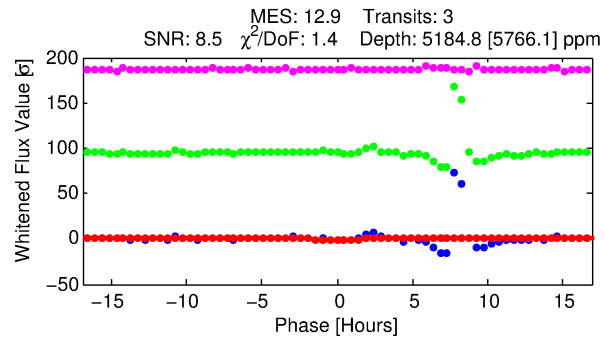
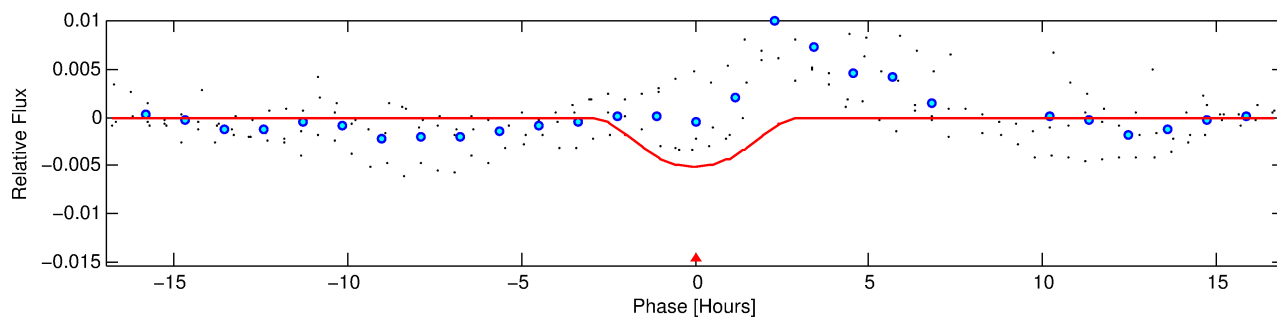
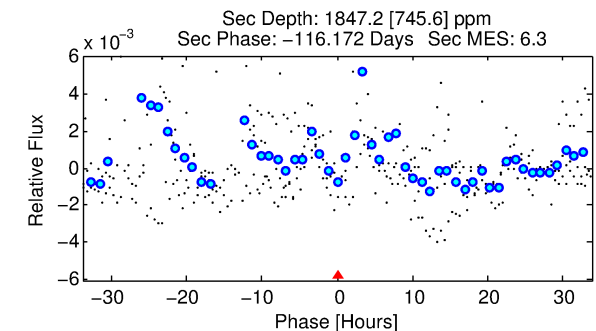
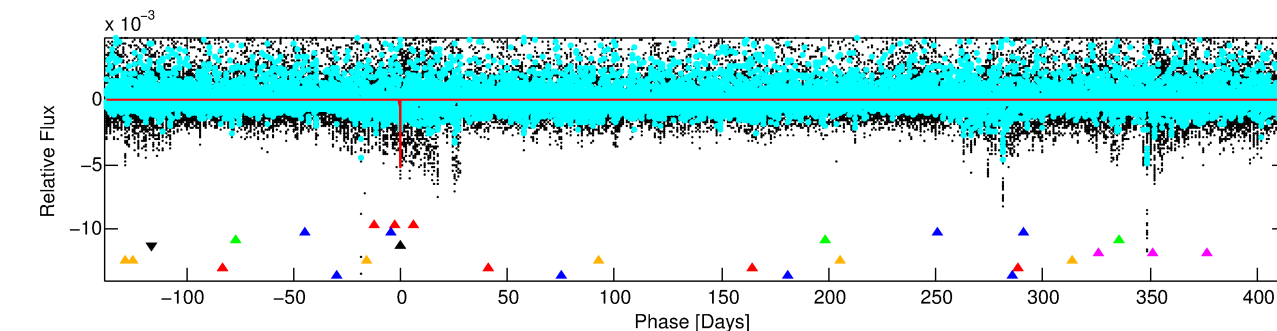
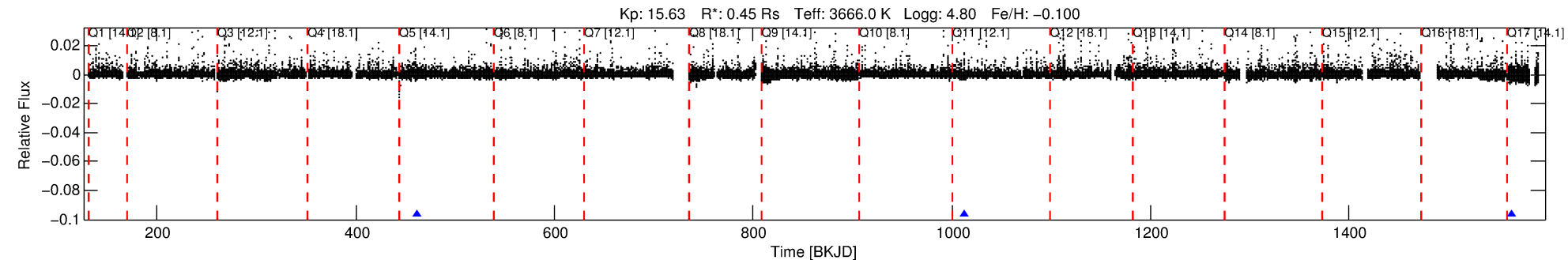
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Ephemeris Match Information For 006949412-04

No Significant Match Found

# DV One-Page Summary

KIC: 6949412 Candidate: 4 of 8 Period: 550.337 d



## DV Fit Results:

Period = 550.33730 [0.04913] d  
Epoch = 462.2724 [0.0632] BKJD  
Rp/R\* = 0.0968 [0.7094]  
a/R\* = 396.78 [907.46]  
b = 0.96 [1.28]  
Seff = 0.03 [0.00]  
Teq = 108 [3] K  
Rp = 4.79 [35.07] Re  
a = 1.0214 [0.0596] AU  
Ag = 46277.58 [678364.04] [0.07σ]  
Teff = 2442 [8951] K [0.26σ]

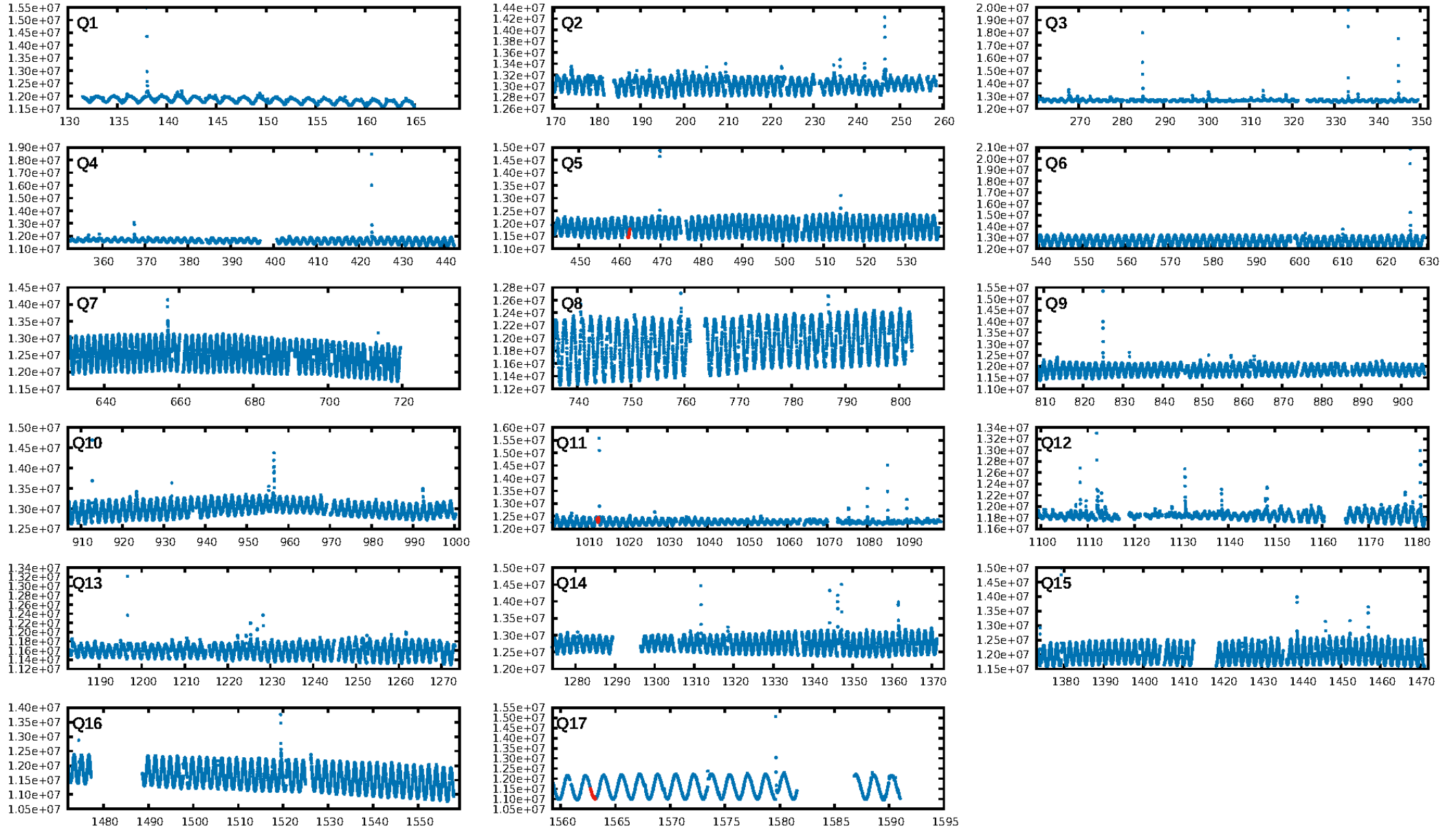
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [269.13σ]  
LongPeriod-sig: 100.0% [36.33σ]  
ModelChiSquare2-sig: 3.0%  
ModelChiSquareGof-sig: 96.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 1.375  
Centroid-sig: 44.9%  
Centroid-so: 0.334 arcsec [0.93σ]  
OotOffset-rm: 0.059 arcsec [0.64σ]  
OotOffset-st: 0/1/0/2 [3]  
KicOffset-st: 0/1/0/2 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

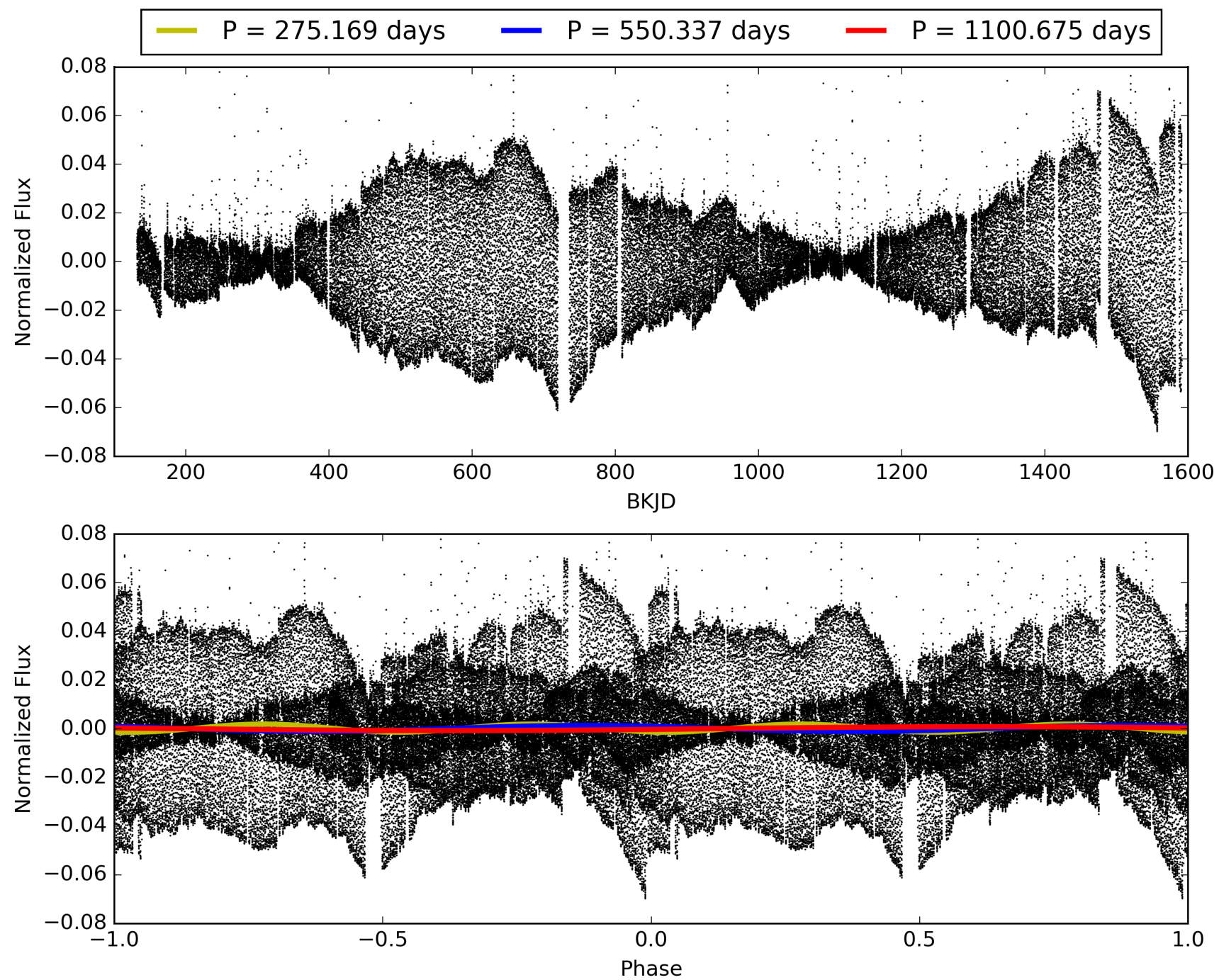
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:10:14 Z

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

# TCE 006949412-04, PDC Light Curves



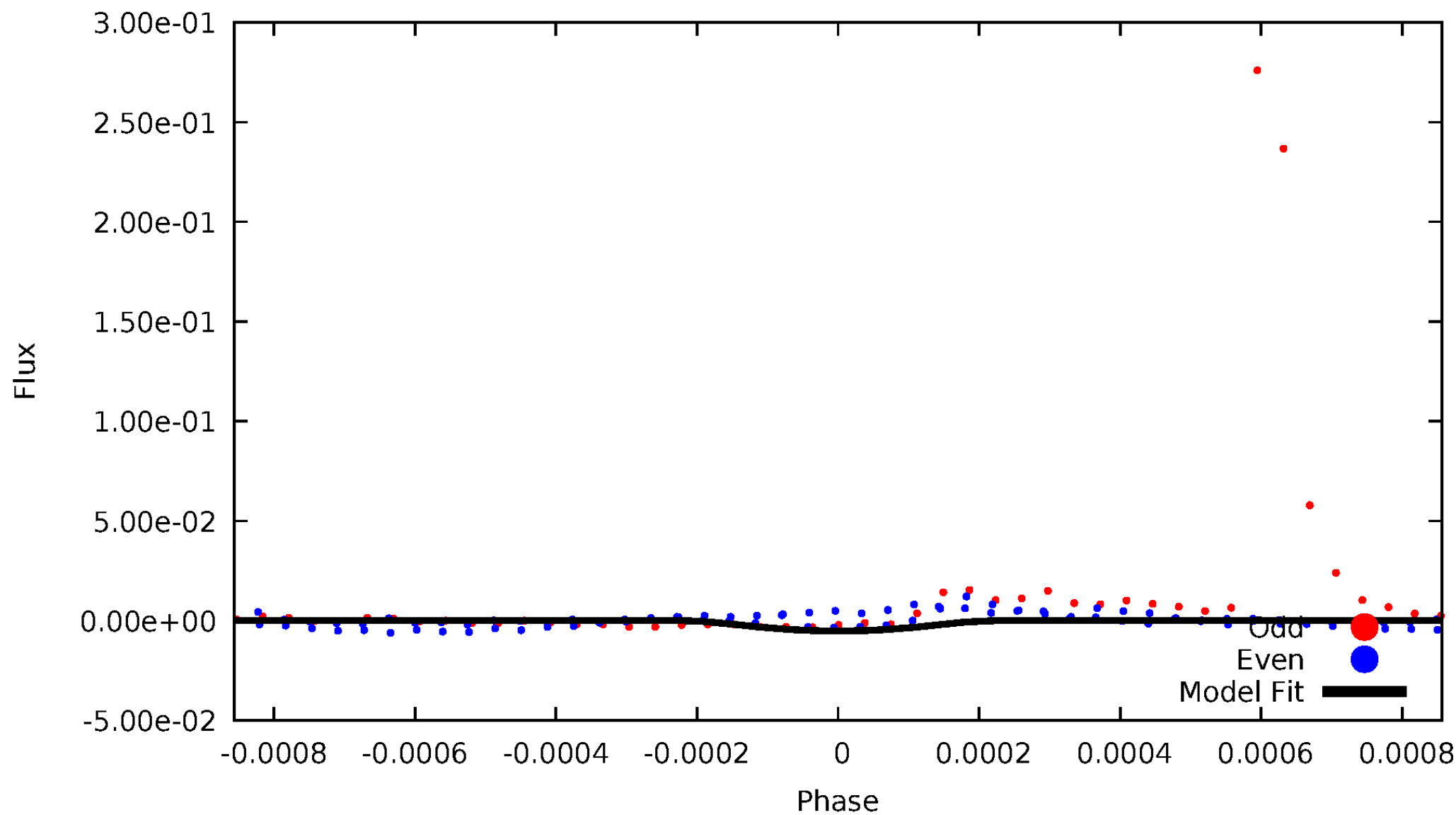
TCE 006949412-04





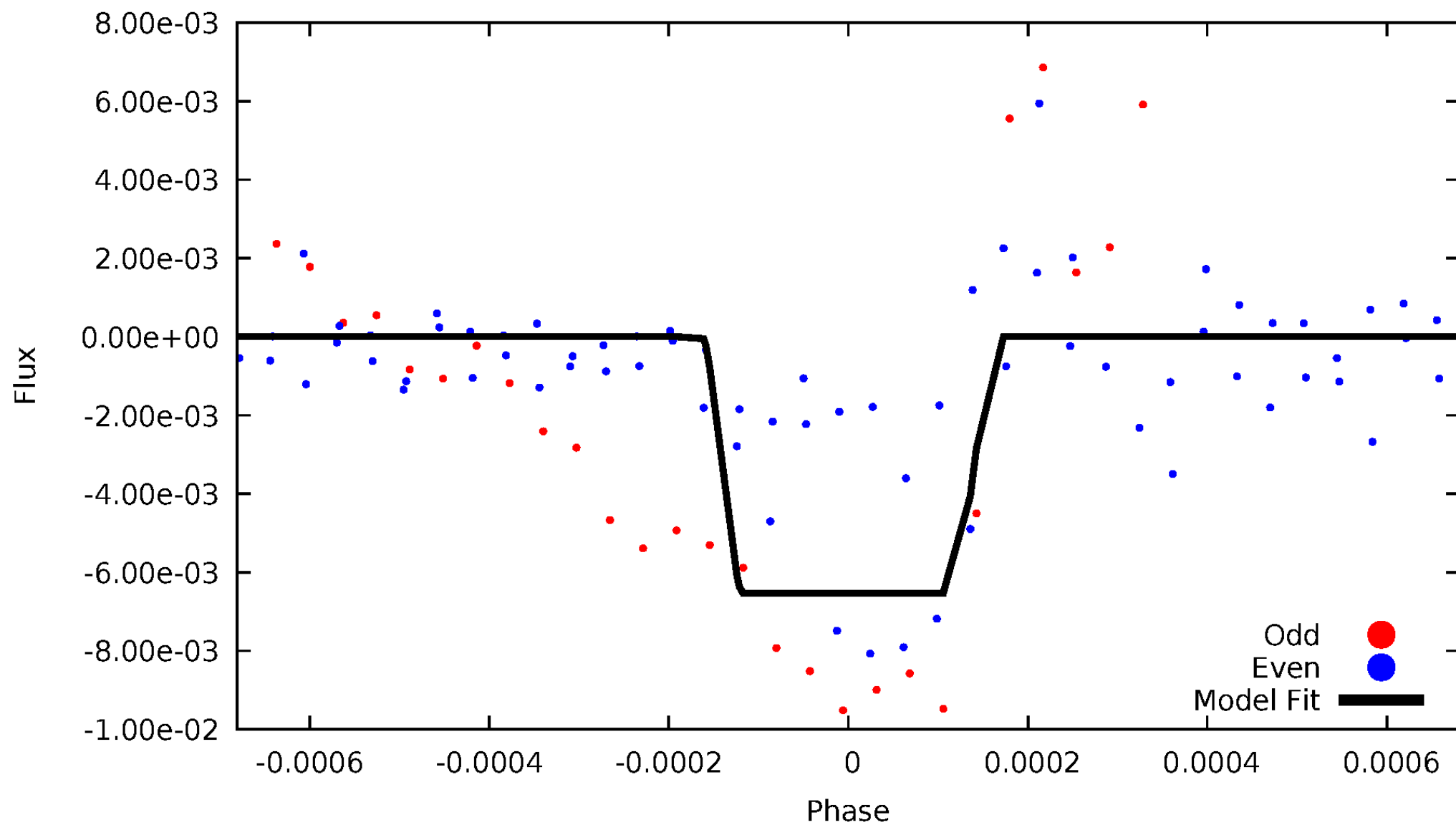
# DV Odd/Even

TCE 006949412-04



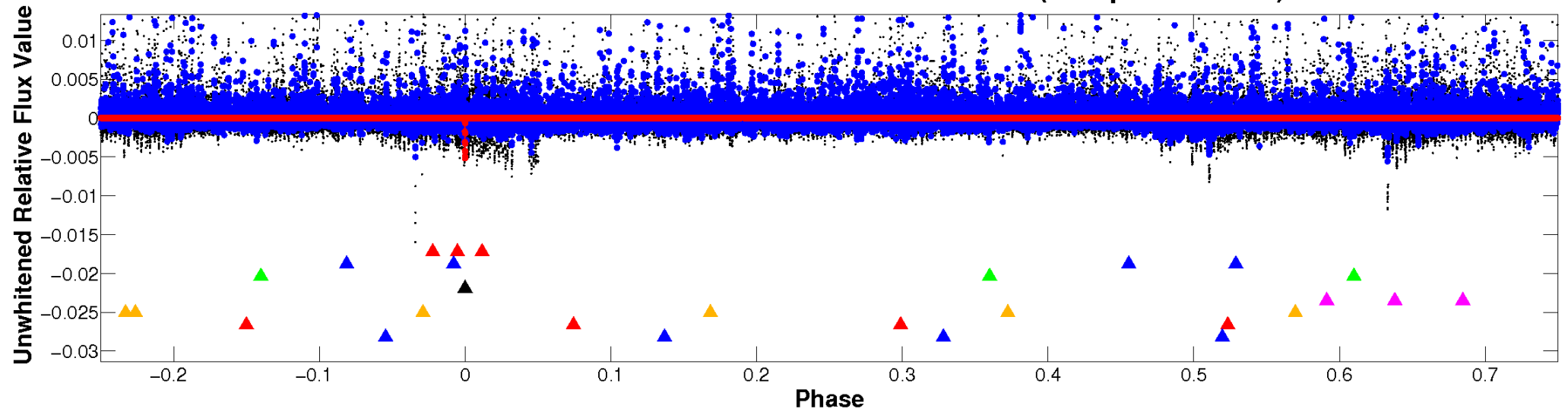
# ALT Odd/Even

TCE 006949412-04

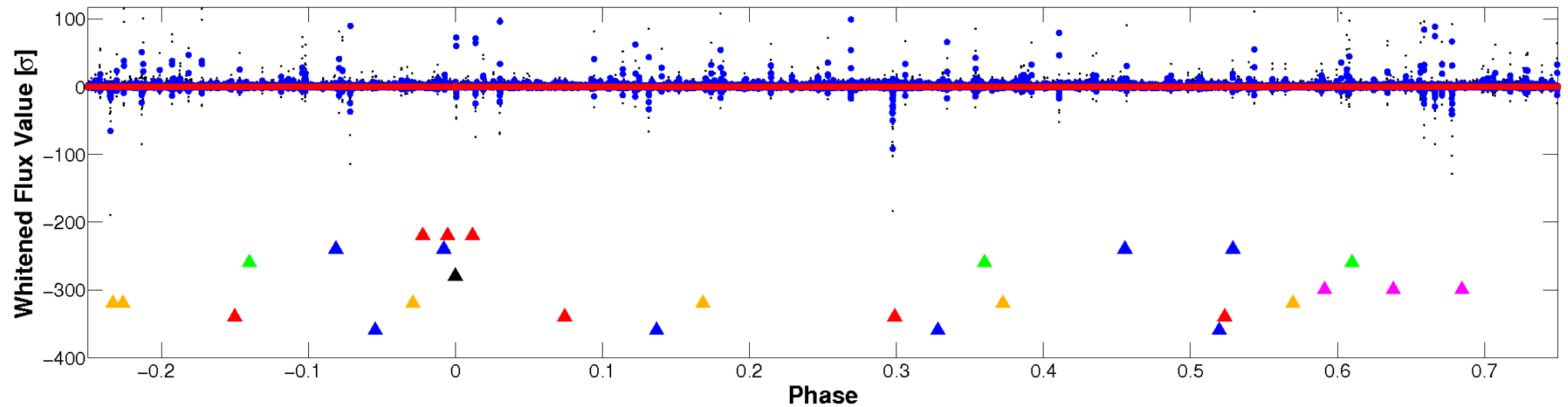


# Non-Whitened Vs. Whitened Light Curve

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

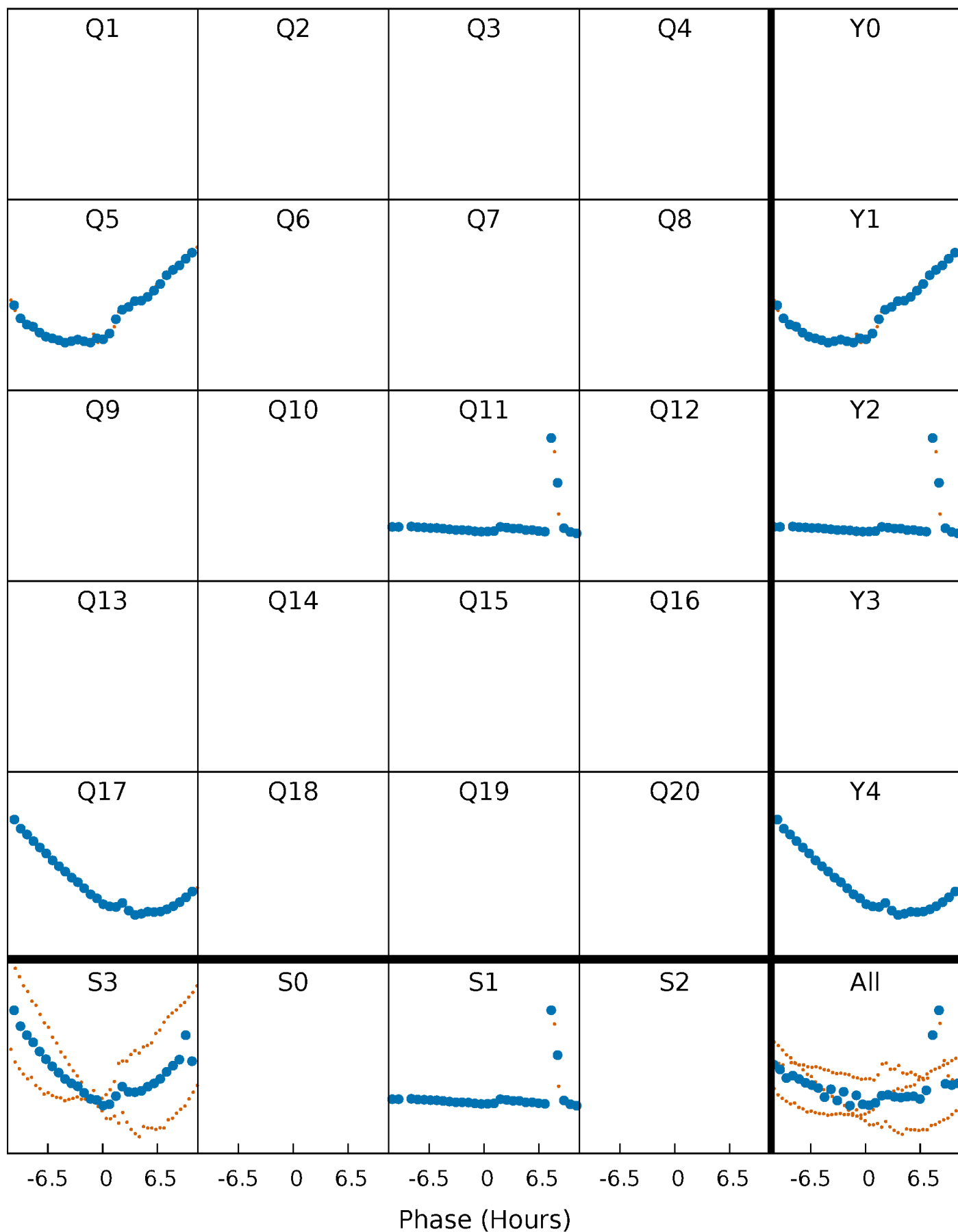


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



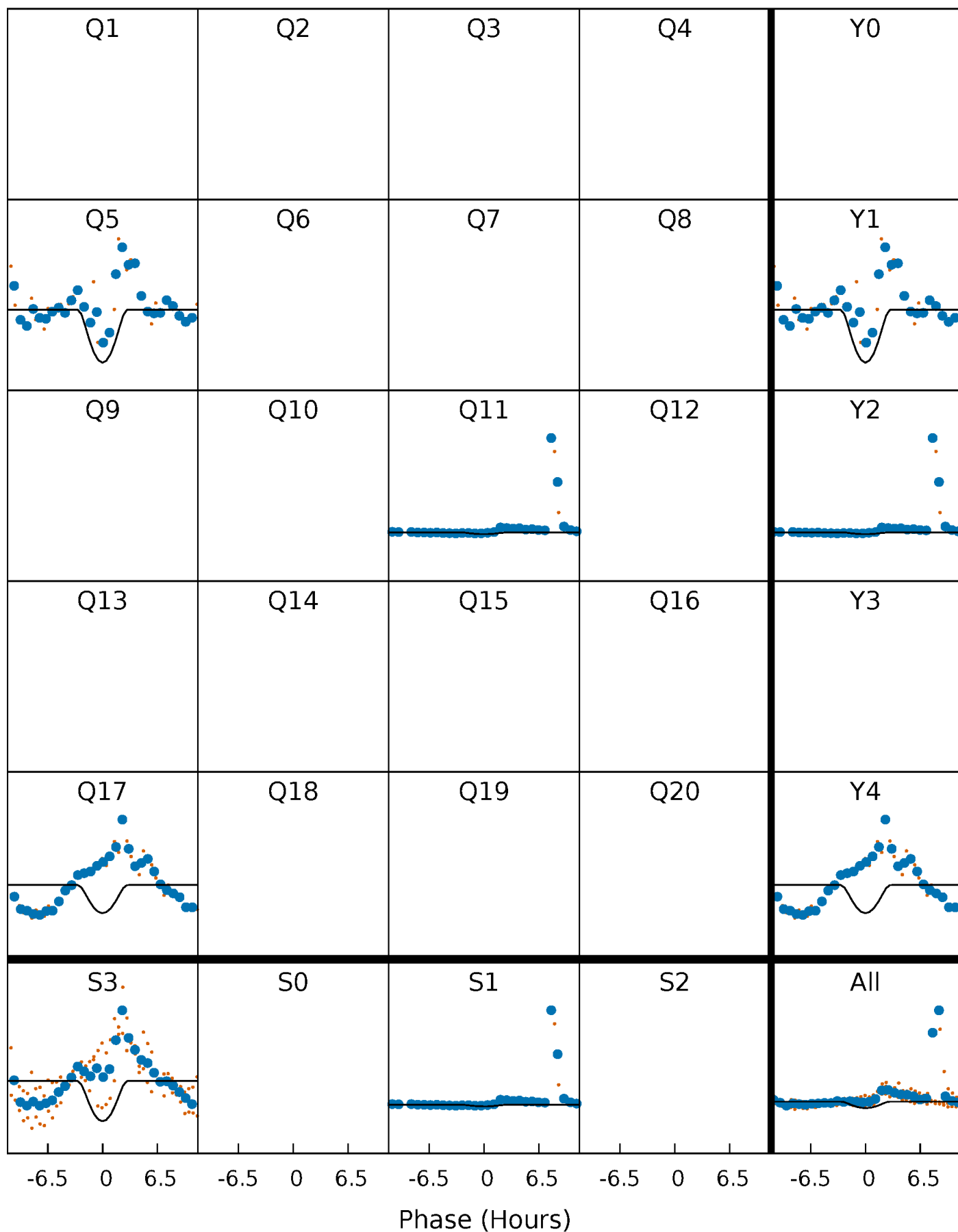
# PDC Quarter-Phased Transit Curves

TCE 006949412-04     $P=550.337297$  Days     $T_0=462.272378$  (BKJD)



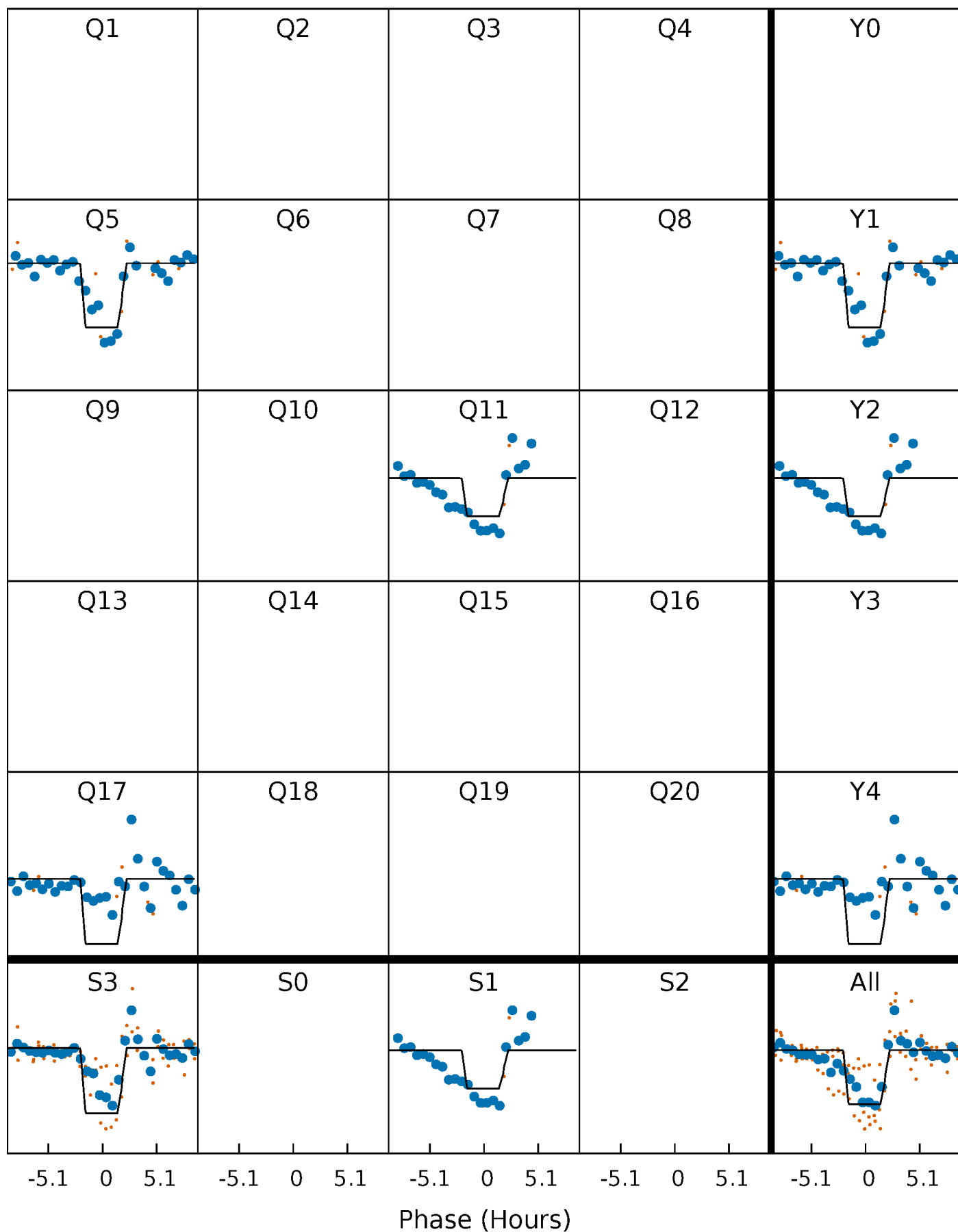
# DV Quarter-Phased Transit Curves

TCE 006949412-04     $P=550.337297$  Days     $T_0=462.272378$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

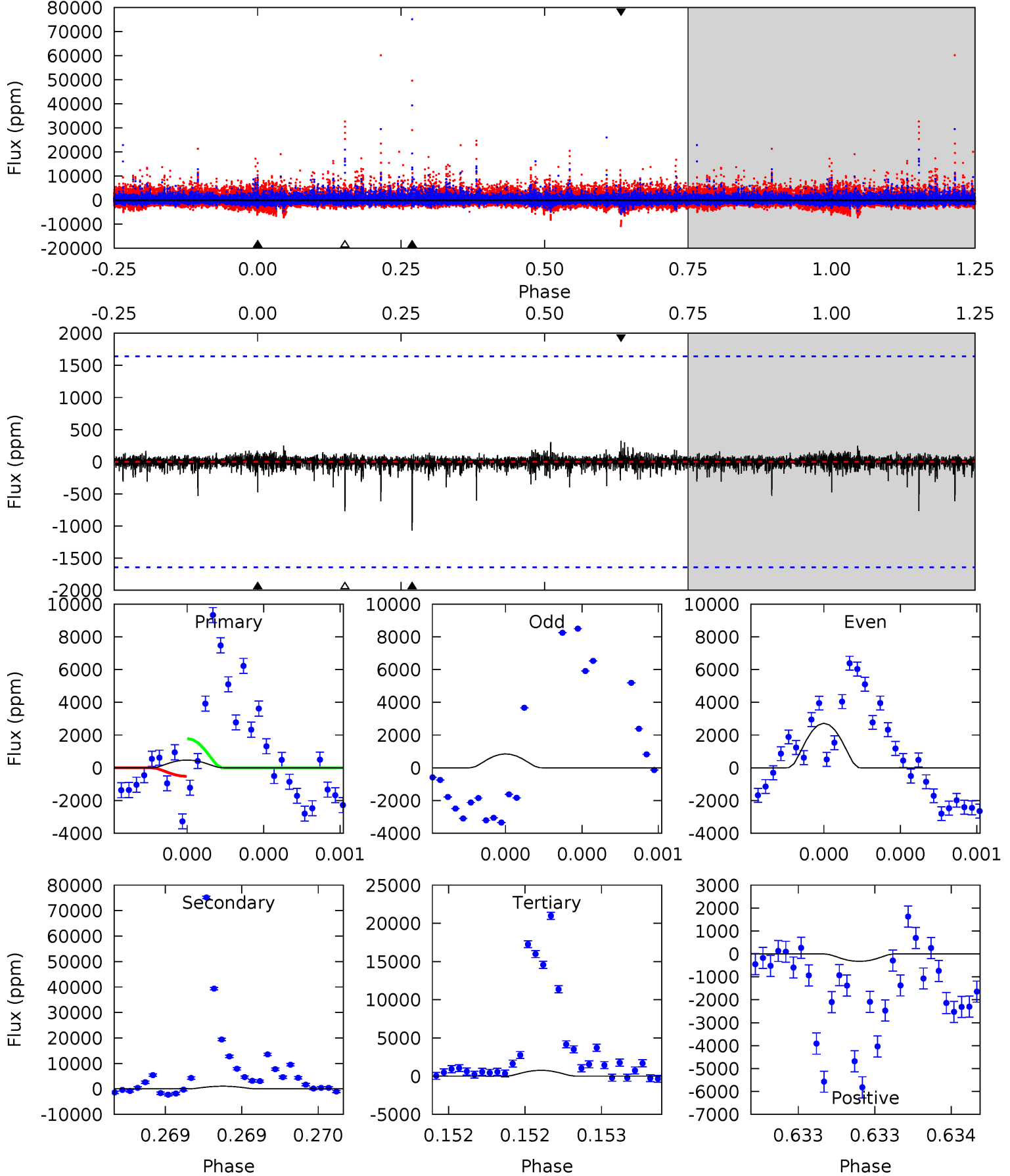
TCE 006949412-04 P=550.337071 Days  $T_0=462.255857$  (BKJD)



# DV Model-Shift Uniqueness Test

006949412-04, P = 550.337297 Days, E = 462.272378 Days

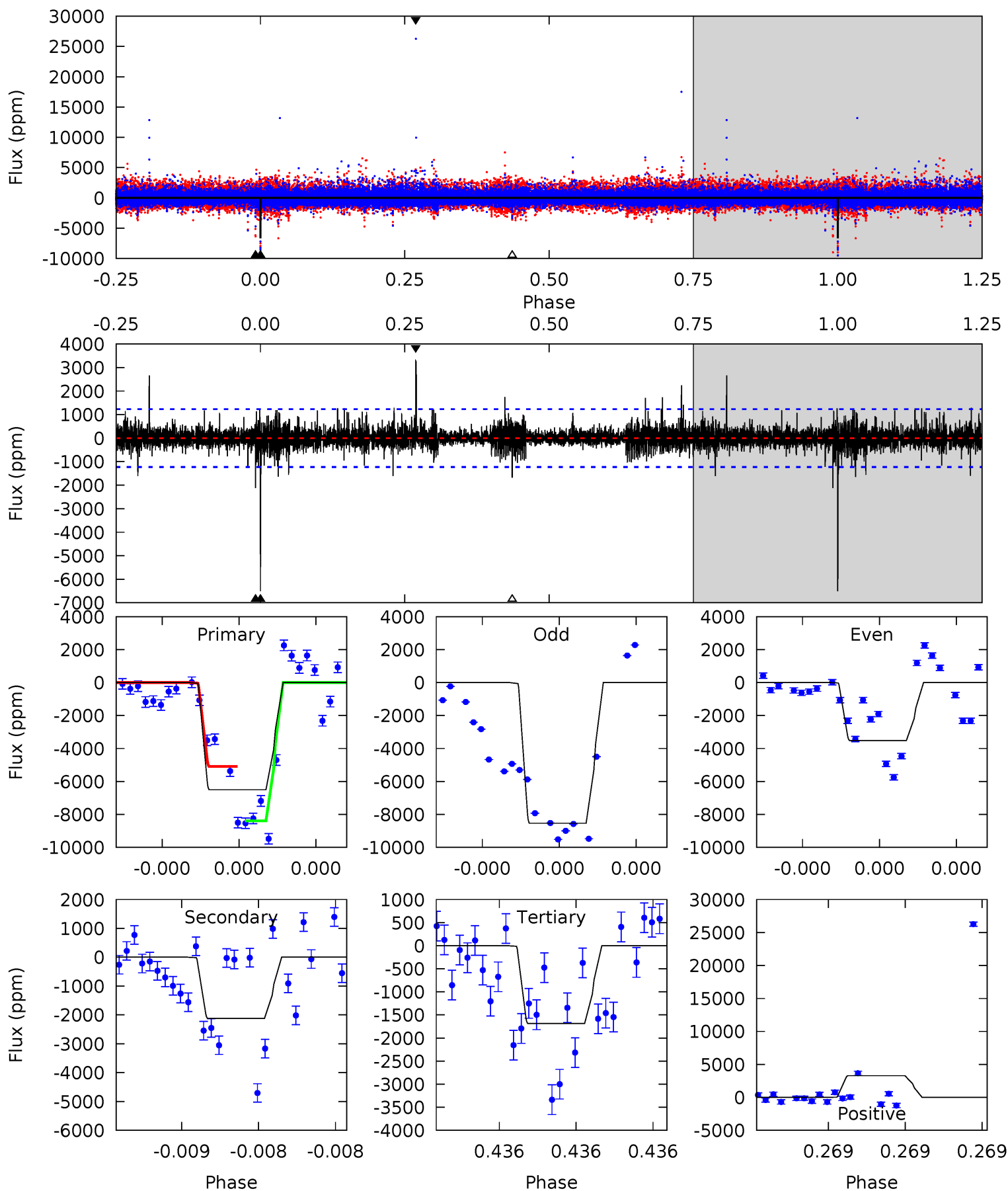
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.61	3.63	2.61	1.11	5.58	3.49	0.22	-1.00	0.50	1.02	2.52	1.69	-1.52	0.23	2.16



# Alt Model-Shift Uniqueness Test

006949412-04, P = 550.337071 Days, E = 462.255857 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
29.9	9.76	7.76	15.2	5.66	3.61	1.28	22.2	14.8	2.00	-5.41	11.6	0.94	0.34	7.48





### Stellar Parameters For KIC 006949412

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3666^{+49}_{-54}$	$4.797^{+0.039}_{-0.028}$	$-0.100^{+0.100}_{-0.100}$	$0.453^{+0.028}_{-0.034}$	$0.468^{+0.026}_{-0.033}$	$7.099^{+1.282}_{-0.744}$
	+1%/-1%	+1%/-1%	+100%/-100%	+6%/-8%	+6%/-7%	+18%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 006949412-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1068 \pm 294$	$25.20^{+26.91}_{-18.24}$	$150^{+3}_{-3}$	$1855^{+565}_{-241}$	$970^{+11512}_{-747}$
Alt.	$-2120 \pm 217$	$23.53^{+29.27}_{-16.55}$	$150^{+3}_{-3}$	$2002^{+652}_{-287}$	$2179^{+21938}_{-1740}$

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

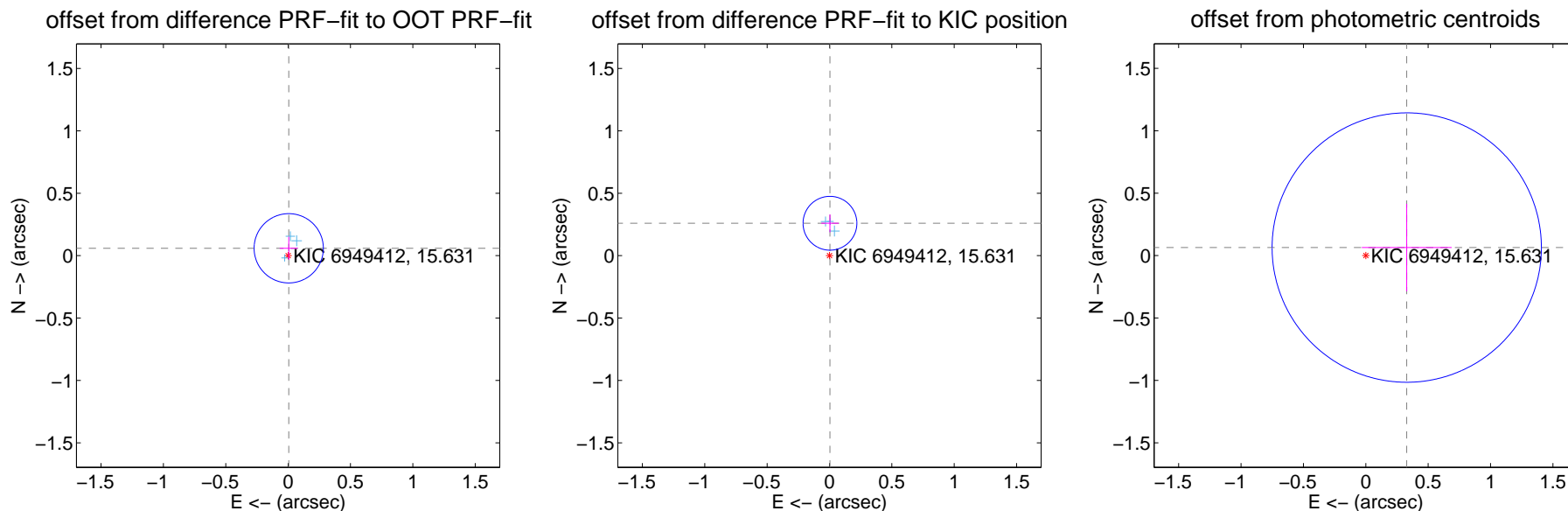
## DV Centroid Data

Supplemental centroid analysis for 006949412-04. Kepler magnitude: 15.63. Transit SNR 8.55

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.059 \pm 0.093$	0.64	$-0.005 \pm 0.073$	$0.059 \pm 0.093$
PRF-fit source offset from KIC position	$0.260 \pm 0.072$	3.61	$-0.004 \pm 0.069$	$0.260 \pm 0.072$
photometric centroid source offset	$0.33 \pm 0.36$	0.93	$-0.33 \pm 0.36$	$0.06 \pm 0.35$

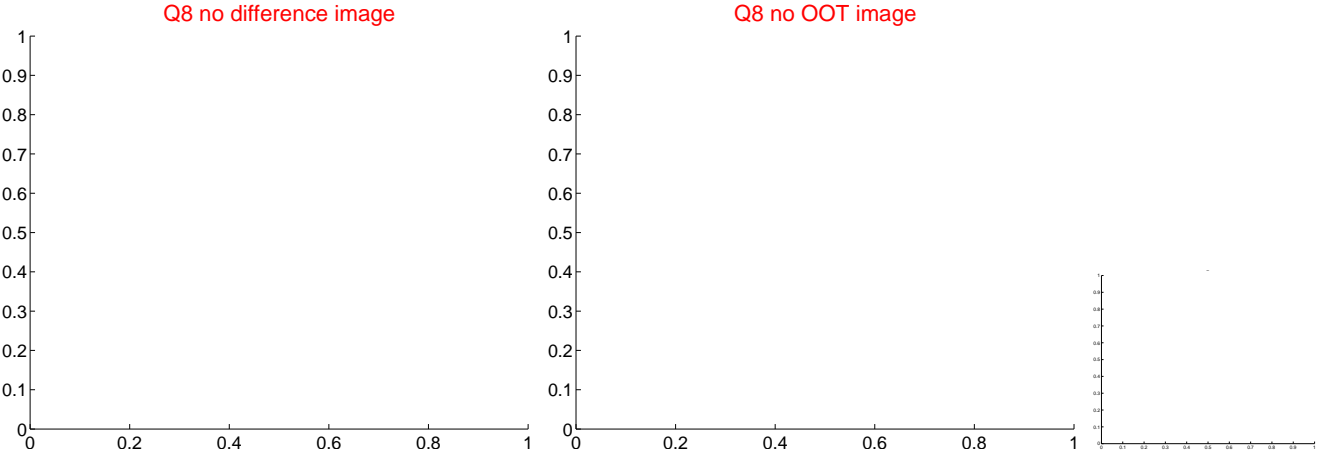
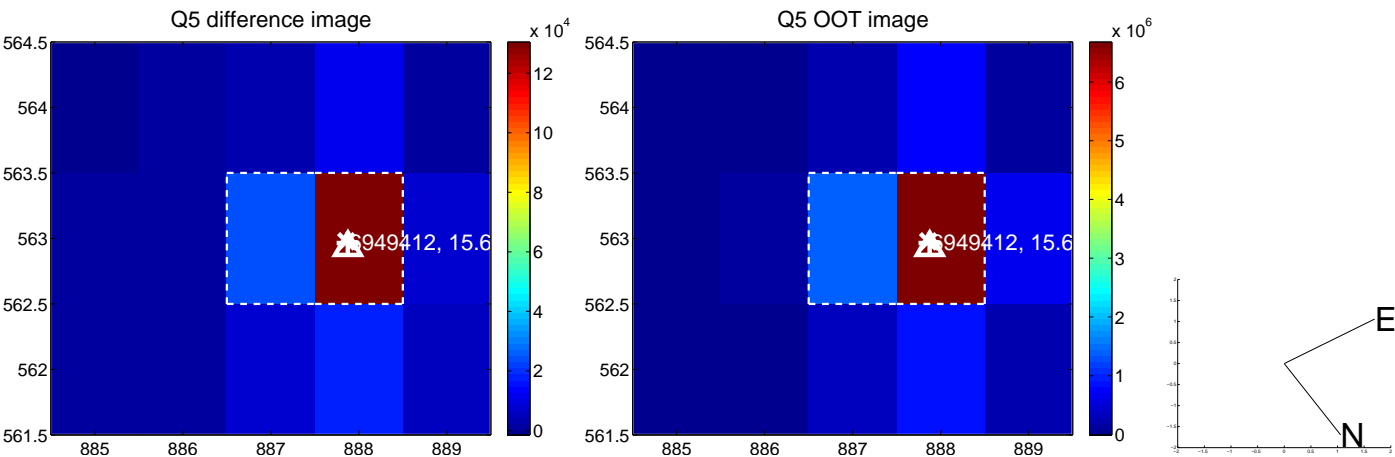


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

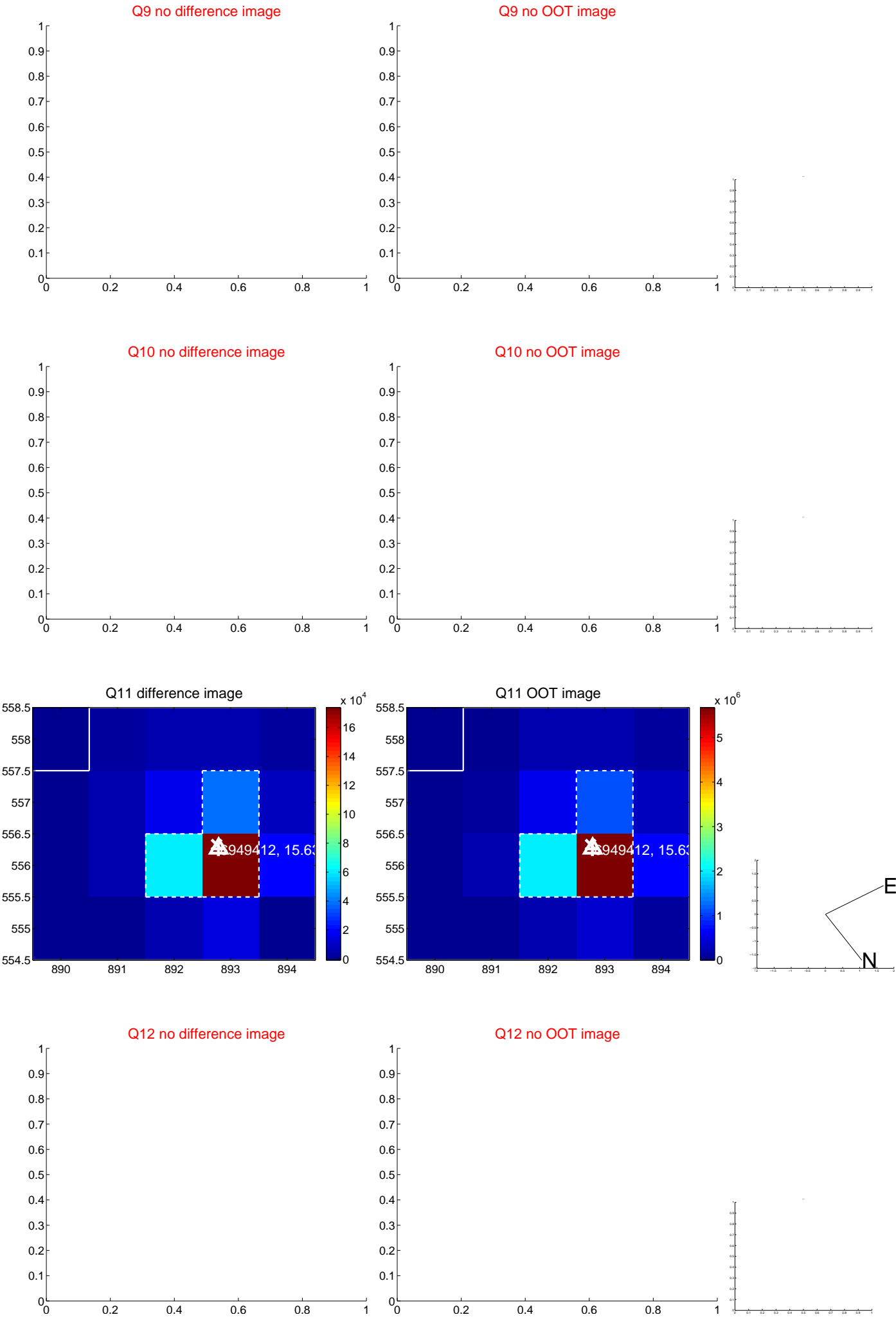
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



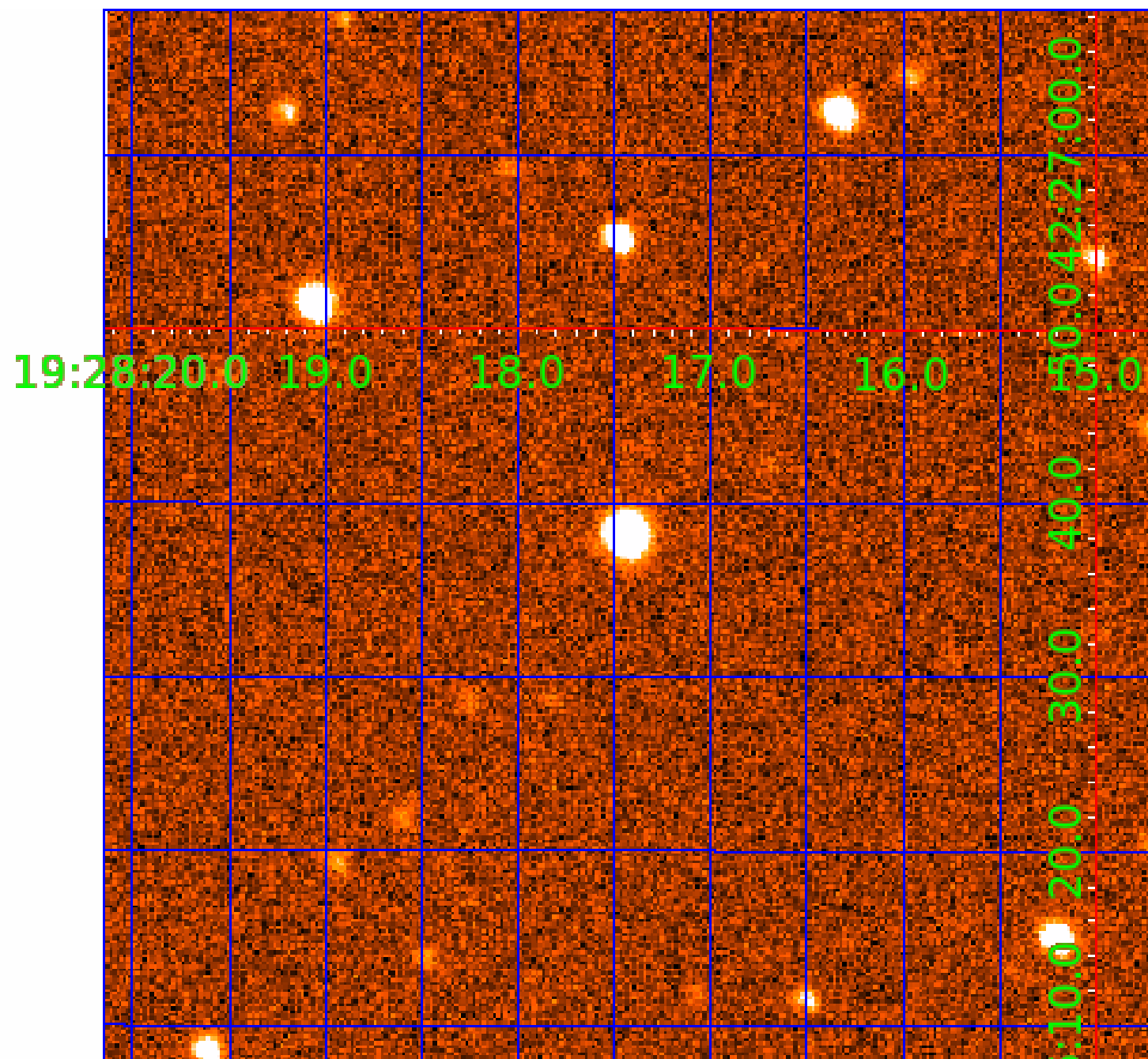
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination





# KIC 006949412

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006949412-01	OBS	No	559.656830	450.057158	3684.1	2.438	15.6	8.2	0.45	3666	2.75	0.03
006949412-04	OBS	No	550.337297	462.272378	5184.8	5.654	12.9	8.5	0.45	3666	4.79	0.03
006949412-05	OBS	No	576.042798	237.334759	3368.9	3.131	14.8	7.2	0.45	3666	2.67	0.03
006949412-06	OBS	No	220.881063	334.052170	2996.4	3.148	12.4	10.3	0.45	3666	2.54	0.11
006949412-07	OBS	No	426.802577	199.949807	2354.7	8.319	10.5	5.4	0.45	3666	2.47	0.04
006949412-08	OBS	No	445.015692	197.906441	1497.3	7.500	11.4	-1.0	0.45	3666	1.74	0.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006949412-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
006949412-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
006949412-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

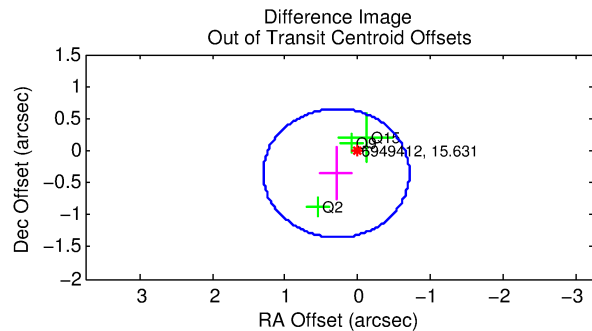
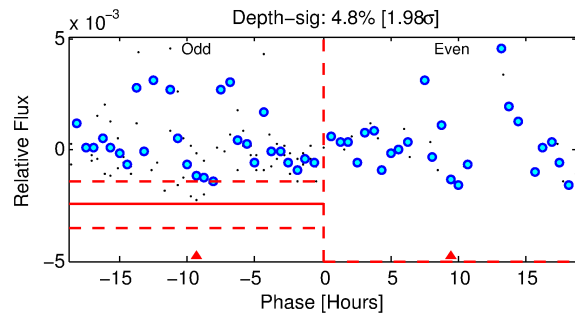
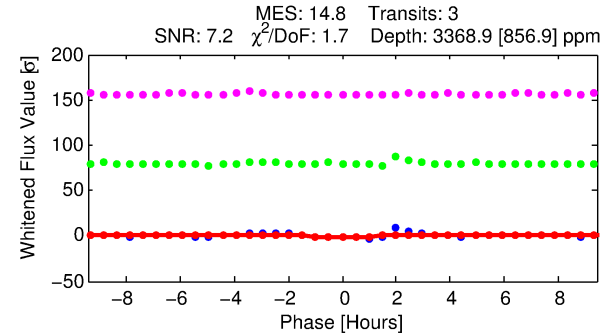
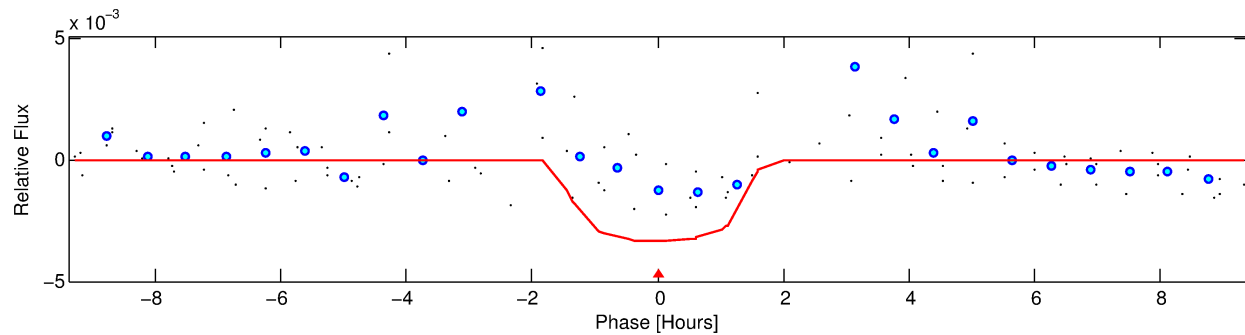
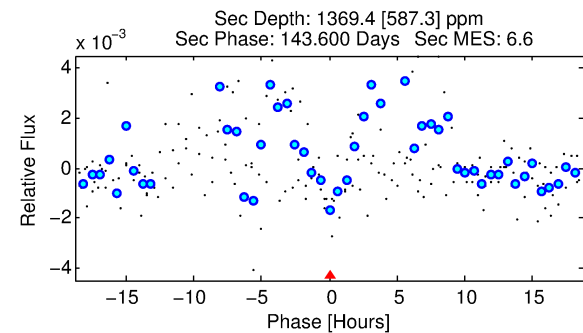
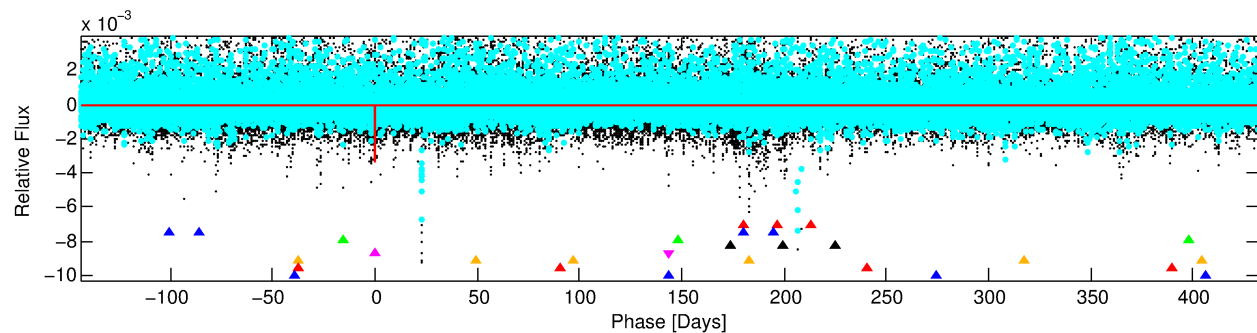
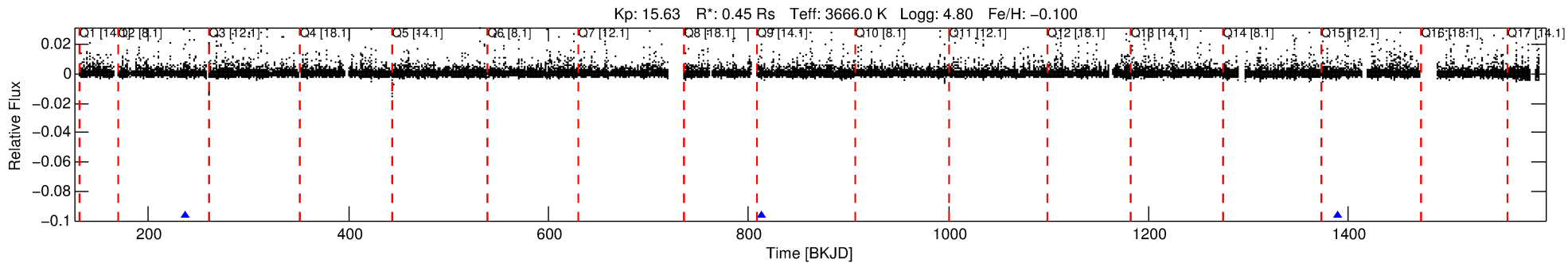
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006949412-05

No Significant Match Found

# DV One-Page Summary

KIC: 6949412 Candidate: 5 of 8 Period: 576.043 d



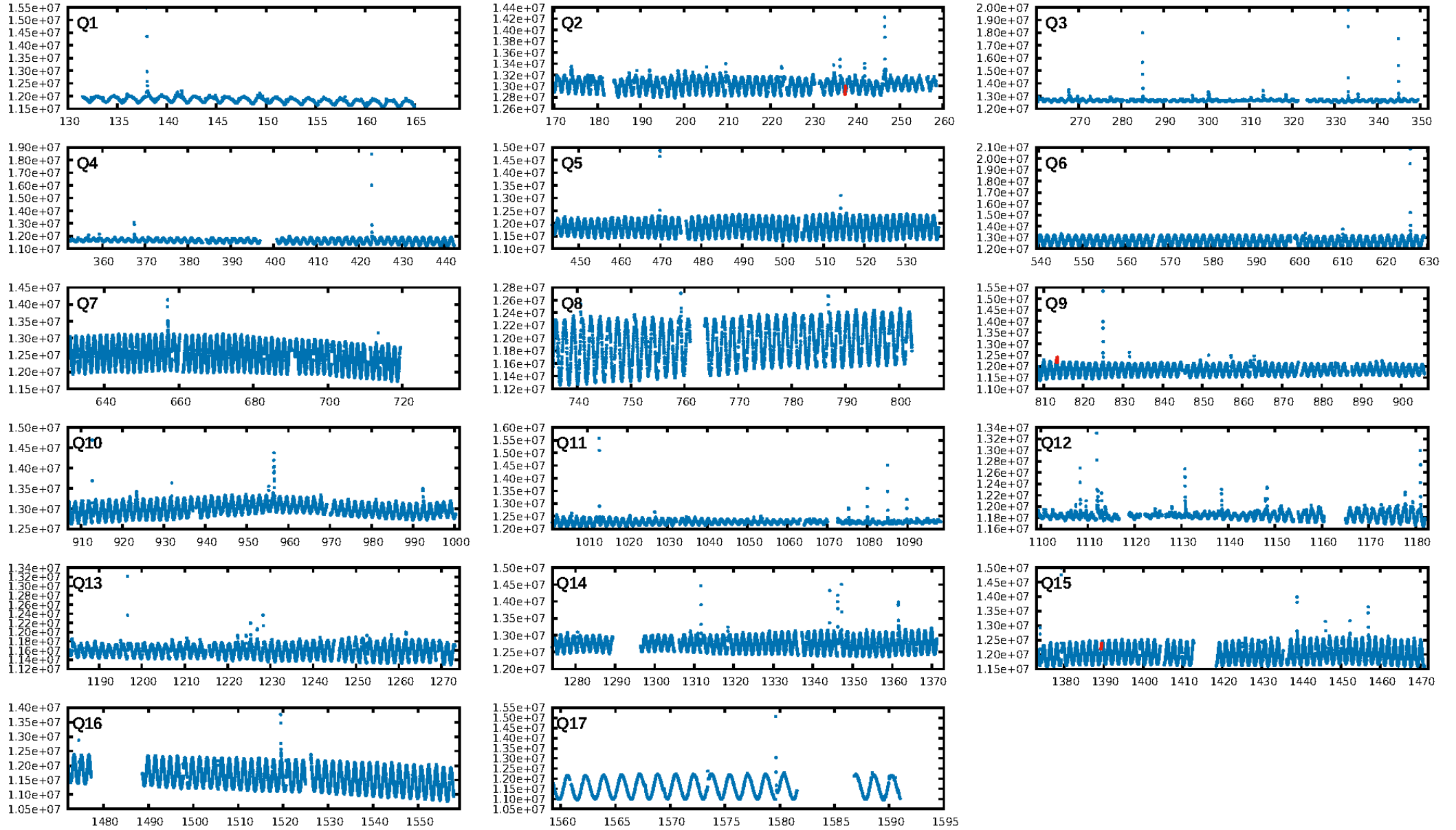
## DV Fit Results:

Period = 576.04280 [0.00605] d  
Epoch = 237.3348 [0.0084] BKJD  
Rp/R\* = 0.0540 [0.3149]  
a/R\* = 1336.23 [34280.84]  
b = 0.46 [44.93]  
Seff = 0.03 [0.00]  
Teff = 106 [3] K  
Rp = 2.67 [15.57] Re  
a = 1.0529 [0.0614] AU  
Ag = 117146.76 [1366889.93] [0.09σ]  
Teffp = 3034 [8851] K [0.33σ]

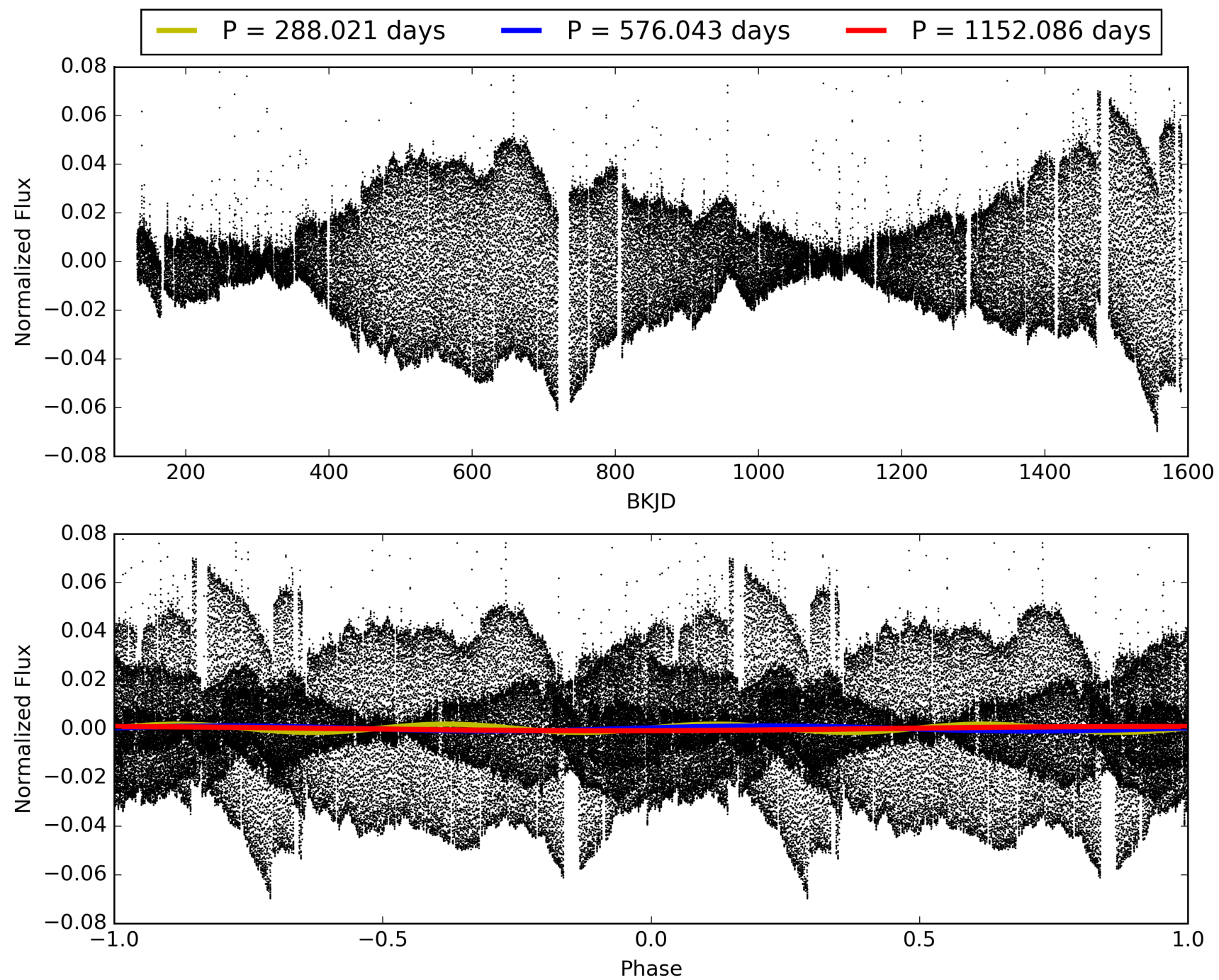
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [99.10σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.5%  
ModelChiSquareGof-sig: 12.4%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 4.577  
Centroid-sig: 31.7%  
Centroid-so: 0.740 arcsec [1.14σ]  
OotOffset-rm: 0.458 arcsec [1.37σ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-rm: 0.370 arcsec [1.36σ]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 006949412-05, PDC Light Curves

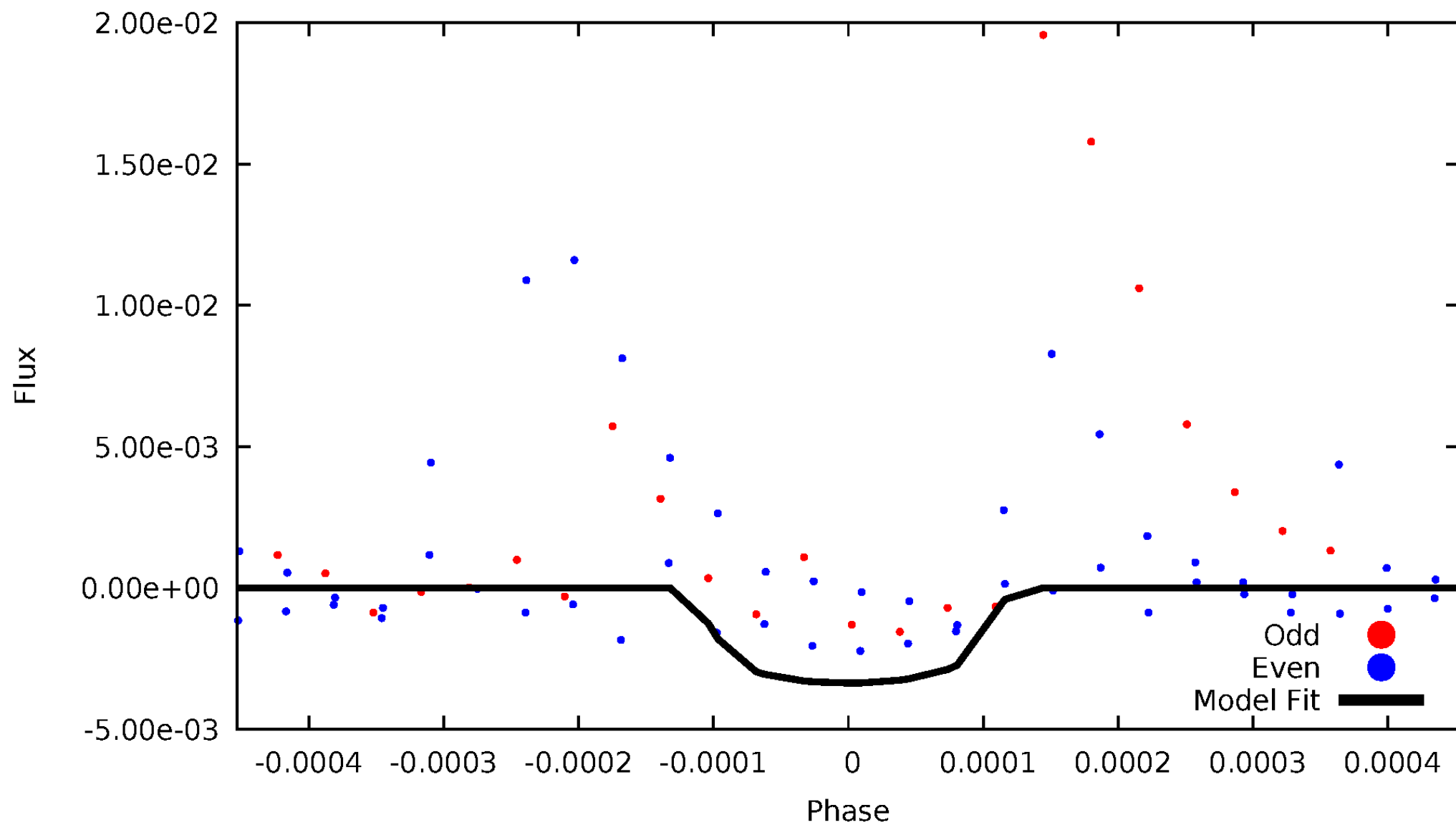


TCE 006949412-05



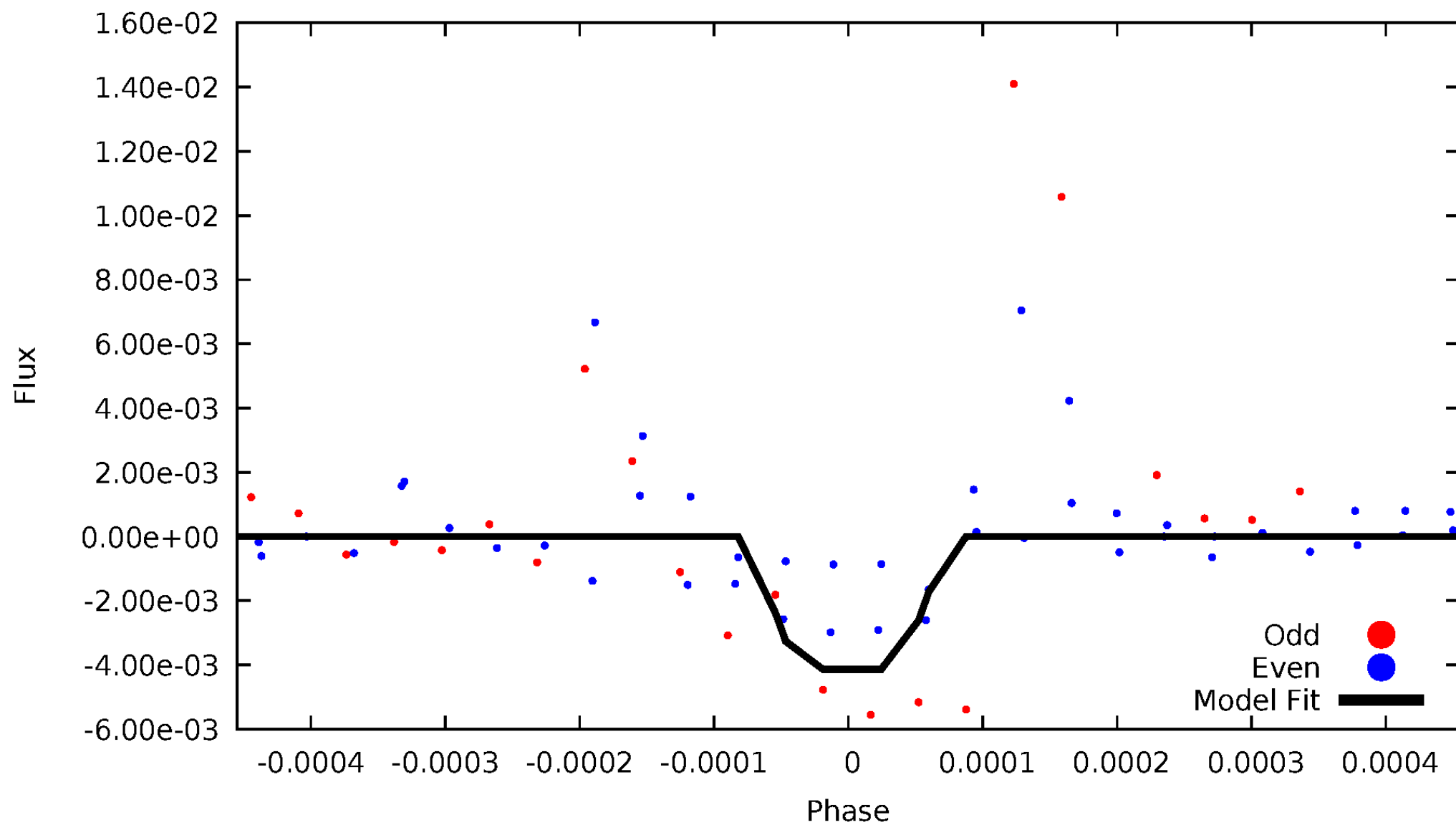
# DV Odd/Even

TCE 006949412-05



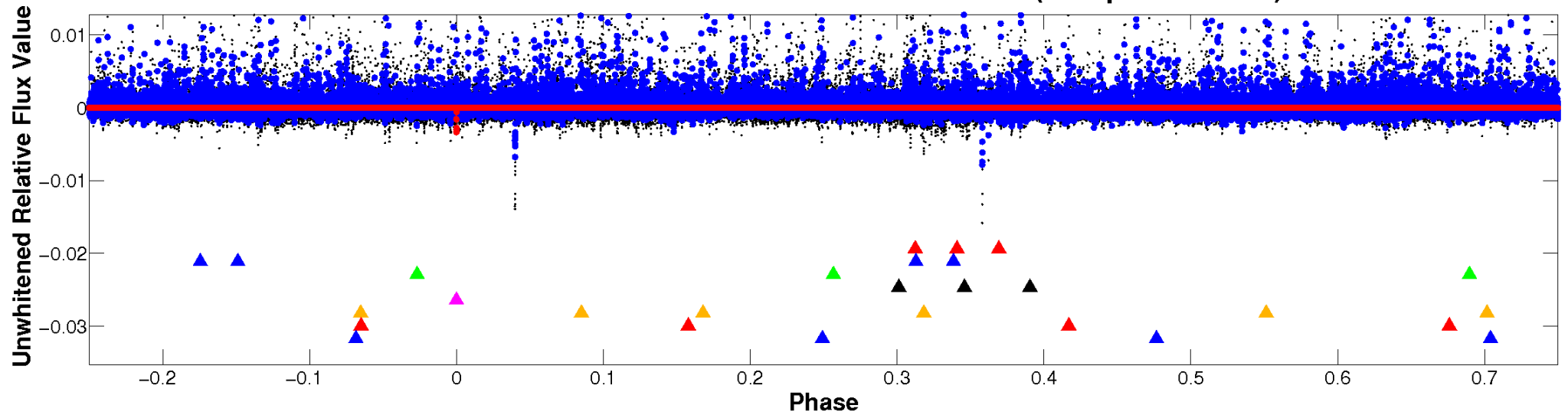
# ALT Odd/Even

TCE 006949412-05

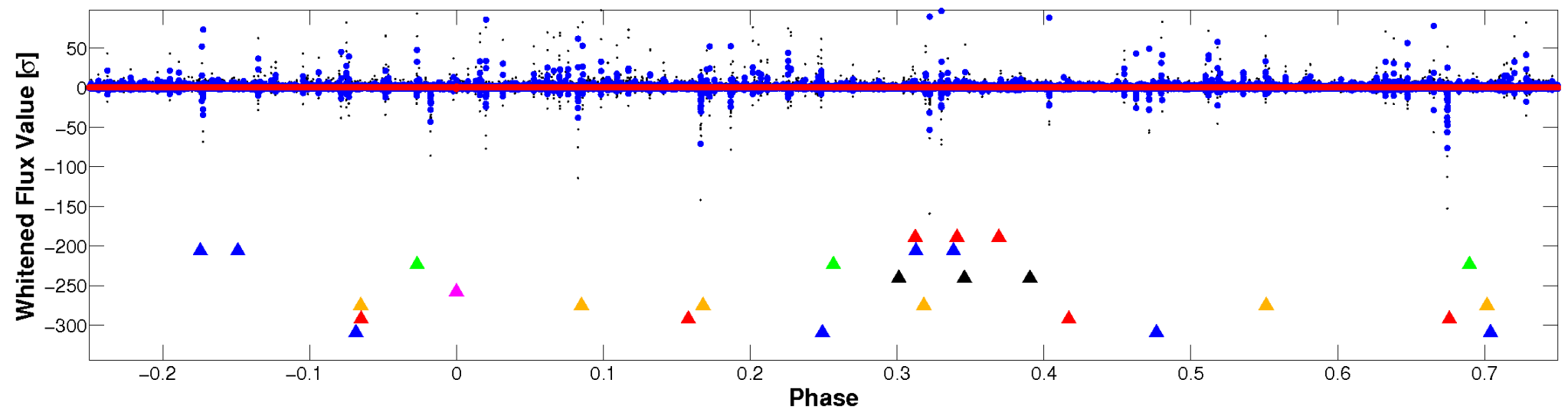


# Non-Whitened Vs. Whitened Light Curve

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

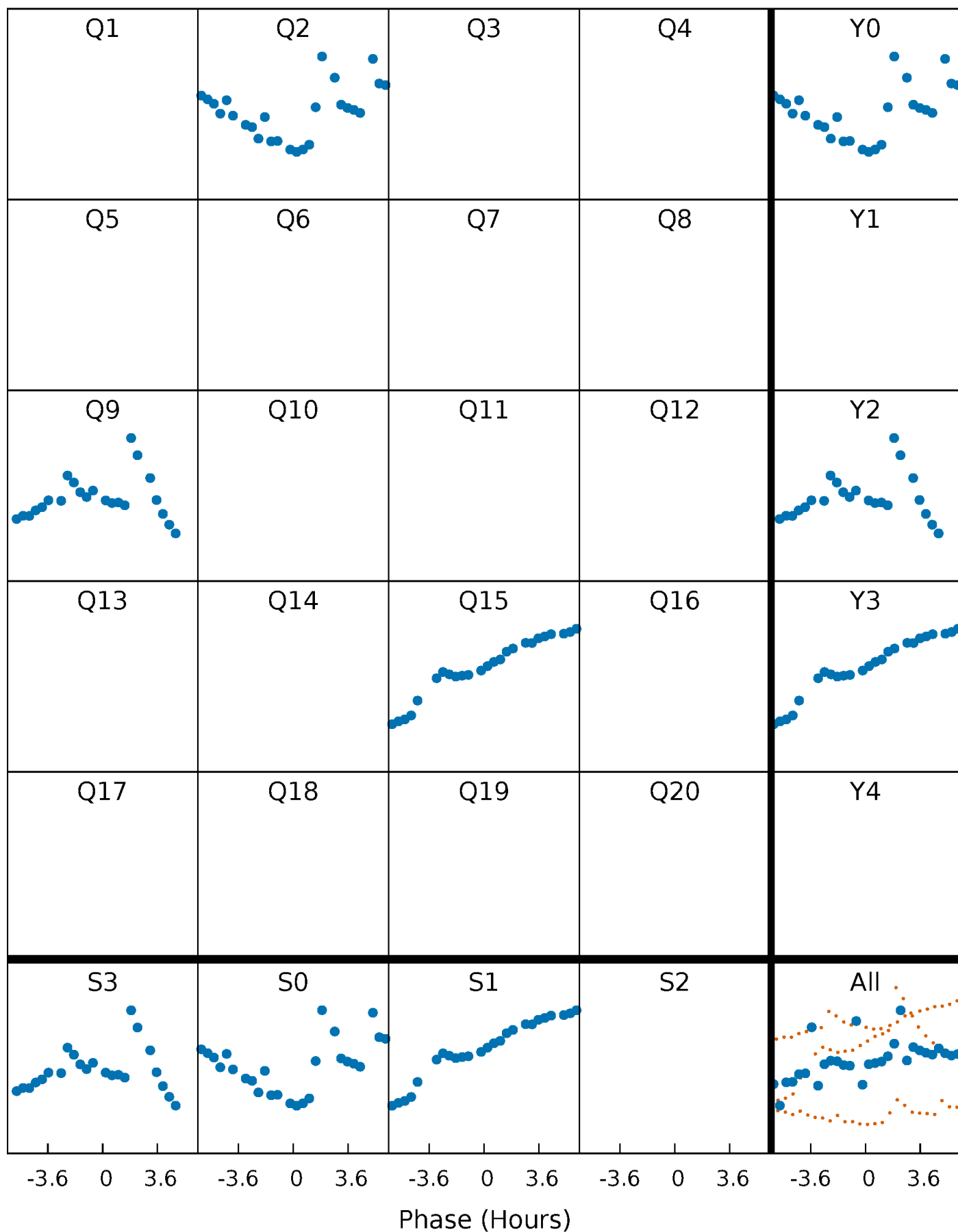


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

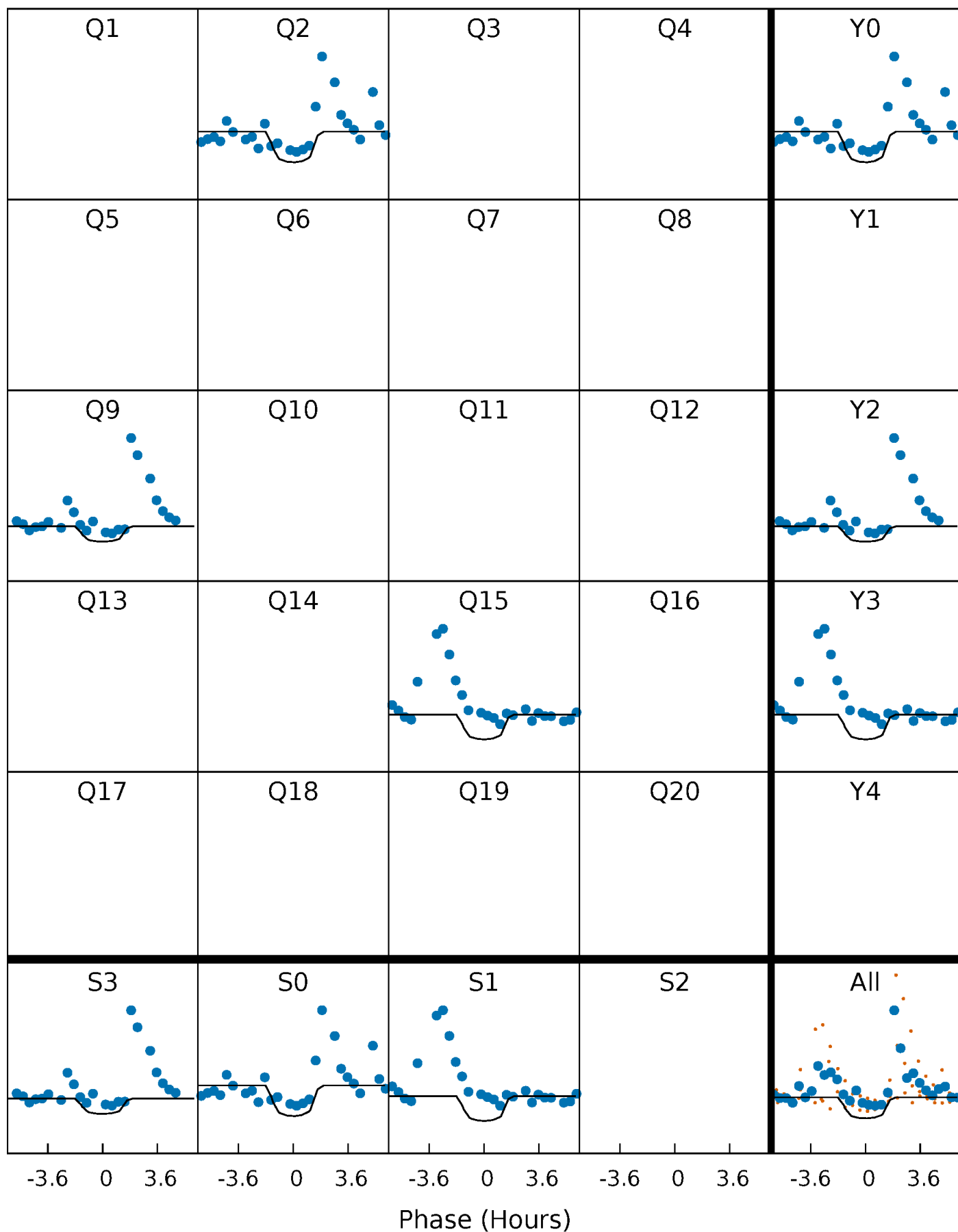
TCE 006949412-05     $P=576.042798$  Days     $T_0=237.334759$  (BKJD)





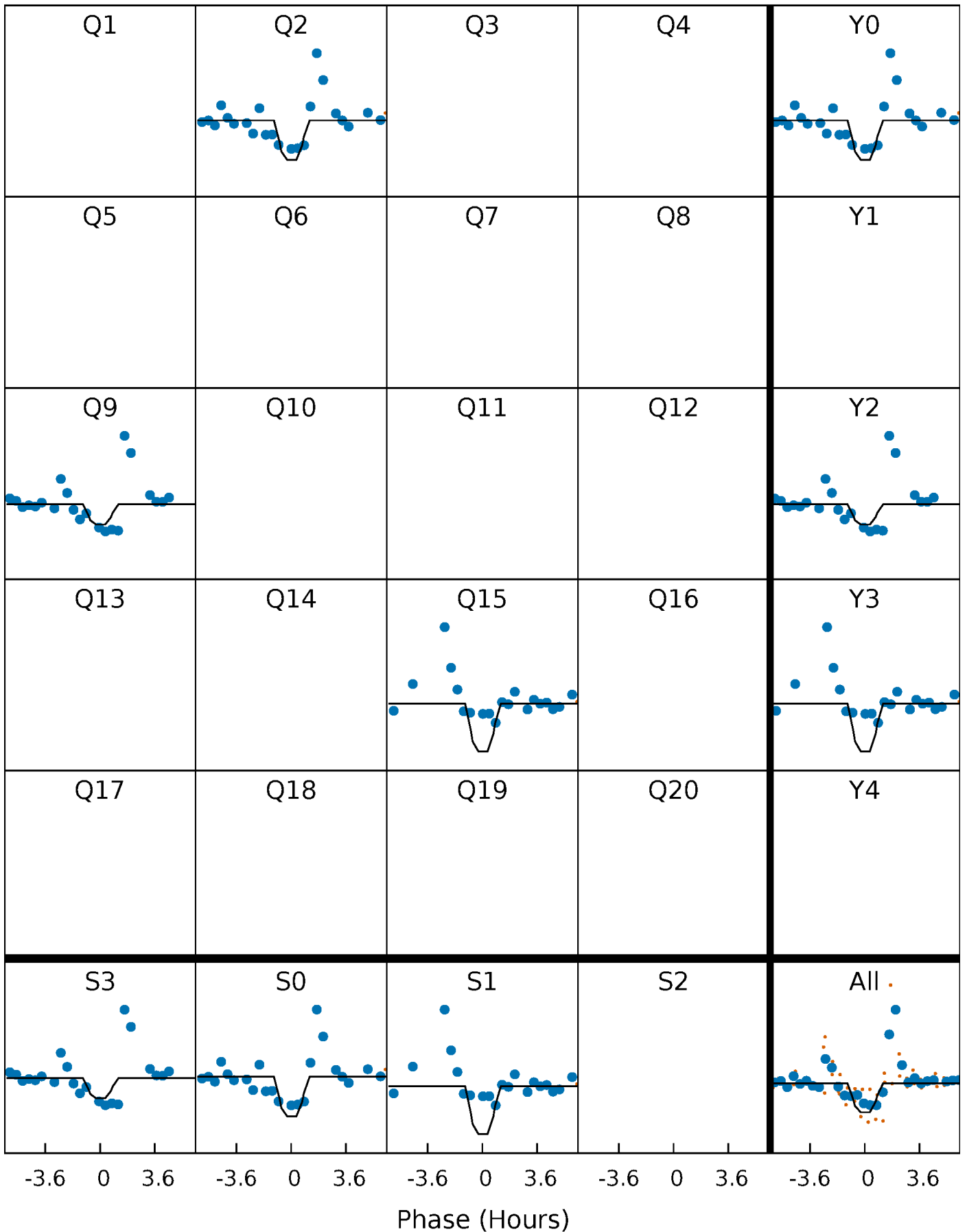
# DV Quarter-Phased Transit Curves

TCE 006949412-05     $P=576.042798$  Days     $T_0=237.334759$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

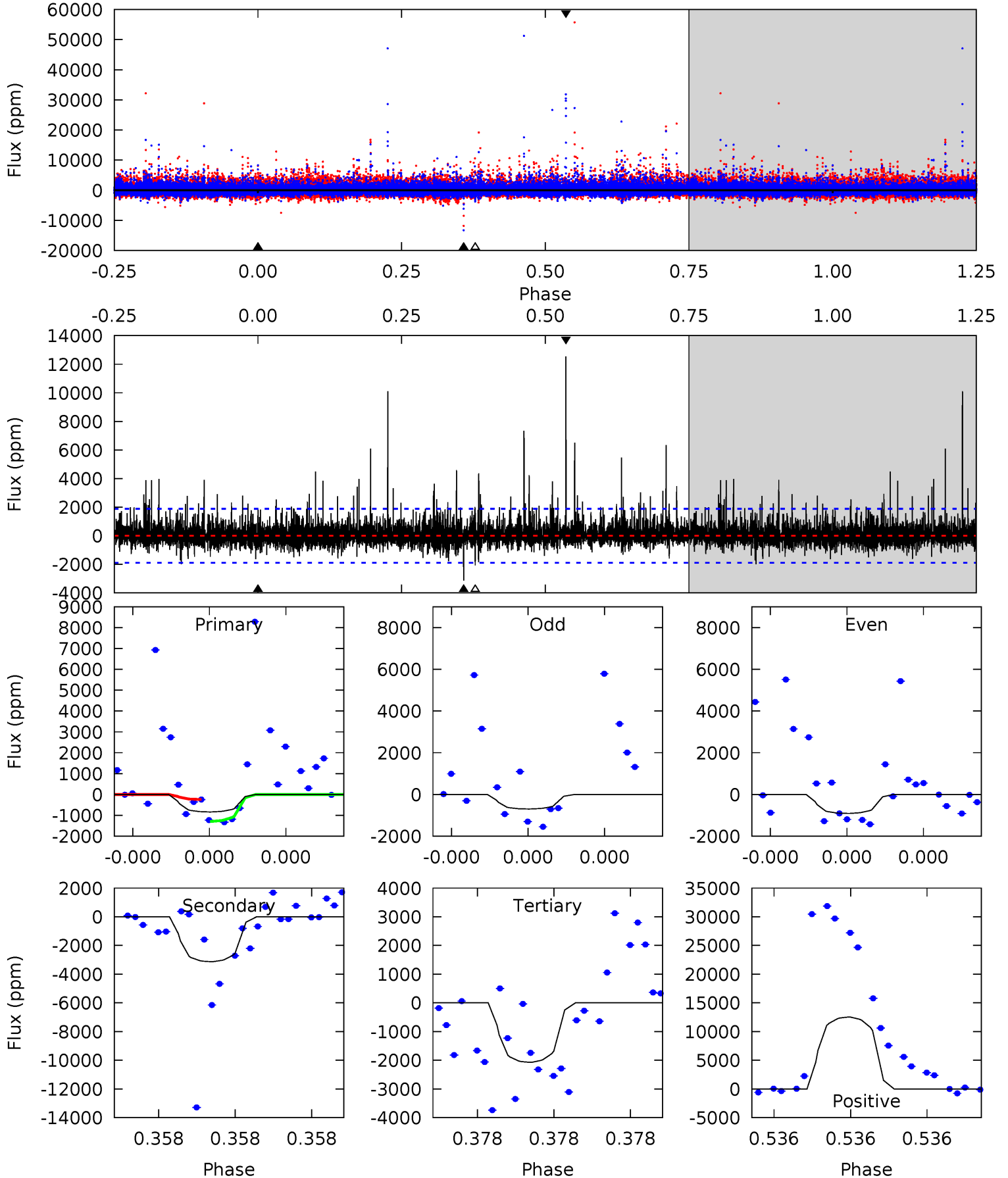
TCE 006949412-05 P=576.042490 Days  $T_0=237.347397$  (BKJD)



# DV Model-Shift Uniqueness Test

006949412-05, P = 576.042798 Days, E = 237.334759 Days

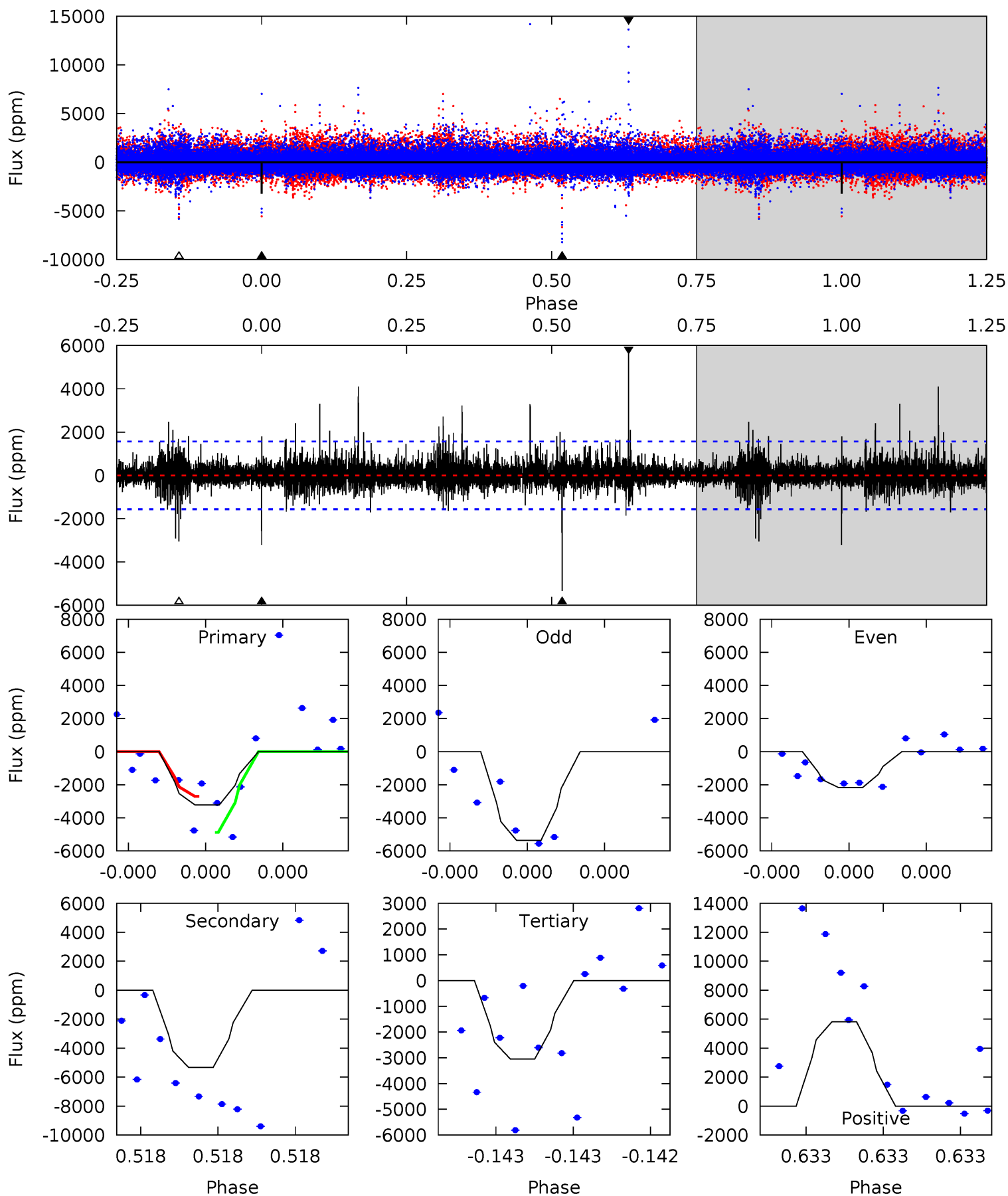
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.52	9.45	6.25	37.8	5.69	3.66	2.01	-3.73	-35.3	3.20	-28.3	0.10	1.21	0.80	1.55



# Alt Model-Shift Uniqueness Test

006949412-05, P = 576.042490 Days, E = 237.347397 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	19.7	11.3	21.6	5.80	3.81	1.38	0.64	-9.65	8.48	-1.81	5.20	0.99	0.52	3.82



### Stellar Parameters For KIC 006949412

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3666^{+49}_{-54}$	$4.797^{+0.039}_{-0.028}$	$-0.100^{+0.100}_{-0.100}$	$0.453^{+0.028}_{-0.034}$	$0.468^{+0.026}_{-0.033}$	$7.099^{+1.282}_{-0.744}$
	+1%/-1%	+1%/-1%	+100%/-100%	+6%/-8%	+6%/-7%	+18%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 006949412-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-3133 \pm 332$	$12.15^{+11.57}_{-8.16}$	$148^{+3}_{-3}$	$2425^{+828}_{-341}$	$12787^{+103617}_{-9422}$
Alt.	$-5334 \pm 270$	$11.70^{+11.99}_{-7.95}$	$148^{+3}_{-3}$	$2604^{+1021}_{-394}$	$23707^{+202902}_{-17964}$

$T_{\text{max}}$  = 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

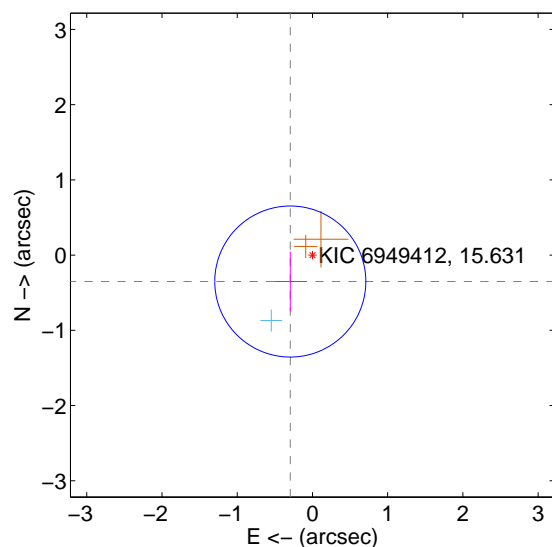
Supplemental centroid analysis for 006949412-05. Kepler magnitude: 15.63. Transit SNR 7.24

There are 1 quarters with good PRF difference image offsets

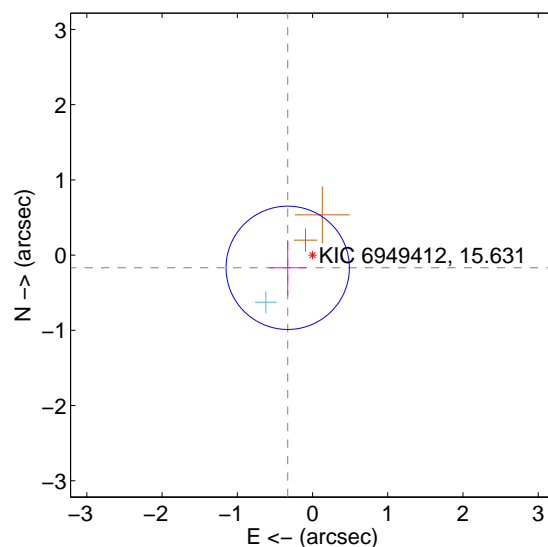
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.458 \pm 0.335$	1.37	$0.294 \pm 0.215$	$-0.351 \pm 0.398$
PRF-fit source offset from KIC position	$0.370 \pm 0.273$	1.36	$0.330 \pm 0.243$	$-0.169 \pm 0.366$
photometric centroid source offset	$0.74 \pm 0.65$	1.14	$-0.74 \pm 0.65$	$0.05 \pm 0.55$

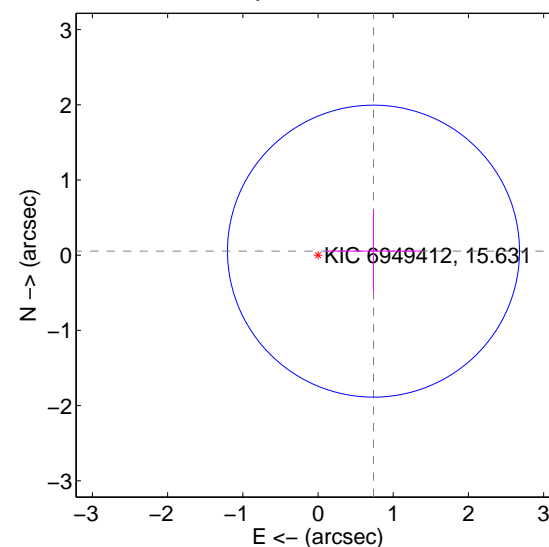
offset from difference PRF-fit to OOT PRF-fit



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.

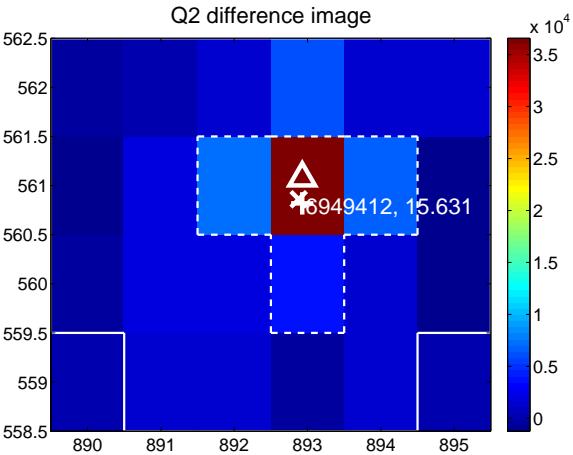
Q1 no difference image



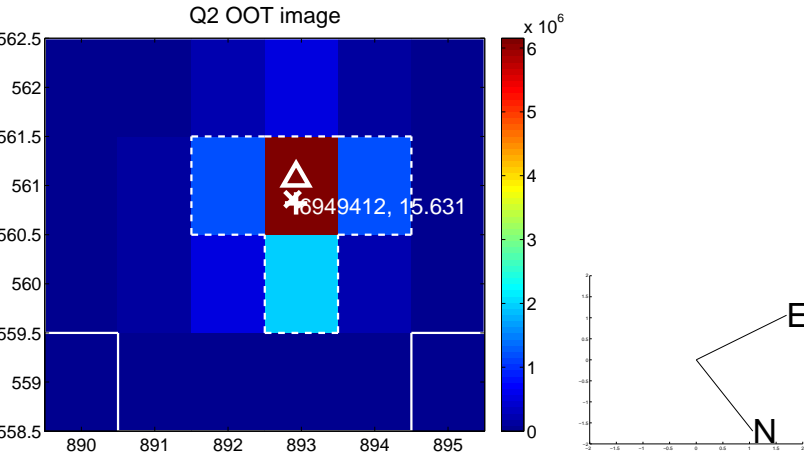
Q1 no OOT image



Q2 difference image



Q2 OOT image



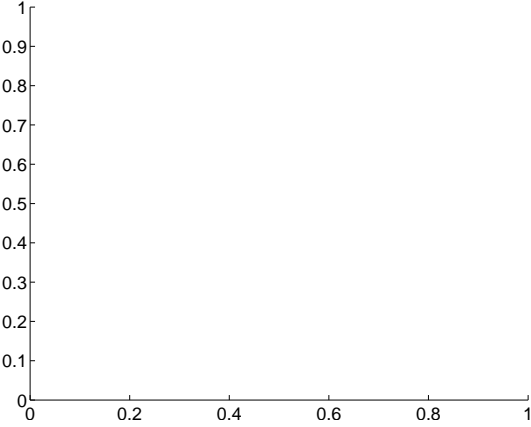
Q3 no difference image



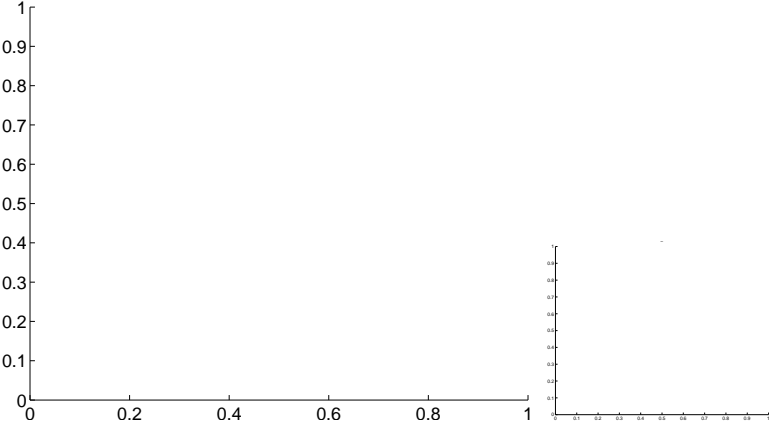
Q3 no OOT image



Q4 no difference image



Q4 no OOT image

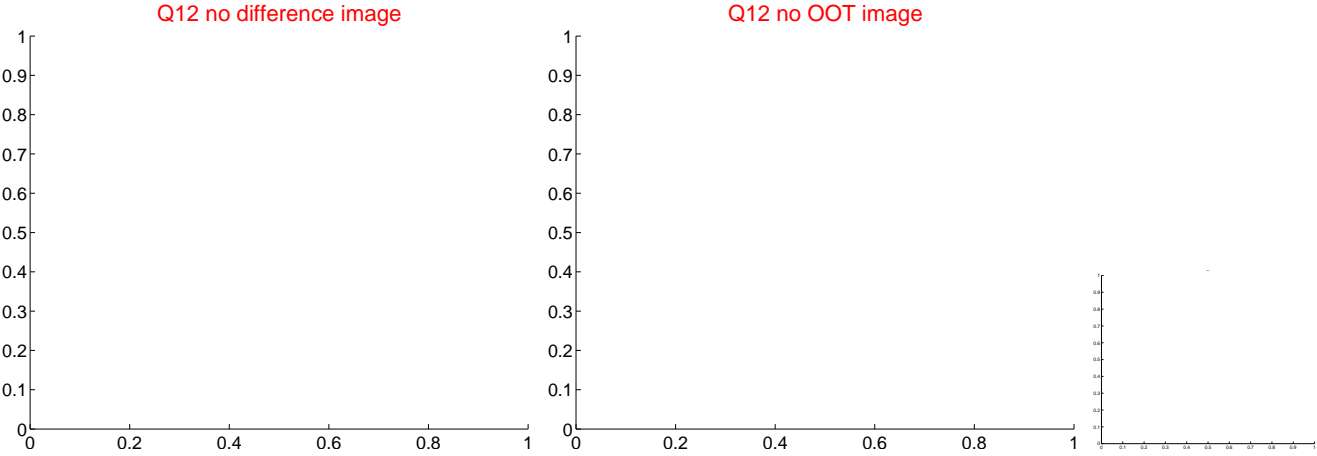
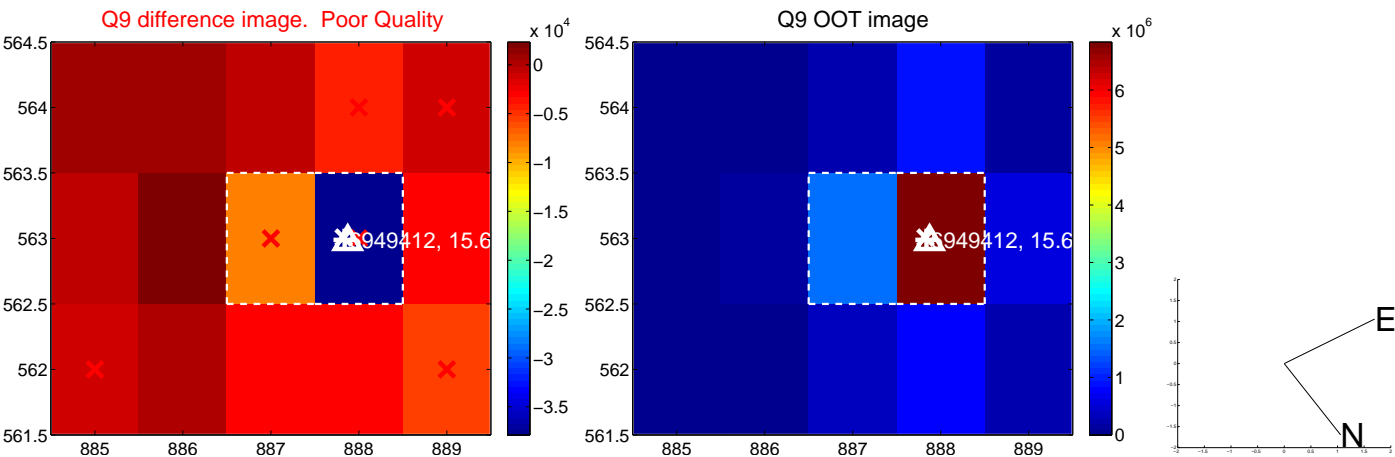


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



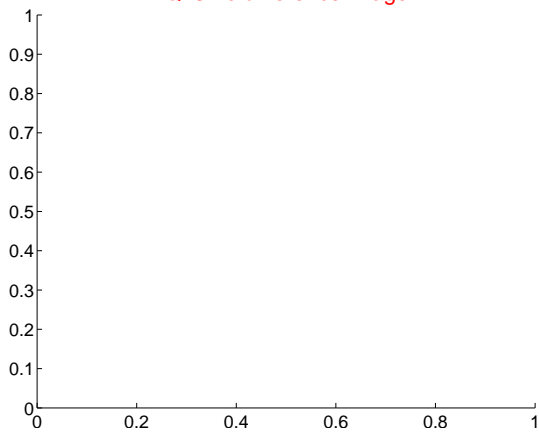


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

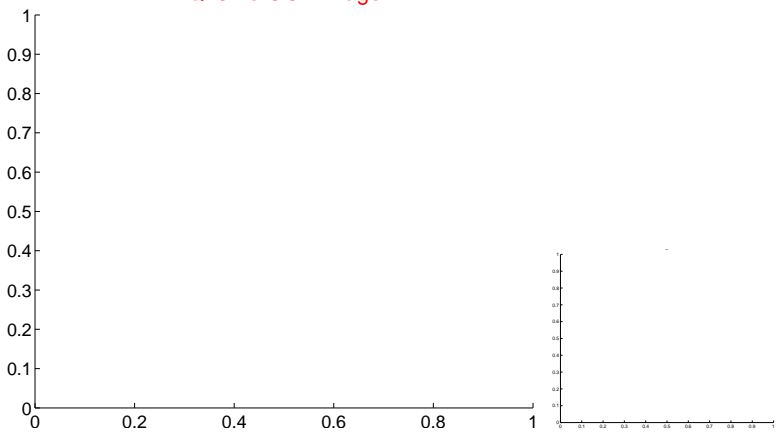


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

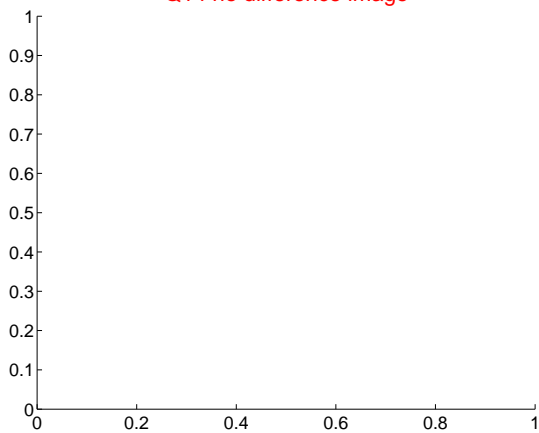
Q13 no difference image



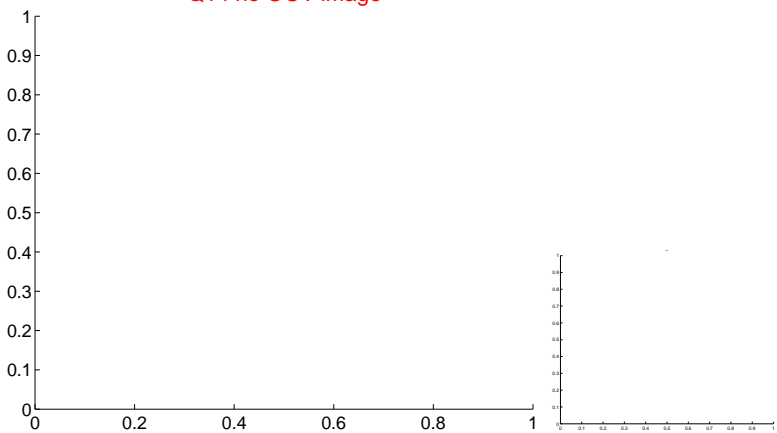
Q13 no OOT image



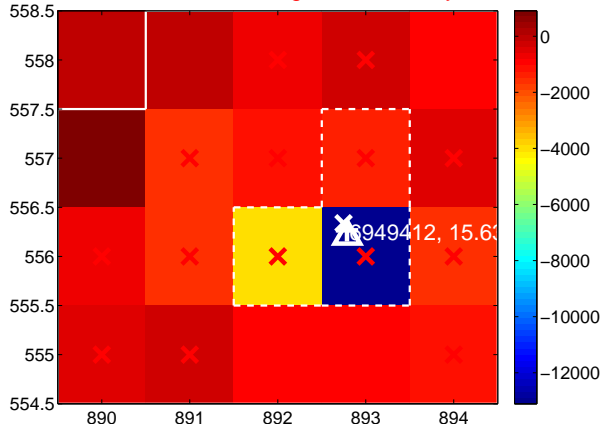
Q14 no difference image



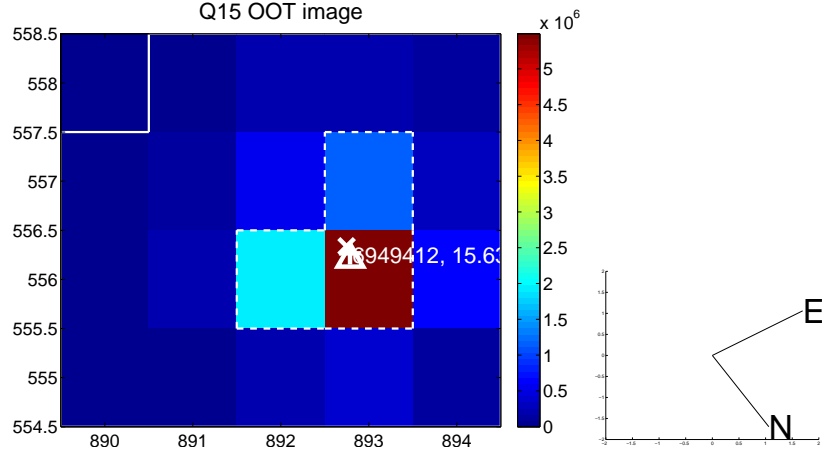
Q14 no OOT image



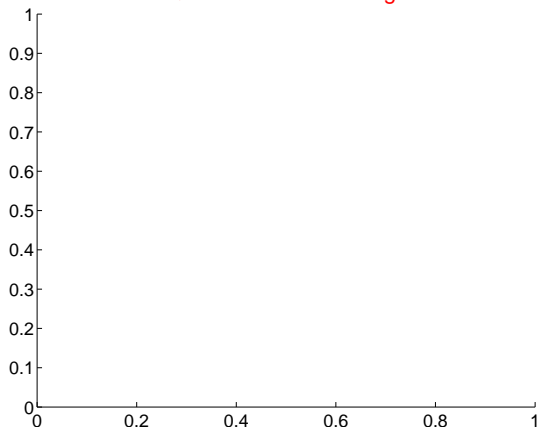
Q15 difference image. Poor Quality



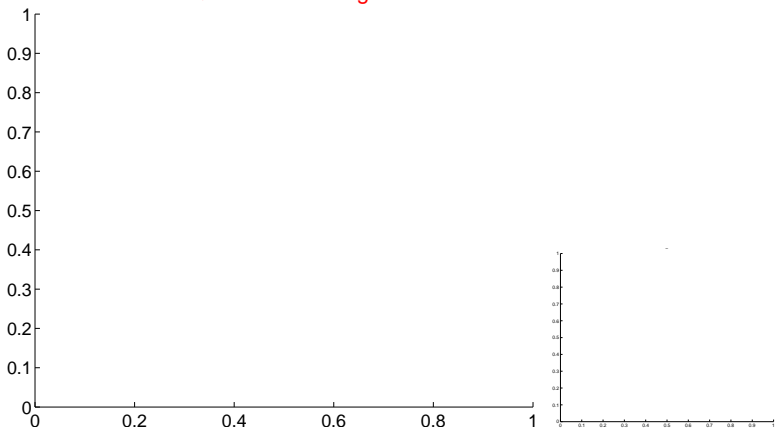
Q15 OOT image



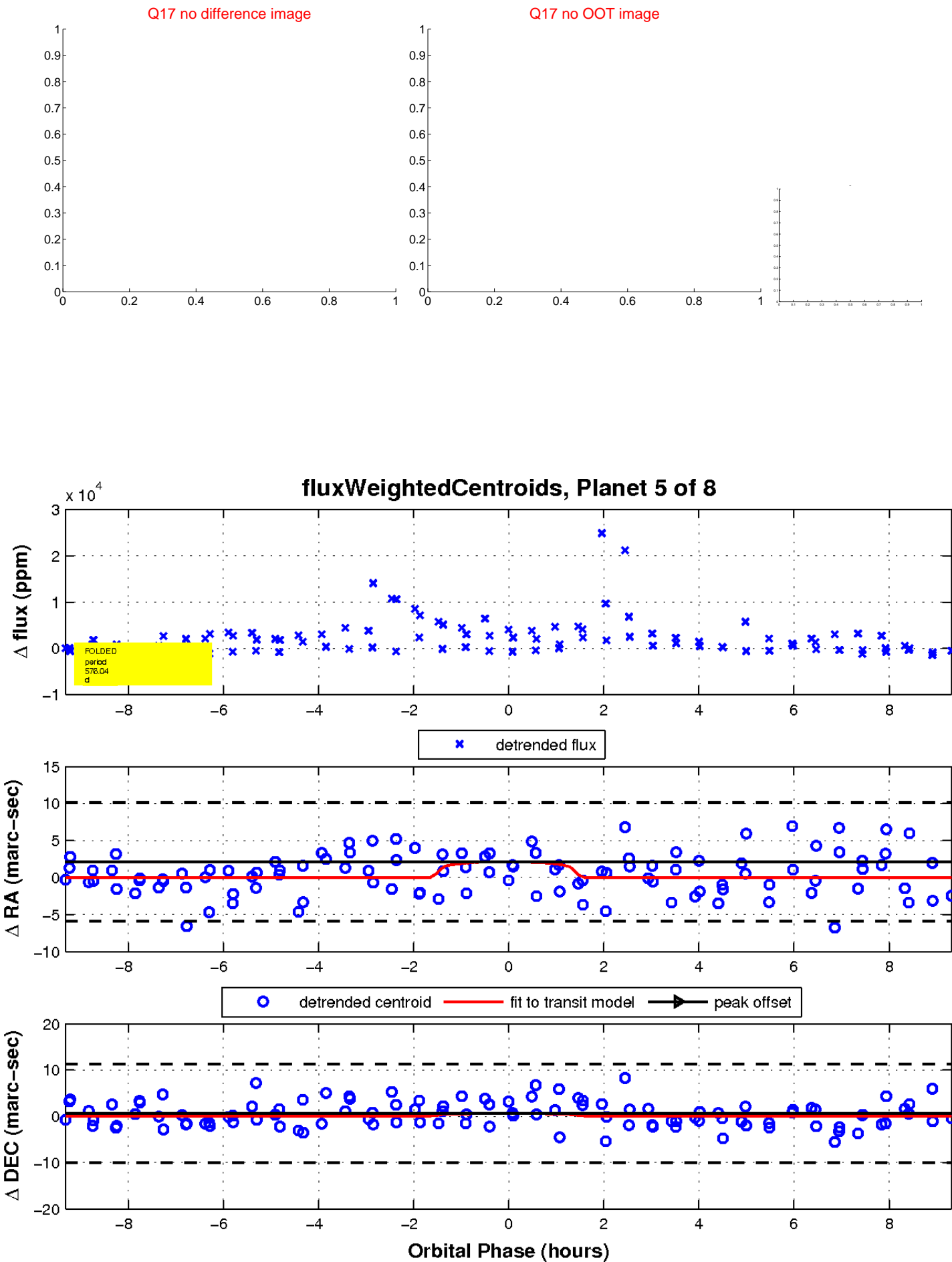
Q16 no difference image



Q16 no OOT image

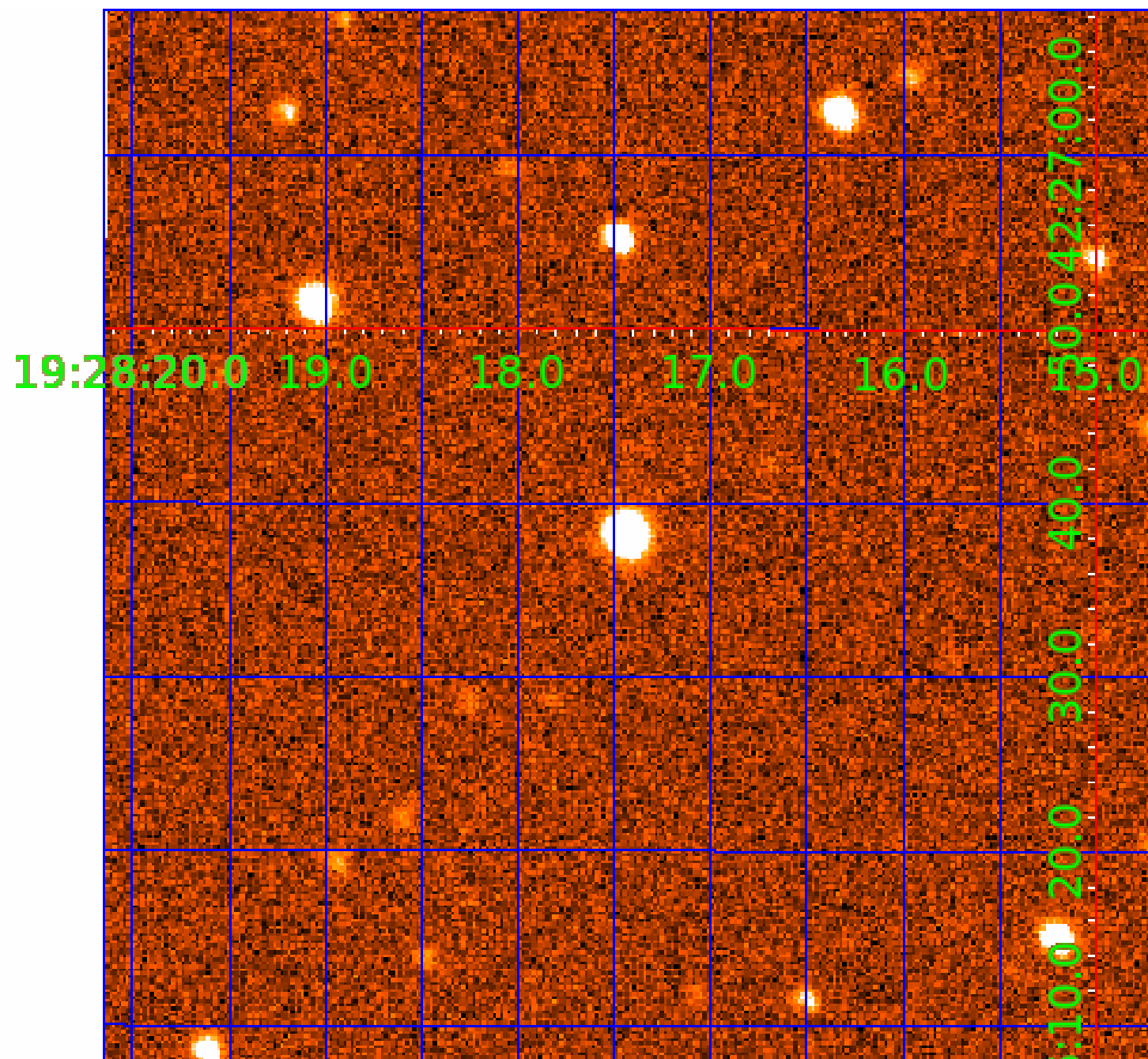


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006949412

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006949412-01	OBS	No	559.656830	450.057158	3684.1	2.438	15.6	8.2	0.45	3666	2.75	0.03
006949412-04	OBS	No	550.337297	462.272378	5184.8	5.654	12.9	8.5	0.45	3666	4.79	0.03
006949412-05	OBS	No	576.042798	237.334759	3368.9	3.131	14.8	7.2	0.45	3666	2.67	0.03
006949412-06	OBS	No	220.881063	334.052170	2996.4	3.148	12.4	10.3	0.45	3666	2.54	0.11
006949412-07	OBS	No	426.802577	199.949807	2354.7	8.319	10.5	5.4	0.45	3666	2.47	0.04
006949412-08	OBS	No	445.015692	197.906441	1497.3	7.500	11.4	-1.0	0.45	3666	1.74	0.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006949412-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
006949412-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
006949412-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

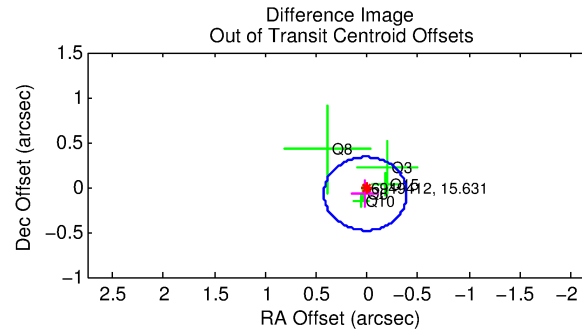
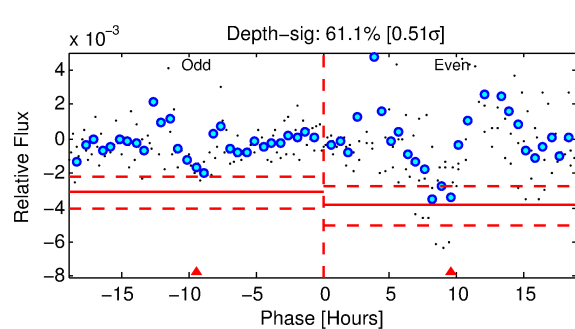
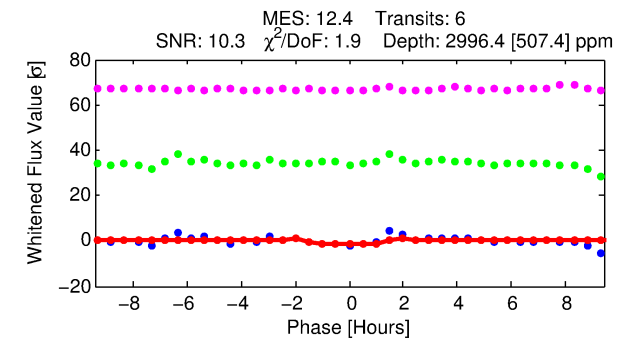
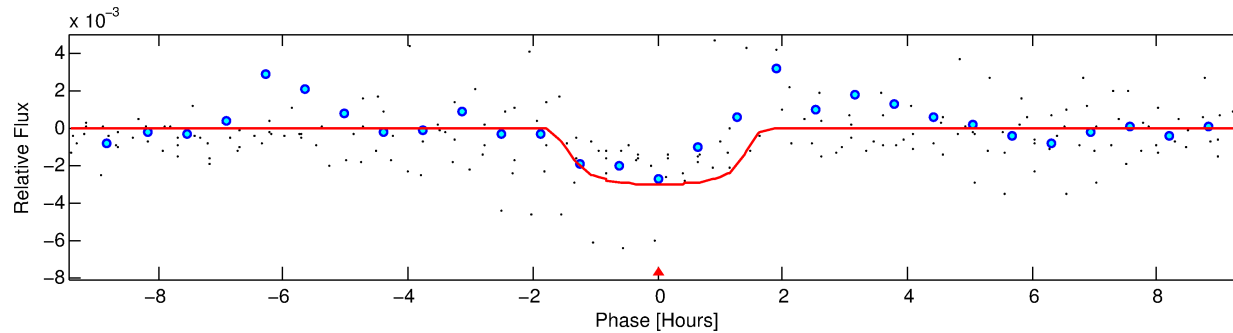
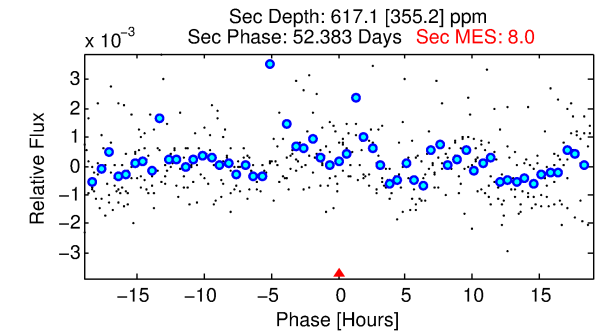
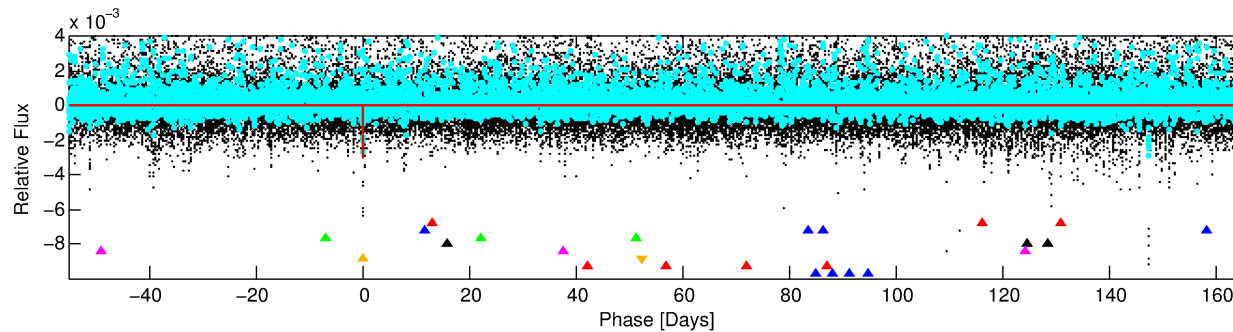
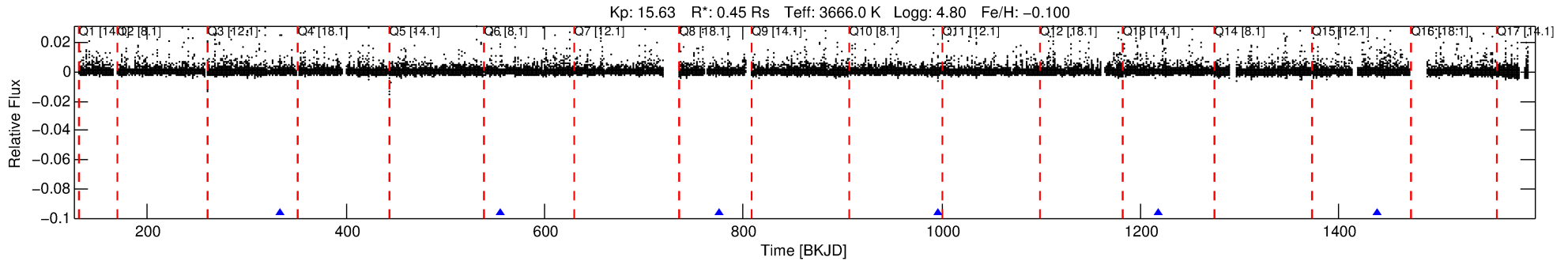
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006949412-06

No Significant Match Found

# DV One-Page Summary

KIC: 6949412 Candidate: 6 of 8 Period: 220.881 d



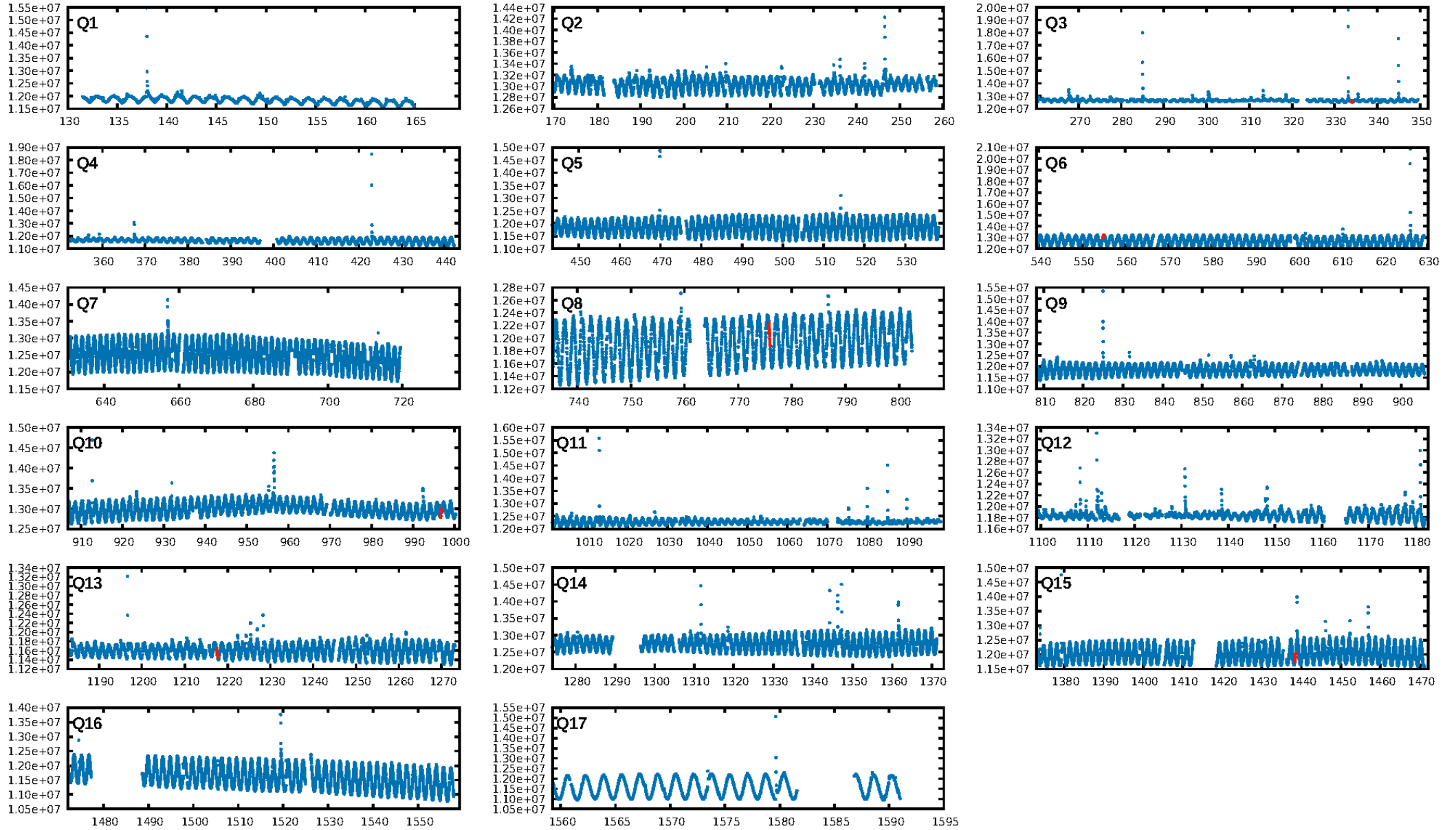
## DV Fit Results:

Period = 220.88106 [0.00214] d  
Epoch = 334.0522 [0.0061] BKJD  
Rp/R\* = 0.0515 [0.0608]  
a/R\* = 487.42 [2491.06]  
b = 0.53 [7.03]  
Seff = 0.11 [0.01]  
Teq = 146 [4] K  
Rp = 2.54 [3.01] Re  
a = 0.5557 [0.0324] AU  
Ag = 16190.81 [39391.23] [0.41σ]  
Teffp = 2547 [1549] K [1.55σ]

## DV Diagnostic Results:

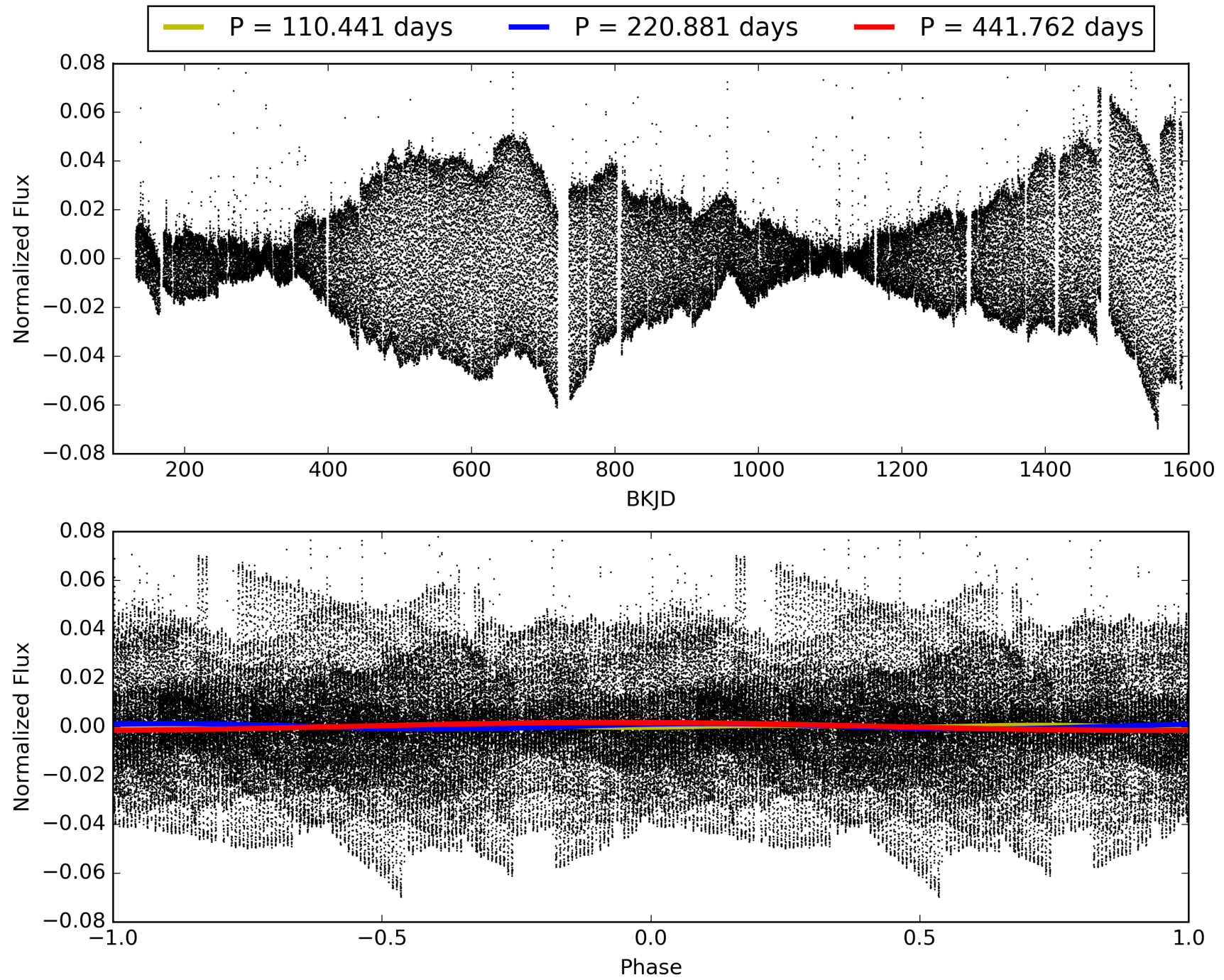
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [318.17σ]  
**ModelChiSquare2-sig: 0.2%**  
ModelChiSquareGof-sig: 84.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -5.718  
Centroid-sig: 61.7%  
Centroid-so: 0.485 arcsec [0.93σ]  
OotOffset-rm: 0.075 arcsec [0.55σ]  
KicOffset-rm: 0.240 arcsec [1.78σ]  
OotOffset-st: 2/2/1/0 [5]  
KicOffset-st: 2/2/1/0 [5]  
DiffImageQuality-fgm: 0.60 [3/5]  
DiffImageOverlap-fno: 1.00 [5/5]

# TCE 006949412-06, PDC Light Curves





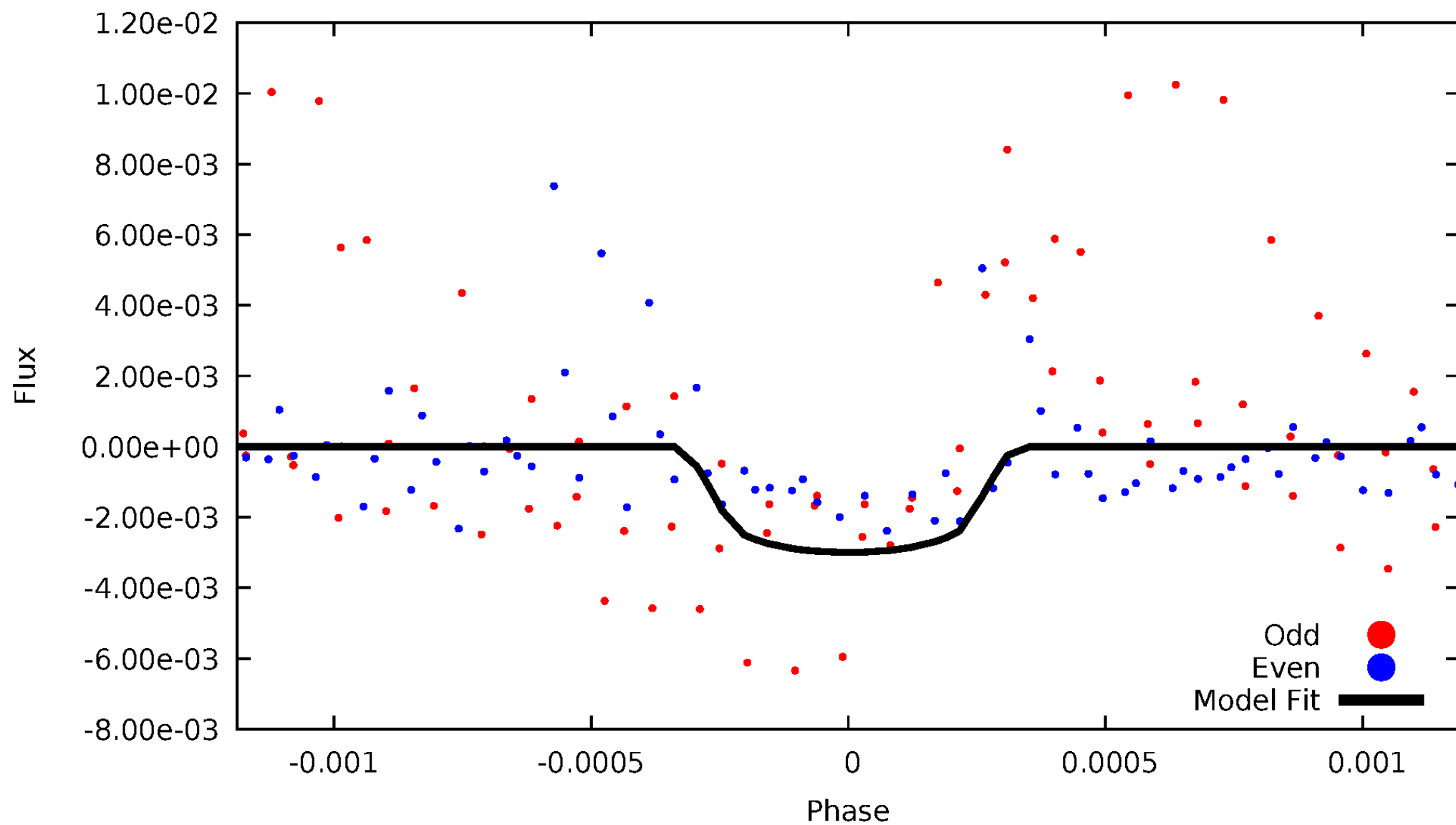
TCE 006949412-06





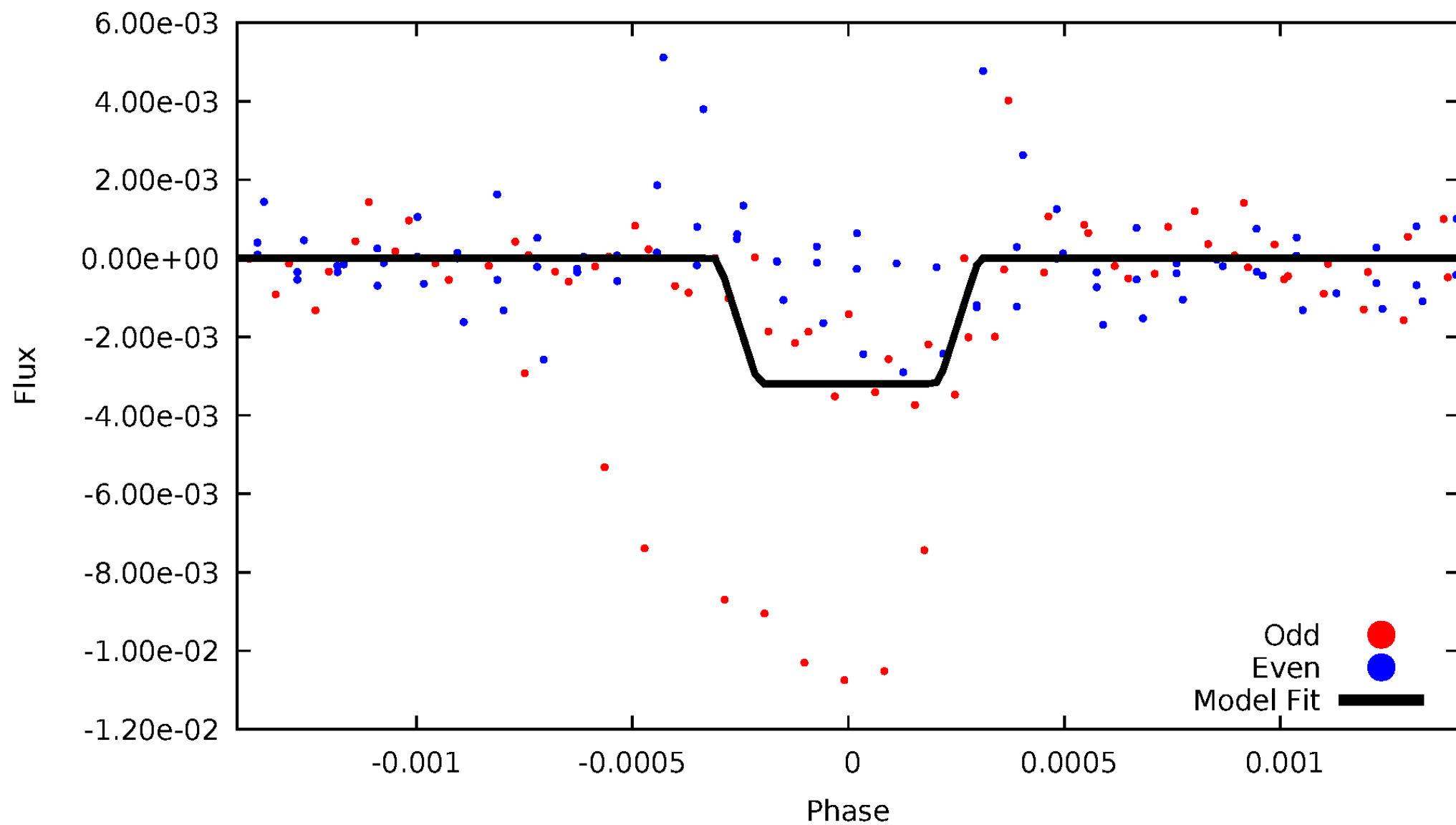
# DV Odd/Even

TCE 006949412-06



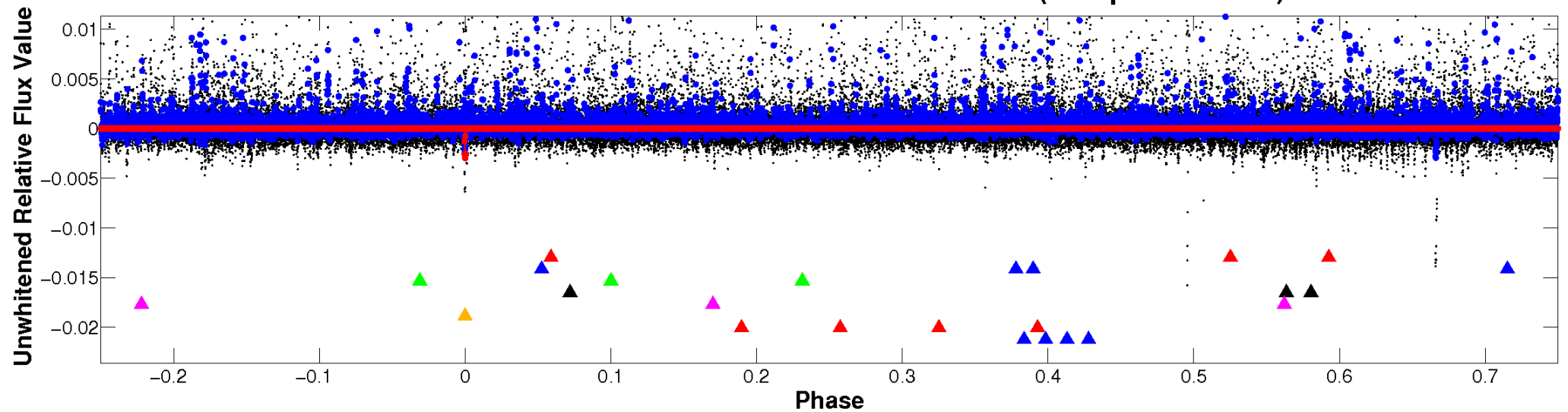
# ALT Odd/Even

TCE 006949412-06

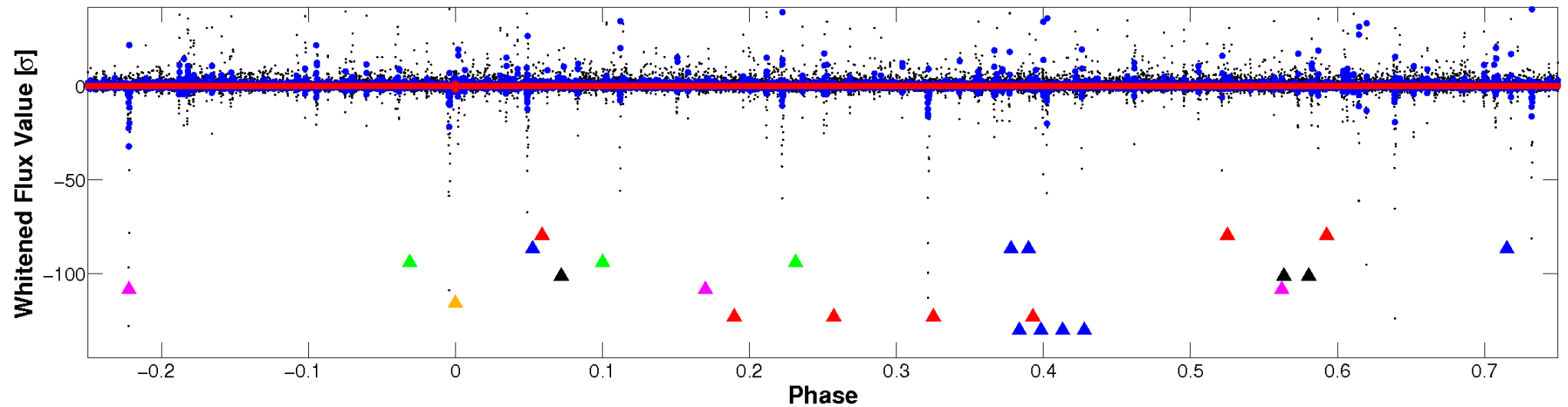


# Non-Whitened Vs. Whitened Light Curve

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

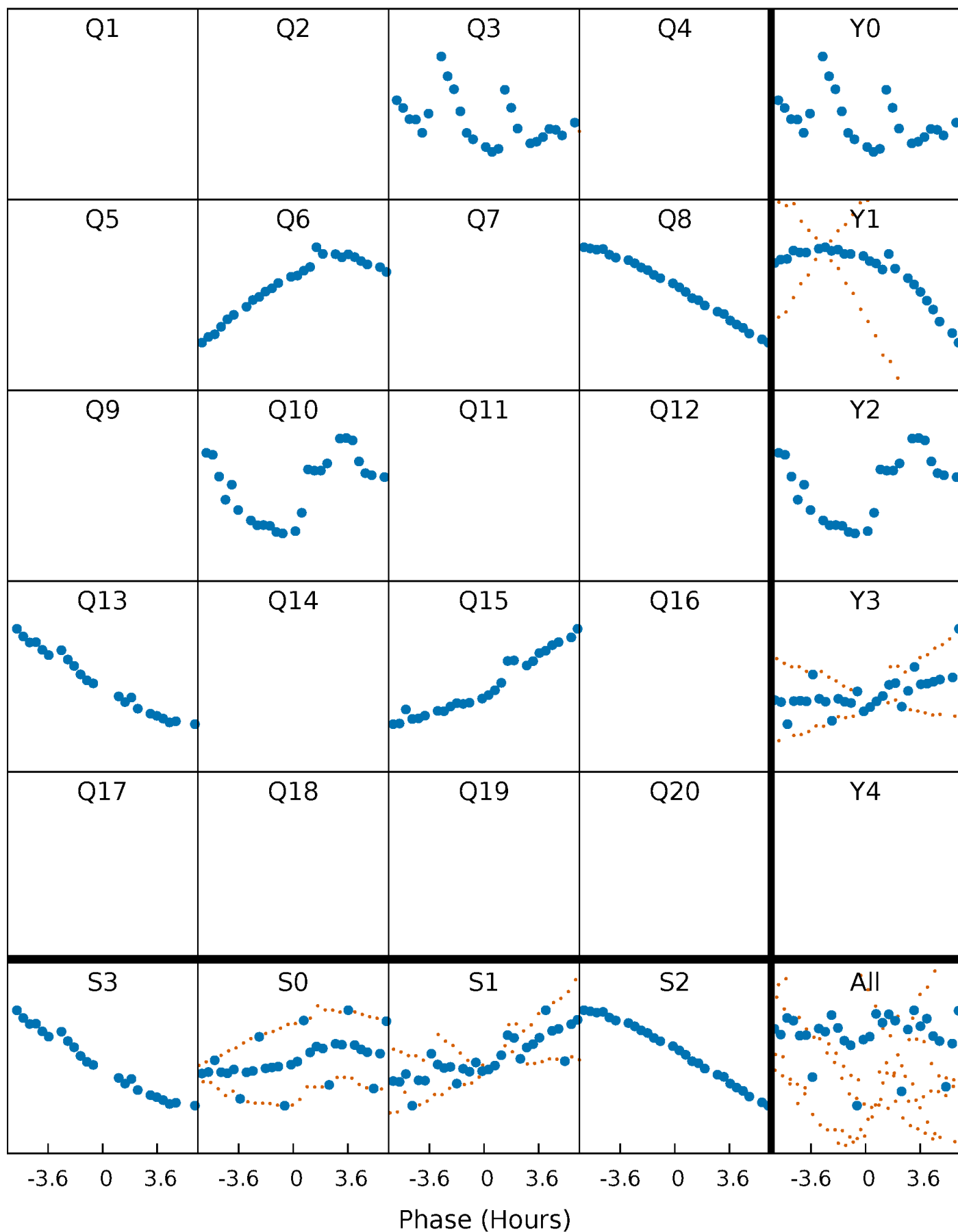


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



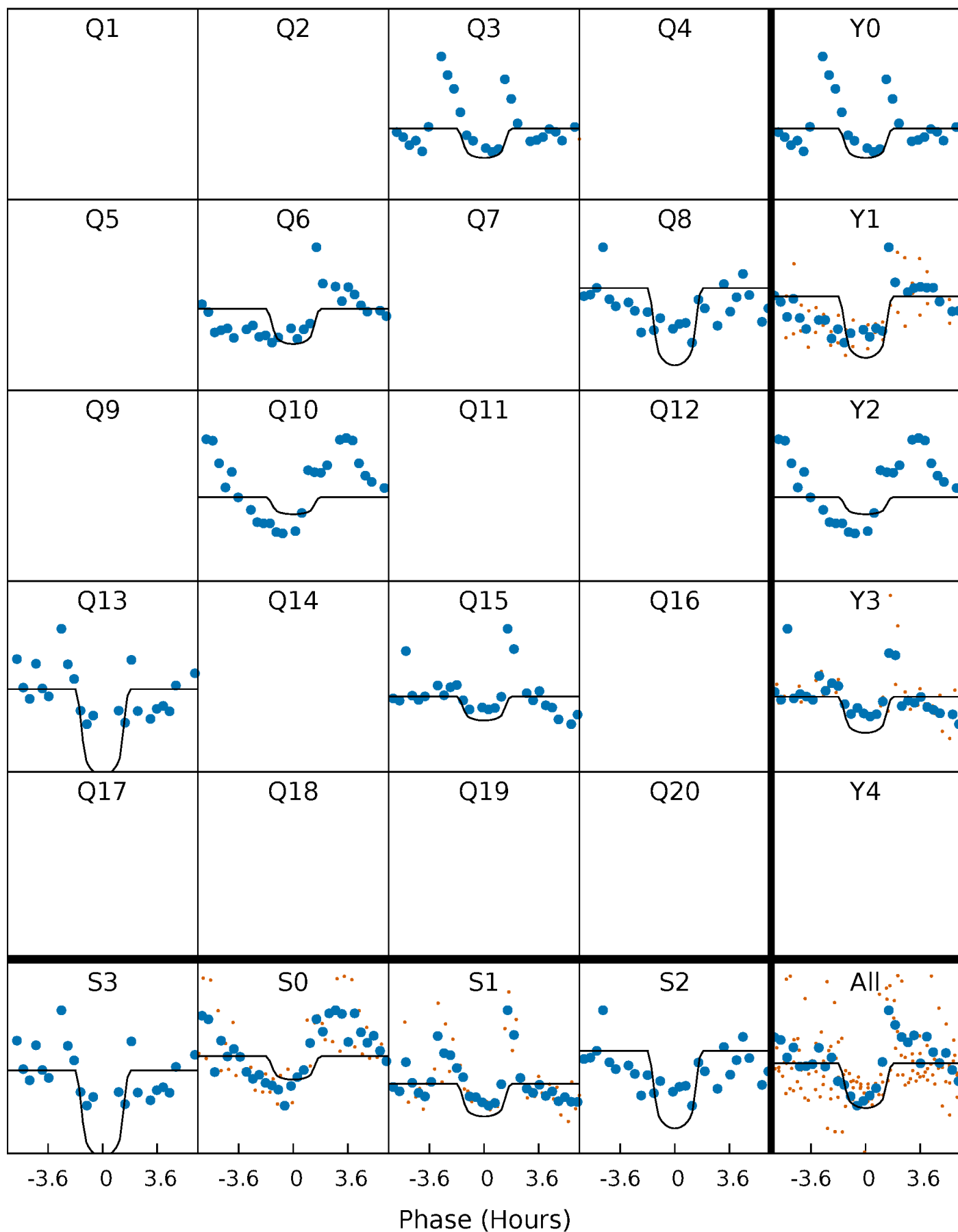
# PDC Quarter-Phased Transit Curves

TCE 006949412-06 P=220.881063 Days  $T_0=334.052170$  (BKJD)



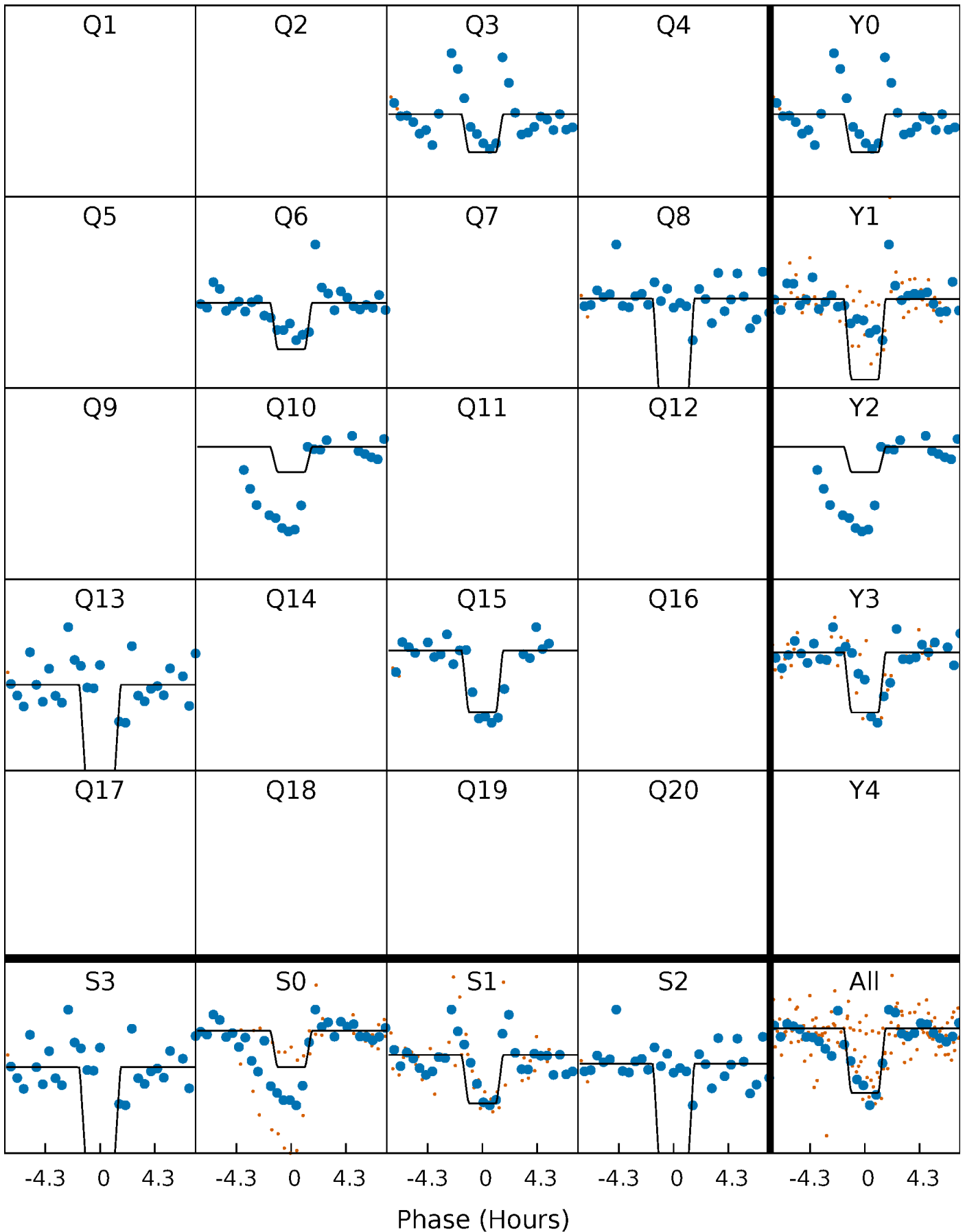
# DV Quarter-Phased Transit Curves

TCE 006949412-06 P=220.881063 Days  $T_0=334.052170$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

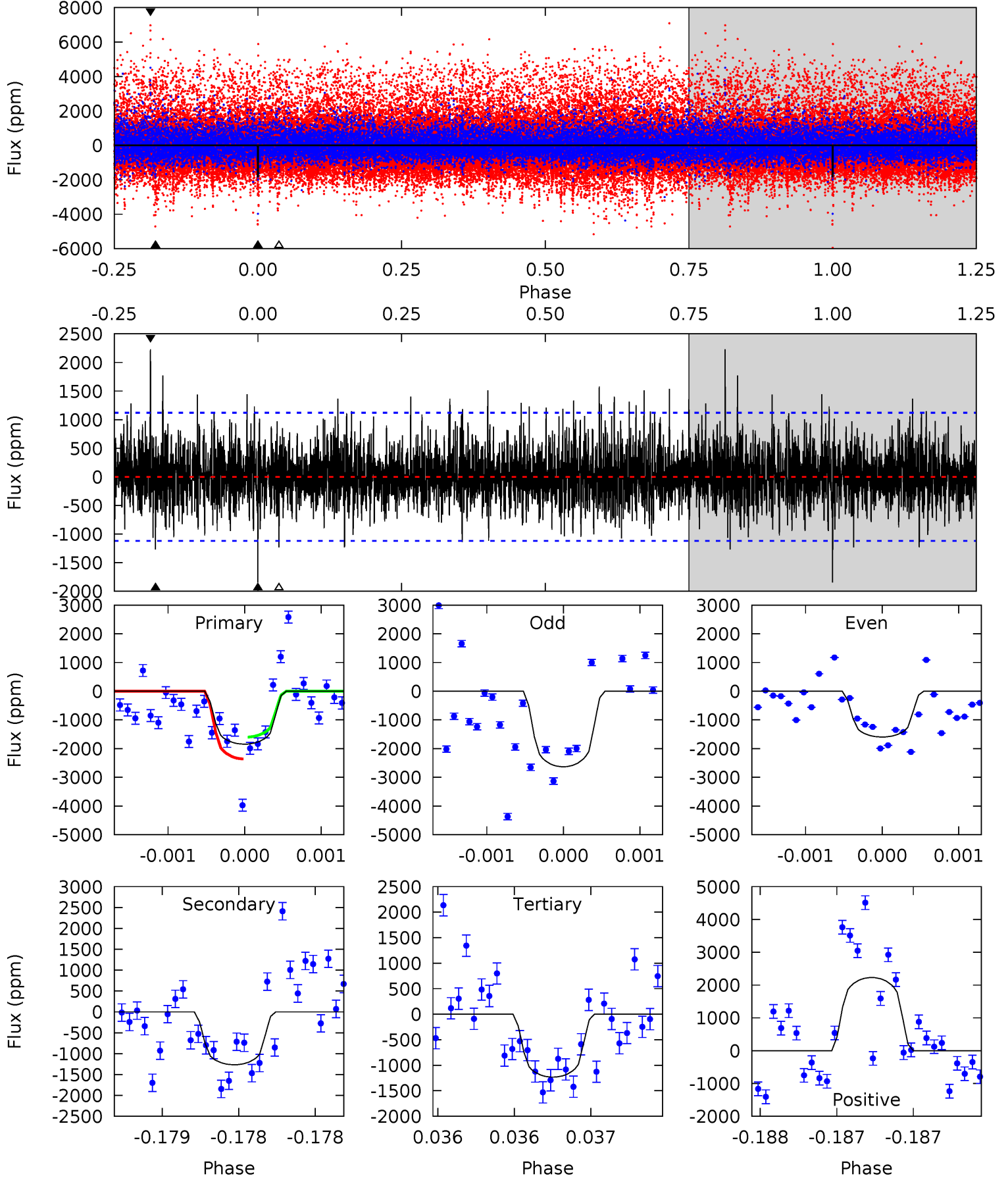
TCE 006949412-06 P=220.877934 Days  $T_0=334.040736$  (BKJD)



# DV Model-Shift Uniqueness Test

006949412-06, P = 220.881063 Days, E = 113.171107 Days

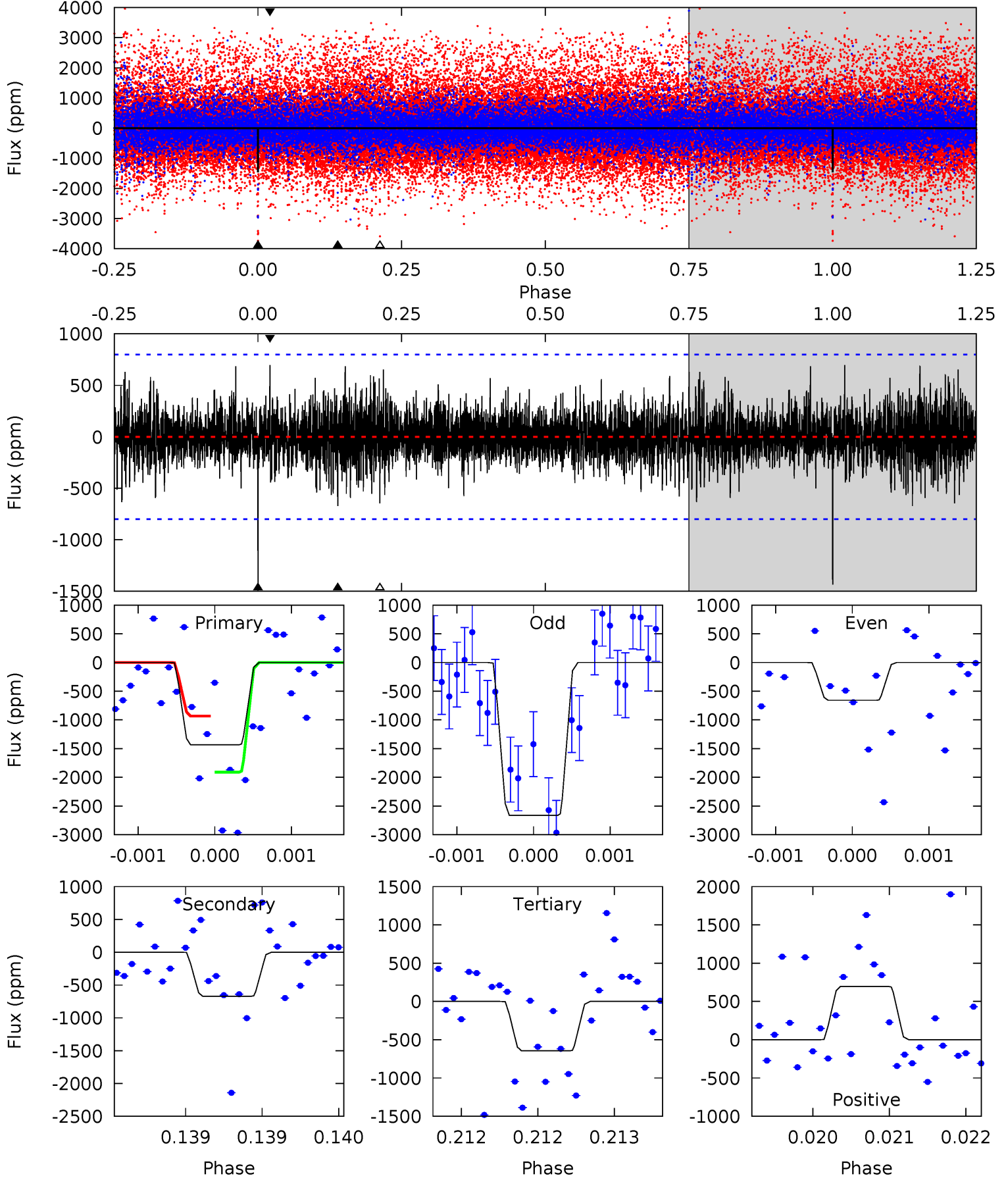
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.11	6.25	6.09	11.0	5.53	3.41	1.90	3.02	-1.90	0.16	-4.75	2.46	1.22	0.55	1.92



# Alt Model-Shift Uniqueness Test

006949412-06, P = 220.877934 Days, E = 113.162802 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
9.95	4.66	4.48	4.83	5.55	3.44	1.16	5.47	5.12	0.18	-0.17	6.67	1.39	0.33	0





### Stellar Parameters For KIC 006949412

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3666^{+49}_{-54}$	$4.797^{+0.039}_{-0.028}$	$-0.100^{+0.100}_{-0.100}$	$0.453^{+0.028}_{-0.034}$	$0.468^{+0.026}_{-0.033}$	$7.099^{+1.282}_{-0.744}$
	+1%/-1%	+1%/-1%	+100%/-100%	+6%/-8%	+6%/-7%	+18%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 006949412-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1266 \pm 203$	$3.27^{+2.87}_{-2.08}$	$204^{+4}_{-4}$	$3027^{+1182}_{-470}$	$20166^{+131489}_{-14499}$
Alt.	$-671 \pm 144$	$3.45^{+2.65}_{-2.31}$	$204^{+4}_{-4}$	$2729^{+1057}_{-360}$	$9408^{+77246}_{-6442}$

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

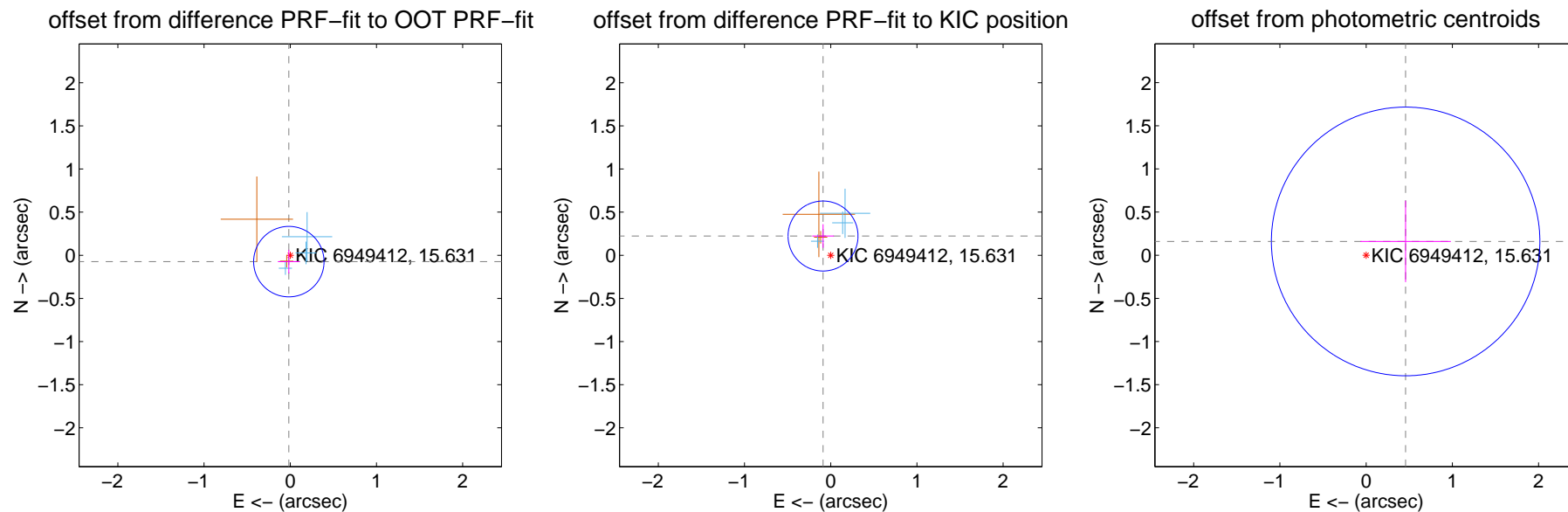
## DV Centroid Data

Supplemental centroid analysis for 006949412-06. Kepler magnitude: 15.63. Transit SNR 10.30

There are 3 quarters with good PRF difference image offsets

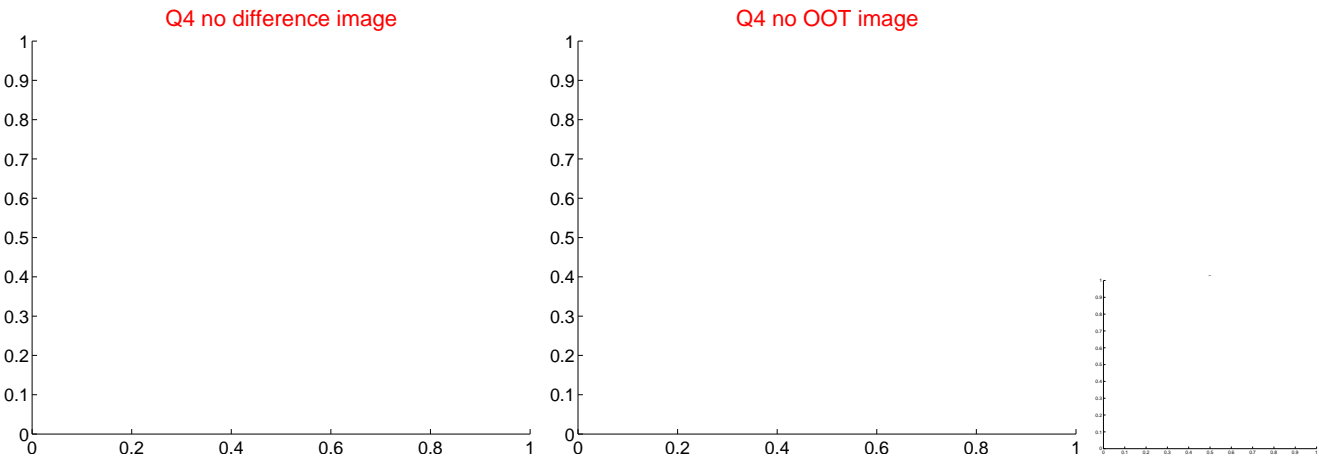
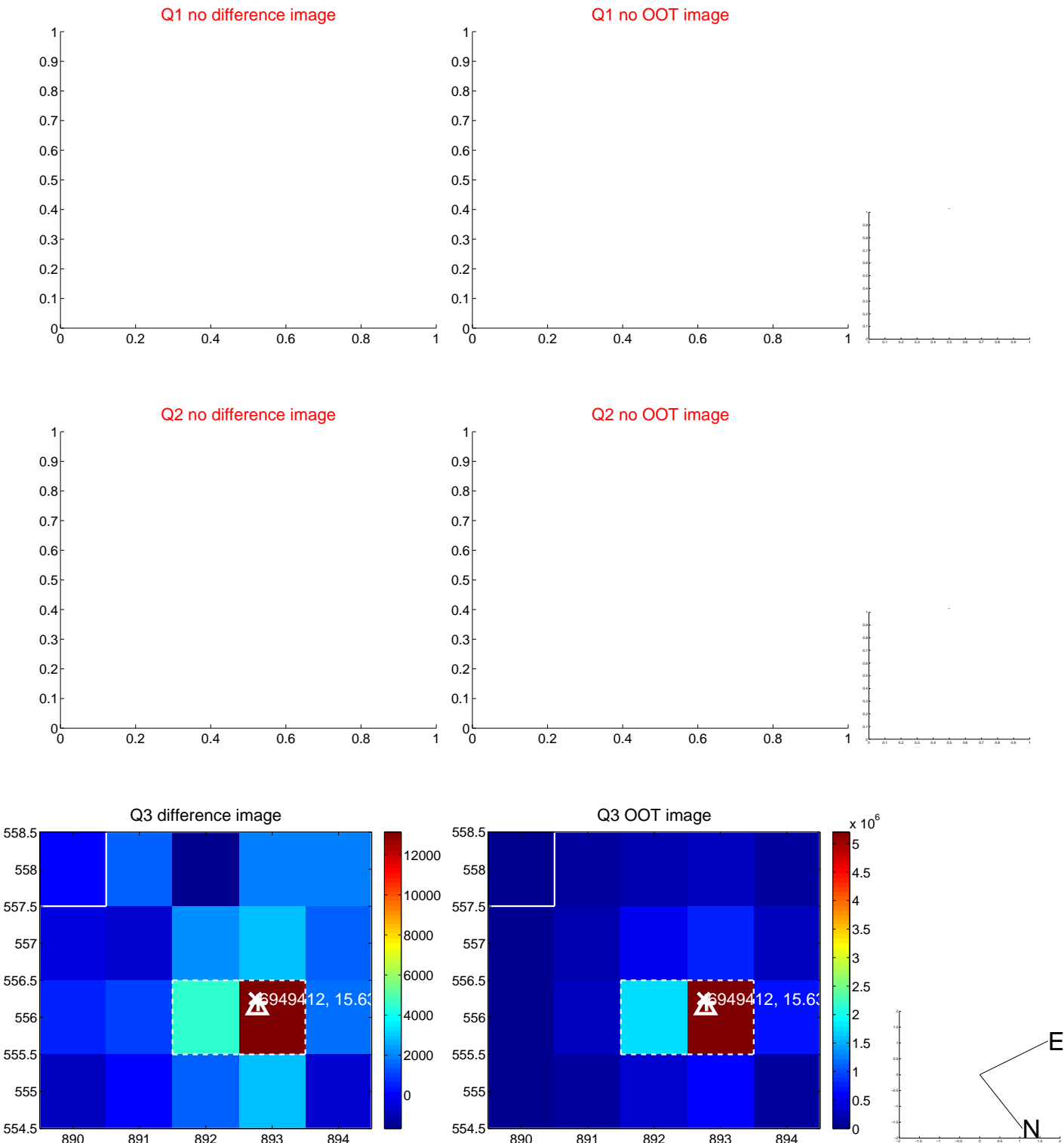
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.075 \pm 0.136$	0.55	$0.017 \pm 0.126$	$-0.074 \pm 0.137$
PRF-fit source offset from KIC position	$0.240 \pm 0.135$	1.78	$0.089 \pm 0.126$	$0.223 \pm 0.137$
photometric centroid source offset	$0.48 \pm 0.52$	0.93	$-0.46 \pm 0.52$	$0.16 \pm 0.47$

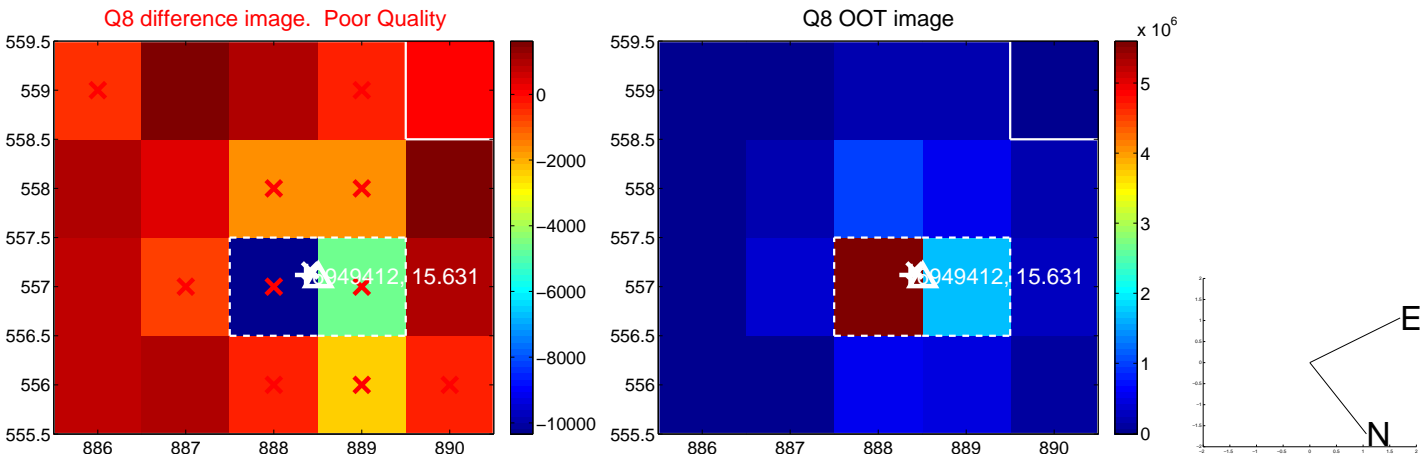
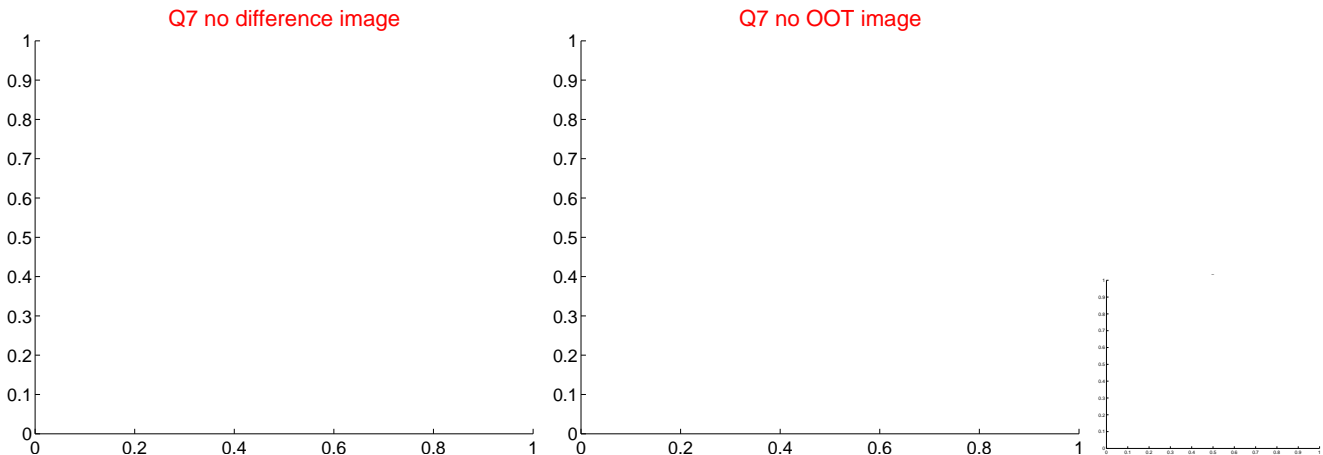
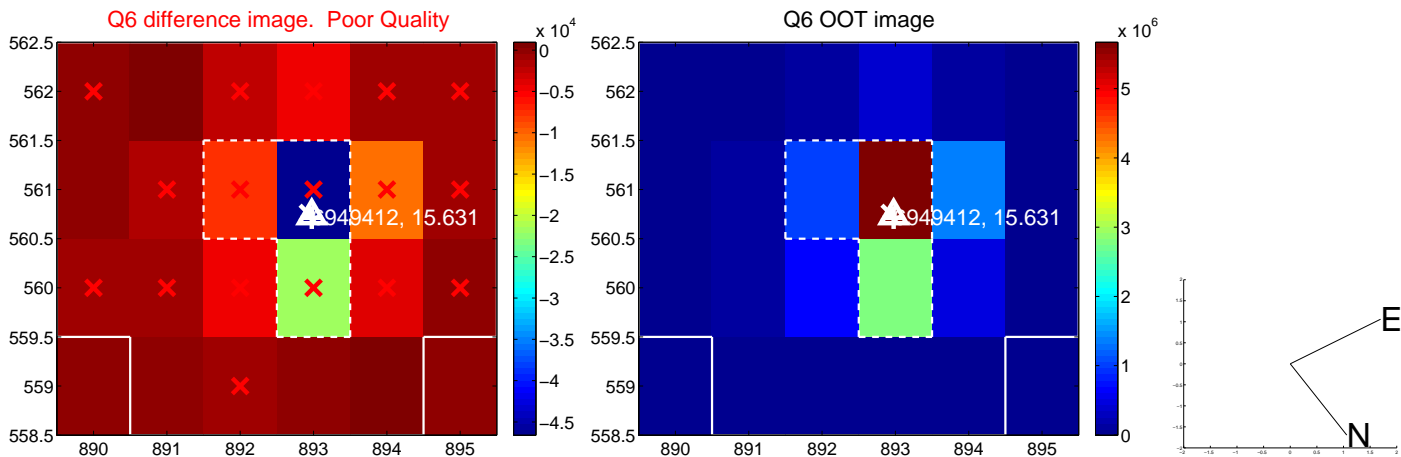
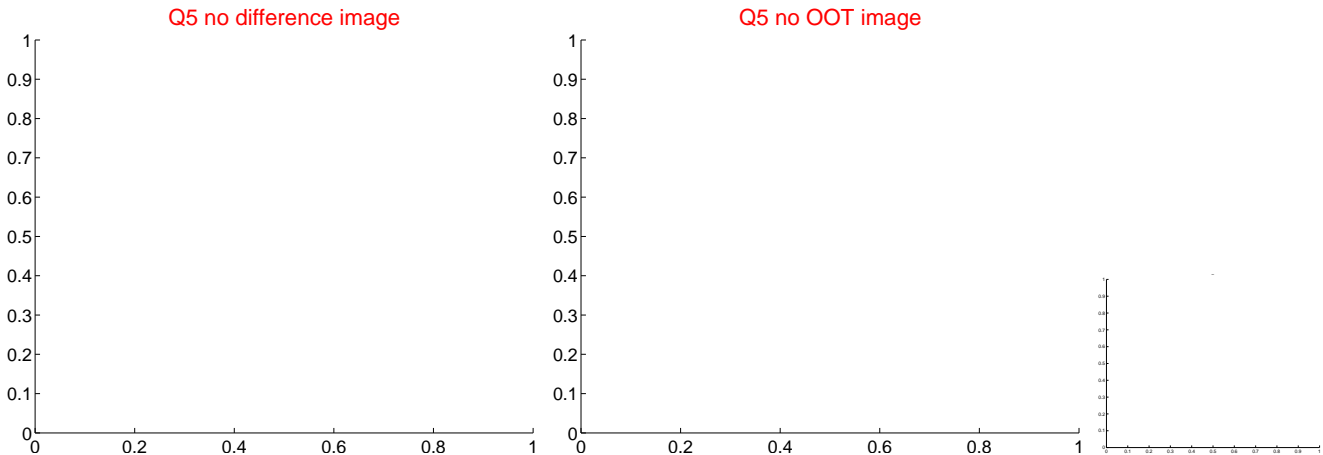


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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



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



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

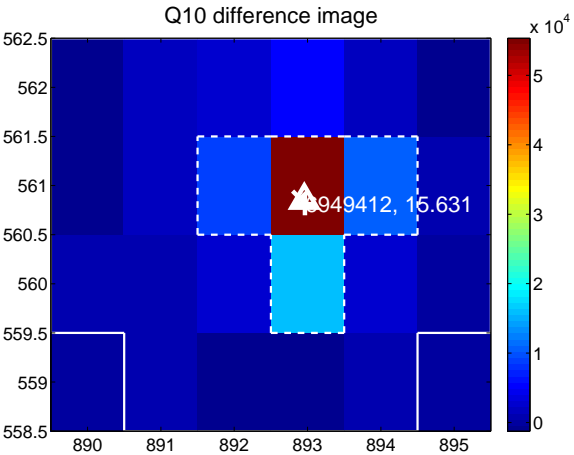
Q9 no difference image



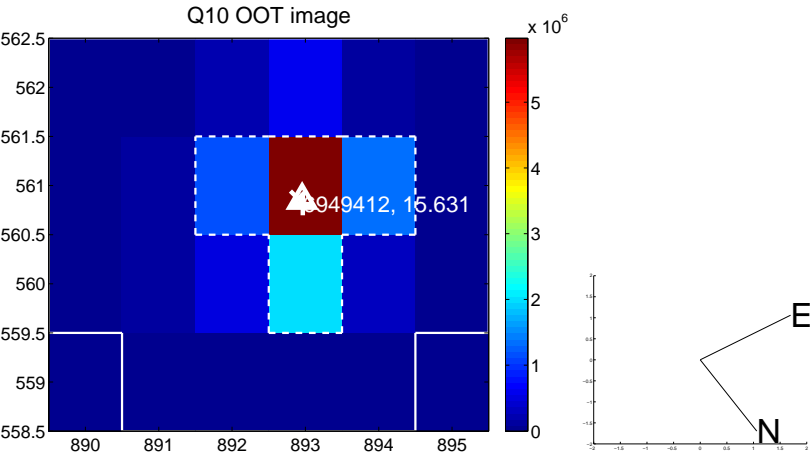
Q9 no OOT image



Q10 difference image



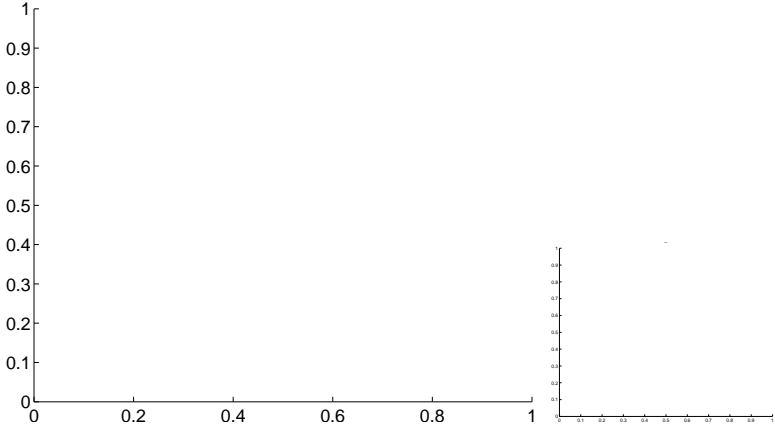
Q10 OOT image



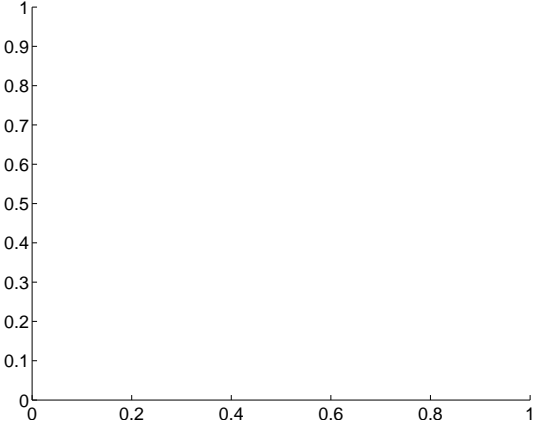
Q11 no difference image



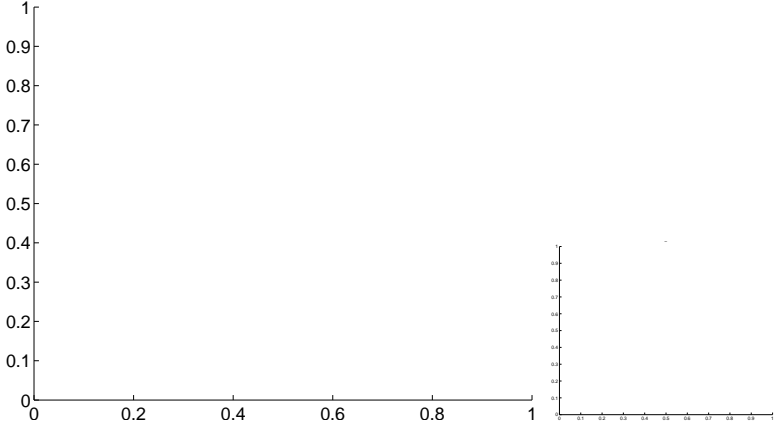
Q11 no OOT image



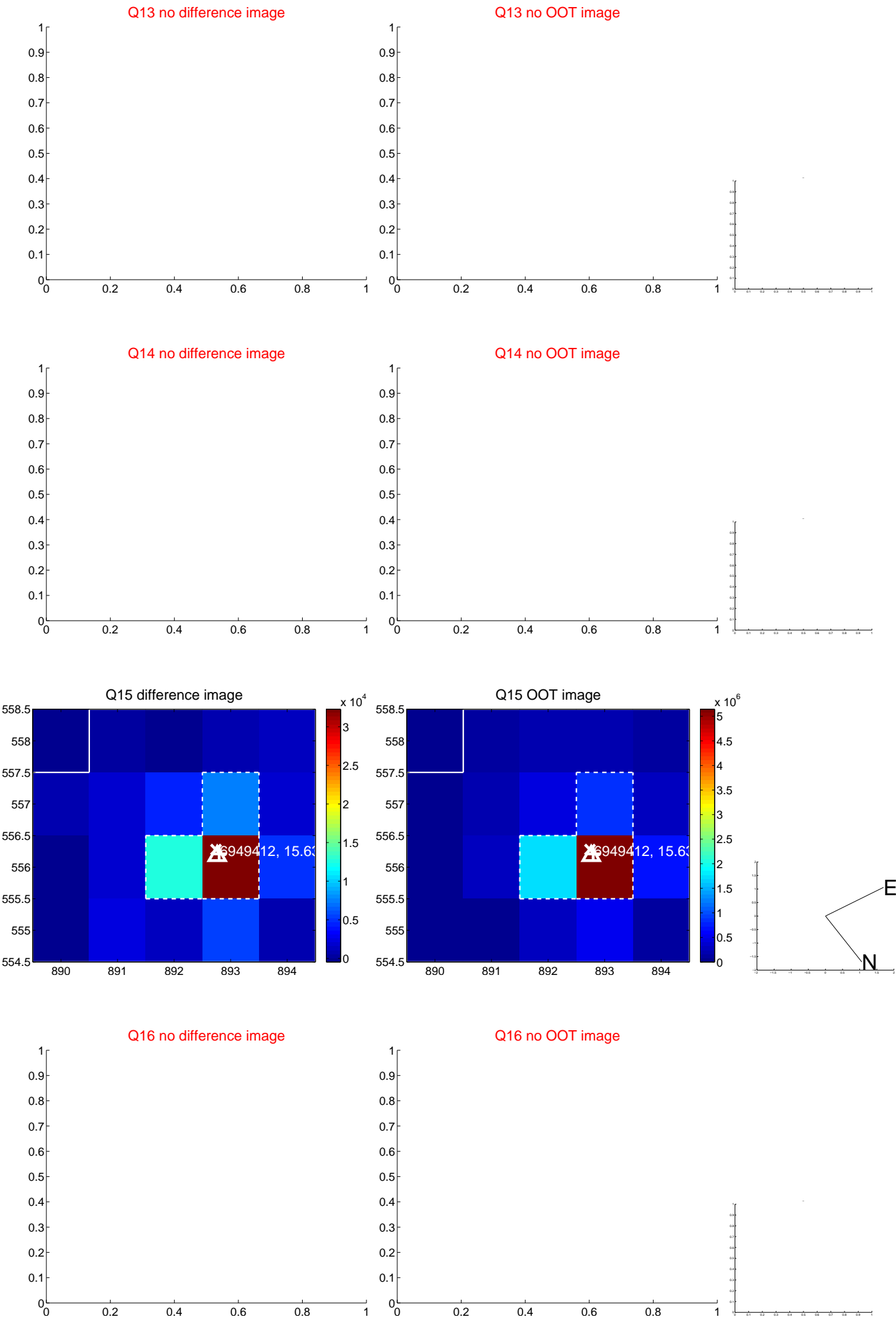
Q12 no difference image



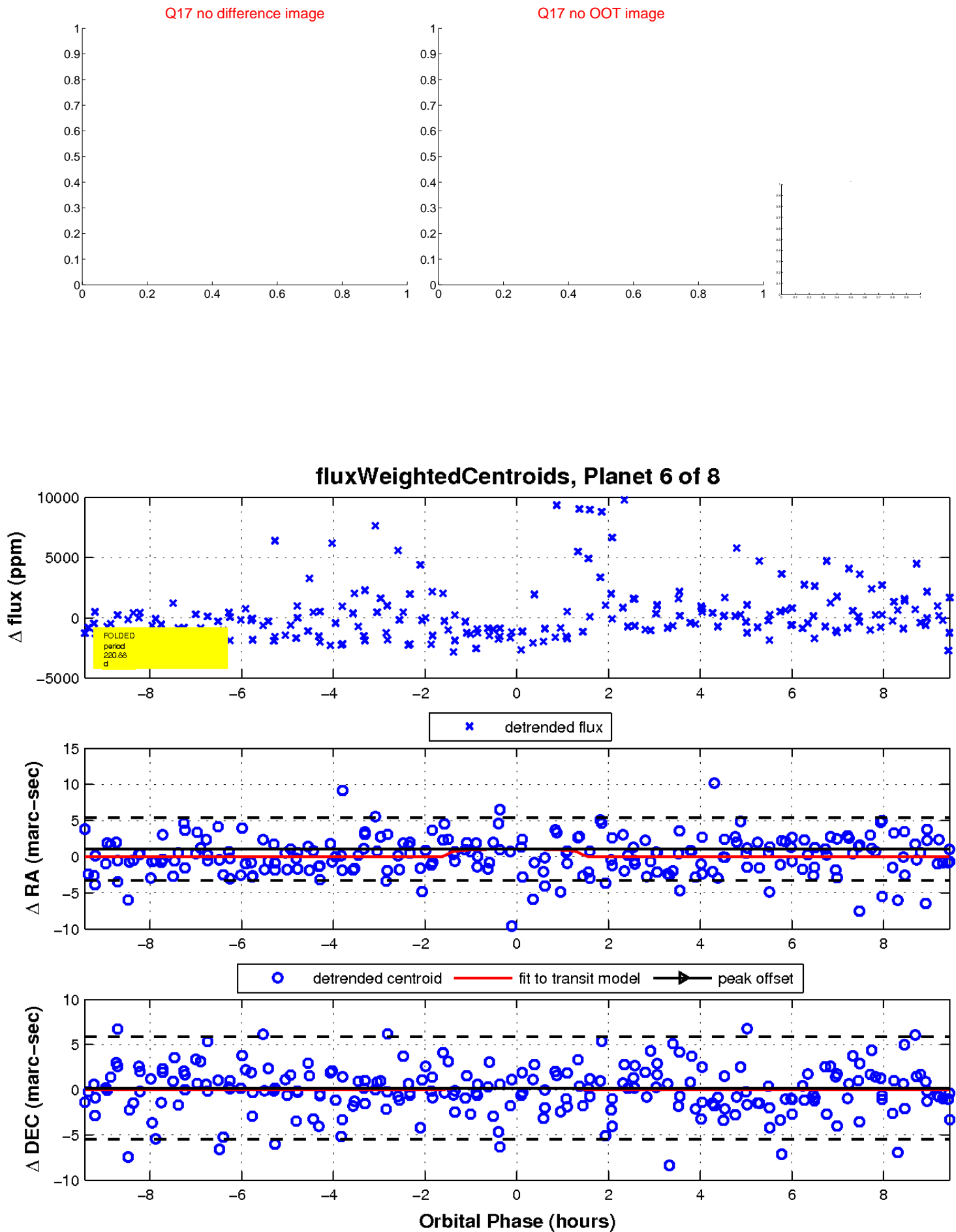
Q12 no OOT image



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

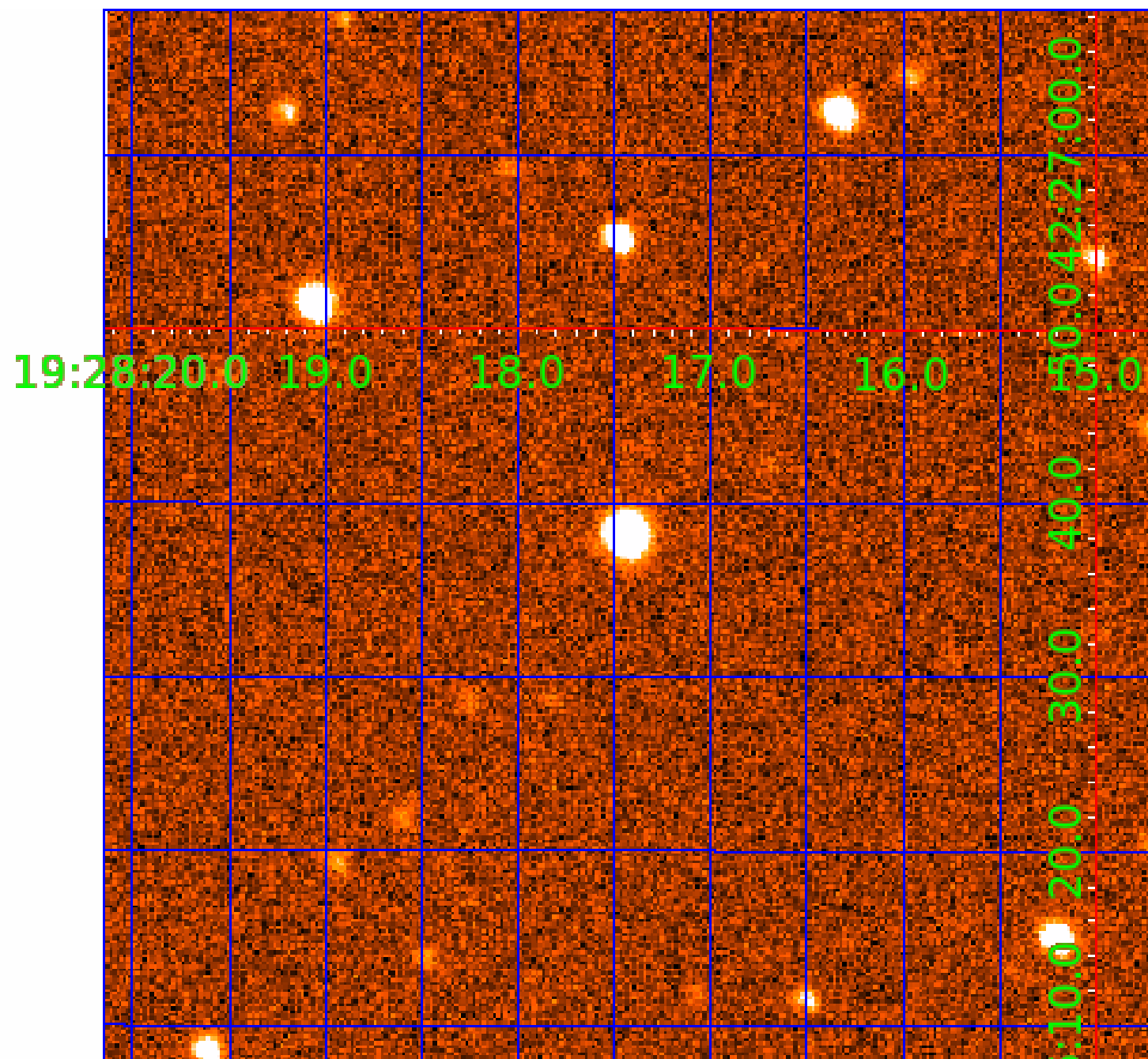


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 006949412

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006949412-01	OBS	No	559.656830	450.057158	3684.1	2.438	15.6	8.2	0.45	3666	2.75	0.03
006949412-04	OBS	No	550.337297	462.272378	5184.8	5.654	12.9	8.5	0.45	3666	4.79	0.03
006949412-05	OBS	No	576.042798	237.334759	3368.9	3.131	14.8	7.2	0.45	3666	2.67	0.03
006949412-06	OBS	No	220.881063	334.052170	2996.4	3.148	12.4	10.3	0.45	3666	2.54	0.11
006949412-07	OBS	No	426.802577	199.949807	2354.7	8.319	10.5	5.4	0.45	3666	2.47	0.04
006949412-08	OBS	No	445.015692	197.906441	1497.3	7.500	11.4	-1.0	0.45	3666	1.74	0.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006949412-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
006949412-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
006949412-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

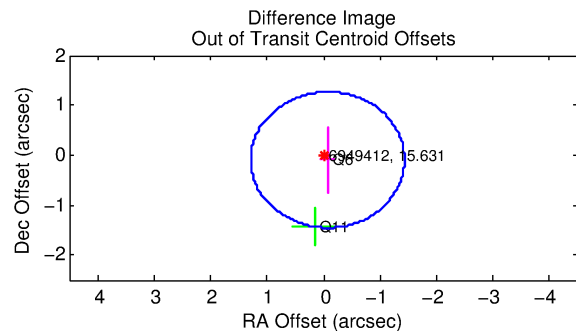
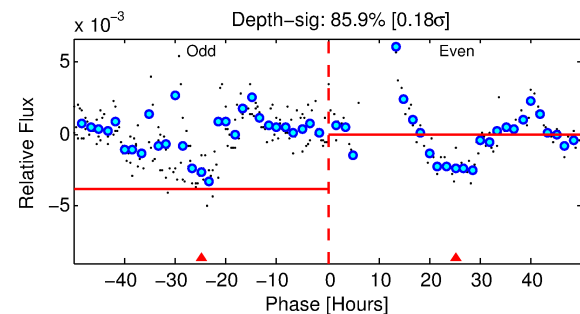
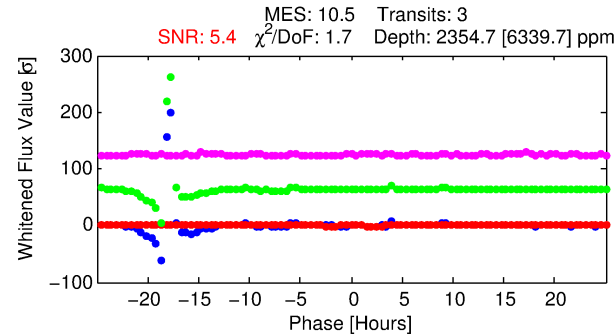
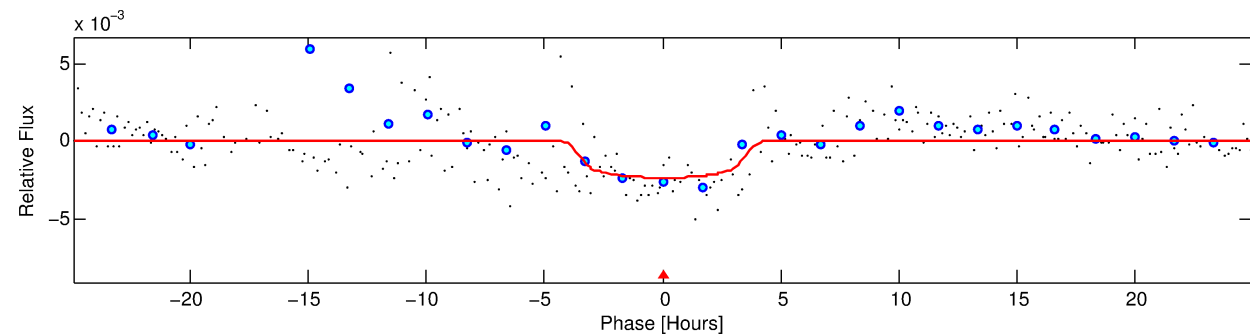
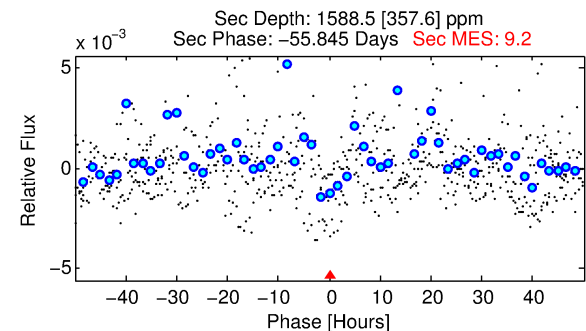
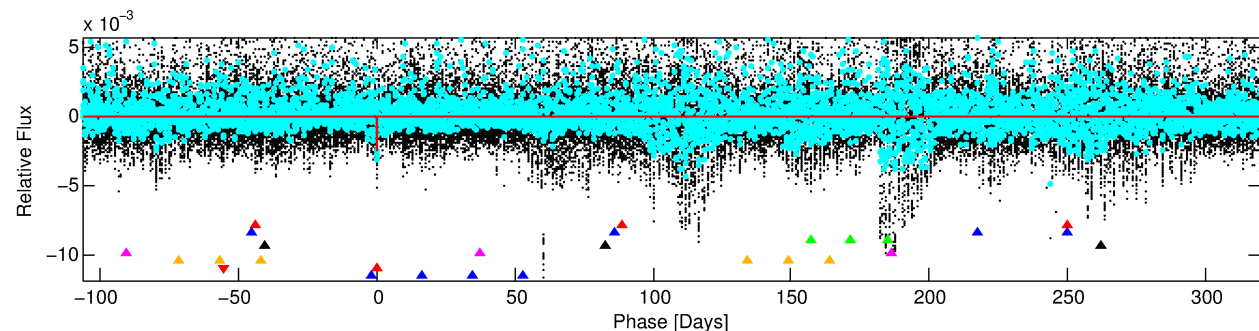
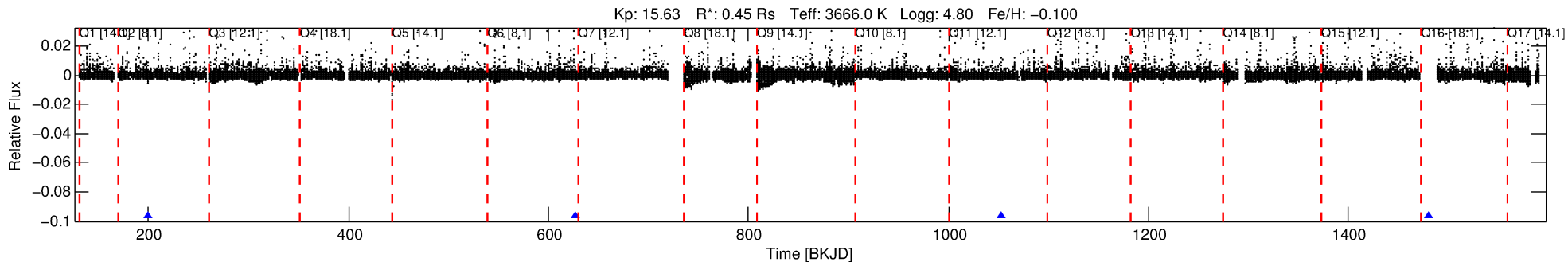
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006949412-07

No Significant Match Found

# DV One-Page Summary

KIC: 6949412 Candidate: 7 of 8 Period: 426.803 d



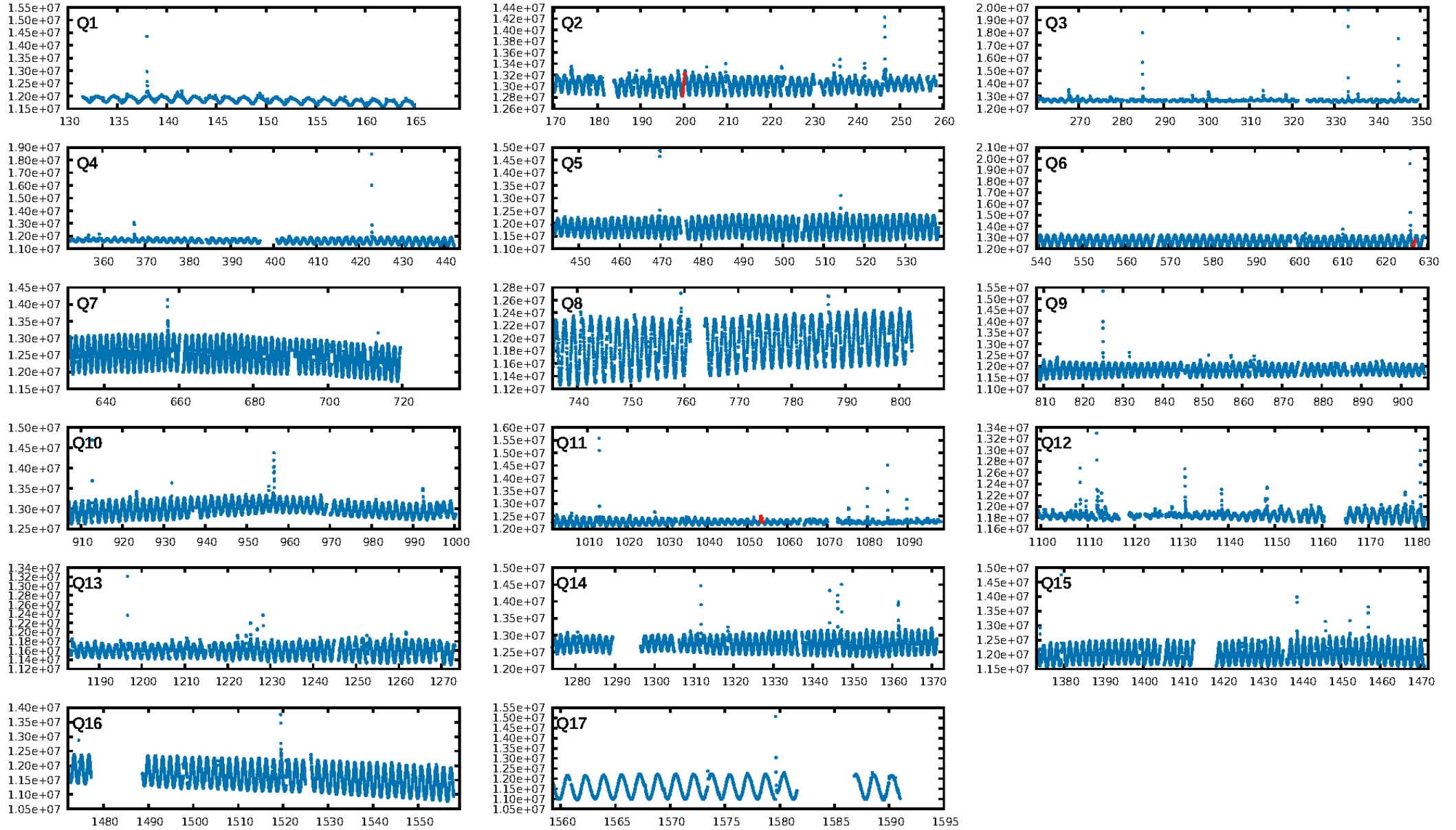
## DV Fit Results:

Period = 426.80258 [0.16981] d  
Epoch = 199.9498 [0.2120] BKJD  
Rp/R\* = 0.0500 [0.0956]  
a/R\* = 253.29 [1241.95]  
b = 0.83 [1.89]  
Seff = 0.04 [0.00]  
Teq = 117 [3] K  
Rp = 2.47 [4.73] Re  
a = 0.8621 [0.0503] AU  
Ag = 106205.62 [406791.08] [0.26σ]  
Teffp = 3272 [3133] K [1.01σ]

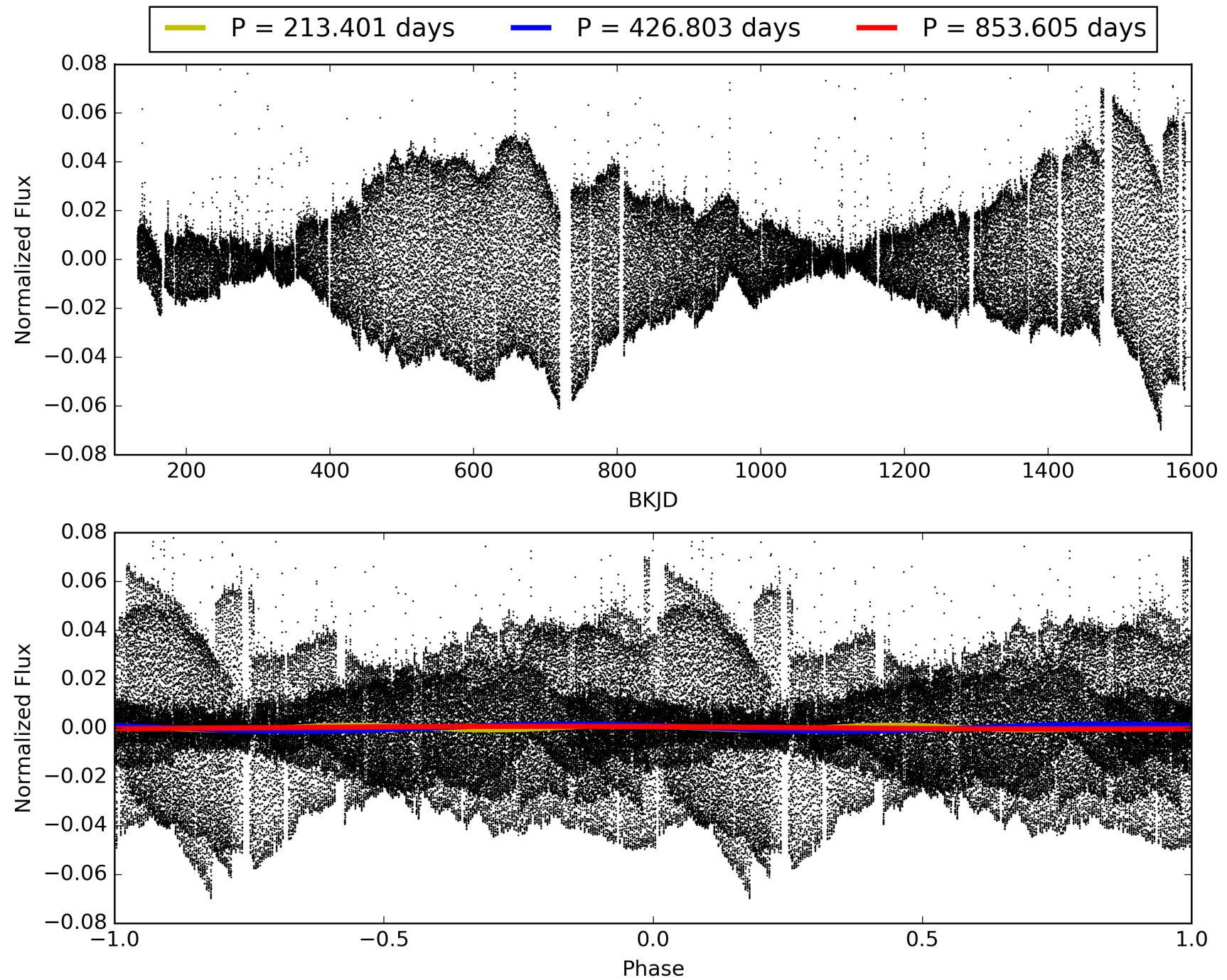
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [34.86σ]  
LongPeriod-sig: 100.0% [39.03σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.9439  
Centroid-sig: 6.6%  
Centroid-so: 1.174 arcsec [1.87σ]  
OotOffset-rm: 0.117 arcsec [0.26σ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-rm: 0.211 arcsec [0.33σ]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [2/2]

# TCE 006949412-07, PDC Light Curves

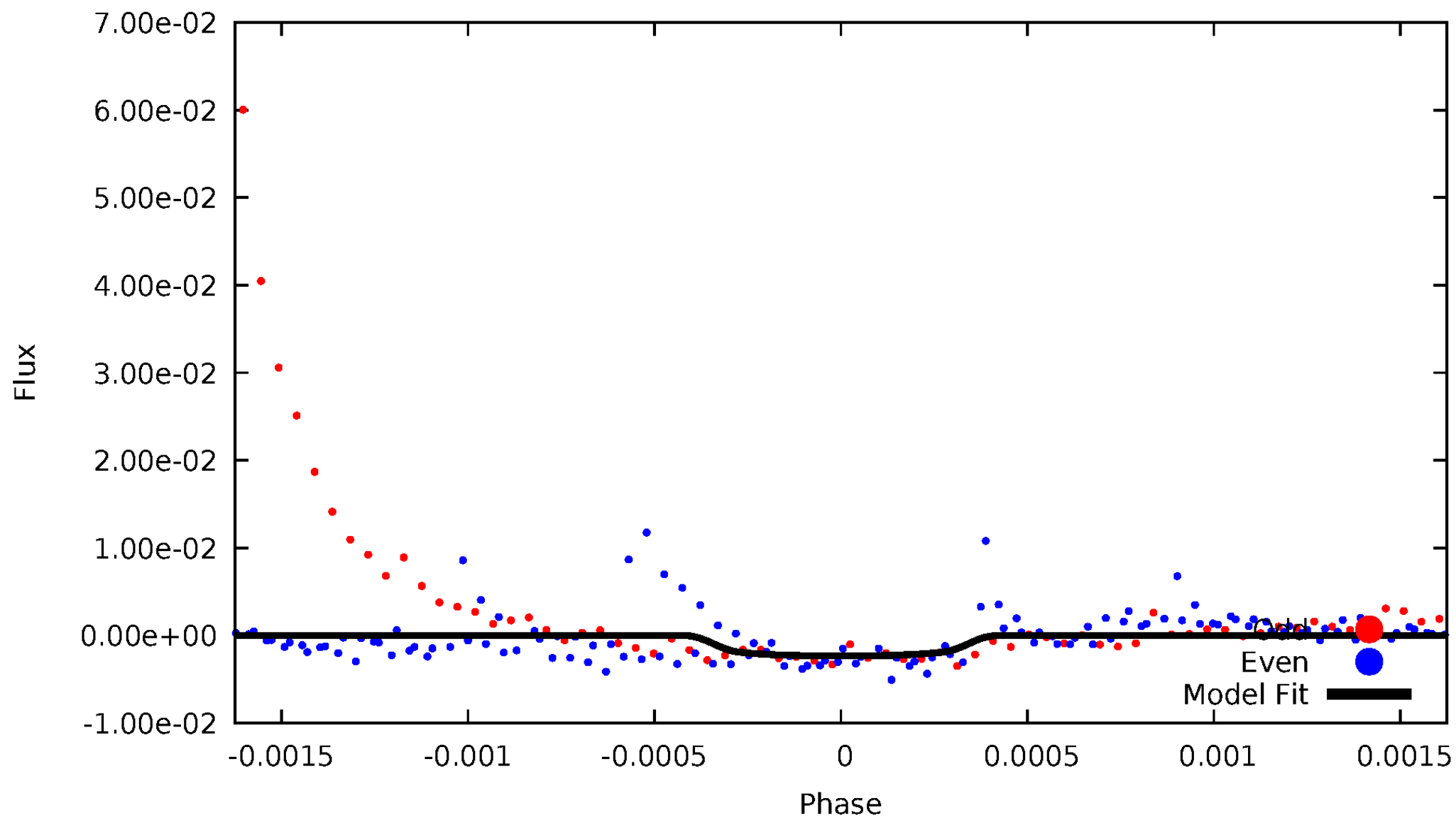


TCE 006949412-07



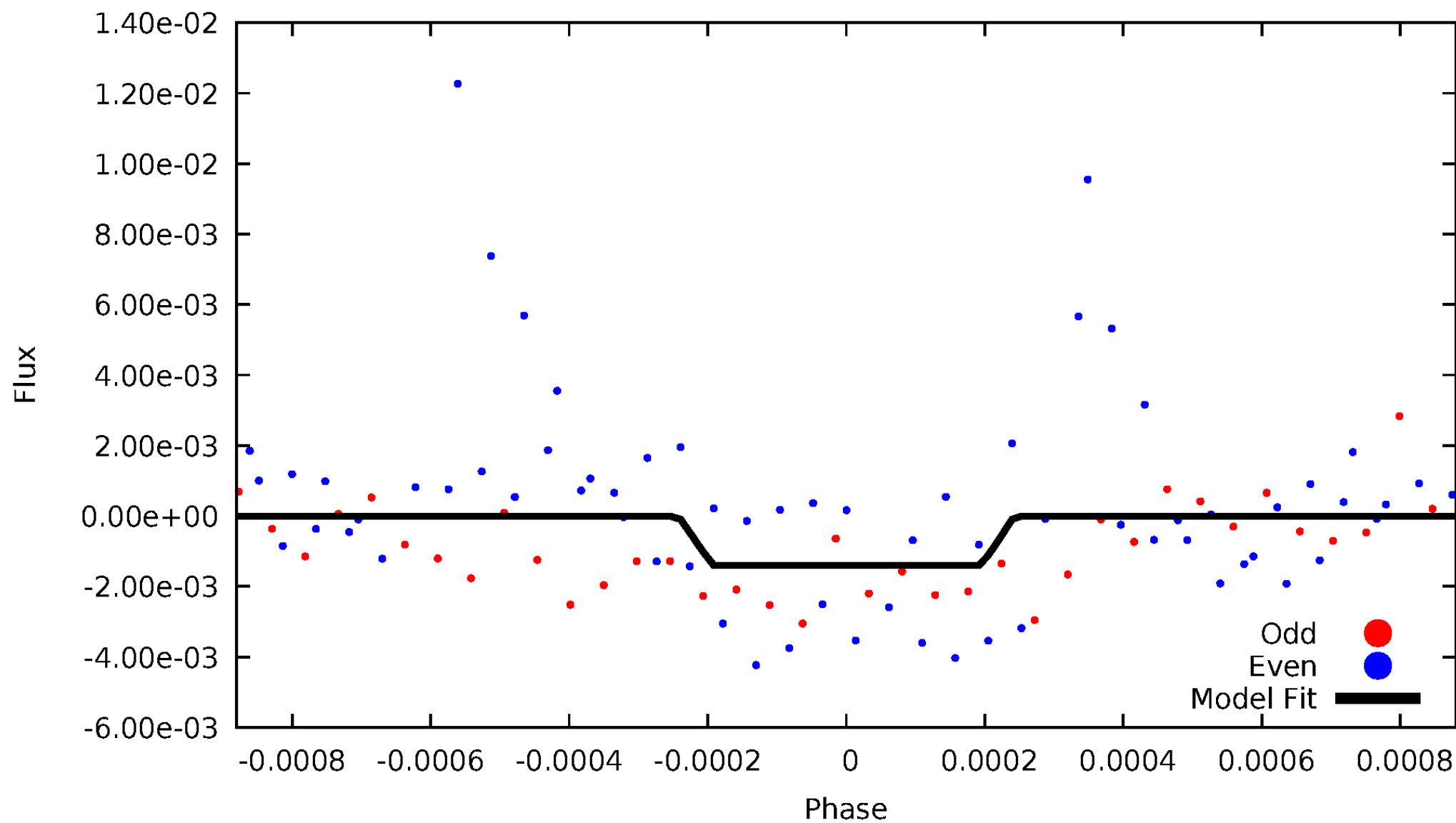
# DV Odd/Even

TCE 006949412-07



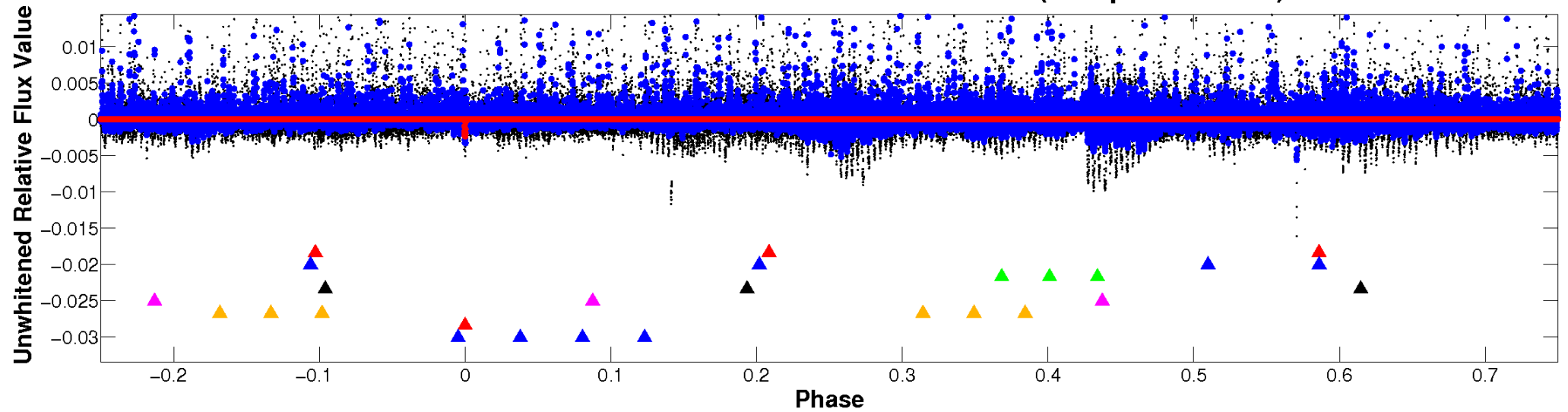
# ALT Odd/Even

TCE 006949412-07

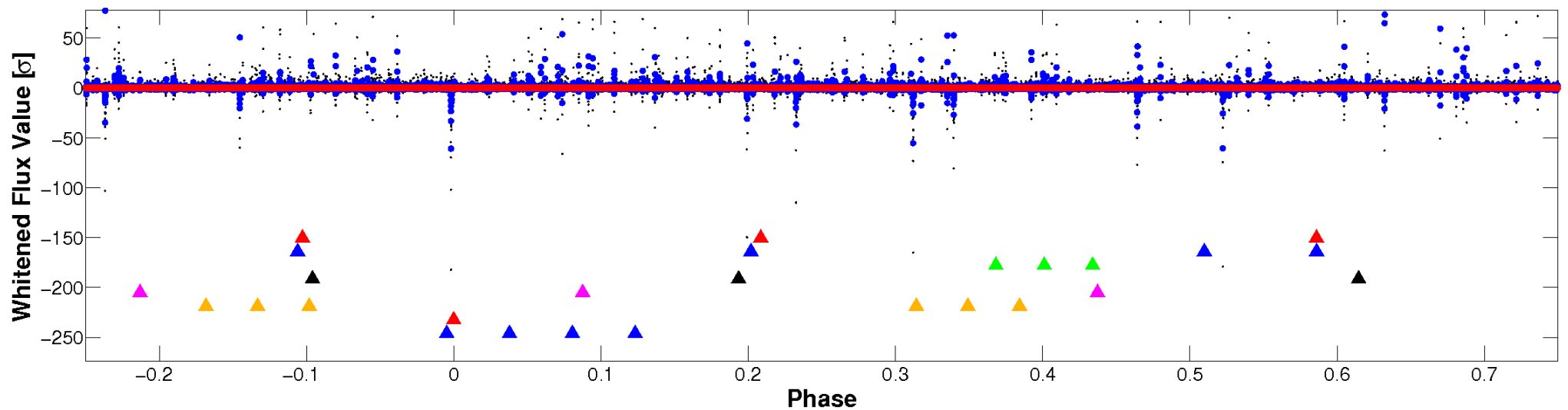


# Non-Whitened Vs. Whitened Light Curve

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

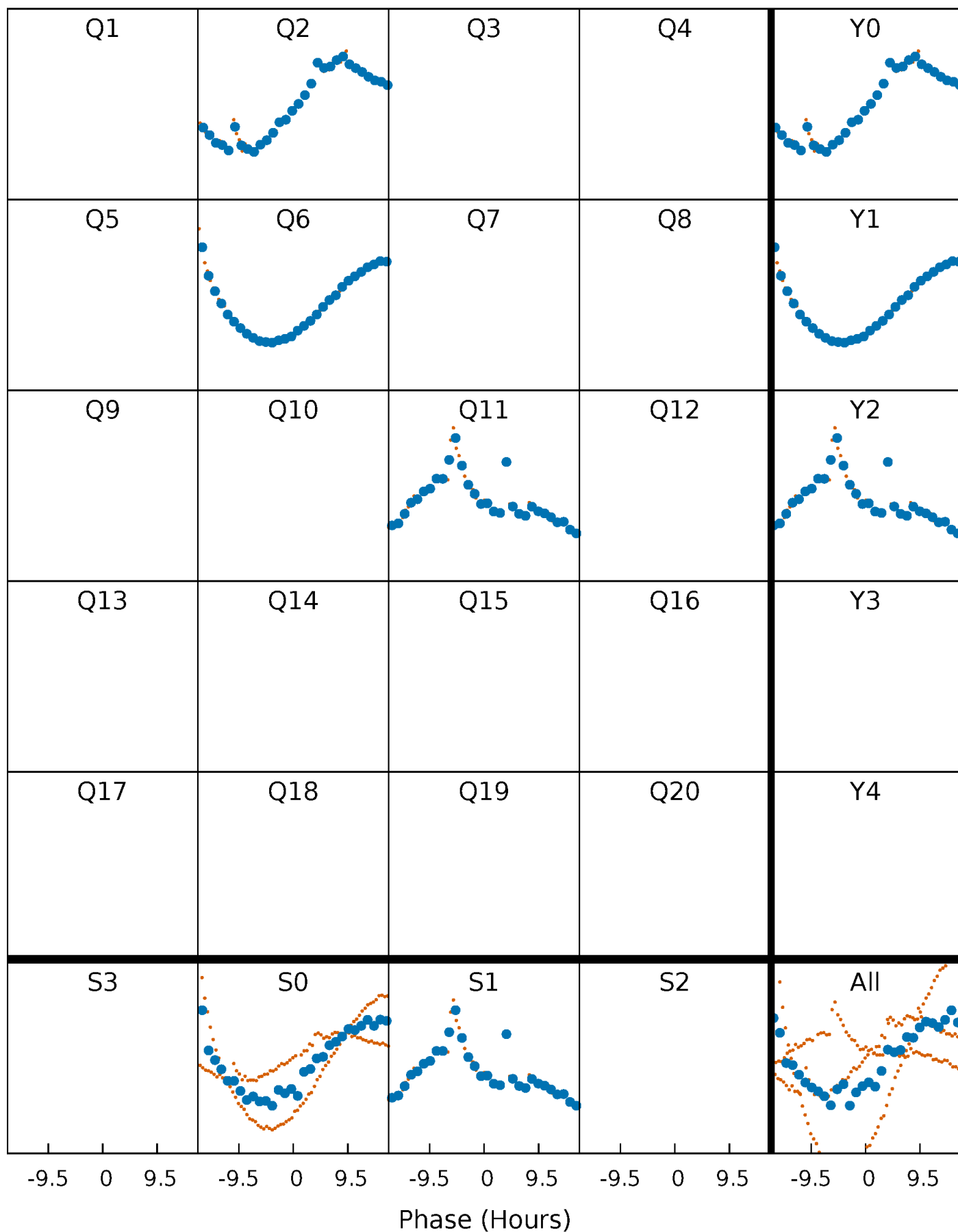


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

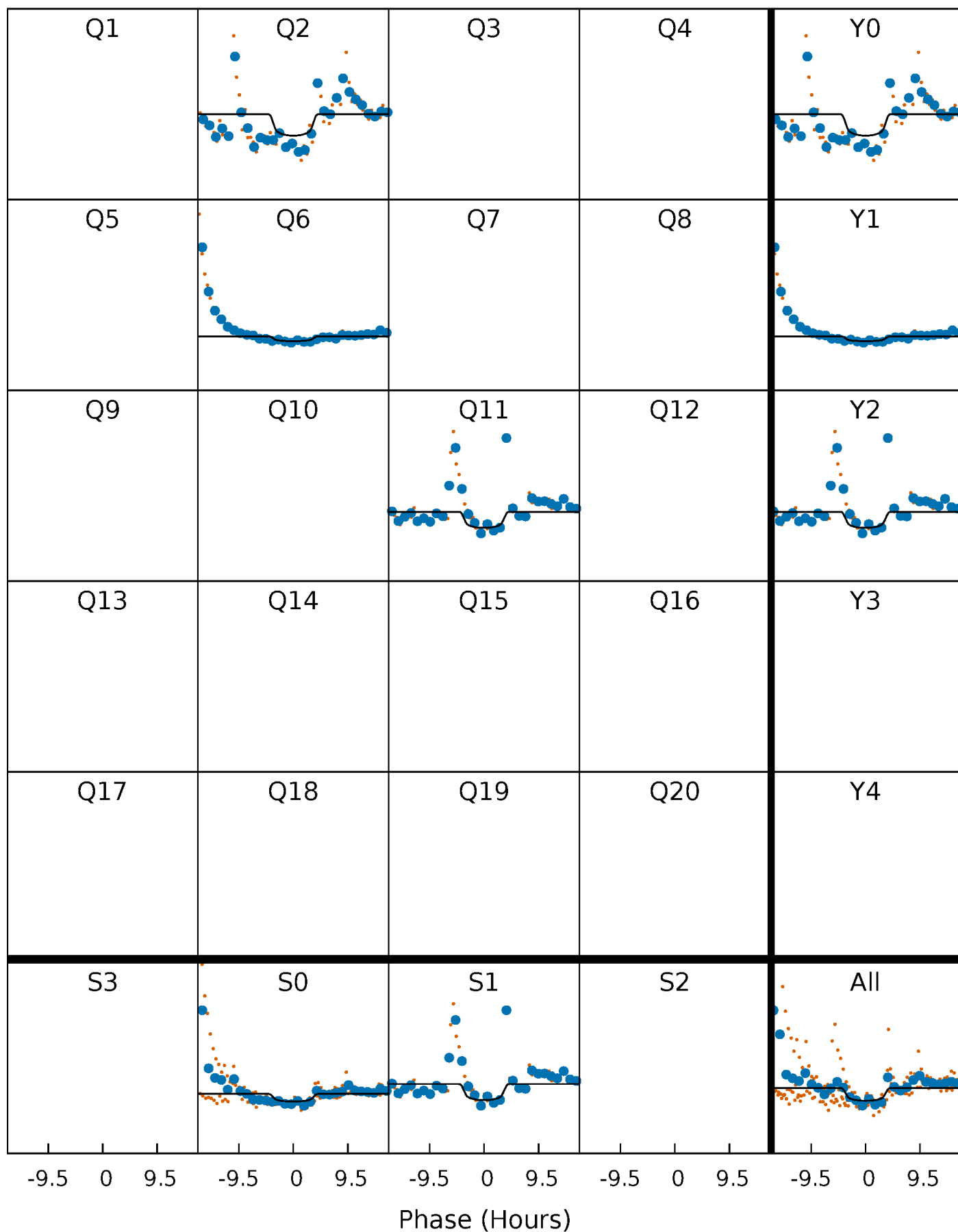
TCE 006949412-07     $P=426.802577$  Days     $T_0=199.949807$  (BKJD)





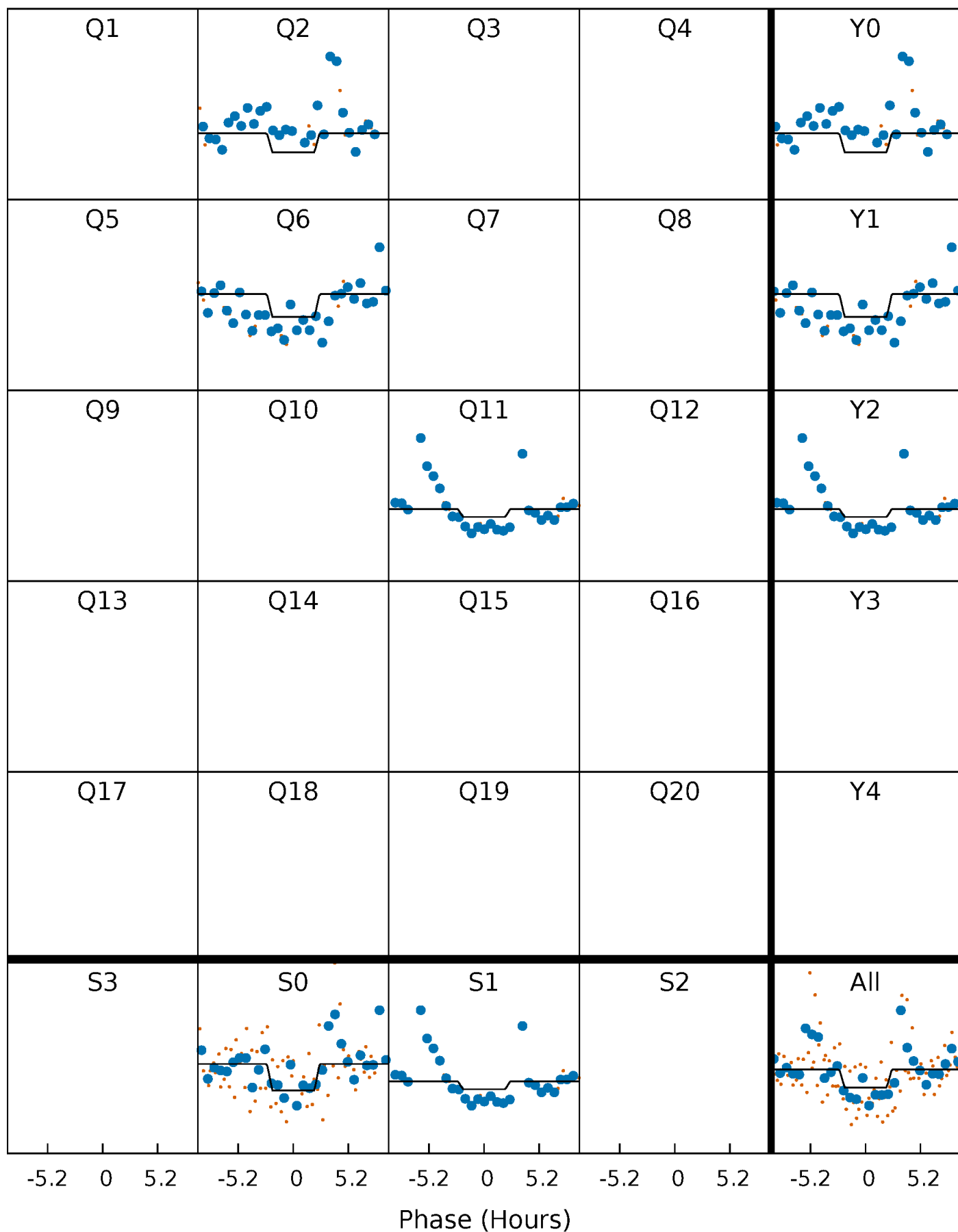
# DV Quarter-Phased Transit Curves

TCE 006949412-07     $P=426.802577$  Days     $T_0=199.949807$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

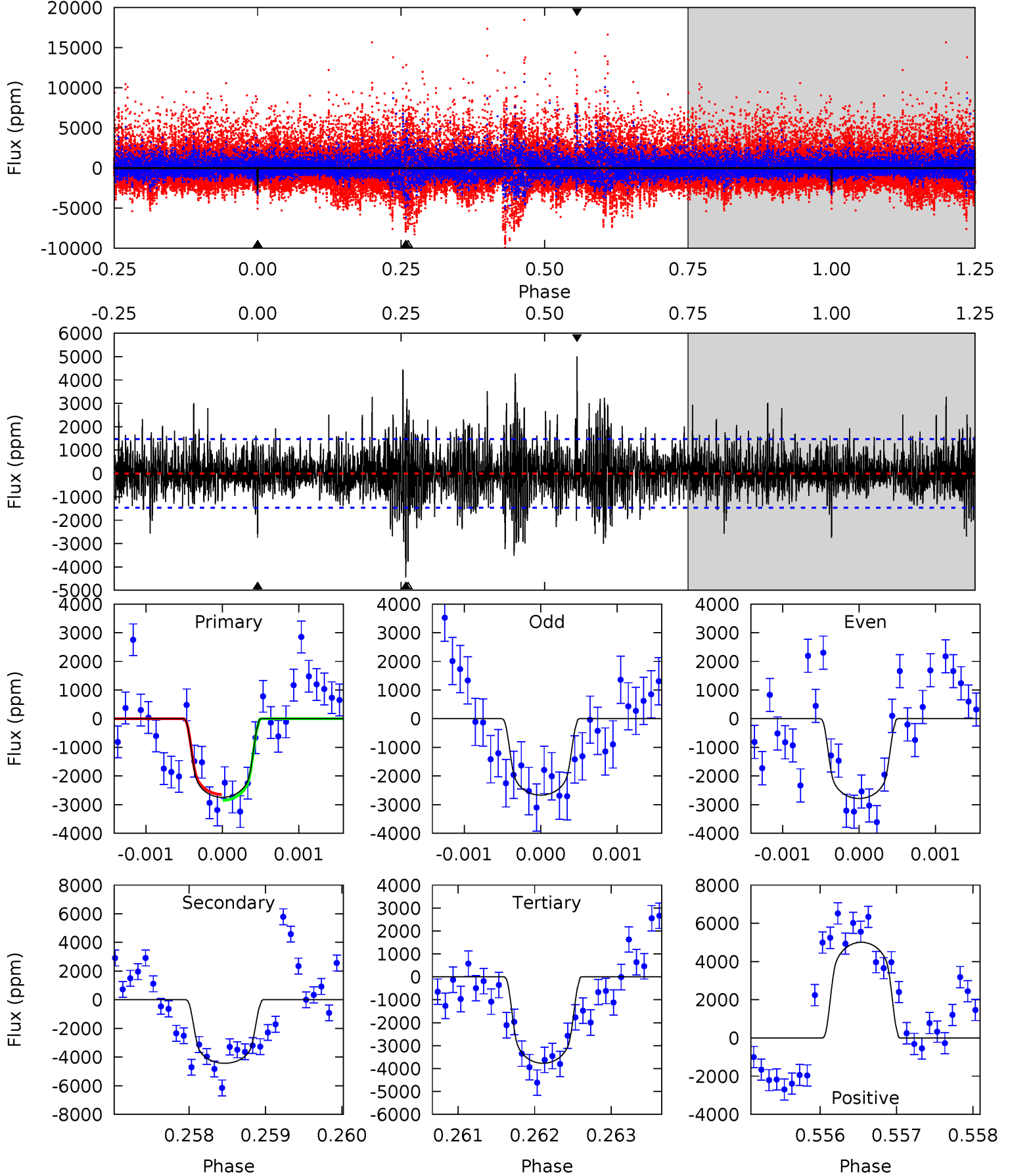
TCE 006949412-07     $P=426.802579$  Days     $T_0=199.966852$  (BKJD)



# DV Model-Shift Uniqueness Test

006949412-07, P = 426.802577 Days, E = 199.949807 Days

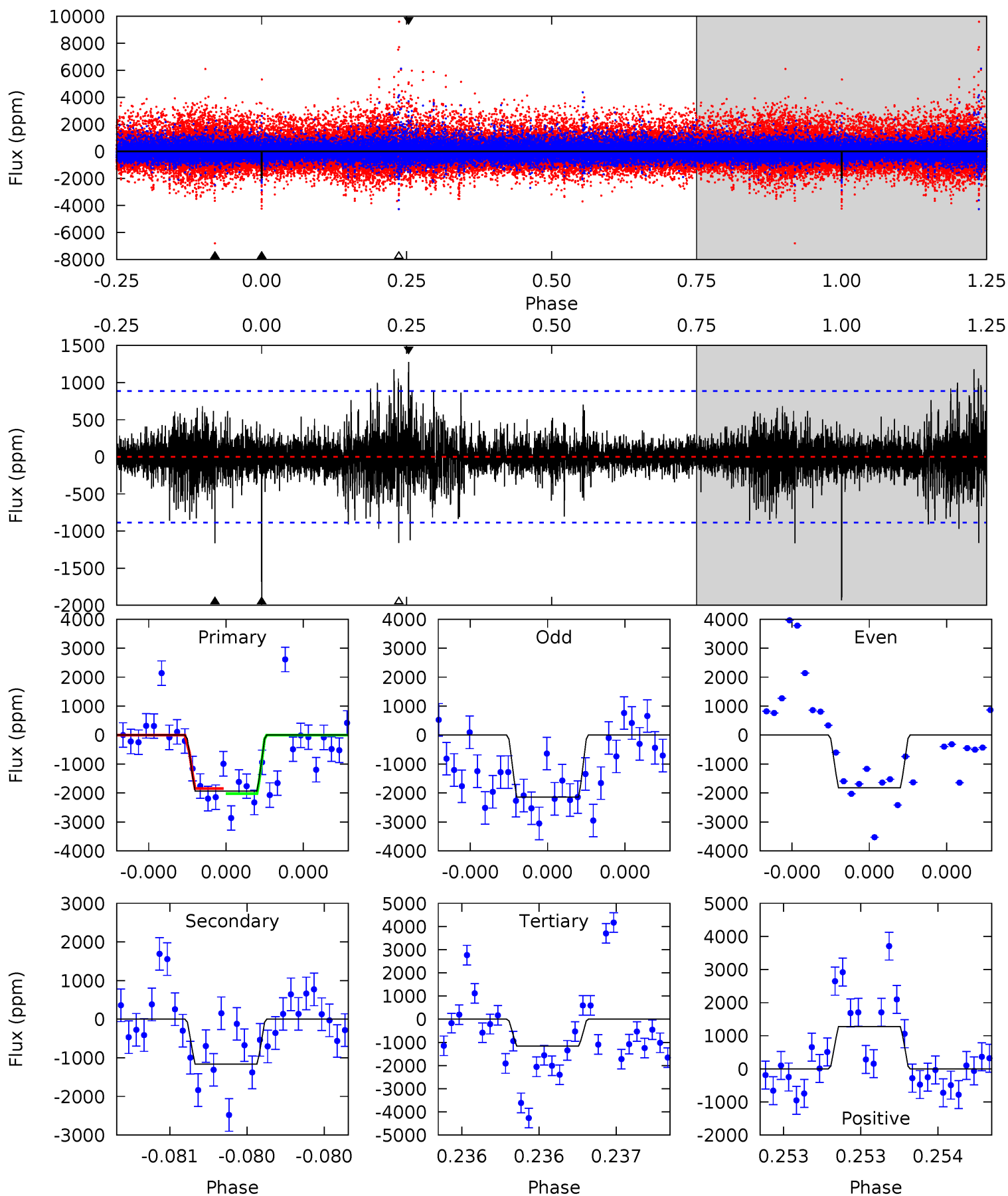
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	16.6	14.1	18.7	5.48	3.34	3.24	-3.83	-8.44	2.47	-2.14	0.10	1.03	0.53	0.39



# Alt Model-Shift Uniqueness Test

006949412-07, P = 426.802579 Days, E = 199.966852 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
12.2	7.32	7.30	8.04	5.58	3.49	1.21	4.86	4.12	0.02	-0.72	0.92	0.87	0.40	0.57



### Stellar Parameters For KIC 006949412

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3666^{+49}_{-54}$	$4.797^{+0.039}_{-0.028}$	$-0.100^{+0.100}_{-0.100}$	$0.453^{+0.028}_{-0.034}$	$0.468^{+0.026}_{-0.033}$	$7.099^{+1.282}_{-0.744}$
	+1%/-1%	+1%/-1%	+100%/-100%	+6%/-8%	+6%/-7%	+18%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 006949412-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-4433 \pm 268$	$4.12^{+3.76}_{-2.77}$	$164^{+3}_{-3}$	$3424^{+1711}_{-595}$	$110440^{+922712}_{-81508}$
Alt.	$-1162 \pm 159$	$3.91^{+3.99}_{-2.66}$	$163^{+3}_{-3}$	$2862^{+1182}_{-477}$	$31102^{+272740}_{-23818}$

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

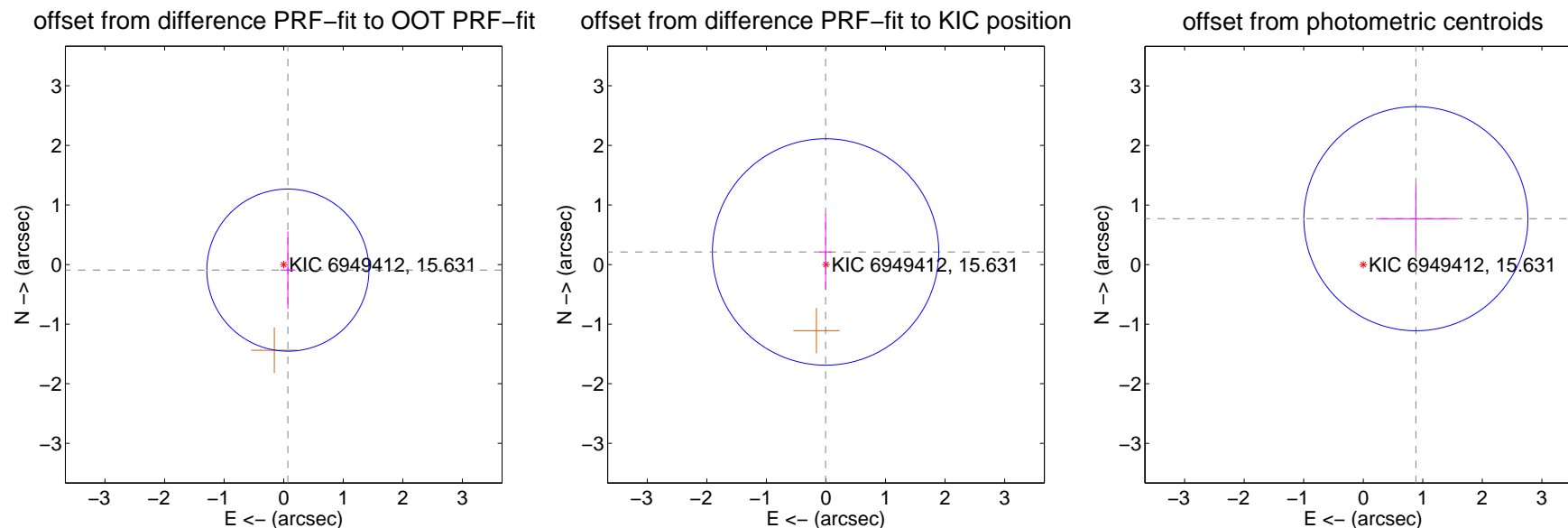
## DV Centroid Data

Supplemental centroid analysis for 006949412-07. Kepler magnitude: 15.63. Transit SNR 5.41

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.117 \pm 0.454$	0.26	$-0.071 \pm 0.128$	$-0.094 \pm 0.648$
PRF-fit source offset from KIC position	$0.211 \pm 0.633$	0.33	$0.007 \pm 0.099$	$0.211 \pm 0.636$
photometric centroid source offset	$1.17 \pm 0.63$	1.87	$-0.88 \pm 0.67$	$0.77 \pm 0.57$



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.

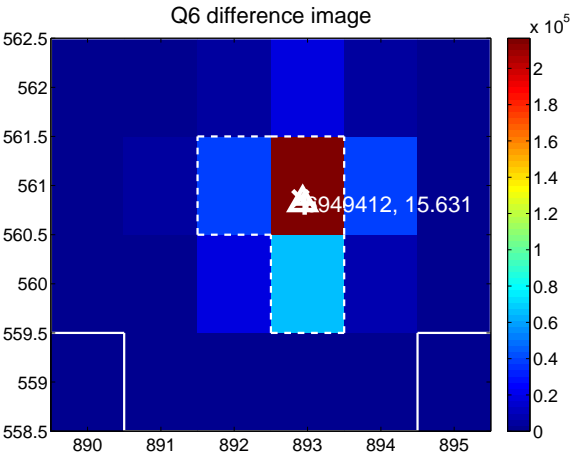
Q5 no difference image



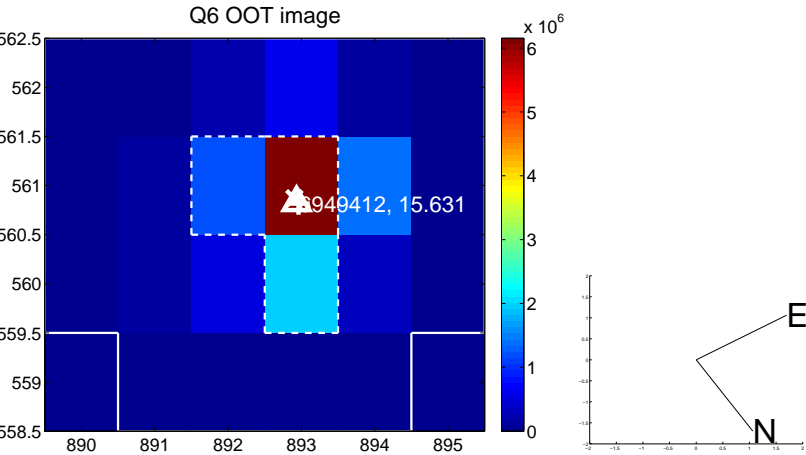
Q5 no OOT image



Q6 difference image



Q6 OOT image



Q7 no difference image



Q7 no OOT image



Q8 no difference image

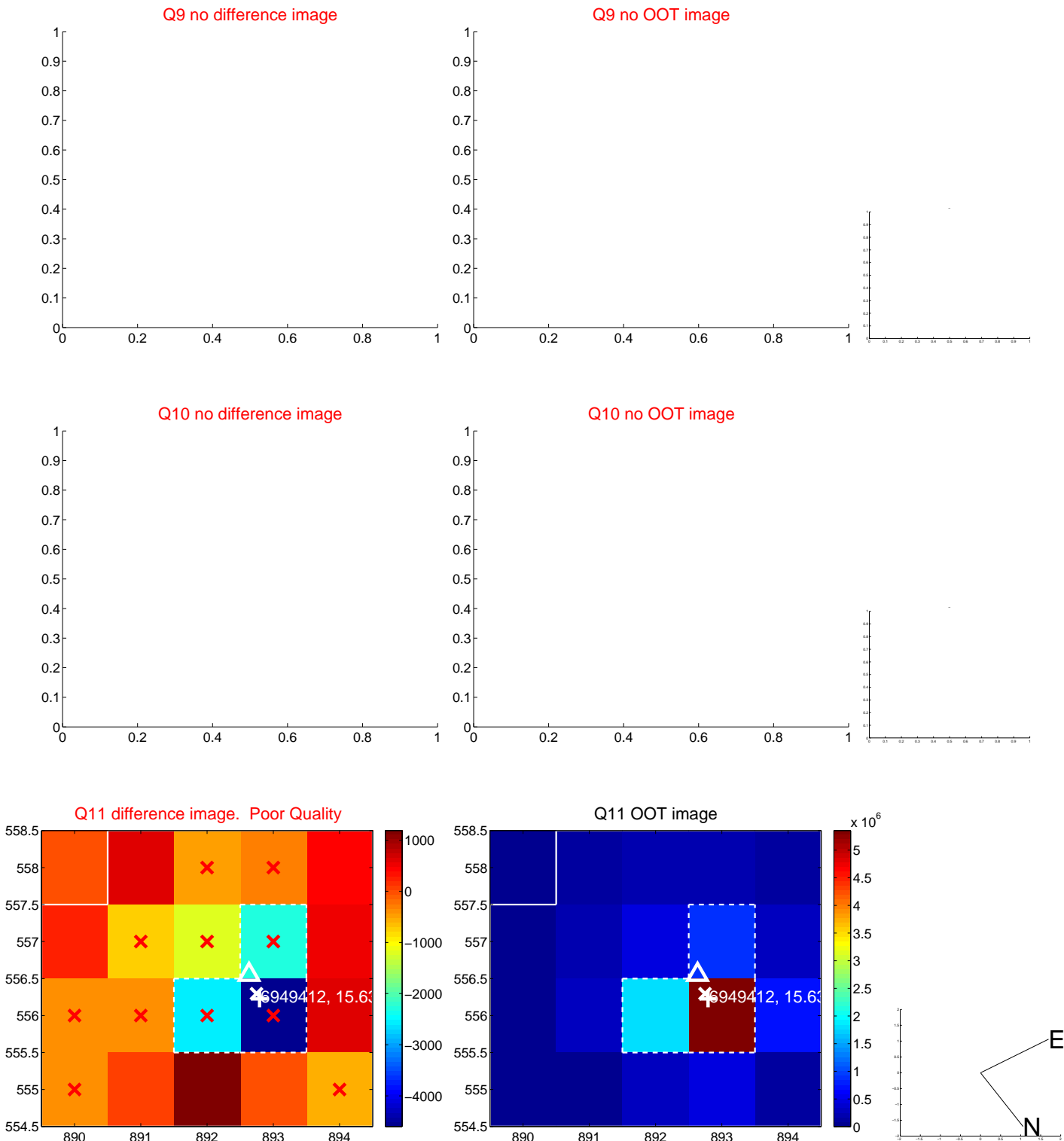


Q8 no OOT image





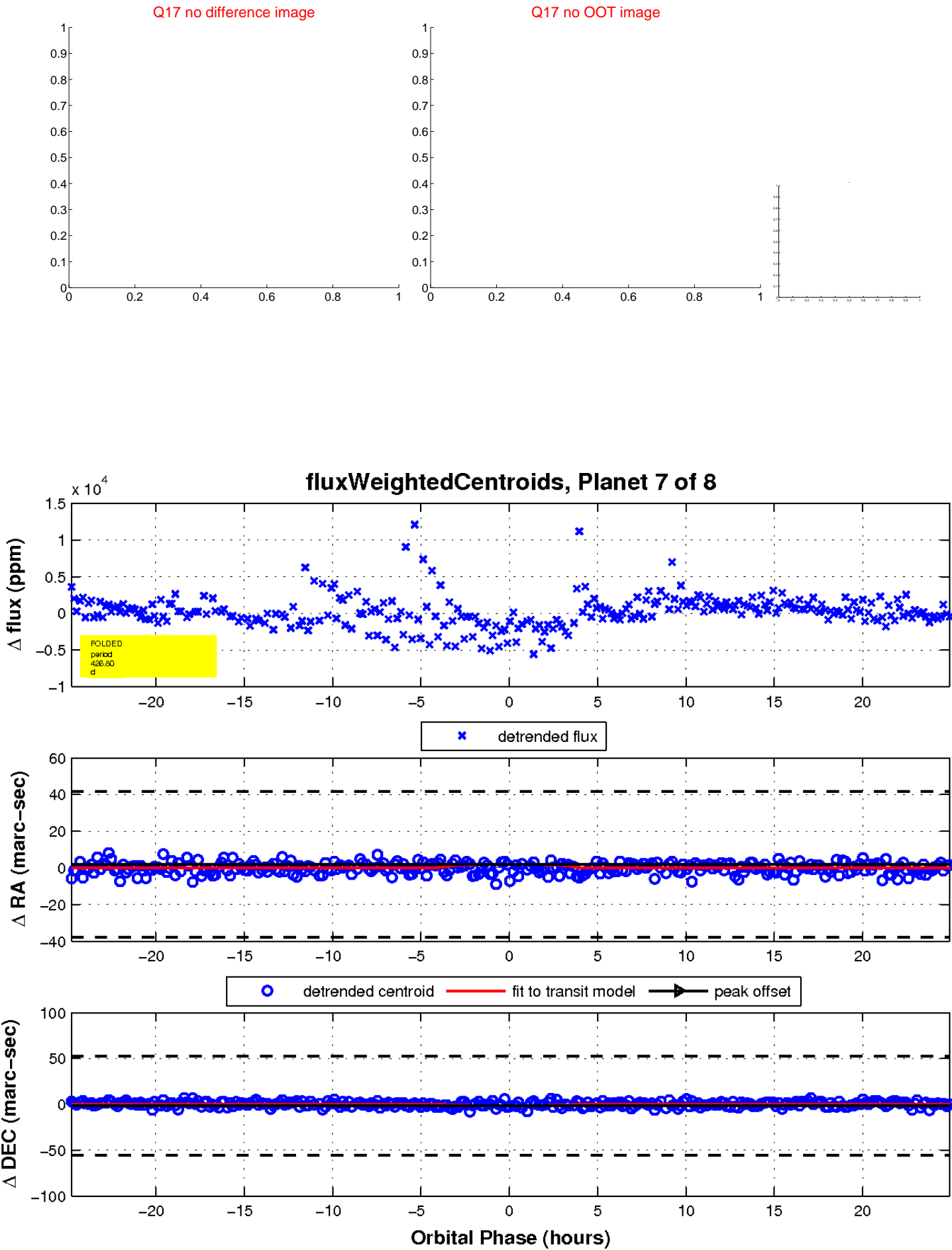
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

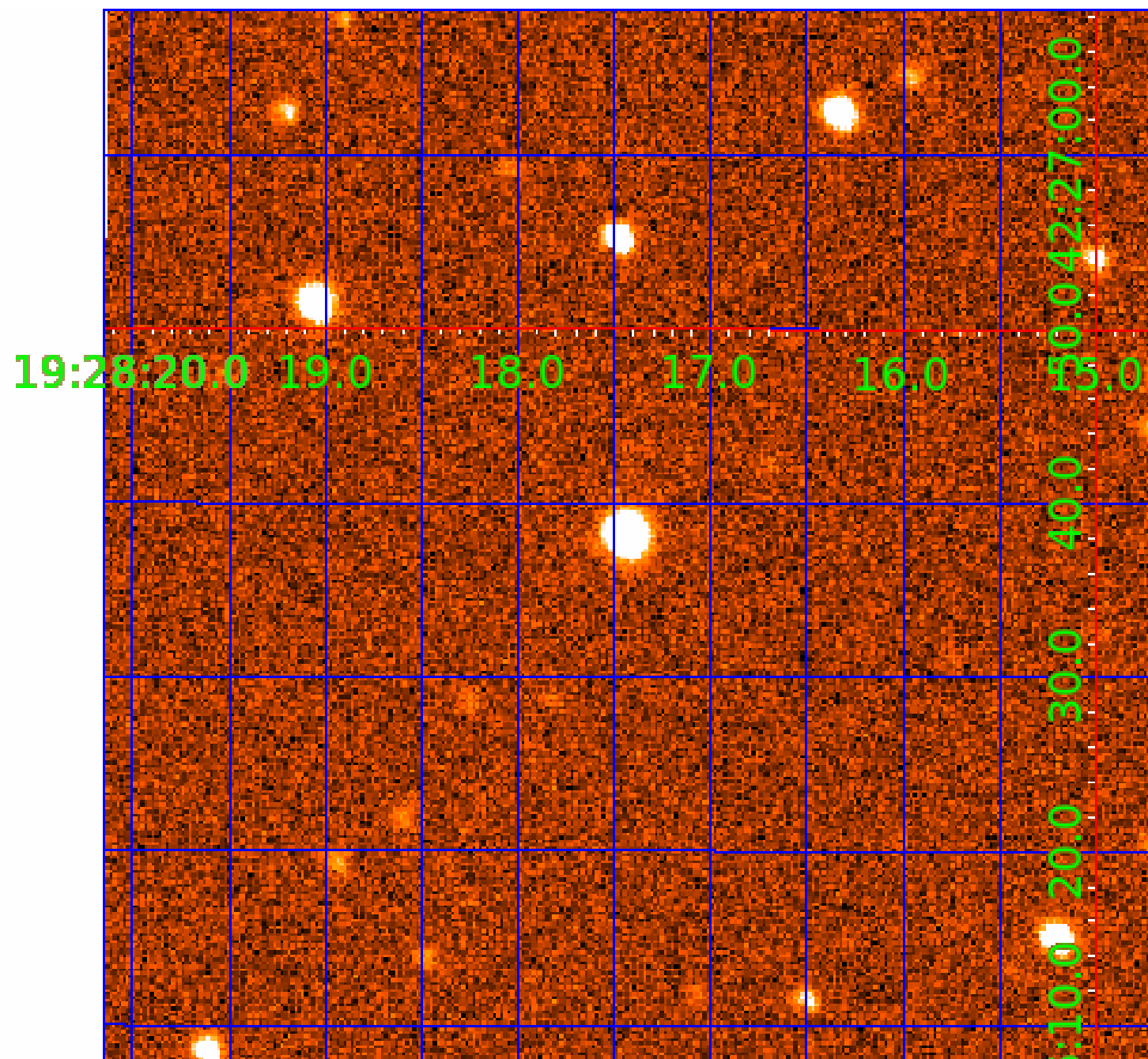


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006949412

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006949412-01	OBS	No	559.656830	450.057158	3684.1	2.438	15.6	8.2	0.45	3666	2.75	0.03
006949412-04	OBS	No	550.337297	462.272378	5184.8	5.654	12.9	8.5	0.45	3666	4.79	0.03
006949412-05	OBS	No	576.042798	237.334759	3368.9	3.131	14.8	7.2	0.45	3666	2.67	0.03
006949412-06	OBS	No	220.881063	334.052170	2996.4	3.148	12.4	10.3	0.45	3666	2.54	0.11
006949412-07	OBS	No	426.802577	199.949807	2354.7	8.319	10.5	5.4	0.45	3666	2.47	0.04
006949412-08	OBS	No	445.015692	197.906441	1497.3	7.500	11.4	-1.0	0.45	3666	1.74	0.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006949412-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
006949412-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
006949412-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006949412-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

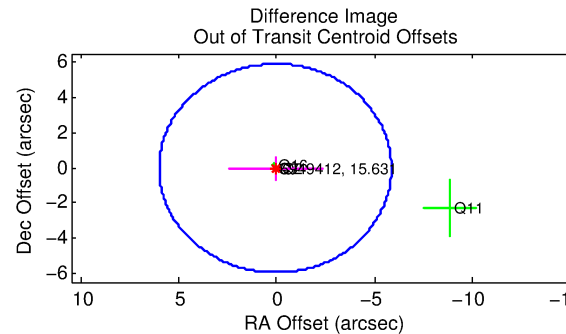
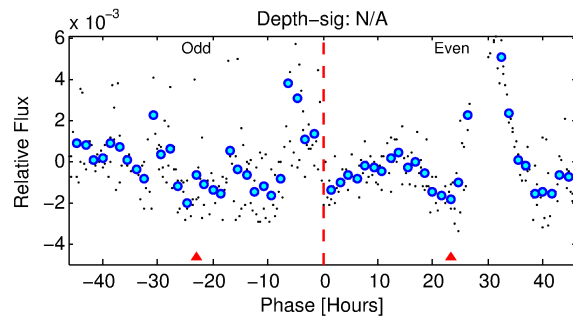
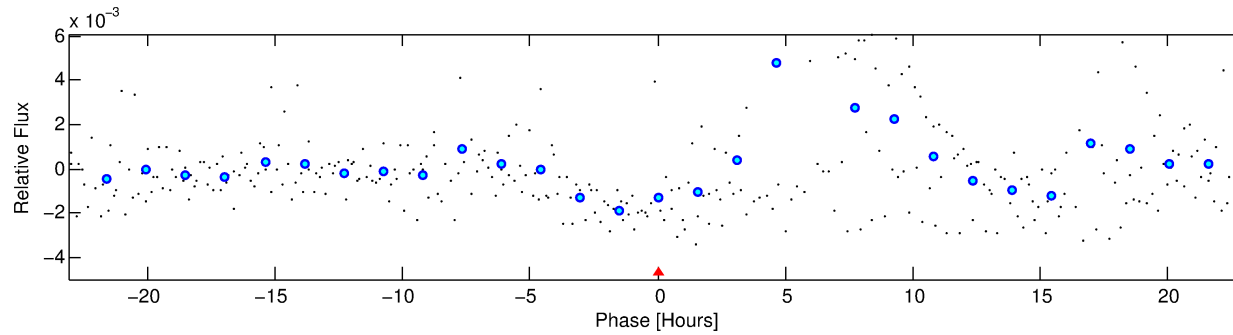
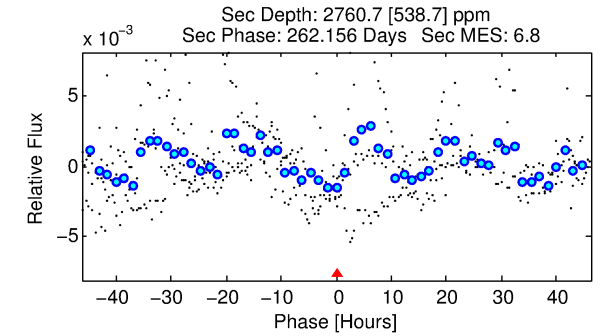
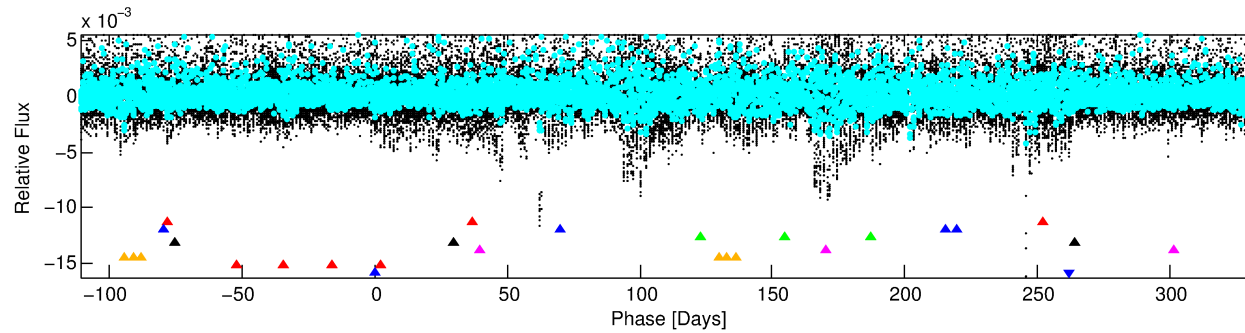
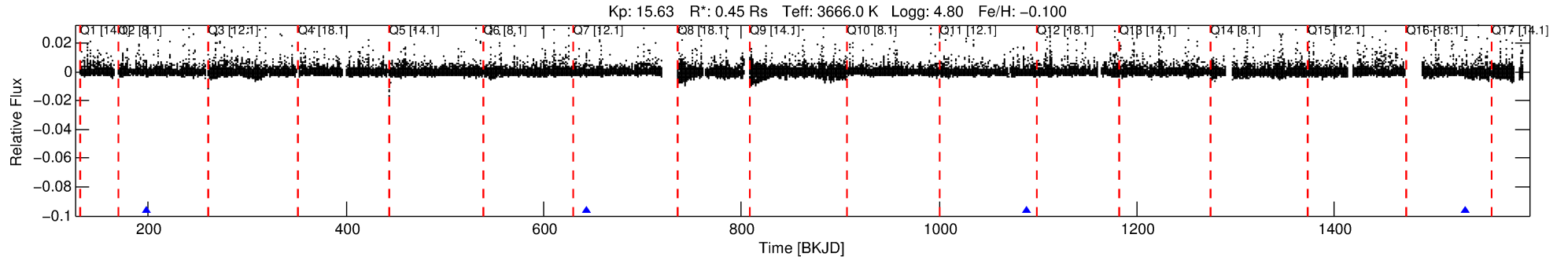
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006949412-08

No Significant Match Found

# DV One-Page Summary

KIC: 6949412 Candidate: 8 of 8 Period: 445.016 d



## TPS TCE Results:

Period = 445.01569 d  
Epoch = 197.9064 BKJD

DV fit results are unavailable

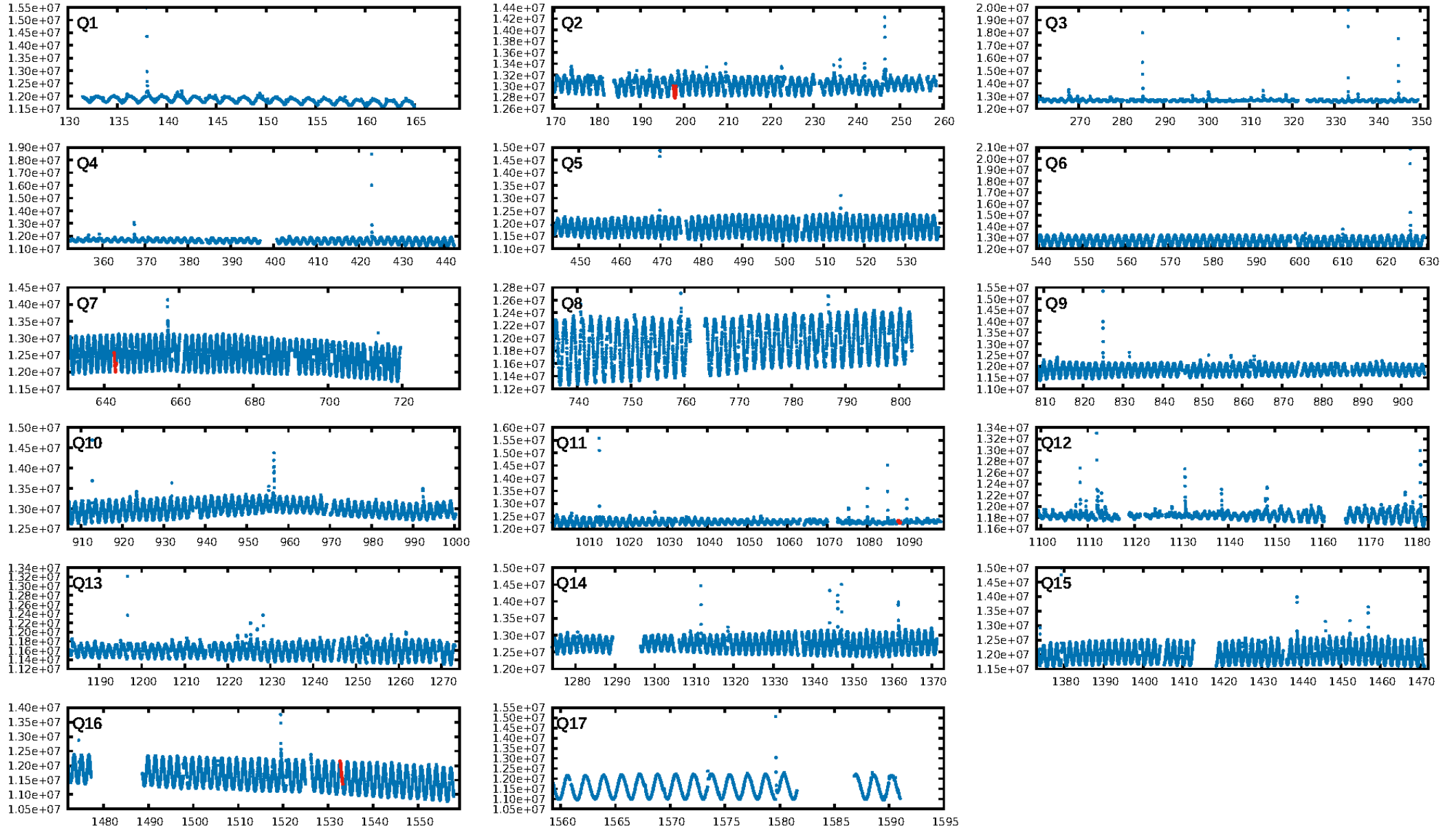
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [39.03σ]  
LongPeriod-sig: 100.0% [269.13σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 2.195  
Centroid-sig: 90.9%  
Centroid-so: 0.275 arcsec [1.41σ]  
OotOffset-rm: 0.075 arcsec [0.04σ]  
KicOffset-rm: 0.271 arcsec [0.39σ]  
OotOffset-st: 1/2/1/0 [4]  
KicOffset-st: 1/2/1/0 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 1.00 [4/4]

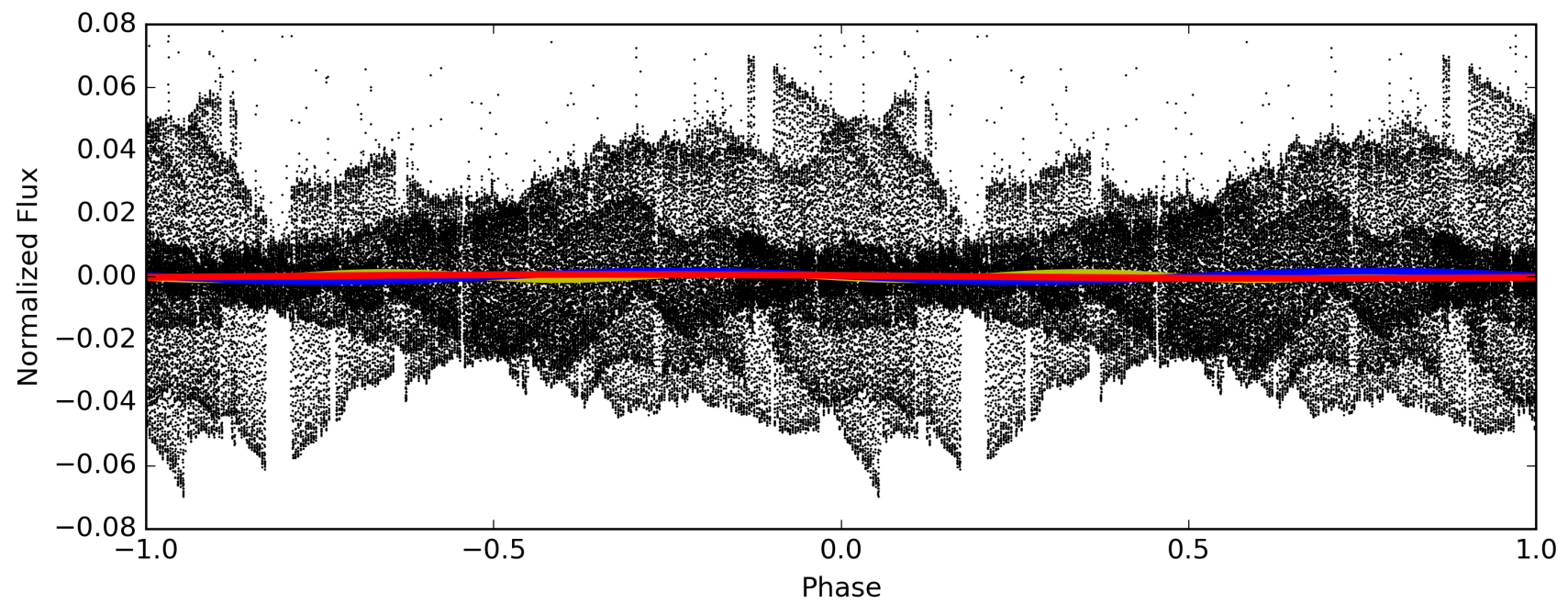
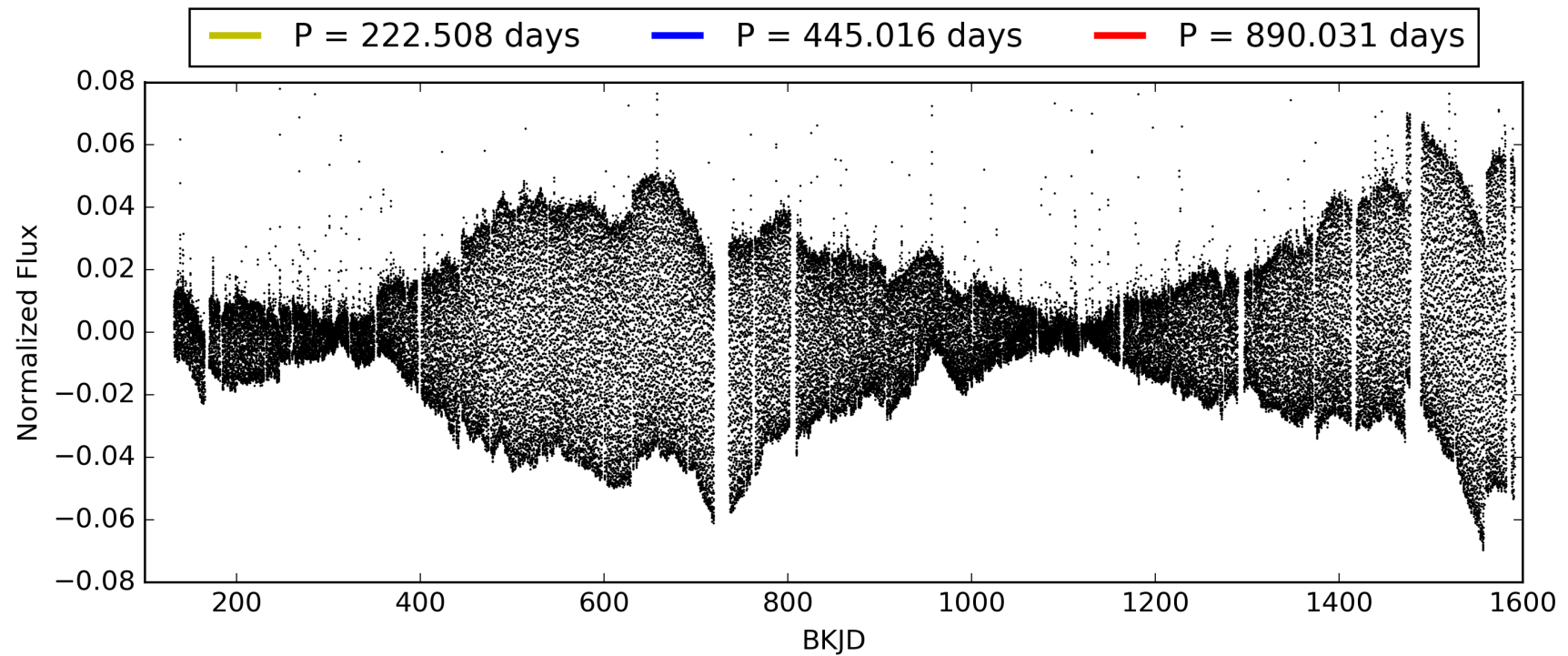
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:11:12 Z

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

# TCE 006949412-08, PDC Light Curves



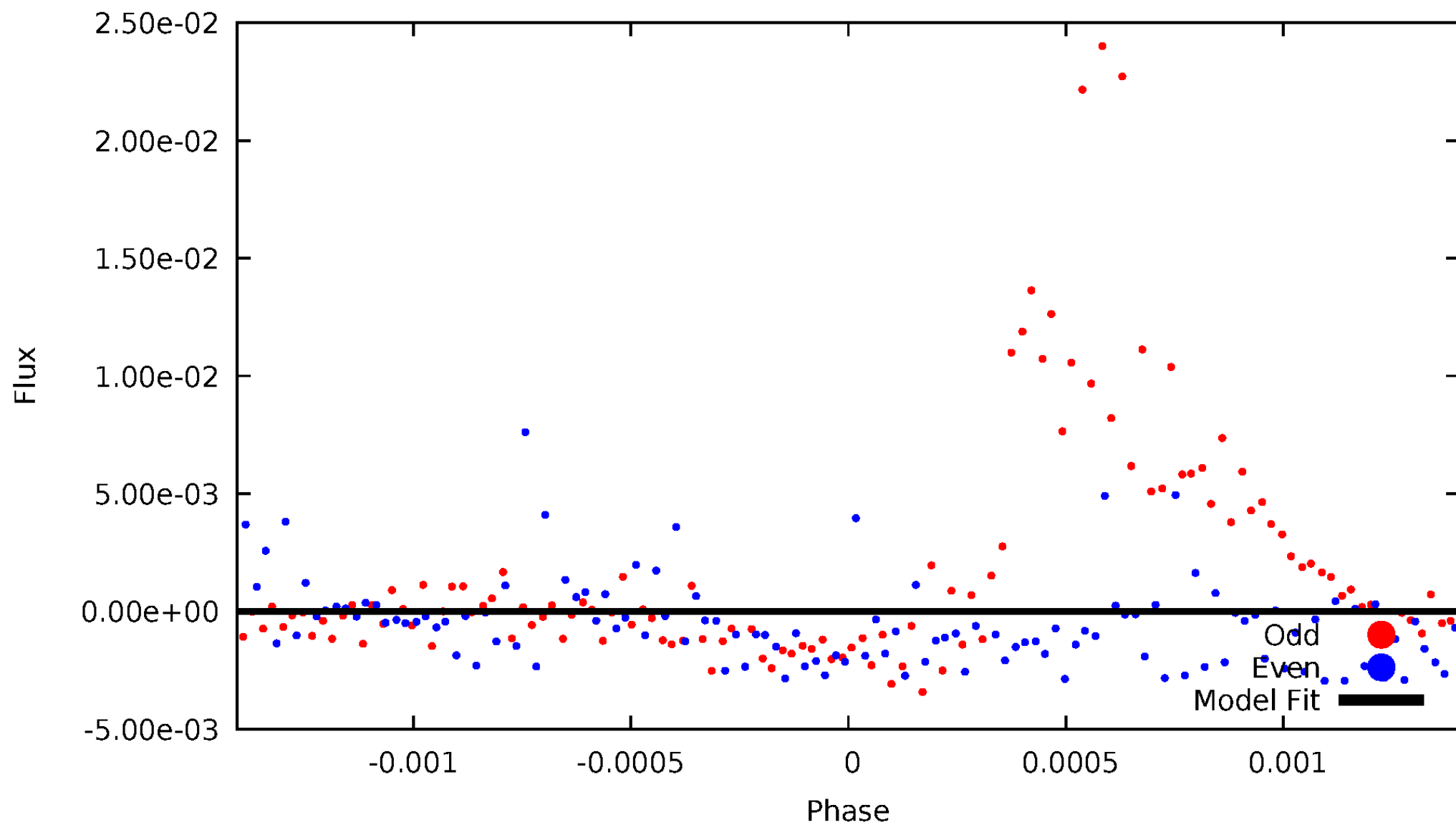
TCE 006949412-08





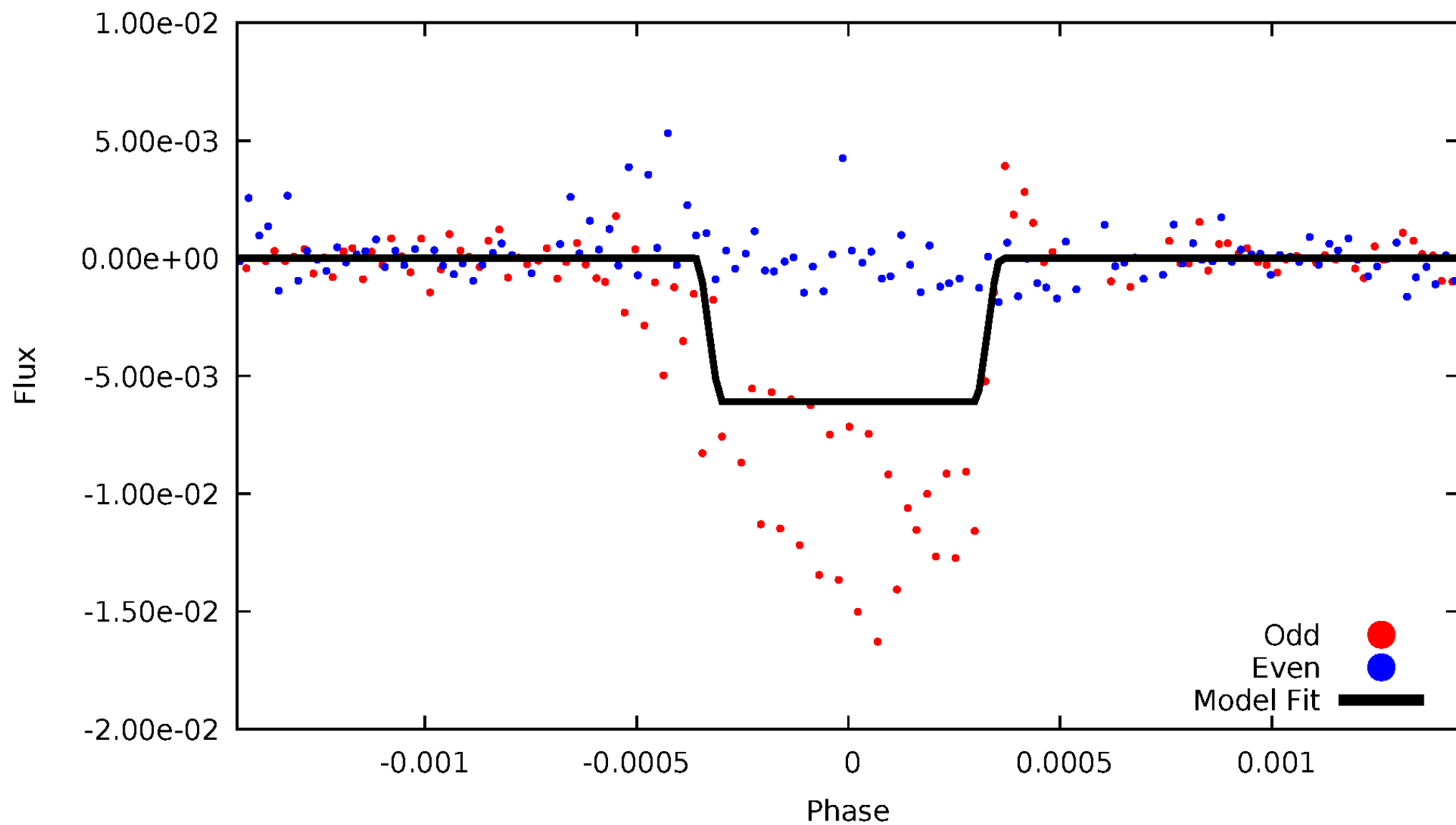
# DV Odd/Even

TCE 006949412-08



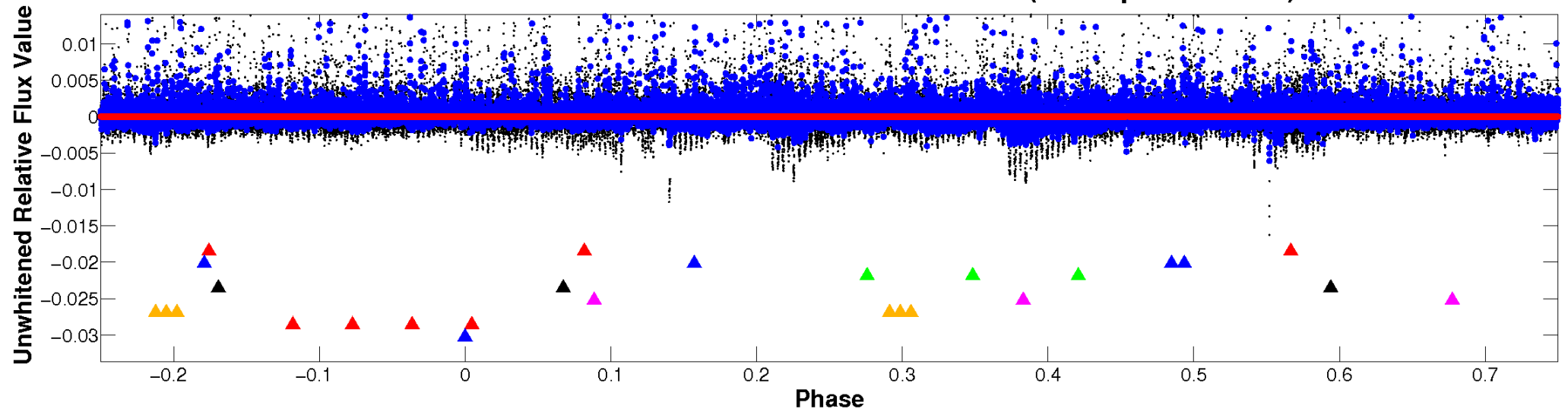
# ALT Odd/Even

TCE 006949412-08



# Non-Whitened Vs. Whitened Light Curve

**Planet 8 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

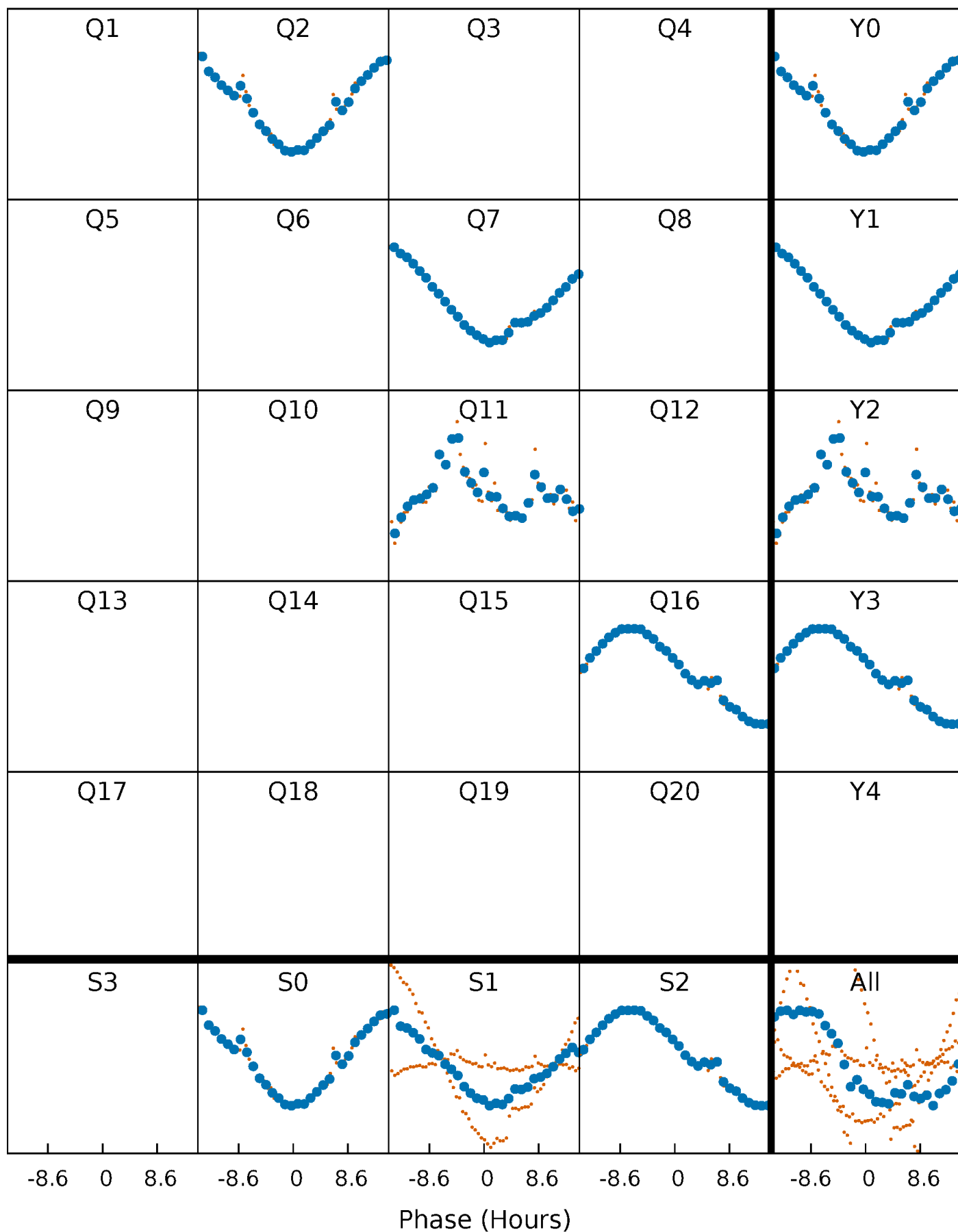


**Planet 8 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



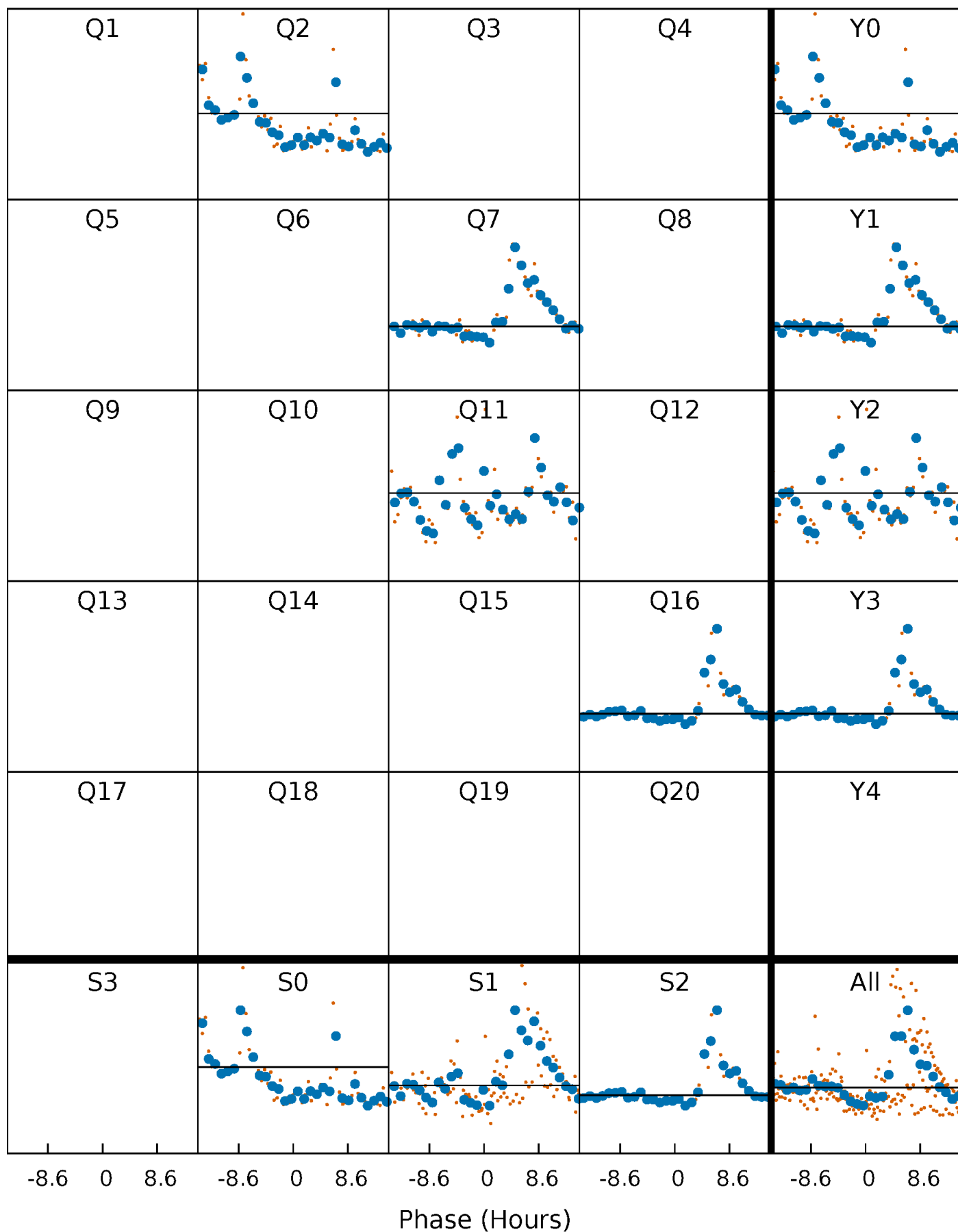
# PDC Quarter-Phased Transit Curves

TCE 006949412-08 P=445.015692 Days  $T_0=197.906441$  (BKJD)



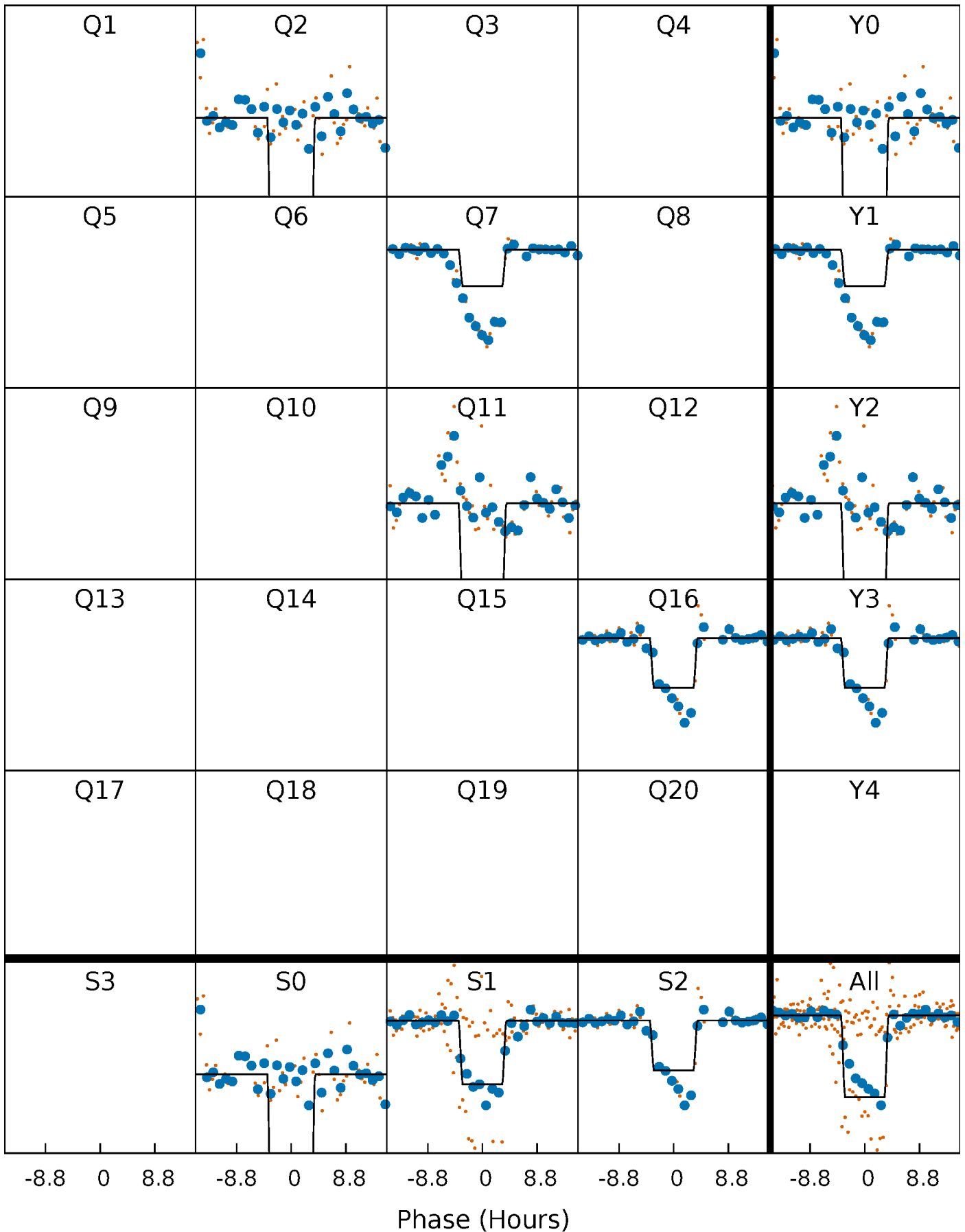
# DV Quarter-Phased Transit Curves

TCE 006949412-08     $P=445.015692$  Days     $T_0=197.906441$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

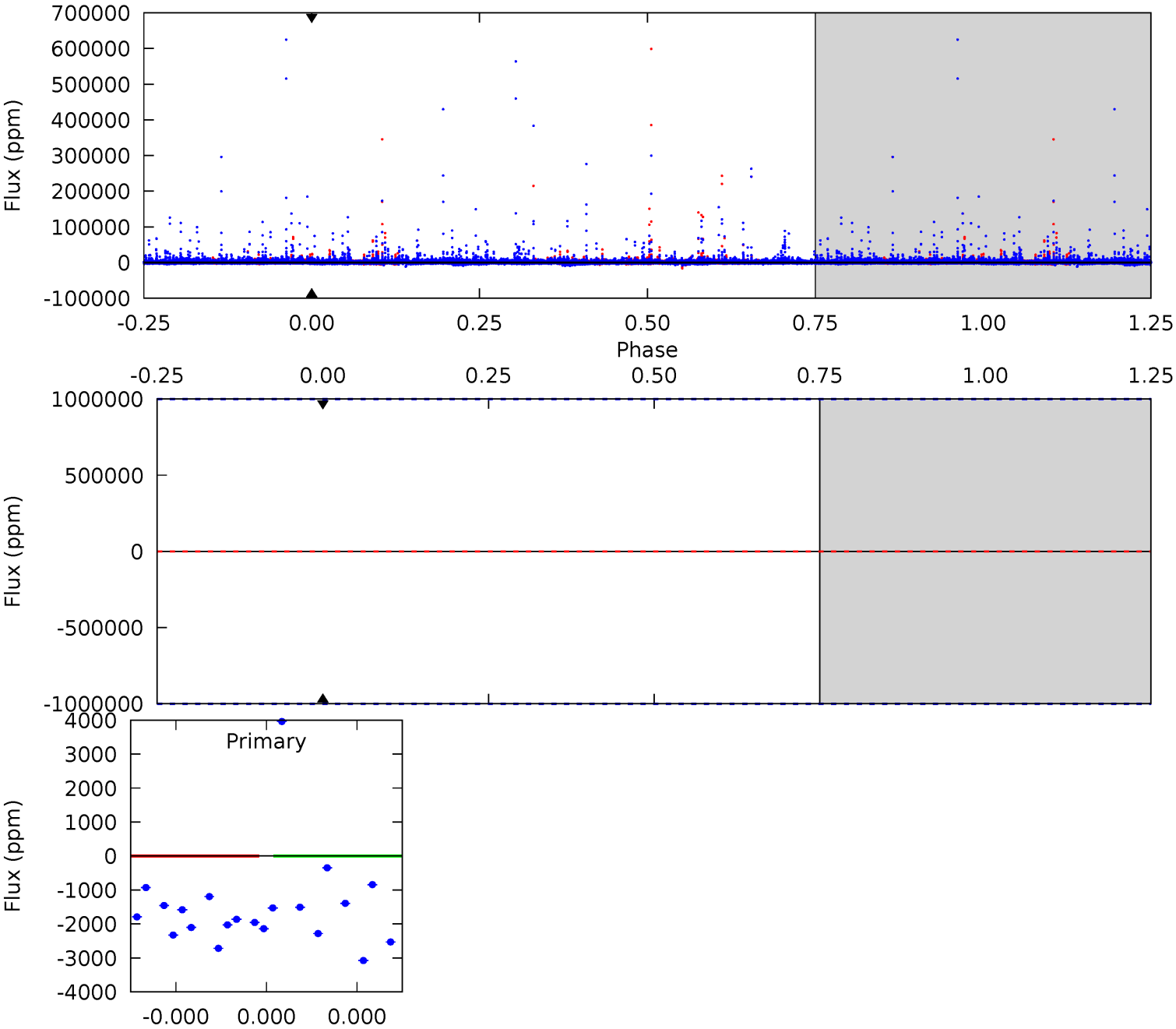
TCE 006949412-08     $P=445.015692$  Days     $T_0=197.919934$  (BKJD)



# DV Model-Shift Uniqueness Test

006949412-08, P = 445.015692 Days, E = 197.906441 Days

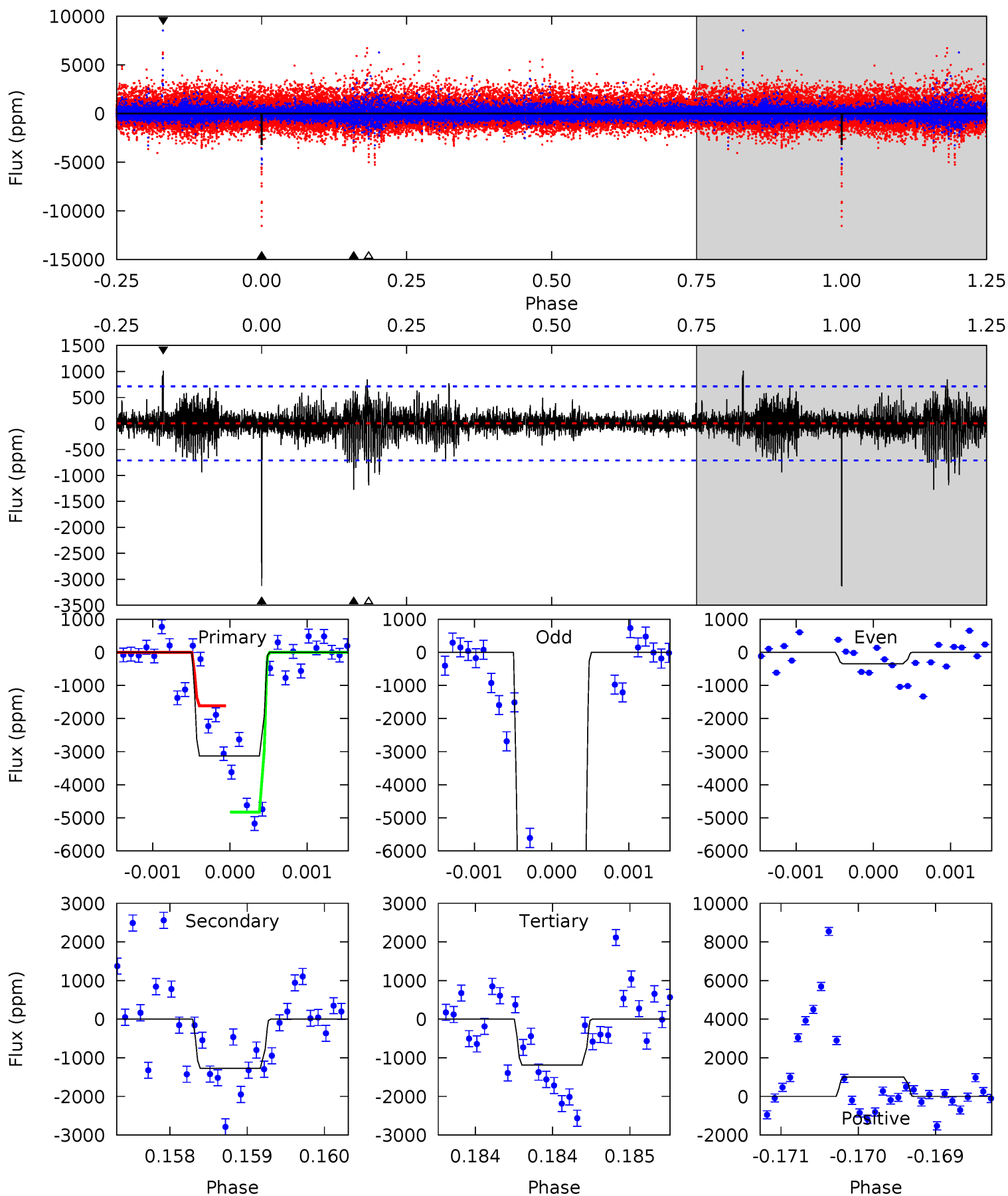
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006949412-08, P = 445.015692 Days, E = 197.919934 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
24.2	9.86	9.17	7.82	5.51	3.38	1.31	15.0	16.4	0.68	2.03	40.2	1.30	0.24	0





### Stellar Parameters For KIC 006949412

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3666^{+49}_{-54}$	$4.797^{+0.039}_{-0.028}$	$-0.100^{+0.100}_{-0.100}$	$0.453^{+0.028}_{-0.034}$	$0.468^{+0.026}_{-0.033}$	$7.099^{+1.282}_{-0.744}$
	+1%/-1%	+1%/-1%	+100%/-100%	+6%/-8%	+6%/-7%	+18%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 006949412-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$3.80^{+4.25}_{-2.66}$	$161^{+3}_{-3}$	$3513^{+5077}_{-10743}$	$154748^{+7181699}_{-4251251}$
Alt.	$-1274 \pm 129$	$5.23^{+4.08}_{-3.50}$	$161^{+3}_{-3}$	$2670^{+984}_{-353}$	$19618^{+159041}_{-13151}$

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

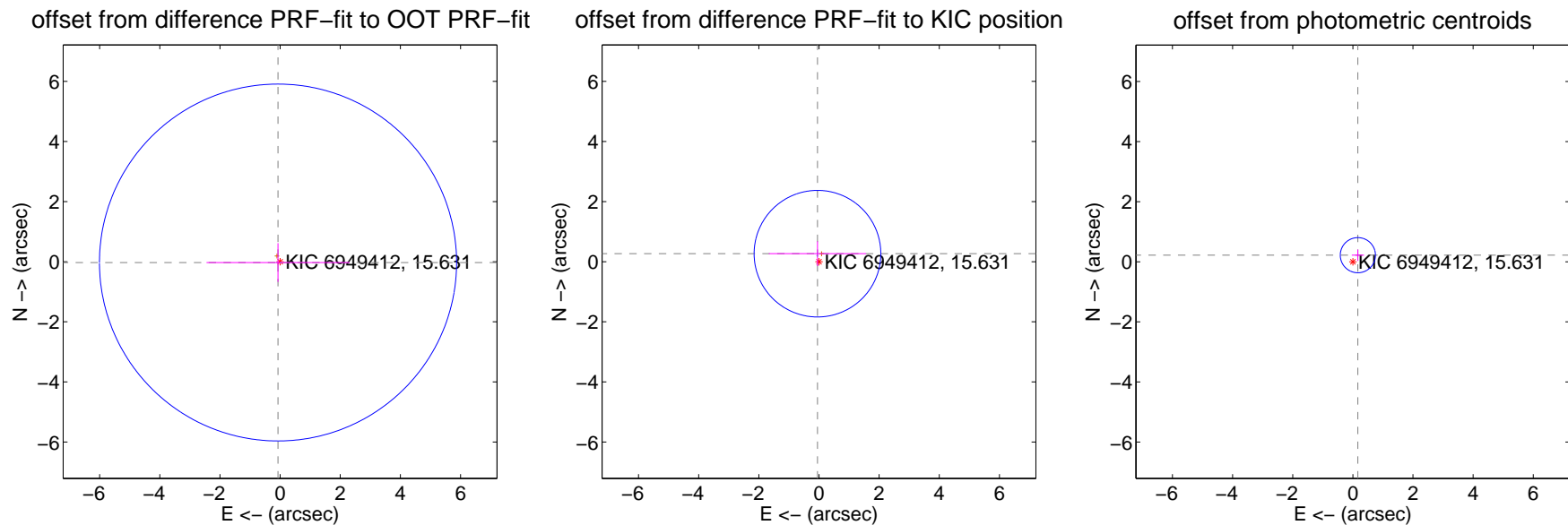
## DV Centroid Data

Supplemental centroid analysis for 006949412-08. Kepler magnitude: 15.63. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

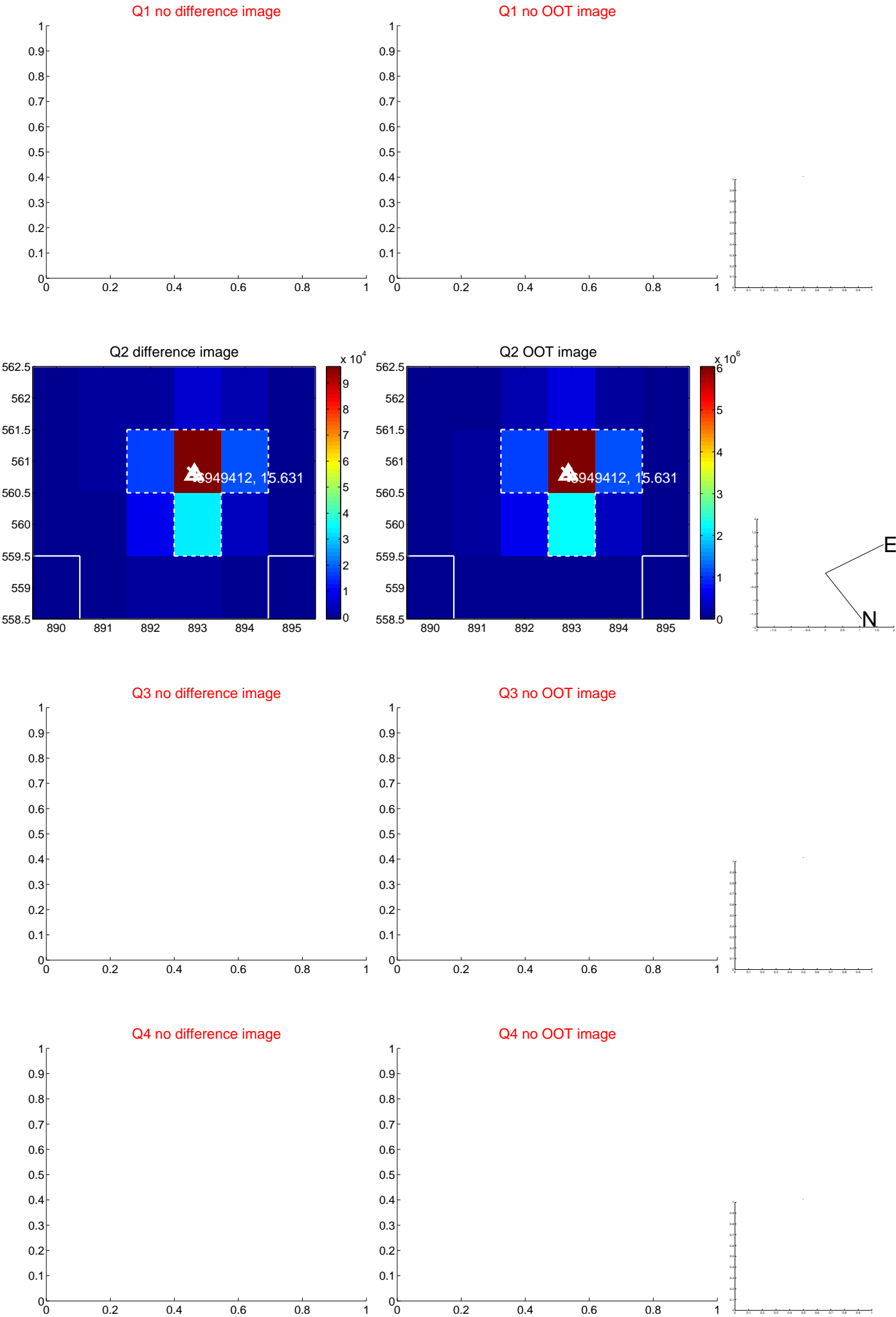
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.075 \pm 1.979$	0.04	$0.069 \pm 2.378$	$-0.027 \pm 0.643$
PRF-fit source offset from KIC position	$0.271 \pm 0.702$	0.39	$0.050 \pm 1.618$	$0.267 \pm 0.412$
photometric centroid source offset	$0.28 \pm 0.19$	1.41	$-0.17 \pm 0.20$	$0.22 \pm 0.19$

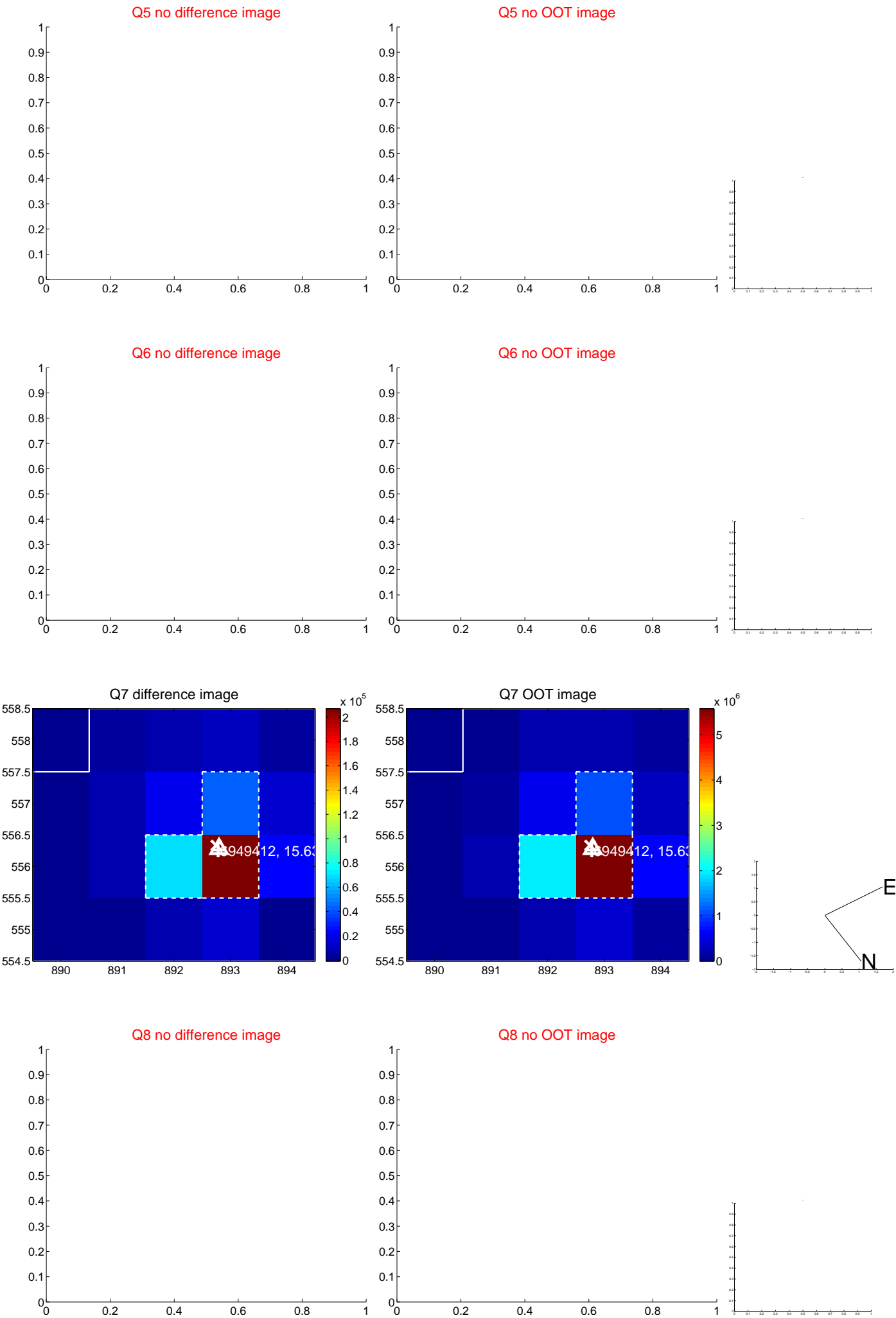


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

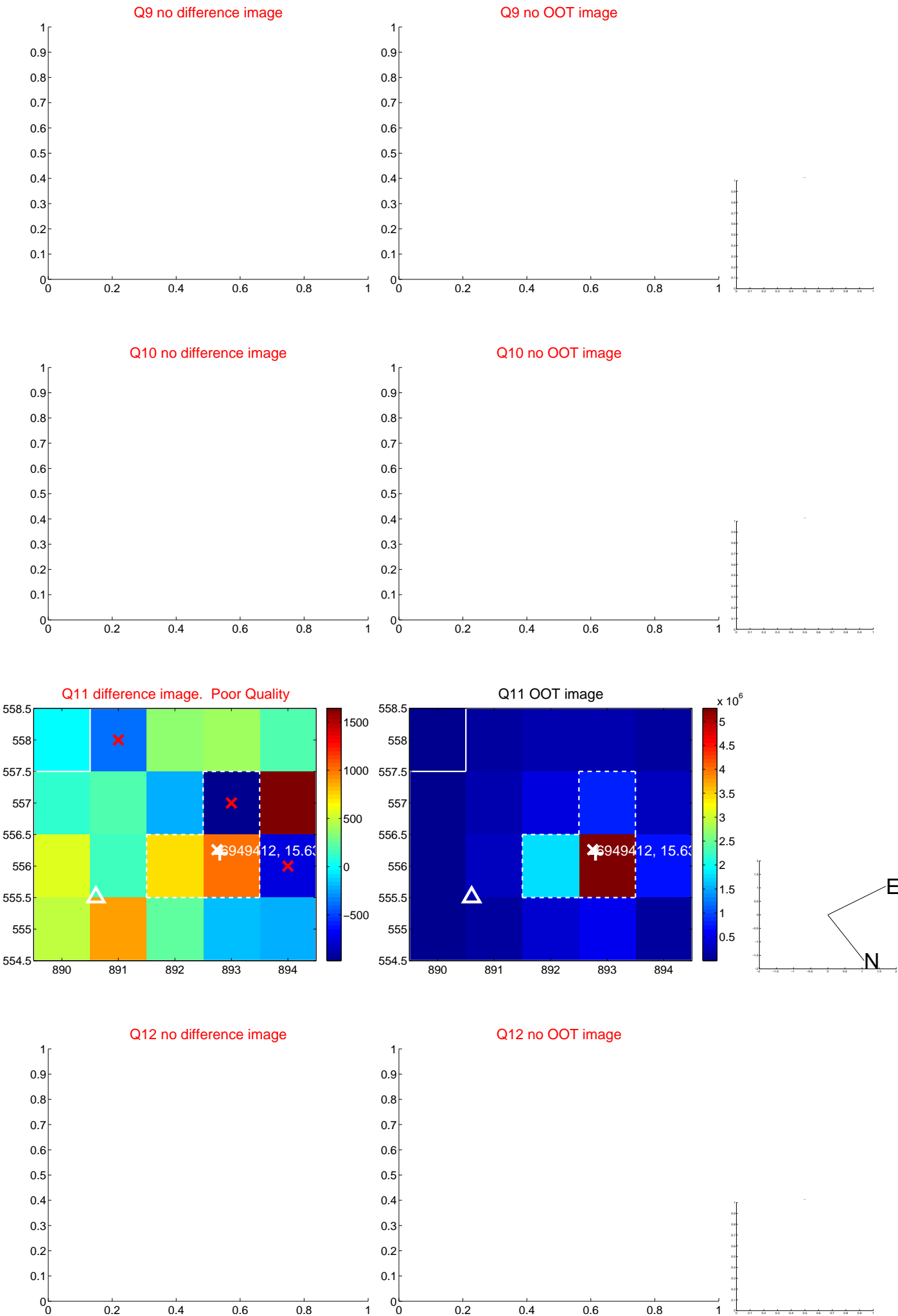
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



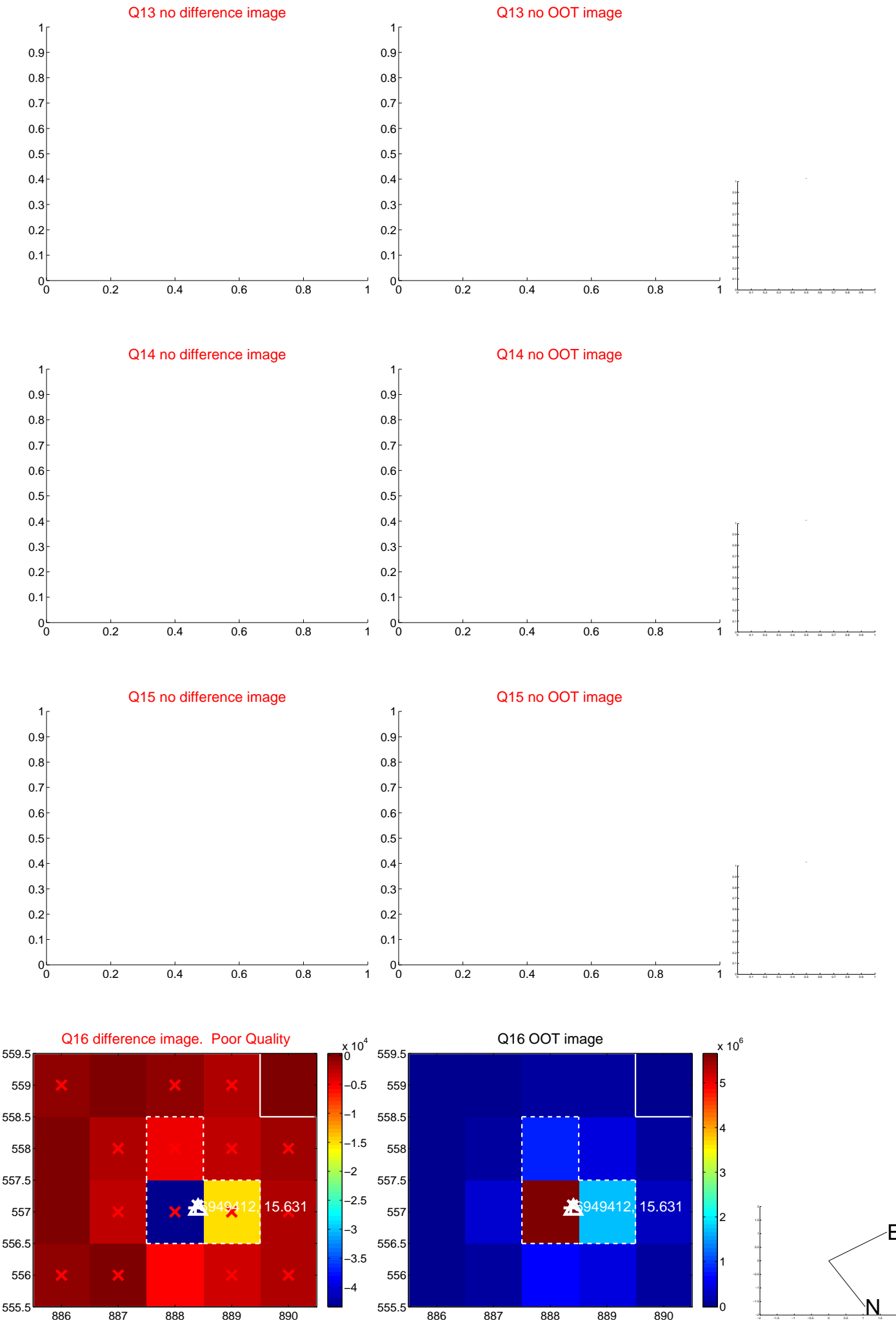
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



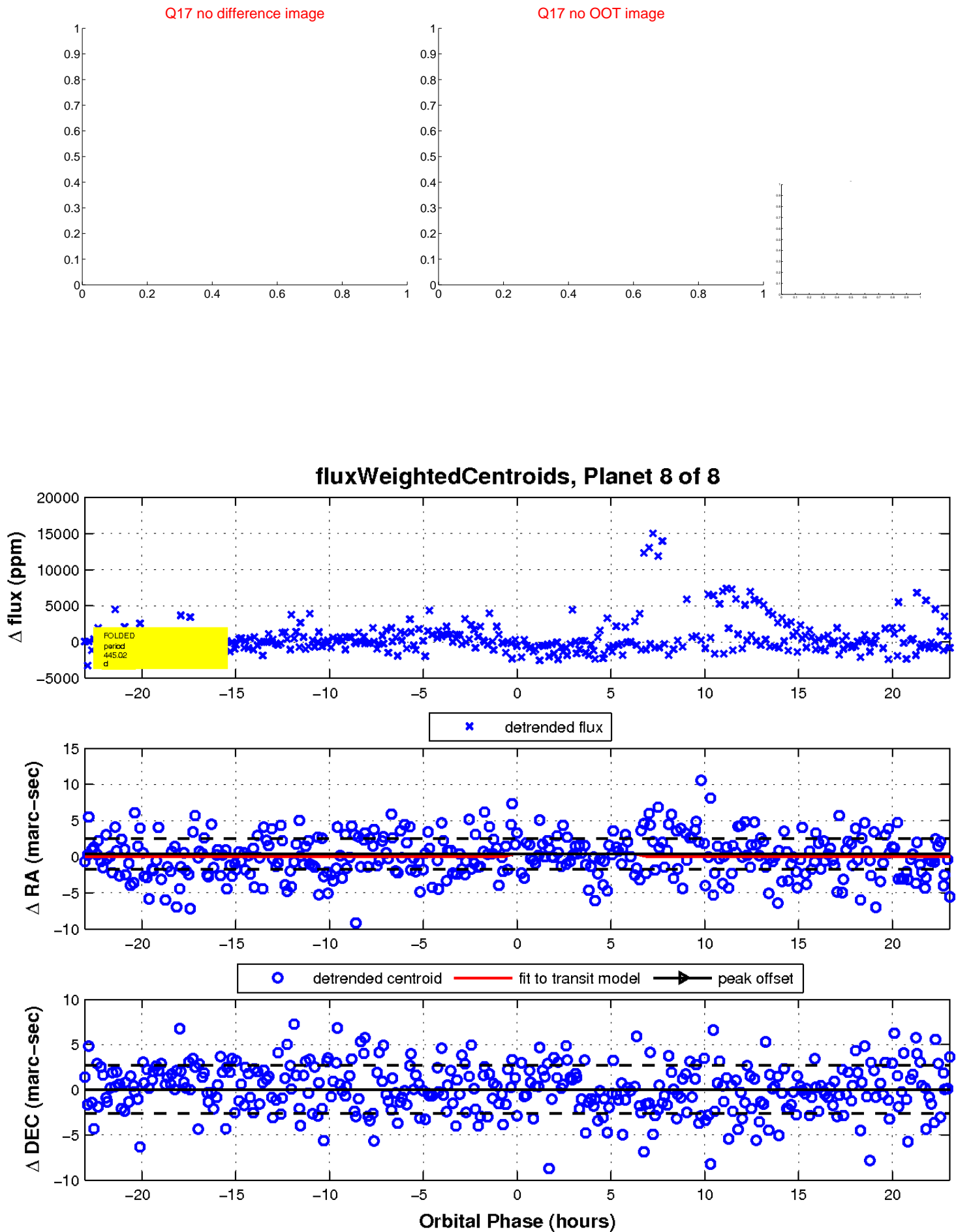
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



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



UKIRT Image

Declination

