

# KIC 006691930

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006691930-01	OBS	No	312.559954	438.656327	2199.8	12.778	15.2	8.7	0.82	5524	4.11	0.84
006691930-02	OBS	No	425.100719	290.458555	392.5	0.968	12.0	1.0	0.82	5524	2.23	0.56
006691930-03	OBS	No	425.394623	290.856289	1270.6	12.307	11.9	6.7	0.82	5524	3.00	0.56
006691930-04	OBS	No	518.903445	423.710902	995.5	10.500	11.2	-1.0	0.82	5524	2.56	0.43
006691930-05	OBS	No	545.771146	462.745706	2422.3	7.332	9.6	9.4	0.82	5524	4.09	0.40
006691930-06	OBS	No	428.090130	488.134669	2007.3	13.294	9.8	8.9	0.82	5524	4.36	0.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006691930-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006691930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006691930-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006691930-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

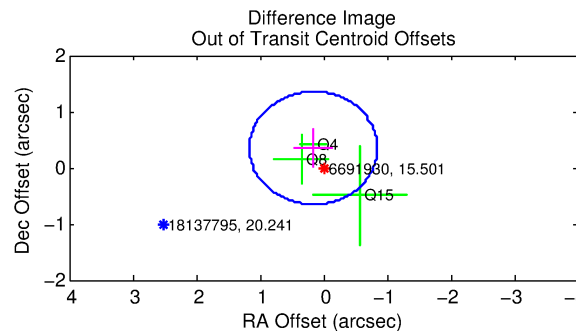
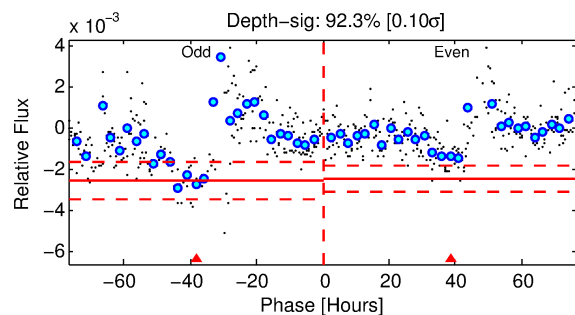
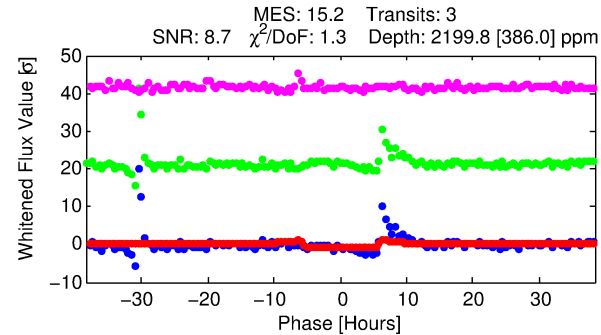
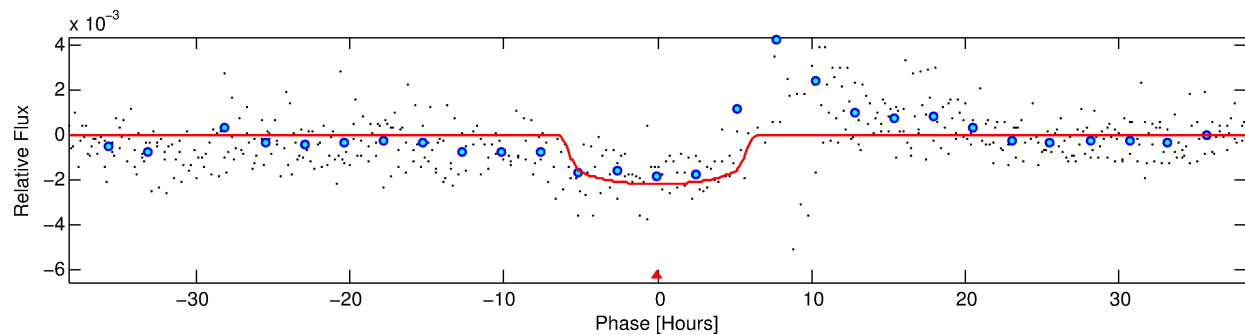
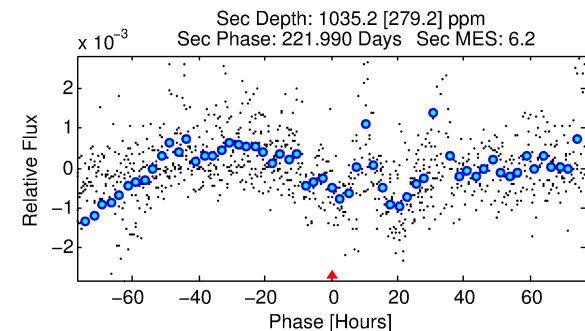
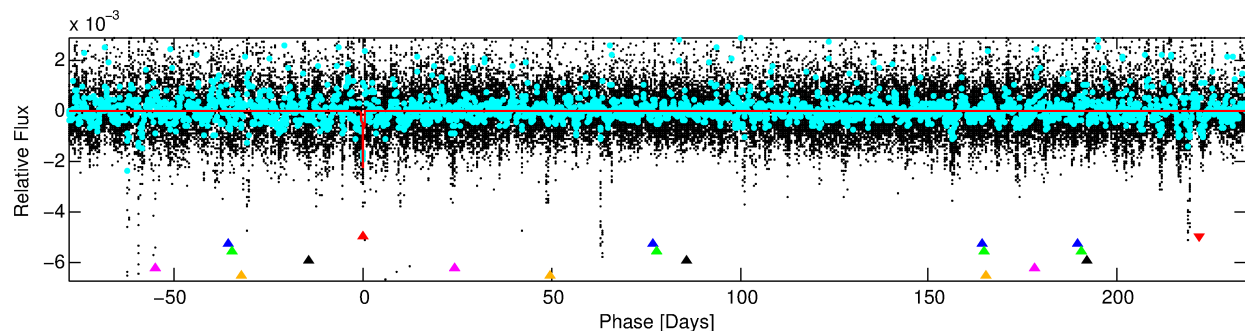
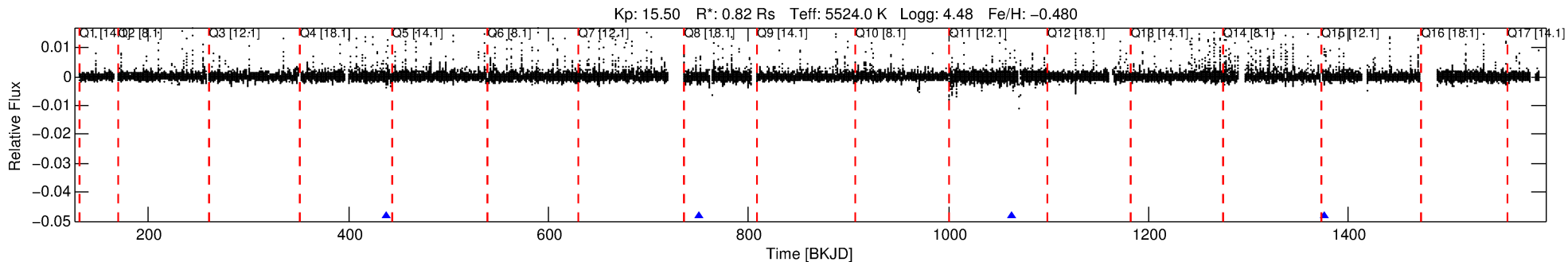
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006691930-01

No Significant Match Found

# DV One-Page Summary

KIC: 6691930 Candidate: 1 of 6 Period: 312.560 d



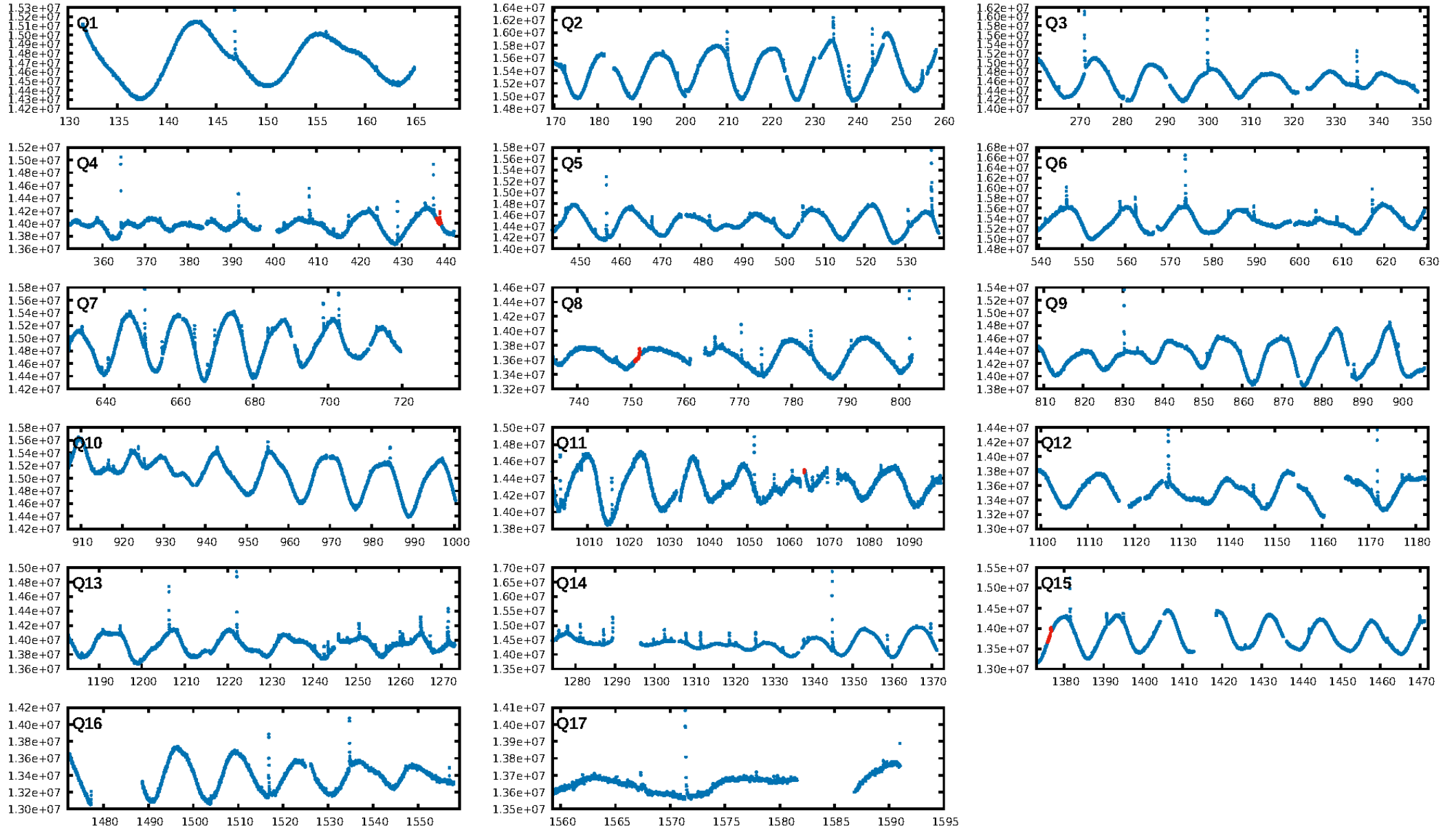
## DV Fit Results:

Period = 312.55995 [0.00743] d  
Epoch = 438.6563 [0.0147] BKJD  
Rp/R\* = 0.0460 [0.0069]  
a/R\* = 144.21 [68.87]  
b = 0.71 [0.34]  
Seff = 0.84 [0.22]  
Teq = 244 [16] K  
Rp = 4.11 [0.99] Re  
a = 0.8163 [0.1288] AU  
Ag = 22429.41 [10398.37] [2.16σ]  
Teffp = 4621 [489] K [8.94σ]

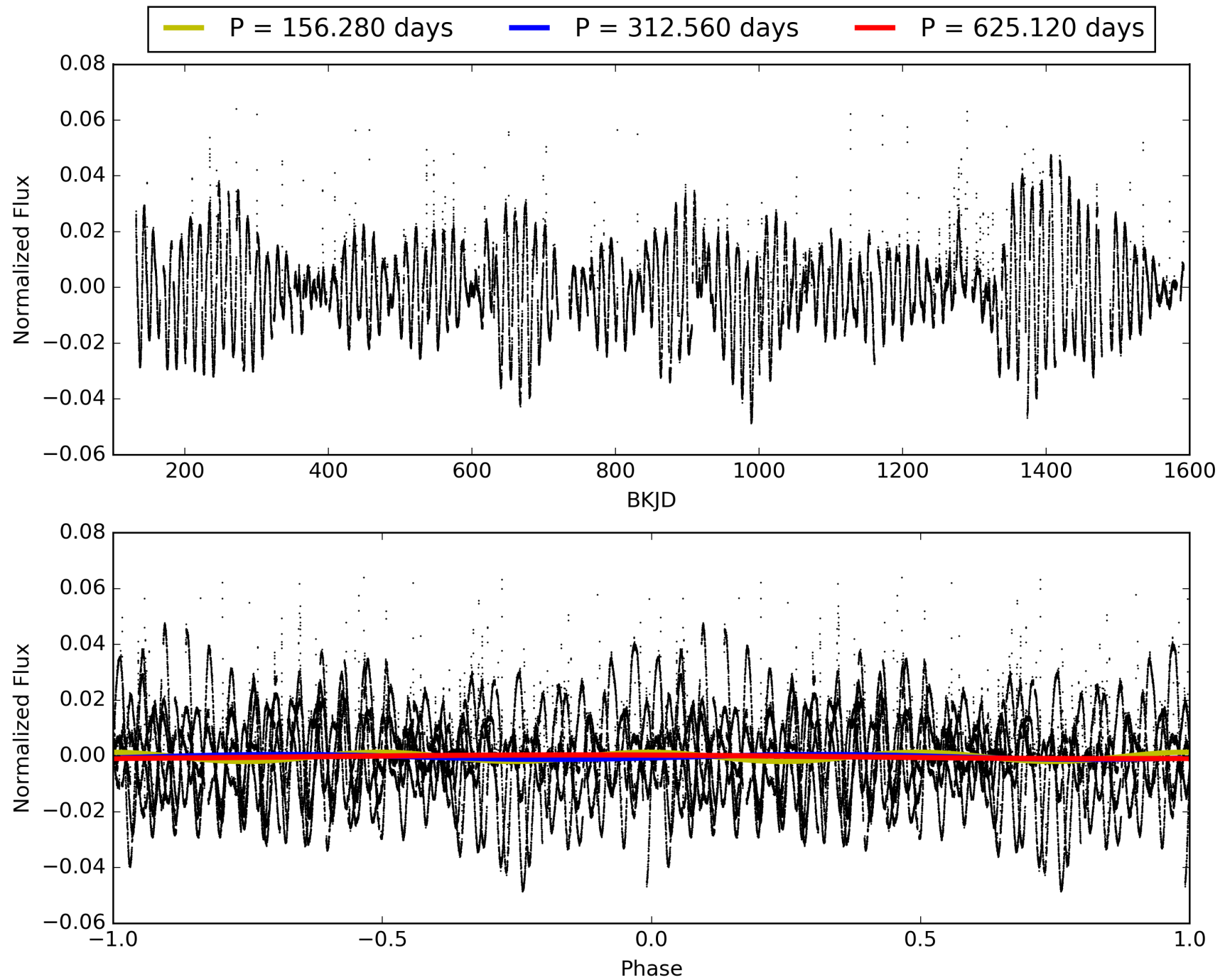
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [210.78σ]  
ModelChiSquare2-sig: 5.7%  
ModelChiSquareGof-sig: 60.9%  
Bootstrap-pfa: 7.47e-15  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.1701**  
Centroid-sig: 1.9%  
Centroid-so: 0.979 arcsec [1.68σ]  
OotOffset-rm: 0.383 arcsec [1.14σ]  
KicOffset-rm: 0.320 arcsec [0.97σ]  
OotOffset-st: 0/1/2/0 [3]  
KicOffset-st: 0/1/2/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 006691930-01, PDC Light Curves



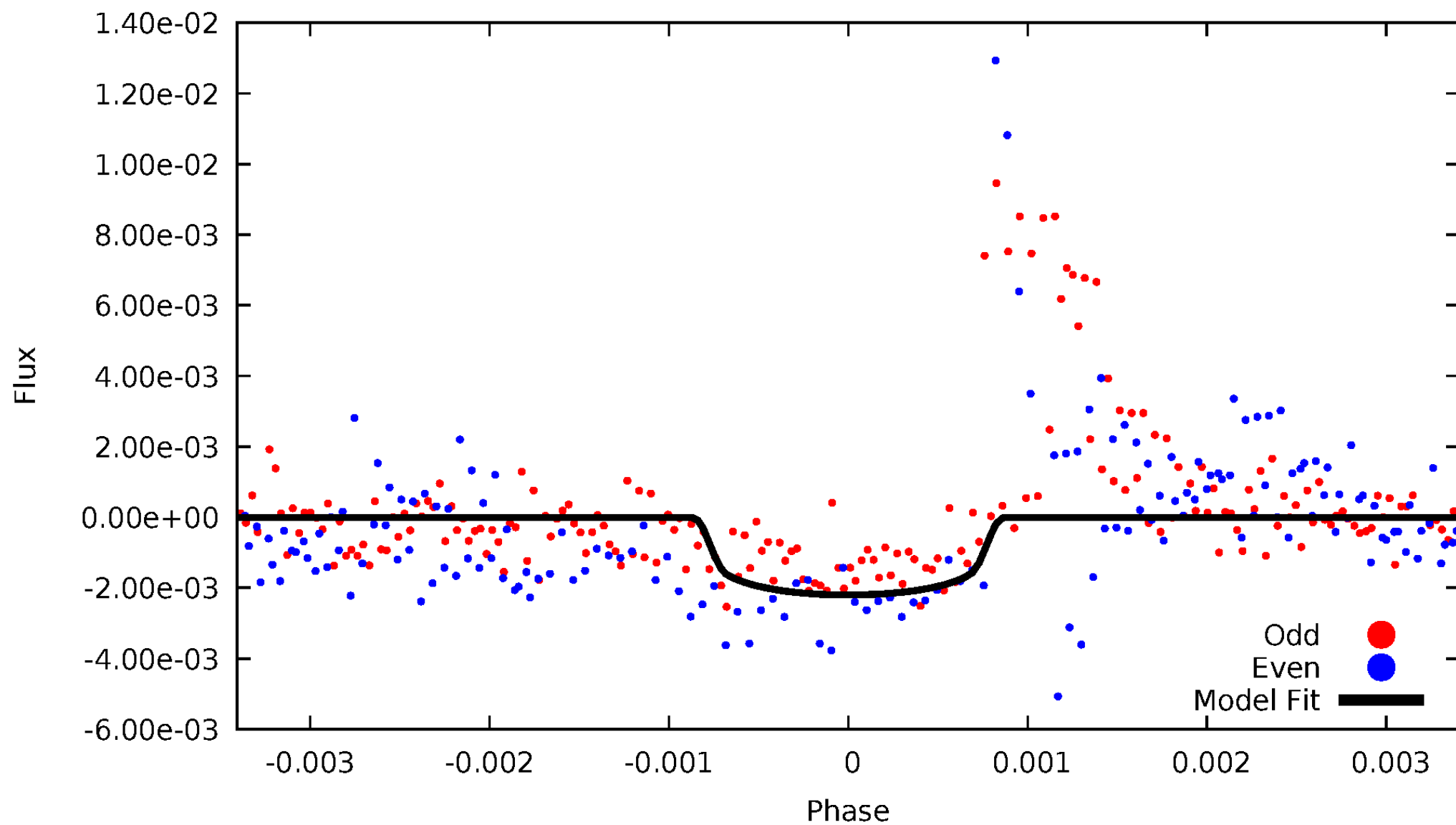
TCE 006691930-01





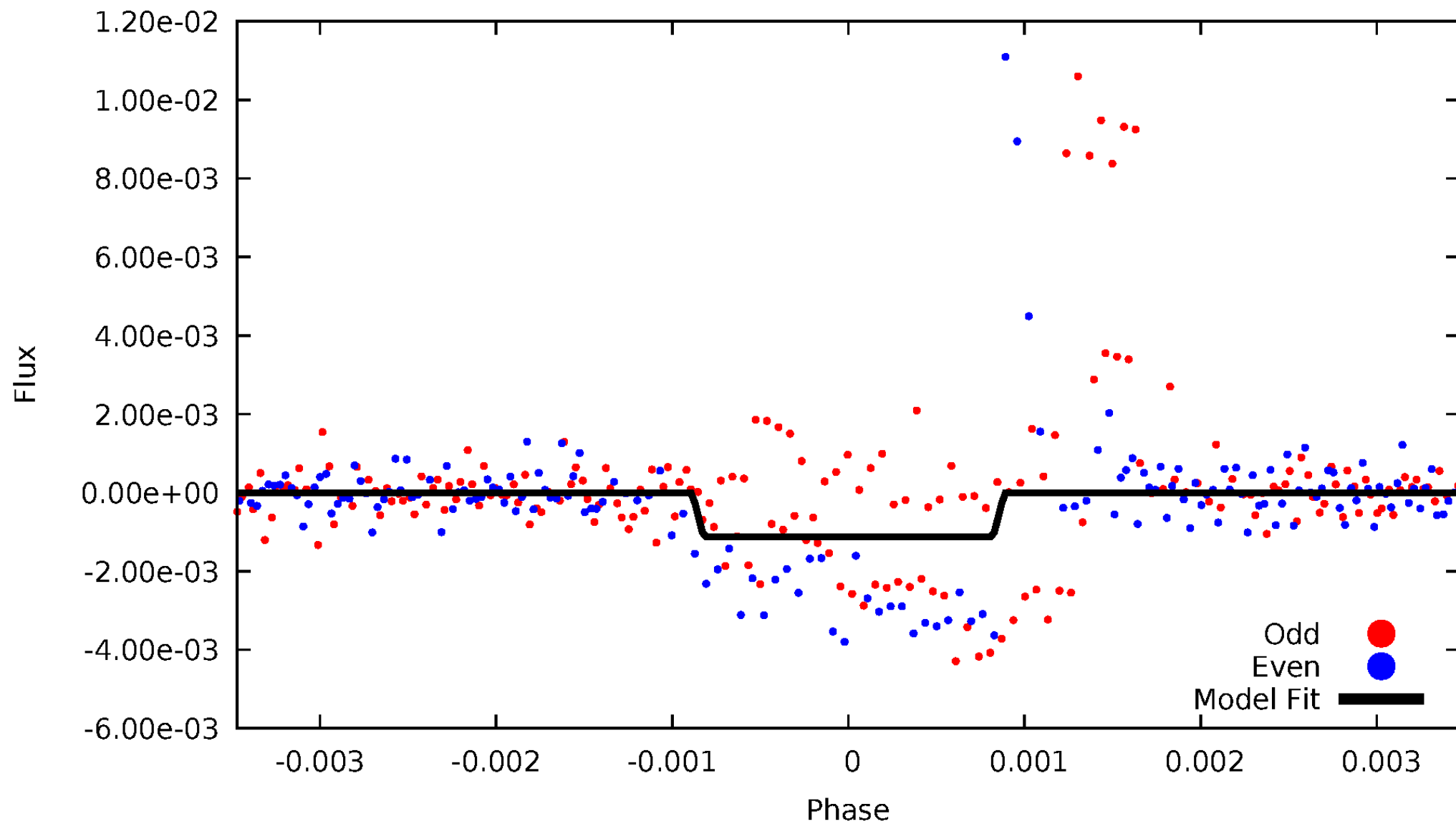
# DV Odd/Even

TCE 006691930-01

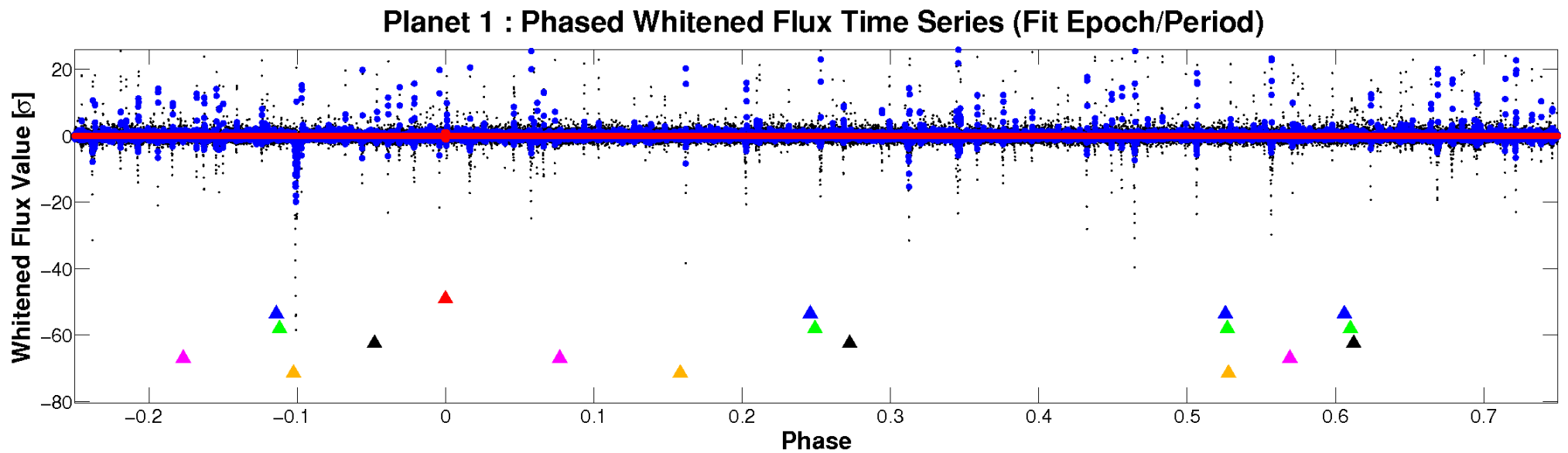
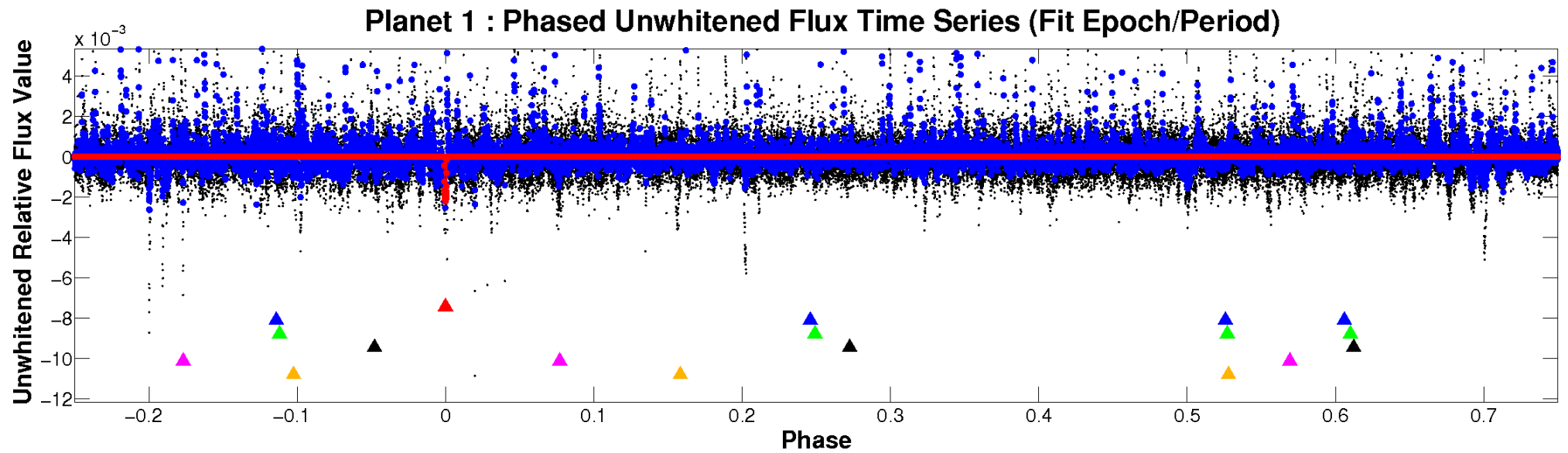


# ALT Odd/Even

TCE 006691930-01

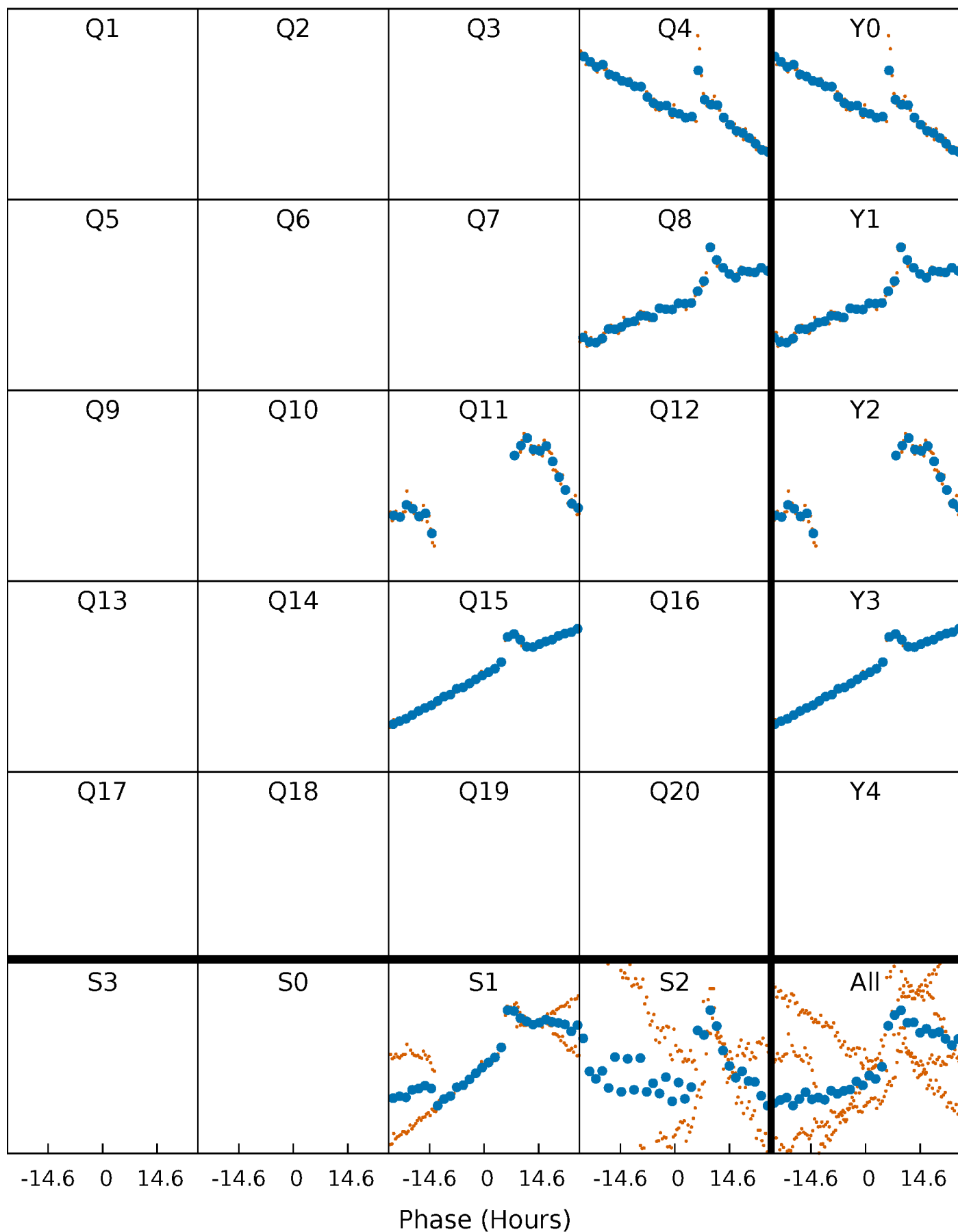


# Non-Whitened Vs. Whitened Light Curve



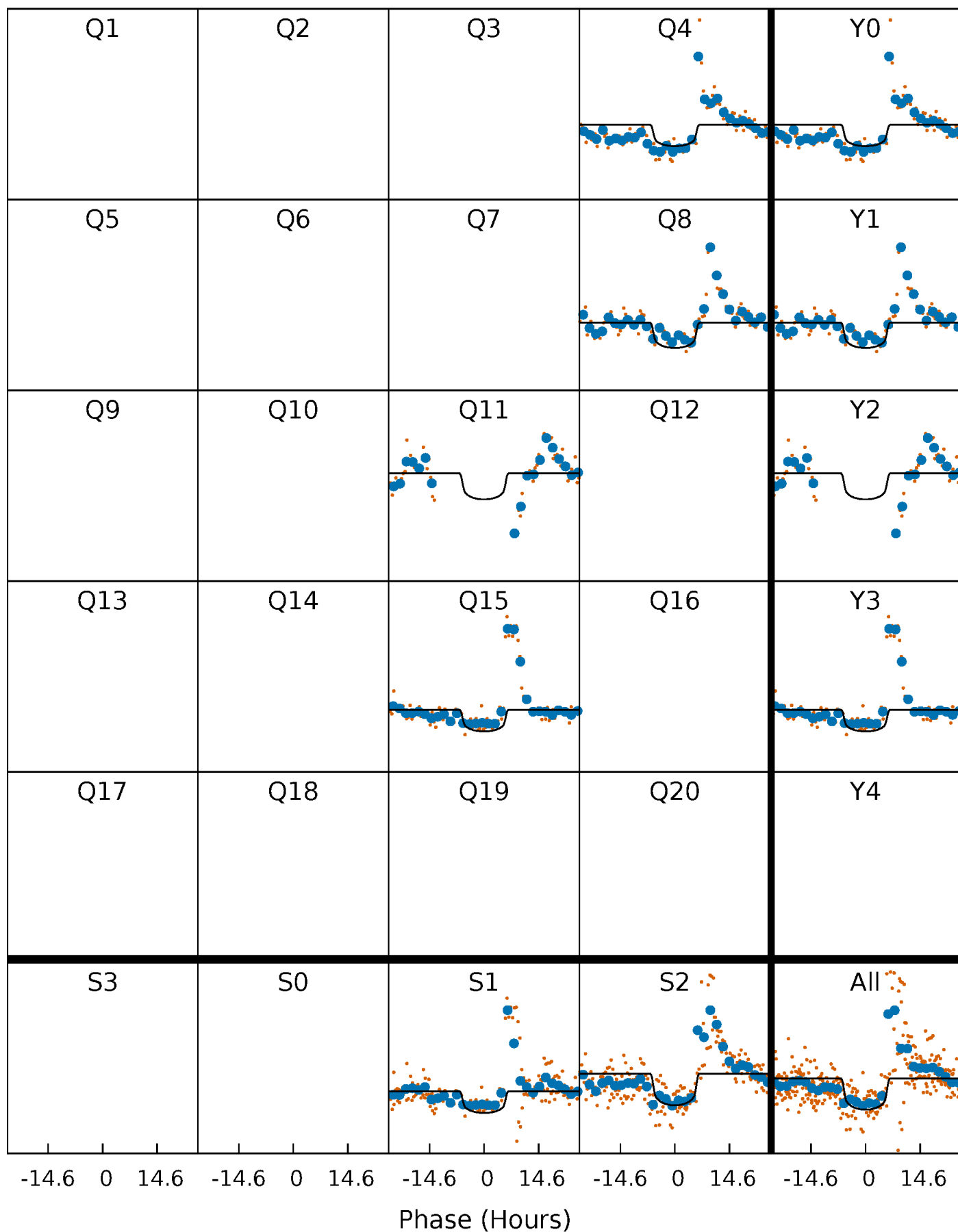
# PDC Quarter-Phased Transit Curves

TCE 006691930-01 P=312.559954 Days  $T_0=438.656327$  (BKJD)



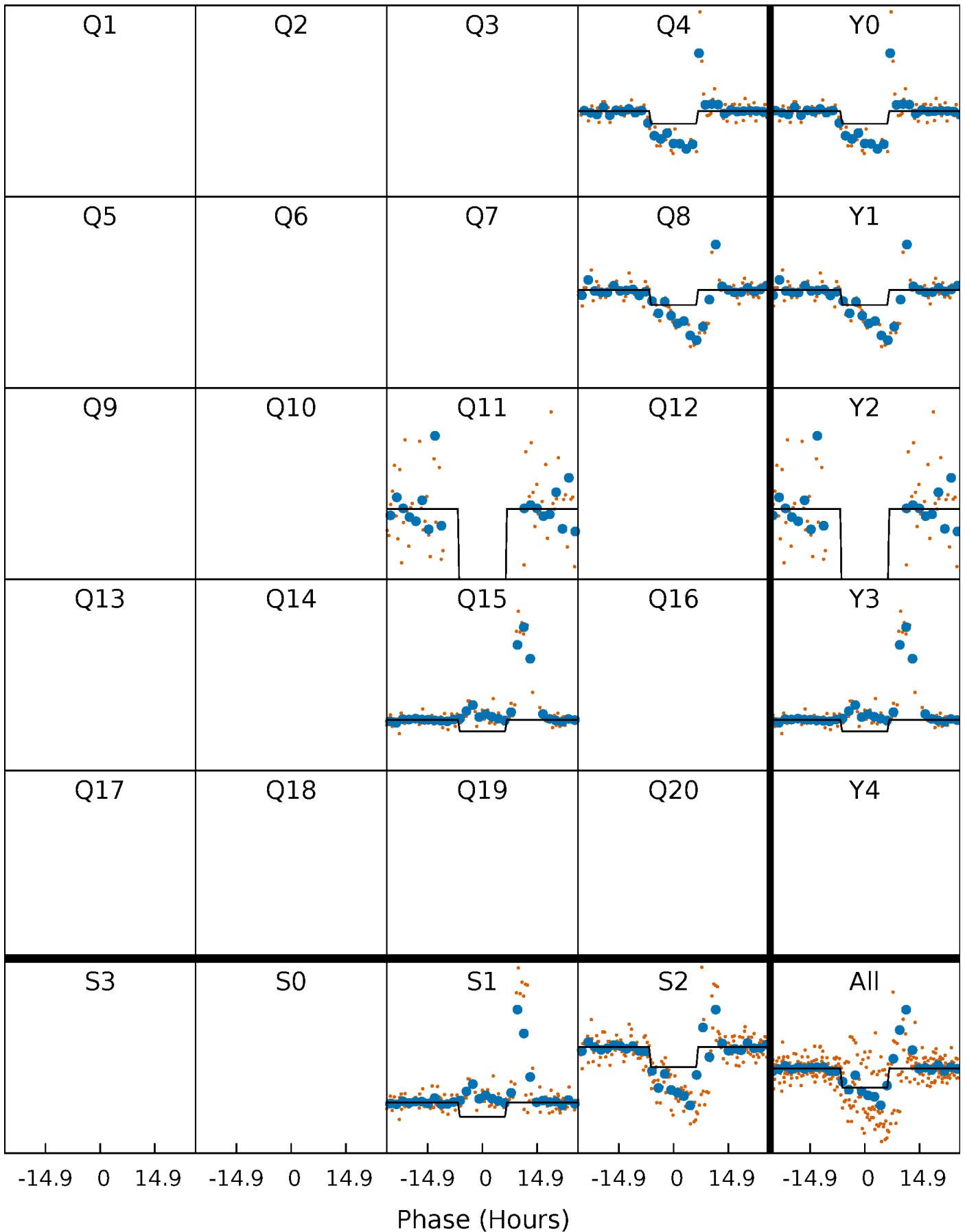
# DV Quarter-Phased Transit Curves

TCE 006691930-01     $P=312.559954$  Days     $T_0=438.656327$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006691930-01 P=312.517678 Days  $T_0=438.633628$  (BKJD)

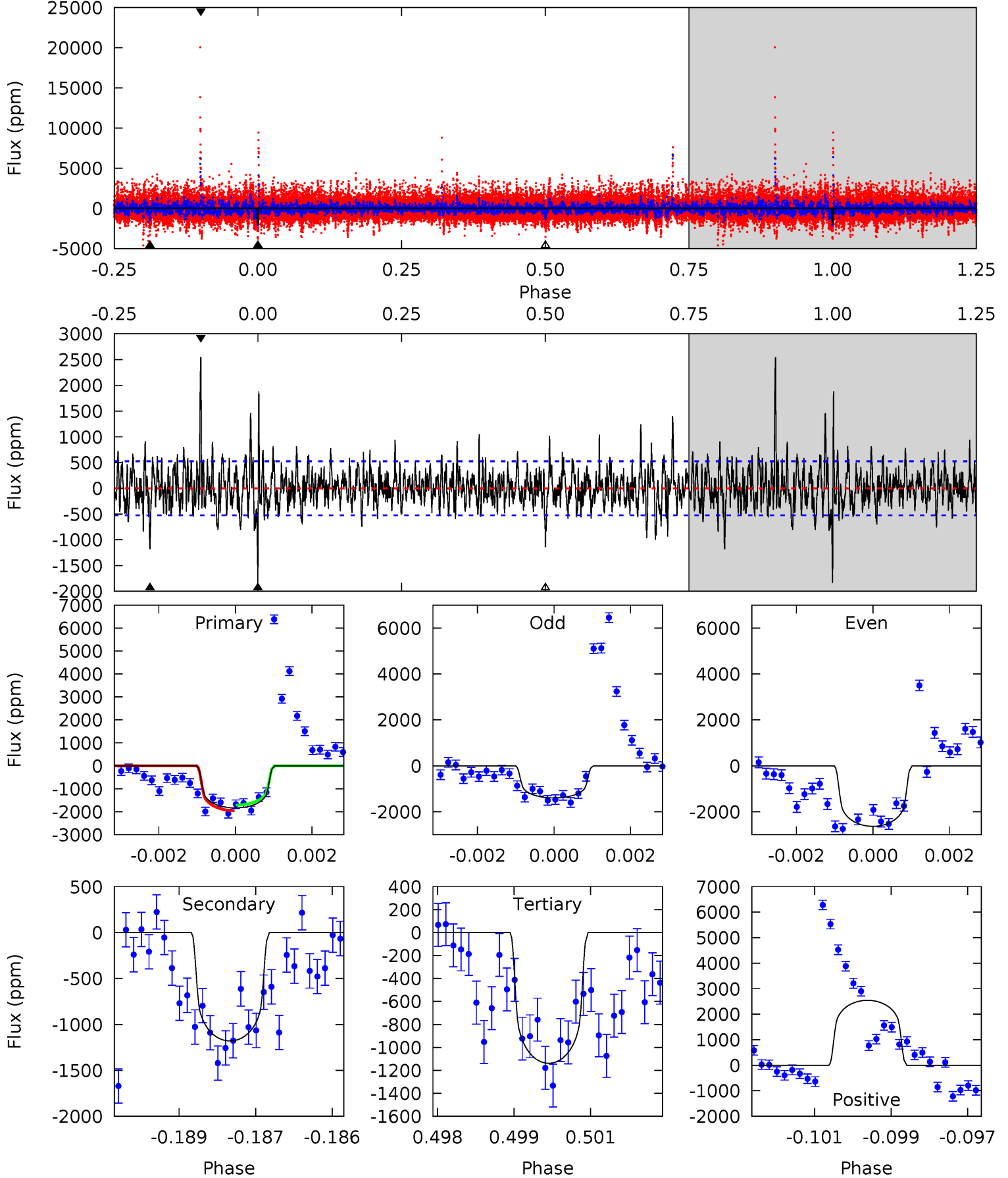




# DV Model-Shift Uniqueness Test

006691930-01, P = 312.559954 Days, E = 126.096373 Days

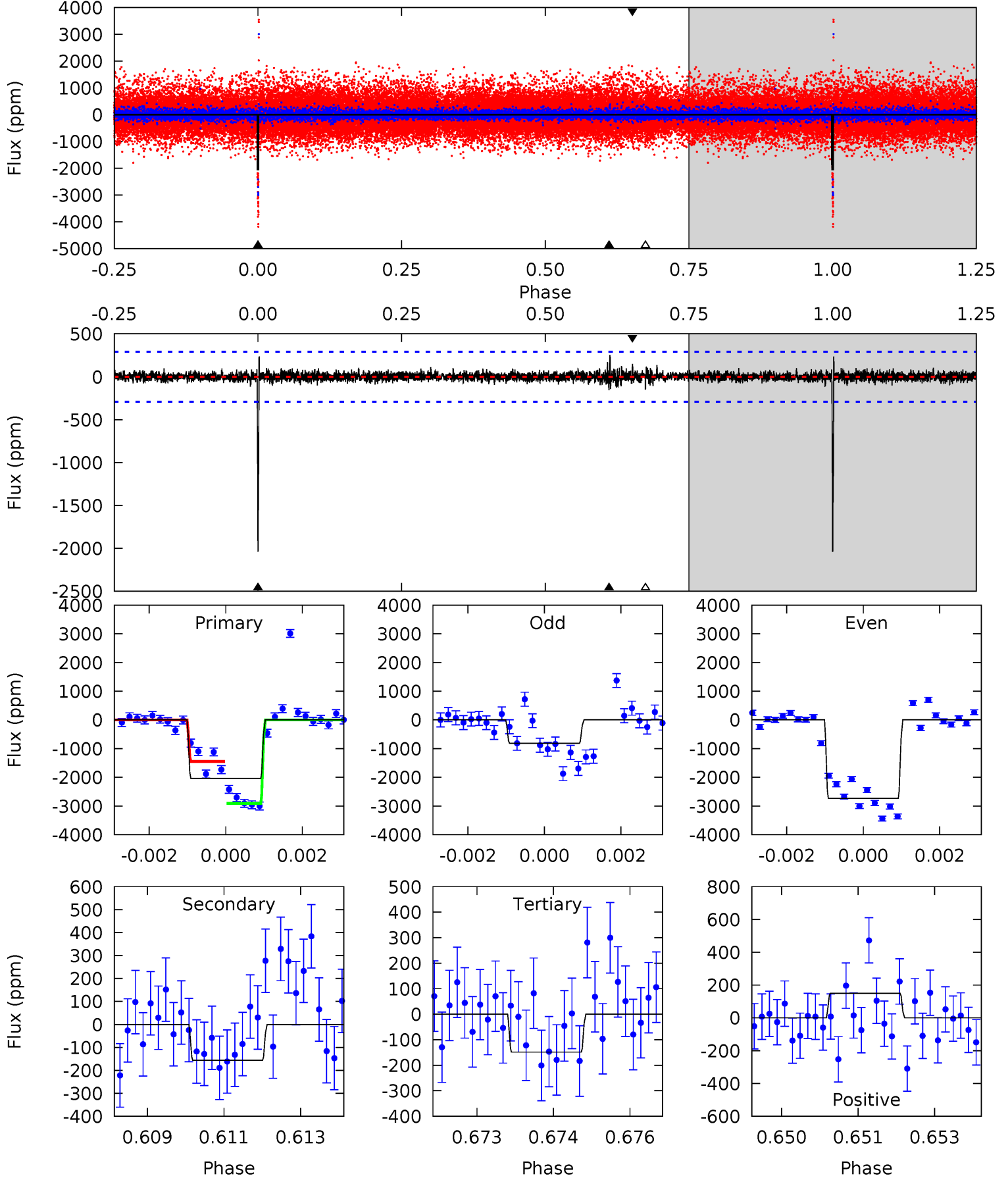
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.8	12.1	11.6	26.0	5.35	3.13	3.18	7.12	-7.25	0.42	-13.9	3.91	1.24	0.58	1.26



# Alt Model-Shift Uniqueness Test

006691930-01,  $P = 312.517678$  Days,  $E = 126.115950$  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
37.3	2.86	2.71	2.73	5.35	3.13	0.54	34.6	34.6	0.15	0.13	18.9	0.68	0.11	0



### Stellar Parameters For KIC 006691930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5524^{+180}_{-163}$	$4.481^{+0.113}_{-0.125}$	$-0.480^{+0.300}_{-0.300}$	$0.820^{+0.154}_{-0.116}$	$0.742^{+0.116}_{-0.041}$	$1.897^{+0.930}_{-0.683}$
	+3%/-3%	+3%/-3%	+62%/-62%	+19%/-14%	+16%/-6%	+49%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006691930-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1180 \pm 98$	$4.16^{+0.75}_{-0.66}$	$341^{+19}_{-16}$	$4879^{+349}_{-318}$	$25046^{+10971}_{-6849}$
Alt.	$-156 \pm 55$	$3.04^{+0.69}_{-0.69}$	$343^{+18}_{-17}$	$3753^{+378}_{-330}$	$6212^{+5173}_{-2855}$

$T_{\text{max}}$  = 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

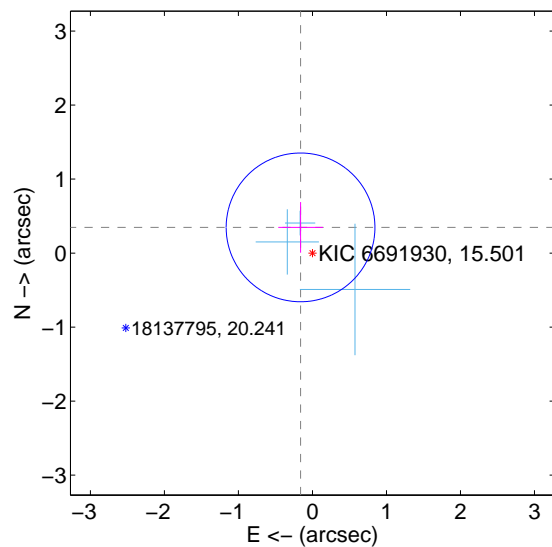
Supplemental centroid analysis for 006691930-01. Kepler magnitude: 15.50. Transit SNR 8.71

There are 3 quarters with good PRF difference image offsets

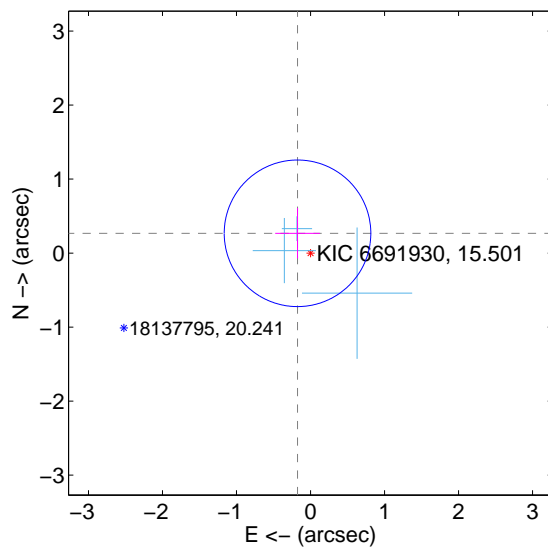
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.383 \pm 0.335$	1.14	$0.161 \pm 0.302$	$0.347 \pm 0.342$
PRF-fit source offset from KIC position	$0.320 \pm 0.330$	0.97	$0.176 \pm 0.302$	$0.267 \pm 0.342$
photometric centroid source offset	$0.98 \pm 0.58$	1.68	$0.81 \pm 0.57$	$0.55 \pm 0.61$

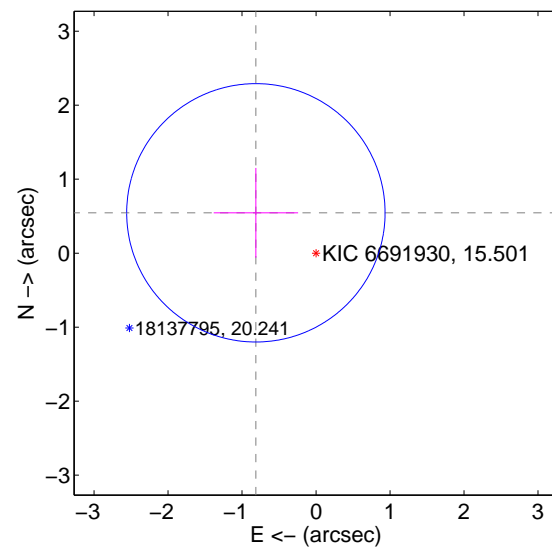
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

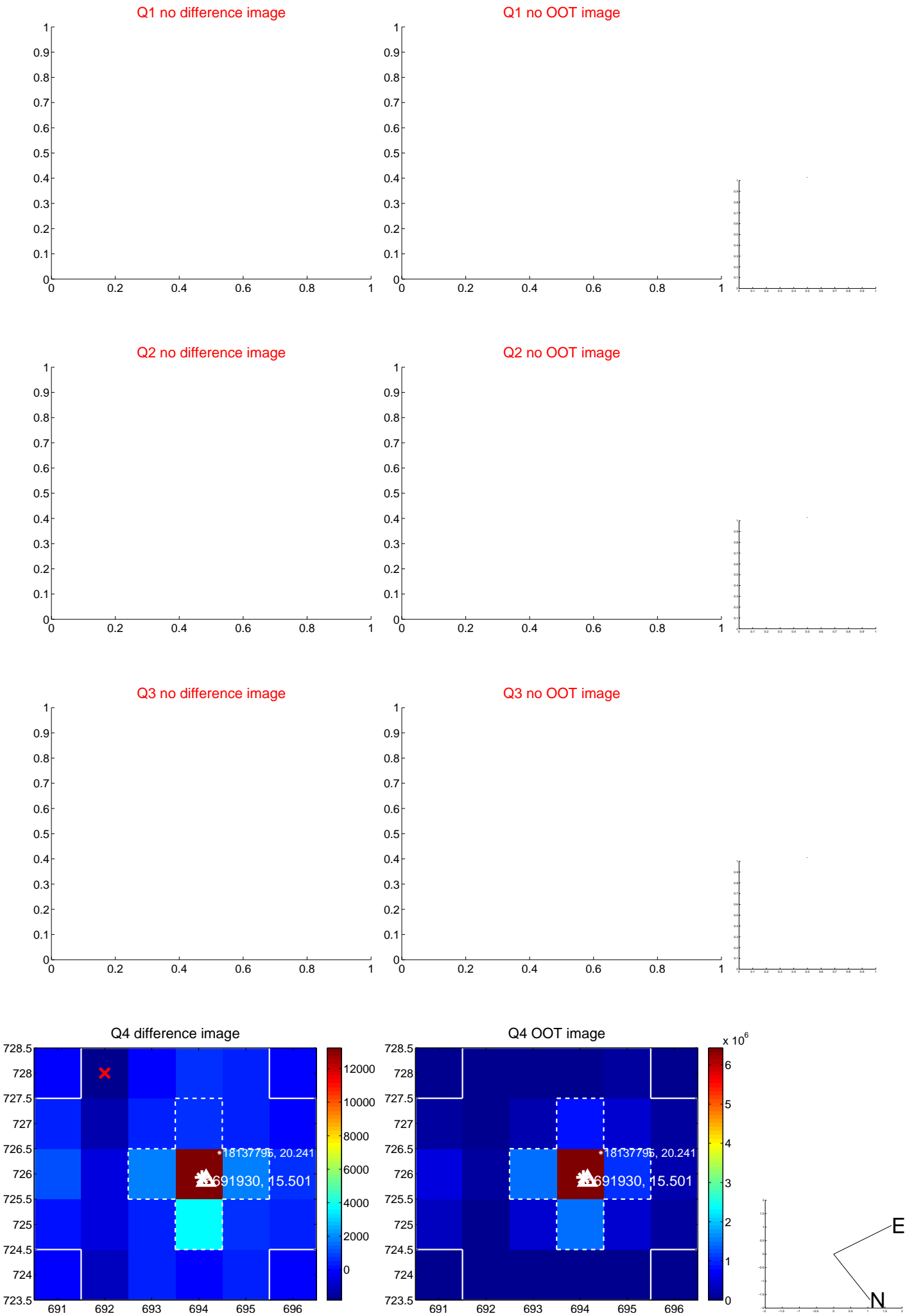


offset from photometric centroids

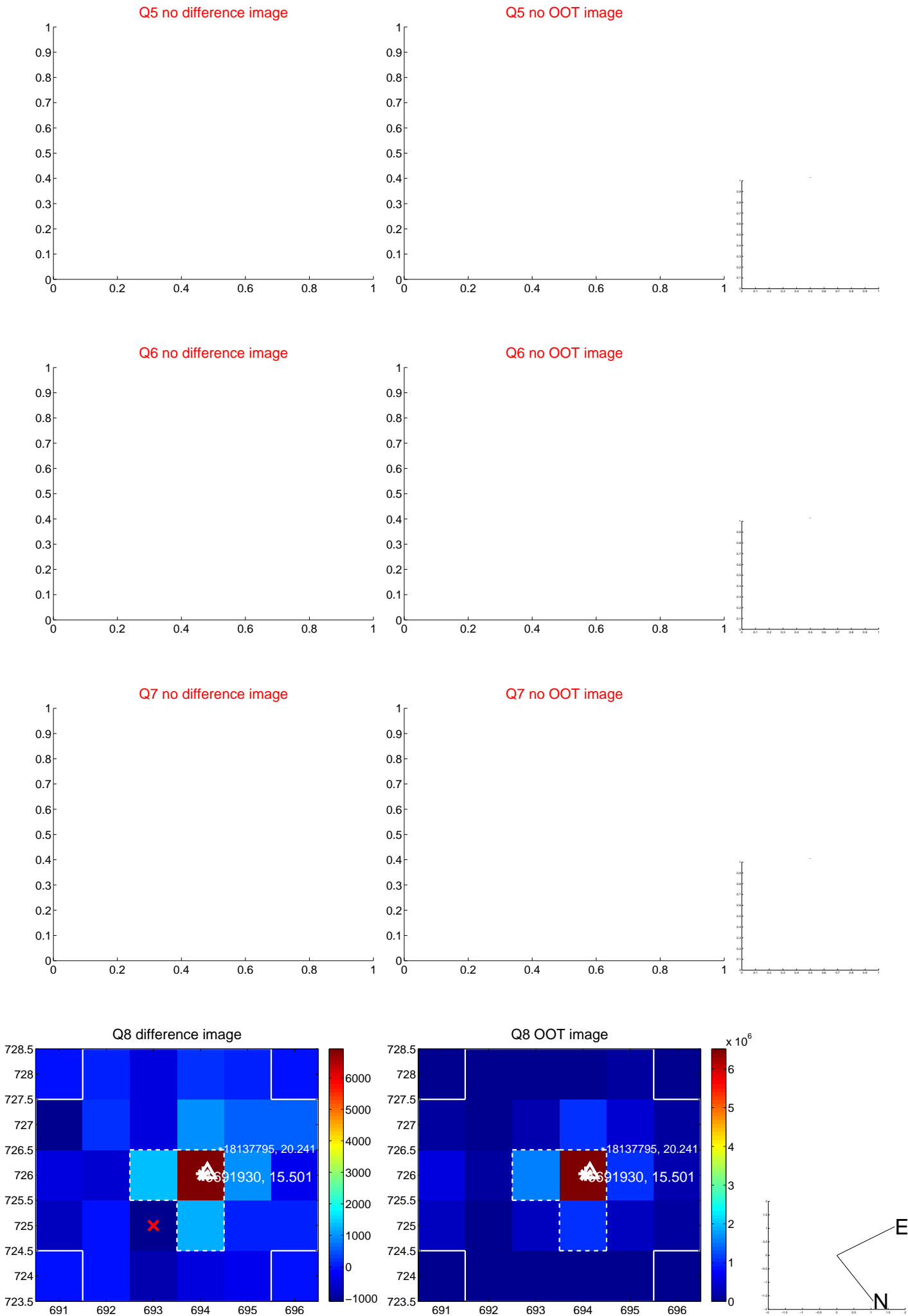


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



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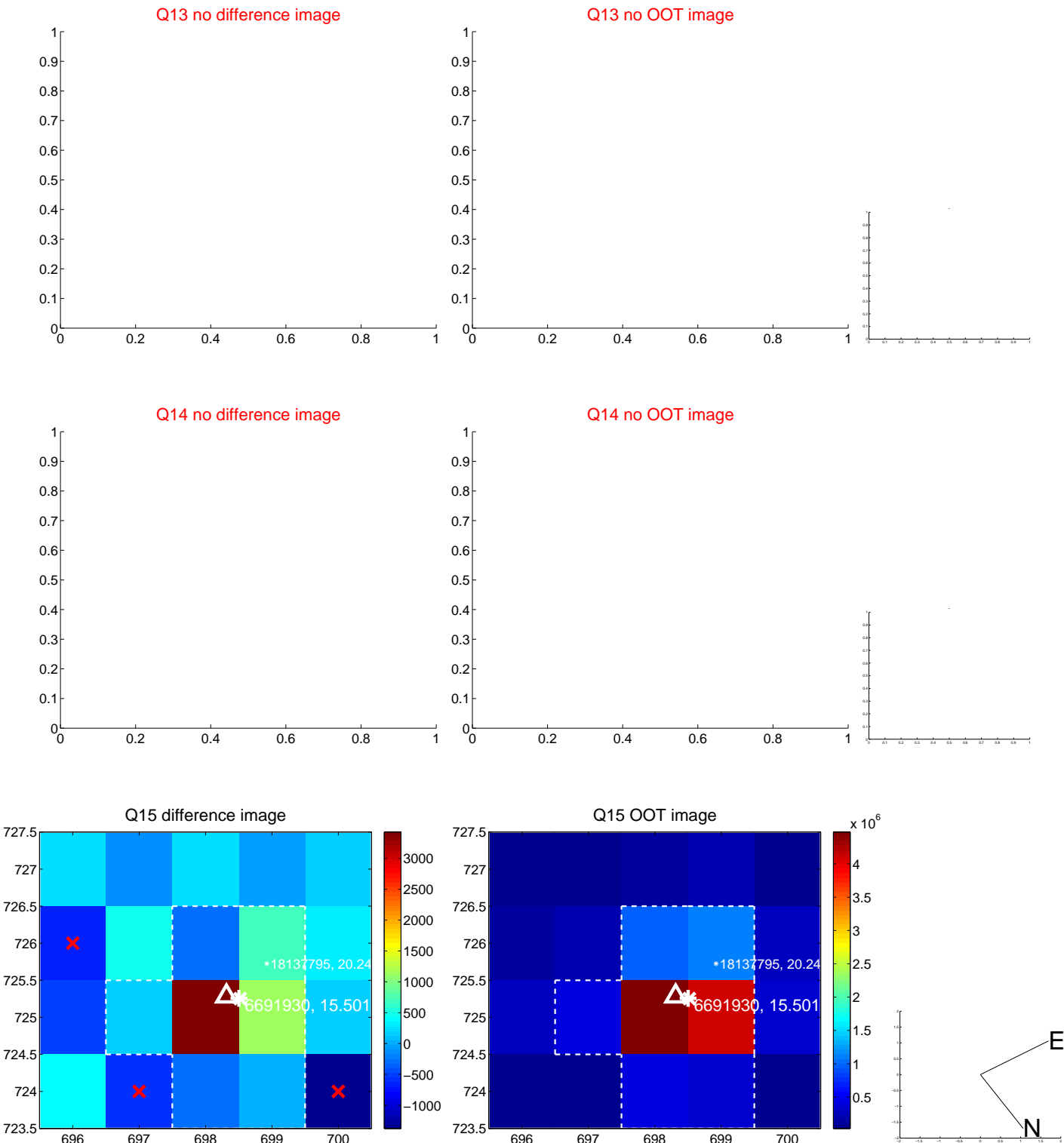




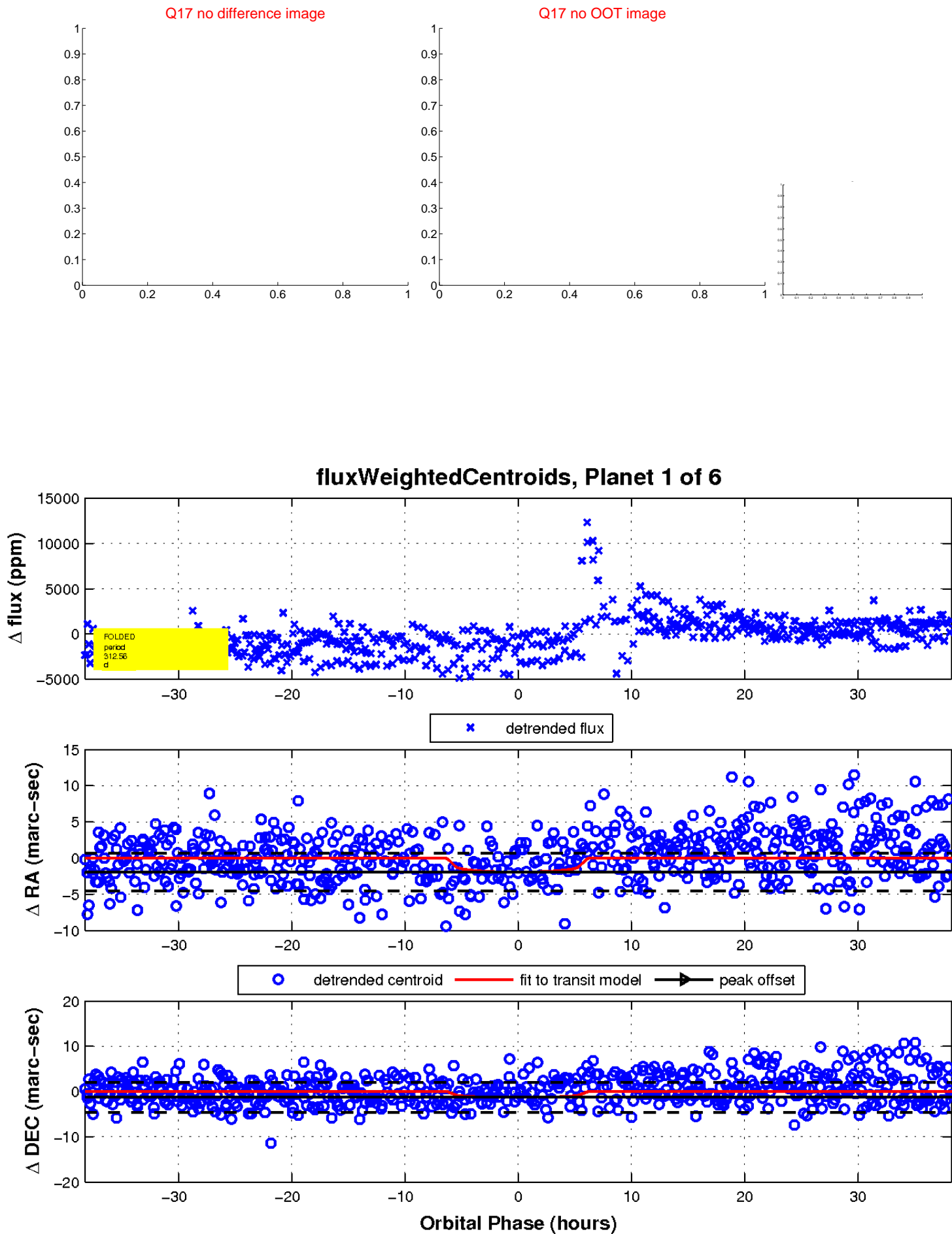
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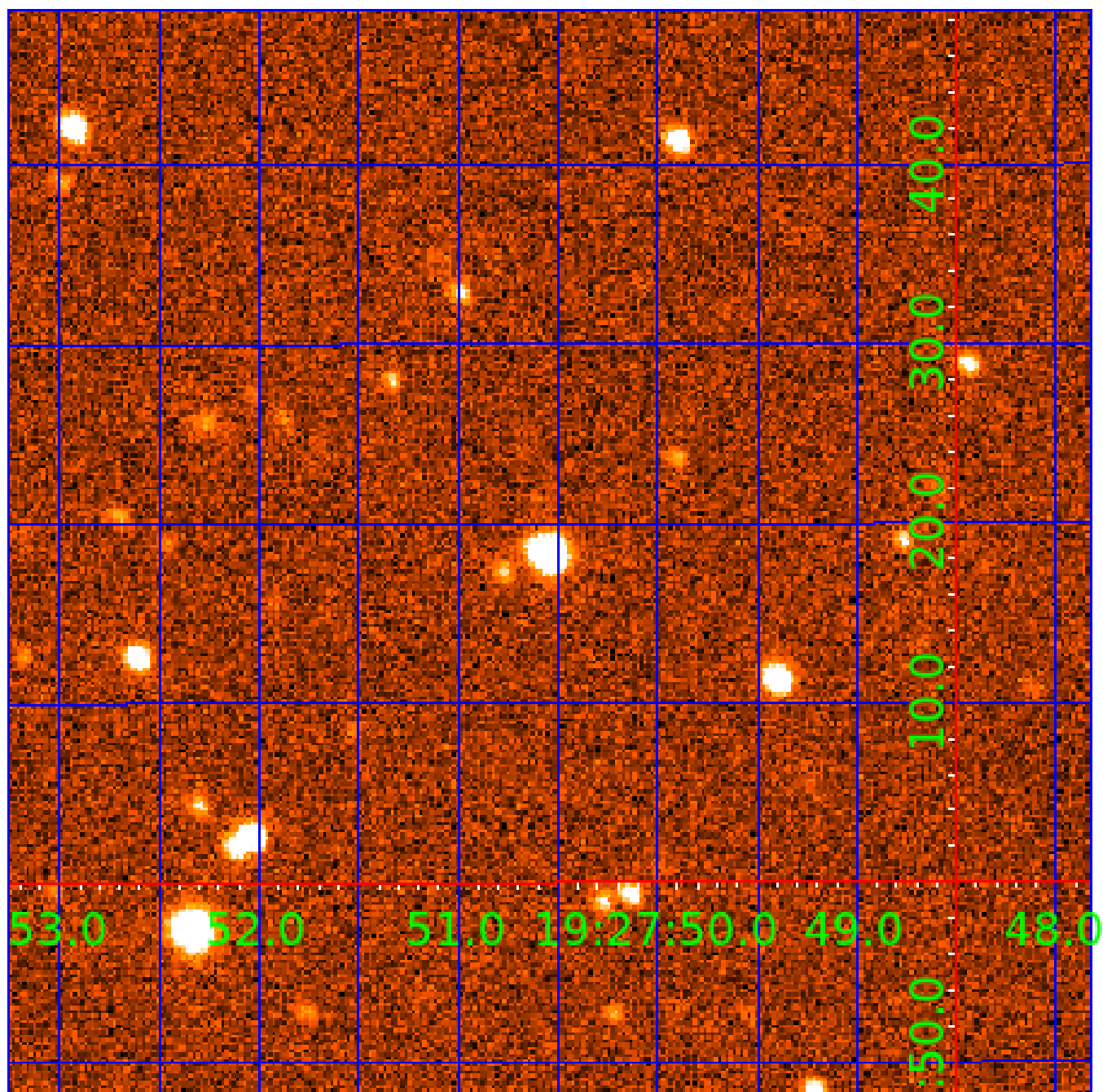


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# UKIRT Image

Declination



# KIC 006691930

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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006691930-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006691930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006691930-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006691930-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

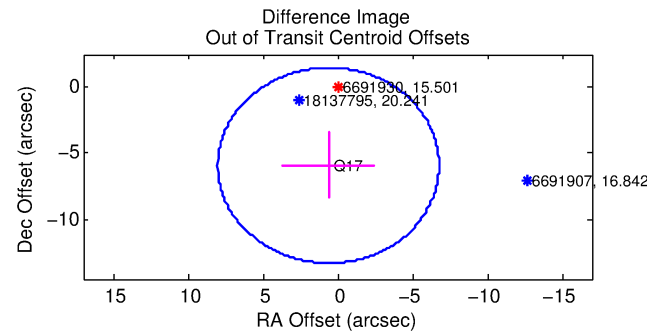
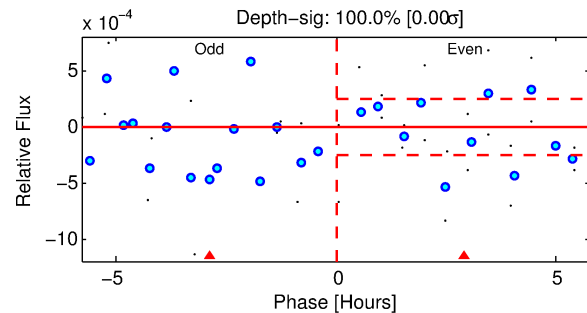
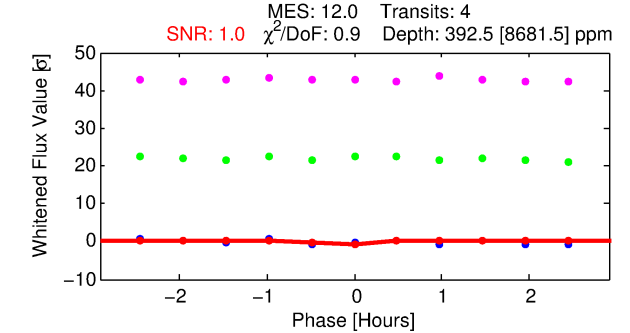
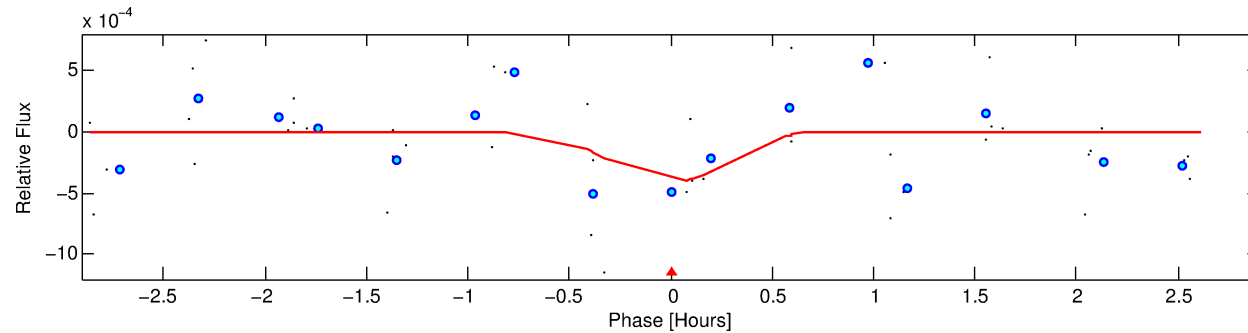
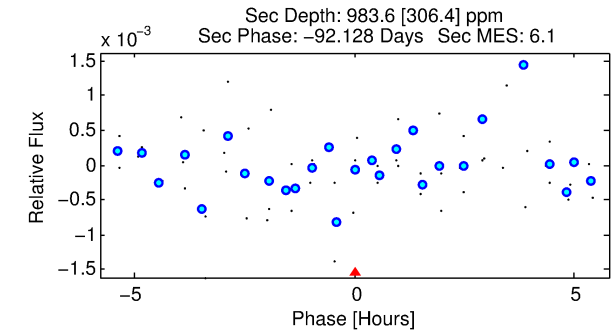
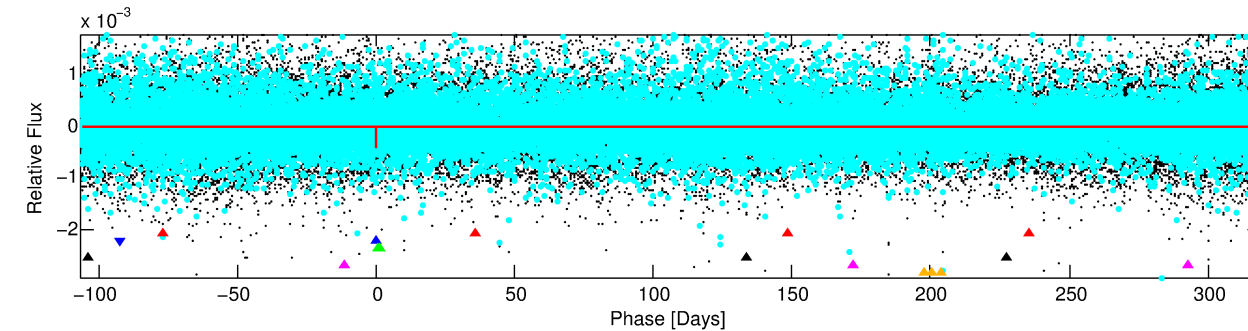
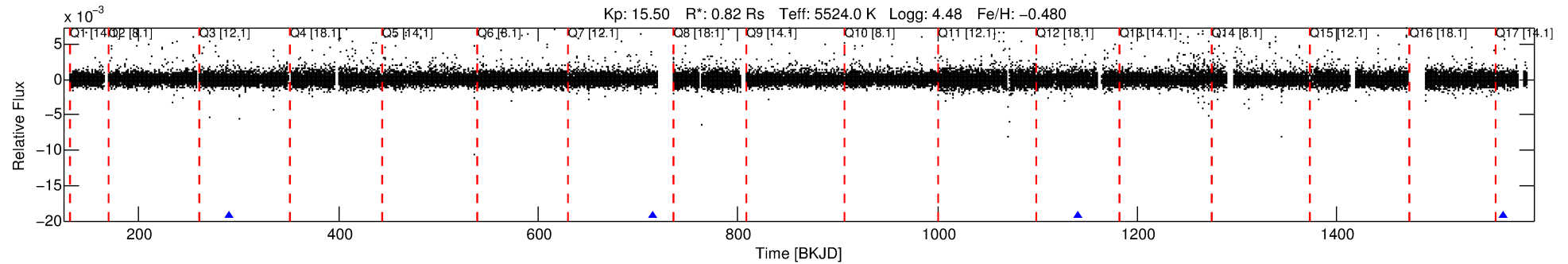
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006691930-02

No Significant Match Found

# DV One-Page Summary

KIC: 6691930 Candidate: 2 of 6 Period: 425.101 d



## DV Fit Results:

Period = 425.10072 [0.07463] d  
Epoch = 290.4586 [0.0827] BKJD  
Rp/R\* = 0.0249 [0.8771]  
a/R\* = 1138.57 [91927.21]  
b = 0.97 [7.15]  
Seff = 0.56 [0.15]  
Teq = 220 [15] K  
Rp = 2.23 [78.49] Re  
a = 1.0021 [0.1581] AU  
Ag = 109080.42 [7671692.41] [0.01 $\sigma$ ]  
Teffp = 6194 [108910] K [0.05 $\sigma$ ]

## DV Diagnostic Results:

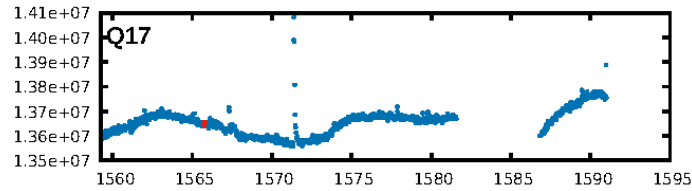
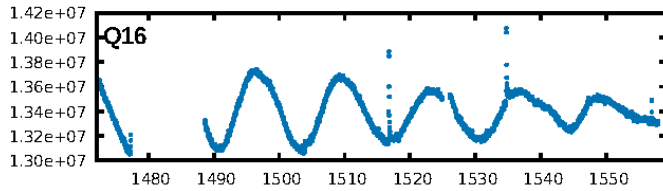
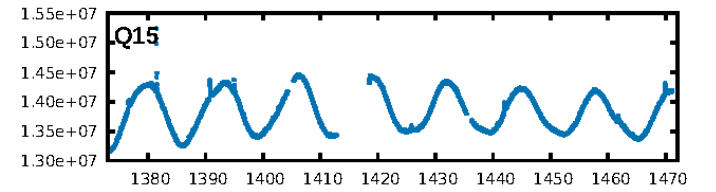
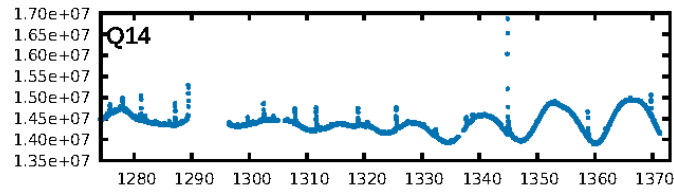
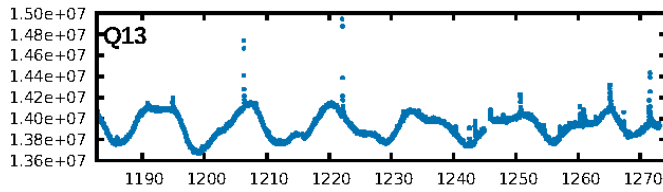
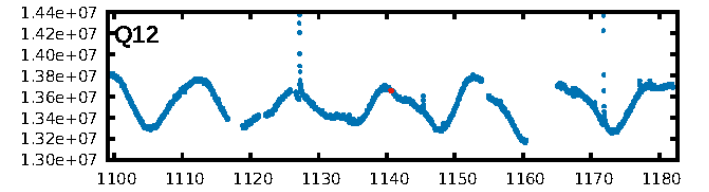
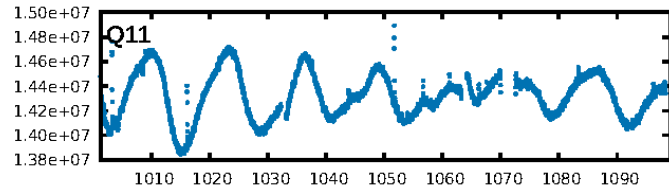
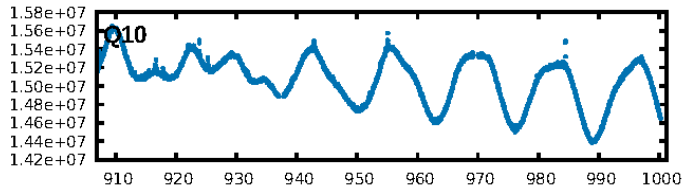
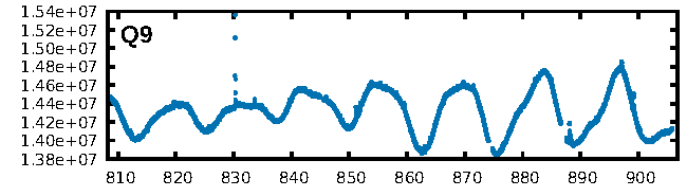
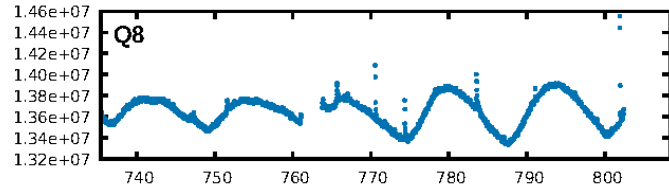
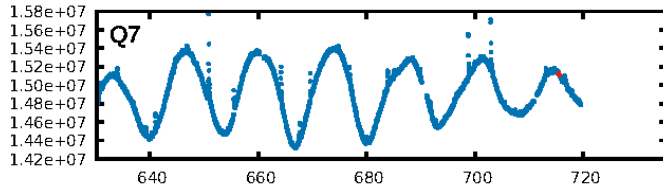
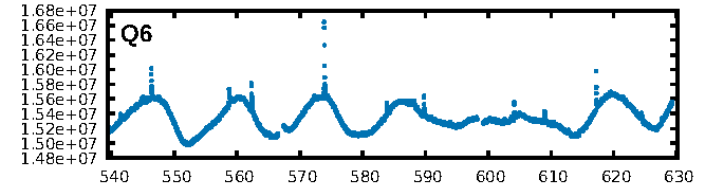
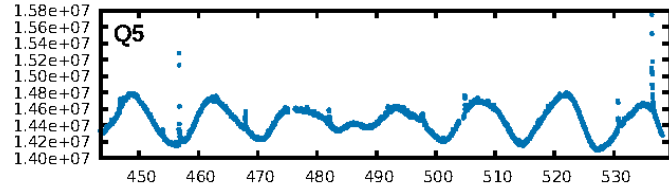
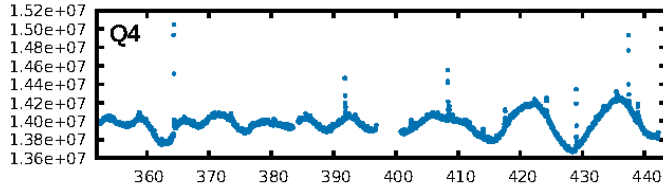
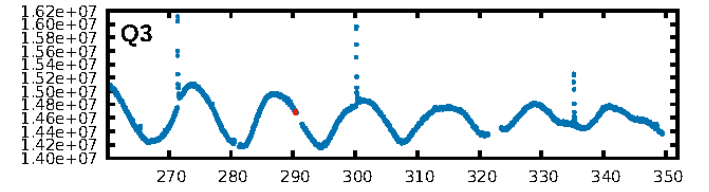
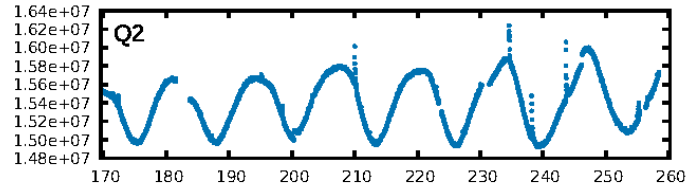
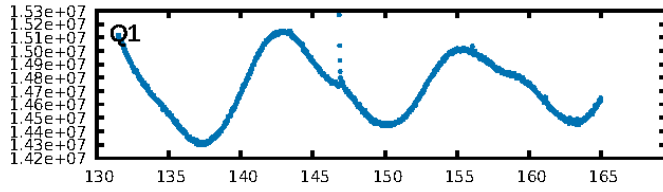
ShortPeriod-sig: 100.0% [210.78 $\sigma$ ]  
LongPeriod-sig: 43.2% [0.57 $\sigma$ ]  
ModelChiSquare2-sig: 96.1%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 7.49e-11**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -0.1972  
Centroid-sig: 59.6%  
Centroid-so: 3.725 arcsec [0.44 $\sigma$ ]  
OotOffset-rm: 5.937 arcsec [2.41 $\sigma$ ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-rm: 5.944 arcsec [2.41 $\sigma$ ]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:16:51 Z

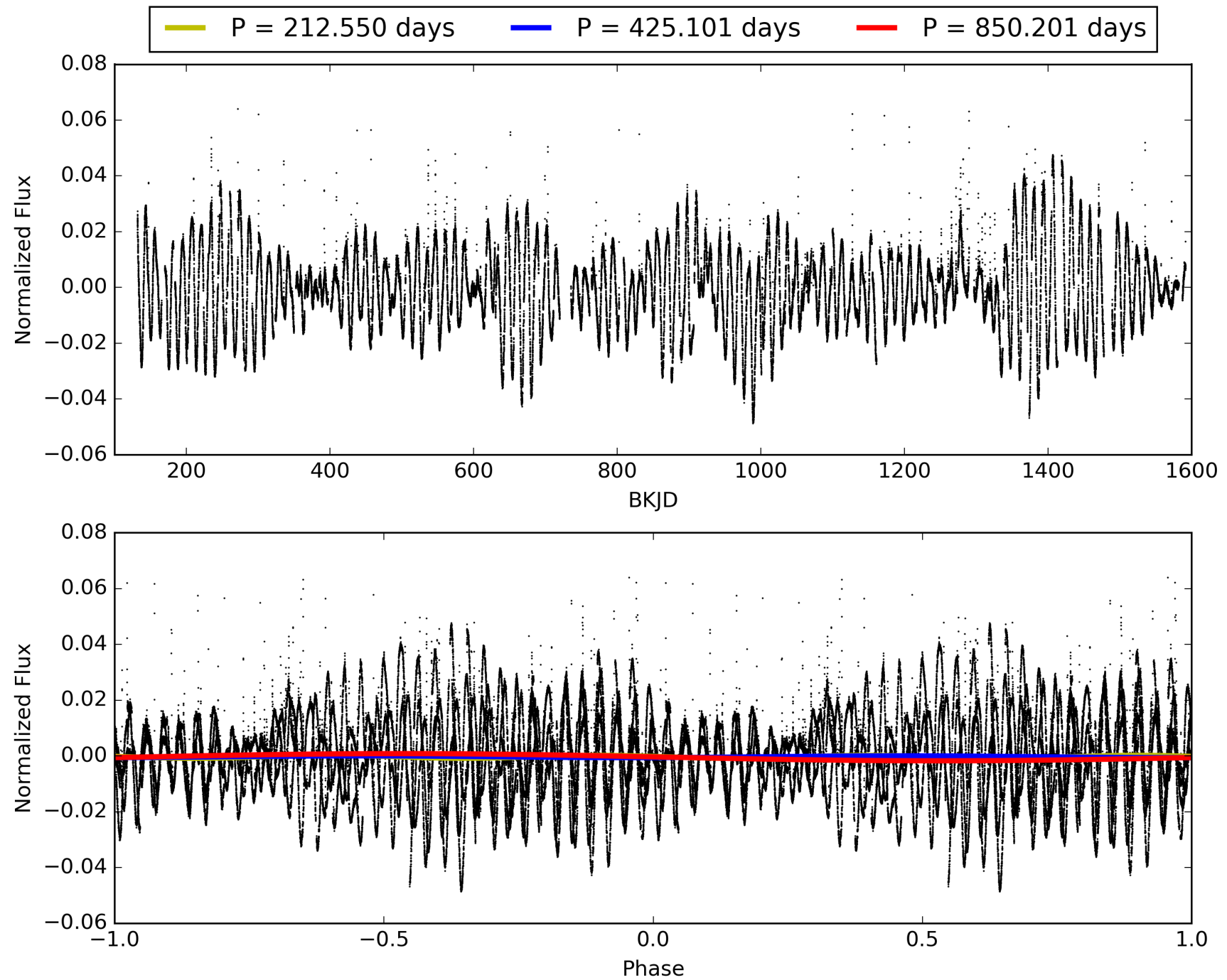
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006691930-02, PDC Light Curves

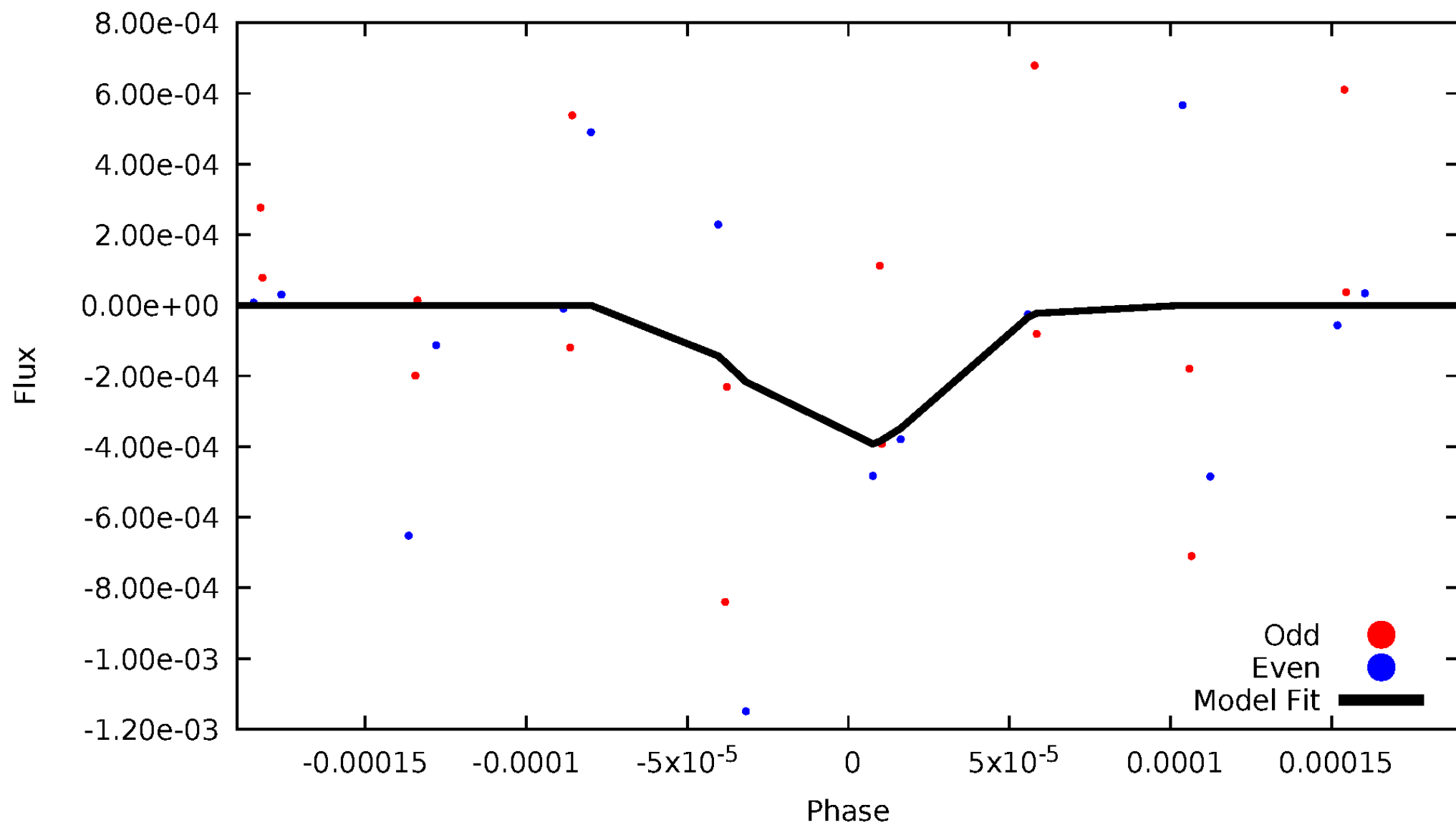


# TCE 006691930-02



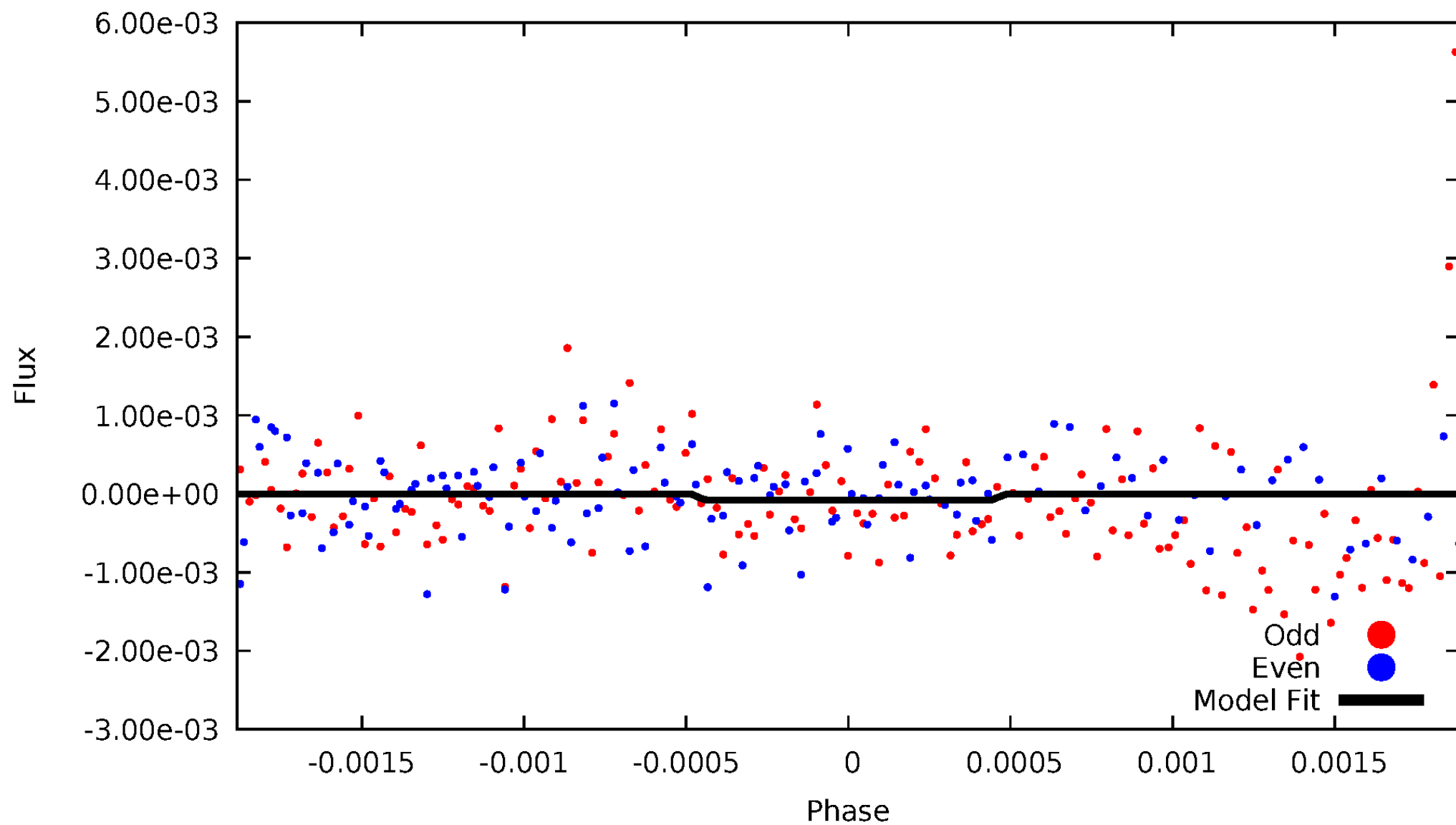
# DV Odd/Even

TCE 006691930-02



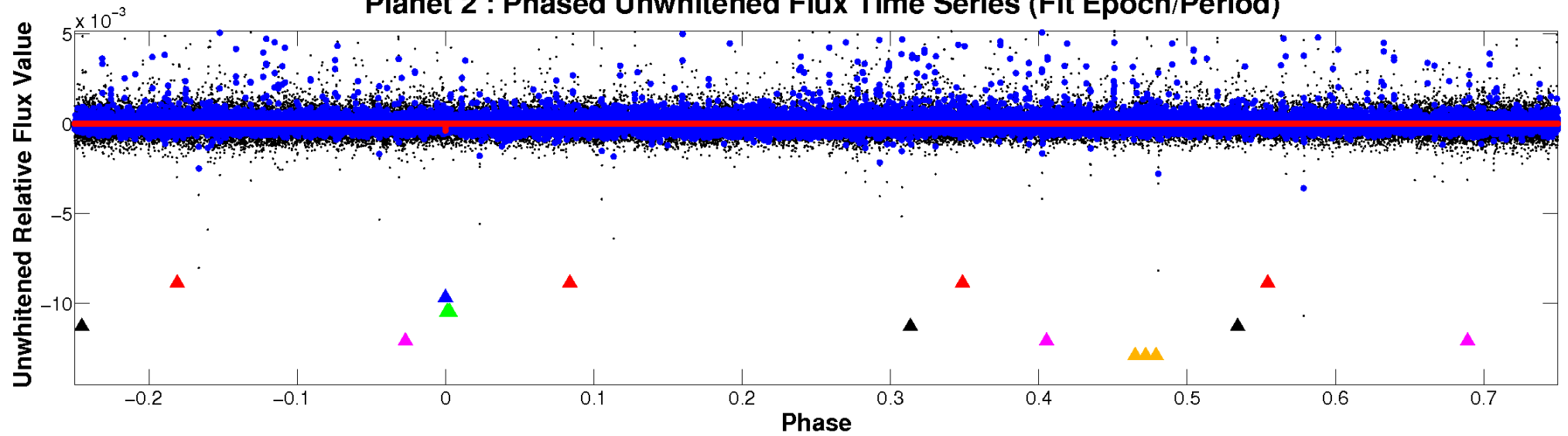
# ALT Odd/Even

TCE 006691930-02

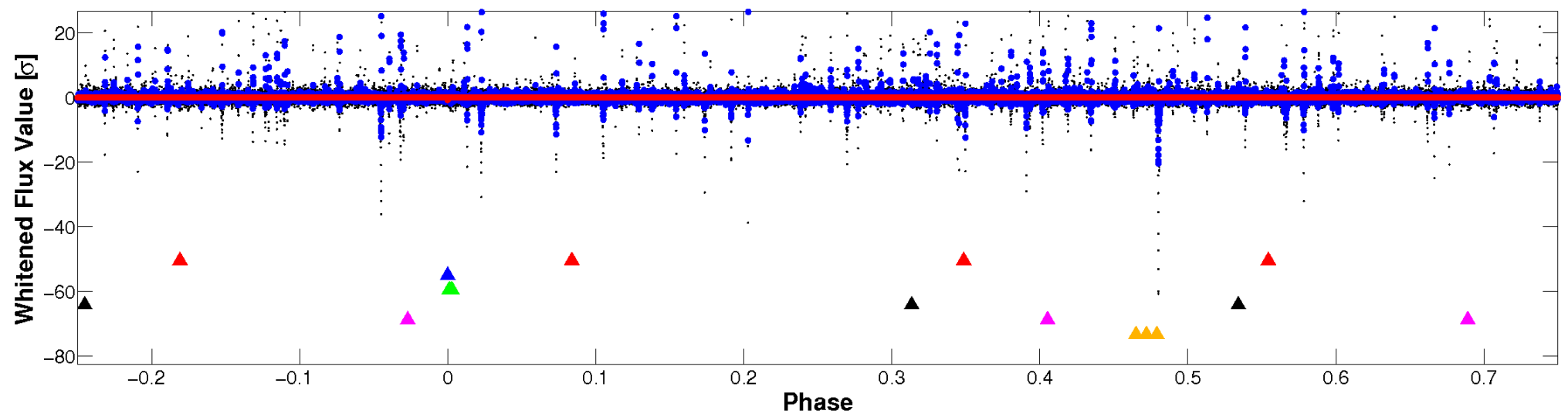


# Non-Whitened Vs. Whitened Light Curve

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

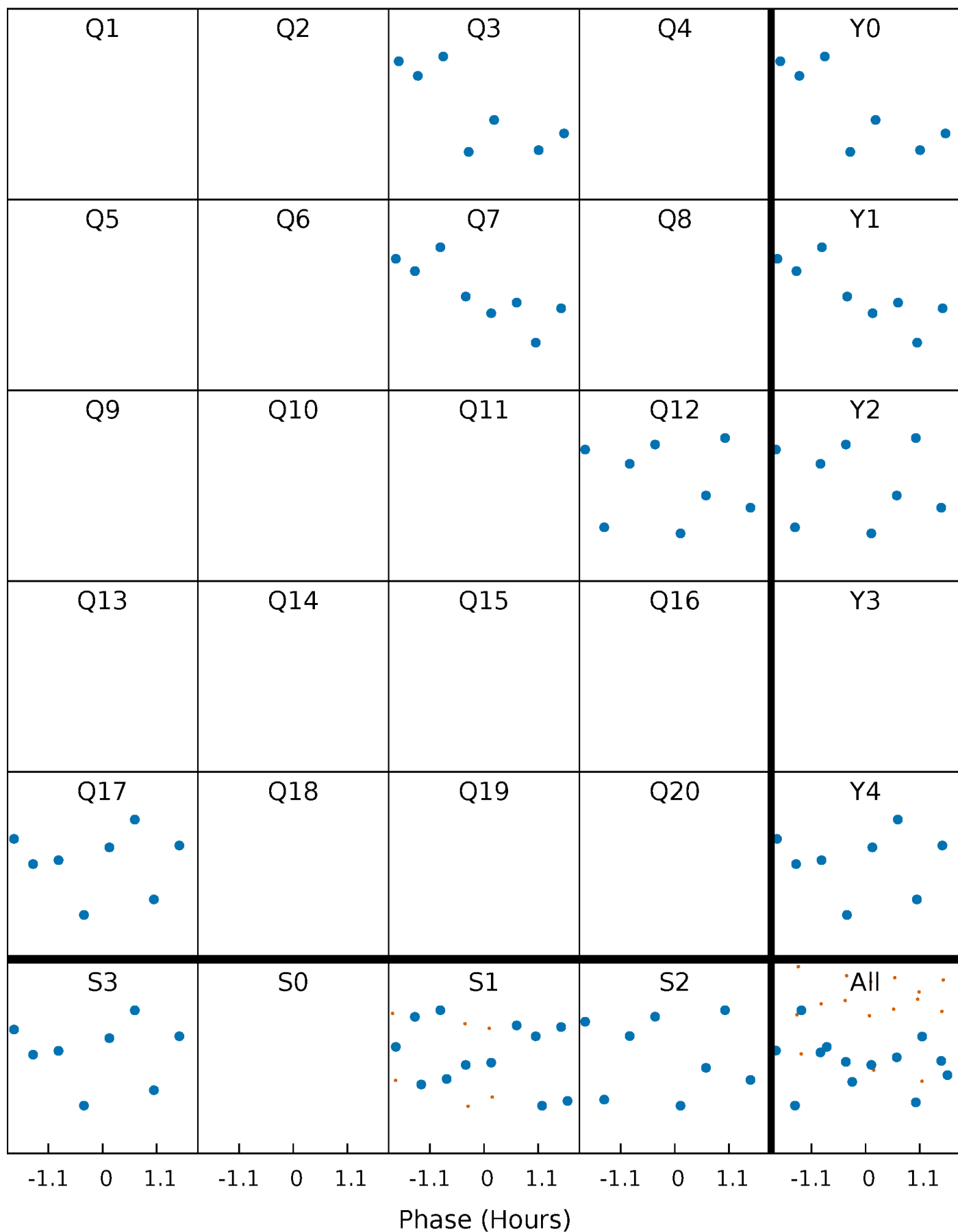


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

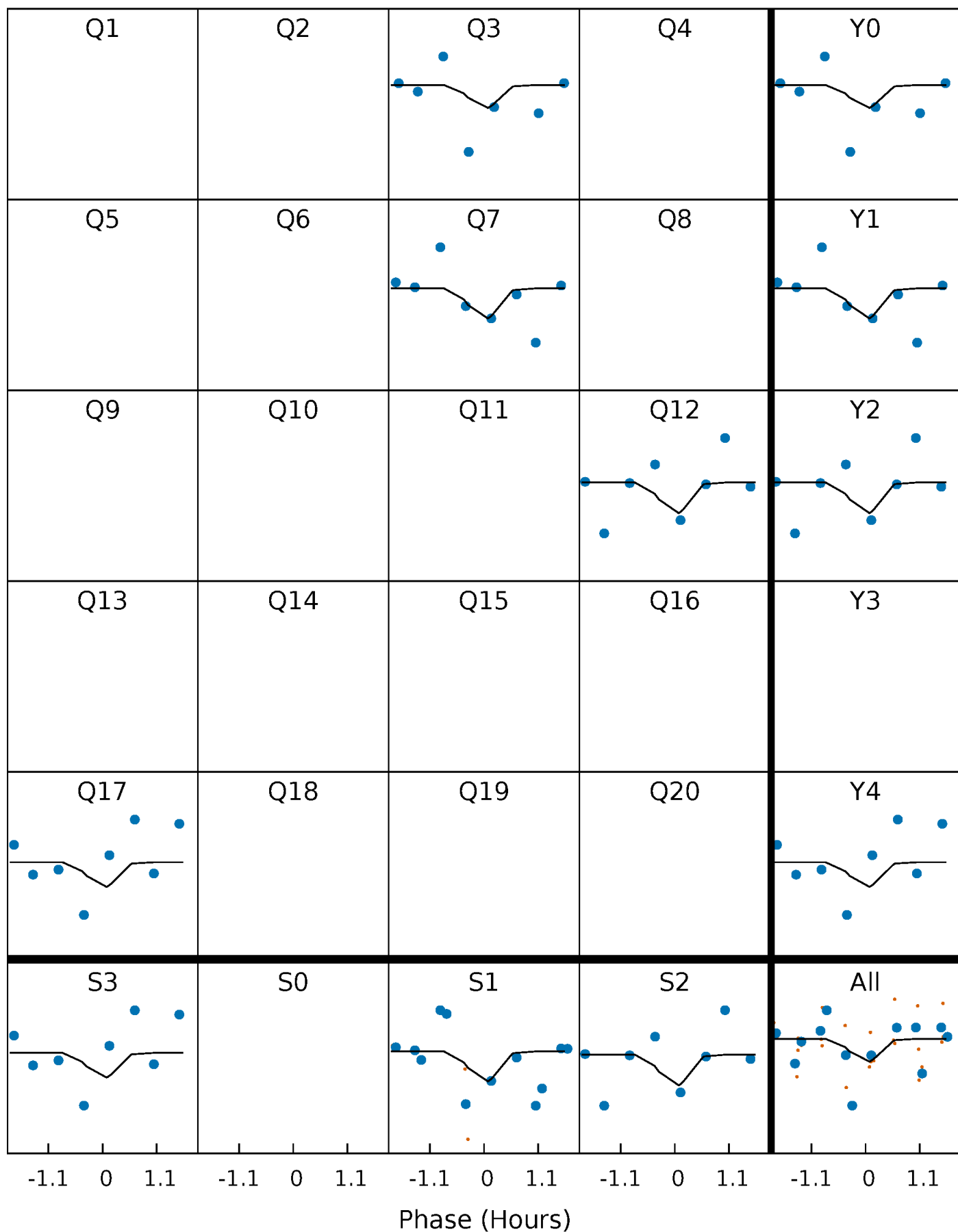
TCE 006691930-02 P=425.100719 Days  $T_0=290.458555$  (BKJD)





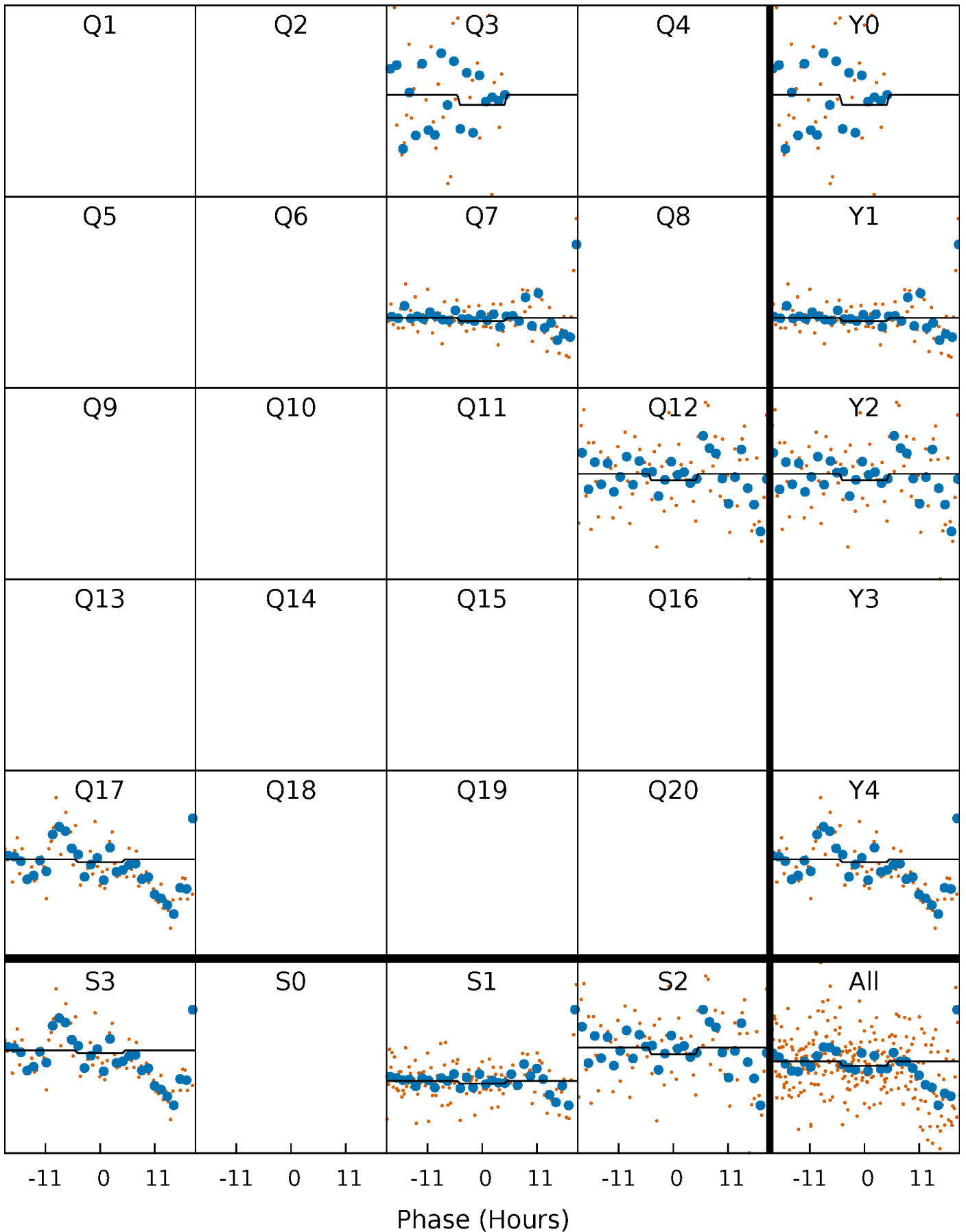
# DV Quarter-Phased Transit Curves

TCE 006691930-02 P=425.100719 Days  $T_0=290.458555$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

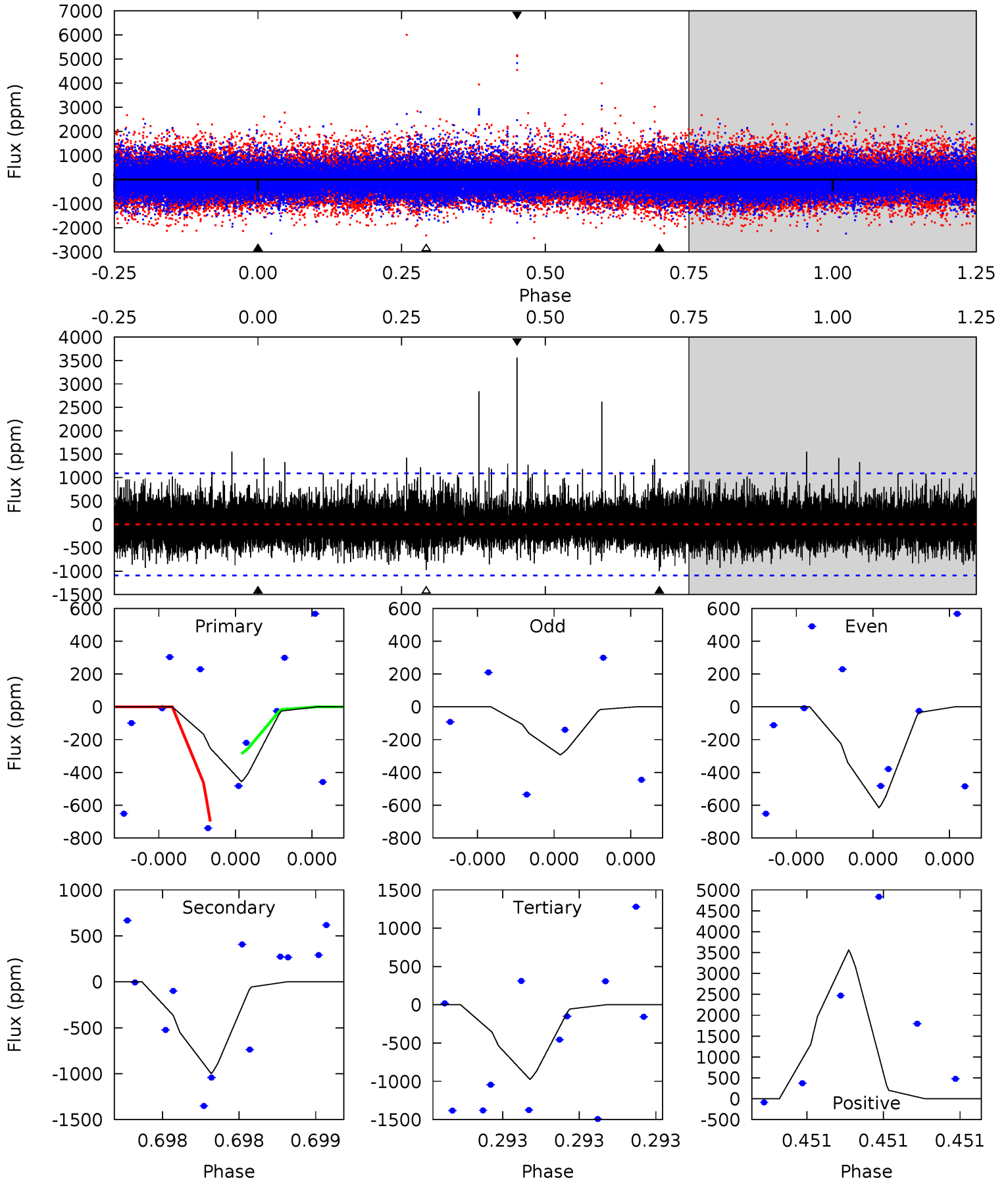
TCE 006691930-02     $P=425.372230$  Days     $T_0=290.363991$  (BKJD)



# DV Model-Shift Uniqueness Test

006691930-02, P = 425.100719 Days, E = 290.458555 Days

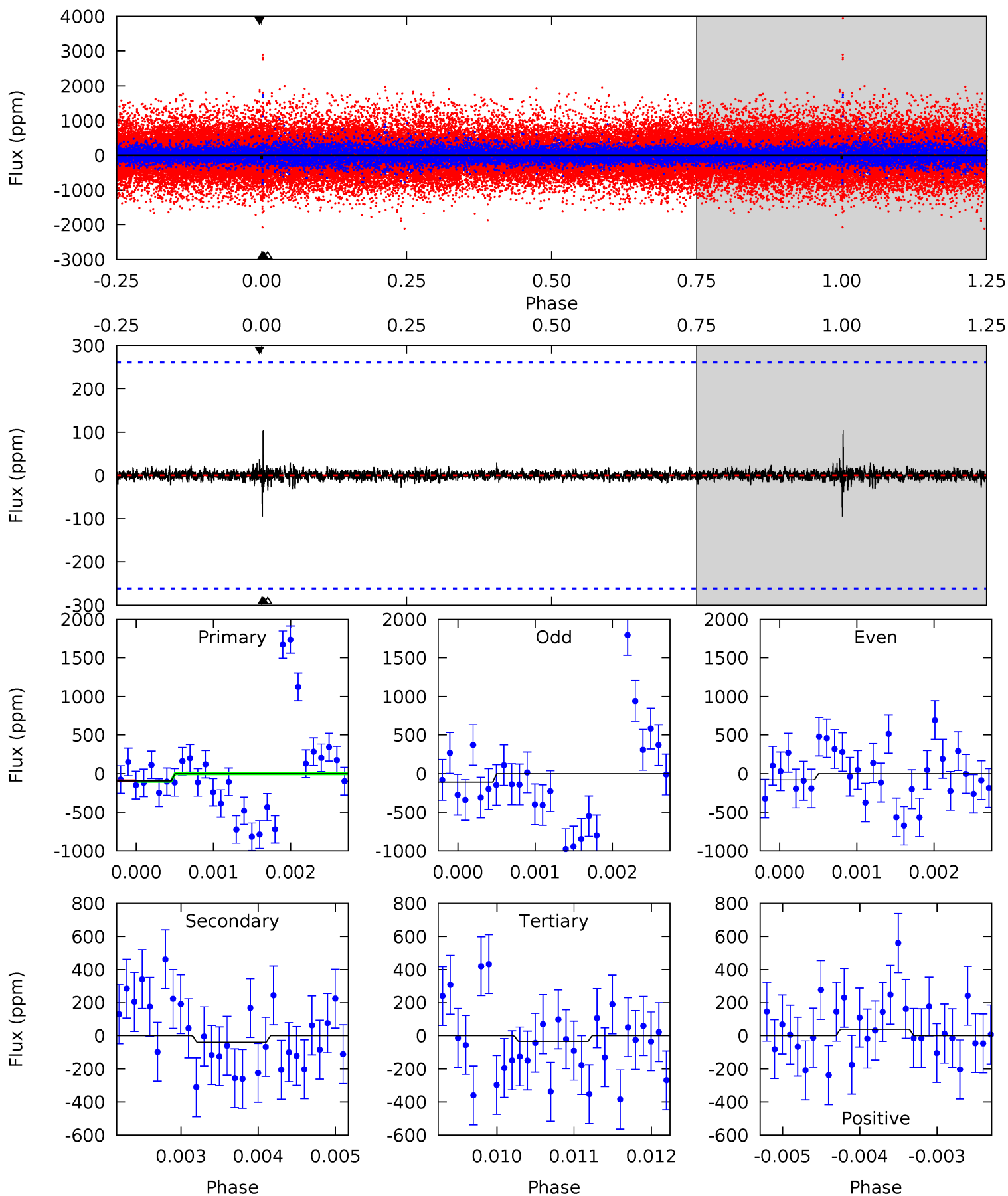
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.45	5.36	5.23	19.1	5.85	3.90	1.37	-2.78	-16.7	0.13	-13.7	0.55	1.18	0.78	0.97



# Alt Model-Shift Uniqueness Test

006691930-02, P = 425.372230 Days, E = 290.363991 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
1.99	0.81	0.72	0.79	5.46	3.30	0.14	1.26	1.19	0.09	0.02	0.31	1.19	0.52	0.07



### Stellar Parameters For KIC 006691930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5524^{+180}_{-163}$	$4.481^{+0.113}_{-0.125}$	$-0.480^{+0.300}_{-0.300}$	$0.820^{+0.154}_{-0.116}$	$0.742^{+0.116}_{-0.041}$	$1.897^{+0.930}_{-0.683}$
	+3%/-3%	+3%/-3%	+62%/-62%	+19%/-14%	+16%/-6%	+49%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006691930-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-999 \pm 186$	$55.80^{+59.61}_{-40.51}$	$308^{+17}_{-16}$	$2195^{+834}_{-299}$	$171^{+2164}_{-127}$
Alt.	$-39 \pm 48$	$54.44^{+55.16}_{-38.95}$	$309^{+17}_{-17}$	$1545^{+449}_{-2963}$	$4.638^{+67.573}_{-5.610}$

$T_{\text{max}}$  = 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

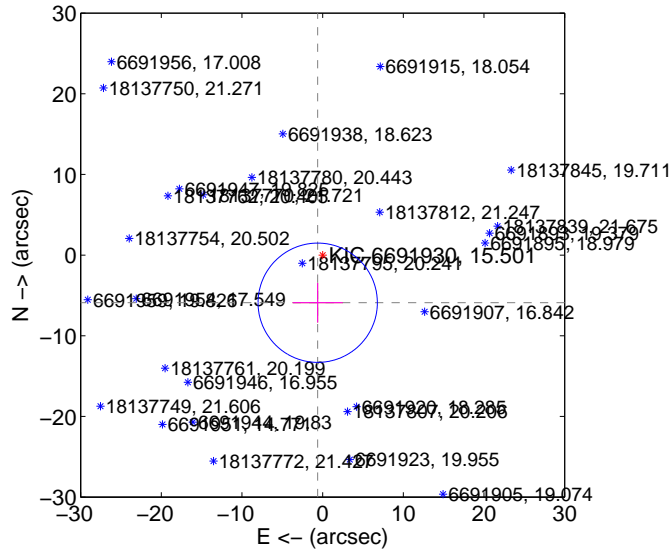
Supplemental centroid analysis for 006691930-02. Kepler magnitude: 15.50. Transit SNR 1.01

There are 0 quarters with good PRF difference image offsets

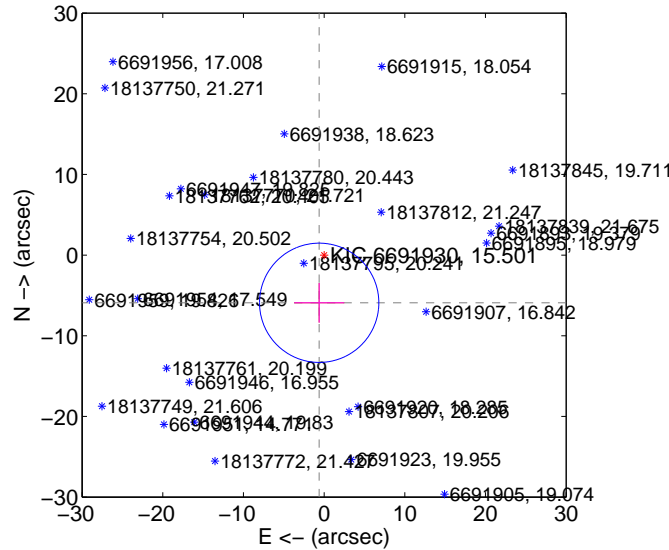
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.937 \pm 2.464$	2.41	$0.612 \pm 3.106$	$-5.906 \pm 2.457$
PRF-fit source offset from KIC position	$5.944 \pm 2.464$	2.41	$0.612 \pm 3.106$	$-5.913 \pm 2.457$
photometric centroid source offset	$3.73 \pm 8.42$	0.44	$2.17 \pm 8.22$	$-3.03 \pm 8.52$

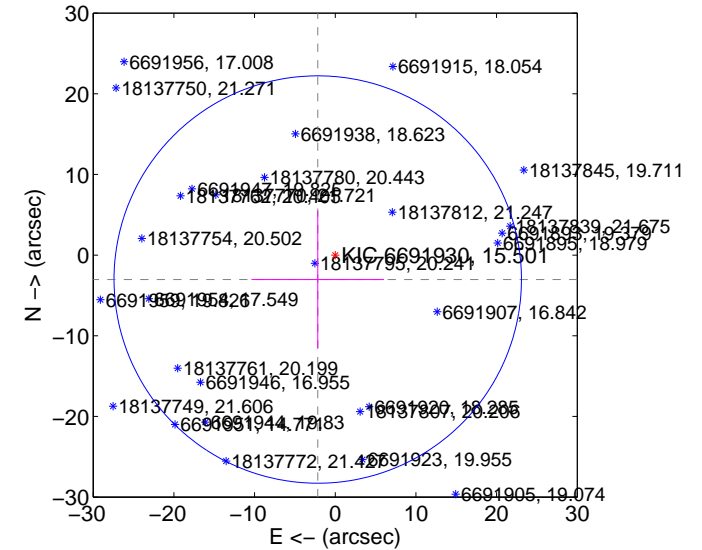
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

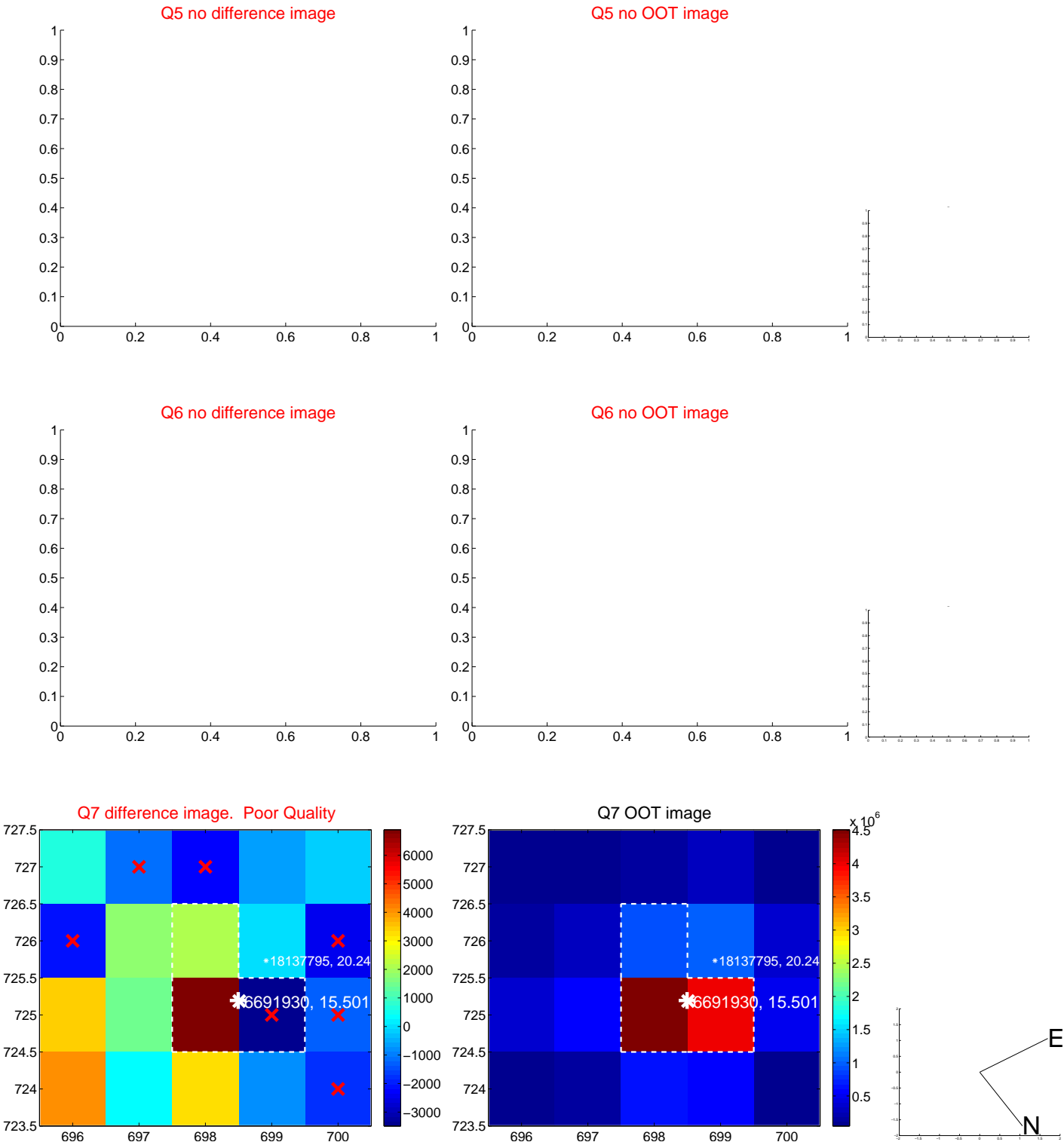


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

Q9 no difference image



Q9 no OOT image



Q10 no difference image



Q10 no OOT image



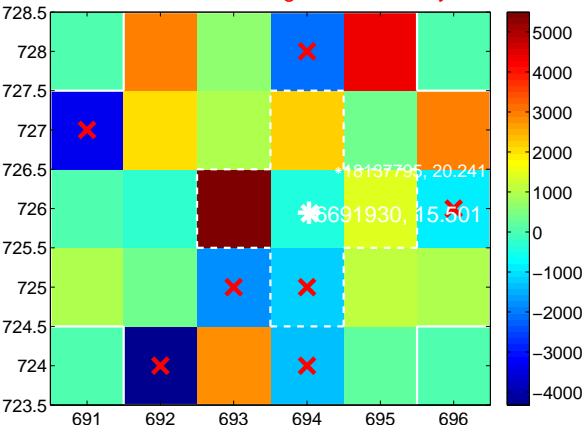
Q11 no difference image



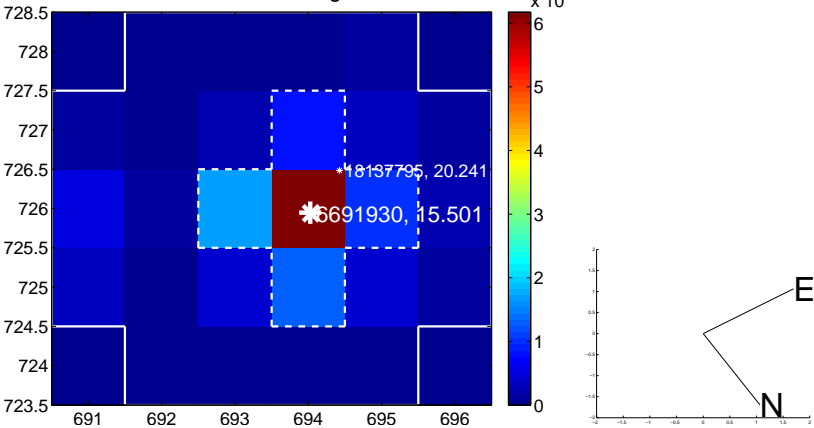
Q11 no OOT image



Q12 difference image. Poor Quality



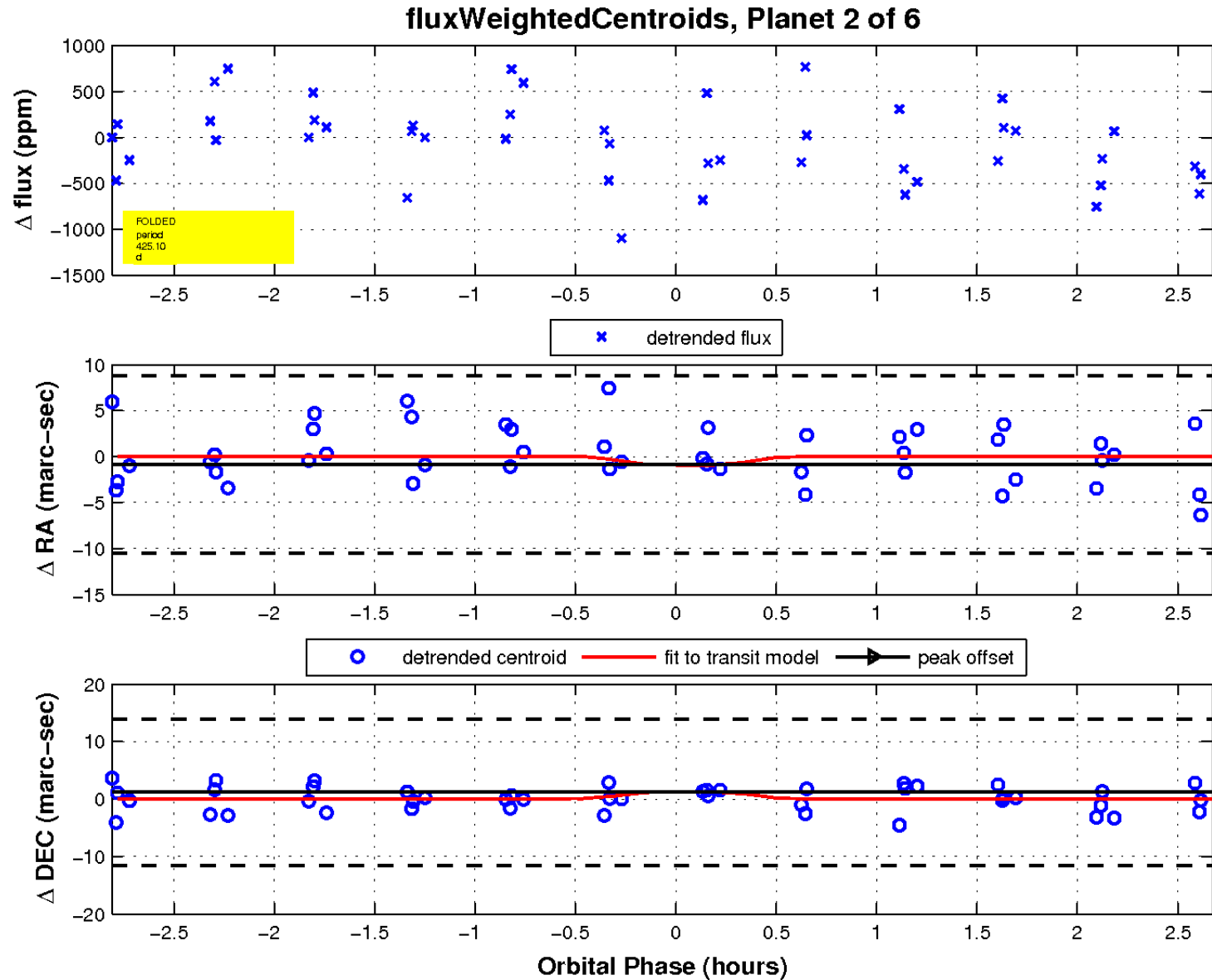
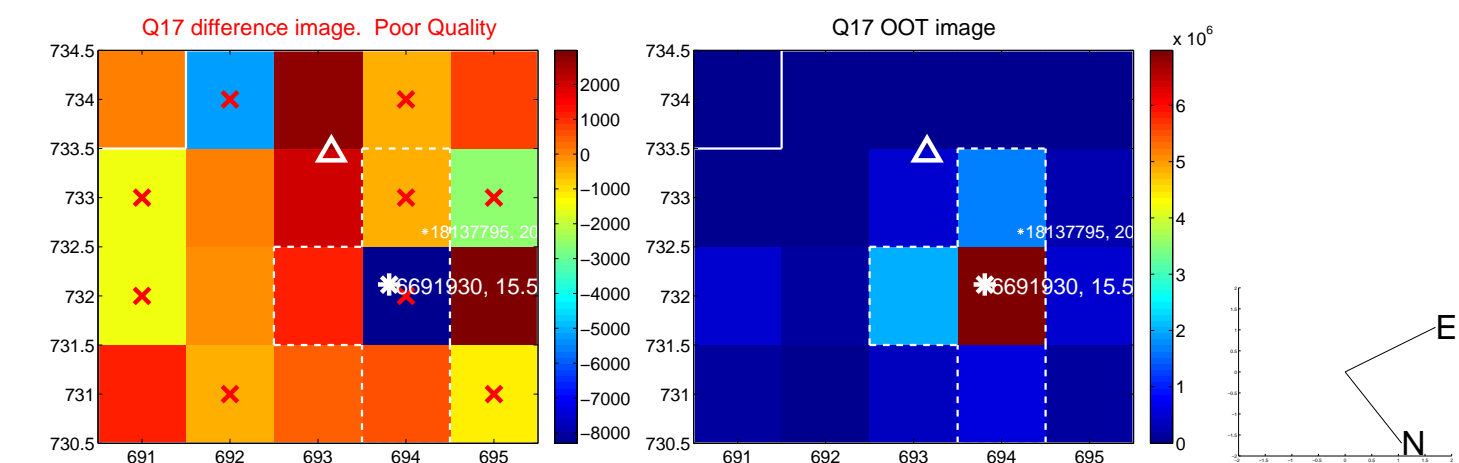
Q12 OOT image



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

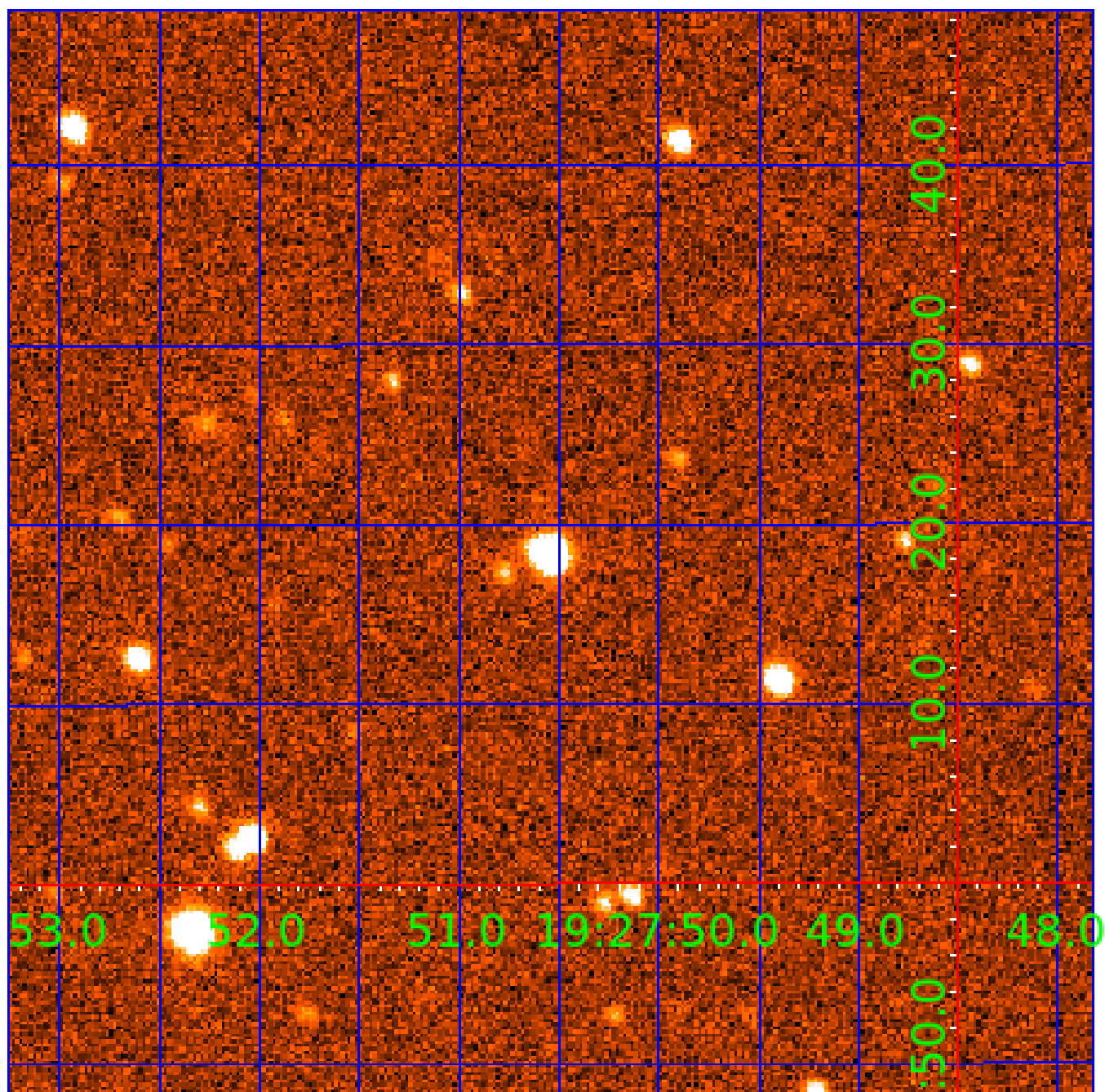


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 006691930

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006691930-01	OBS	No	312.559954	438.656327	2199.8	12.778	15.2	8.7	0.82	5524	4.11	0.84
006691930-02	OBS	No	425.100719	290.458555	392.5	0.968	12.0	1.0	0.82	5524	2.23	0.56
006691930-03	OBS	No	425.394623	290.856289	1270.6	12.307	11.9	6.7	0.82	5524	3.00	0.56
006691930-04	OBS	No	518.903445	423.710902	995.5	10.500	11.2	-1.0	0.82	5524	2.56	0.43
006691930-05	OBS	No	545.771146	462.745706	2422.3	7.332	9.6	9.4	0.82	5524	4.09	0.40
006691930-06	OBS	No	428.090130	488.134669	2007.3	13.294	9.8	8.9	0.82	5524	4.36	0.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006691930-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006691930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006691930-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006691930-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

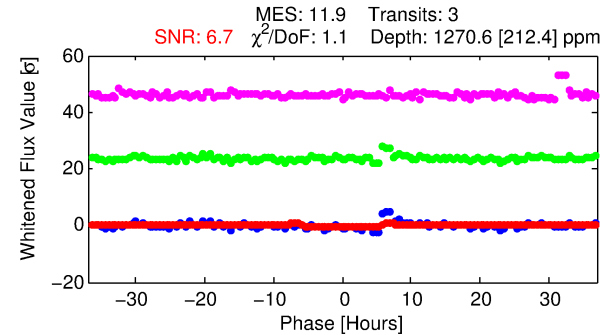
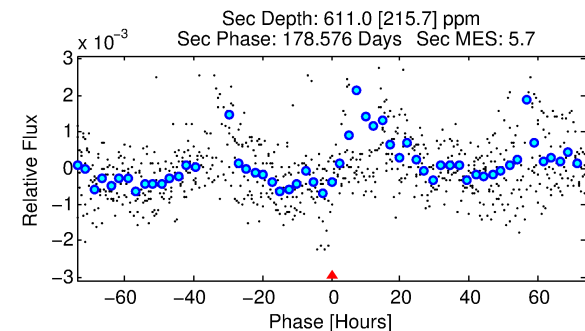
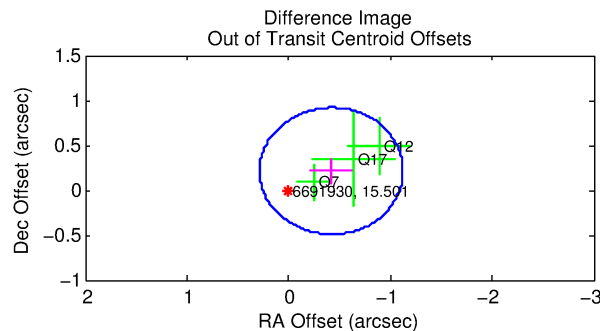
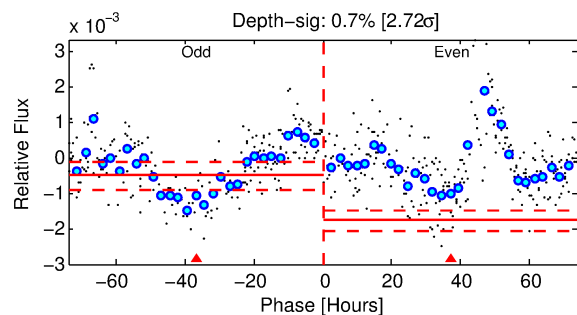
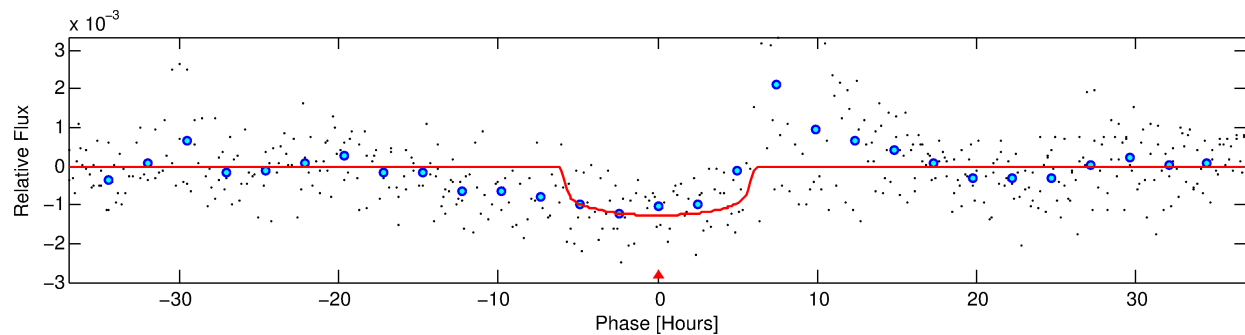
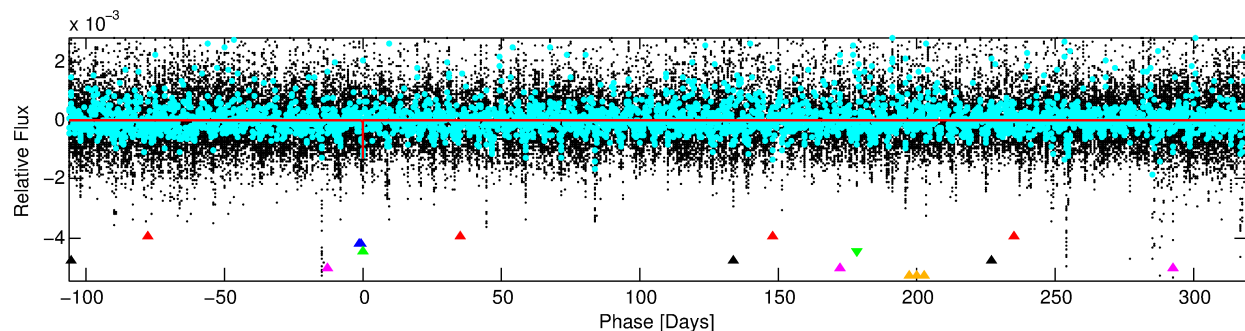
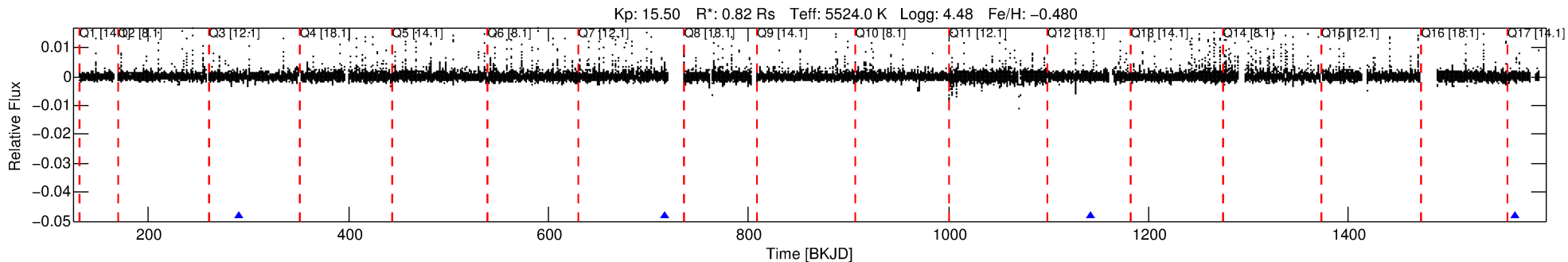
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006691930-03

No Significant Match Found

# DV One-Page Summary

KIC: 6691930 Candidate: 3 of 6 Period: 425.395 d



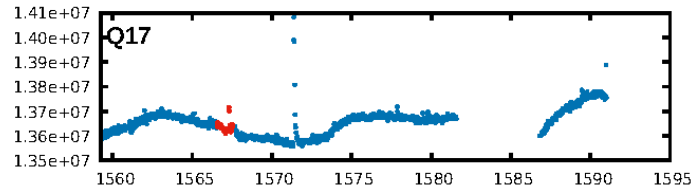
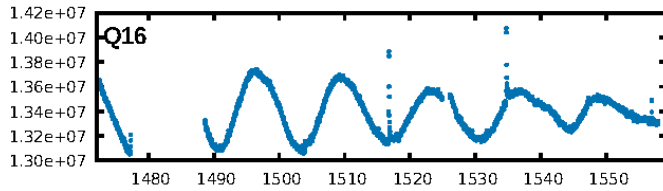
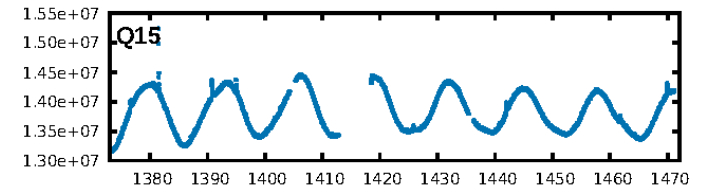
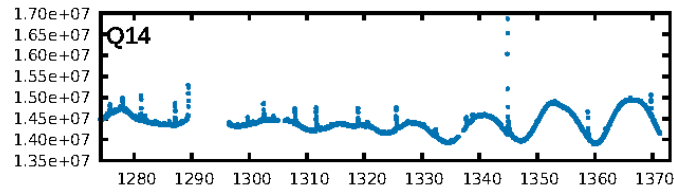
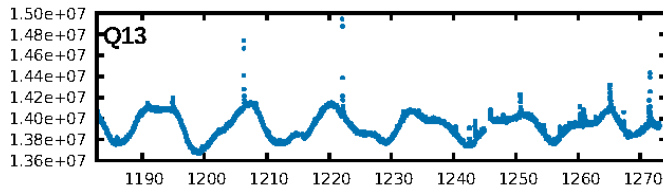
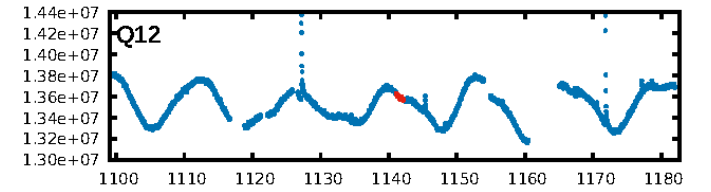
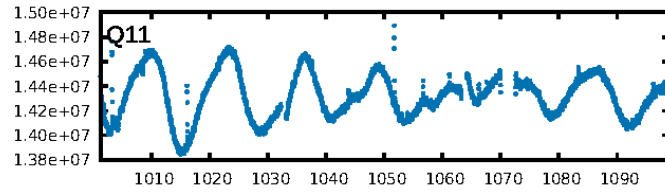
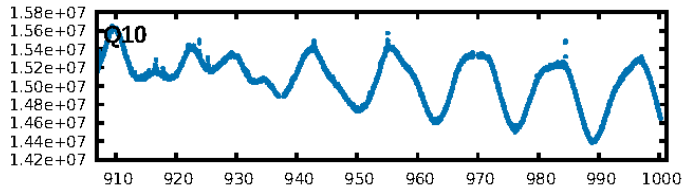
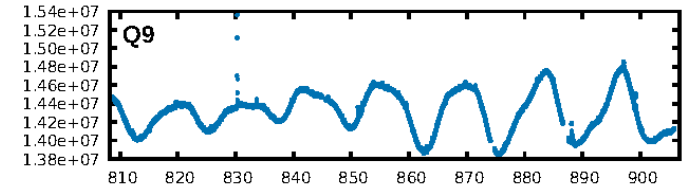
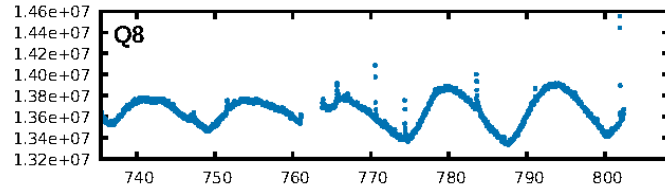
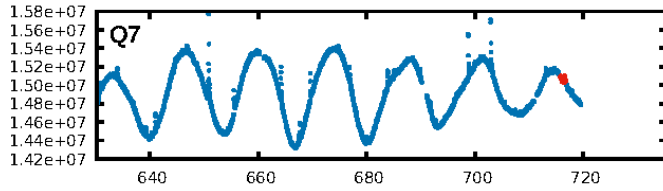
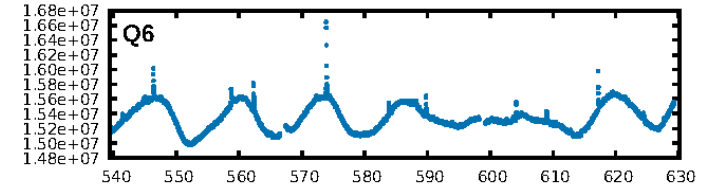
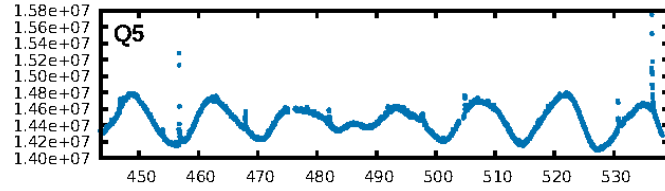
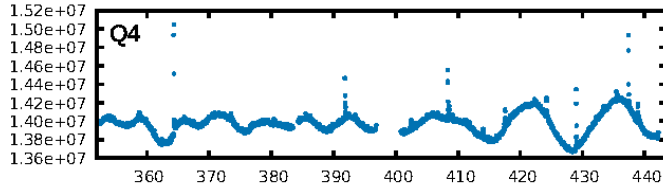
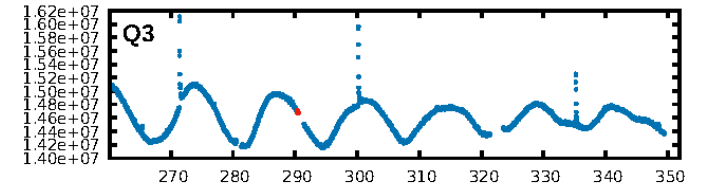
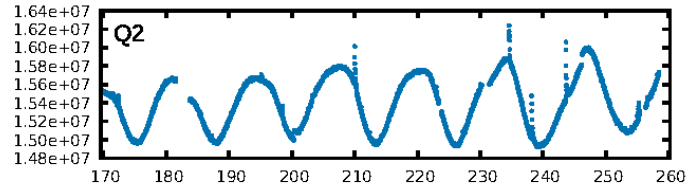
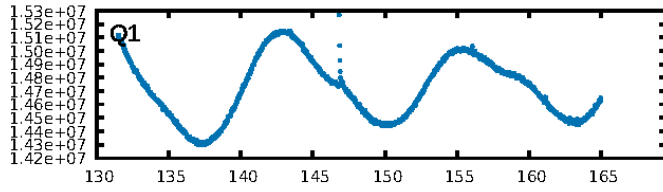
## DV Fit Results:

Period = 425.39462 [0.01012] d  
Epoch = 290.8563 [0.0218] BKJD  
Rp/R\* = 0.0336 [0.0114]  
a/R\* = 232.90 [323.00]  
b = 0.54 [1.84]  
Seff = 0.56 [0.15]  
Teq = 220 [15] K  
Rp = 3.01 [1.17] Re  
a = 1.0025 [0.1581] AU  
Ag = 37406.67 [29865.63] [1.25σ]  
Teffp = 4739 [919] K [4.92σ]

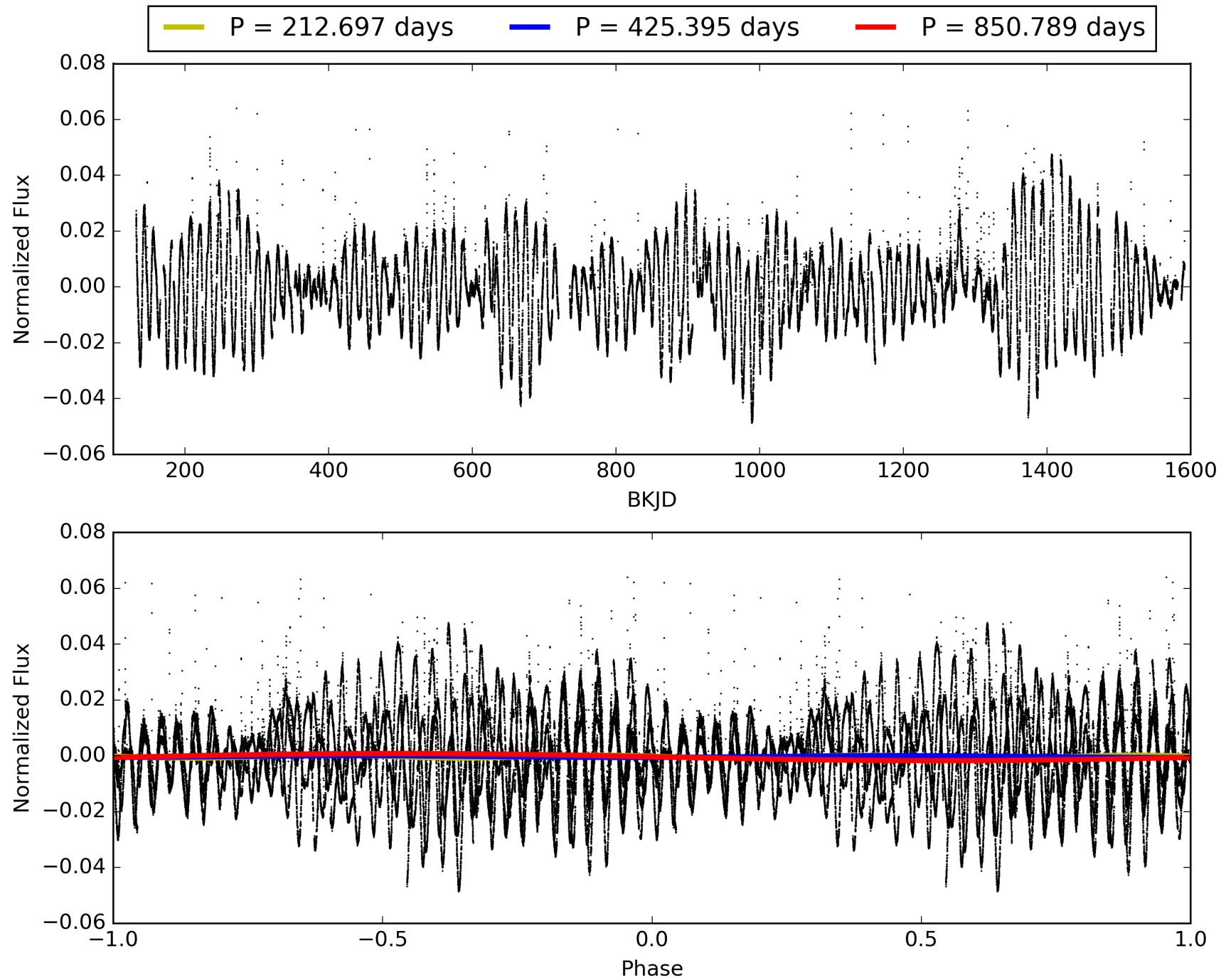
## DV Diagnostic Results:

ShortPeriod-sig: 43.2% [0.57σ]  
LongPeriod-sig: 100.0% [3.57σ]  
ModelChiSquare2-sig: 12.7%  
ModelChiSquareGof-sig: 98.2%  
**Bootstrap-pfa: 1.13e-10**  
RollingBand-fgt: 1.00 [2/2]  
**GhostDiagnostic-chr: 0.5753**  
Centroid-sig: 99.5%  
Centroid-so: 0.053 arcsec [0.07σ]  
OotOffset-rm: 0.470 arcsec [2.00σ]  
KicOffset-rm: 0.475 arcsec [2.36σ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.67 [2/3]

# TCE 006691930-03, PDC Light Curves



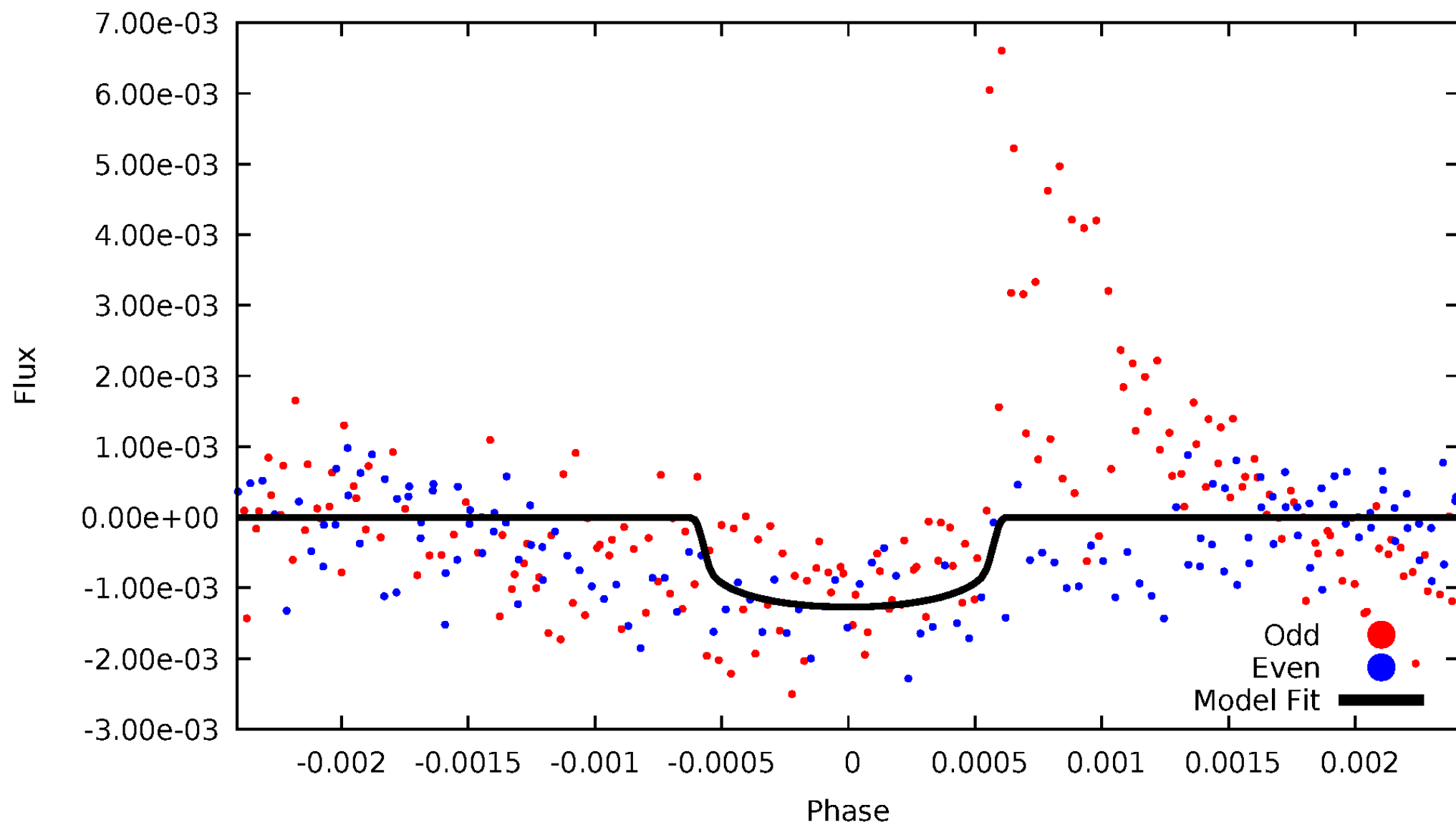
# TCE 006691930-03





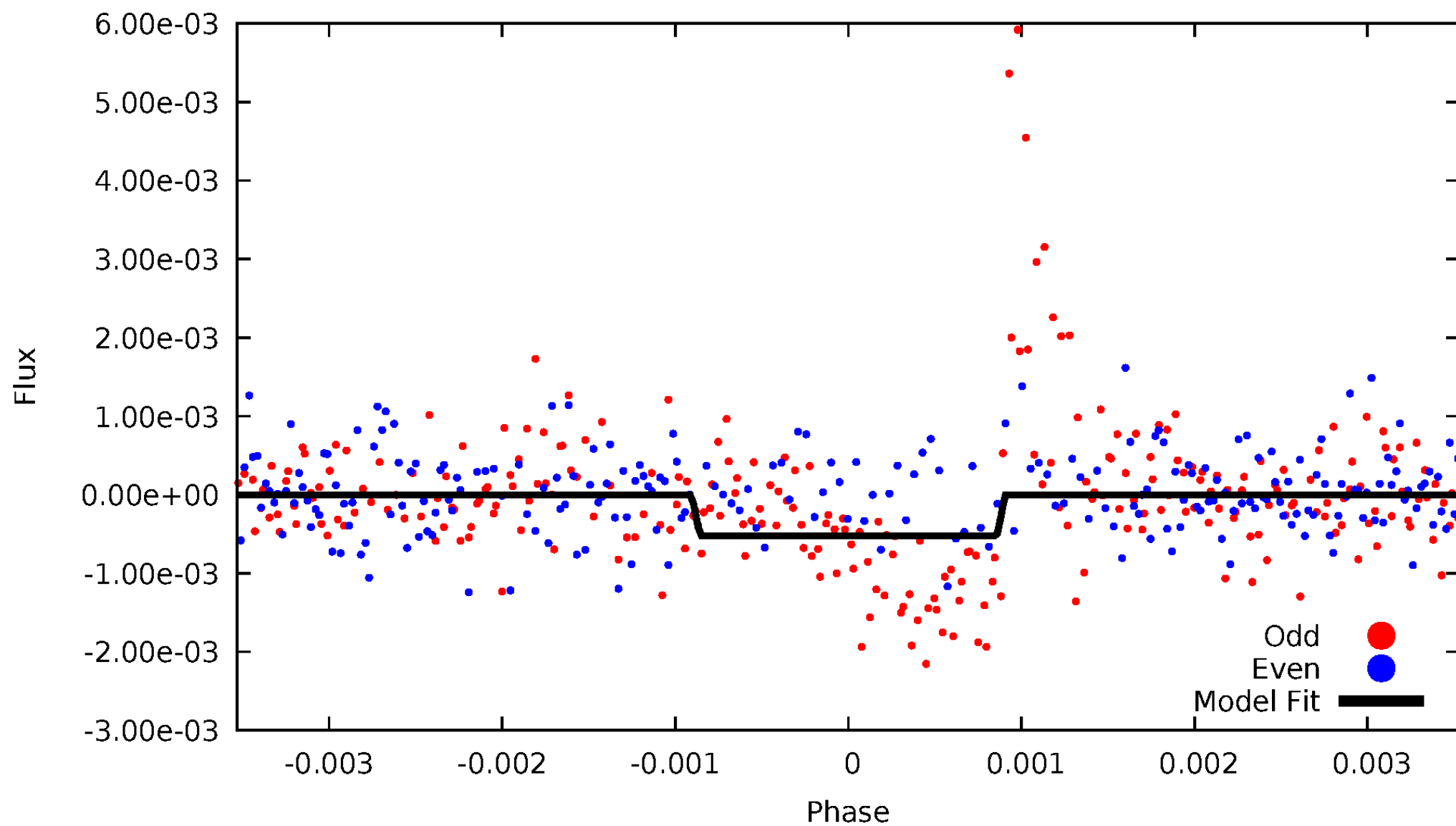
# DV Odd/Even

TCE 006691930-03



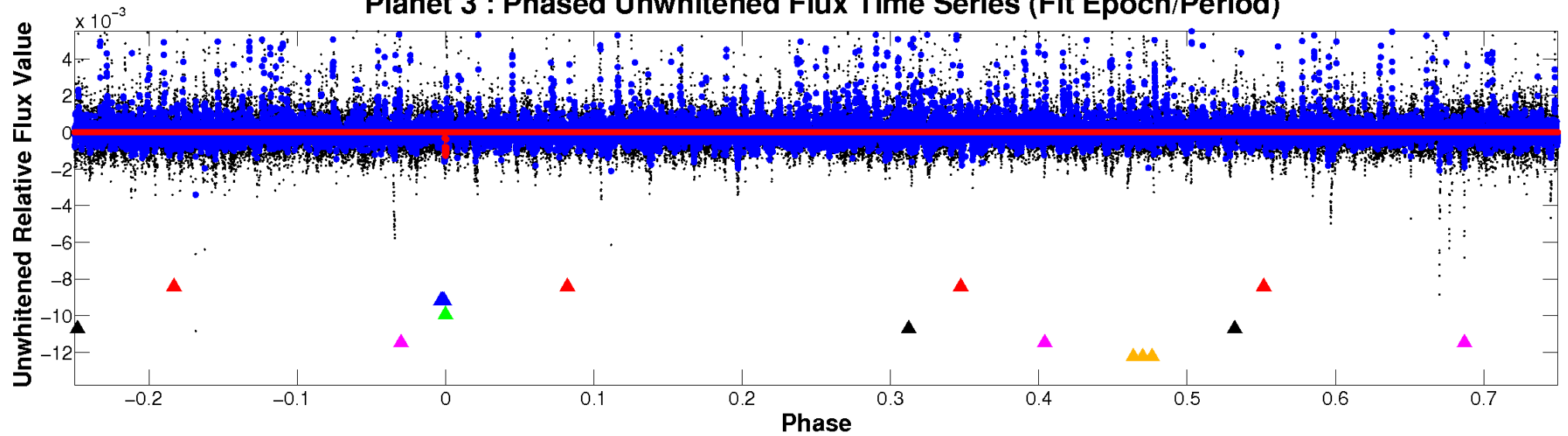
# ALT Odd/Even

TCE 006691930-03

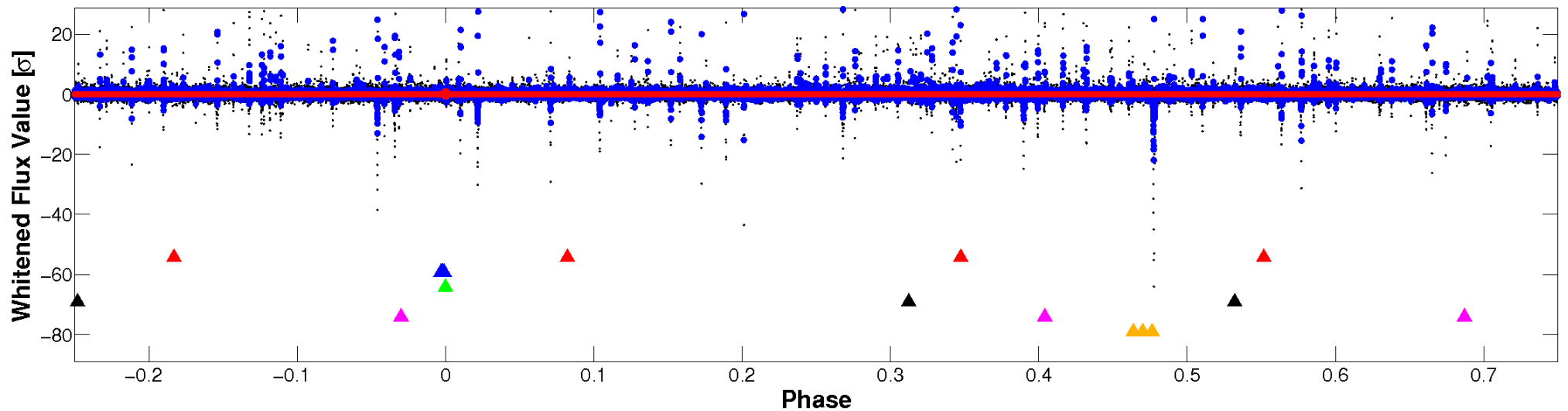


# Non-Whitened Vs. Whitened Light Curve

## Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

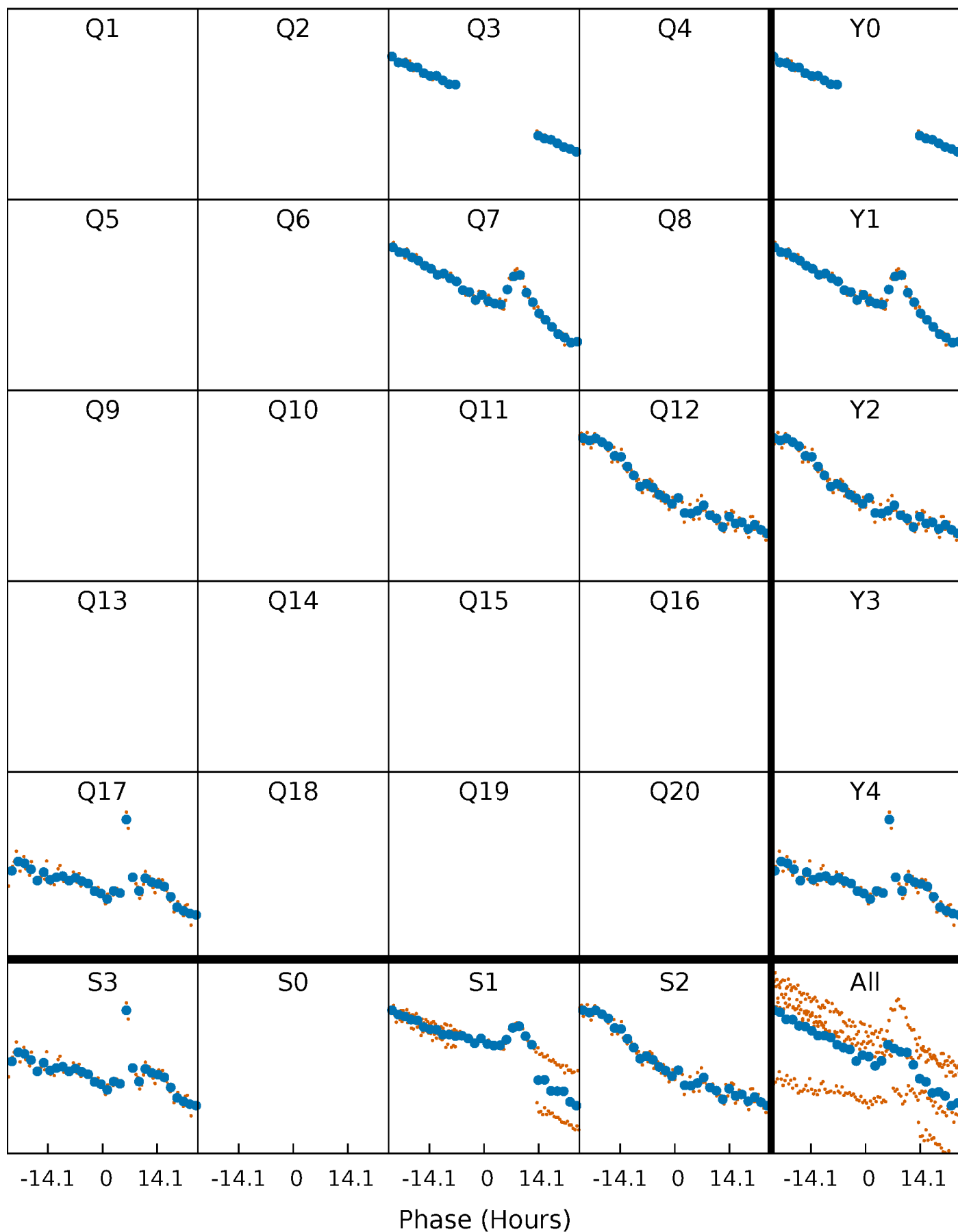


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



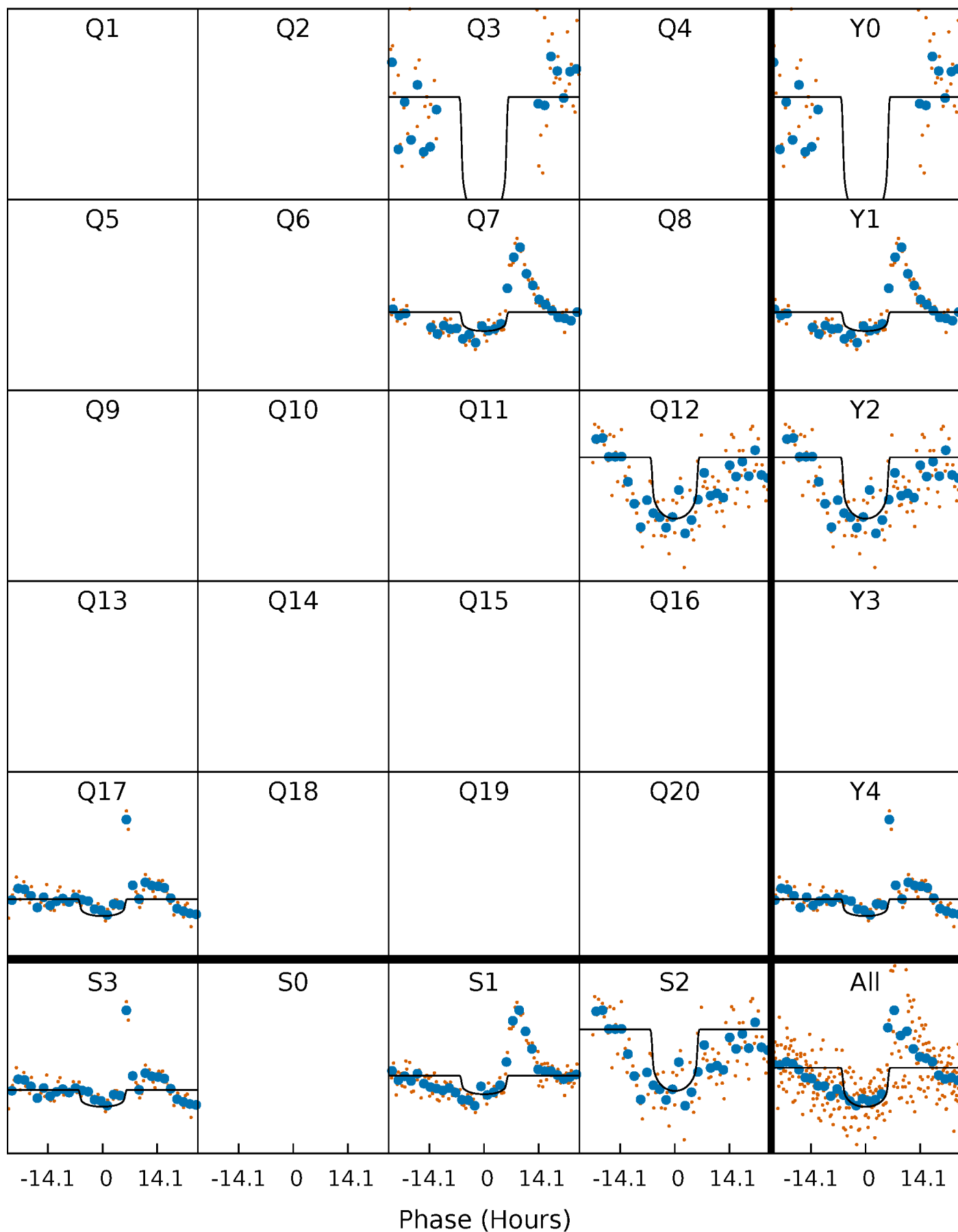
# PDC Quarter-Phased Transit Curves

TCE 006691930-03     $P=425.394623$  Days     $T_0=290.856289$  (BKJD)



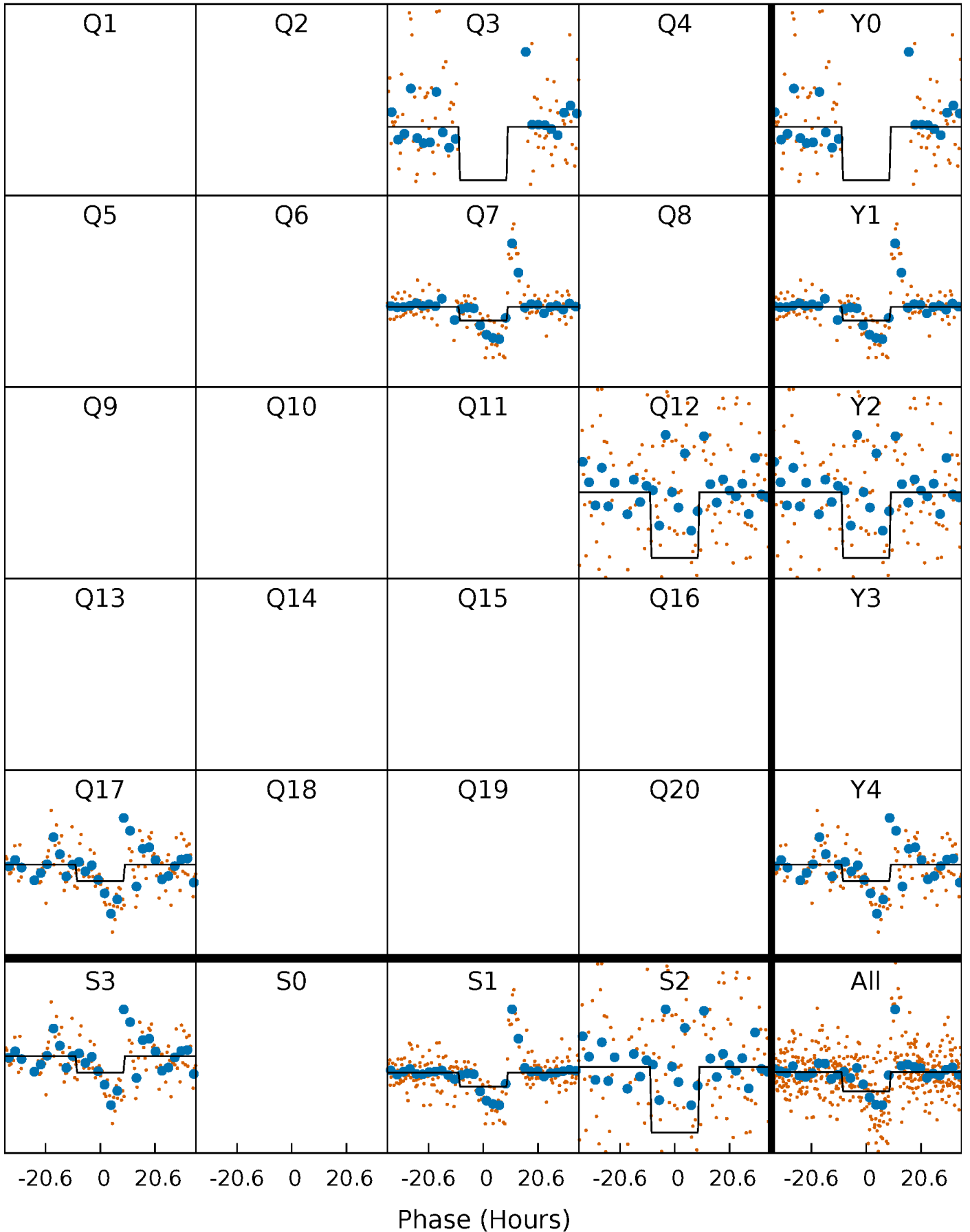
# DV Quarter-Phased Transit Curves

TCE 006691930-03     $P=425.394623$  Days     $T_0=290.856289$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

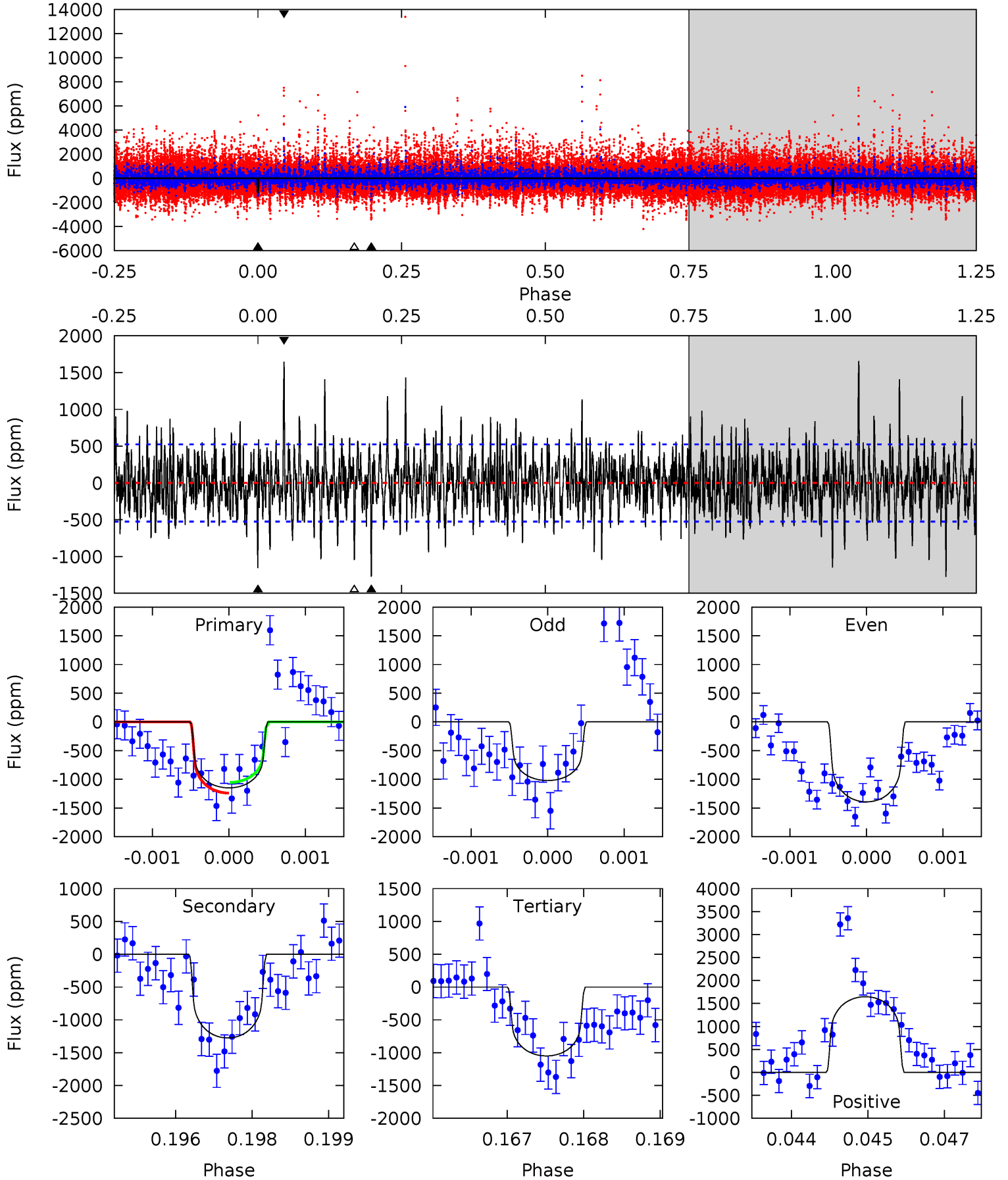
TCE 006691930-03     $P=425.379041$  Days     $T_0=290.744407$  (BKJD)



# DV Model-Shift Uniqueness Test

006691930-03, P = 425.394623 Days, E = 290.856289 Days

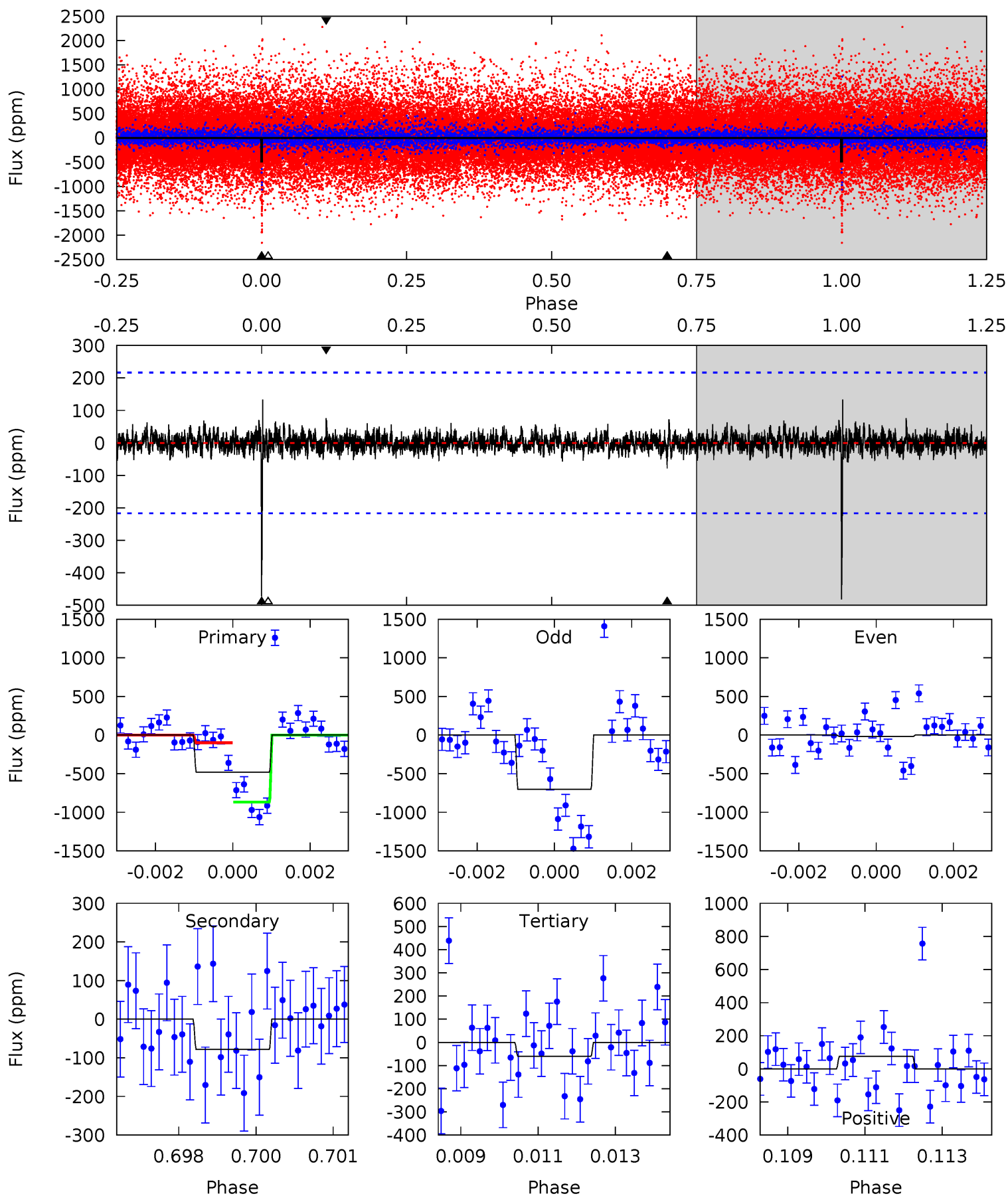
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	13.1	10.8	17.0	5.41	3.23	3.19	1.03	-5.12	2.33	-3.82	1.16	0.78	0.56	0.95



# Alt Model-Shift Uniqueness Test

006691930-03, P = 425.379041 Days, E = 290.744407 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	1.93	1.48	1.88	5.35	3.12	0.44	10.4	10.0	0.45	0.04	7.87	0.70	0.22	9.48





### Stellar Parameters For KIC 006691930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5524^{+180}_{-163}$	$4.481^{+0.113}_{-0.125}$	$-0.480^{+0.300}_{-0.300}$	$0.820^{+0.154}_{-0.116}$	$0.742^{+0.116}_{-0.041}$	$1.897^{+0.930}_{-0.683}$
	+3%/-3%	+3%/-3%	+62%/-62%	+19%/-14%	+16%/-6%	+49%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006691930-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1276 \pm 97$	$3.05^{+1.20}_{-1.10}$	$309^{+17}_{-16}$	$5666^{+1479}_{-717}$	$78601^{+115994}_{-38197}$
Alt.	$-78 \pm 41$	$2.05^{+1.01}_{-0.96}$	$308^{+18}_{-15}$	$3793^{+1101}_{-654}$	$10026^{+30081}_{-7028}$

$T_{max}$  = 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

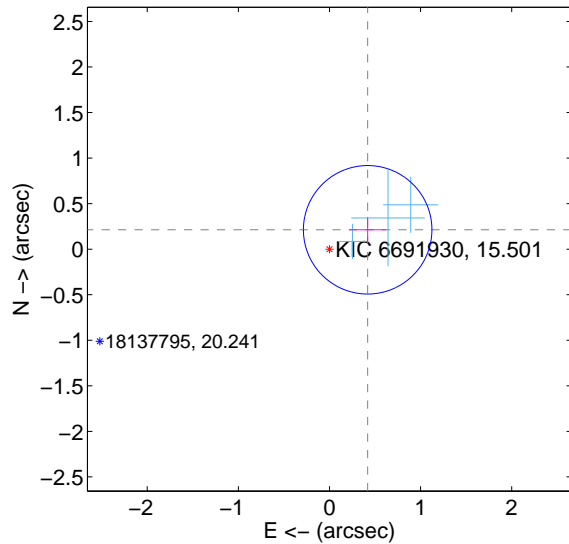
Supplemental centroid analysis for 006691930-03. Kepler magnitude: 15.50. Transit SNR 6.70

There are 3 quarters with good PRF difference image offsets

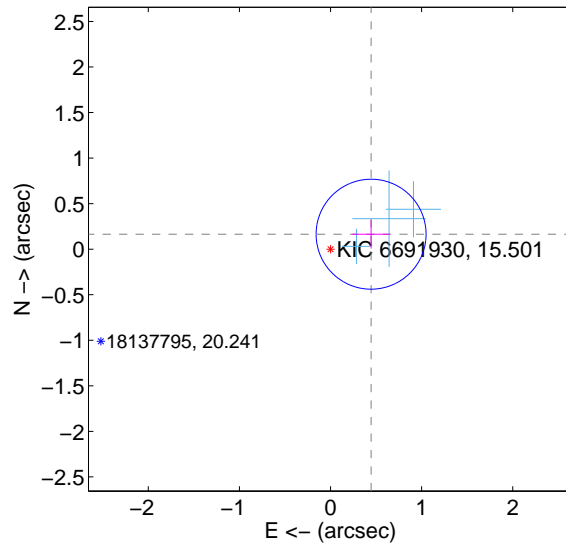
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.470 \pm 0.235$	2.00	$-0.419 \pm 0.202$	$0.213 \pm 0.139$
PRF-fit source offset from KIC position	$0.475 \pm 0.201$	2.36	$-0.445 \pm 0.206$	$0.164 \pm 0.157$
photometric centroid source offset	$0.05 \pm 0.72$	0.07	$-0.05 \pm 0.72$	$-0.01 \pm 0.72$

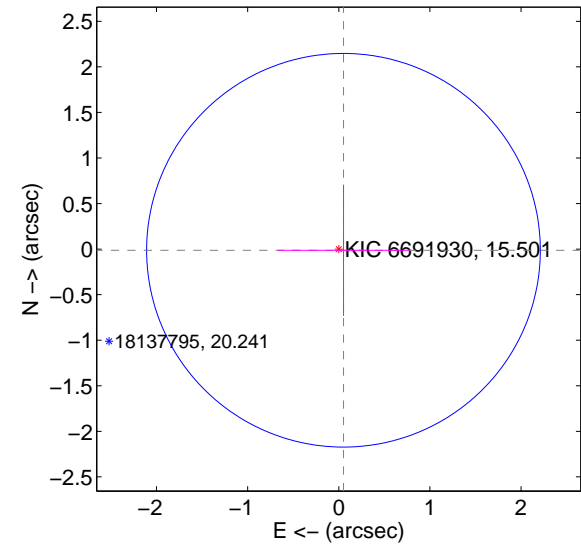
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

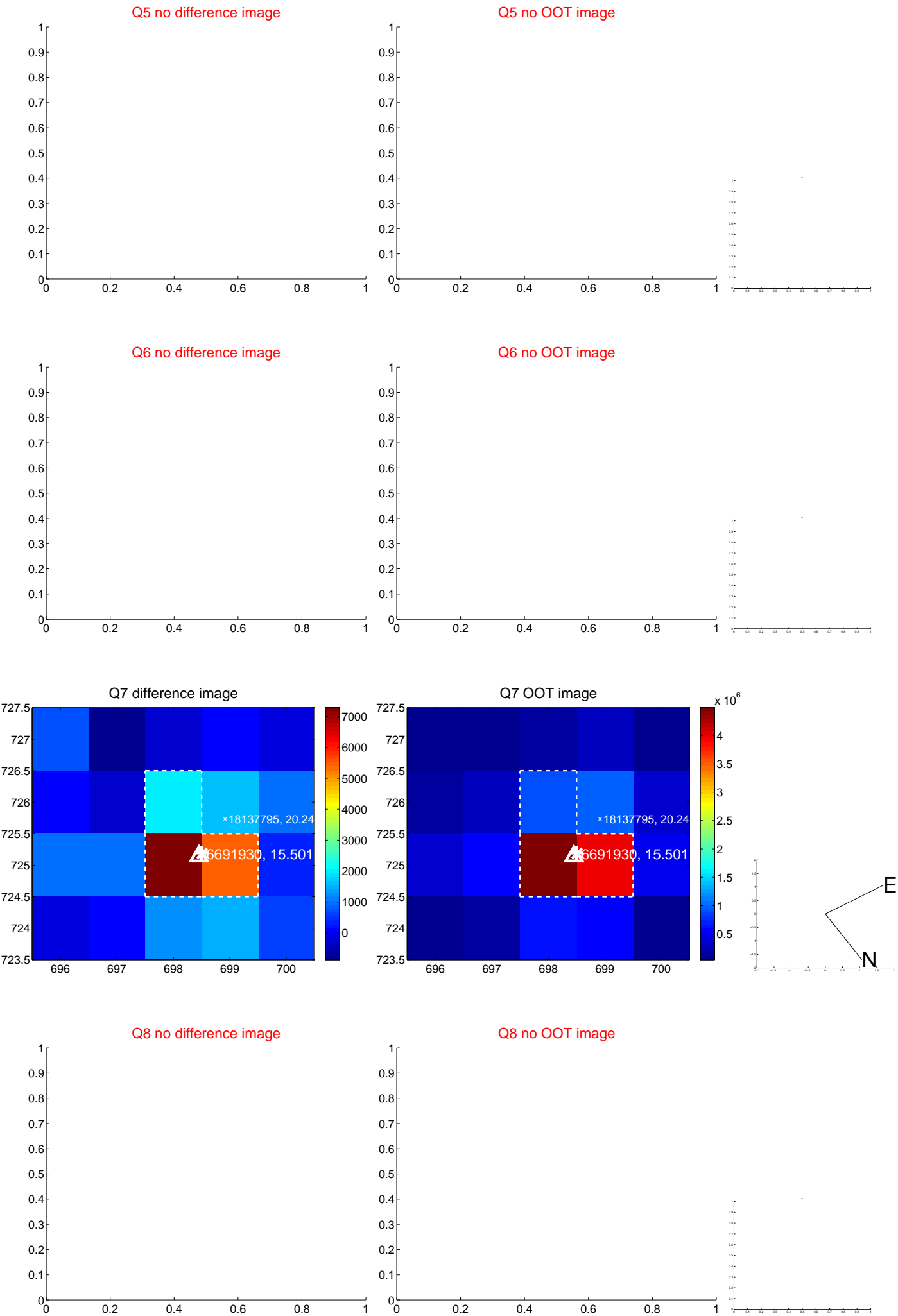


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

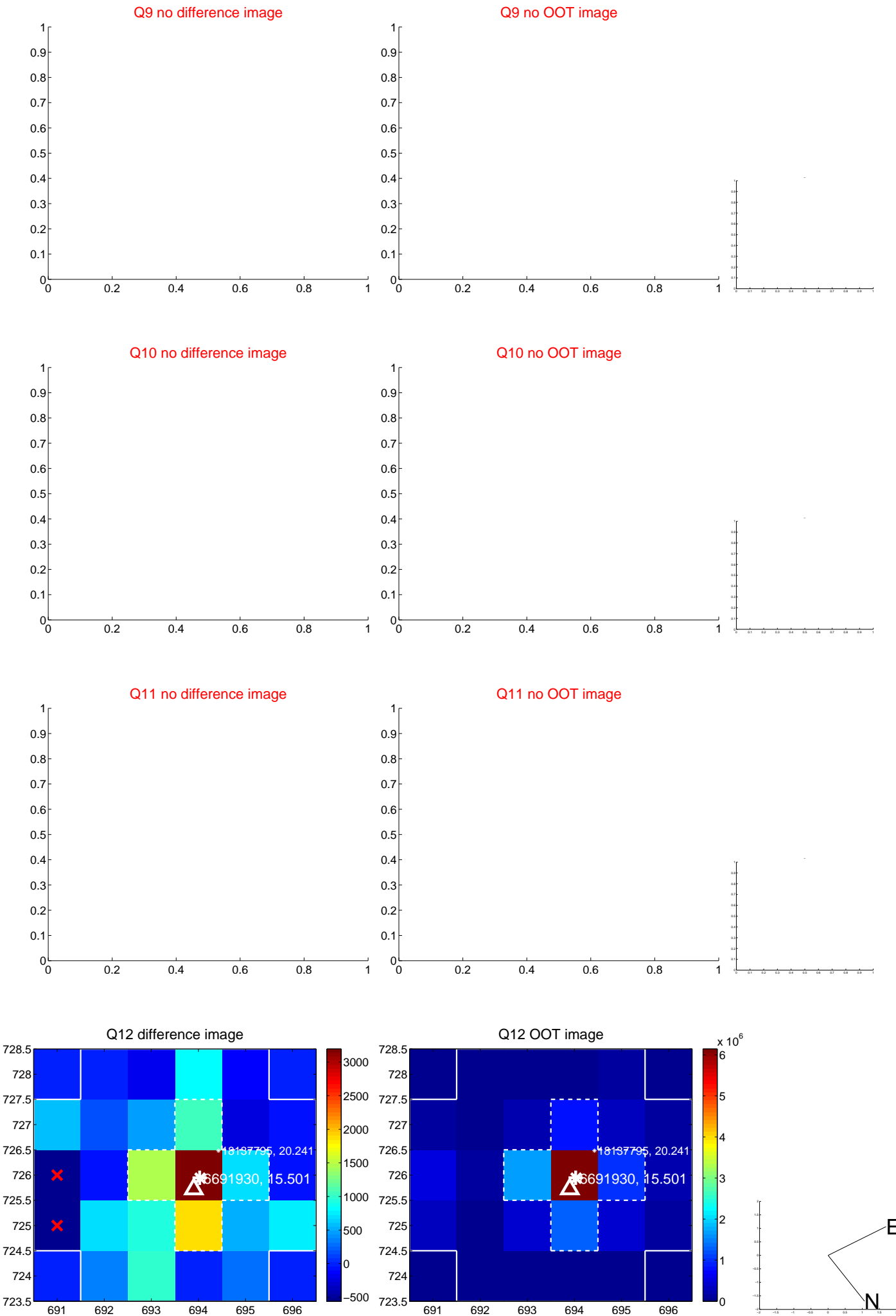
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



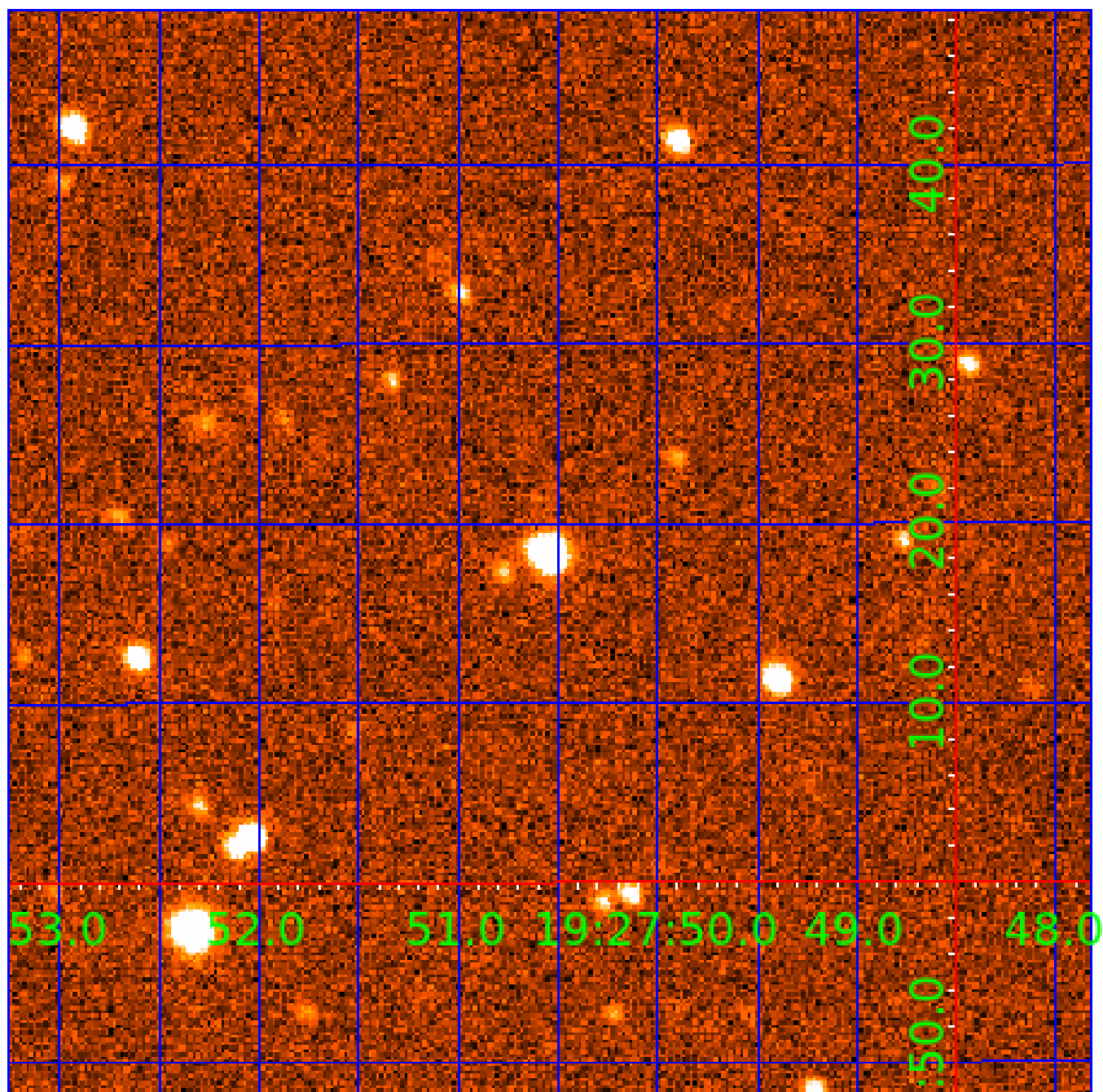
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





# UKIRT Image

Declination





# KIC 006691930

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006691930-01	OBS	No	312.559954	438.656327	2199.8	12.778	15.2	8.7	0.82	5524	4.11	0.84
006691930-02	OBS	No	425.100719	290.458555	392.5	0.968	12.0	1.0	0.82	5524	2.23	0.56
006691930-03	OBS	No	425.394623	290.856289	1270.6	12.307	11.9	6.7	0.82	5524	3.00	0.56
006691930-04	OBS	No	518.903445	423.710902	995.5	10.500	11.2	-1.0	0.82	5524	2.56	0.43
006691930-05	OBS	No	545.771146	462.745706	2422.3	7.332	9.6	9.4	0.82	5524	4.09	0.40
006691930-06	OBS	No	428.090130	488.134669	2007.3	13.294	9.8	8.9	0.82	5524	4.36	0.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006691930-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006691930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006691930-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006691930-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

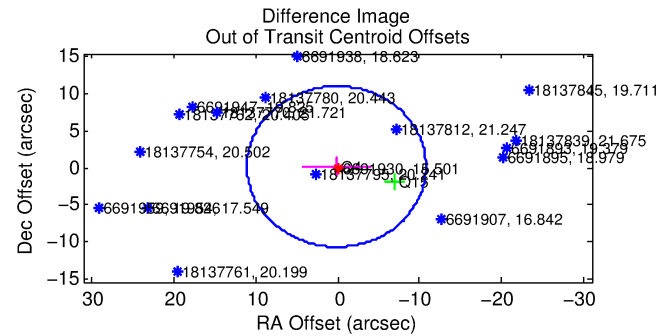
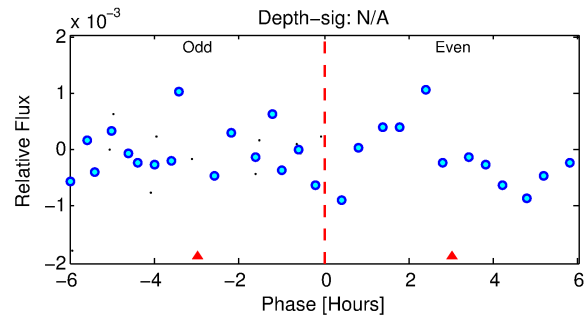
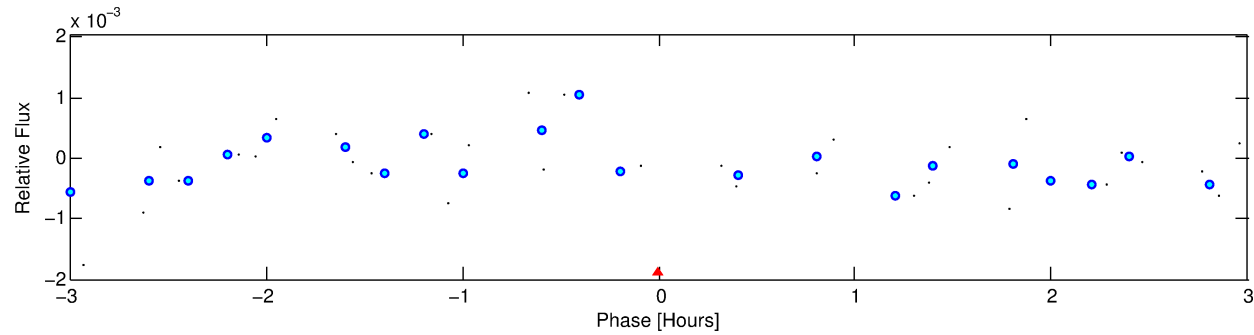
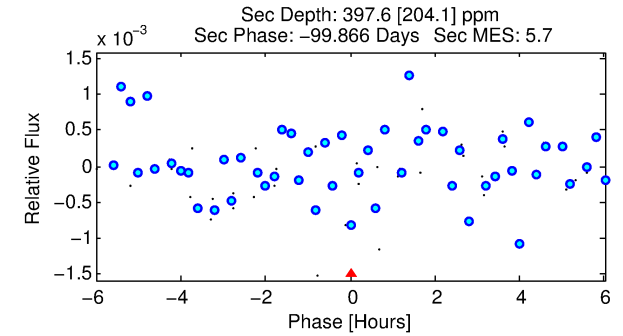
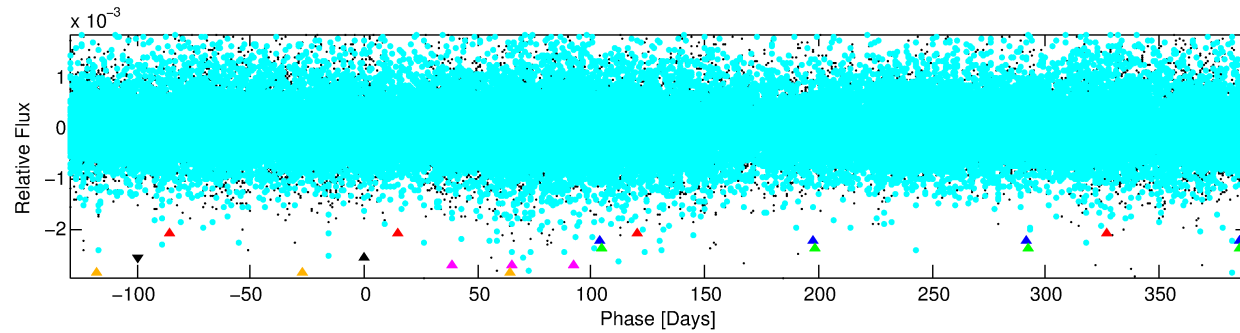
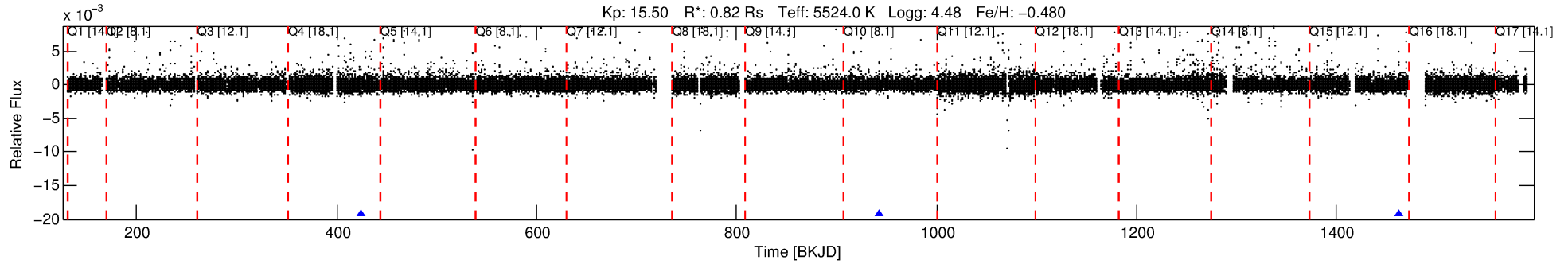
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006691930-04

No Significant Match Found

# DV One-Page Summary

KIC: 6691930 Candidate: 4 of 6 Period: 518.903 d



## TPS TCE Results:

Period = 518.90344 d  
Epoch = 423.7109 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

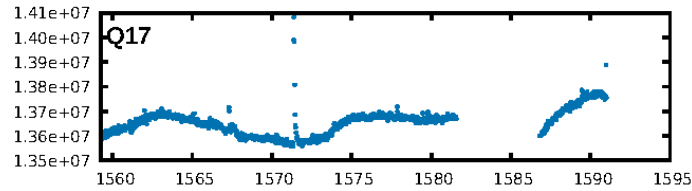
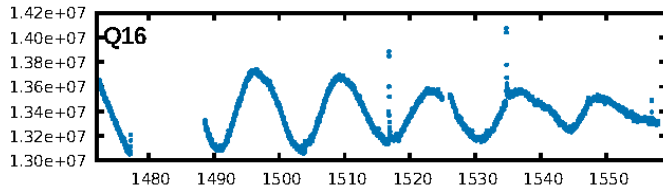
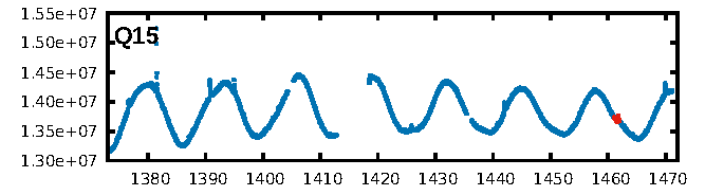
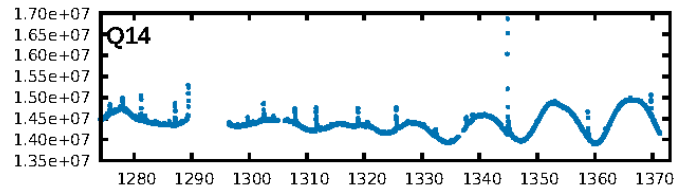
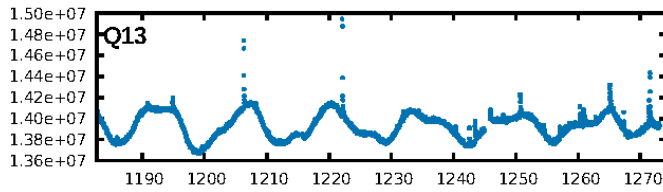
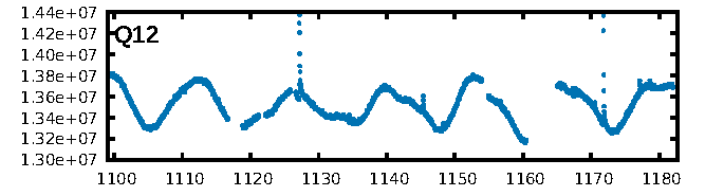
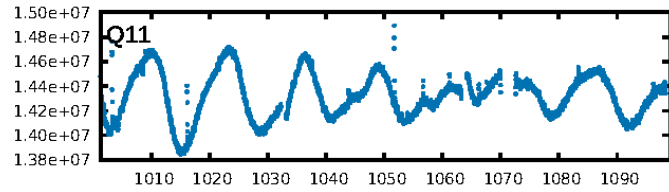
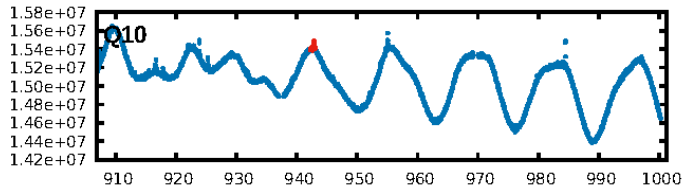
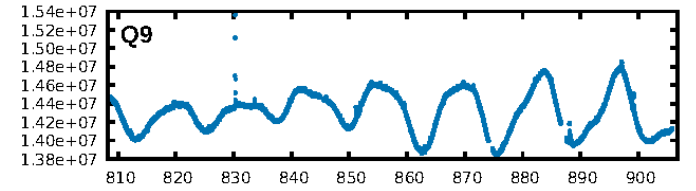
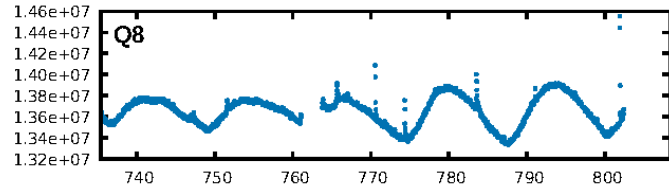
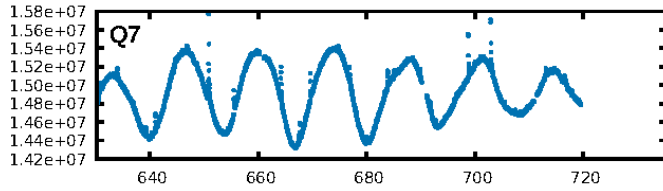
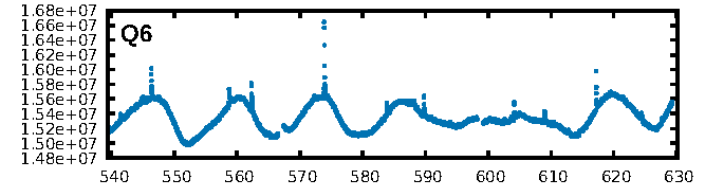
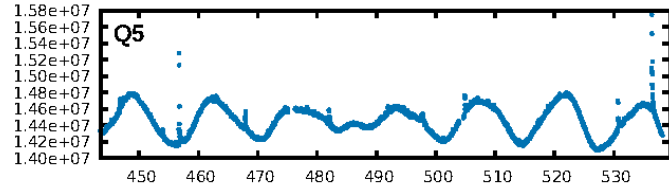
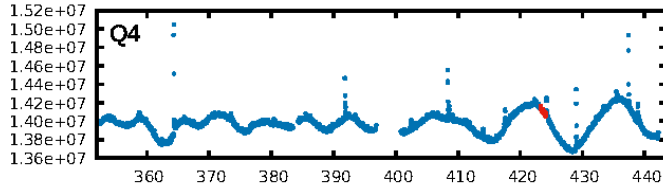
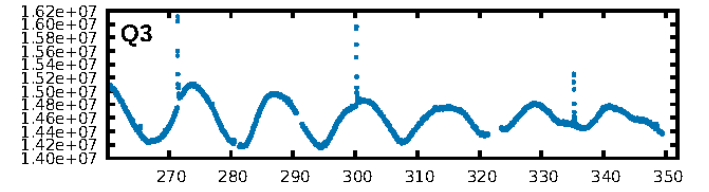
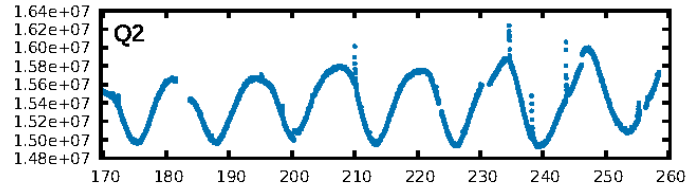
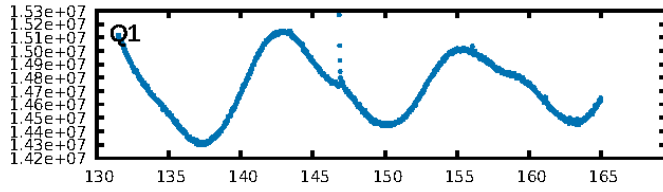
ShortPeriod-sig: 100.0% [128.66σ]  
LongPeriod-sig: 100.0% [50.35σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.47e-09  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 15.97

Centroid-sig: 76.6%  
Centroid-so: 7.837 arcsec [0.47σ]  
OotOffset-rm: 0.209 arcsec [0.06σ]  
KicOffset-rm: 0.173 arcsec [0.08σ]  
OotOffset-st: 0/1/1/0 [2]  
KicOffset-st: 0/1/1/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [2/2]

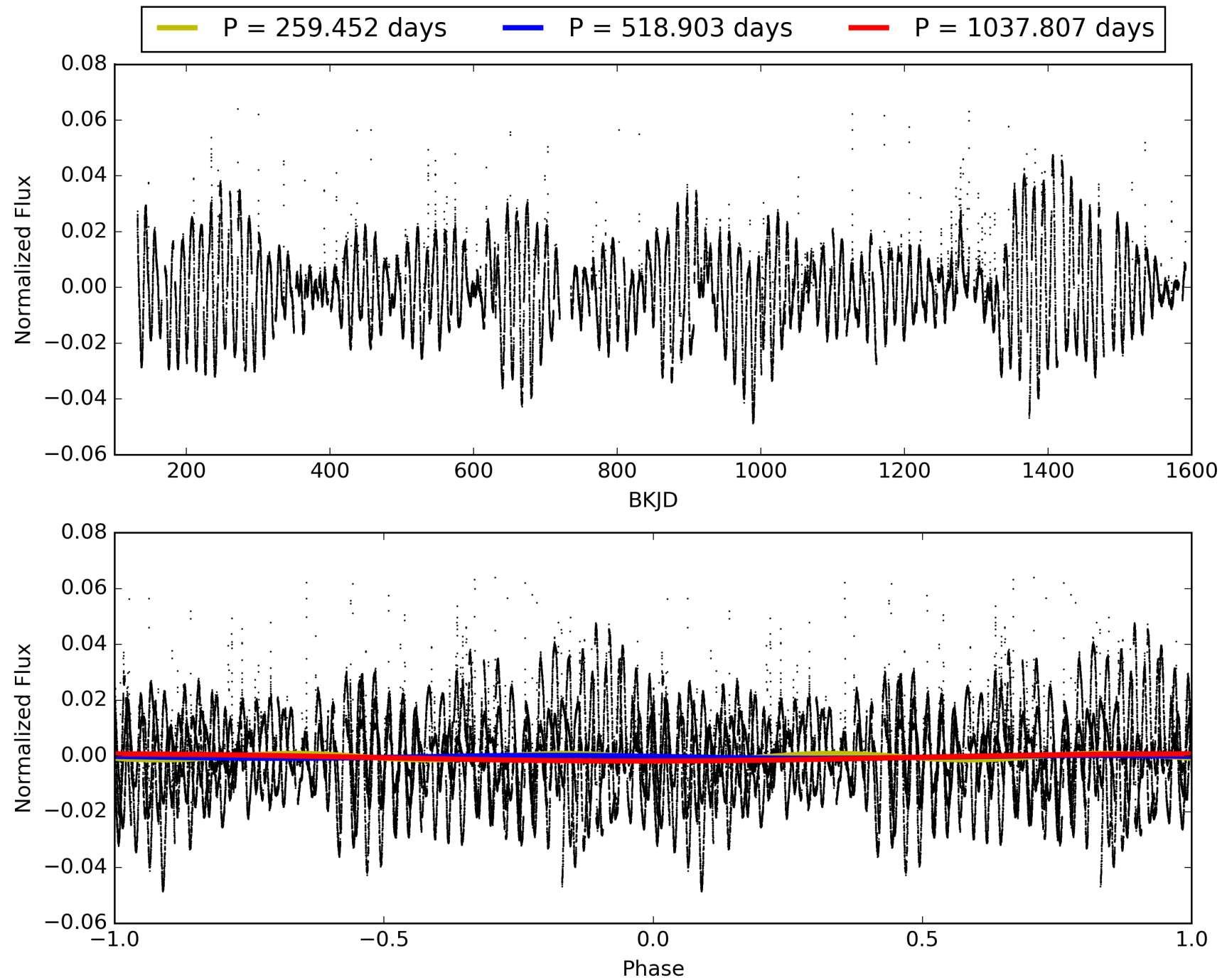
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:17:58 Z

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

# TCE 006691930-04, PDC Light Curves

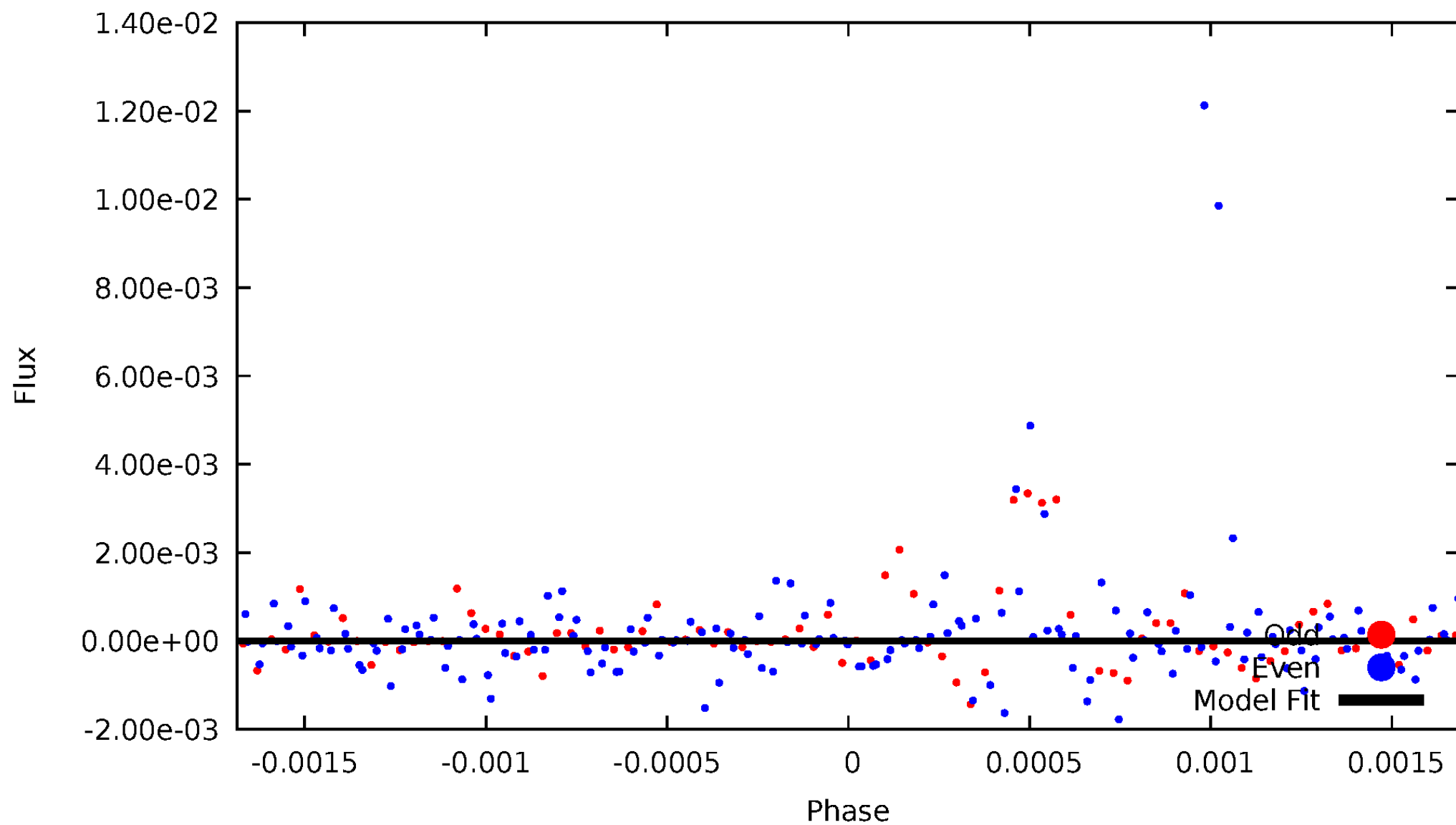


# TCE 006691930-04



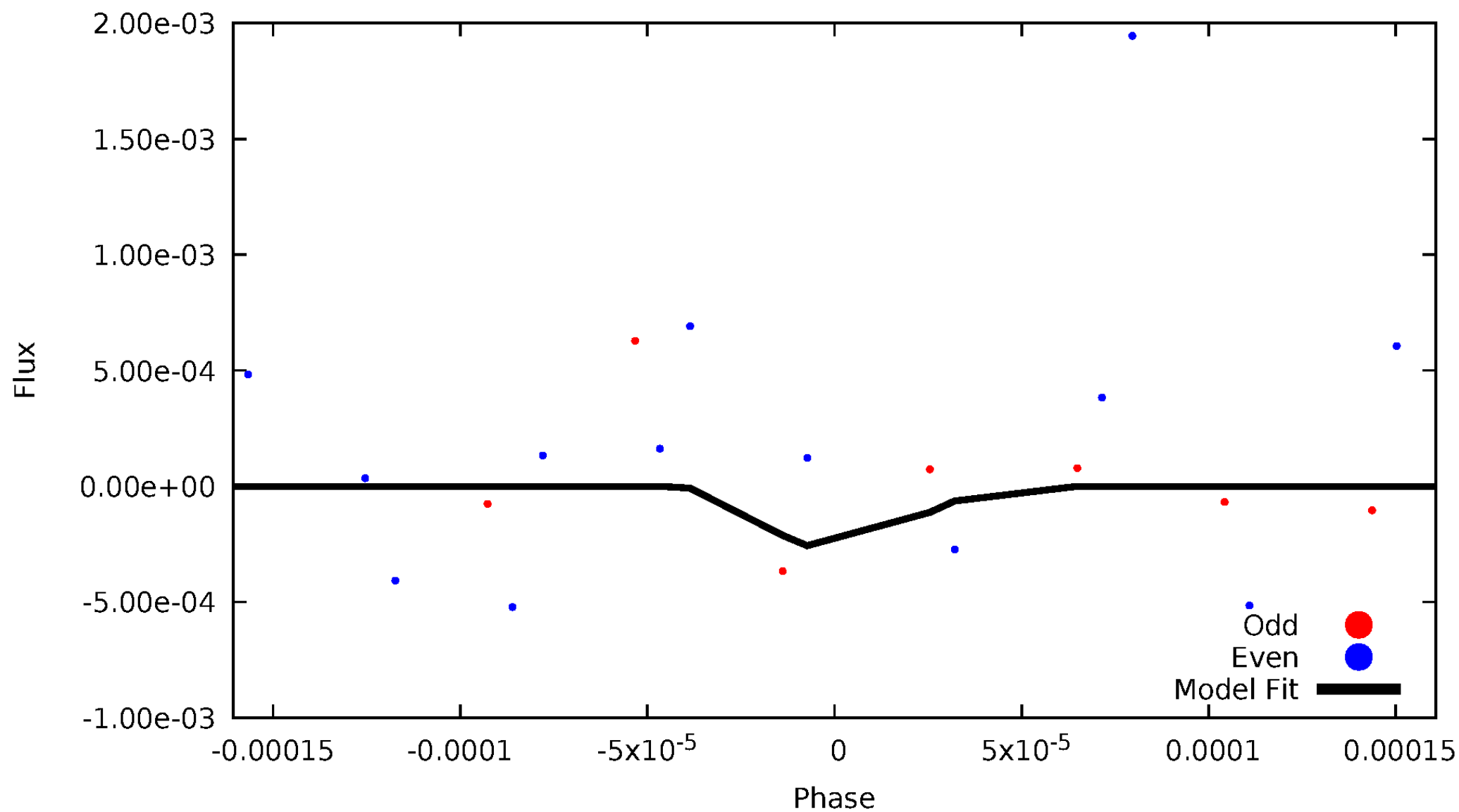
# DV Odd/Even

TCE 006691930-04



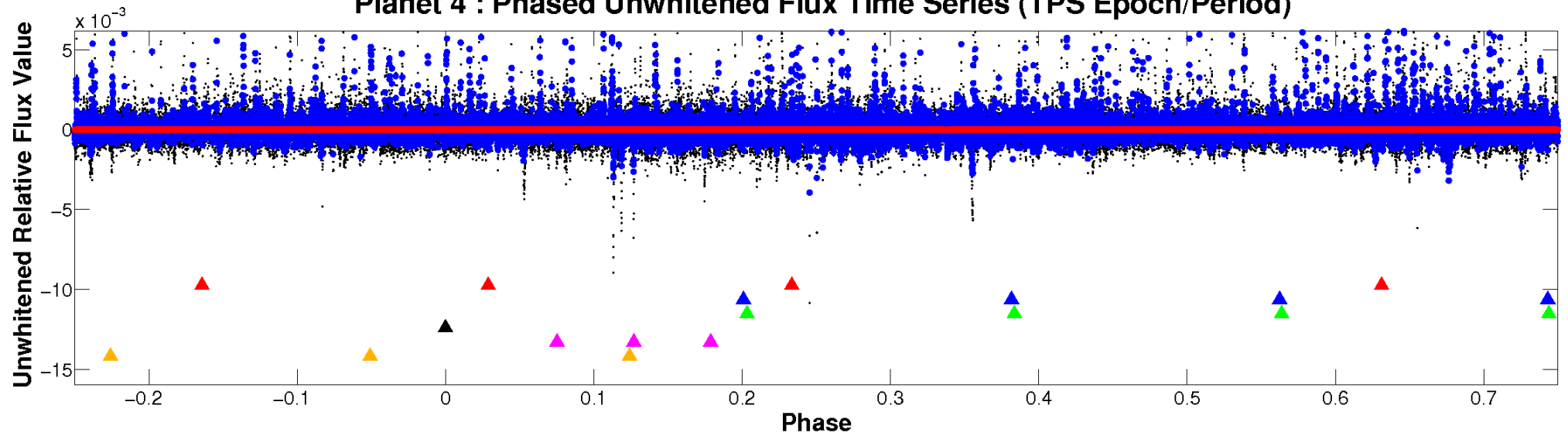
# ALT Odd/Even

TCE 006691930-04

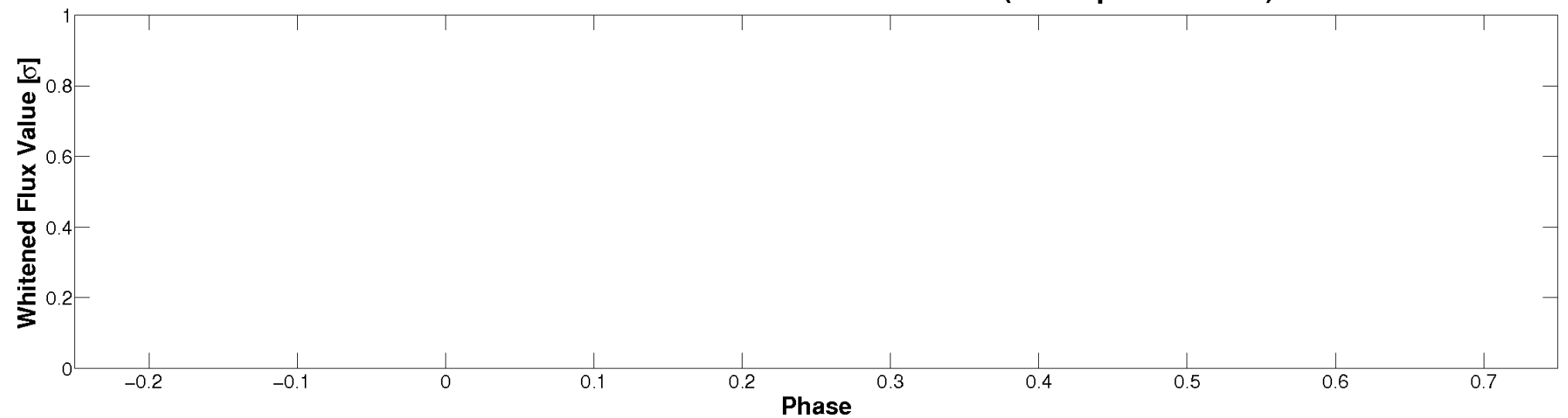


# Non-Whitened Vs. Whitened Light Curve

**Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

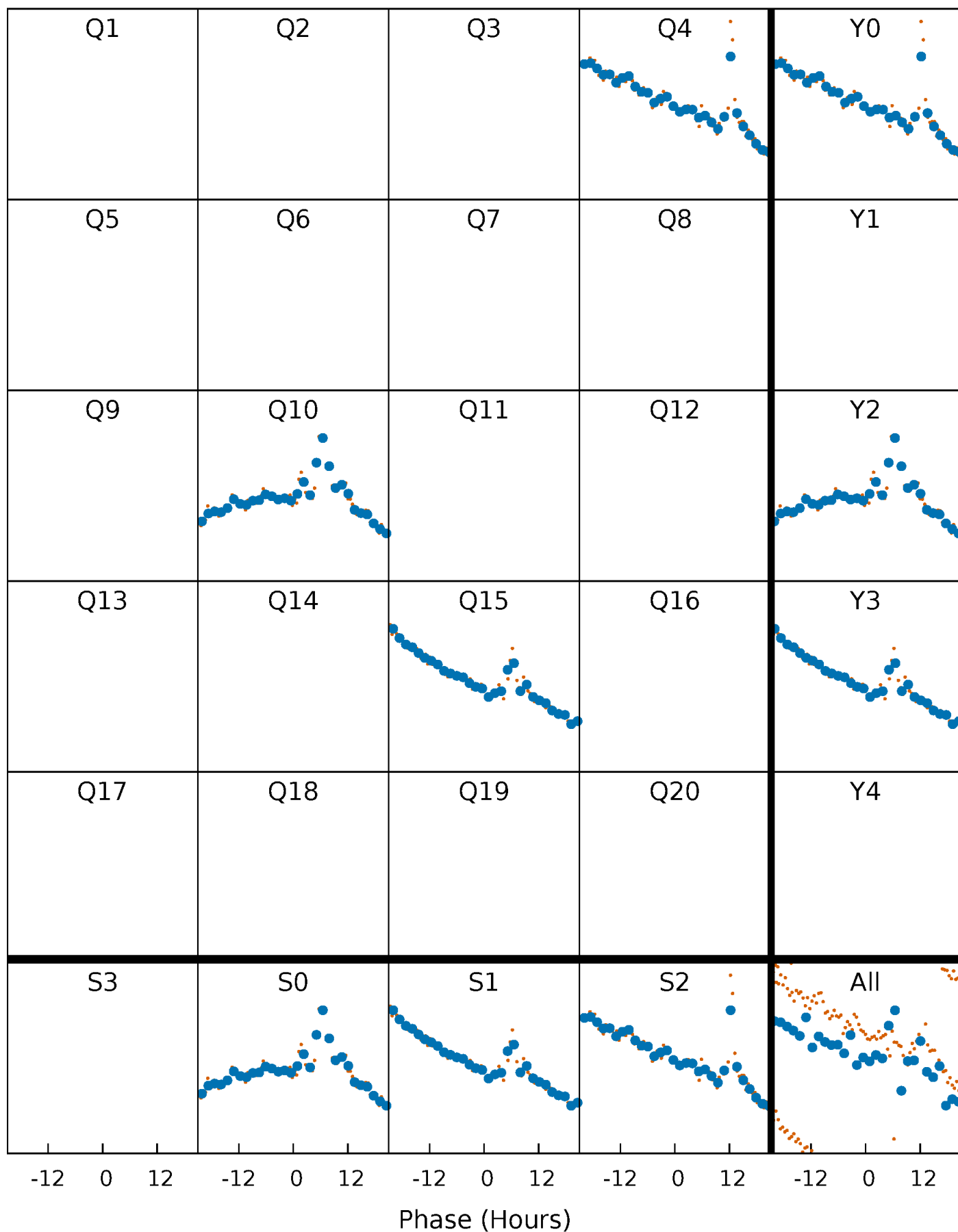


**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

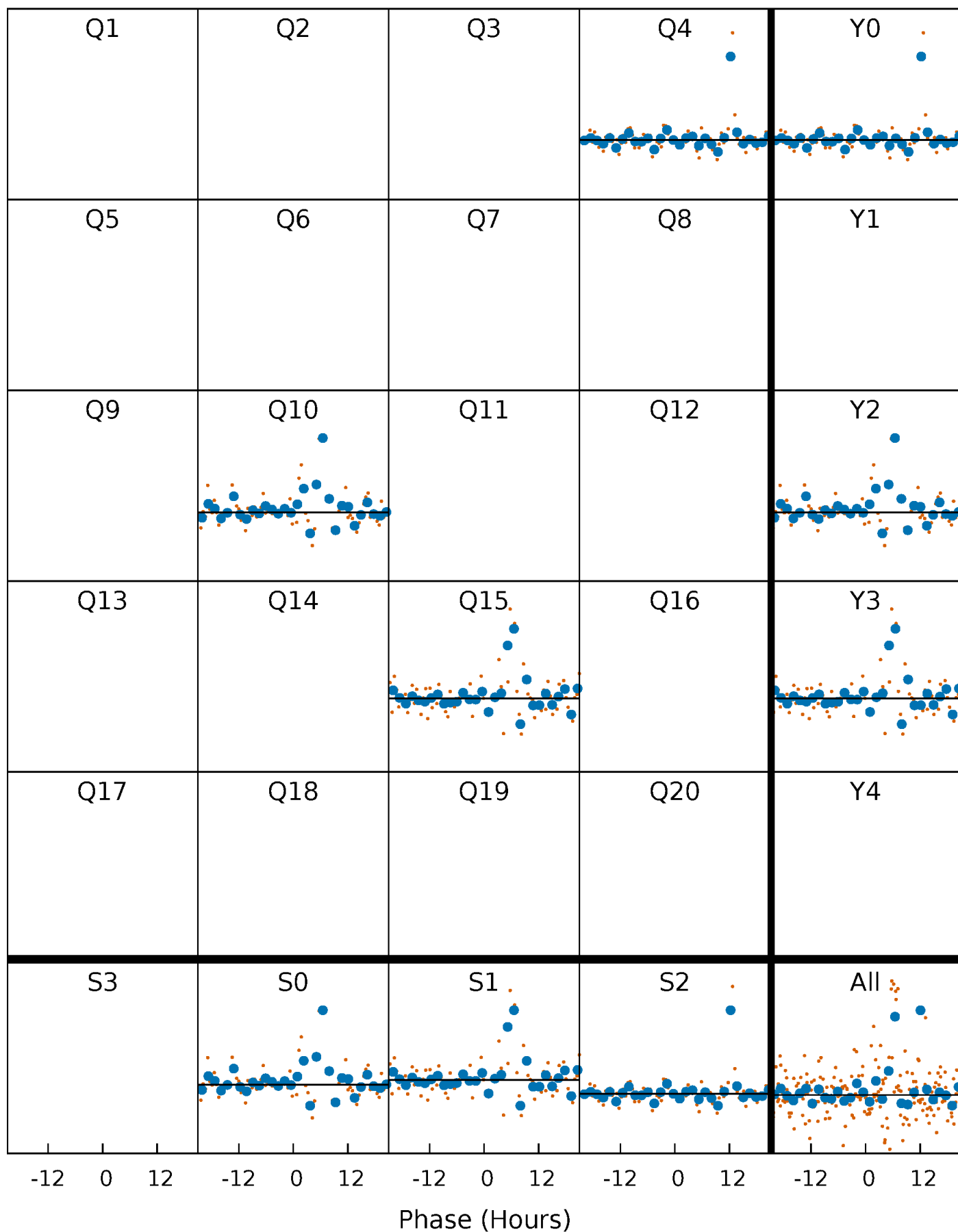
TCE 006691930-04 P=518.903445 Days  $T_0=423.710902$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 006691930-04 P=518.903445 Days  $T_0=423.710902$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

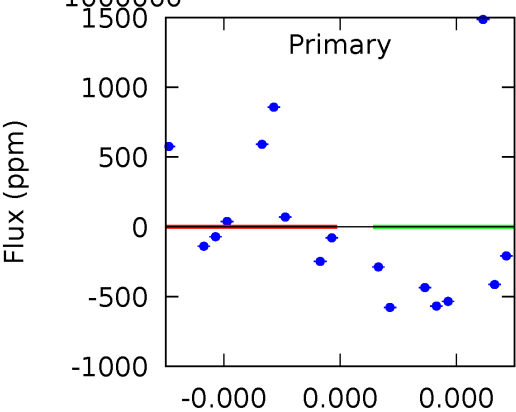
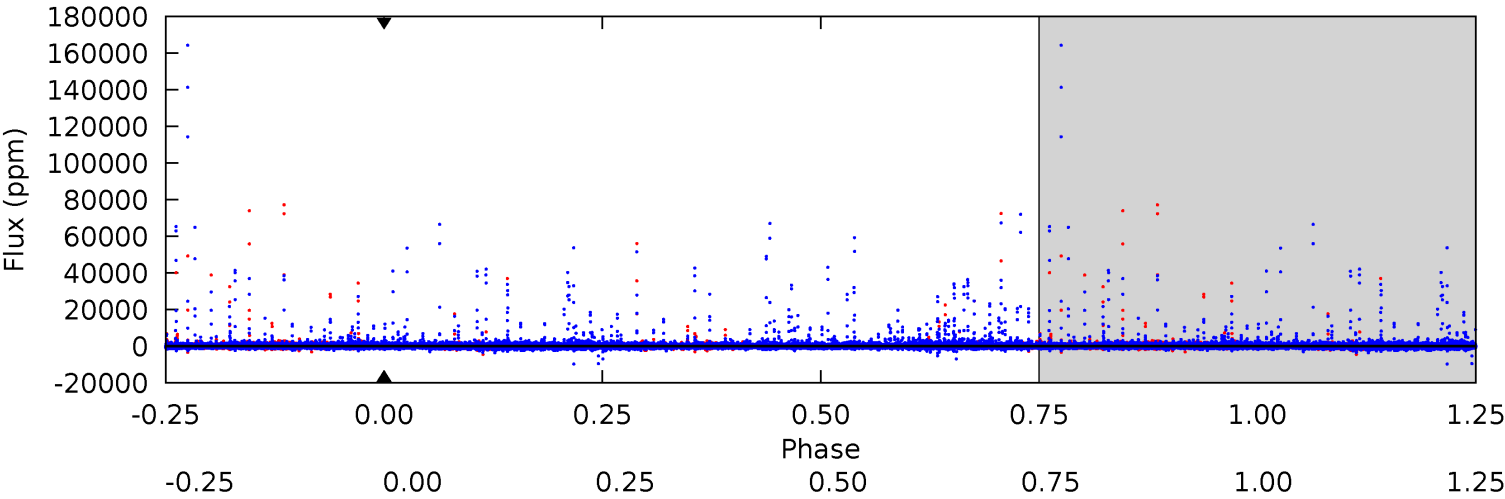
TCE 006691930-04 P=518.903445 Days  $T_0=424.220286$  (BKJD)



DV Model-Shift Uniqueness Test

006691930-04, P = 518.903445 Days, E = 423.710902 Days

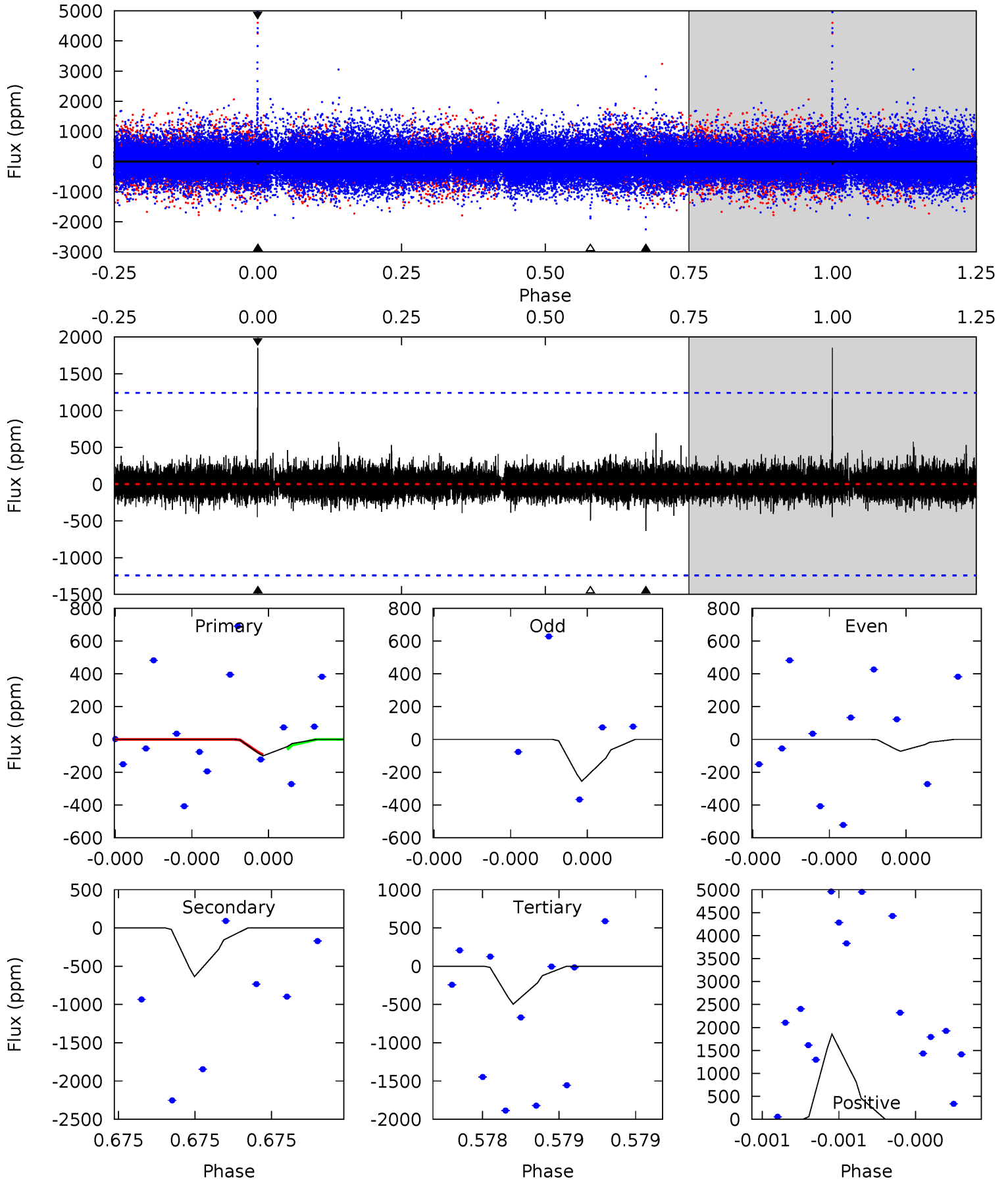
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006691930-04, P = 518.903445 Days, E = 424.220286 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
0.47	2.99	2.33	8.73	5.84	3.88	0.45	-1.86	-8.25	0.66	-5.74	0.47	1.00	0.74	0.08



### Stellar Parameters For KIC 006691930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5524^{+180}_{-163}$	$4.481^{+0.113}_{-0.125}$	$-0.480^{+0.300}_{-0.300}$	$0.820^{+0.154}_{-0.116}$	$0.742^{+0.116}_{-0.041}$	$1.897^{+0.930}_{-0.683}$
	+3%/-3%	+3%/-3%	+62%/-62%	+19%/-14%	+16%/-6%	+49%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006691930-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$6.99^{+7.68}_{-4.62}$	$288^{+16}_{-14}$	$-3340^{+20774}_{-12606}$	$-6616.493^{+2631766.417}_{-2141518.379}$
Alt.	$-636 \pm 213$	$6.46^{+7.48}_{-4.37}$	$290^{+17}_{-16}$	$3631^{+2173}_{-737}$	$10132^{+106203}_{-7890}$

$T_{max}$  = 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

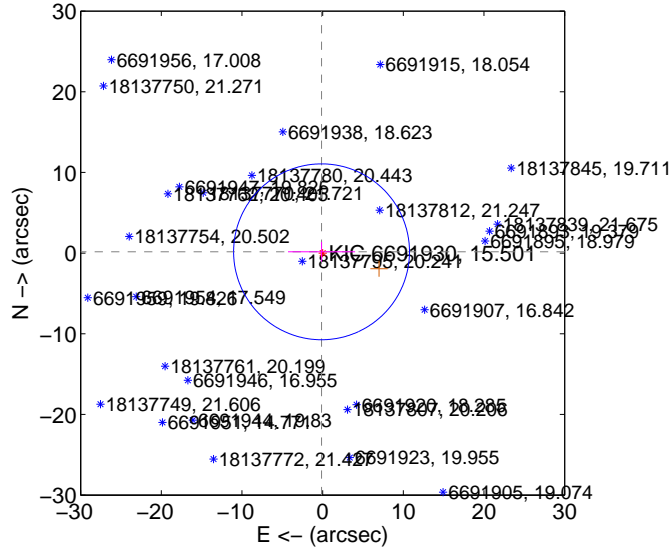
Supplemental centroid analysis for 006691930-04. Kepler magnitude: 15.50. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

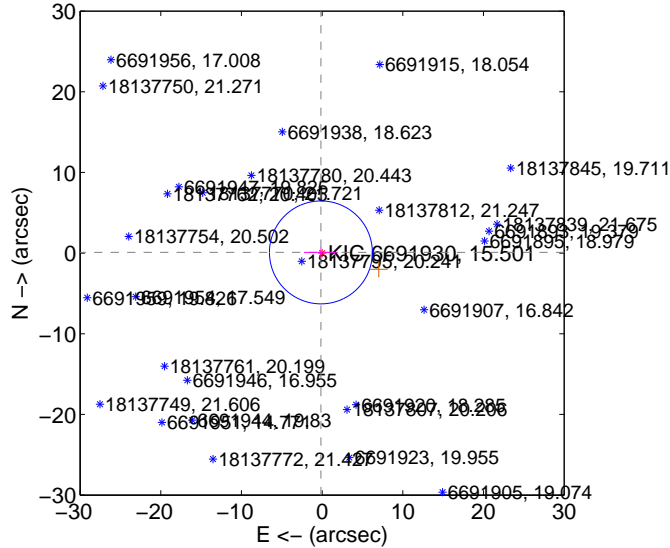
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.209 \pm 3.634$	0.06	$0.136 \pm 4.166$	$0.159 \pm 1.226$
PRF-fit source offset from KIC position	$0.173 \pm 2.126$	0.08	$0.150 \pm 2.099$	$0.086 \pm 0.614$
photometric centroid source offset	$7.84 \pm 16.82$	0.47	$-7.50 \pm 16.93$	$-2.27 \pm 15.65$

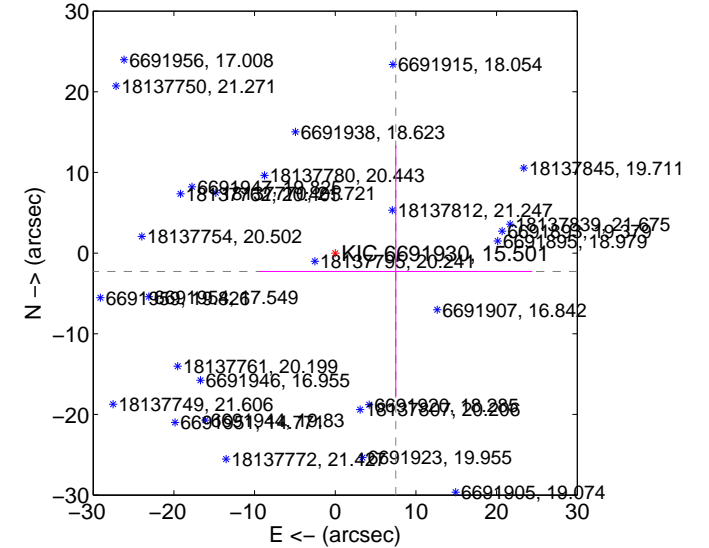
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

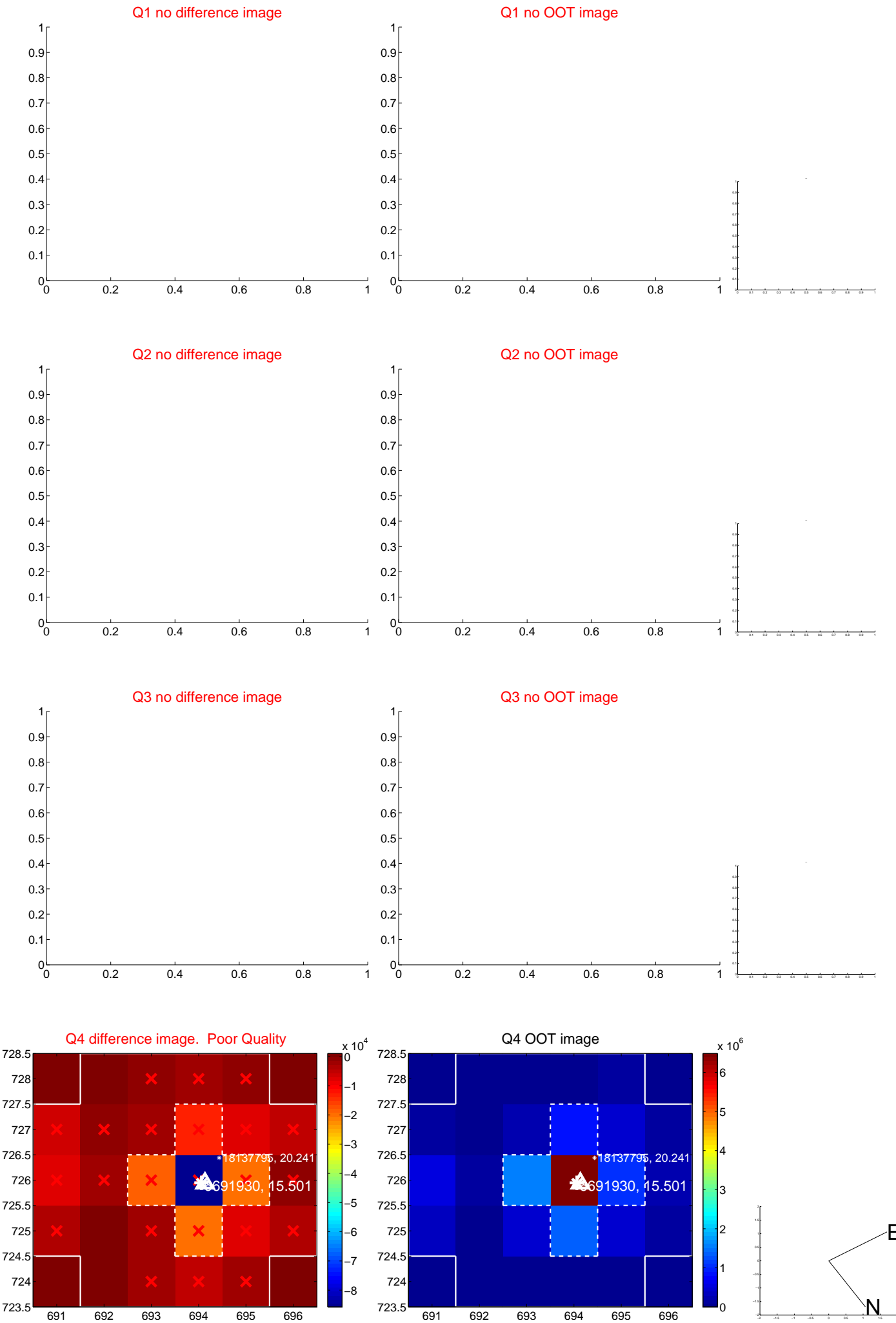


offset from photometric centroids



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

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



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

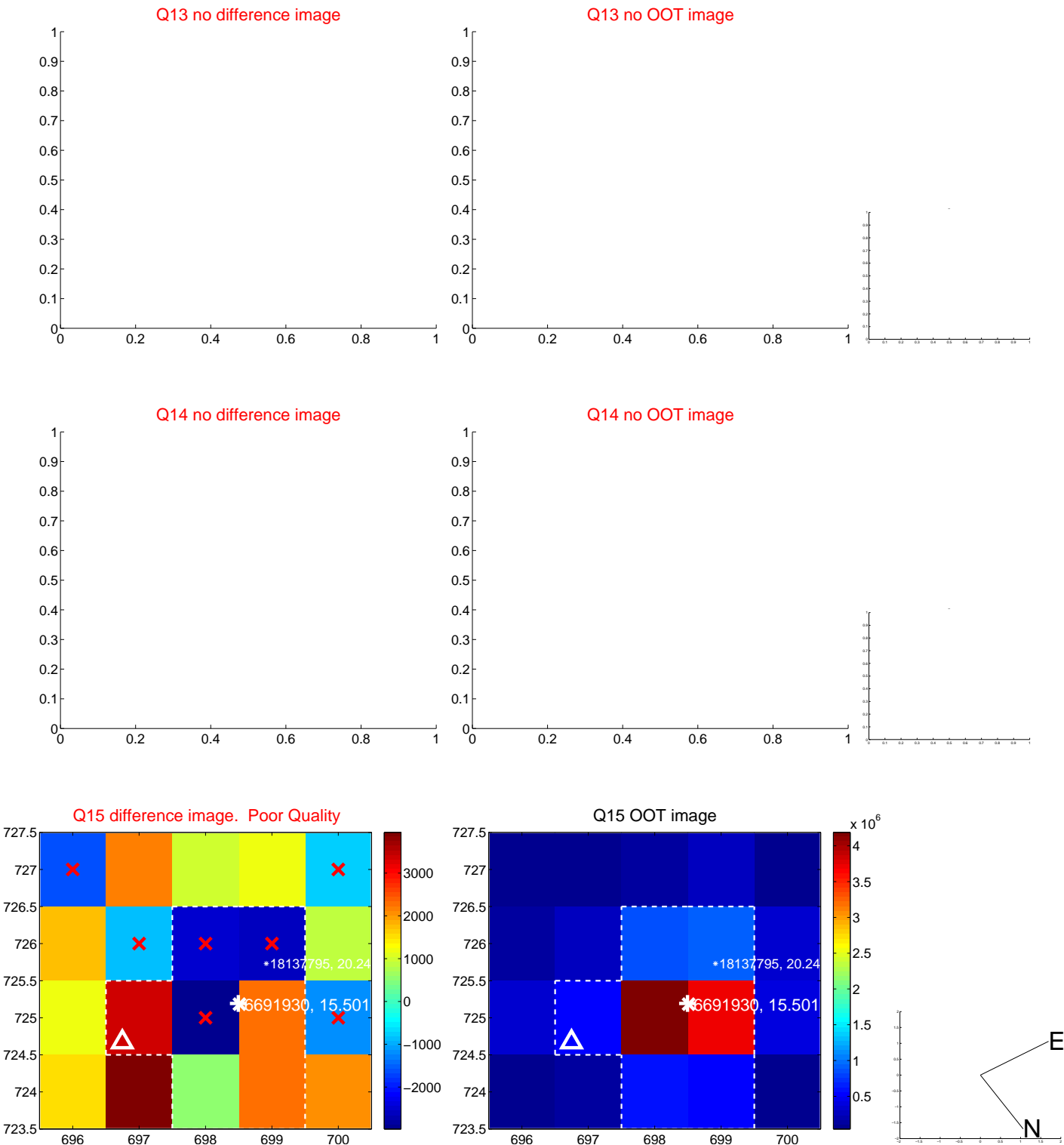




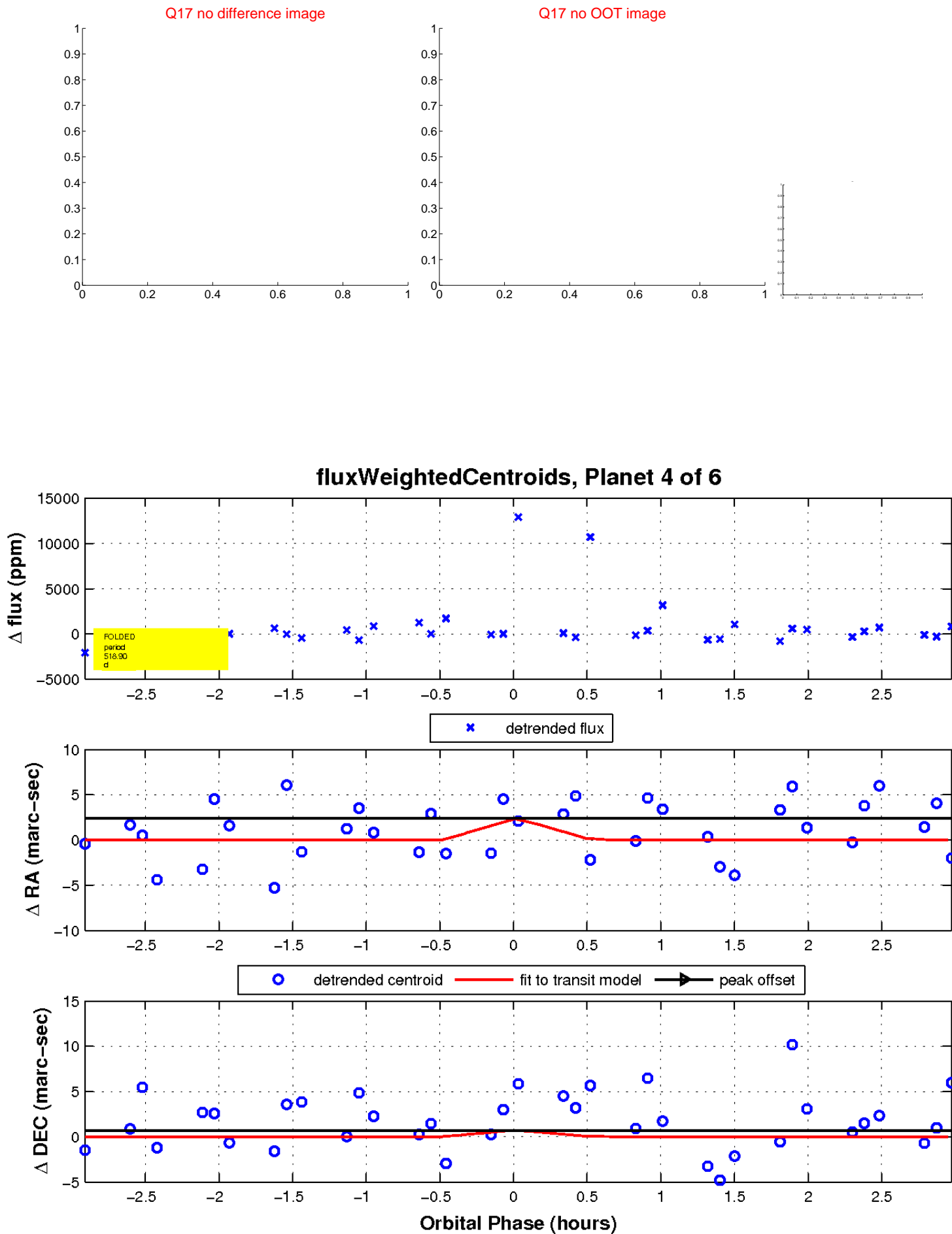
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

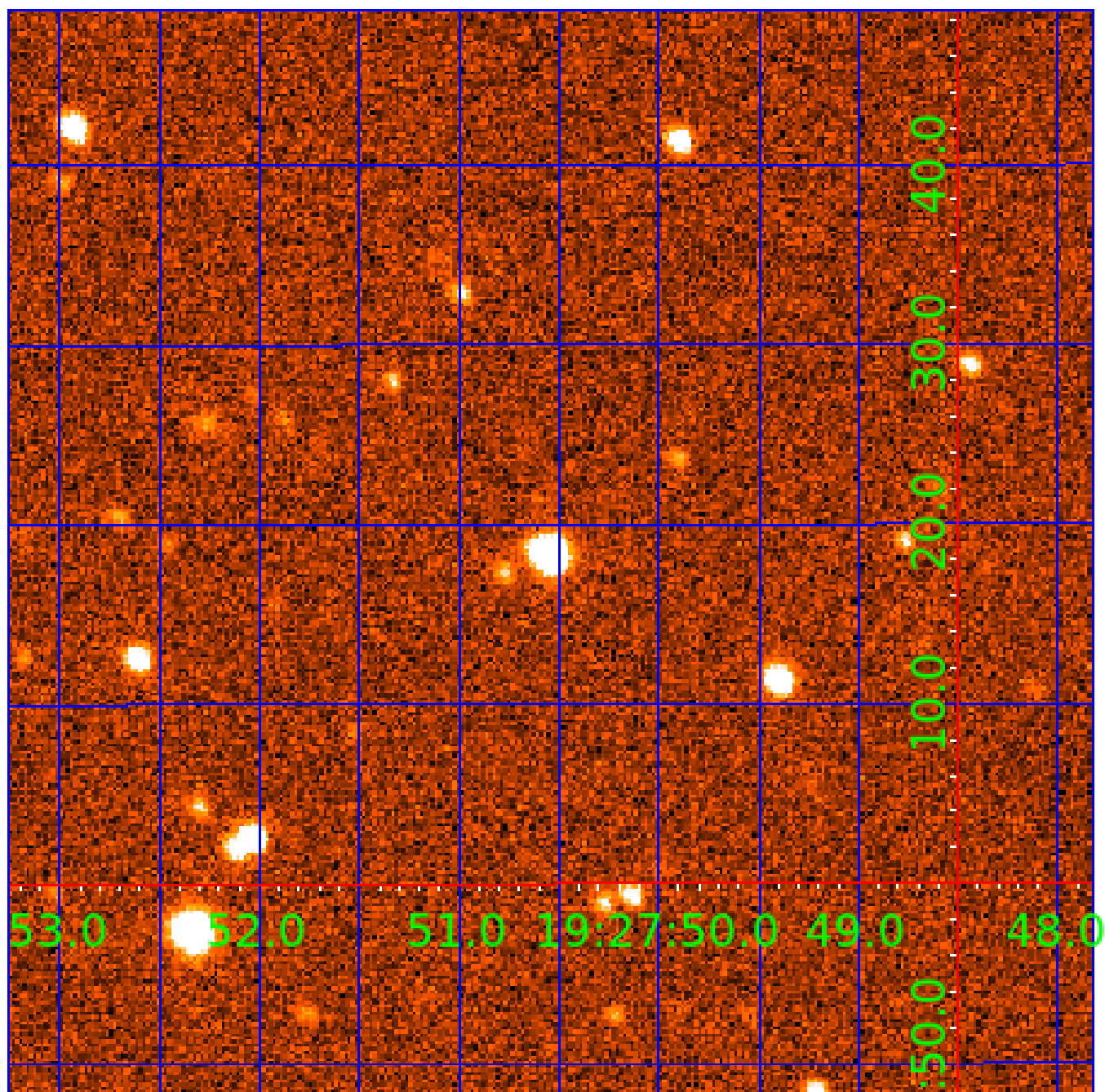


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 006691930

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006691930-01	OBS	No	312.559954	438.656327	2199.8	12.778	15.2	8.7	0.82	5524	4.11	0.84
006691930-02	OBS	No	425.100719	290.458555	392.5	0.968	12.0	1.0	0.82	5524	2.23	0.56
006691930-03	OBS	No	425.394623	290.856289	1270.6	12.307	11.9	6.7	0.82	5524	3.00	0.56
006691930-04	OBS	No	518.903445	423.710902	995.5	10.500	11.2	-1.0	0.82	5524	2.56	0.43
006691930-05	OBS	No	545.771146	462.745706	2422.3	7.332	9.6	9.4	0.82	5524	4.09	0.40
006691930-06	OBS	No	428.090130	488.134669	2007.3	13.294	9.8	8.9	0.82	5524	4.36	0.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006691930-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006691930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006691930-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006691930-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

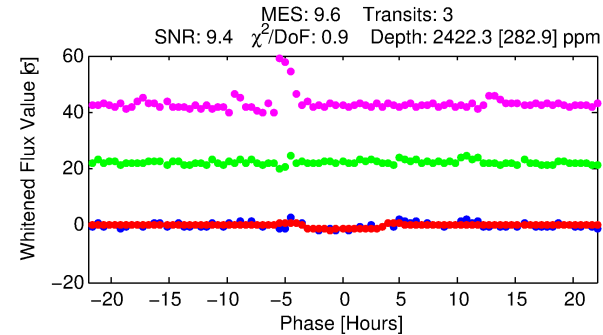
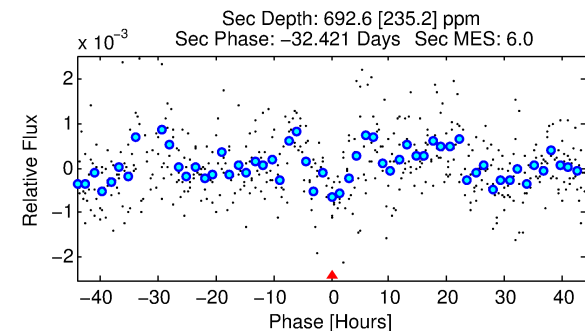
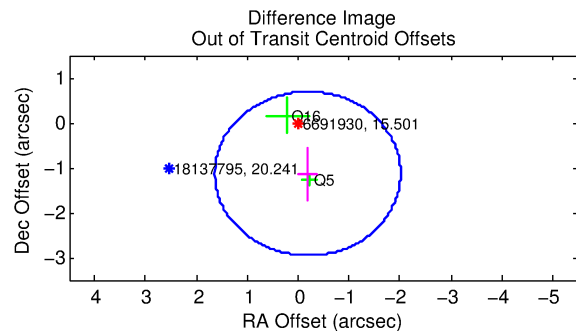
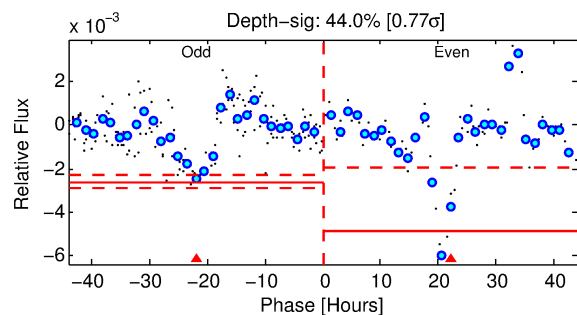
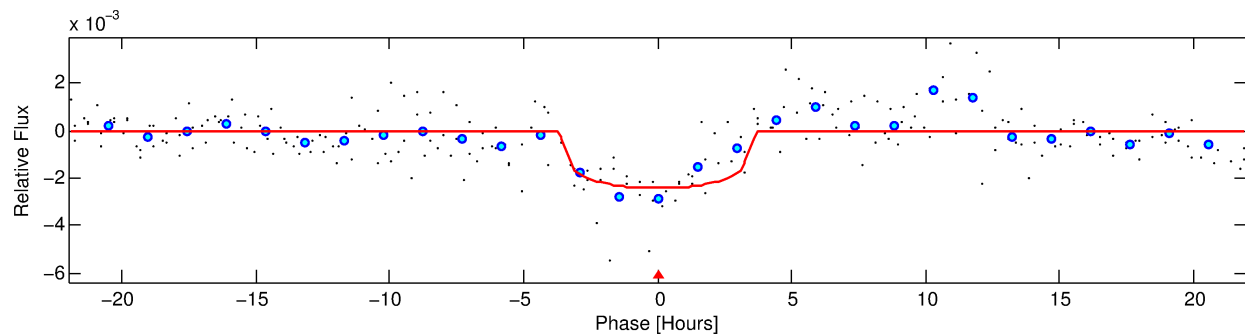
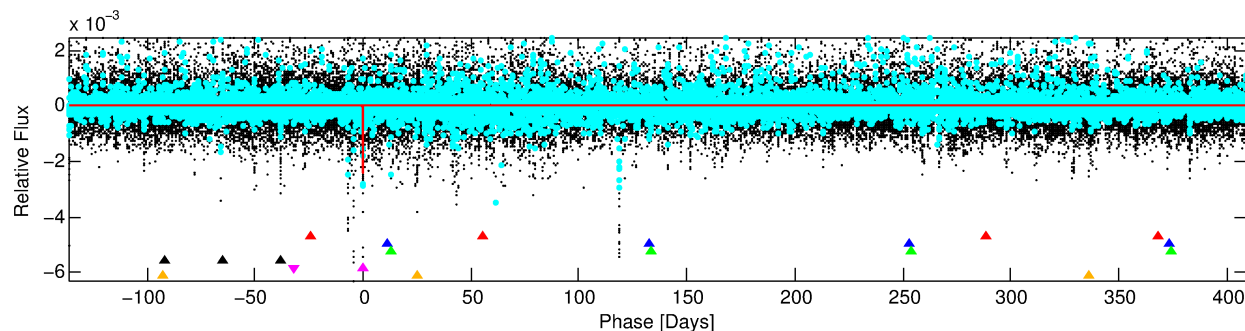
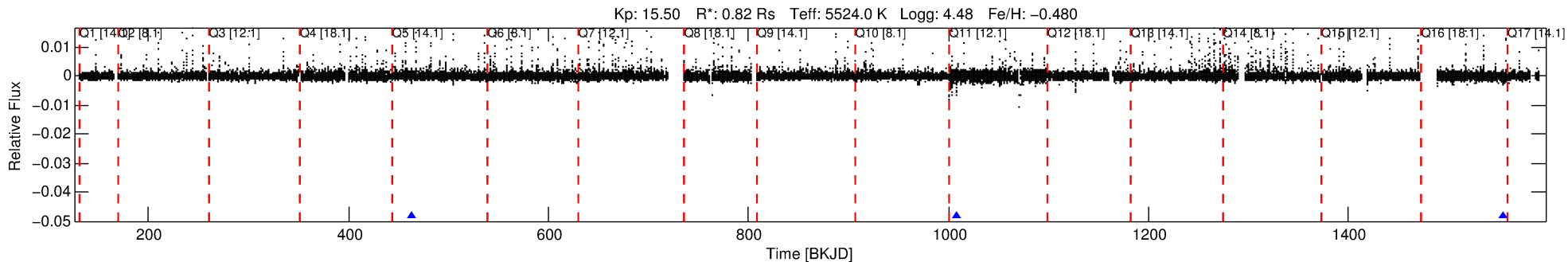
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006691930-05

No Significant Match Found

# DV One-Page Summary

KIC: 6691930 Candidate: 5 of 6 Period: 545.771 d



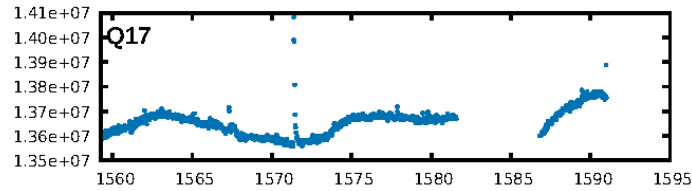
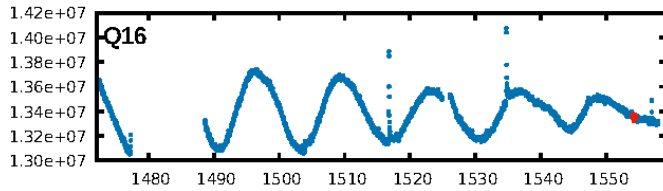
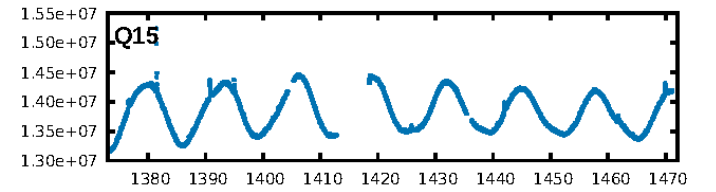
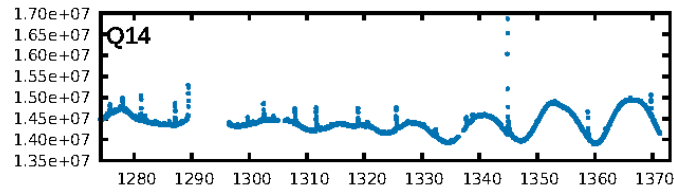
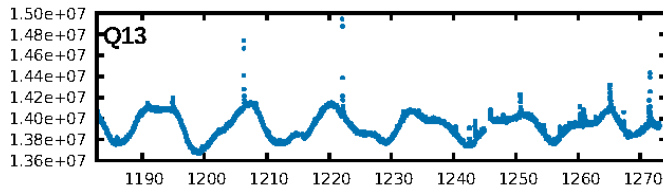
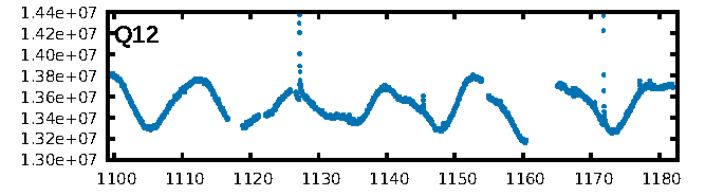
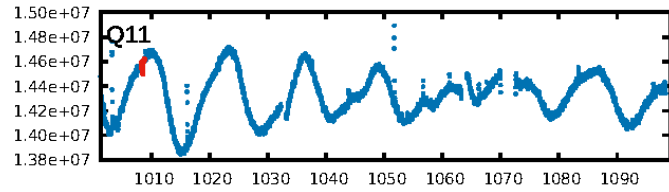
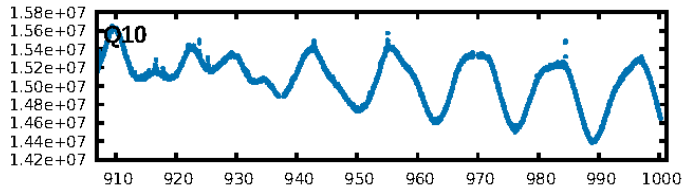
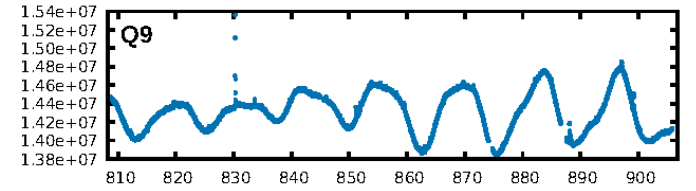
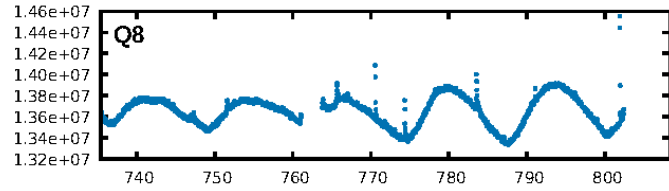
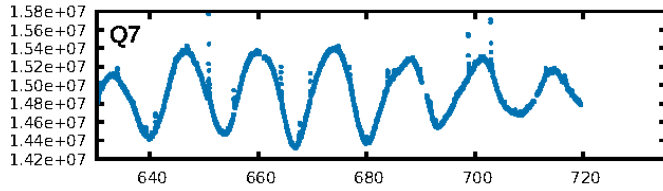
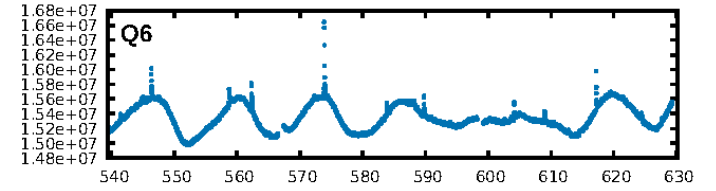
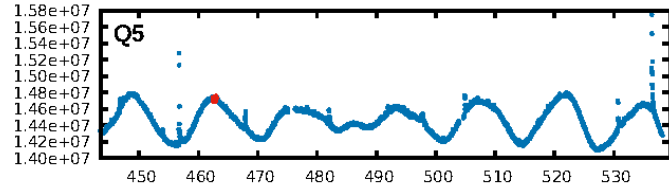
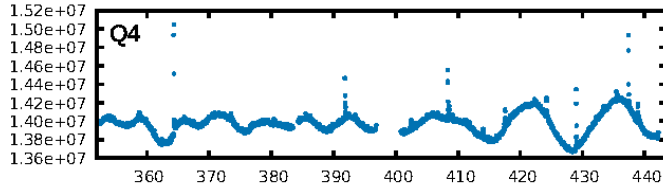
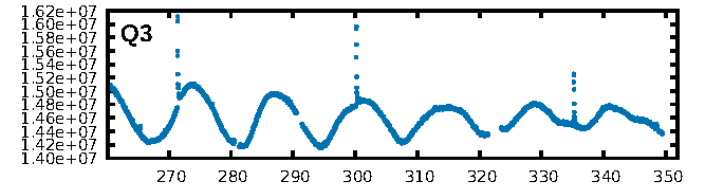
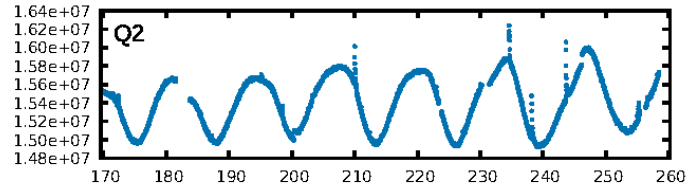
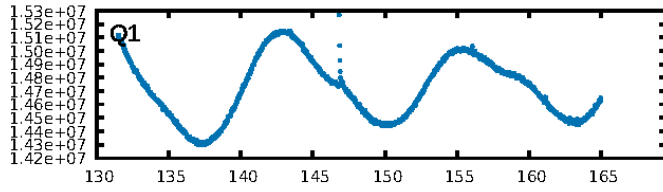
## DV Fit Results:

Period = 545.77115 [0.00514] d  
Epoch = 462.7457 [0.0063] BKJD  
Rp/R\* = 0.0457 [0.0112]  
a/R\* = 541.13 [529.37]  
b = 0.43 [1.84]  
Seff = 0.40 [0.11]  
Teq = 203 [13] K  
Rp = 4.09 [1.26] Re  
a = 1.1837 [0.1867] AU  
Ag = 31944.34 [20381.33] [1.57 $\sigma$ ]  
Teffp = 4193 [639] K [6.24 $\sigma$ ]

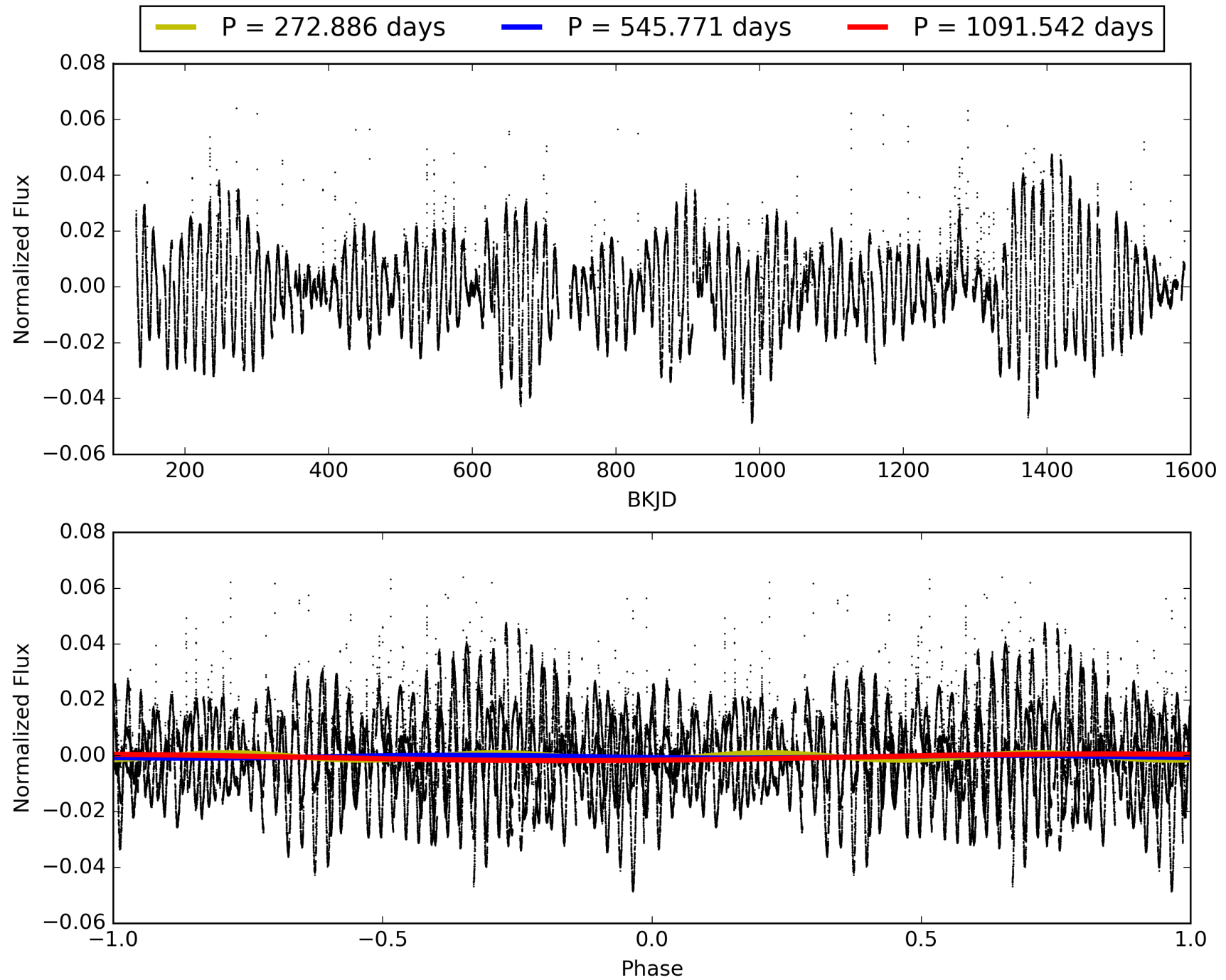
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [50.35 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 70.0%  
ModelChiSquareGof-sig: 99.9%  
**Bootstrap-pfa: 2.42e-08**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: -0.3009**  
Centroid-sig: 92.2%  
Centroid-so: 0.089 arcsec [0.16 $\sigma$ ]  
OotOffset-rm: 1.148 arcsec [1.89 $\sigma$ ]  
KicOffset-rm: 1.150 arcsec [1.64 $\sigma$ ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [2/2]

# TCE 006691930-05, PDC Light Curves



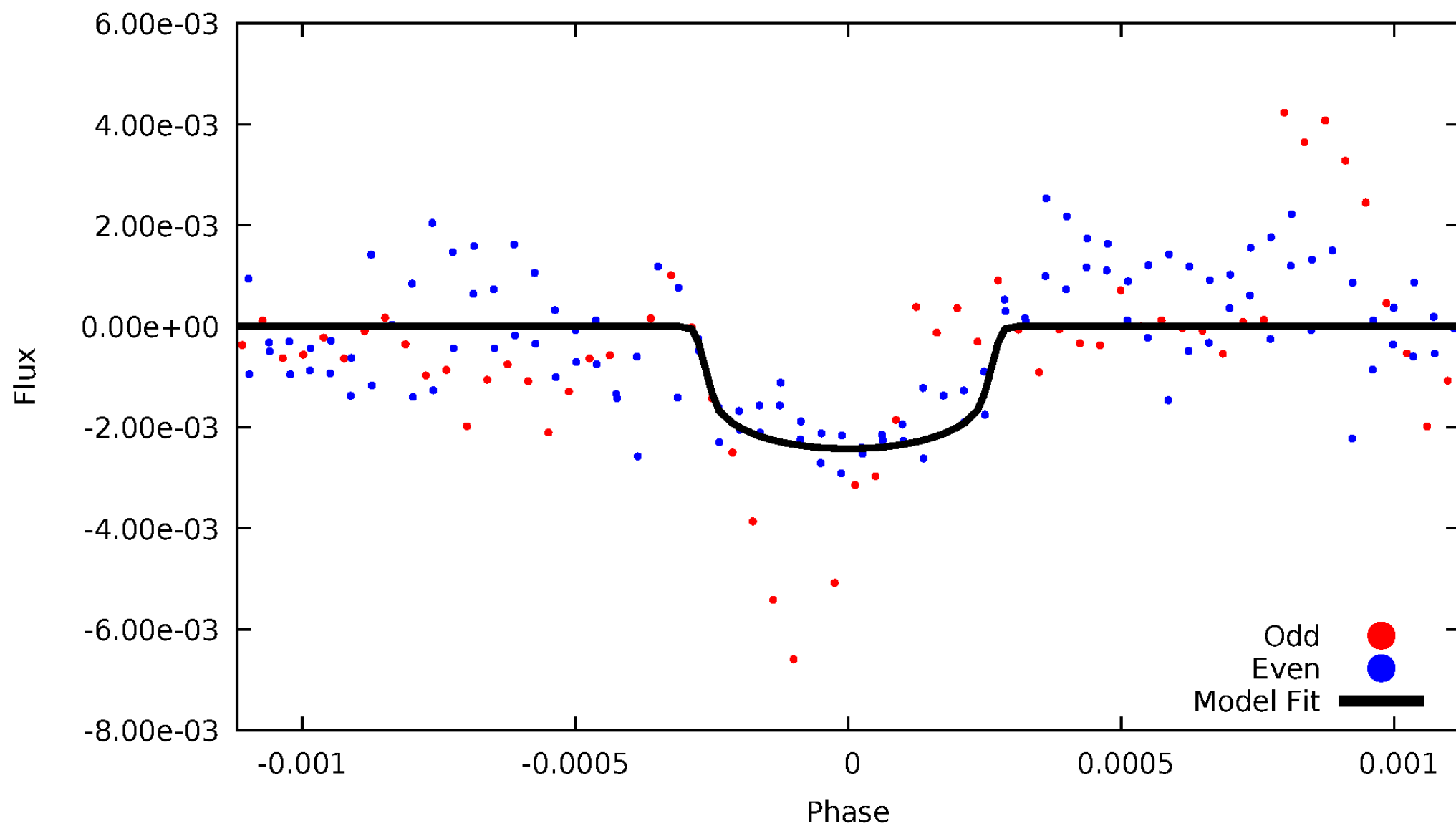
# TCE 006691930-05





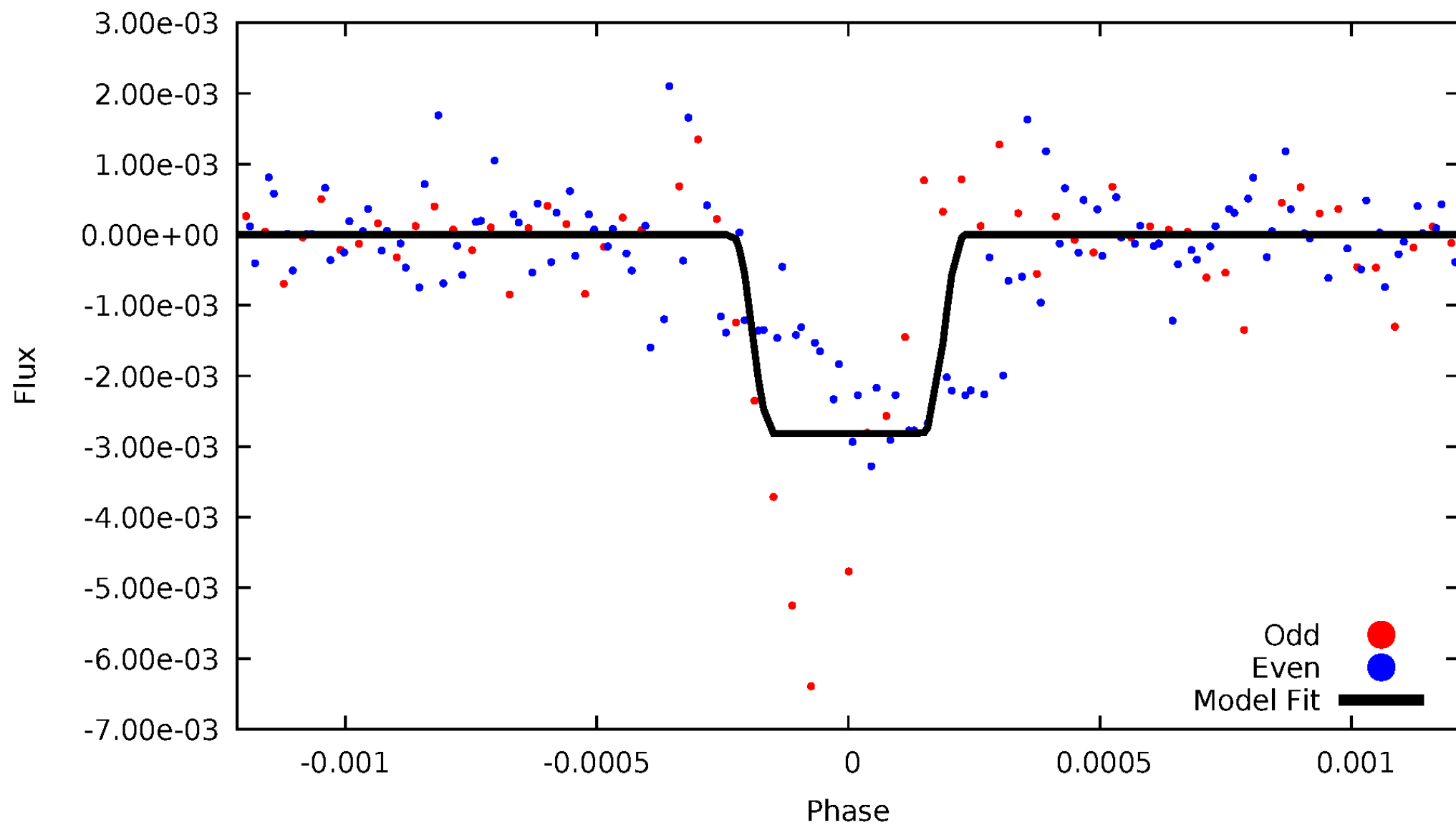
# DV Odd/Even

TCE 006691930-05

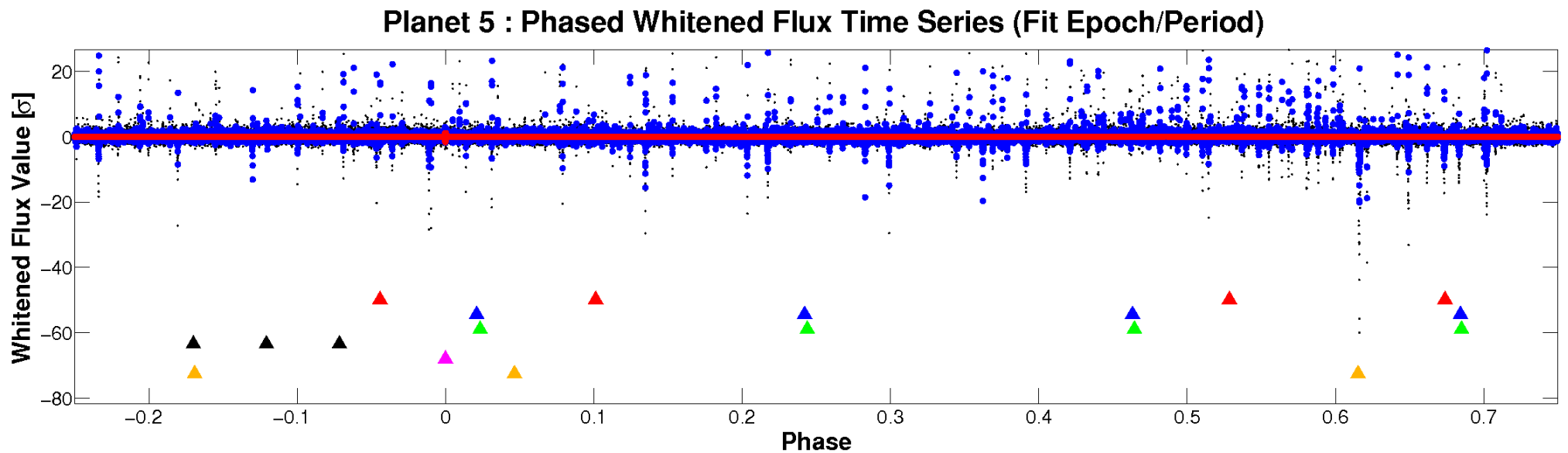
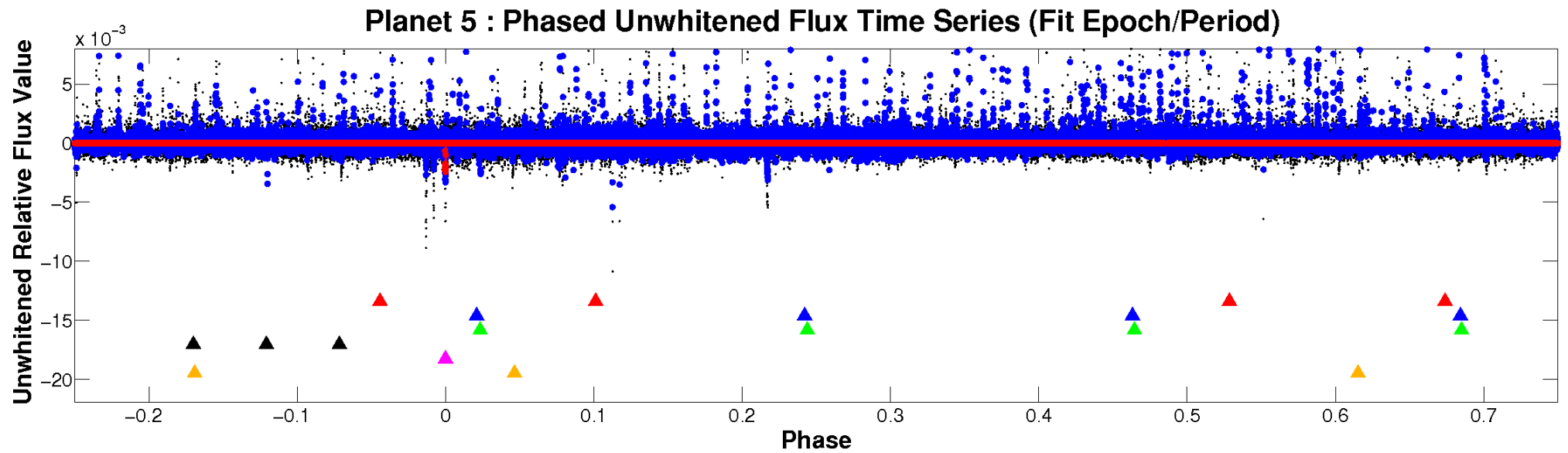


# ALT Odd/Even

TCE 006691930-05

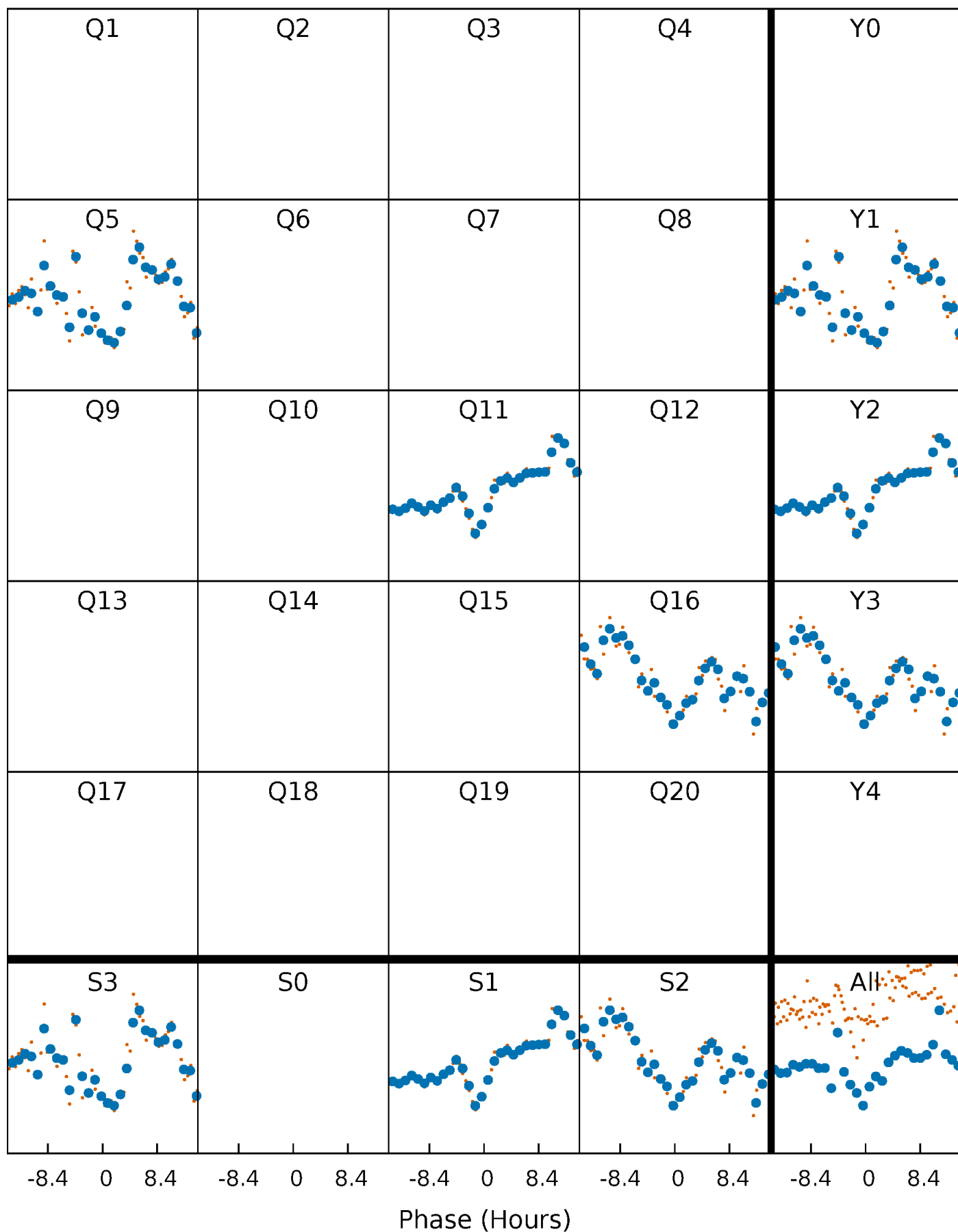


# Non-Whitened Vs. Whitened Light Curve



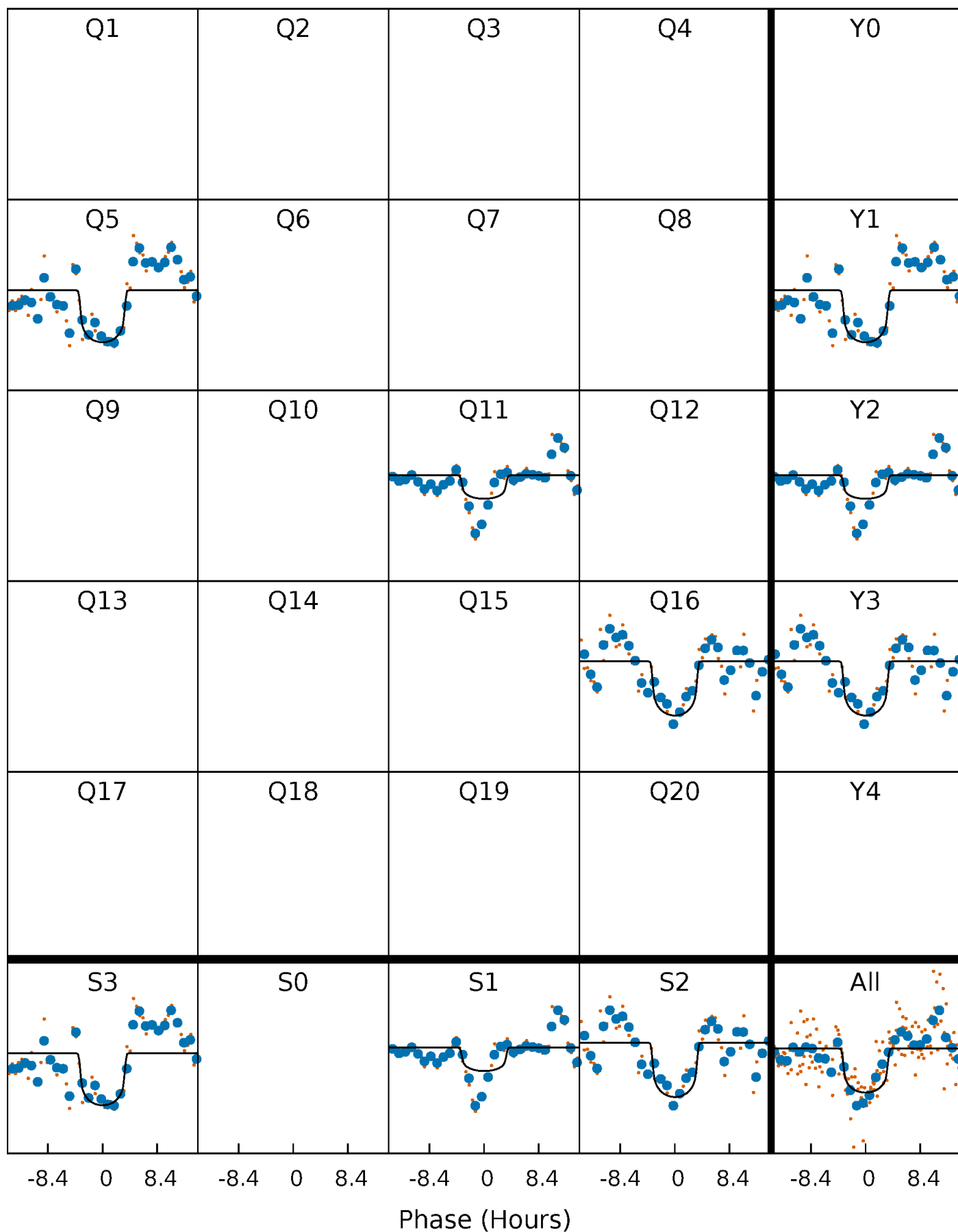
# PDC Quarter-Phased Transit Curves

TCE 006691930-05     $P=545.771145$  Days     $T_0=462.745706$  (BKJD)



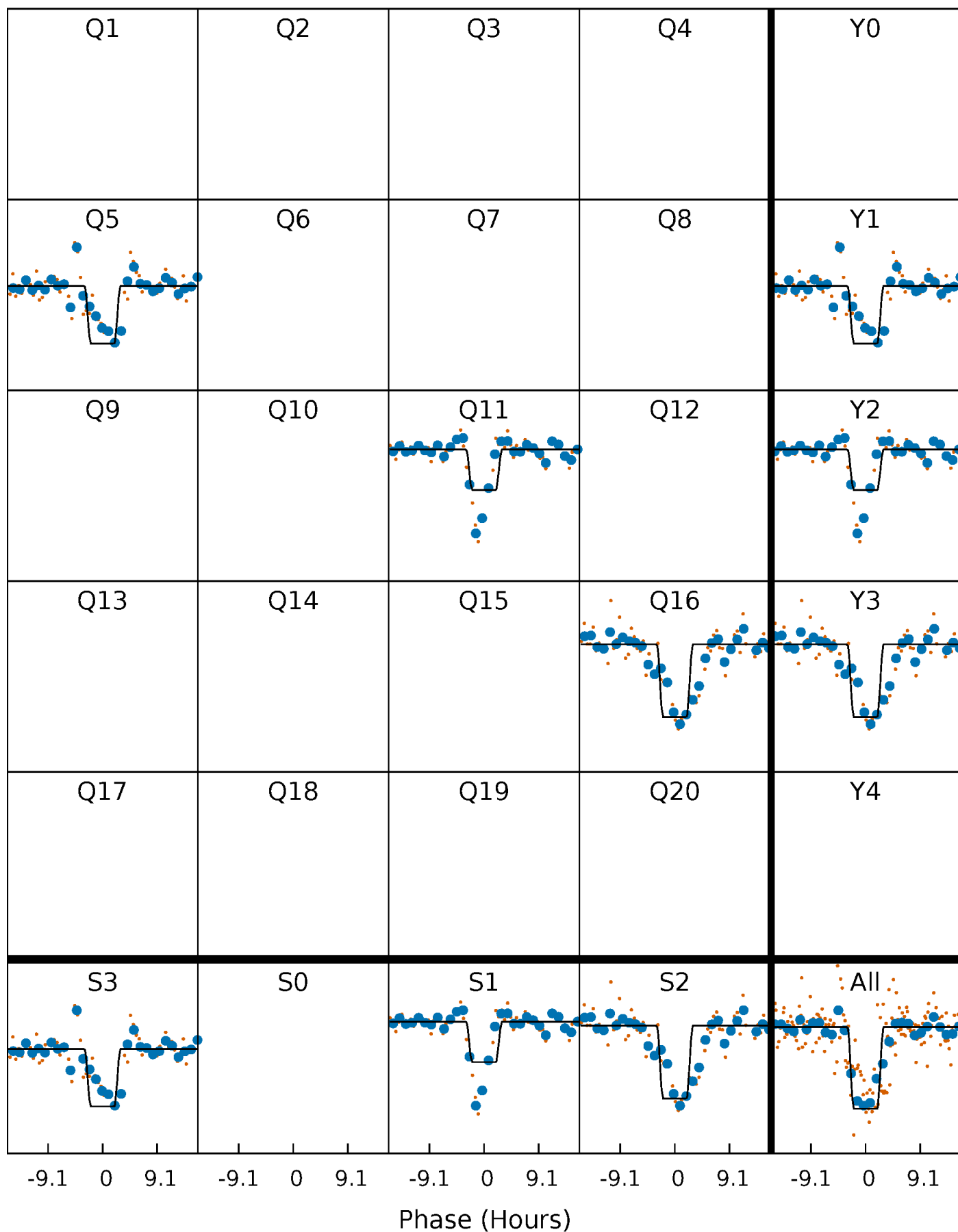
# DV Quarter-Phased Transit Curves

TCE 006691930-05     $P=545.771145$  Days     $T_0=462.745706$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

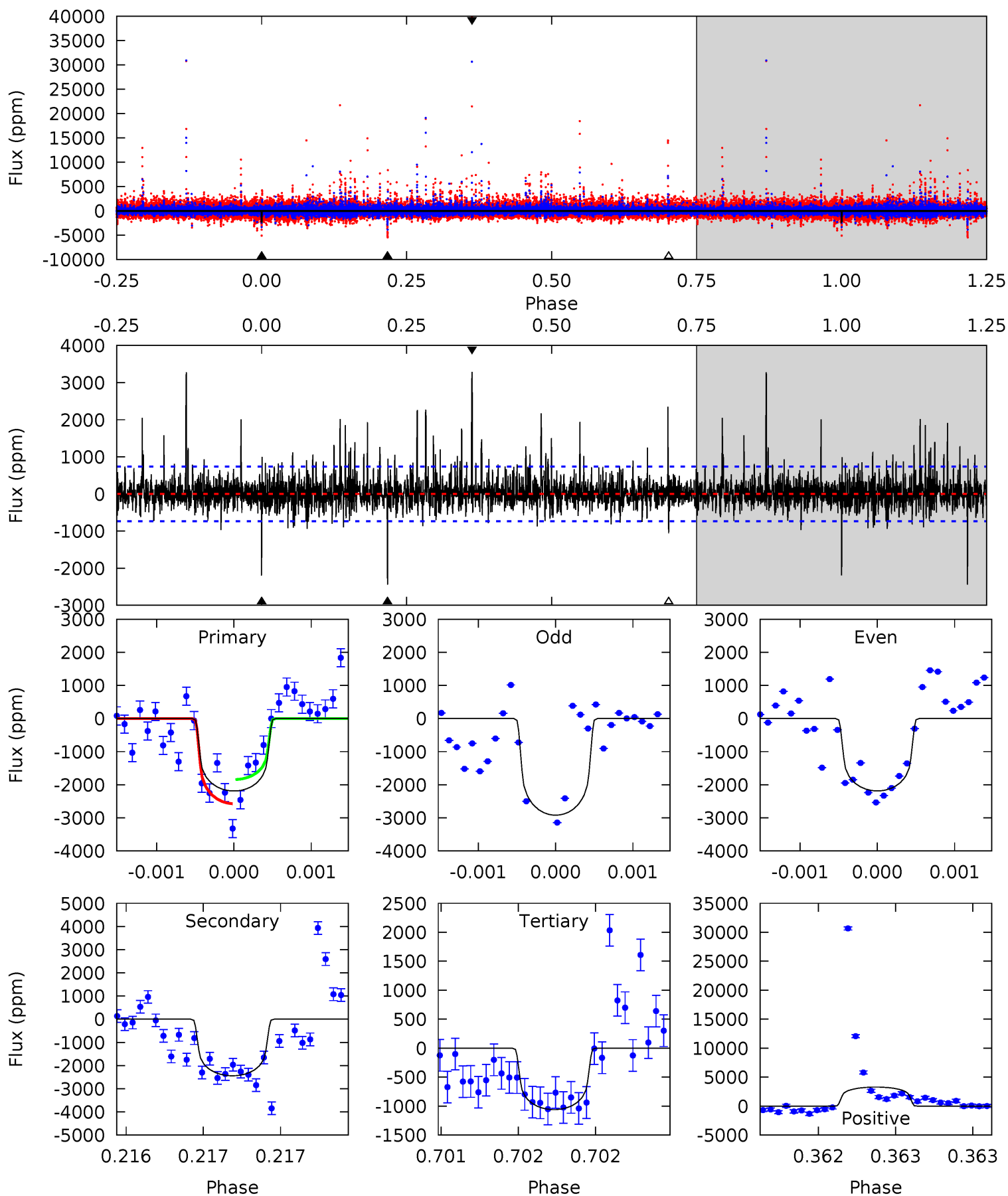
TCE 006691930-05     $P=545.753143$  Days     $T_0=462.749579$  (BKJD)



# DV Model-Shift Uniqueness Test

006691930-05, P = 545.771145 Days, E = 462.745706 Days

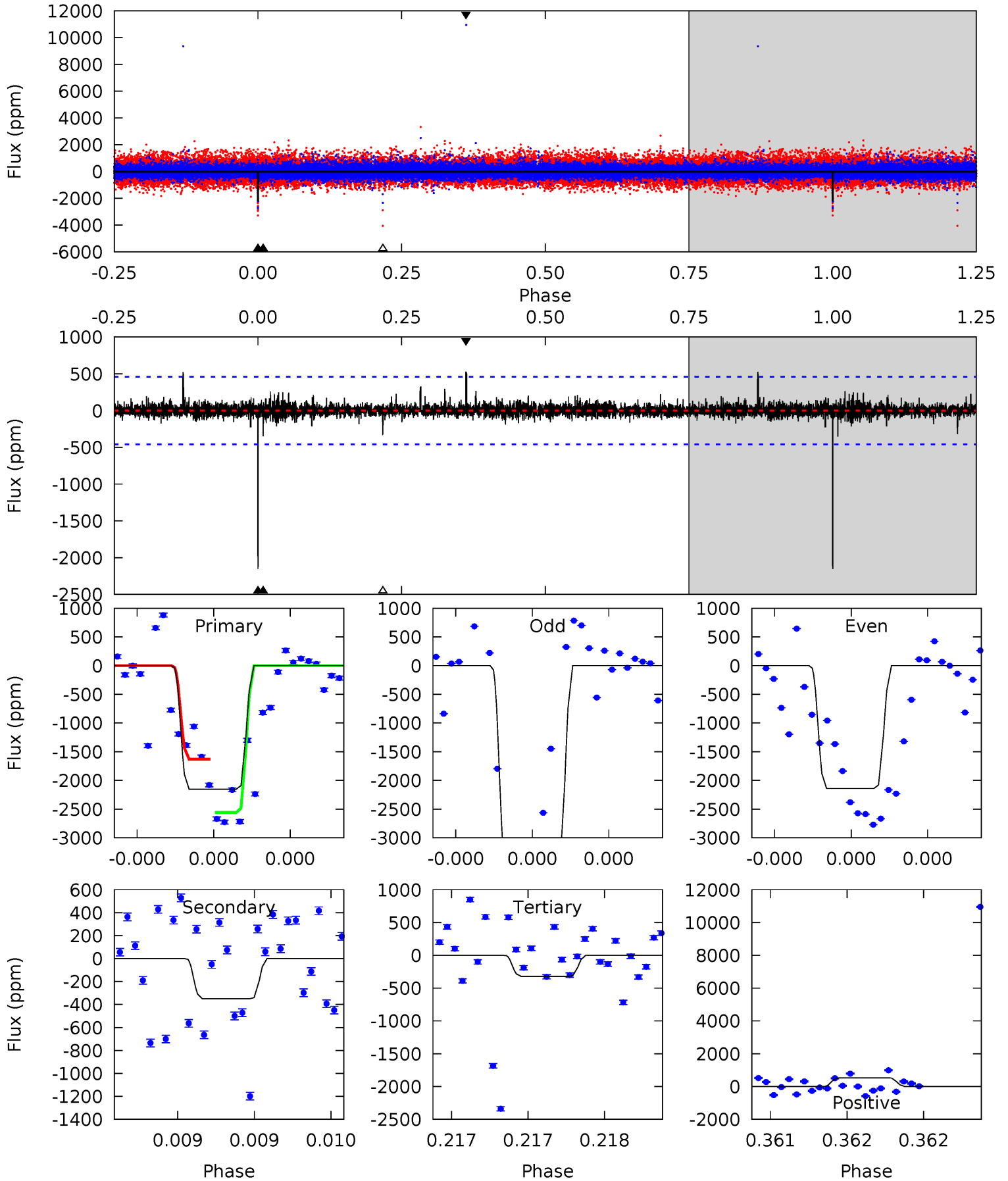
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.5	18.4	8.00	24.8	5.55	3.44	2.43	8.51	-8.26	10.4	-6.35	1.52	1.06	0.57	2.75



# Alt Model-Shift Uniqueness Test

006691930-05, P = 545.753143 Days, E = 462.749579 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.2	4.27	3.91	6.47	5.59	3.51	0.60	22.3	19.8	0.36	-2.20	8.68	1.04	0.20	5.65





### Stellar Parameters For KIC 006691930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5524^{+180}_{-163}$	$4.481^{+0.113}_{-0.125}$	$-0.480^{+0.300}_{-0.300}$	$0.820^{+0.154}_{-0.116}$	$0.742^{+0.116}_{-0.041}$	$1.897^{+0.930}_{-0.683}$
	+3%/-3%	+3%/-3%	+62%/-62%	+19%/-14%	+16%/-6%	+49%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006691930-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2441 \pm 132$	$4.14^{+1.08}_{-1.02}$	$285^{+16}_{-15}$	$5745^{+828}_{-573}$	$110940^{+87623}_{-40816}$
Alt.	$-350 \pm 82$	$4.82^{+1.14}_{-1.03}$	$285^{+16}_{-14}$	$3698^{+380}_{-299}$	$11891^{+8214}_{-4786}$

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

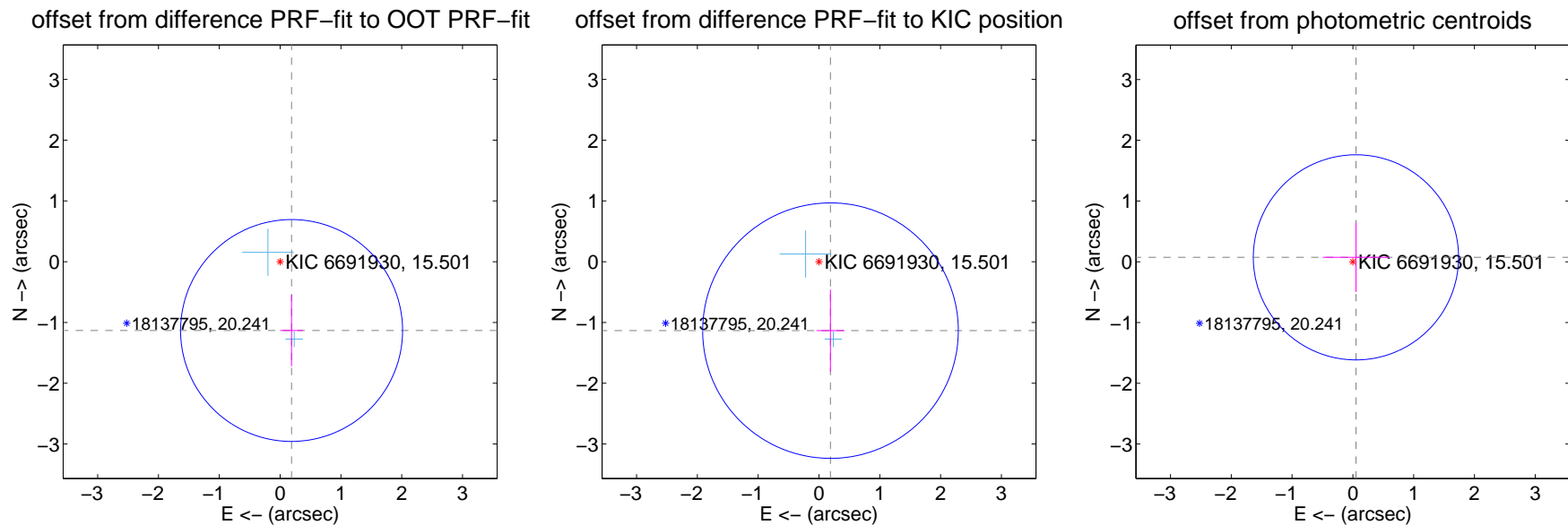
## DV Centroid Data

Supplemental centroid analysis for 006691930-05. Kepler magnitude: 15.50. Transit SNR 9.40

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.148 \pm 0.608$	1.89	$-0.189 \pm 0.188$	$-1.132 \pm 0.587$
PRF-fit source offset from KIC position	$1.150 \pm 0.701$	1.64	$-0.189 \pm 0.228$	$-1.134 \pm 0.674$
photometric centroid source offset	$0.09 \pm 0.56$	0.16	$-0.05 \pm 0.55$	$0.07 \pm 0.57$

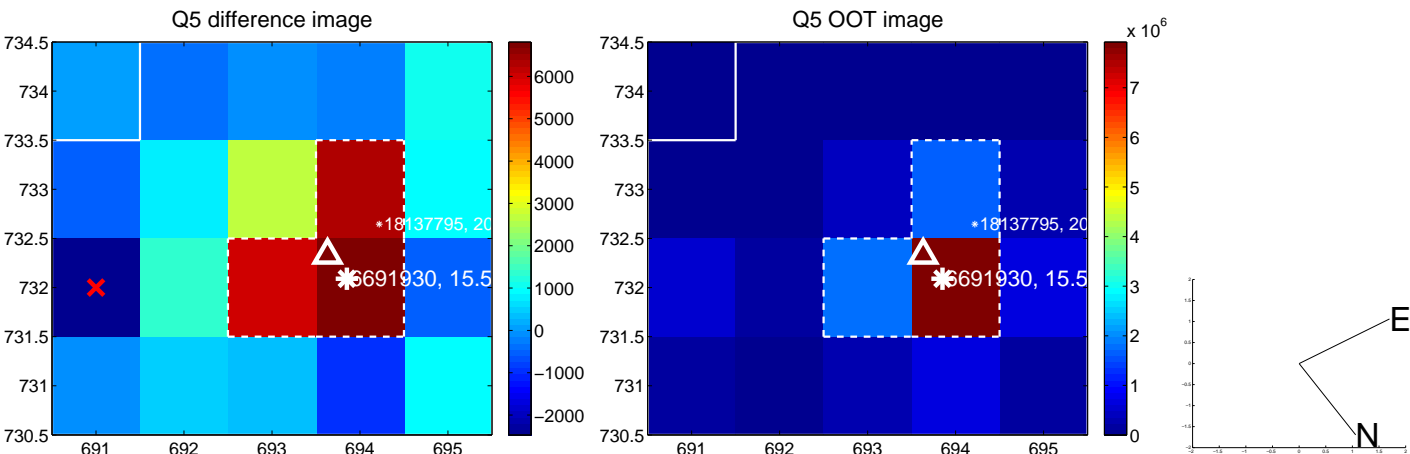


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



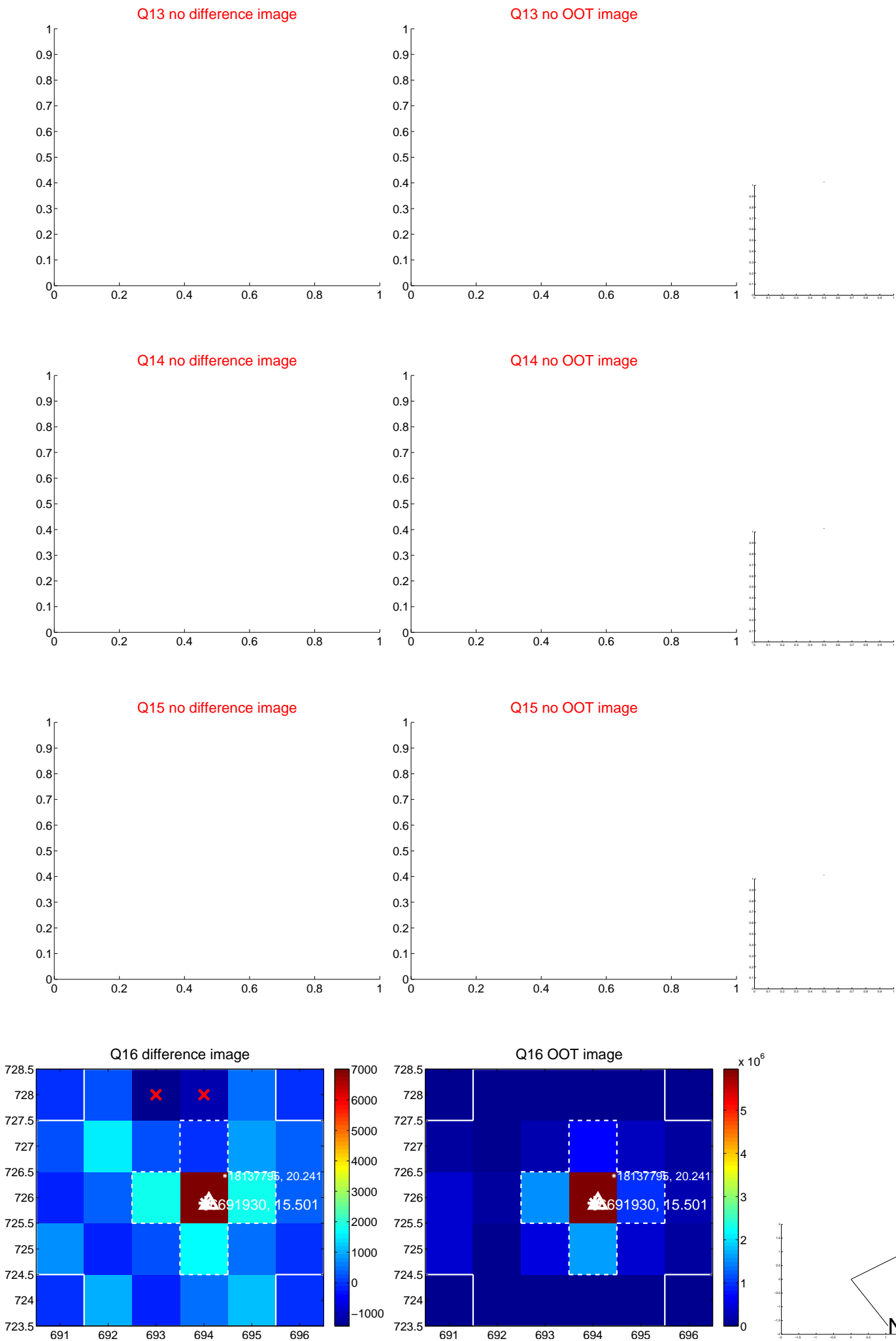
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

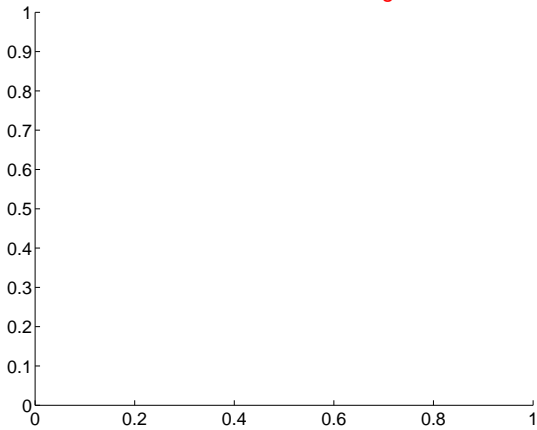


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

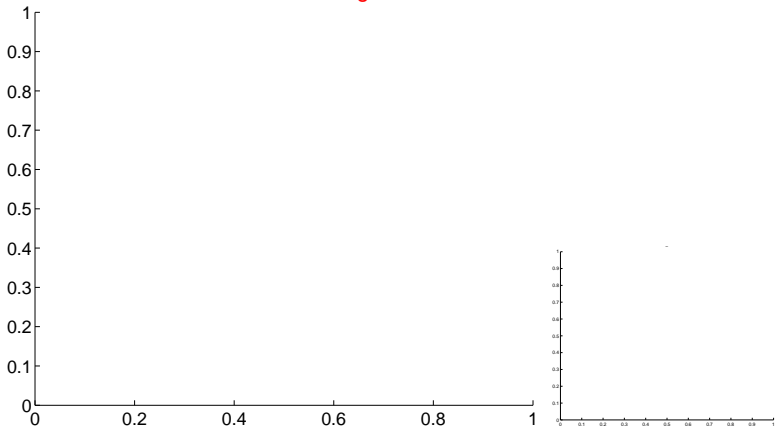


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

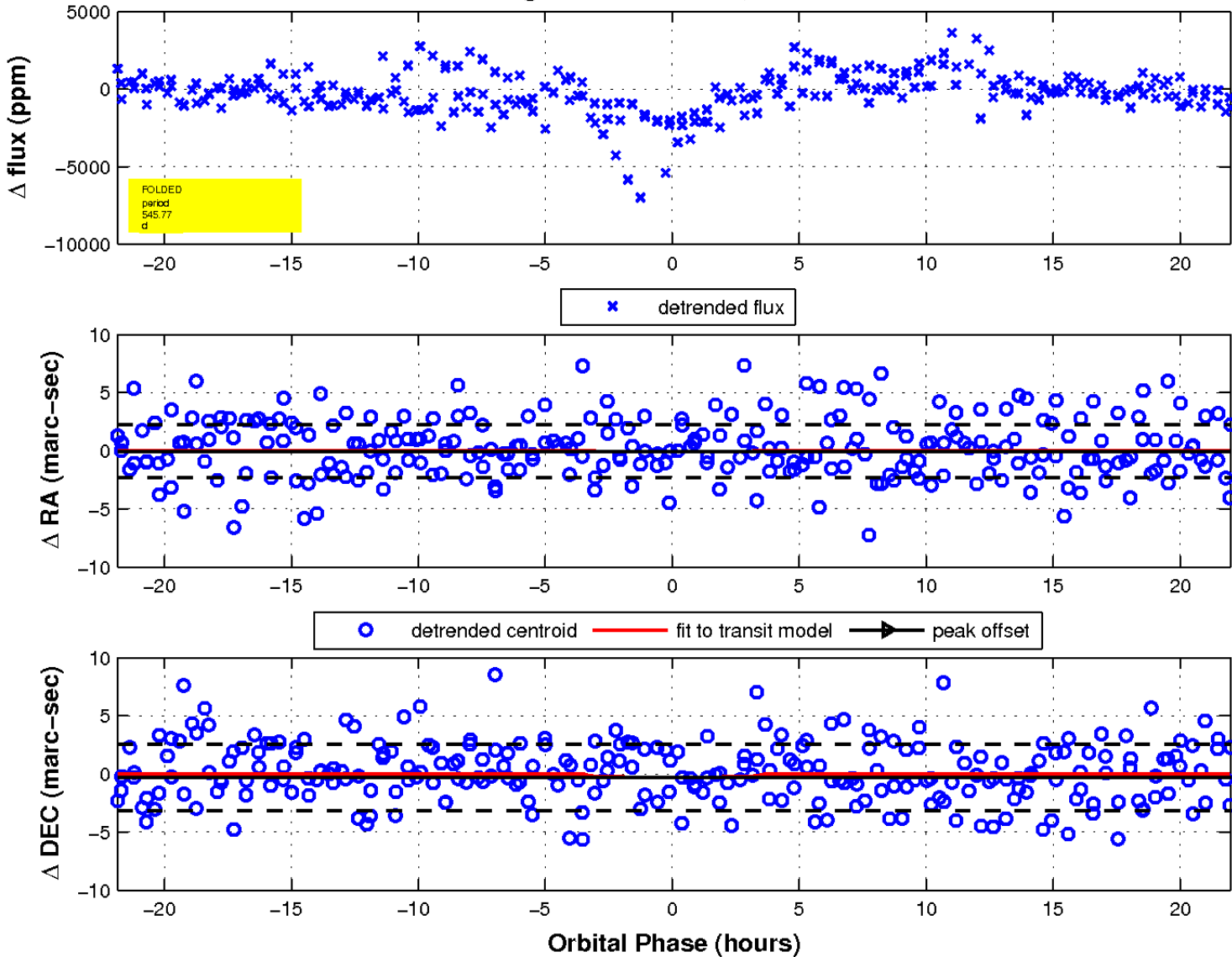
Q17 no difference image



Q17 no OOT image

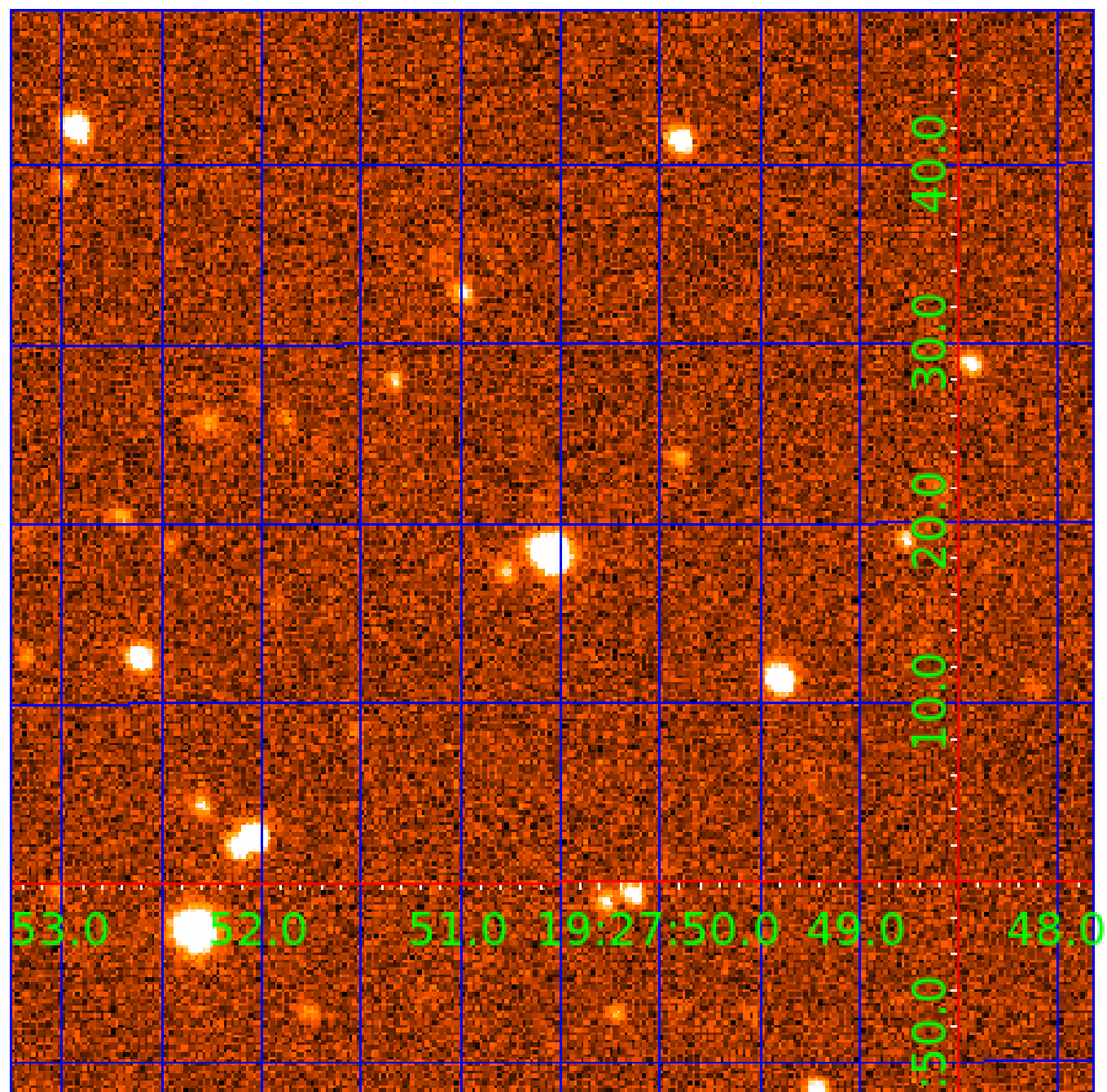


fluxWeightedCentroids, Planet 5 of 6



# UKIRT Image

Declination





# KIC 006691930

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006691930-01	OBS	No	312.559954	438.656327	2199.8	12.778	15.2	8.7	0.82	5524	4.11	0.84
006691930-02	OBS	No	425.100719	290.458555	392.5	0.968	12.0	1.0	0.82	5524	2.23	0.56
006691930-03	OBS	No	425.394623	290.856289	1270.6	12.307	11.9	6.7	0.82	5524	3.00	0.56
006691930-04	OBS	No	518.903445	423.710902	995.5	10.500	11.2	-1.0	0.82	5524	2.56	0.43
006691930-05	OBS	No	545.771146	462.745706	2422.3	7.332	9.6	9.4	0.82	5524	4.09	0.40
006691930-06	OBS	No	428.090130	488.134669	2007.3	13.294	9.8	8.9	0.82	5524	4.36	0.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006691930-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006691930-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006691930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006691930-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006691930-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

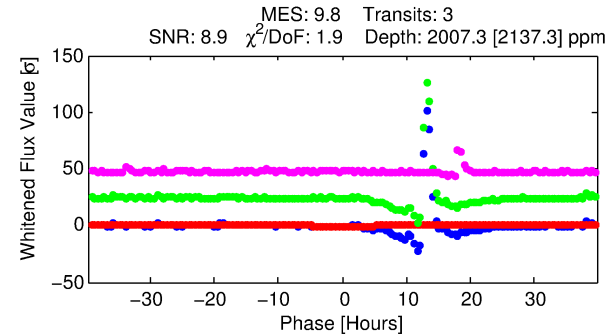
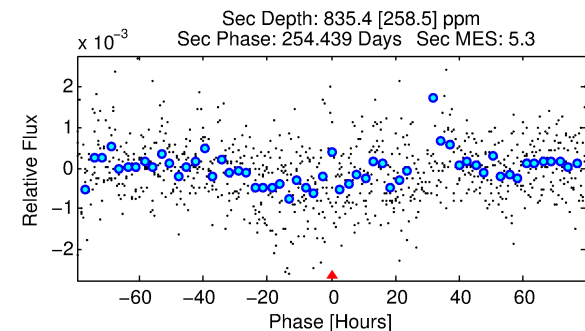
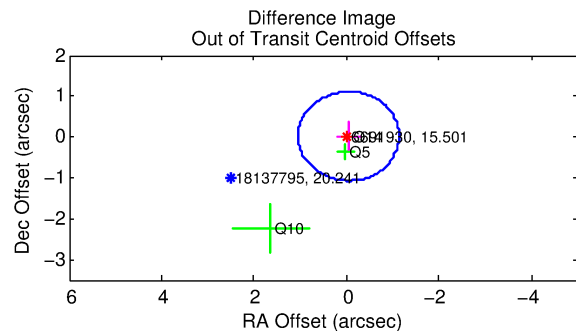
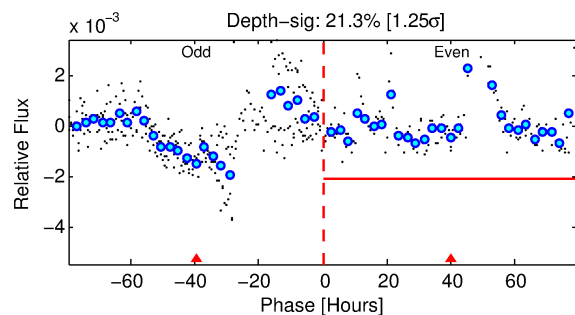
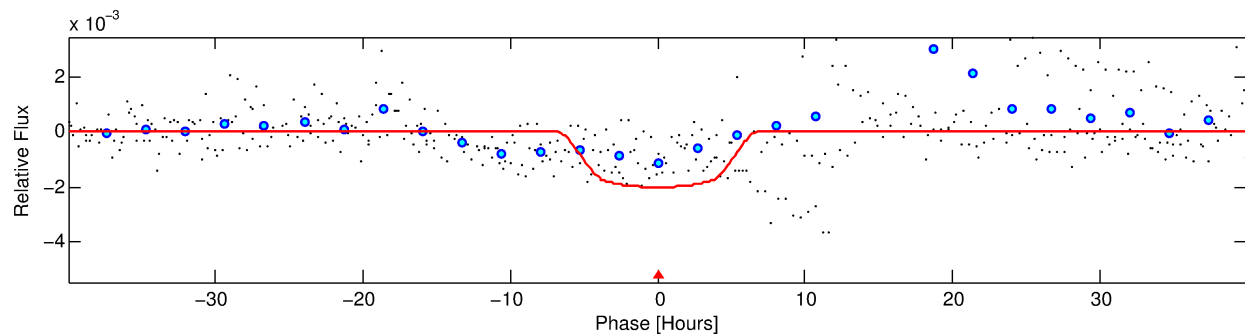
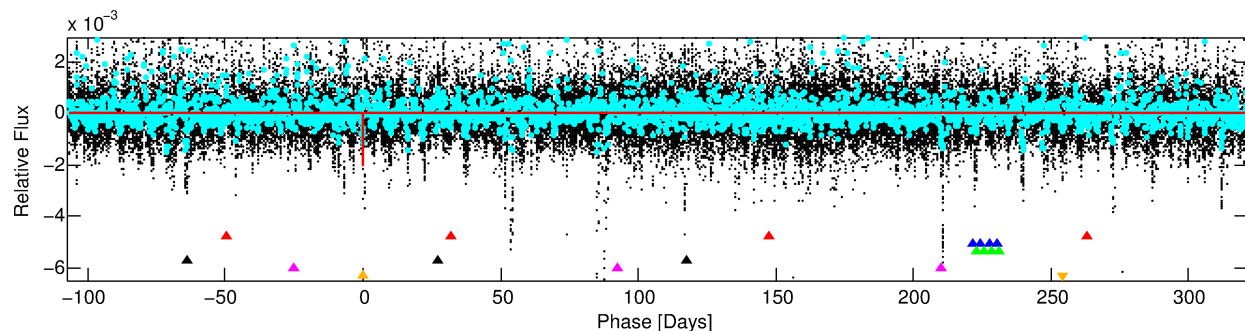
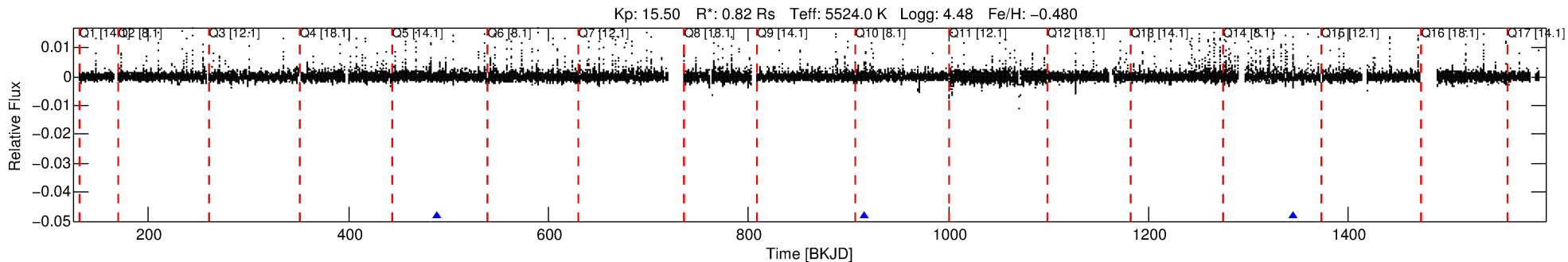
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006691930-06

No Significant Match Found

# DV One-Page Summary

KIC: 6691930 Candidate: 6 of 6 Period: 428.090 d



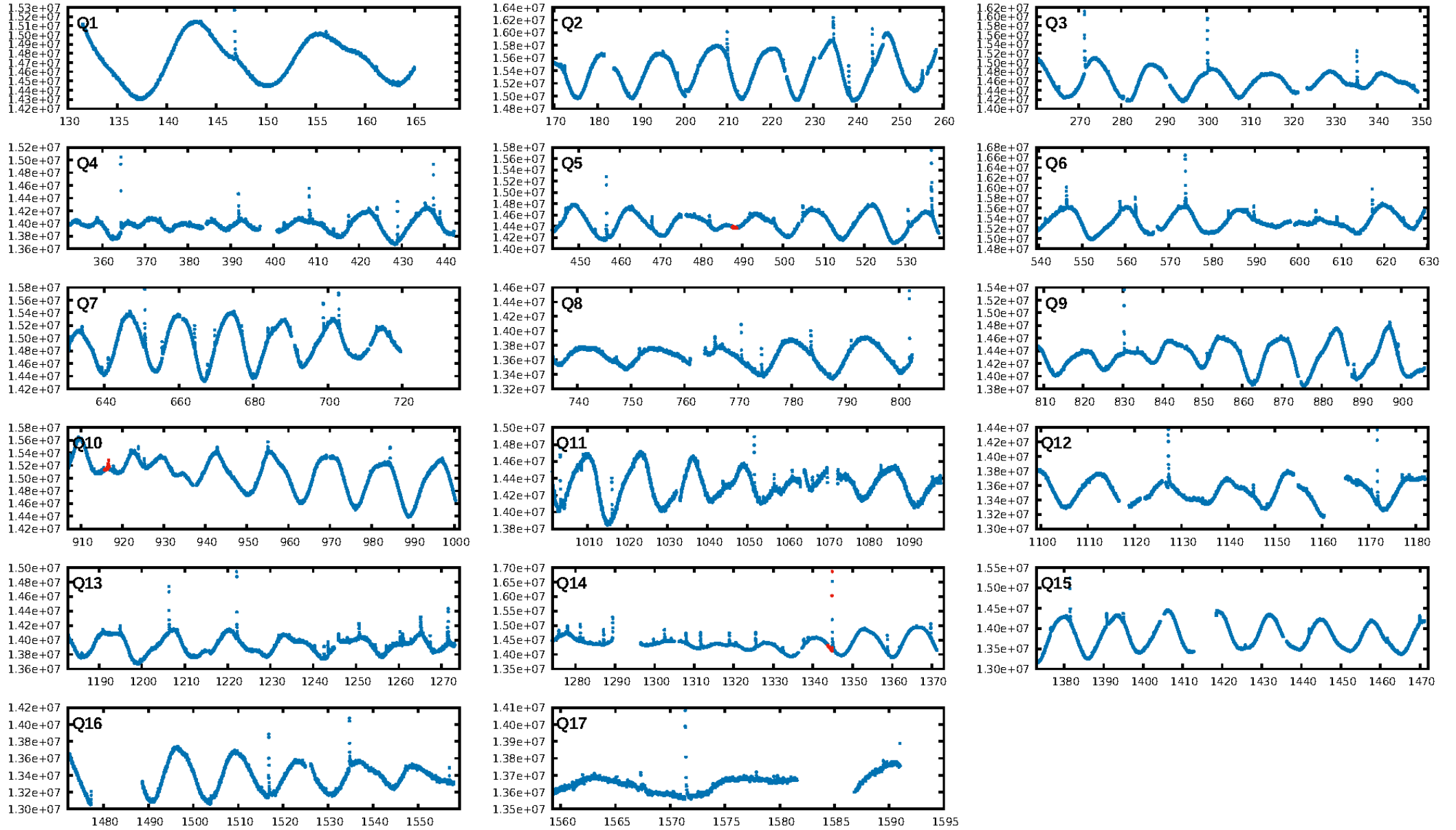
## DV Fit Results:

Period = 428.09013 [0.09831] d  
Epoch = 488.1347 [0.1372] BKJD  
Rp/R\* = 0.0487 [0.0323]  
a/R\* = 133.86 [182.80]  
b = 0.90 [0.31]  
Seff = 0.55 [0.15]  
Teq = 220 [14] K  
Rp = 4.36 [3.01] Re  
a = 1.0068 [0.1588] AU  
Ag = 24506.41 [33848.25] [0.72σ]  
Teffp = 4255 [1455] K [2.77σ]

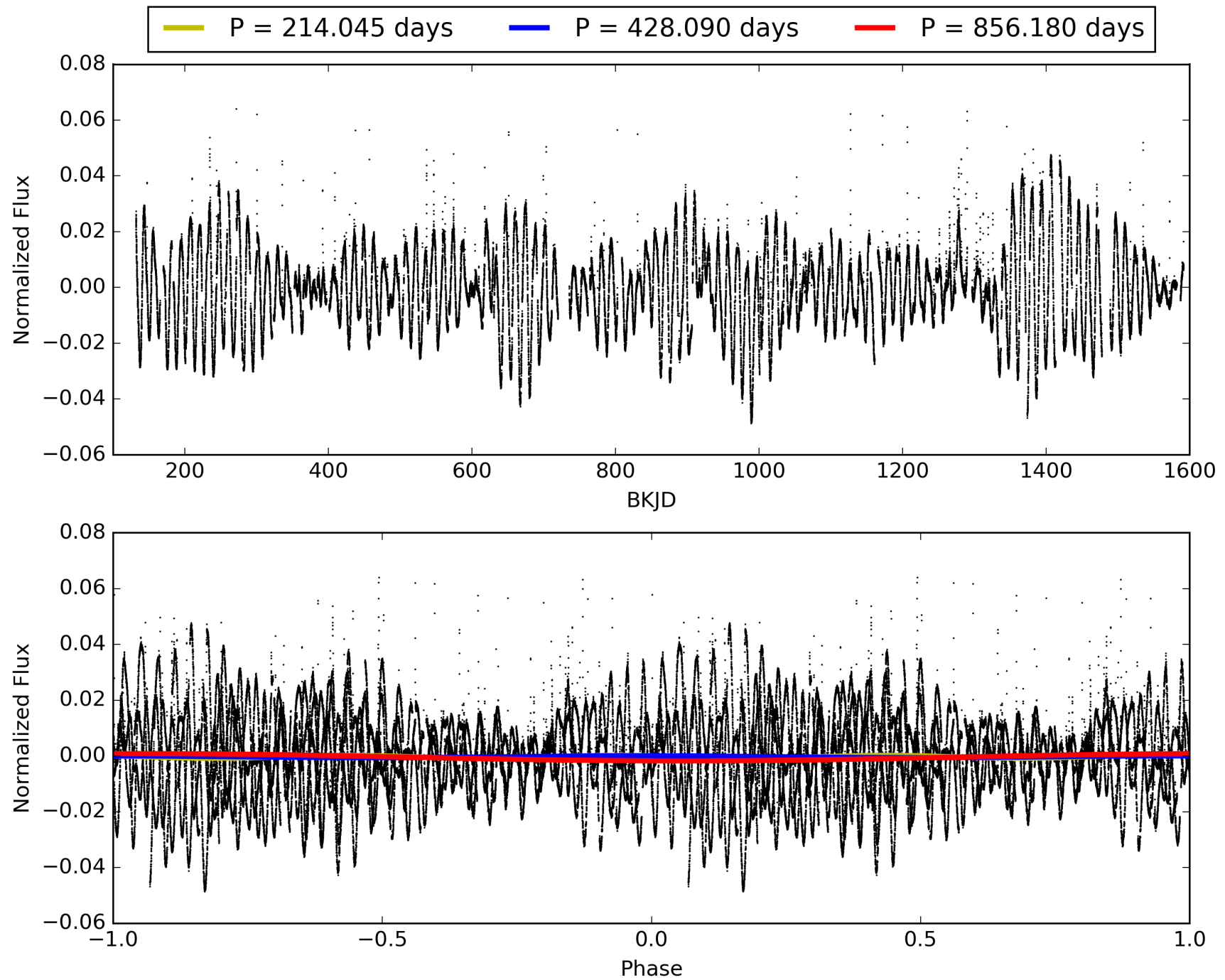
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [3.57σ]  
LongPeriod-sig: 100.0% [128.66σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 3.9%  
Bootstrap-pfa: 3.57e-08  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.5072  
Centroid-sig: 50.5%  
Centroid-so: 0.336 arcsec [0.66σ]  
OotOffset-rm: 0.043 arcsec [0.12σ]  
KicOffset-rm: 0.196 arcsec [0.71σ]  
OotOffset-st: 2/0/0/1 [3]  
KicOffset-st: 2/0/0/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 006691930-06, PDC Light Curves

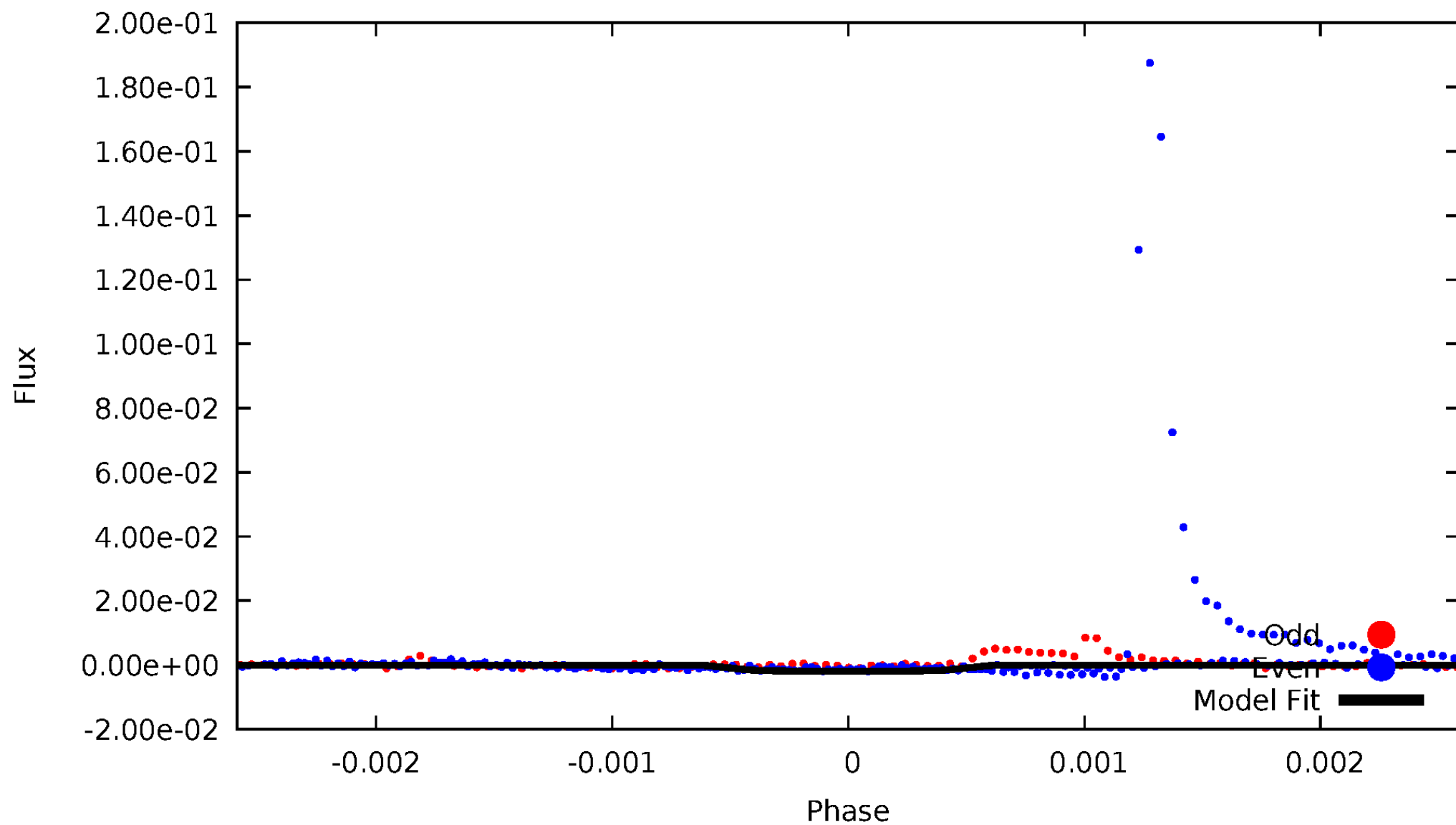


# TCE 006691930-06



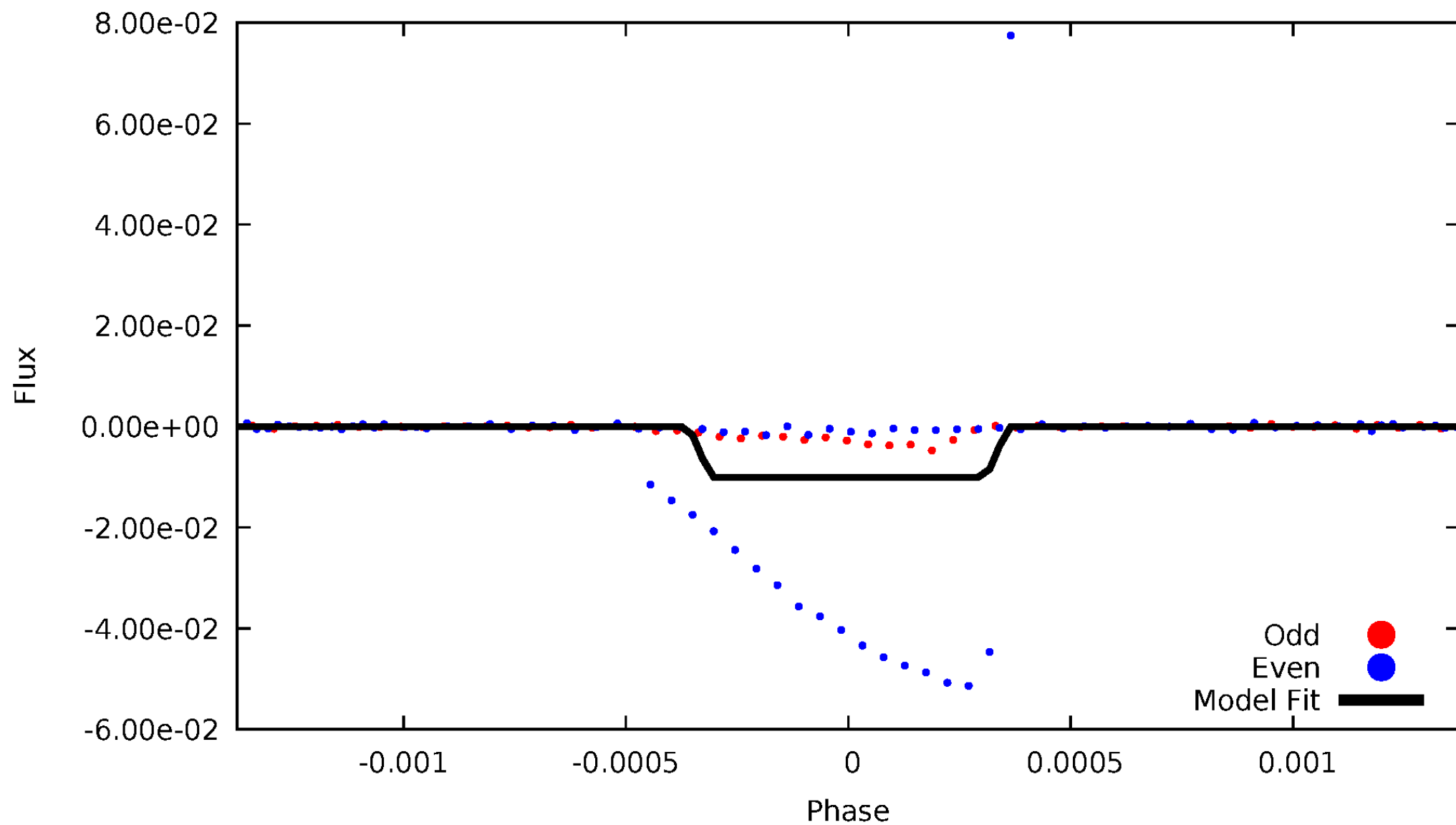
# DV Odd/Even

TCE 006691930-06



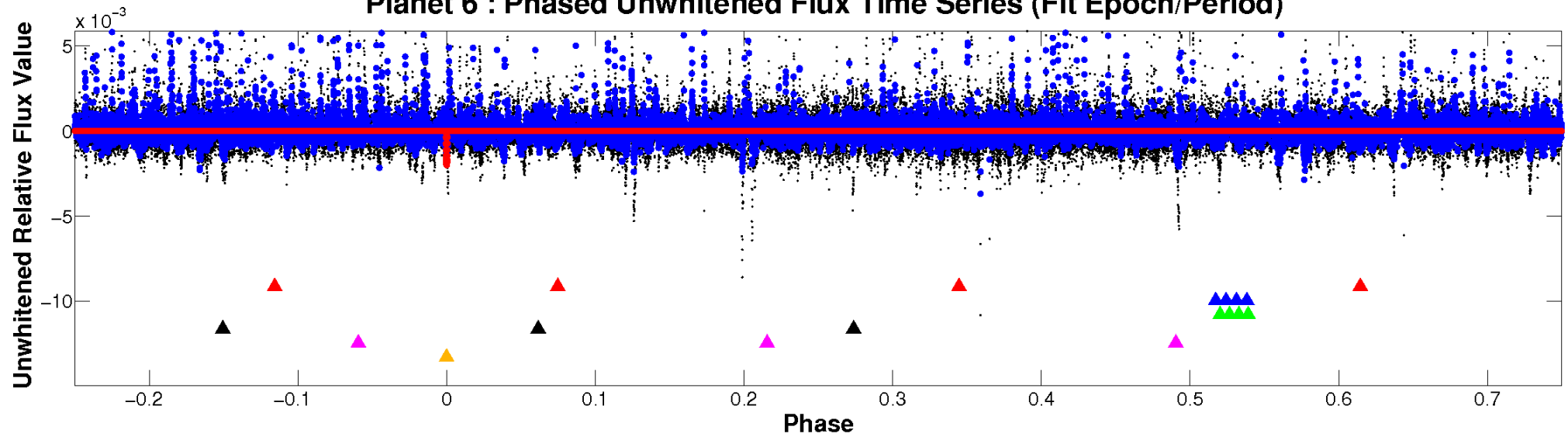
# ALT Odd/Even

TCE 006691930-06

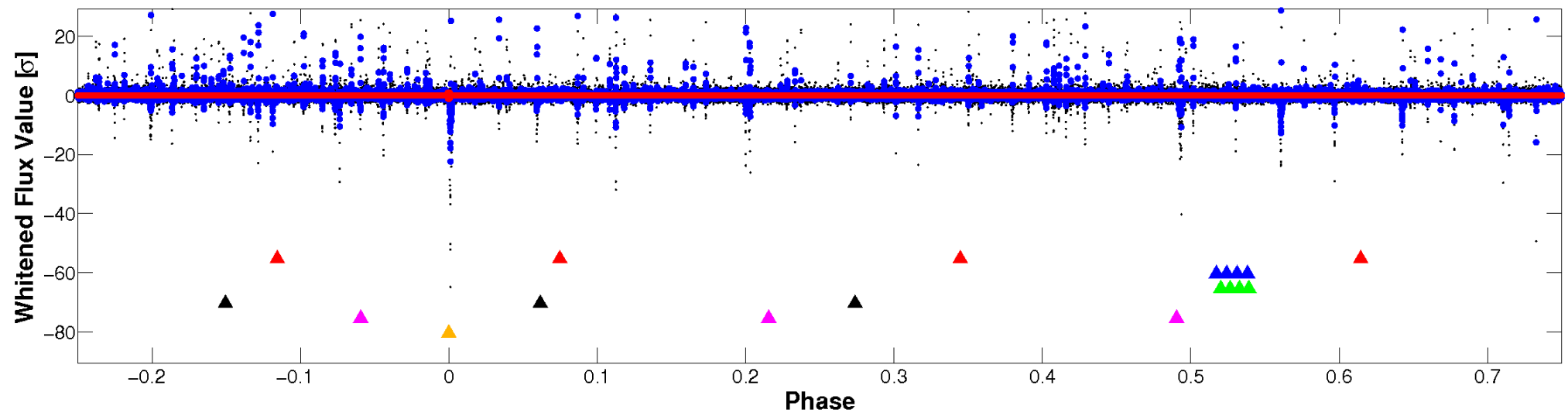


# Non-Whitened Vs. Whitened Light Curve

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

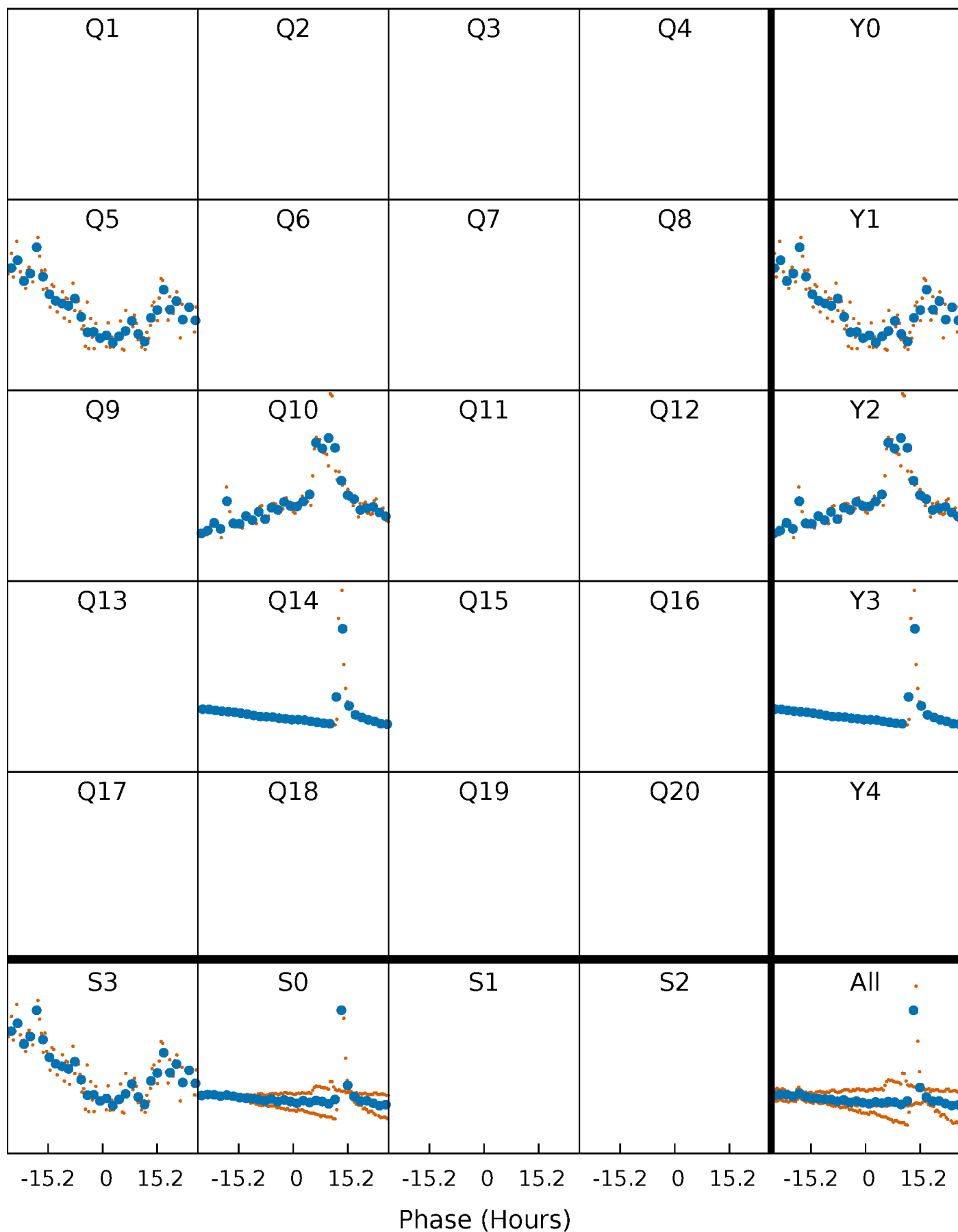


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

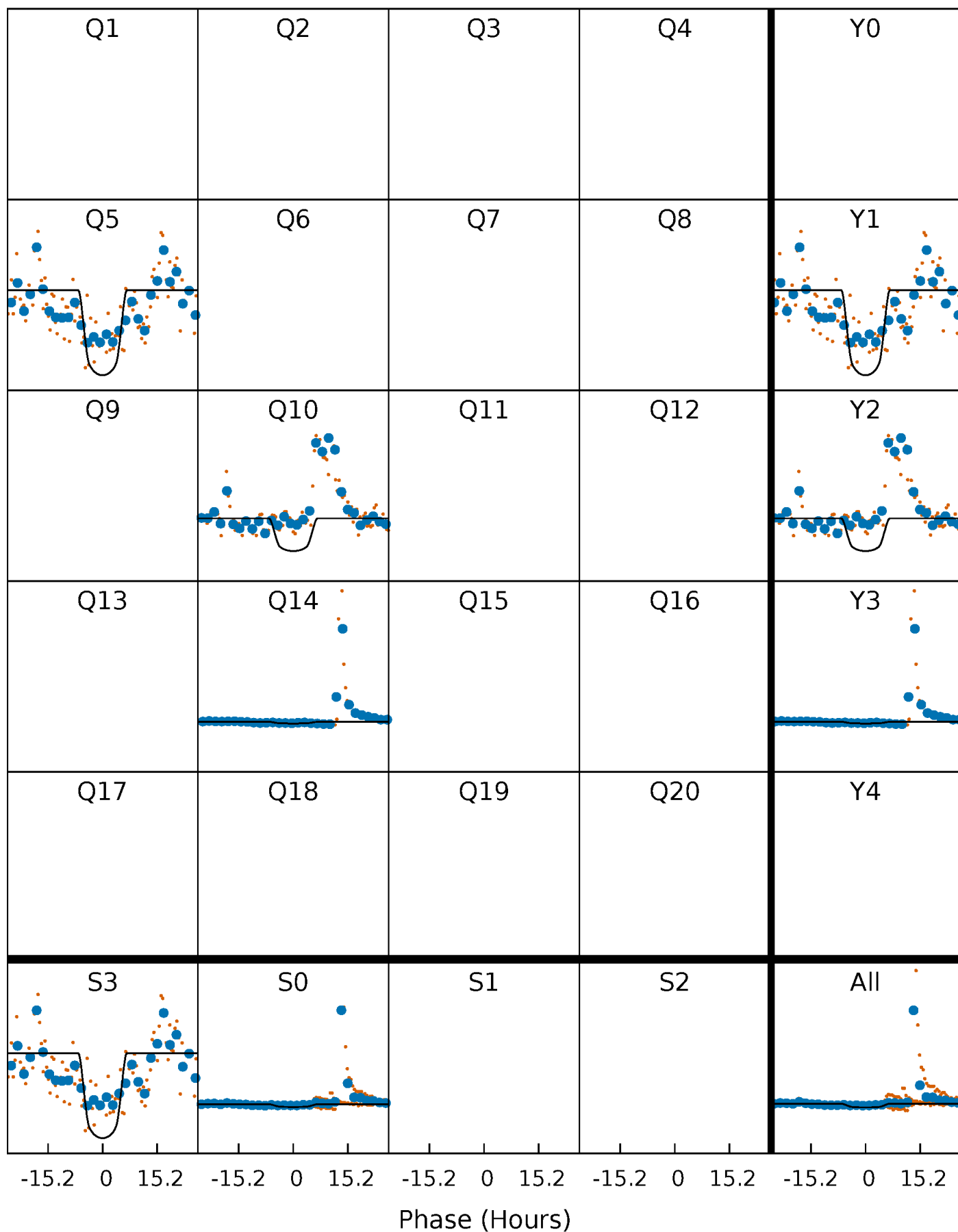
TCE 006691930-06 P=428.090130 Days  $T_0=488.134669$  (BKJD)





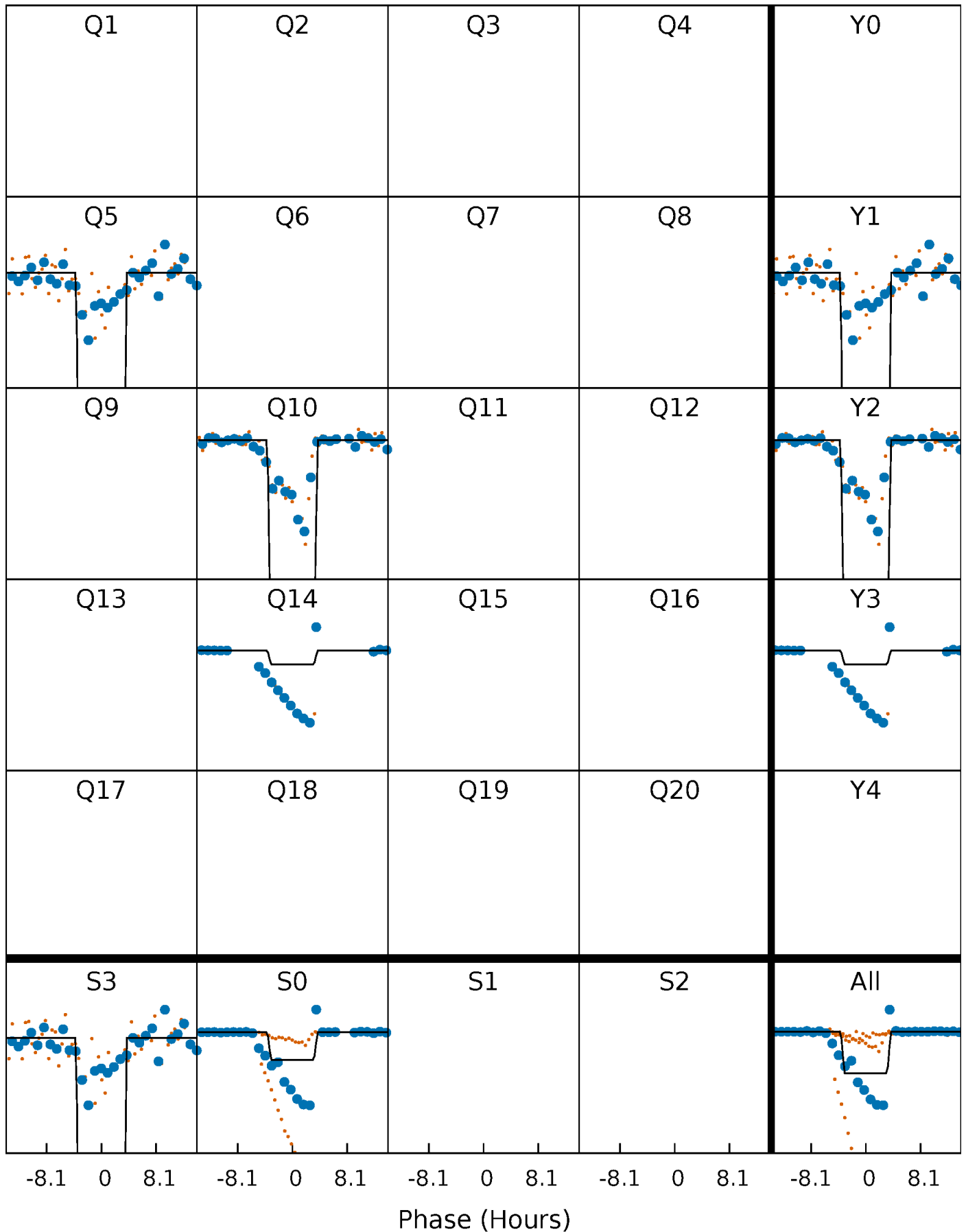
# DV Quarter-Phased Transit Curves

TCE 006691930-06 P=428.090130 Days  $T_0=488.134669$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

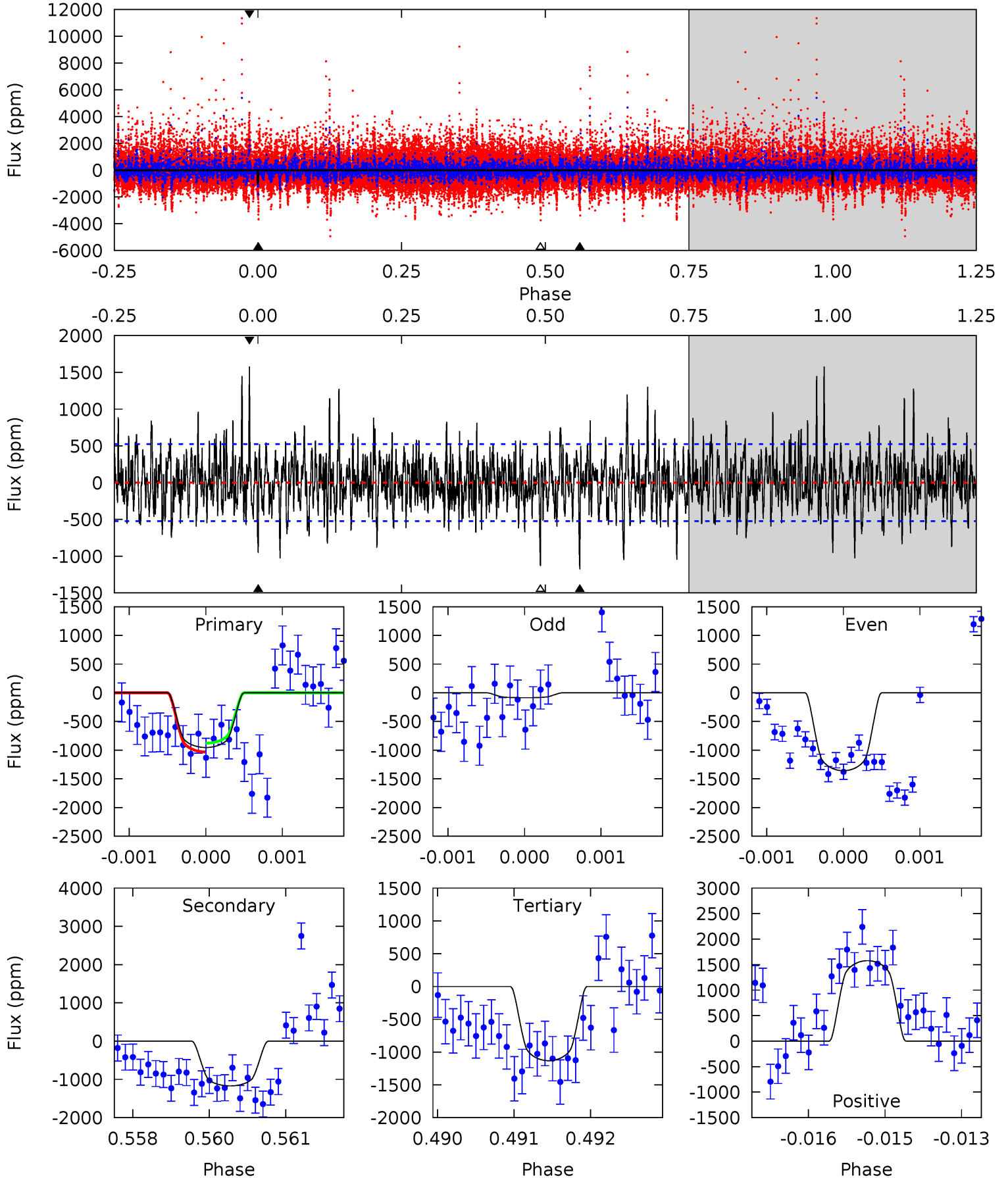
TCE 006691930-06 P=428.335096 Days  $T_0=488.014277$  (BKJD)



# DV Model-Shift Uniqueness Test

006691930-06,  $P = 428.090130$  Days,  $E = 60.044539$  Days

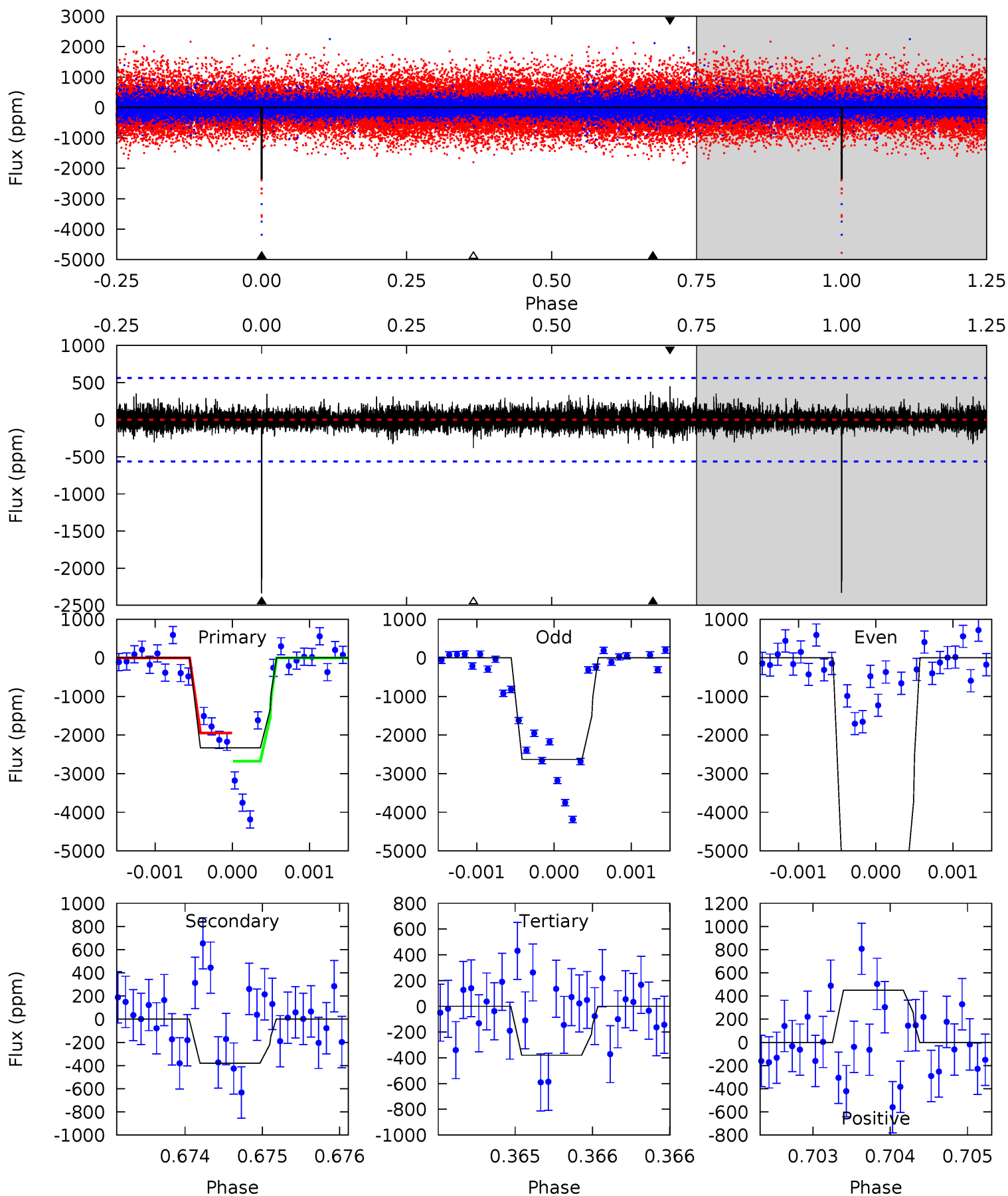
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.81	12.0	11.6	16.2	5.40	3.21	3.07	-1.83	-6.42	0.40	-4.19	4.27	0.72	0.57	0.80



# Alt Model-Shift Uniqueness Test

006691930-06, P = 428.335096 Days, E = 59.679181 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.8	3.73	3.72	4.41	5.52	3.40	0.72	19.1	18.4	0.01	-0.68	23.3	5.49	0.16	3.69



### Stellar Parameters For KIC 006691930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5524^{+180}_{-163}$	$4.481^{+0.113}_{-0.125}$	$-0.480^{+0.300}_{-0.300}$	$0.820^{+0.154}_{-0.116}$	$0.742^{+0.116}_{-0.041}$	$1.897^{+0.930}_{-0.683}$
	+3%/-3%	+3%/-3%	+62%/-62%	+19%/-14%	+16%/-6%	+49%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006691930-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1170 \pm 97$	$4.85^{+2.87}_{-2.79}$	$307^{+18}_{-15}$	$4561^{+2385}_{-707}$	$27838^{+130309}_{-16621}$
Alt.	$-381 \pm 102$	$9.14^{+3.26}_{-2.96}$	$309^{+17}_{-16}$	$3062^{+392}_{-263}$	$2491^{+3338}_{-1208}$

$T_{max}$  = 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

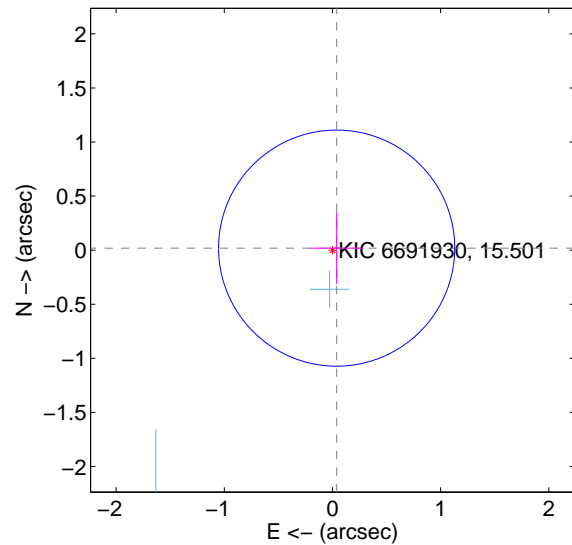
Supplemental centroid analysis for 006691930-06. Kepler magnitude: 15.50. Transit SNR 8.94

There are 3 quarters with good PRF difference image offsets

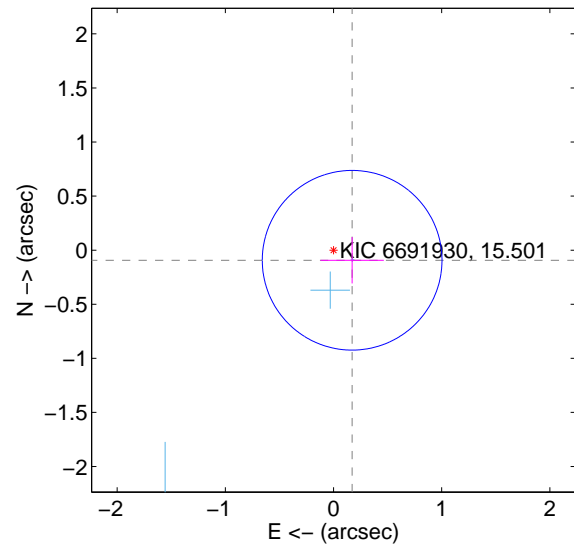
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.043 \pm 0.364$	0.12	$-0.039 \pm 0.251$	$0.019 \pm 0.333$
PRF-fit source offset from KIC position	$0.196 \pm 0.277$	0.71	$-0.172 \pm 0.293$	$-0.093 \pm 0.215$
photometric centroid source offset	$0.34 \pm 0.51$	0.66	$-0.20 \pm 0.48$	$0.27 \pm 0.53$

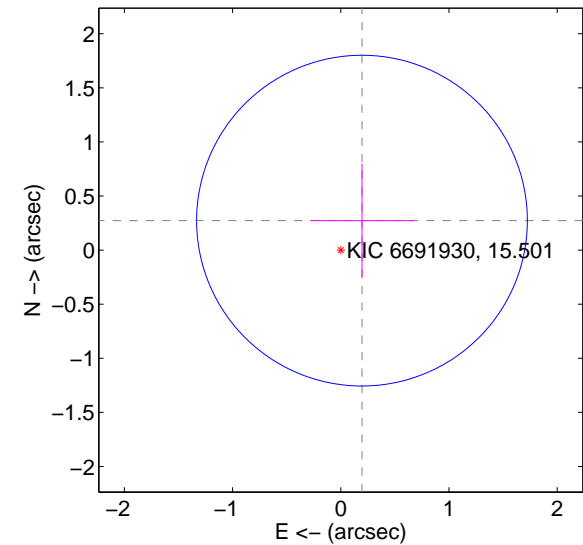
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

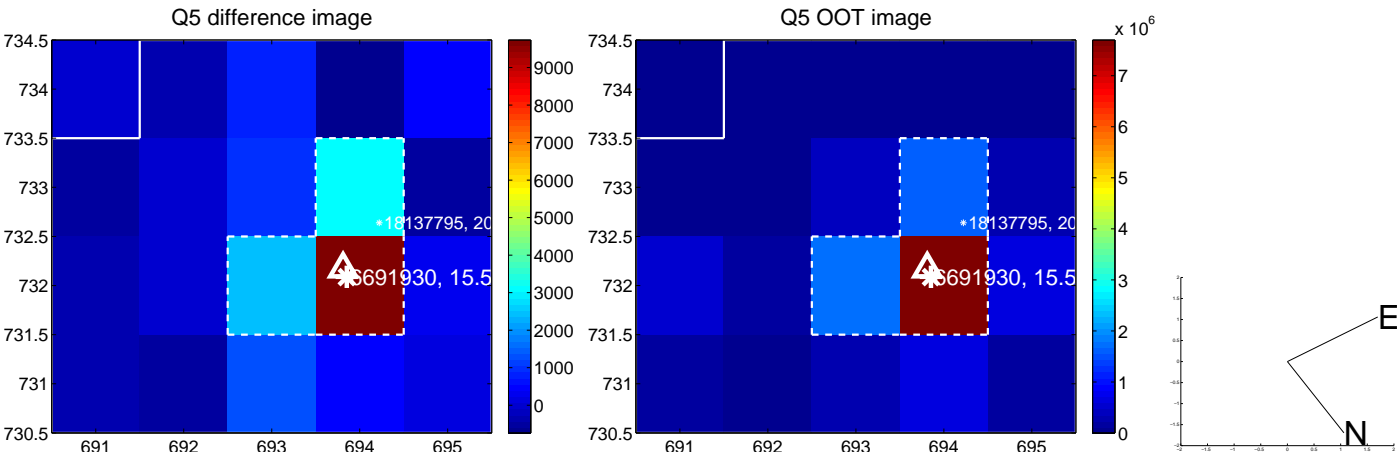


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

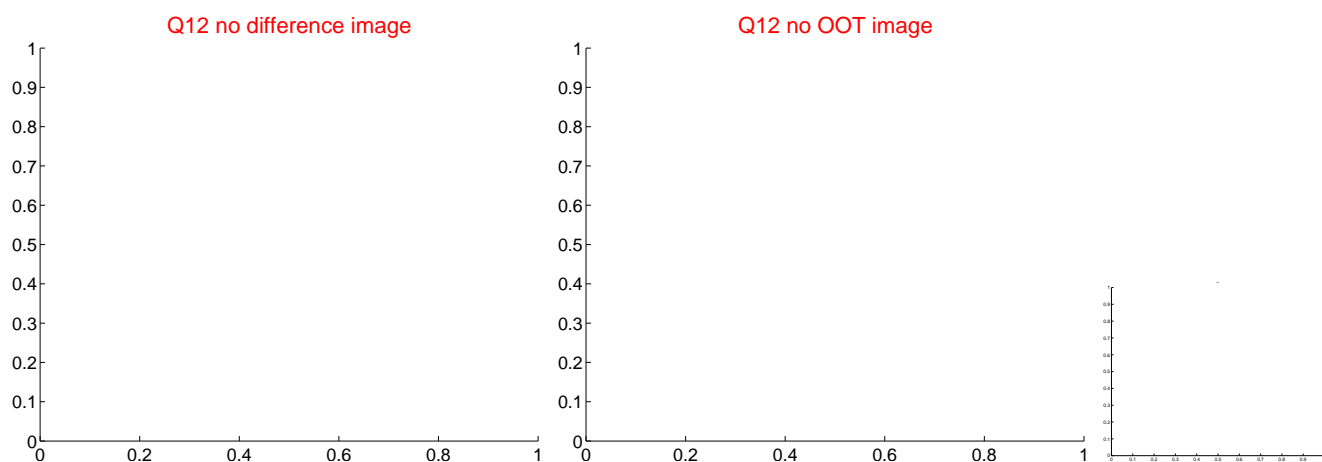
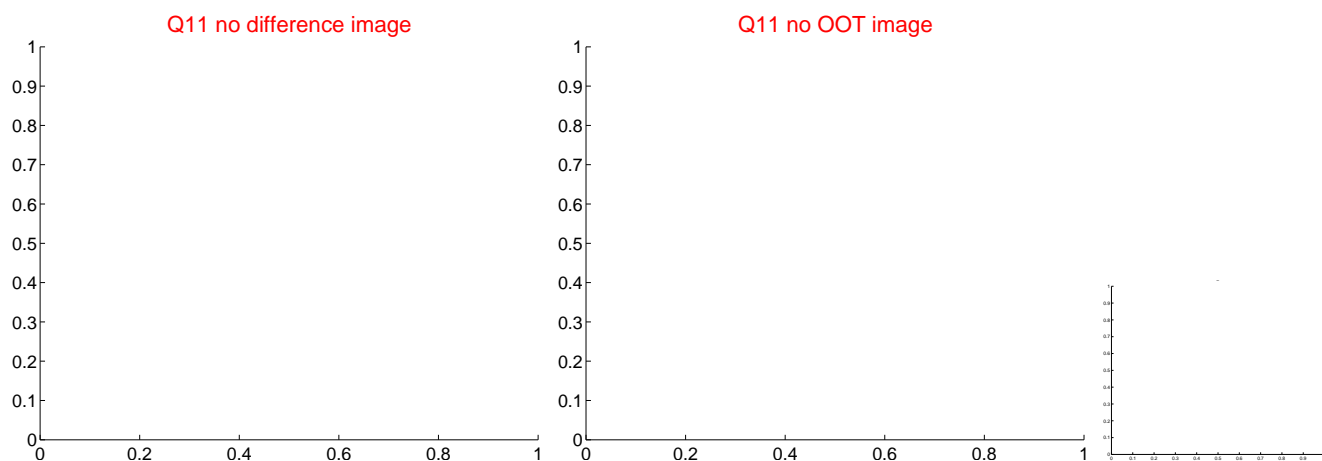
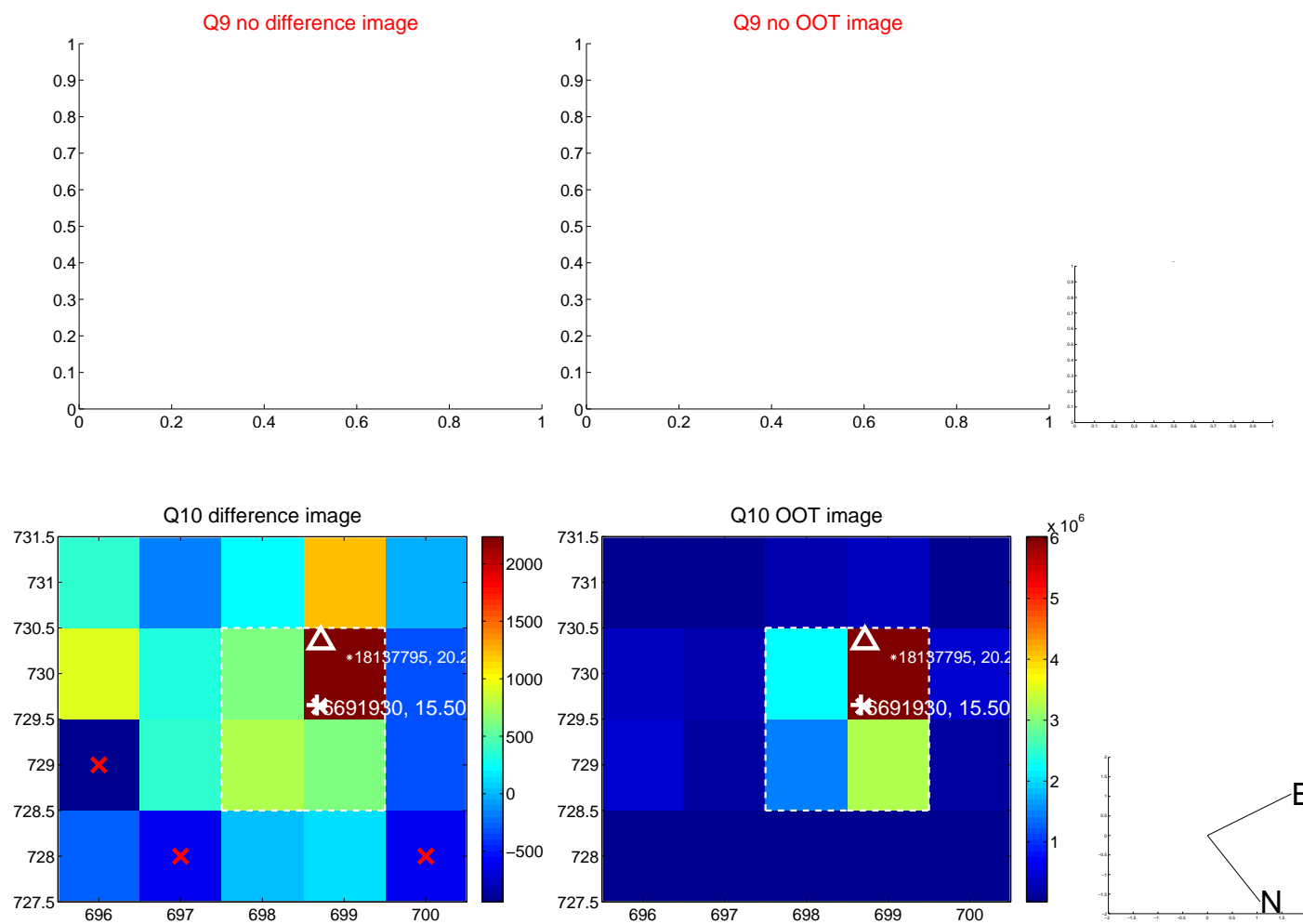


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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.

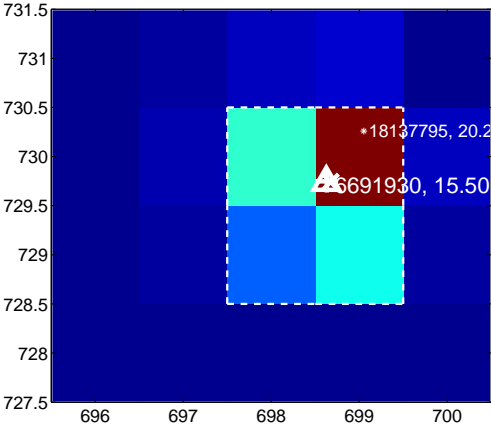
Q13 no difference image



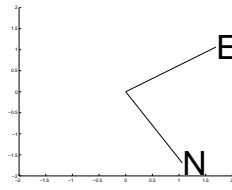
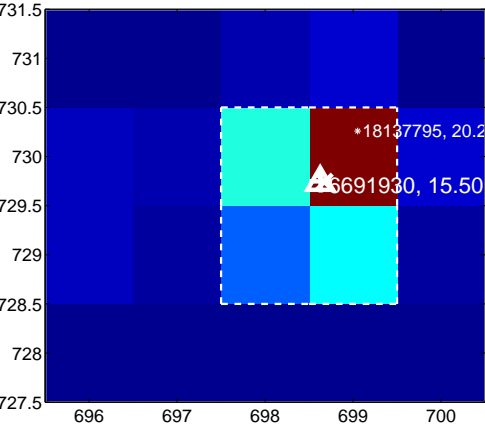
Q13 no OOT image



Q14 difference image



Q14 OOT image



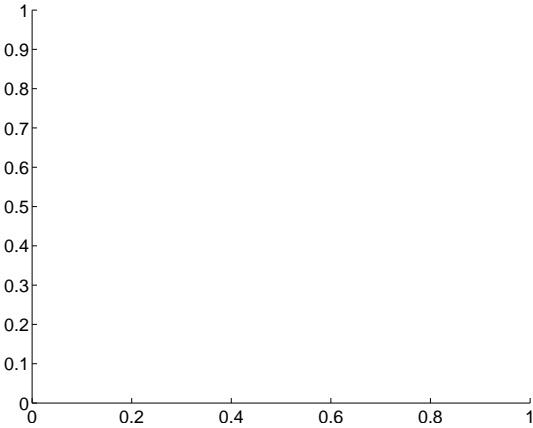
Q15 no difference image



Q15 no OOT image



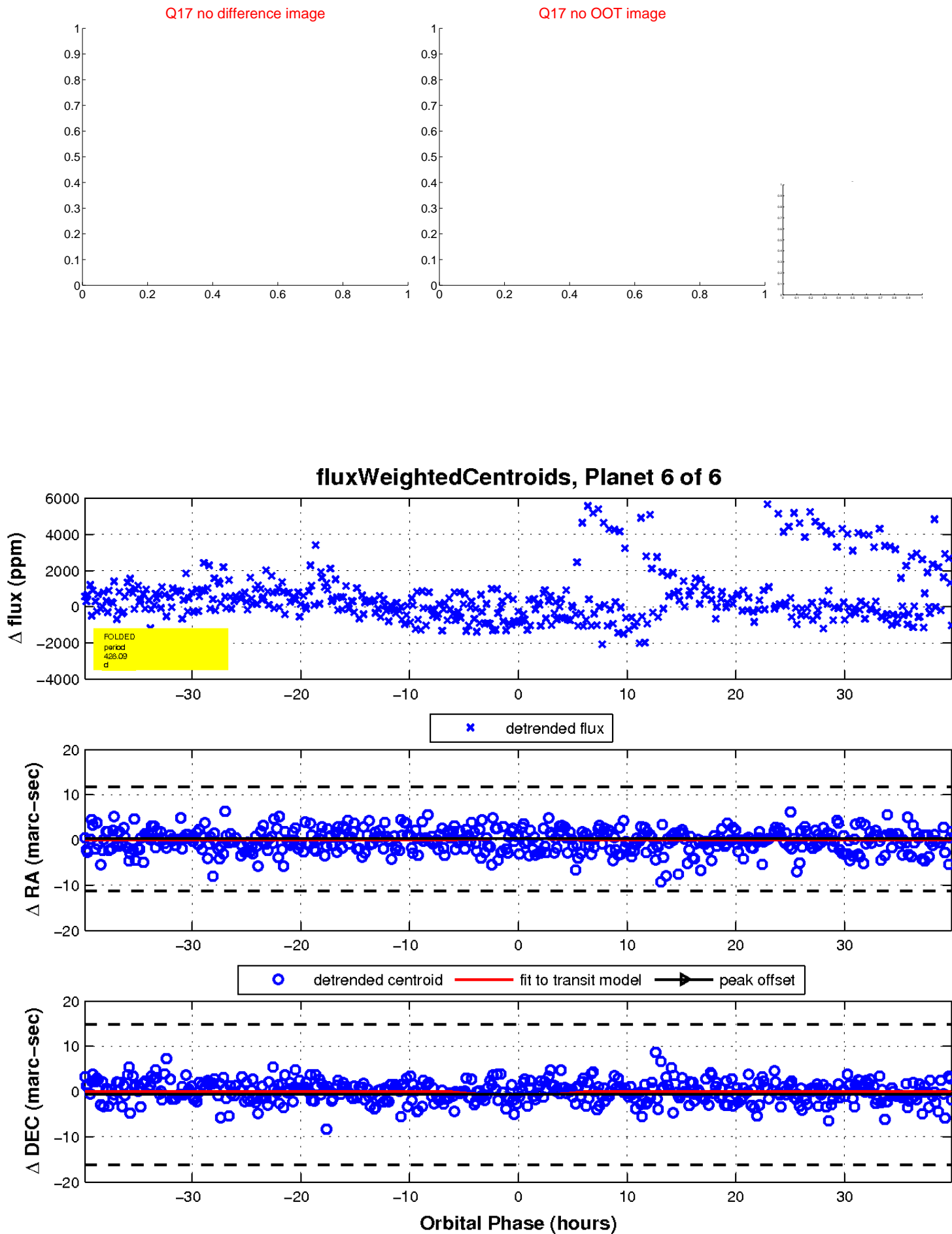
Q16 no difference image



Q16 no OOT image



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



# UKIRT Image

Declination

