

# KIC 007910731

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007910731-01	OBS	No	384.637097	218.236223	1350.4	0.959	14.5	3.0	1.09	6323	4.81	1.46
007910731-02	OBS	No	1.671973	132.848767	121.9	4.347	11.6	3.8	1.09	6323	1.42	2060.76
007910731-03	OBS	No	388.984443	216.944547	2167.8	3.000	15.4	-1.0	1.09	6323	5.11	1.44
007910731-04	OBS	No	276.234017	177.304661	14505.4	7.378	14.2	11.3	1.09	6323	15.30	2.27
007910731-06	OBS	No	18.395921	140.263369	631.0	15.000	12.5	-1.0	1.09	6323	2.75	84.21

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007910731-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
007910731-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_KIC_POS
007910731-03	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—CENT_NOFITS
007910731-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
007910731-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS

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

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

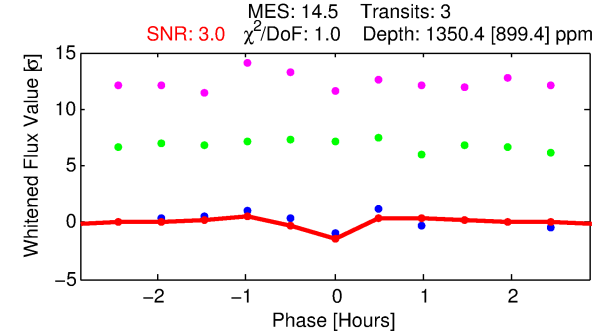
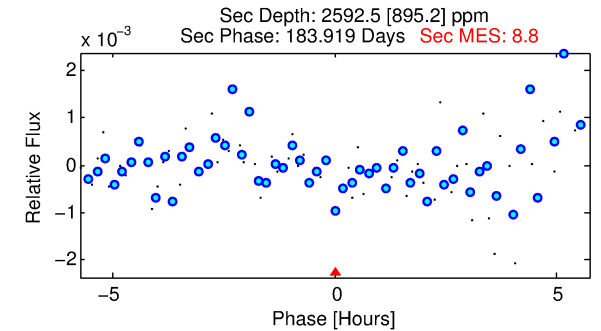
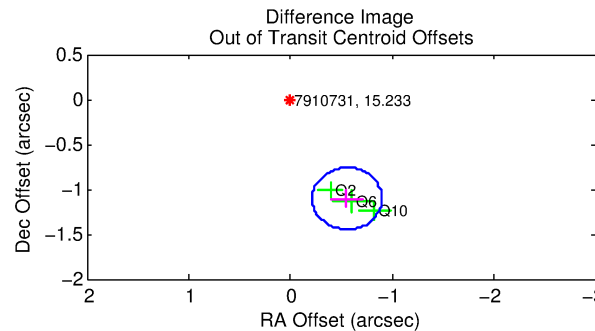
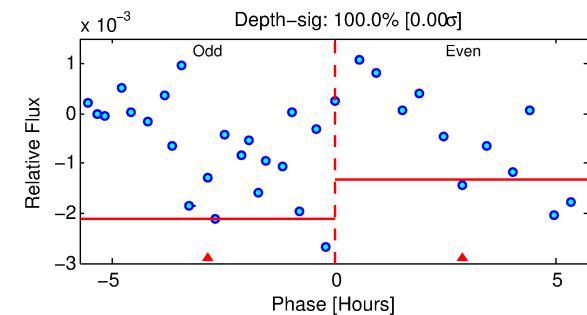
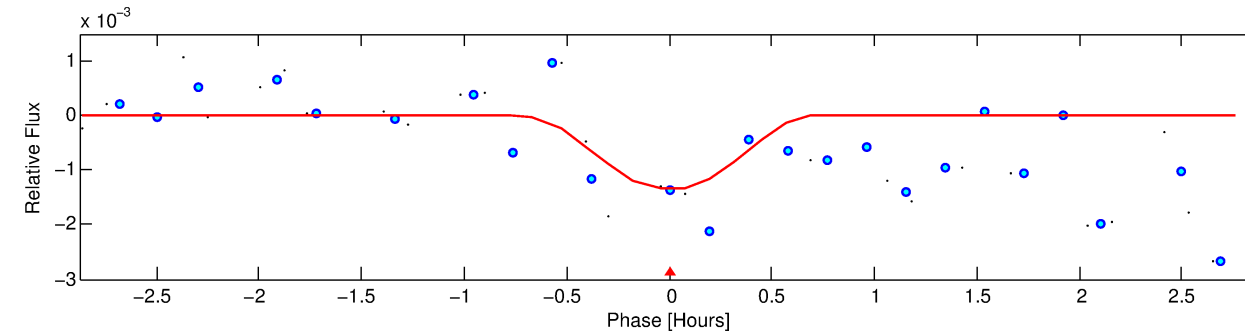
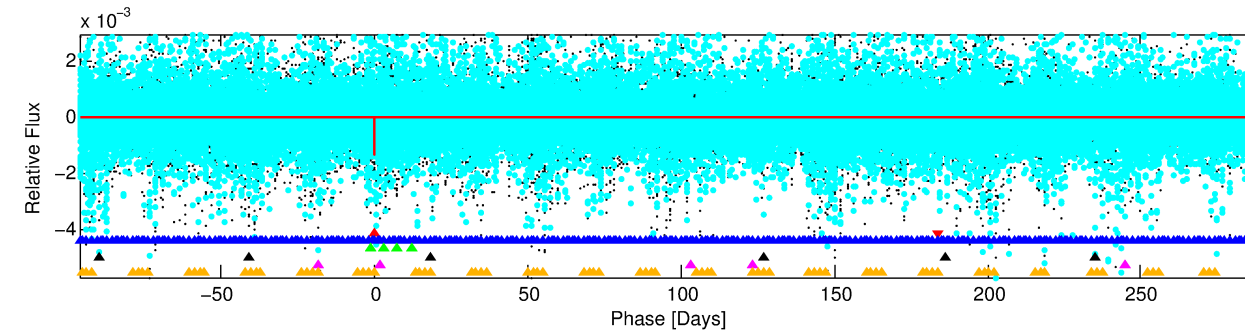
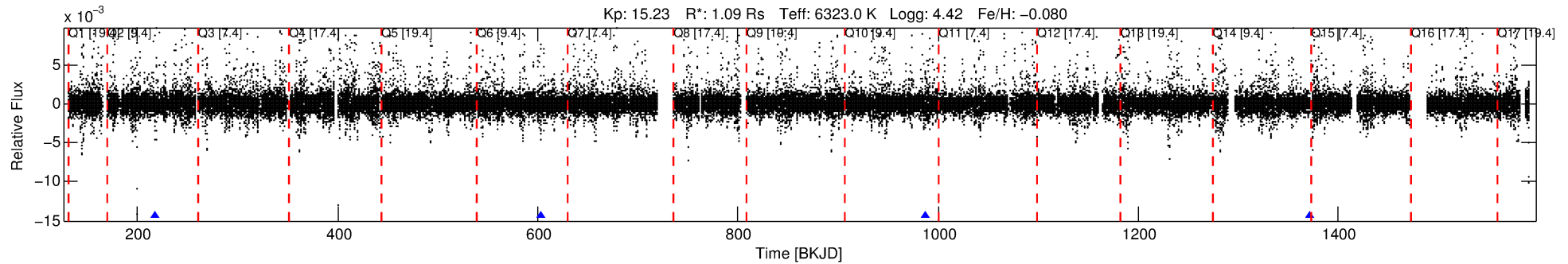
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007910731-01

No Significant Match Found

# DV One-Page Summary

KIC: 7910731 Candidate: 1 of 6 Period: 384.637 d



## DV Fit Results:

Period = 384.63710 [0.00666] d  
Epoch = 218.2362 [0.0097] BKJD  
Rp/R\* = 0.0404 [0.0871]  
a/R\* = 1561.07 [16494.63]  
b = 0.91 [2.10]  
Seff = 1.46 [0.56]  
Teq = 280 [27] K  
Rp = 4.81 [10.49] Re  
a = 1.0818 [0.2674] AU  
Ag = 72056.55 [313109.79] [0.23 $\sigma$ ]  
Teffp = 7103 [7695] K [0.89 $\sigma$ ]

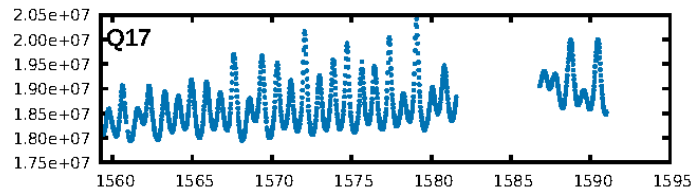
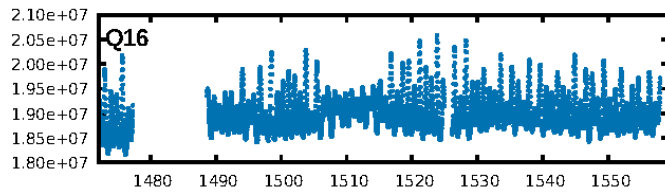
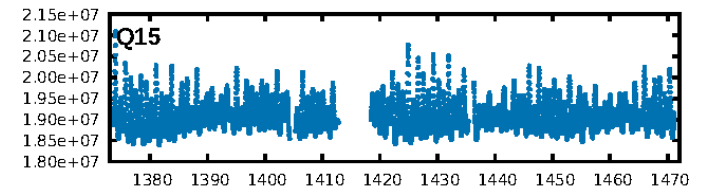
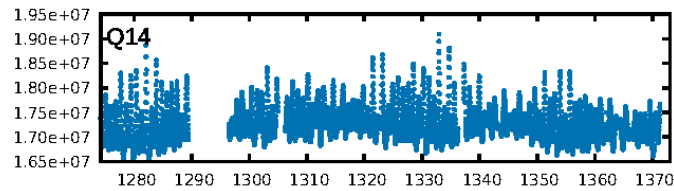
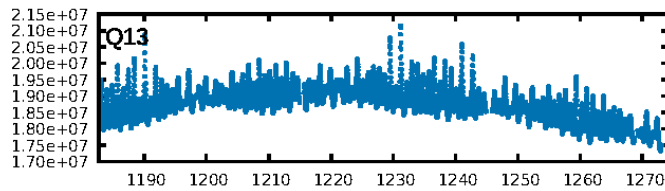
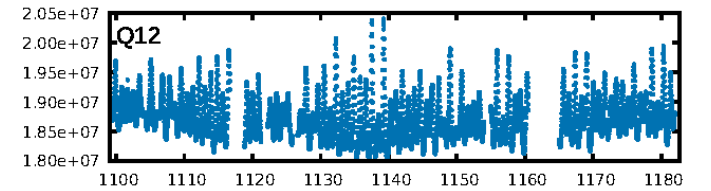
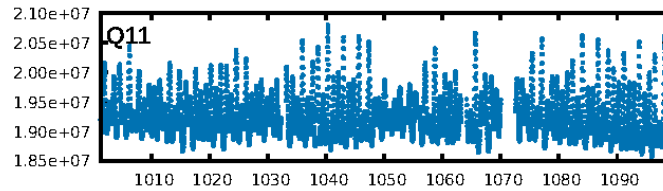
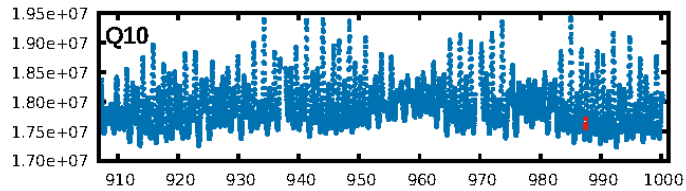
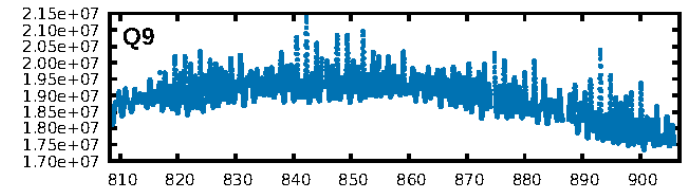
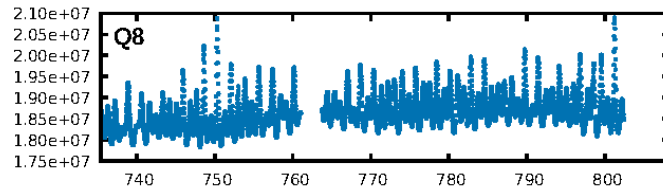
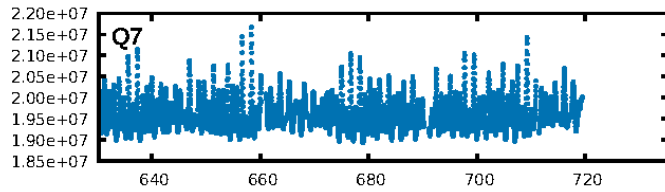
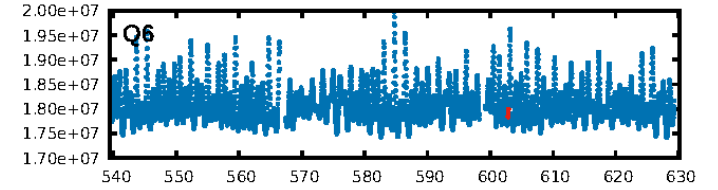
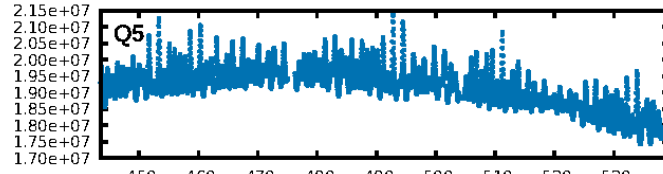
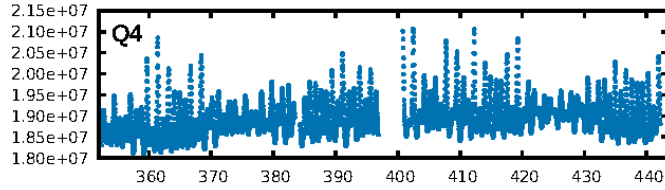
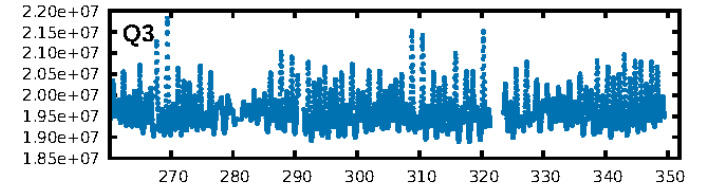
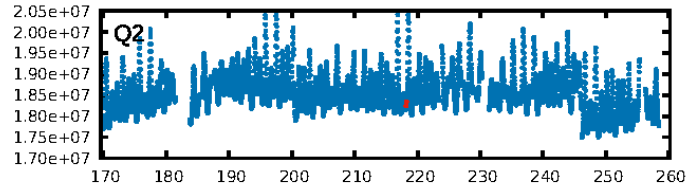
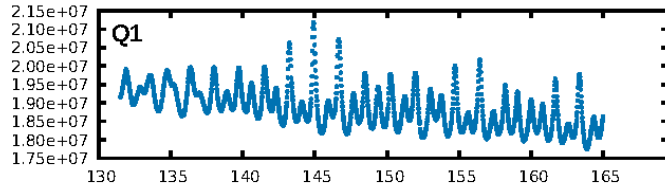
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [349.67 $\sigma$ ]  
LongPeriod-sig: 100.0% [33.13 $\sigma$ ]  
ModelChiSquare2-sig: 32.8%  
ModelChiSquareGof-sig: 74.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -1.907  
Centroid-sig: 81.9%  
Centroid-so: 0.967 arcsec [0.45 $\sigma$ ]  
**OotOffset-rm: 1.237 arcsec [10.77 $\sigma$ ]**  
KicOffset-rm: 0.168 arcsec [1.83 $\sigma$ ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.00 [0/3]

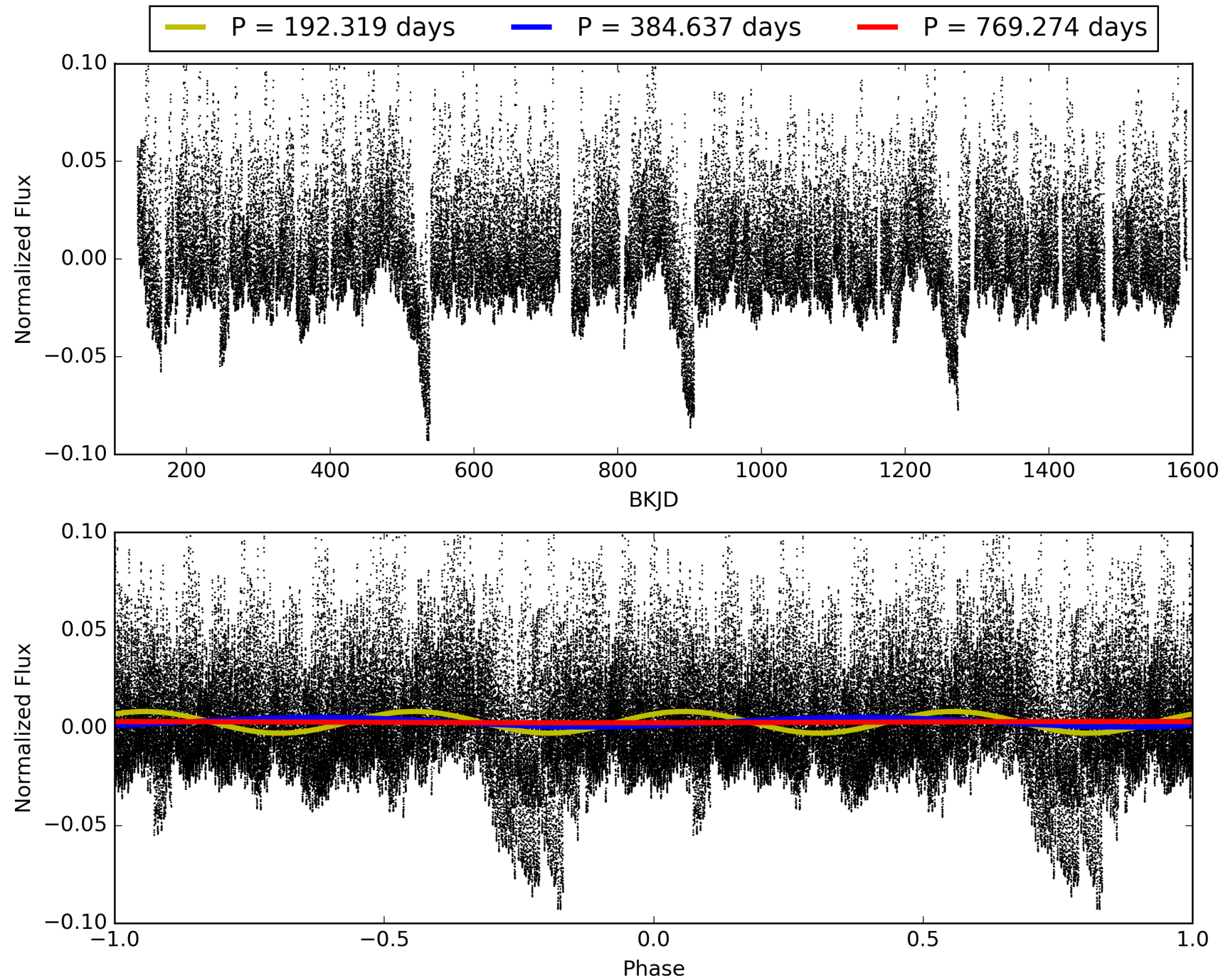
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:21:02 Z

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

# TCE 007910731-01, PDC Light Curves



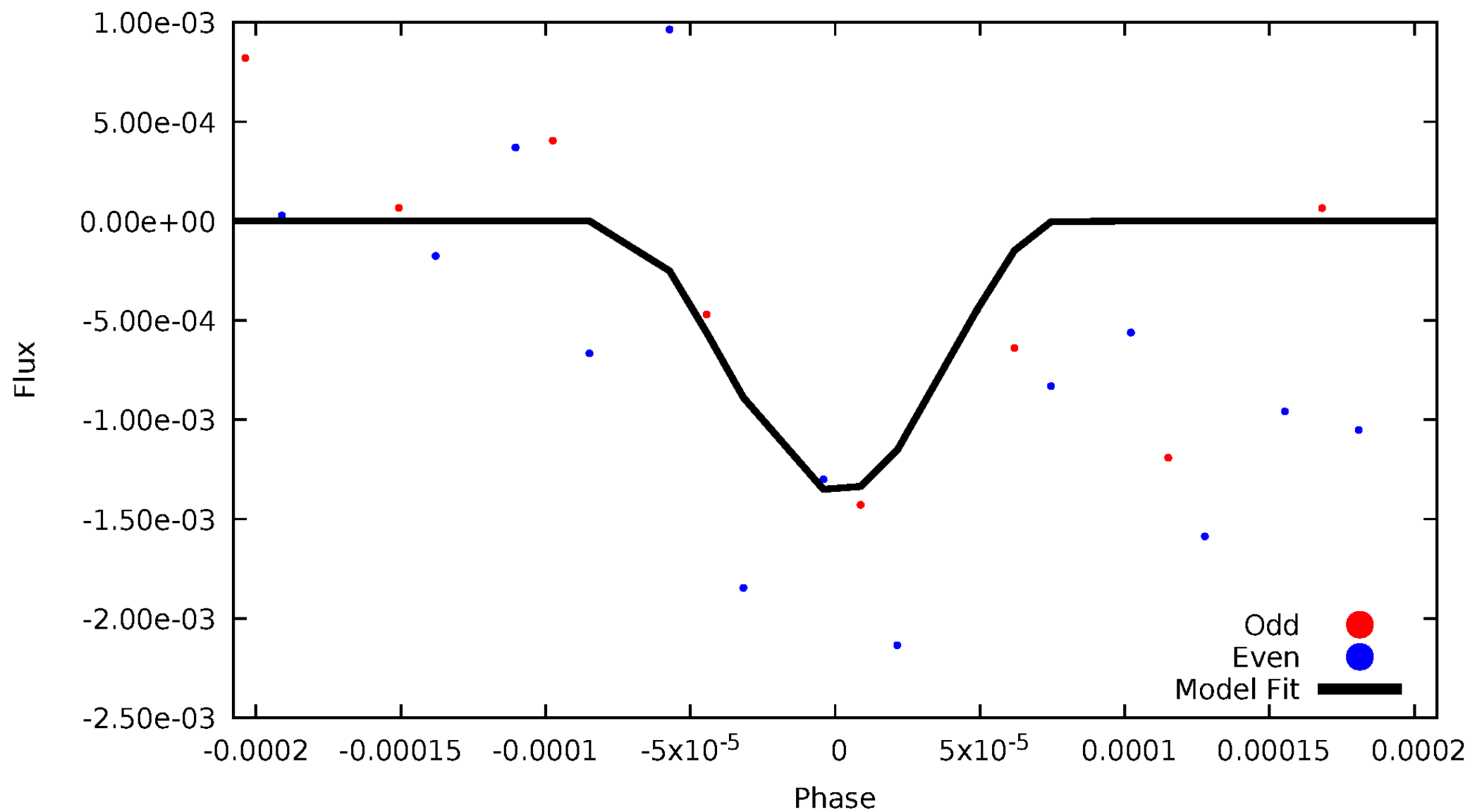
TCE 007910731-01





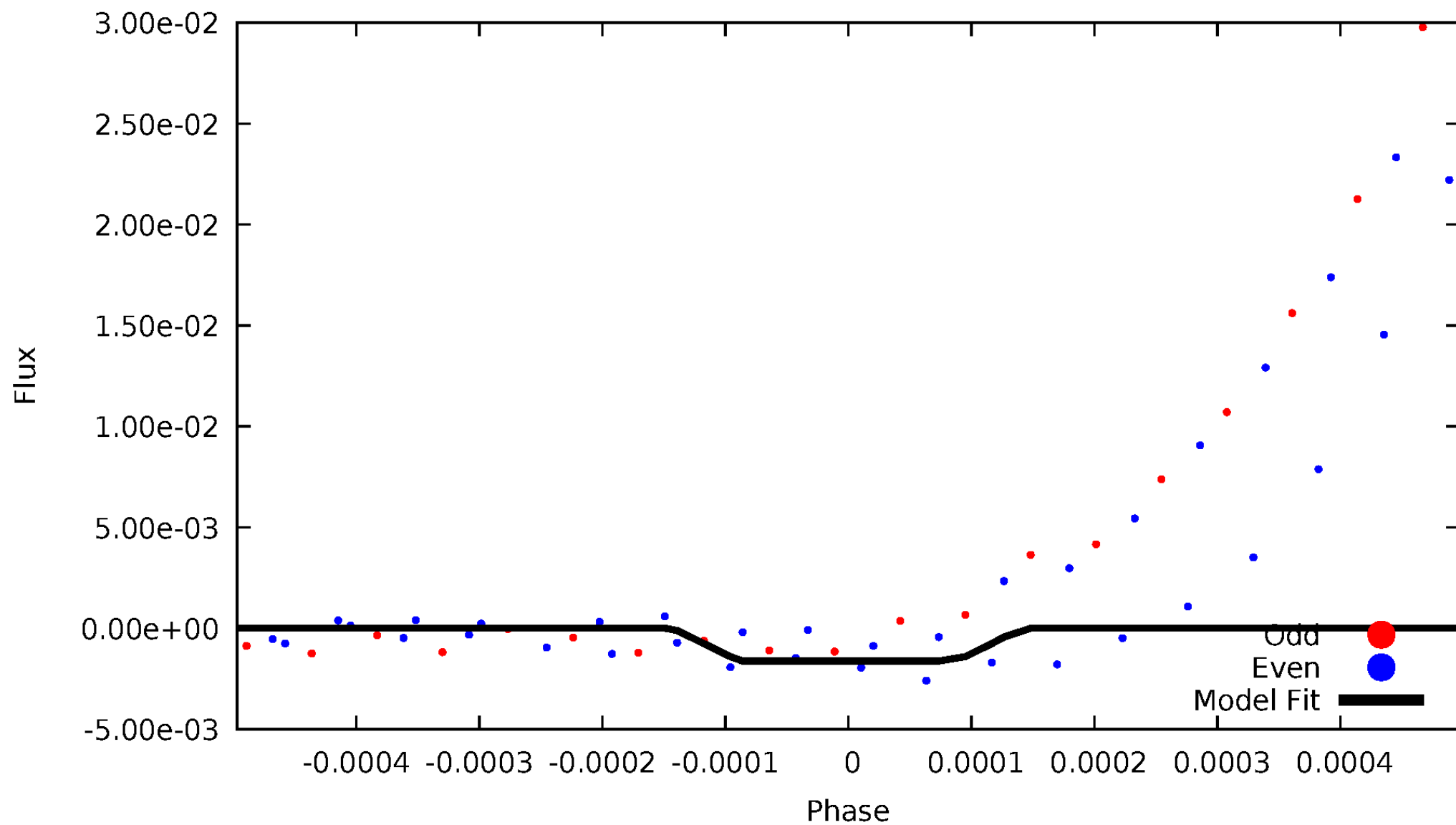
# DV Odd/Even

TCE 007910731-01

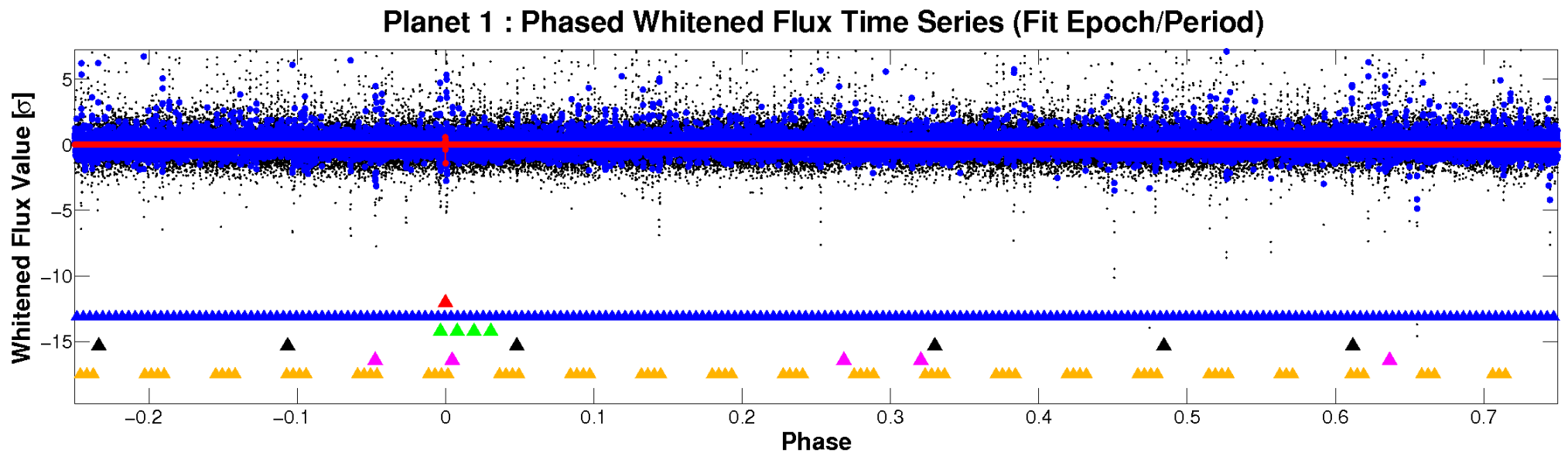
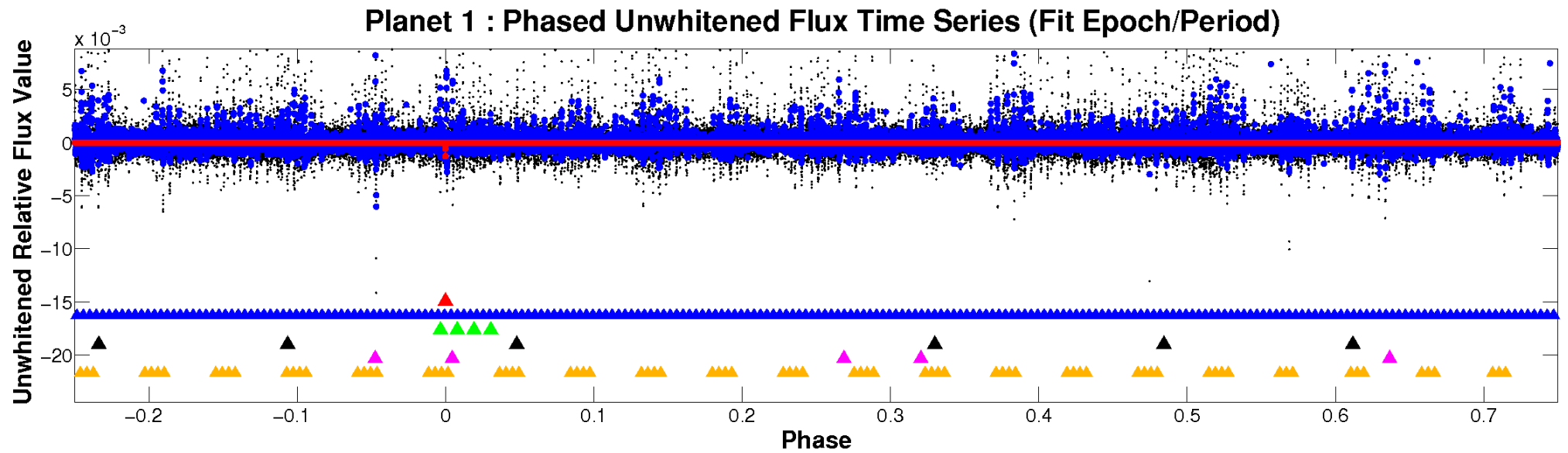


# ALT Odd/Even

TCE 007910731-01

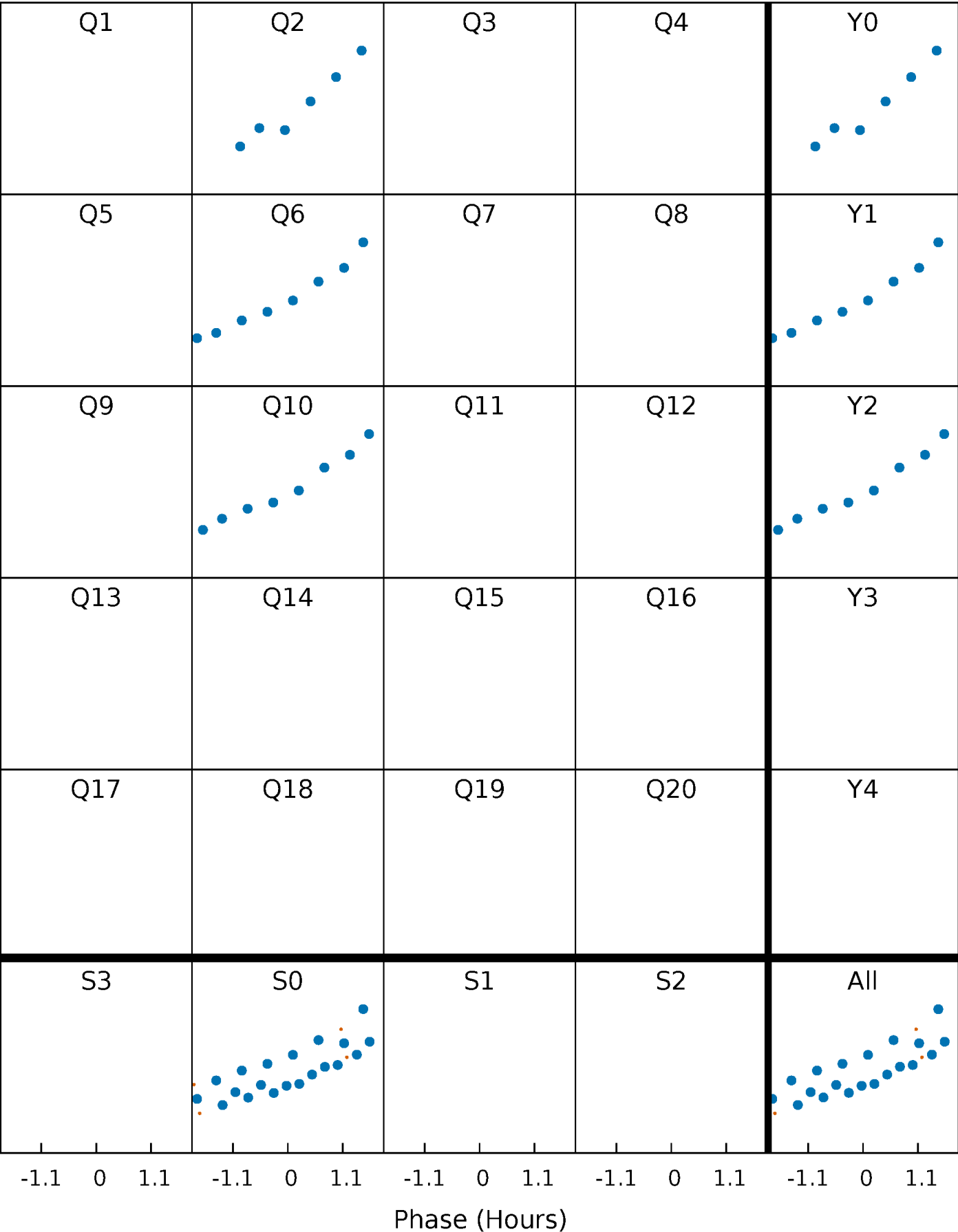


# Non-Whitened Vs. Whitened Light Curve



PDC Quarter-Phased Transit Curves

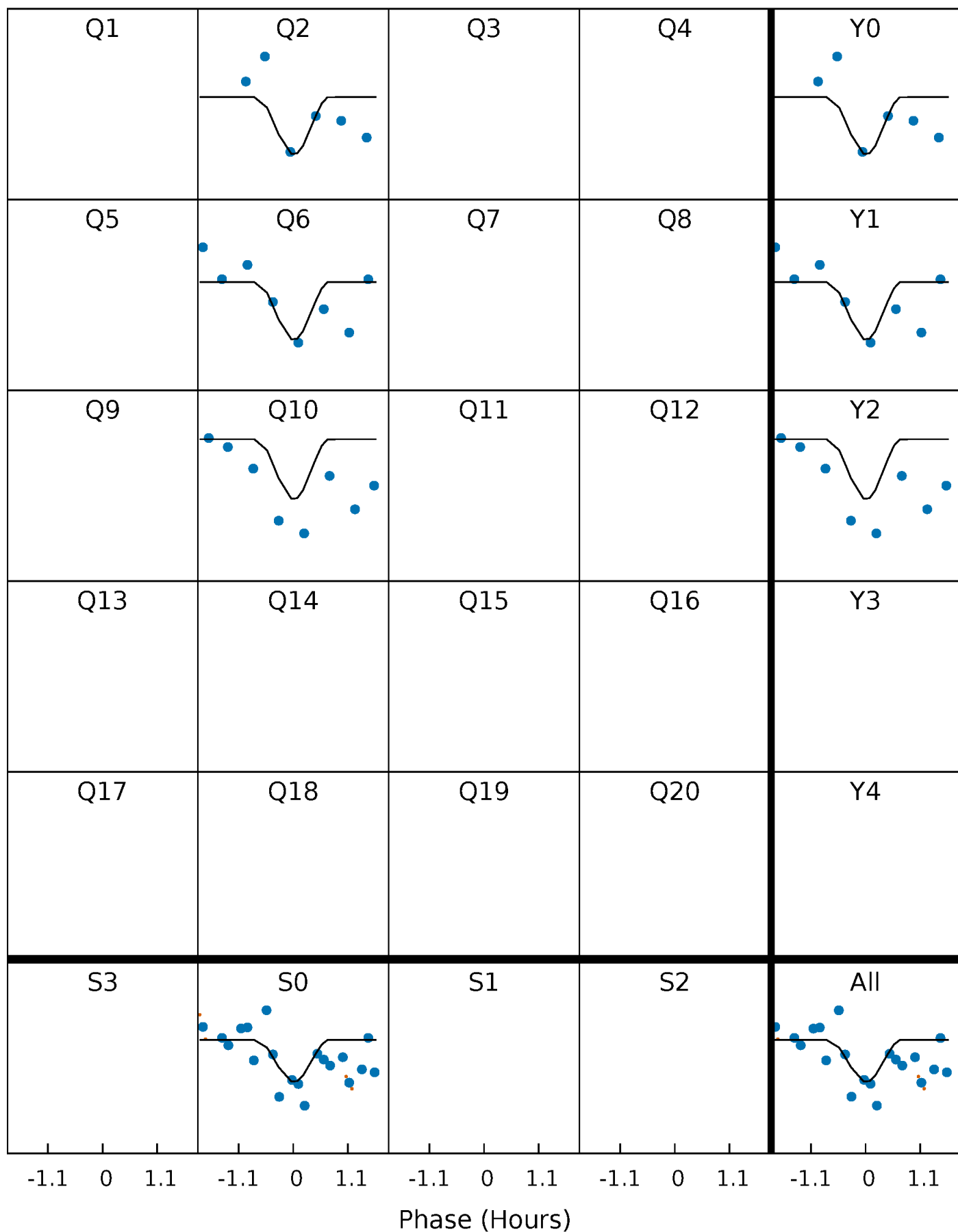
TCE 007910731-01    P=384.637097 Days    T<sub>0</sub>=218.236223 (BKJD)





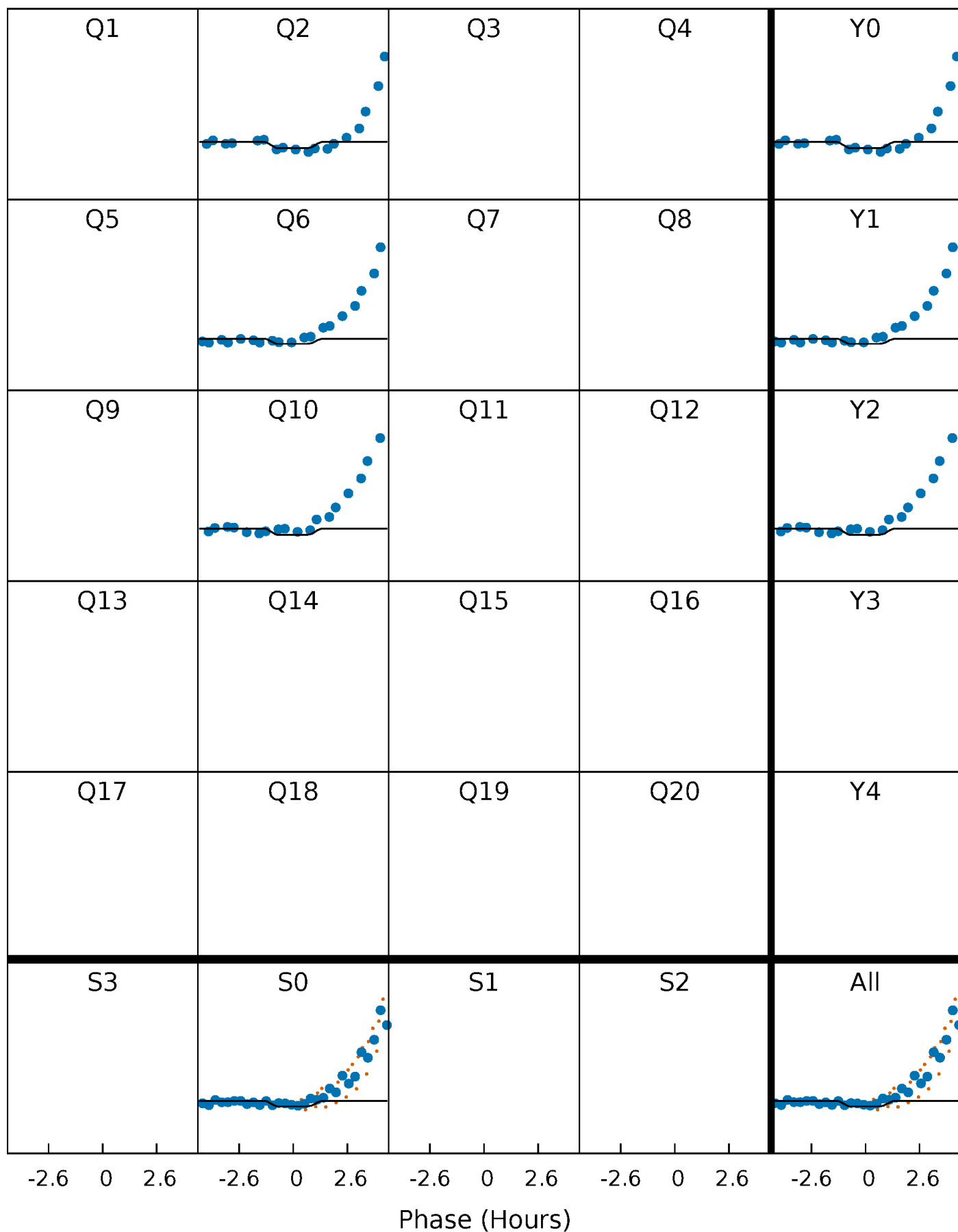
# DV Quarter-Phased Transit Curves

TCE 007910731-01 P=384.637097 Days  $T_0=218.236223$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

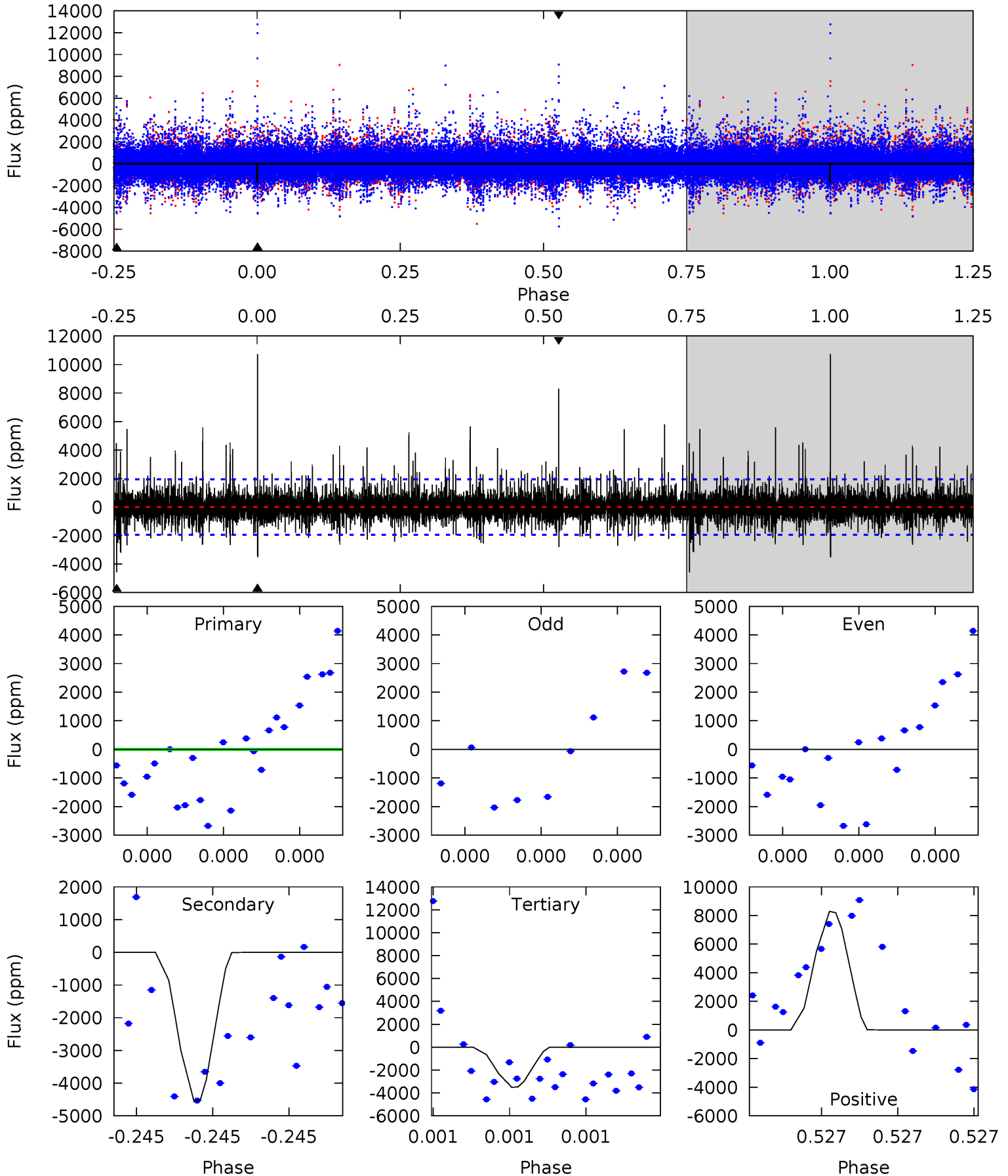
TCE 007910731-01 P=384.609442 Days  $T_0=218.271531$  (BKJD)



# DV Model-Shift Uniqueness Test

007910731-01, P = 384.637097 Days, E = 218.236223 Days

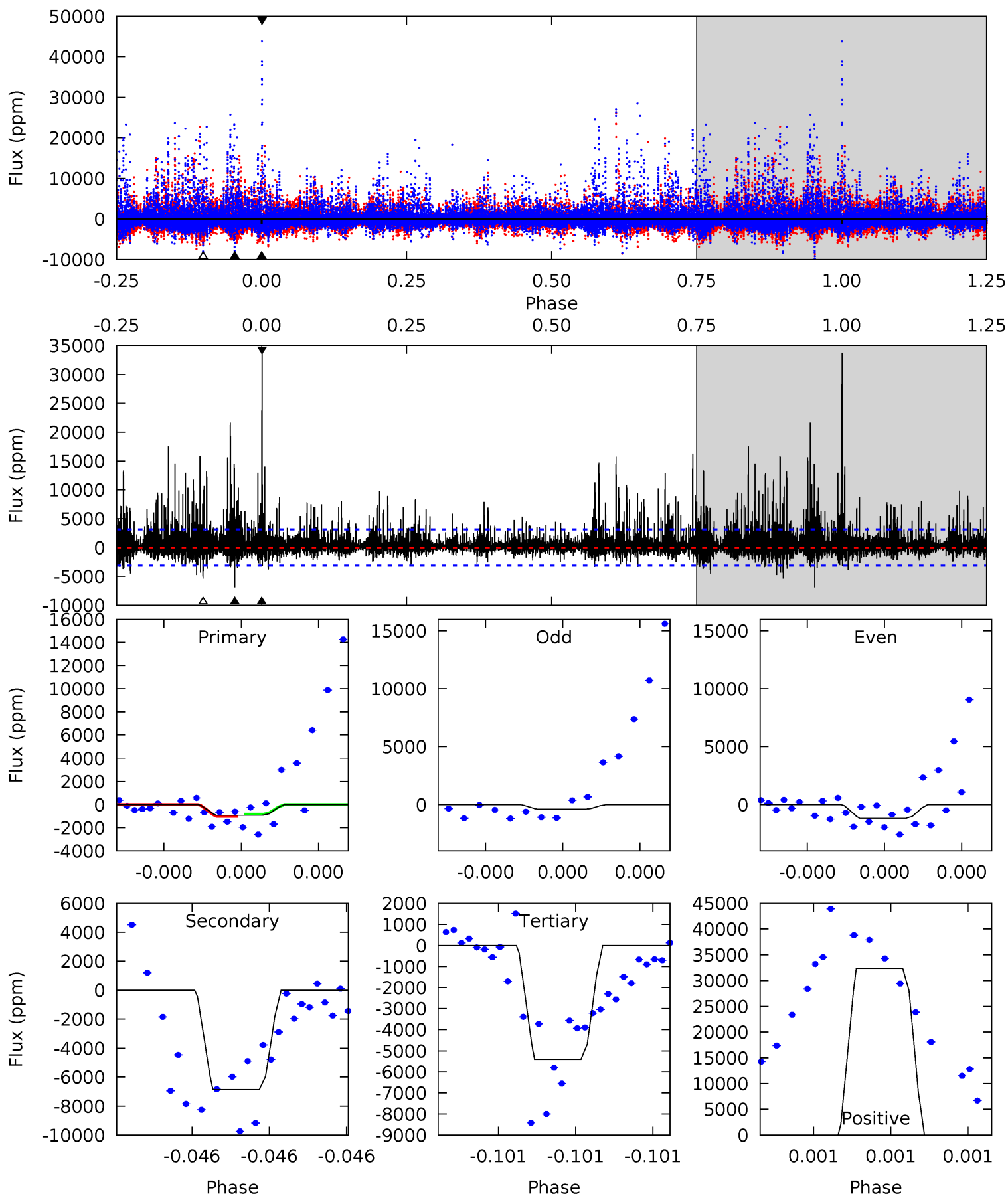
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.12	13.5	10.4	24.6	5.77	3.78	1.88	-5.29	-19.5	3.14	-11.0	0.55	1.19	0.70	0.47



# Alt Model-Shift Uniqueness Test

007910731-01, P = 384.609442 Days, E = 218.271531 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
1.67	12.4	9.74	58.4	5.68	3.65	3.15	-8.08	-56.7	2.63	-46.0	0.52	2.32	0.83	0.15





### Stellar Parameters For KIC 007910731

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6323^{+174}_{-239}$	$4.418^{+0.062}_{-0.188}$	$-0.080^{+0.250}_{-0.300}$	$1.093^{+0.329}_{-0.141}$	$1.140^{+0.157}_{-0.157}$	$1.230^{+0.406}_{-0.594}$
	+3%/-4%	+1%/-4%	+312%/-375%	+30%/-13%	+14%/-14%	+33%/-48%
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 007910731-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-4567 \pm 337$	$9.36^{+9.52}_{-6.39}$	$399^{+26}_{-22}$	$5985^{+7002}_{-1588}$	$33184^{+322204}_{-24955}$
Alt.	$-6861 \pm 554$	$9.56^{+9.57}_{-6.35}$	$400^{+29}_{-21}$	$6549^{+7422}_{-1716}$	$48859^{+368846}_{-36738}$

$T_{\text{max}}$  = 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

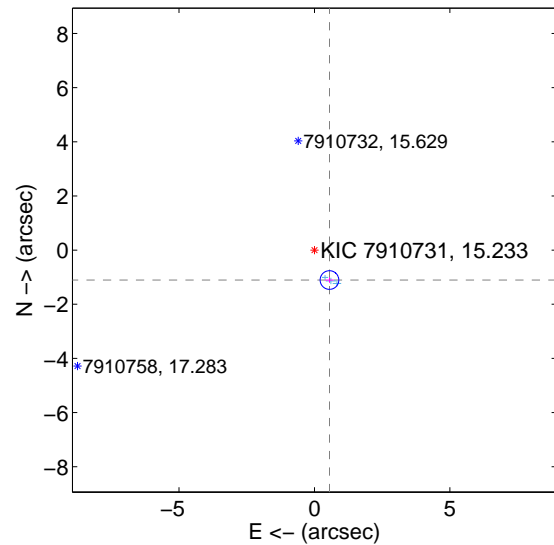
Supplemental centroid analysis for 007910731-01. Kepler magnitude: 15.23. Transit SNR 2.98

There are 3 quarters with good PRF difference image offsets

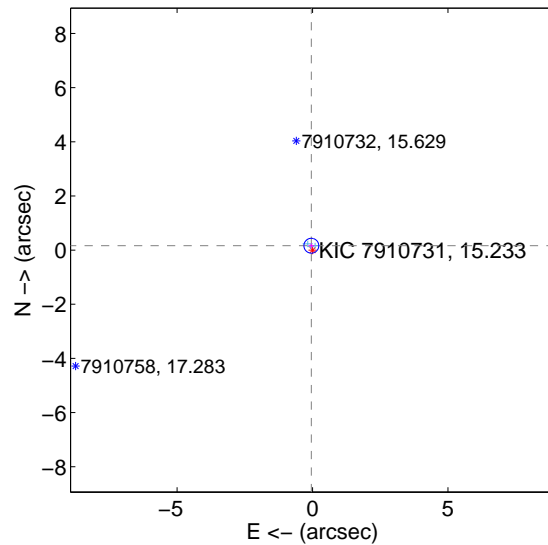
The direct PRF centroid is offset from the target star catalog position by about 1.58 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.237 \pm 0.115$	$10.77$	$-0.555 \pm 0.159$	$-1.105 \pm 0.101$
PRF-fit source offset from KIC position	$0.168 \pm 0.091$	$1.83$	$0.044 \pm 0.112$	$0.162 \pm 0.090$
photometric centroid source offset	$0.97 \pm 2.16$	$0.45$	$0.86 \pm 1.93$	$0.45 \pm 2.84$

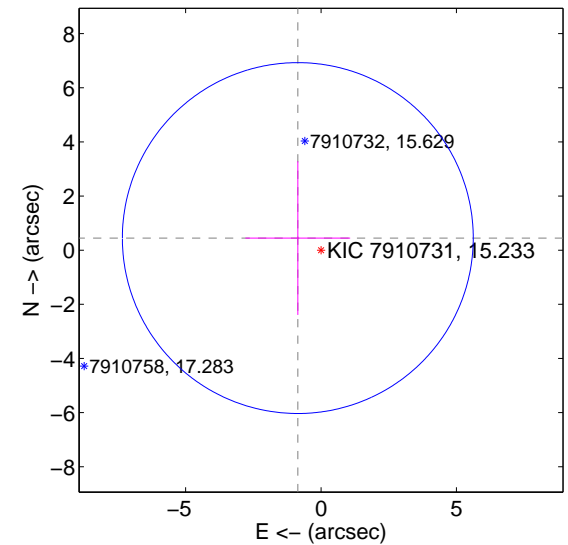
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



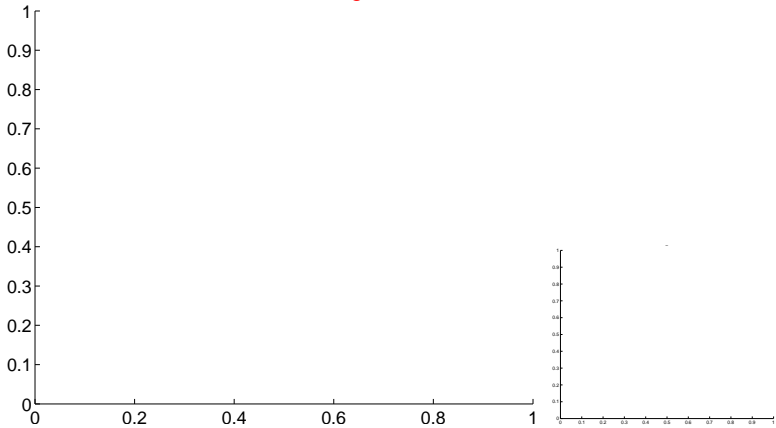
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

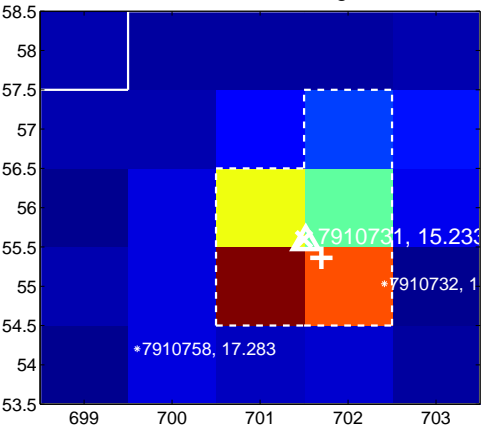
Q1 no difference image



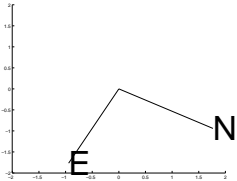
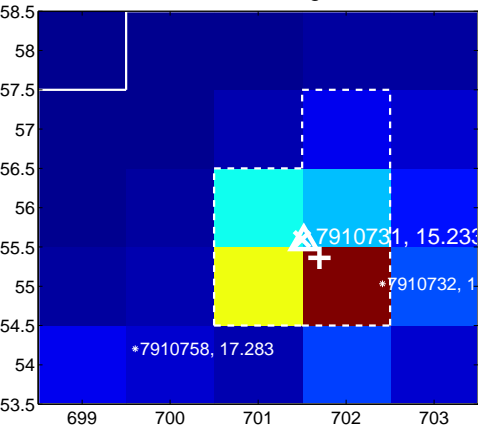
Q1 no OOT image



Q2 difference image



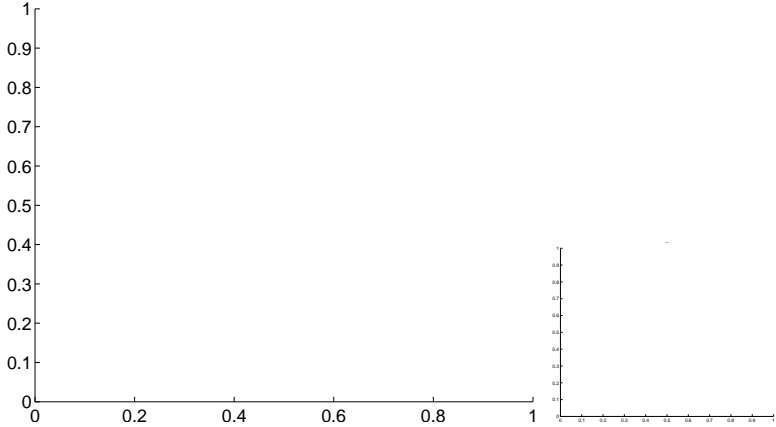
Q2 OOT image



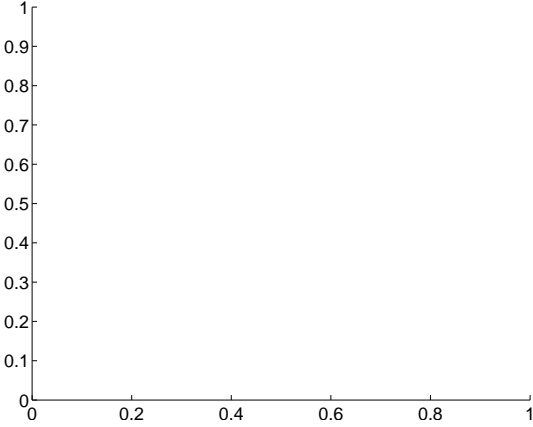
Q3 no difference image



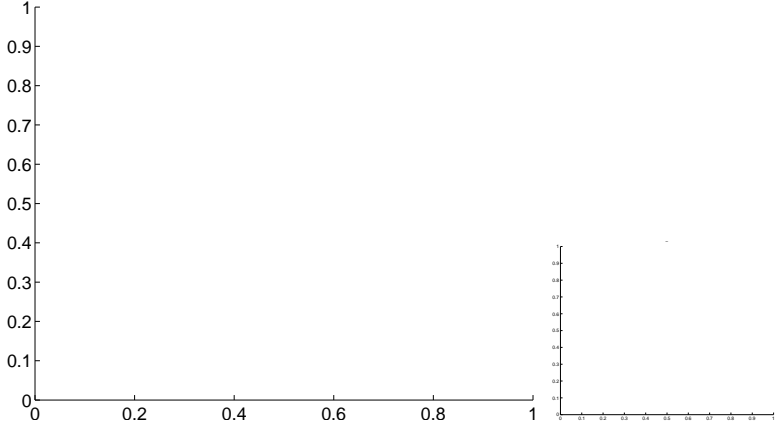
Q3 no OOT image



Q4 no difference image



Q4 no OOT image



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

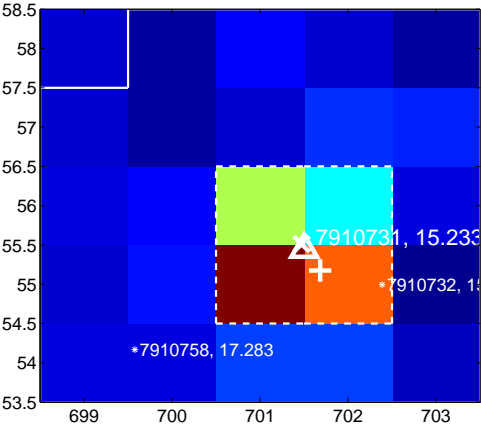
Q5 no difference image



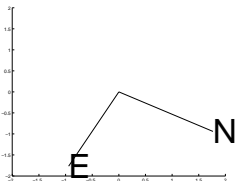
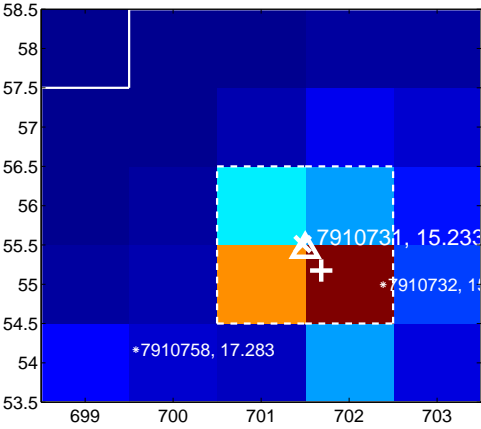
Q5 no OOT image



Q6 difference image



Q6 OOT image



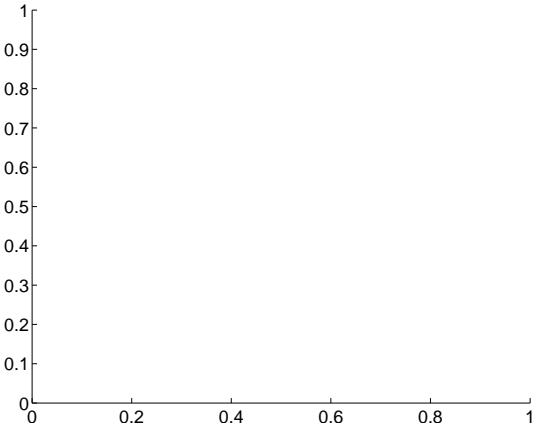
Q7 no difference image



Q7 no OOT image



Q8 no difference image



Q8 no OOT image



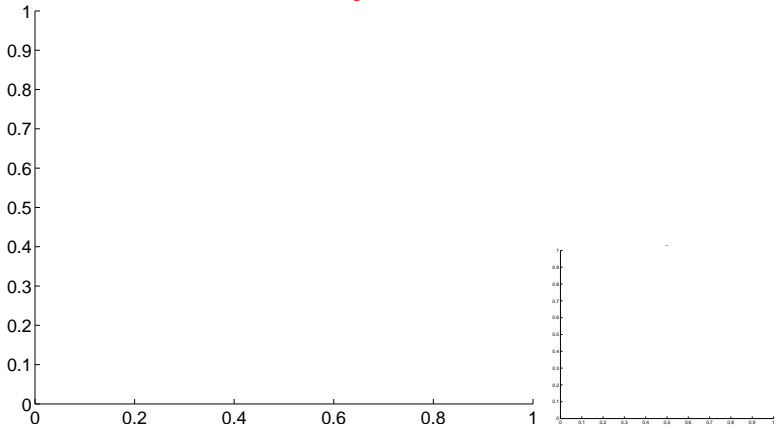


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

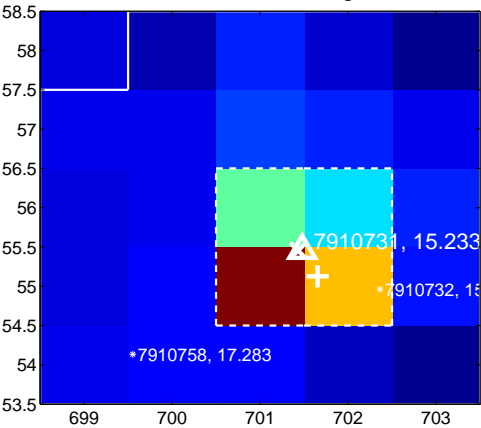
Q9 no difference image



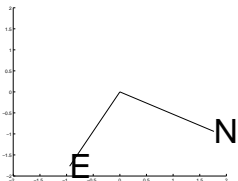
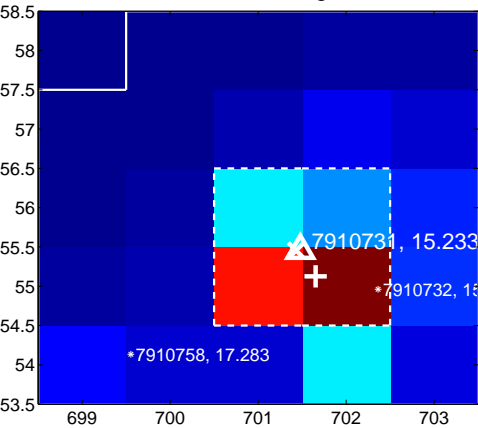
Q9 no OOT image



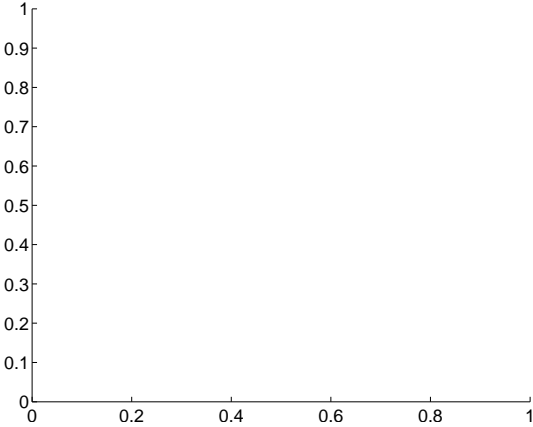
Q10 difference image



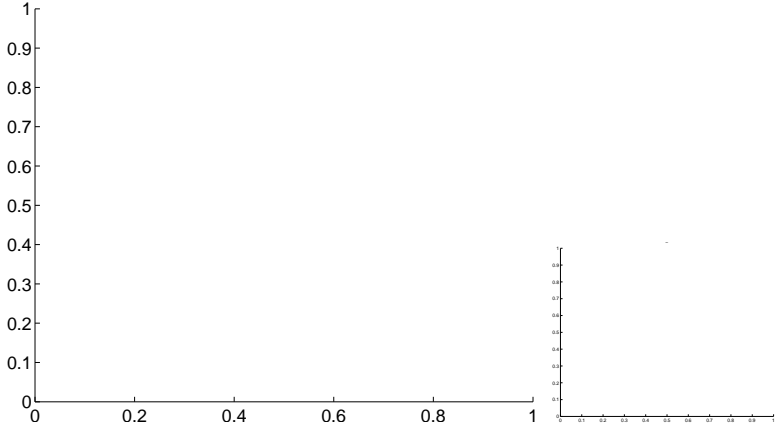
Q10 OOT image



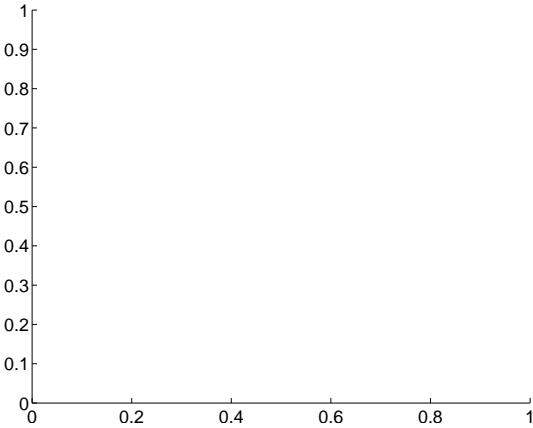
Q11 no difference image



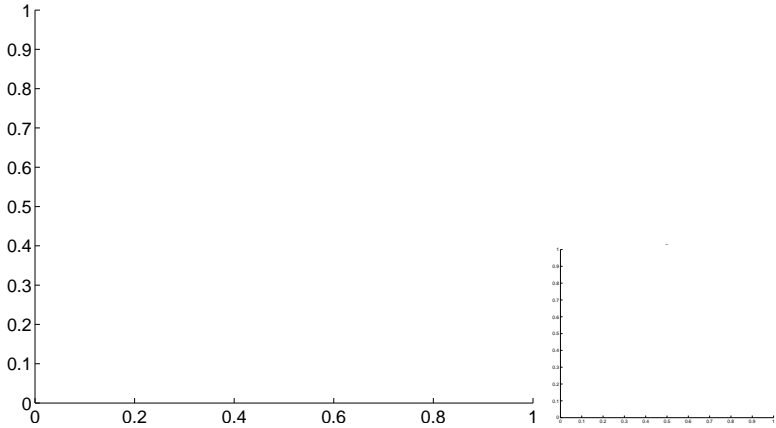
Q11 no OOT image



Q12 no difference image



Q12 no OOT image



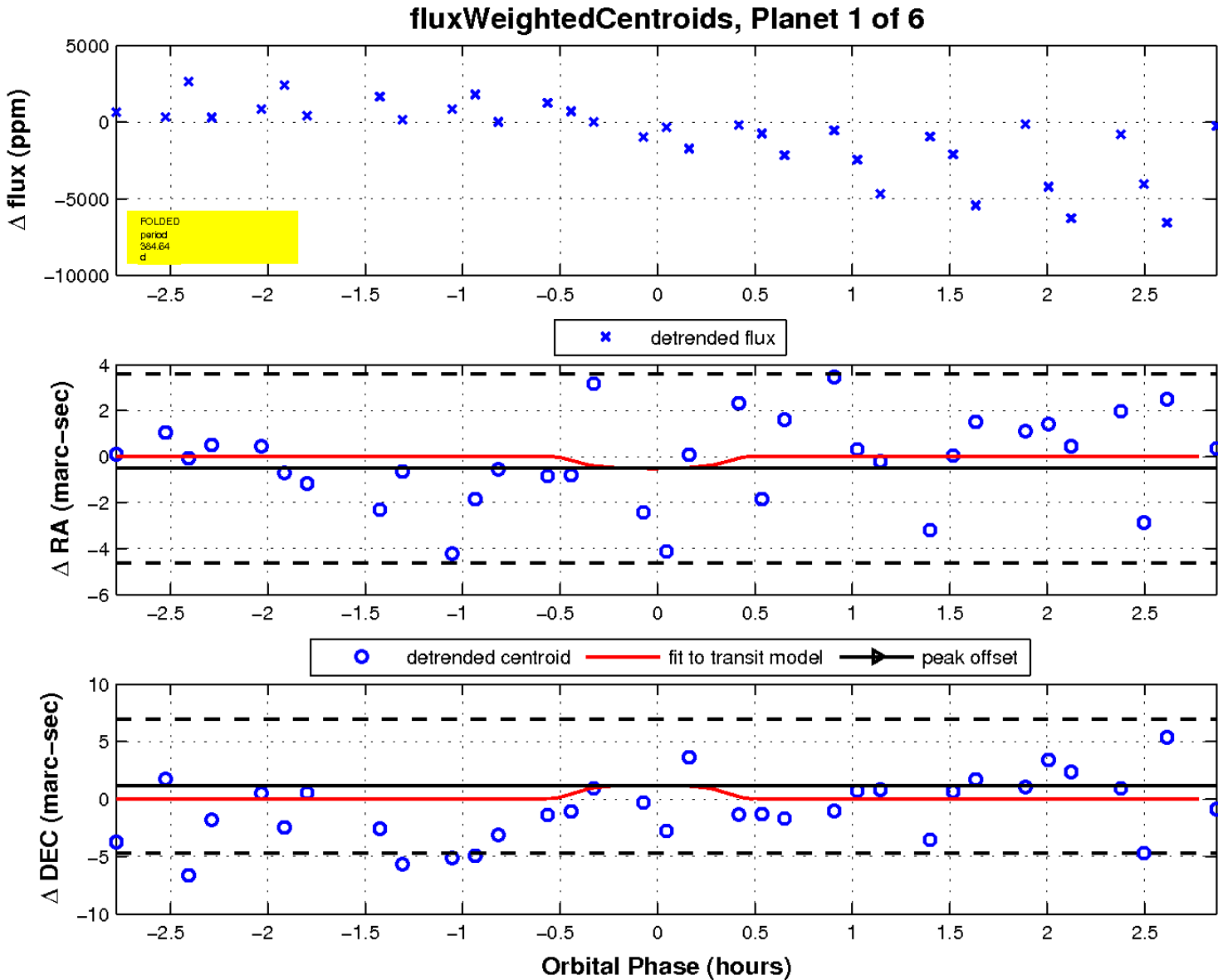
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

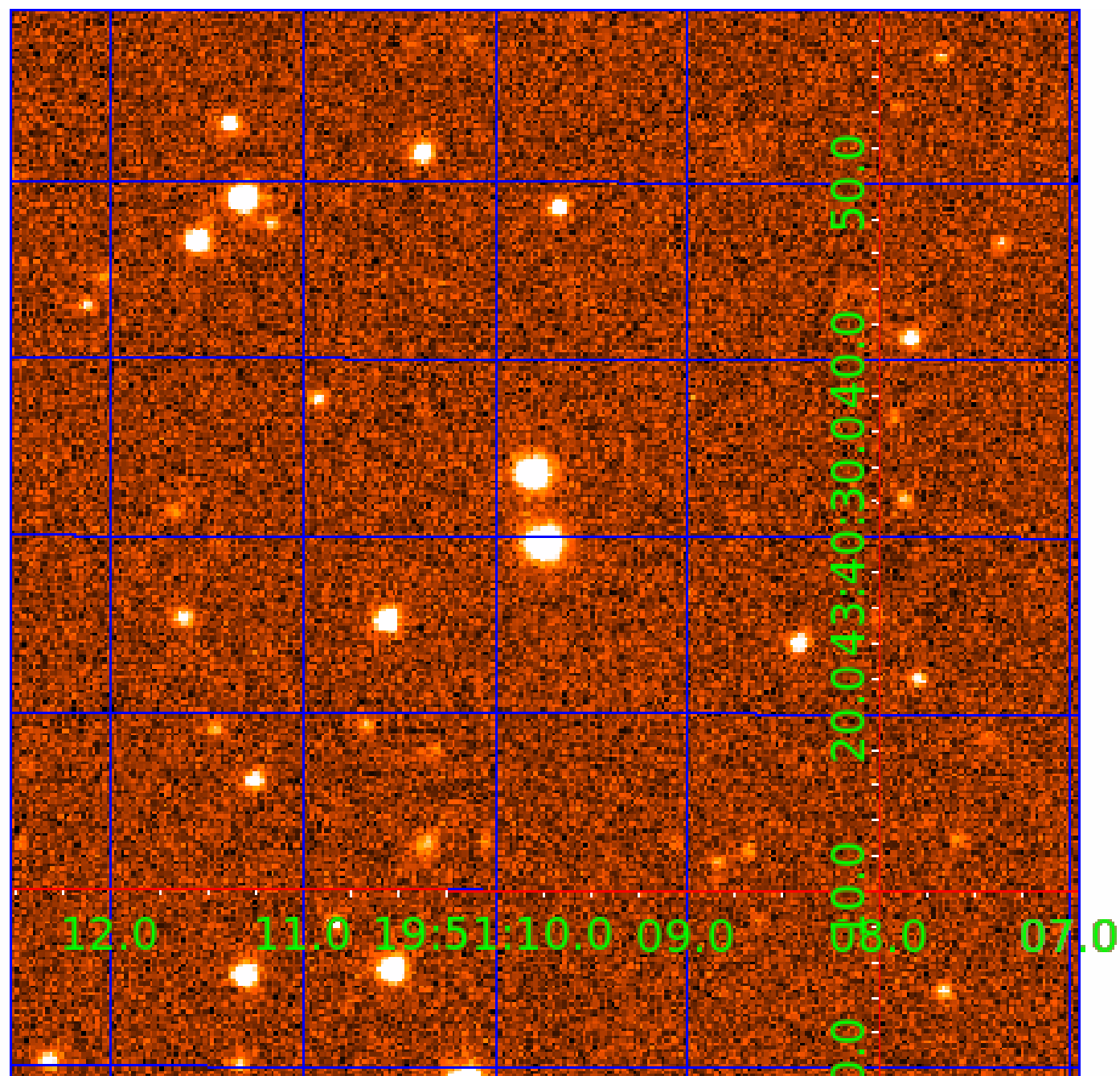
Q17 no difference image

Q17 no OOT image



UKIRT Image

Declination





# KIC 007910731

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007910731-01	OBS	No	384.637097	218.236223	1350.4	0.959	14.5	3.0	1.09	6323	4.81	1.46
007910731-02	OBS	No	1.671973	132.848767	121.9	4.347	11.6	3.8	1.09	6323	1.42	2060.76
007910731-03	OBS	No	388.984443	216.944547	2167.8	3.000	15.4	-1.0	1.09	6323	5.11	1.44
007910731-04	OBS	No	276.234017	177.304661	14505.4	7.378	14.2	11.3	1.09	6323	15.30	2.27
007910731-06	OBS	No	18.395921	140.263369	631.0	15.000	12.5	-1.0	1.09	6323	2.75	84.21

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007910731-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
007910731-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_KIC_POS
007910731-03	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—CENT_NOFITS
007910731-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
007910731-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS

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

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

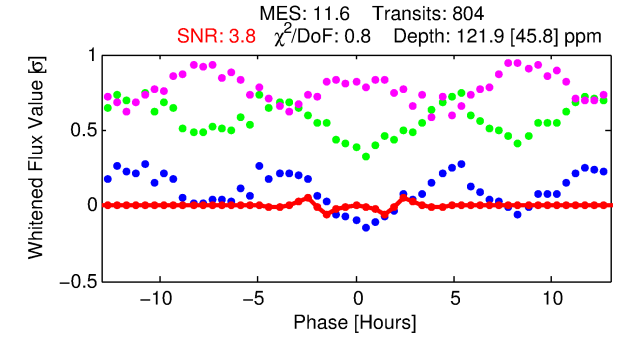
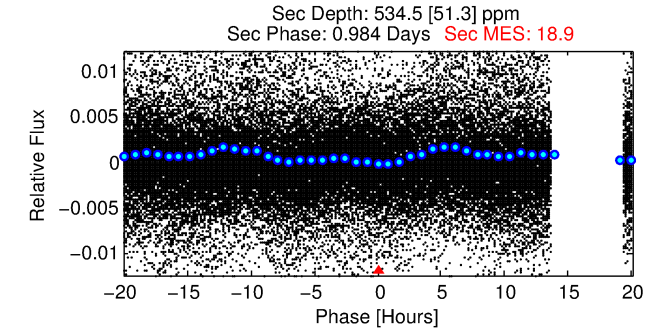
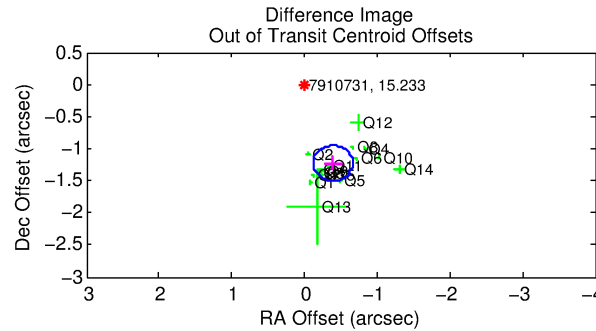
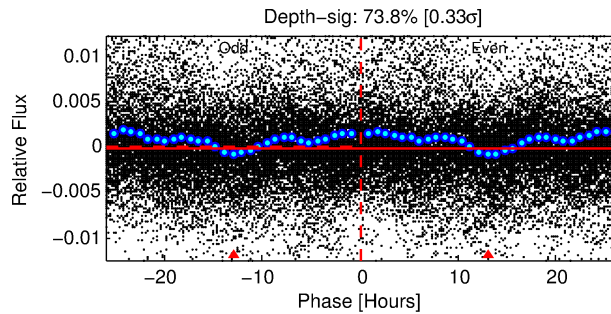
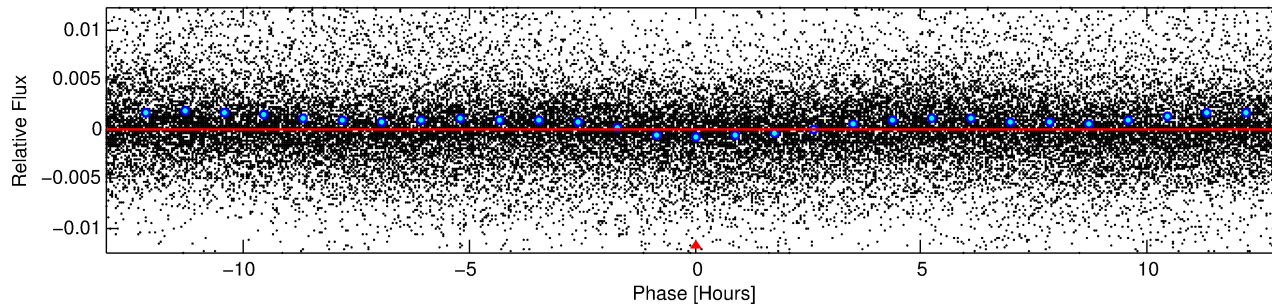
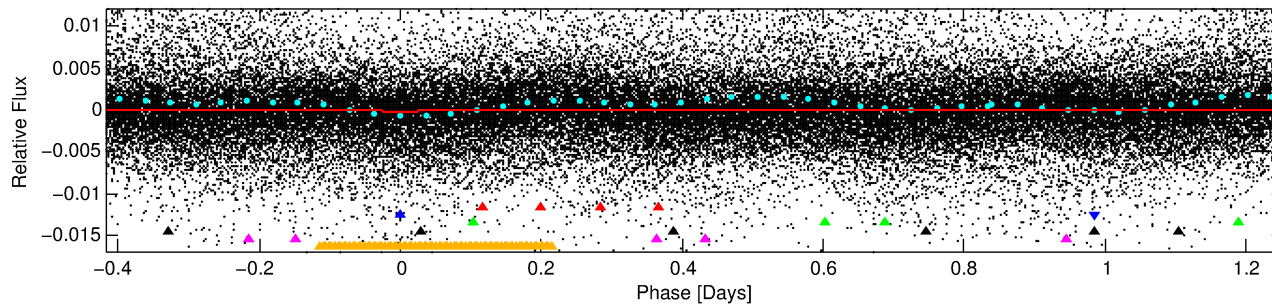
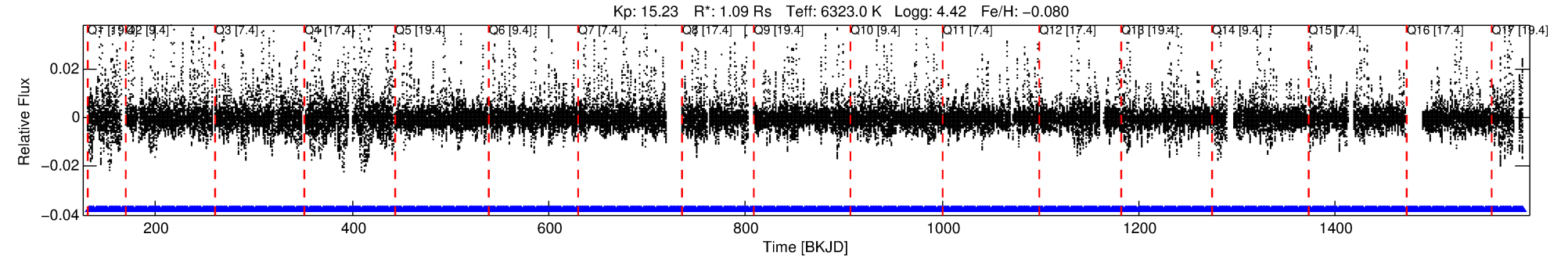
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007910731-02

No Significant Match Found

# DV One-Page Summary

KIC: 7910731 Candidate: 2 of 6 Period: 1.672 d



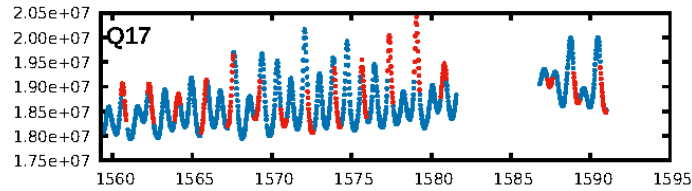
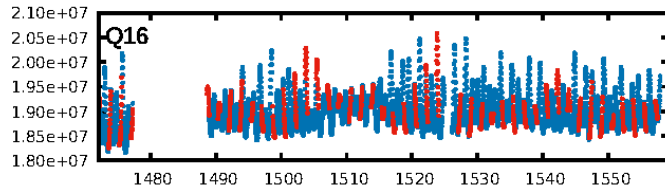
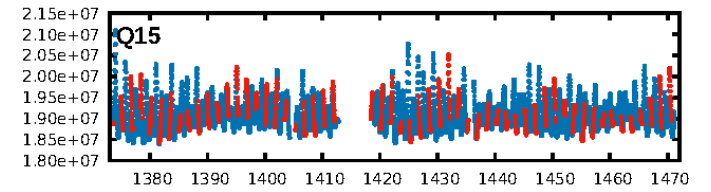
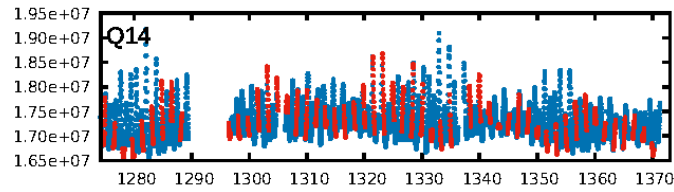
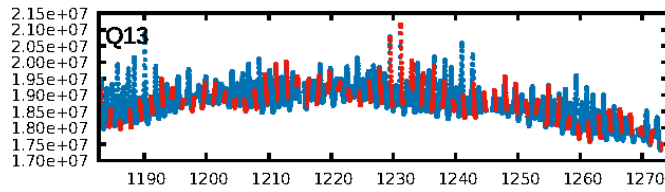
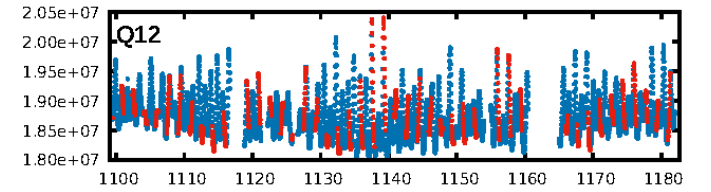
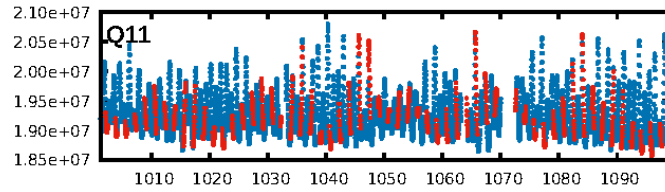
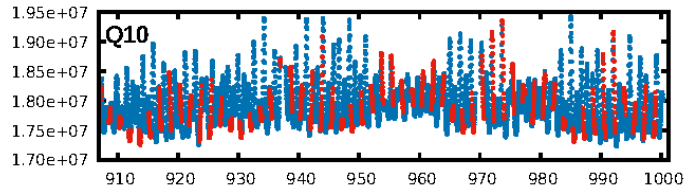
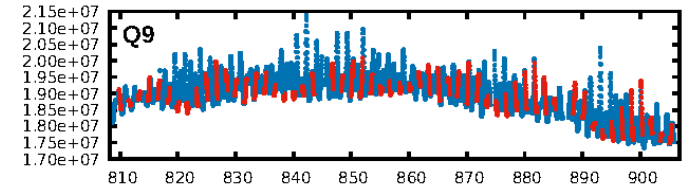
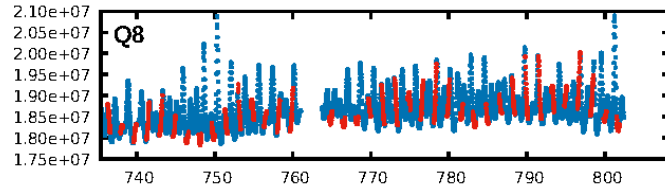
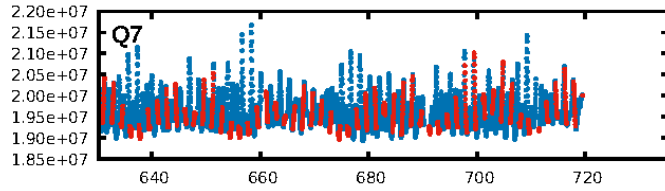
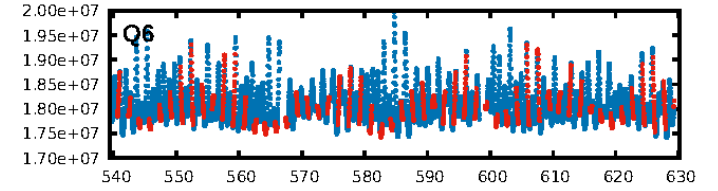
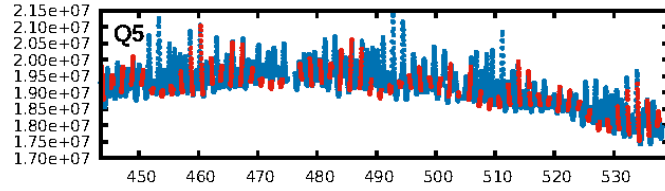
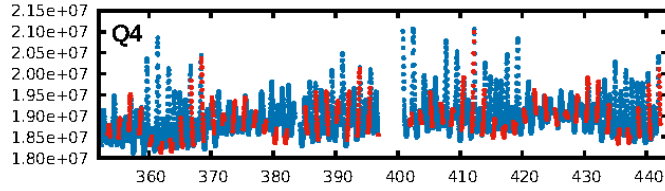
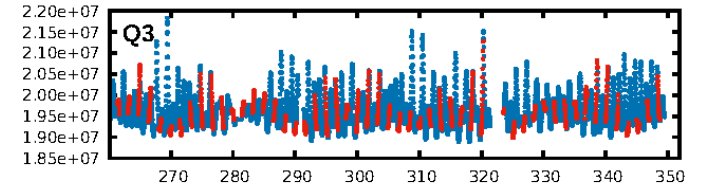
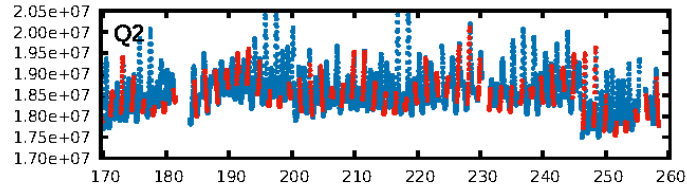
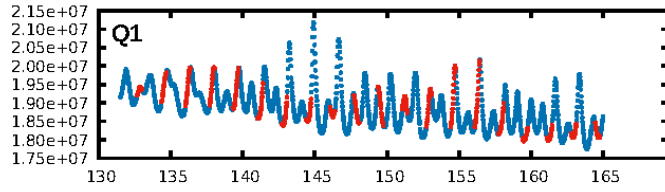
## DV Fit Results:

Period = 1.67197 [0.00003] d  
Epoch = 132.8488 [0.0037] BKJD  
Rp/R\* = 0.0119 [0.0043]  
a/R\* = 1.64 [1.50]  
b = 0.90 [0.30]  
Seff = 2060.76 [788.53]  
Teff = 1718 [164] K  
Rp = 1.42 [0.66] Re  
a = 0.0288 [0.0071] AU  
Ag = 121.32 [97.43] [1.23 $\sigma$ ]  
**Teffp = 8816 [1626] K [4.34 $\sigma$ ]**

## DV Diagnostic Results:

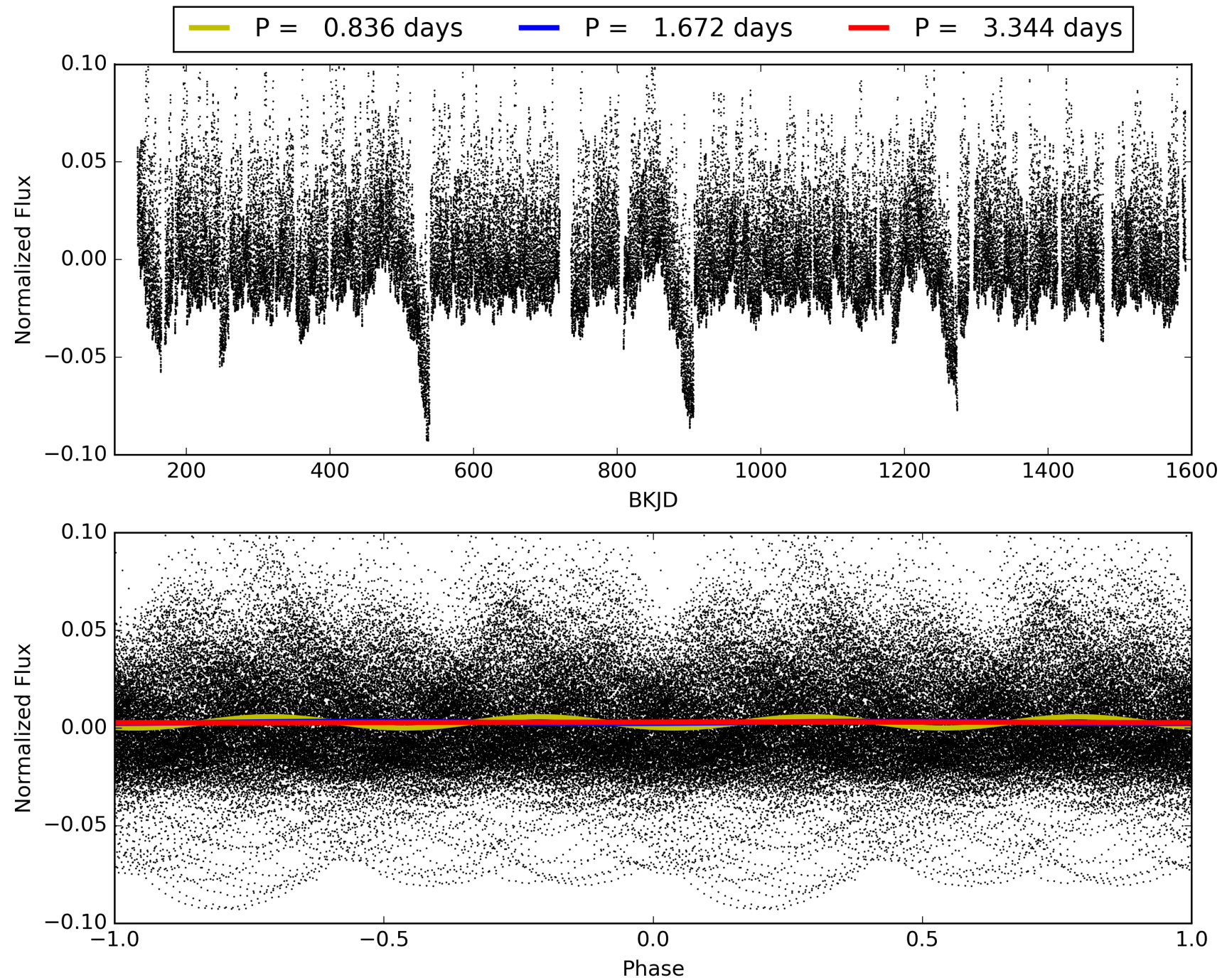
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [25.70 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [768/768]  
**GhostDiagnostic-chr: -0.3586**  
Centroid-sig: 14.2%  
Centroid-so: 1.209 arcsec [1.36 $\sigma$ ]  
**OotOffset-rm: 1.290 arcsec [14.09 $\sigma$ ]**  
KicOffset-rm: 0.110 arcsec [1.26 $\sigma$ ]  
OotOffset-st: 4/4/3/5 [16]  
KicOffset-st: 4/4/3/5 [16]  
DiffImageQuality-fgm: 0.75 [12/16]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007910731-02, PDC Light Curves



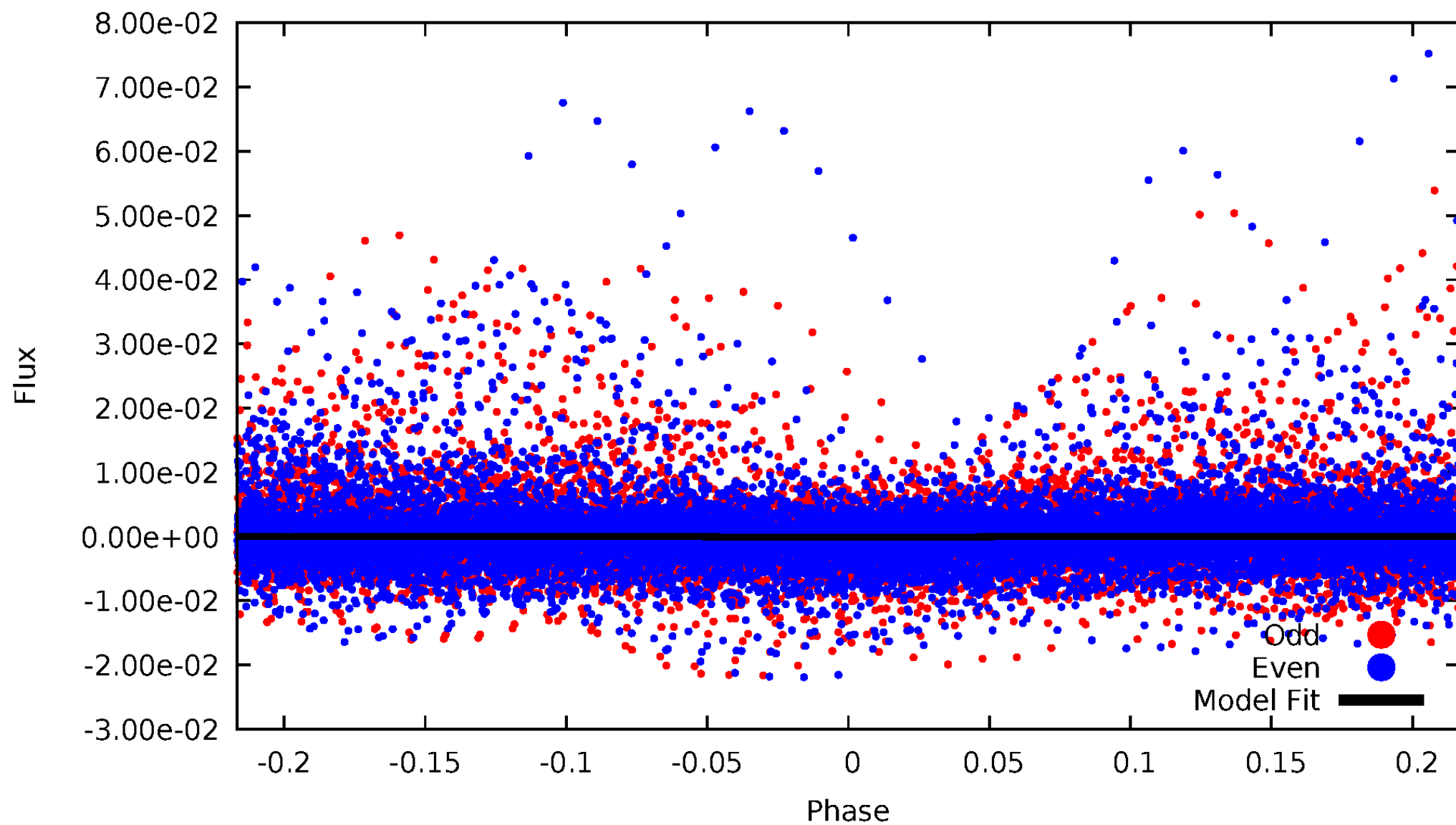


TCE 007910731-02



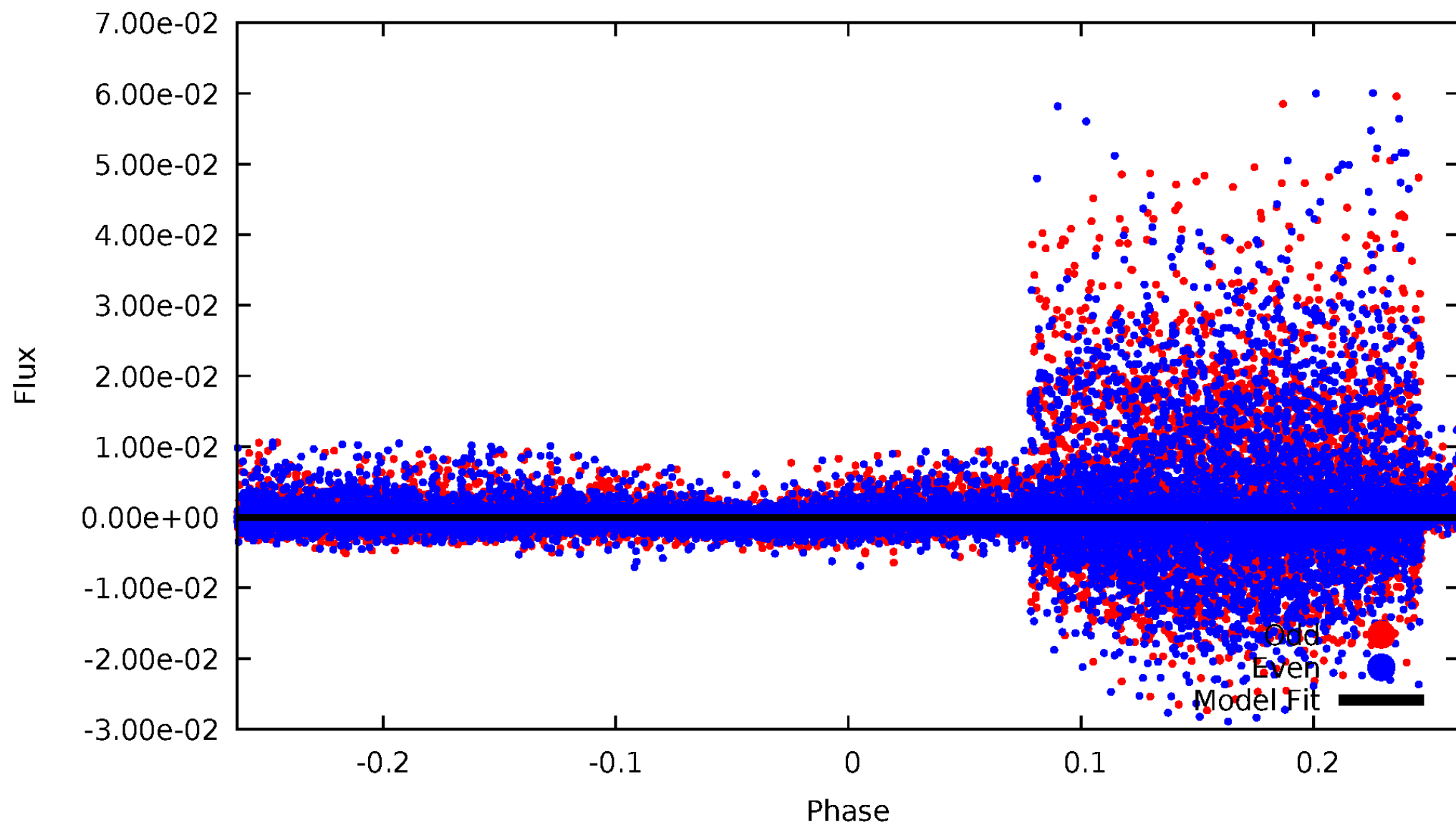
# DV Odd/Even

TCE 007910731-02



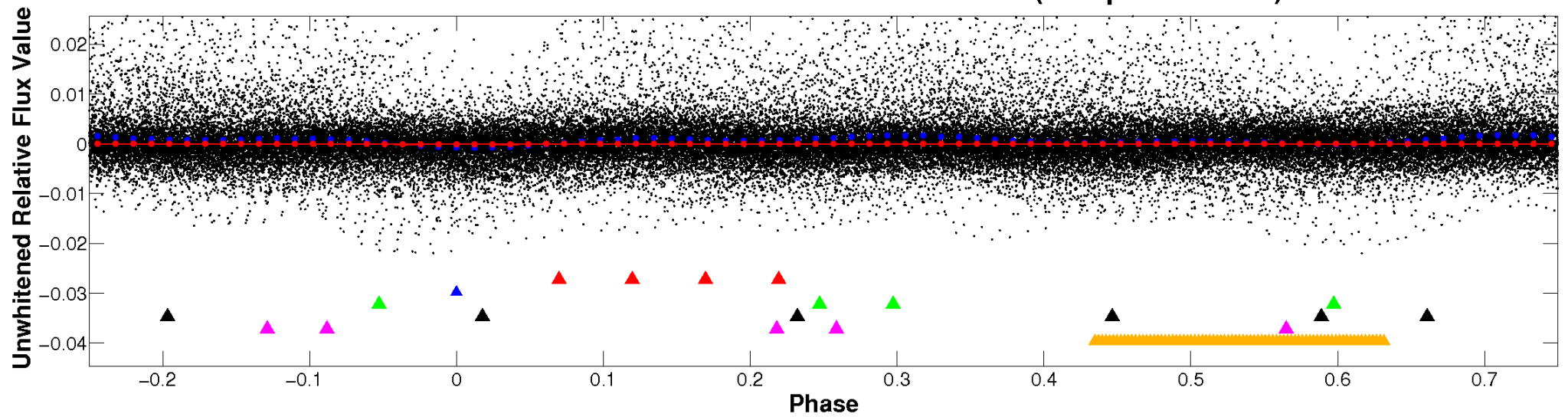
# ALT Odd/Even

TCE 007910731-02

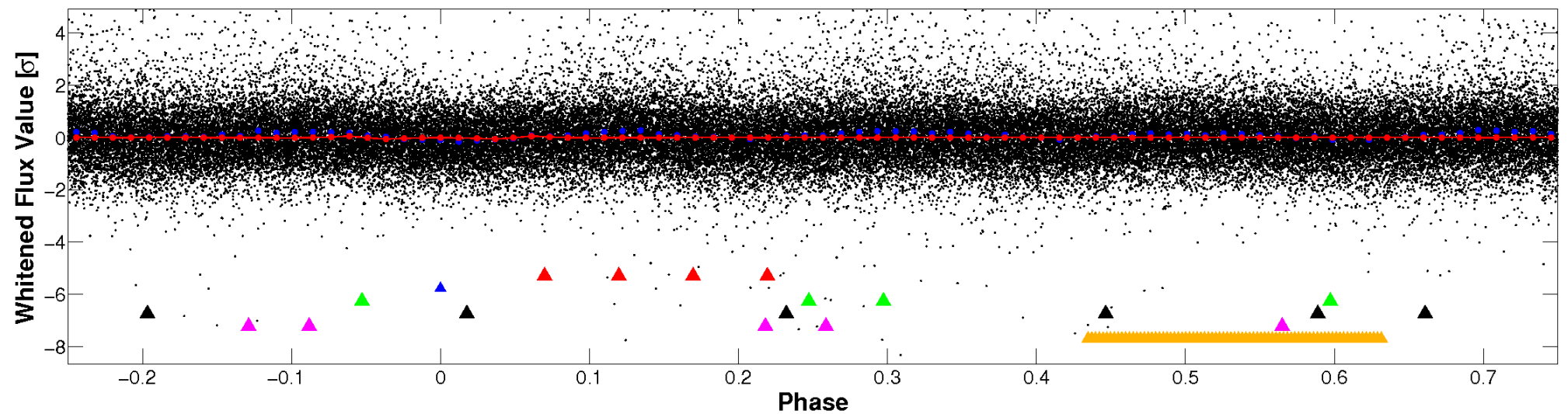


# Non-Whitened Vs. Whitened Light Curve

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



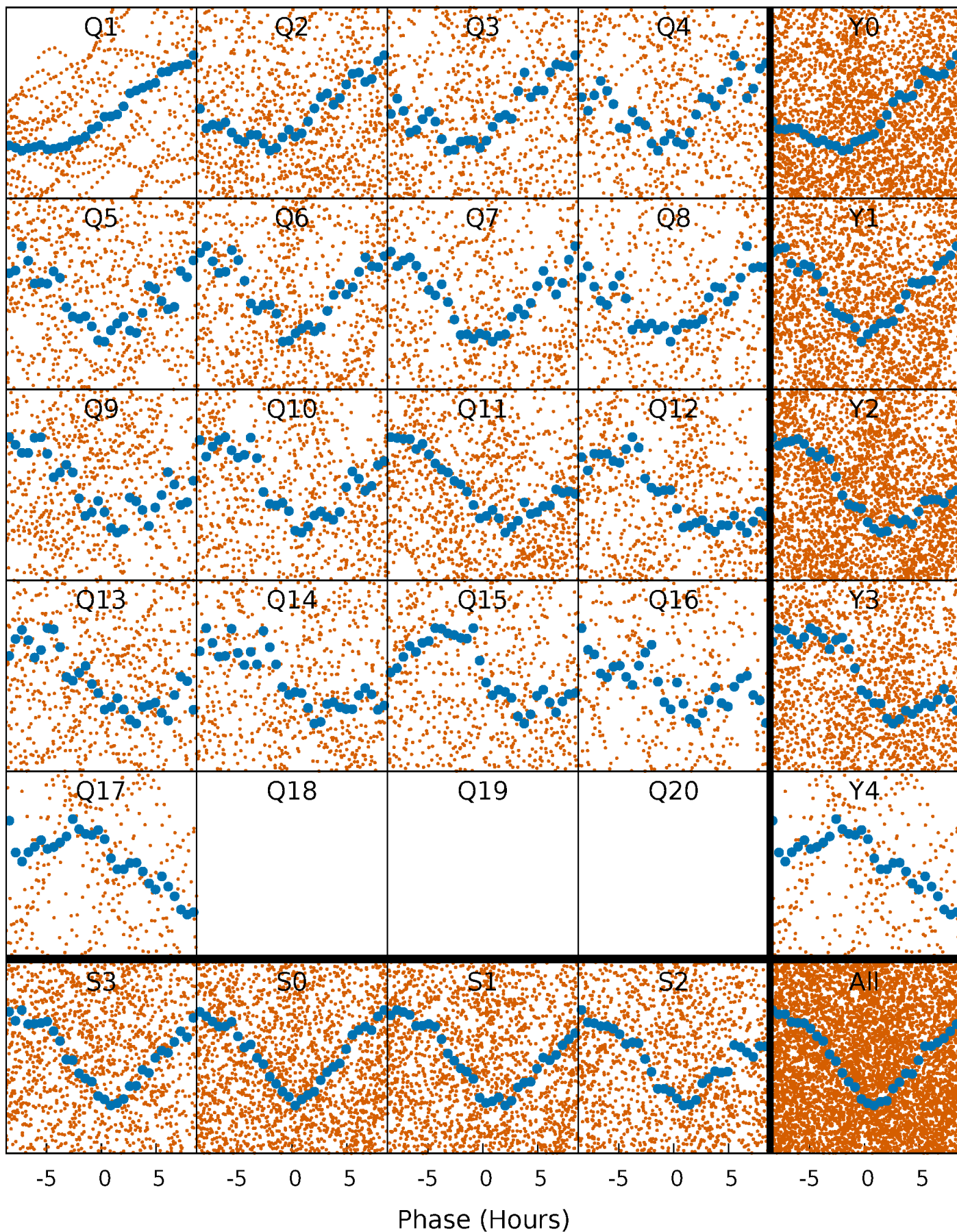
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





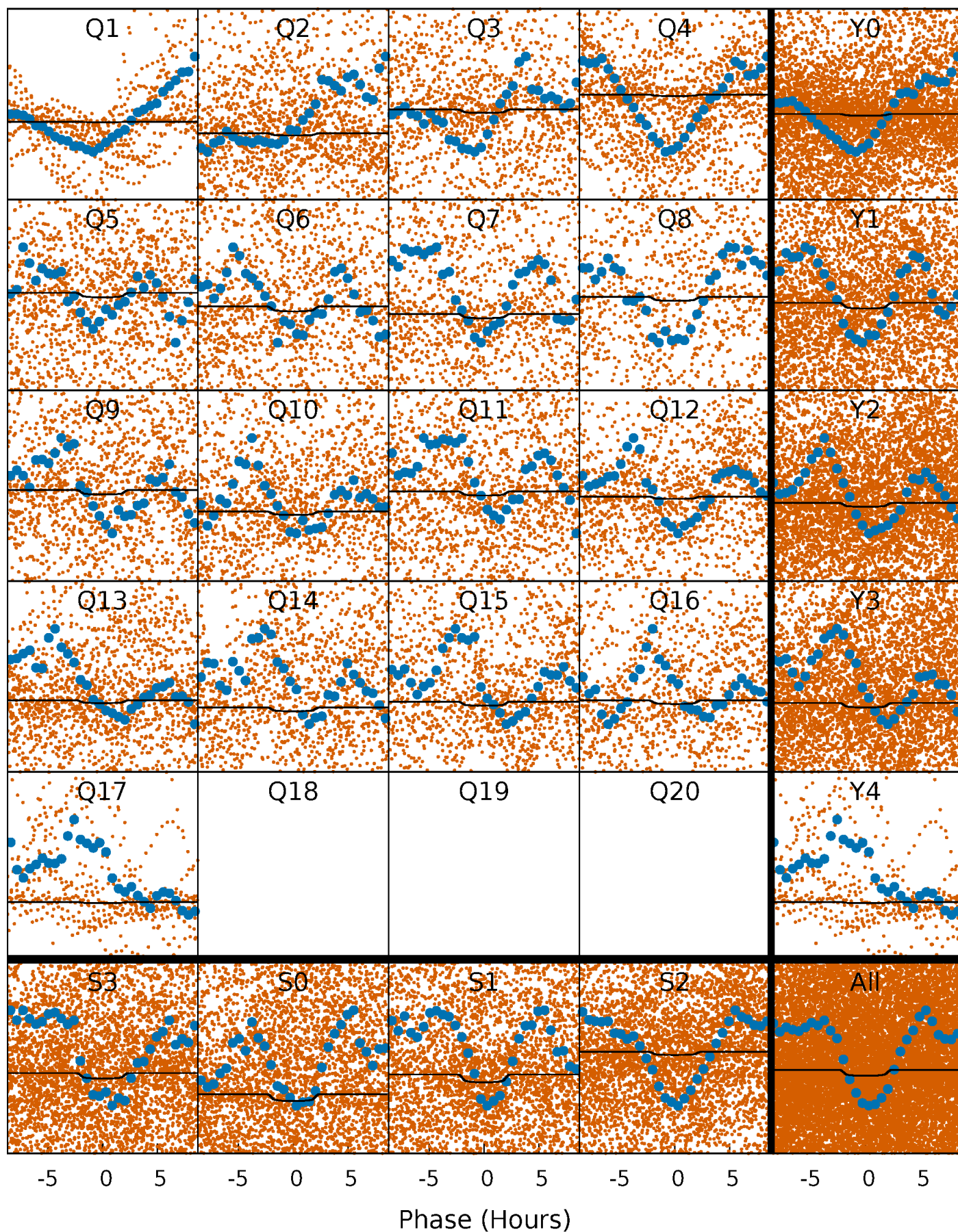
# PDC Quarter-Phased Transit Curves

TCE 007910731-02 P= 1.671973 Days  $T_0=132.848767$  (BKJD)



# DV Quarter-Phased Transit Curves

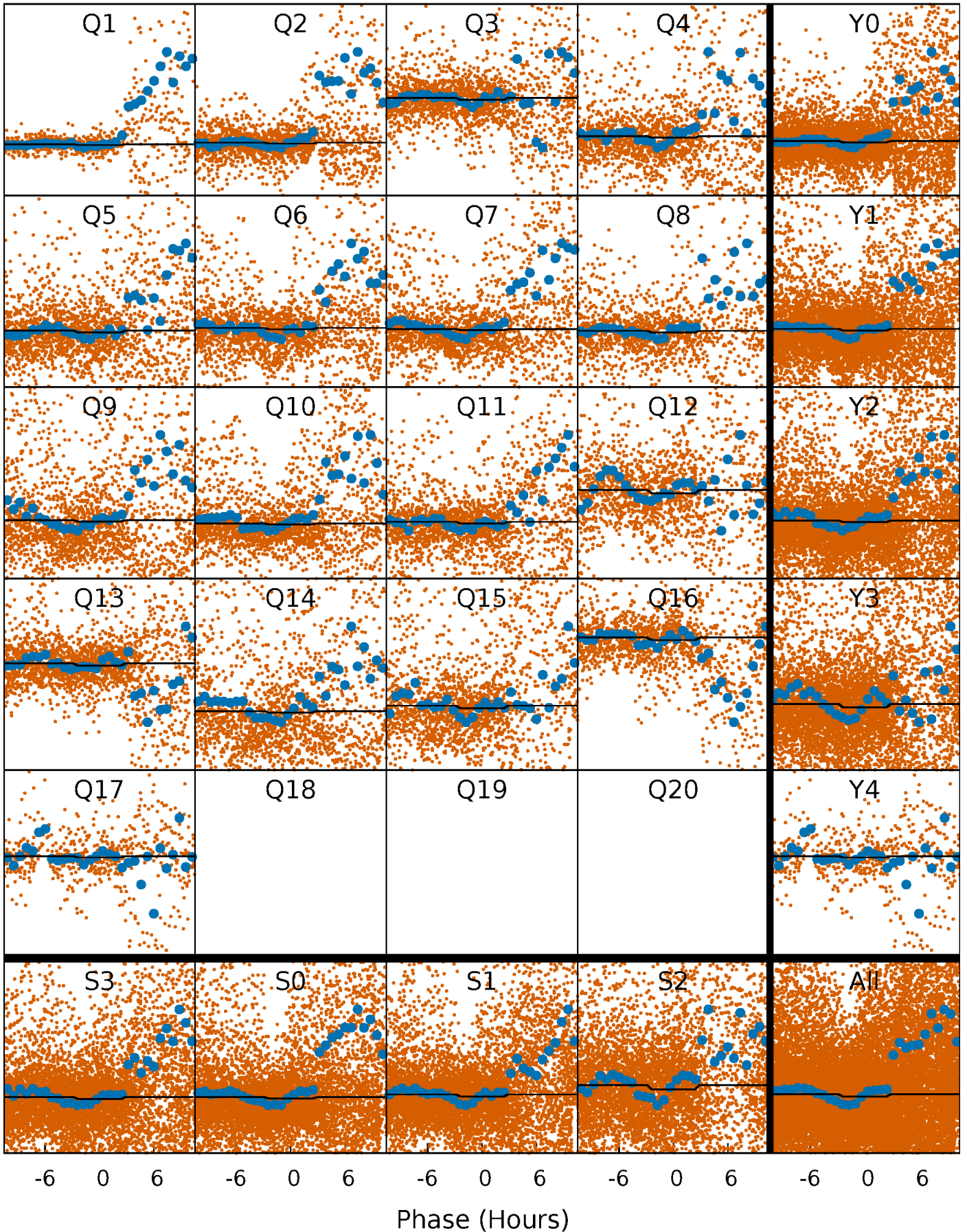
TCE 007910731-02 P= 1.671973 Days  $T_0=132.848767$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

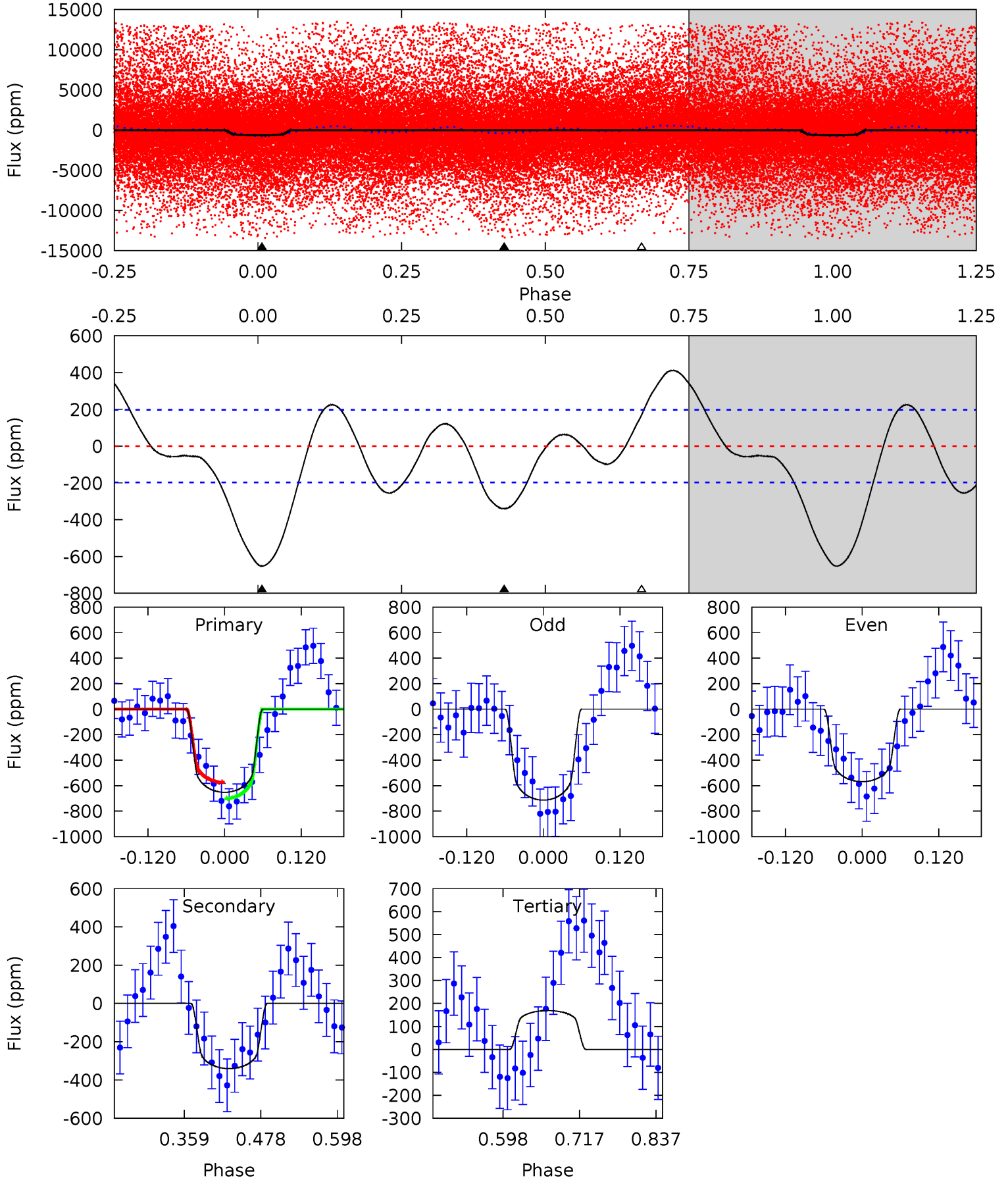
TCE 007910731-02   P= 1.672228 Days    $T_0=132.834238$  (BKJD)



# DV Model-Shift Uniqueness Test

007910731-02, P = 1.671973 Days, E = 131.176794 Days

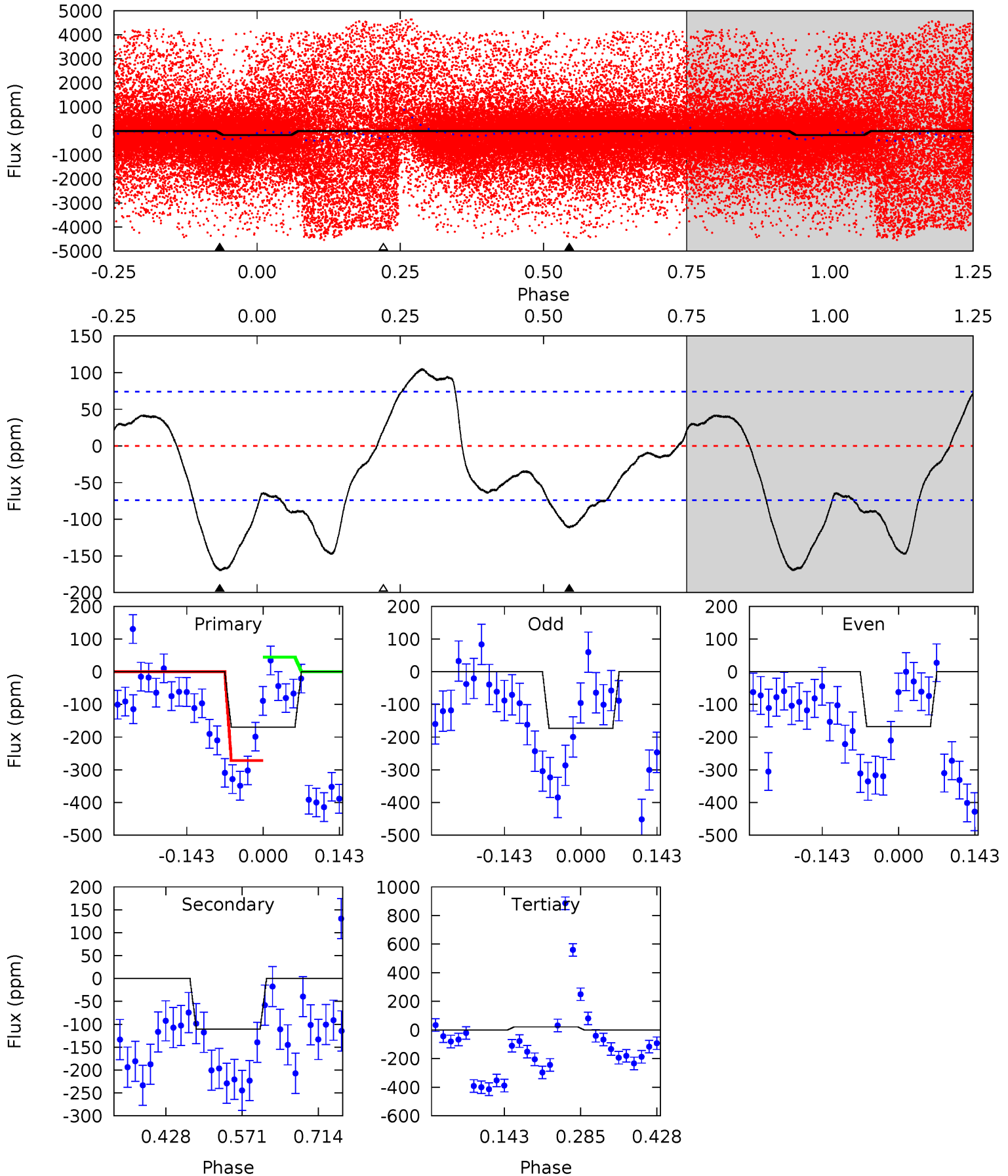
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	7.81	-3.87	0	4.53	1.56	4.17	18.8	15.0	11.7	7.81	1.69	1.73	0.39	1.47



# Alt Model-Shift Uniqueness Test

007910731-02, P = 1.672228 Days, E = 131.162010 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	6.73	-1.31	0	4.49	1.47	4.20	11.6	10.3	8.05	6.73	0.16	0.96	0.38	8.00



### Stellar Parameters For KIC 007910731

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6323^{+174}_{-239}$	$4.418^{+0.062}_{-0.188}$	$-0.080^{+0.250}_{-0.300}$	$1.093^{+0.329}_{-0.141}$	$1.140^{+0.157}_{-0.157}$	$1.230^{+0.406}_{-0.594}$
	+3%/-4%	+1%/-4%	+312%/-375%	+30%/-13%	+14%/-14%	+33%/-48%
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 007910731-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-340 \pm 44$	$1.48^{+0.56}_{-0.53}$	$2440^{+159}_{-123}$	$7974^{+2817}_{-1257}$	$67^{+101}_{-31}$
Alt.	$-111 \pm 16$	$1.03^{+0.57}_{-0.48}$	$2433^{+169}_{-119}$	$7071^{+3792}_{-1376}$	$44^{+126}_{-25}$

$T_{\text{max}}$  = 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

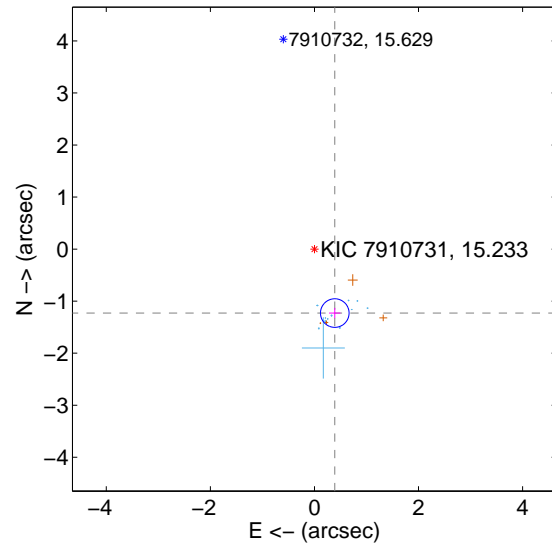
Supplemental centroid analysis for 007910731-02. Kepler magnitude: 15.23. Transit SNR 3.78

There are 12 quarters with good PRF difference image offsets

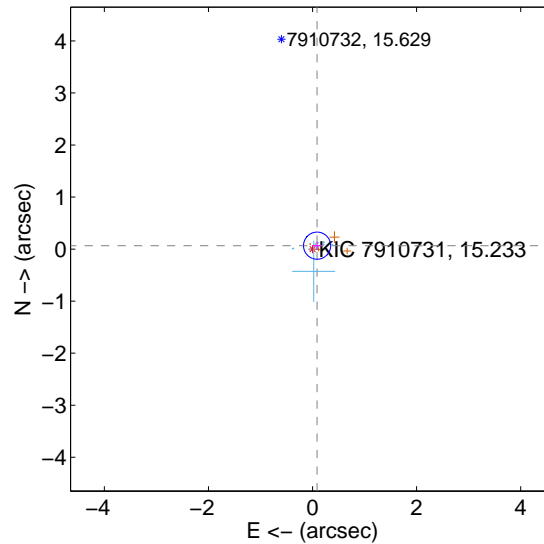
The direct PRF centroid is offset from the target star catalog position by about 1.53 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.290 \pm 0.092$	14.09	$-0.391 \pm 0.111$	$-1.229 \pm 0.099$
PRF-fit source offset from KIC position	$0.110 \pm 0.087$	1.26	$-0.088 \pm 0.088$	$0.066 \pm 0.075$
photometric centroid source offset	$1.21 \pm 0.89$	1.36	$1.21 \pm 0.88$	$-0.08 \pm 1.63$

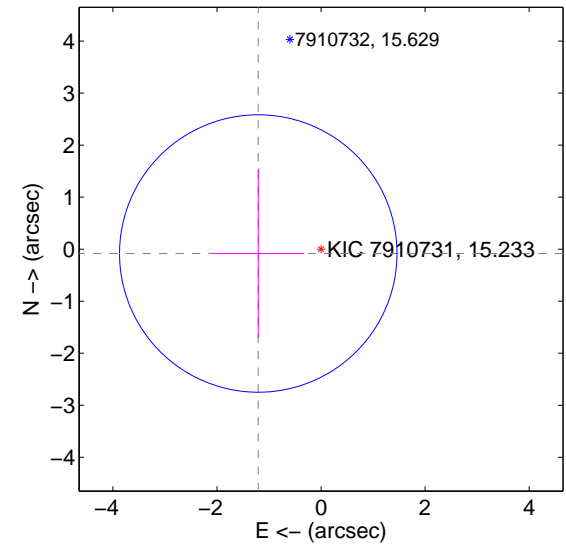
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

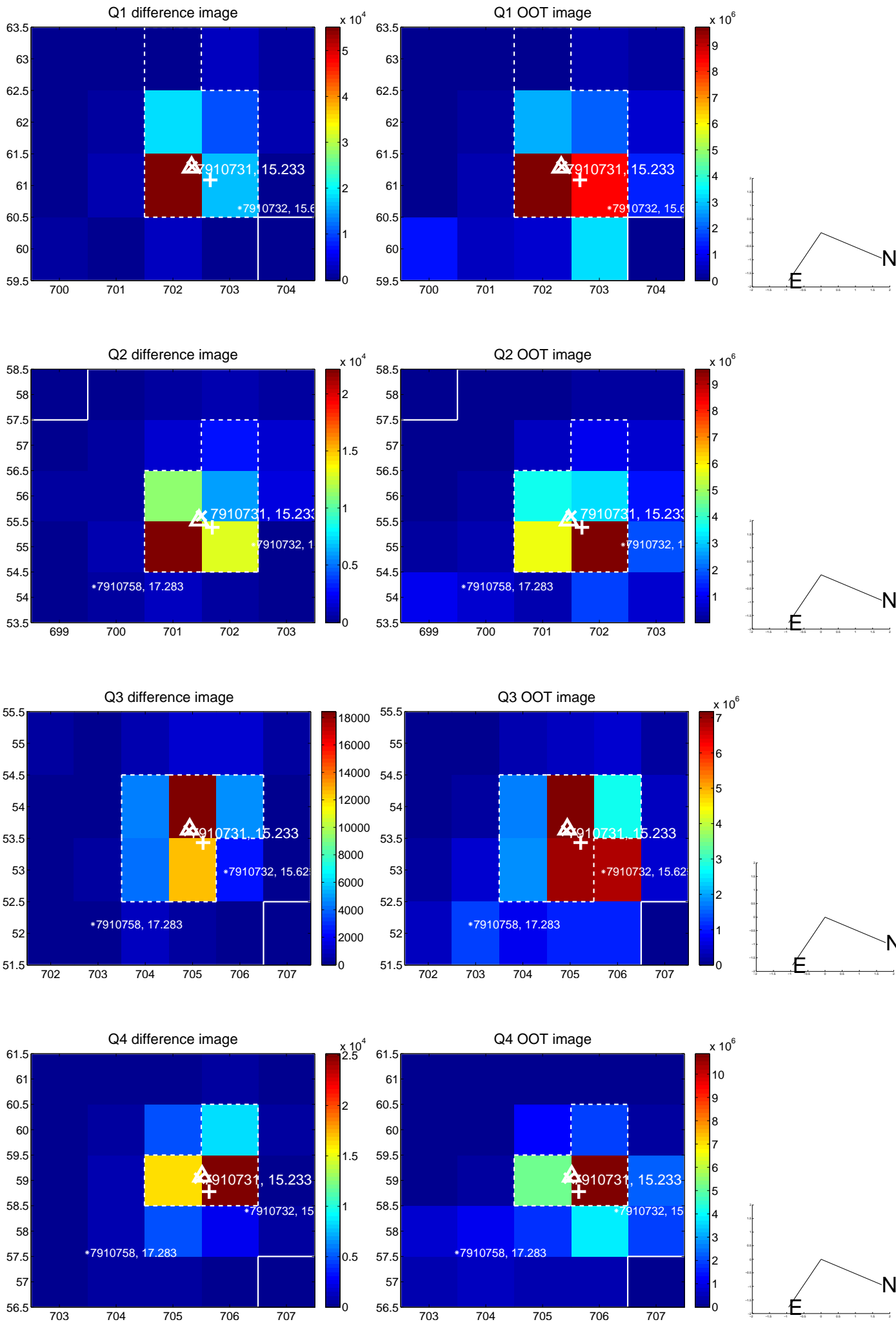


offset from photometric centroids



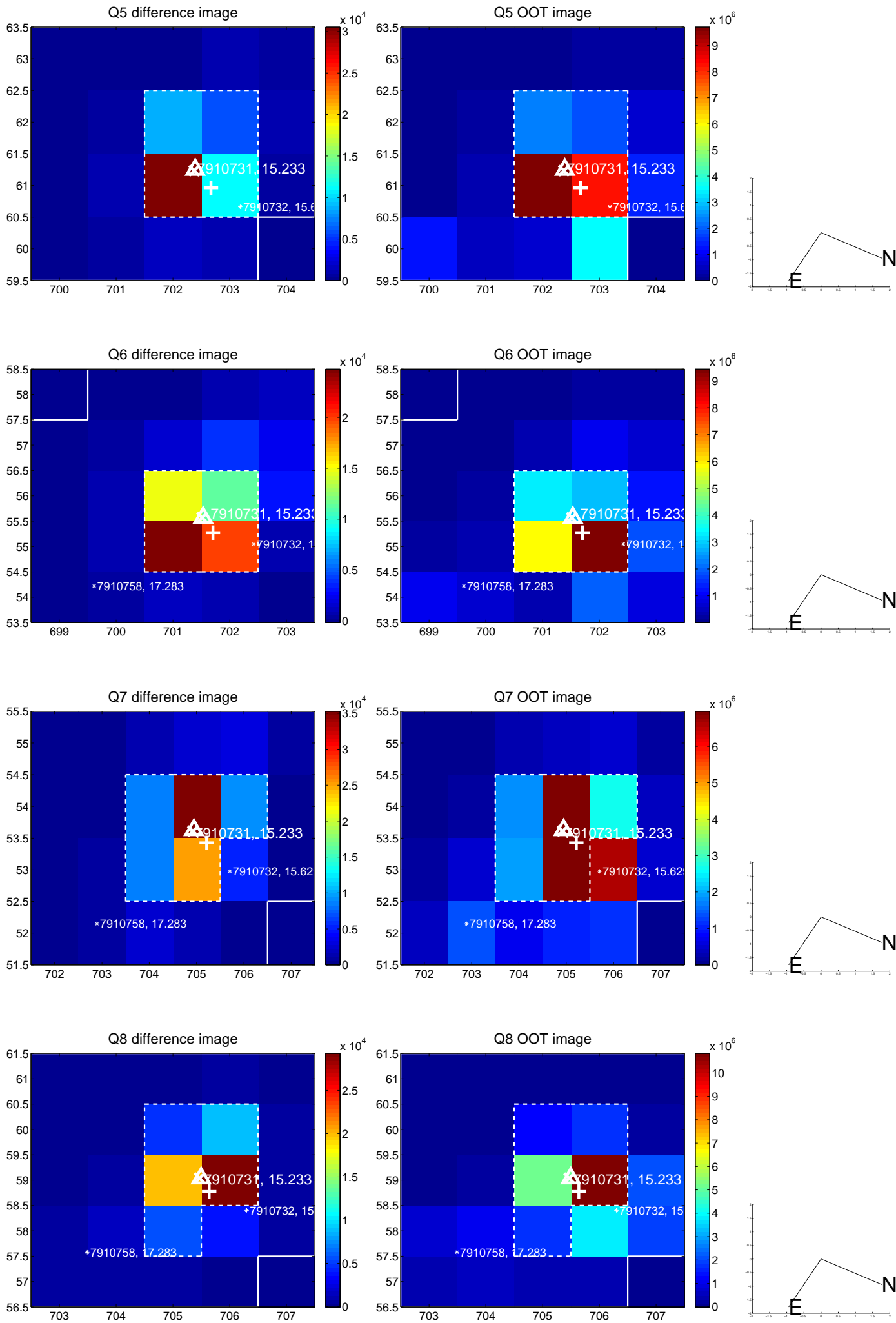
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

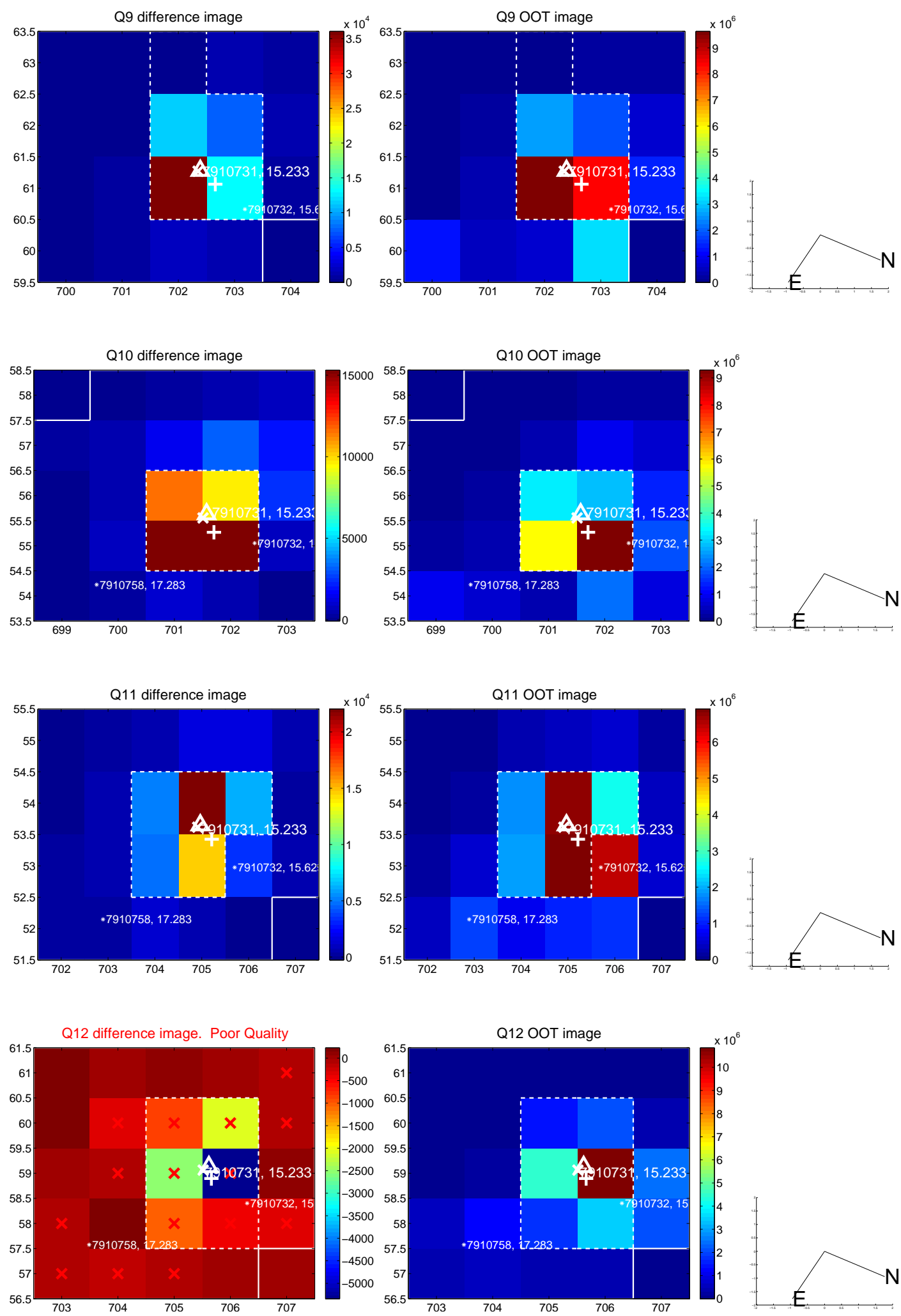




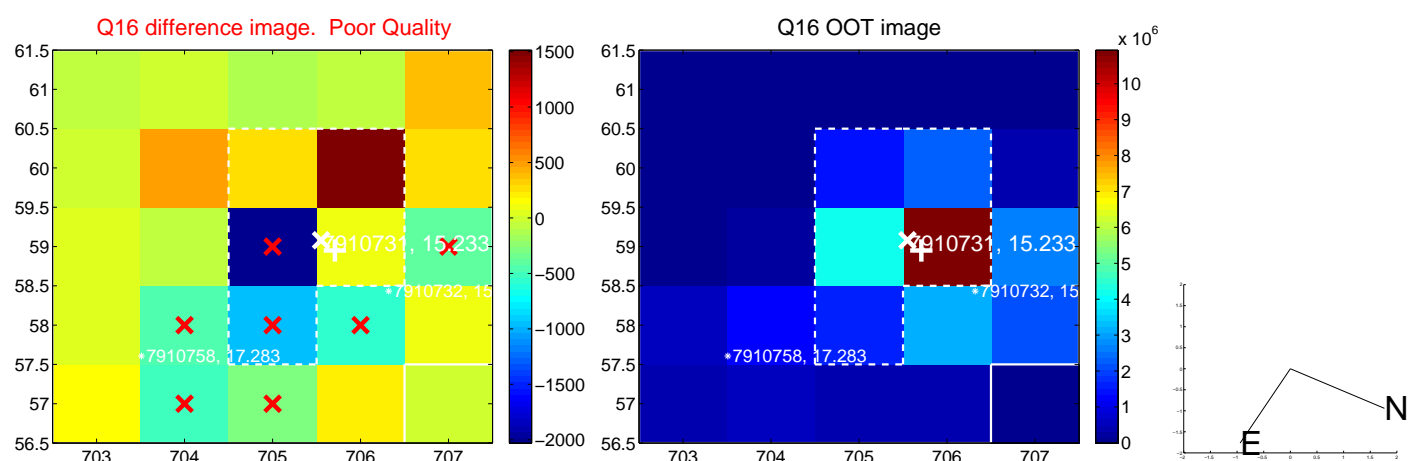
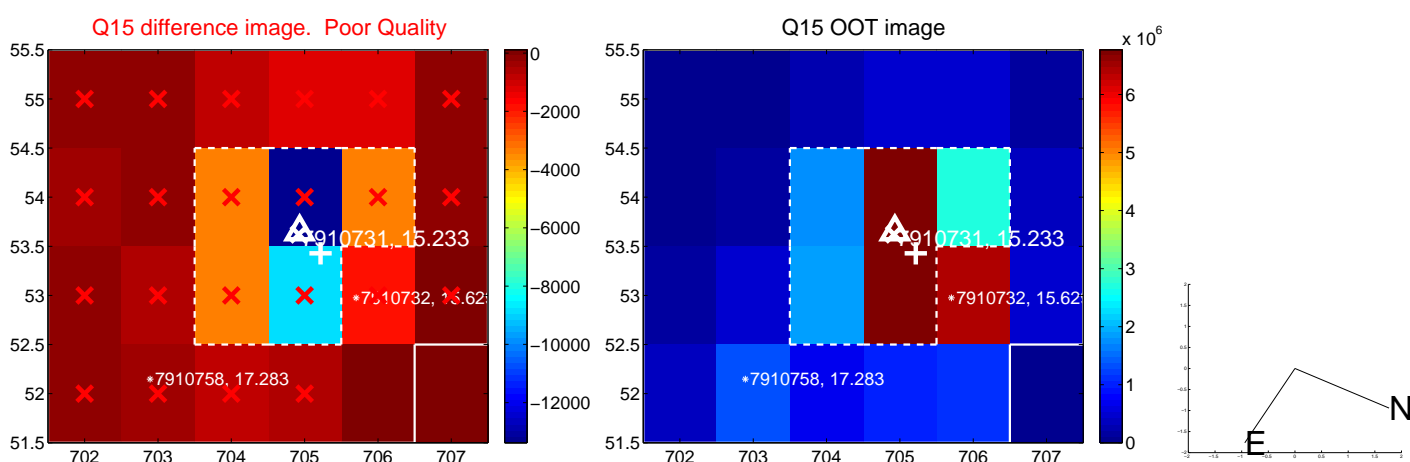
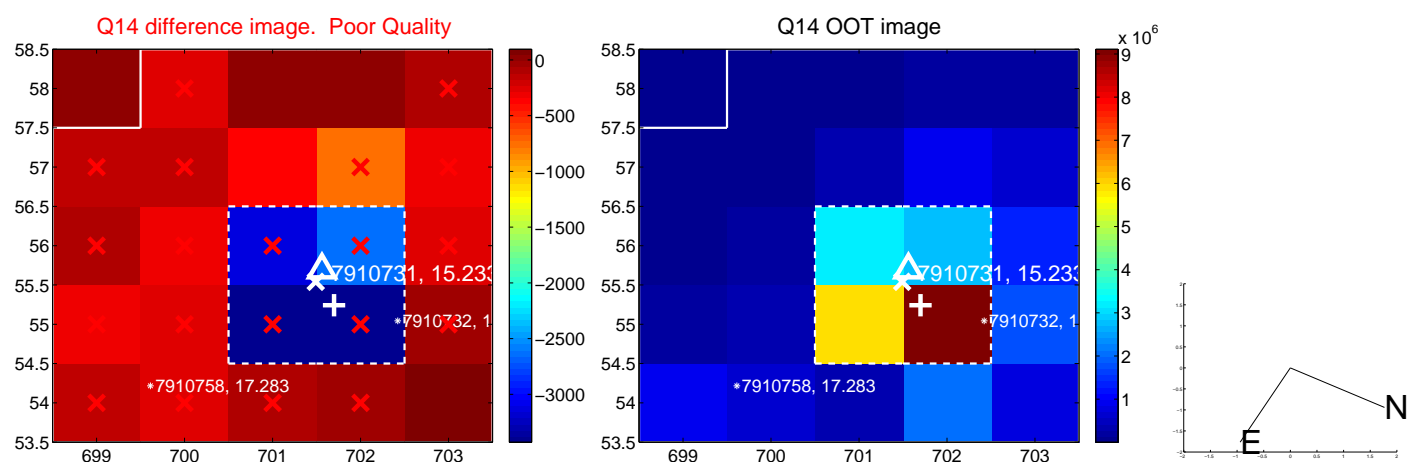
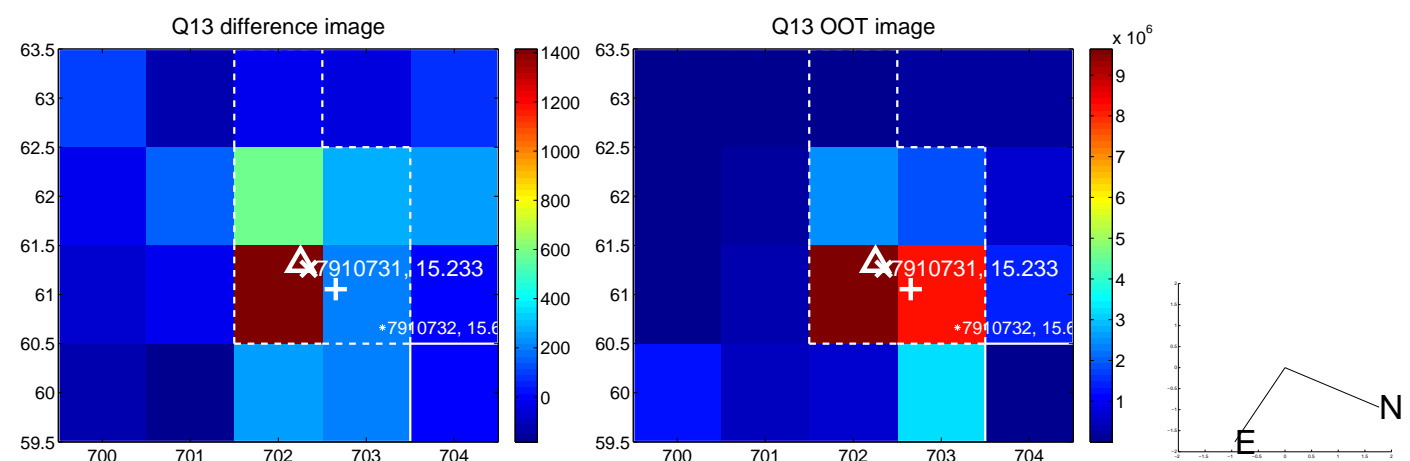
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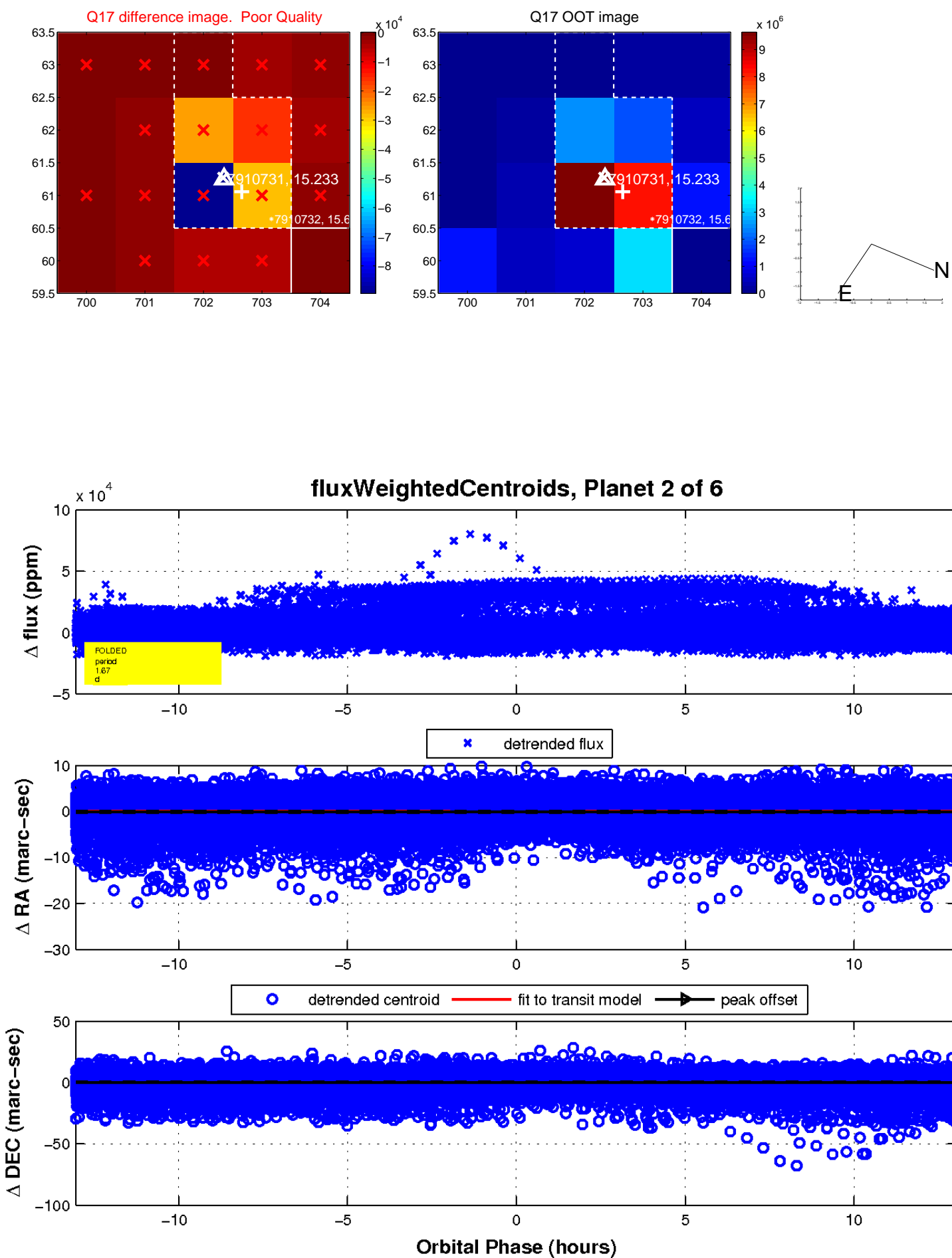
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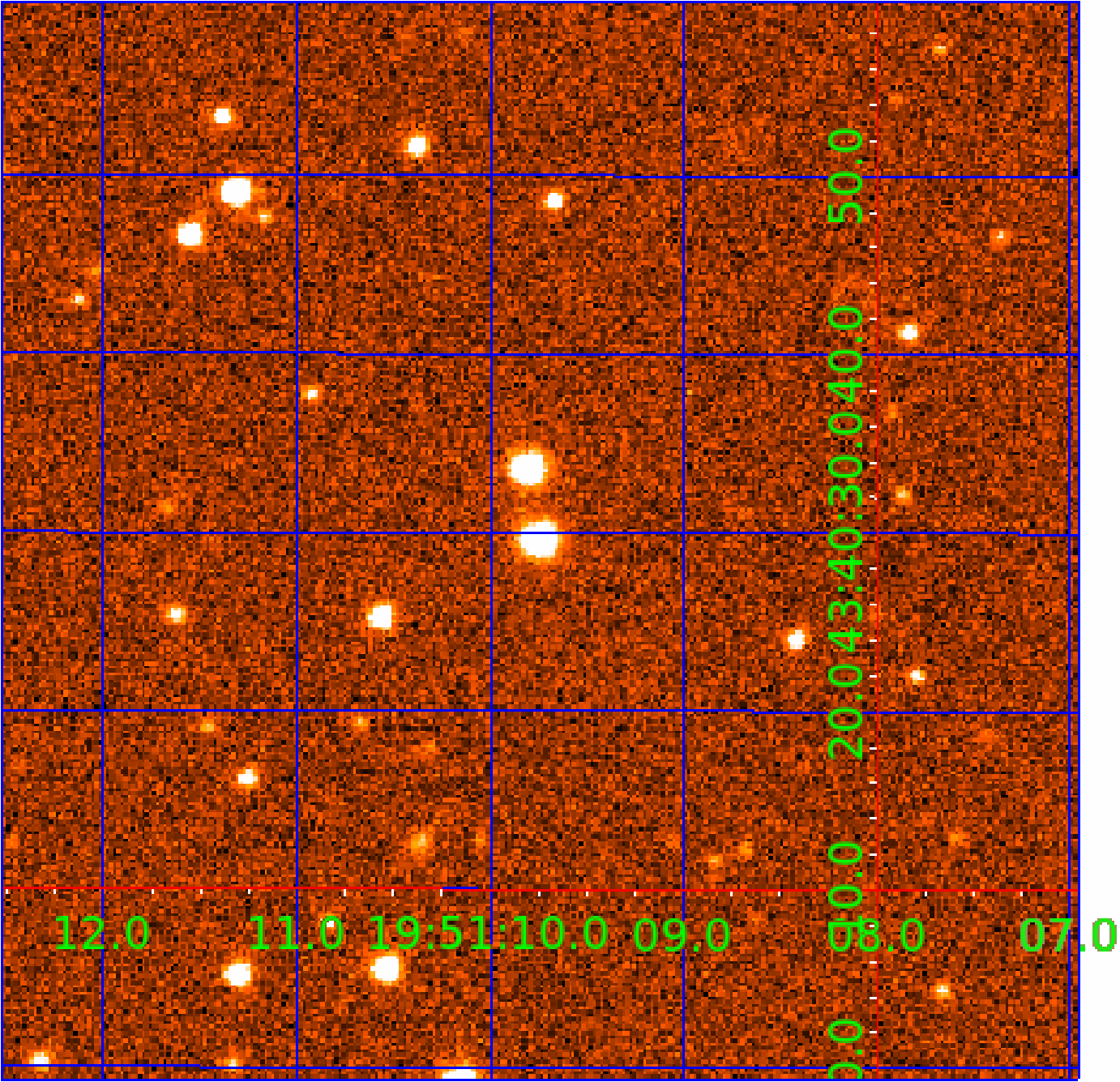


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UKIRT Image

Declination



# KIC 007910731

## 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

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007910731-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_KIC_POS
007910731-03	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—CENT_NOFITS
007910731-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
007910731-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS

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

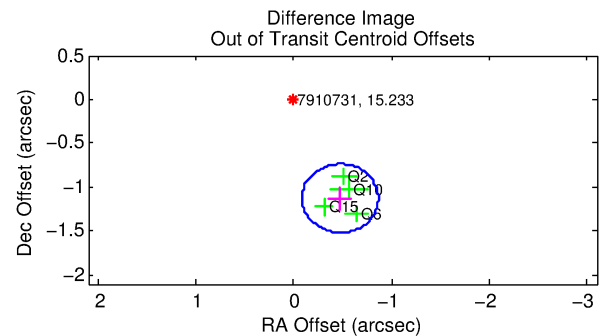
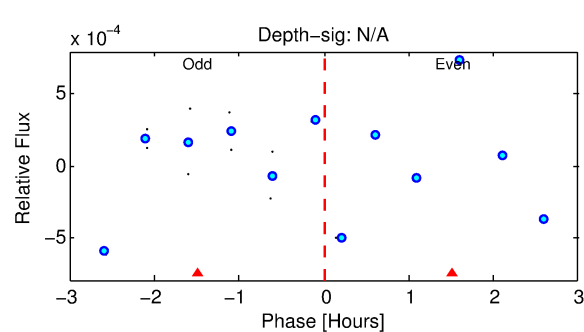
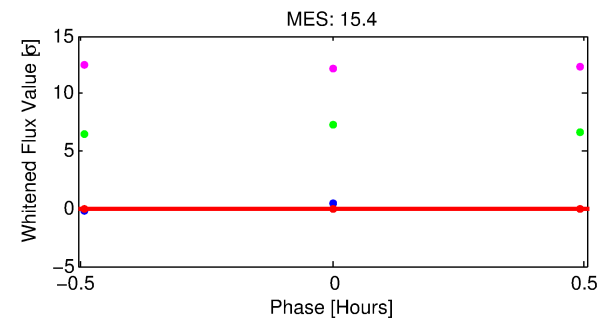
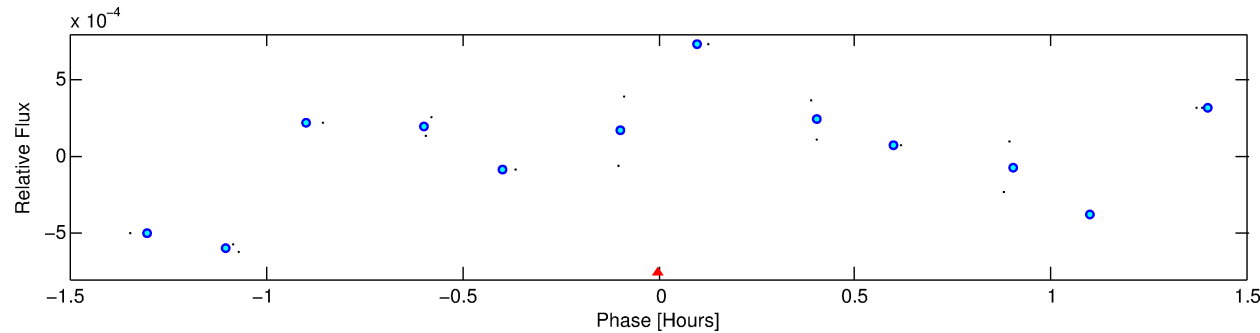
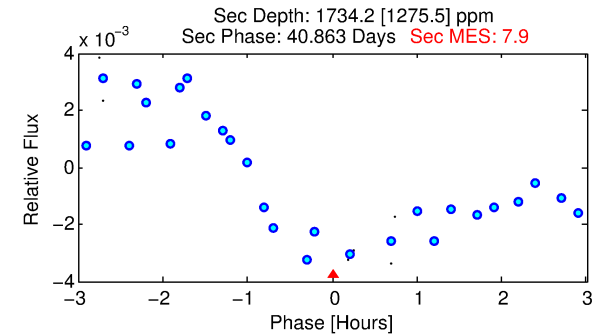
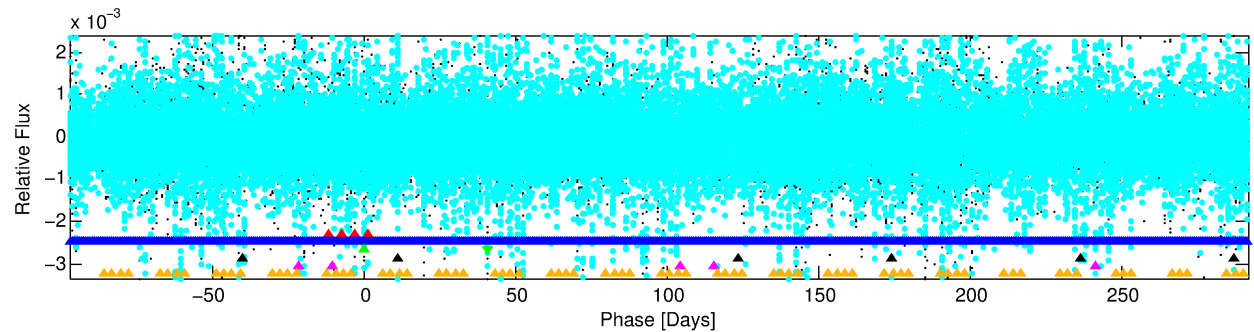
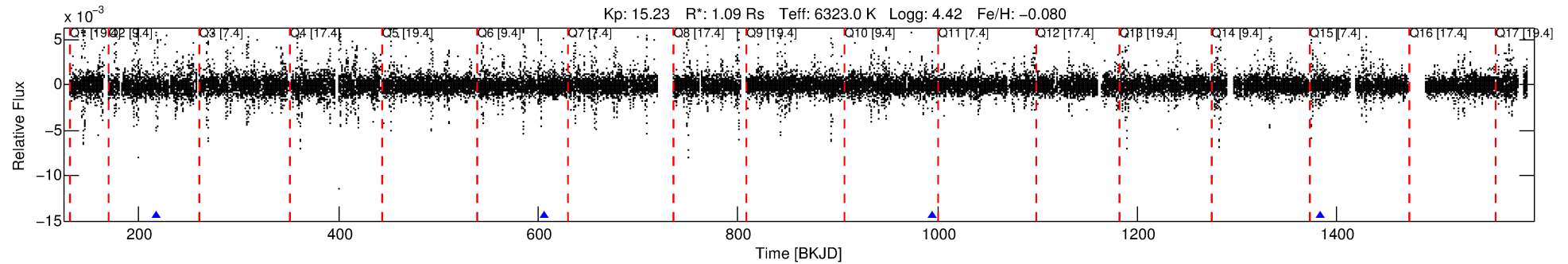
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007910731-03

No Significant Match Found

# DV One-Page Summary

KIC: 7910731 Candidate: 3 of 6 Period: 388.984 d



## TPS TCE Results:

Period = 388.98444 d  
Epoch = 216.9445 BKJD

**DV fit results are unavailable**

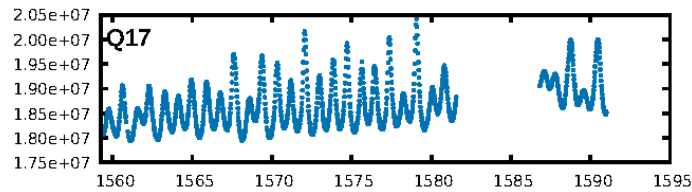
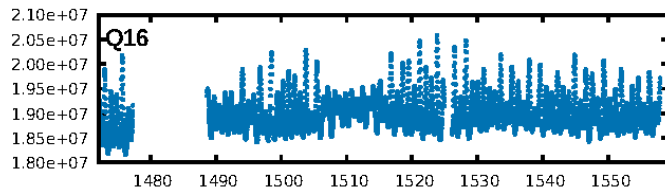
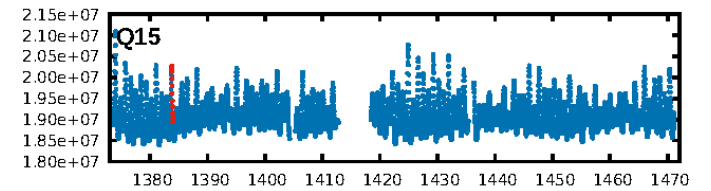
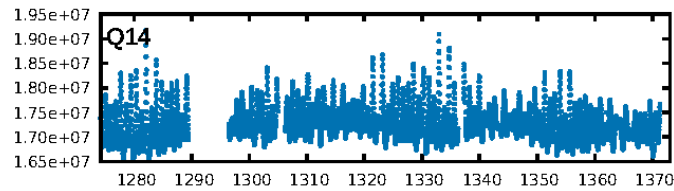
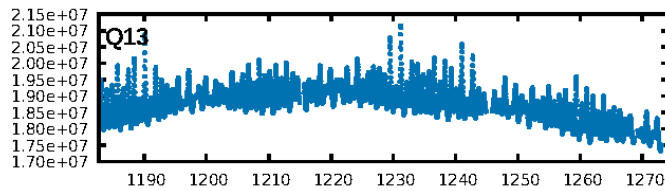
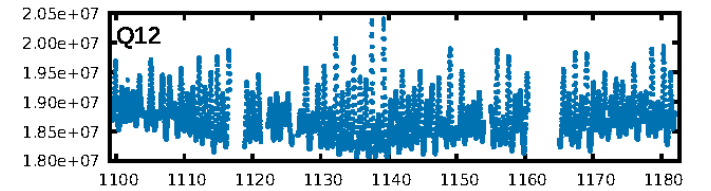
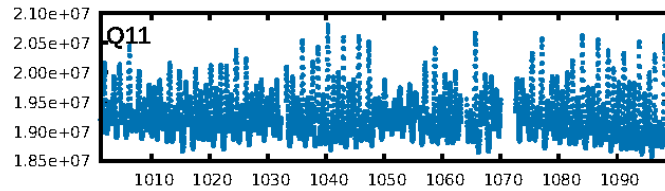
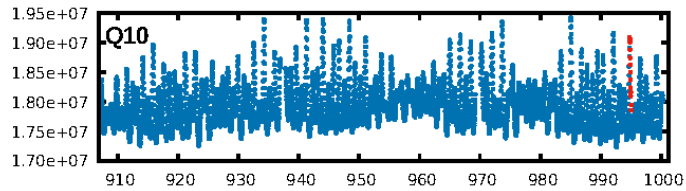
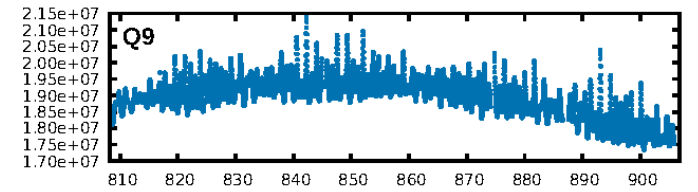
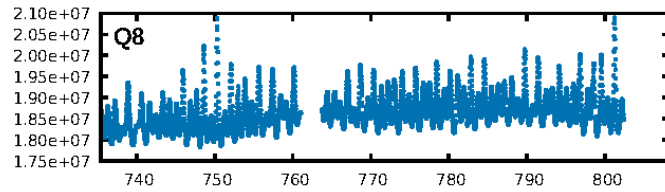
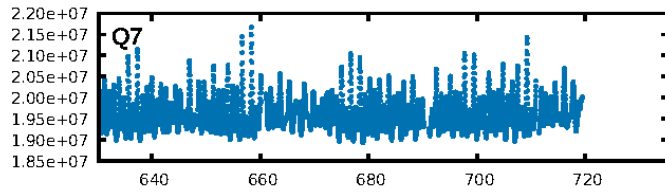
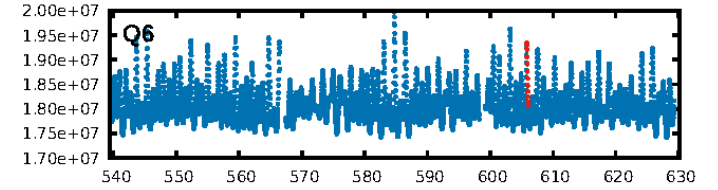
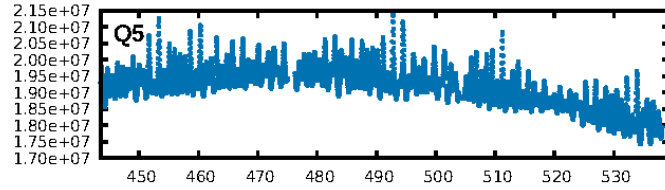
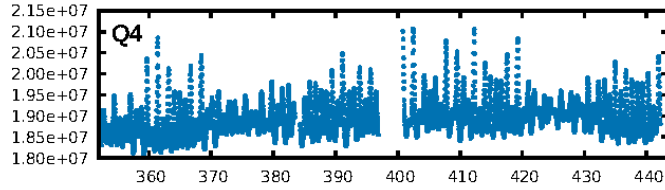
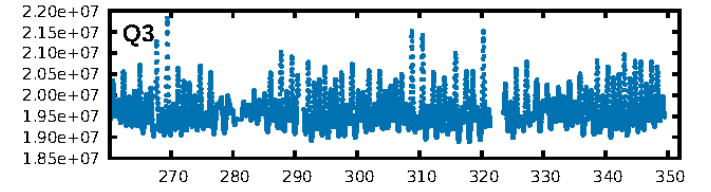
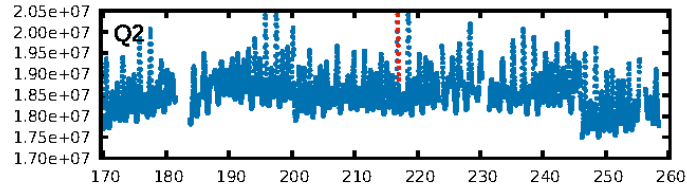
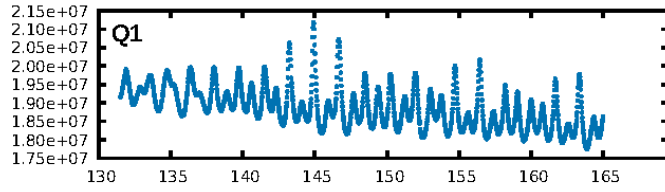
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [33.13 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: -1.005**  
Centroid-sig: 77.6%  
Centroid-so: 60.543 arcsec [0.44 $\sigma$ ]  
**OotOffset-rm: 1.221 arcsec [9.38 $\sigma$ ]**  
OotOffset-st: 3/1/0/0 [4]  
KicOffset-rm: 0.208 arcsec [2.19 $\sigma$ ]  
KicOffset-st: 3/1/0/0 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 0.75 [3/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:22:12 Z

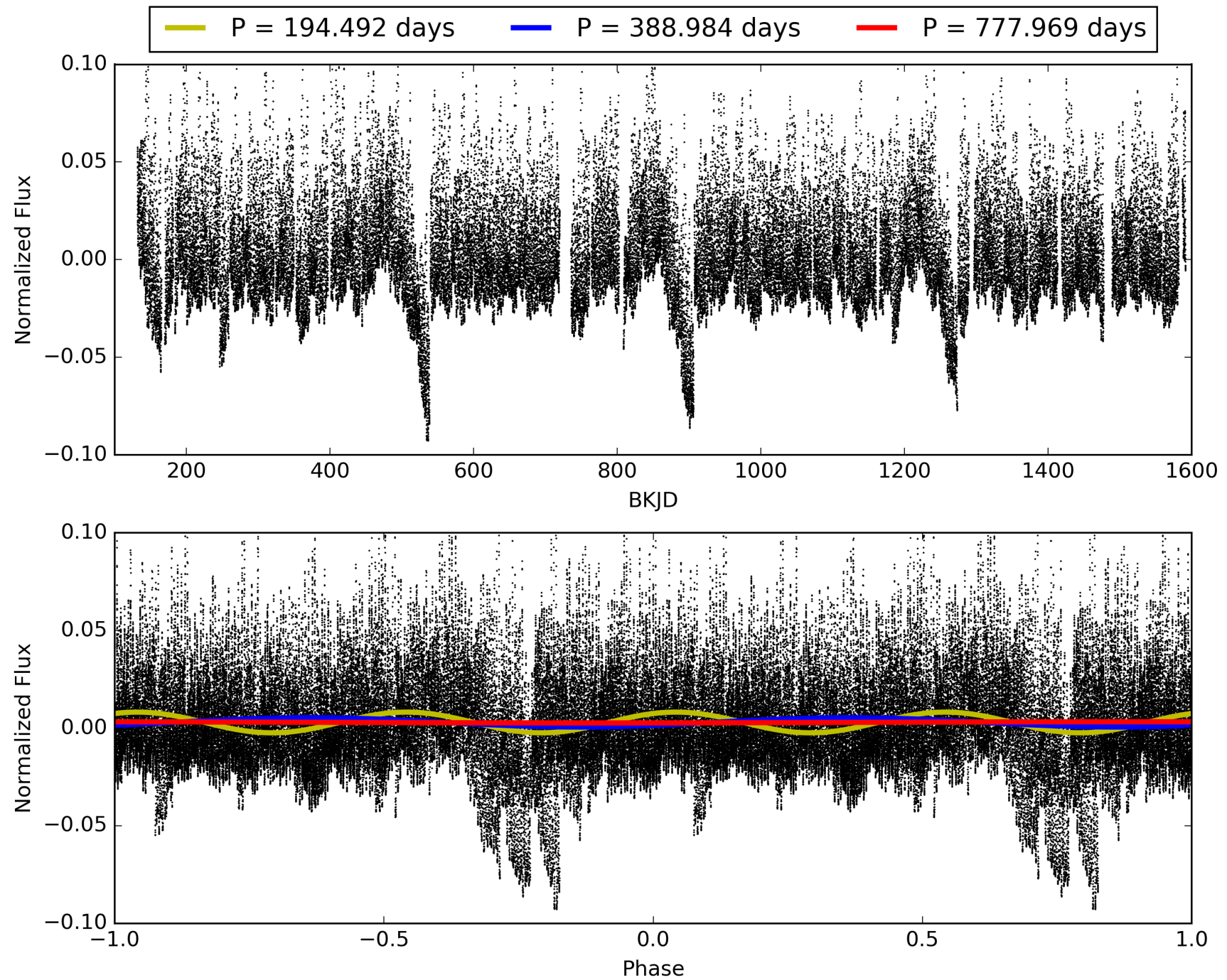
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007910731-03, PDC Light Curves



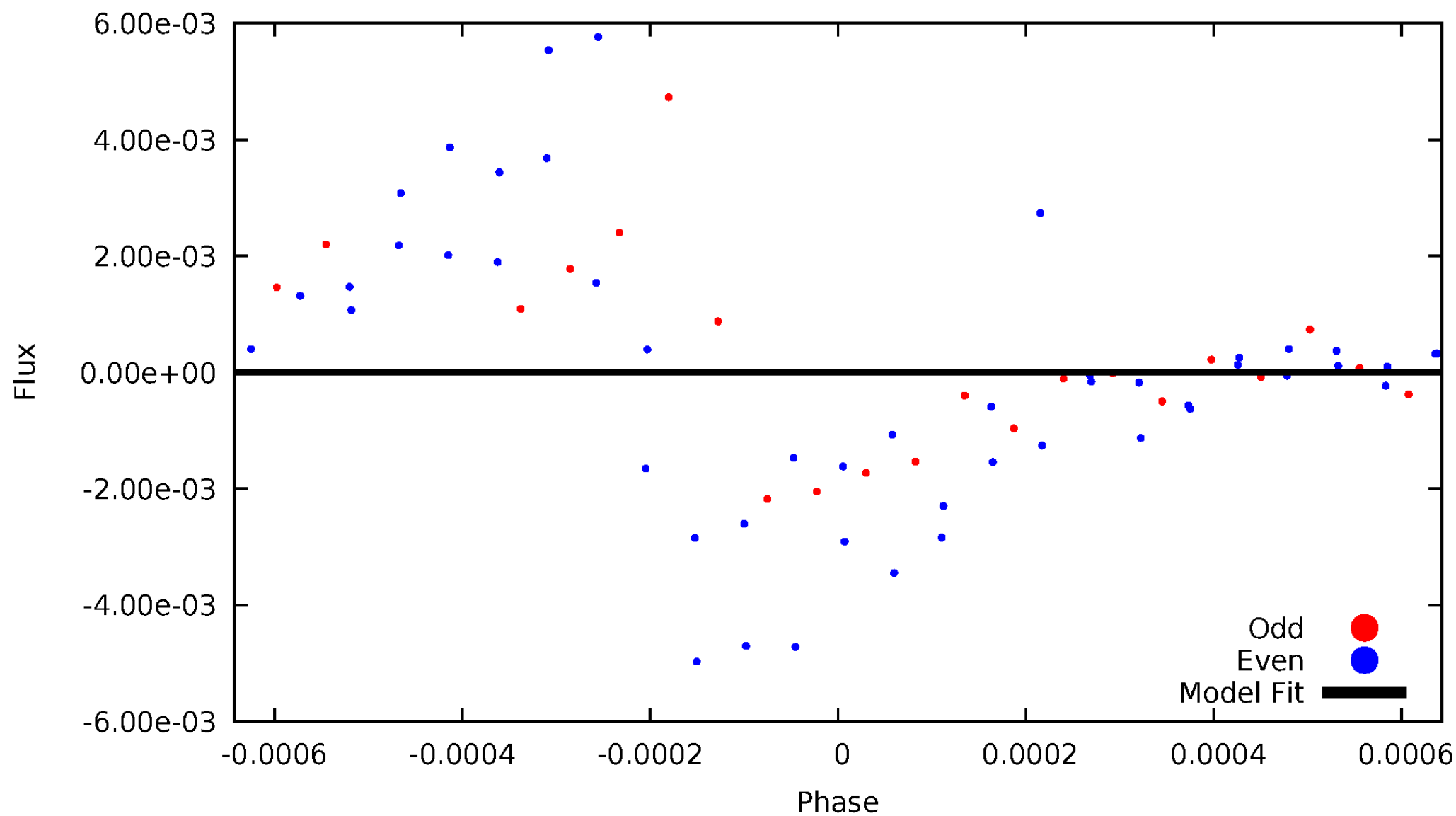


TCE 007910731-03



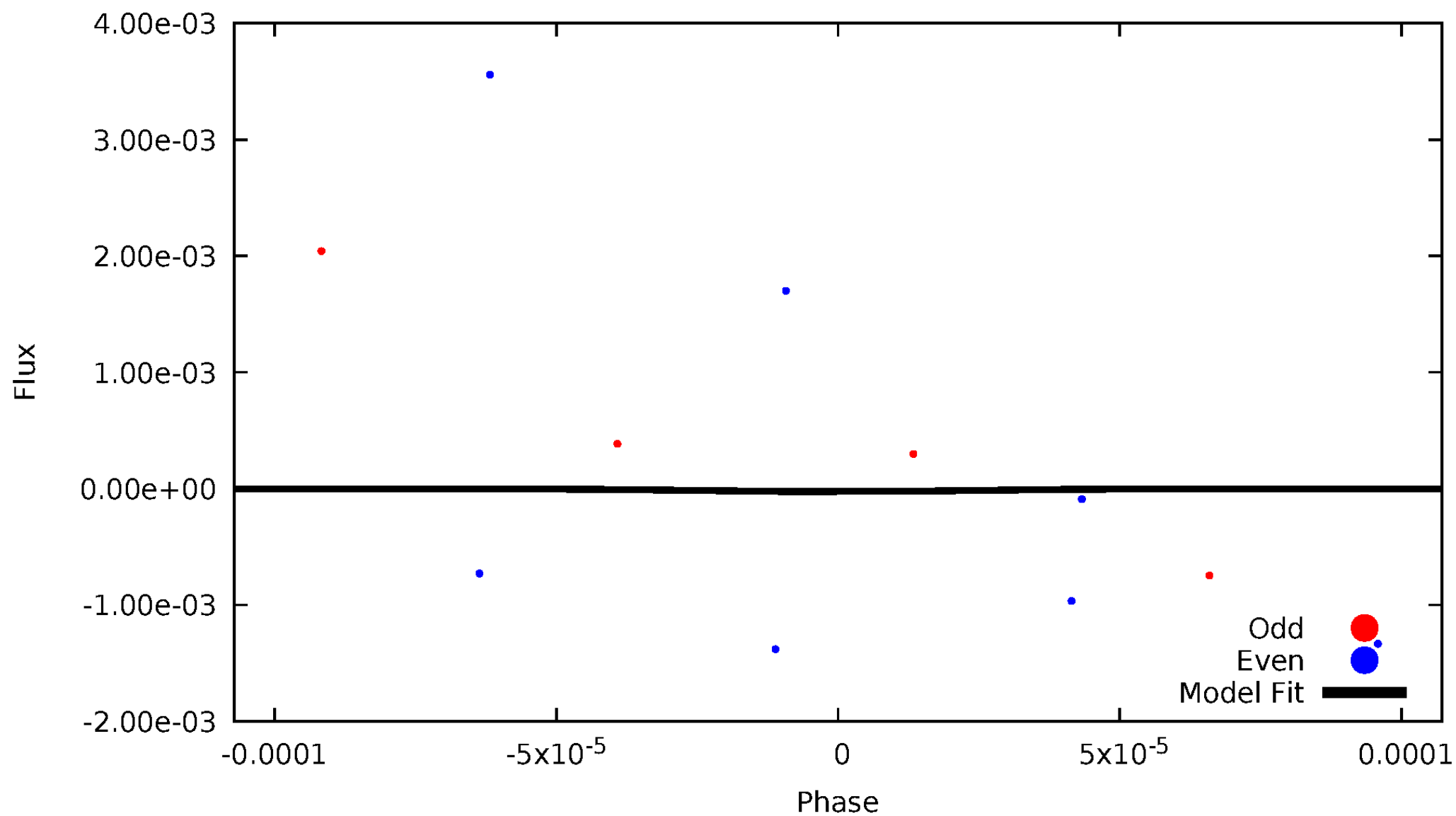
DV Odd/Even

TCE 007910731-03



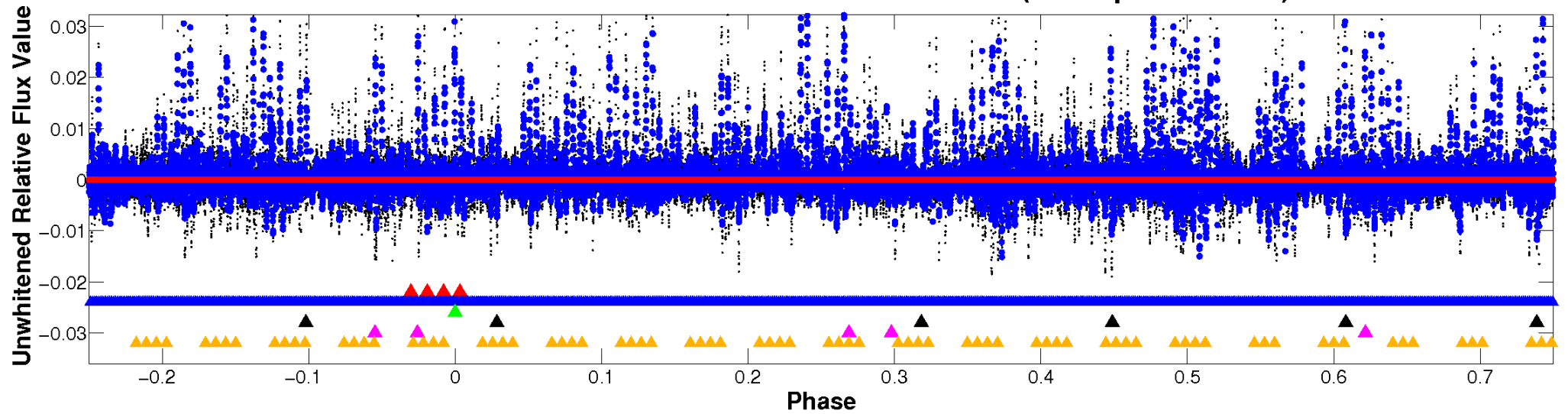
# ALT Odd/Even

TCE 007910731-03

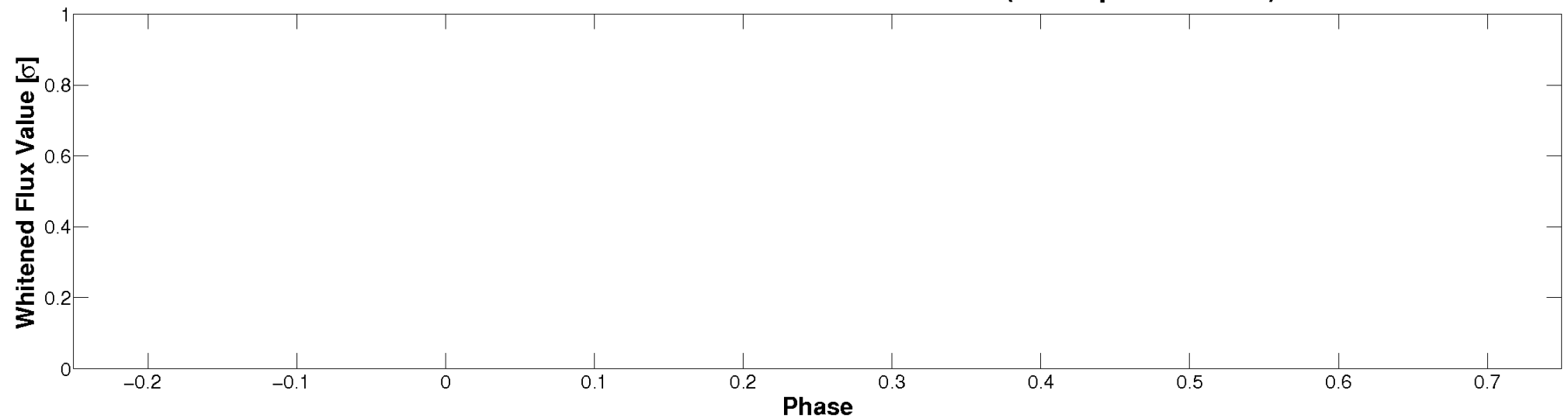


# Non-Whitened Vs. Whitened Light Curve

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

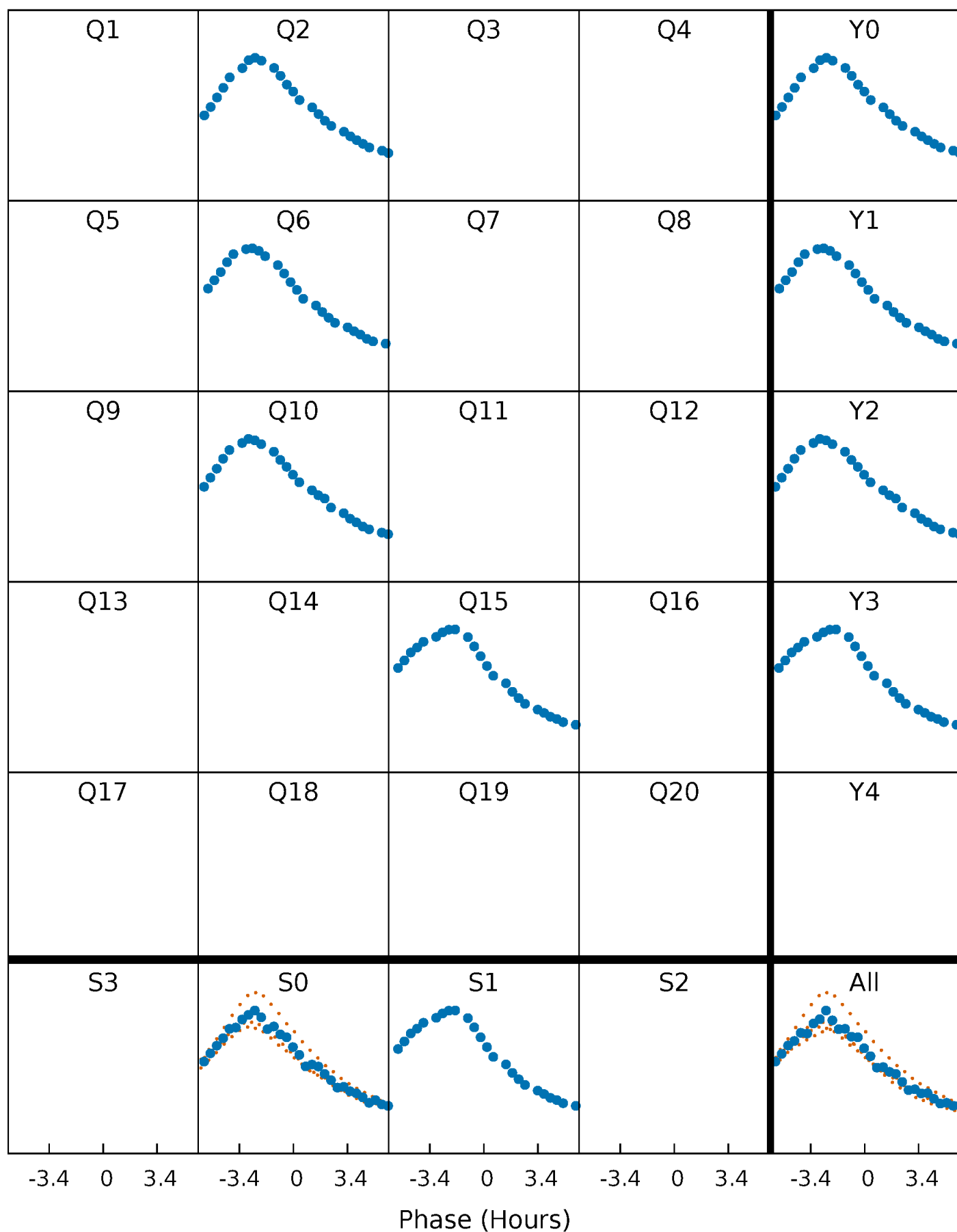


Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)



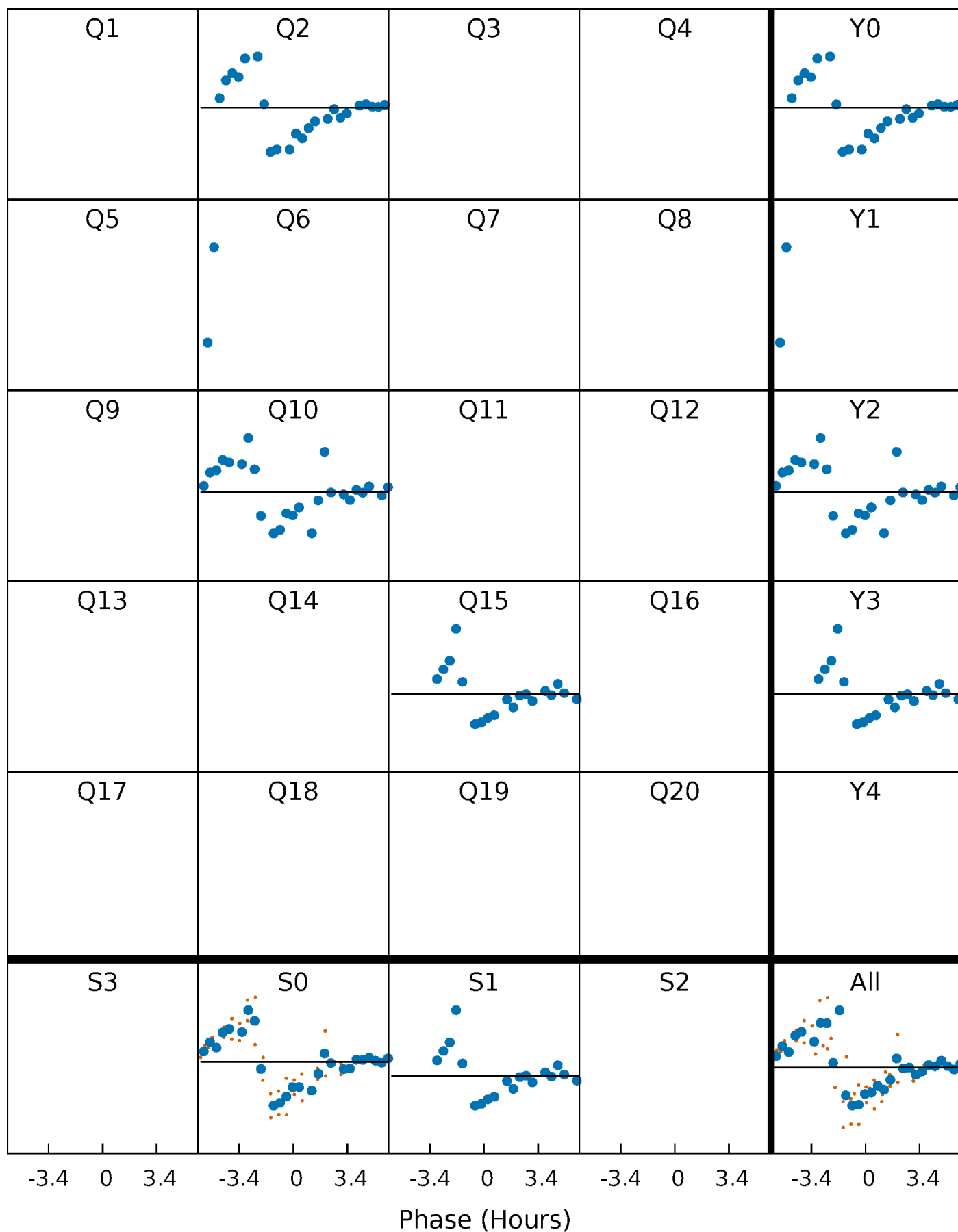
# PDC Quarter-Phased Transit Curves

TCE 007910731-03 P=388.984443 Days  $T_0=216.944547$  (BKJD)



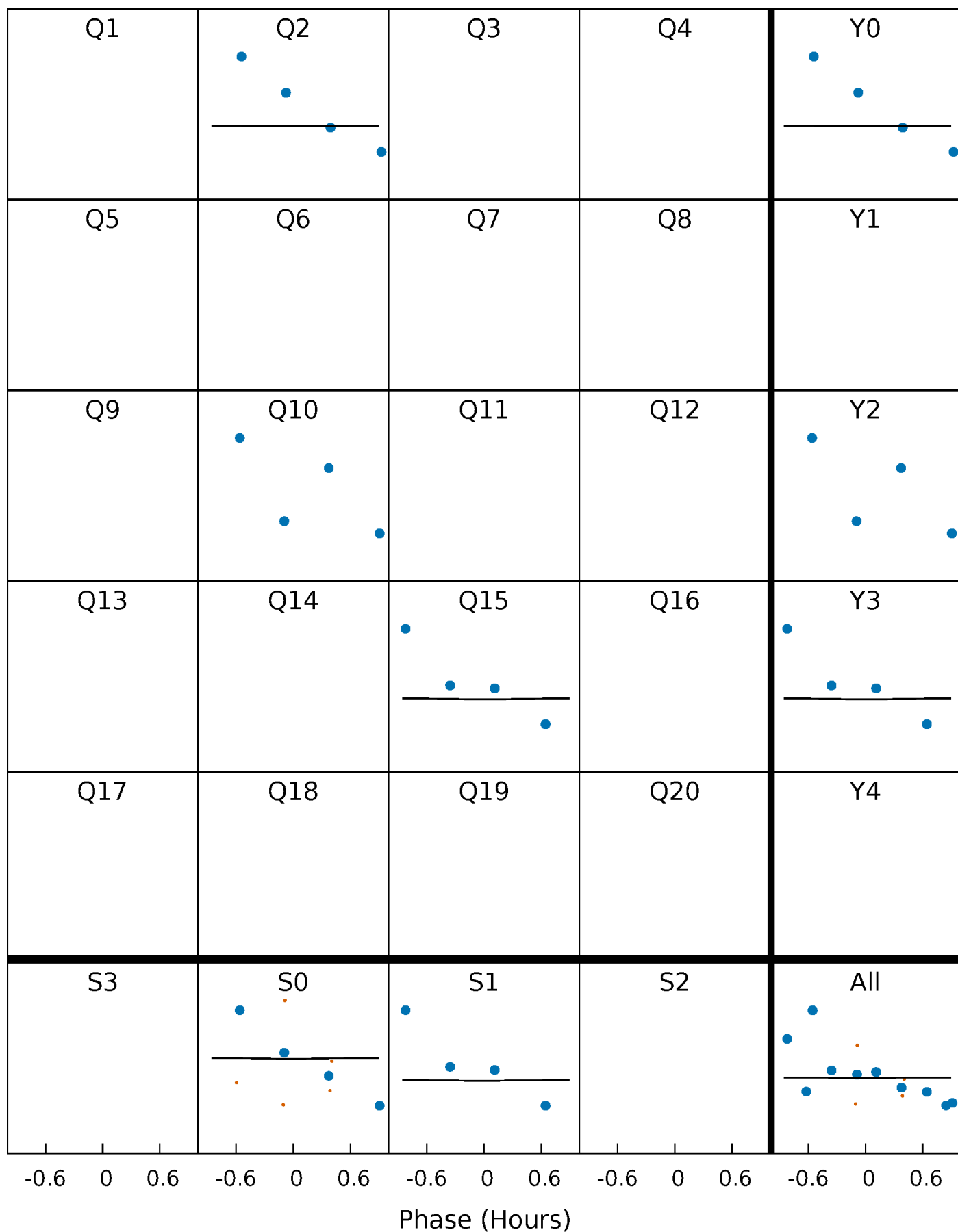
# DV Quarter-Phased Transit Curves

TCE 007910731-03 P=388.984443 Days  $T_0=216.944547$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

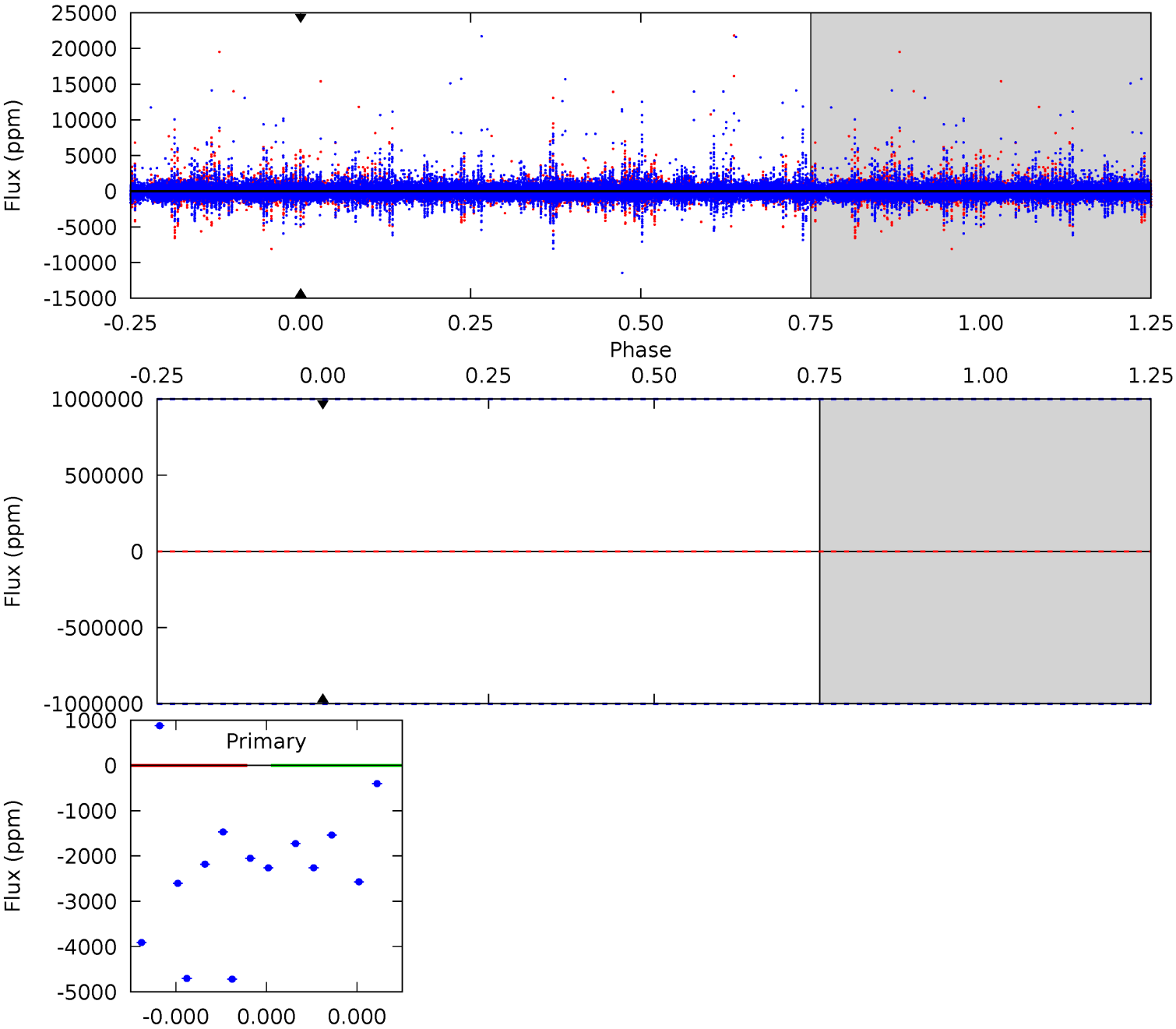
TCE 007910731-03 P=388.984443 Days  $T_0=217.134827$  (BKJD)



# DV Model-Shift Uniqueness Test

007910731-03, P = 388.984443 Days, E = 216.944547 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

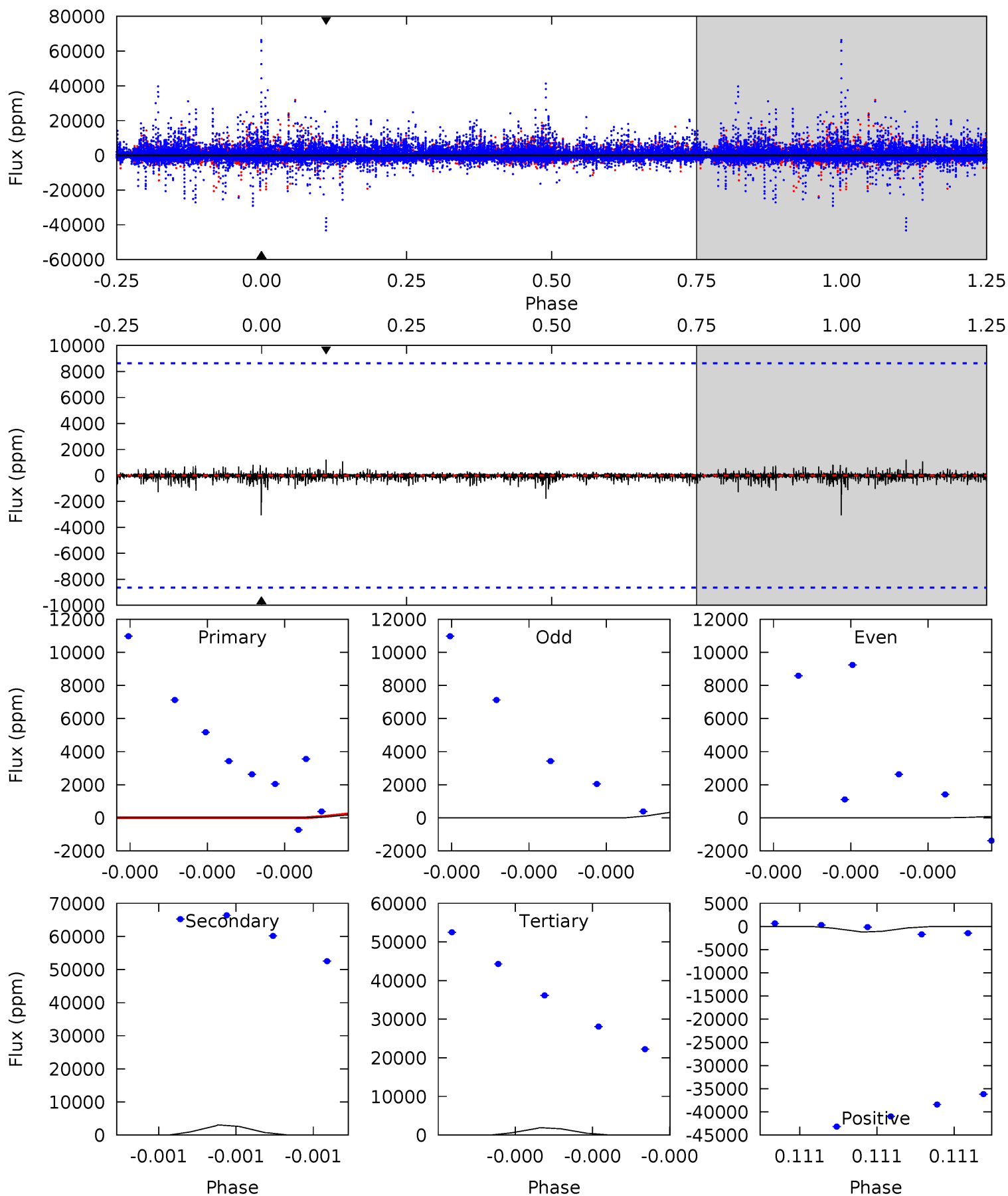




# Alt Model-Shift Uniqueness Test

007910731-03, P = 388.984443 Days, E = 217.134827 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
0.14	2.09	1.31	0.82	5.88	3.94	0.08	-1.17	-0.69	0.78	1.26	0.07	0.29	0.28	0.09



### Stellar Parameters For KIC 007910731

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6323^{+174}_{-239}$	$4.418^{+0.062}_{-0.188}$	$-0.080^{+0.250}_{-0.300}$	$1.093^{+0.329}_{-0.141}$	$1.140^{+0.157}_{-0.157}$	$1.230^{+0.406}_{-0.594}$
	+3%/-4%	+1%/-4%	+312%/-375%	+30%/-13%	+14%/-14%	+33%/-48%
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 007910731-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$10.41^{+10.29}_{-7.45}$	$396^{+28}_{-20}$	$2612^{+21970}_{-24439}$	$273^{+1157384}_{-989932}$
Alt.	$-3063 \pm 1469$	$8.03^{+9.05}_{-5.43}$	$396^{+28}_{-19}$	$5562^{+6005}_{-1492}$	$25260^{+244441}_{-20111}$

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

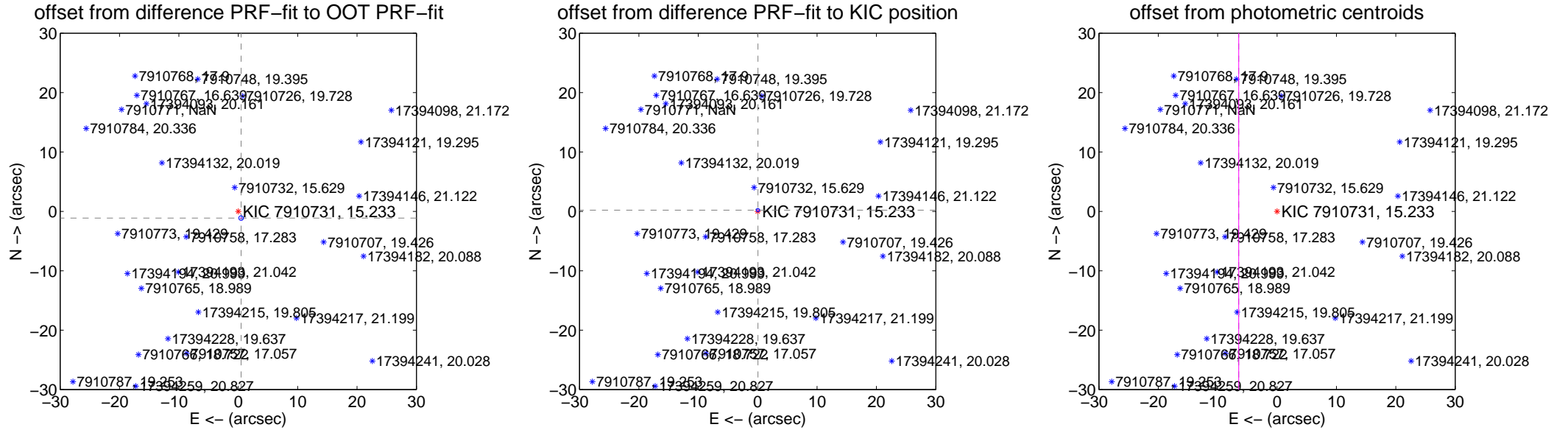
## DV Centroid Data

Supplemental centroid analysis for 007910731-03. Kepler magnitude: 15.23. Transit SNR -1.00

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.41 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>1.221 <math>\pm</math> 0.130</b>	<b>9.38</b>	-0.474 $\pm$ 0.115	-1.125 $\pm$ 0.133
PRF-fit source offset from KIC position	0.208 $\pm$ 0.095	2.19	-0.044 $\pm$ 0.120	0.204 $\pm$ 0.094
photometric centroid source offset	60.54 $\pm$ 137.64	0.44	6.46 $\pm$ 101.44	60.20 $\pm$ 138.00



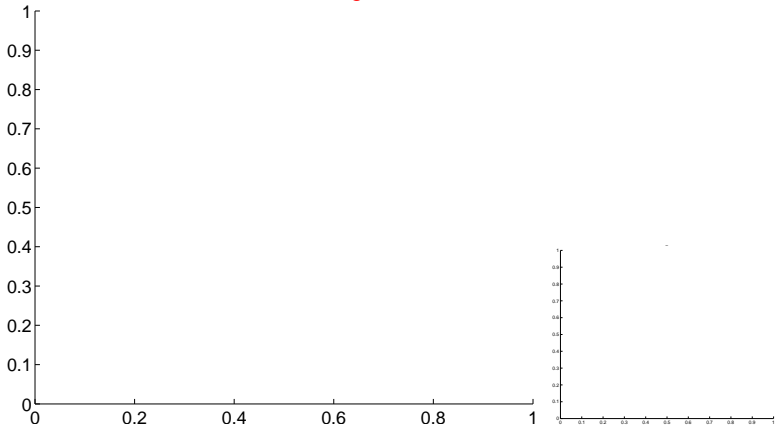
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

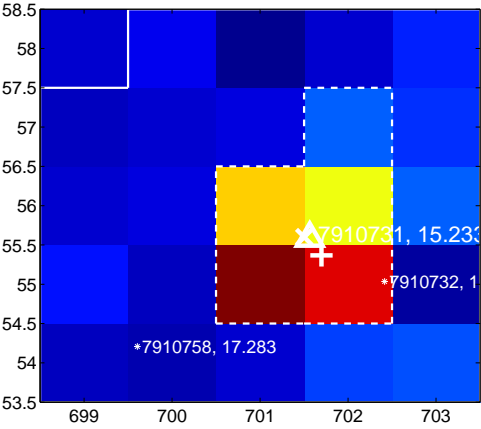
Q1 no difference image



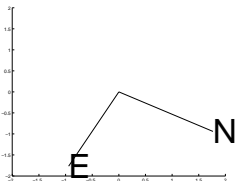
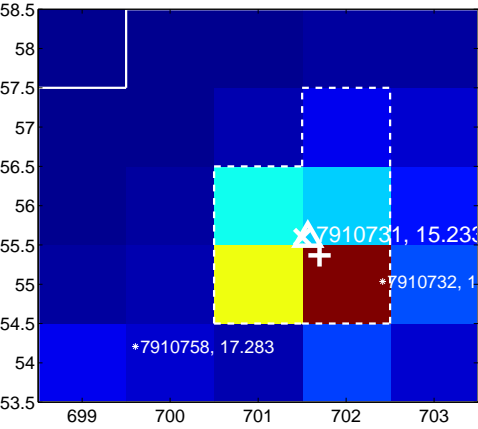
Q1 no OOT image



Q2 difference image



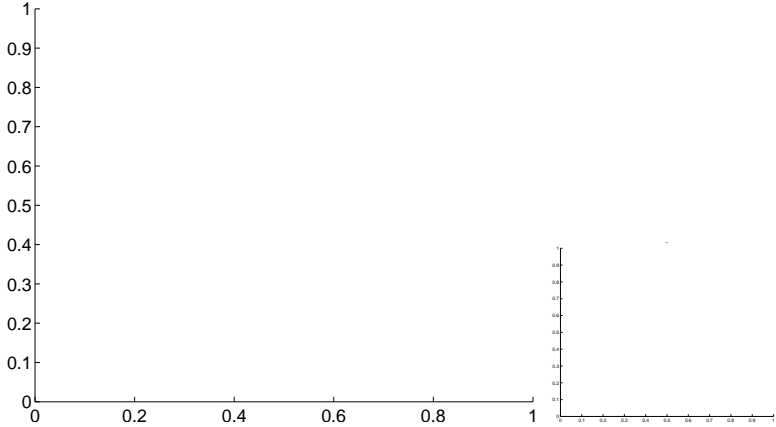
Q2 OOT image



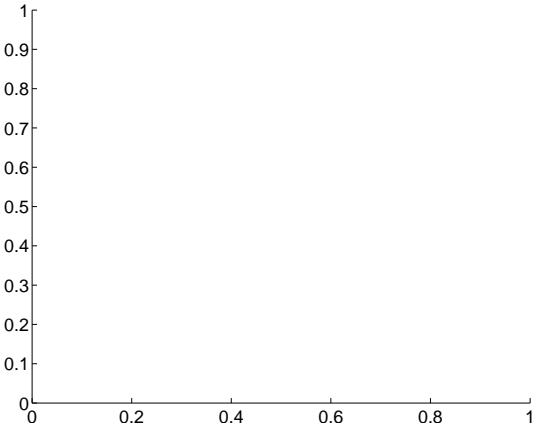
Q3 no difference image



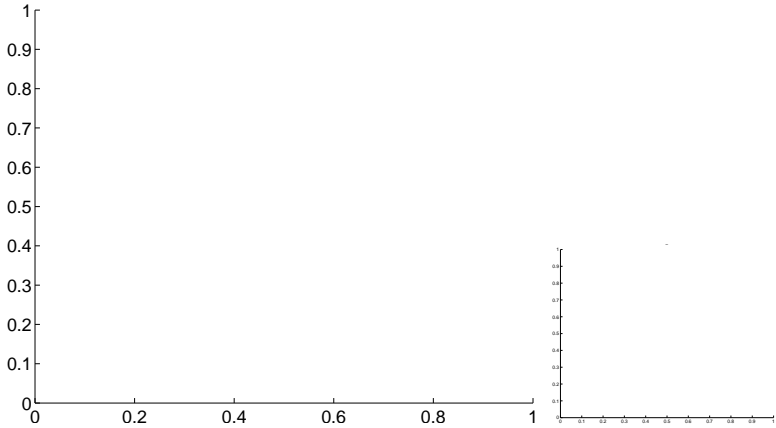
Q3 no OOT image



Q4 no difference image



Q4 no OOT image

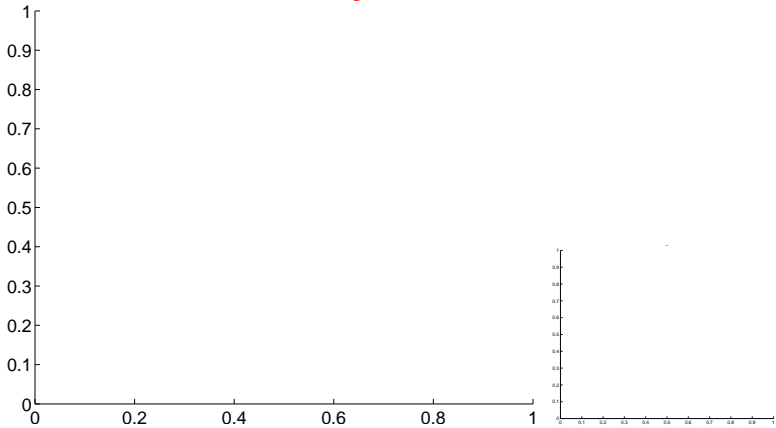


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

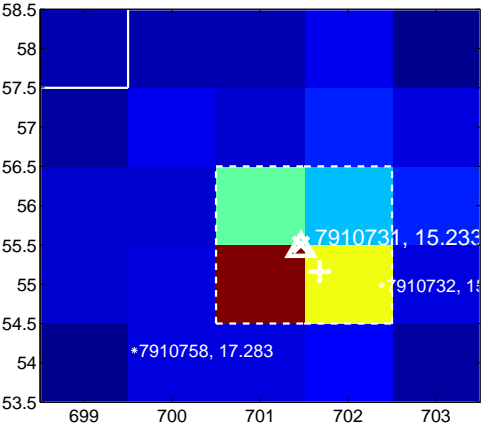
Q5 no difference image



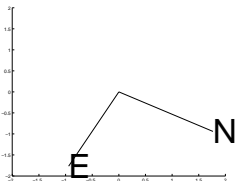
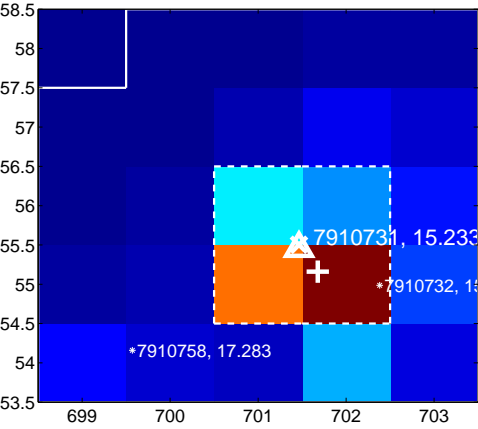
Q5 no OOT image



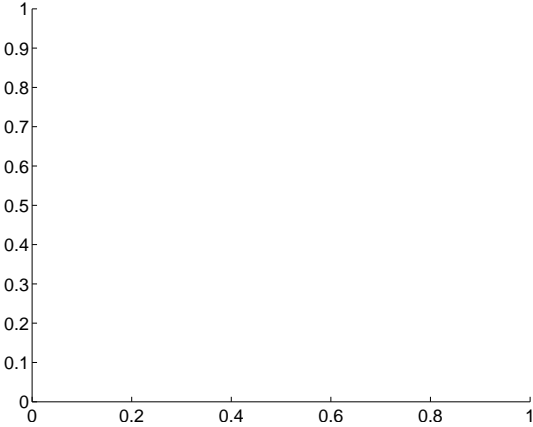
Q6 difference image



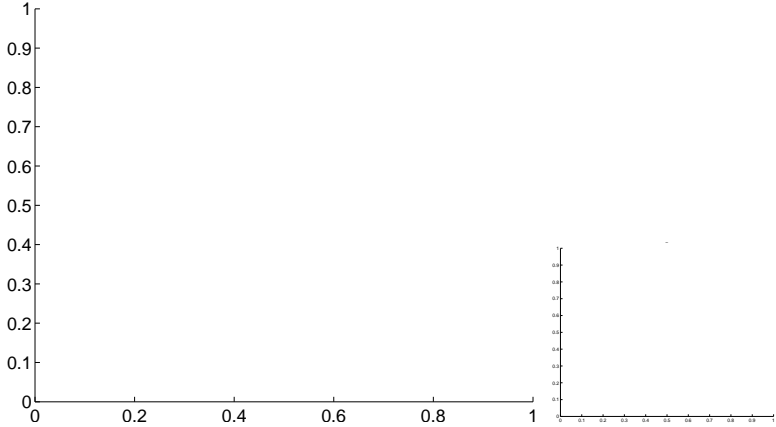
Q6 OOT image



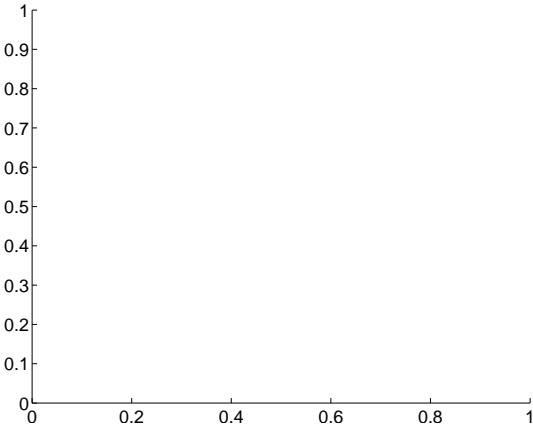
Q7 no difference image



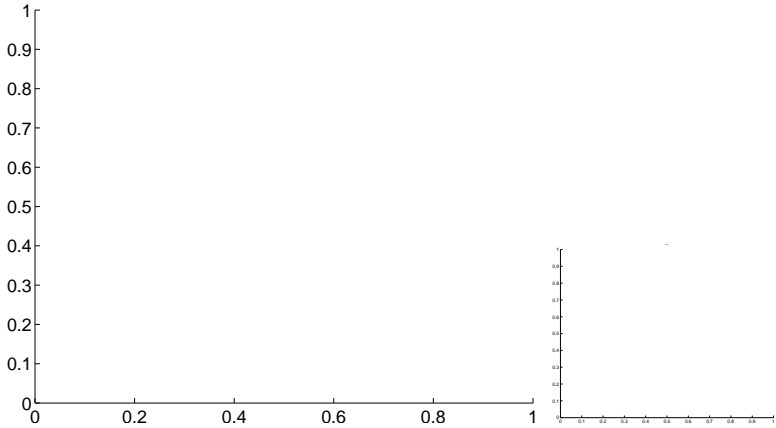
Q7 no OOT image



Q8 no difference image



Q8 no OOT image

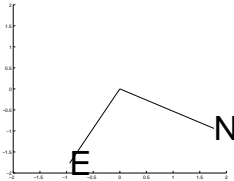
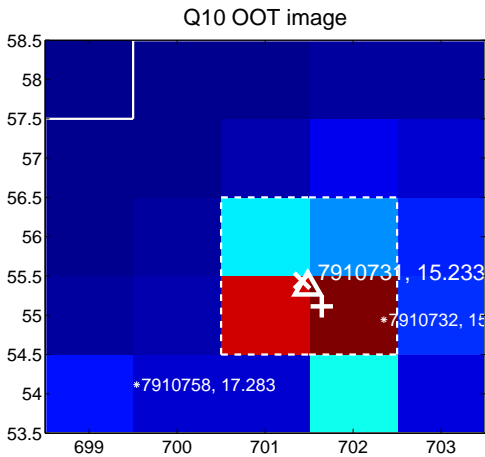
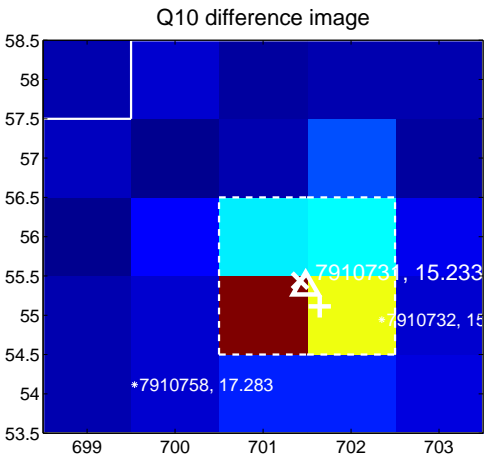
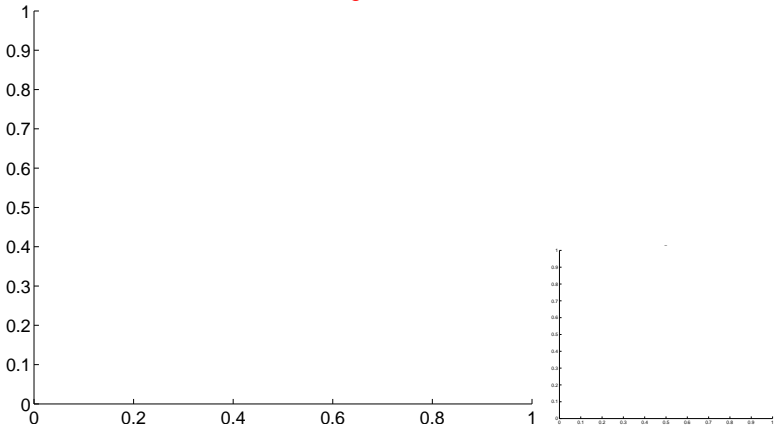


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

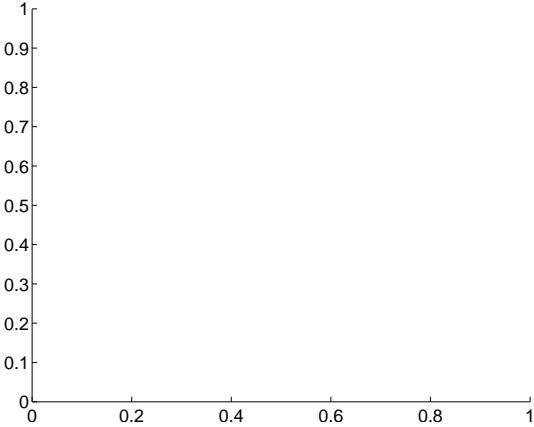
Q9 no difference image



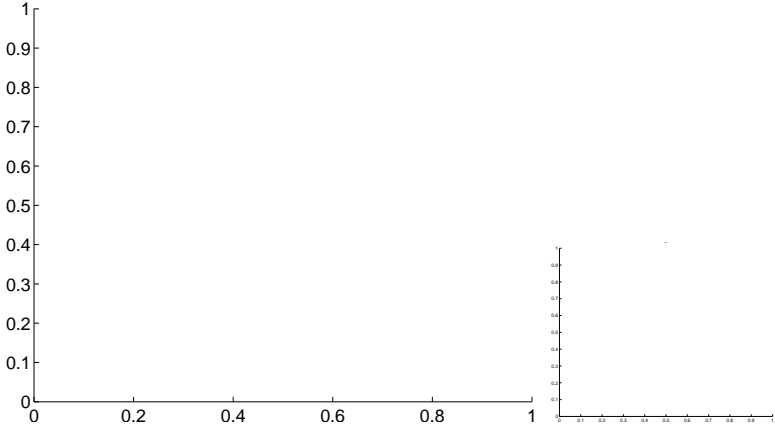
Q9 no OOT image



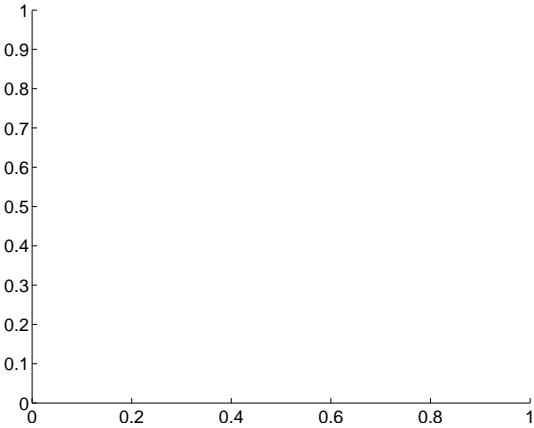
Q11 no difference image



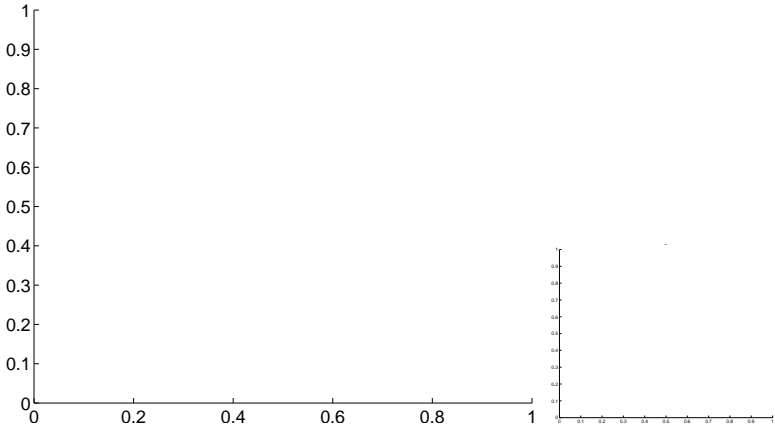
Q11 no OOT image



Q12 no difference image

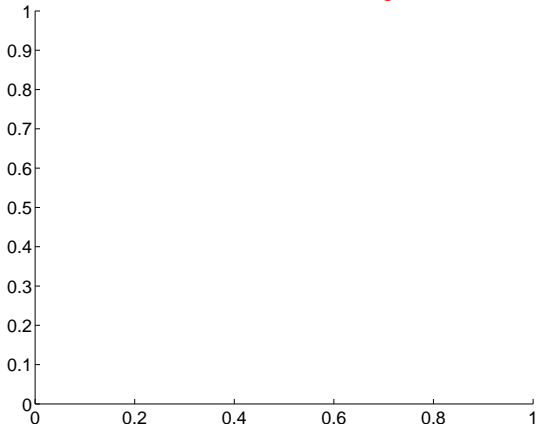


Q12 no OOT image

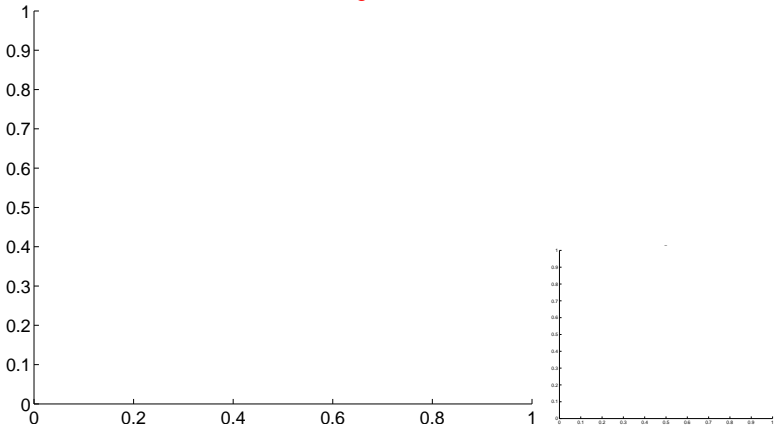


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

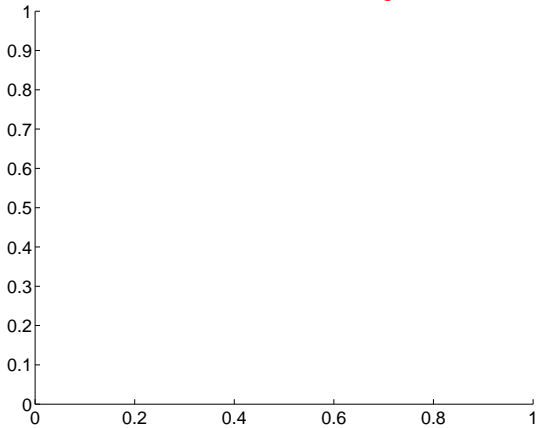
Q13 no difference image



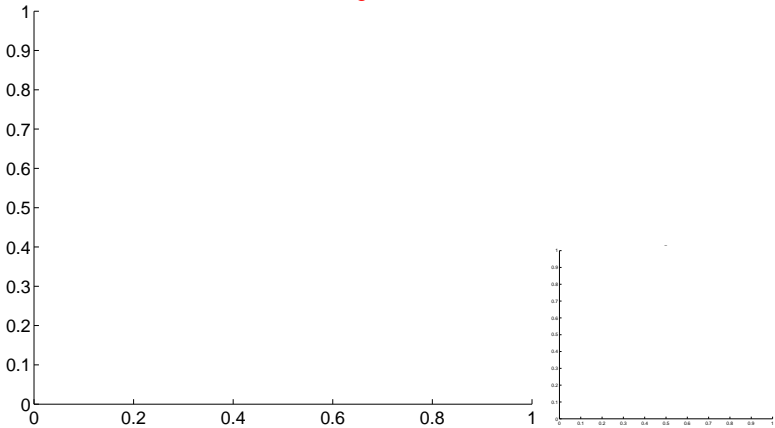
Q13 no OOT image



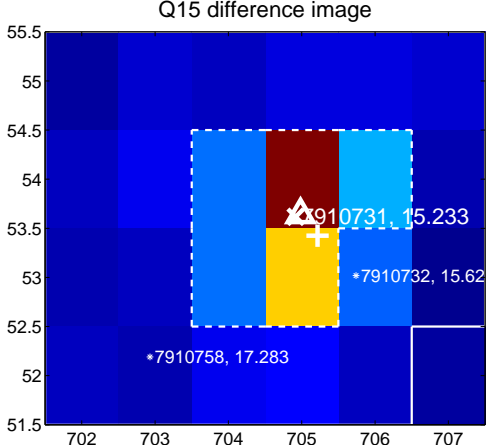
Q14 no difference image



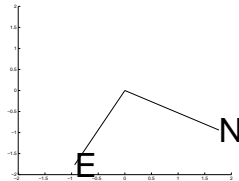
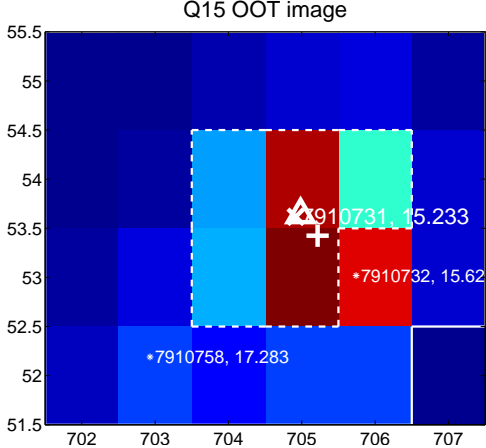
Q14 no OOT image



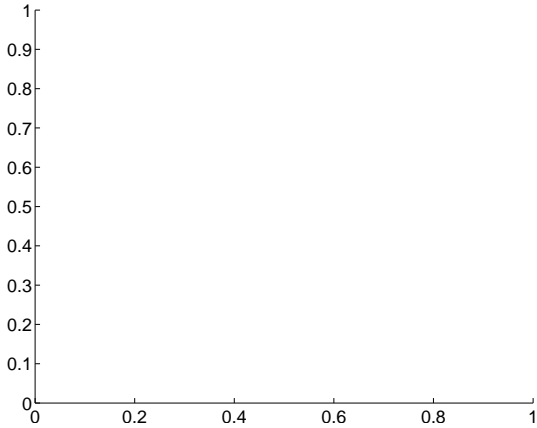
Q15 difference image



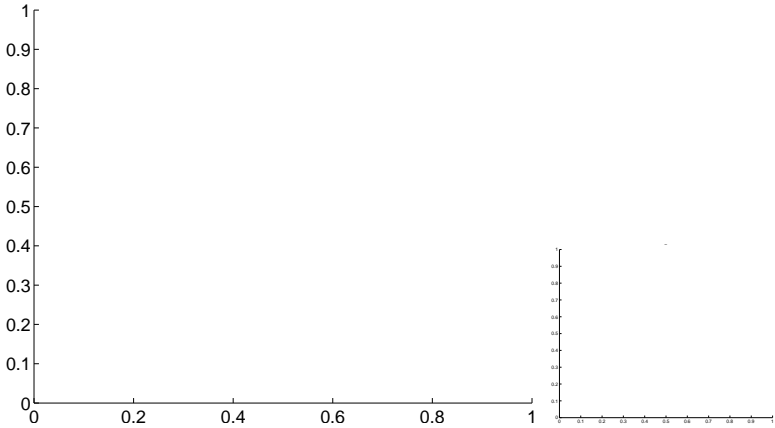
Q15 OOT image



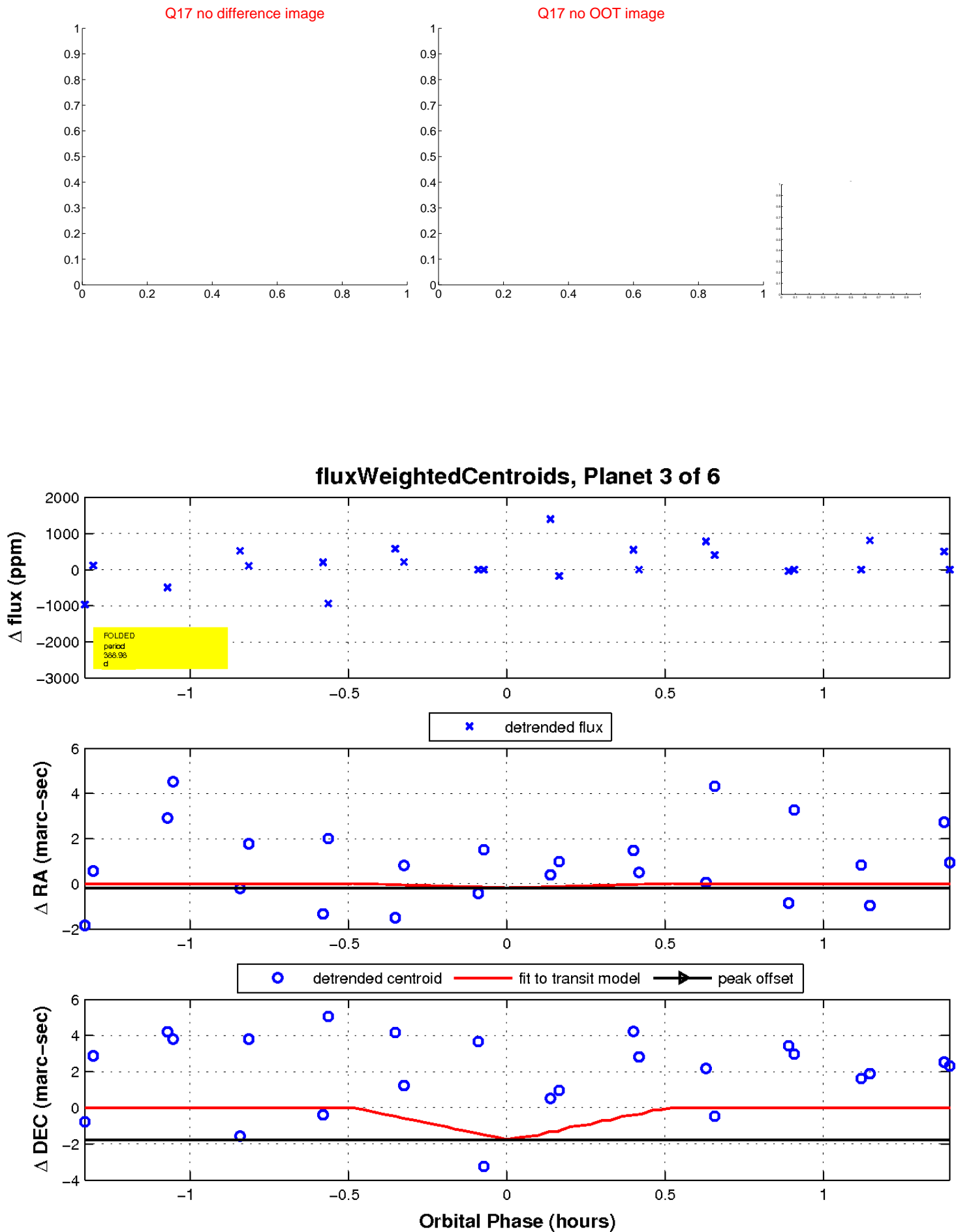
Q16 no difference image



Q16 no OOT image

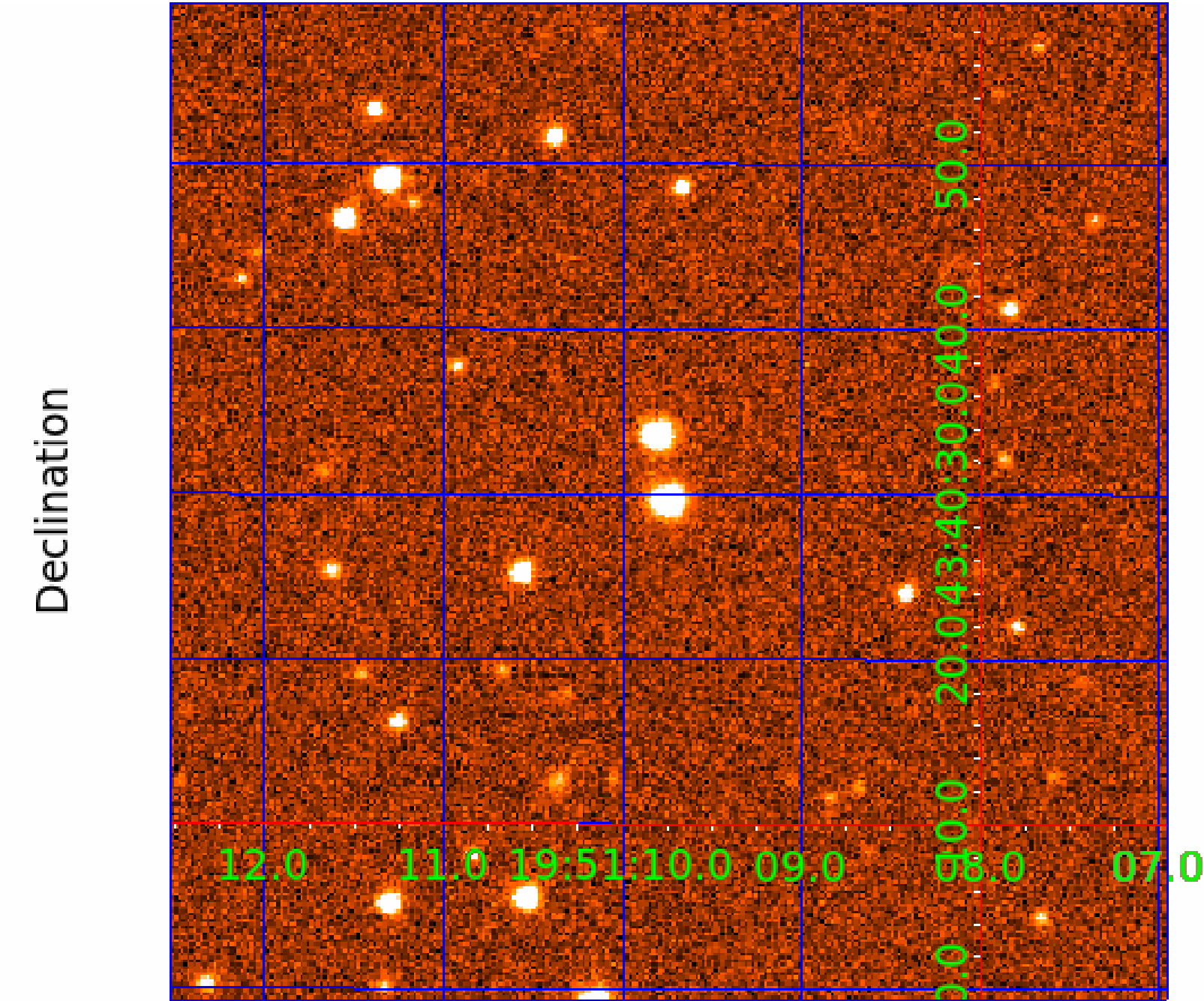


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image



# KIC 007910731

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007910731-01	OBS	No	384.637097	218.236223	1350.4	0.959	14.5	3.0	1.09	6323	4.81	1.46
007910731-02	OBS	No	1.671973	132.848767	121.9	4.347	11.6	3.8	1.09	6323	1.42	2060.76
007910731-03	OBS	No	388.984443	216.944547	2167.8	3.000	15.4	-1.0	1.09	6323	5.11	1.44
007910731-04	OBS	No	276.234017	177.304661	14505.4	7.378	14.2	11.3	1.09	6323	15.30	2.27
007910731-06	OBS	No	18.395921	140.263369	631.0	15.000	12.5	-1.0	1.09	6323	2.75	84.21

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007910731-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
007910731-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_KIC_POS
007910731-03	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—CENT_NOFITS
007910731-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
007910731-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS

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

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

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

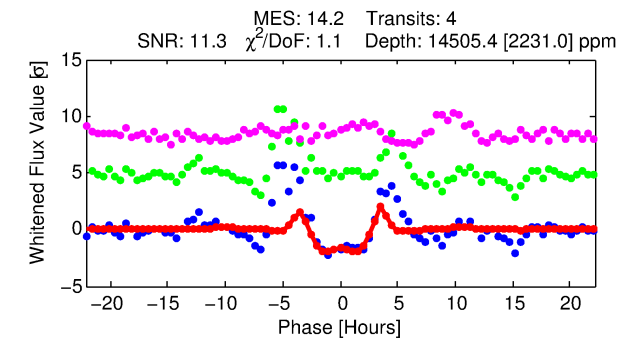
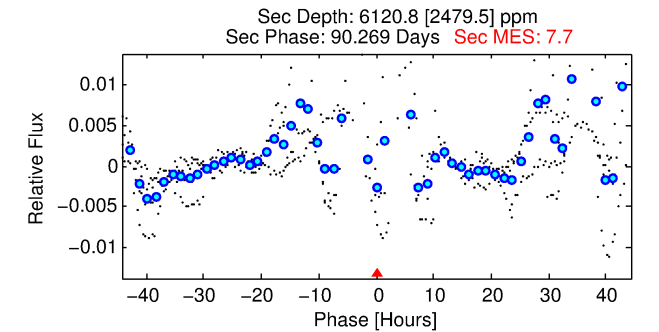
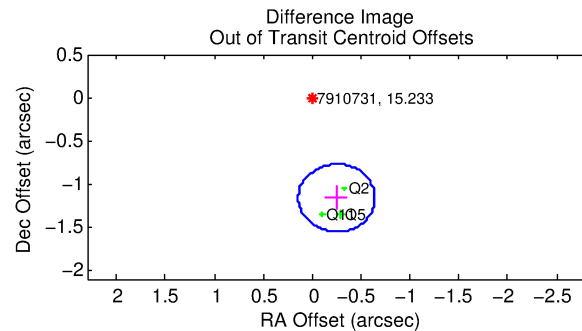
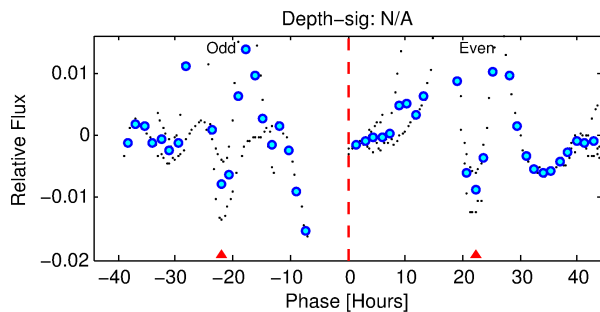
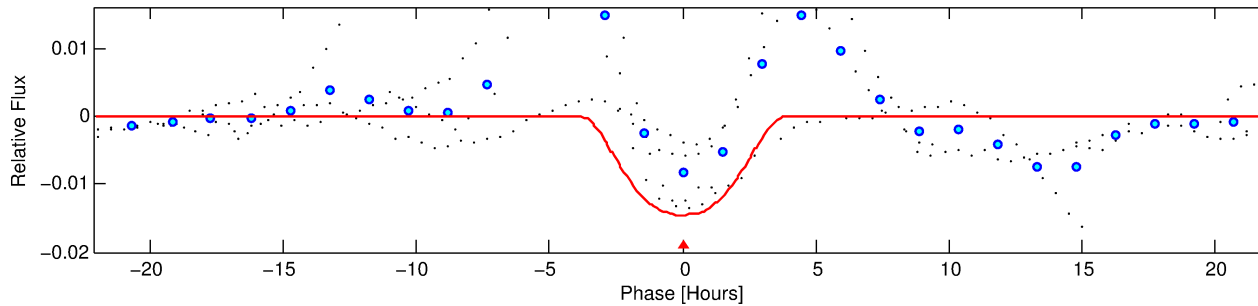
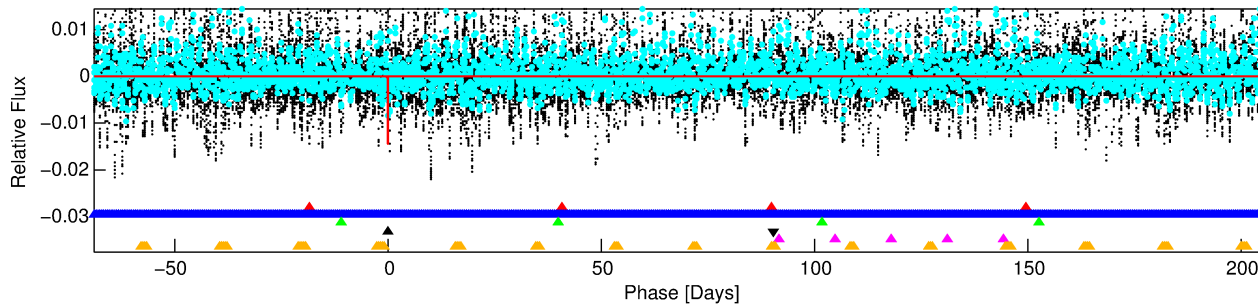
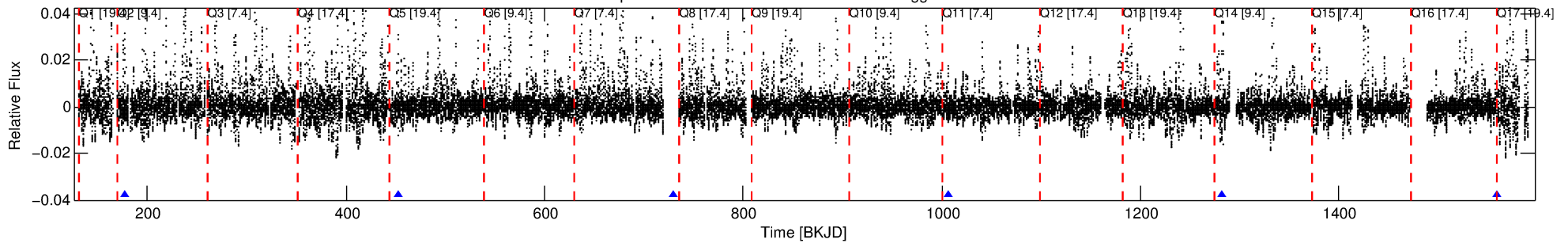
Ephemeris Match Information For 007910731-04

No Significant Match Found

# DV One-Page Summary

KIC: 7910731 Candidate: 4 of 6 Period: 276.234 d

Kp: 15.23 R\*: 1.09 Rs Teff: 6323.0 K Logg: 4.42 Fe/H: -0.080



## DV Fit Results:

Period = 276.23402 [0.00366] d  
Epoch = 177.3047 [0.0100] BKJD  
Rp/R\* = 0.1283 [0.0107]  
a/R\* = 205.28 [11.64]  
b = 0.87 [0.02]  
Seff = 2.27 [0.87]  
Teff = 313 [30] K  
Rp = 15.30 [4.78] Re  
a = 0.8676 [0.2144] AU  
Ag = 10823.44 [6080.41] [1.78σ]  
Teffp = 4938 [572] K [8.07σ]

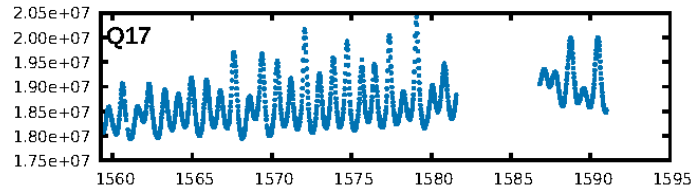
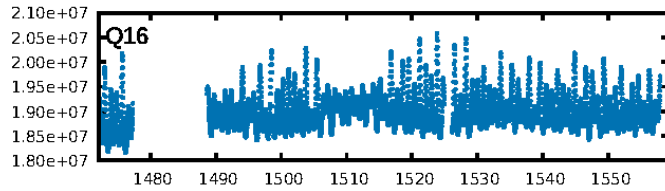
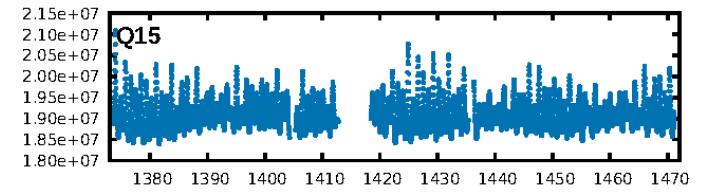
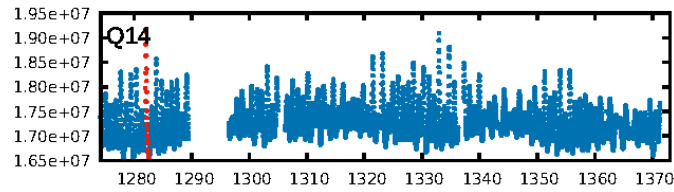
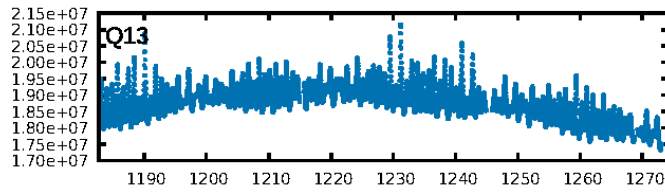
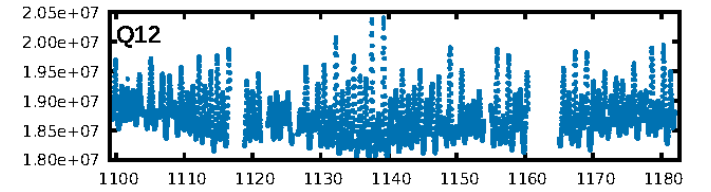
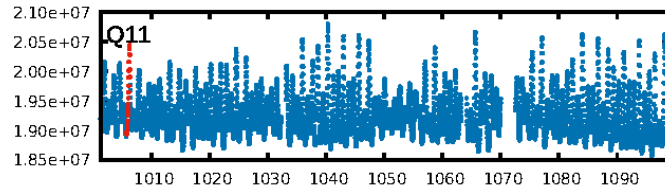
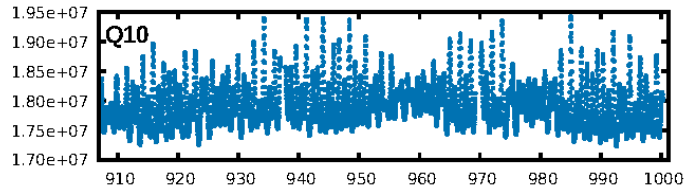
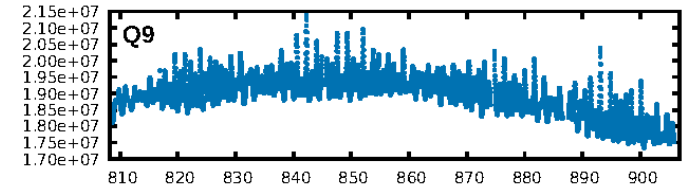
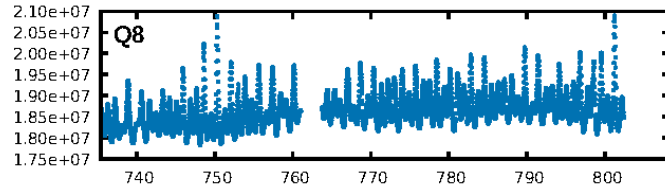
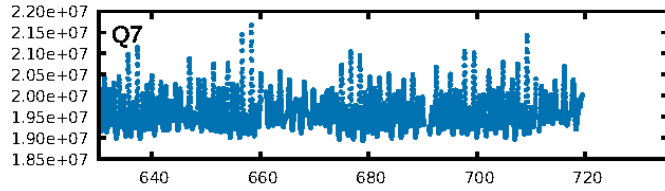
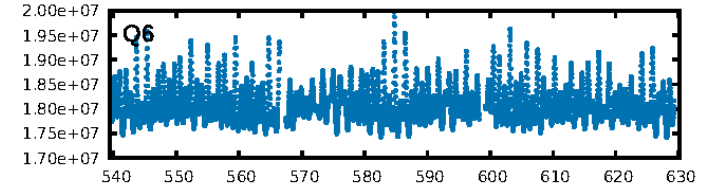
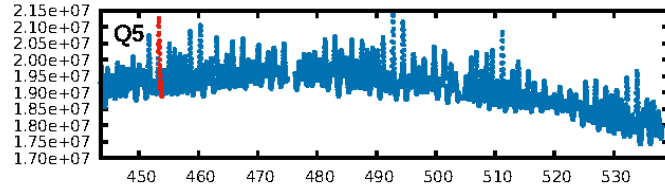
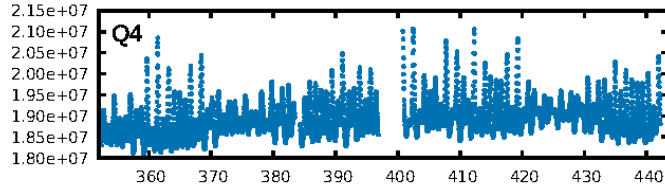
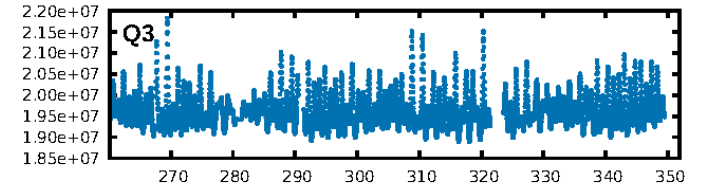
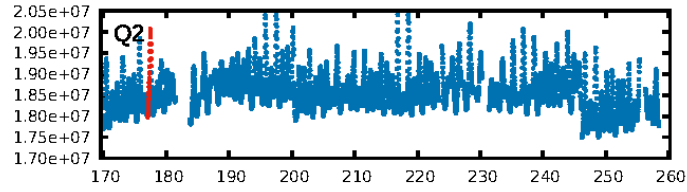
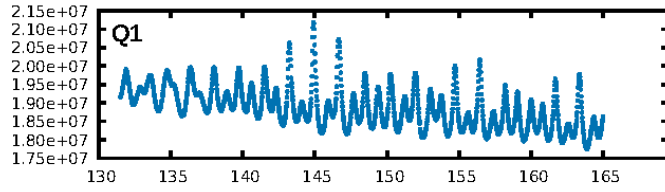
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [34.25σ]  
LongPeriod-sig: 100.0% [349.67σ]  
ModelChiSquare2-sig: 40.6%  
ModelChiSquareGof-sig: 98.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.7925  
Centroid-sig: 2.3%  
Centroid-so: 1.042 arcsec [4.30σ]  
OotOffset-rm: 1.189 arcsec [9.12σ]  
KicOffset-rm: 0.023 arcsec [0.25σ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 0.00 [0/3]

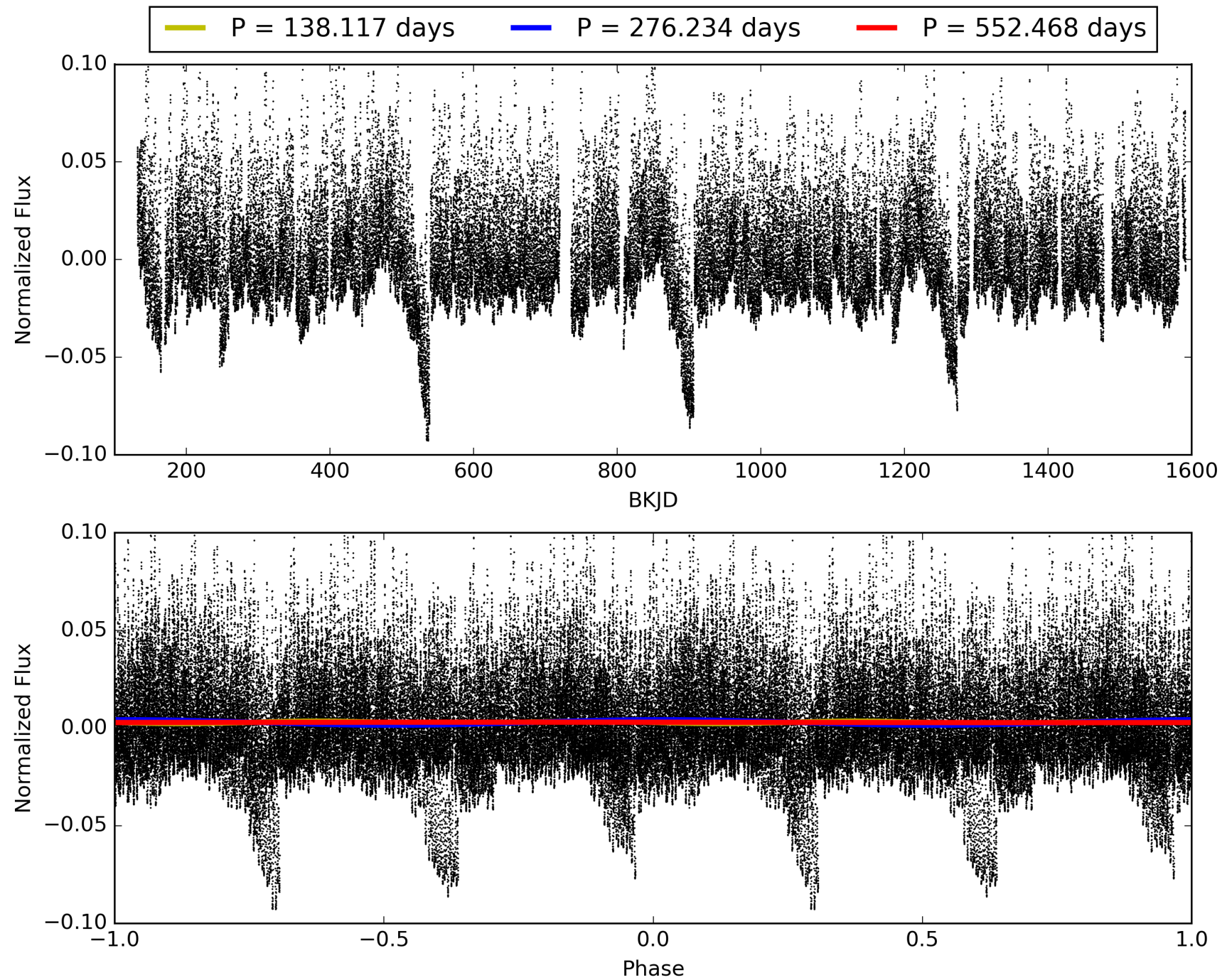
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:22:21 Z

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

# TCE 007910731-04, PDC Light Curves

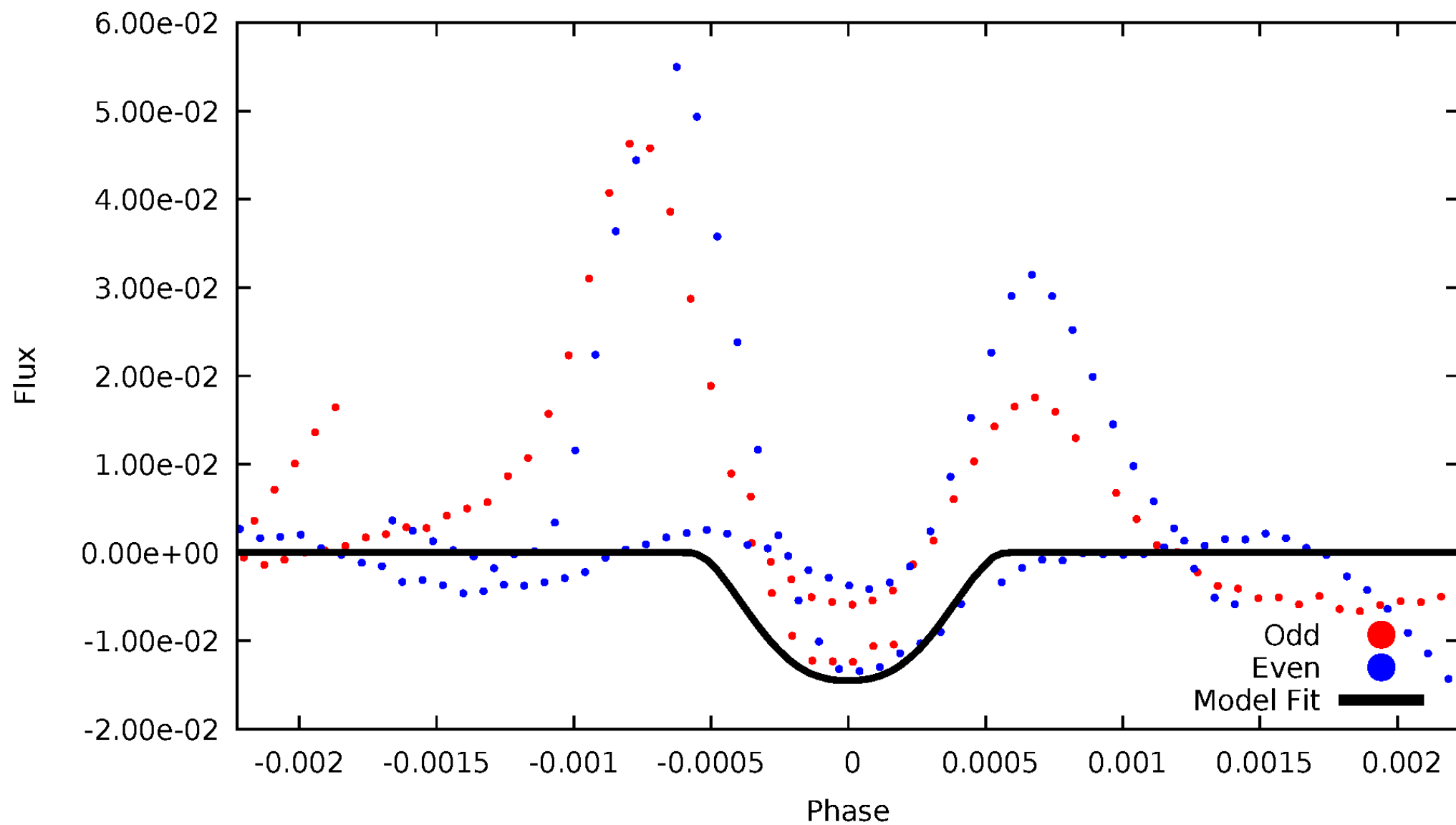


TCE 007910731-04



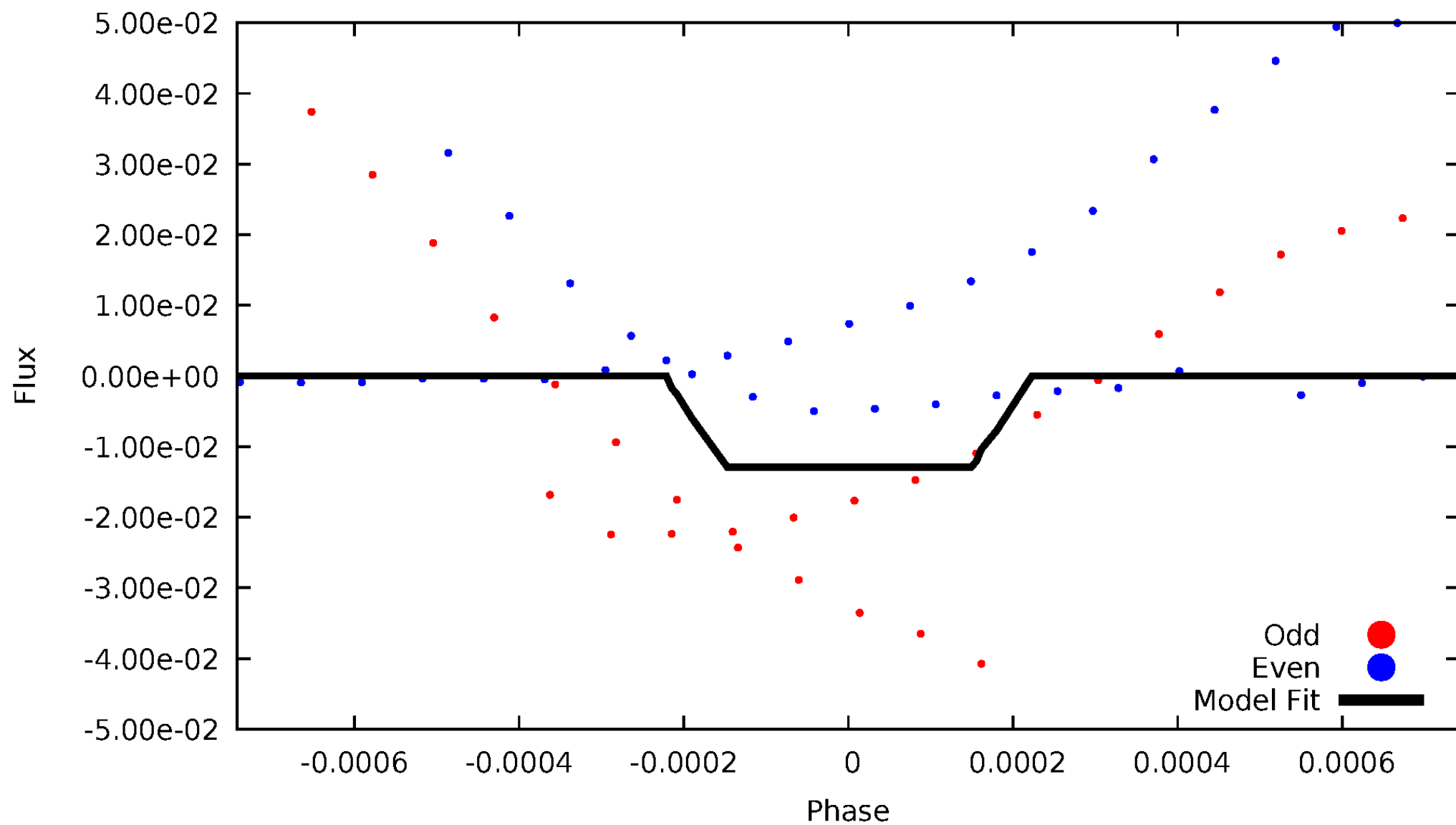
# DV Odd/Even

TCE 007910731-04



# ALT Odd/Even

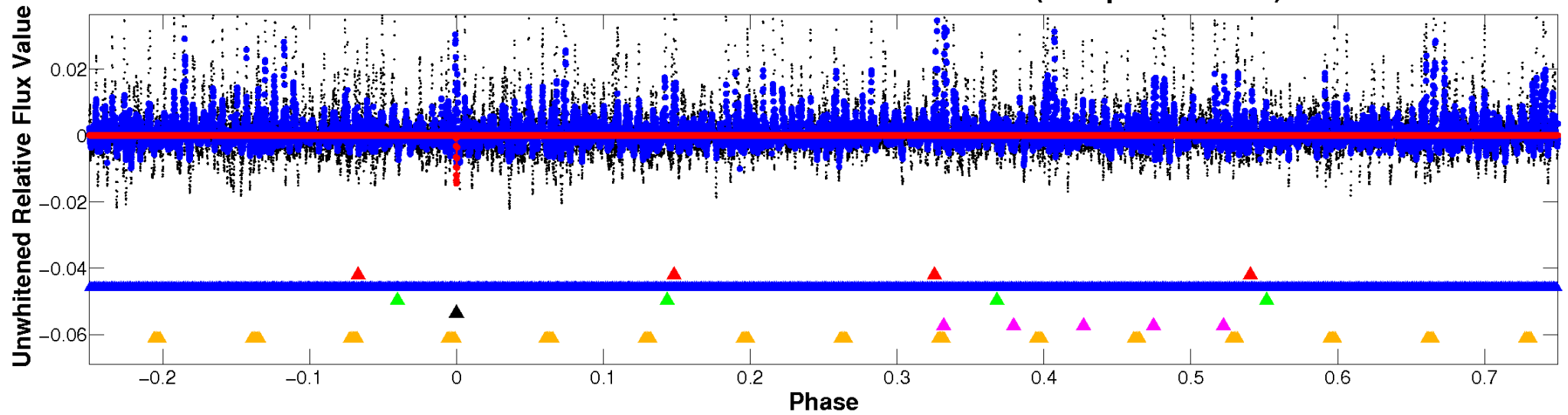
TCE 007910731-04



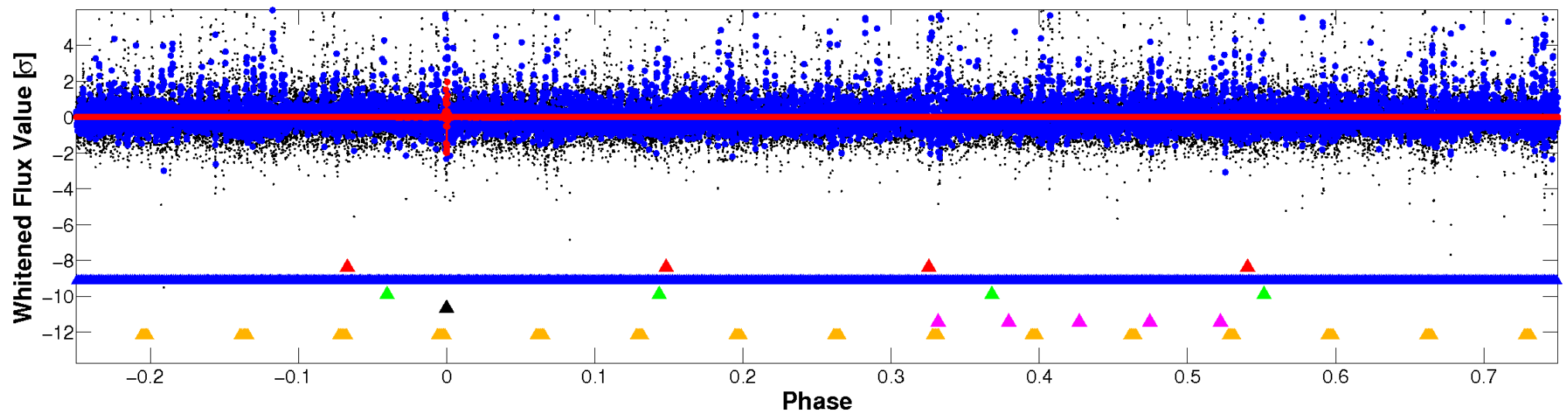


# Non-Whitened Vs. Whitened Light Curve

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

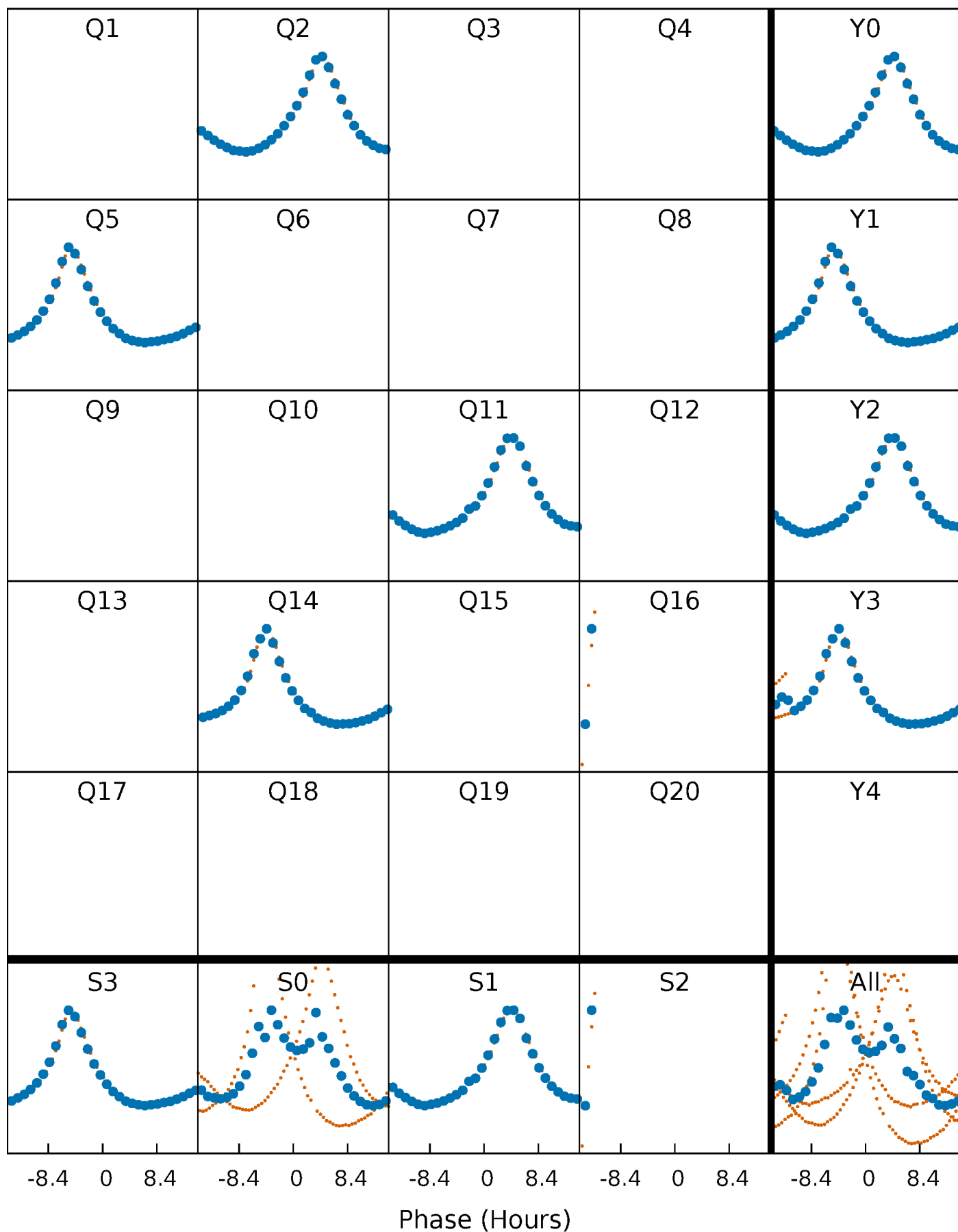


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



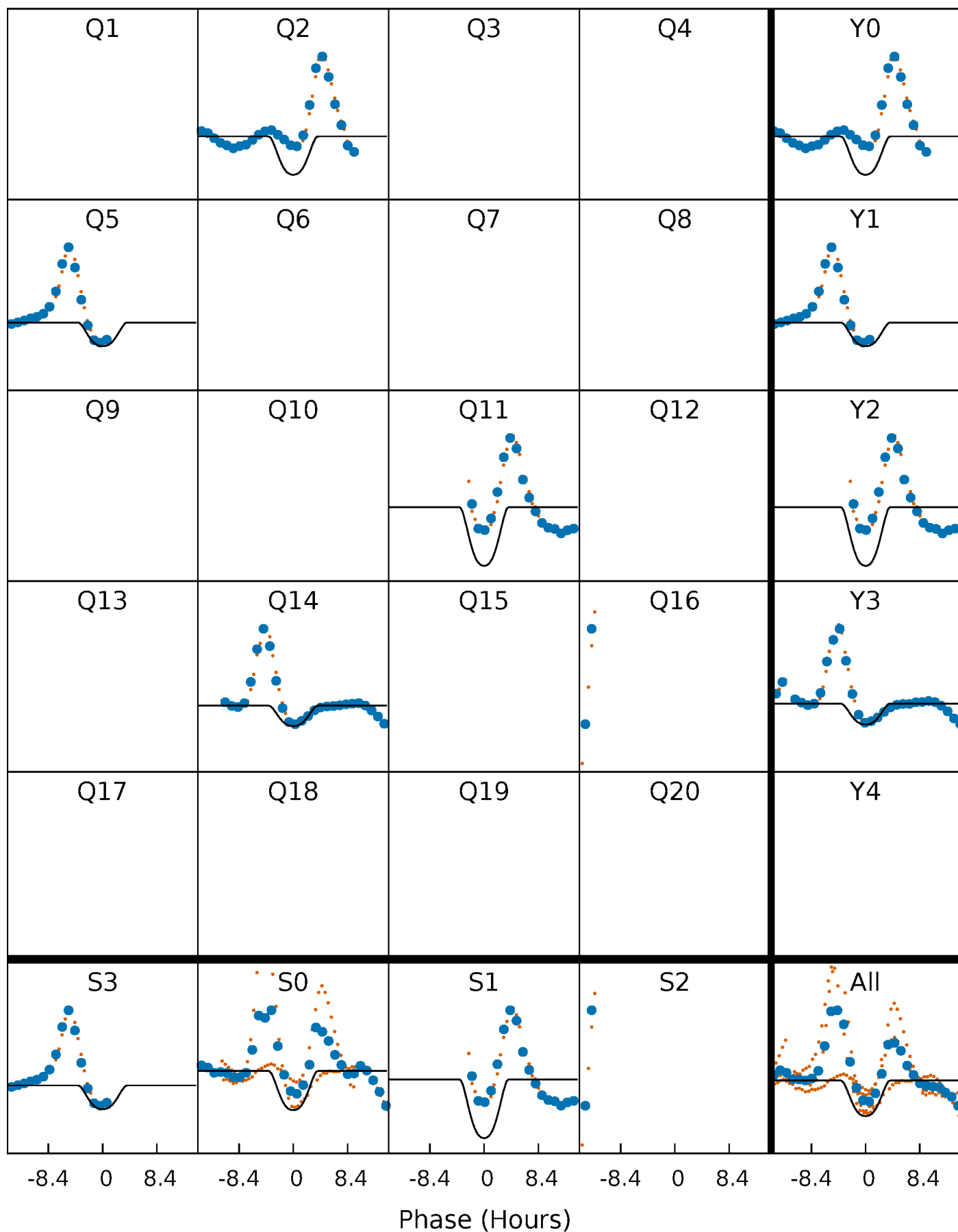
# PDC Quarter-Phased Transit Curves

TCE 007910731-04 P=276.234017 Days  $T_0=177.304661$  (BKJD)



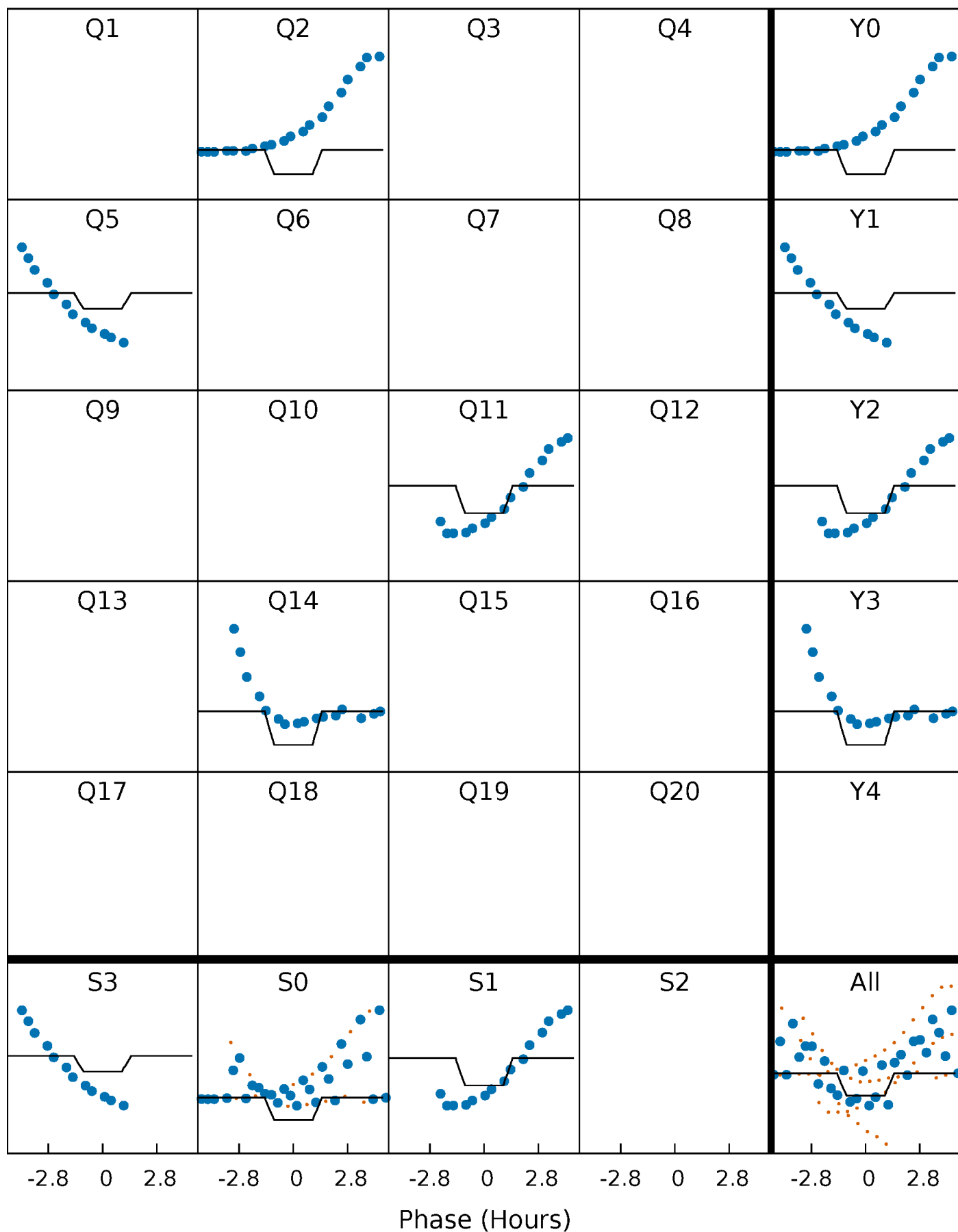
# DV Quarter-Phased Transit Curves

TCE 007910731-04 P=276.234017 Days  $T_0=177.304661$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

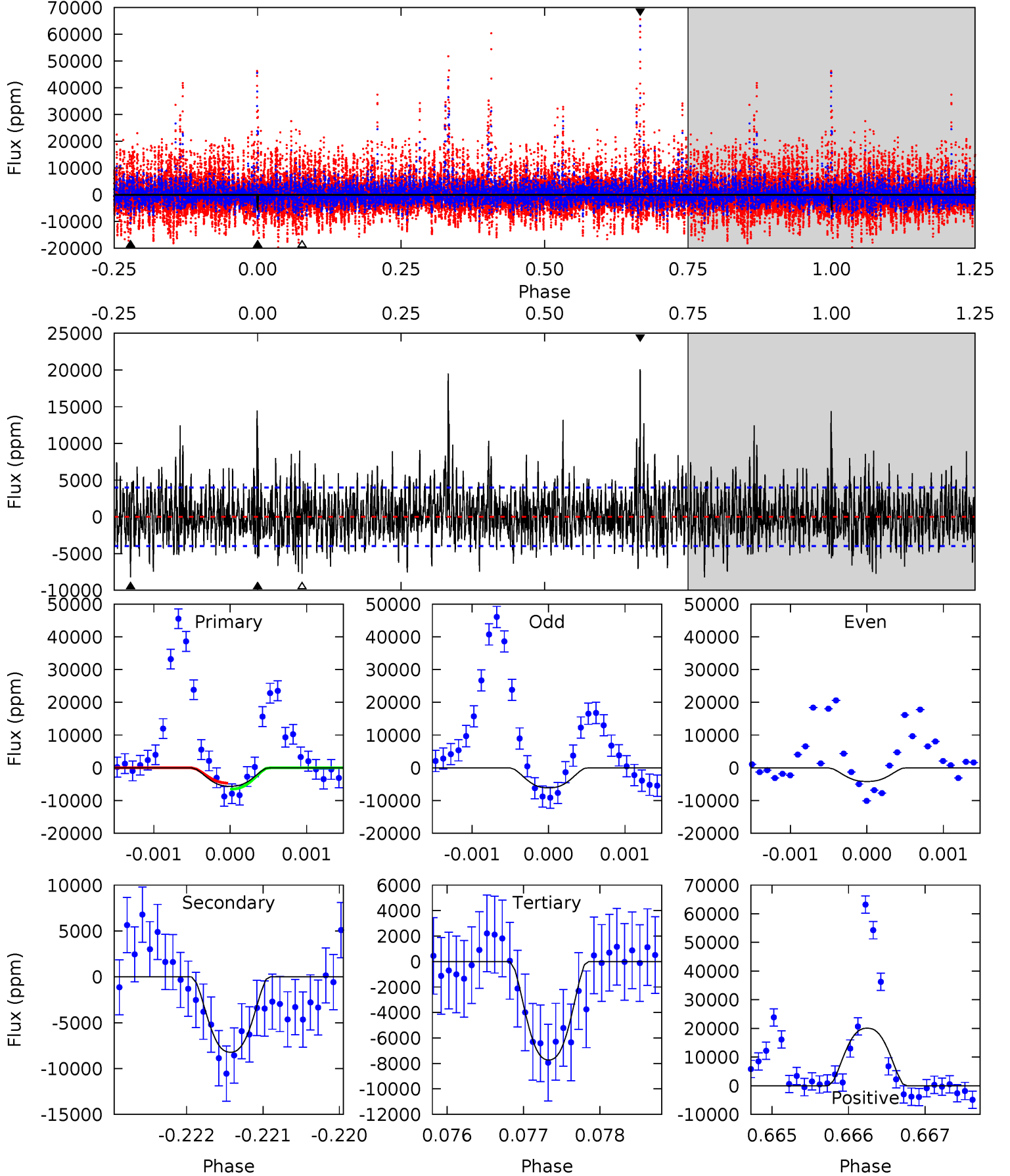
TCE 007910731-04 P=276.234486 Days  $T_0=177.305127$  (BKJD)



# DV Model-Shift Uniqueness Test

007910731-04, P = 276.234017 Days, E = 177.304661 Days

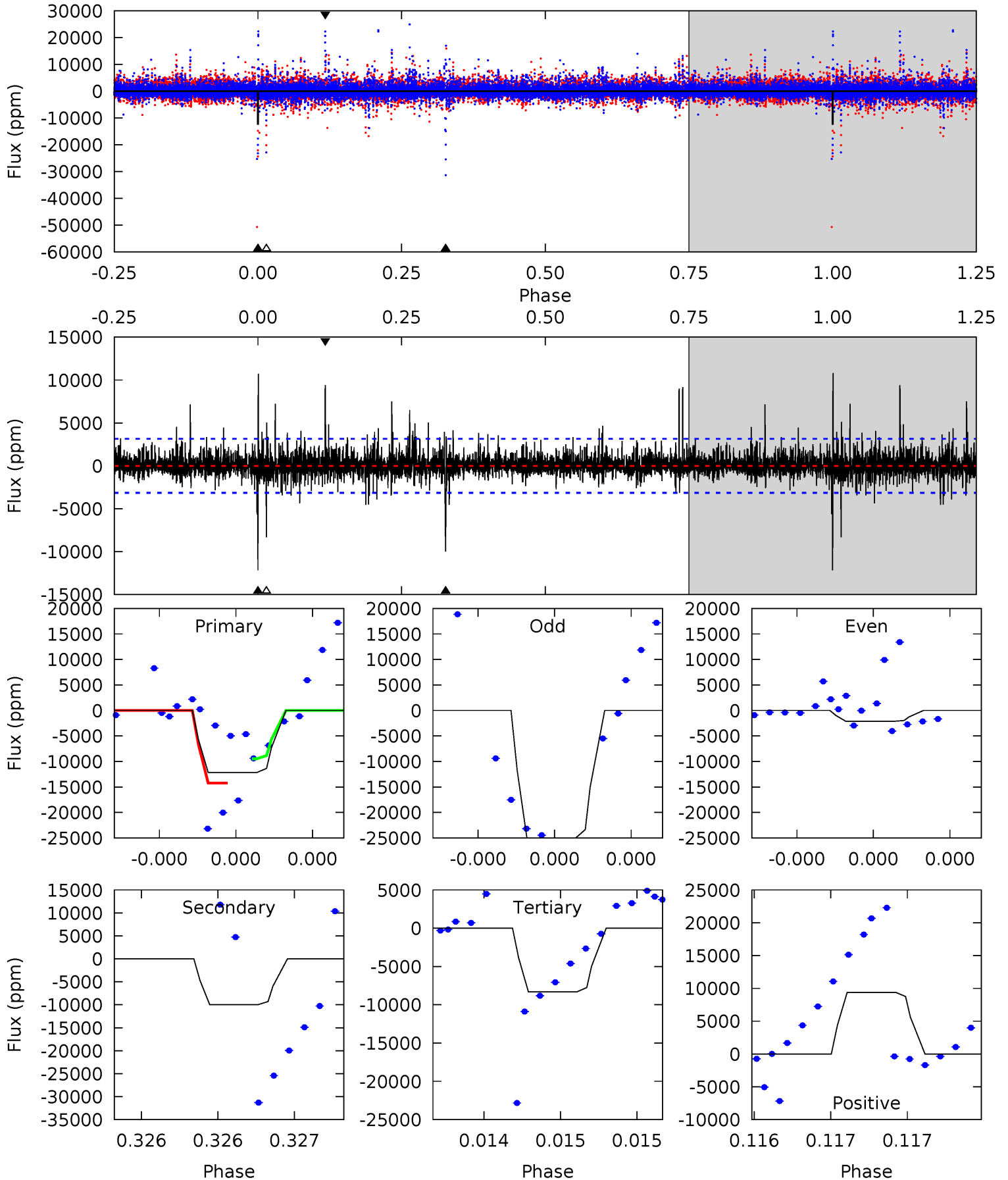
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.69	11.2	10.5	27.4	5.43	3.26	3.87	-2.85	-19.7	0.67	-16.2	1.13	1.02	0.71	1.25



# Alt Model-Shift Uniqueness Test

007910731-04, P = 276.234486 Days, E = 177.305127 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
21.7	17.7	14.8	16.7	5.62	3.55	1.76	6.87	4.94	2.95	1.02	17.5	1.10	0.47	3.52



### Stellar Parameters For KIC 007910731

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6323^{+174}_{-239}$	$4.418^{+0.062}_{-0.188}$	$-0.080^{+0.250}_{-0.300}$	$1.093^{+0.329}_{-0.141}$	$1.140^{+0.157}_{-0.157}$	$1.230^{+0.406}_{-0.594}$
	+3%/-4%	+1%/-4%	+312%/-375%	+30%/-13%	+14%/-14%	+33%/-48%
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 007910731-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-8225 \pm 733$	$15.88^{+2.65}_{-2.07}$	$446^{+32}_{-24}$	$5348^{+282}_{-248}$	$13479^{+3990}_{-3633}$
Alt.	$-9962 \pm 561$	$13.80^{+2.25}_{-1.59}$	$443^{+30}_{-23}$	$5928^{+356}_{-324}$	$21334^{+5702}_{-5276}$

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



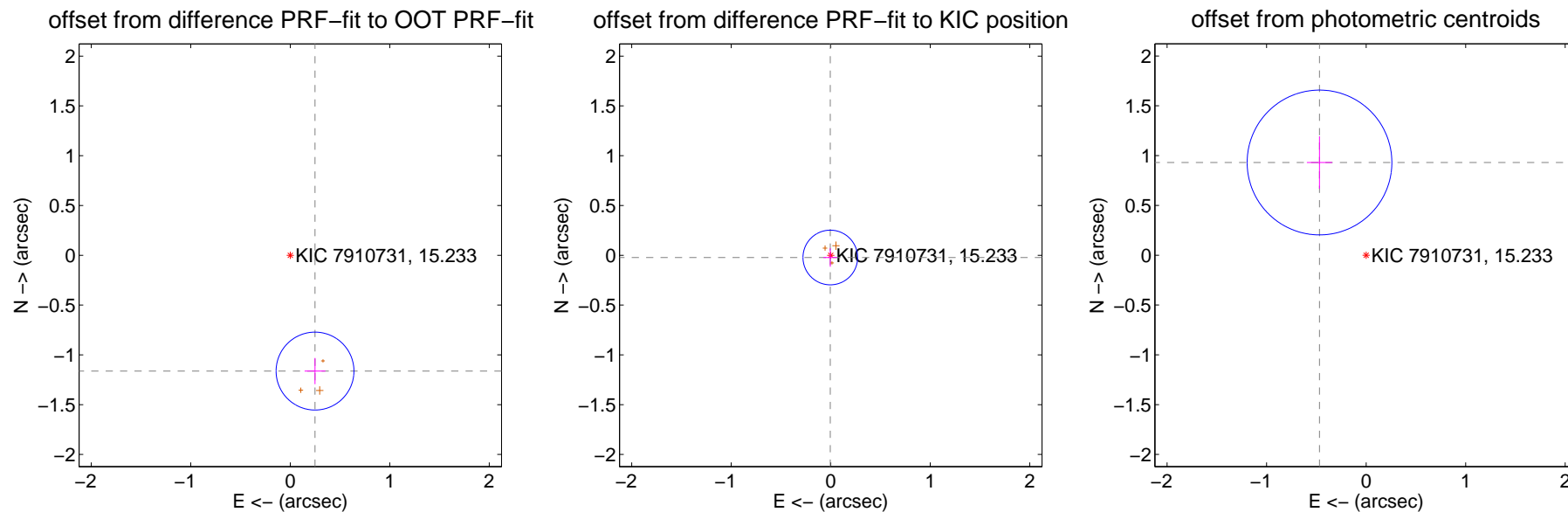
## DV Centroid Data

Supplemental centroid analysis for 007910731-04. Kepler magnitude: 15.23. Transit SNR 11.26

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.44 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.189 \pm 0.130$	9.12	$-0.249 \pm 0.104$	$-1.163 \pm 0.131$
PRF-fit source offset from KIC position	$0.023 \pm 0.091$	0.25	$0.004 \pm 0.069$	$-0.022 \pm 0.093$
photometric centroid source offset	$1.04 \pm 0.24$	4.30	$0.47 \pm 0.13$	$0.93 \pm 0.26$



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

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

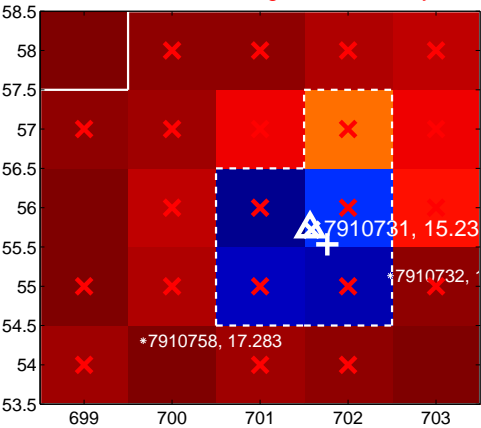
Q1 no difference image



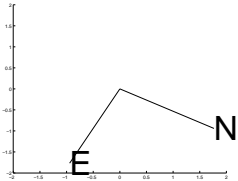
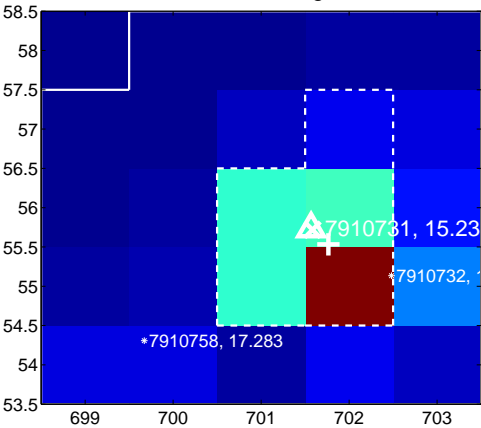
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



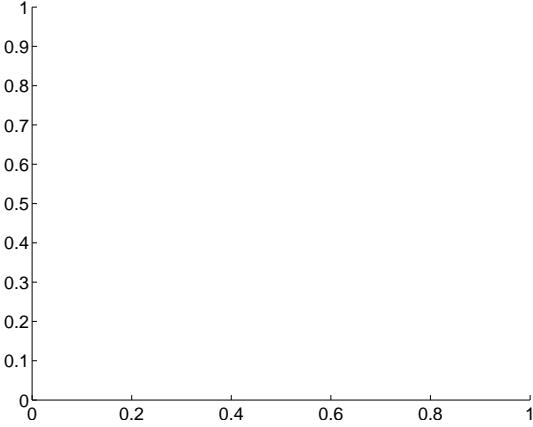
Q3 no difference image



Q3 no OOT image



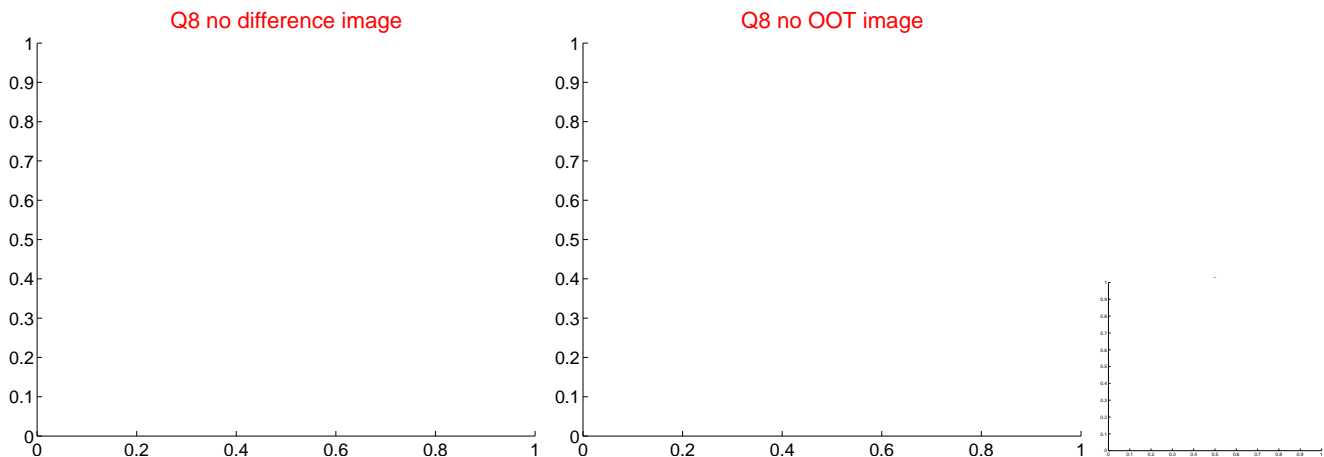
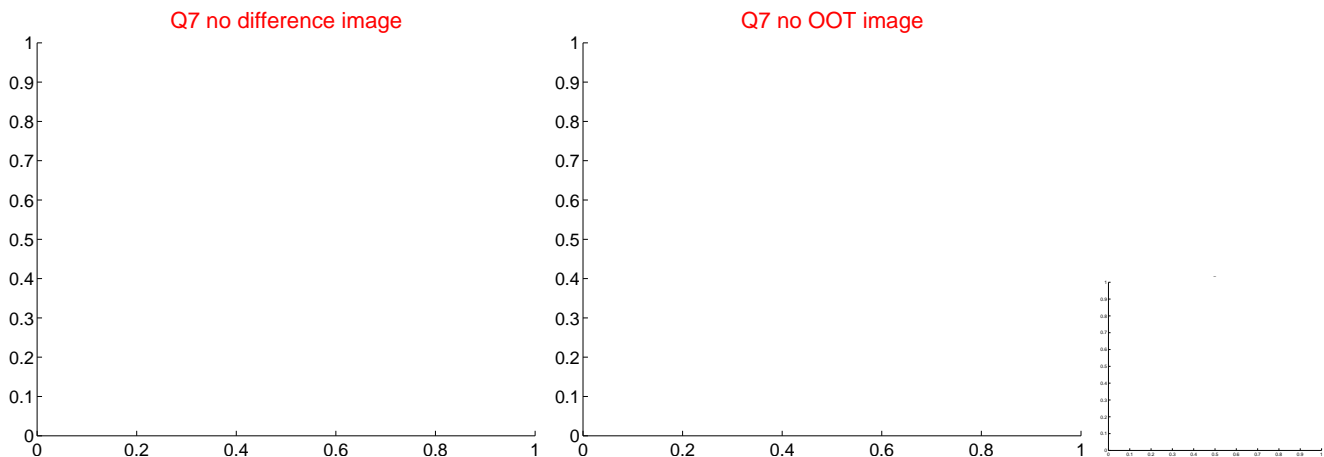
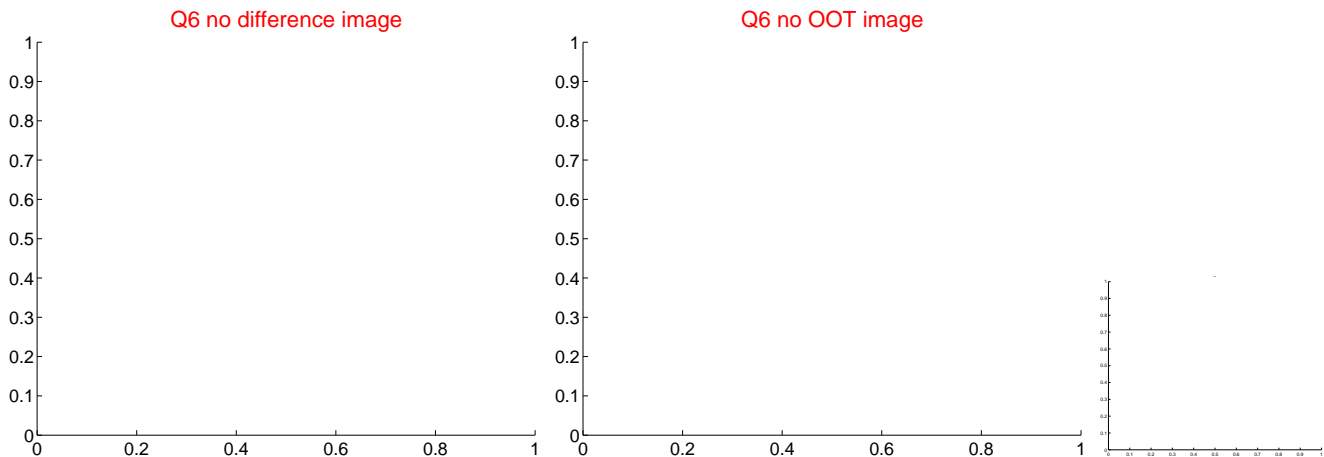
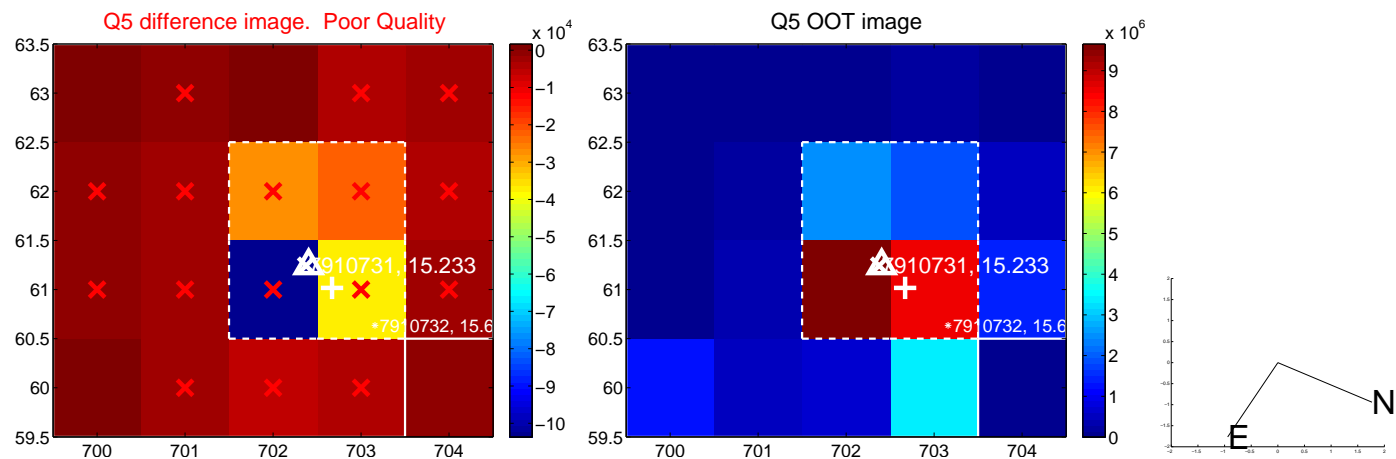
Q4 no difference image



Q4 no OOT image



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



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

Q9 no difference image



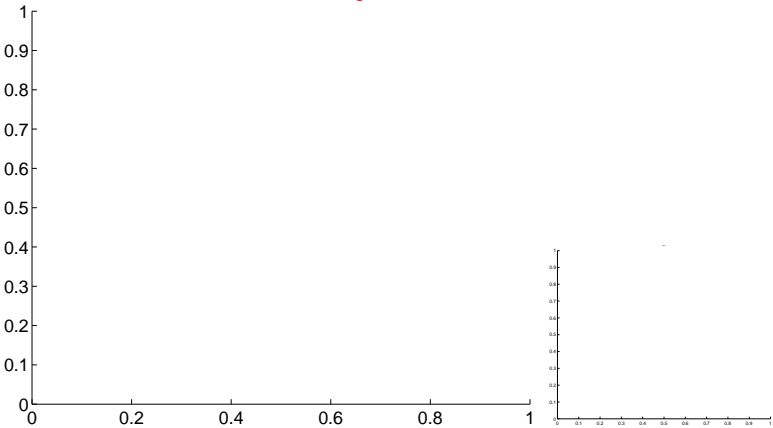
Q9 no OOT image



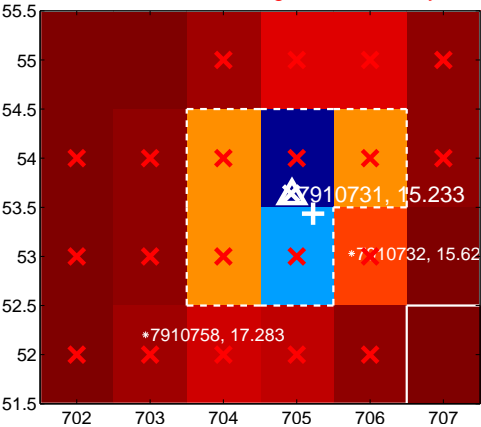
Q10 no difference image



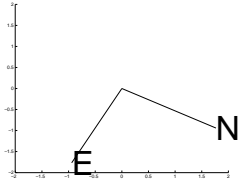
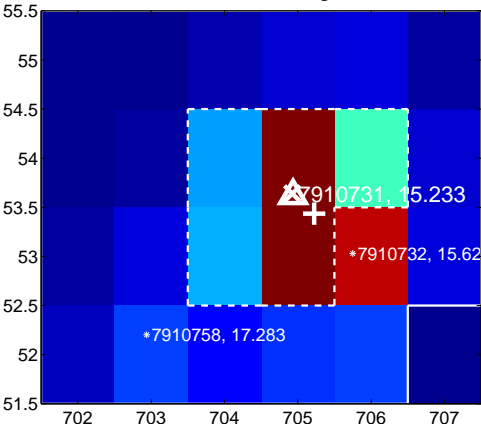
Q10 no OOT image



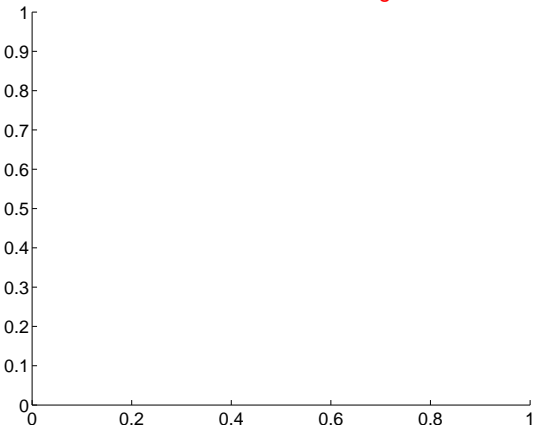
Q11 difference image. Poor Quality



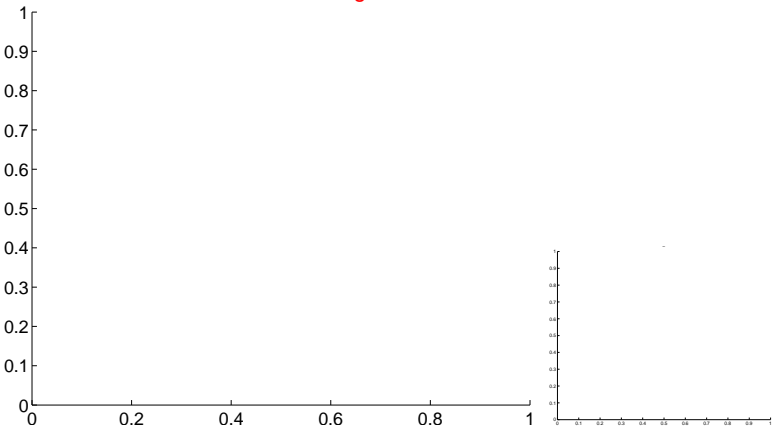
Q11 OOT image



Q12 no difference image



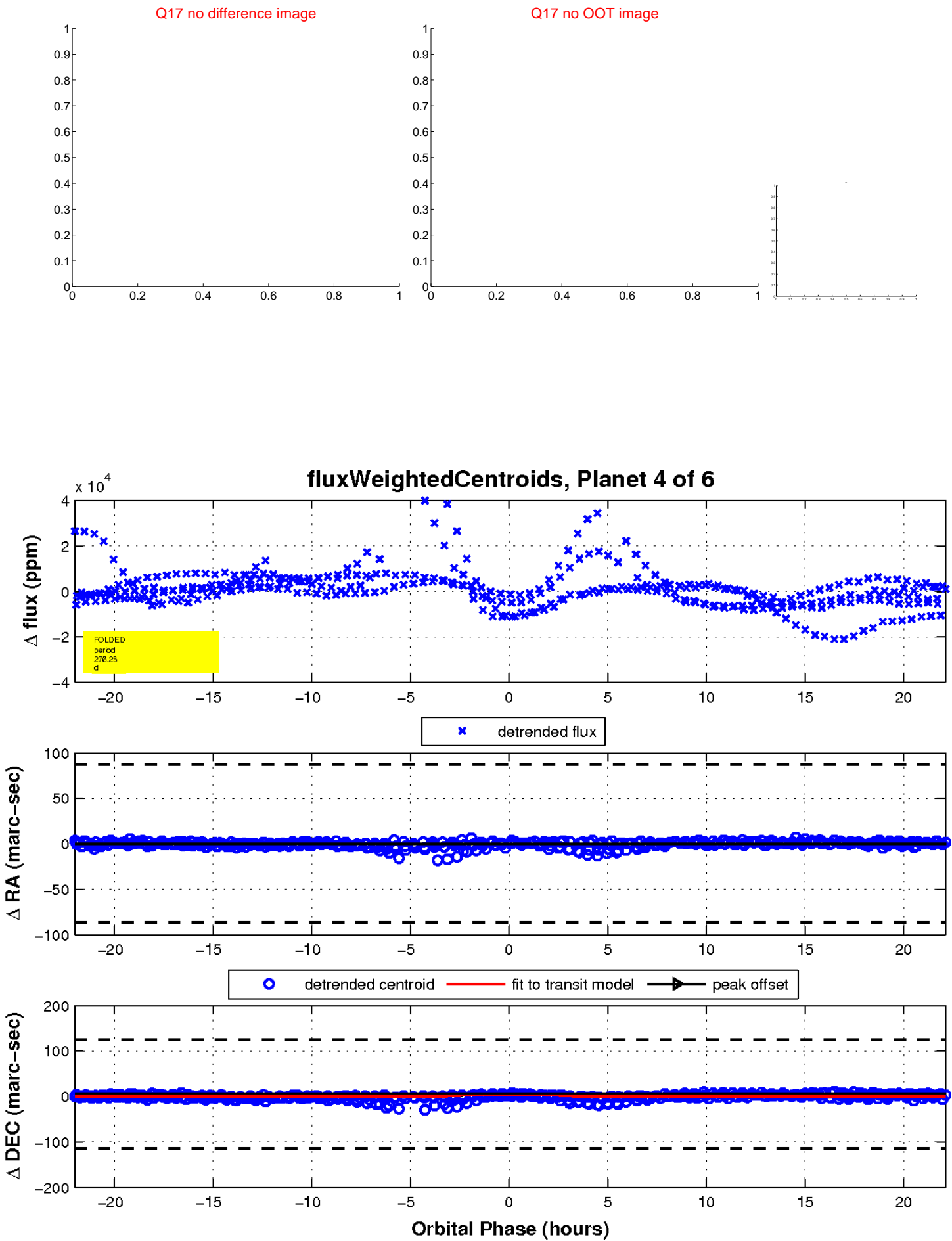
Q12 no OOT image



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

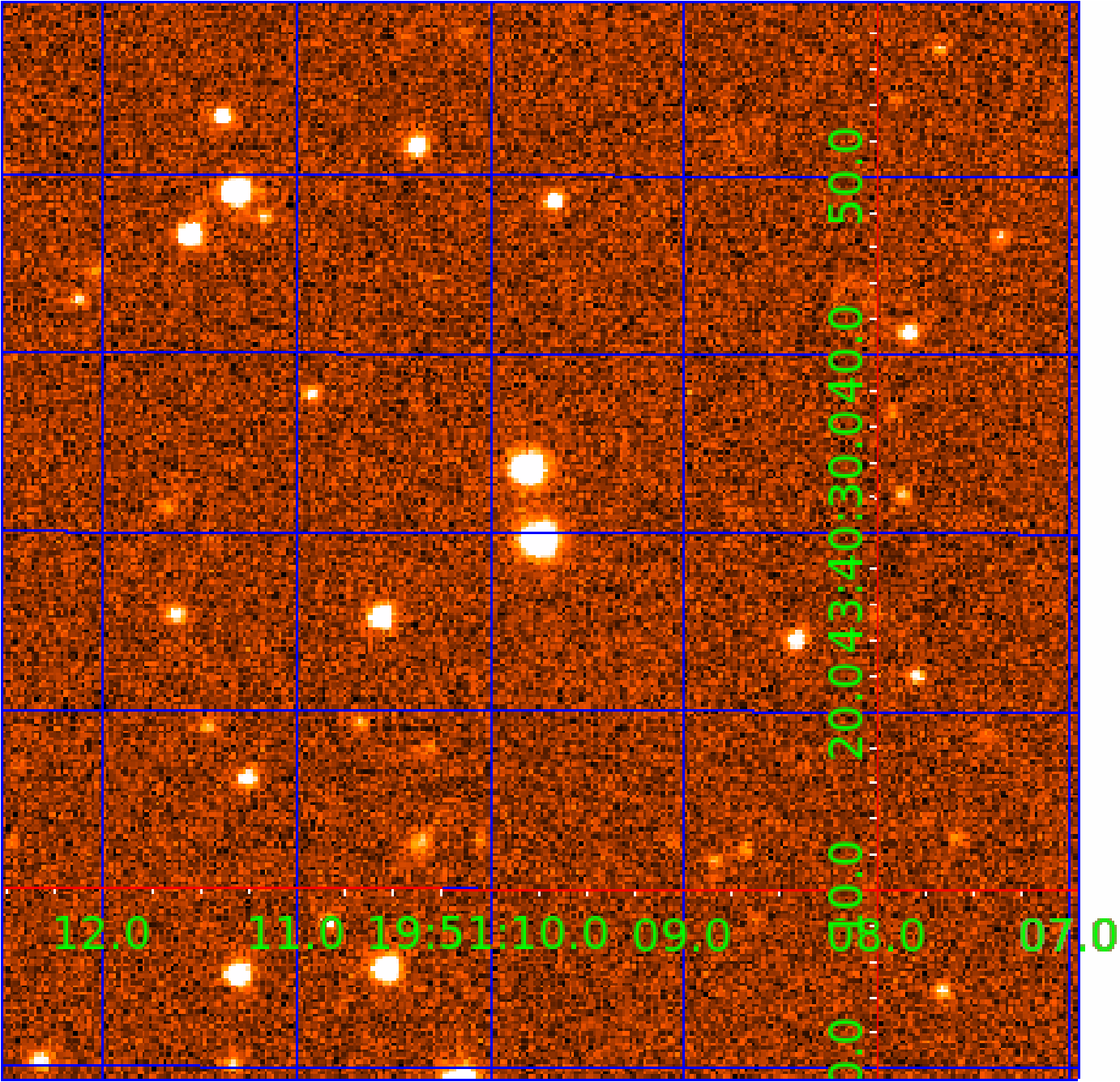


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007910731

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007910731-01	OBS	No	384.637097	218.236223	1350.4	0.959	14.5	3.0	1.09	6323	4.81	1.46
007910731-02	OBS	No	1.671973	132.848767	121.9	4.347	11.6	3.8	1.09	6323	1.42	2060.76
007910731-03	OBS	No	388.984443	216.944547	2167.8	3.000	15.4	-1.0	1.09	6323	5.11	1.44
007910731-04	OBS	No	276.234017	177.304661	14505.4	7.378	14.2	11.3	1.09	6323	15.30	2.27
007910731-06	OBS	No	18.395921	140.263369	631.0	15.000	12.5	-1.0	1.09	6323	2.75	84.21

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007910731-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
007910731-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_KIC_POS
007910731-03	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—CENT_NOFITS
007910731-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
007910731-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS

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

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

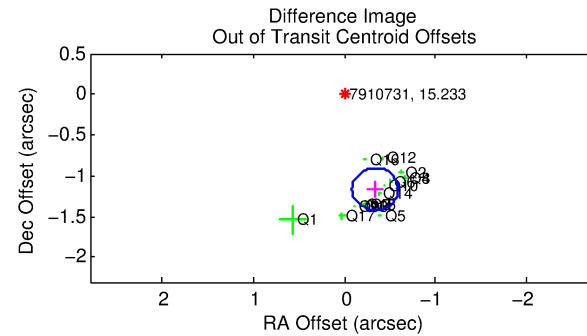
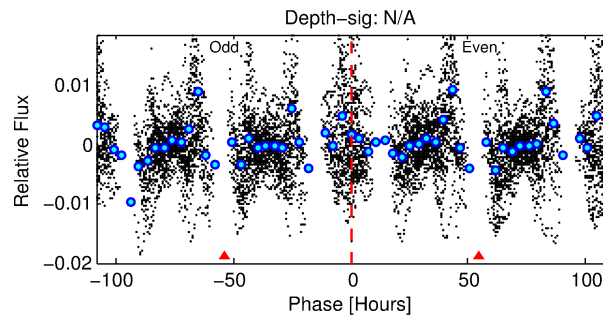
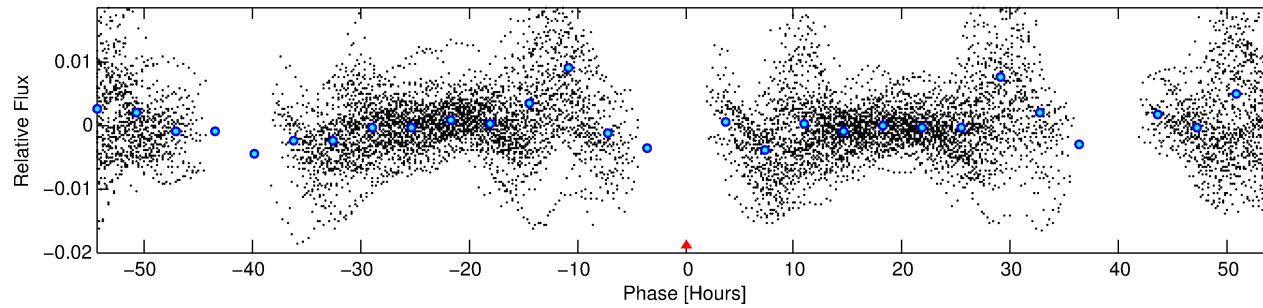
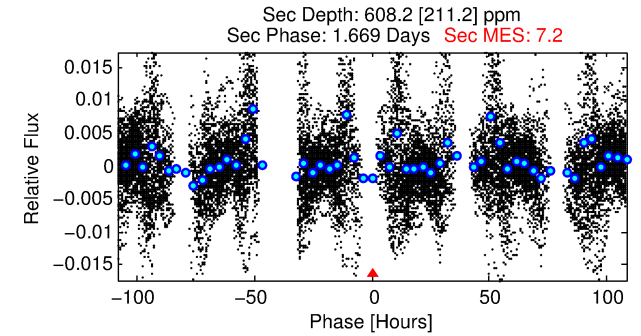
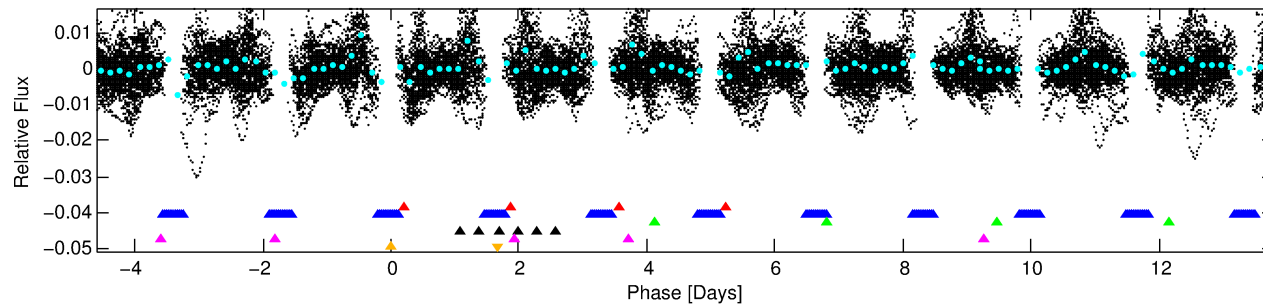
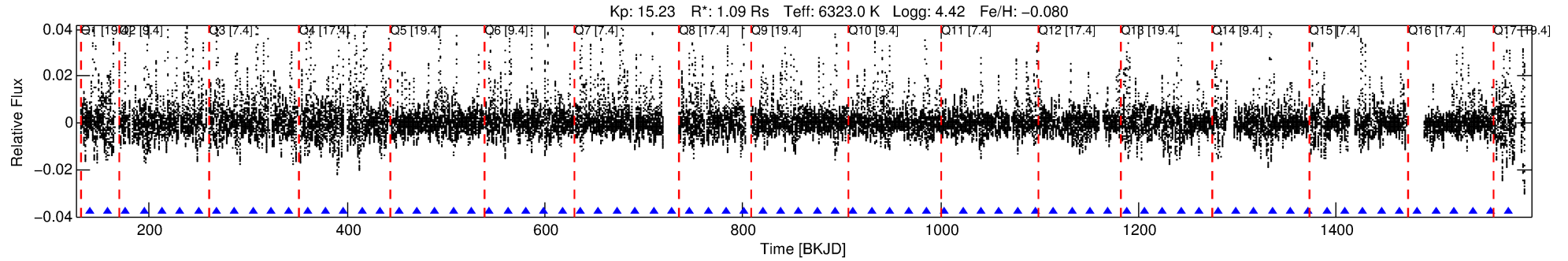
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007910731-06

No Significant Match Found

# DV One-Page Summary

KIC: 7910731 Candidate: 6 of 6 Period: 18.396 d



## TPS TCE Results:

Period = 18.39592 d  
Epoch = 140.2634 BKJD

**DV fit results are unavailable**

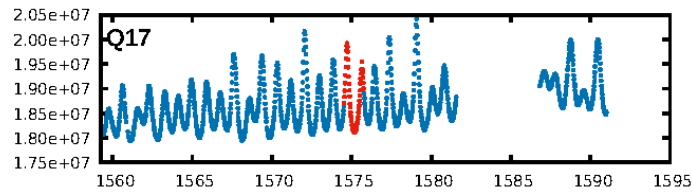
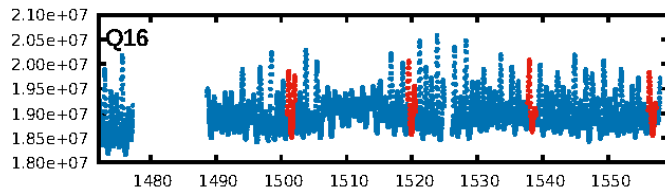
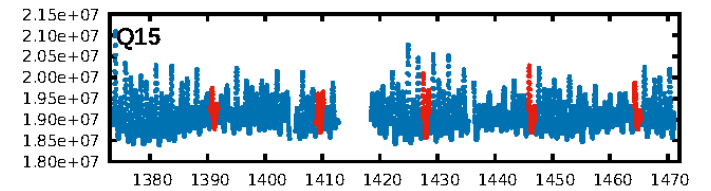
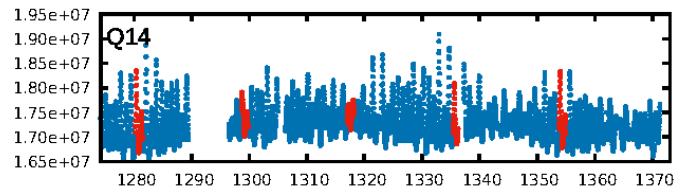
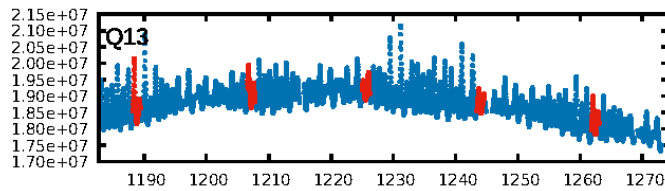
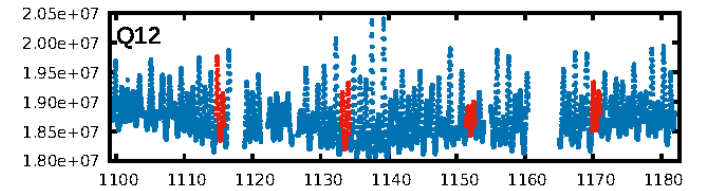
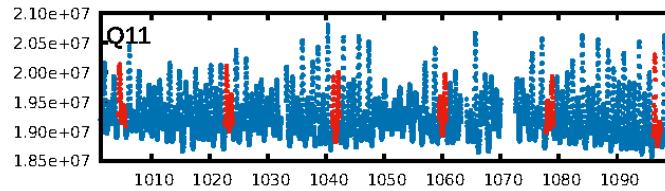
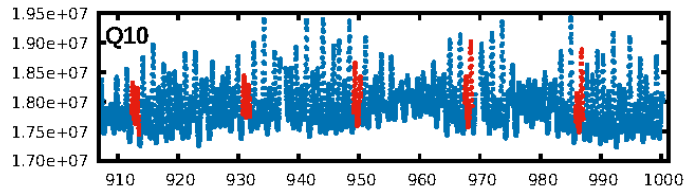
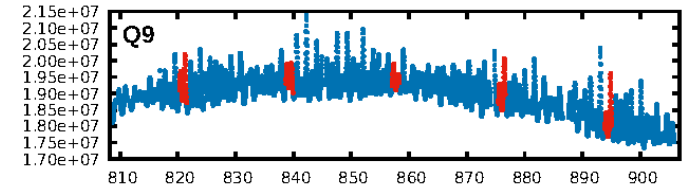
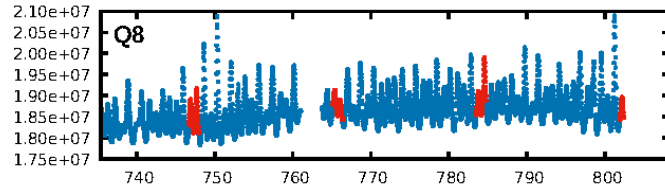
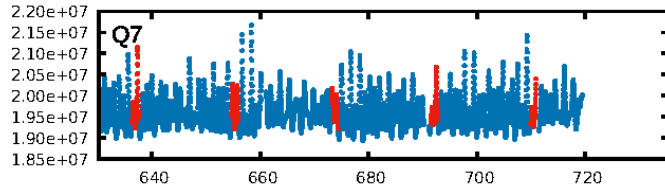
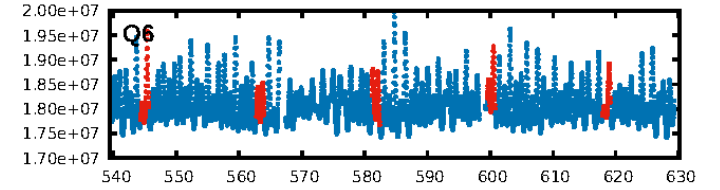
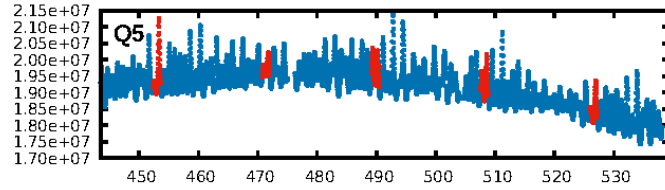
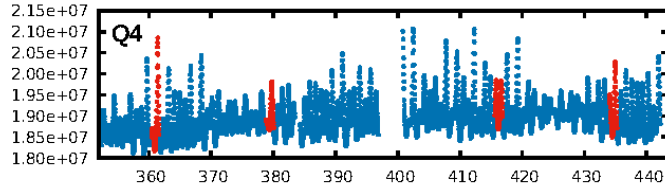
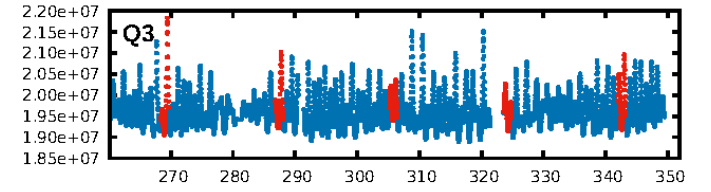
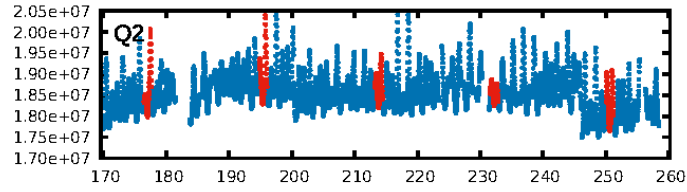
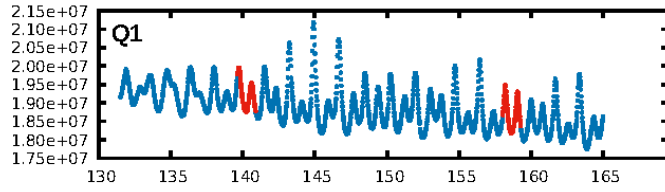
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [25.70 $\sigma$ ]  
LongPeriod-sig: 100.0% [367.38 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [73/73]  
**GhostDiagnostic-chr: 2.01**  
Centroid-sig: 0.7%  
**Centroid-so: 1.399 arcsec [71.34 $\sigma$ ]**  
**OotOffset-rm: 1.209 arcsec [14.11 $\sigma$ ]**  
KicOffset-rm: 0.063 arcsec [0.86 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

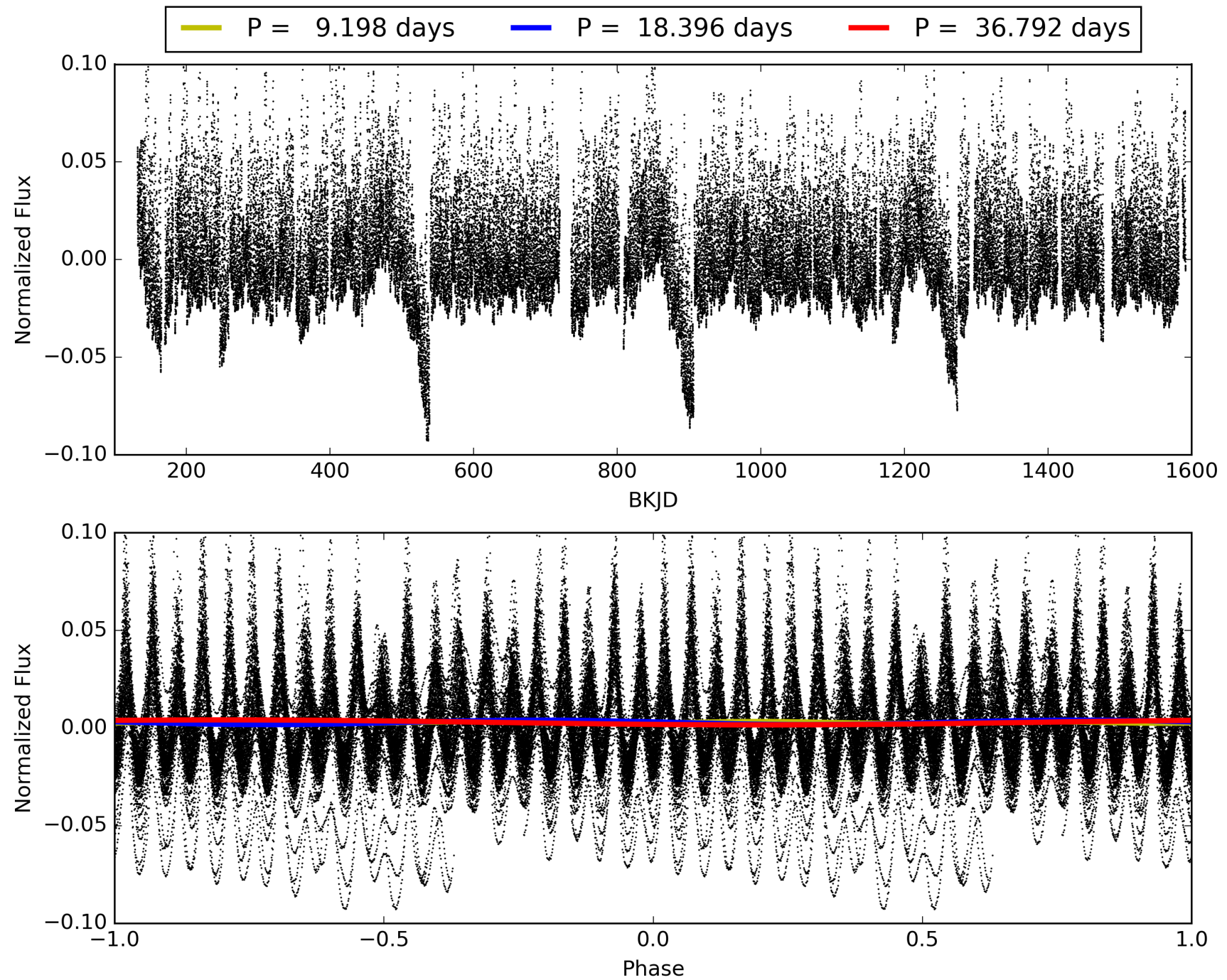
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:22:35 Z

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

# TCE 007910731-06, PDC Light Curves

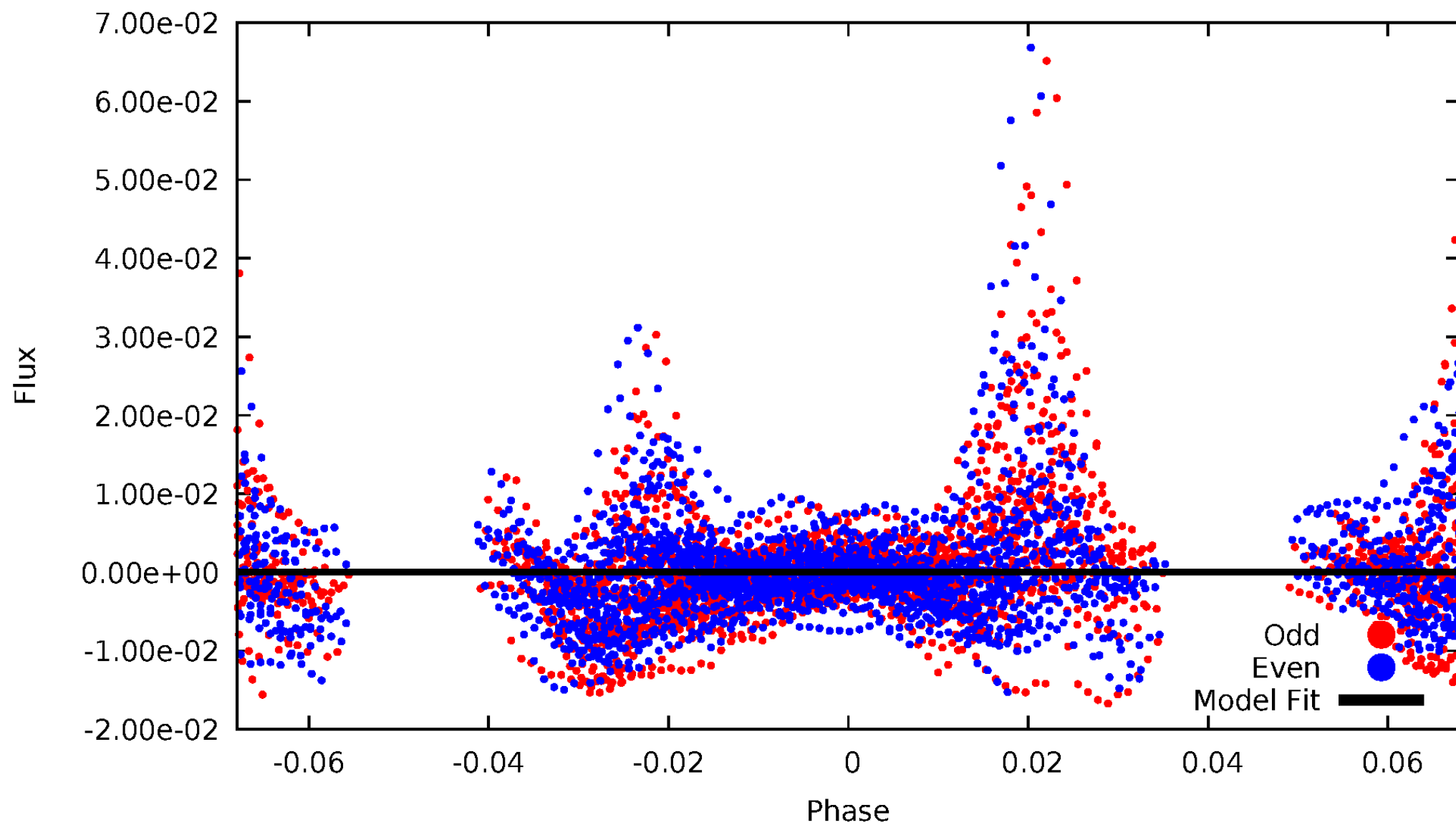


TCE 007910731-06



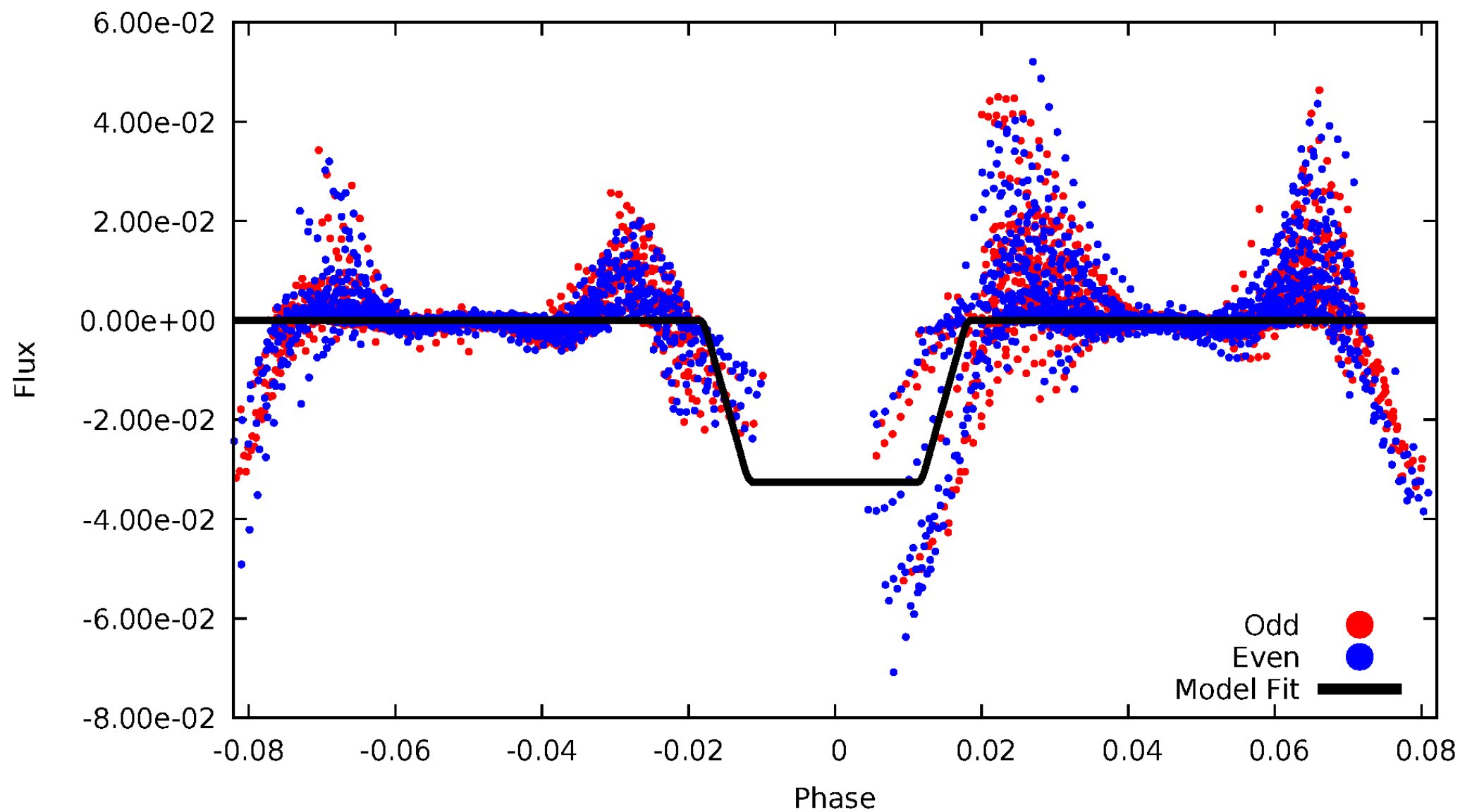
# DV Odd/Even

TCE 007910731-06



# ALT Odd/Even

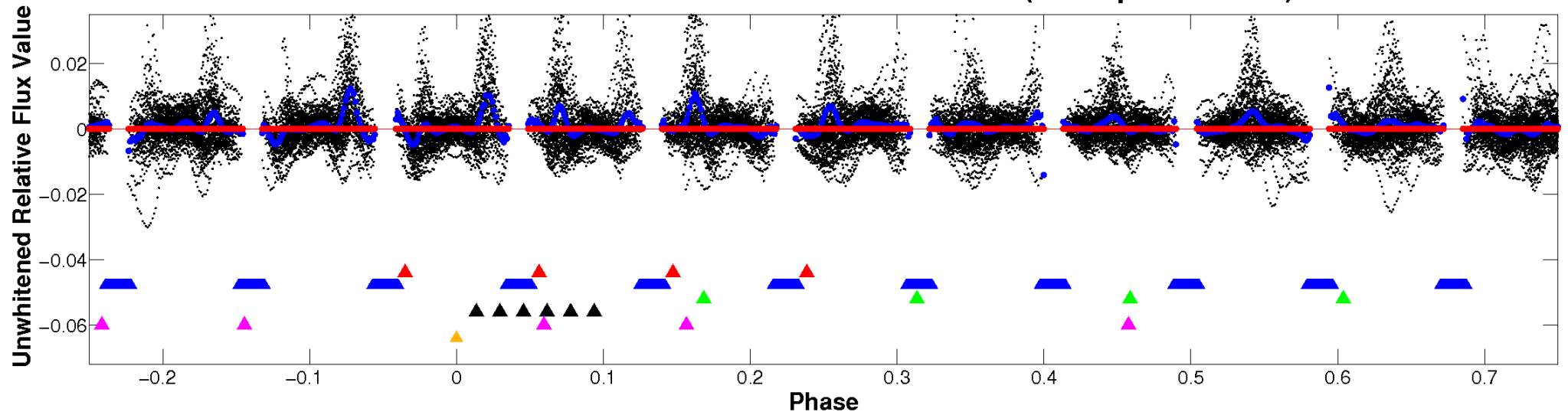
TCE 007910731-06





# Non-Whitened Vs. Whitened Light Curve

**Planet 6 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

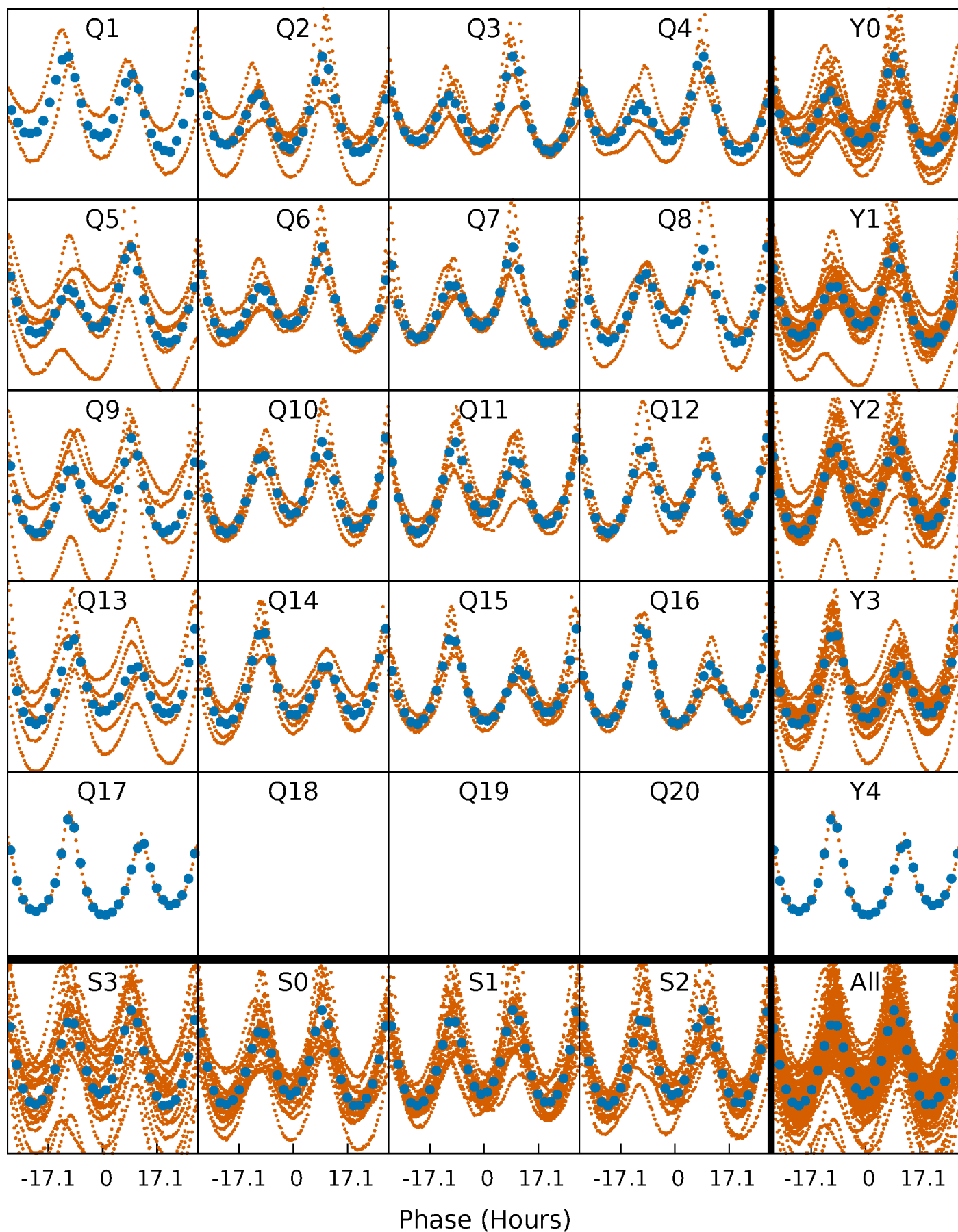


**Planet 6 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

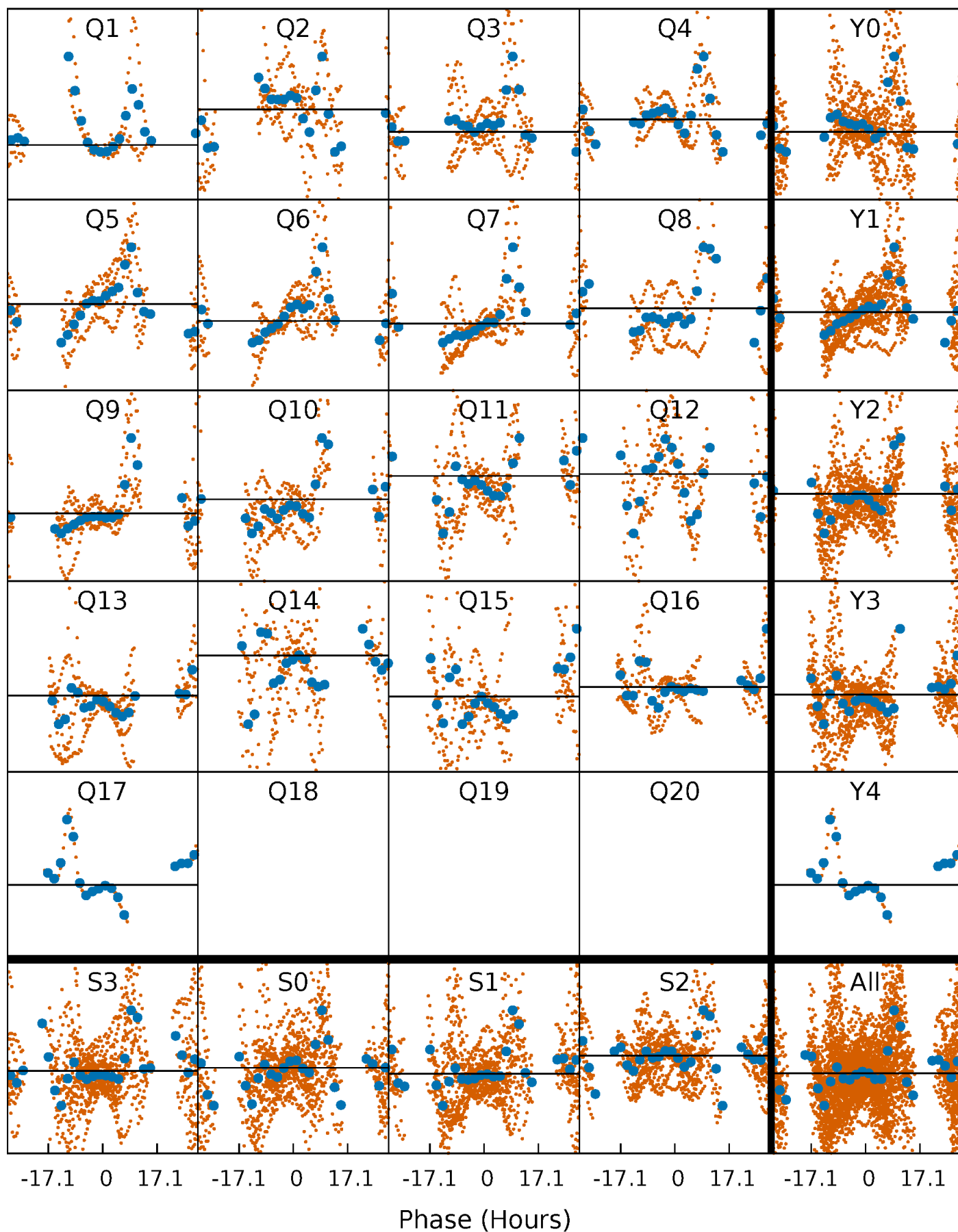
TCE 007910731-06 P= 18.395921 Days  $T_0=140.263369$  (BKJD)





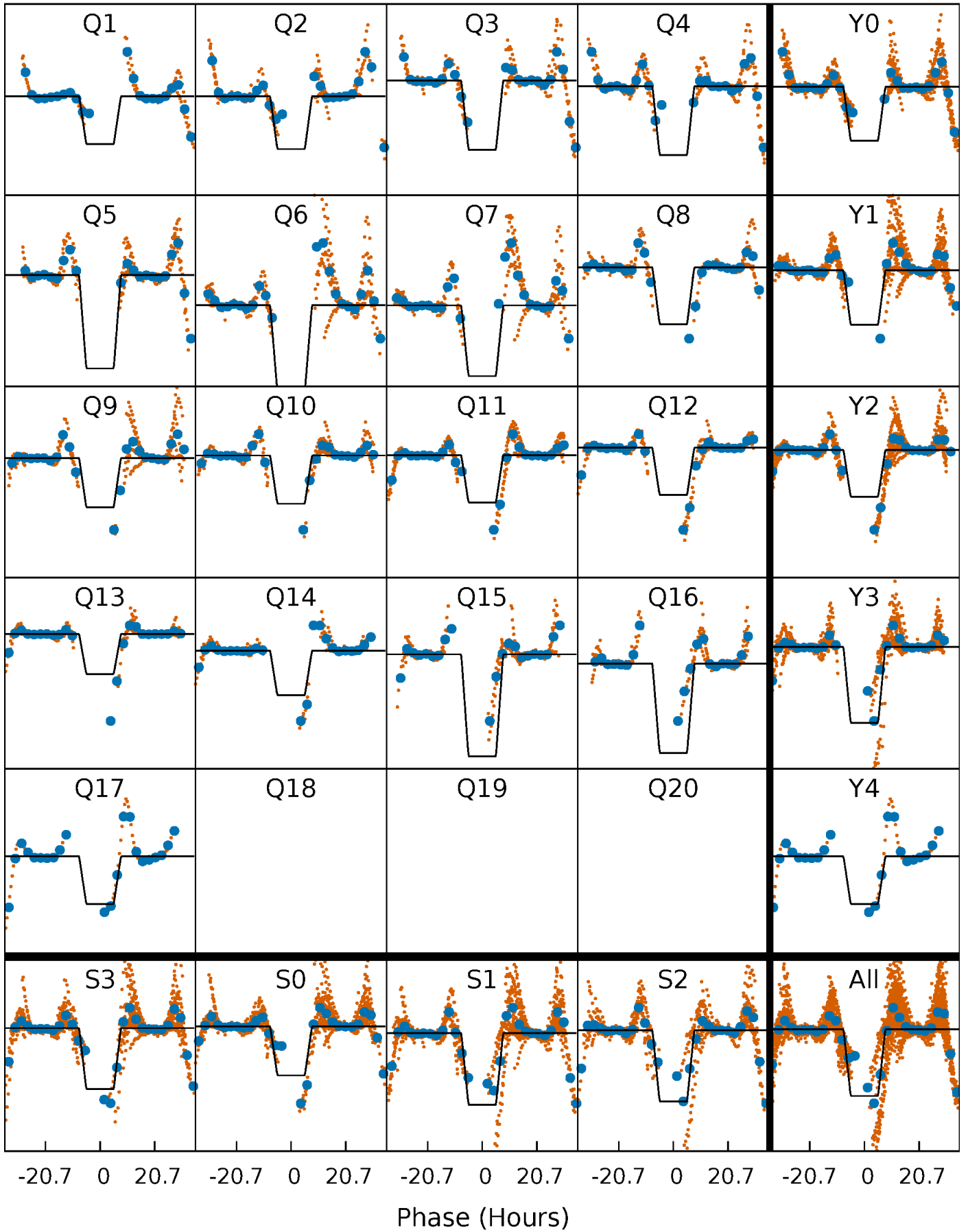
# DV Quarter-Phased Transit Curves

TCE 007910731-06 P= 18.395921 Days  $T_0=140.263369$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

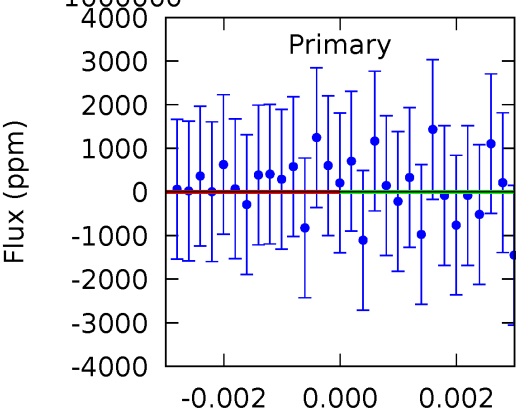
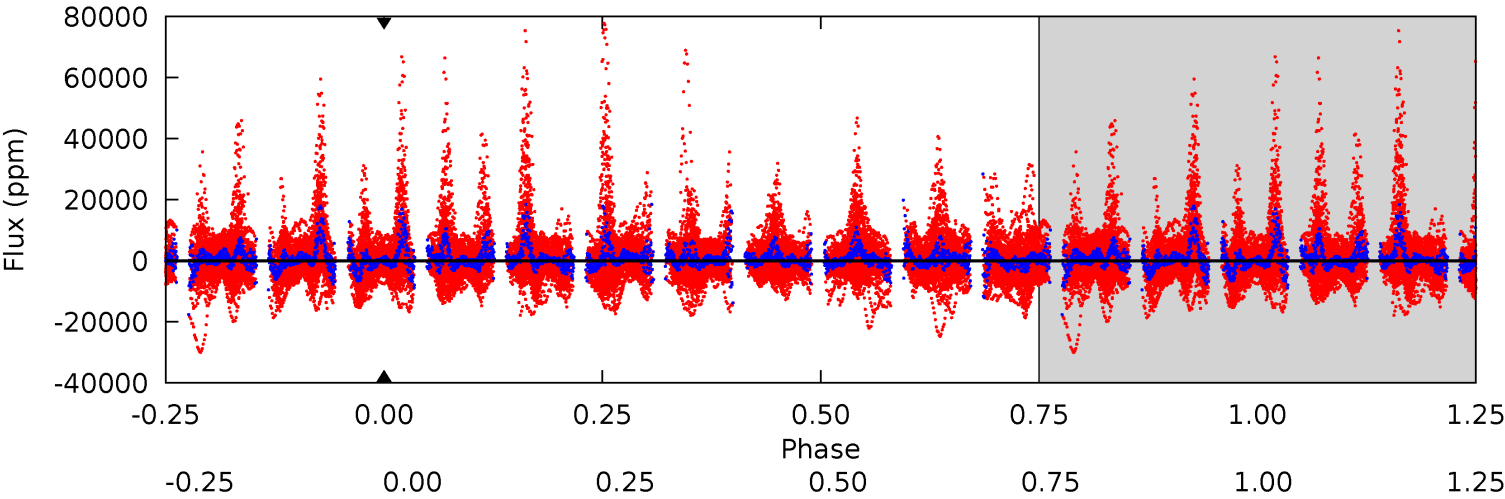
TCE 007910731-06 P= 18.395921 Days  $T_0=139.422726$  (BKJD)



DV Model-Shift Uniqueness Test

007910731-06, P = 18.395921 Days, E = 121.867448 Days

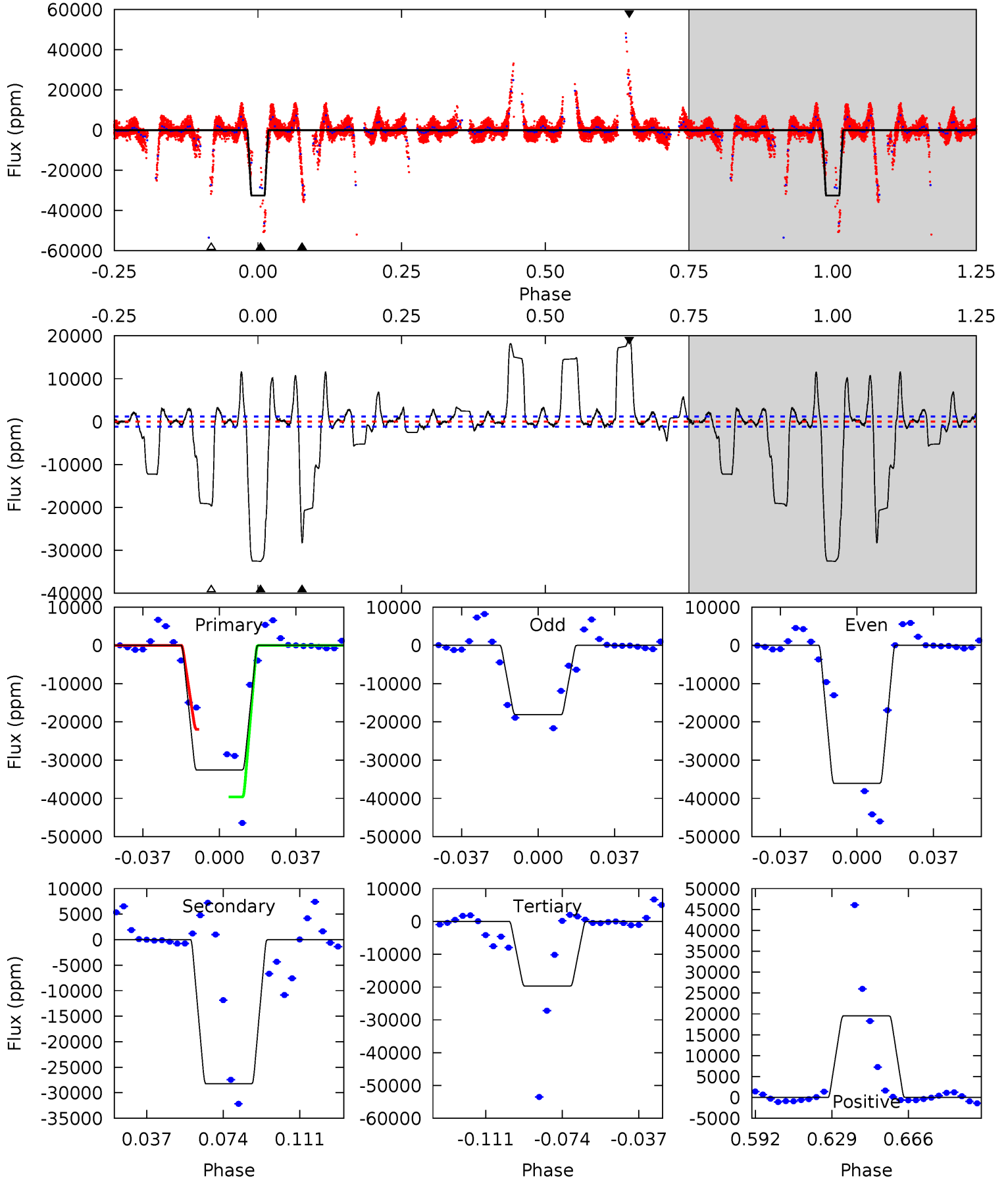
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

007910731-06, P = 18.395921 Days, E = 121.026805 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
131.8	114.3	79.7	79.0	4.77	2.09	8.49	52.1	52.8	34.6	35.3	36.8	1.39	0.37	32.6



### Stellar Parameters For KIC 007910731

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6323^{+174}_{-239}$	$4.418^{+0.062}_{-0.188}$	$-0.080^{+0.250}_{-0.300}$	$1.093^{+0.329}_{-0.141}$	$1.140^{+0.157}_{-0.157}$	$1.230^{+0.406}_{-0.594}$
	+3%/-4%	+1%/-4%	+312%/-375%	+30%/-13%	+14%/-14%	+33%/-48%
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 007910731-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$9.27^{+9.90}_{-6.50}$	$1094^{+77}_{-54}$	$-3649^{+27341}_{-19977}$	$-29.537^{+19703.779}_{-21165.807}$
Alt.	$-28226 \pm 247$	$23.04^{+12.13}_{-11.21}$	$1094^{+78}_{-54}$	$6011^{+2796}_{-1026}$	$612^{+1599}_{-352}$

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

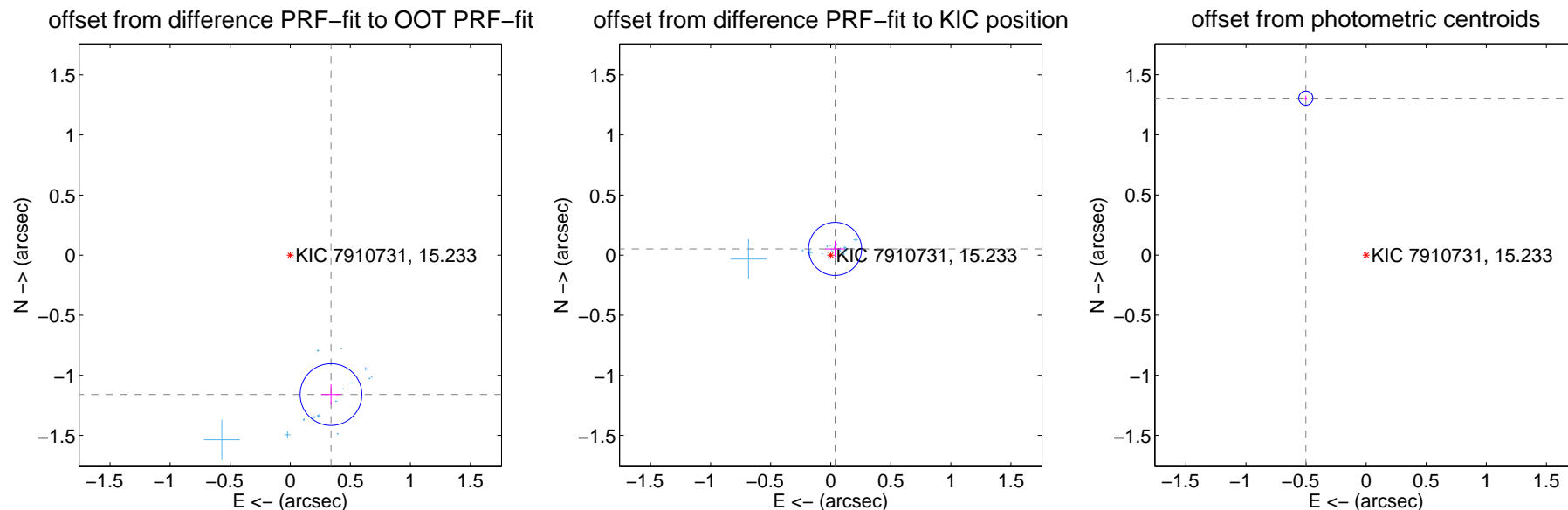
## DV Centroid Data

Supplemental centroid analysis for 007910731-06. Kepler magnitude: 15.23. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

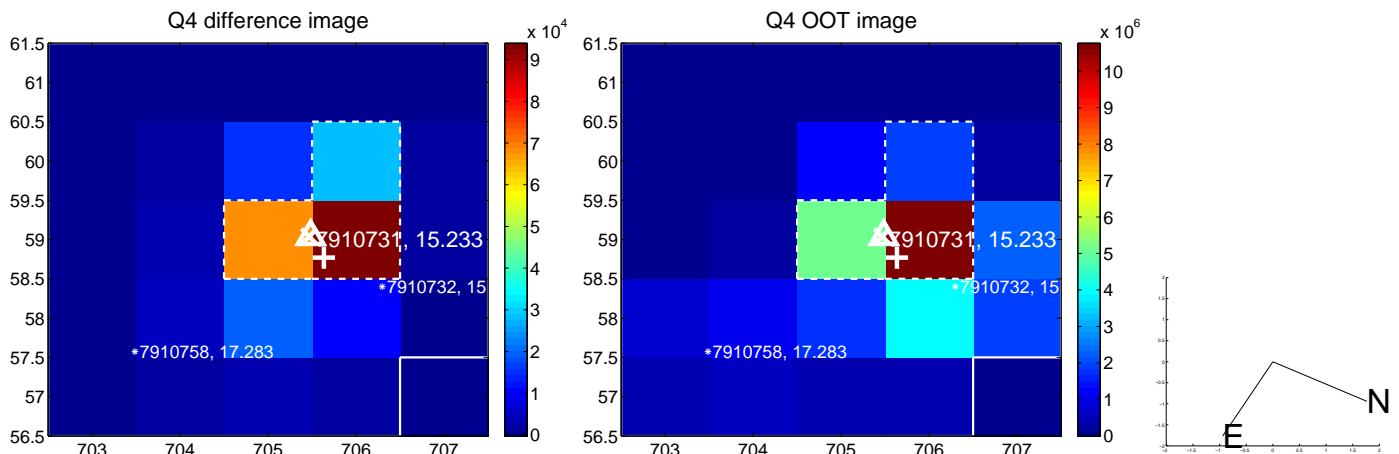
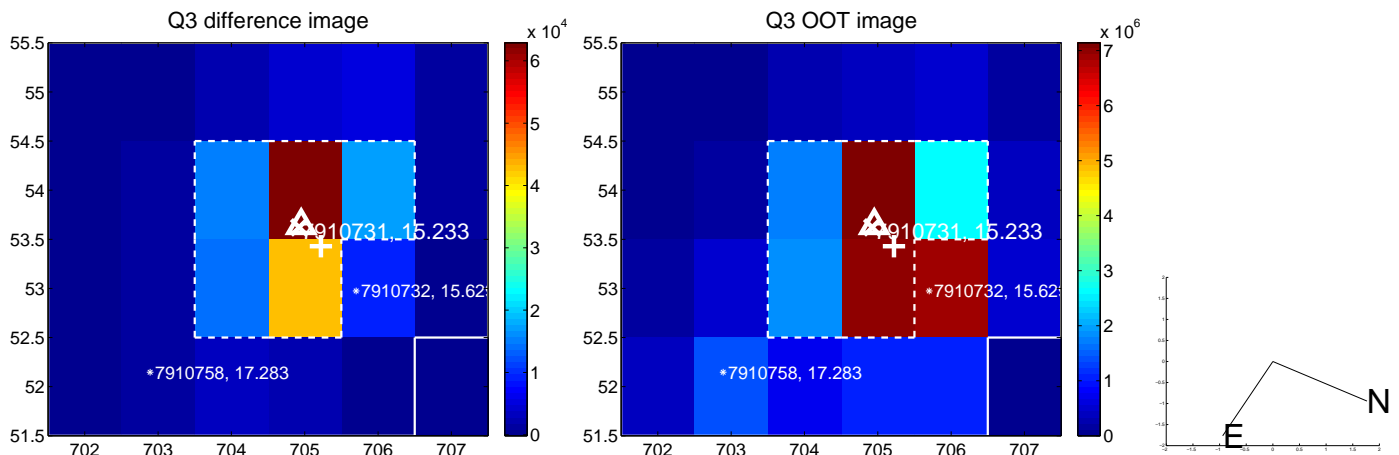
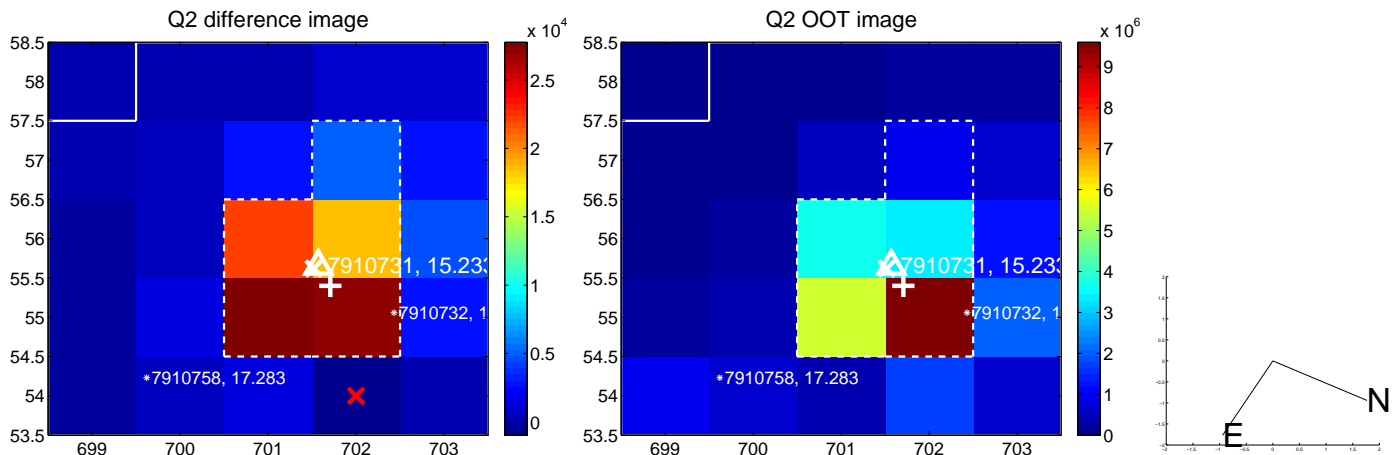
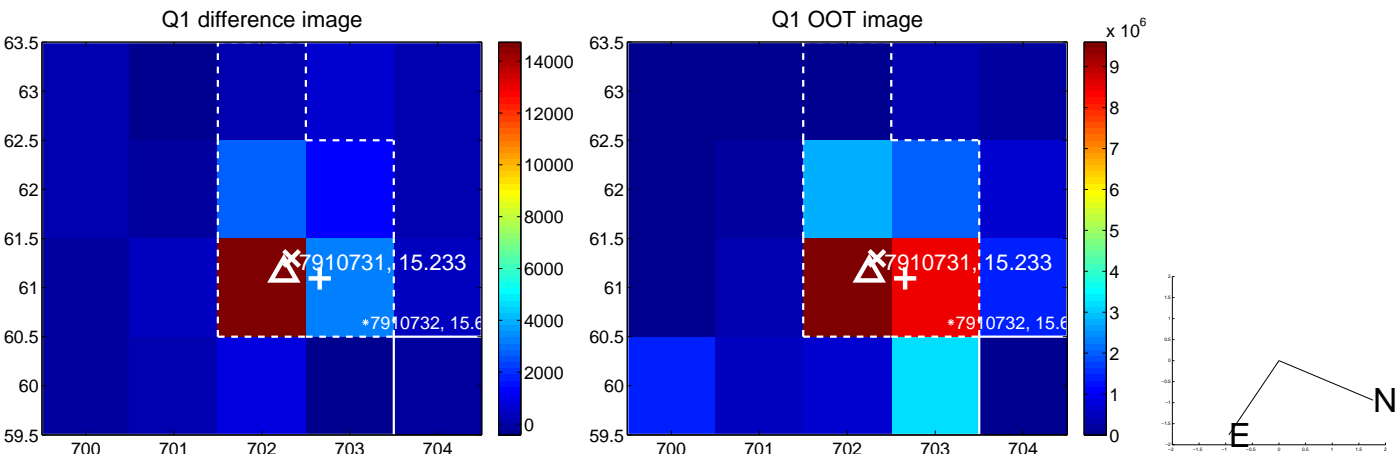
The direct PRF centroid is offset from the target star catalog position by about 1.52 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.209 \pm 0.086$	14.11	$-0.339 \pm 0.083$	$-1.160 \pm 0.086$
PRF-fit source offset from KIC position	$0.063 \pm 0.074$	0.86	$-0.036 \pm 0.081$	$0.052 \pm 0.067$
photometric centroid source offset	$1.40 \pm 0.02$	71.34	$0.50 \pm 0.01$	$1.31 \pm 0.02$

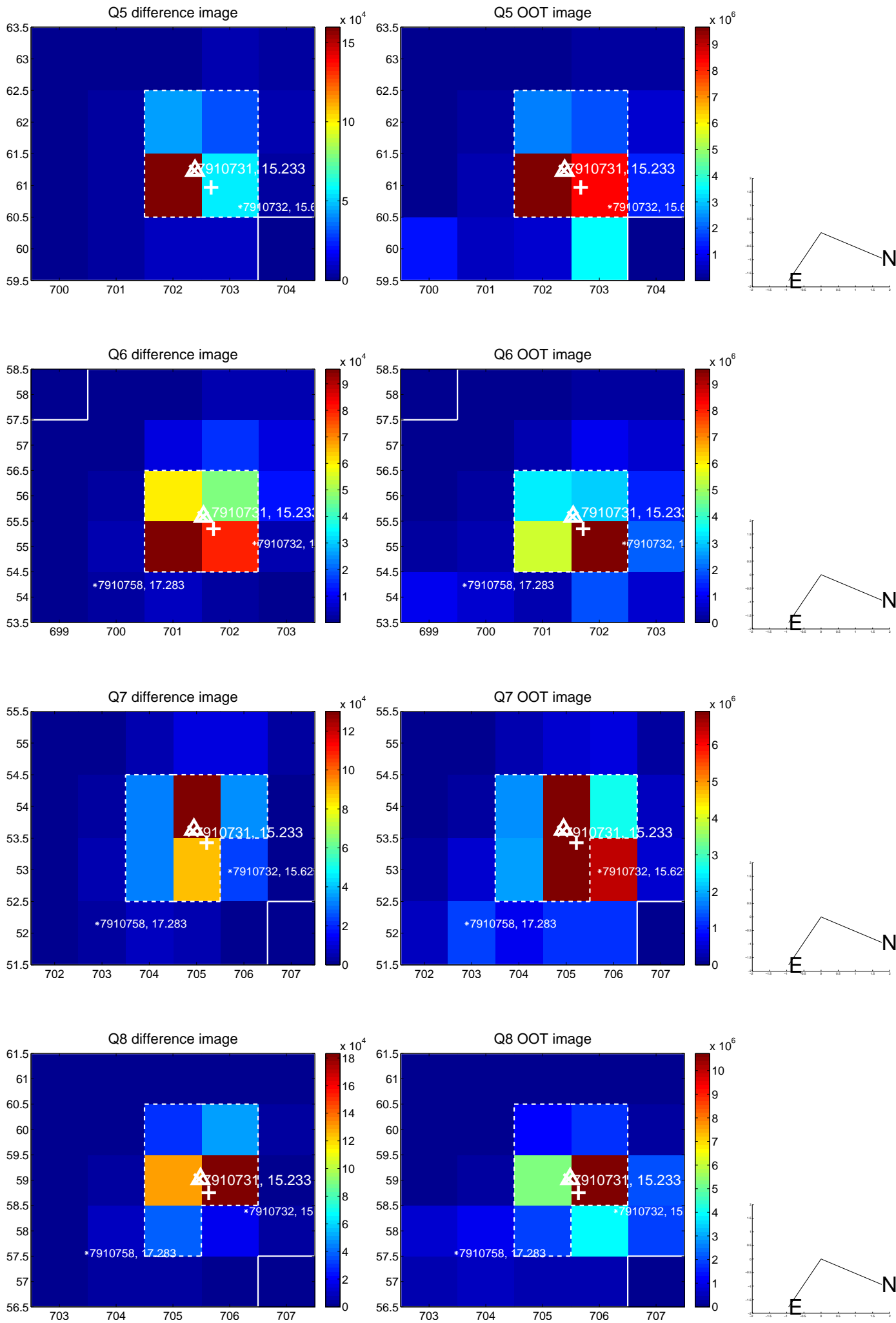


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

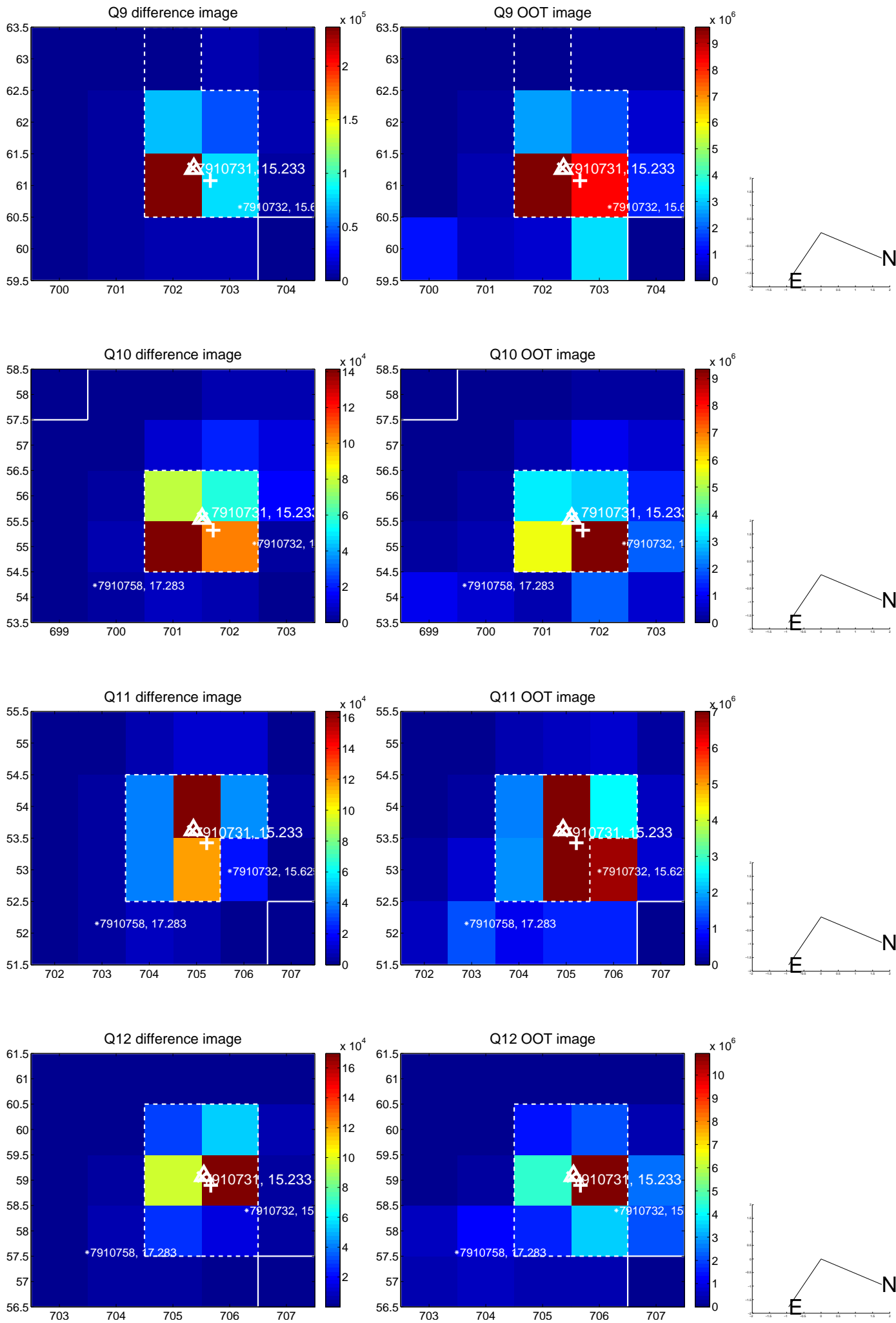


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

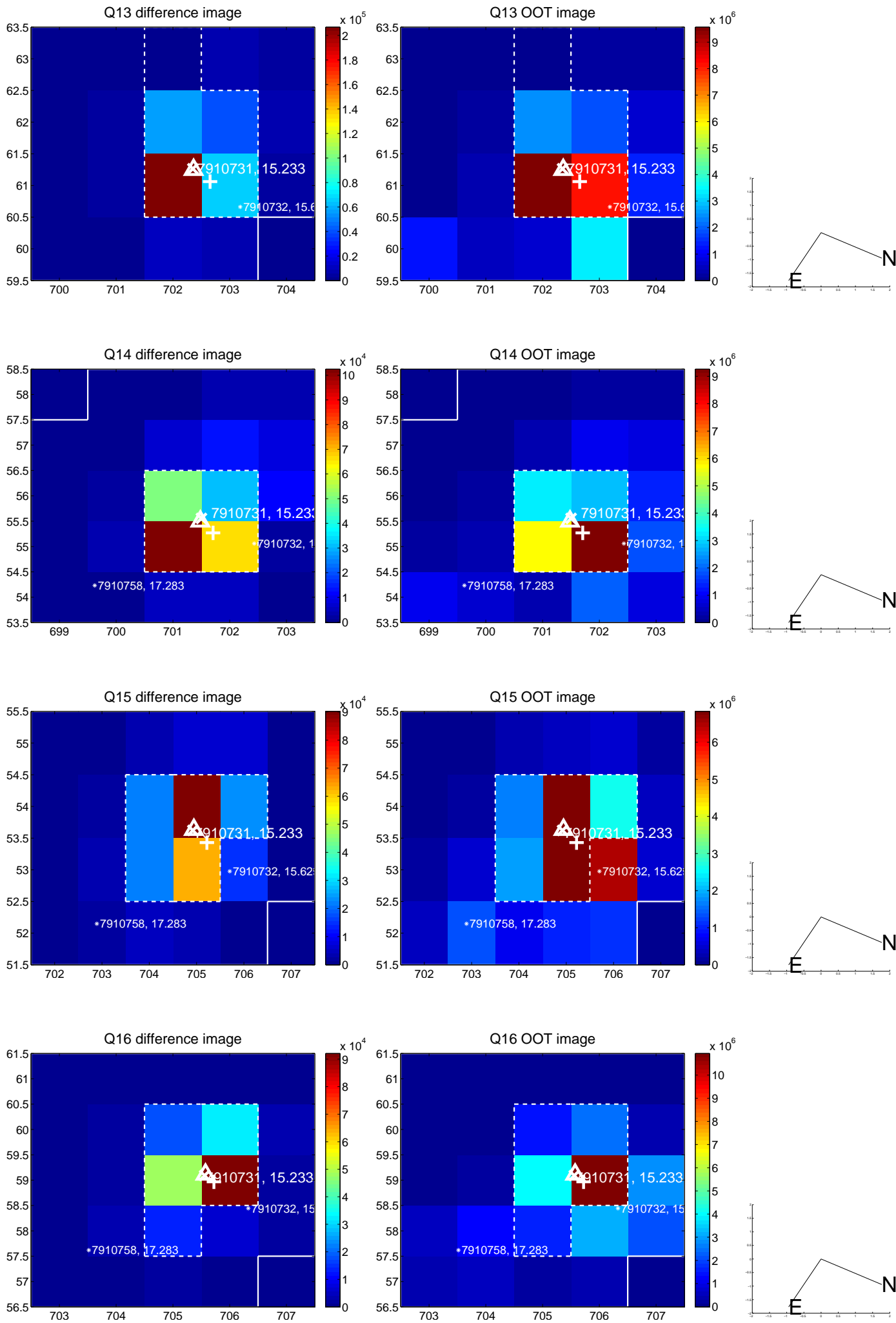




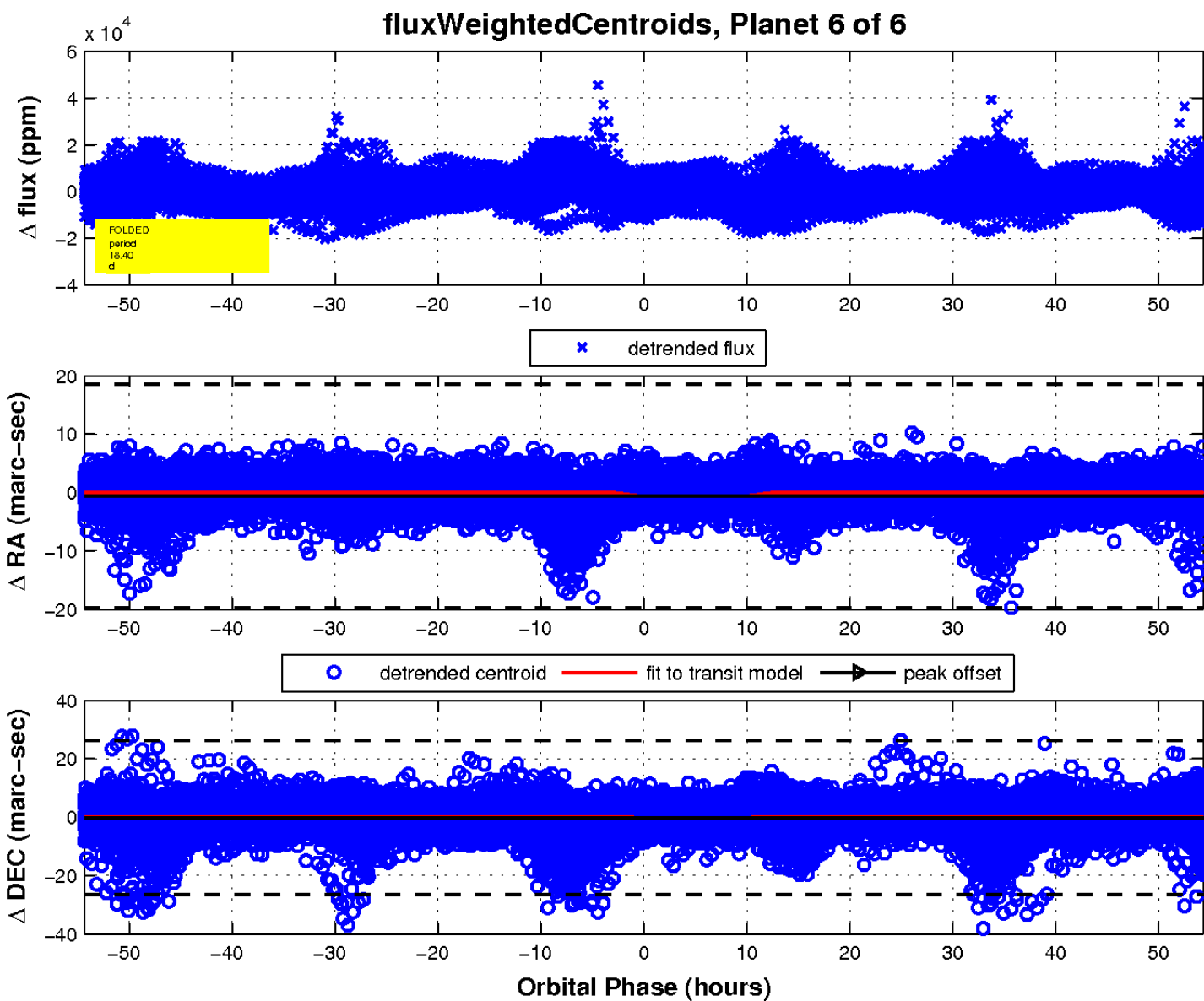
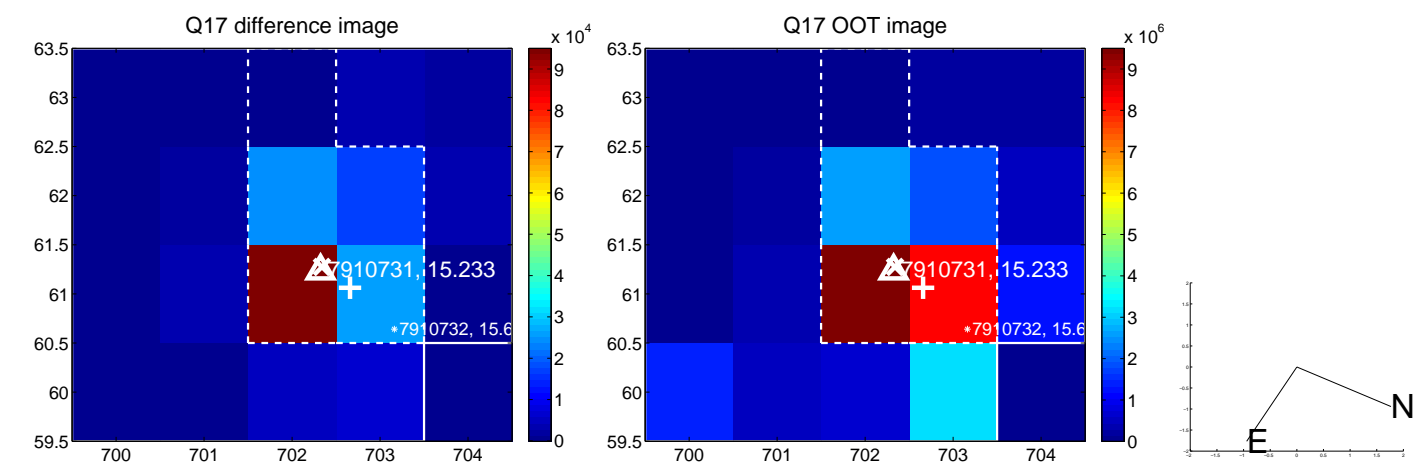
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

