

# KIC 006310397

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006310397-01	OBS	No	0.863182	131.728634	14.8	5.846	8.2	8.0	1.86	7318	0.73	21587.48
006310397-02	OBS	No	0.874973	131.560918	67.7	3.376	13.6	19.0	1.86	7318	1.77	21200.48
006310397-03	OBS	No	41.328636	134.705272	355.1	3.498	11.9	12.9	1.86	7318	6.70	124.17
006310397-04	OBS	No	23.265667	134.760839	356.8	2.277	10.5	11.6	1.86	7318	4.47	267.13
006310397-05	OBS	No	12.336945	138.858564	273.9	1.076	11.1	11.2	1.86	7318	3.16	622.39
006310397-06	OBS	No	9.439660	134.800797	197.5	4.500	9.9	-1.0	1.86	7318	2.64	889.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006310397-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006310397-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT
006310397-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—MOD_NONUNIQ_DV
006310397-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

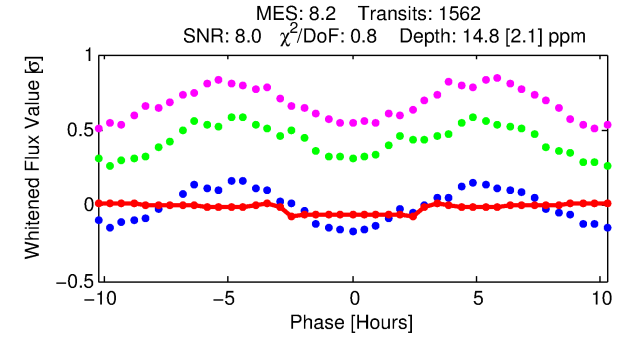
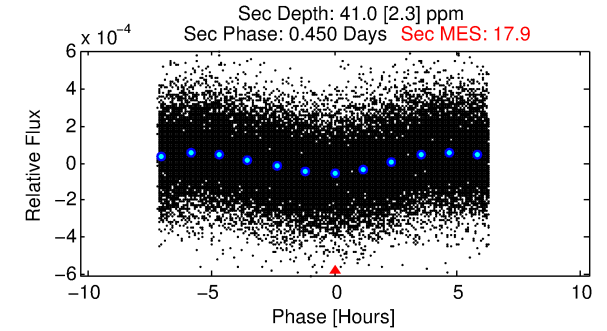
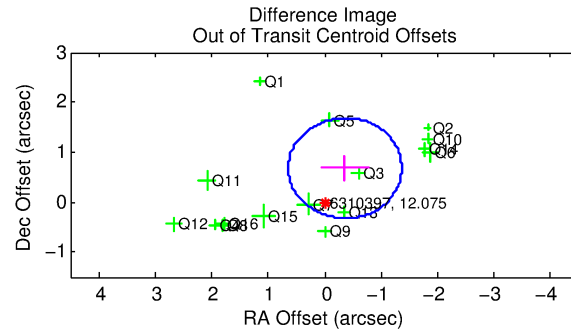
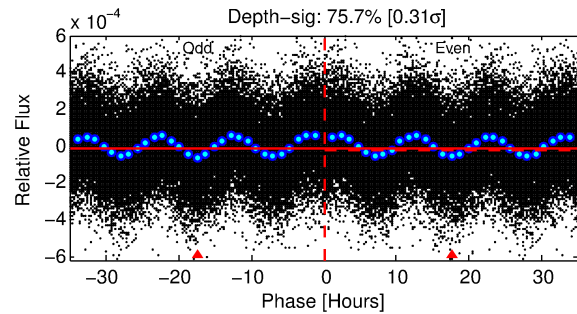
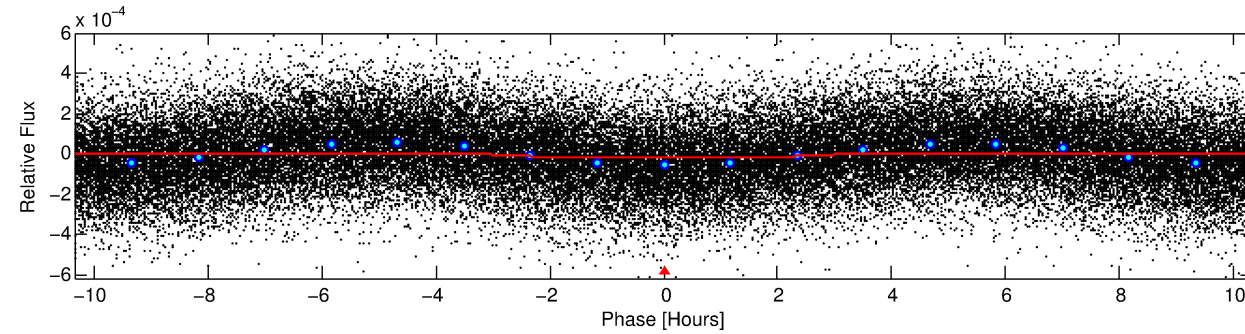
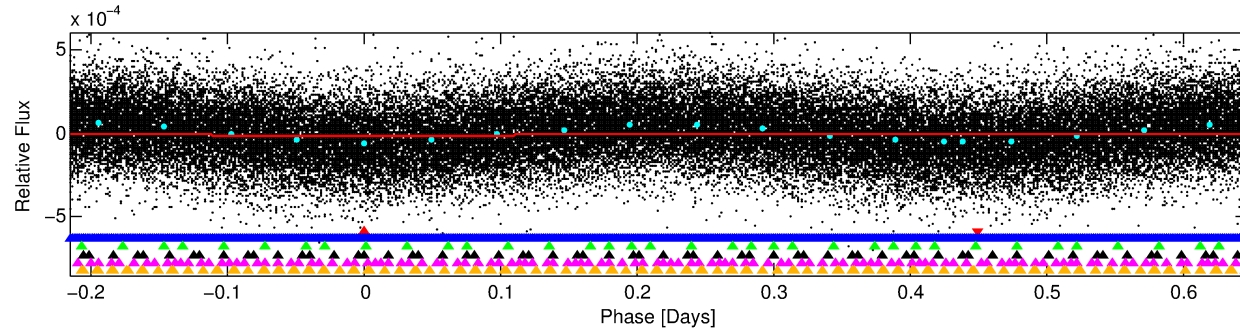
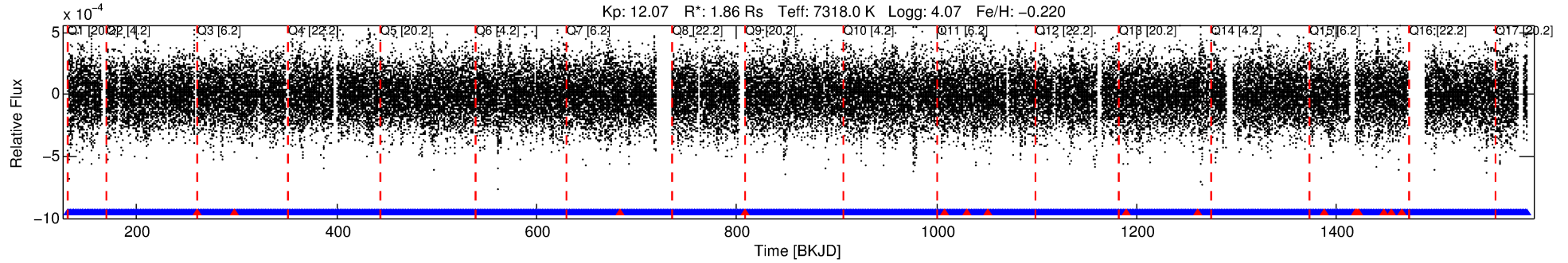
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006310397-01

No Significant Match Found

# DV One-Page Summary

KIC: 6310397 Candidate: 1 of 6 Period: 0.863 d



## DV Fit Results:

Period = 0.86318 [0.00002] d  
Epoch = 131.7286 [0.0043] BKJD  
Rp/R\* = 0.0036 [0.0026]  
a/R\* = 1.27 [2.08]  
b = 0.28 [14.03]  
Seff = 21587.48 [8617.48]  
Teq = 3091 [308] K  
Rp = 0.73 [0.56] Re  
a = 0.0203 [0.0049] AU  
Ag = 17.46 [25.94] [0.63 $\sigma$ ]  
Teffp = 9769 [3541] K [1.88 $\sigma$ ]

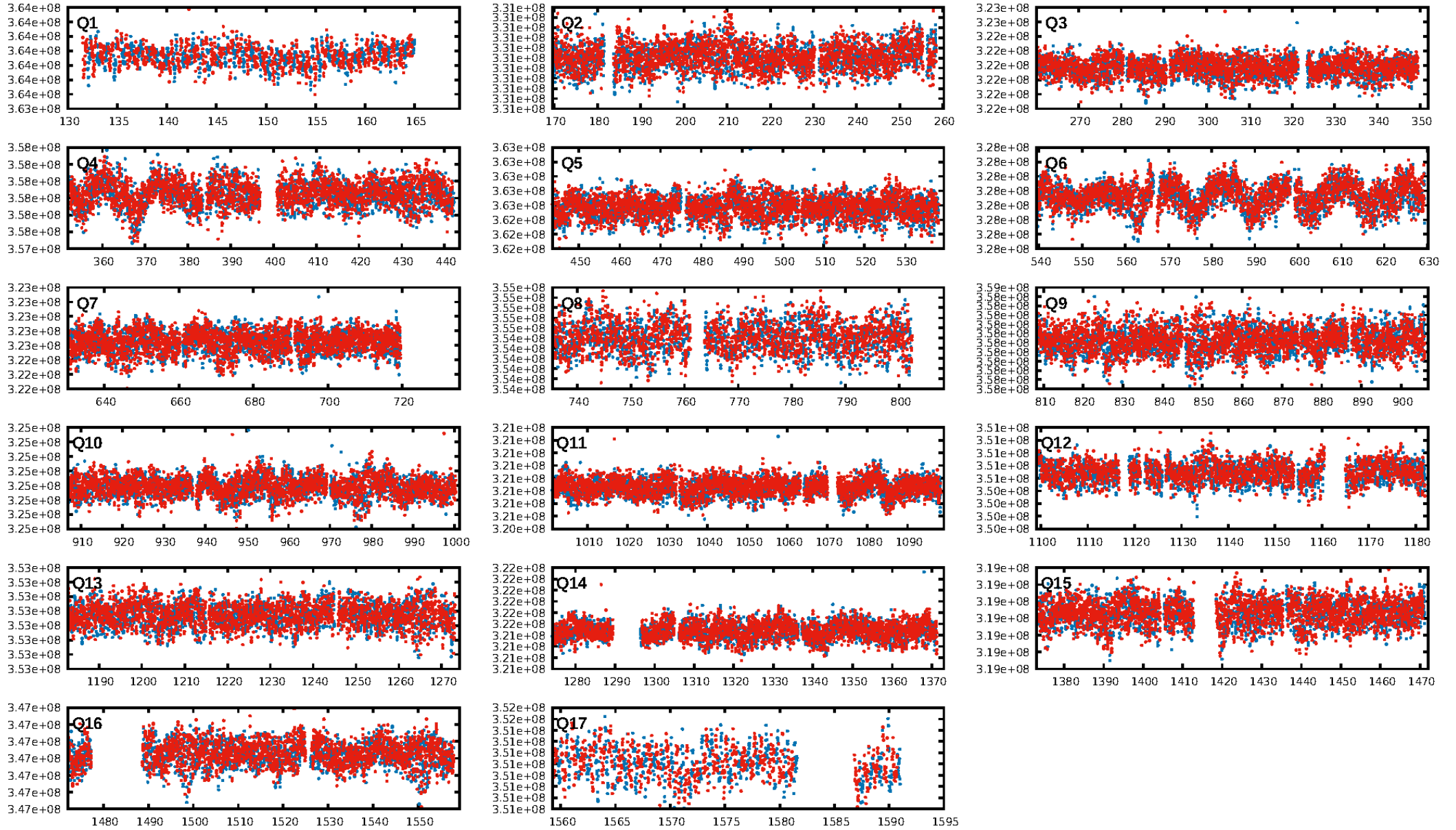
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 3.3% [0.04 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [1475/1492]  
GhostDiagnostic-chr: 4.17  
Centroid-sig: 0.0%  
Centroid-so: 1.915 arcsec [3.30 $\sigma$ ]  
OotOffset-rm: 0.768 arcsec [2.30 $\sigma$ ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-rm: 0.814 arcsec [2.61 $\sigma$ ]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.94 [15/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:53:05 Z

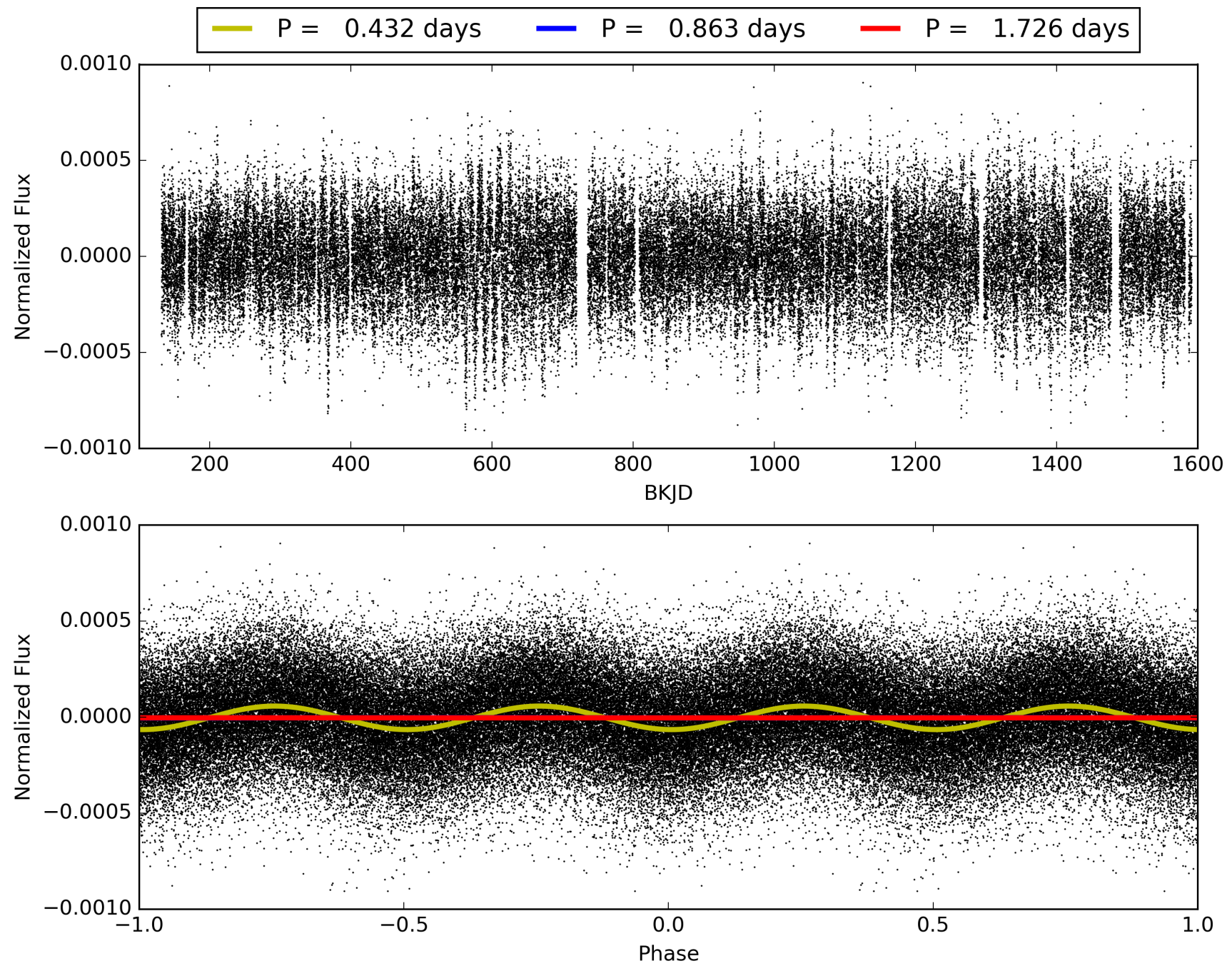
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006310397-01, PDC Light Curves





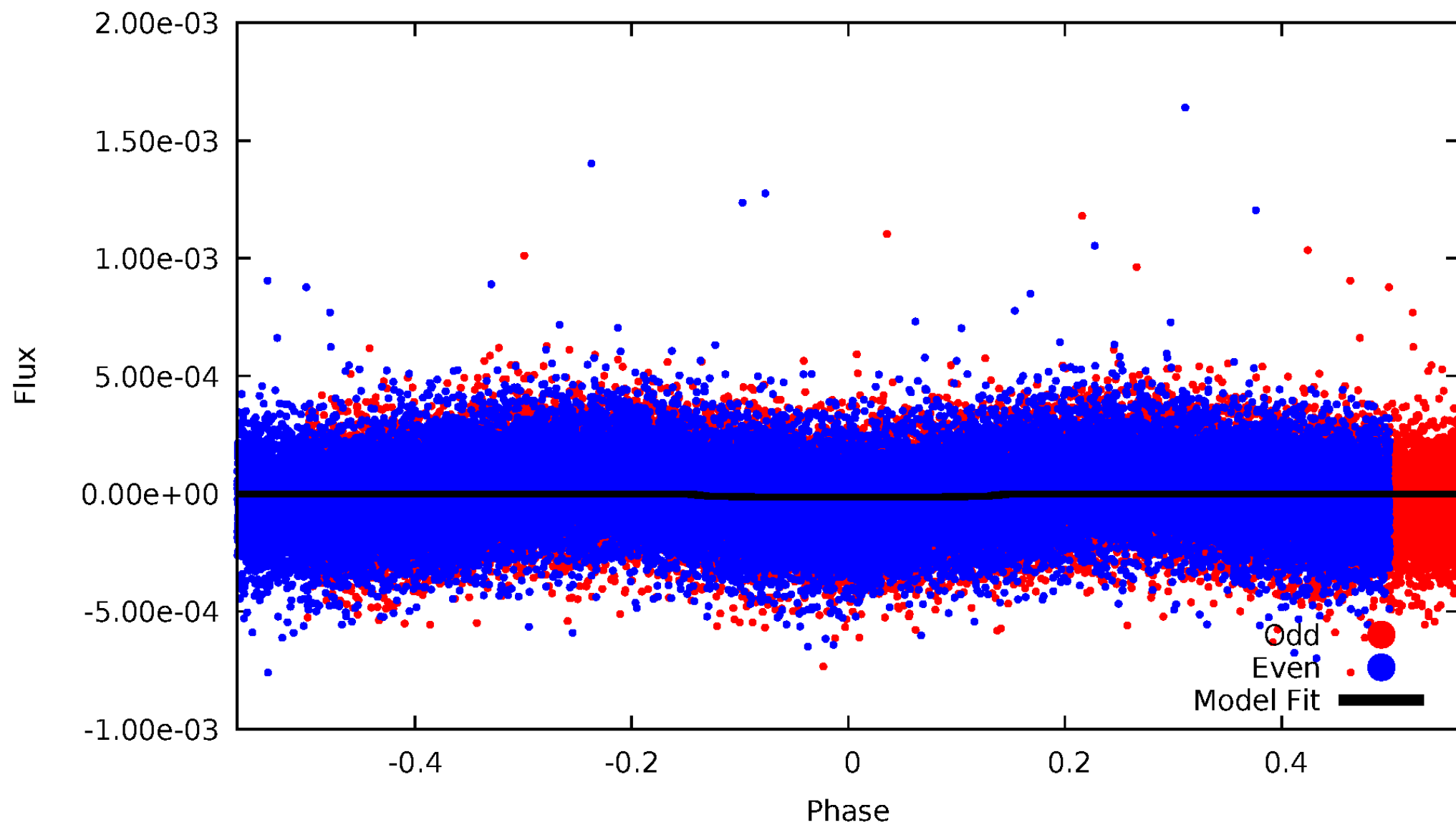
TCE 006310397-01





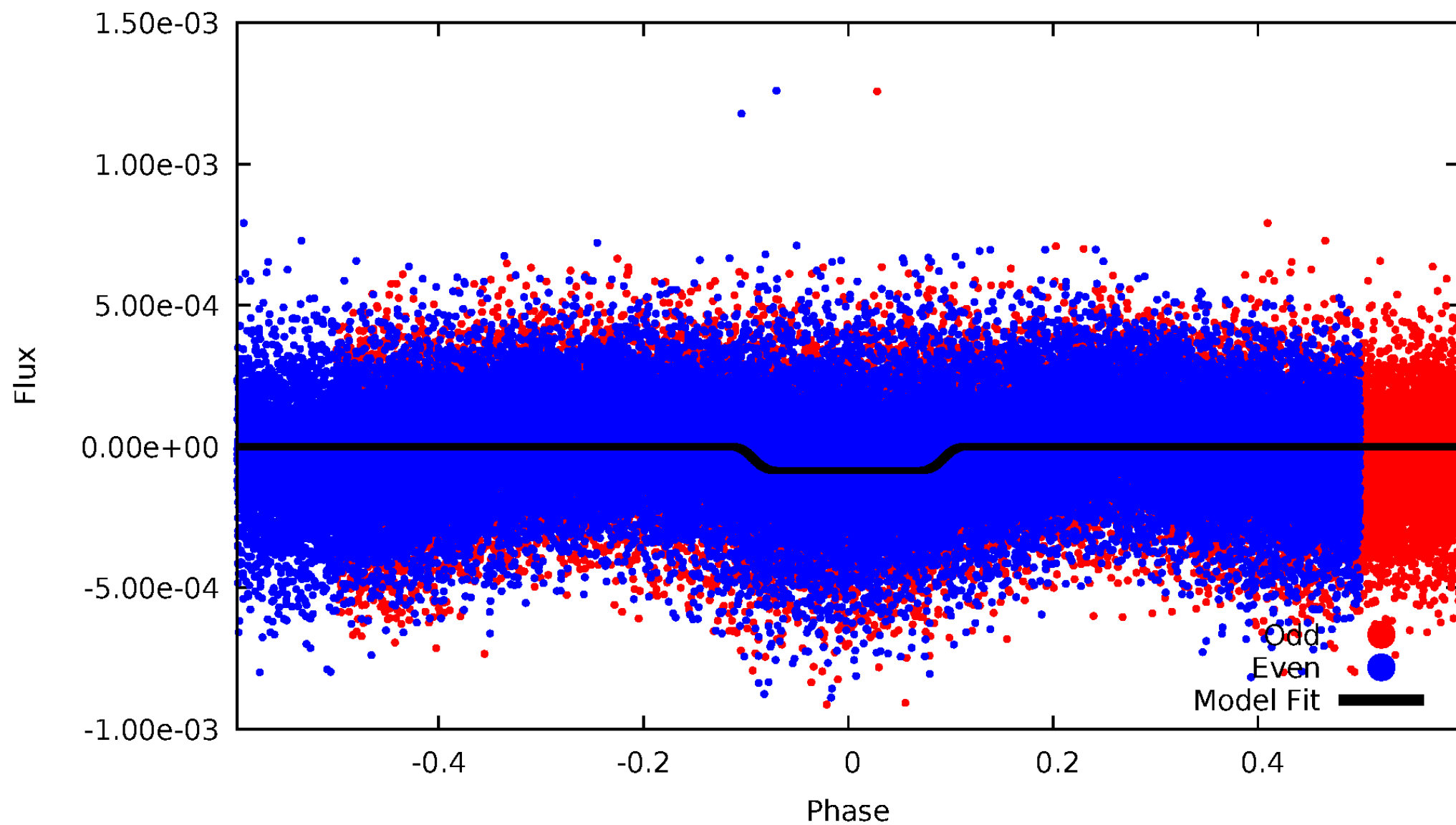
# DV Odd/Even

TCE 006310397-01

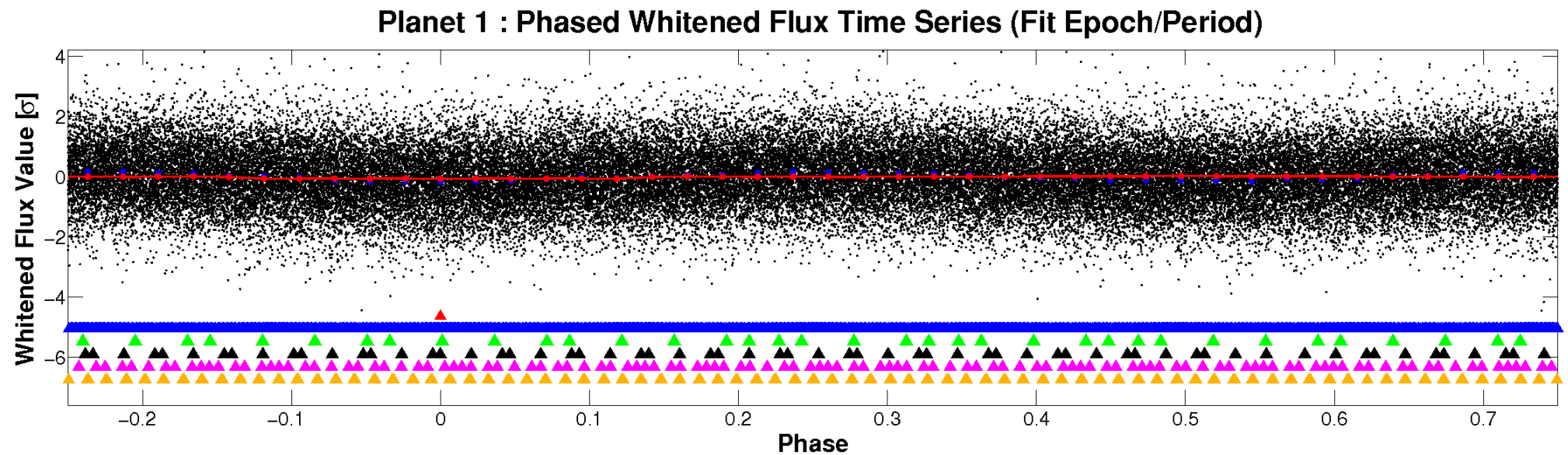
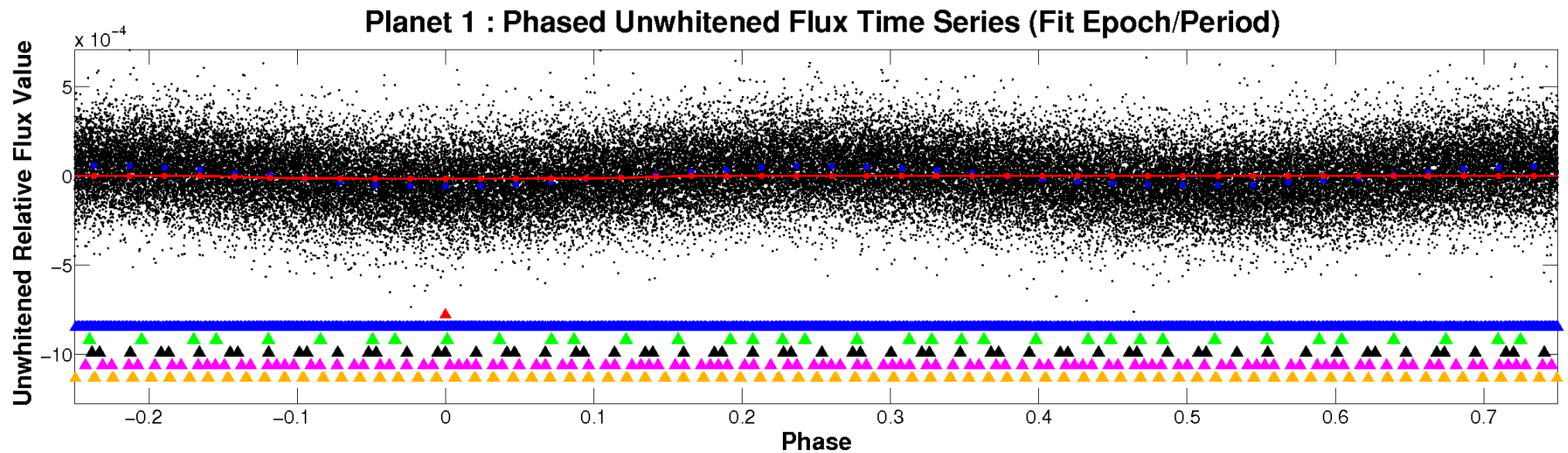


# ALT Odd/Even

TCE 006310397-01



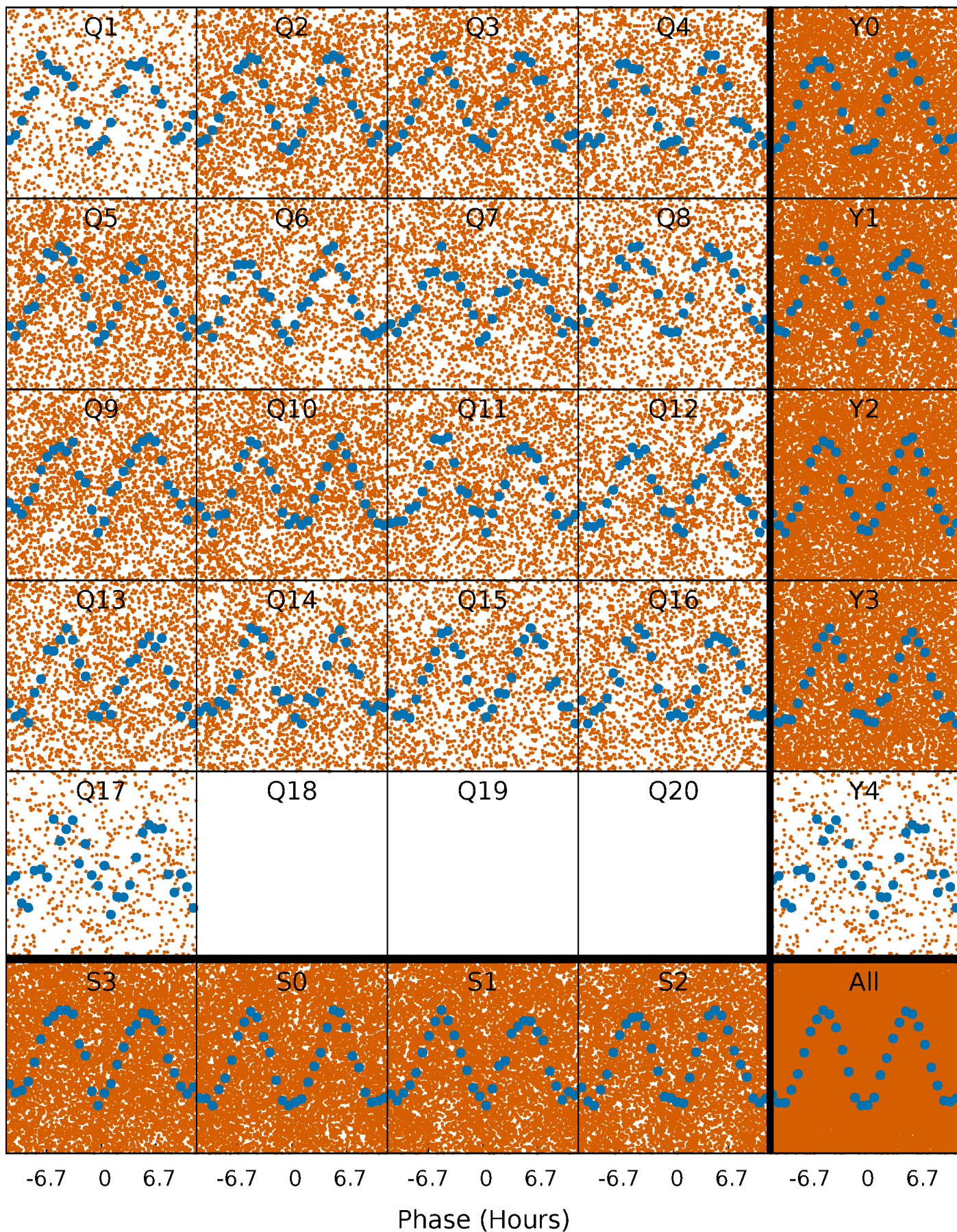
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

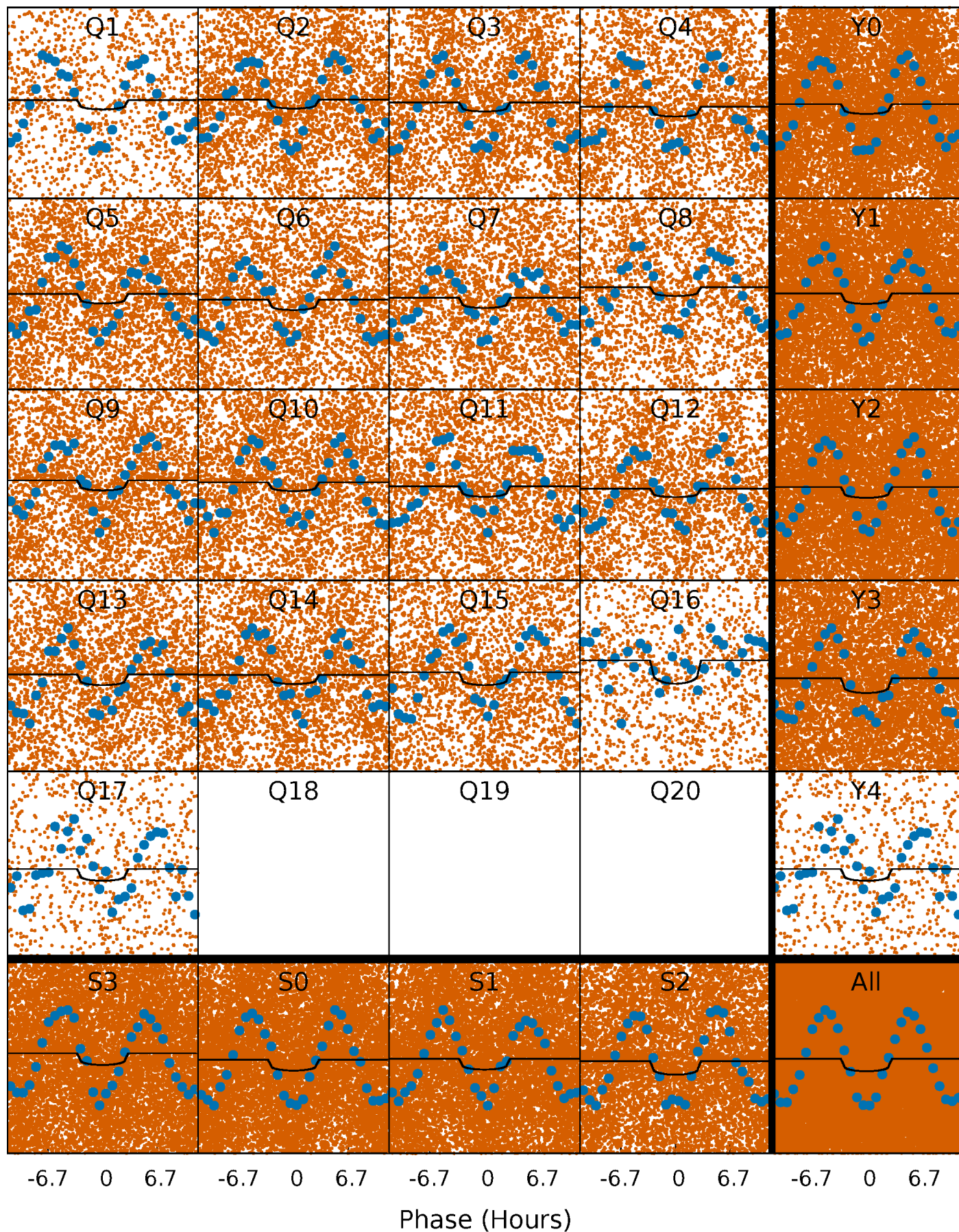
TCE 006310397-01 P= 0.863182 Days  $T_0=131.728634$  (BKJD)





# DV Quarter-Phased Transit Curves

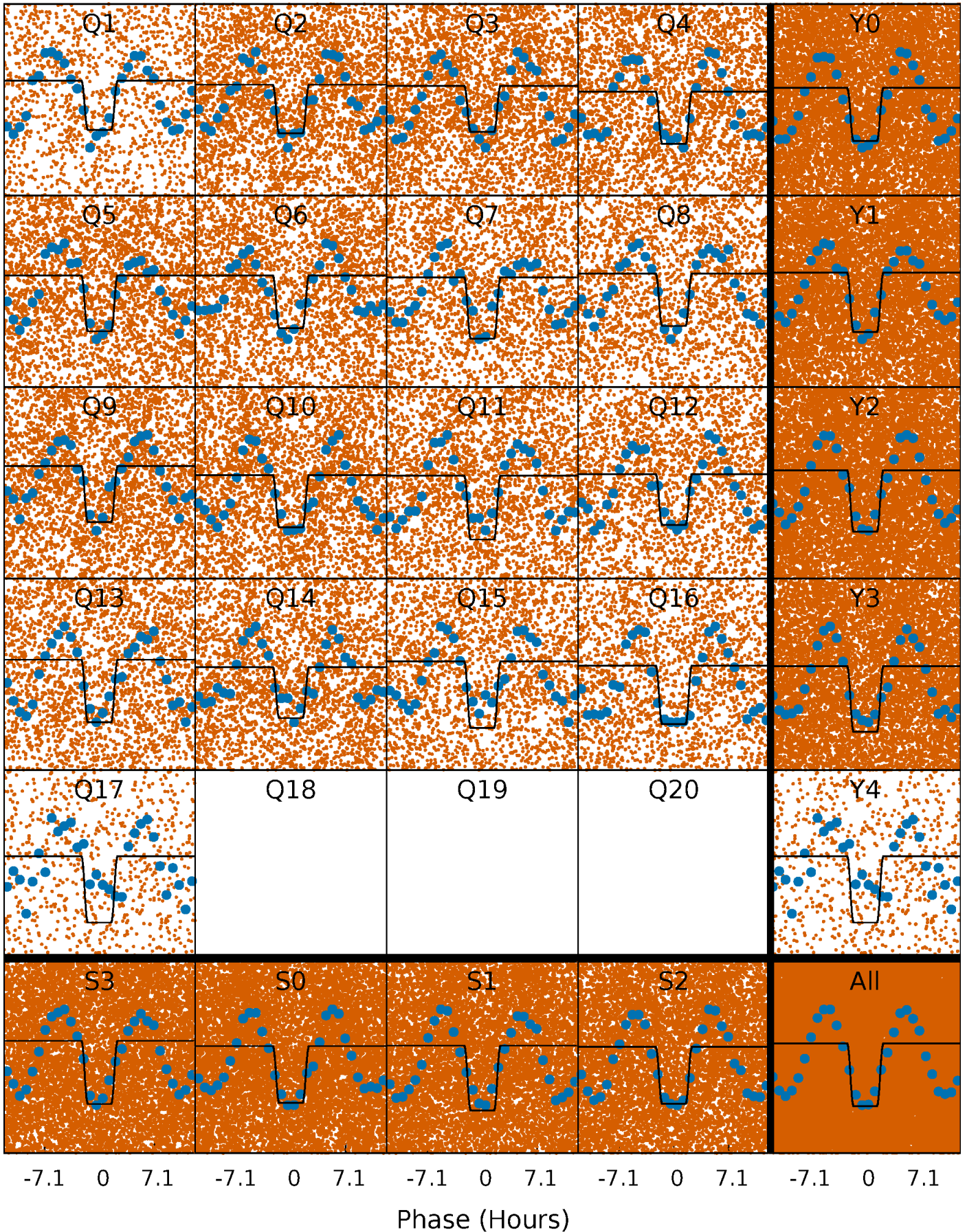
TCE 006310397-01 P= 0.863182 Days  $T_0=131.728634$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 006310397-01   P= 0.863197 Days    $T_0=131.720128$  (BKJD)

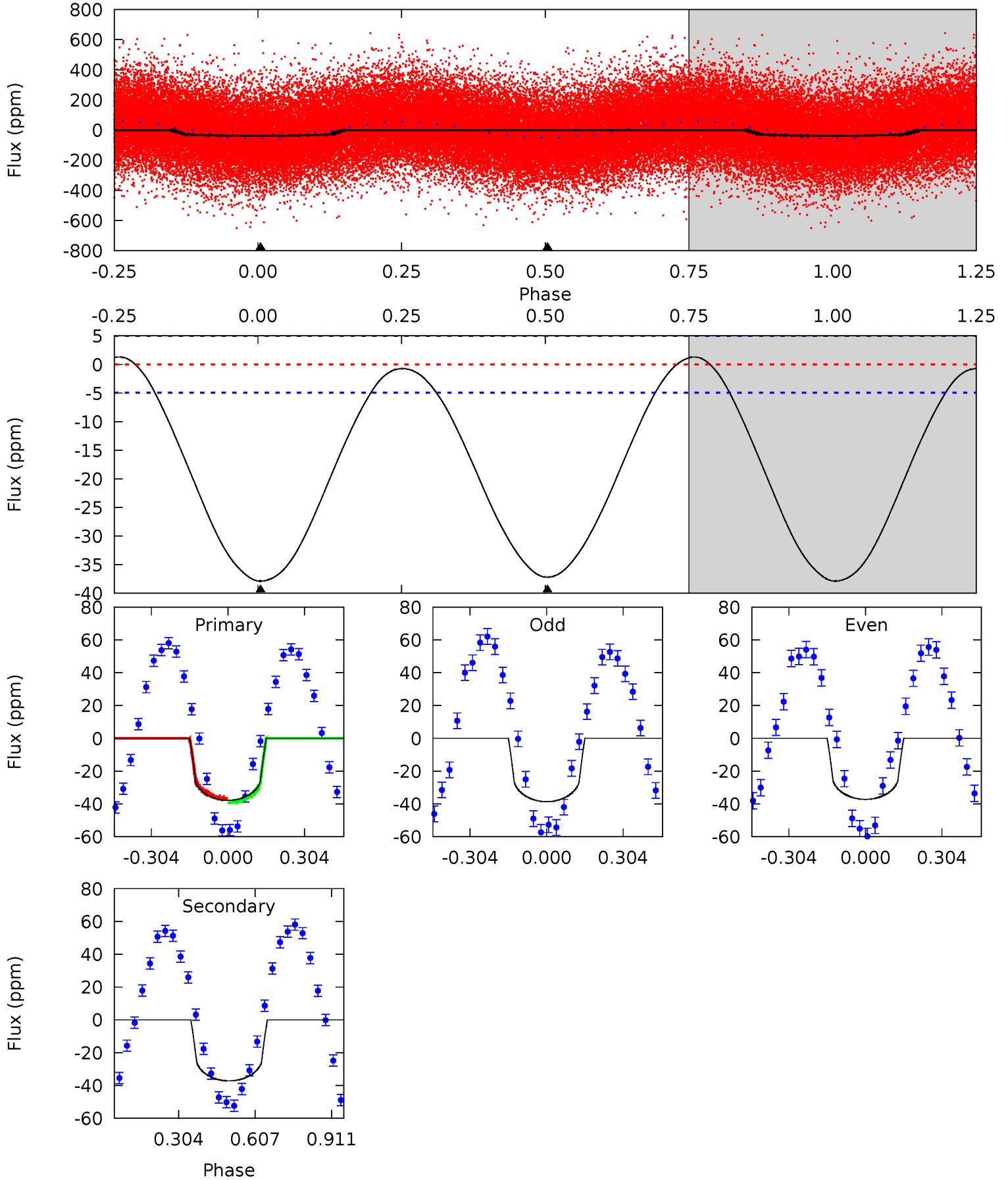




# DV Model-Shift Uniqueness Test

006310397-01, P = 0.863182 Days, E = 130.865452 Days

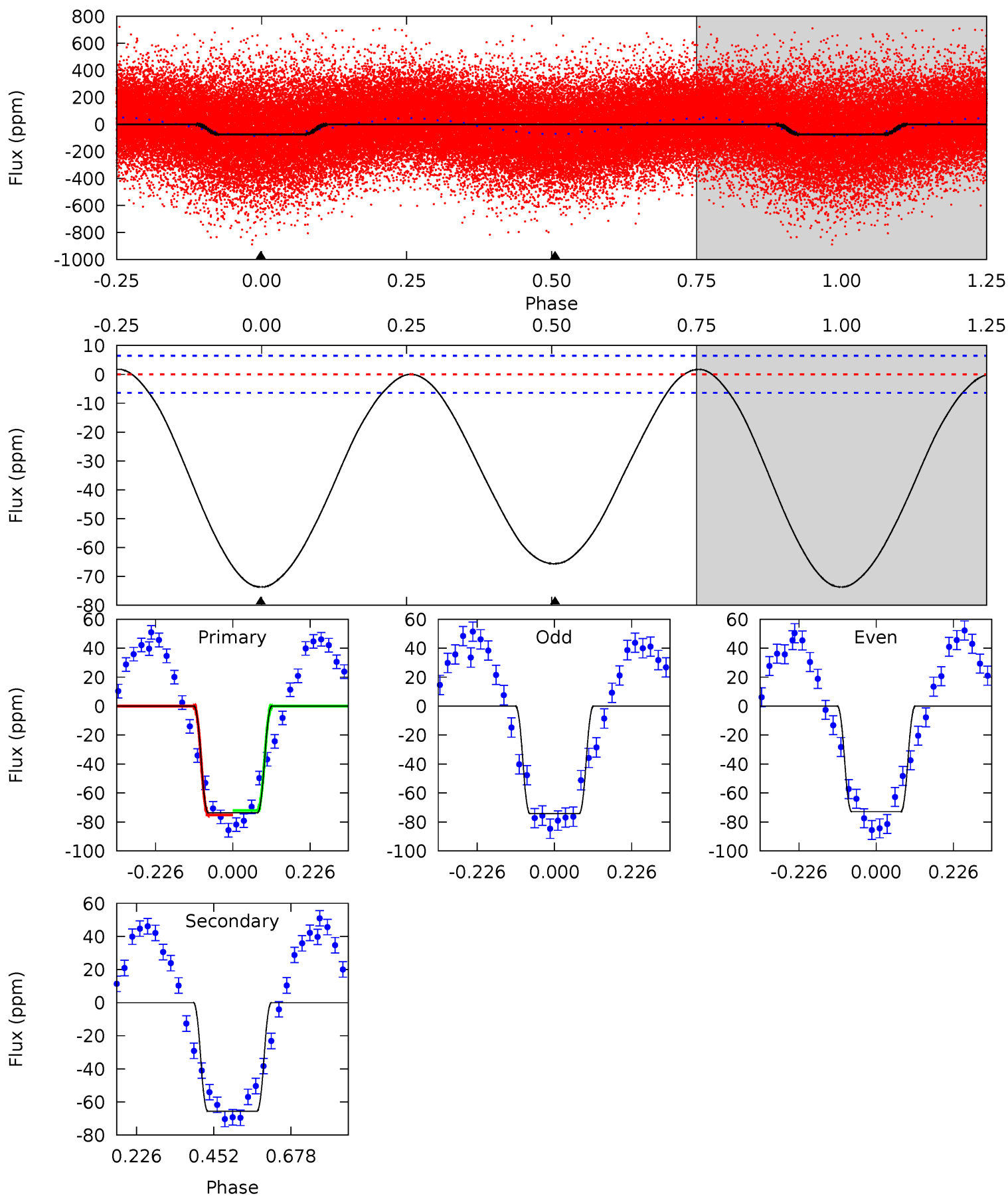
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.1	32.4	0	0	4.33	1.03	0.87	33.1	33.1	32.4	32.4	0.60	1.02	0.03	1.20



# Alt Model-Shift Uniqueness Test

006310397-01, P = 0.863197 Days, E = 130.856931 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
50.5	45.0	0	0	4.39	1.21	0.88	50.5	50.5	45.0	45.0	0.45	1.04	0.02	0.93



### Stellar Parameters For KIC 006310397

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7318^{+230}_{-307}$	$4.073^{+0.204}_{-0.167}$	$-0.220^{+0.250}_{-0.350}$	$1.857^{+0.507}_{-0.507}$	$1.486^{+0.209}_{-0.255}$	$0.327^{+0.382}_{-0.153}$
	+3%/-4%	+5%/-4%	+114%/-159%	+27%/-27%	+14%/-17%	+117%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006310397-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-37 \pm 1$	$0.76^{+0.49}_{-0.44}$	$4290^{+318}_{-323}$	$9974^{+11471}_{-2952}$	$15^{+65}_{-9}$
Alt.	$-66 \pm 1$	$1.84^{+0.61}_{-0.57}$	$4273^{+349}_{-340}$	$6629^{+1441}_{-863}$	$4.406^{+4.708}_{-1.886}$

$T_{\text{max}}$  = 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

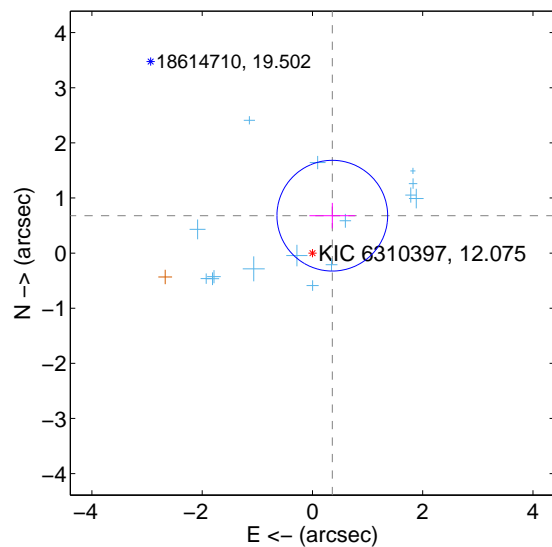
Supplemental centroid analysis for 006310397-01. Kepler magnitude: 12.07. Transit SNR 8.02

There are 15 quarters with good PRF difference image offsets

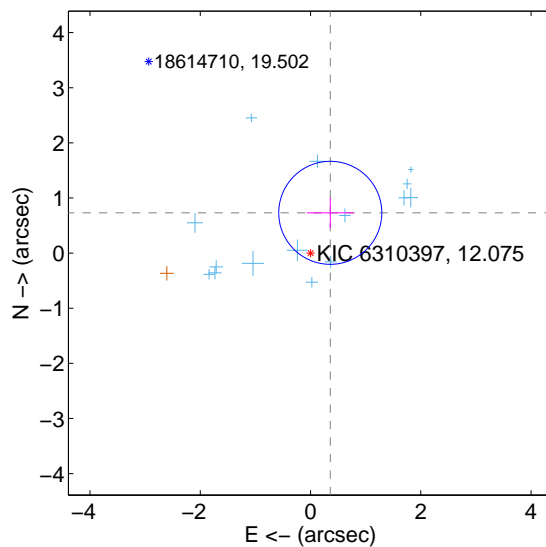
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.768 \pm 0.335$	2.30	$-0.360 \pm 0.416$	$0.679 \pm 0.231$
PRF-fit source offset from KIC position	$0.814 \pm 0.312$	2.61	$-0.358 \pm 0.427$	$0.731 \pm 0.277$
photometric centroid source offset	$1.92 \pm 0.58$	3.30	$0.76 \pm 0.86$	$-1.76 \pm 0.51$

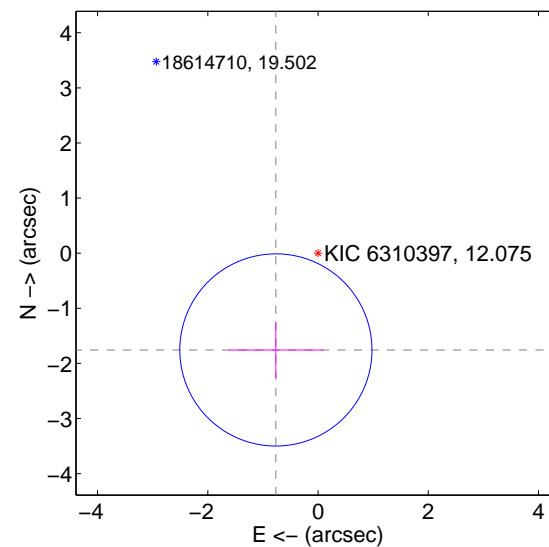
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

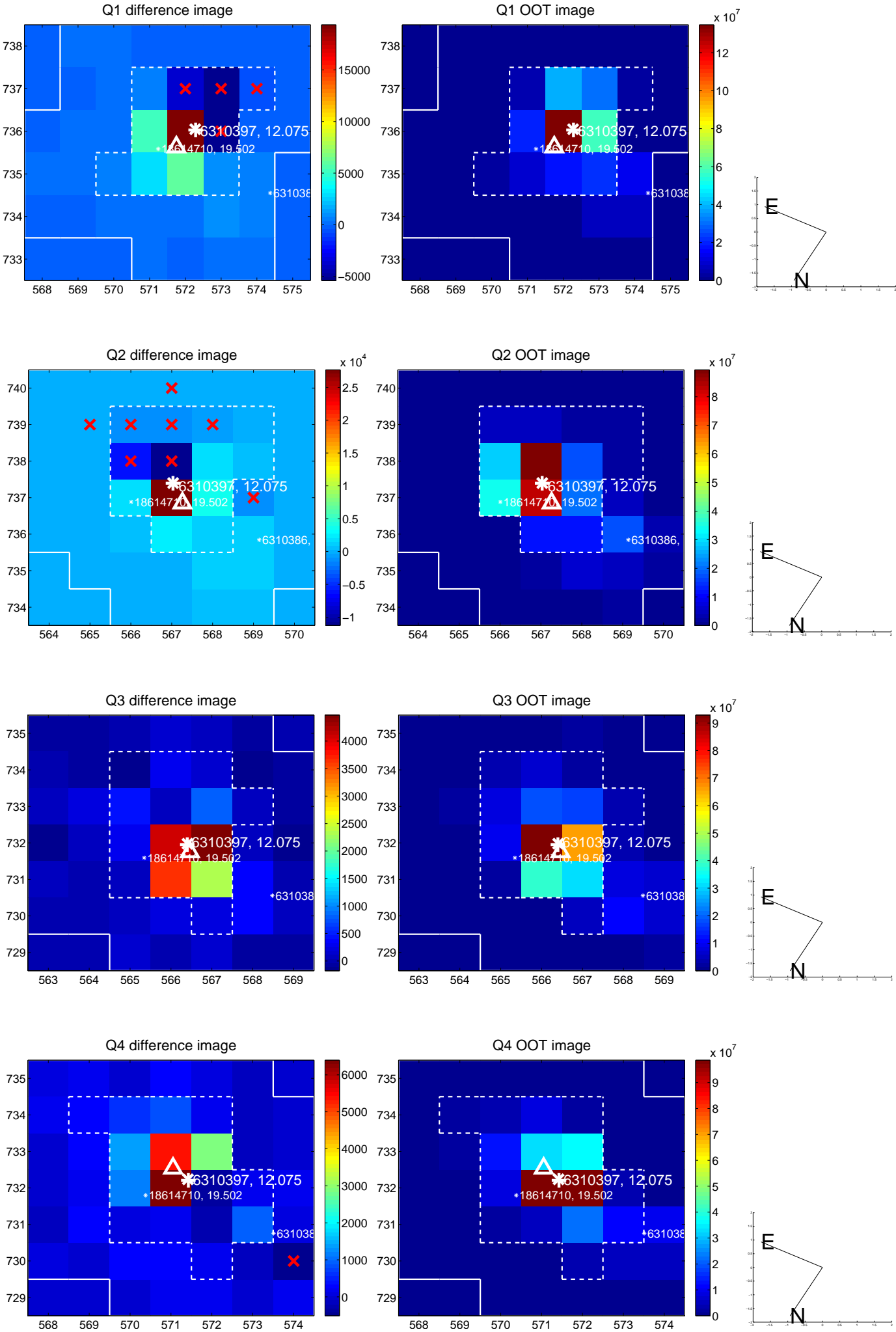


offset from photometric centroids

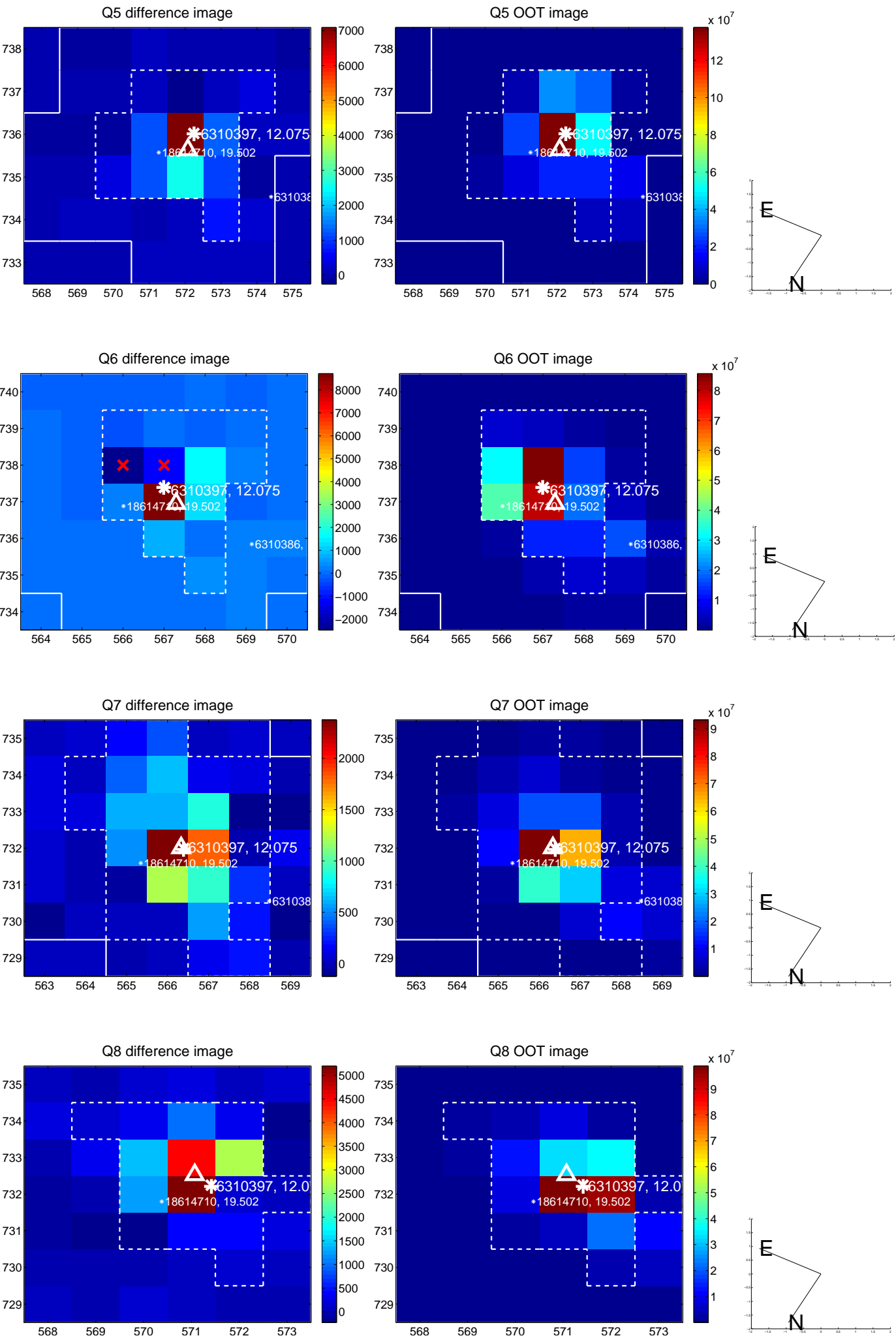


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

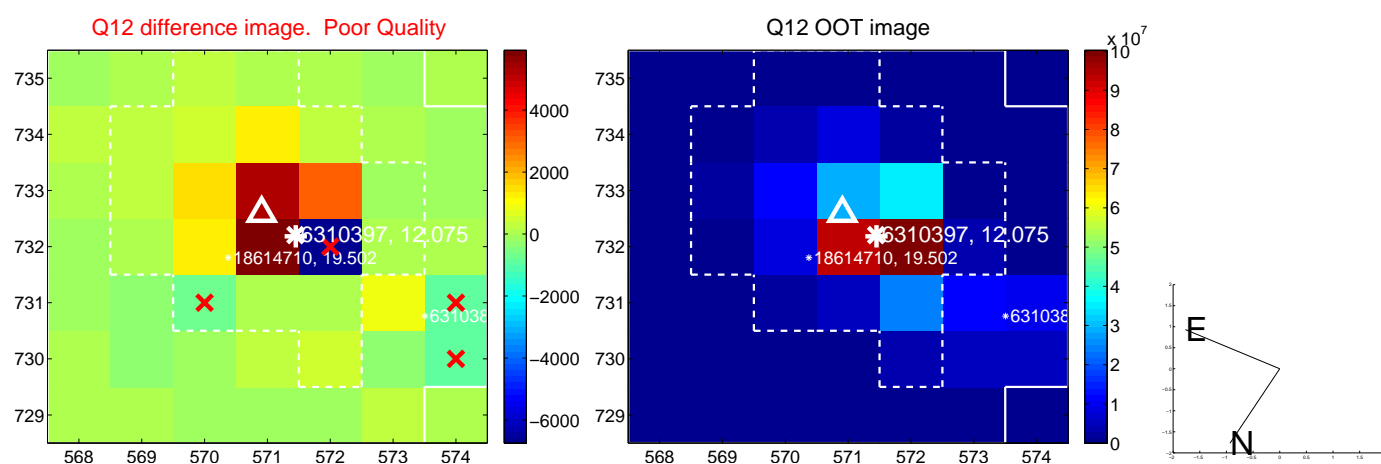
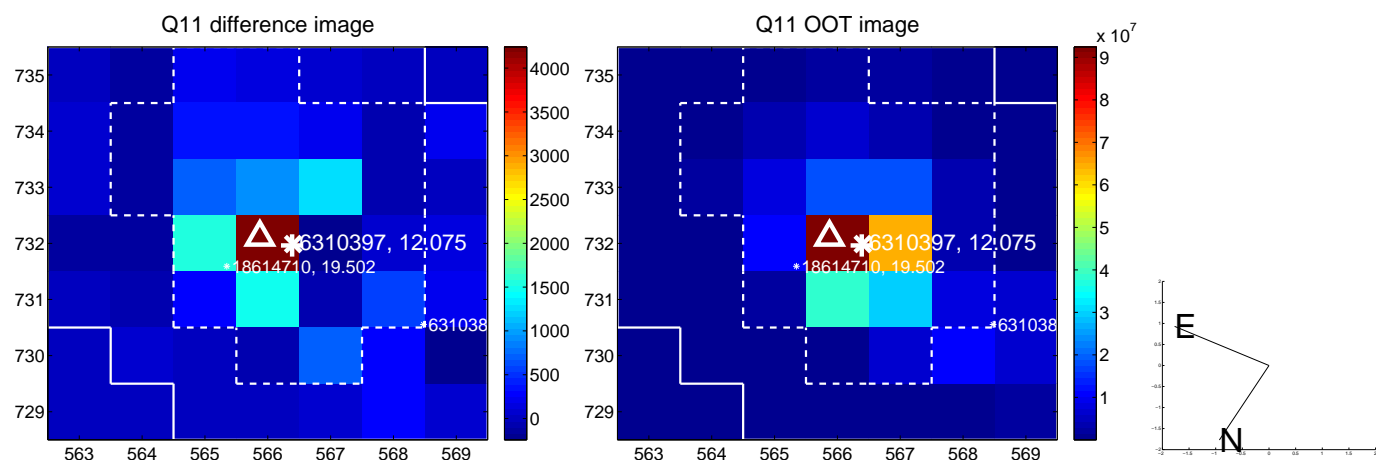
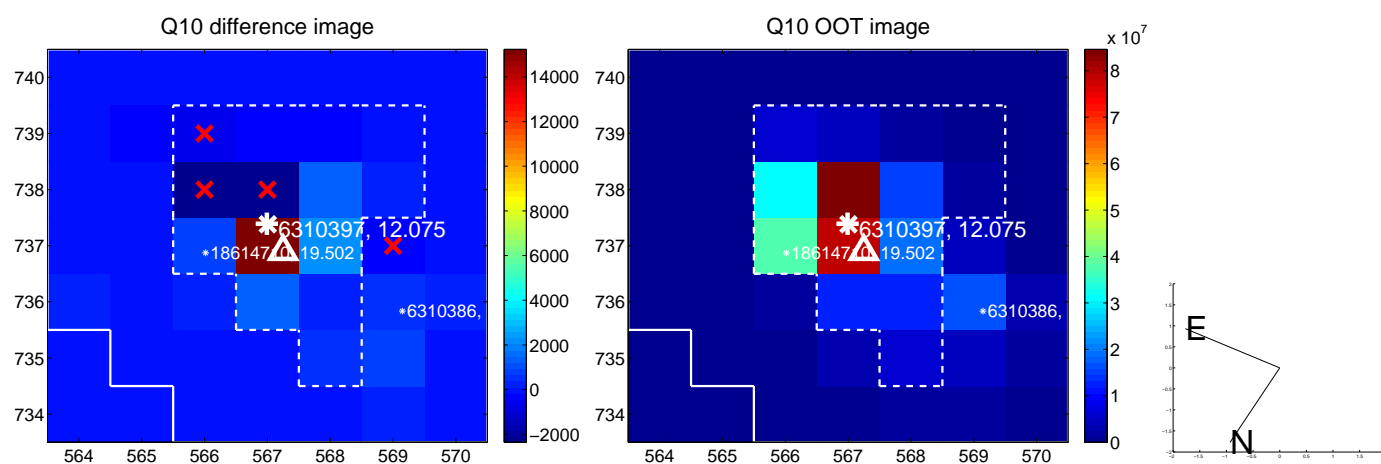
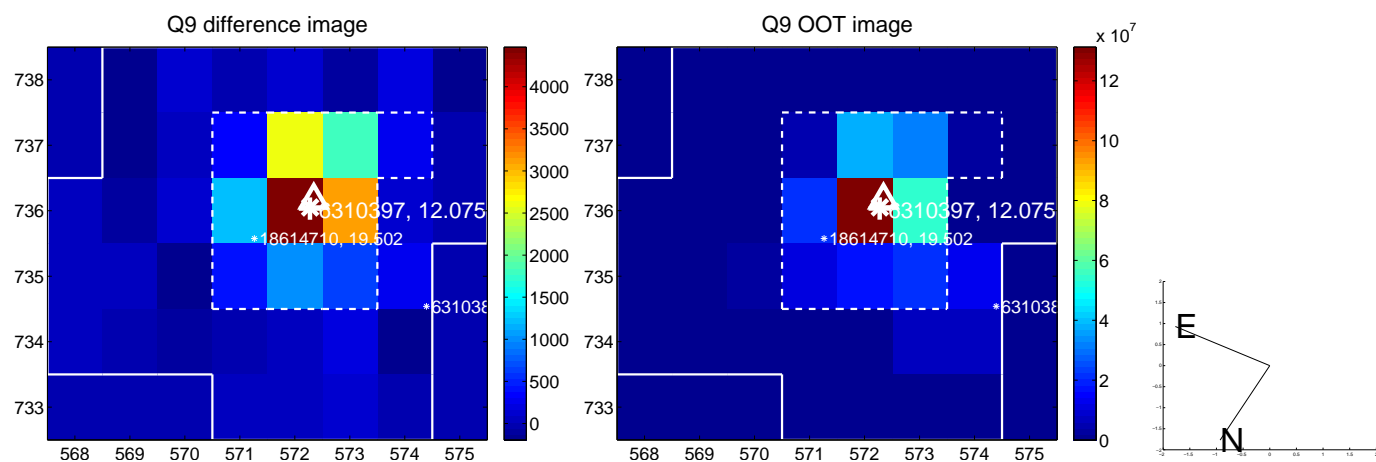


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

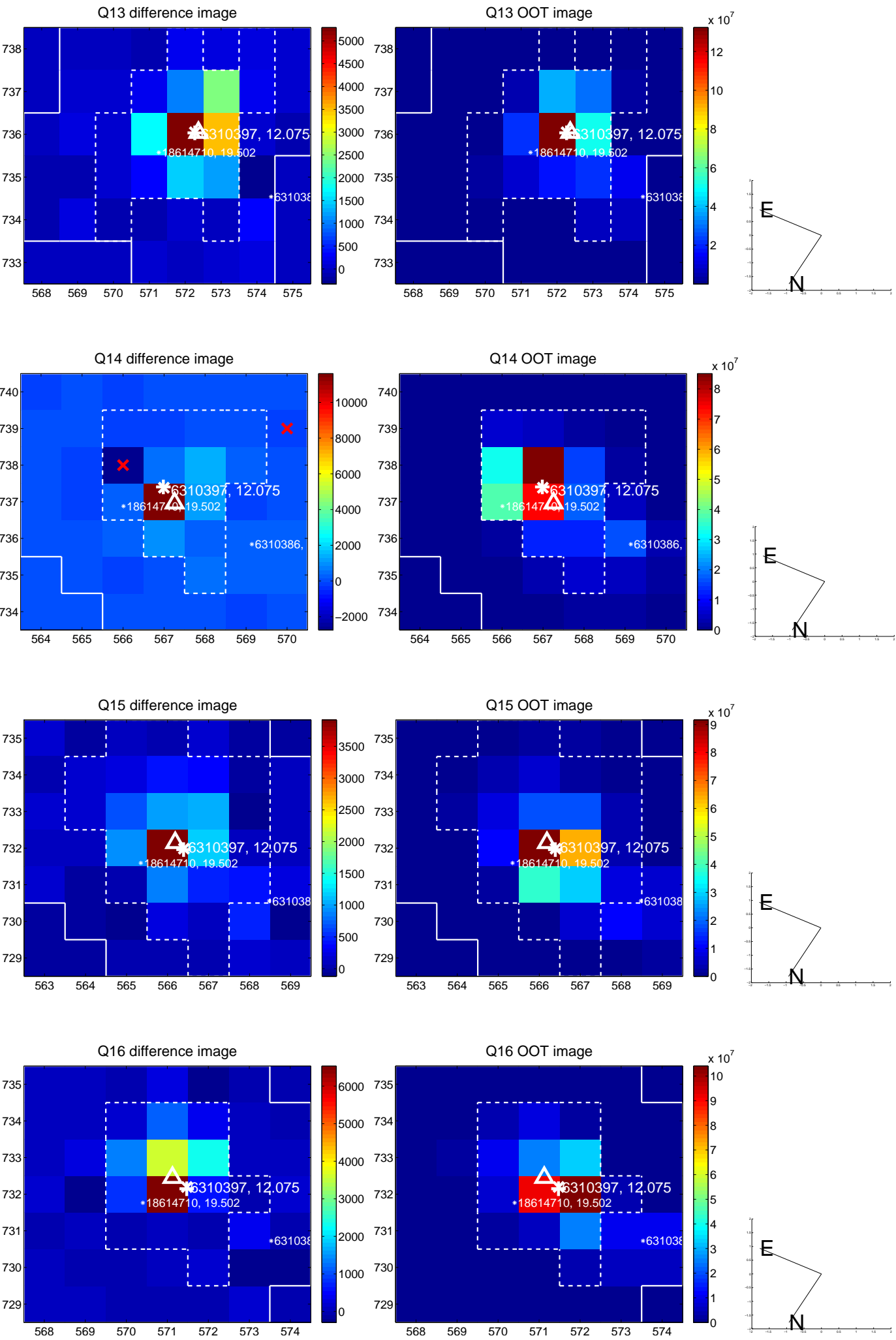




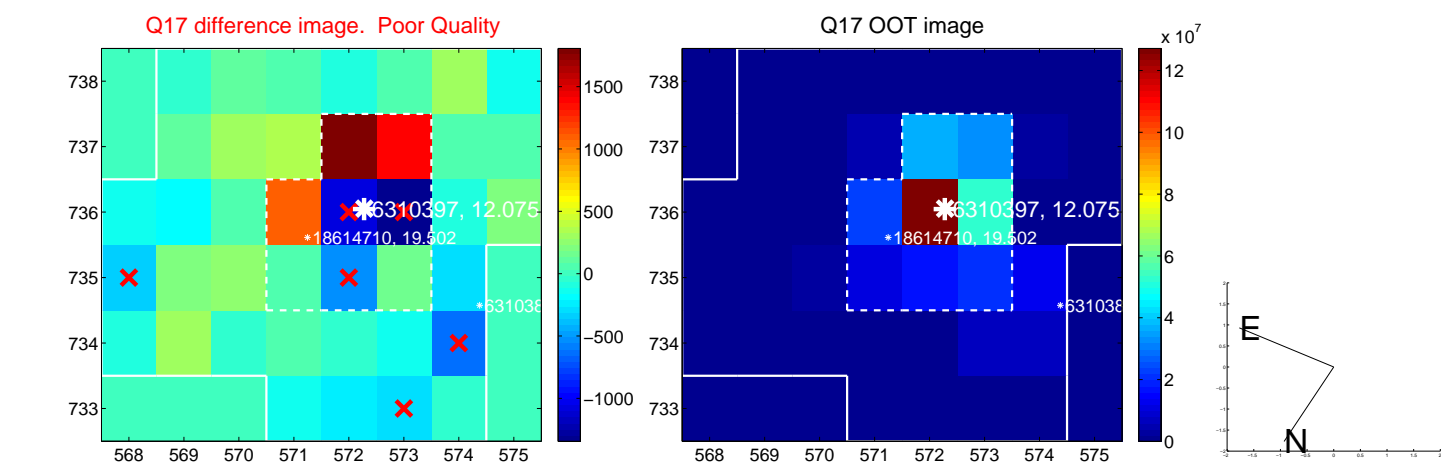
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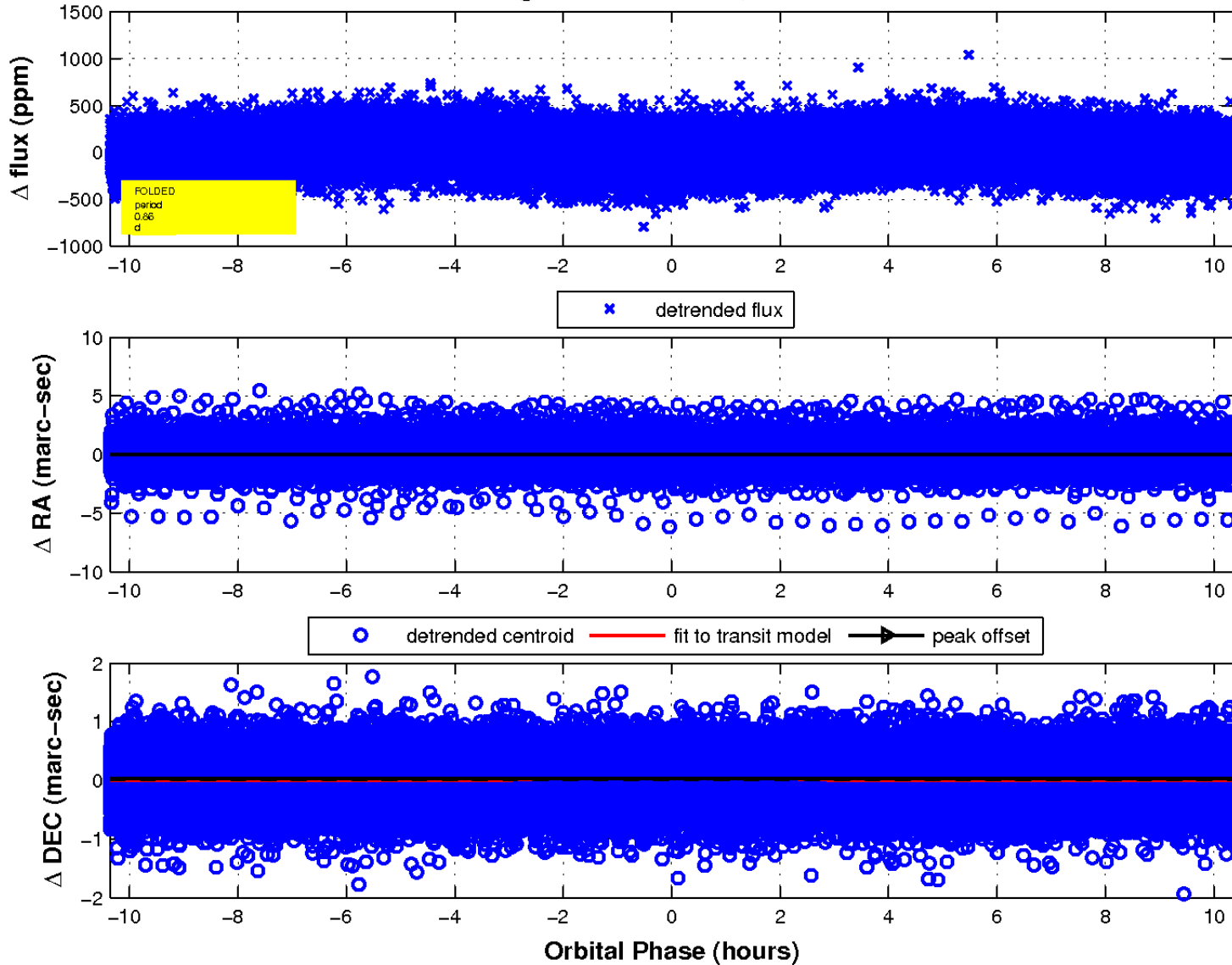
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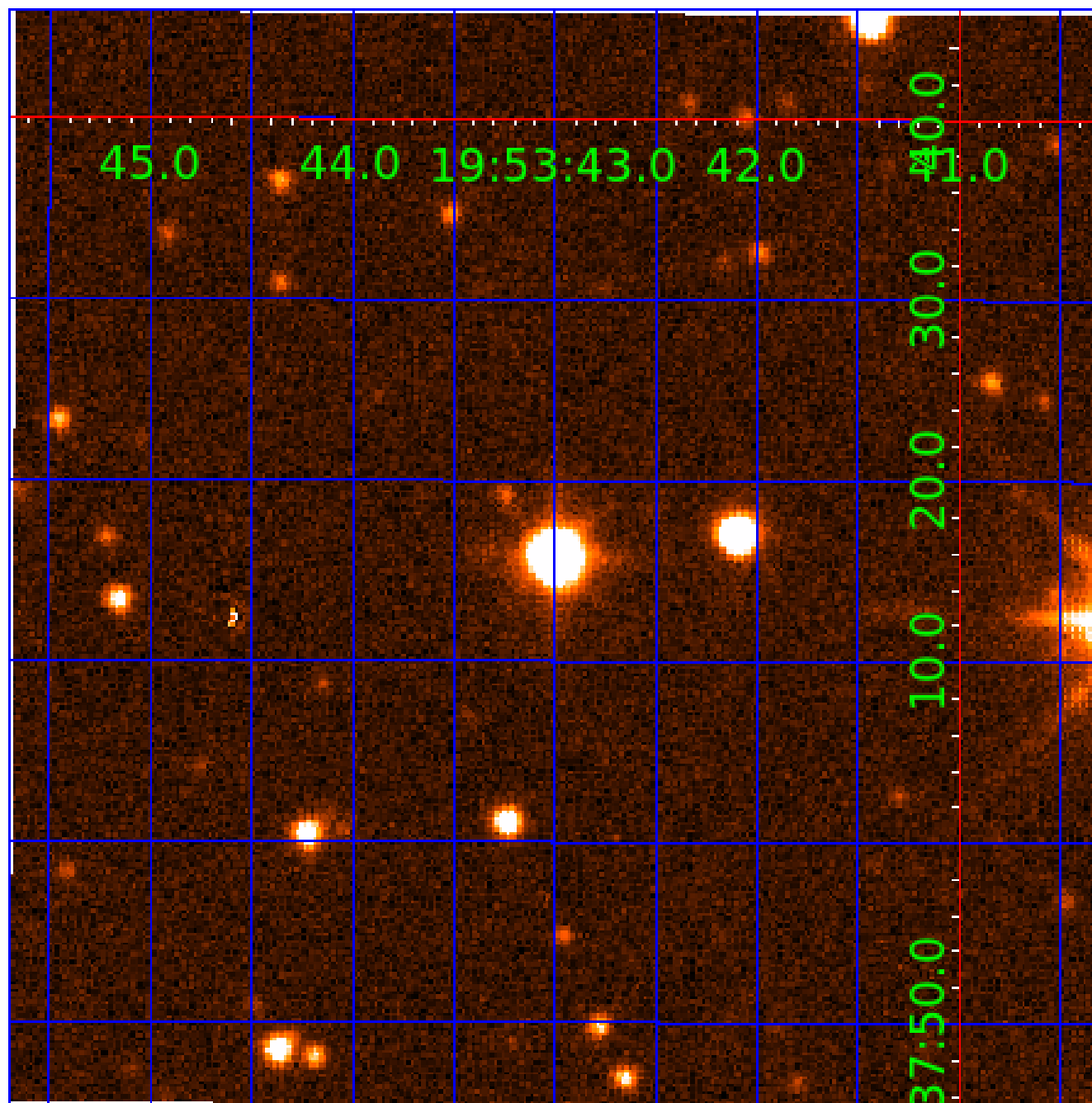


fluxWeightedCentroids, Planet 1 of 6



UKIRT Image

Declination





# KIC 006310397

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006310397-01	OBS	No	0.863182	131.728634	14.8	5.846	8.2	8.0	1.86	7318	0.73	21587.48
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006310397-06	OBS	No	9.439660	134.800797	197.5	4.500	9.9	-1.0	1.86	7318	2.64	889.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006310397-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006310397-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT
006310397-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—MOD_NONUNIQ_DV
006310397-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

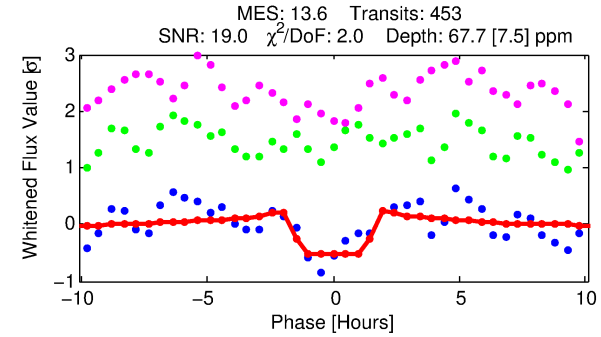
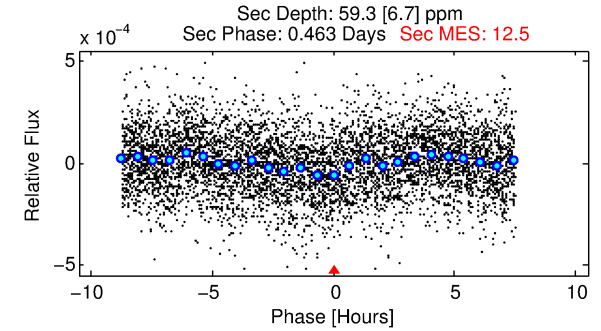
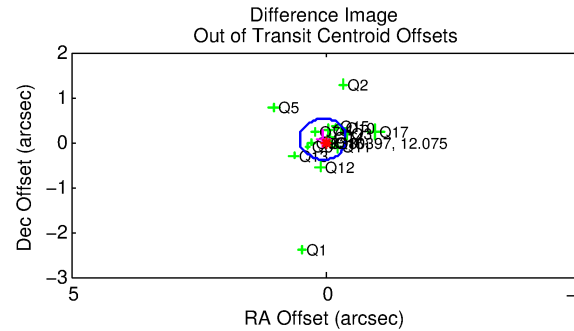
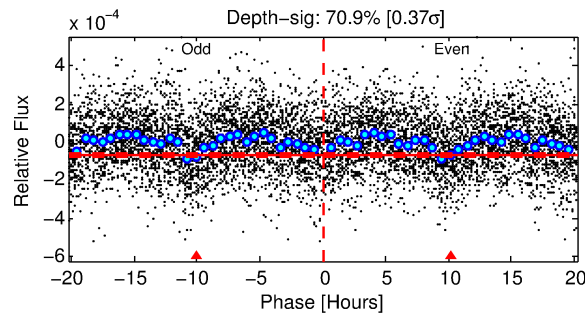
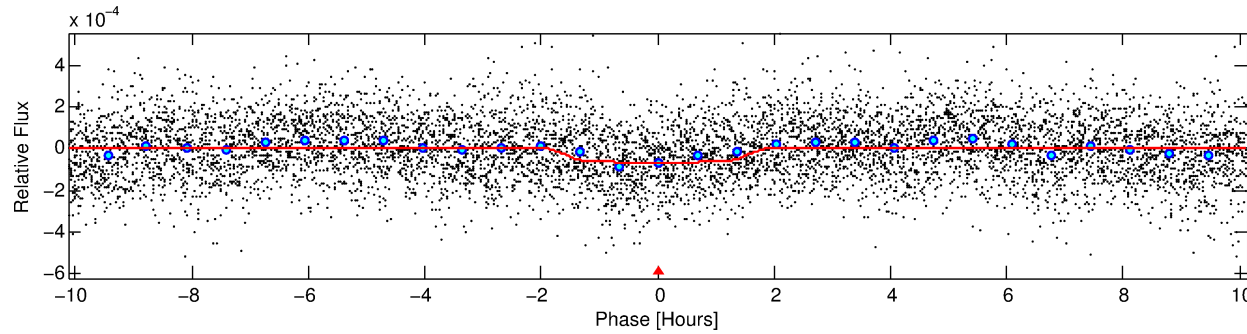
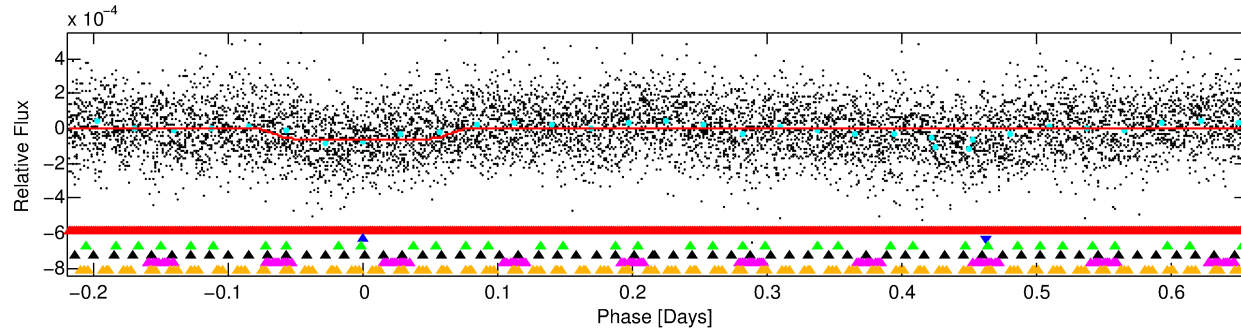
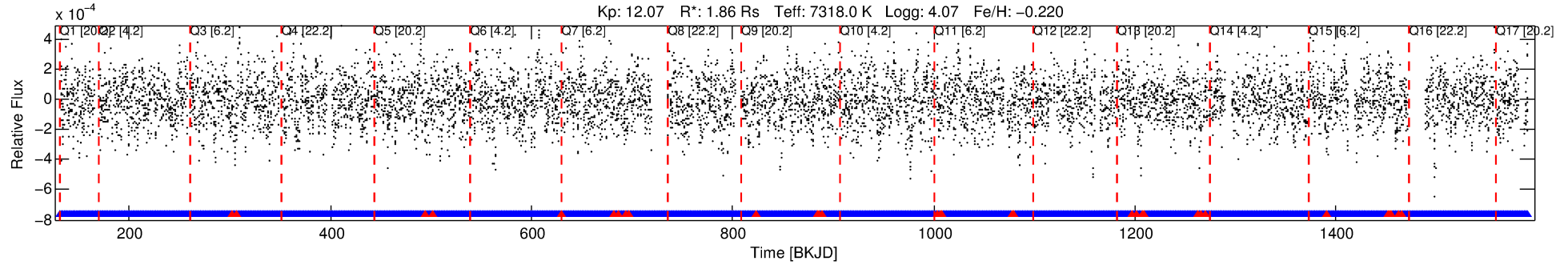
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006310397-02

No Significant Match Found

# DV One-Page Summary

KIC: 6310397 Candidate: 2 of 6 Period: 0.875 d



## DV Fit Results:

Period = 0.87497 [0.00001] d  
Epoch = 131.5609 [0.0024] BKJD  
Rp/R\* = 0.0087 [0.0031]  
a/R\* = 1.32 [1.22]  
b = 0.89 [0.50]  
Seff = 21200.48 [8462.99]  
Teq = 3077 [307] K  
Rp = 1.77 [0.79] Re  
a = 0.0204 [0.0049] AU  
Ag = 4.37 [3.53] [0.96 $\sigma$ ]  
Teffp = 6879 [1273] K [2.90 $\sigma$ ]

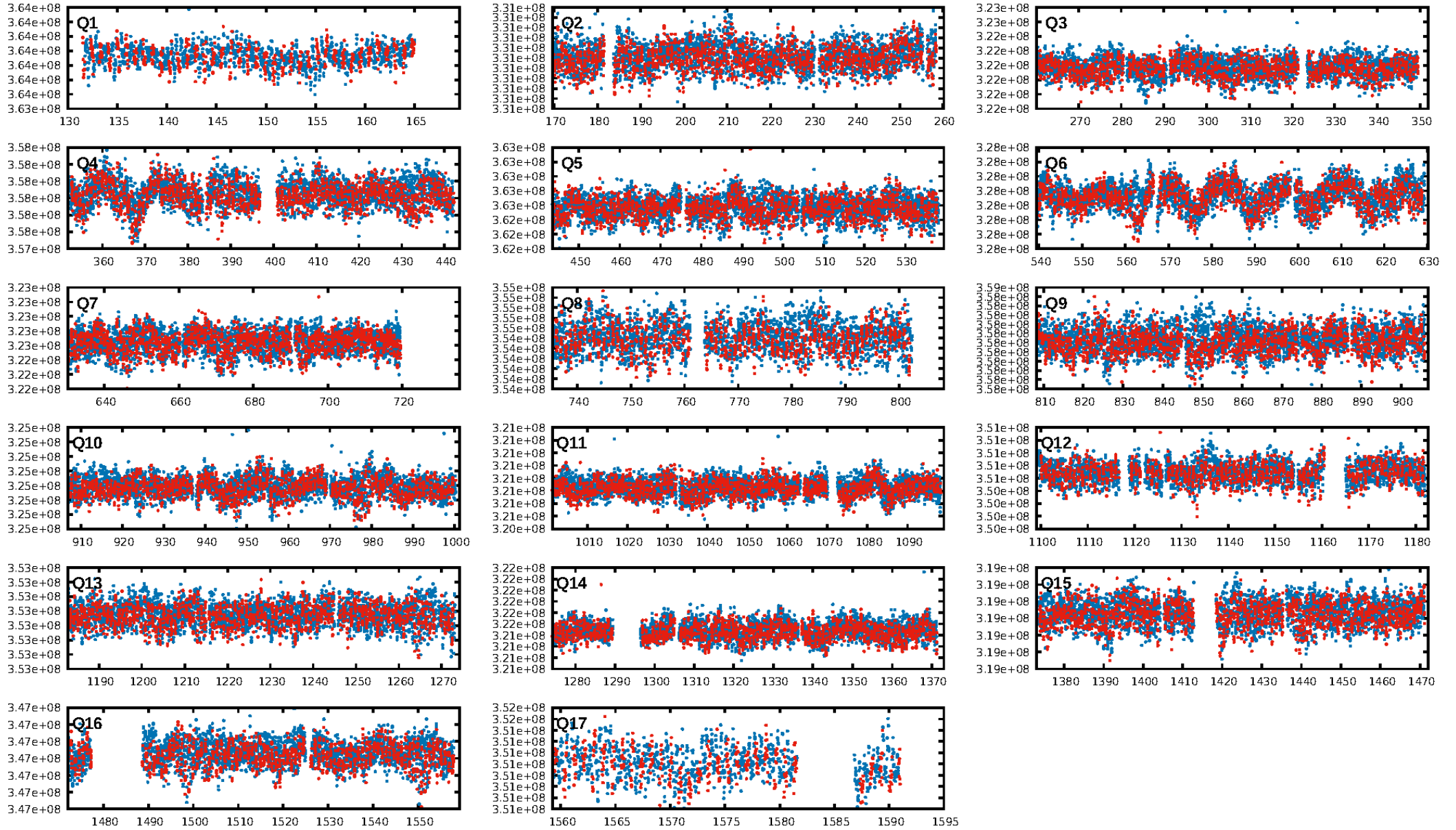
## DV Diagnostic Results:

ShortPeriod-sig: 3.3% [0.04 $\sigma$ ]  
LongPeriod-sig: 100.0% [36.54 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.92 [407/442]  
GhostDiagnostic-chr: 1.623  
Centroid-sig: 0.7%  
Centroid-so: 0.219 arcsec [1.48 $\sigma$ ]  
OotOffset-rm: 0.087 arcsec [0.57 $\sigma$ ]  
KicOffset-rm: 0.138 arcsec [0.81 $\sigma$ ]  
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: 31-Jan-2016 05:53:18 Z

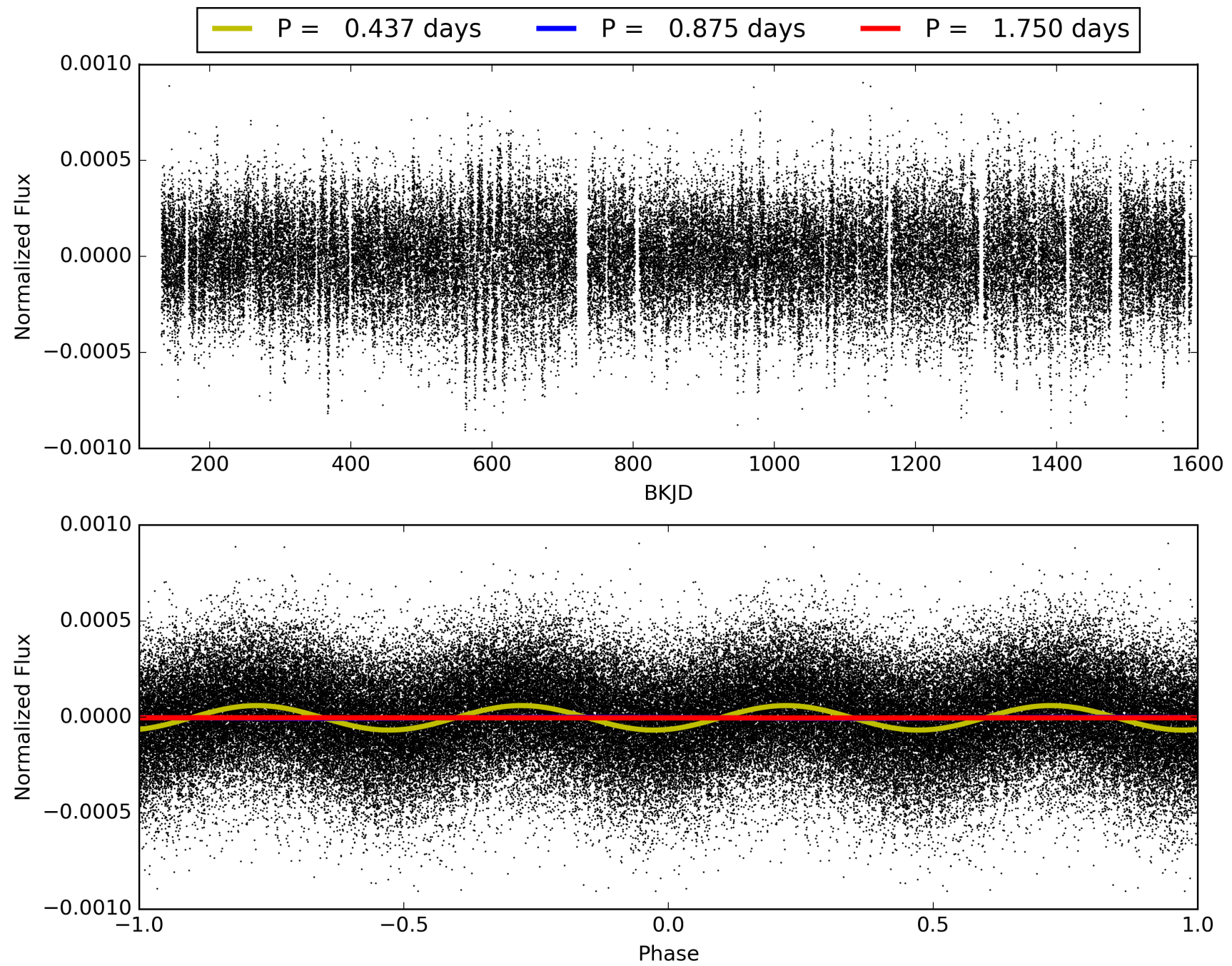
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006310397-02, PDC Light Curves



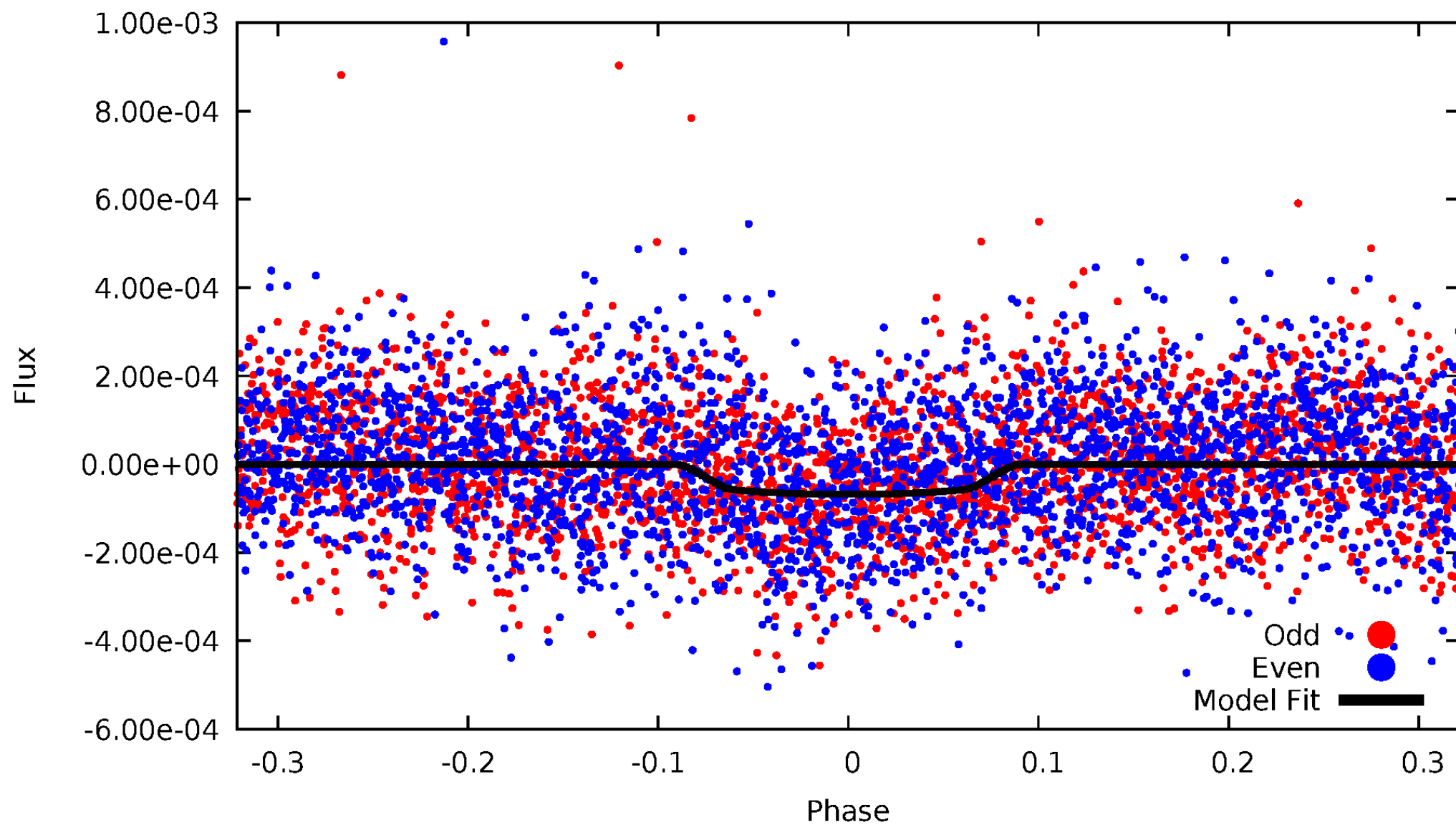


TCE 006310397-02



DV Odd/Even

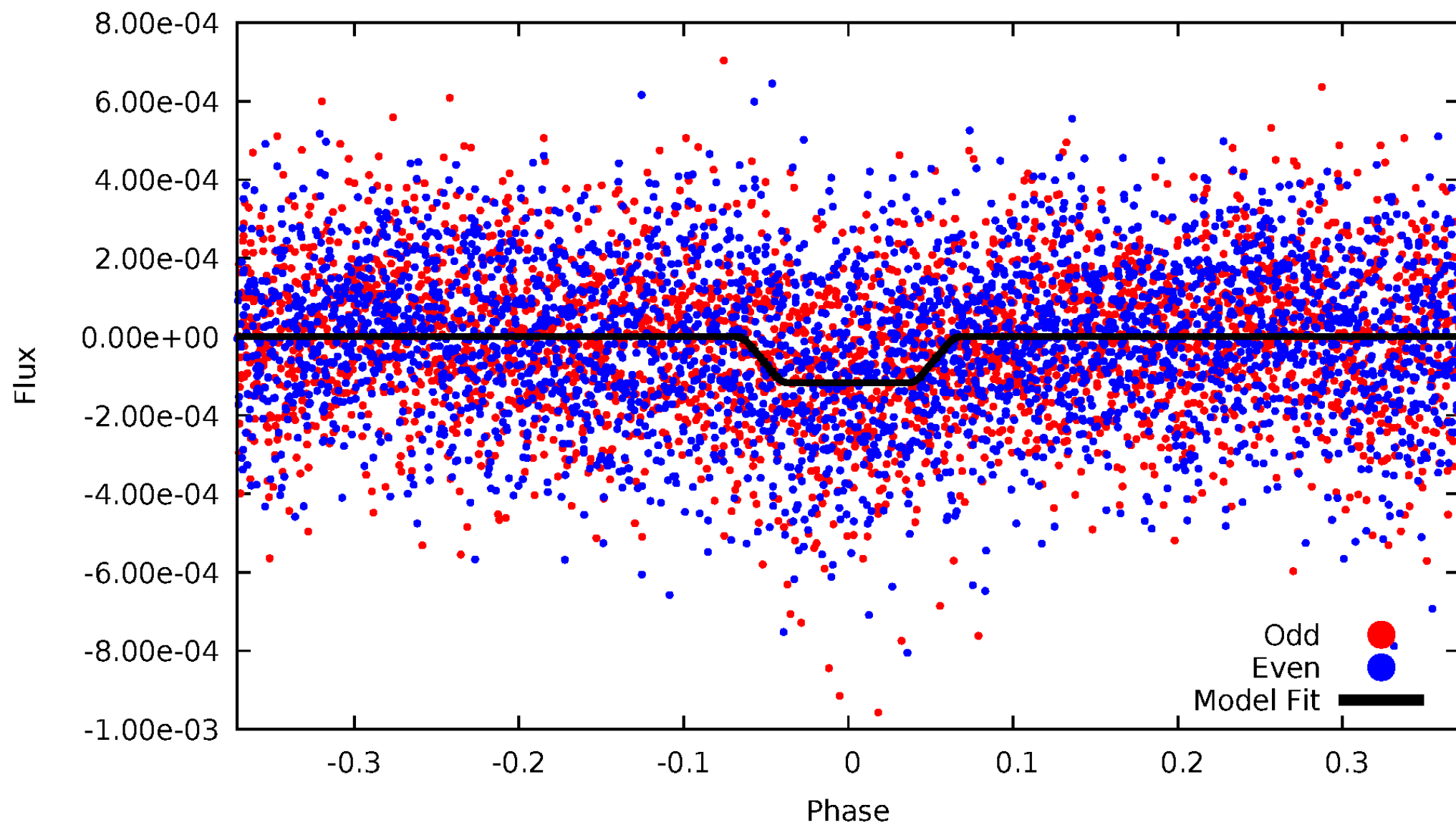
TCE 006310397-02





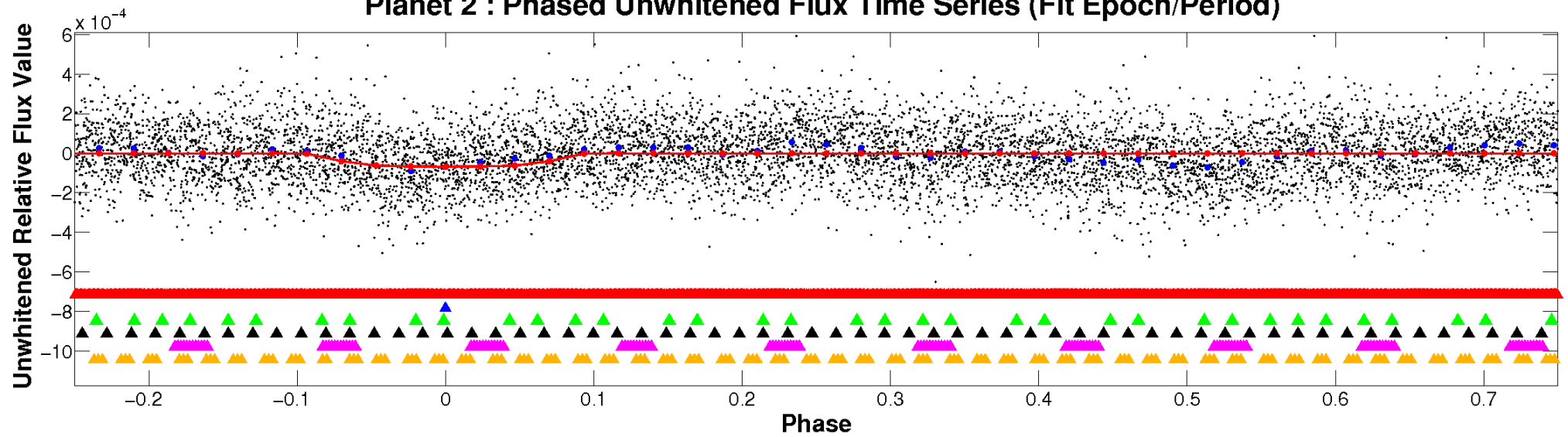
# ALT Odd/Even

TCE 006310397-02

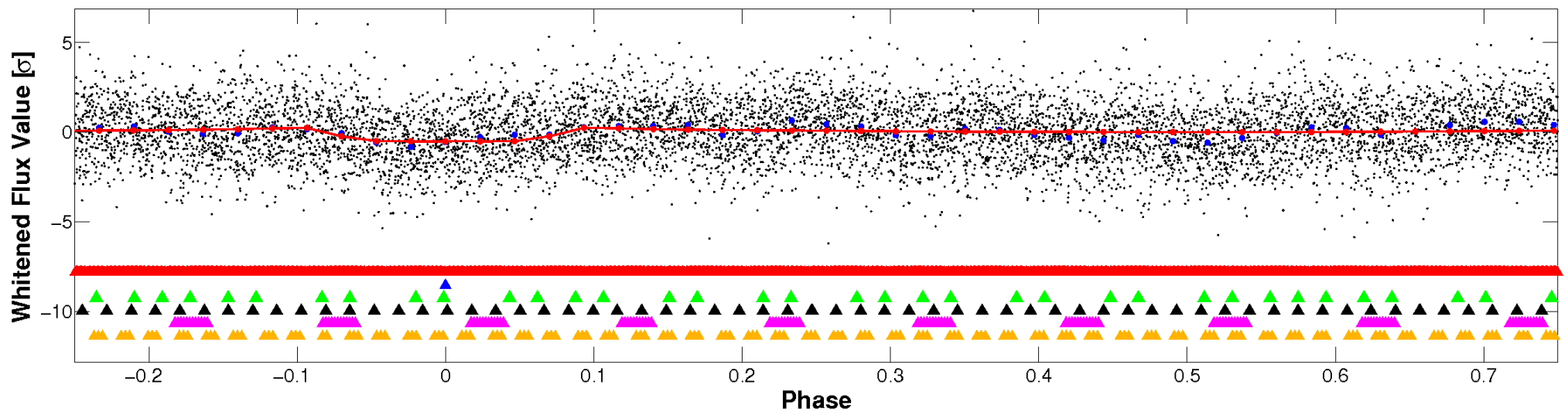


# Non-Whitened Vs. Whitened Light Curve

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

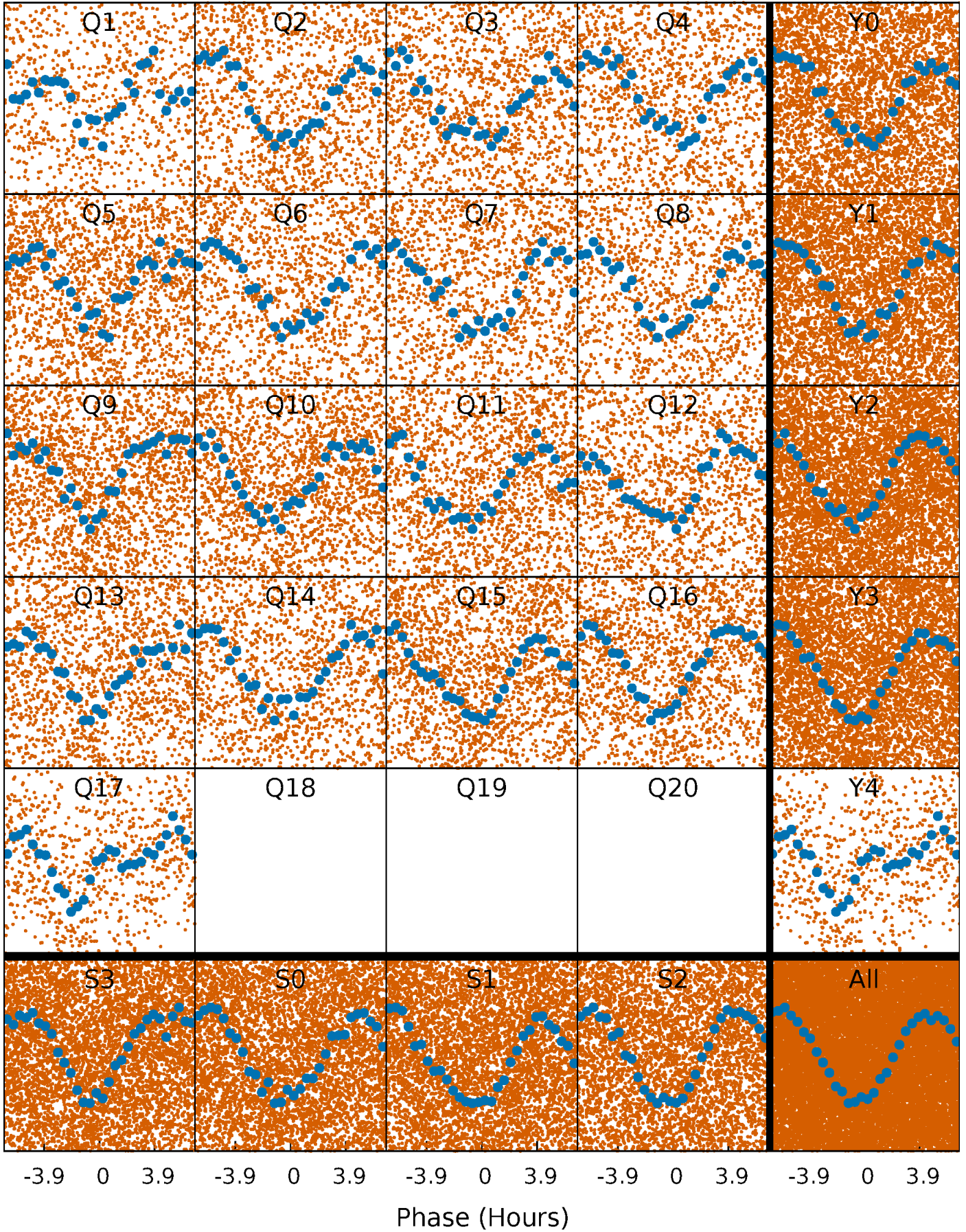


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

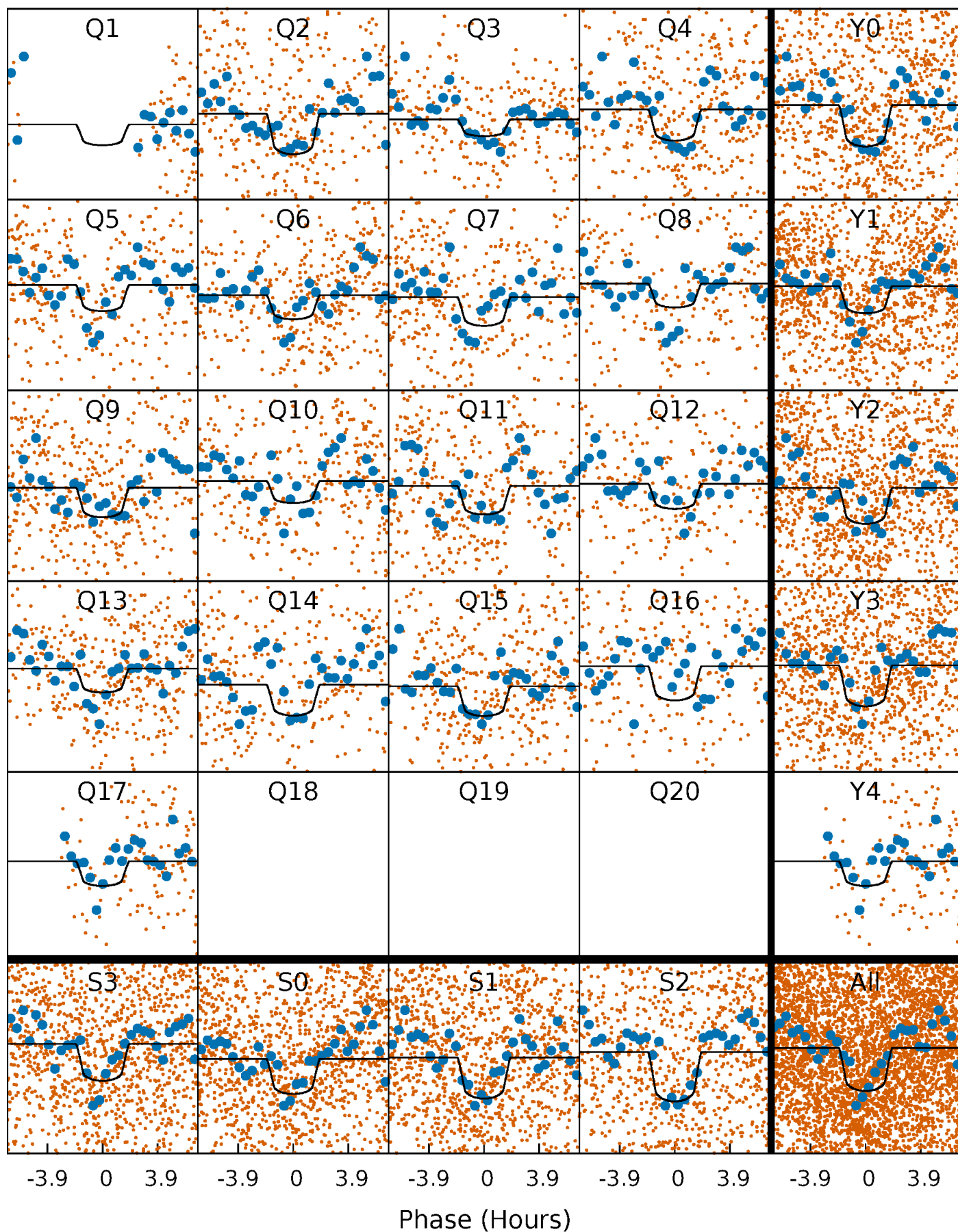
TCE 006310397-02   P= 0.874973 Days    $T_0=131.560918$  (BKJD)





# DV Quarter-Phased Transit Curves

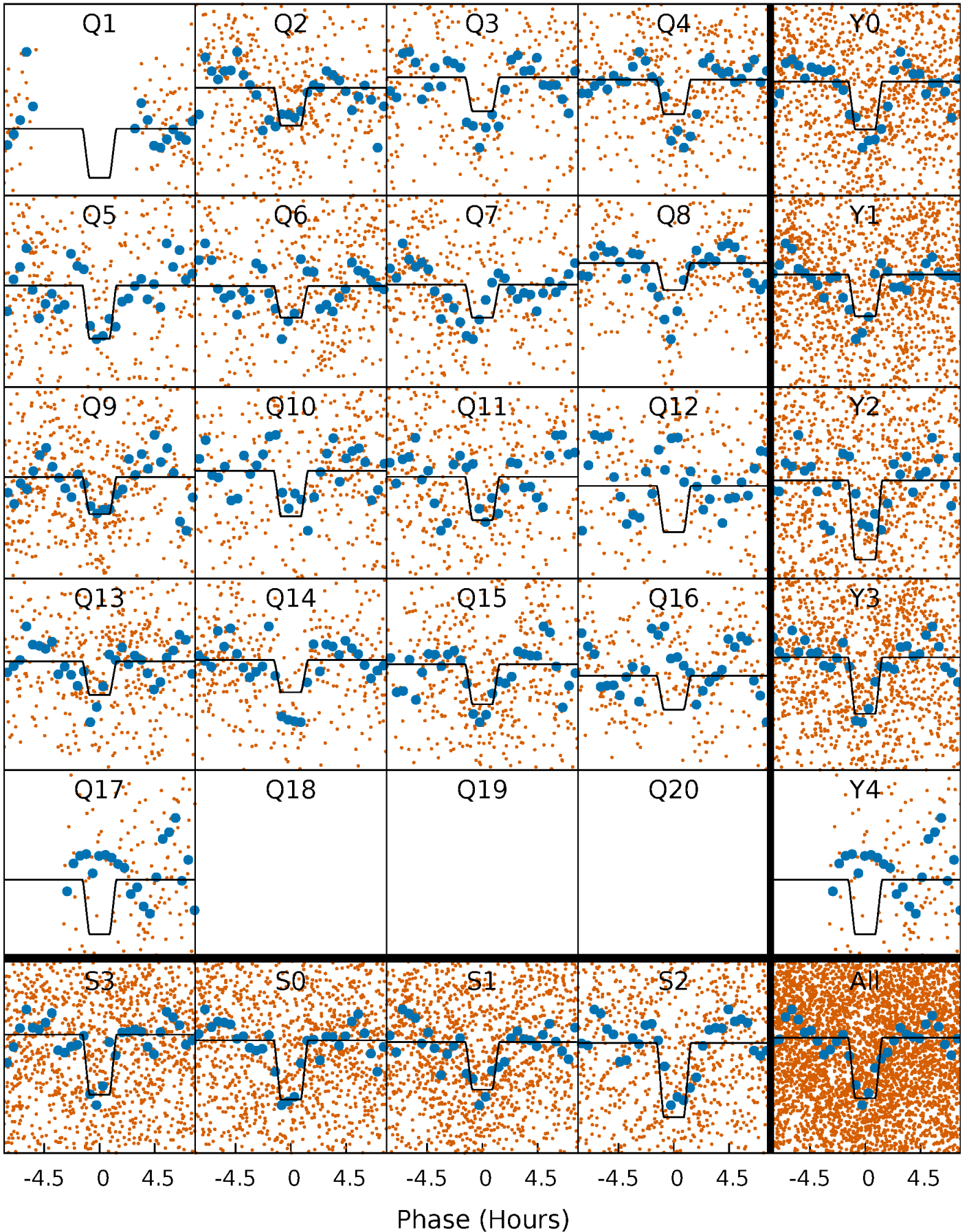
TCE 006310397-02   P= 0.874973 Days    $T_0=131.560918$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

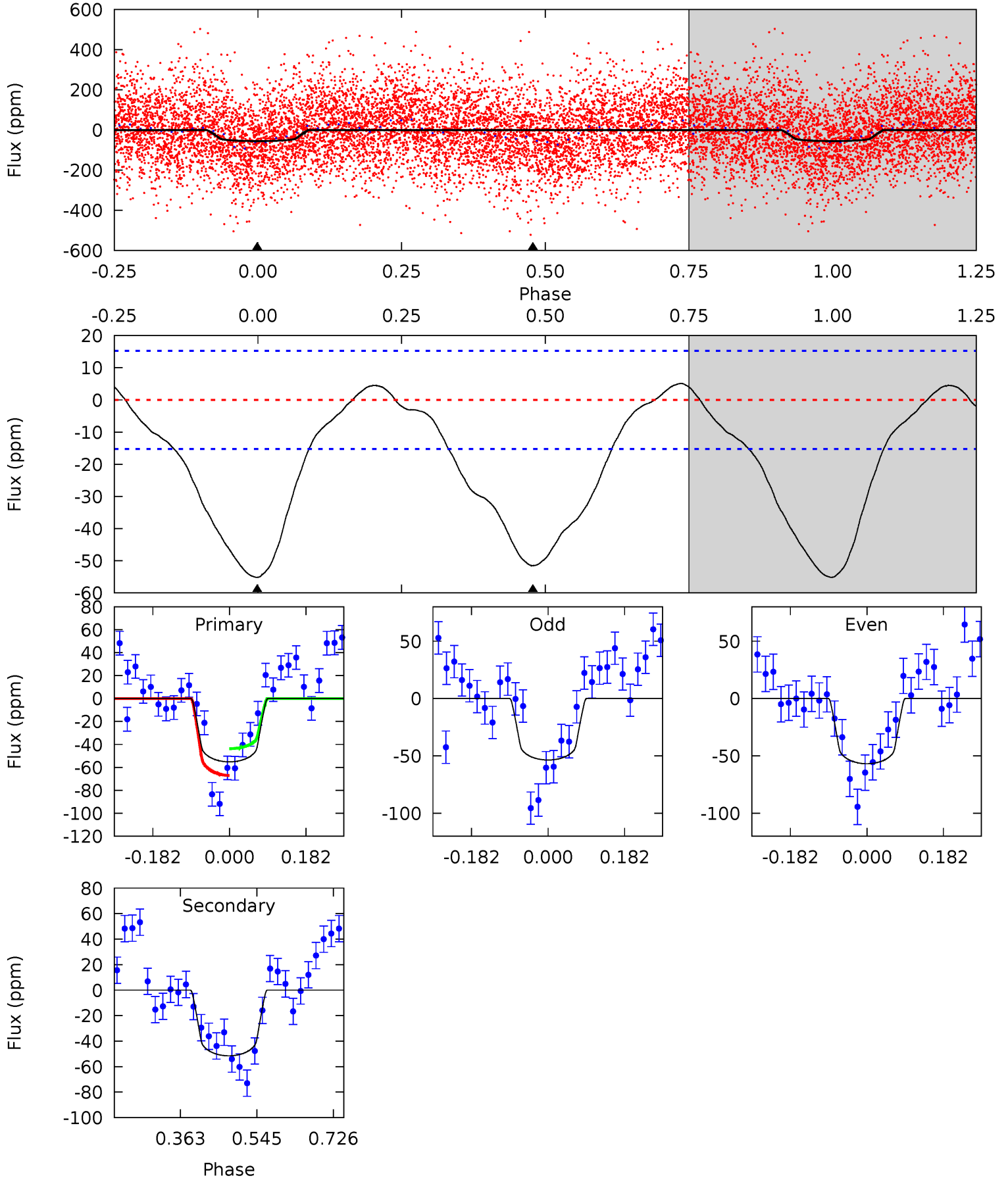
TCE 006310397-02   P= 0.874981 Days    $T_0=131.547272$  (BKJD)



# DV Model-Shift Uniqueness Test

006310397-02, P = 0.874973 Days, E = 131.560918 Days

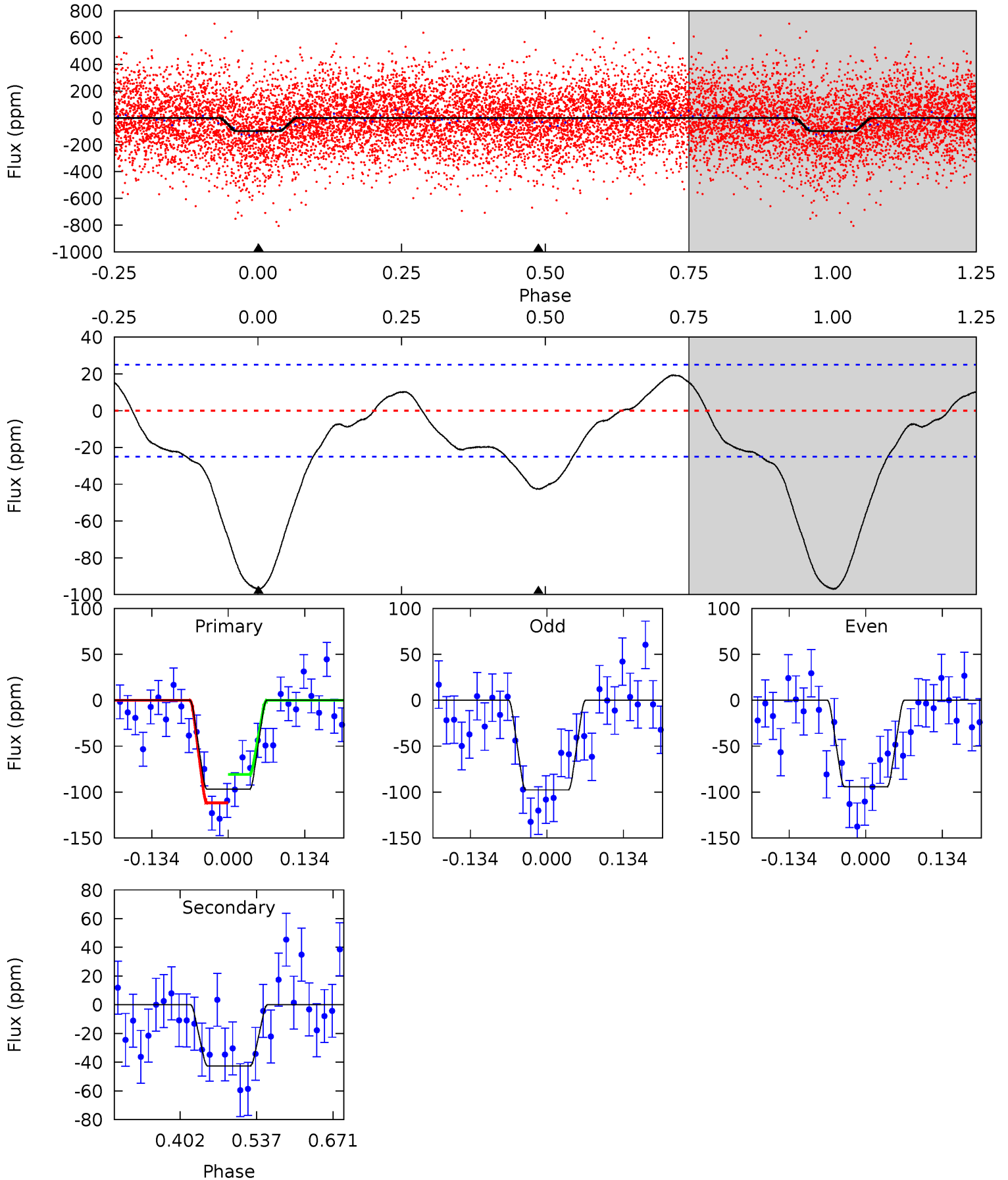
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	15.0	0	0	4.44	1.34	1.15	16.1	16.1	15.0	15.0	0.47	0.80	0.09	3.35



# Alt Model-Shift Uniqueness Test

006310397-02, P = 0.874981 Days, E = 131.547272 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
17.5	7.67	0	0	4.50	1.50	2.22	17.5	17.5	7.67	7.67	0.31	1.00	0.17	2.79



### Stellar Parameters For KIC 006310397

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7318^{+230}_{-307}$	$4.073^{+0.204}_{-0.167}$	$-0.220^{+0.250}_{-0.350}$	$1.857^{+0.507}_{-0.507}$	$1.486^{+0.209}_{-0.255}$	$0.327^{+0.382}_{-0.153}$
	+3%/-4%	+5%/-4%	+114%/-159%	+27%/-27%	+14%/-17%	+117%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006310397-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-52 \pm 3$	$1.73^{+0.70}_{-0.67}$	$4277^{+301}_{-334}$	$6497^{+1888}_{-1089}$	$4.026^{+6.099}_{-2.038}$
Alt.	$-43 \pm 6$	$2.19^{+0.70}_{-0.67}$	$4288^{+345}_{-339}$	$5358^{+1128}_{-649}$	$2.014^{+2.227}_{-0.840}$

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



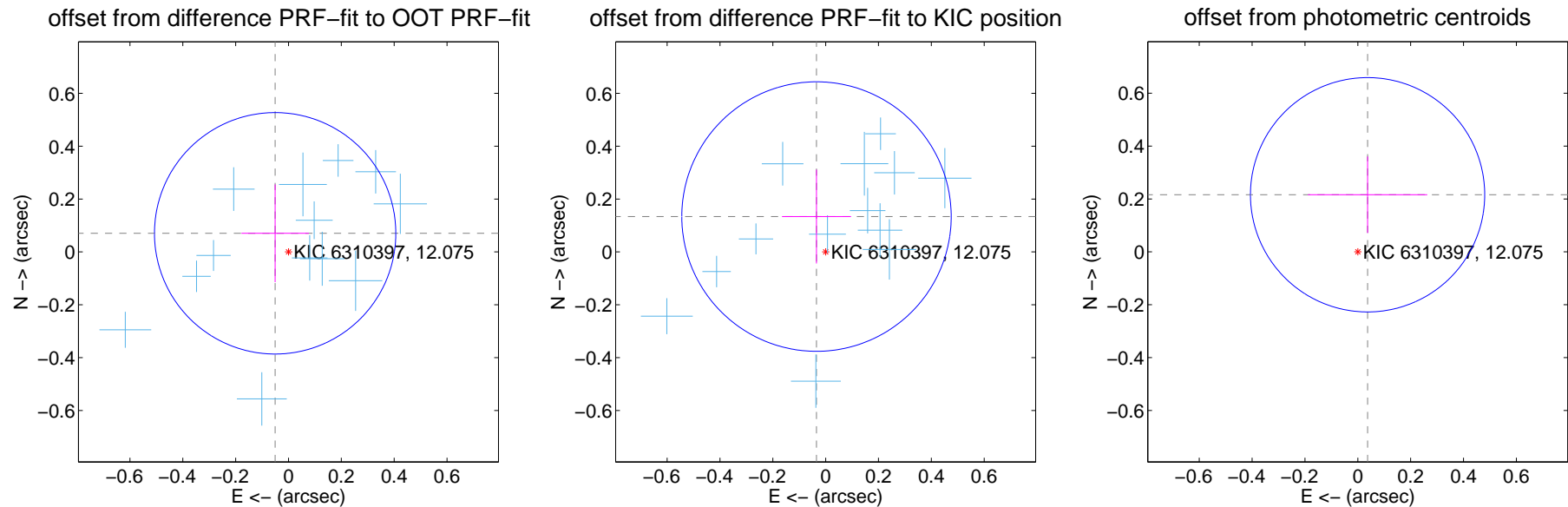
## DV Centroid Data

Supplemental centroid analysis for 006310397-02. Kepler magnitude: 12.07. Transit SNR 18.96

There are 17 quarters with good PRF difference image offsets

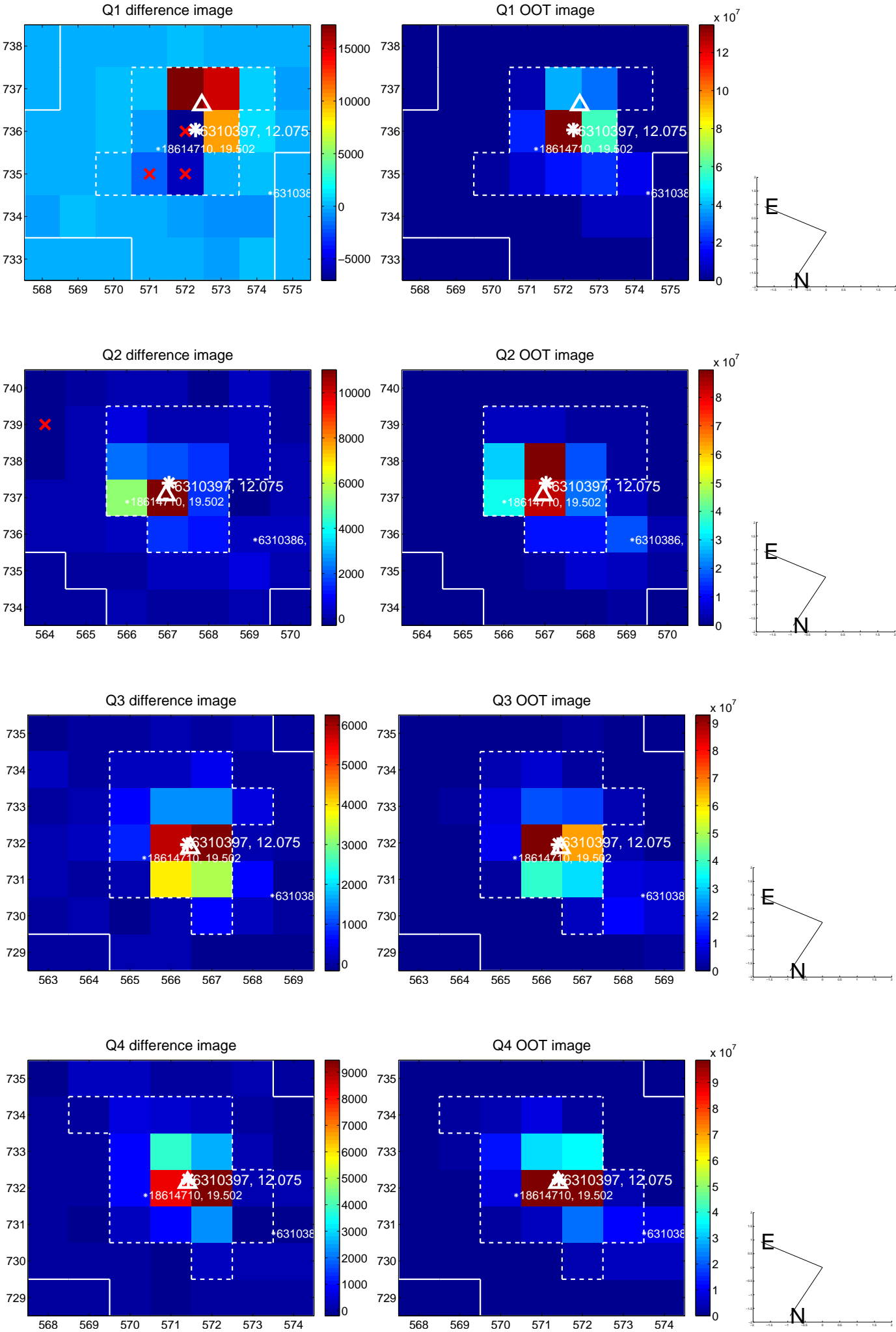
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.087 \pm 0.152$	0.57	$0.051 \pm 0.127$	$0.070 \pm 0.185$
PRF-fit source offset from KIC position	$0.138 \pm 0.170$	0.81	$0.035 \pm 0.131$	$0.134 \pm 0.177$
photometric centroid source offset	$0.22 \pm 0.15$	1.48	$-0.04 \pm 0.23$	$0.22 \pm 0.14$

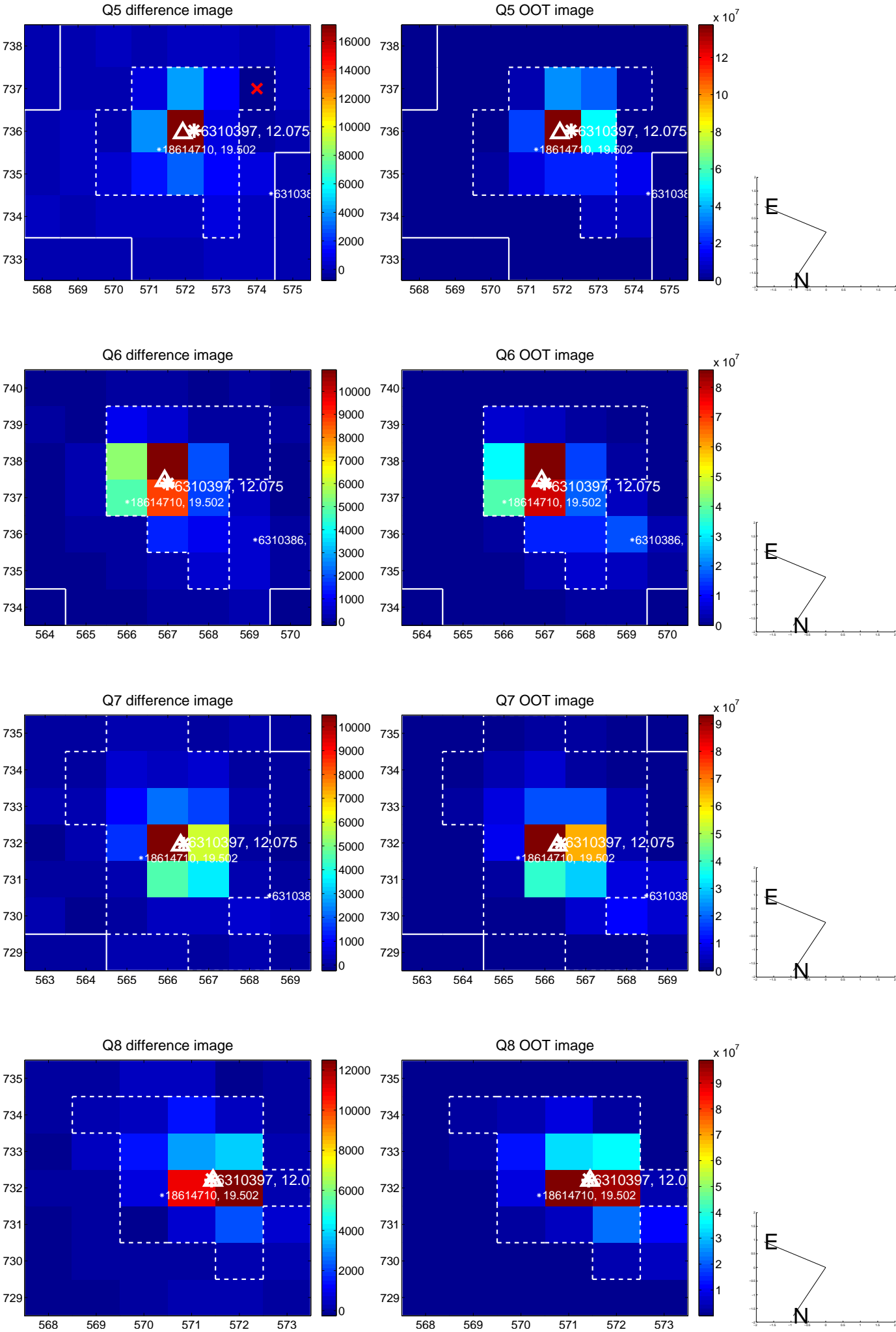


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

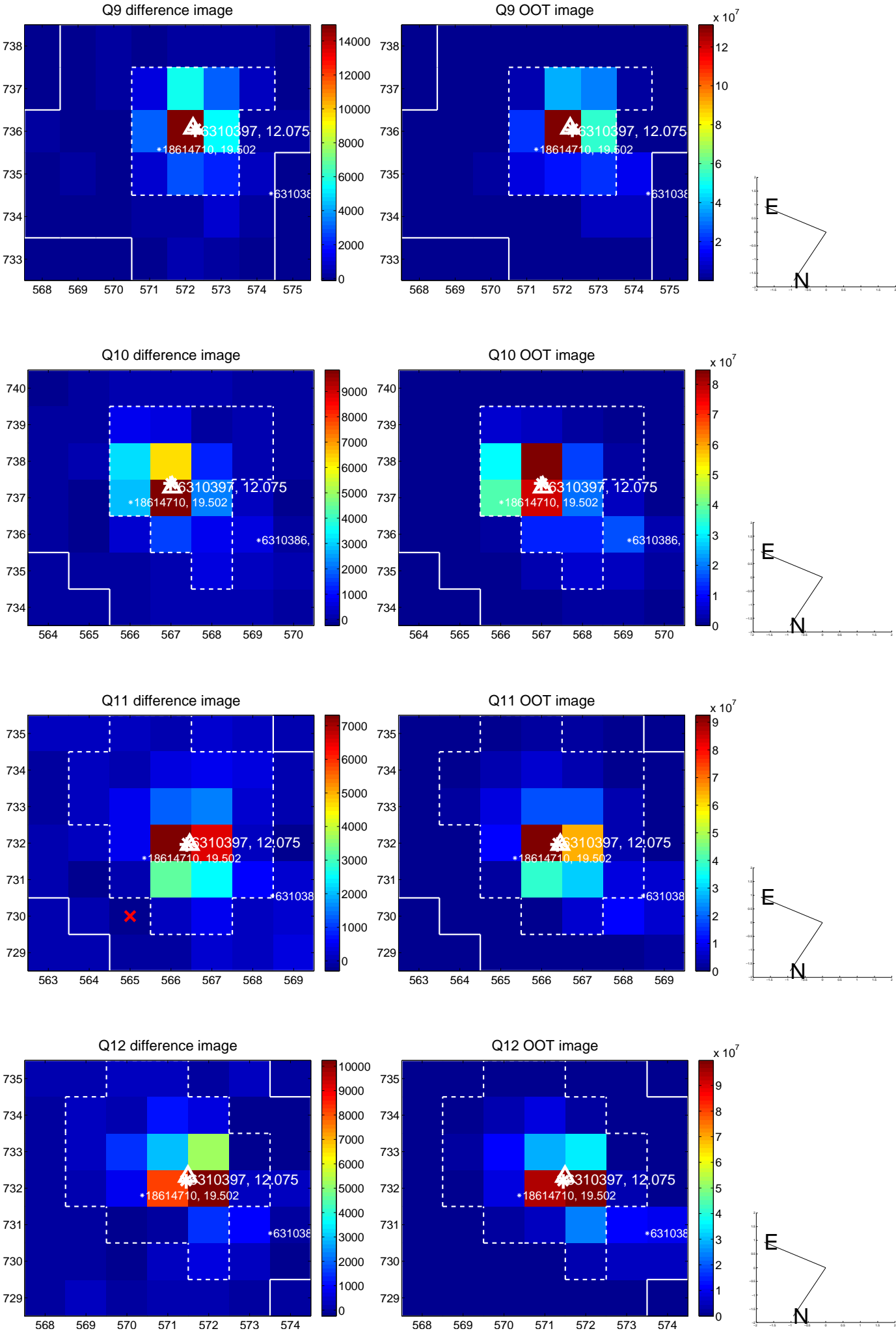
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



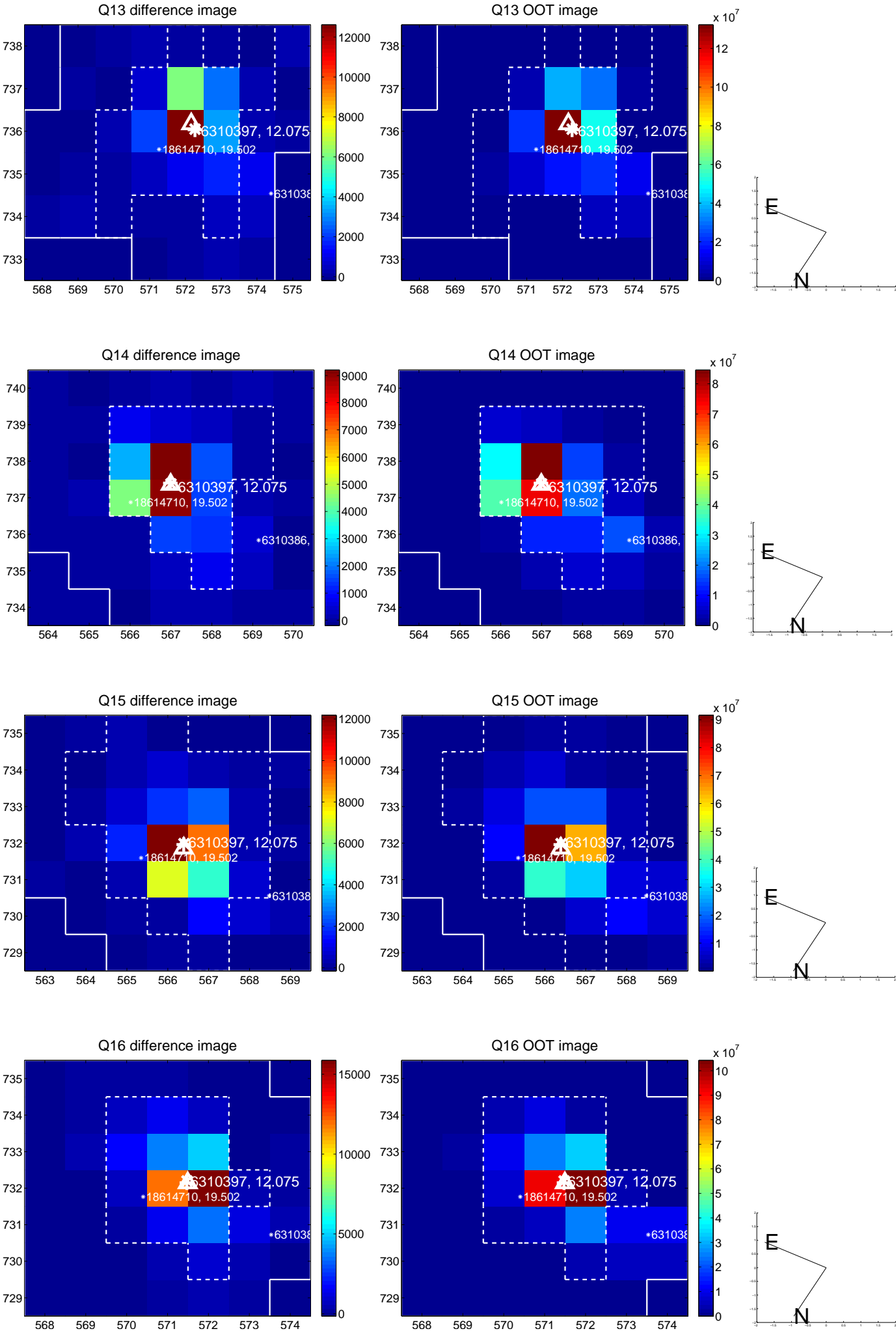
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

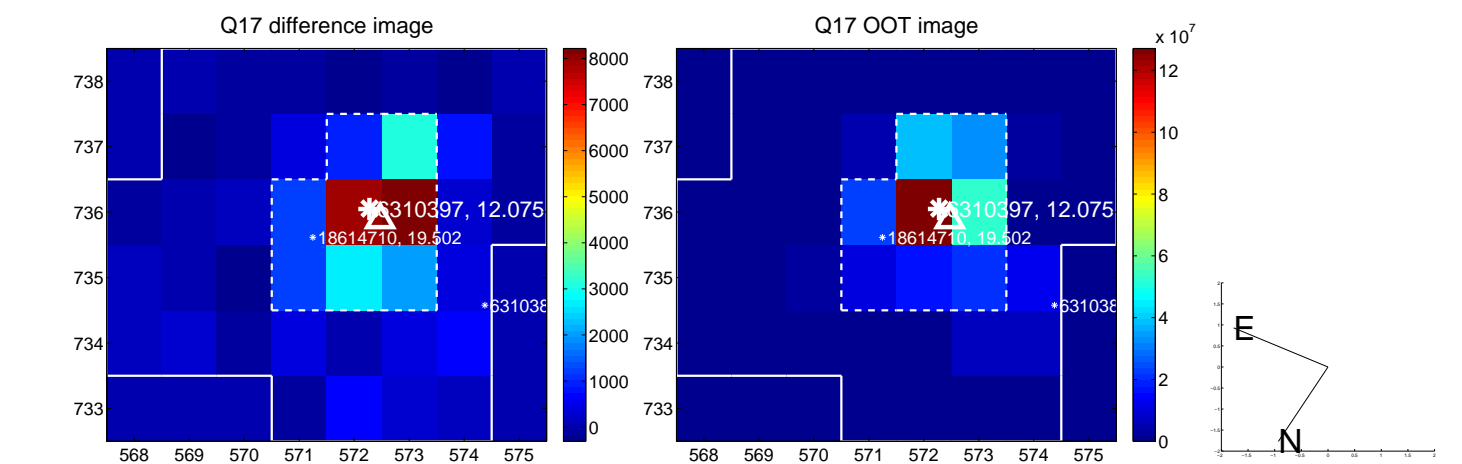


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

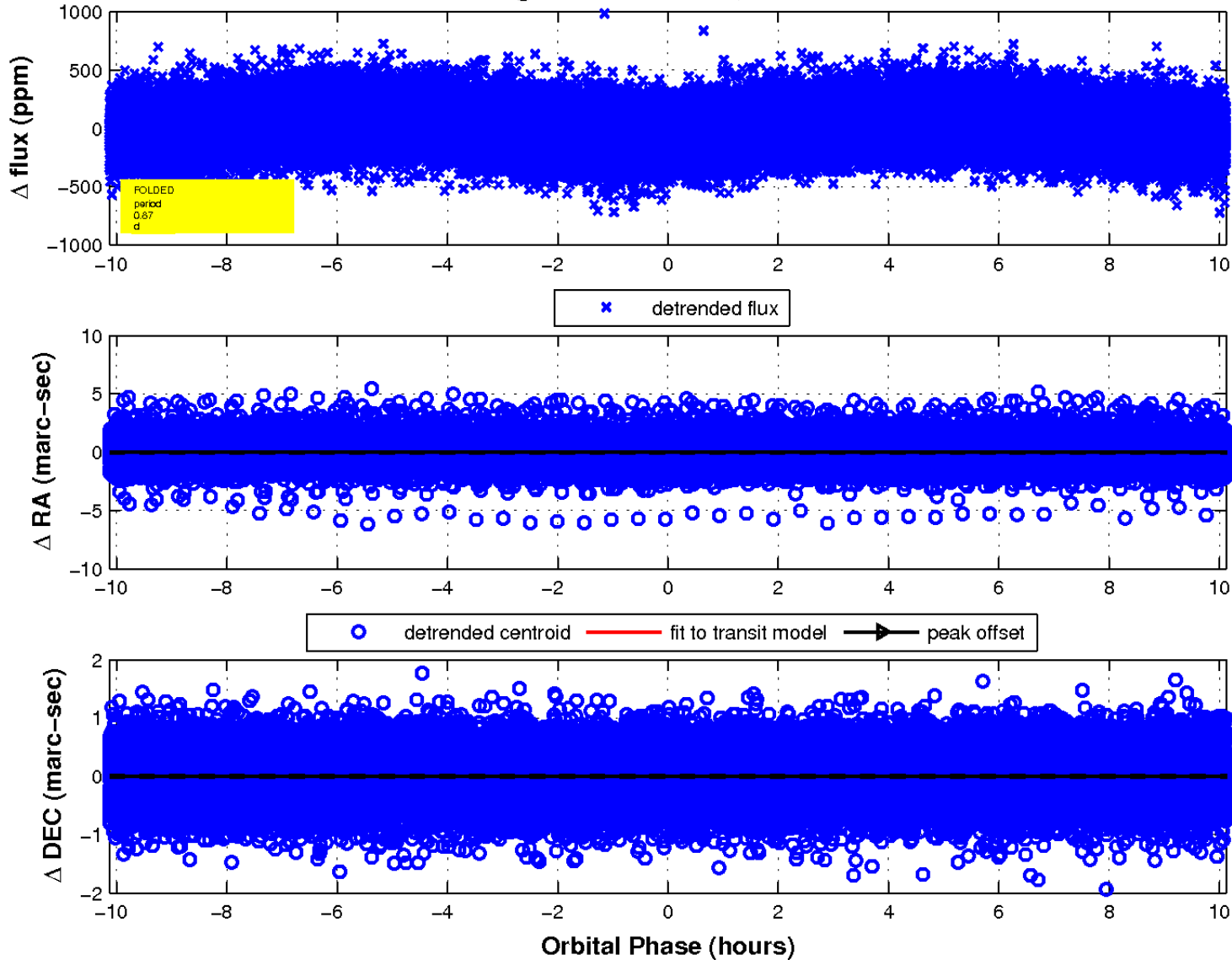




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

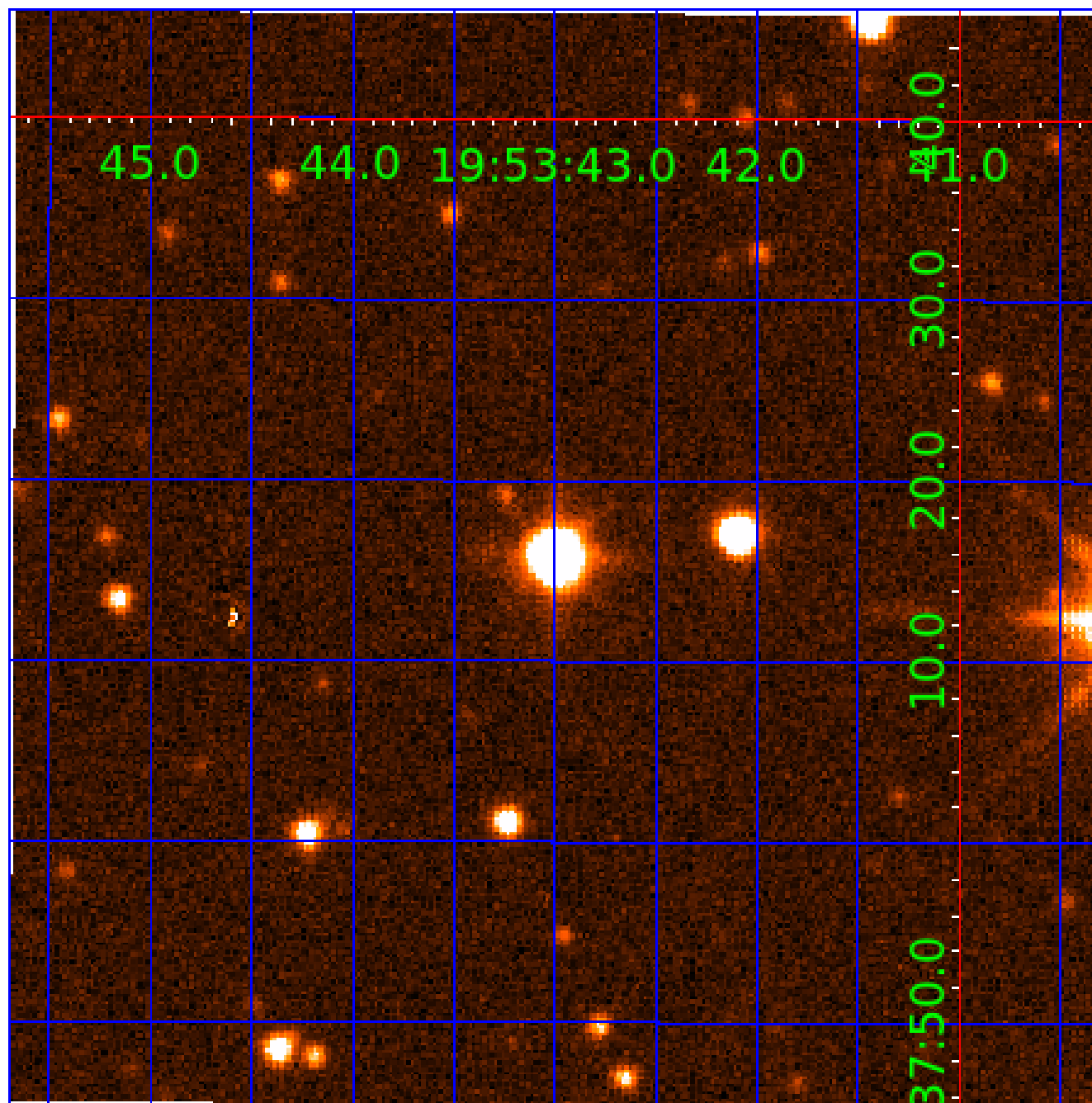


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination



# KIC 006310397

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006310397-01	OBS	No	0.863182	131.728634	14.8	5.846	8.2	8.0	1.86	7318	0.73	21587.48
006310397-02	OBS	No	0.874973	131.560918	67.7	3.376	13.6	19.0	1.86	7318	1.77	21200.48
006310397-03	OBS	No	41.328636	134.705272	355.1	3.498	11.9	12.9	1.86	7318	6.70	124.17
006310397-04	OBS	No	23.265667	134.760839	356.8	2.277	10.5	11.6	1.86	7318	4.47	267.13
006310397-05	OBS	No	12.336945	138.858564	273.9	1.076	11.1	11.2	1.86	7318	3.16	622.39
006310397-06	OBS	No	9.439660	134.800797	197.5	4.500	9.9	-1.0	1.86	7318	2.64	889.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006310397-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006310397-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT
006310397-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—MOD_NONUNIQ_DV
006310397-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

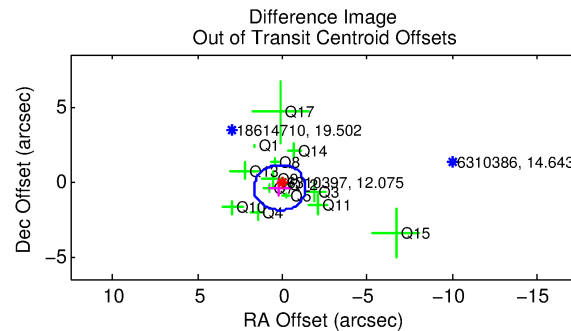
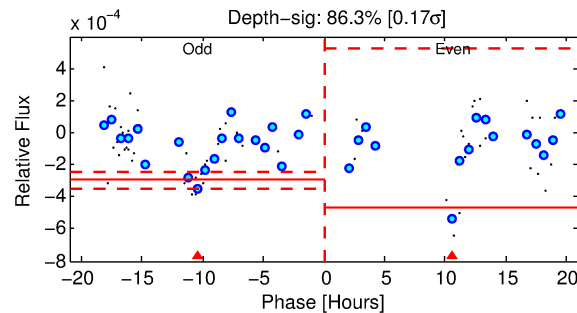
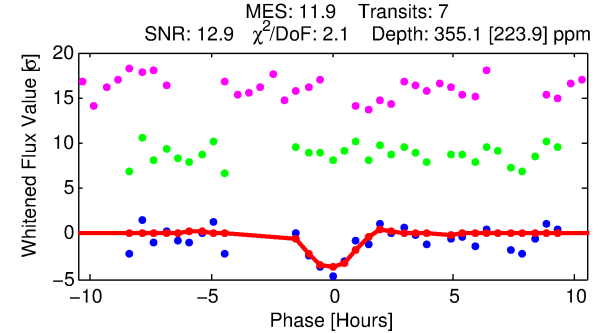
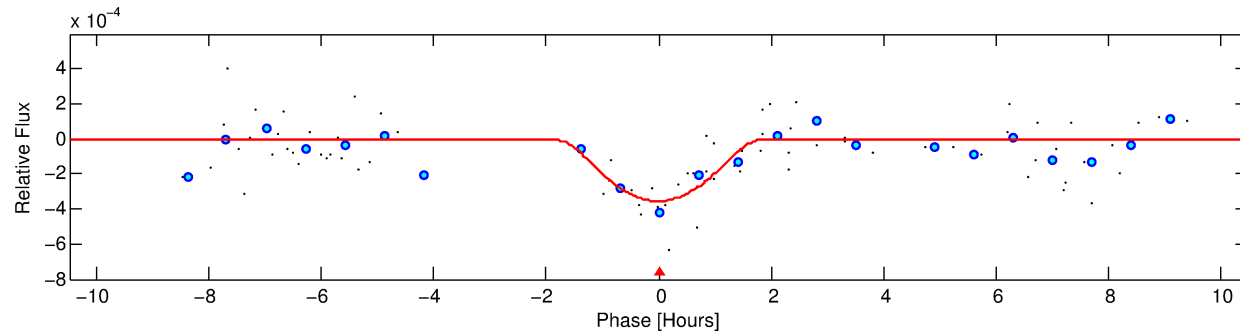
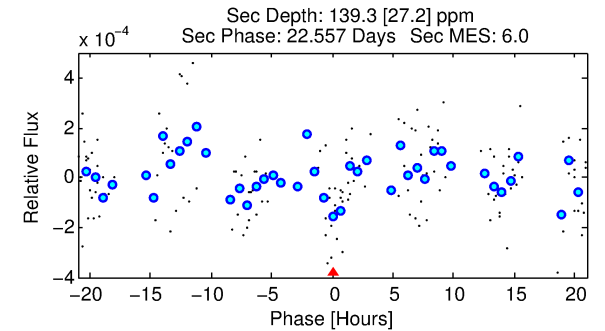
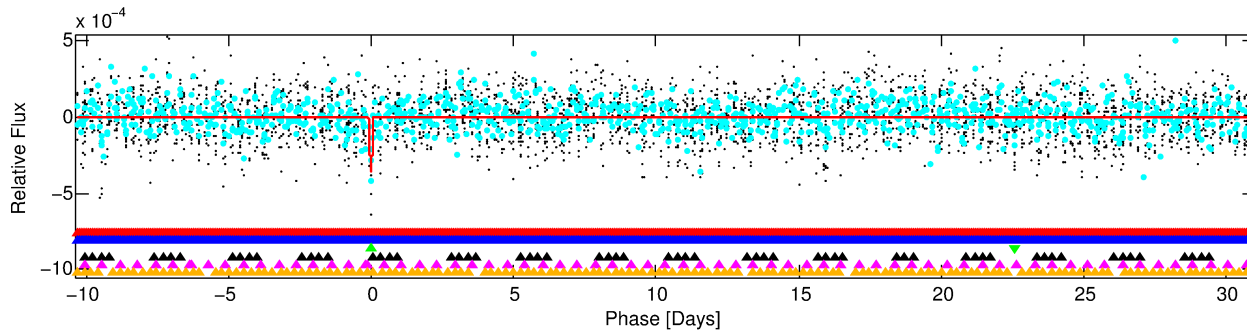
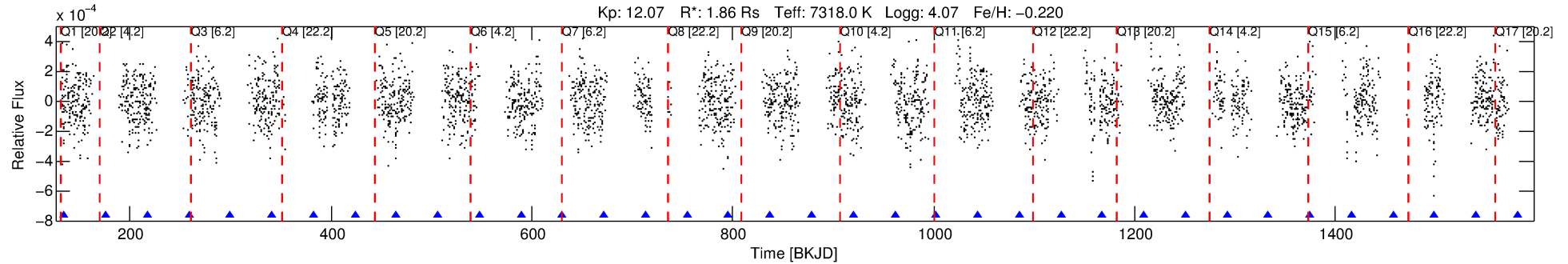
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006310397-03

No Significant Match Found

# DV One-Page Summary

KIC: 6310397 Candidate: 3 of 6 Period: 41.329 d



## DV Fit Results:

Period = 41.32864 [0.00051] d  
Epoch = 134.7053 [0.0092] BKJD  
Rp/R\* = 0.0331 [0.1514]  
a/R\* = 23.47 [29.36]  
b = 1.00 [0.24]  
Seff = 124.17 [49.57]  
Teq = 851 [85] K  
Rp = 6.70 [30.74] Re  
a = 0.2671 [0.0641] AU  
Ag = 121.76 [1116.27] [0.11σ]  
Teffp = 4372 [10014] K [0.35σ]

## DV Diagnostic Results:

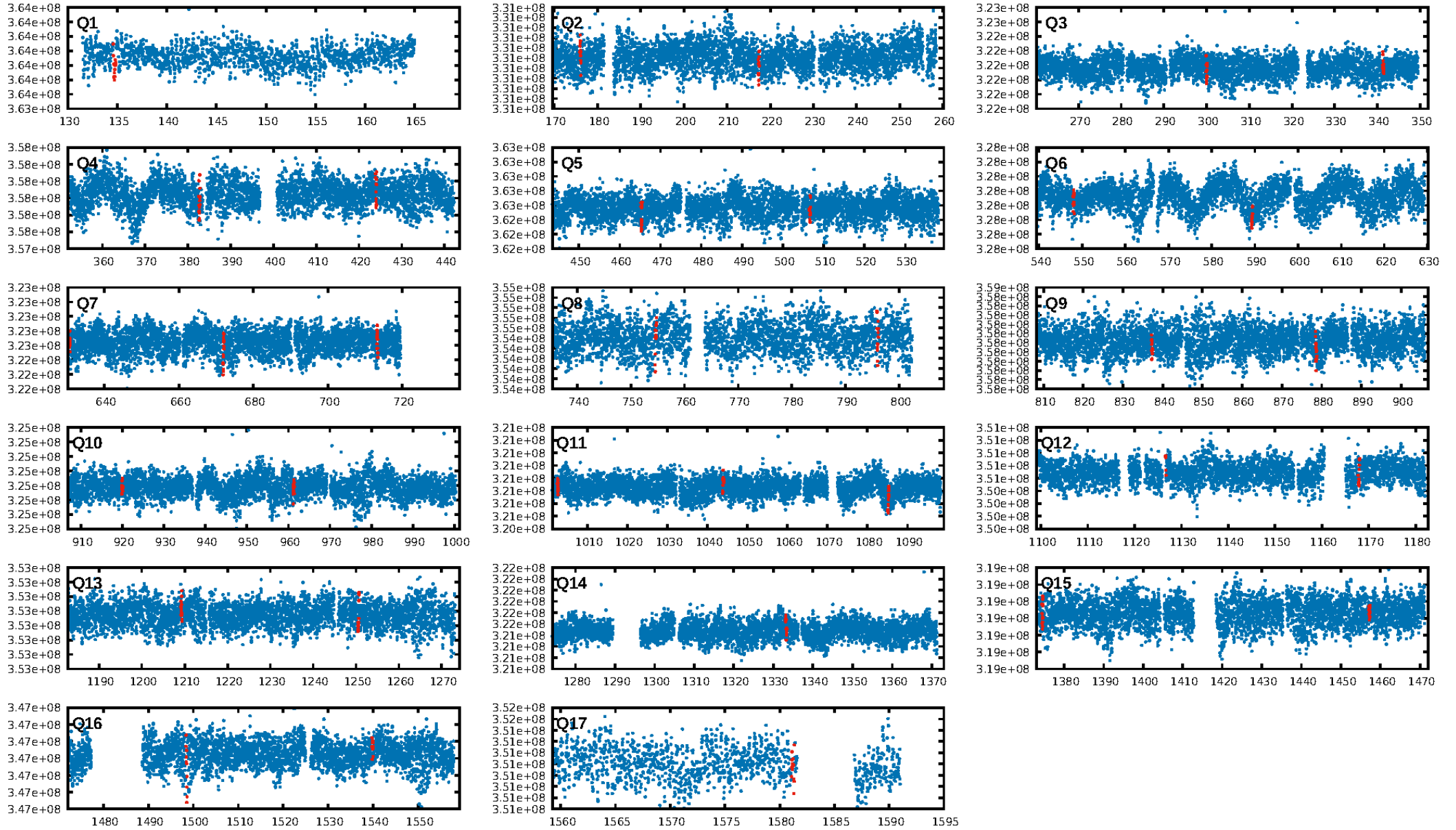
ShortPeriod-sig: 100.0% [103.85σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 15.1%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -0.5682  
Centroid-sig: 97.7%  
Centroid-so: 0.516 arcsec [1.43σ]  
OotOffset-rm: 0.420 arcsec [0.83σ]  
KicOffset-rm: 0.360 arcsec [0.74σ]  
OotOffset-st: 2/4/3/5 [14]  
KicOffset-st: 2/4/3/5 [14]  
DiffImageQuality-fgm: 0.64 [9/14]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:53:22 Z

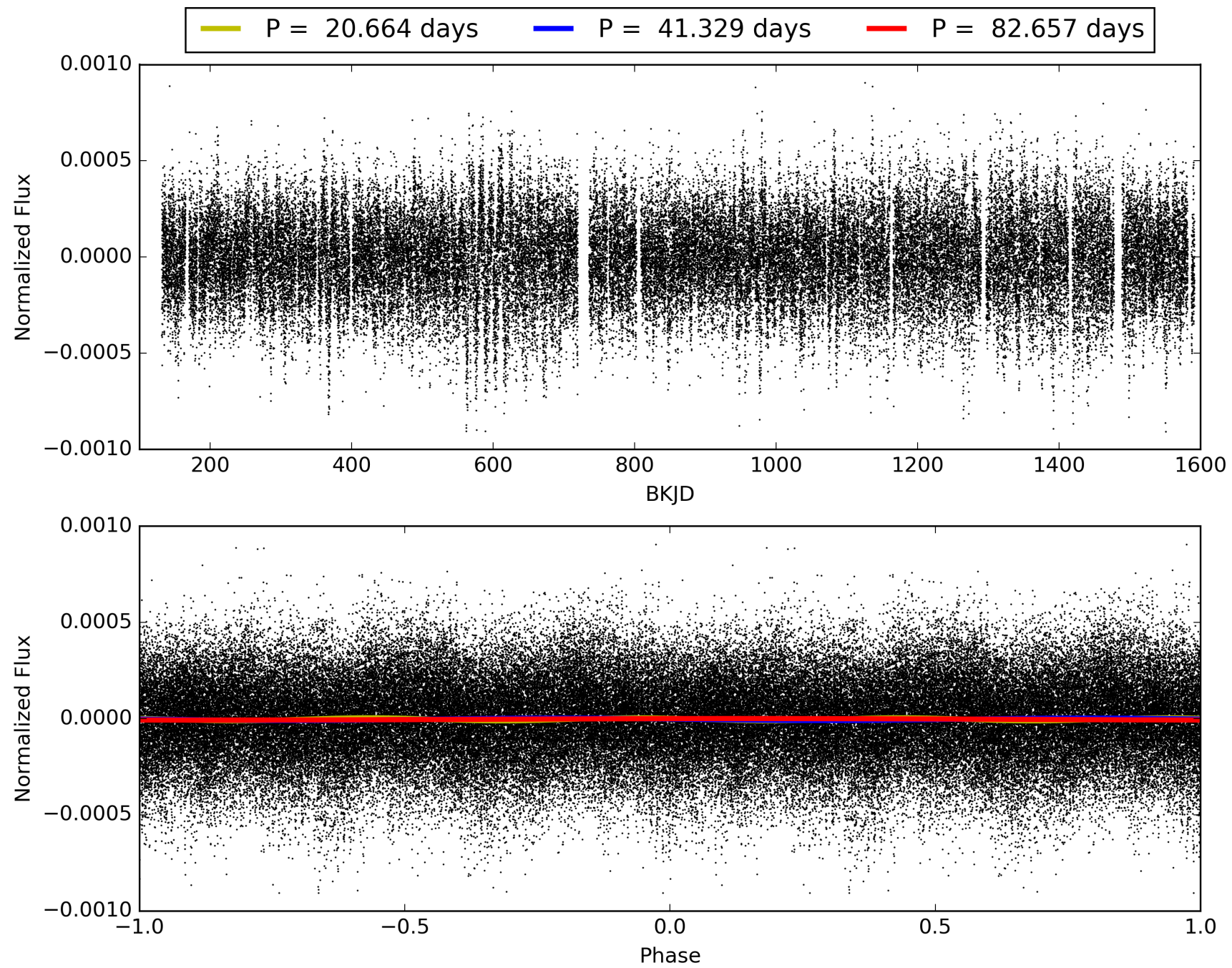
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006310397-03, PDC Light Curves

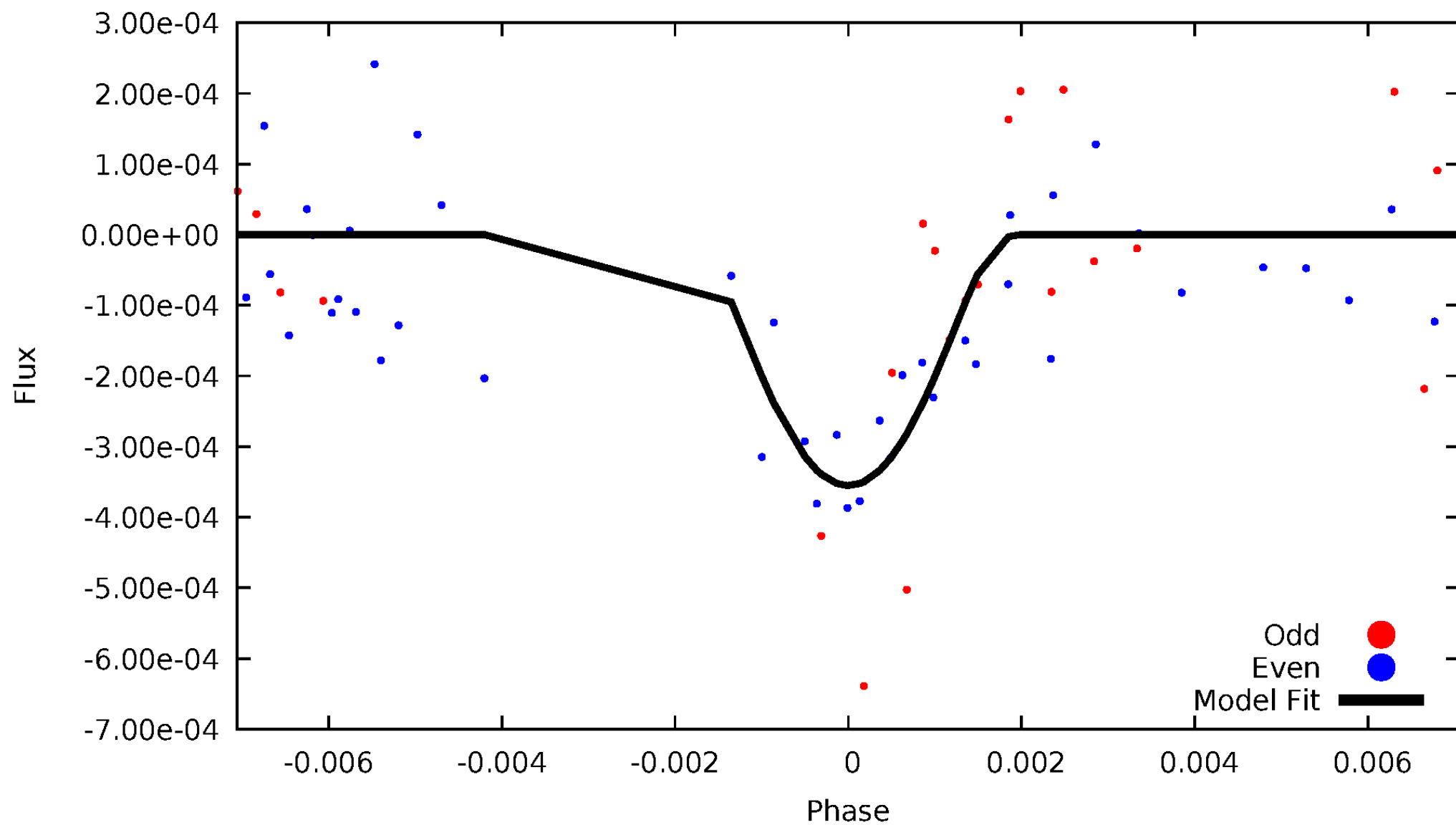


TCE 006310397-03



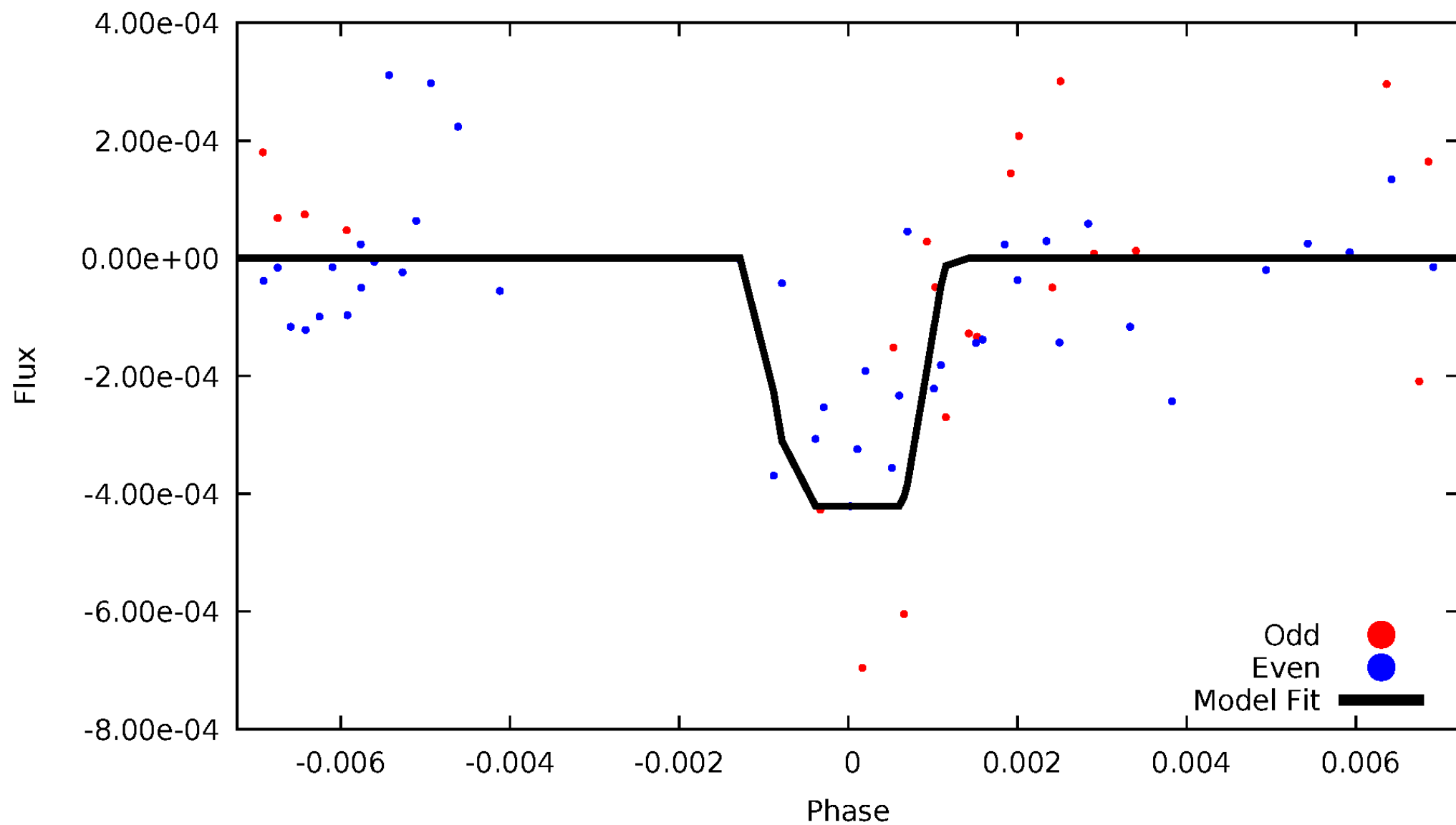
# DV Odd/Even

TCE 006310397-03



# ALT Odd/Even

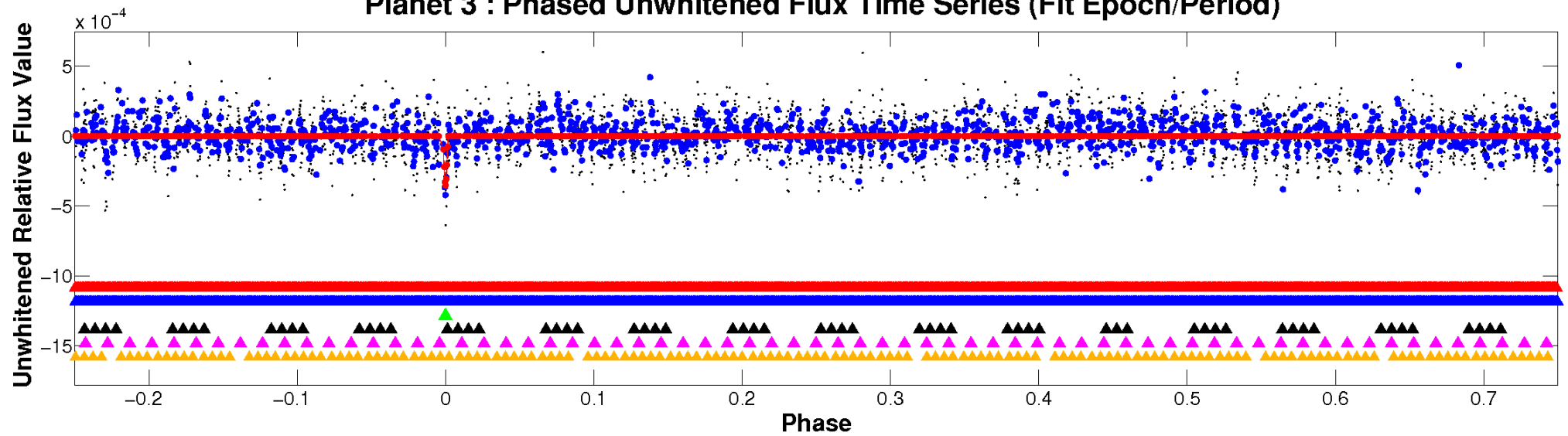
TCE 006310397-03



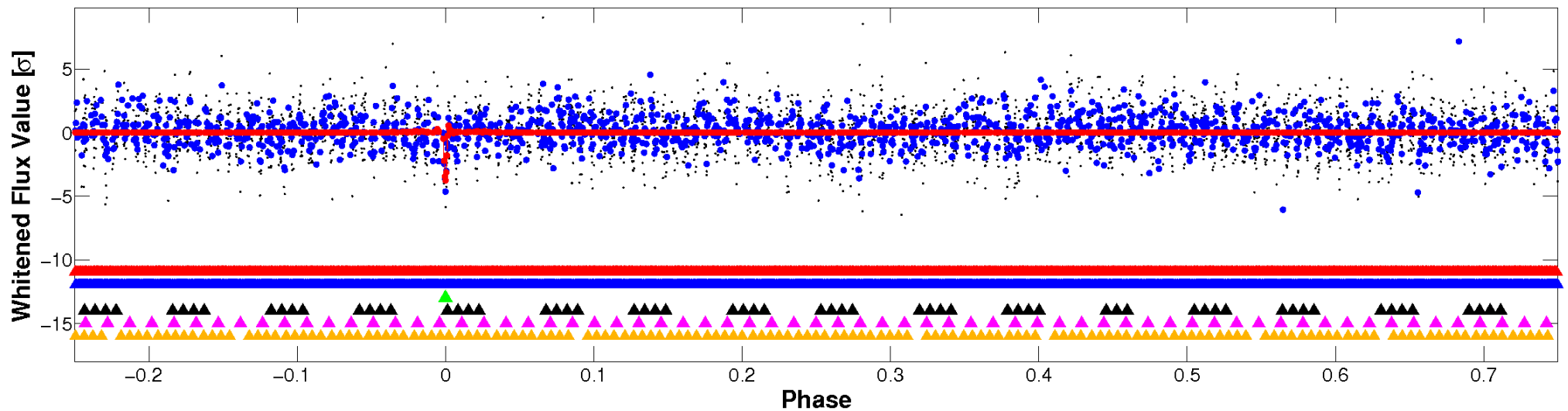


# Non-Whitened Vs. Whitened Light Curve

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

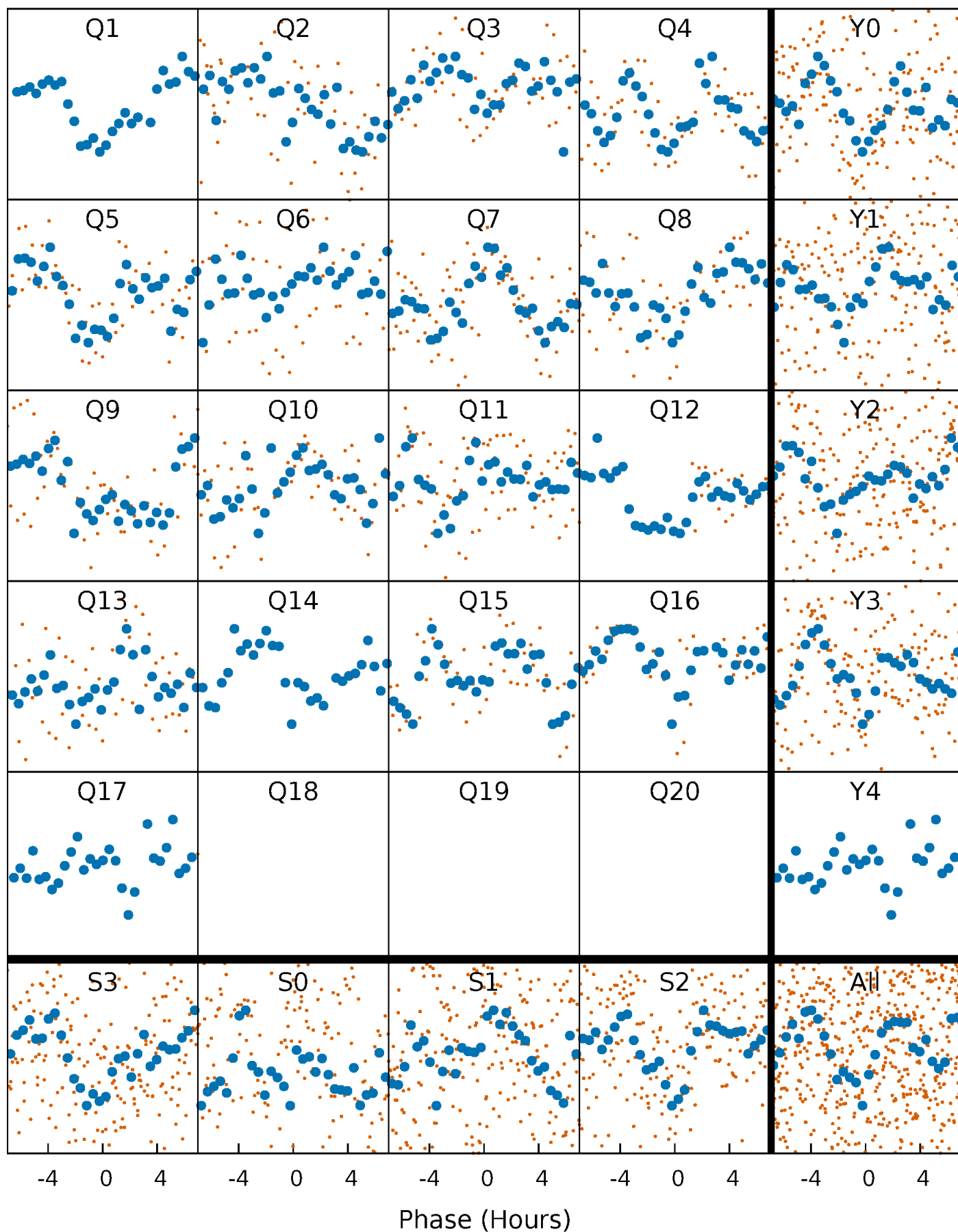


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



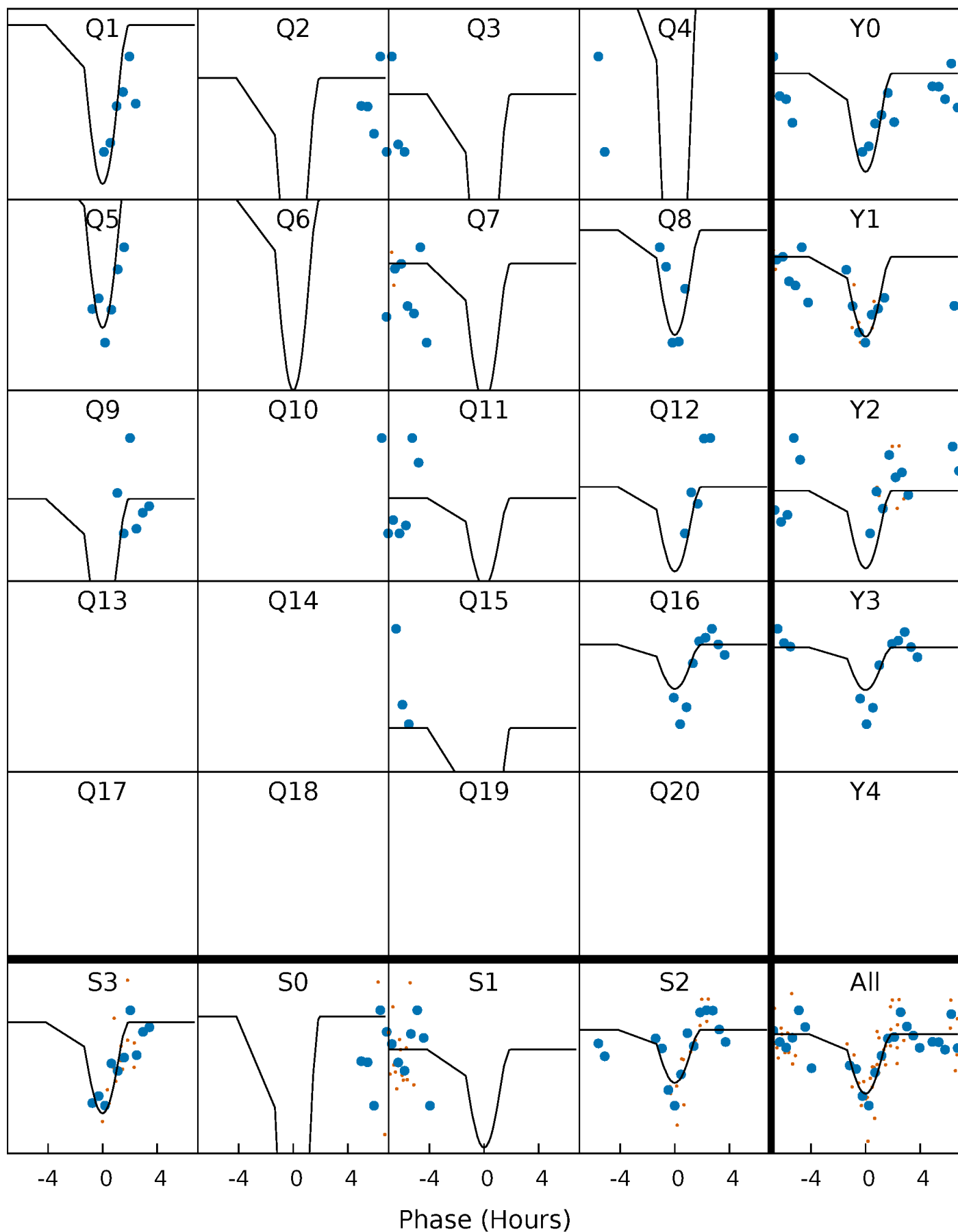
# PDC Quarter-Phased Transit Curves

TCE 006310397-03   P= 41.328636 Days    $T_0=134.705272$  (BKJD)



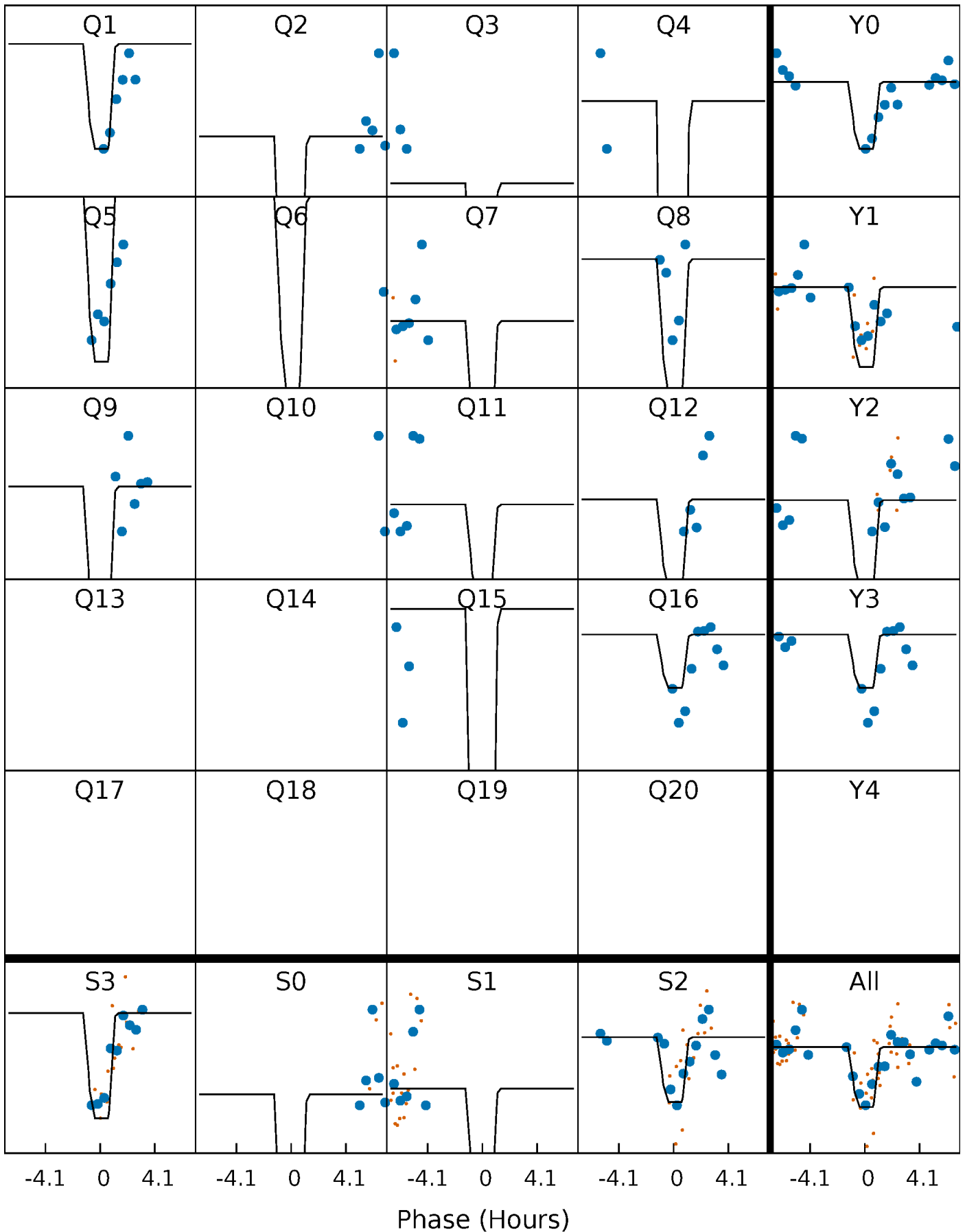
# DV Quarter-Phased Transit Curves

TCE 006310397-03   P= 41.328636 Days    $T_0=134.705272$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

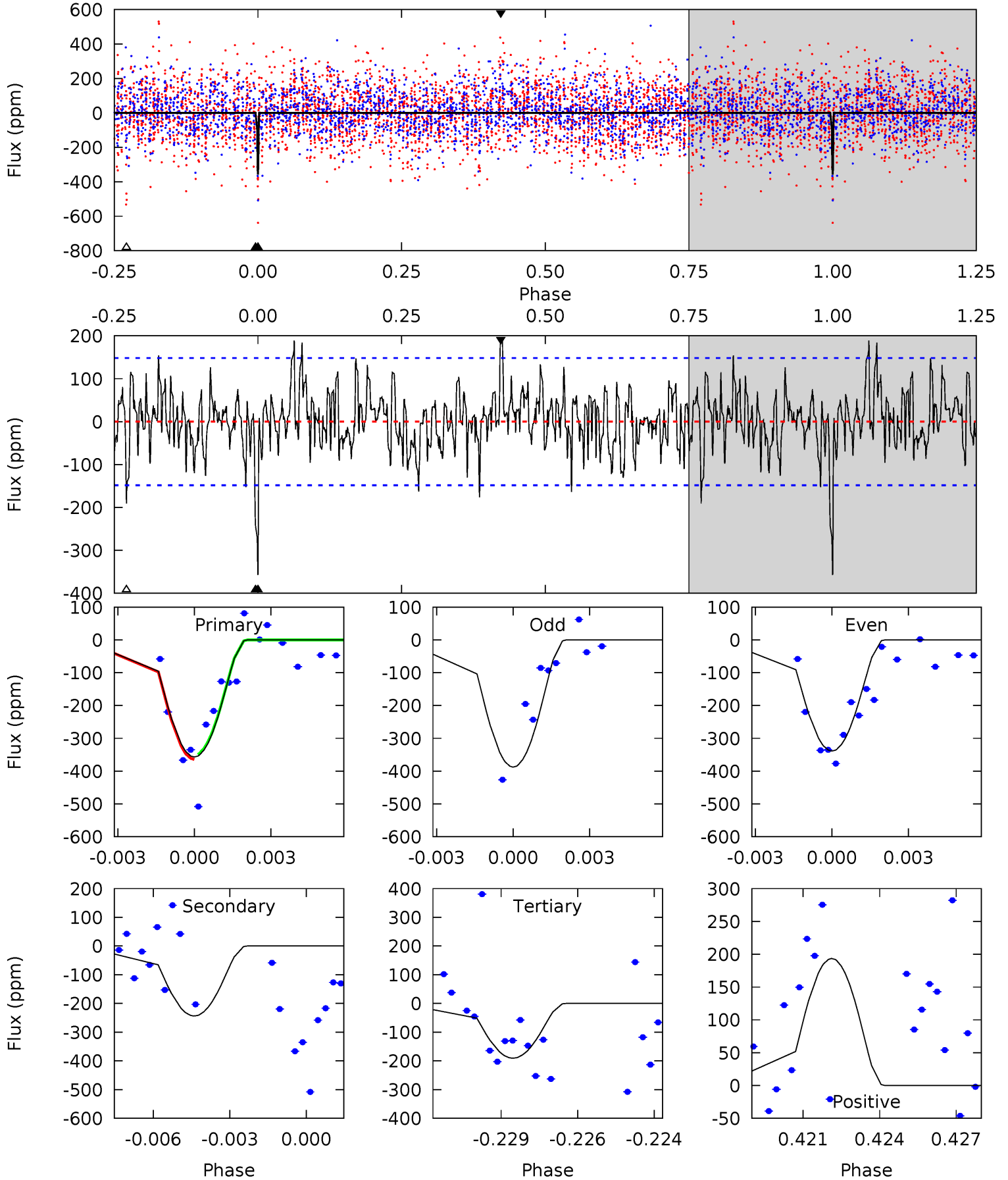
TCE 006310397-03 P= 41.328852 Days  $T_0=134.698792$  (BKJD)



# DV Model-Shift Uniqueness Test

006310397-03, P = 41.328636 Days, E = 93.376636 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	8.64	6.76	6.86	5.26	2.98	2.07	5.90	5.80	1.88	1.78	0.86	0.96	0.35	0.23

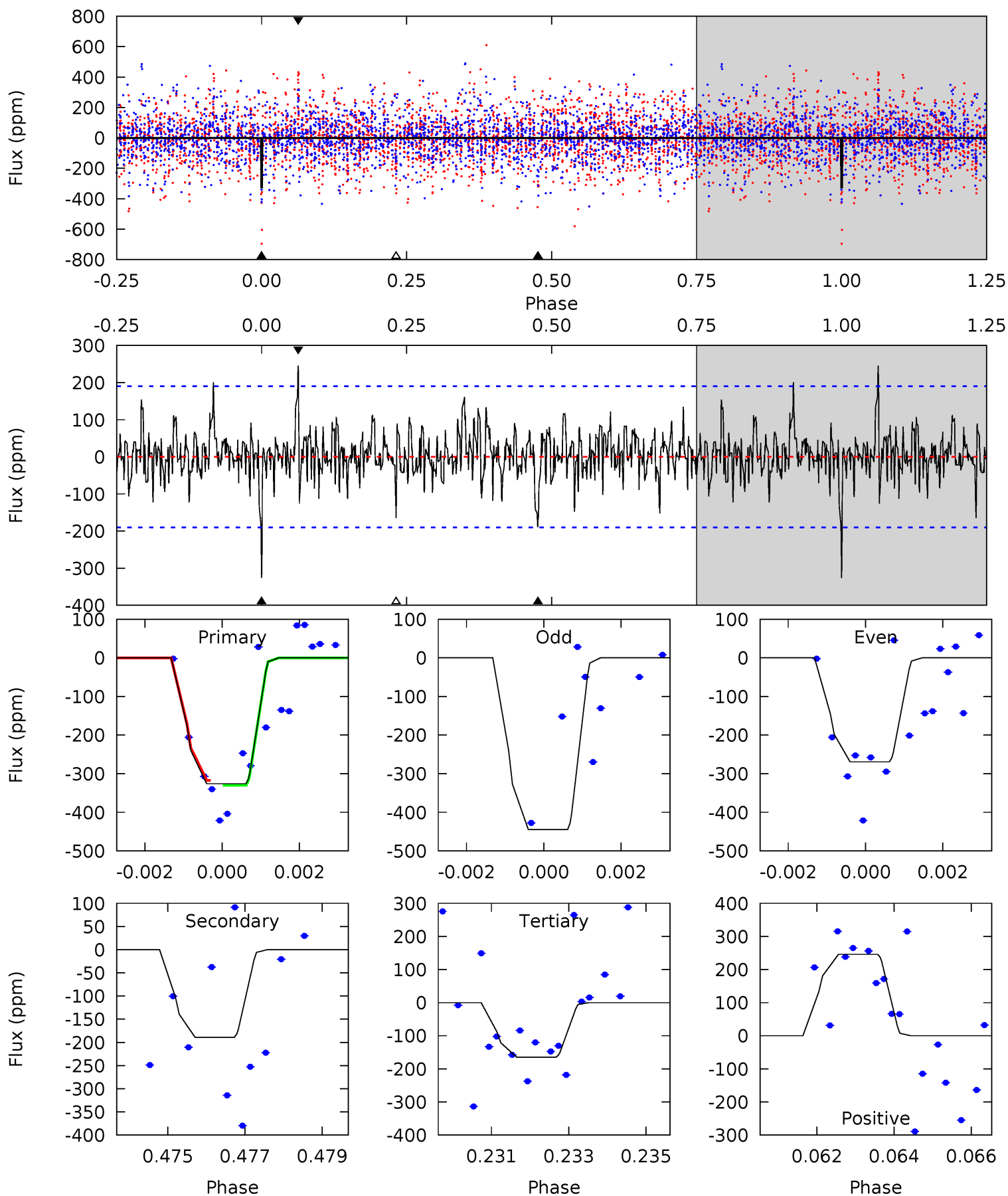




# Alt Model-Shift Uniqueness Test

006310397-03, P = 41.328852 Days, E = 93.369940 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.15	5.31	4.63	6.90	5.33	3.10	1.39	4.52	2.25	0.68	-1.59	2.38	0.98	0.43	0.13



### Stellar Parameters For KIC 006310397

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7318^{+230}_{-307}$	$4.073^{+0.204}_{-0.167}$	$-0.220^{+0.250}_{-0.350}$	$1.857^{+0.507}_{-0.507}$	$1.486^{+0.209}_{-0.255}$	$0.327^{+0.382}_{-0.153}$
	+3%/-4%	+5%/-4%	+114%/-159%	+27%/-27%	+14%/-17%	+117%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006310397-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-244 \pm 28$	$23.85^{+24.33}_{-15.87}$	$1183^{+88}_{-89}$	$3191^{+1479}_{-584}$	$17^{+136}_{-13}$
Alt.	$-189 \pm 36$	$21.18^{+24.00}_{-14.04}$	$1184^{+88}_{-98}$	$3160^{+1520}_{-588}$	$16^{+132}_{-13}$

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

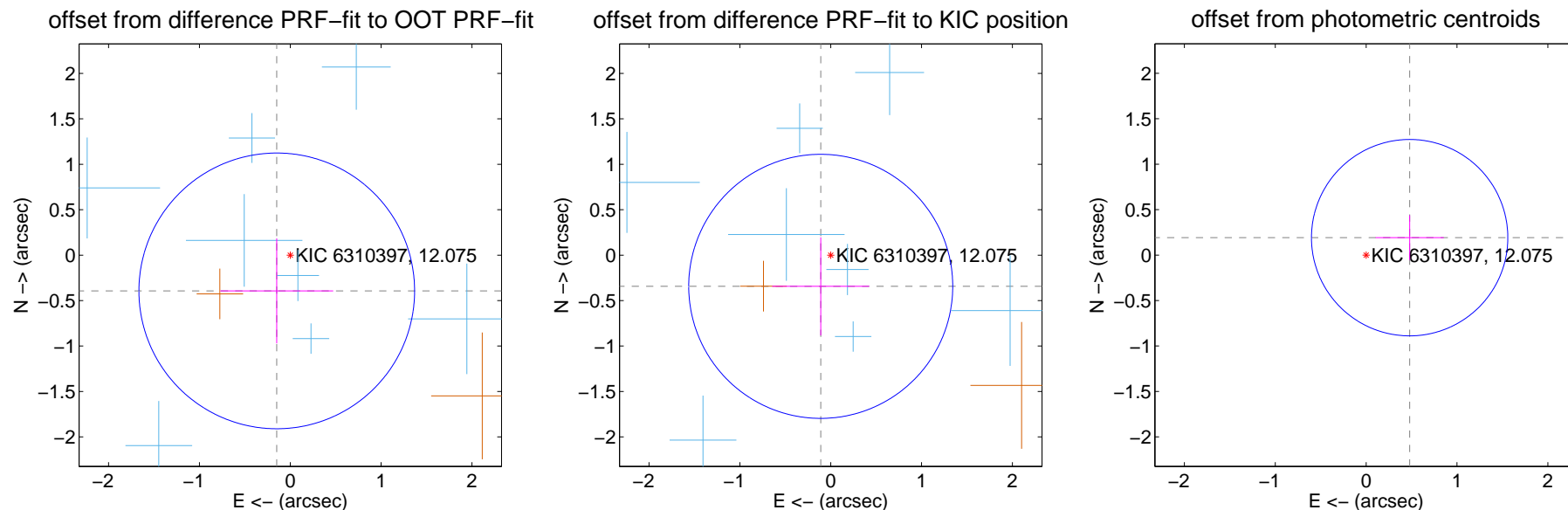
## DV Centroid Data

Supplemental centroid analysis for 006310397-03. Kepler magnitude: 12.07. Transit SNR 12.90

There are 9 quarters with good PRF difference image offsets

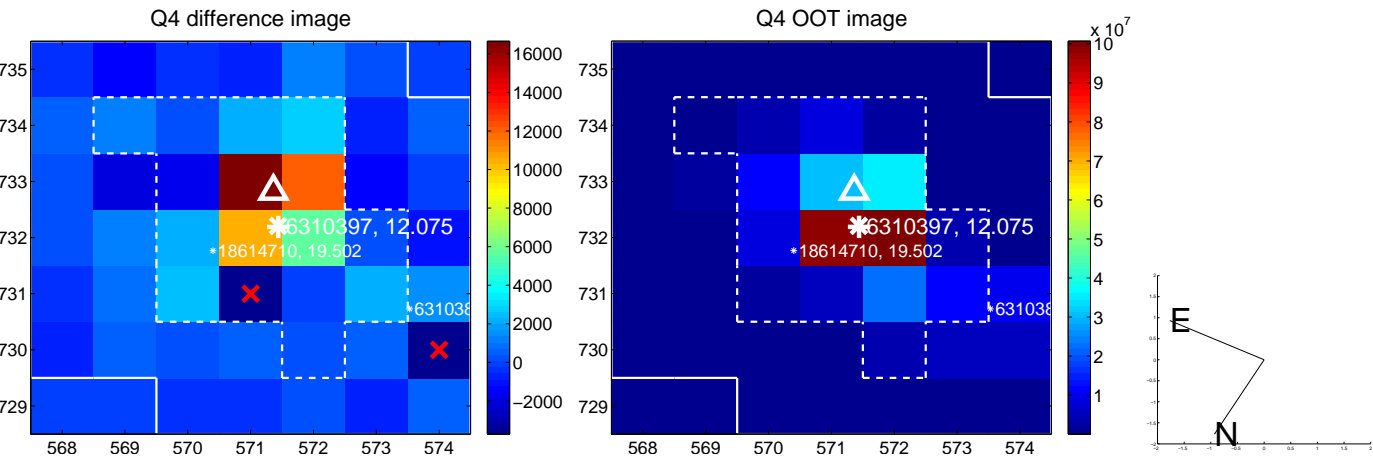
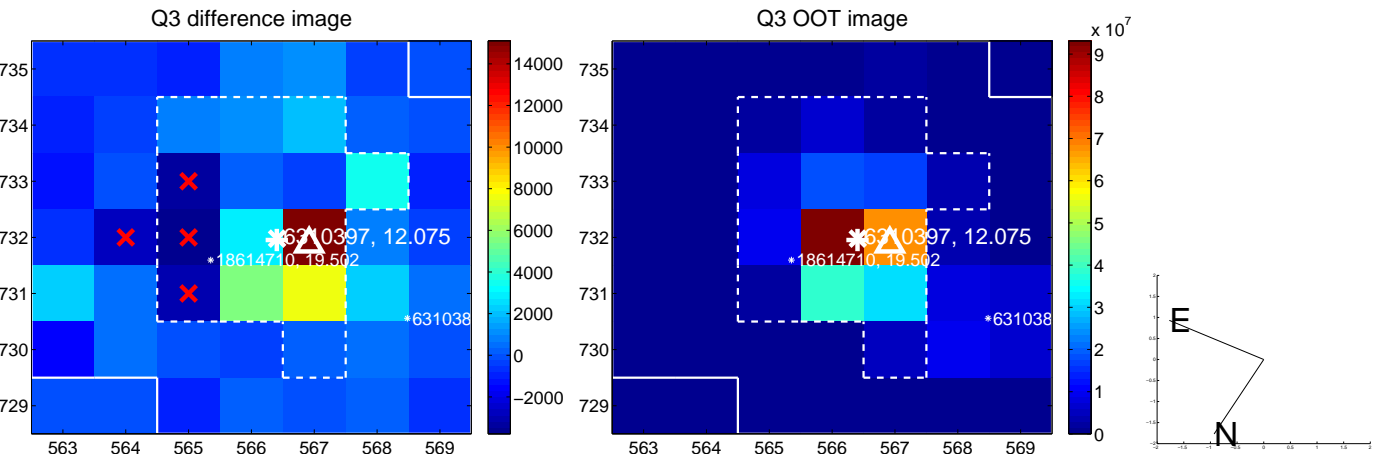
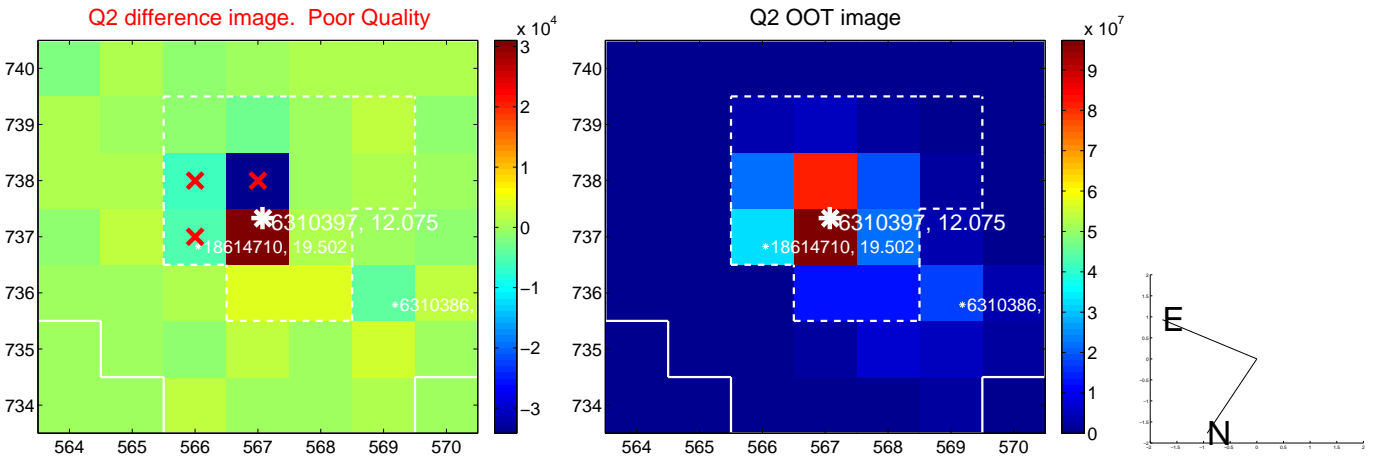
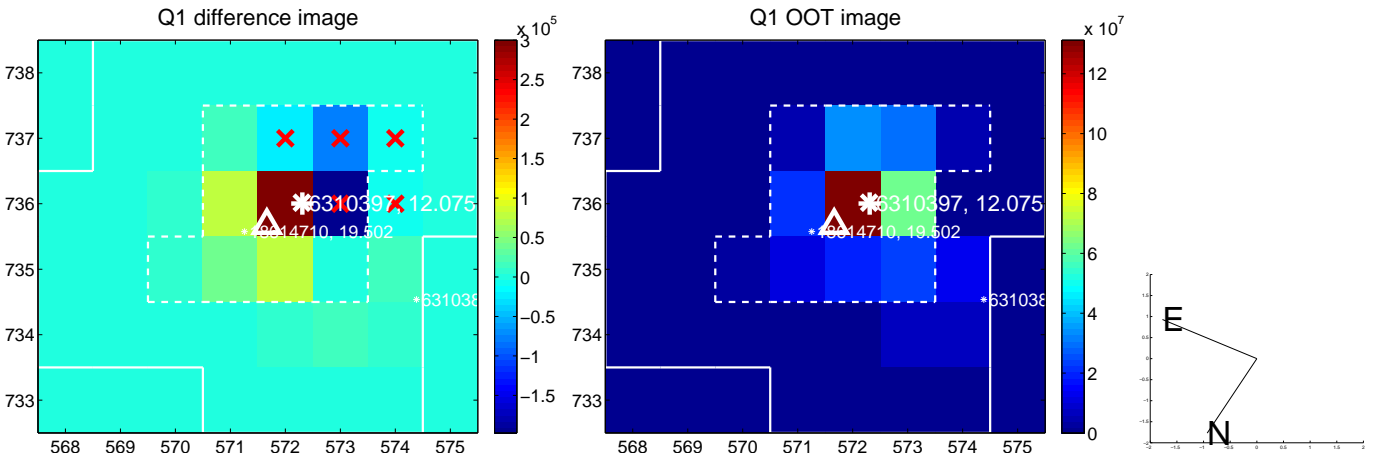
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.420 \pm 0.506$	0.83	$0.149 \pm 0.622$	$-0.393 \pm 0.578$
PRF-fit source offset from KIC position	$0.360 \pm 0.484$	0.74	$0.110 \pm 0.535$	$-0.343 \pm 0.539$
photometric centroid source offset	$0.52 \pm 0.36$	1.43	$-0.48 \pm 0.38$	$0.19 \pm 0.25$

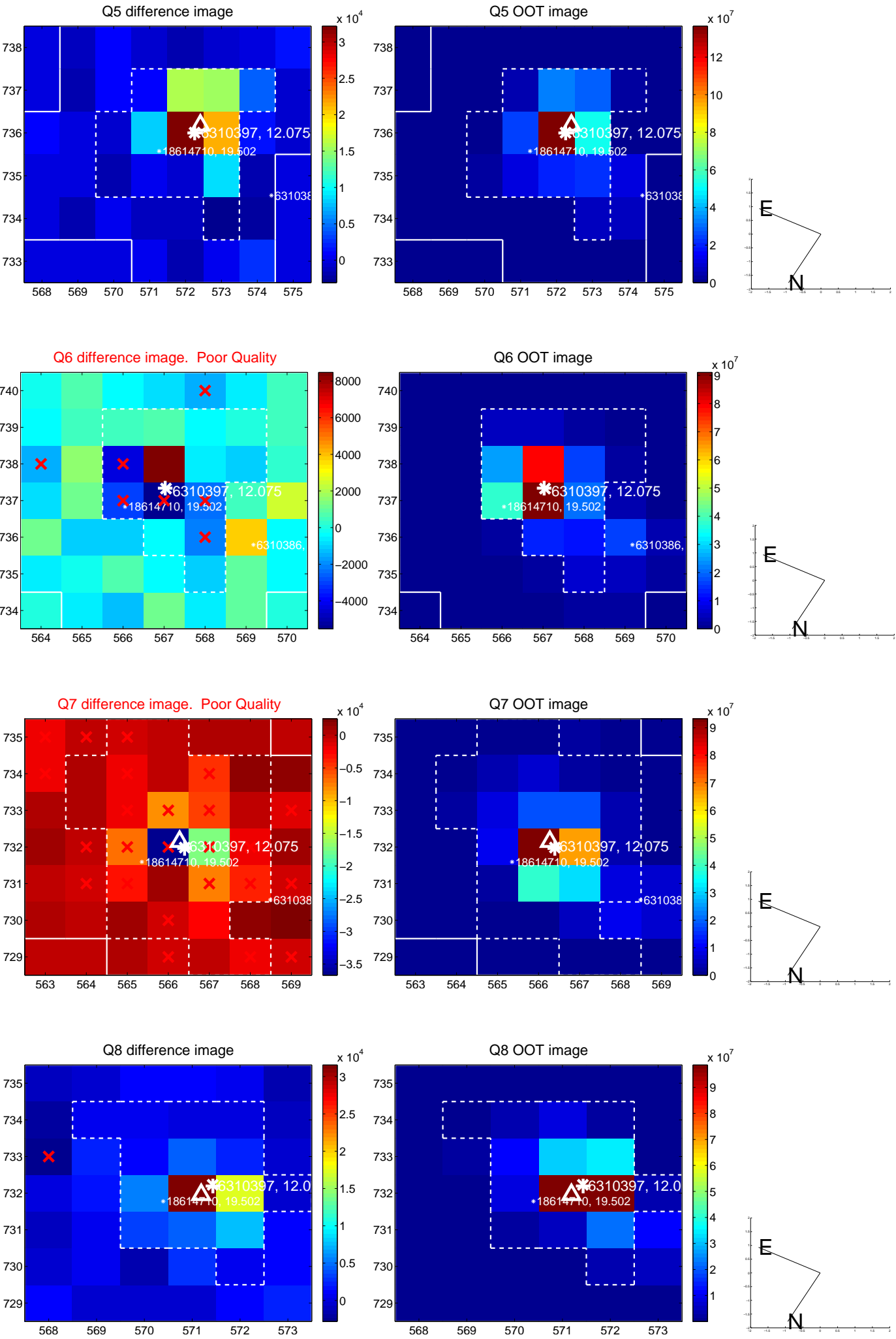


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

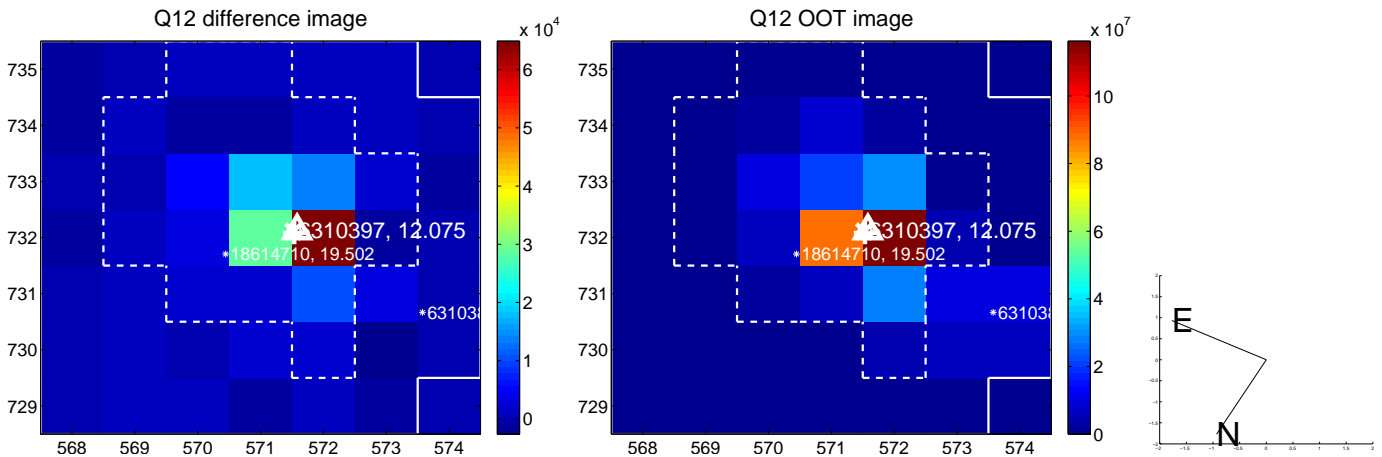
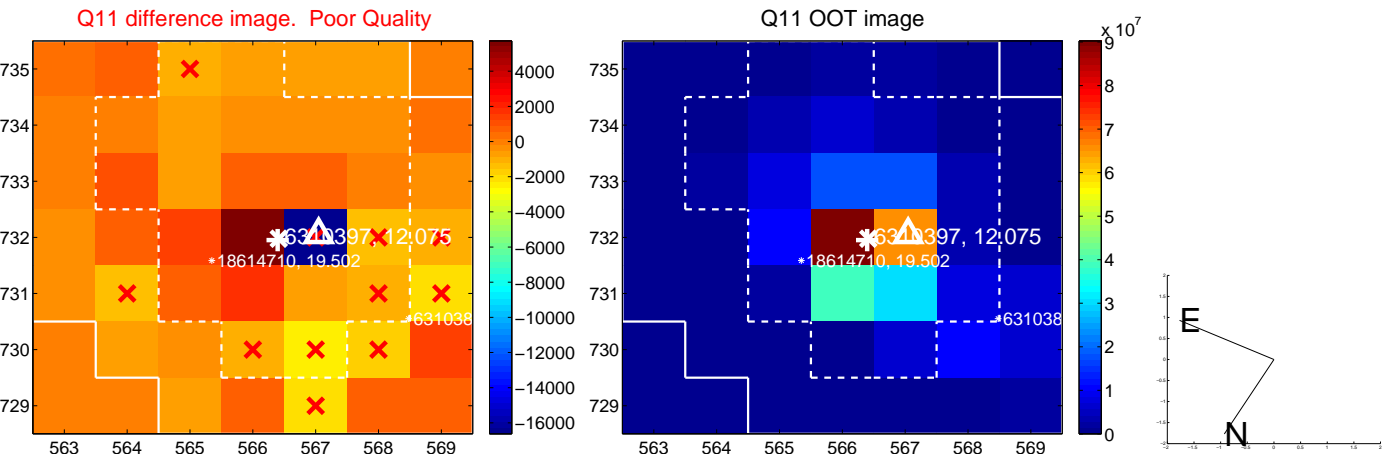
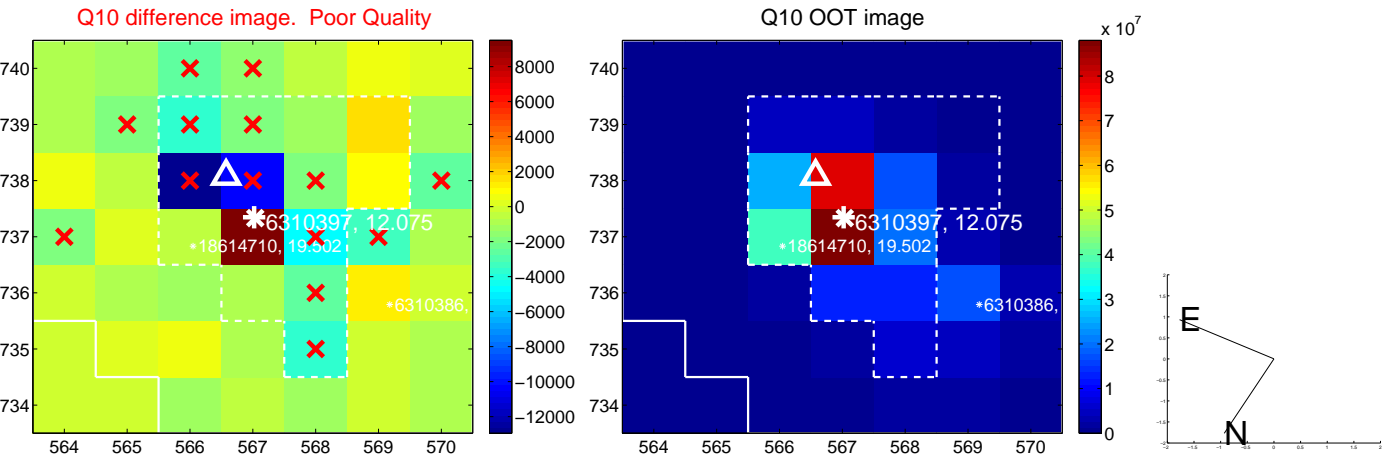
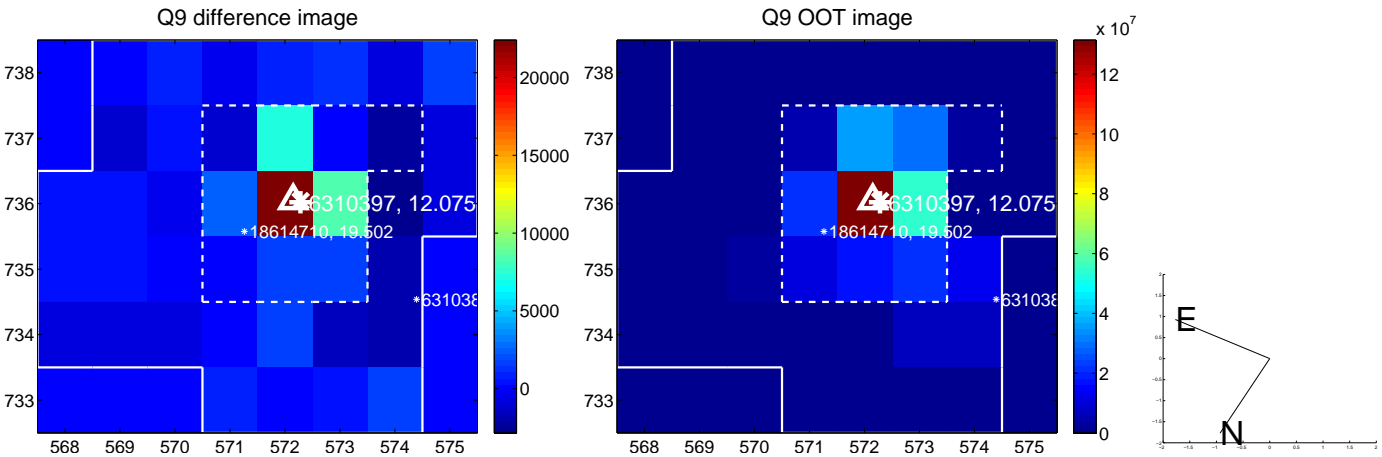


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

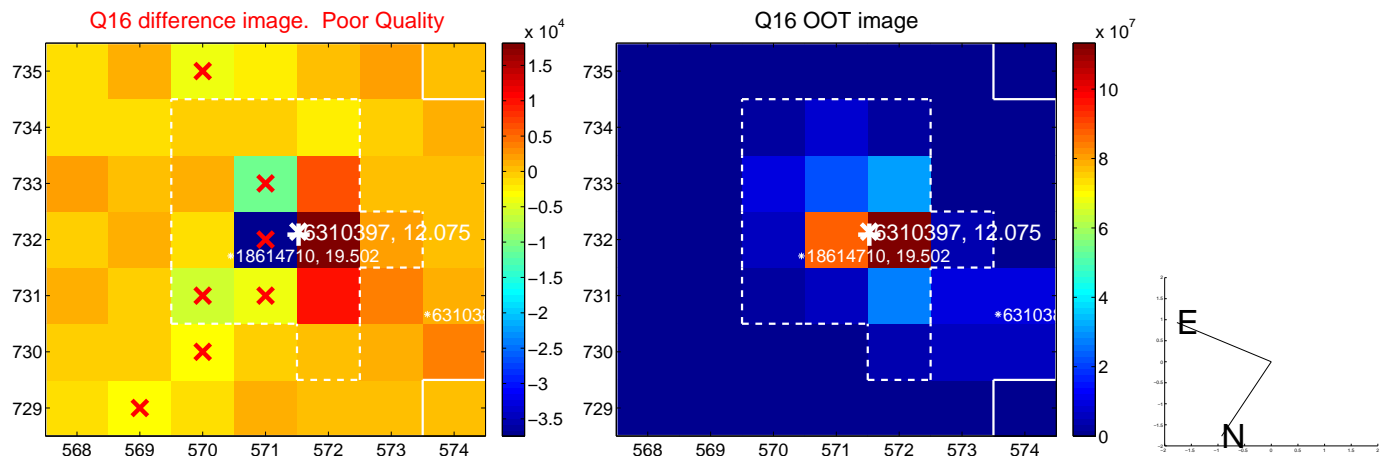
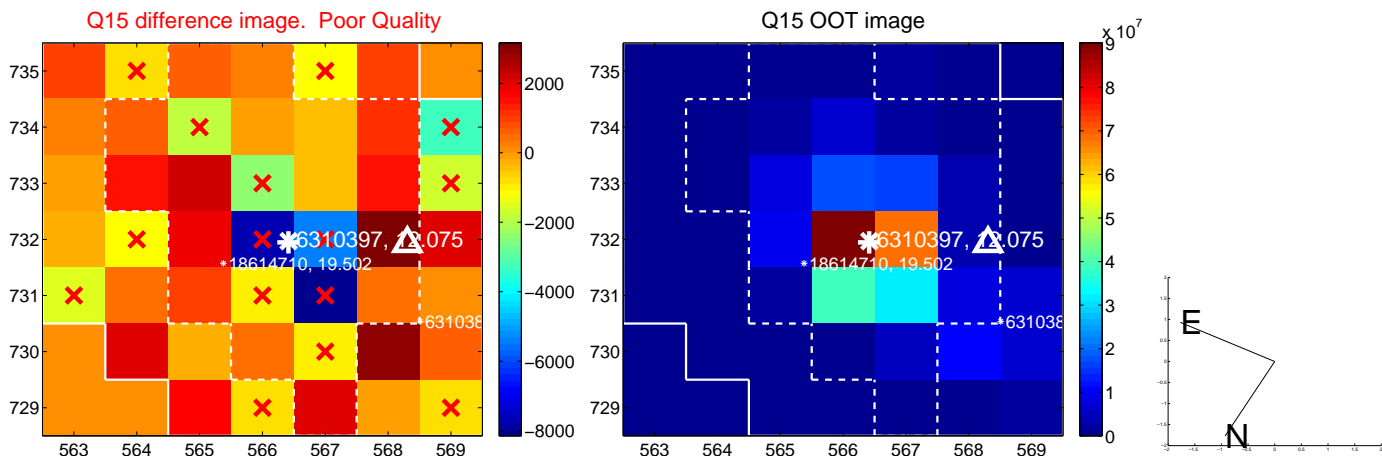
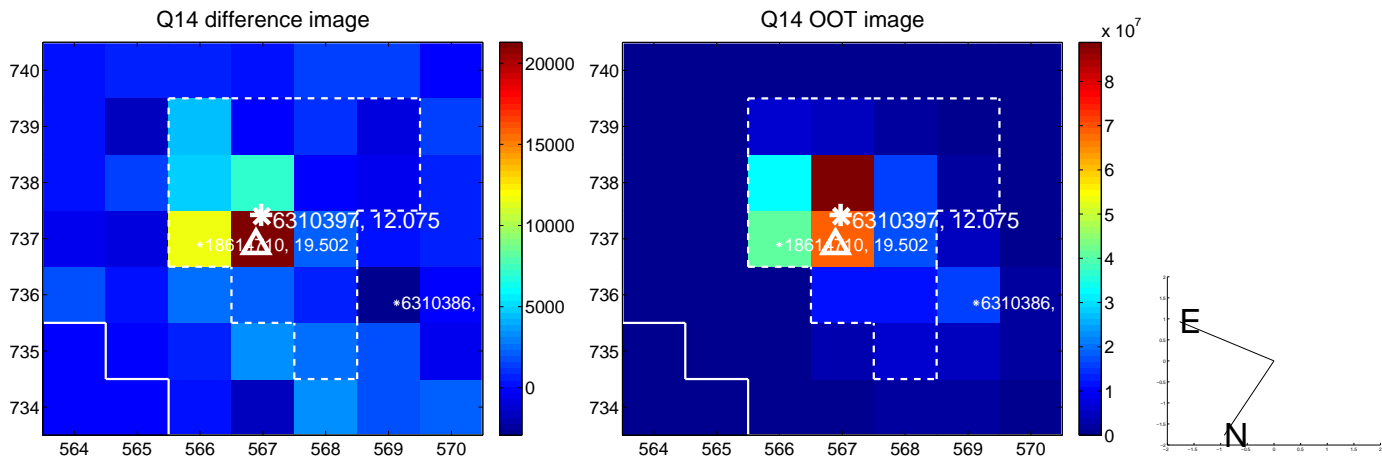
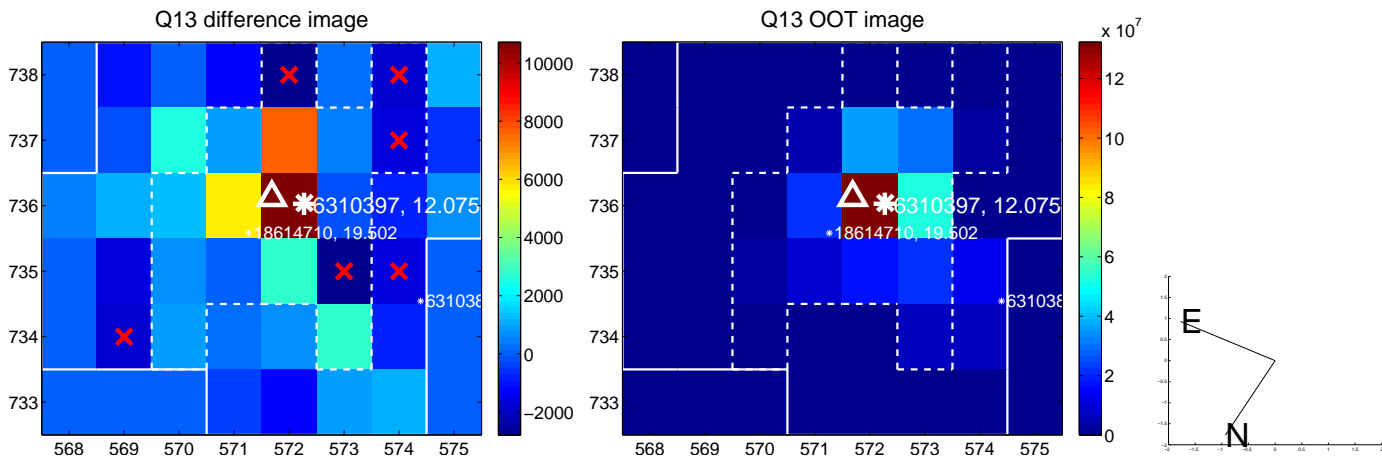




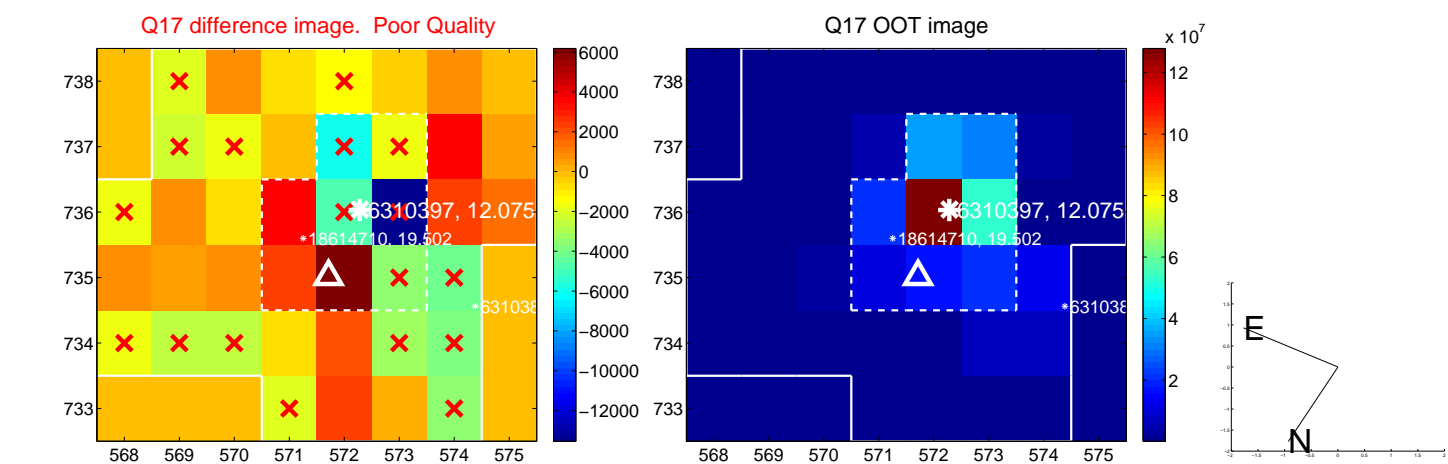
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



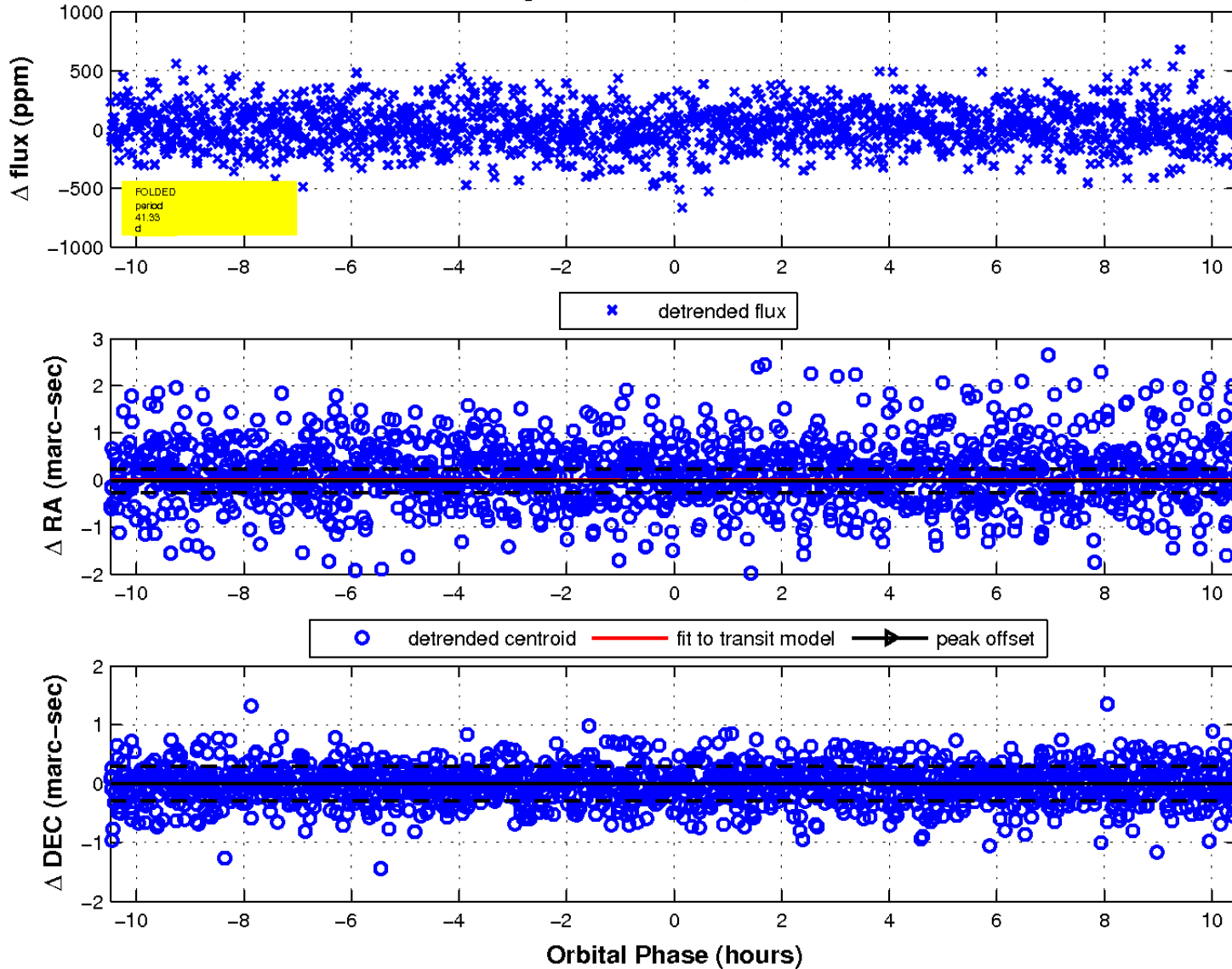
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

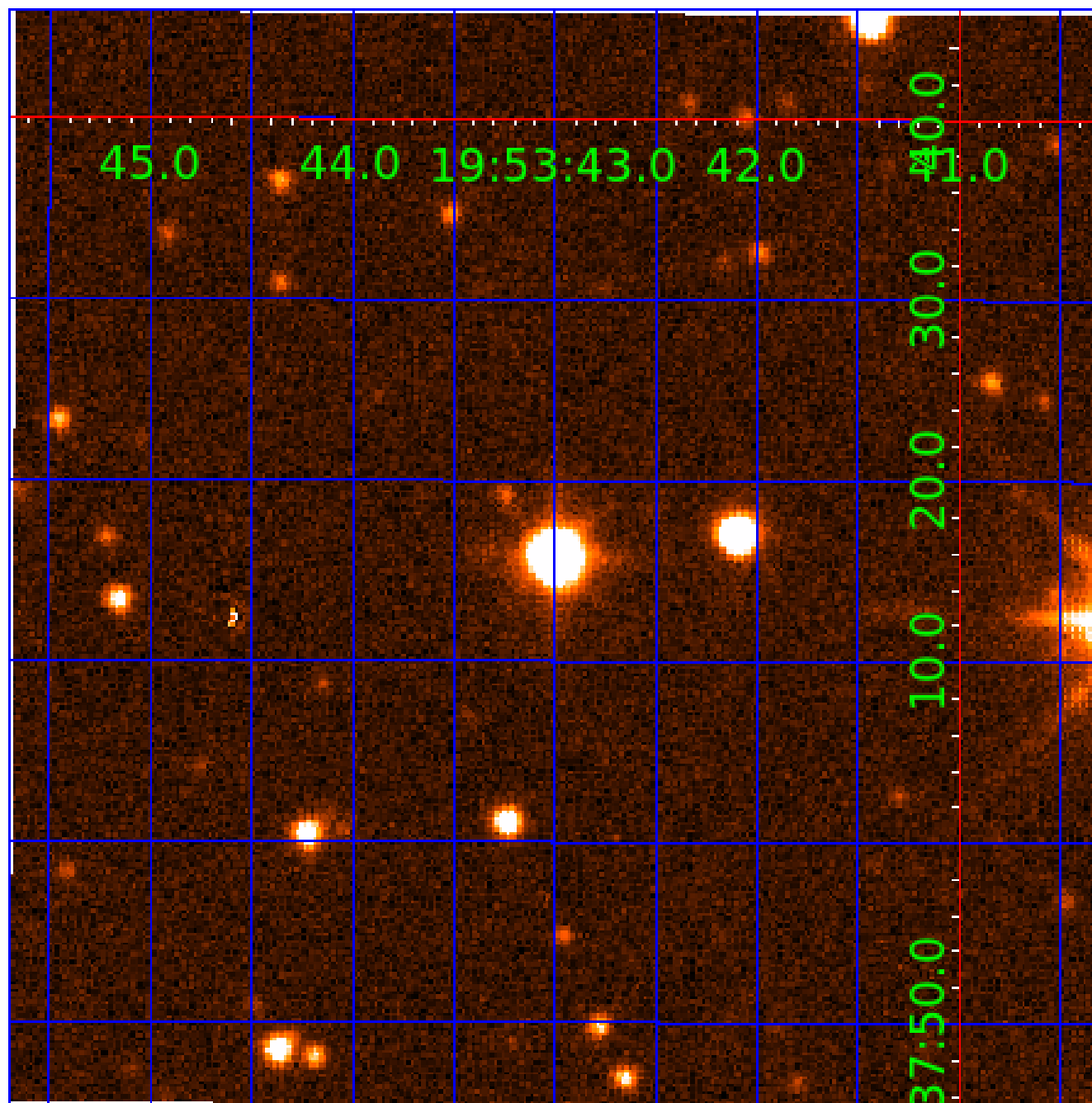


fluxWeightedCentroids, Planet 3 of 6



UKIRT Image

Declination



# KIC 006310397

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006310397-01	OBS	No	0.863182	131.728634	14.8	5.846	8.2	8.0	1.86	7318	0.73	21587.48
006310397-02	OBS	No	0.874973	131.560918	67.7	3.376	13.6	19.0	1.86	7318	1.77	21200.48
006310397-03	OBS	No	41.328636	134.705272	355.1	3.498	11.9	12.9	1.86	7318	6.70	124.17
006310397-04	OBS	No	23.265667	134.760839	356.8	2.277	10.5	11.6	1.86	7318	4.47	267.13
006310397-05	OBS	No	12.336945	138.858564	273.9	1.076	11.1	11.2	1.86	7318	3.16	622.39
006310397-06	OBS	No	9.439660	134.800797	197.5	4.500	9.9	-1.0	1.86	7318	2.64	889.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006310397-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006310397-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT
006310397-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—MOD_NONUNIQ_DV
006310397-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

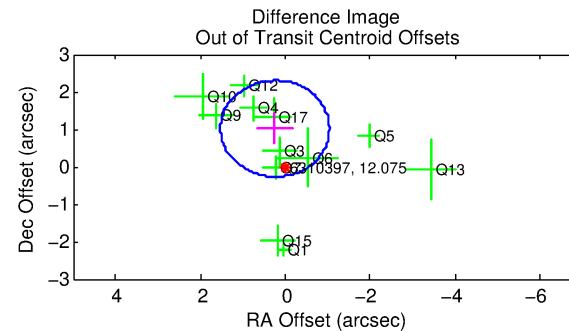
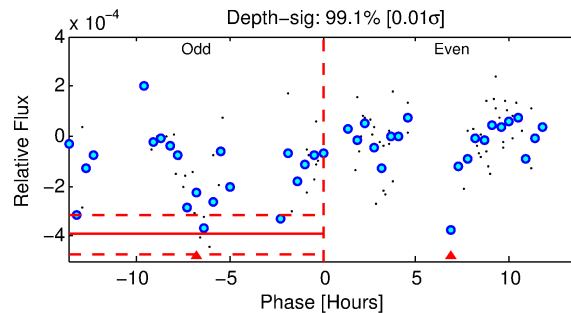
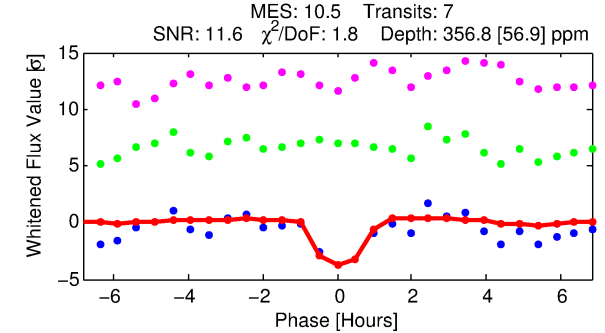
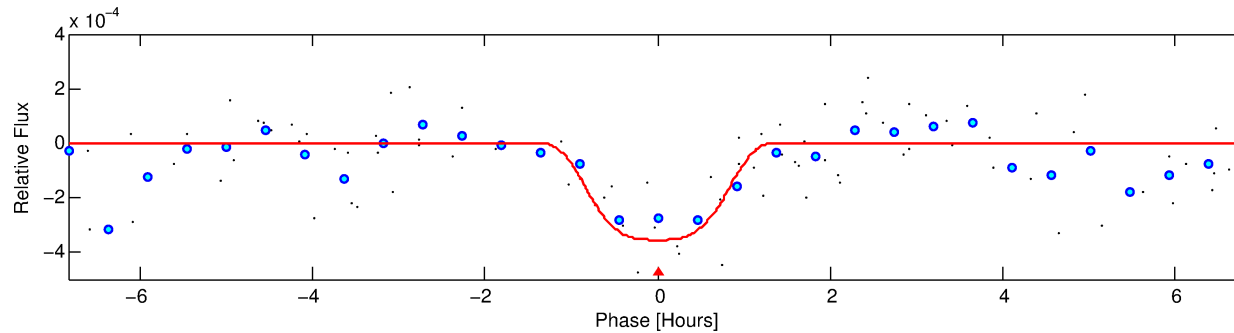
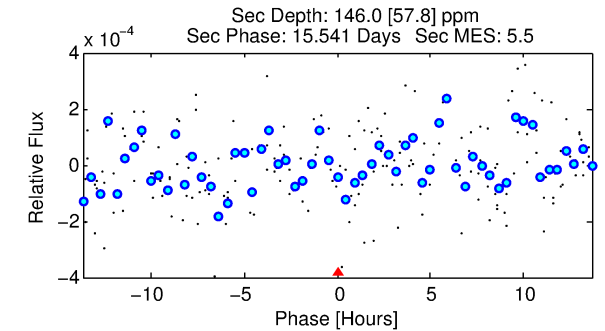
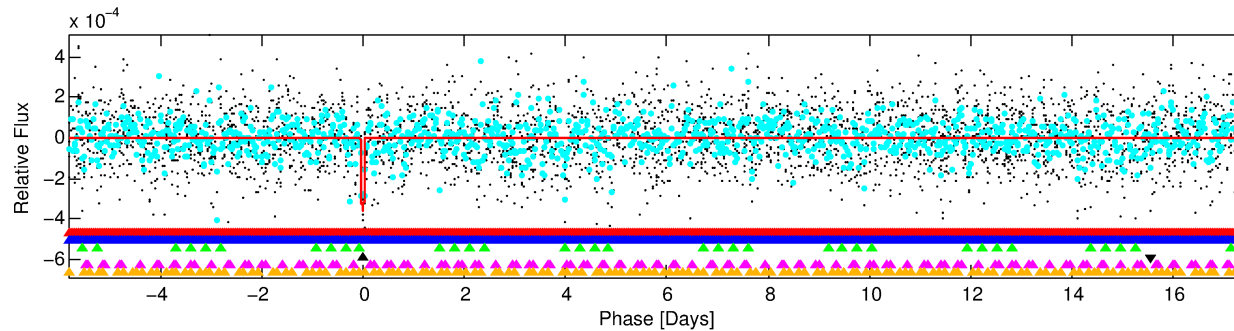
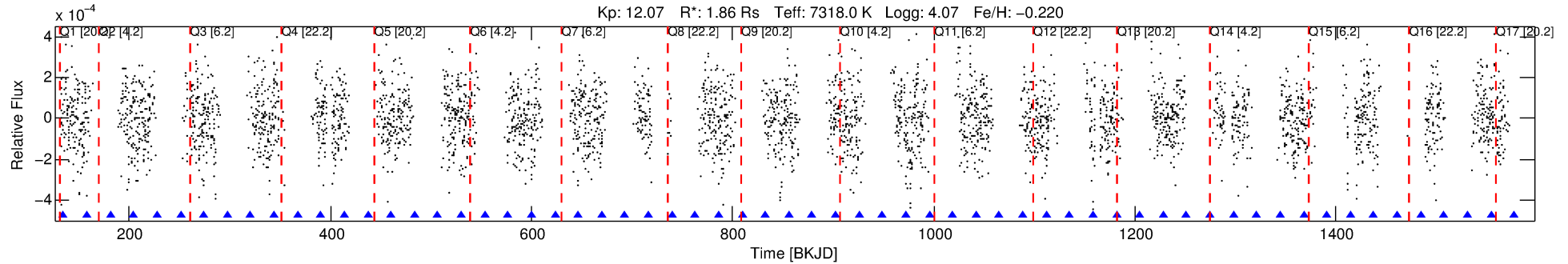
## Ephemeris Match Information For 006310397-04

No Significant Match Found



# DV One-Page Summary

KIC: 6310397 Candidate: 4 of 6 Period: 23.266 d



## DV Fit Results:

Period = 23.26567 [0.00020] d  
Epoch = 134.7608 [0.0067] BKJD  
Rp/R\* = 0.0221 [0.0024]  
a/R\* = 25.08 [7.58]  
b = 0.97 [0.02]  
Seff = 267.13 [106.63]  
Teq = 1031 [103] K  
Rp = 4.47 [1.31] Re  
a = 0.1821 [0.0437] AU  
Ag = 133.29 [77.04] [1.72σ]  
Teffp = 5416 [651] K [6.66σ]

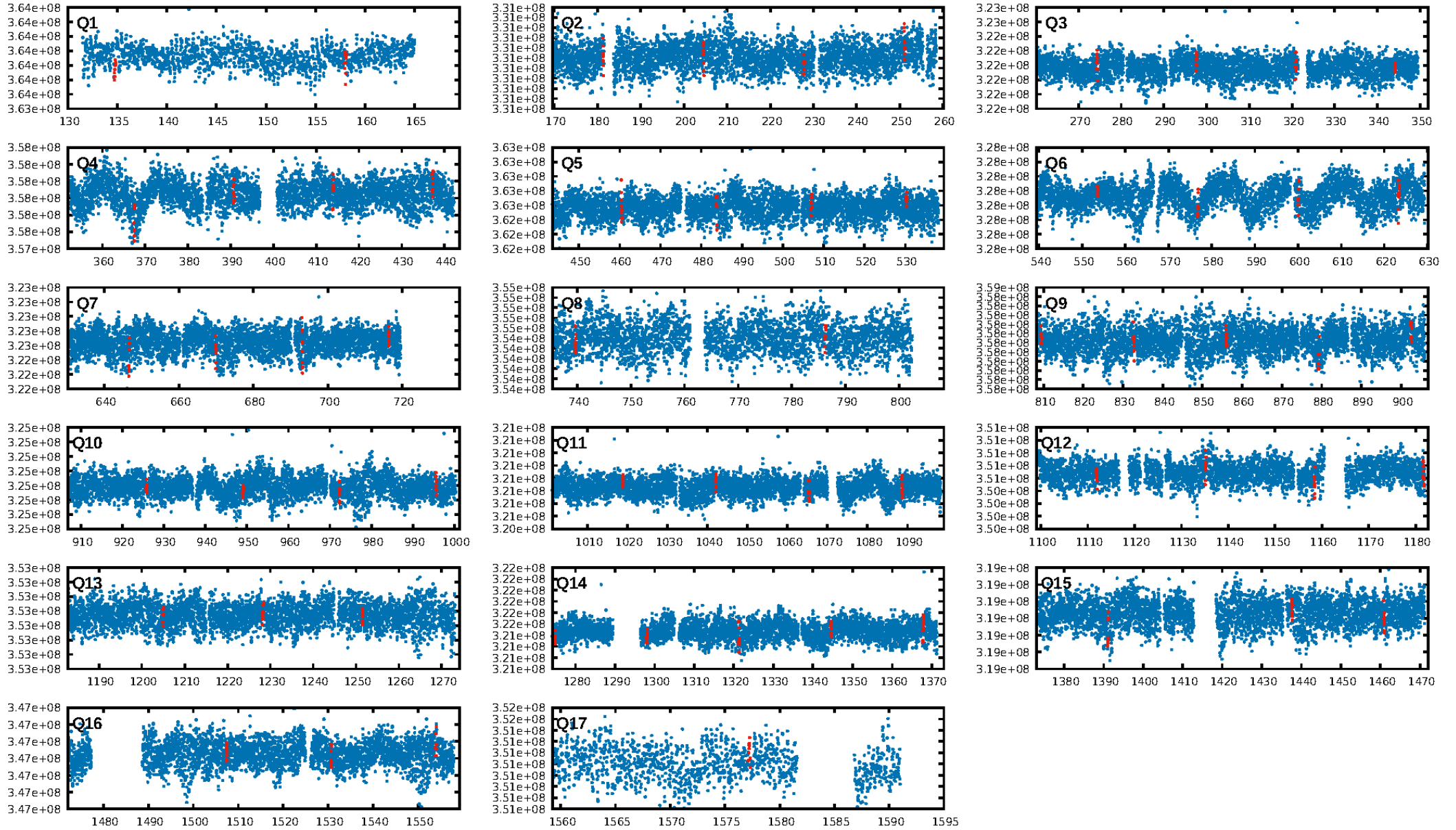
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [104.13σ]  
LongPeriod-sig: 100.0% [103.85σ]  
ModelChiSquare2-sig: 38.3%  
ModelChiSquareGof-sig: 99.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -0.8632  
Centroid-sig: 27.7%  
Centroid-so: 0.518 arcsec [2.09σ]  
OotOffset-rm: 1.044 arcsec [2.44σ]  
KicOffset-rm: 1.107 arcsec [2.68σ]  
OotOffset-st: 2/3/2/5 [12]  
KicOffset-st: 2/3/2/5 [12]  
DiffImageQuality-fgm: 0.50 [6/12]  
DiffImageOverlap-fno: 0.00 [0/17]

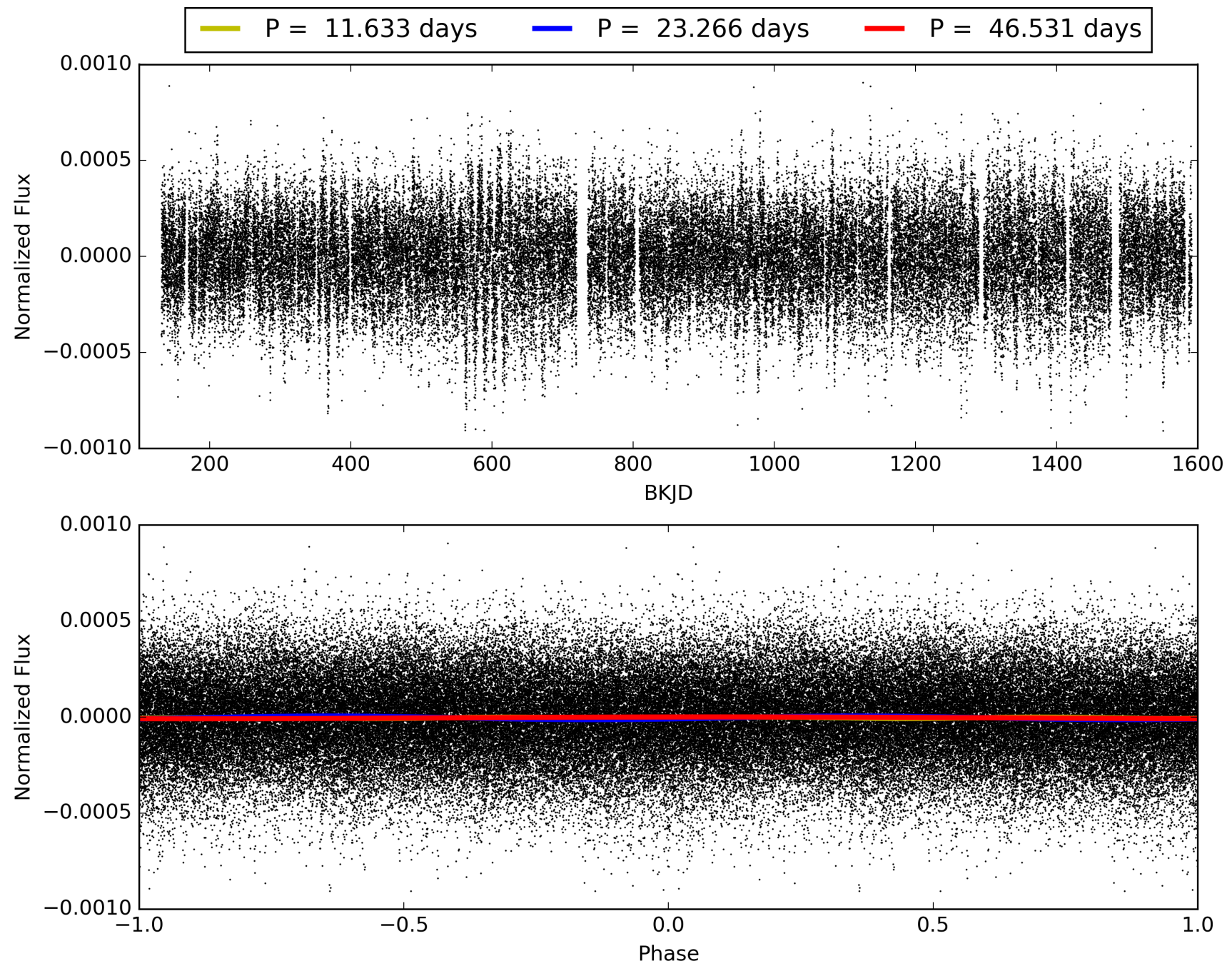
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:53:25 Z

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

# TCE 006310397-04, PDC Light Curves

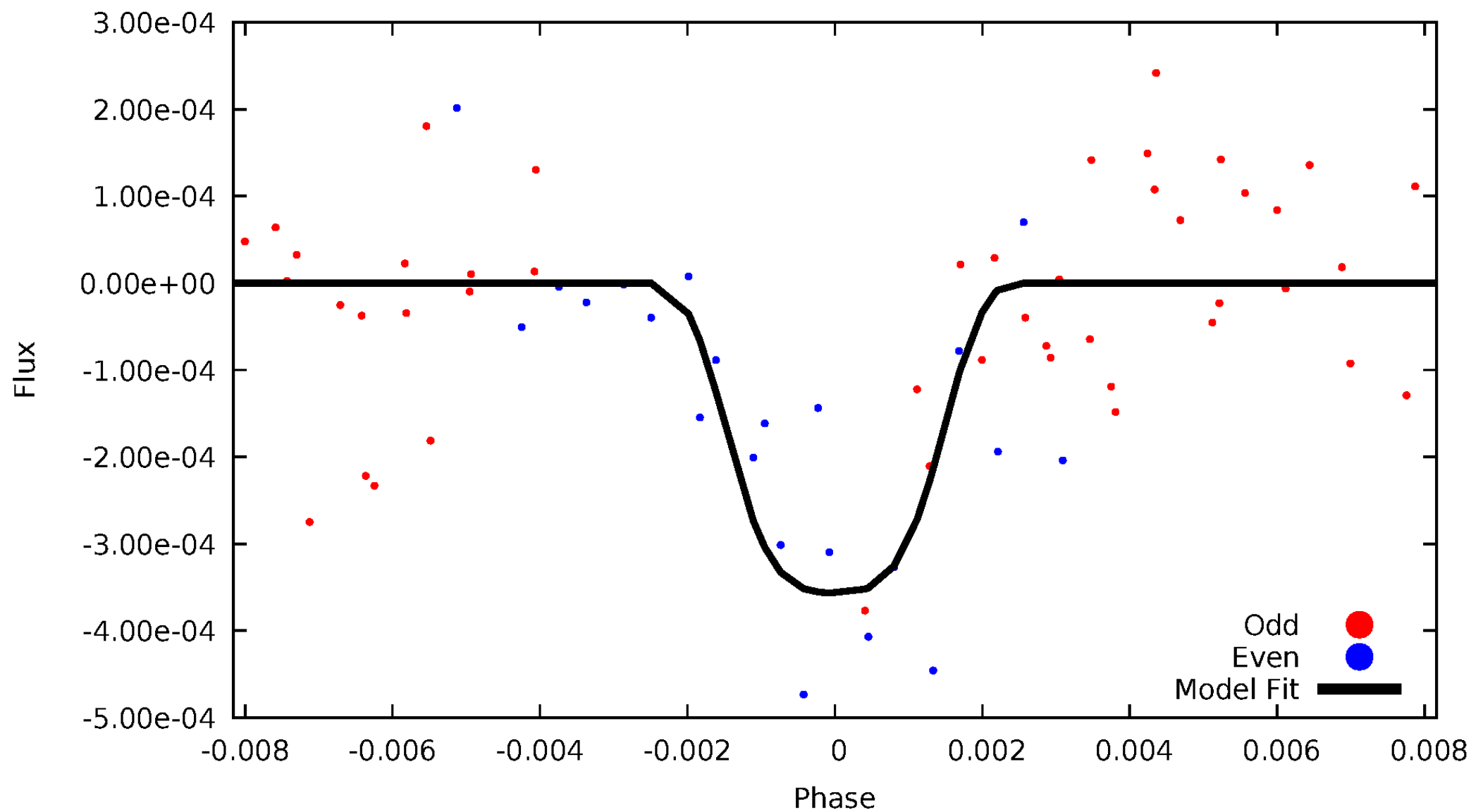


TCE 006310397-04



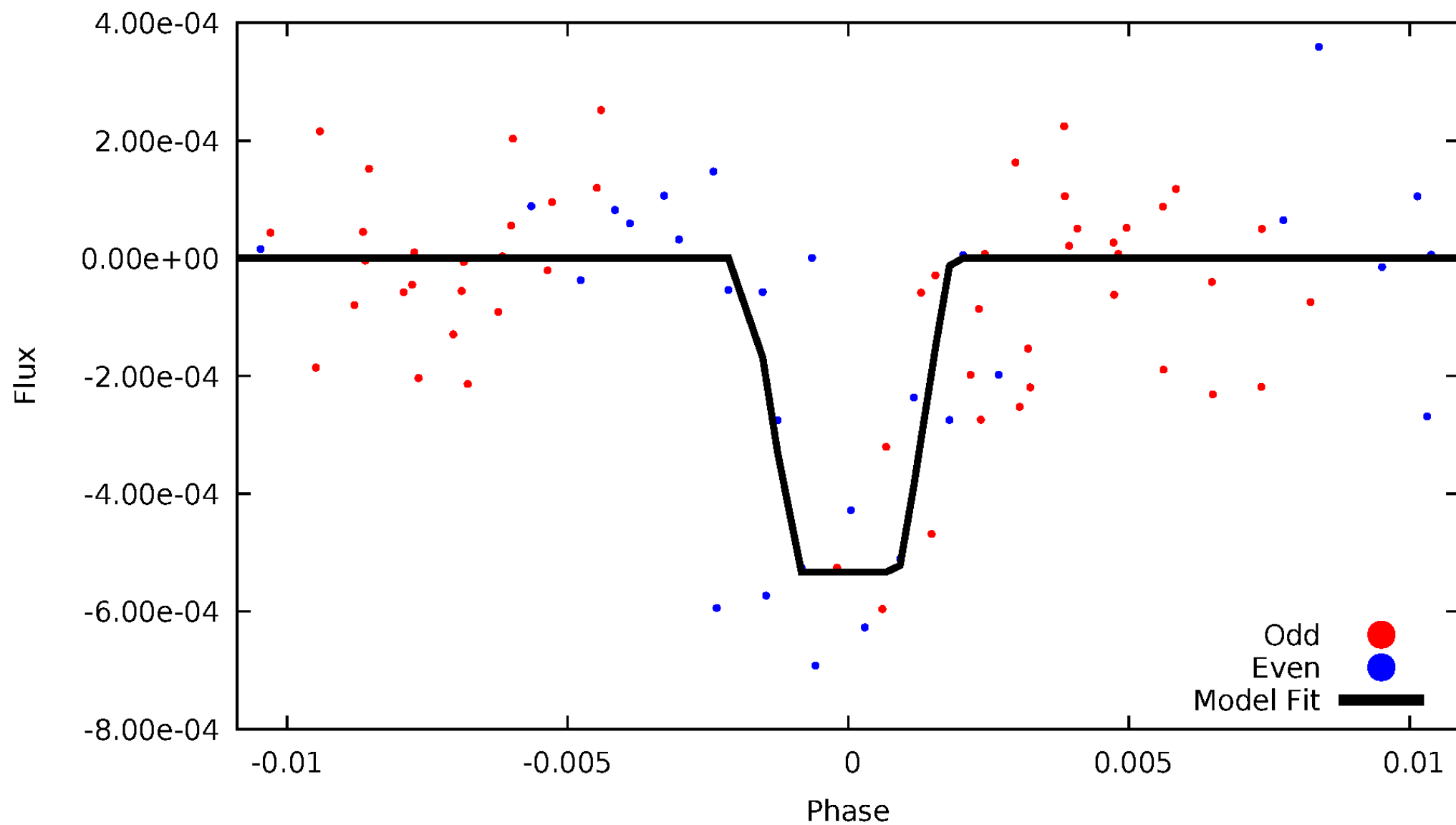
# DV Odd/Even

TCE 006310397-04



# ALT Odd/Even

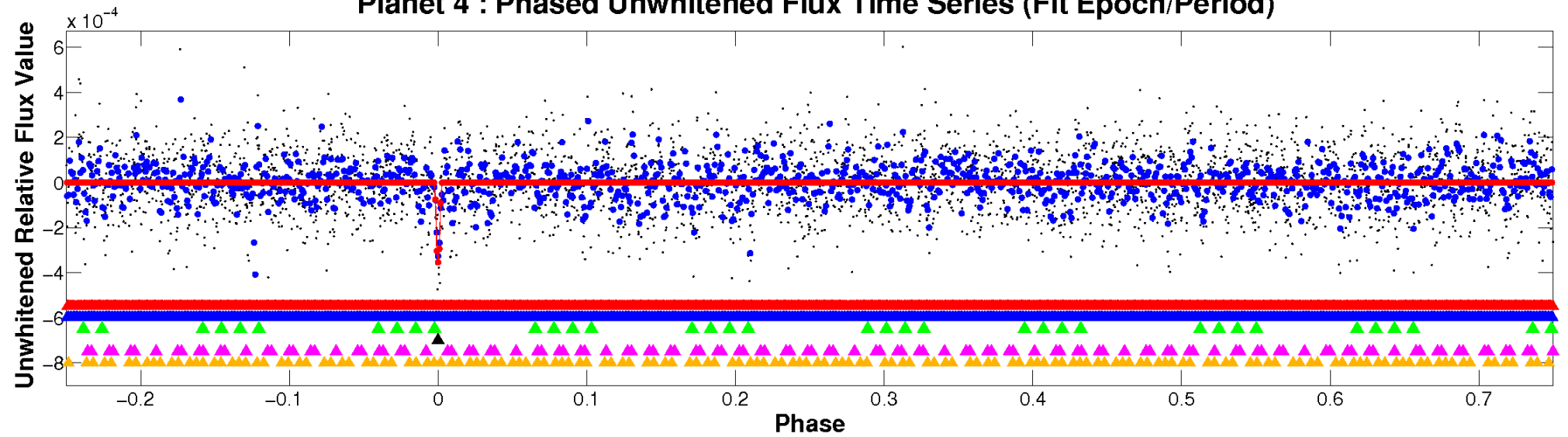
TCE 006310397-04



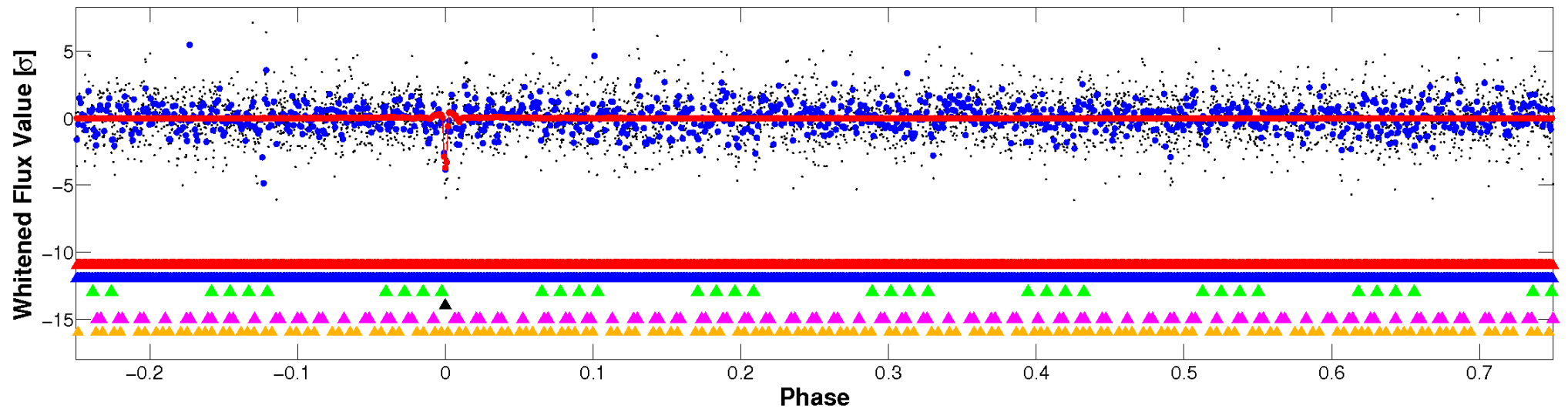


# Non-Whitened Vs. Whitened Light Curve

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

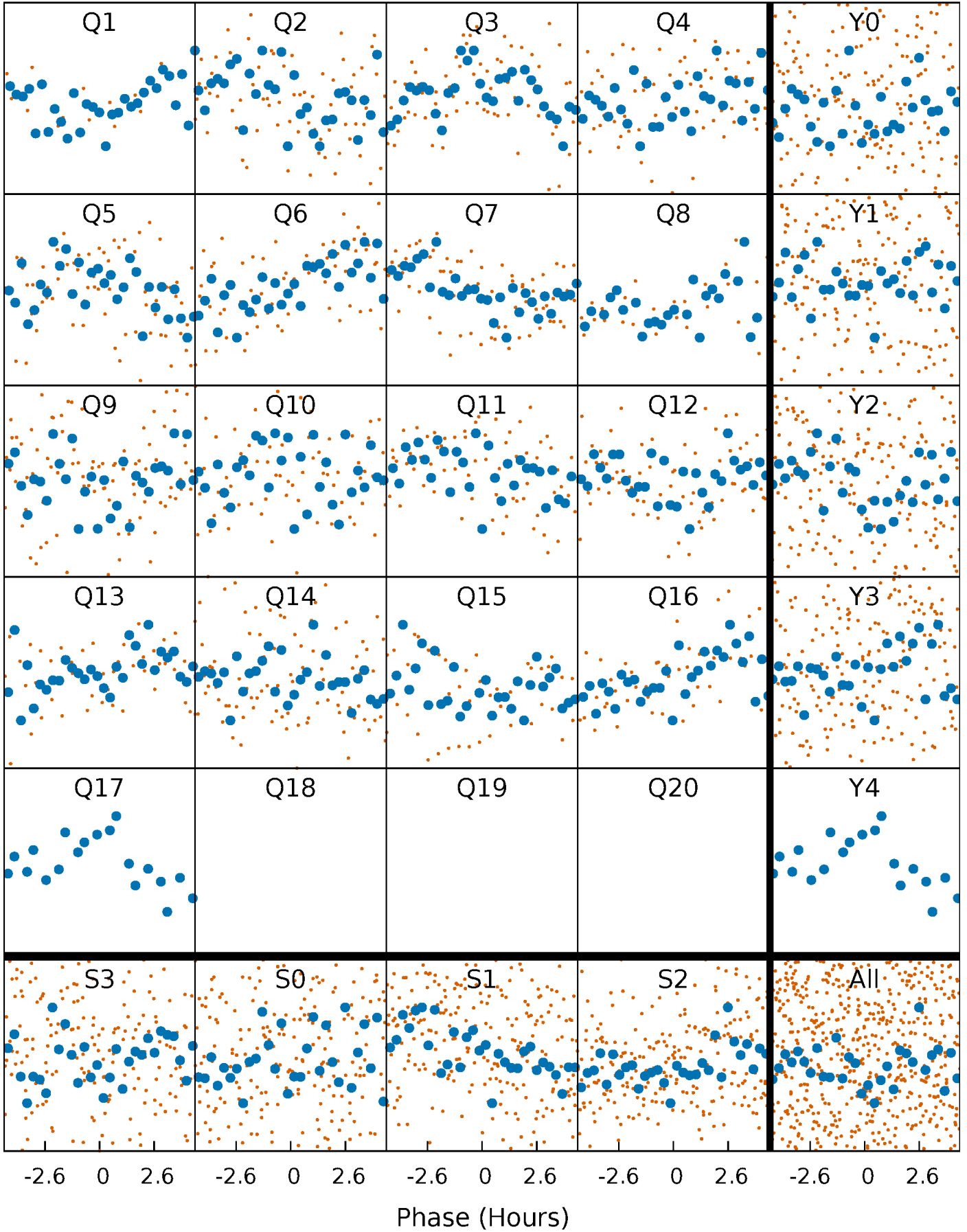


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



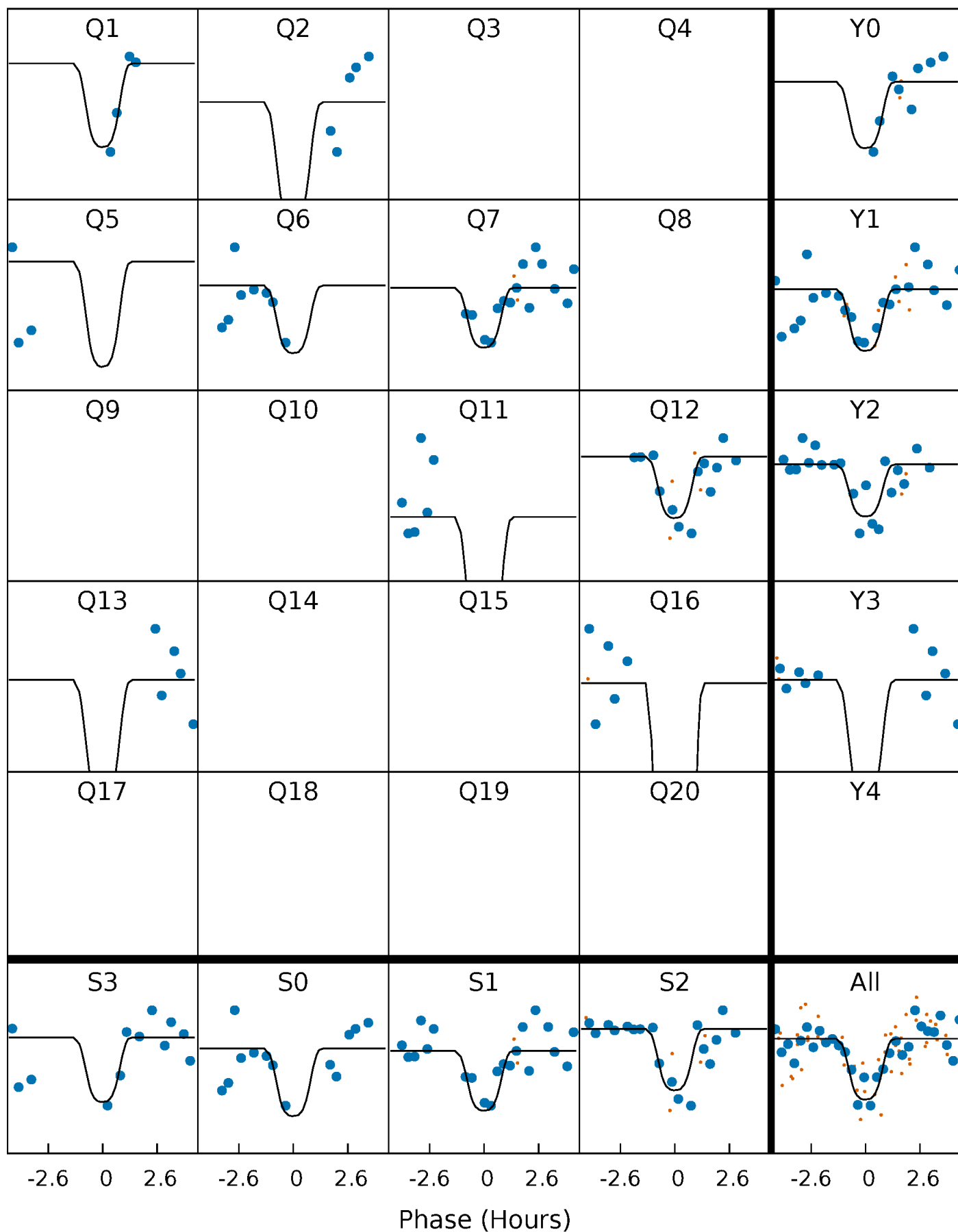
# PDC Quarter-Phased Transit Curves

TCE 006310397-04   P= 23.265667 Days    $T_0=134.760839$  (BKJD)



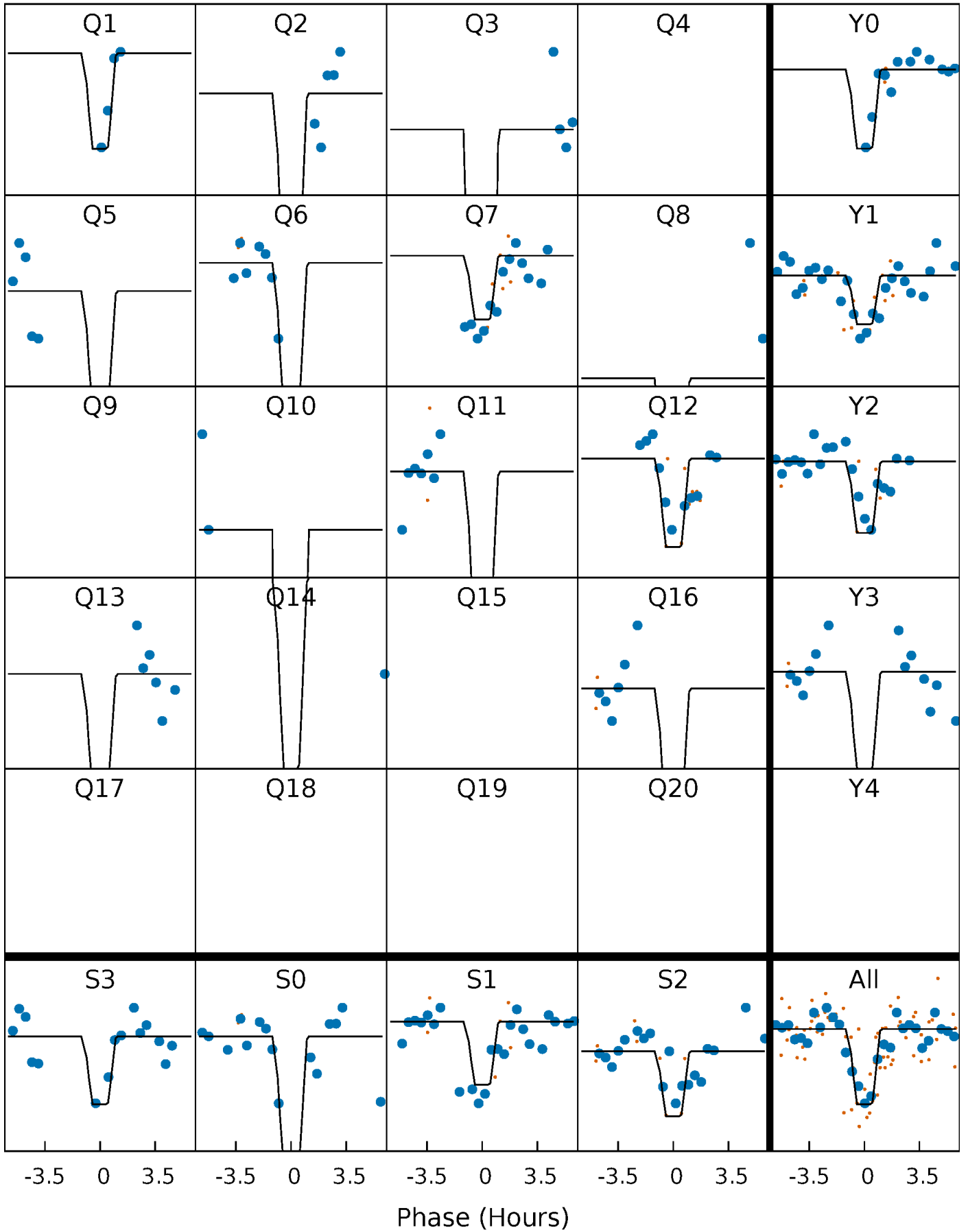
# DV Quarter-Phased Transit Curves

TCE 006310397-04 P= 23.265667 Days  $T_0=134.760839$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

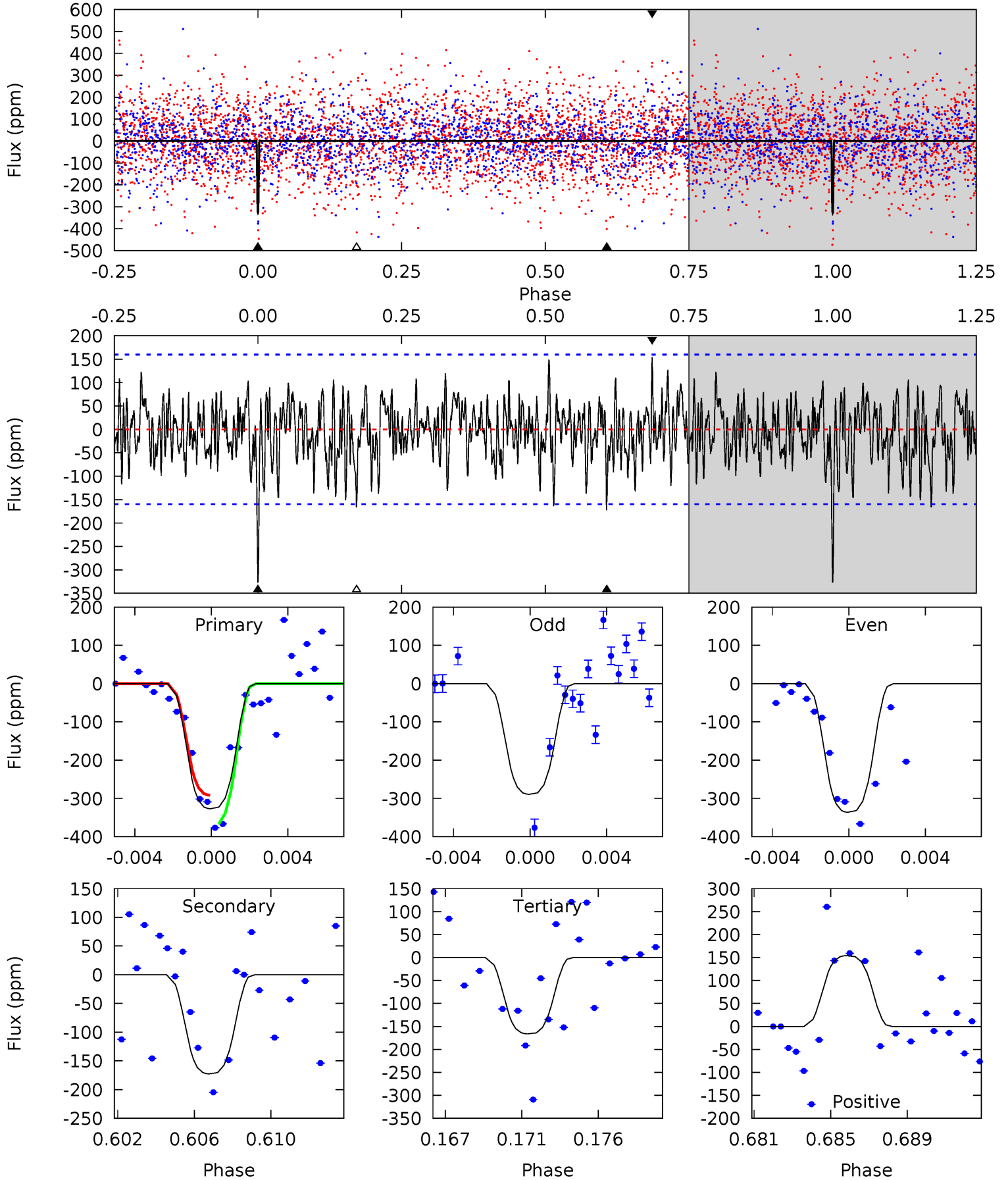
TCE 006310397-04     $P = 23.265558$  Days     $T_0 = 134.775155$  (BKJD)



# DV Model-Shift Uniqueness Test

006310397-04, P = 23.265667 Days, E = 111.495172 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
10.6	5.60	5.39	5.00	5.18	2.85	1.65	5.21	5.61	0.21	0.60	0.72	1.00	0.32	1.18

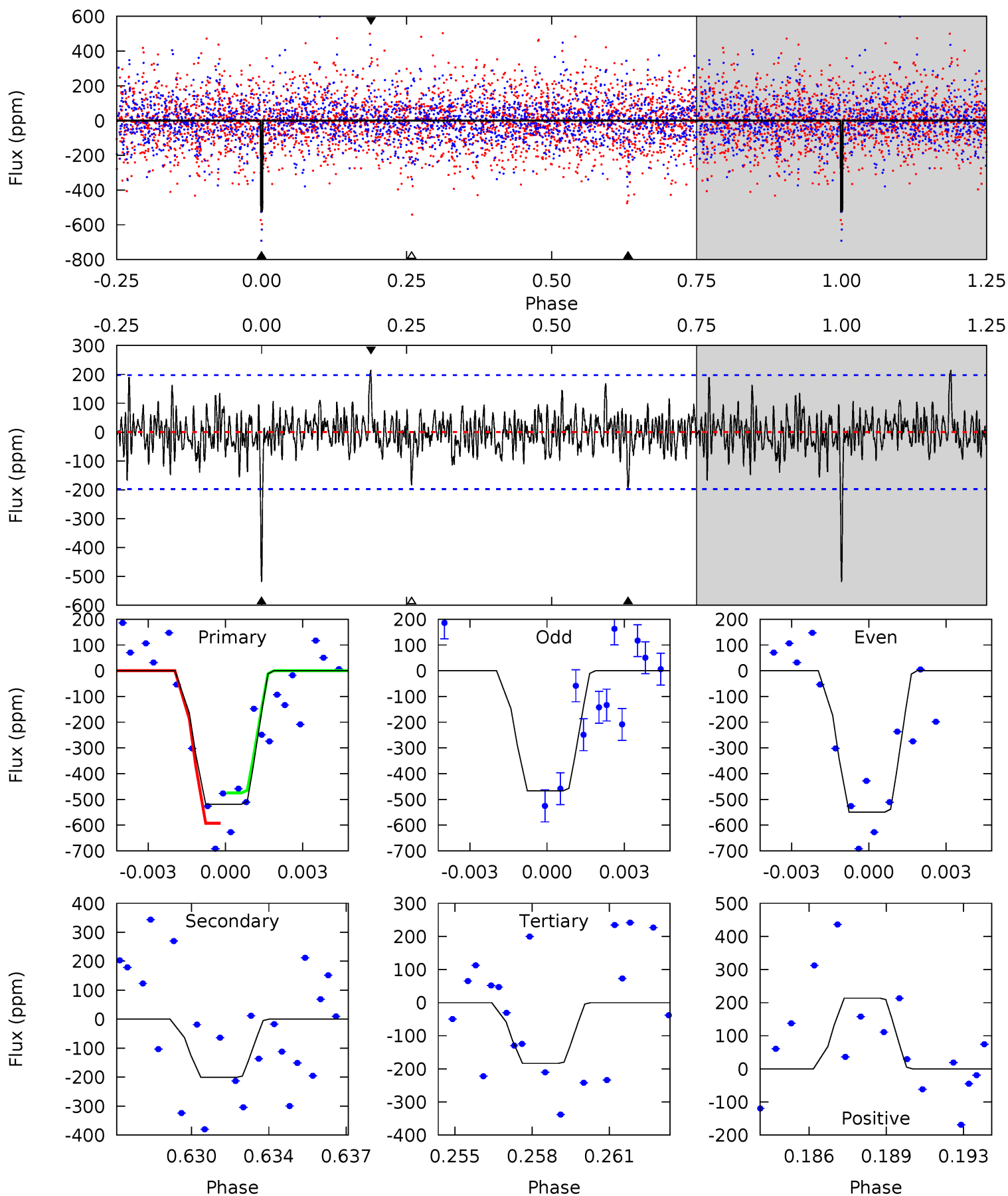




# Alt Model-Shift Uniqueness Test

006310397-04, P = 23.265558 Days, E = 111.509597 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
13.8	5.32	4.87	5.67	5.24	2.94	1.33	8.90	8.10	0.45	-0.34	1.10	0.91	0.29	1.43



### Stellar Parameters For KIC 006310397

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7318^{+230}_{-307}$	$4.073^{+0.204}_{-0.167}$	$-0.220^{+0.250}_{-0.350}$	$1.857^{+0.507}_{-0.507}$	$1.486^{+0.209}_{-0.255}$	$0.327^{+0.382}_{-0.153}$
	+3%/-4%	+5%/-4%	+114%/-159%	+27%/-27%	+14%/-17%	+117%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006310397-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-173 \pm 31$	$4.44^{+0.84}_{-0.80}$	$1430^{+109}_{-107}$	$5579^{+407}_{-384}$	$159^{+78}_{-51}$
Alt.	$-201 \pm 38$	$4.63^{+0.93}_{-0.78}$	$1431^{+109}_{-116}$	$5642^{+398}_{-374}$	$170^{+77}_{-56}$

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

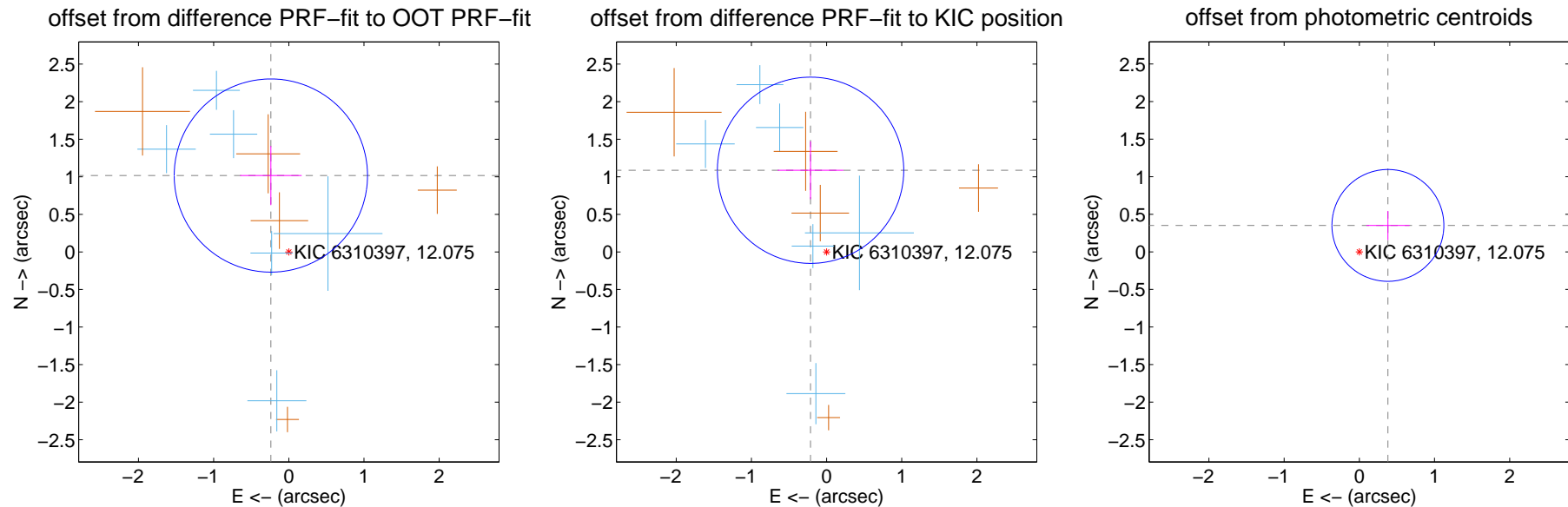
## DV Centroid Data

Supplemental centroid analysis for 006310397-04. Kepler magnitude: 12.07. Transit SNR 11.62

There are 6 quarters with good PRF difference image offsets

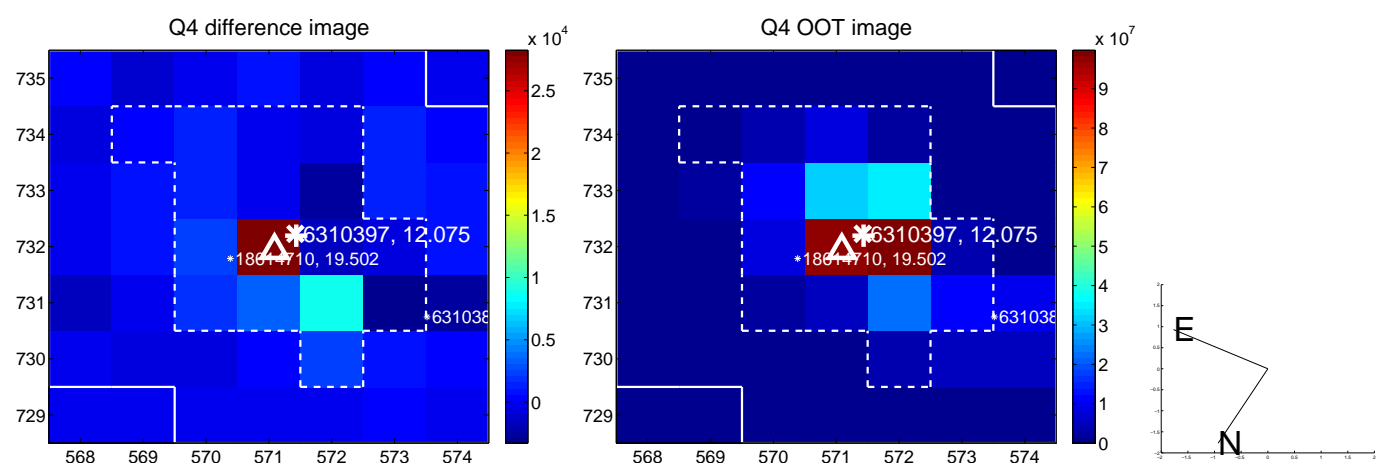
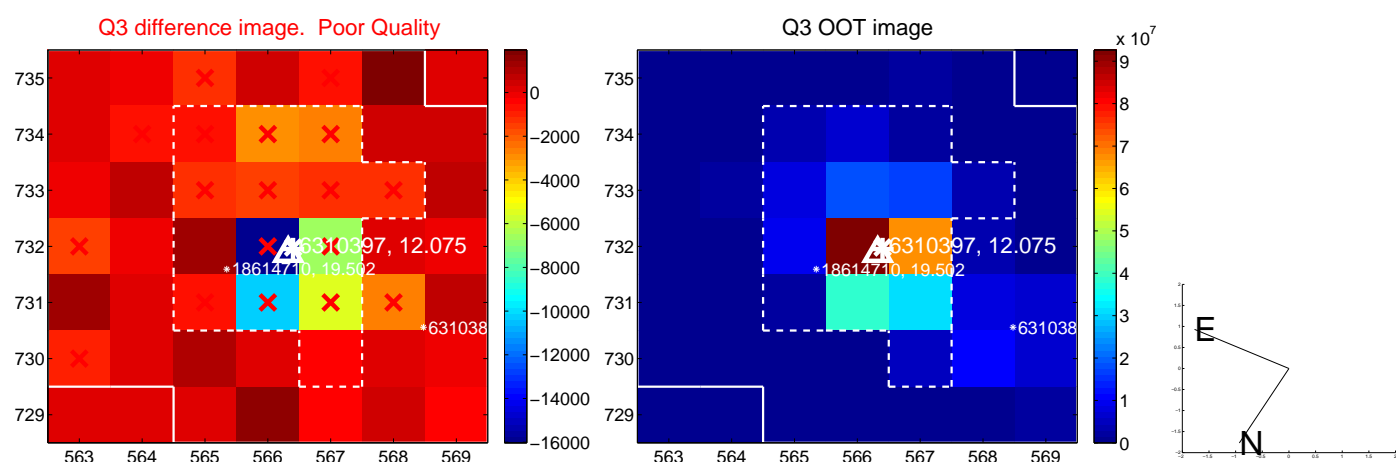
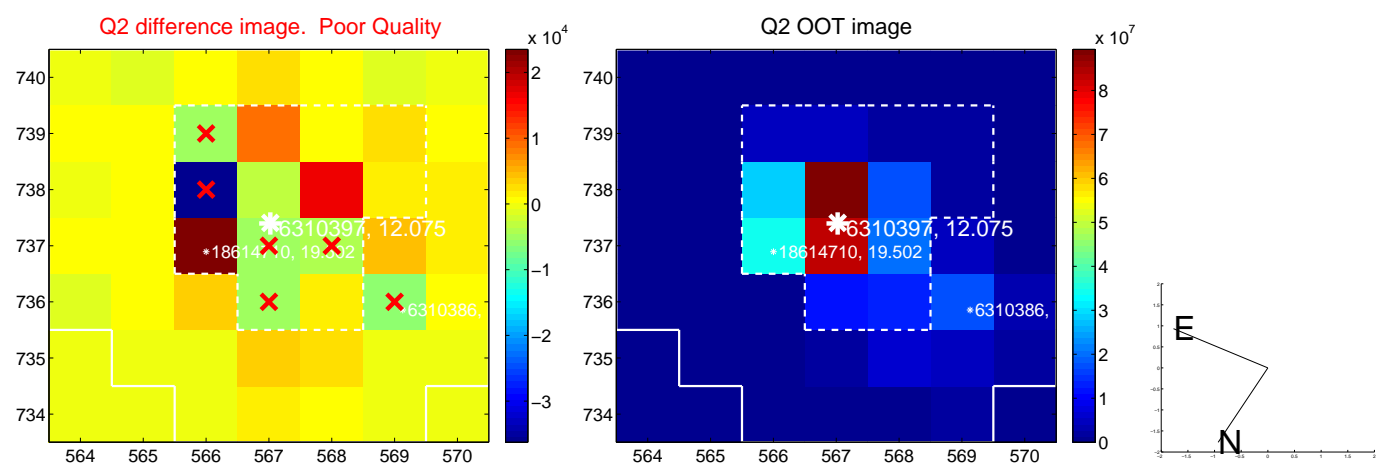
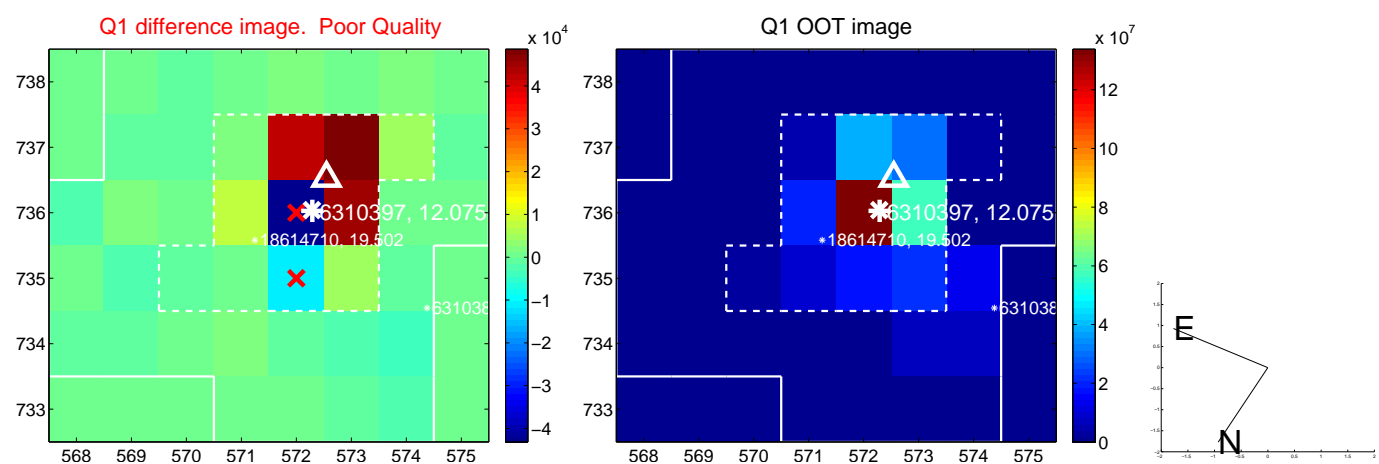
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.044 \pm 0.428$	2.44	$0.239 \pm 0.409$	$1.016 \pm 0.393$
PRF-fit source offset from KIC position	$1.107 \pm 0.413$	2.68	$0.213 \pm 0.437$	$1.087 \pm 0.385$
photometric centroid source offset	$0.52 \pm 0.25$	2.09	$-0.38 \pm 0.29$	$0.35 \pm 0.19$

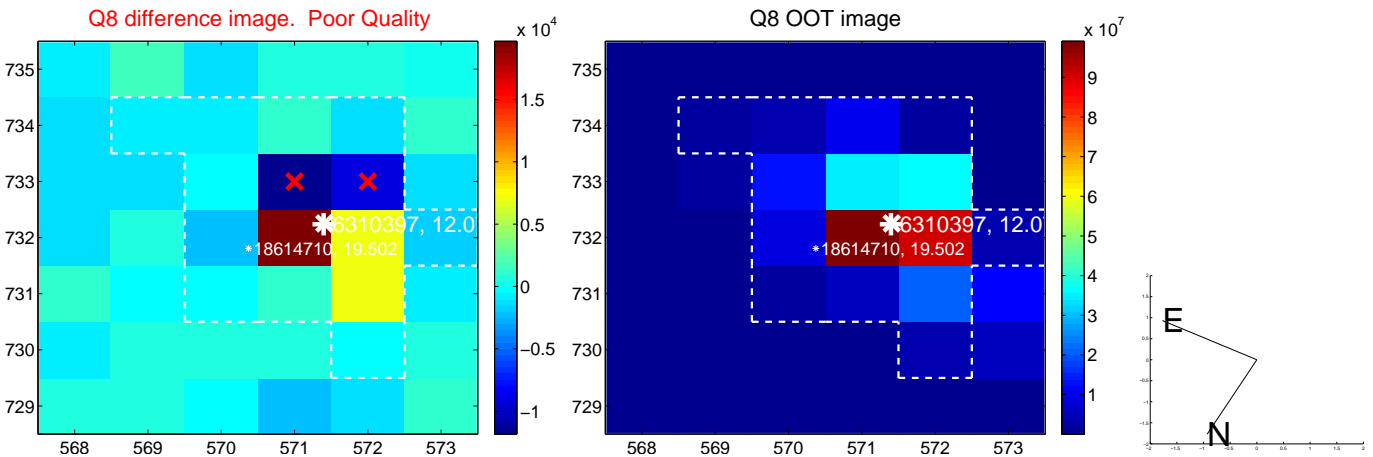
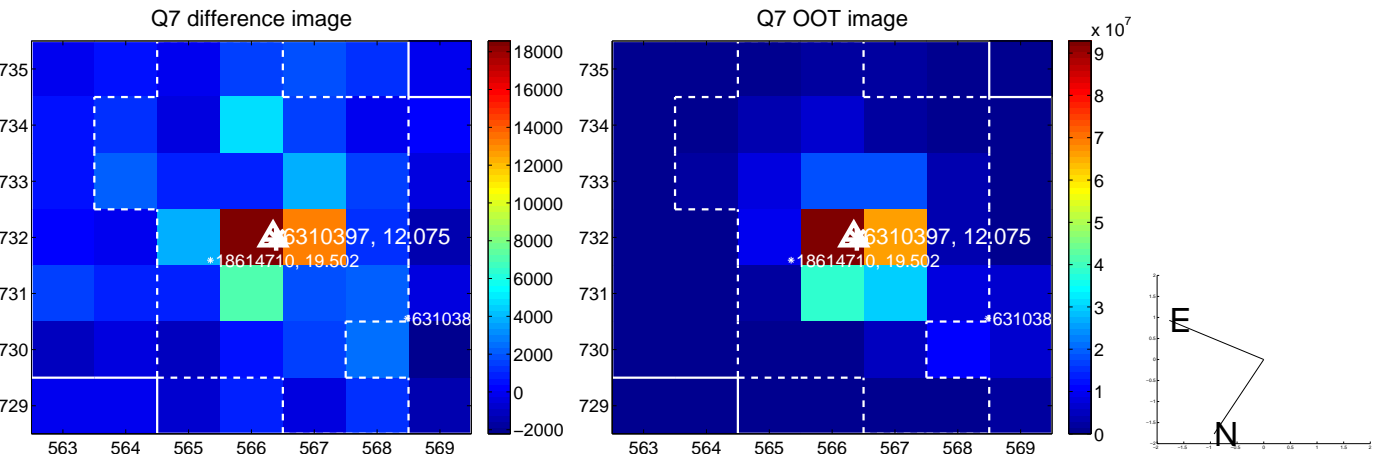
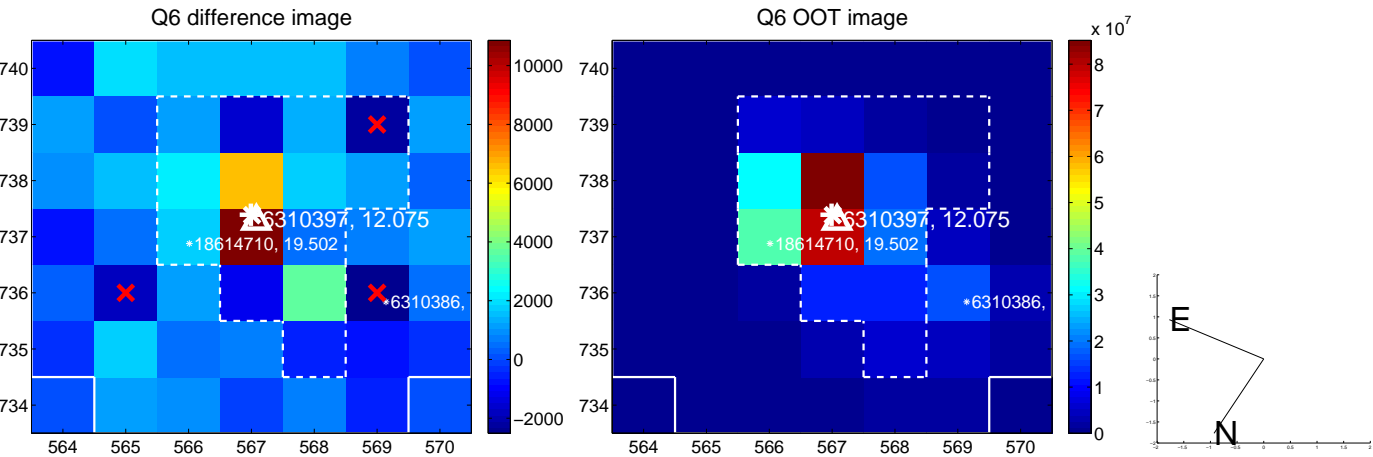
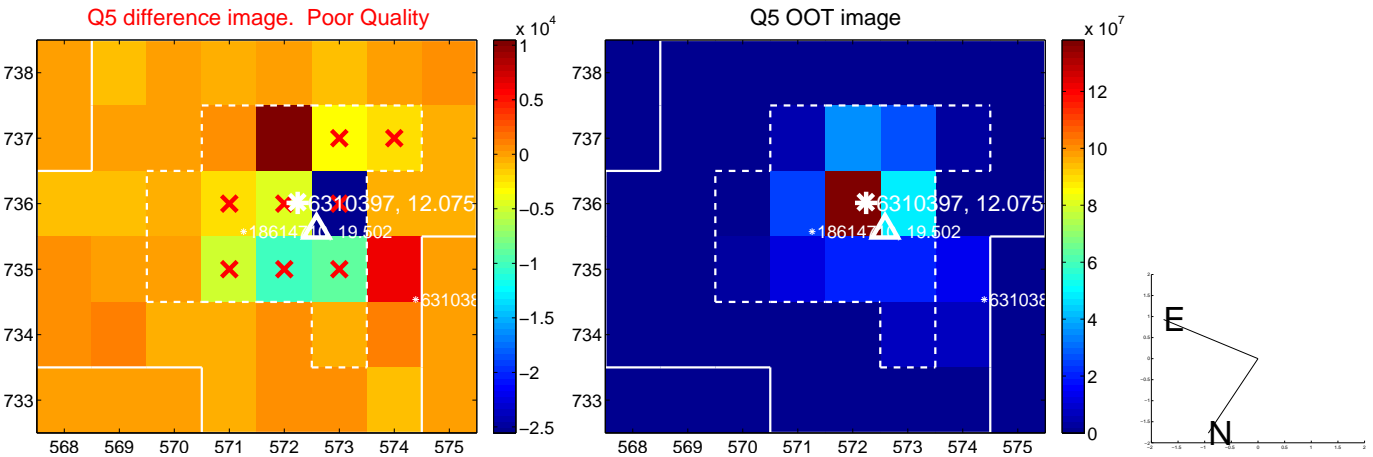


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

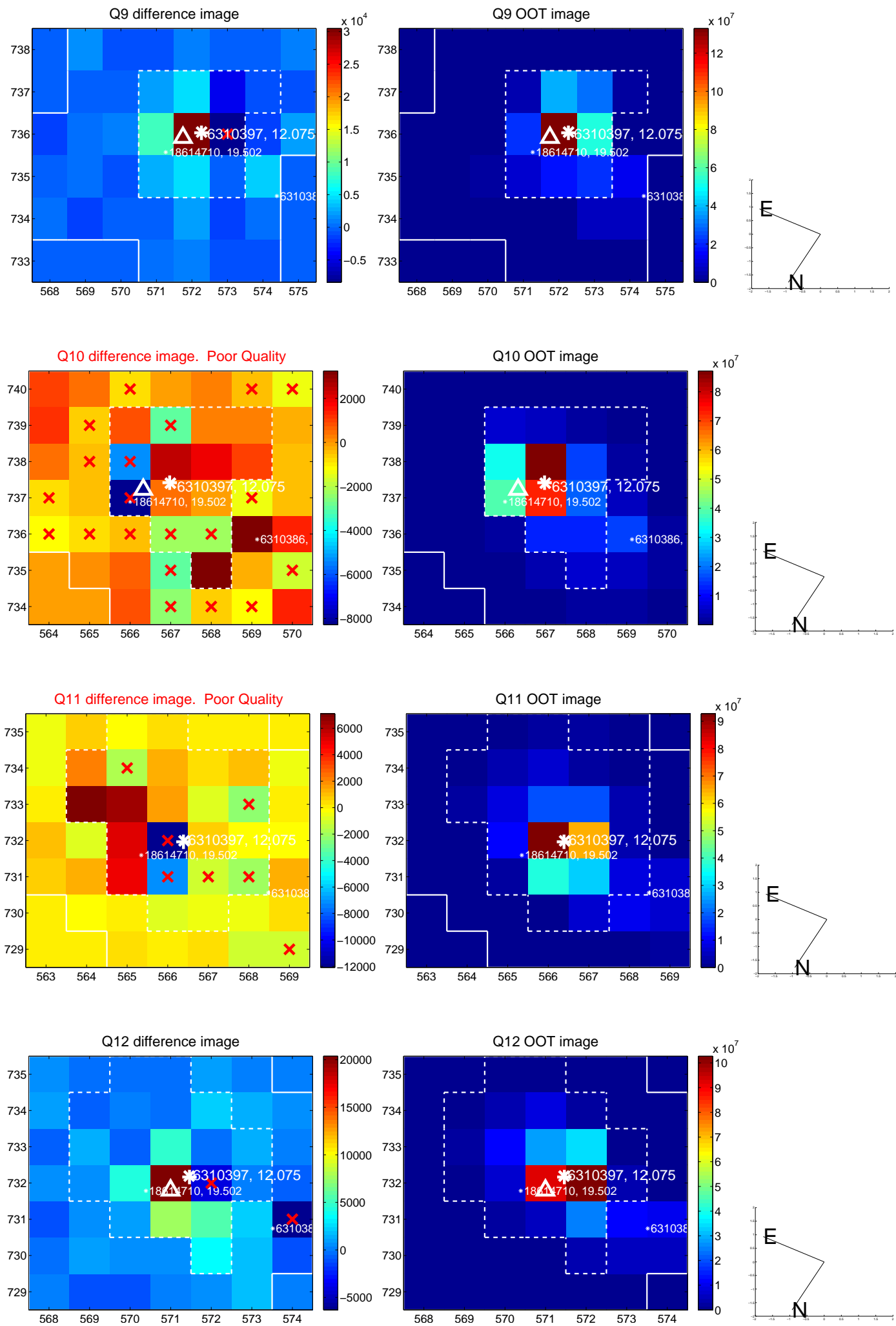
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

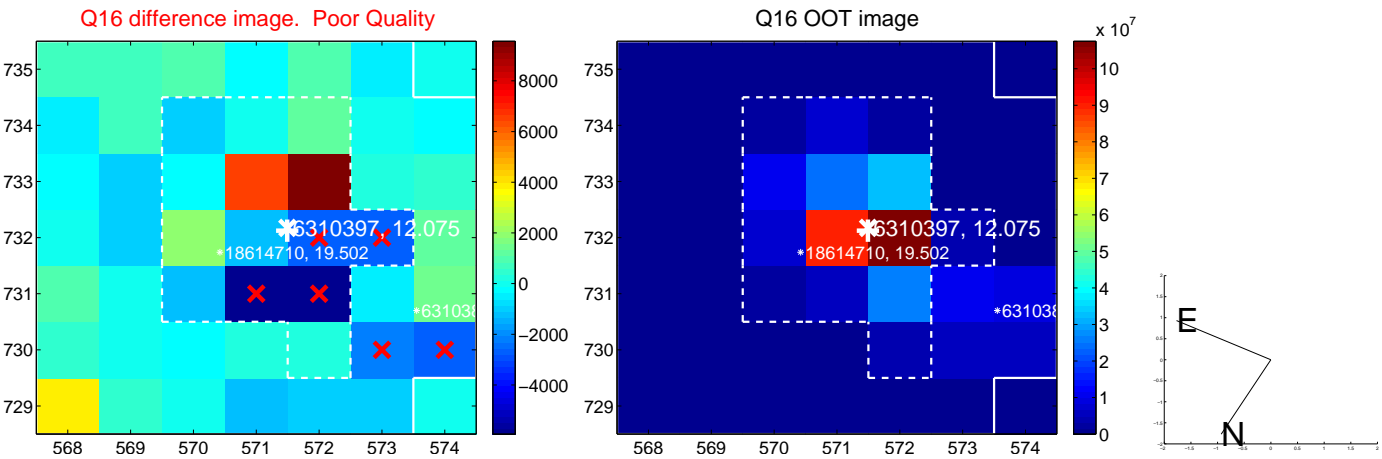
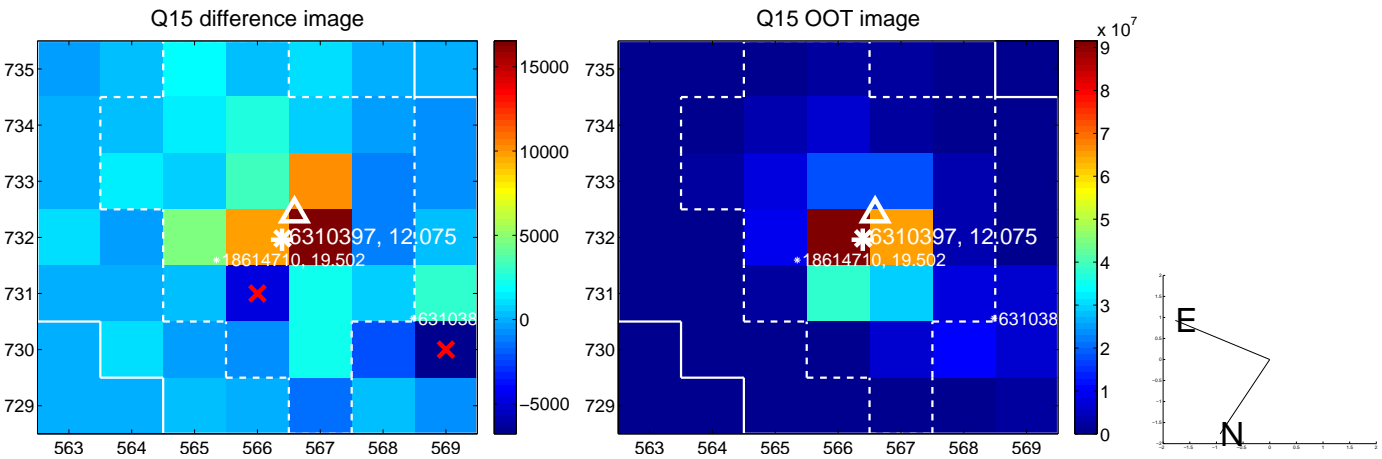
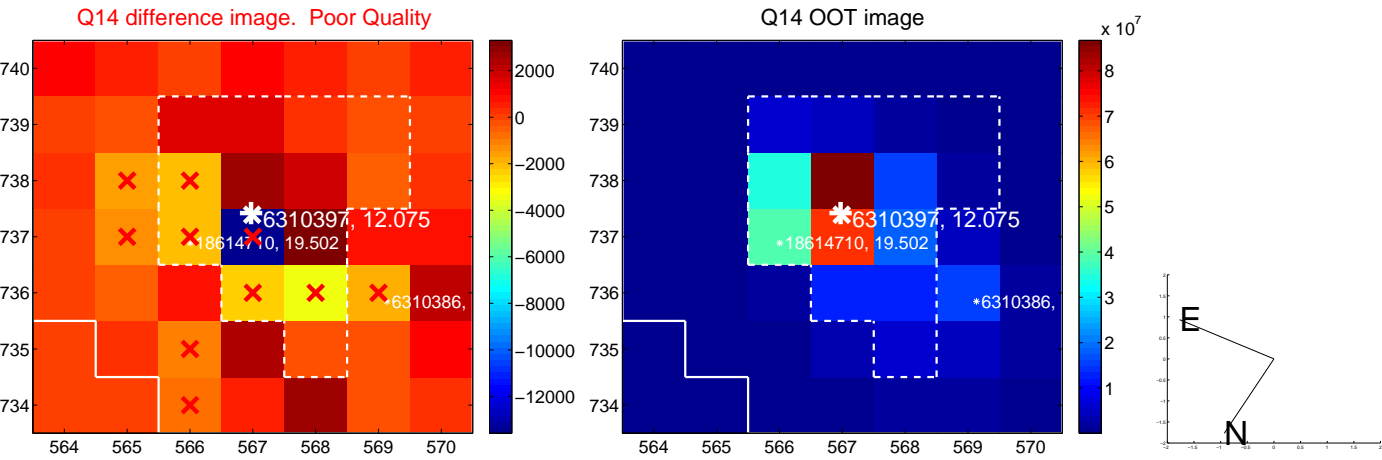
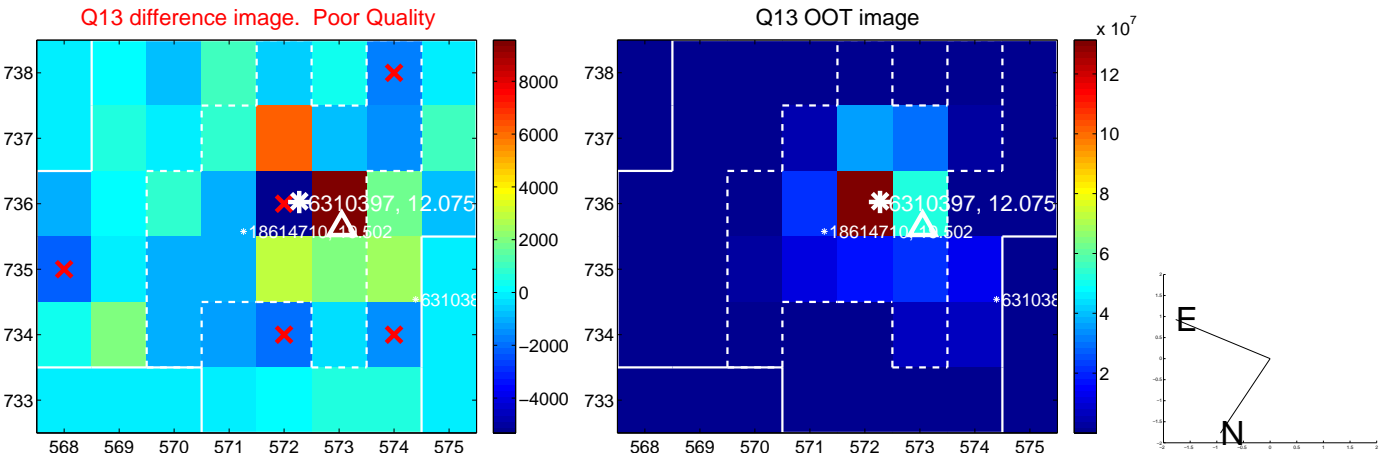


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

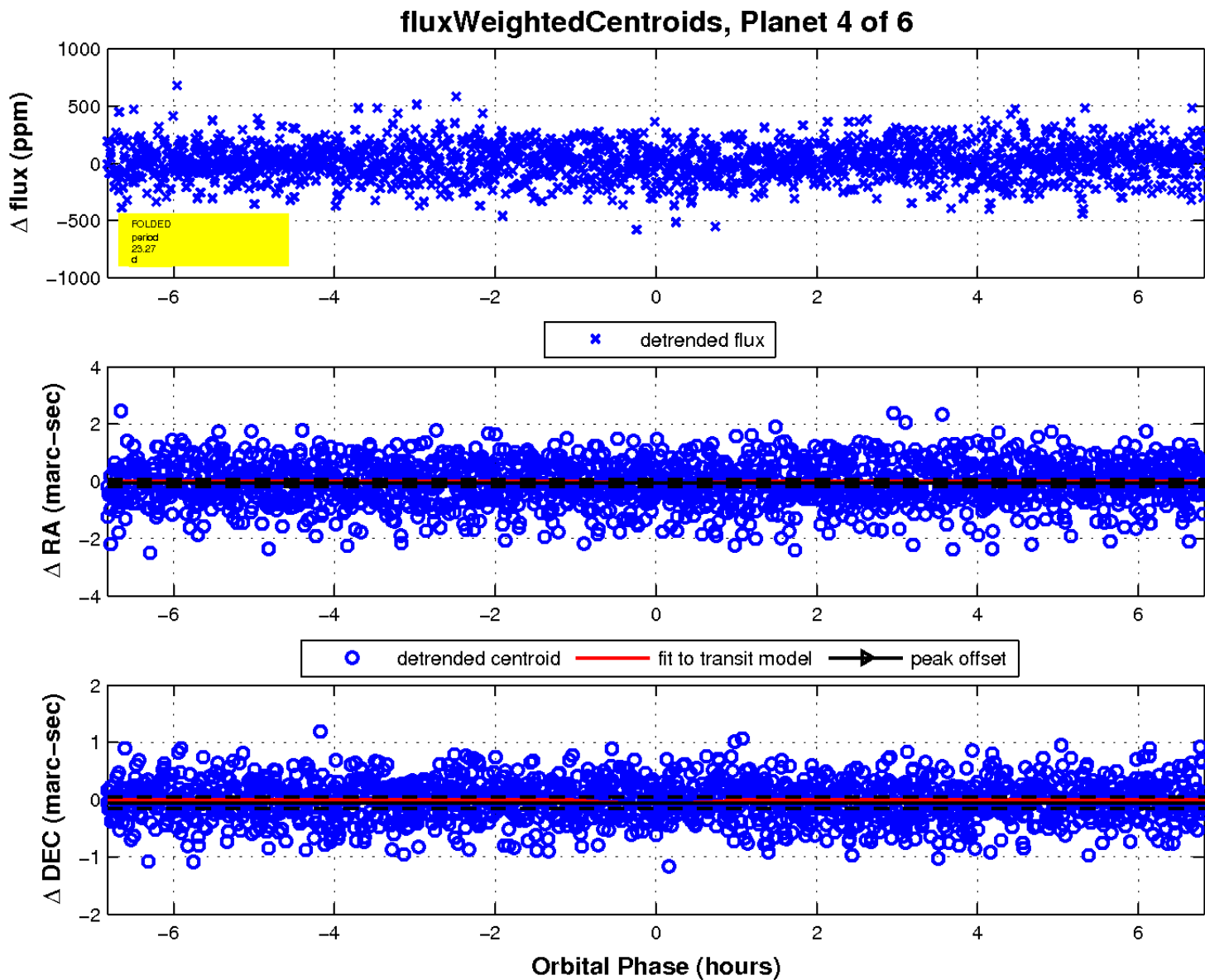
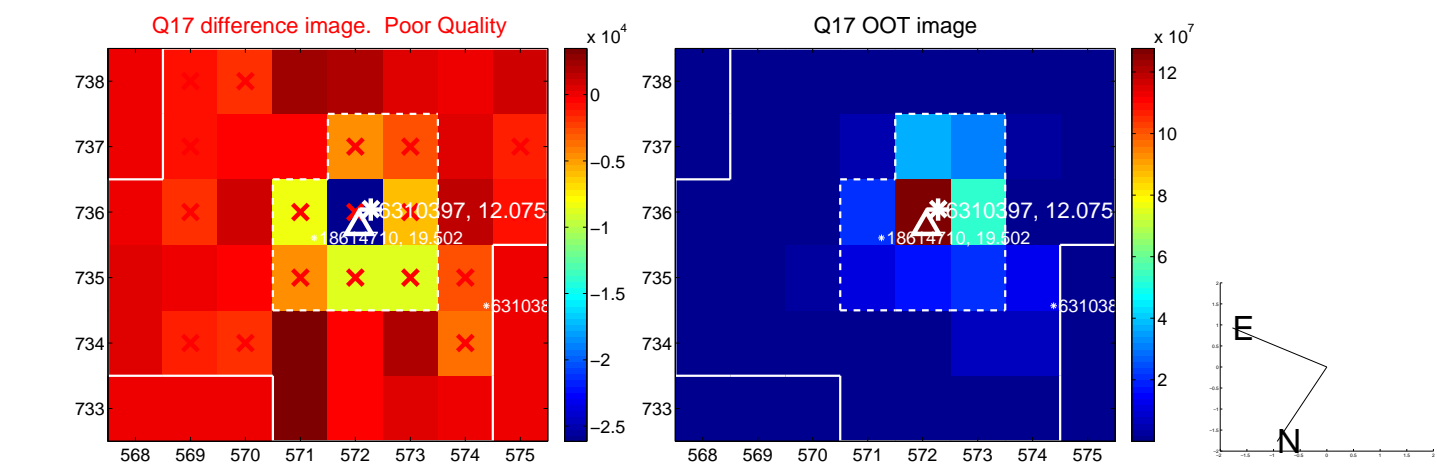




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

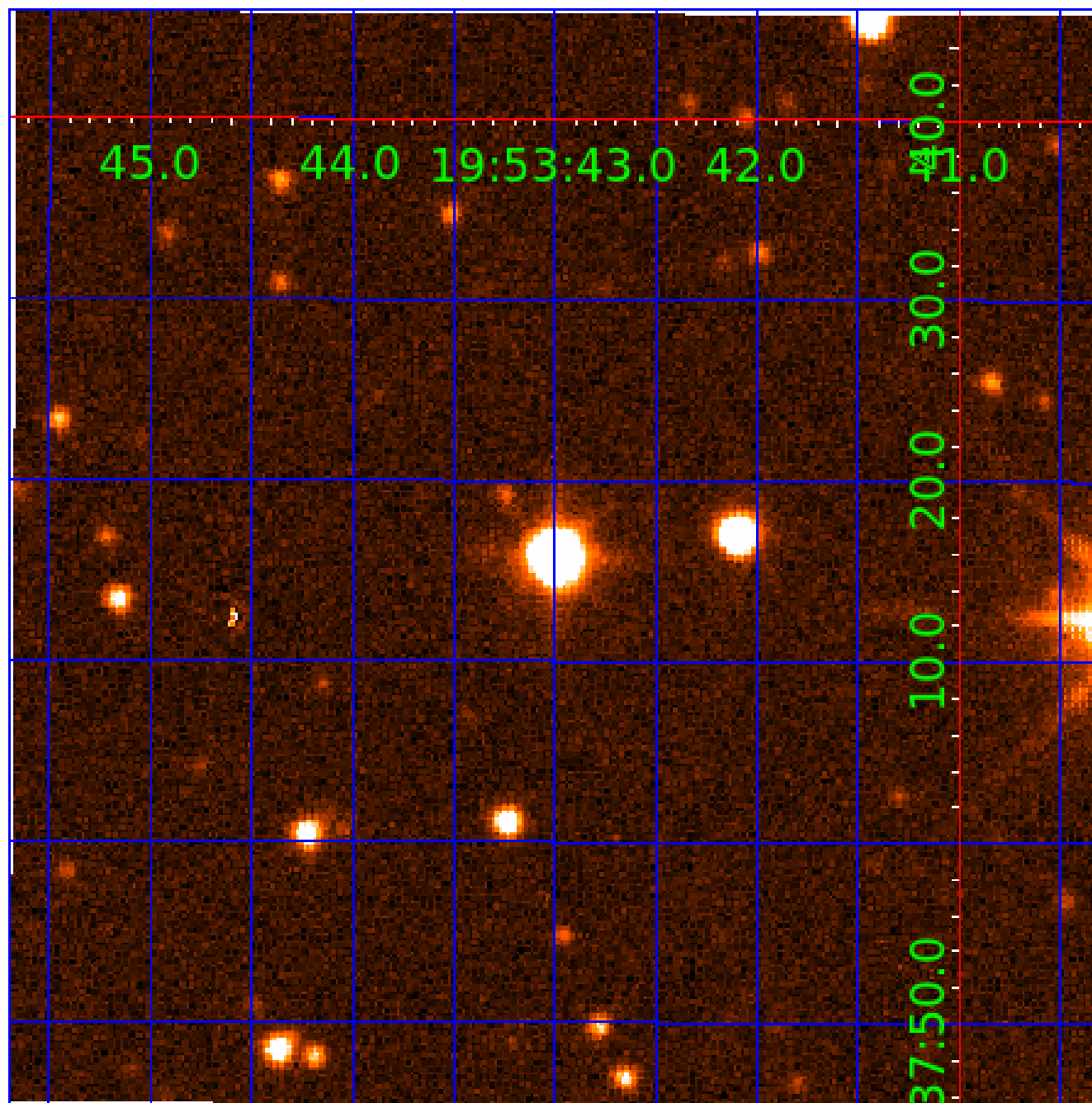


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006310397

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006310397-01	OBS	No	0.863182	131.728634	14.8	5.846	8.2	8.0	1.86	7318	0.73	21587.48
006310397-02	OBS	No	0.874973	131.560918	67.7	3.376	13.6	19.0	1.86	7318	1.77	21200.48
006310397-03	OBS	No	41.328636	134.705272	355.1	3.498	11.9	12.9	1.86	7318	6.70	124.17
006310397-04	OBS	No	23.265667	134.760839	356.8	2.277	10.5	11.6	1.86	7318	4.47	267.13
006310397-05	OBS	No	12.336945	138.858564	273.9	1.076	11.1	11.2	1.86	7318	3.16	622.39
006310397-06	OBS	No	9.439660	134.800797	197.5	4.500	9.9	-1.0	1.86	7318	2.64	889.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006310397-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006310397-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT
006310397-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—MOD_NONUNIQ_DV
006310397-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

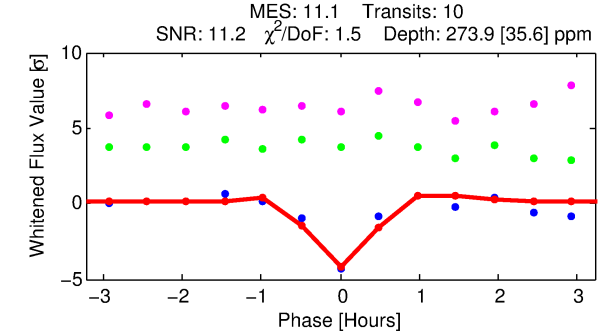
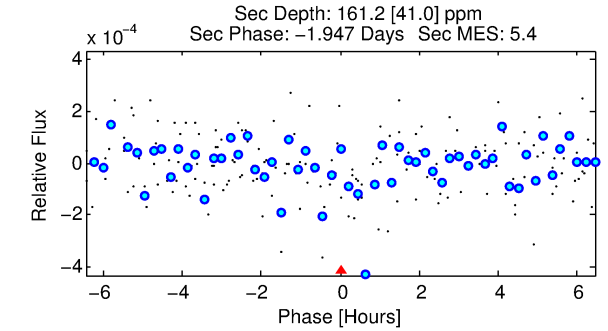
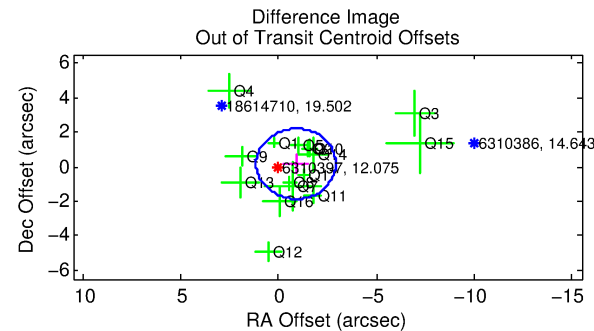
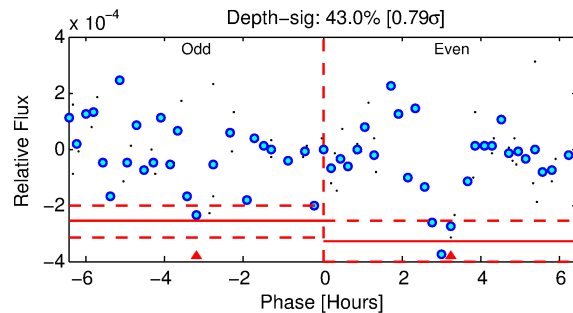
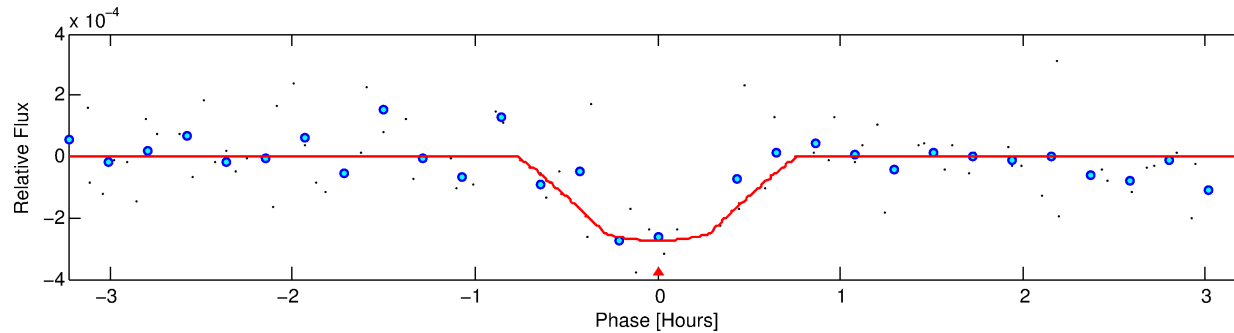
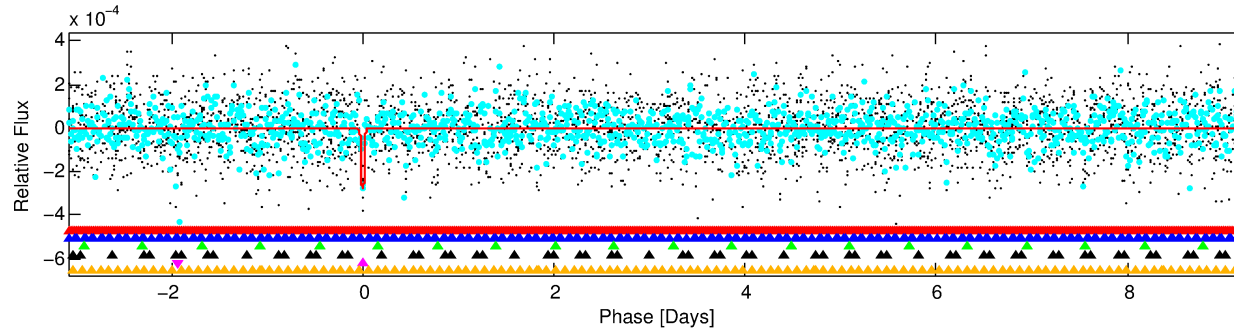
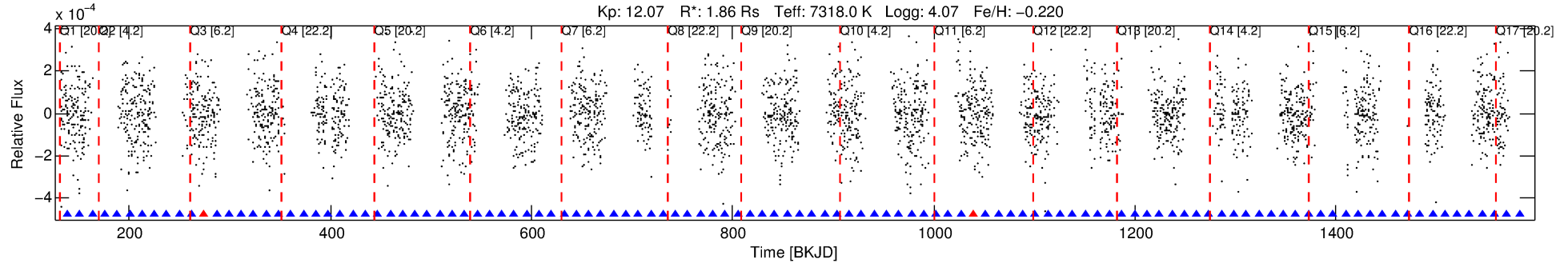
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006310397-05

No Significant Match Found

# DV One-Page Summary

KIC: 6310397 Candidate: 5 of 6 Period: 12.337 d



## DV Fit Results:

Period = 12.33694 [0.00009] d  
Epoch = 138.8586 [0.0047] BKJD  
Rp/R\* = 0.0156 [0.0120]  
a/R\* = 83.73 [368.22]  
b = 0.34 [11.45]  
Seff = 622.39 [248.45]  
Teq = 1274 [127] K  
Rp = 3.16 [2.57] Re  
a = 0.1193 [0.0286] AU  
Ag = 126.25 [201.48] [0.62 $\sigma$ ]  
Teffp = 6601 [2580] K [2.06 $\sigma$ ]

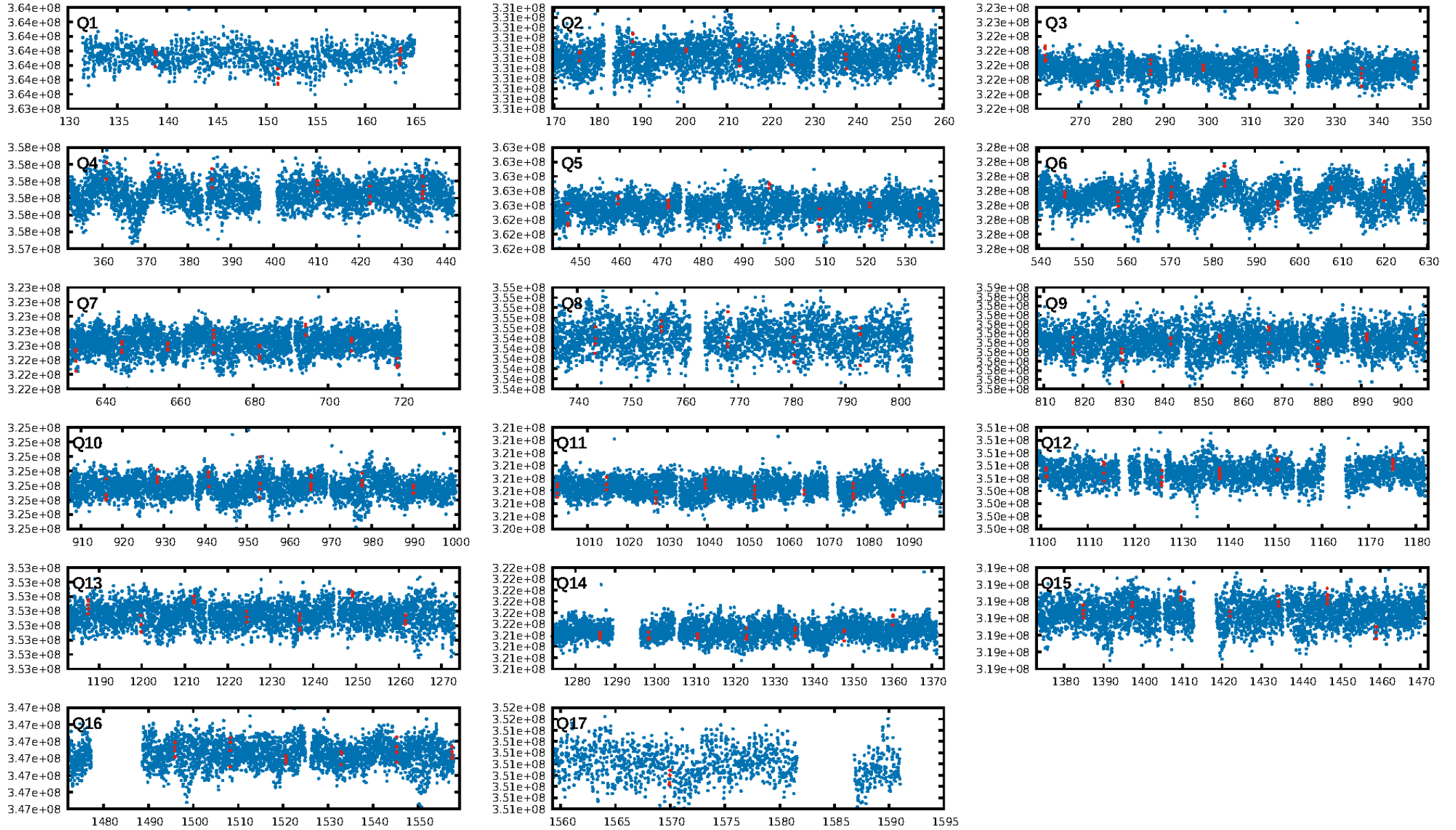
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [15.03 $\sigma$ ]  
LongPeriod-sig: 100.0% [104.13 $\sigma$ ]  
ModelChiSquare2-sig: 21.6%  
ModelChiSquareGof-sig: 98.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.78 [7/9]  
GhostDiagnostic-chr: -0.566  
Centroid-sig: 43.8%  
Centroid-so: 0.448 arcsec [1.54 $\sigma$ ]  
OotOffset-rm: 0.896 arcsec [1.32 $\sigma$ ]  
KicOffset-rm: 0.927 arcsec [1.45 $\sigma$ ]  
OotOffset-st: 3/4/4/5 [16]  
KicOffset-st: 3/4/4/5 [16]  
DiffImageQuality-fgm: 0.31 [5/16]  
DiffImageOverlap-fno: 0.24 [4/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:53:28 Z

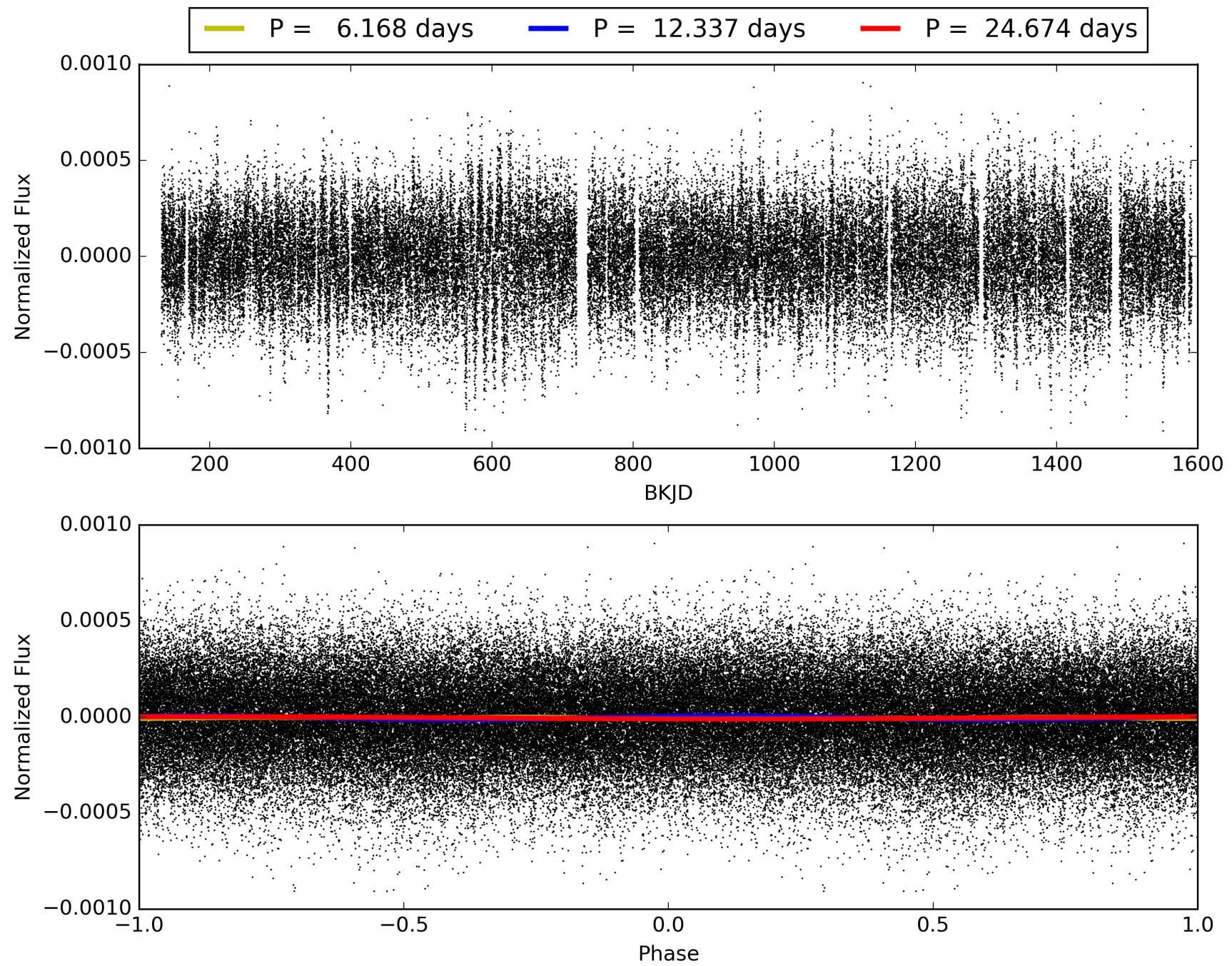
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006310397-05, PDC Light Curves



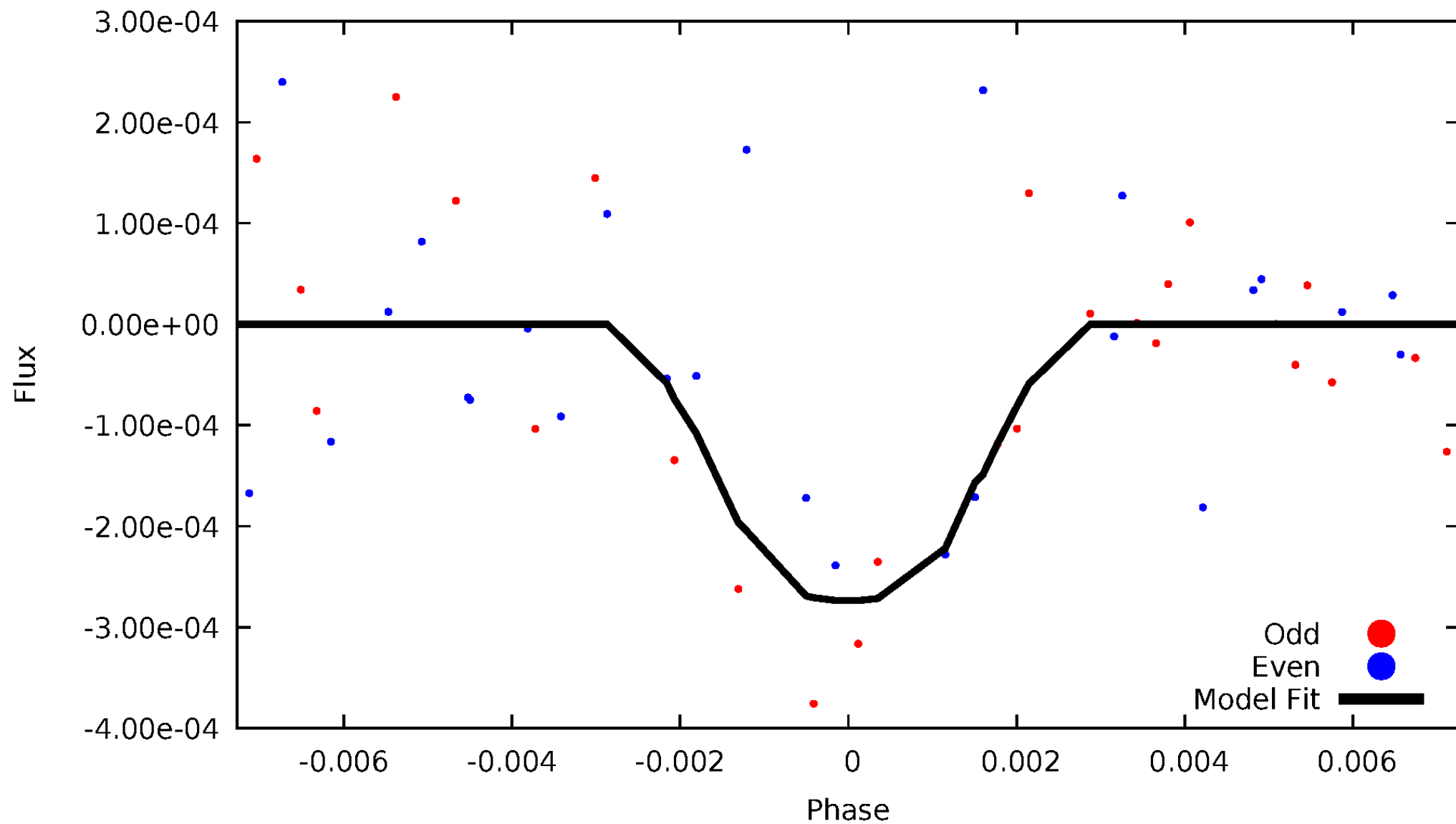


TCE 006310397-05



# DV Odd/Even

TCE 006310397-05



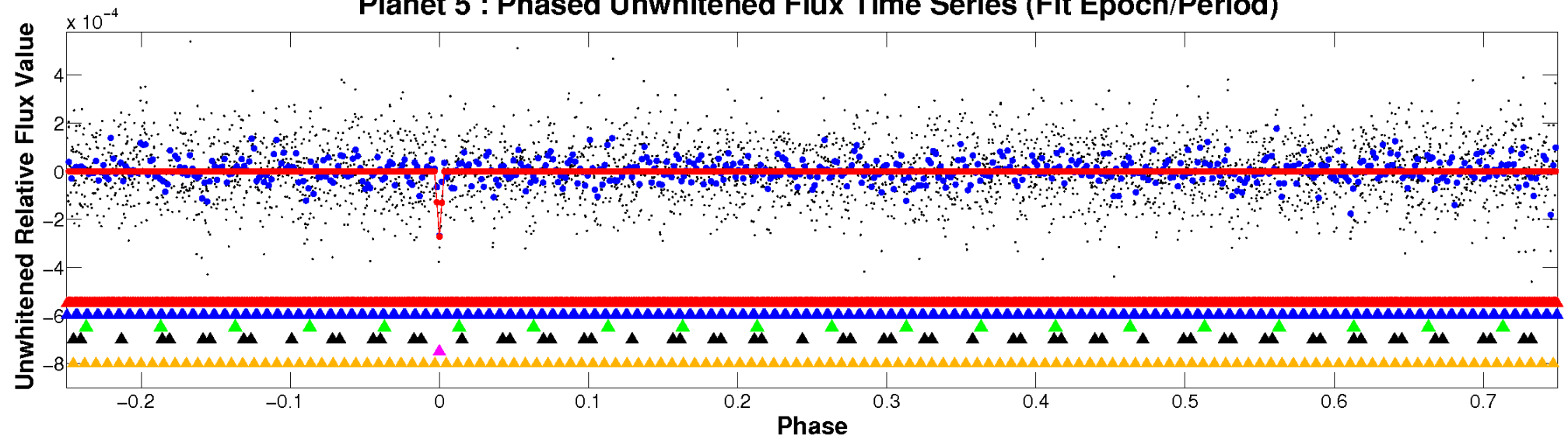


ALT Odd/Even

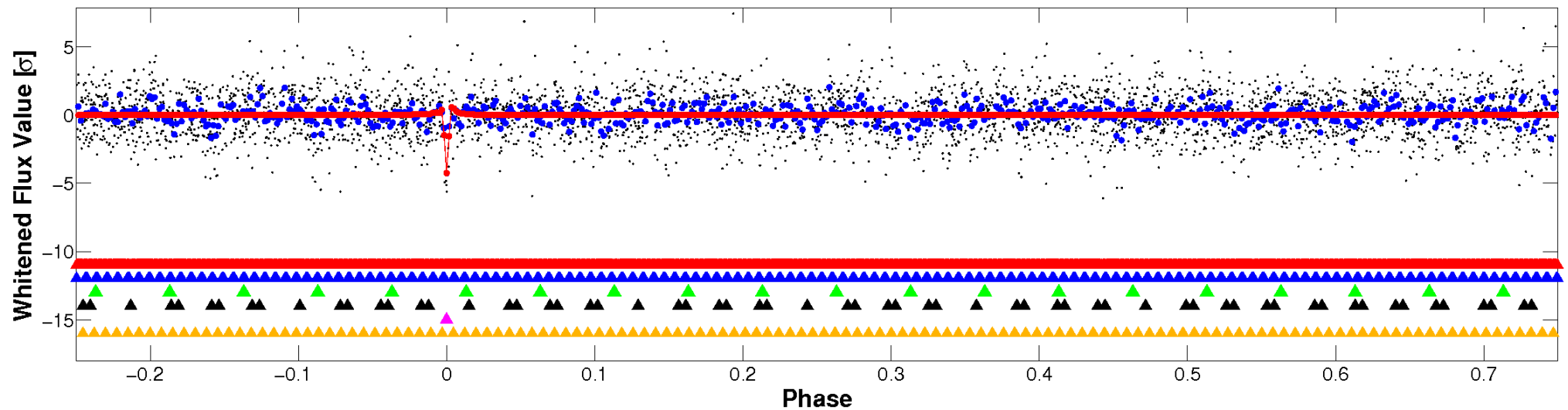
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

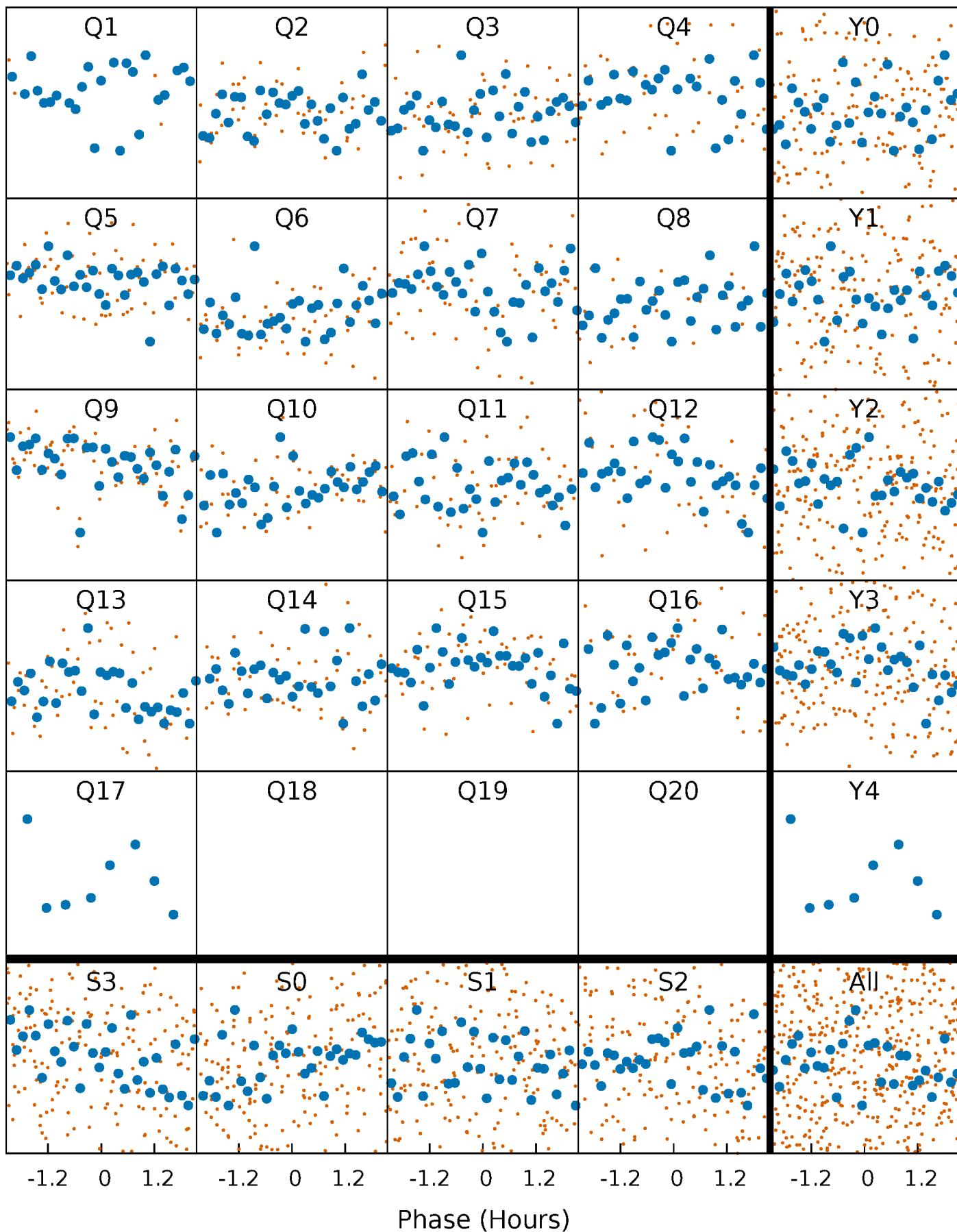


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

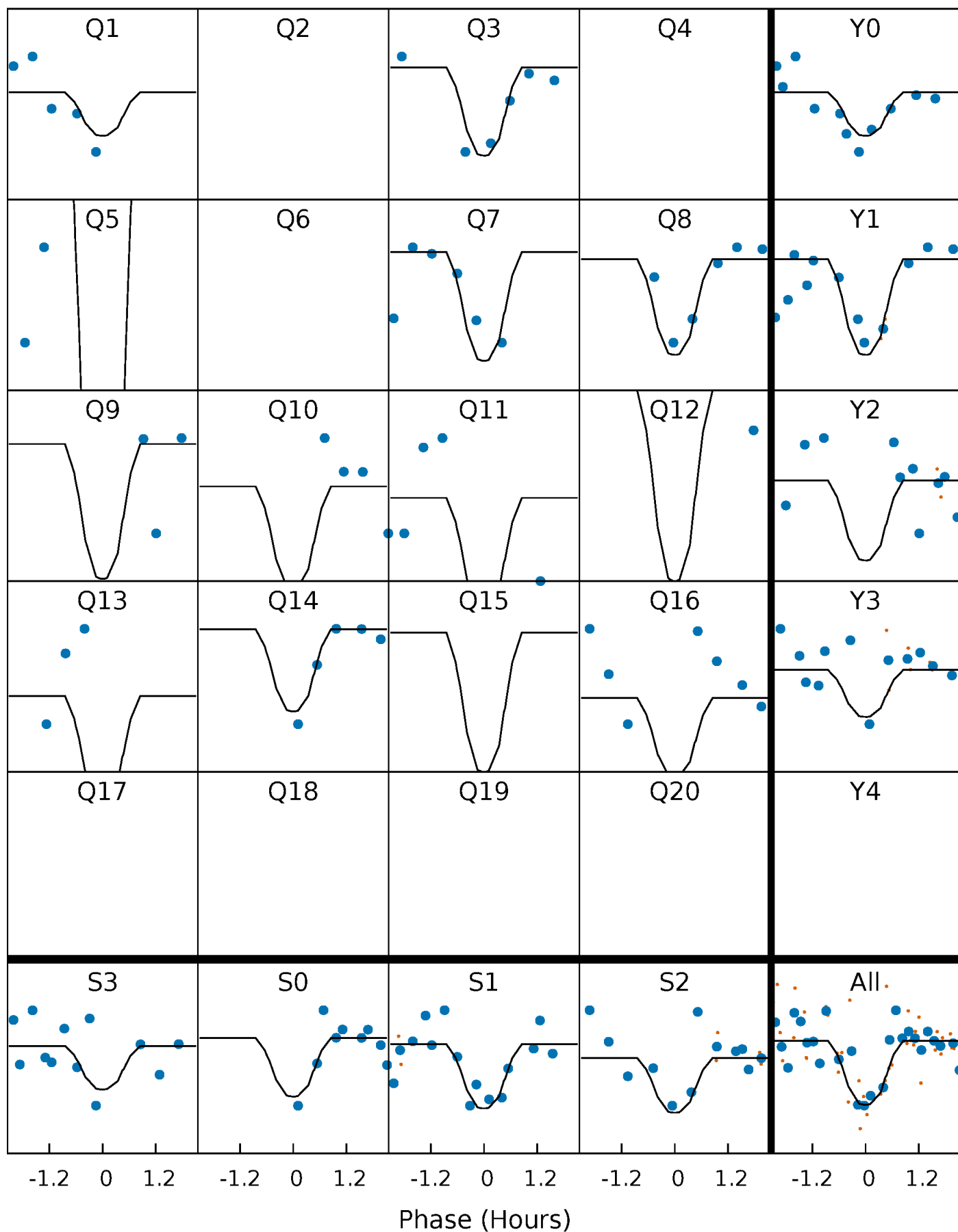
TCE 006310397-05   P= 12.336945 Days    $T_0=138.858564$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 006310397-05     $P = 12.336945$  Days     $T_0 = 138.858564$  (BKJD)

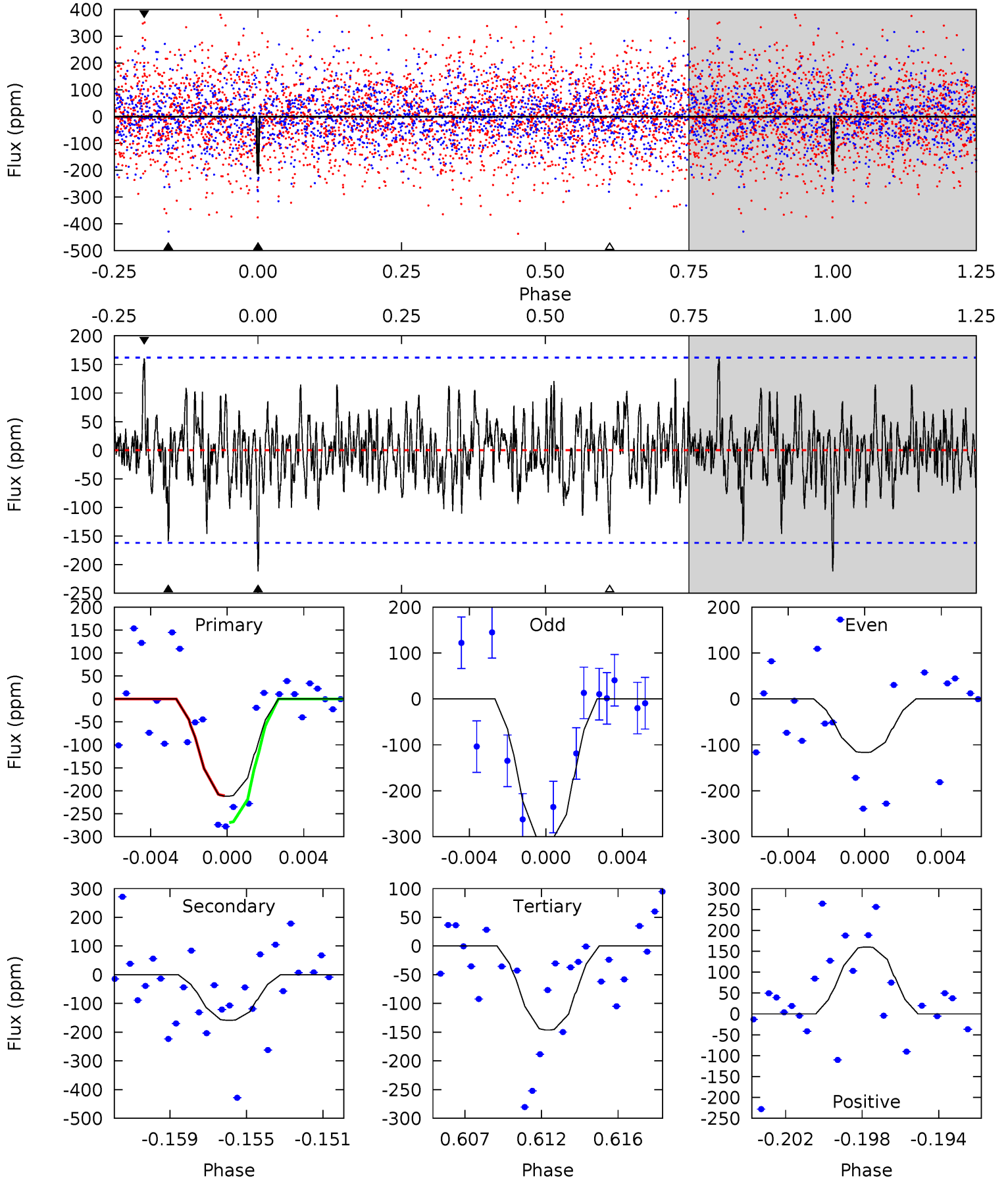


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

006310397-05, P = 12.336945 Days, E = 126.521619 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.78	5.09	4.68	5.13	5.19	2.85	1.43	2.10	1.65	0.40	-0.05	3.12	1.01	0.43	0.90



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 006310397

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7318^{+230}_{-307}$	$4.073^{+0.204}_{-0.167}$	$-0.220^{+0.250}_{-0.350}$	$1.857^{+0.507}_{-0.507}$	$1.486^{+0.209}_{-0.255}$	$0.327^{+0.382}_{-0.153}$
	+3%/-4%	+5%/-4%	+114%/-159%	+27%/-27%	+14%/-17%	+117%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006310397-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-159 \pm 31$	$3.32^{+2.41}_{-2.00}$	$1771^{+127}_{-139}$	$6194^{+4689}_{-1333}$	$109^{+561}_{-73}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

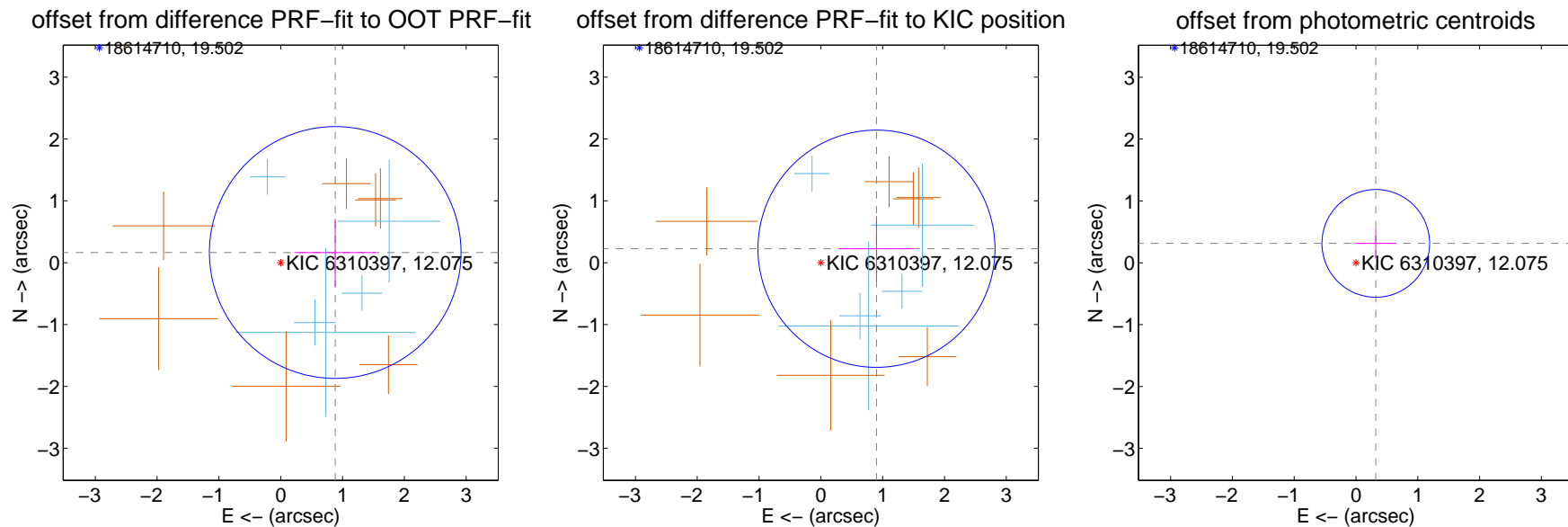
## DV Centroid Data

Supplemental centroid analysis for 006310397-05. Kepler magnitude: 12.07. Transit SNR 11.22

There are 5 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

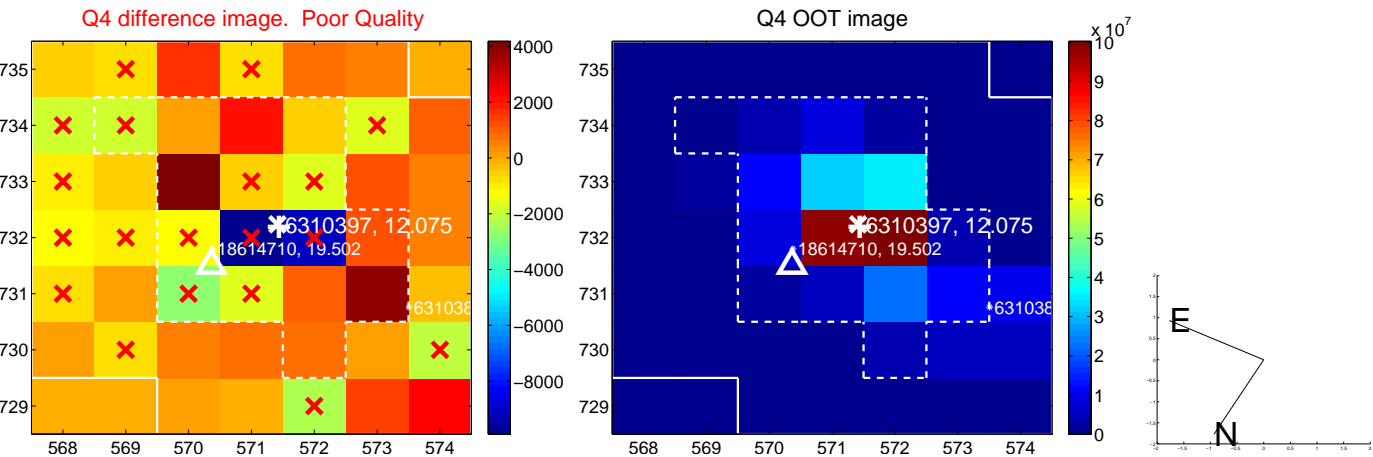
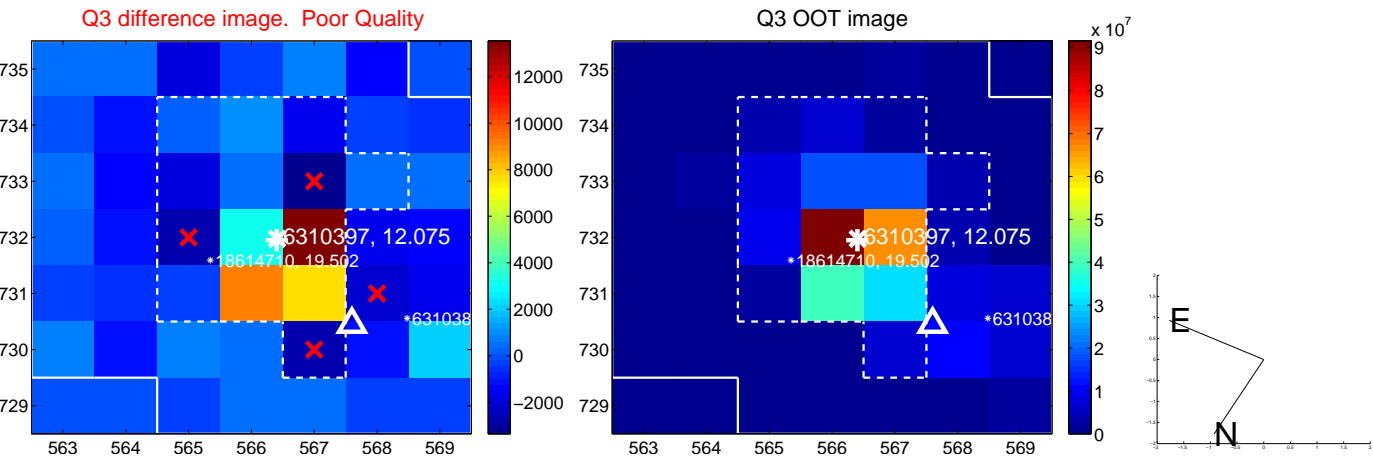
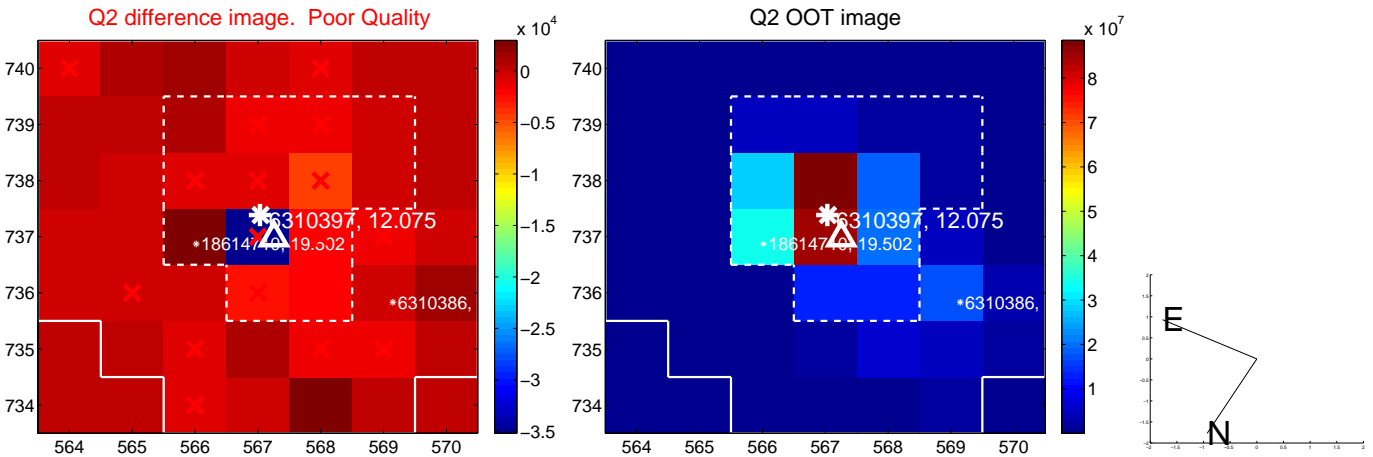
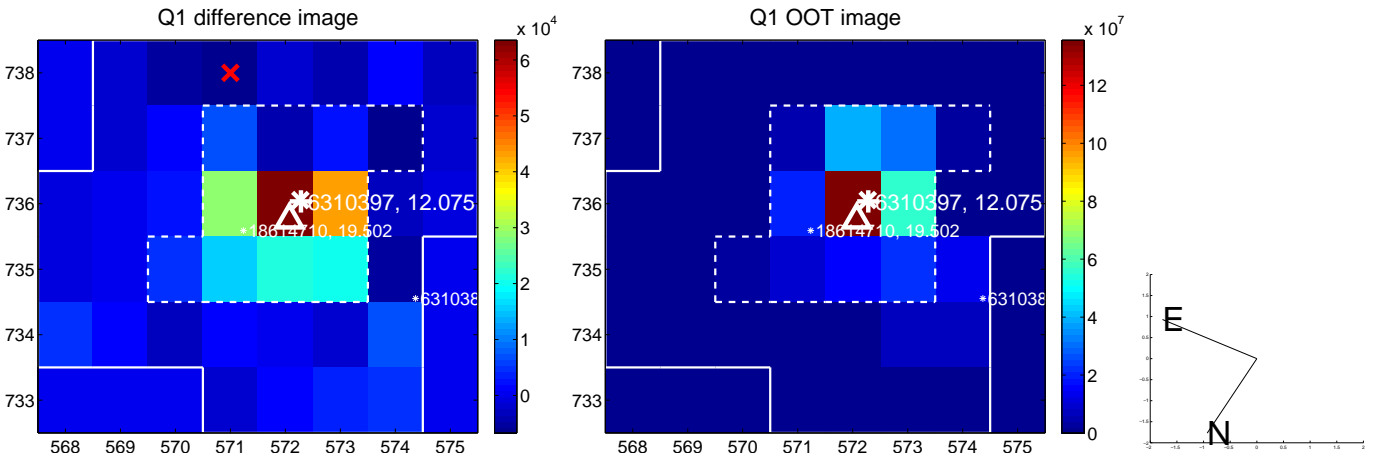
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.896 \pm 0.678$	1.32	$-0.881 \pm 0.658$	$0.164 \pm 0.546$
PRF-fit source offset from KIC position	$0.927 \pm 0.639$	1.45	$-0.899 \pm 0.604$	$0.226 \pm 0.527$
photometric centroid source offset	$0.45 \pm 0.29$	1.54	$-0.32 \pm 0.33$	$0.31 \pm 0.24$



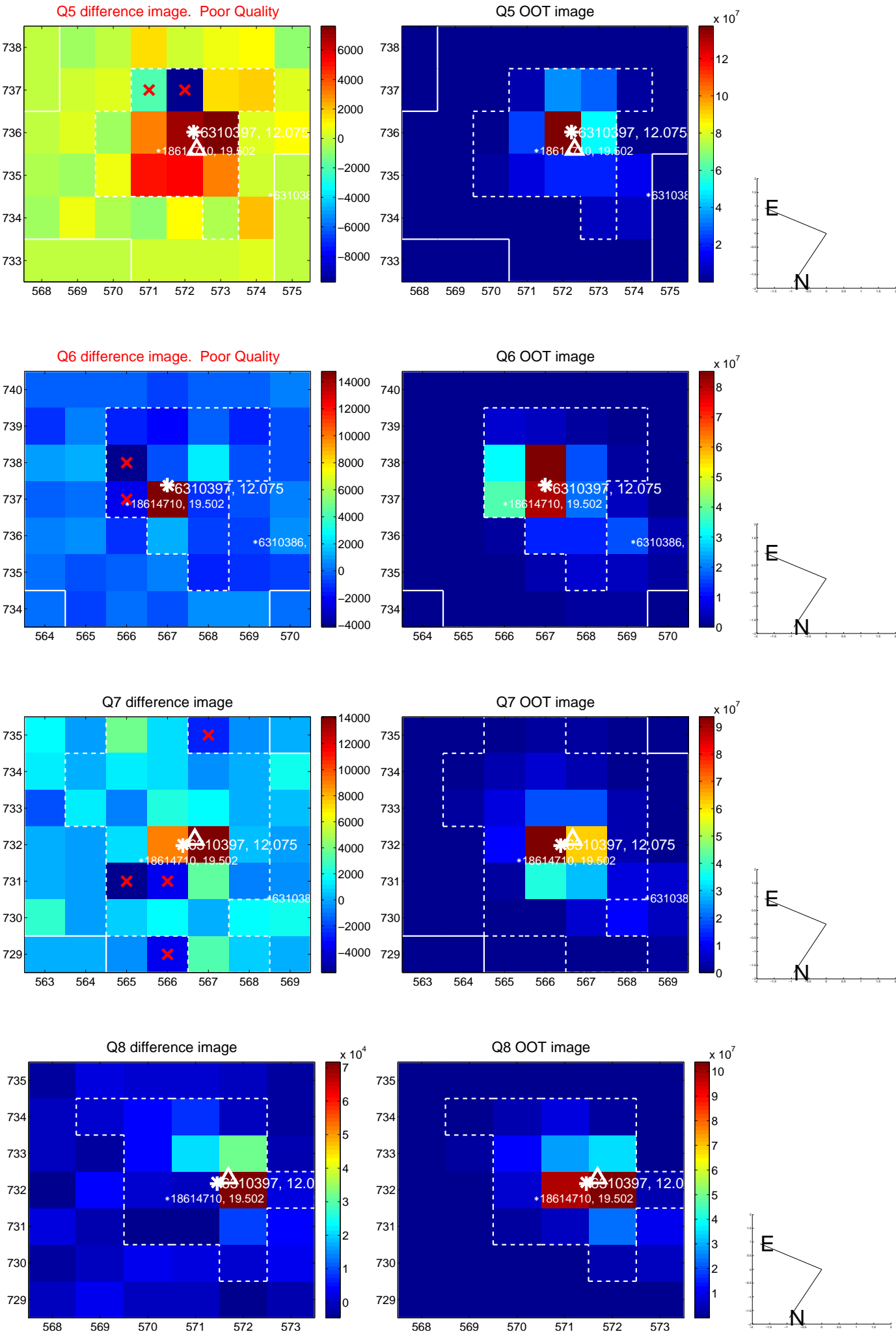
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



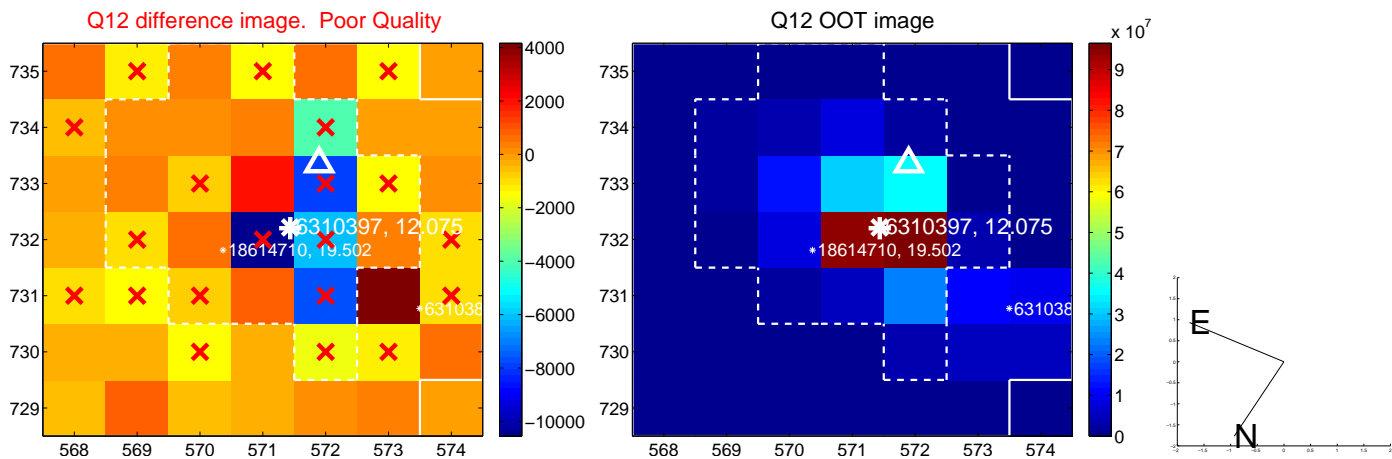
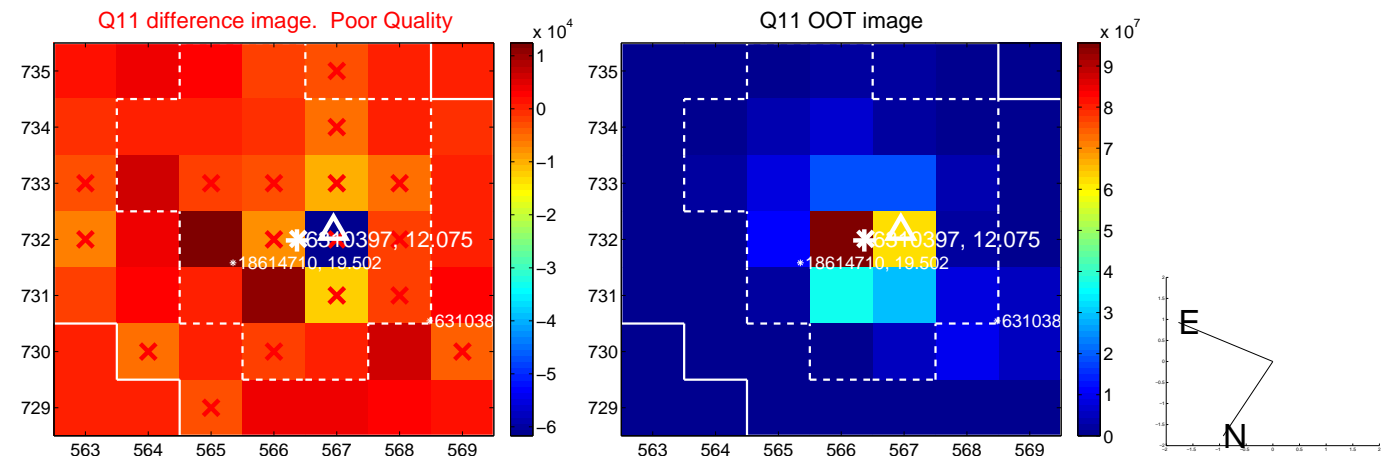
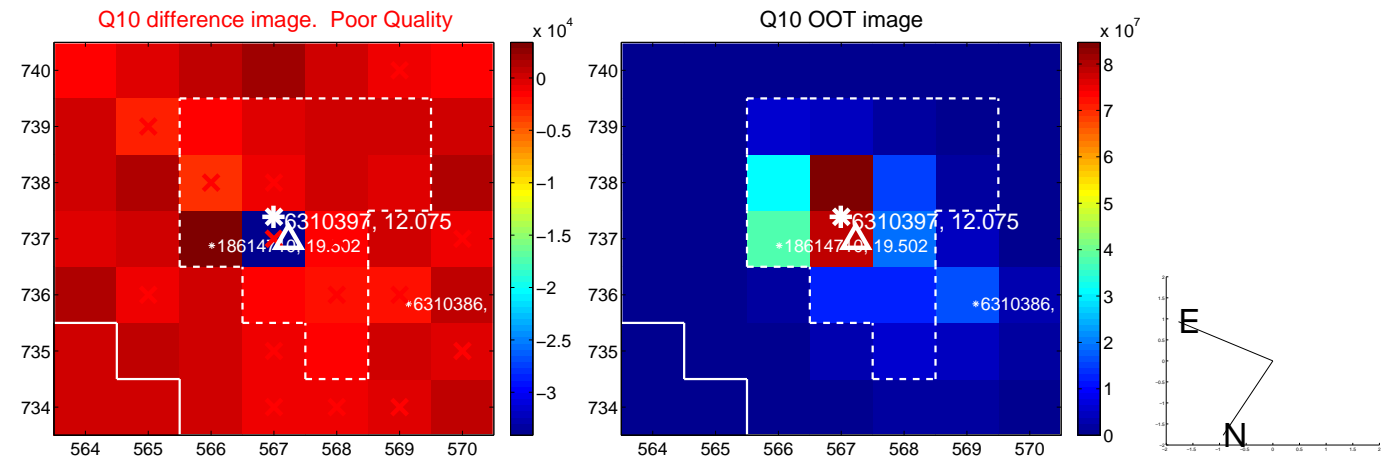
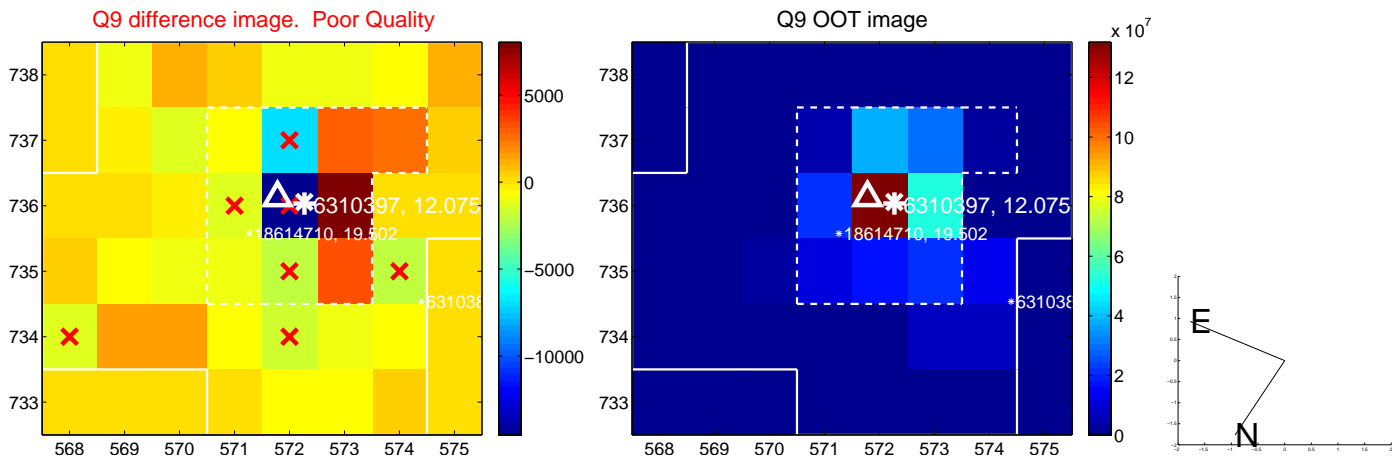
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



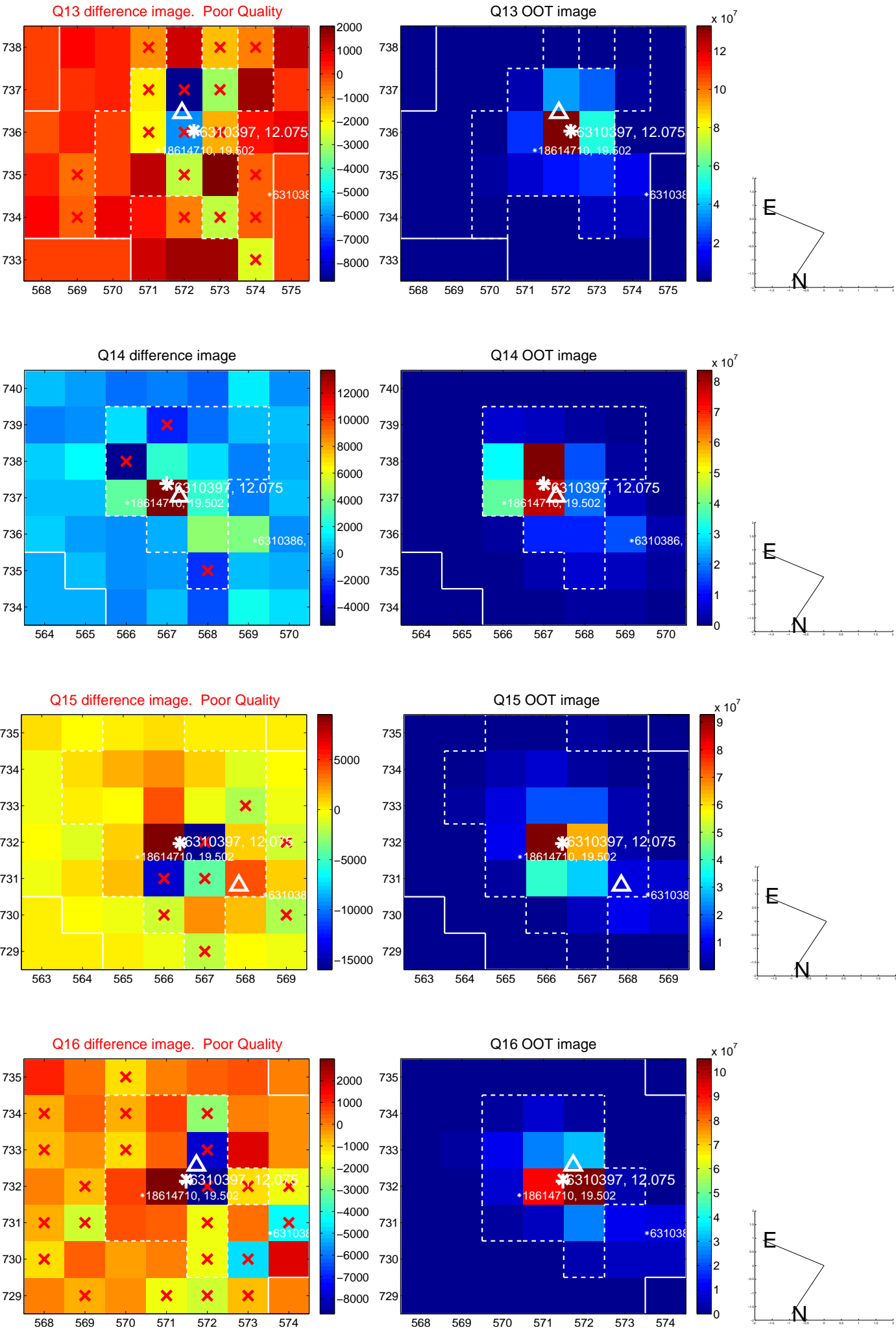
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



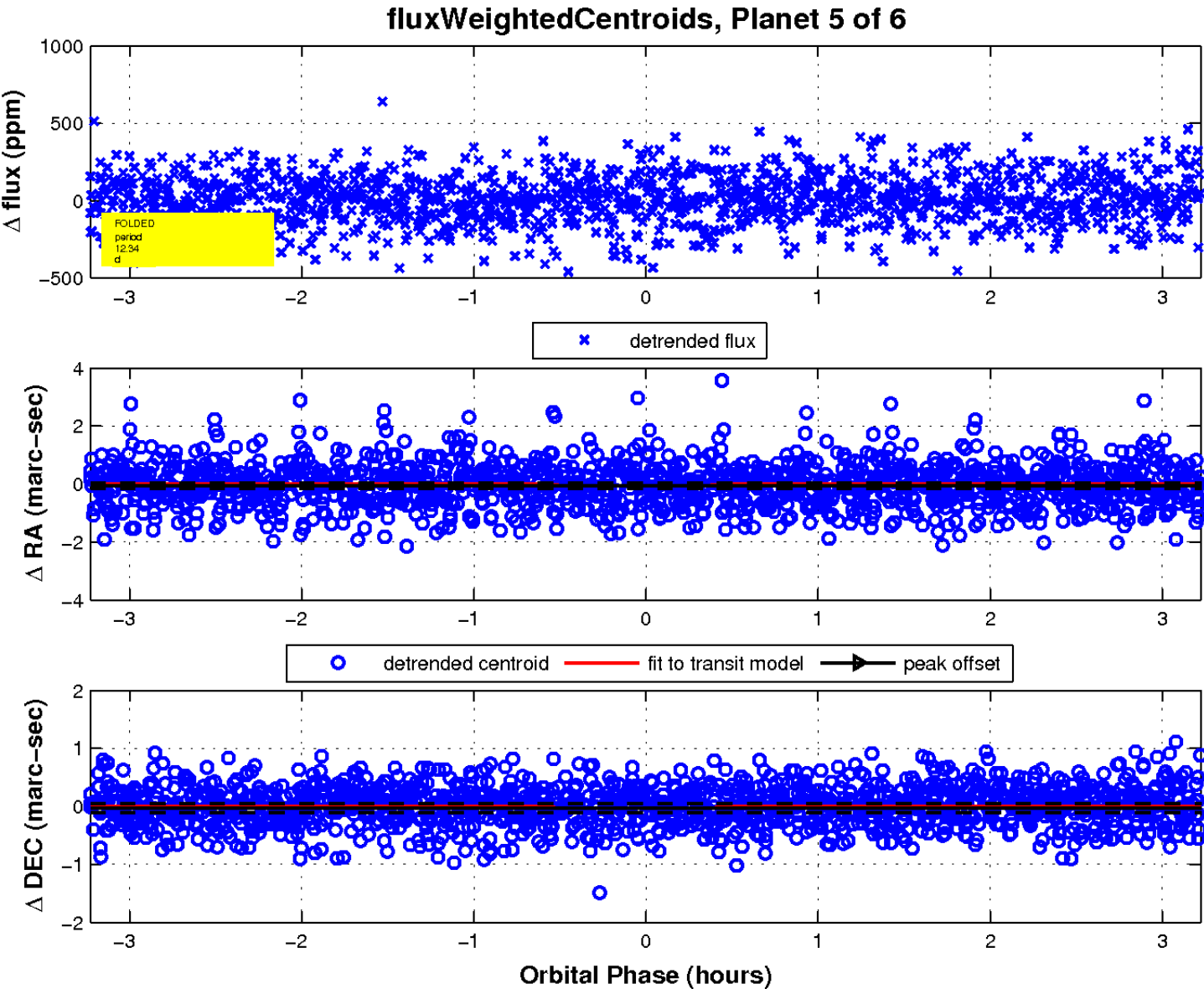
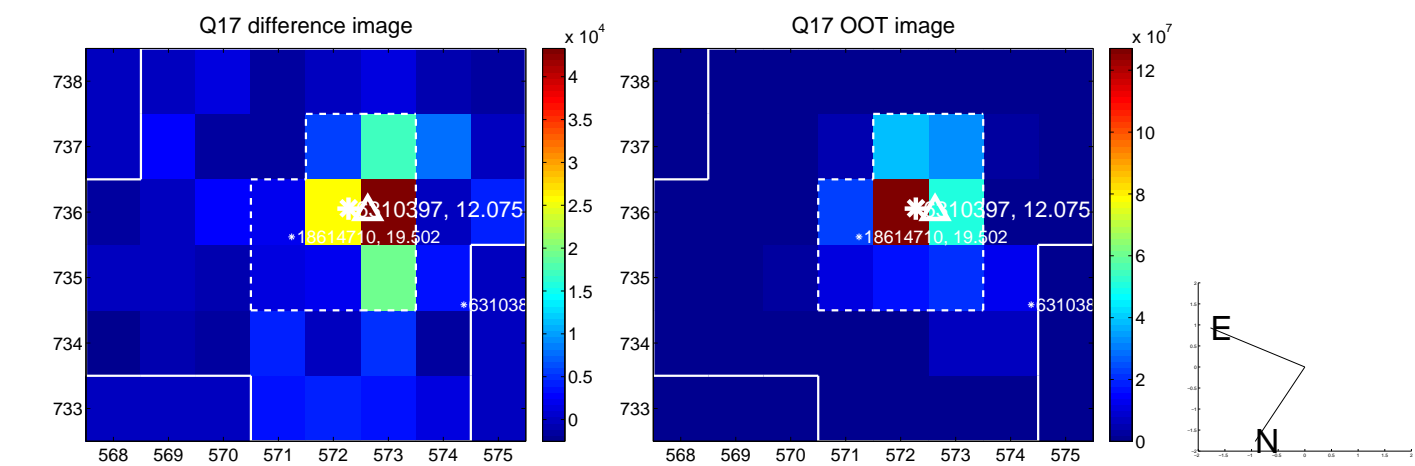
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

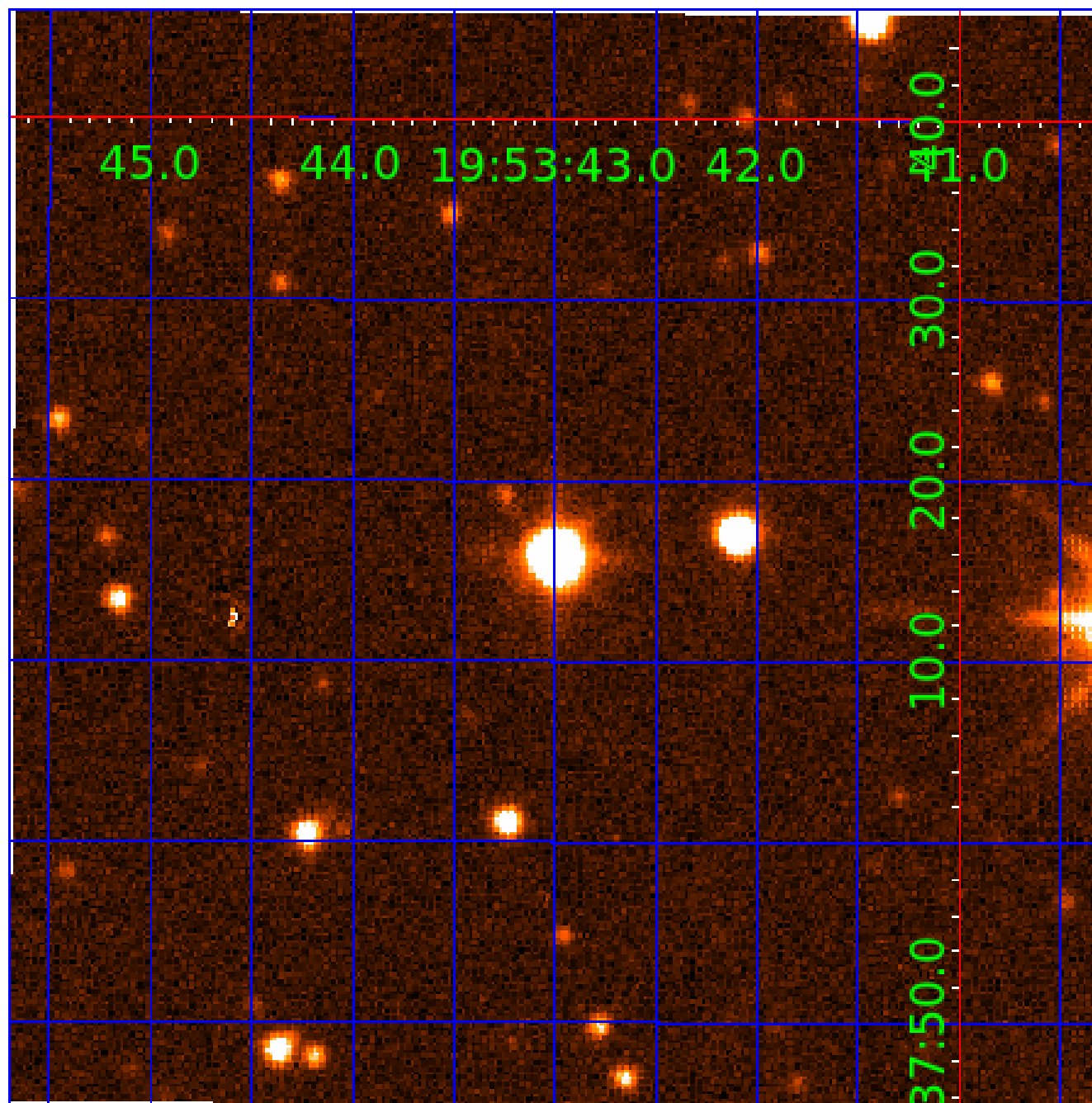


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006310397

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006310397-01	OBS	No	0.863182	131.728634	14.8	5.846	8.2	8.0	1.86	7318	0.73	21587.48
006310397-02	OBS	No	0.874973	131.560918	67.7	3.376	13.6	19.0	1.86	7318	1.77	21200.48
006310397-03	OBS	No	41.328636	134.705272	355.1	3.498	11.9	12.9	1.86	7318	6.70	124.17
006310397-04	OBS	No	23.265667	134.760839	356.8	2.277	10.5	11.6	1.86	7318	4.47	267.13
006310397-05	OBS	No	12.336945	138.858564	273.9	1.076	11.1	11.2	1.86	7318	3.16	622.39
006310397-06	OBS	No	9.439660	134.800797	197.5	4.500	9.9	-1.0	1.86	7318	2.64	889.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006310397-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006310397-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT
006310397-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006310397-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—MOD_NONUNIQ_DV
006310397-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

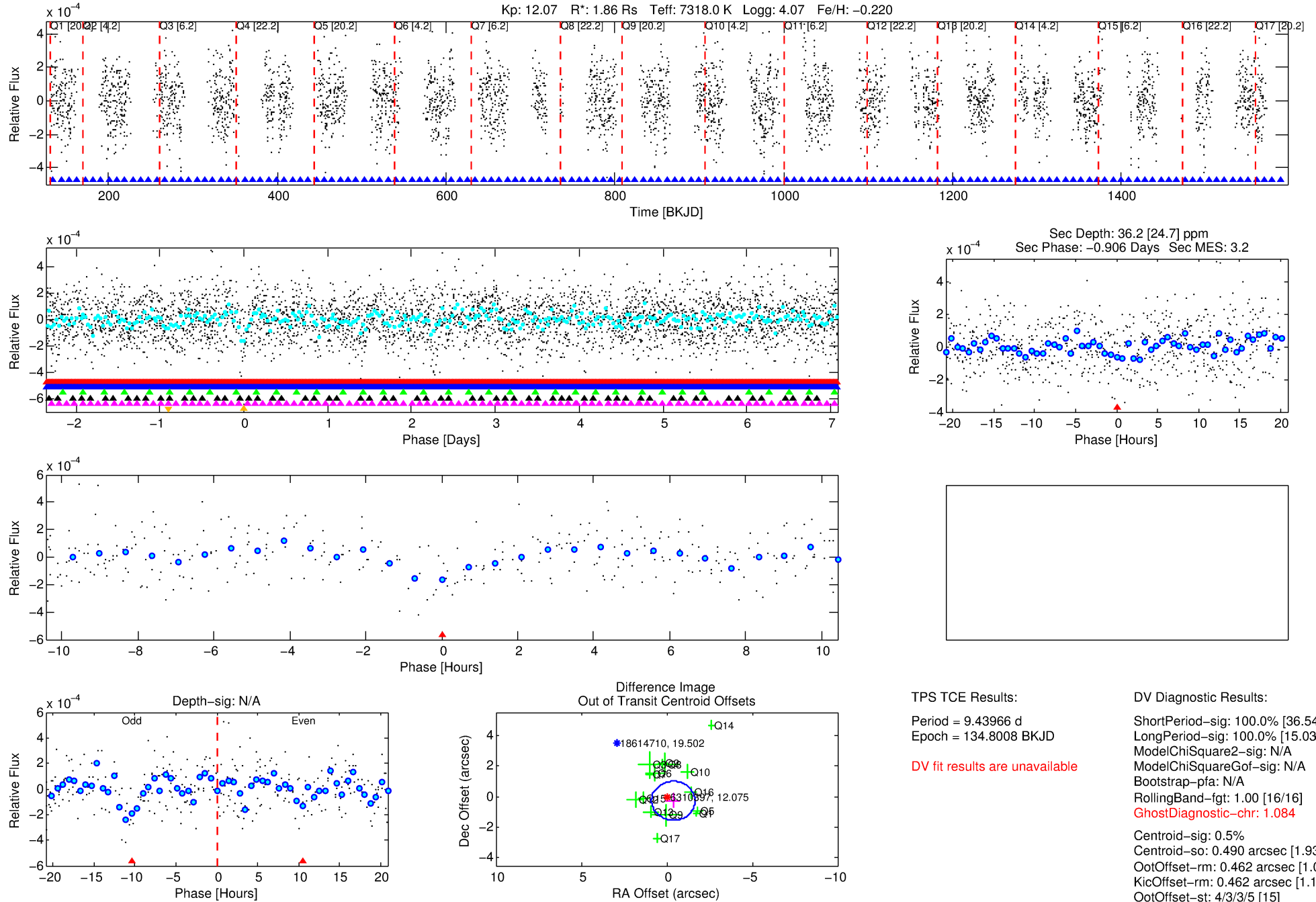
Ephemeris Match Information For 006310397-06

No Significant Match Found



# DV One-Page Summary

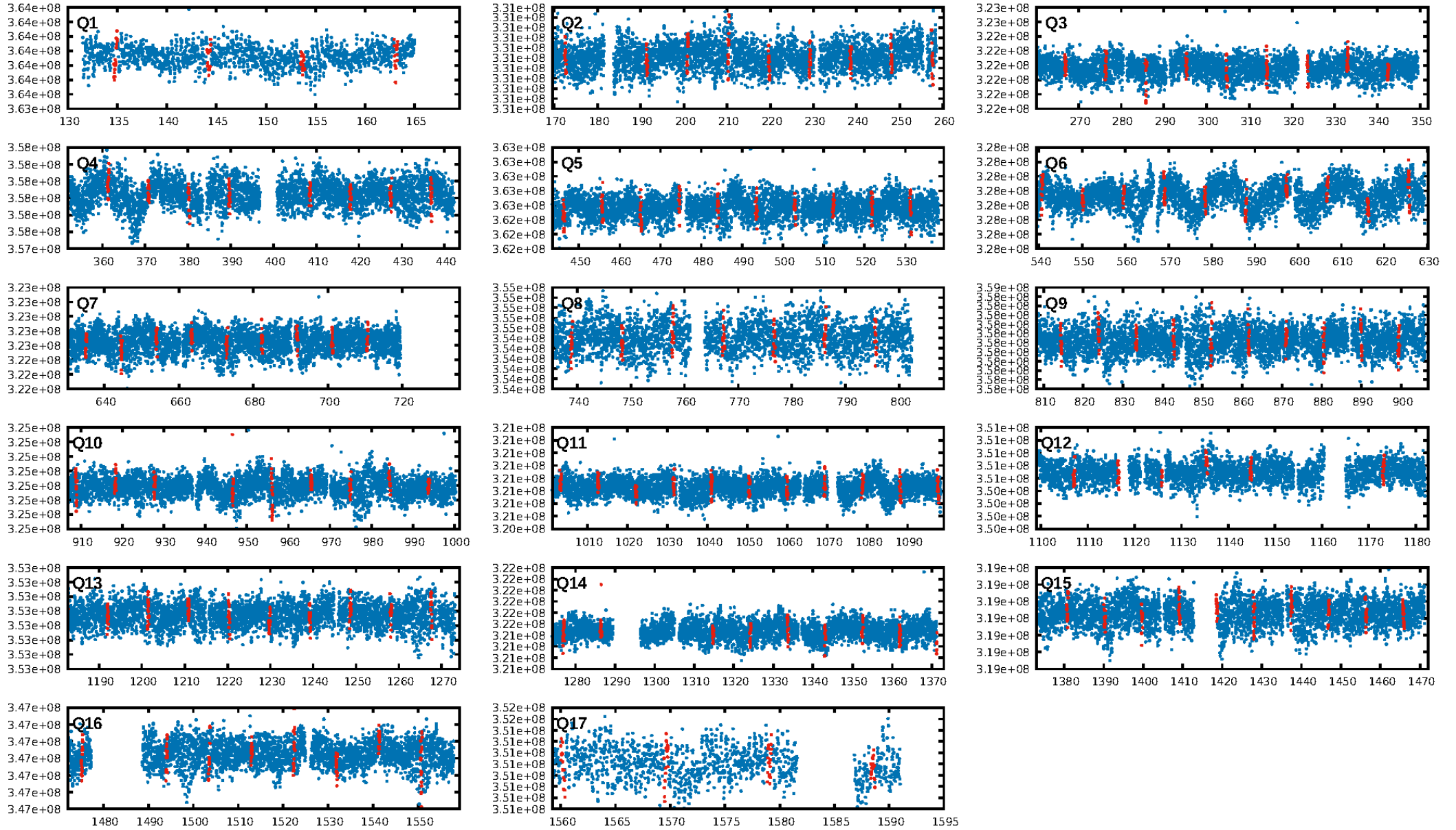
KIC: 6310397 Candidate: 6 of 6 Period: 9.440 d



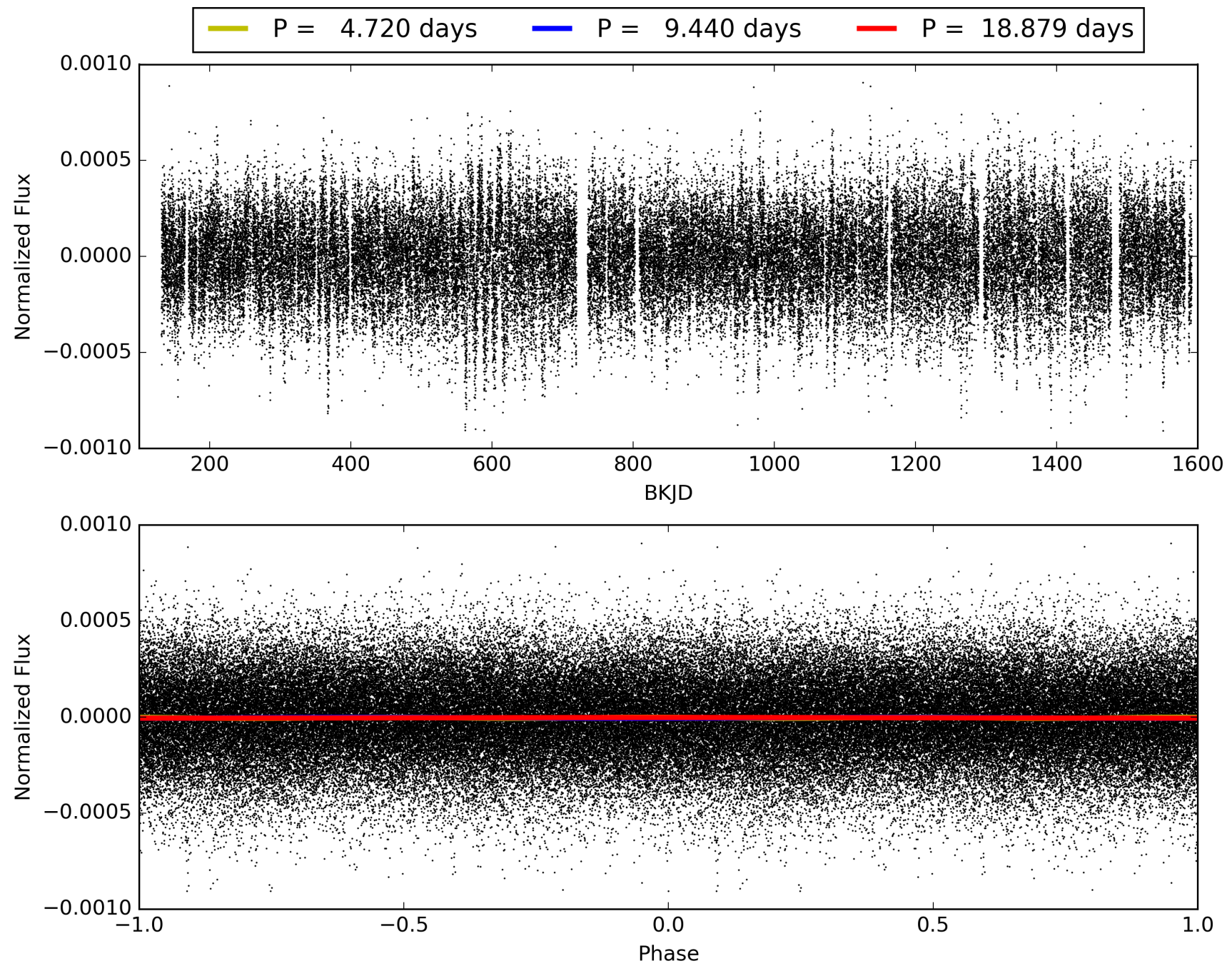
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:53:30 Z

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

# TCE 006310397-06, PDC Light Curves

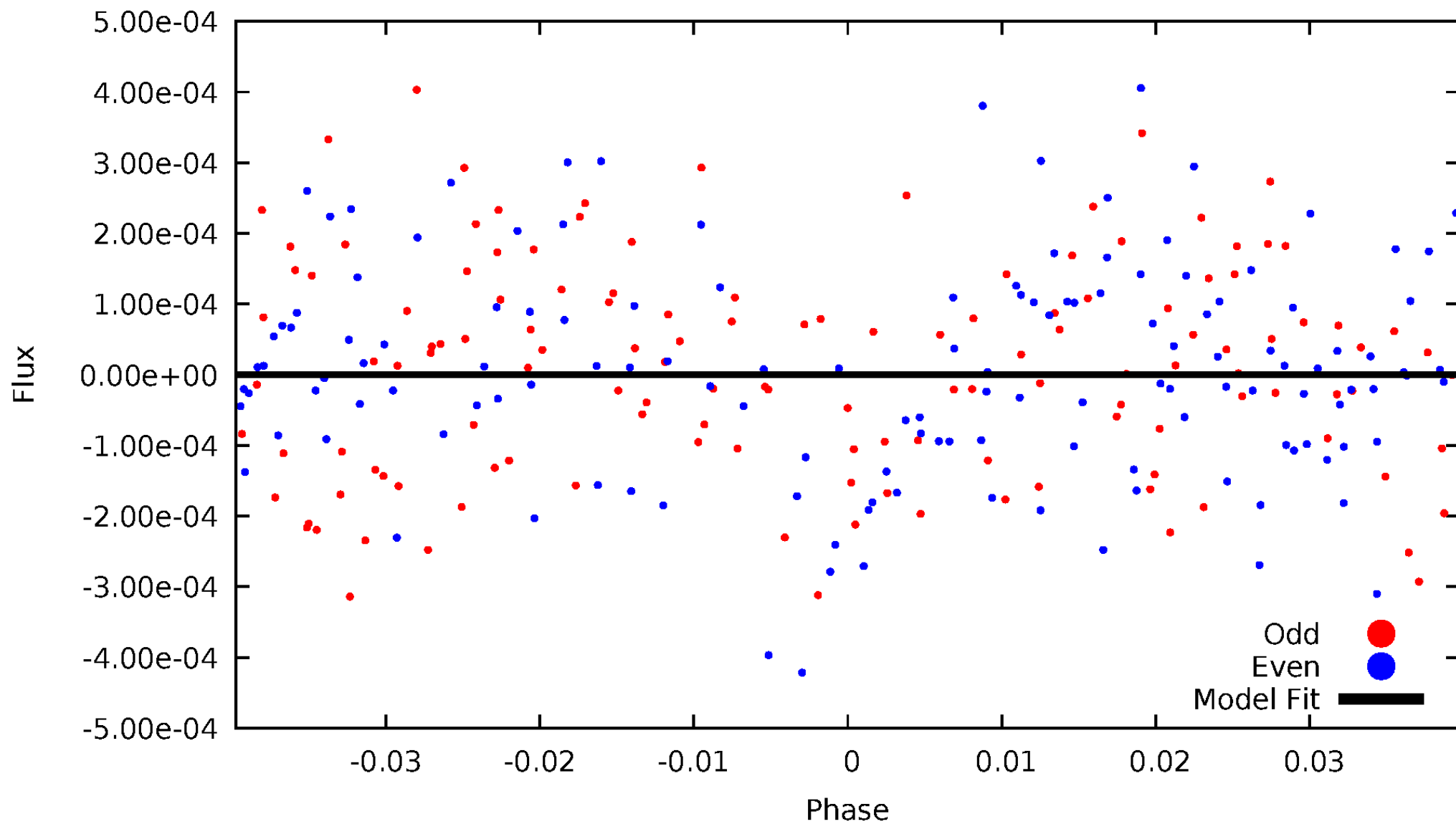


TCE 006310397-06



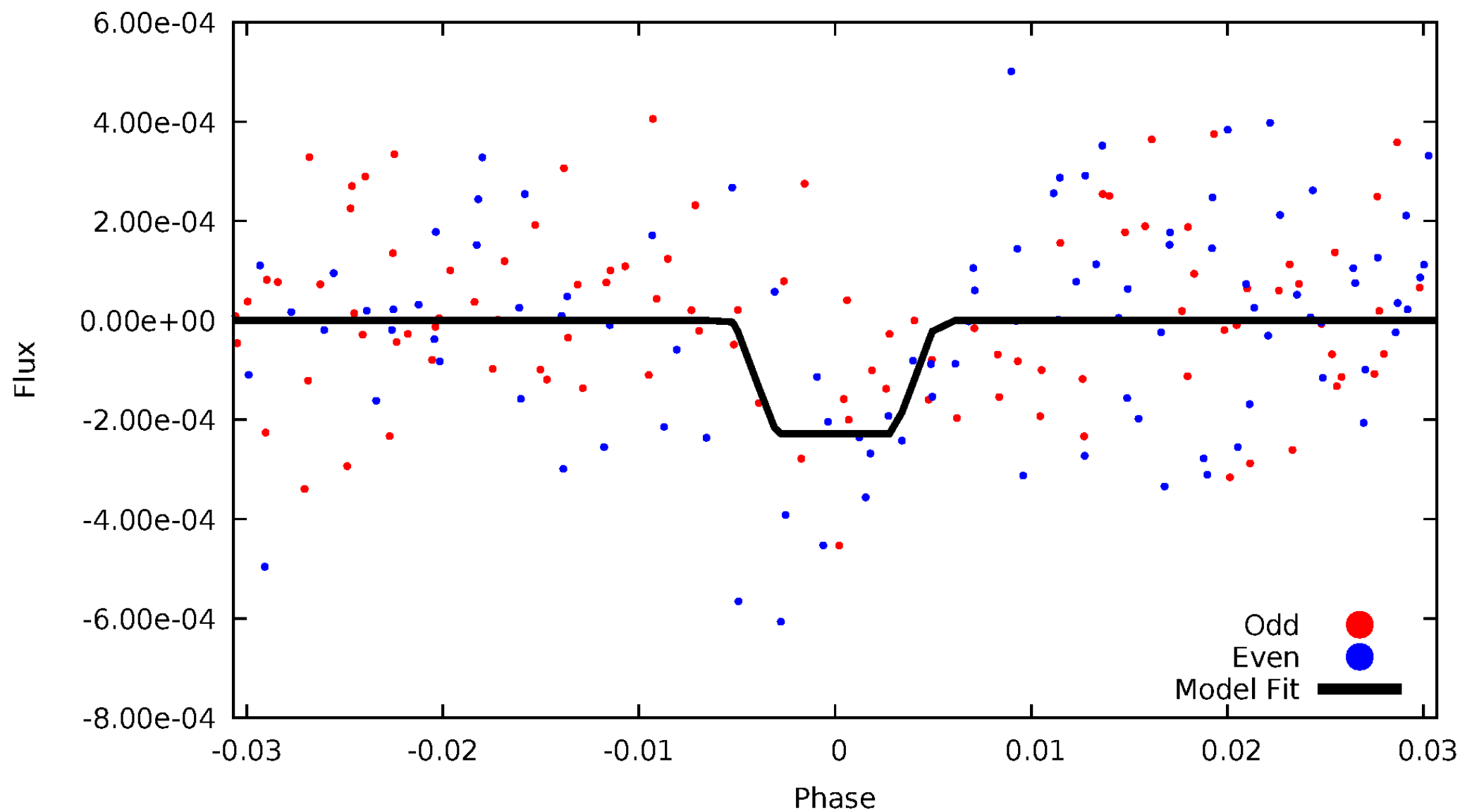
# DV Odd/Even

TCE 006310397-06



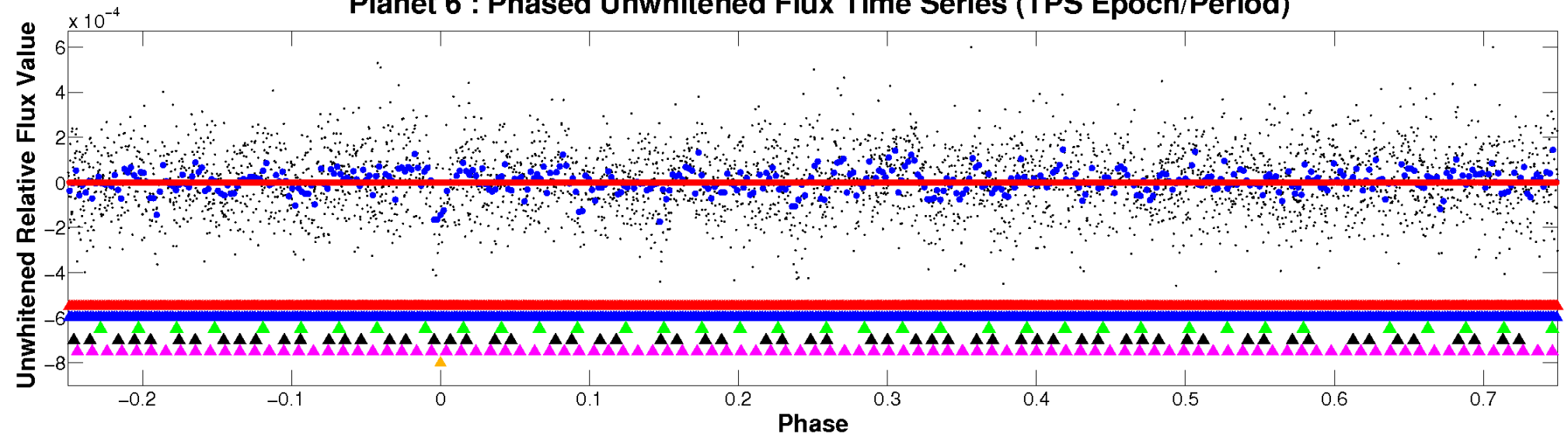
# ALT Odd/Even

TCE 006310397-06

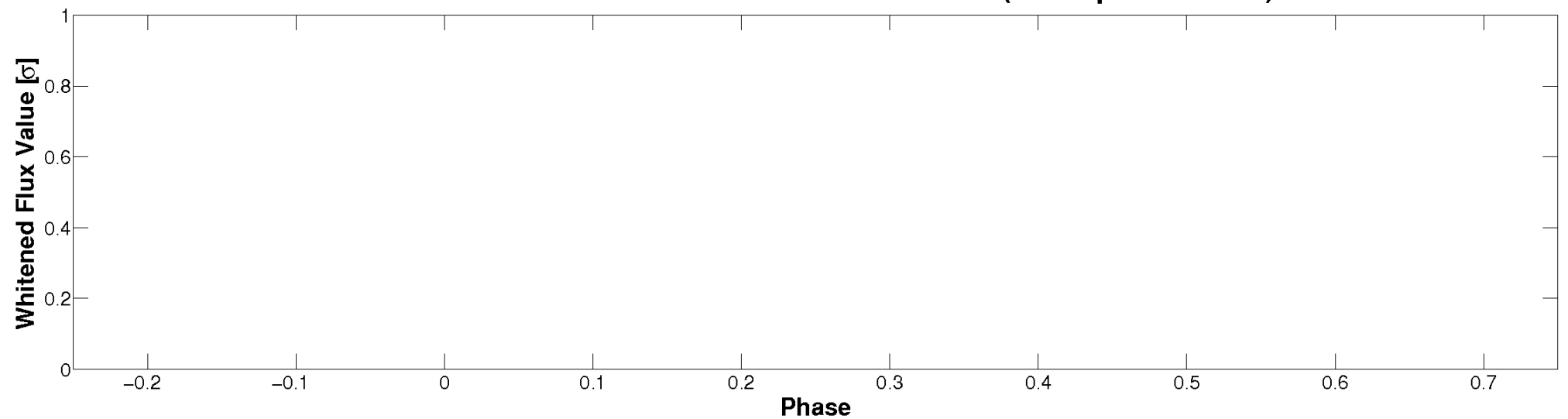


# Non-Whitened Vs. Whitened Light Curve

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



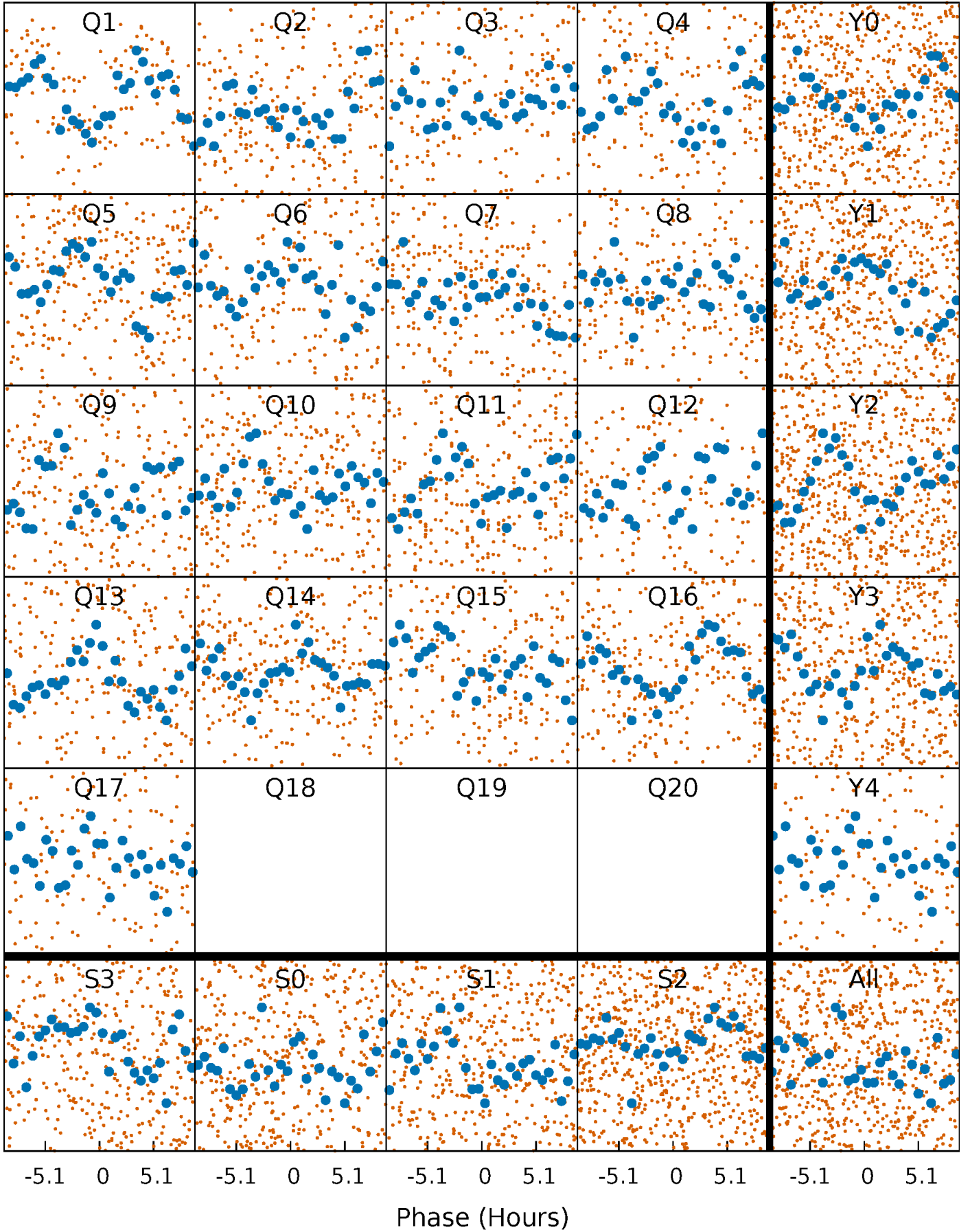
**Planet 6 : Phased Whitened Flux Time Series (TPS Epoch/Period)**





# PDC Quarter-Phased Transit Curves

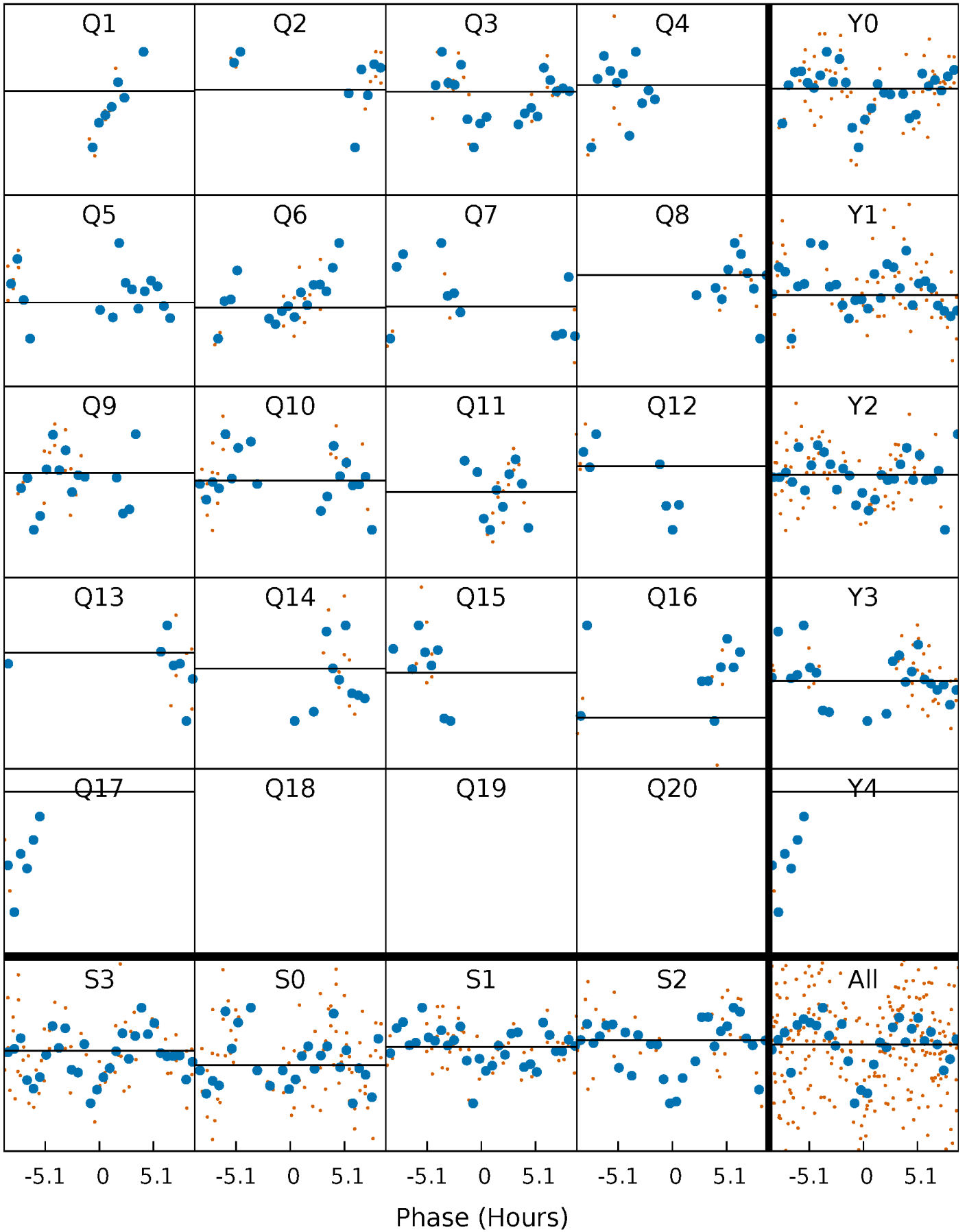
TCE 006310397-06    P= 9.439660 Days     $T_0=134.800797$  (BKJD)





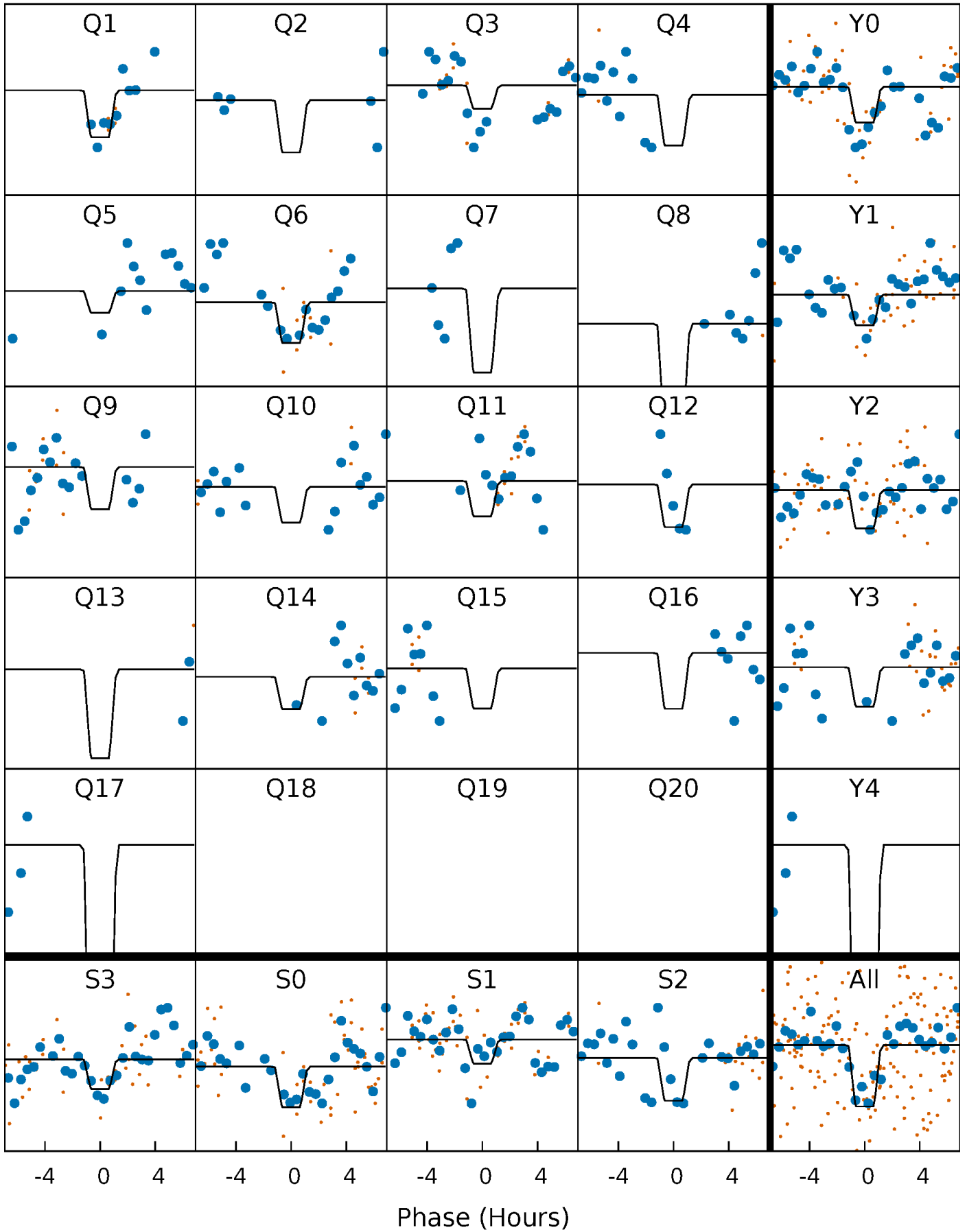
# DV Quarter-Phased Transit Curves

TCE 006310397-06 P= 9.439660 Days  $T_0=134.800797$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

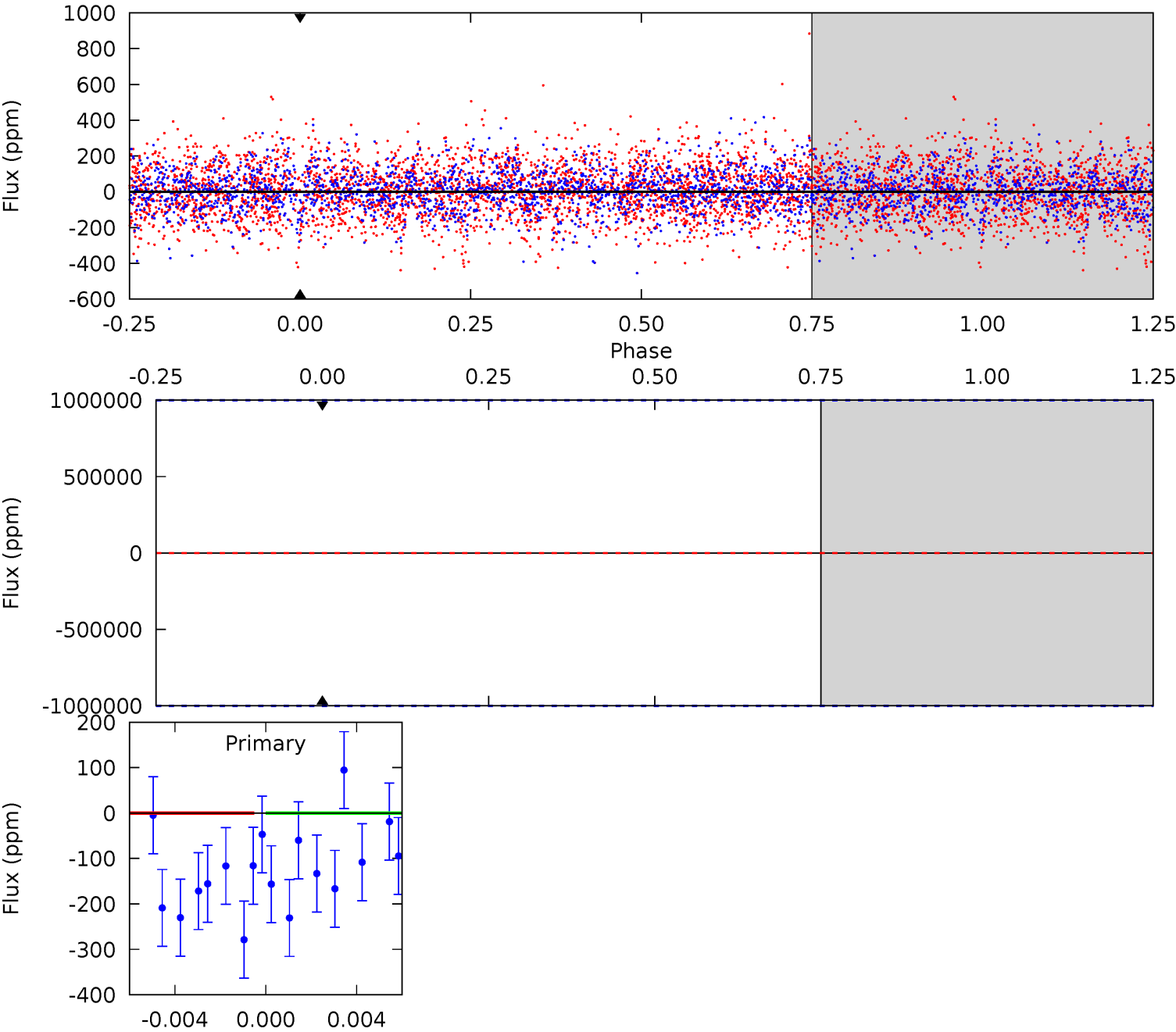
TCE 006310397-06   P= 9.439660 Days    $T_0=134.798824$  (BKJD)



DV Model-Shift Uniqueness Test

006310397-06, P = 9.439660 Days, E = 125.361137 Days

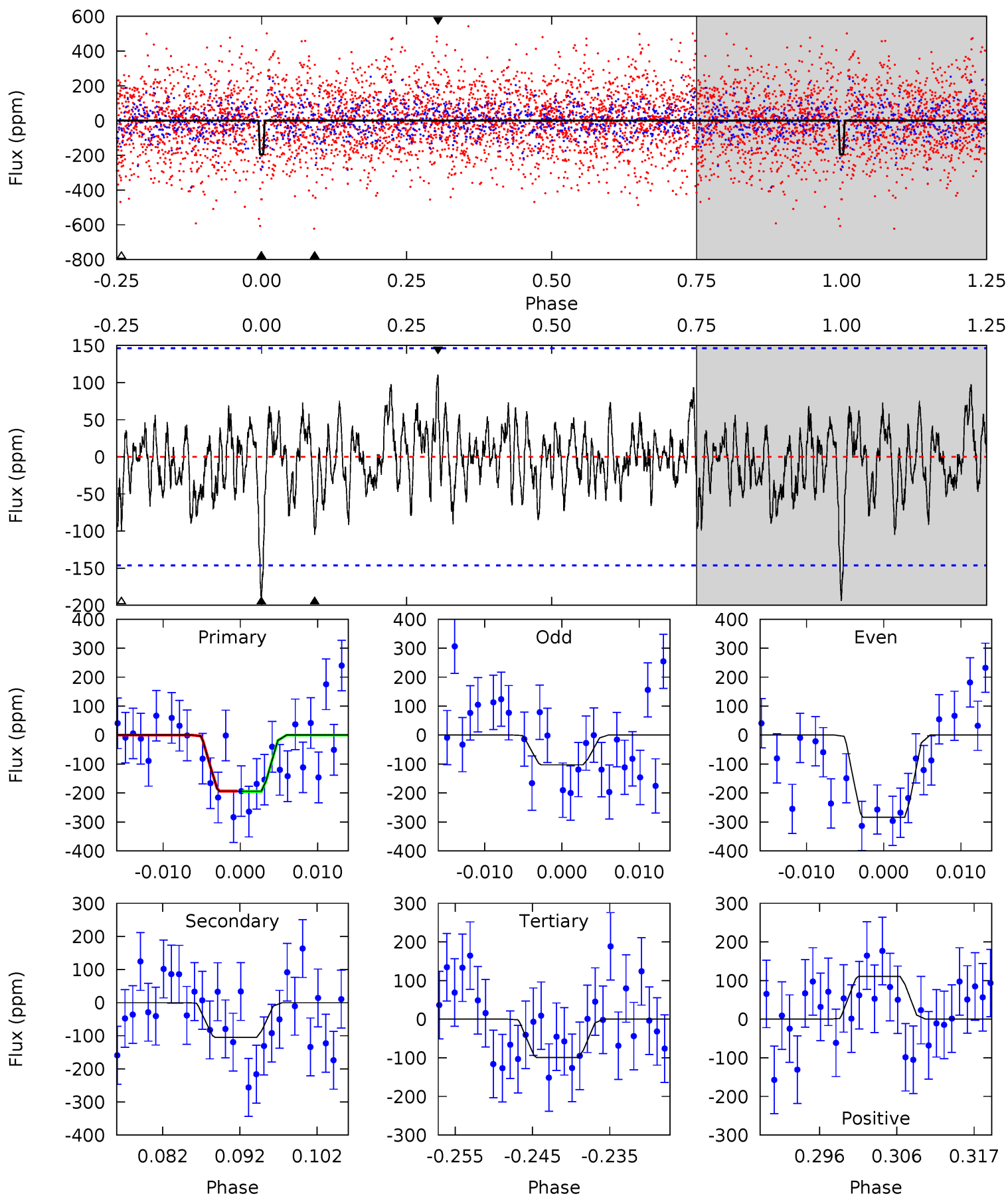
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006310397-06, P = 9.439660 Days, E = 125.359164 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.67	3.60	3.41	3.80	5.02	2.57	1.23	3.25	2.87	0.18	-0.20	3.12	0.92	0.36	0.02



### Stellar Parameters For KIC 006310397

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7318^{+230}_{-307}$	$4.073^{+0.204}_{-0.167}$	$-0.220^{+0.250}_{-0.350}$	$1.857^{+0.507}_{-0.507}$	$1.486^{+0.209}_{-0.255}$	$0.327^{+0.382}_{-0.153}$
	+3%/-4%	+5%/-4%	+114%/-159%	+27%/-27%	+14%/-17%	+117%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006310397-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$14.27^{+15.99}_{-10.07}$	$1937^{+149}_{-153}$	$5101^{+36438}_{-36958}$	$31^{+5351}_{-3649}$
Alt.	$-105 \pm 29$	$16.07^{+15.92}_{-11.70}$	$1939^{+137}_{-153}$	$3108^{+1974}_{-757}$	$2.172^{+29.523}_{-1.637}$

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

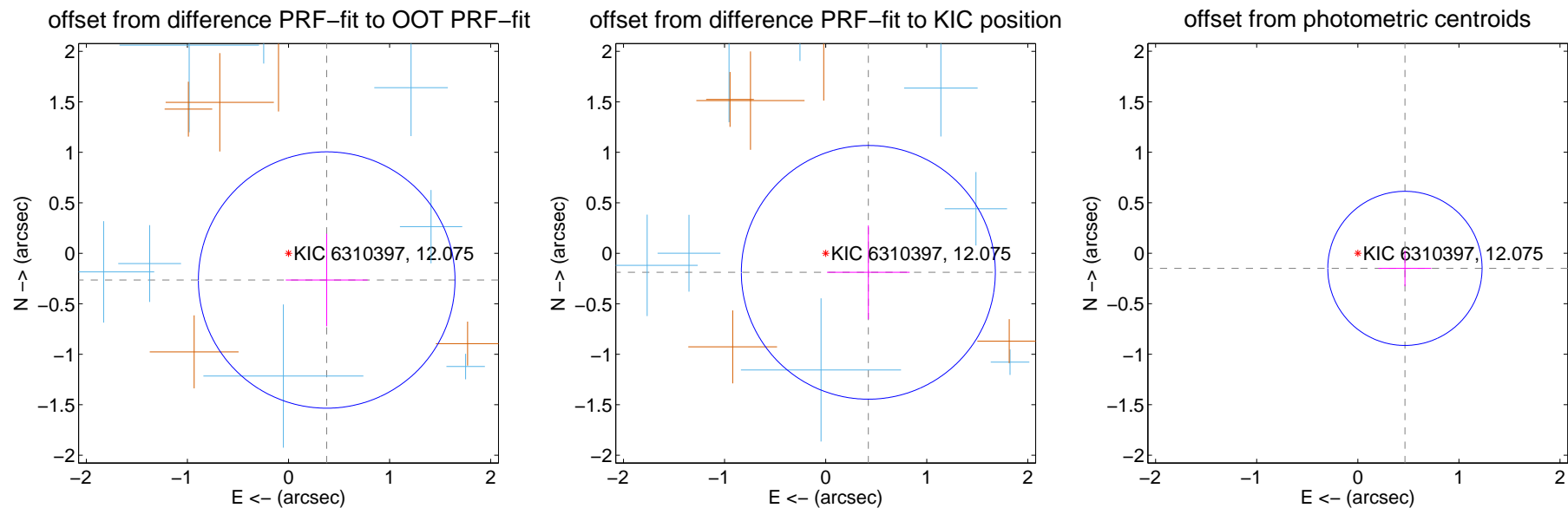
## DV Centroid Data

Supplemental centroid analysis for 006310397-06. Kepler magnitude: 12.07. Transit SNR -1.00

There are 8 quarters with good PRF difference image offsets

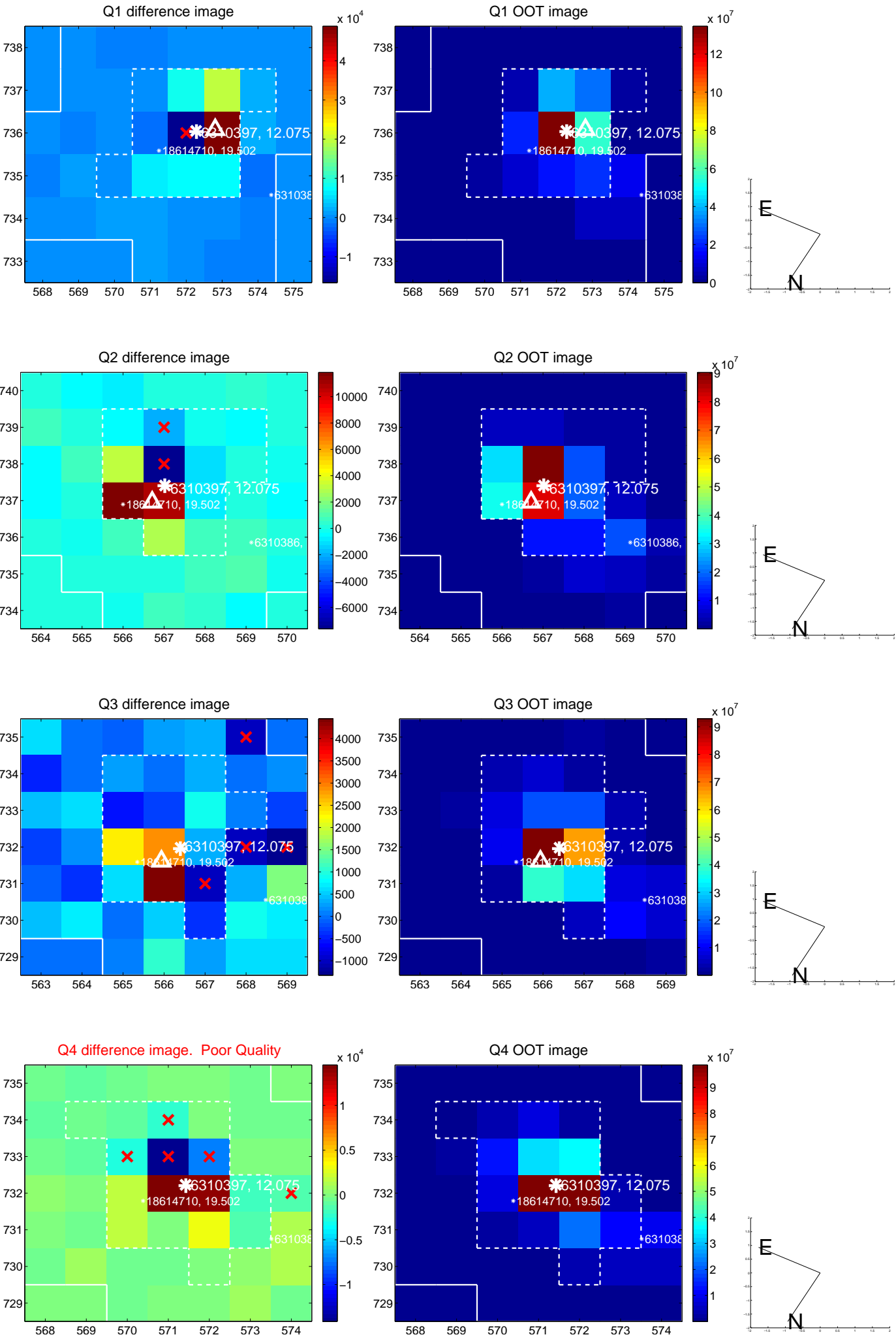
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.462 \pm 0.423$	1.09	$-0.378 \pm 0.405$	$-0.265 \pm 0.458$
PRF-fit source offset from KIC position	$0.462 \pm 0.419$	1.10	$-0.422 \pm 0.409$	$-0.189 \pm 0.464$
photometric centroid source offset	$0.49 \pm 0.25$	1.93	$-0.47 \pm 0.26$	$-0.15 \pm 0.18$



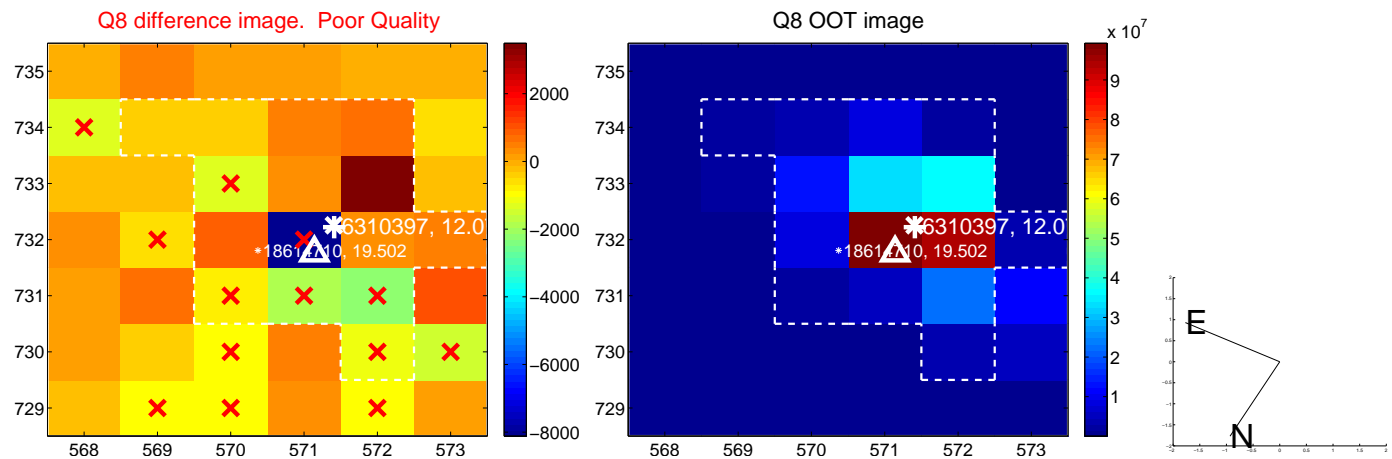
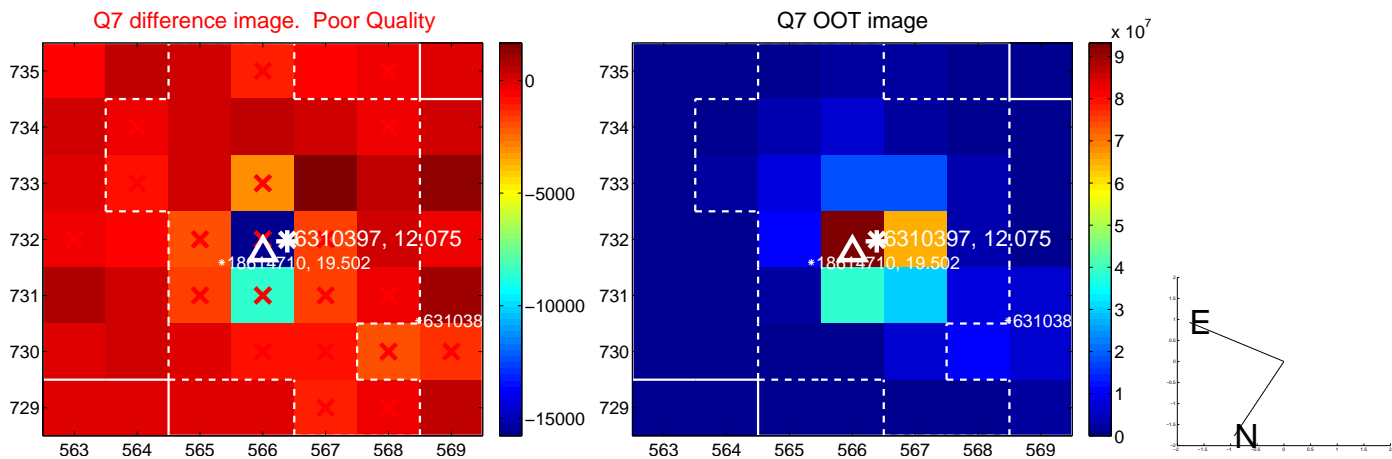
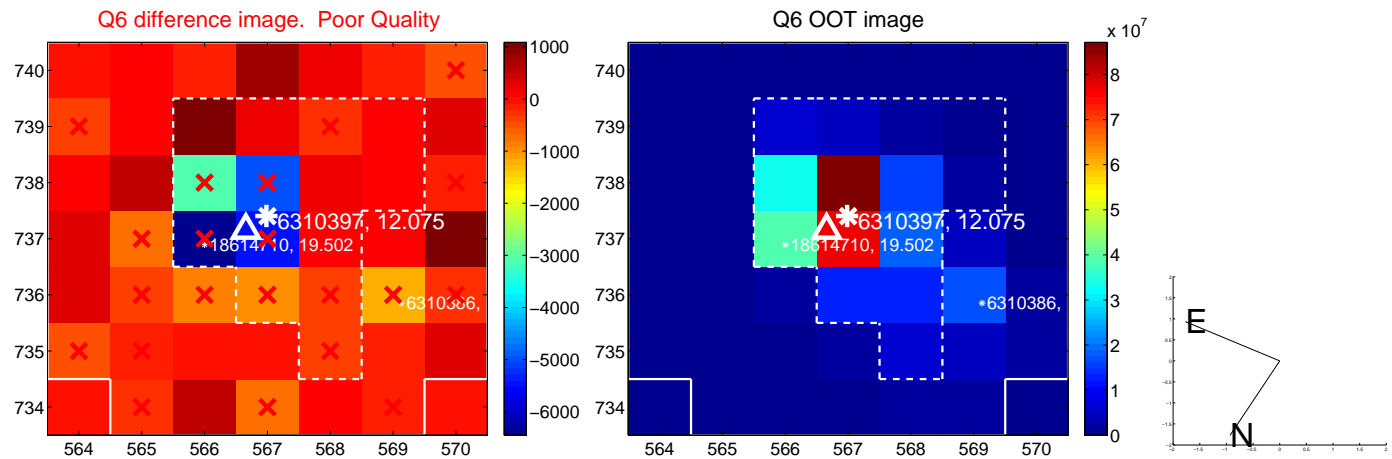
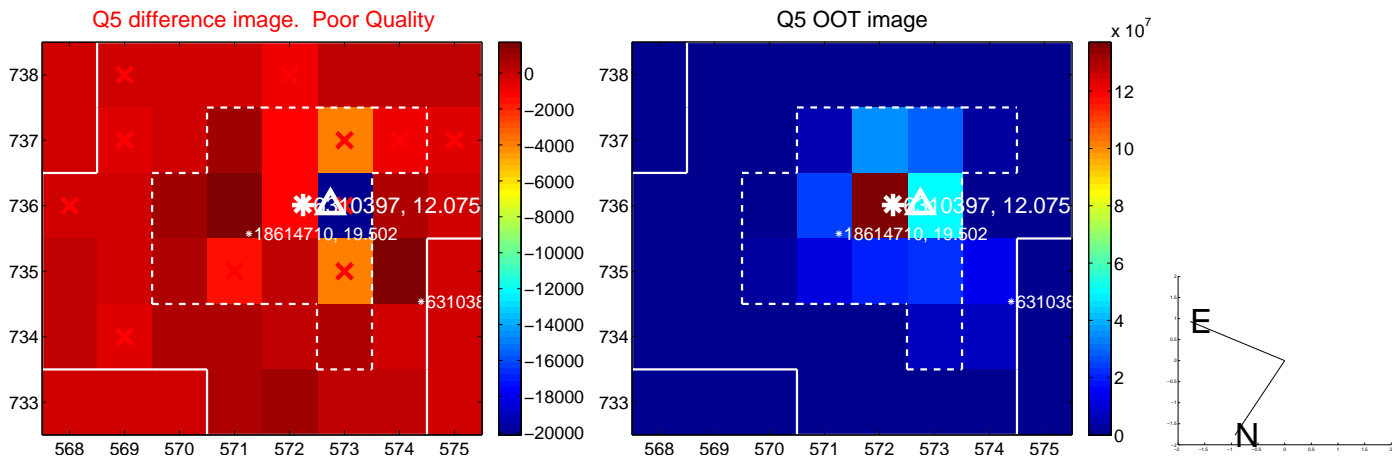
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

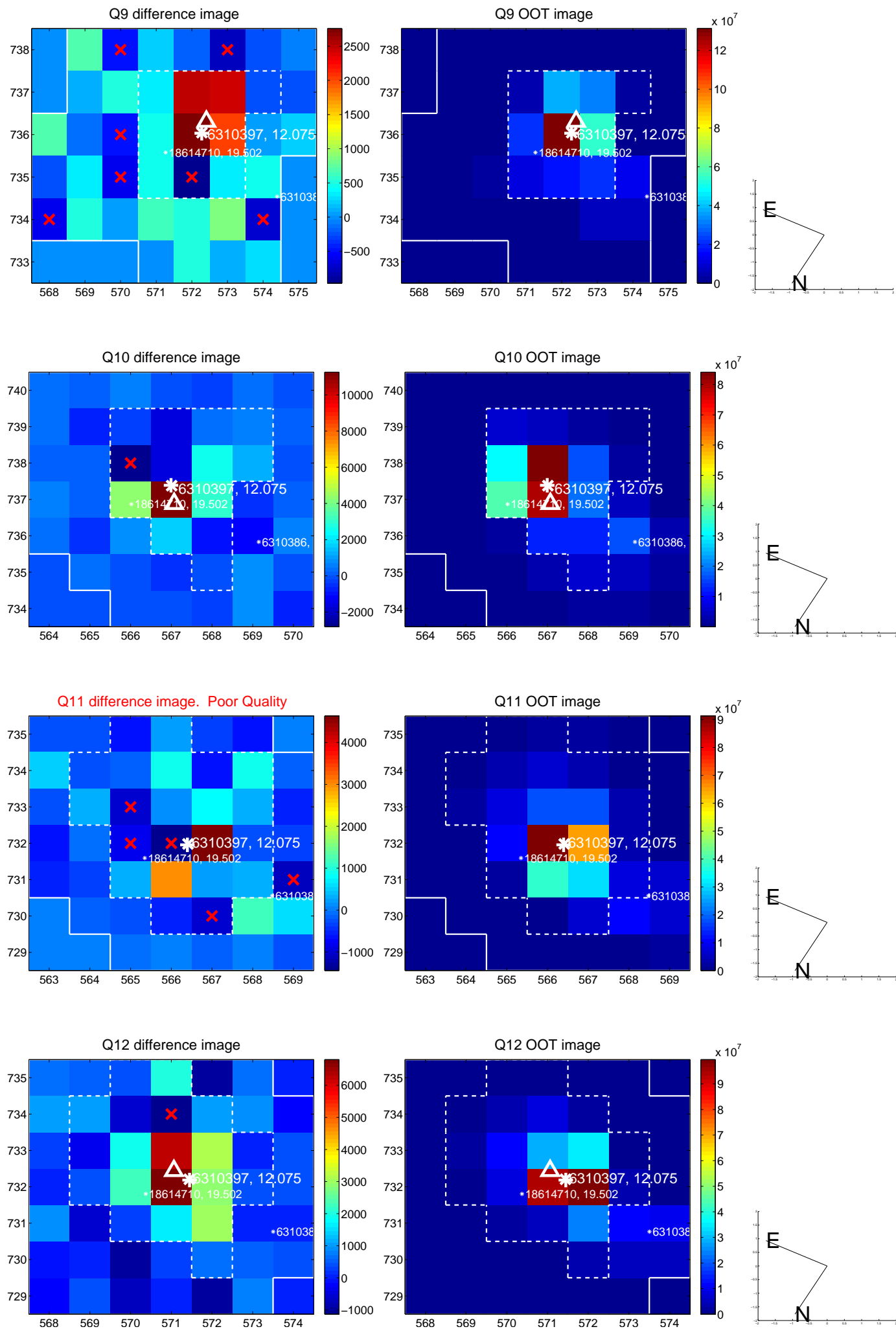




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

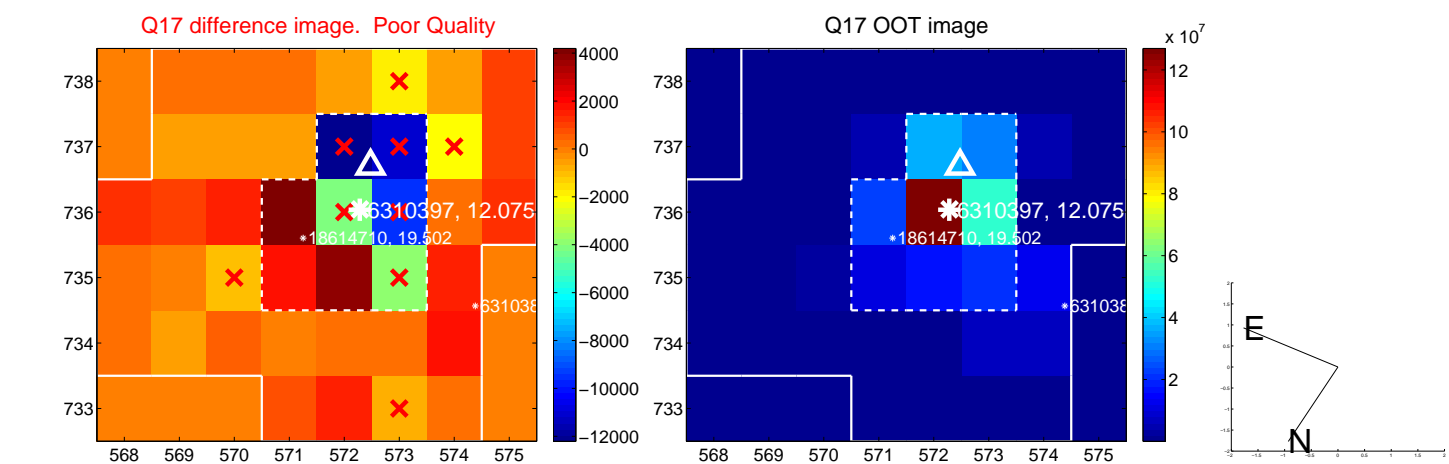


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

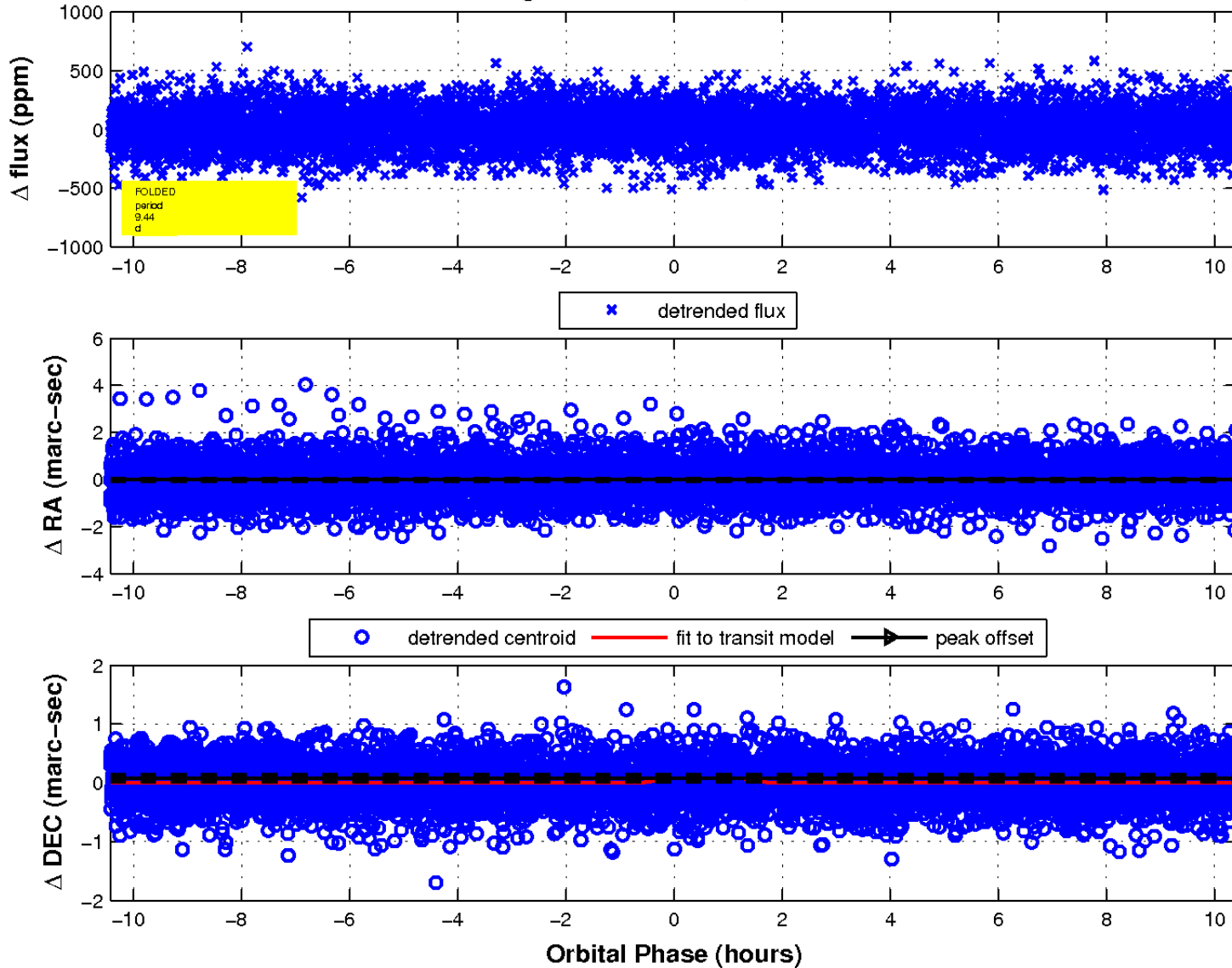




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

