

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

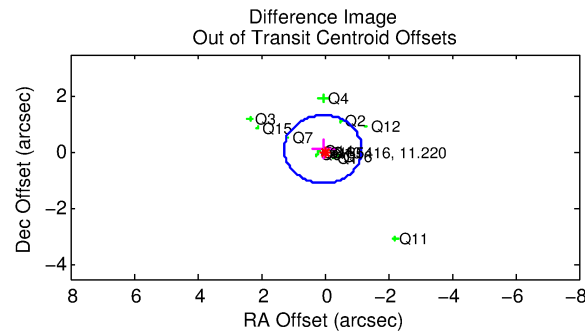
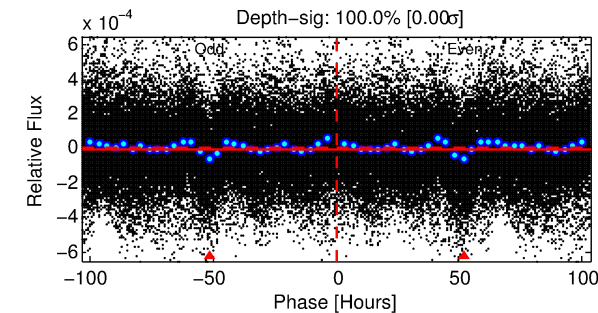
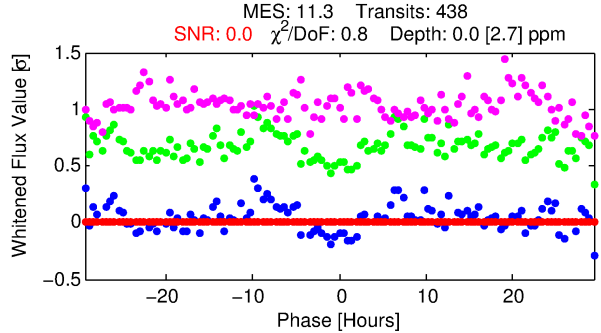
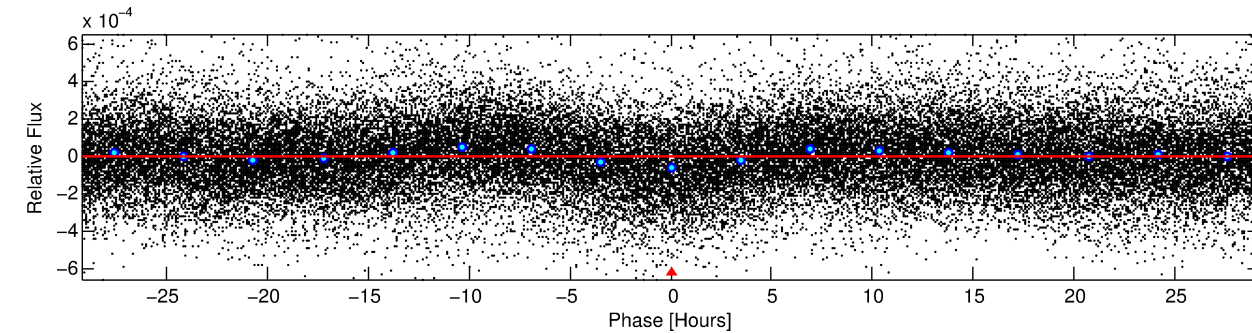
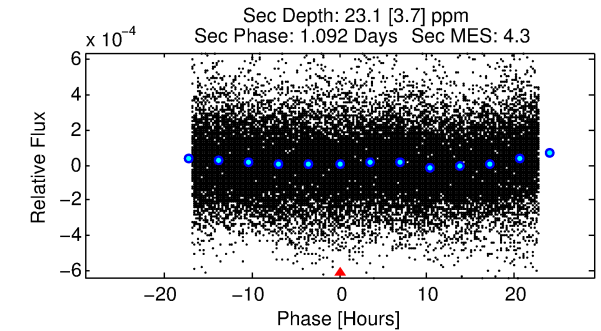
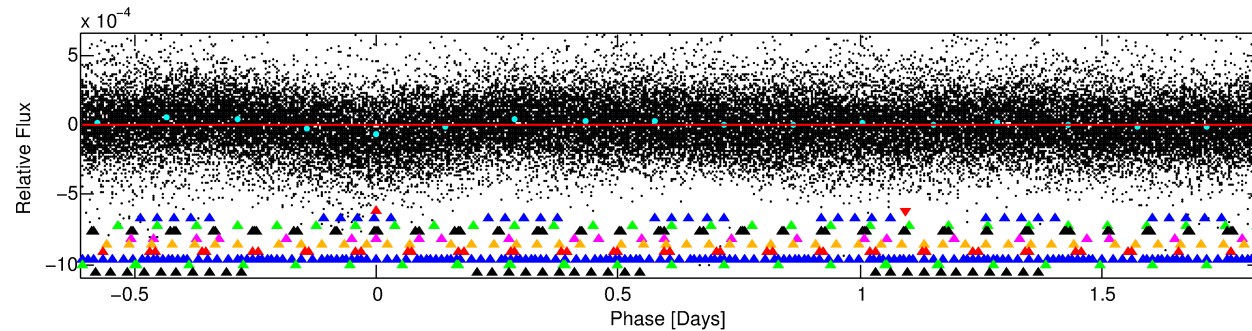
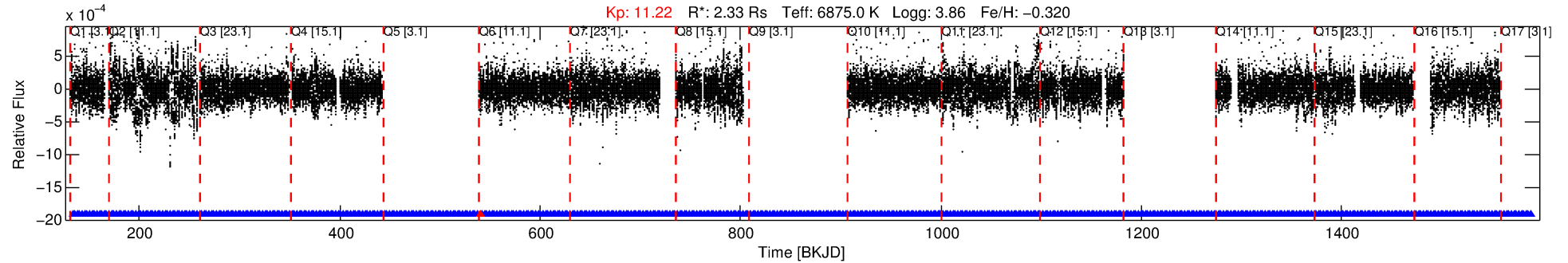
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006185416-01

No Significant Match Found

# DV One-Page Summary

KIC: 6185416 Candidate: 1 of 10 Period: 2.434 d



## DV Fit Results:

Period = 2.43376 [80.58121] d  
Epoch = 133.4967 [14338.9300] BKJD  
Rp/R\* = 0.0000 [0.4510]  
a/R\* = 1.23 [4258.53]  
b = 0.30 [31149.10]  
Seff = 6804.74 [300423.96]  
Teq = 2316 [25562] K  
Rp = 0.00 [114.51] Re  
a = 0.0399 [0.8810] AU  
Ag = 46414378.29 [16100646215024.90] [10.000]  
Teffp = 295551 [25631624596] K [0.000]

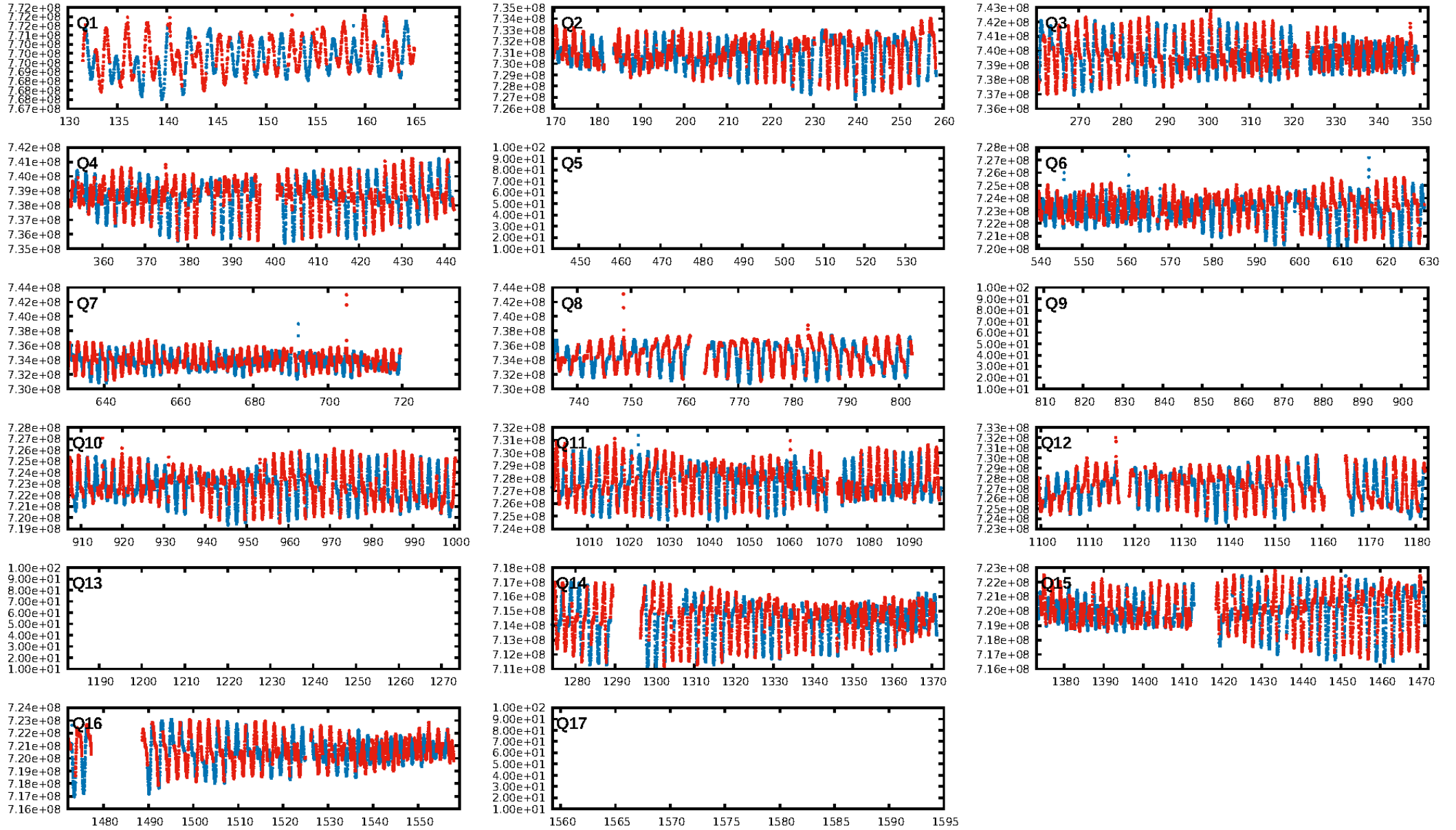
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [7.90σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [423/424]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
QofOffset-rm: 0.128 arcsec [0.32σ]  
QofOffset-rm: 0.226 arcsec [0.60σ]  
QofOffset-st: 4/4/4 [13]  
KicOffset-st: 4/4/4 [13]  
DiffImageQuality-fgm: 0.15 [2/13]  
DiffImageOverlap-fno: 1.00 [13/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:23 Z

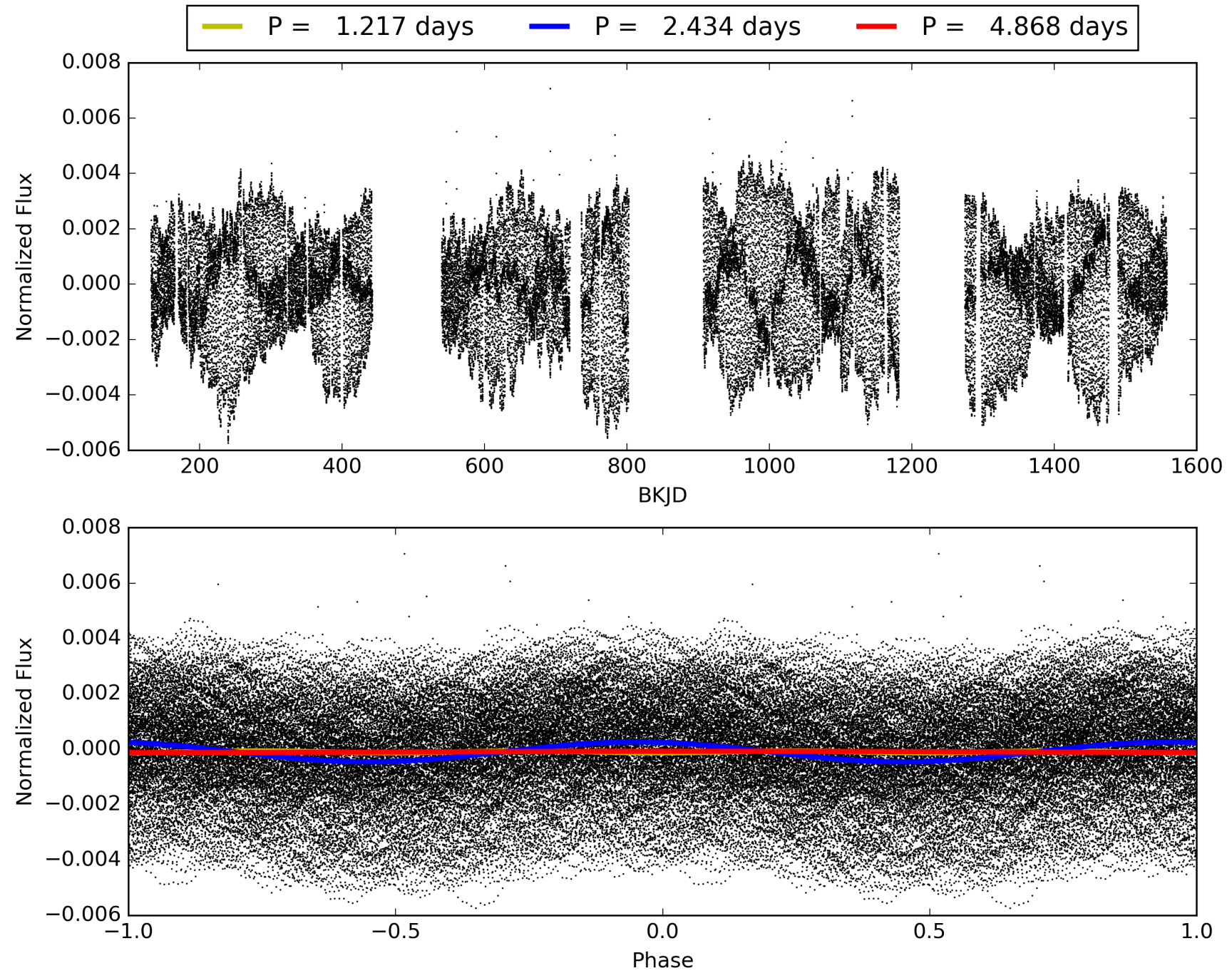
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006185416-01, PDC Light Curves





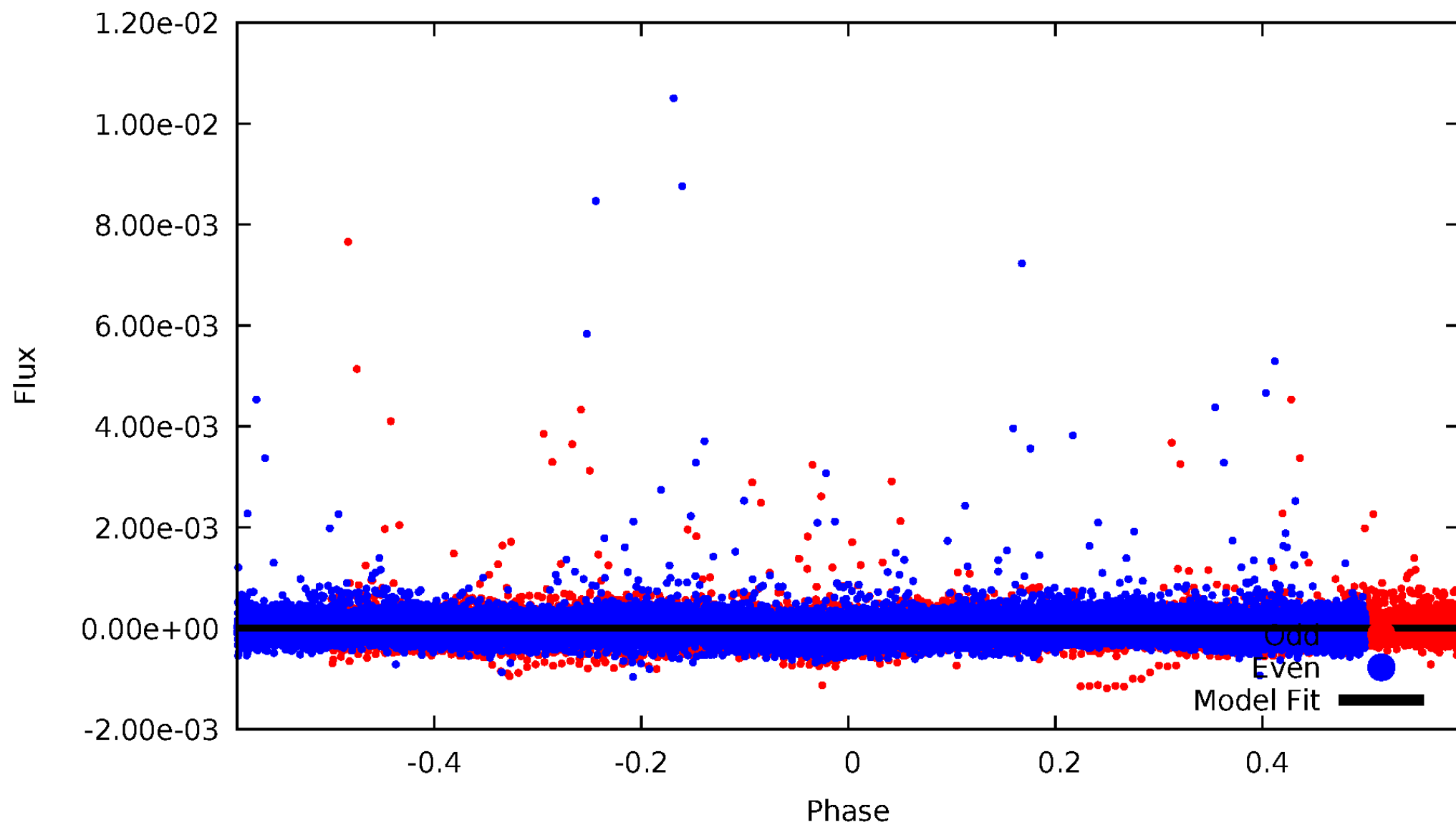
TCE 006185416-01





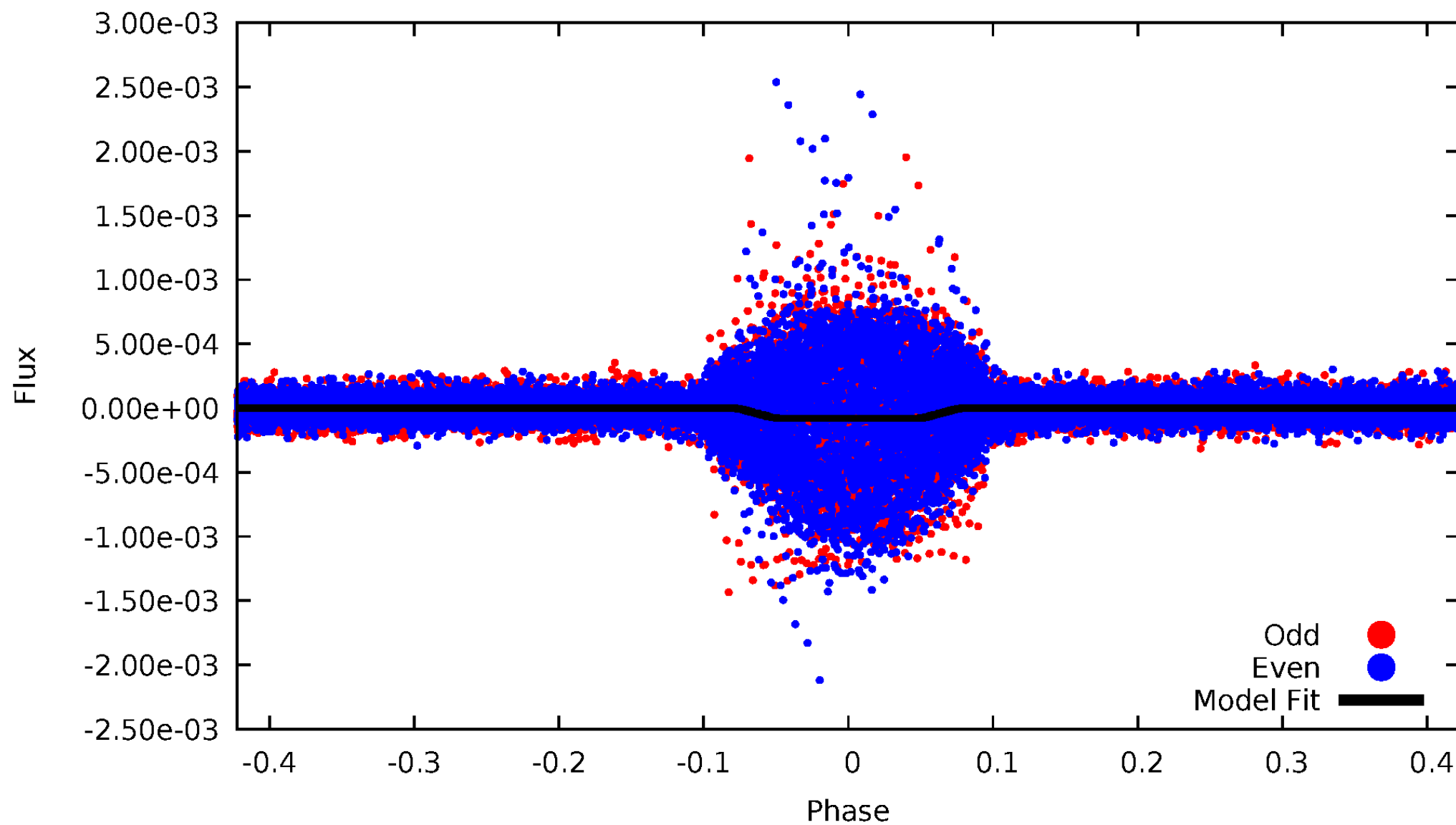
# DV Odd/Even

TCE 006185416-01

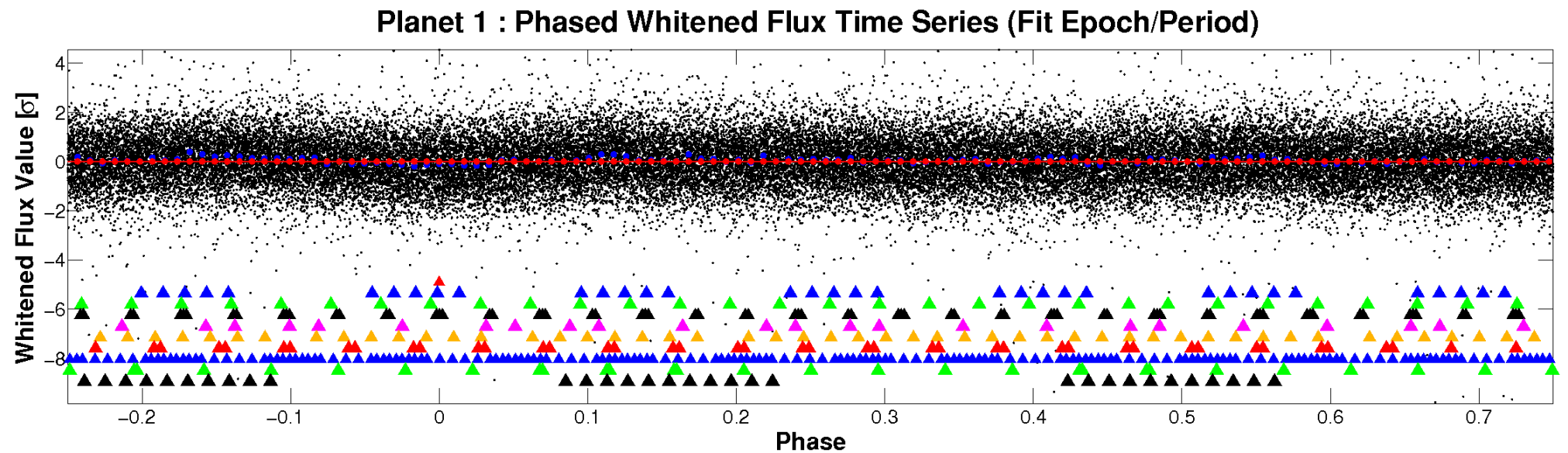
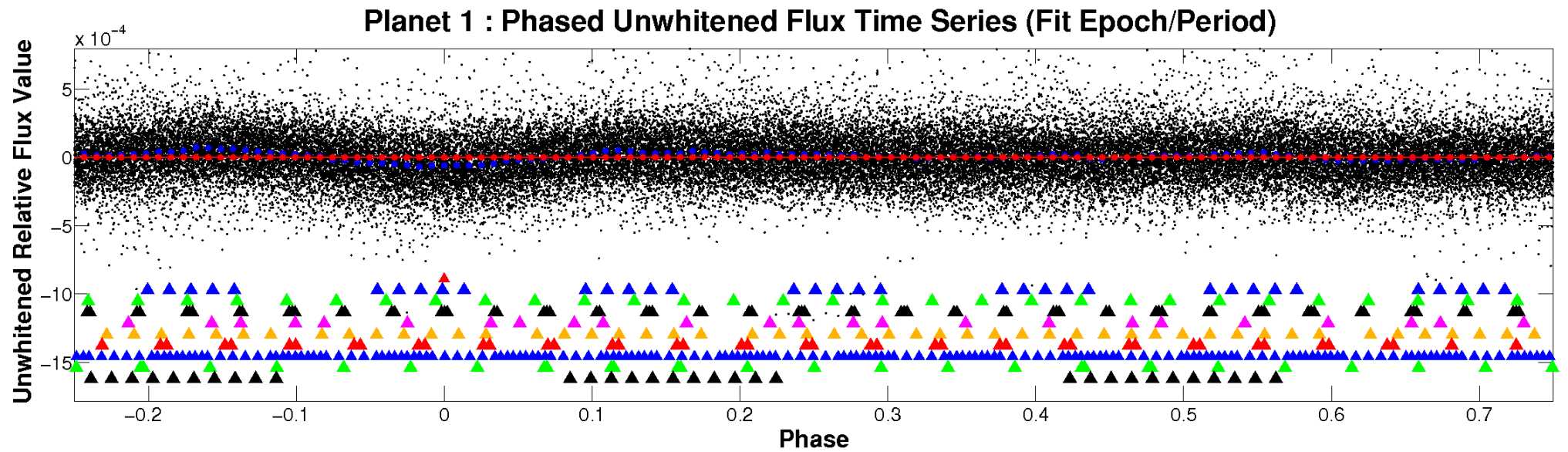


# ALT Odd/Even

TCE 006185416-01



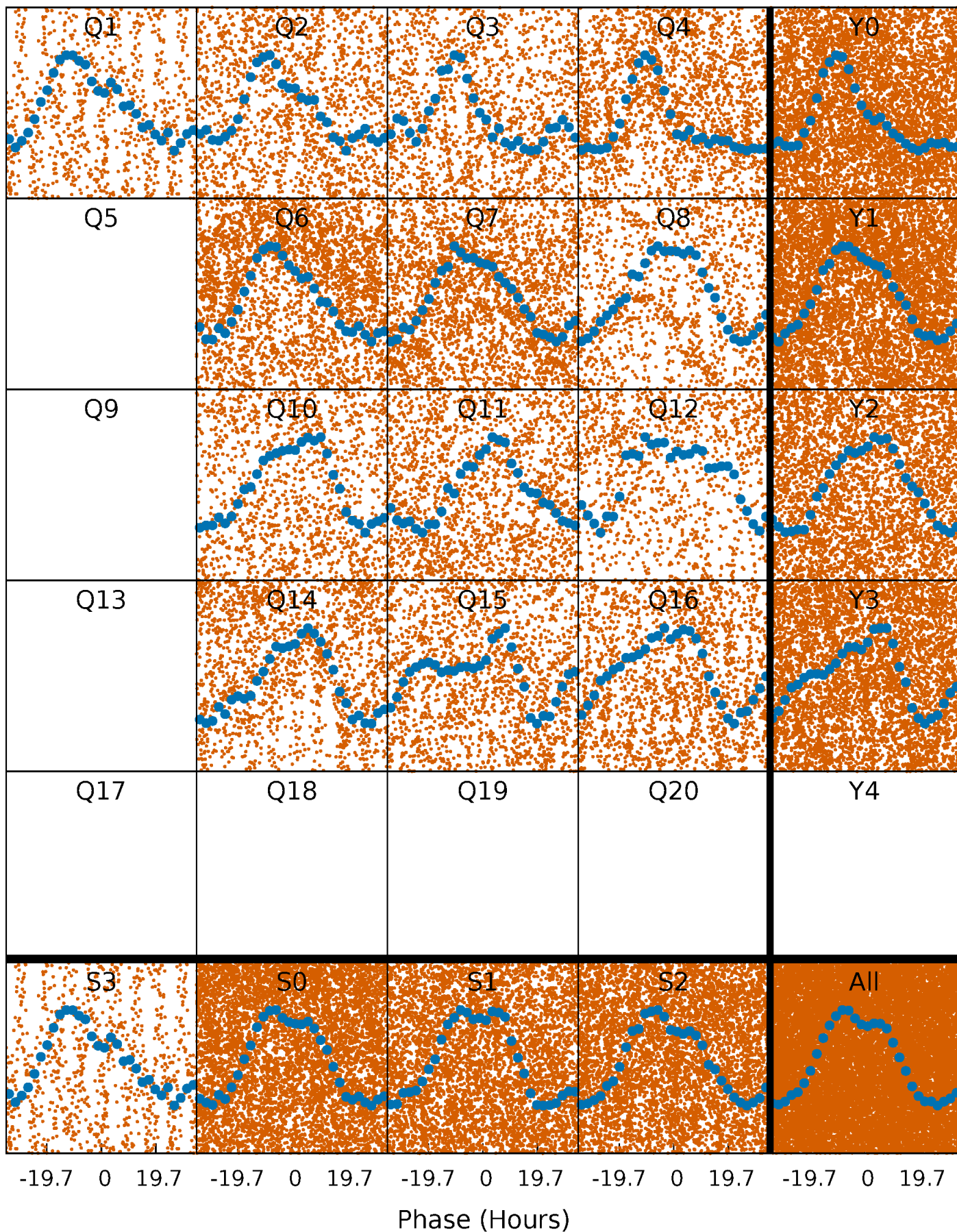
# Non-Whitened Vs. Whitened Light Curve





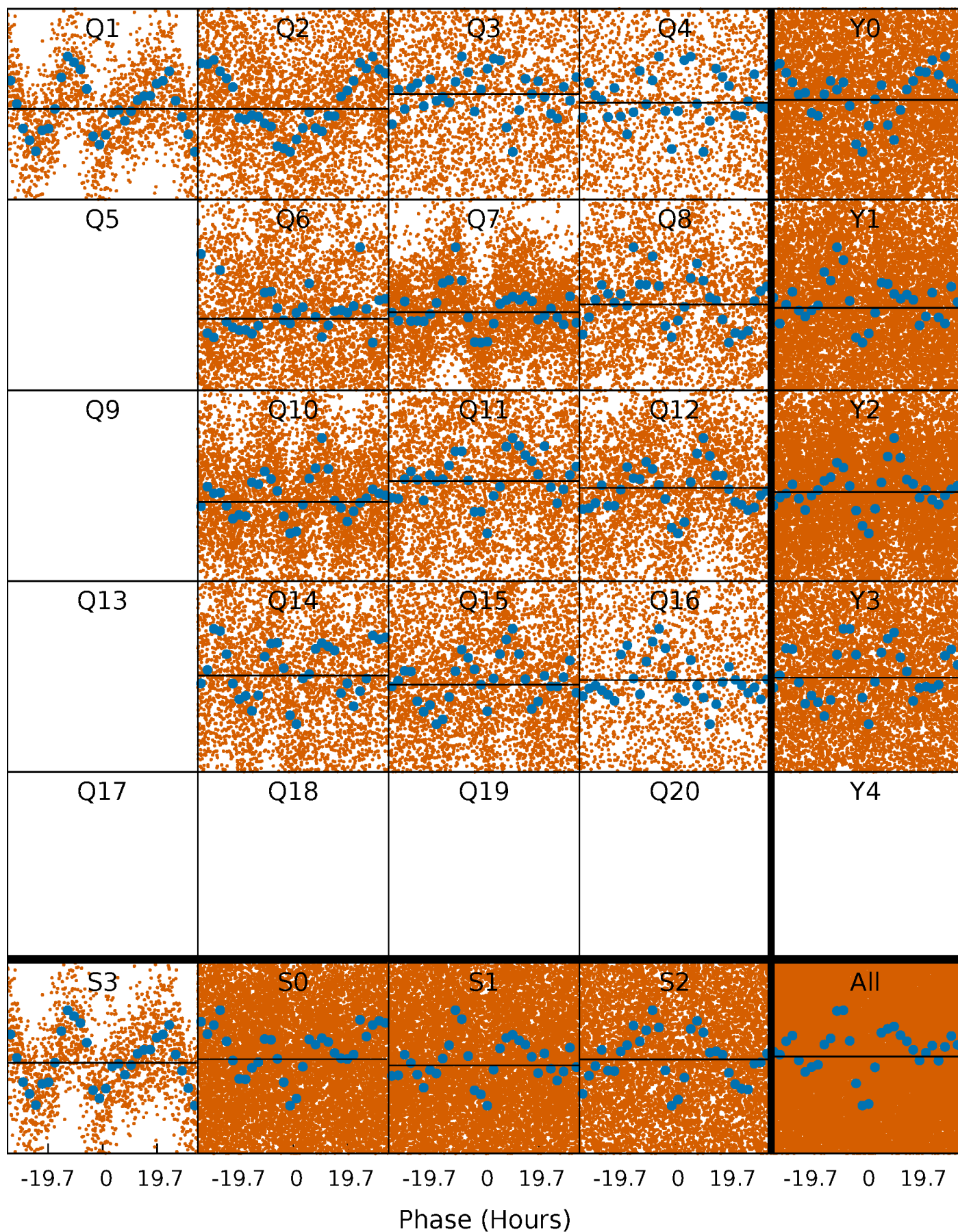
# PDC Quarter-Phased Transit Curves

TCE 006185416-01 P= 2.433763 Days  $T_0=133.496685$  (BKJD)



# DV Quarter-Phased Transit Curves

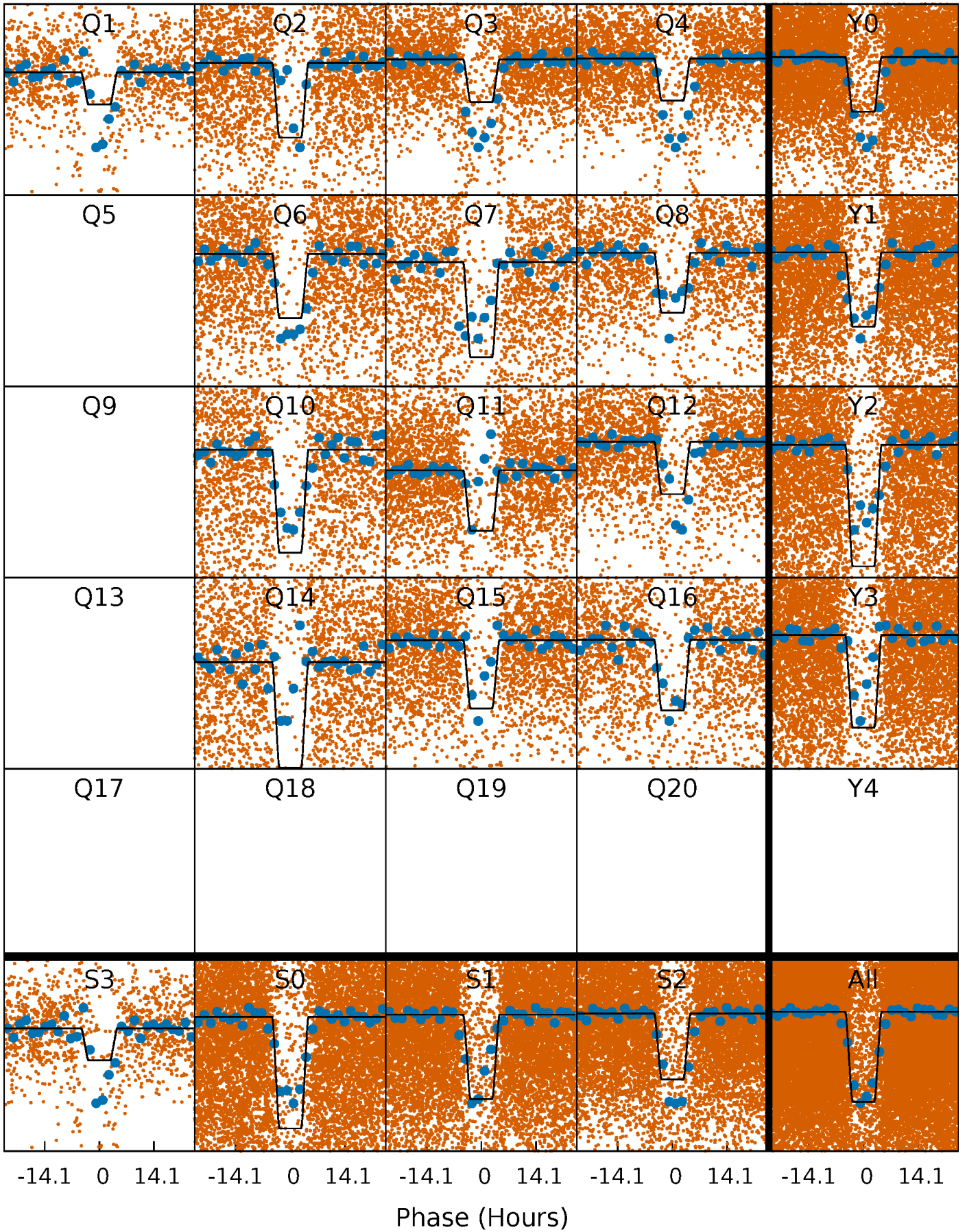
TCE 006185416-01 P= 2.433763 Days  $T_0=133.496685$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 006185416-01 P= 2.434012 Days  $T_0=133.415747$  (BKJD)

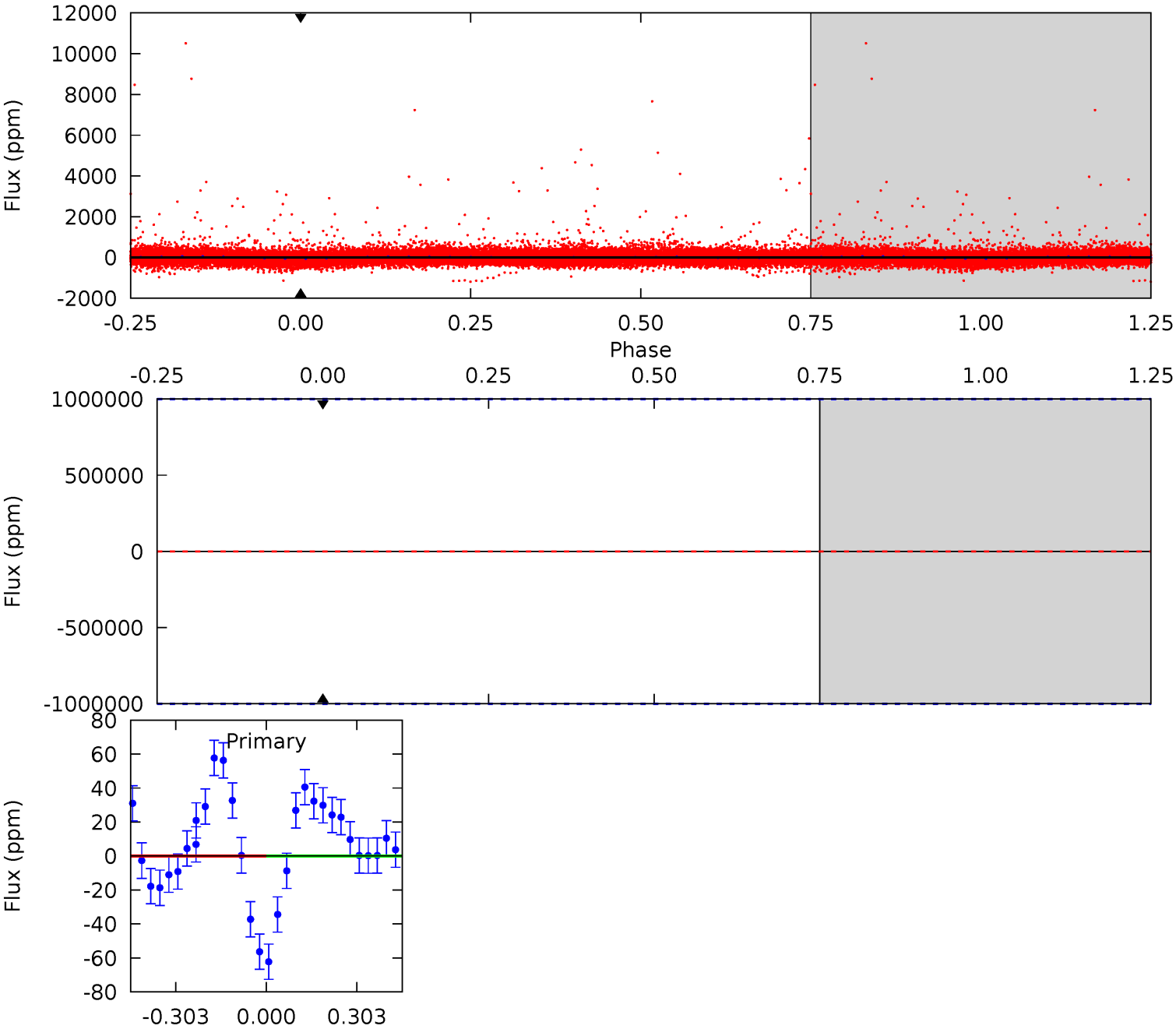




DV Model-Shift Uniqueness Test

006185416-01, P = 2.433763 Days, E = 131.062922 Days

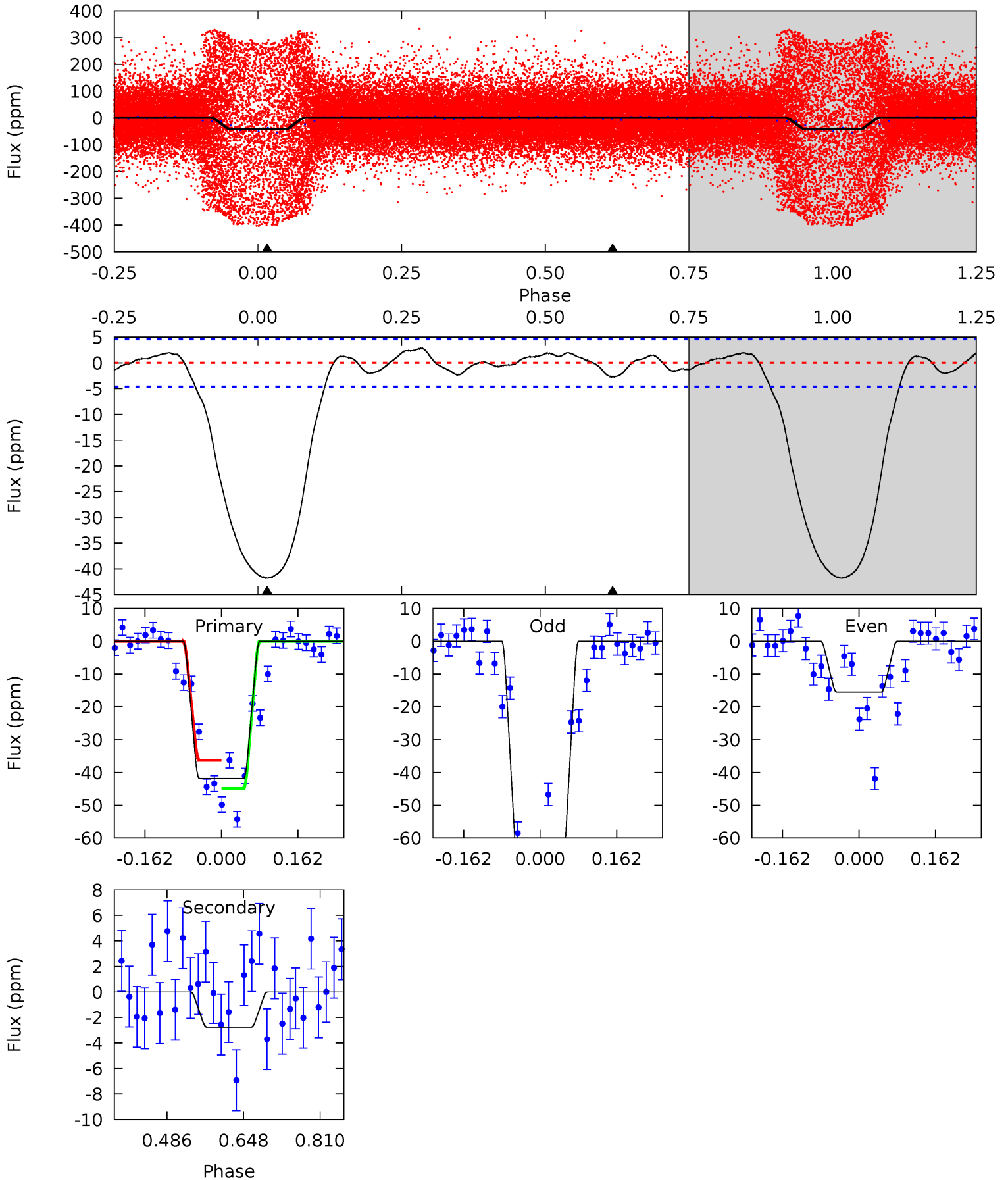
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006185416-01, P = 2.434012 Days, E = 130.981735 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
40.5	2.68	0	0	4.46	1.40	1.37	40.5	40.5	2.68	2.68	24.8	1.54	0.06	0



### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$72.75^{+76.46}_{-49.26}$	$1140^{+606}_{-275}$	$-2971^{+11293}_{-4746}$	$-0.780^{+1872.784}_{-1579.399}$
Alt.	$-3 \pm 1$	$76.58^{+86.20}_{-56.74}$	$1121^{+530}_{-239}$	$-1865^{+3319}_{-365}$	$0.025^{+0.299}_{-0.022}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$



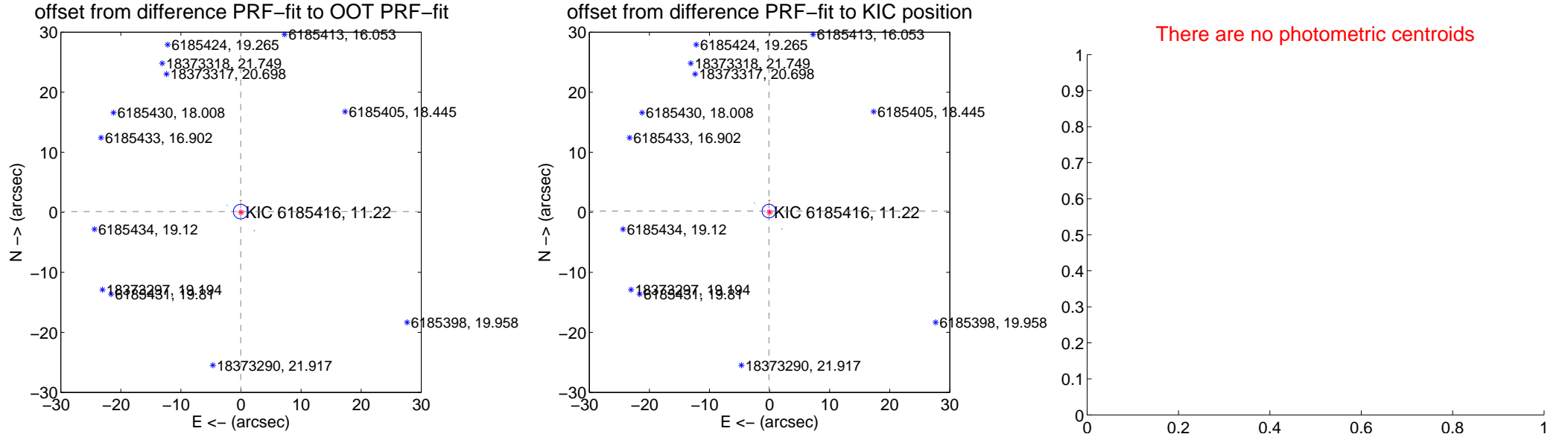
## DV Centroid Data

Supplemental centroid analysis for 006185416-01. **Kepler magnitude: 11.22.** Transit SNR 0.00

**There are 2 quarters with good PRF difference image offsets**

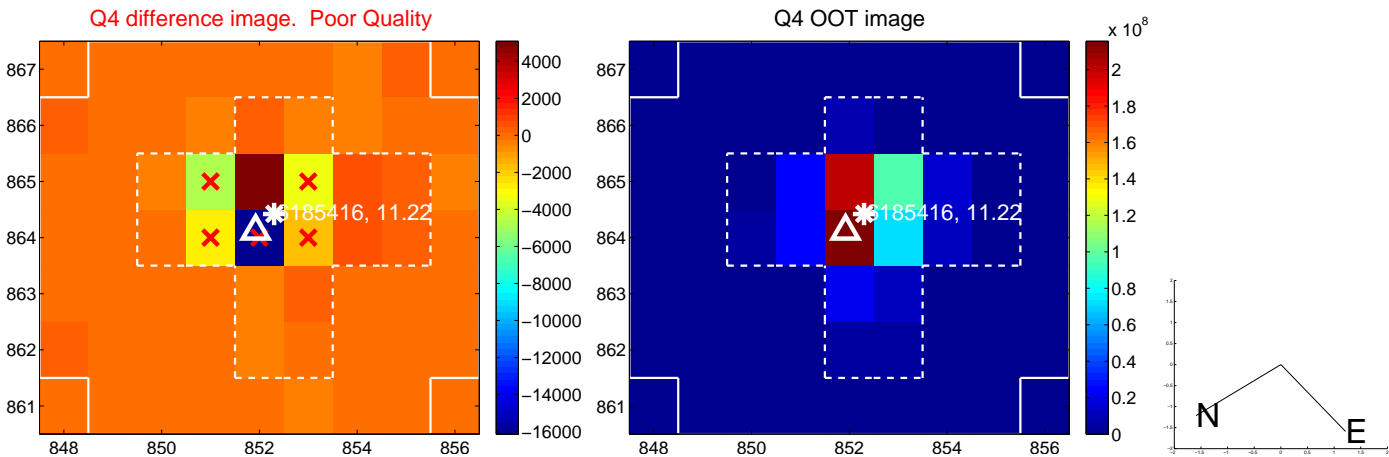
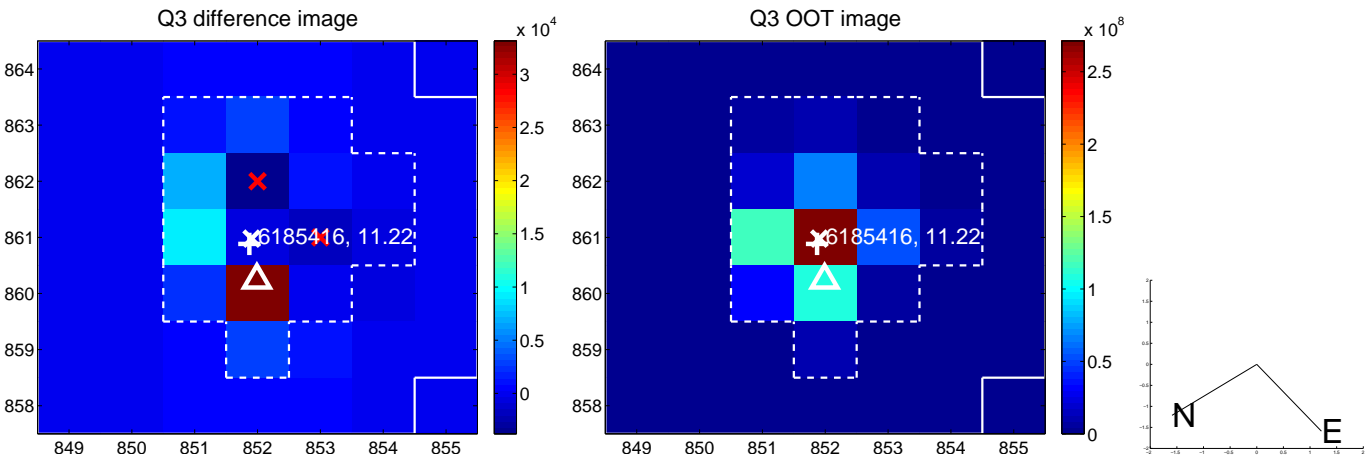
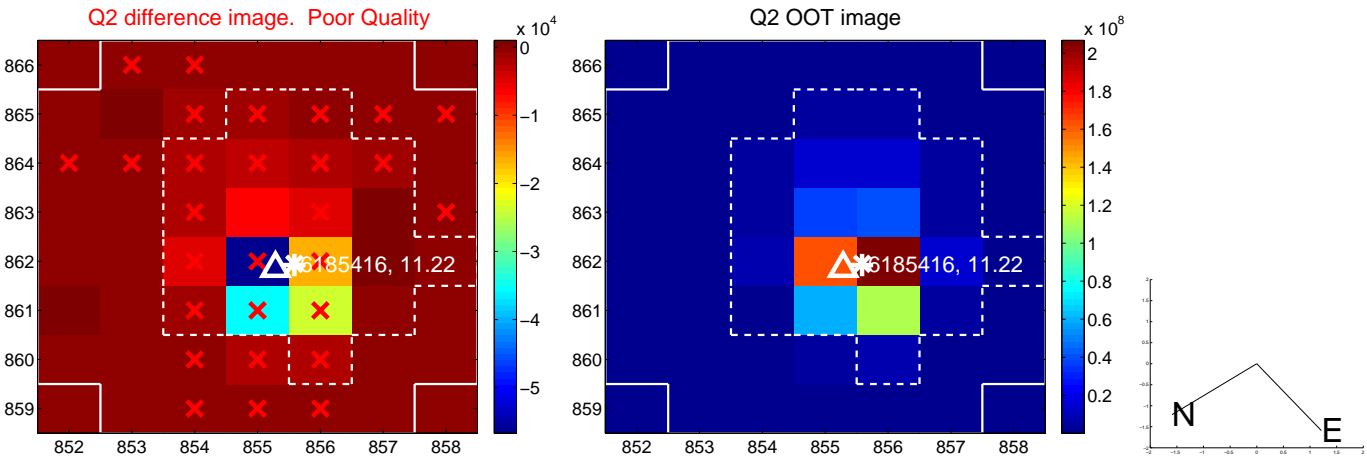
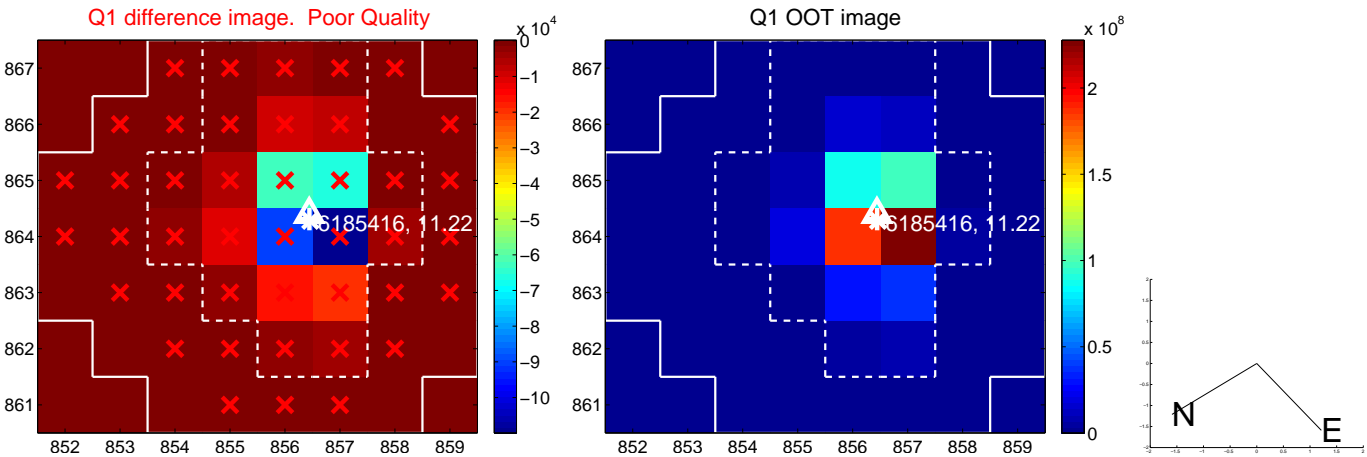
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.128 \pm 0.405$	0.32	$0.051 \pm 0.347$	$0.118 \pm 0.334$
PRF-fit source offset from KIC position	$0.226 \pm 0.378$	0.60	$0.102 \pm 0.335$	$0.201 \pm 0.302$
photometric centroid source offset	—	—	—	—

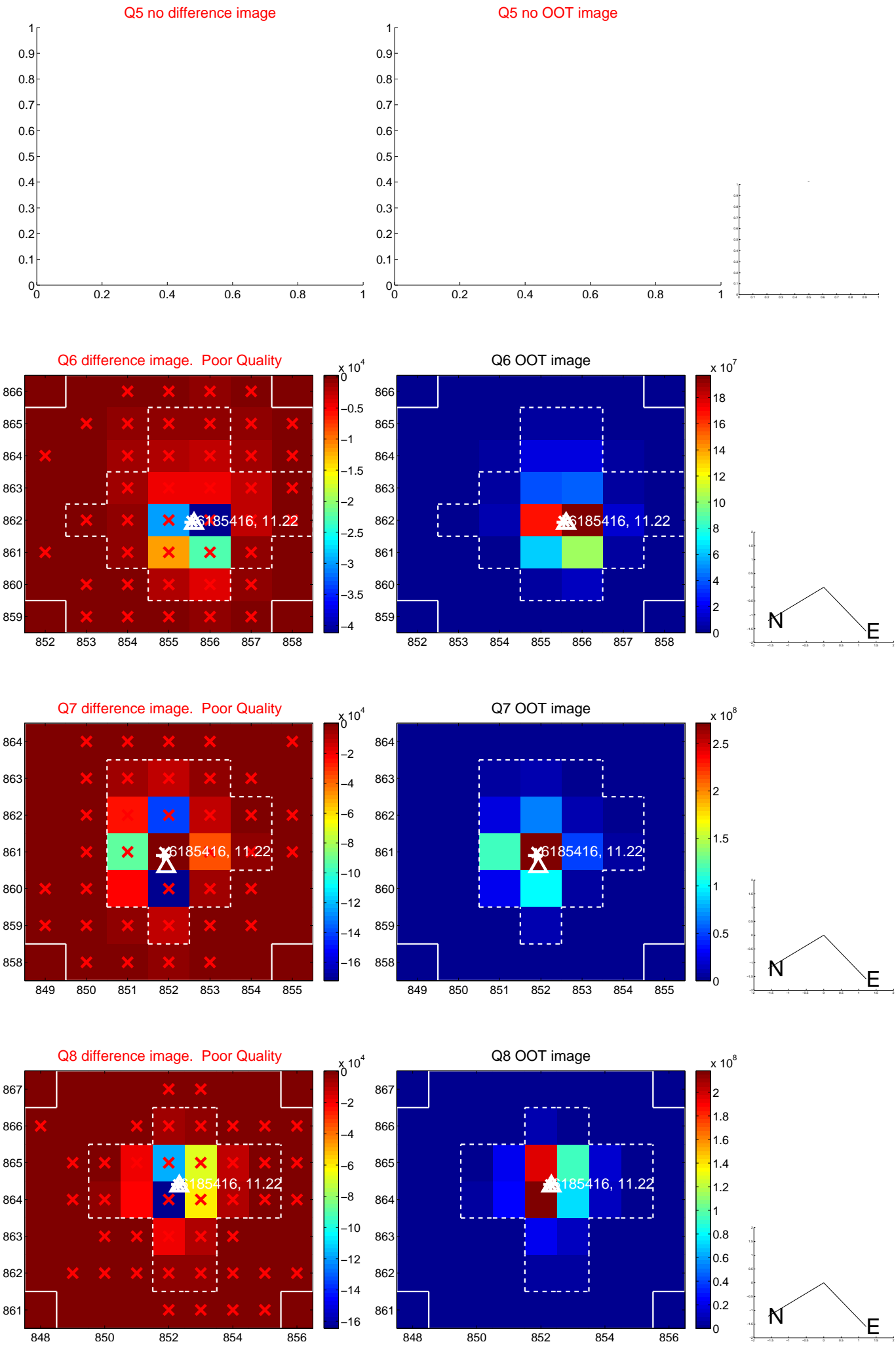


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

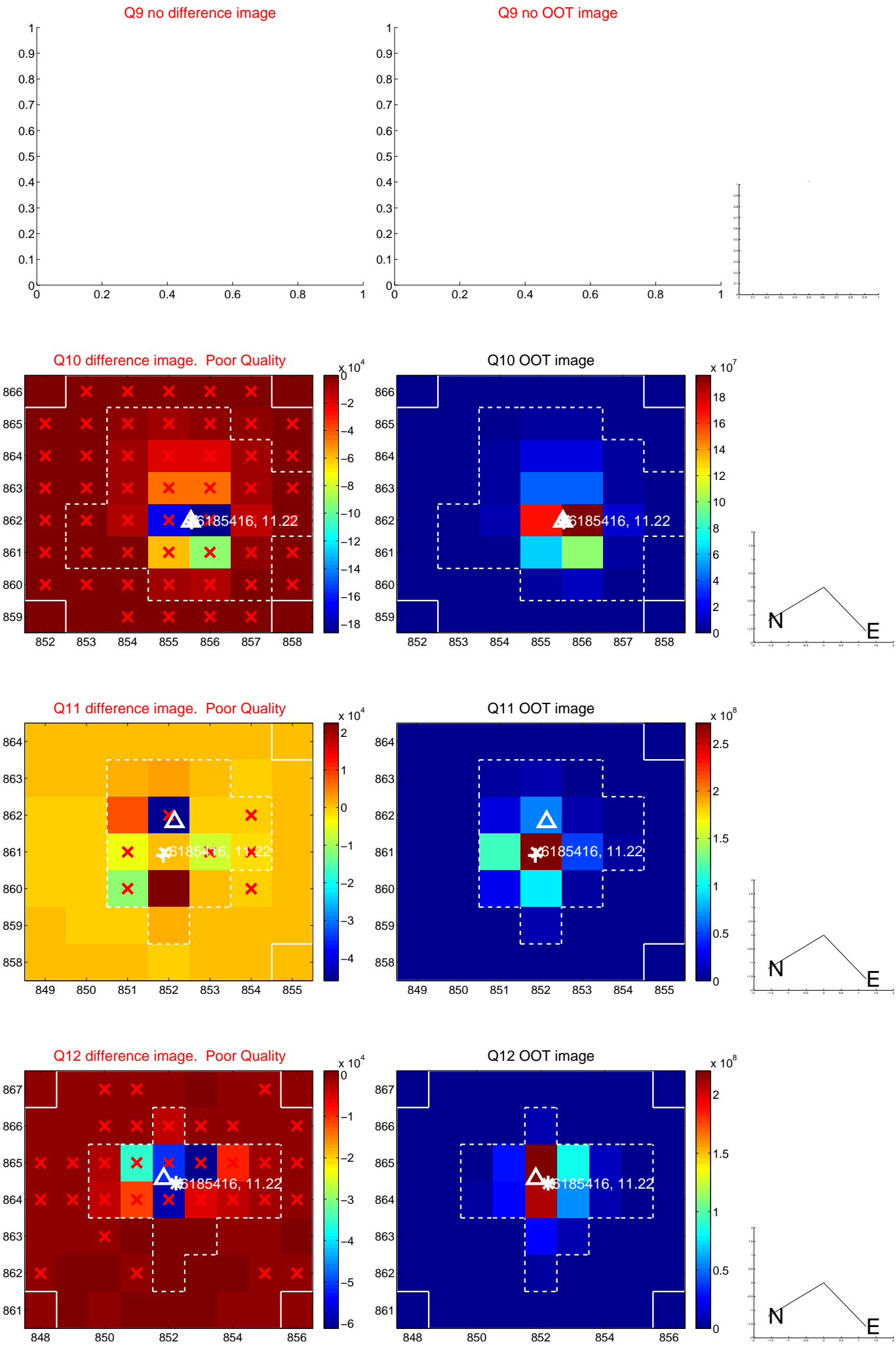


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

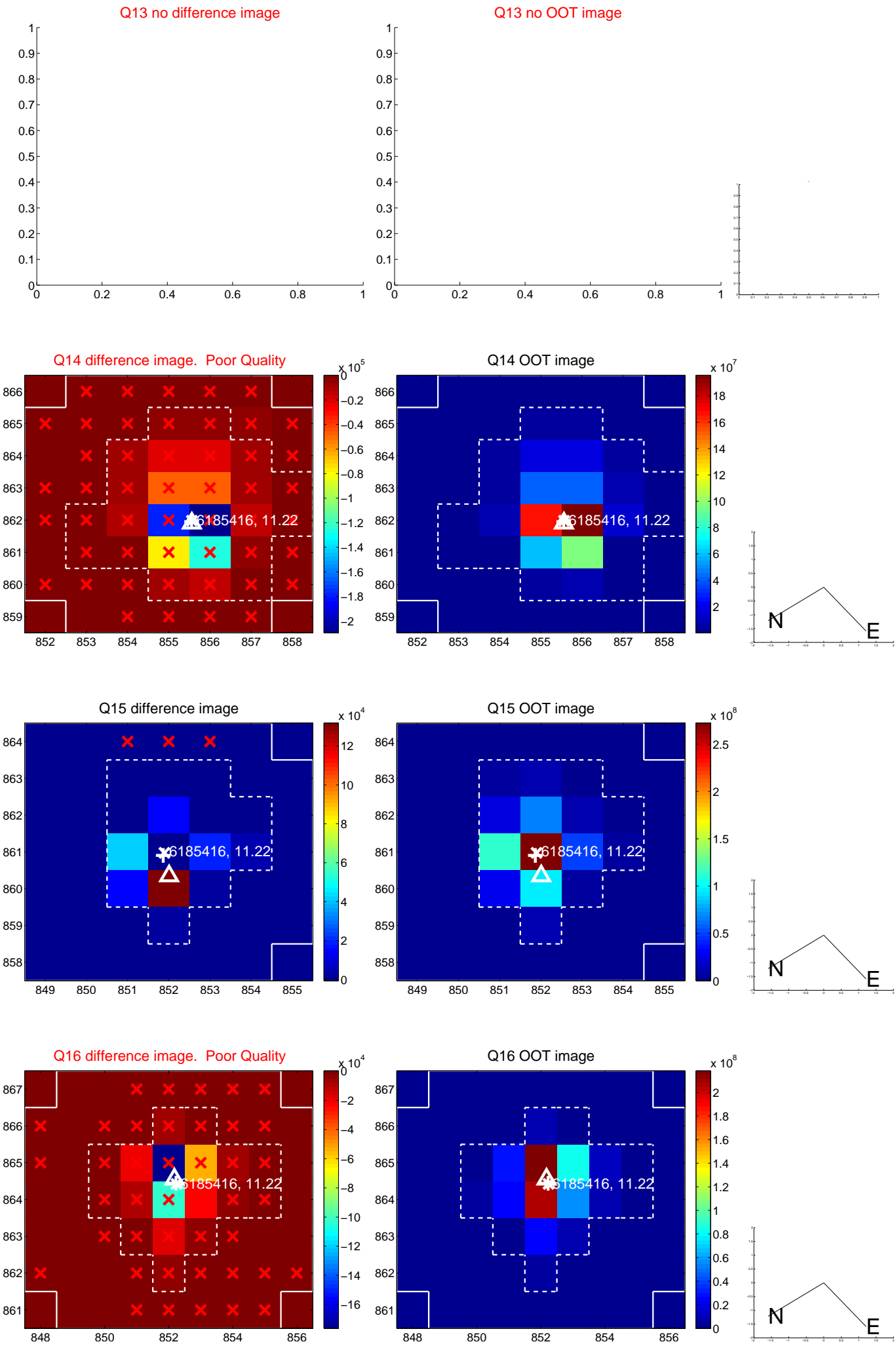




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



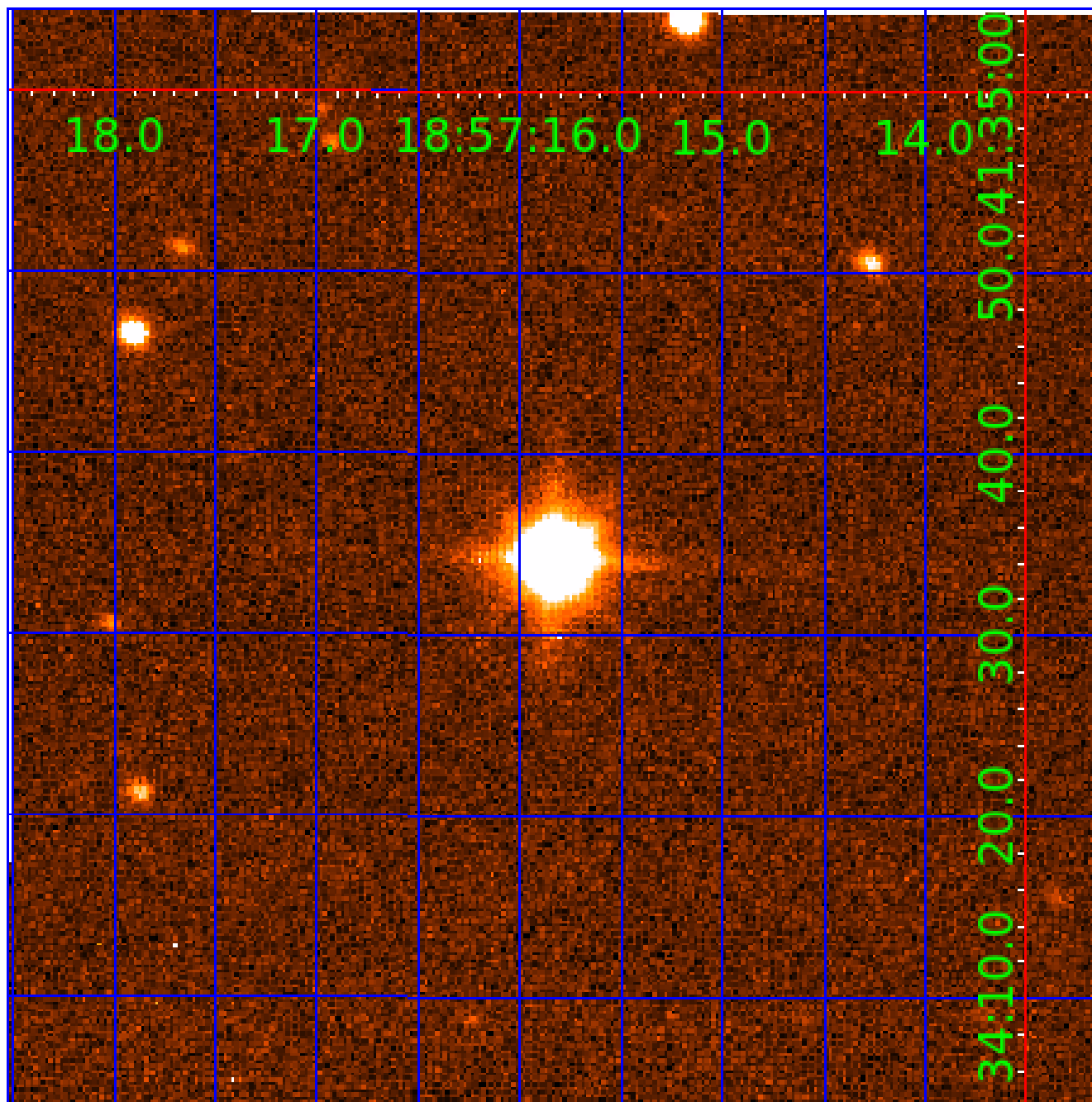
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

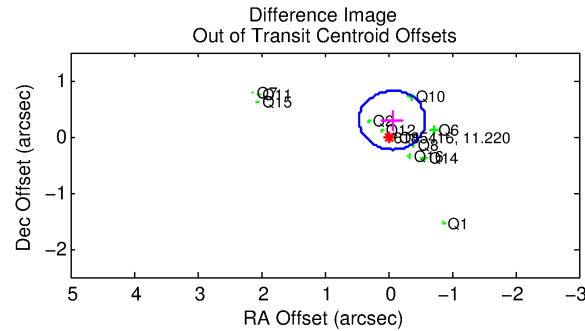
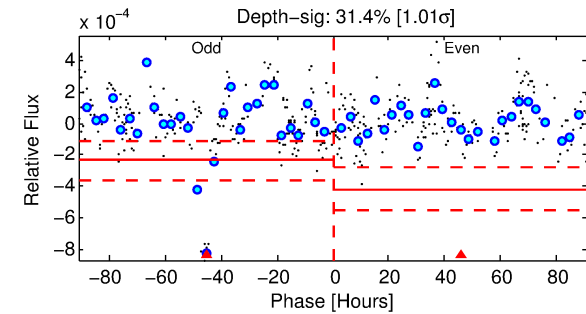
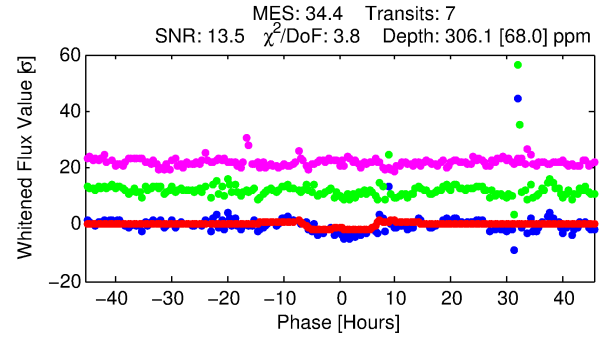
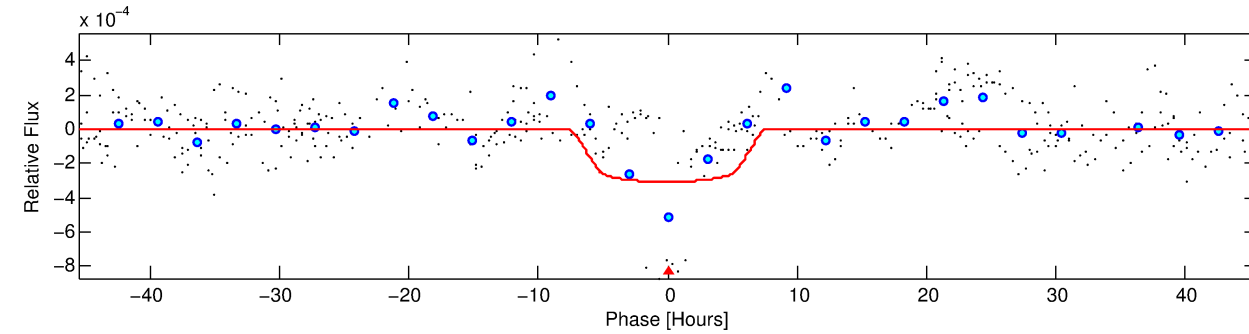
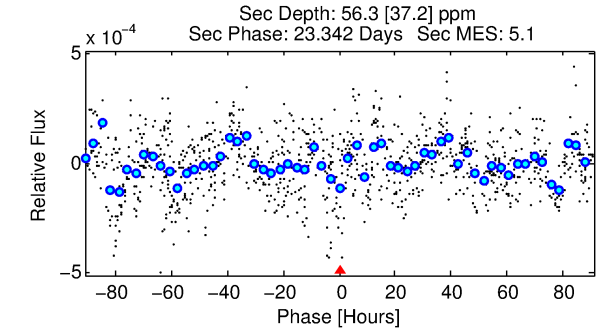
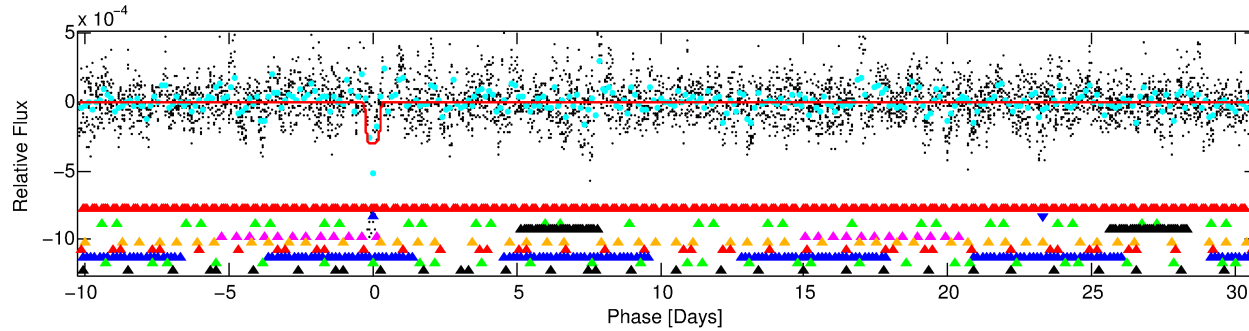
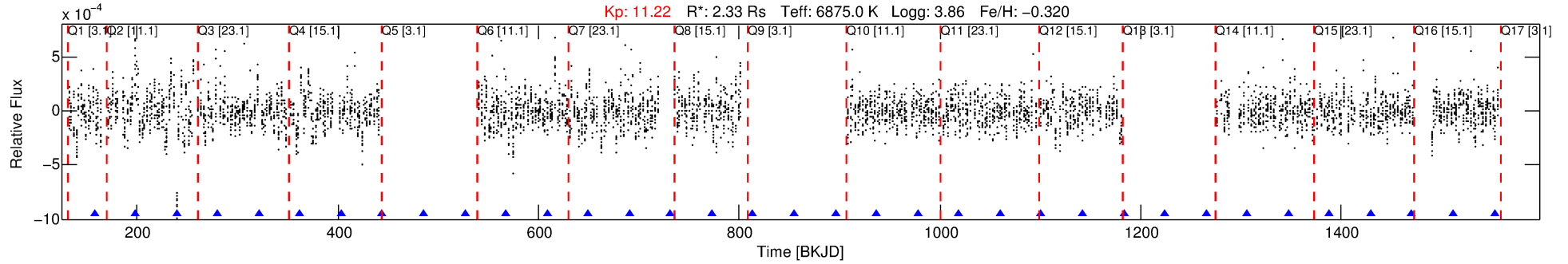
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006185416-02

No Significant Match Found

# DV One-Page Summary

KIC: 6185416 Candidate: 2 of 10 Period: 41.031 d



## DV Fit Results:

Period = 41.03139 [0.00187] d  
Epoch = 157.3463 [0.0448] BKJD  
Rp/R\* = 0.0197 [0.0026]  
a/R\* = 7.67 [2.45]  
b = 0.95 [0.03]  
Seff = 157.41 [80.04]  
Teq = 903 [115] K  
Rp = 5.00 [1.85] Re  
a = 0.2624 [0.0834] AU  
Ag = 85.42 [73.98] [1.14 $\sigma$ ]  
Teffp = 4245 [765] K [4.32 $\sigma$ ]

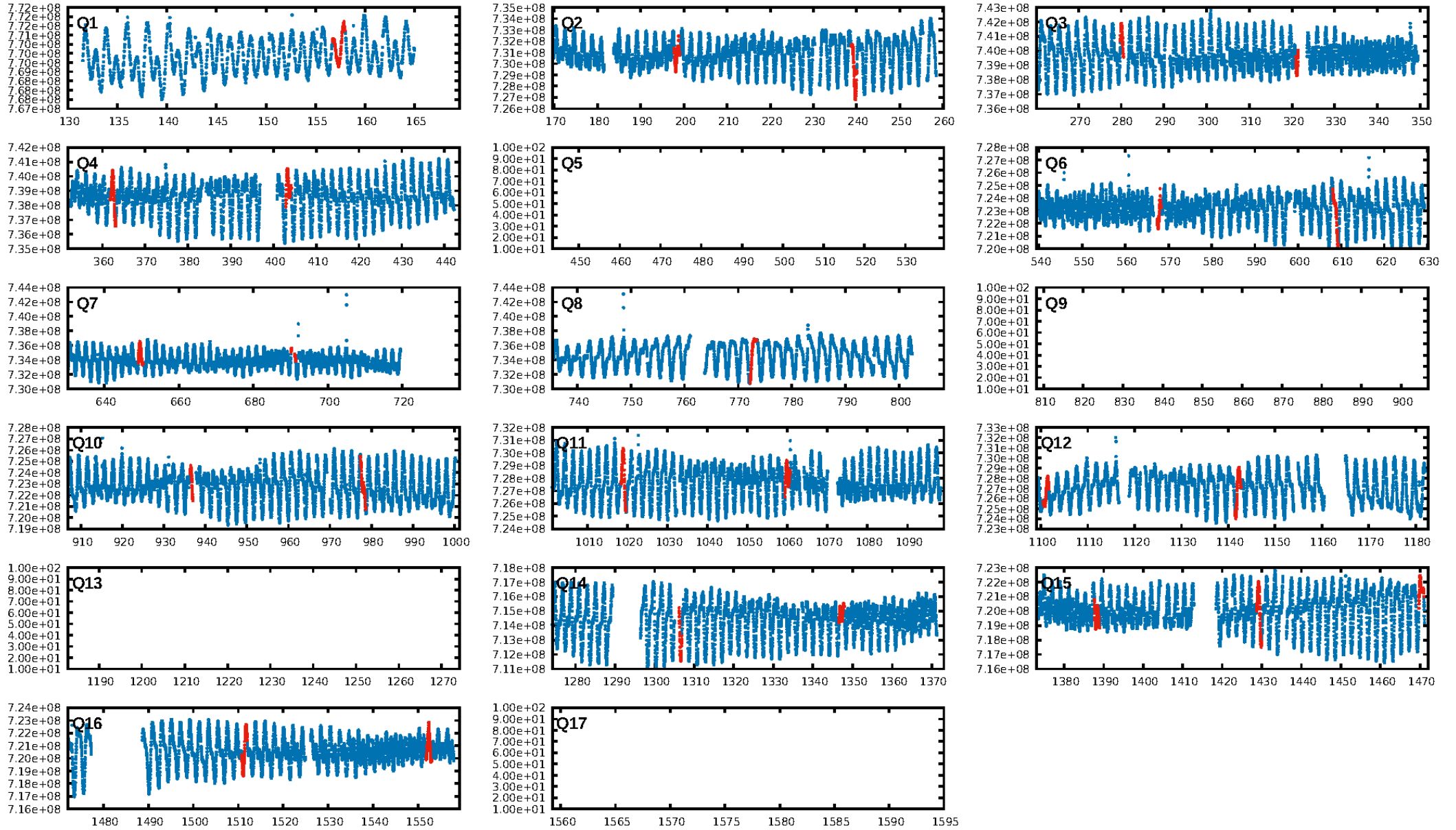
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.38 $\sigma$ ]  
LongPeriod-sig: 100.0% [6.88 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 23.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: 3.546  
Centroid-sig: N/A  
Centroid-so: 0.170 arcsec [0.85 $\sigma$ ]  
OotOffset-rm: 0.296 arcsec [1.70 $\sigma$ ]  
KicOffset-rm: 0.417 arcsec [1.89 $\sigma$ ]  
OotOffset-st: 4/3/4/1 [12]  
KicOffset-st: 4/3/4/1 [12]  
DiffImageQuality-fgm: 0.25 [3/12]  
DiffImageOverlap-fno: 0.00 [0/12]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:33 Z

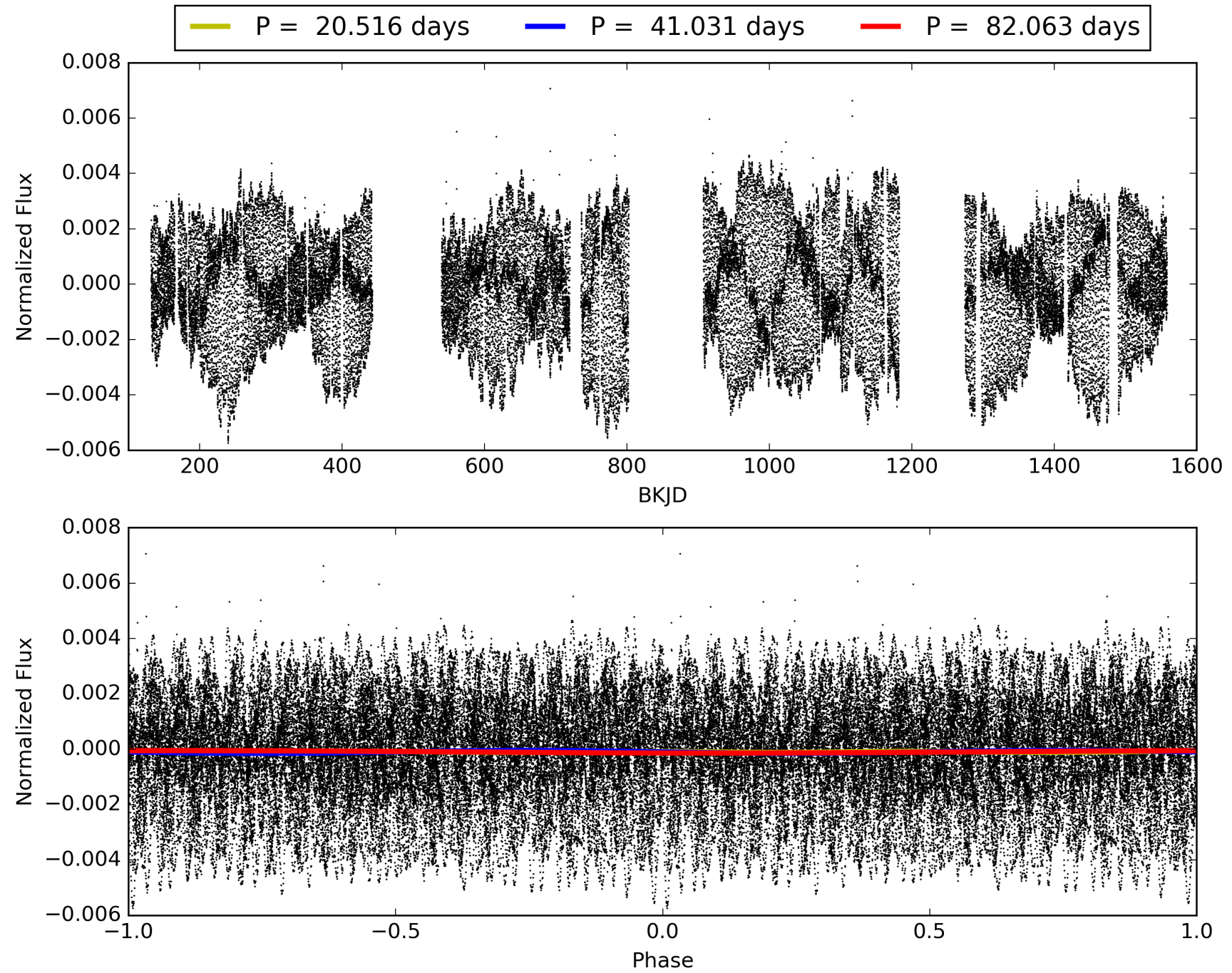
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006185416-02, PDC Light Curves



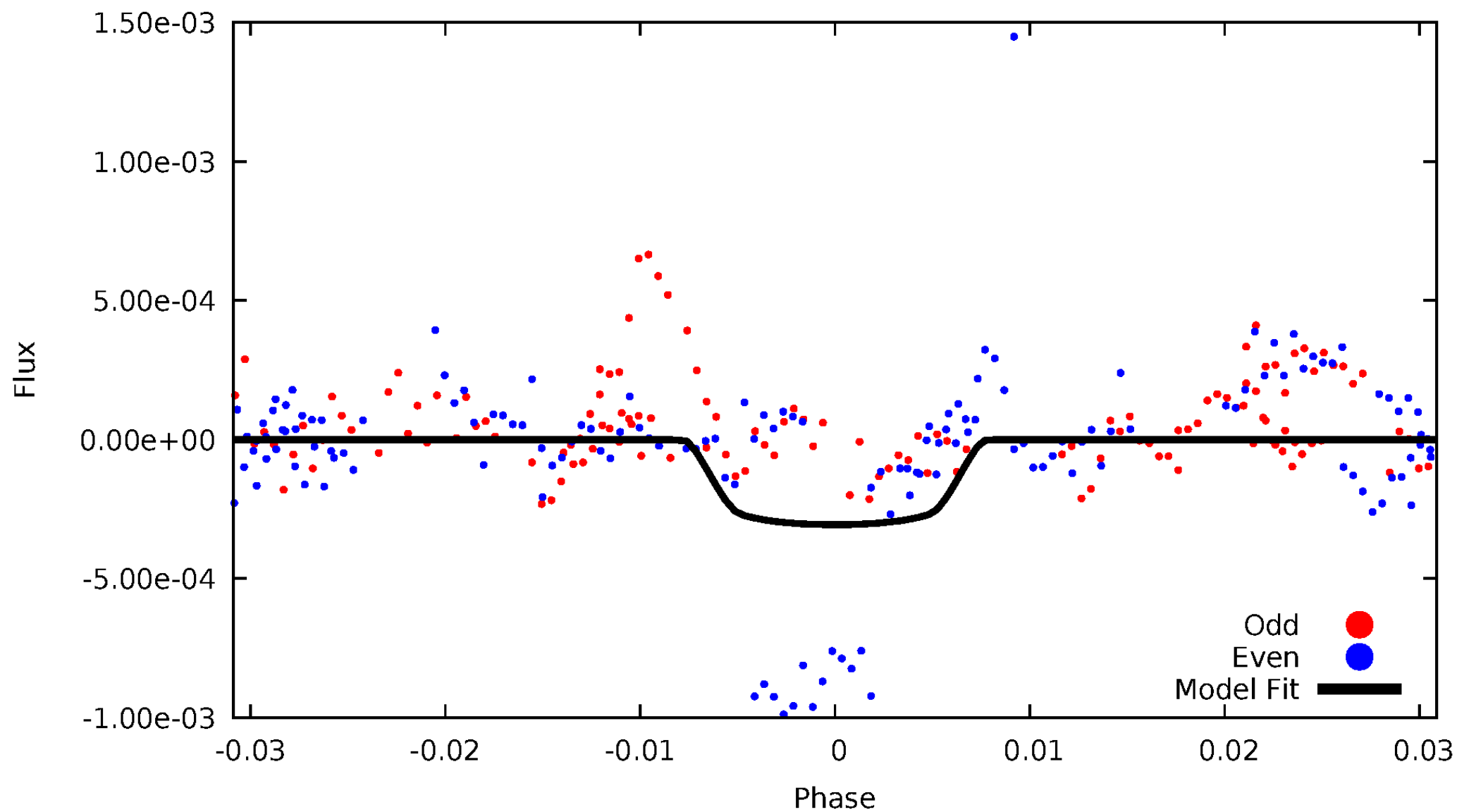


# TCE 006185416-02



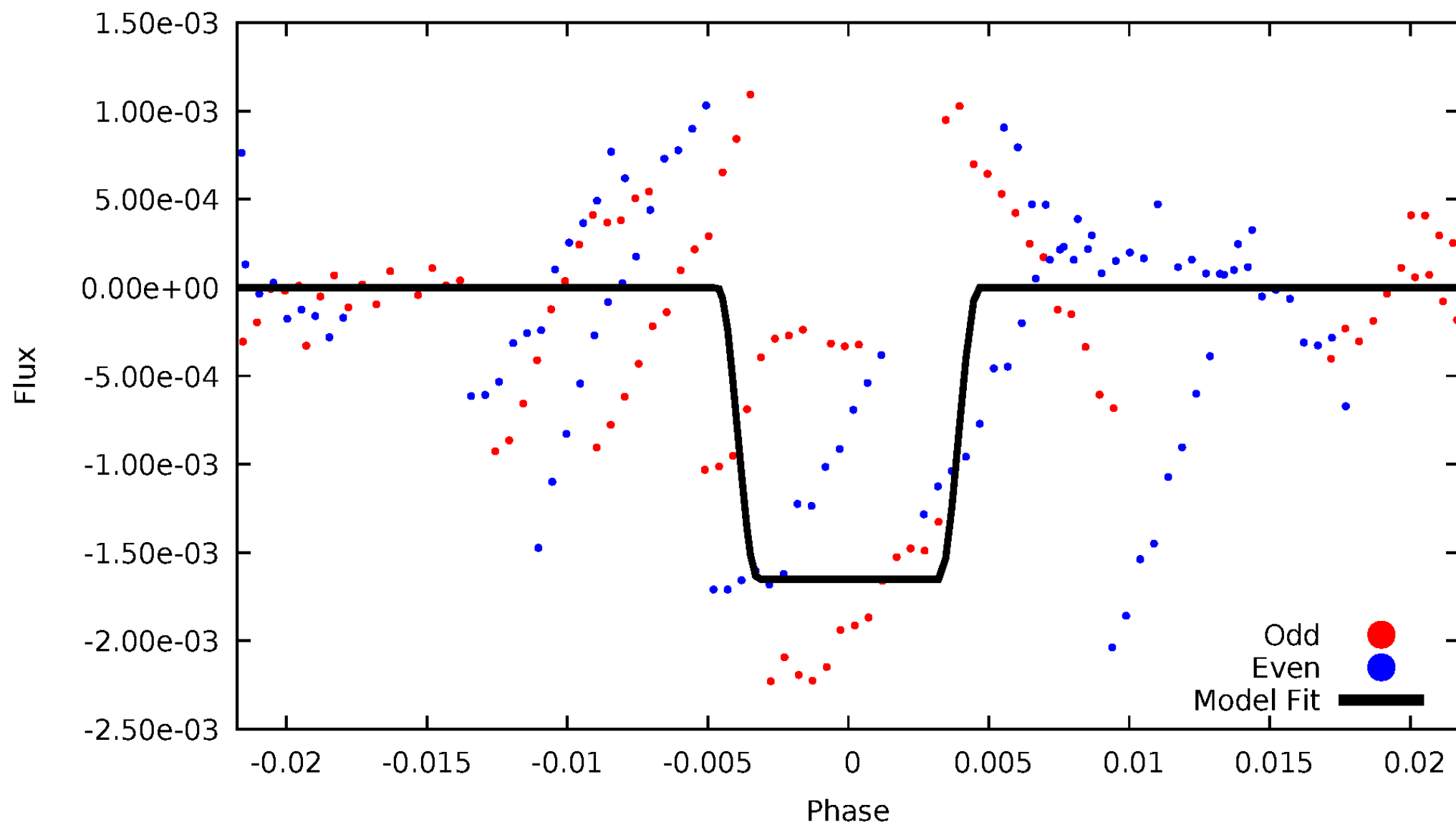
# DV Odd/Even

TCE 006185416-02



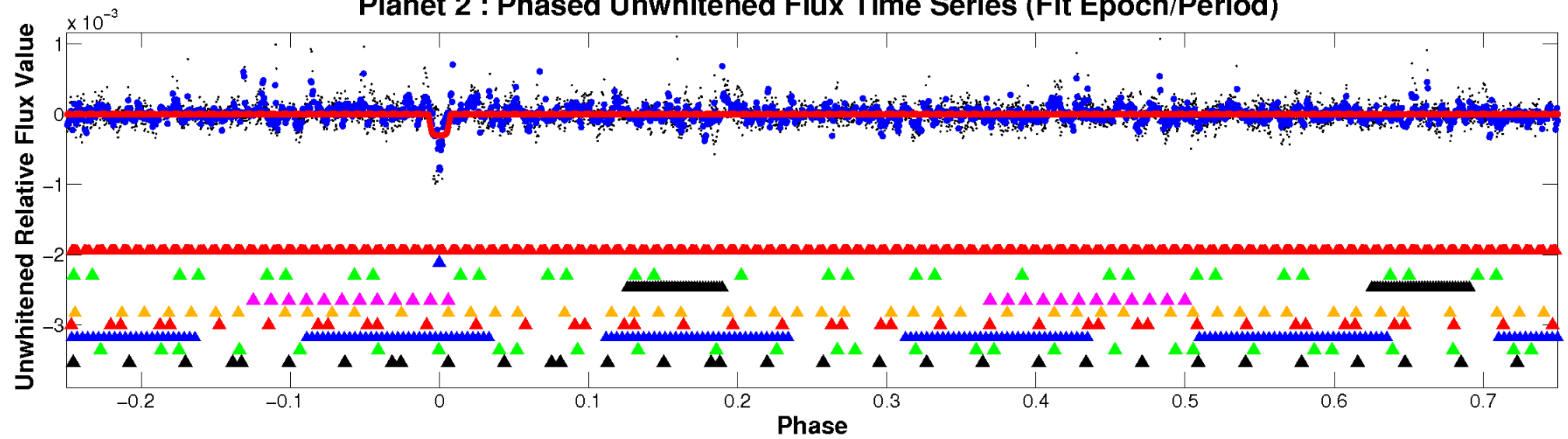
# ALT Odd/Even

TCE 006185416-02

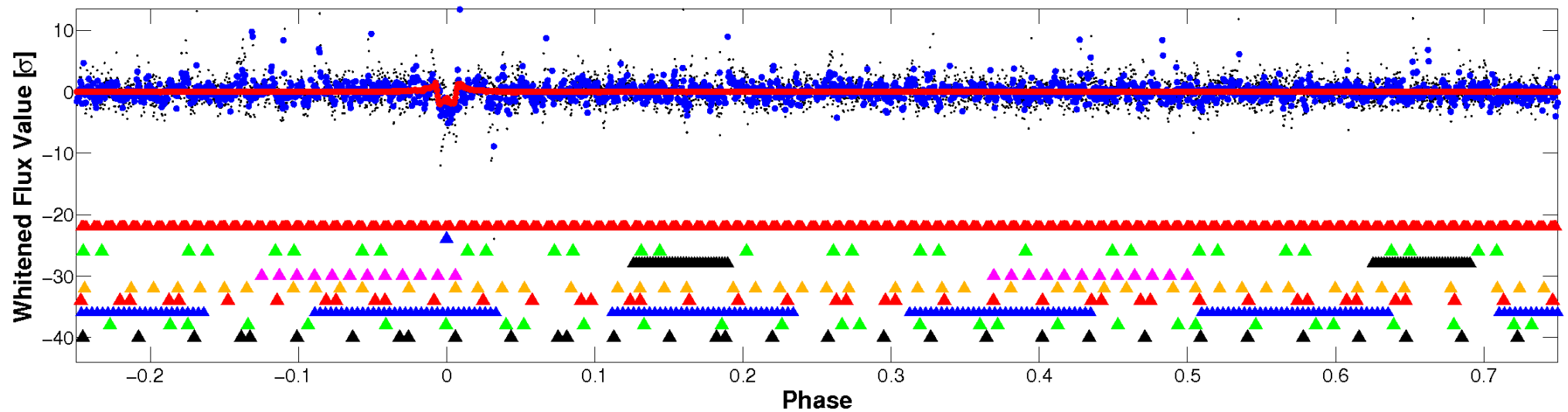


# Non-Whitened Vs. Whitened Light Curve

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

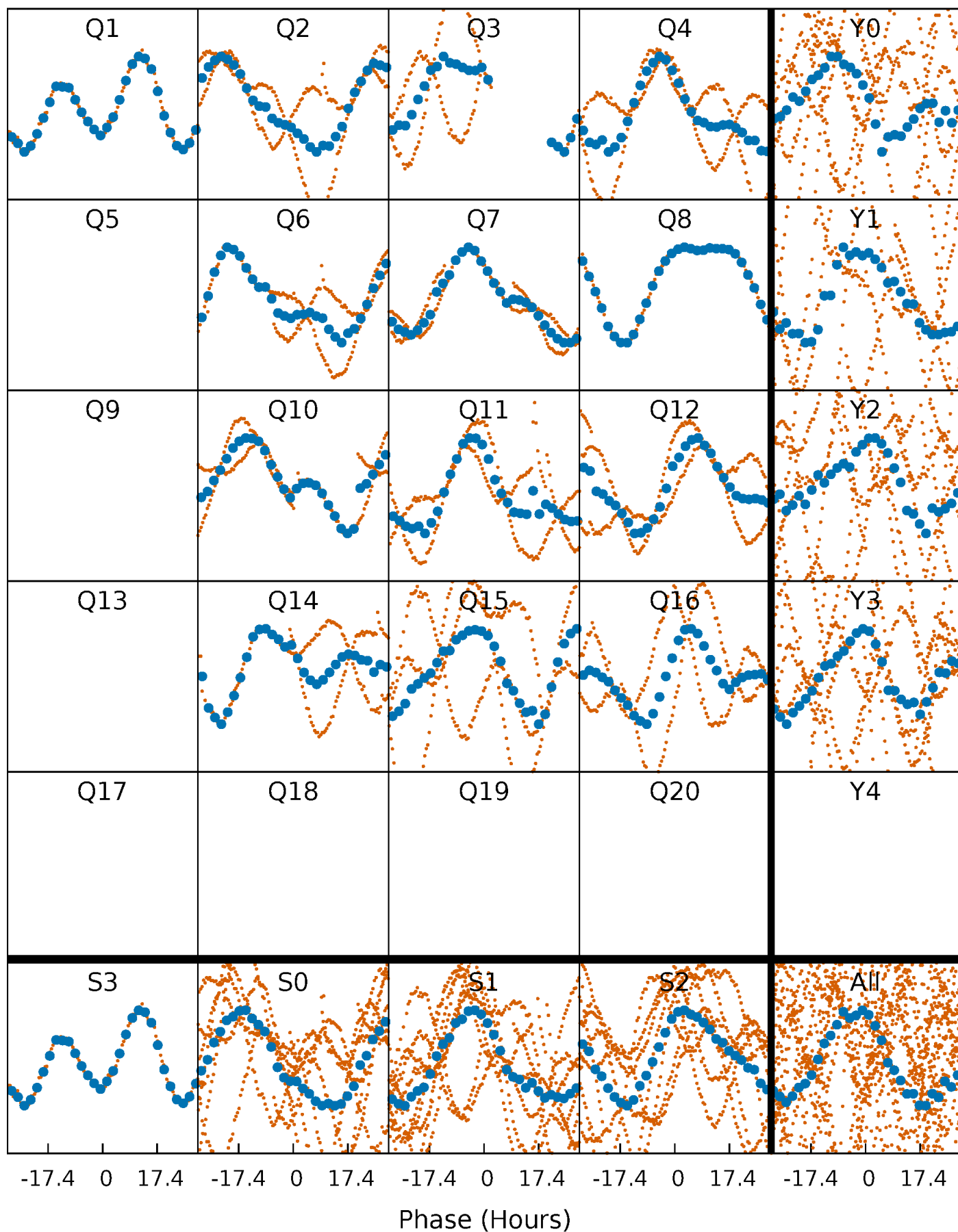


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



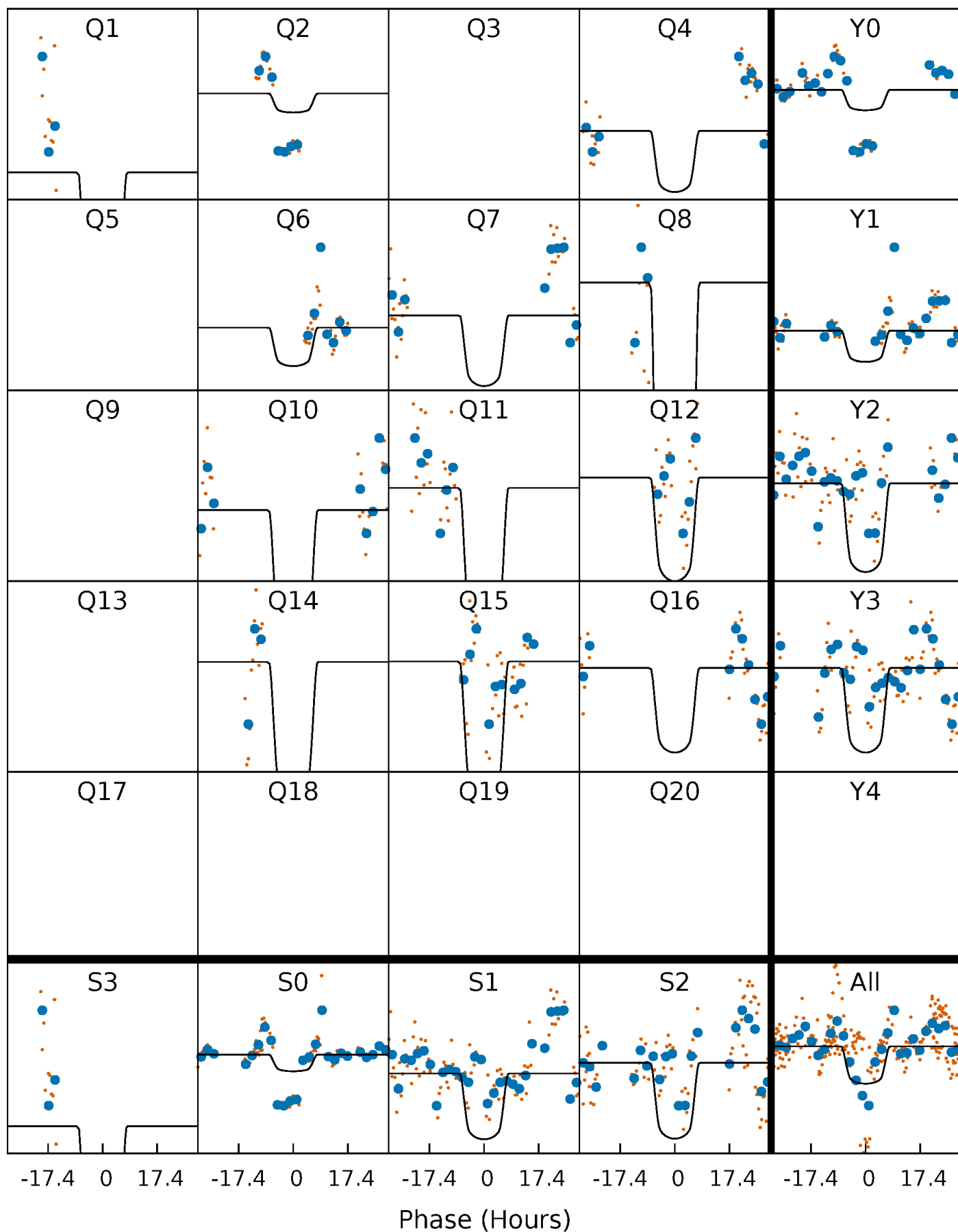
# PDC Quarter-Phased Transit Curves

TCE 006185416-02 P= 41.031387 Days  $T_0=157.346339$  (BKJD)



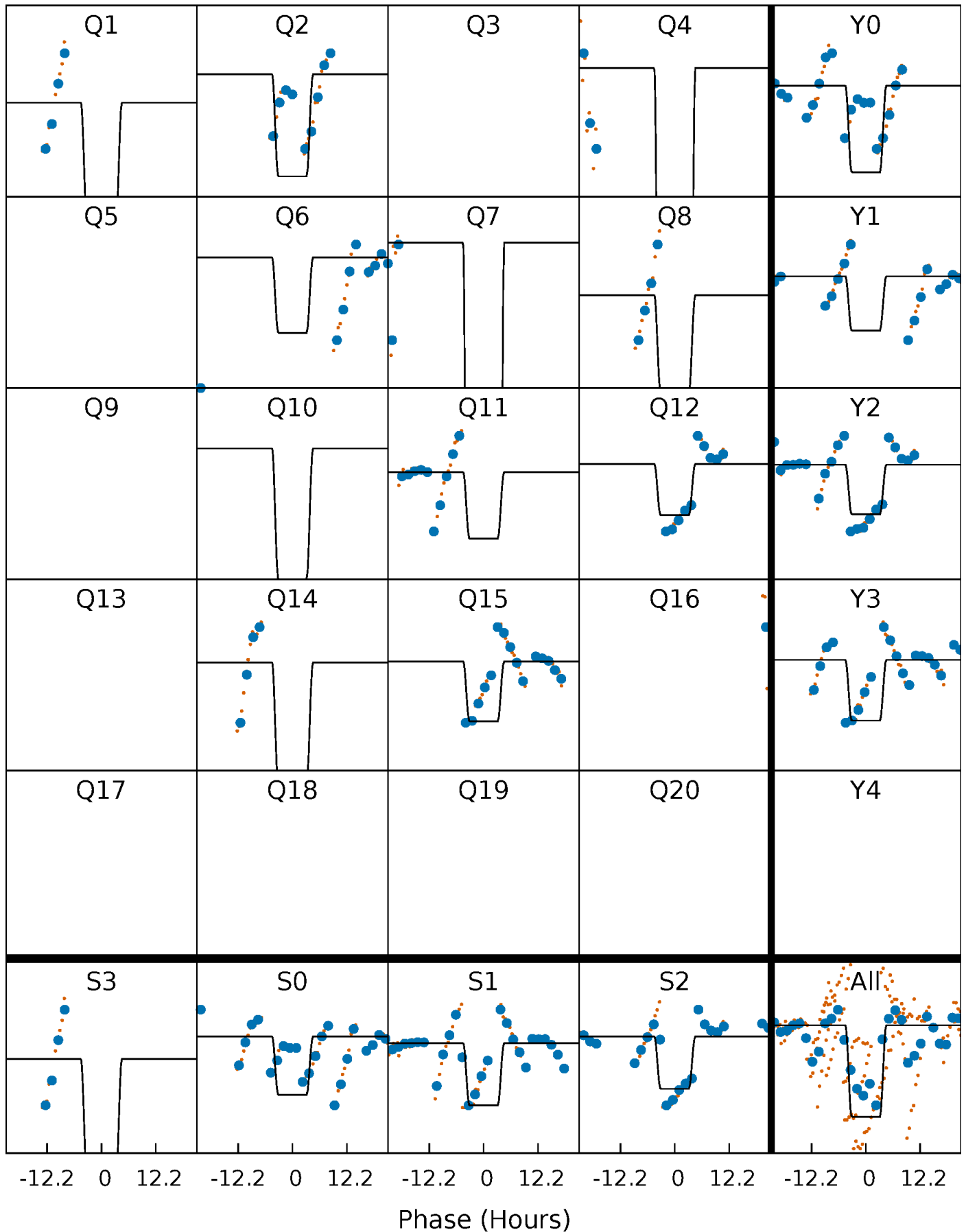
# DV Quarter-Phased Transit Curves

TCE 006185416-02 P= 41.031387 Days  $T_0=157.346339$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006185416-02   P= 41.037219 Days    $T_0=157.054993$  (BKJD)

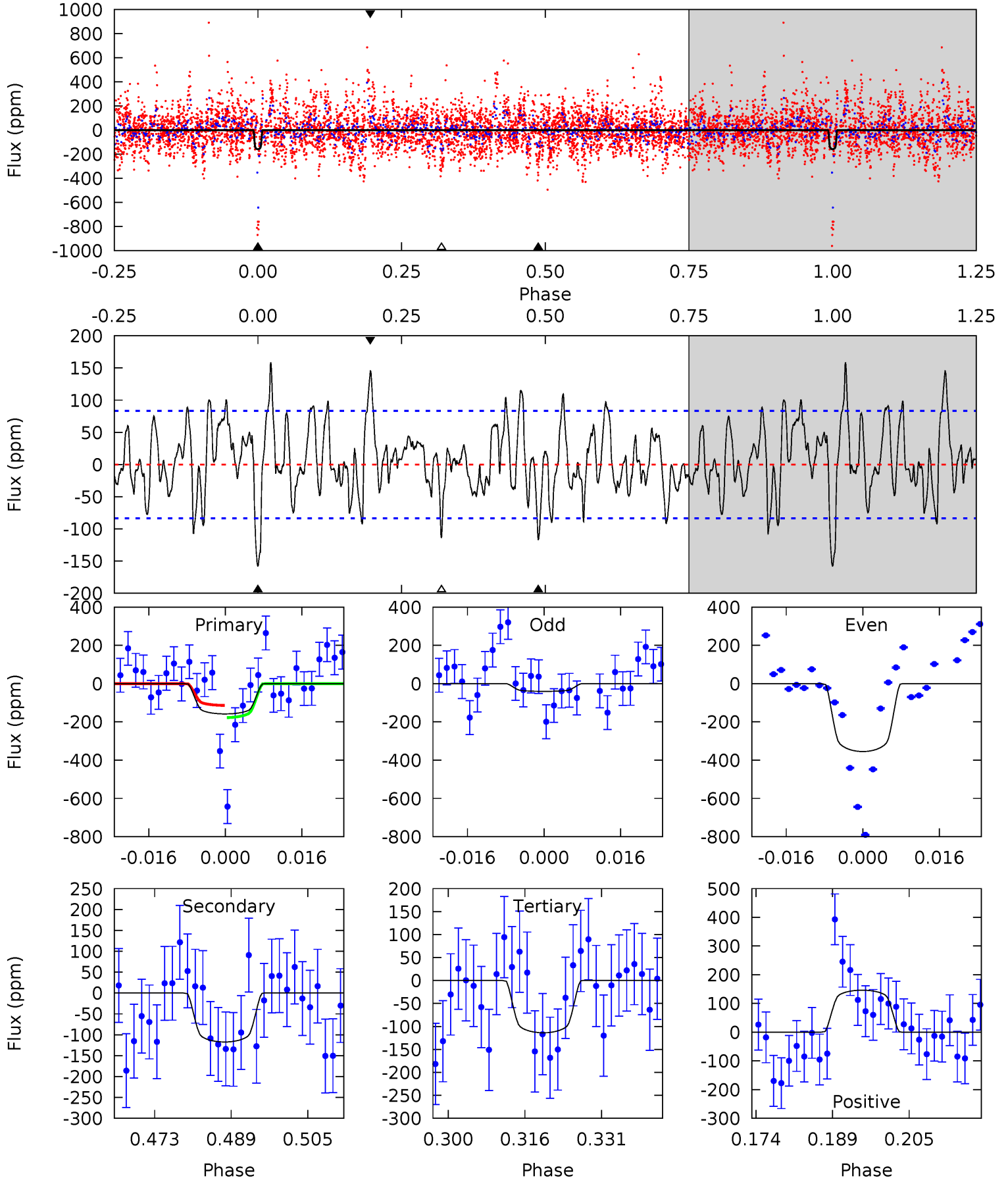




# DV Model-Shift Uniqueness Test

006185416-02, P = 41.031387 Days, E = 116.314952 Days

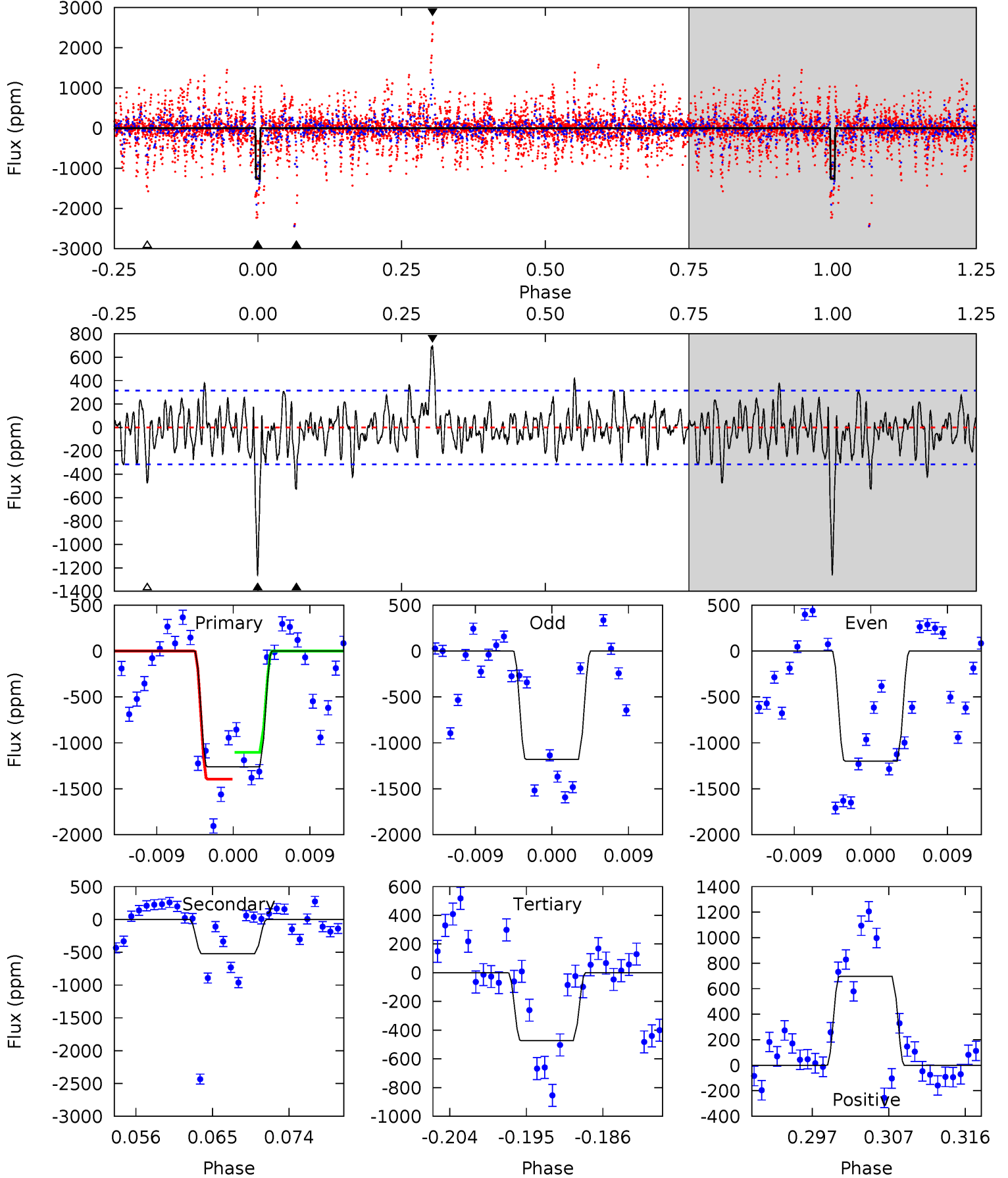
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.36	6.93	6.73	8.64	4.94	2.41	2.76	2.64	0.72	0.20	-1.71	7.93	1.02	0.50	1.87



# Alt Model-Shift Uniqueness Test

006185416-02, P = 41.037219 Days, E = 116.017774 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
20.2	8.38	7.56	11.1	5.04	2.60	2.25	12.6	9.03	0.82	-2.76	0.12	0.45	0.36	2.30



### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-117 \pm 17$	$4.71^{+0.95}_{-0.92}$	$1230^{+78}_{-102}$	$5149^{+357}_{-346}$	$203^{+103}_{-66}$
Alt.	$-524 \pm 63$	$10.11^{+1.49}_{-1.86}$	$1245^{+71}_{-103}$	$5194^{+234}_{-228}$	$199^{+88}_{-49}$

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

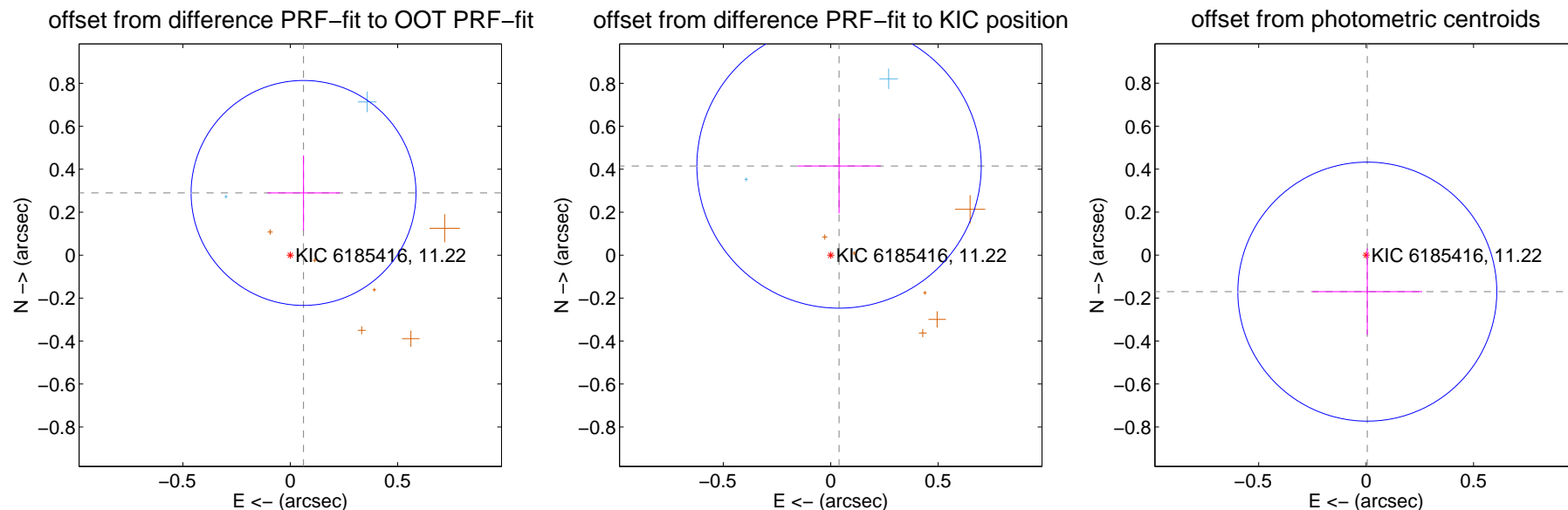
## DV Centroid Data

Supplemental centroid analysis for 006185416-02. **Kepler magnitude: 11.22**. Transit SNR 13.54

**There are 3 quarters with good PRF difference image offsets**

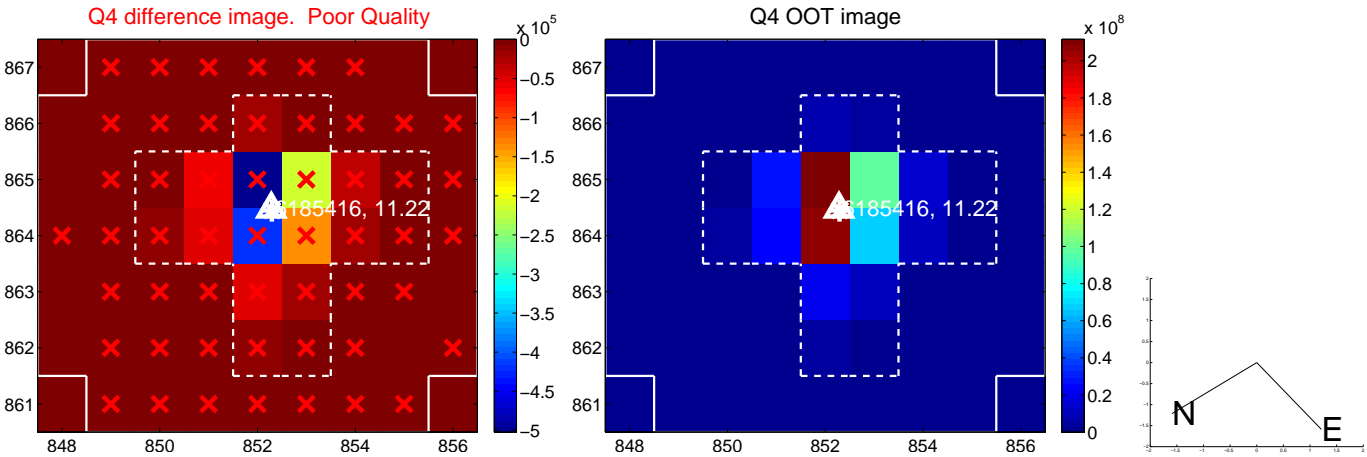
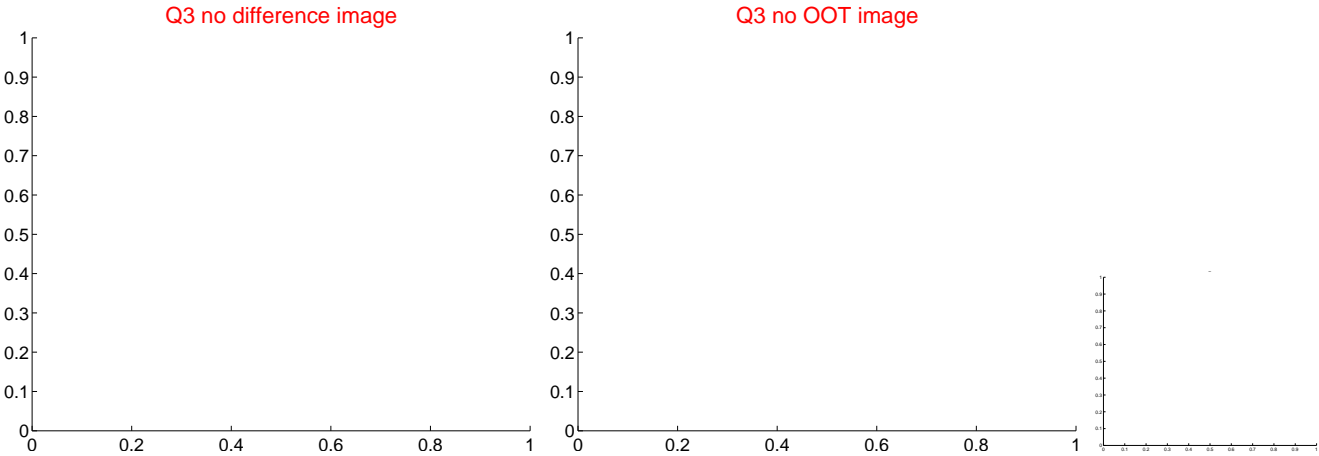
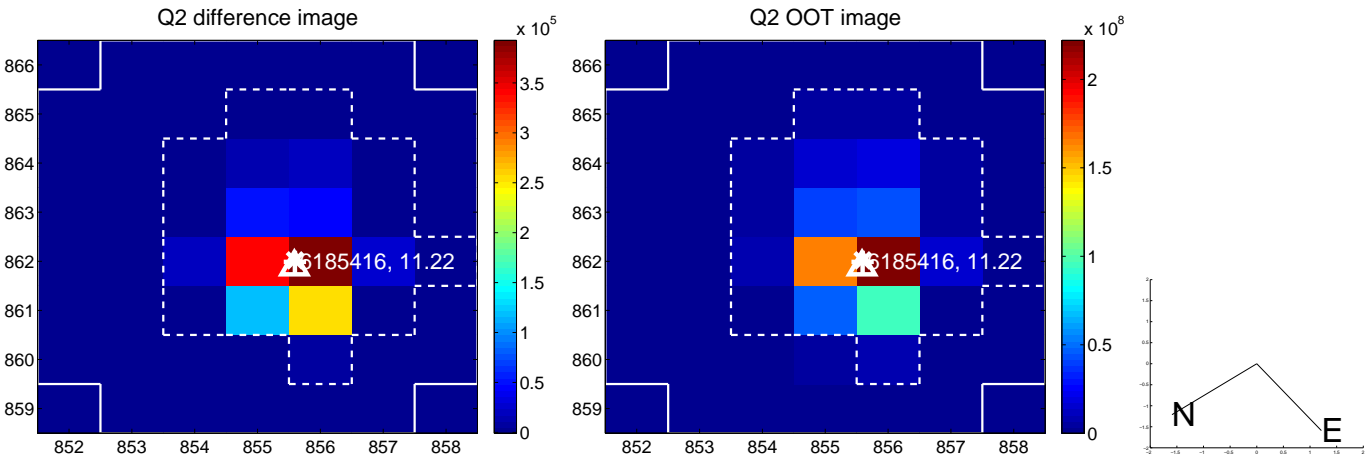
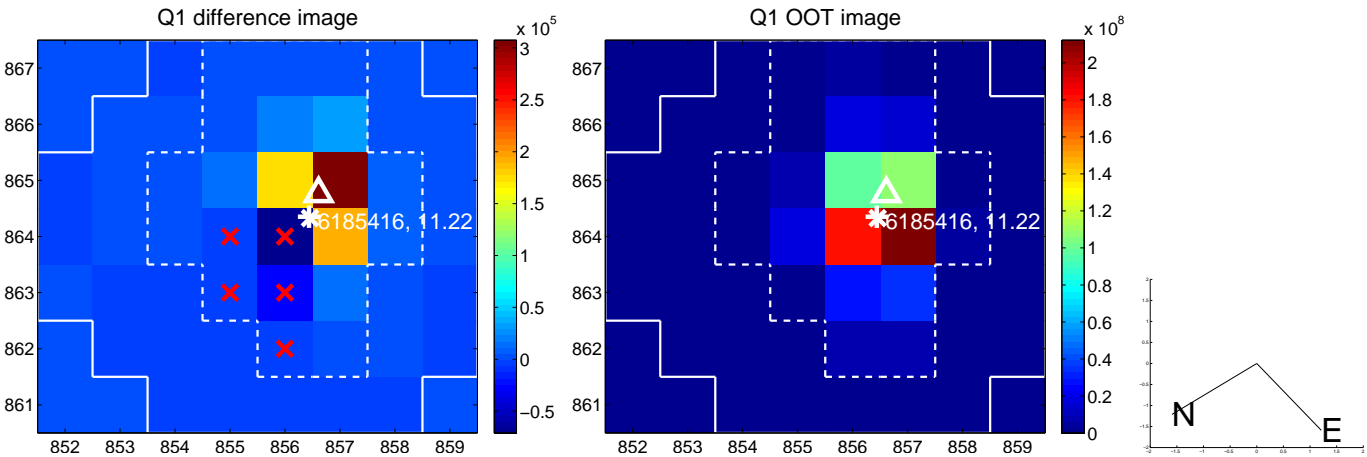
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.296 \pm 0.175$	1.70	$-0.062 \pm 0.168$	$0.290 \pm 0.175$
PRF-fit source offset from KIC position	$0.417 \pm 0.221$	1.89	$-0.039 \pm 0.194$	$0.415 \pm 0.221$
photometric centroid source offset	$0.17 \pm 0.20$	0.85	$-0.01 \pm 0.26$	$-0.17 \pm 0.20$



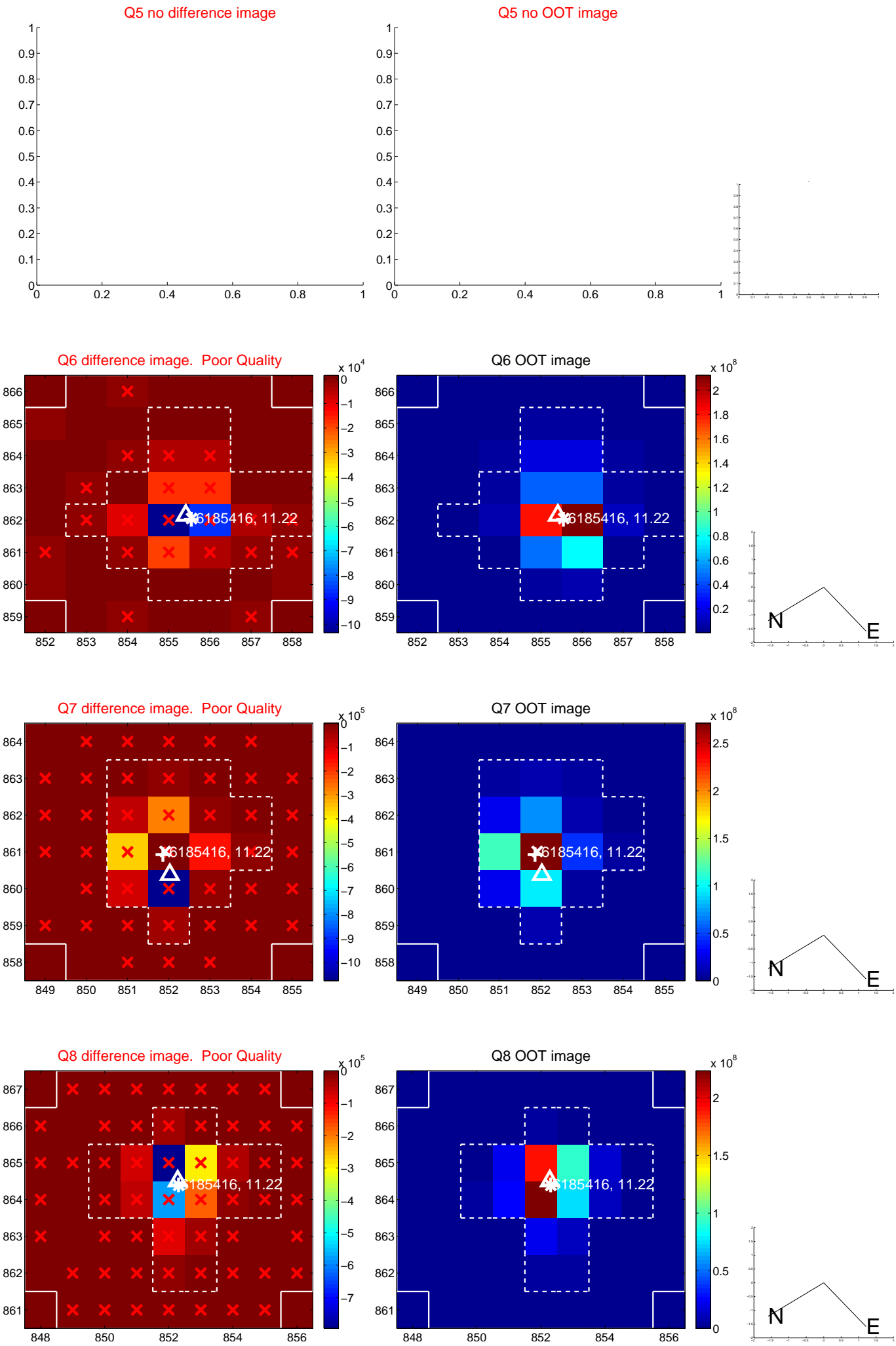
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

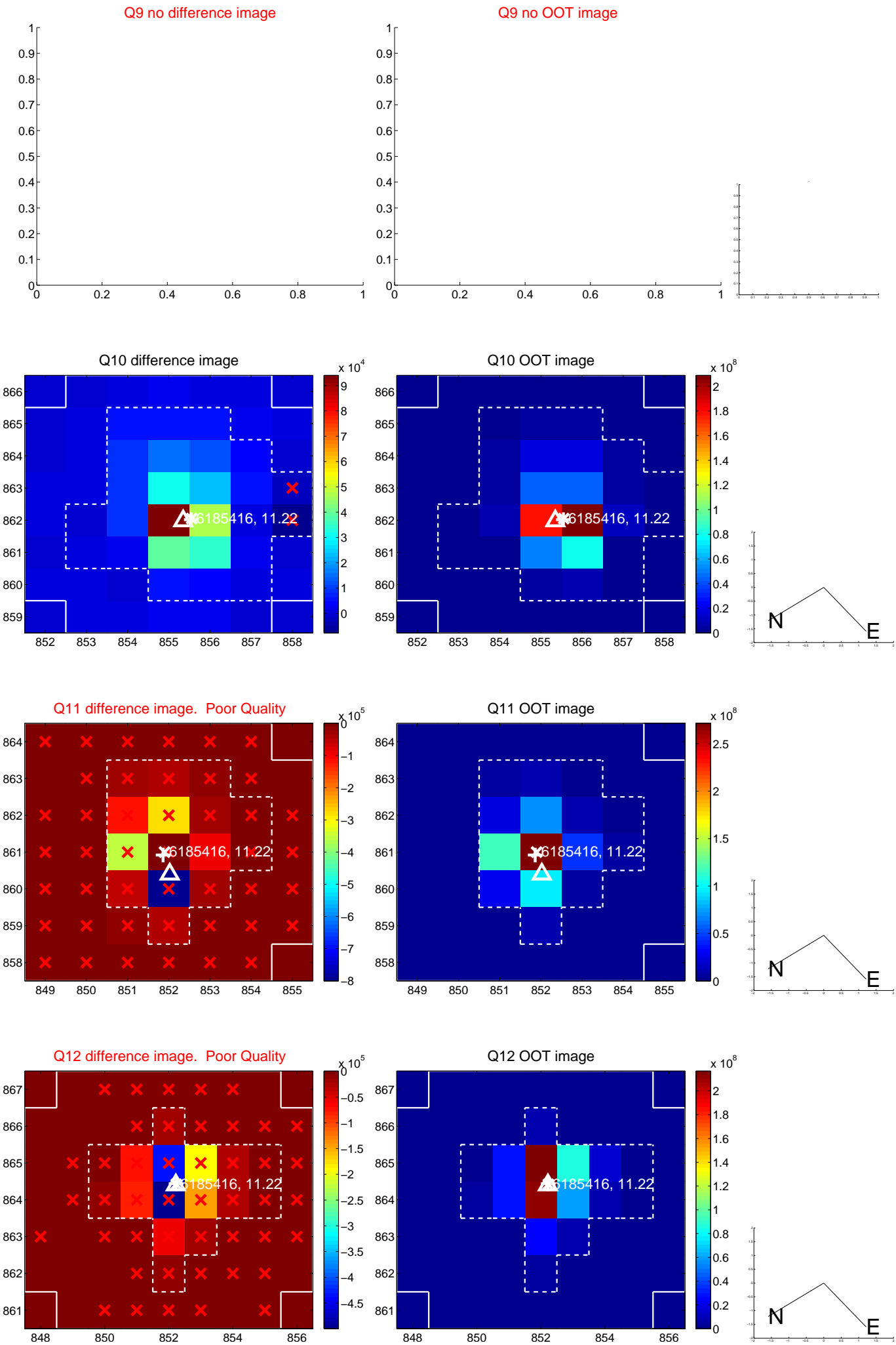




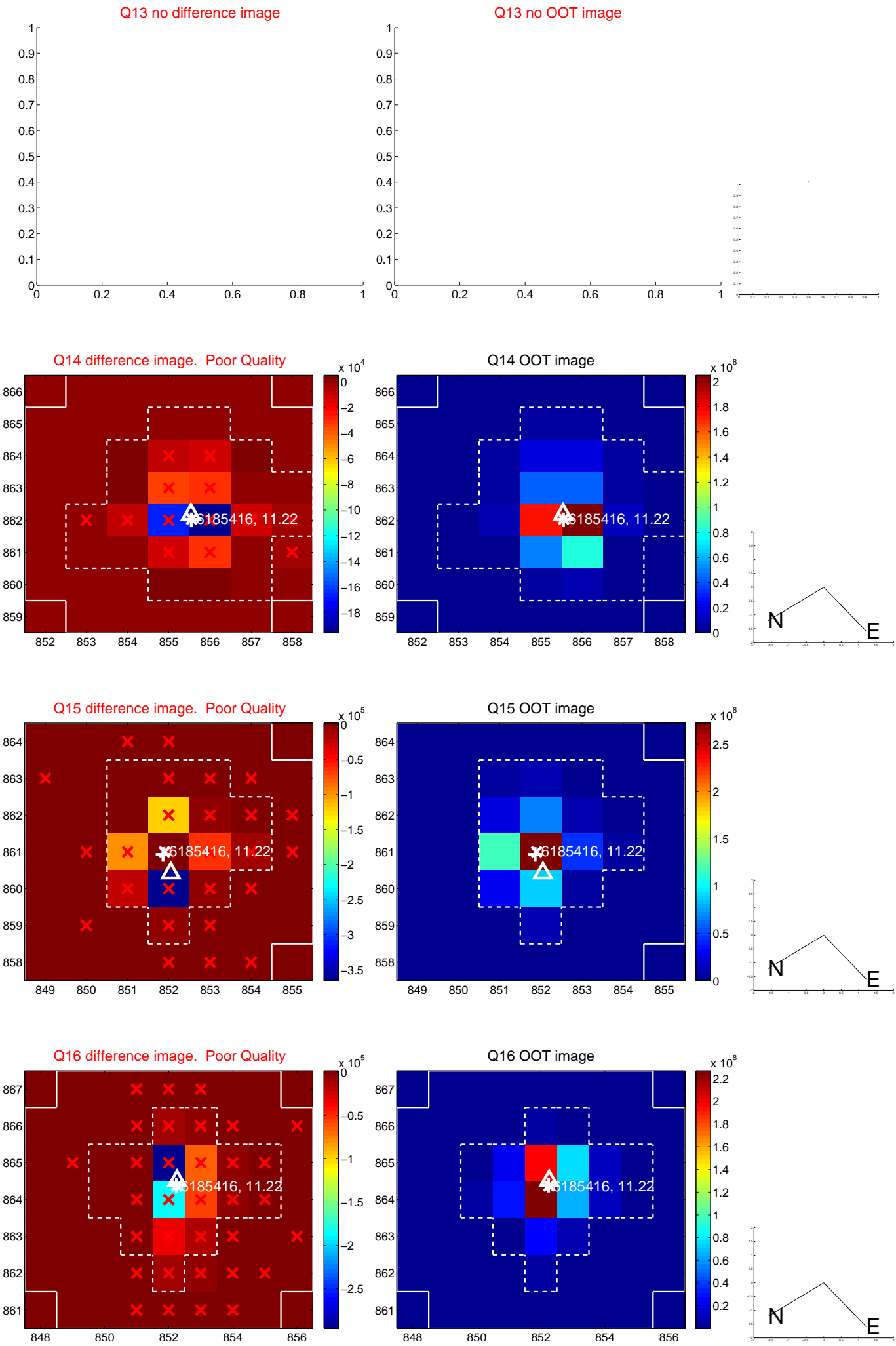
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



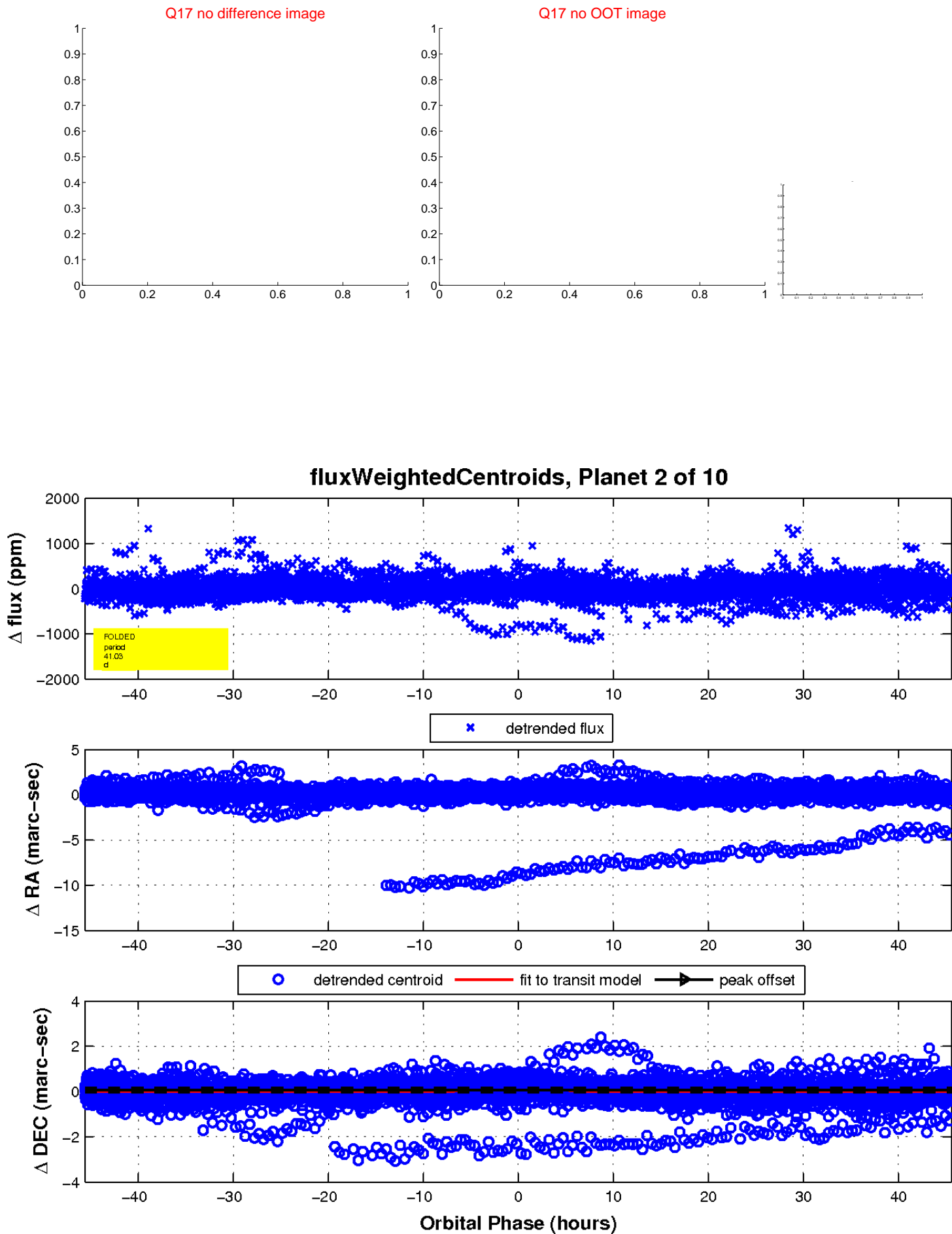
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

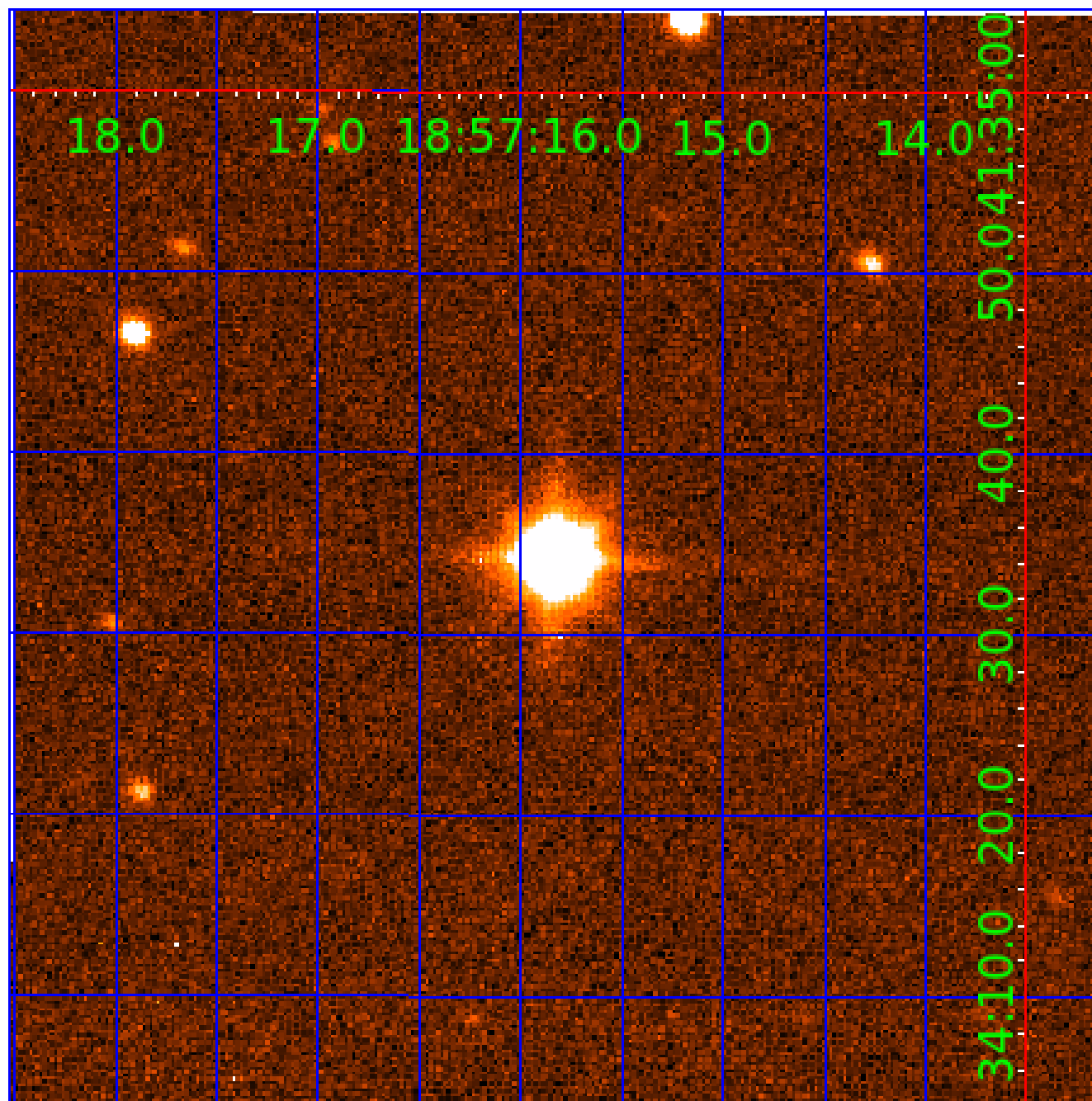


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

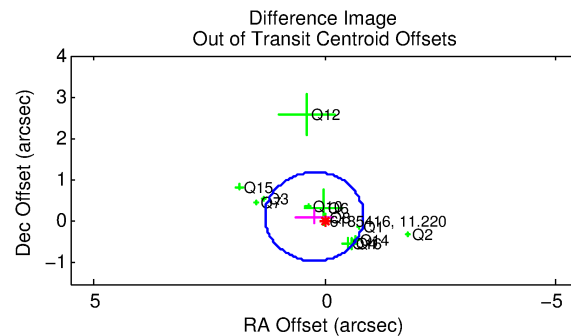
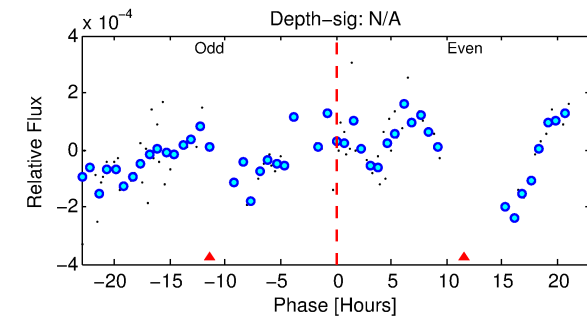
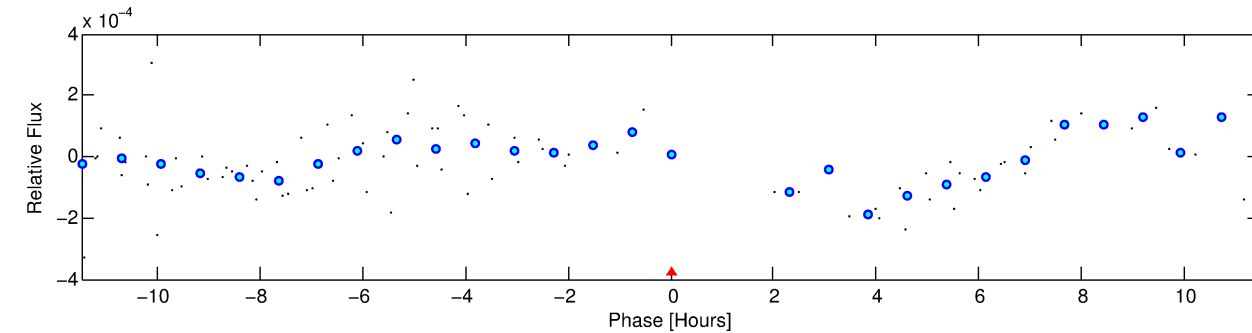
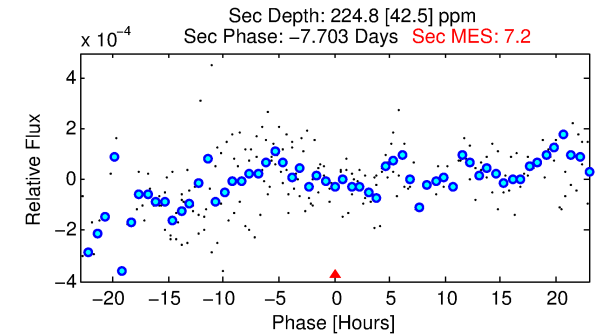
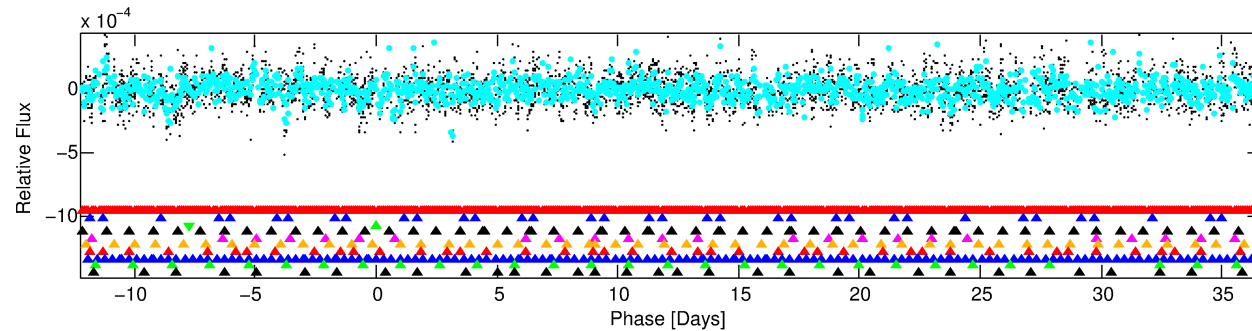
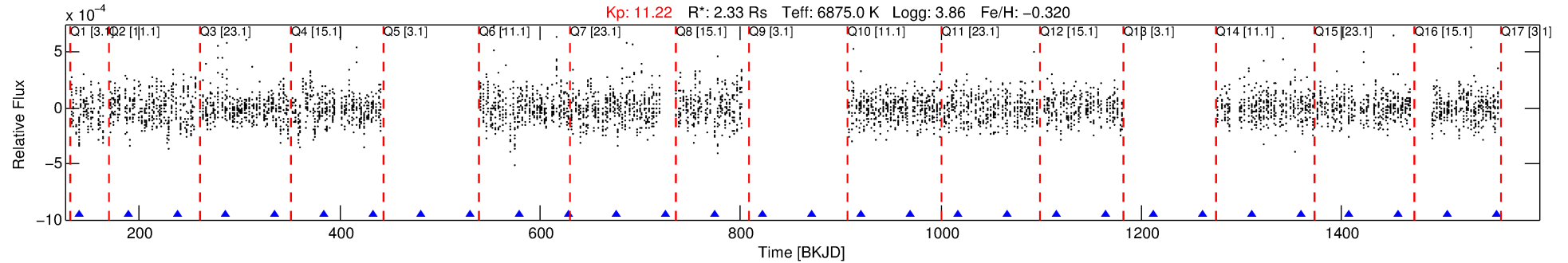
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006185416-03

No Significant Match Found

# DV One-Page Summary

KIC: 6185416 Candidate: 3 of 10 Period: 48.757 d



## TPS TCE Results:

Period = 48.75697 d  
Epoch = 139.5584 BKJD

DV fit results are unavailable

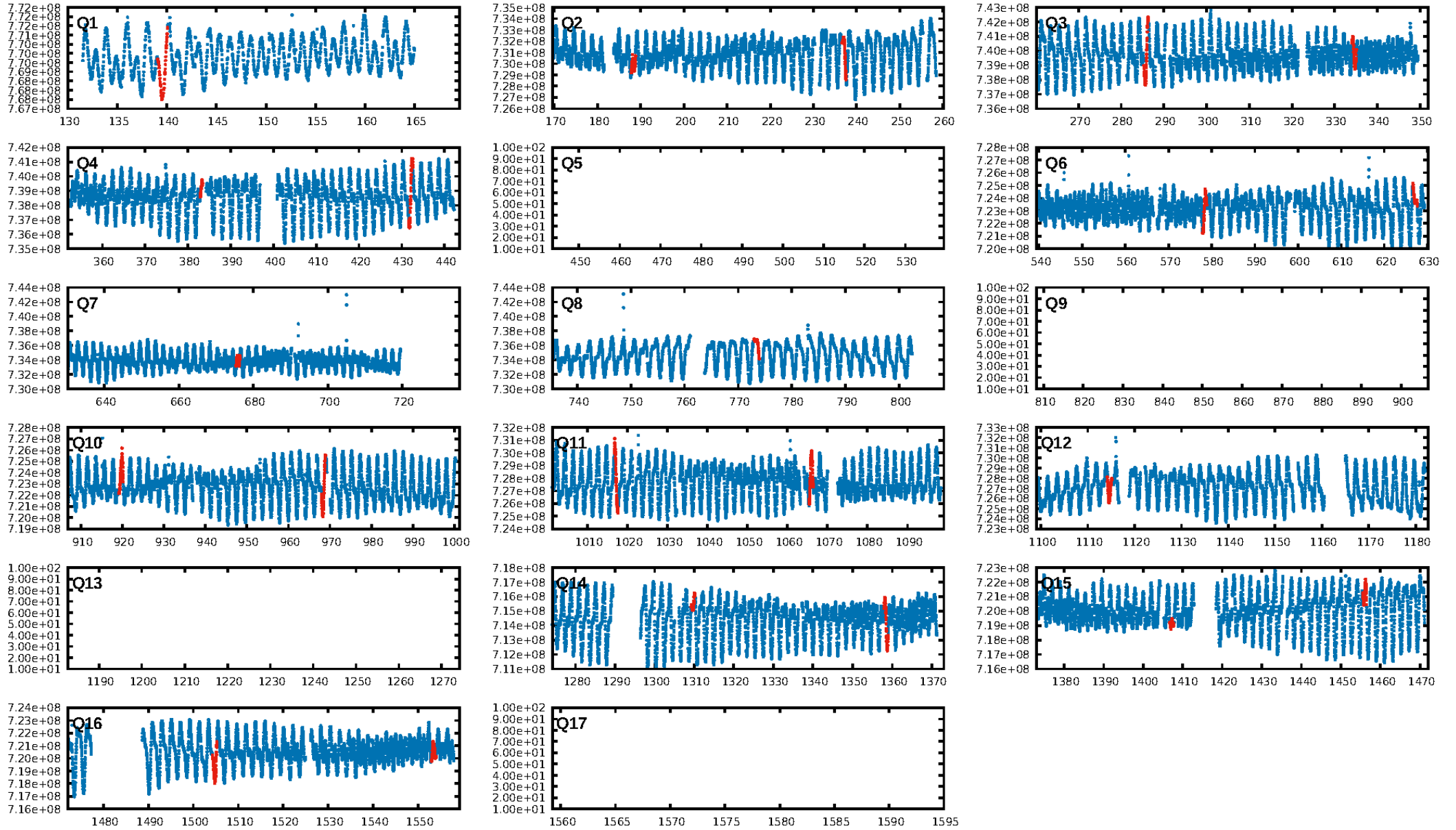
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.60 $\sigma$ ]  
LongPeriod-sig: 99.8% [3.14 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -0.818  
Centroid-sig: N/A  
Centroid-so: 0.113 arcsec [1.26 $\sigma$ ]  
OotOffset-rm: 0.255 arcsec [0.72 $\sigma$ ]  
KicOffset-rm: 0.443 arcsec [1.20 $\sigma$ ]  
OotOffset-st: 4/3/4/1 [12]  
KicOffset-st: 4/3/4/1 [12]  
DiffImageQuality-fgm: 0.58 [7/12]  
DiffImageOverlap-fno: 0.31 [4/13]

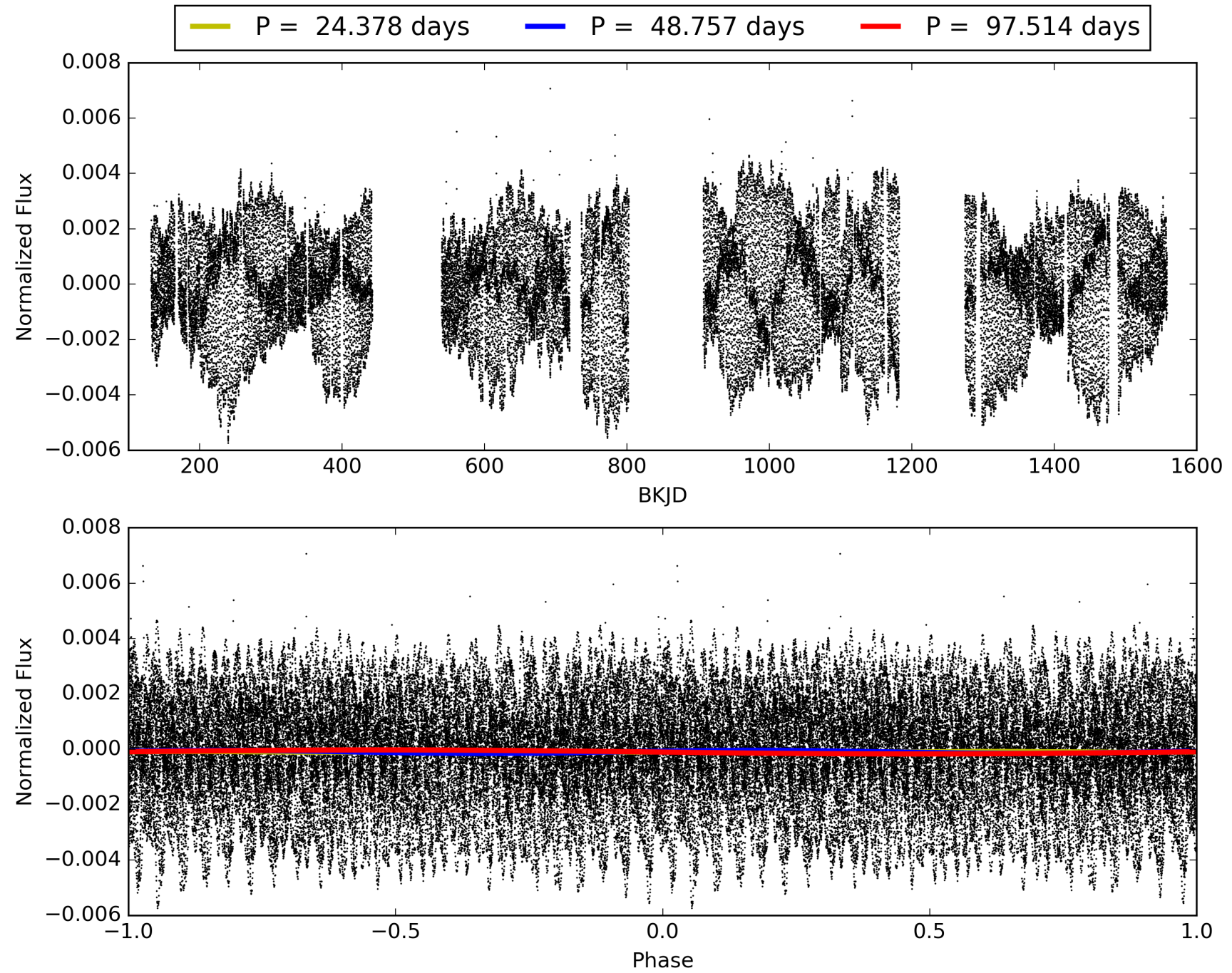
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:36 Z

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

# TCE 006185416-03, PDC Light Curves

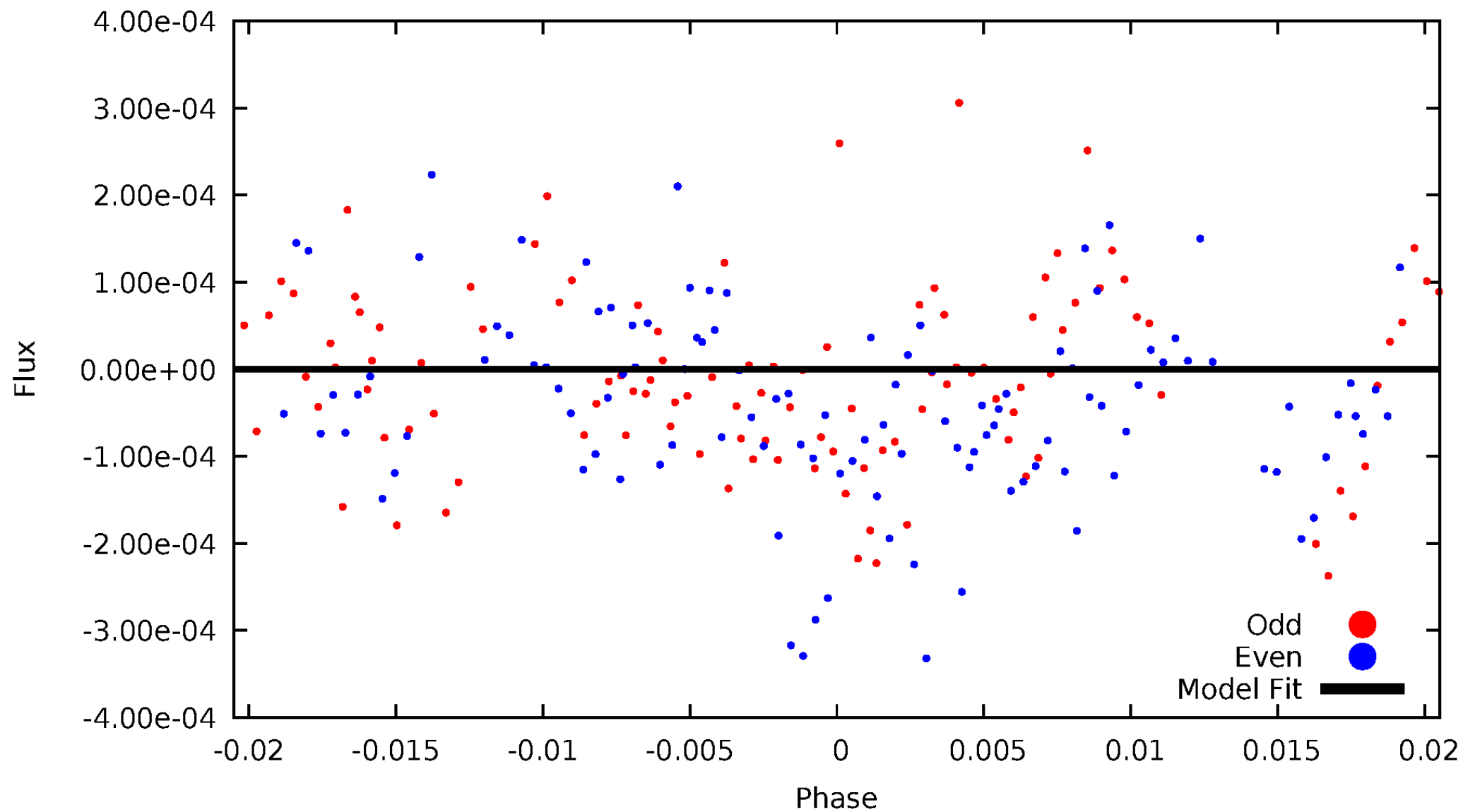


TCE 006185416-03



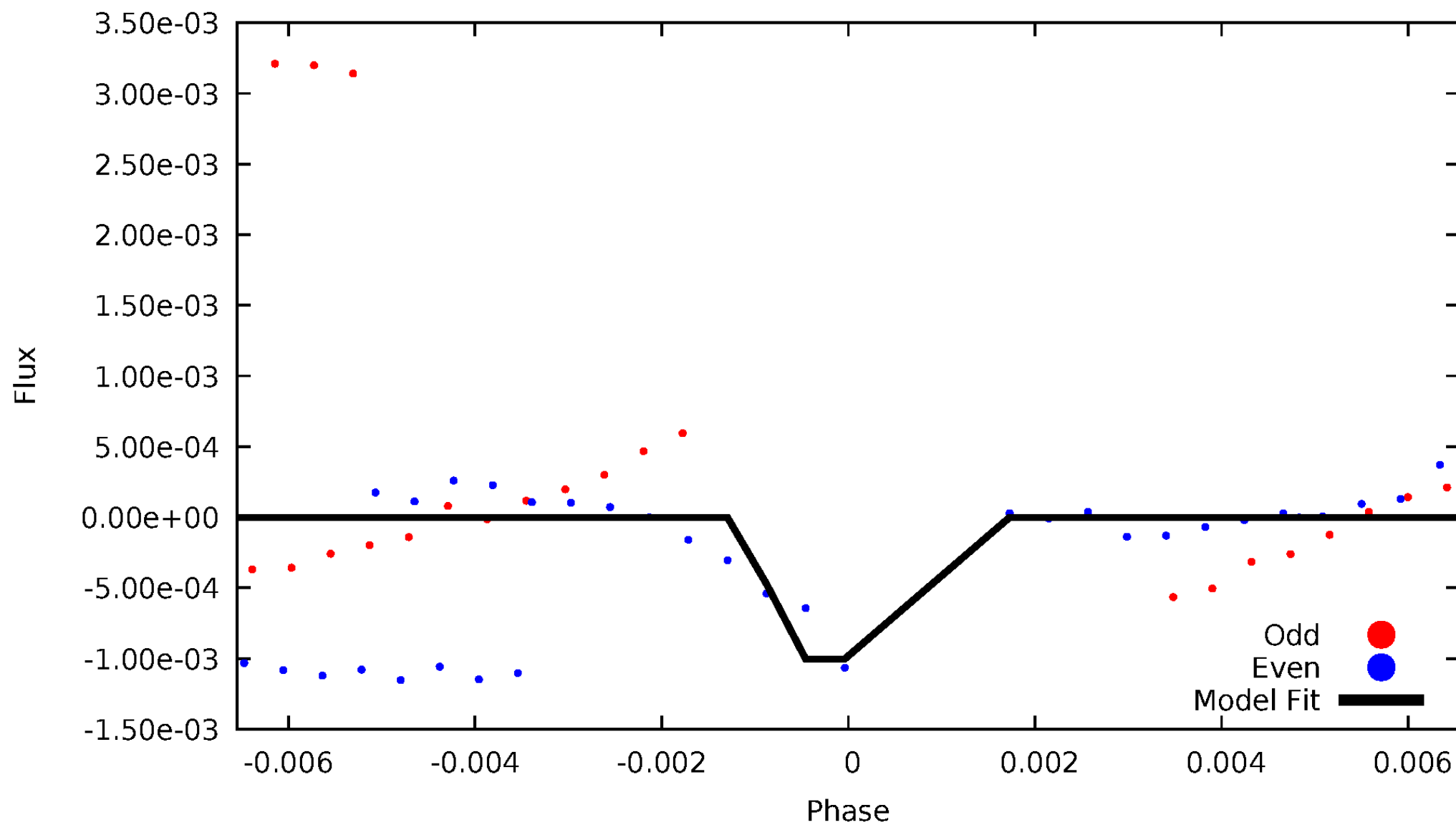
# DV Odd/Even

TCE 006185416-03

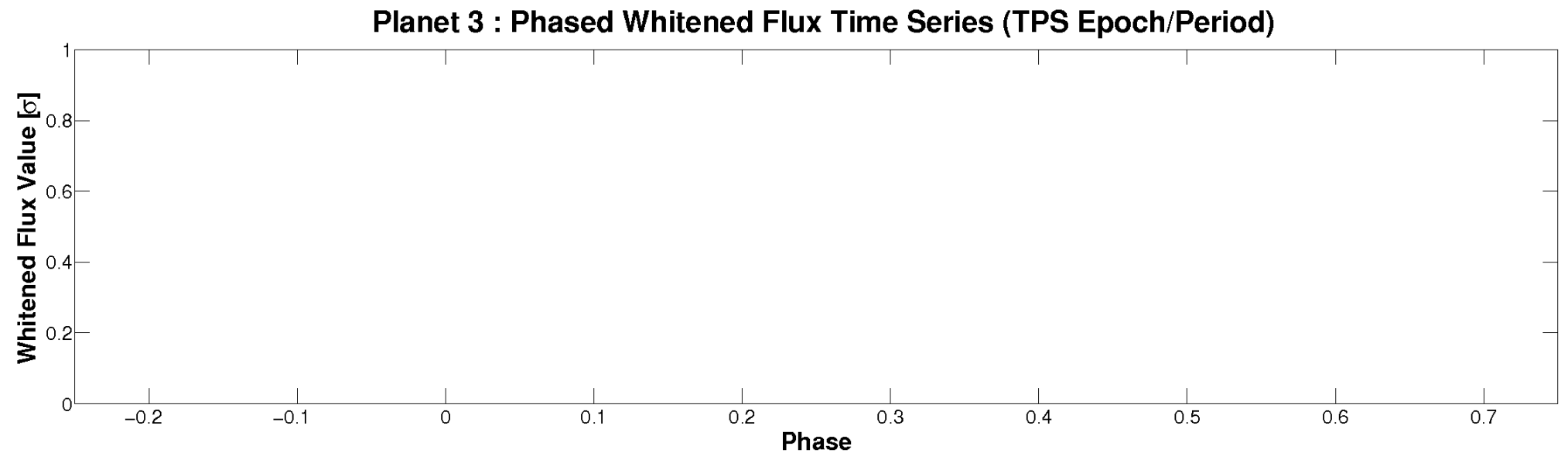
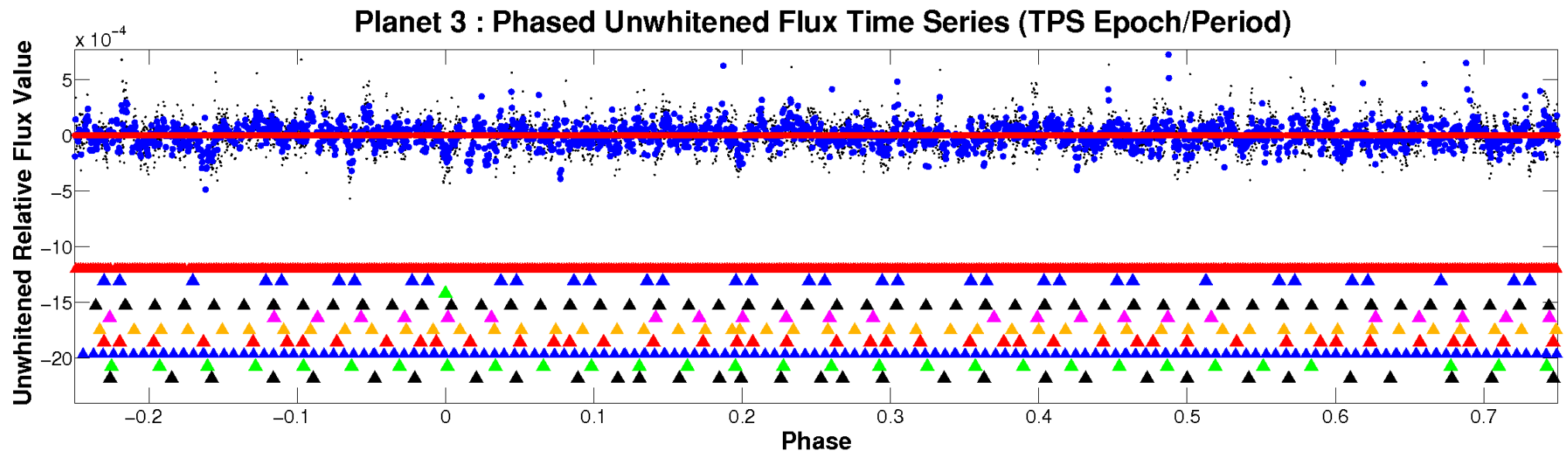


# ALT Odd/Even

TCE 006185416-03



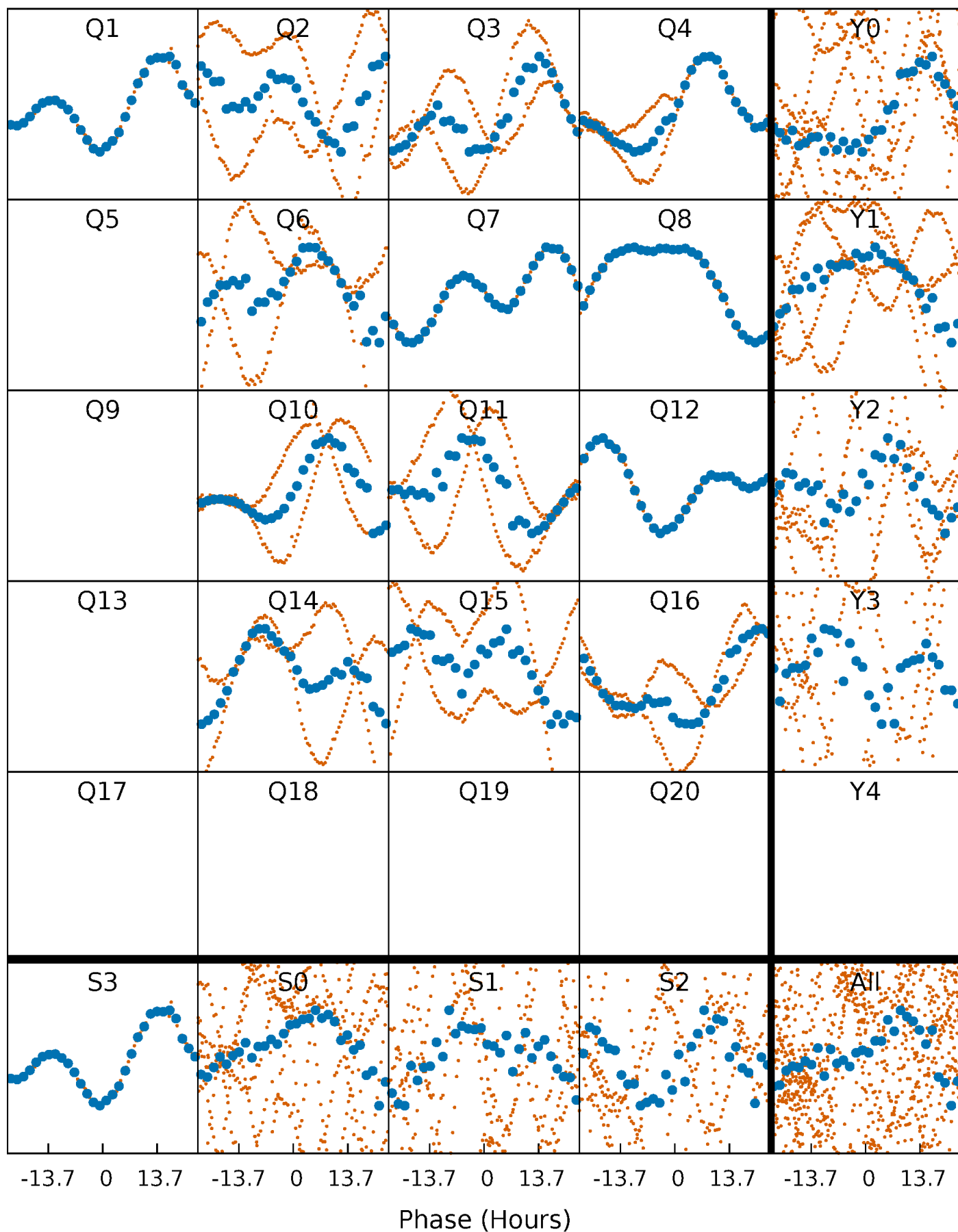
# Non-Whitened Vs. Whitened Light Curve





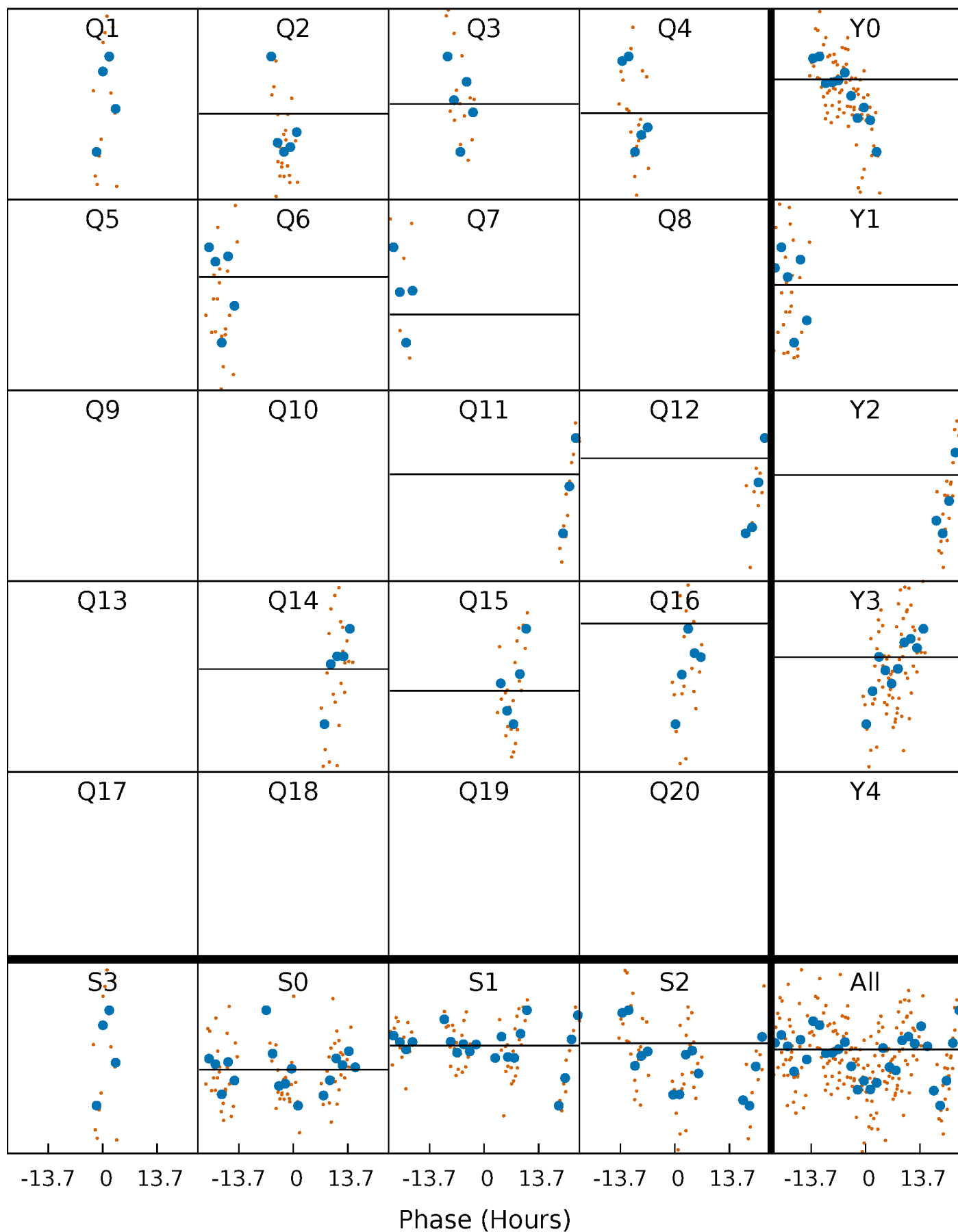
# PDC Quarter-Phased Transit Curves

TCE 006185416-03 P= 48.756972 Days  $T_0=139.558411$  (BKJD)



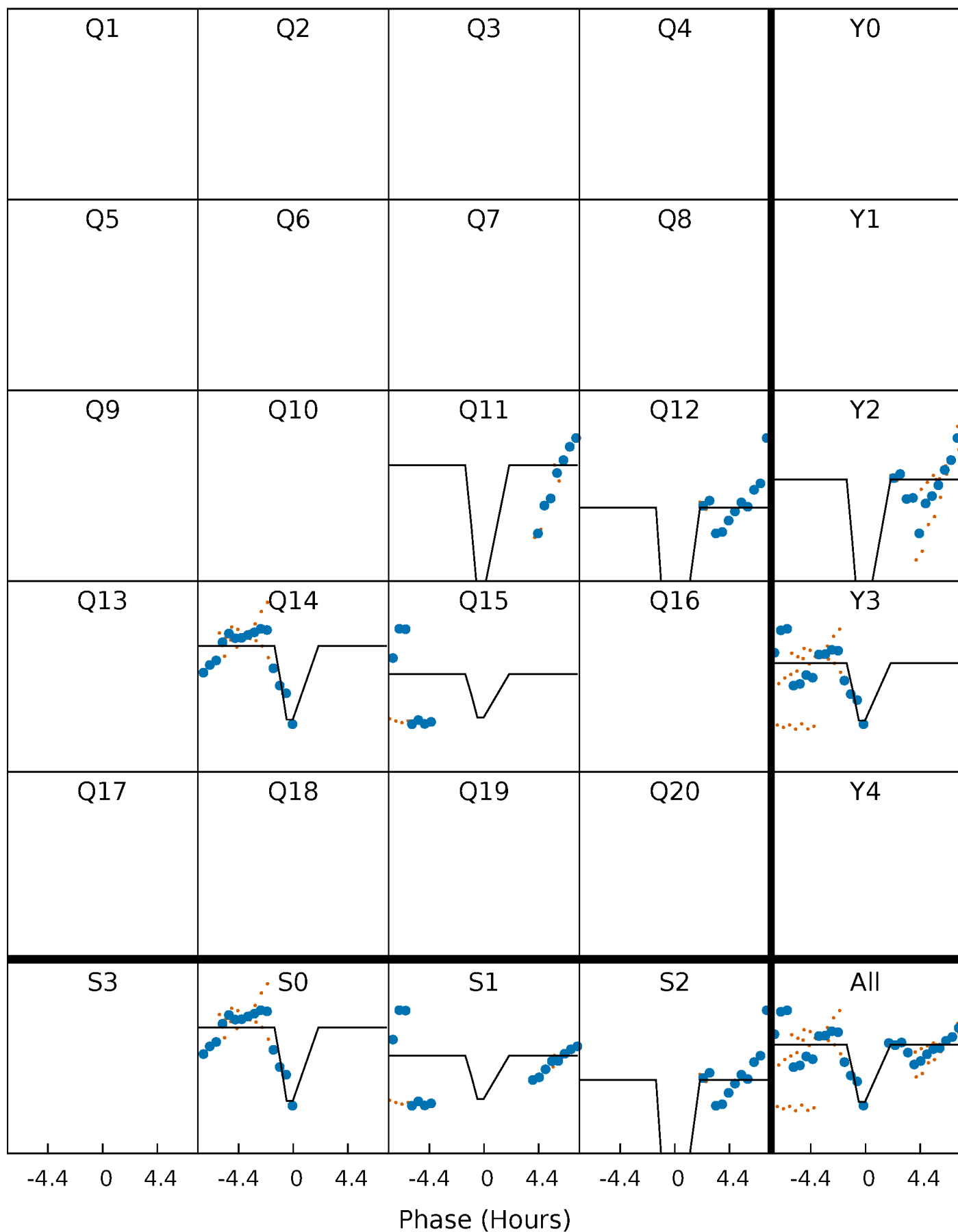
# DV Quarter-Phased Transit Curves

TCE 006185416-03     $P = 48.756972$  Days     $T_0 = 139.558411$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

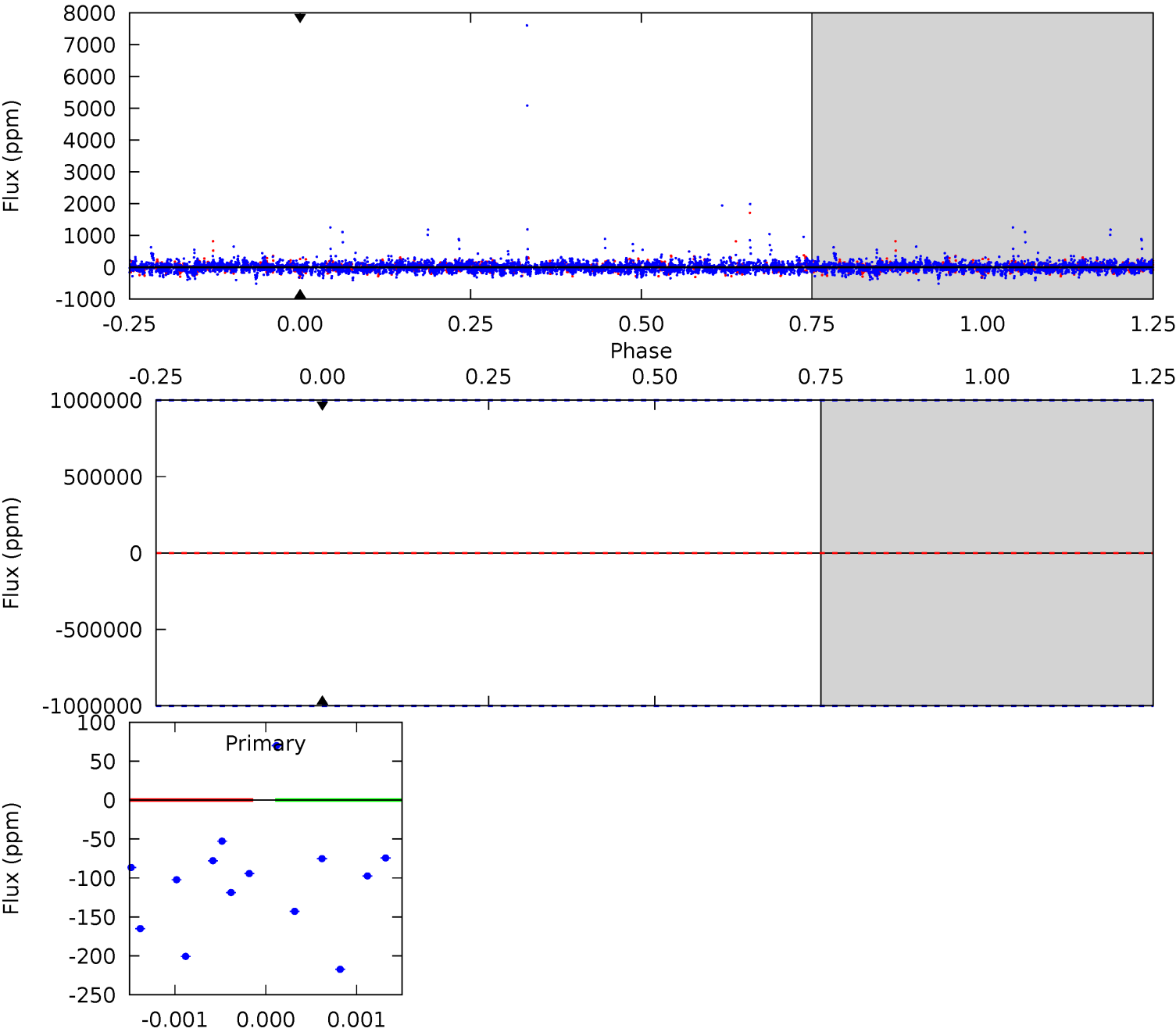
TCE 006185416-03   P= 48.756972 Days    $T_0=140.183698$  (BKJD)



# DV Model-Shift Uniqueness Test

006185416-03, P = 48.756972 Days, E = 90.801439 Days

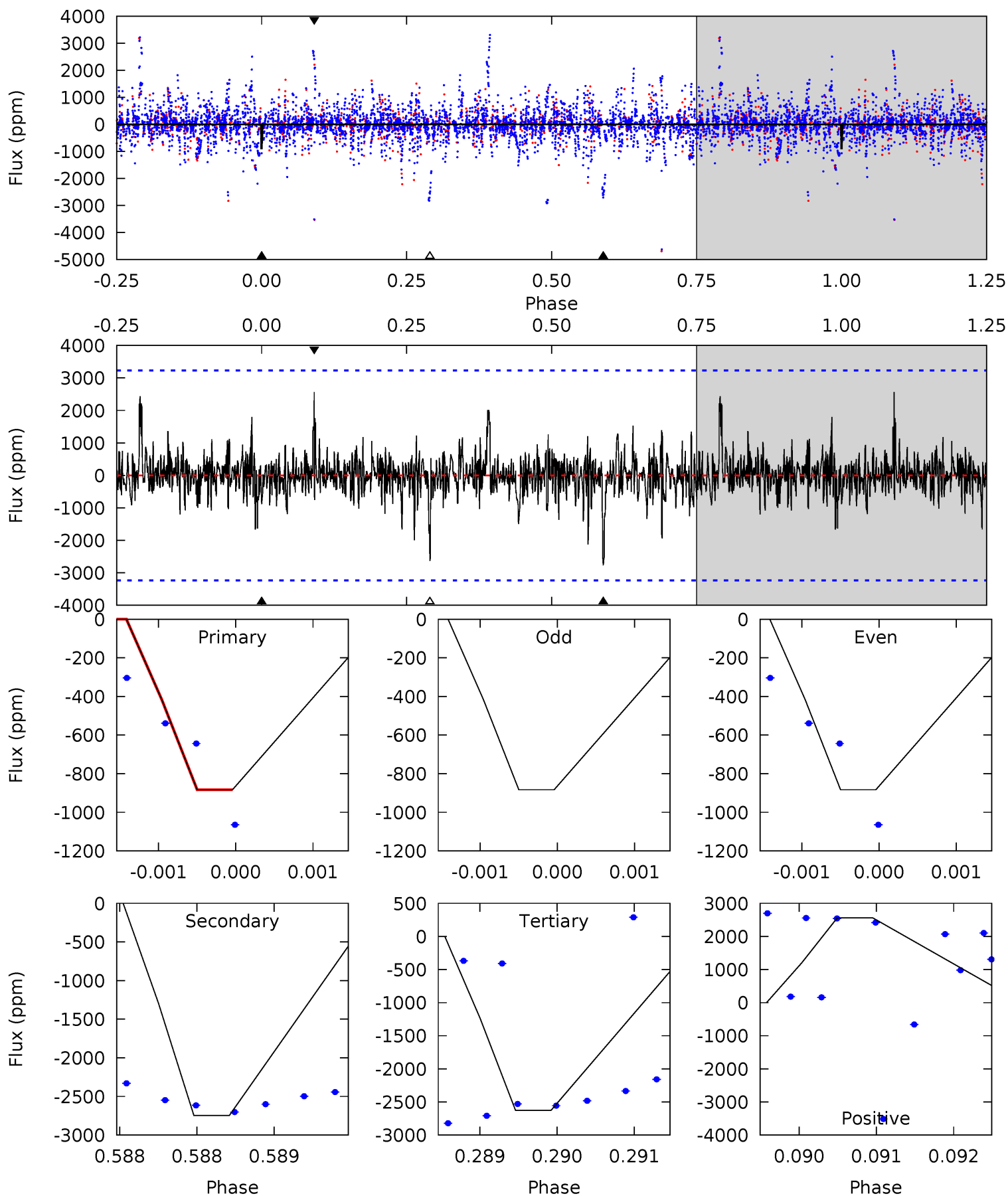
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006185416-03, P = 48.756972 Days, E = 91.426726 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
1.49	4.65	4.45	4.33	5.47	3.32	0.80	-2.95	-2.84	0.20	0.31	0.00	0	0.48	0



### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$16.85^{+18.08}_{-11.29}$	$1169^{+69}_{-104}$	$-5531^{+37275}_{-28129}$	$-368.481^{+29760.952}_{-31525.972}$
Alt.	$-2747 \pm 591$	$18.04^{+20.53}_{-12.06}$	$1170^{+71}_{-97}$	$5666^{+4974}_{-1488}$	$390^{+3050}_{-300}$

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

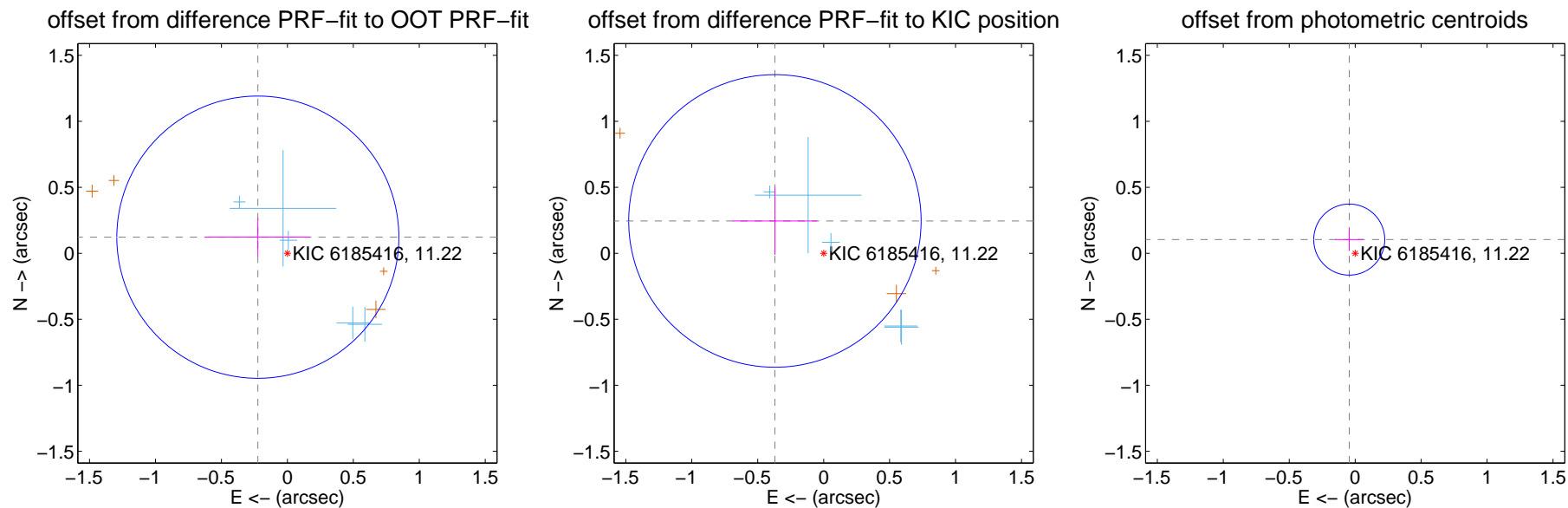
## DV Centroid Data

Supplemental centroid analysis for 006185416-03. **Kepler magnitude: 11.22**. Transit SNR -1.00

There are 7 quarters with good PRF difference image offsets

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

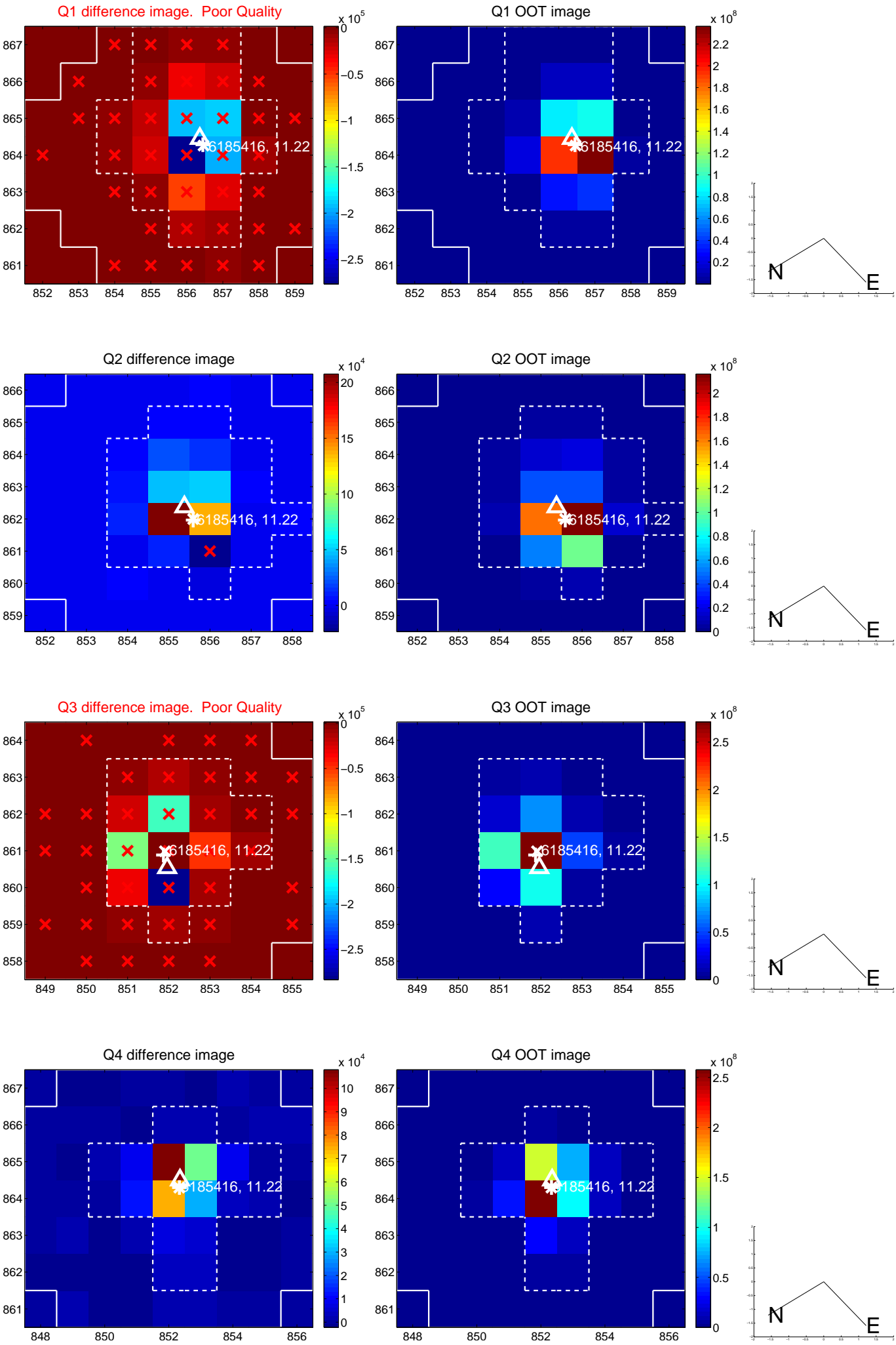
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.255 \pm 0.356$	0.72	$0.224 \pm 0.398$	$0.122 \pm 0.145$
PRF-fit source offset from KIC position	$0.443 \pm 0.369$	1.20	$0.370 \pm 0.320$	$0.245 \pm 0.256$
photometric centroid source offset	$0.11 \pm 0.09$	1.26	$0.04 \pm 0.11$	$0.10 \pm 0.09$



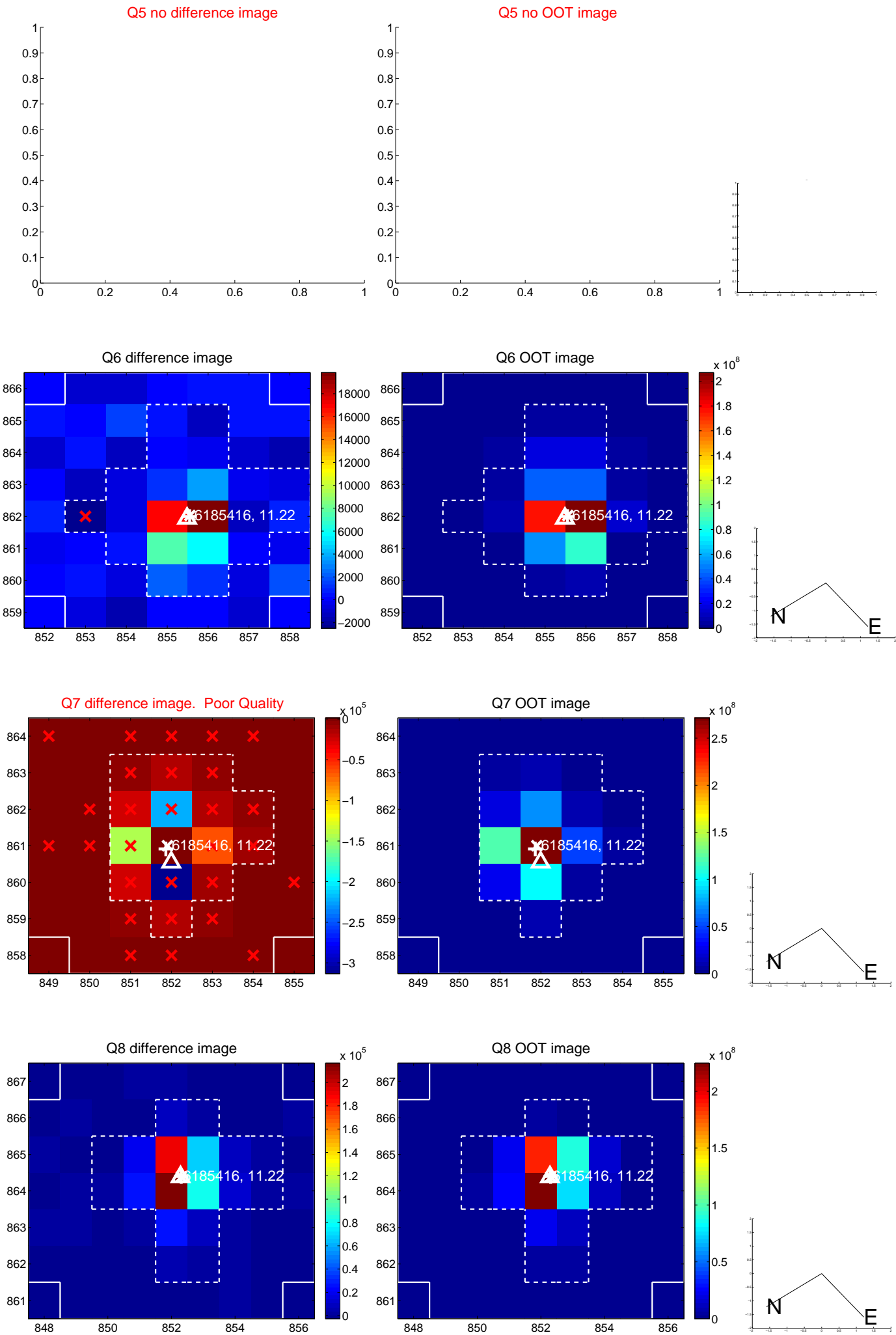
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



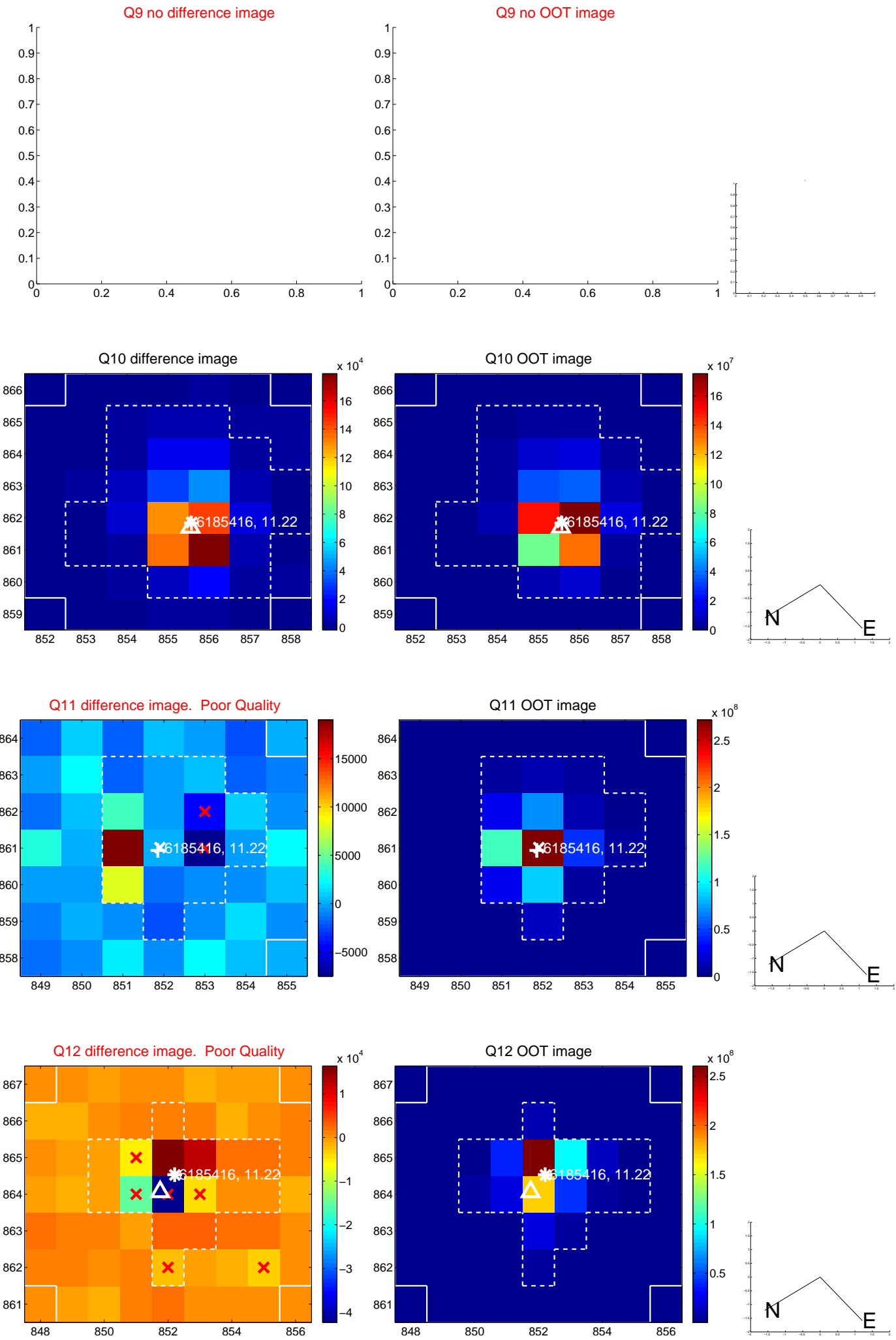
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



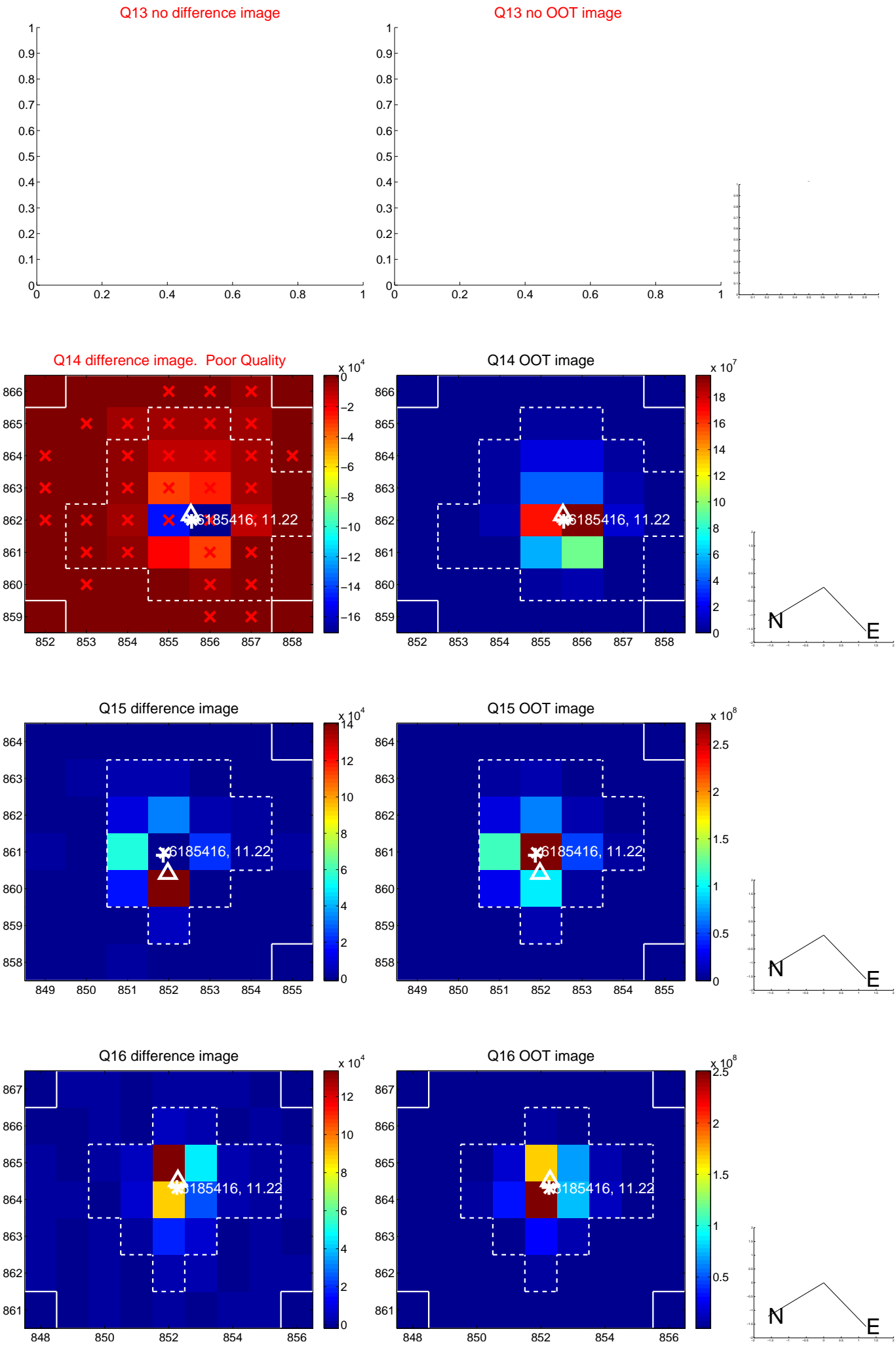
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



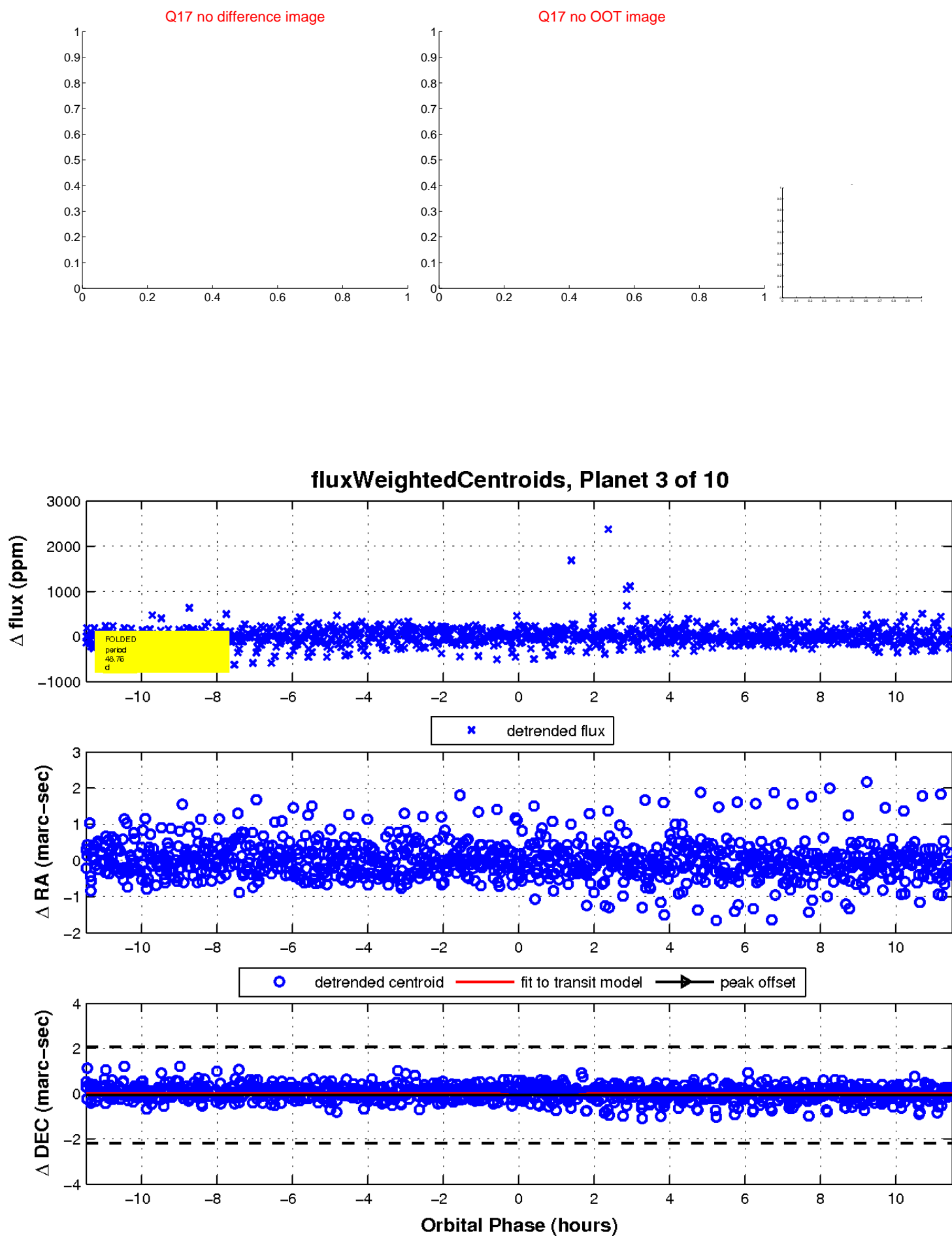
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

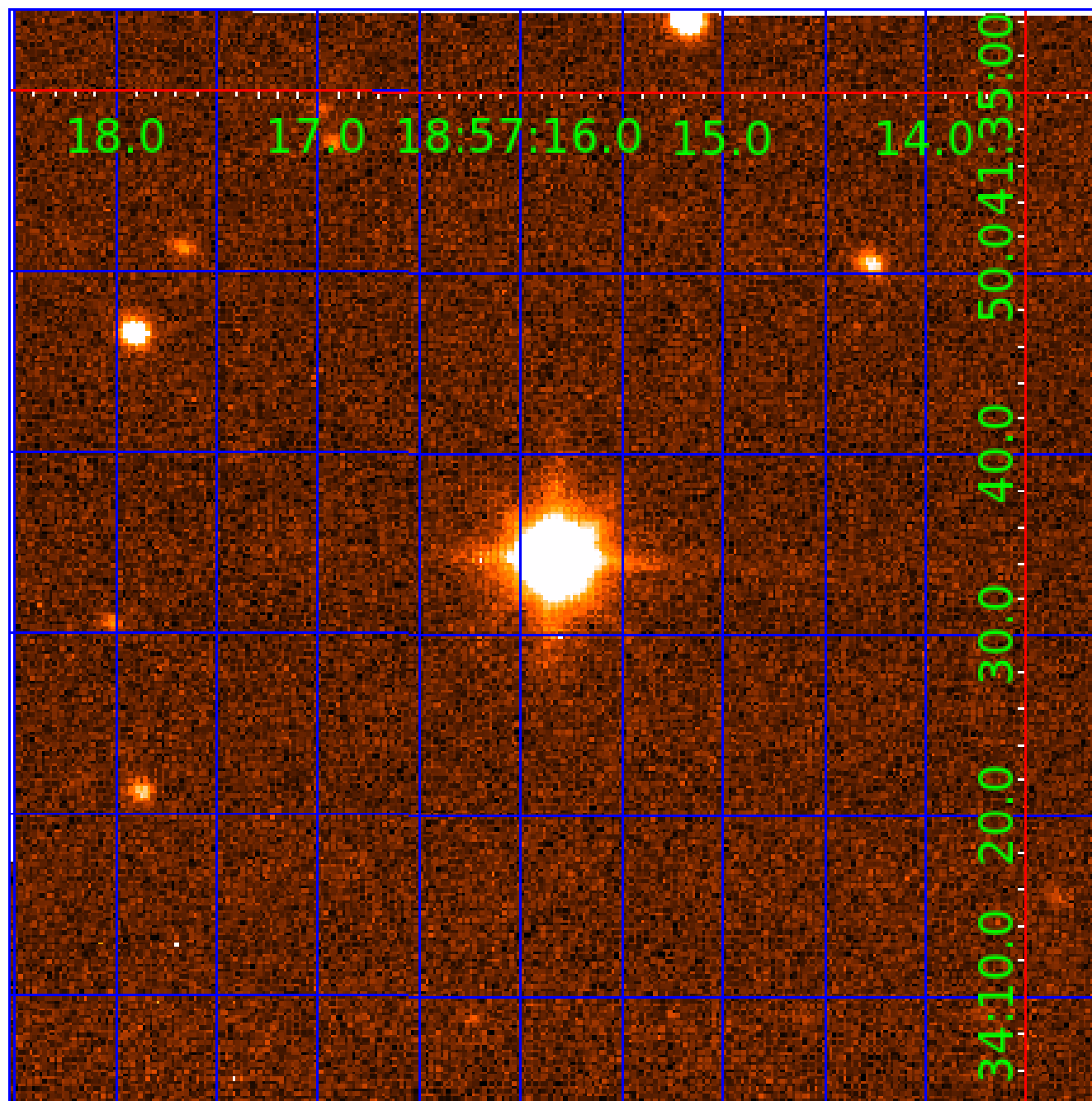


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

**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.

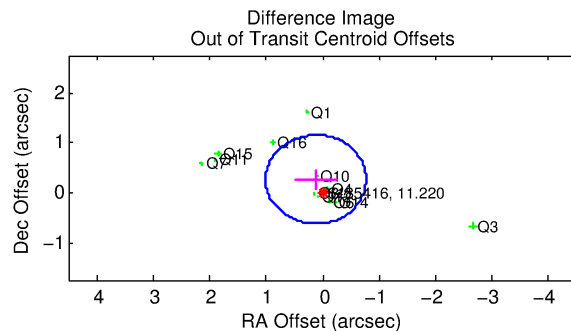
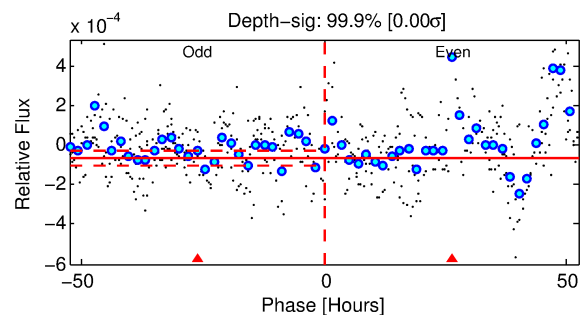
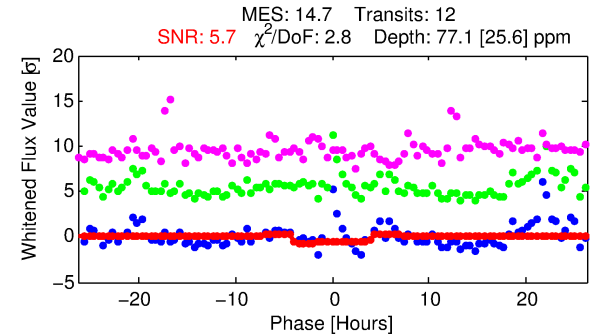
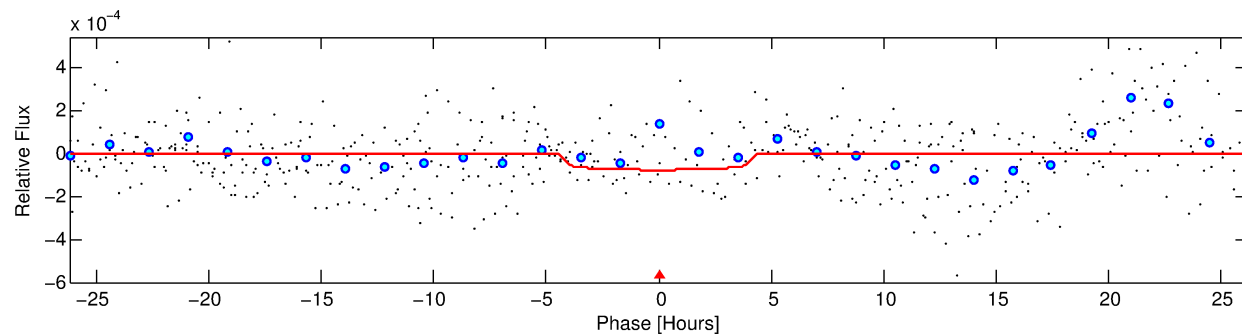
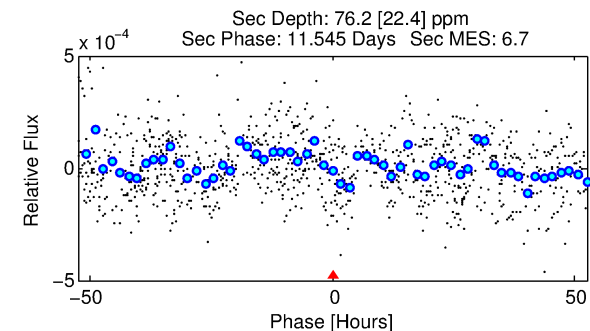
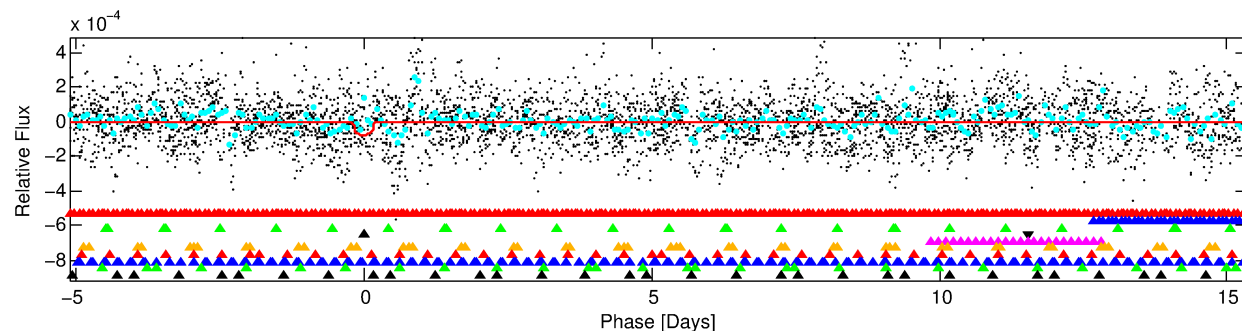
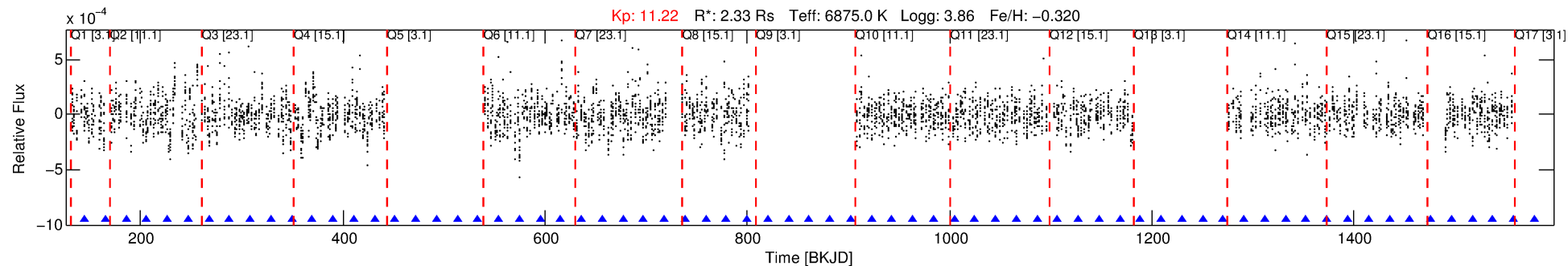
Ephemeris Match Information For 006185416-04

No Significant Match Found



# DV One-Page Summary

KIC: 6185416 Candidate: 4 of 10 Period: 20.477 d



## DV Fit Results:

Period = 20.47735 [0.00067] d  
Epoch = 144.6537 [0.0248] BKJD  
Rp/R\* = 0.0092 [0.0039]  
a/R\* = 8.91 [19.51]  
b = 0.88 [0.58]  
Seff = 397.63 [202.19]  
Teq = 1139 [145] K  
Rp = 2.34 [1.28] Re  
a = 0.1651 [0.0524] AU  
Ag = 208.44 [213.82] [0.97σ]  
Teffp = 6689 [1516] K [3.64σ]

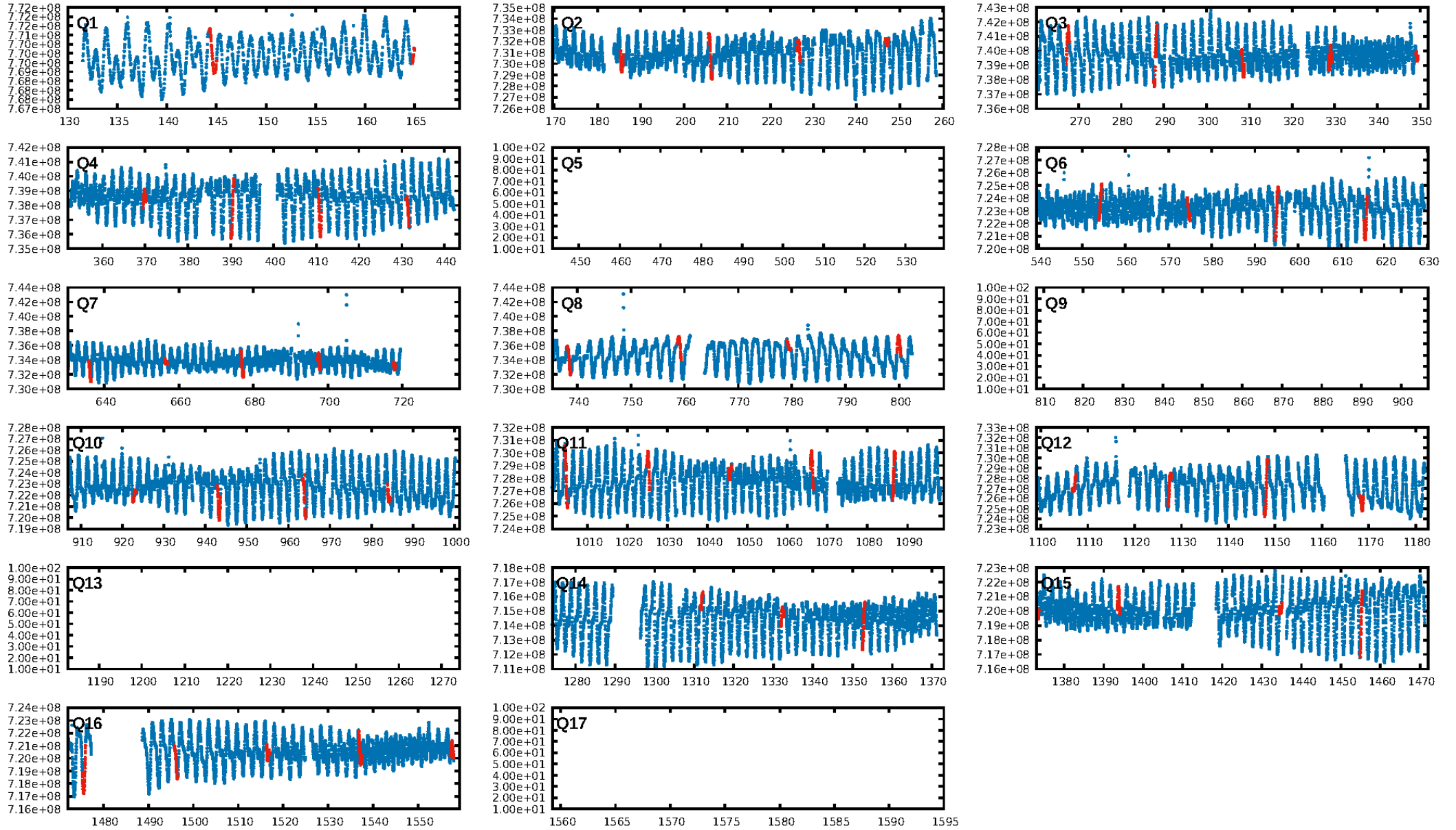
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [30.99σ]  
LongPeriod-sig: 100.0% [22.72σ]  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: -0.5918  
Centroid-sig: N/A  
Centroid-so: 0.772 arcsec [1.15σ]  
OotOffset-rm: 0.291 arcsec [0.98σ]  
KicOffset-rm: 0.376 arcsec [1.63σ]  
OotOffset-st: 3/4/4/1 [12]  
KicOffset-st: 3/4/4/1 [12]  
DiffImageQuality-fgm: 0.67 [8/12]  
DiffImageOverlap-fno: 0.23 [3/13]

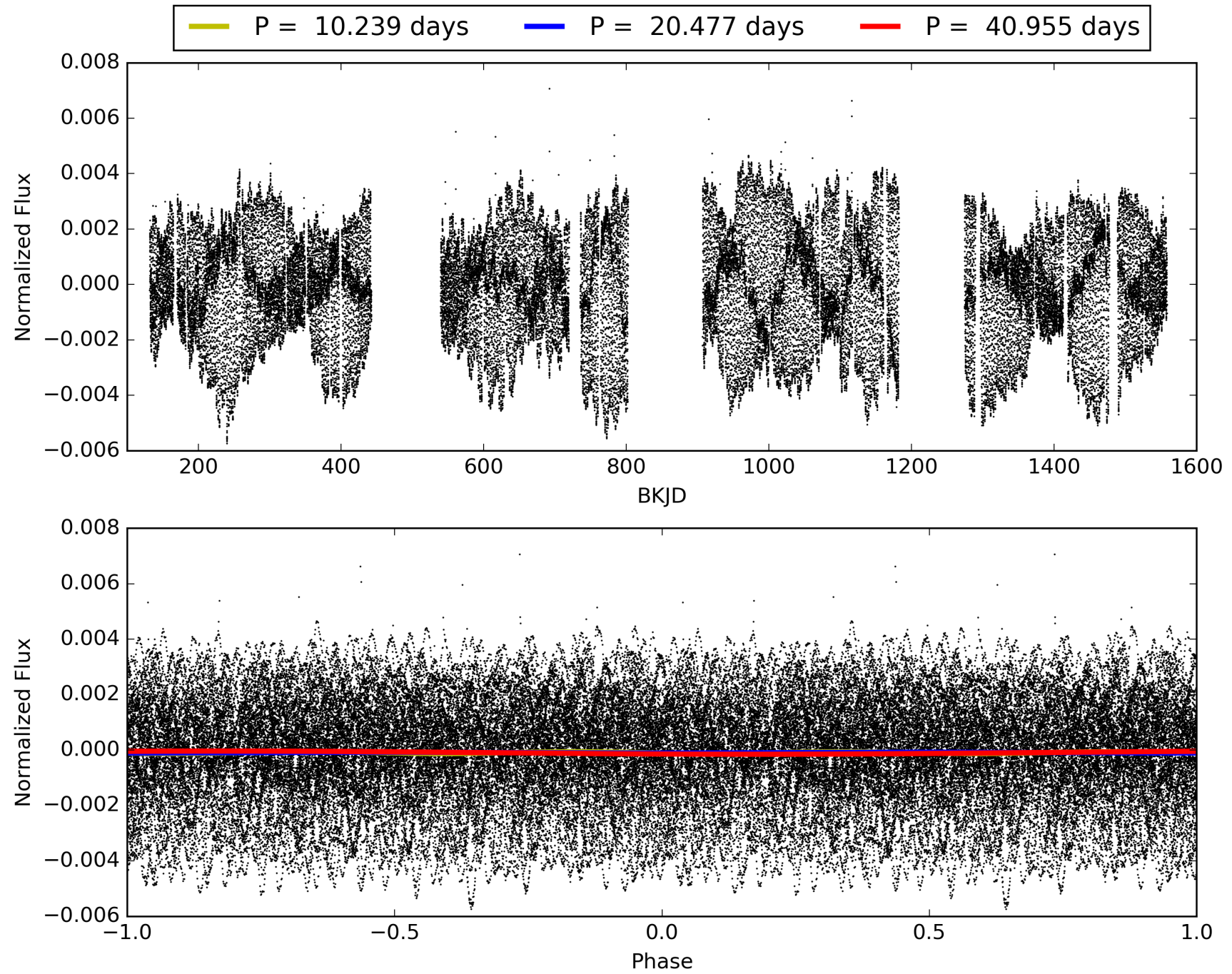
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:39 Z

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

# TCE 006185416-04, PDC Light Curves

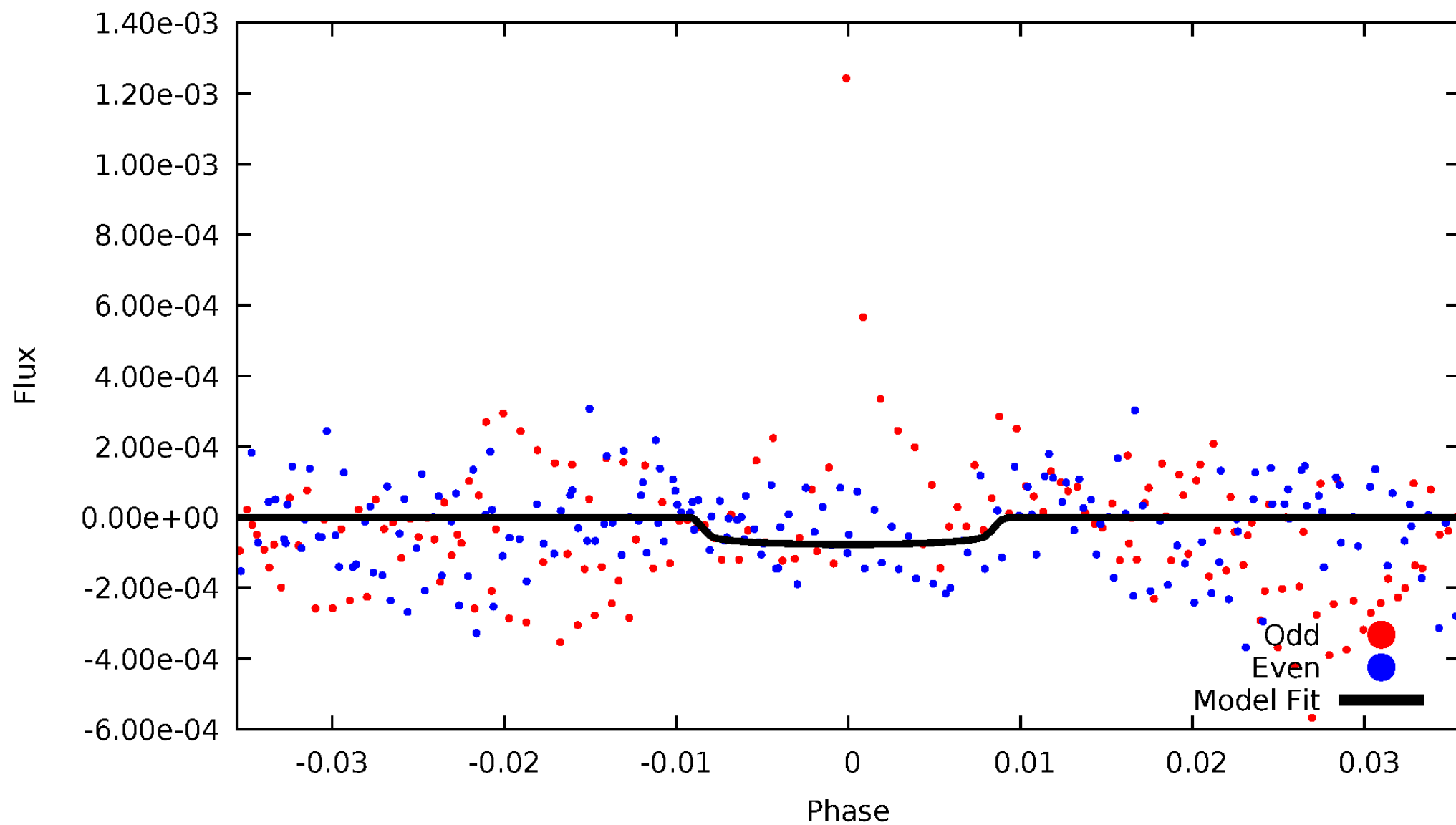


TCE 006185416-04



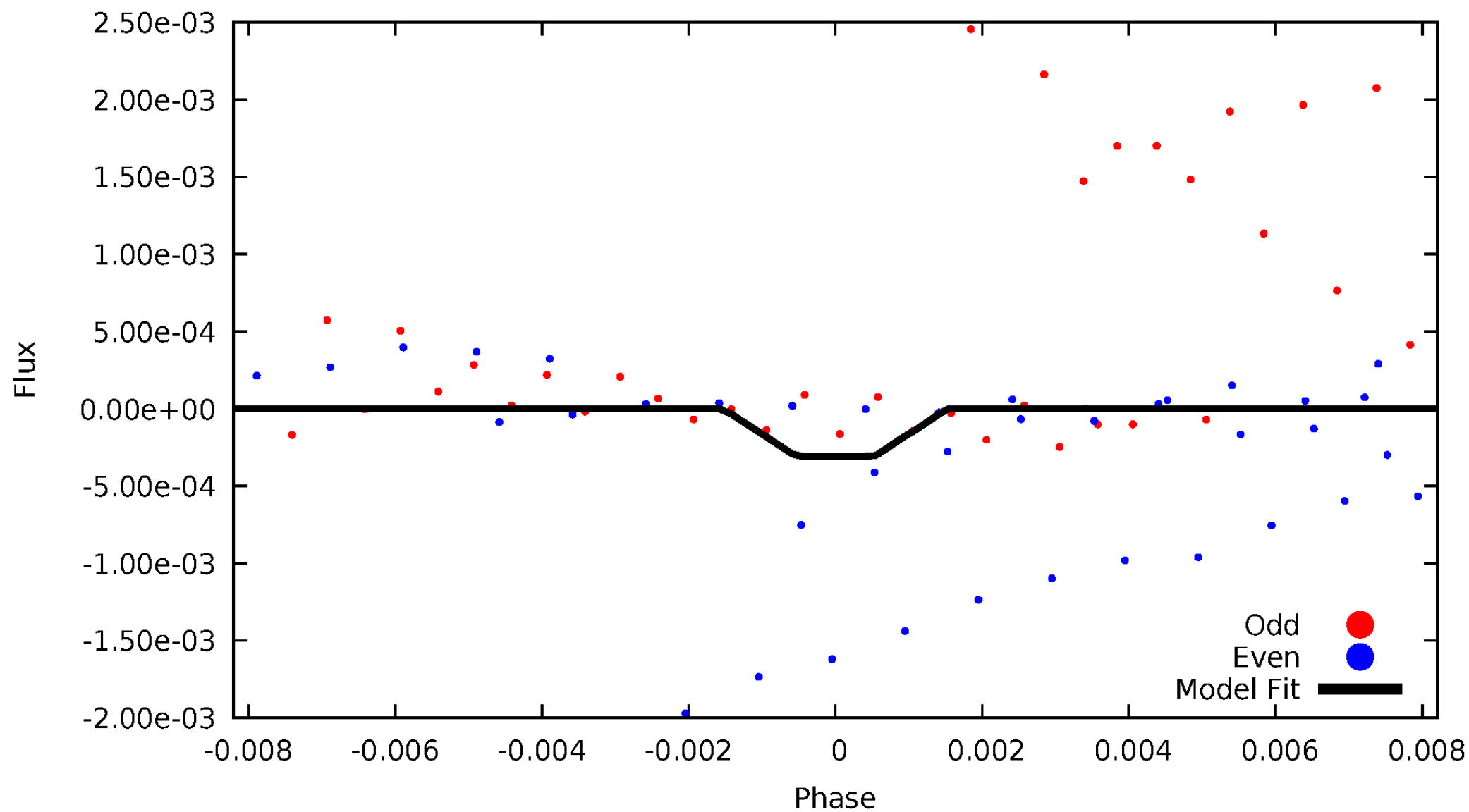
# DV Odd/Even

TCE 006185416-04



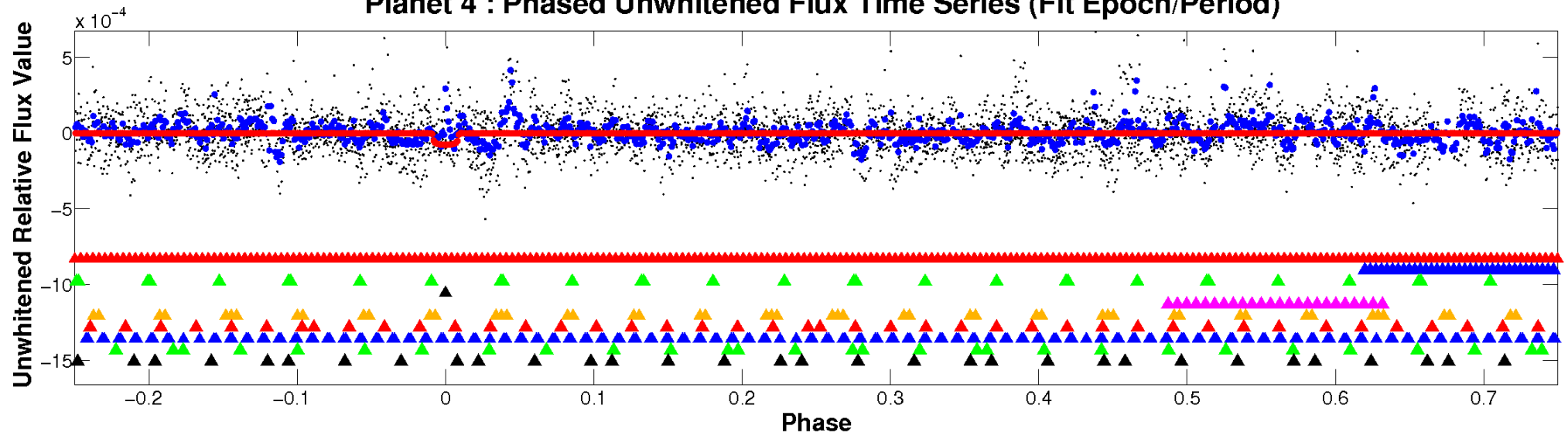
# ALT Odd/Even

TCE 006185416-04

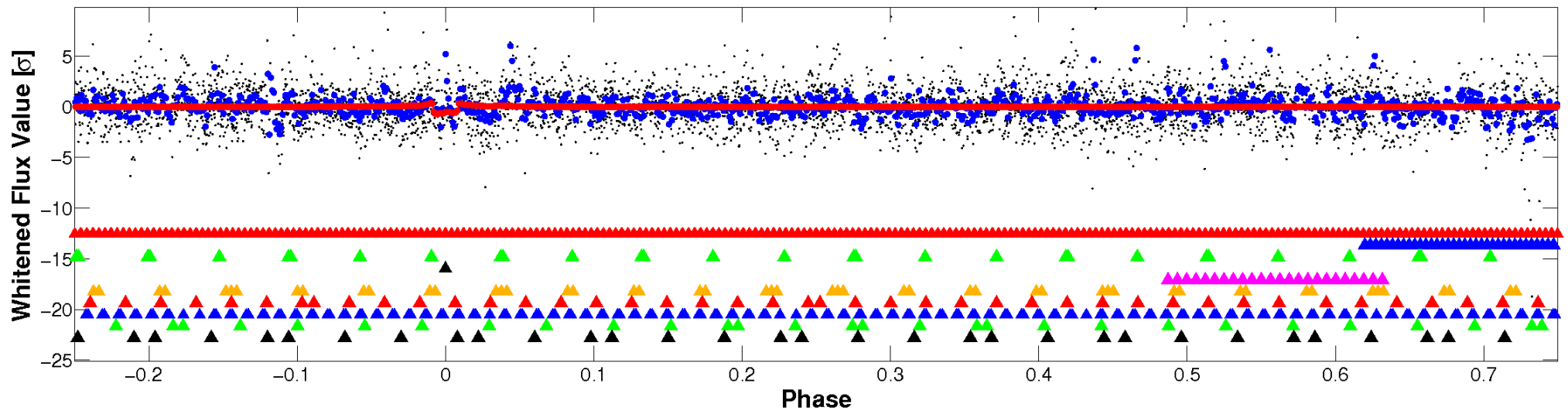


# Non-Whitened Vs. Whitened Light Curve

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



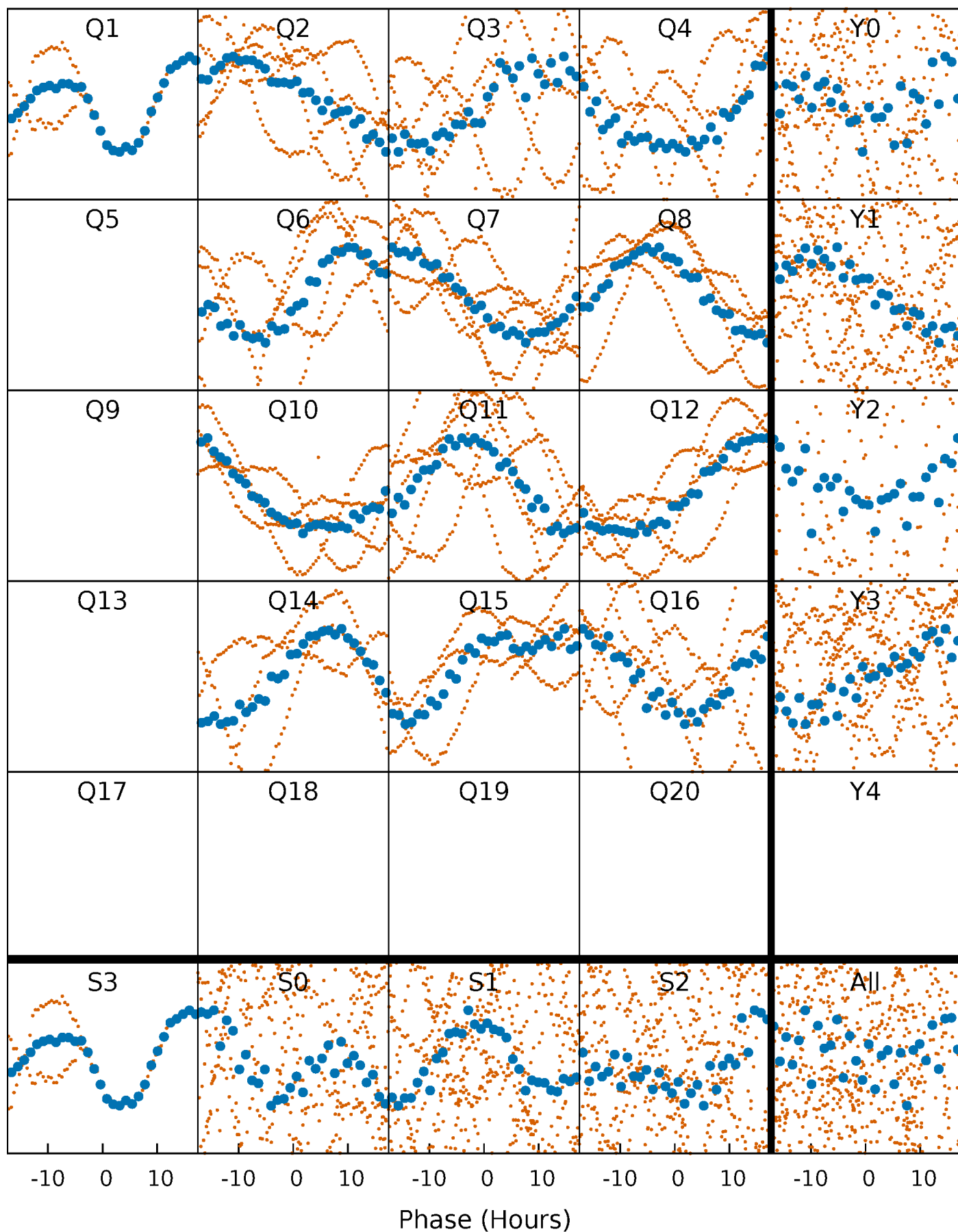
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

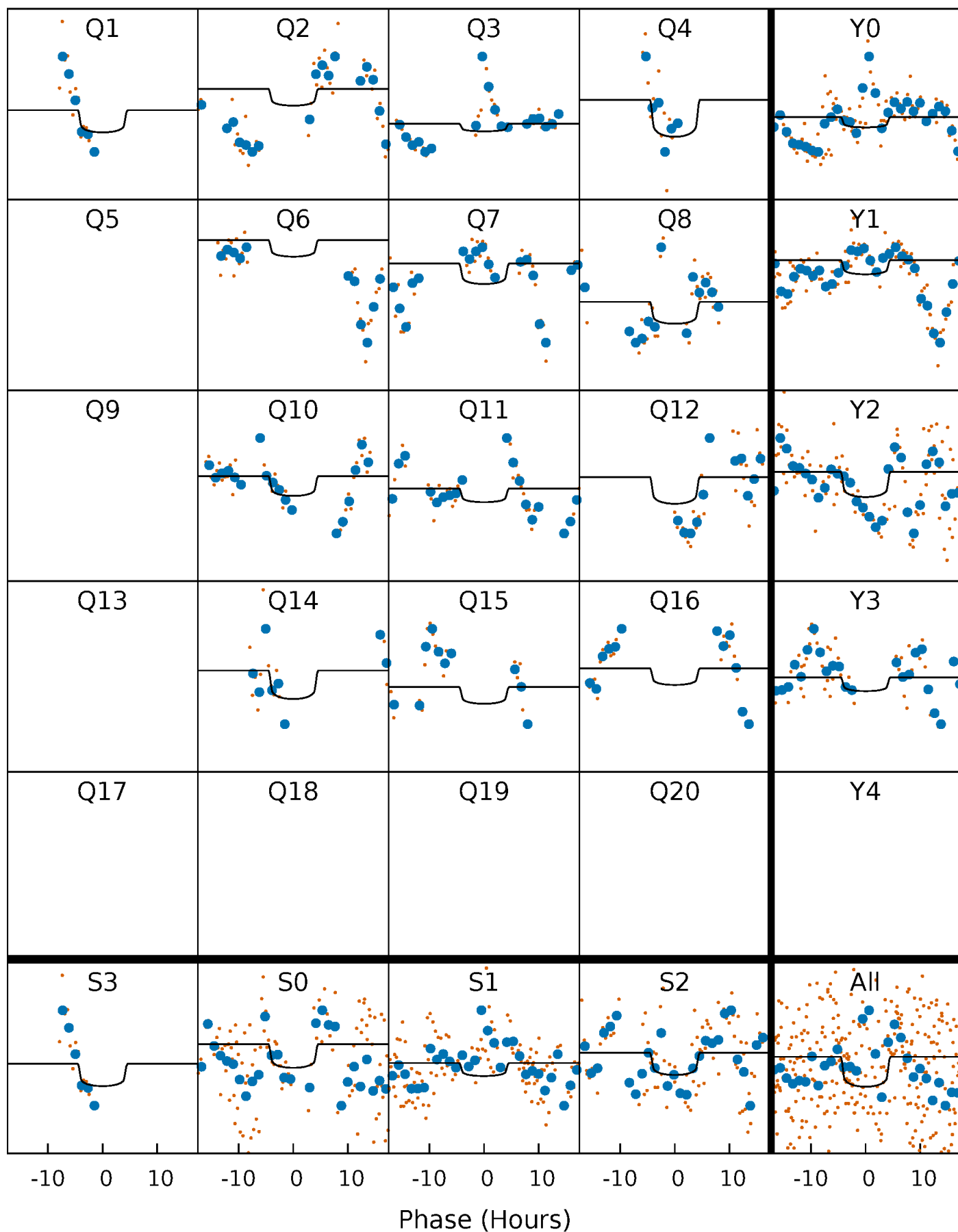
TCE 006185416-04 P= 20.477350 Days  $T_0=144.653720$  (BKJD)





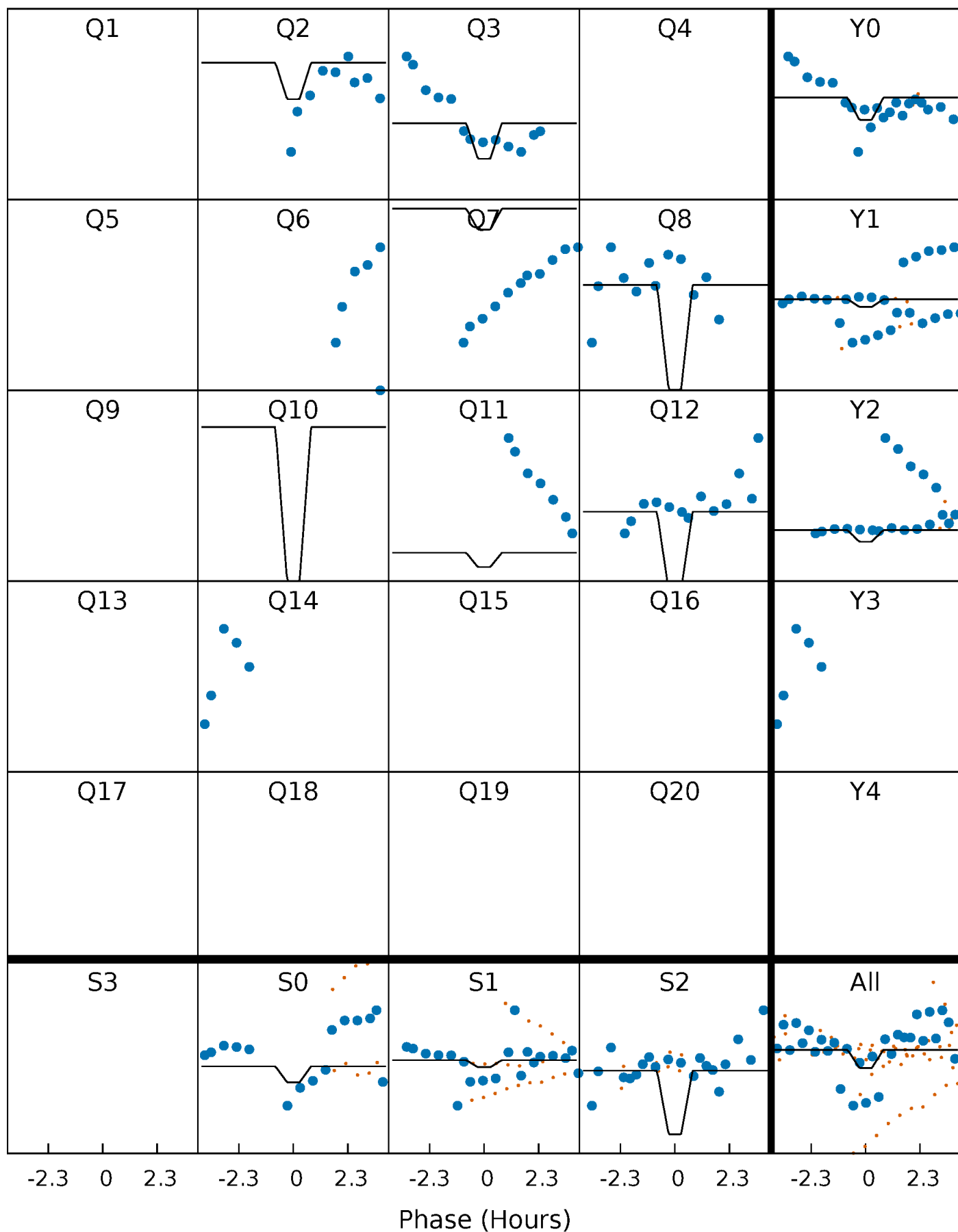
# DV Quarter-Phased Transit Curves

TCE 006185416-04   P= 20.477350 Days    $T_0=144.653720$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

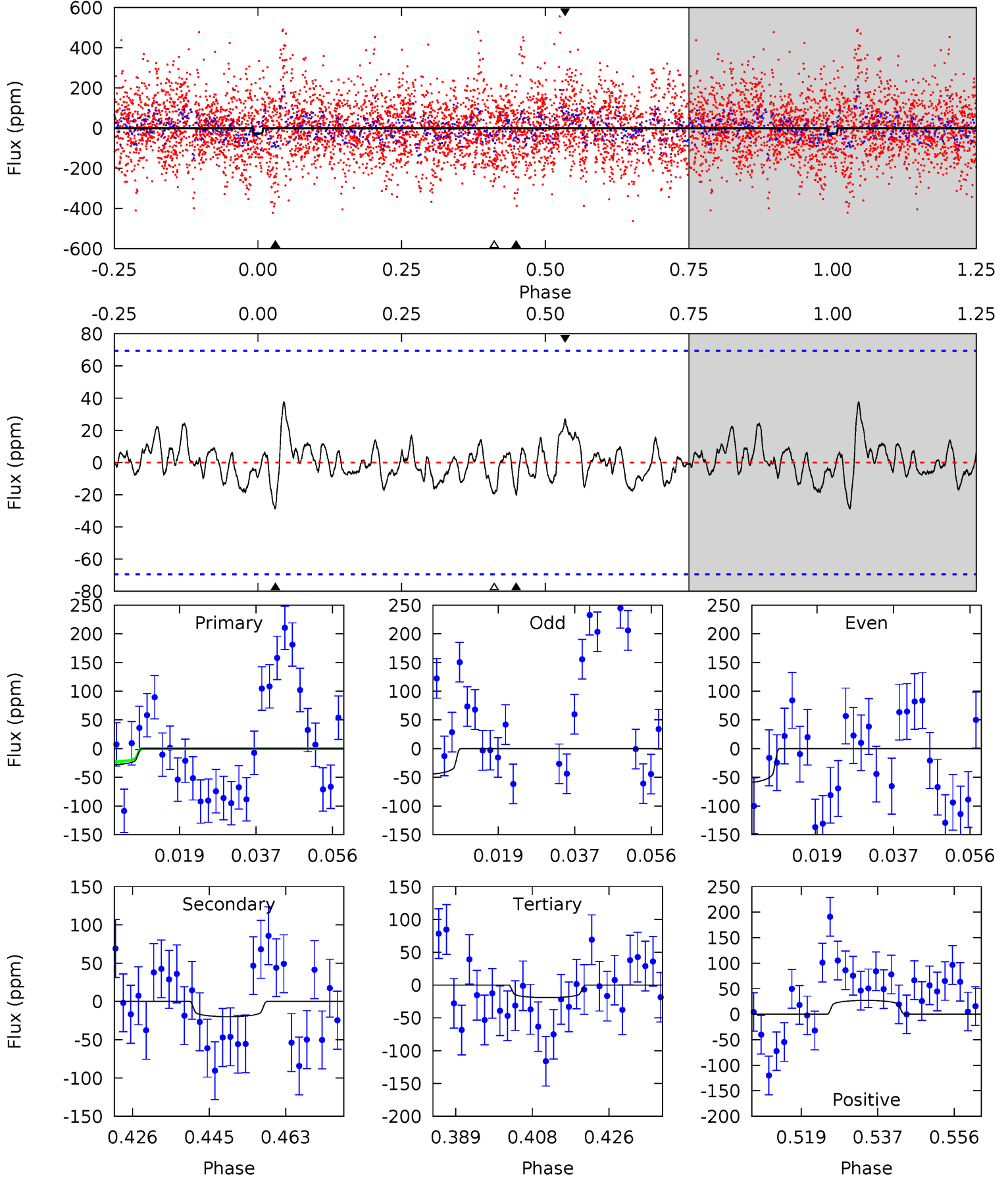
TCE 006185416-04   P= 20.467443 Days    $T_0=145.221865$  (BKJD)



# DV Model-Shift Uniqueness Test

006185416-04, P = 20.477350 Days, E = 124.176370 Days

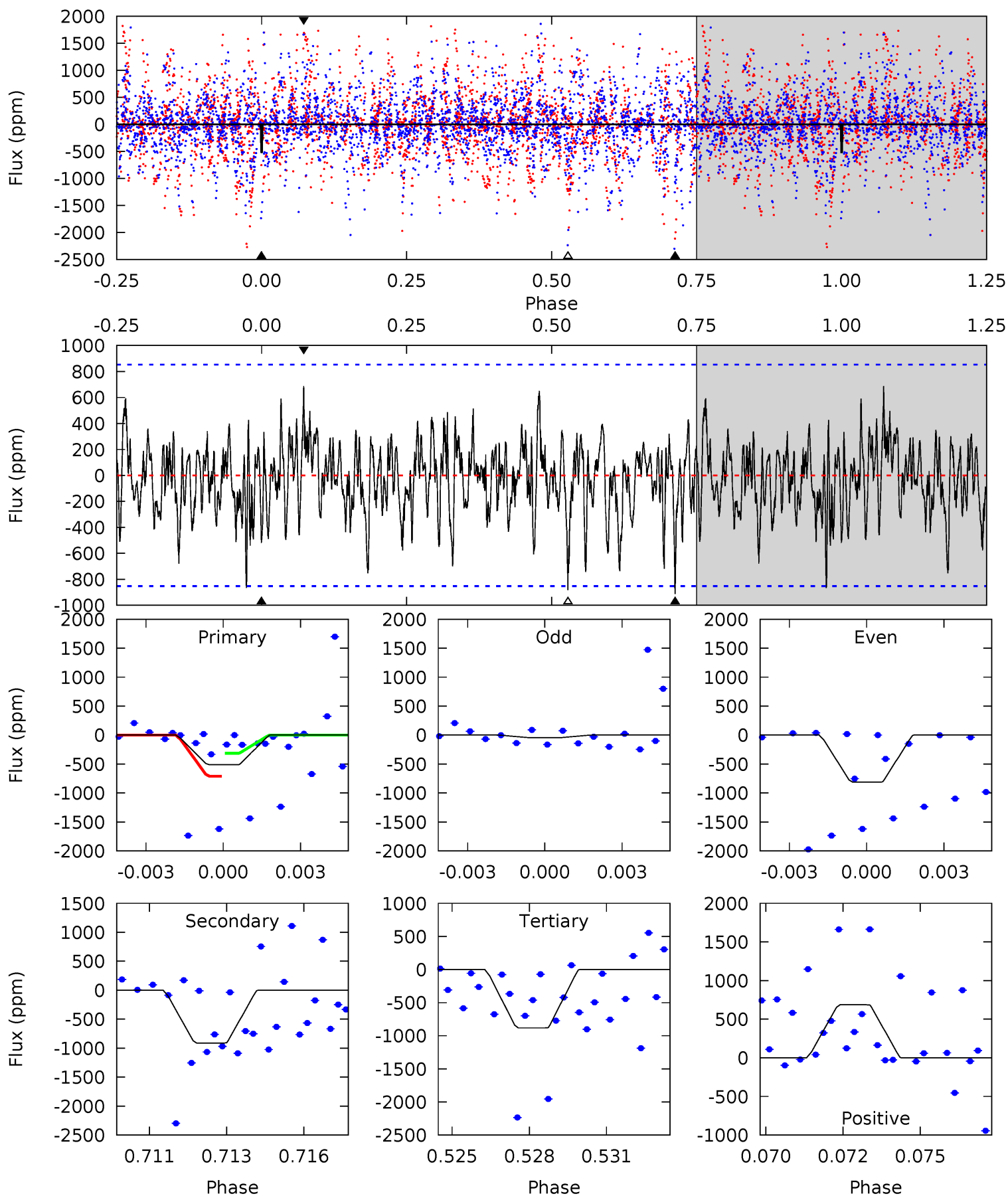
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.01	1.40	1.35	1.91	4.91	2.35	0.66	0.66	0.11	0.05	-0.50	0.49	0.39	0.57	0.29



# Alt Model-Shift Uniqueness Test

006185416-04, P = 20.467443 Days, E = 124.754422 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.18	5.66	5.47	4.25	5.28	3.01	1.47	-2.29	-1.08	0.19	1.40	2.10	2.80	0.43	1.23



### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-20 \pm 14$	$2.20^{+1.08}_{-0.96}$	$1568^{+83}_{-133}$	$4891^{+1548}_{-1074}$	$62^{+138}_{-46}$
Alt.	$-913 \pm 161$	$4.21^{+1.18}_{-1.10}$	$1559^{+85}_{-135}$	$9544^{+2029}_{-1324}$	$772^{+648}_{-308}$

$T_{max}$  = 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

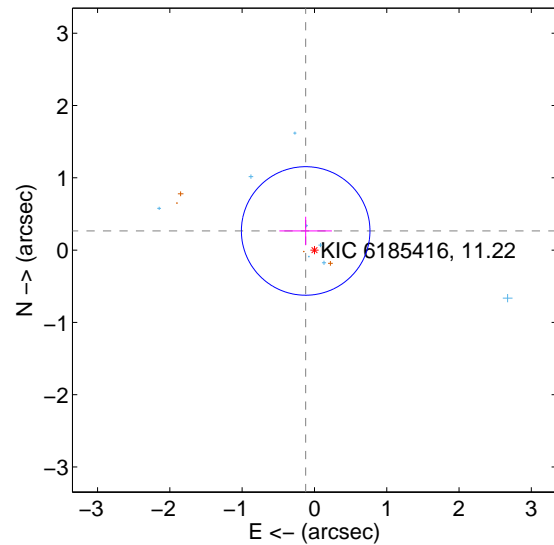
Supplemental centroid analysis for 006185416-04. **Kepler magnitude: 11.22**. Transit SNR 5.73

There are 8 quarters with good PRF difference image offsets

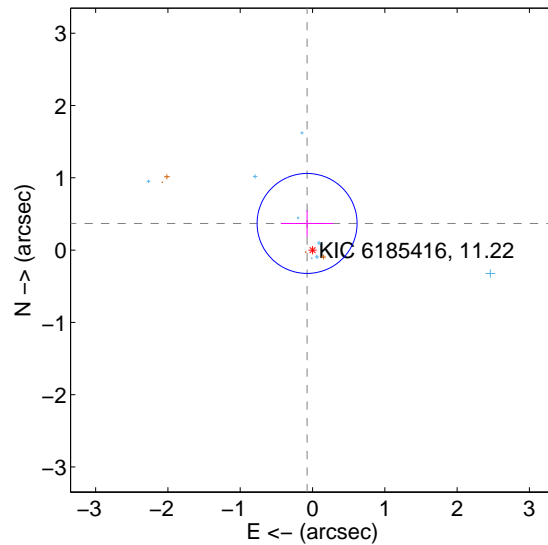
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.291 \pm 0.296$	0.98	$0.121 \pm 0.364$	$0.265 \pm 0.197$
PRF-fit source offset from KIC position	$0.376 \pm 0.230$	1.63	$0.075 \pm 0.363$	$0.369 \pm 0.182$
photometric centroid source offset	$0.77 \pm 0.67$	1.15	$0.76 \pm 0.68$	$-0.14 \pm 0.54$

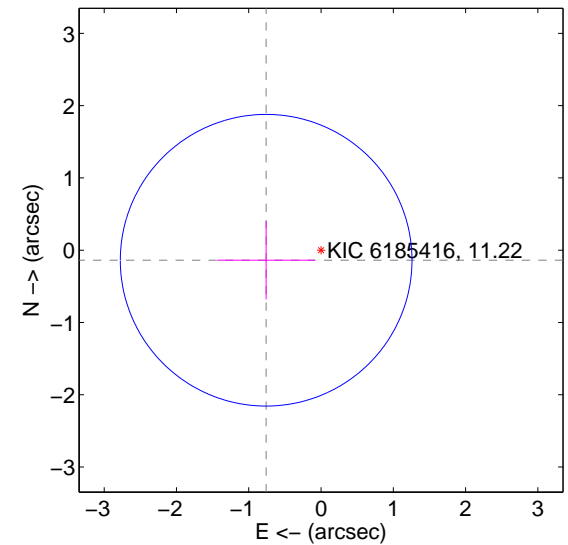
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

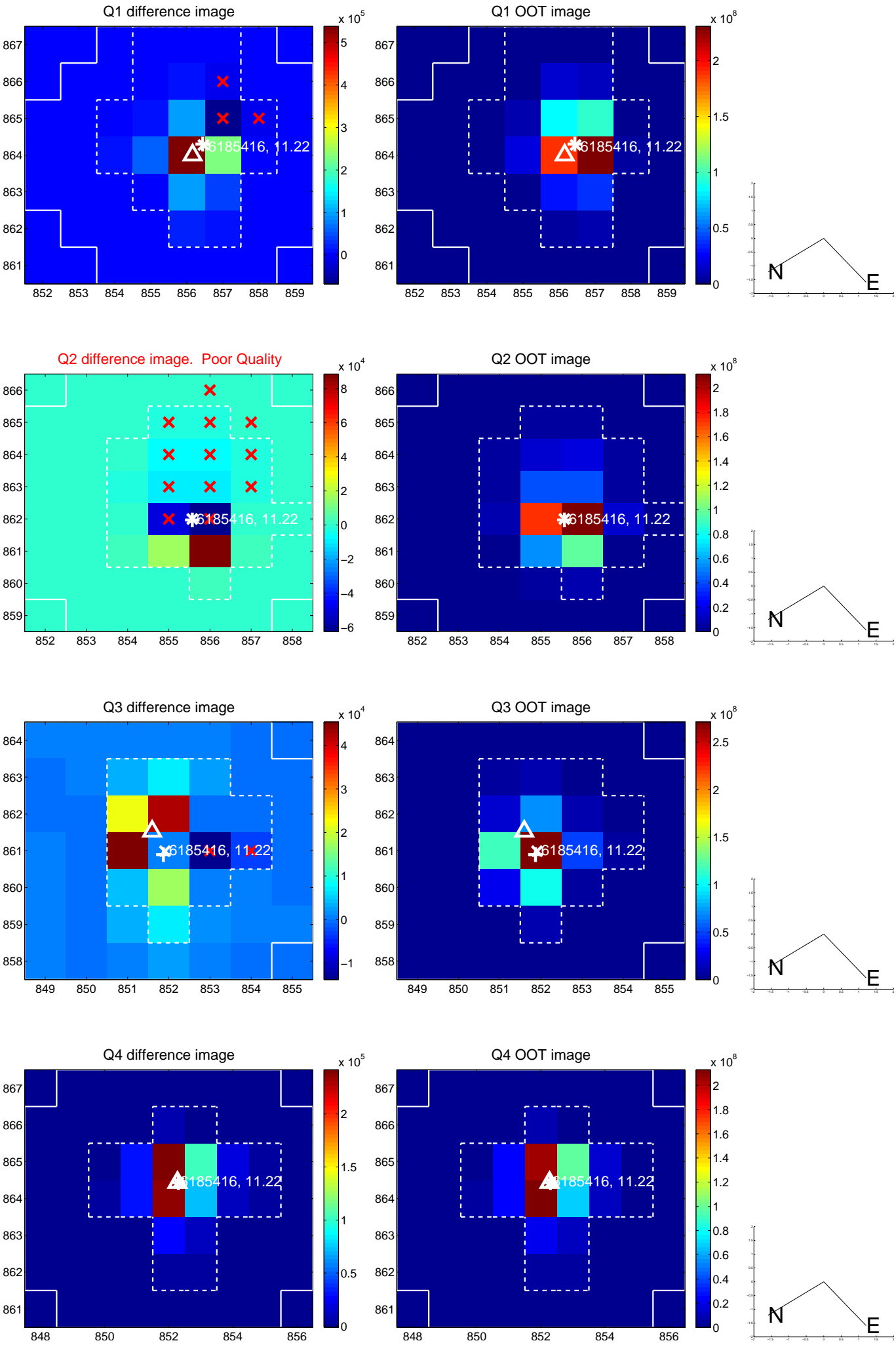


offset from photometric centroids

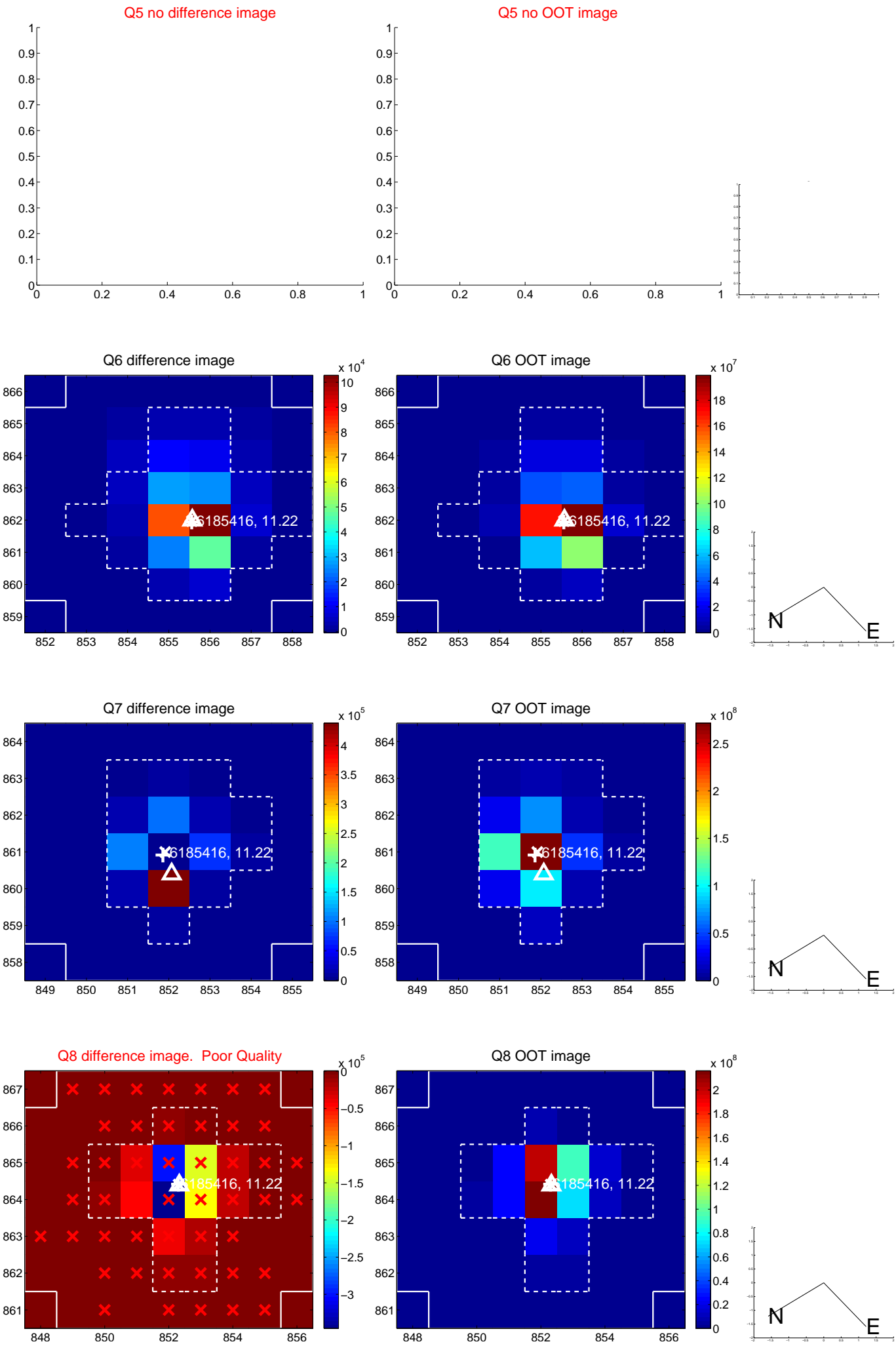


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

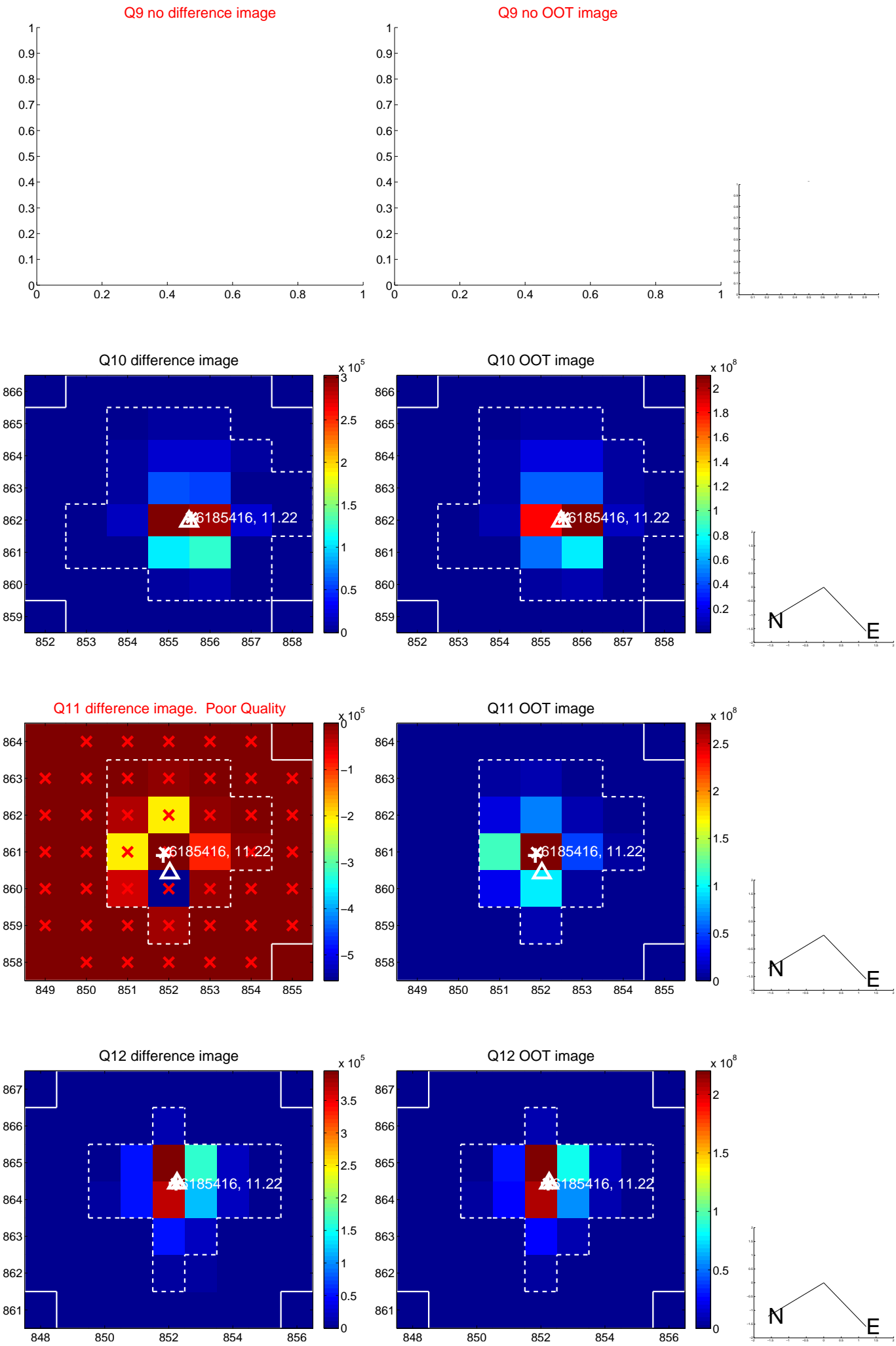


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

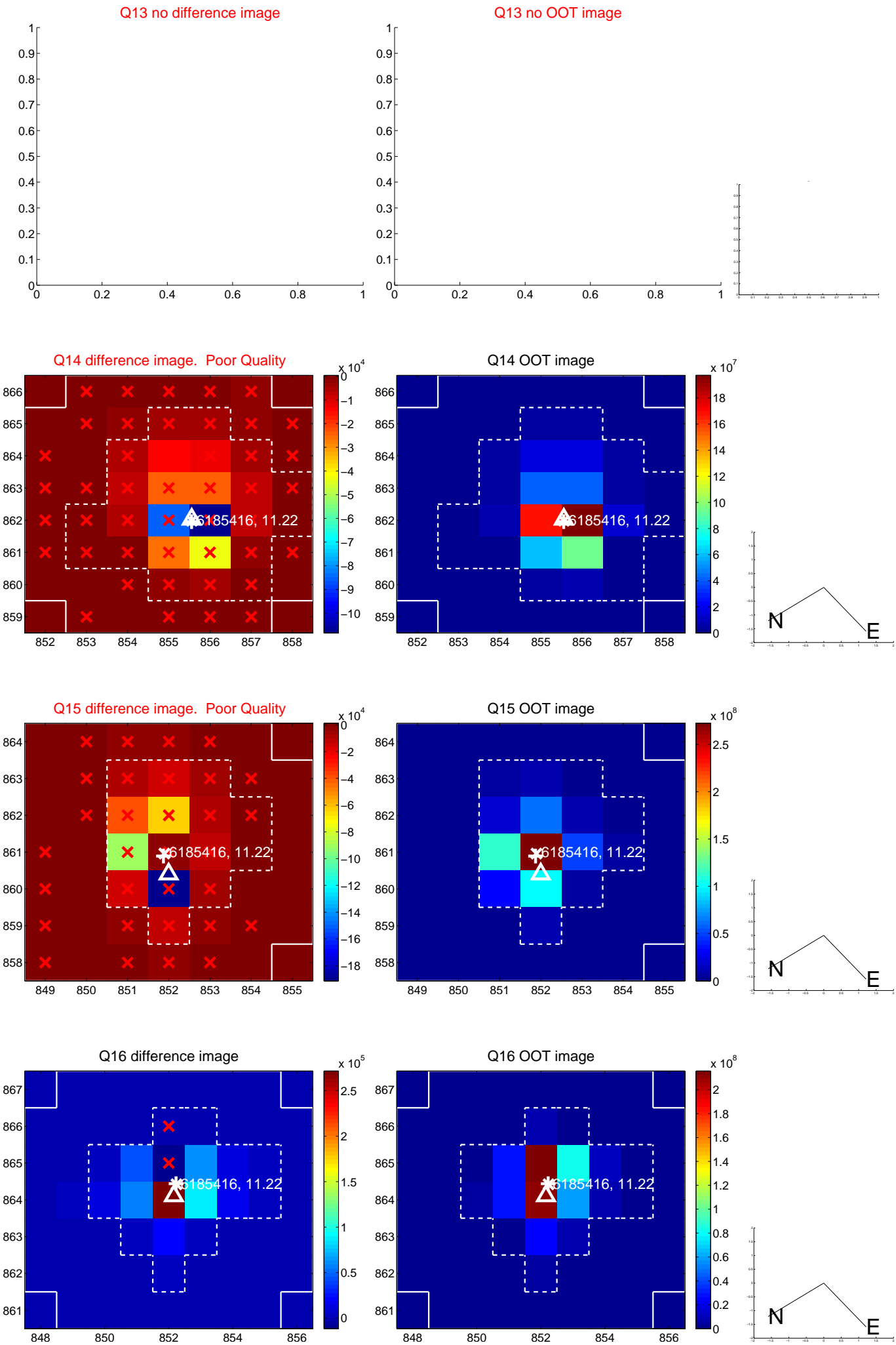




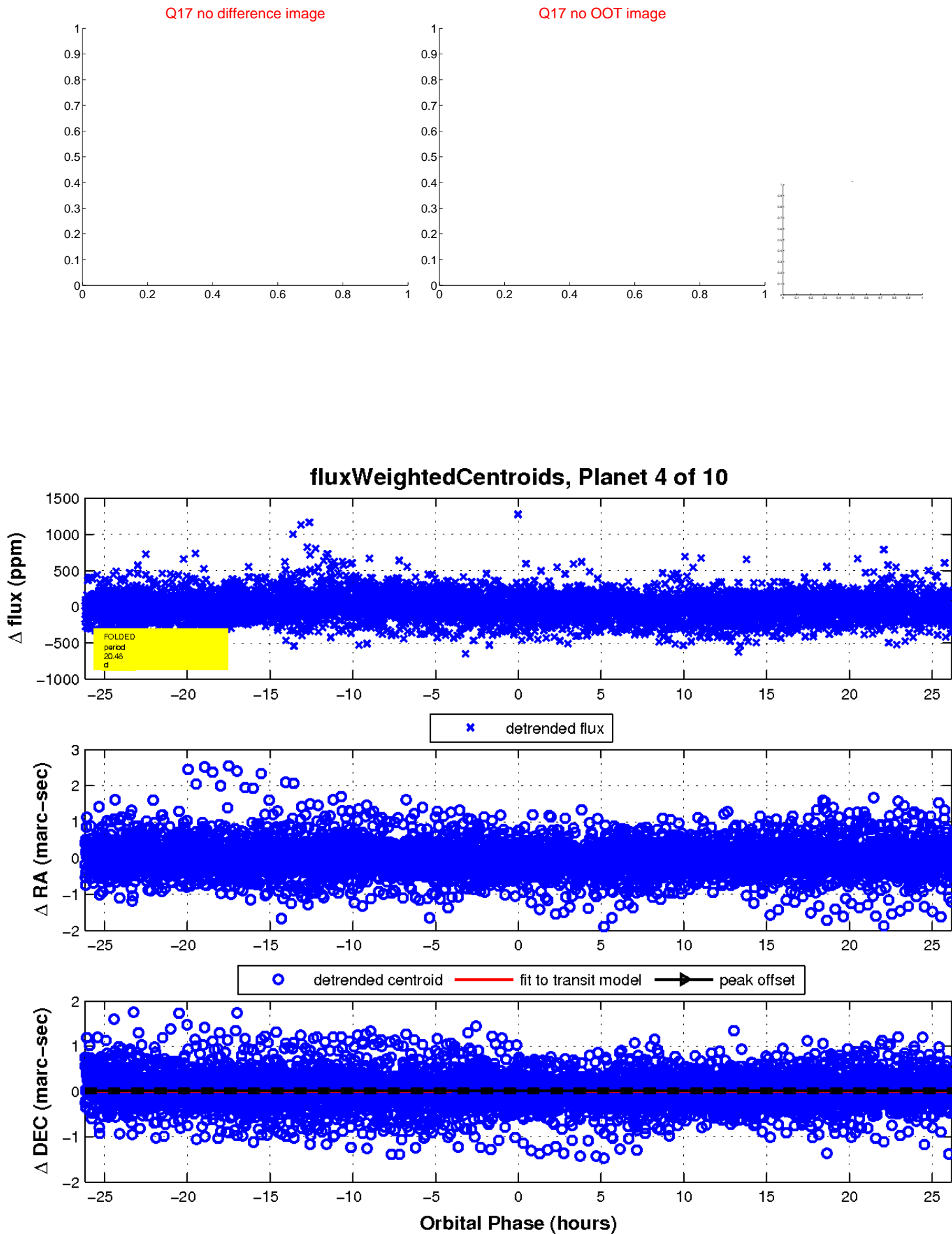
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

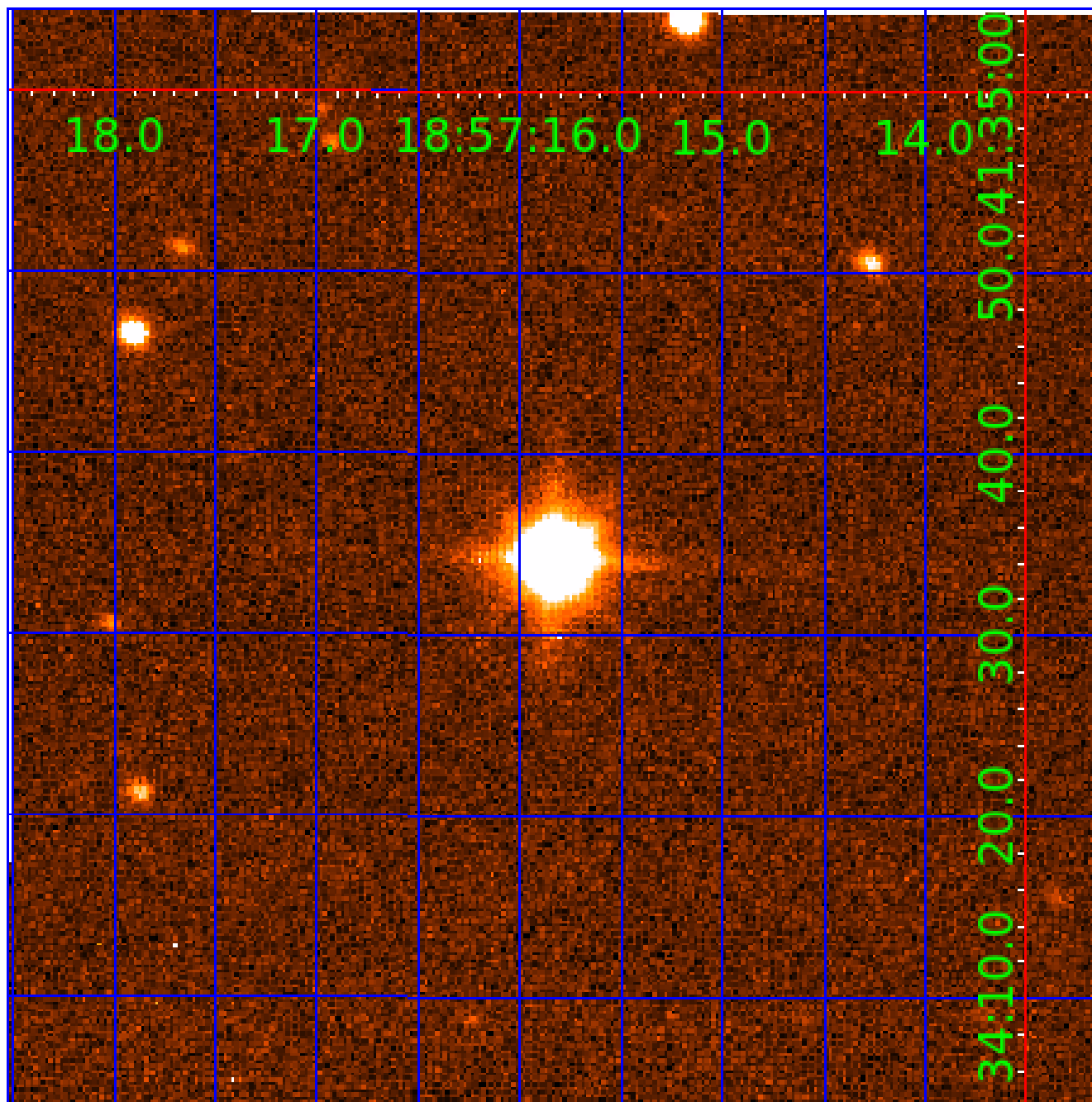


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

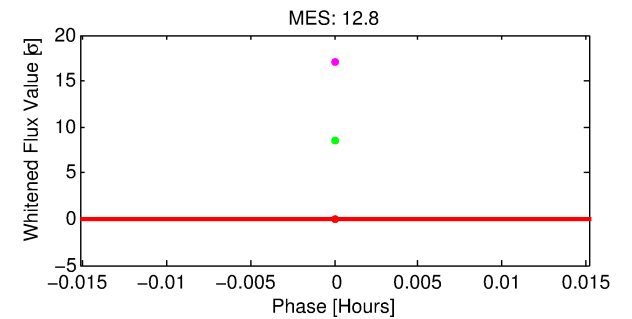
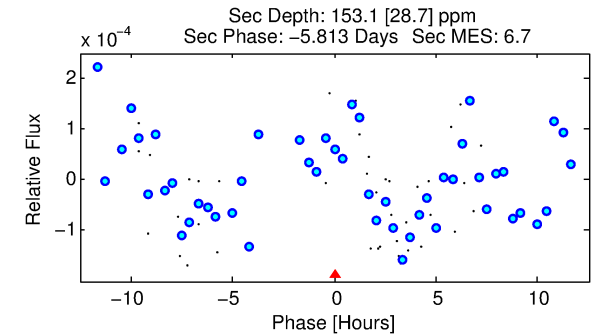
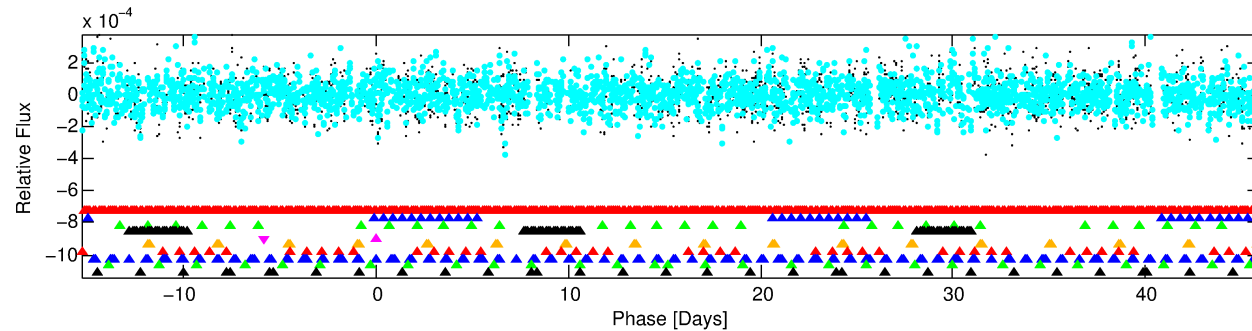
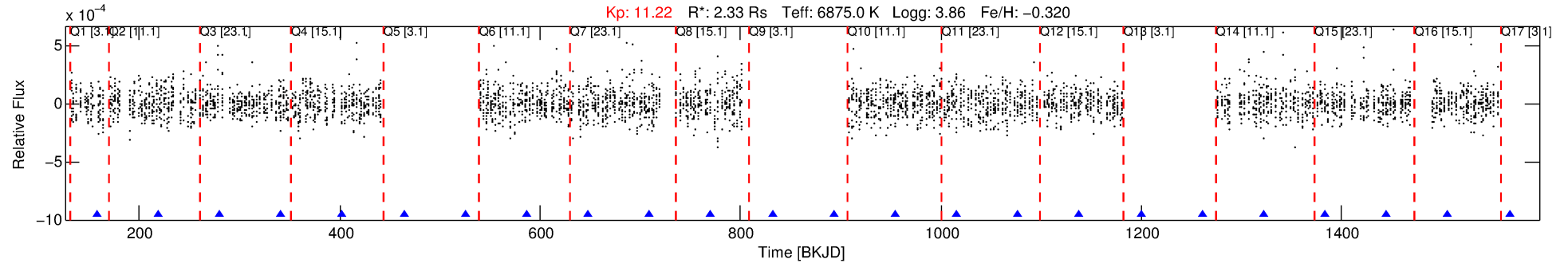
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006185416-05

No Significant Match Found

# DV One-Page Summary

KIC: 6185416 Candidate: 5 of 10 Period: 61.303 d



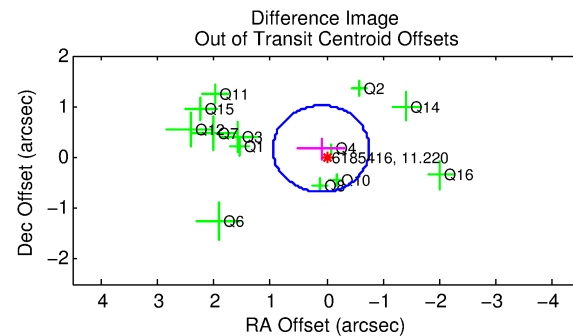
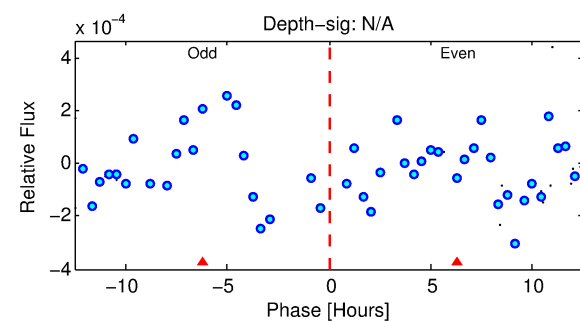
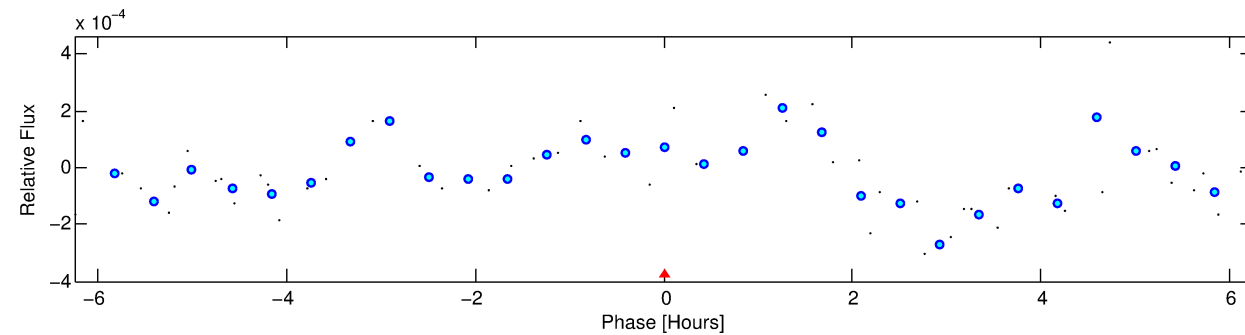
## TPS TCE Results:

Period = 61.30339 d  
Epoch = 157.5891 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

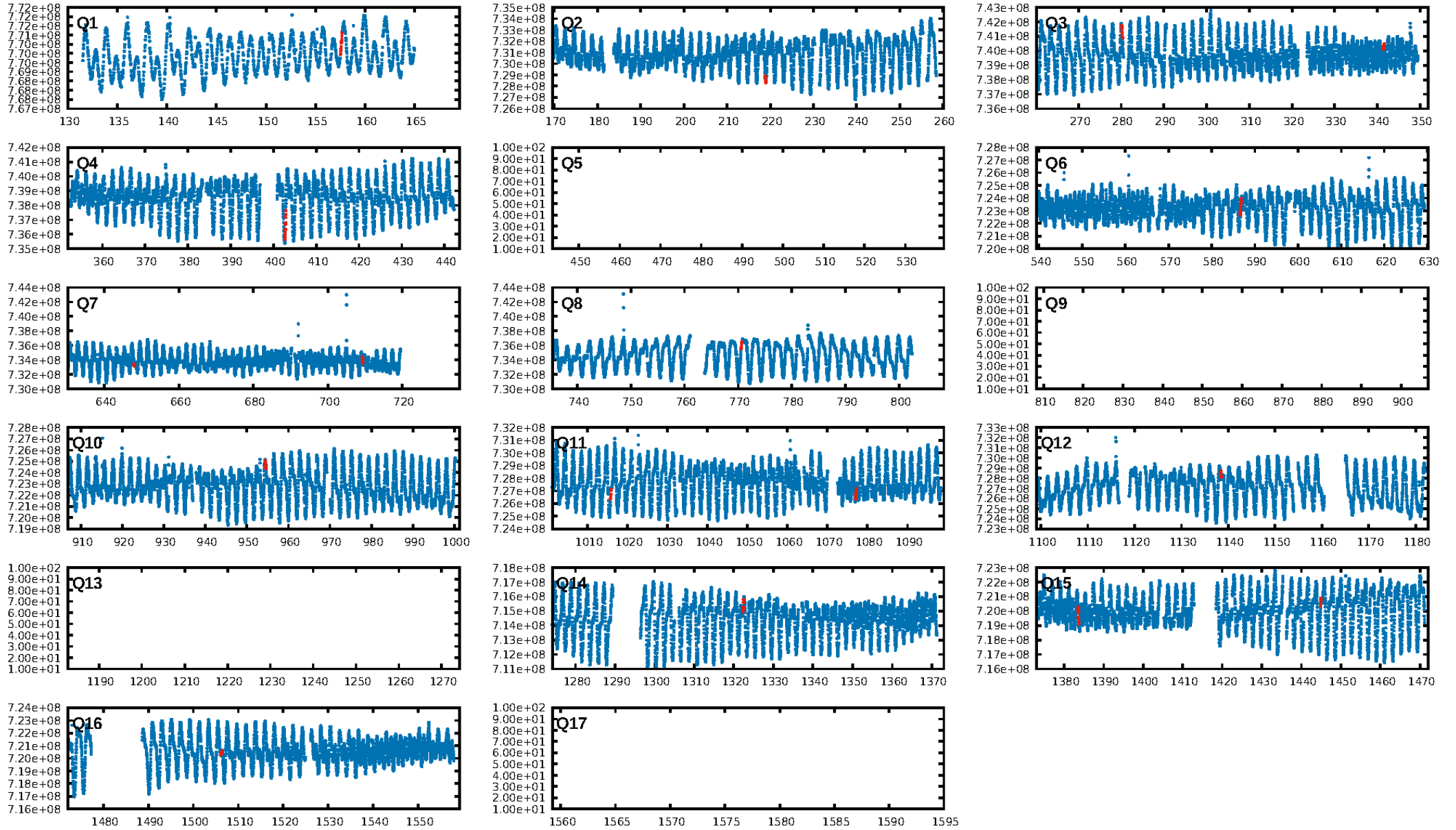
ShortPeriod-sig: 100.0% [95.02 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.1331  
Centroid-sig: N/A  
Centroid-so: 0.208 arcsec [0.62 $\sigma$ ]  
OotOffset-rm: 0.191 arcsec [0.67 $\sigma$ ]  
KicOffset-rm: 0.249 arcsec [0.82 $\sigma$ ]  
OotOffset-st: 4/4/4/1 [13]  
KicOffset-st: 4/4/4/1 [13]  
DiffImageQuality-fgm: 0.54 [7/13]  
DiffImageOverlap-fno: 0.62 [8/13]



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:42 Z

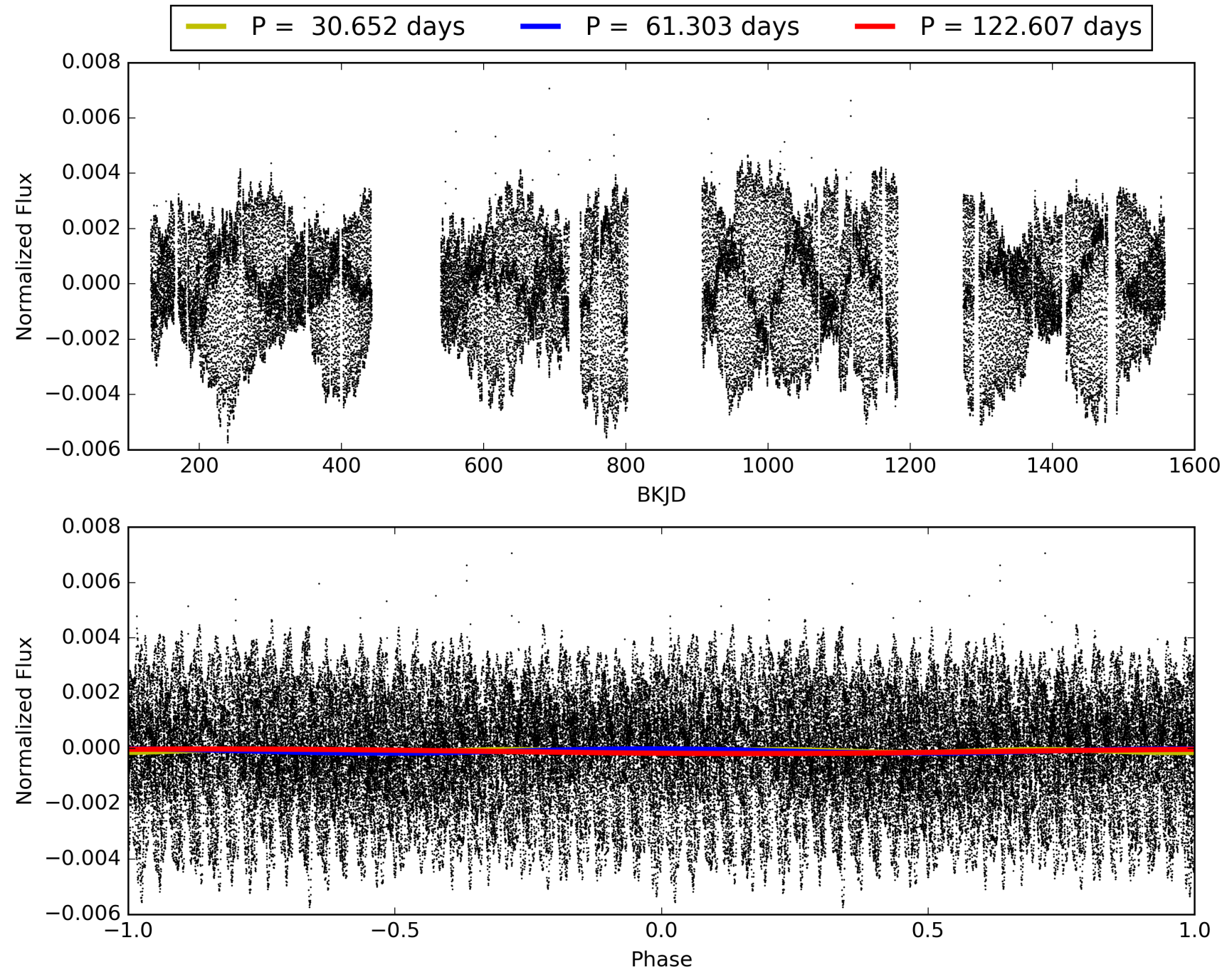
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006185416-05, PDC Light Curves





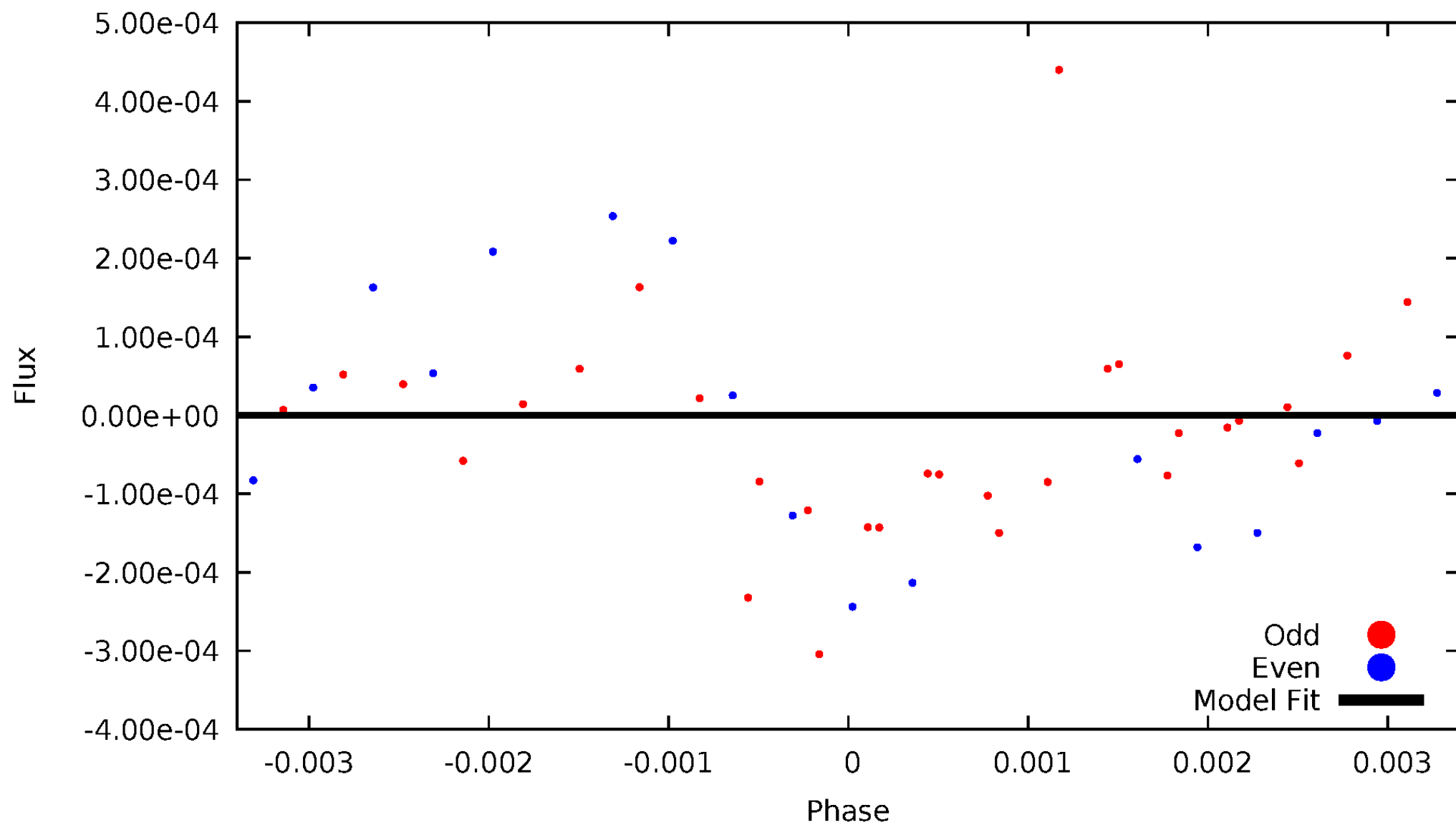
# TCE 006185416-05





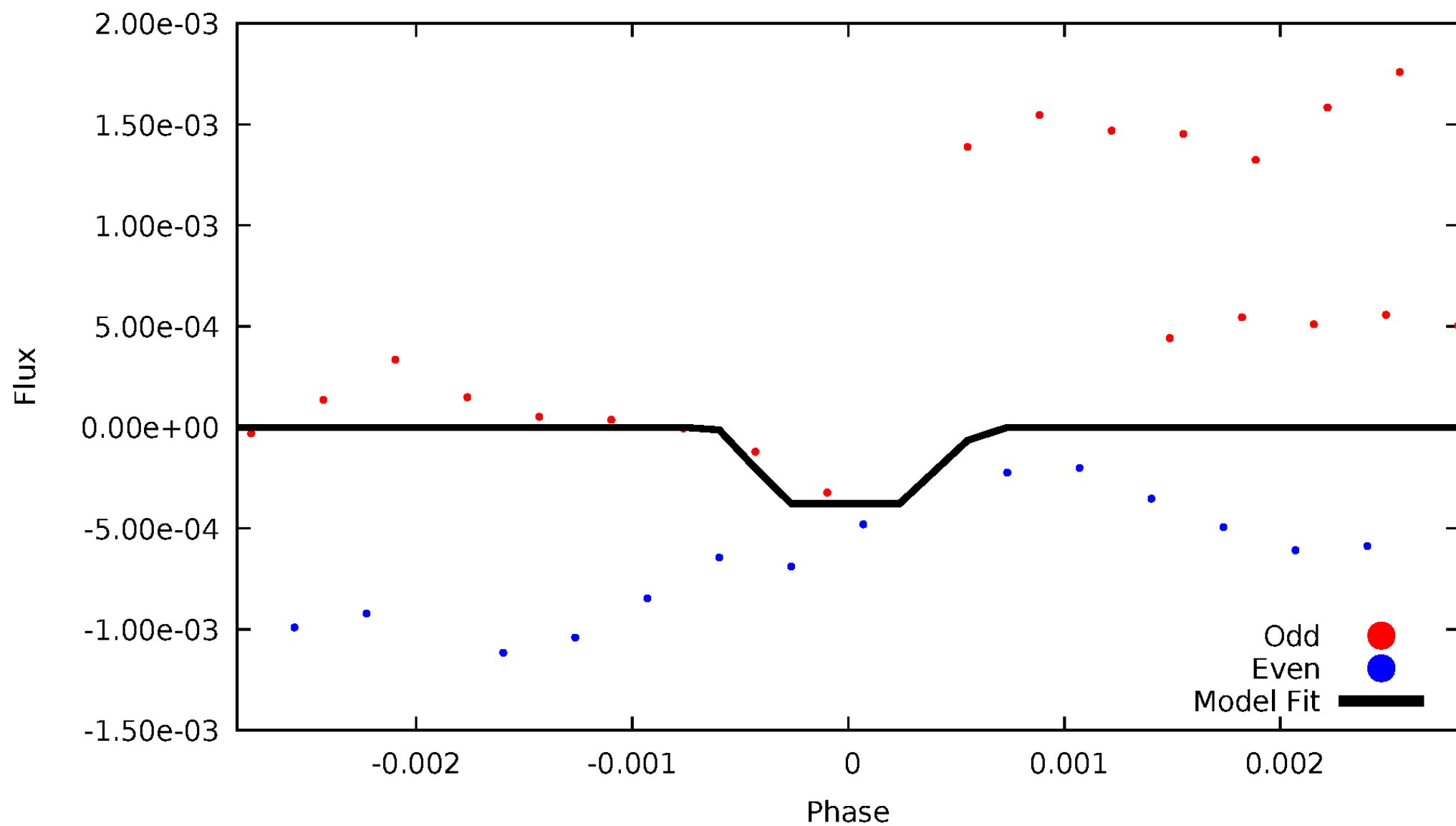
# DV Odd/Even

TCE 006185416-05

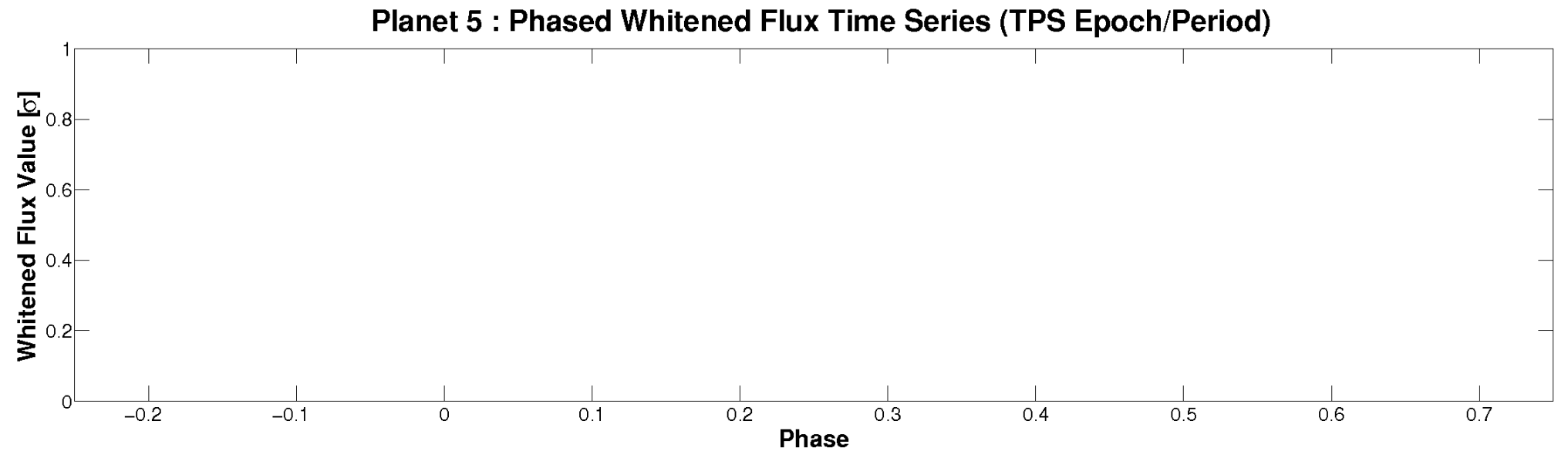
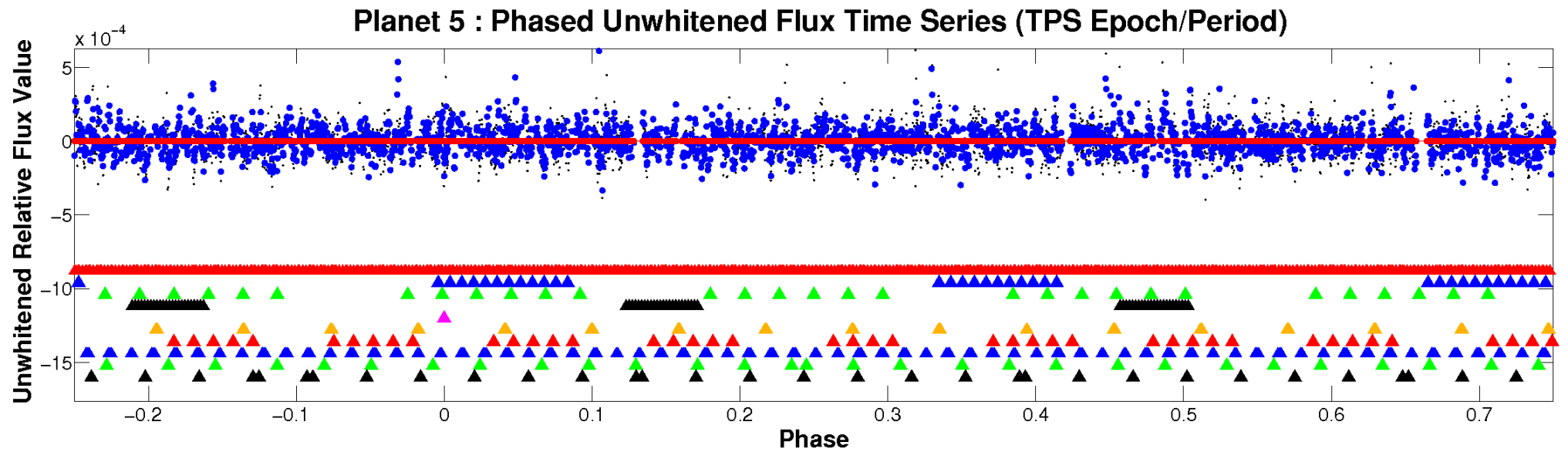


# ALT Odd/Even

TCE 006185416-05

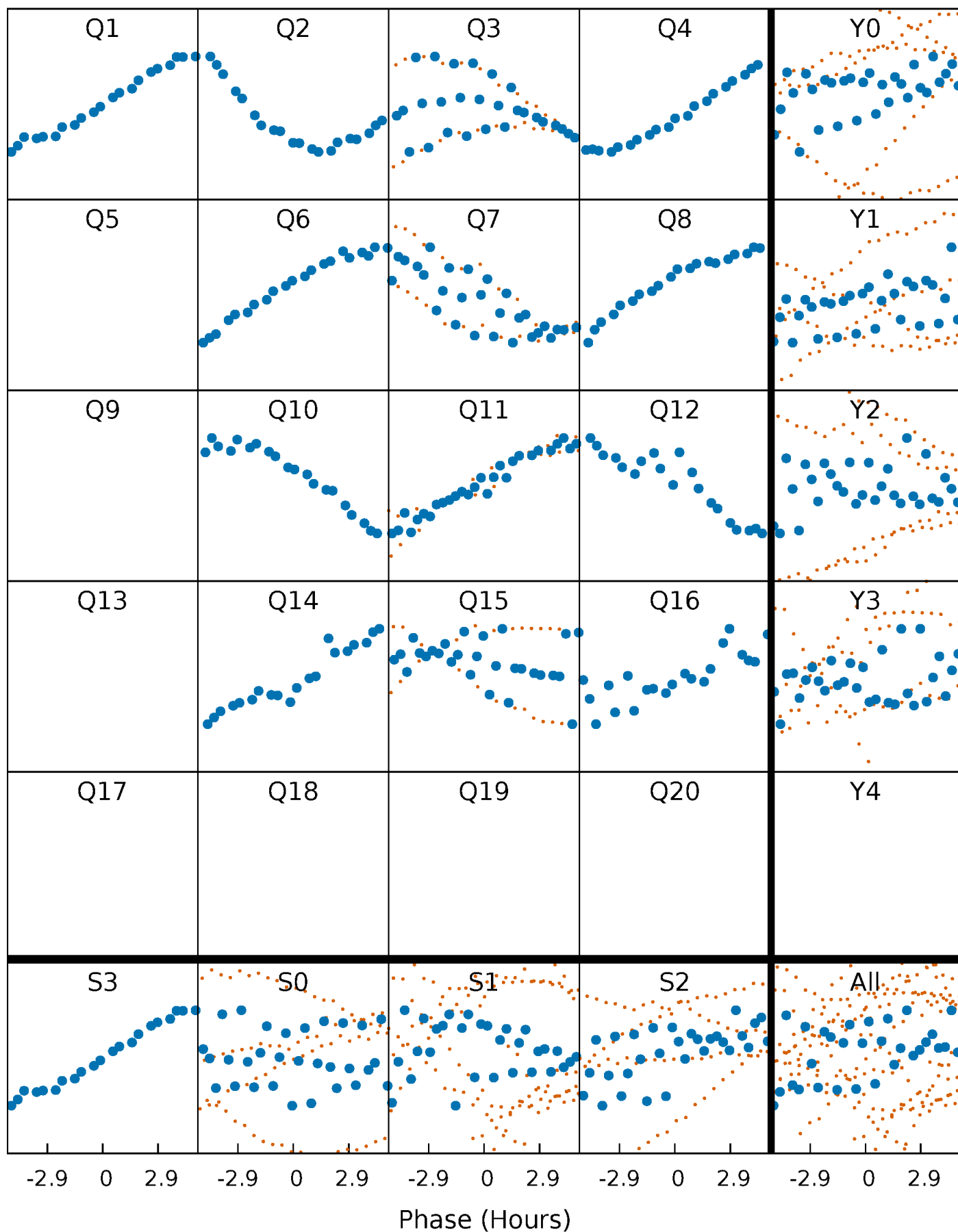


# Non-Whitened Vs. Whitened Light Curve



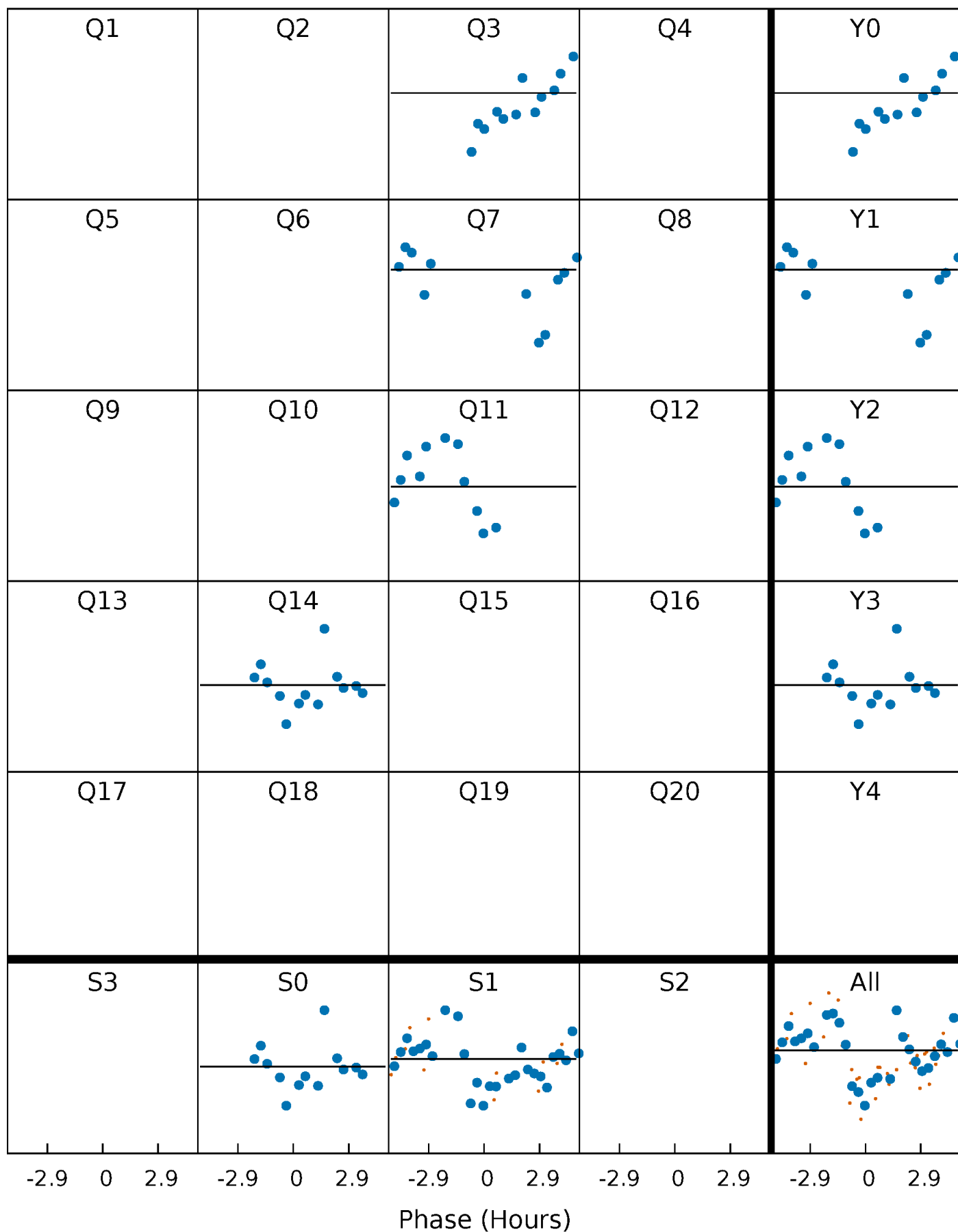
# PDC Quarter-Phased Transit Curves

TCE 006185416-05     $P = 61.303390$  Days     $T_0 = 157.589125$  (BKJD)



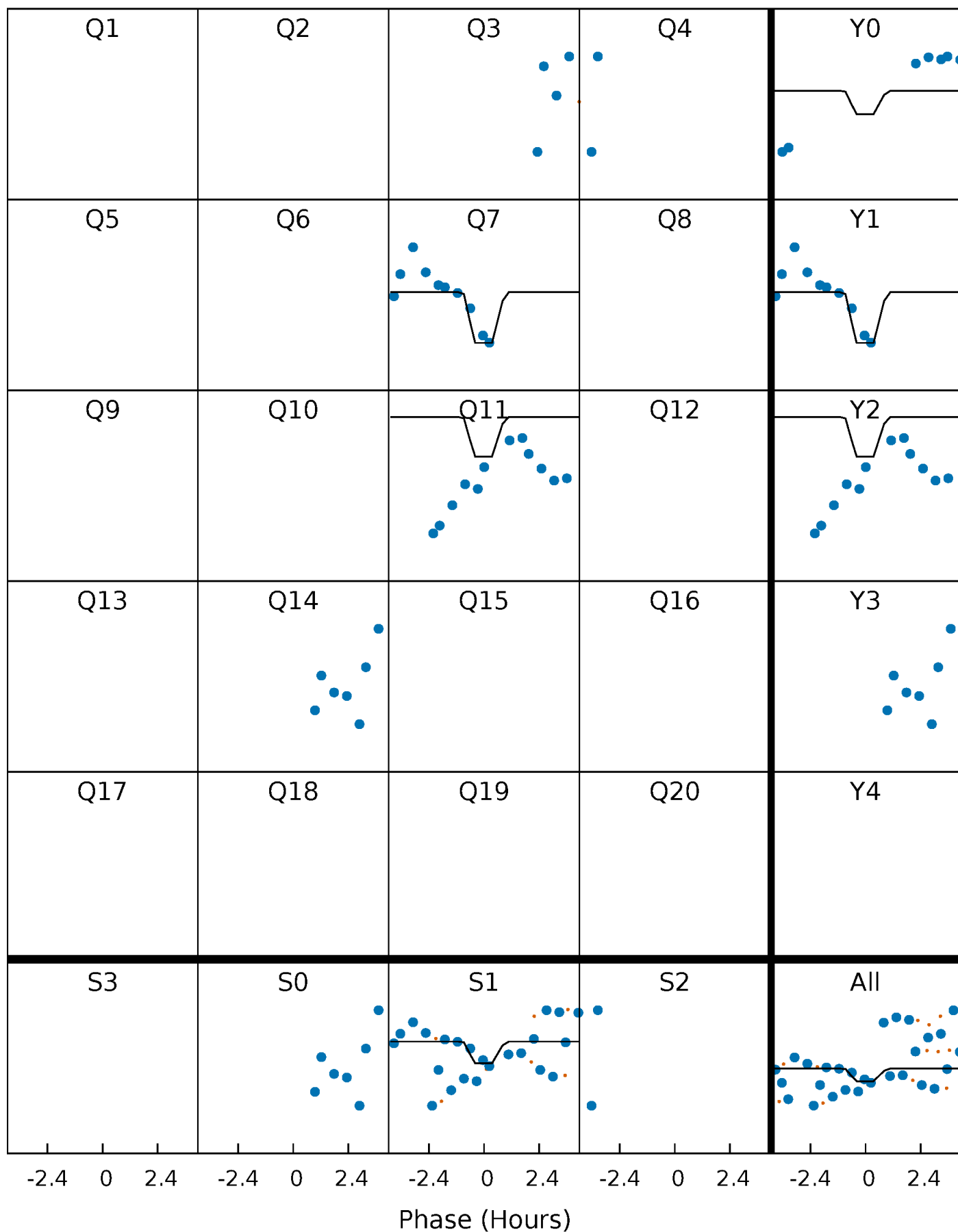
# DV Quarter-Phased Transit Curves

TCE 006185416-05    P= 61.303390 Days     $T_0=157.589125$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

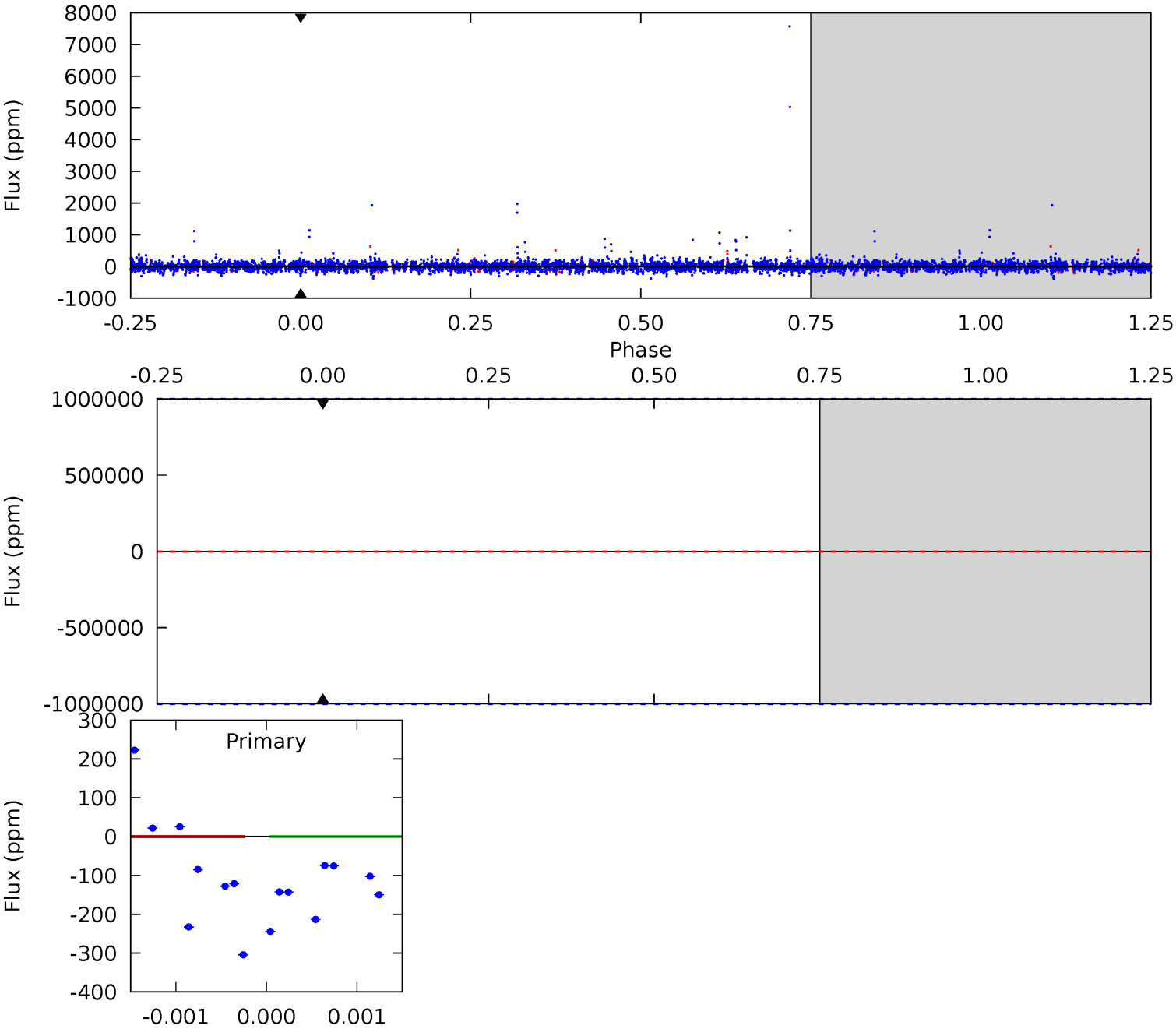
TCE 006185416-05    P= 61.303390 Days     $T_0=157.463719$  (BKJD)



# DV Model-Shift Uniqueness Test

006185416-05, P = 61.303390 Days, E = 96.285735 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

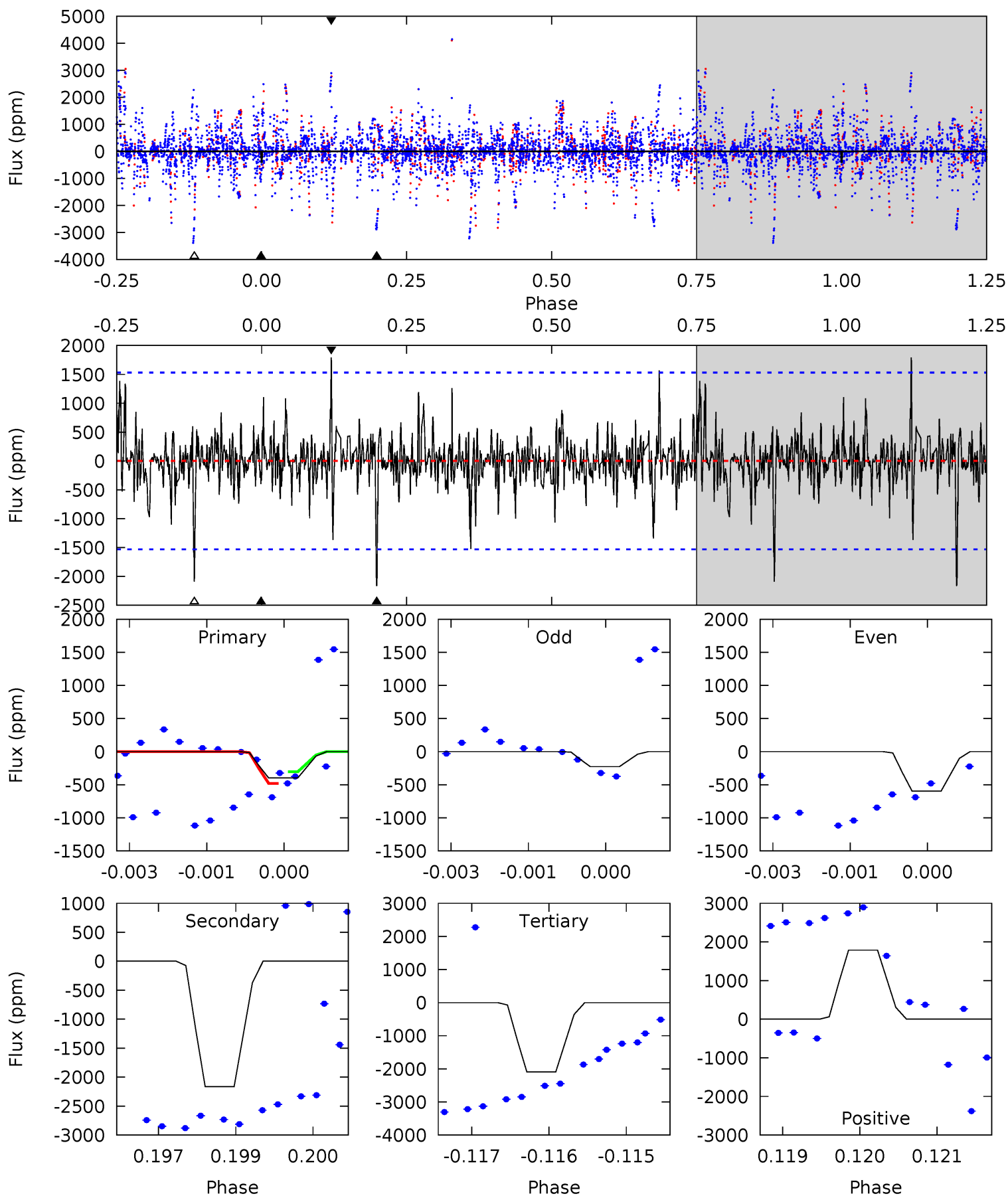




# Alt Model-Shift Uniqueness Test

006185416-05, P = 61.303390 Days, E = 96.160329 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
1.40	7.63	7.37	6.31	5.40	3.21	1.22	-5.97	-4.91	0.26	1.32	0.57	1.00	0.45	0.32



### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$17.37^{+19.18}_{-12.03}$	$1080^{+68}_{-93}$	$5681^{+31989}_{-36487}$	$530^{+47676}_{-36320}$
Alt.	$-2164 \pm 283$	$17.67^{+19.37}_{-12.09}$	$1084^{+70}_{-93}$	$5423^{+5122}_{-1375}$	$440^{+4363}_{-343}$

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

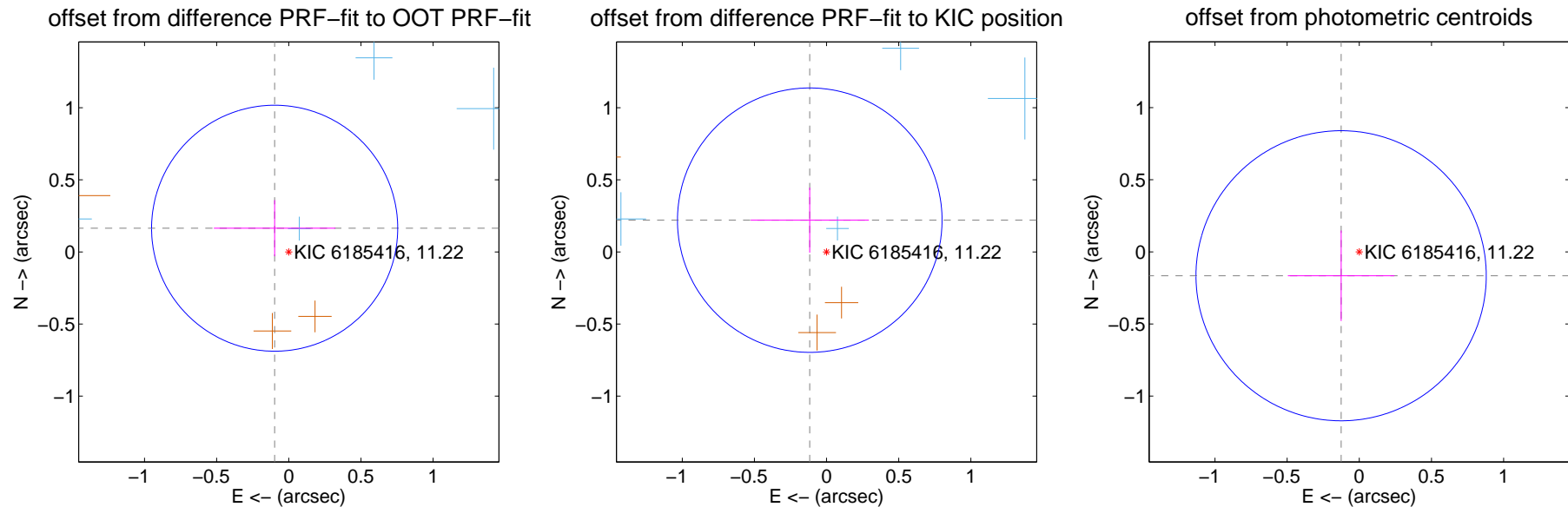
## DV Centroid Data

Supplemental centroid analysis for 006185416-05. **Kepler magnitude: 11.22**. Transit SNR -1.00

There are 7 quarters with good PRF difference image offsets

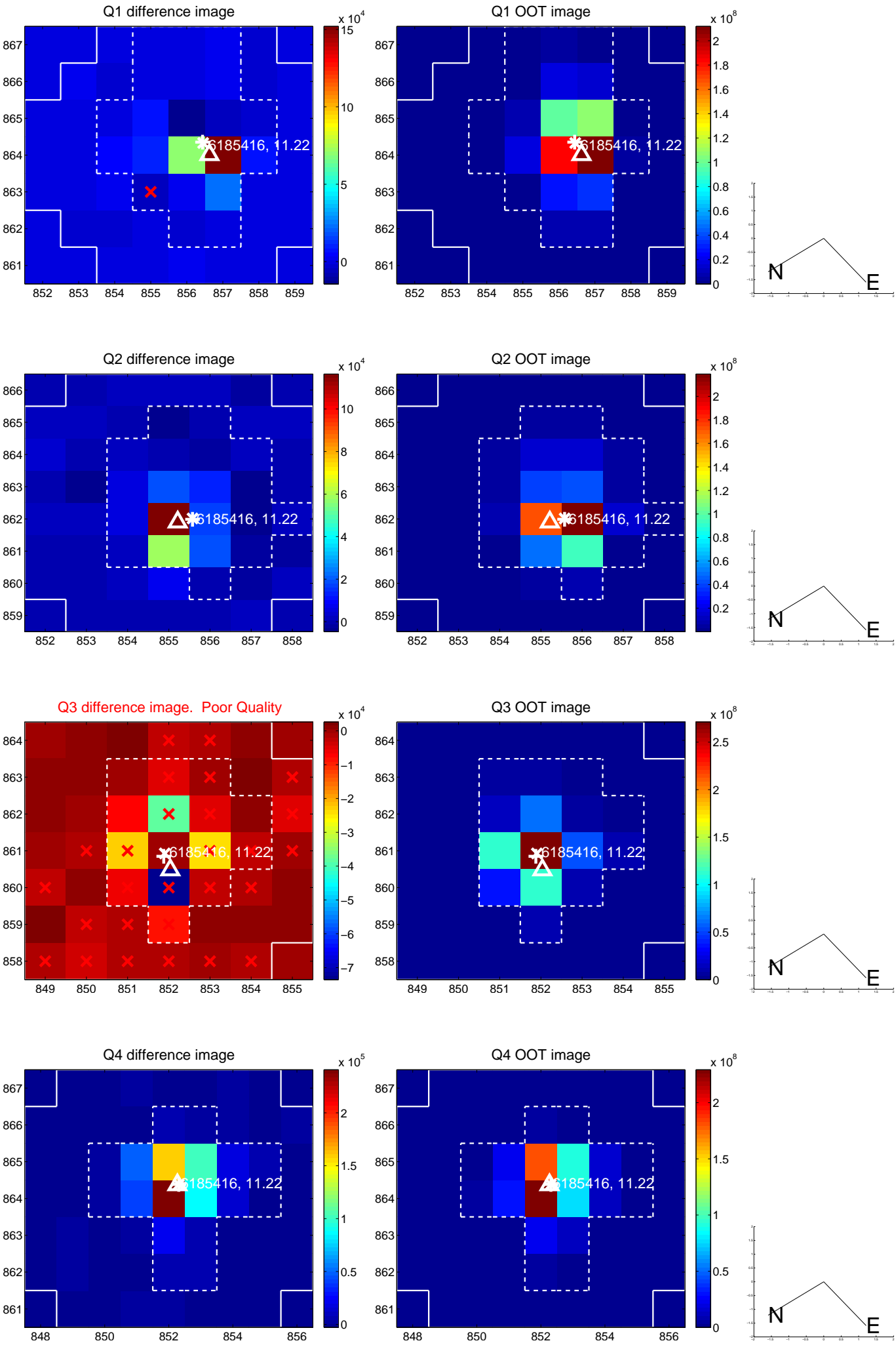
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.191 \pm 0.284$	0.67	$0.098 \pm 0.421$	$0.164 \pm 0.195$
PRF-fit source offset from KIC position	$0.249 \pm 0.306$	0.82	$0.117 \pm 0.410$	$0.220 \pm 0.225$
photometric centroid source offset	$0.21 \pm 0.34$	0.62	$0.13 \pm 0.37$	$-0.17 \pm 0.31$

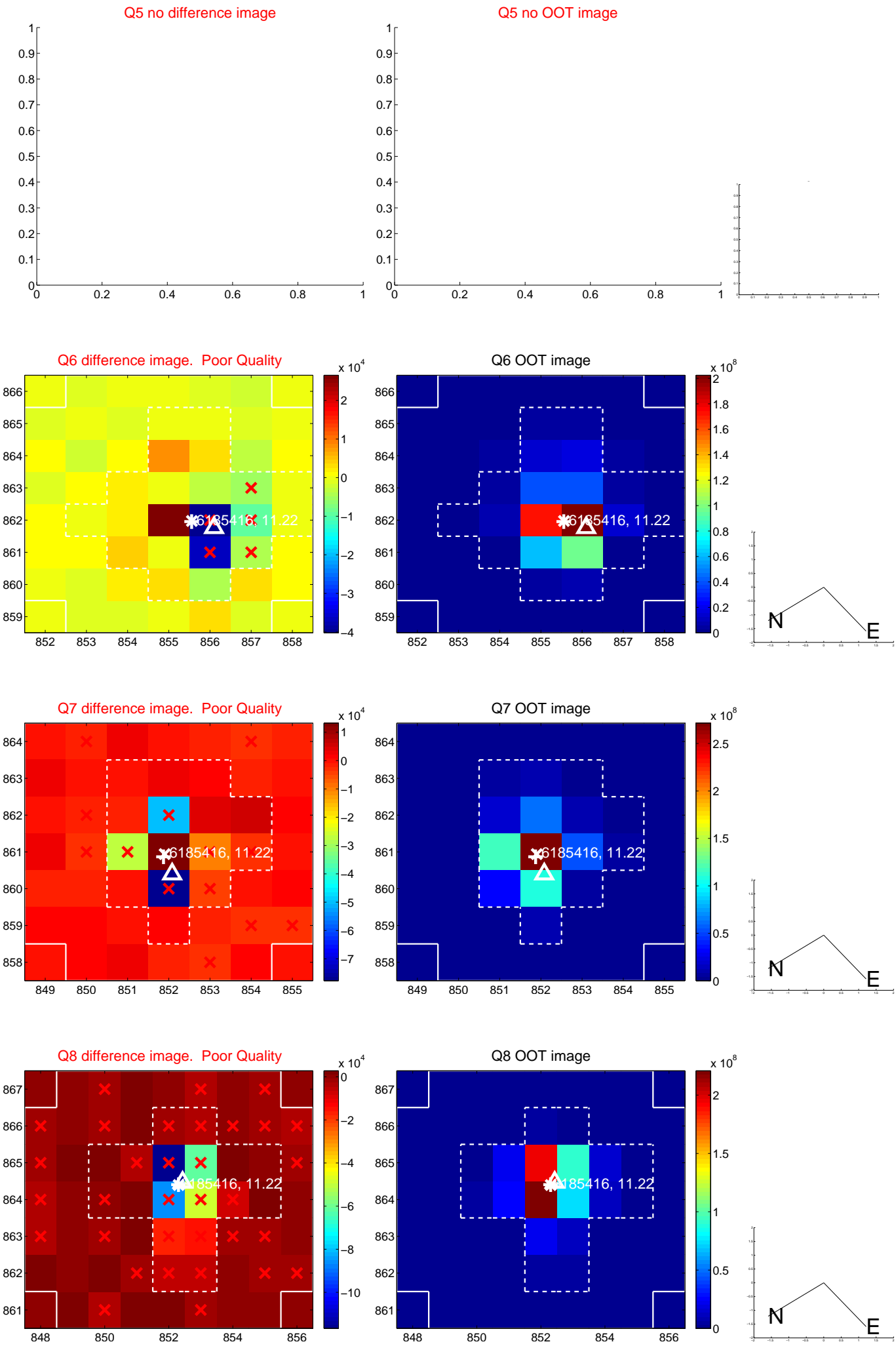


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

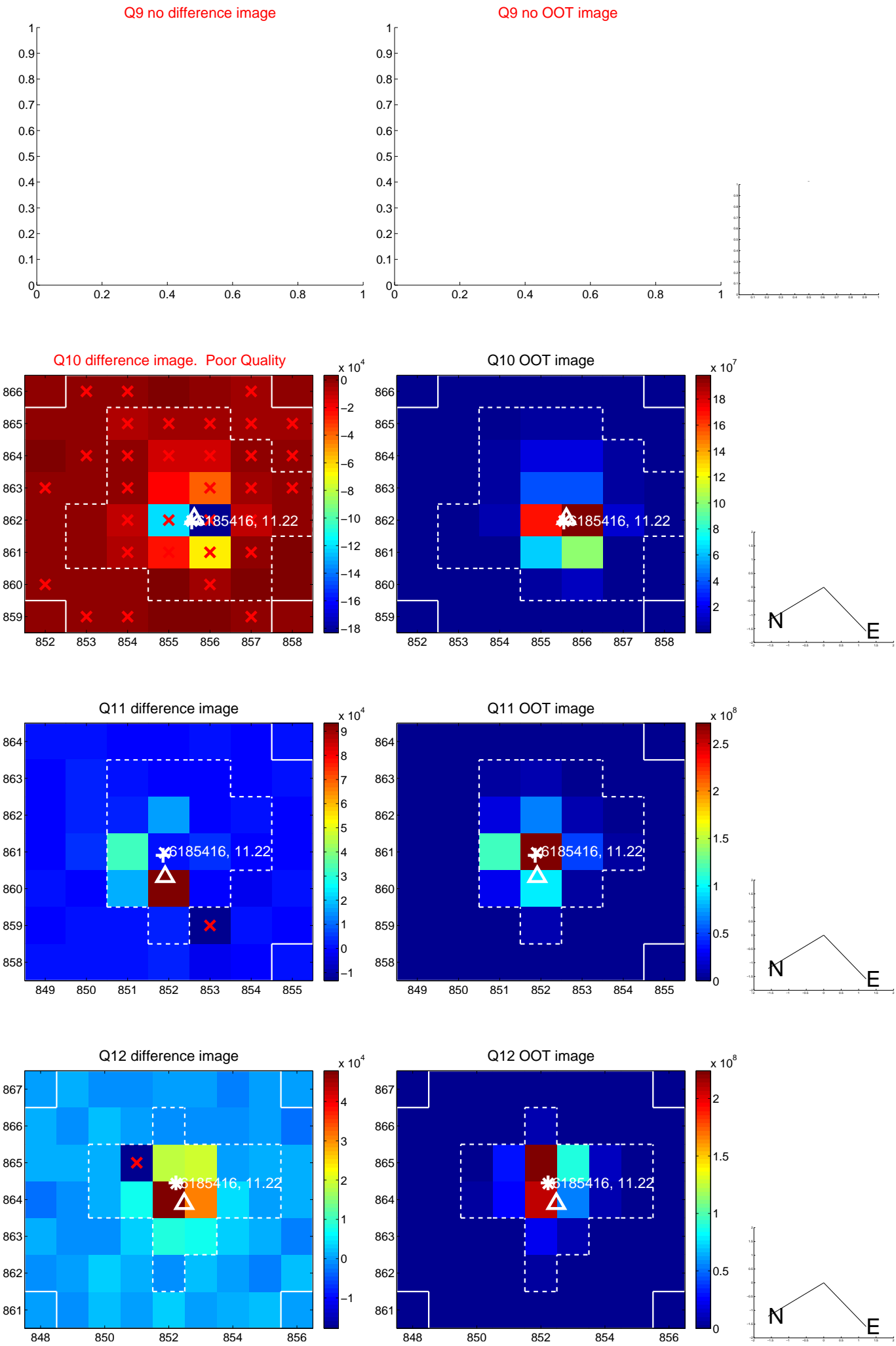
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



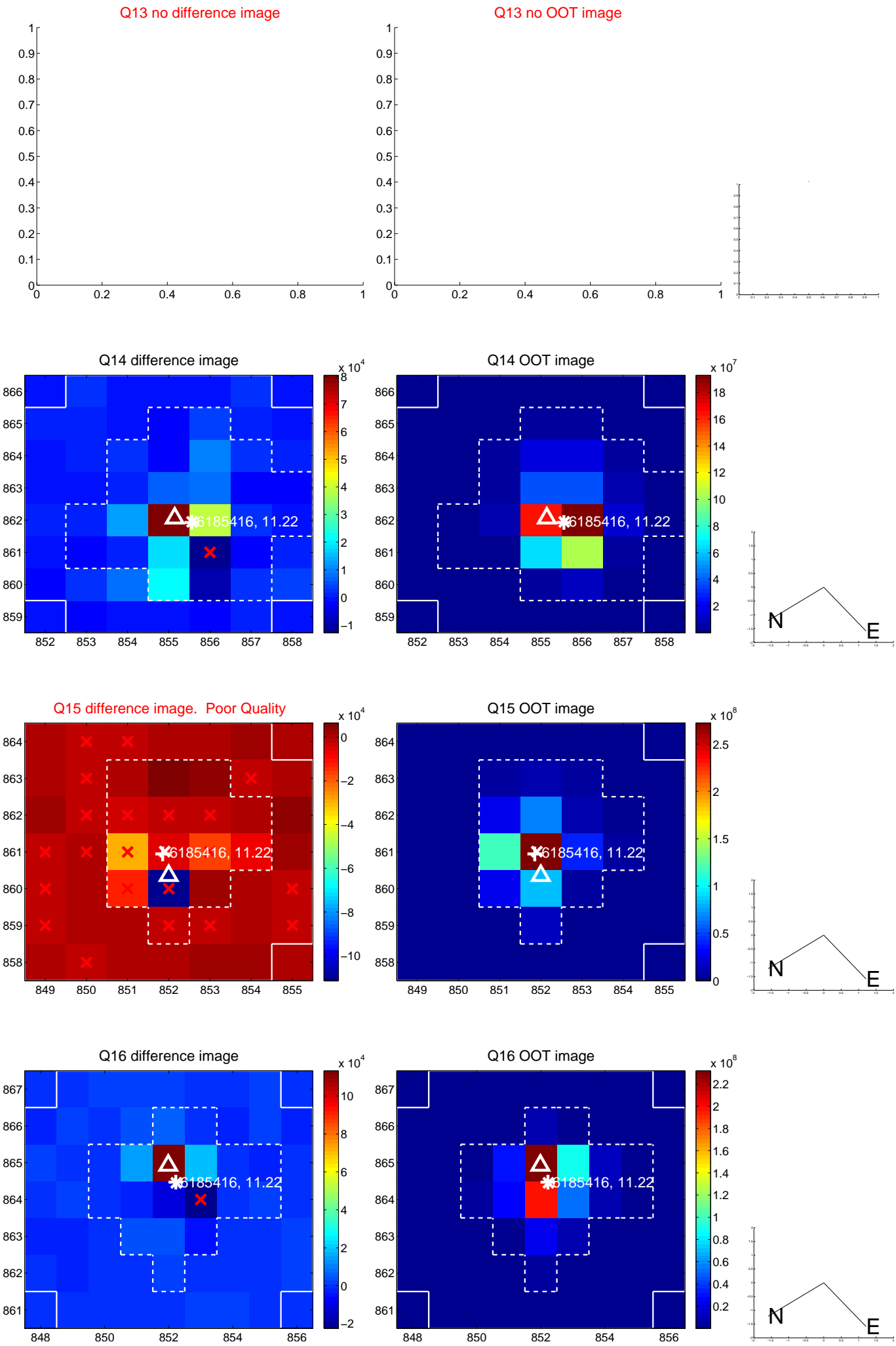
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

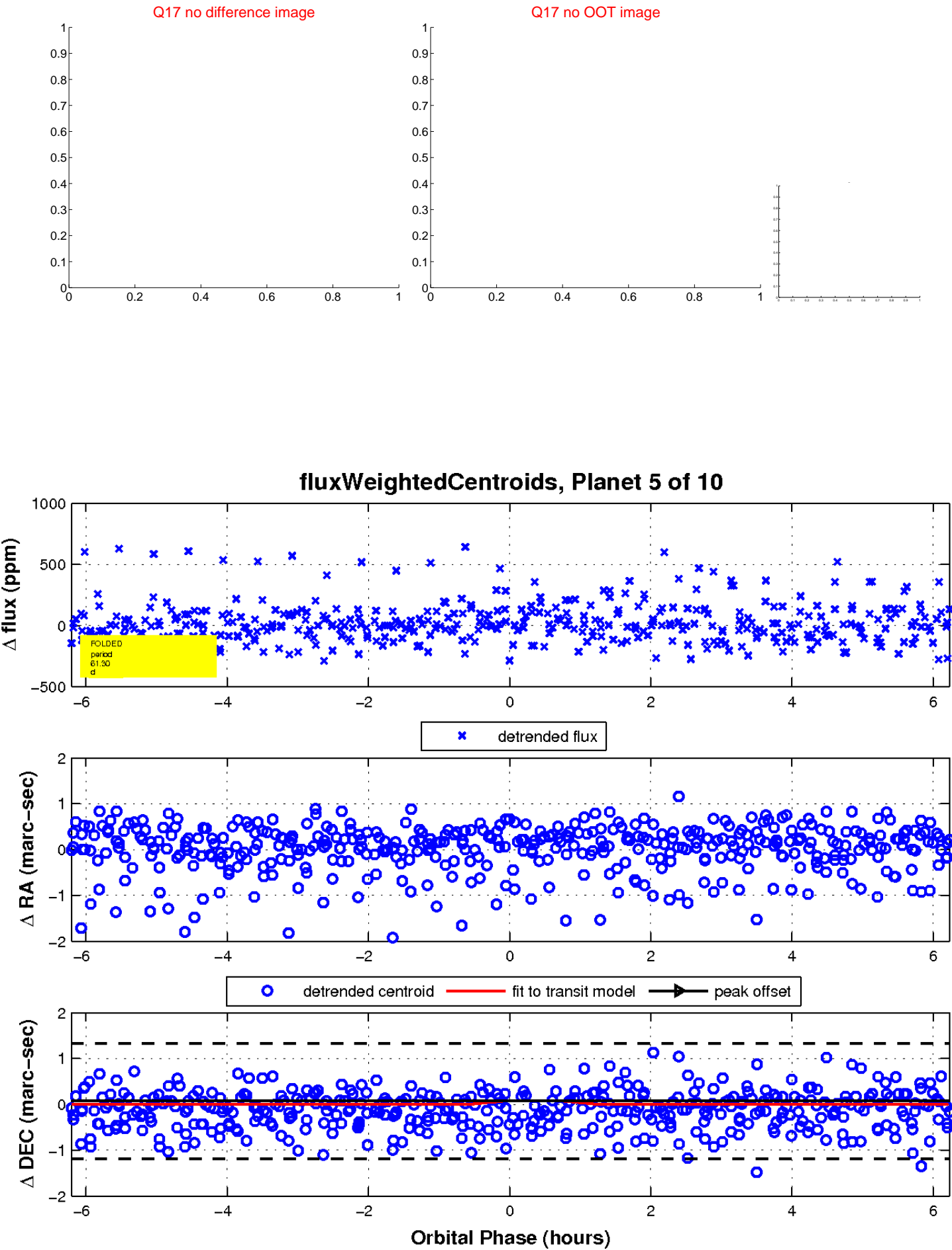


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



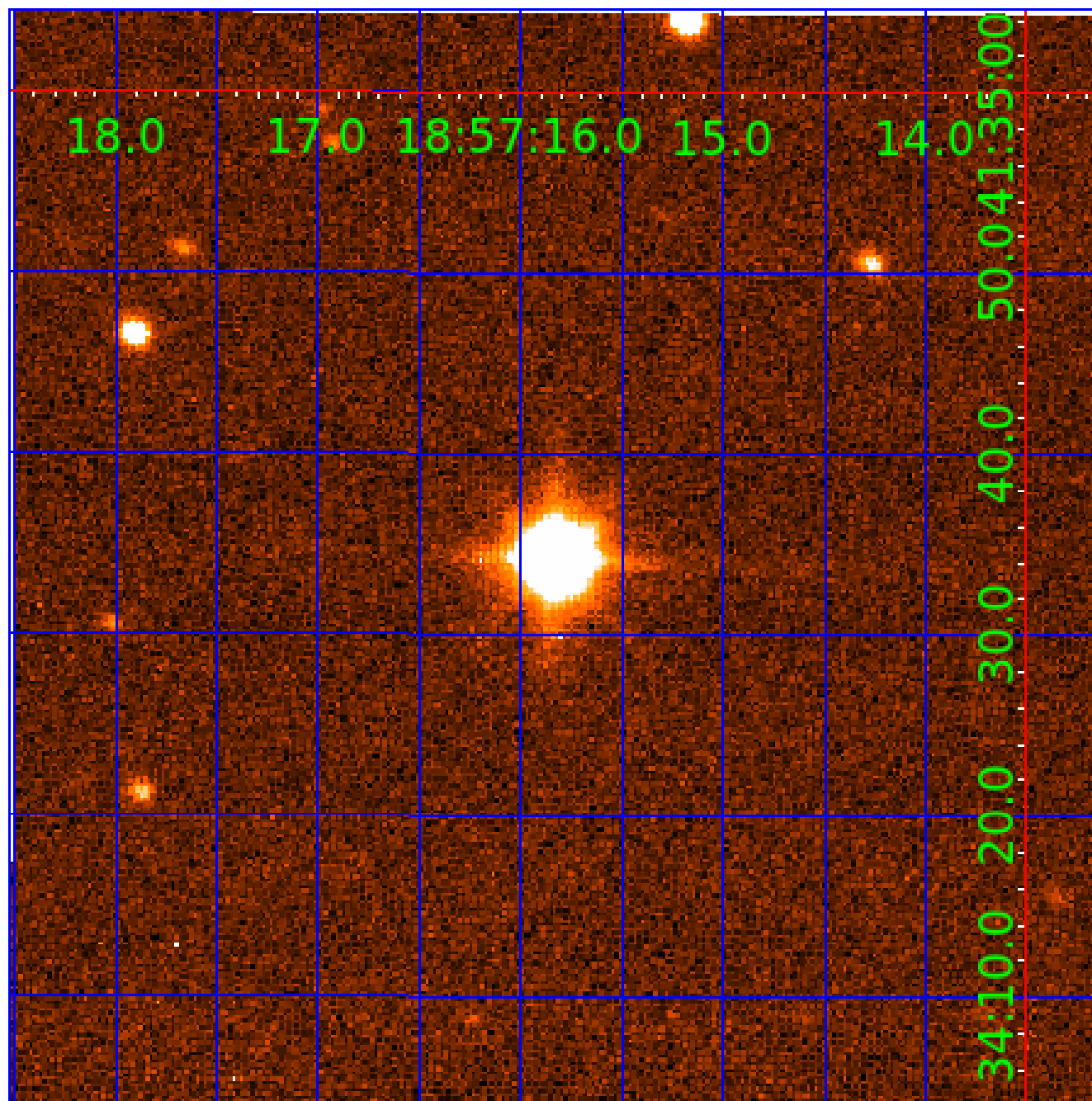


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

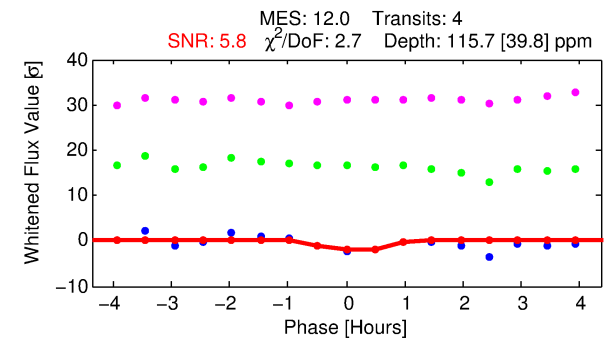
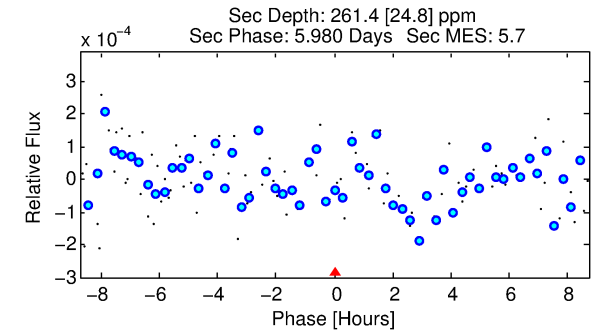
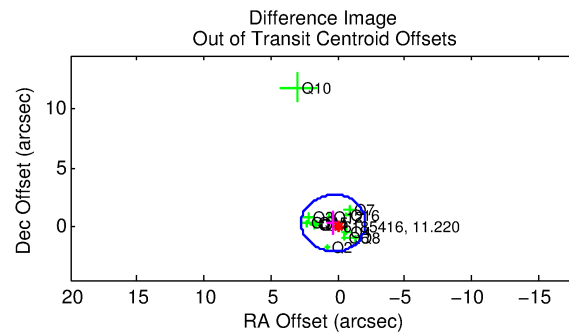
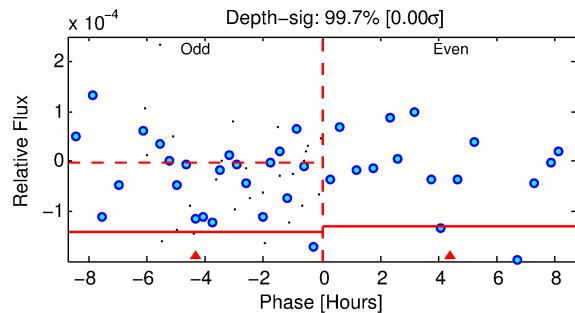
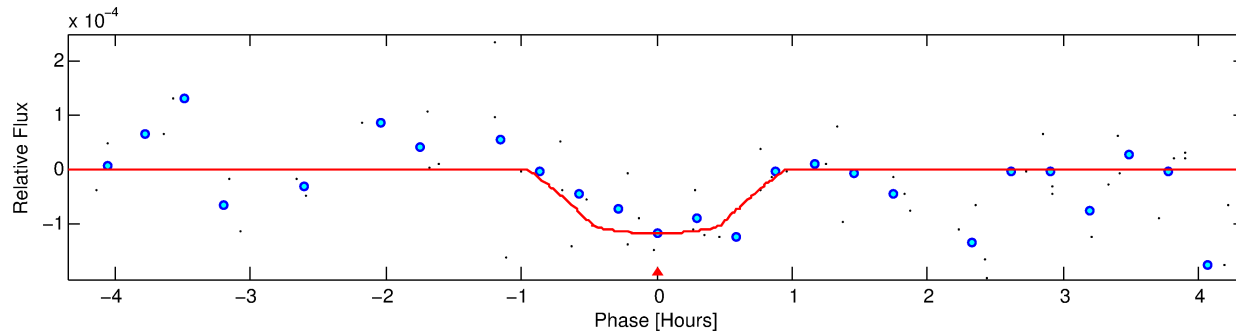
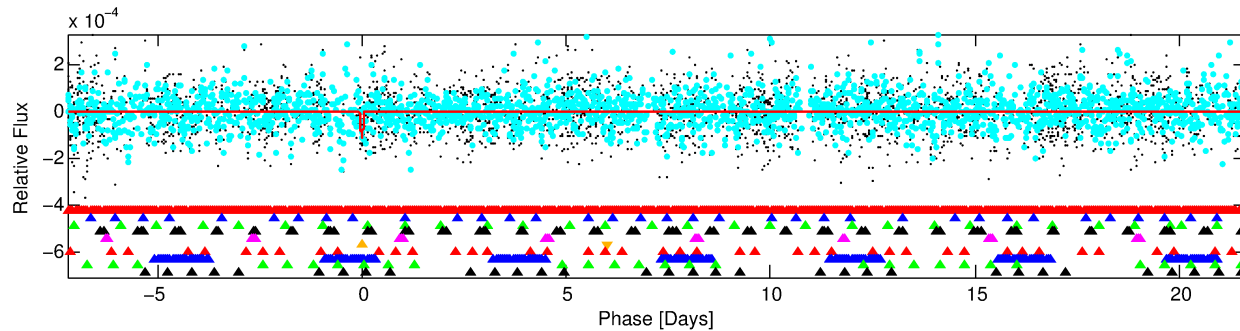
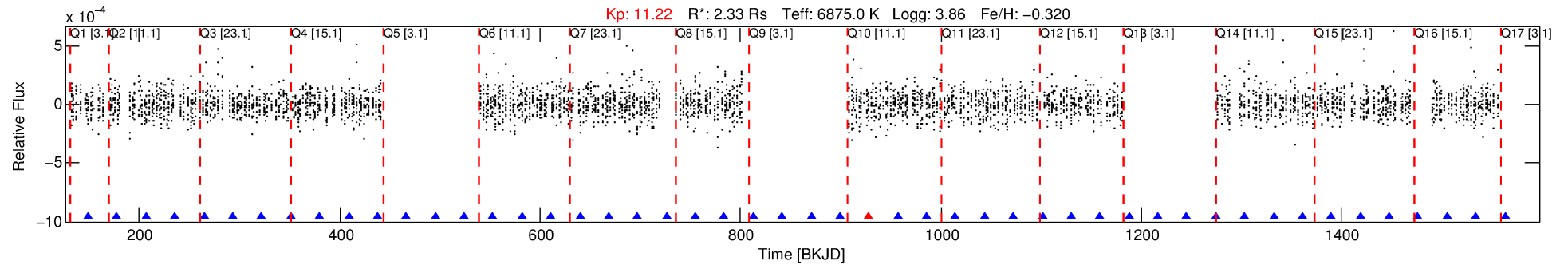
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006185416-06

No Significant Match Found

# DV One-Page Summary

KIC: 6185416 Candidate: 6 of 10 Period: 28.851 d



## DV Fit Results:

Period = 28.85105 [0.00038] d  
Epoch = 149.2304 [0.0141] BKJD  
Rp/R\* = 0.0107 [0.0144]  
a/R\* = 103.10 [780.75]  
b = 0.75 [4.52]  
Seff = 251.75 [128.01]  
Teq = 1016 [129] K  
Rp = 2.72 [3.77] Re  
a = 0.2075 [0.0659] AU  
Ag = 834.43 [2277.97] [0.37 $\sigma$ ]  
Teffp = 8440 [5671] K [1.31 $\sigma$ ]

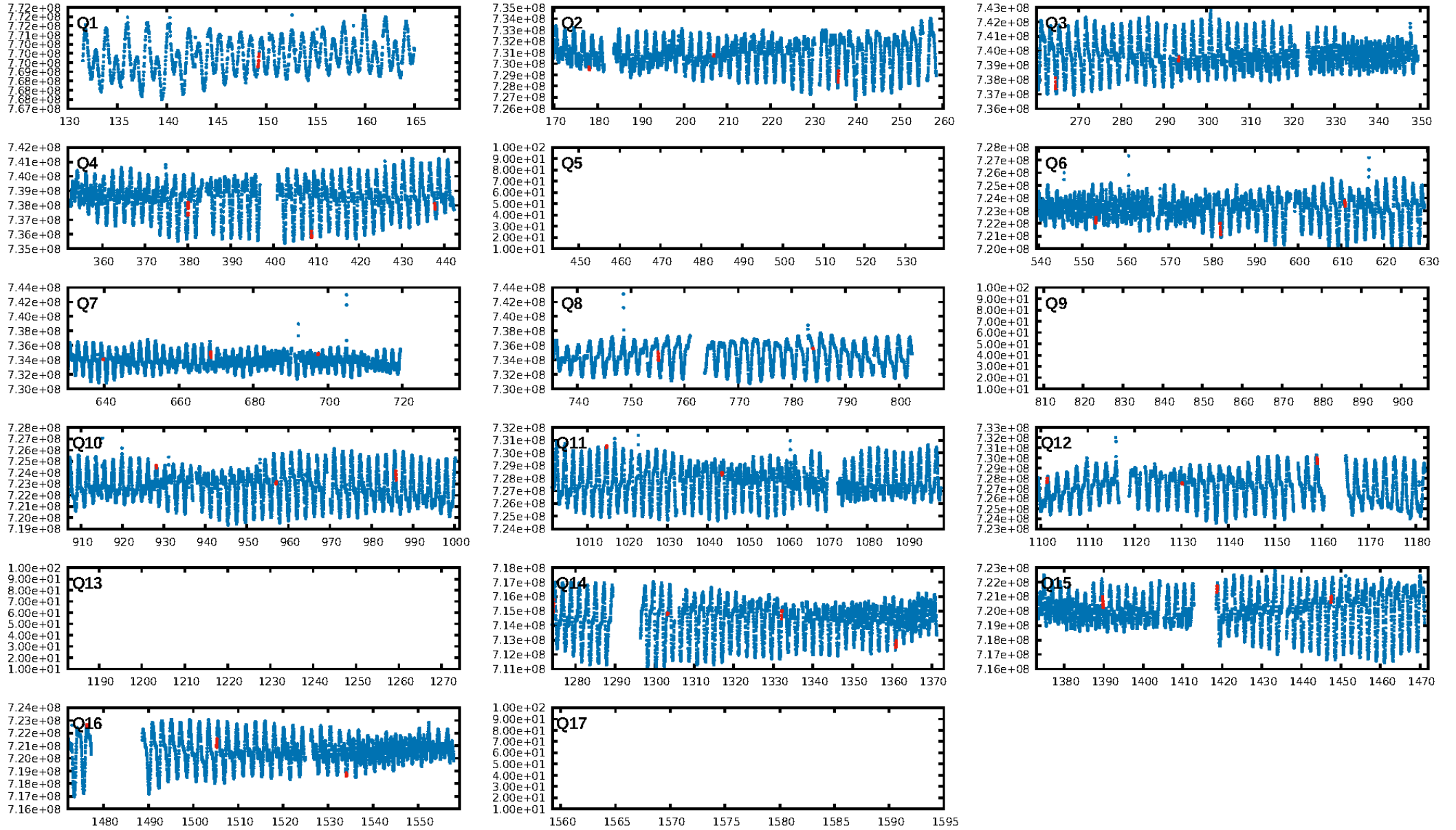
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [22.72 $\sigma$ ]  
LongPeriod-sig: 100.0% [19.94 $\sigma$ ]  
ModelChiSquare2-sig: 9.1%  
ModelChiSquareGof-sig: 48.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.67 [2/3]  
GhostDiagnostic-chr: -0.5713  
Centroid-sig: N/A  
Centroid-so: 0.735 arcsec [0.94 $\sigma$ ]  
OotOffset-rm: 0.463 arcsec [0.58 $\sigma$ ]  
KicOffset-rm: 0.512 arcsec [0.60 $\sigma$ ]  
OotOffset-st: 4/4/4/1 [13]  
KicOffset-st: 4/4/4/1 [13]  
DiffImageQuality-fgm: 0.46 [6/13]  
DiffImageOverlap-fno: 0.69 [9/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:45 Z

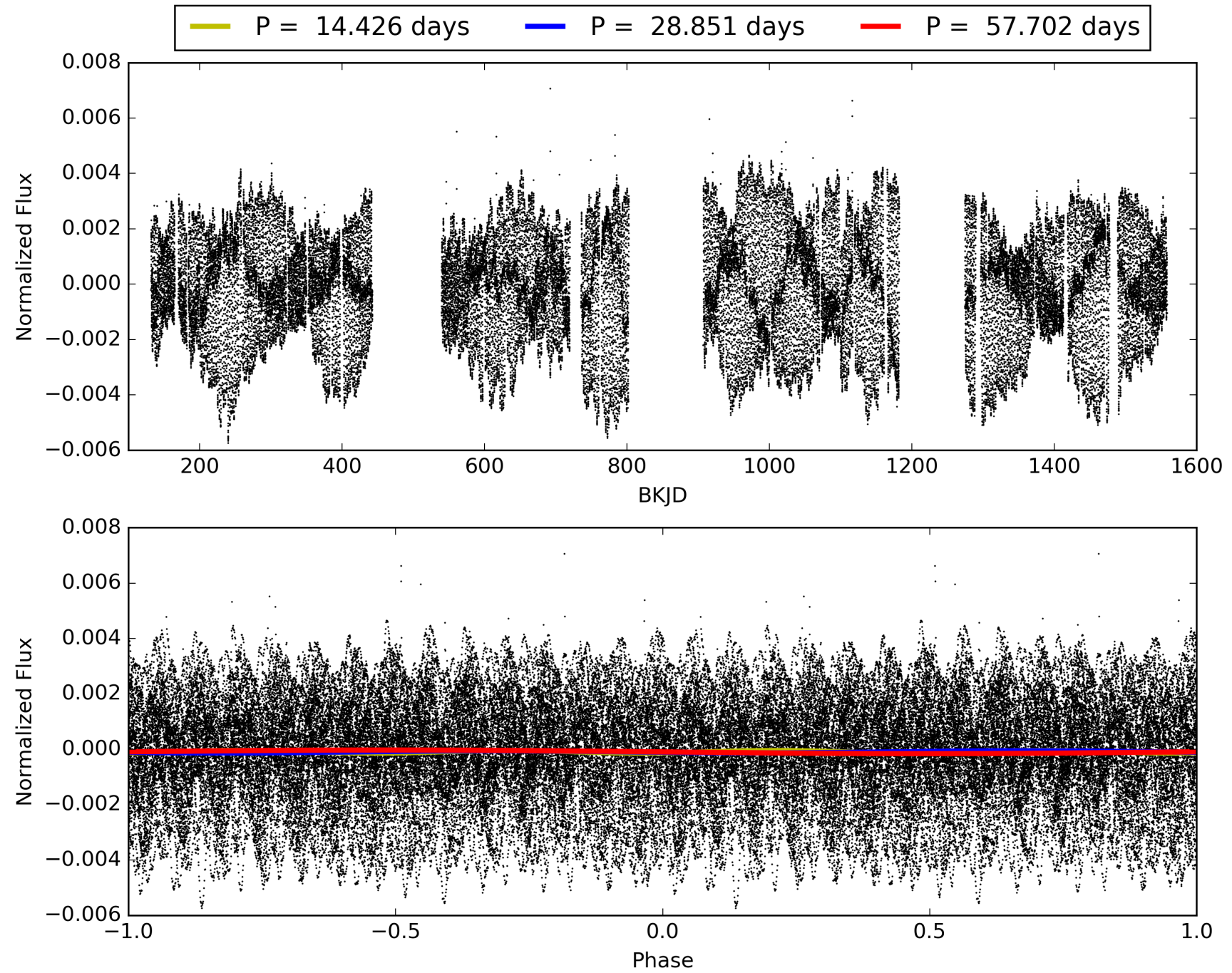
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006185416-06, PDC Light Curves



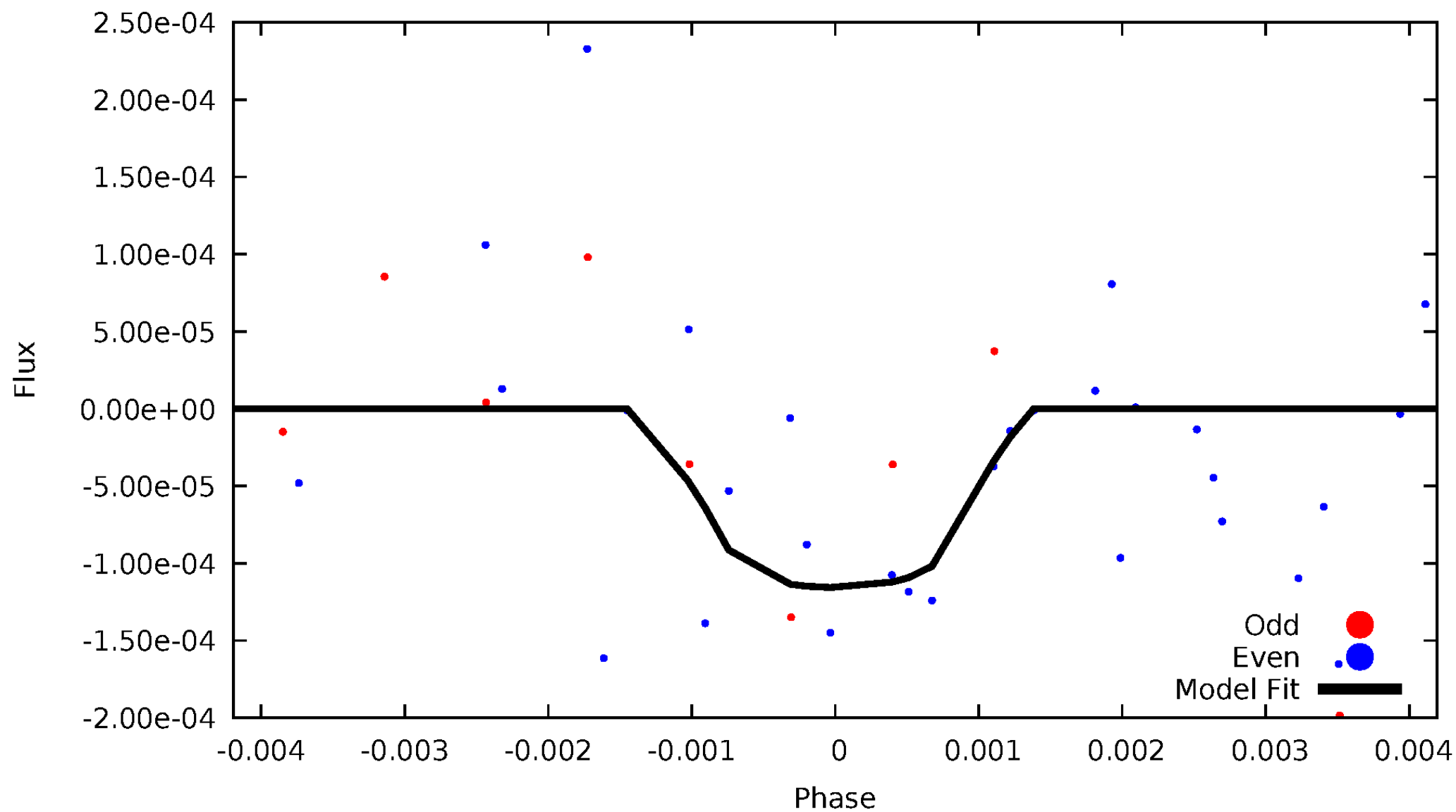


TCE 006185416-06



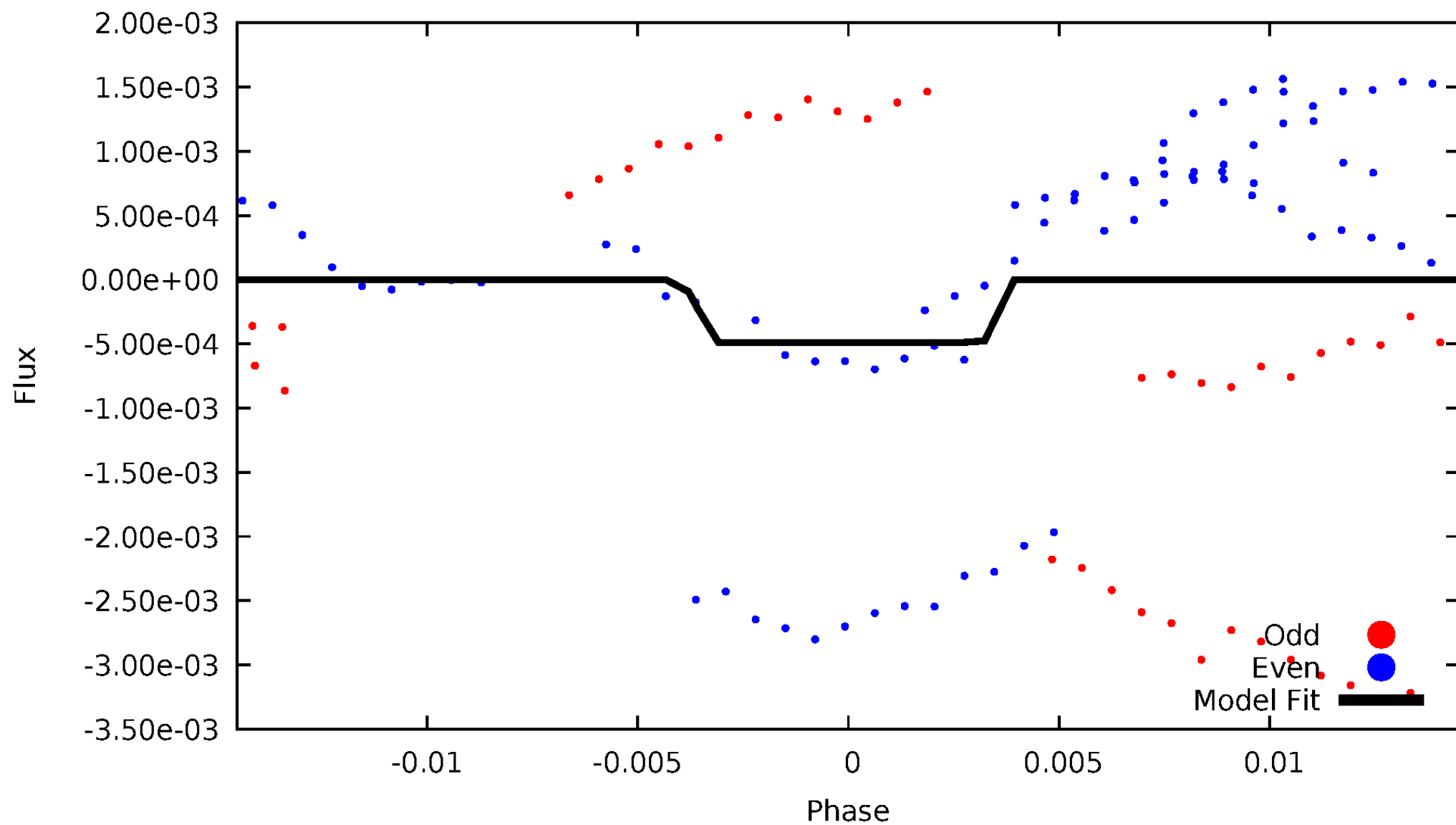
# DV Odd/Even

TCE 006185416-06



# ALT Odd/Even

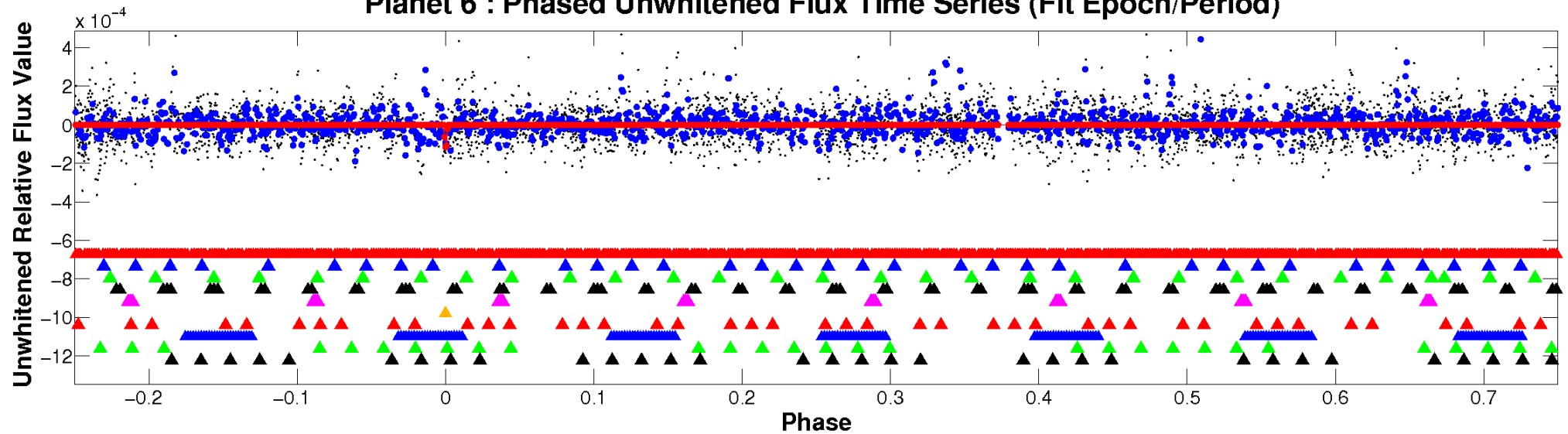
TCE 006185416-06



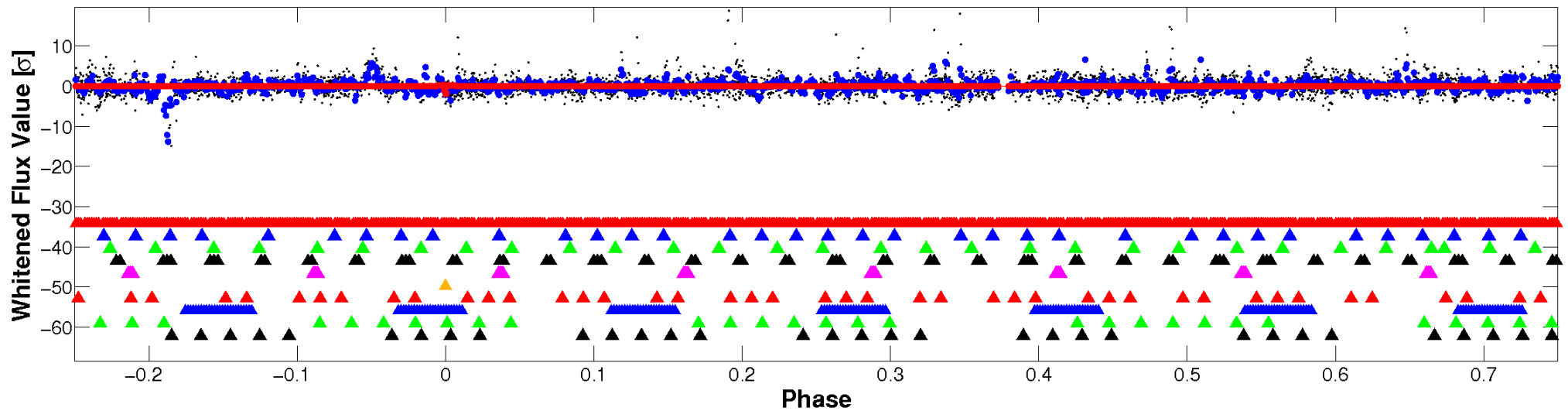


# Non-Whitened Vs. Whitened Light Curve

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

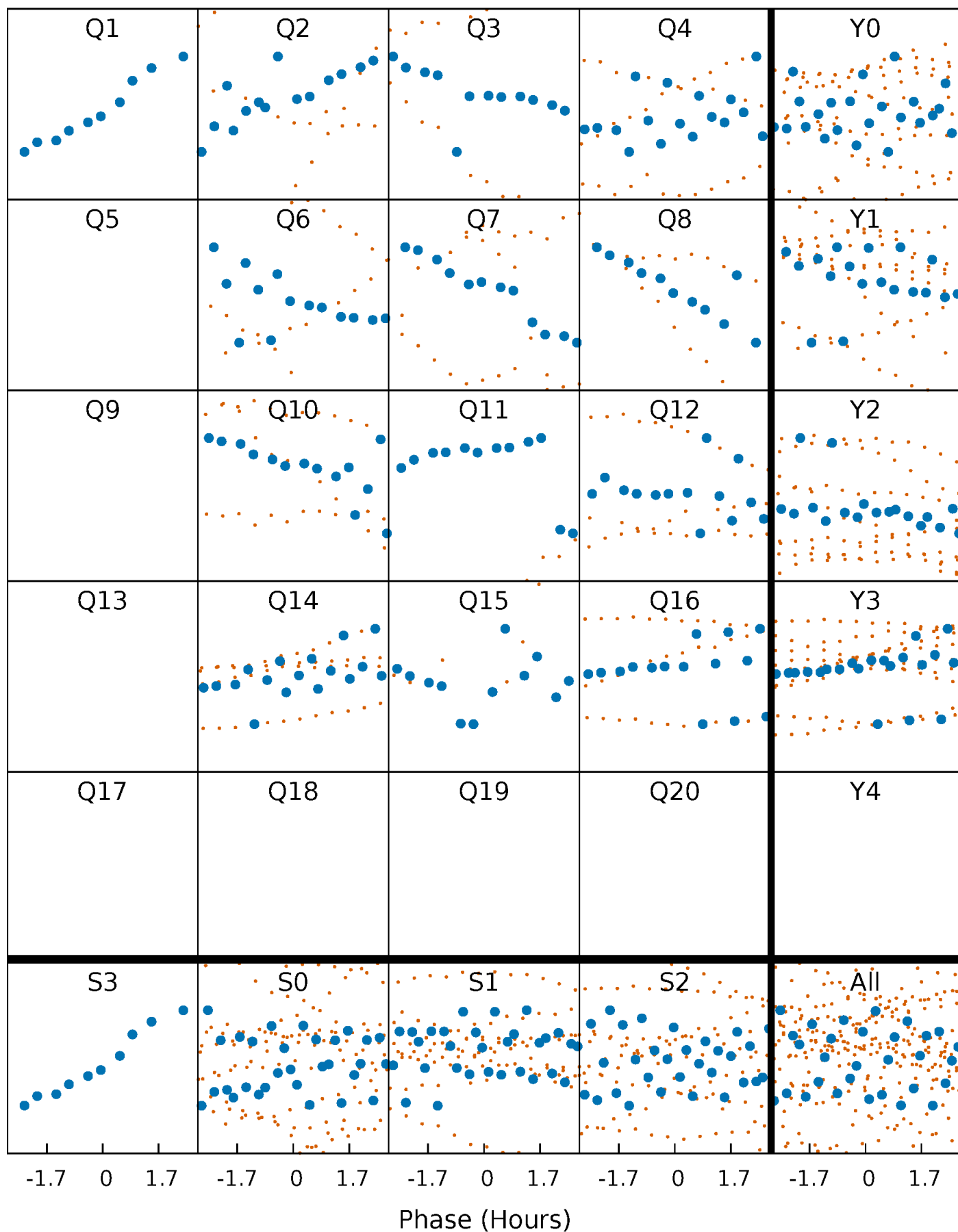


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



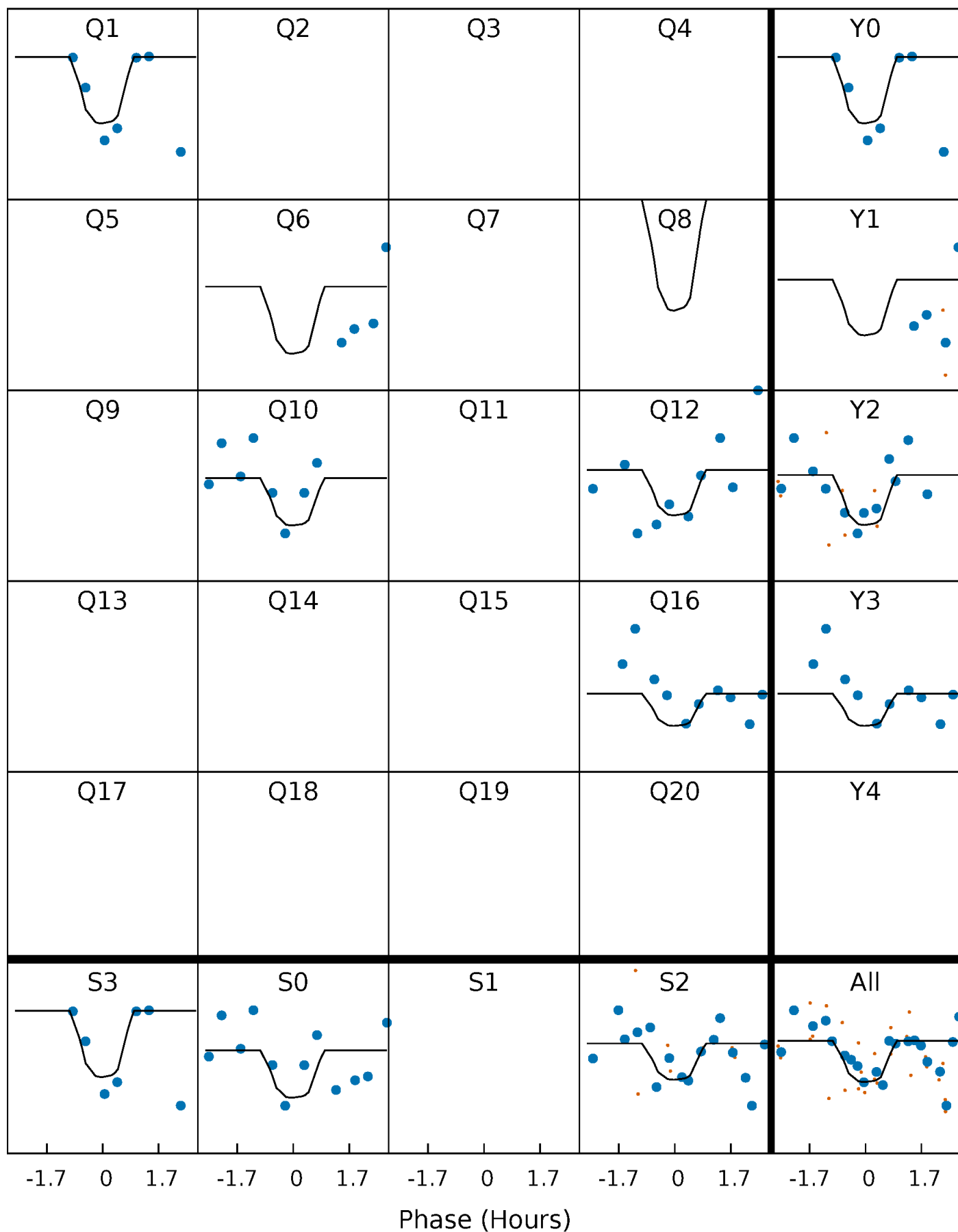
# PDC Quarter-Phased Transit Curves

TCE 006185416-06 P= 28.851051 Days  $T_0=149.230404$  (BKJD)



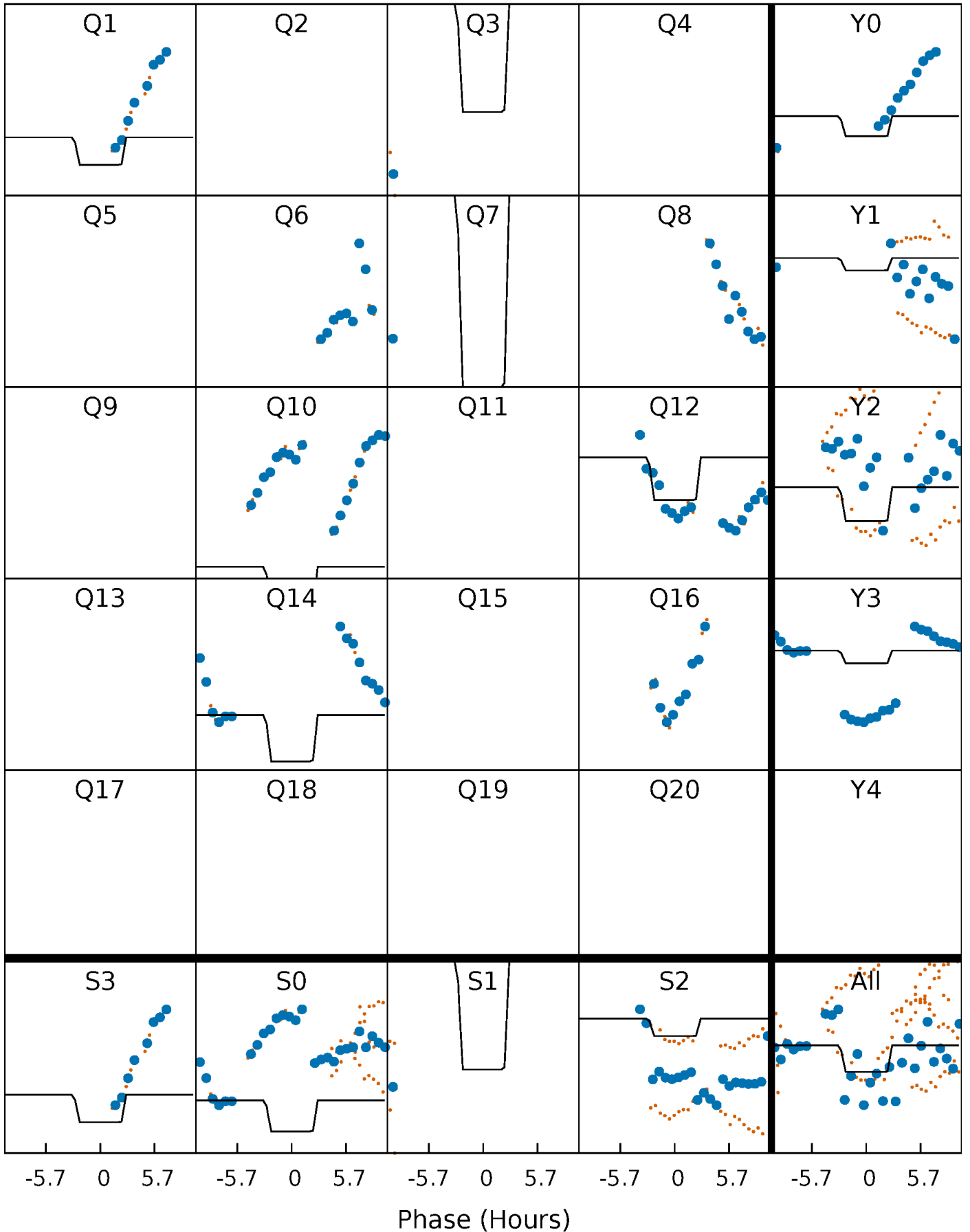
# DV Quarter-Phased Transit Curves

TCE 006185416-06 P= 28.851051 Days  $T_0=149.230404$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

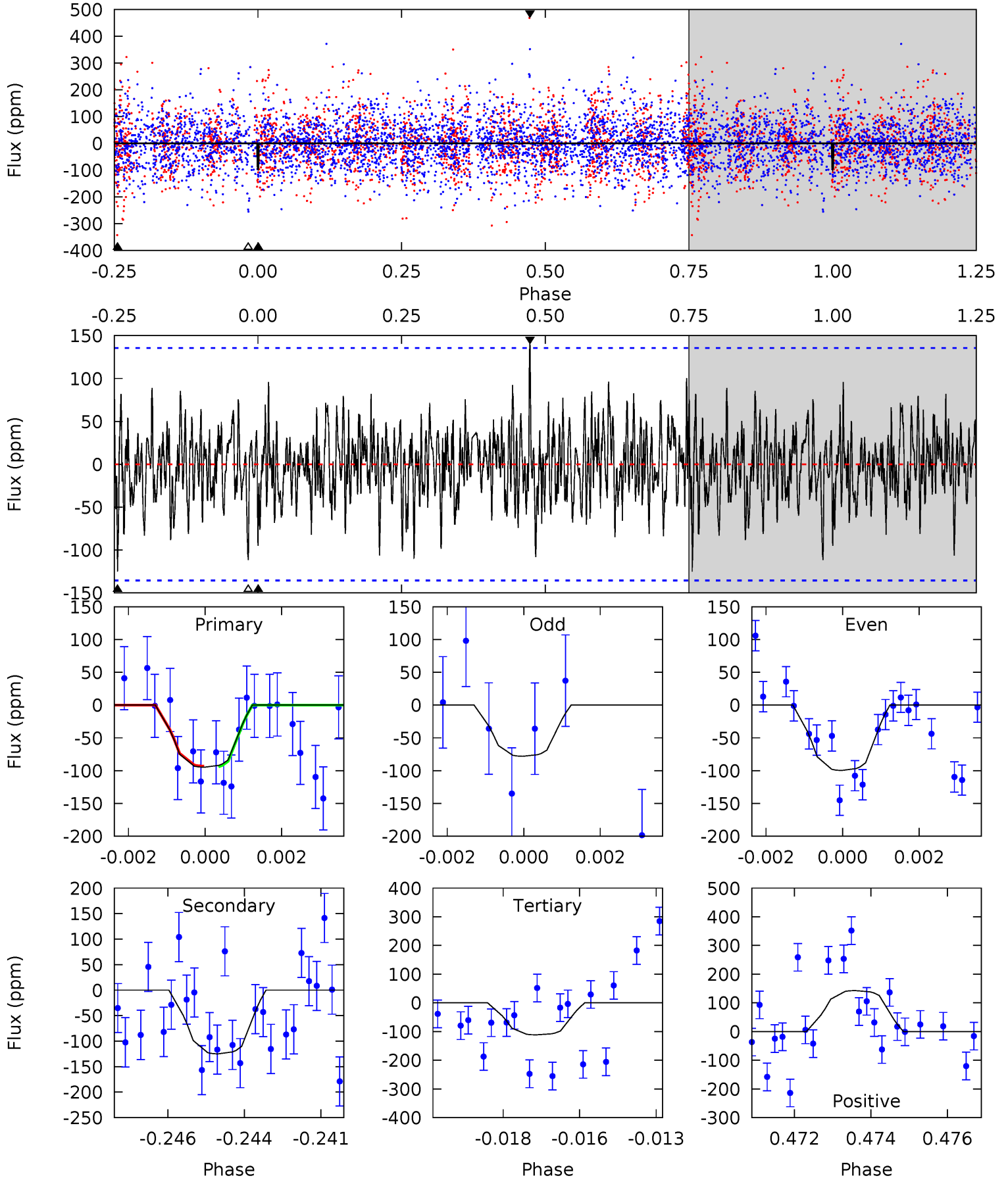
TCE 006185416-06 P= 28.853724 Days  $T_0=149.136223$  (BKJD)



# DV Model-Shift Uniqueness Test

006185416-06, P = 28.851051 Days, E = 120.379353 Days

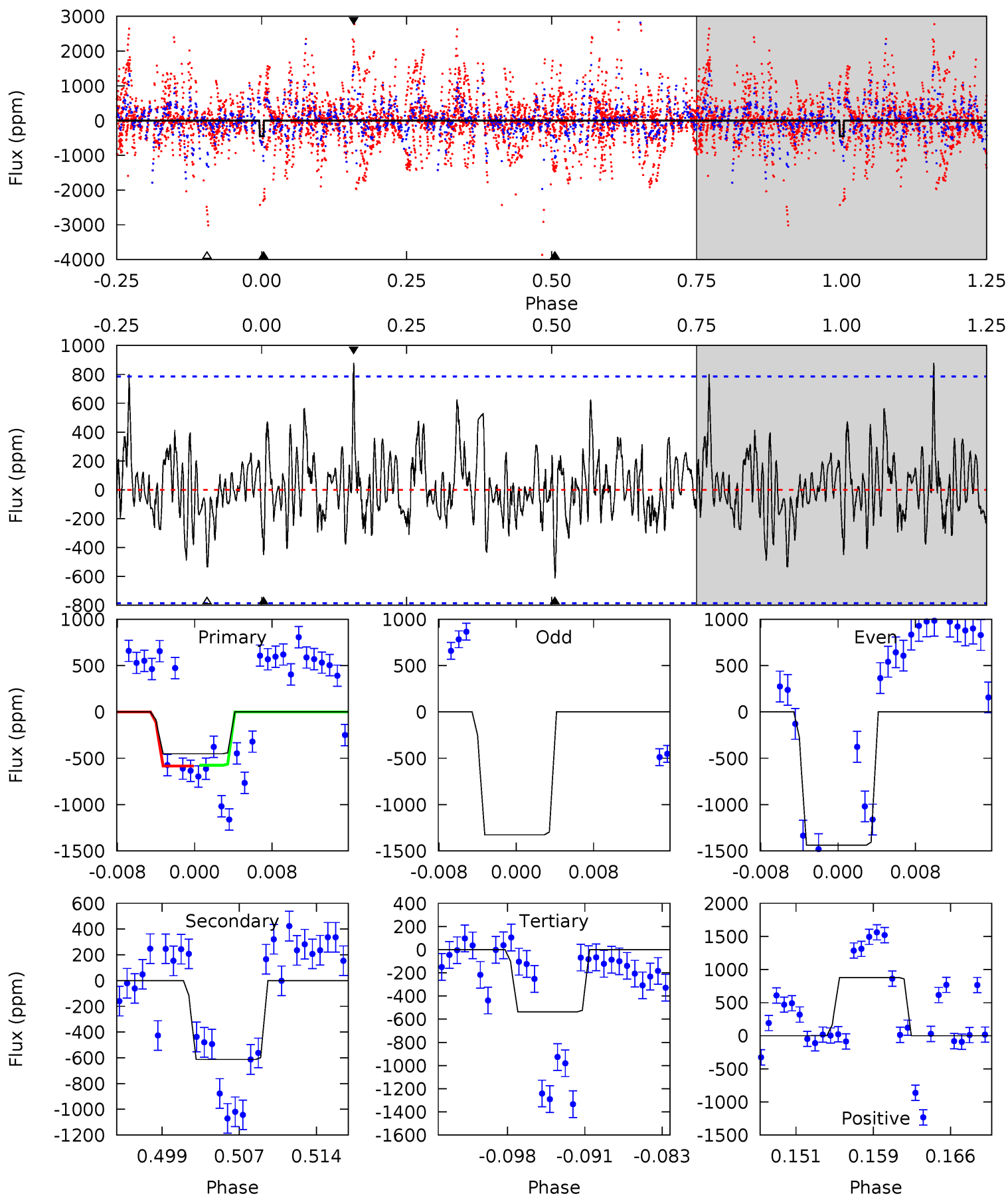
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.72	4.89	4.36	5.60	5.31	3.06	1.38	-0.65	-1.88	0.53	-0.70	0.37	0.92	0.53	0.02



# Alt Model-Shift Uniqueness Test

006185416-06, P = 28.853724 Days, E = 120.282499 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.92	3.96	3.46	5.68	5.08	2.67	1.22	-0.54	-2.76	0.50	-1.72	0.38	1.45	0.59	0.03



### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-125 \pm 26$	$3.59^{+3.15}_{-2.37}$	$1395^{+89}_{-114}$	$5888^{+5561}_{-1371}$	$235^{+1845}_{-169}$
Alt.	$-613 \pm 155$	$5.53^{+3.64}_{-3.13}$	$1388^{+81}_{-123}$	$7114^{+5431}_{-1690}$	$486^{+2041}_{-327}$

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

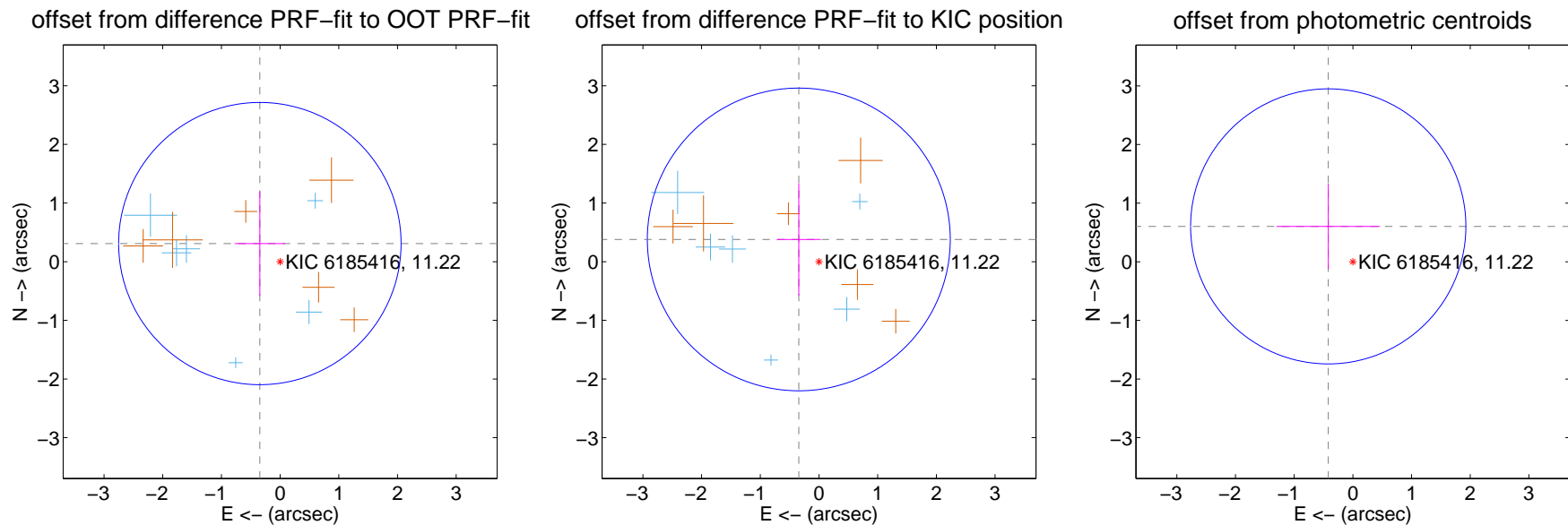
## DV Centroid Data

Supplemental centroid analysis for 006185416-06. **Kepler magnitude: 11.22.** Transit SNR 5.78

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

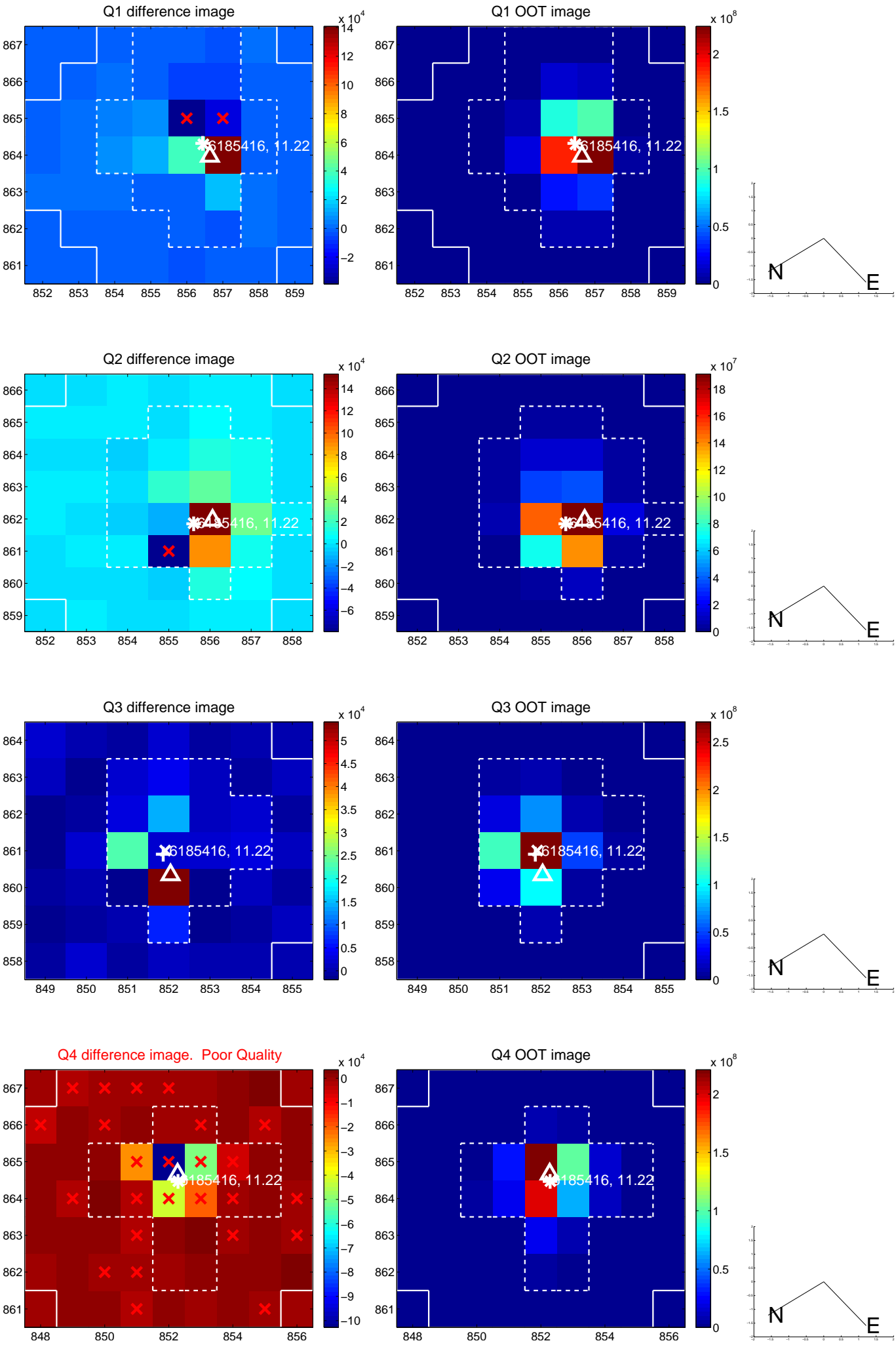
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.463 \pm 0.802$	0.58	$0.345 \pm 0.429$	$0.309 \pm 0.891$
PRF-fit source offset from KIC position	$0.512 \pm 0.860$	0.60	$0.344 \pm 0.375$	$0.379 \pm 0.957$
photometric centroid source offset	$0.73 \pm 0.78$	0.94	$0.42 \pm 0.88$	$0.60 \pm 0.73$



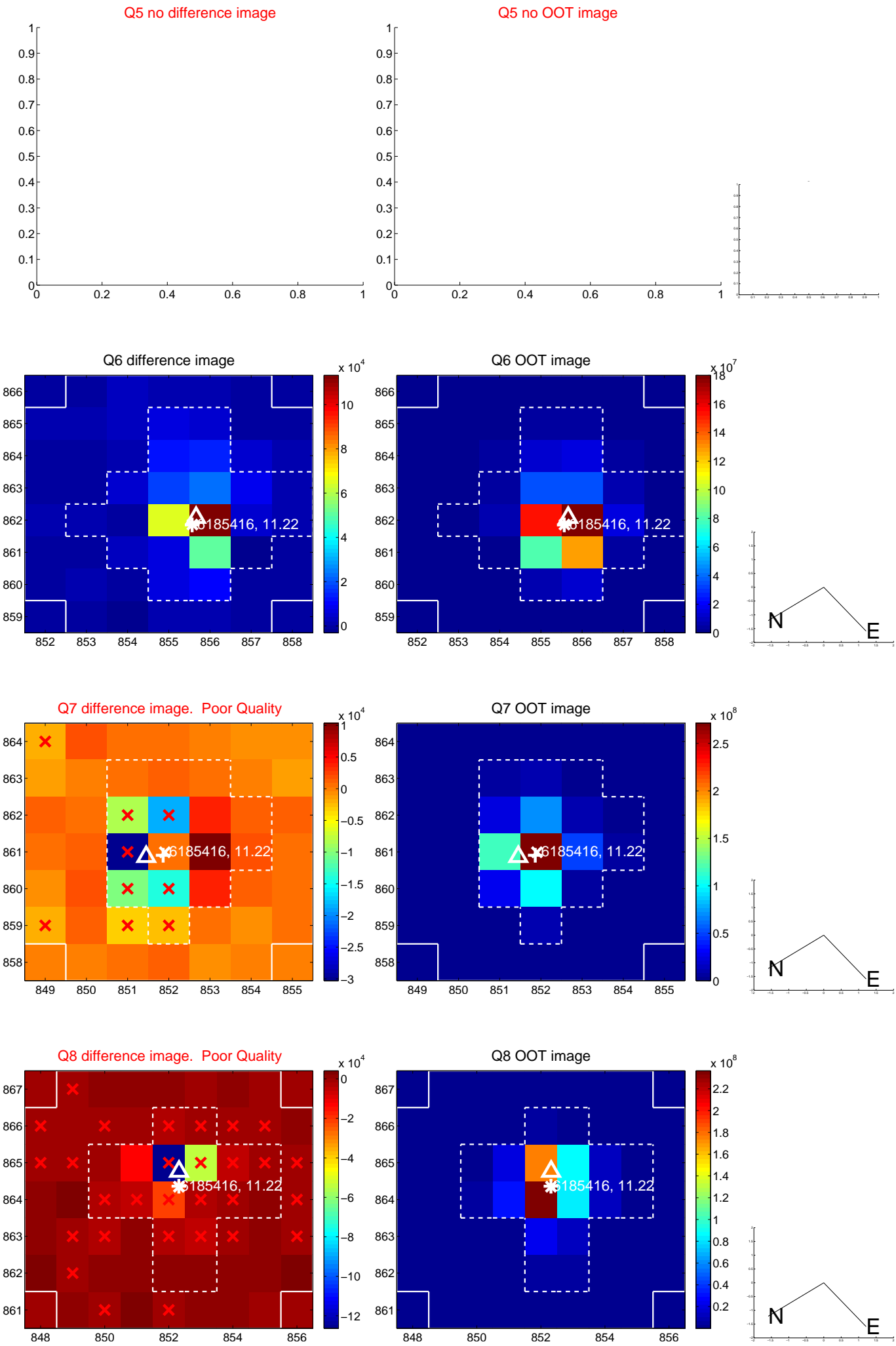
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



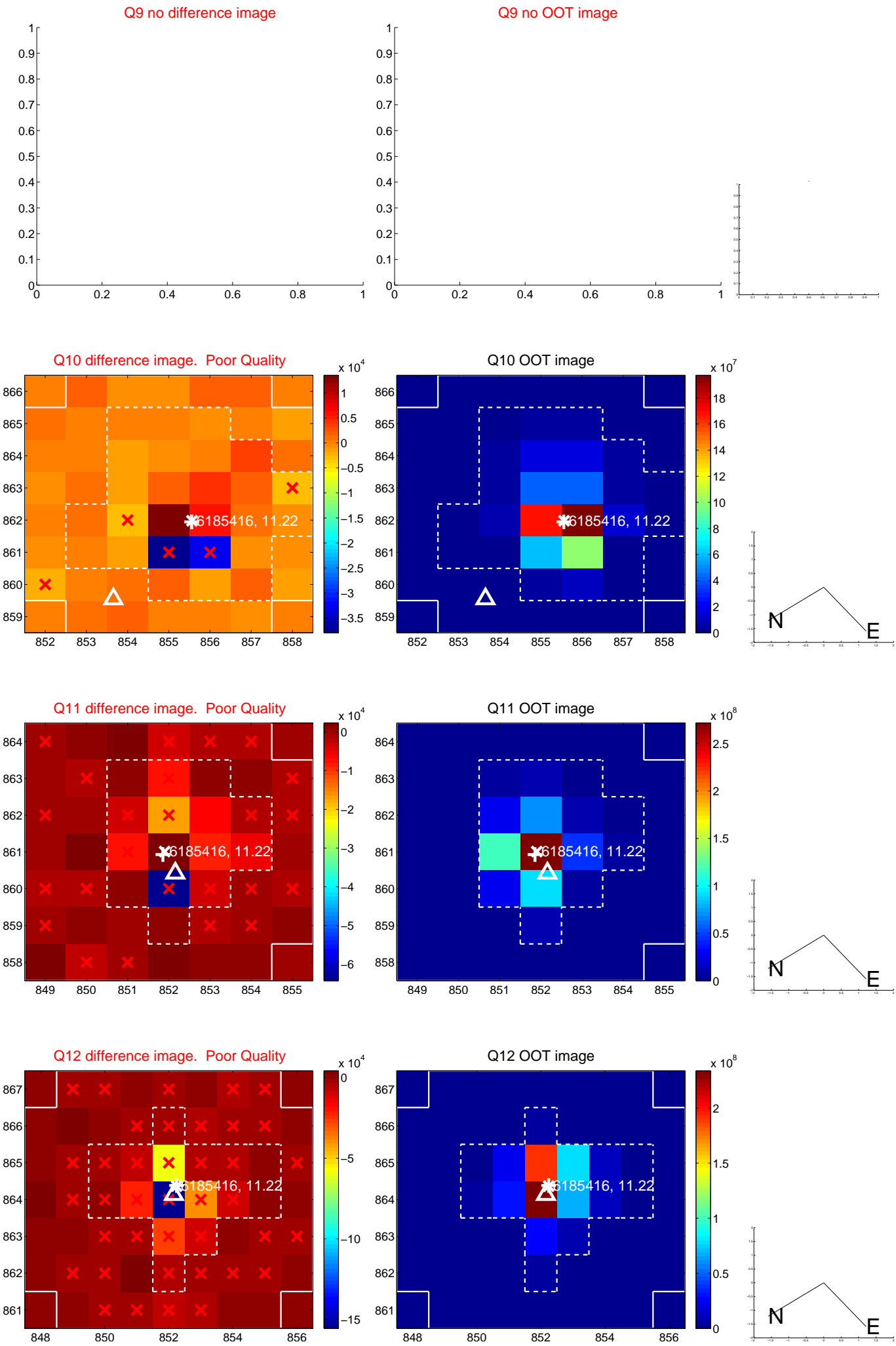
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



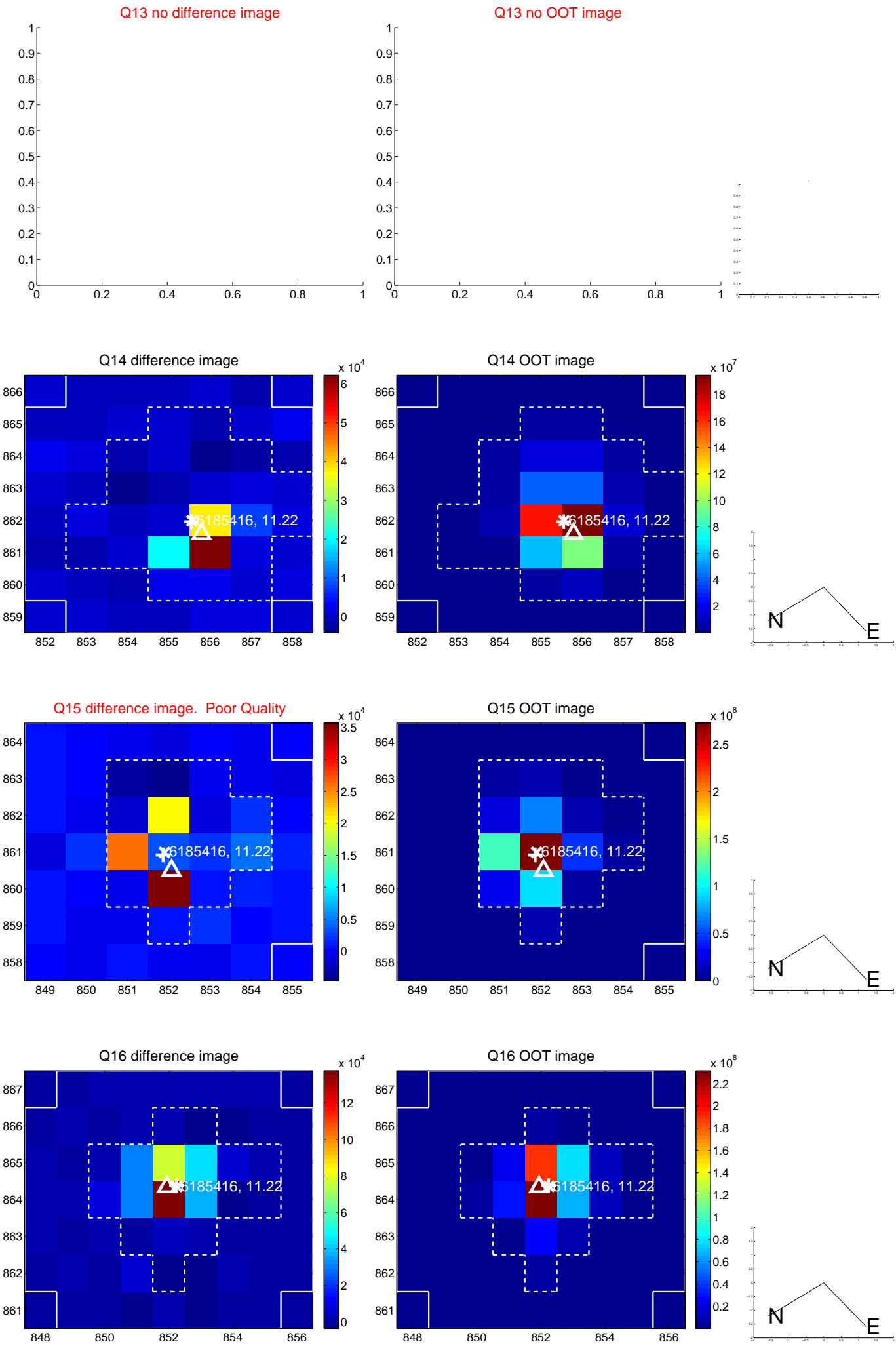
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



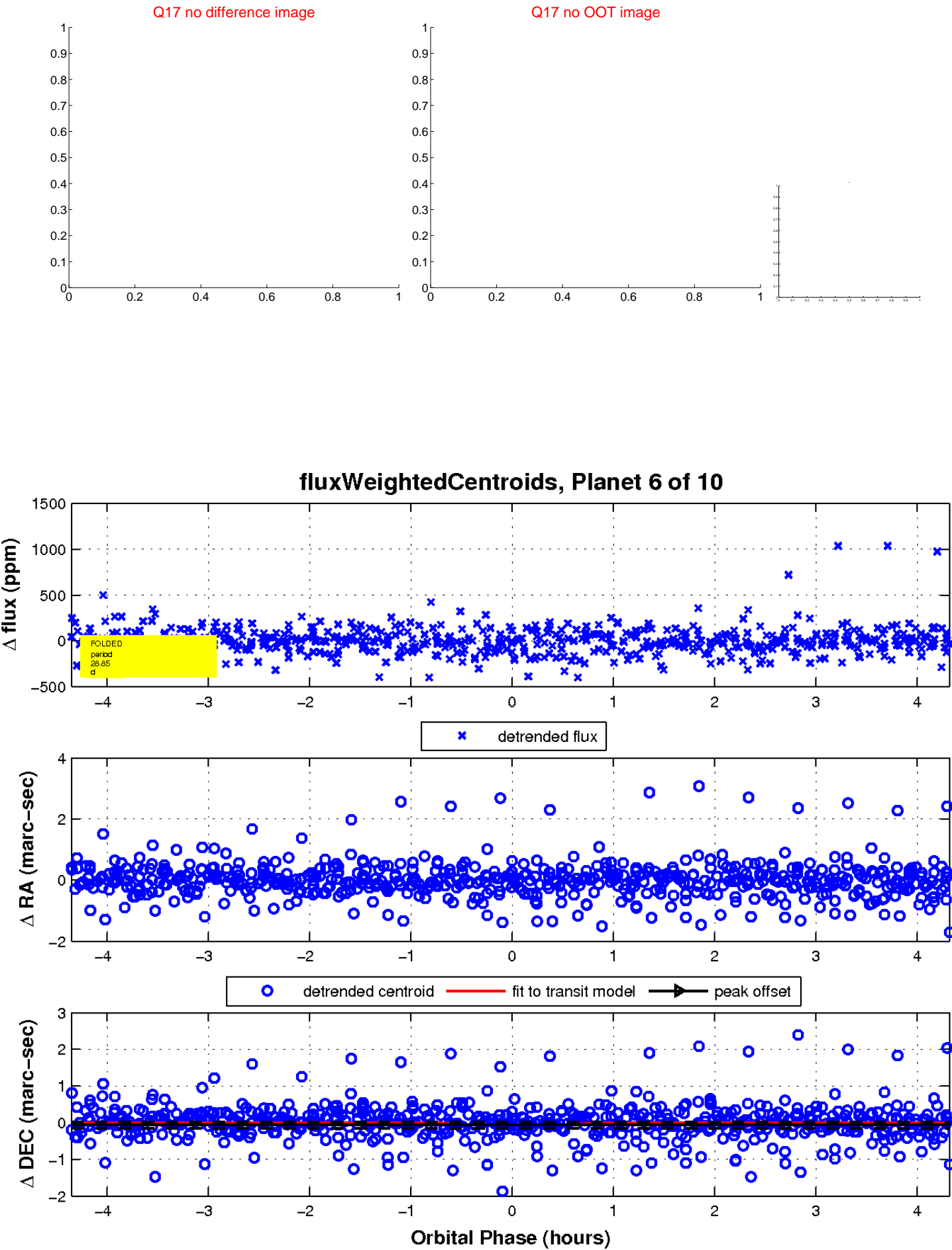
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

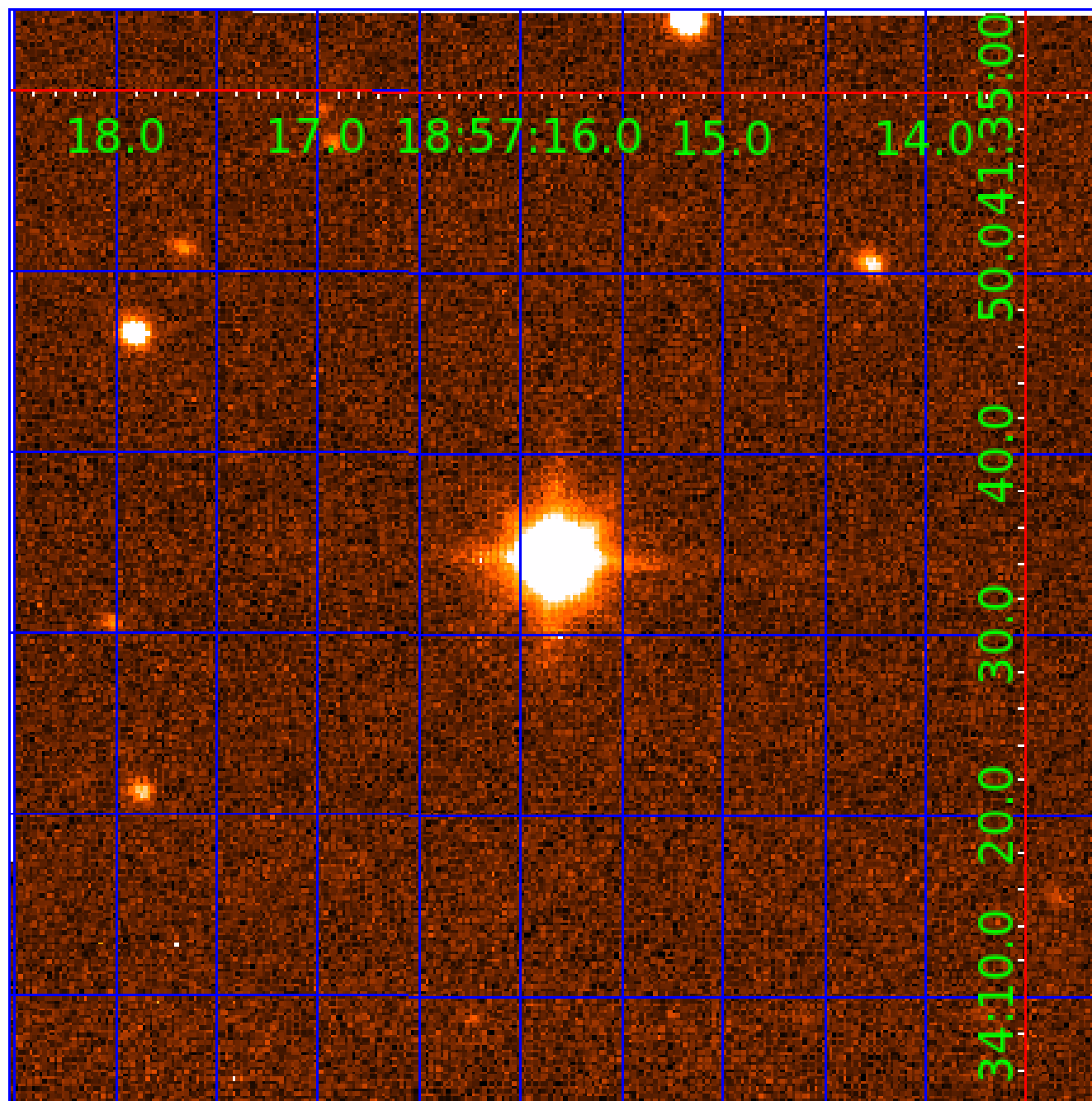


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

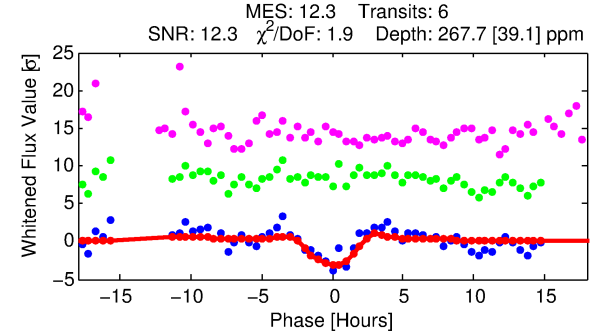
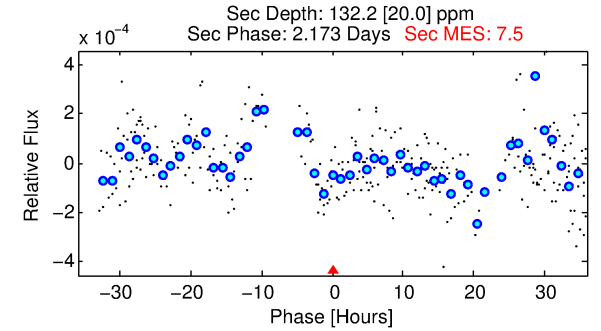
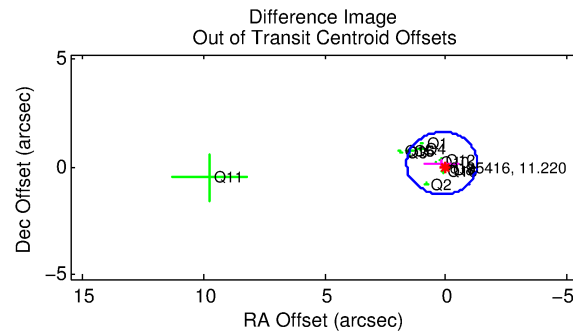
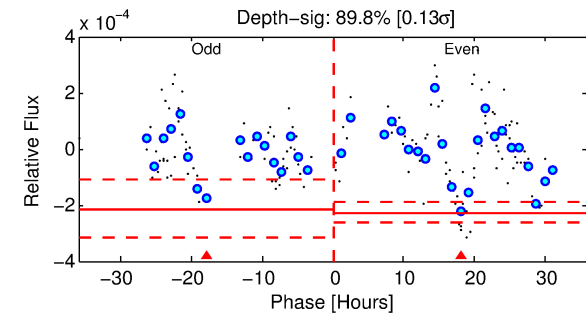
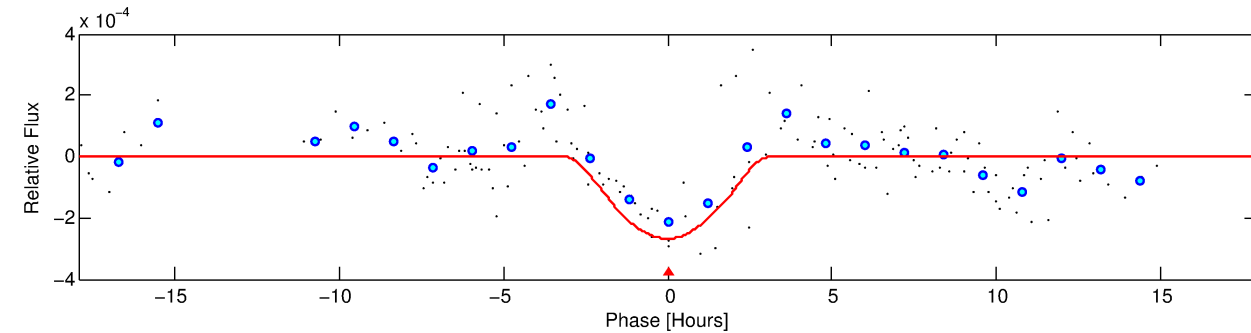
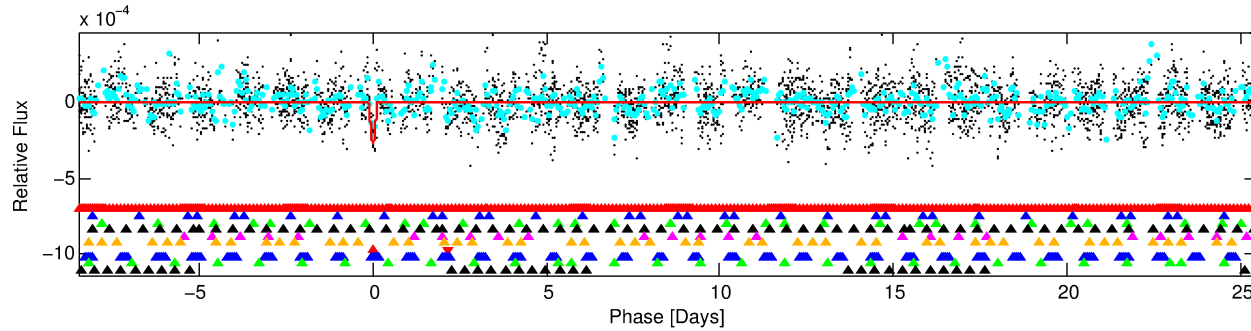
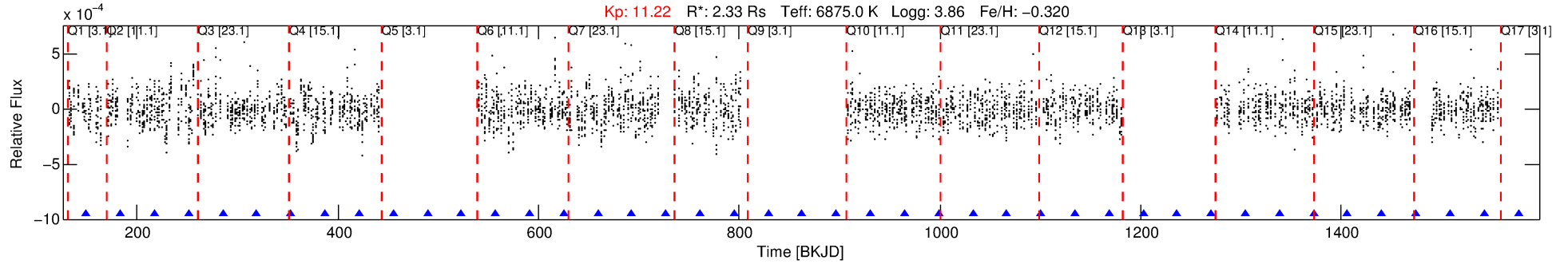
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006185416-07

No Significant Match Found

# DV One-Page Summary

KIC: 6185416 Candidate: 7 of 10 Period: 33.966 d



## DV Fit Results:

Period = 33.96642 [0.00062] d  
Epoch = 149.6616 [0.0109] BKJD  
Rp/R\* = 0.0281 [0.0718]  
a/R\* = 10.67 [7.55]  
b = 1.00 [0.11]  
Seff = 202.51 [102.97]  
Teq = 962 [122] K  
Rp = 7.15 [18.41] Re  
a = 0.2313 [0.0735] AU  
Ag = 76.23 [391.18] [0.19 $\sigma$ ]  
Teffp = 4394 [5613] K [0.61 $\sigma$ ]

## DV Diagnostic Results:

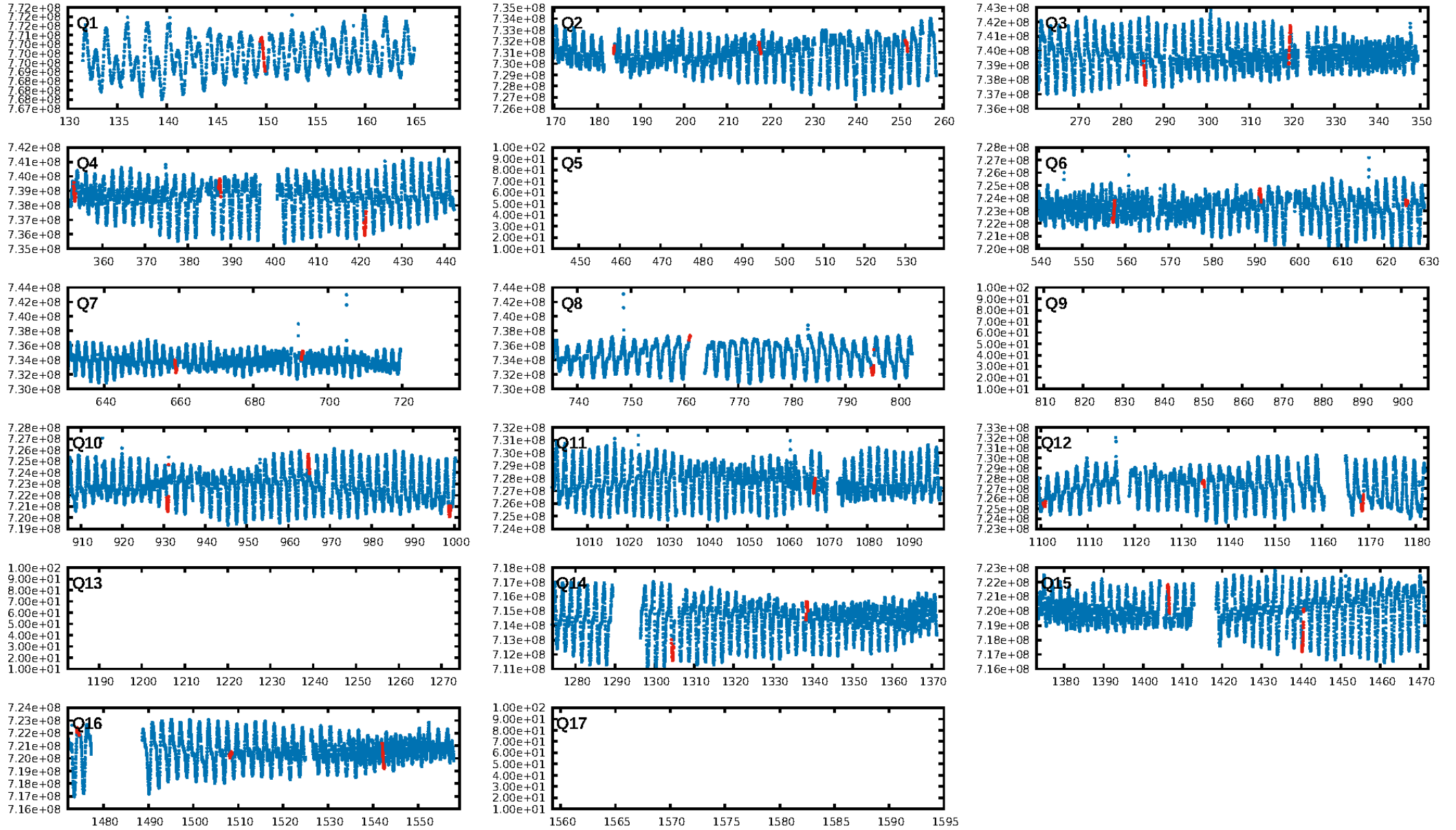
ShortPeriod-sig: 100.0% [19.94 $\sigma$ ]  
LongPeriod-sig: 100.0% [10.38 $\sigma$ ]  
ModelChiSquare2-sig: 75.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 7.293  
Centroid-sig: N/A  
Centroid-so: 0.705 arcsec [2.59 $\sigma$ ]  
OotOffset-rm: 0.226 arcsec [0.46 $\sigma$ ]  
KicOffset-rm: 0.295 arcsec [0.62 $\sigma$ ]  
OotOffset-st: 4/3/4/1 [12]  
KicOffset-st: 4/3/4/1 [12]  
DiffImageQuality-fgm: 0.58 [7/12]  
DiffImageOverlap-fno: 0.31 [4/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:48 Z

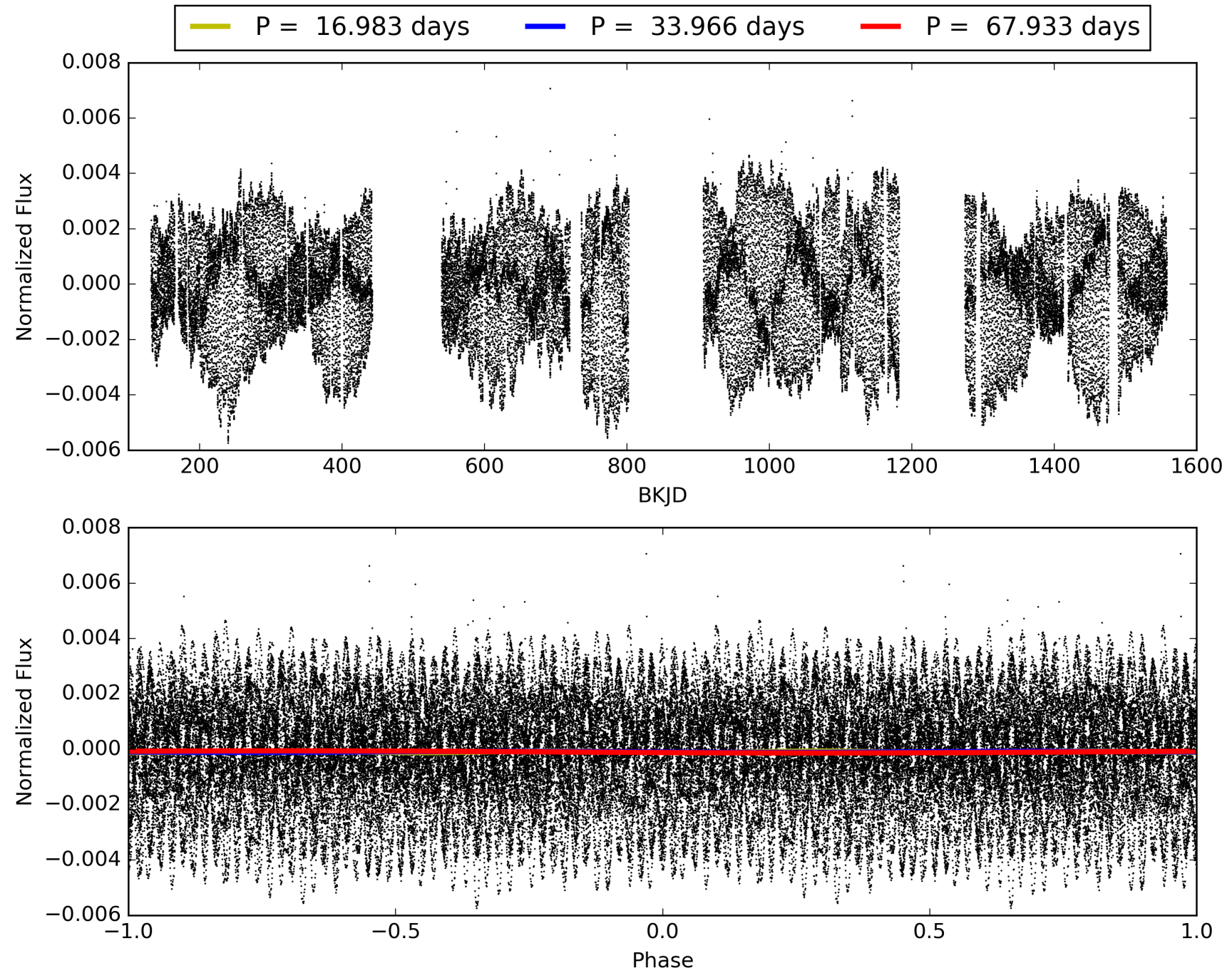
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006185416-07, PDC Light Curves

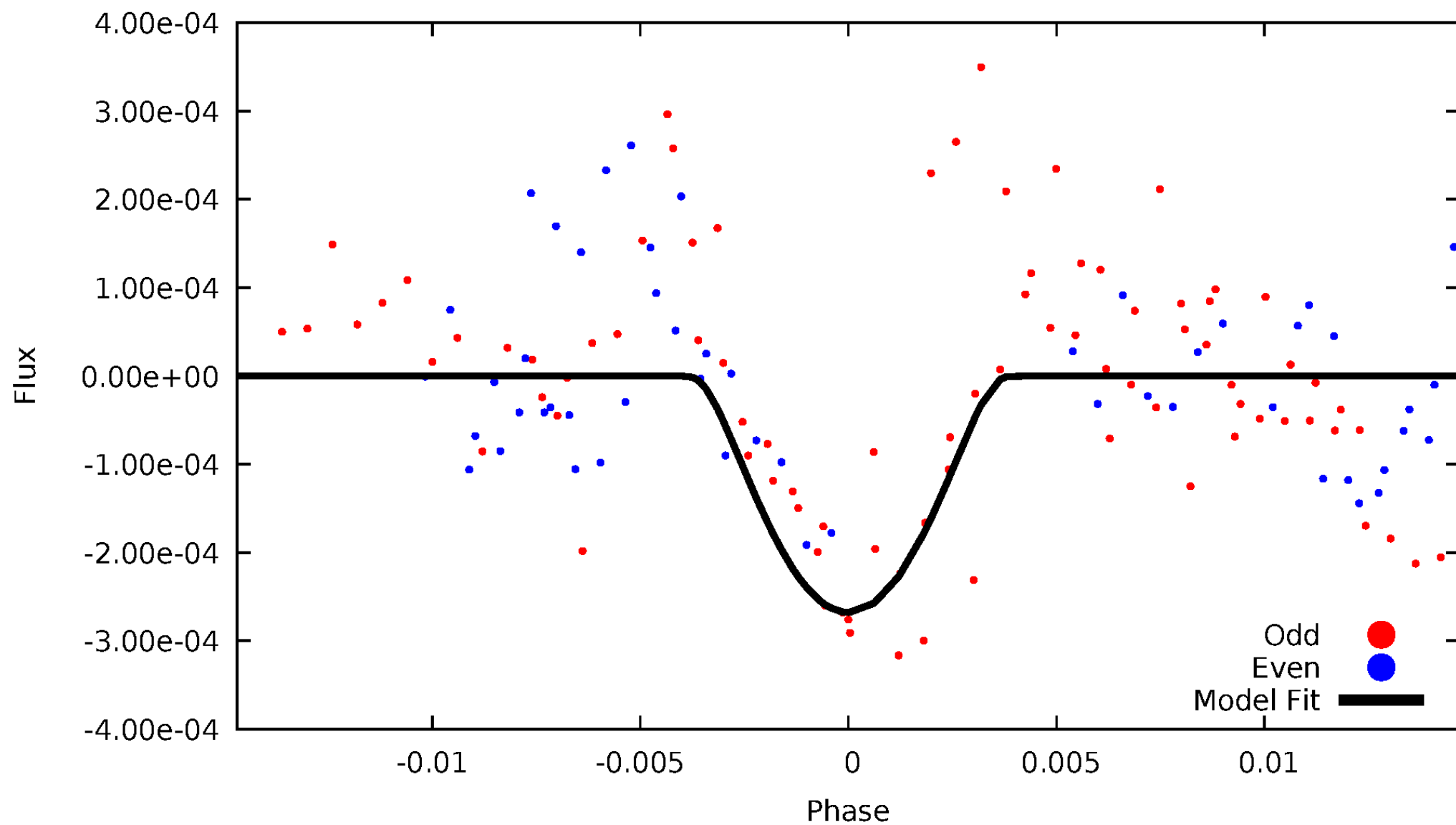


TCE 006185416-07



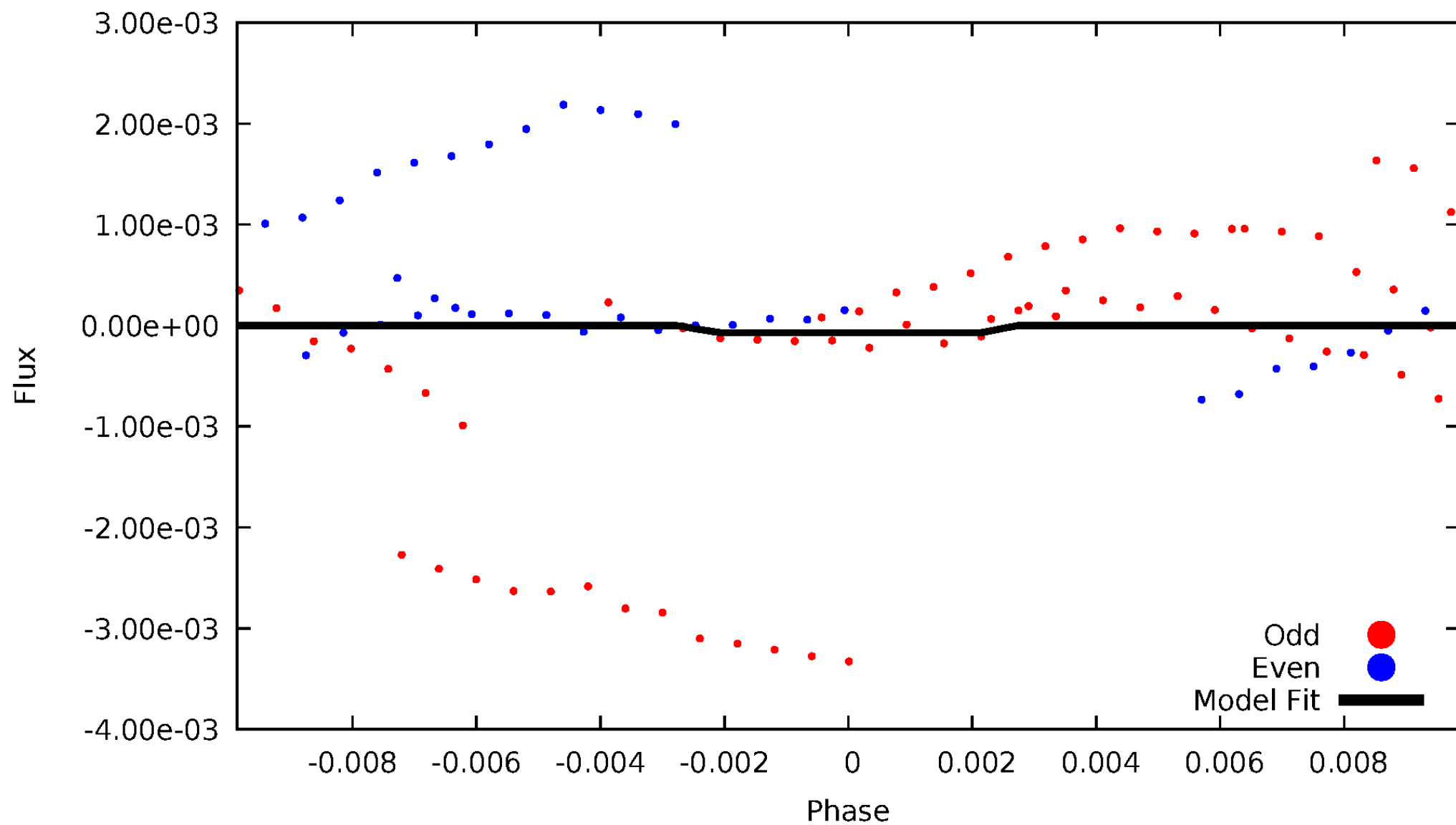
# DV Odd/Even

TCE 006185416-07



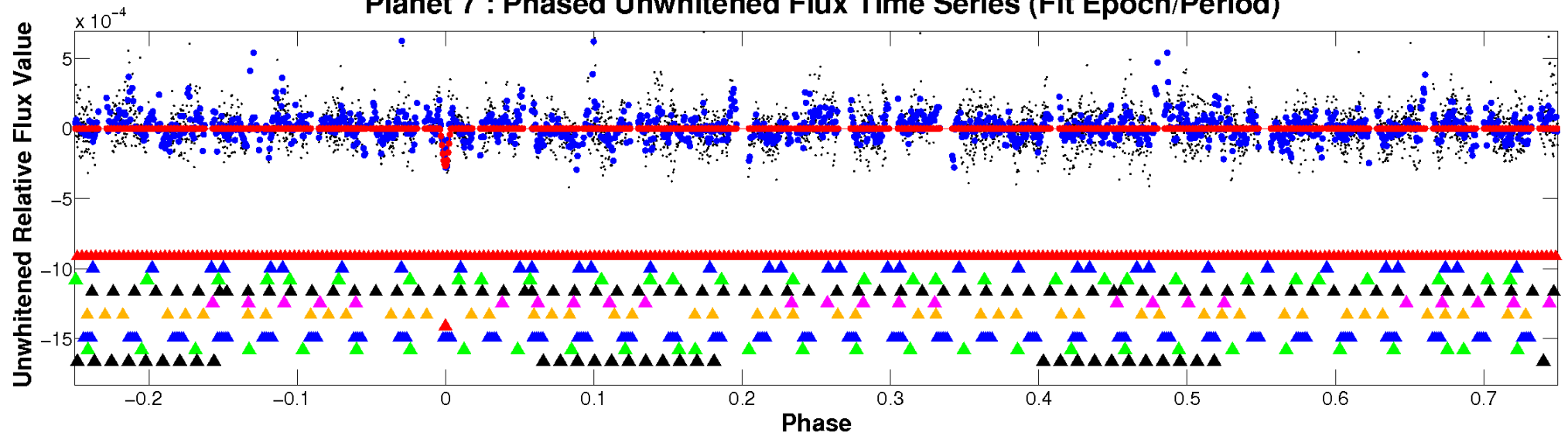
# ALT Odd/Even

TCE 006185416-07

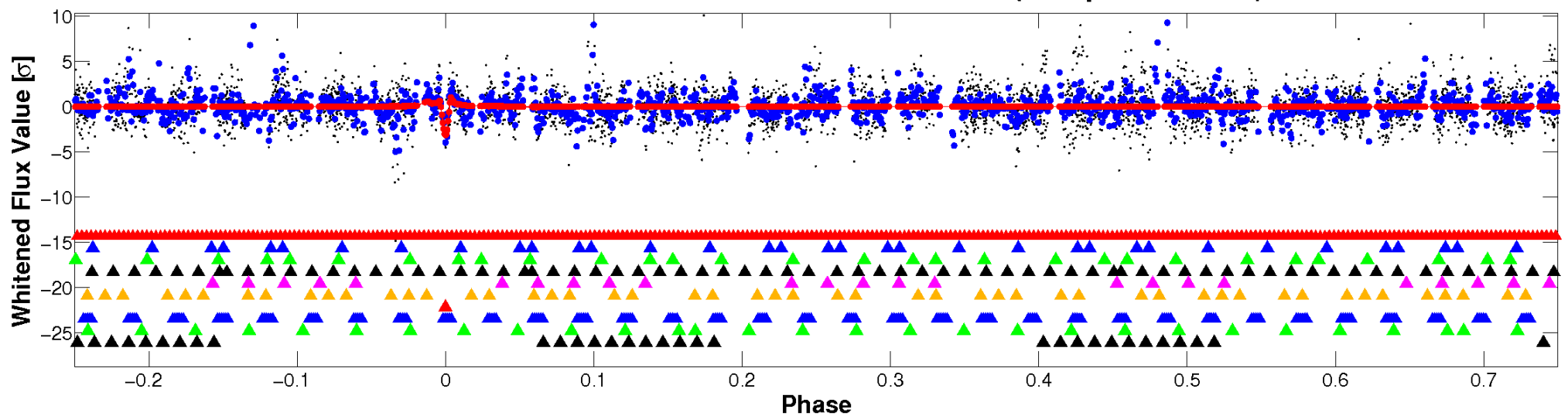


# Non-Whitened Vs. Whitened Light Curve

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

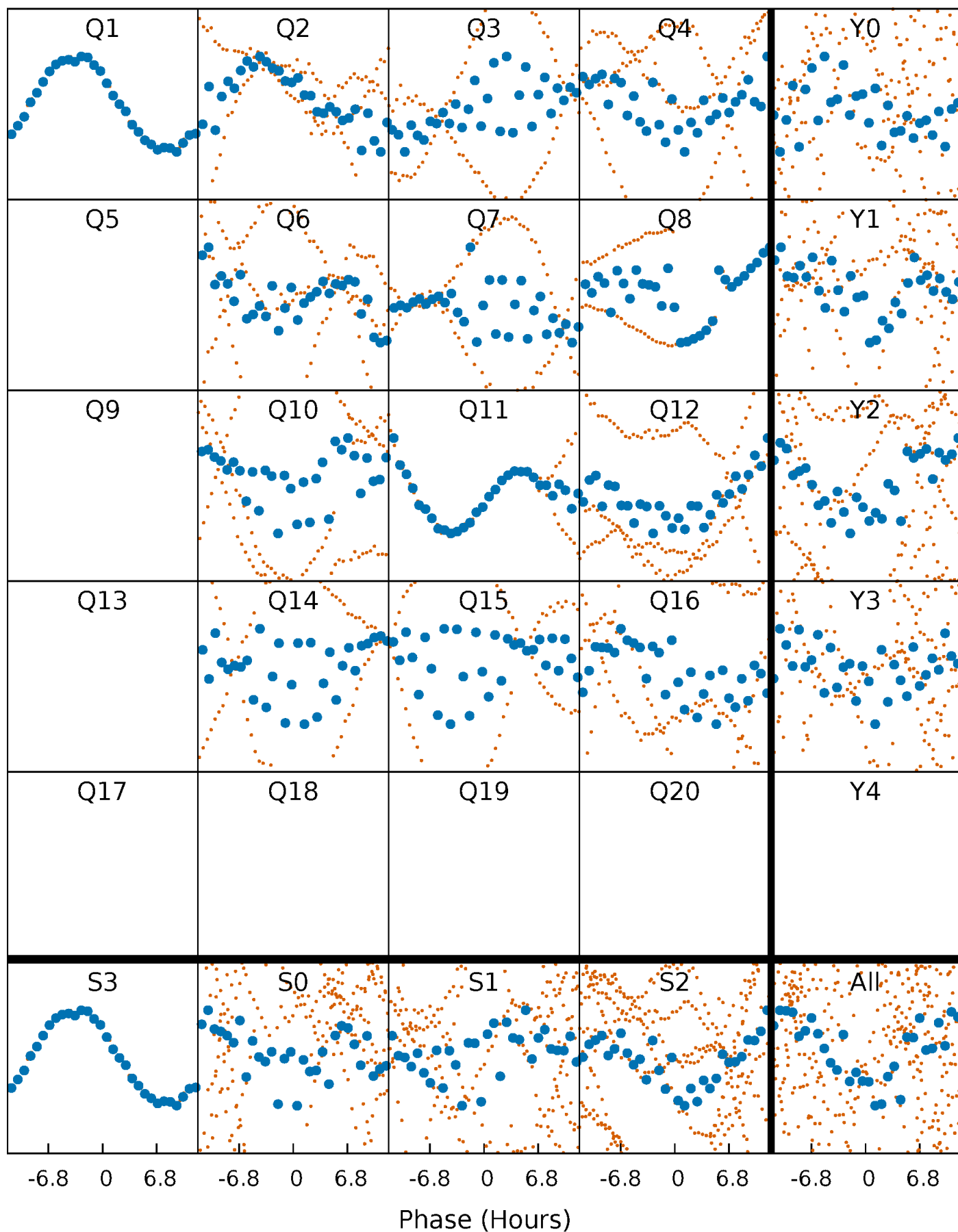


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



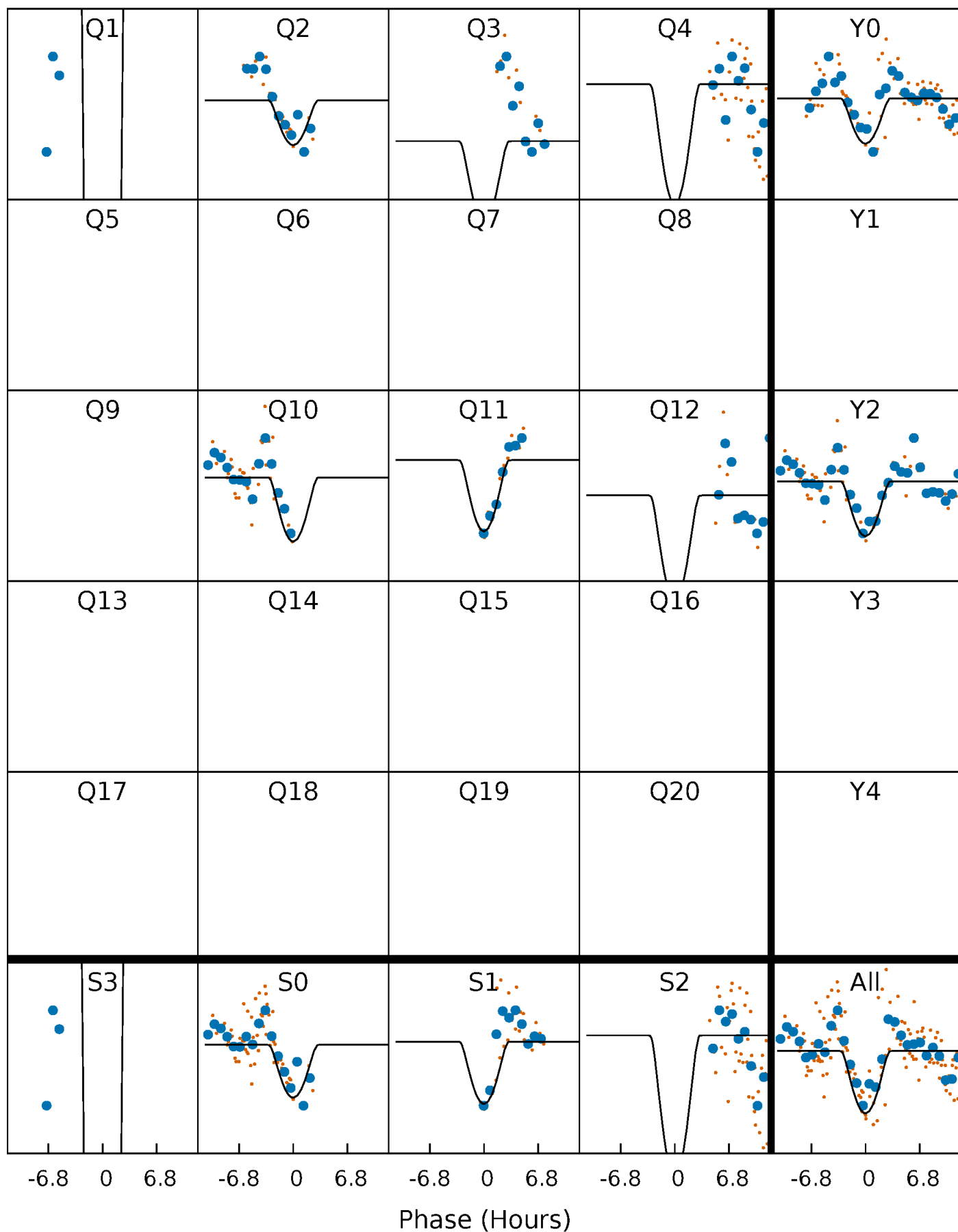
# PDC Quarter-Phased Transit Curves

TCE 006185416-07 P= 33.966423 Days  $T_0=149.661553$  (BKJD)



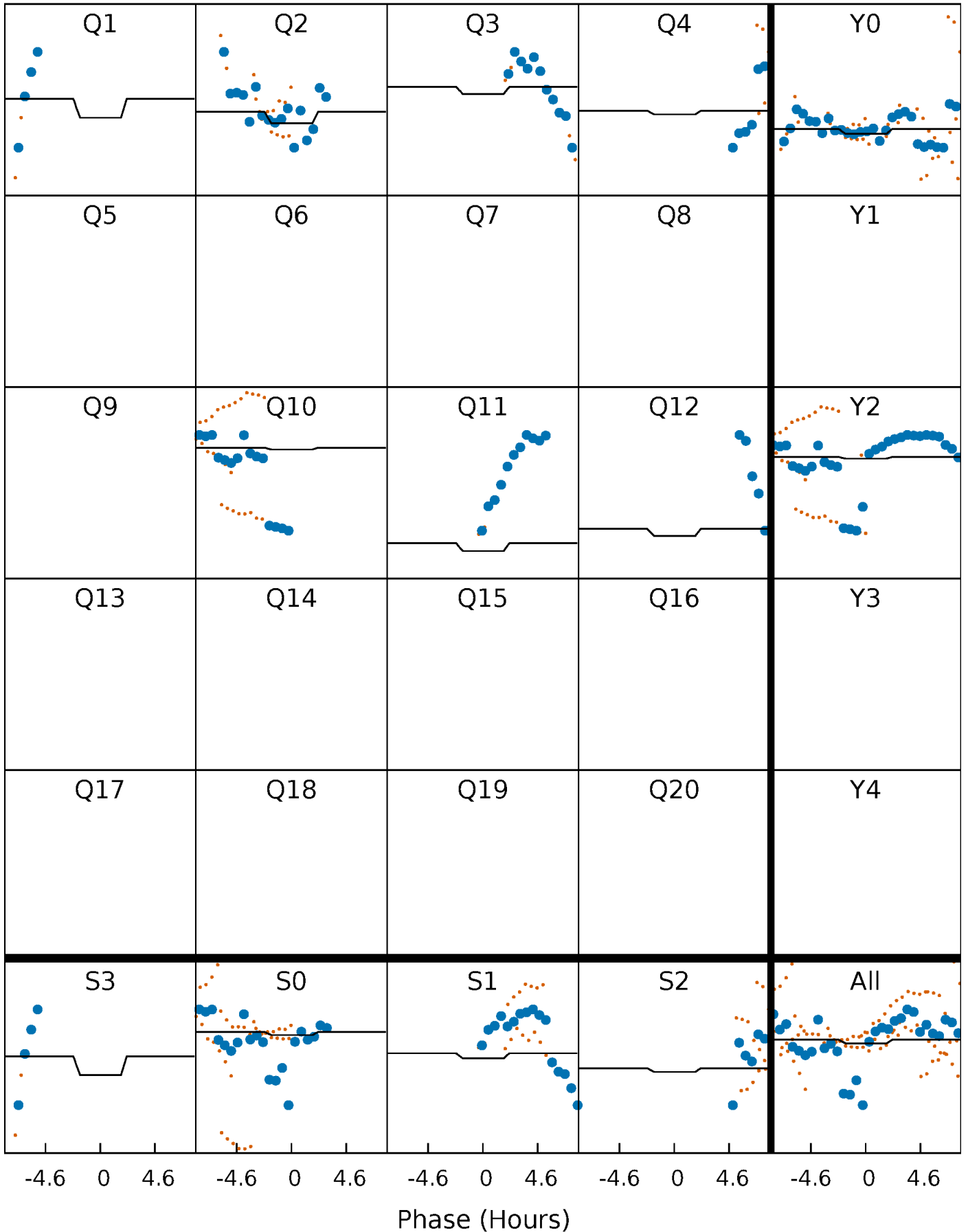
# DV Quarter-Phased Transit Curves

TCE 006185416-07 P= 33.966423 Days  $T_0=149.661553$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006185416-07 P= 33.966715 Days  $T_0=149.649233$  (BKJD)

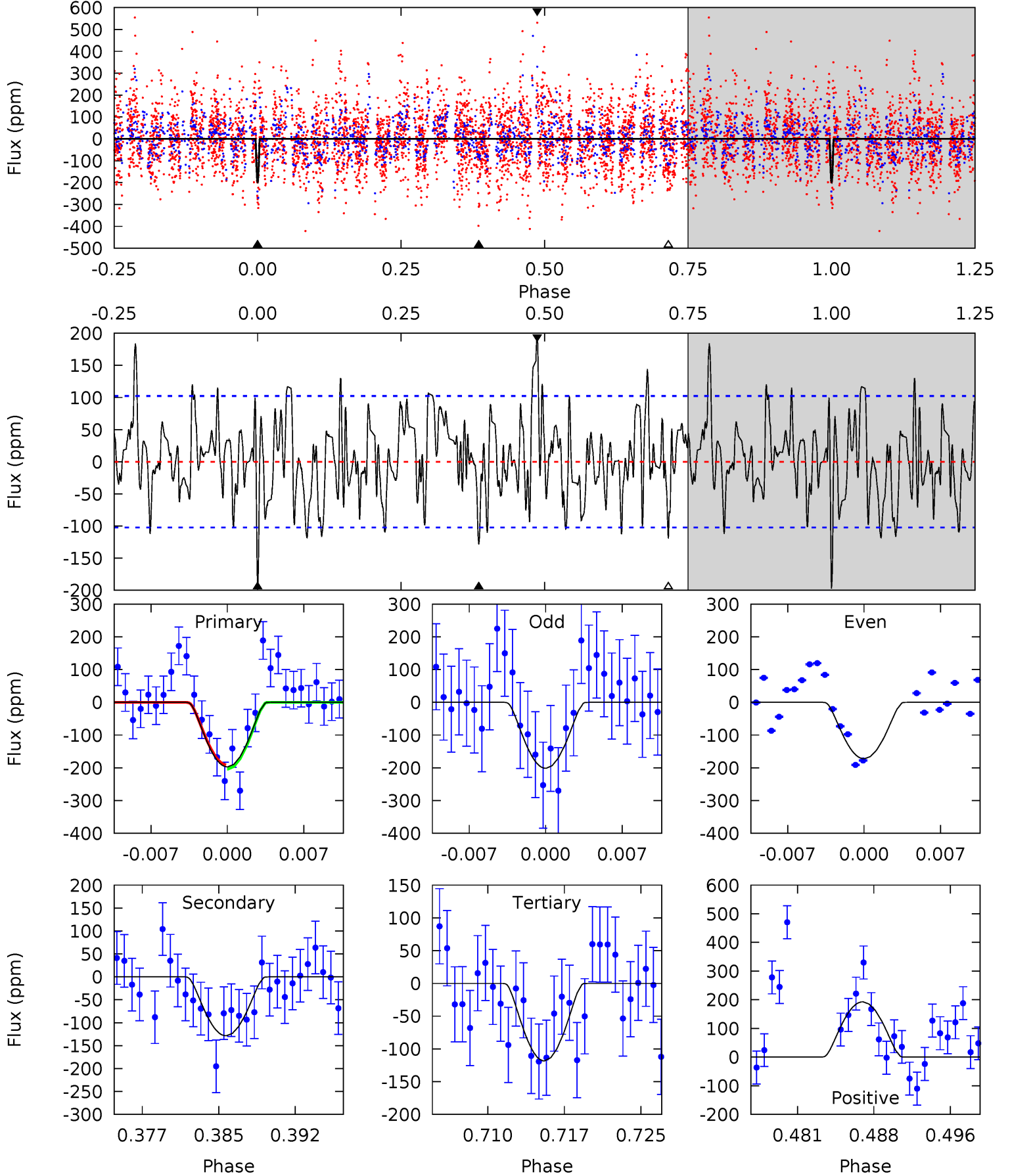




# DV Model-Shift Uniqueness Test

006185416-07, P = 33.966423 Days, E = 115.695130 Days

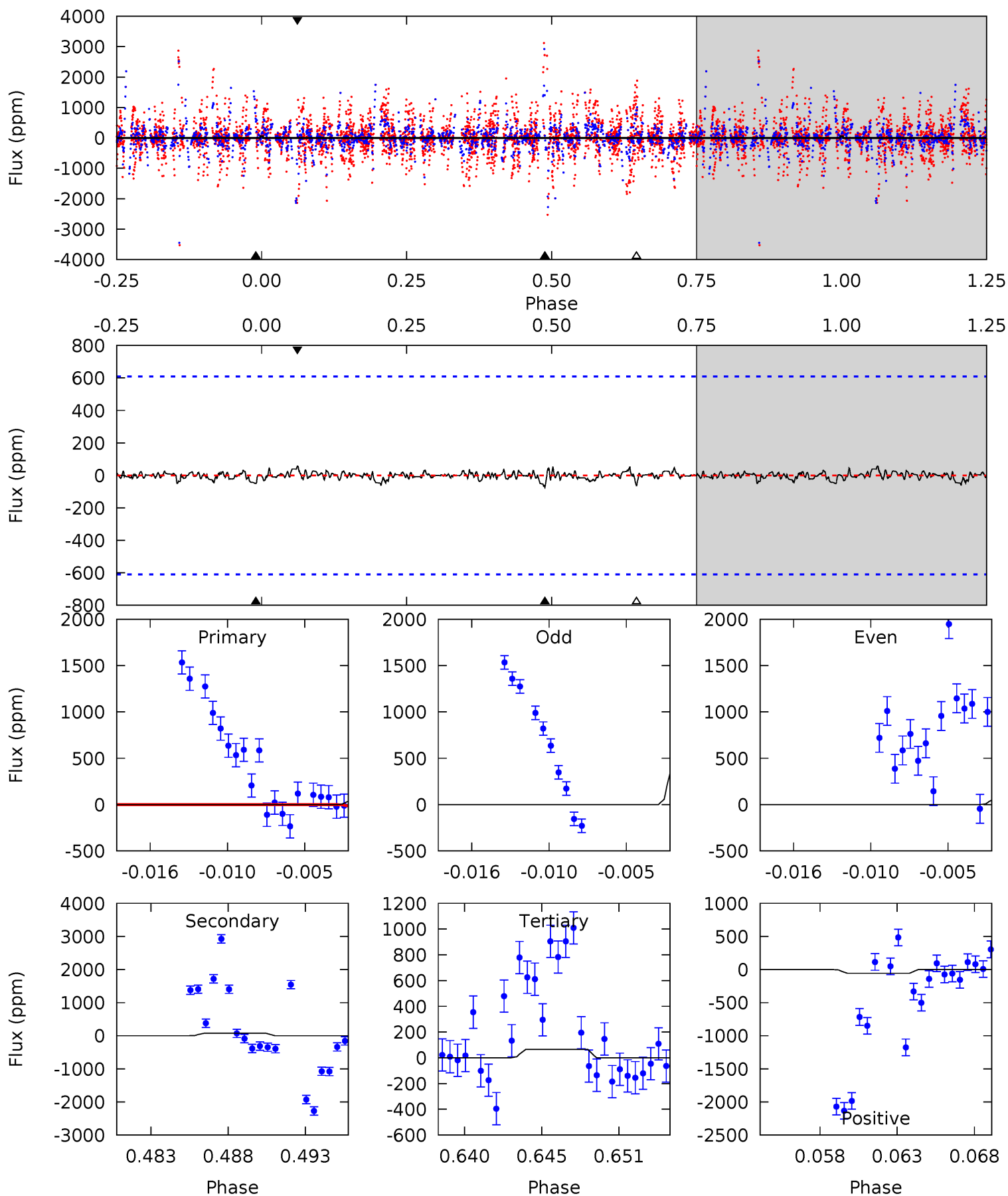
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.79	6.38	5.87	9.57	5.08	2.68	2.63	3.92	0.22	0.51	-3.19	0.57	0.56	0.49	0.32



# Alt Model-Shift Uniqueness Test

006185416-07, P = 33.966715 Days, E = 115.682518 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
0.42	0.64	0.55	0.48	5.15	2.79	0.14	-0.13	-0.06	0.08	0.15	1.10	24.2	0.43	0.44



### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-129 \pm 20$	$15.04^{+14.20}_{-10.64}$	$1317^{+77}_{-102}$	$3415^{+2006}_{-621}$	$17^{+181}_{-12}$
Alt.	$-75 \pm 118$	$11.80^{+13.71}_{-8.37}$	$1315^{+77}_{-124}$	$3097^{+1903}_{-6111}$	$9.003^{+140.140}_{-16.365}$

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

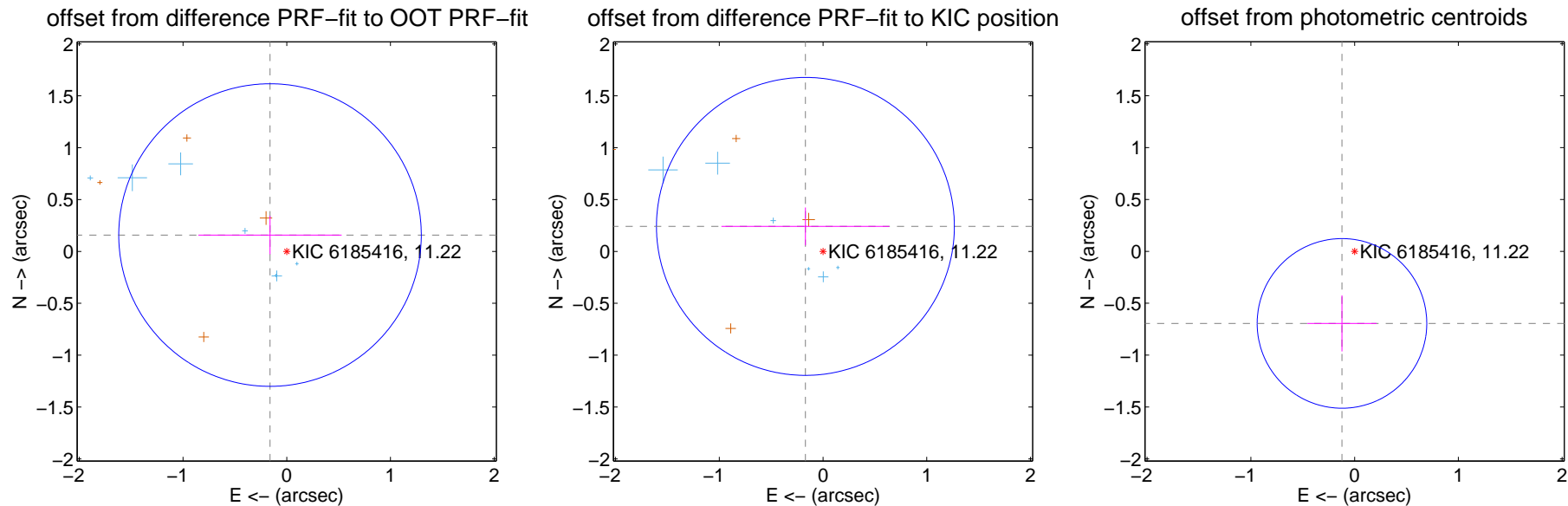
## DV Centroid Data

Supplemental centroid analysis for 006185416-07. **Kepler magnitude: 11.22**. Transit SNR 12.26

There are 7 quarters with good PRF difference image offsets

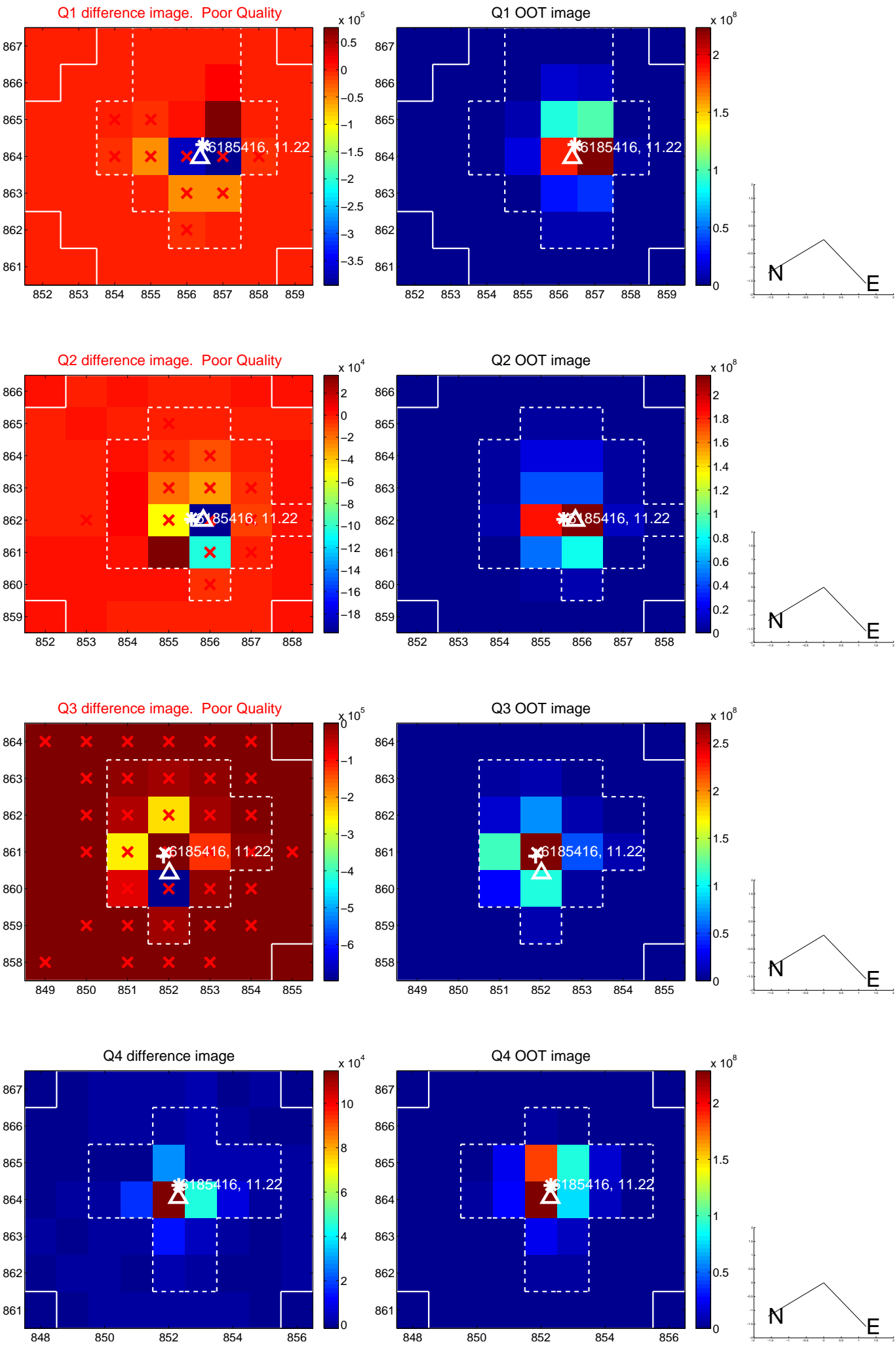
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.226 \pm 0.486$	0.46	$0.161 \pm 0.691$	$0.158 \pm 0.185$
PRF-fit source offset from KIC position	$0.295 \pm 0.479$	0.62	$0.170 \pm 0.810$	$0.241 \pm 0.182$
photometric centroid source offset	$0.70 \pm 0.27$	2.59	$0.12 \pm 0.33$	$-0.69 \pm 0.27$

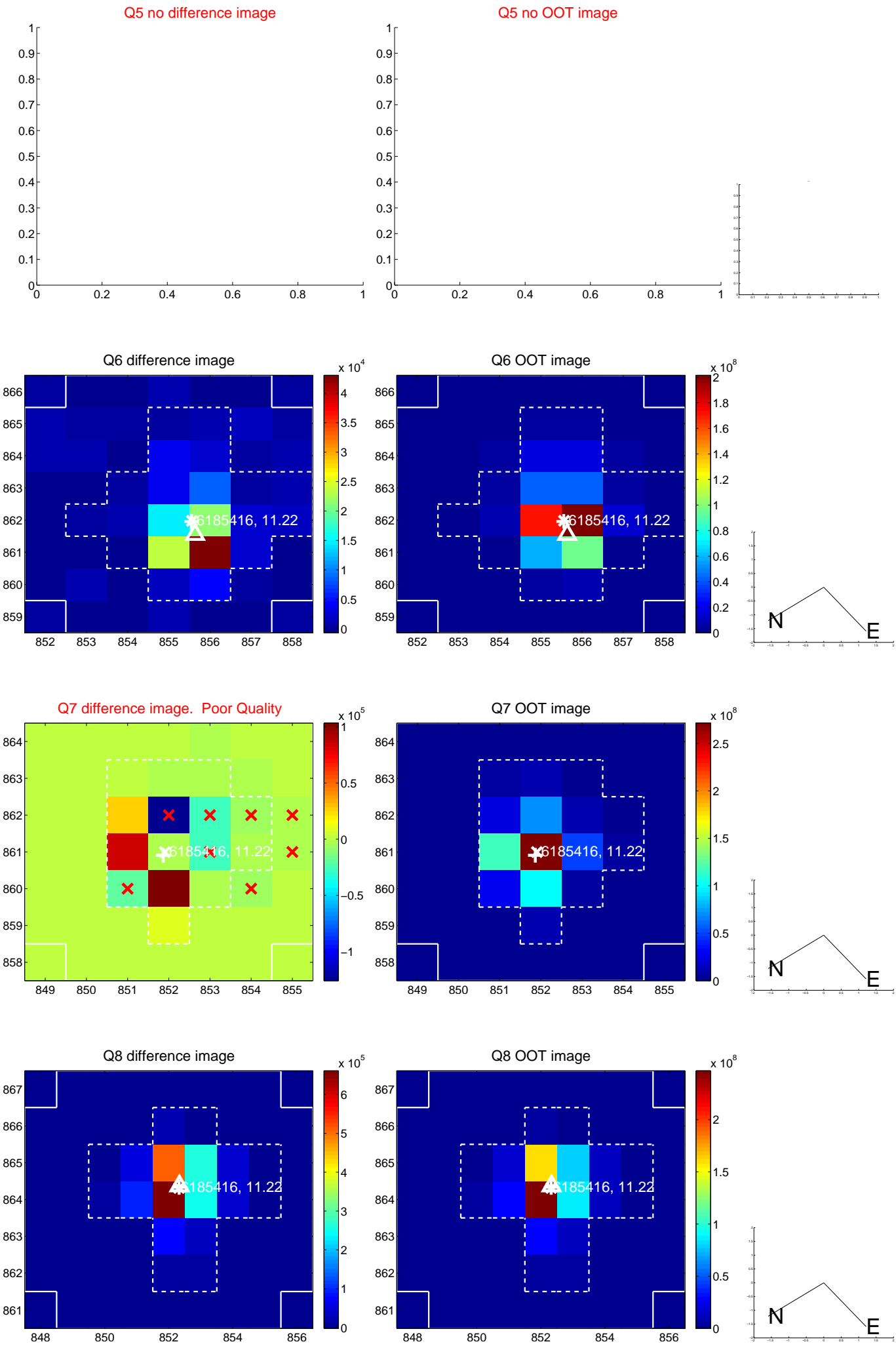


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

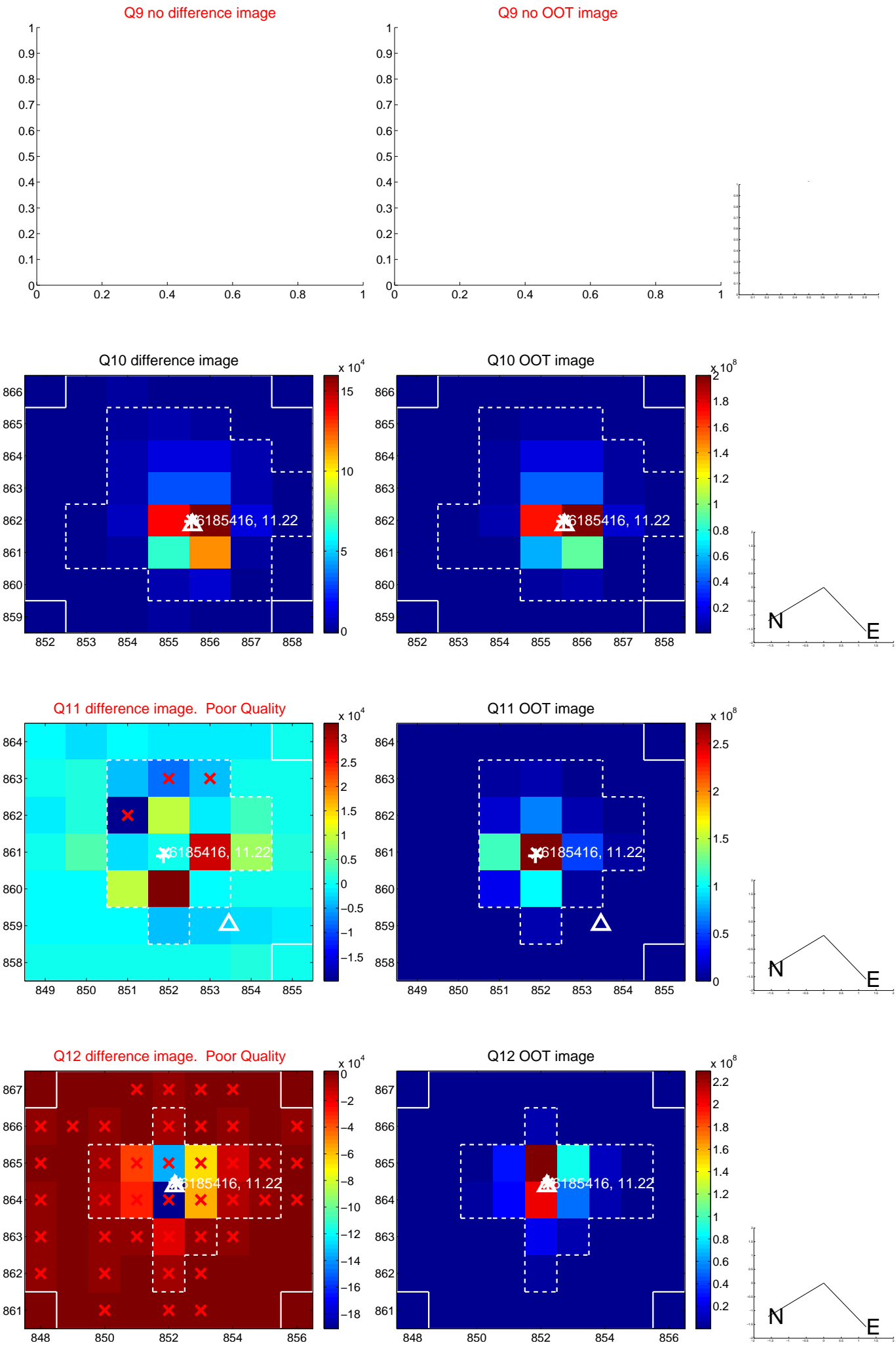
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



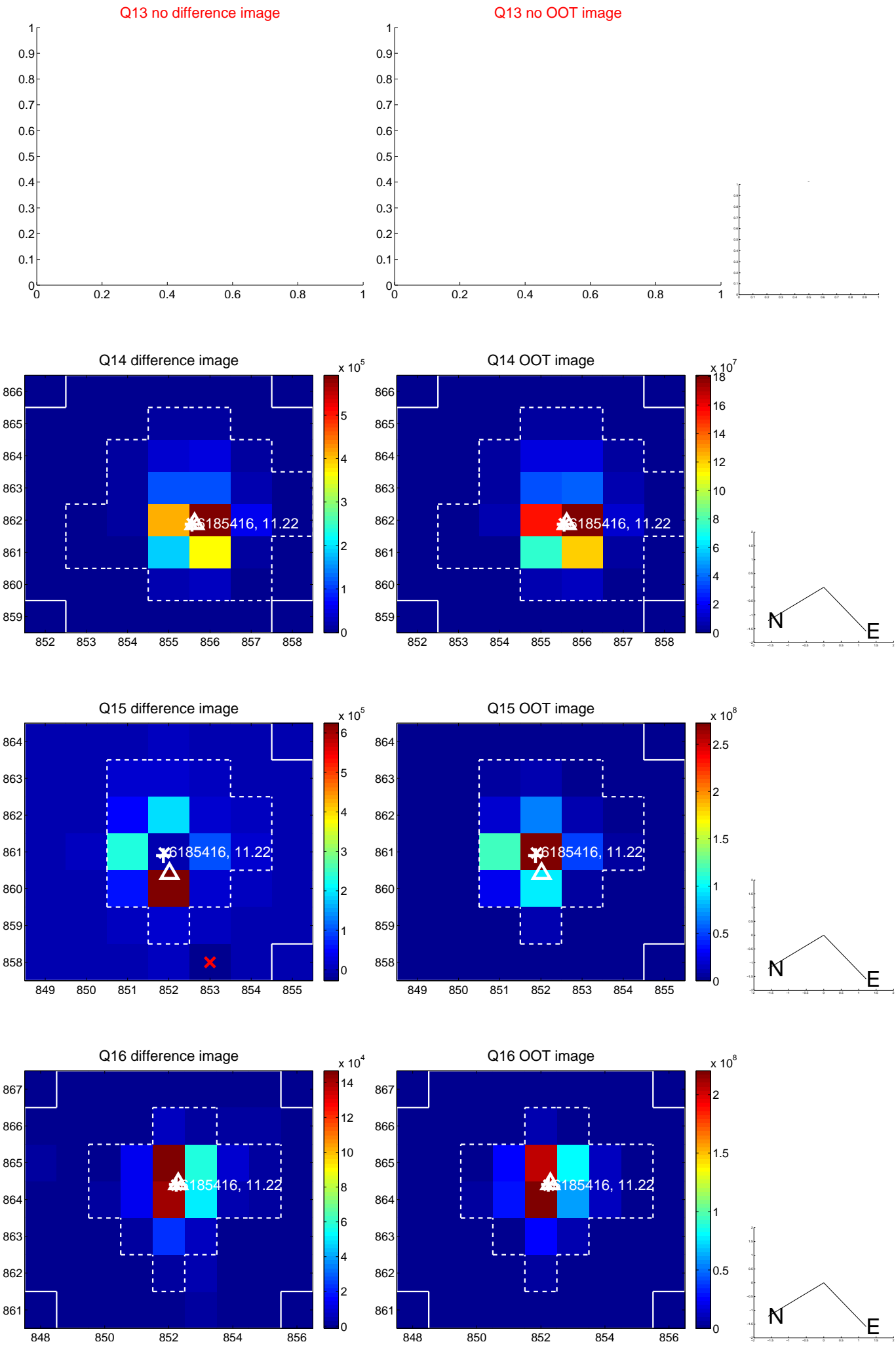
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

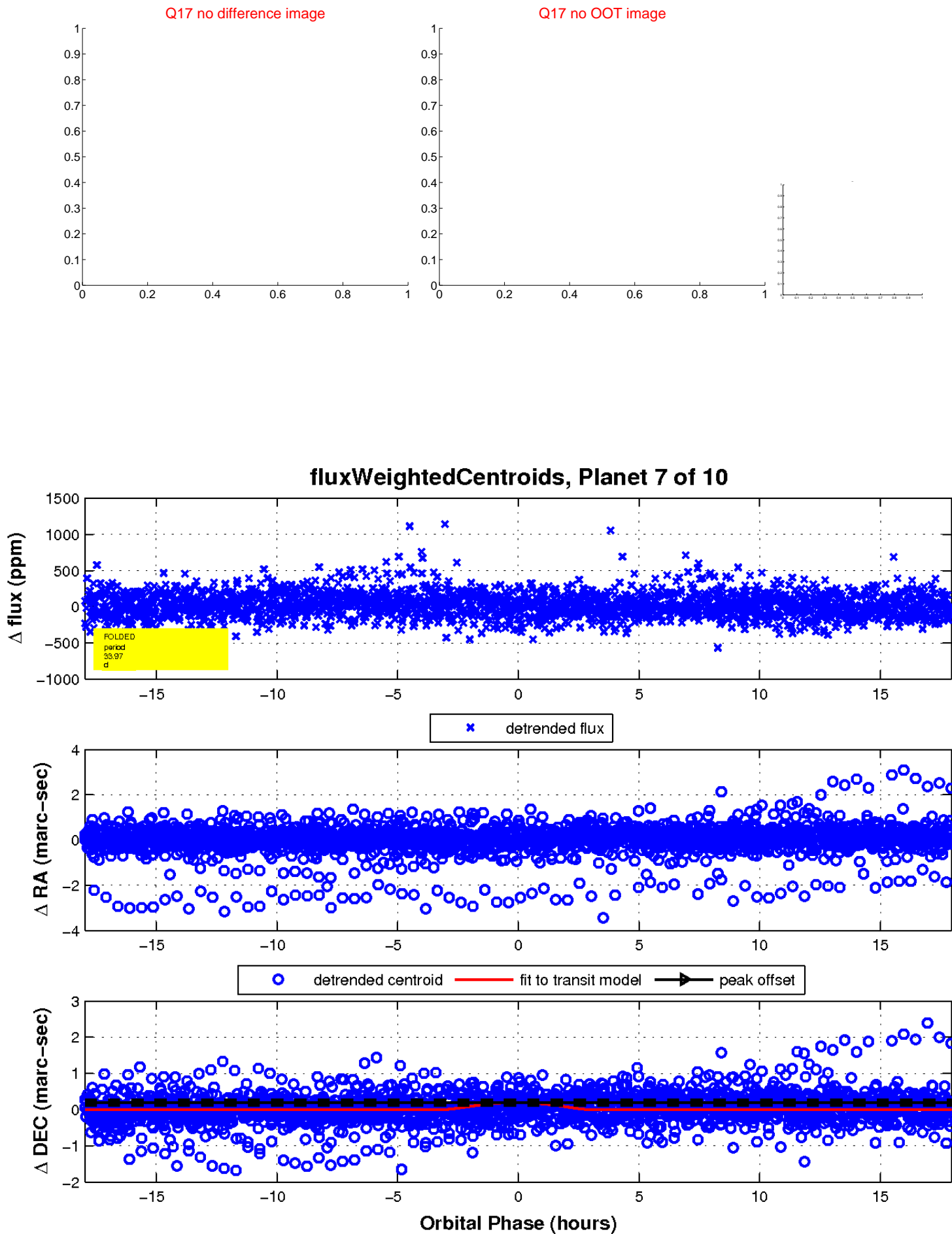


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



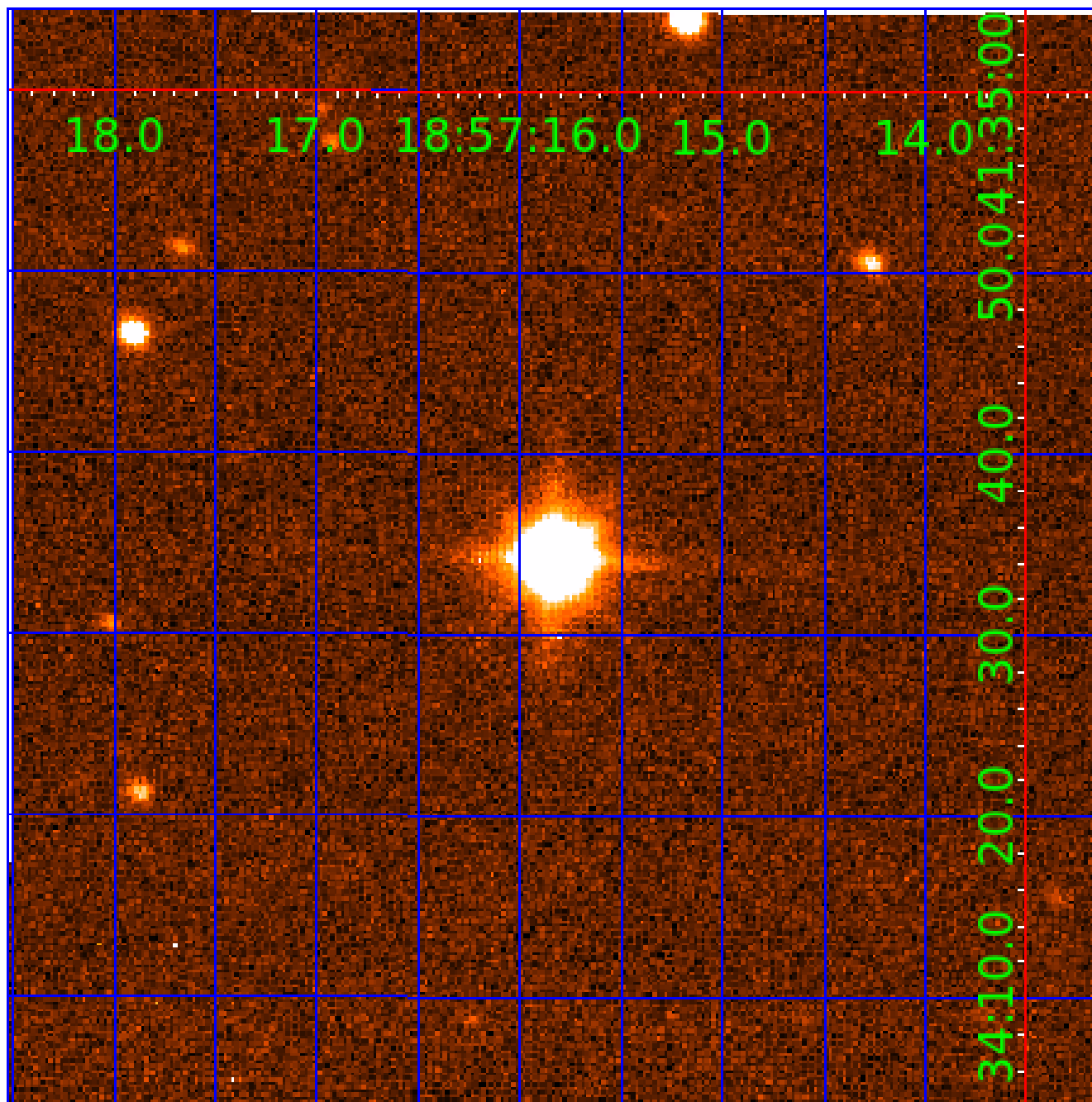


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

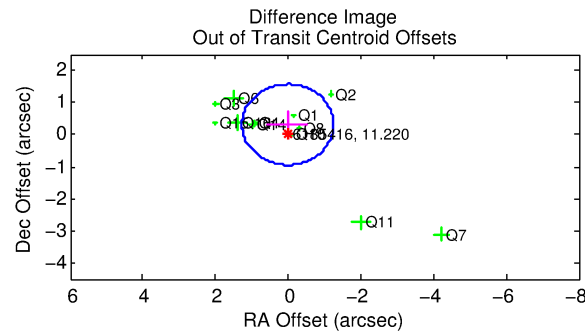
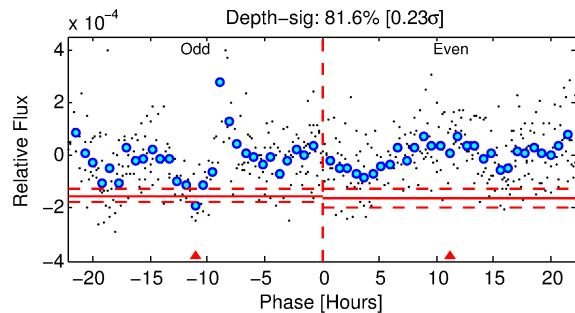
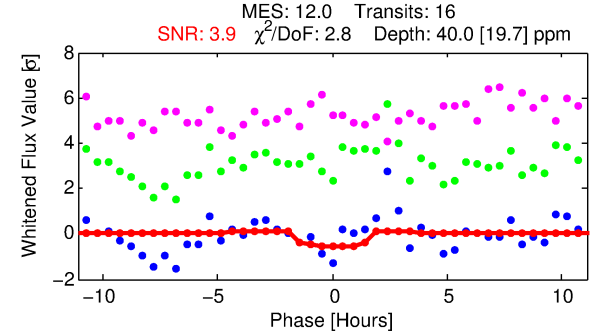
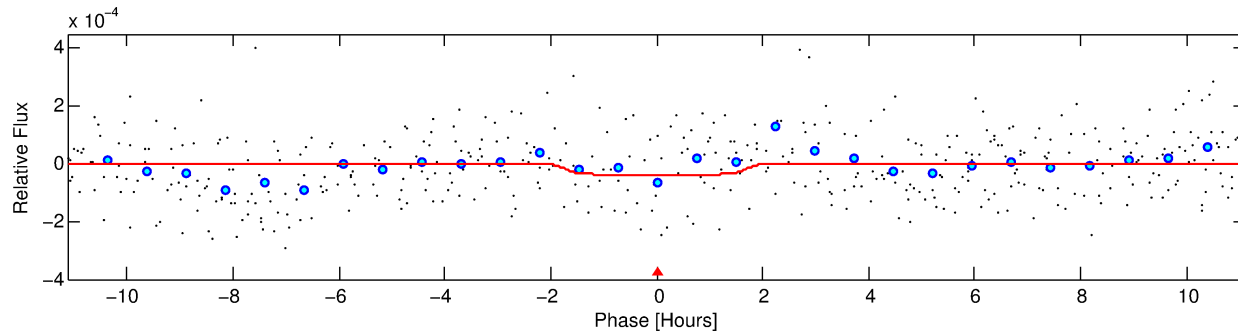
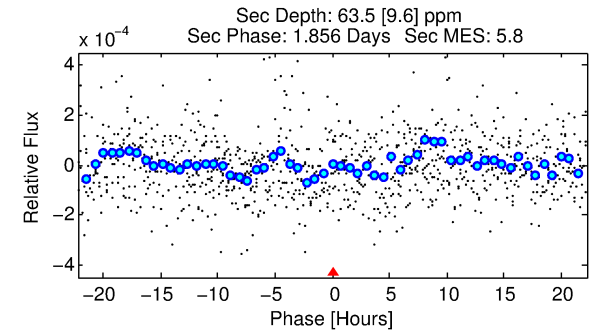
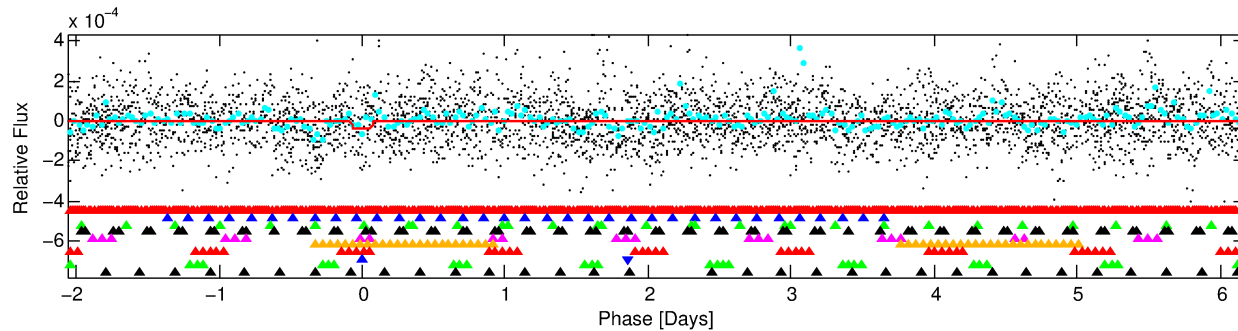
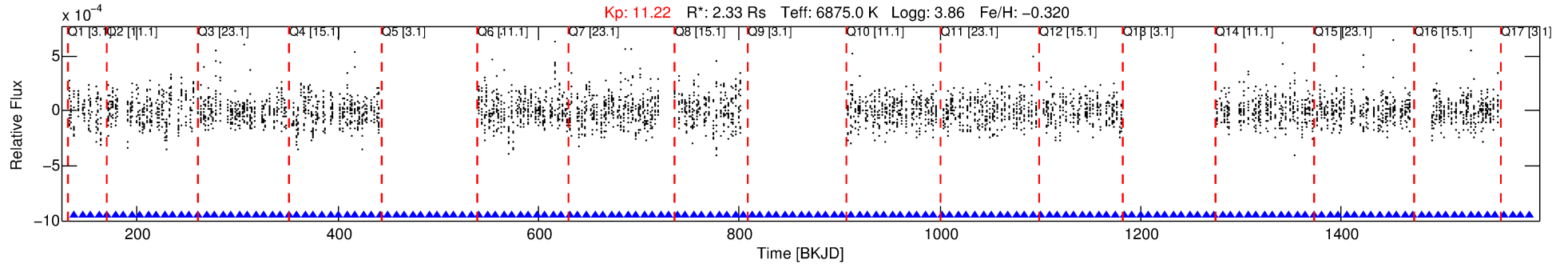
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006185416-08

No Significant Match Found

# DV One-Page Summary

KIC: 6185416 Candidate: 8 of 10 Period: 8.236 d



## DV Fit Results:

Period = 8.23576 [0.00028] d  
Epoch = 137.2263 [0.0243] BKJD  
Rp/R\* = 0.0070 [0.0086]  
a/R\* = 6.21 [45.40]  
b = 0.94 [0.94]  
Seff = 1339.40 [681.05]  
Teq = 1543 [196] K  
Rp = 1.78 [2.27] Re  
a = 0.0900 [0.0286] AU  
Ag = 89.41 [224.46] [0.39σ]  
Teffp = 7334 [4518] K [1.28σ]

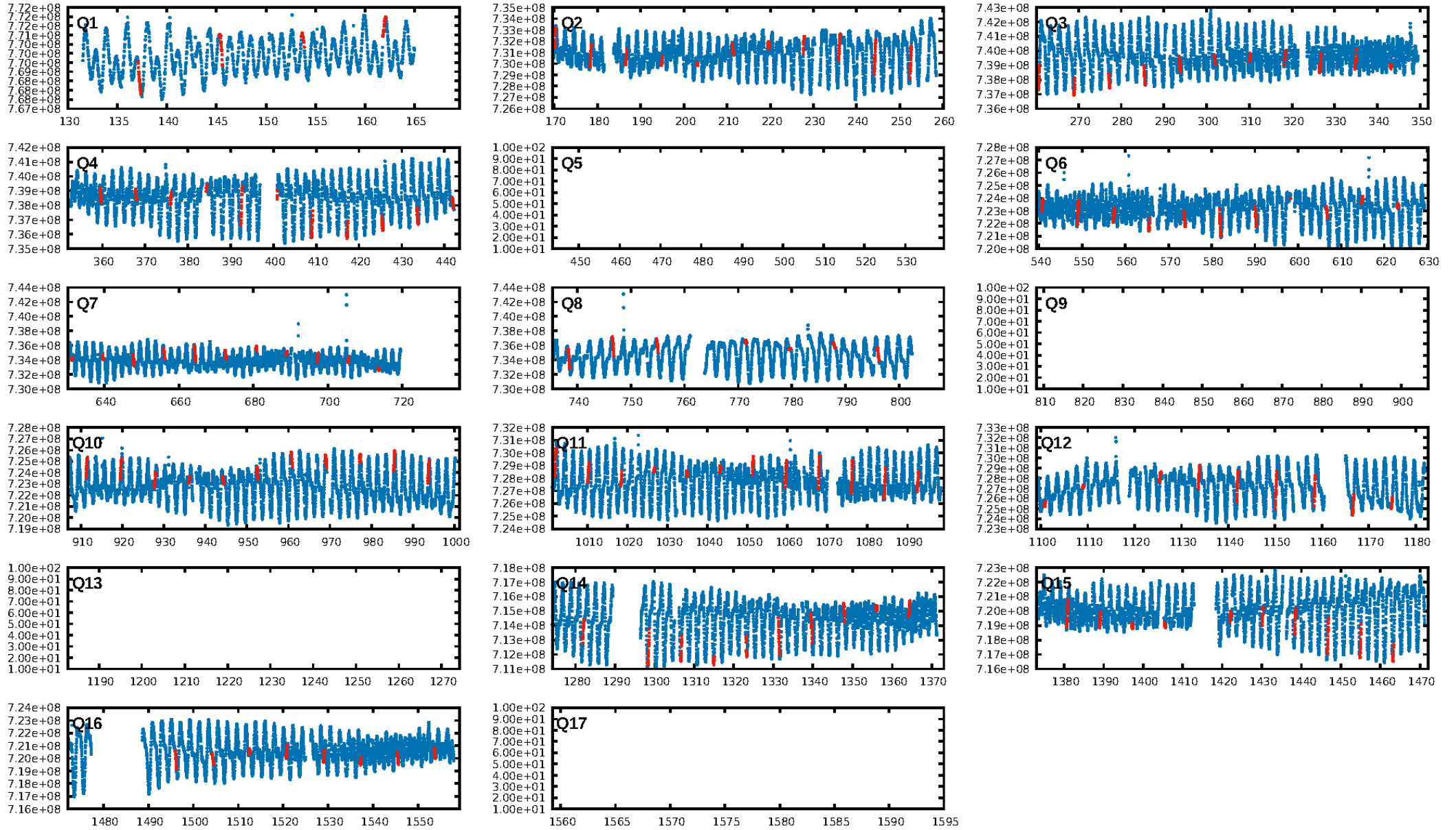
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.90σ]  
LongPeriod-sig: 100.0% [30.99σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [15/15]  
GhostDiagnostic-chr: -9.949  
Centroid-sig: N/A  
Centroid-so: 0.232 arcsec [0.24σ]  
OotOffset-rm: 0.310 arcsec [0.74σ]  
OotOffset-st: 4/4/3/1 [12]  
KicOffset-rm: 0.412 arcsec [0.96σ]  
KicOffset-st: 4/4/3/1 [12]  
DiffImageQuality-fgm: 0.50 [6/12]  
DiffImageOverlap-fno: 0.92 [12/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:51 Z

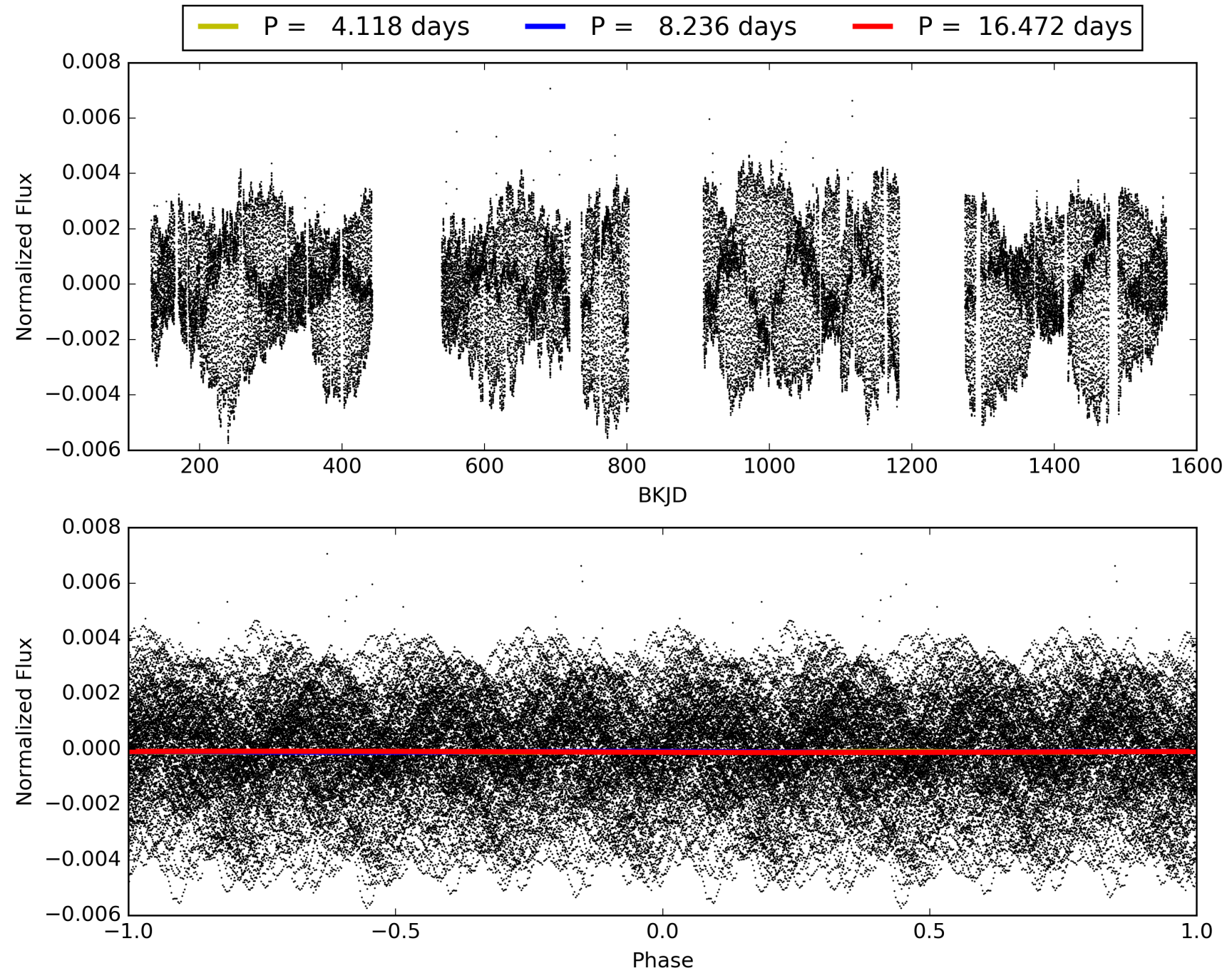
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006185416-08, PDC Light Curves



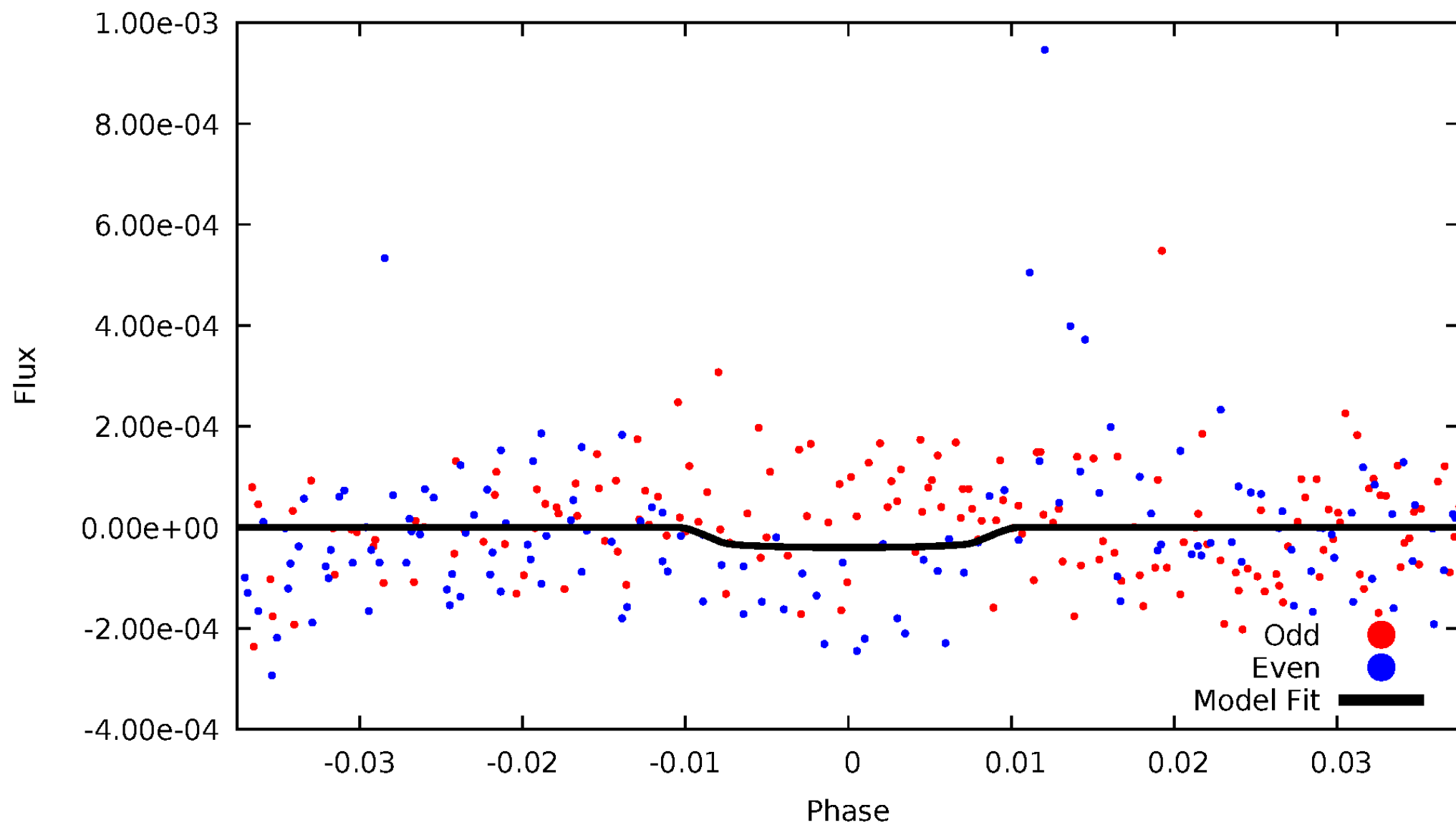


TCE 006185416-08



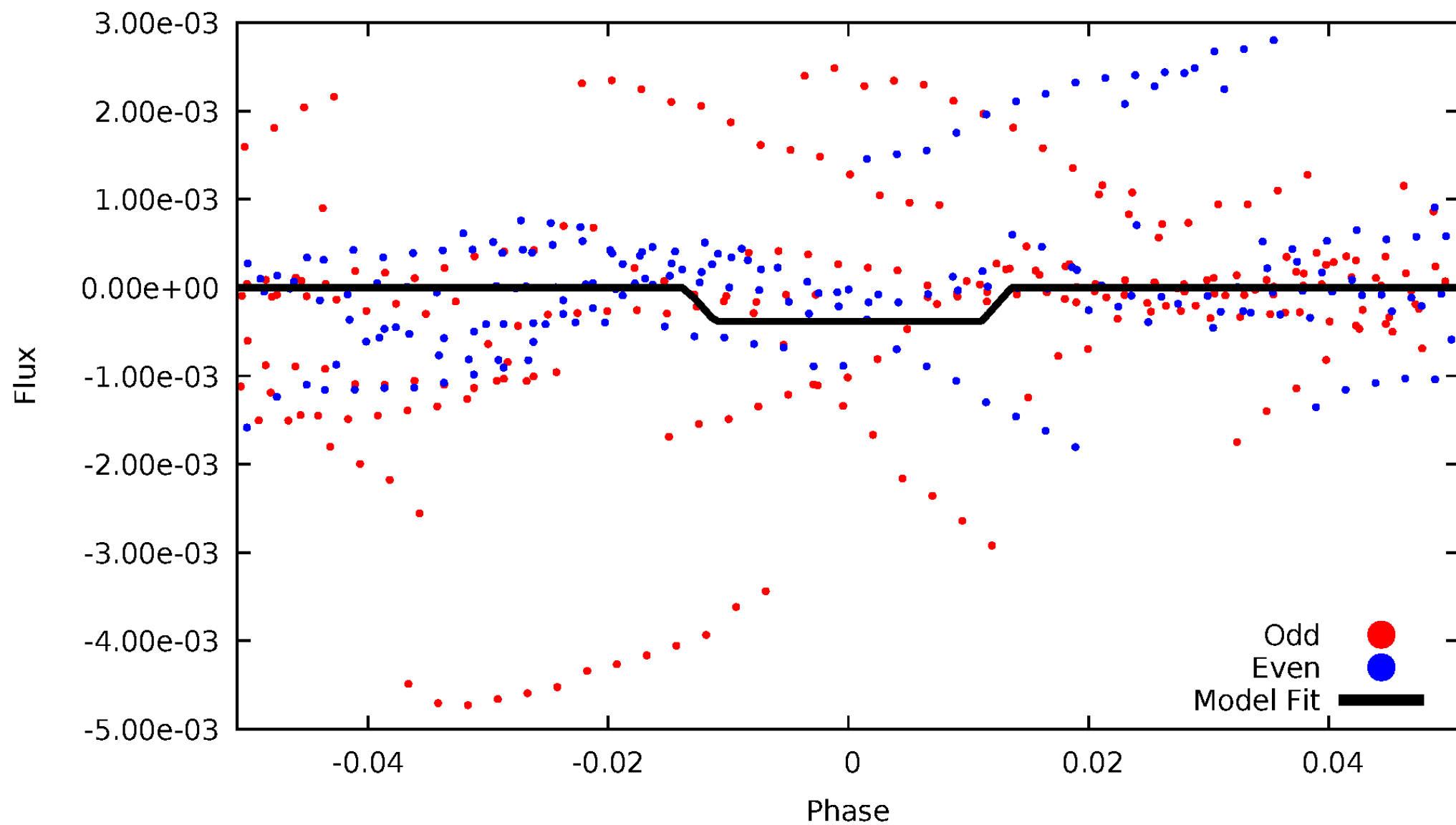
# DV Odd/Even

TCE 006185416-08



# ALT Odd/Even

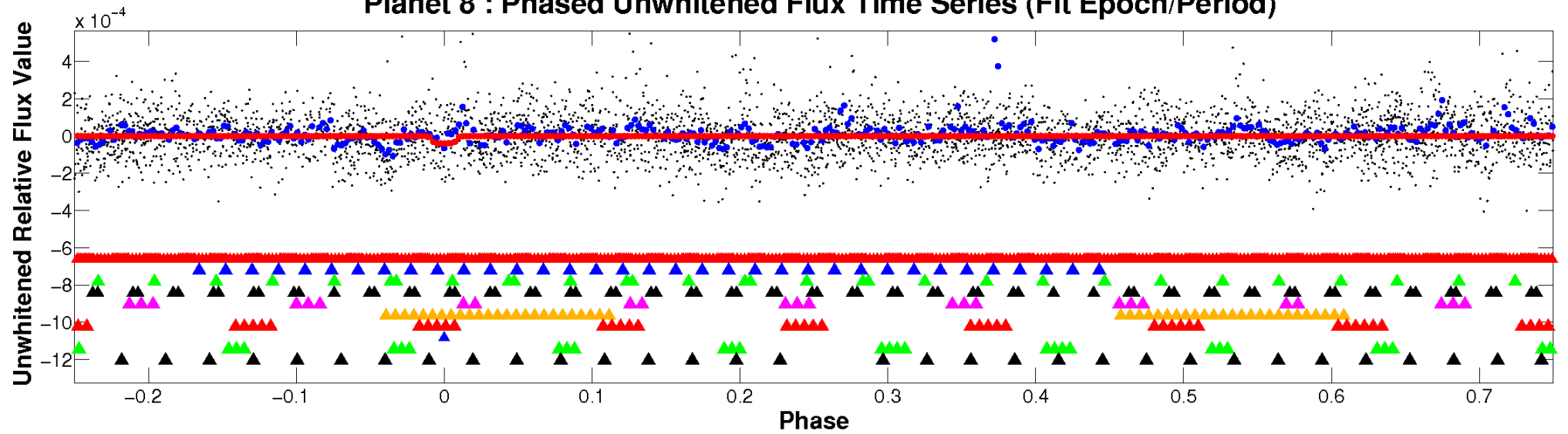
TCE 006185416-08



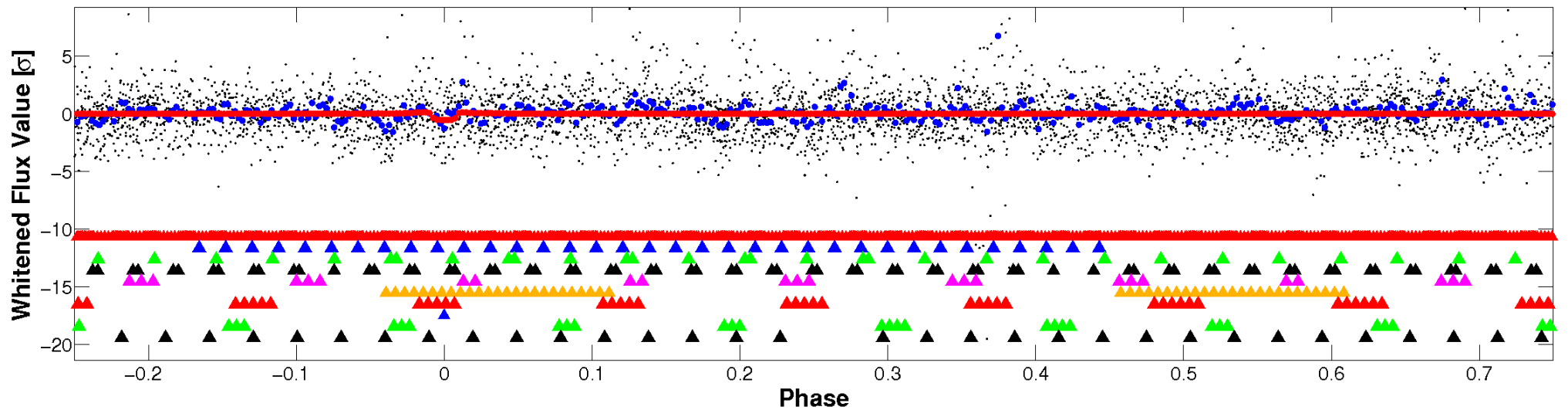


# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

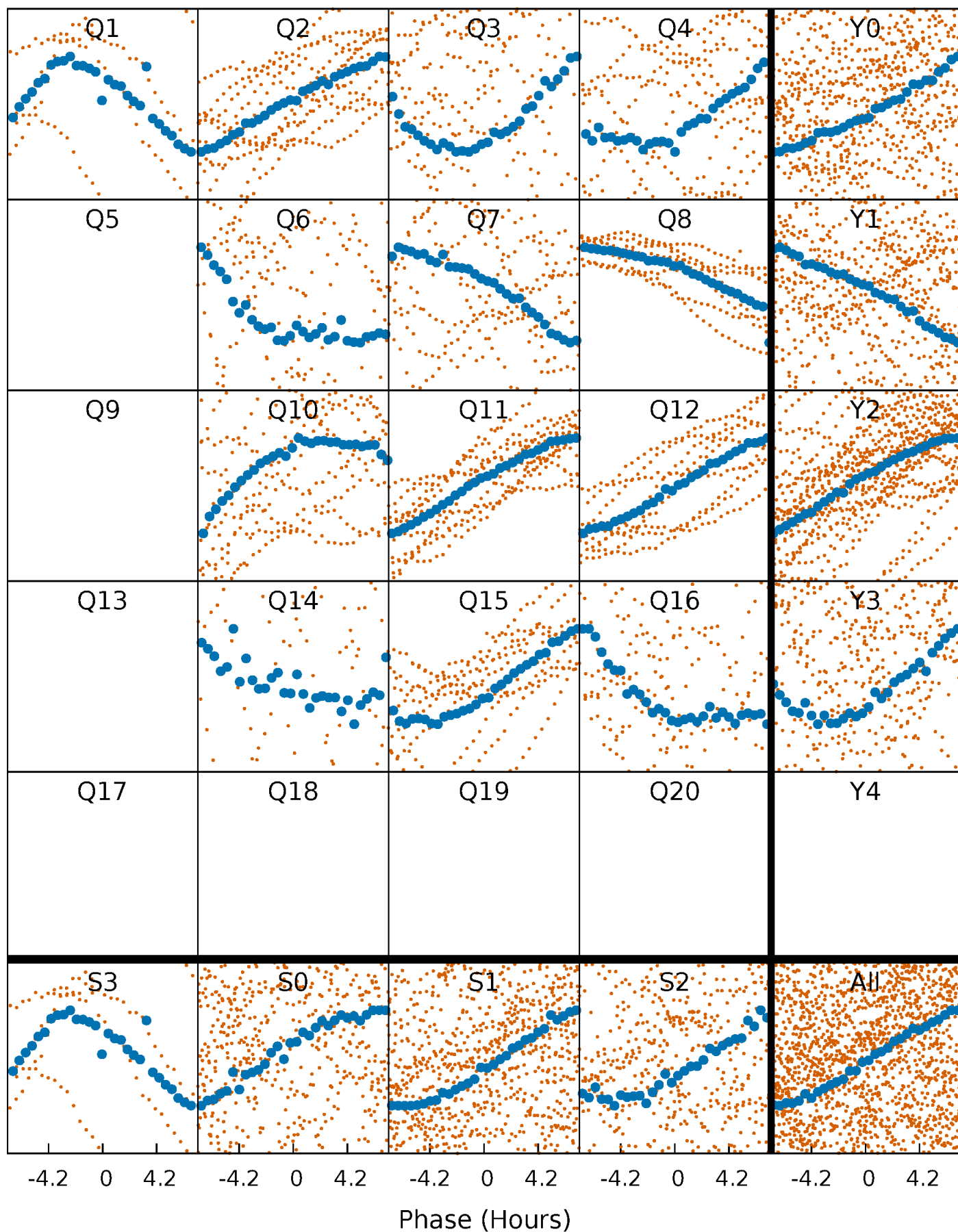


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



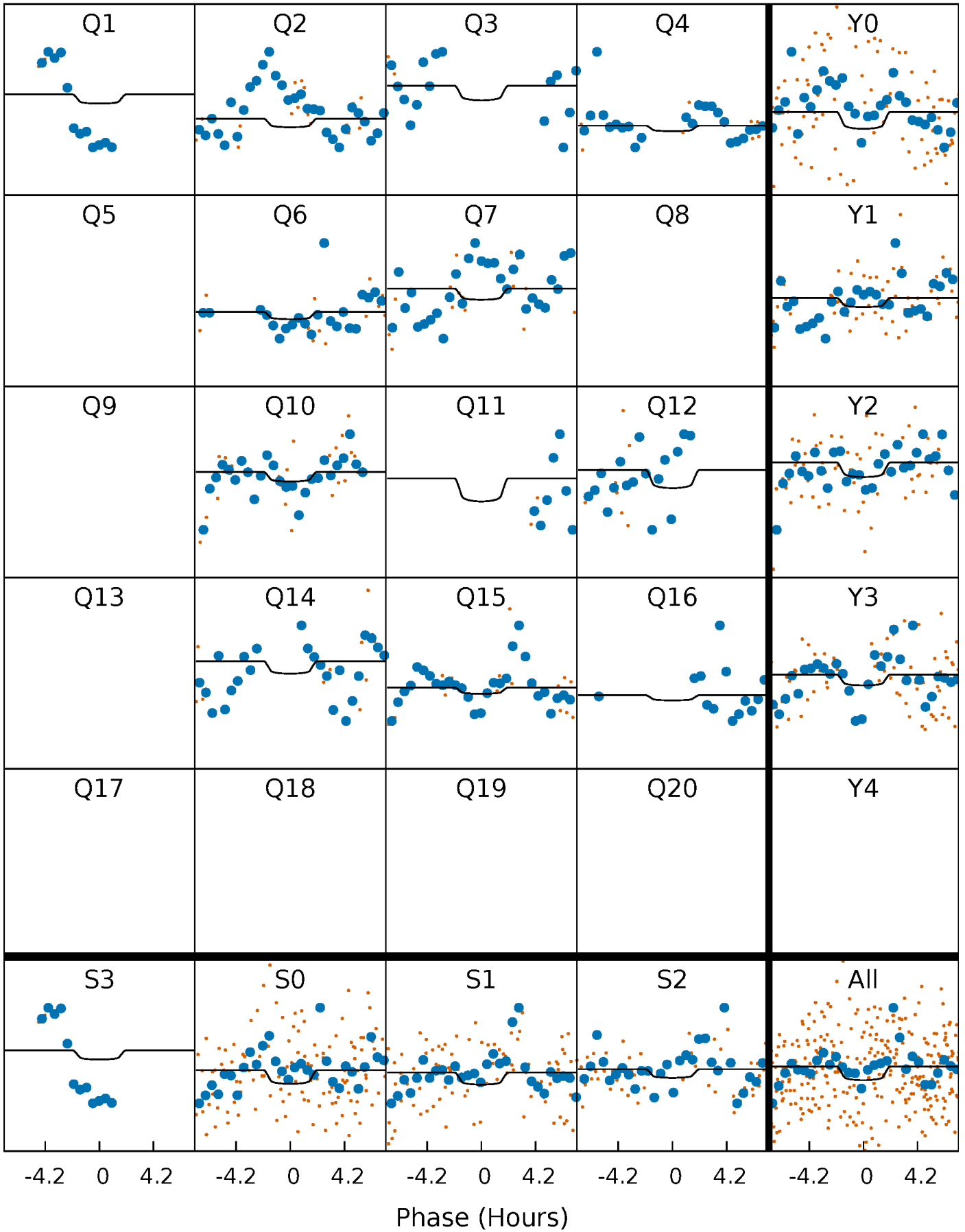
# PDC Quarter-Phased Transit Curves

TCE 006185416-08   P= 8.235765 Days    $T_0=137.226252$  (BKJD)



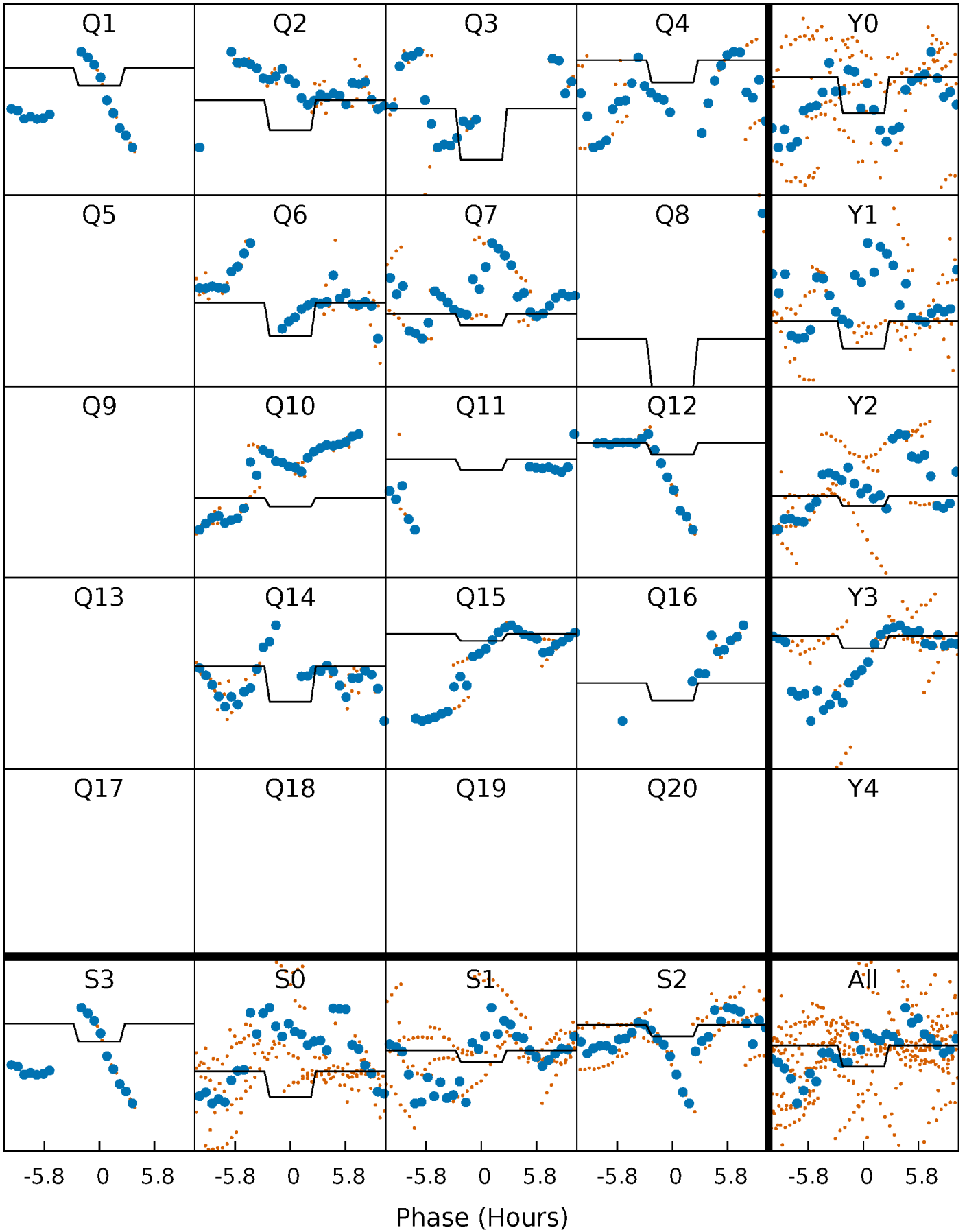
# DV Quarter-Phased Transit Curves

TCE 006185416-08     $P = 8.235765$  Days     $T_0 = 137.226252$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

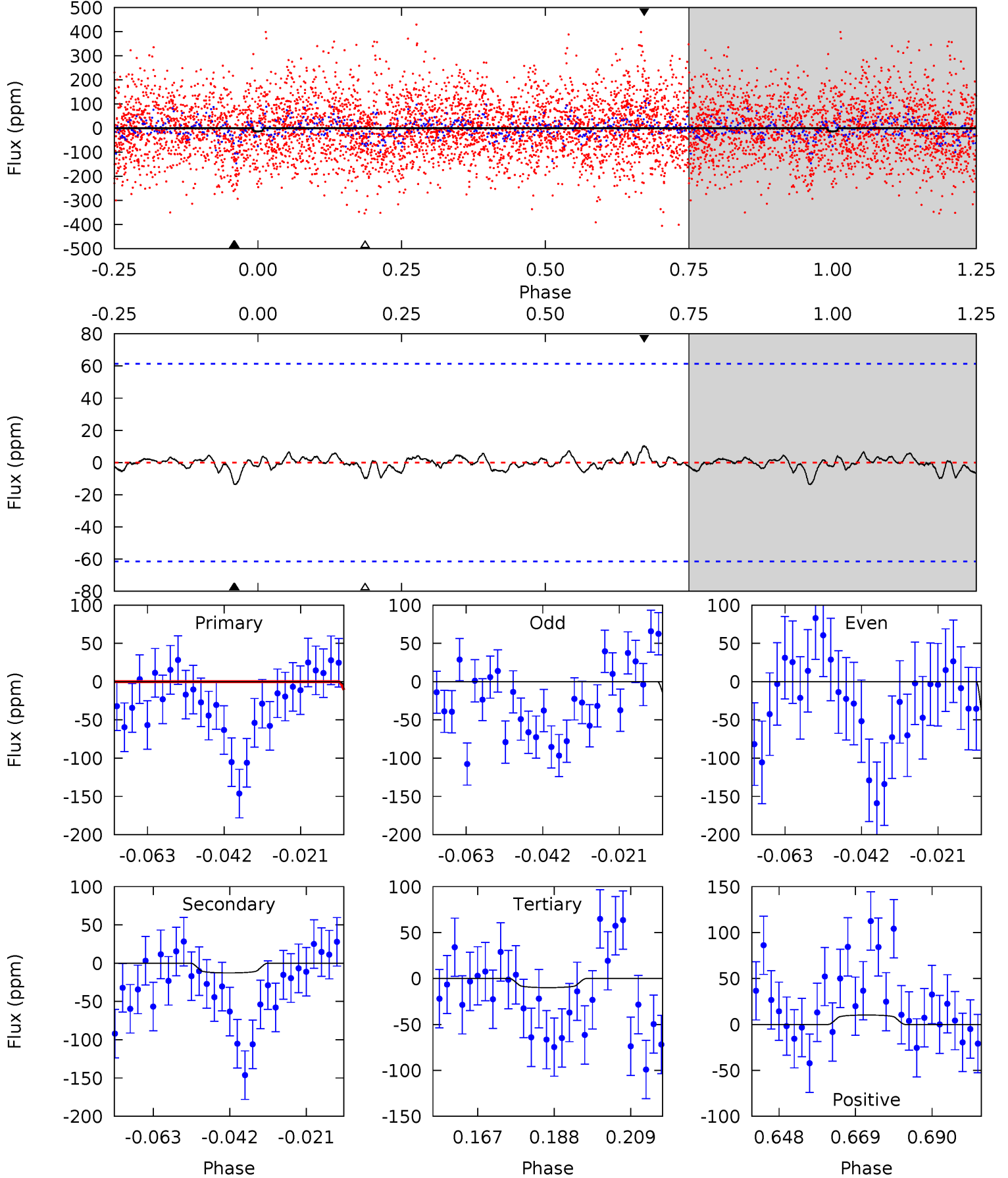
TCE 006185416-08 P= 8.236316 Days  $T_0=137.119586$  (BKJD)



# DV Model-Shift Uniqueness Test

006185416-08, P = 8.235765 Days, E = 128.990487 Days

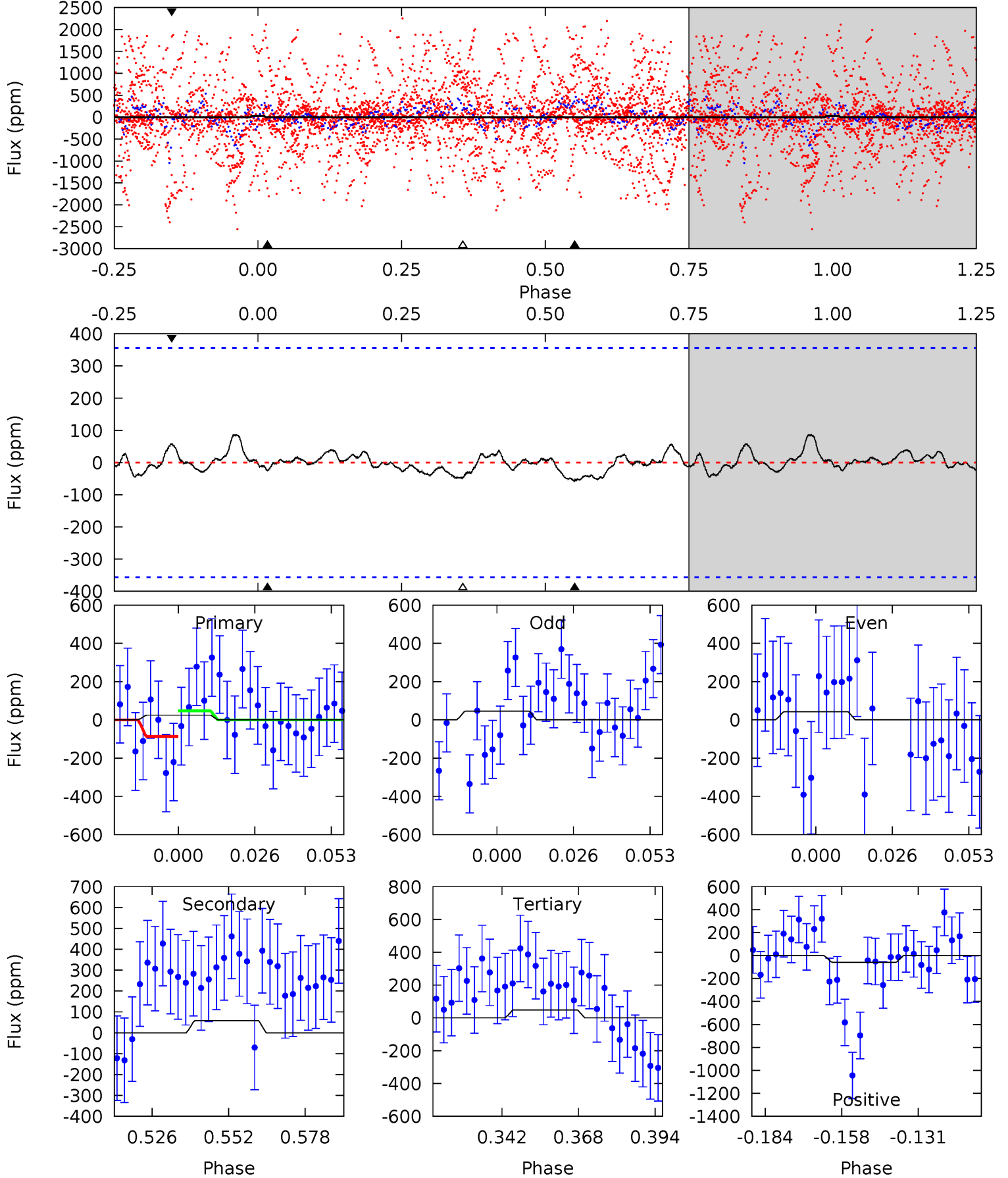
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.08	1.02	0.79	0.81	4.88	2.31	0.26	0.29	0.27	0.23	0.20	3.20	-1.04	0.43	1.23



# Alt Model-Shift Uniqueness Test

006185416-08, P = 8.236316 Days, E = 128.883270 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
0.34	0.79	0.66	0.80	4.84	2.22	0.36	-0.32	-0.46	0.12	-0.01	0.02	1.52	0.60	0.28



### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-08 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-13 \pm 13$	$2.15^{+2.03}_{-1.44}$	$2114^{+124}_{-178}$	$4237^{+2654}_{-6830}$	$9.319^{+78.393}_{-9.325}$
Alt.	$-58 \pm 74$	$4.66^{+2.36}_{-2.04}$	$2122^{+116}_{-186}$	$4299^{+1562}_{-7877}$	$9.239^{+34.141}_{-12.624}$

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

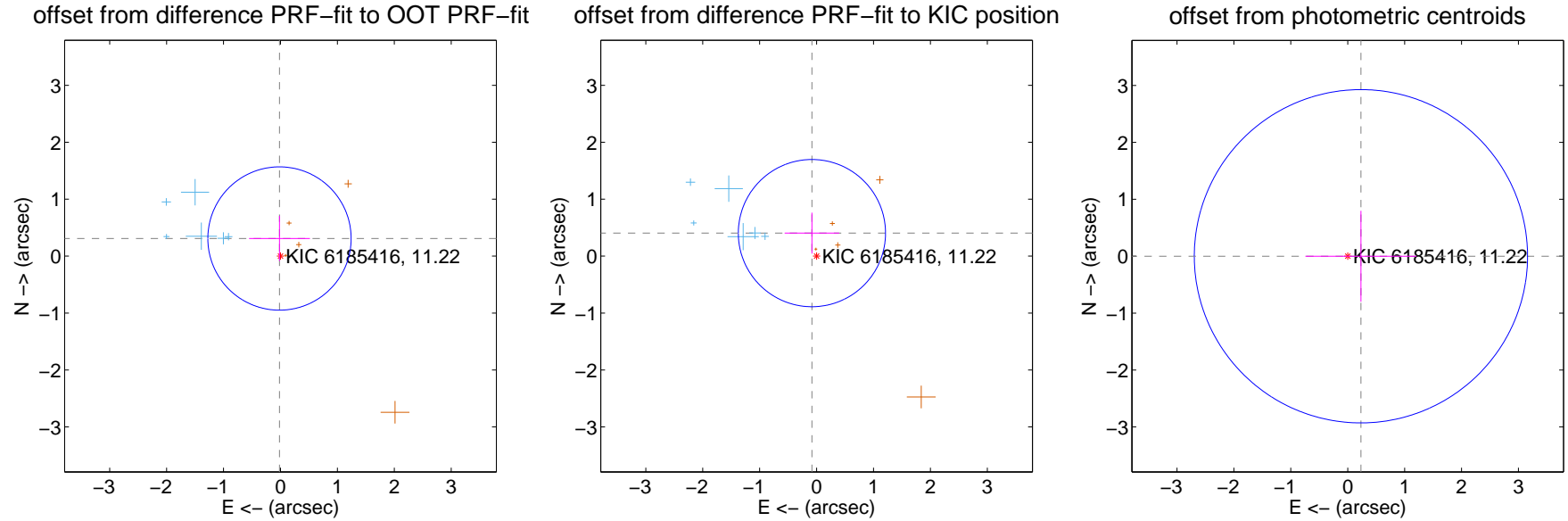
## DV Centroid Data

Supplemental centroid analysis for 006185416-08. **Kepler magnitude: 11.22**. Transit SNR 3.92

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

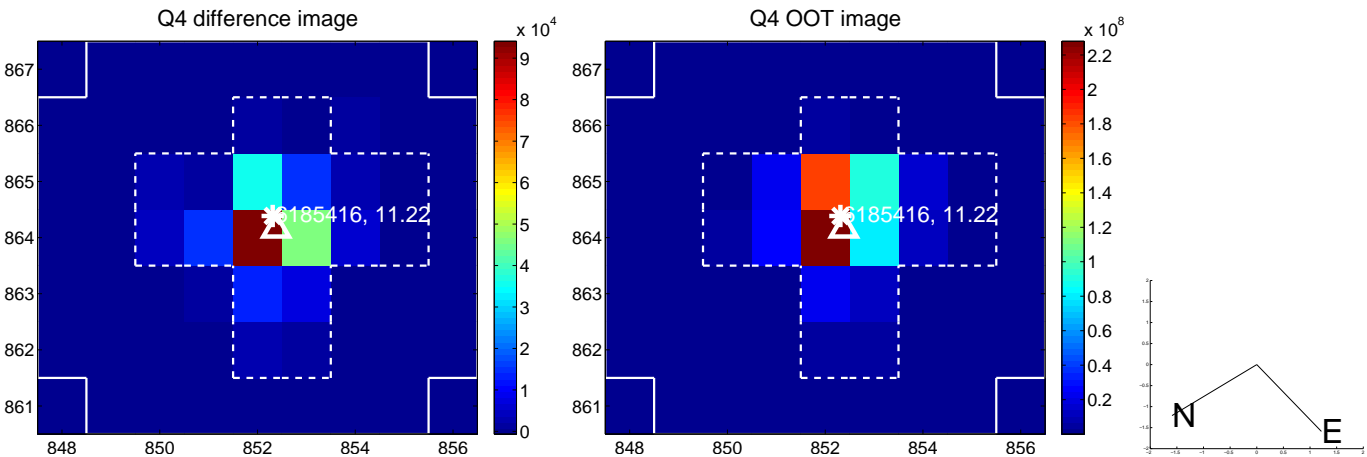
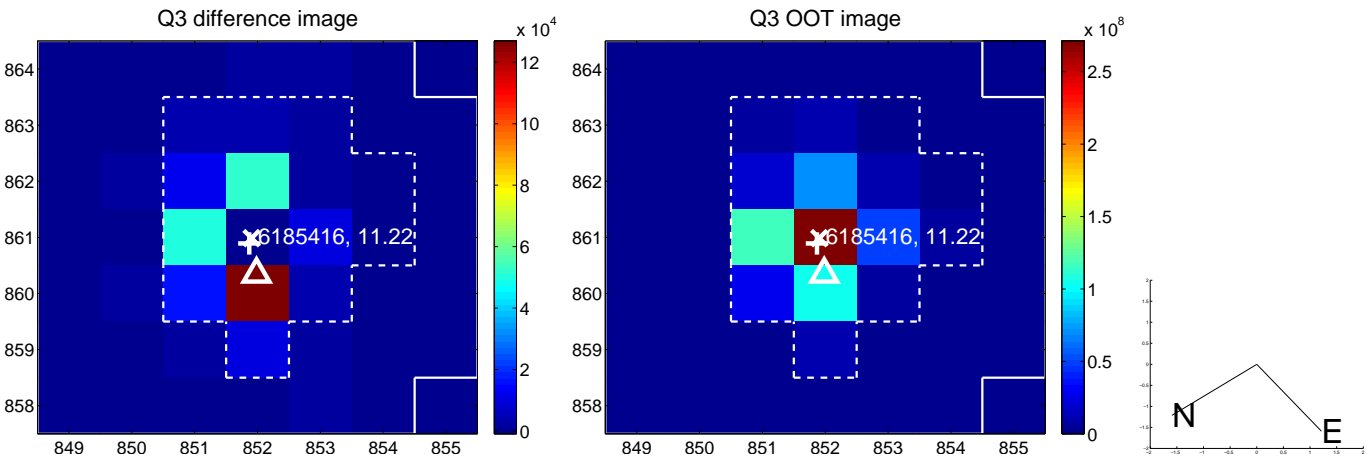
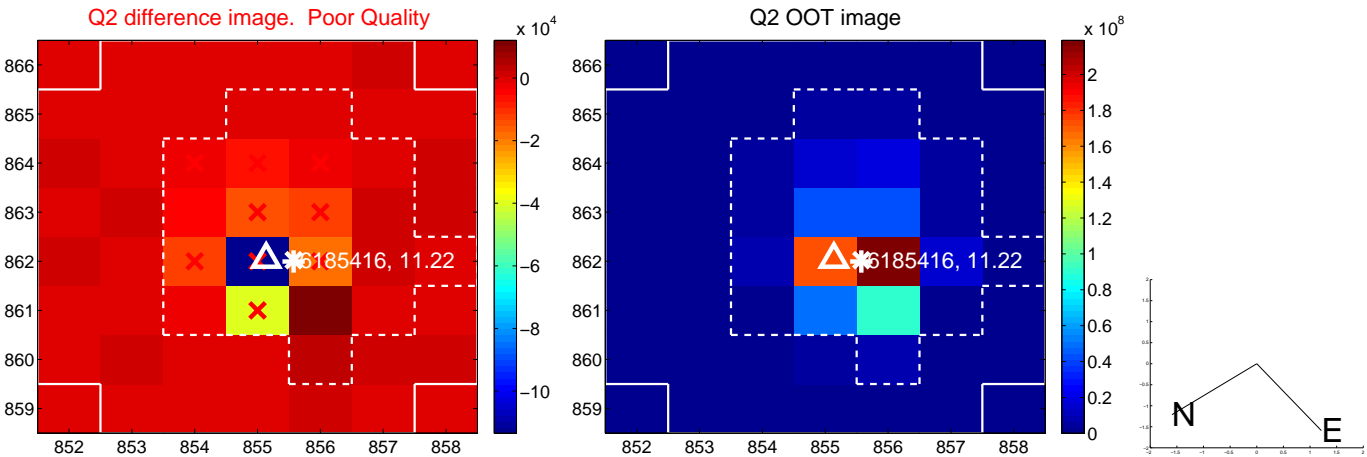
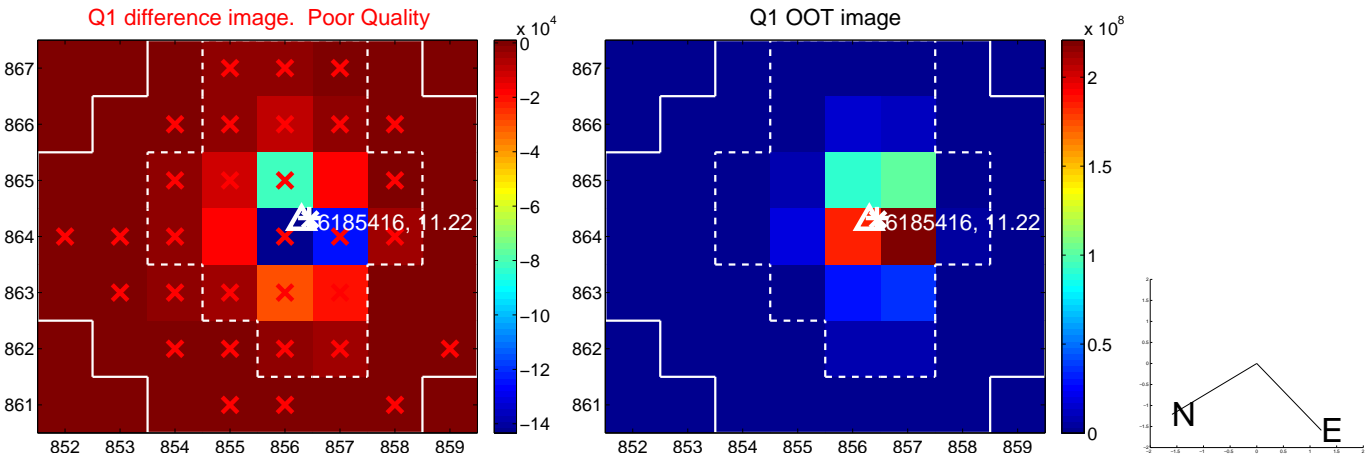
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.310 \pm 0.419$	0.74	$0.017 \pm 0.535$	$0.309 \pm 0.396$
PRF-fit source offset from KIC position	$0.412 \pm 0.431$	0.96	$0.082 \pm 0.480$	$0.404 \pm 0.360$
photometric centroid source offset	$0.23 \pm 0.98$	0.24	$-0.23 \pm 0.98$	$-0.00 \pm 0.80$



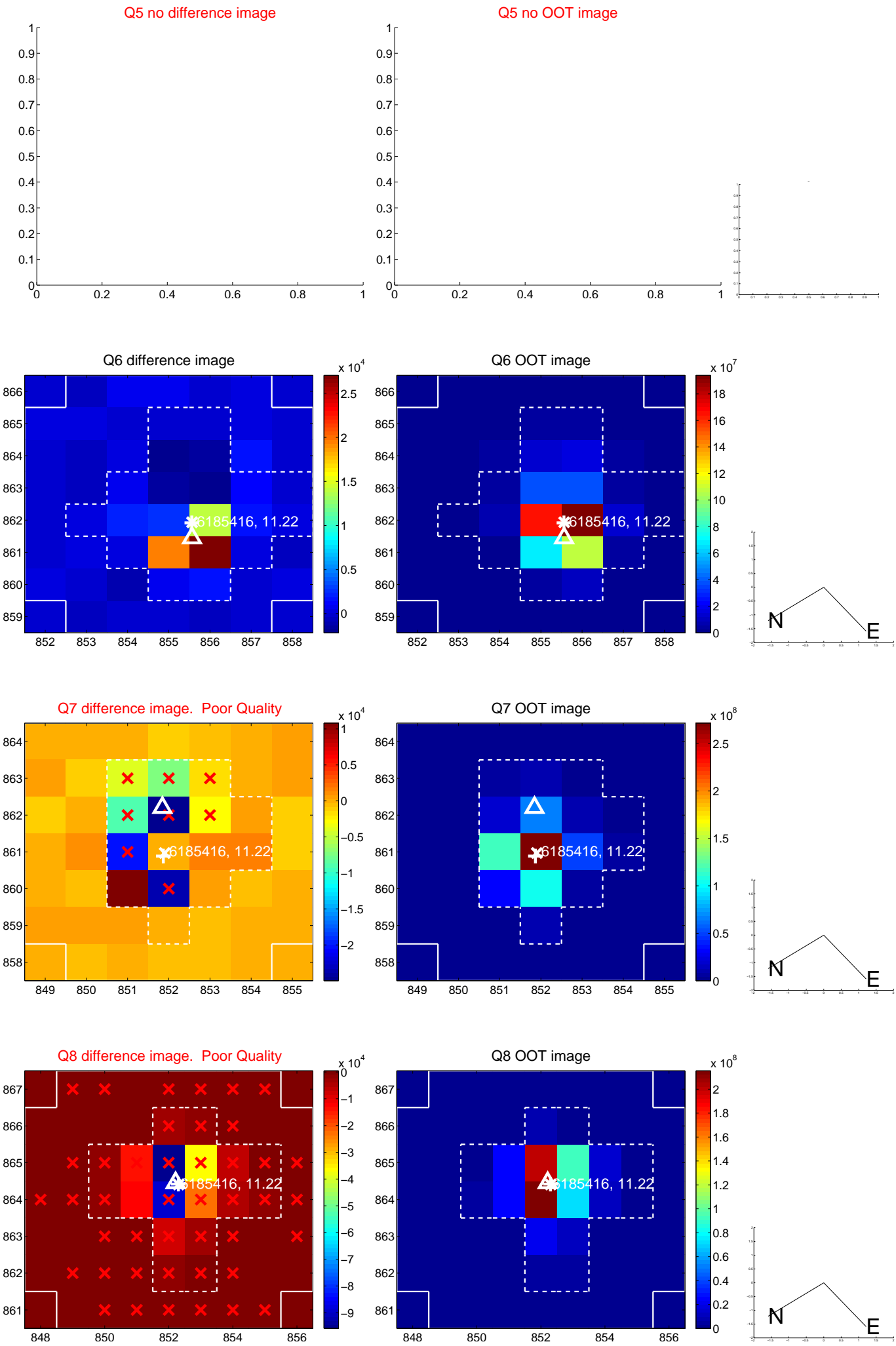
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



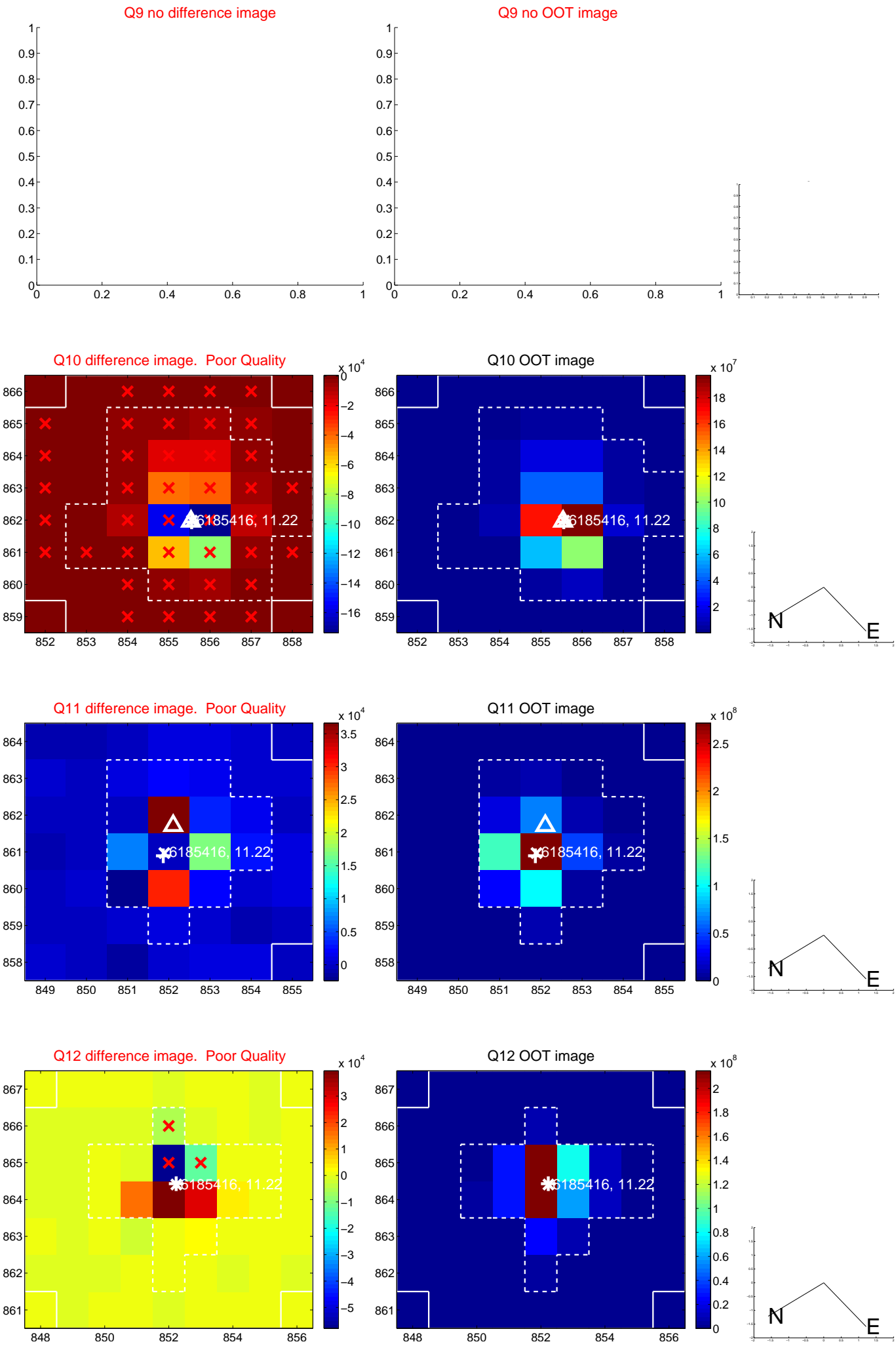
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



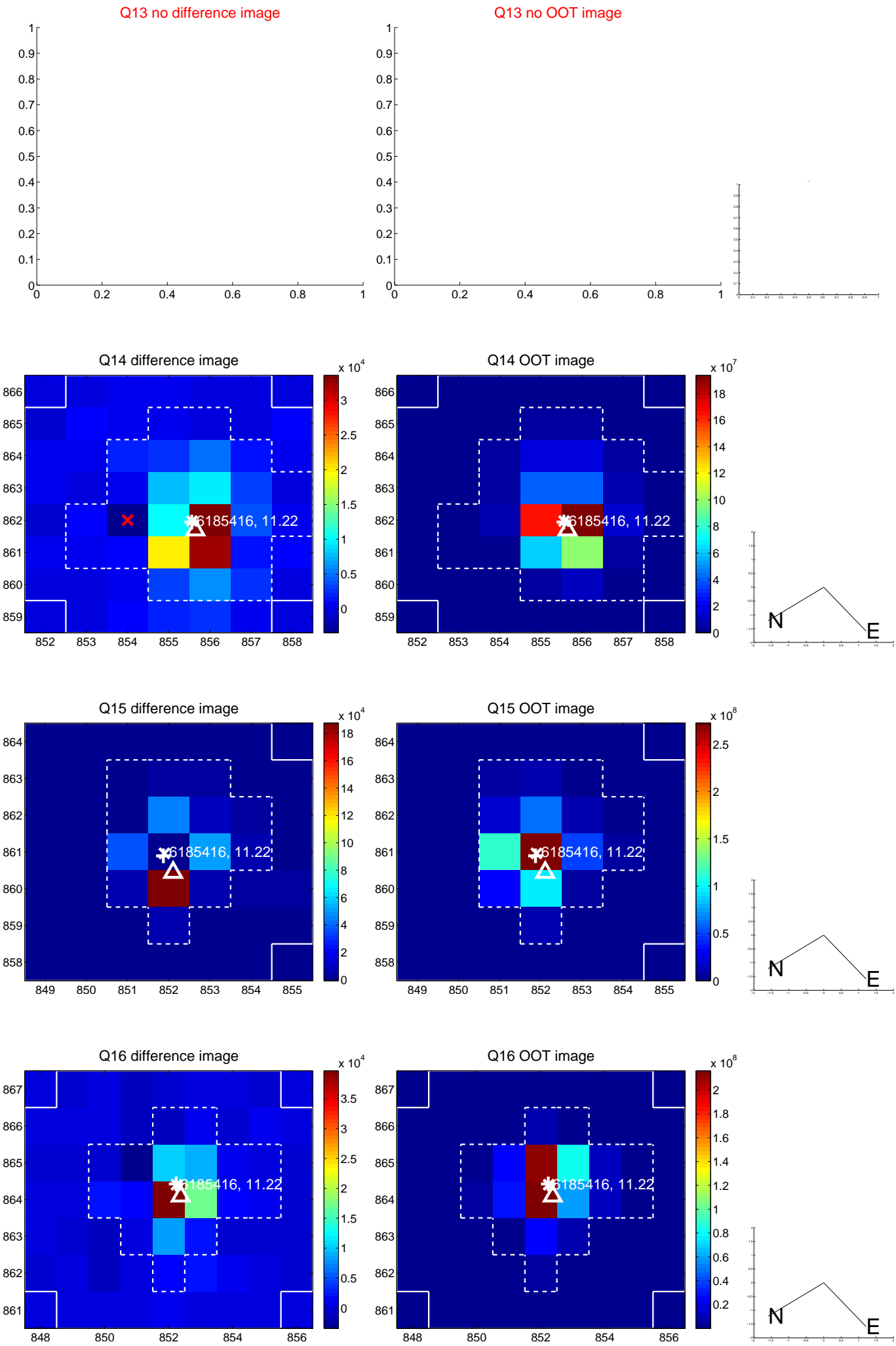
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



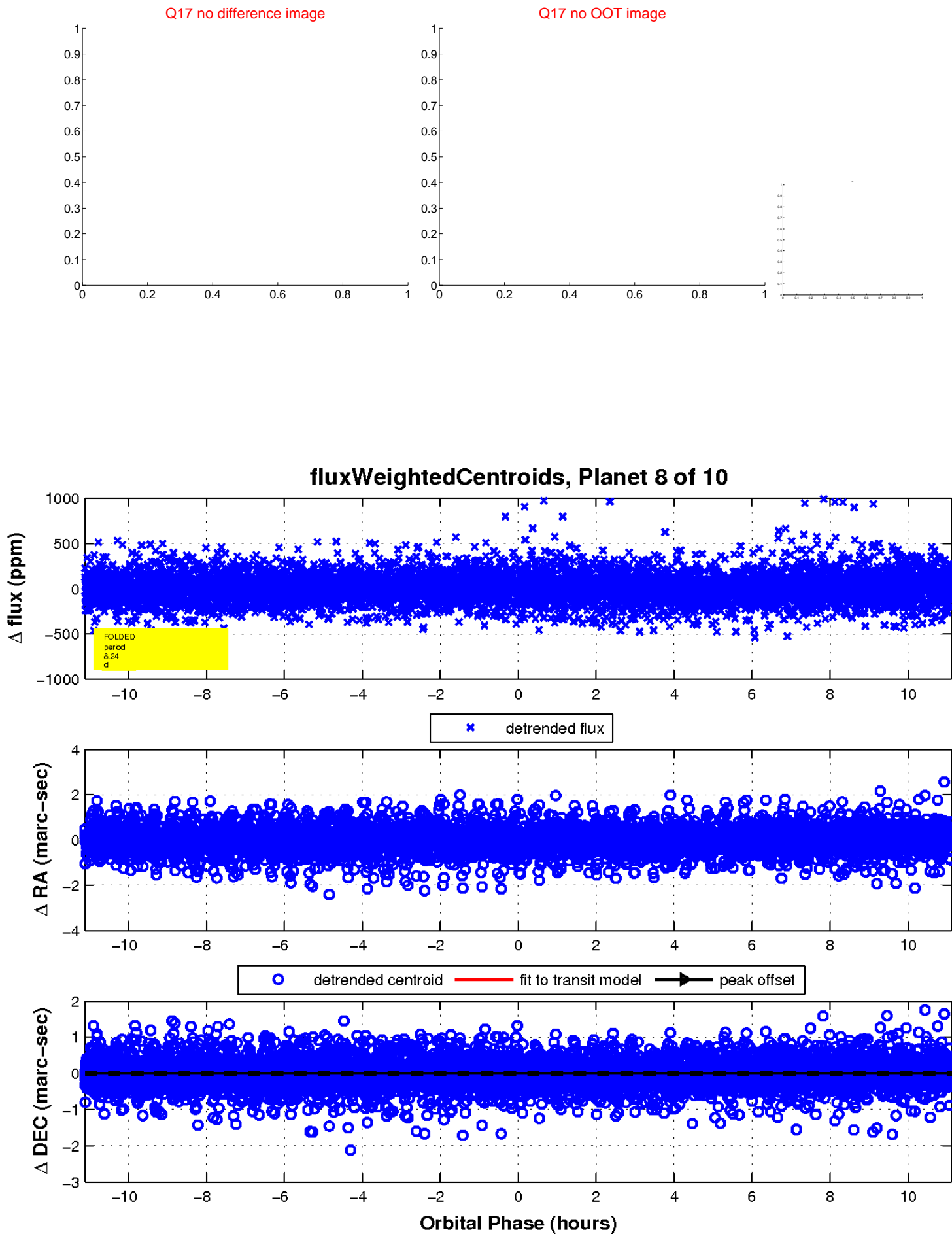
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

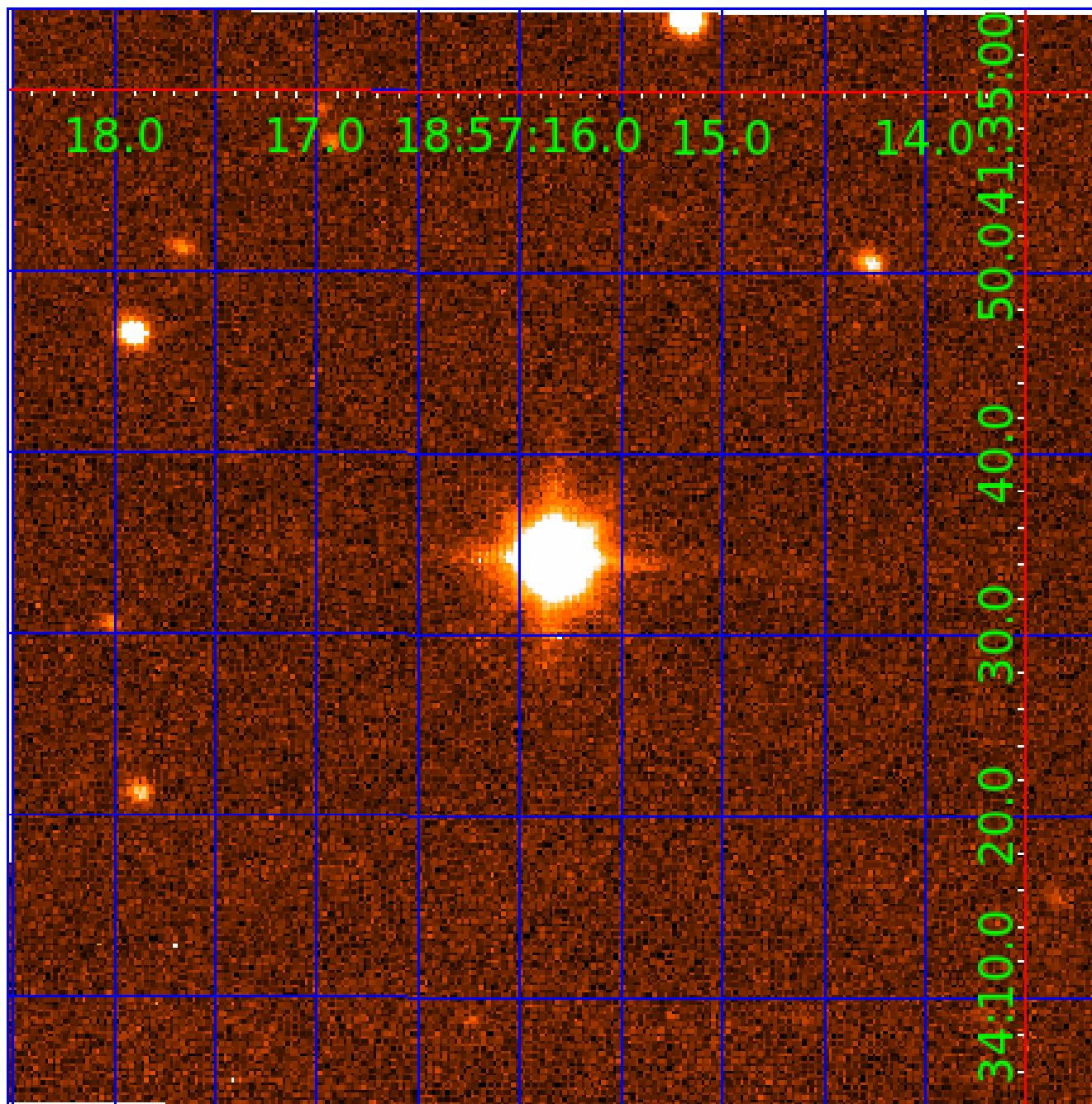


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

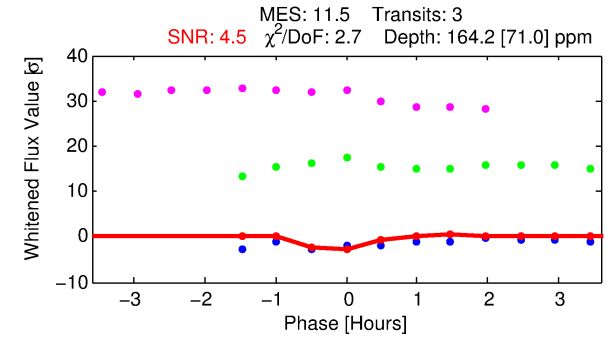
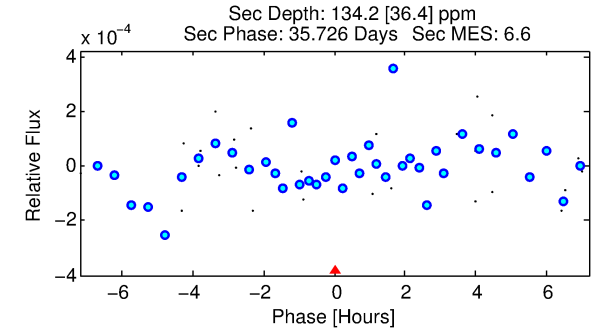
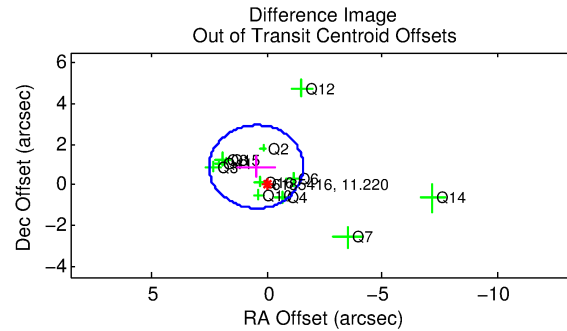
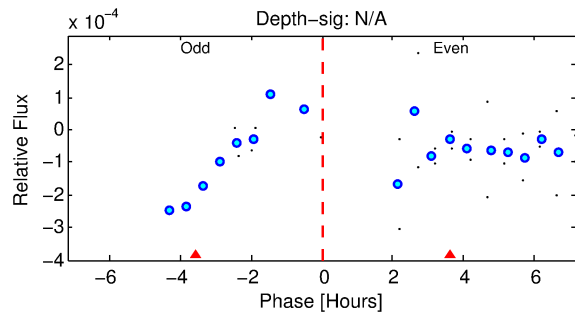
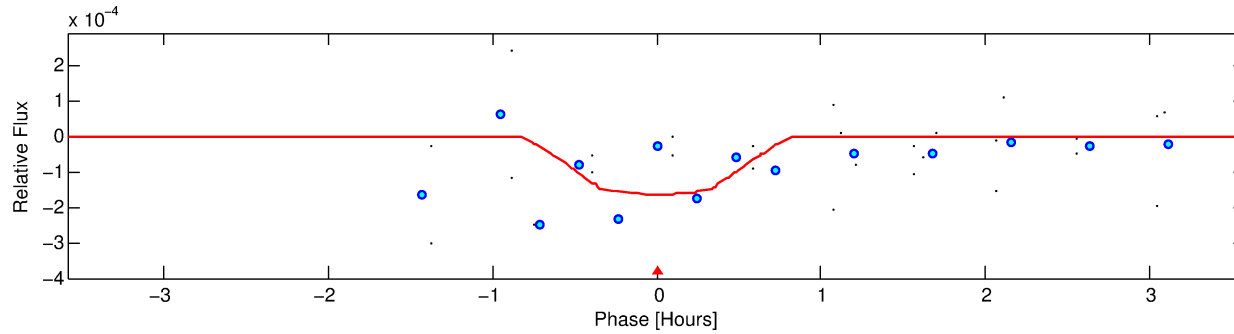
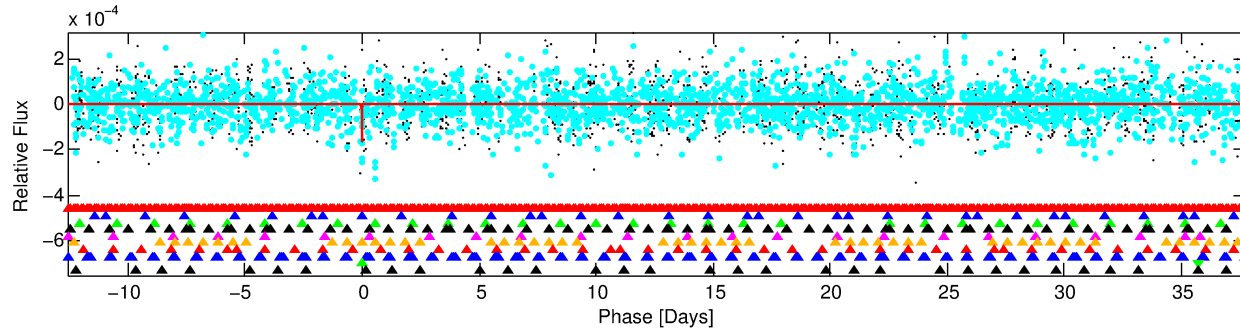
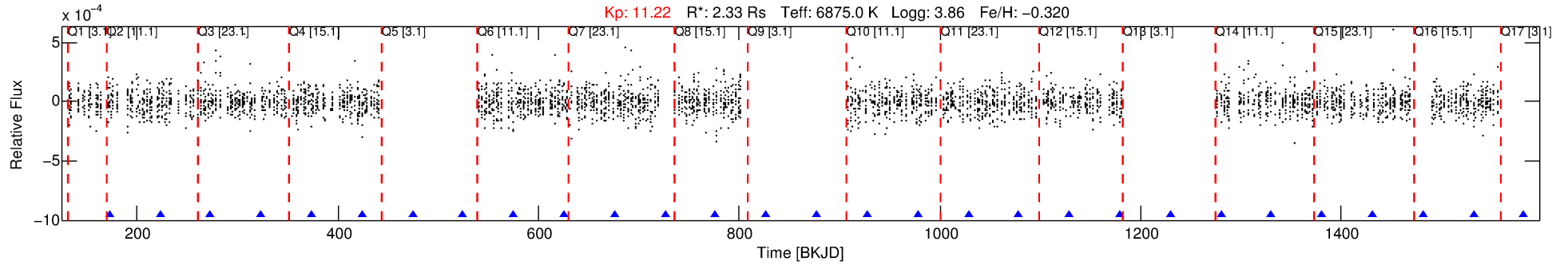
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006185416-09

No Significant Match Found

# DV One-Page Summary

KIC: 6185416 Candidate: 9 of 10 Period: 50.334 d



## DV Fit Results:

Period = 50.33445 [0.00611] d  
Epoch = 172.6061 [0.0451] BKJD  
Rp/R\* = 0.0125 [0.2453]  
a/R\* = 256.09 [28927.68]  
b = 0.63 [111.47]  
Seff = 119.87 [60.95]  
Teq = 844 [107] K  
Rp = 3.16 [62.30] Re  
a = 0.3007 [0.0955] AU  
Ag = 668.04 [26324.98] [0.03] $\sigma$   
Teffp = 6632 [65331] K [0.09] $\sigma$

## DV Diagnostic Results:

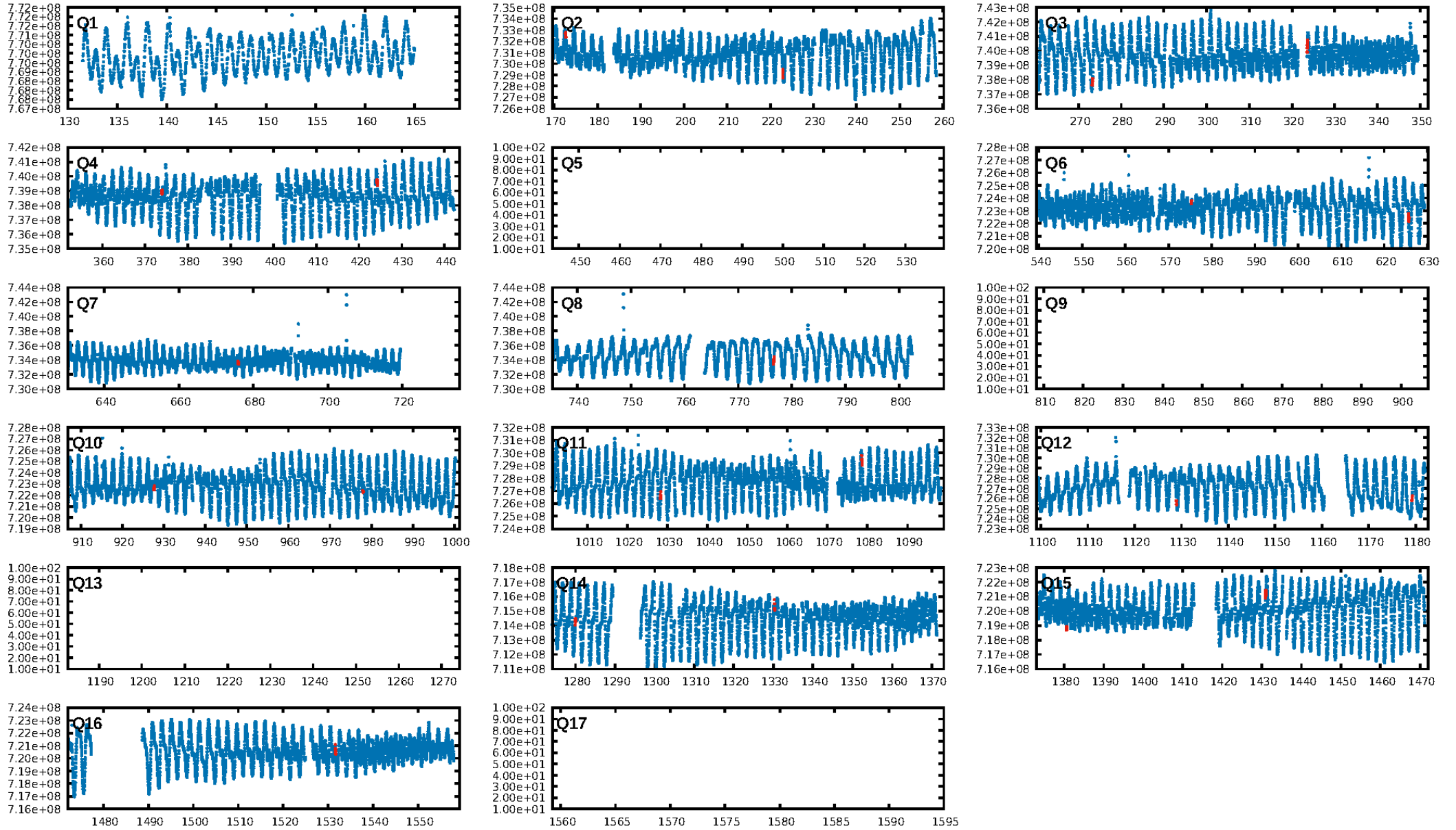
ShortPeriod-sig: 99.8% [3.14 $\sigma$ ]  
LongPeriod-sig: 100.0% [95.02 $\sigma$ ]  
ModelChiSquare2-sig: 24.8%  
ModelChiSquareGof-sig: 89.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.597  
Centroid-sig: N/A  
Centroid-so: 1.685 arcsec [1.97 $\sigma$ ]  
OotOffset-rm: 1.006 arcsec [1.48 $\sigma$ ]  
KicOffset-rm: 1.230 arcsec [1.99 $\sigma$ ]  
OotOffset-st: 4/4/4/0 [12]  
KicOffset-st: 4/4/4/0 [12]  
DiffImageQuality-fgm: 0.33 [4/12]  
DiffImageOverlap-fno: 0.67 [8/12]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:54 Z

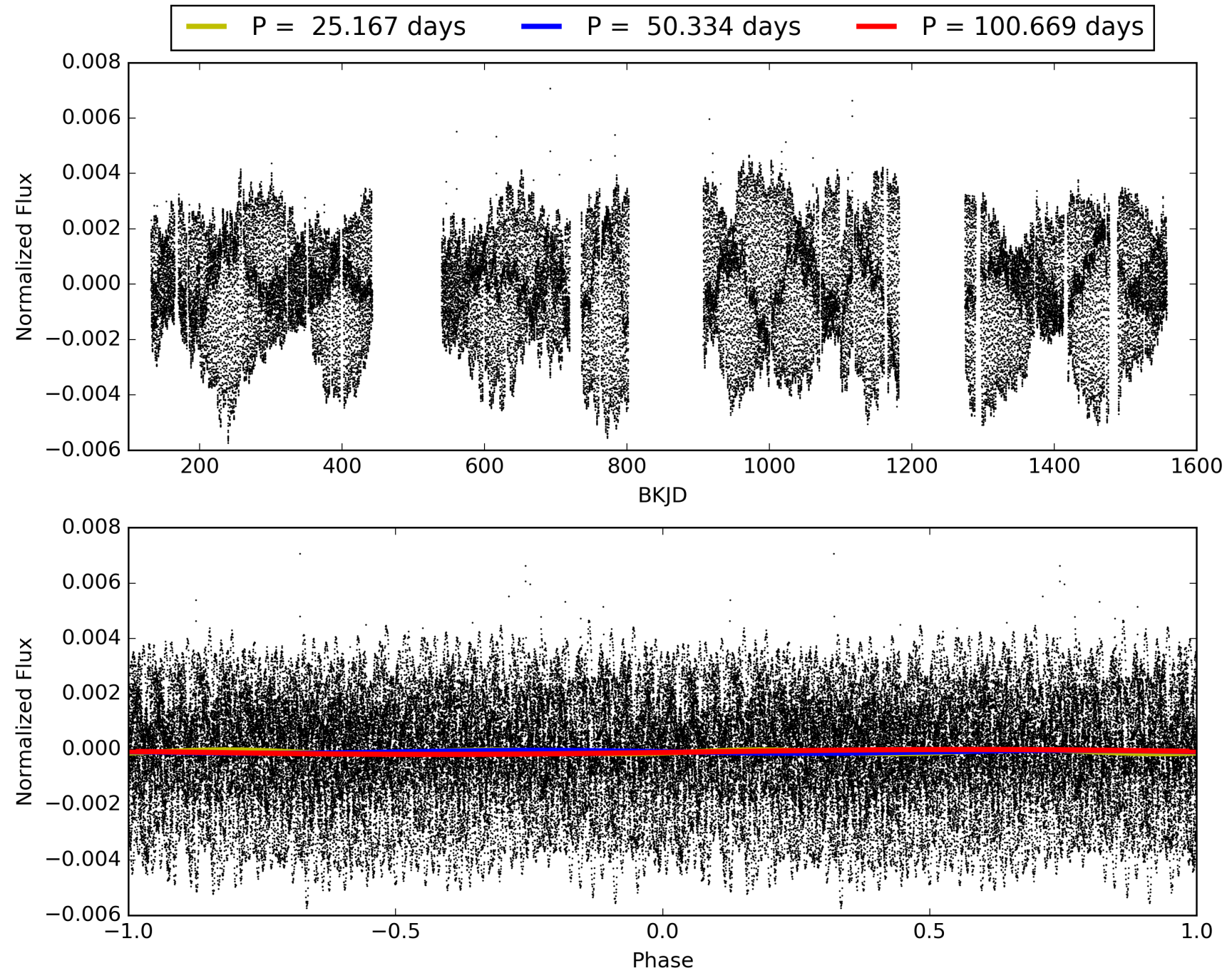
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006185416-09, PDC Light Curves

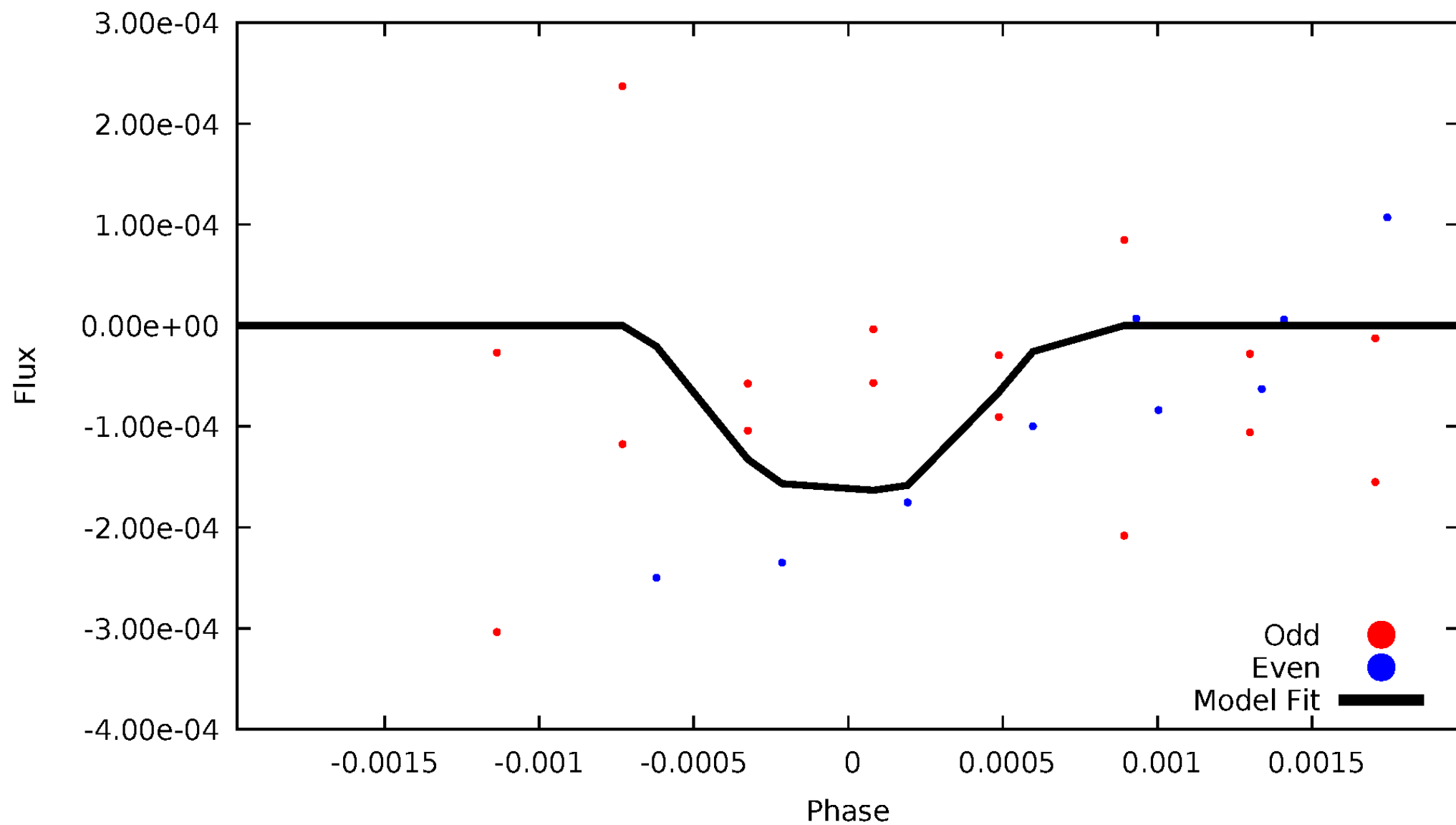


TCE 006185416-09



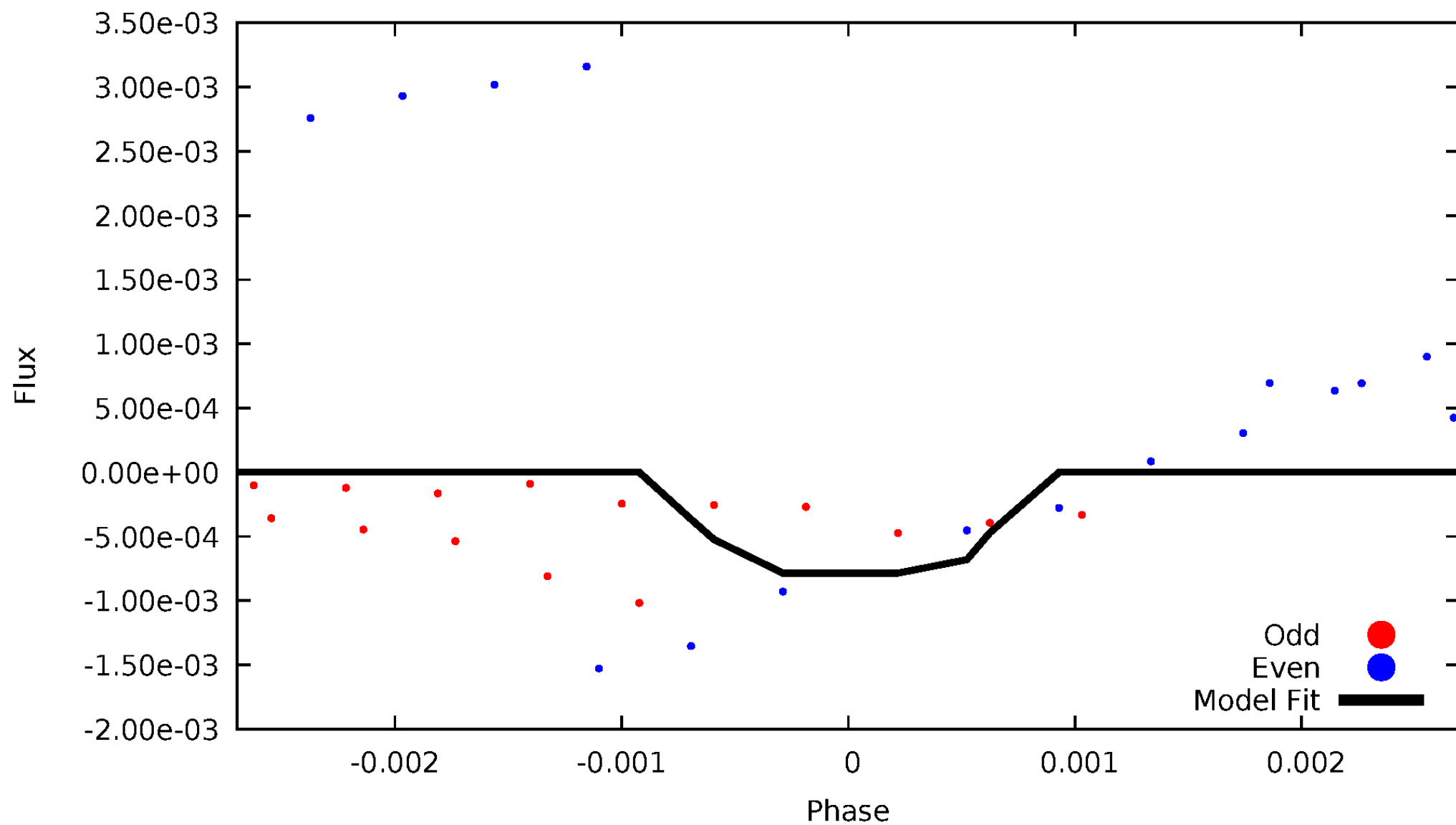
# DV Odd/Even

TCE 006185416-09



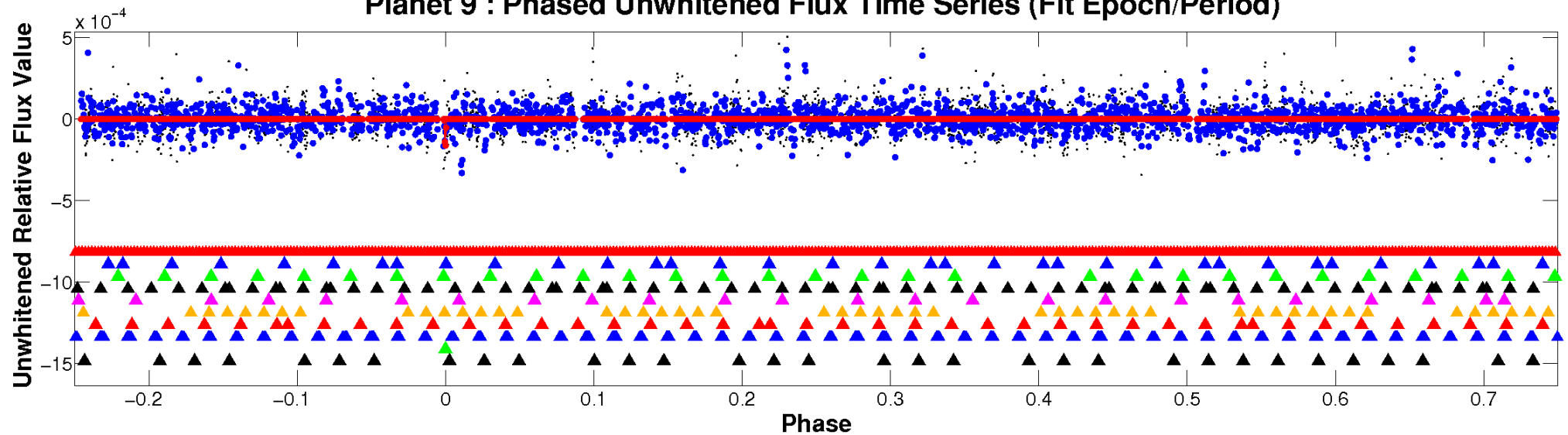
# ALT Odd/Even

TCE 006185416-09

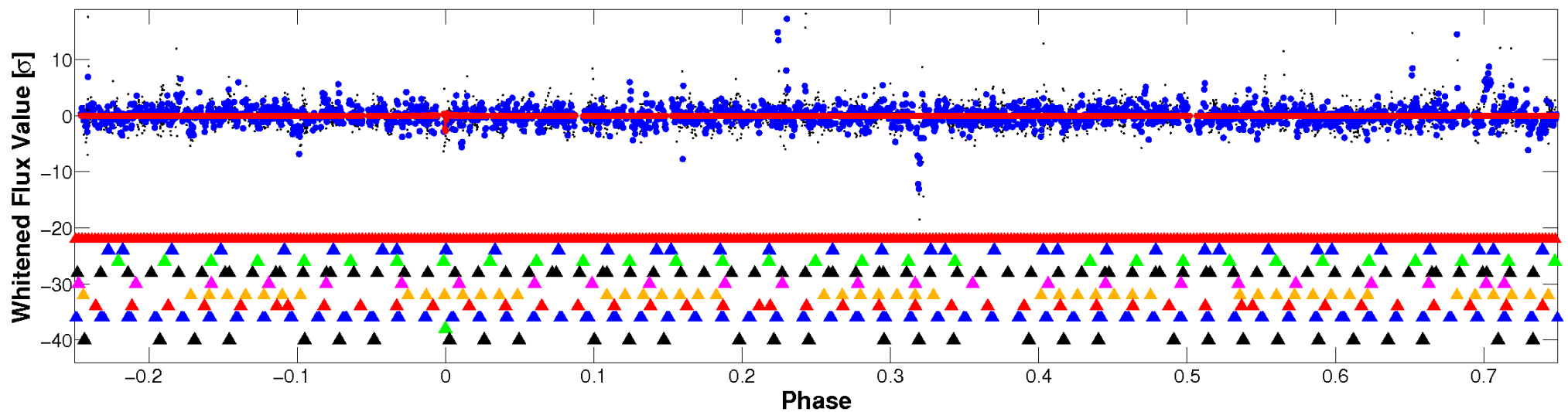


# Non-Whitened Vs. Whitened Light Curve

Planet 9 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

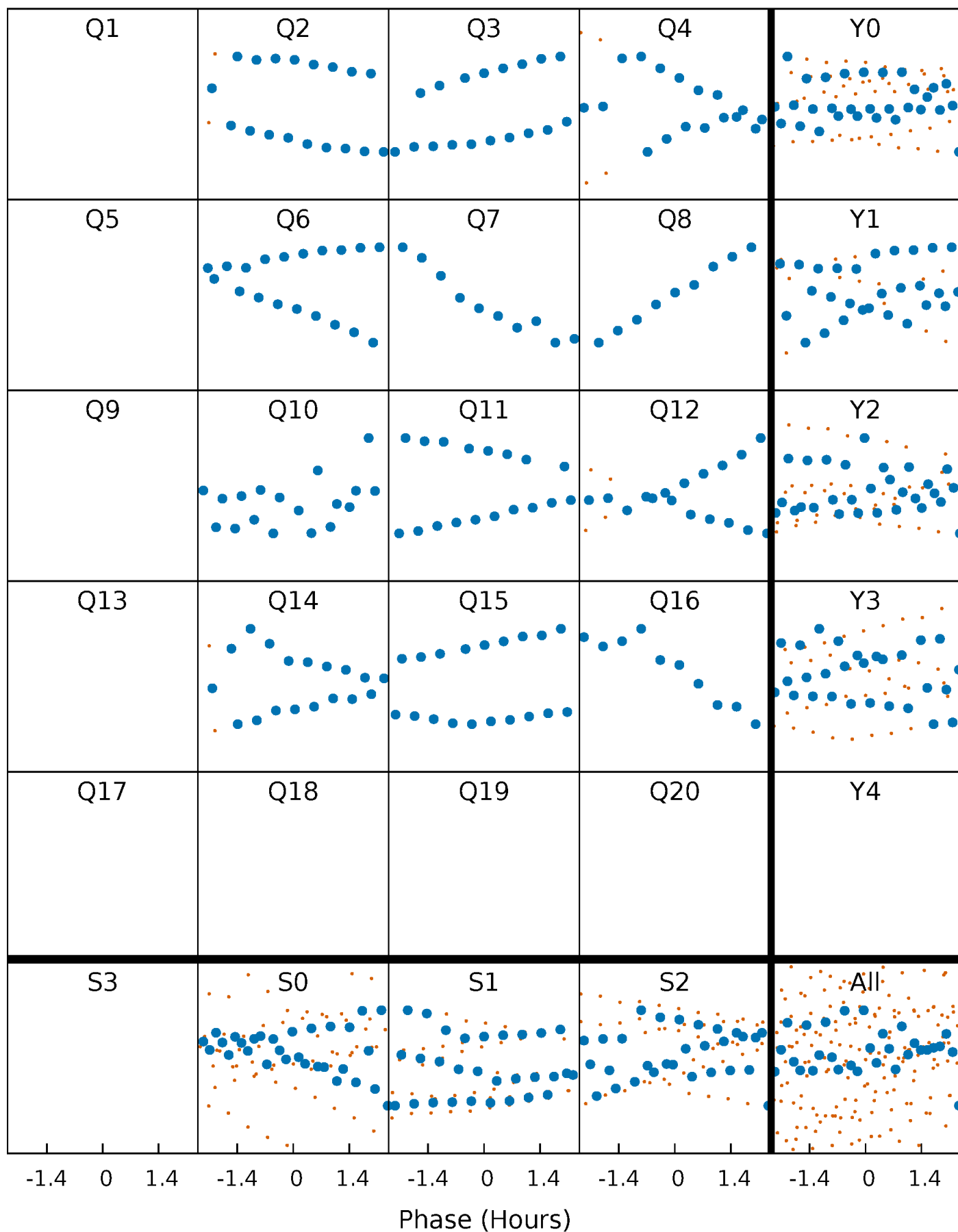


Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)



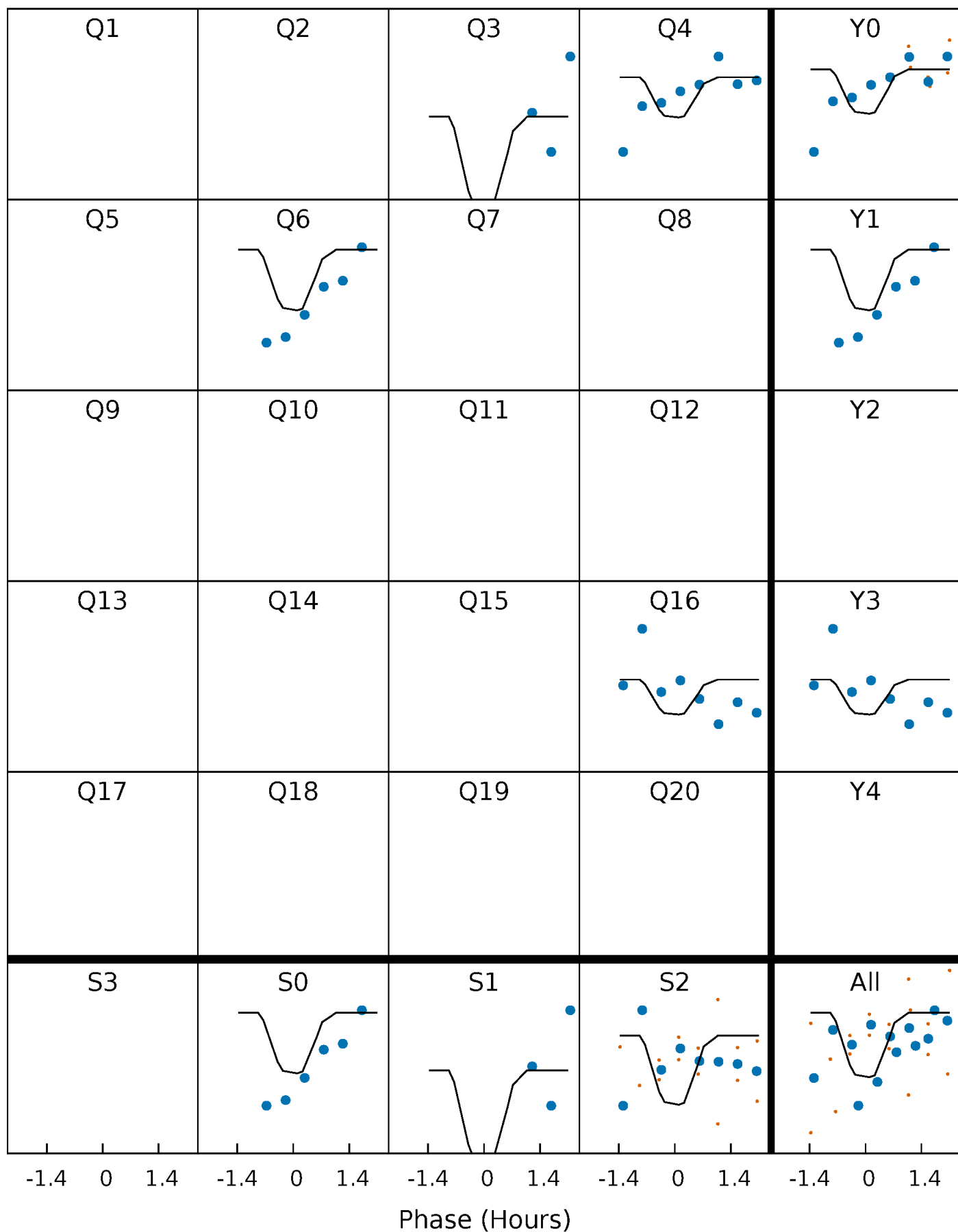
# PDC Quarter-Phased Transit Curves

TCE 006185416-09   P= 50.334445 Days    $T_0=172.606097$  (BKJD)



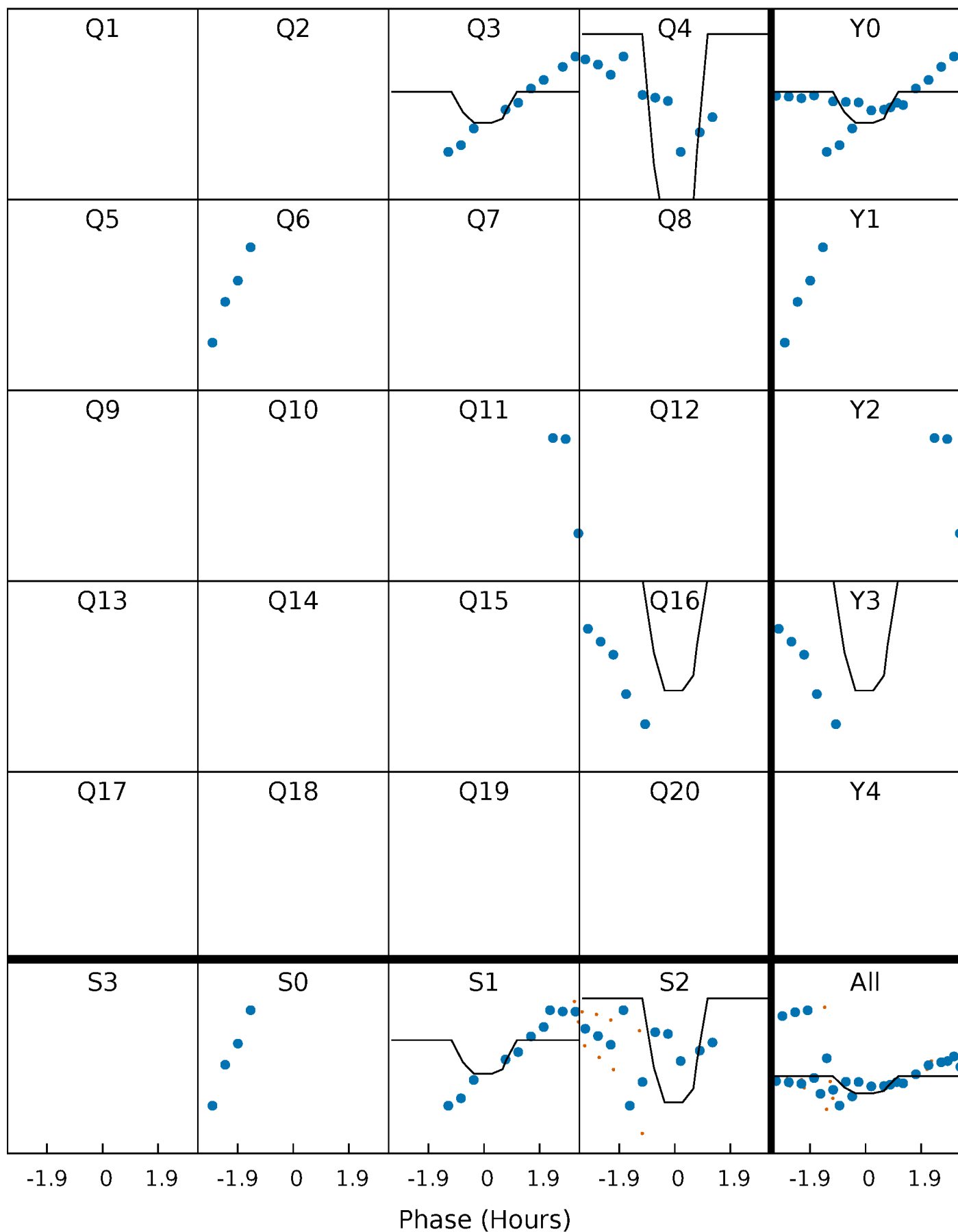
# DV Quarter-Phased Transit Curves

TCE 006185416-09 P= 50.334445 Days  $T_0=172.606097$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006185416-09 P= 50.338912 Days  $T_0=172.699436$  (BKJD)

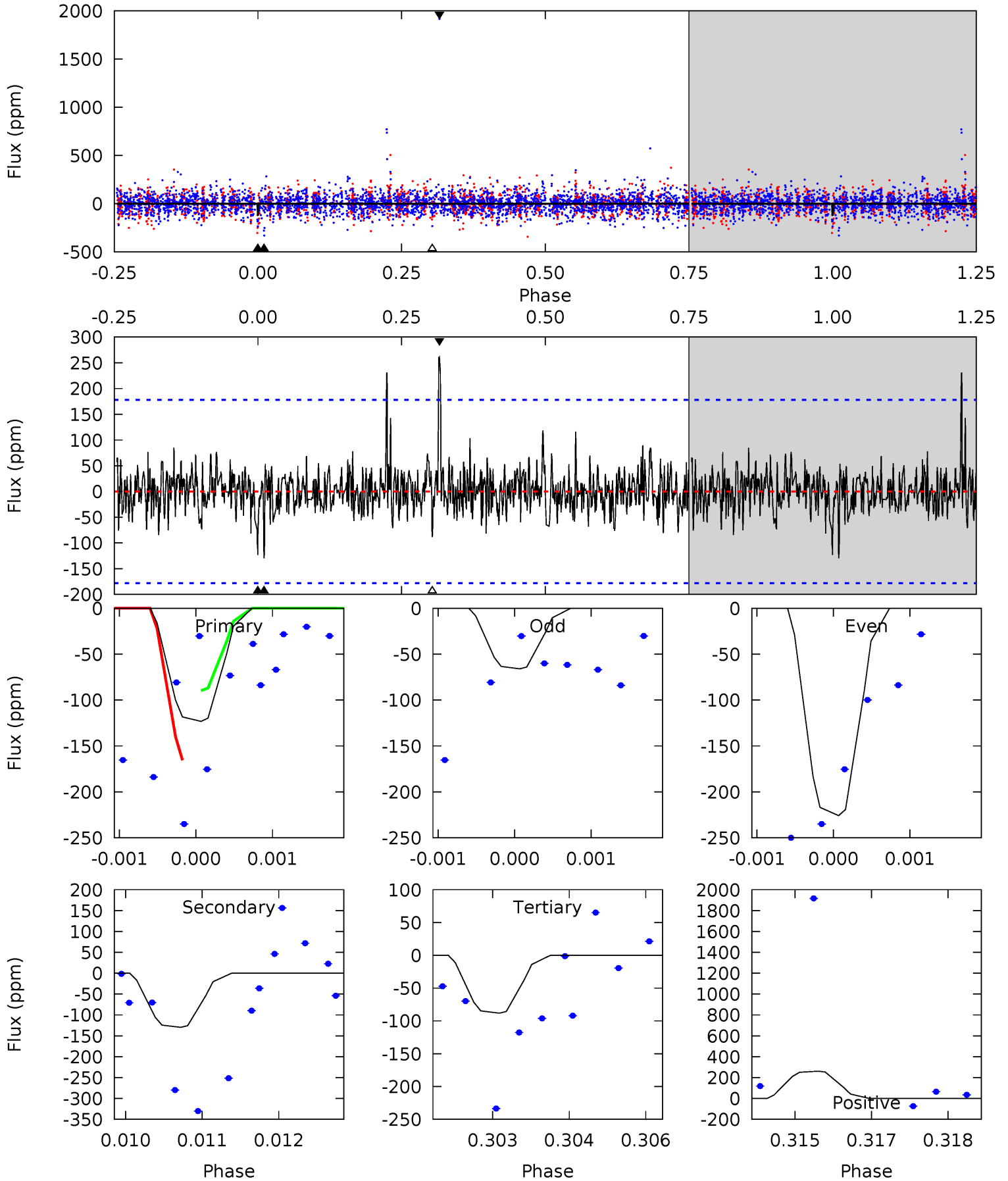




# DV Model-Shift Uniqueness Test

006185416-09, P = 50.334445 Days, E = 122.271652 Days

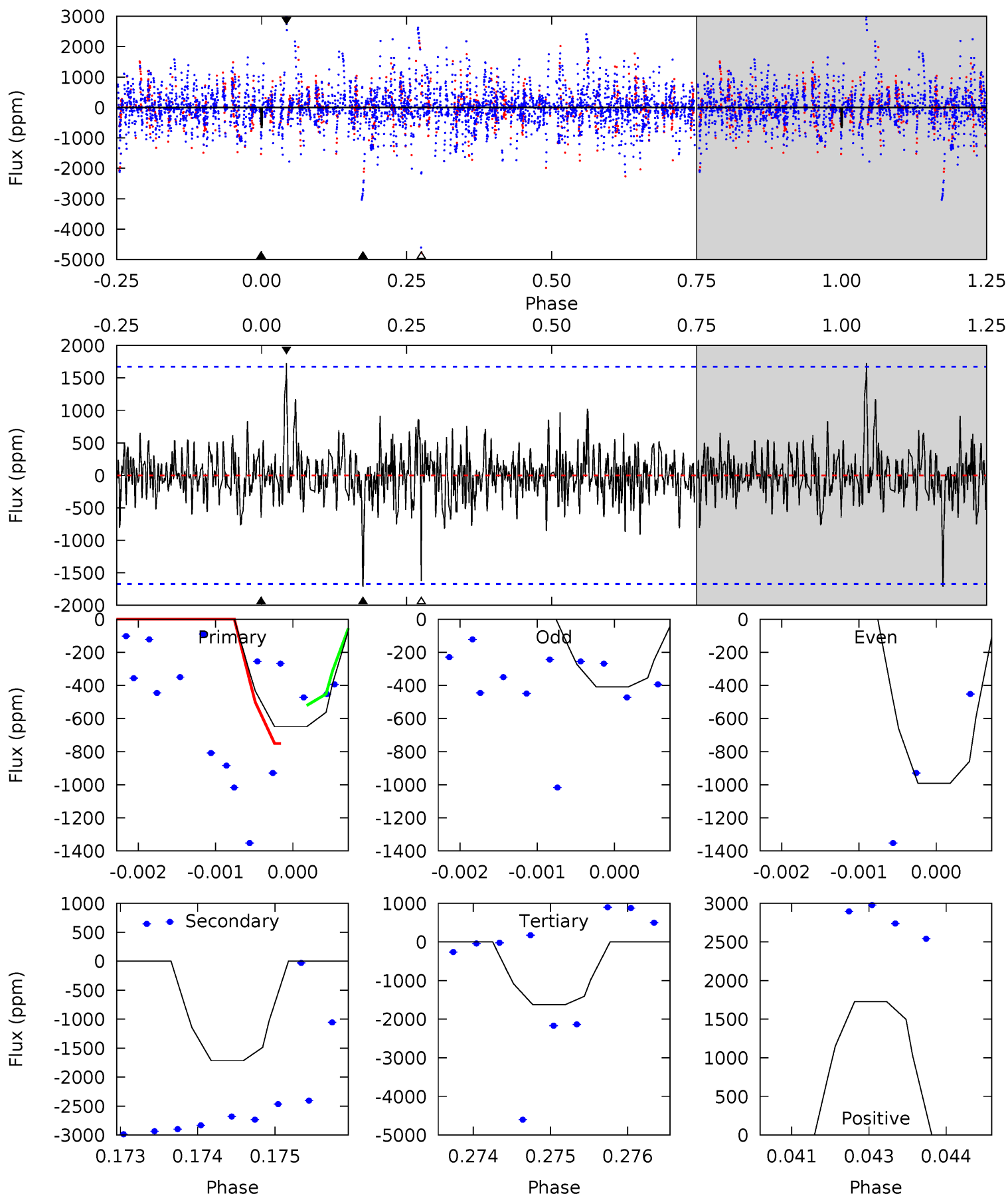
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.75	3.94	2.69	7.95	5.42	3.23	0.98	1.07	-4.20	1.26	-4.00	1.72	1.45	0.67	1.06



# Alt Model-Shift Uniqueness Test

006185416-09, P = 50.338912 Days, E = 122.360524 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.10	5.55	5.26	5.59	5.42	3.23	0.95	-3.16	-3.49	0.29	-0.04	0.90	1.00	0.50	0.38



### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-09 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-130 \pm 33$	$38.60^{+45.65}_{-27.15}$	$1151^{+80}_{-97}$	$2565^{+1143}_{-450}$	$4.187^{+45.123}_{-3.276}$
Alt.	$-1715 \pm 309$	$40.23^{+46.76}_{-28.08}$	$1157^{+70}_{-105}$	$3766^{+2366}_{-802}$	$55^{+541}_{-44}$

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

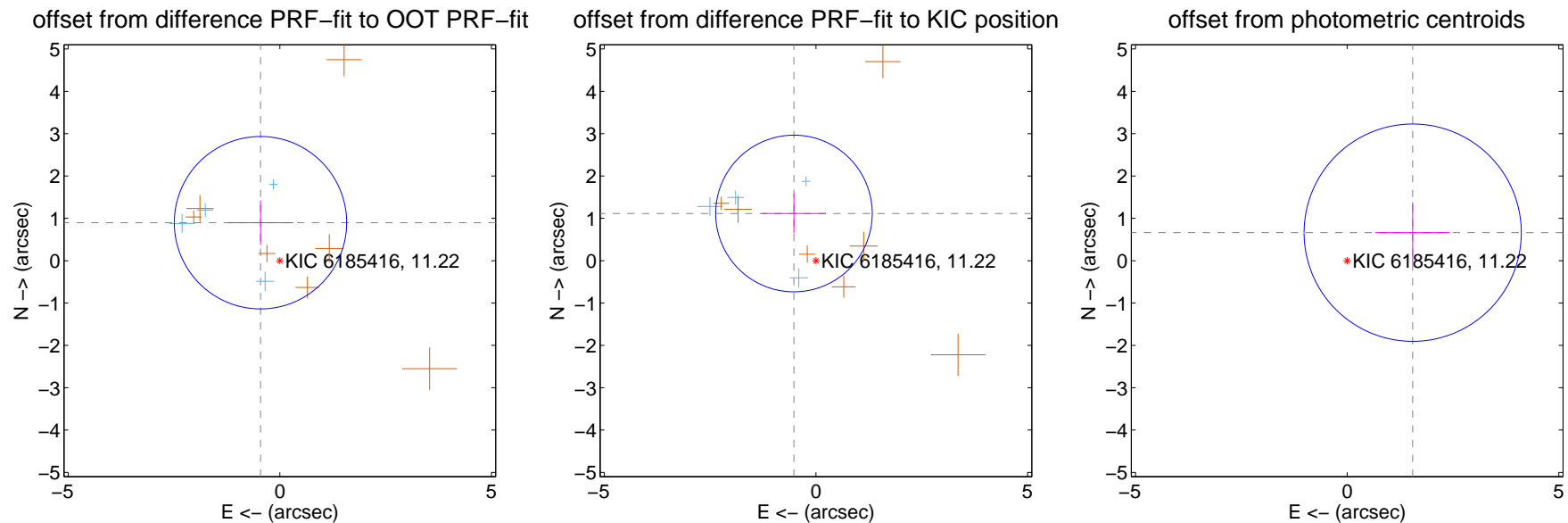
## DV Centroid Data

Supplemental centroid analysis for 006185416-09. **Kepler magnitude: 11.22**. Transit SNR 4.54

There are 4 quarters with good PRF difference image offsets

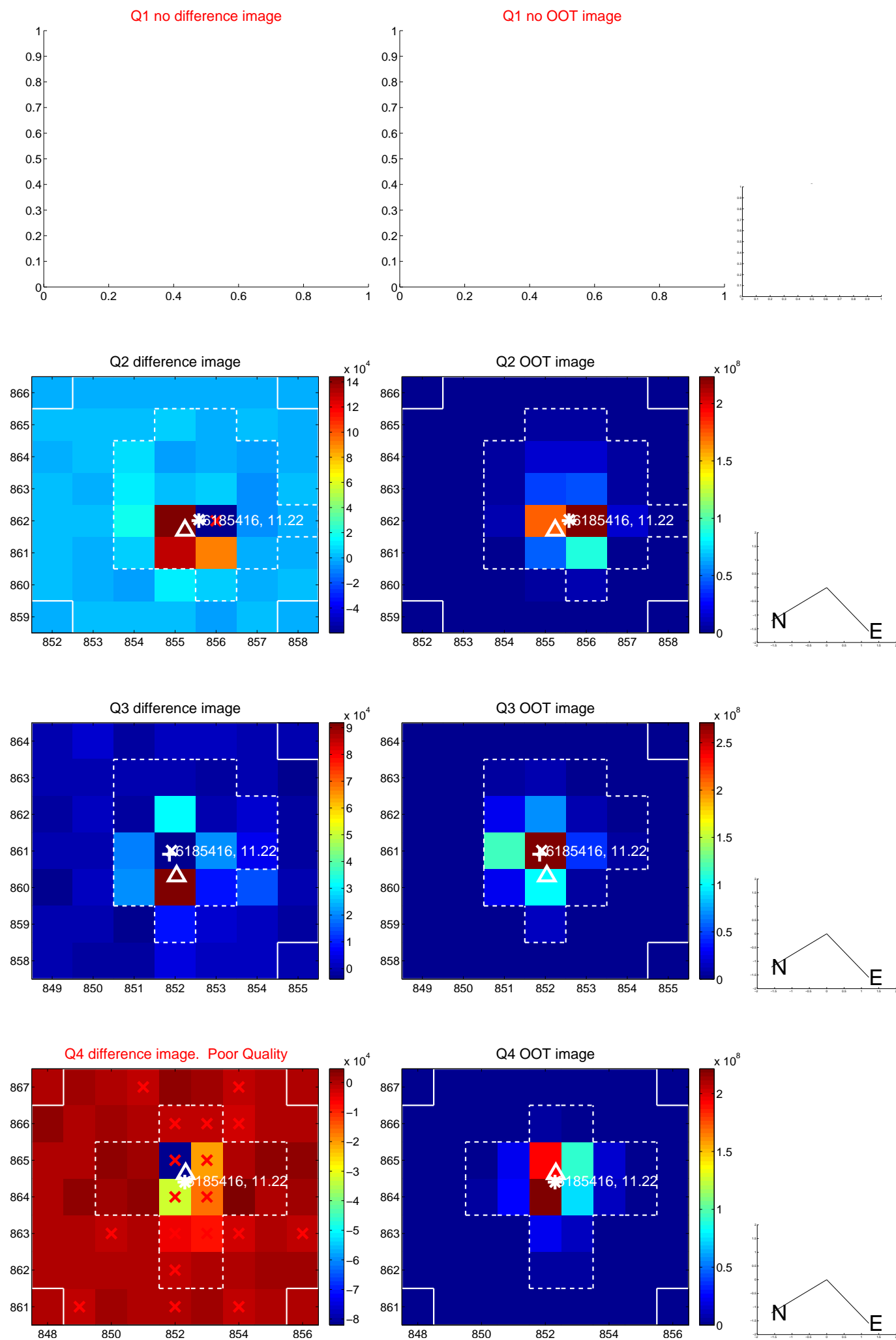
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.006 \pm 0.679$	1.48	$0.456 \pm 0.776$	$0.897 \pm 0.525$
PRF-fit source offset from KIC position	$1.230 \pm 0.617$	1.99	$0.519 \pm 0.757$	$1.115 \pm 0.465$
photometric centroid source offset	$1.68 \pm 0.86$	1.97	$-1.55 \pm 0.88$	$0.66 \pm 0.72$

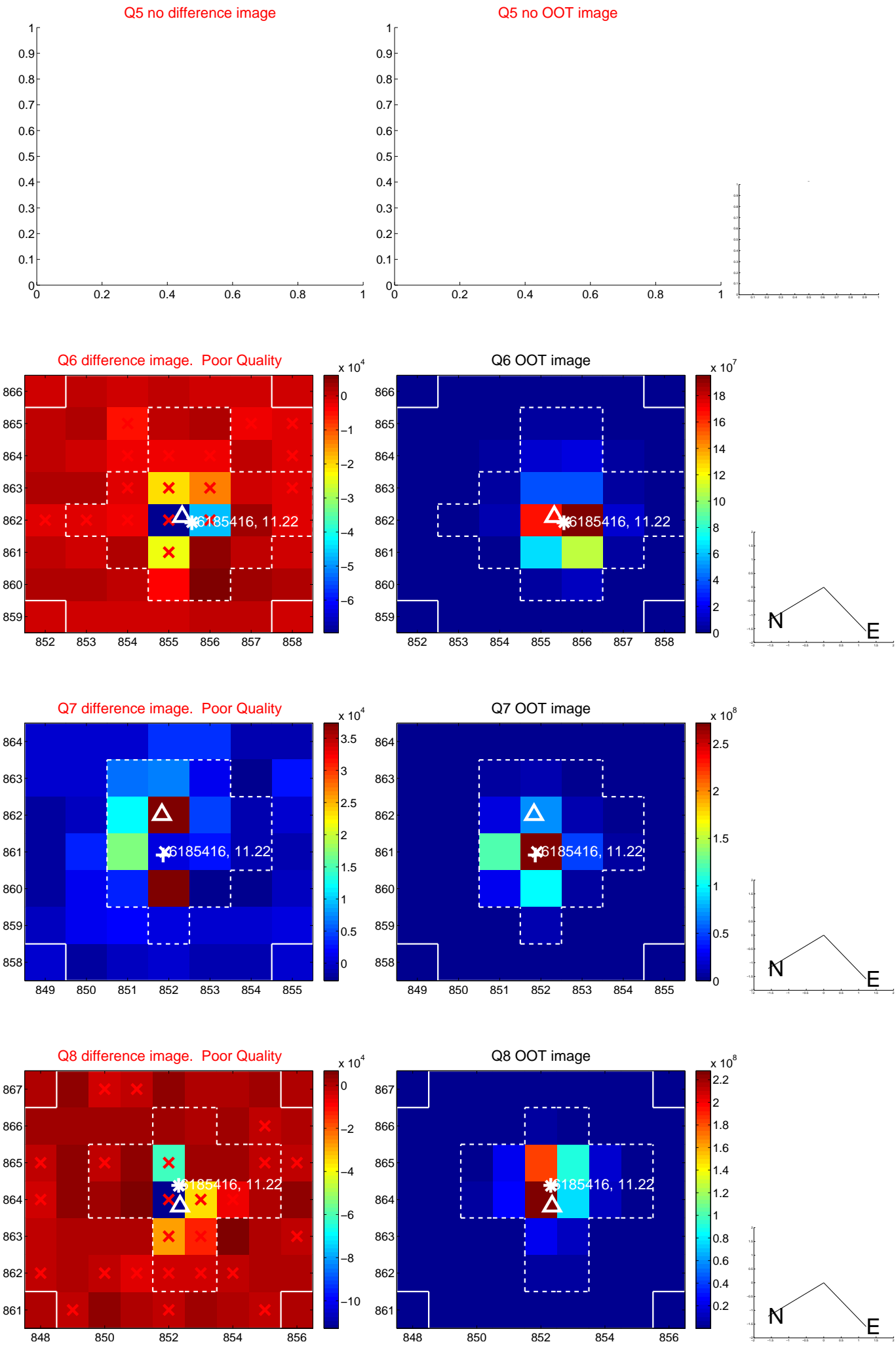


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

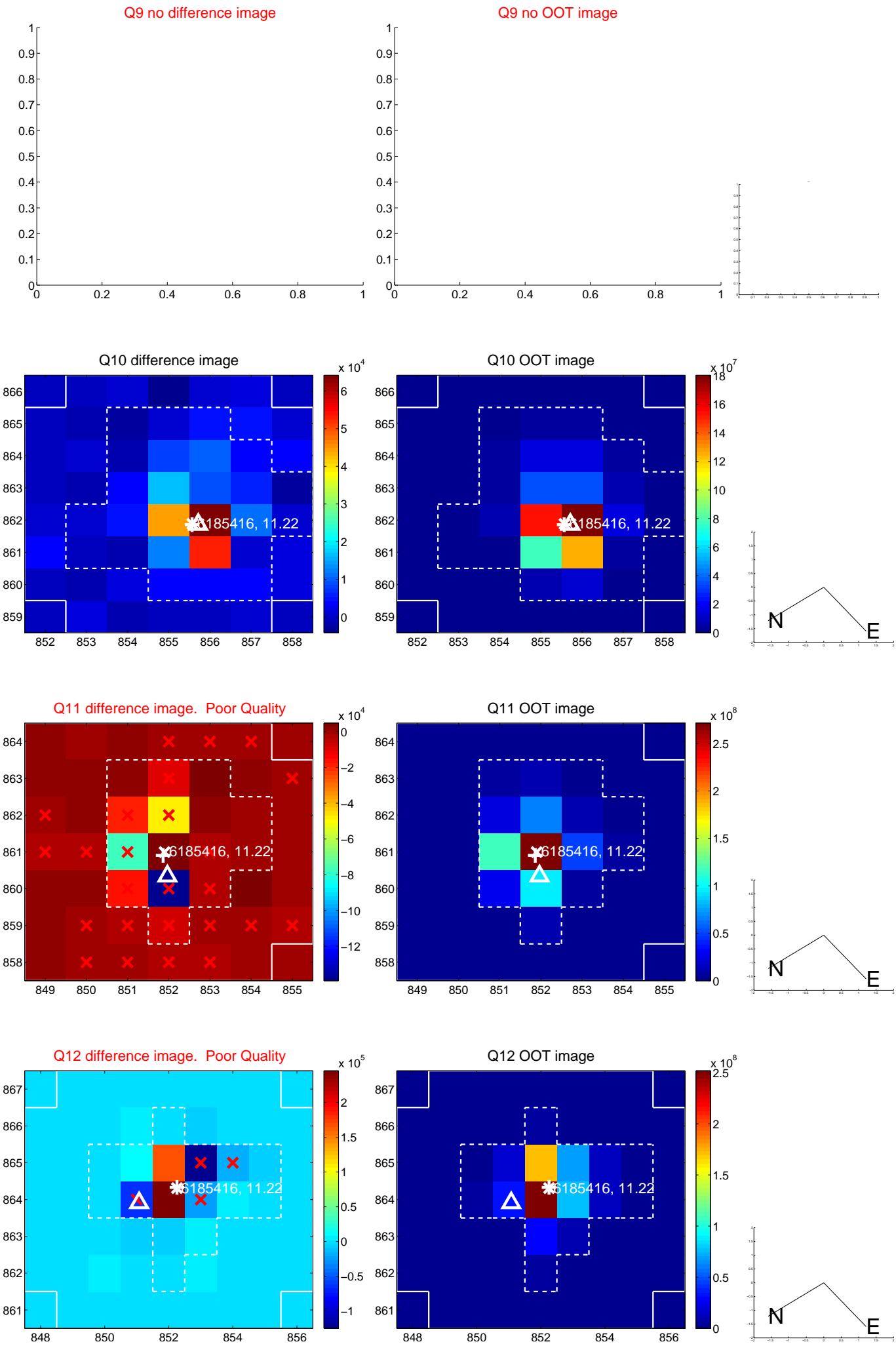
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



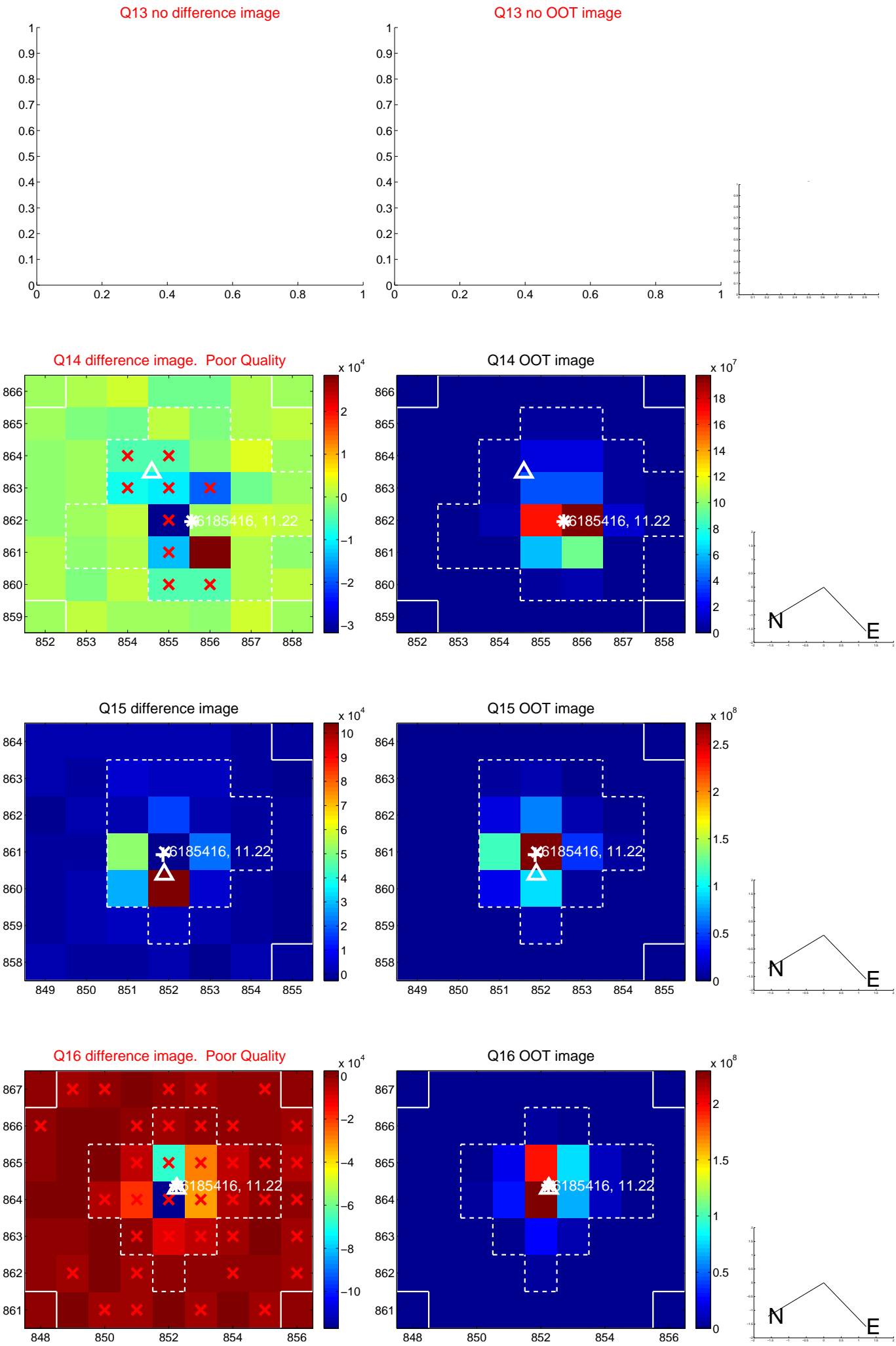
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

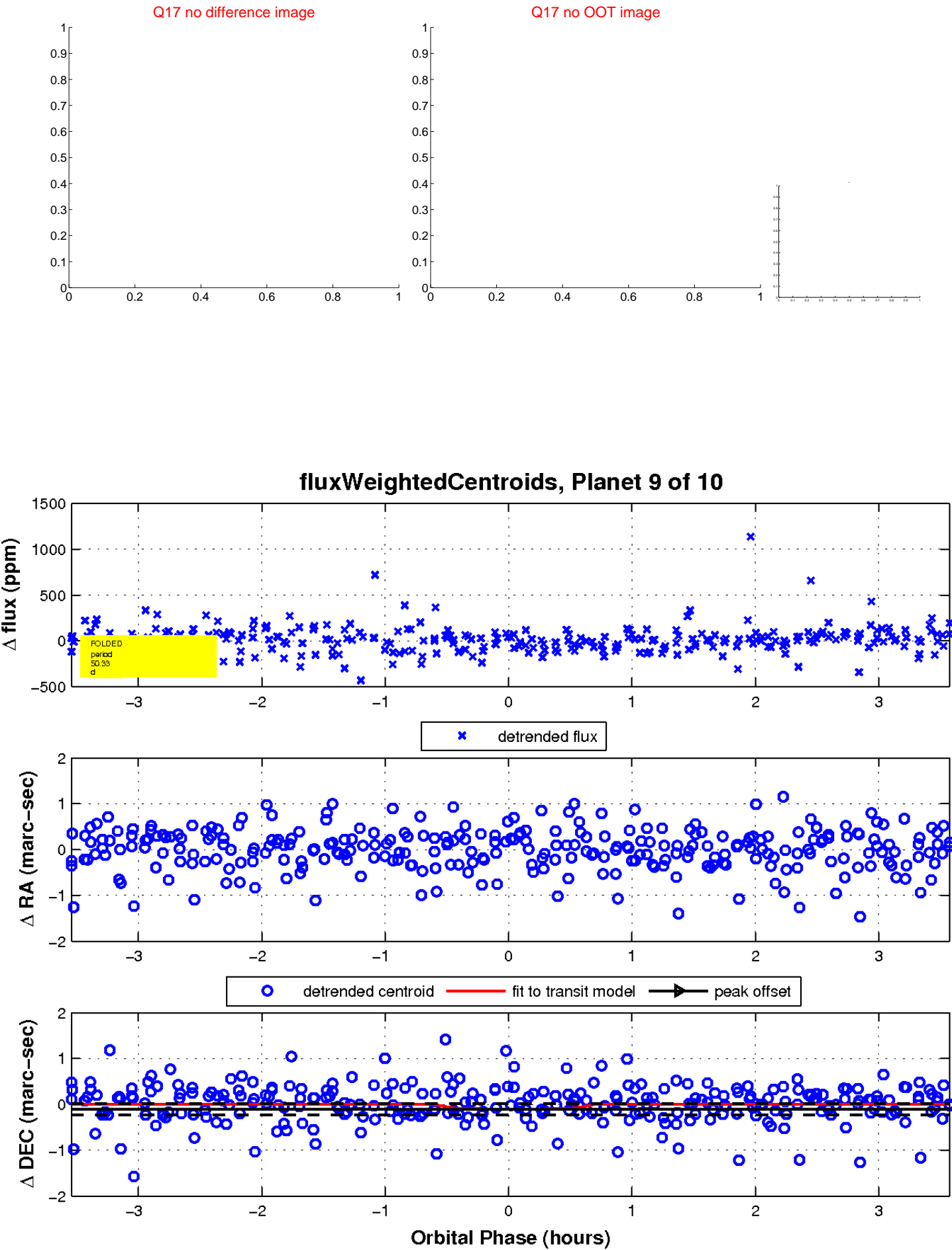


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



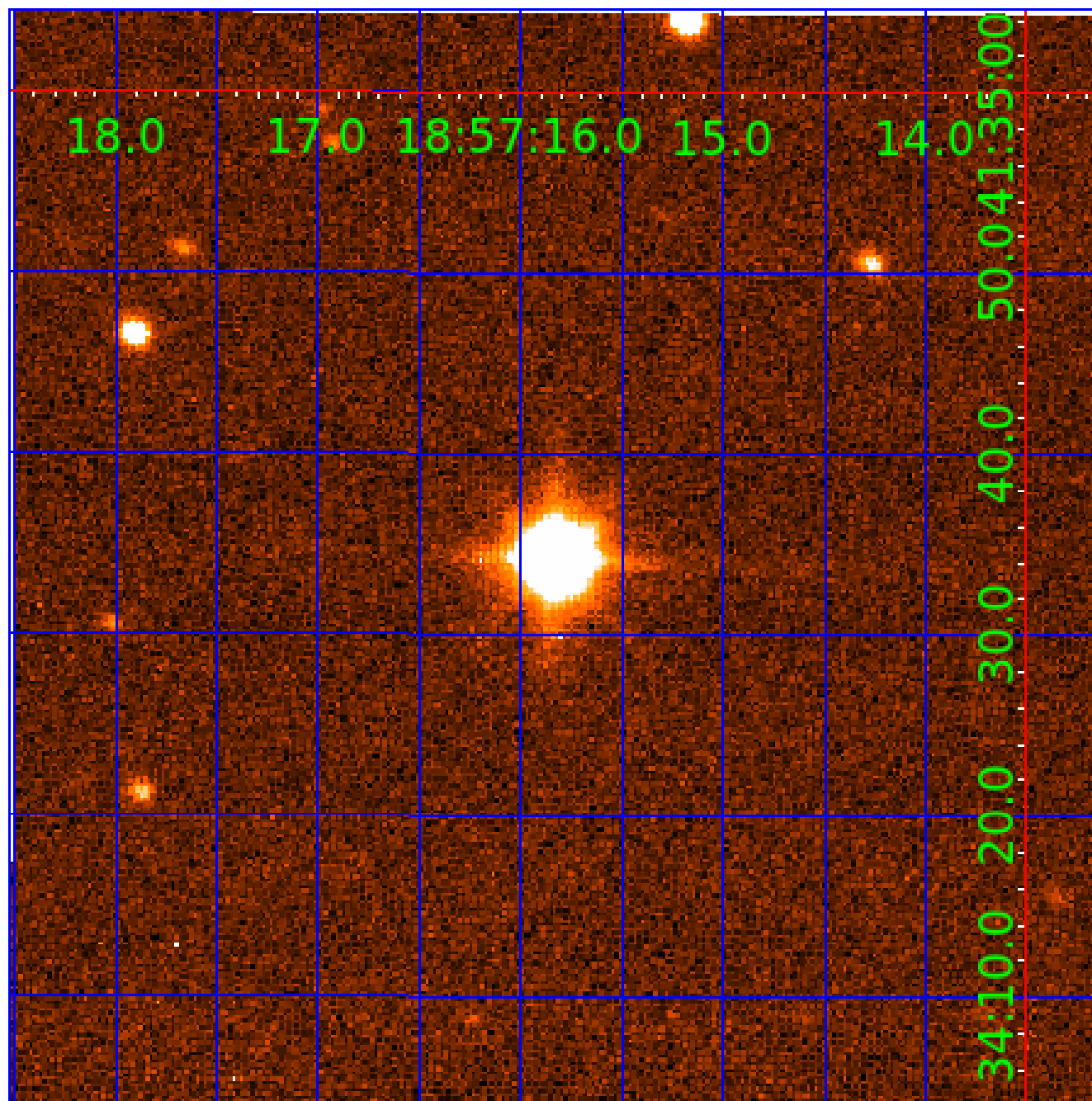


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006185416-01	OBS	No	2.433763	133.496685	0.0	17.243	11.3	0.0	2.33	6875	0.00	6804.74
006185416-02	OBS	No	41.031387	157.346339	306.1	15.200	34.4	13.5	2.33	6875	5.00	157.41
006185416-03	OBS	No	48.756972	139.558411	165.8	12.000	18.3	-1.0	2.33	6875	3.03	125.06
006185416-04	OBS	No	20.477350	144.653720	77.1	8.727	14.7	5.7	2.33	6875	2.34	397.63
006185416-05	OBS	No	61.303390	157.589125	195.6	2.500	12.8	-1.0	2.33	6875	3.29	92.16
006185416-06	OBS	No	28.851051	149.230404	115.7	1.451	12.0	5.8	2.33	6875	2.72	251.75
006185416-07	OBS	No	33.966423	149.661553	267.7	5.985	12.3	12.3	2.33	6875	7.15	202.51
006185416-08	OBS	No	8.235765	137.226252	40.0	3.707	12.0	3.9	2.33	6875	1.78	1339.40
006185416-09	OBS	No	50.334445	172.606097	164.2	1.194	11.5	4.5	2.33	6875	3.16	119.87
006185416-10	OBS	No	45.418954	151.901819	216.2	1.800	11.9	10.3	2.33	6875	3.74	137.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006185416-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006185416-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006185416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
006185416-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
006185416-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

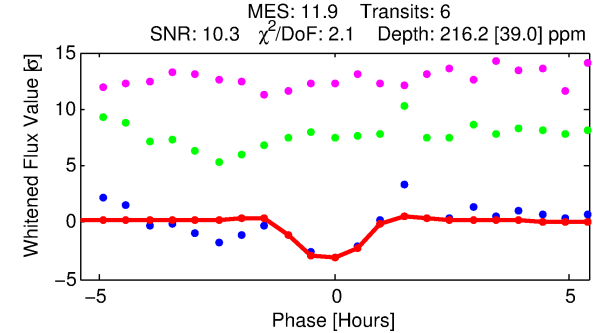
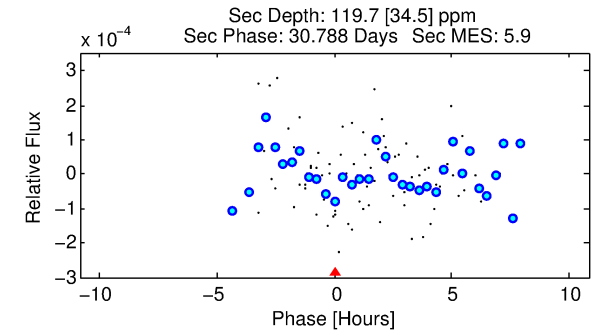
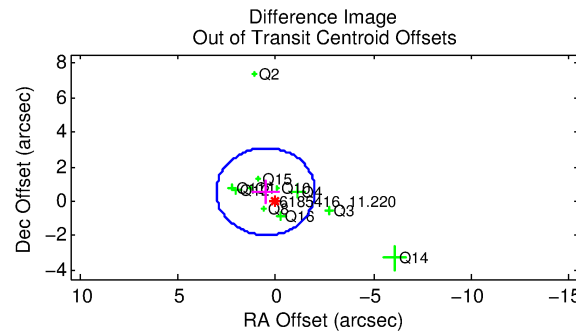
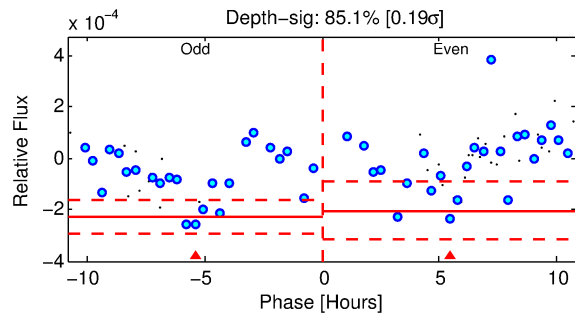
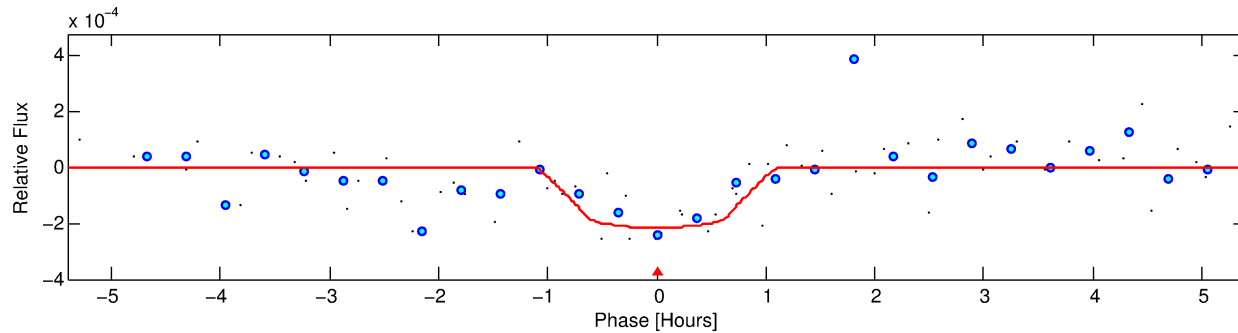
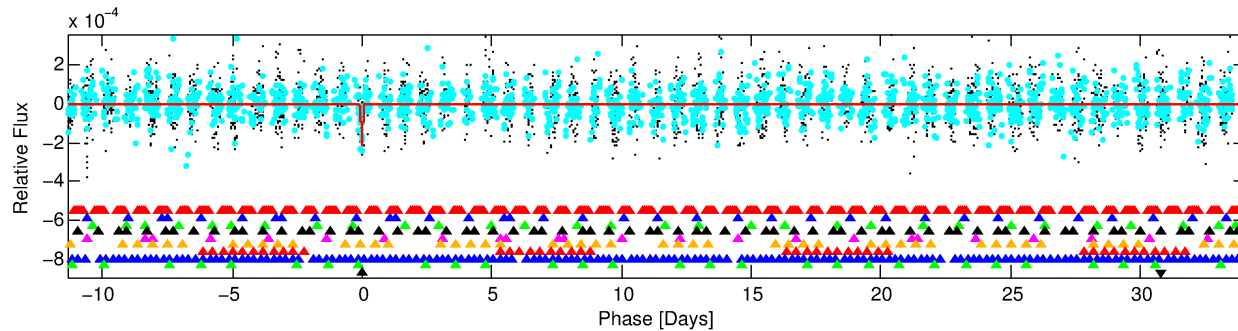
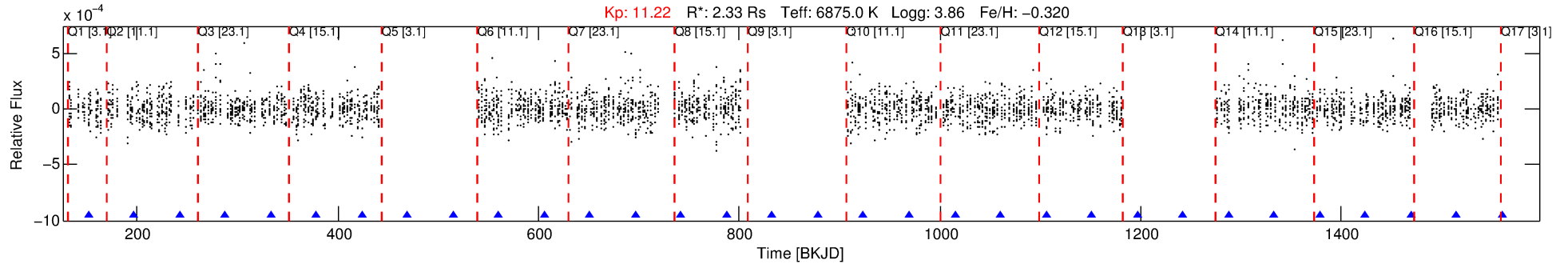
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006185416-10

No Significant Match Found

# DV One-Page Summary

KIC: 6185416 Candidate: 10 of 10 Period: 45.419 d



## DV Fit Results:

Period = 45.41895 [0.00051] d  
Epoch = 151.9018 [0.0067] BKJD  
Rp/R\* = 0.0147 [0.0235]  
a/R\* = 127.62 [1211.09]  
b = 0.77 [5.09]  
Seff = 137.47 [69.90]  
Teq = 873 [111] K  
Rp = 3.74 [6.11] Re  
a = 0.2808 [0.0892] AU  
Ag = 370.82 [1202.60] [0.31 $\sigma$ ]  
Teffp = 5924 [4750] K [1.06 $\sigma$ ]

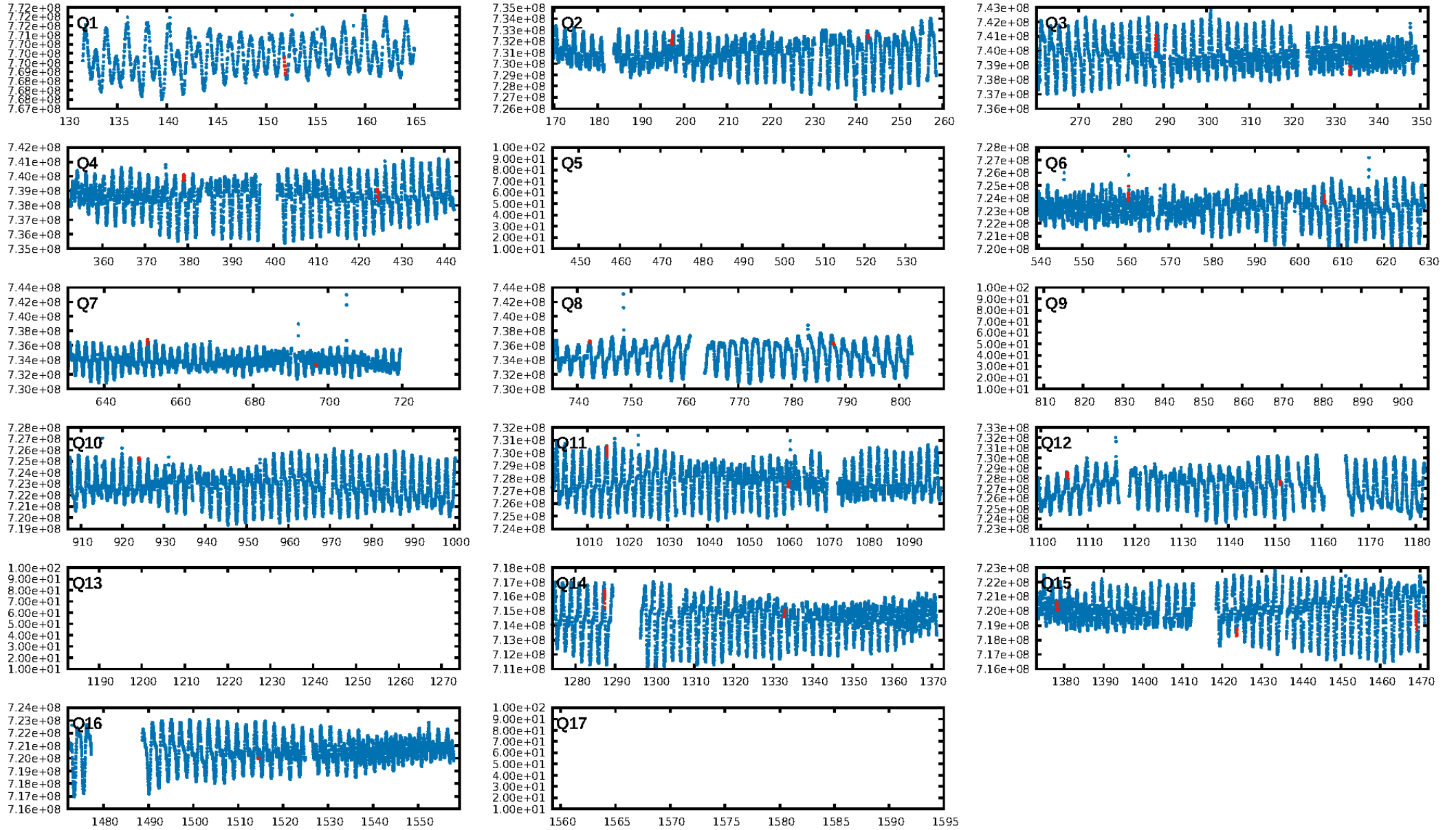
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.88 $\sigma$ ]  
LongPeriod-sig: 100.0% [6.60 $\sigma$ ]  
ModelChiSquare2-sig: 2.6%  
ModelChiSquareGof-sig: 72.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 0.8655  
Centroid-sig: N/A  
Centroid-so: 0.204 arcsec [0.44 $\sigma$ ]  
OotOffset-rm: 0.760 arcsec [0.90 $\sigma$ ]  
KicOffset-rm: 0.860 arcsec [0.96 $\sigma$ ]  
OotOffset-st: 3/3/4/1 [11]  
KicOffset-st: 3/3/4/1 [11]  
DiffImageQuality-fgm: 0.18 [2/11]  
DiffImageOverlap-fno: 0.38 [5/13]

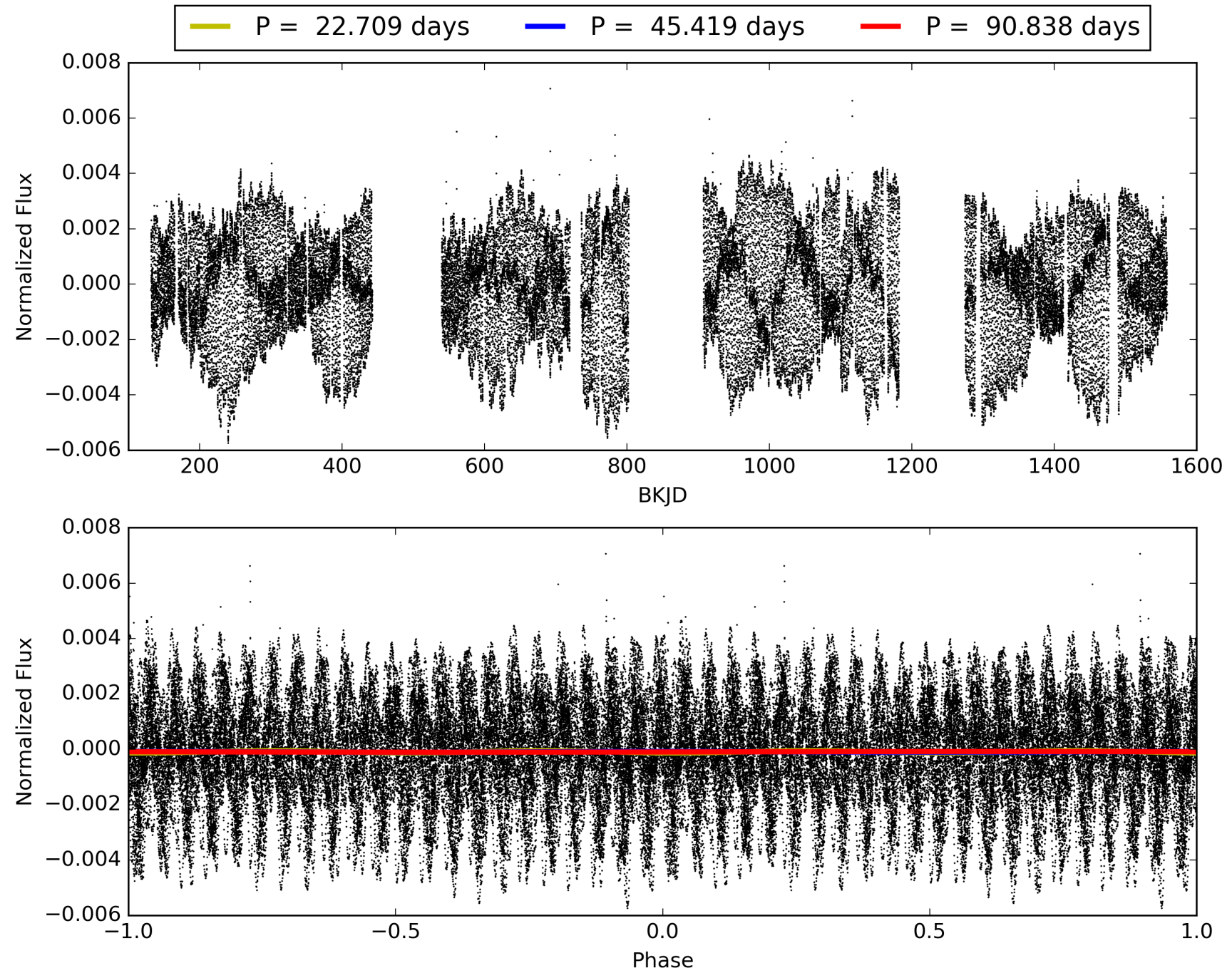
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:40:58 Z

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

# TCE 006185416-10, PDC Light Curves



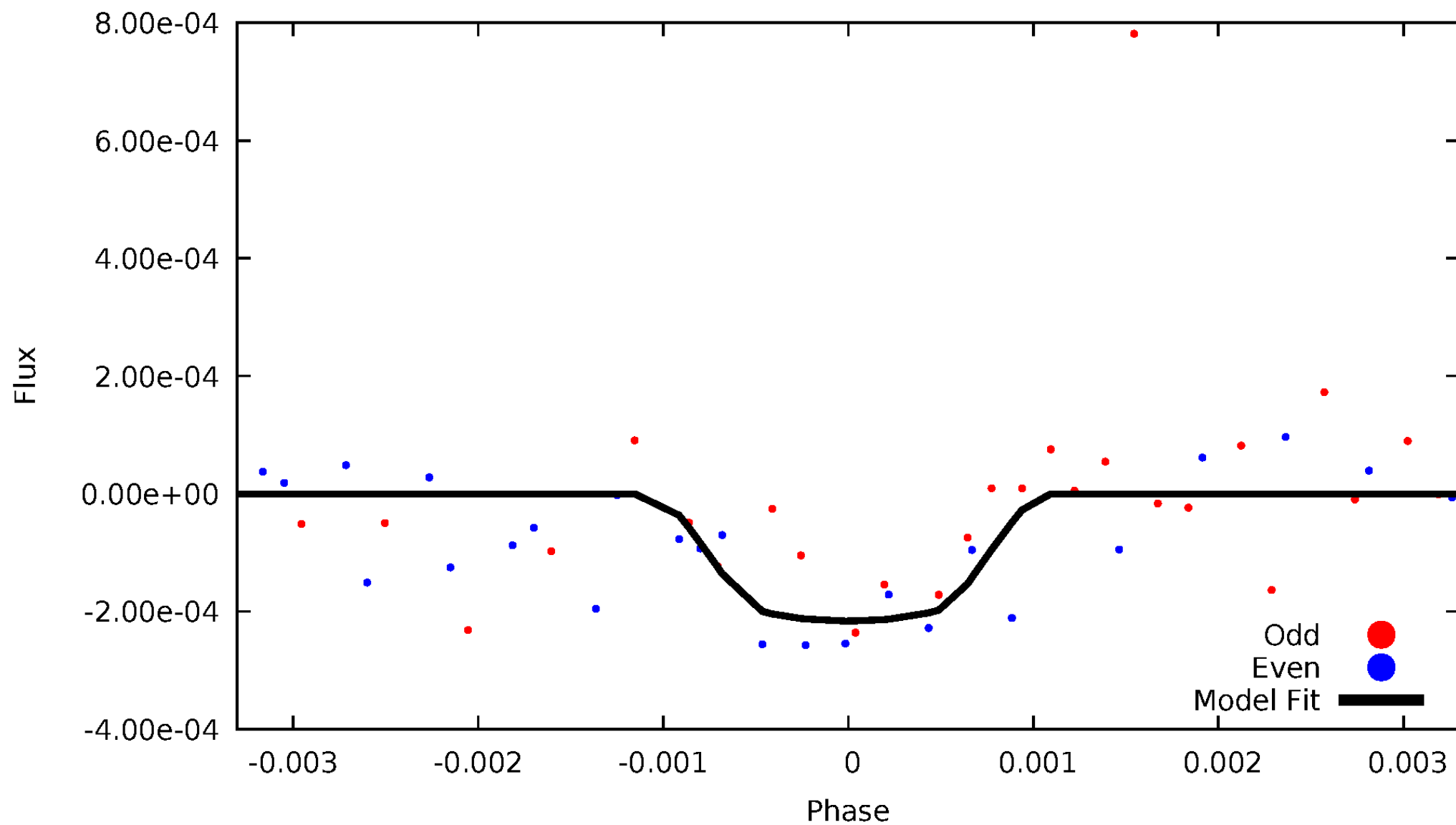
# TCE 006185416-10





# DV Odd/Even

TCE 006185416-10





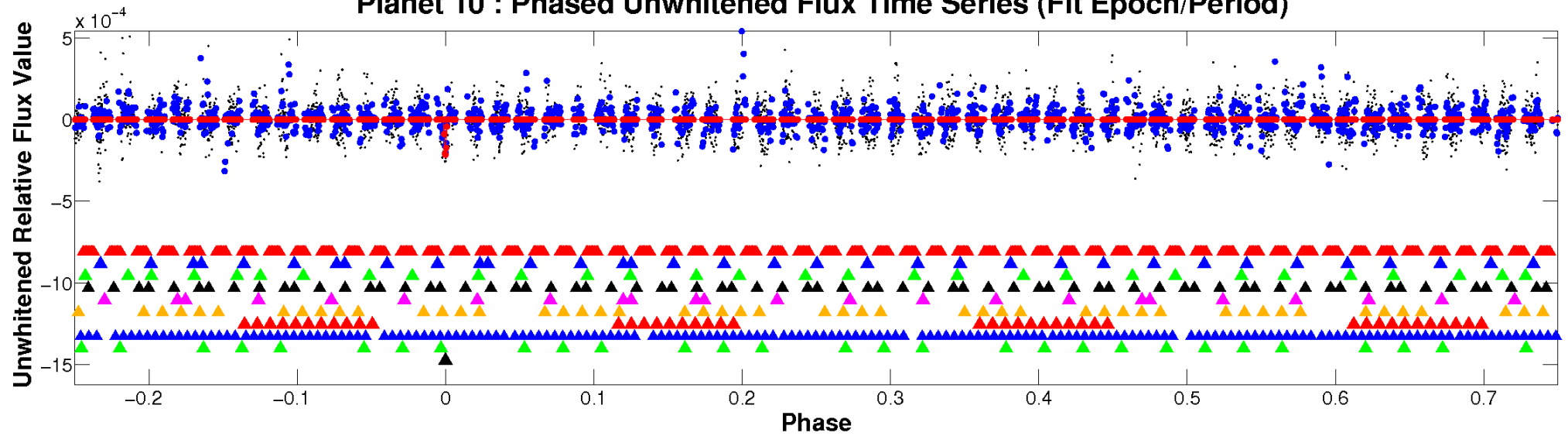


ALT Odd/Even

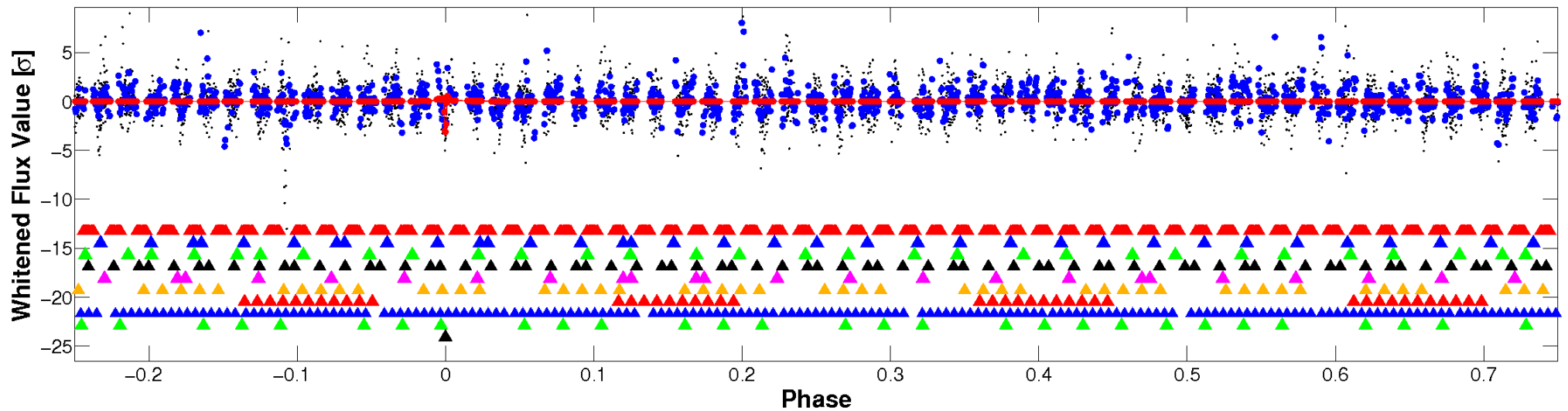
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

Planet 10 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

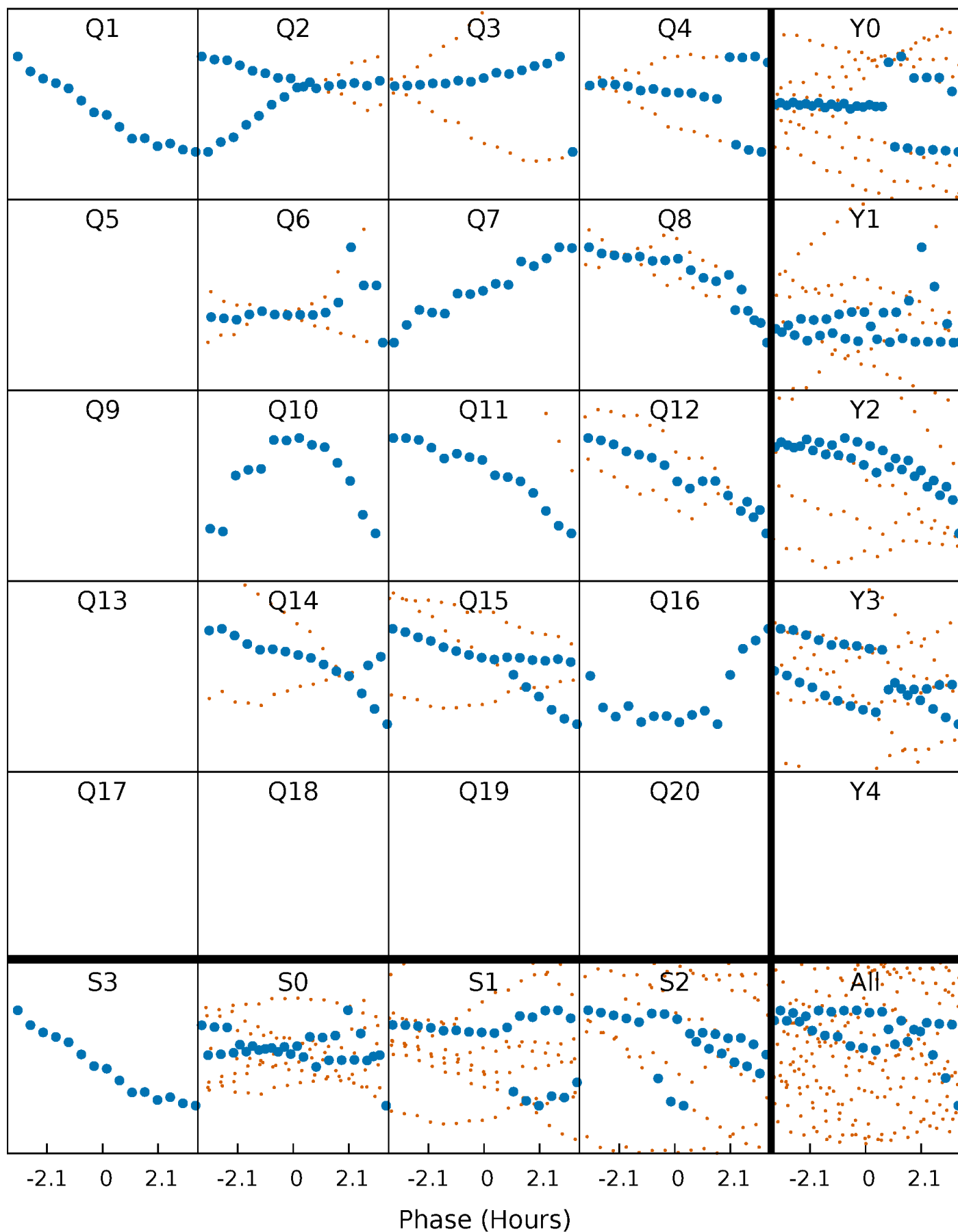


Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)



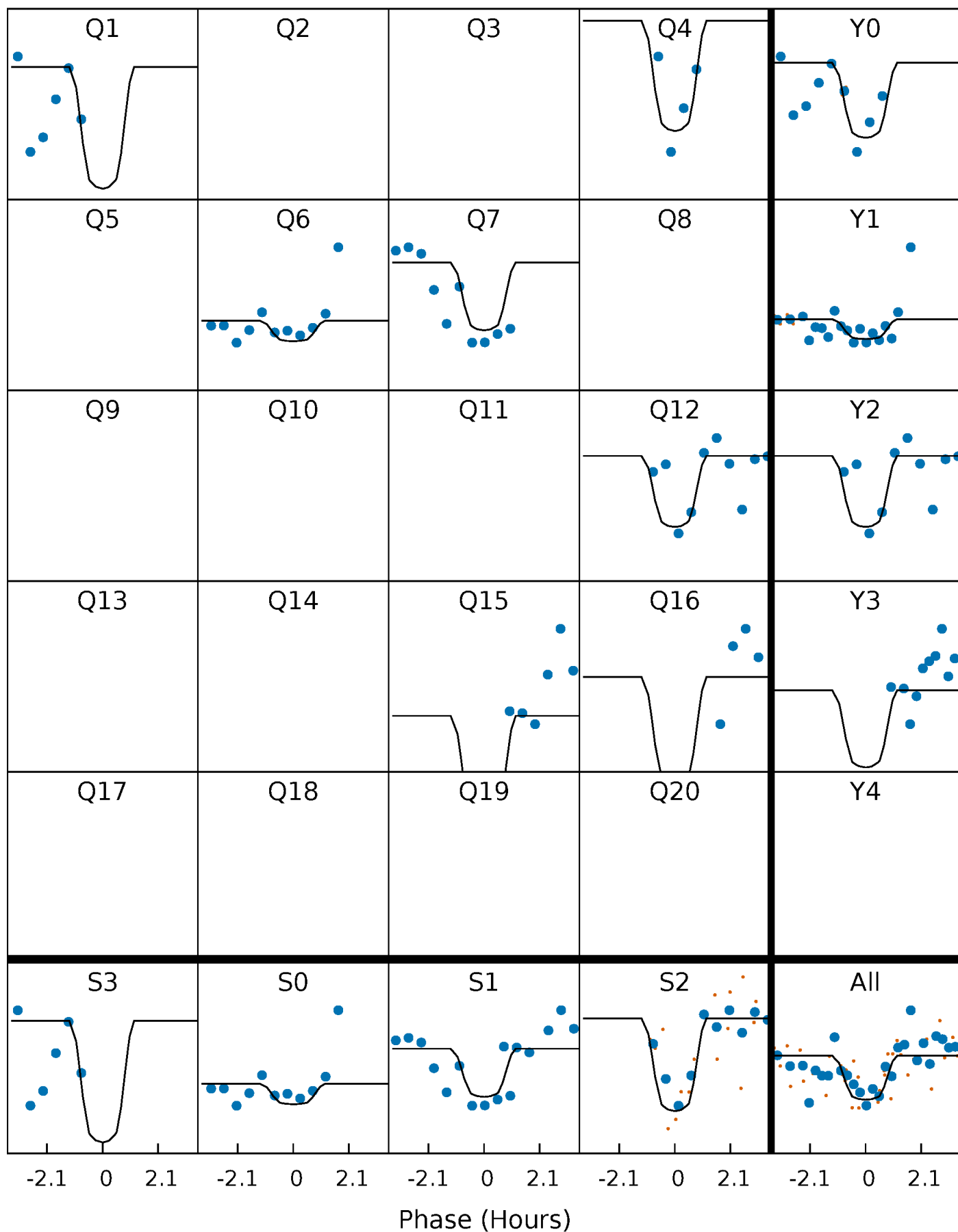
# PDC Quarter-Phased Transit Curves

TCE 006185416-10 P= 45.418954 Days  $T_0=151.901819$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 006185416-10 P= 45.418954 Days  $T_0=151.901819$  (BKJD)

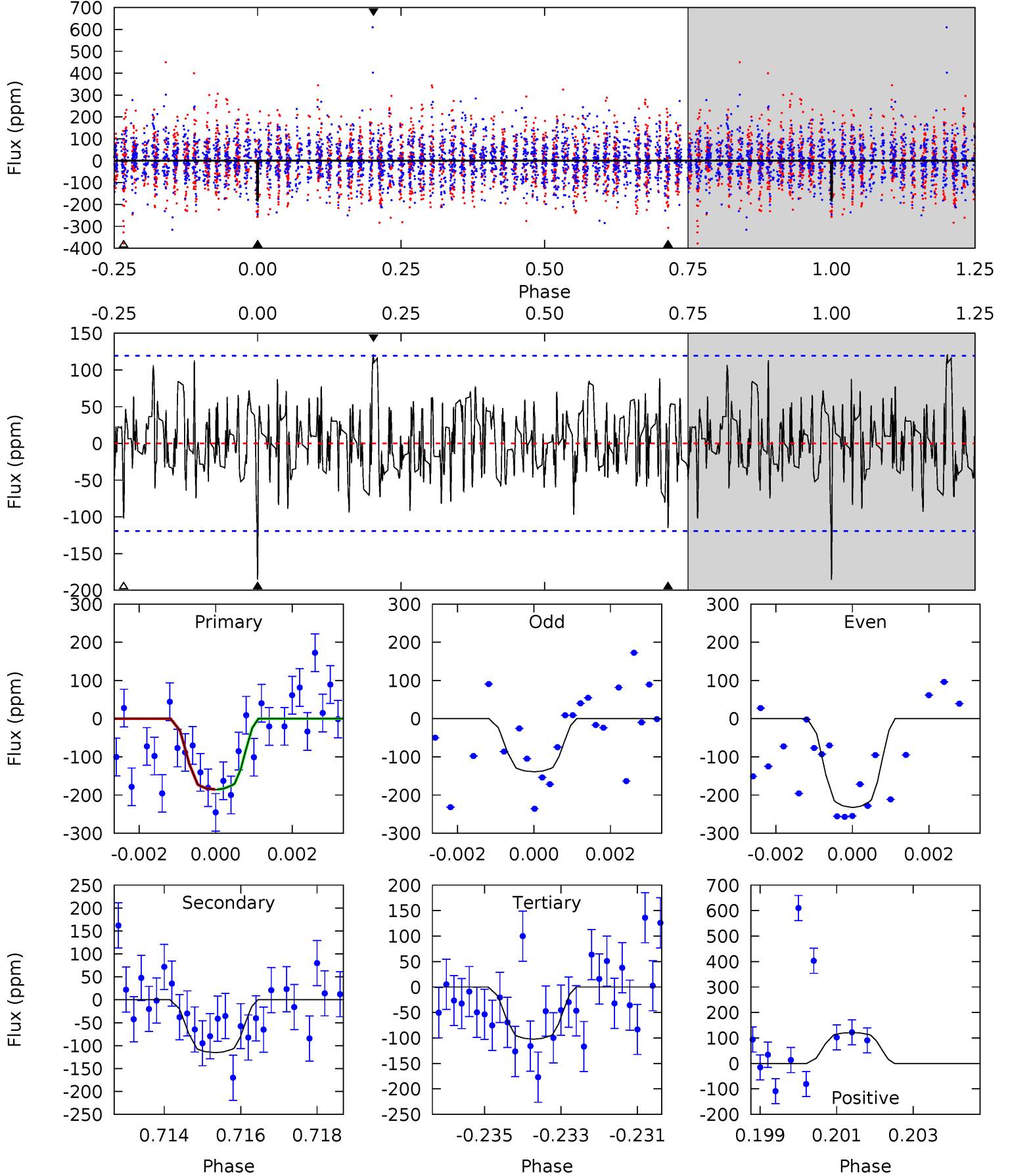


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

006185416-10,  $P = 45.418954$  Days,  $E = 106.482865$  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
8.28	5.15	4.57	5.41	5.33	3.10	1.64	3.71	2.87	0.58	-0.26	1.89	1.10	0.40	0.00



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 006185416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6875^{+170}_{-204}$	$3.860^{+0.285}_{-0.095}$	$-0.320^{+0.300}_{-0.250}$	$2.327^{+0.433}_{-0.804}$	$1.430^{+0.219}_{-0.267}$	$0.160^{+0.276}_{-0.055}$
	+2%/-3%	+7%/-2%	+94%/-78%	+19%/-35%	+15%/-19%	+172%/-35%
Source	PHO1	FLK73	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 006185416-10 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-115 \pm 22$	$4.86^{+5.64}_{-3.37}$	$1199^{+66}_{-106}$	$5006^{+4645}_{-1181}$	$206^{+1930}_{-158}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{max}$  = 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

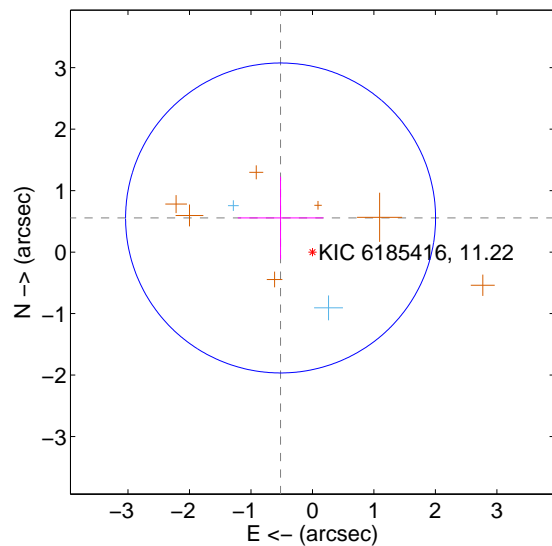
Supplemental centroid analysis for 006185416-10. **Kepler magnitude: 11.22.** Transit SNR 10.32

**There are 2 quarters with good PRF difference image offsets**

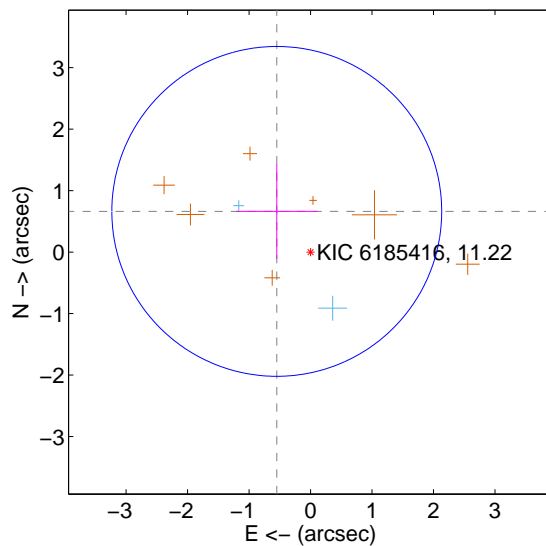
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.760 \pm 0.840$	0.90	$0.518 \pm 0.696$	$0.555 \pm 0.672$
PRF-fit source offset from KIC position	$0.860 \pm 0.894$	0.96	$0.549 \pm 0.661$	$0.662 \pm 0.771$
photometric centroid source offset	$0.20 \pm 0.47$	0.44	$-0.14 \pm 0.51$	$0.15 \pm 0.42$

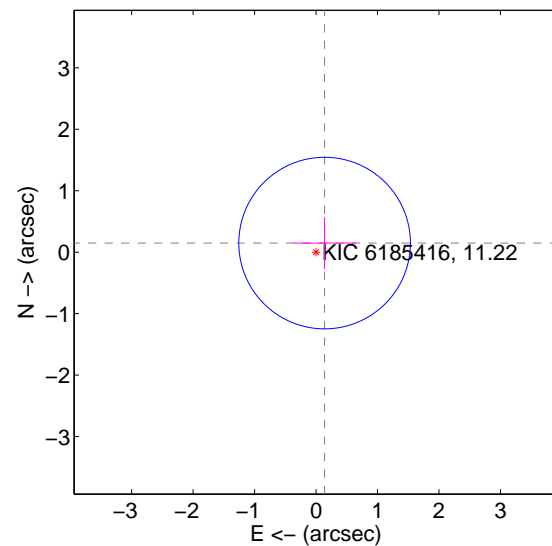
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

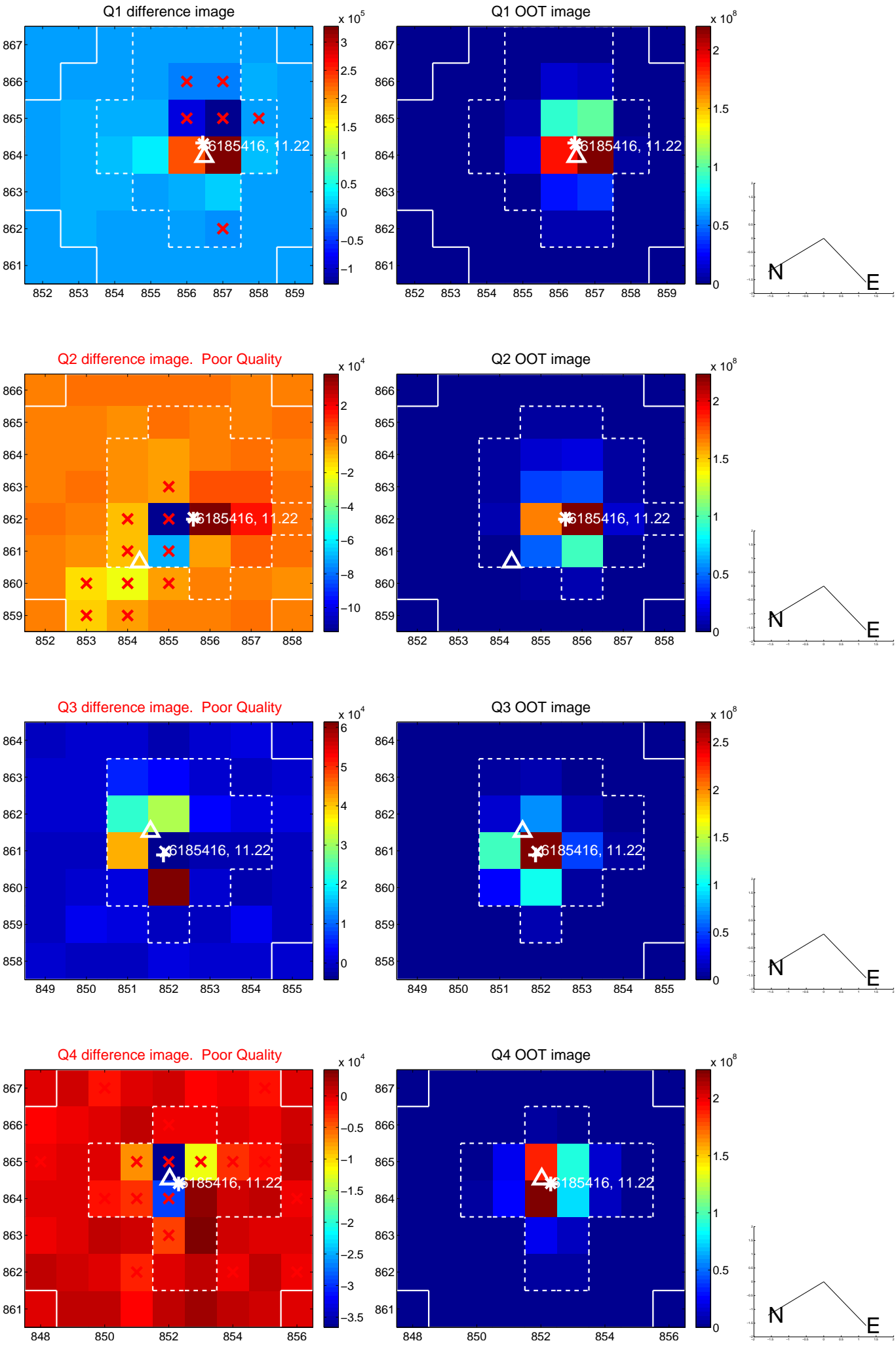


offset from photometric centroids

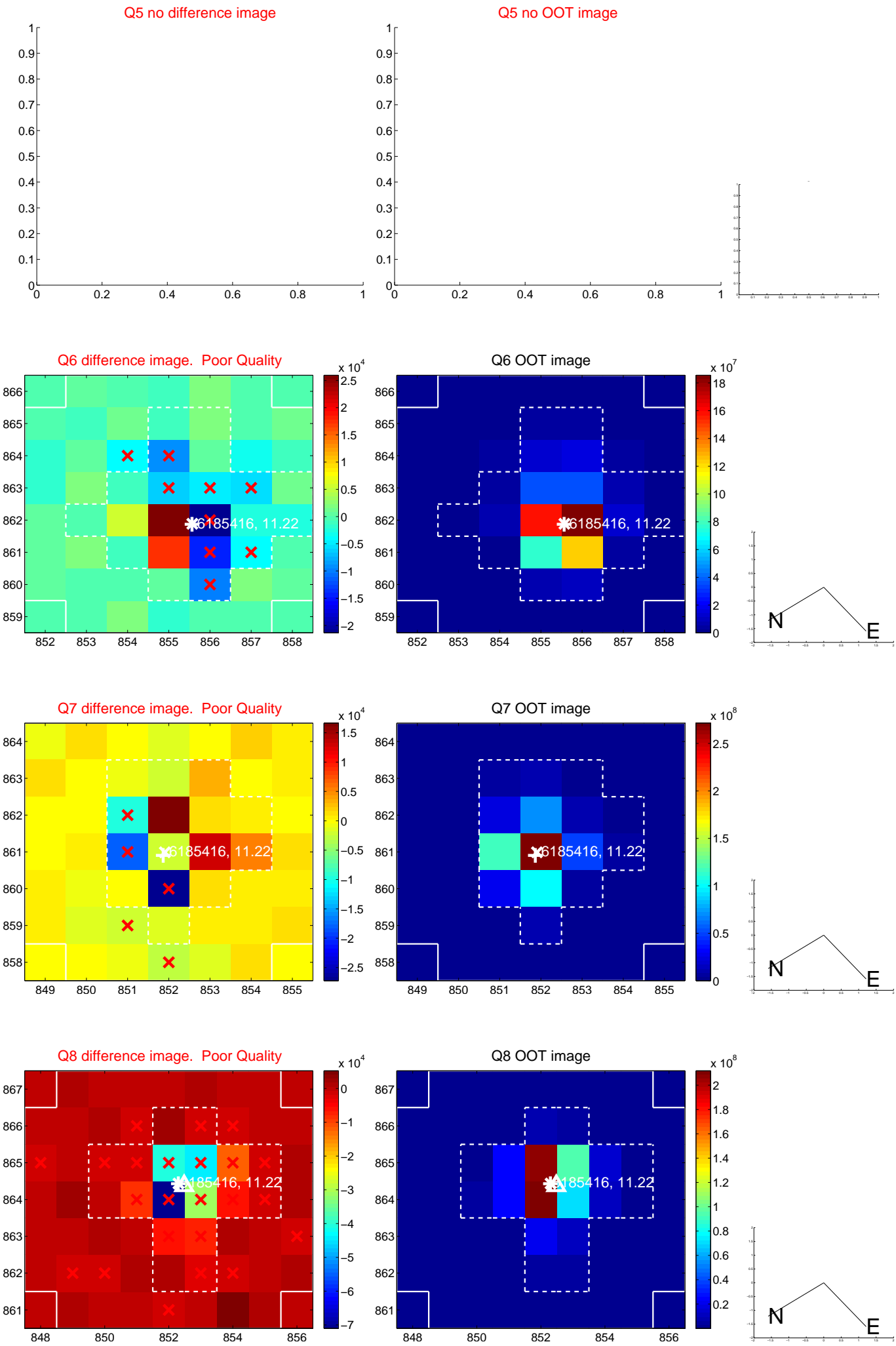


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

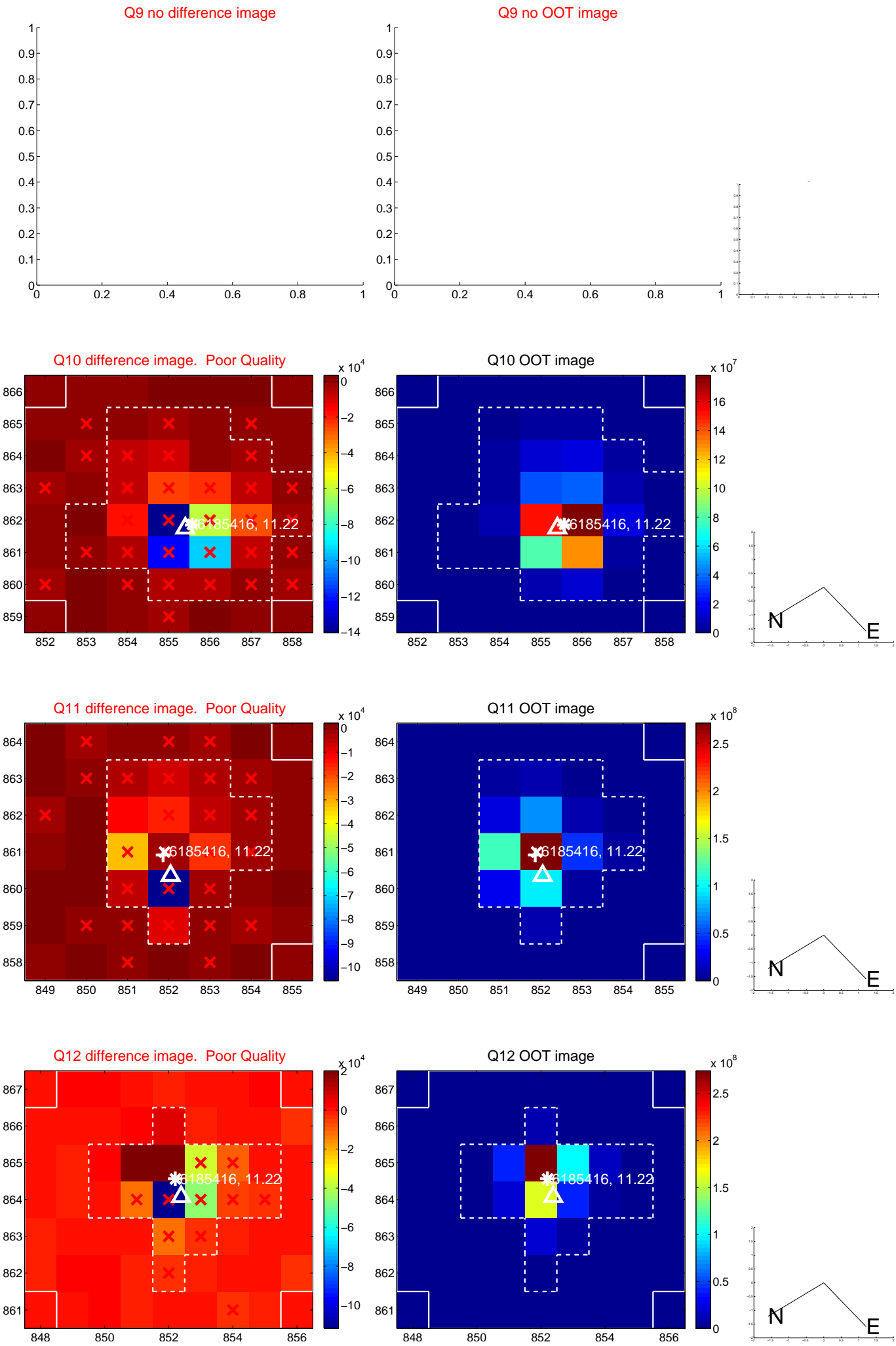
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



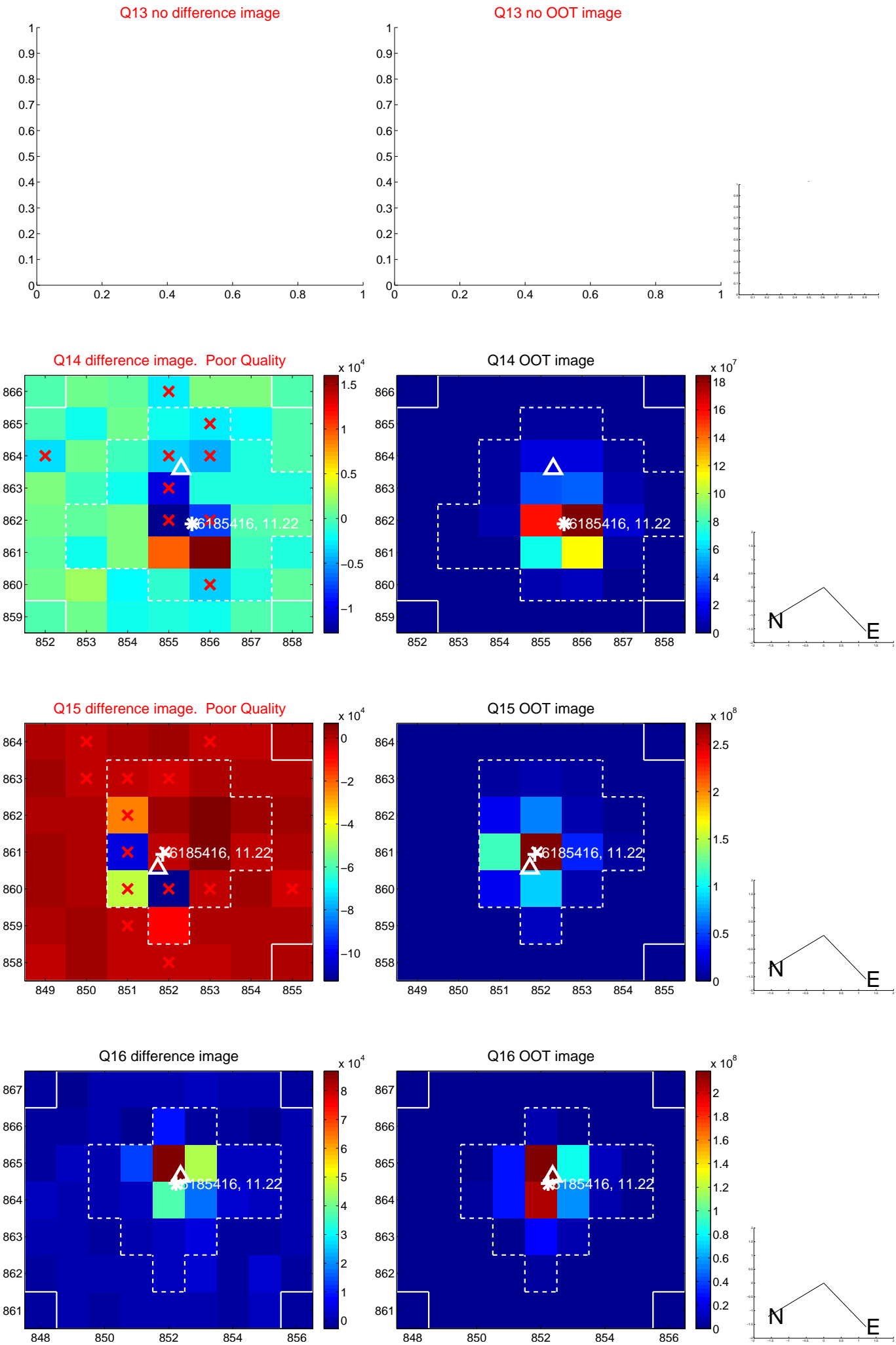
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



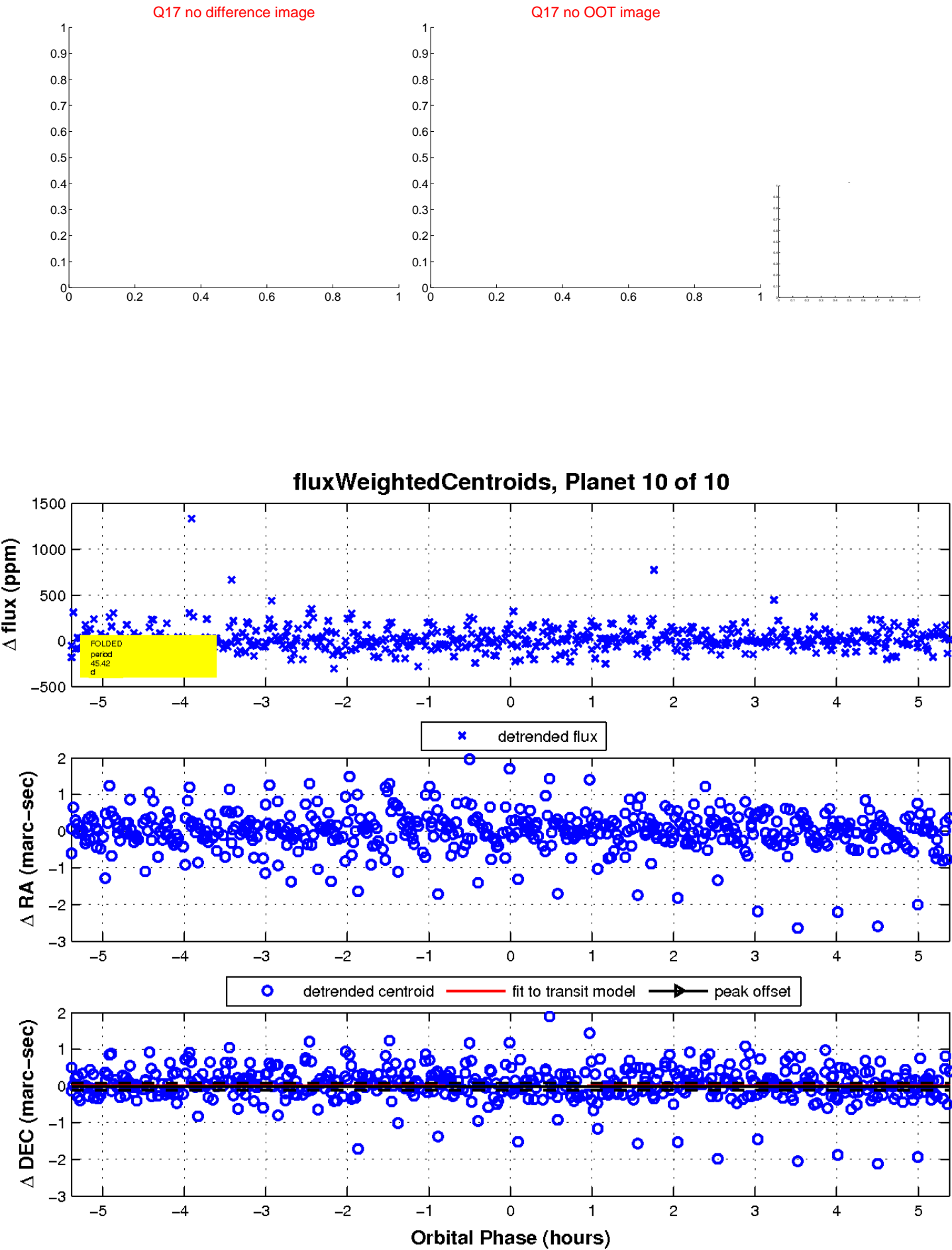
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

