

# KIC 011186618

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011186618-01	OBS	No	0.942573	131.654324	40.6	5.694	9.6	6.8	0.53	4671	0.37	509.57
011186618-02	OBS	No	167.860775	173.465028	2915.5	13.204	17.4	10.9	0.53	4671	5.45	0.51
011186618-03	OBS	No	185.867599	266.571084	3029.4	10.359	13.2	10.3	0.53	4671	5.58	0.44
011186618-04	OBS	No	87.907703	191.522304	1248.1	5.052	12.5	7.5	0.53	4671	1.99	1.21
011186618-05	OBS	No	58.594744	176.774498	583.6	6.364	9.3	4.1	0.53	4671	1.46	2.07
011186618-06	OBS	No	125.616664	136.793538	271.6	7.769	9.3	1.4	0.53	4671	1.04	0.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011186618-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
011186618-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_MEAS
011186618-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
011186618-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

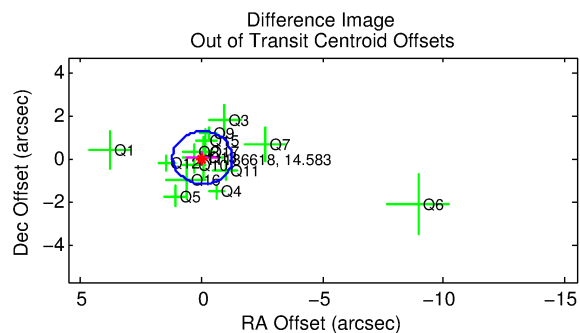
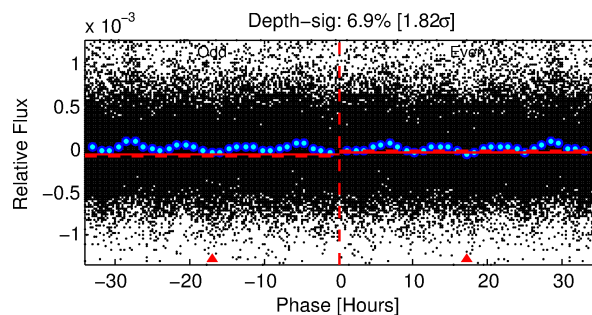
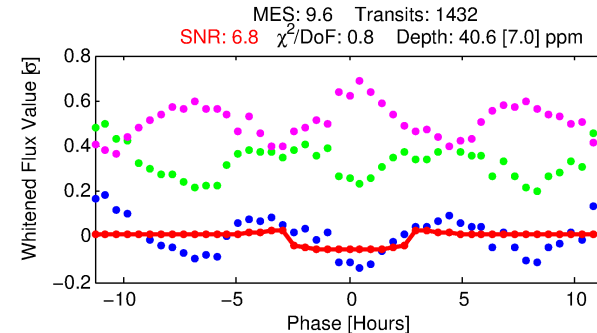
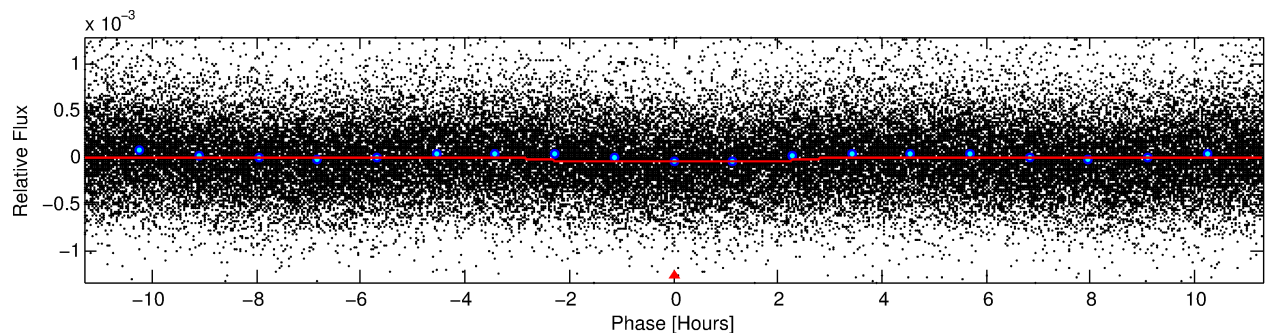
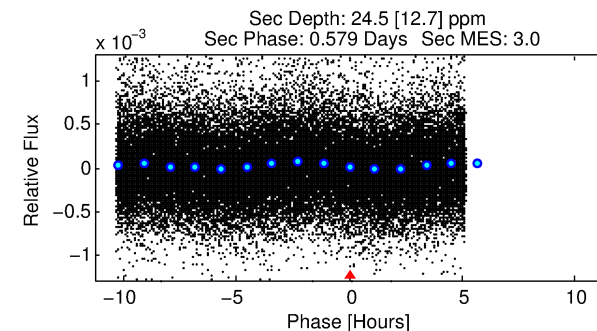
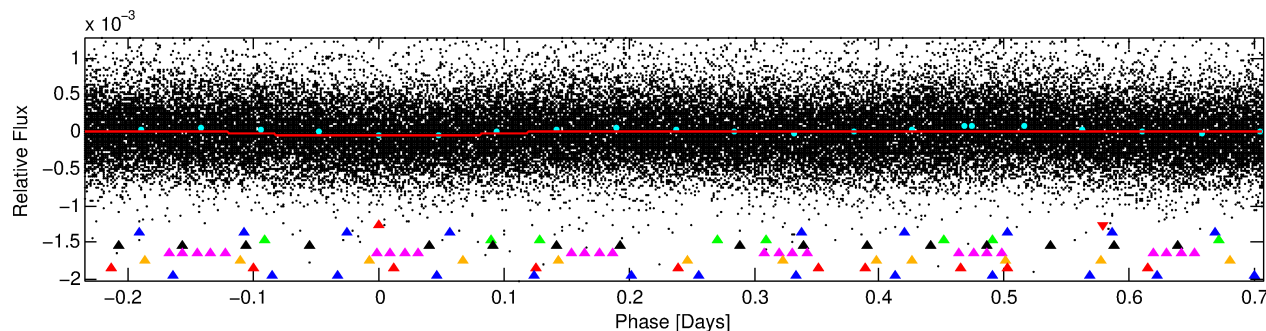
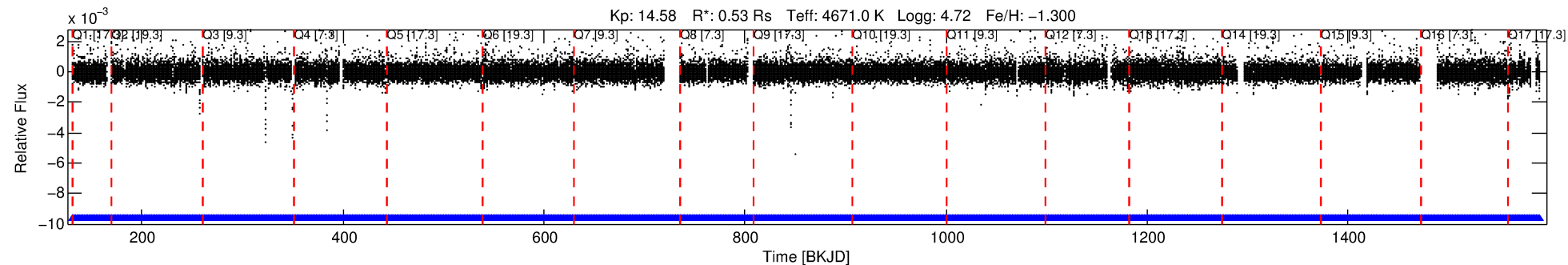
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011186618-01

No Significant Match Found

# DV One-Page Summary

KIC: 11186618 Candidate: 1 of 8 Period: 0.943 d



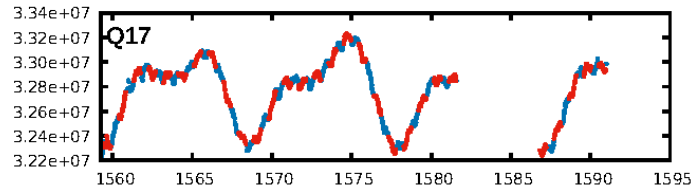
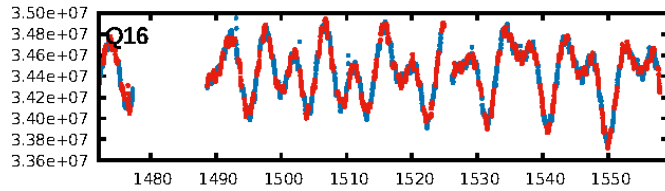
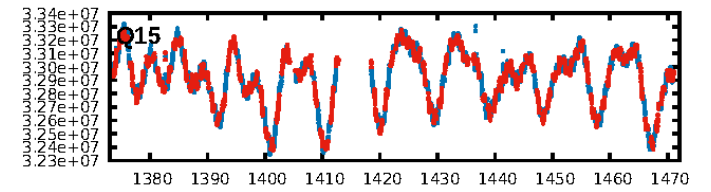
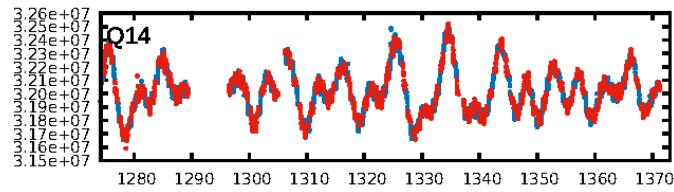
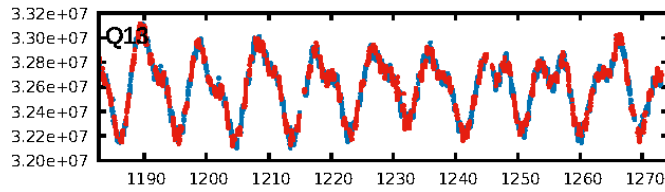
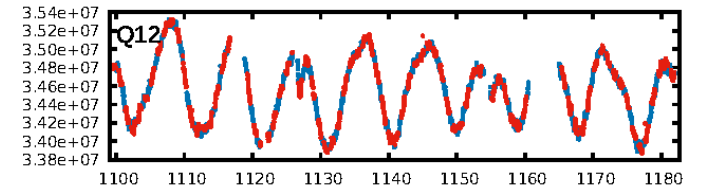
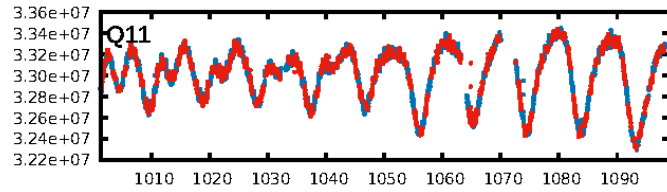
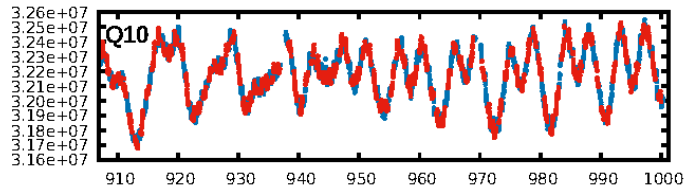
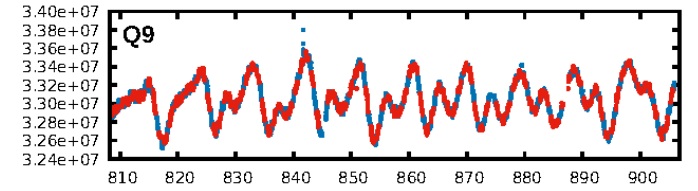
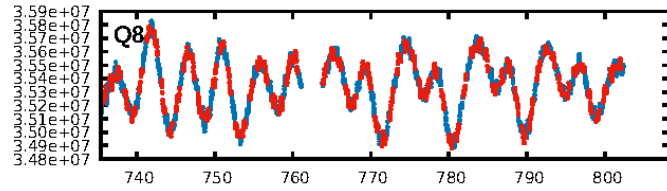
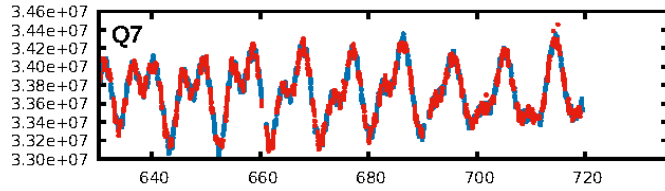
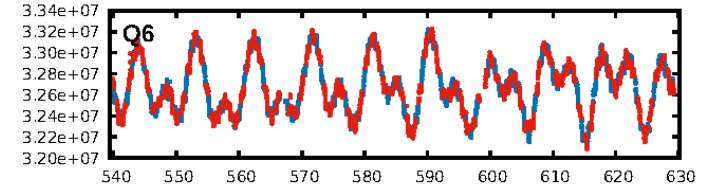
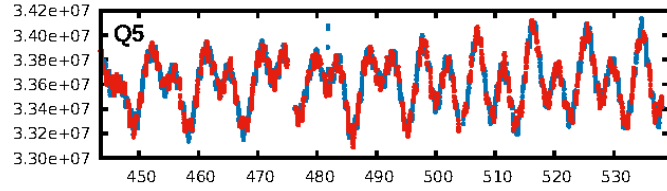
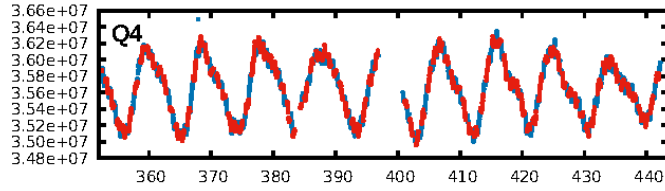
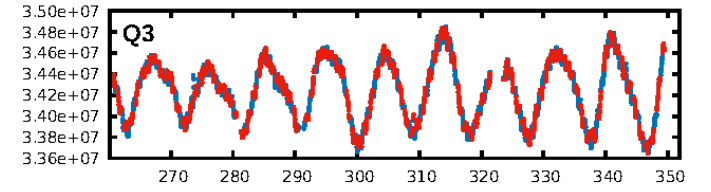
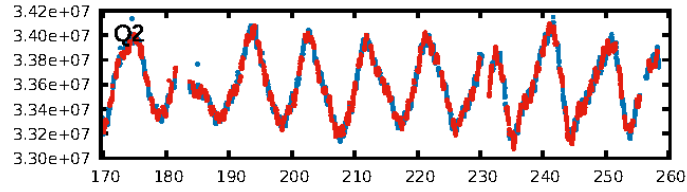
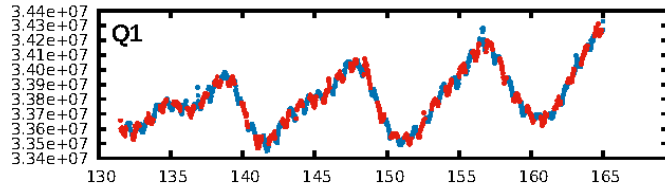
## DV Fit Results:

Period = 0.94257 [0.00002] d  
Epoch = 131.6543 [0.0050] BKJD  
Rp/R\* = 0.0064 [0.0053]  
a/R\* = 1.20 [1.22]  
b = 0.76 [1.88]  
Seff = 509.57 [81.72]  
Teff = 1212 [49] K  
Rp = 0.37 [0.31] Re  
a = 0.0153 [0.0009] AU  
Ag = 23.30 [40.64] [0.55σ]  
Teffp = 4115 [1797] K [1.62σ]

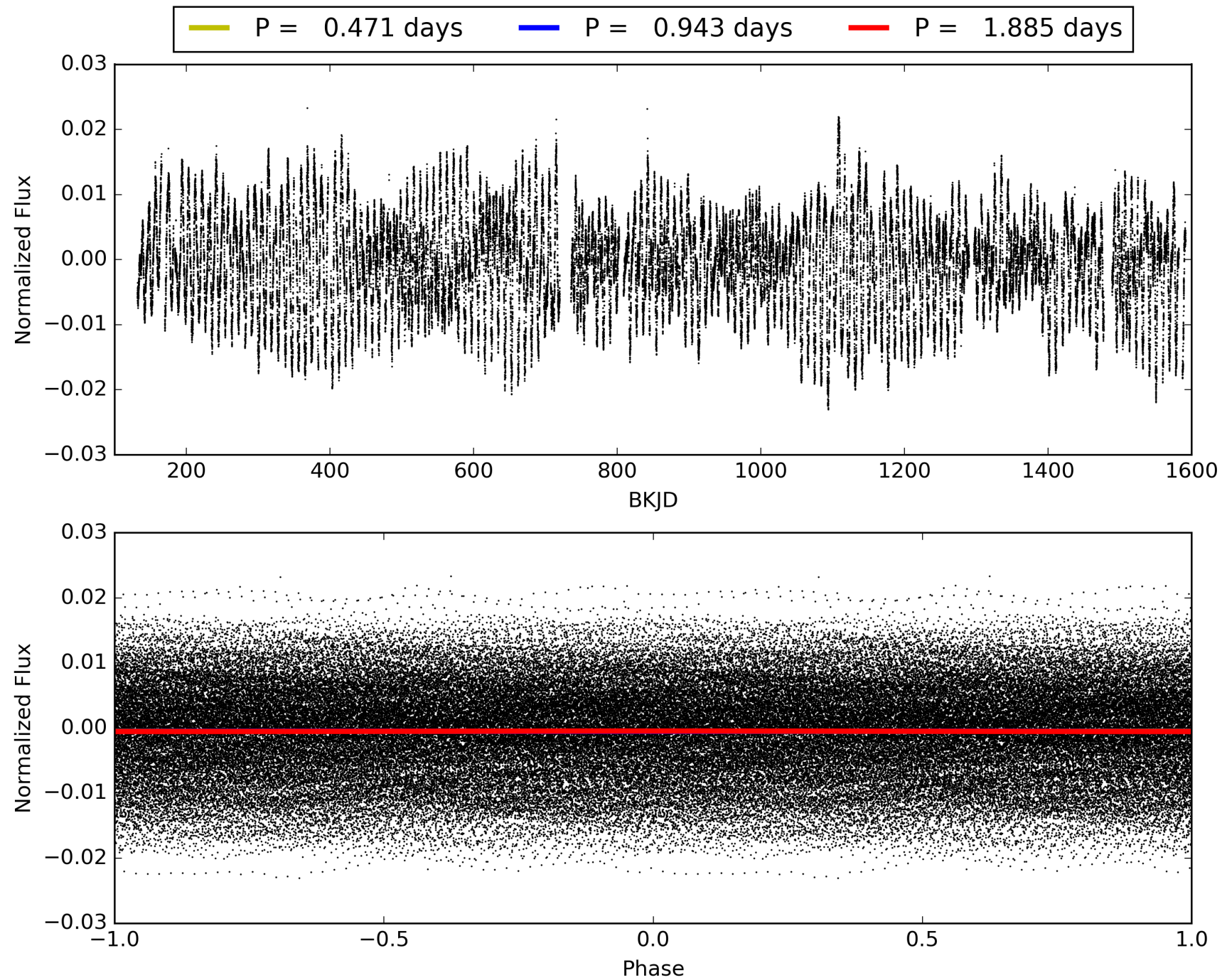
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [162.04σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1367/1367]  
GhostDiagnostic-chr: -0.1468  
Centroid-sig: 77.1%  
Centroid-so: 0.610 arcsec [0.79σ]  
OotOffset-rm: 0.074 arcsec [0.18σ]  
KicOffset-rm: 0.275 arcsec [1.00σ]  
OotOffset-st: 3/4/3/5 [15]  
KicOffset-st: 3/4/3/5 [15]  
DiffImageQuality-fgm: 0.40 [6/15]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 011186618-01, PDC Light Curves



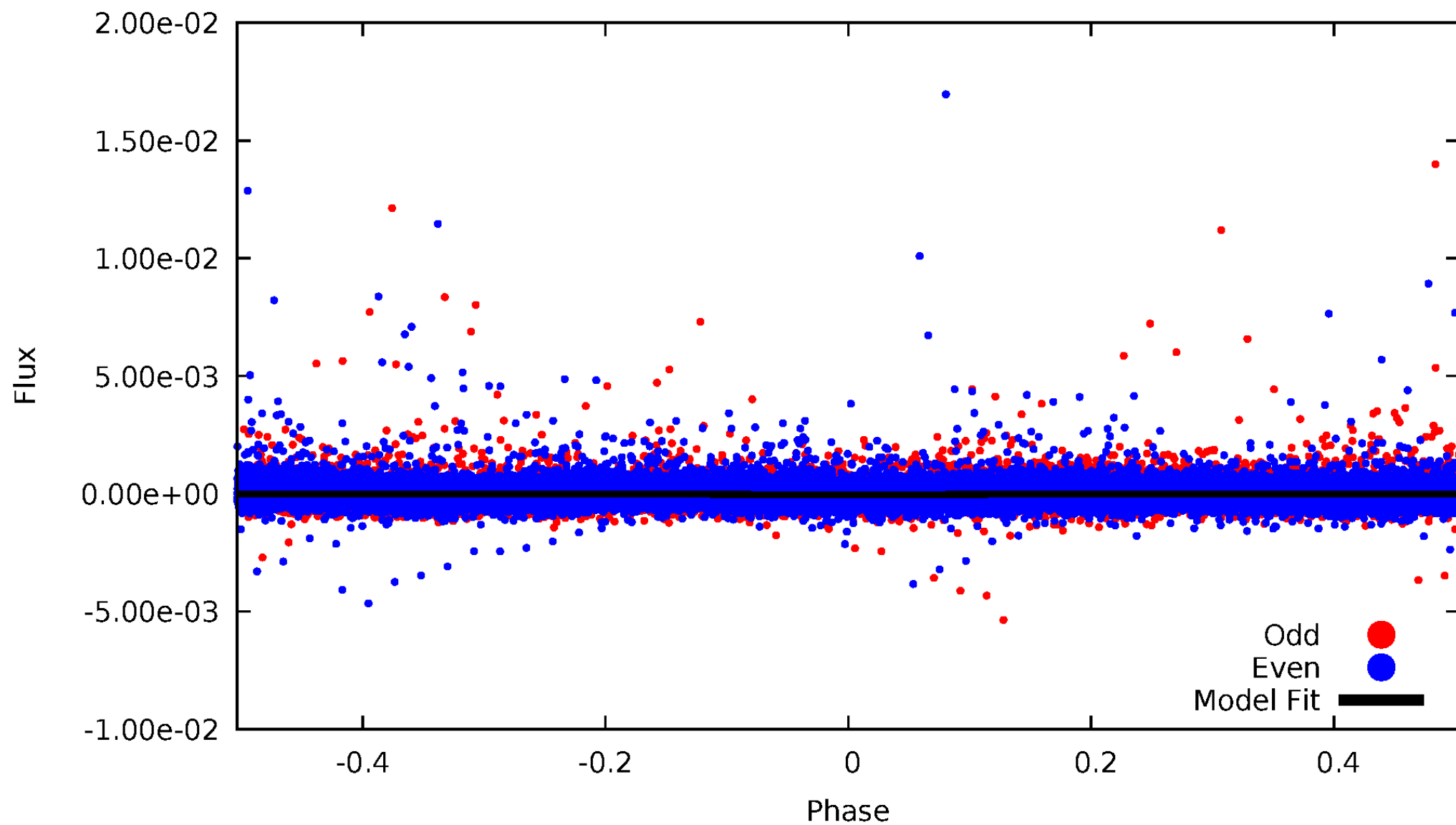
TCE 011186618-01





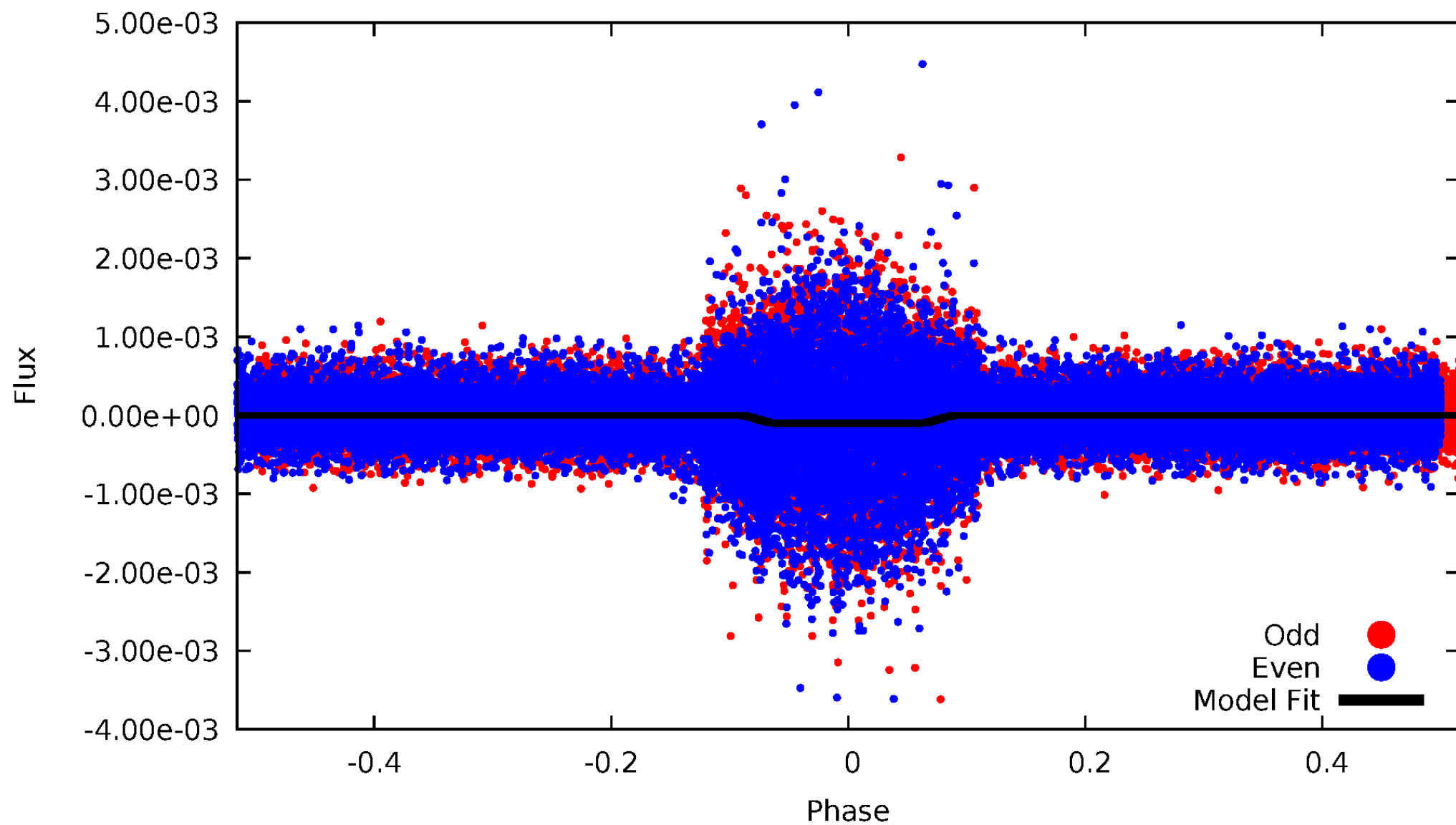
# DV Odd/Even

TCE 011186618-01

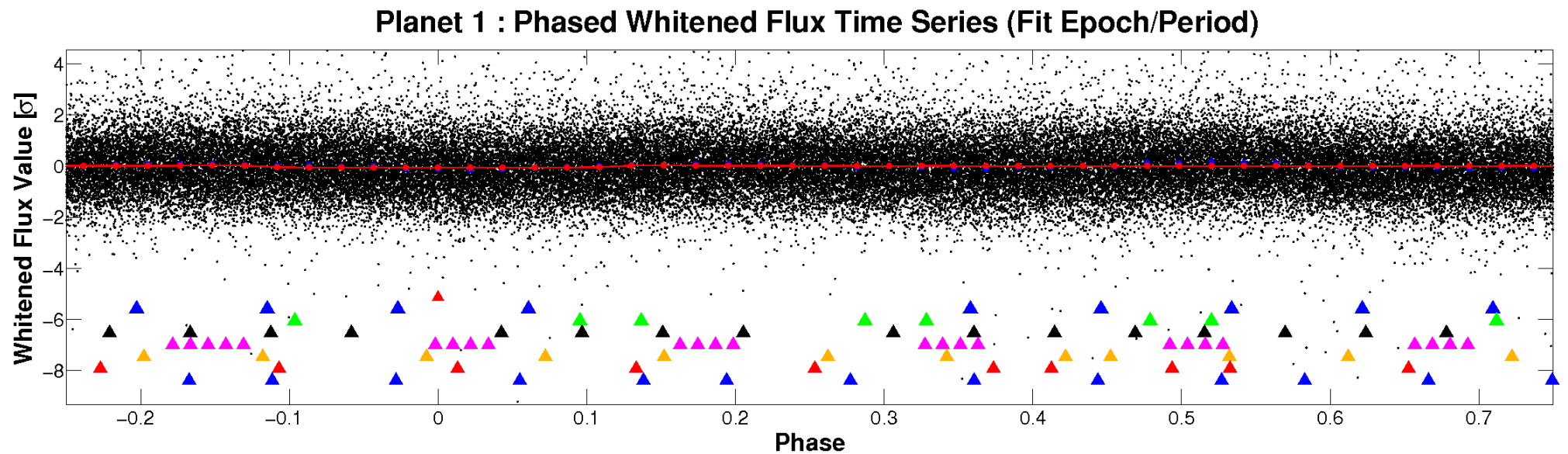
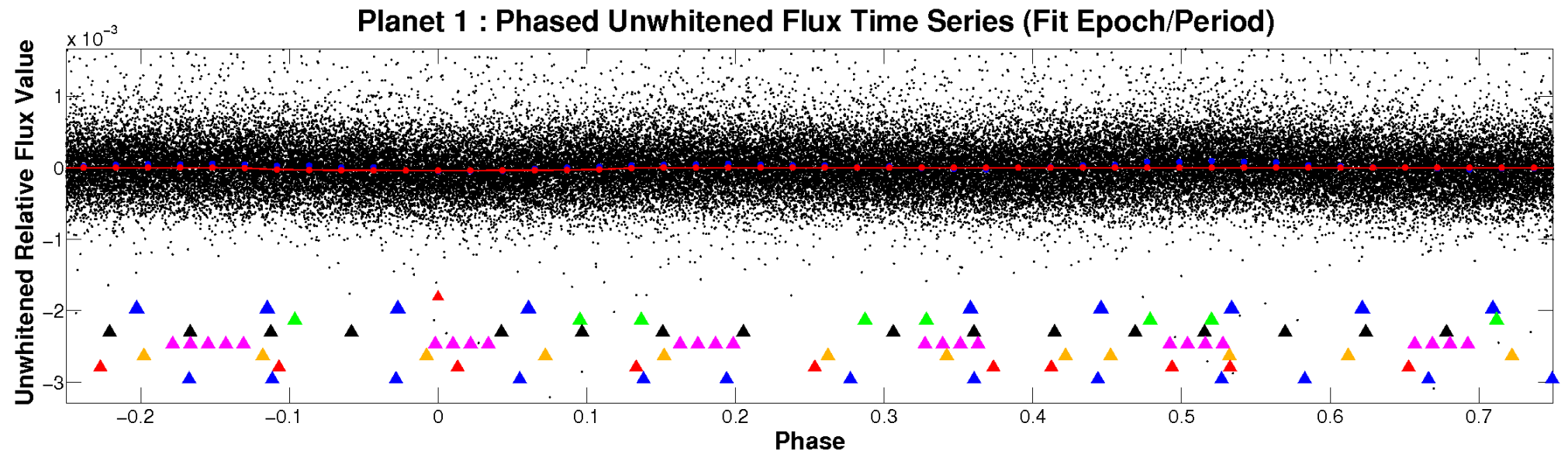


# ALT Odd/Even

TCE 011186618-01

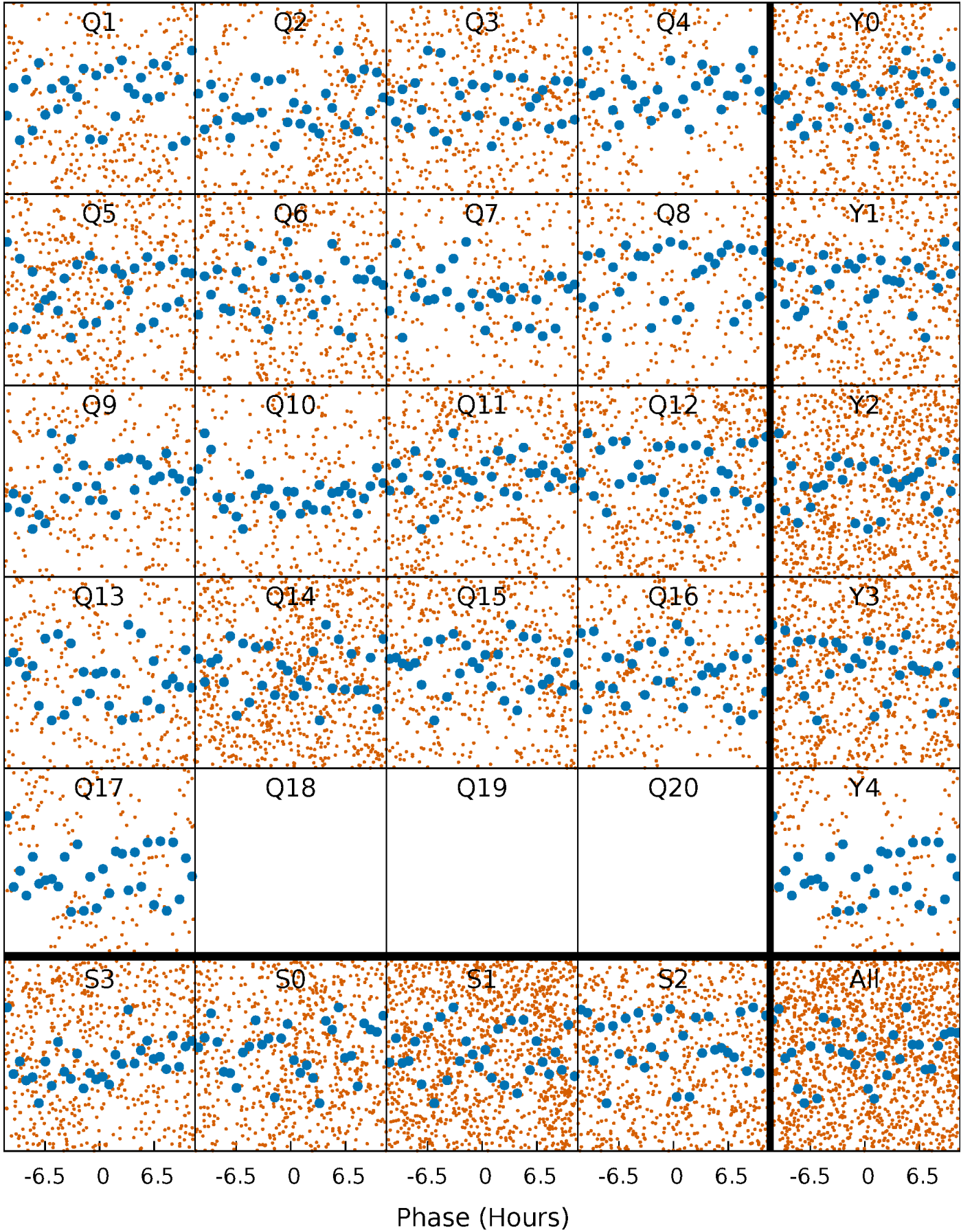


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

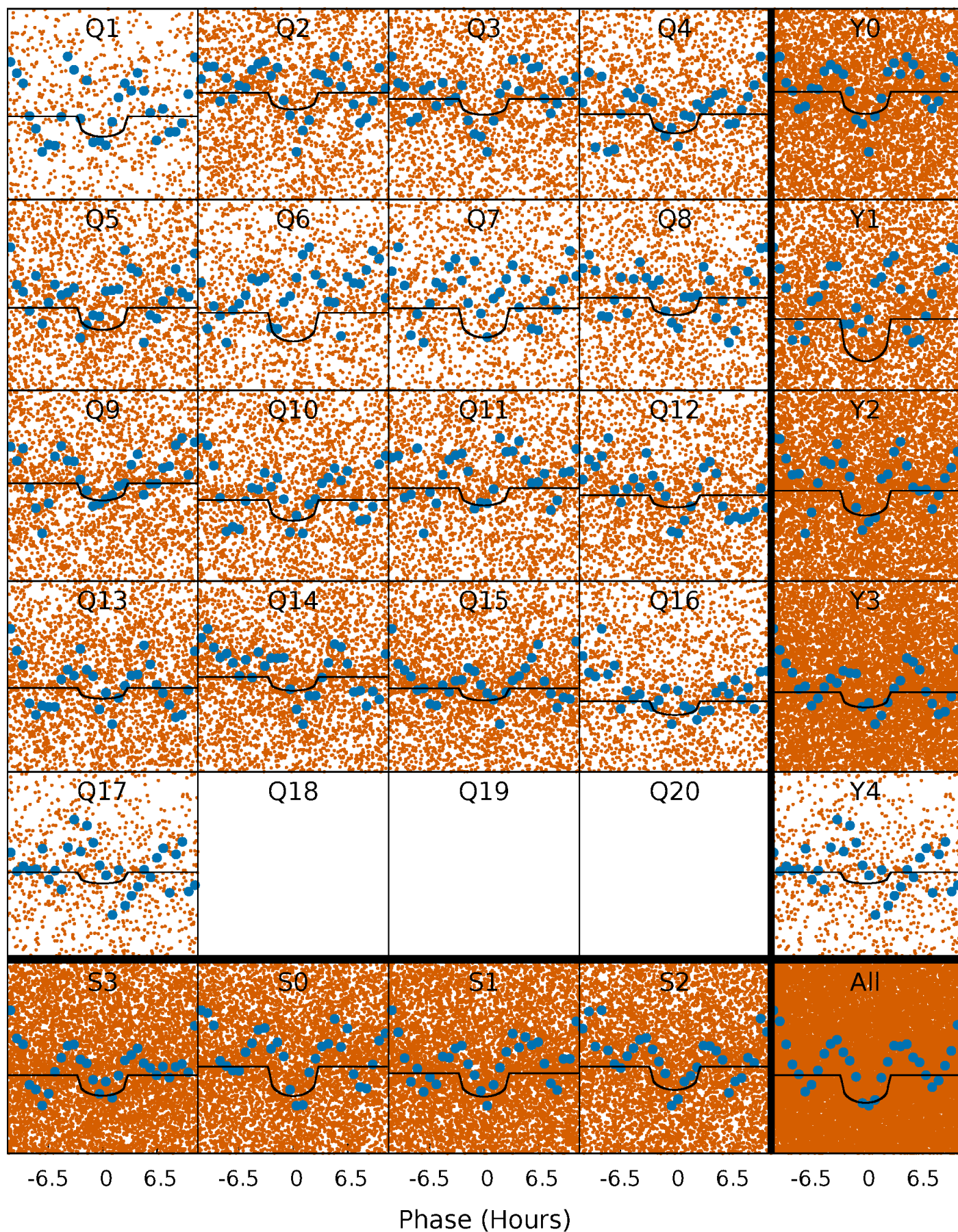
TCE 011186618-01   P= 0.942573 Days    $T_0=131.654324$  (BKJD)





# DV Quarter-Phased Transit Curves

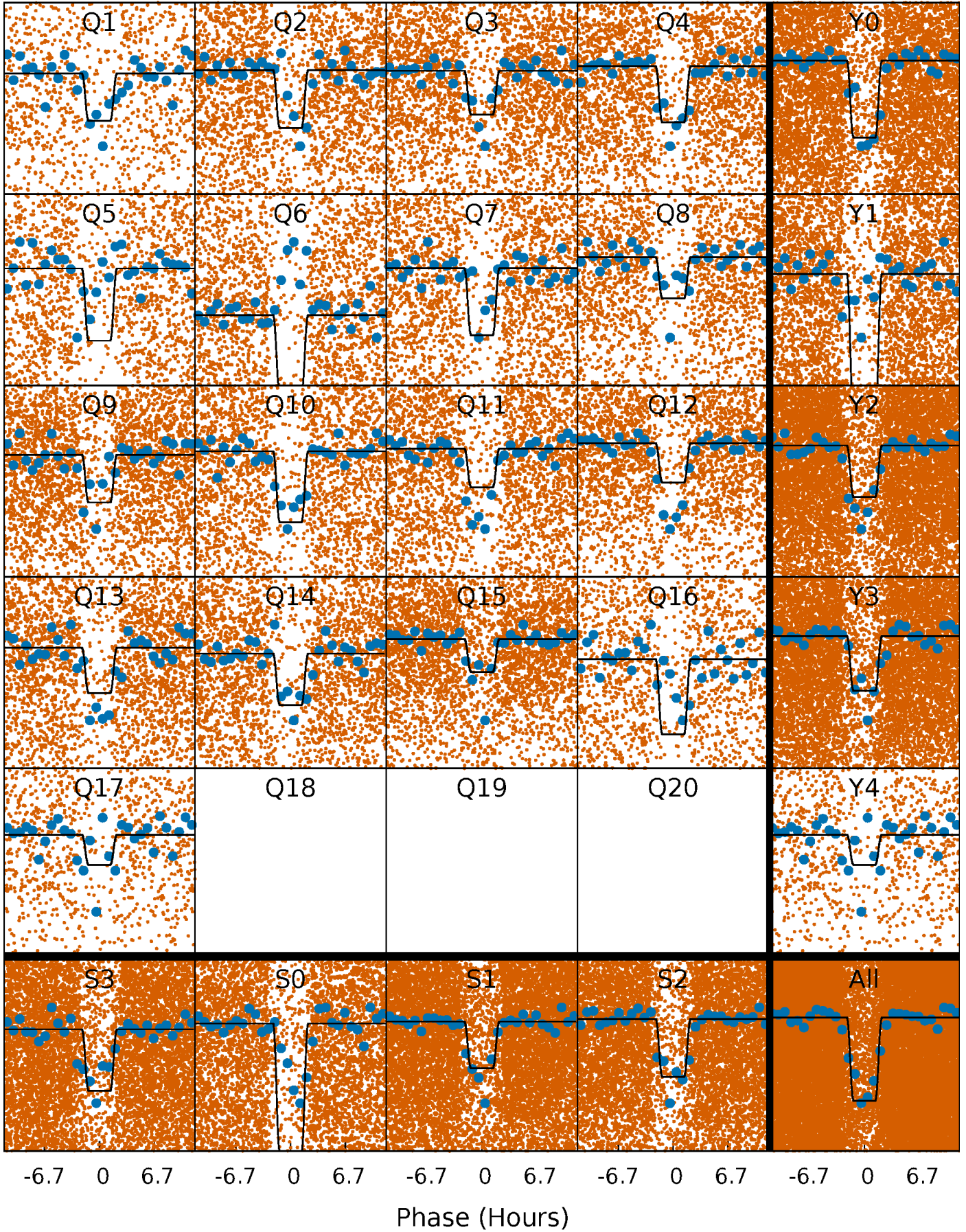
TCE 011186618-01 P= 0.942573 Days  $T_0=131.654324$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

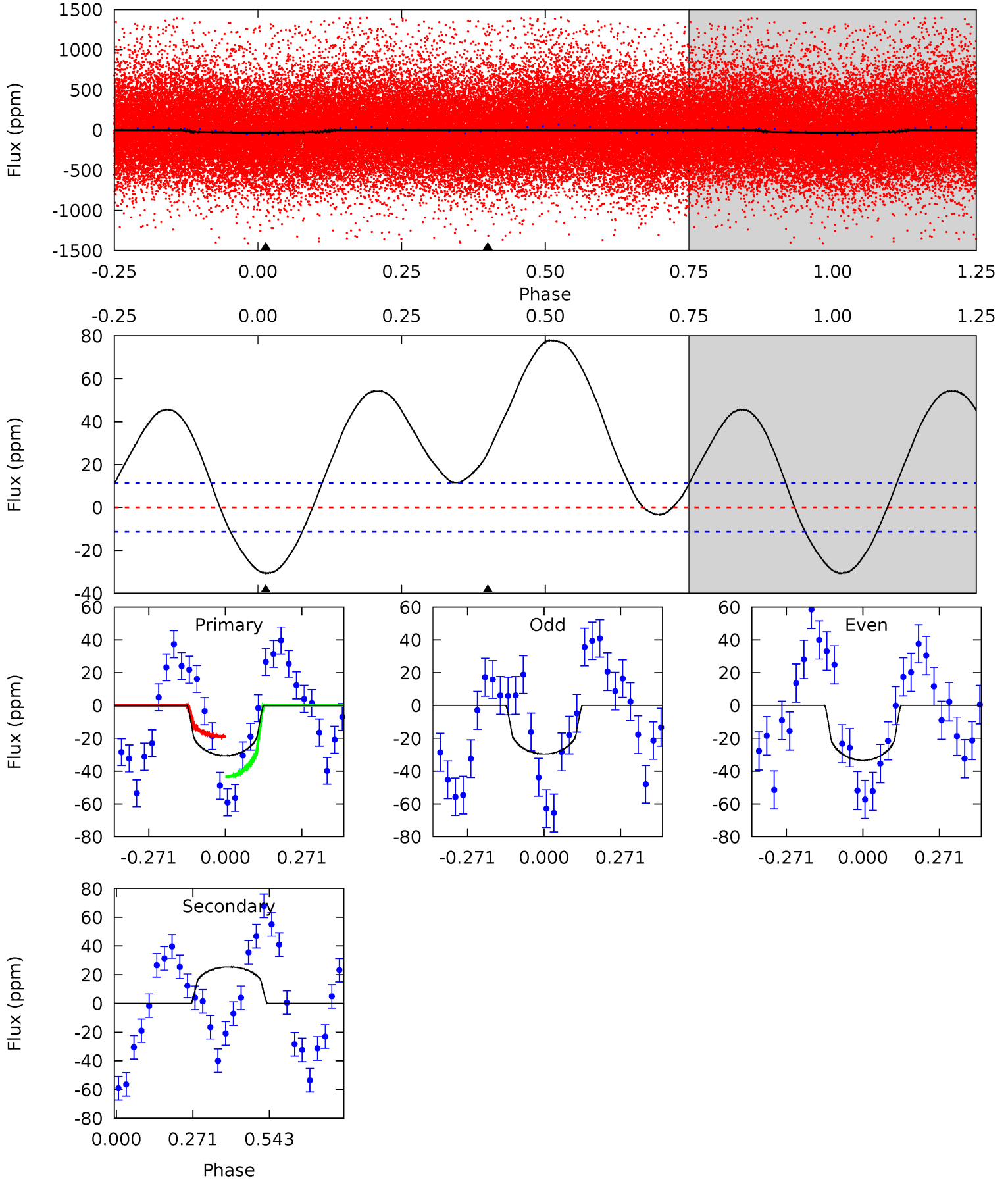
TCE 011186618-01 P= 0.942624 Days  $T_0=131.640591$  (BKJD)



# DV Model-Shift Uniqueness Test

011186618-01, P = 0.942573 Days, E = 130.711751 Days

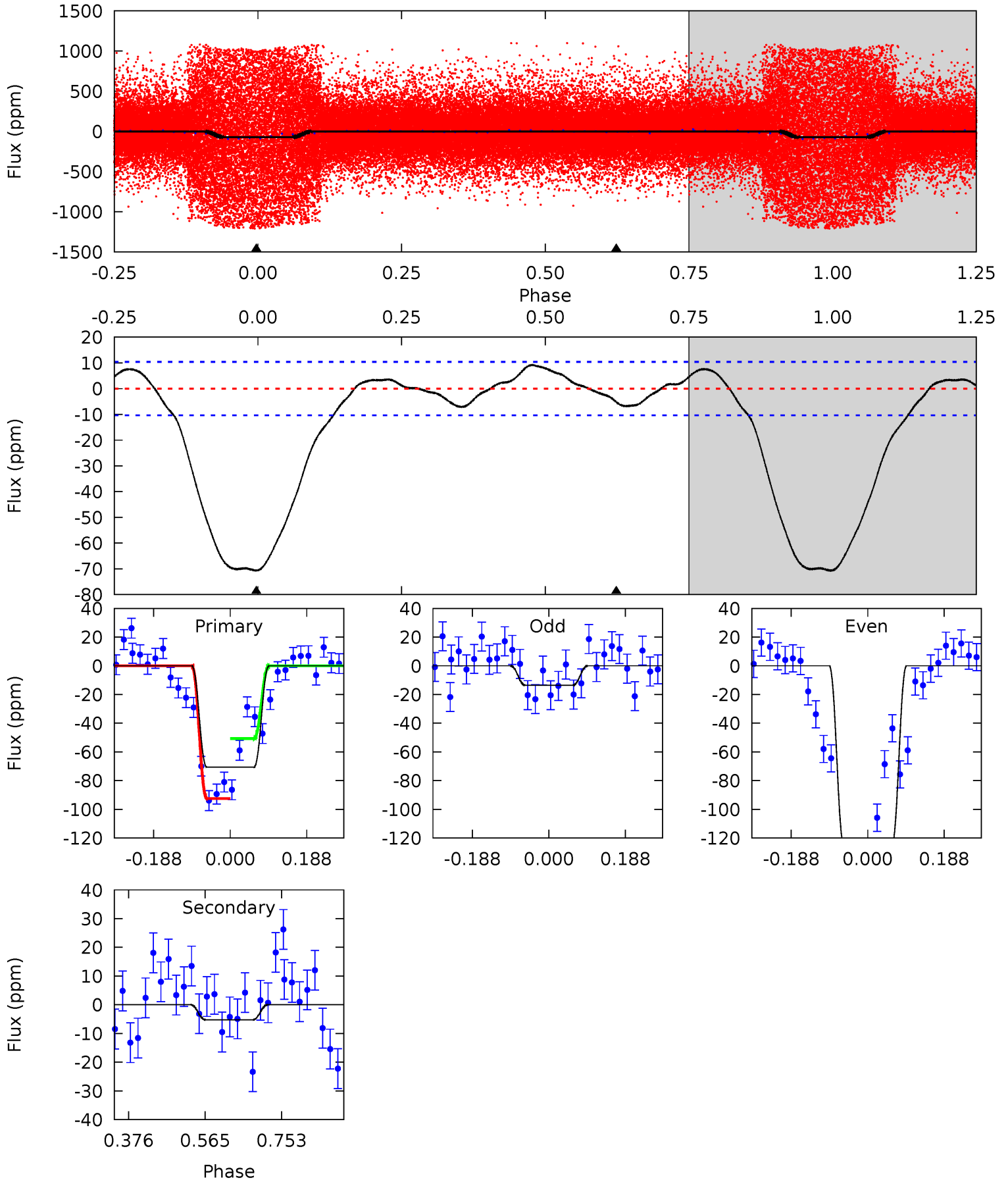
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	-9.75	0	0	4.35	1.10	1.82	11.7	11.7	-9.75	-9.75	0.74	0.61	0.72	4.62



# Alt Model-Shift Uniqueness Test

011186618-01, P = 0.942624 Days, E = 130.697967 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
30.2	2.24	0	0	4.43	1.32	1.41	30.2	30.2	2.24	2.24	24.0	1.30	0.11	0





### Stellar Parameters For KIC 011186618

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4671^{+125}_{-153}$	$4.721^{+0.052}_{-0.024}$	$-1.300^{+0.300}_{-0.350}$	$0.528^{+0.029}_{-0.037}$	$0.534^{+0.036}_{-0.022}$	$5.111^{+1.091}_{-0.505}$
	+3%/-3%	+1%/-1%	+23%/-27%	+5%/-7%	+7%/-4%	+21%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 011186618-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$25 \pm 3$	$0.42^{+0.27}_{-0.25}$	$1683^{+53}_{-62}$	$-4070^{+614}_{-1814}$	$-18.962^{+12.320}_{-92.991}$
Alt.	$-5 \pm 2$	$0.60^{+0.30}_{-0.28}$	$1682^{+53}_{-66}$	$2766^{+650}_{-451}$	$1.875^{+5.046}_{-1.209}$

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

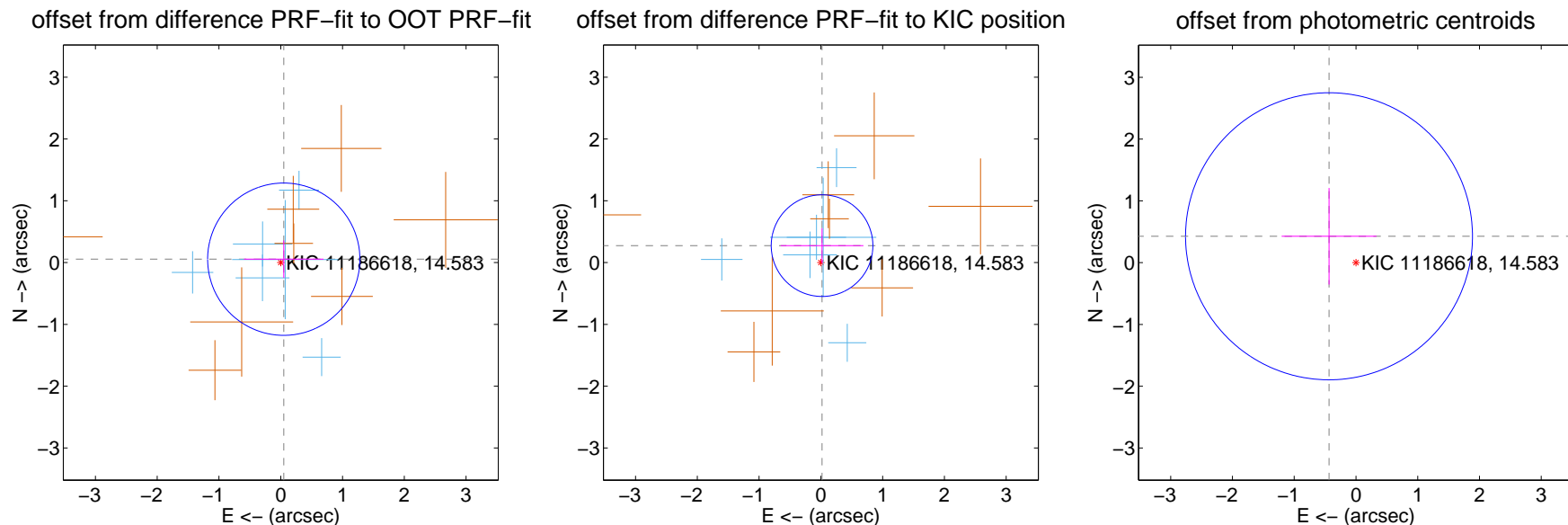
## DV Centroid Data

Supplemental centroid analysis for 011186618-01. Kepler magnitude: 14.58. Transit SNR 6.85

There are 6 quarters with good PRF difference image offsets

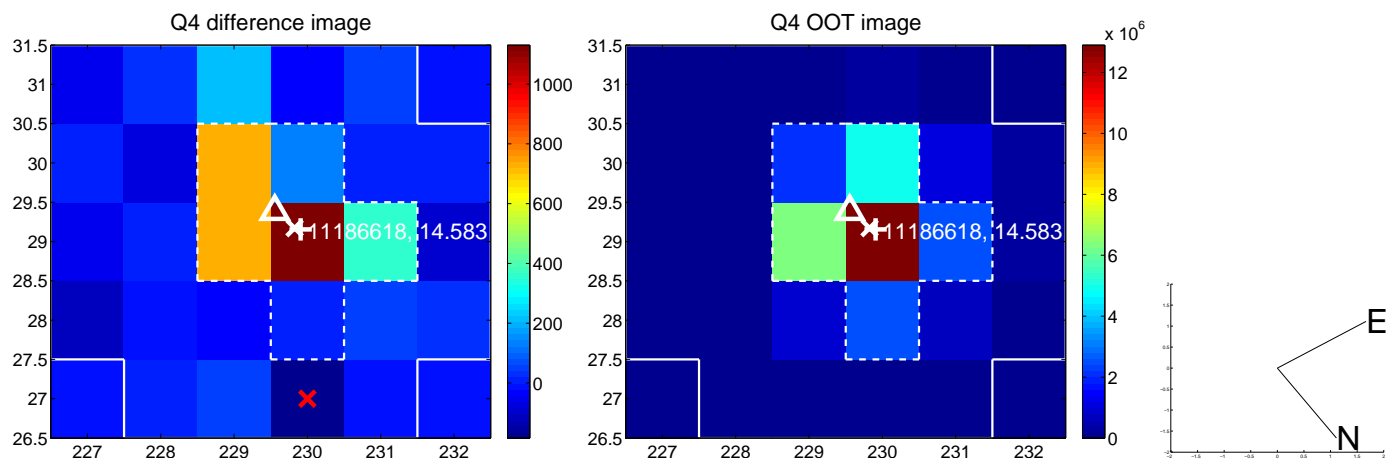
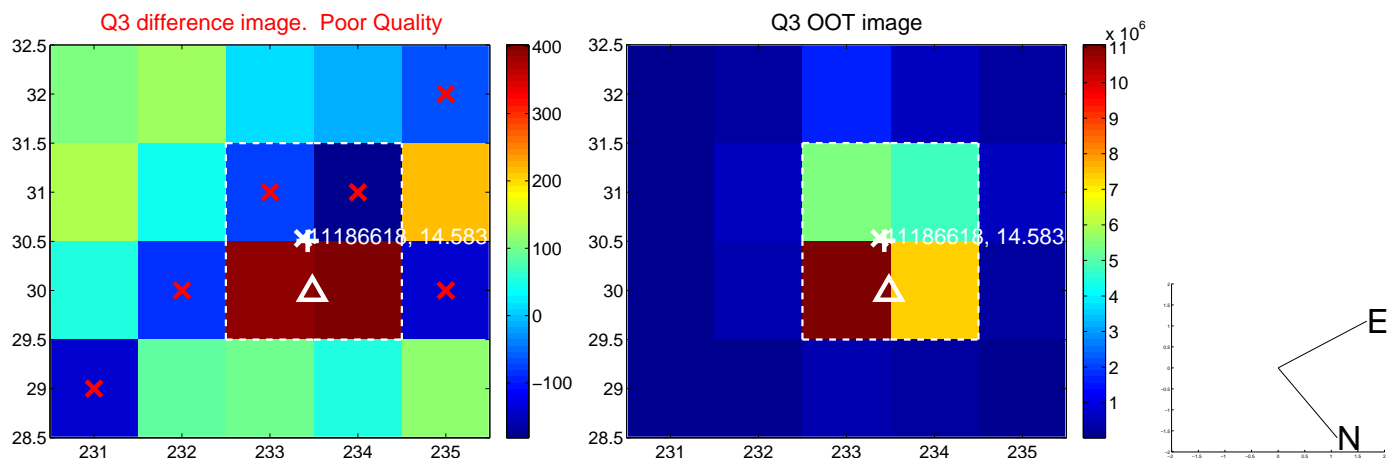
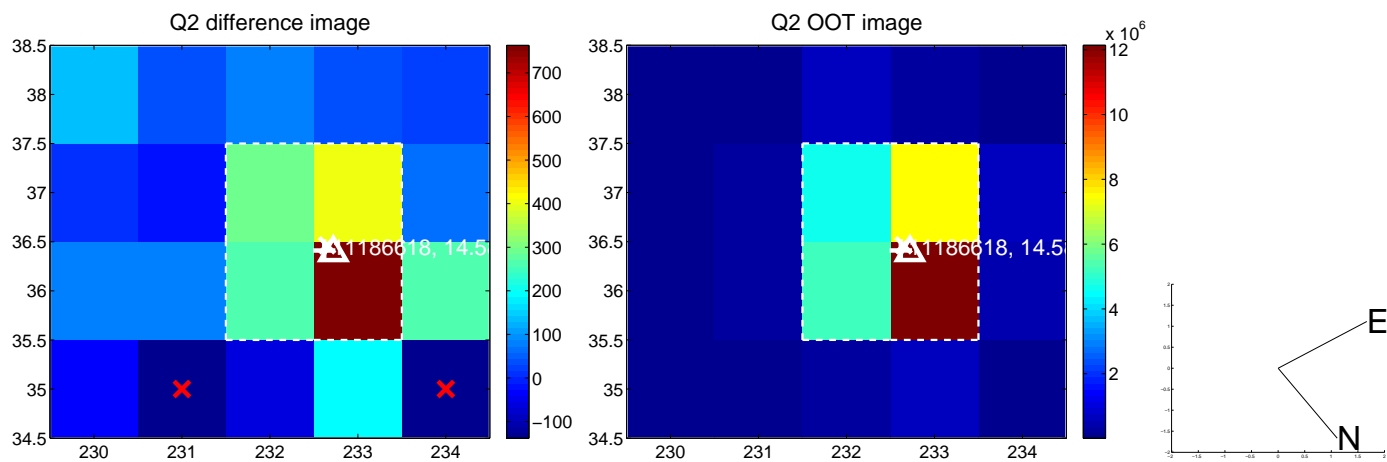
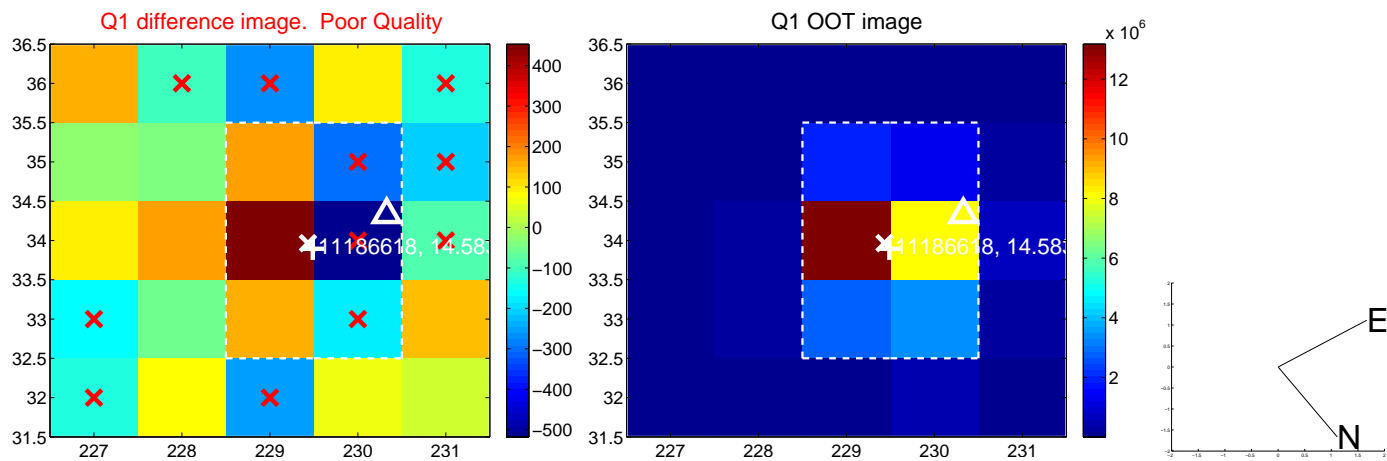
The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.074 \pm 0.411$	0.18	$-0.049 \pm 0.644$	$0.055 \pm 0.302$
PRF-fit source offset from KIC position	$0.275 \pm 0.274$	1.00	$-0.019 \pm 0.670$	$0.275 \pm 0.281$
photometric centroid source offset	$0.61 \pm 0.77$	0.79	$0.44 \pm 0.77$	$0.43 \pm 0.78$

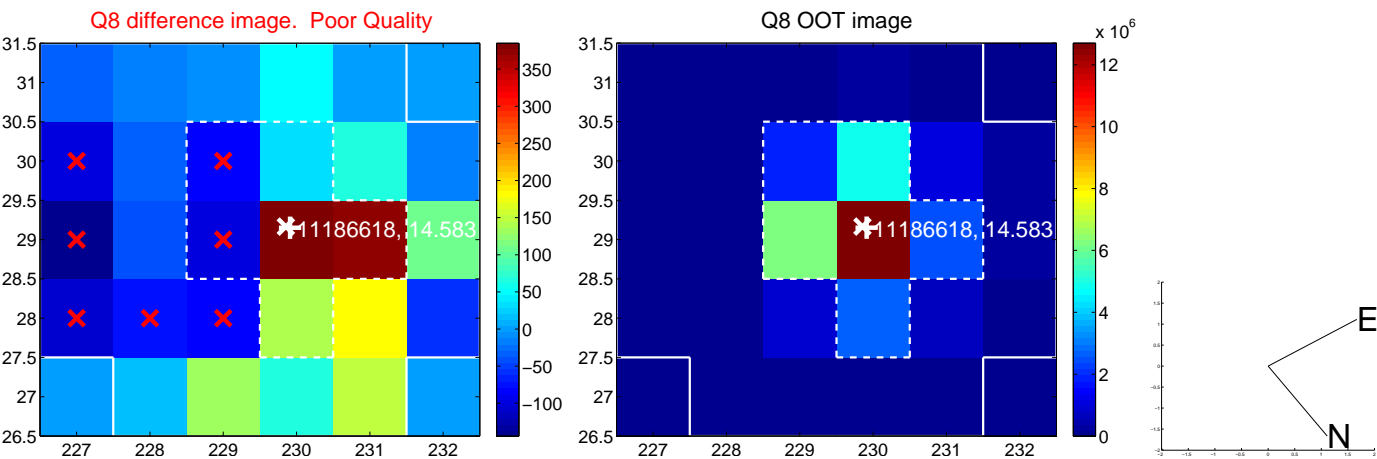
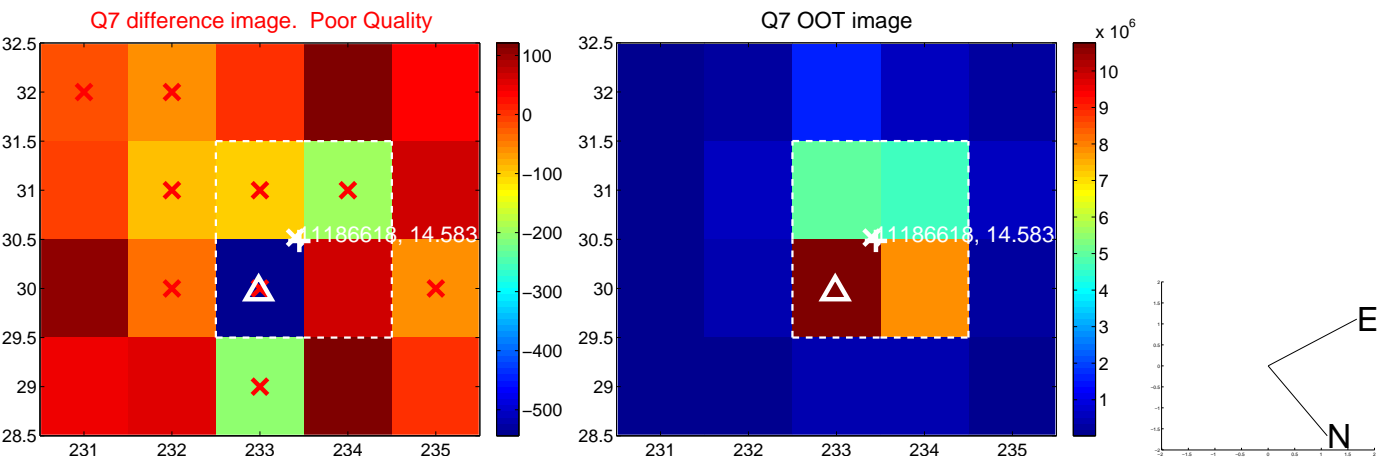
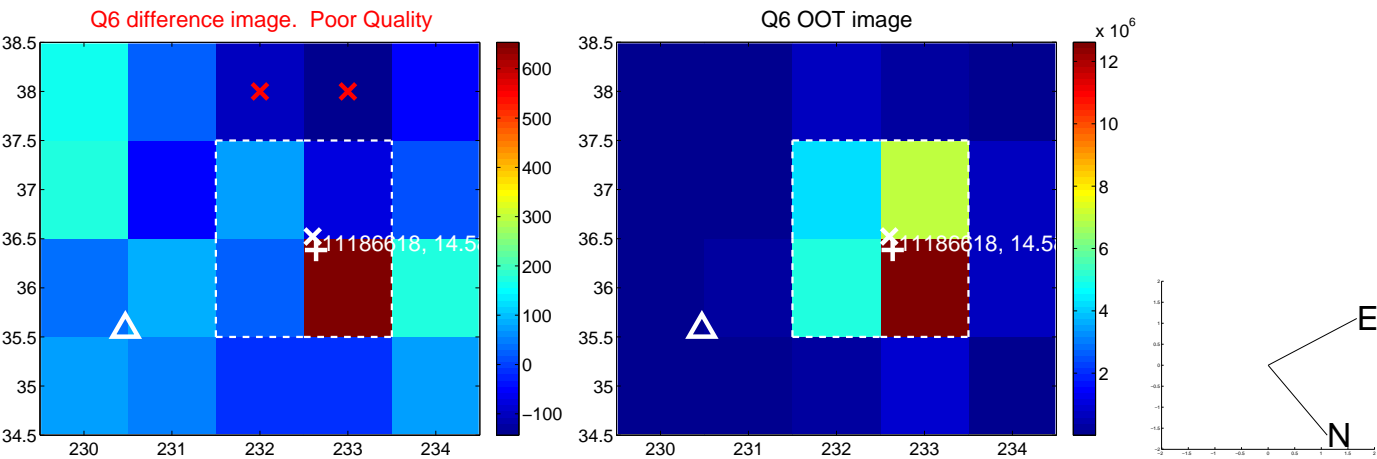
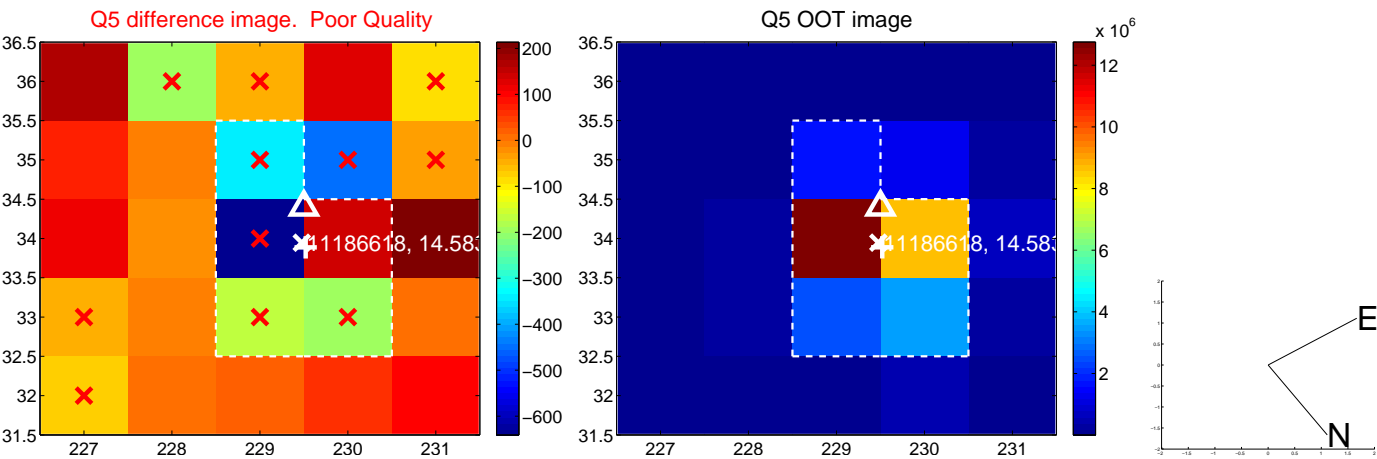


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

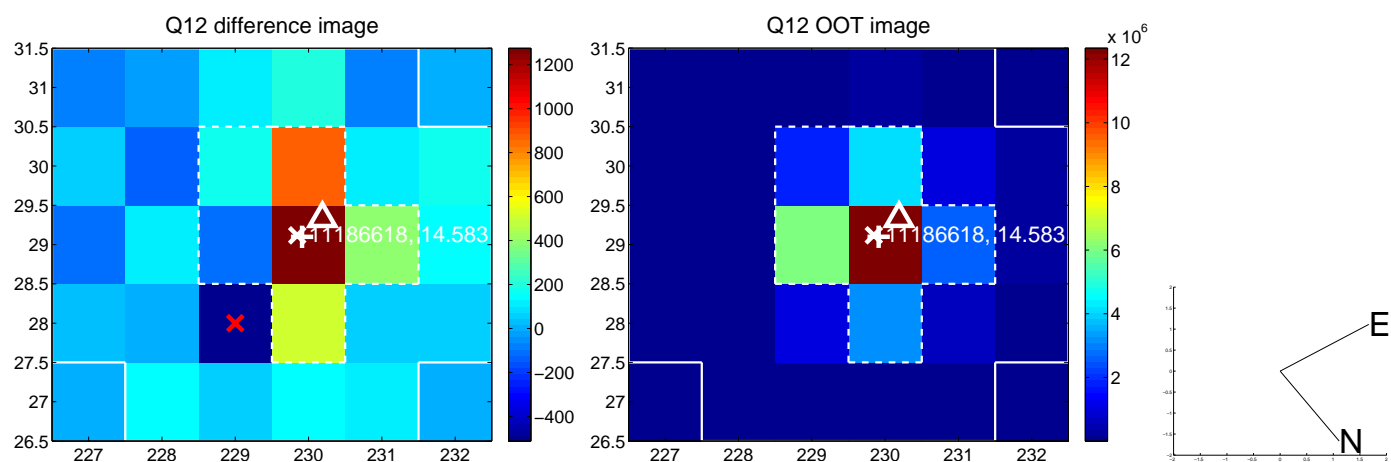
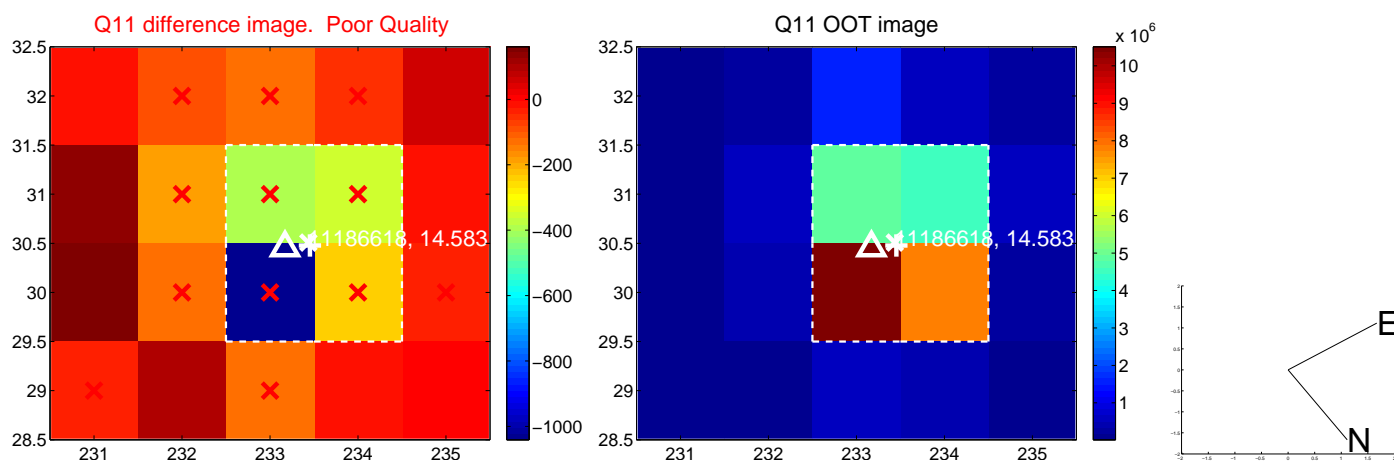
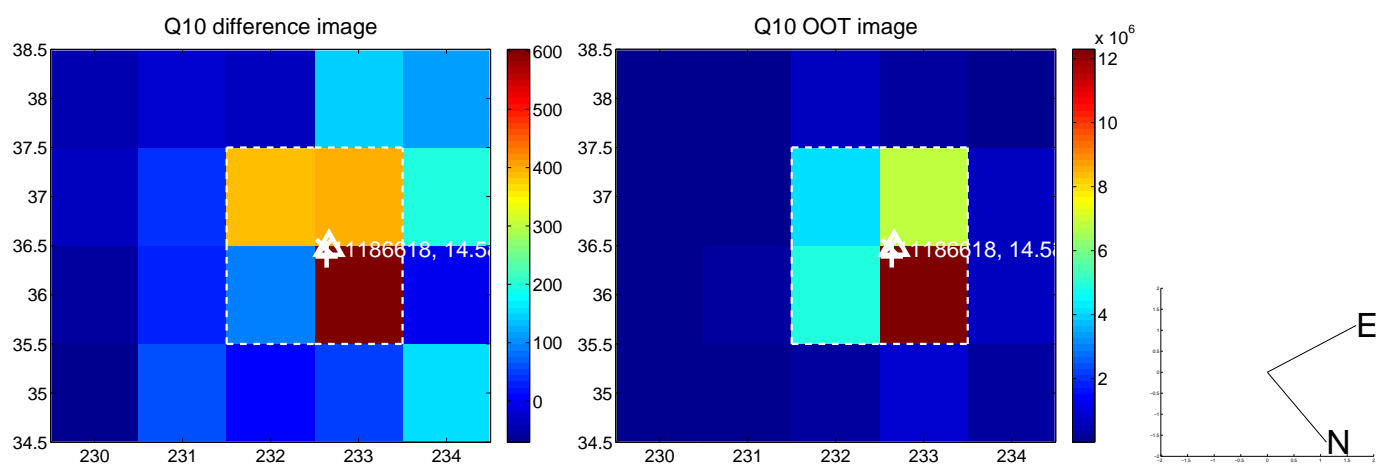
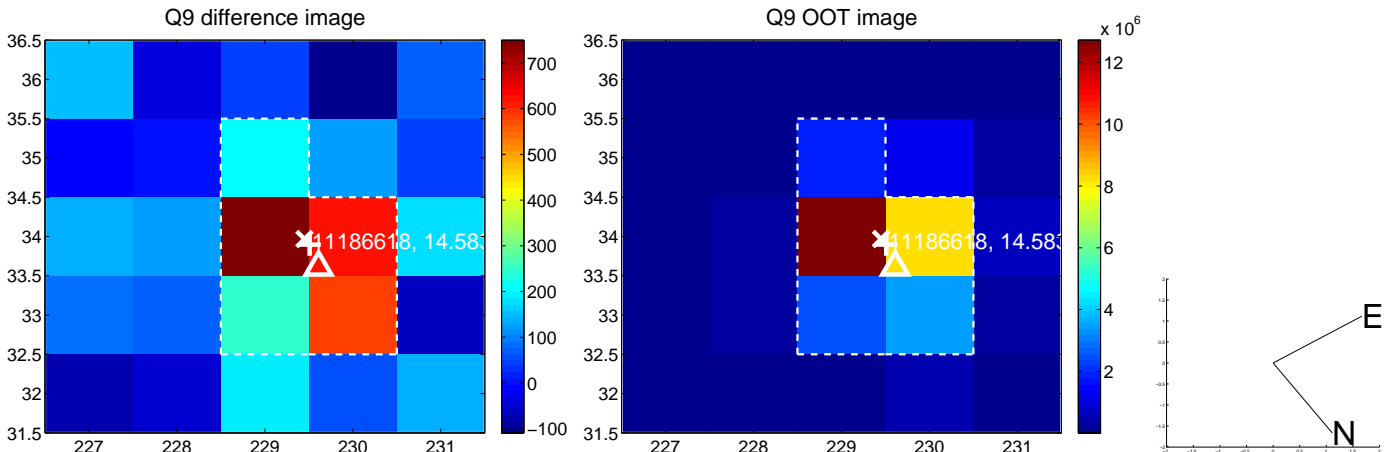


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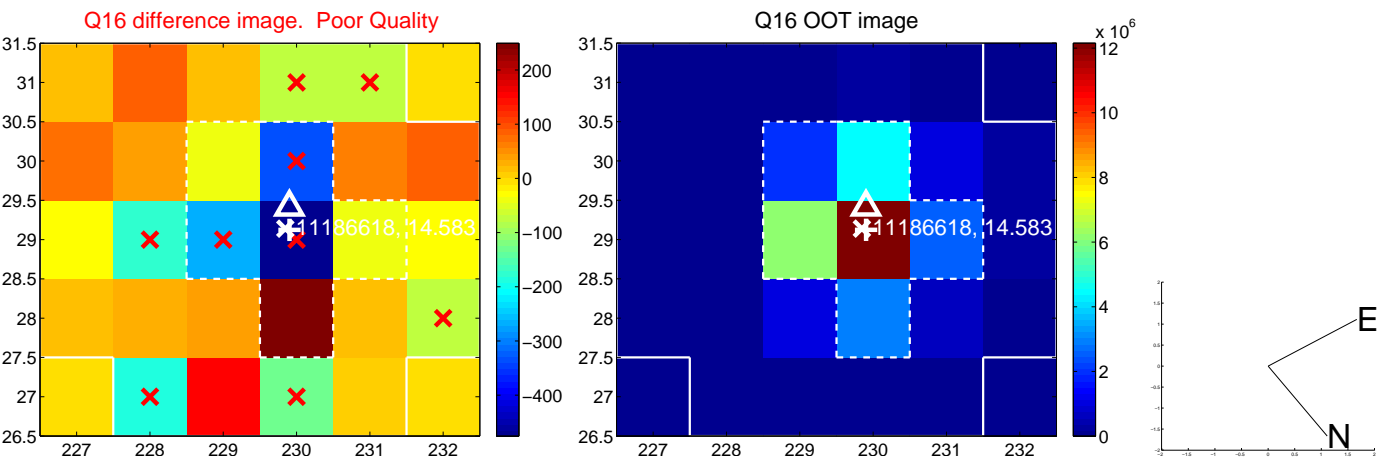
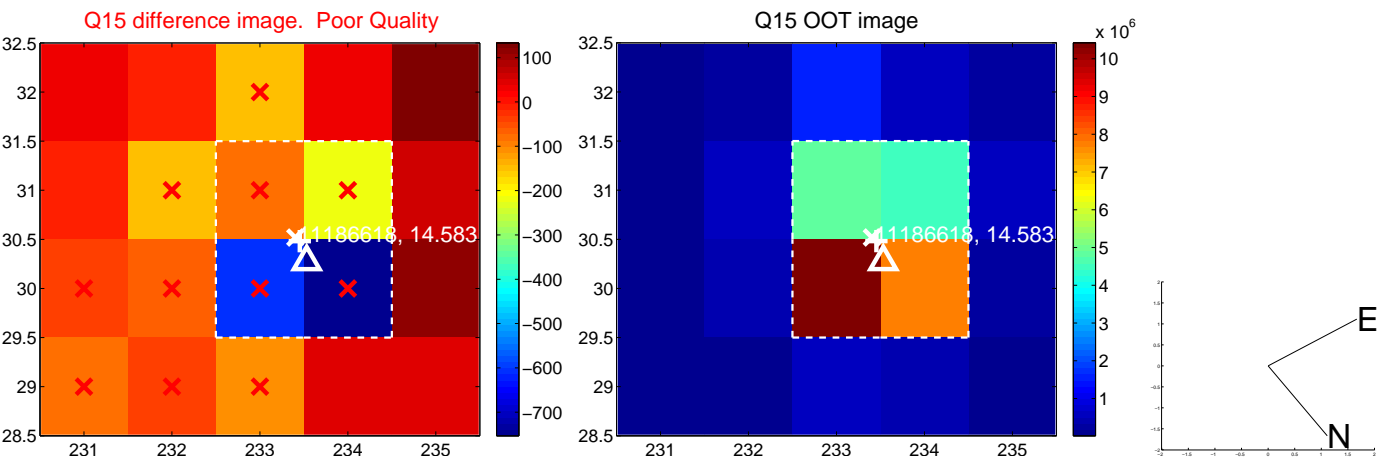
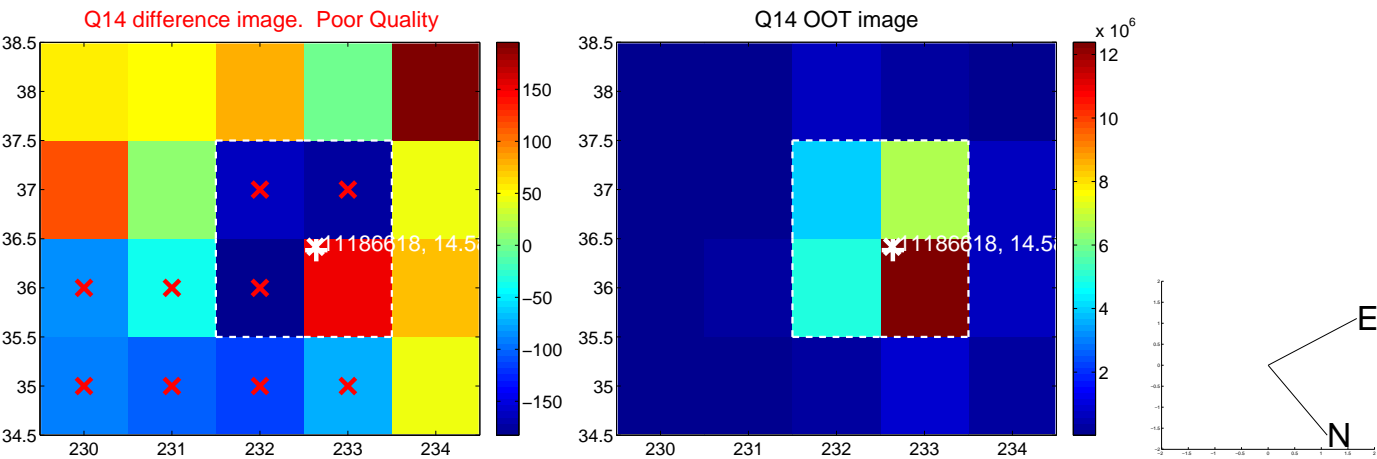
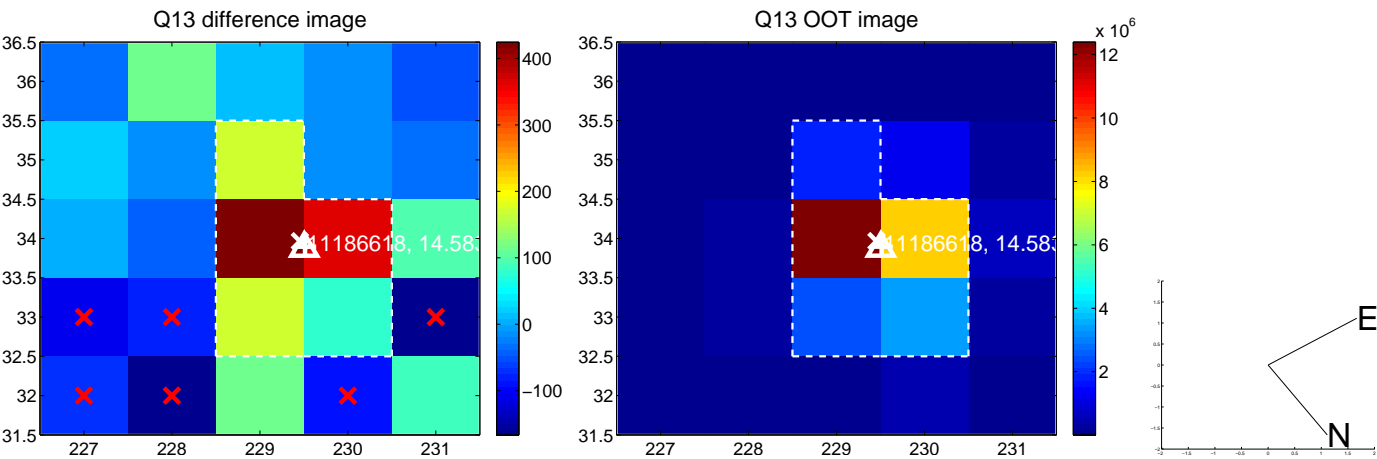




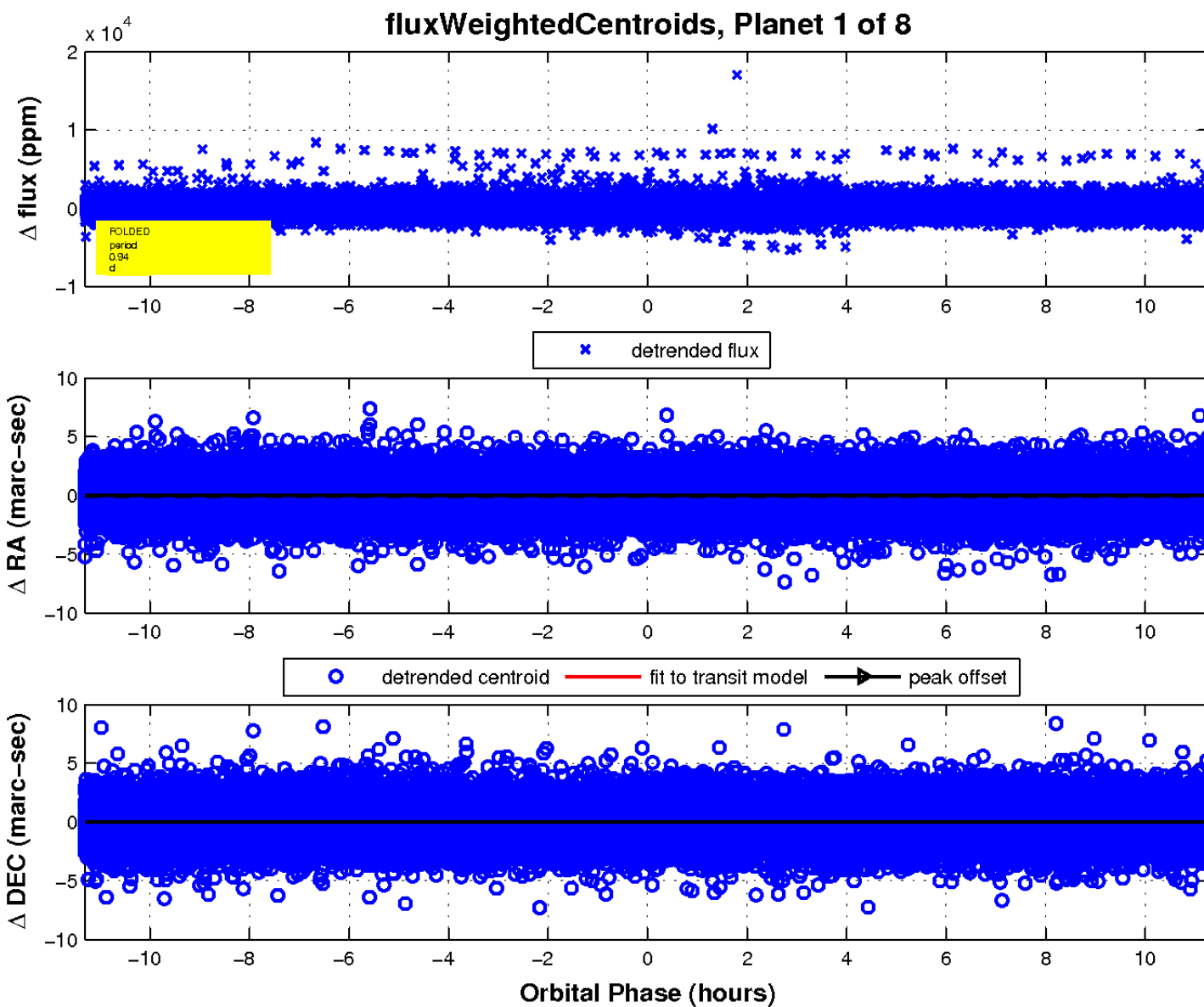
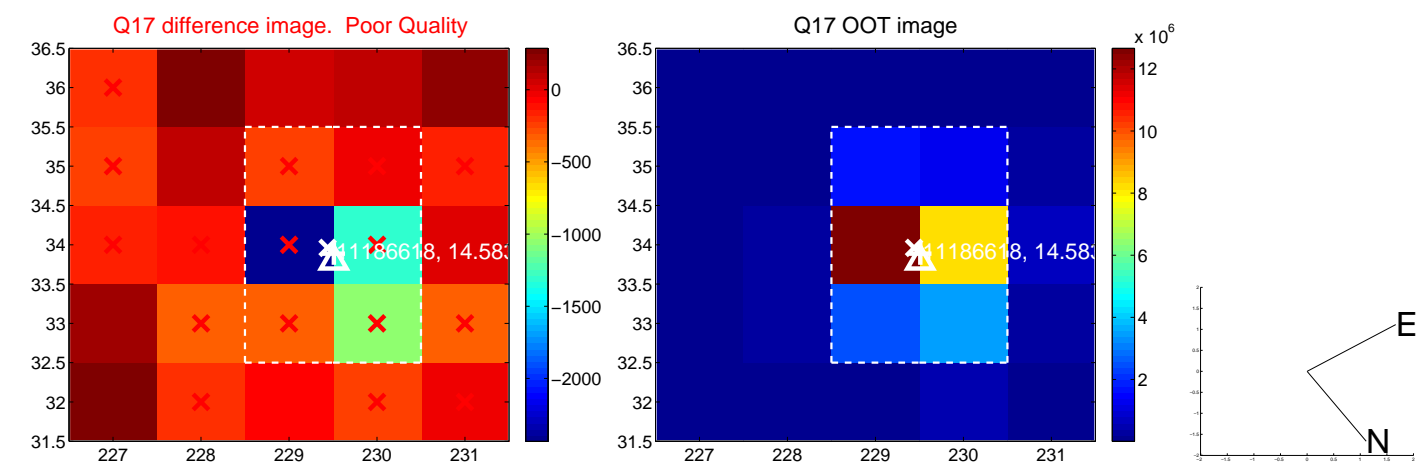
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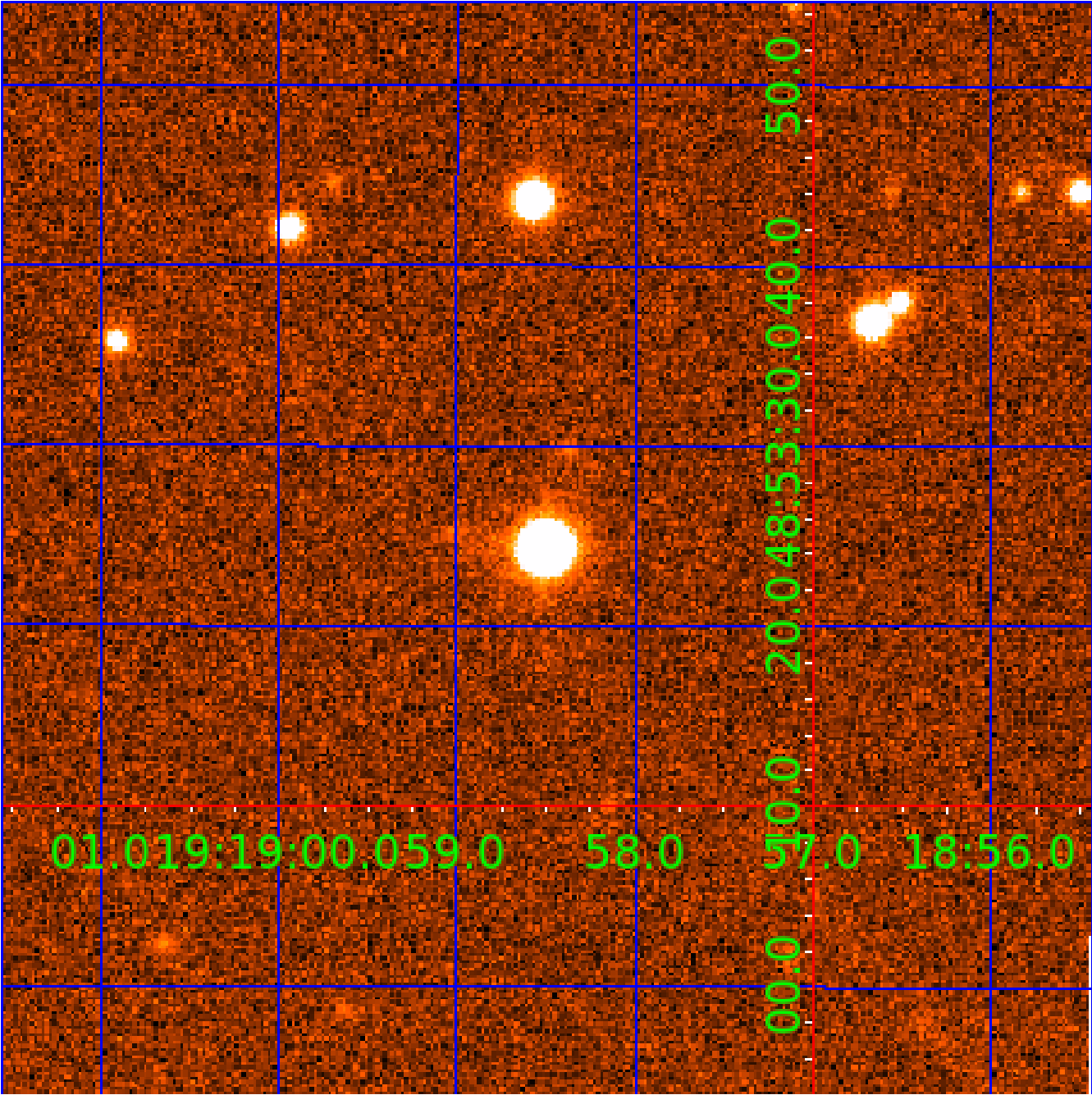


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UKIRT Image

Declination





# KIC 011186618

## Q1-17 DR25 TCE Parameters

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TCE	Run Type	Disp	Score	N	S	C	E	Comments
011186618-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
011186618-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_MEAS
011186618-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
011186618-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

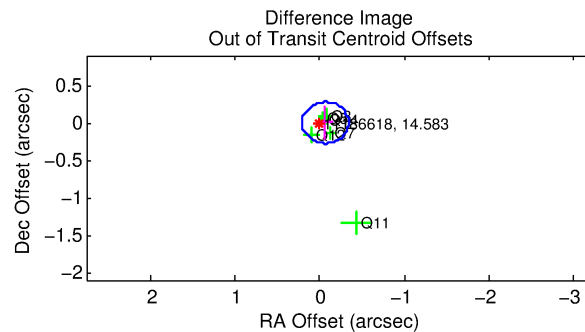
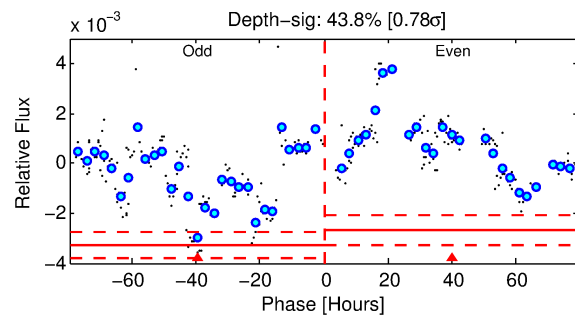
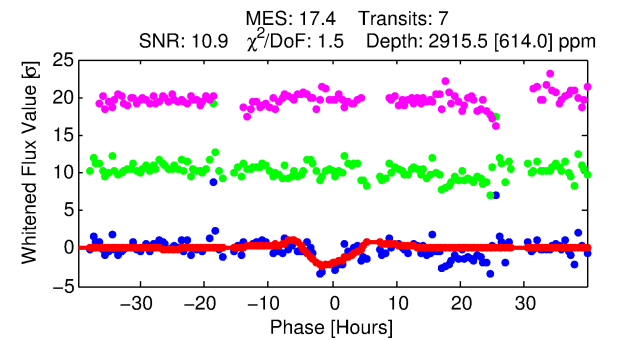
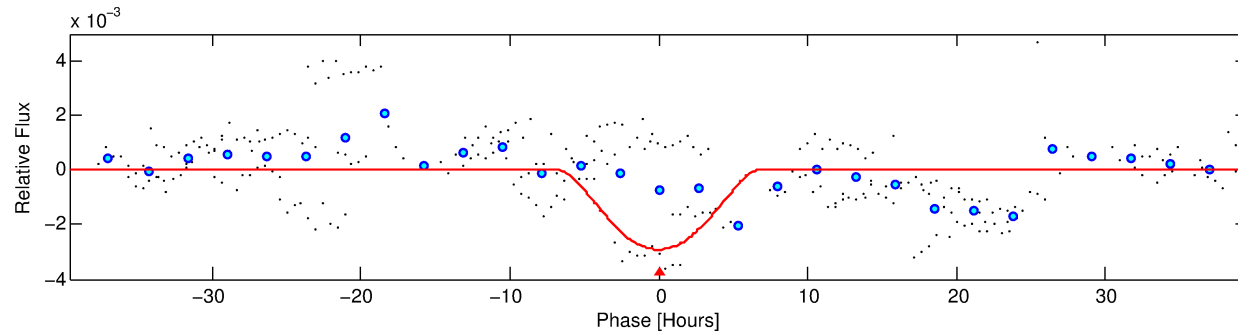
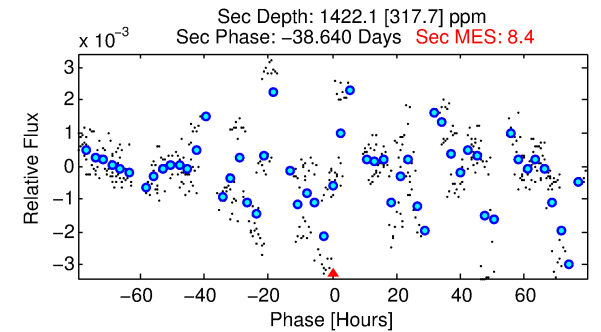
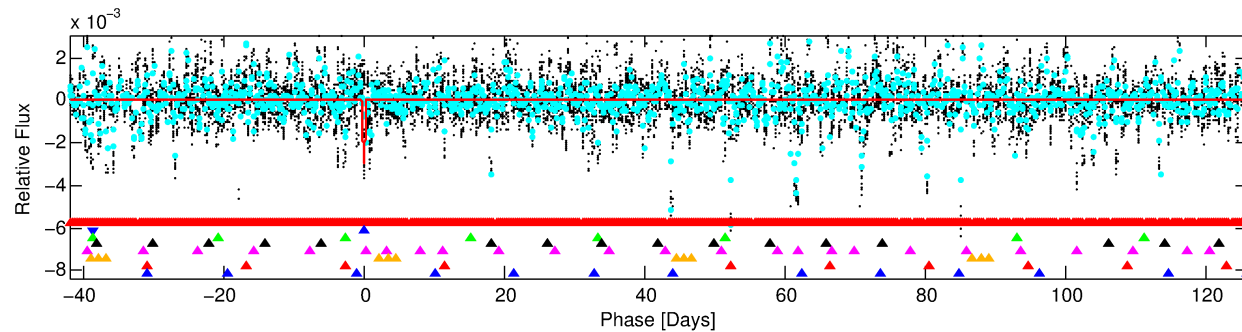
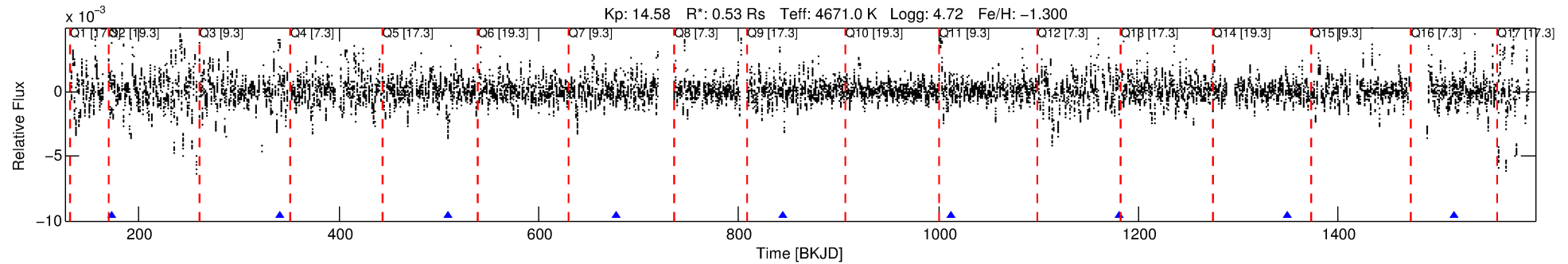
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011186618-02

No Significant Match Found

# DV One-Page Summary

KIC: 11186618 Candidate: 2 of 8 Period: 167.861 d



## DV Fit Results:

Period = 167.86077 [0.00971] d  
Epoch = 173.4650 [0.0278] BKJD  
Rp/R\* = 0.0946 [0.2017]  
a/R\* = 43.39 [18.52]  
b = 1.00 [0.29]  
Seff = 0.51 [0.08]  
Teq = 215 [9] K  
Rp = 5.45 [11.63] Re  
a = 0.4835 [0.0297] AU  
Ag = 6150.90 [26262.32] [0.23σ]  
Teffp = 2948 [3148] K [0.87σ]

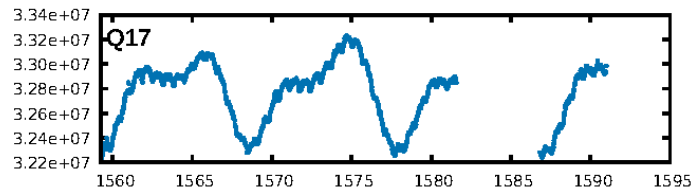
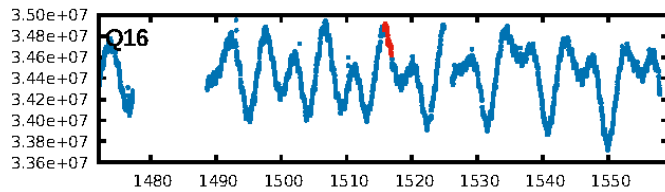
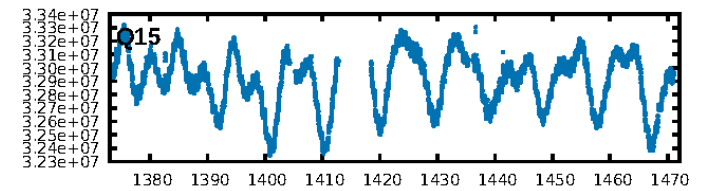
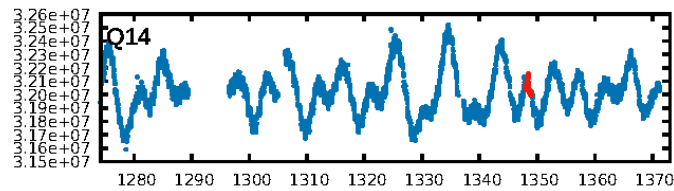
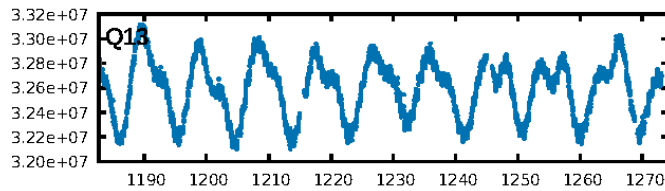
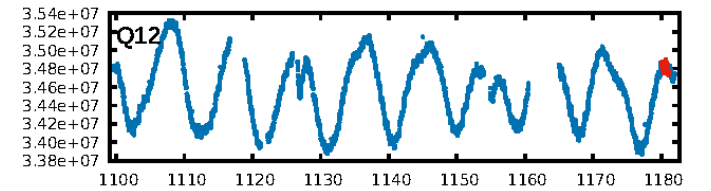
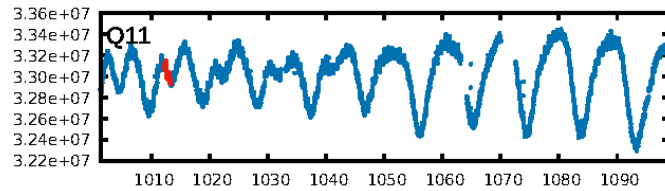
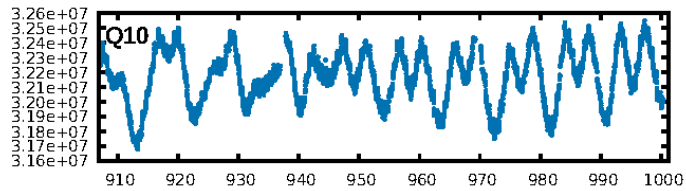
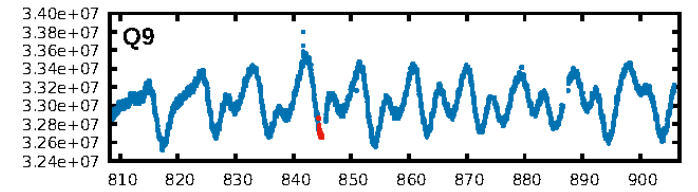
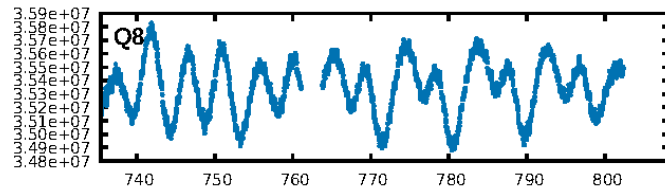
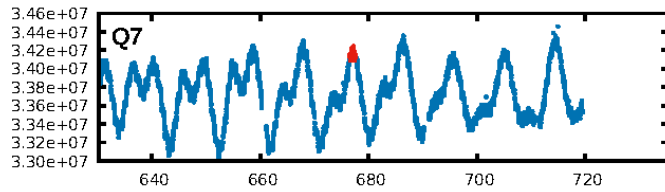
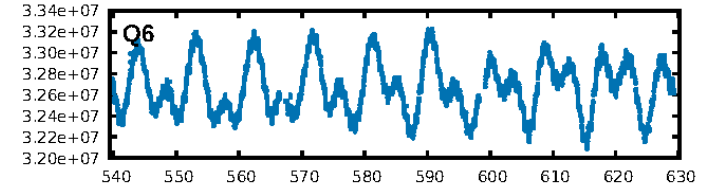
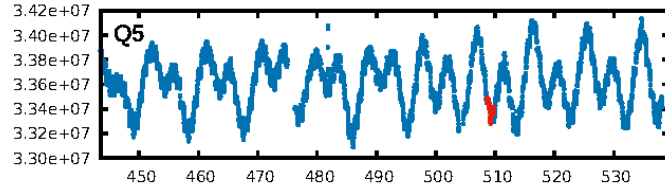
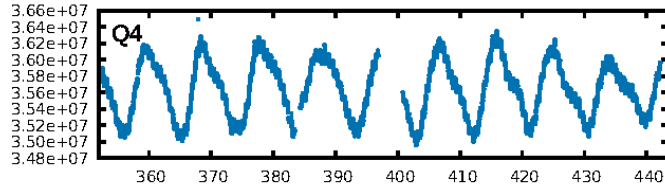
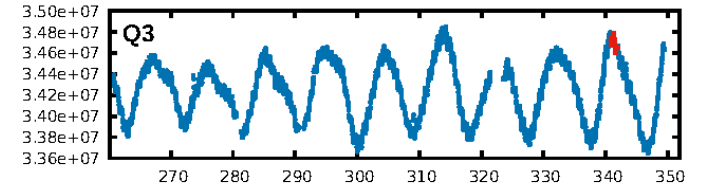
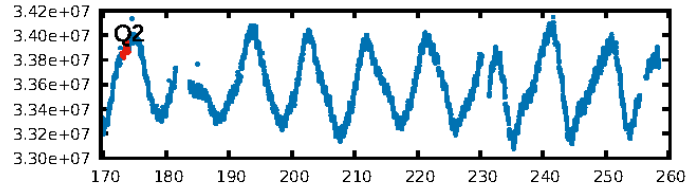
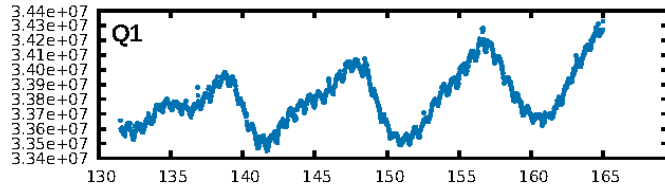
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [23.24σ]  
LongPeriod-sig: 100.0% [25.75σ]  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
**GhostDiagnostic-chr: 9.813**  
Centroid-sig: 17.3%  
Centroid-so: 0.344 arcsec [2.77σ]  
OotOffset-rm: 0.067 arcsec [0.73σ]  
KicOffset-rm: 0.174 arcsec [0.71σ]  
OotOffset-st: 1/3/1/1 [6]  
KicOffset-st: 1/3/1/1 [6]  
DiffImageQuality-fgm: 0.33 [2/6]  
DiffImageOverlap-fno: 0.00 [0/7]

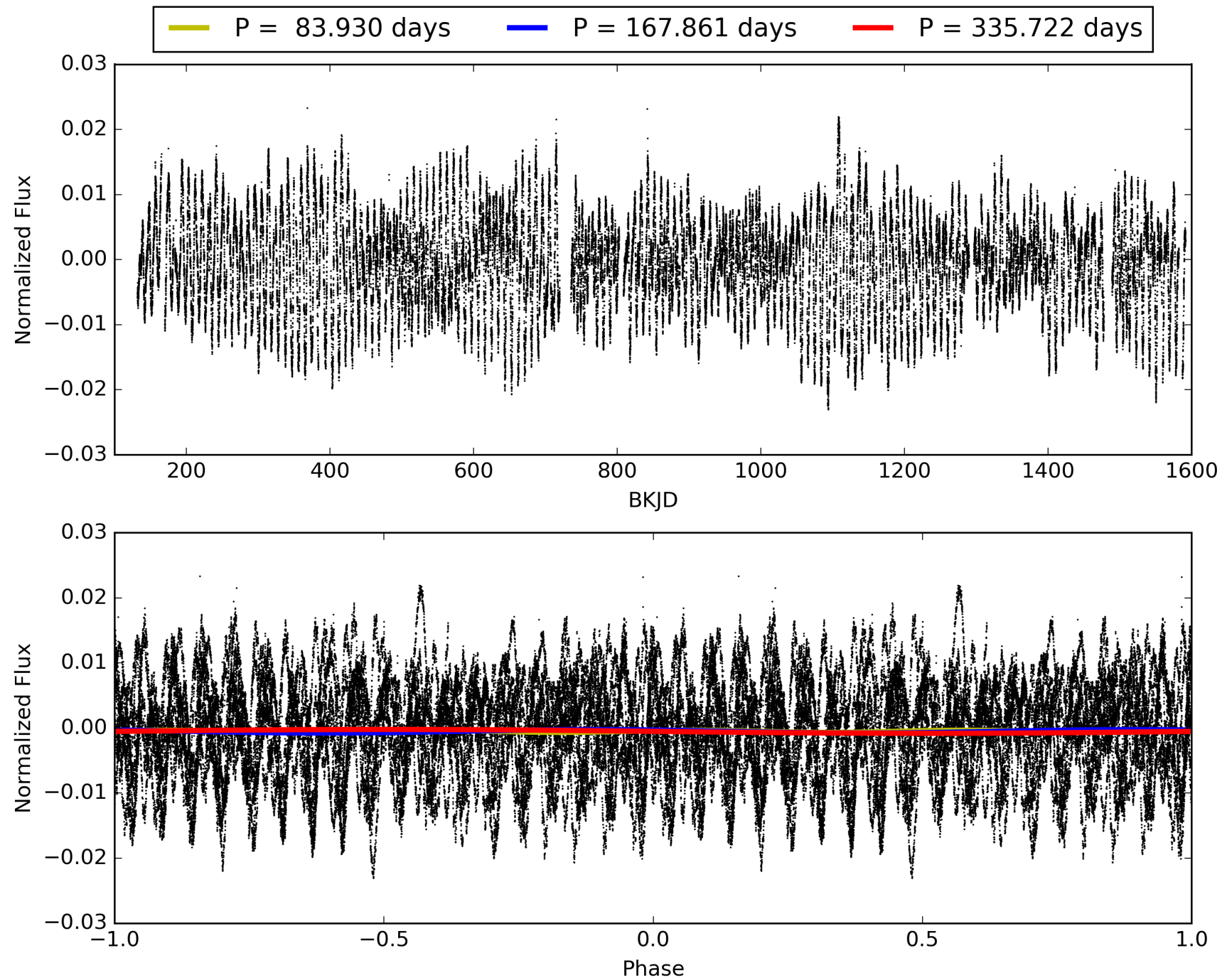
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:28:23 Z

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

# TCE 011186618-02, PDC Light Curves

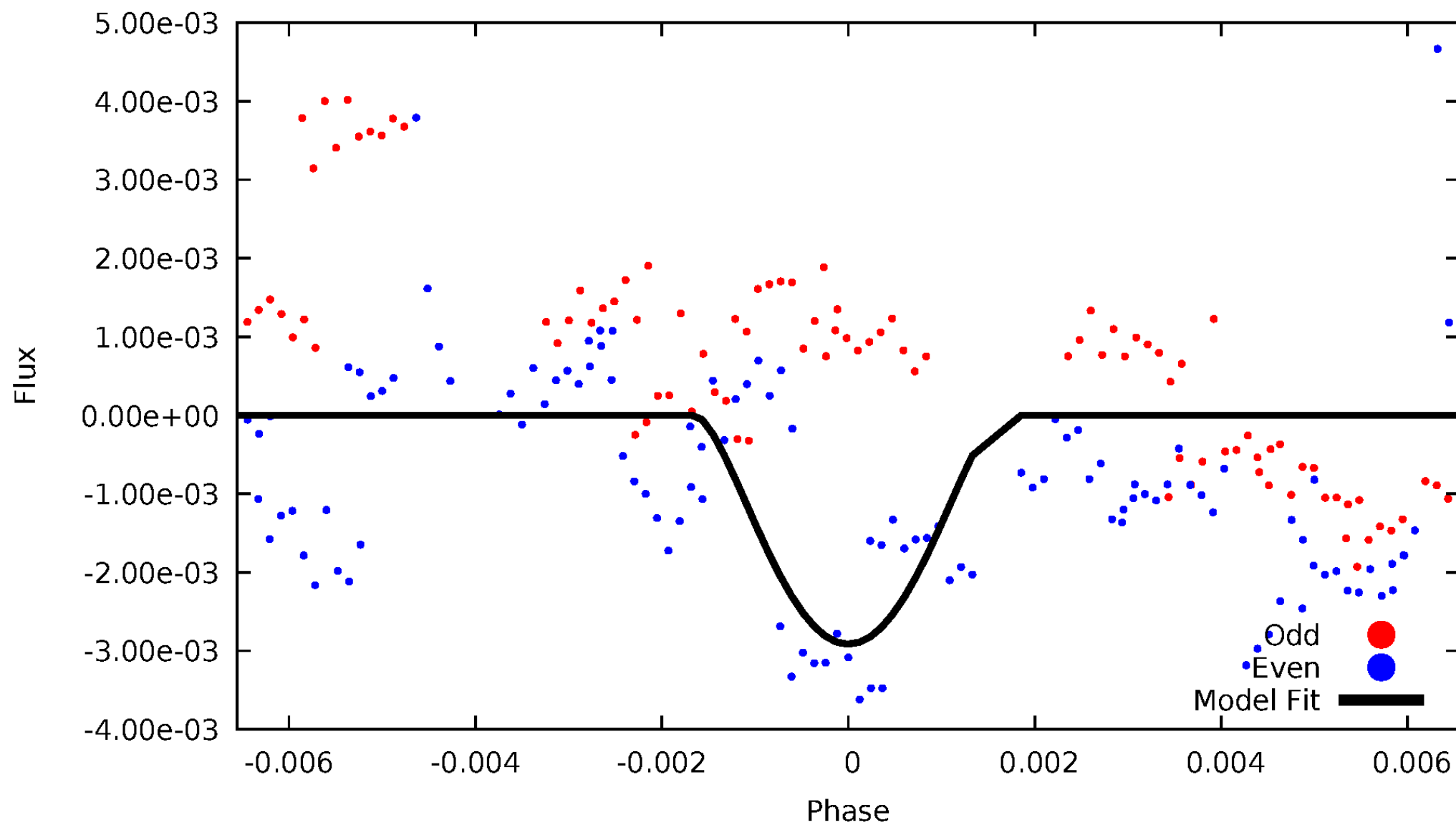


# TCE 011186618-02



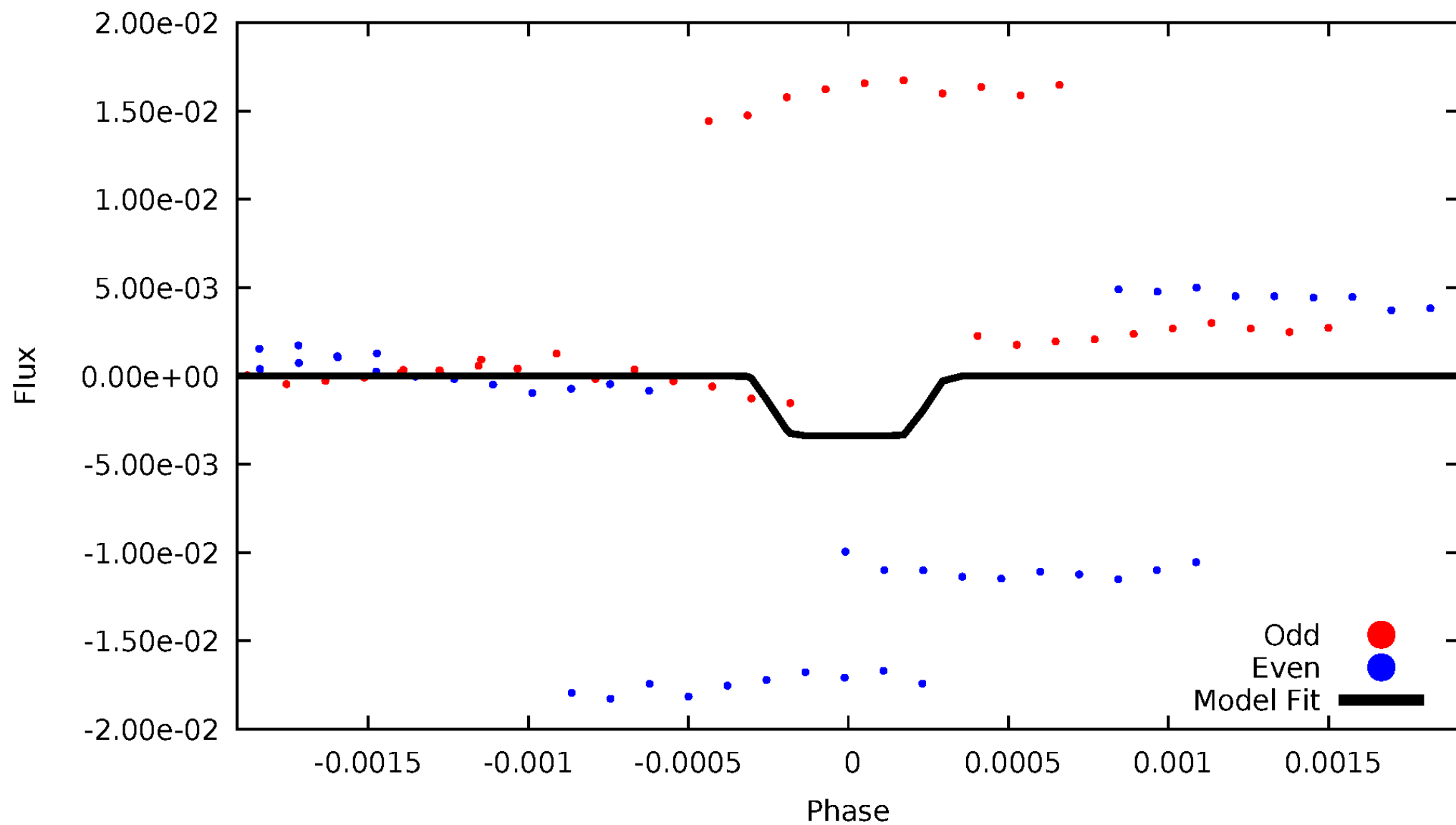
# DV Odd/Even

TCE 011186618-02



# ALT Odd/Even

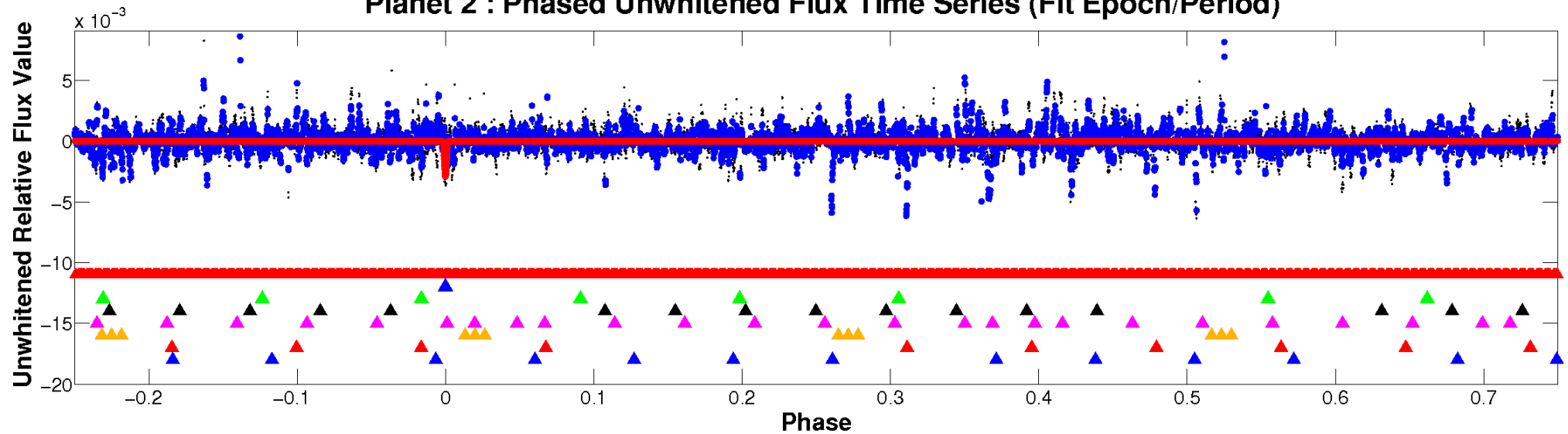
TCE 011186618-02



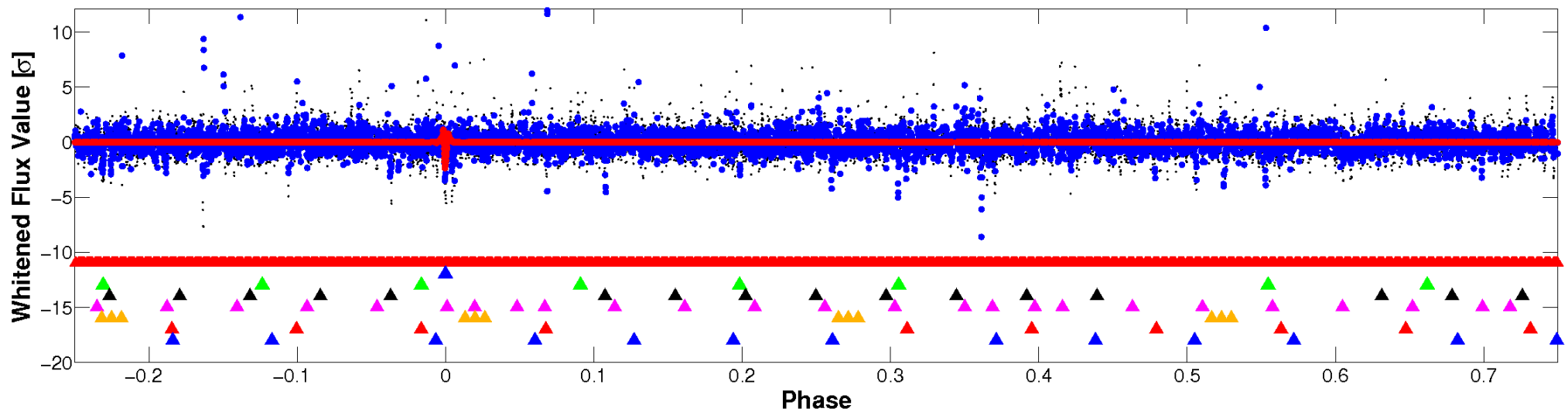


# Non-Whitened Vs. Whitened Light Curve

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

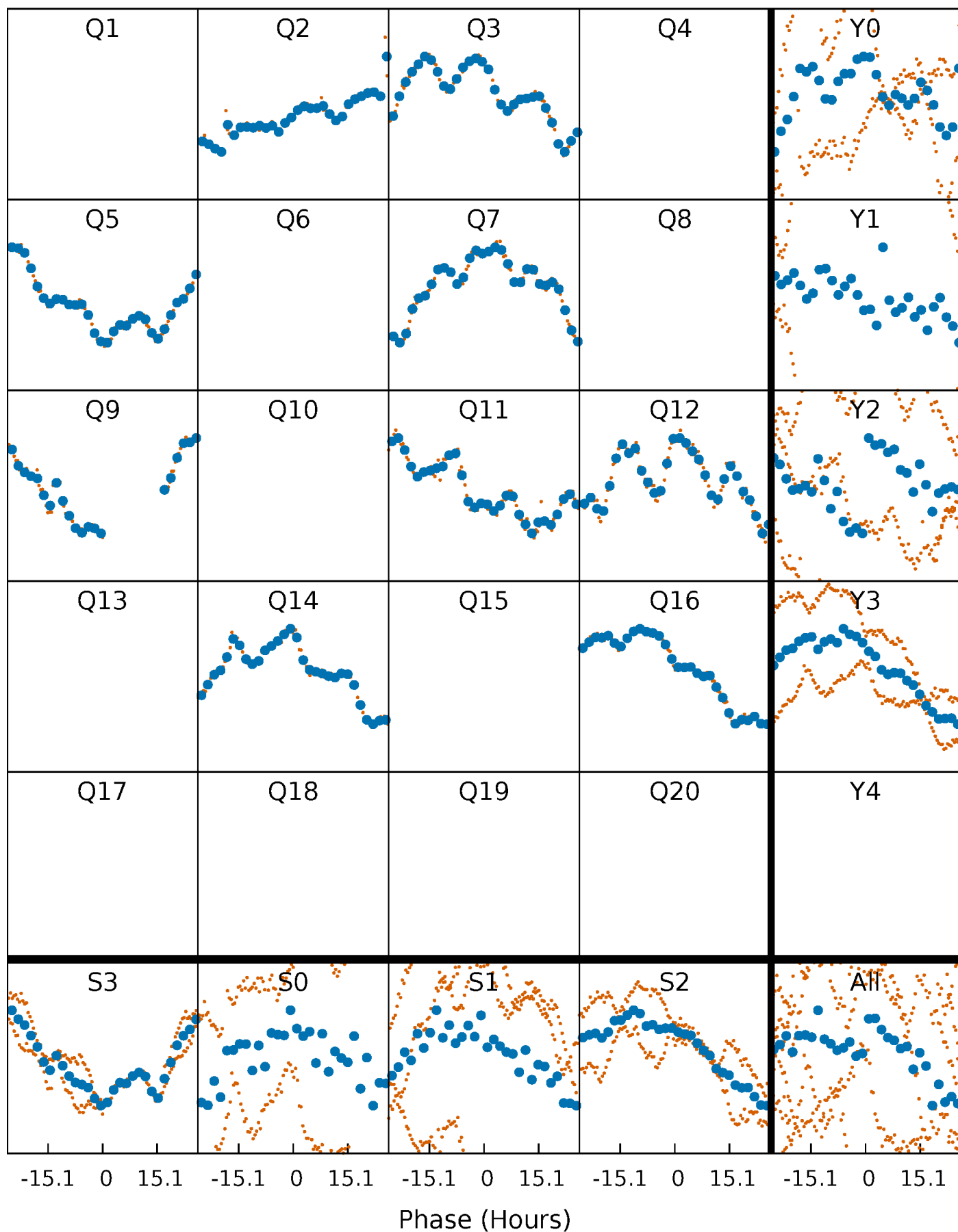


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



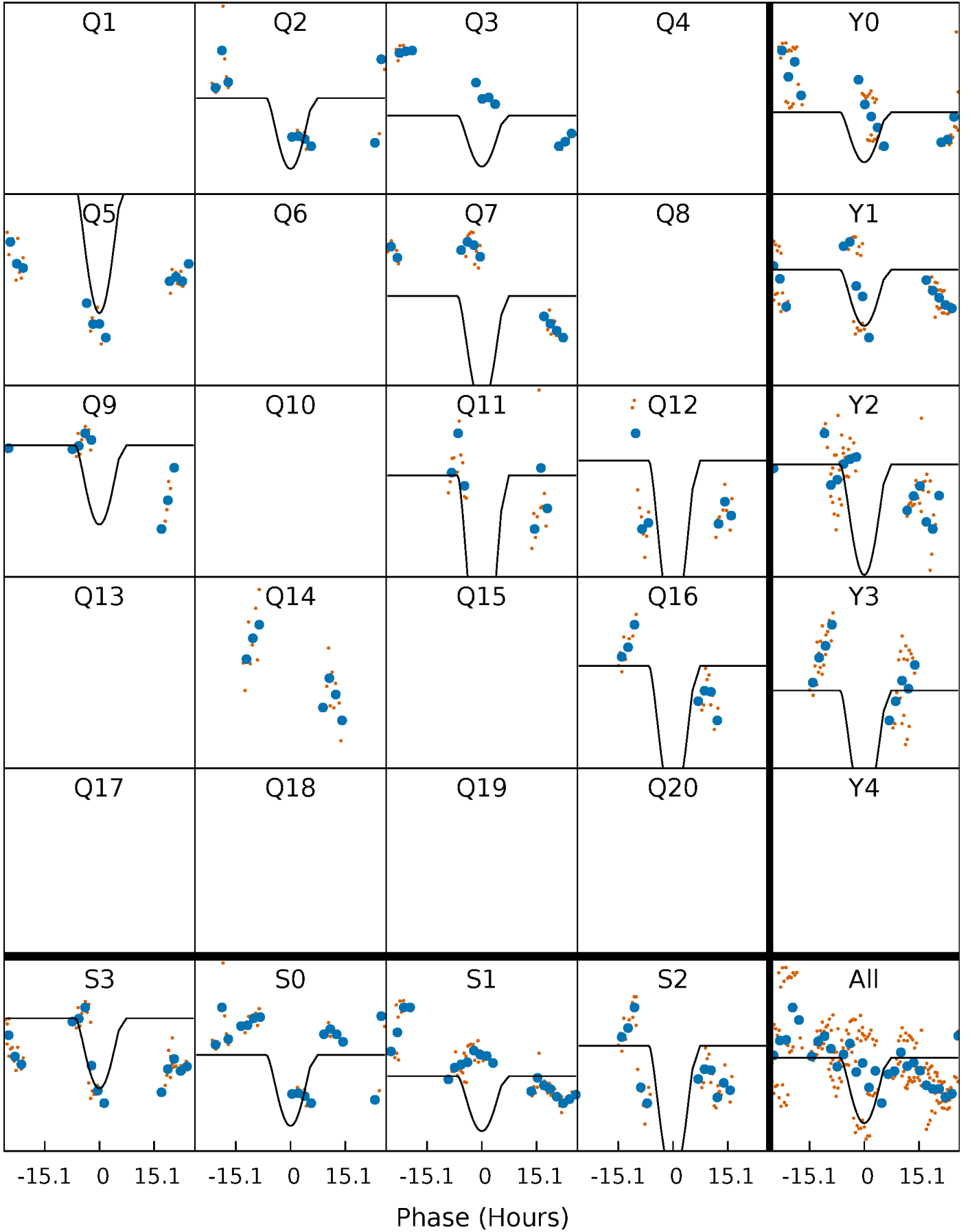
# PDC Quarter-Phased Transit Curves

TCE 011186618-02 P=167.860775 Days  $T_0=173.465028$  (BKJD)



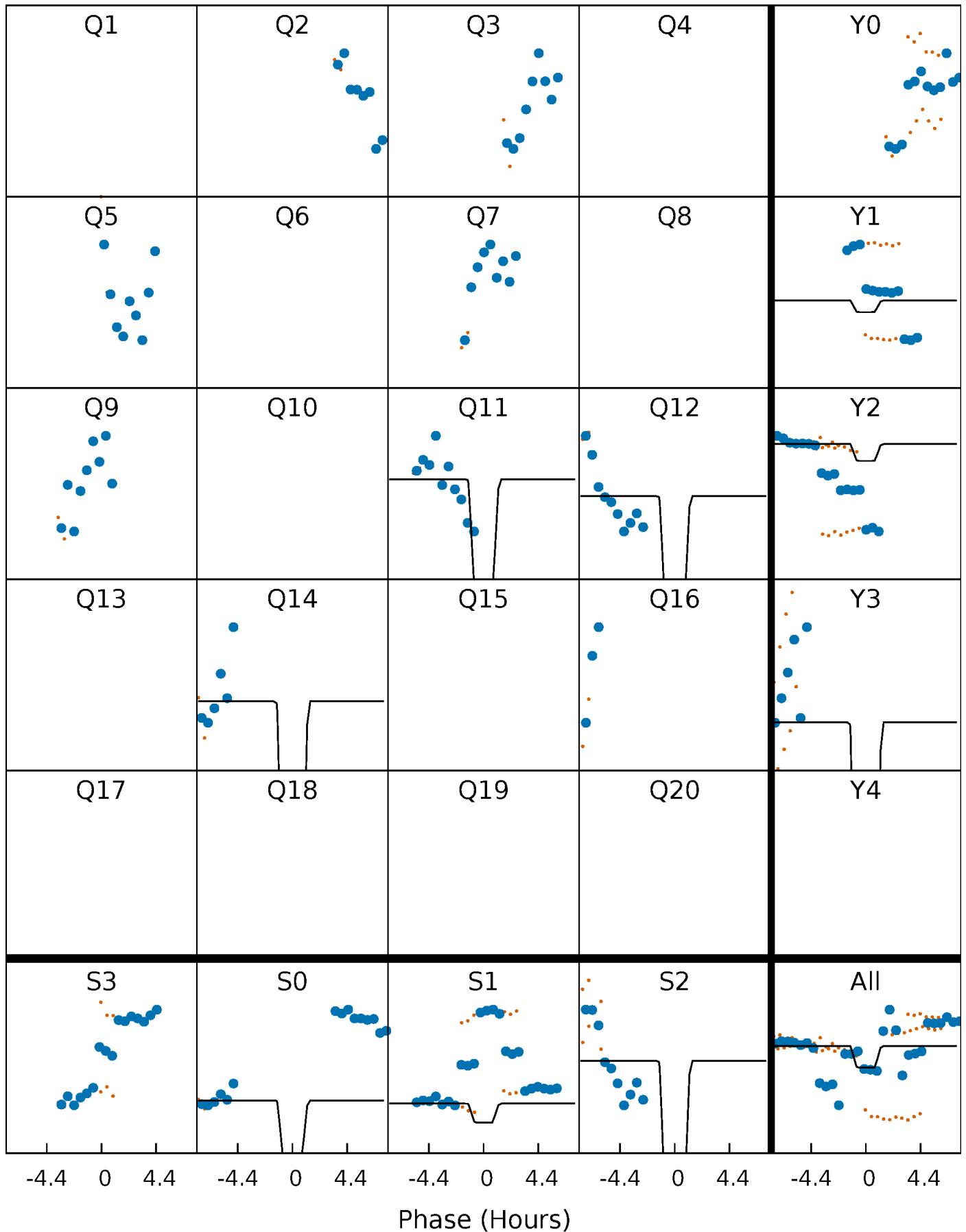
# DV Quarter-Phased Transit Curves

TCE 011186618-02 P=167.860775 Days  $T_0=173.465028$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

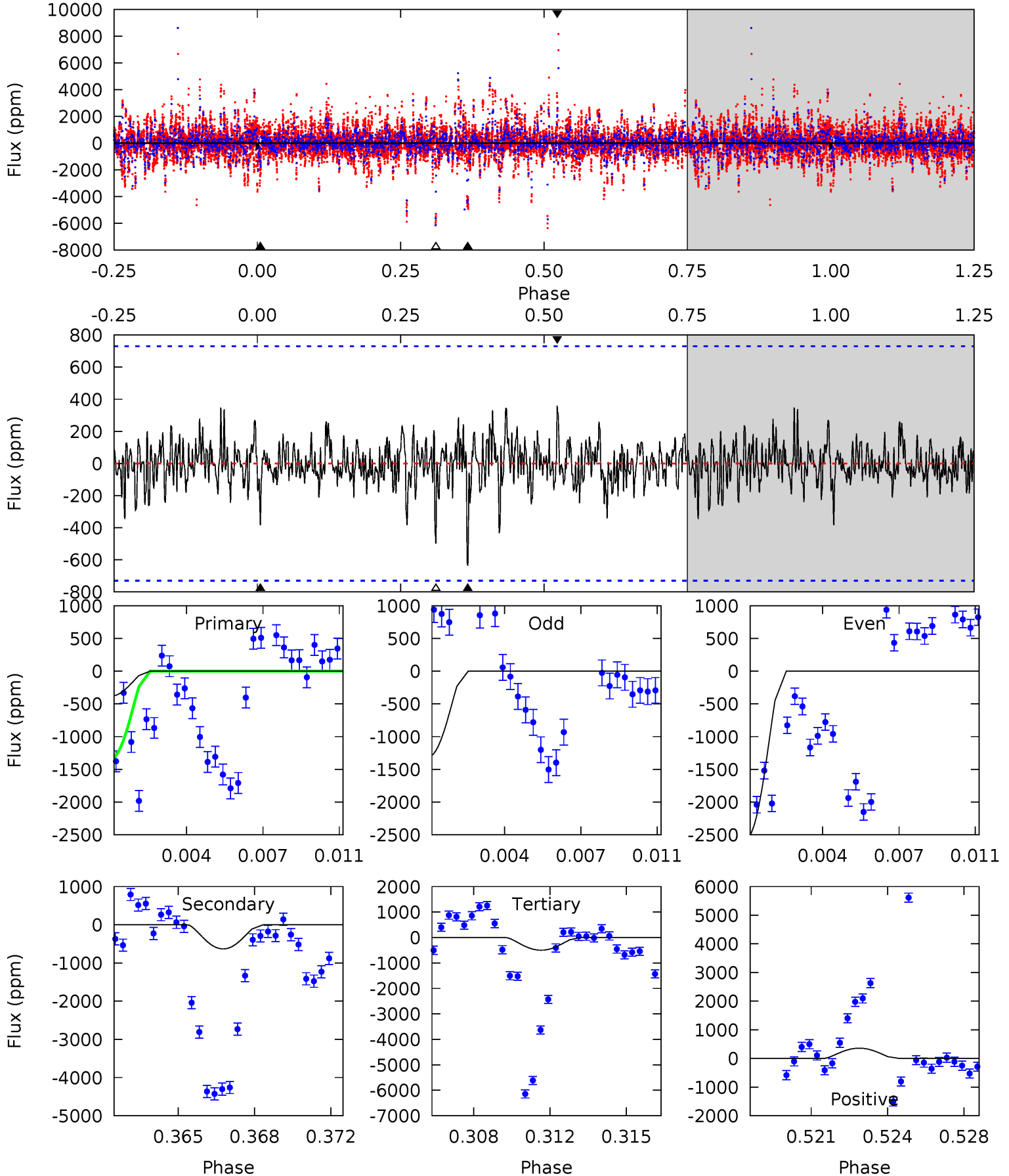
TCE 011186618-02 P=167.851425 Days  $T_0=173.362710$  (BKJD)



# DV Model-Shift Uniqueness Test

011186618-02, P = 167.860775 Days, E = 5.604253 Days

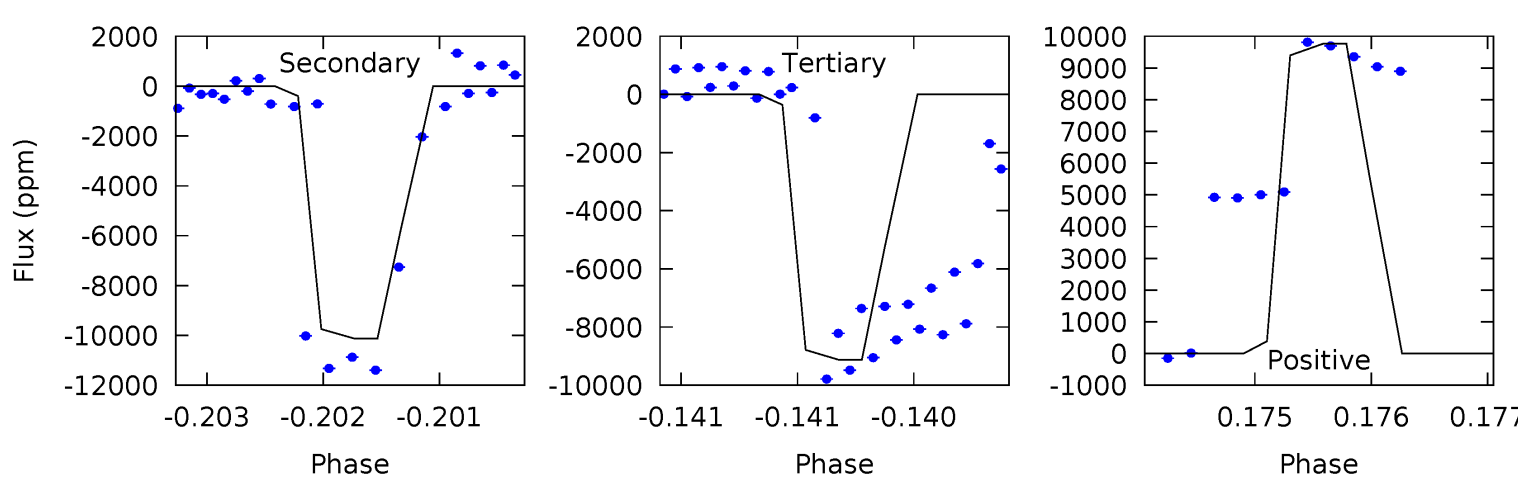
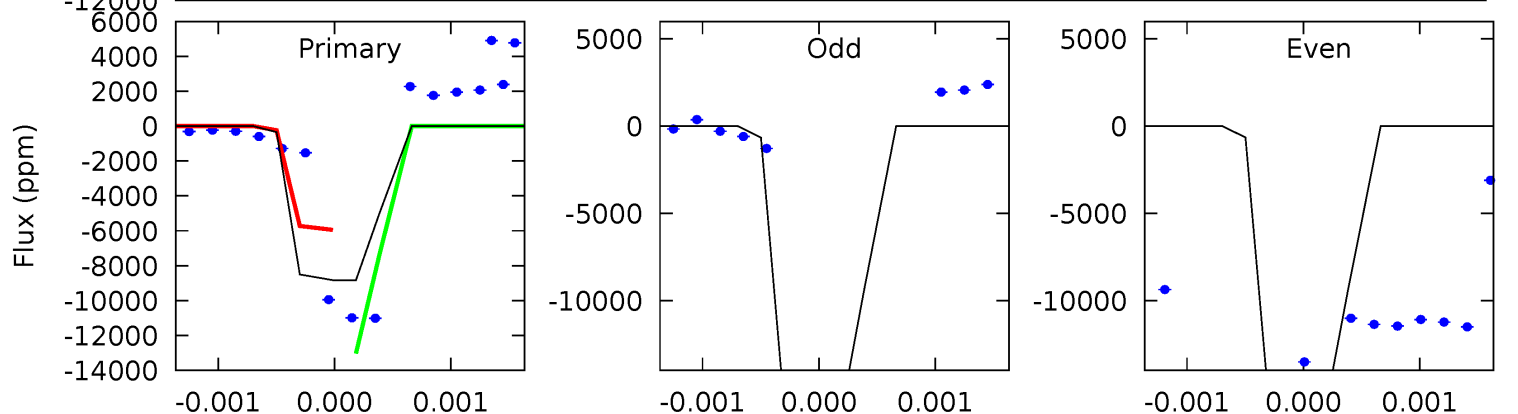
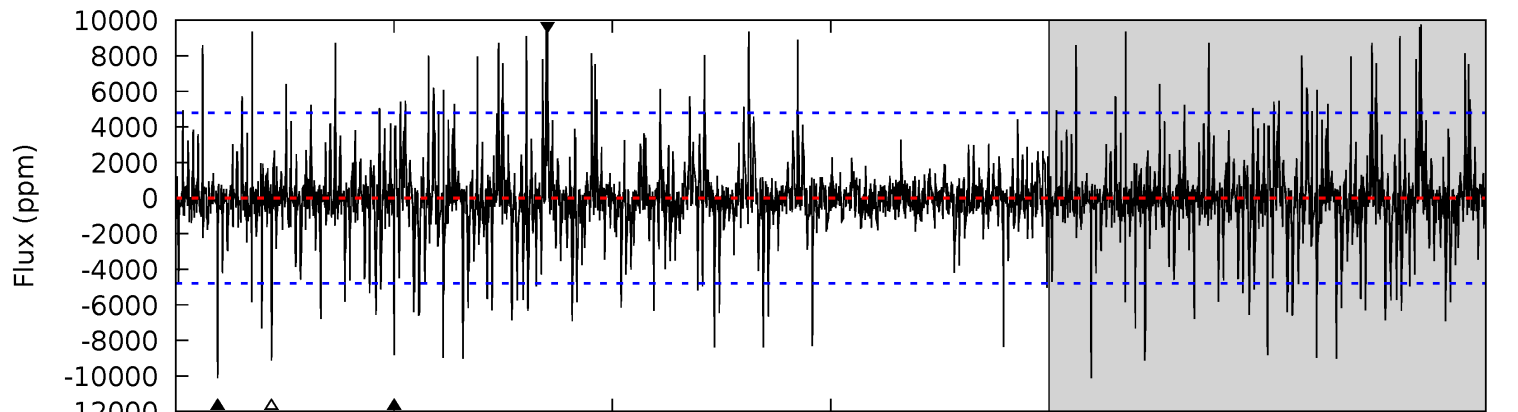
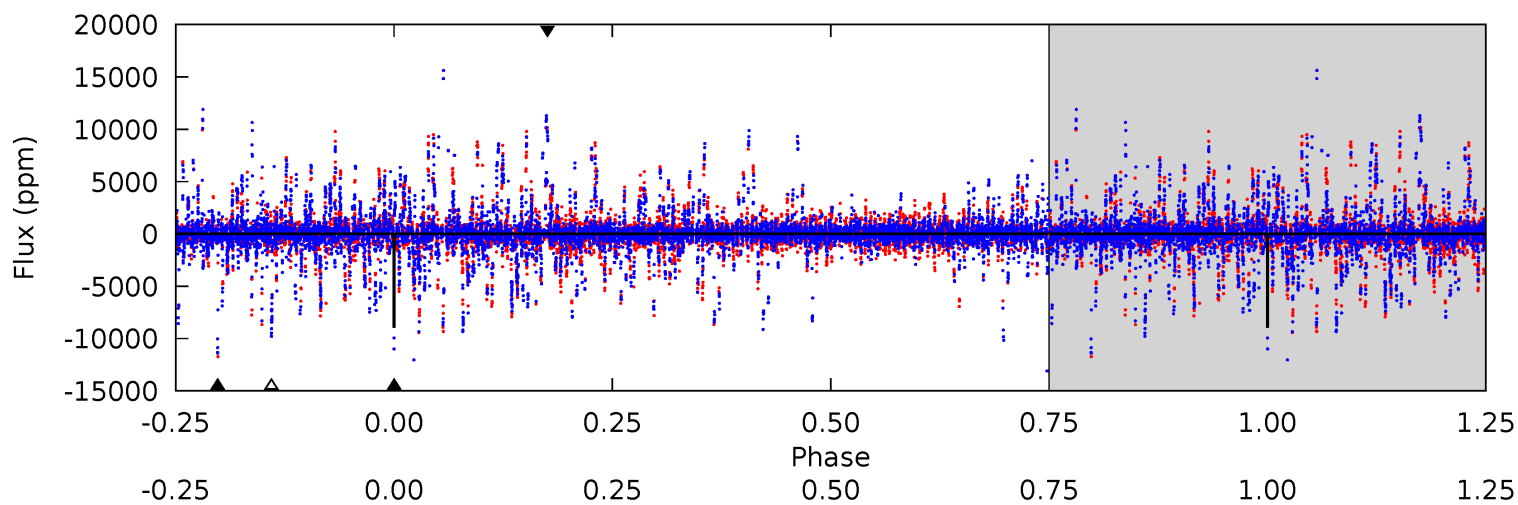
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.74	4.52	3.56	2.57	5.22	2.92	0.76	-0.82	0.17	0.96	1.95	4.57	16.4	0.36	2.41



# Alt Model-Shift Uniqueness Test

011186618-02, P = 167.851425 Days, E = 5.511285 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	11.7	10.5	11.3	5.54	3.43	1.81	-0.34	-1.08	1.16	0.42	0.21	0.58	0.49	4.00



### Stellar Parameters For KIC 011186618

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4671^{+125}_{-153}$	$4.721^{+0.052}_{-0.024}$	$-1.300^{+0.300}_{-0.350}$	$0.528^{+0.029}_{-0.037}$	$0.534^{+0.036}_{-0.022}$	$5.111^{+1.091}_{-0.505}$
	+3%/-3%	+1%/-1%	+23%/-27%	+5%/-7%	+7%/-4%	+21%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 011186618-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-632 \pm 140$	$10.31^{+9.34}_{-6.86}$	$298^{+10}_{-11}$	$2526^{+881}_{-359}$	$757^{+5976}_{-550}$
Alt.	$-10125 \pm 866$	$9.01^{+9.29}_{-6.34}$	$299^{+10}_{-10}$	$3929^{+2814}_{-770}$	$16113^{+168348}_{-12081}$

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



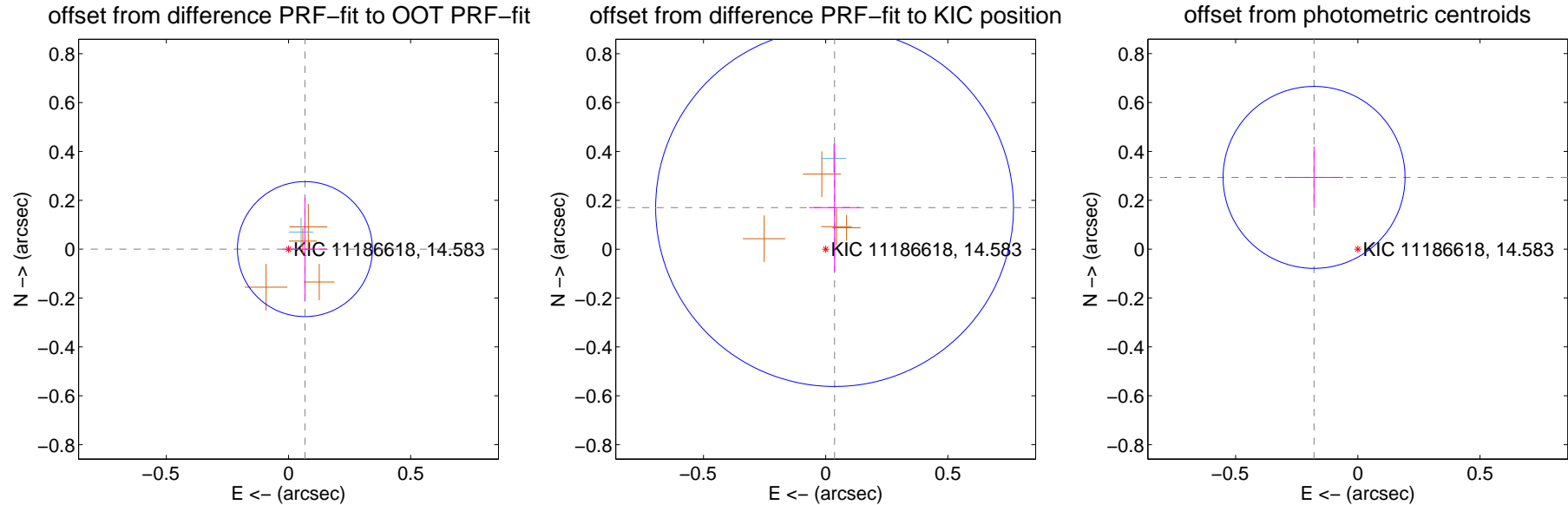
## DV Centroid Data

Supplemental centroid analysis for 011186618-02. Kepler magnitude: 14.58. Transit SNR 10.93

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.067 \pm 0.092$	0.73	$-0.067 \pm 0.093$	$0.000 \pm 0.211$
PRF-fit source offset from KIC position	$0.174 \pm 0.244$	0.71	$-0.036 \pm 0.104$	$0.170 \pm 0.262$
photometric centroid source offset	$0.34 \pm 0.12$	2.77	$0.18 \pm 0.12$	$0.29 \pm 0.13$



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

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

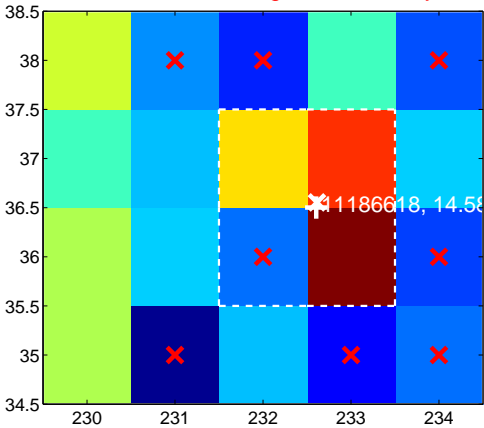
Q1 no difference image



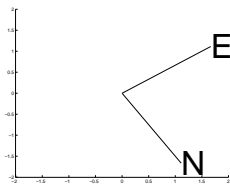
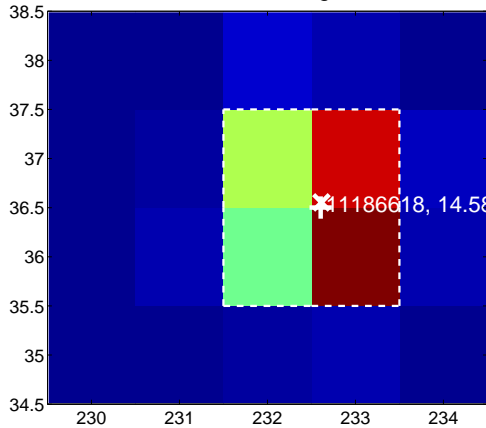
Q1 no OOT image



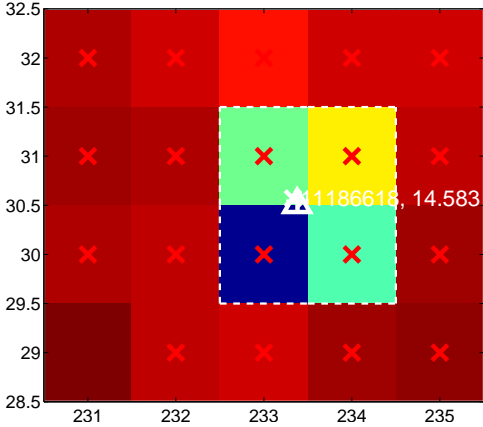
Q2 difference image. Poor Quality



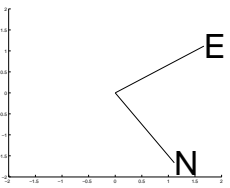
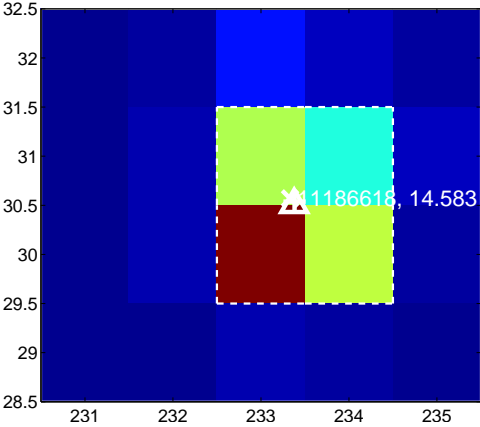
Q2 OOT image



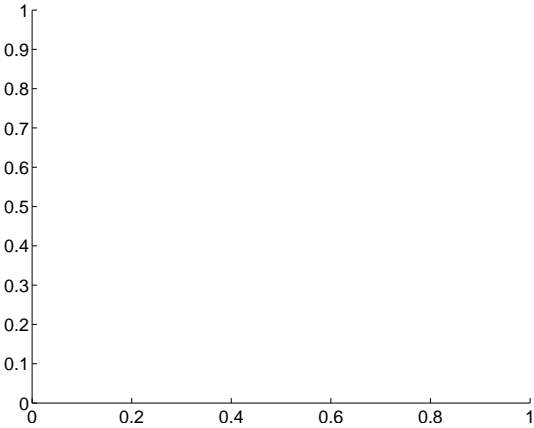
Q3 difference image. Poor Quality



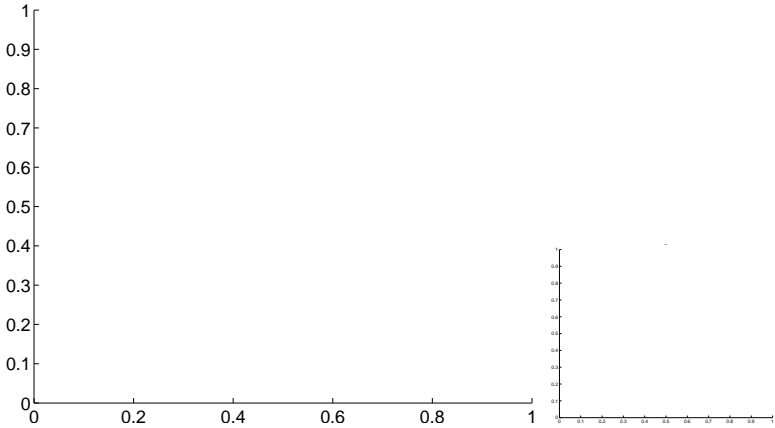
Q3 OOT image



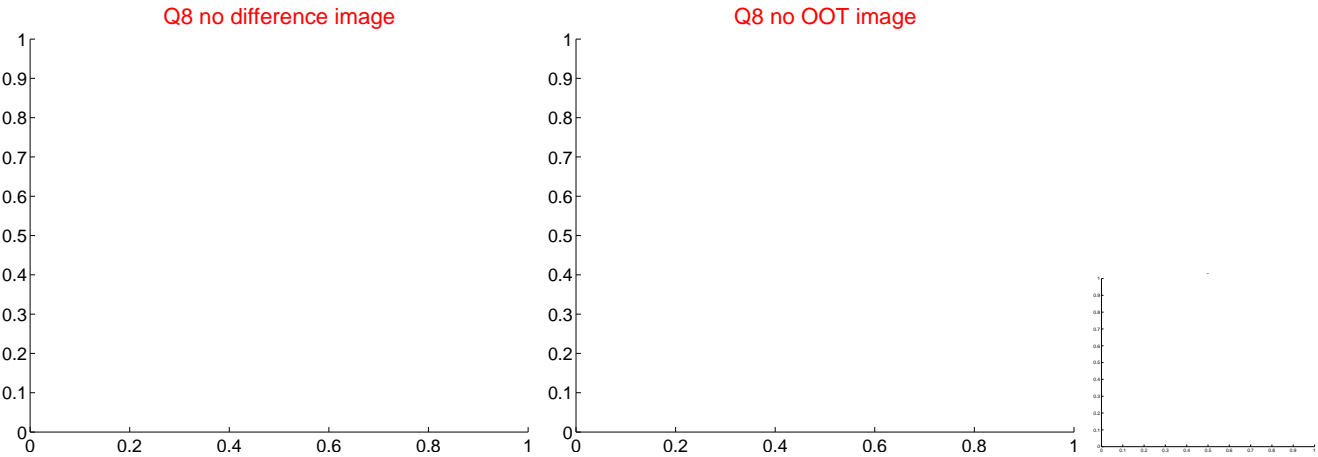
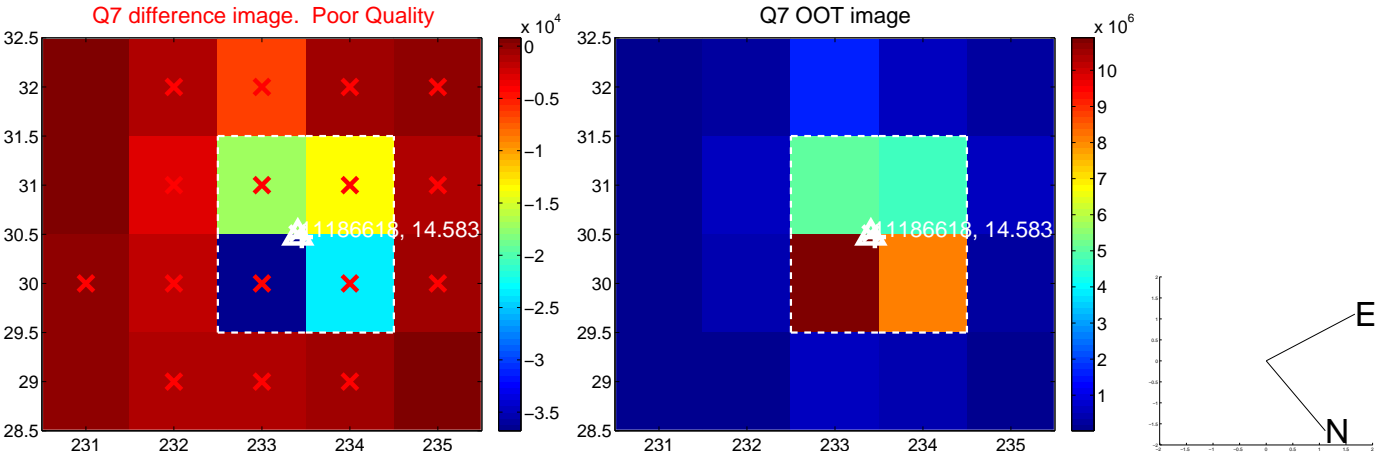
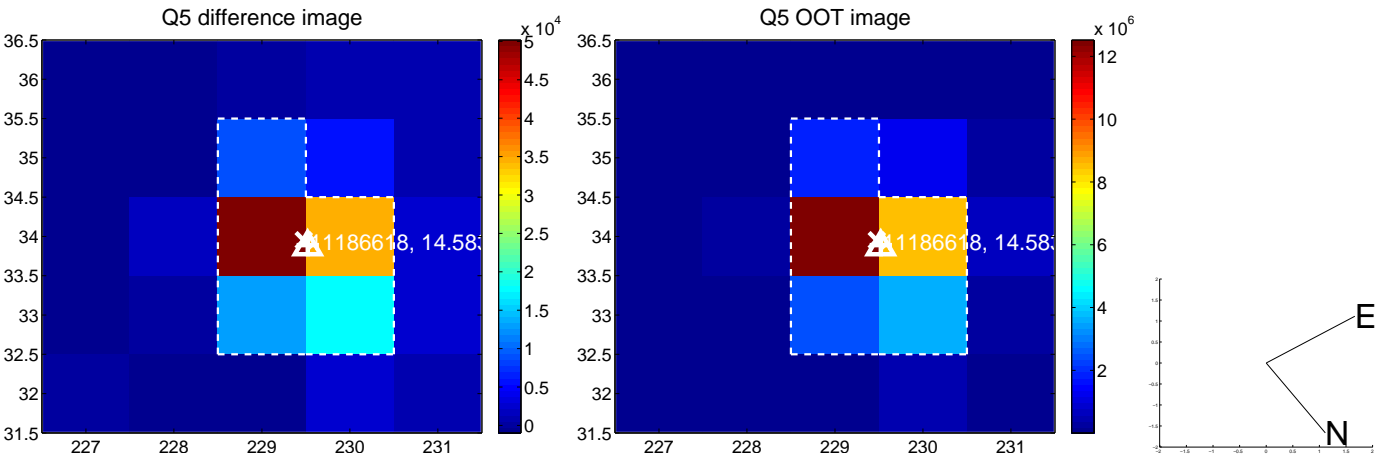
Q4 no difference image



Q4 no OOT image



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



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

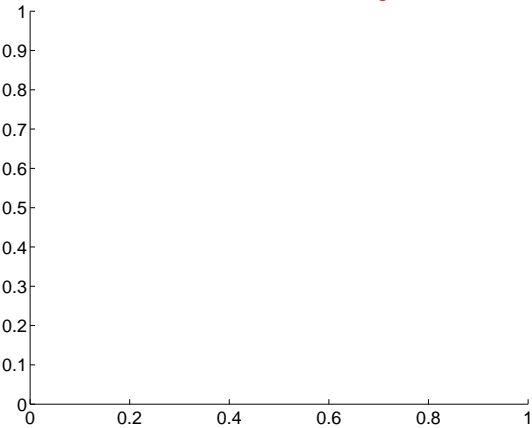
Q9 no difference image



Q9 no OOT image



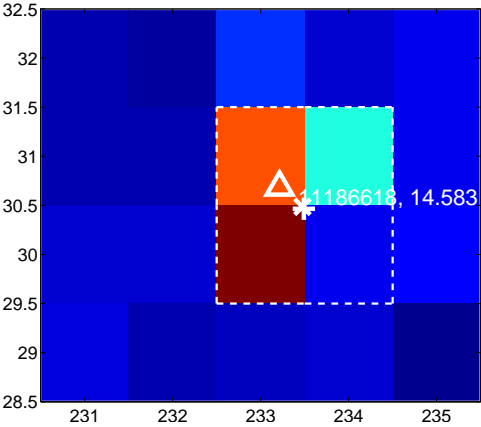
Q10 no difference image



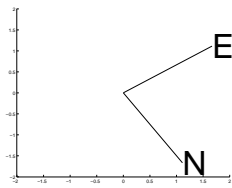
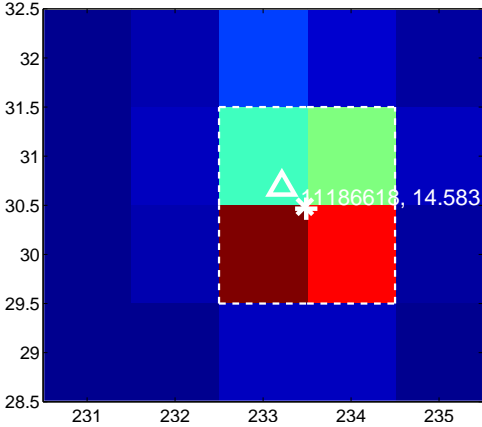
Q10 no OOT image



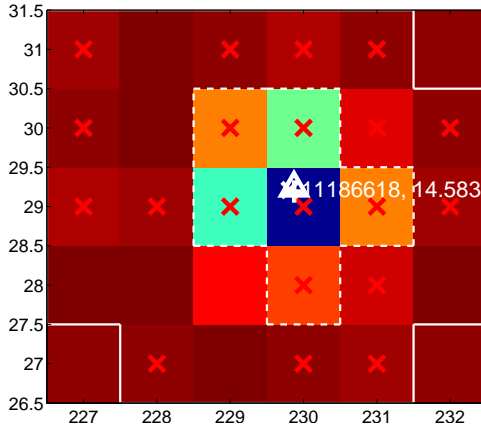
Q11 difference image



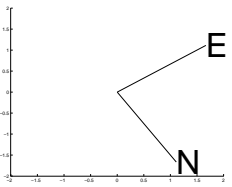
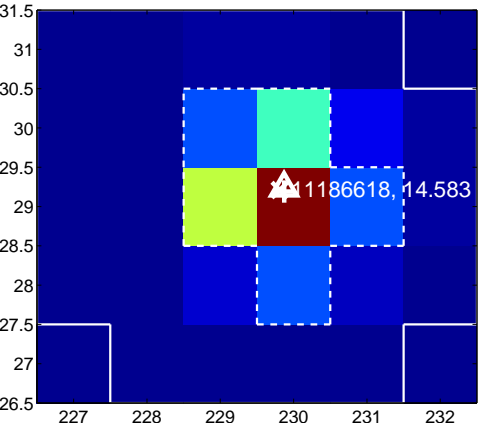
Q11 OOT image



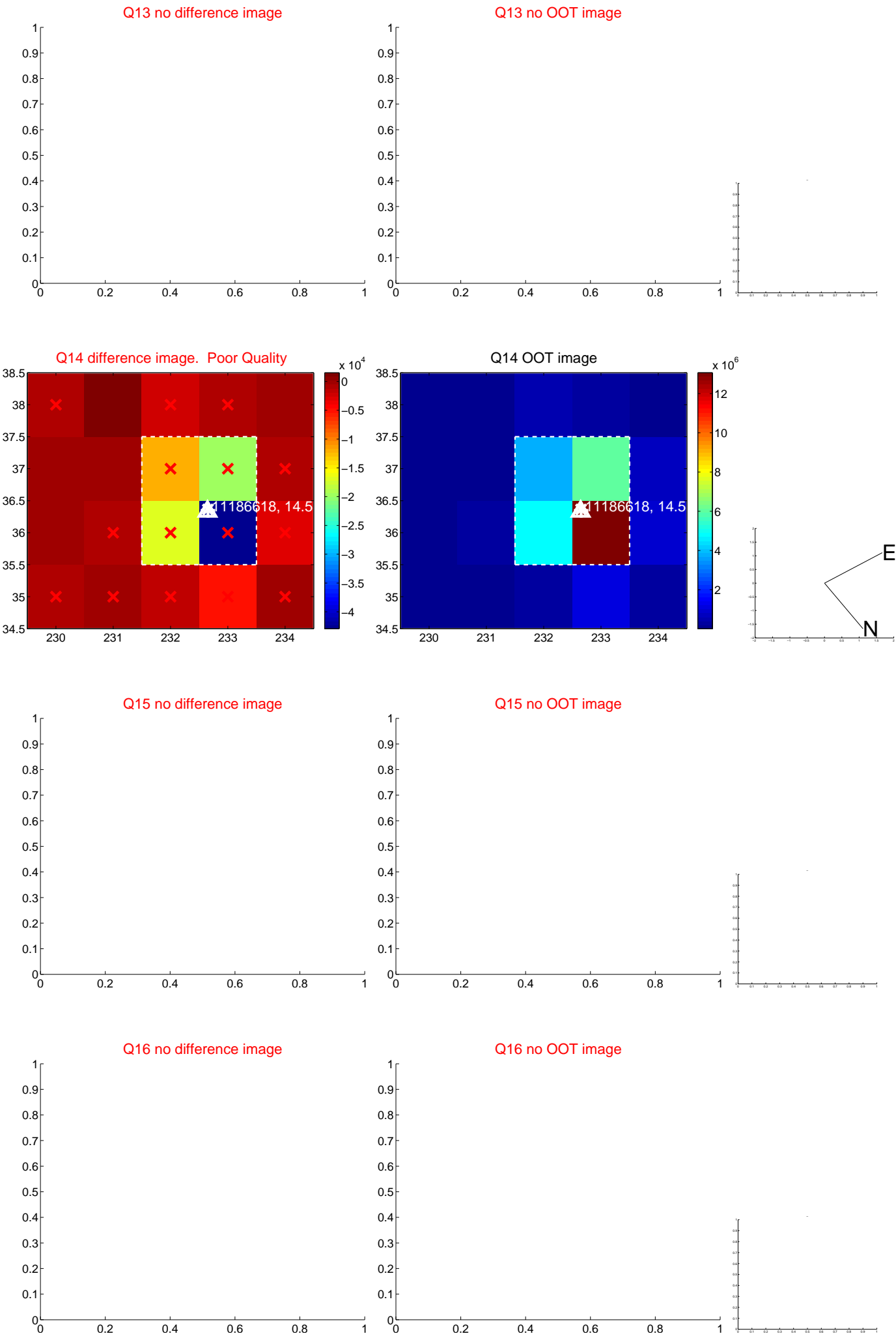
Q12 difference image. Poor Quality



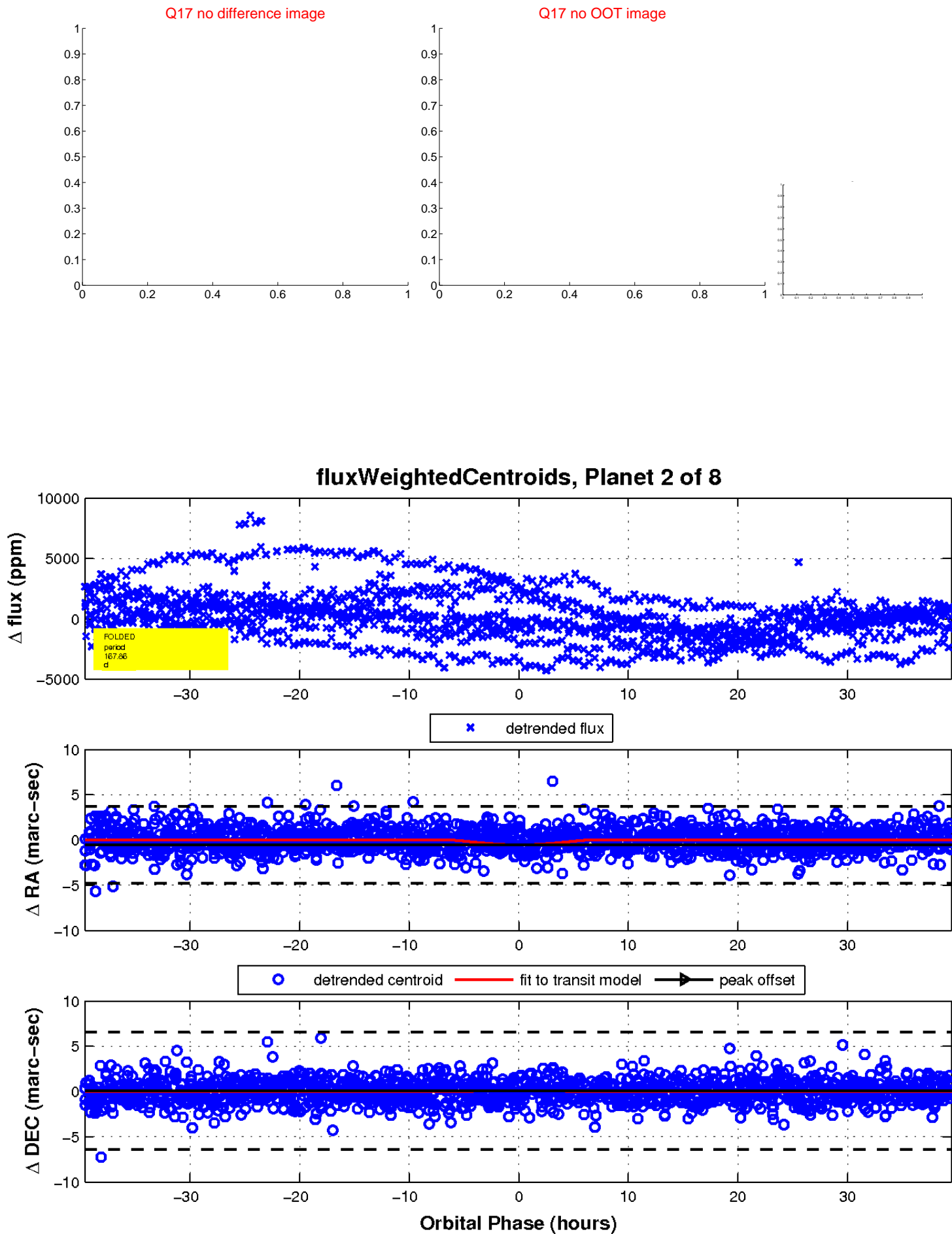
Q12 OOT image



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

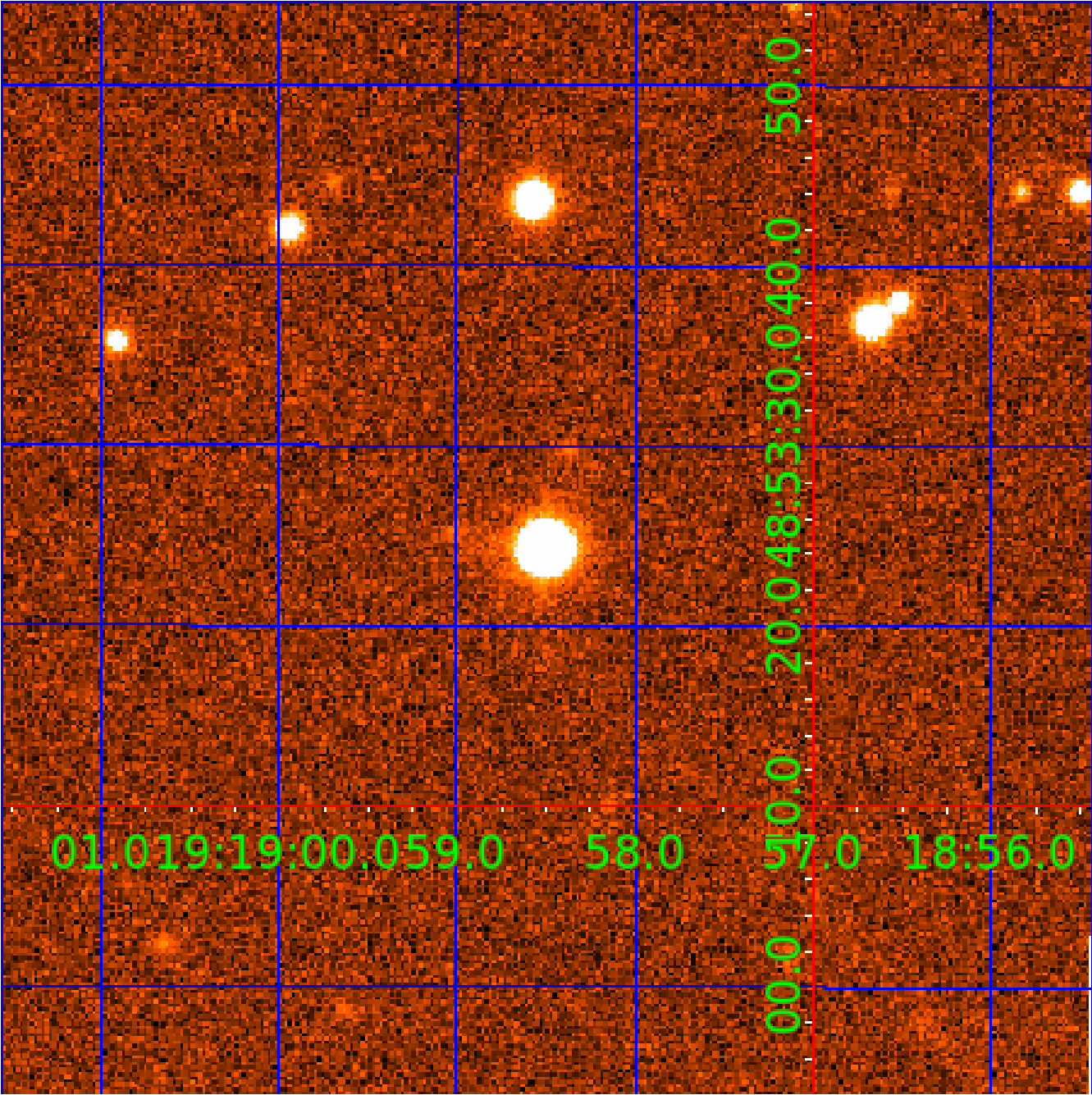


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 011186618

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011186618-01	OBS	No	0.942573	131.654324	40.6	5.694	9.6	6.8	0.53	4671	0.37	509.57
011186618-02	OBS	No	167.860775	173.465028	2915.5	13.204	17.4	10.9	0.53	4671	5.45	0.51
011186618-03	OBS	No	185.867599	266.571084	3029.4	10.359	13.2	10.3	0.53	4671	5.58	0.44
011186618-04	OBS	No	87.907703	191.522304	1248.1	5.052	12.5	7.5	0.53	4671	1.99	1.21
011186618-05	OBS	No	58.594744	176.774498	583.6	6.364	9.3	4.1	0.53	4671	1.46	2.07
011186618-06	OBS	No	125.616664	136.793538	271.6	7.769	9.3	1.4	0.53	4671	1.04	0.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011186618-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
011186618-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_MEAS
011186618-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
011186618-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

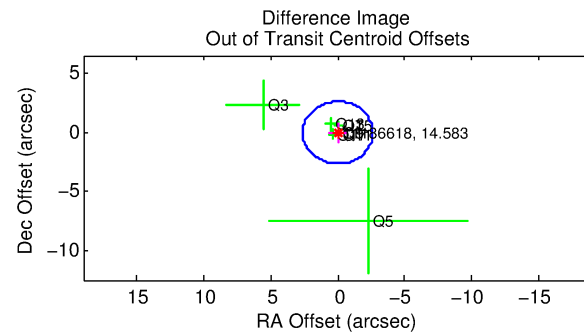
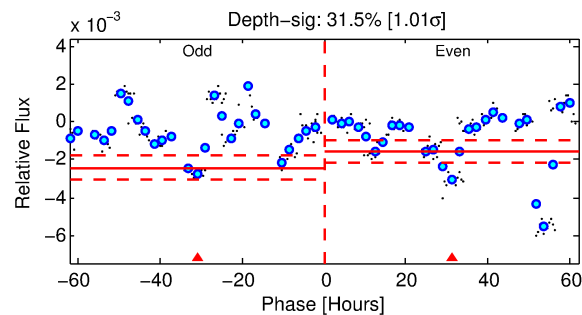
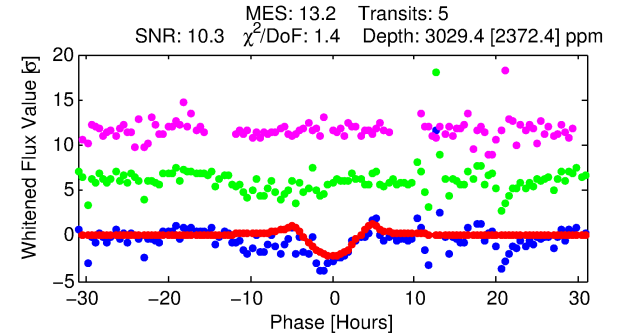
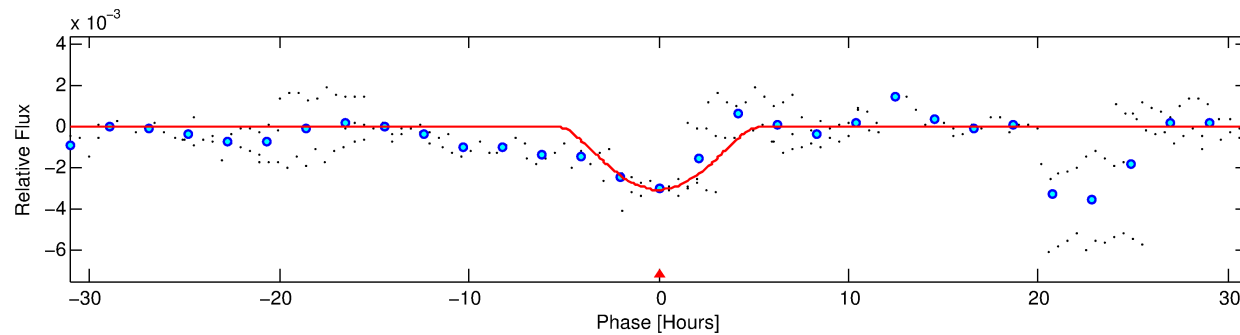
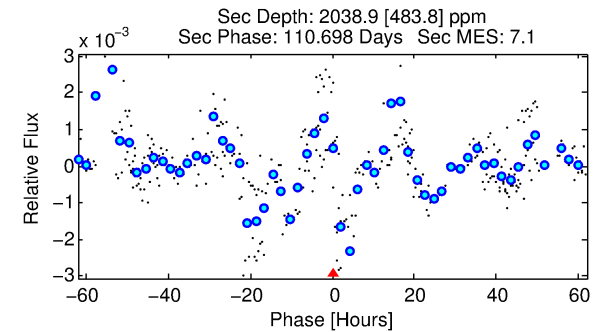
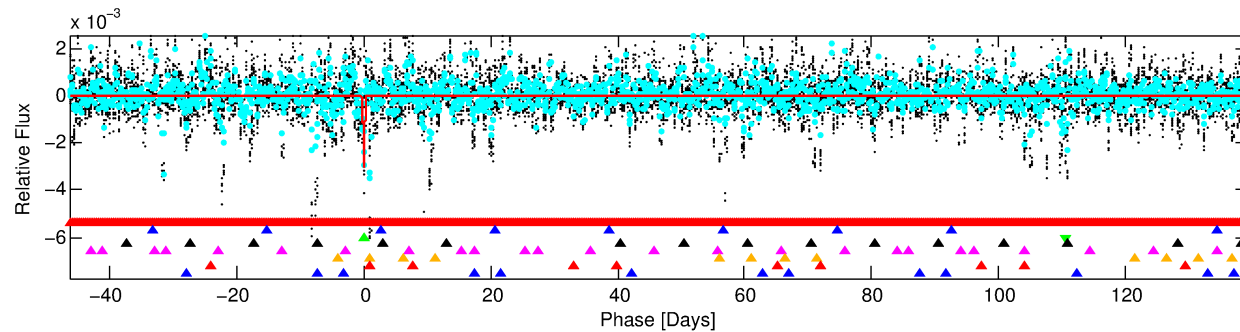
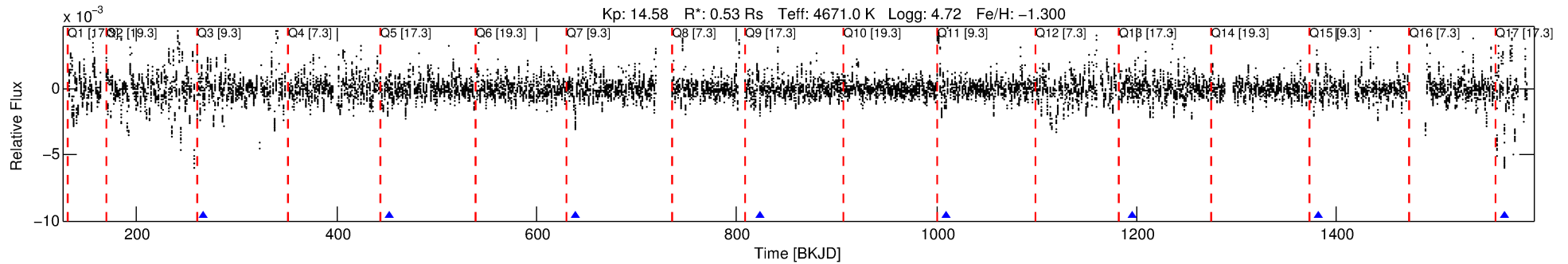
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011186618-03

No Significant Match Found

# DV One-Page Summary

KIC: 11186618 Candidate: 3 of 8 Period: 185.868 d



## DV Fit Results:

Period = 185.86760 [0.00530] d  
Epoch = 266.5711 [0.0194] BKJD  
Rp/R\* = 0.0968 [0.2429]  
a/R\* = 61.76 [30.41]  
b = 1.00 [0.29]  
Seff = 0.44 [0.07]  
Teq = 208 [8] K  
Rp = 5.58 [14.00] Re  
a = 0.5175 [0.0318] AU  
Ag = 9659.13 [48549.69] [0.20σ]  
Teffp = 3190 [4010] K [0.74σ]

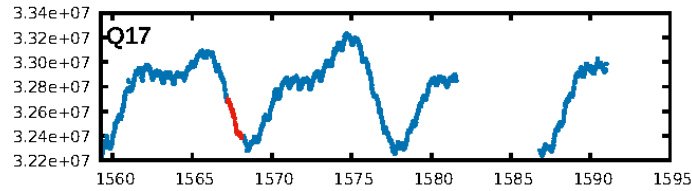
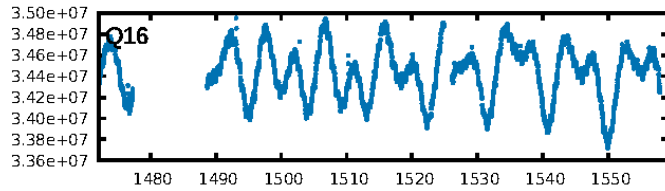
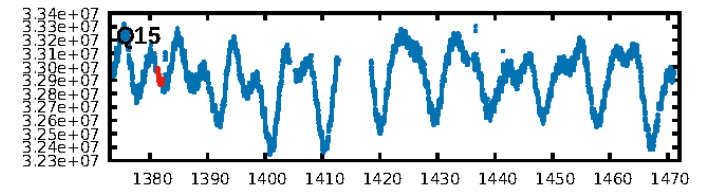
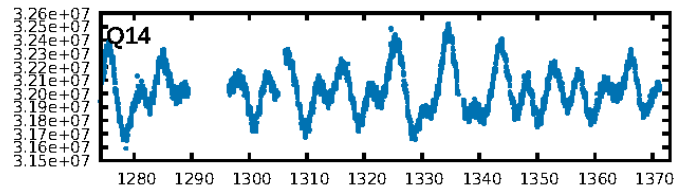
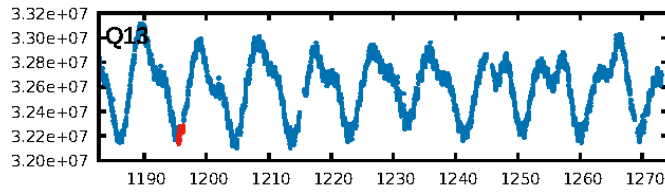
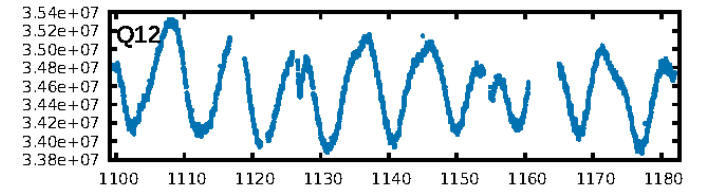
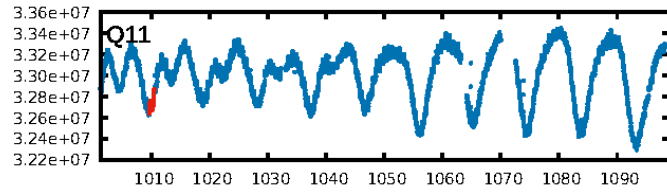
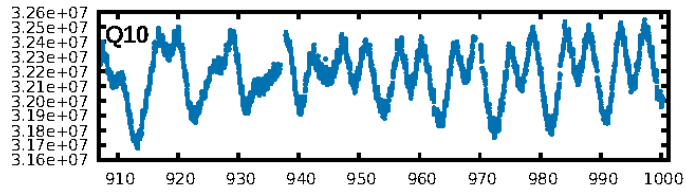
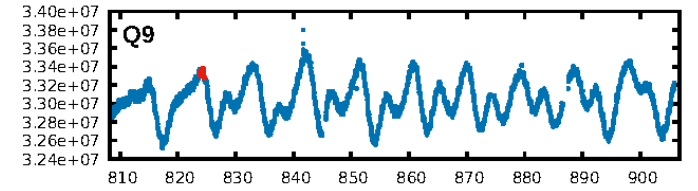
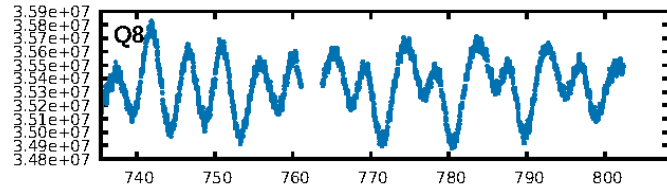
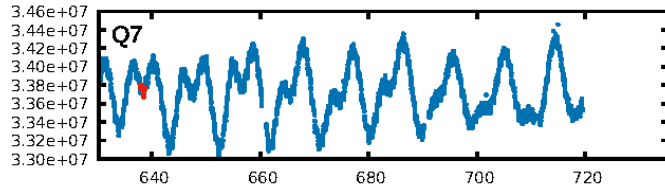
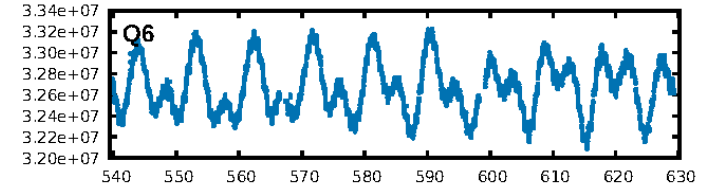
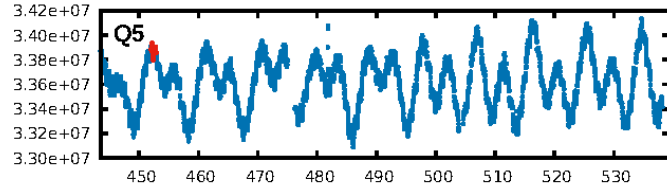
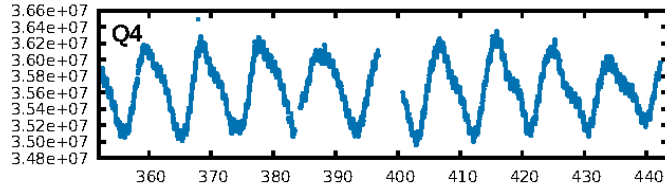
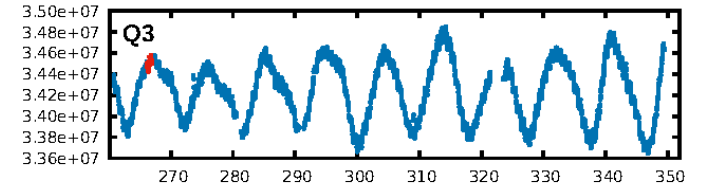
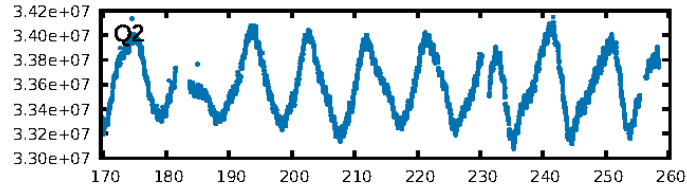
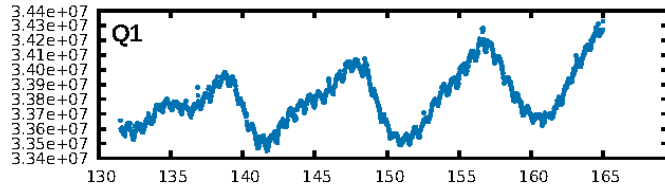
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [25.75σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.366  
Centroid-sig: 2.1%  
Centroid-so: 0.186 arcsec [1.33σ]  
OotOffset-rm: 0.044 arcsec [0.05σ]  
OotOffset-st: 0/4/0/4 [8]  
KicOffset-rm: 0.177 arcsec [0.20σ]  
KicOffset-st: 0/4/0/4 [8]  
DiffImageQuality-fgm: 0.62 [5/8]  
DiffImageOverlap-fno: 0.00 [0/8]

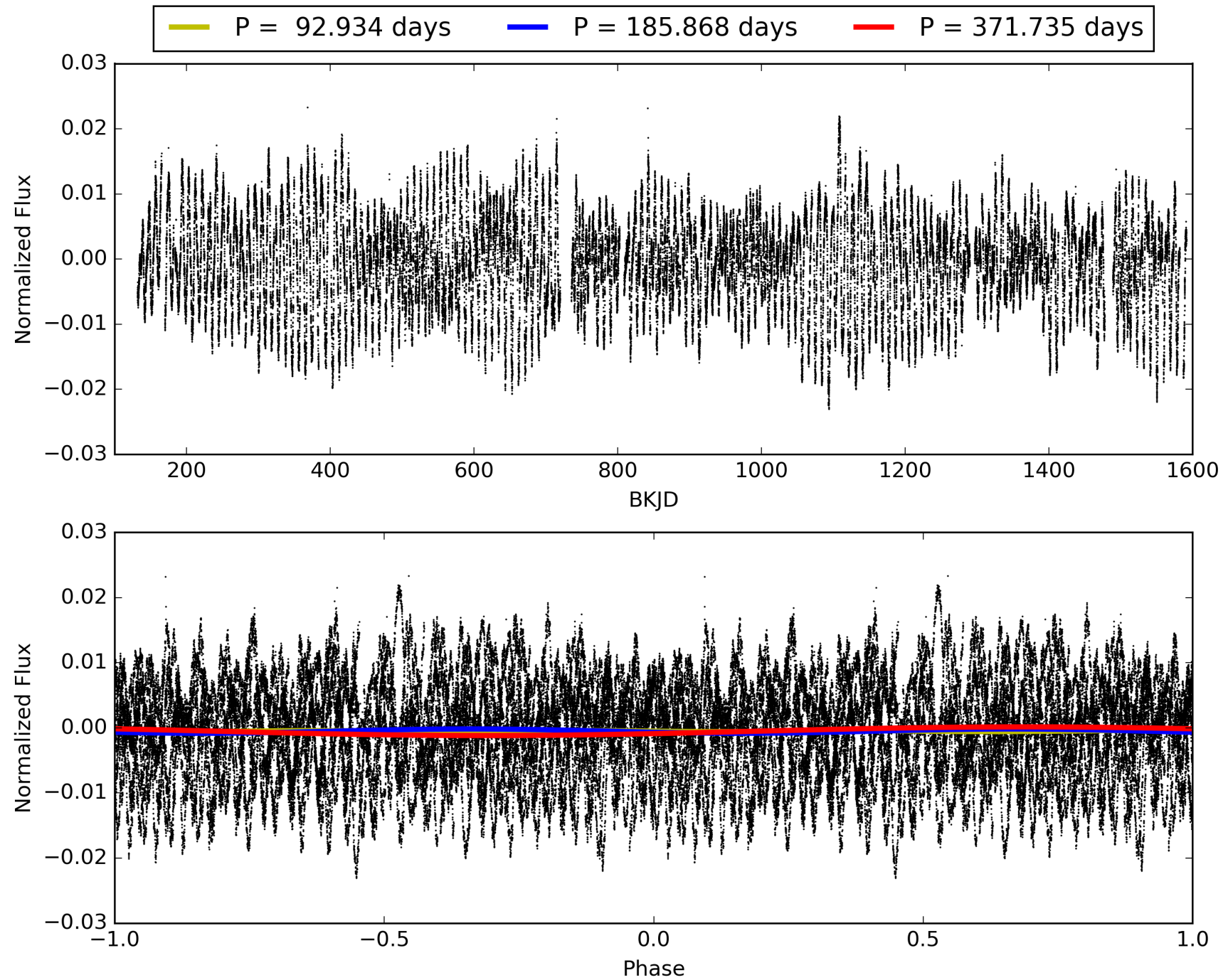
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:28:27 Z

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

# TCE 011186618-03, PDC Light Curves

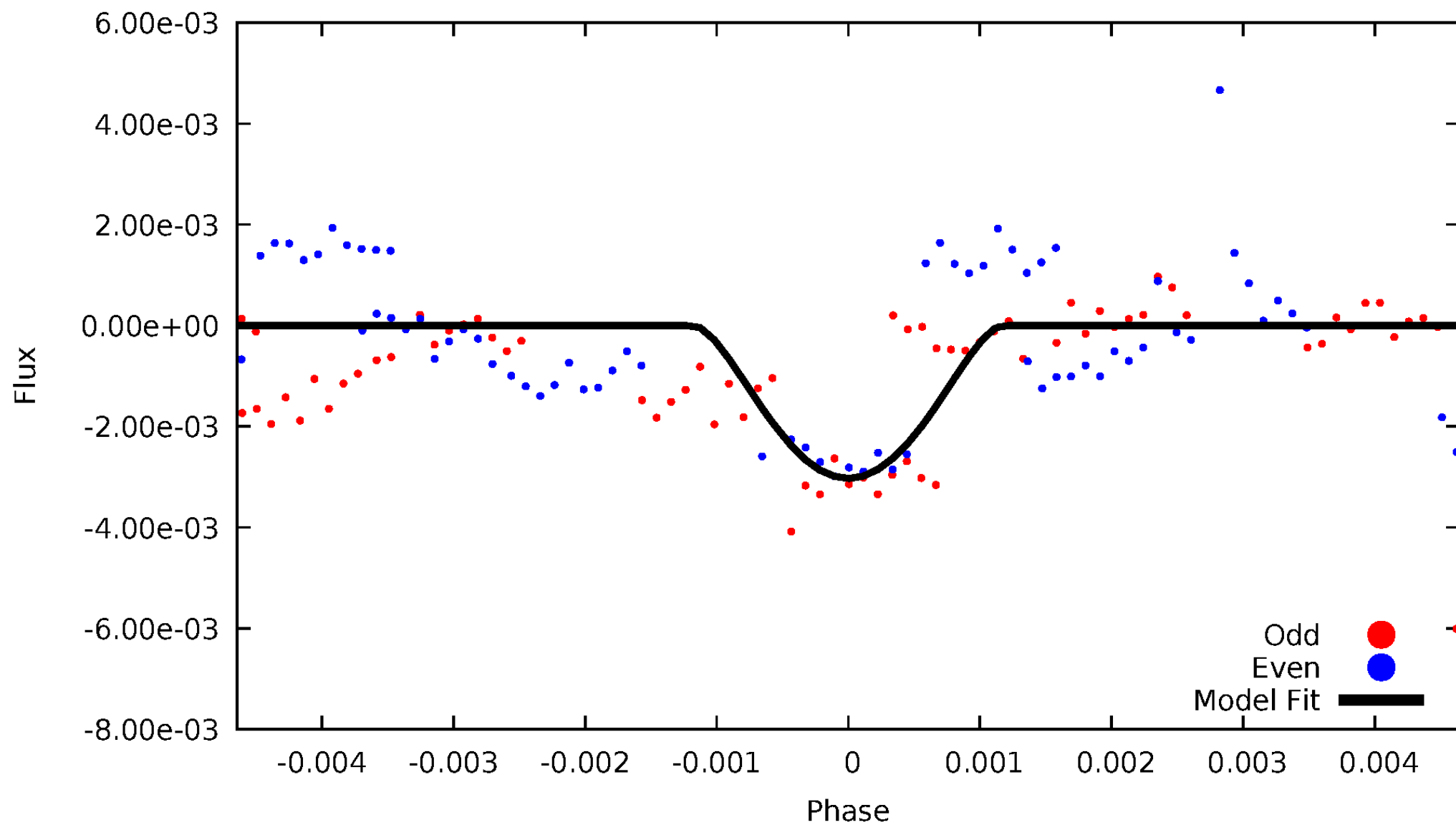


# TCE 011186618-03



# DV Odd/Even

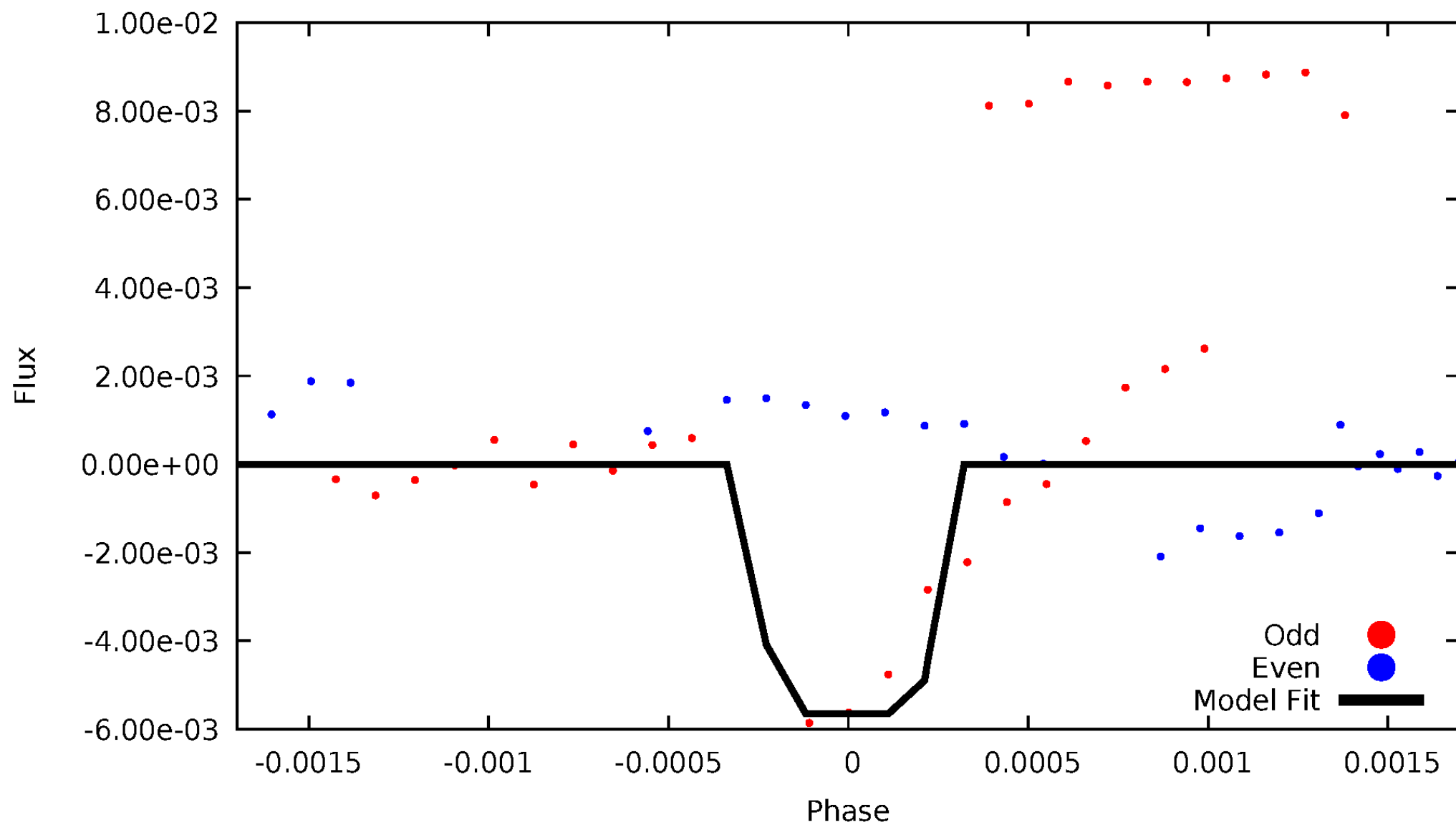
TCE 011186618-03



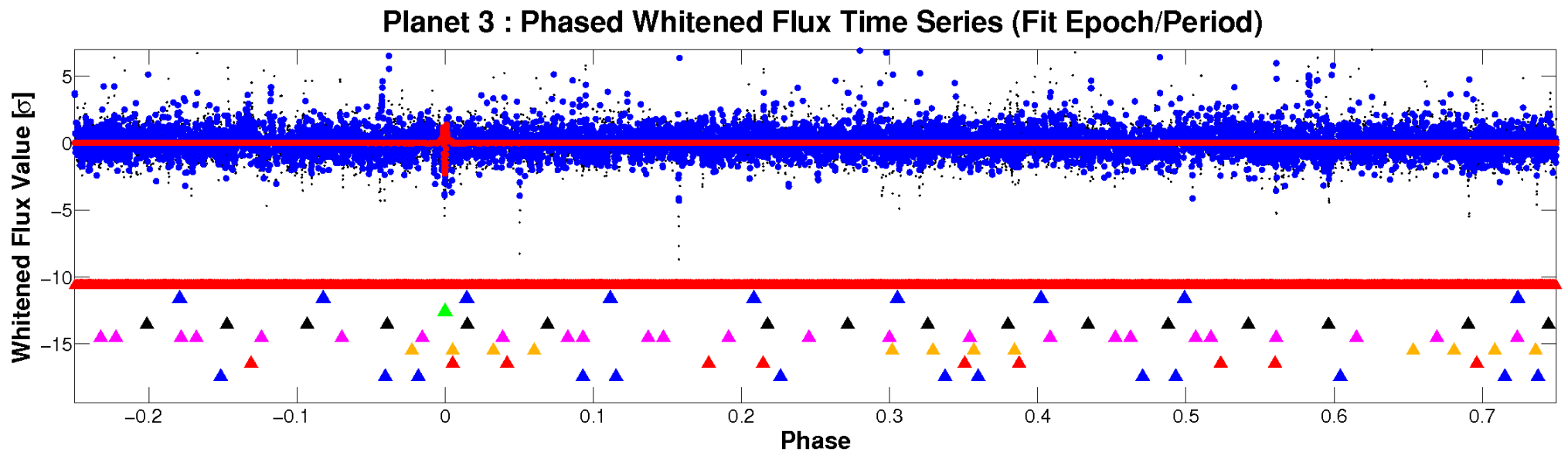
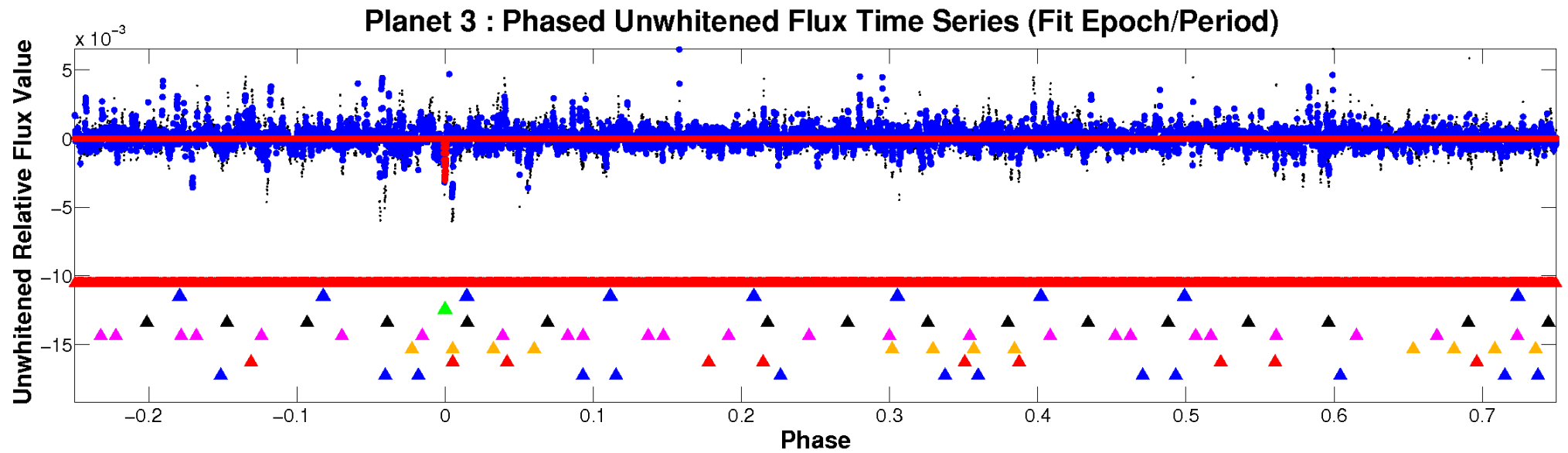


# ALT Odd/Even

TCE 011186618-03

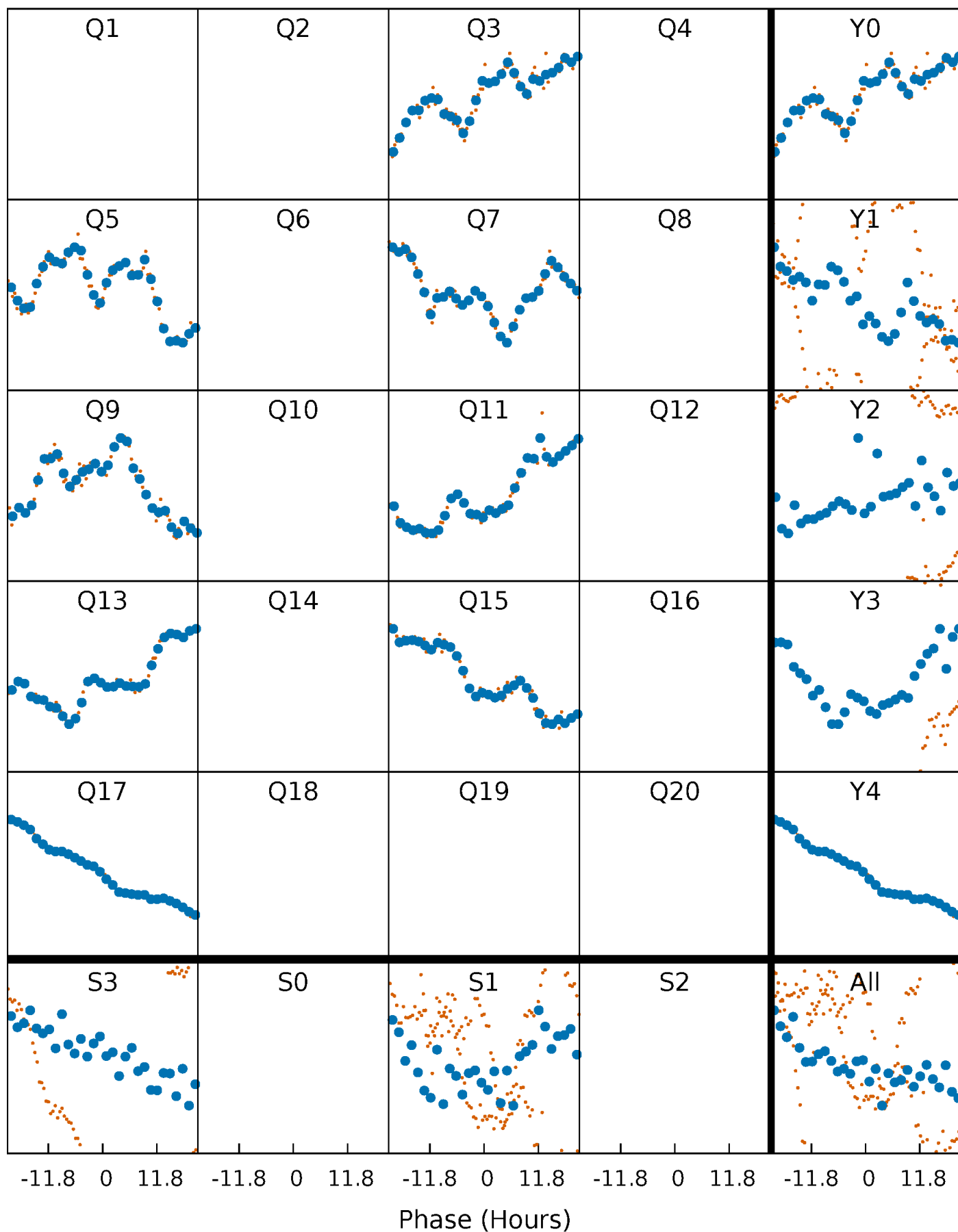


# Non-Whitened Vs. Whitened Light Curve



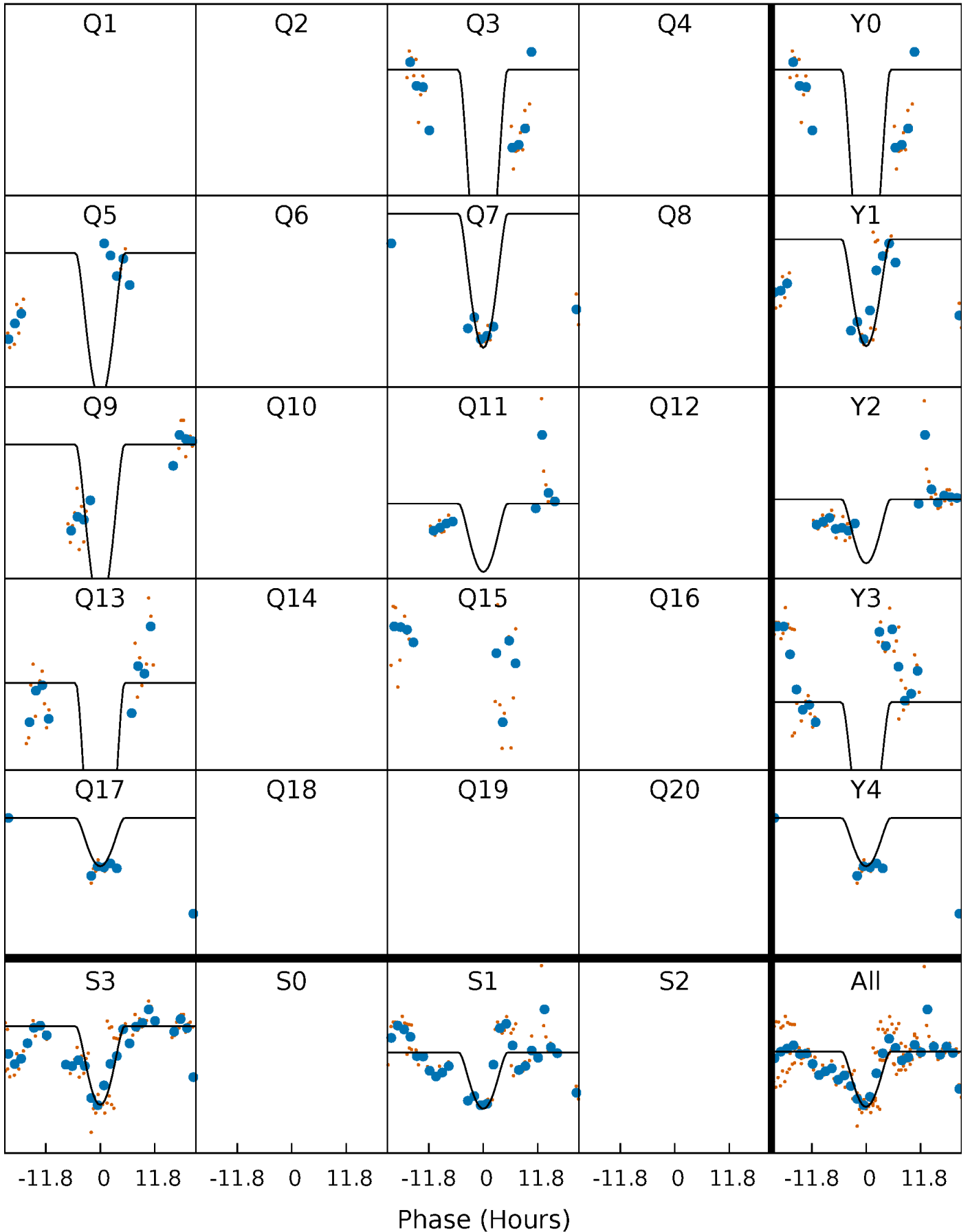
# PDC Quarter-Phased Transit Curves

TCE 011186618-03 P=185.867599 Days  $T_0=266.571084$  (BKJD)



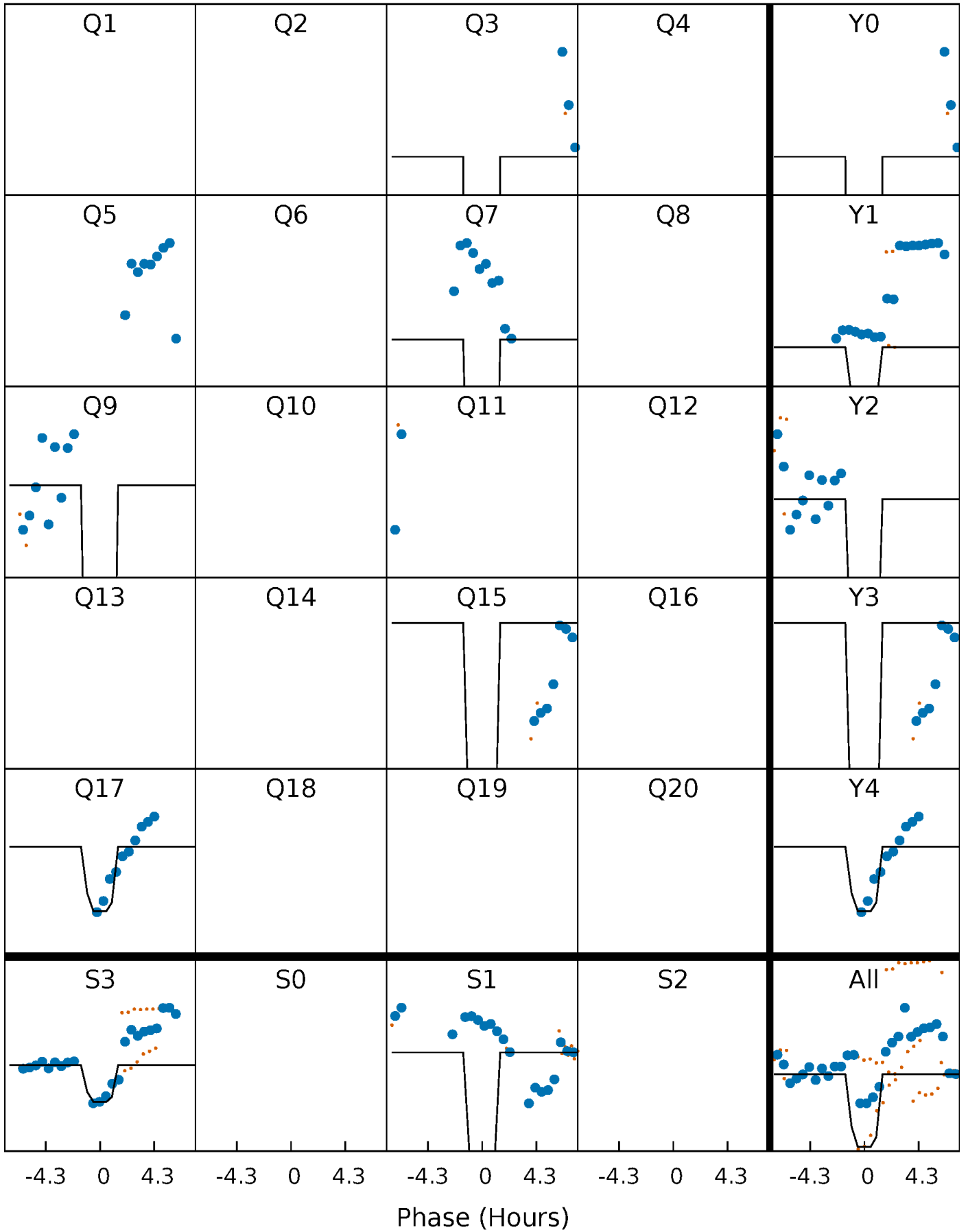
# DV Quarter-Phased Transit Curves

TCE 011186618-03     $P=185.867599$  Days     $T_0=266.571084$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

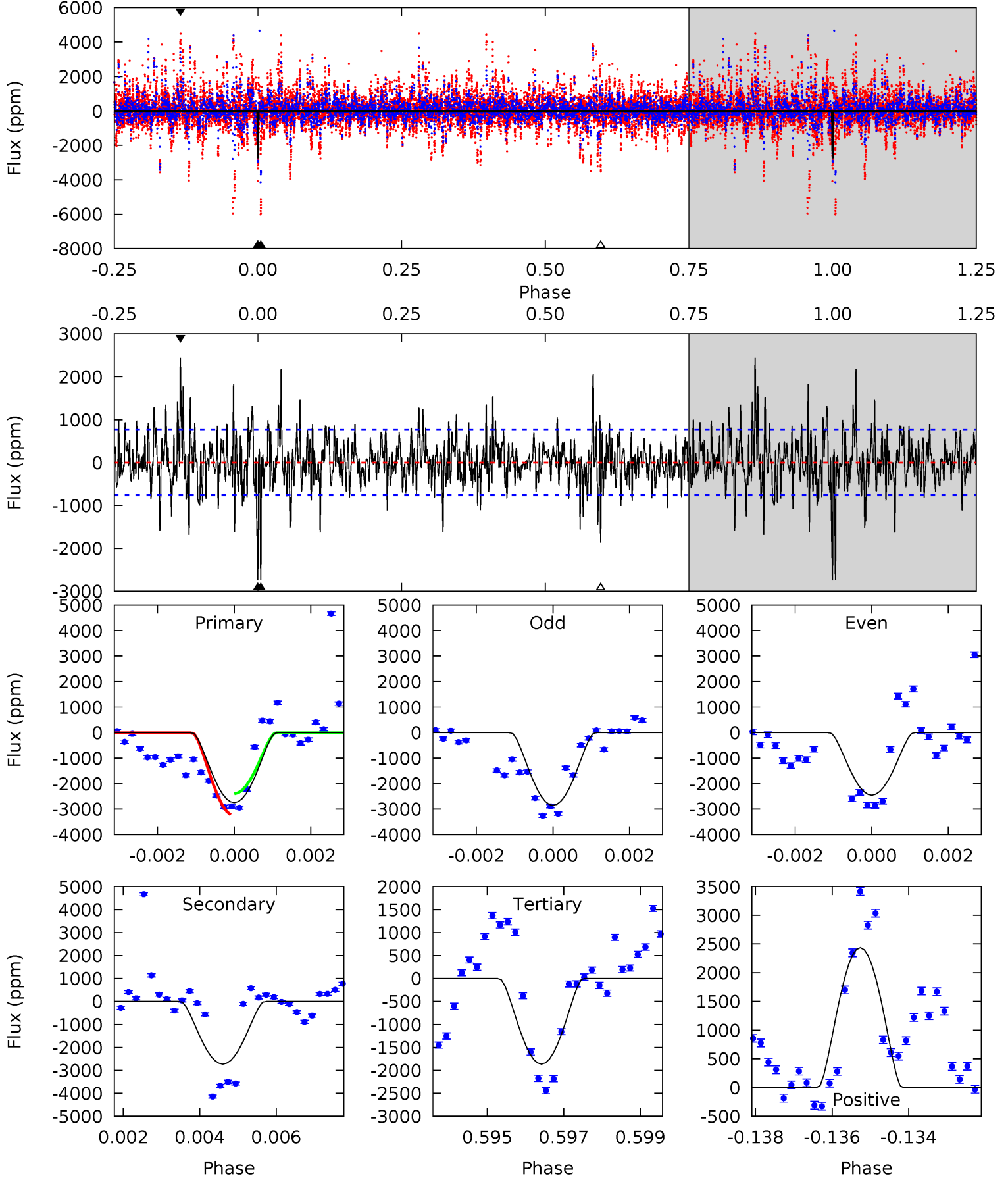
TCE 011186618-03 P=185.859068 Days  $T_0=266.570133$  (BKJD)



# DV Model-Shift Uniqueness Test

011186618-03, P = 185.867599 Days, E = 80.703485 Days

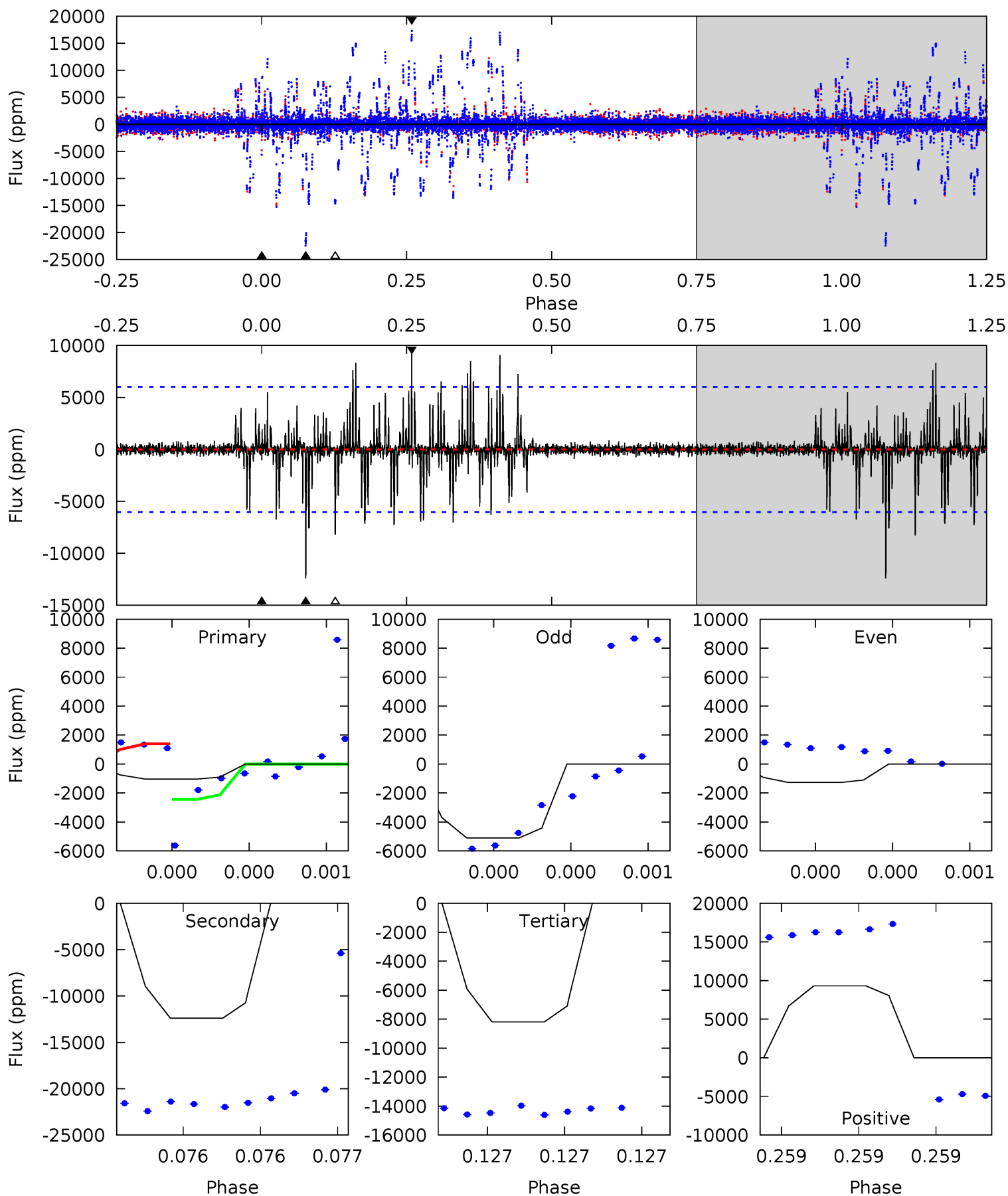
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.2	19.1	13.0	17.0	5.31	3.07	3.42	6.16	2.16	6.04	2.04	1.36	0.47	0.47	2.76



# Alt Model-Shift Uniqueness Test

011186618-03, P = 185.859068 Days, E = 80.711065 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
0.97	11.6	7.66	8.70	5.64	3.58	1.06	-6.69	-7.73	3.94	2.89	1.76	1.00	0.43	0.54





### Stellar Parameters For KIC 011186618

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4671^{+125}_{-153}$	$4.721^{+0.052}_{-0.024}$	$-1.300^{+0.300}_{-0.350}$	$0.528^{+0.029}_{-0.037}$	$0.534^{+0.036}_{-0.022}$	$5.111^{+1.091}_{-0.505}$
	+3%/-3%	+1%/-1%	+23%/-27%	+5%/-7%	+7%/-4%	+21%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 011186618-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2729 \pm 143$	$11.74^{+10.84}_{-8.12}$	$289^{+9}_{-11}$	$2964^{+1368}_{-475}$	$3000^{+28969}_{-2208}$
Alt.	$-12396 \pm 1069$	$11.22^{+11.64}_{-7.58}$	$290^{+8}_{-10}$	$3809^{+2158}_{-769}$	$14937^{+126187}_{-11380}$

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

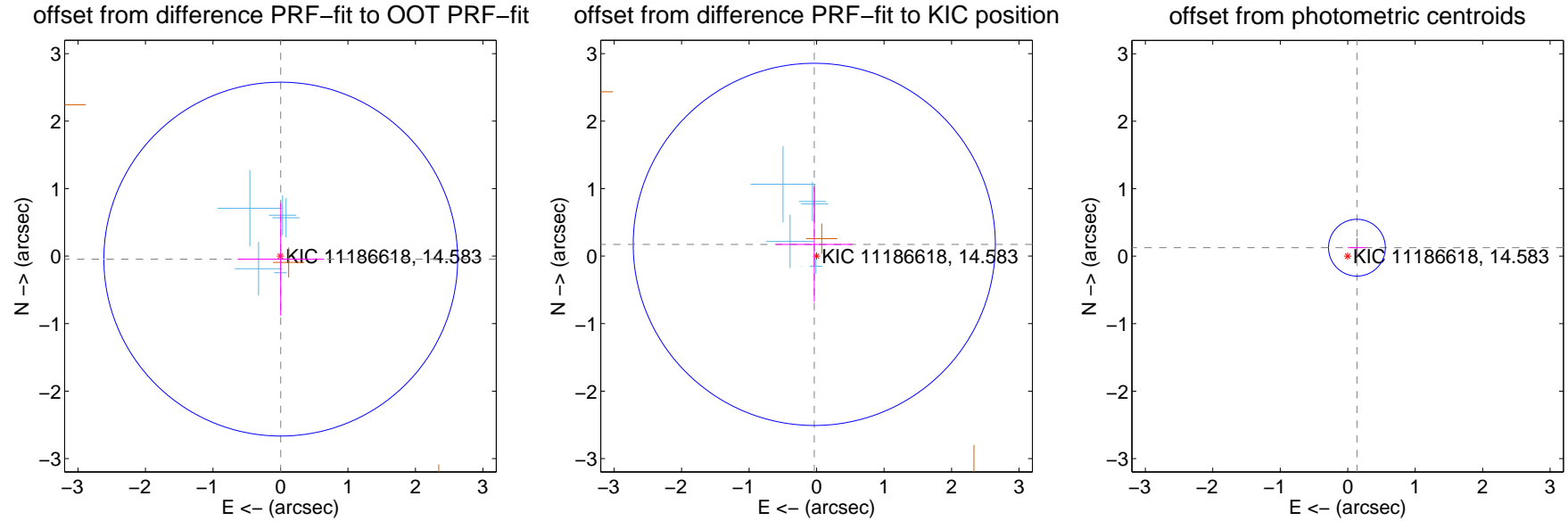
## DV Centroid Data

Supplemental centroid analysis for 011186618-03. Kepler magnitude: 14.58. Transit SNR 10.31

There are 5 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.044 \pm 0.874$	0.05	$-0.004 \pm 0.639$	$-0.044 \pm 0.836$
PRF-fit source offset from KIC position	$0.177 \pm 0.894$	0.20	$0.034 \pm 0.566$	$0.174 \pm 0.851$
photometric centroid source offset	$0.19 \pm 0.14$	1.33	$-0.14 \pm 0.14$	$0.13 \pm 0.14$



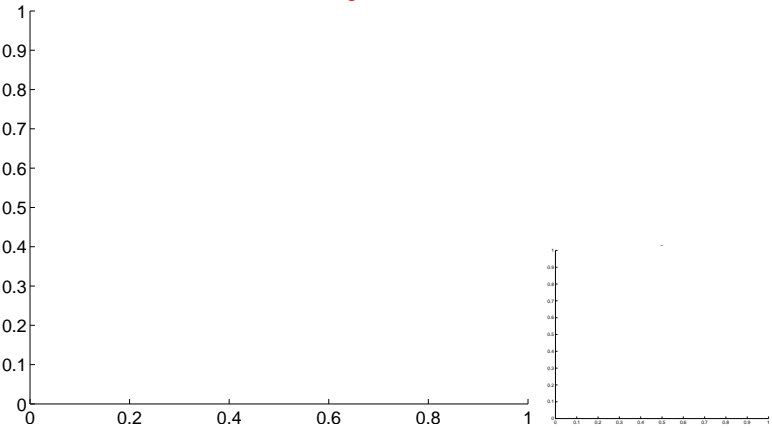
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

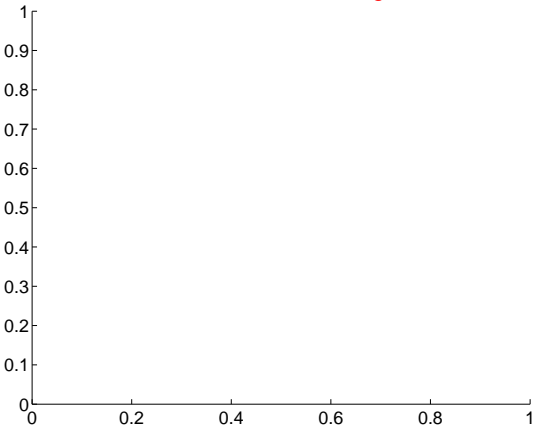
Q1 no difference image



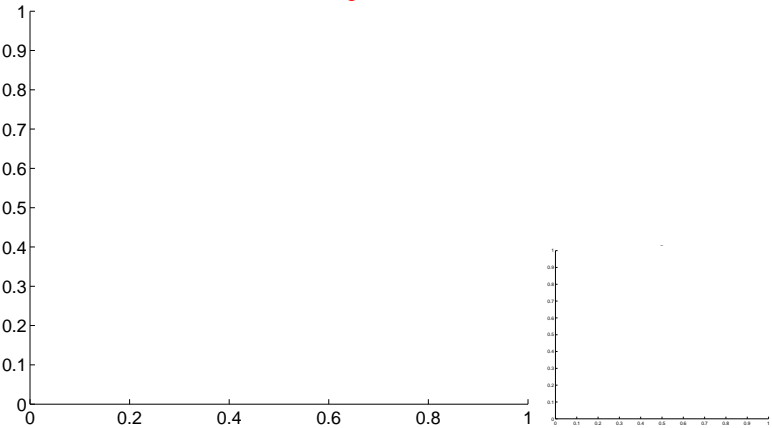
Q1 no OOT image



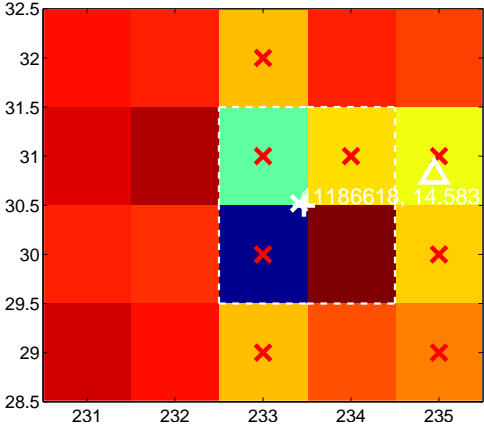
Q2 no difference image



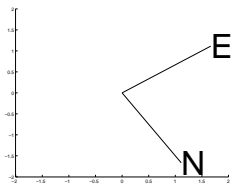
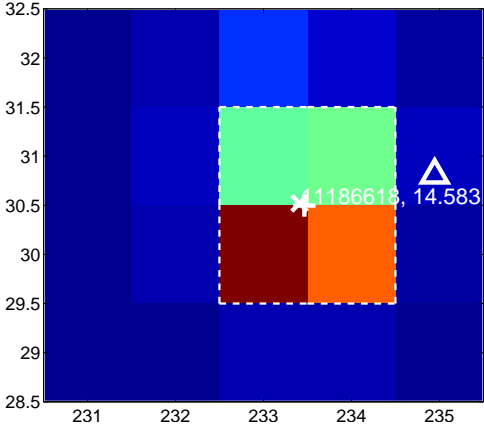
Q2 no OOT image



Q3 difference image. Poor Quality



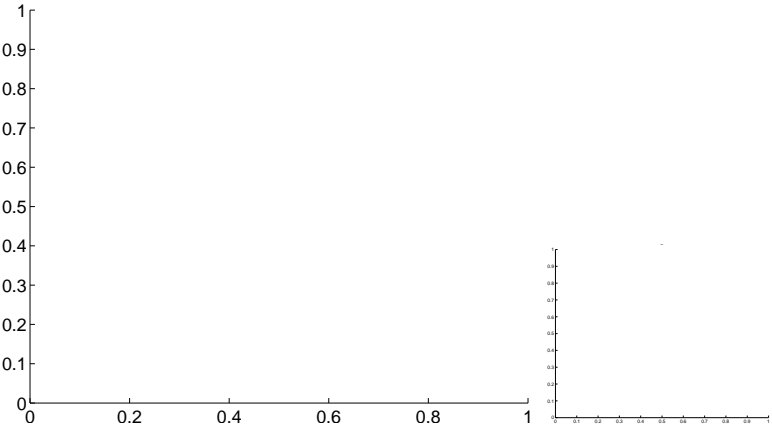
Q3 OOT image



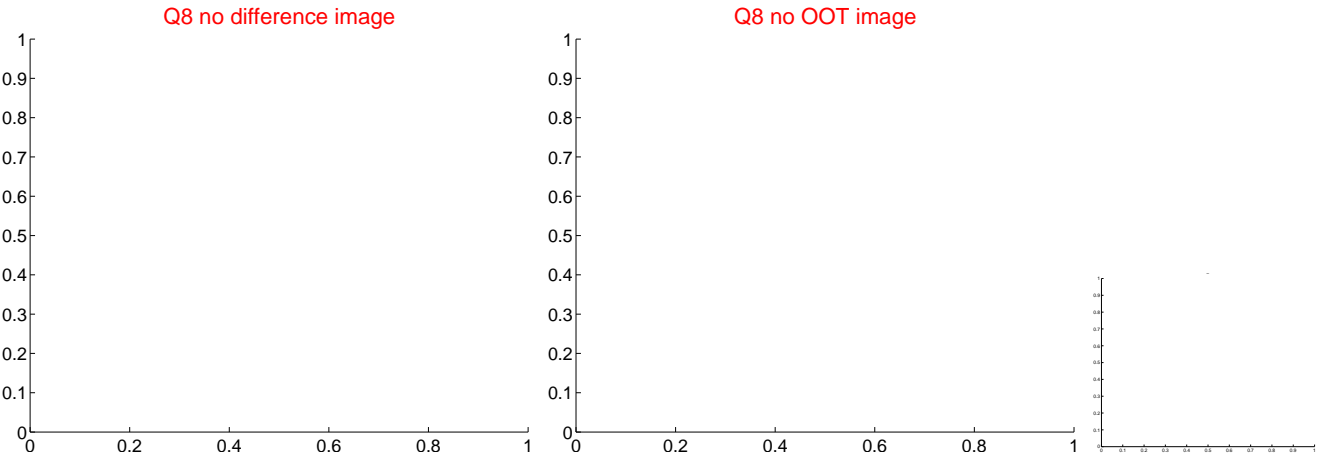
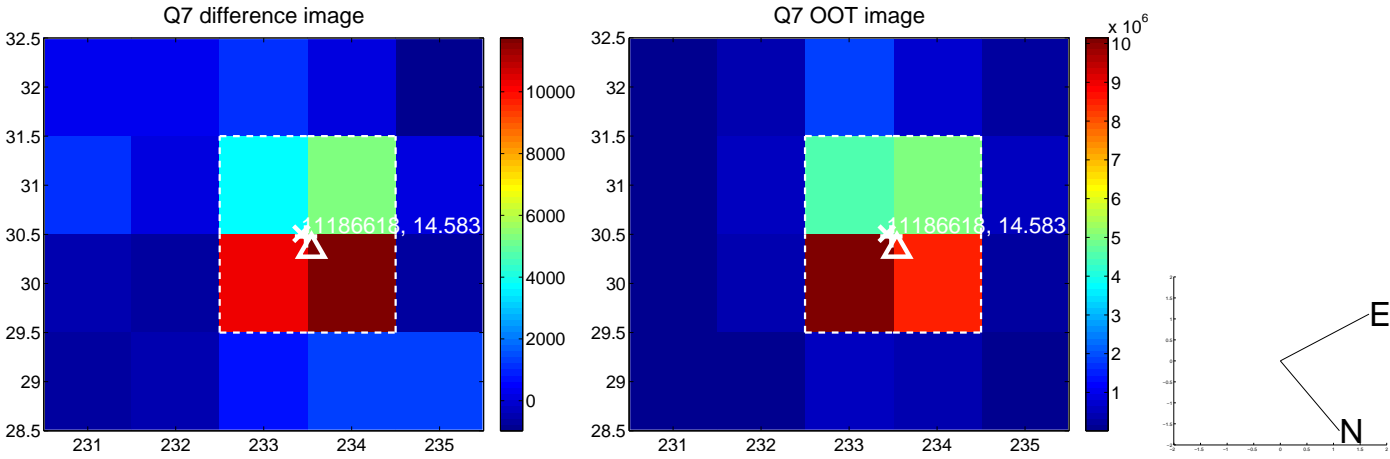
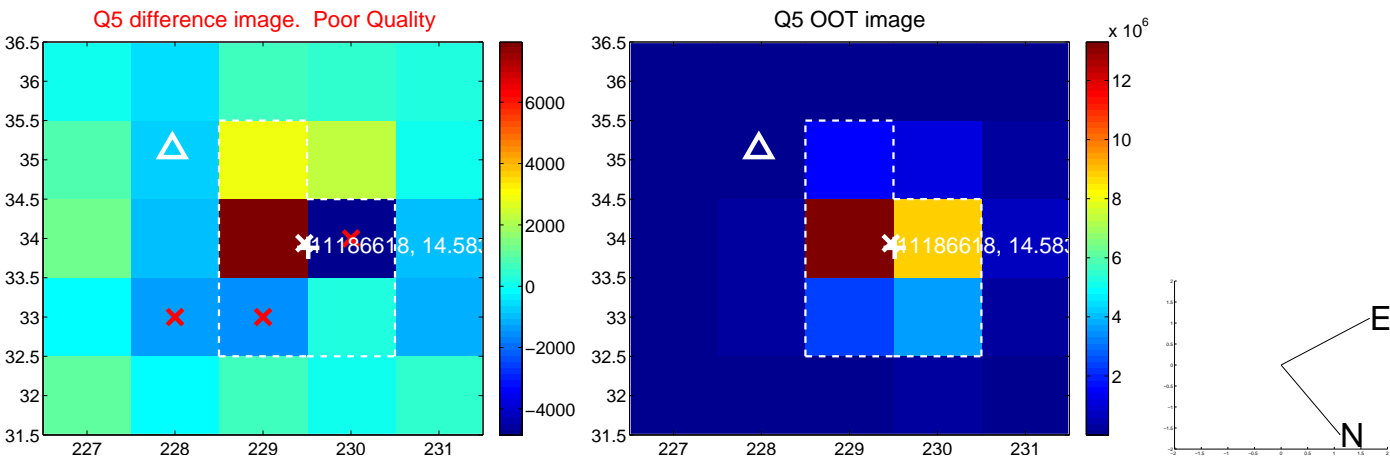
Q4 no difference image



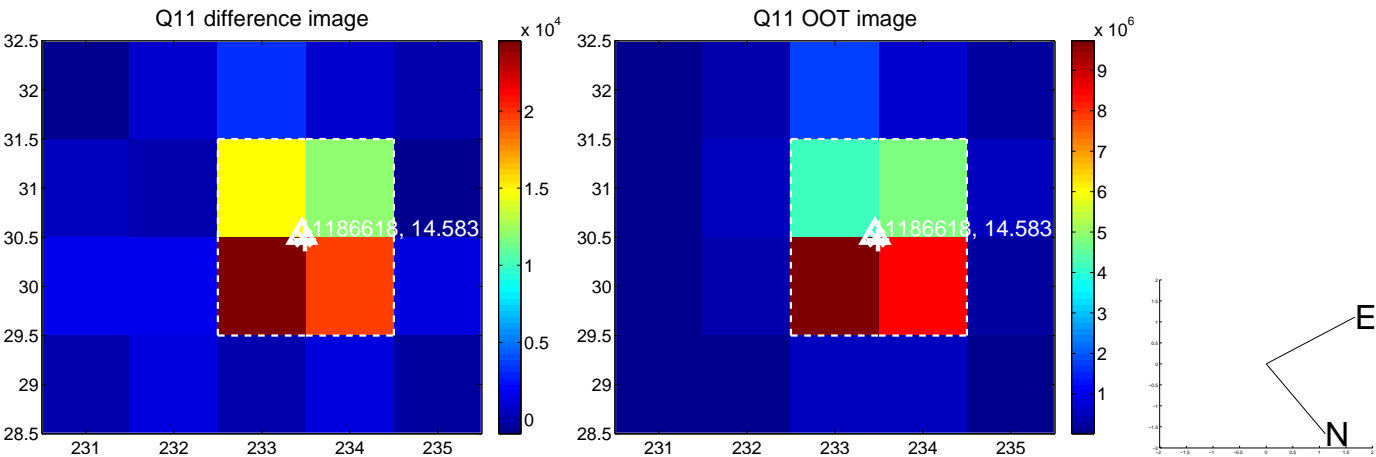
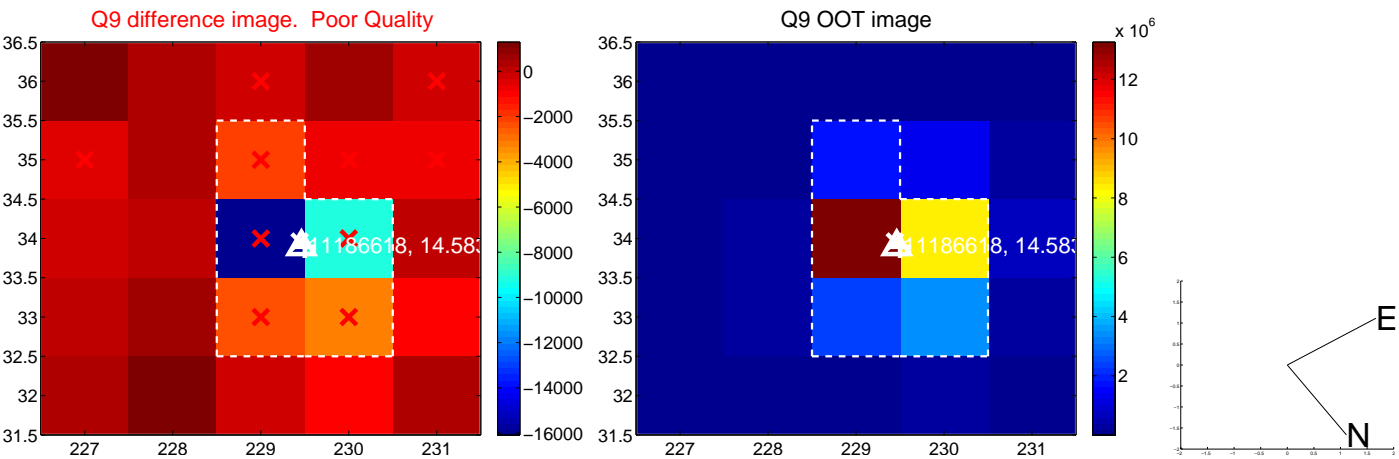
Q4 no OOT image



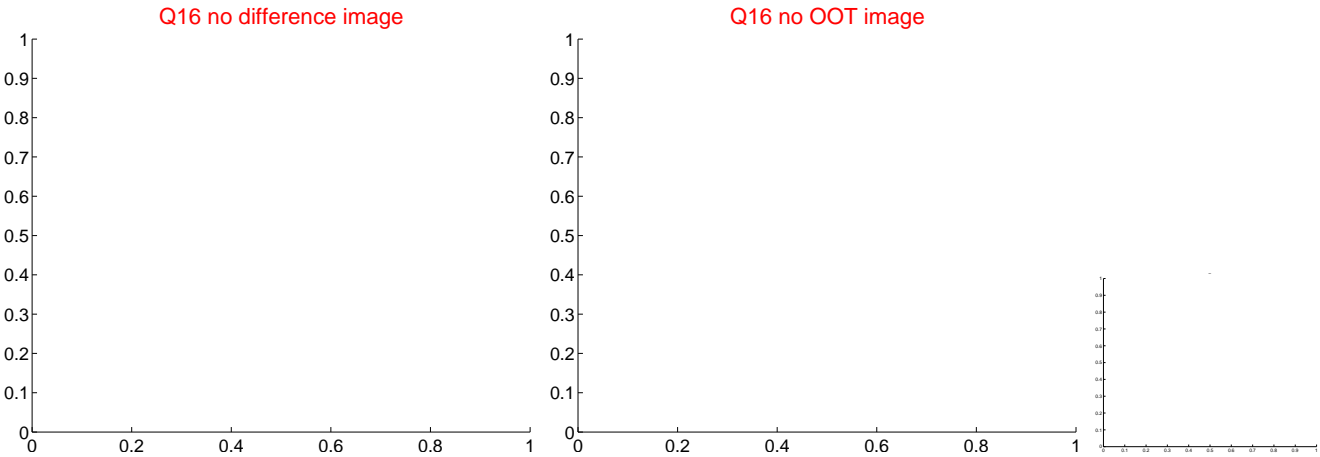
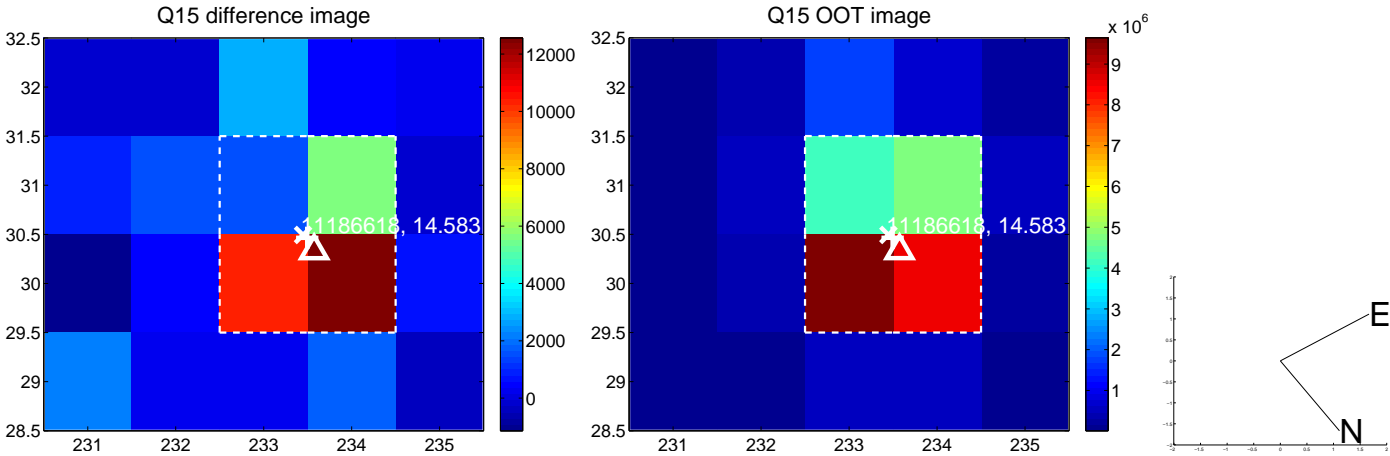
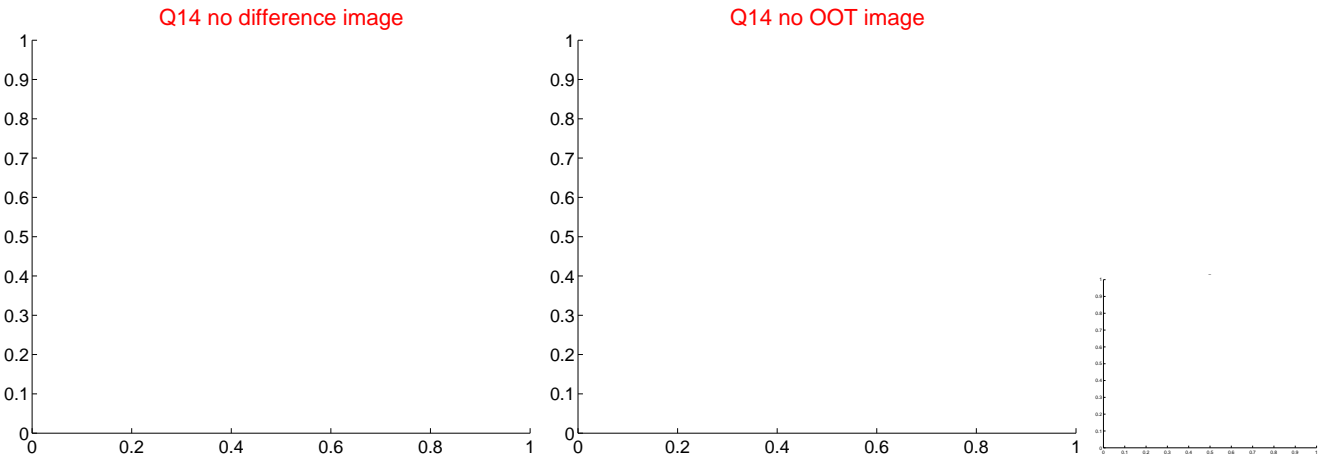
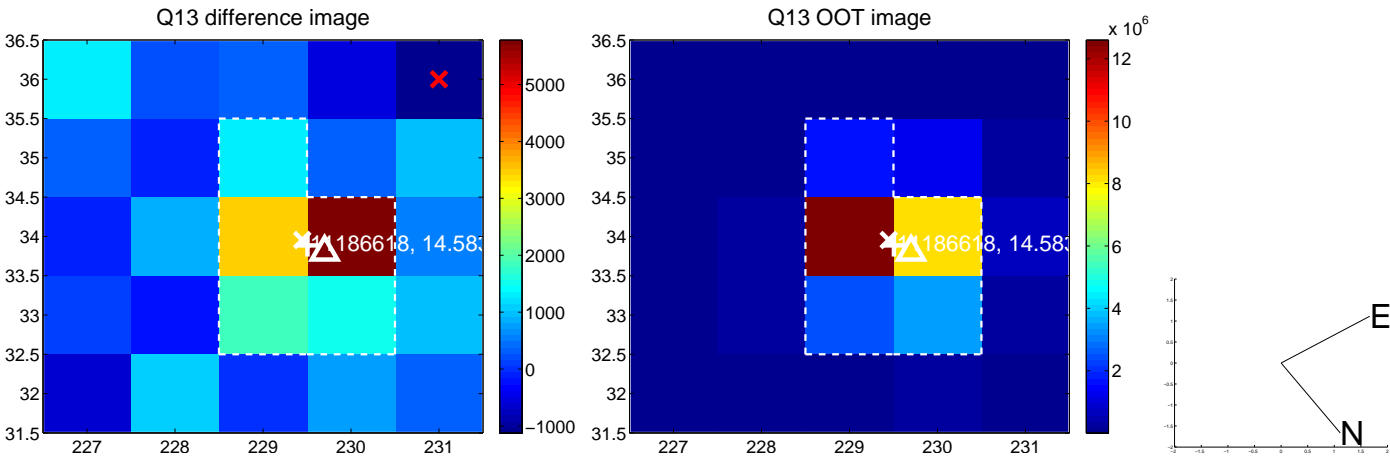
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



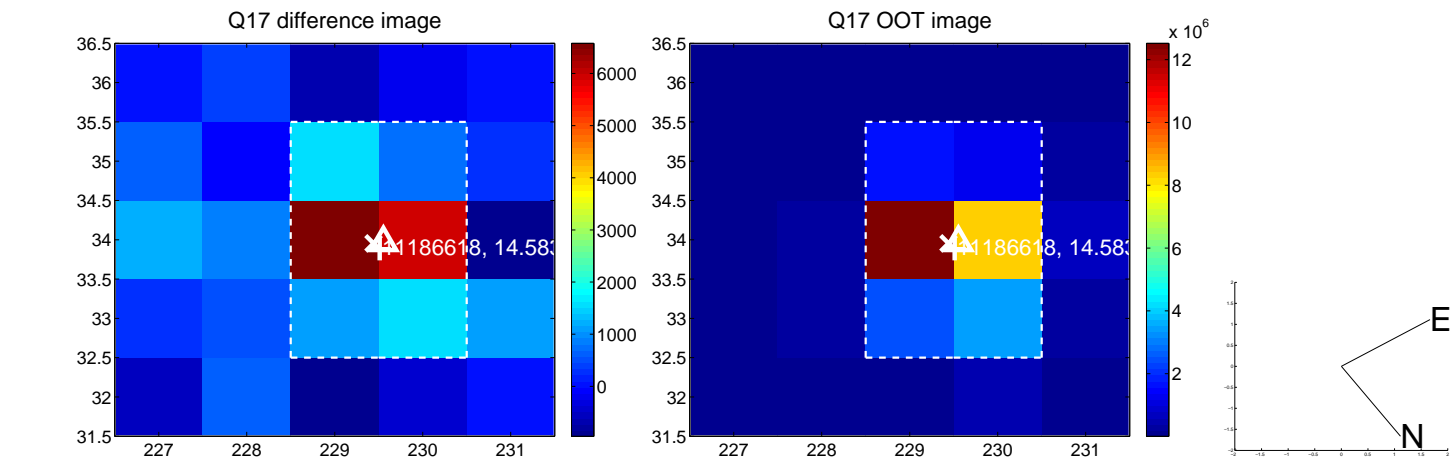
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



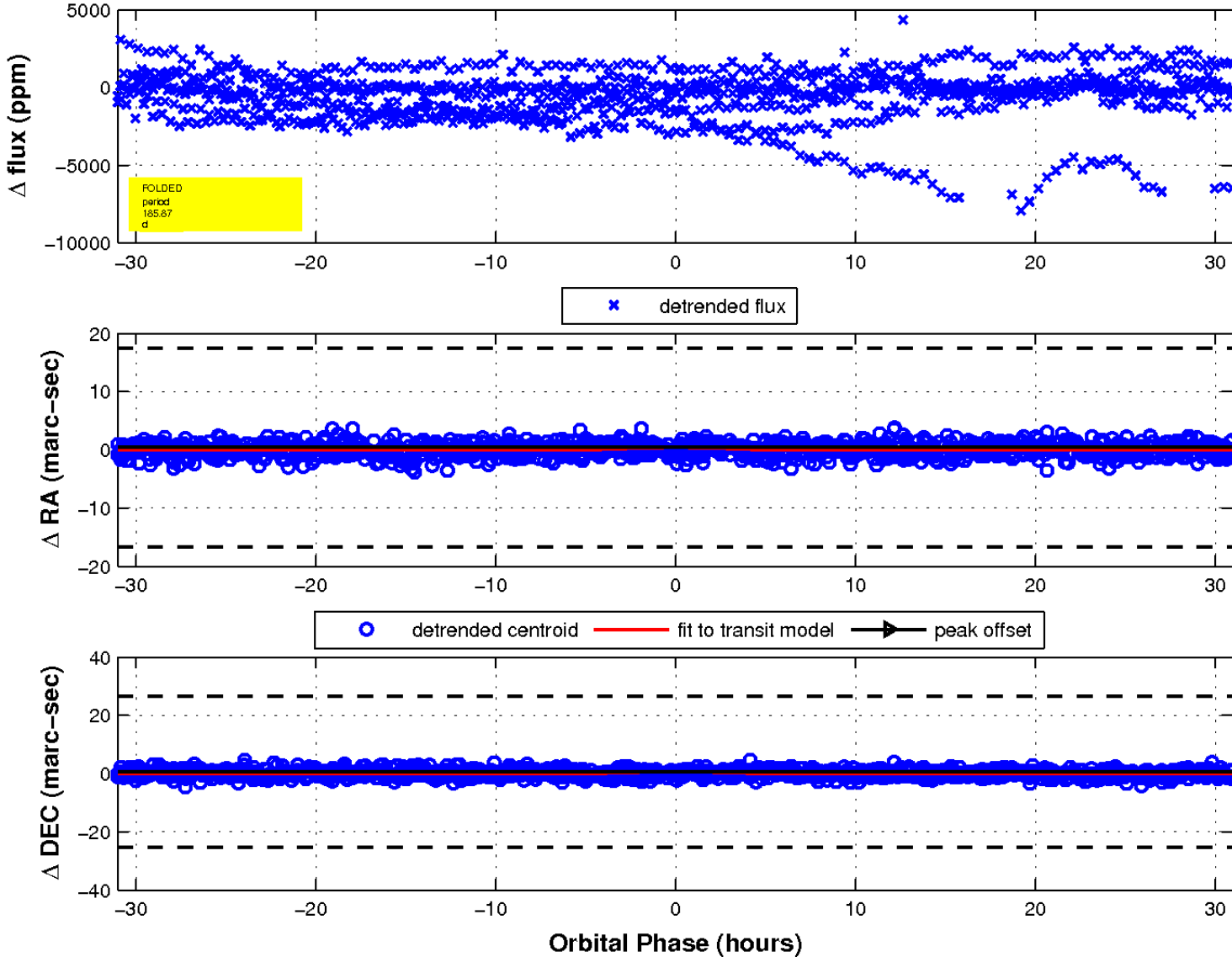
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



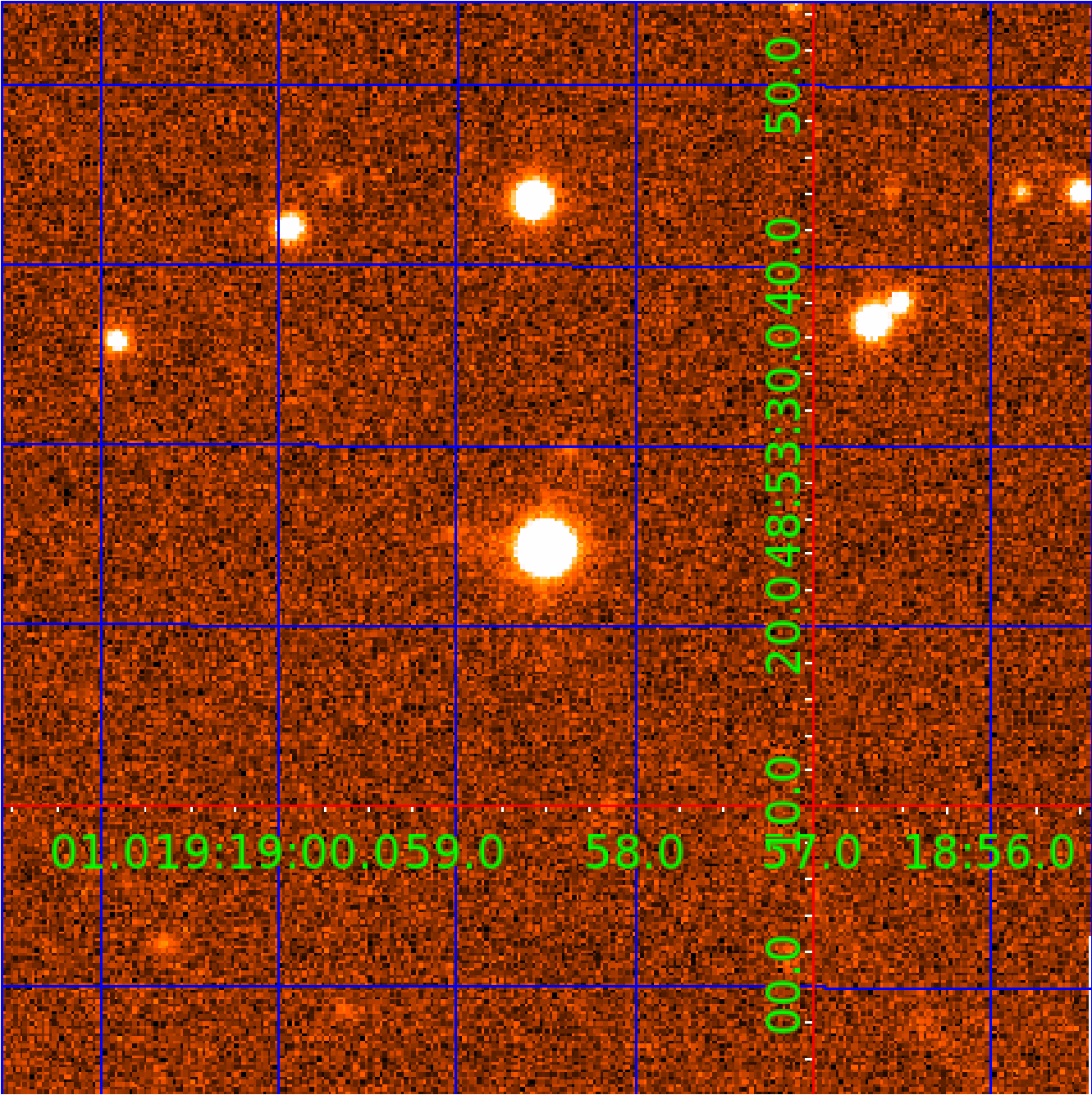
fluxWeightedCentroids, Planet 3 of 8





UKIRT Image

Declination



# KIC 011186618

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011186618-01	OBS	No	0.942573	131.654324	40.6	5.694	9.6	6.8	0.53	4671	0.37	509.57
011186618-02	OBS	No	167.860775	173.465028	2915.5	13.204	17.4	10.9	0.53	4671	5.45	0.51
011186618-03	OBS	No	185.867599	266.571084	3029.4	10.359	13.2	10.3	0.53	4671	5.58	0.44
011186618-04	OBS	No	87.907703	191.522304	1248.1	5.052	12.5	7.5	0.53	4671	1.99	1.21
011186618-05	OBS	No	58.594744	176.774498	583.6	6.364	9.3	4.1	0.53	4671	1.46	2.07
011186618-06	OBS	No	125.616664	136.793538	271.6	7.769	9.3	1.4	0.53	4671	1.04	0.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011186618-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
011186618-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_MEAS
011186618-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
011186618-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

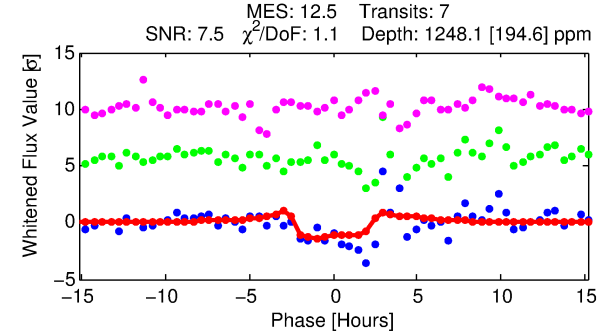
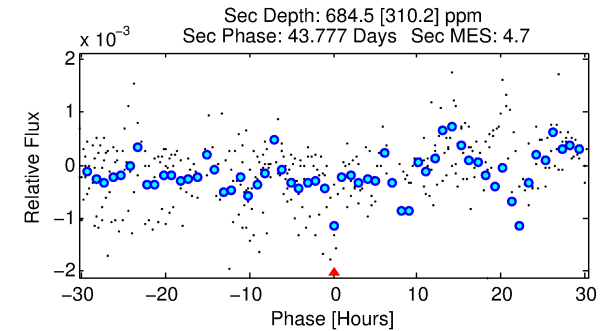
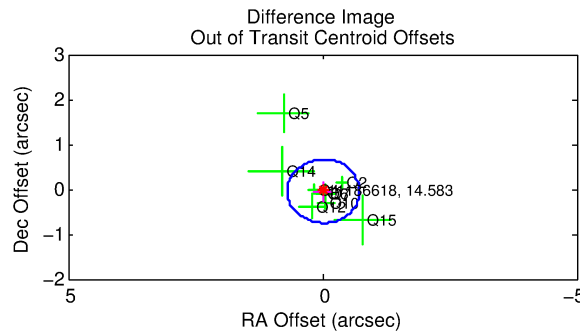
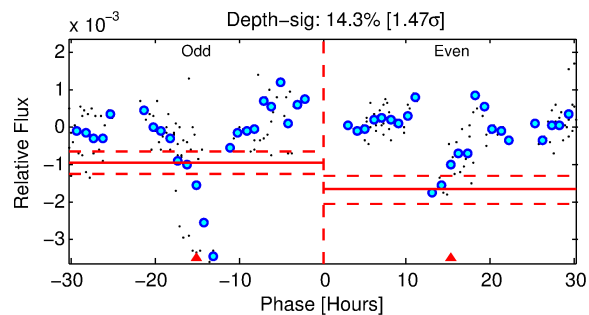
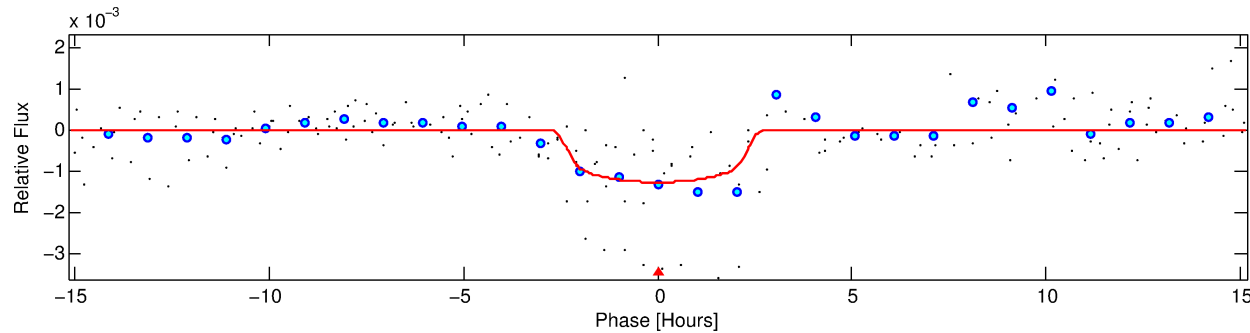
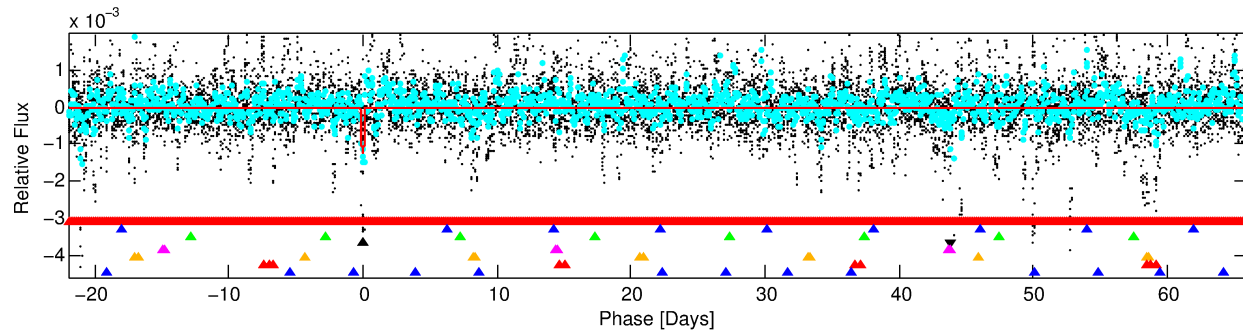
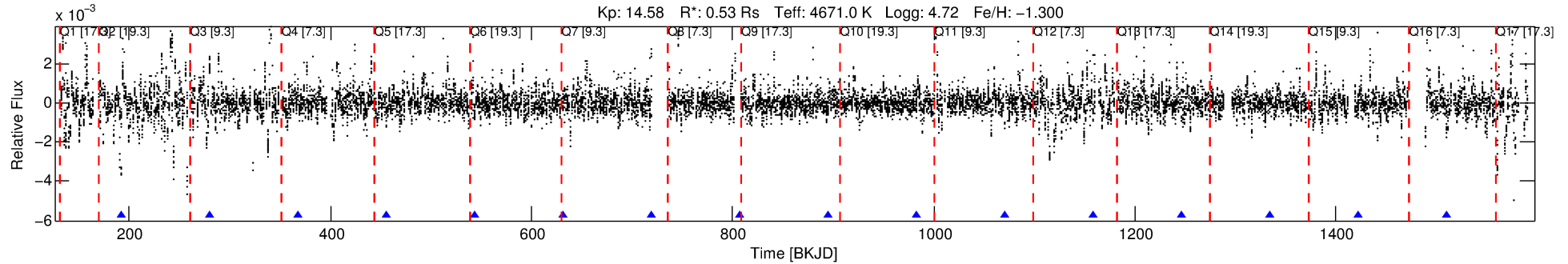
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011186618-04

No Significant Match Found

# DV One-Page Summary

KIC: 11186618 Candidate: 4 of 8 Period: 87.908 d



## DV Fit Results:

Period = 87.90770 [0.00103] d  
Epoch = 191.5223 [0.0085] BKJD  
Rp/R\* = 0.0345 [0.0165]  
a/R\* = 100.97 [181.48]  
b = 0.70 [1.31]  
Seff = 1.20 [0.19]  
Teq = 267 [11] K  
Rp = 1.99 [0.96] Re  
a = 0.3142 [0.0193] AU  
Ag = 9385.68 [9963.67] [0.94 $\sigma$ ]  
Teffp = 4065 [1083] K [3.51 $\sigma$ ]

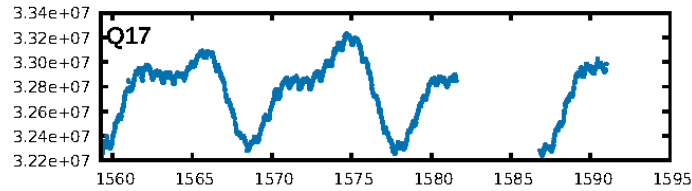
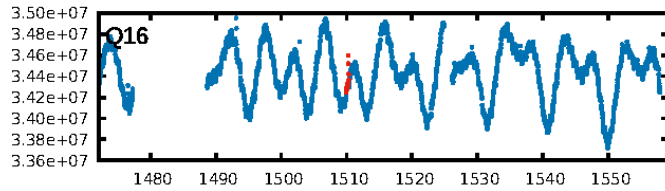
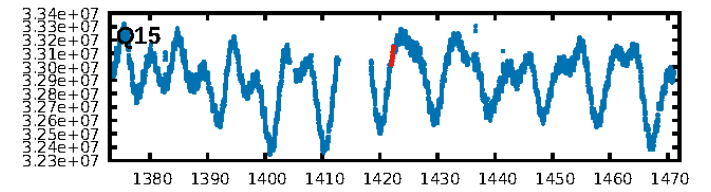
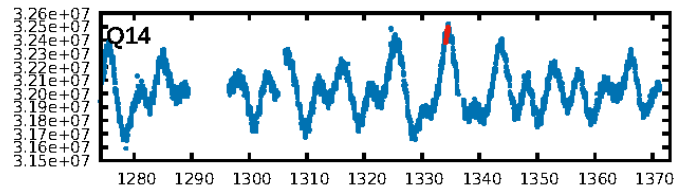
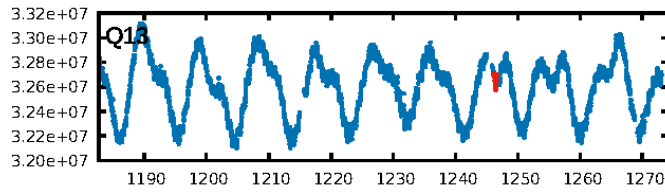
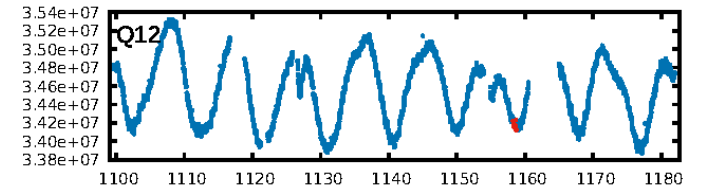
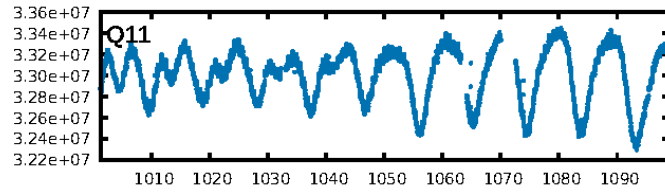
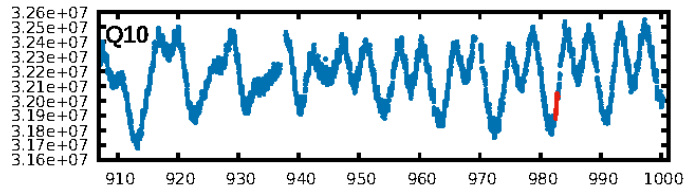
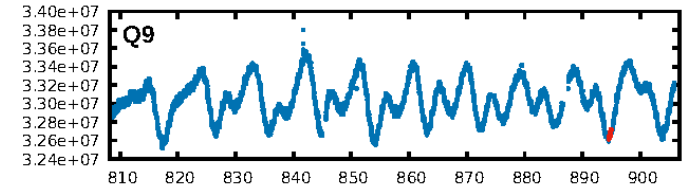
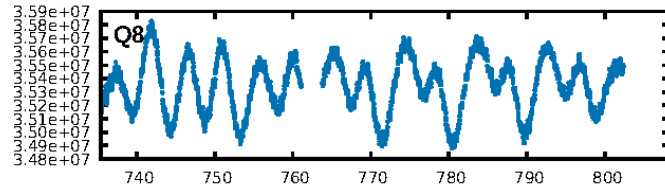
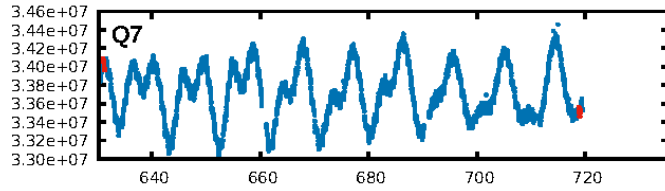
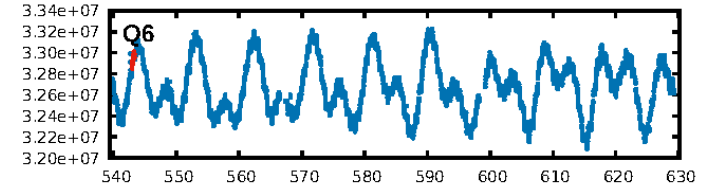
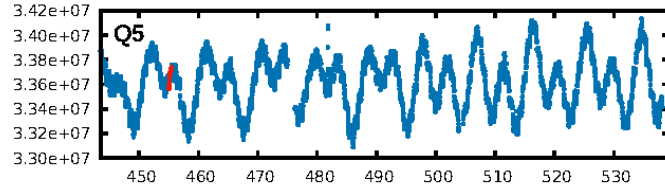
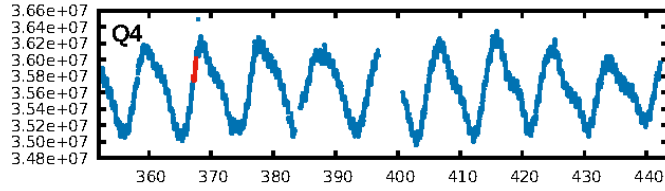
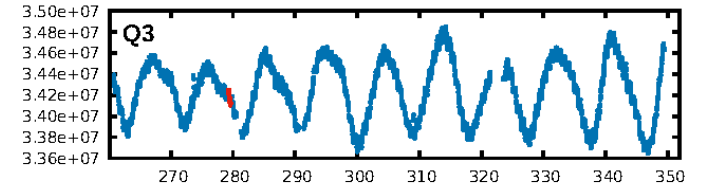
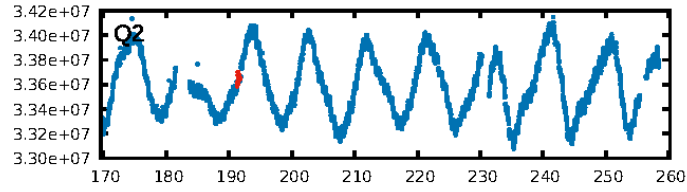
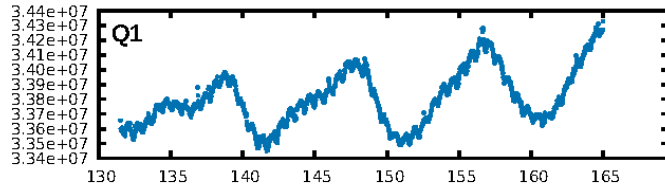
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [86.58 $\sigma$ ]  
LongPeriod-sig: 100.0% [64.51 $\sigma$ ]  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: 1.642  
Centroid-sig: 44.5%  
Centroid-so: 0.456 arcsec [1.60 $\sigma$ ]  
OotOffset-rm: 0.048 arcsec [0.20 $\sigma$ ]  
KicOffset-rm: 0.278 arcsec [1.60 $\sigma$ ]  
OotOffset-st: 4/2/2/1 [9]  
KicOffset-st: 4/2/2/1 [9]  
DiffImageQuality-fgm: 0.44 [4/9]  
DiffImageOverlap-fno: 0.00 [0/11]

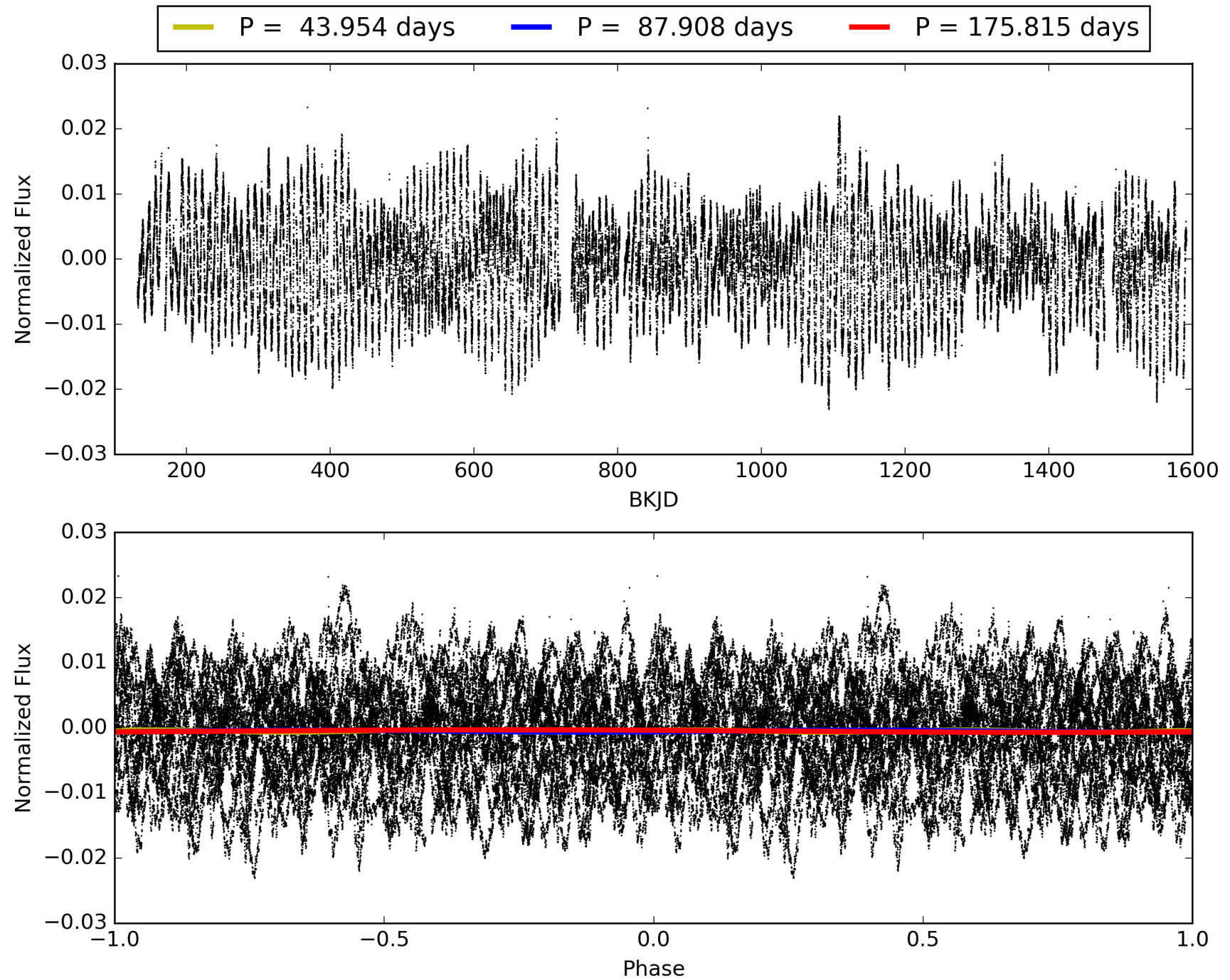
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:28:31 Z

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

# TCE 011186618-04, PDC Light Curves

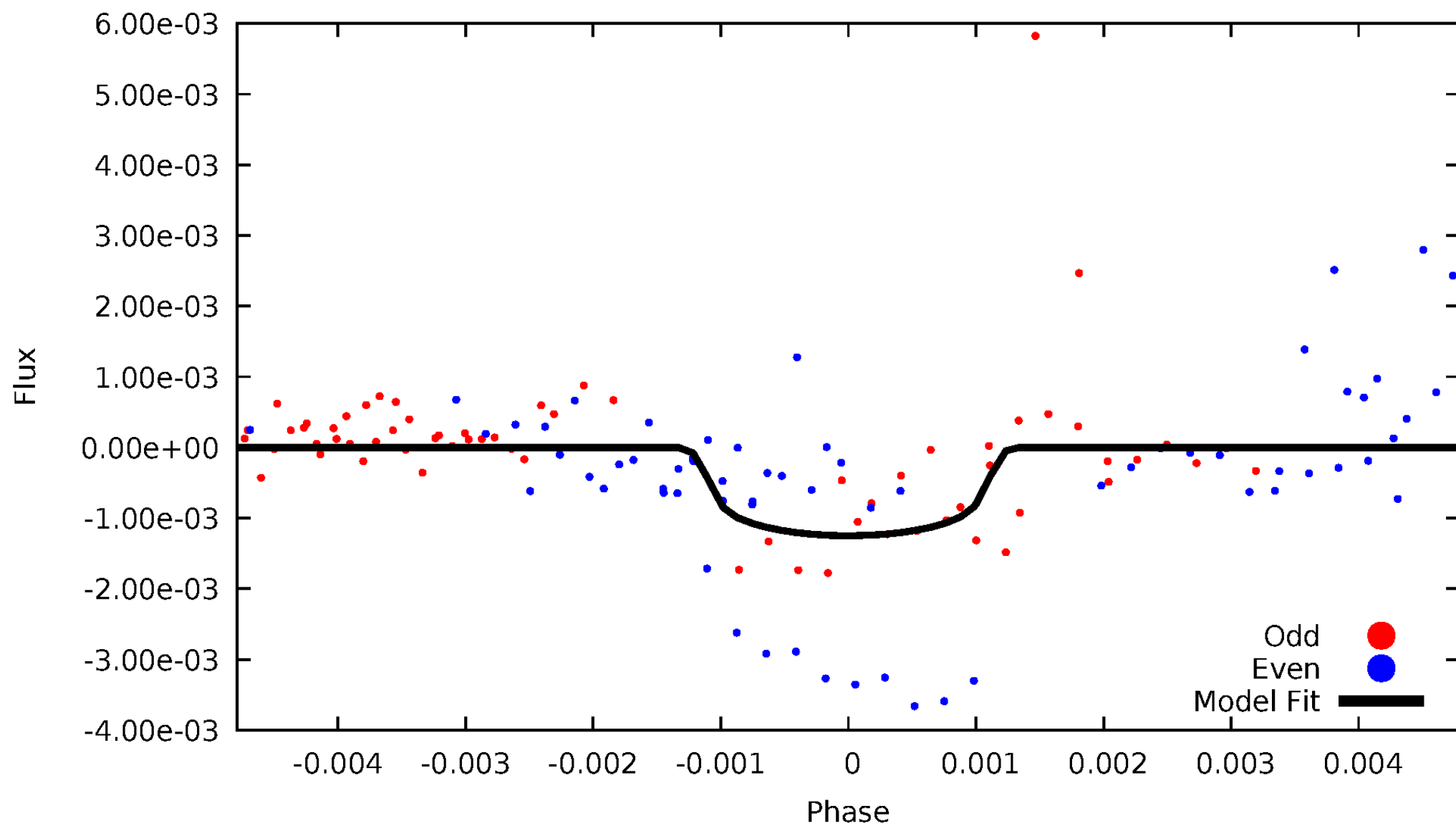


# TCE 011186618-04



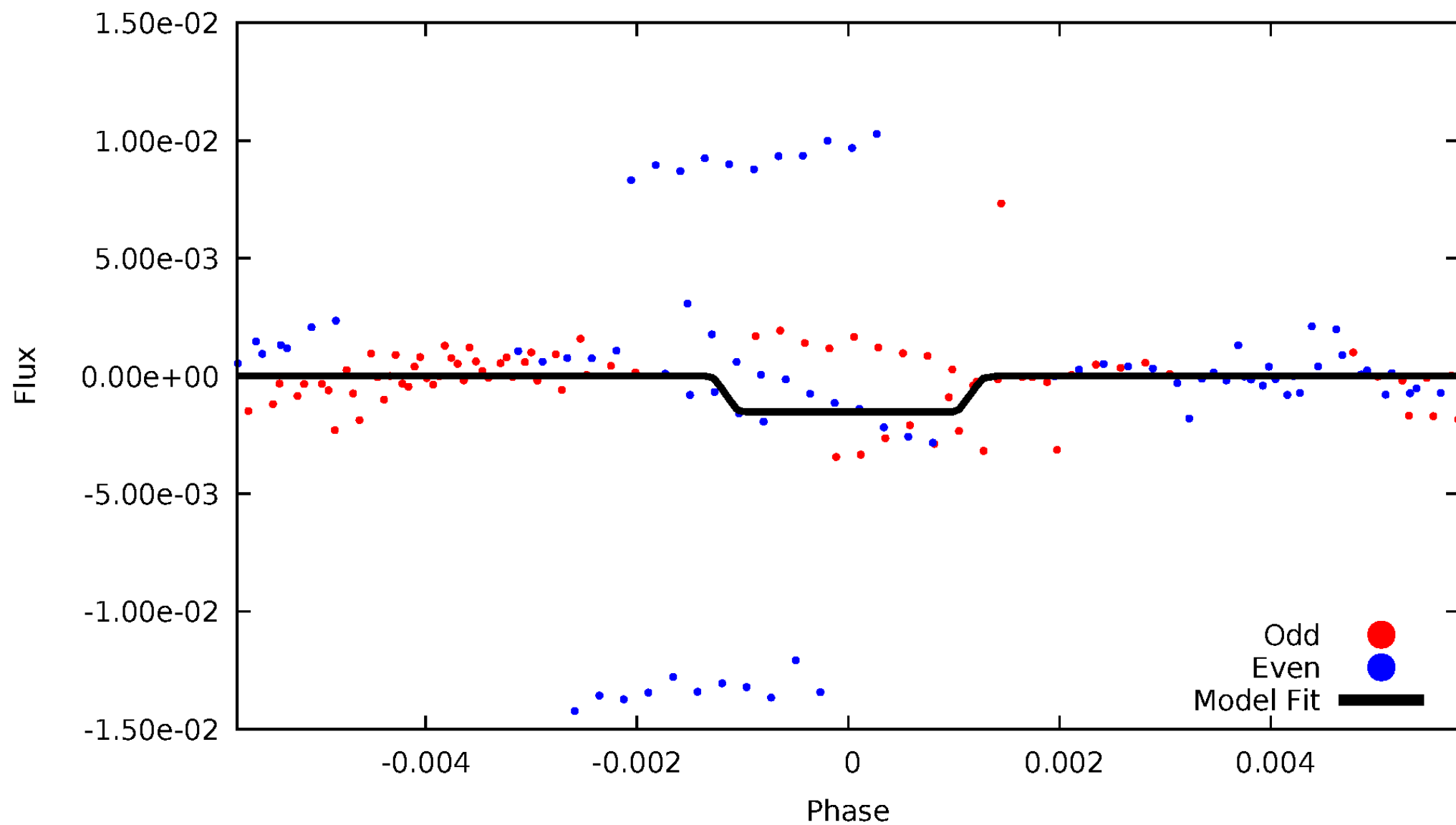
# DV Odd/Even

TCE 011186618-04



# ALT Odd/Even

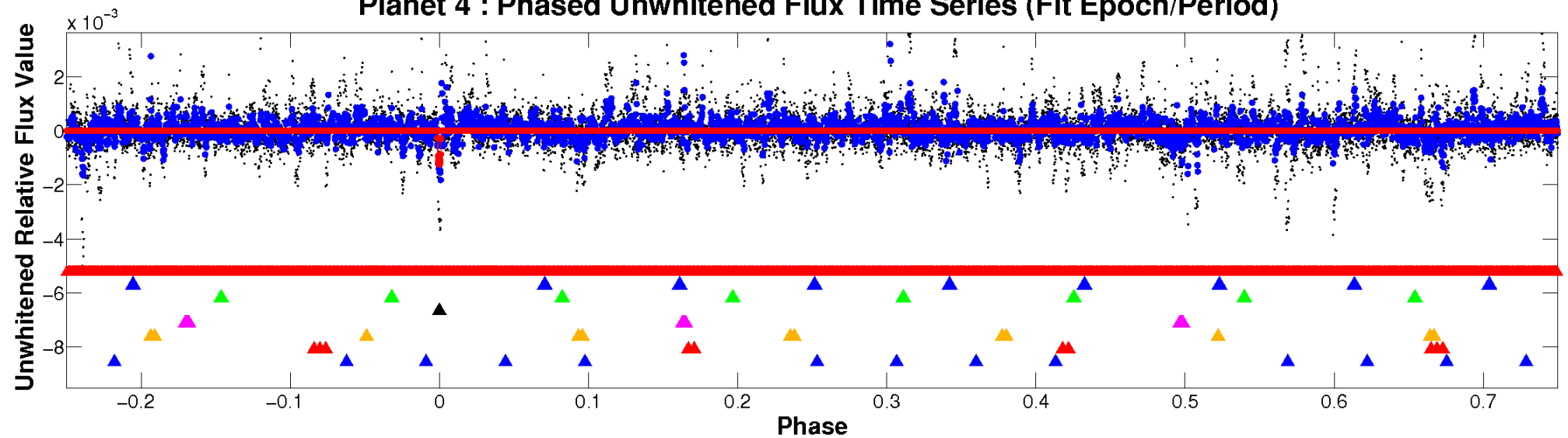
TCE 011186618-04



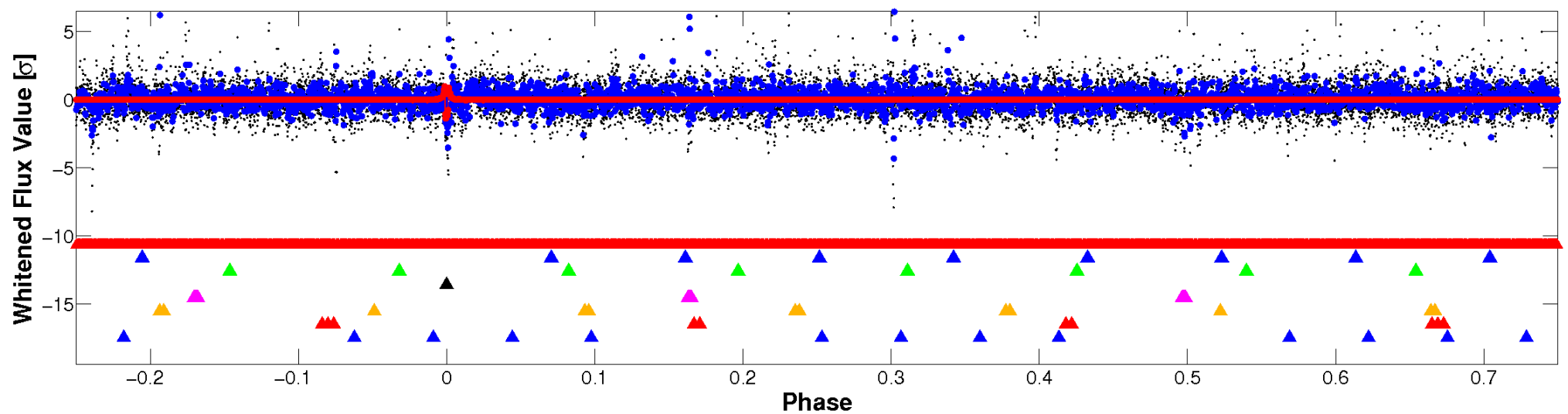


# Non-Whitened Vs. Whitened Light Curve

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

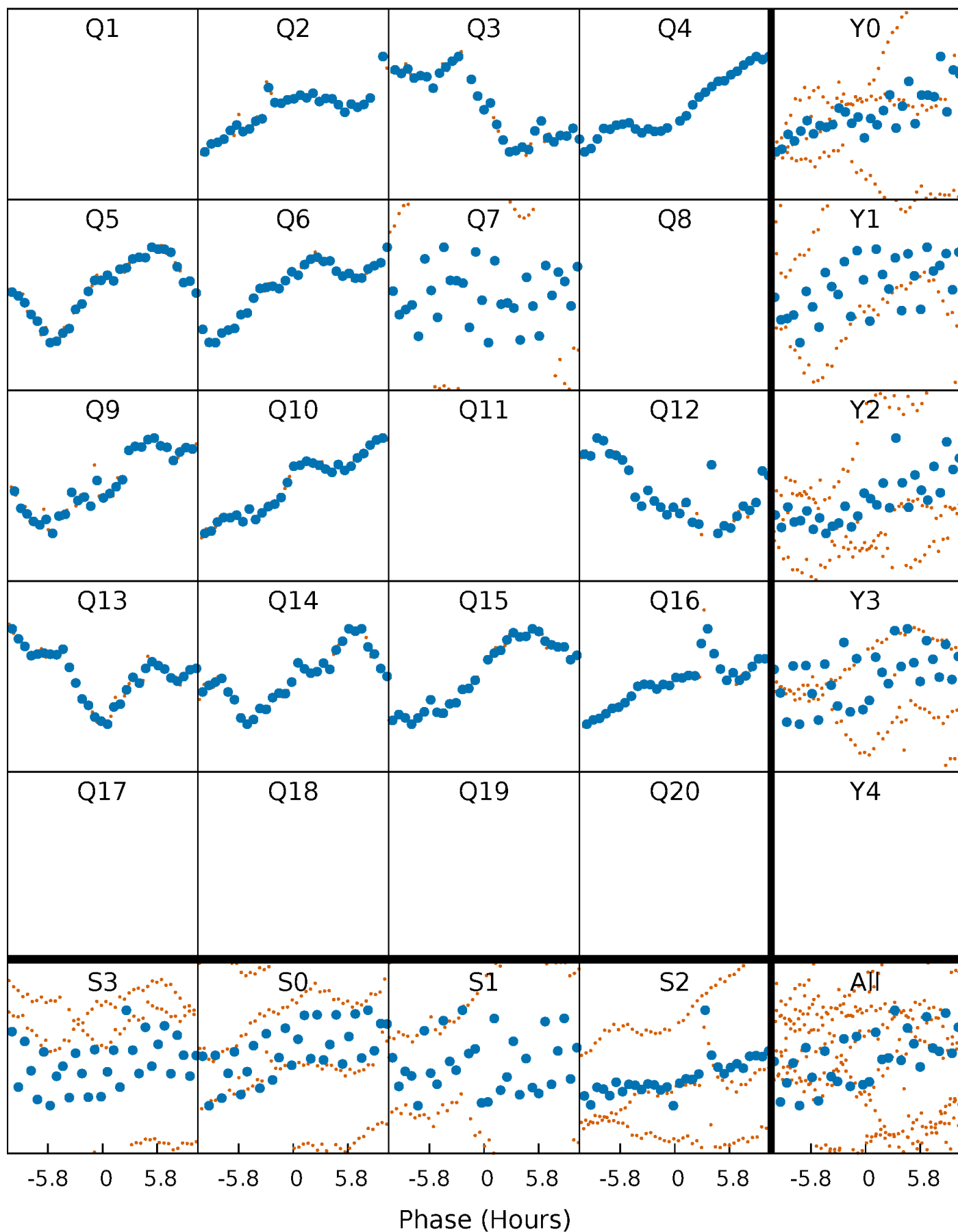


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



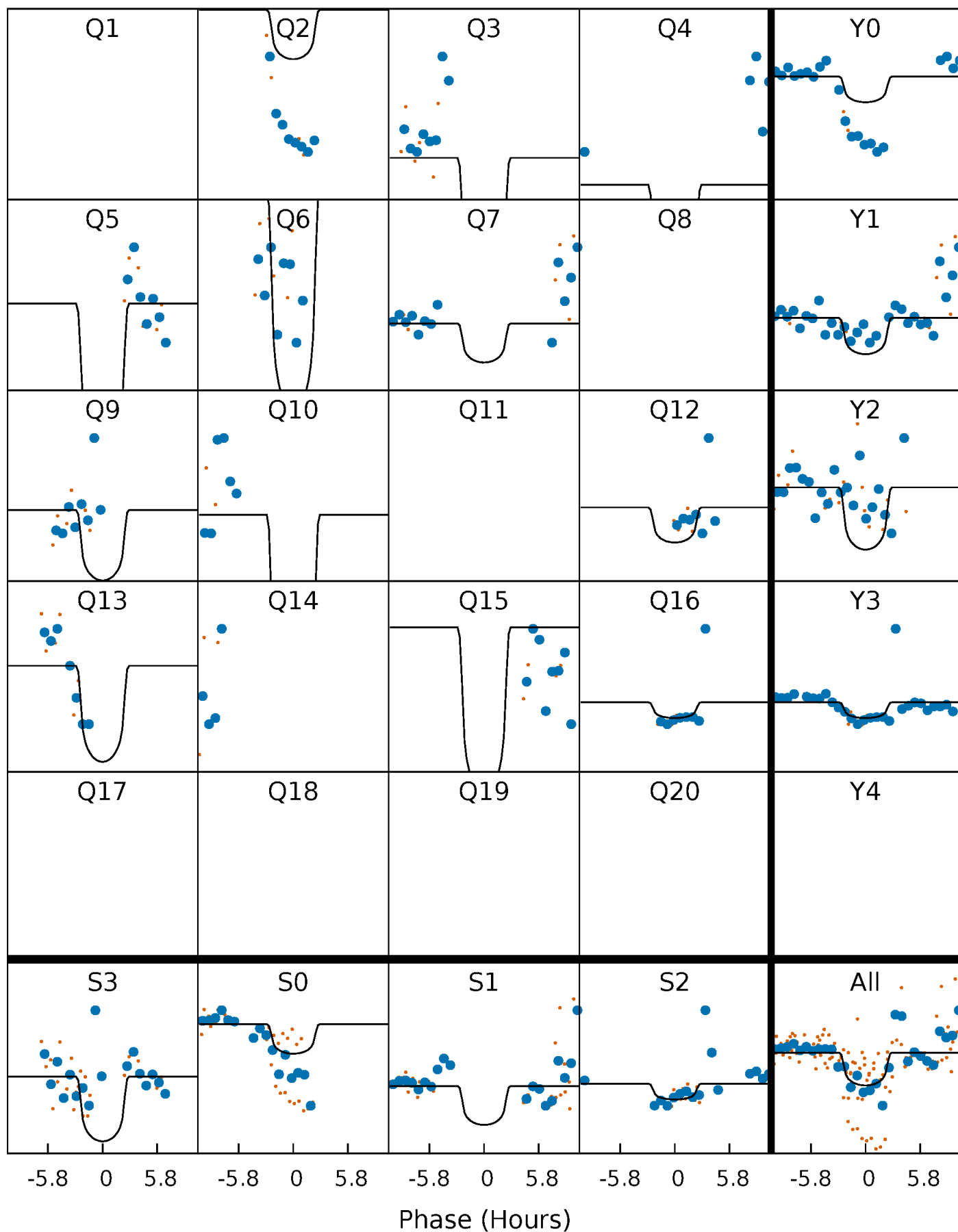
# PDC Quarter-Phased Transit Curves

TCE 011186618-04 P= 87.907703 Days  $T_0=191.522304$  (BKJD)



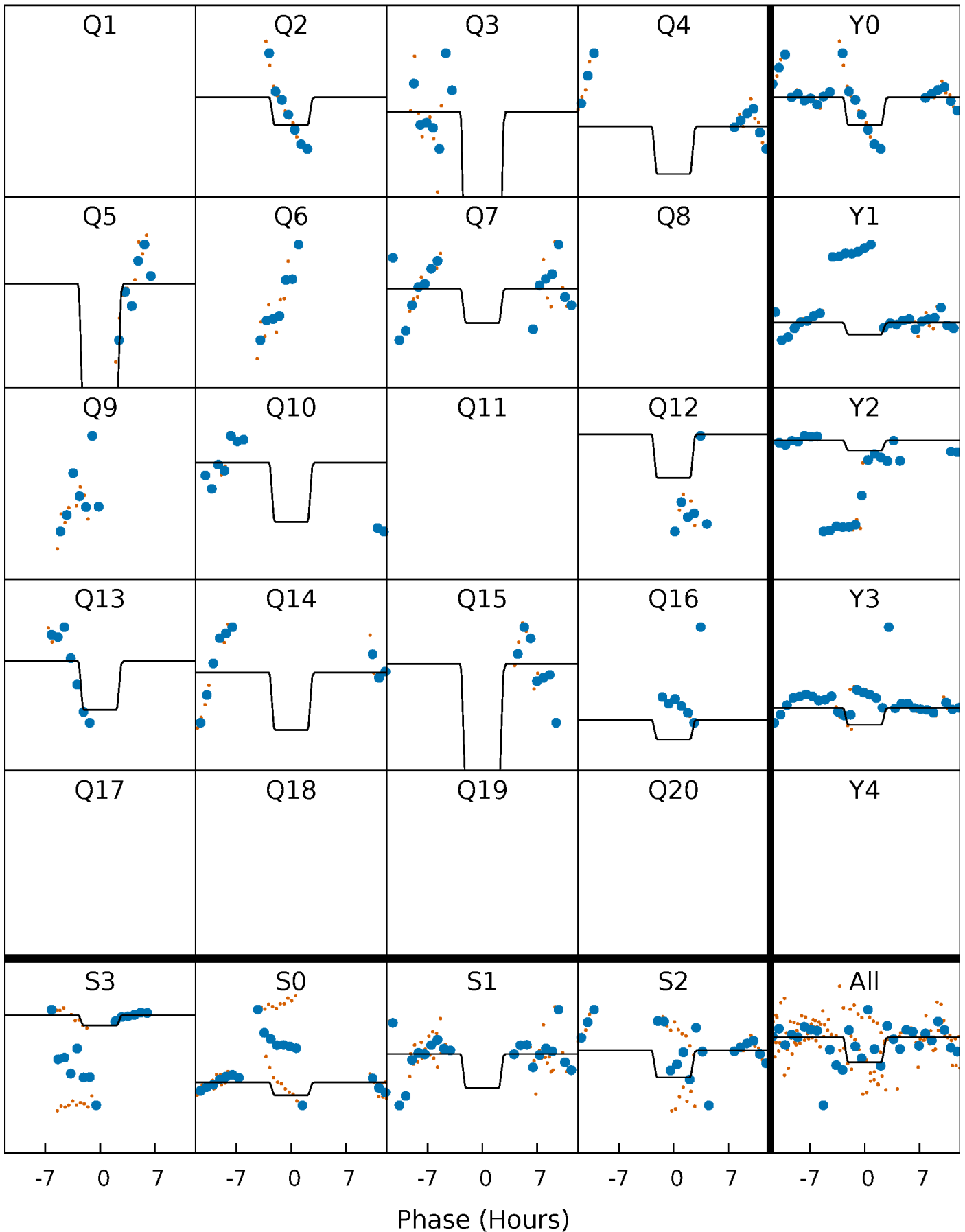
# DV Quarter-Phased Transit Curves

TCE 011186618-04 P= 87.907703 Days  $T_0=191.522304$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

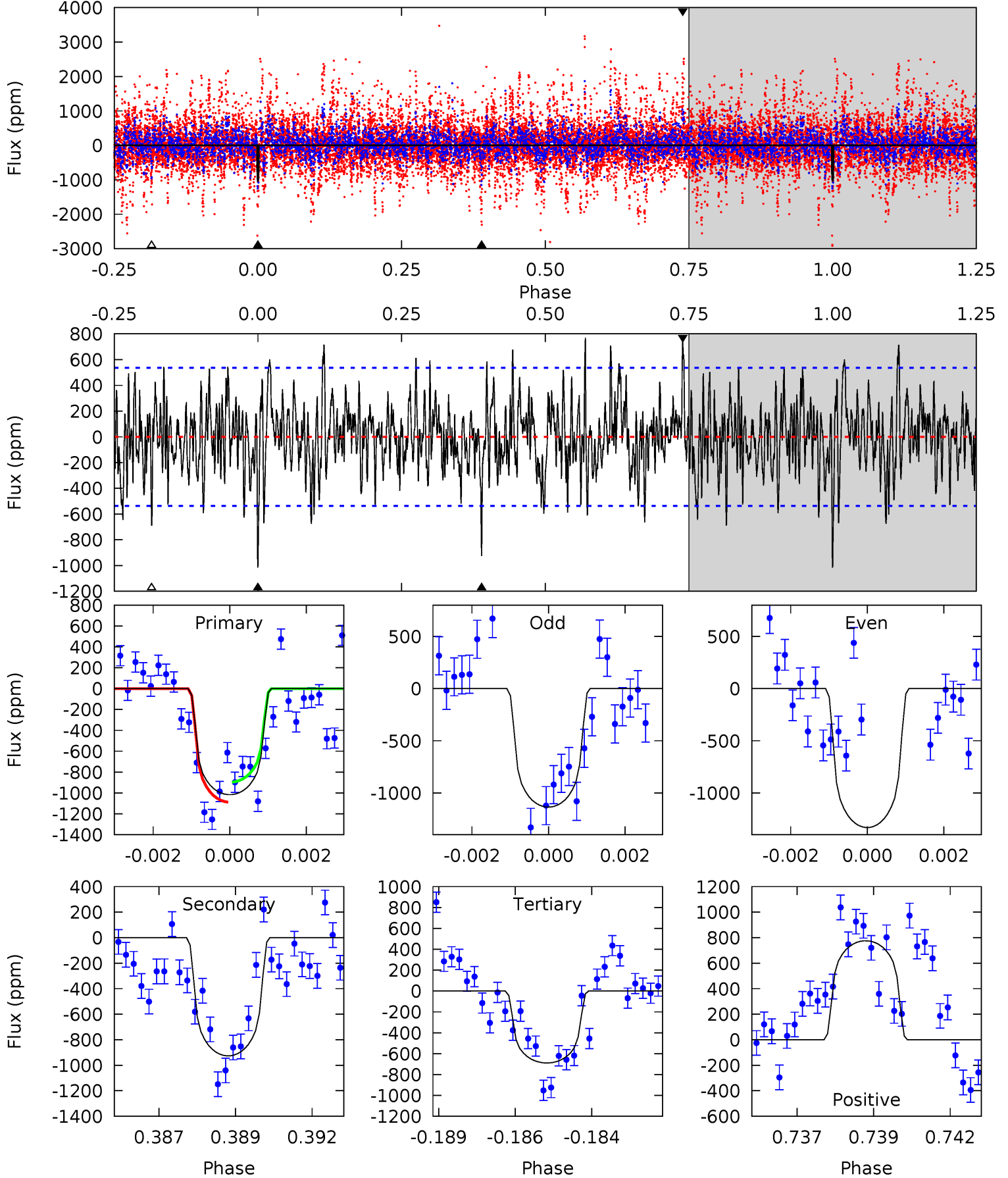
TCE 011186618-04 P= 87.906739 Days  $T_0=191.538472$  (BKJD)



# DV Model-Shift Uniqueness Test

011186618-04, P = 87.907703 Days, E = 103.614601 Days

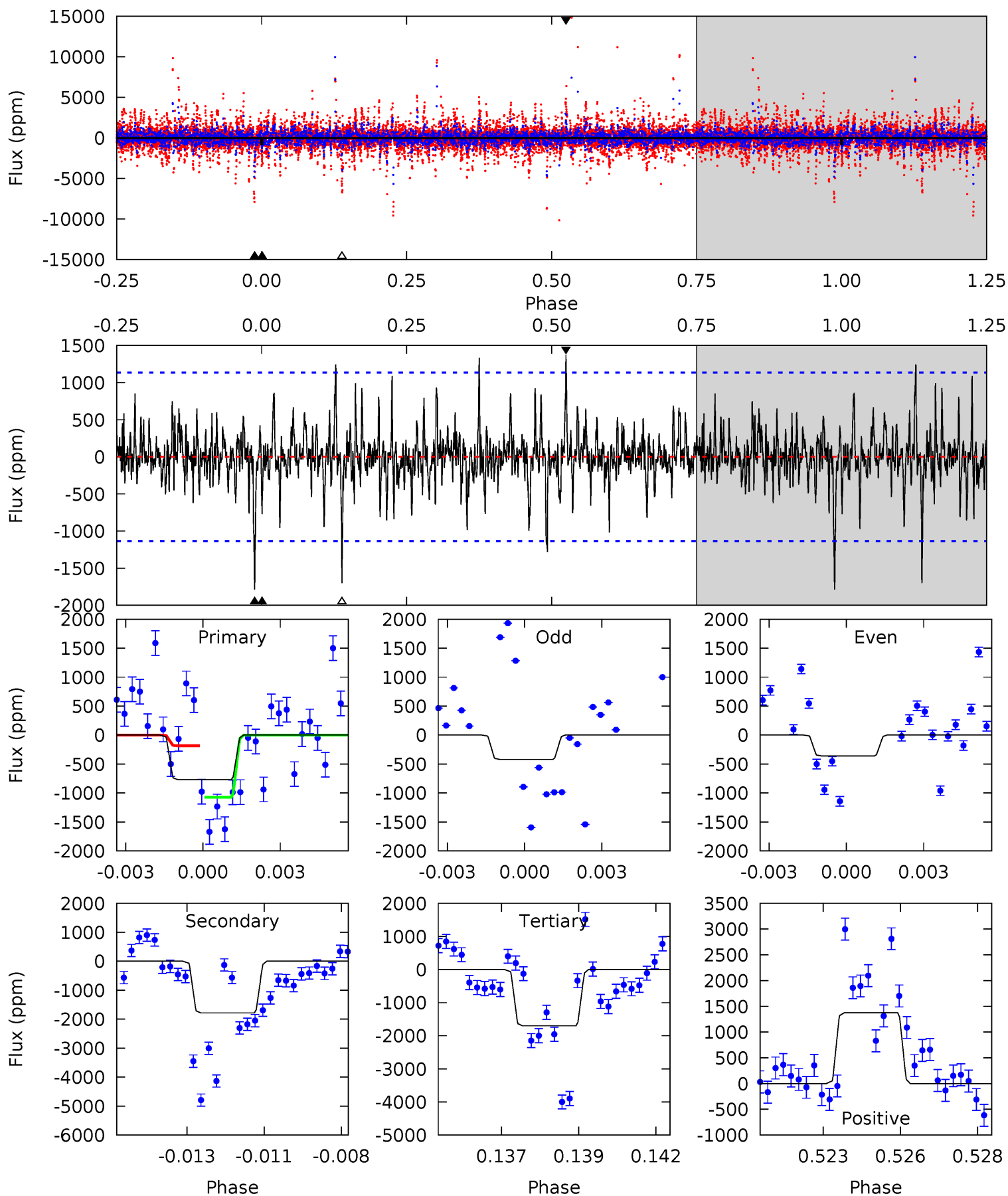
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.0	9.13	6.80	7.65	5.29	3.03	2.30	3.23	2.37	2.34	1.48	0.94	1.45	0.43	0.93



# Alt Model-Shift Uniqueness Test

011186618-04, P = 87.906739 Days, E = 103.631733 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
3.58	8.30	7.91	6.39	5.27	3.00	1.35	-4.34	-2.81	0.38	1.91	0.12	1.16	0.44	2.06



### Stellar Parameters For KIC 011186618

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4671^{+125}_{-153}$	$4.721^{+0.052}_{-0.024}$	$-1.300^{+0.300}_{-0.350}$	$0.528^{+0.029}_{-0.037}$	$0.534^{+0.036}_{-0.022}$	$5.111^{+1.091}_{-0.505}$
	+3%/-3%	+1%/-1%	+23%/-27%	+5%/-7%	+7%/-4%	+21%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 011186618-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-926 \pm 101$	$1.93^{+1.00}_{-0.77}$	$371^{+12}_{-13}$	$4467^{+1184}_{-625}$	$13540^{+25303}_{-7746}$
Alt.	$-1785 \pm 215$	$2.29^{+0.94}_{-1.01}$	$370^{+12}_{-13}$	$4780^{+1393}_{-620}$	$18813^{+40630}_{-9743}$

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



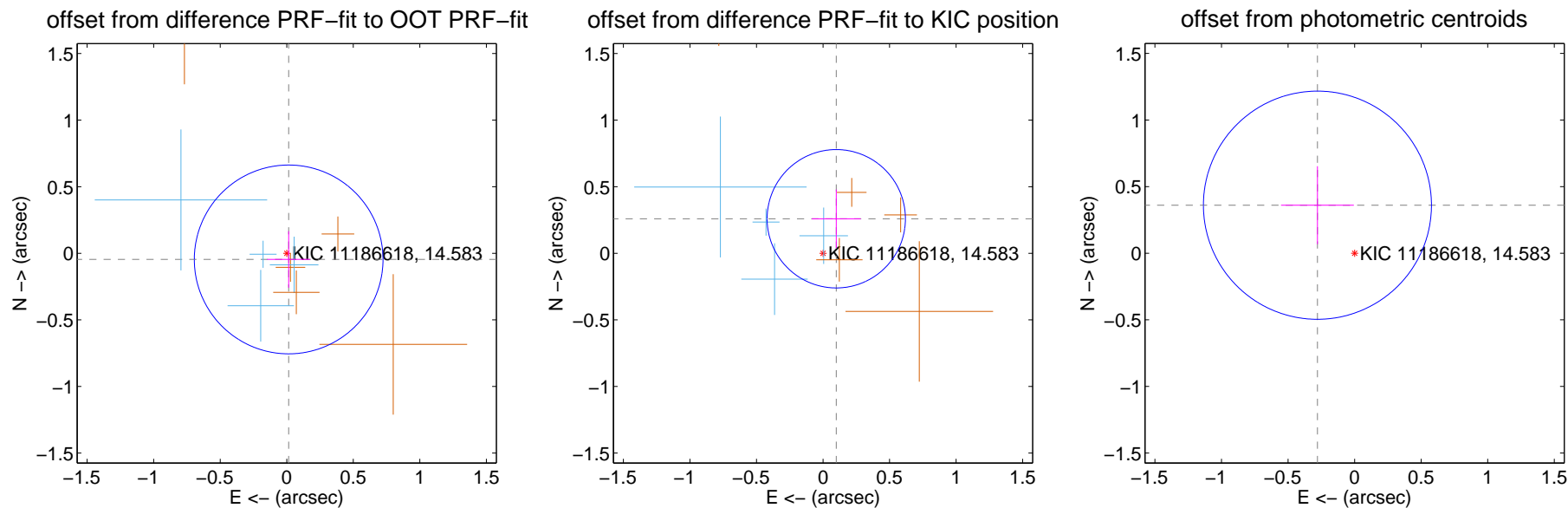
## DV Centroid Data

Supplemental centroid analysis for 011186618-04. Kepler magnitude: 14.58. Transit SNR 7.46

There are 4 quarters with good PRF difference image offsets

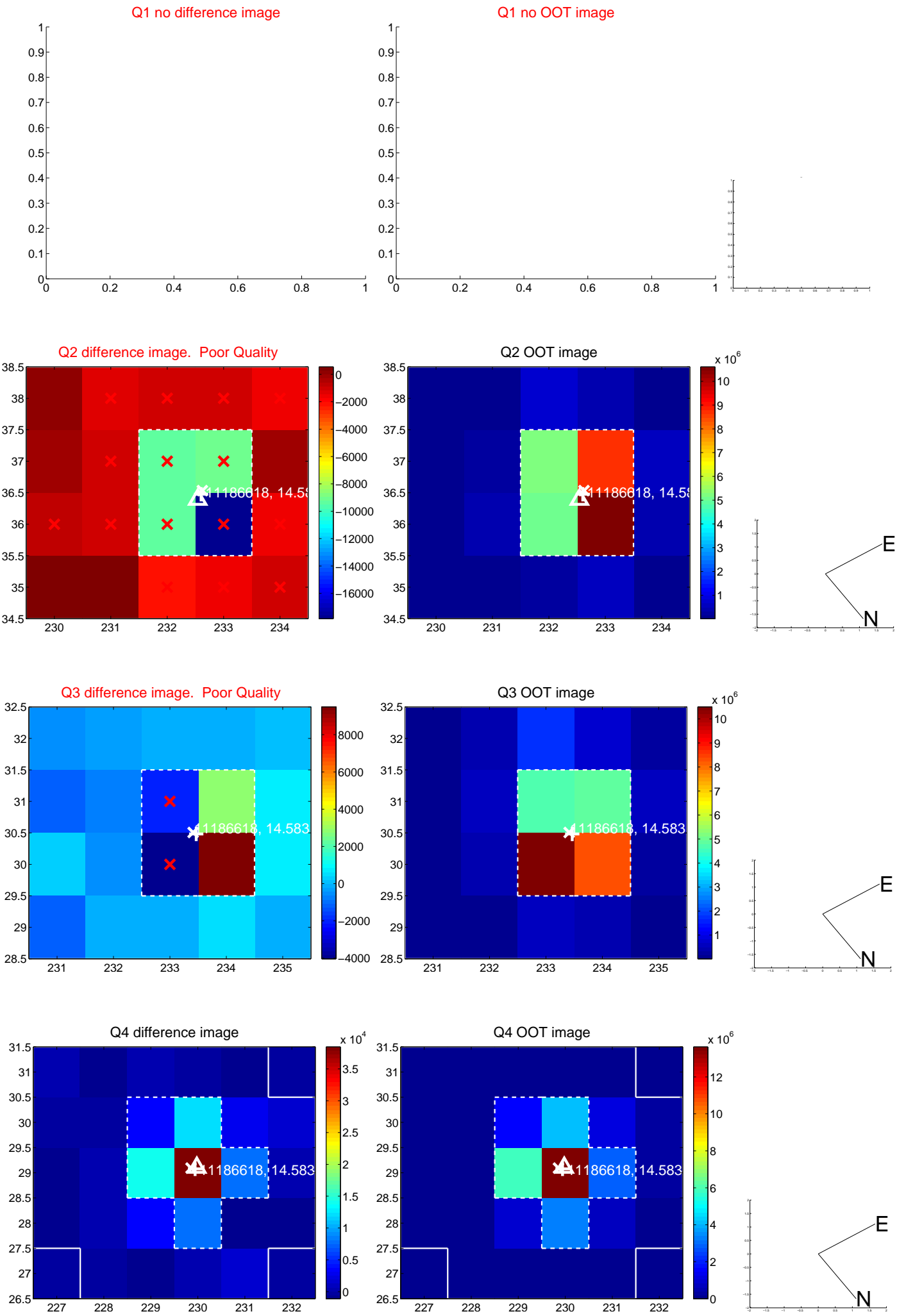
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.048 \pm 0.236$	0.20	$-0.014 \pm 0.162$	$-0.046 \pm 0.212$
PRF-fit source offset from KIC position	$0.278 \pm 0.173$	1.60	$-0.100 \pm 0.184$	$0.259 \pm 0.220$
photometric centroid source offset	$0.46 \pm 0.29$	1.60	$0.28 \pm 0.27$	$0.36 \pm 0.29$

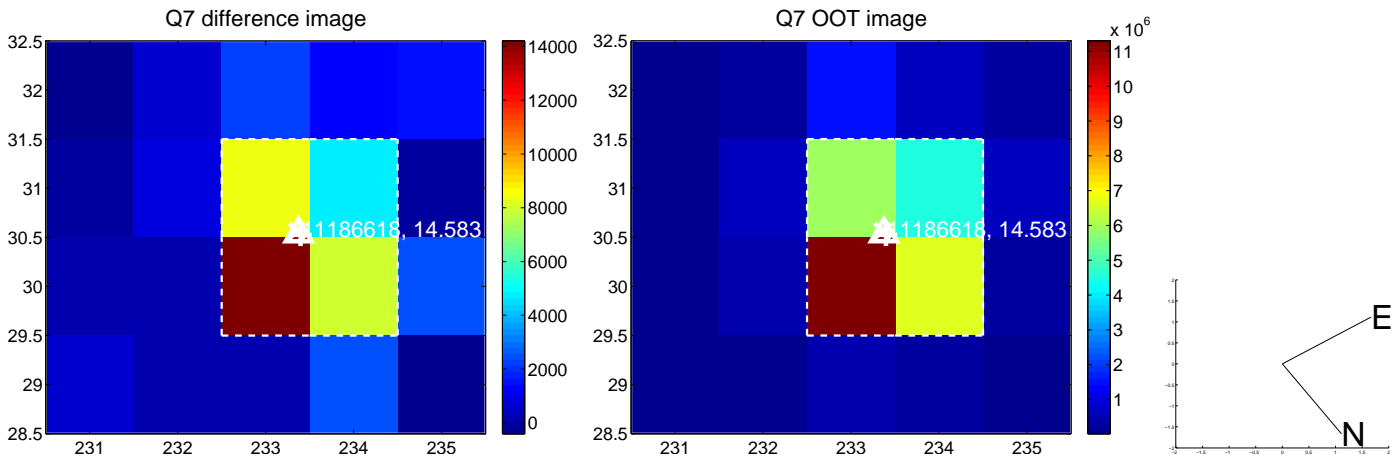
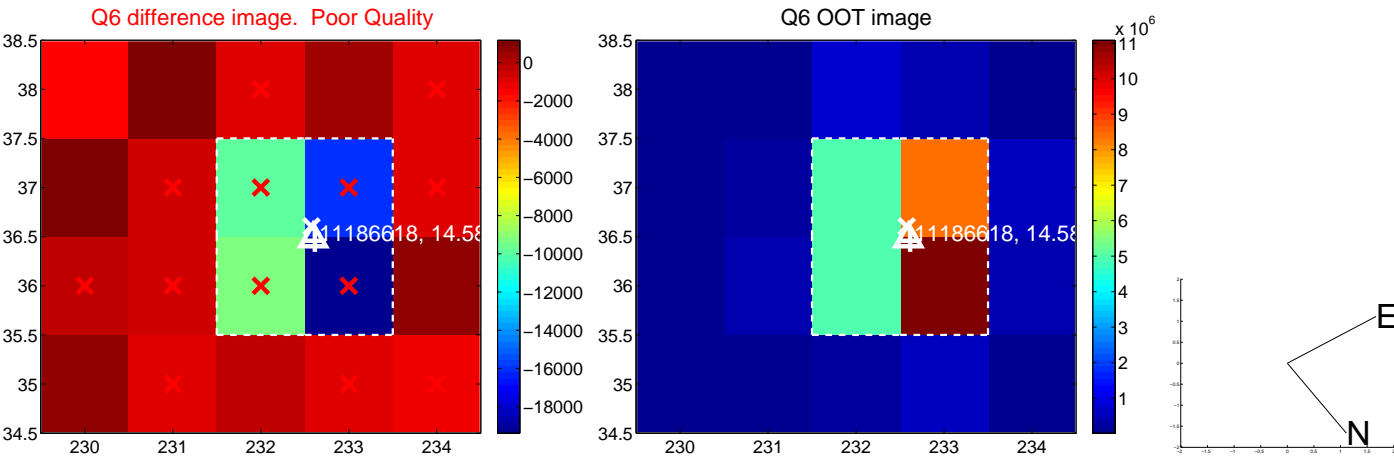
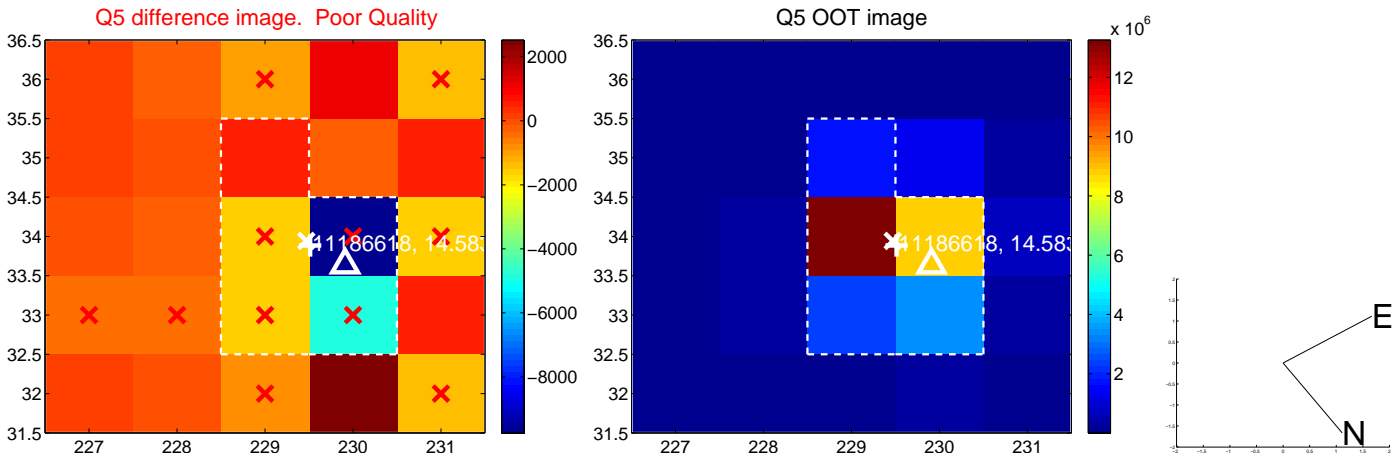


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

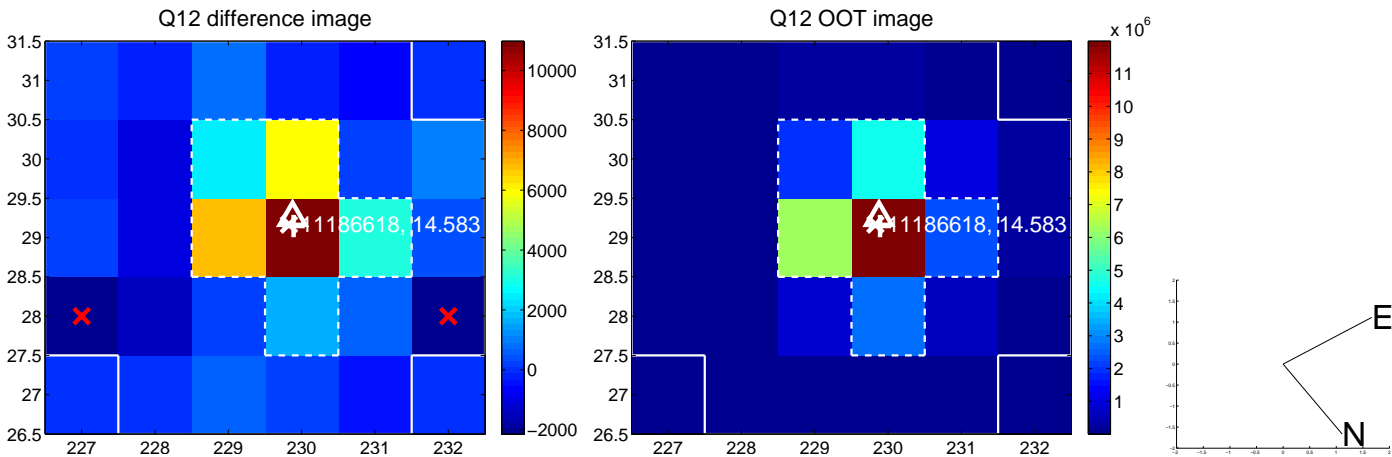
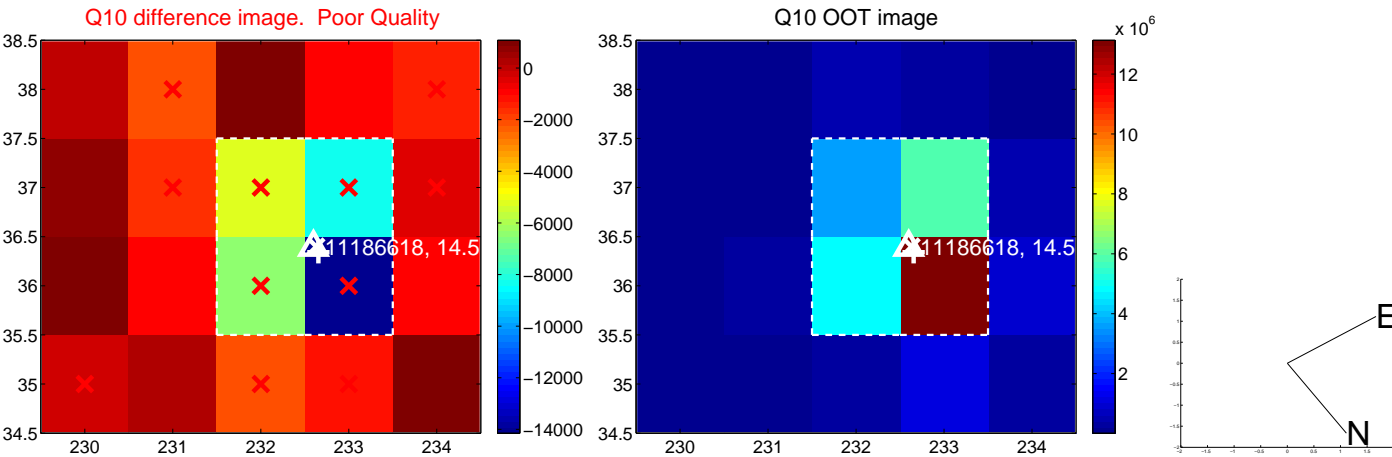
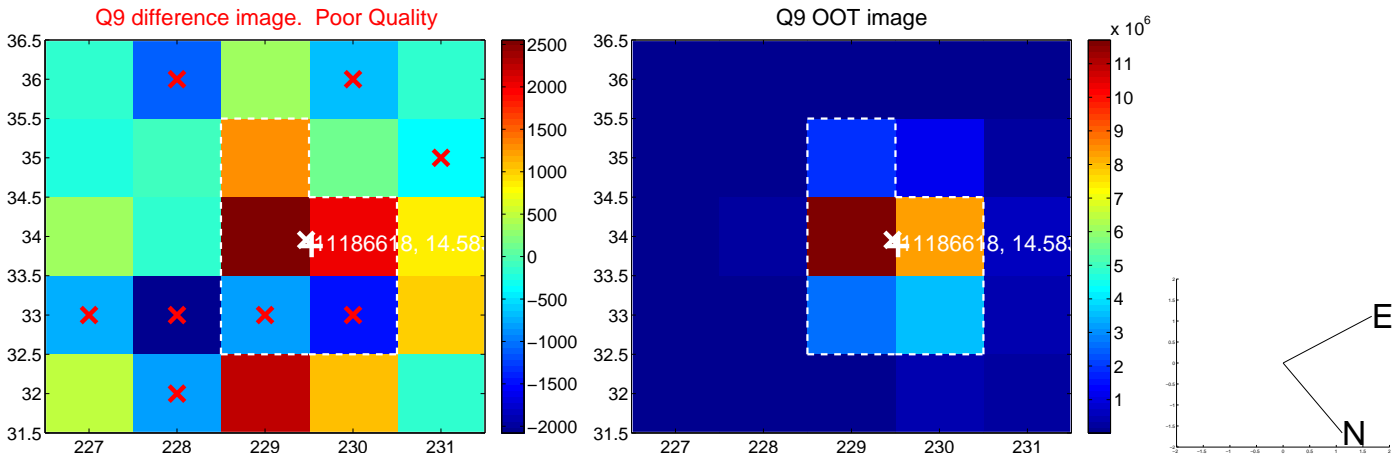
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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

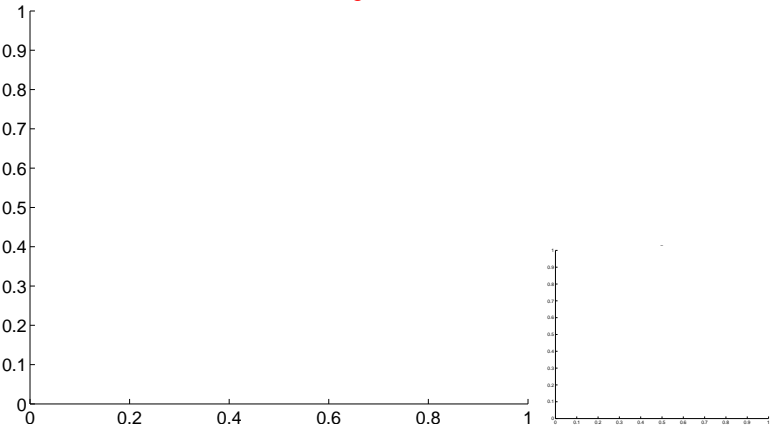


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

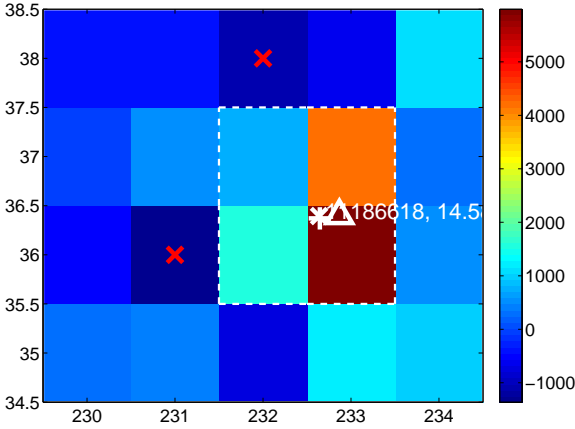
Q13 no difference image



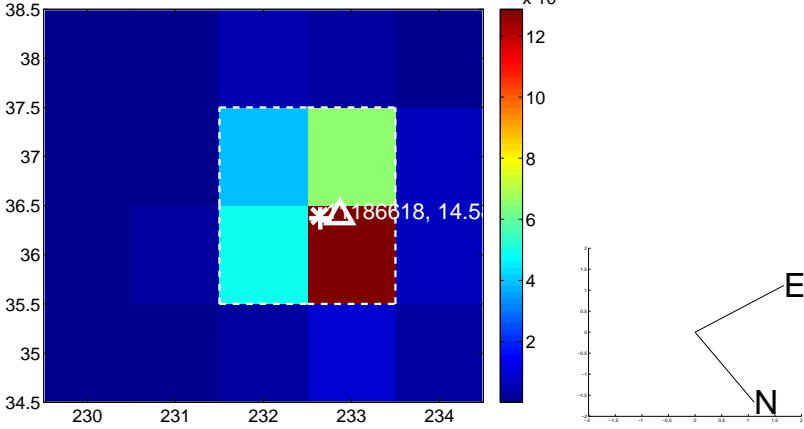
Q13 no OOT image



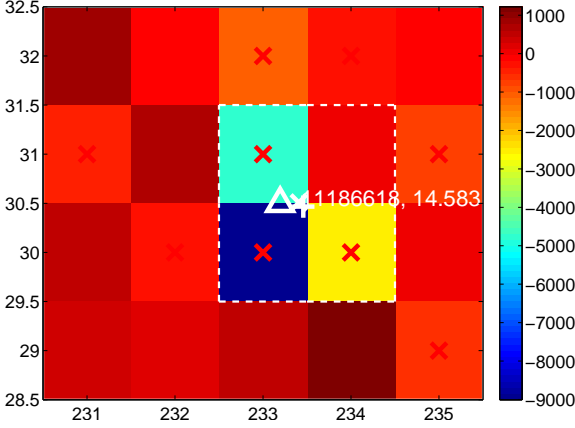
Q14 difference image



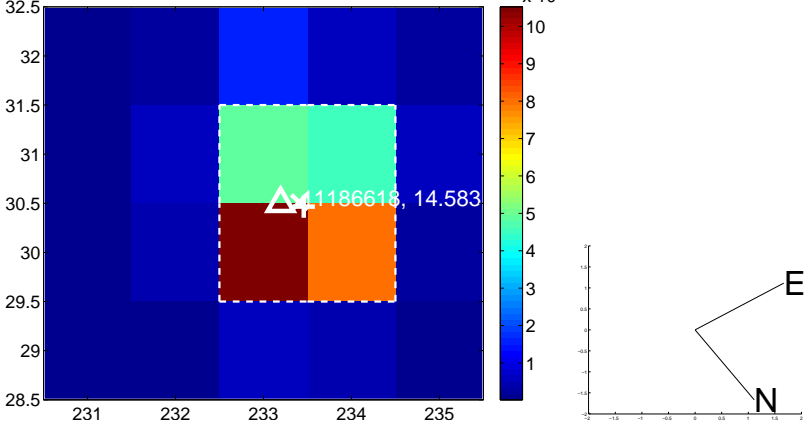
Q14 OOT image



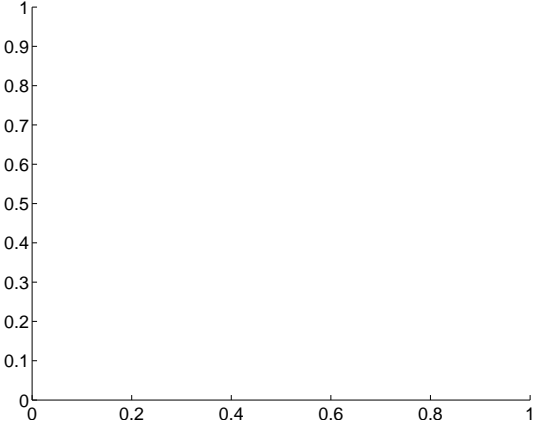
Q15 difference image. Poor Quality



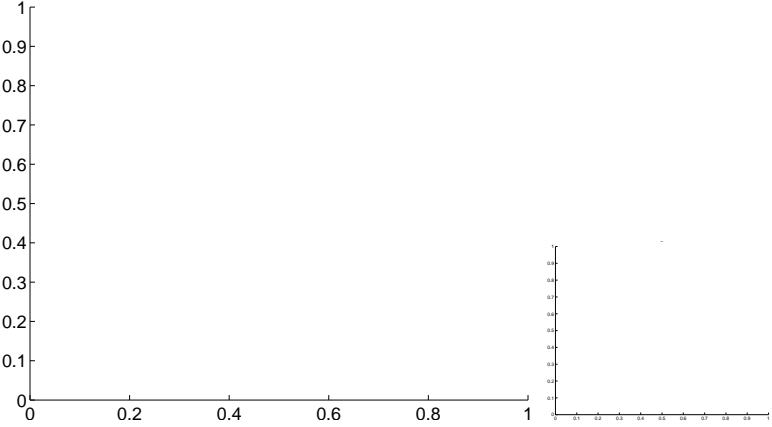
Q15 OOT image



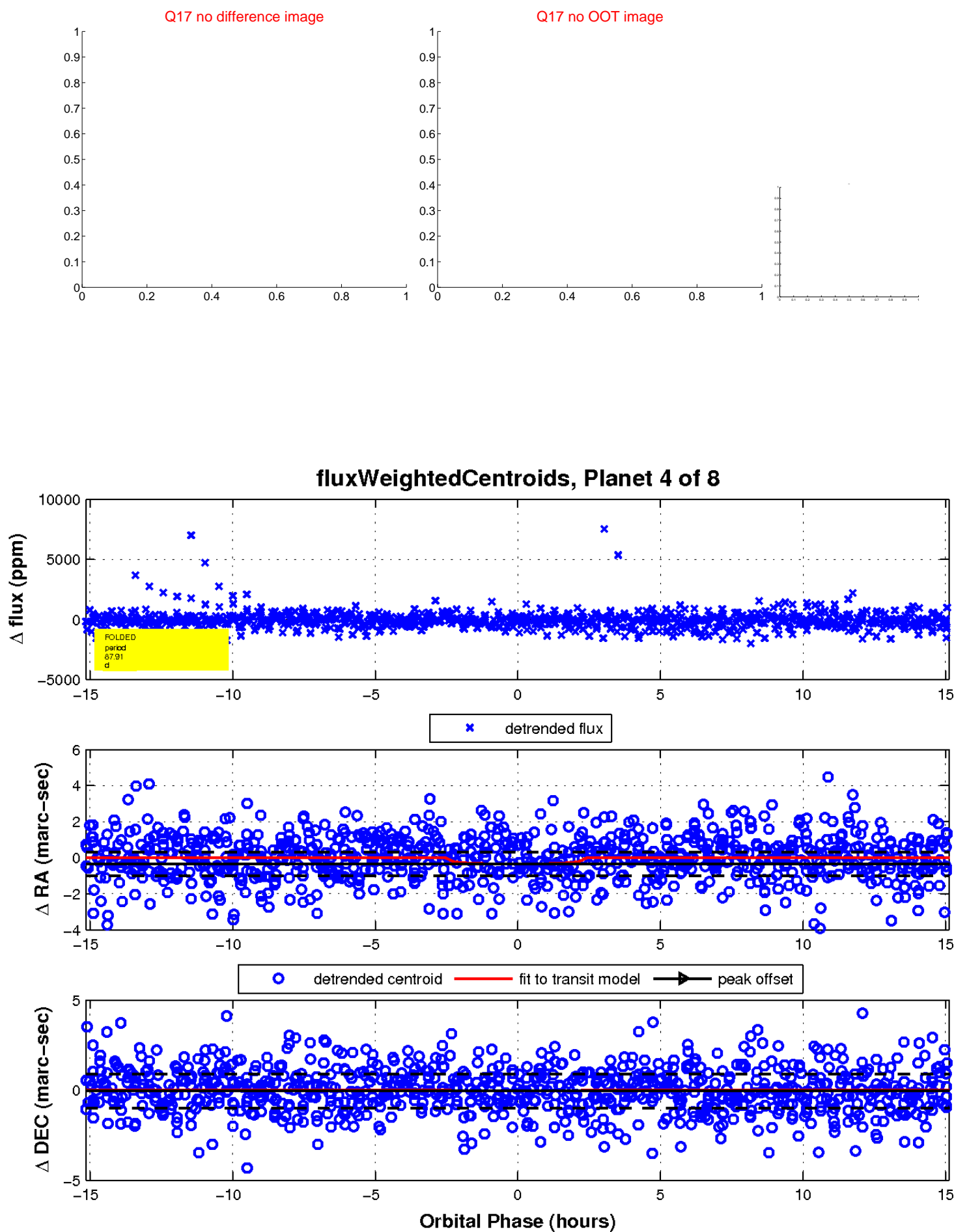
Q16 no difference image



Q16 no OOT image

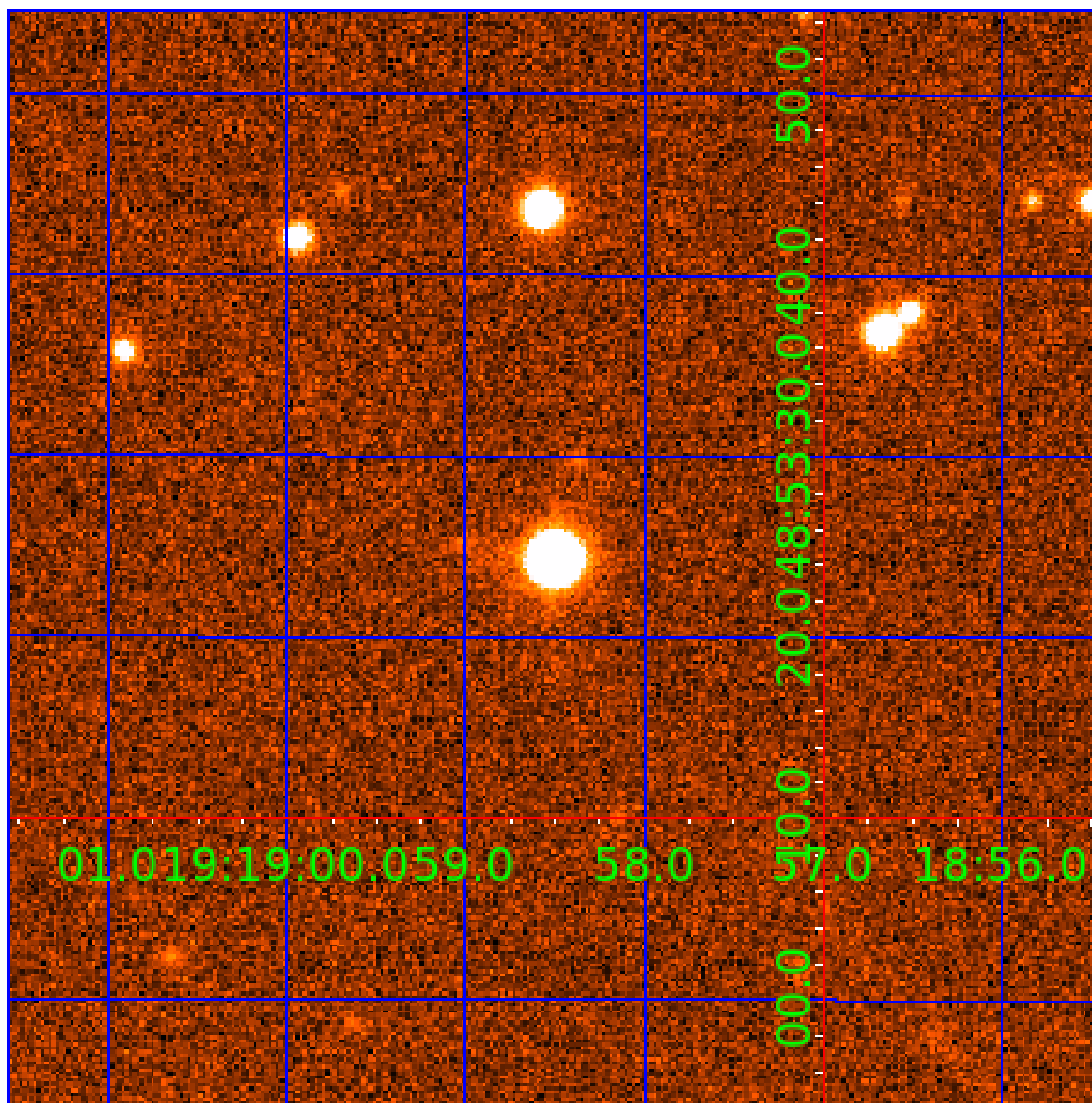


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011186618

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011186618-01	OBS	No	0.942573	131.654324	40.6	5.694	9.6	6.8	0.53	4671	0.37	509.57
011186618-02	OBS	No	167.860775	173.465028	2915.5	13.204	17.4	10.9	0.53	4671	5.45	0.51
011186618-03	OBS	No	185.867599	266.571084	3029.4	10.359	13.2	10.3	0.53	4671	5.58	0.44
011186618-04	OBS	No	87.907703	191.522304	1248.1	5.052	12.5	7.5	0.53	4671	1.99	1.21
011186618-05	OBS	No	58.594744	176.774498	583.6	6.364	9.3	4.1	0.53	4671	1.46	2.07
011186618-06	OBS	No	125.616664	136.793538	271.6	7.769	9.3	1.4	0.53	4671	1.04	0.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011186618-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
011186618-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_MEAS
011186618-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
011186618-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**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.

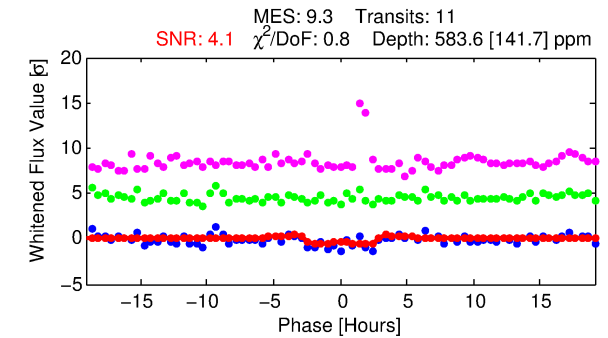
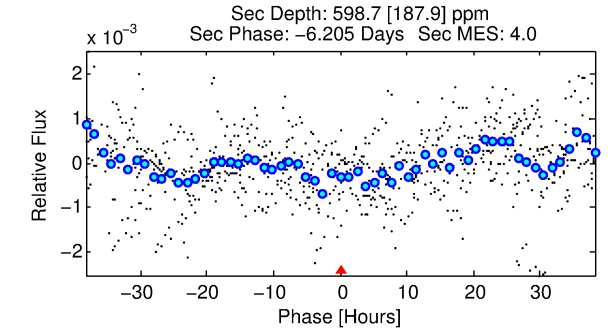
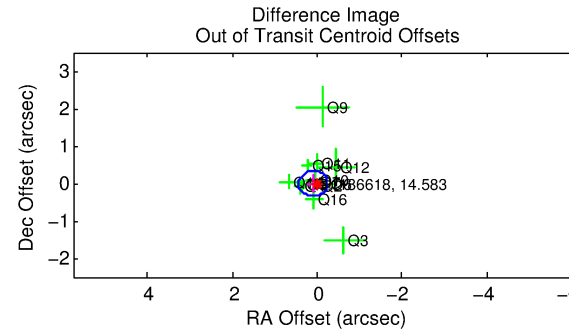
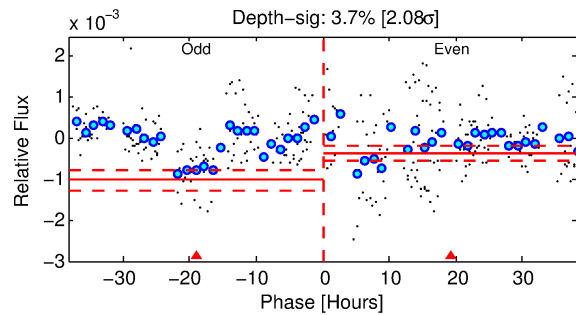
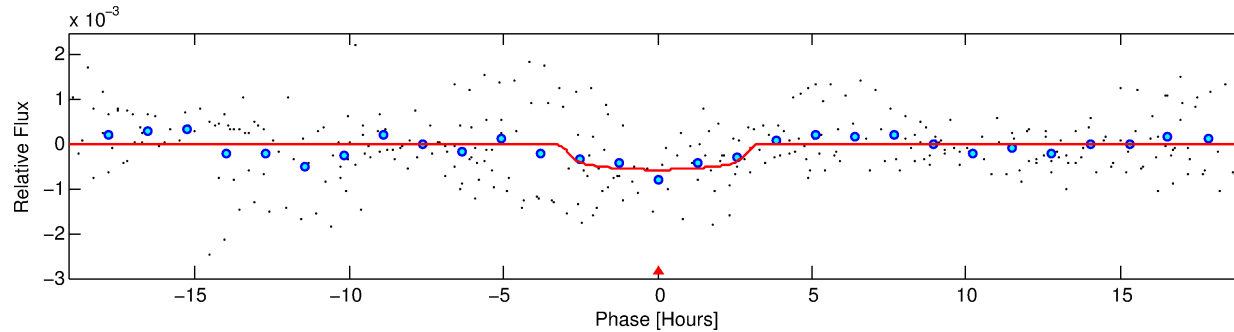
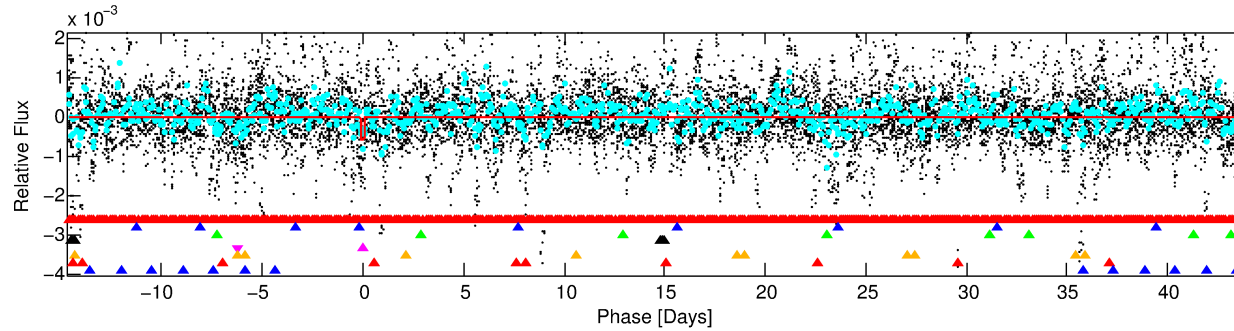
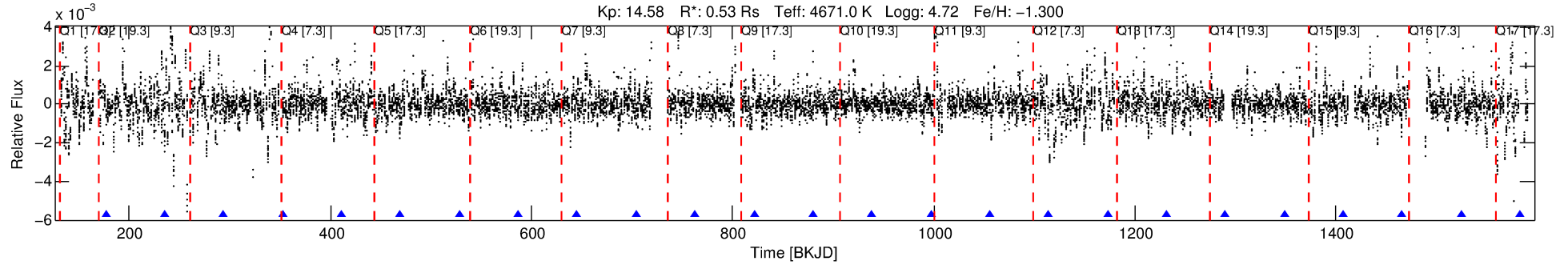
Ephemeris Match Information For 011186618-05

No Significant Match Found



# DV One-Page Summary

KIC: 11186618 Candidate: 5 of 8 Period: 58.595 d



## DV Fit Results:

Period = 58.59474 [0.00114] d  
Epoch = 176.7745 [0.0172] BKJD  
Rp/R\* = 0.0252 [0.0101]  
a/R\* = 41.34 [61.16]  
b = 0.84 [0.52]  
Seff = 2.07 [0.33]  
Teq = 306 [12] K  
Rp = 1.45 [0.59] Re  
a = 0.2397 [0.0147] AU  
Ag = 8944.32 [7701.64] [1.16 $\sigma$ ]  
Teffp = 4598 [996] K [4.31 $\sigma$ ]

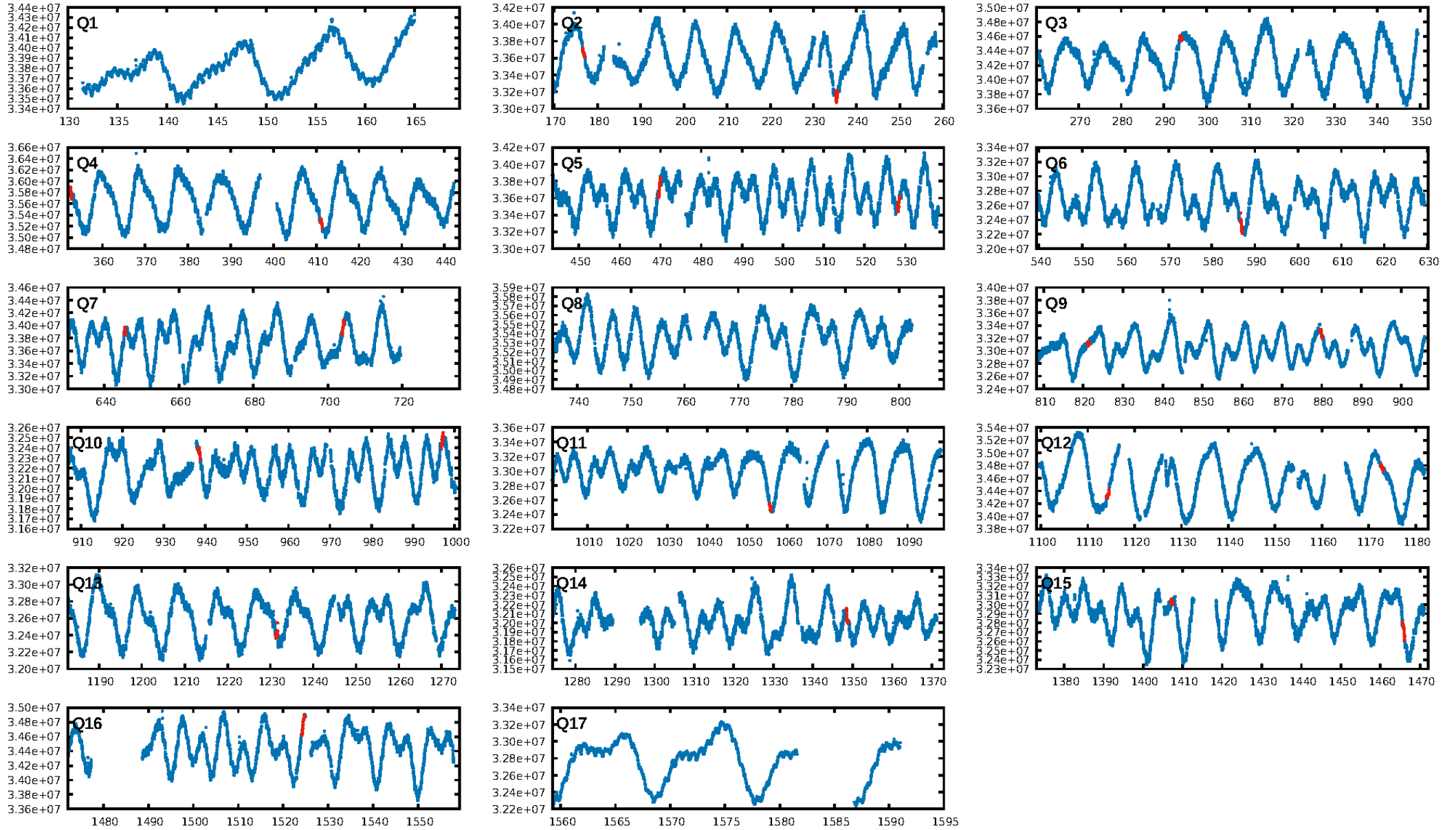
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [162.04 $\sigma$ ]  
LongPeriod-sig: 100.0% [86.58 $\sigma$ ]  
ModelChiSquare2-sig: 3.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: -1.451  
Centroid-sig: 3.3%  
Centroid-so: 0.958 arcsec [2.17 $\sigma$ ]  
OotOffset-rm: 0.095 arcsec [0.84 $\sigma$ ]  
OotOffset-st: 4/4/3/2 [13]  
KicOffset-rm: 0.257 arcsec [1.29 $\sigma$ ]  
KicOffset-st: 4/4/3/2 [13]  
DiffImageQuality-fgm: 0.62 [8/13]  
DiffImageOverlap-fno: 0.00 [0/13]

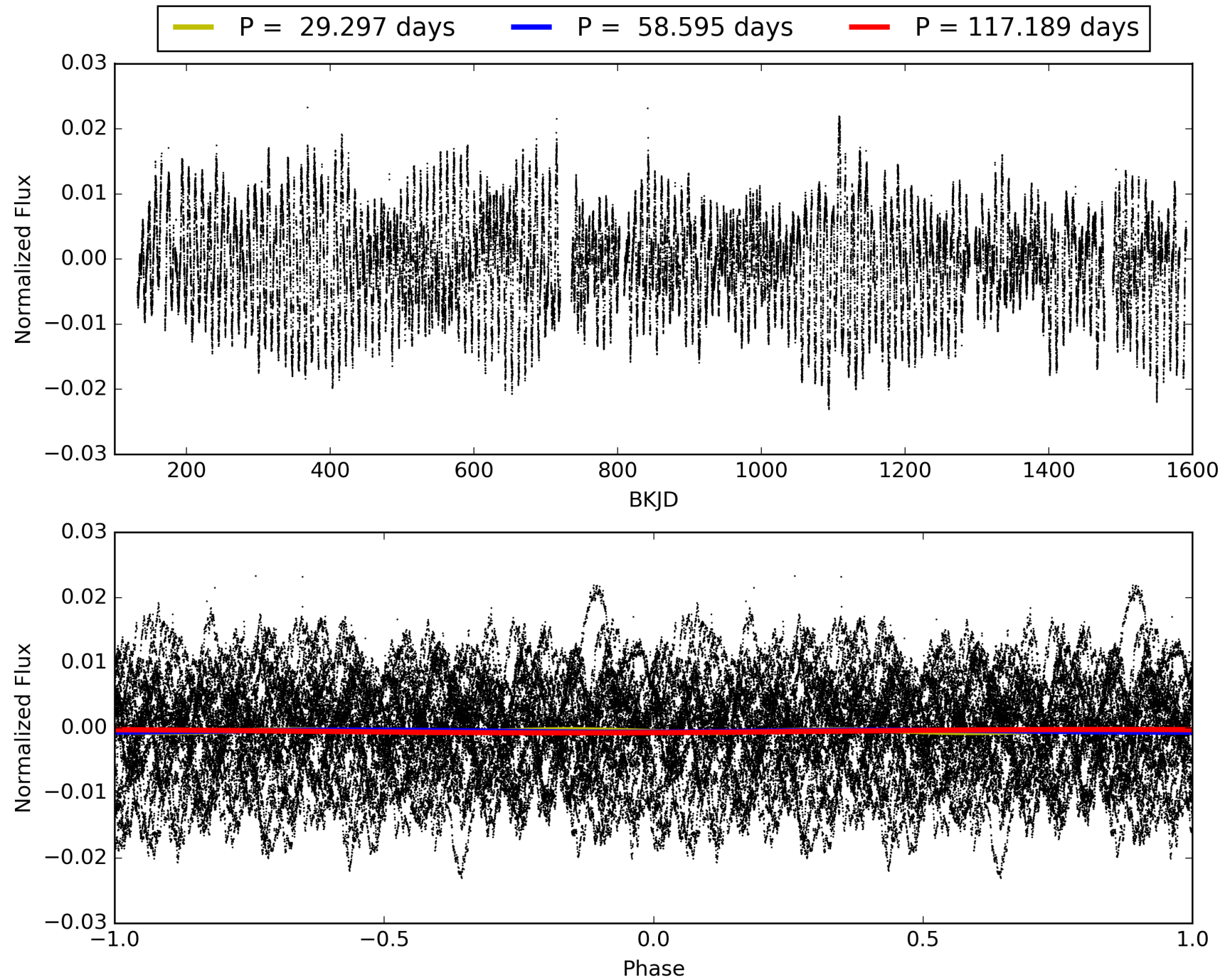
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:28:35 Z

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

# TCE 011186618-05, PDC Light Curves

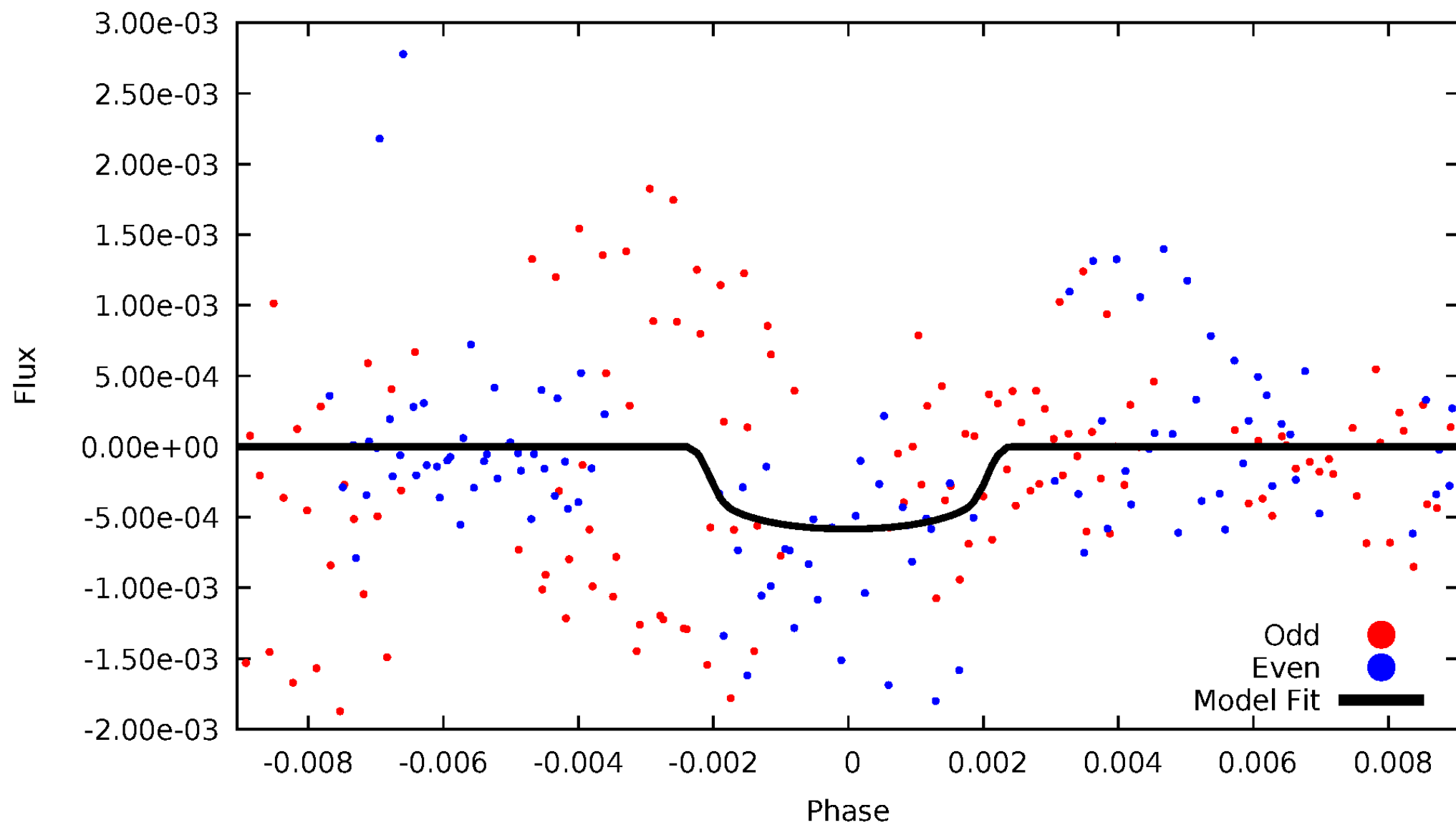


# TCE 011186618-05



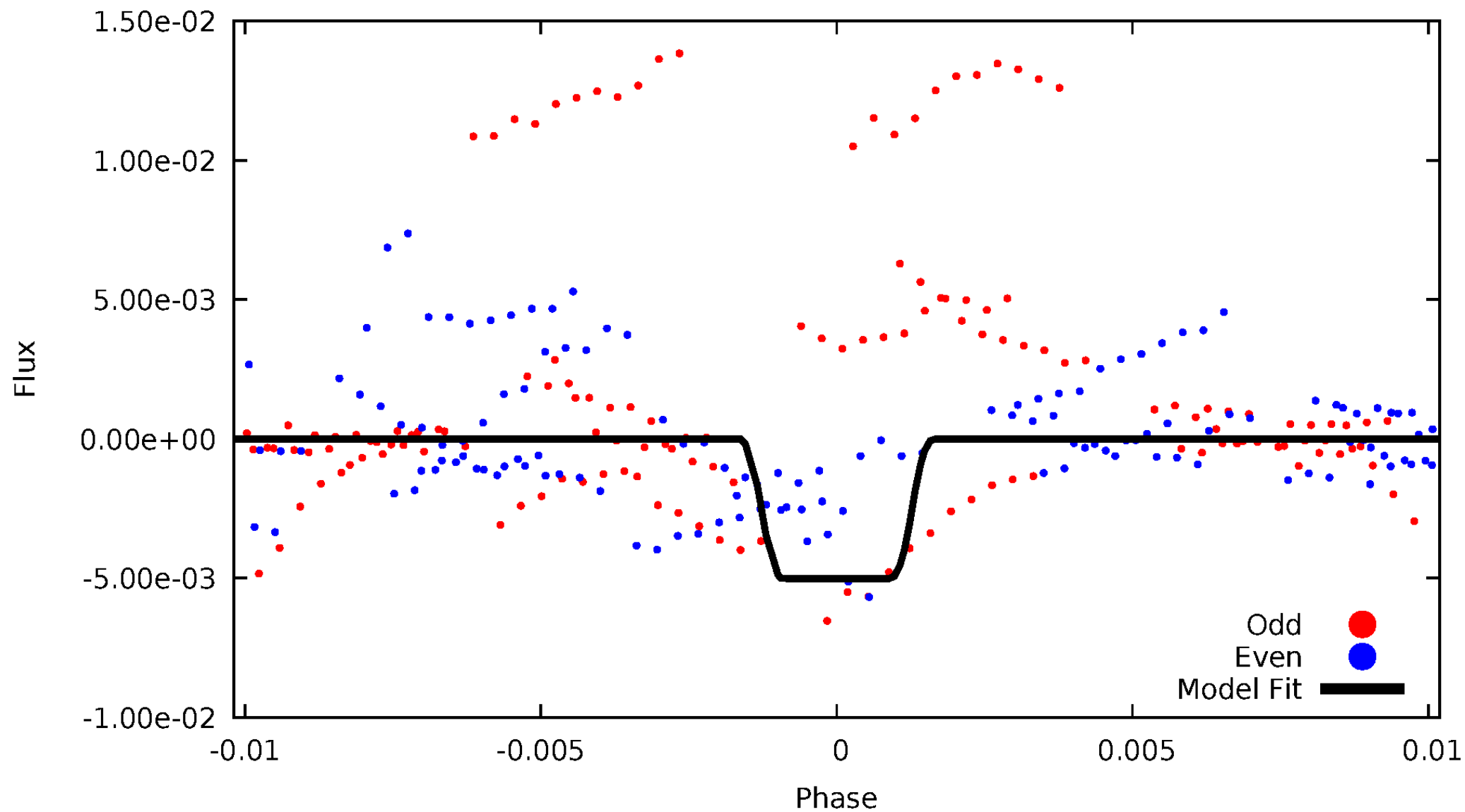
# DV Odd/Even

TCE 011186618-05



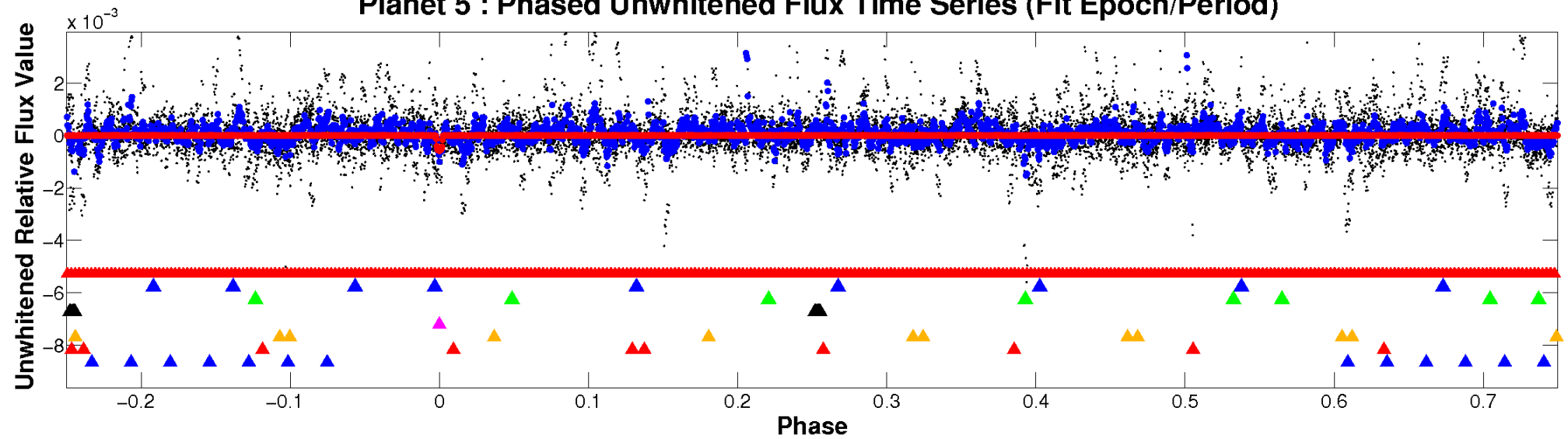
# ALT Odd/Even

TCE 011186618-05

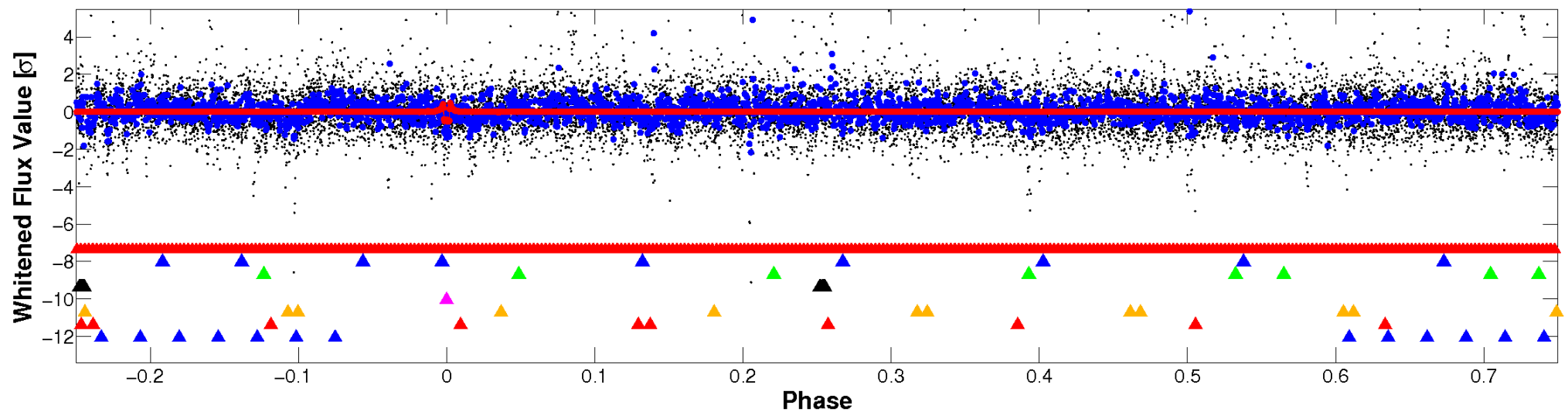


# Non-Whitened Vs. Whitened Light Curve

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

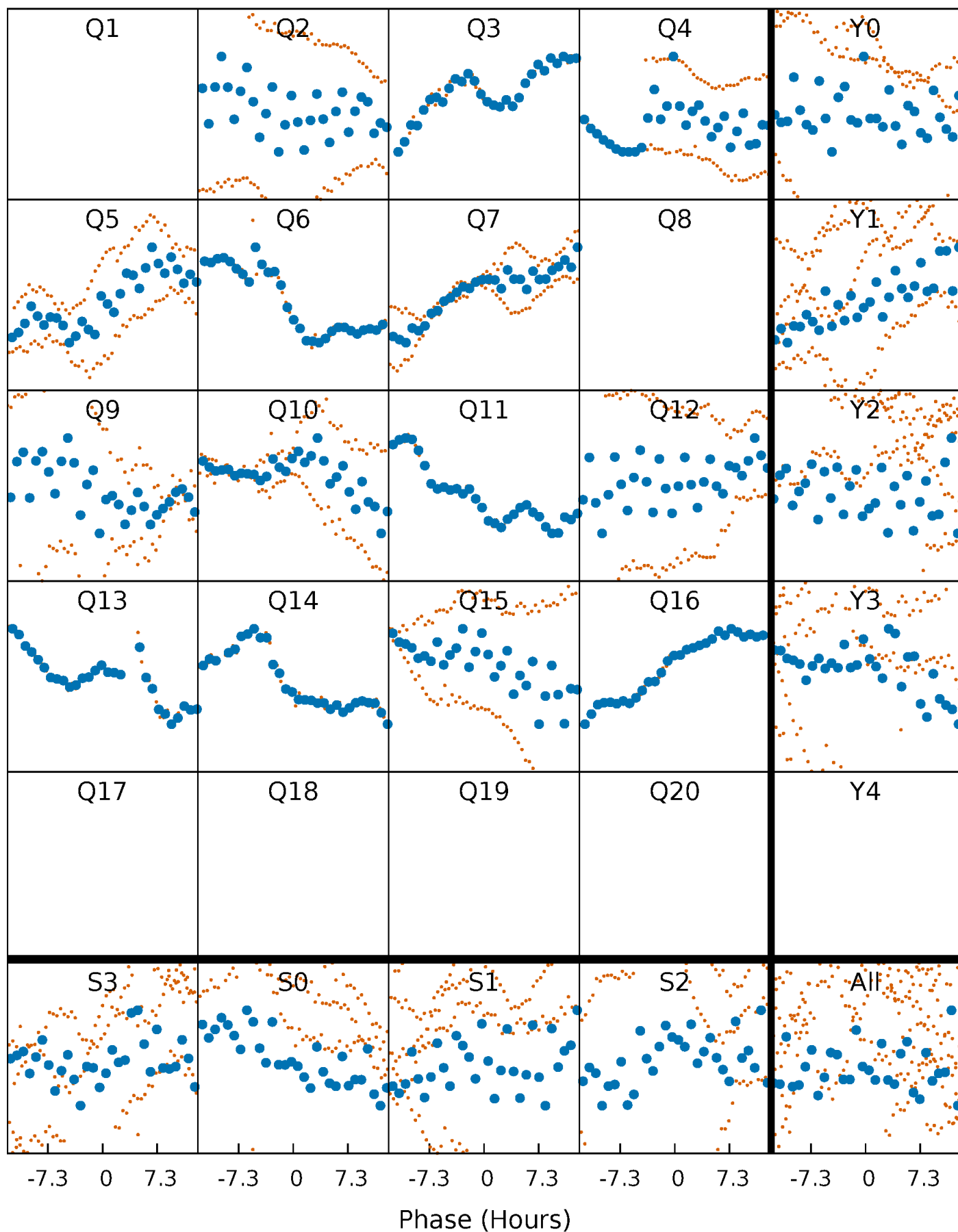


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

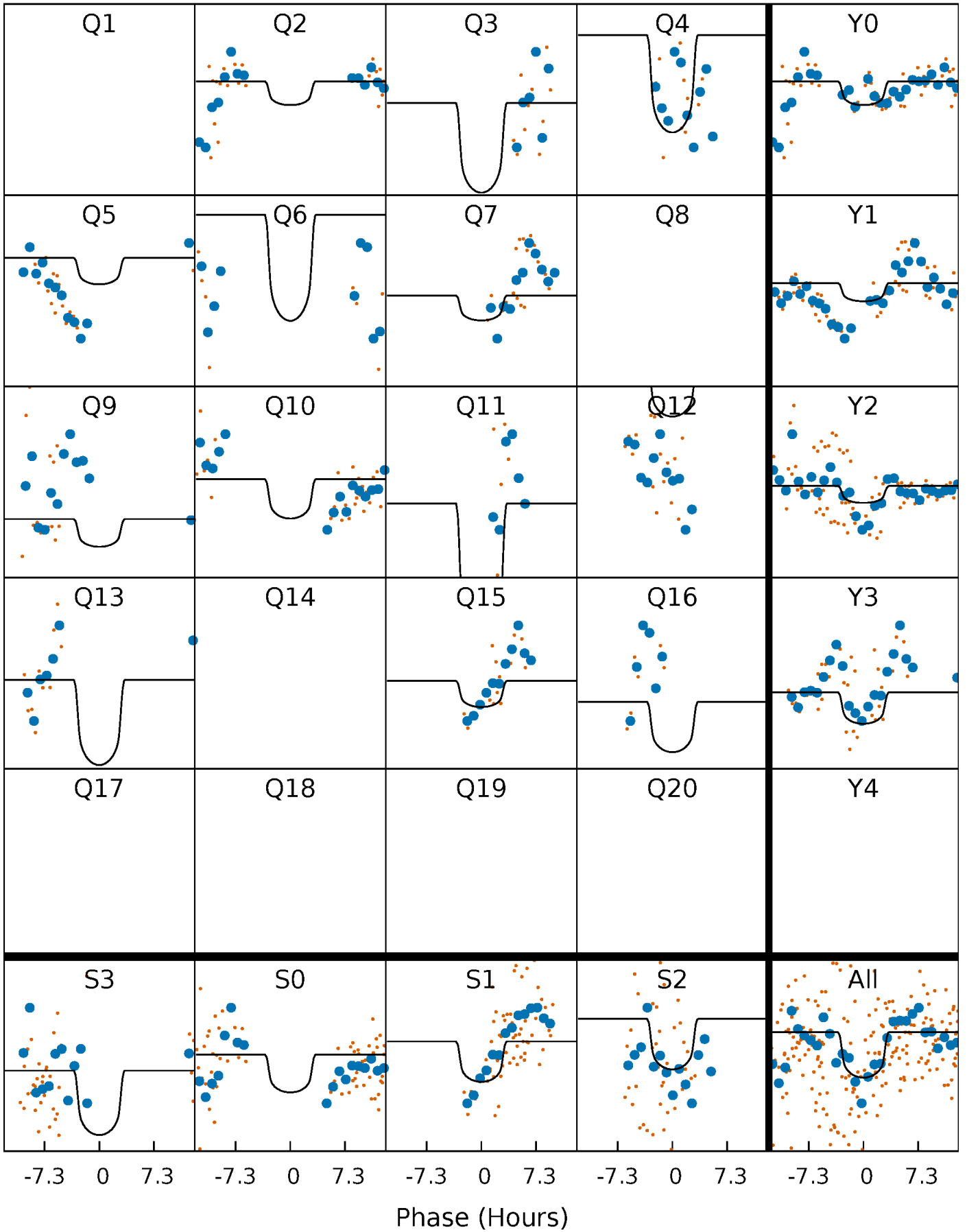
TCE 011186618-05 P= 58.594744 Days  $T_0=176.774498$  (BKJD)





# DV Quarter-Phased Transit Curves

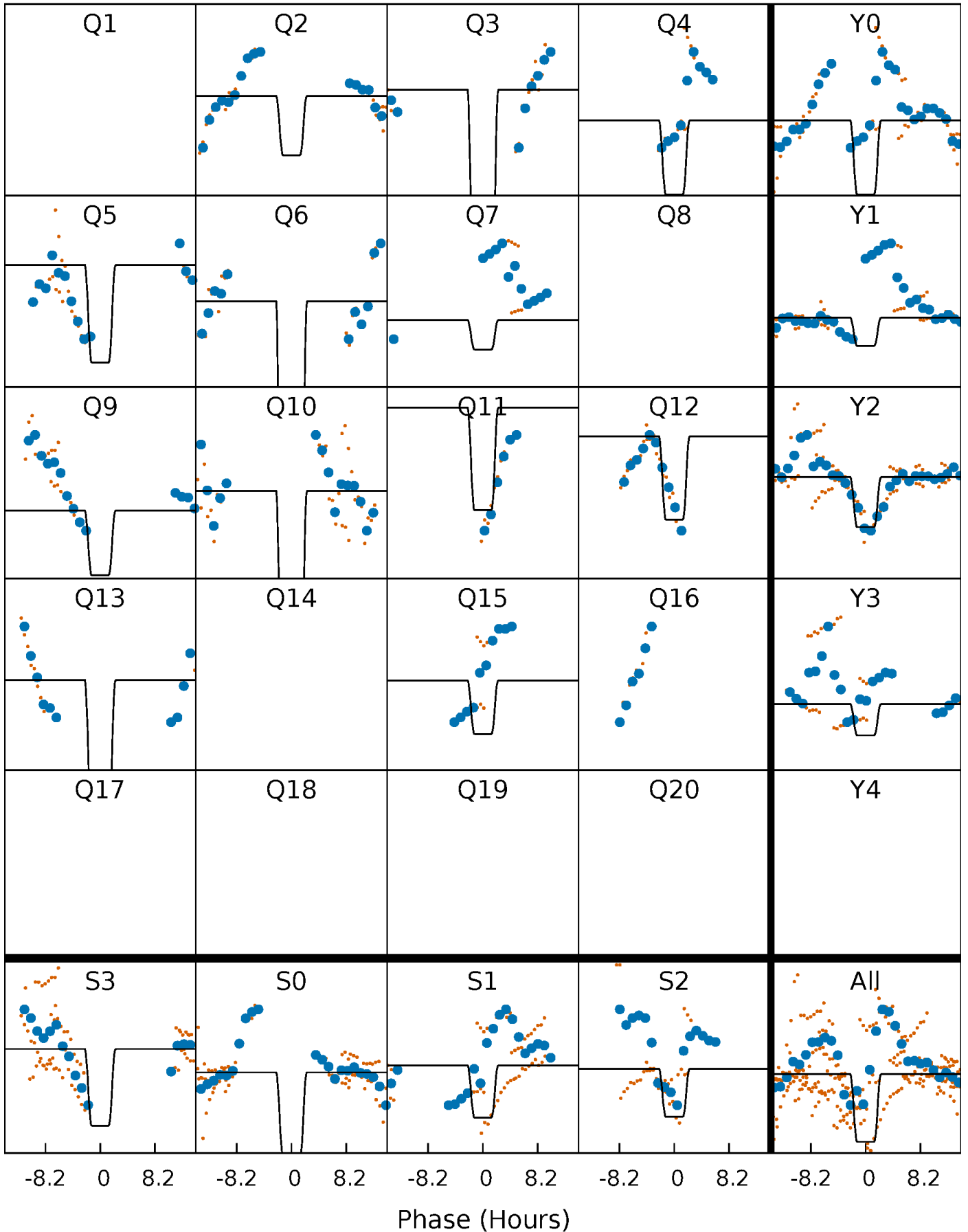
TCE 011186618-05   P= 58.594744 Days    $T_0=176.774498$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

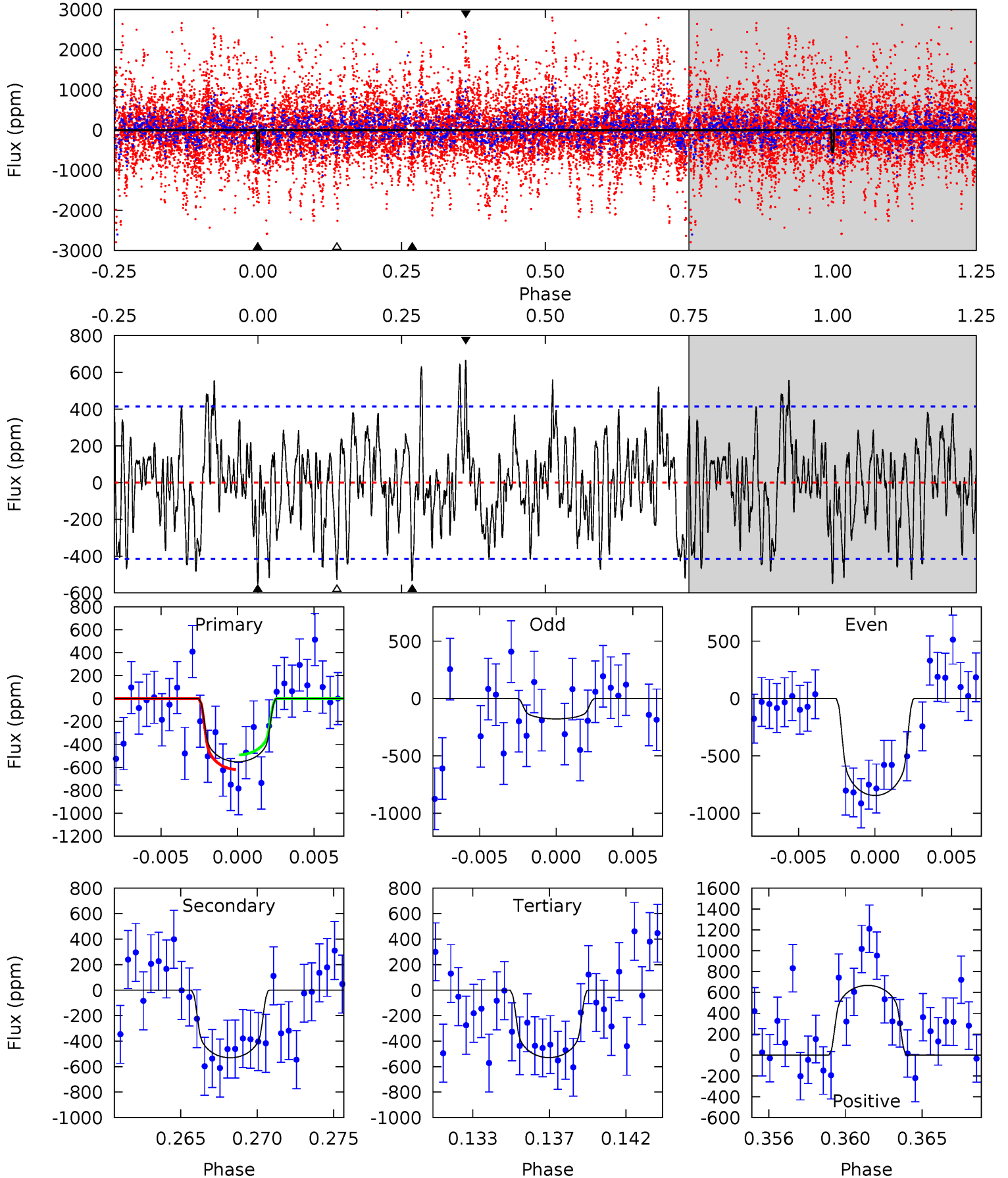
TCE 011186618-05   P= 58.601161 Days    $T_0=176.735829$  (BKJD)



# DV Model-Shift Uniqueness Test

011186618-05, P = 58.594744 Days, E = 118.179754 Days

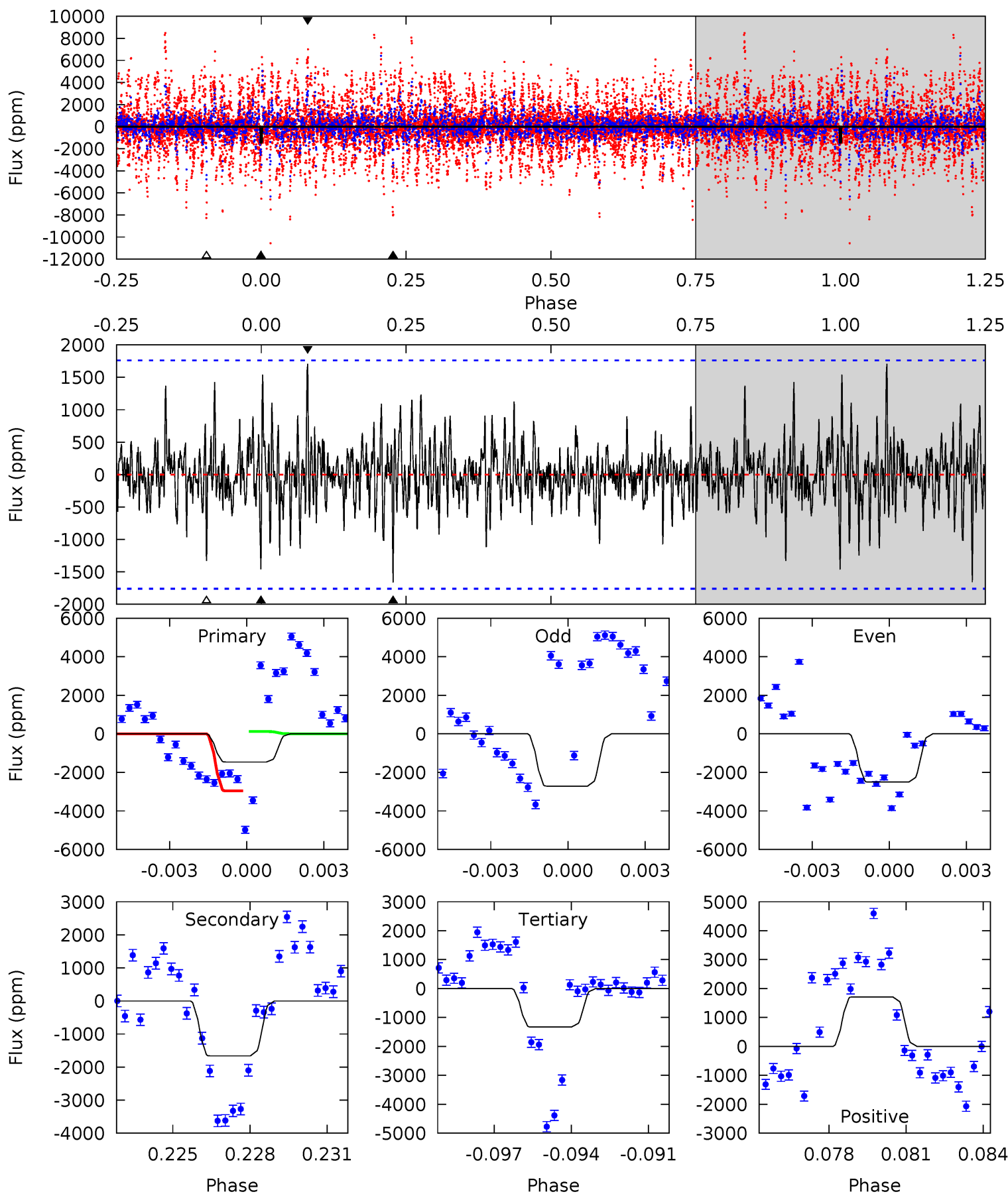
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.88	6.62	6.60	8.32	5.17	2.82	2.59	0.28	-1.45	0.02	-1.71	4.14	0.94	0.55	0.81



# Alt Model-Shift Uniqueness Test

011186618-05, P = 58.601161 Days, E = 118.134668 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
4.35	4.95	3.96	5.09	5.24	2.96	1.06	0.40	-0.74	0.99	-0.14	0.27	-1.50	0.51	4.50



### Stellar Parameters For KIC 011186618

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4671^{+125}_{-153}$	$4.721^{+0.052}_{-0.024}$	$-1.300^{+0.300}_{-0.350}$	$0.528^{+0.029}_{-0.037}$	$0.534^{+0.036}_{-0.022}$	$5.111^{+1.091}_{-0.505}$
	+3%/-3%	+1%/-1%	+23%/-27%	+5%/-7%	+7%/-4%	+21%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 011186618-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-530 \pm 80$	$1.47^{+0.59}_{-0.55}$	$425^{+13}_{-15}$	$4447^{+1060}_{-522}$	$7794^{+12748}_{-3833}$
Alt.	$-1661 \pm 336$	$4.03^{+0.64}_{-0.61}$	$425^{+13}_{-16}$	$3804^{+264}_{-231}$	$3250^{+1408}_{-970}$

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

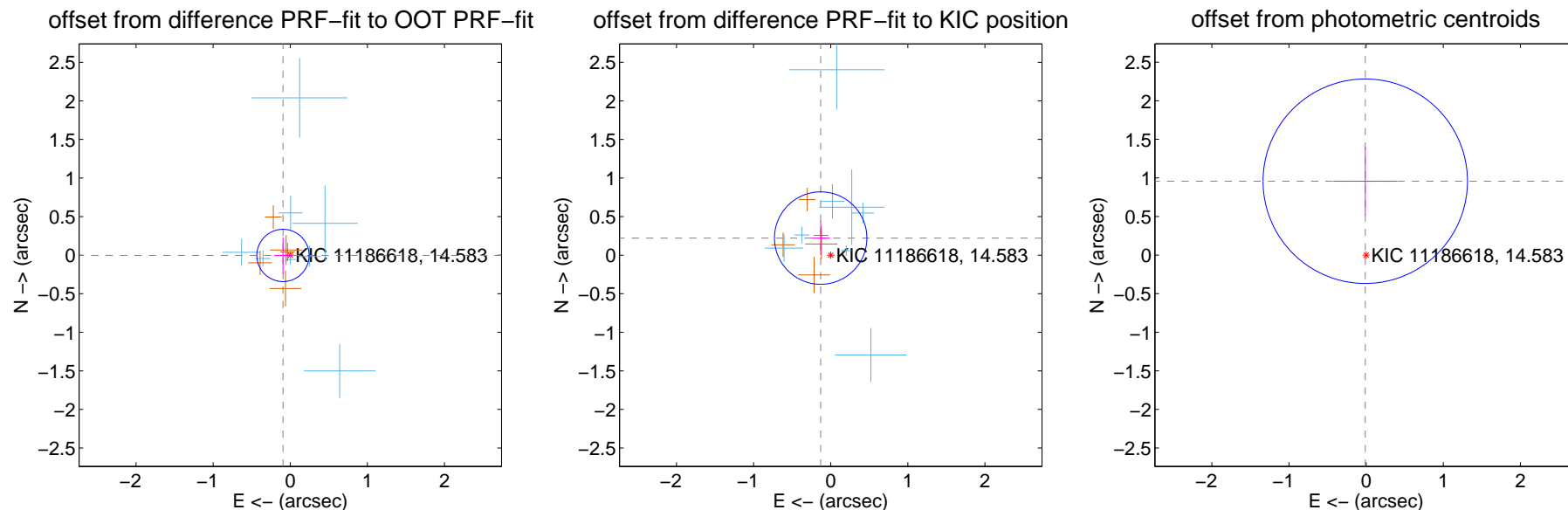
## DV Centroid Data

Supplemental centroid analysis for 011186618-05. Kepler magnitude: 14.58. Transit SNR 4.11

There are 8 quarters with good PRF difference image offsets

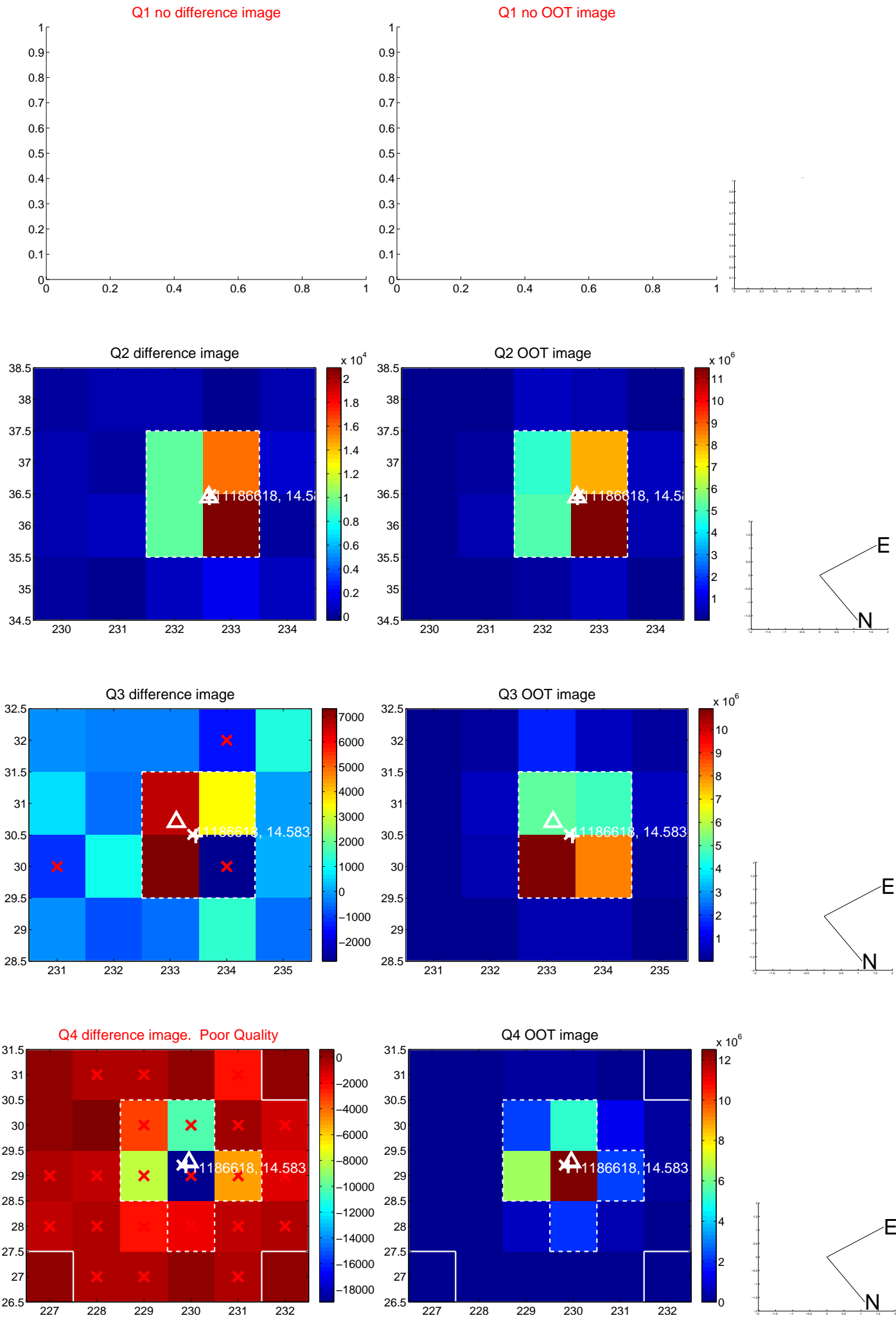
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.095 \pm 0.113$	0.84	$0.094 \pm 0.113$	$-0.004 \pm 0.234$
PRF-fit source offset from KIC position	$0.257 \pm 0.200$	1.29	$0.130 \pm 0.121$	$0.222 \pm 0.221$
photometric centroid source offset	$0.96 \pm 0.44$	2.17	$0.01 \pm 0.42$	$0.96 \pm 0.44$

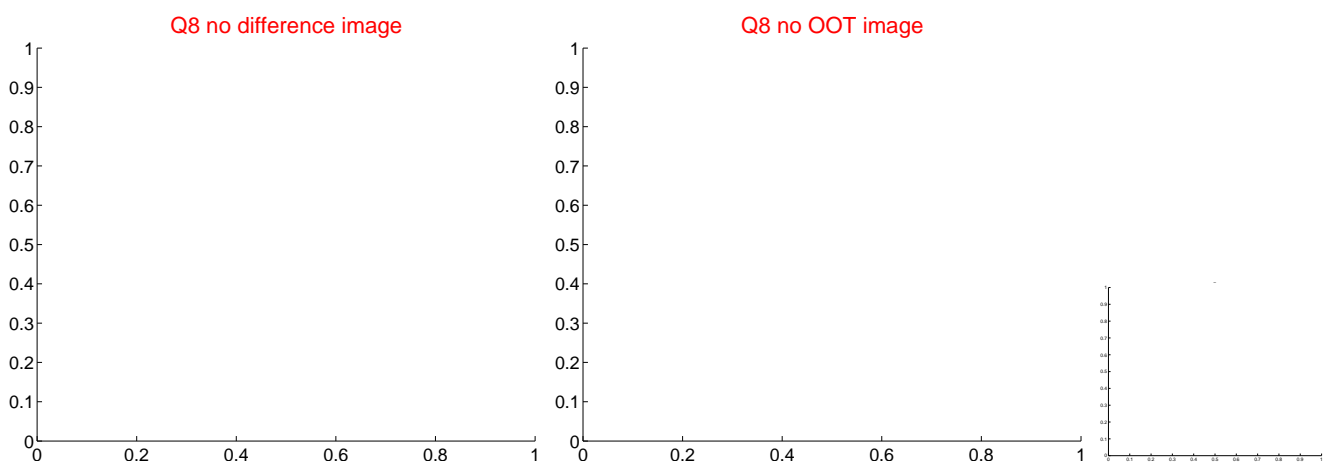
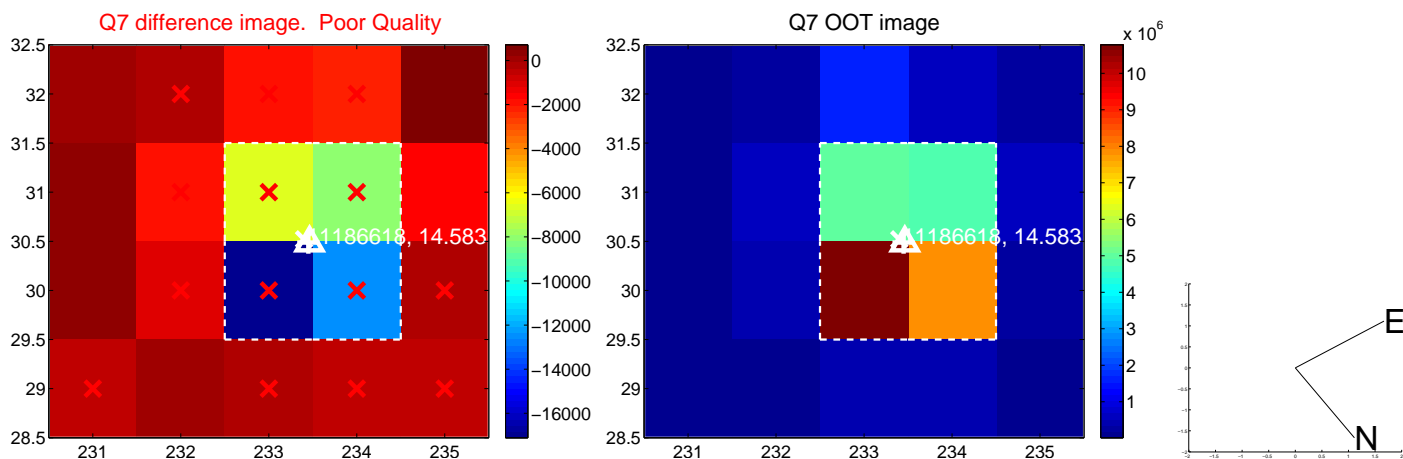
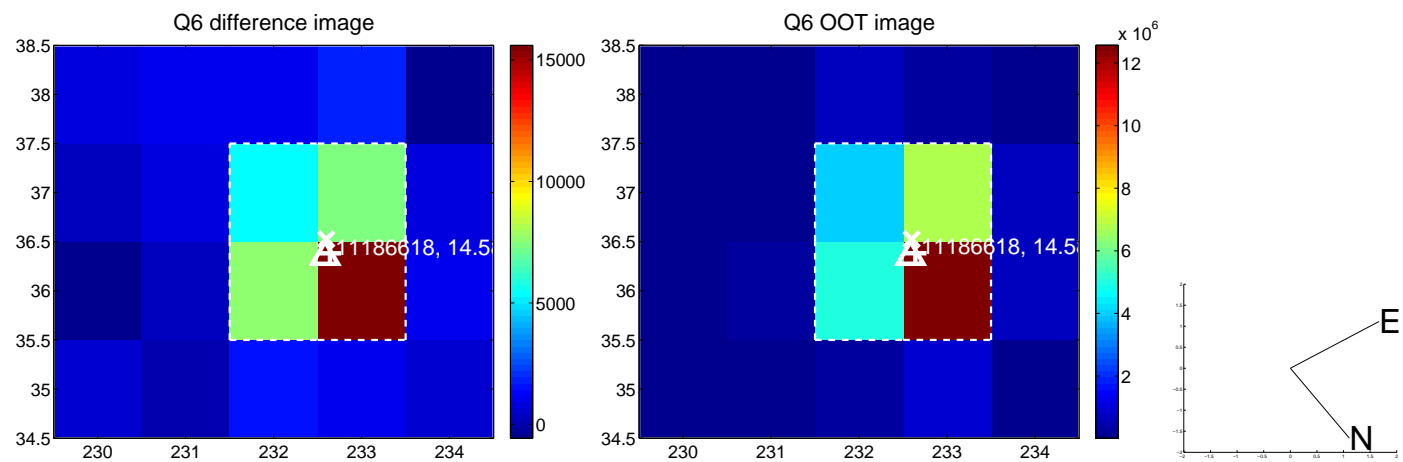
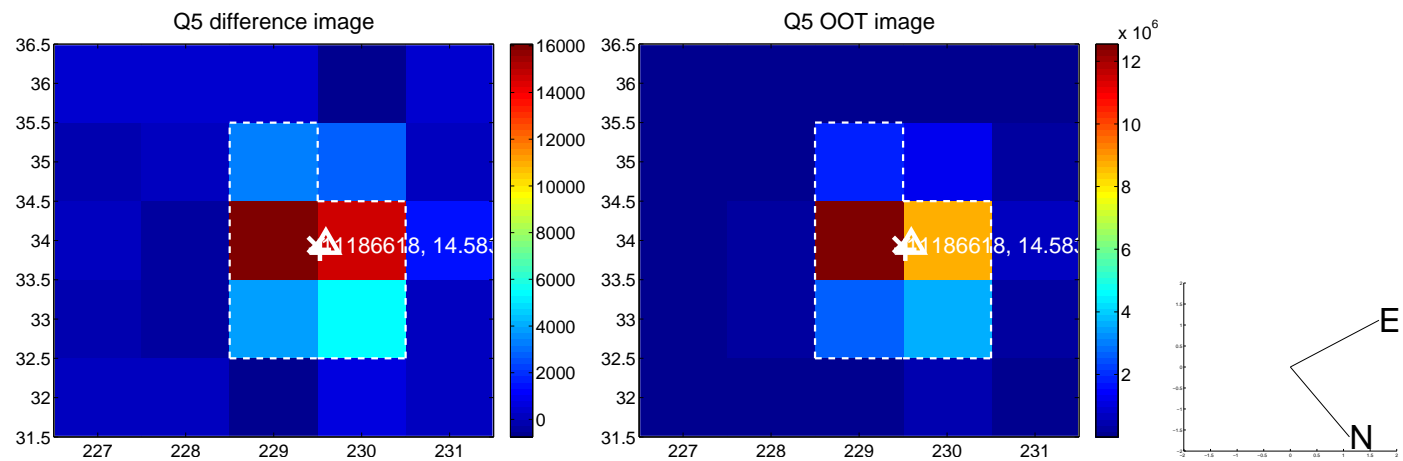


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

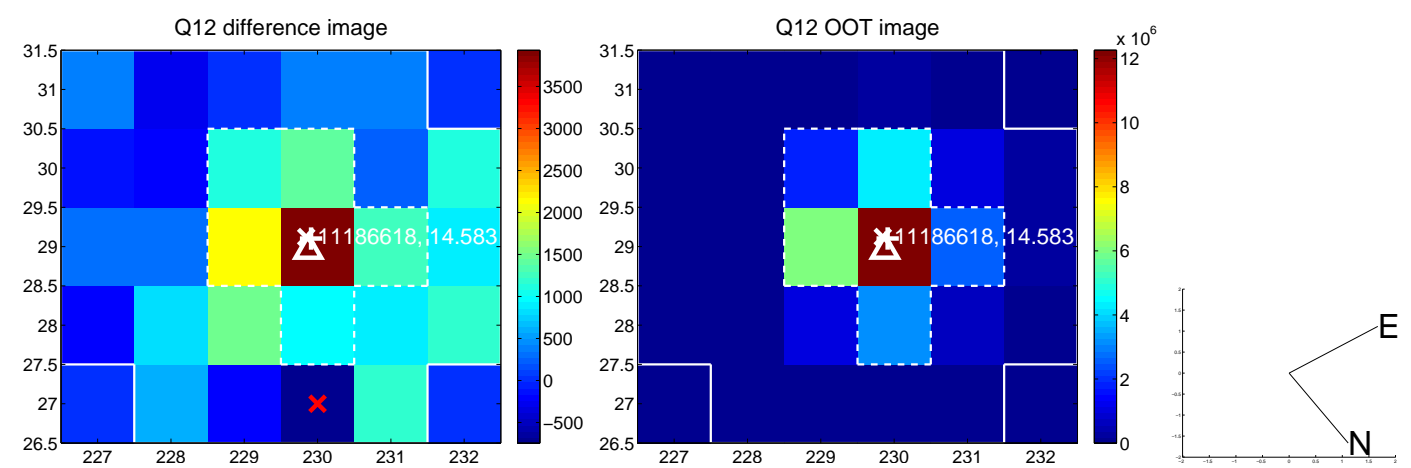
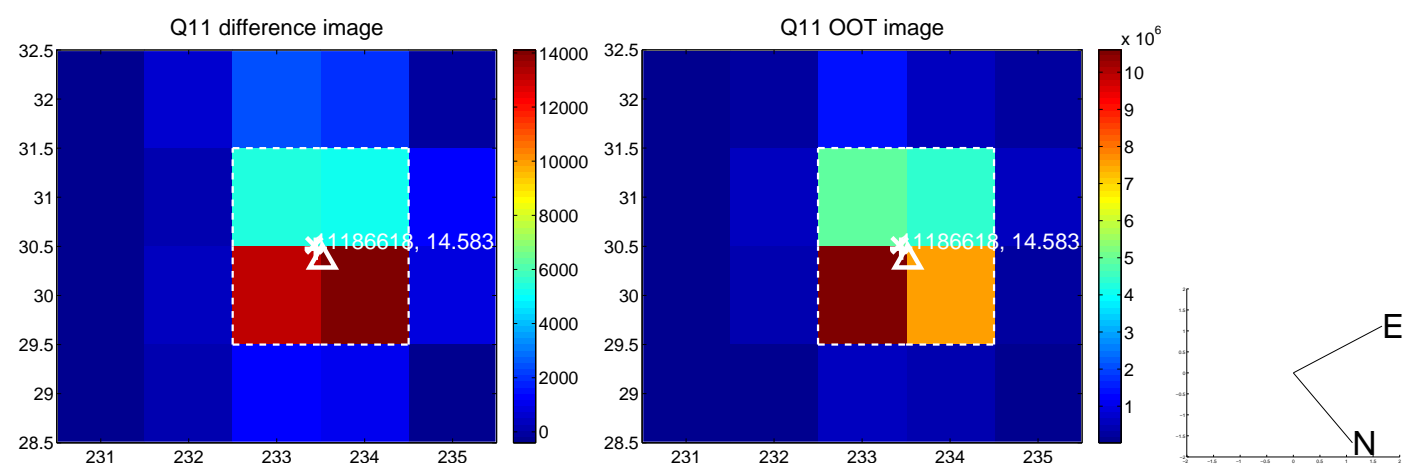
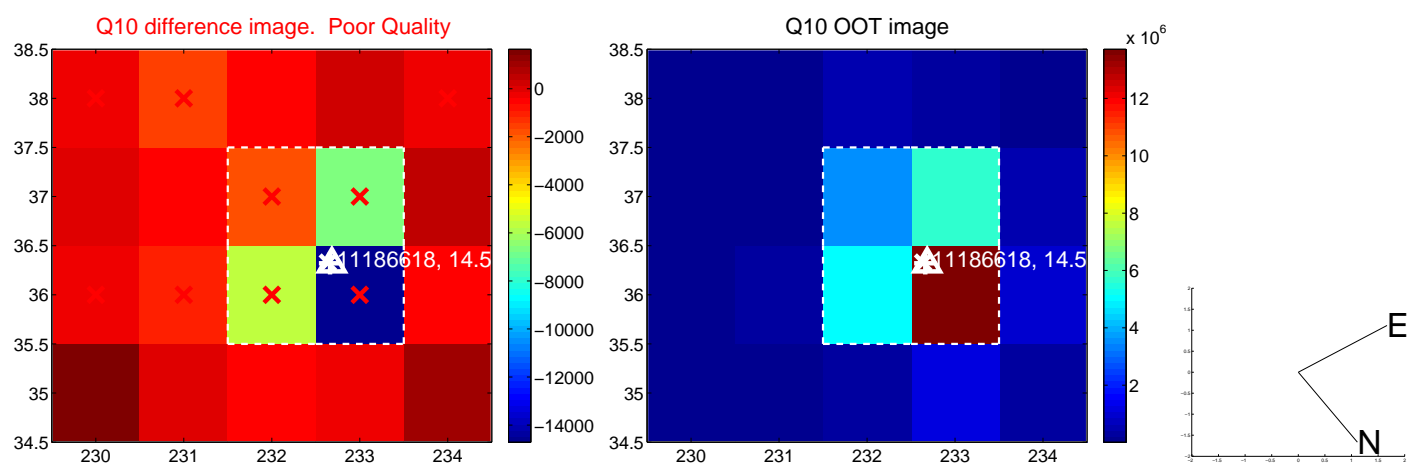
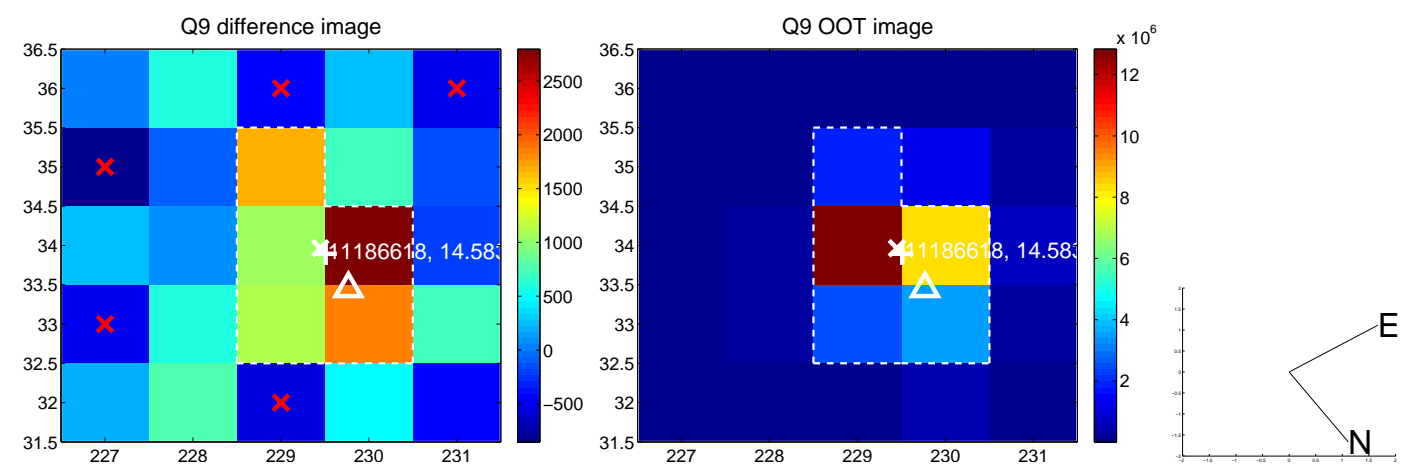
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

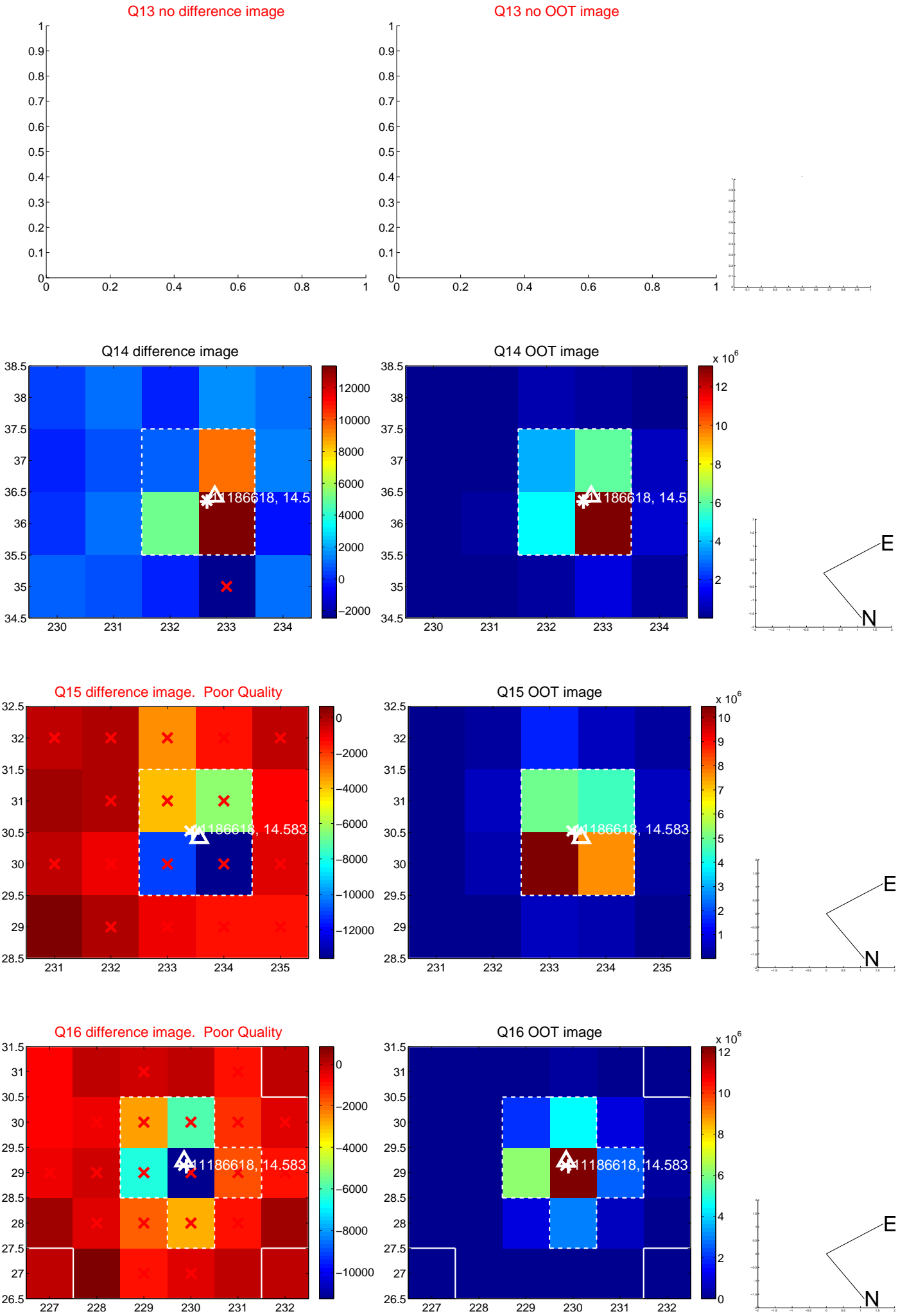


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

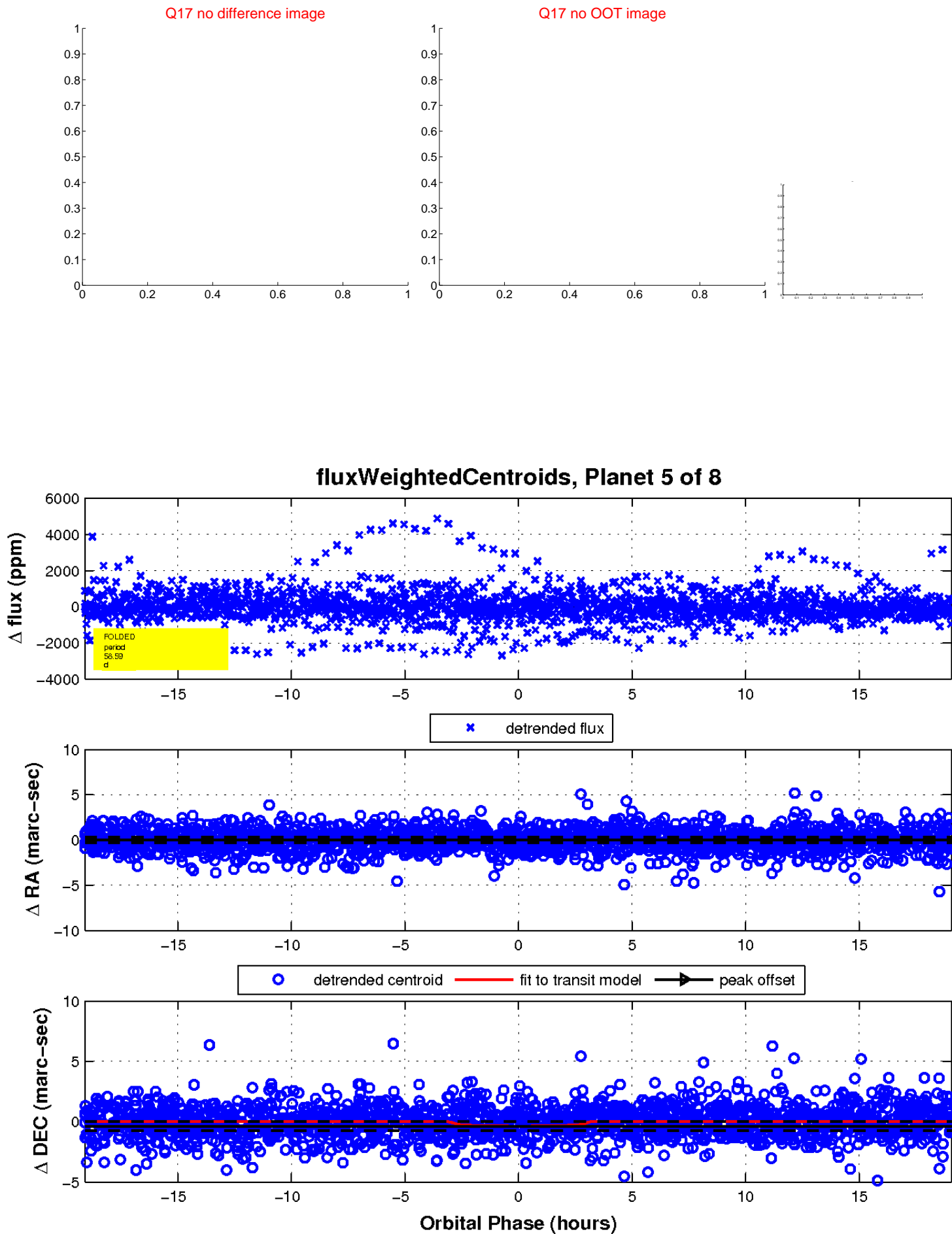




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

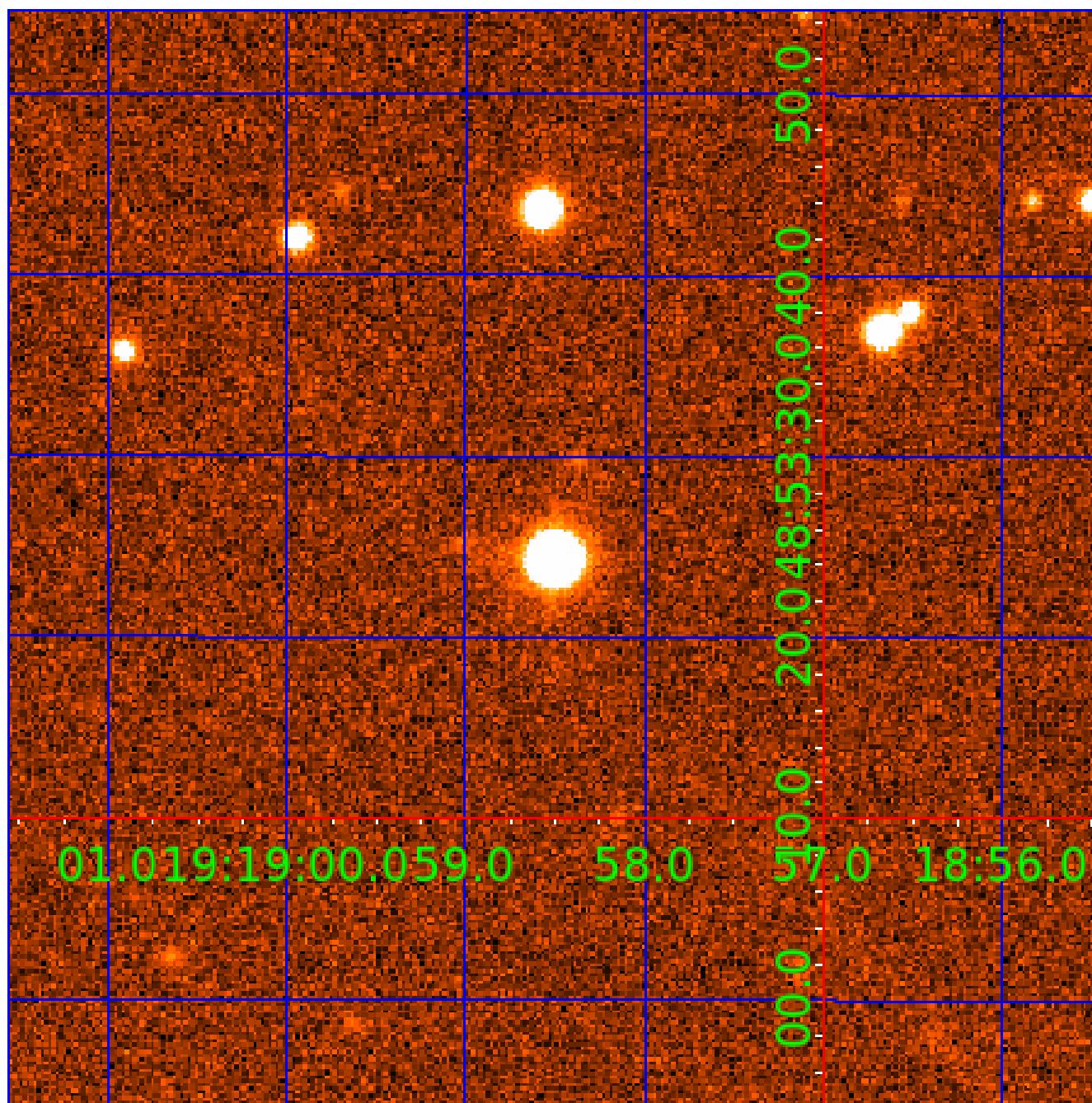


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011186618

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011186618-01	OBS	No	0.942573	131.654324	40.6	5.694	9.6	6.8	0.53	4671	0.37	509.57
011186618-02	OBS	No	167.860775	173.465028	2915.5	13.204	17.4	10.9	0.53	4671	5.45	0.51
011186618-03	OBS	No	185.867599	266.571084	3029.4	10.359	13.2	10.3	0.53	4671	5.58	0.44
011186618-04	OBS	No	87.907703	191.522304	1248.1	5.052	12.5	7.5	0.53	4671	1.99	1.21
011186618-05	OBS	No	58.594744	176.774498	583.6	6.364	9.3	4.1	0.53	4671	1.46	2.07
011186618-06	OBS	No	125.616664	136.793538	271.6	7.769	9.3	1.4	0.53	4671	1.04	0.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011186618-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
011186618-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_MEAS
011186618-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
011186618-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011186618-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

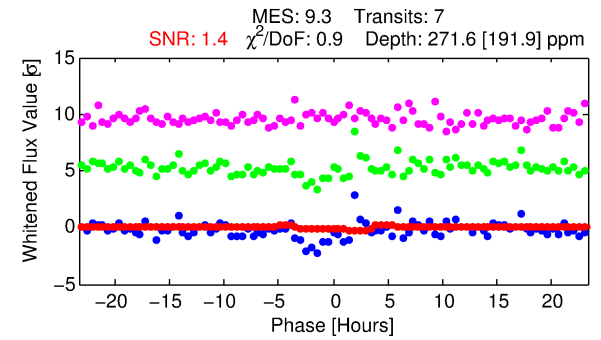
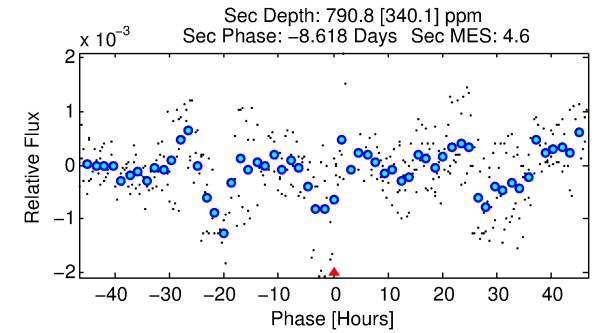
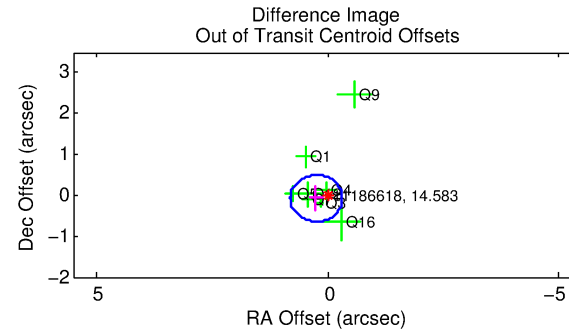
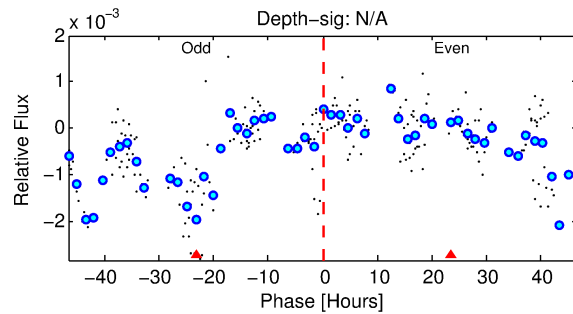
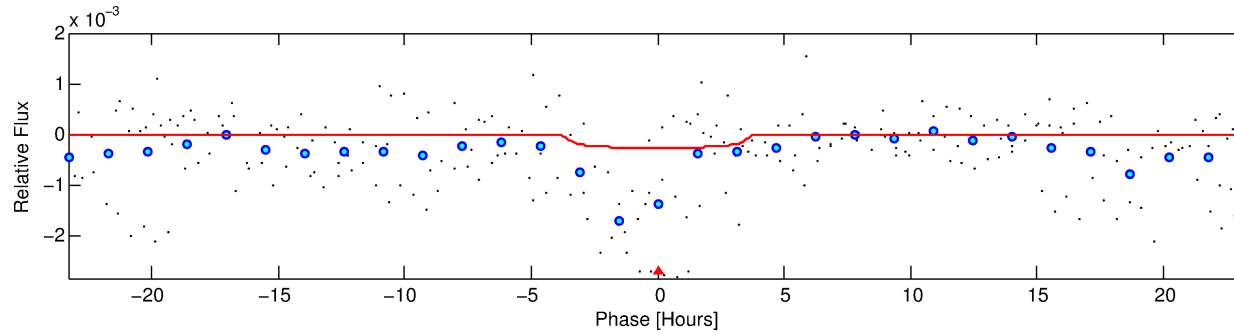
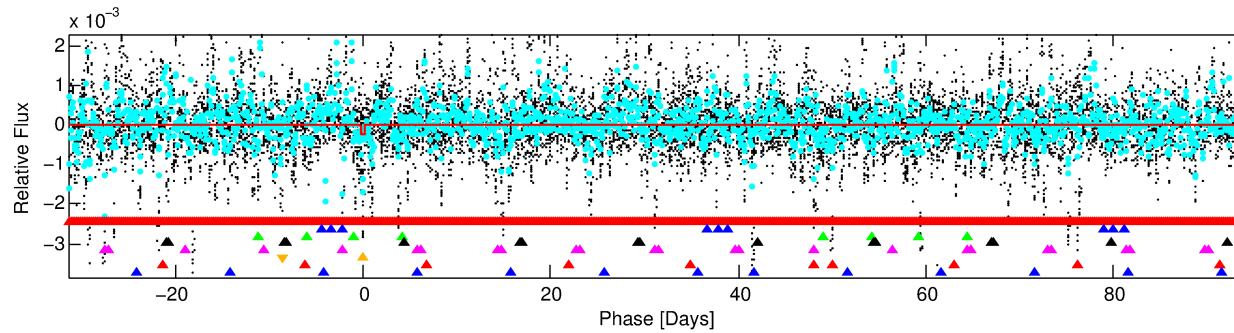
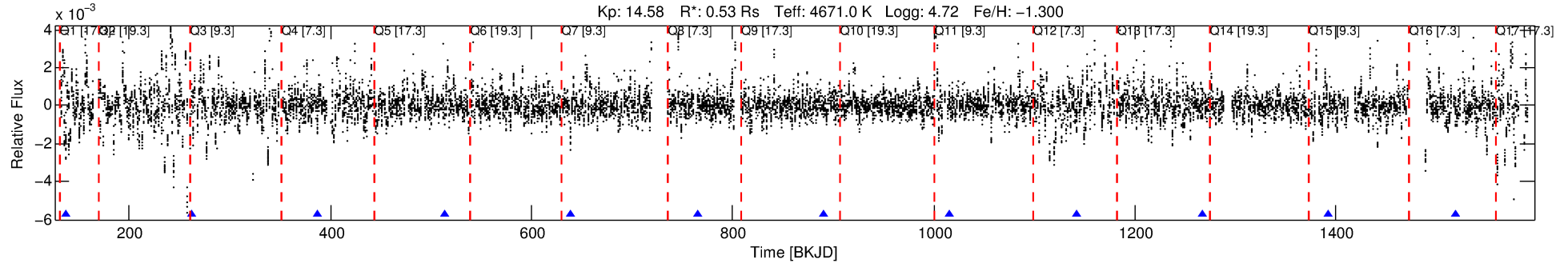
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011186618-06

No Significant Match Found

# DV One-Page Summary

KIC: 11186618 Candidate: 6 of 8 Period: 125.617 d



## DV Fit Results:

Period = 125.61666 [0.00808] d  
Epoch = 136.7935 [0.0545] BKJD  
Rp/R\* = 0.0180 [0.0139]  
a/R\* = 60.58 [162.88]  
b = 0.89 [0.61]  
Seff = 0.75 [0.12]  
Teq = 237 [10] K  
Rp = 1.04 [0.80] Re  
a = 0.3986 [0.0245] AU  
Ag = 64366.36 [103378.41] [0.62σ]  
Teffp = 5841 [2349] K [2.39σ]

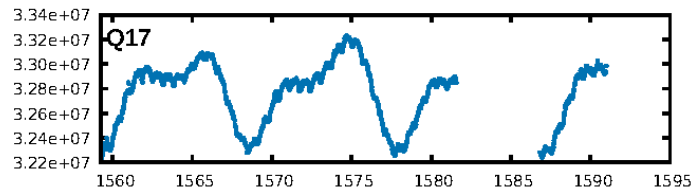
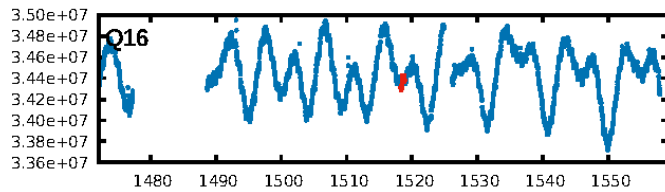
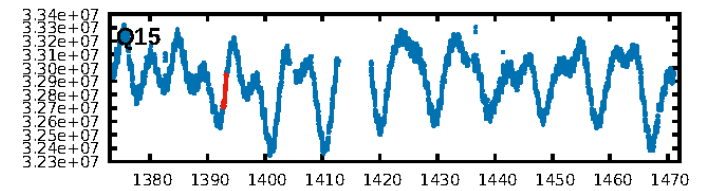
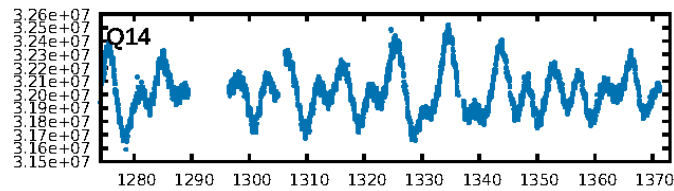
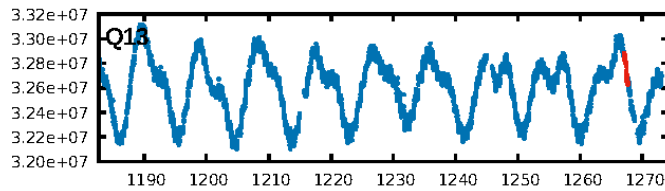
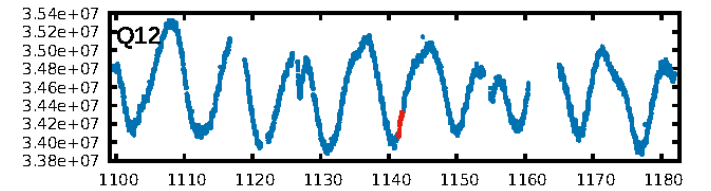
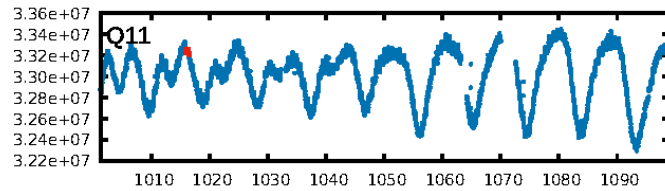
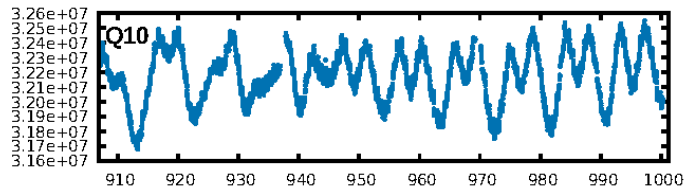
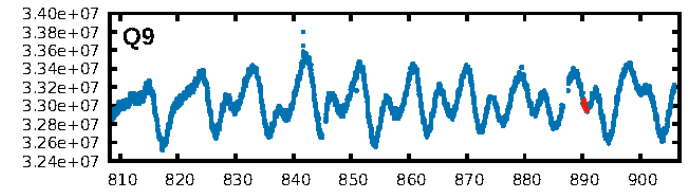
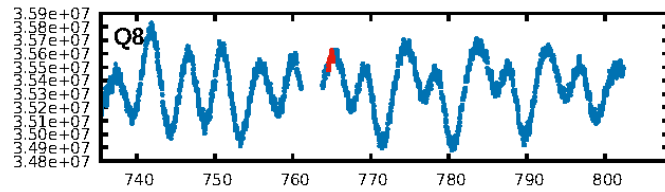
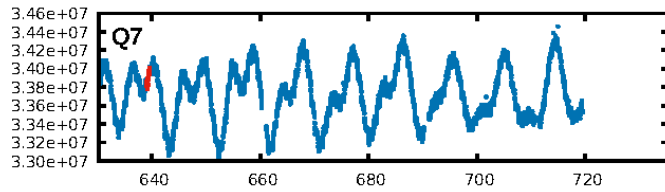
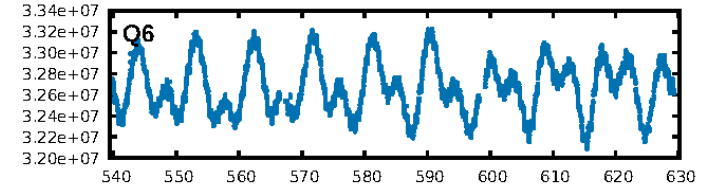
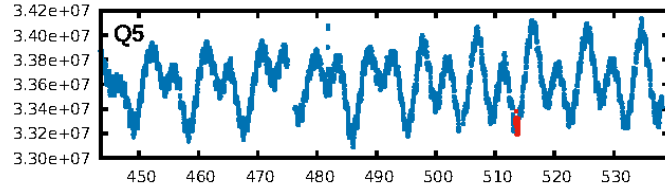
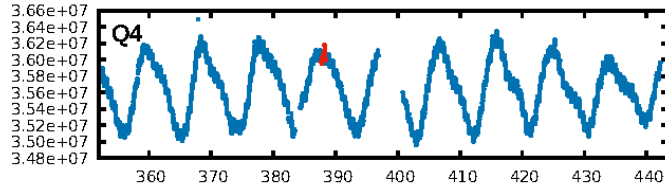
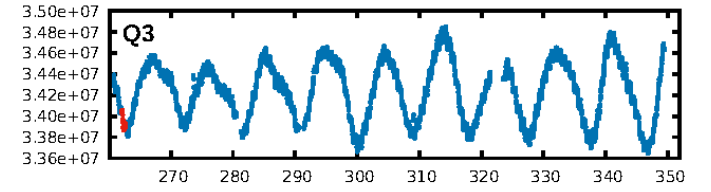
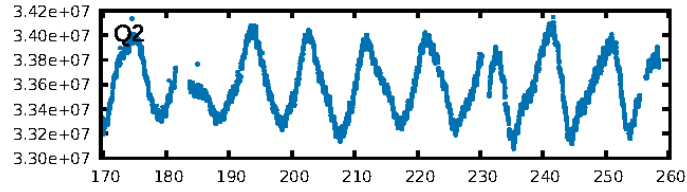
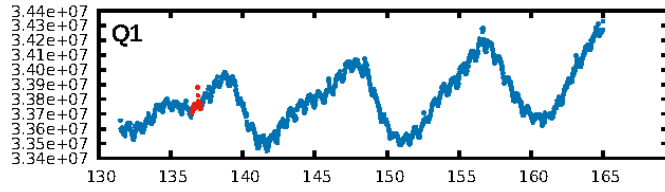
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [20.12σ]  
LongPeriod-sig: 100.0% [68.09σ]  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 0.8937  
Centroid-sig: 26.7%  
Centroid-so: 1.145 arcsec [1.01σ]  
OotOffset-rm: 0.254 arcsec [1.34σ]  
KicOffset-rm: 0.396 arcsec [2.55σ]  
OotOffset-st: 0/2/3/3 [8]  
KicOffset-st: 0/2/3/3 [8]  
DiffImageQuality-fgm: 0.50 [4/8]  
DiffImageOverlap-fno: 0.00 [0/9]

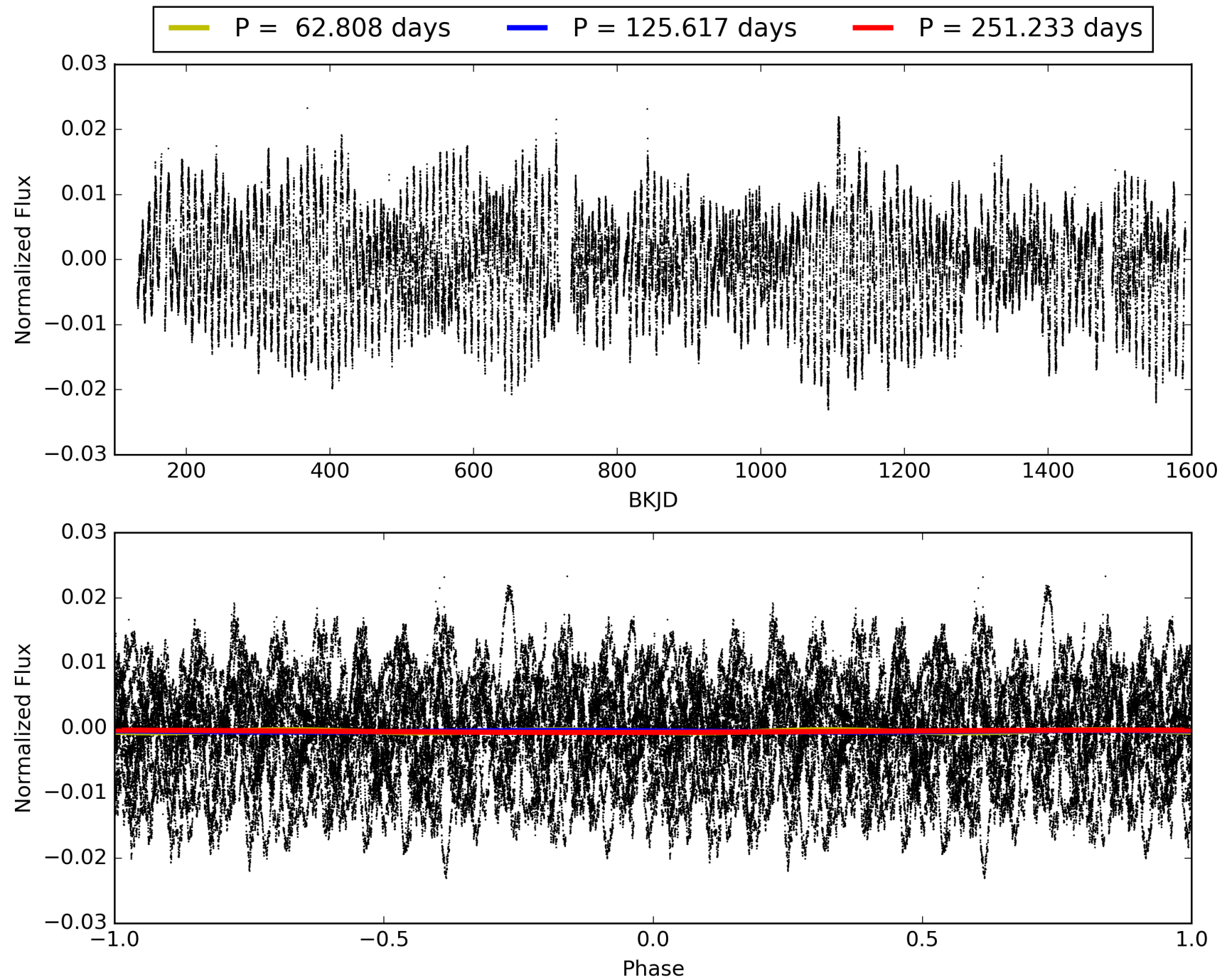
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:28:39 Z

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

# TCE 011186618-06, PDC Light Curves



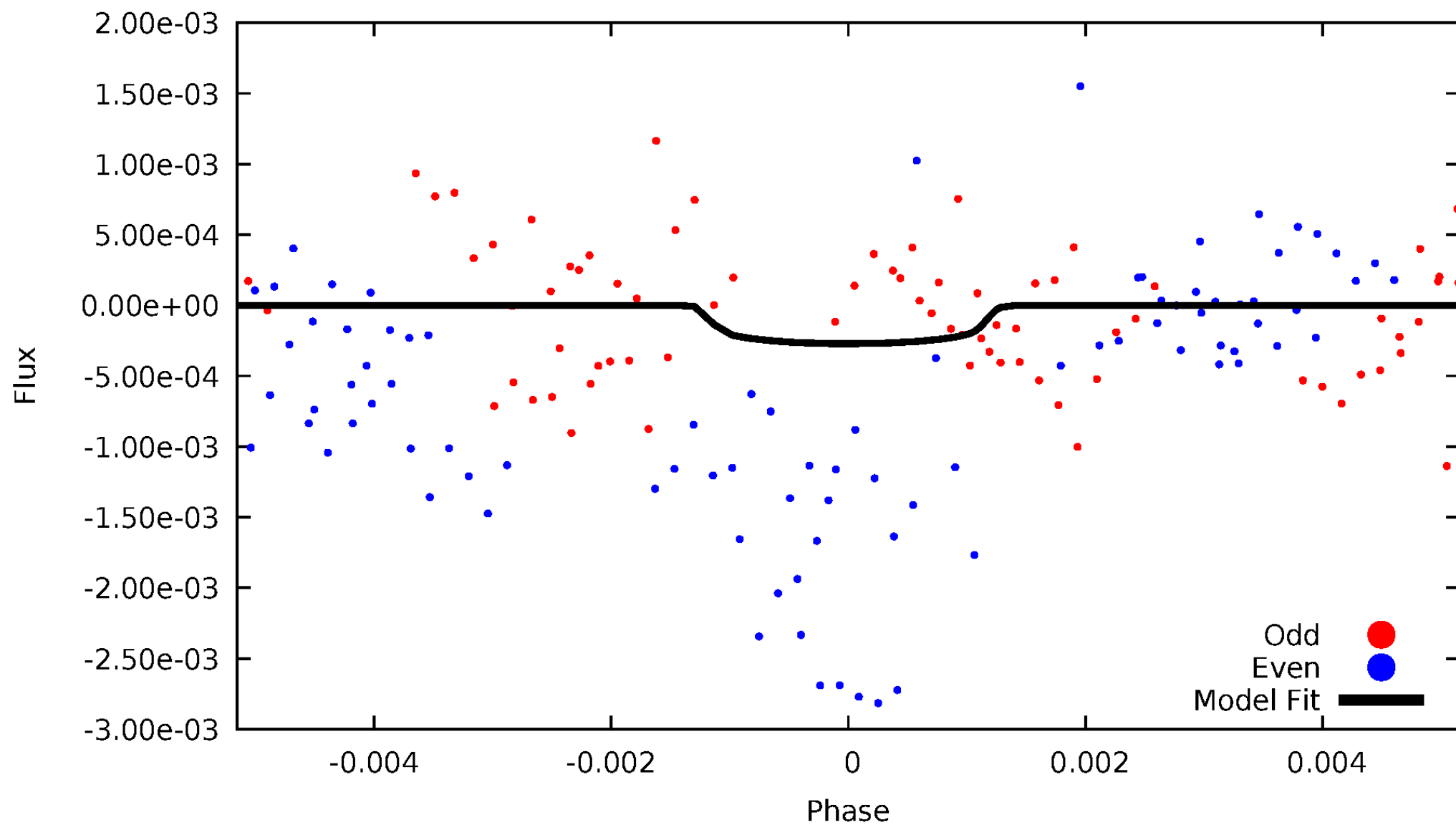
# TCE 011186618-06





# DV Odd/Even

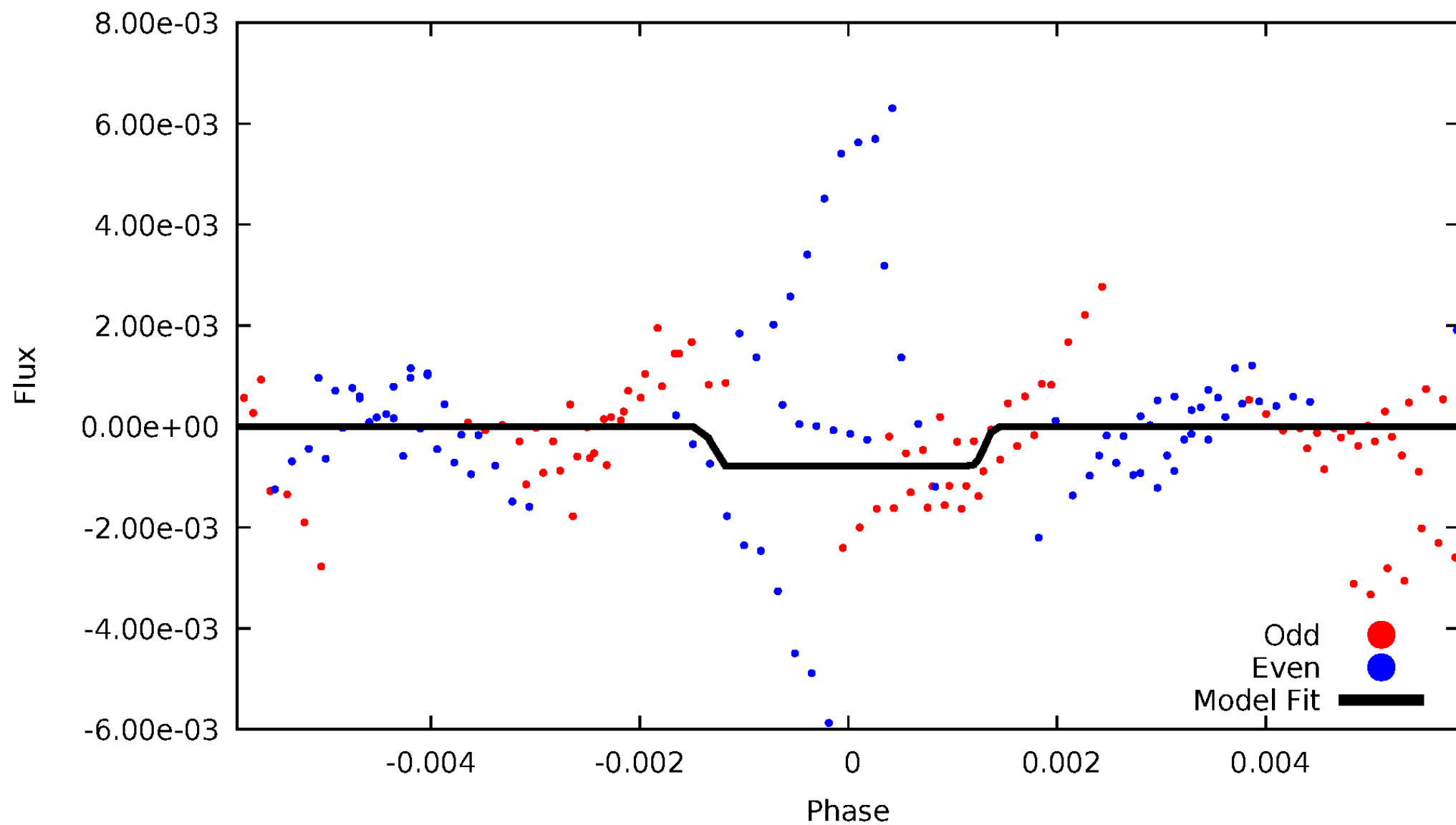
TCE 011186618-06





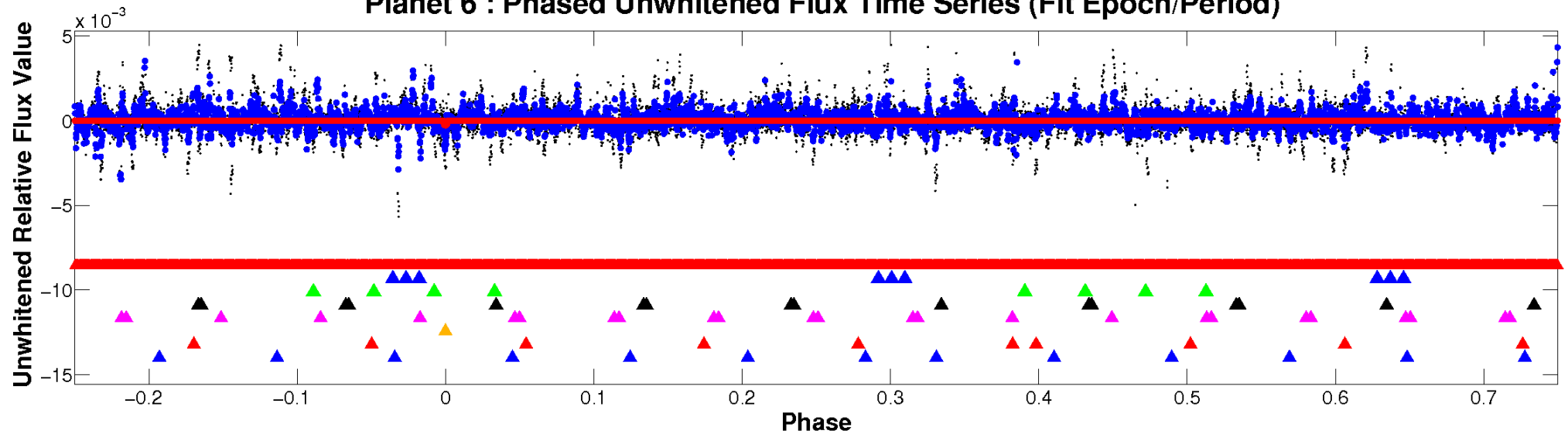
# ALT Odd/Even

TCE 011186618-06

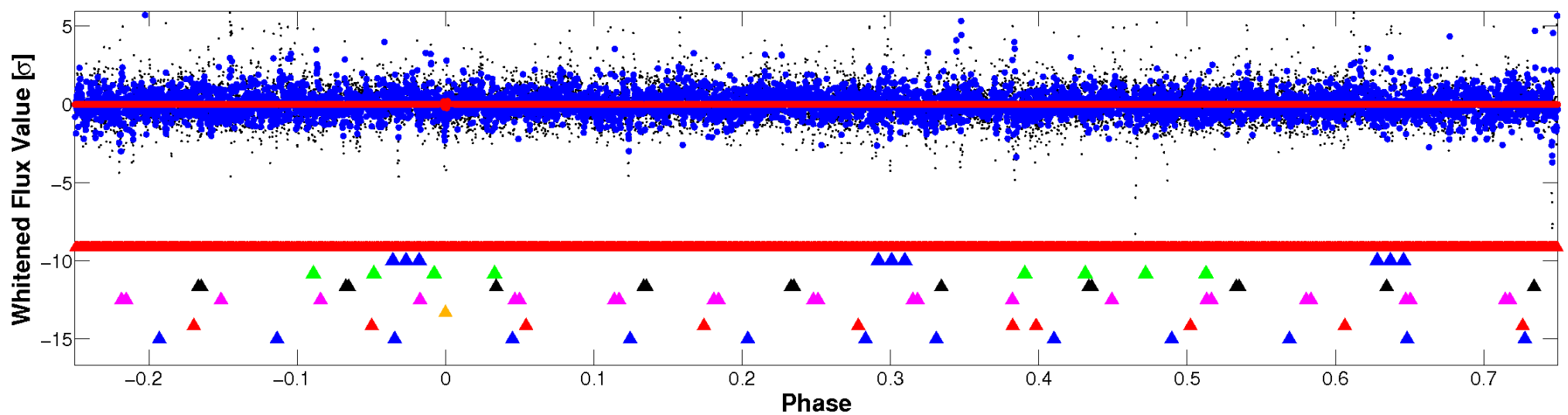


# Non-Whitened Vs. Whitened Light Curve

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

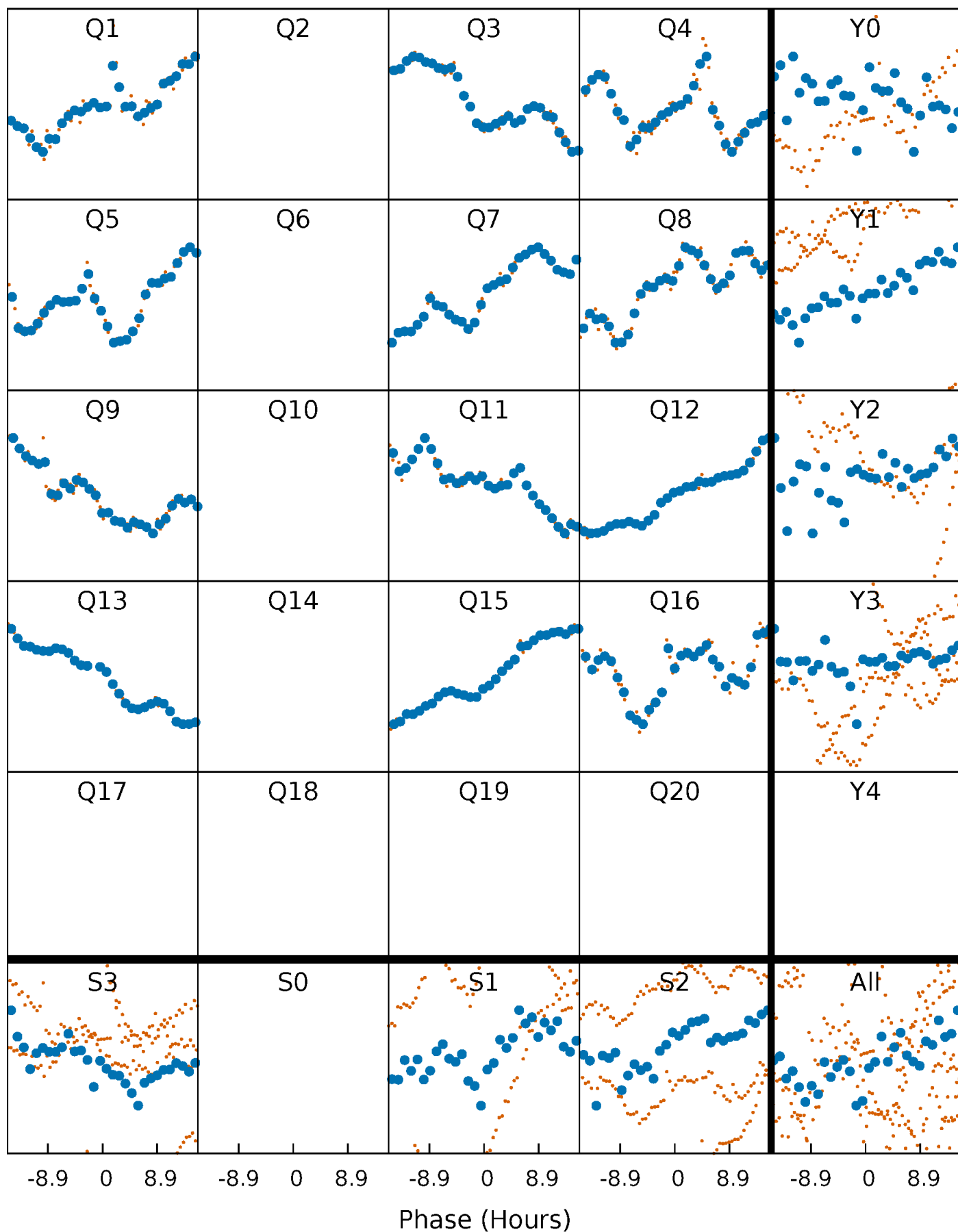


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



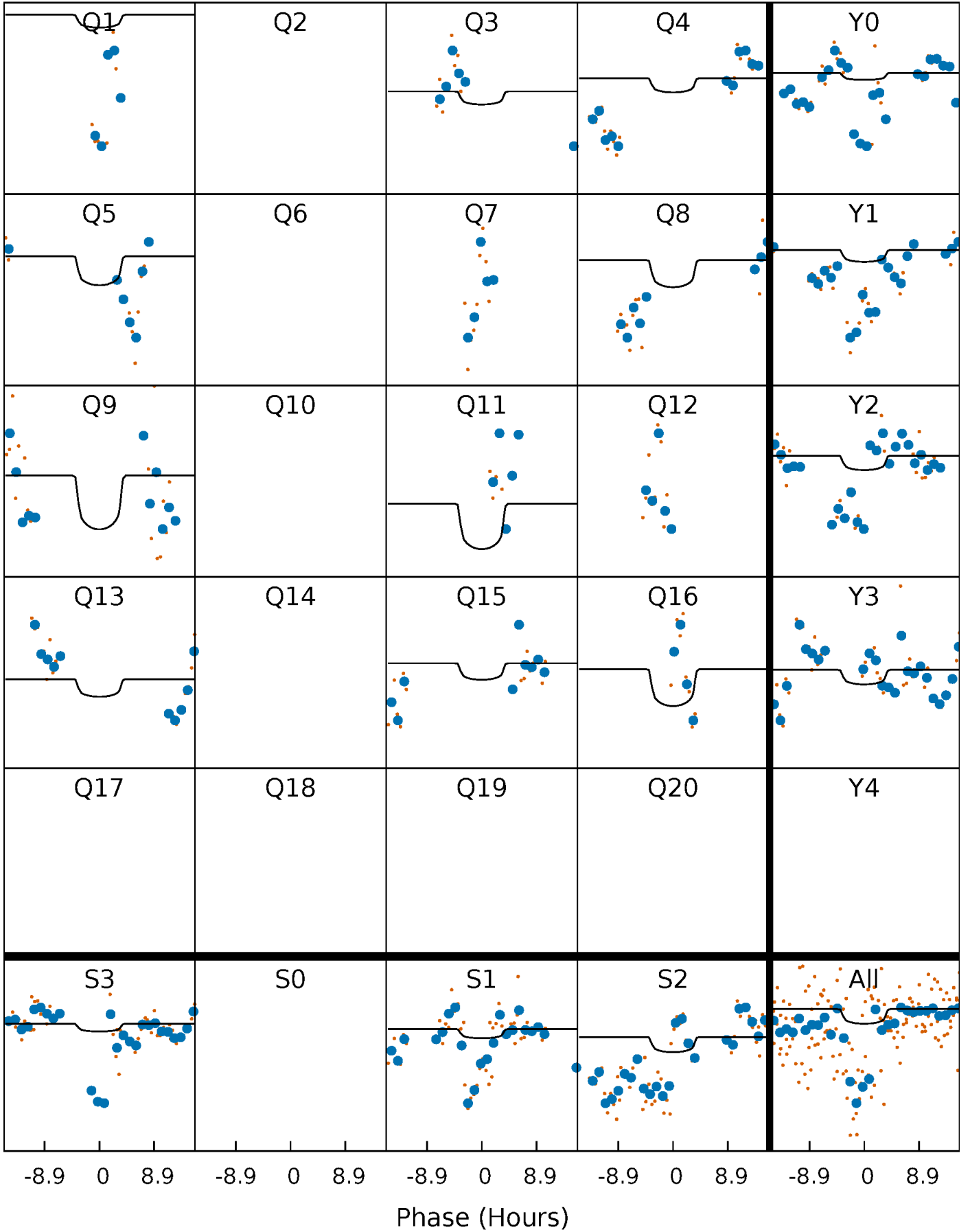
# PDC Quarter-Phased Transit Curves

TCE 011186618-06 P=125.616664 Days  $T_0=136.793538$  (BKJD)



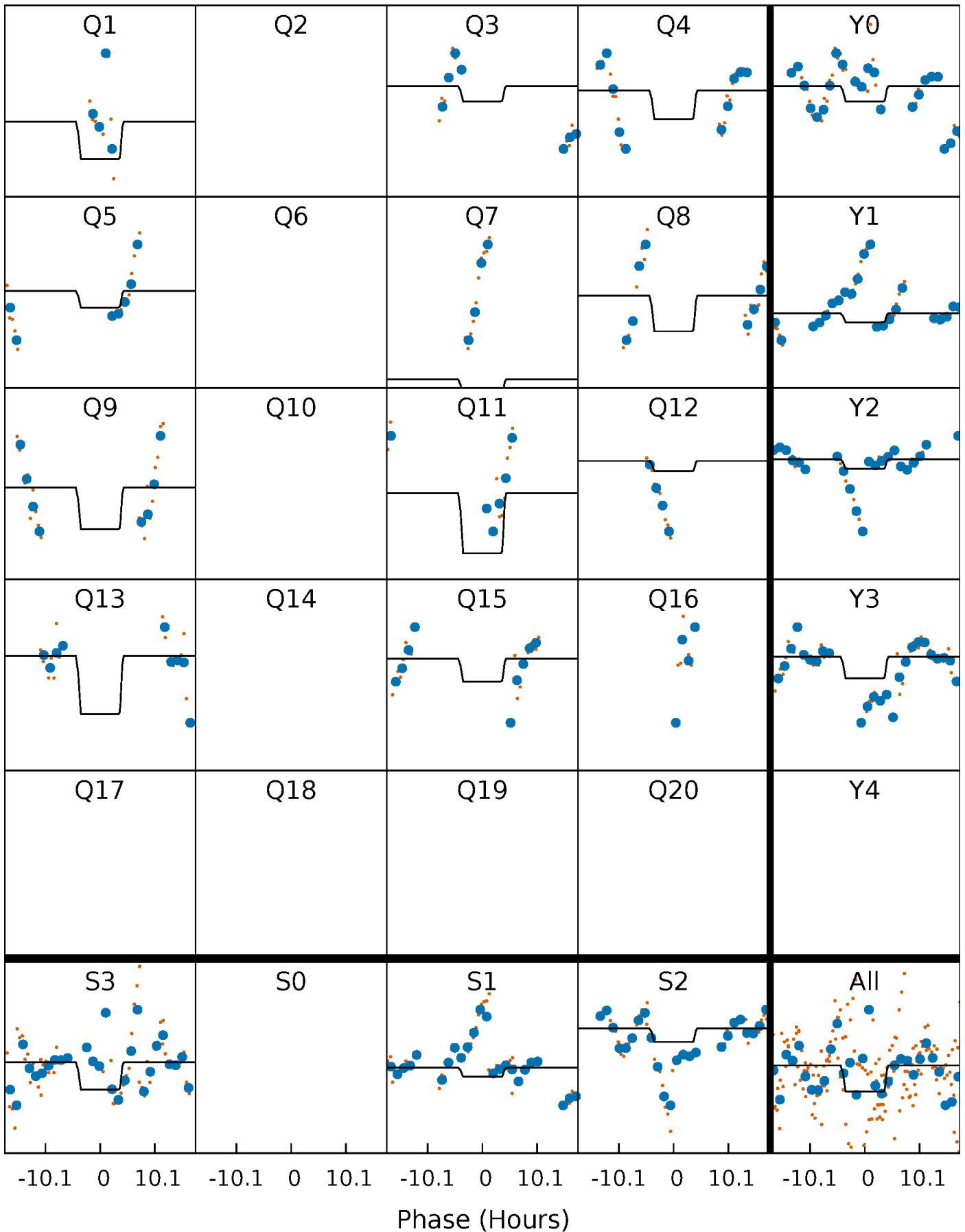
# DV Quarter-Phased Transit Curves

TCE 011186618-06 P=125.616664 Days  $T_0=136.793538$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

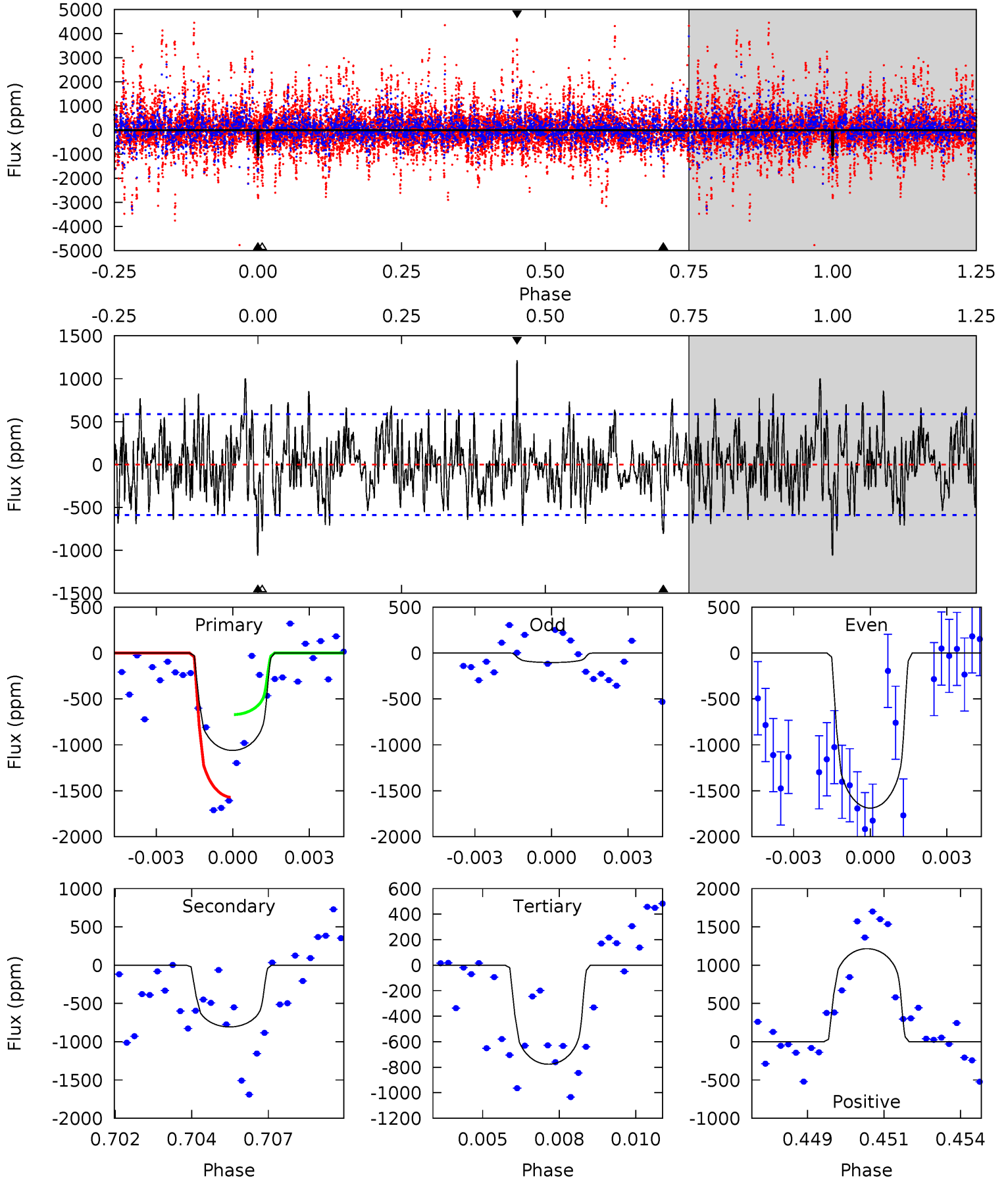
TCE 011186618-06 P=125.613353 Days  $T_0=136.822662$  (BKJD)



# DV Model-Shift Uniqueness Test

011186618-06, P = 125.616664 Days, E = 11.176874 Days

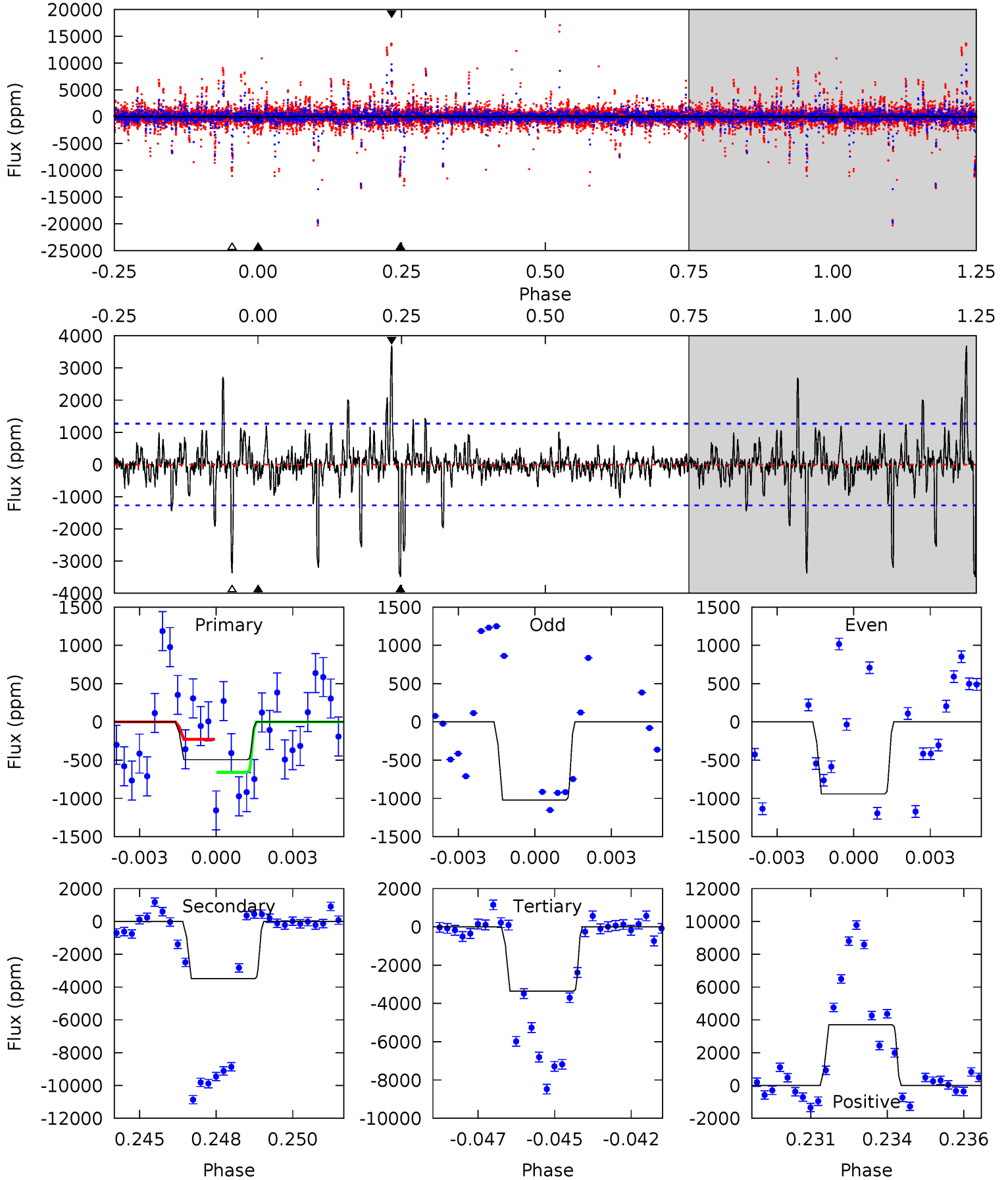
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.53	7.25	6.98	10.9	5.28	3.01	2.57	2.56	-1.39	0.28	-3.67	6.73	1.97	0.53	3.96



# Alt Model-Shift Uniqueness Test

011186618-06, P = 125.613353 Days, E = 11.209309 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
2.05	14.5	14.0	15.4	5.27	2.99	2.15	-11.9	-13.3	0.52	-0.87	0.14	0.81	0.51	0.92



### Stellar Parameters For KIC 011186618

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4671^{+125}_{-153}$	$4.721^{+0.052}_{-0.024}$	$-1.300^{+0.300}_{-0.350}$	$0.528^{+0.029}_{-0.037}$	$0.534^{+0.036}_{-0.022}$	$5.111^{+1.091}_{-0.505}$
	+3%/-3%	+1%/-1%	+23%/-27%	+5%/-7%	+7%/-4%	+21%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 011186618-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-807 \pm 111$	$1.11^{+0.80}_{-0.63}$	$329^{+12}_{-12}$	$5482^{+3221}_{-1124}$	$58057^{+261126}_{-37803}$
Alt.	$-3487 \pm 241$	$1.62^{+0.81}_{-0.72}$	$329^{+10}_{-11}$	$6560^{+2848}_{-1243}$	$118788^{+266761}_{-66613}$

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



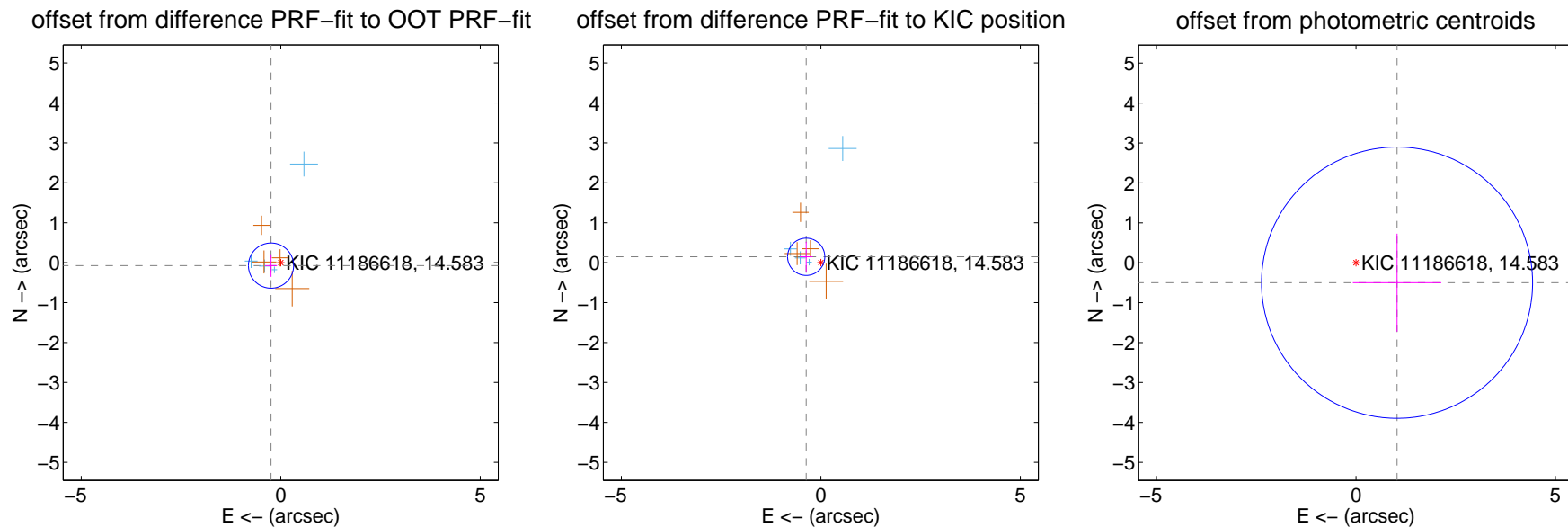
## DV Centroid Data

Supplemental centroid analysis for 011186618-06. Kepler magnitude: 14.58. Transit SNR 1.45

There are 4 quarters with good PRF difference image offsets

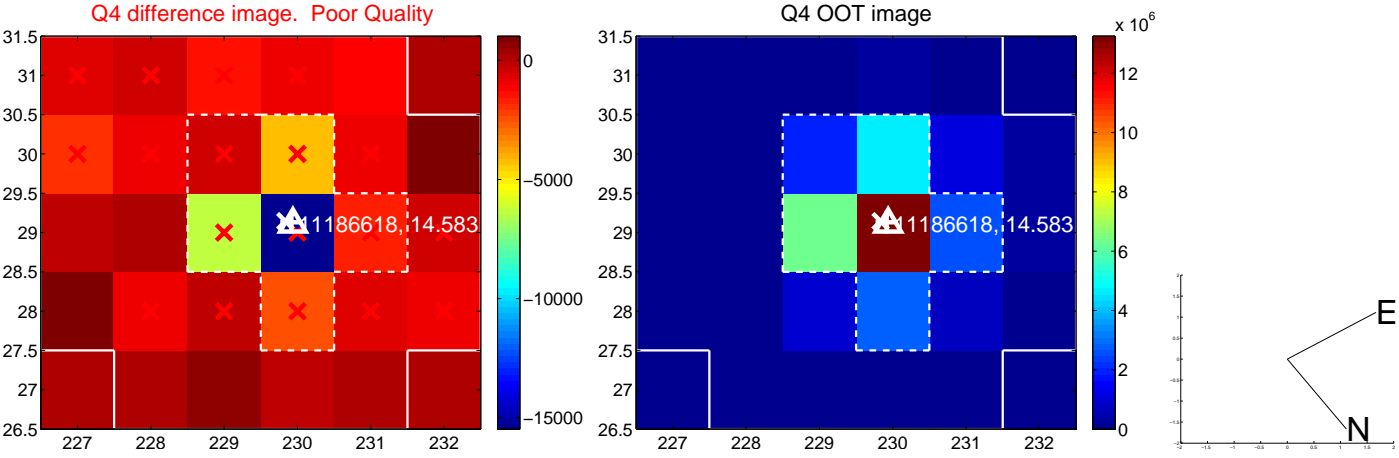
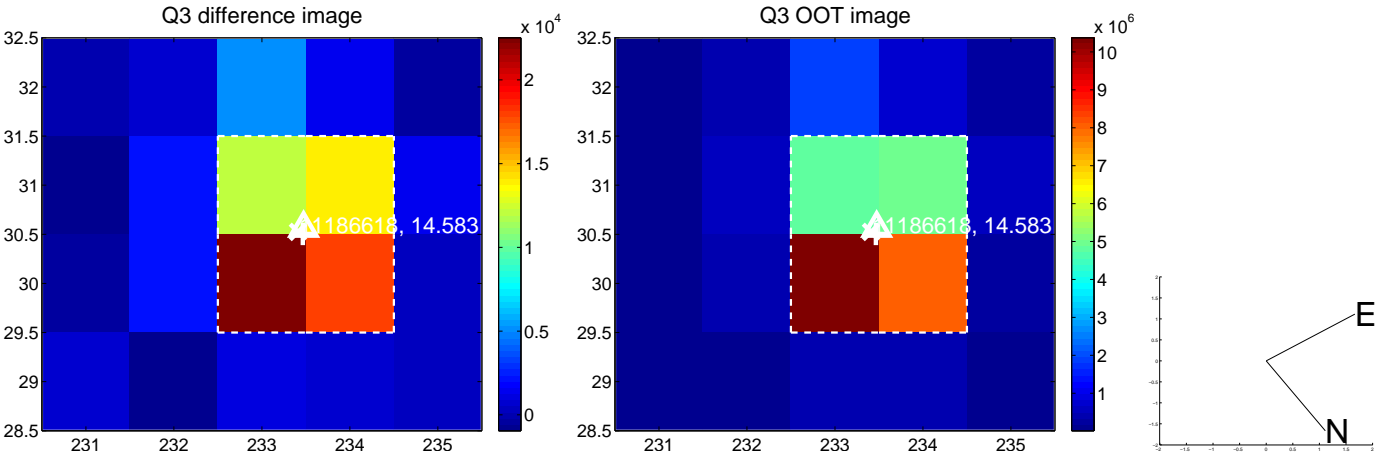
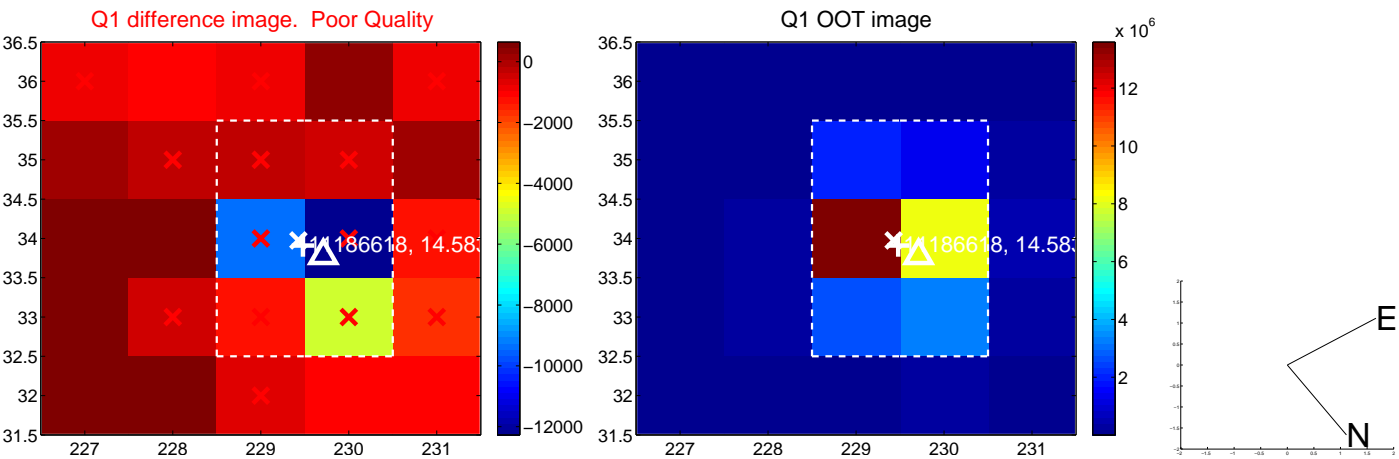
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.254 \pm 0.189$	1.34	$0.243 \pm 0.150$	$-0.073 \pm 0.282$
PRF-fit source offset from KIC position	$0.396 \pm 0.156$	2.55	$0.368 \pm 0.161$	$0.148 \pm 0.377$
photometric centroid source offset	$1.14 \pm 1.13$	1.01	$-1.03 \pm 1.11$	$-0.50 \pm 1.23$

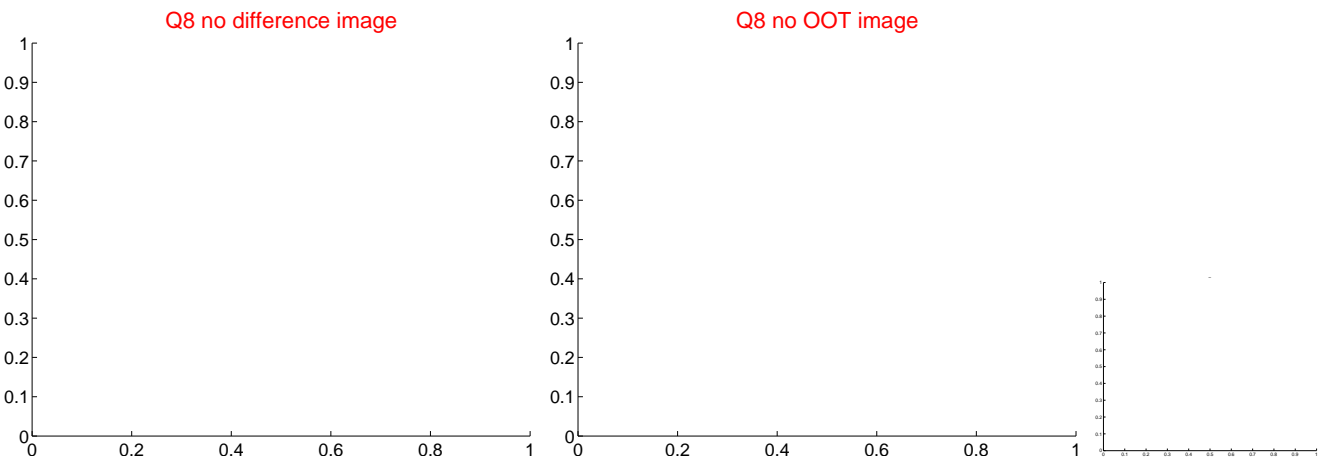
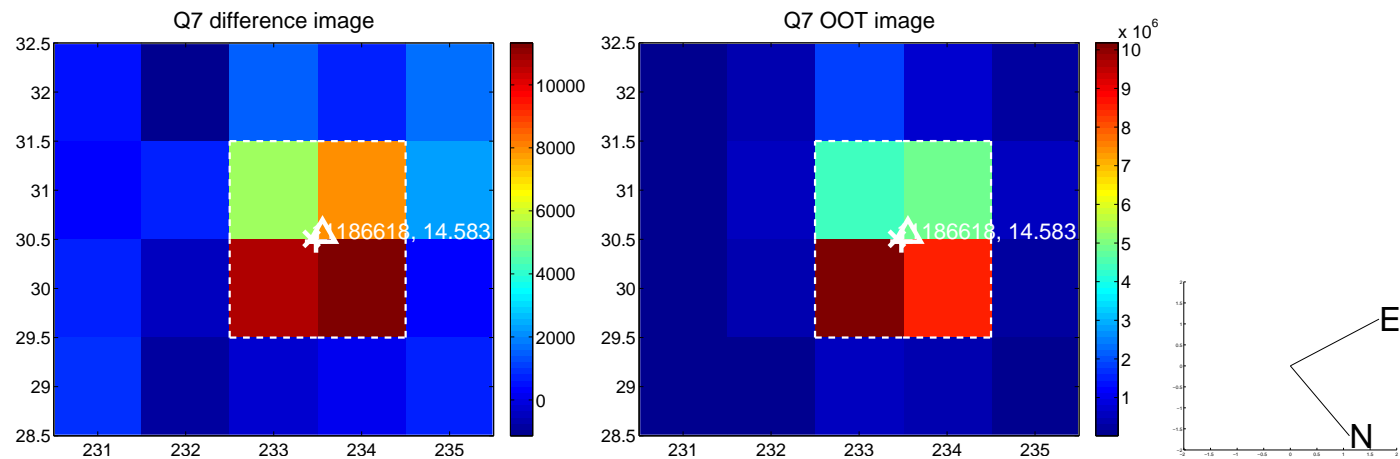
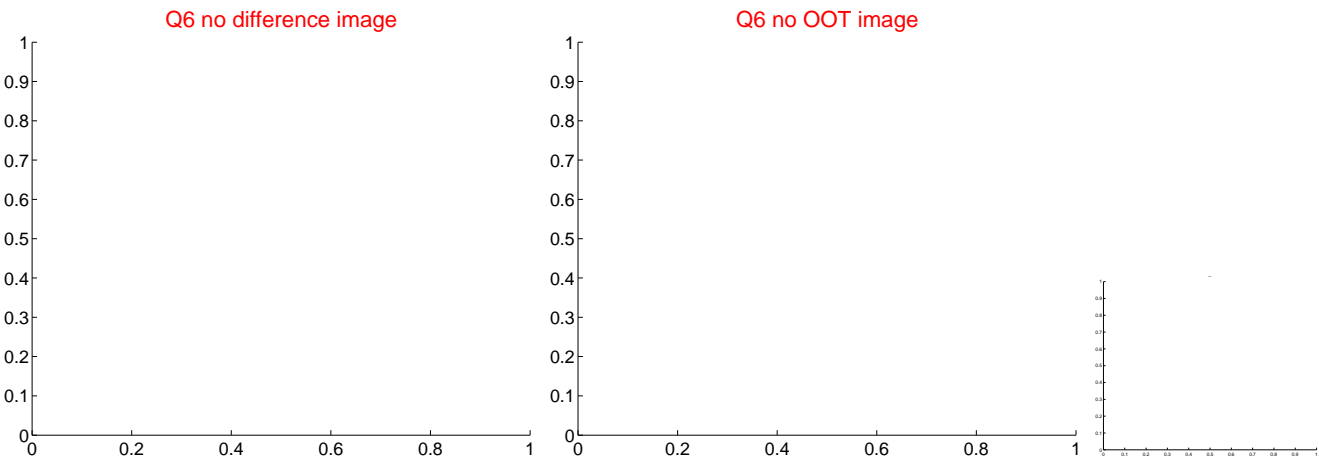
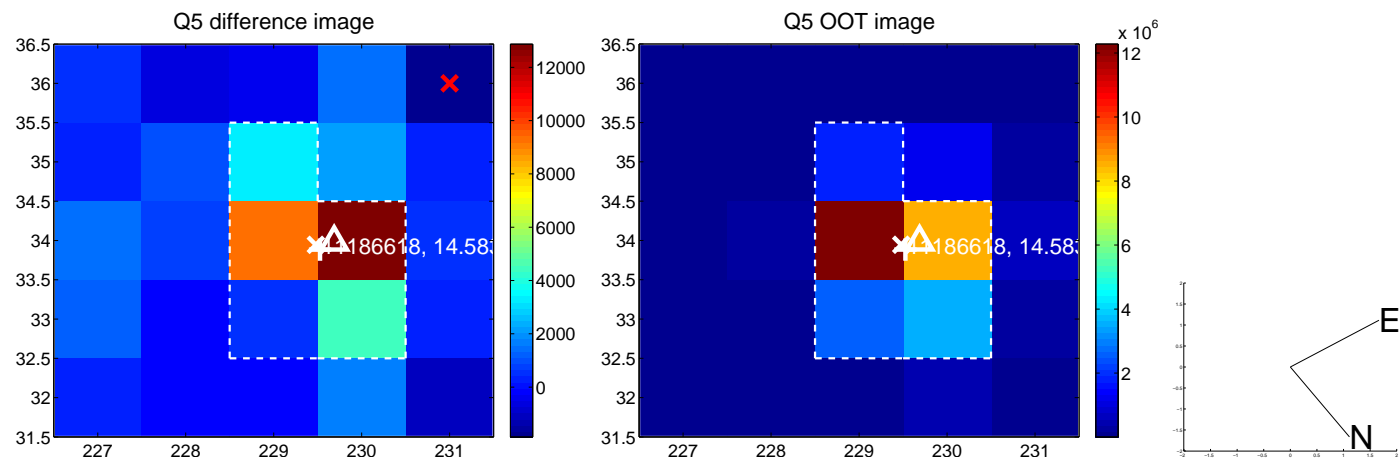


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

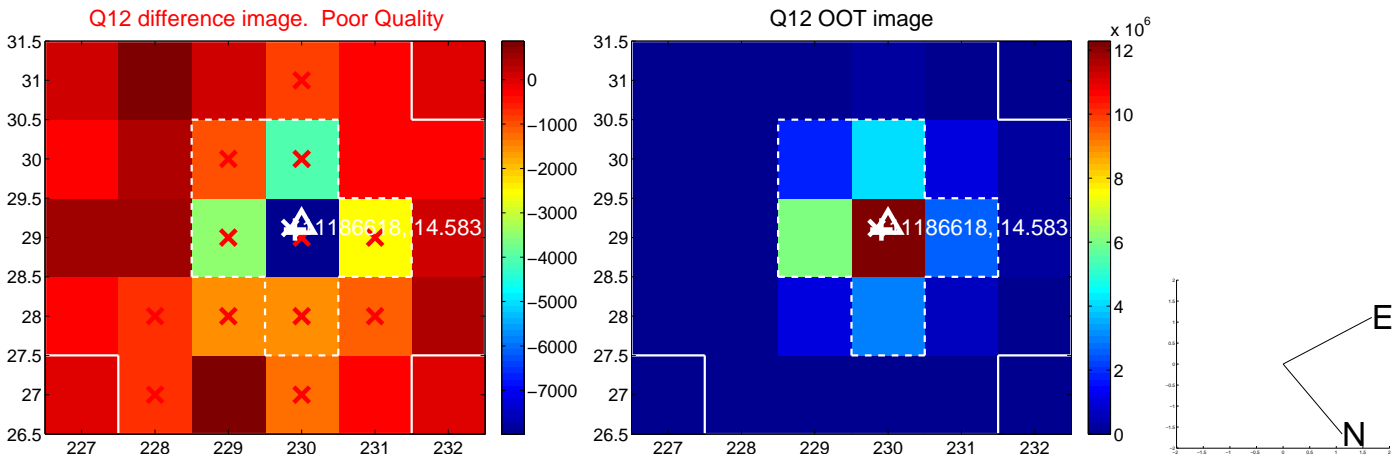
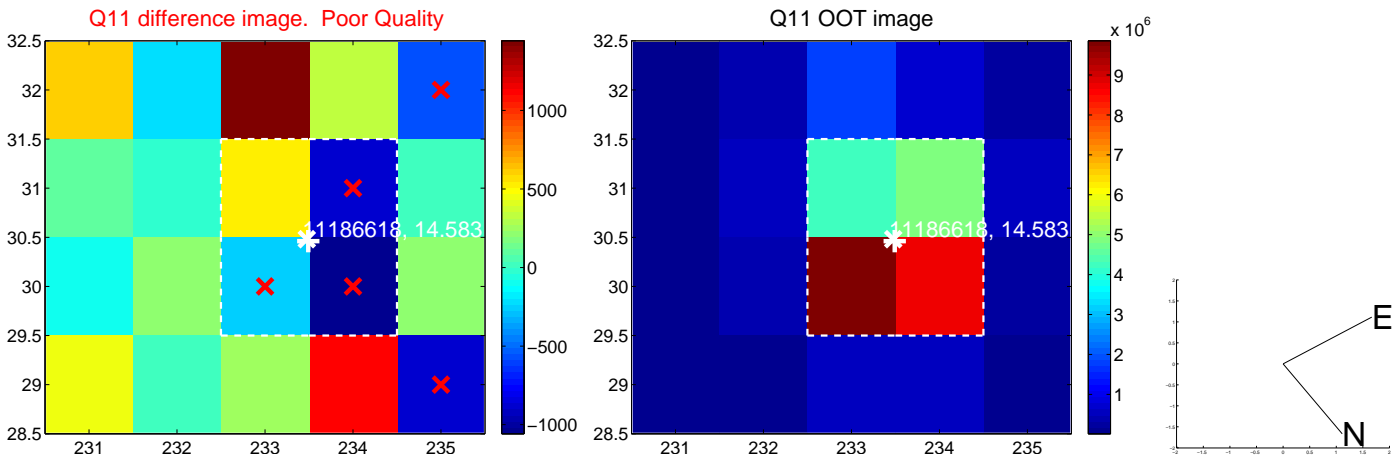
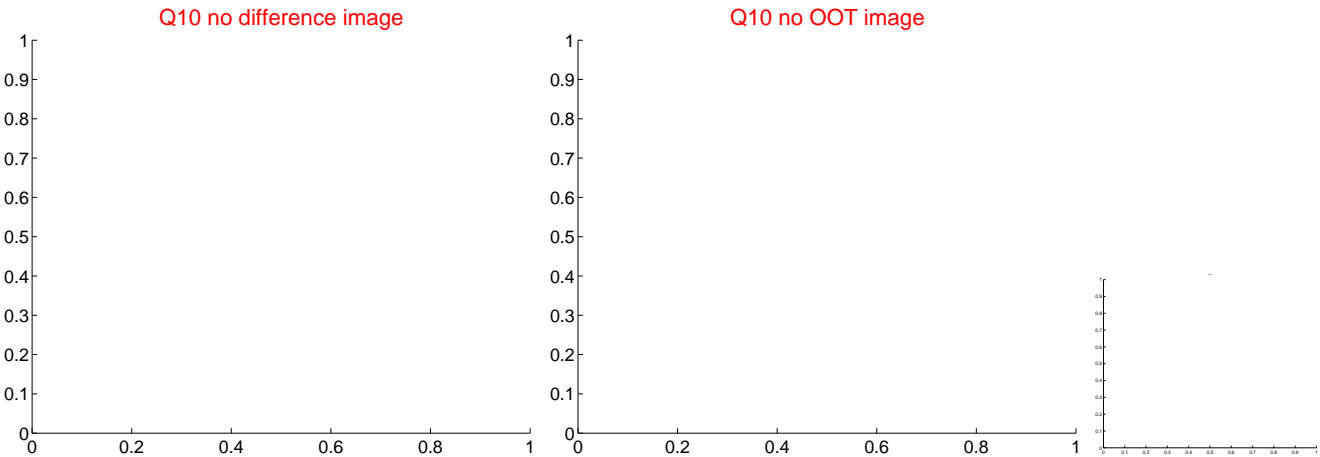
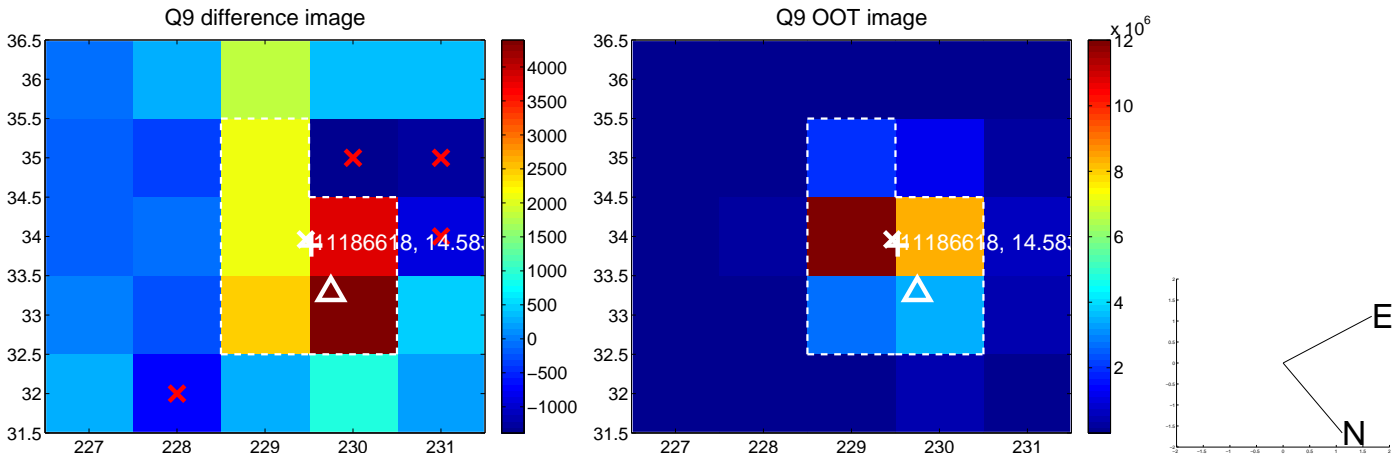
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



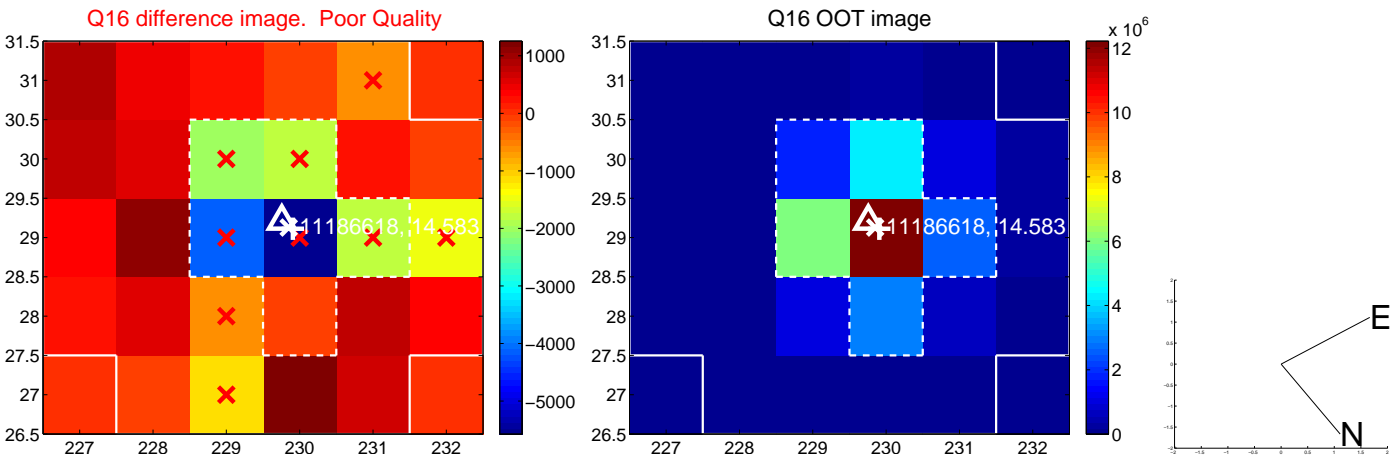
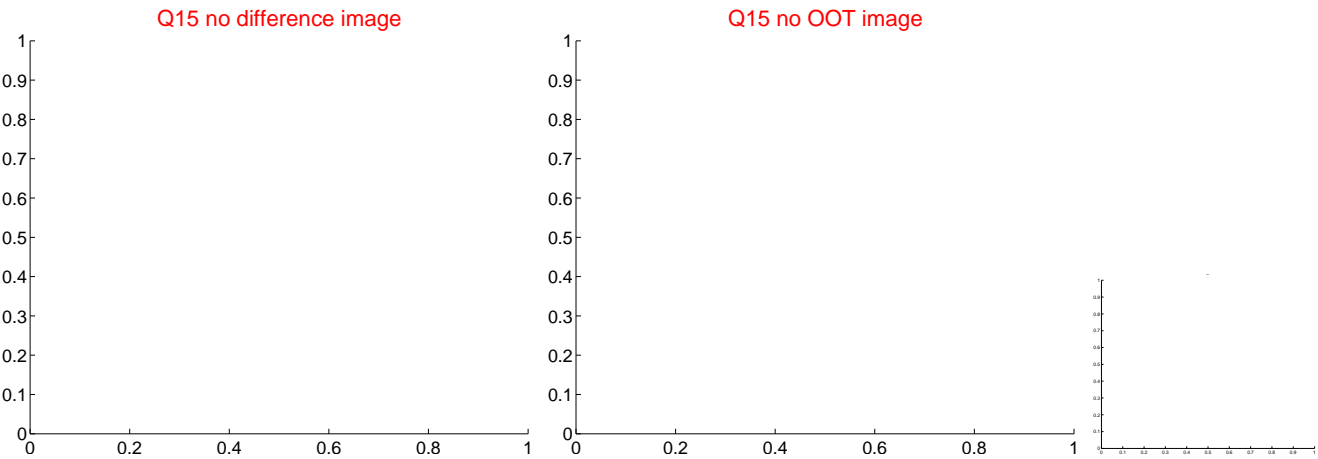
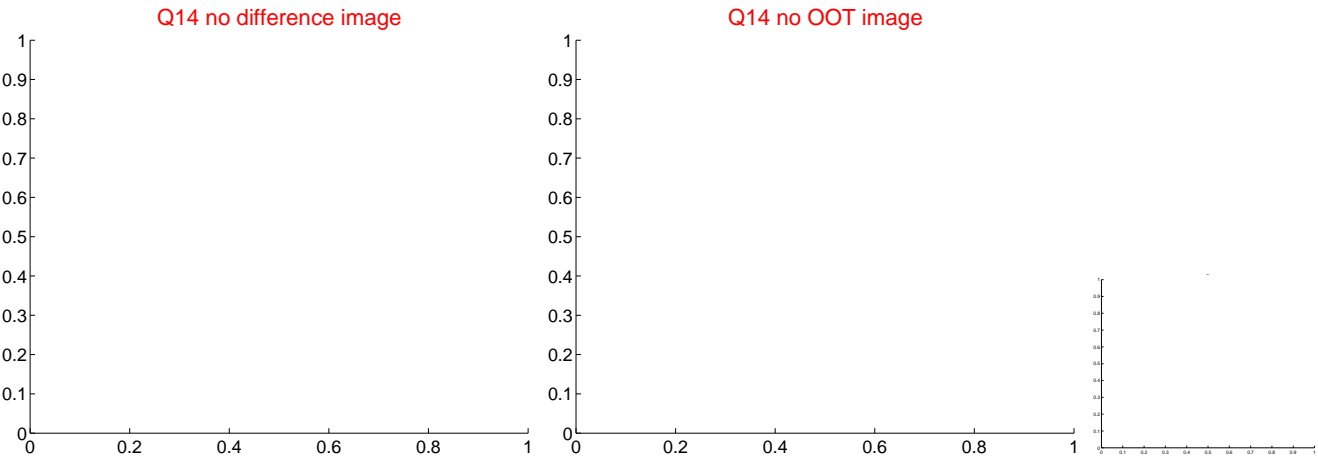
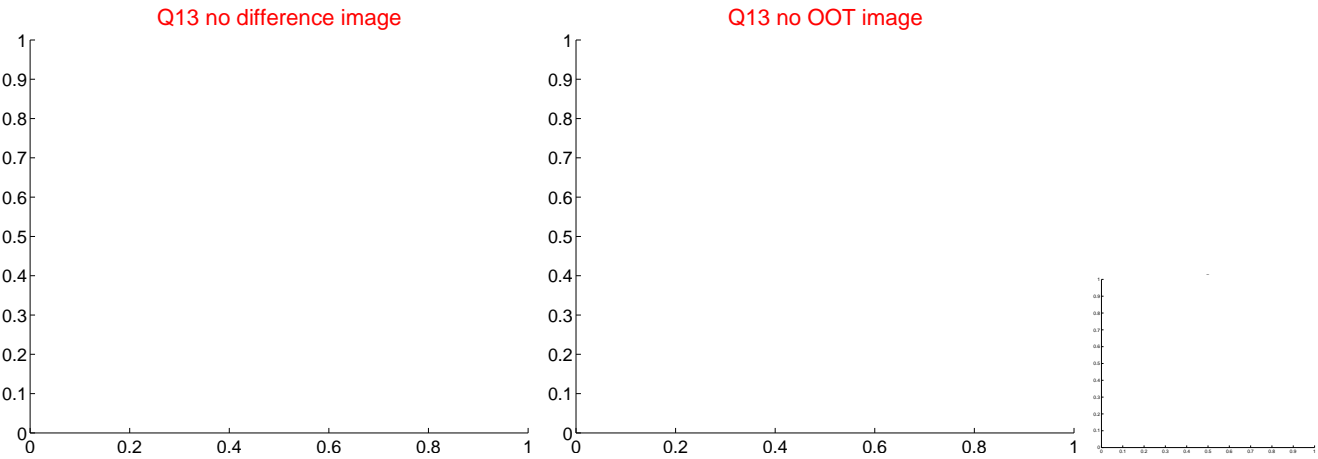
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



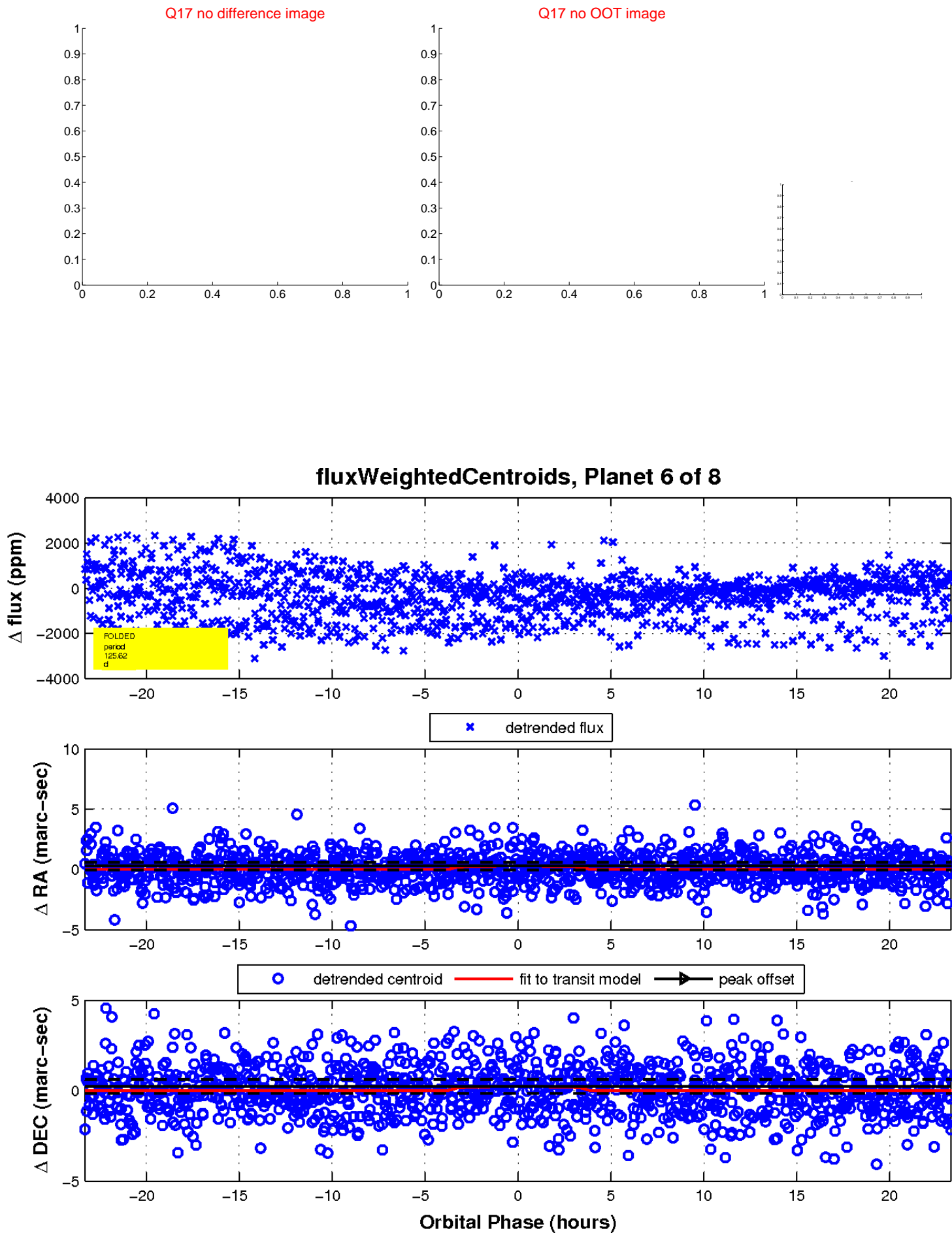
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

