

# KIC 008167938

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008167938-01	OBS	6052.01	2.565734	133.224742	577.1	1.175	50.8	65.6	4.71	11360	13.02	106724.06
008167938-02	OBS	No	2.565656	131.904967	191.8	1.874	33.1	23.4	4.71	11360	7.46	106728.39
008167938-03	OBS	No	1.282847	131.829744	125.5	1.500	15.5	-1.0	4.71	11360	5.46	268933.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008167938-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
008167938-02	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_SATURATED—HALO_GHOST
008167938-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

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

Ephemeris Match Information For 008167938-01

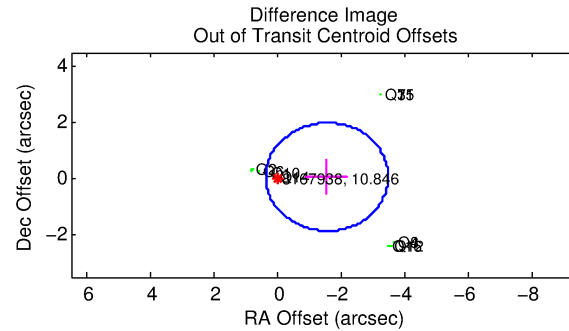
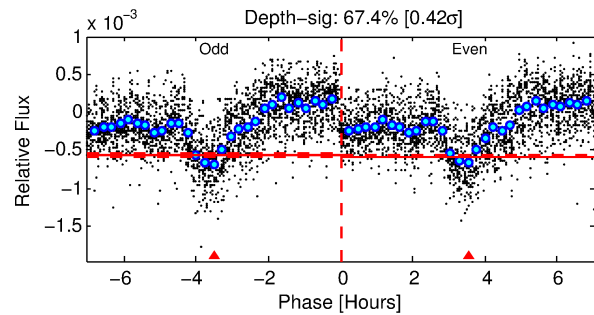
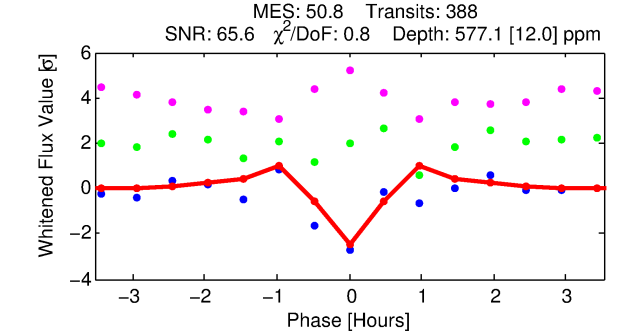
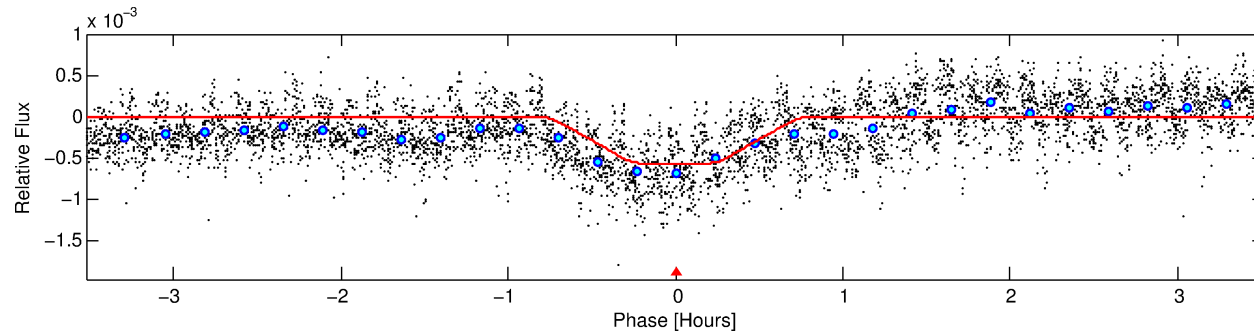
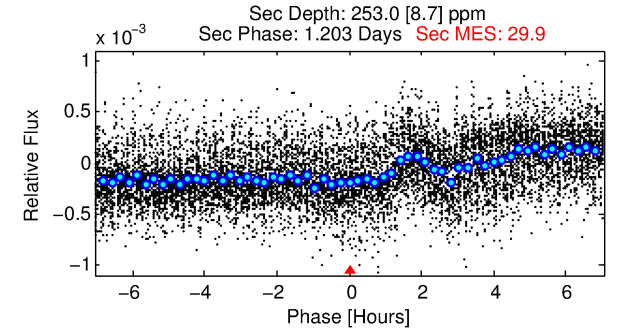
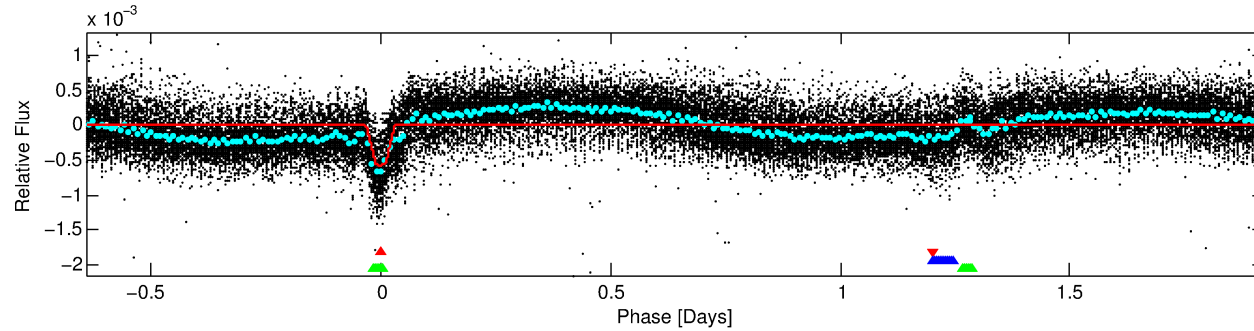
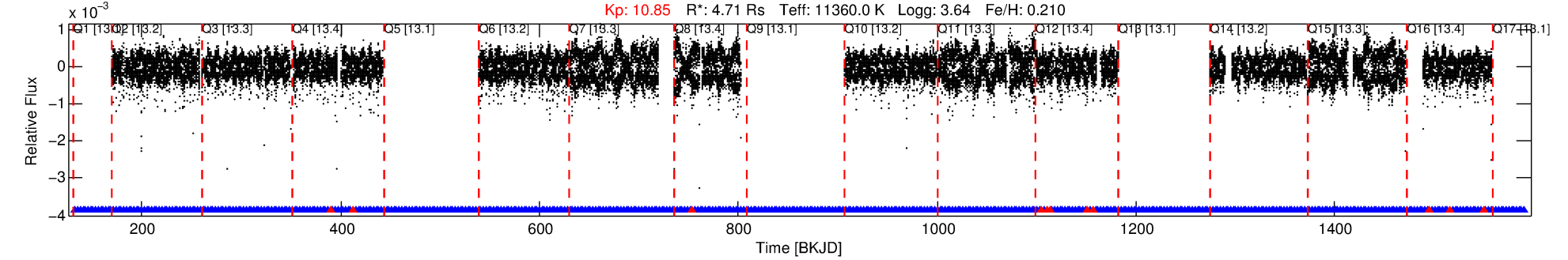
No Significant Match Found

# DV One-Page Summary

KIC: 8167938 Candidate: 1 of 3 Period: 2.566 d

KOI: K06052 Corr: No Ephemeris Match

Kp: 10.85 R\*: 4.71 Rs Teff: 11360.0 K Logg: 3.64 Fe/H: 0.210



## DV Fit Results:

Period = 2.56573 [0.00000] d  
Epoch = 133.2247 [0.0002] BKJD  
Rp/R\* = 0.0253 [0.0008]  
a/R\* = 8.06 [1.90]  
b = 0.91 [0.05]  
Seff = 106724.06 [104982.98]  
Teff = 4609 [1133] K  
Rp = 13.02 [6.29] Re  
a = 0.0557 [0.0263] AU  
Ag = 2.55 [1.95] [0.79σ]  
Teffp = 9004 [1406] K [2.43σ]

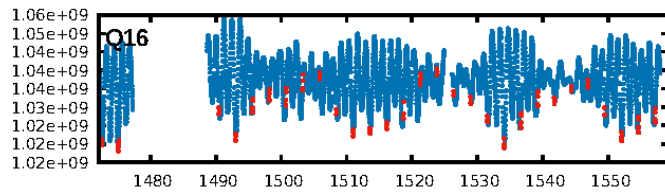
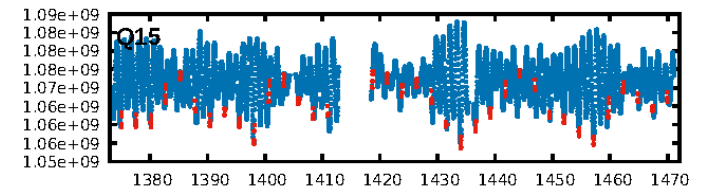
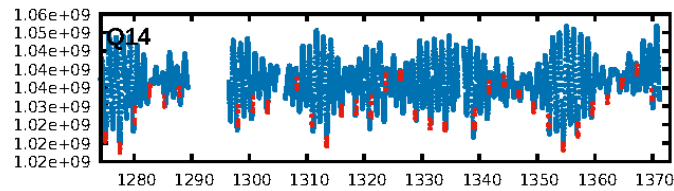
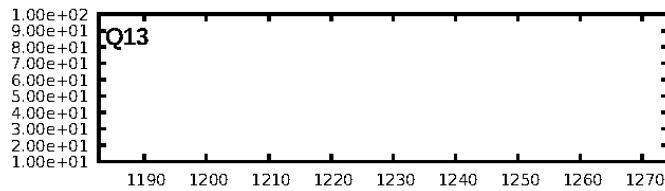
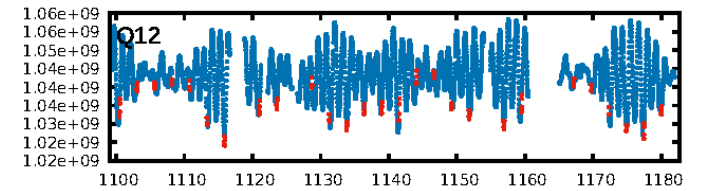
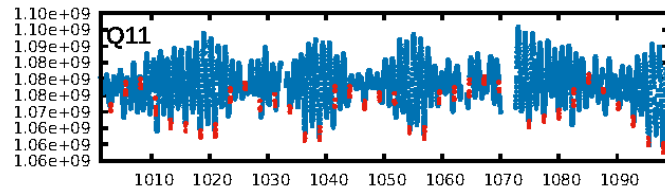
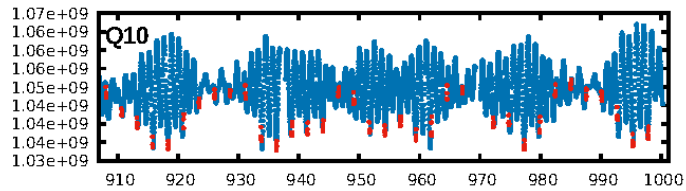
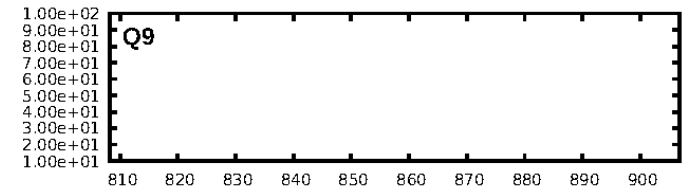
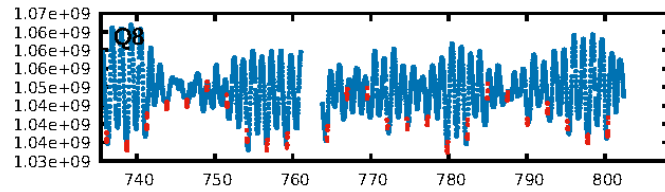
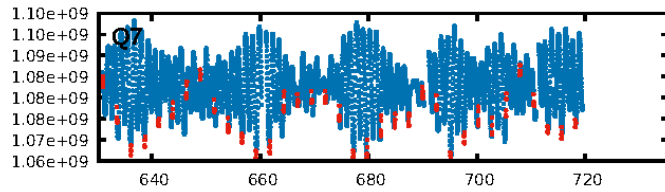
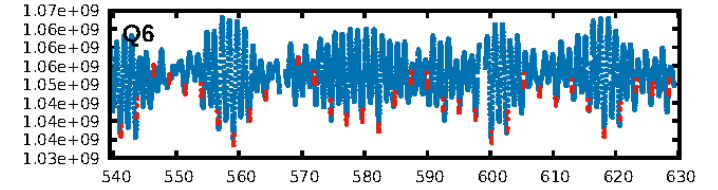
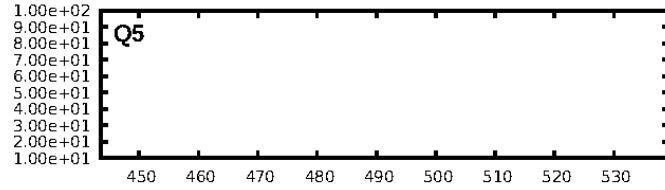
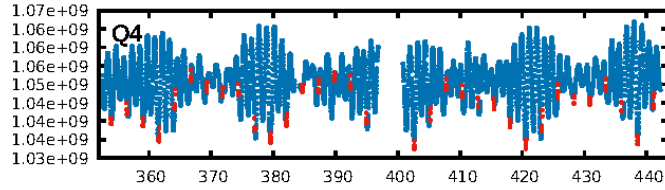
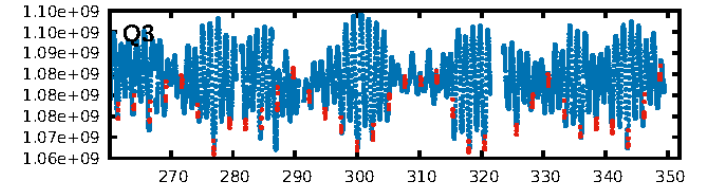
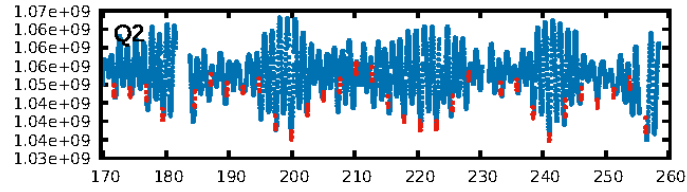
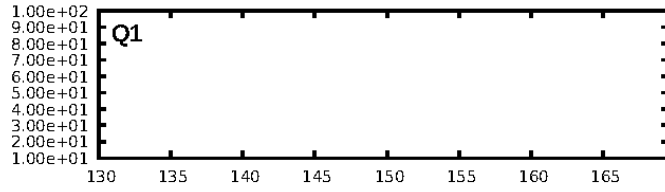
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.97 [377/388]  
GhostDiagnostic-chr: 1.69  
Centroid-sig: 0.0%  
Centroid-so: 0.649 arcsec [7.48σ]  
OotOffset-rm: 1.551 arcsec [2.42σ]  
KicOffset-rm: 1.430 arcsec [2.65σ]  
OotOffset-st: 4/4/4/0 [12]  
KicOffset-st: 4/4/4/0 [12]  
DiffImageQuality-fgm: 0.33 [4/12]  
DiffImageOverlap-fno: 0.00 [0/12]

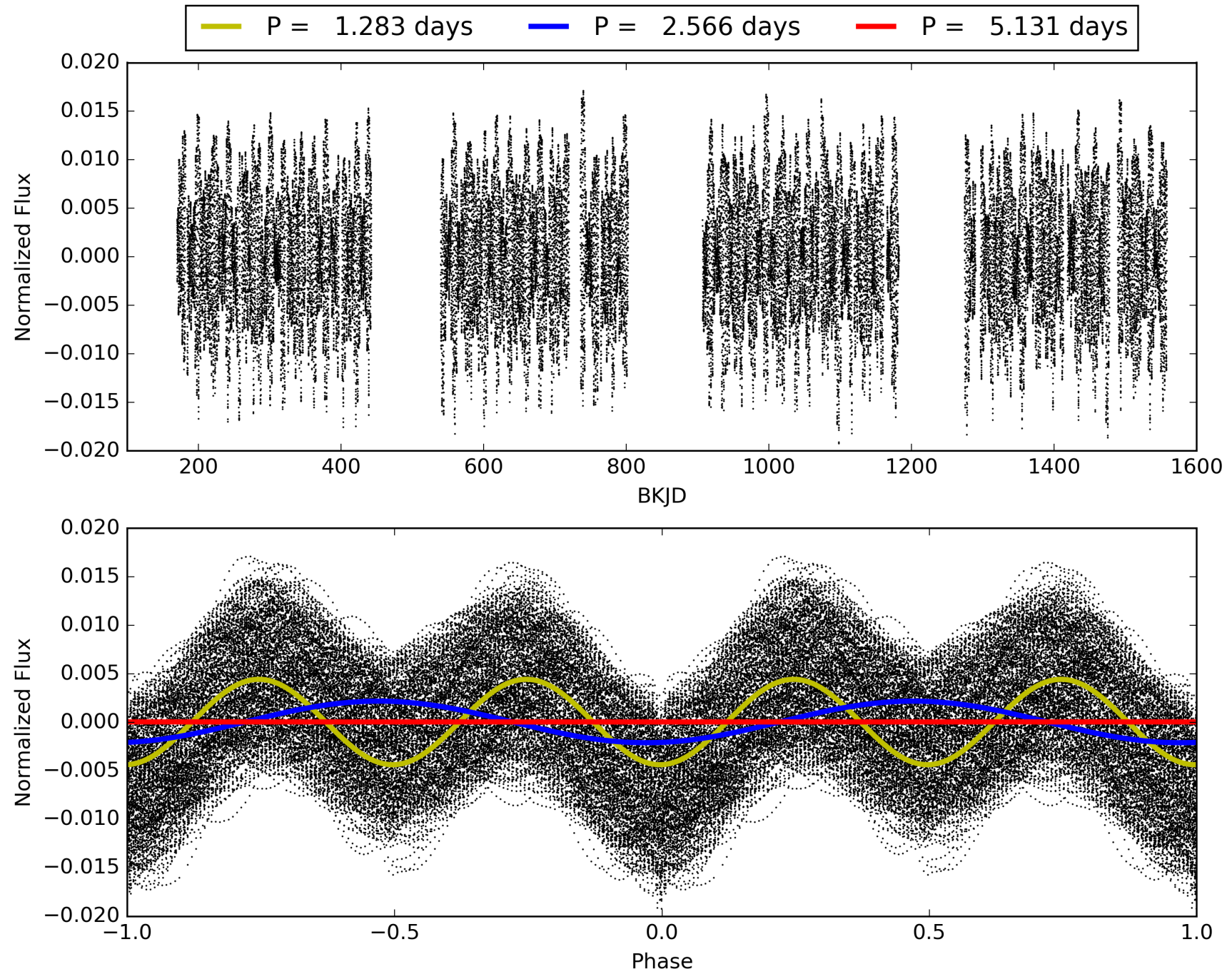
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:11:29 Z

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

# TCE 008167938-01, PDC Light Curves

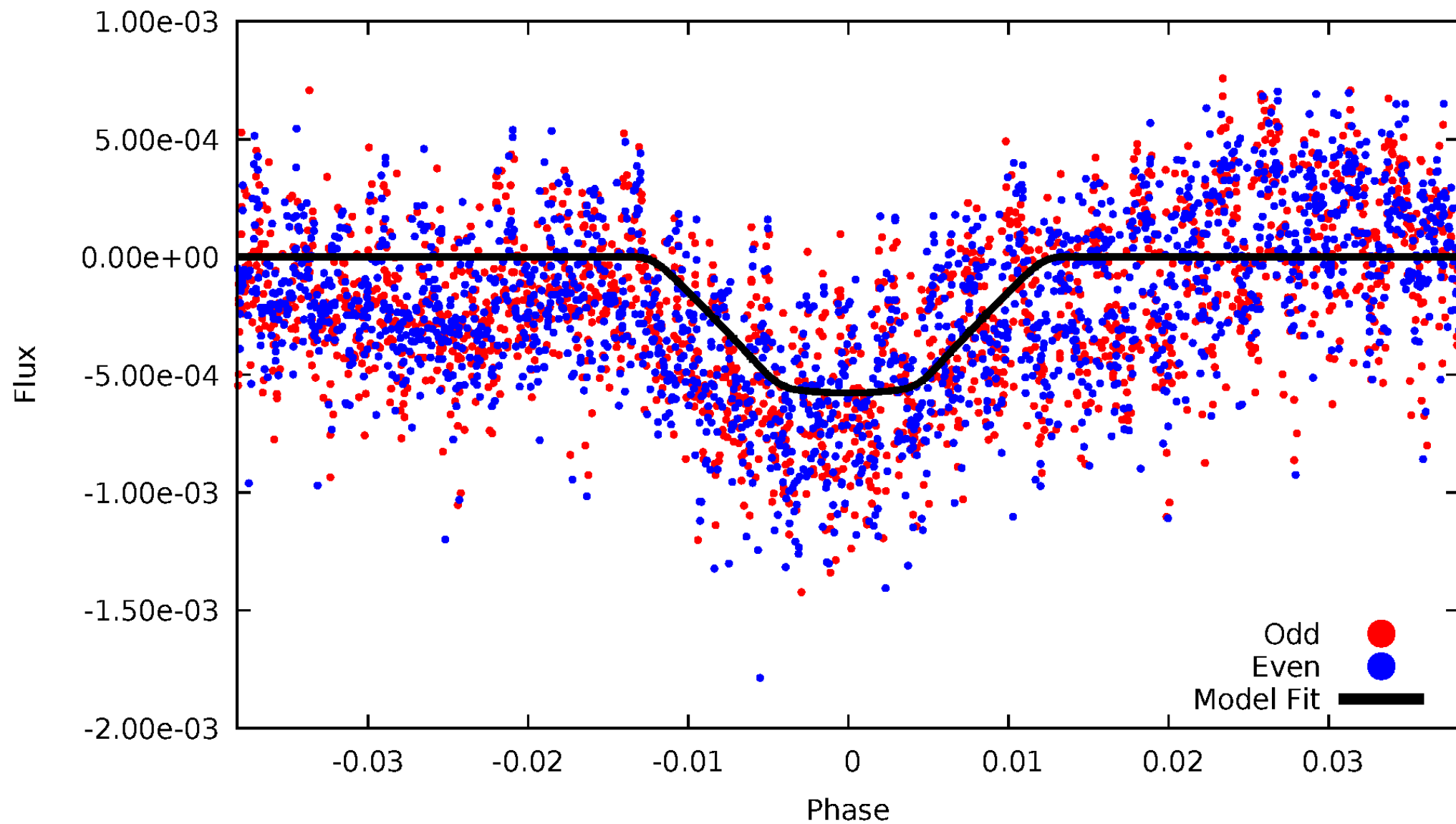


TCE 008167938-01



# DV Odd/Even

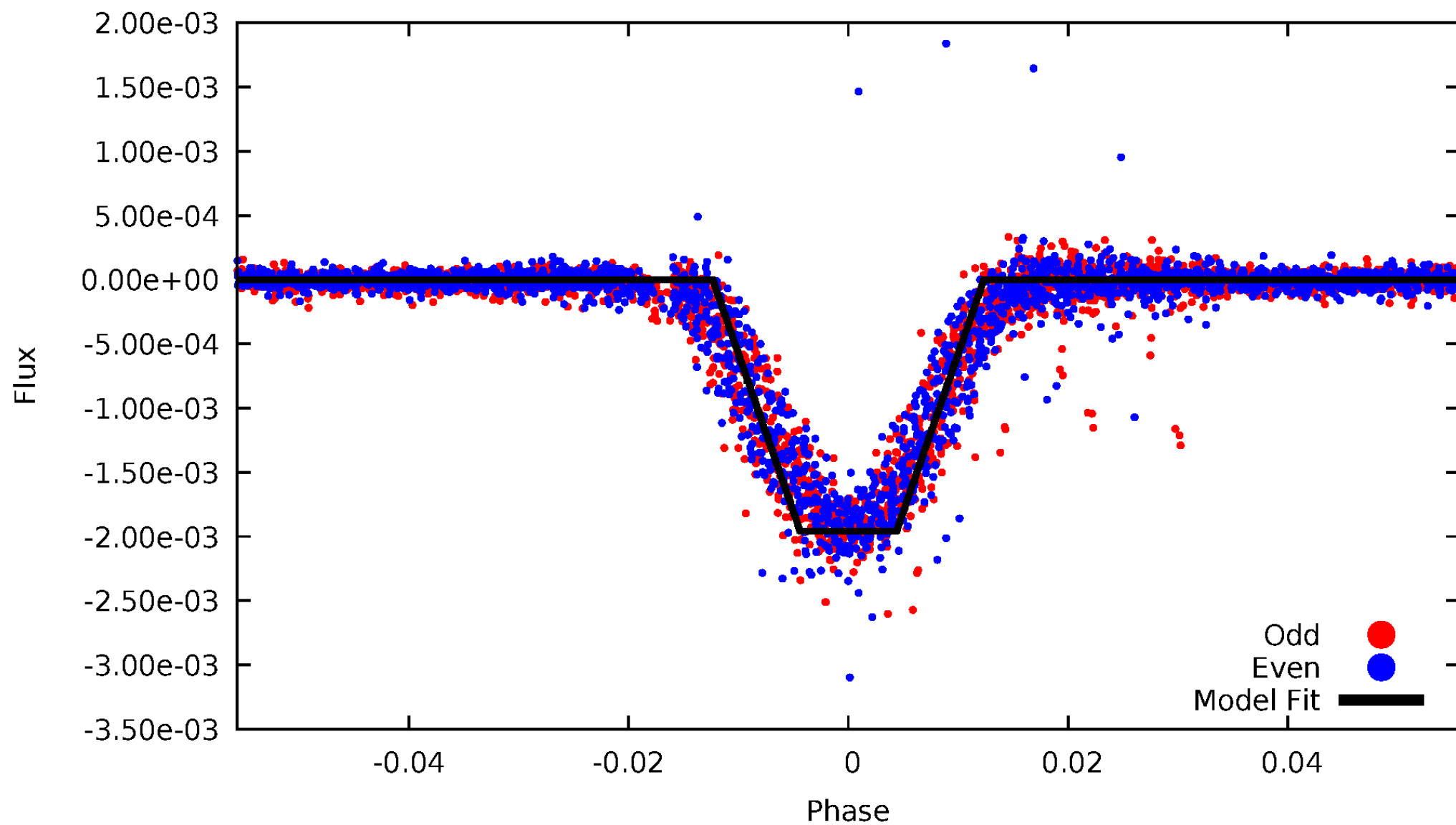
TCE 008167938-01





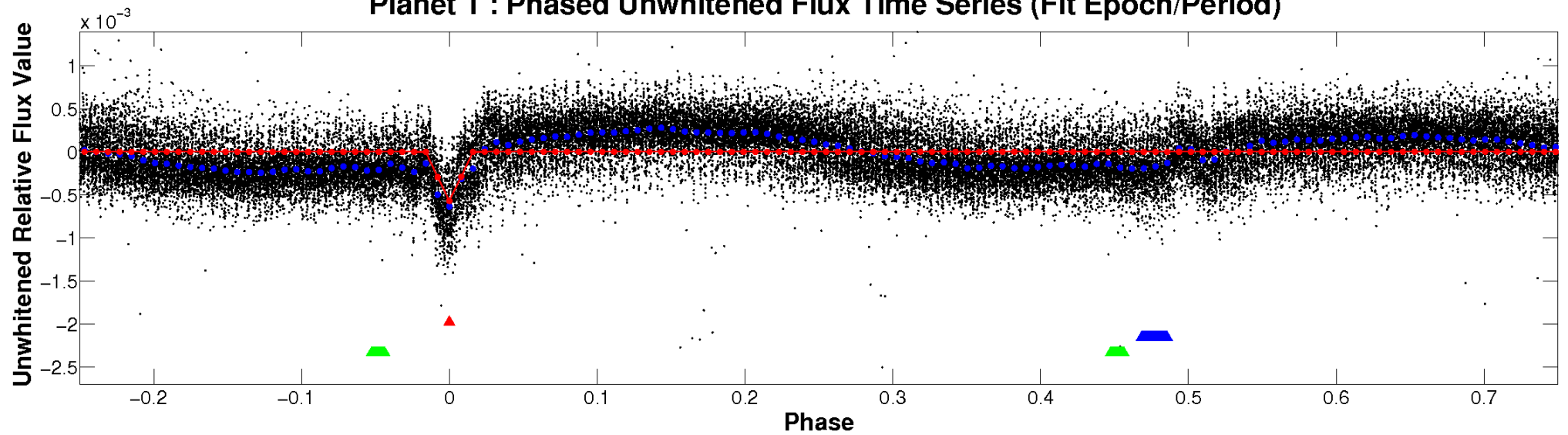
# ALT Odd/Even

TCE 008167938-01

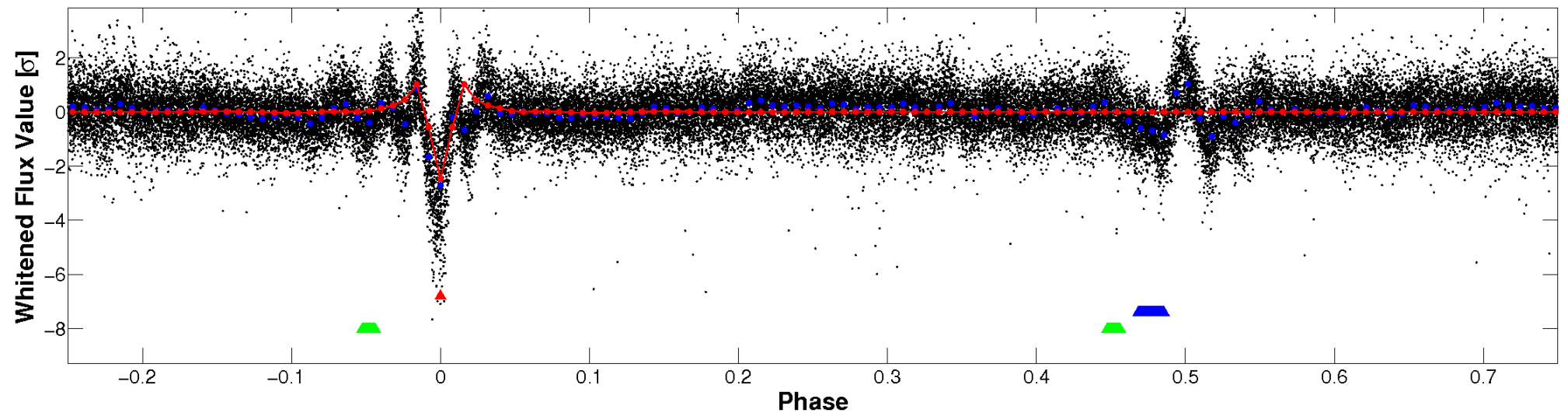


# Non-Whitened Vs. Whitened Light Curve

**Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

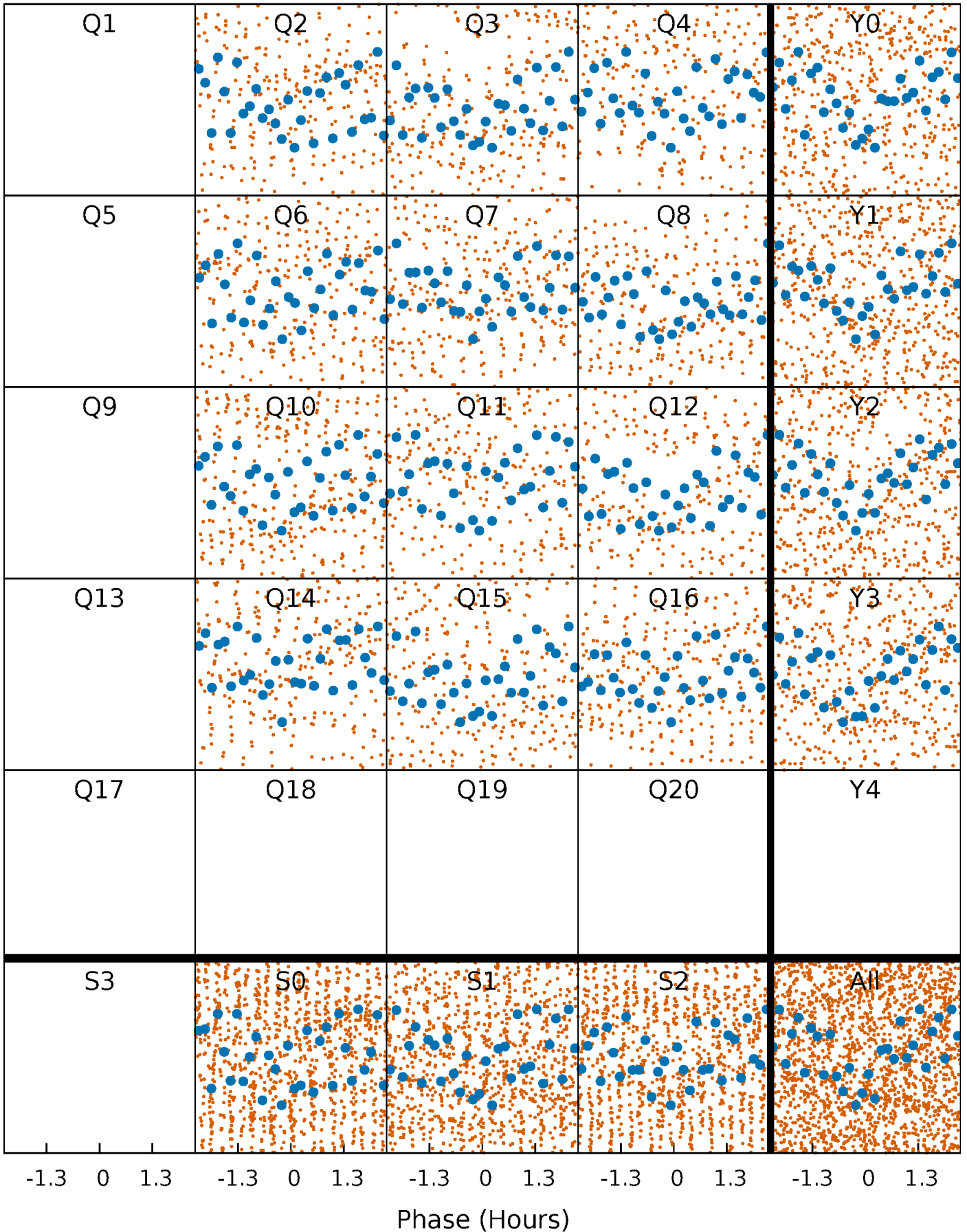


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

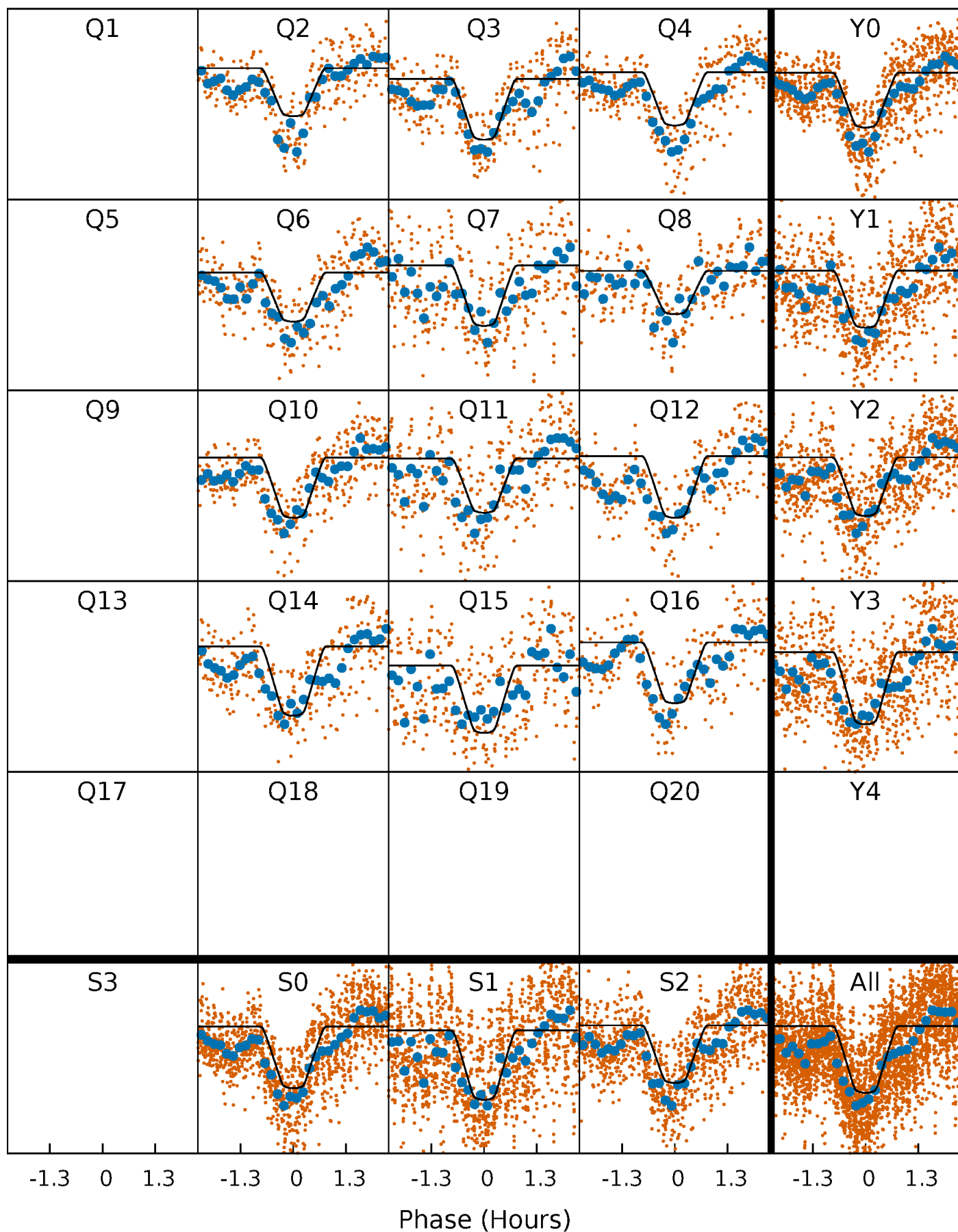
TCE 008167938-01   P= 2.565734 Days    $T_0=133.224742$  (BKJD)





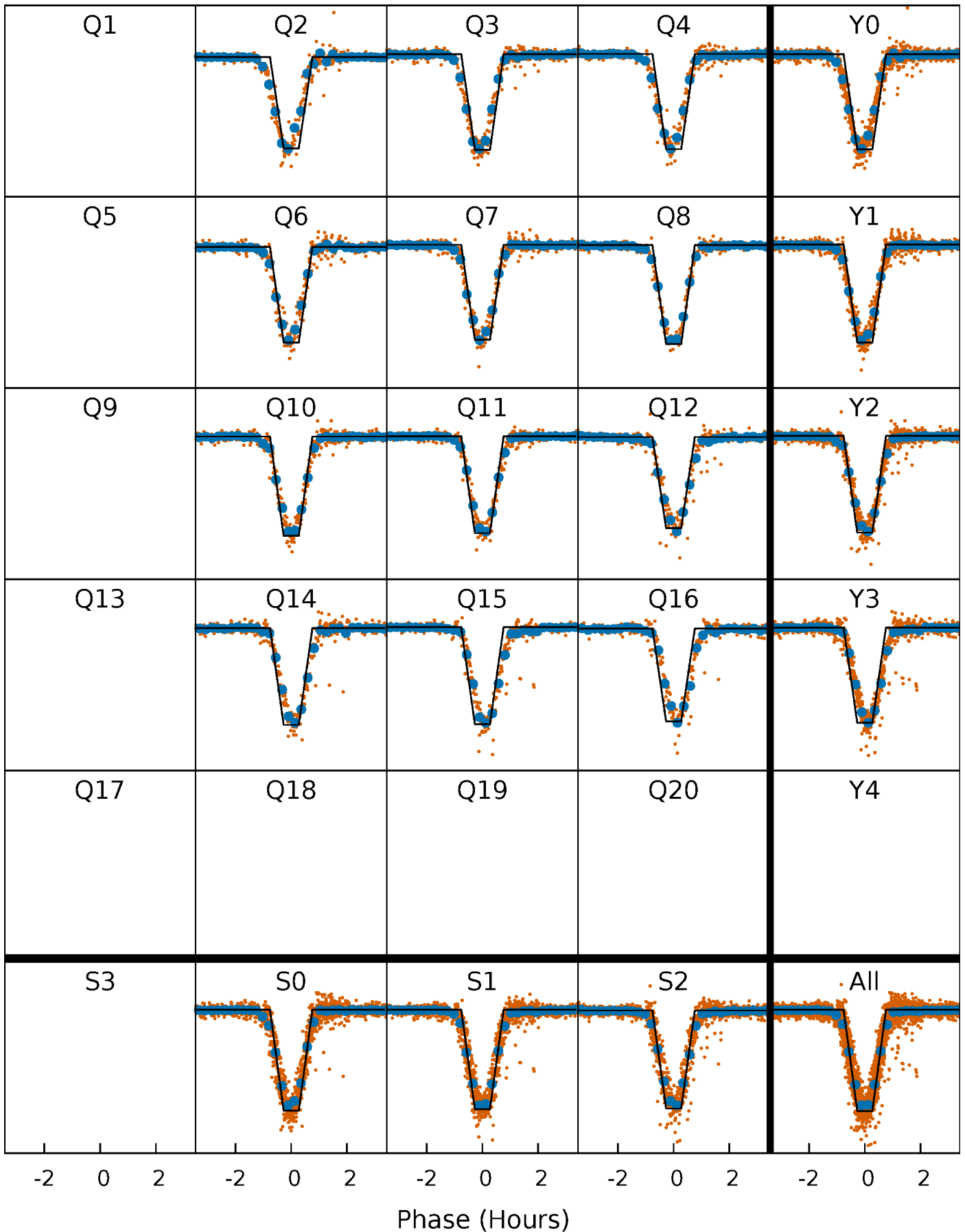
# DV Quarter-Phased Transit Curves

TCE 008167938-01   P= 2.565734 Days    $T_0=133.224742$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

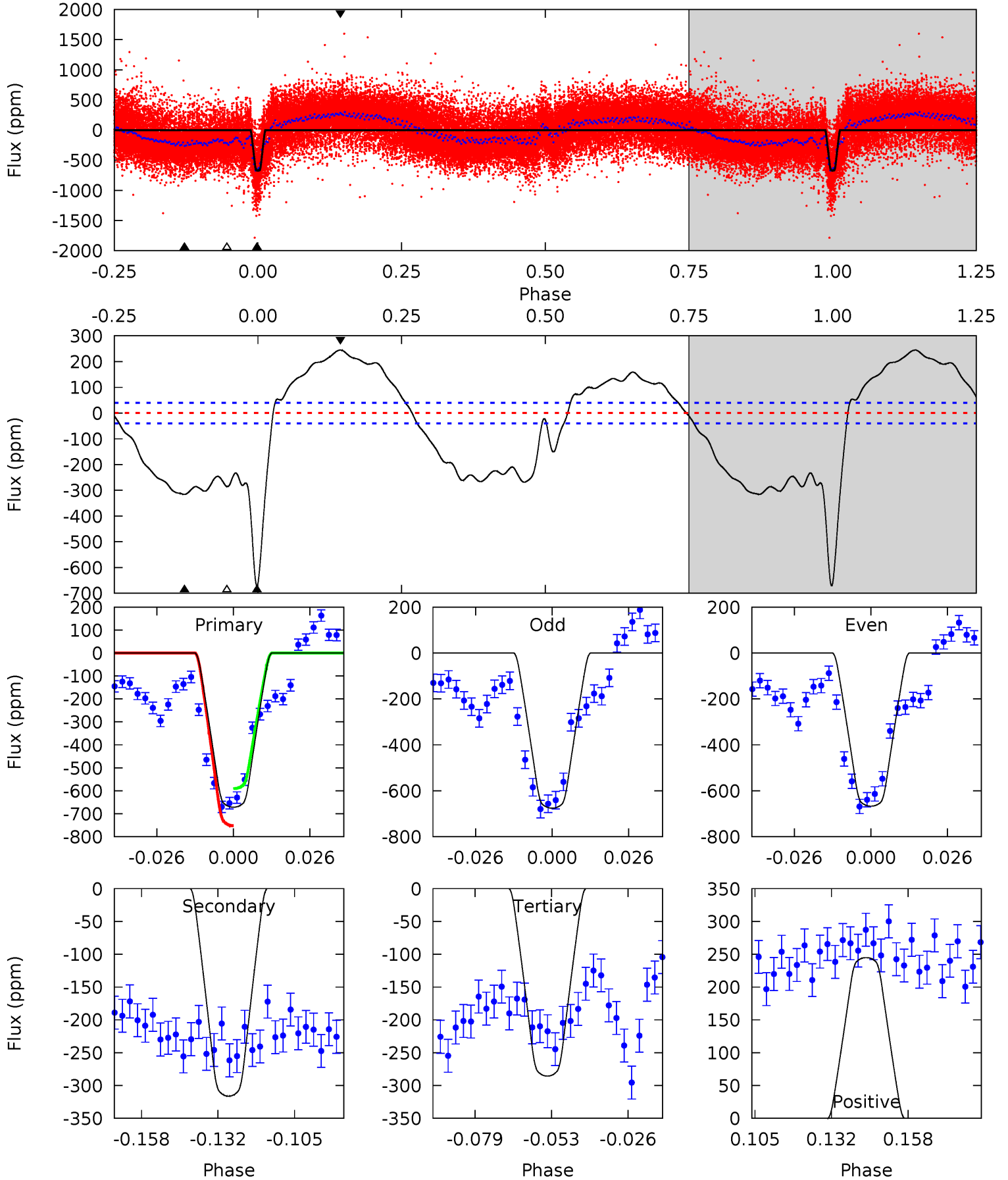
TCE 008167938-01 P= 2.565695 Days  $T_0=133.227737$  (BKJD)



# DV Model-Shift Uniqueness Test

008167938-01, P = 2.565734 Days, E = 133.224742 Days

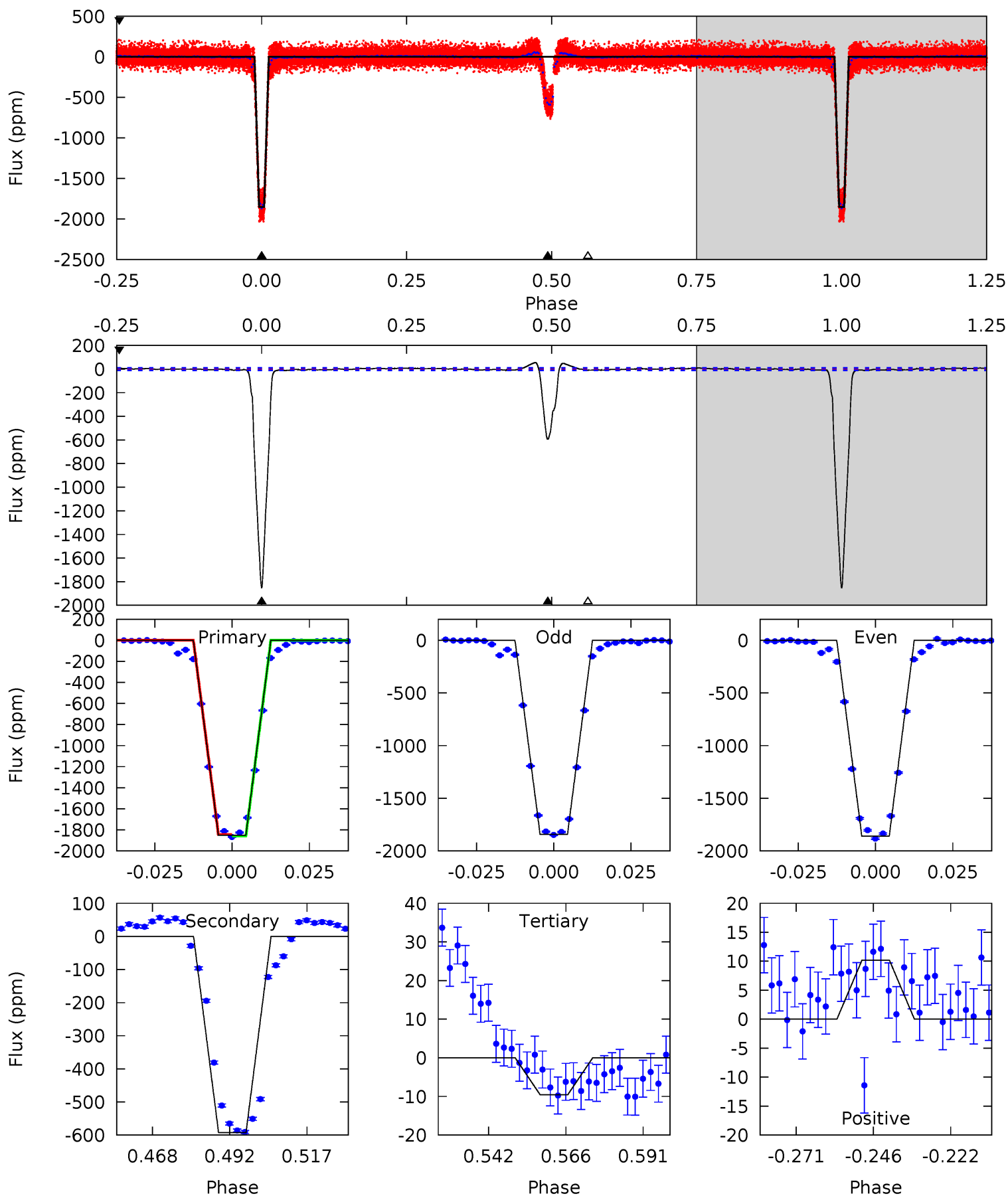
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
82.0	38.6	34.9	29.9	4.84	2.22	21.4	47.1	52.1	3.73	8.72	0.52	0.95	0.27	9.79



# Alt Model-Shift Uniqueness Test

008167938-01, P = 2.565695 Days, E = 133.227737 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
924.1	295.9	4.79	5.09	4.85	2.25	4.28	919.3	919.0	291.2	290.9	4.10	1.01	0.03	0



### Stellar Parameters For KIC 008167938

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$11360^{+587}_{-1762}$	$3.636^{+0.451}_{-0.106}$	$0.210^{+0.150}_{-0.200}$	$4.712^{+0.568}_{-2.273}$	$3.504^{+0.070}_{-1.062}$	$0.047^{+0.211}_{-0.012}$
	+5%/-16%	+12%/-3%	+71%/-95%	+12%/-48%	+2%/-30%	+448%/-26%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008167938-01 / KOI 6052.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-316 \pm 8$	$12.54^{+1.46}_{-3.35}$	$6027^{+759}_{-1058}$	$8425^{+540}_{-1062}$	$3.359^{+2.305}_{-0.644}$
Alt.	$-593 \pm 2$	$22.20^{+2.36}_{-6.11}$	$6060^{+786}_{-1084}$	$7193^{+331}_{-787}$	$2.022^{+1.554}_{-0.357}$

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



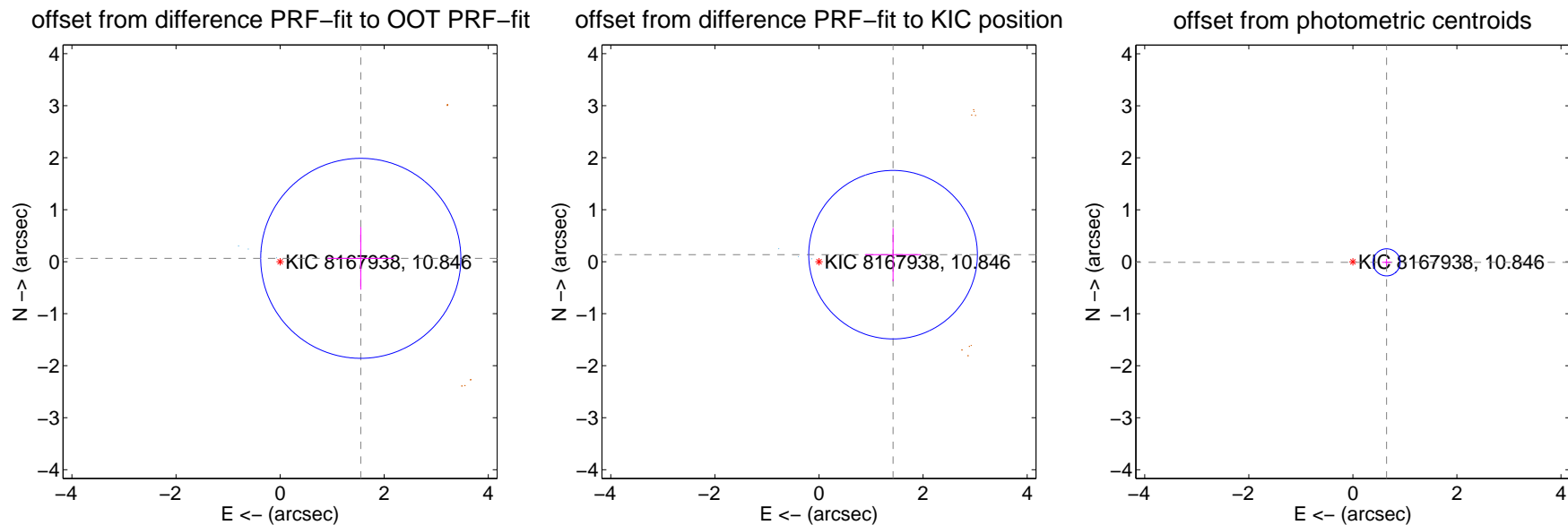
## DV Centroid Data

Supplemental centroid analysis for 008167938-01. **Kepler magnitude: 10.85.** Transit SNR 65.56

There are 4 quarters with good PRF difference image offsets

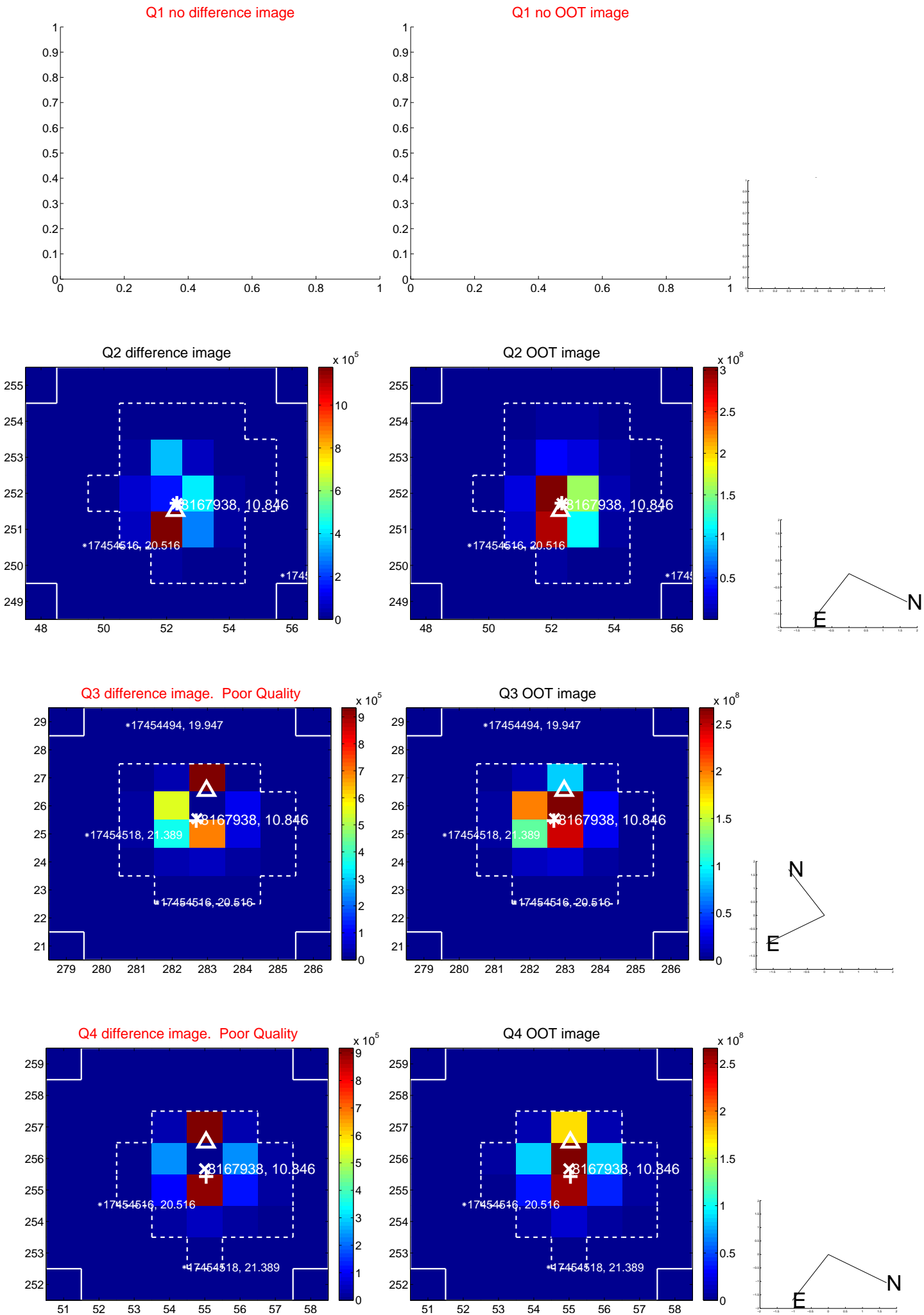
The direct PRF centroid is offset from the target star catalog position by about 1.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.551 \pm 0.641$	2.42	$-1.550 \pm 0.641$	$0.065 \pm 0.602$
PRF-fit source offset from KIC position	$1.430 \pm 0.540$	2.65	$-1.423 \pm 0.540$	$0.135 \pm 0.514$
photometric centroid source offset	<b><math>0.65 \pm 0.09</math></b>	<b>7.48</b>	$-0.65 \pm 0.09$	$-0.01 \pm 0.07$



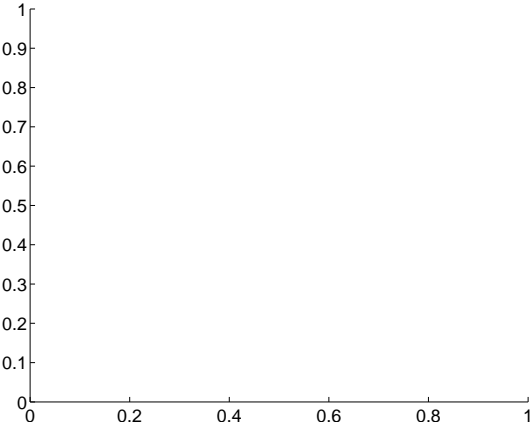
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

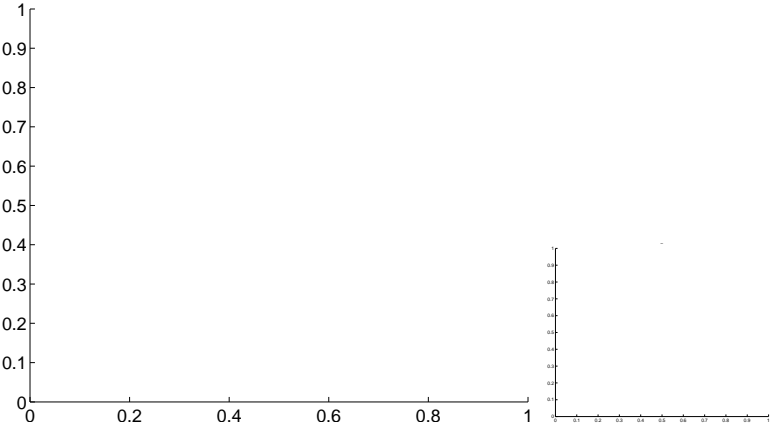


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

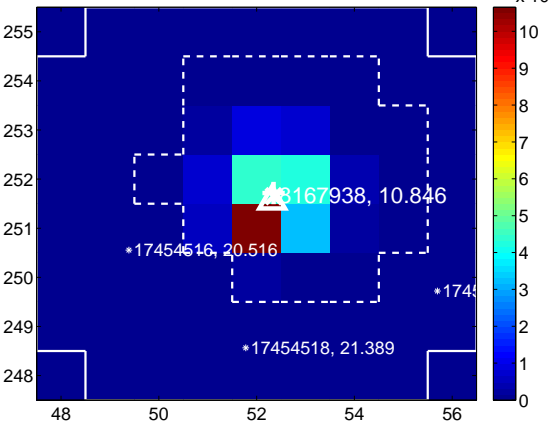
Q5 no difference image



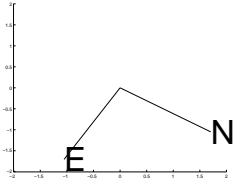
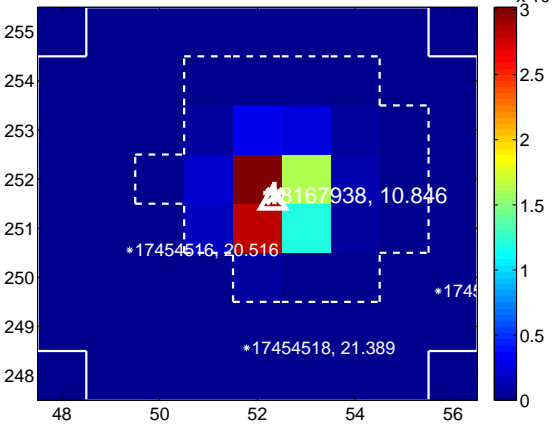
Q5 no OOT image



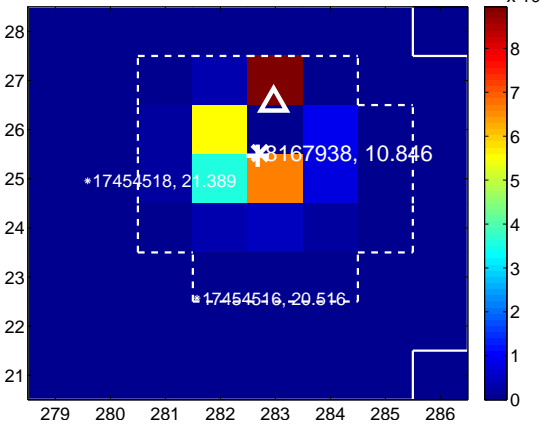
Q6 difference image



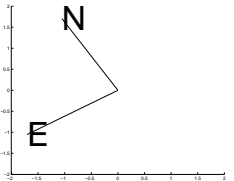
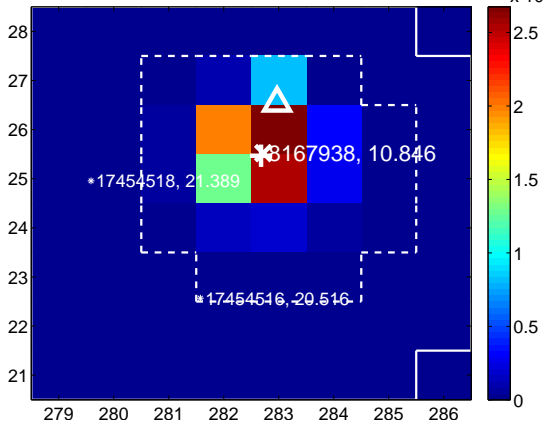
Q6 OOT image



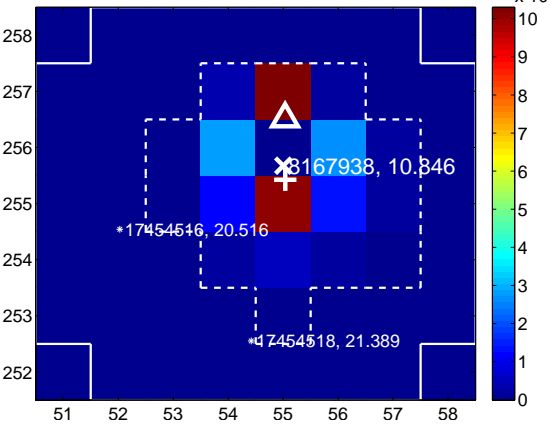
Q7 difference image. Poor Quality



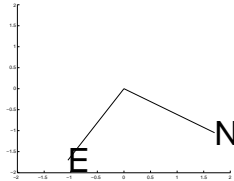
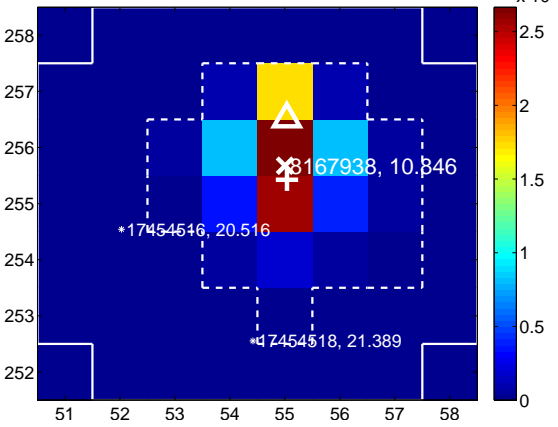
Q7 OOT image



Q8 difference image. Poor Quality

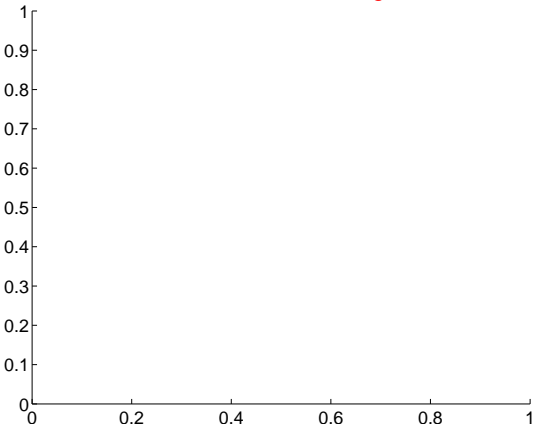


Q8 OOT image

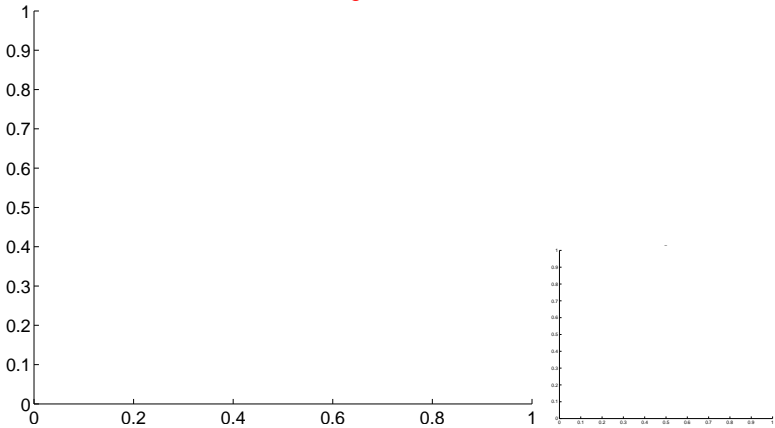


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

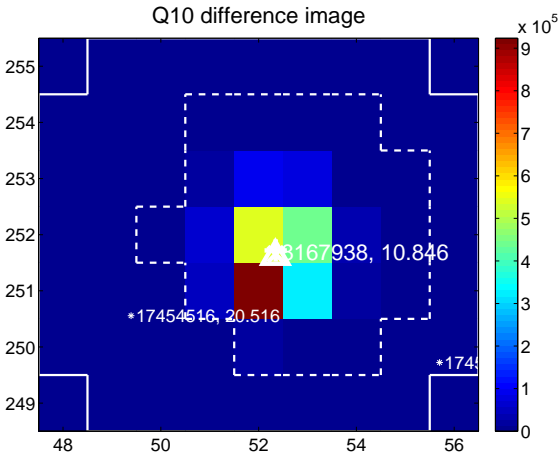
Q9 no difference image



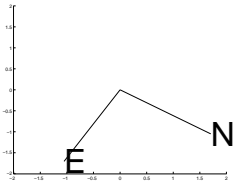
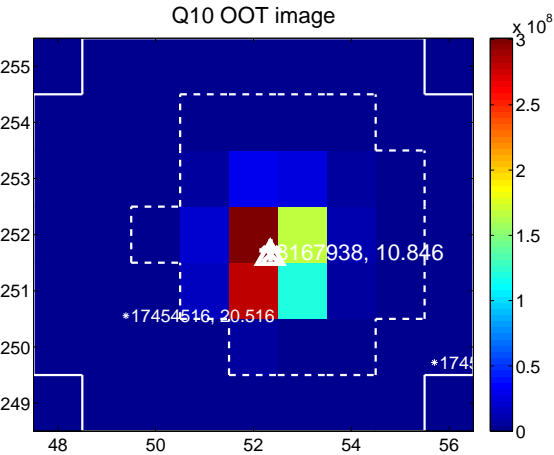
Q9 no OOT image



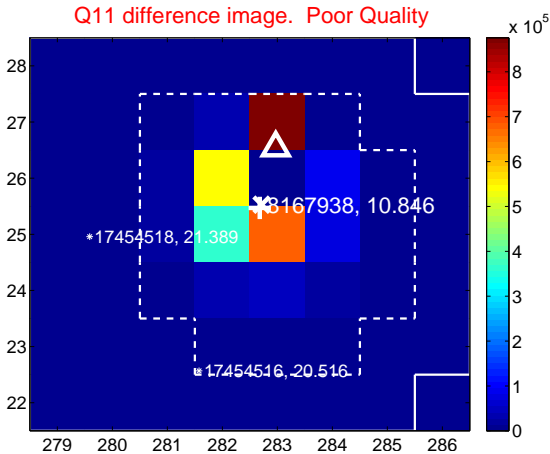
Q10 difference image



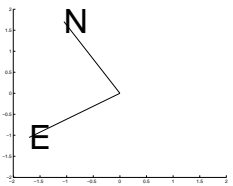
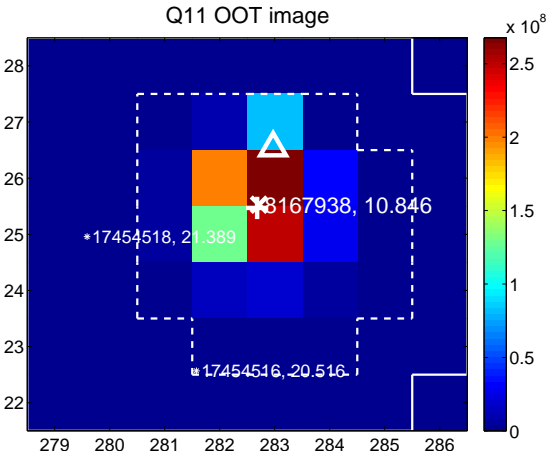
Q10 OOT image



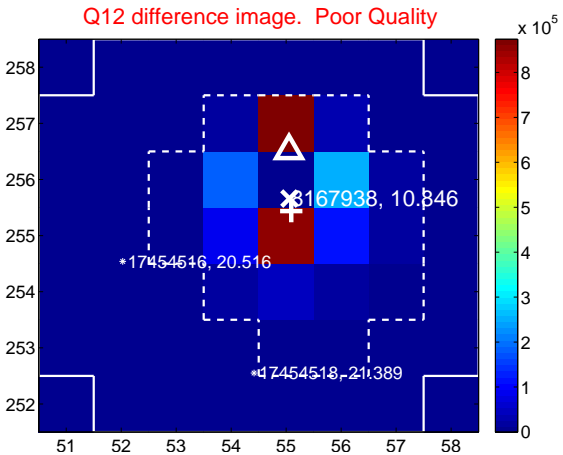
Q11 difference image. Poor Quality



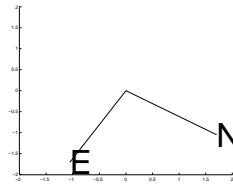
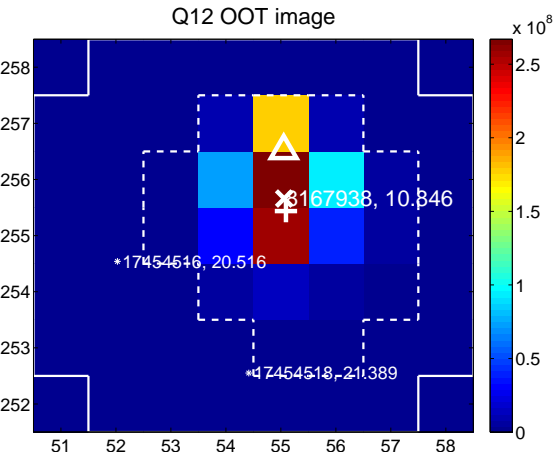
Q11 OOT image



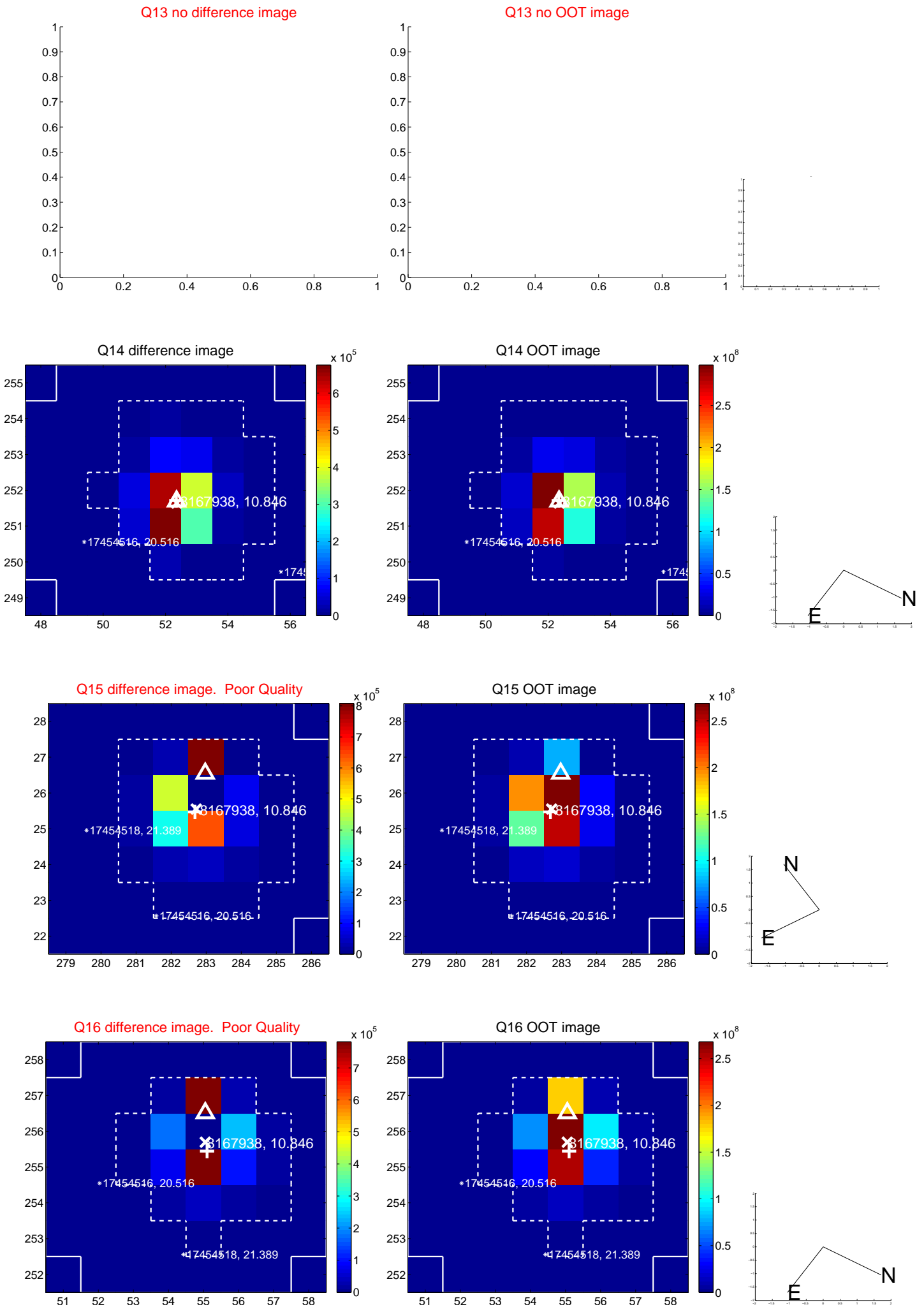
Q12 difference image. Poor Quality



Q12 OOT image

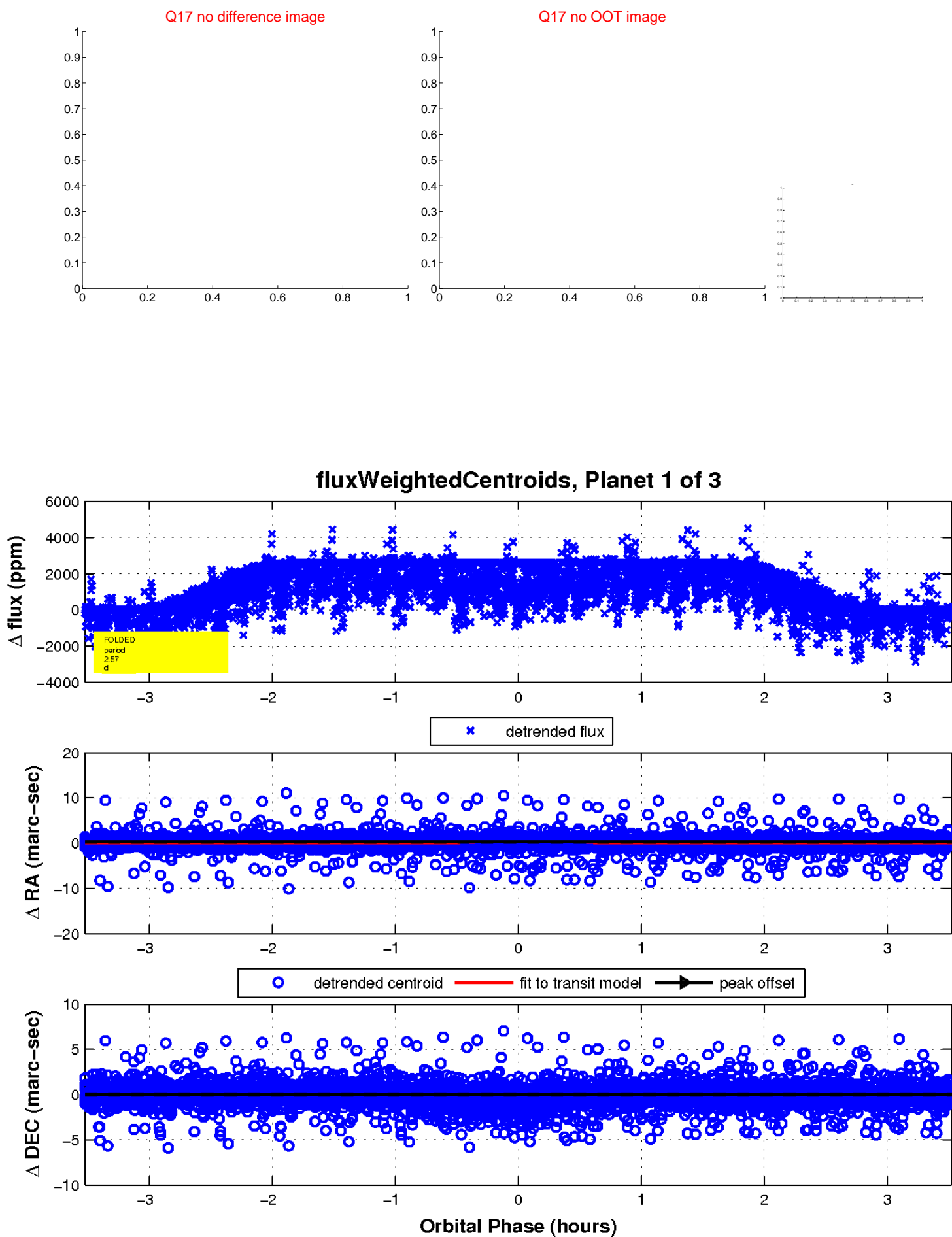


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



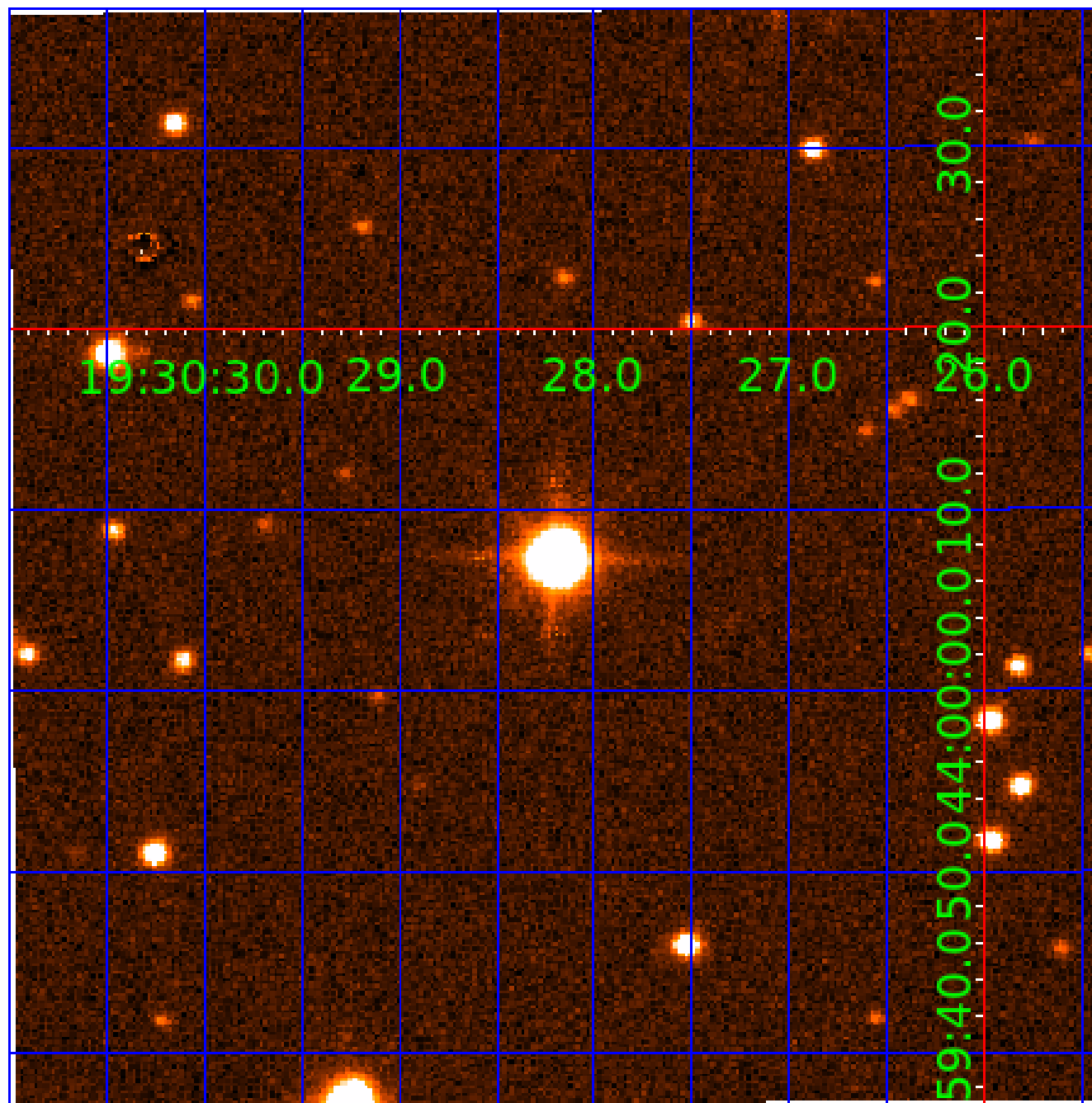


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008167938

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008167938-01	OBS	6052.01	2.565734	133.224742	577.1	1.175	50.8	65.6	4.71	11360	13.02	106724.06
008167938-02	OBS	No	2.565656	131.904967	191.8	1.874	33.1	23.4	4.71	11360	7.46	106728.39
008167938-03	OBS	No	1.282847	131.829744	125.5	1.500	15.5	-1.0	4.71	11360	5.46	268933.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008167938-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
008167938-02	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_SATURATED—HALO_GHOST
008167938-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

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

## Ephemeris Match Information For 008167938-02

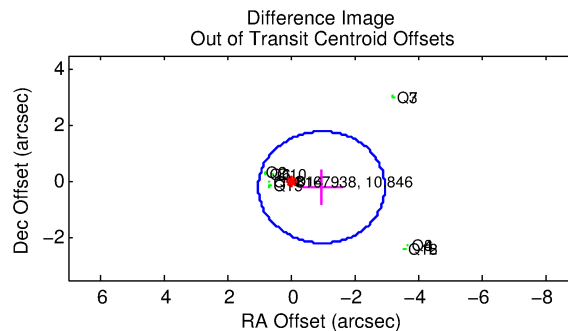
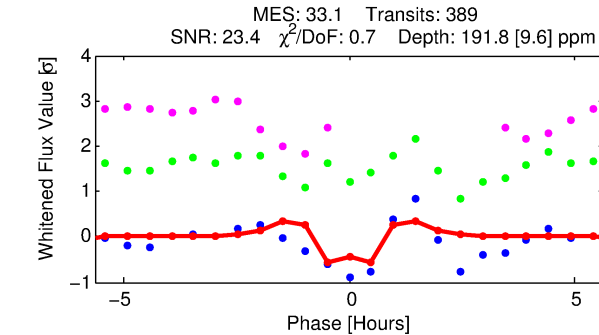
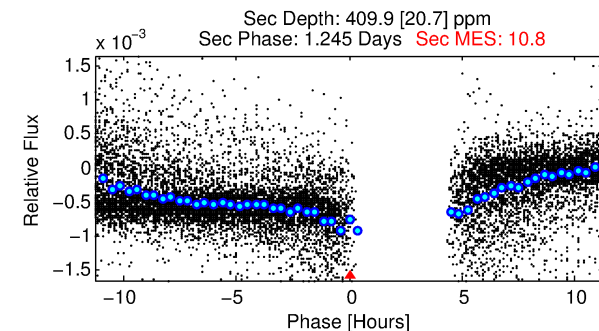
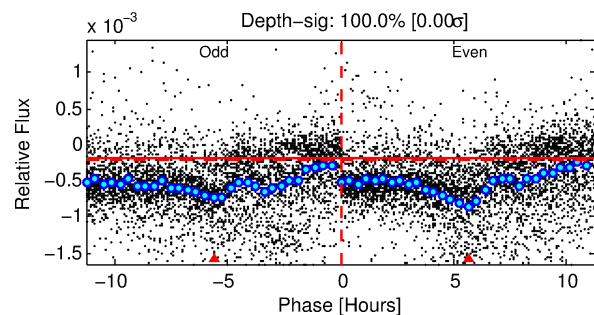
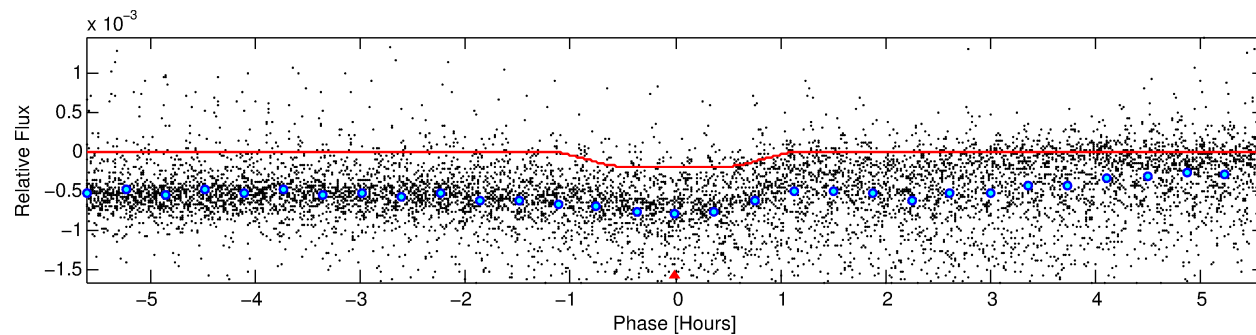
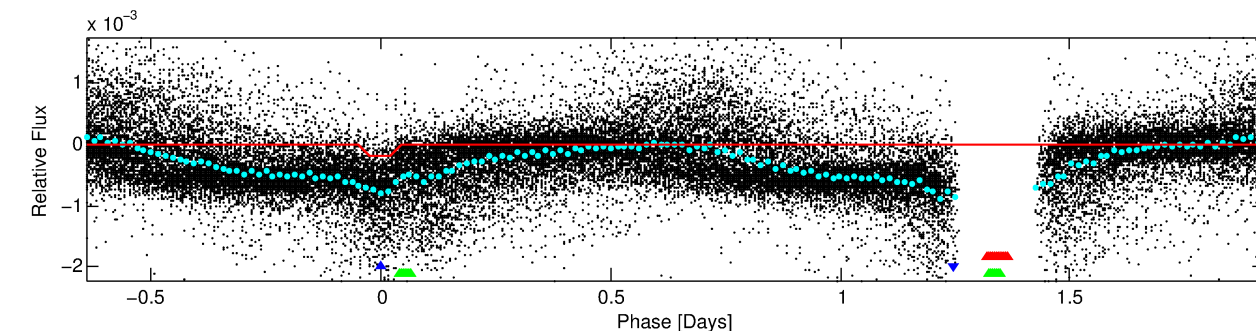
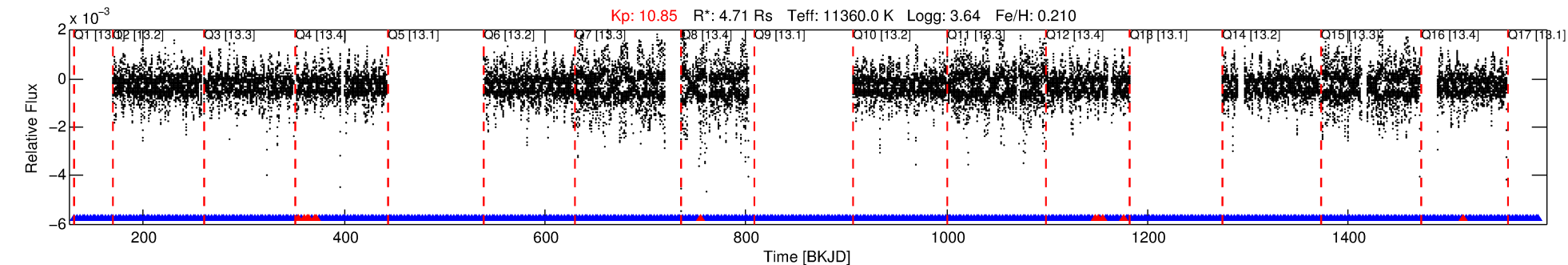
No Significant Match Found

# DV One-Page Summary

KIC: 8167938 Candidate: 2 of 3 Period: 2.566 d

KOI: K06052 Corr: No Ephemeris Match

Kp: 10.85 R\*: 4.71 Rs Teff: 11360.0 K Logg: 3.64 Fe/H: 0.210



## DV Fit Results:

Period = 2.56566 [0.00000] d  
Epoch = 131.9050 [0.0005] BKJD  
Rp/R\* = 0.0145 [0.0009]  
a/R\* = 4.99 [2.32]  
b = 0.90 [0.10]  
Seff = 106728.39 [104987.23]  
Teq = 4609 [1133] K  
Rp = 7.46 [3.63] Re  
a = 0.0557 [0.0263] AU  
Ag = 12.59 [9.77] [1.19σ]  
Teffp = 13424 [2133] K [3.65σ]

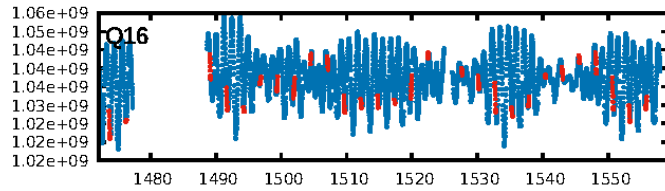
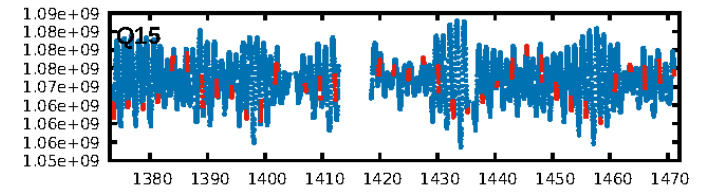
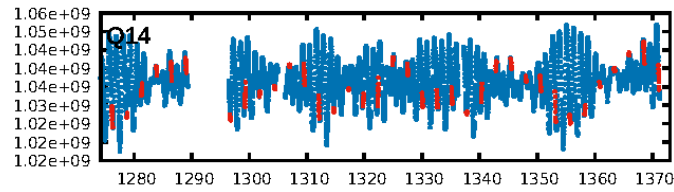
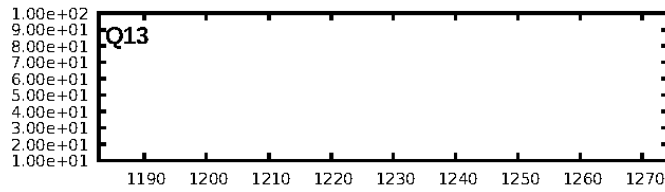
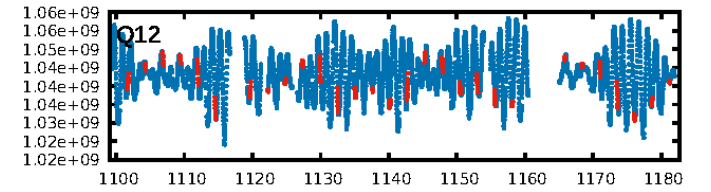
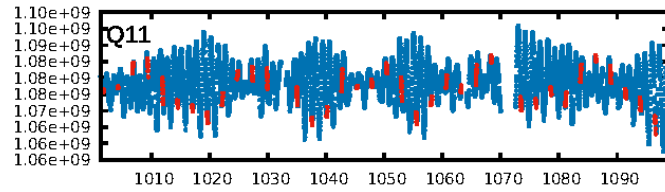
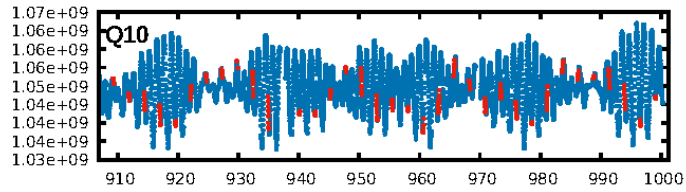
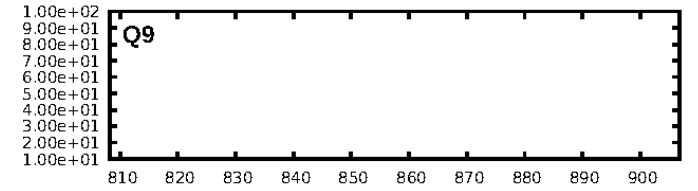
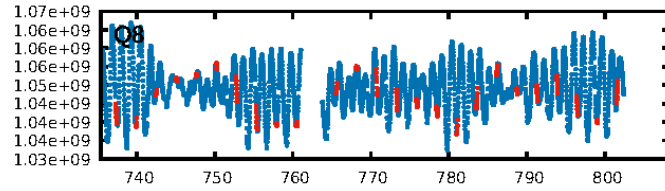
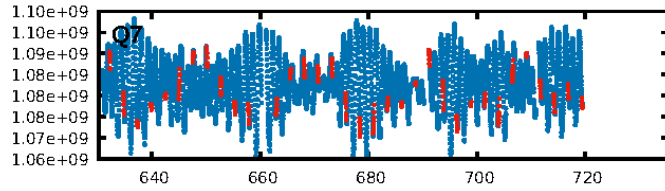
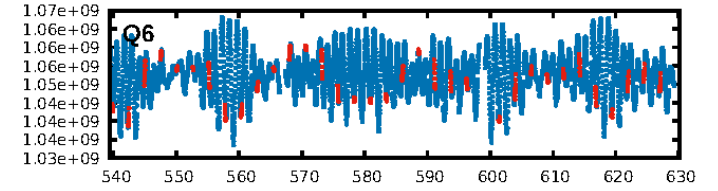
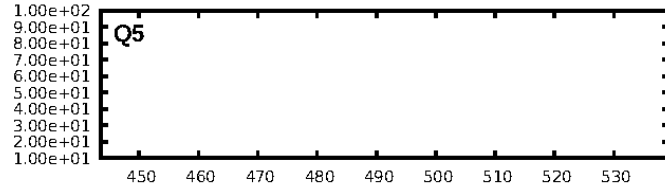
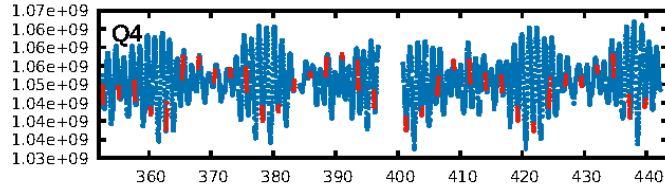
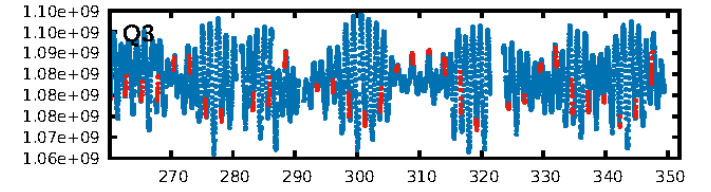
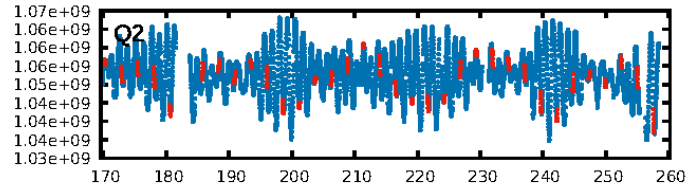
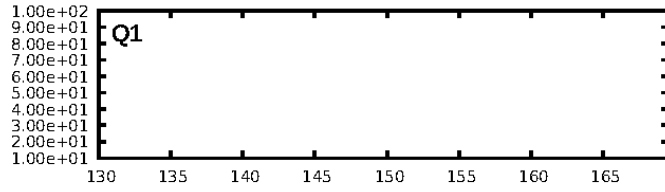
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.82σ]  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.97 [377/389]  
GhostDiagnostic-chr: -0.1089  
Centroid-sig: 0.1%  
Centroid-so: 0.420 arcsec [2.12σ]  
OotOffset-rm: 0.995 arcsec [1.50σ]  
KicOffset-rm: 0.860 arcsec [1.47σ]  
OotOffset-st: 4/4/4/0 [12]  
KicOffset-st: 4/4/4/0 [12]  
DiffImageQuality-fgm: 0.33 [4/12]  
DiffImageOverlap-fno: 0.00 [0/12]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:11:35 Z

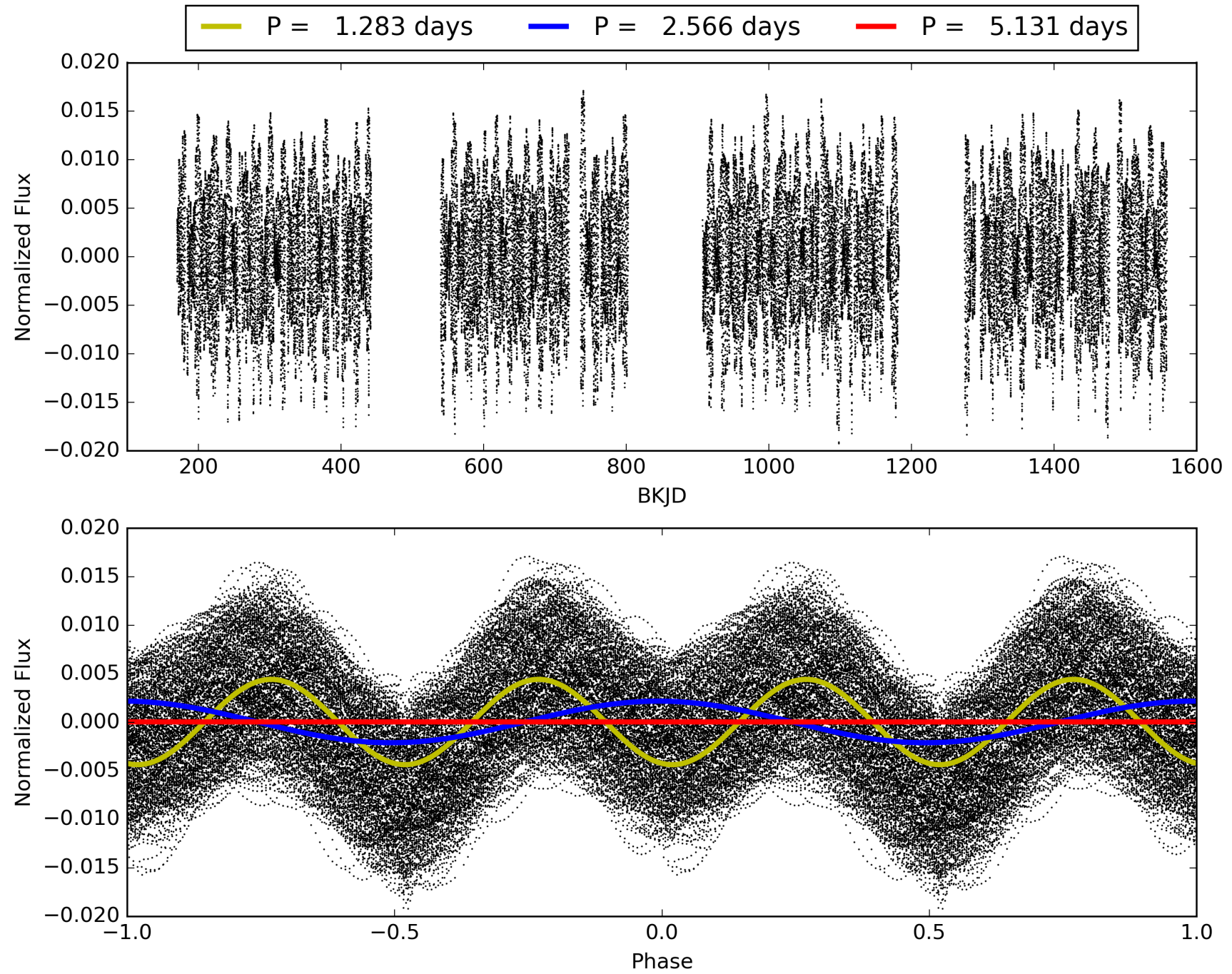
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008167938-02, PDC Light Curves



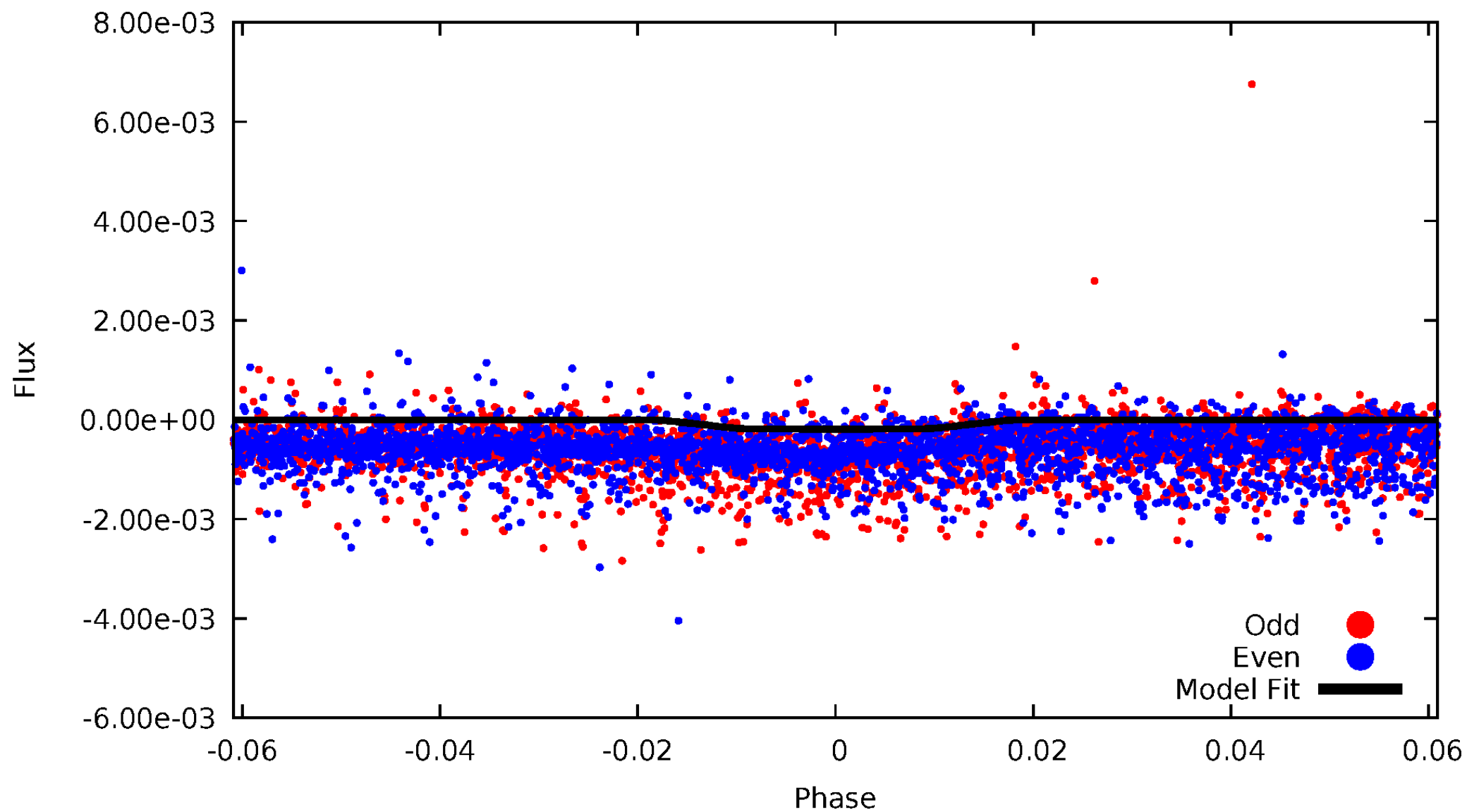


TCE 008167938-02



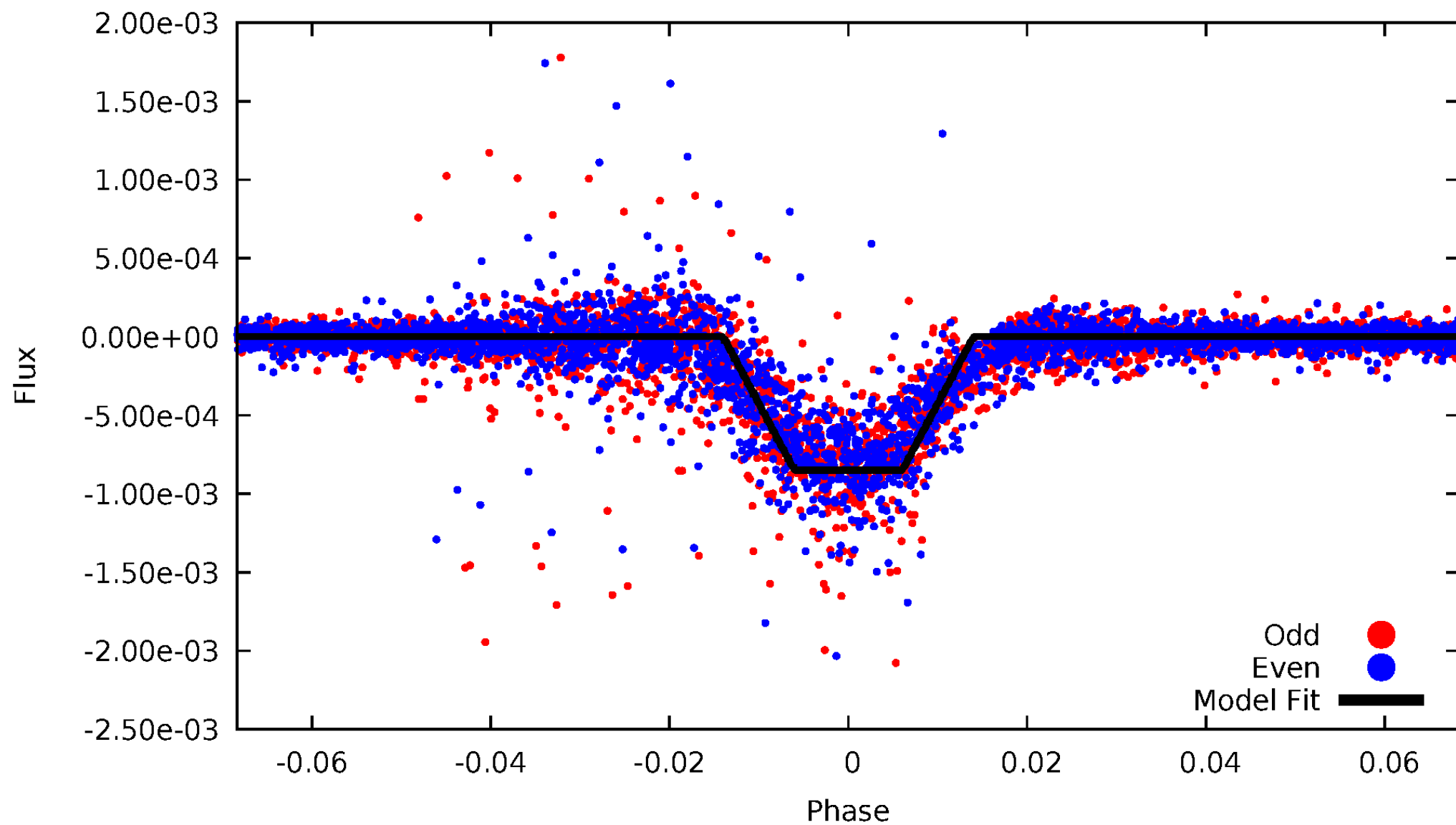
# DV Odd/Even

TCE 008167938-02



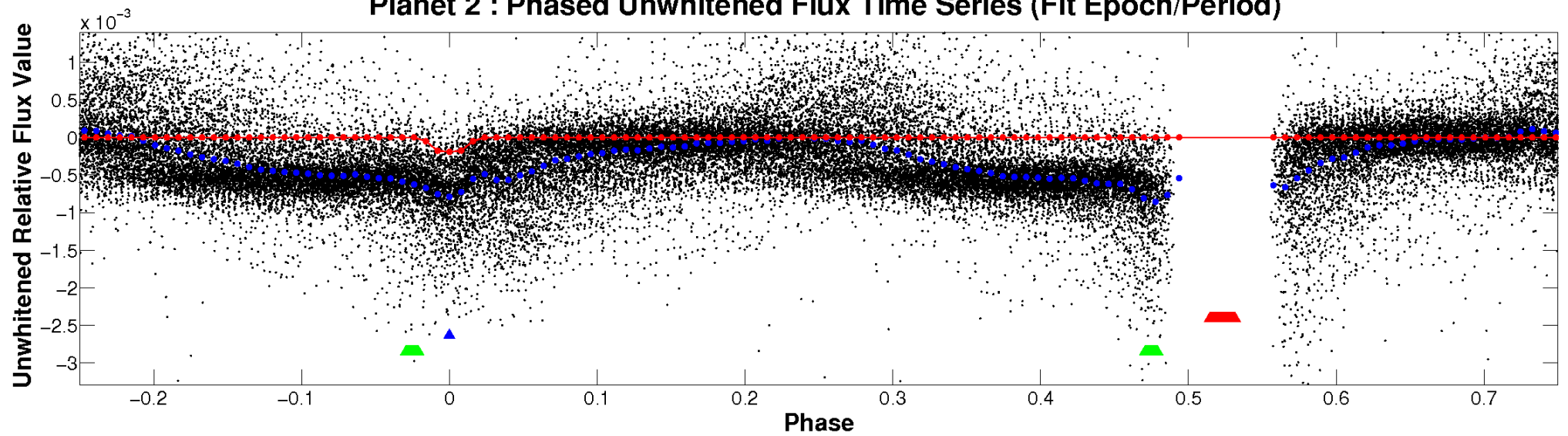
# ALT Odd/Even

TCE 008167938-02

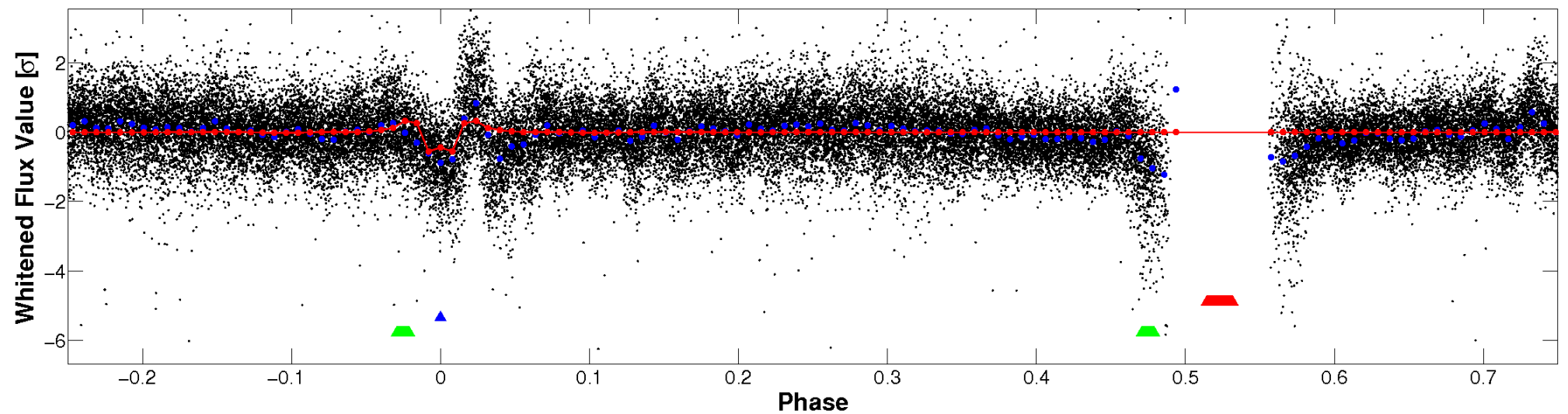


# Non-Whitened Vs. Whitened Light Curve

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

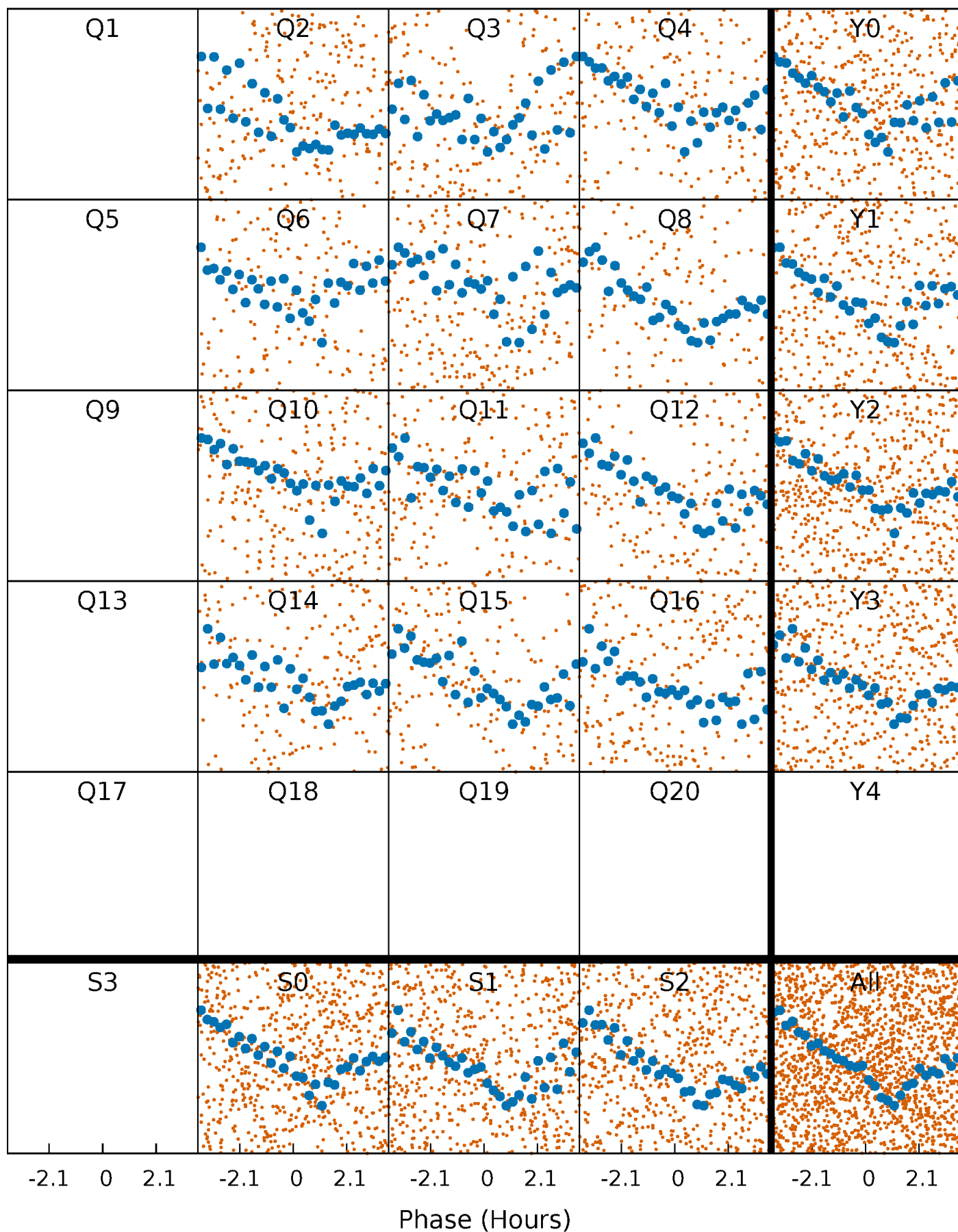


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

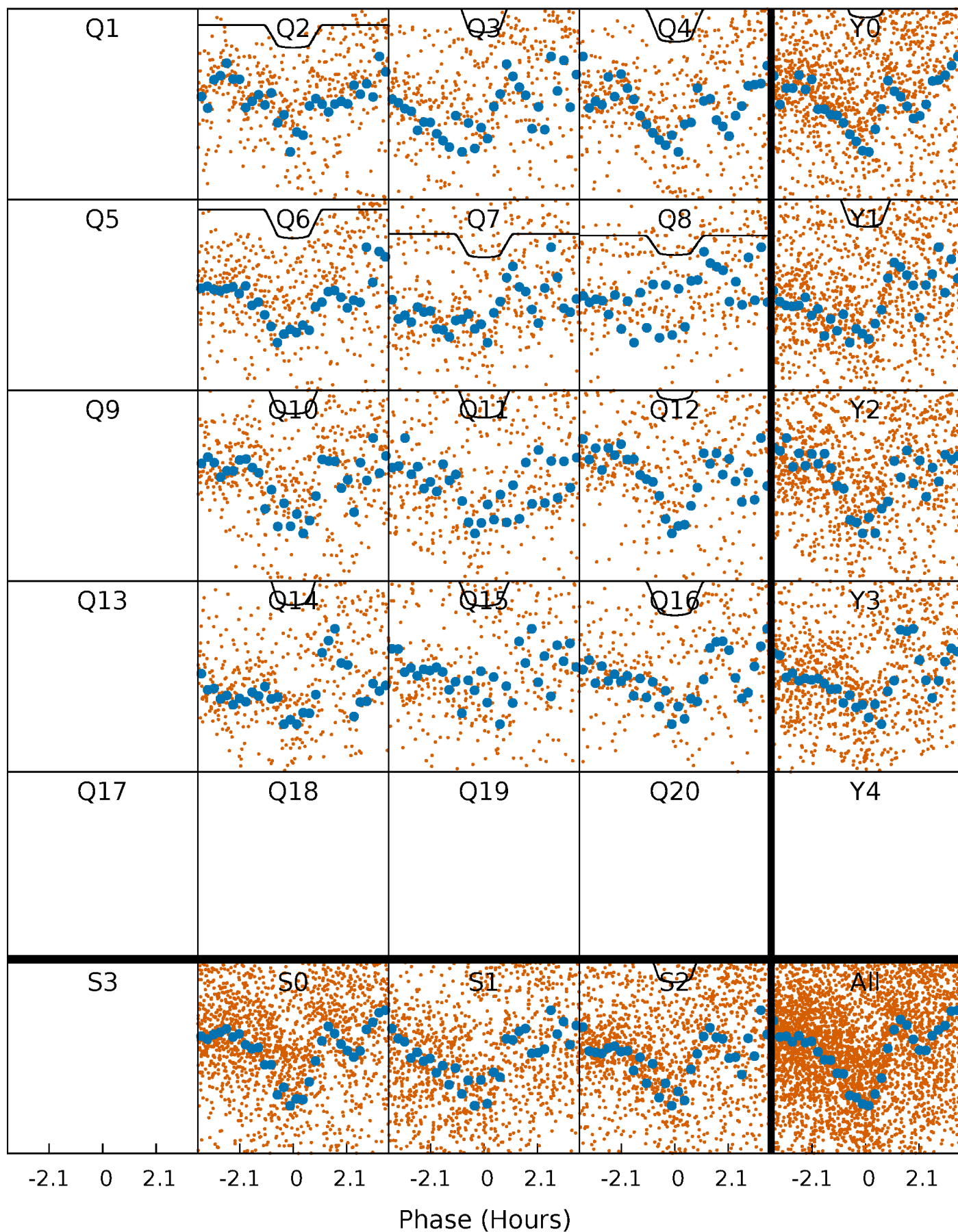
TCE 008167938-02   P= 2.565656 Days    $T_0=131.904967$  (BKJD)





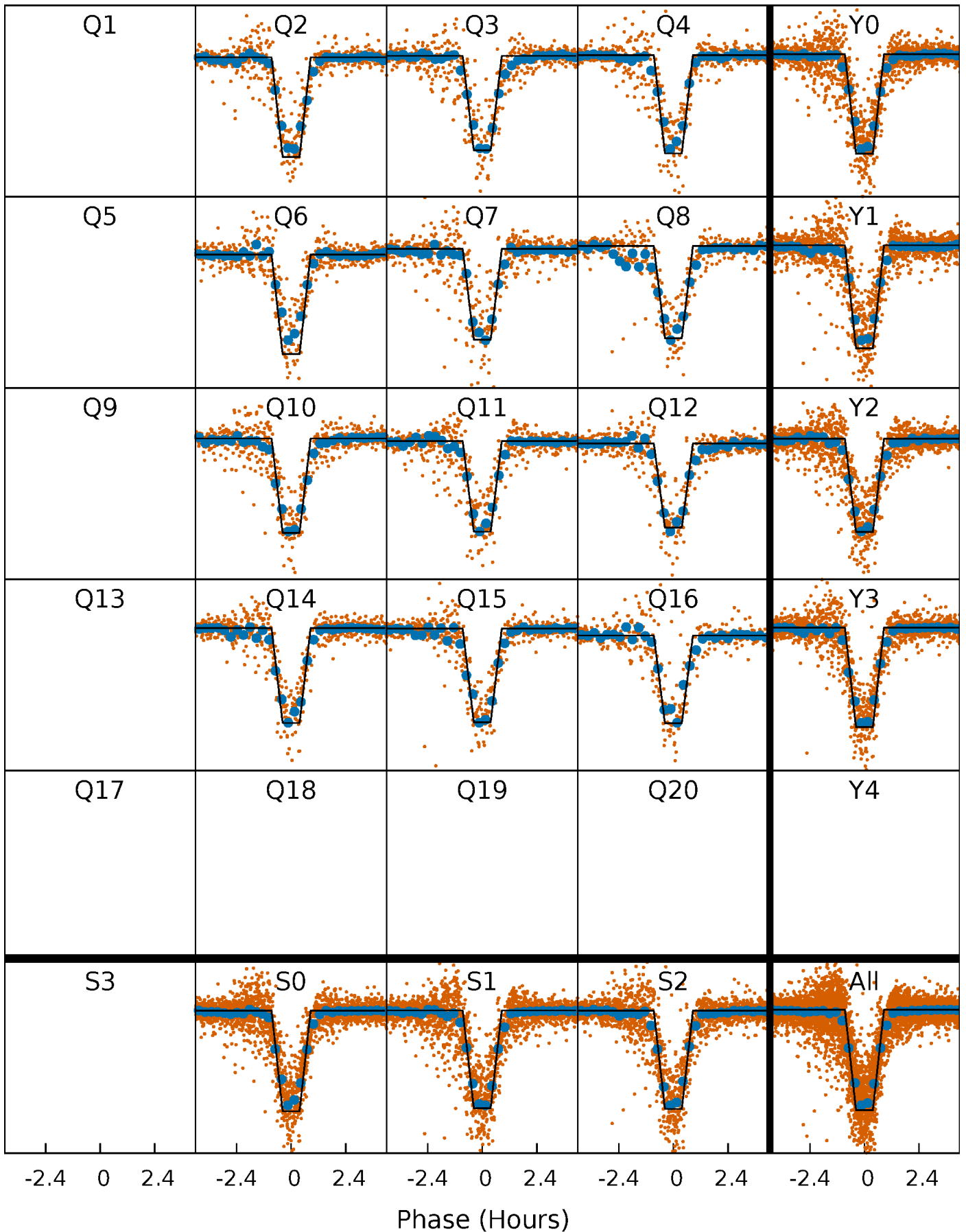
# DV Quarter-Phased Transit Curves

TCE 008167938-02 P= 2.565656 Days  $T_0=131.904967$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

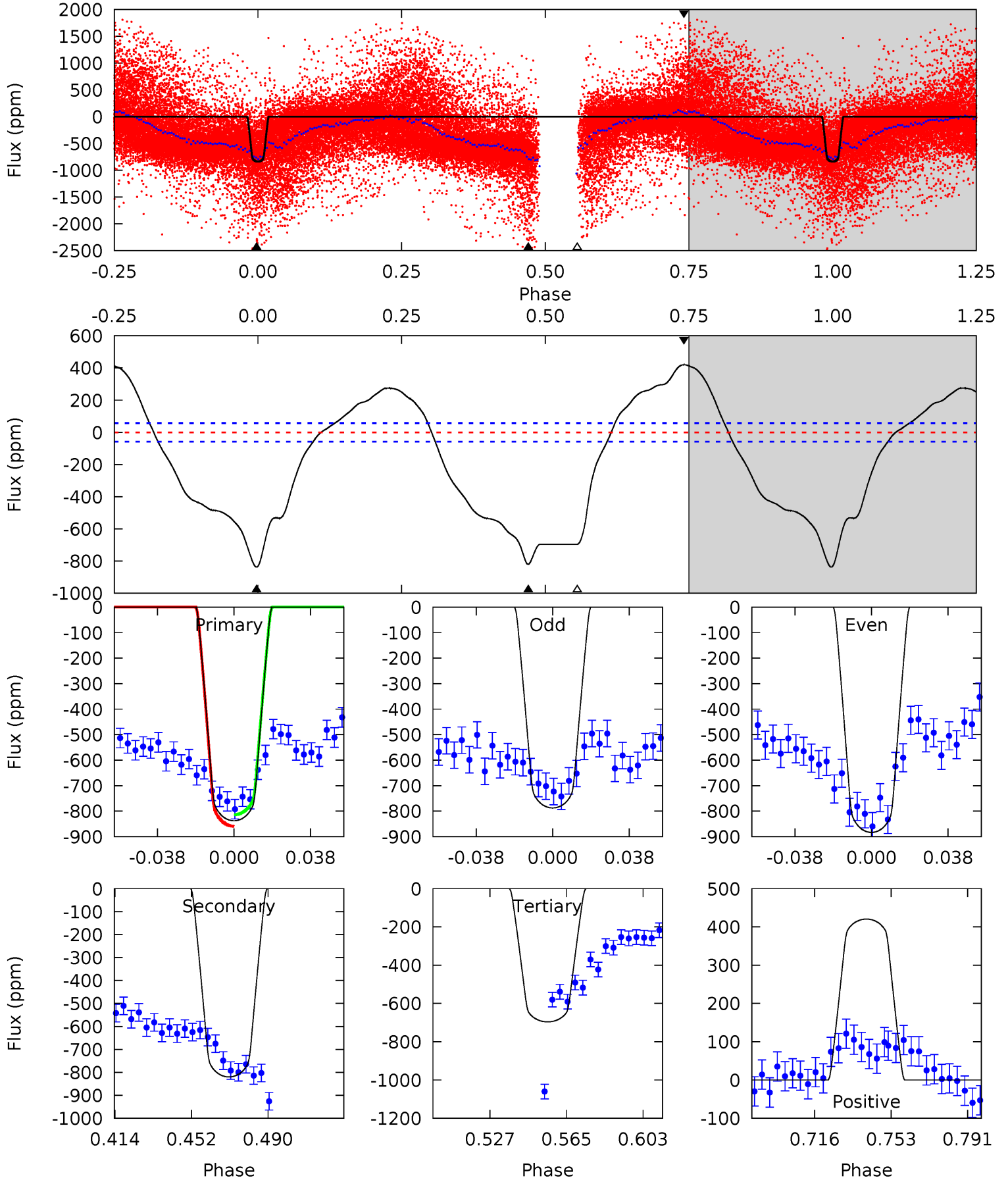
TCE 008167938-02   P= 2.565725 Days    $T_0=131.926227$  (BKJD)



# DV Model-Shift Uniqueness Test

008167938-02, P = 2.565656 Days, E = 131.904967 Days

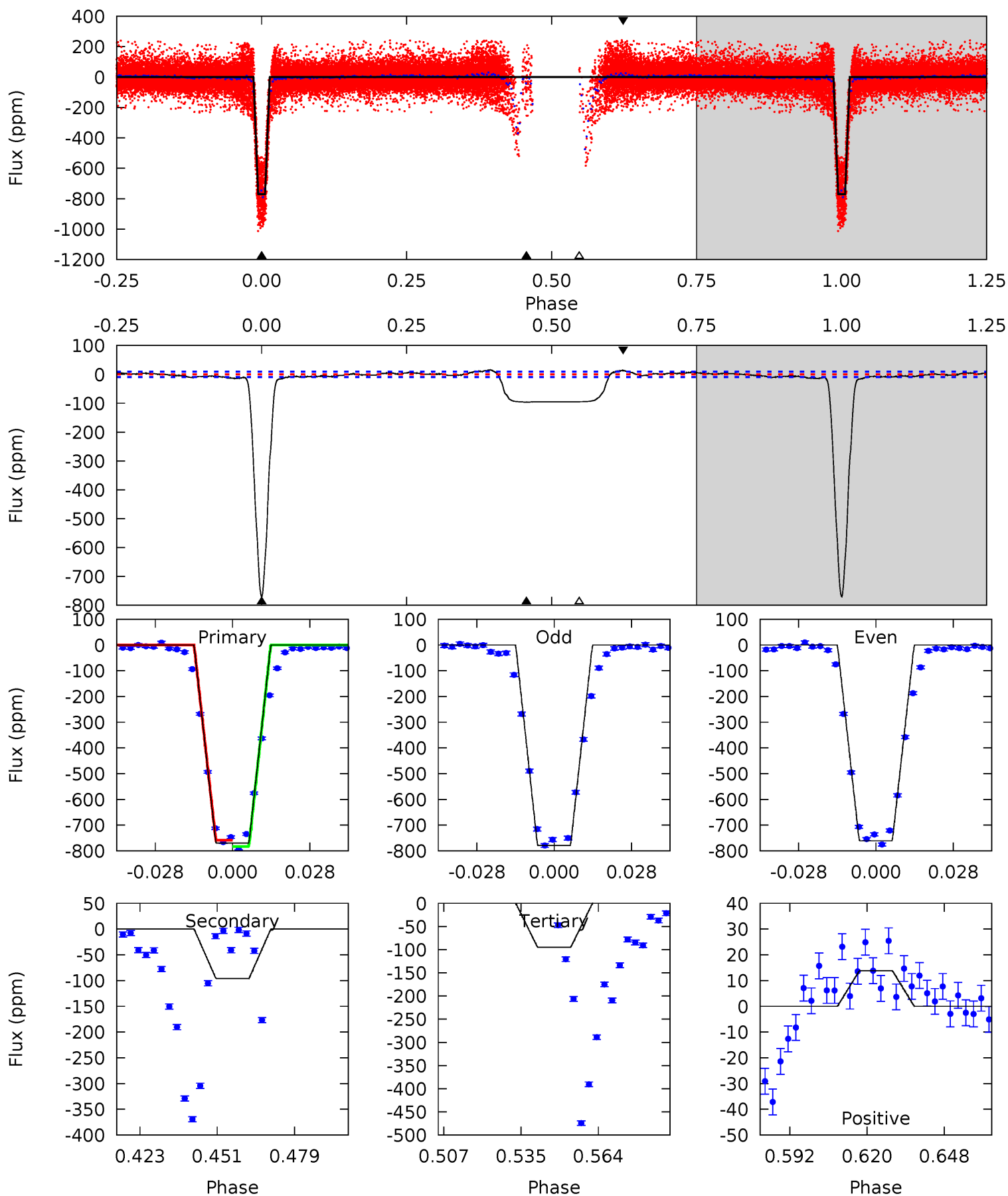
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
68.6	67.2	57.1	34.5	4.77	2.08	25.6	11.6	34.2	10.1	32.7	3.95	1.07	0.33	1.89



# Alt Model-Shift Uniqueness Test

008167938-02, P = 2.565725 Days, E = 131.926227 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
384.8	48.1	47.5	6.91	4.82	2.19	5.60	337.2	377.9	0.54	41.2	4.52	1.02	0.02	0



### Stellar Parameters For KIC 008167938

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$11360^{+587}_{-1762}$	$3.636^{+0.451}_{-0.106}$	$0.210^{+0.150}_{-0.200}$	$4.712^{+0.568}_{-2.273}$	$3.504^{+0.070}_{-1.062}$	$0.047^{+0.211}_{-0.012}$
	+5%/-16%	+12%/-3%	+71%/-95%	+12%/-48%	+2%/-30%	+448%/-26%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008167938-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-820 \pm 12$	$7.12^{+1.03}_{-1.69}$	$6073^{+720}_{-1000}$	$21290^{+3155}_{-4548}$	$27^{+17}_{-6}$
Alt.	$-96 \pm 2$	$14.37^{+1.71}_{-3.77}$	$6006^{+791}_{-1083}$	$5107^{+410}_{-458}$	$0.770^{+0.542}_{-0.149}$

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

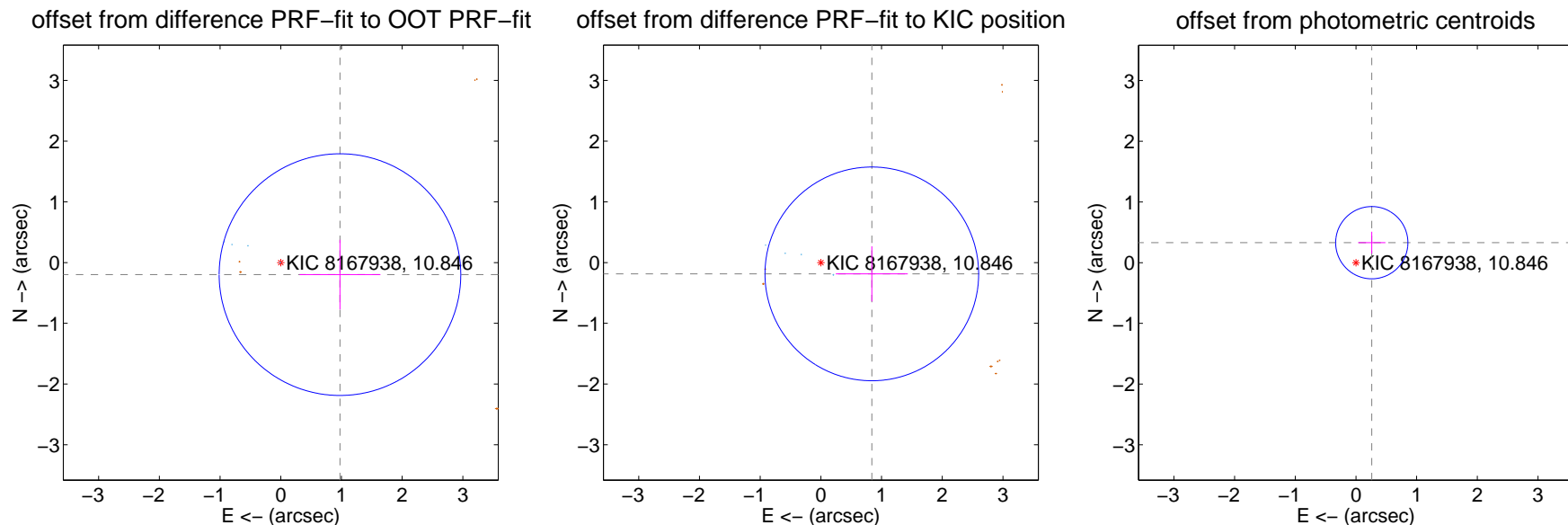
## DV Centroid Data

Supplemental centroid analysis for 008167938-02. **Kepler magnitude: 10.85.** Transit SNR 23.44

There are 4 quarters with good PRF difference image offsets

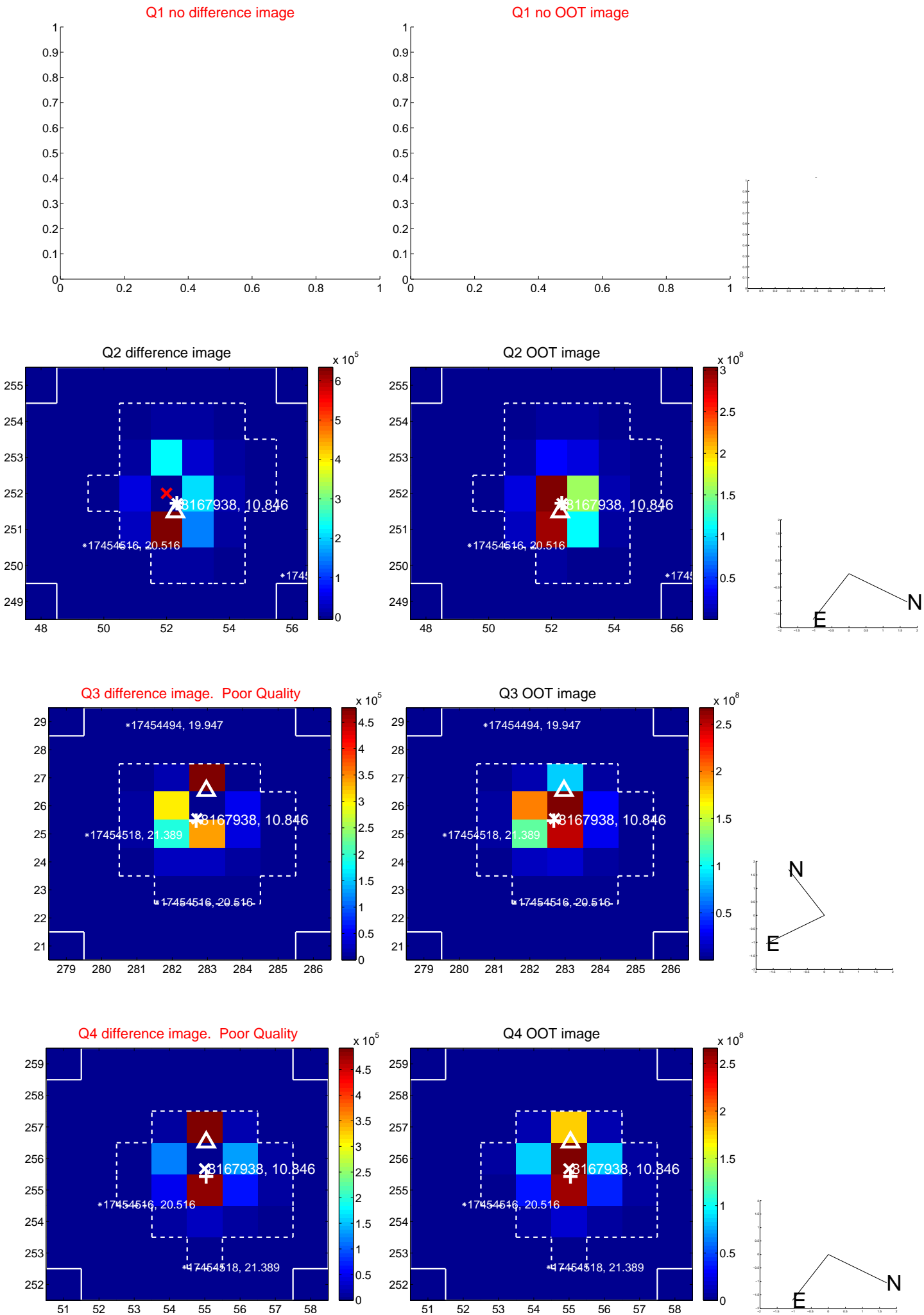
The direct PRF centroid is offset from the target star catalog position by about 1.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.995 \pm 0.663$	1.50	$-0.976 \pm 0.667$	$-0.198 \pm 0.574$
PRF-fit source offset from KIC position	$0.860 \pm 0.587$	1.47	$-0.840 \pm 0.592$	$-0.186 \pm 0.455$
photometric centroid source offset	$0.42 \pm 0.20$	2.12	$-0.26 \pm 0.22$	$0.33 \pm 0.18$



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

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





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

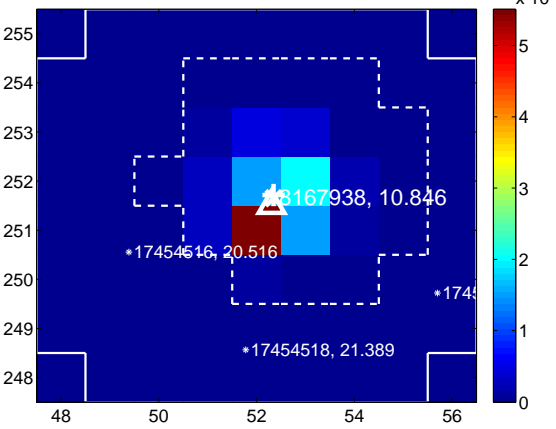
Q5 no difference image



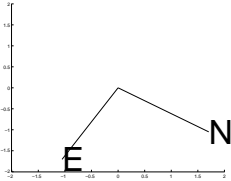
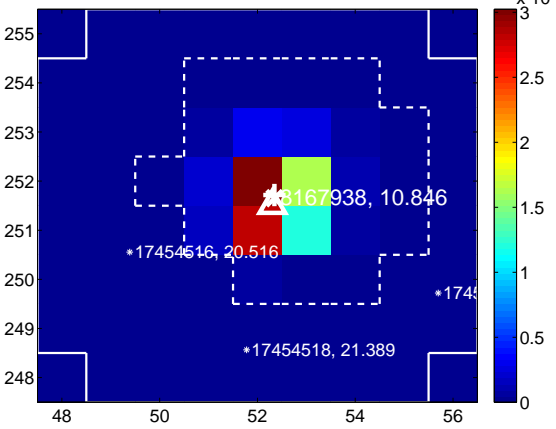
Q5 no OOT image



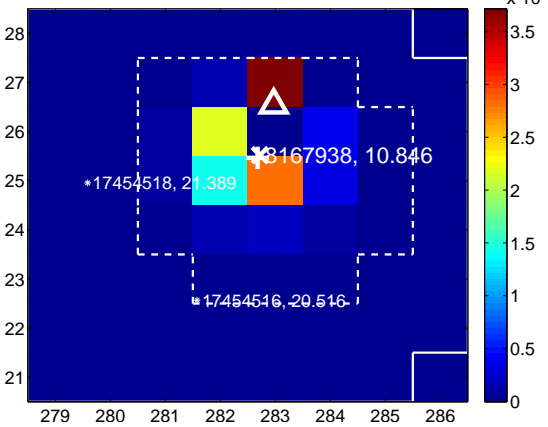
Q6 difference image



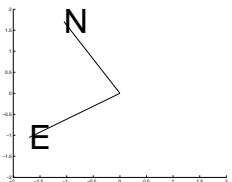
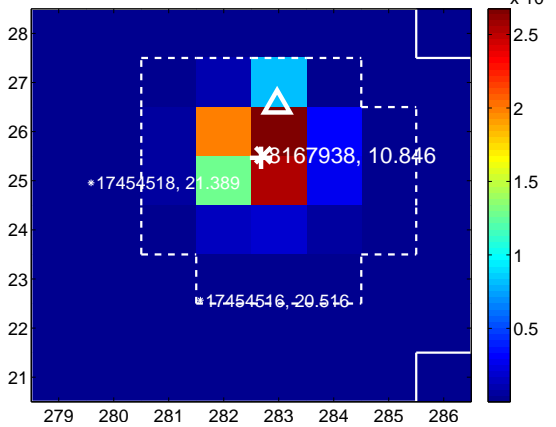
Q6 OOT image



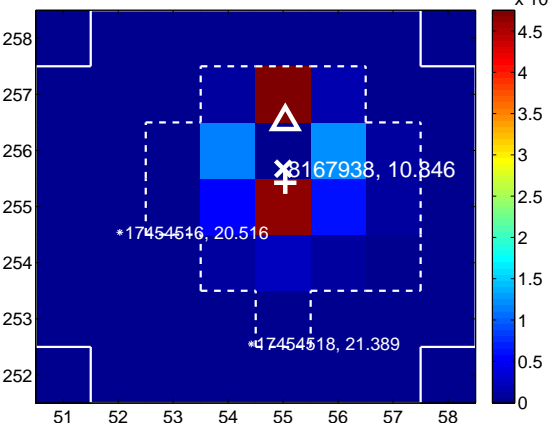
Q7 difference image. Poor Quality



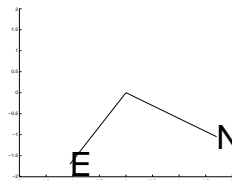
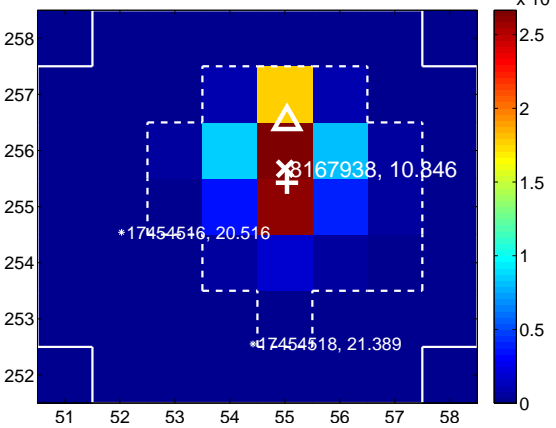
Q7 OOT image



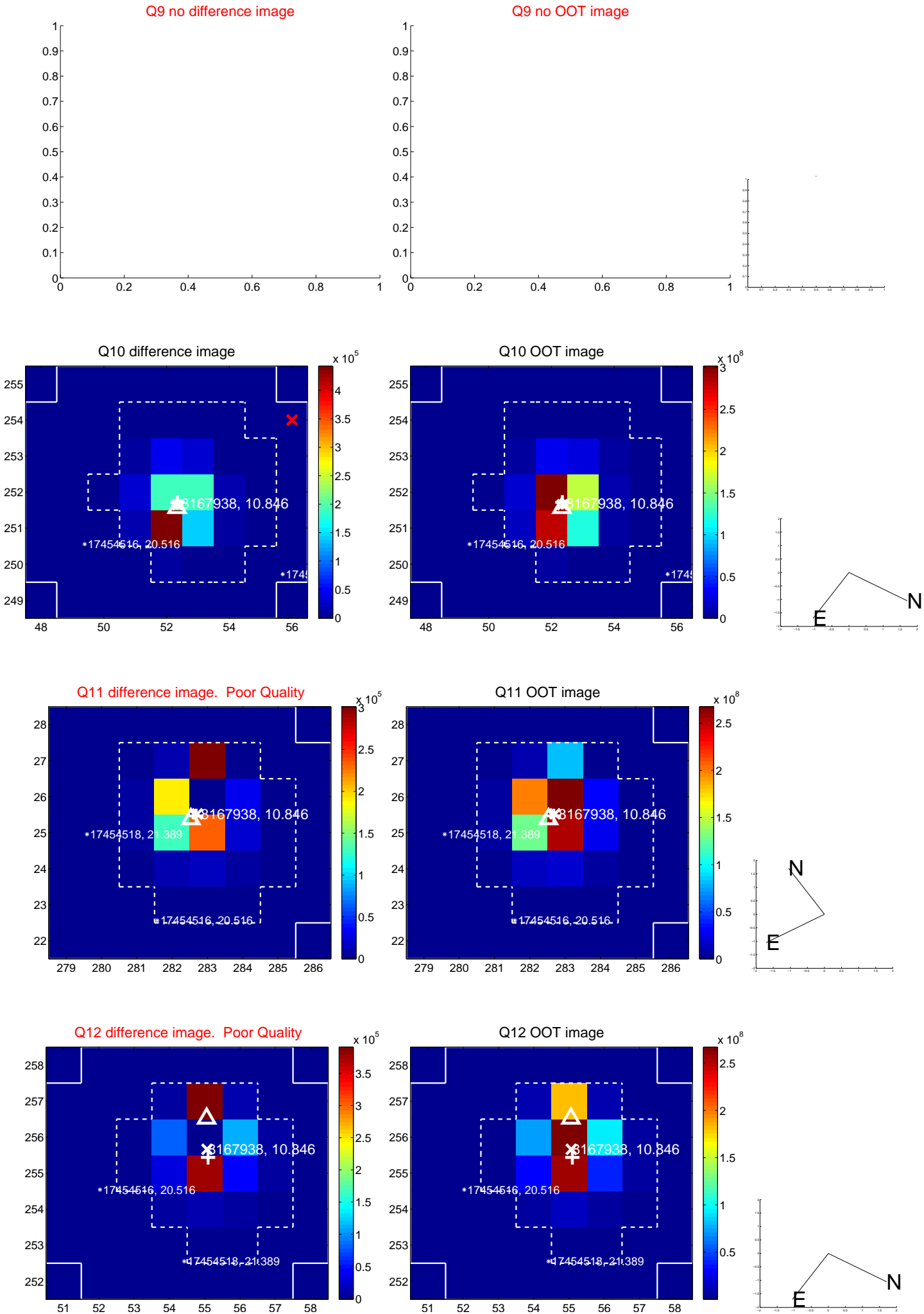
Q8 difference image. Poor Quality



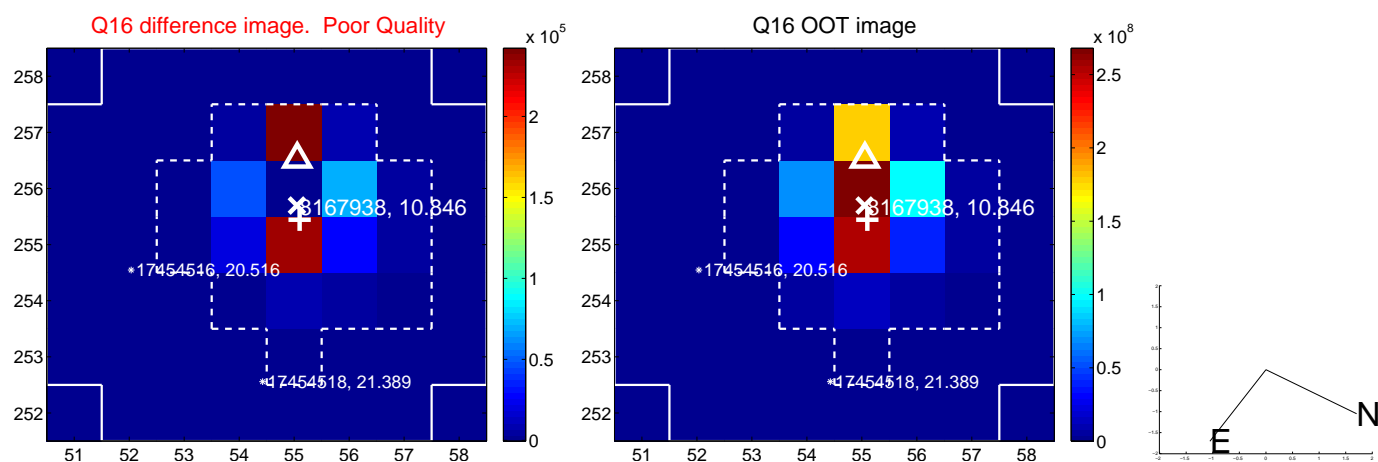
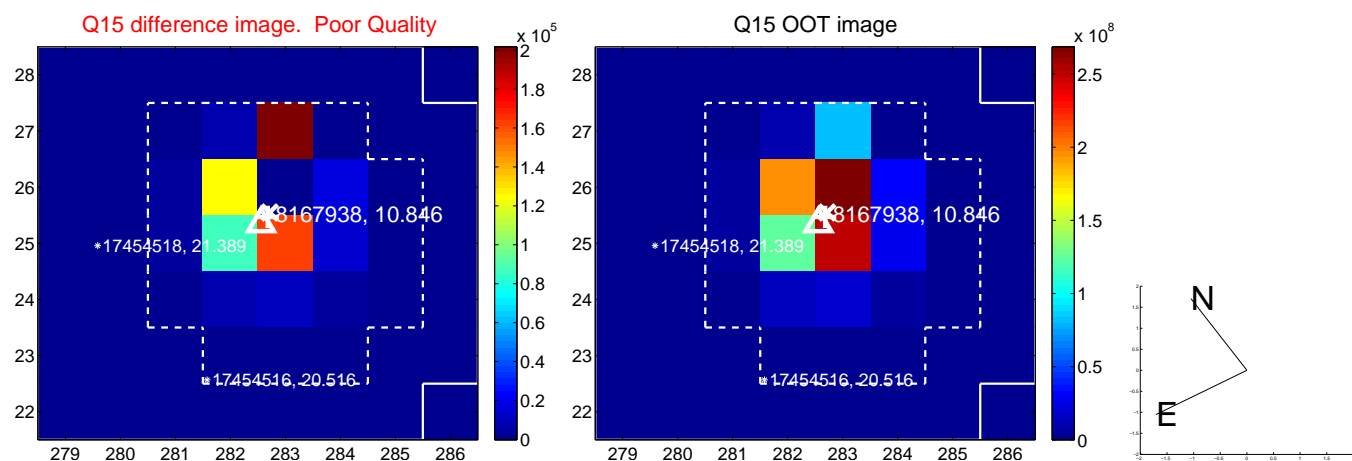
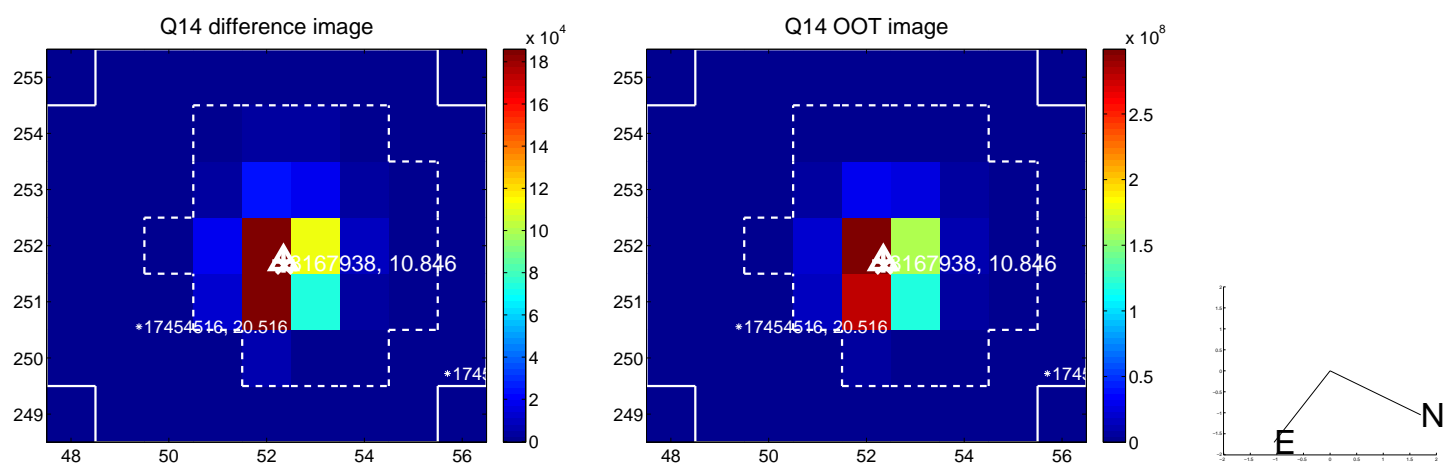
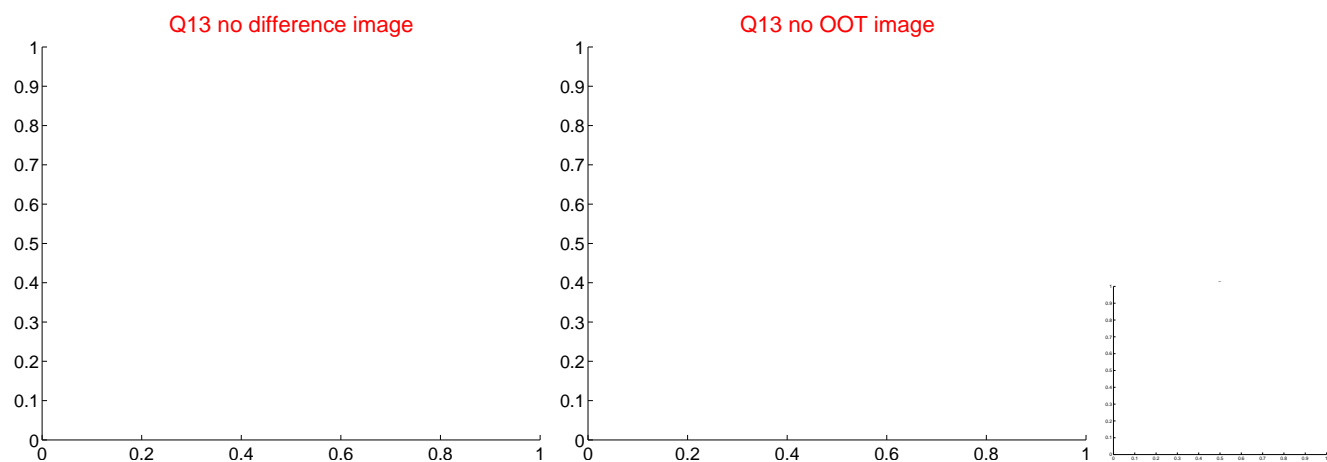
Q8 OOT image



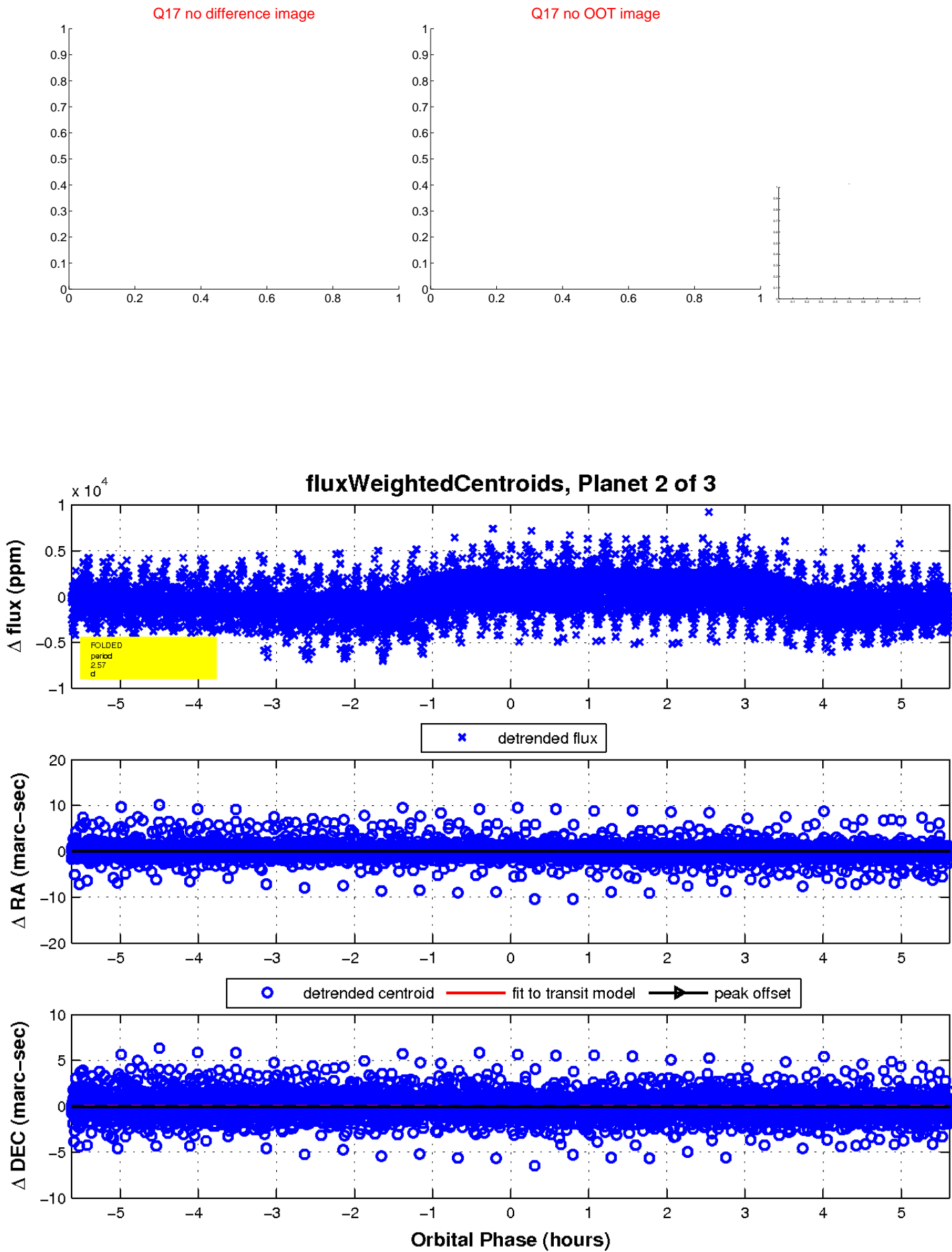
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

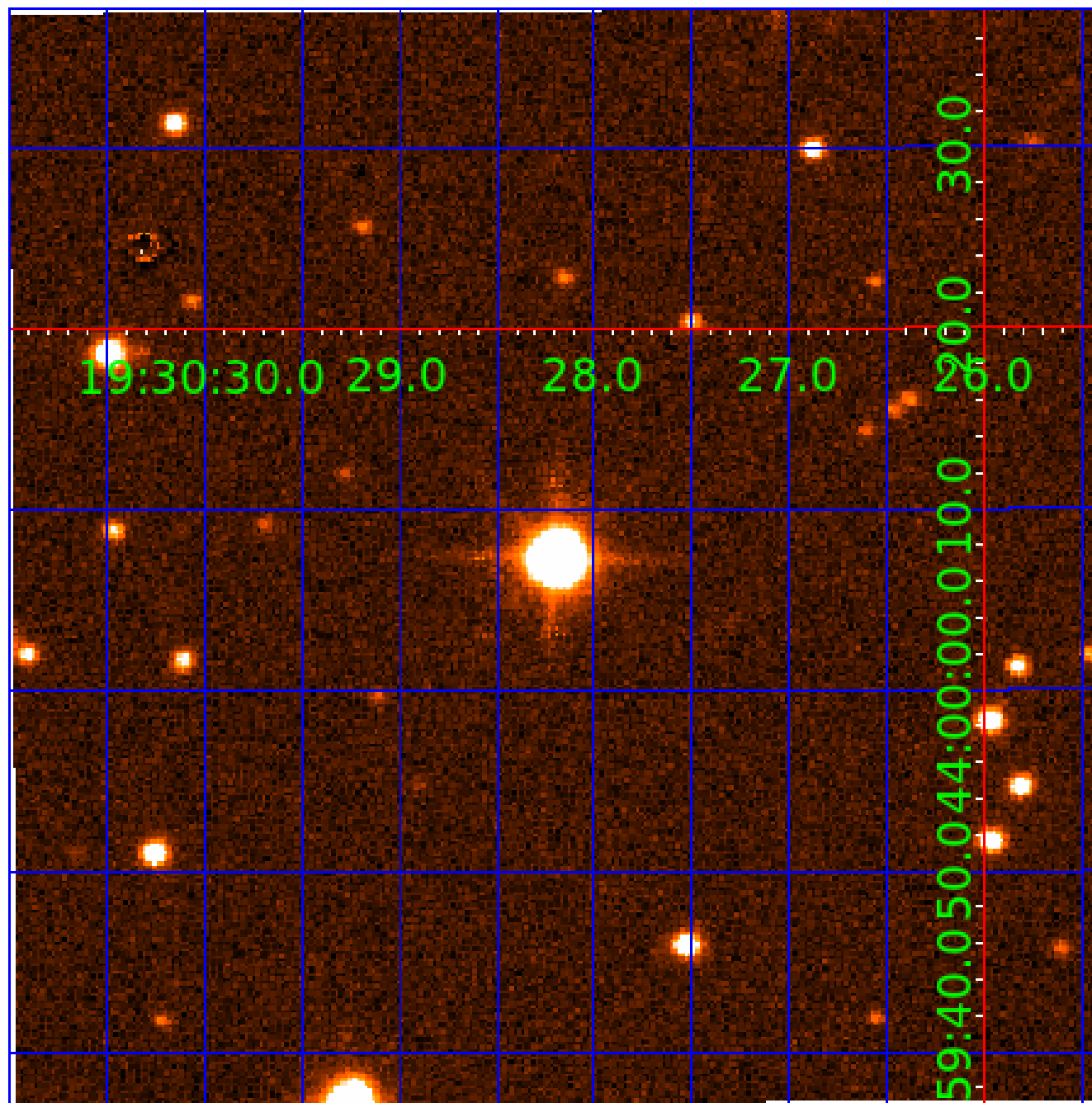


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008167938

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008167938-01	OBS	6052.01	2.565734	133.224742	577.1	1.175	50.8	65.6	4.71	11360	13.02	106724.06
008167938-02	OBS	No	2.565656	131.904967	191.8	1.874	33.1	23.4	4.71	11360	7.46	106728.39
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008167938-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
008167938-02	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_SATURATED—HALO_GHOST
008167938-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

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

## Ephemeris Match Information For 008167938-03

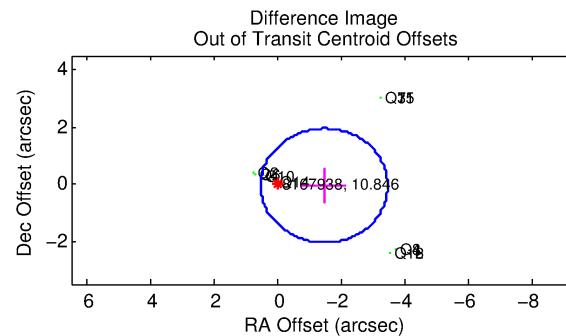
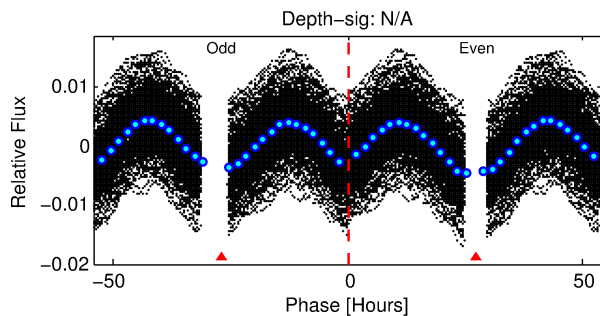
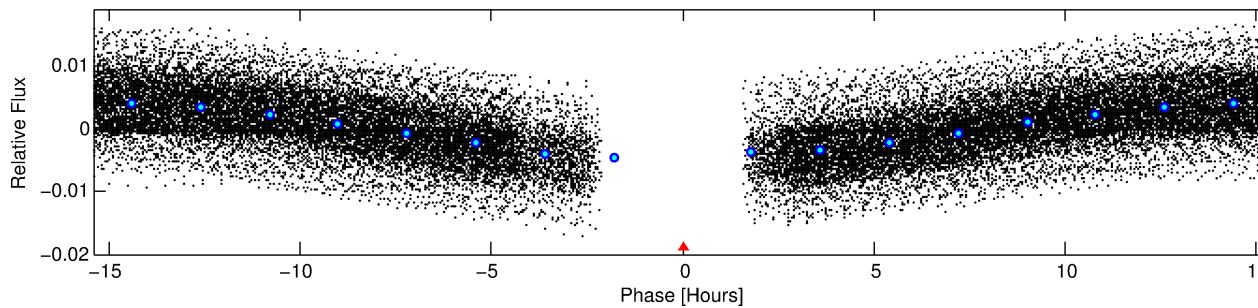
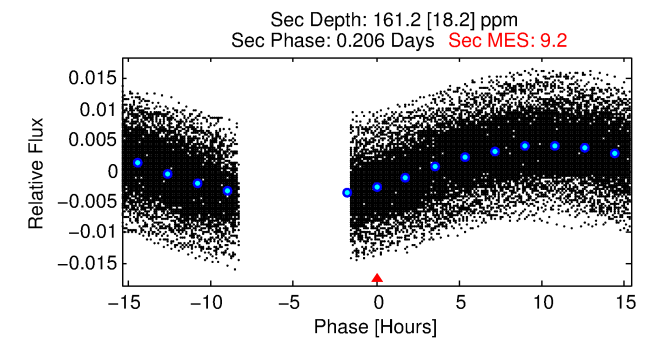
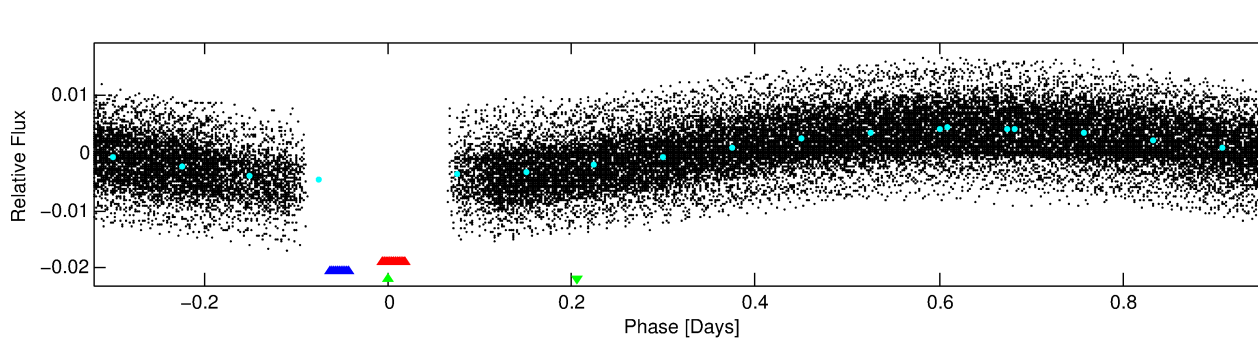
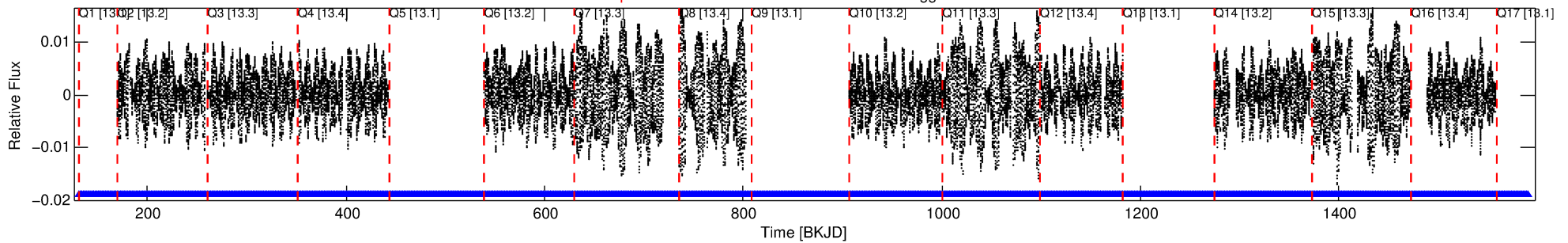
No Significant Match Found

# DV One-Page Summary

KIC: 8167938 Candidate: 3 of 3 Period: 1.283 d

KOI: K06052 Corr: No Ephemeris Match

Kp: 10.85 R\*: 4.71 Rs Teff: 11360.0 K Logg: 3.64 Fe/H: 0.210



## TPS TCE Results:

Period = 1.28285 d  
Epoch = 131.8297 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

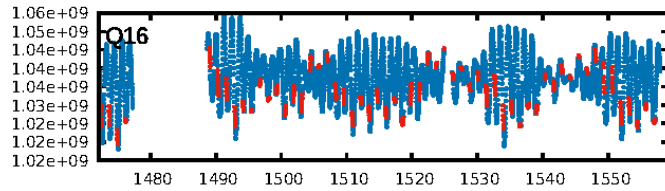
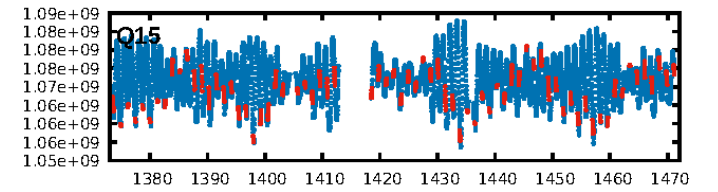
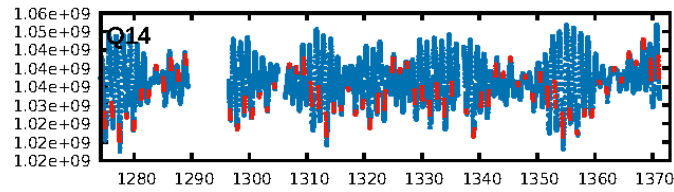
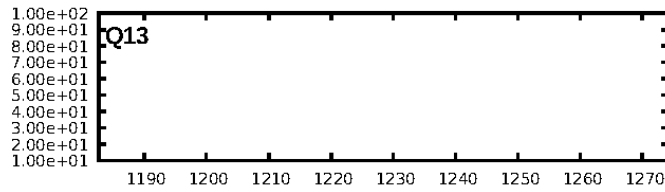
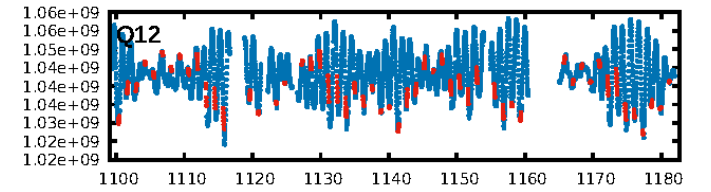
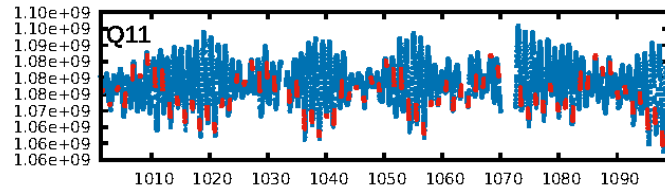
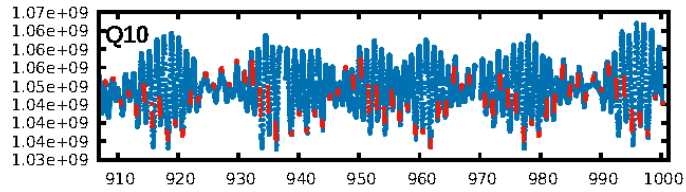
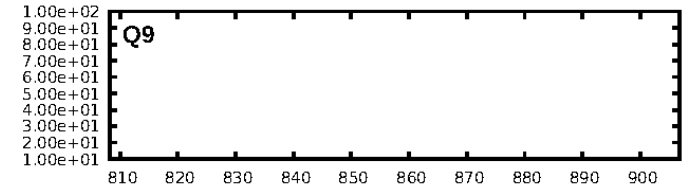
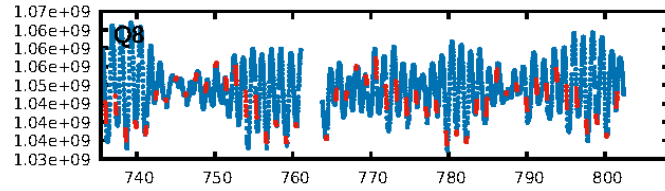
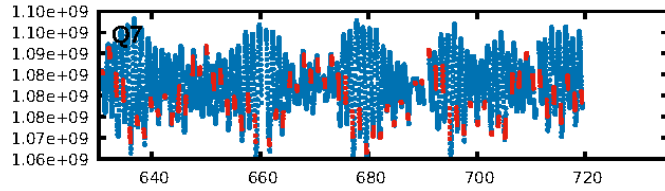
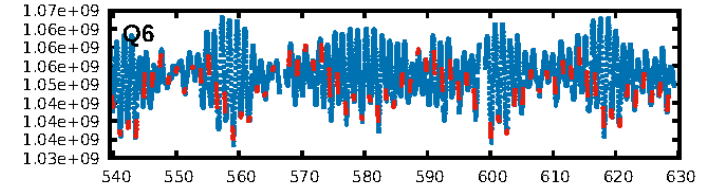
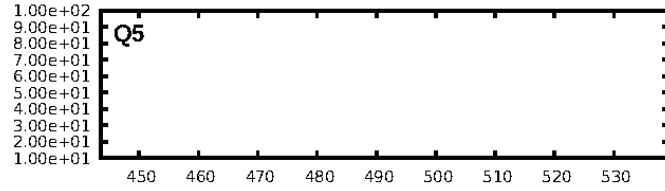
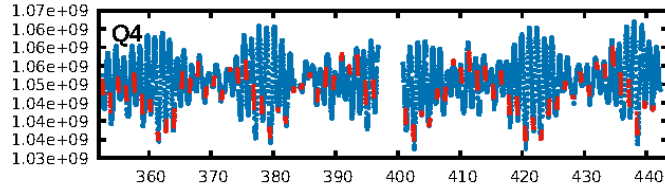
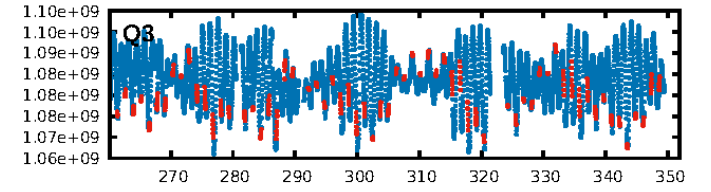
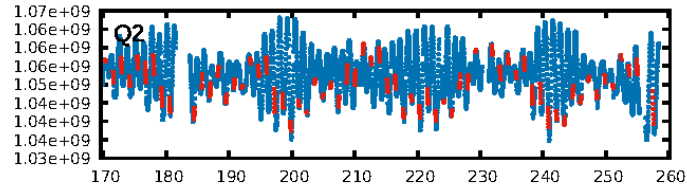
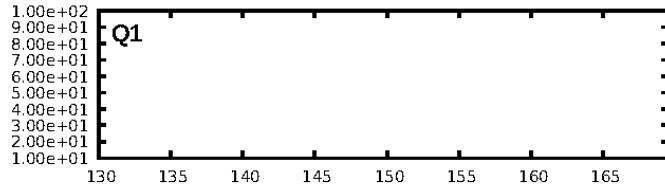
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [12.82σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [779/779]  
GhostDiagnostic-chr: -0.3313  
Centroid-sig: 2.4%  
Centroid-so: 0.177 arcsec [17.53σ]  
OotOffset-rm: 1.457 arcsec [2.19σ]  
KicOffset-rm: 1.393 arcsec [2.50σ]  
OotOffset-st: 4/4/4/0 [12]  
KicOffset-st: 4/4/4/0 [12]  
DiffImageQuality-fgm: 0.33 [4/12]  
DiffImageOverlap-fno: 0.00 [0/12]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:11:43 Z

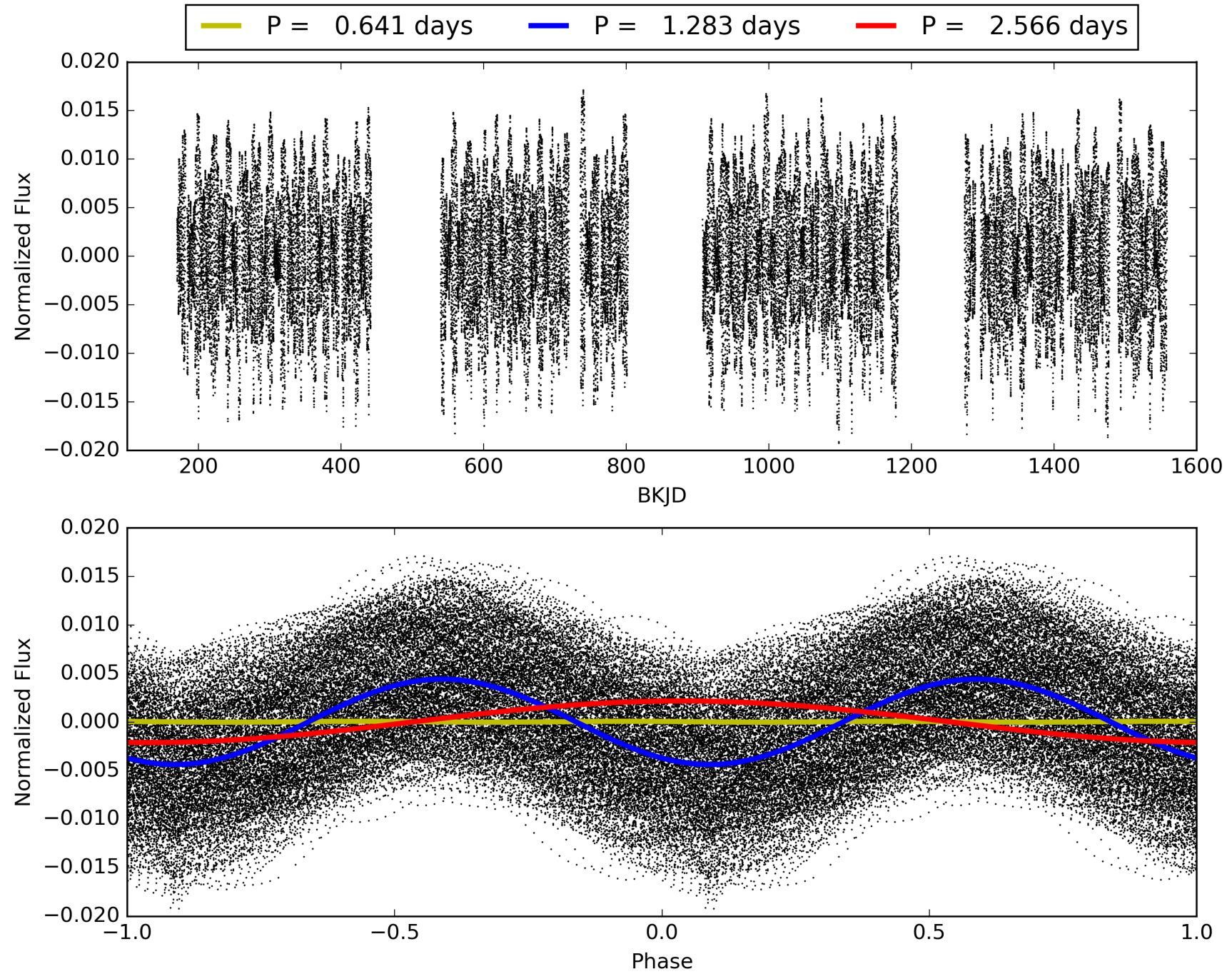
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008167938-03, PDC Light Curves

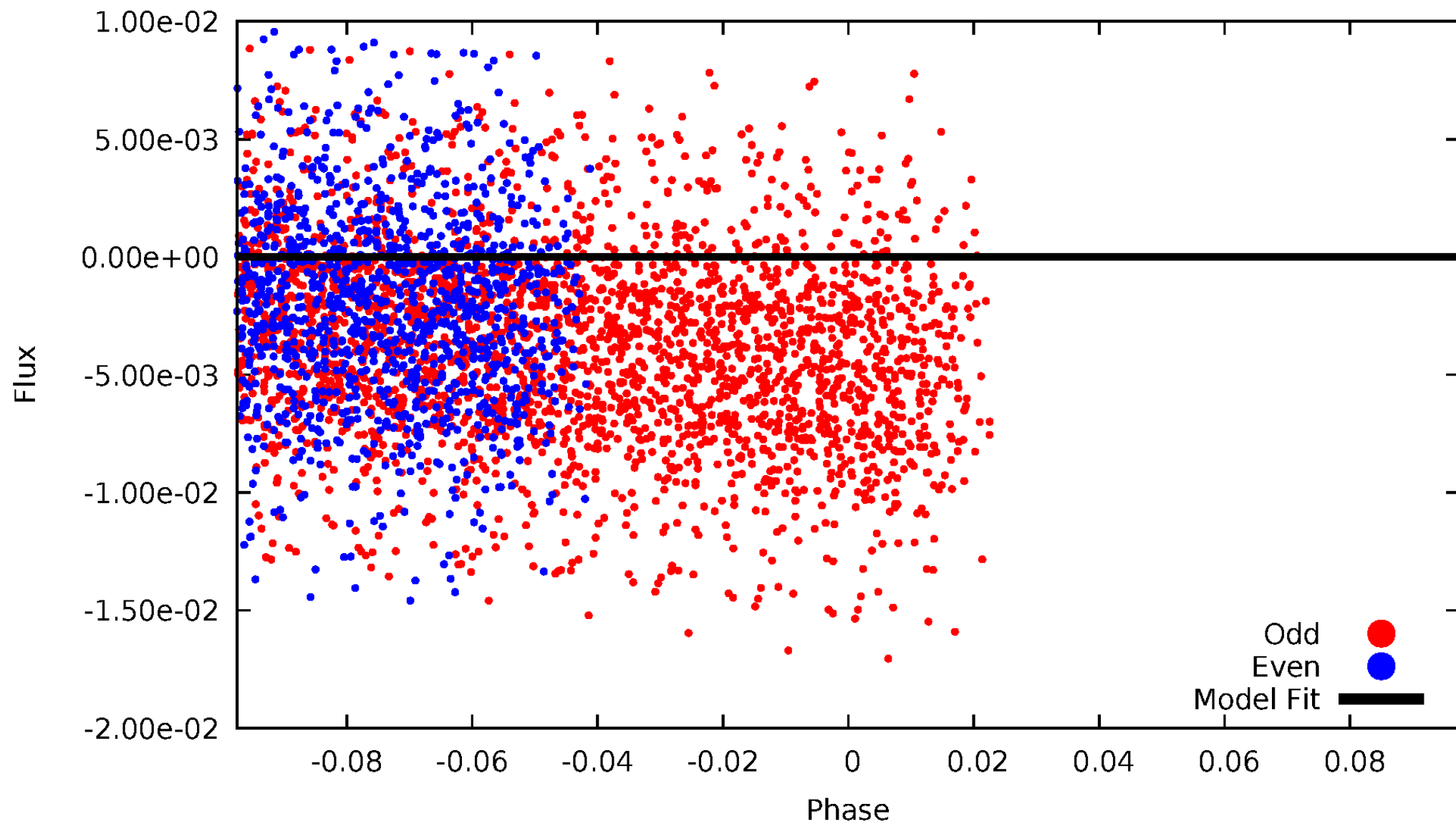


TCE 008167938-03



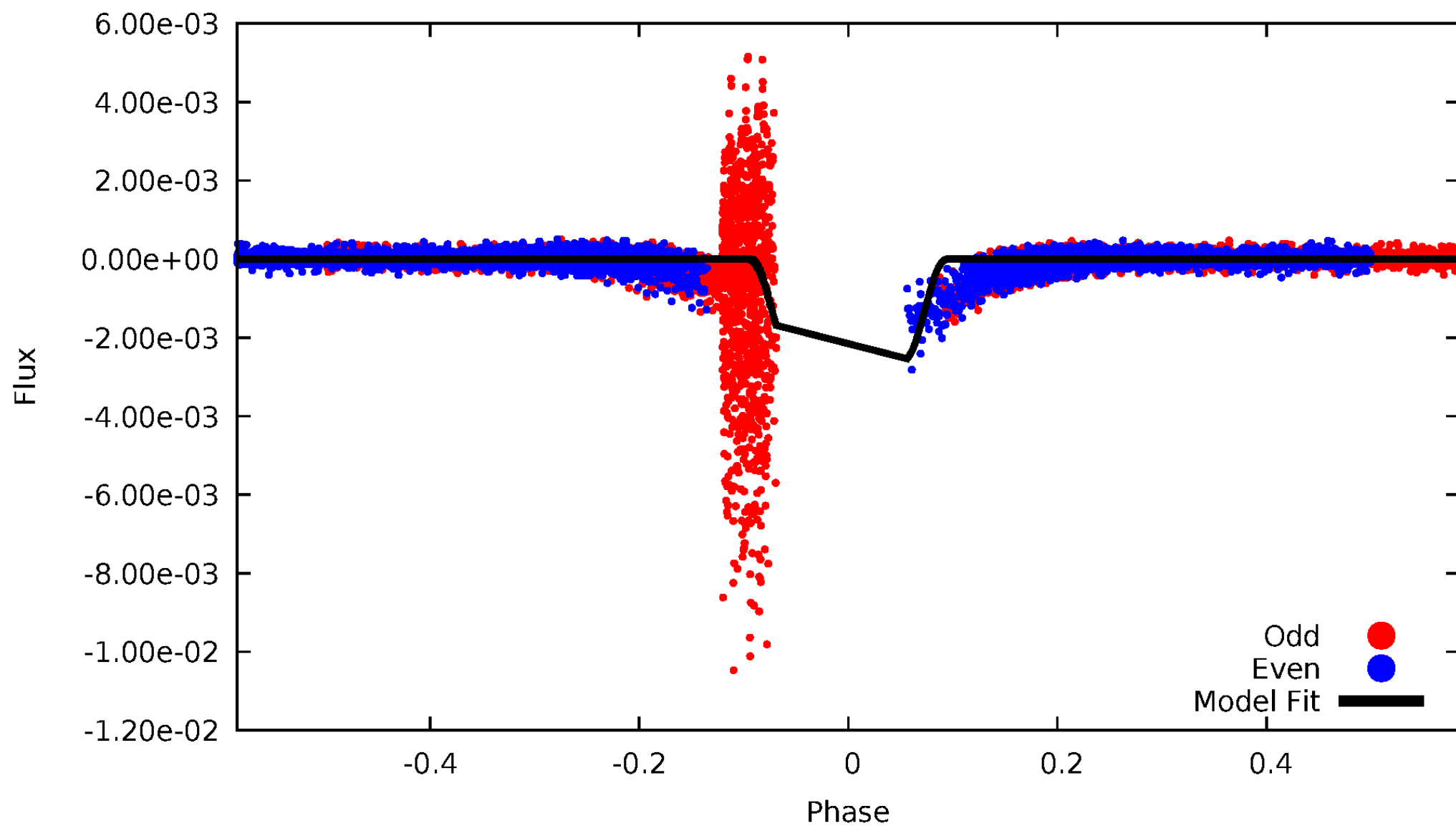
DV Odd/Even

TCE 008167938-03

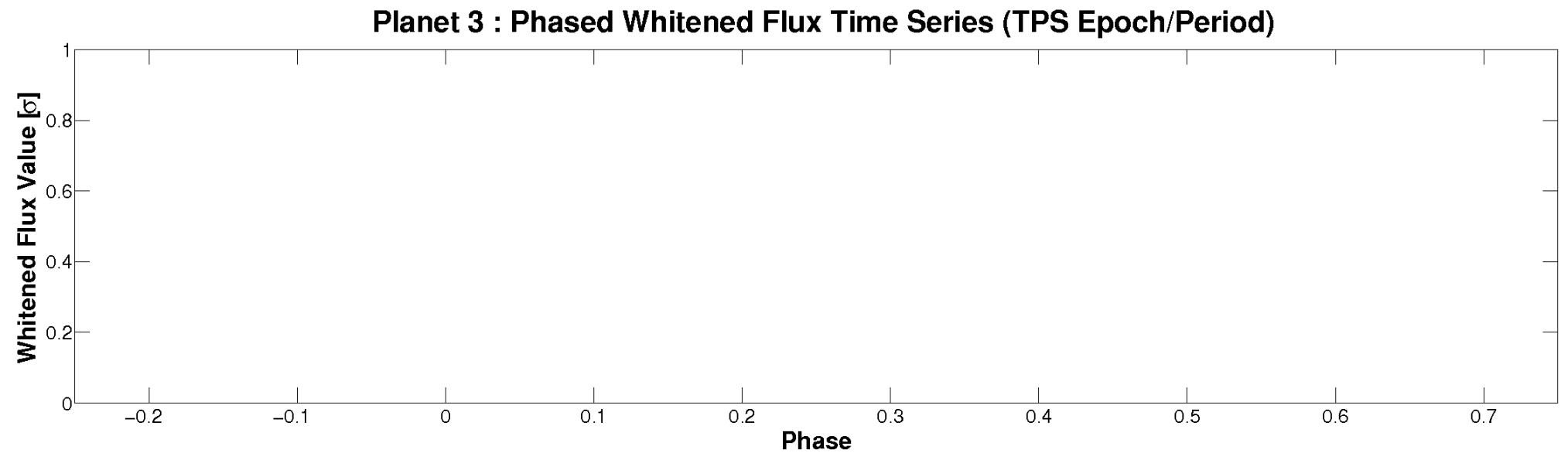
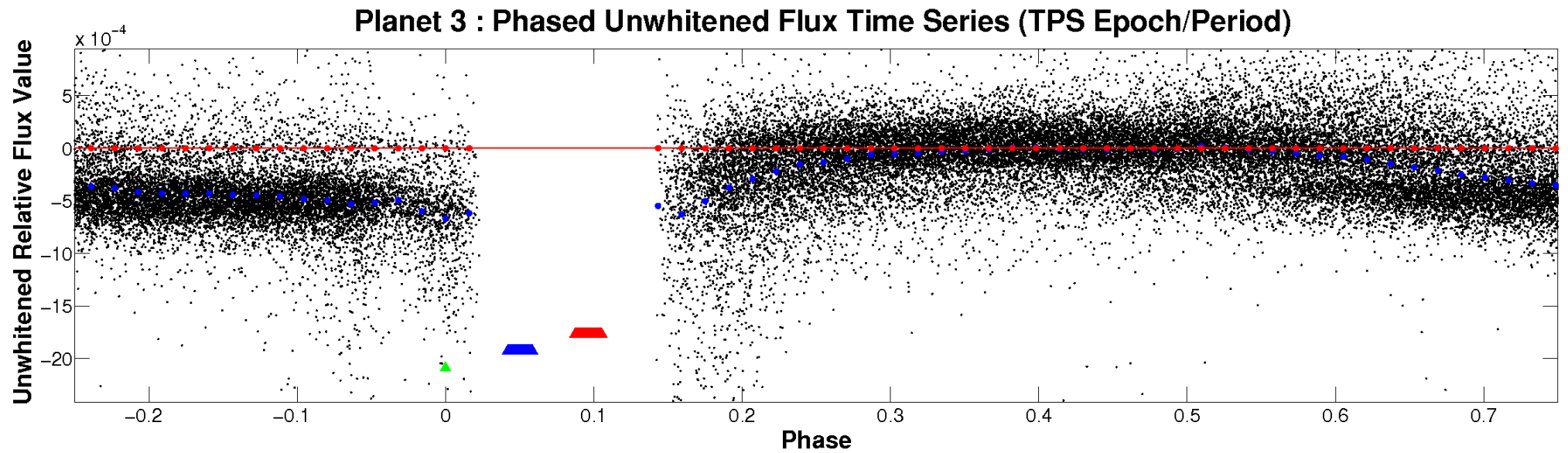


# ALT Odd/Even

TCE 008167938-03



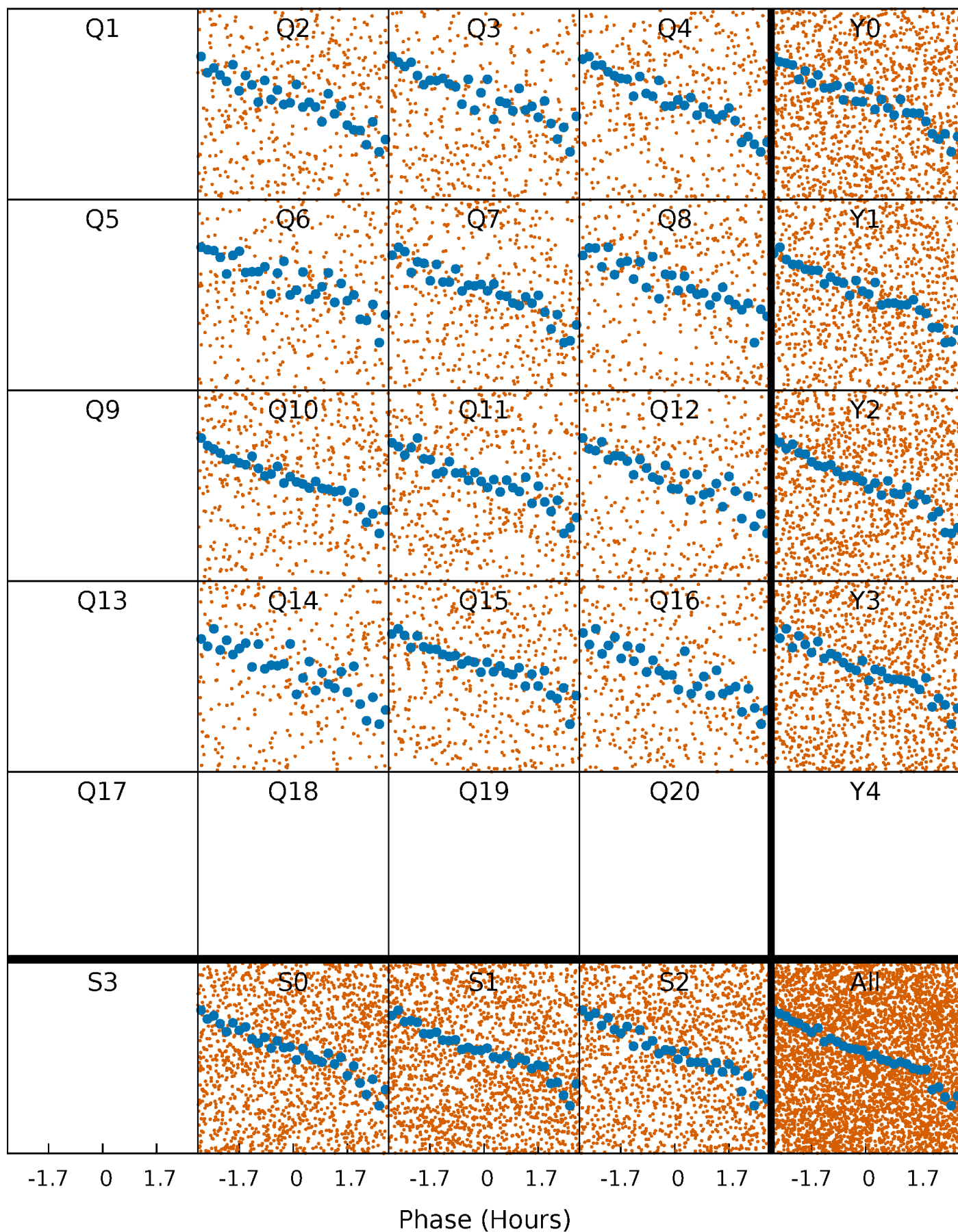
# Non-Whitened Vs. Whitened Light Curve





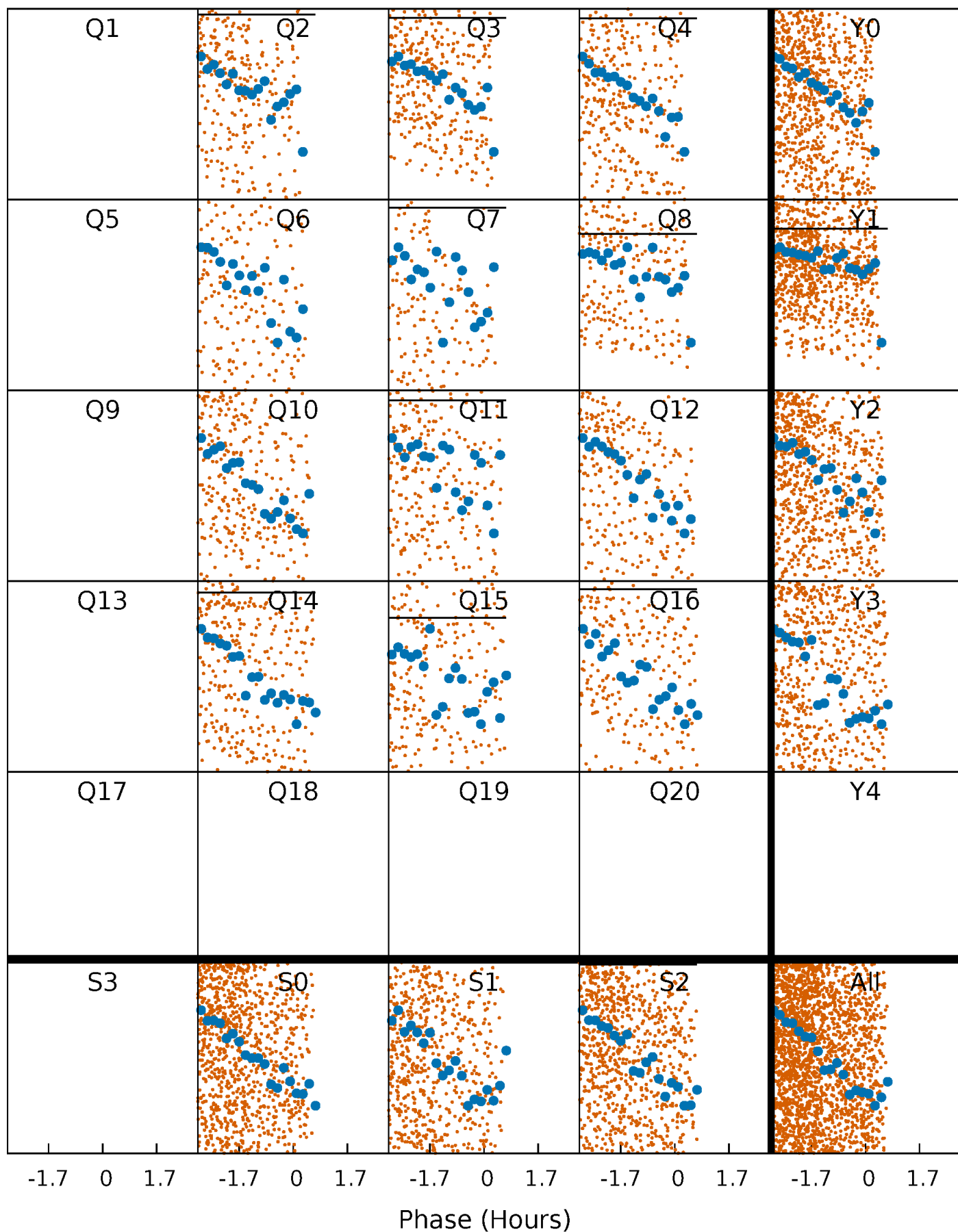
# PDC Quarter-Phased Transit Curves

TCE 008167938-03   P= 1.282847 Days    $T_0=131.829744$  (BKJD)



# DV Quarter-Phased Transit Curves

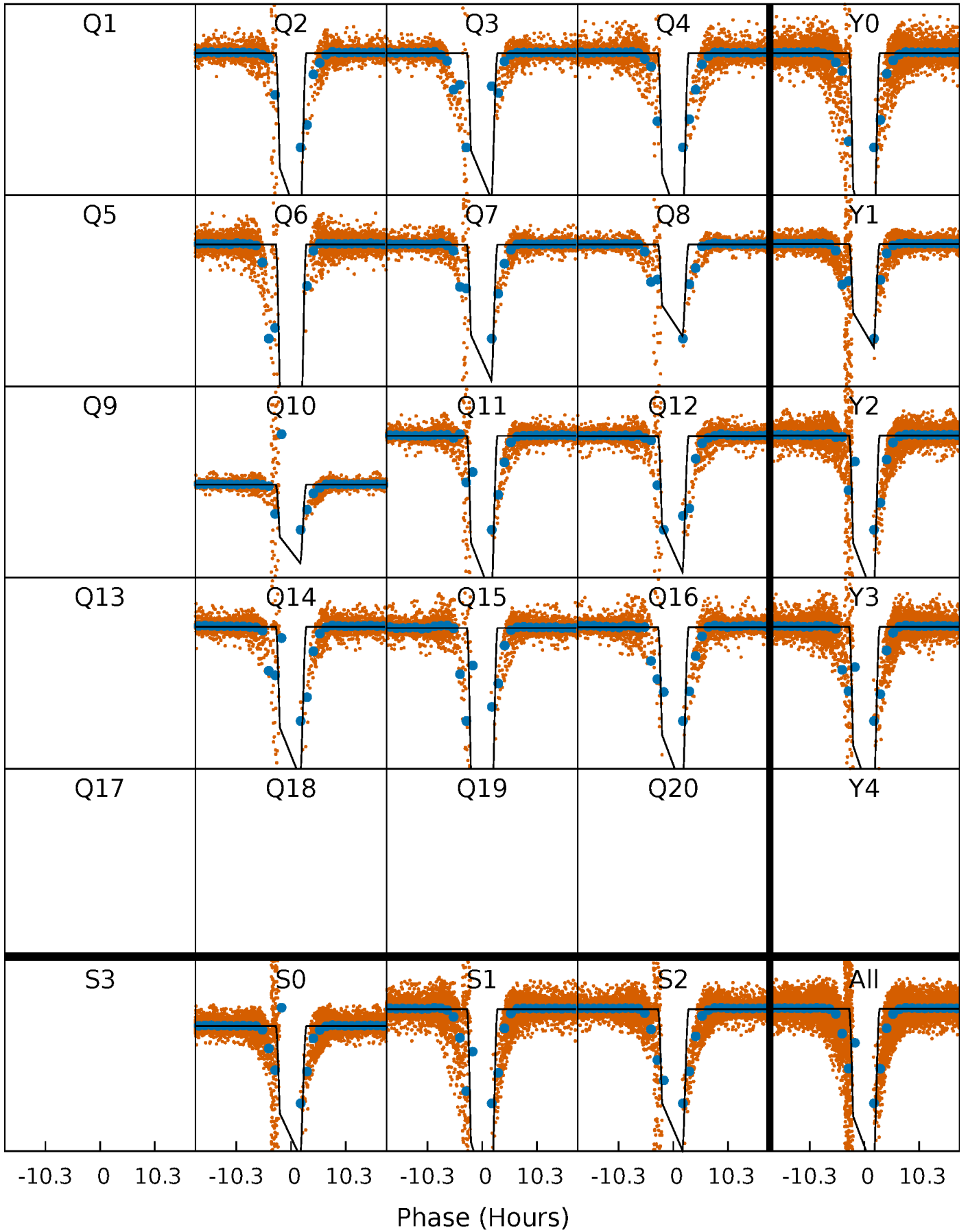
TCE 008167938-03 P= 1.282847 Days  $T_0=131.829744$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

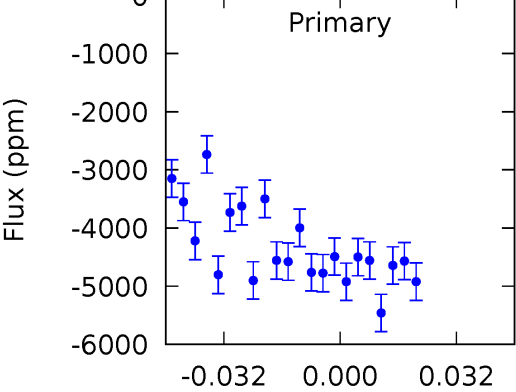
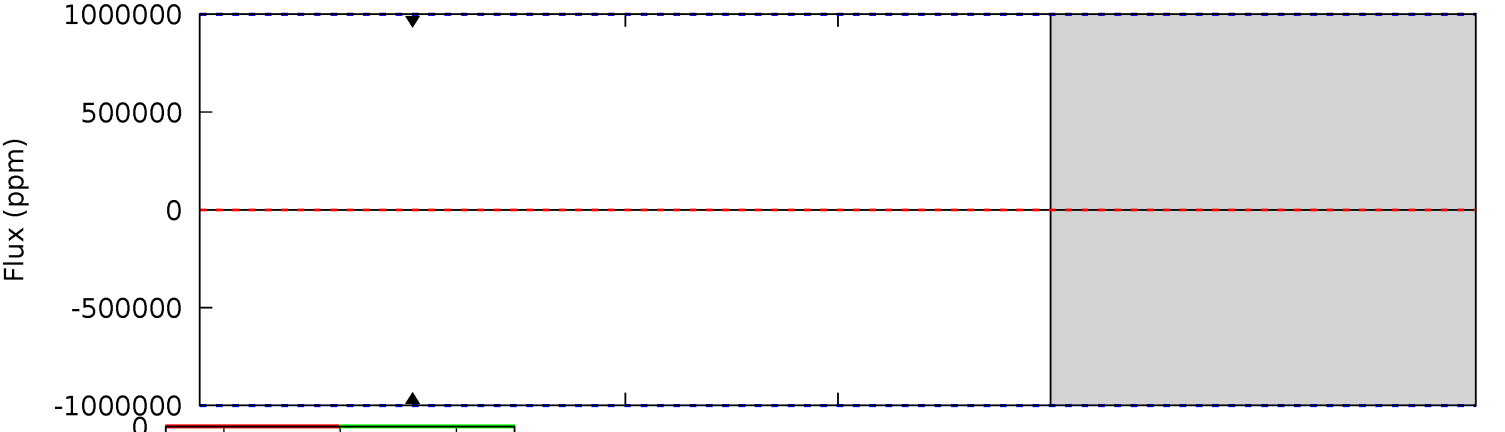
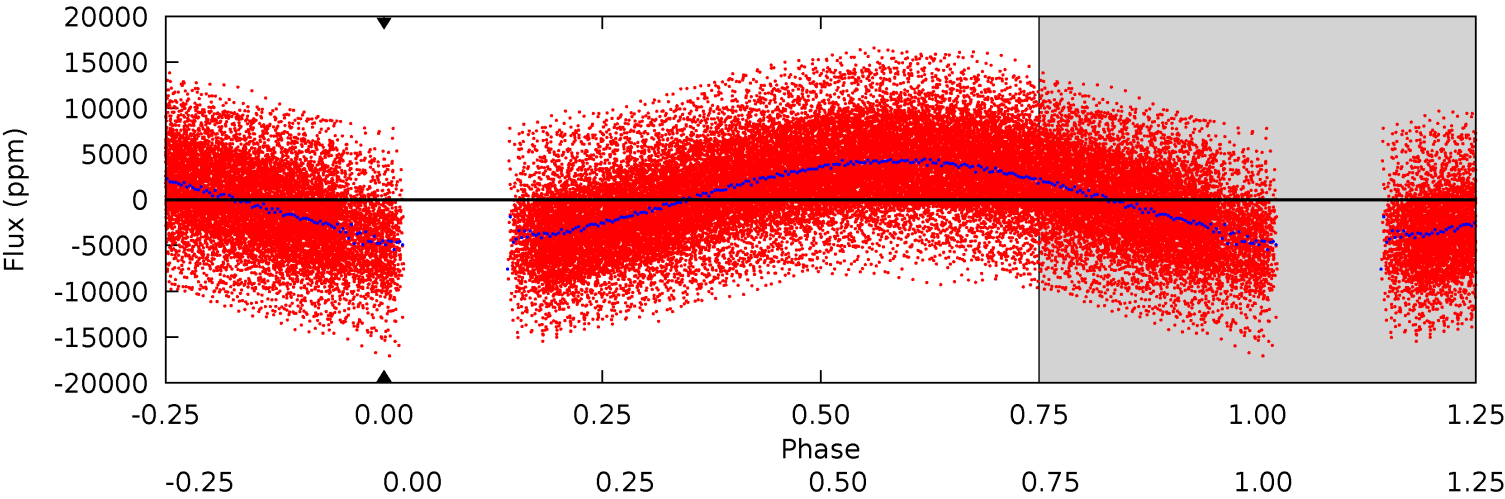
TCE 008167938-03 P= 1.282847 Days  $T_0=131.947236$  (BKJD)



DV Model-Shift Uniqueness Test

008167938-03, P = 1.282847 Days, E = 131.829744 Days

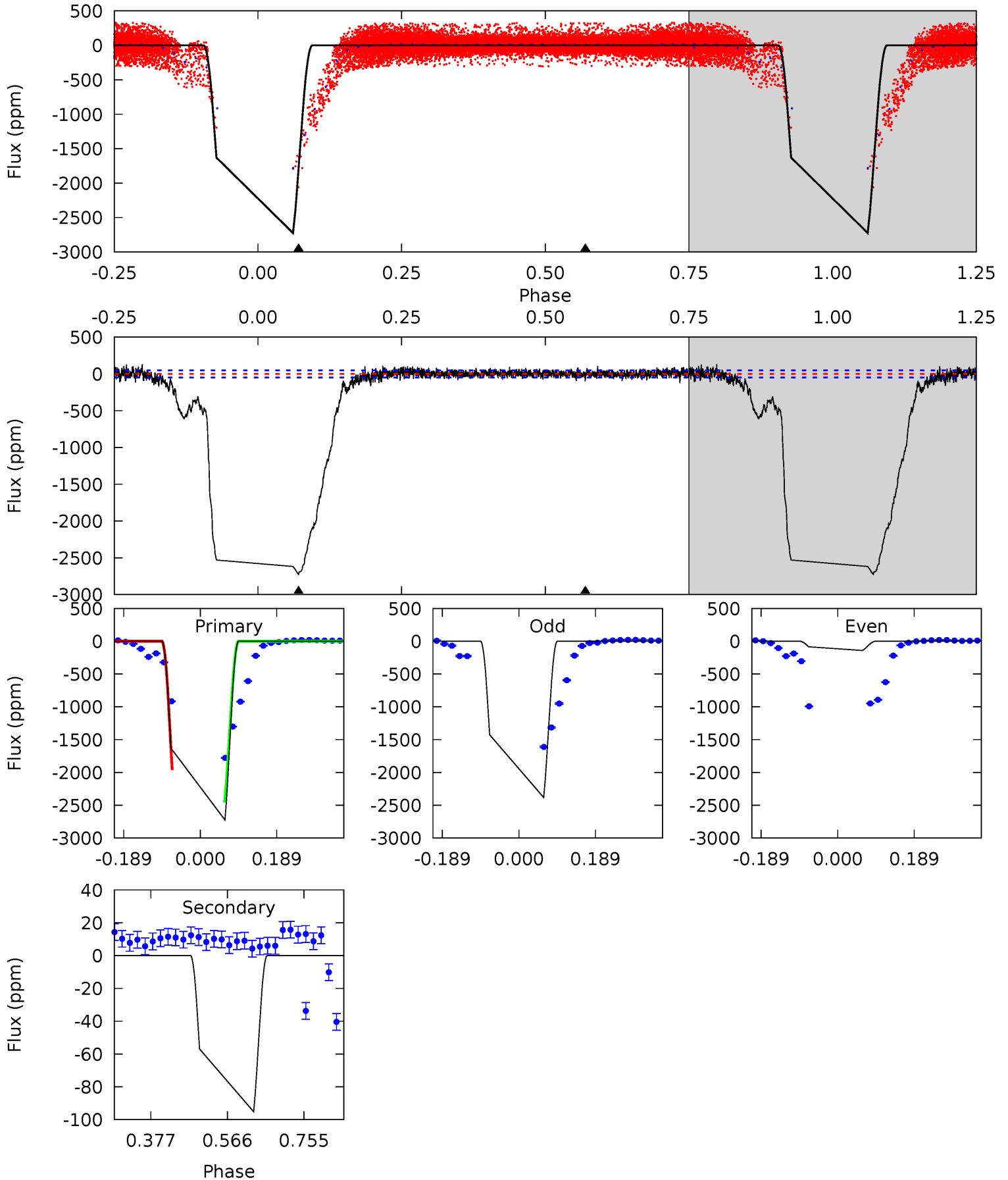
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008167938-03, P = 1.282847 Days, E = 131.947236 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
249.7	8.73	0	0	4.43	1.31	6.40	249.7	249.7	8.73	8.73	94.1	1.21	0.05	24.7



### Stellar Parameters For KIC 008167938

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$11360^{+587}_{-1762}$	$3.636^{+0.451}_{-0.106}$	$0.210^{+0.150}_{-0.200}$	$4.712^{+0.568}_{-2.273}$	$3.504^{+0.070}_{-1.062}$	$0.047^{+0.211}_{-0.012}$
	+5%/-16%	+12%/-3%	+71%/-95%	+12%/-48%	+2%/-30%	+448%/-26%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008167938-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$32.39^{+37.30}_{-22.35}$	$7710^{+906}_{-1343}$	$-8223^{+135168}_{-108750}$	$-0.998^{+126.600}_{-123.715}$
Alt.	$-95 \pm 11$	$41.78^{+41.93}_{-26.71}$	$7673^{+866}_{-1463}$	$-5234^{+2294}_{-692}$	$0.035^{+0.239}_{-0.026}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

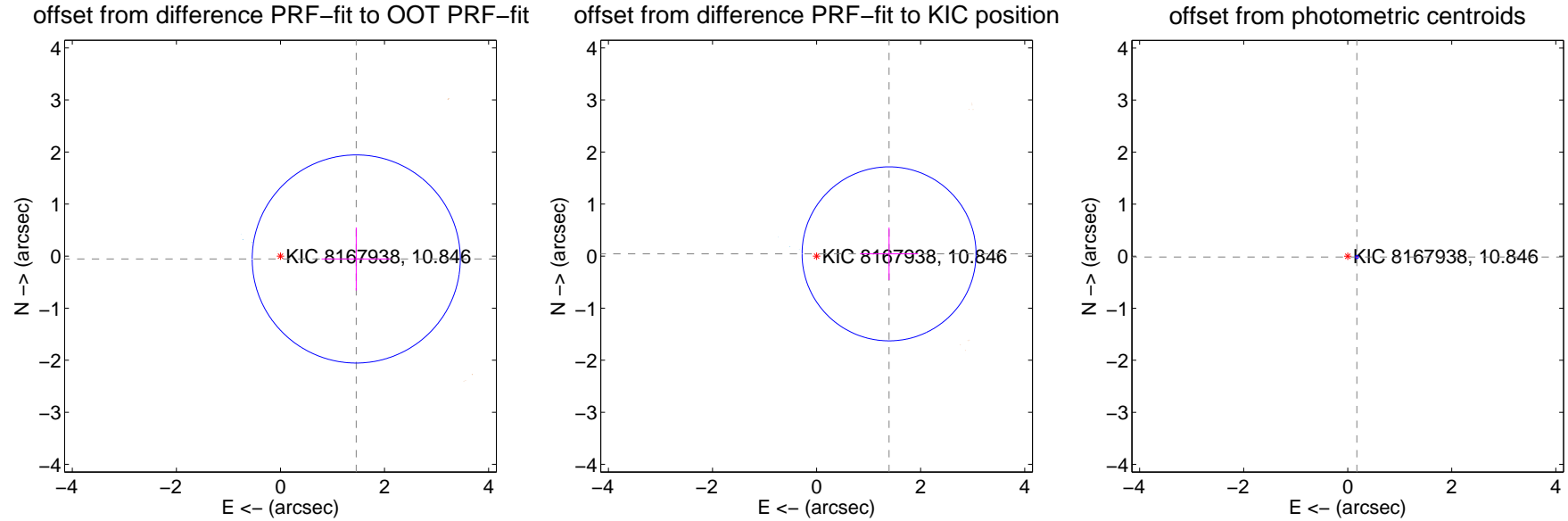
## DV Centroid Data

Supplemental centroid analysis for 008167938-03. **Kepler magnitude: 10.85.** Transit SNR -1.00

There are 4 quarters with good PRF difference image offsets

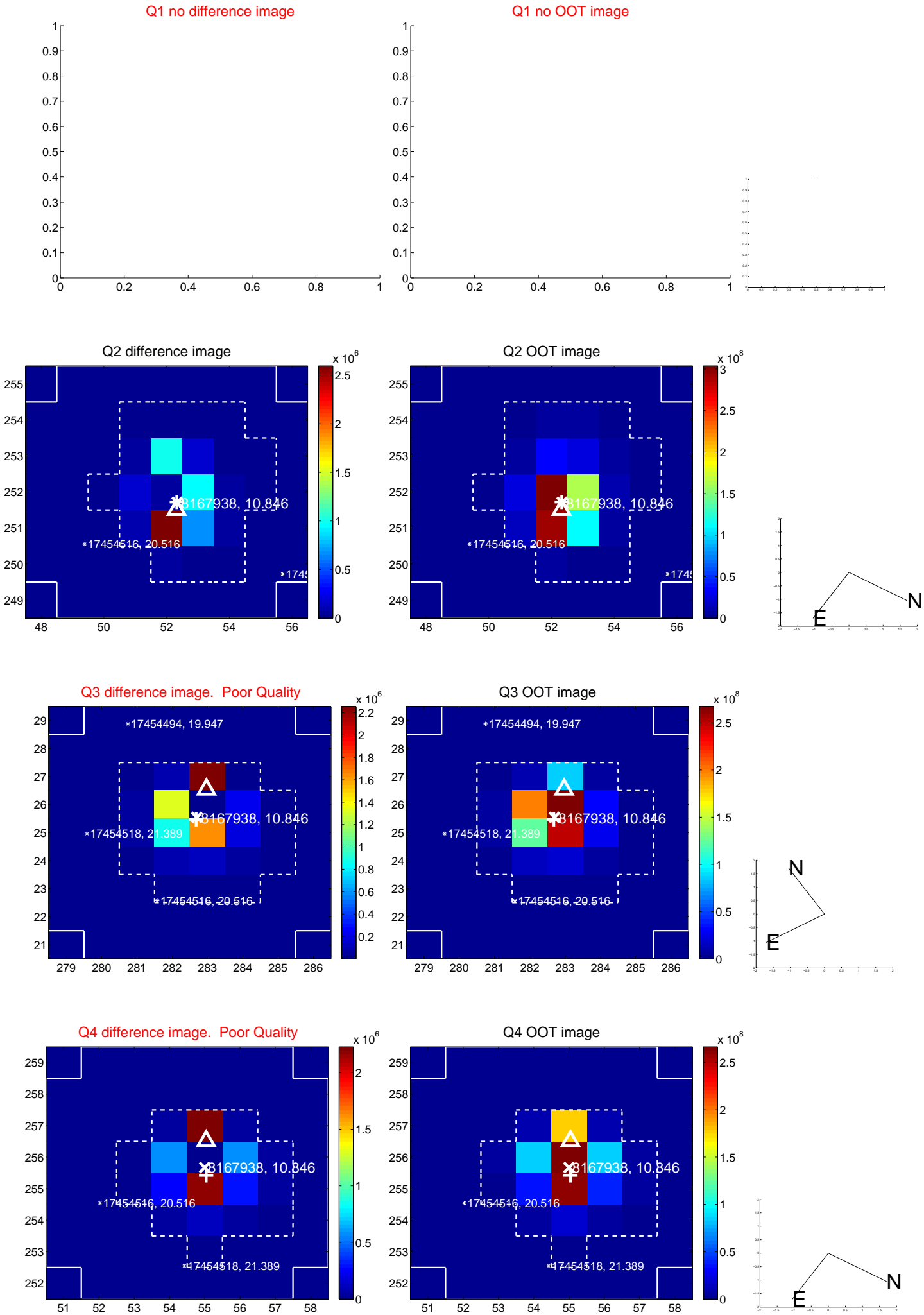
The direct PRF centroid is offset from the target star catalog position by about 1.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.457 \pm 0.666$	2.19	$-1.456 \pm 0.666$	$-0.055 \pm 0.605$
PRF-fit source offset from KIC position	$1.393 \pm 0.557$	2.50	$-1.393 \pm 0.557$	$0.044 \pm 0.505$
photometric centroid source offset	<b><math>0.18 \pm 0.01</math></b>	<b>17.53</b>	$-0.18 \pm 0.01$	$-0.02 \pm 0.01$



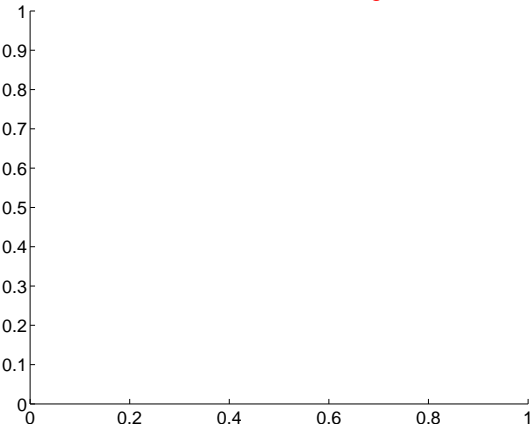
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

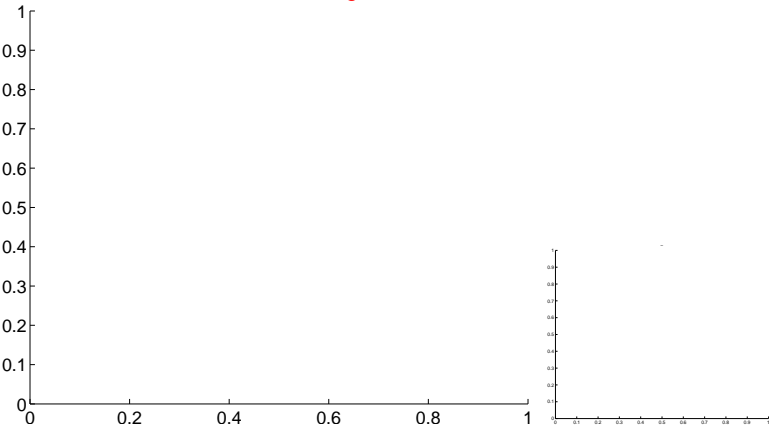


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

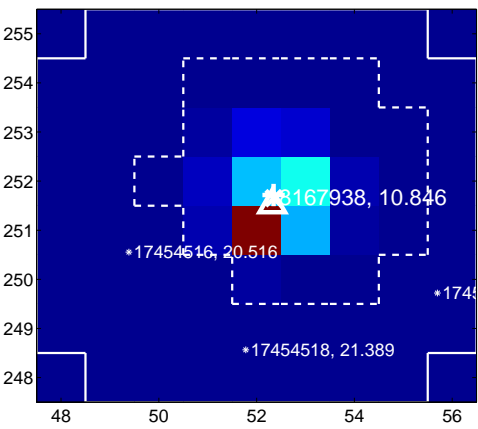
Q5 no difference image



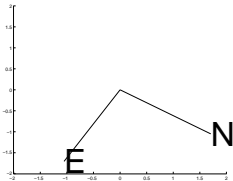
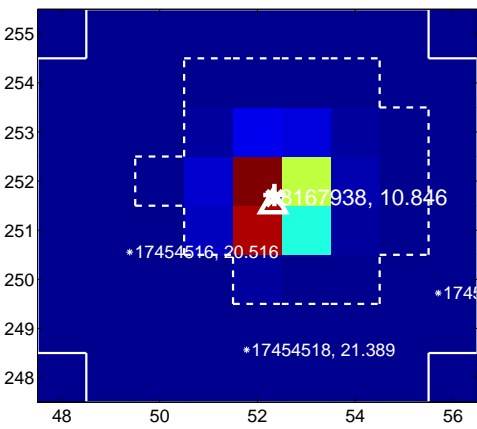
Q5 no OOT image



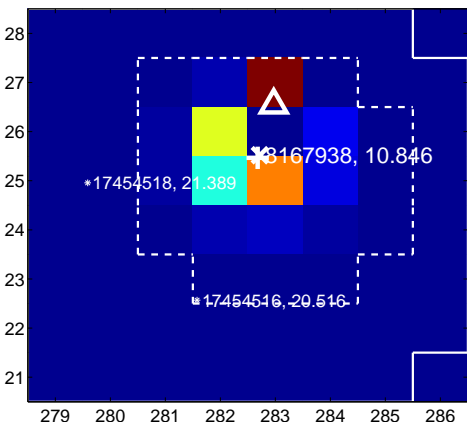
Q6 difference image



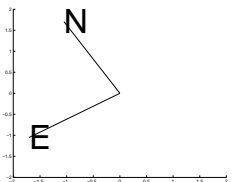
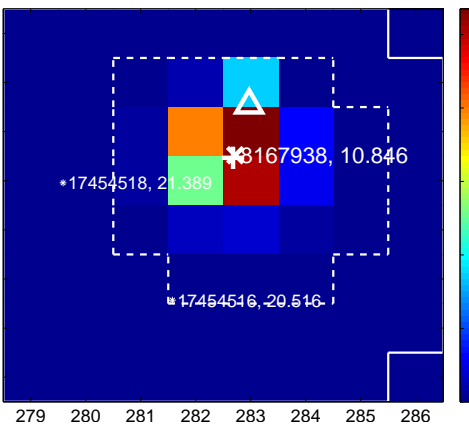
Q6 OOT image



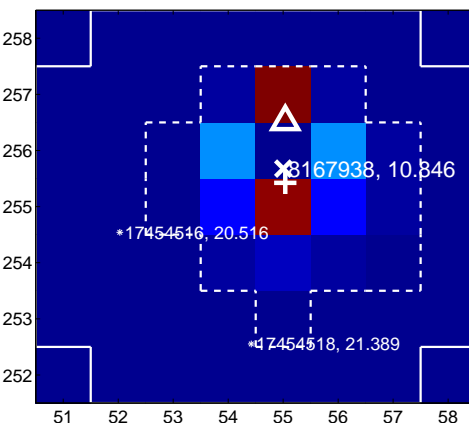
Q7 difference image. Poor Quality



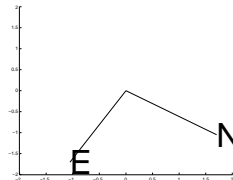
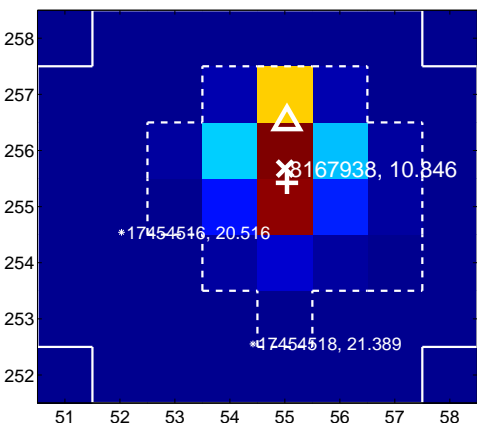
Q7 OOT image



Q8 difference image. Poor Quality

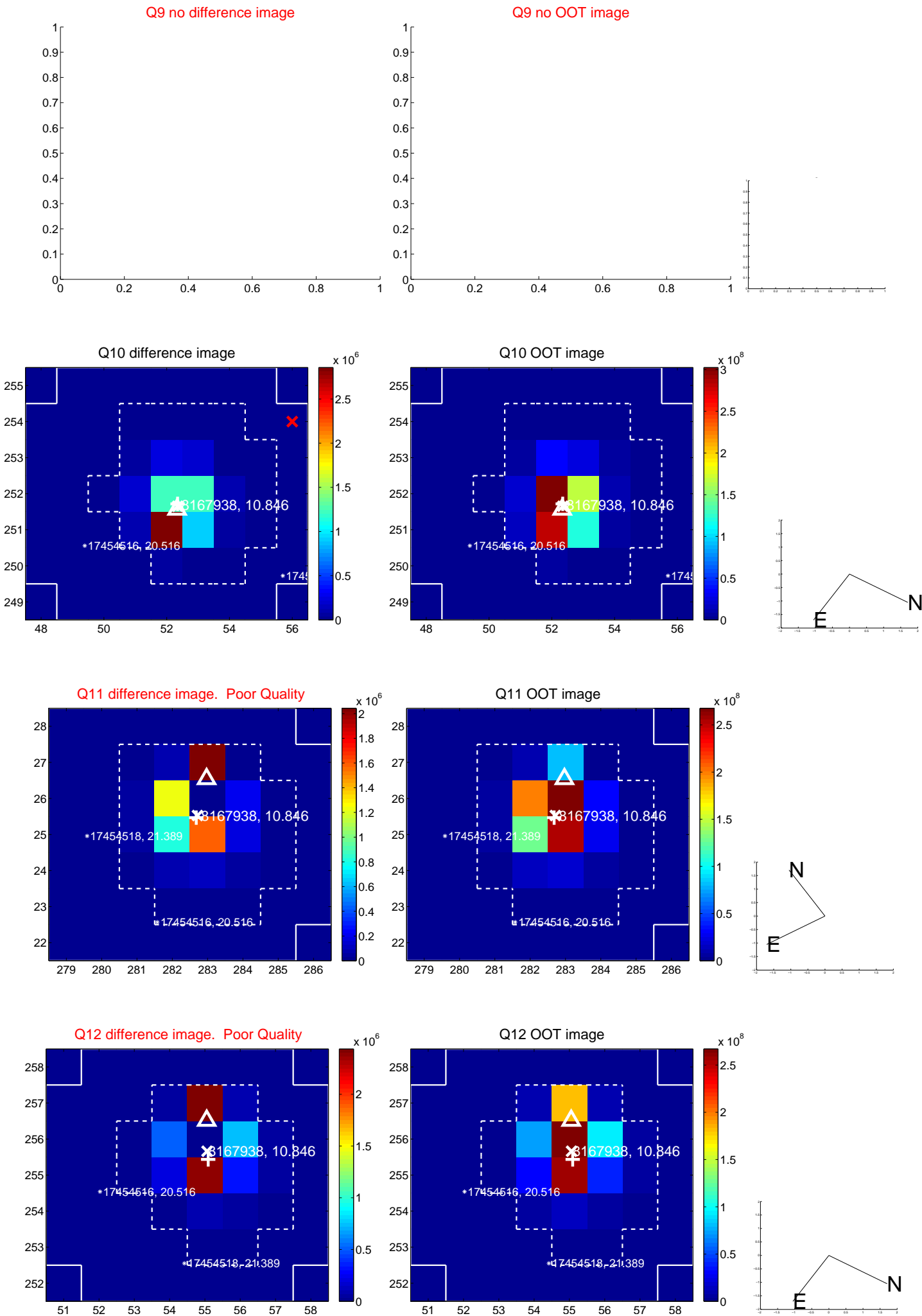


Q8 OOT image

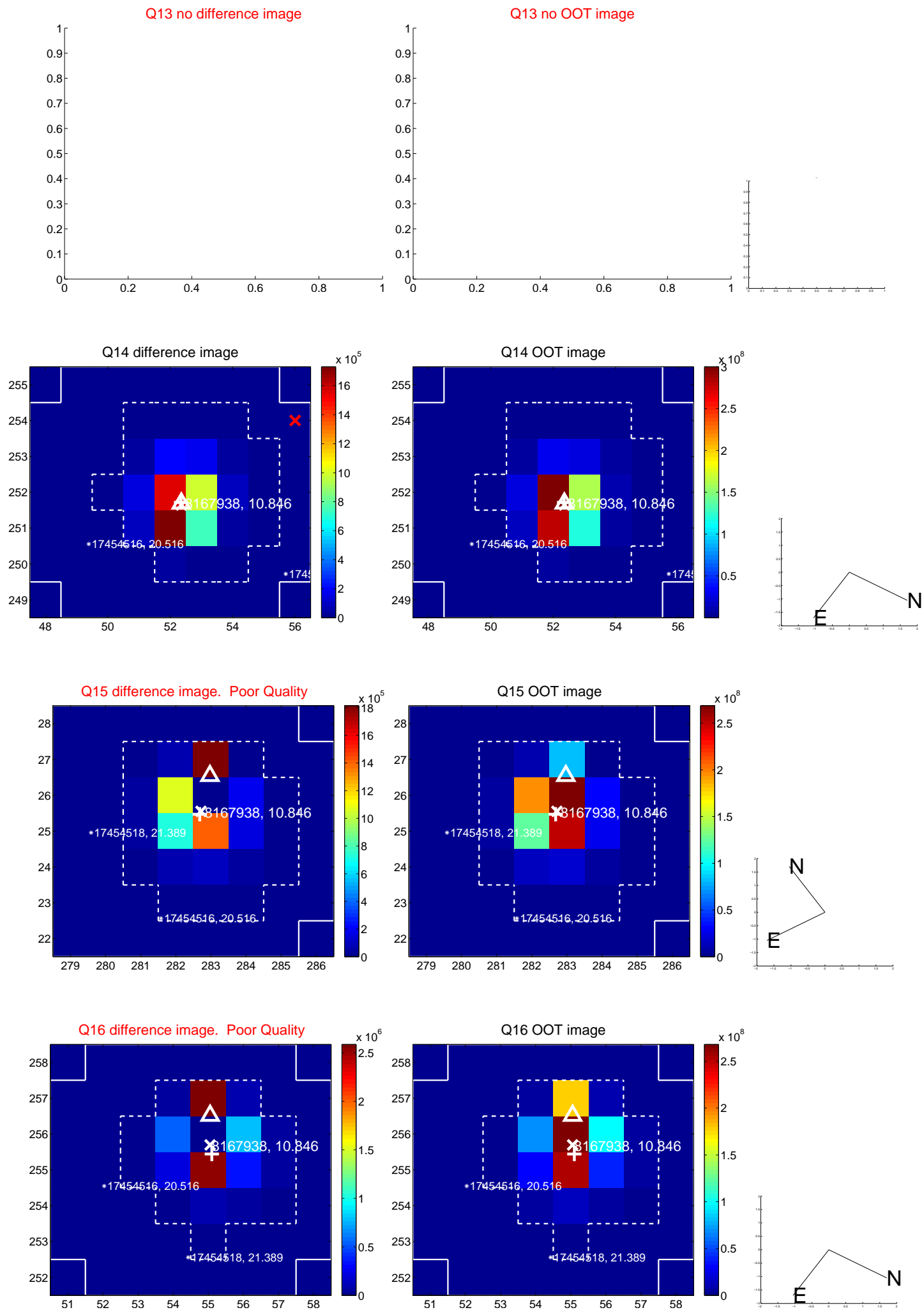




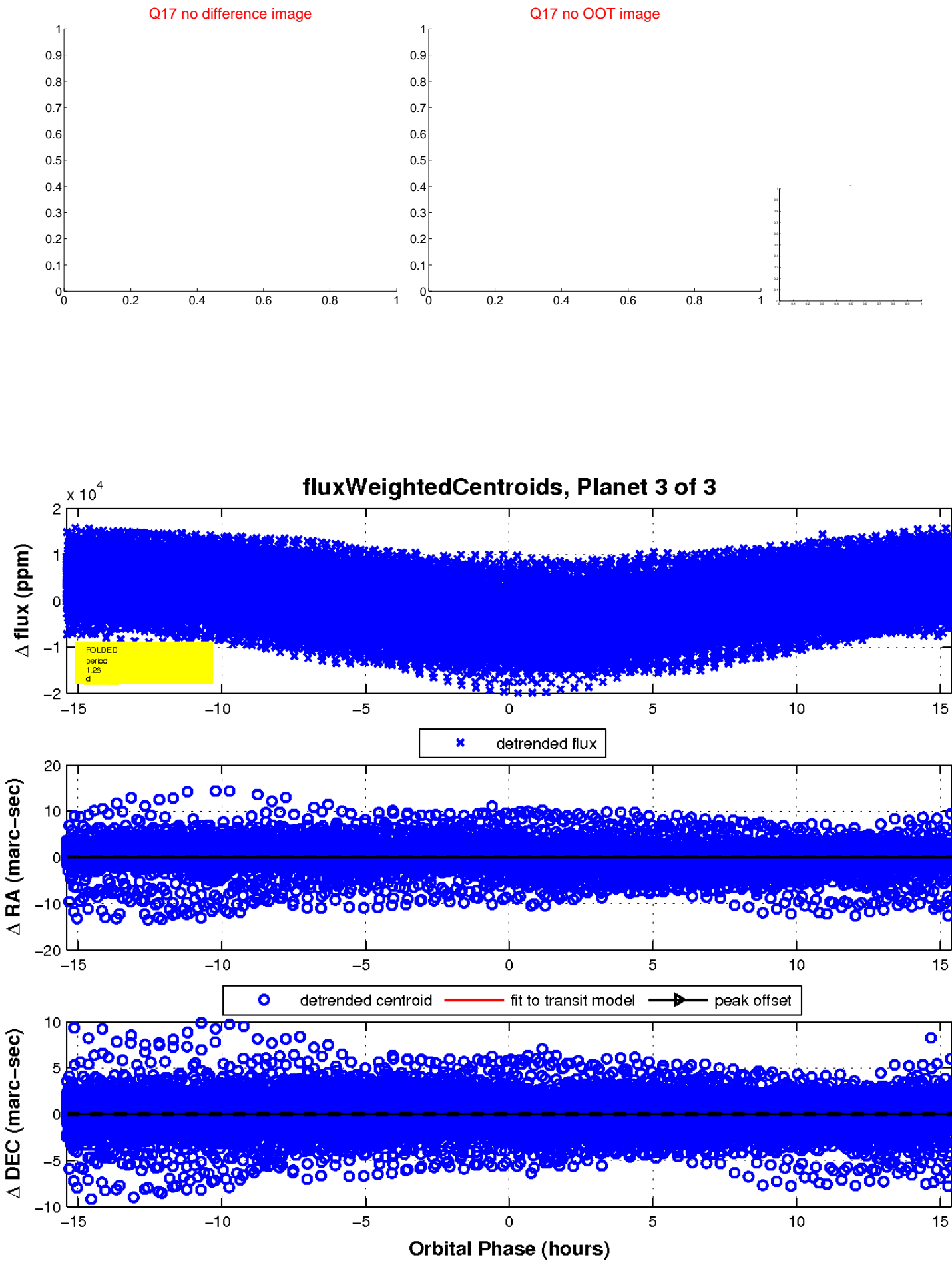
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

