

# KIC 007281838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007281838-01	OBS	No	0.566752	131.853725	45.4	3.967	13.0	7.8	1.08	6116	0.74	7338.25
007281838-02	OBS	No	23.034622	143.976175	1060.1	2.101	10.0	9.6	1.08	6116	3.53	52.51
007281838-03	OBS	No	25.395660	153.219359	1049.5	1.872	10.4	8.8	1.08	6116	3.93	46.11
007281838-04	OBS	No	33.933401	145.247478	1647.1	1.140	11.9	11.3	1.08	6116	4.41	31.33
007281838-05	OBS	No	26.251749	132.692163	1756.8	2.033	9.1	12.1	1.08	6116	8.73	44.11
007281838-06	OBS	No	12.662621	142.254739	1117.7	1.069	9.7	10.5	1.08	6116	4.00	116.61

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007281838-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
007281838-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007281838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007281838-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_DIFFS

**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.

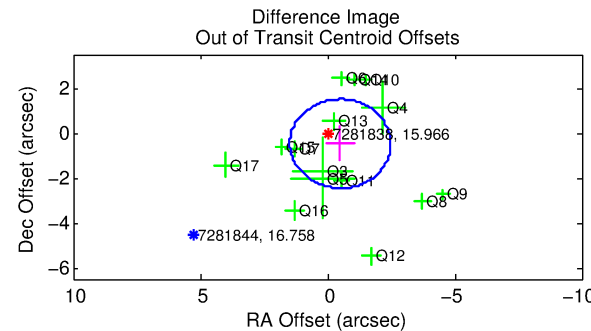
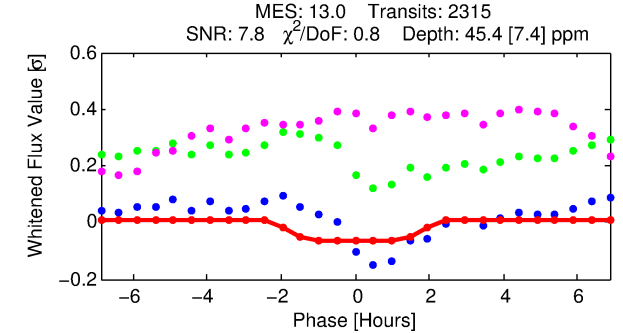
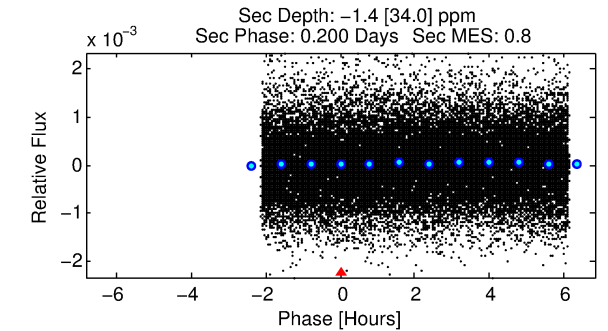
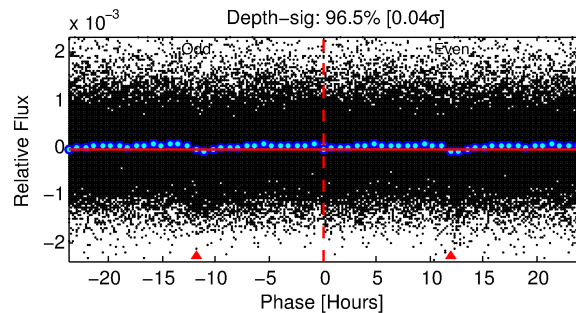
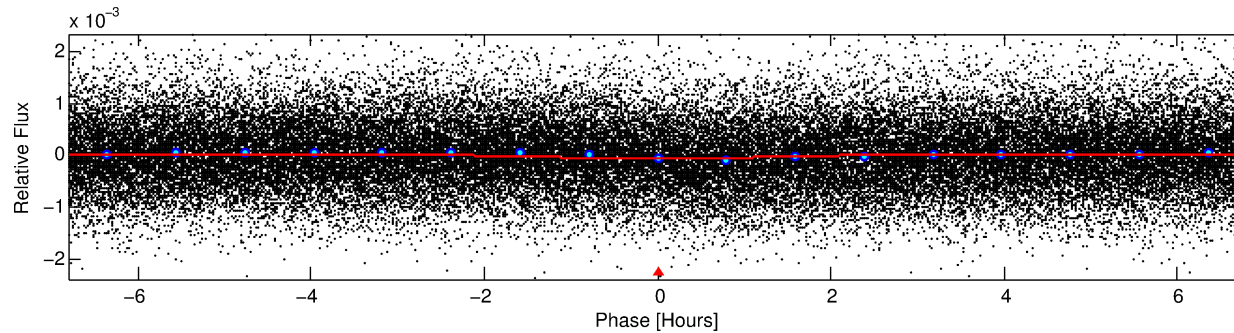
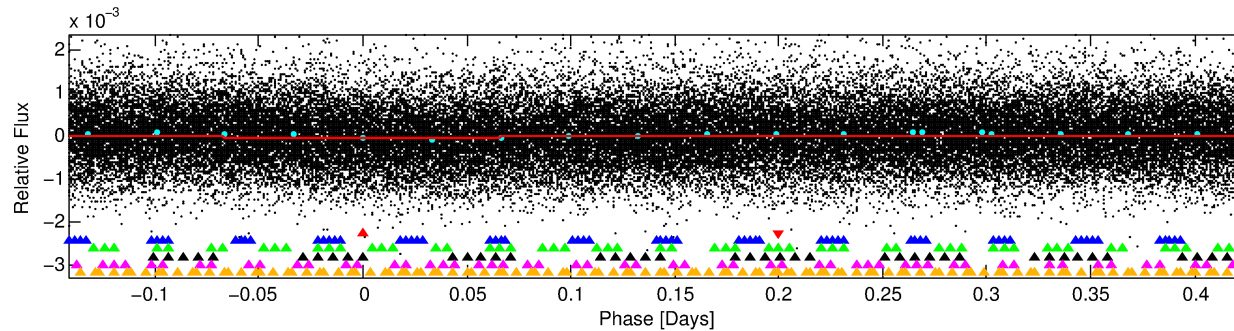
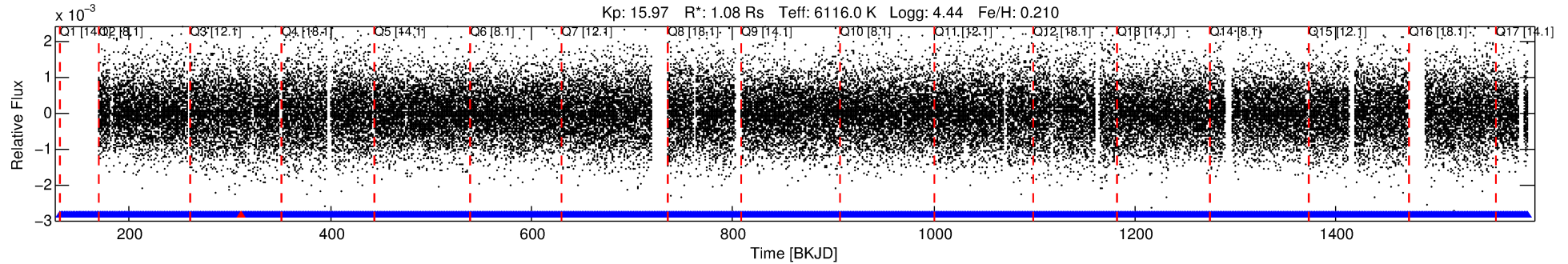
## Ephemeris Match Information For 007281838-01

TCE (1)	KIC	Parent (2)	Parent KIC	P <sub>1</sub> :P <sub>2</sub>	Dist ( $\mu$ )	$\Delta$ Row	$\Delta$ Col	m <sub>2</sub>	m <sub>1</sub>	D <sub>2</sub> /D <sub>1</sub>	Mechanism	Flag	$\sigma_P$	$\sigma_T$
007281838-01	7281838	RR-Lyr-pri	7198959	1:1	958.6	113	212	7.86	15.96	13851.00	Direct-PRF	0	0.93	22.94

**Notes:** P<sub>1</sub>:P<sub>2</sub> is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column. m<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 7281838 Candidate: 1 of 6 Period: 0.567 d



## DV Fit Results:

Period = 0.56675 [0.00001] d  
Epoch = 131.8537 [0.0058] BKJD  
Rp/R\* = 0.0063 [0.0091]  
a/R\* = 1.22 [2.73]  
b = 0.44 [12.63]  
Seff = 7338.25 [2698.74]  
Teq = 2360 [217] K  
Rp = 0.74 [1.10] Re  
a = 0.0142 [0.0032] AU  
Ag = N/A  
Teffp = N/A

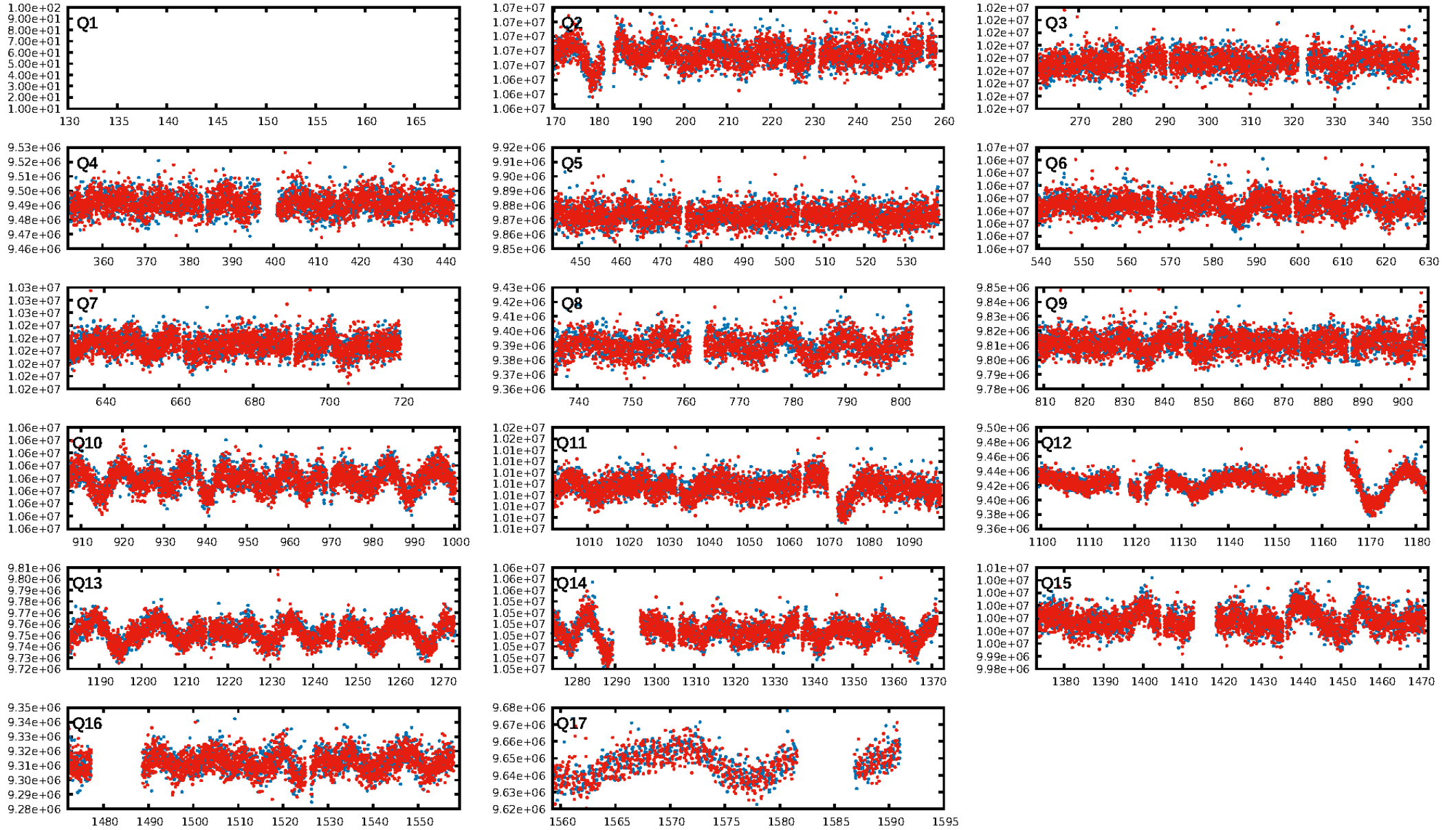
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [70.65σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.08e-19  
RollingBand-fgt: 1.00 [2267/2268]  
**GhostDiagnostic-chr: 0.01519**  
Centroid-sig: 0.0%  
**Centroid-so: 5.051 arcsec [3.39σ]**  
OotOffset-rm: 0.692 arcsec [1.05σ]  
KicOffset-rm: 0.680 arcsec [1.01σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.13 [2/15]  
DiffImageOverlap-fno: 1.00 [16/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:58:13 Z

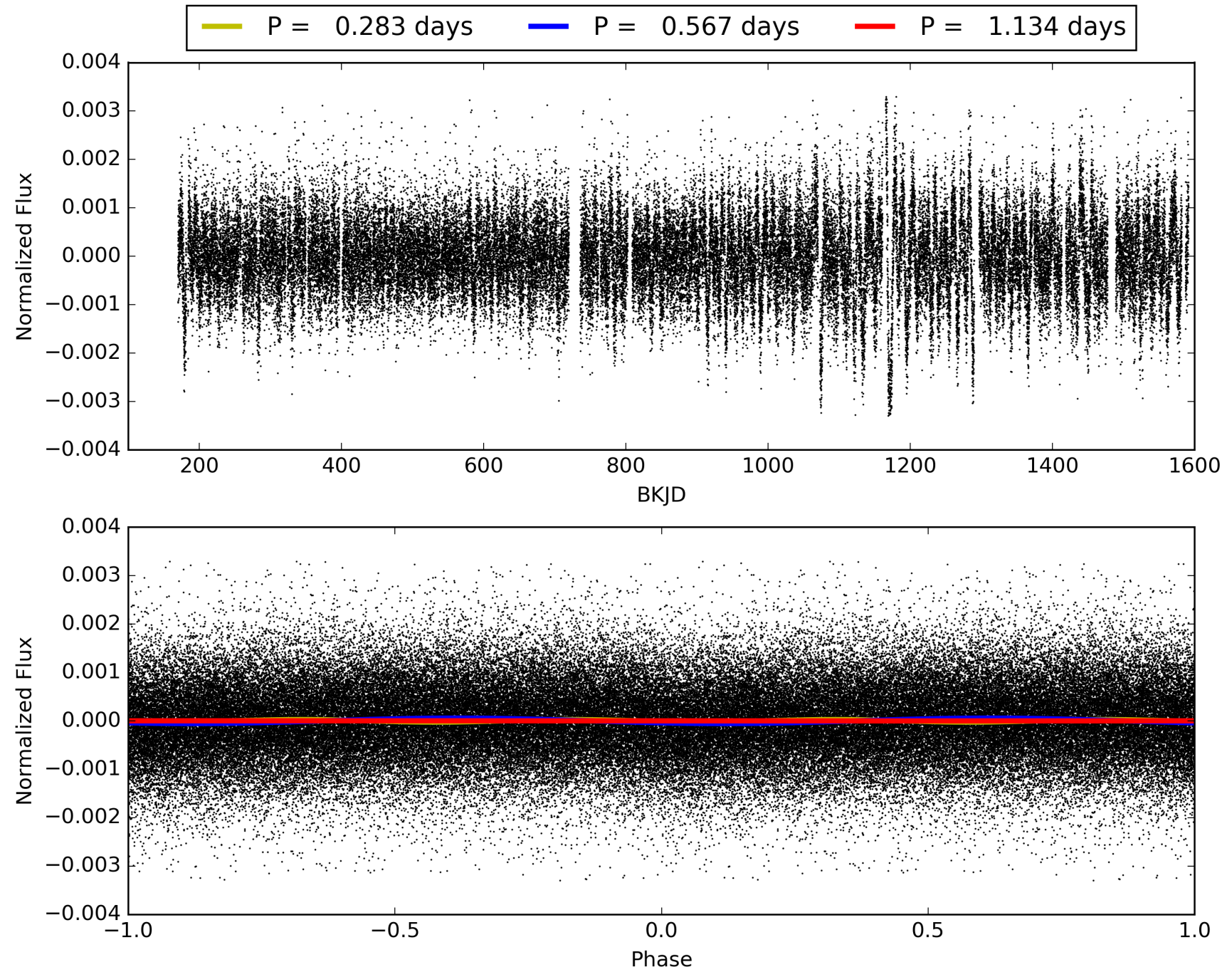
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007281838-01, PDC Light Curves





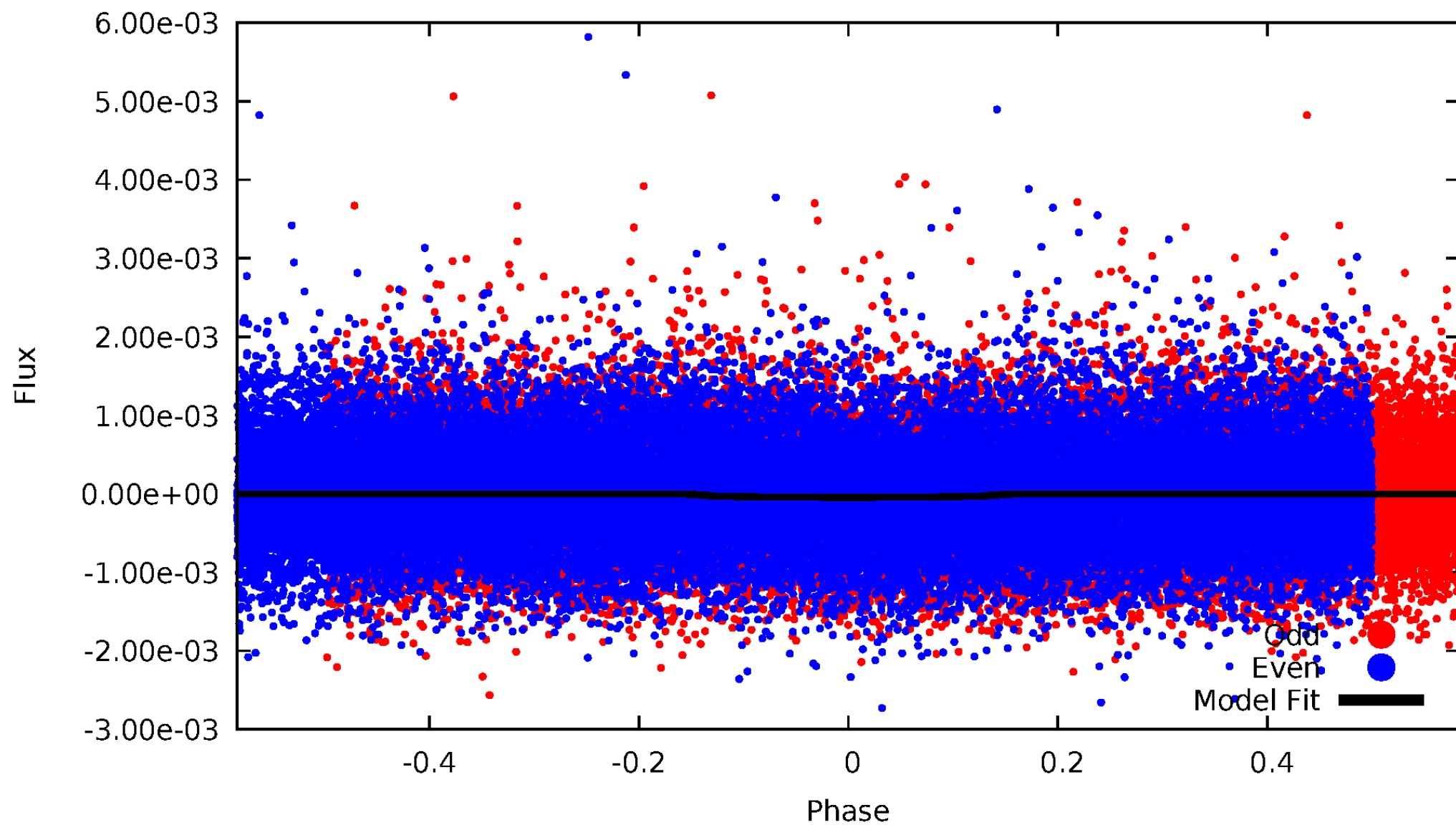
# TCE 007281838-01





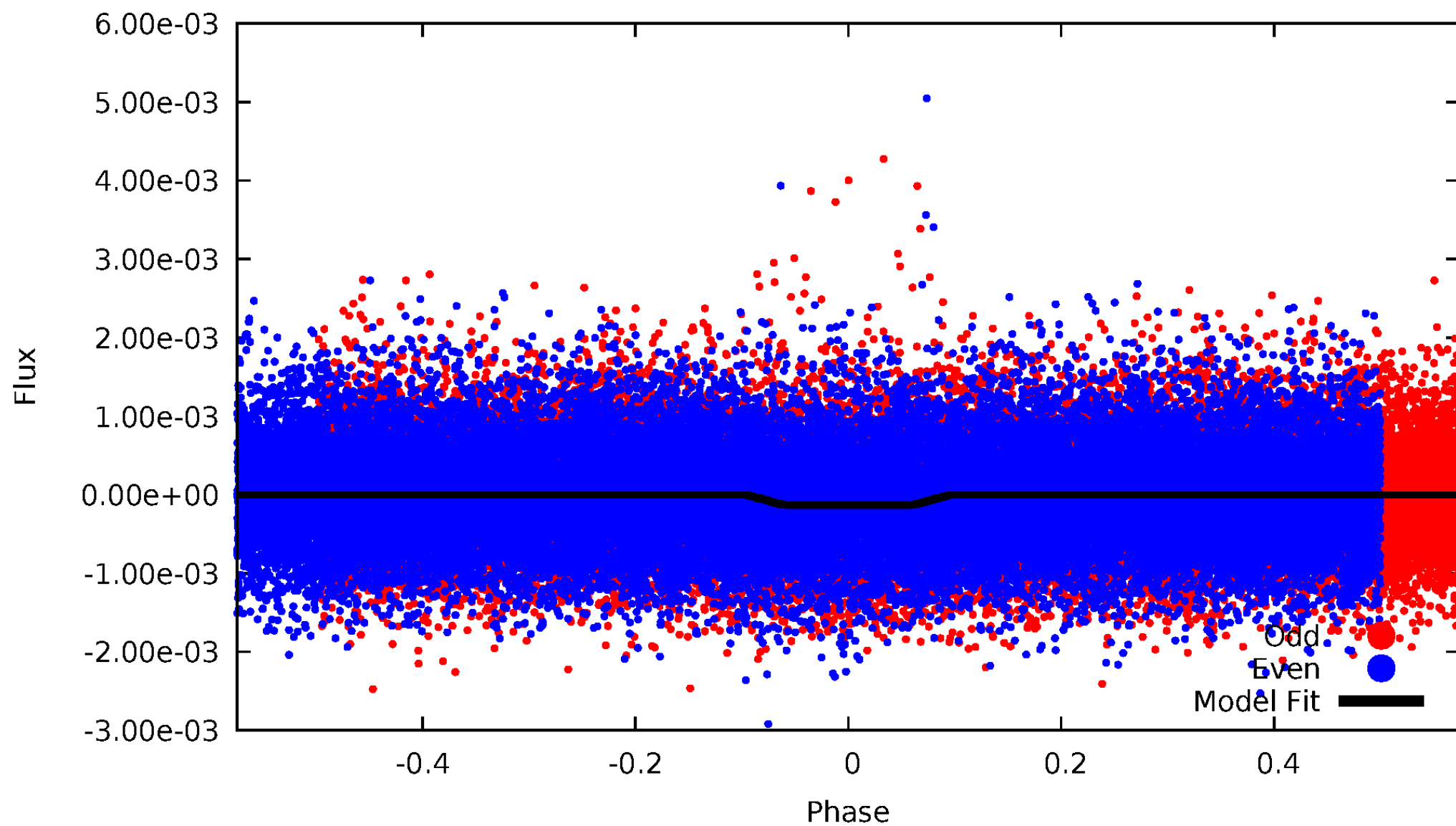
# DV Odd/Even

TCE 007281838-01

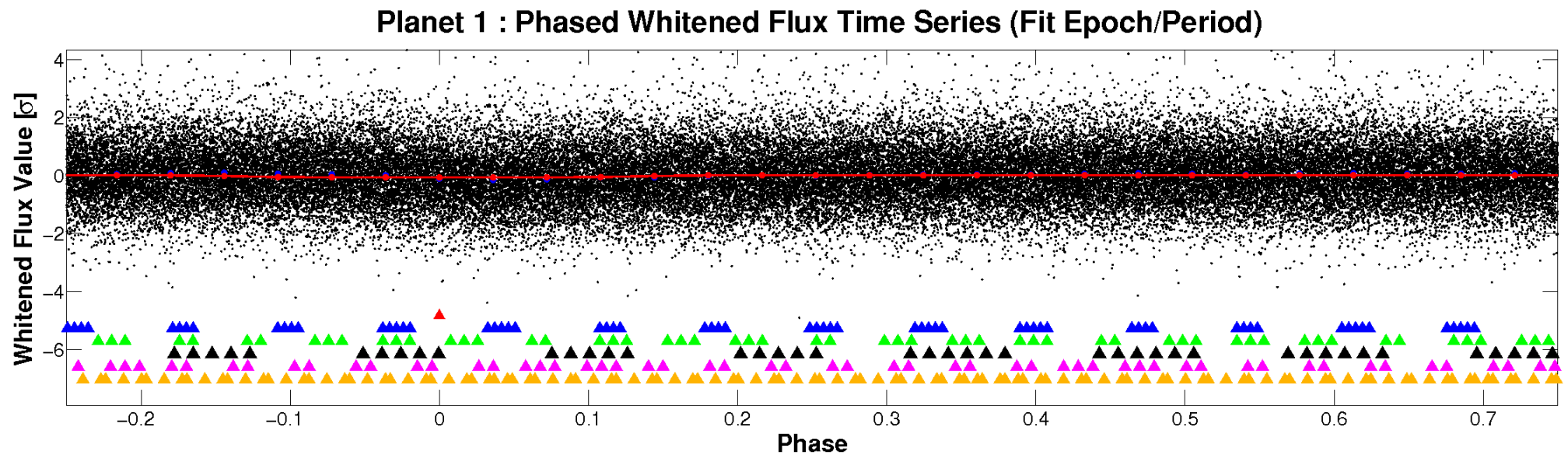
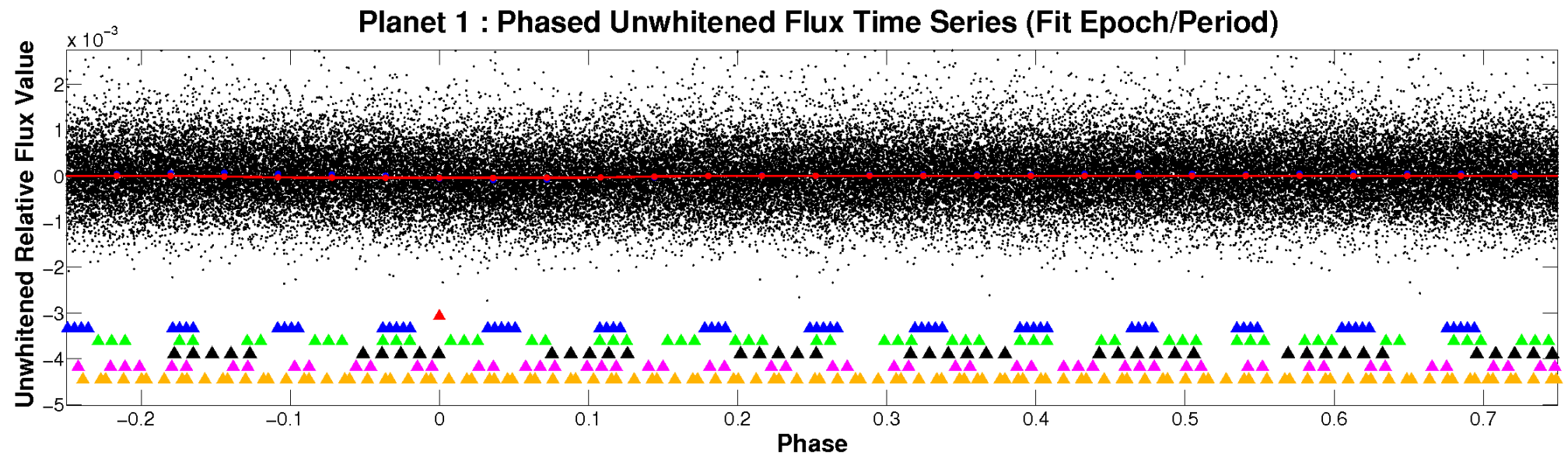


# ALT Odd/Even

TCE 007281838-01



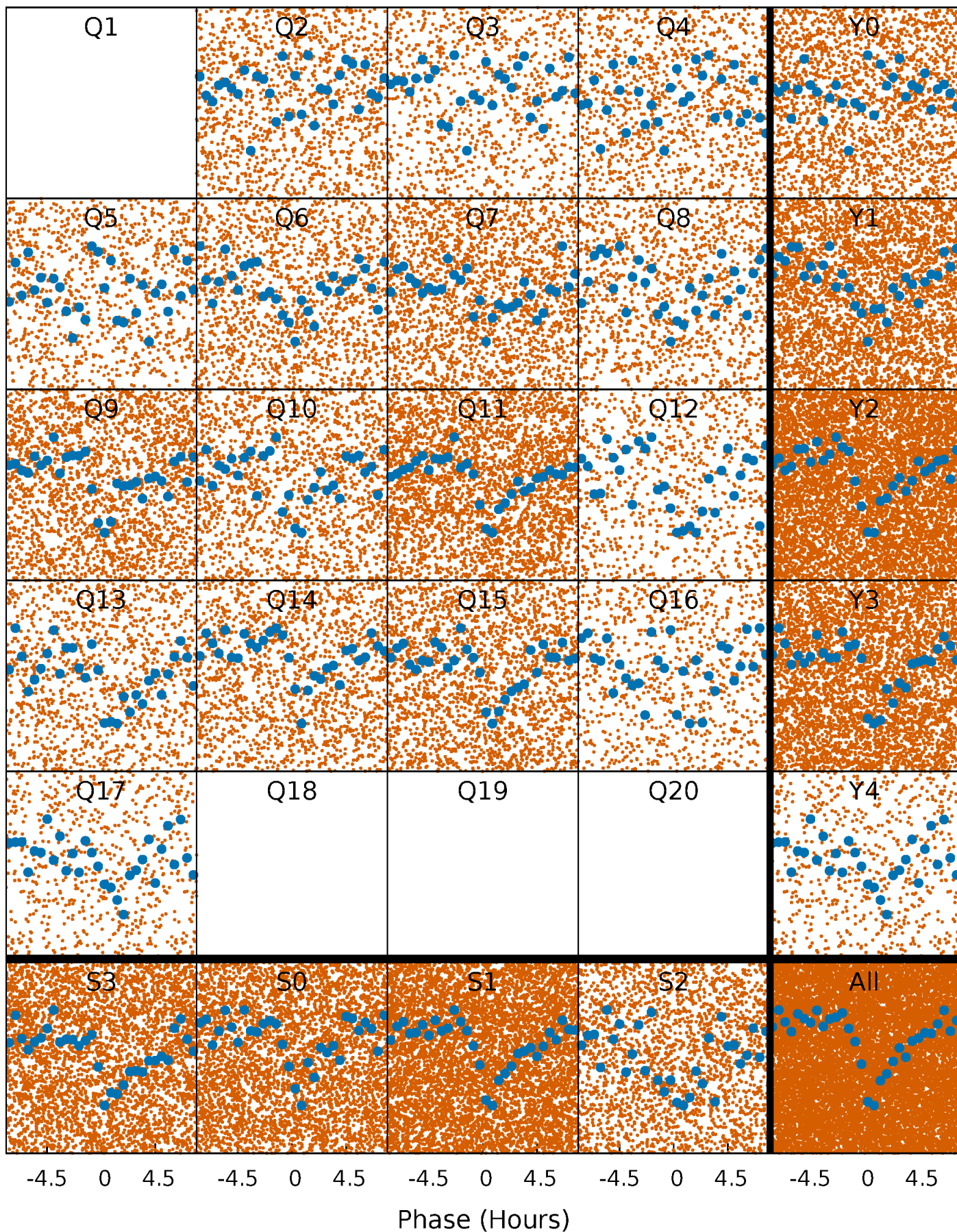
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

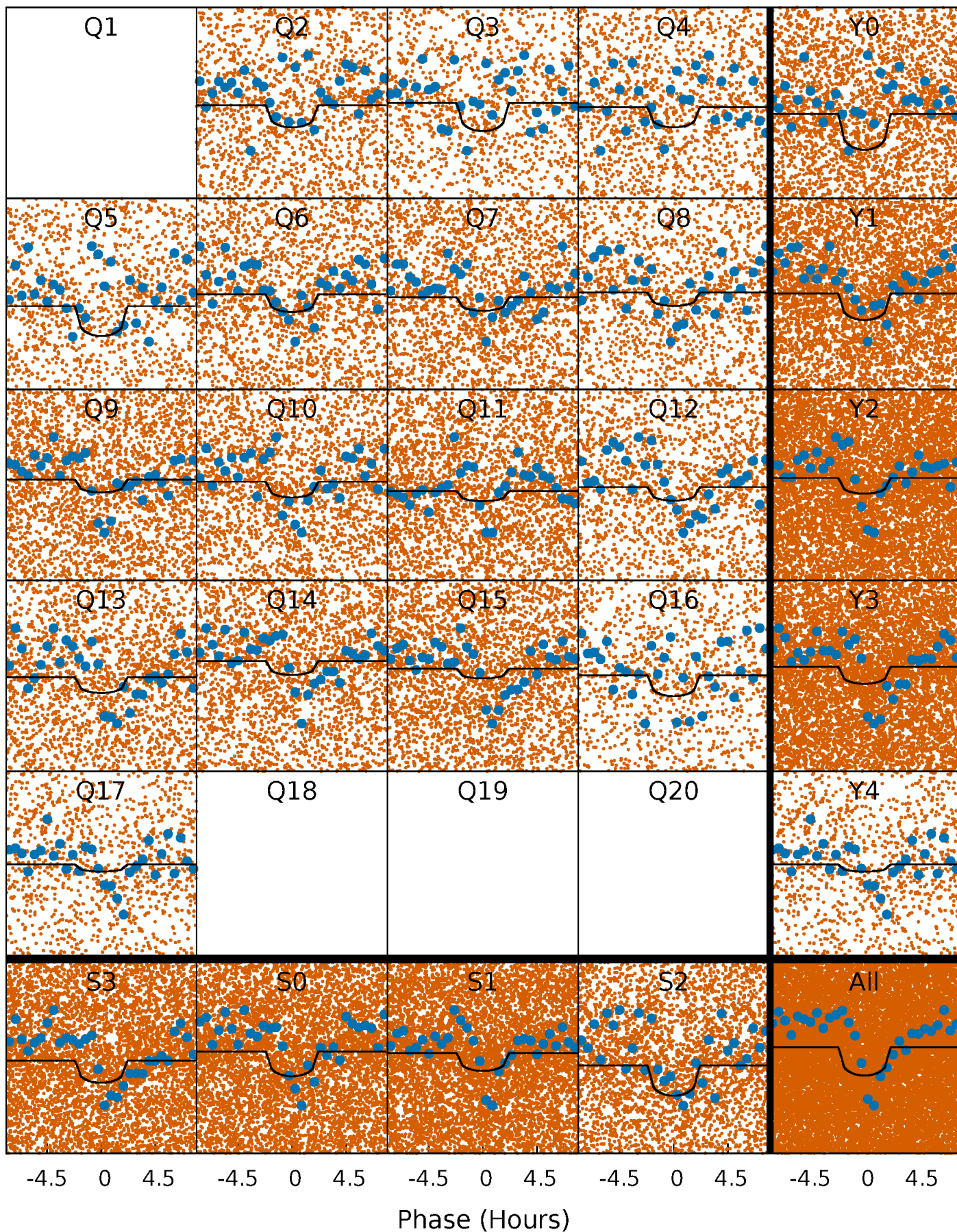
TCE 007281838-01 P= 0.566752 Days  $T_0=131.853725$  (BKJD)





# DV Quarter-Phased Transit Curves

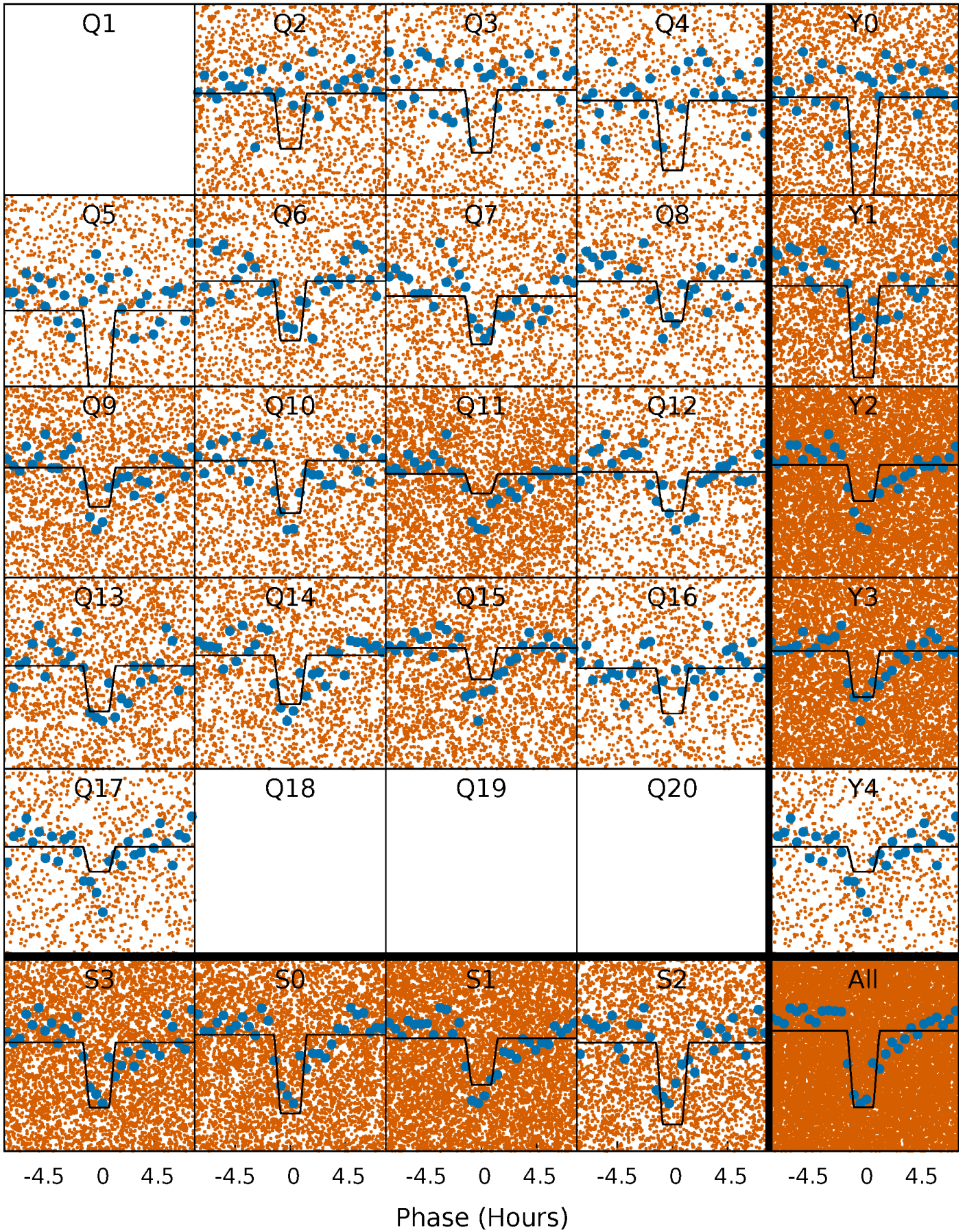
TCE 007281838-01 P= 0.566752 Days  $T_0=131.853725$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007281838-01 P= 0.566788 Days  $T_0=131.826811$  (BKJD)

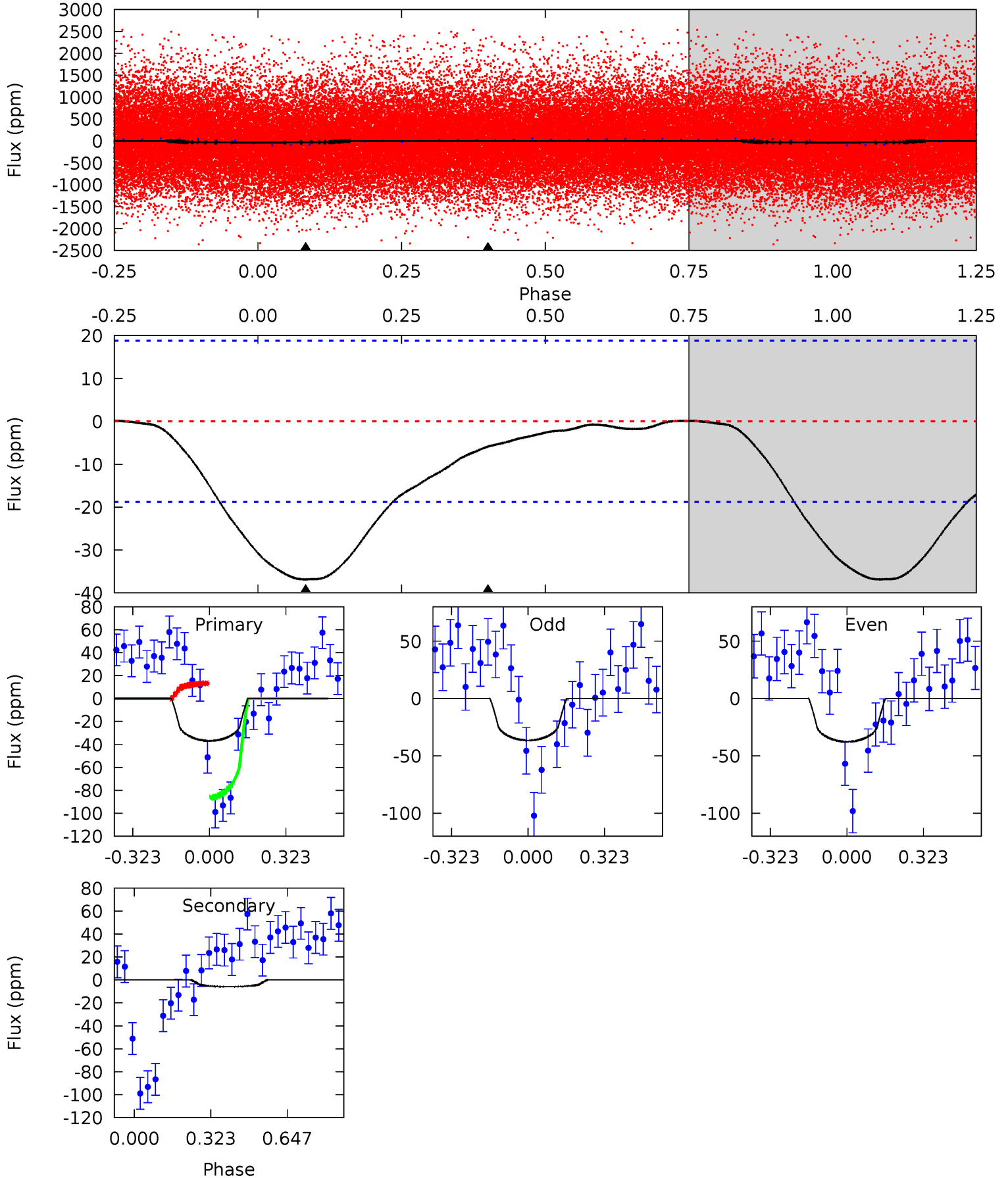




# DV Model-Shift Uniqueness Test

007281838-01, P = 0.566752 Days, E = 131.853725 Days

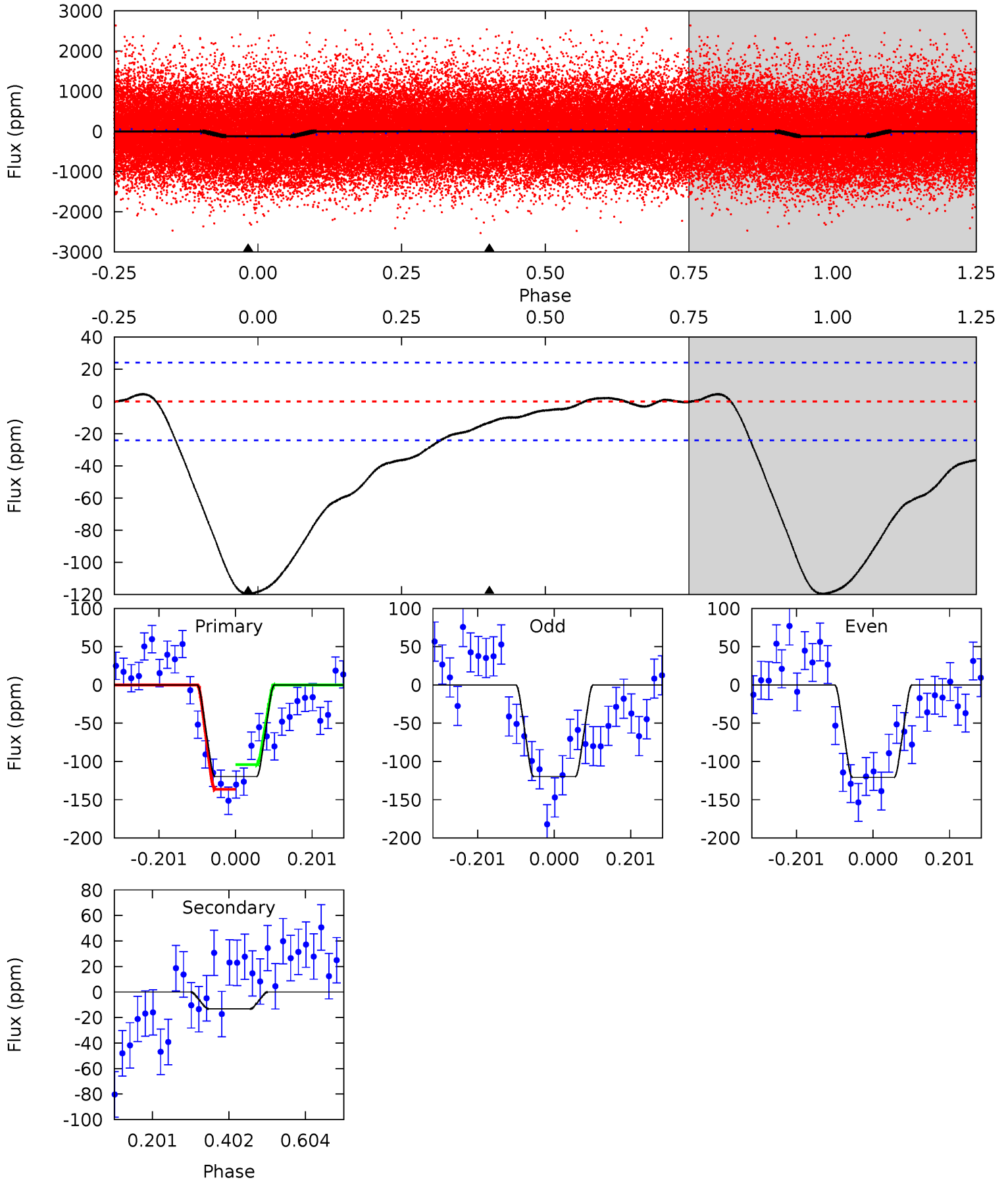
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.45	1.35	0	0	4.31	0.99	0.06	8.45	8.45	1.35	1.35	0.14	0.90	0.00	8.30



# Alt Model-Shift Uniqueness Test

007281838-01, P = 0.566788 Days, E = 131.826811 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.9	2.41	0	0	4.42	1.28	2.48	21.9	21.9	2.41	2.41	0.11	0.93	0.04	2.90



### Stellar Parameters For KIC 007281838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6116^{+170}_{-233}$	$4.440^{+0.058}_{-0.184}$	$0.210^{+0.150}_{-0.300}$	$1.084^{+0.292}_{-0.104}$	$1.181^{+0.119}_{-0.164}$	$1.307^{+0.321}_{-0.632}$
	+3%/-4%	+1%/-4%	+71%/-143%	+27%/-10%	+10%/-14%	+25%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007281838-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-6 \pm 4$	$1.15^{+0.99}_{-0.74}$	$3354^{+212}_{-177}$	$2730^{+2244}_{-5991}$	$0.384^{+2.878}_{-0.338}$
Alt.	$-13 \pm 5$	$1.56^{+1.11}_{-0.90}$	$3343^{+212}_{-157}$	$3139^{+1872}_{-6079}$	$0.521^{+2.712}_{-0.352}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

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

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

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



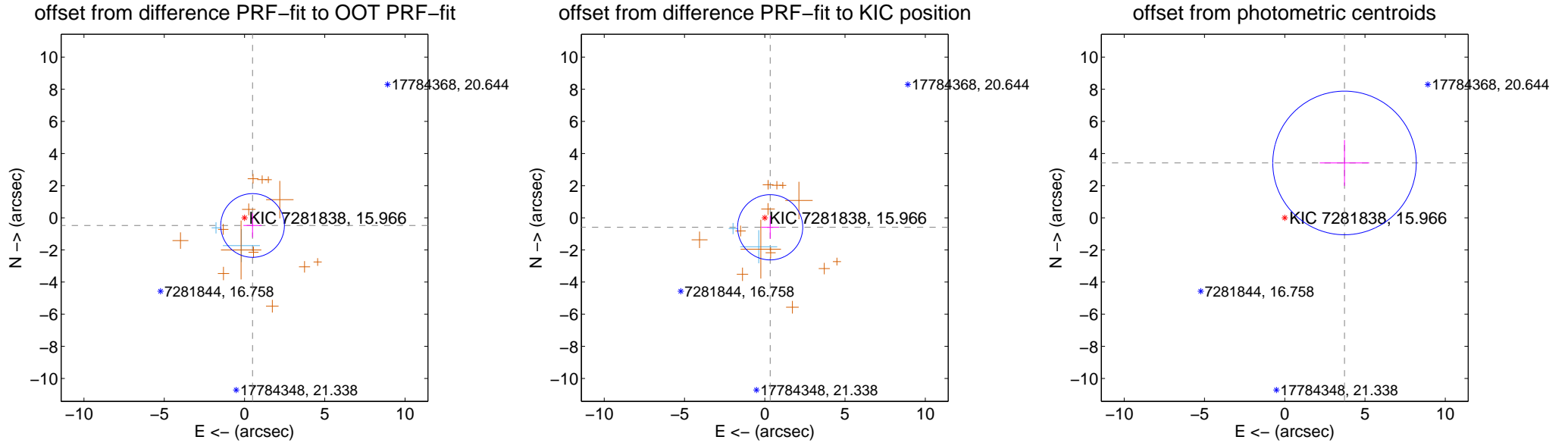
## DV Centroid Data

Supplemental centroid analysis for 007281838-01. Kepler magnitude: 15.97. Transit SNR 7.81

There are 2 quarters with good PRF difference image offsets

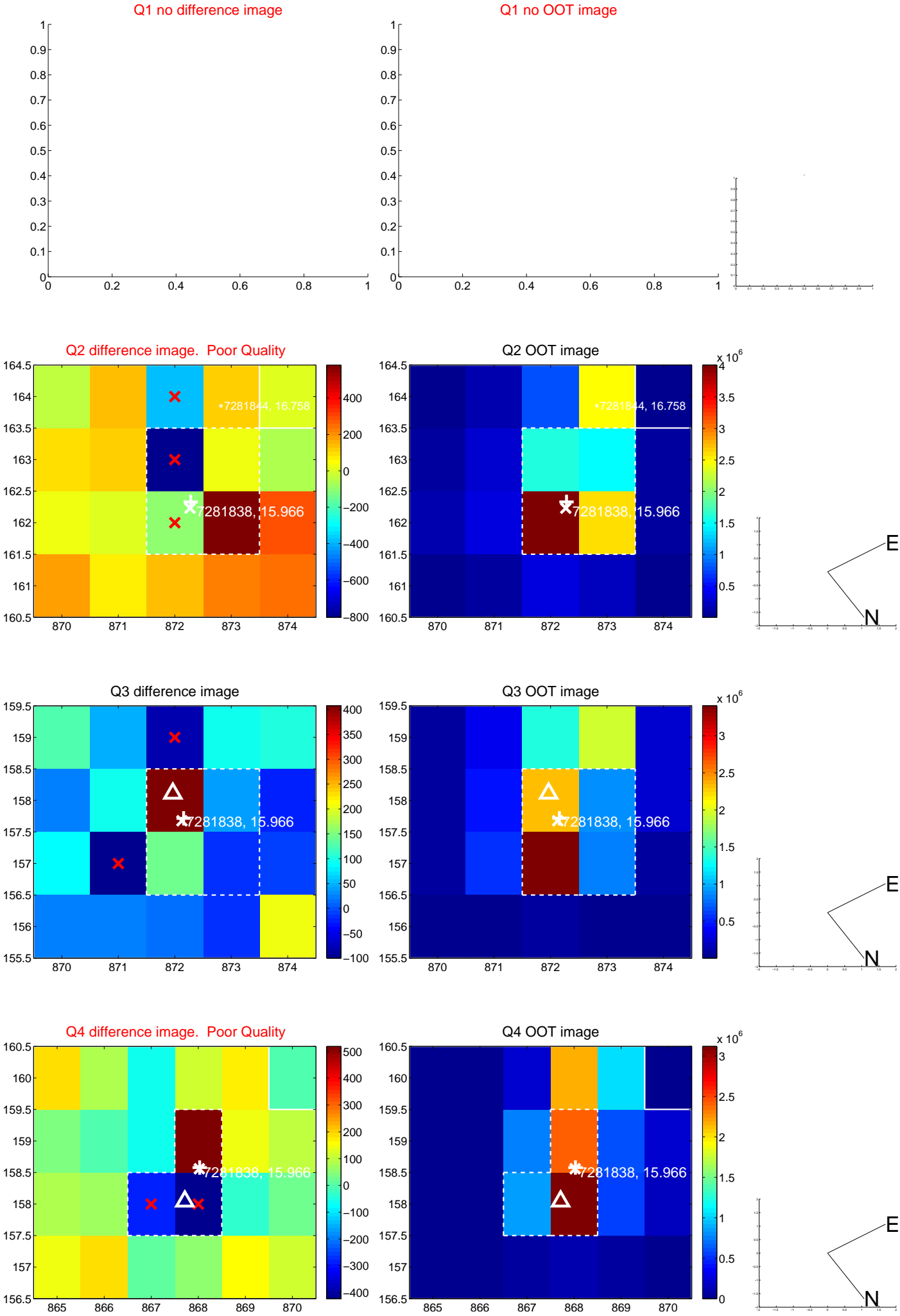
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.692 \pm 0.661$	1.05	$-0.500 \pm 0.570$	$-0.478 \pm 0.748$
PRF-fit source offset from KIC position	$0.680 \pm 0.677$	1.01	$-0.335 \pm 0.558$	$-0.592 \pm 0.711$
photometric centroid source offset	$5.05 \pm 1.49$	3.39	$-3.72 \pm 1.54$	$3.41 \pm 1.43$

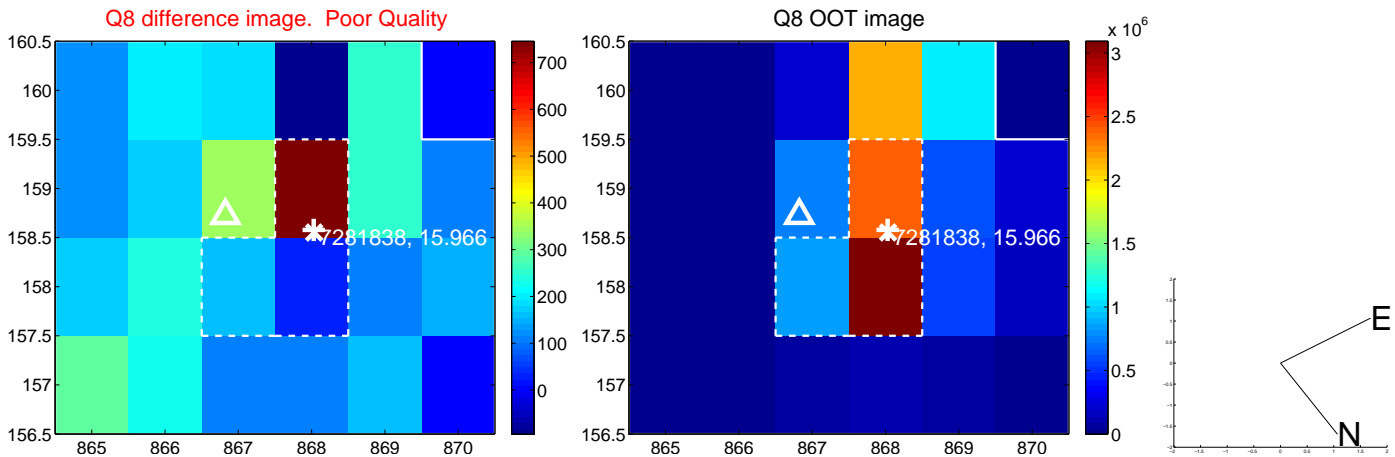
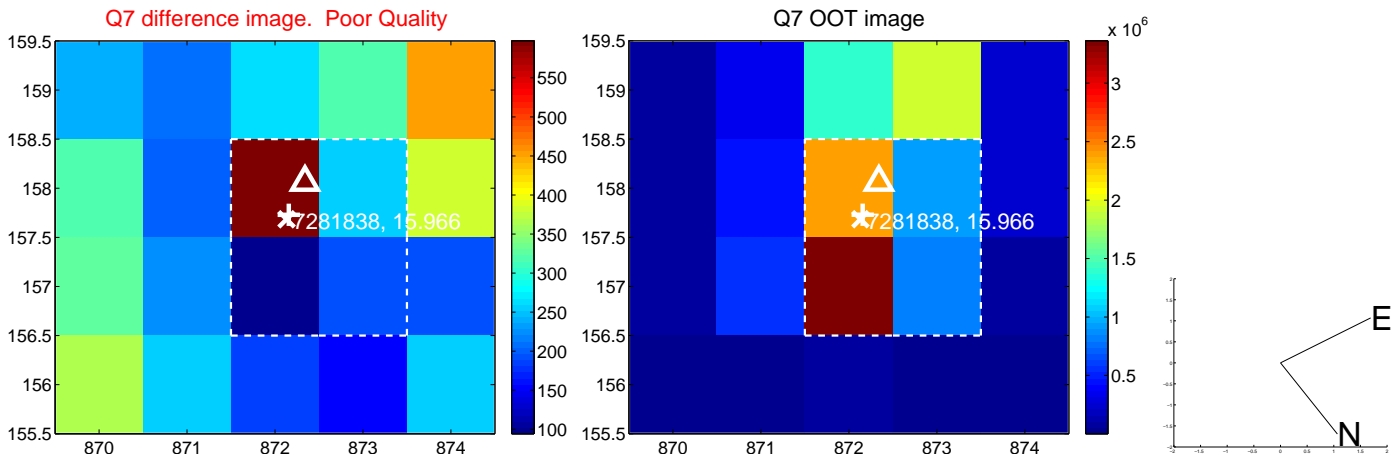
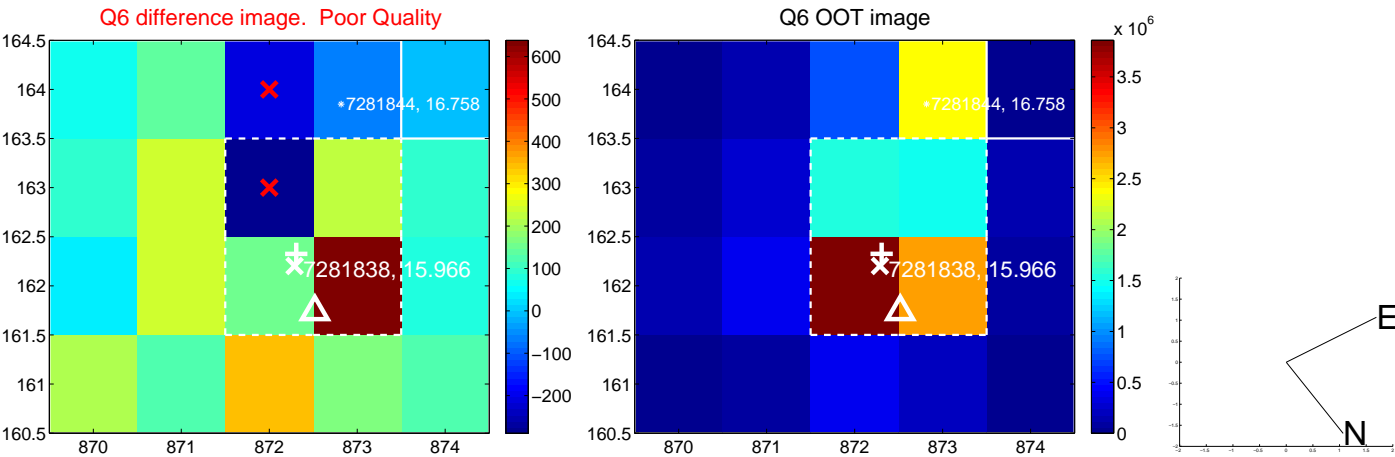
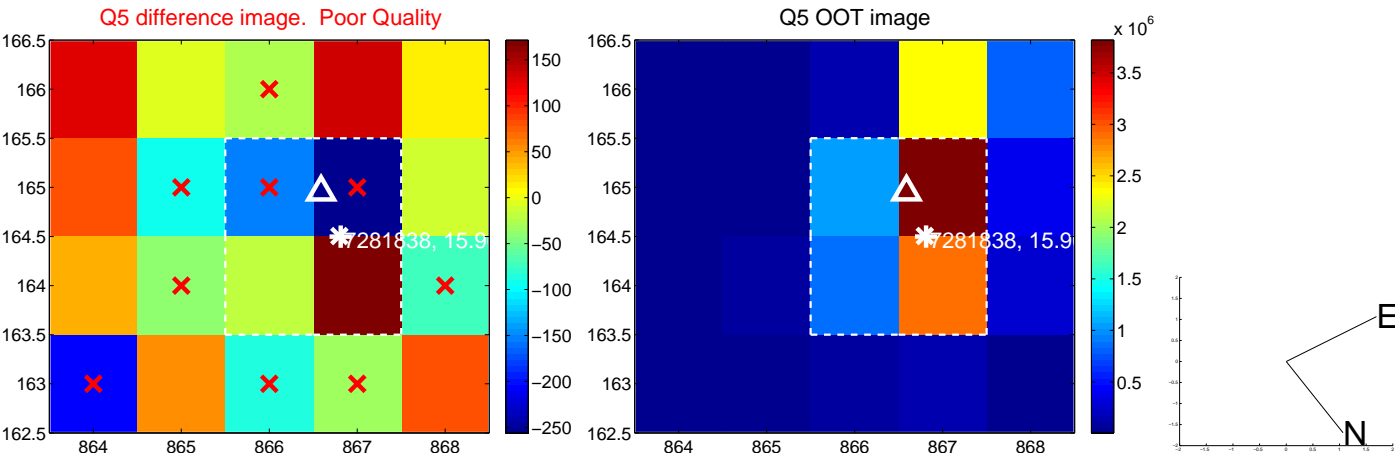


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

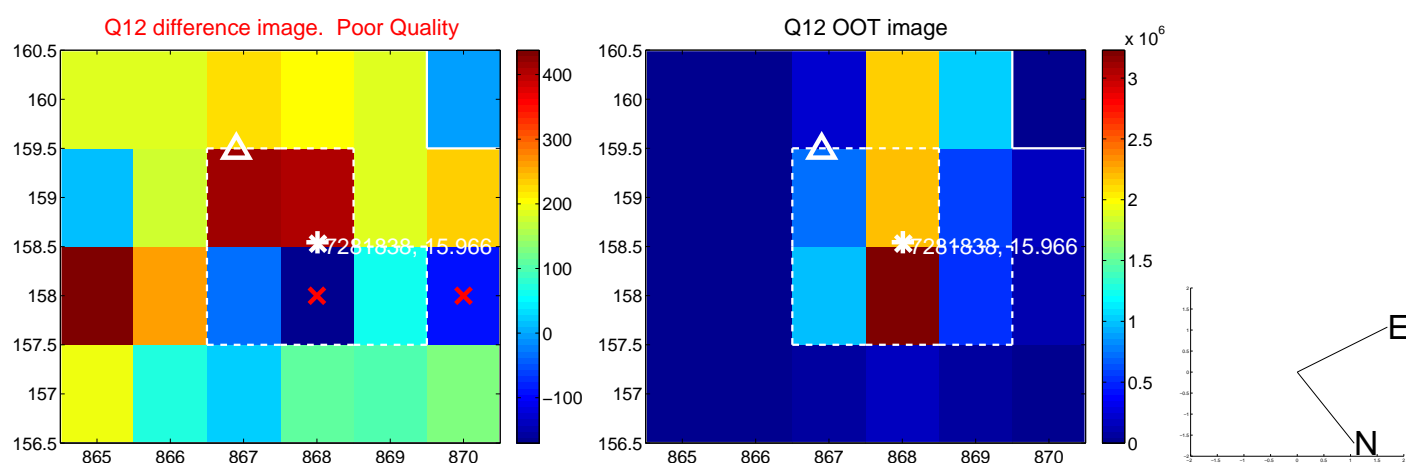
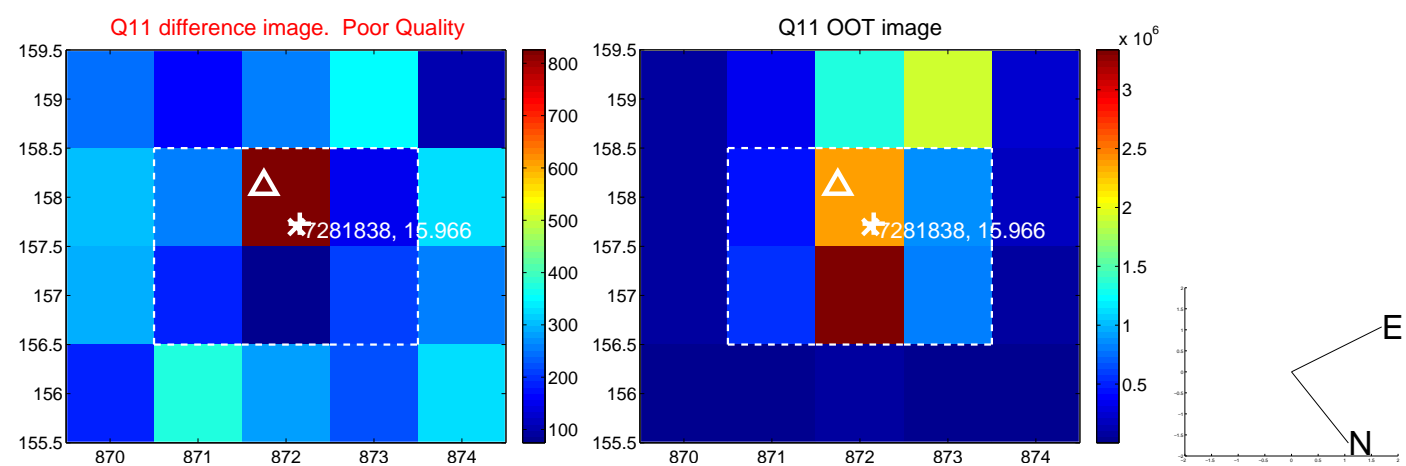
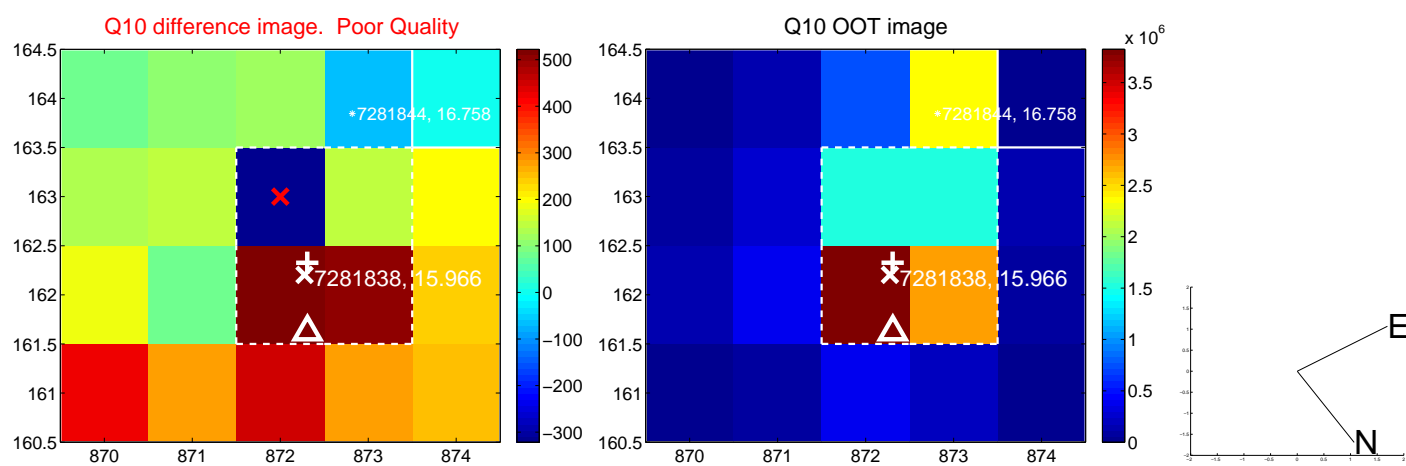
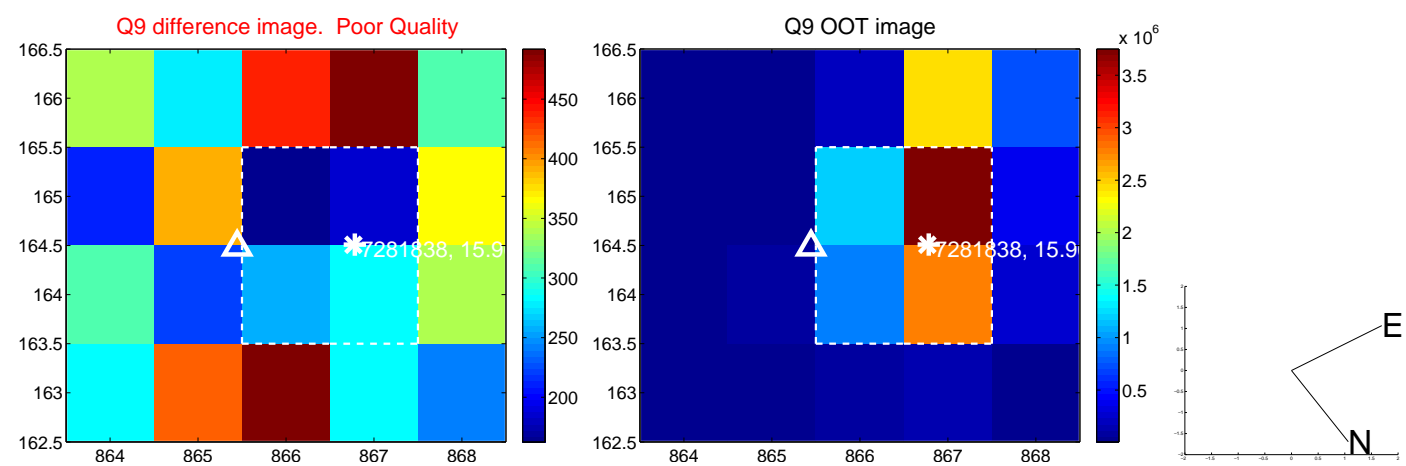


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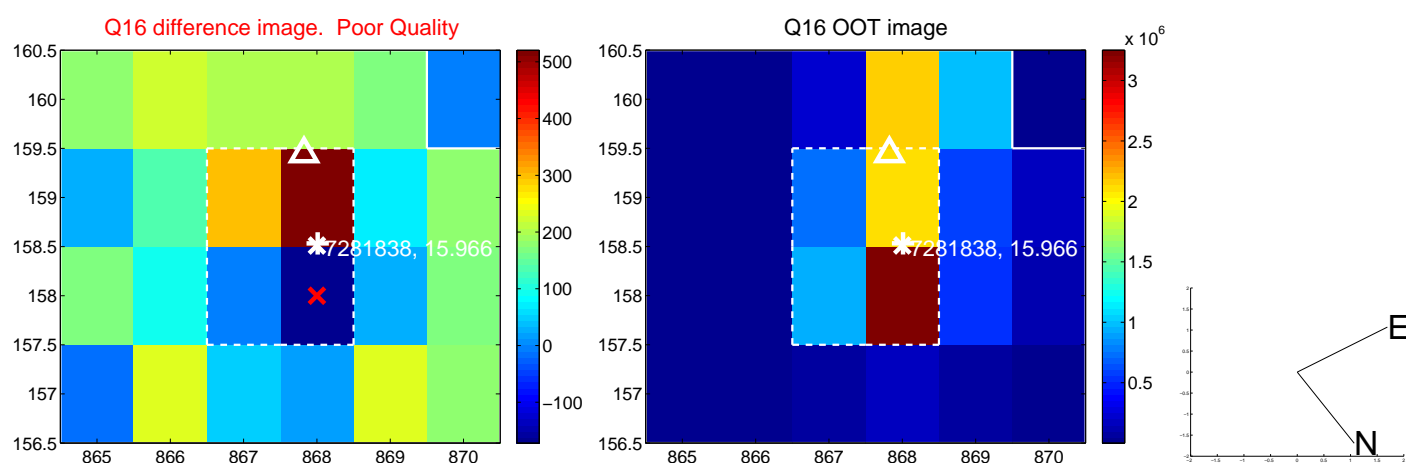
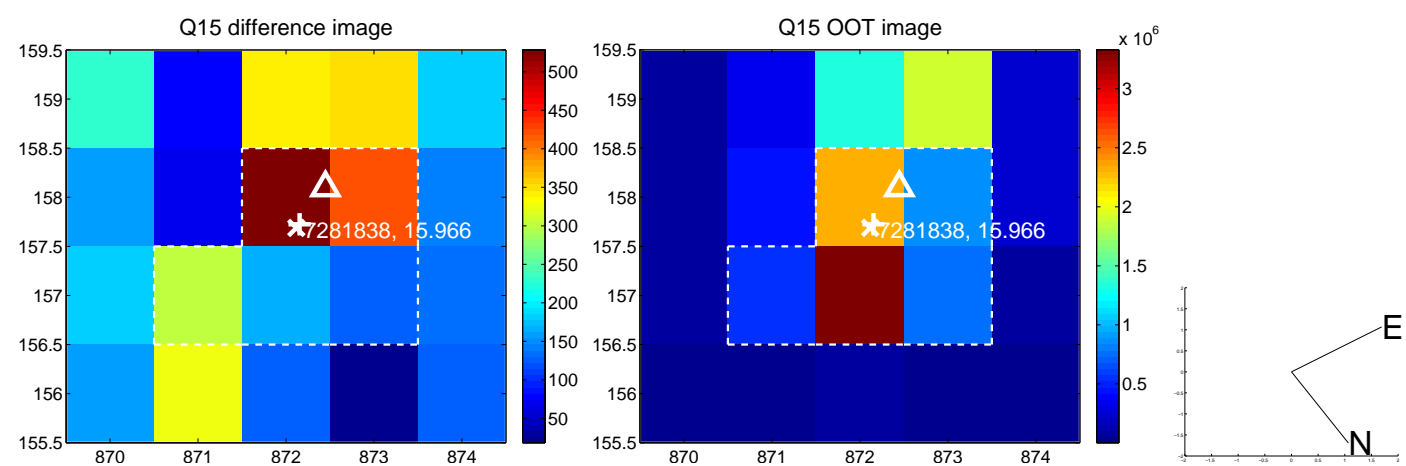
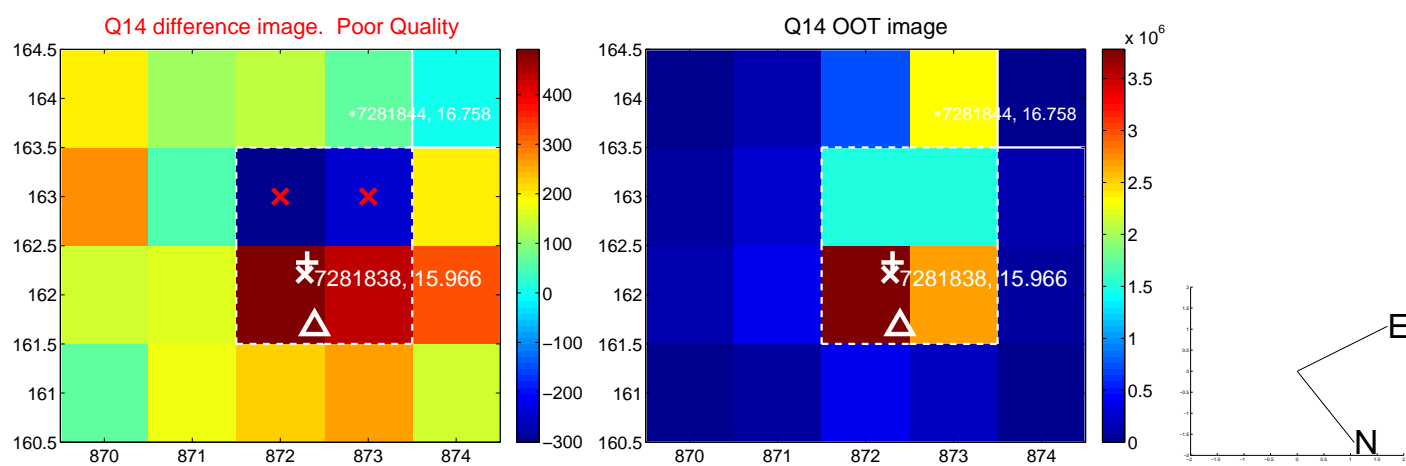
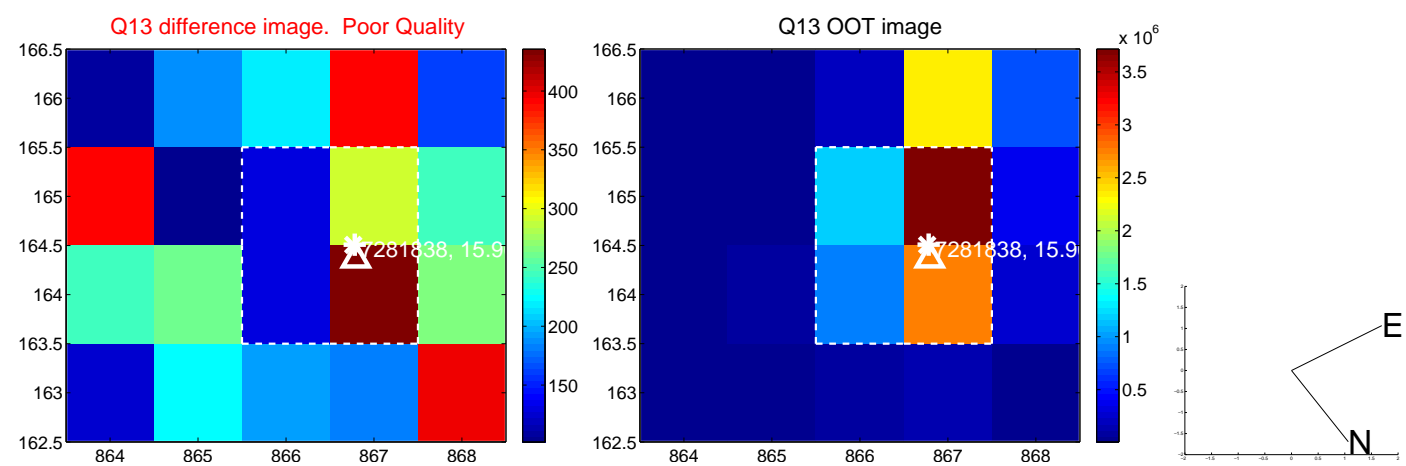




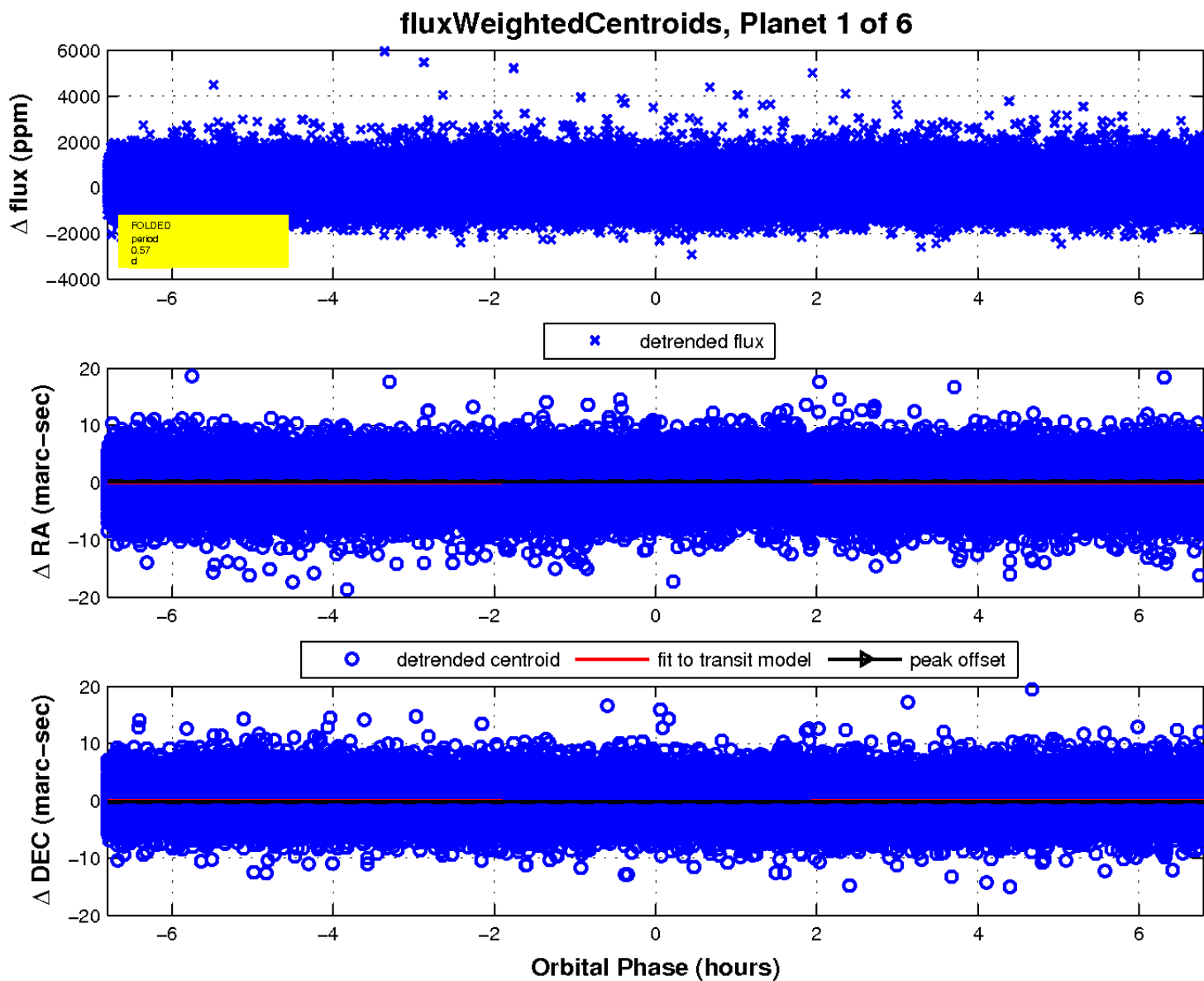
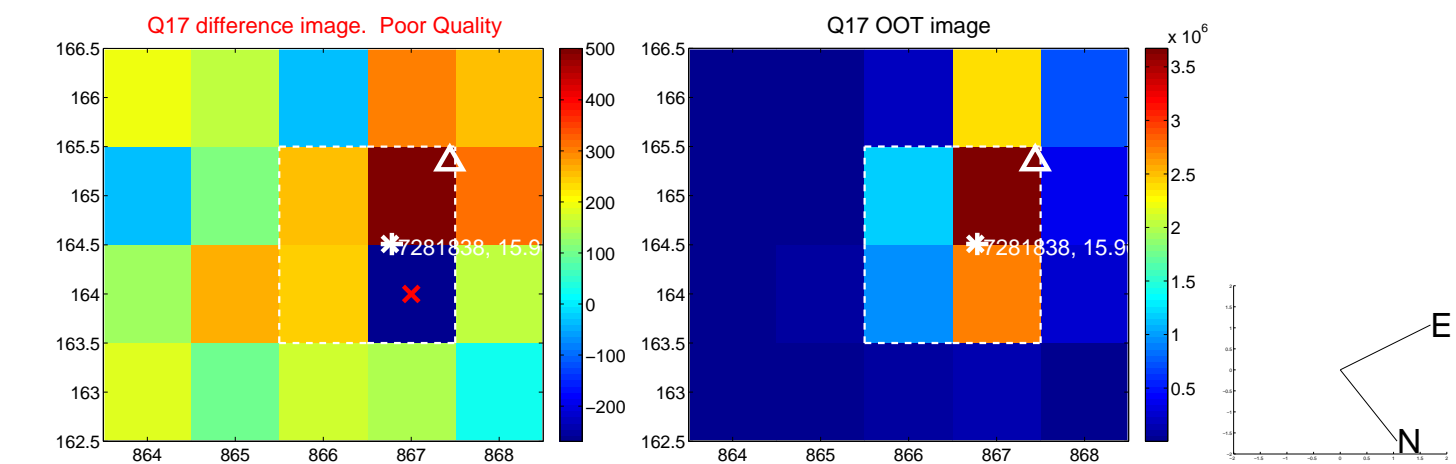
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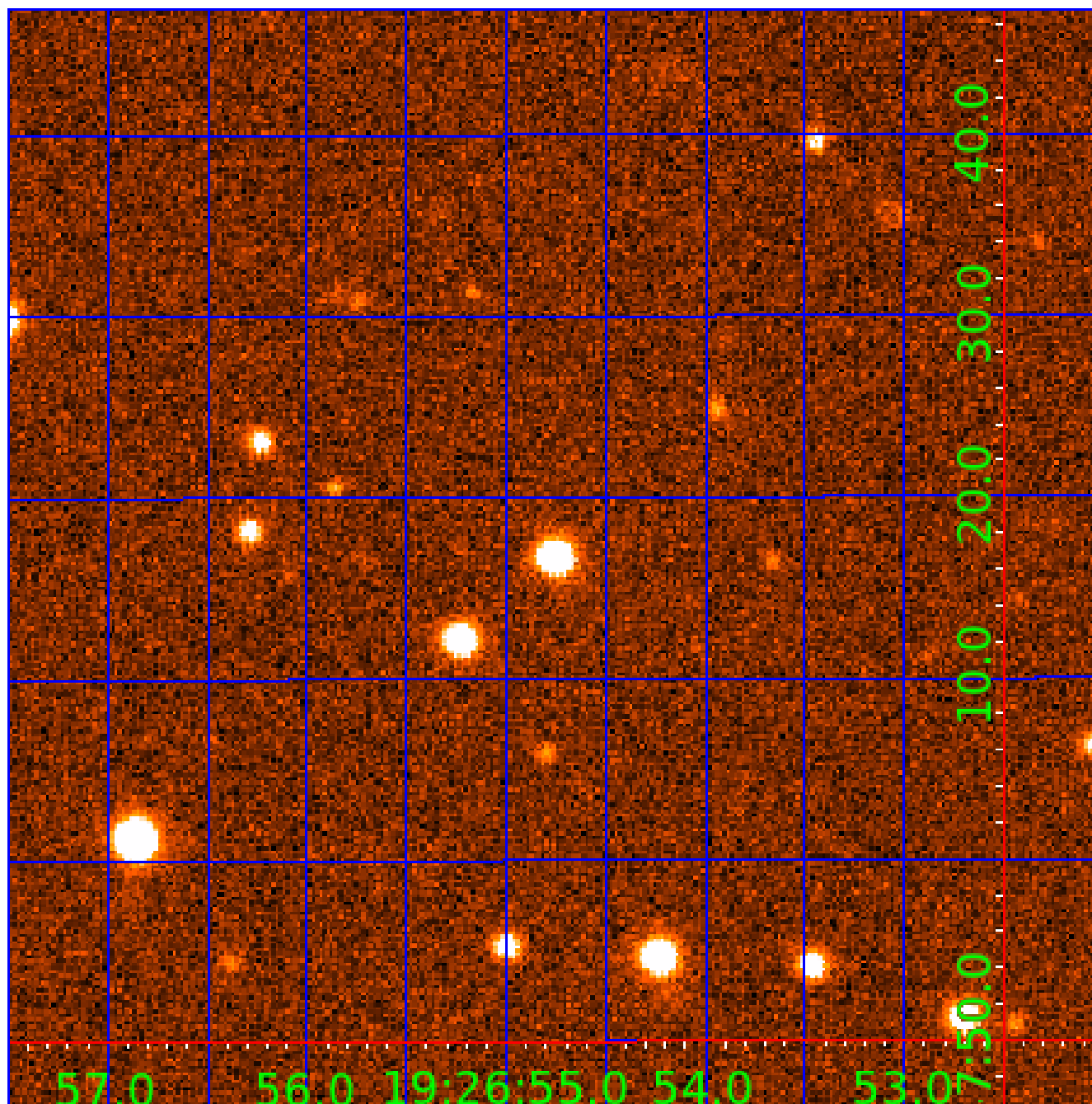


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UKIRT Image

Declination



# KIC 007281838

## Q1-17 DR25 TCE Parameters

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007281838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007281838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
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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.

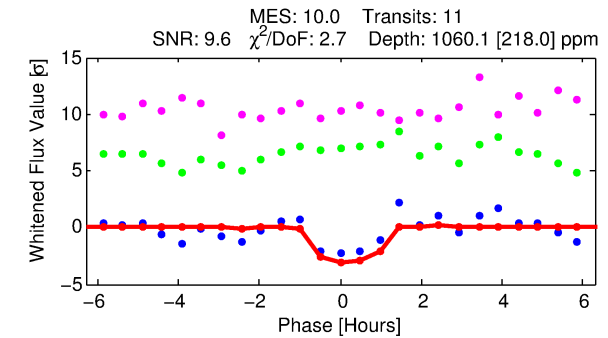
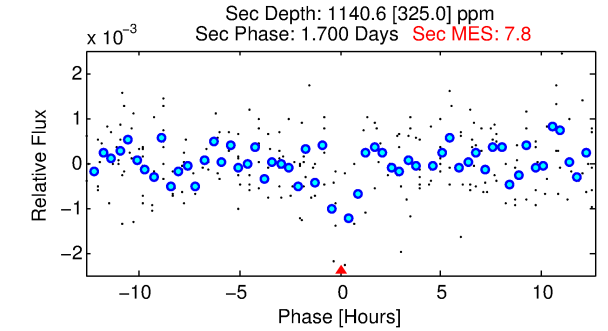
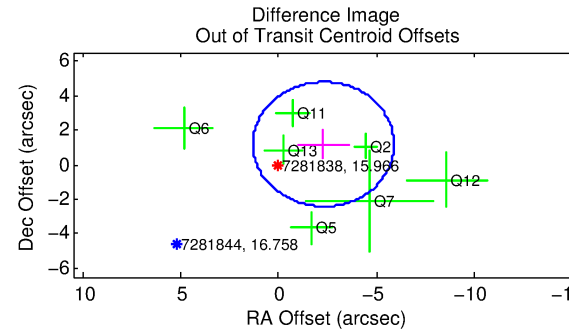
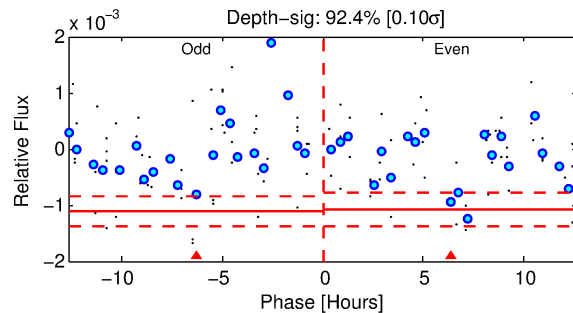
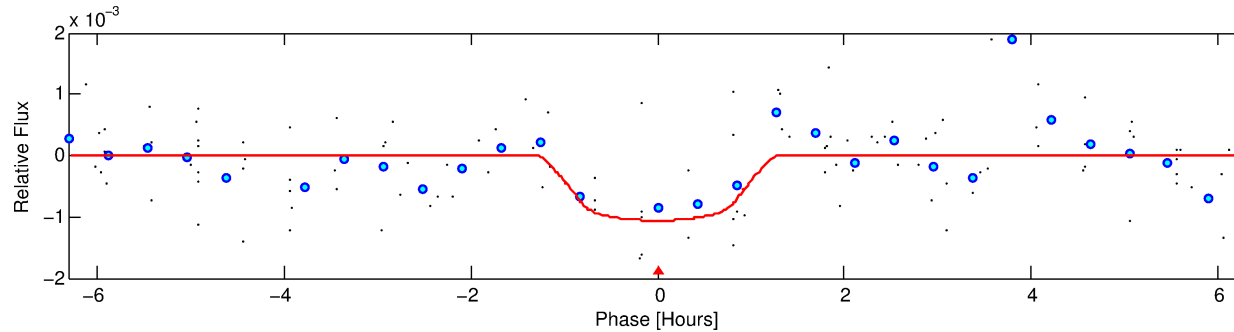
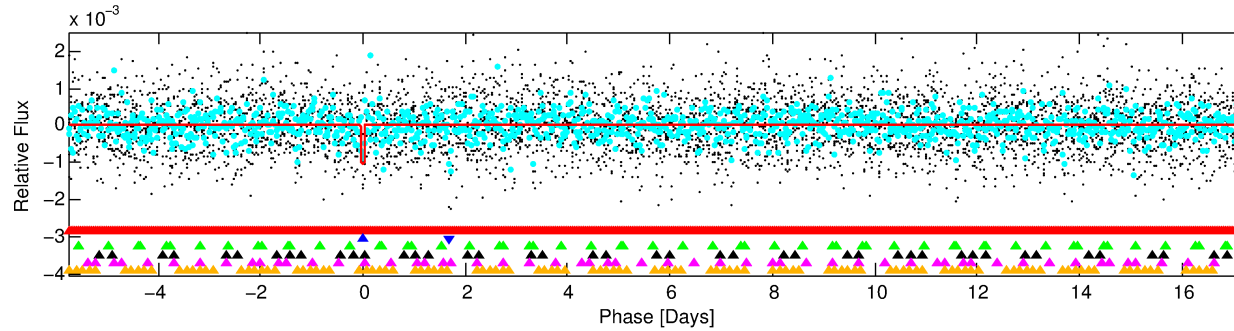
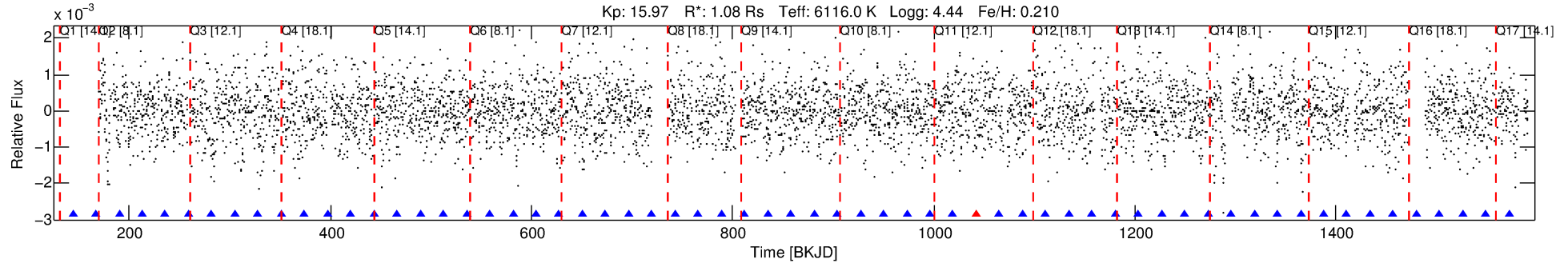
## Ephemeris Match Information For 007281838-02

No Significant Match Found



# DV One-Page Summary

KIC: 7281838 Candidate: 2 of 6 Period: 23.035 d



## DV Fit Results:

Period = 23.03462 [0.00043] d  
Epoch = 143.9762 [0.0164] BKJD  
Rp/R\* = 0.0299 [0.1771]  
a/R\* = 84.60 [2335.85]  
b = 0.20 [133.38]  
Seff = 52.51 [19.31]  
Teq = 686 [63] K  
Rp = 3.53 [20.97] Re  
a = 0.1675 [0.0383] AU  
Ag = 1410.84 [16743.37] [0.08 $\sigma$ ]  
Teffp = 6504 [19292] K [0.30 $\sigma$ ]

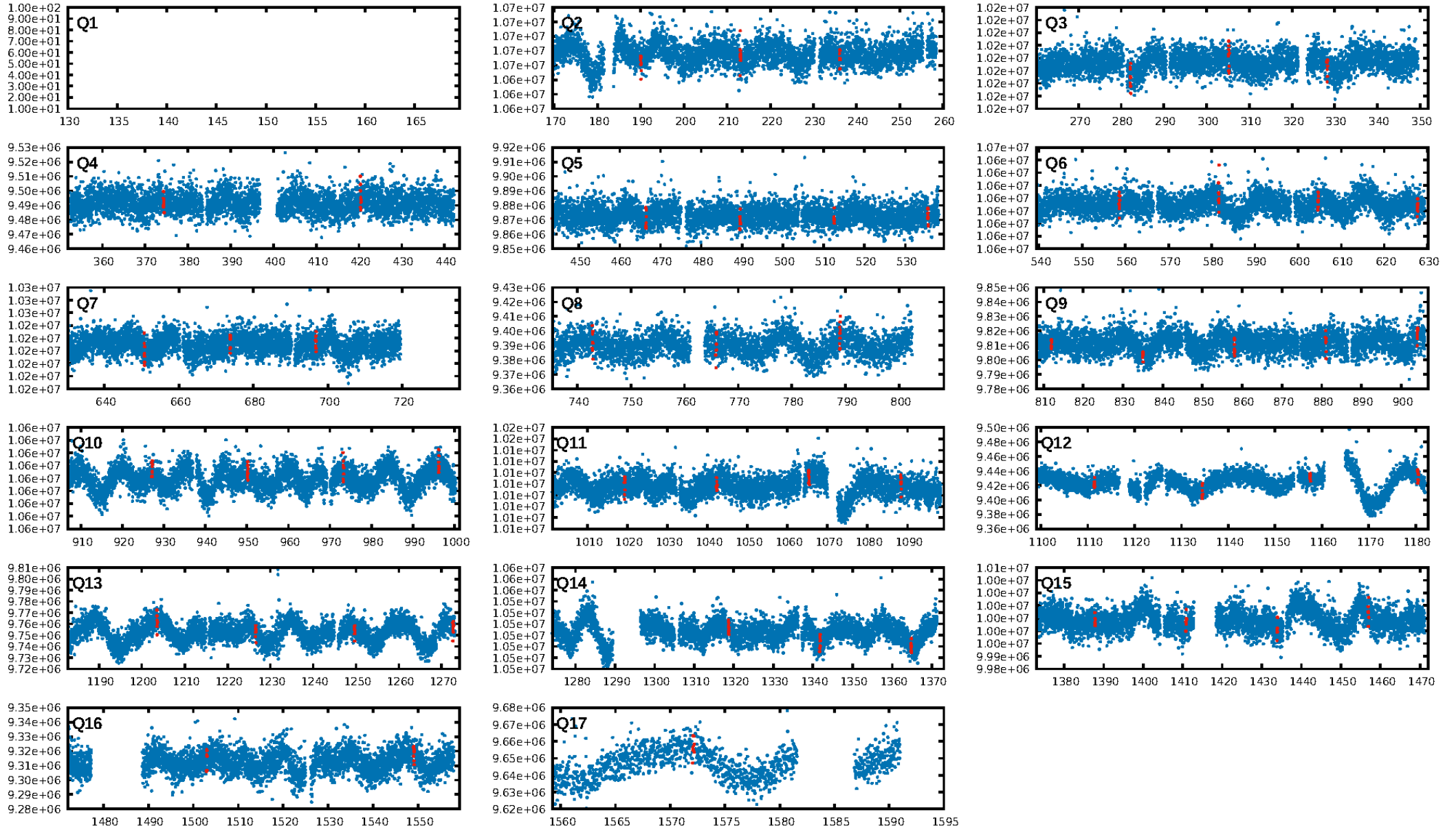
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [105.60 $\sigma$ ]  
LongPeriod-sig: 100.0% [20.14 $\sigma$ ]  
ModelChiSquare2-sig: 2.3%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 1.35e-10  
RollingBand-fgt: 0.91 [10/11]  
GhostDiagnostic-chr: 0.1701  
Centroid-sig: 51.2%  
Centroid-so: 1.087 arcsec [1.95 $\sigma$ ]  
OotOffset-rm: 2.578 arcsec [2.15 $\sigma$ ]  
KicOffset-rm: 2.337 arcsec [1.90 $\sigma$ ]  
OotOffset-st: 2/2/1/2 [7]  
KicOffset-st: 2/2/1/2 [7]  
DiffImageQuality-fgm: 0.00 [0/7]  
DiffImageOverlap-fno: 0.00 [0/16]

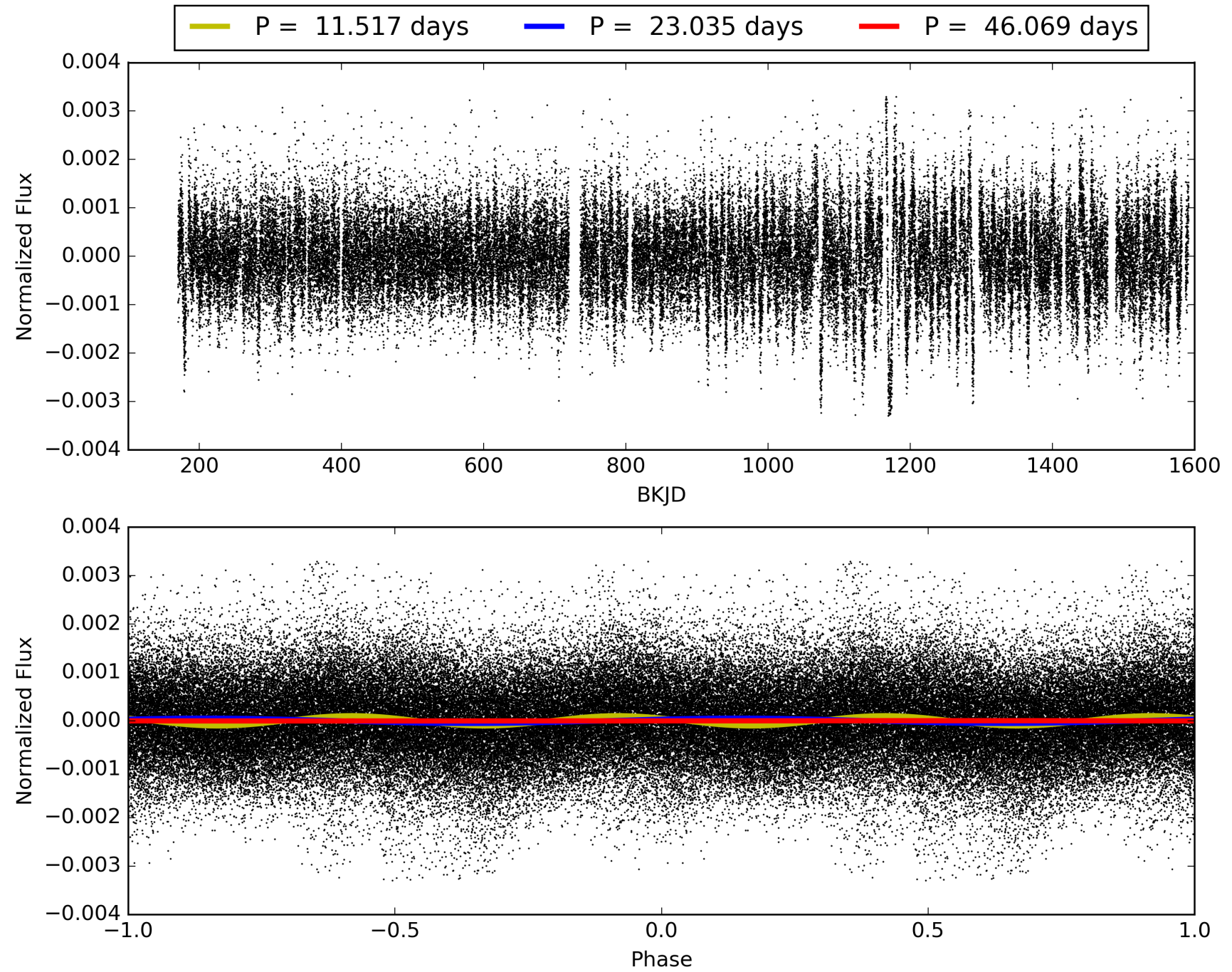
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:58:24 Z

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

# TCE 007281838-02, PDC Light Curves

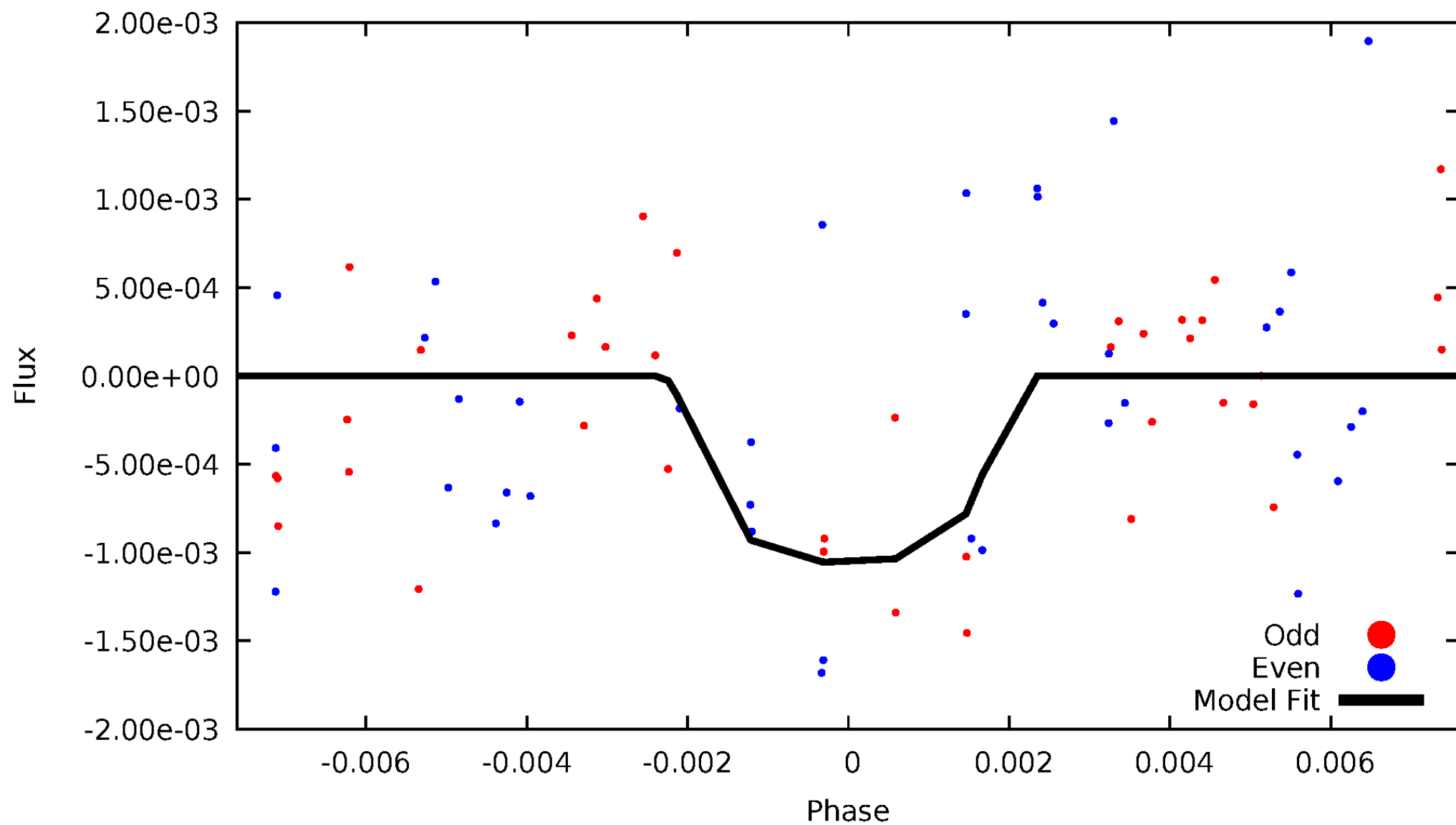


# TCE 007281838-02



# DV Odd/Even

TCE 007281838-02





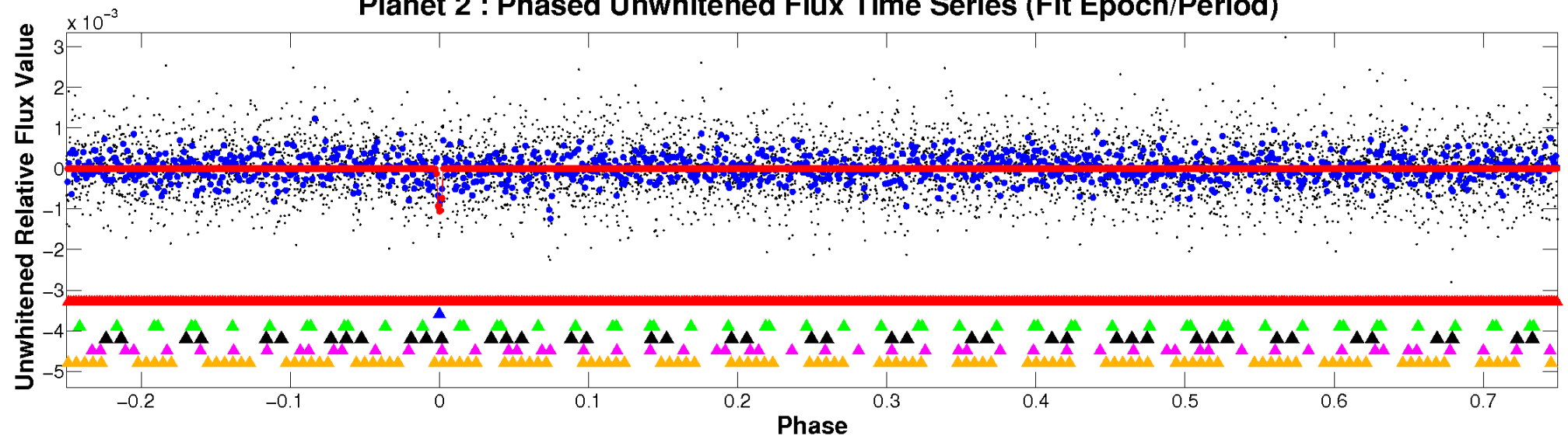


ALT Odd/Even

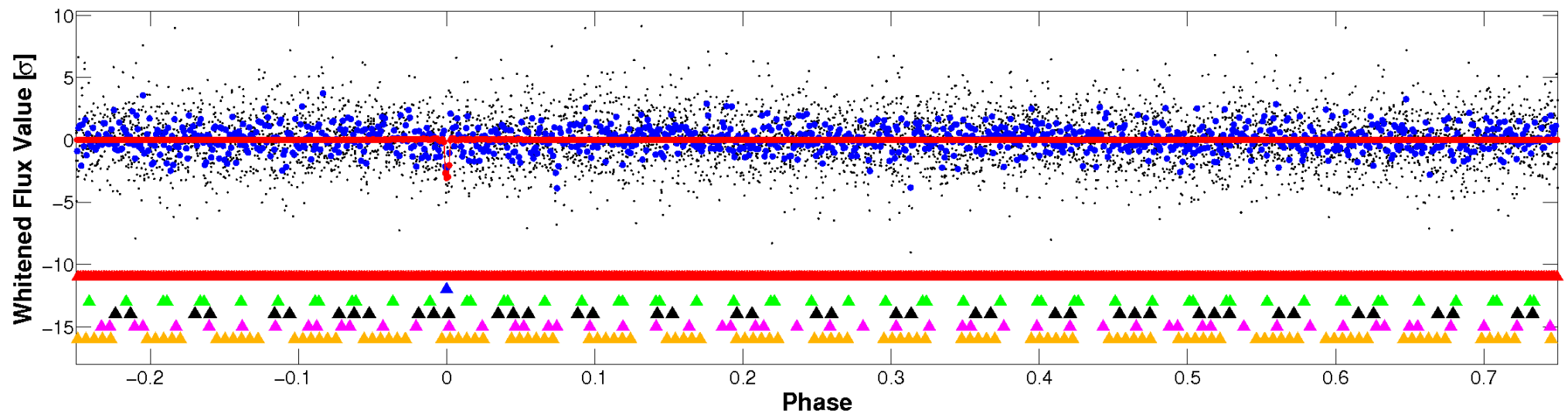
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

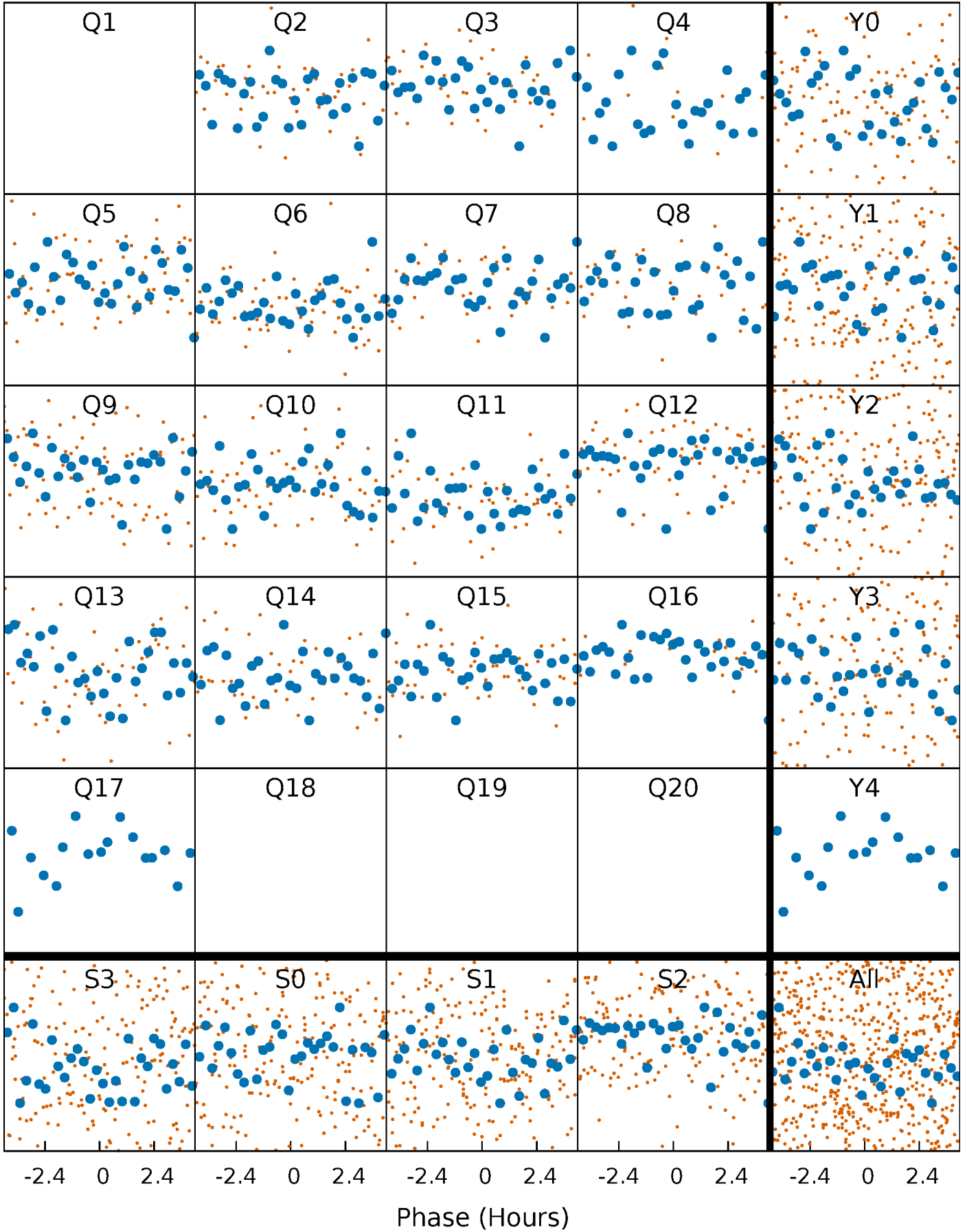


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

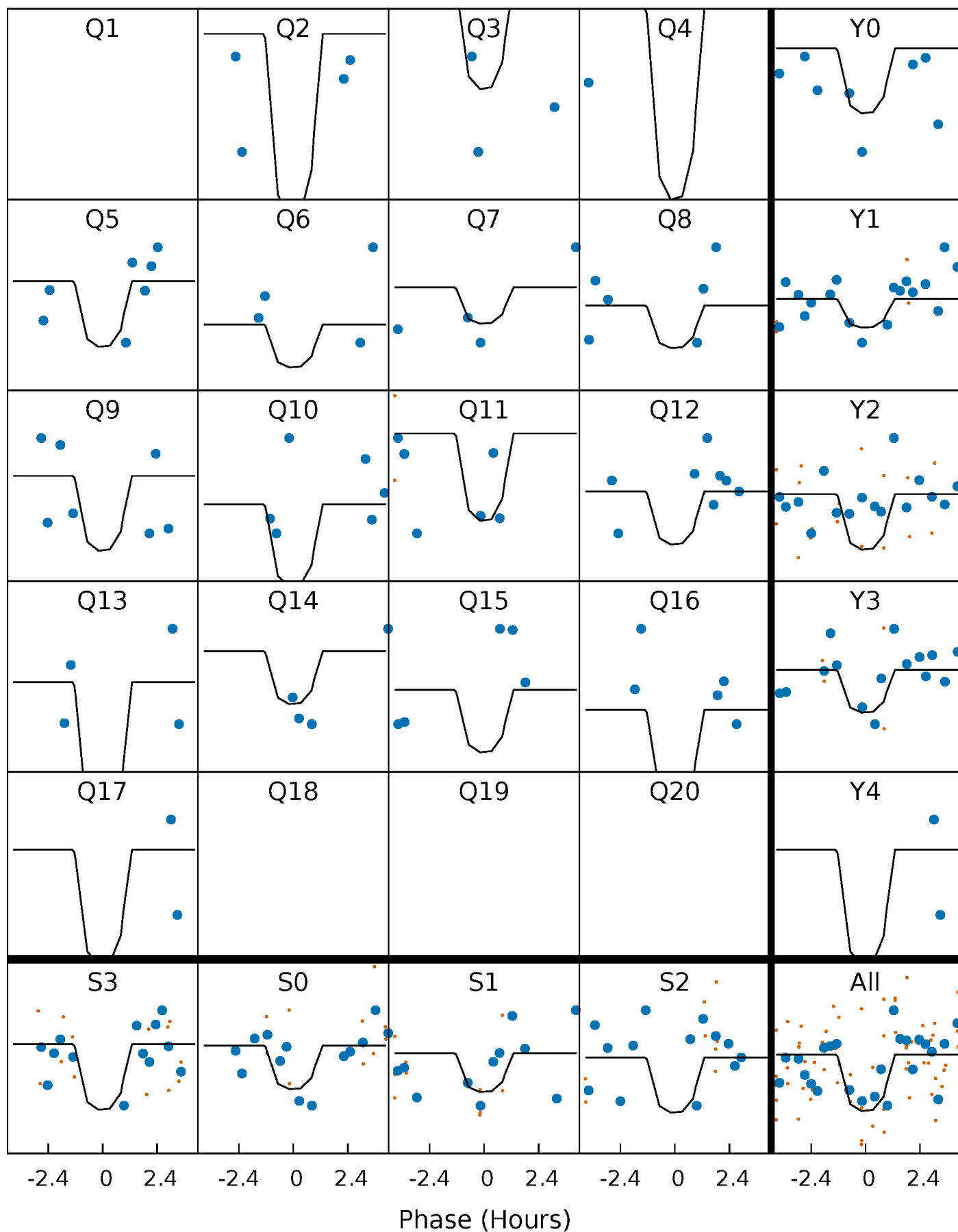
TCE 007281838-02   P= 23.034622 Days    $T_0=143.976175$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 007281838-02 P= 23.034622 Days  $T_0=143.976175$  (BKJD)

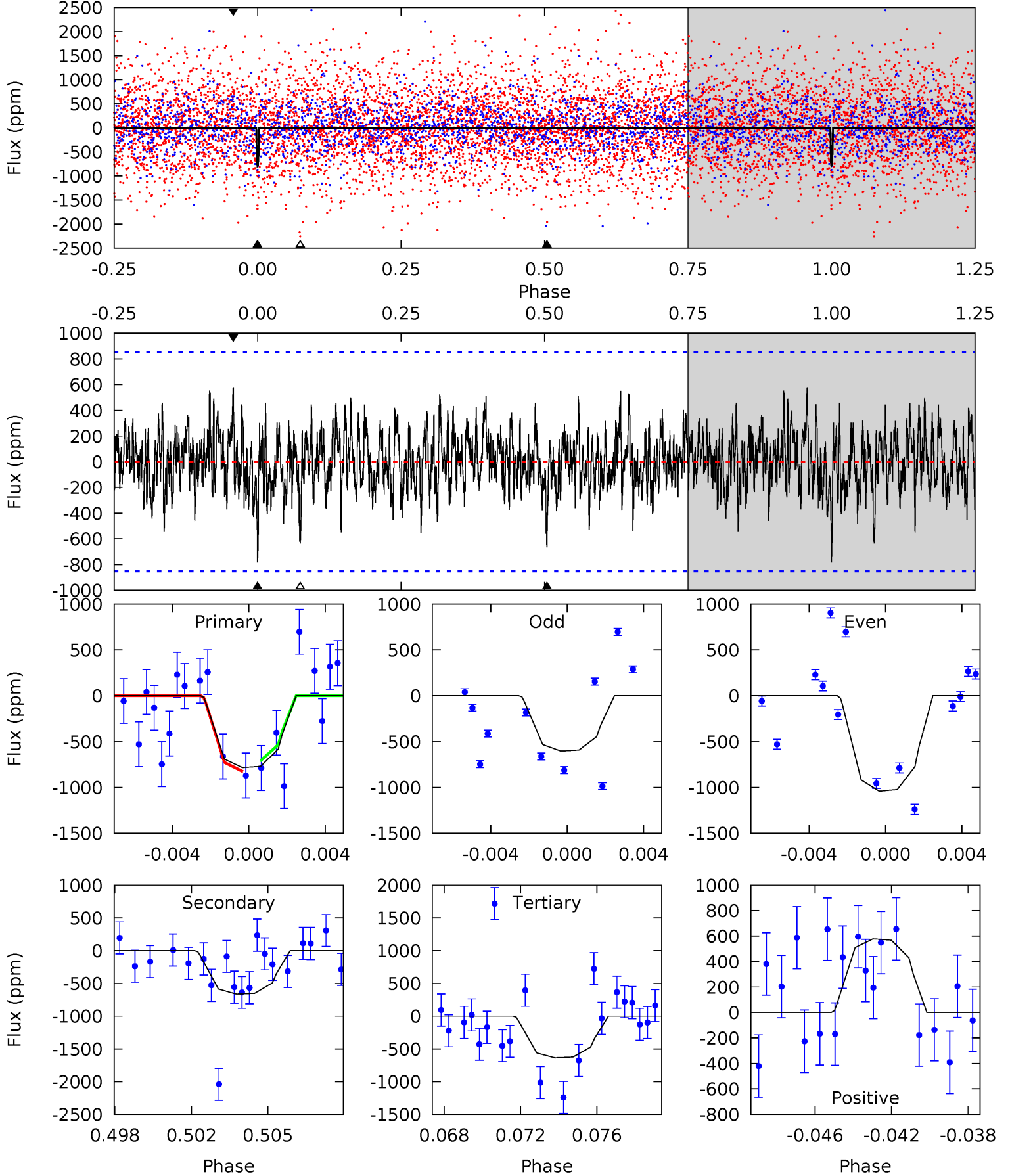


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

007281838-02, P = 23.034622 Days, E = 143.976175 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
4.79	4.06	3.89	3.53	5.21	2.89	1.16	0.90	1.26	0.17	0.53	1.31	0.68	0.42	0.35



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.



### Stellar Parameters For KIC 007281838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6116^{+170}_{-233}$	$4.440^{+0.058}_{-0.184}$	$0.210^{+0.150}_{-0.300}$	$1.084^{+0.292}_{-0.104}$	$1.181^{+0.119}_{-0.164}$	$1.307^{+0.321}_{-0.632}$
	+3%/-4%	+1%/-4%	+71%/-143%	+27%/-10%	+10%/-14%	+25%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007281838-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	-664 $\pm$ 164	$16.44^{+15.54}_{-11.33}$	$969^{+62}_{-46}$	$3254^{+1705}_{-600}$	$38^{+346}_{-29}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

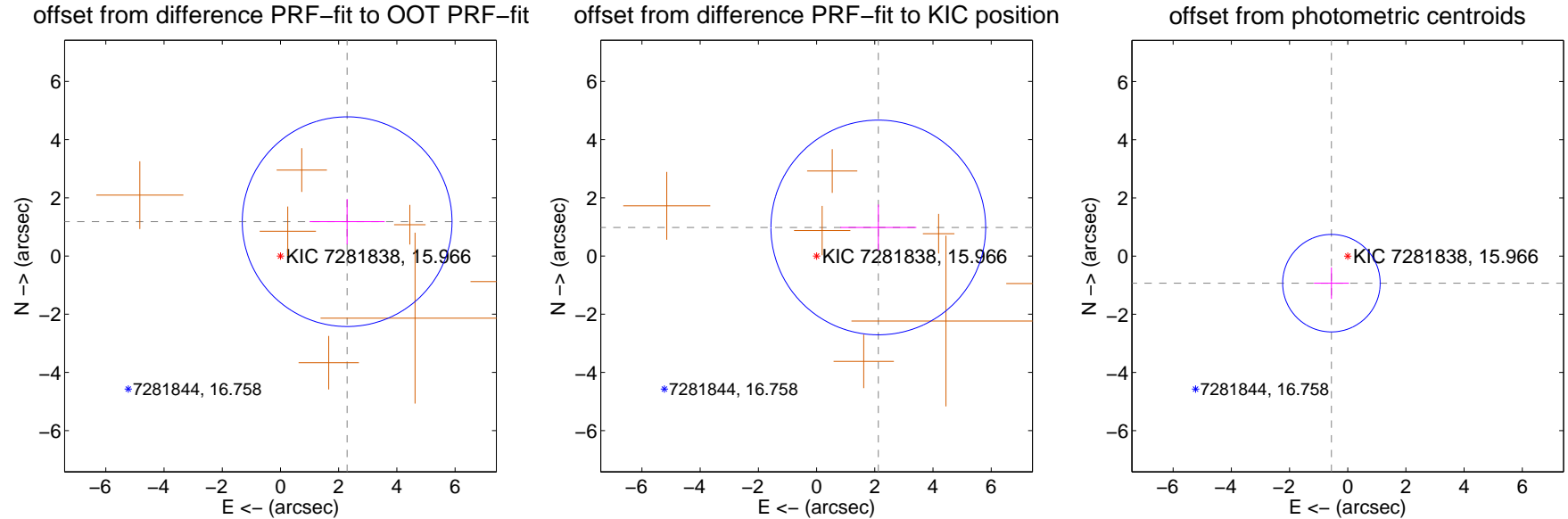
## DV Centroid Data

Supplemental centroid analysis for 007281838-02. Kepler magnitude: 15.97. Transit SNR 9.62

There are 0 quarters with good PRF difference image offsets

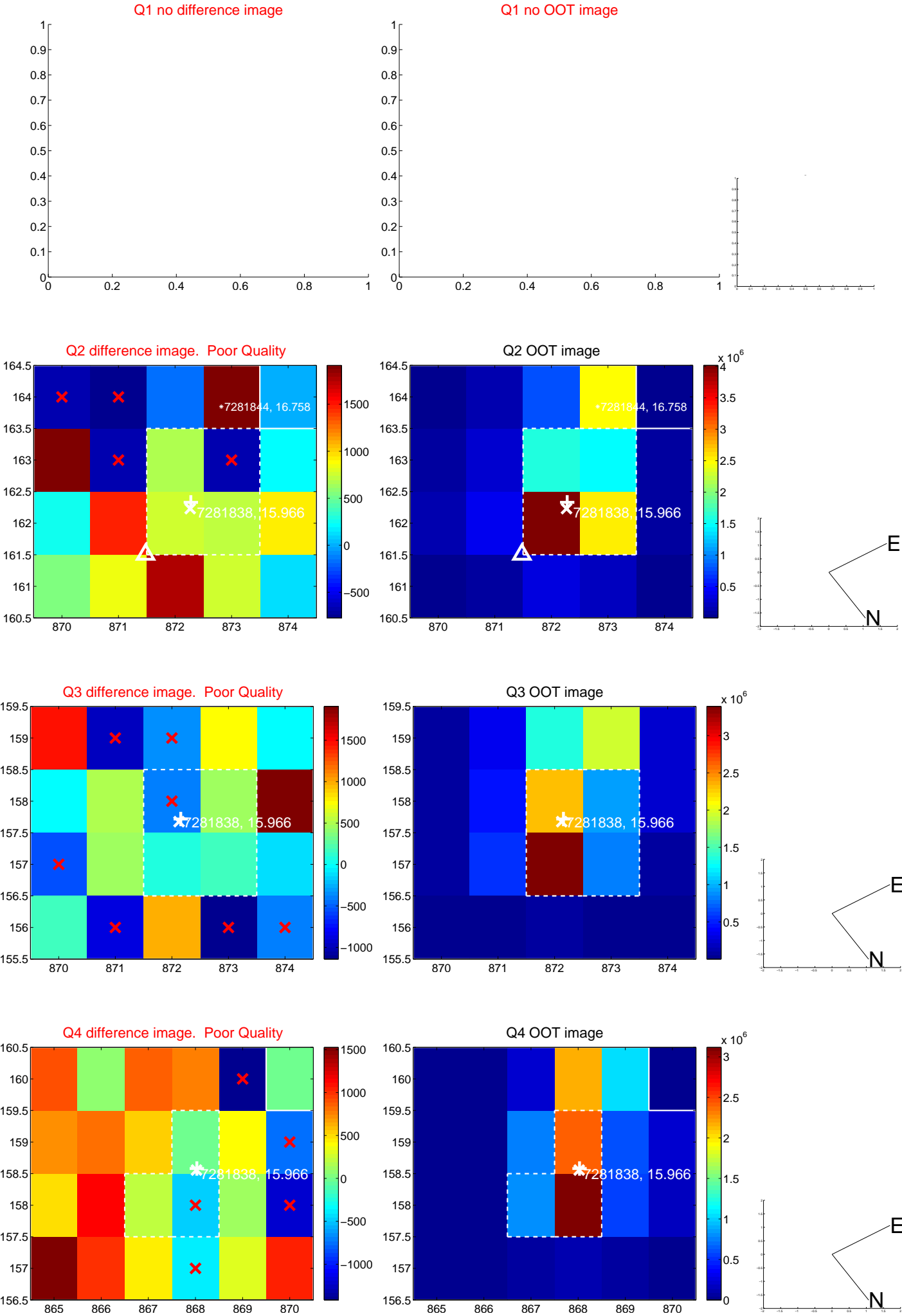
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.578 \pm 1.201$	2.15	$-2.292 \pm 1.290$	$1.180 \pm 0.781$
PRF-fit source offset from KIC position	$2.337 \pm 1.230$	1.90	$-2.121 \pm 1.305$	$0.981 \pm 0.786$
photometric centroid source offset	$1.09 \pm 0.56$	1.95	$0.56 \pm 0.60$	$-0.93 \pm 0.54$

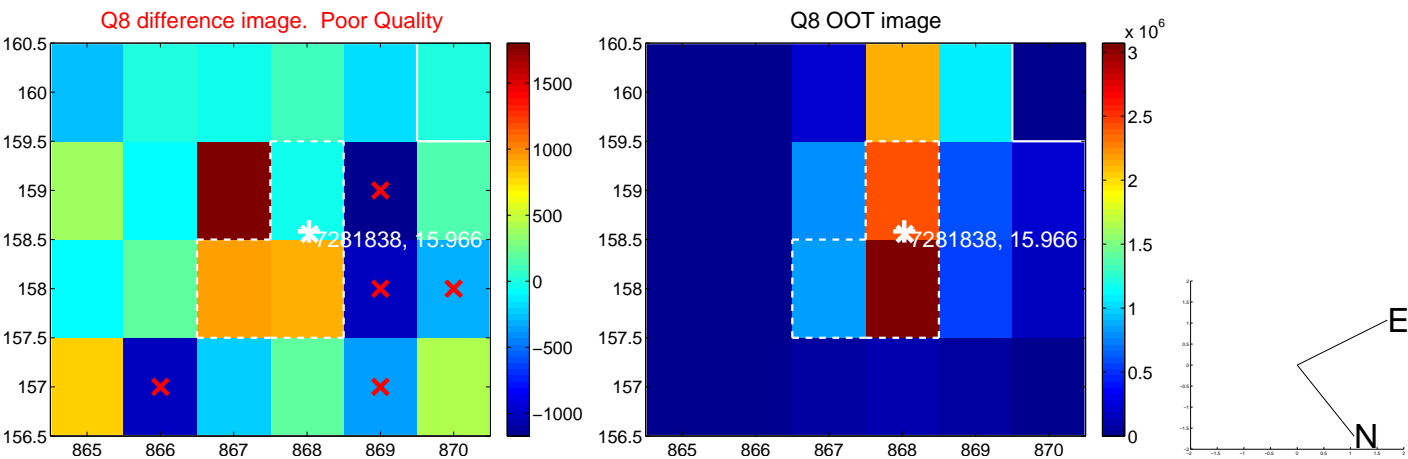
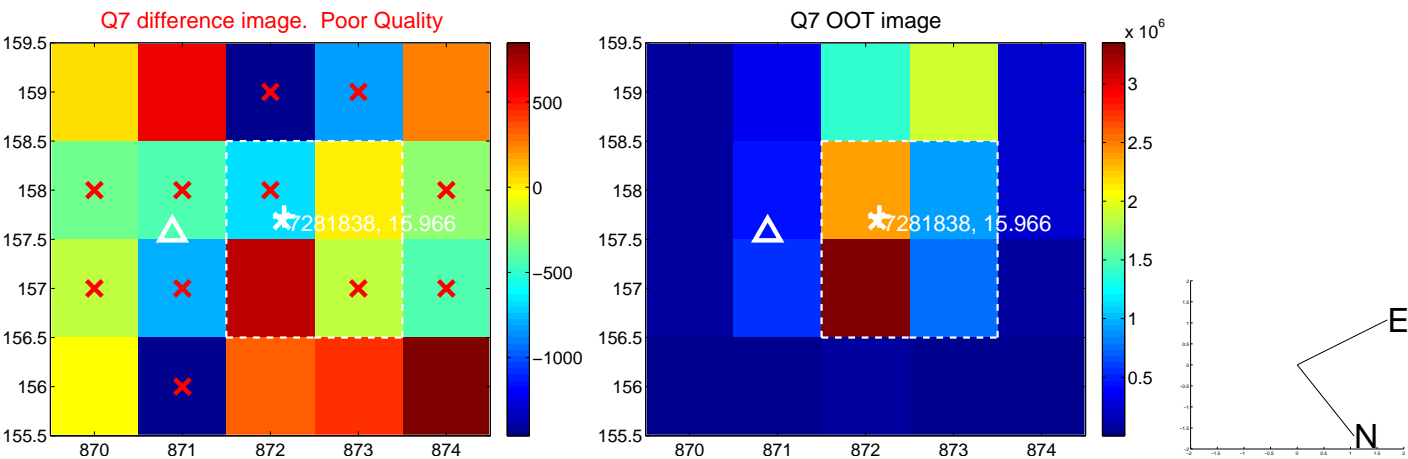
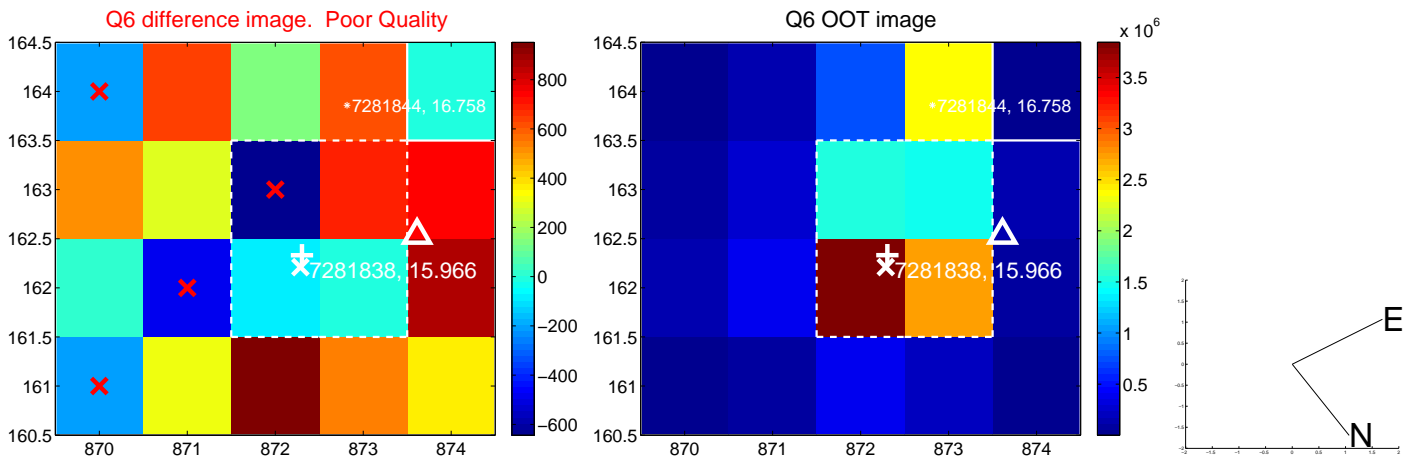
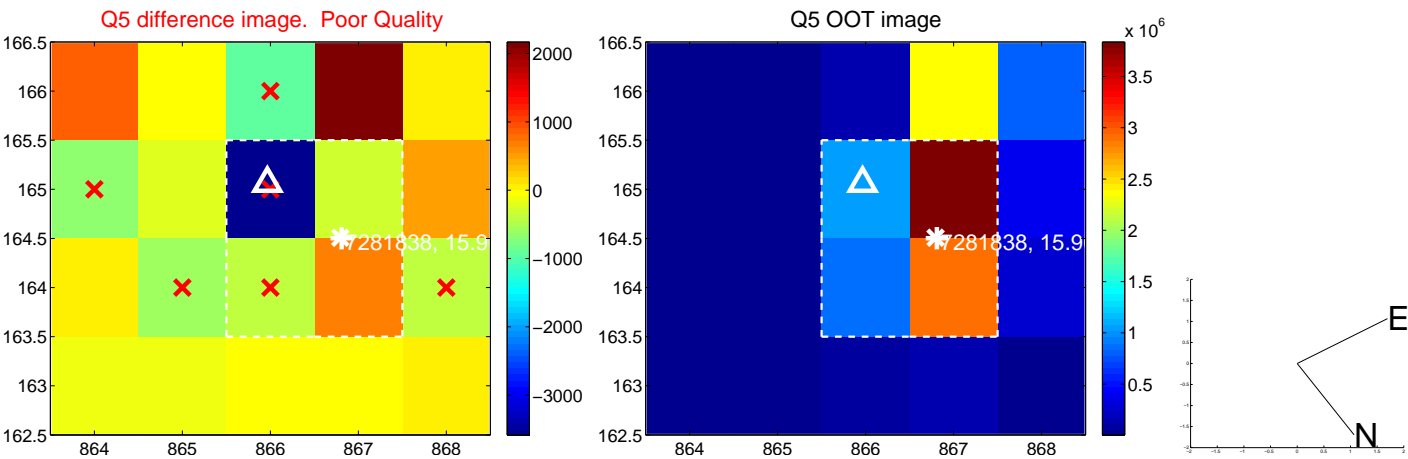


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

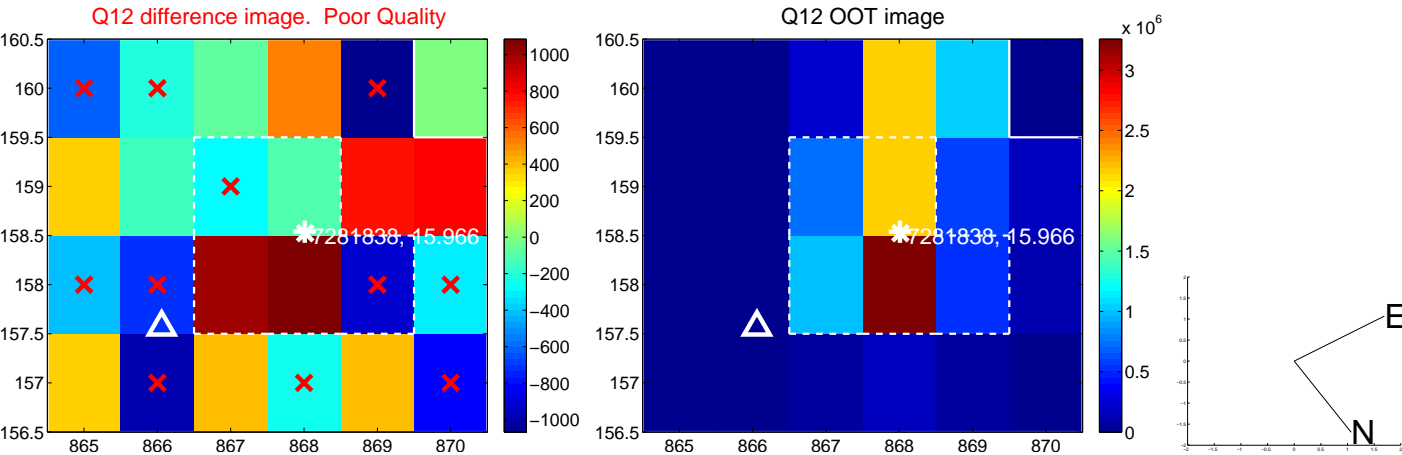
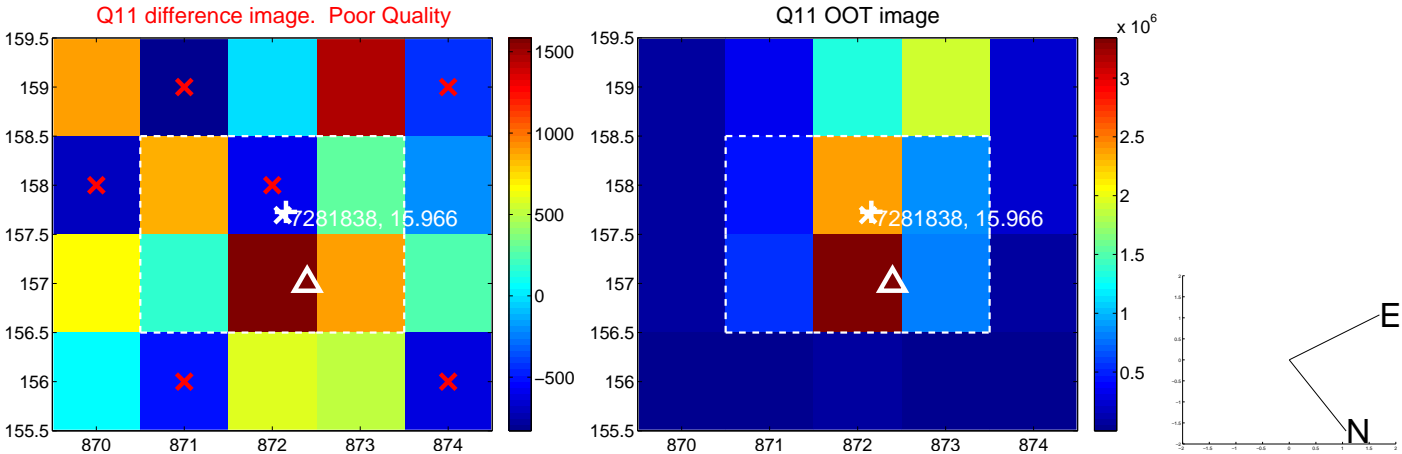
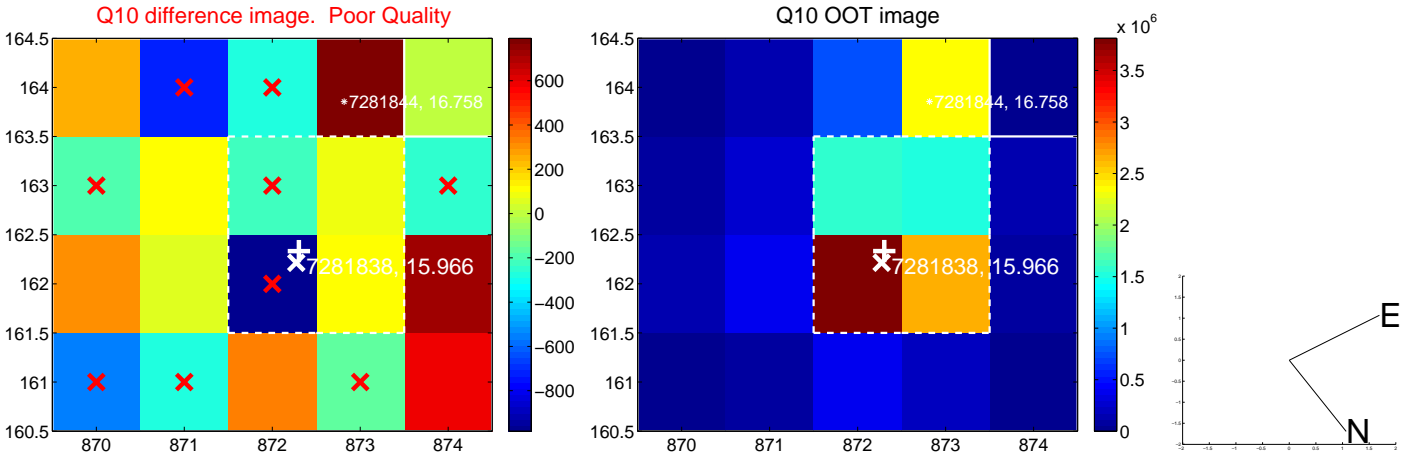
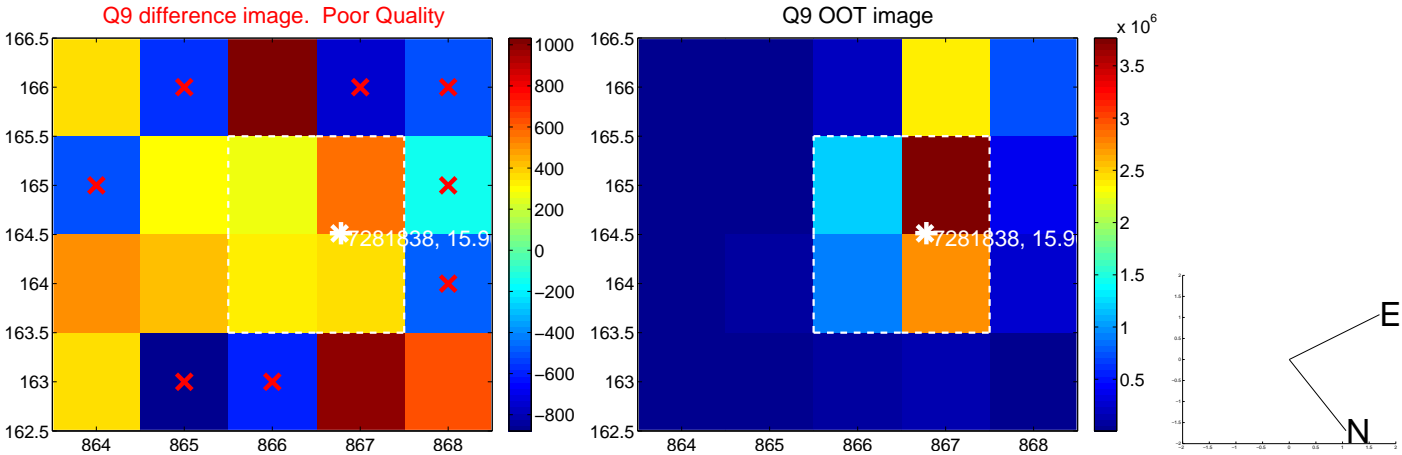
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

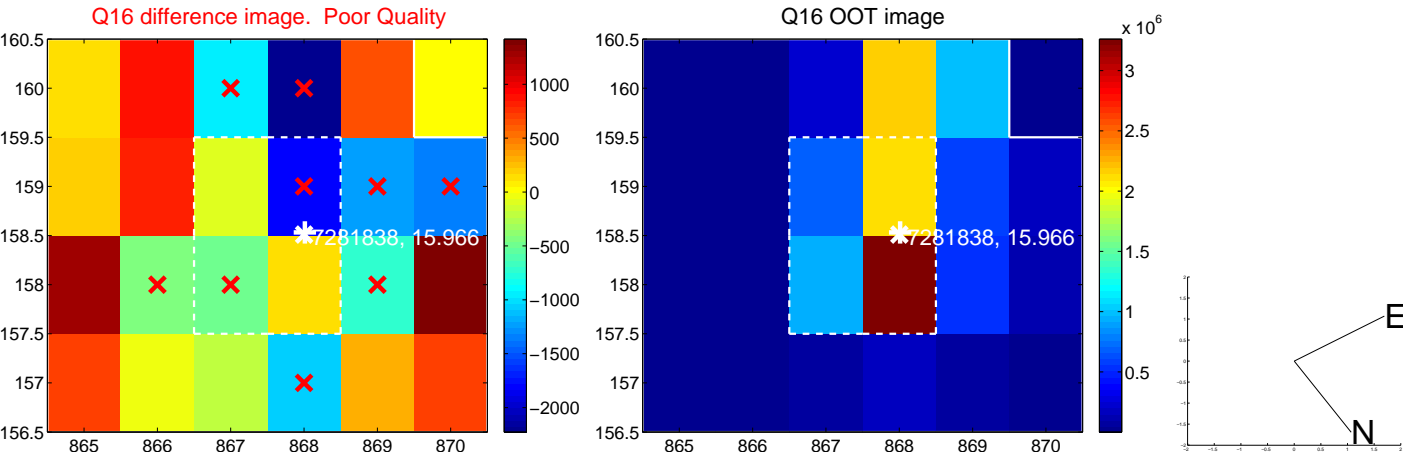
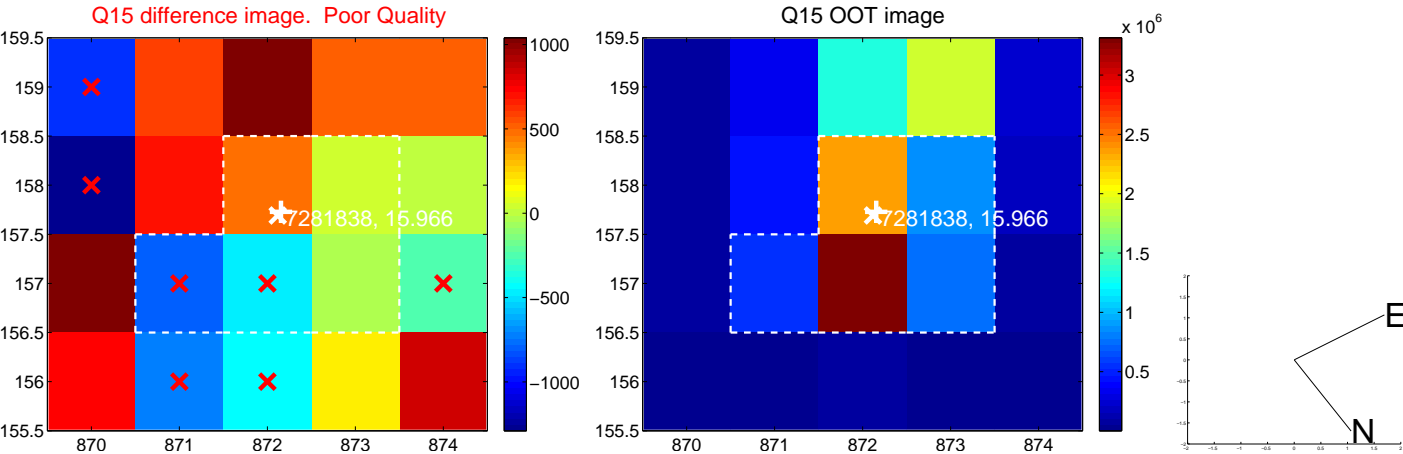
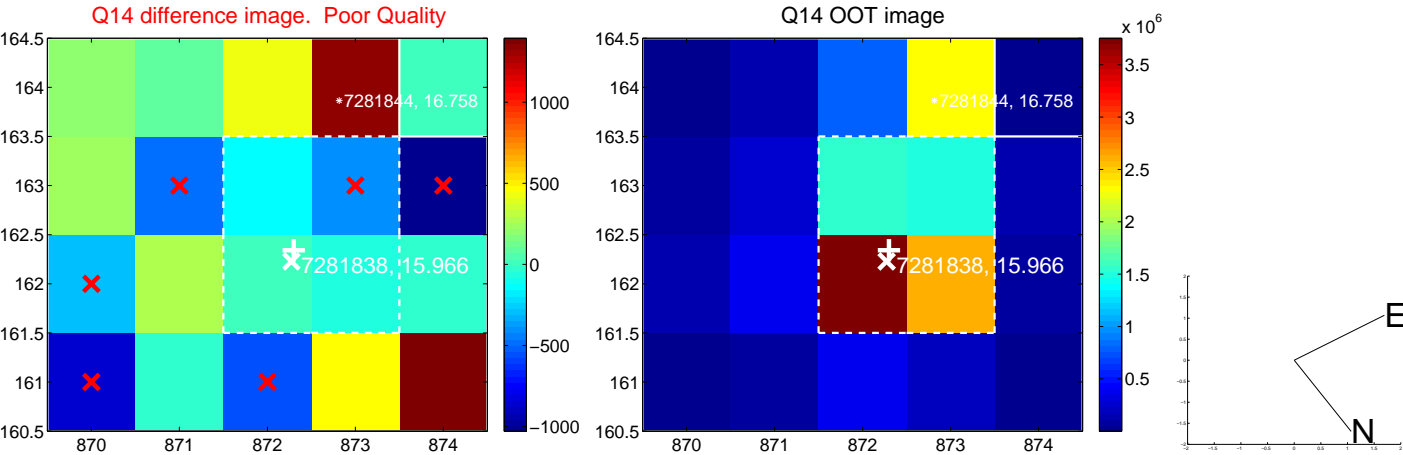
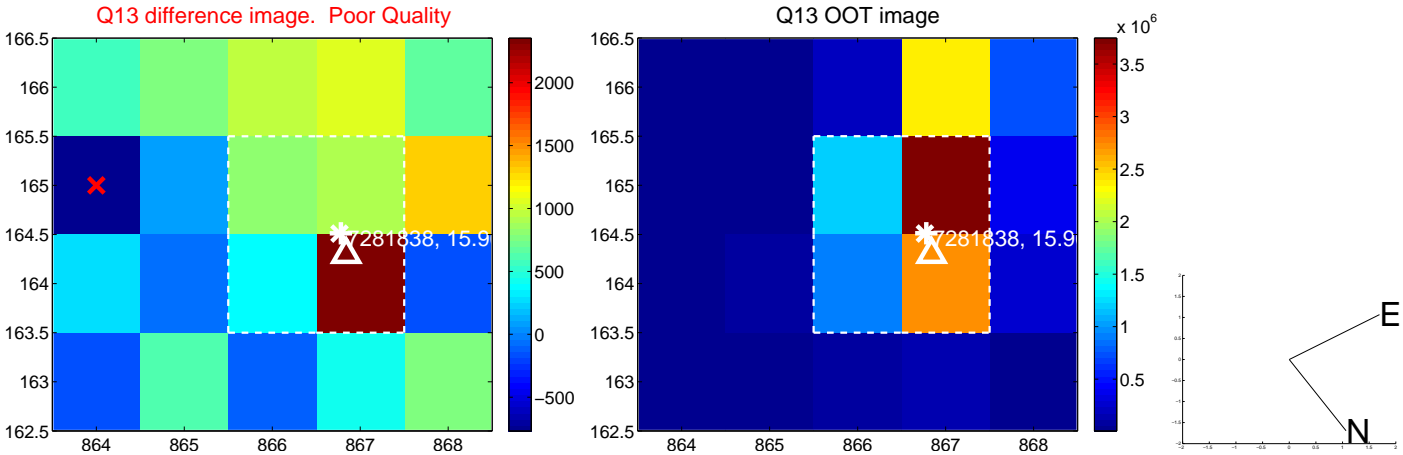


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

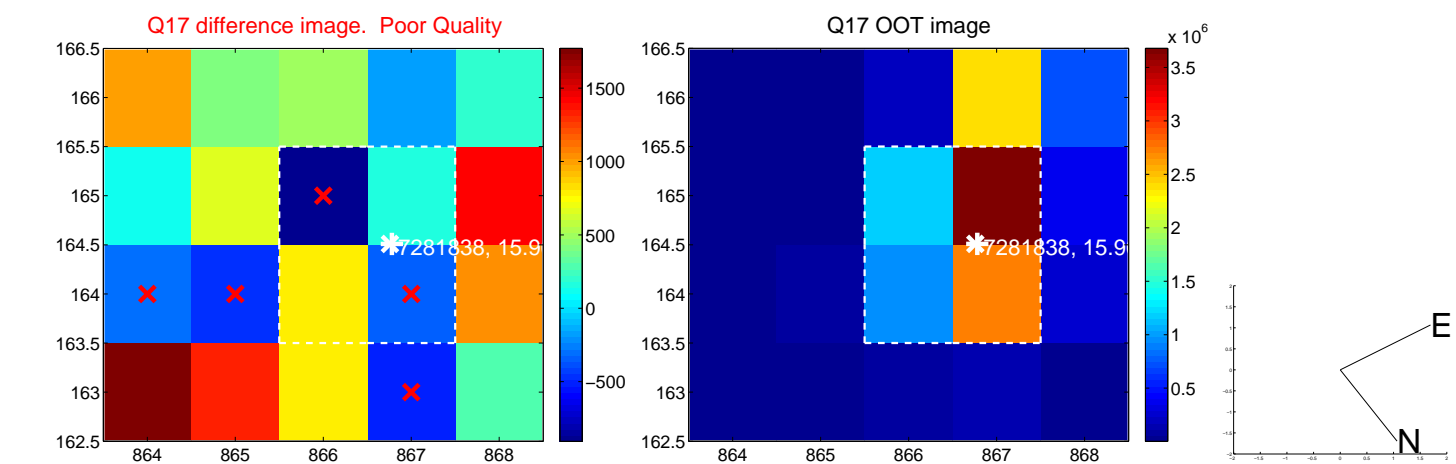




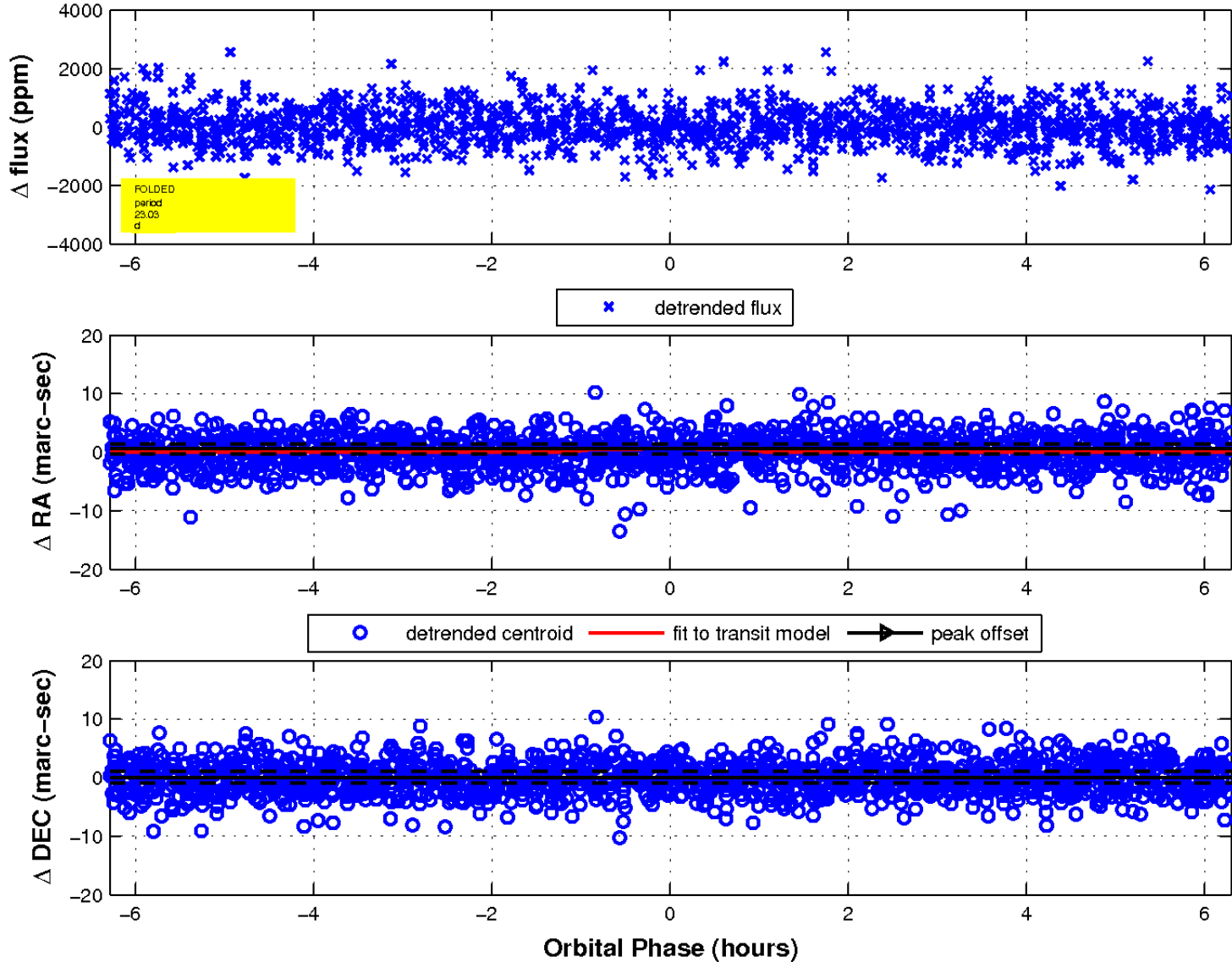
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

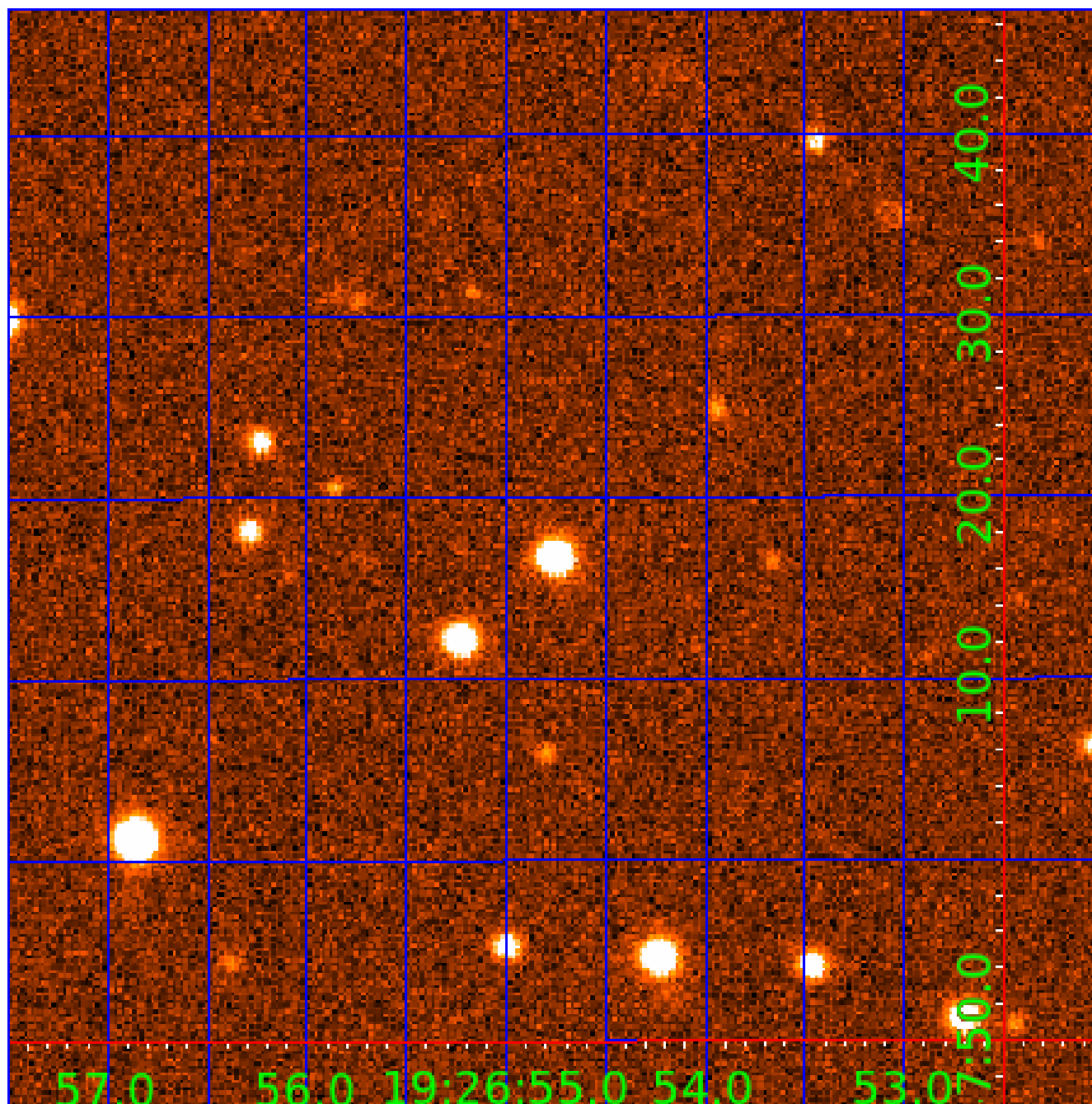


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination



# KIC 007281838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007281838-01	OBS	No	0.566752	131.853725	45.4	3.967	13.0	7.8	1.08	6116	0.74	7338.25
007281838-02	OBS	No	23.034622	143.976175	1060.1	2.101	10.0	9.6	1.08	6116	3.53	52.51
007281838-03	OBS	No	25.395660	153.219359	1049.5	1.872	10.4	8.8	1.08	6116	3.93	46.11
007281838-04	OBS	No	33.933401	145.247478	1647.1	1.140	11.9	11.3	1.08	6116	4.41	31.33
007281838-05	OBS	No	26.251749	132.692163	1756.8	2.033	9.1	12.1	1.08	6116	8.73	44.11
007281838-06	OBS	No	12.662621	142.254739	1117.7	1.069	9.7	10.5	1.08	6116	4.00	116.61

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007281838-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
007281838-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007281838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007281838-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_DIFFS

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

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

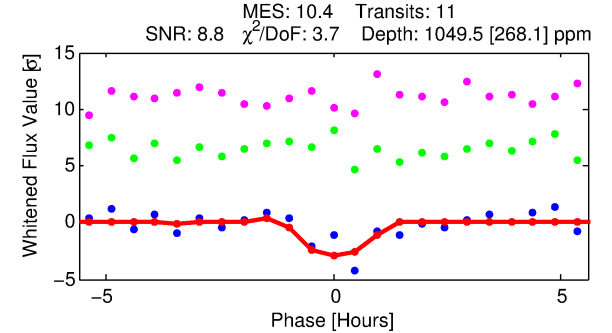
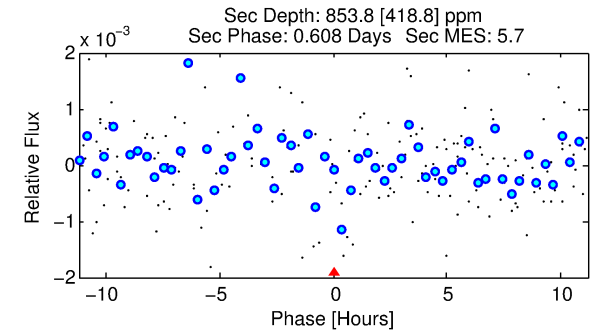
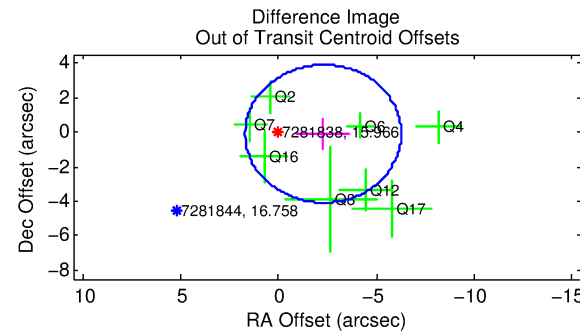
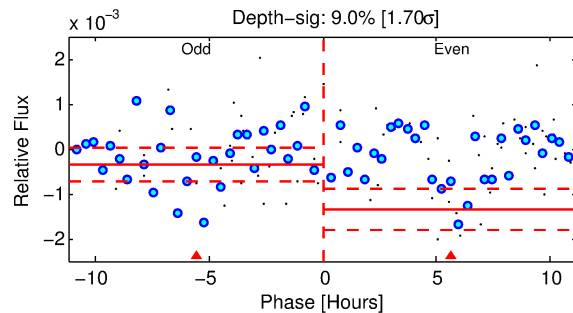
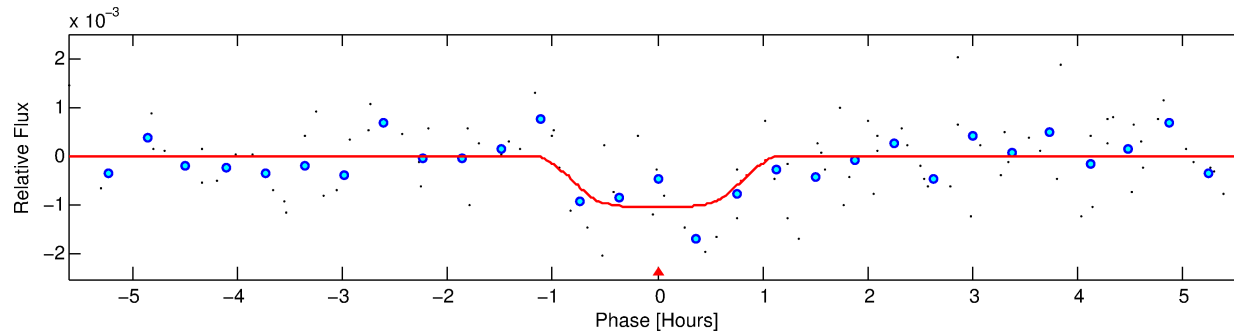
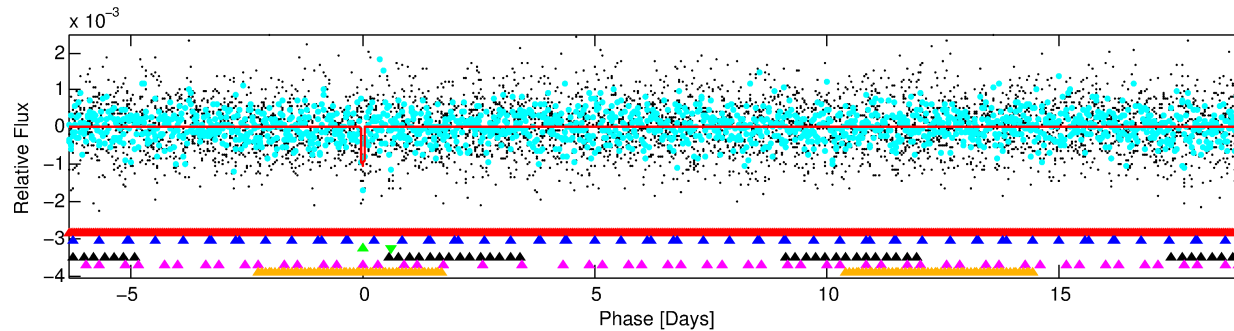
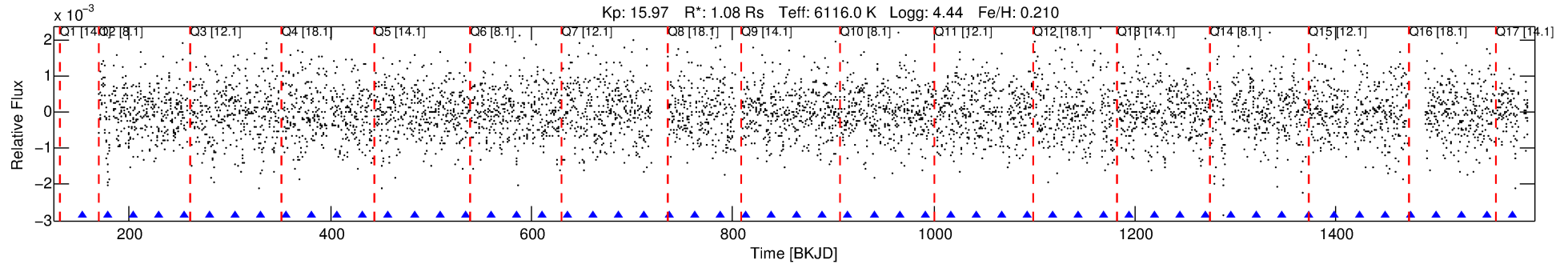
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007281838-03

No Significant Match Found

# DV One-Page Summary

KIC: 7281838 Candidate: 3 of 6 Period: 25.396 d



## DV Fit Results:

Period = 25.39566 [0.00035] d  
Epoch = 153.2194 [0.0095] BKJD  
Rp/R\* = 0.0332 [0.0766]  
a/R\* = 66.04 [721.78]  
b = 0.81 [4.64]  
Seff = 46.11 [16.96]  
Teq = 664 [61] K  
Rp = 3.93 [9.12] Re  
a = 0.1787 [0.0408] AU  
Ag = 973.18 [4525.70] [0.21 $\sigma$ ]  
Teffp = 5738 [6657] K [0.76 $\sigma$ ]

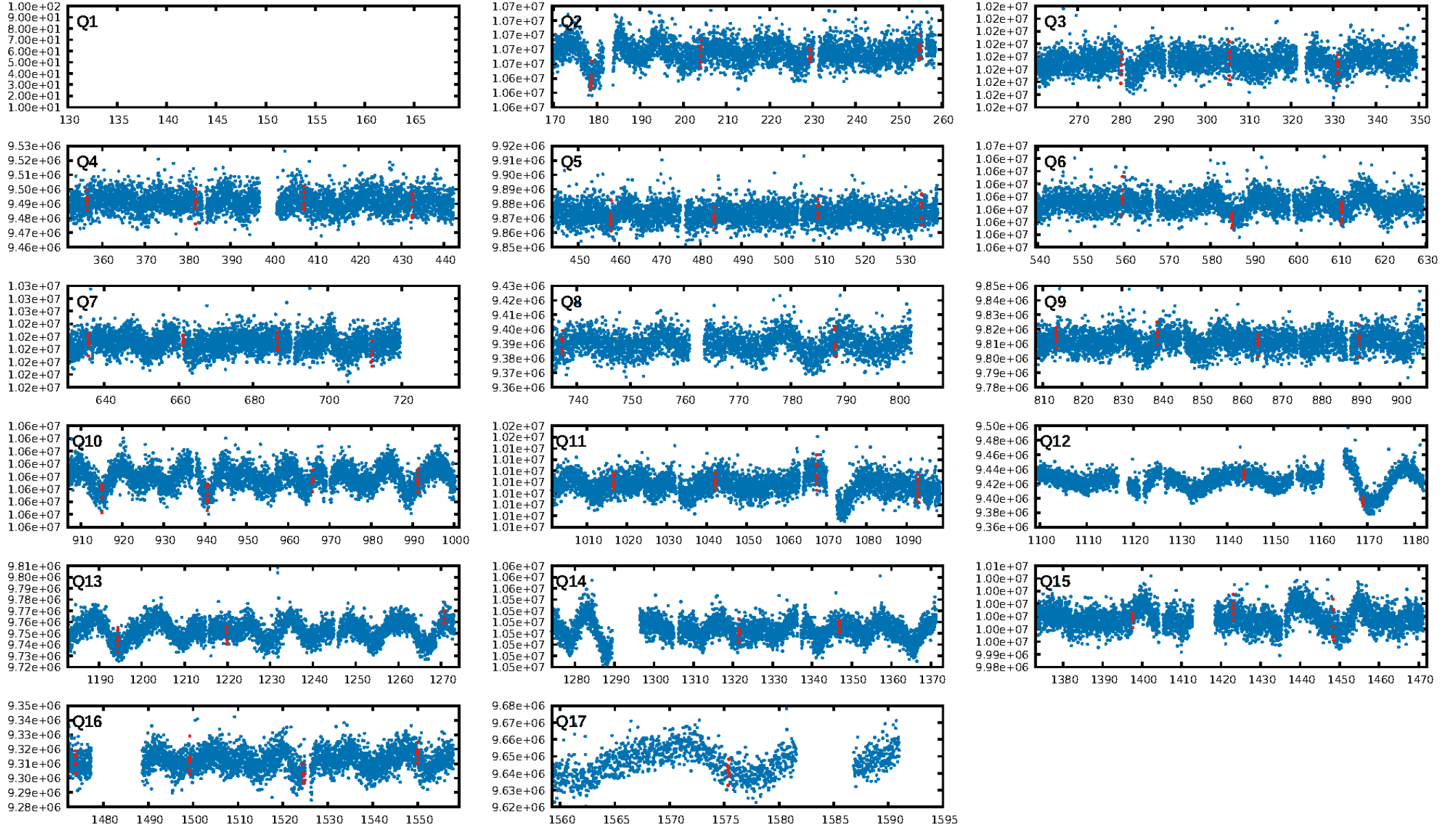
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [20.14 $\sigma$ ]  
LongPeriod-sig: 100.0% [7.43 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 70.5%  
Bootstrap-pfa: 3.26e-11  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: 0.5337  
Centroid-sig: 18.4%  
Centroid-so: 0.719 arcsec [1.16 $\sigma$ ]  
OotOffset-rm: 2.279 arcsec [1.71 $\sigma$ ]  
OotOffset-st: 2/1/4/1 [8]  
KicOffset-rm: 2.097 arcsec [1.58 $\sigma$ ]  
KicOffset-st: 2/1/4/1 [8]  
DiffImageQuality-fgm: 0.00 [0/8]  
DiffImageOverlap-fno: 0.00 [0/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:58:27 Z

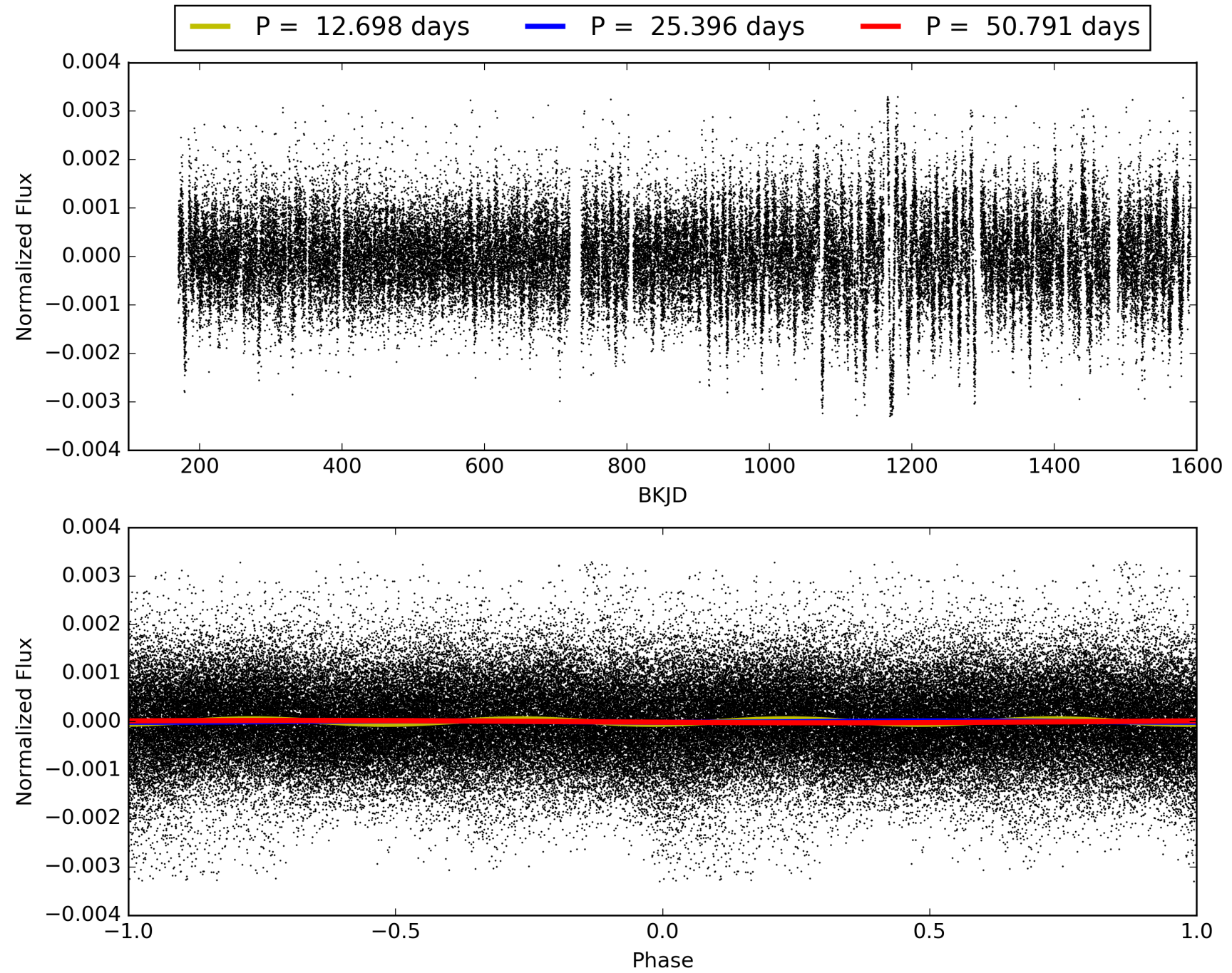
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007281838-03, PDC Light Curves



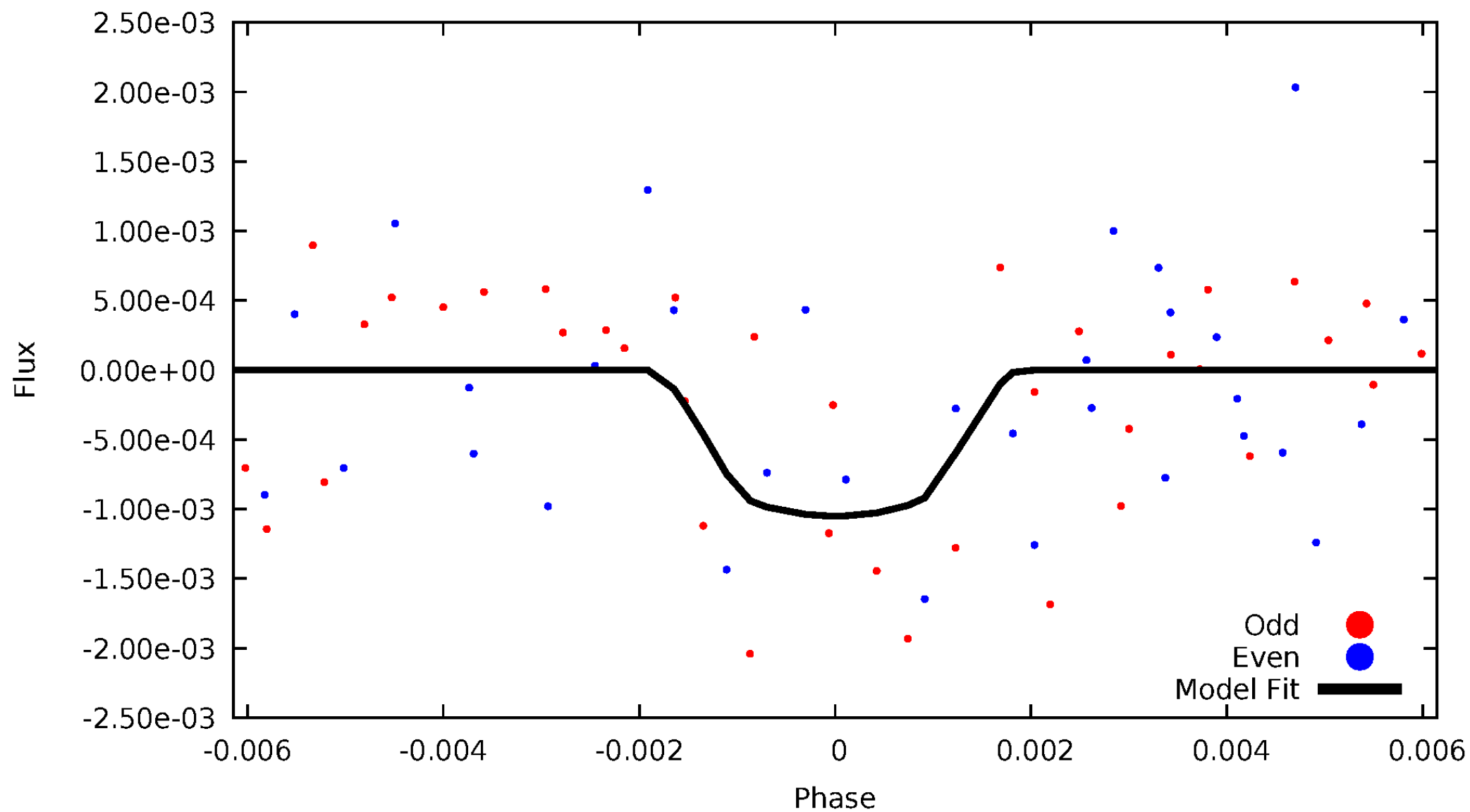


TCE 007281838-03



# DV Odd/Even

TCE 007281838-03



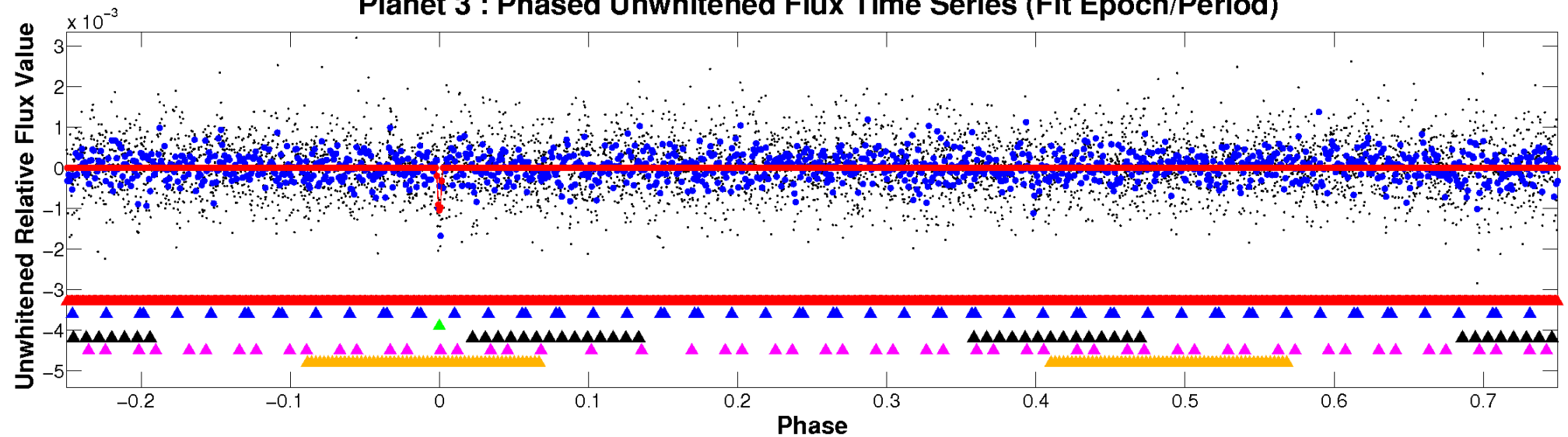


ALT Odd/Even

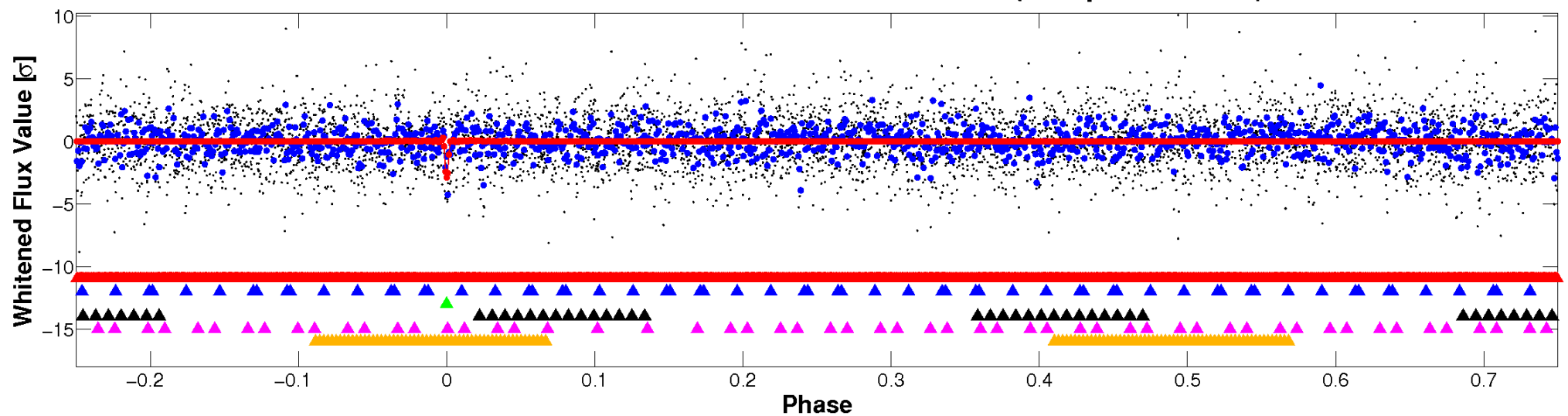
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

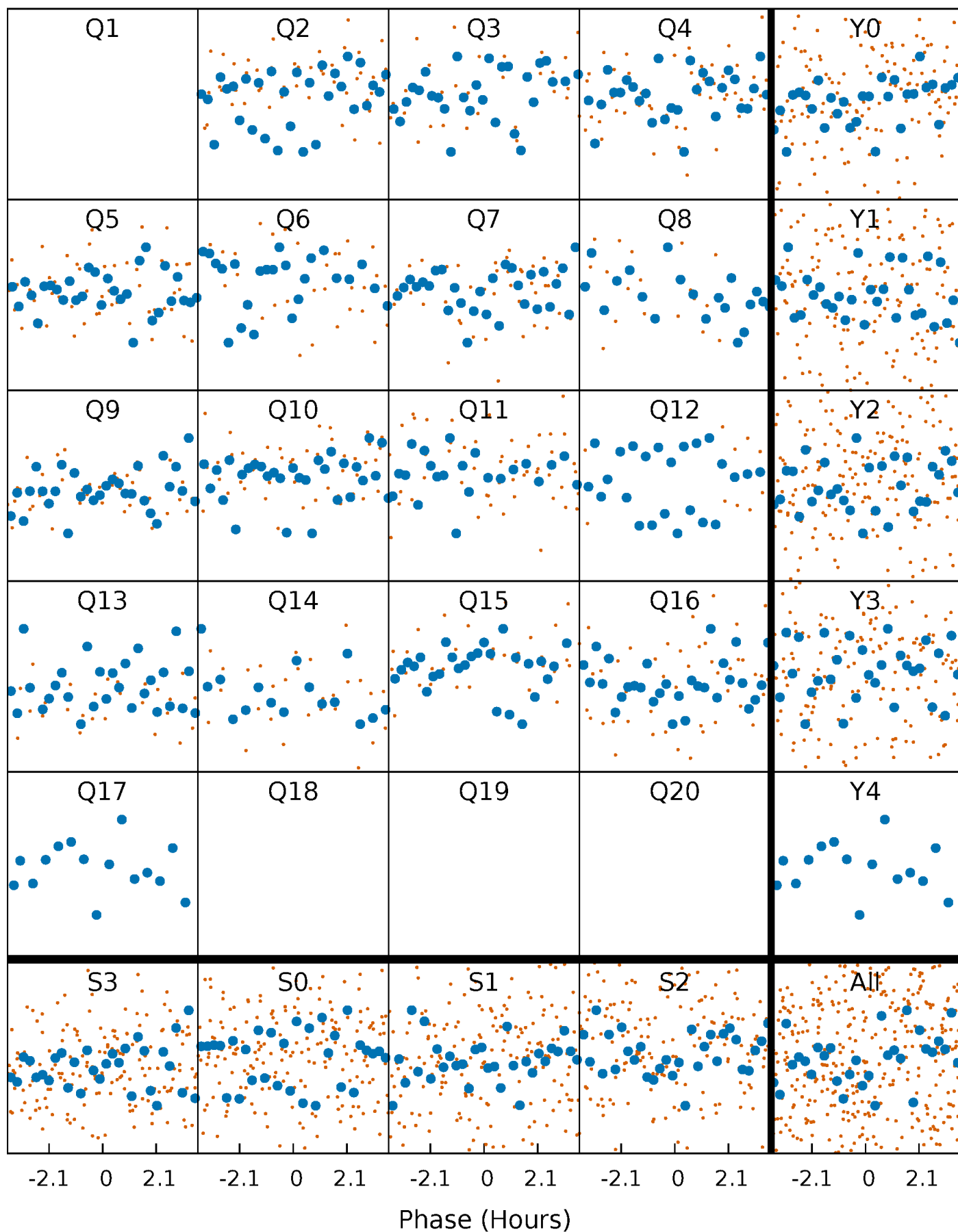


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

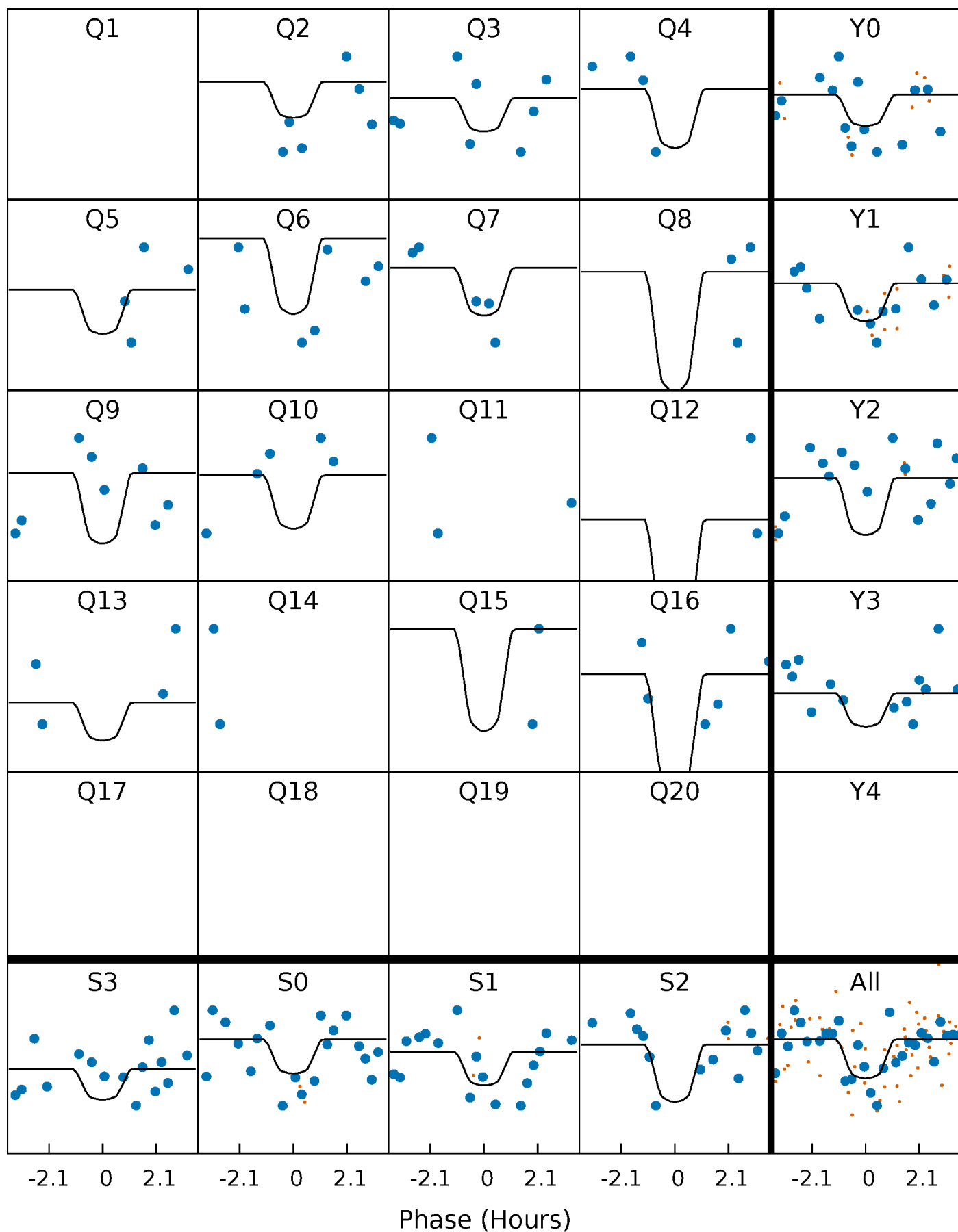
TCE 007281838-03 P= 25.395660 Days  $T_0=153.219359$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 007281838-03 P= 25.395660 Days  $T_0=153.219359$  (BKJD)

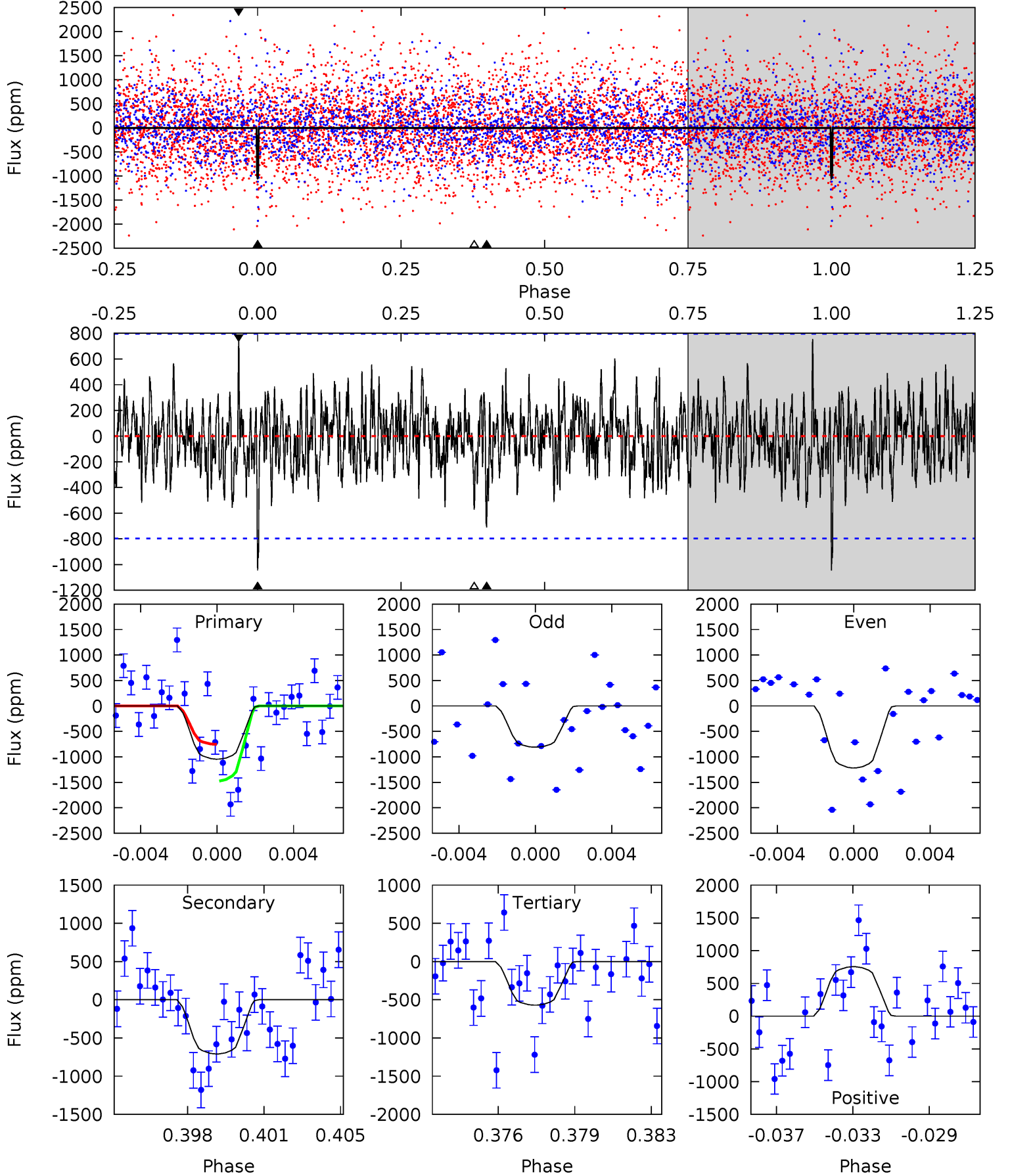


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

007281838-03, P = 25.395660 Days, E = 153.219359 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
6.84	4.64	3.73	4.94	5.21	2.90	1.32	3.11	1.90	0.91	-0.30	1.32	0.90	0.42	2.35



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 007281838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6116^{+170}_{-233}$	$4.440^{+0.058}_{-0.184}$	$0.210^{+0.150}_{-0.300}$	$1.084^{+0.292}_{-0.104}$	$1.181^{+0.119}_{-0.164}$	$1.307^{+0.321}_{-0.632}$
	+3%/-4%	+1%/-4%	+71%/-143%	+27%/-10%	+10%/-14%	+25%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007281838-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-709 \pm 153$	$8.40^{+7.63}_{-5.90}$	$941^{+65}_{-47}$	$4124^{+2862}_{-847}$	$180^{+1758}_{-136}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

## DV Centroid Data

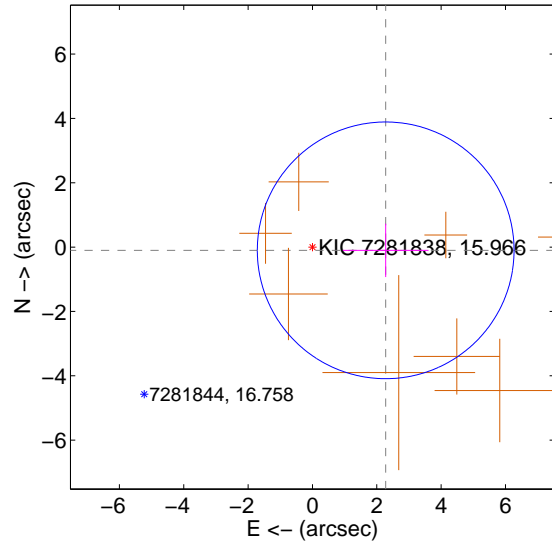
Supplemental centroid analysis for 007281838-03. Kepler magnitude: 15.97. Transit SNR 8.81

There are 0 quarters with good PRF difference image offsets

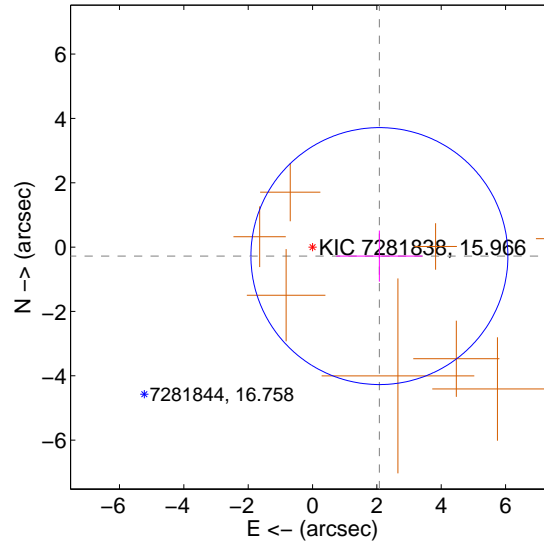
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.279 \pm 1.330$	1.71	$-2.277 \pm 1.331$	$-0.101 \pm 0.829$
PRF-fit source offset from KIC position	$2.097 \pm 1.331$	1.58	$-2.079 \pm 1.339$	$-0.279 \pm 0.792$
photometric centroid source offset	$0.72 \pm 0.62$	1.16	$0.30 \pm 0.67$	$-0.66 \pm 0.61$

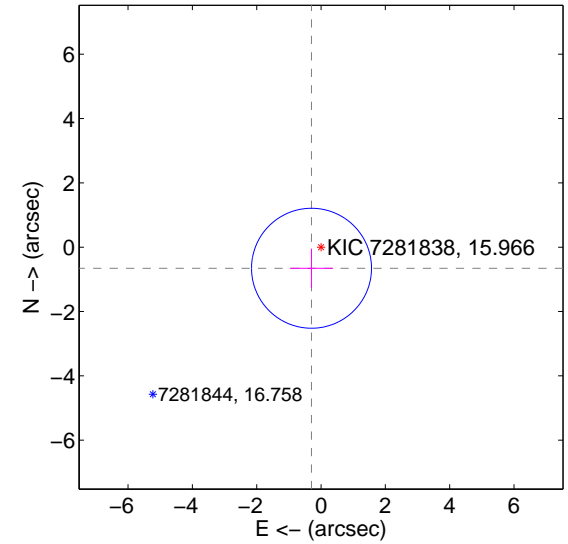
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



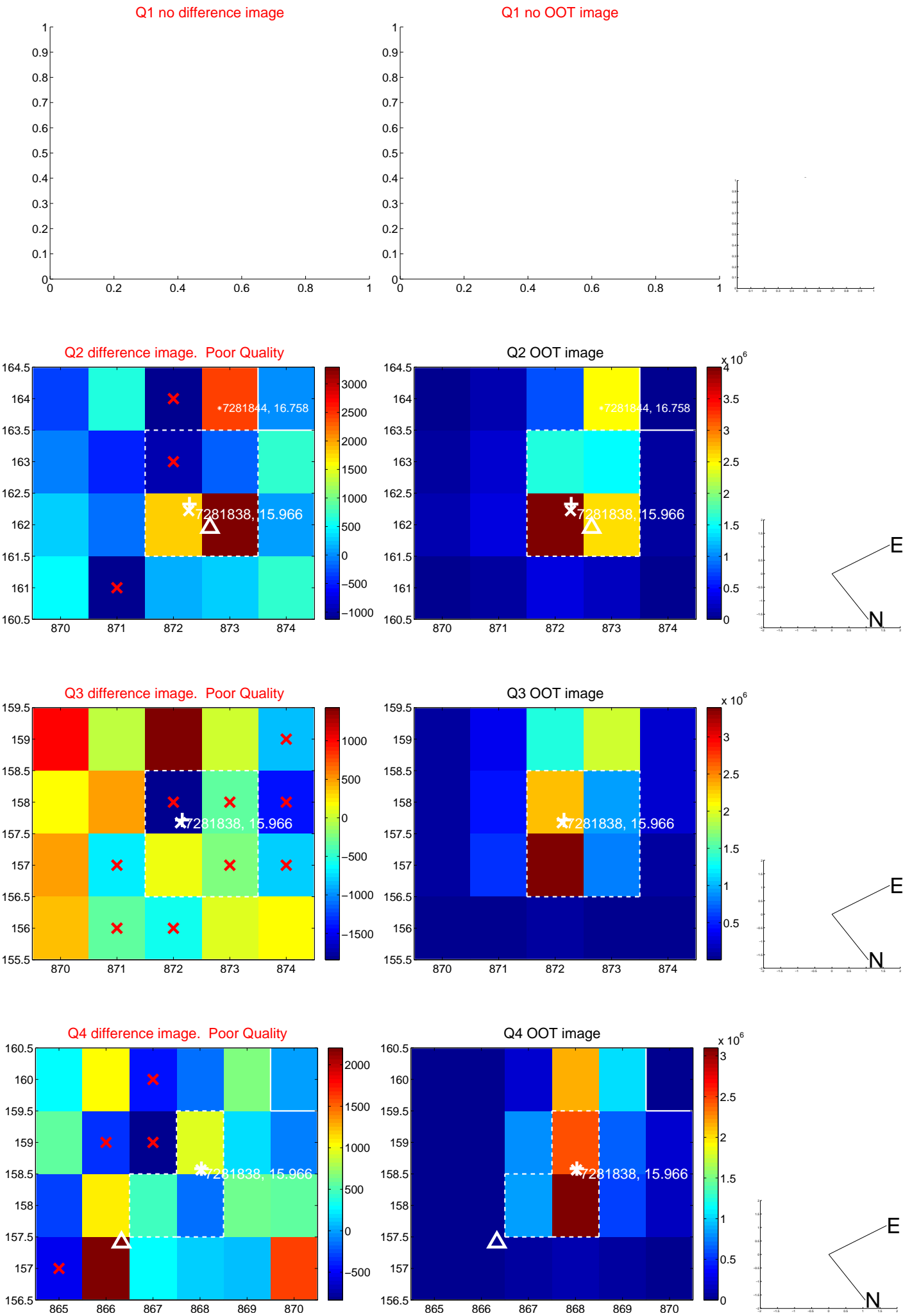
offset from photometric centroids



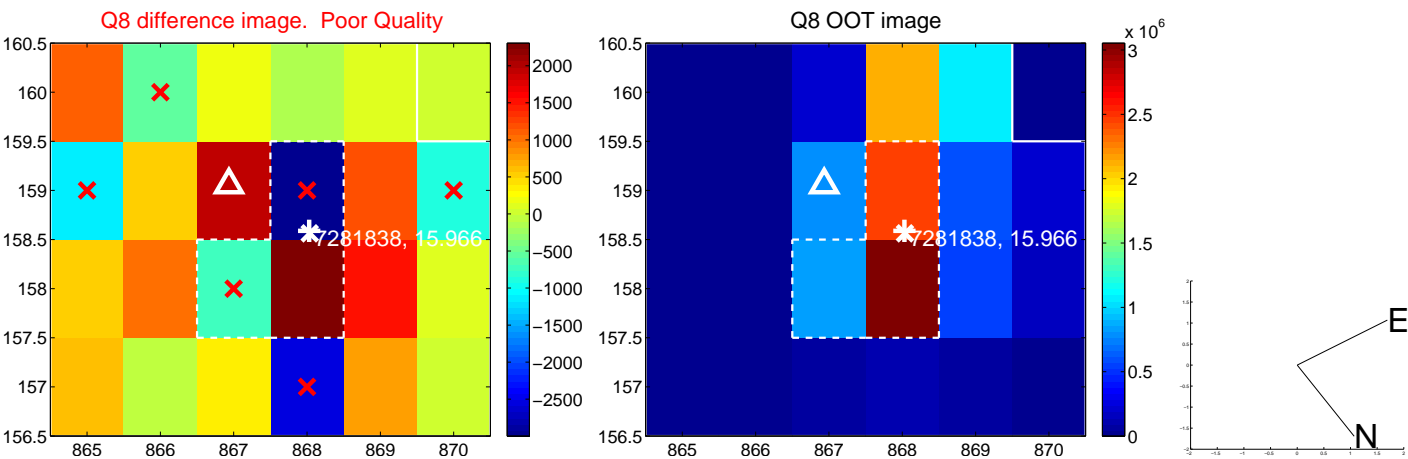
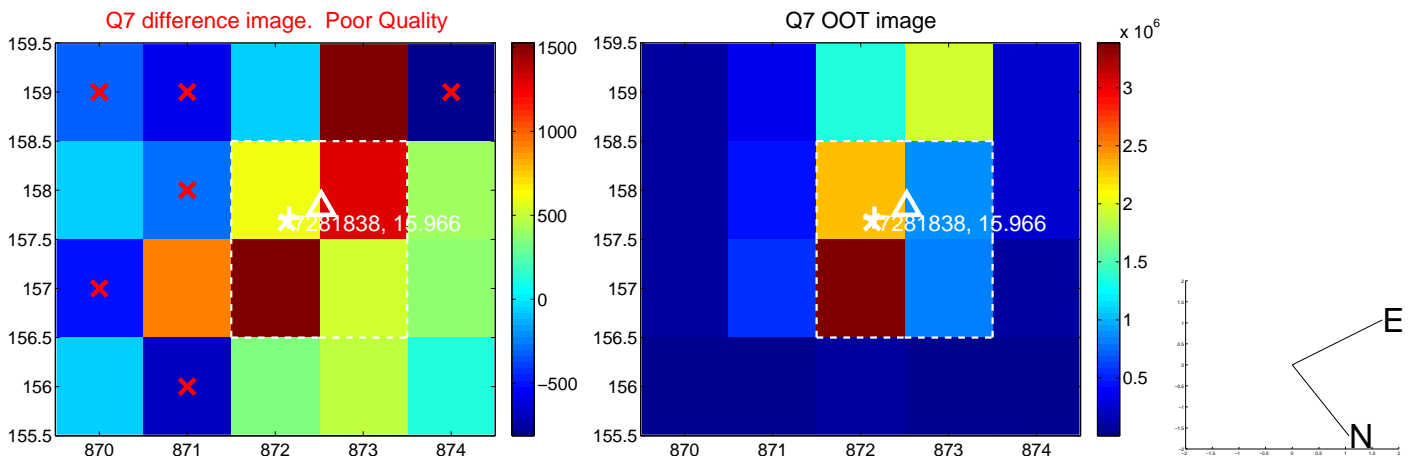
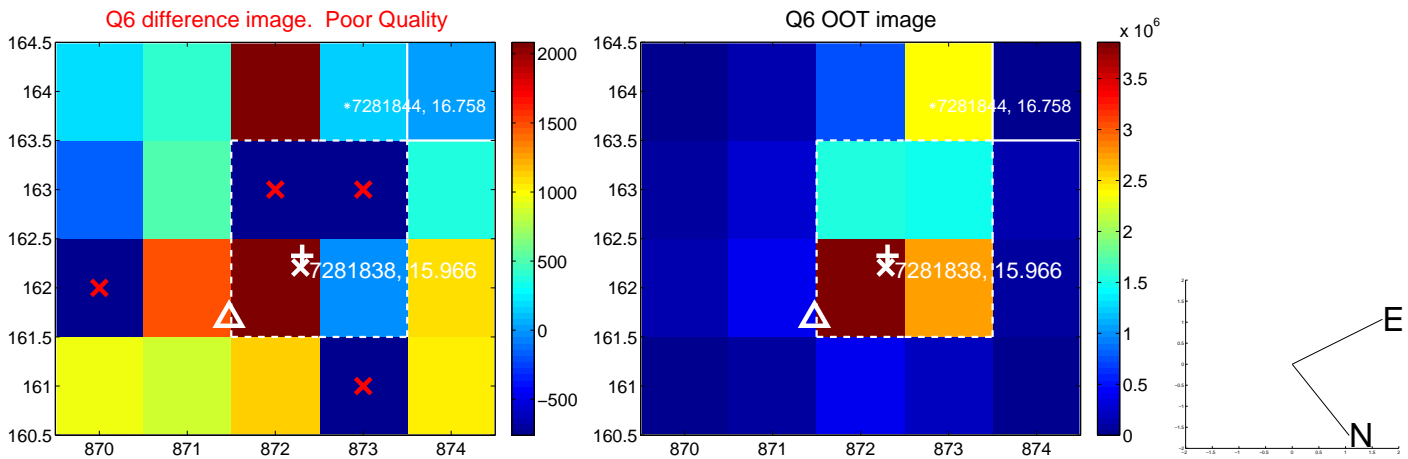
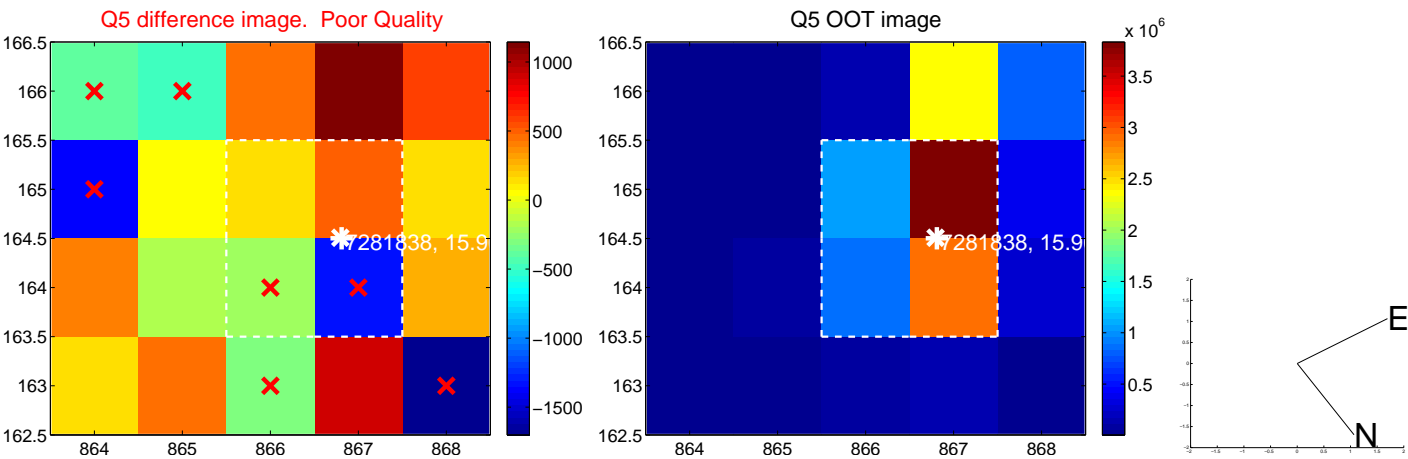
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



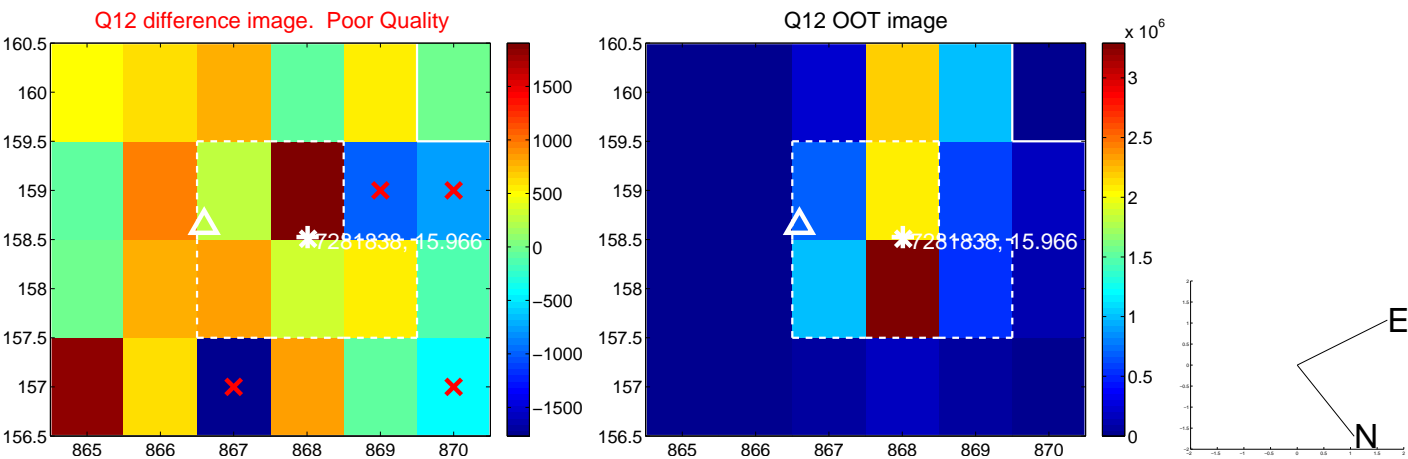
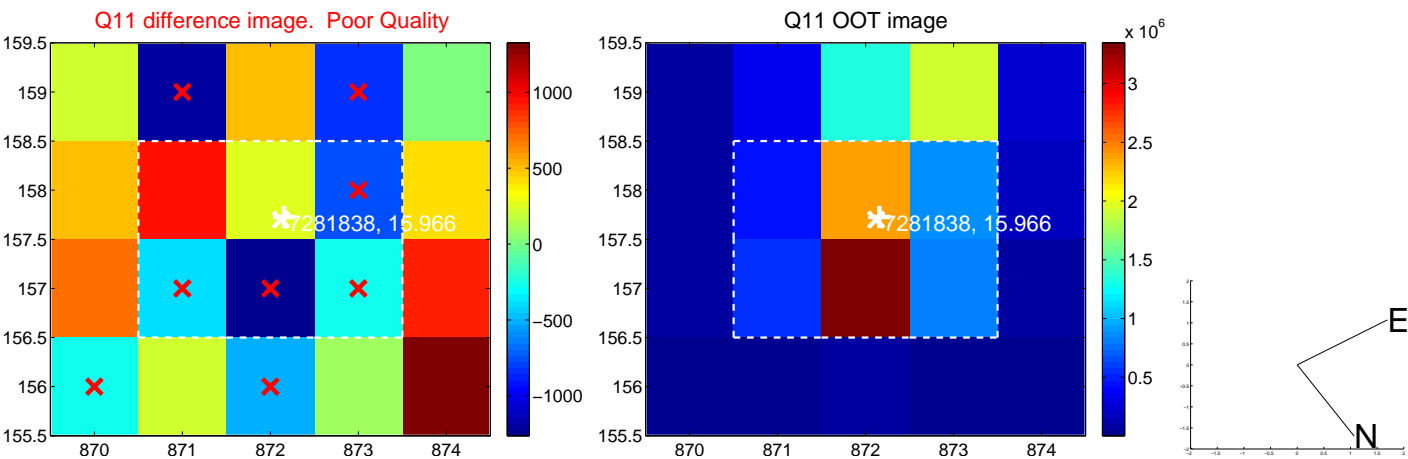
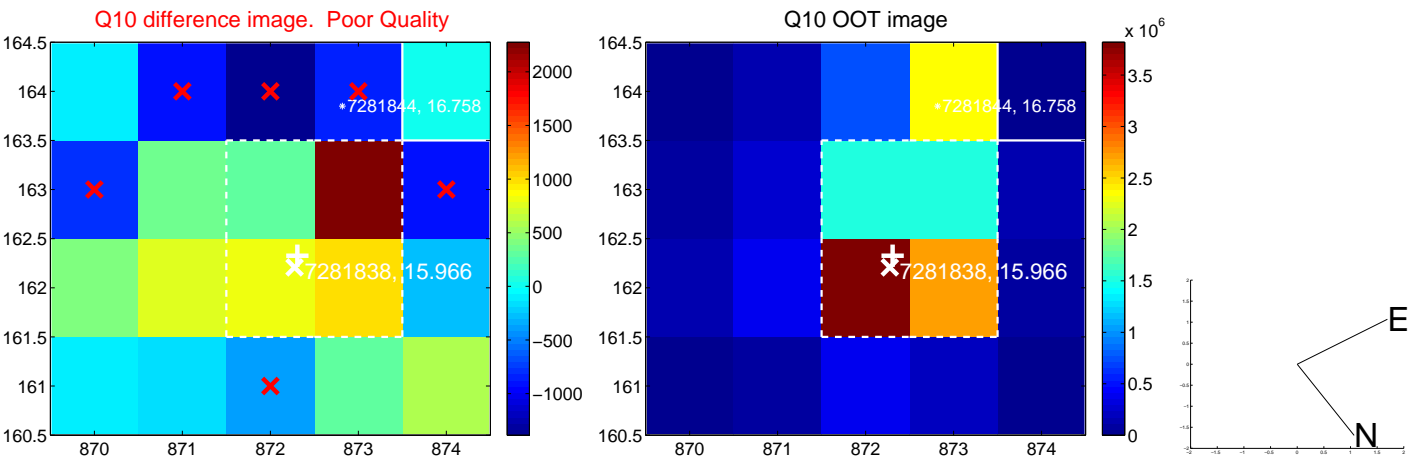
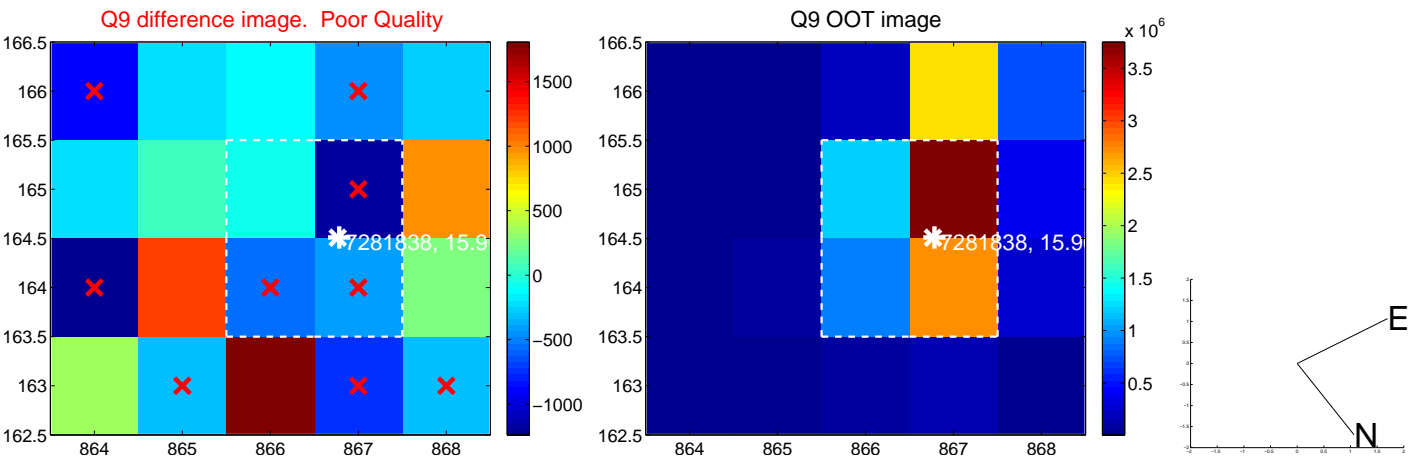
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



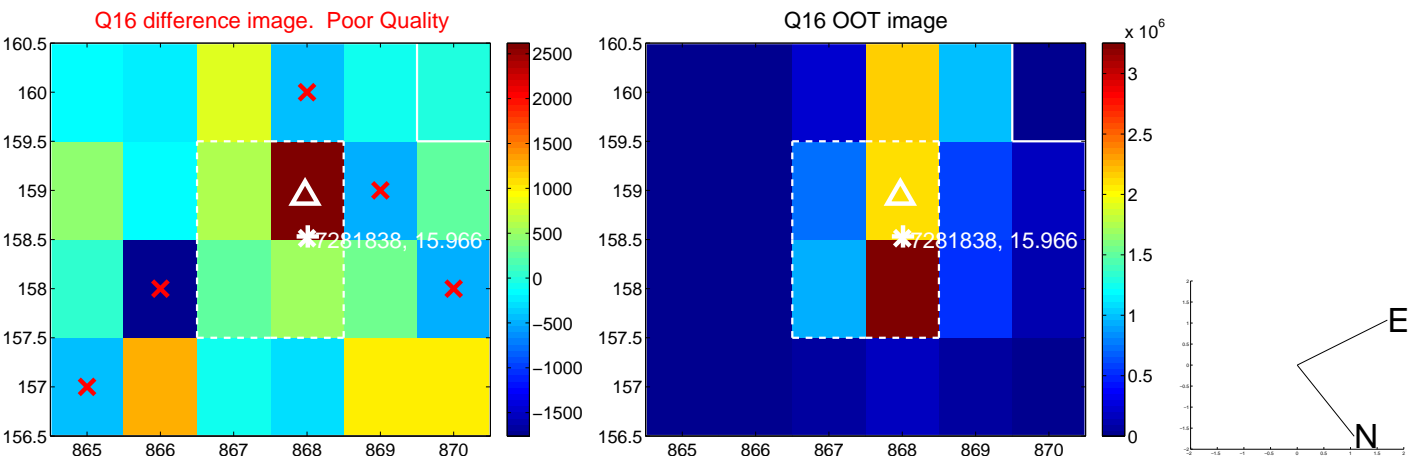
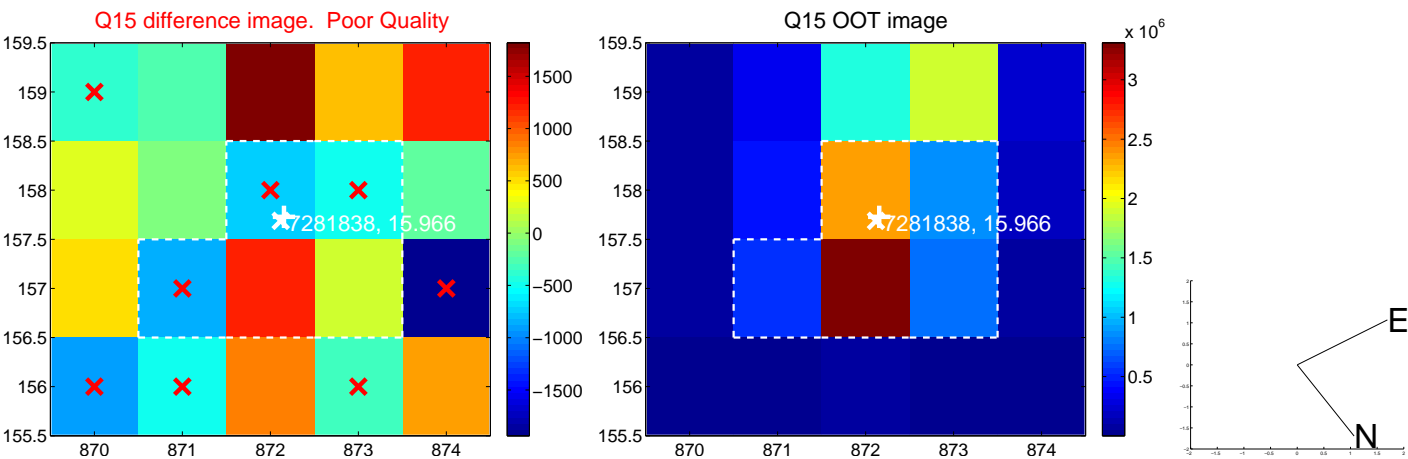
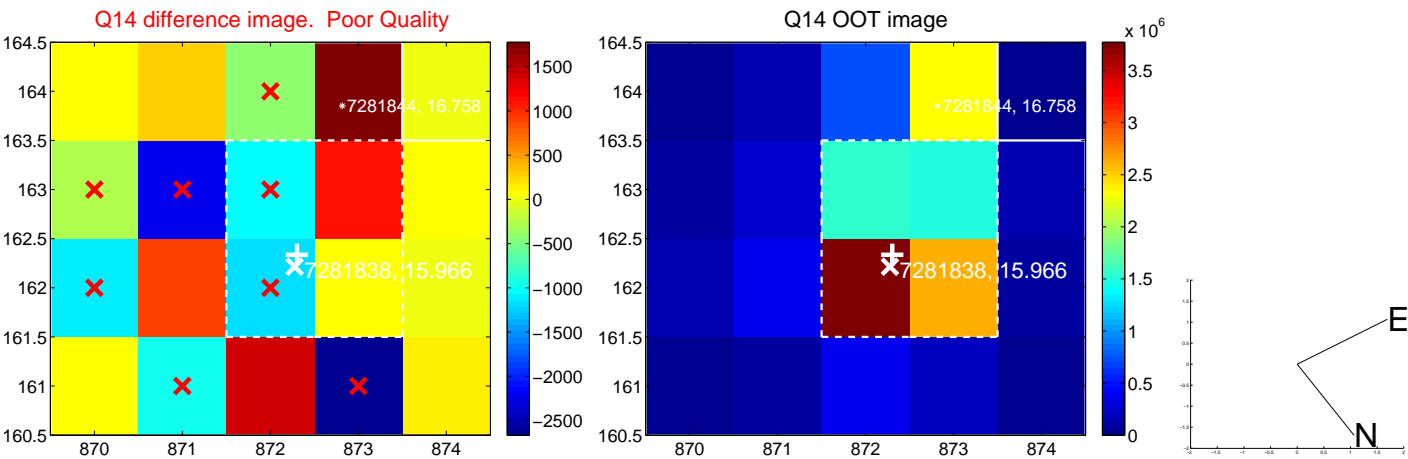
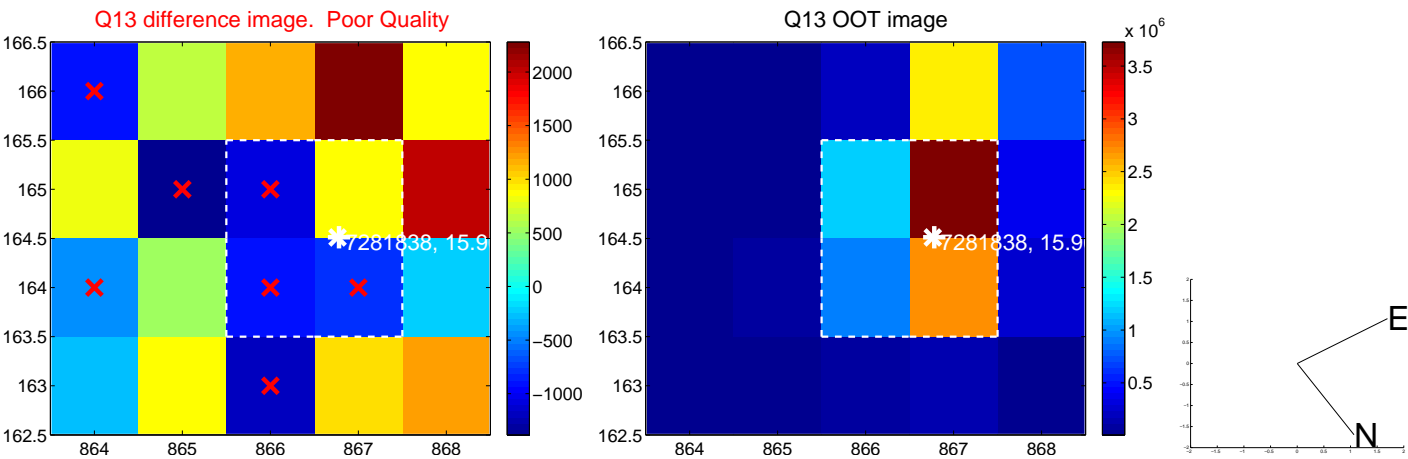
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



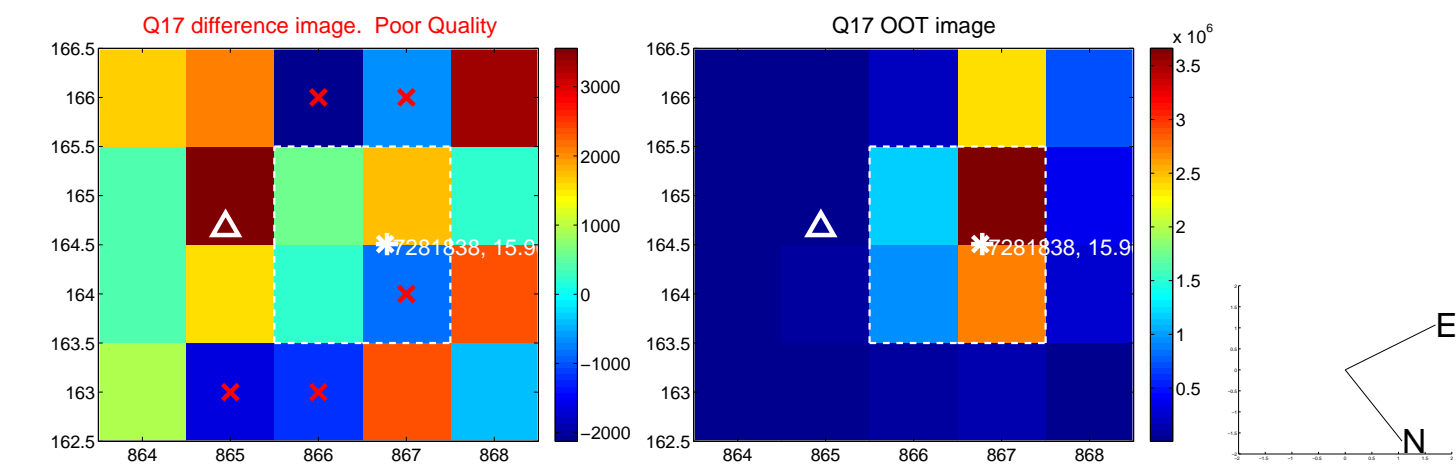
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



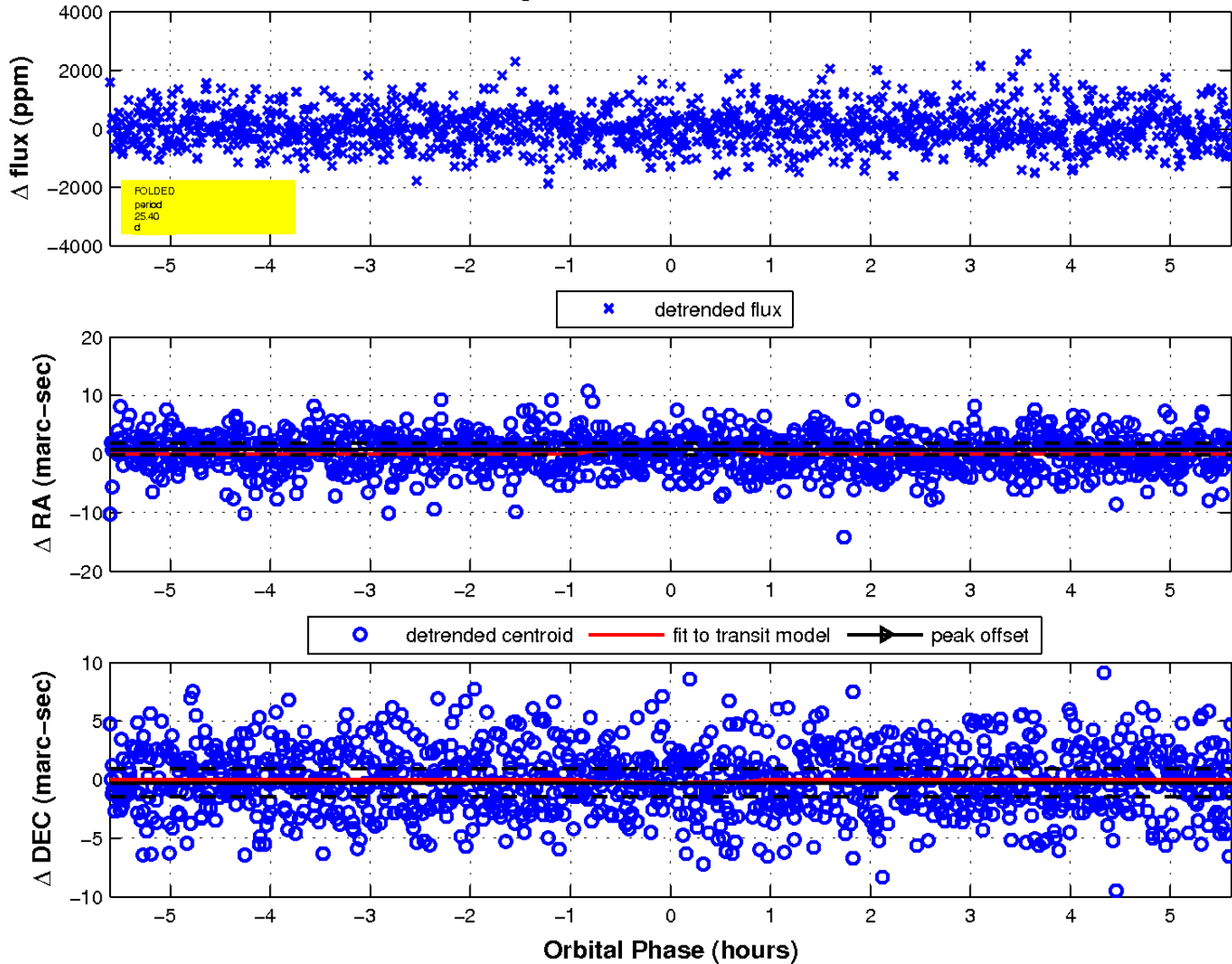
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

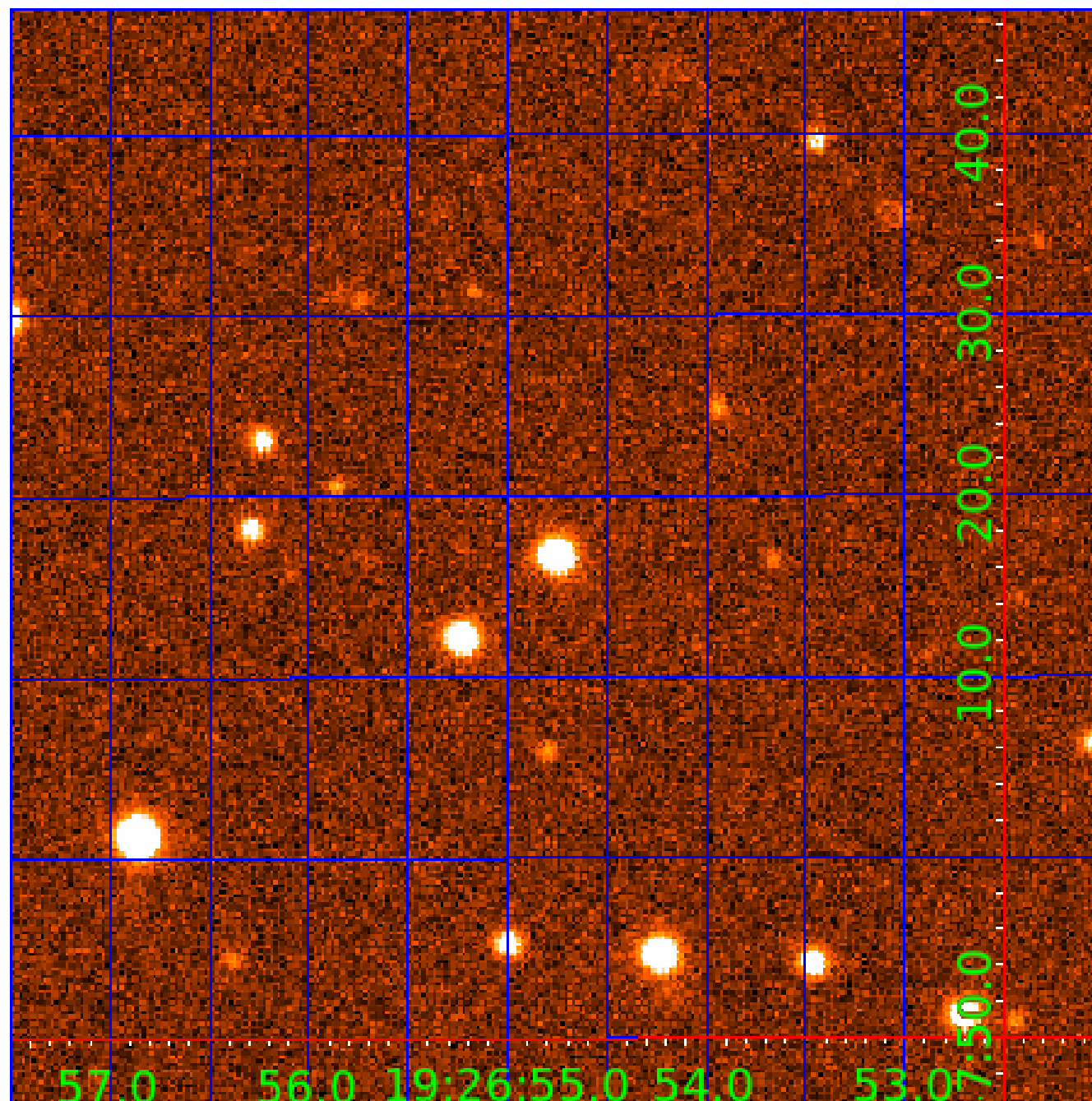


fluxWeightedCentroids, Planet 3 of 6



UKIRT Image

Declination





# KIC 007281838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007281838-01	OBS	No	0.566752	131.853725	45.4	3.967	13.0	7.8	1.08	6116	0.74	7338.25
007281838-02	OBS	No	23.034622	143.976175	1060.1	2.101	10.0	9.6	1.08	6116	3.53	52.51
007281838-03	OBS	No	25.395660	153.219359	1049.5	1.872	10.4	8.8	1.08	6116	3.93	46.11
007281838-04	OBS	No	33.933401	145.247478	1647.1	1.140	11.9	11.3	1.08	6116	4.41	31.33
007281838-05	OBS	No	26.251749	132.692163	1756.8	2.033	9.1	12.1	1.08	6116	8.73	44.11
007281838-06	OBS	No	12.662621	142.254739	1117.7	1.069	9.7	10.5	1.08	6116	4.00	116.61

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007281838-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
007281838-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007281838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007281838-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_DIFFS

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

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

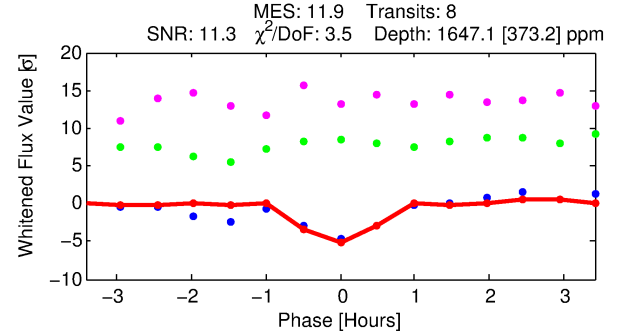
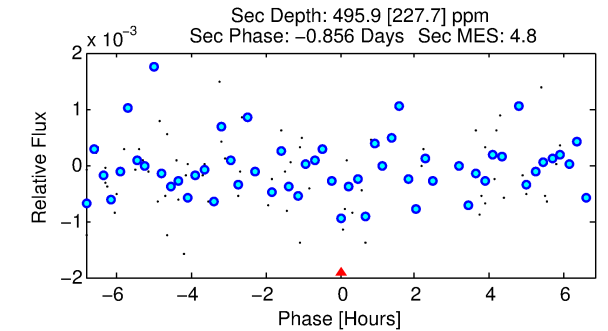
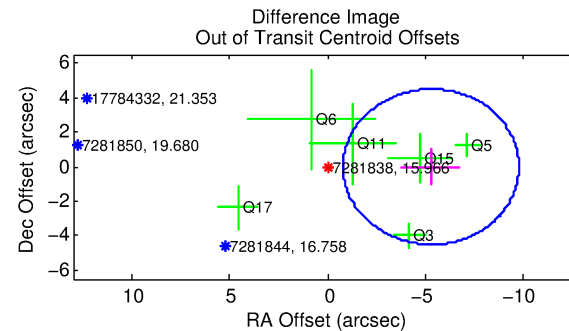
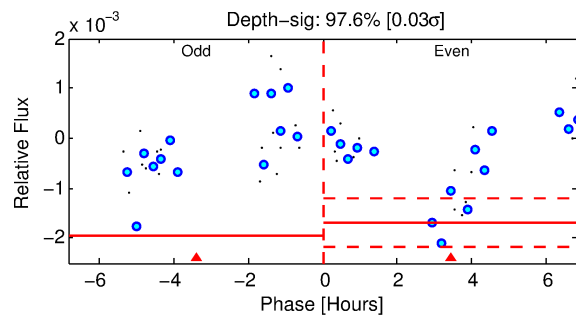
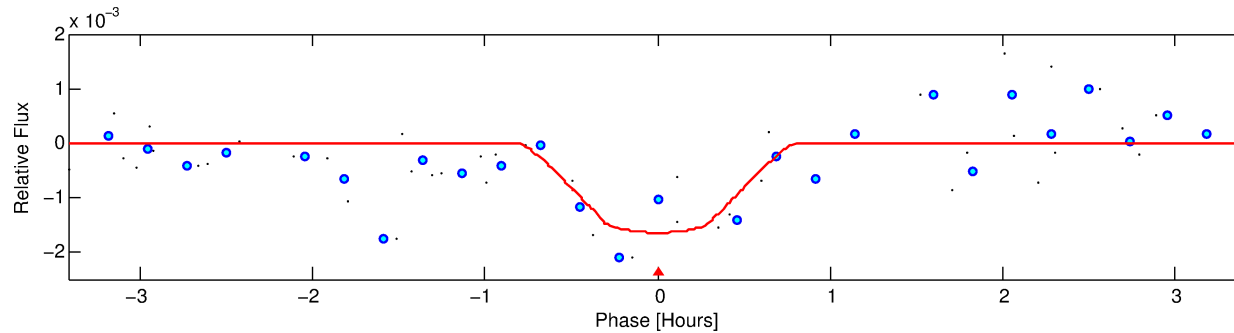
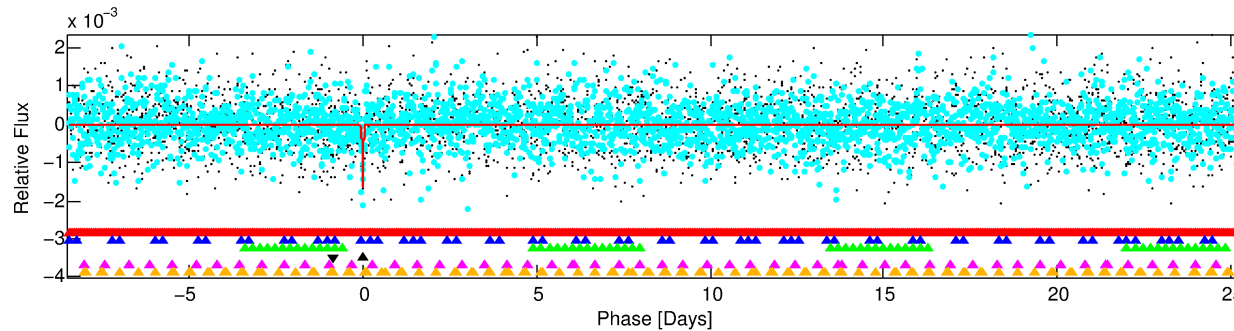
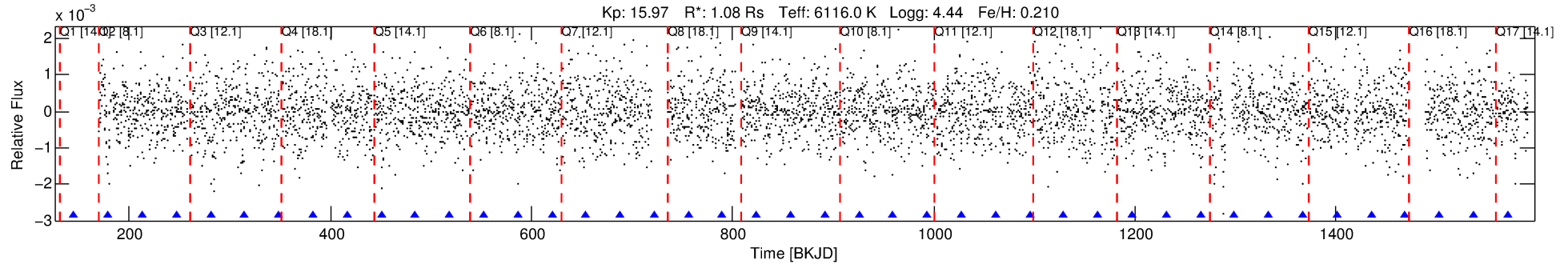
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007281838-04

No Significant Match Found

# DV One-Page Summary

KIC: 7281838 Candidate: 4 of 6 Period: 33.933 d



## DV Fit Results:

Period = 33.93340 [0.00041] d  
Epoch = 145.2475 [0.0095] BKJD  
Rp/R\* = 0.0373 [0.1172]  
a/R\* = 234.51 [3459.14]  
b = 0.11 [131.70]  
Seff = 31.33 [11.52]  
Teq = 603 [55] K  
Rp = 4.41 [13.92] Re  
a = 0.2168 [0.0495] AU  
Ag = 658.65 [4156.29] [0.16 $\sigma$ ]  
Teffp = 4725 [7446] K [0.55 $\sigma$ ]

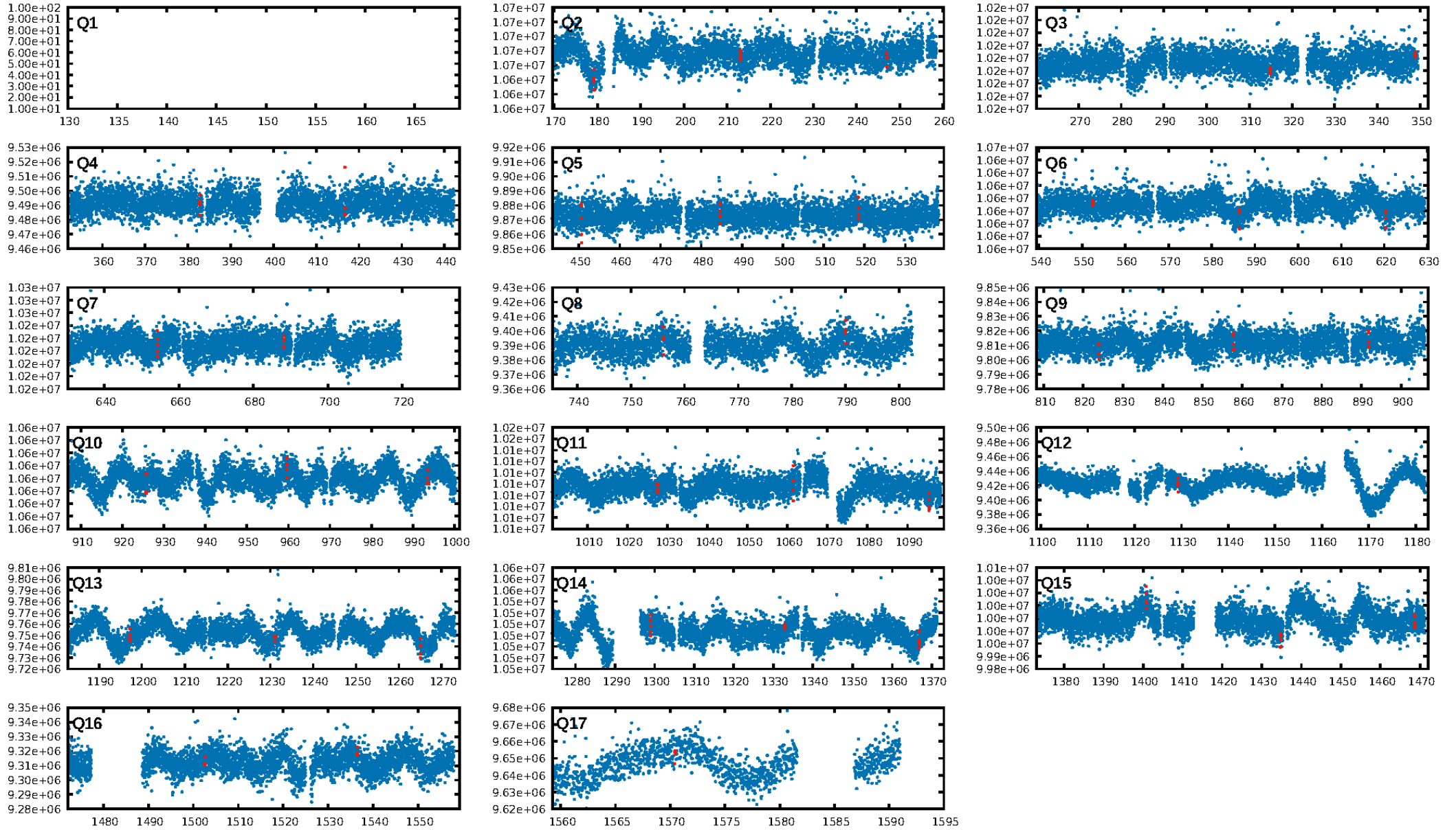
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [79.08 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.7%  
ModelChiSquareGof-sig: 67.4%  
Bootstrap-pfa: 3.57e-13  
GhostDiagnostic-chr: 0.132  
Centroid-sig: 14.5%  
Centroid-so: 1.724 arcsec [3.02 $\sigma$ ]  
OotOffset-rm: 5.286 arcsec [3.53 $\sigma$ ]  
KicOffset-rm: 5.098 arcsec [3.21 $\sigma$ ]  
OotOffset-st: 1/3/0/2 [6]  
KicOffset-st: 1/3/0/2 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 0.00 [0/16]

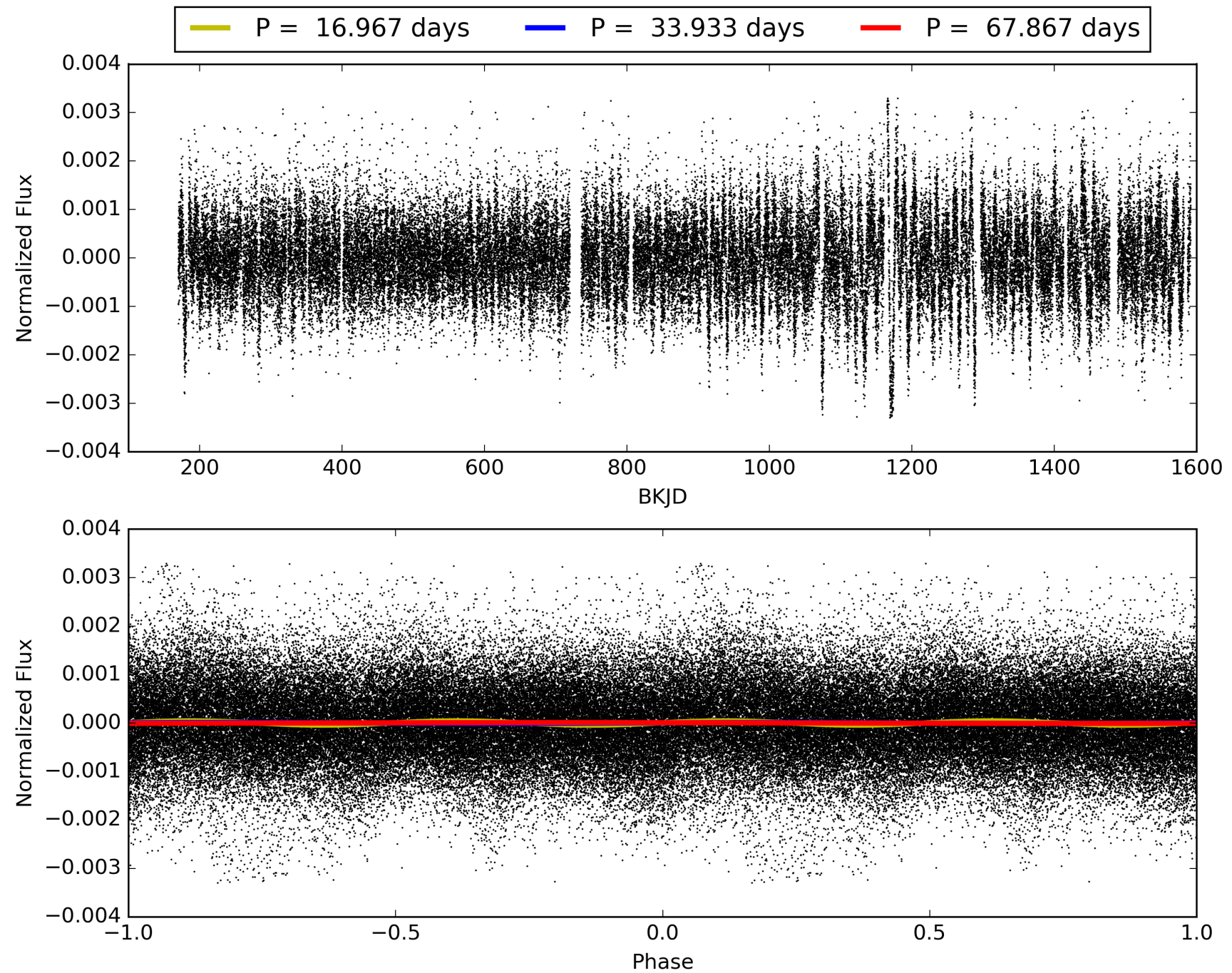
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:58:30 Z

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

# TCE 007281838-04, PDC Light Curves

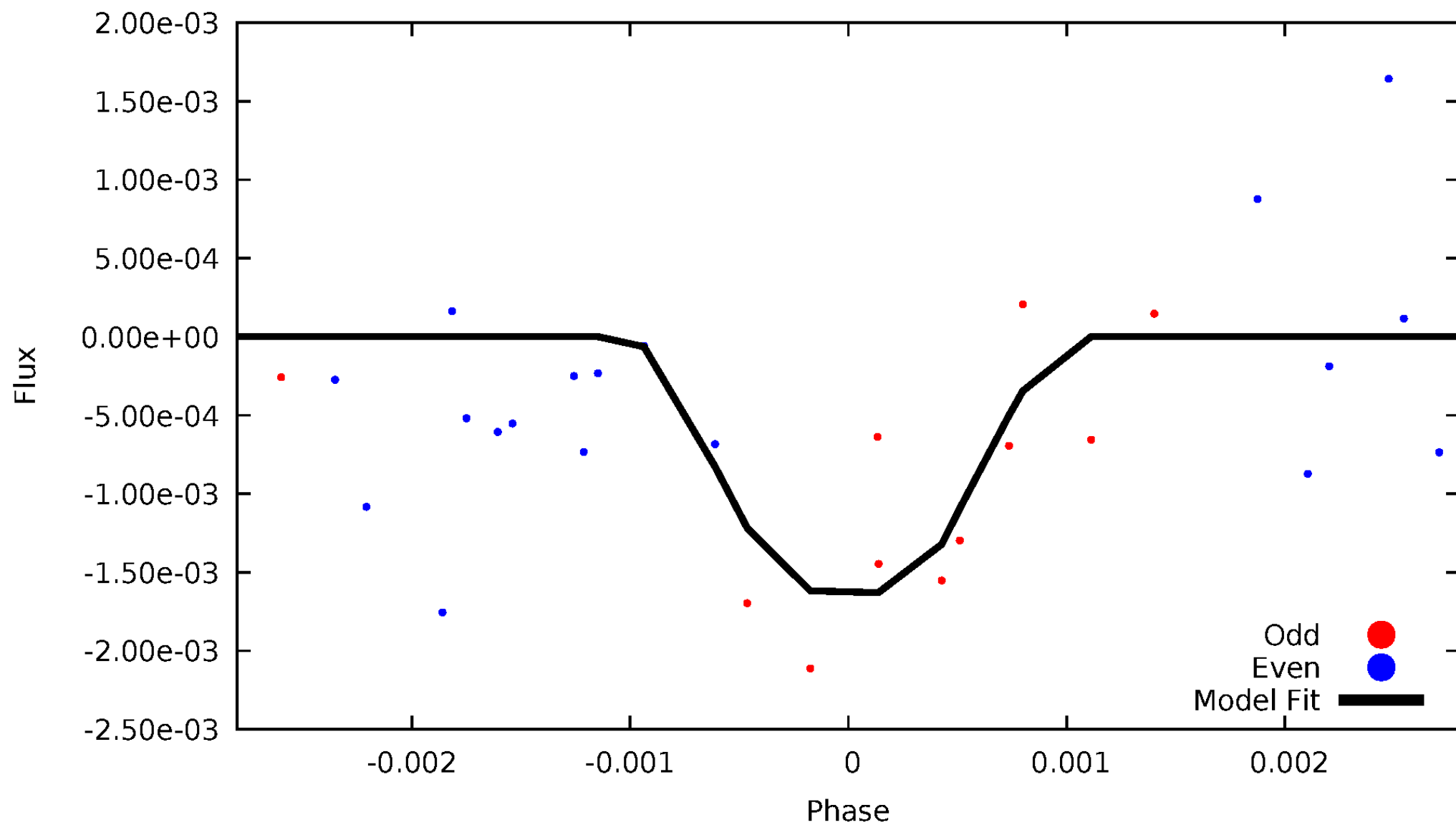


# TCE 007281838-04



# DV Odd/Even

TCE 007281838-04





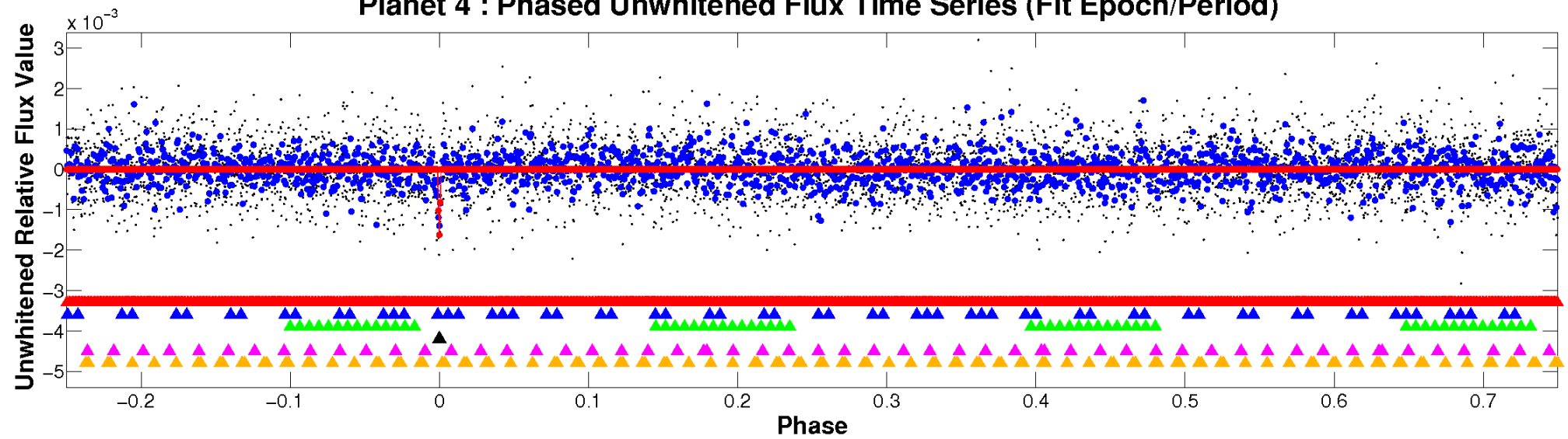
ALT Odd/Even

This plot does not exist for this TCE.

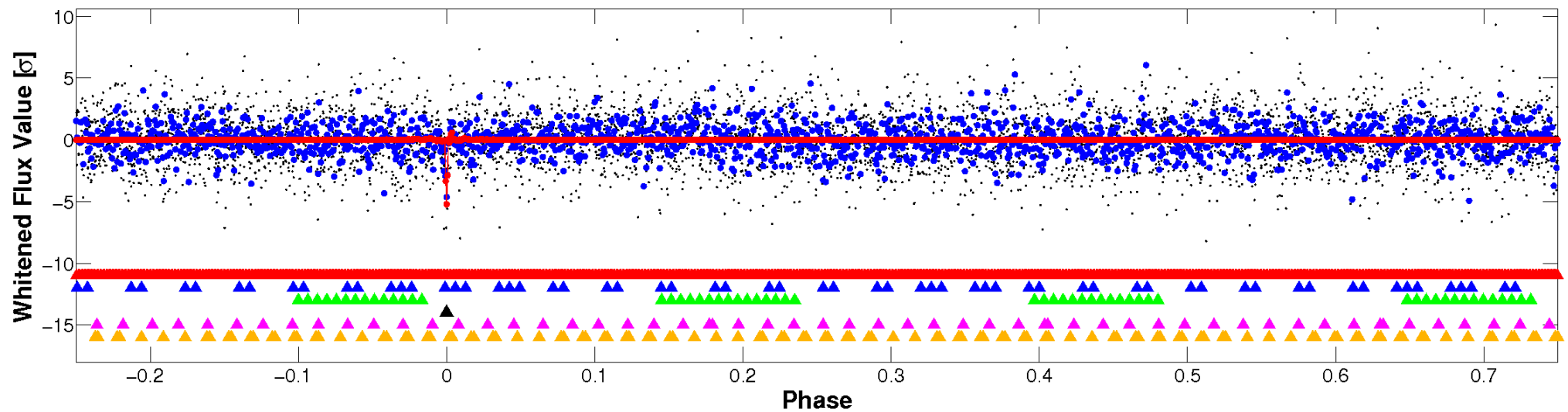


# Non-Whitened Vs. Whitened Light Curve

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

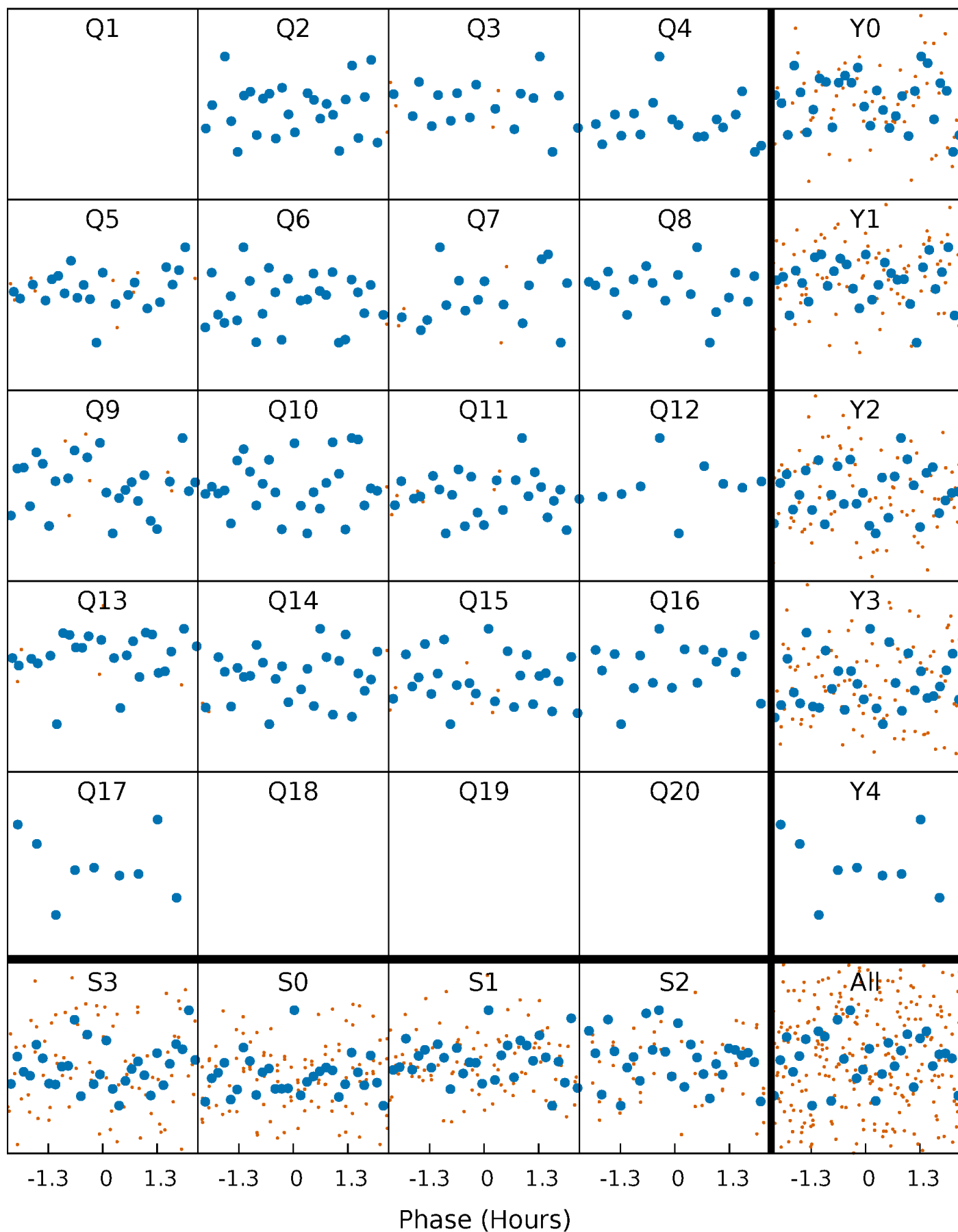


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



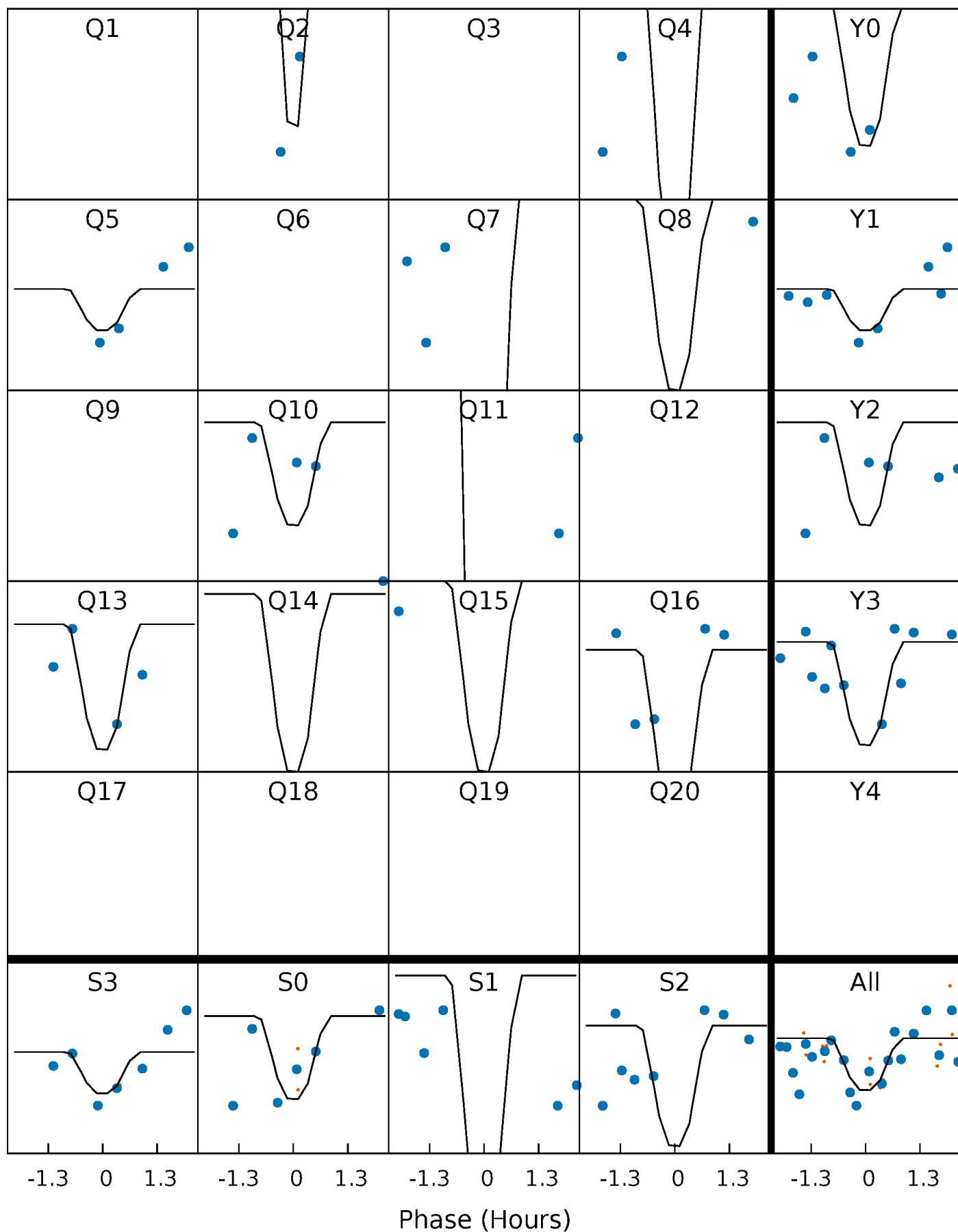
# PDC Quarter-Phased Transit Curves

TCE 007281838-04 P= 33.933401 Days  $T_0=145.247478$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 007281838-04 P= 33.933401 Days  $T_0=145.247478$  (BKJD)

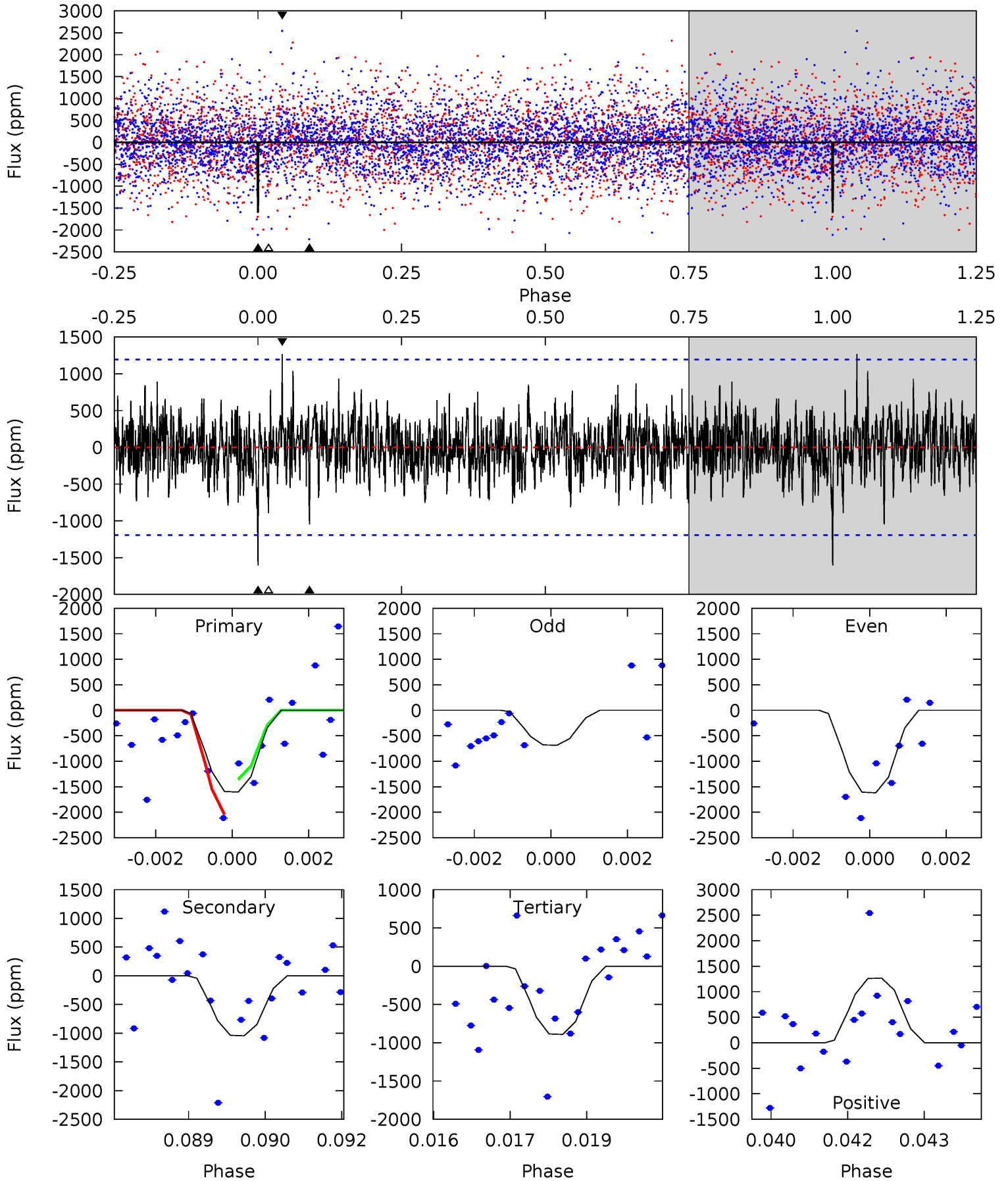


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

007281838-04, P = 33.933401 Days, E = 145.247478 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.19	4.69	4.00	5.69	5.35	3.13	1.31	3.20	1.51	0.69	-1.00	1.40	0.87	0.44	1.51



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 007281838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6116^{+170}_{-233}$	$4.440^{+0.058}_{-0.184}$	$0.210^{+0.150}_{-0.300}$	$1.084^{+0.292}_{-0.104}$	$1.181^{+0.119}_{-0.164}$	$1.307^{+0.321}_{-0.632}$
	+3%/-4%	+1%/-4%	+71%/-143%	+27%/-10%	+10%/-14%	+25%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007281838-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1045 \pm 223$	$11.60^{+11.27}_{-8.20}$	$854^{+50}_{-41}$	$3856^{+2616}_{-703}$	$192^{+2005}_{-139}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

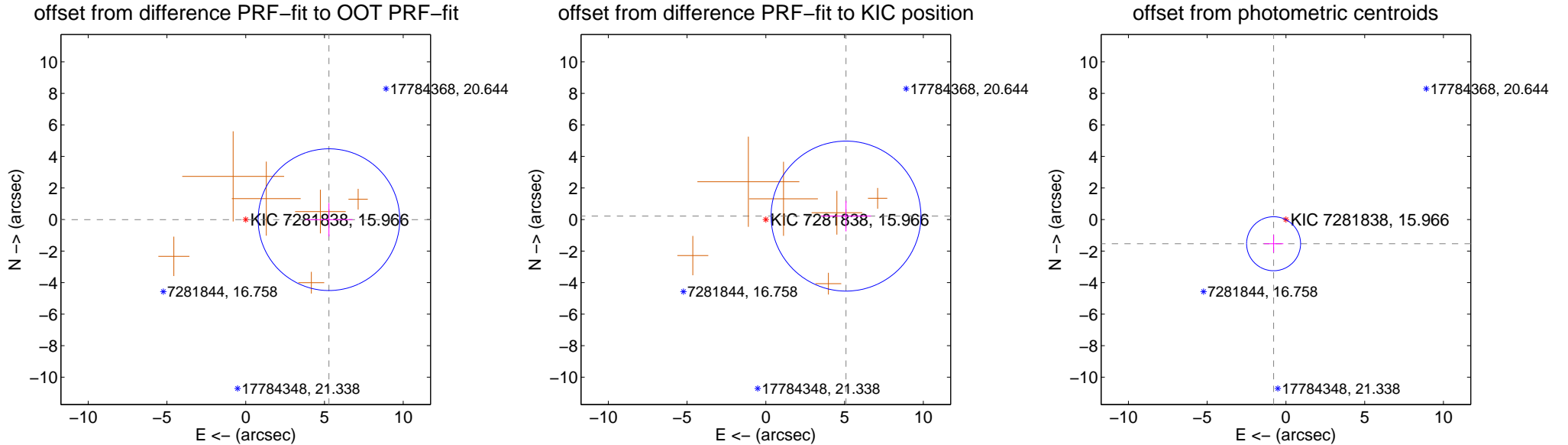
## DV Centroid Data

Supplemental centroid analysis for 007281838-04. Kepler magnitude: 15.97. Transit SNR 11.34

There are 0 quarters with good PRF difference image offsets

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

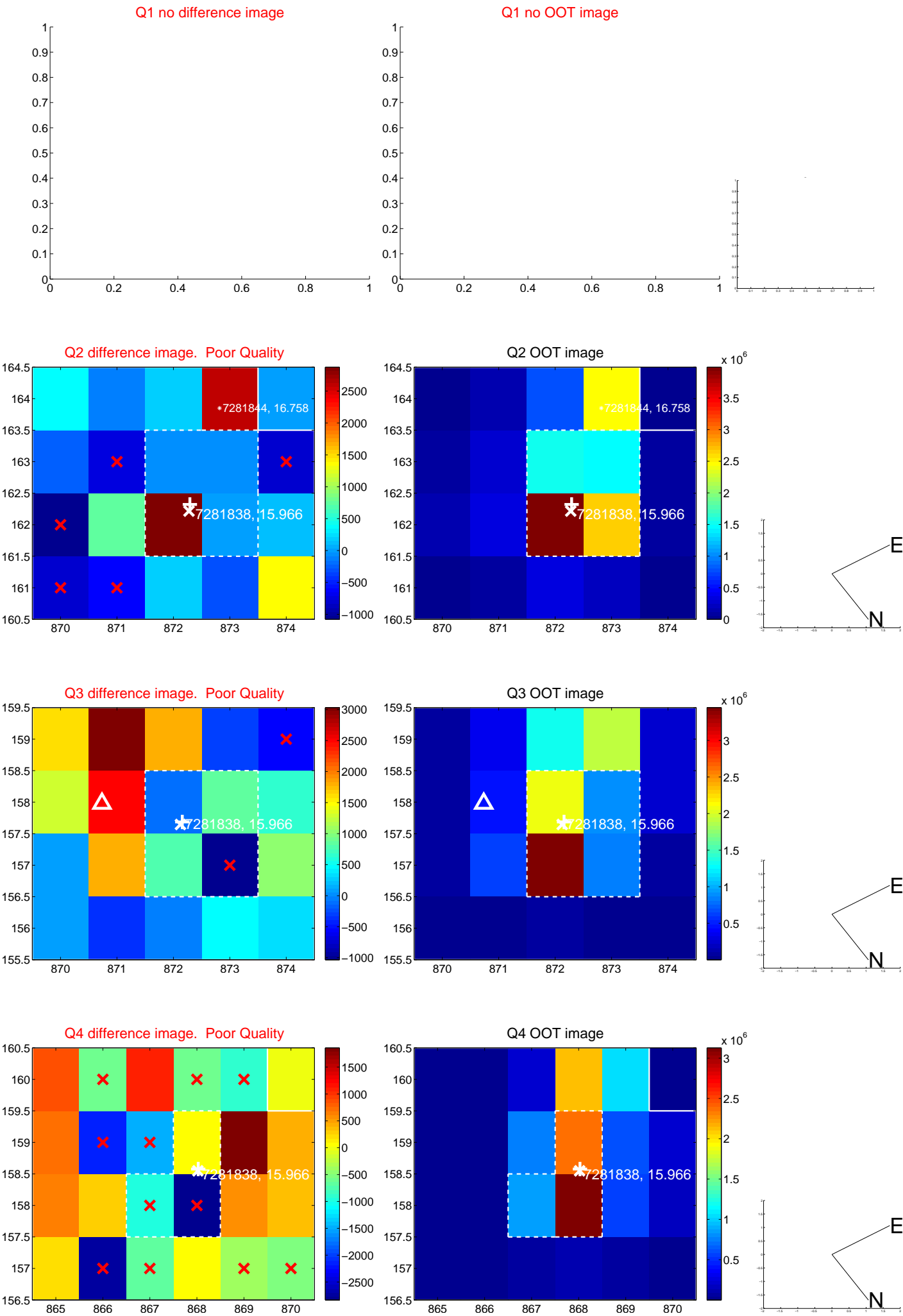
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.286 \pm 1.498$	3.53	$-5.286 \pm 1.498$	$-0.009 \pm 1.058$
PRF-fit source offset from KIC position	$5.098 \pm 1.586$	3.21	$-5.093 \pm 1.587$	$0.217 \pm 0.967$
photometric centroid source offset	$1.72 \pm 0.57$	3.02	$0.78 \pm 0.62$	$-1.54 \pm 0.56$



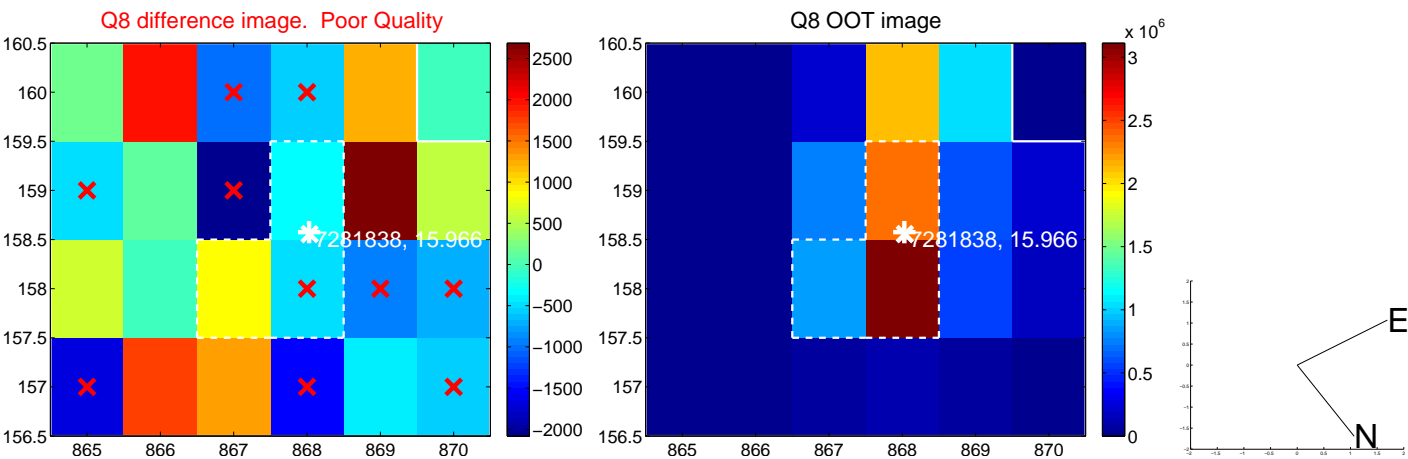
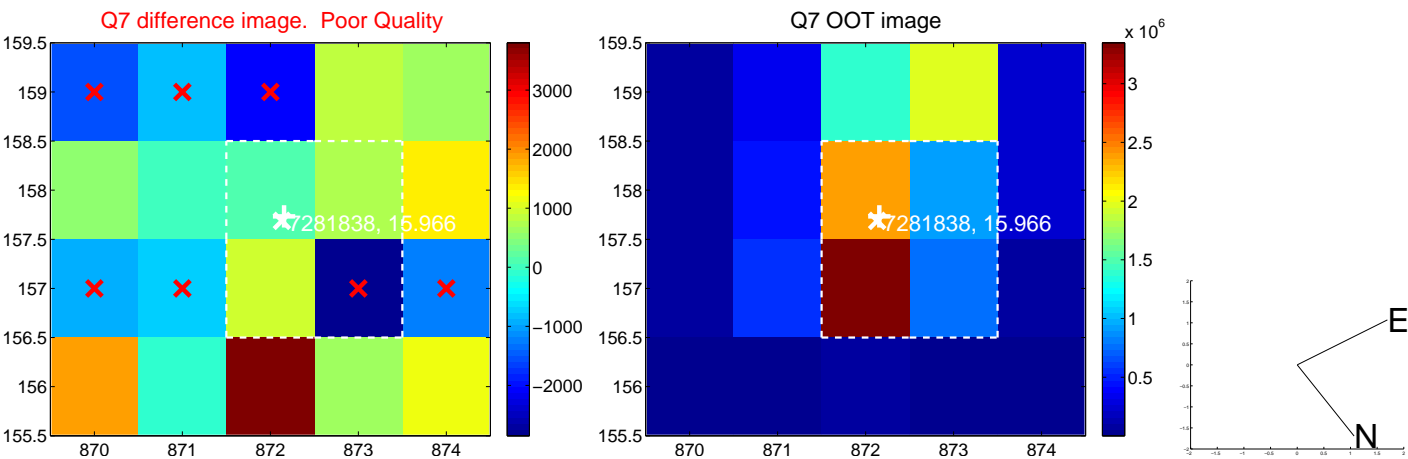
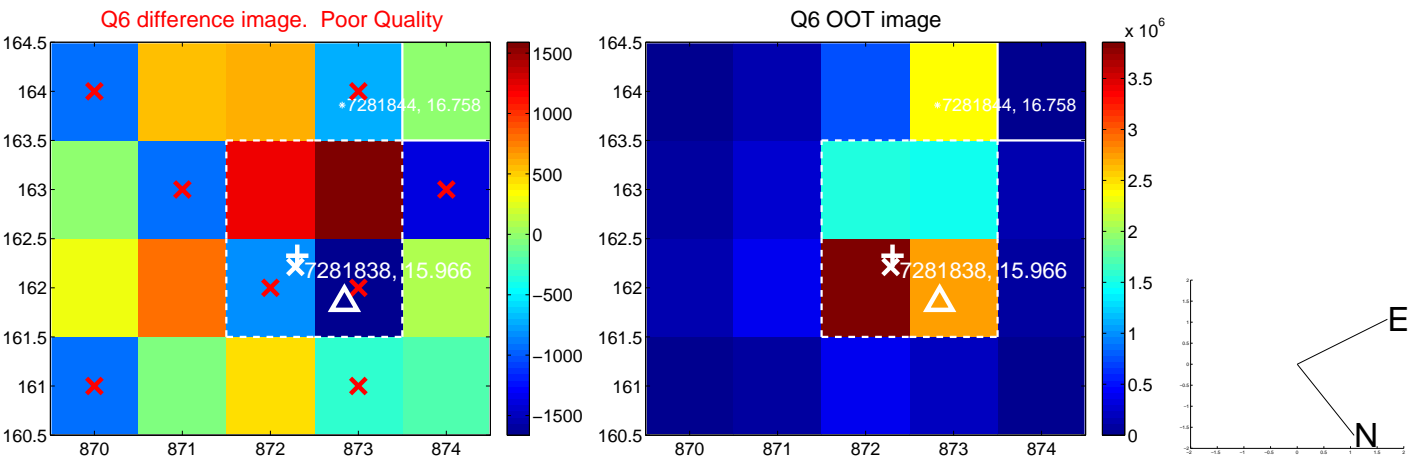
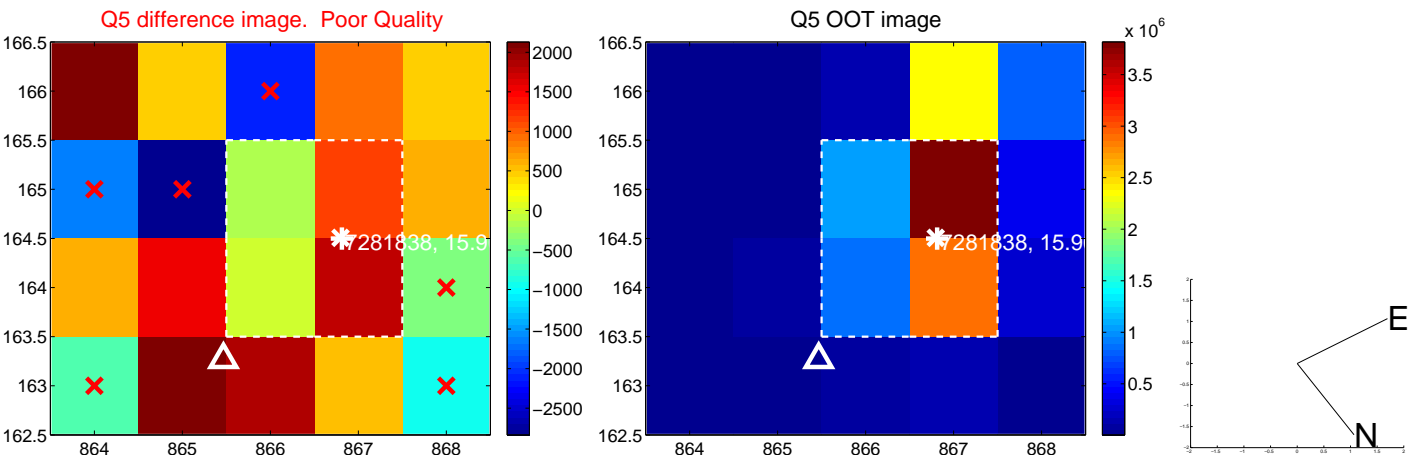
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



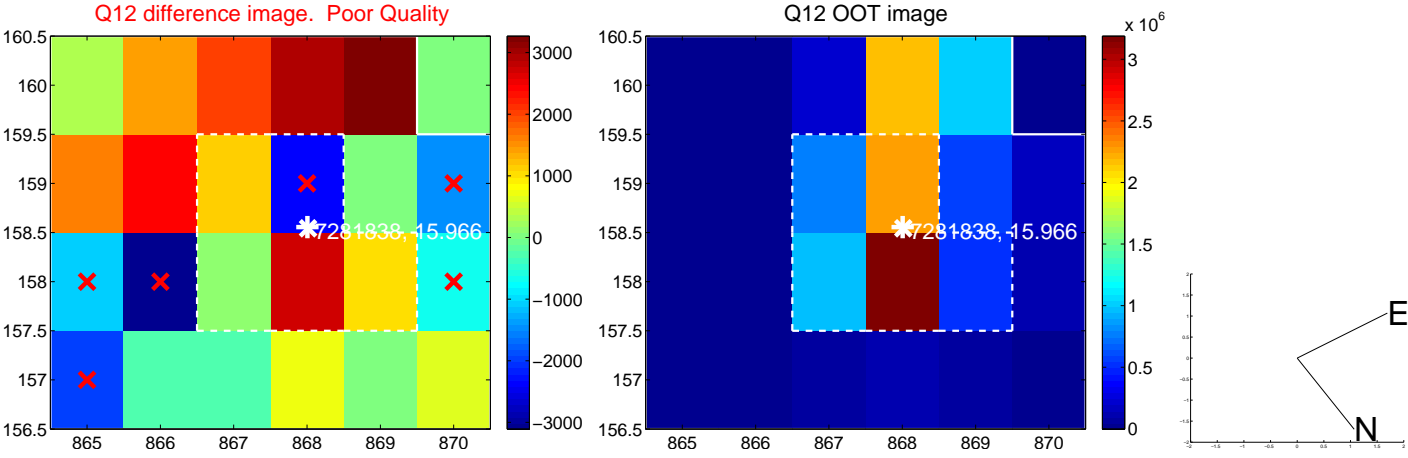
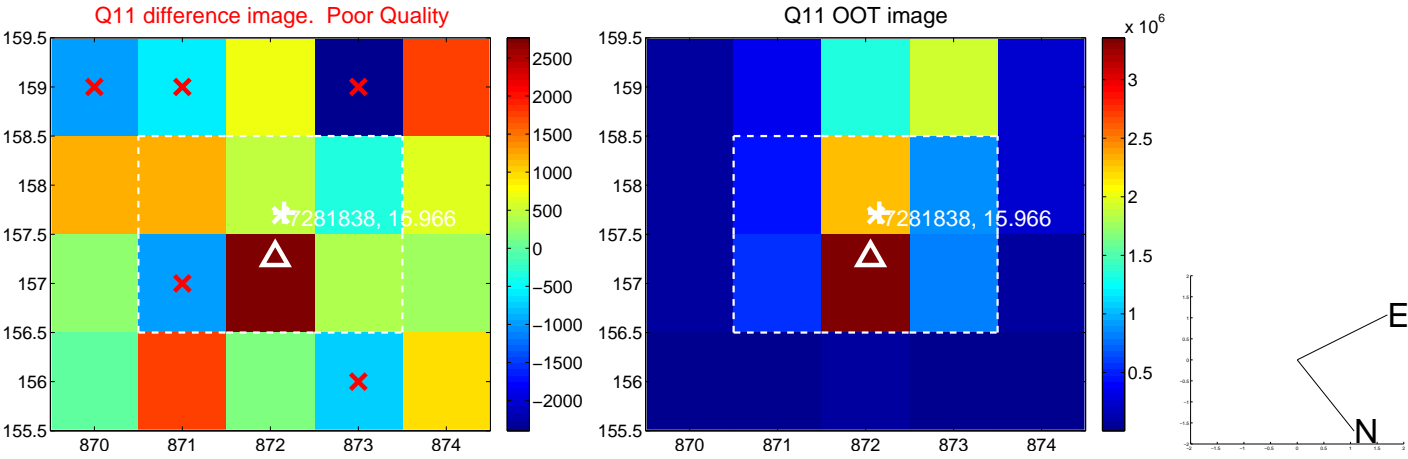
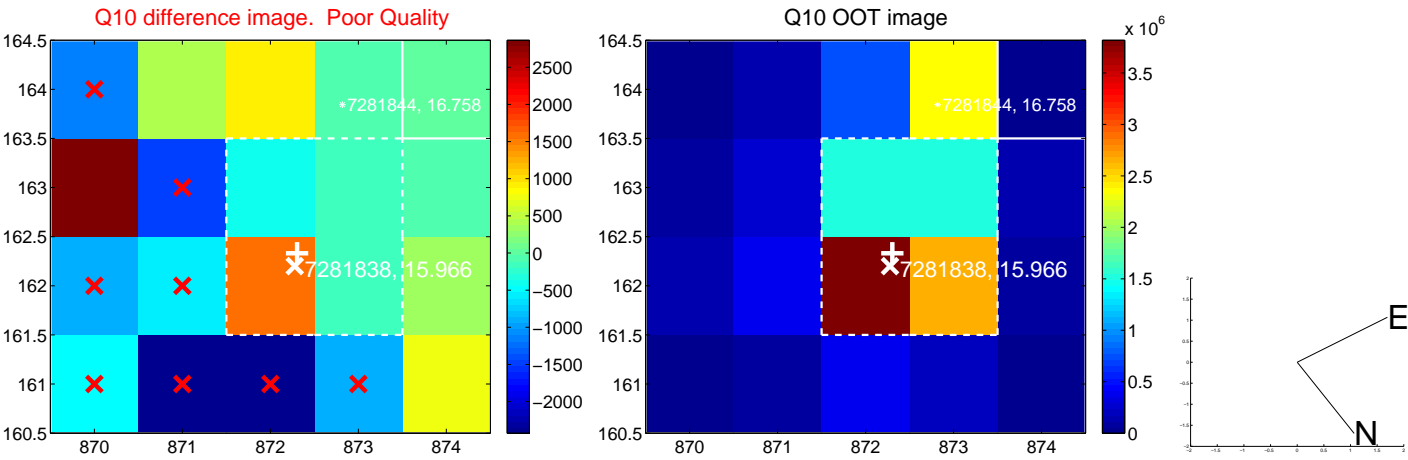
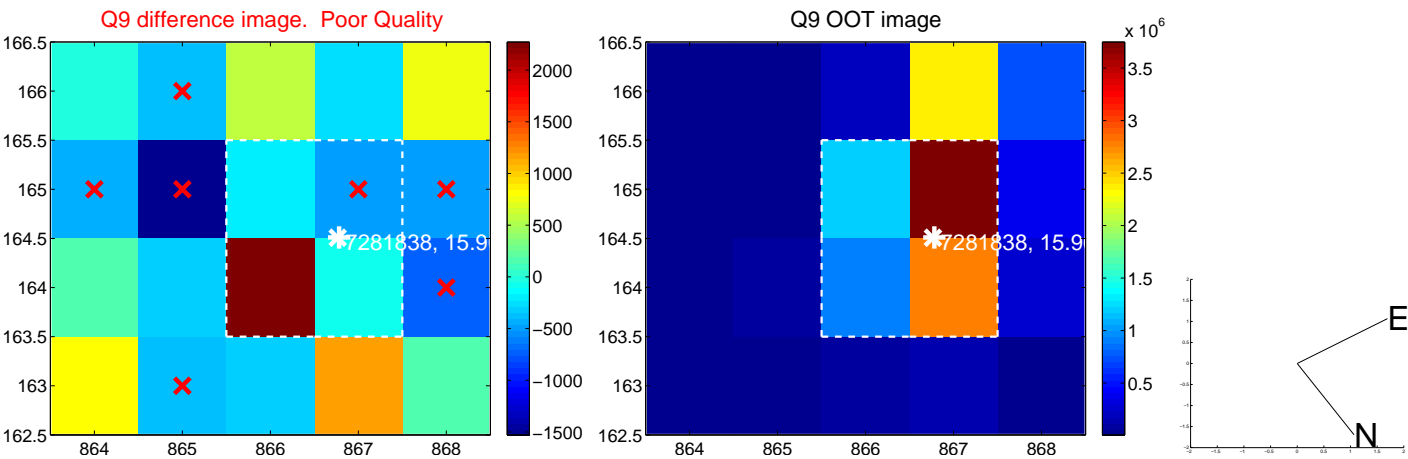
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



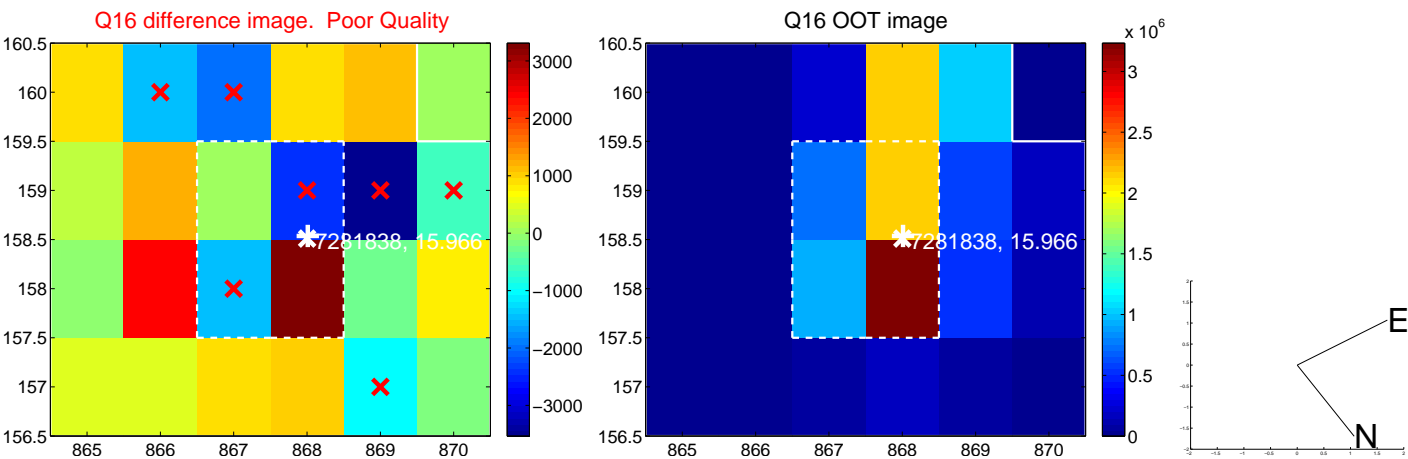
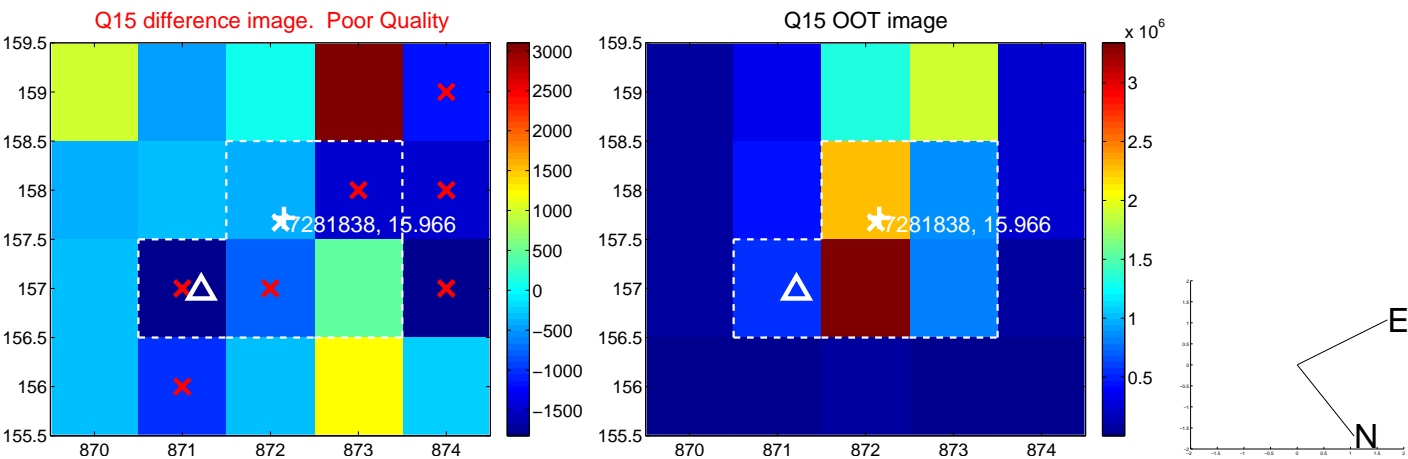
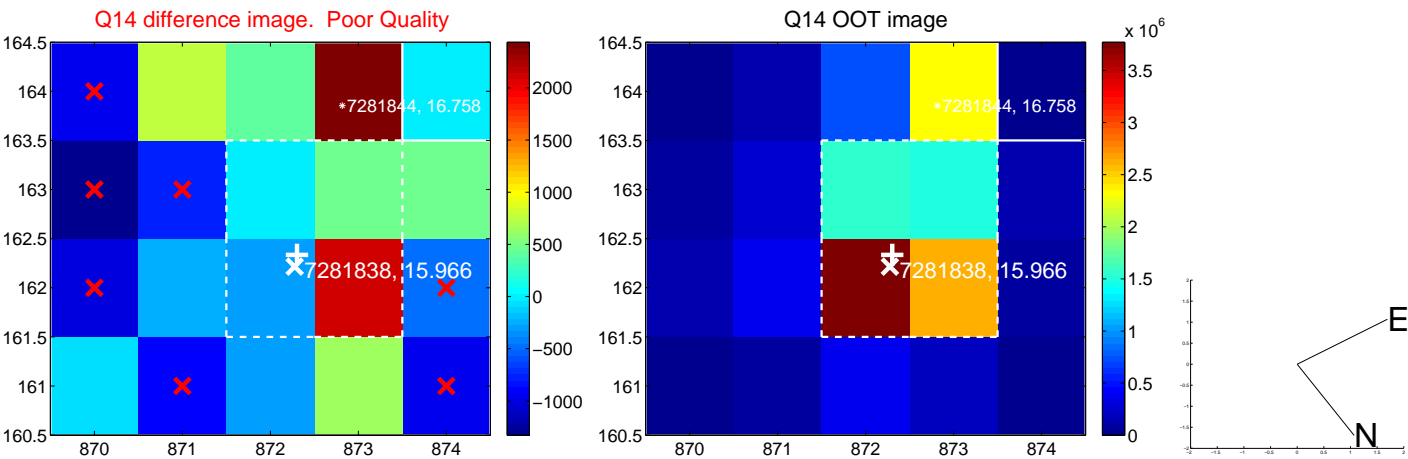
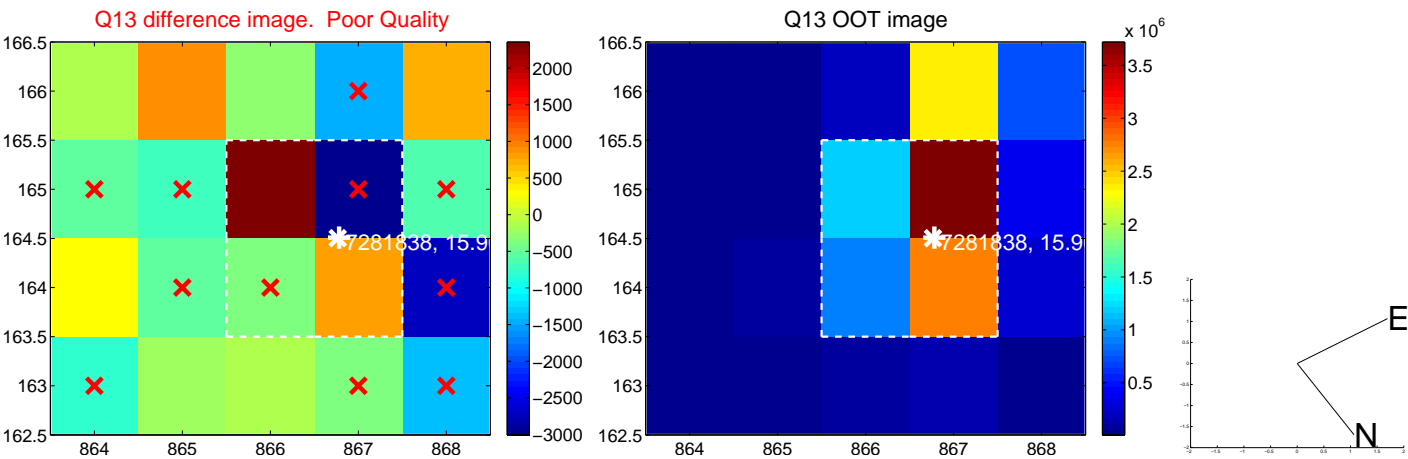
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



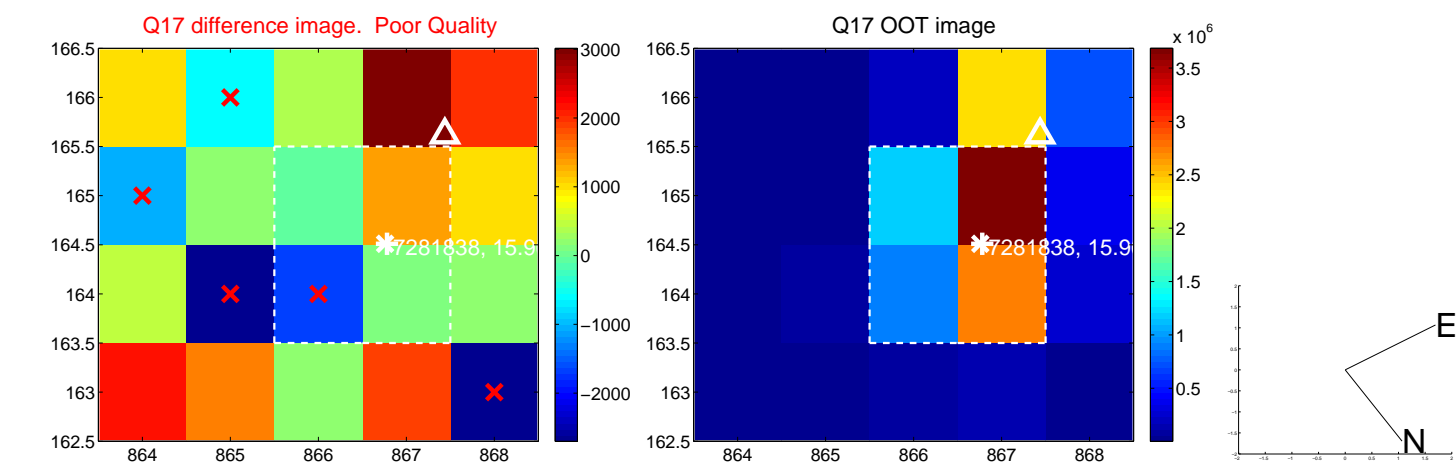
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



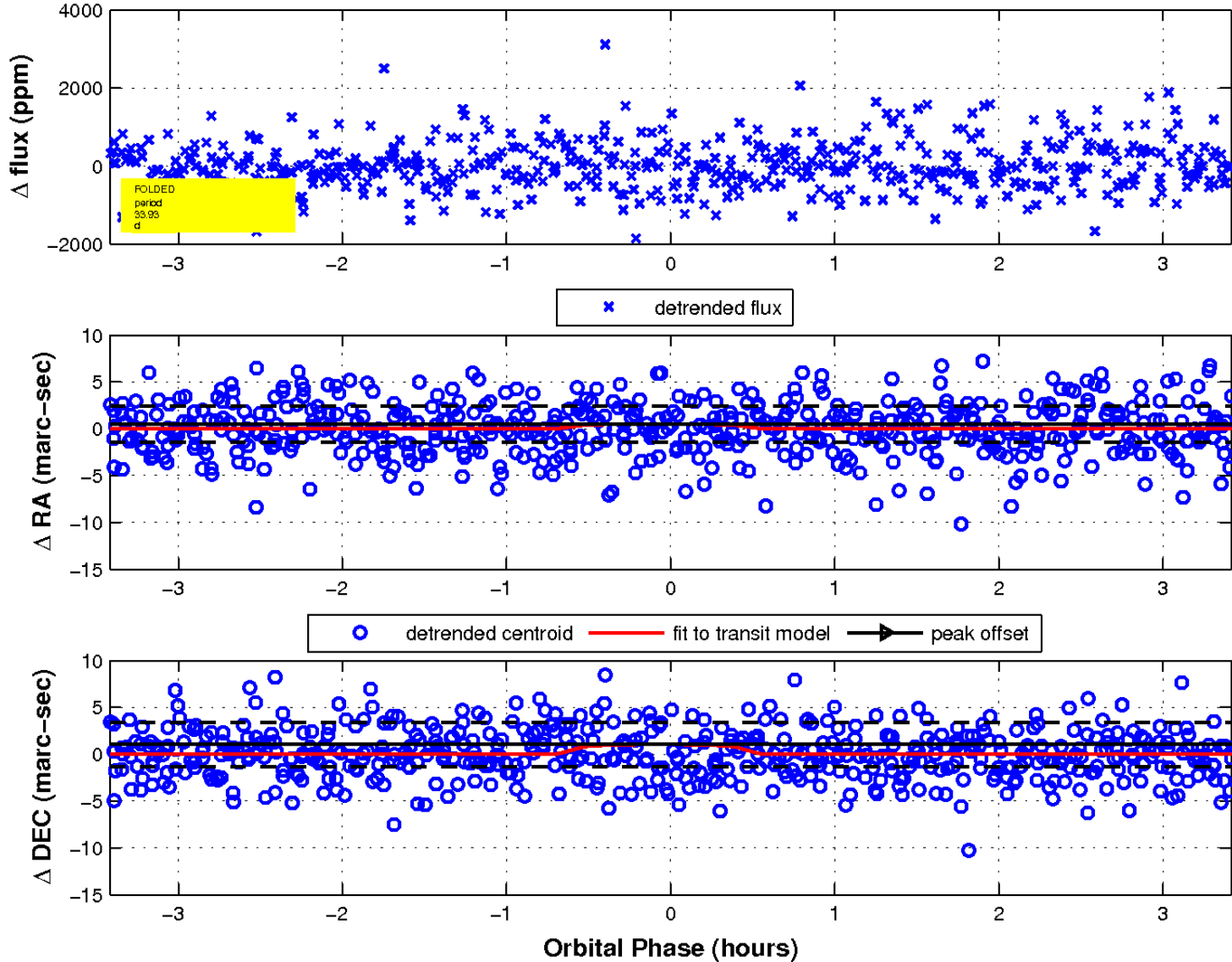
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

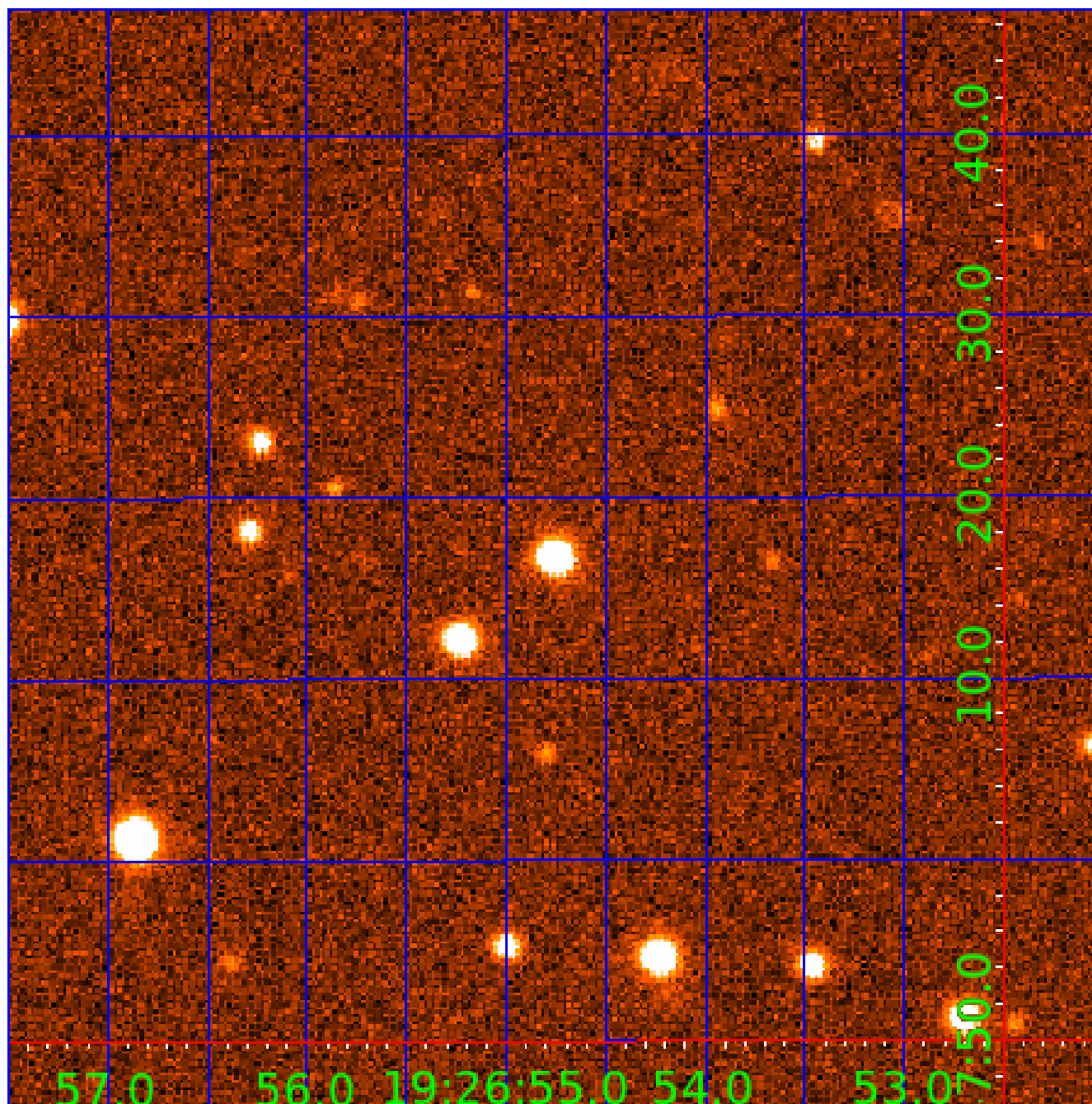


fluxWeightedCentroids, Planet 4 of 6



UKIRT Image

Declination



# KIC 007281838

## Q1-17 DR25 TCE Parameters

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007281838-01	OBS	No	0.566752	131.853725	45.4	3.967	13.0	7.8	1.08	6116	0.74	7338.25
007281838-02	OBS	No	23.034622	143.976175	1060.1	2.101	10.0	9.6	1.08	6116	3.53	52.51
007281838-03	OBS	No	25.395660	153.219359	1049.5	1.872	10.4	8.8	1.08	6116	3.93	46.11
007281838-04	OBS	No	33.933401	145.247478	1647.1	1.140	11.9	11.3	1.08	6116	4.41	31.33
007281838-05	OBS	No	26.251749	132.692163	1756.8	2.033	9.1	12.1	1.08	6116	8.73	44.11
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TCE	Run Type	Disp	Score	N	S	C	E	Comments
007281838-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
007281838-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007281838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007281838-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_DIFFS

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

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

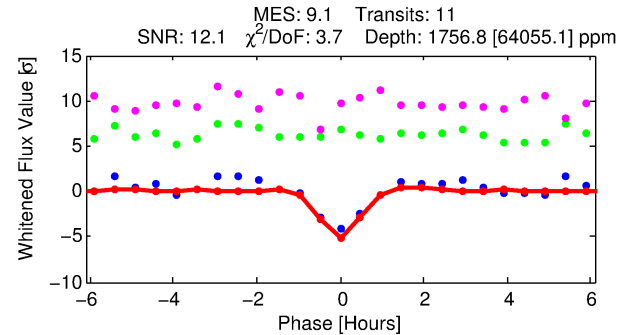
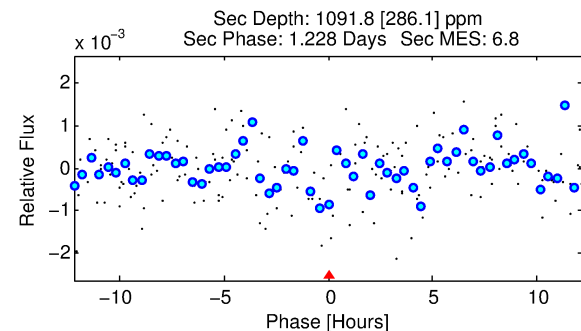
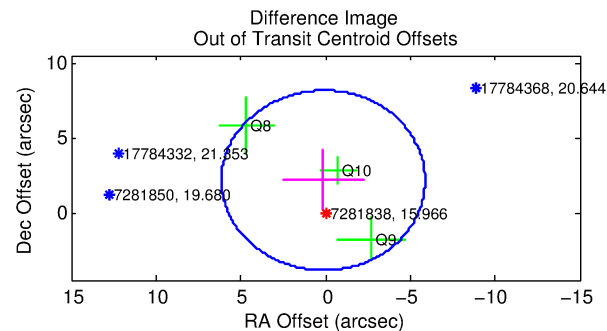
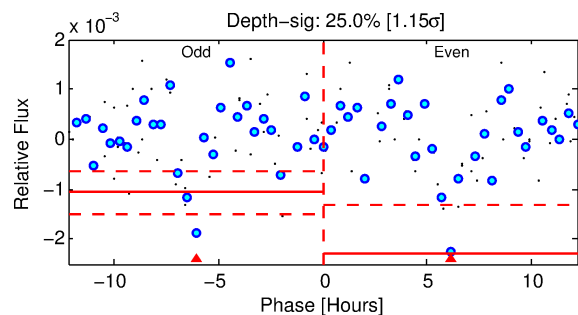
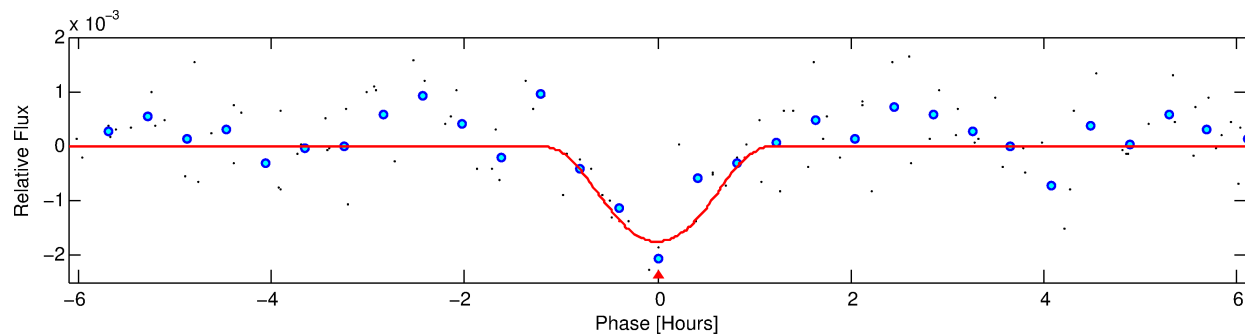
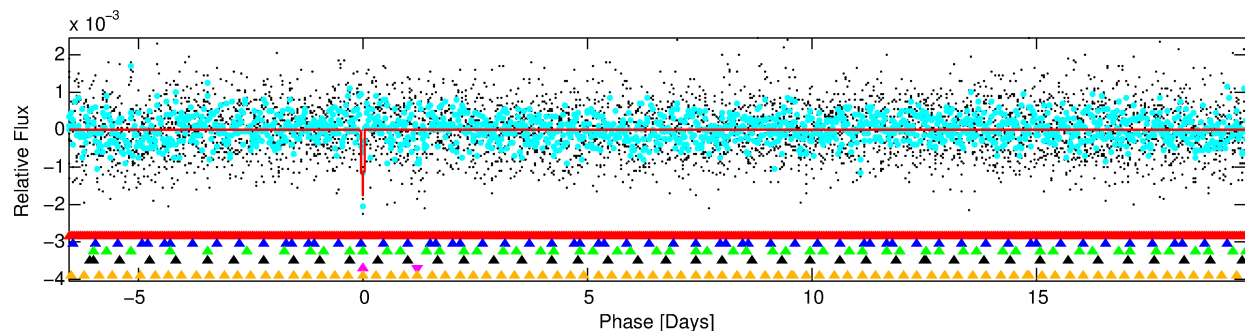
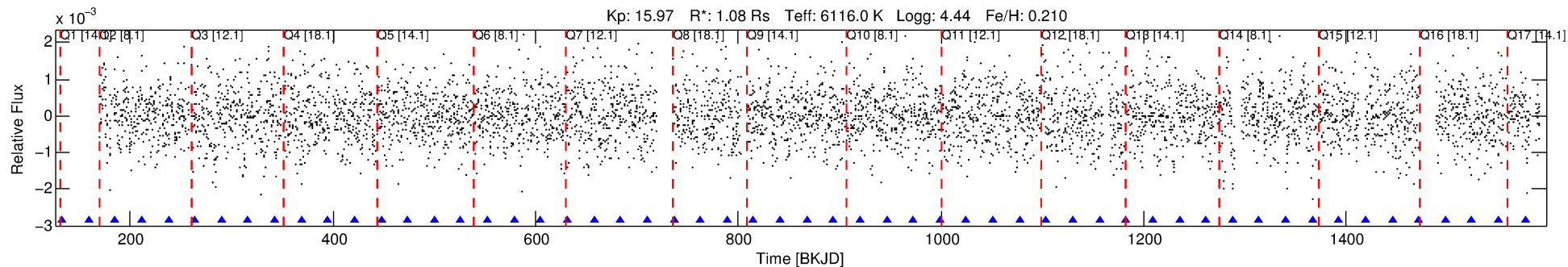
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007281838-05

No Significant Match Found

# DV One-Page Summary

KIC: 7281838 Candidate: 5 of 6 Period: 26.252 d



## DV Fit Results:

Period = 26.25175 [0.00021] d  
Epoch = 132.6922 [0.0073] BKJD  
Rp/R\* = 0.0738 [0.8457]  
a/R\* = 38.60 [97.18]  
b = 1.00 [2.97]  
Seff = 44.11 [16.22]  
Teq = 657 [60] K  
Rp = 8.73 [100.06] Re  
a = 0.1827 [0.0417] AU  
Ag = 263.13 [6030.64] [0.04 $\sigma$ ]  
Teff = 4092 [23445] K [0.15 $\sigma$ ]

## DV Diagnostic Results:

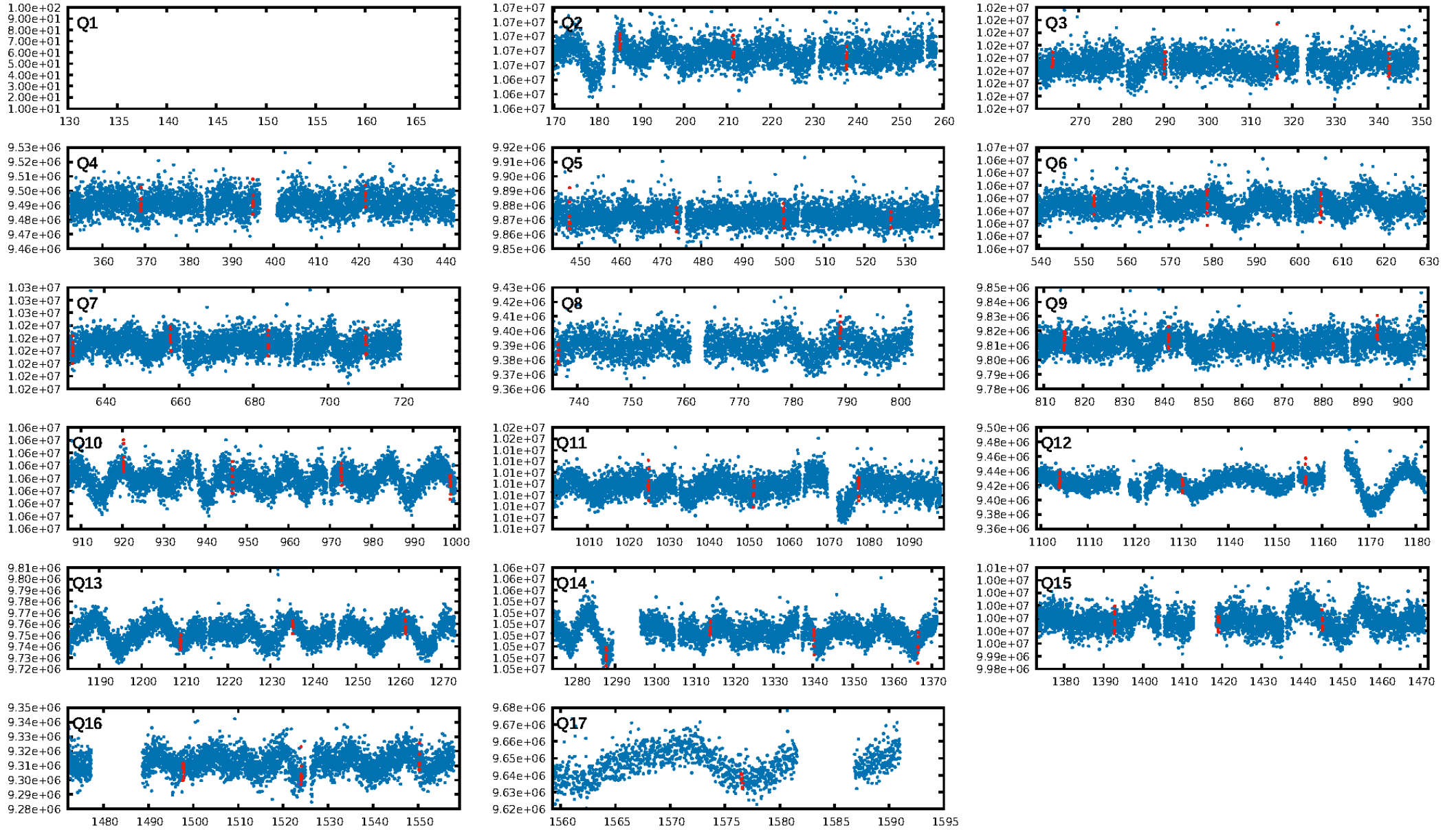
ShortPeriod-sig: 100.0% [7.43 $\sigma$ ]  
LongPeriod-sig: 100.0% [79.08 $\sigma$ ]  
ModelChiSquare2-sig: 5.6%  
ModelChiSquareGof-sig: 98.5%  
**Bootstrap-pfa: 8.12e-09**  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: 2.054  
Centroid-sig: 0.6%  
Centroid-so: 1.047 arcsec [2.20 $\sigma$ ]  
OotOffset-rm: 2.154 arcsec [1.08 $\sigma$ ]  
KicOffset-rm: 1.937 arcsec [0.77 $\sigma$ ]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 0.00 [0/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:58:33 Z

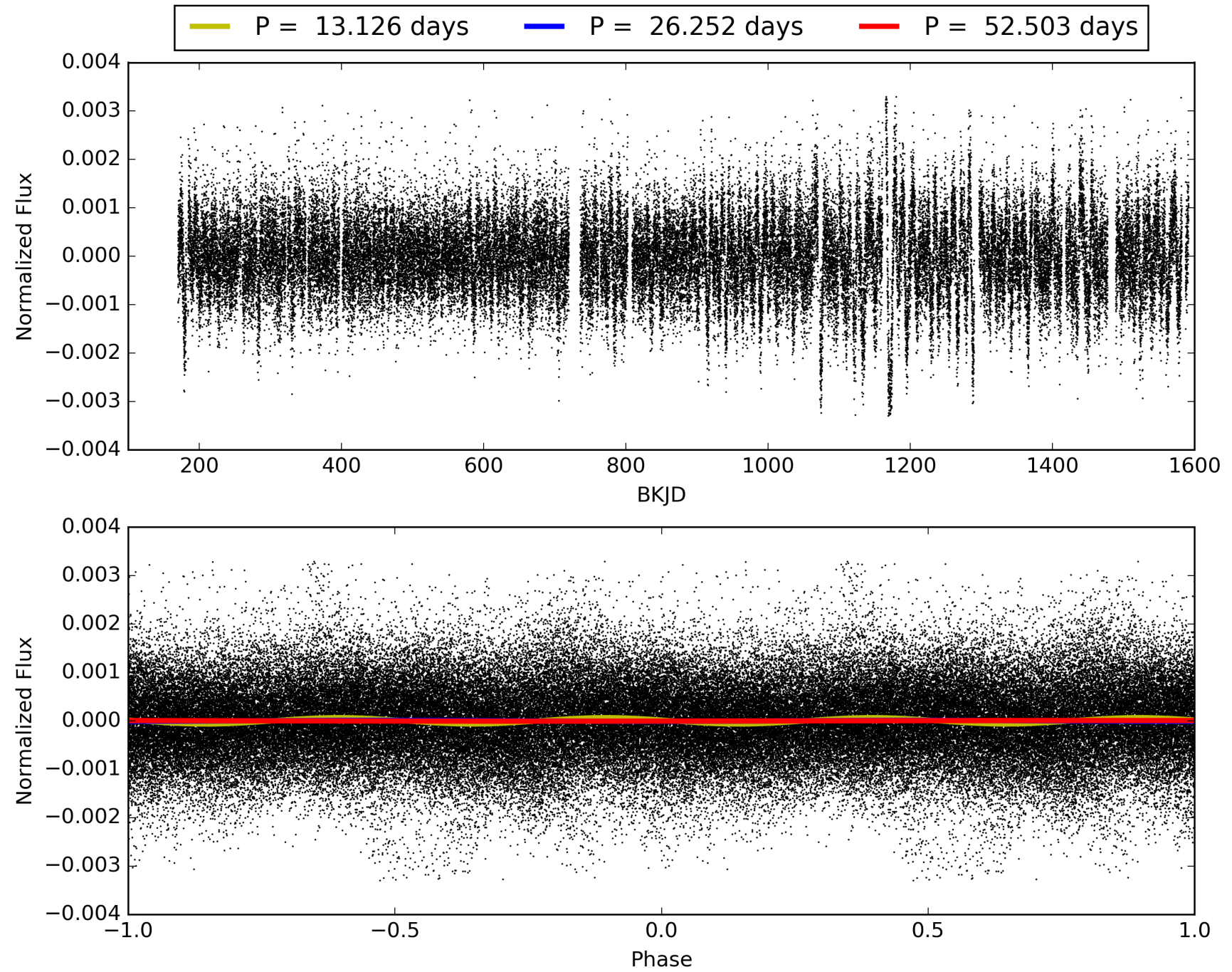
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 007281838-05, PDC Light Curves

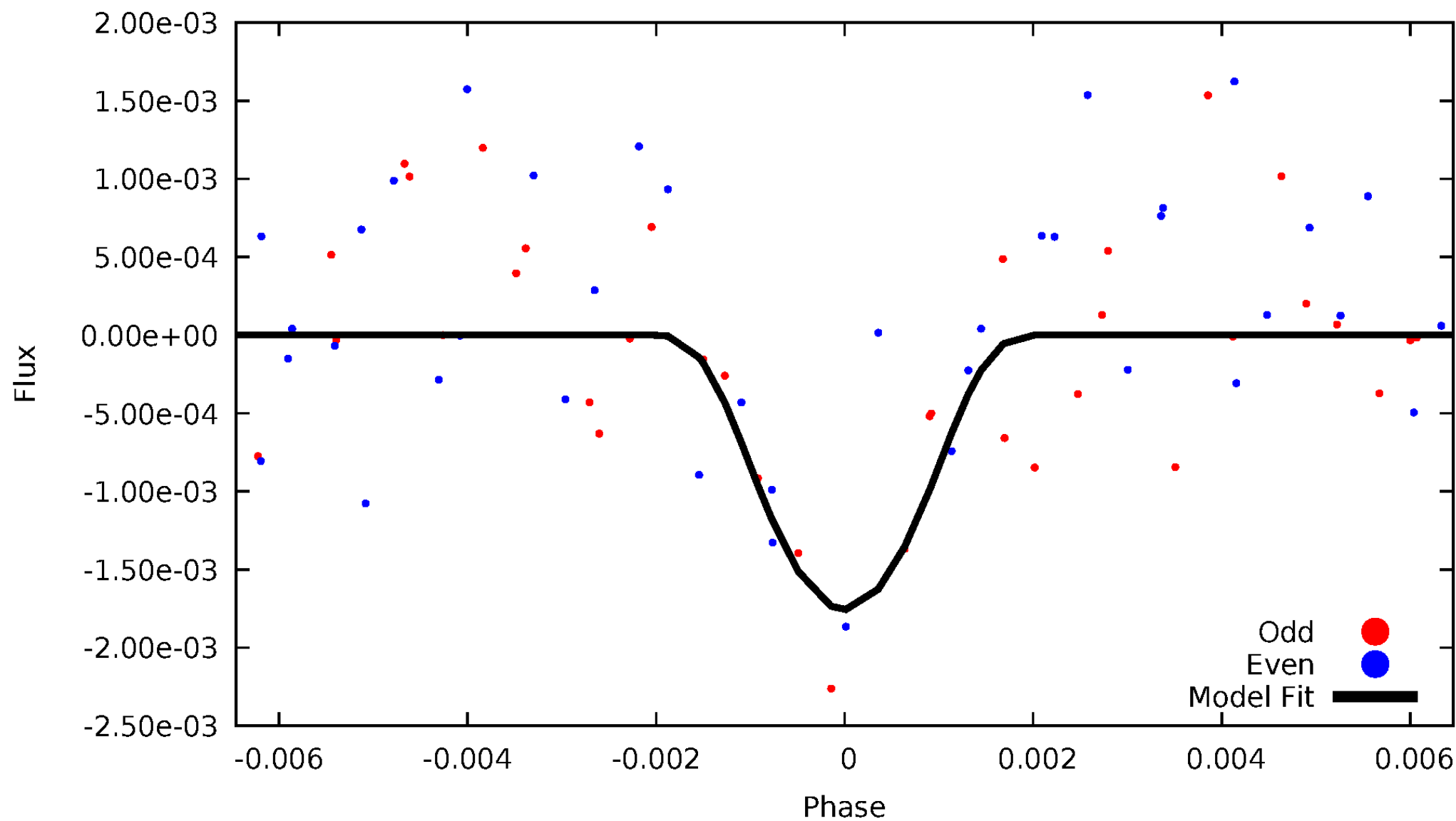


# TCE 007281838-05



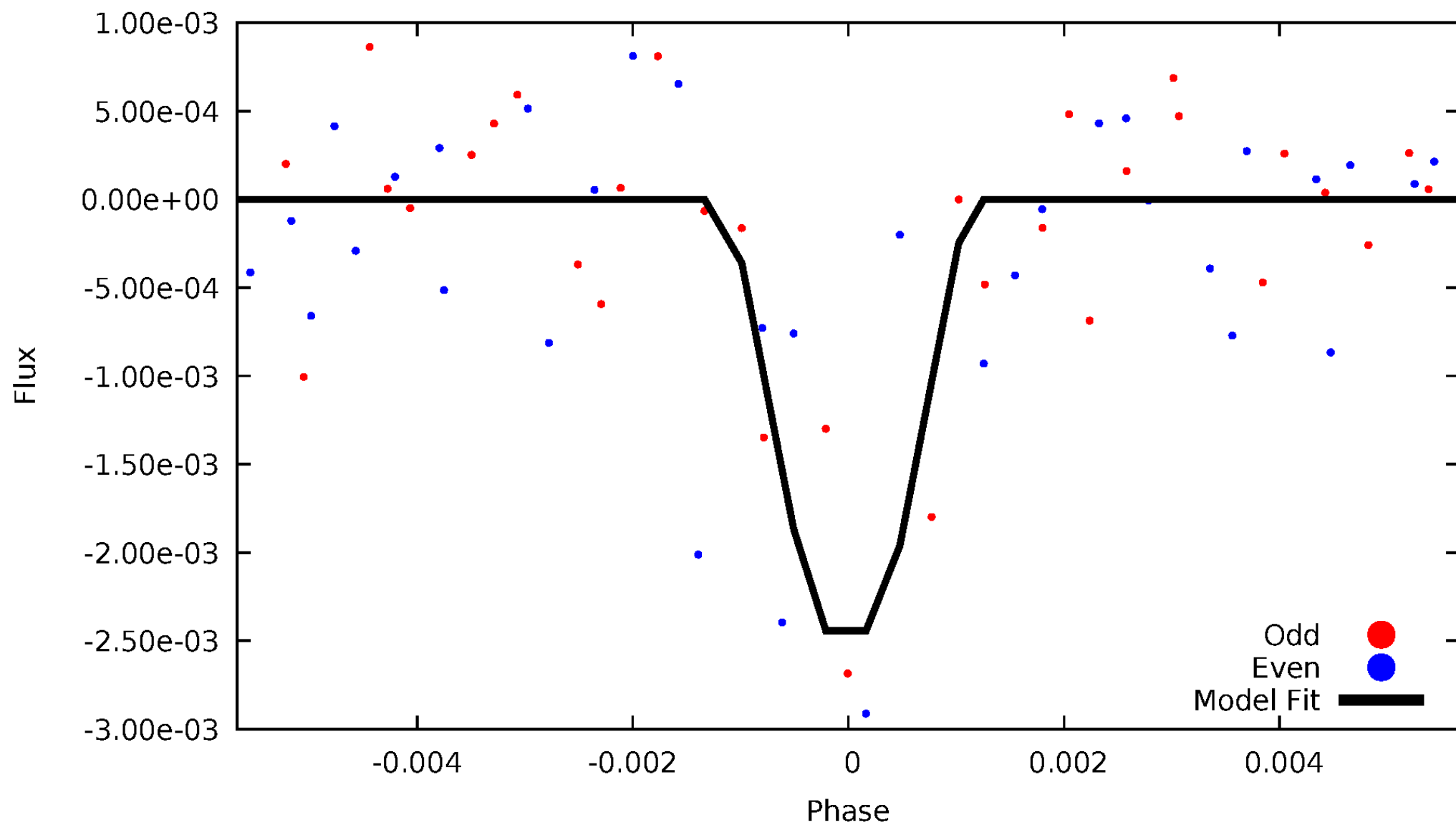
# DV Odd/Even

TCE 007281838-05



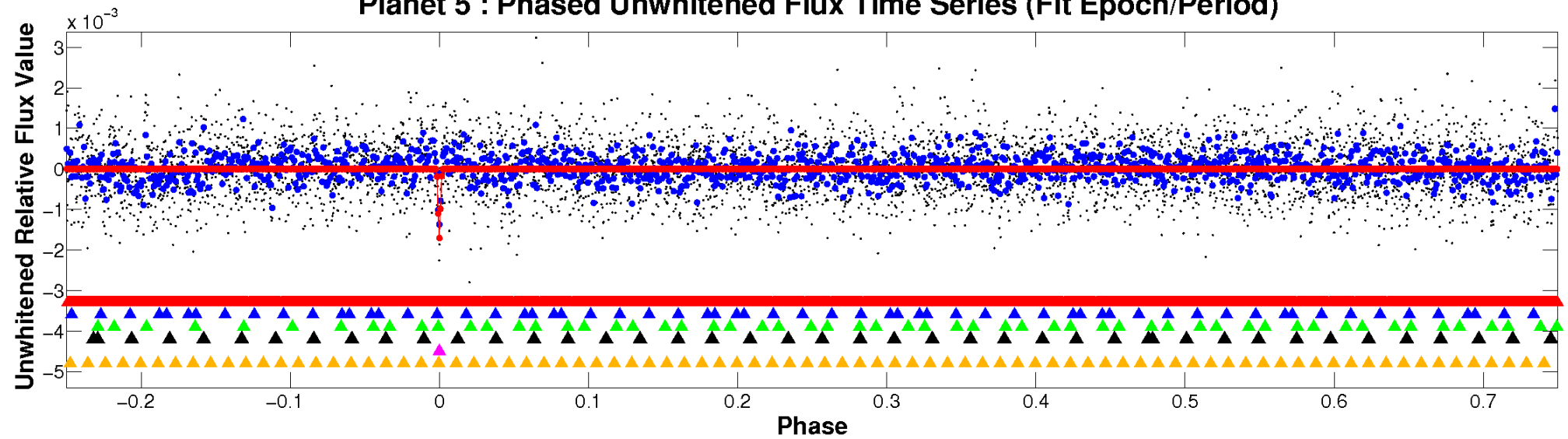
# ALT Odd/Even

TCE 007281838-05

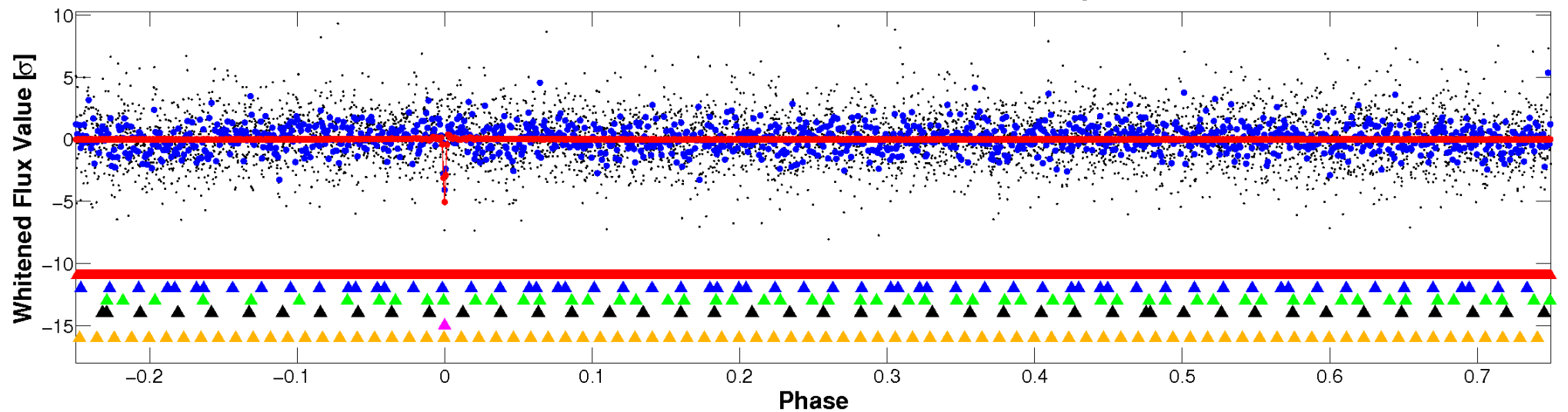


# Non-Whitened Vs. Whitened Light Curve

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

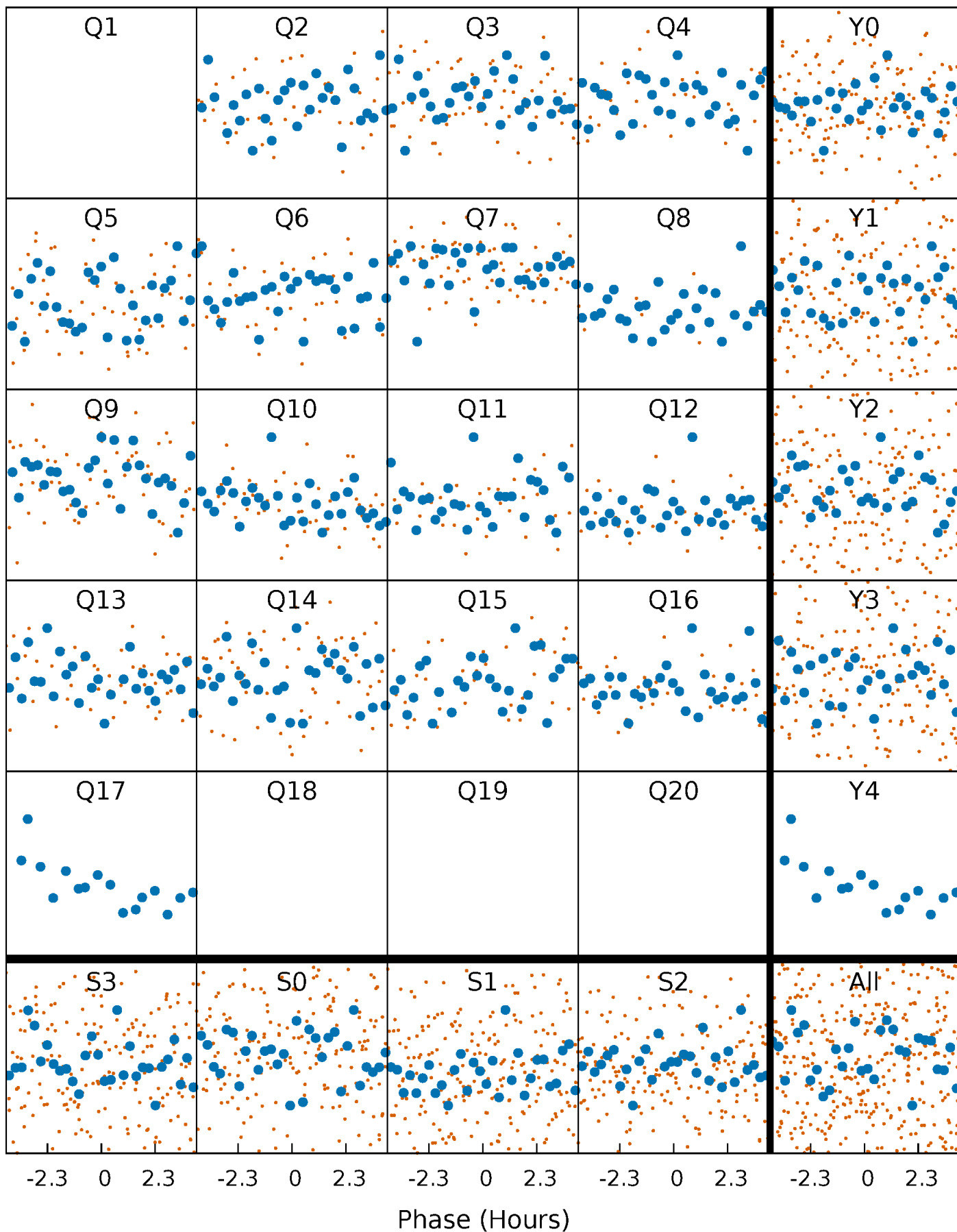


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



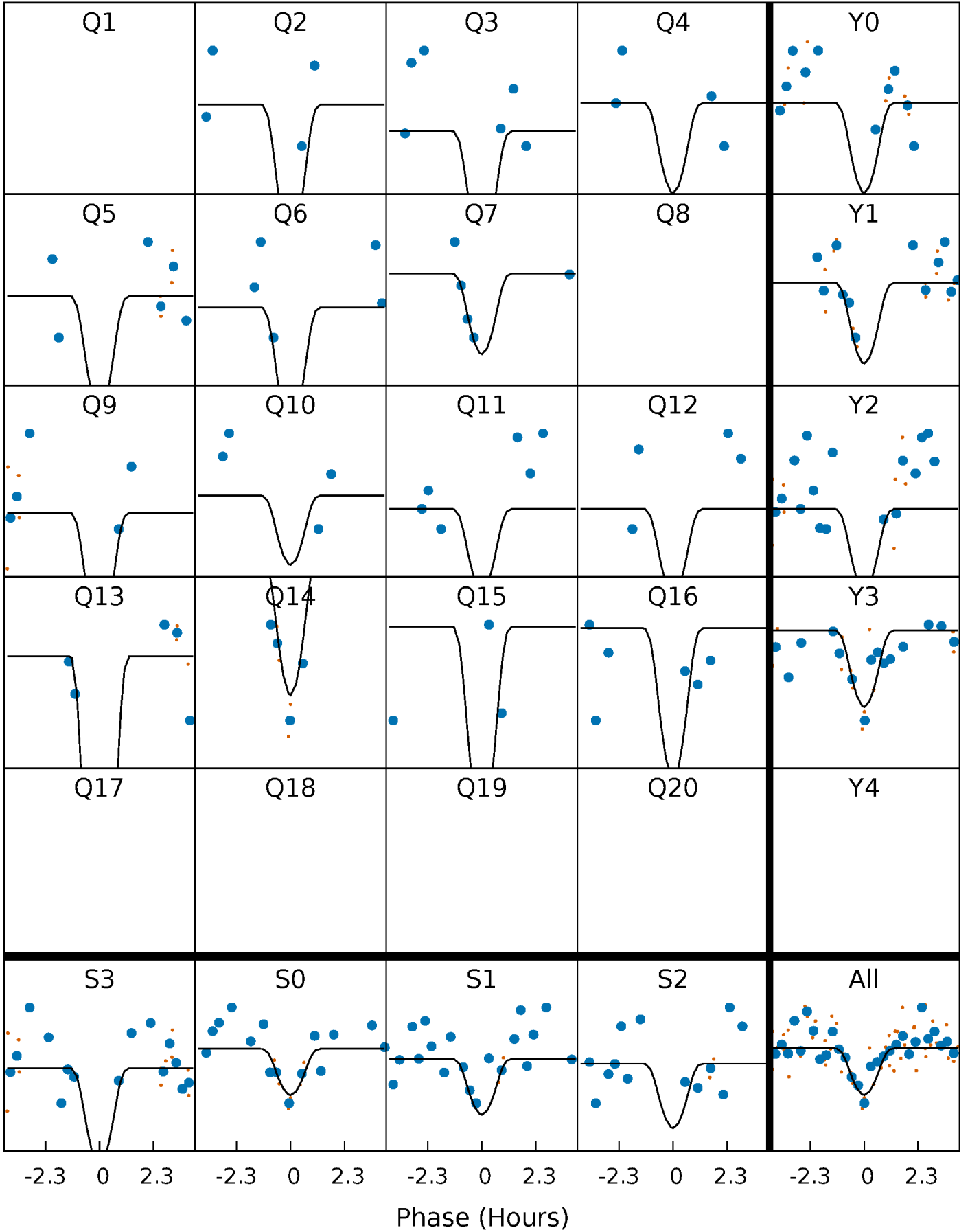
# PDC Quarter-Phased Transit Curves

TCE 007281838-05   P= 26.251749 Days    $T_0=132.692163$  (BKJD)



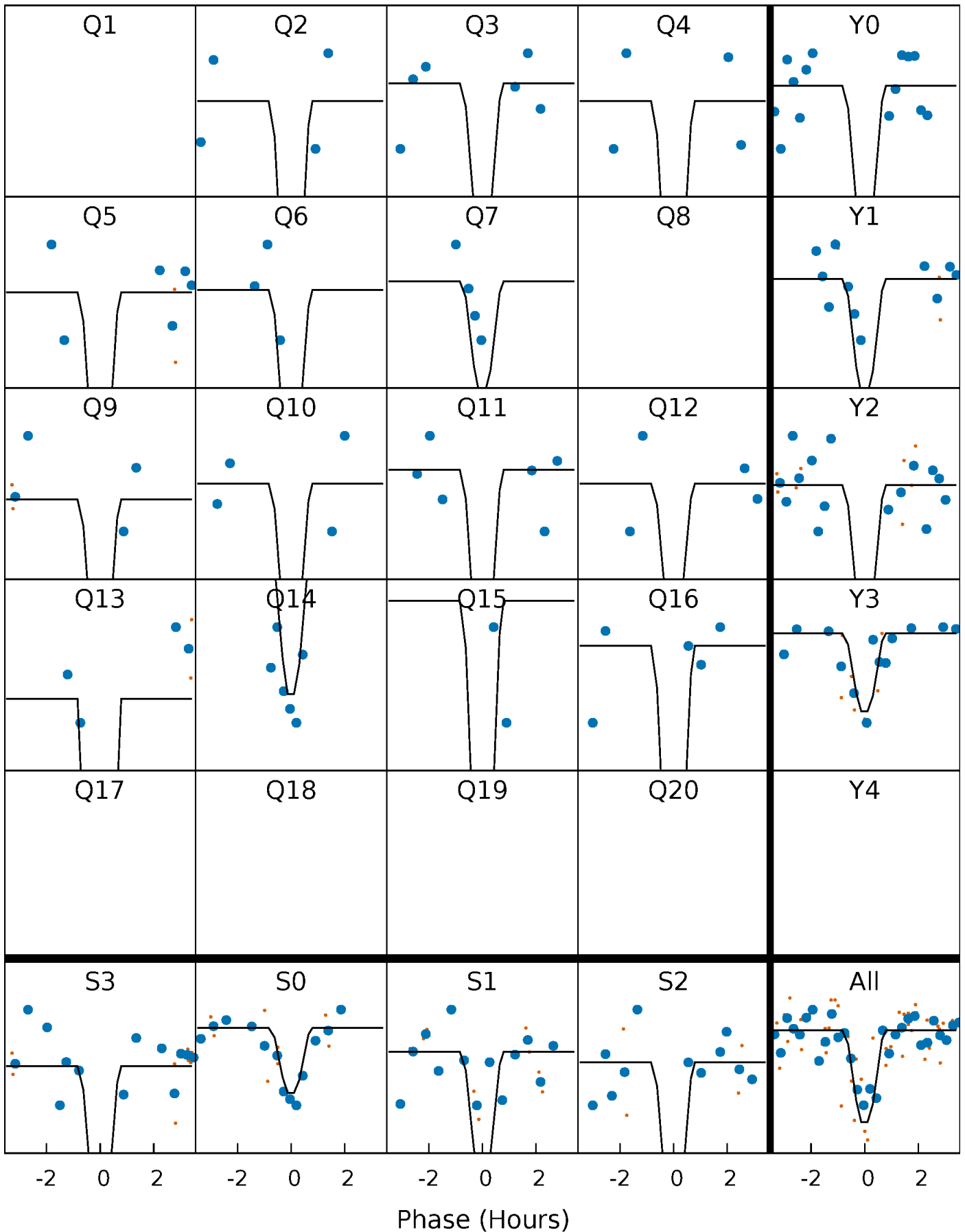
# DV Quarter-Phased Transit Curves

TCE 007281838-05   P= 26.251749 Days    $T_0=132.692163$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007281838-05     $P = 26.251886$  Days     $T_0 = 132.682165$  (BKJD)

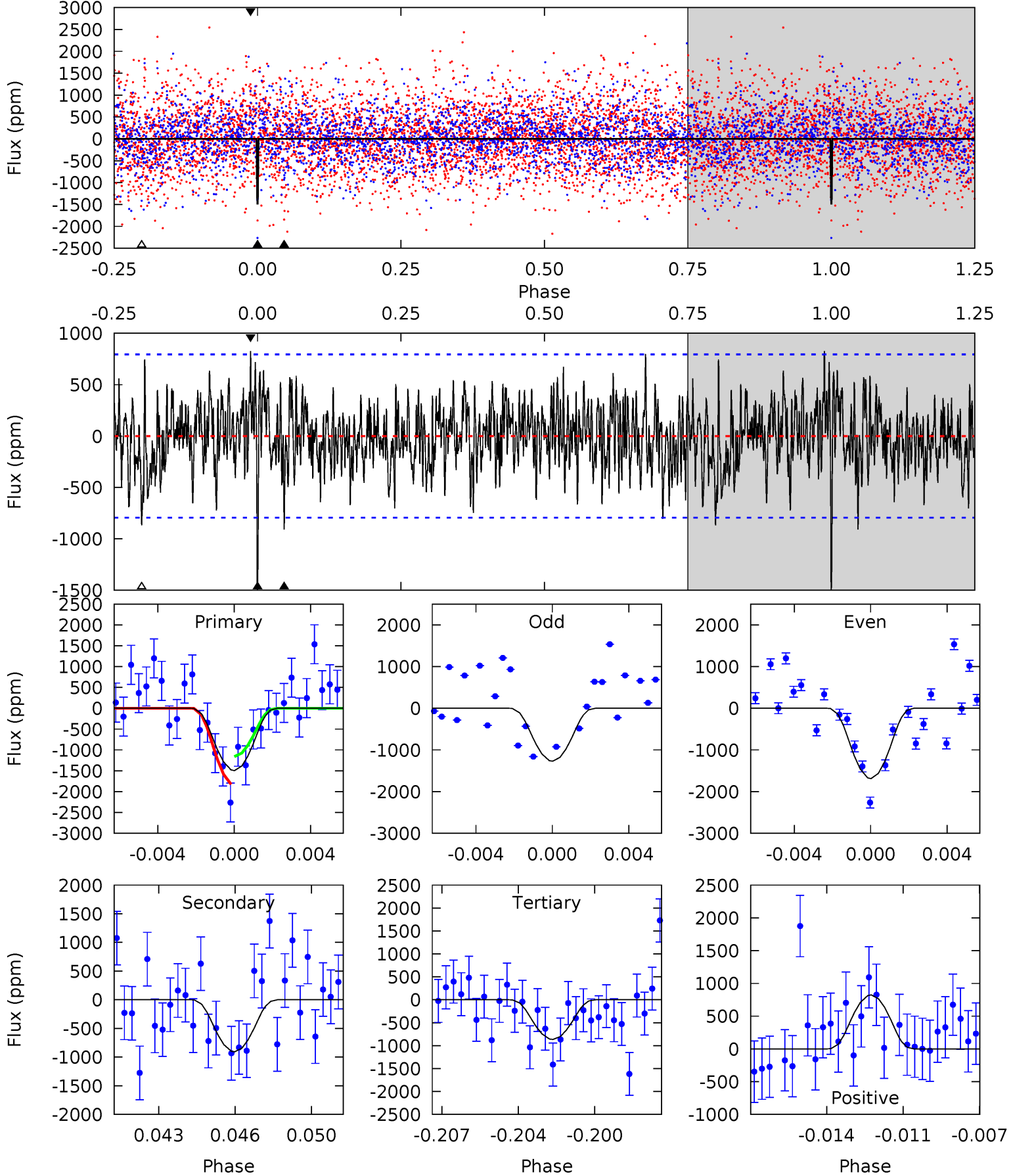




# DV Model-Shift Uniqueness Test

007281838-05, P = 26.251749 Days, E = 132.692163 Days

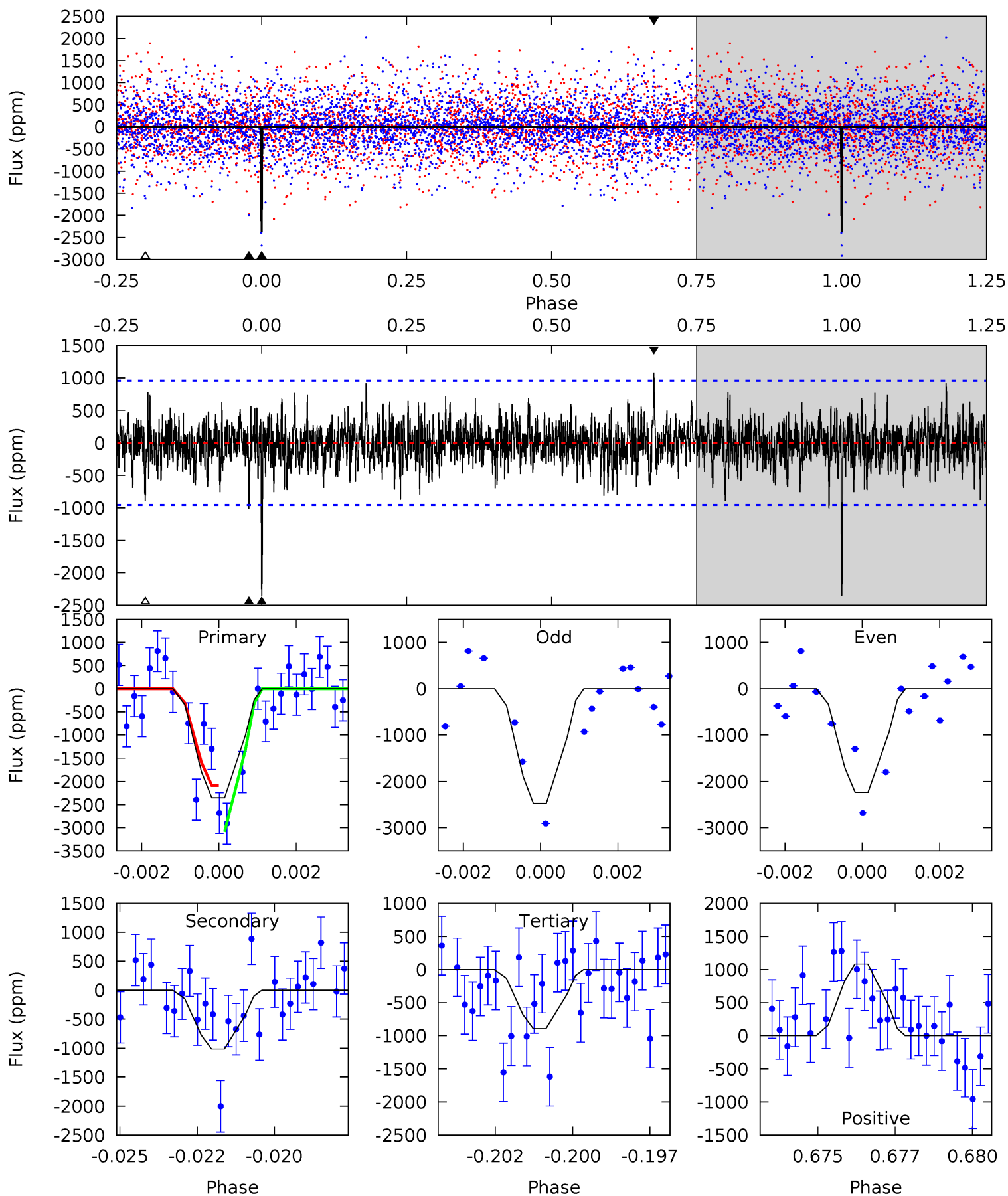
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.83	5.97	5.69	5.42	5.22	2.91	1.76	4.14	4.41	0.28	0.55	1.37	1.15	0.36	2.18



# Alt Model-Shift Uniqueness Test

007281838-05, P = 26.251886 Days, E = 132.682165 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	5.61	4.94	6.00	5.31	3.06	1.39	8.09	7.02	0.68	-0.39	0.66	0.83	0.32	2.65



### Stellar Parameters For KIC 007281838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6116^{+170}_{-233}$	$4.440^{+0.058}_{-0.184}$	$0.210^{+0.150}_{-0.300}$	$1.084^{+0.292}_{-0.104}$	$1.181^{+0.119}_{-0.164}$	$1.307^{+0.321}_{-0.632}$
	+3%/-4%	+1%/-4%	+71%/-143%	+27%/-10%	+10%/-14%	+25%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007281838-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	-909 $\pm$ 152	$76.27^{+75.91}_{-51.89}$	$933^{+63}_{-45}$	$2230^{+826}_{-384}$	$2.668^{+24.727}_{-1.968}$
Alt.	-1013 $\pm$ 181	$71.37^{+78.51}_{-50.25}$	$933^{+67}_{-47}$	$2319^{+845}_{-437}$	$3.518^{+36.658}_{-2.750}$

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

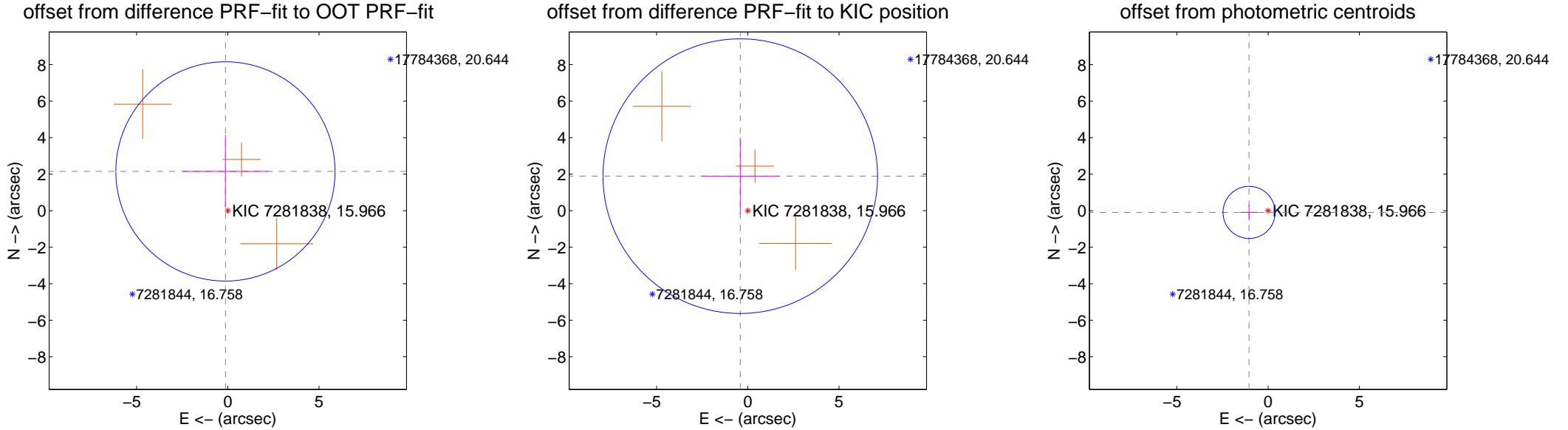
## DV Centroid Data

Supplemental centroid analysis for 007281838-05. Kepler magnitude: 15.97. Transit SNR 12.13

There are 0 quarters with good PRF difference image offsets

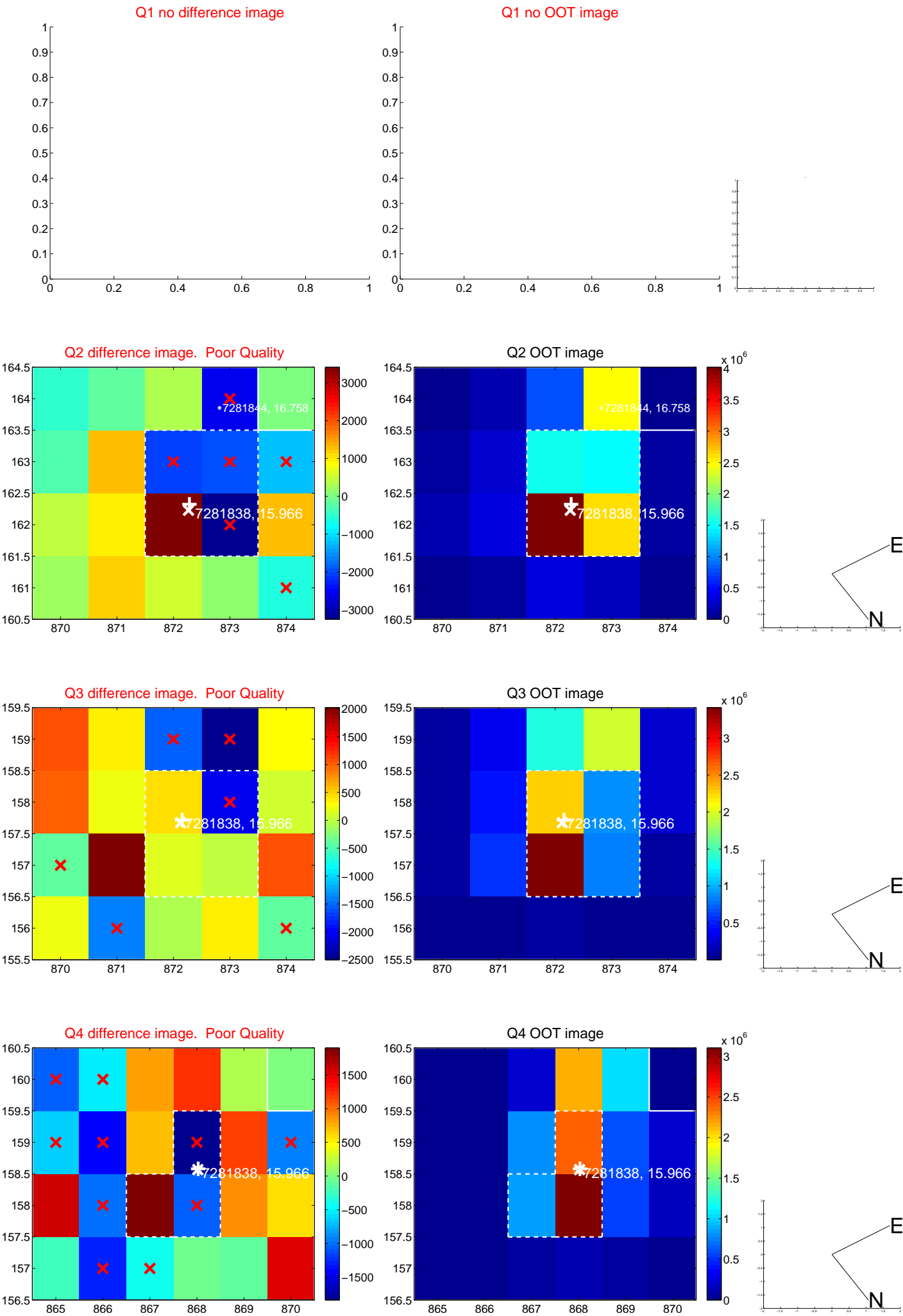
The direct PRF centroid is offset from the target star catalog position by about 0.52 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.154 \pm 2.002$	1.08	$0.129 \pm 2.341$	$2.151 \pm 2.001$
PRF-fit source offset from KIC position	$1.937 \pm 2.507$	0.77	$0.414 \pm 2.152$	$1.892 \pm 2.111$
photometric centroid source offset	$1.05 \pm 0.48$	2.20	$1.04 \pm 0.48$	$-0.09 \pm 0.43$

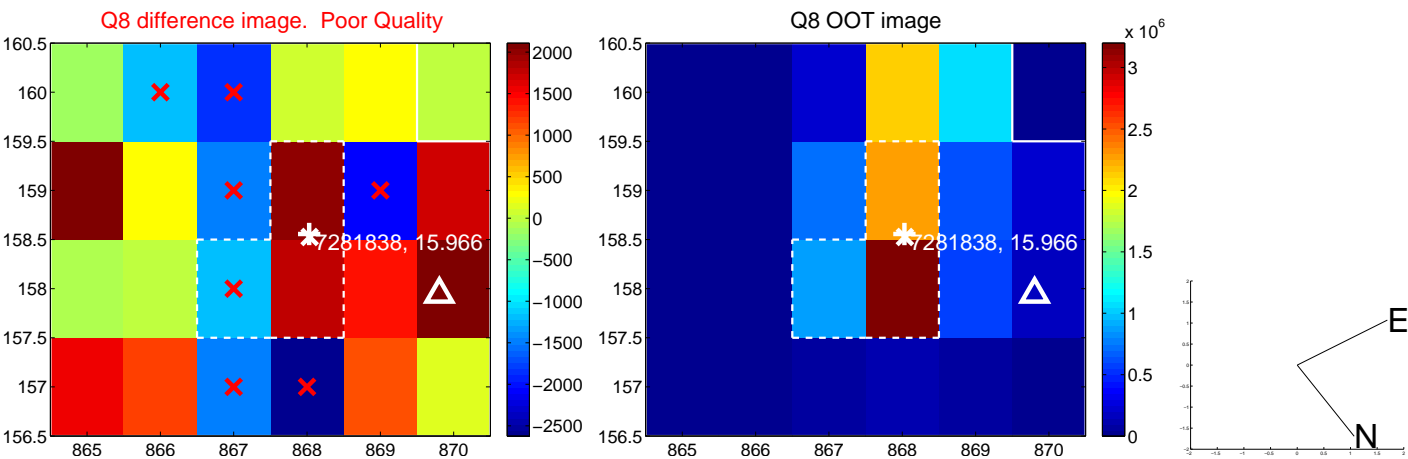
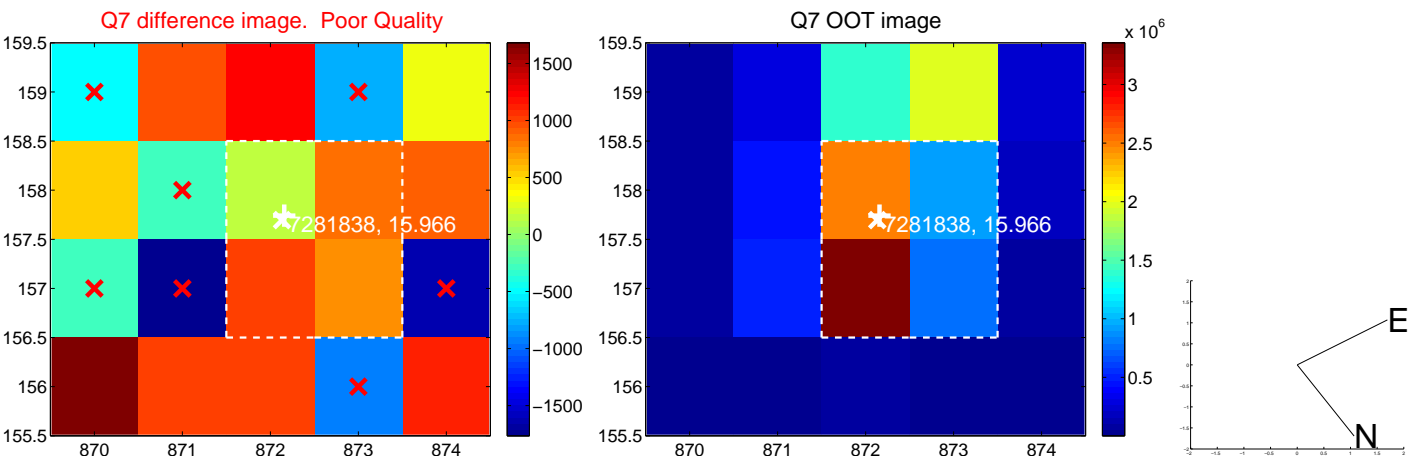
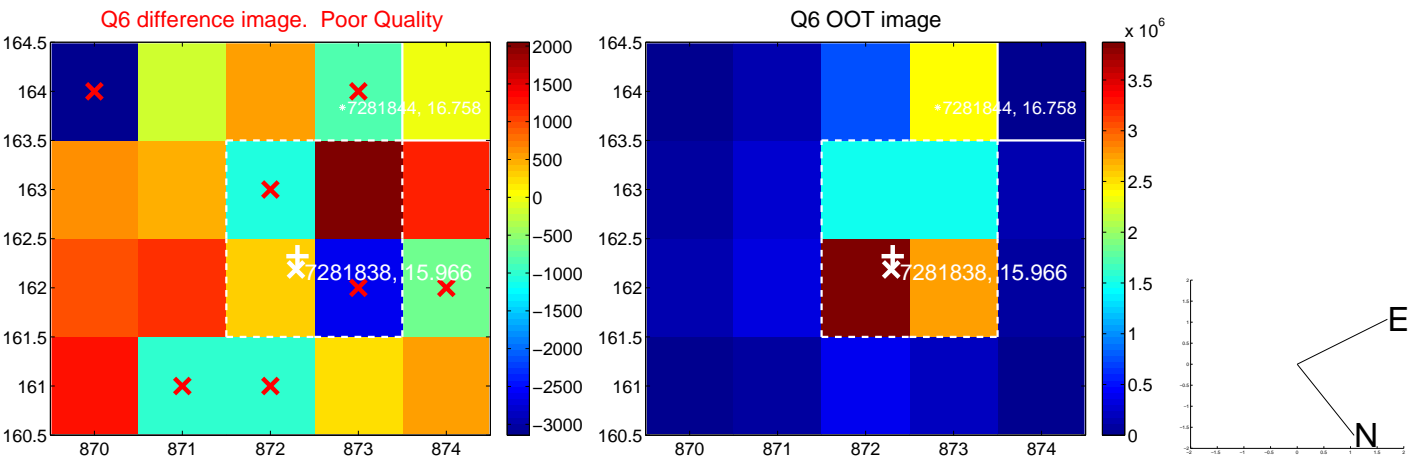
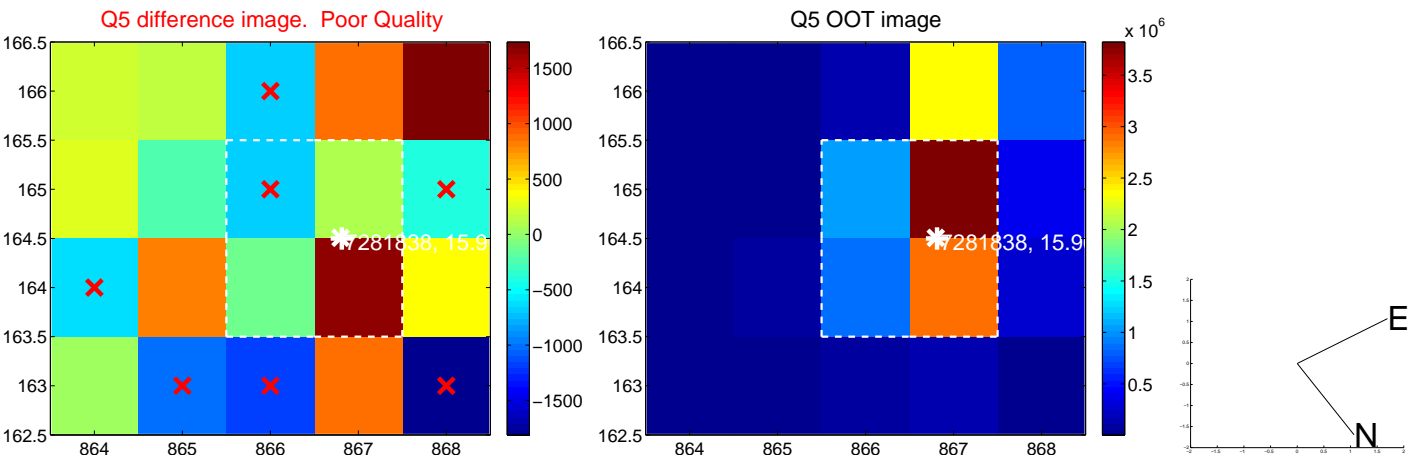


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

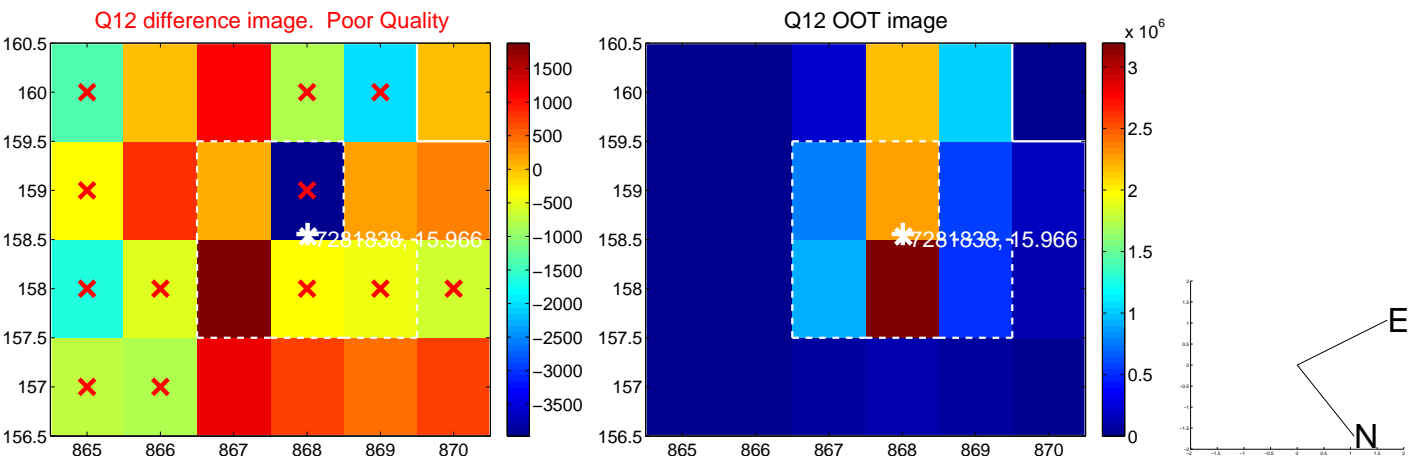
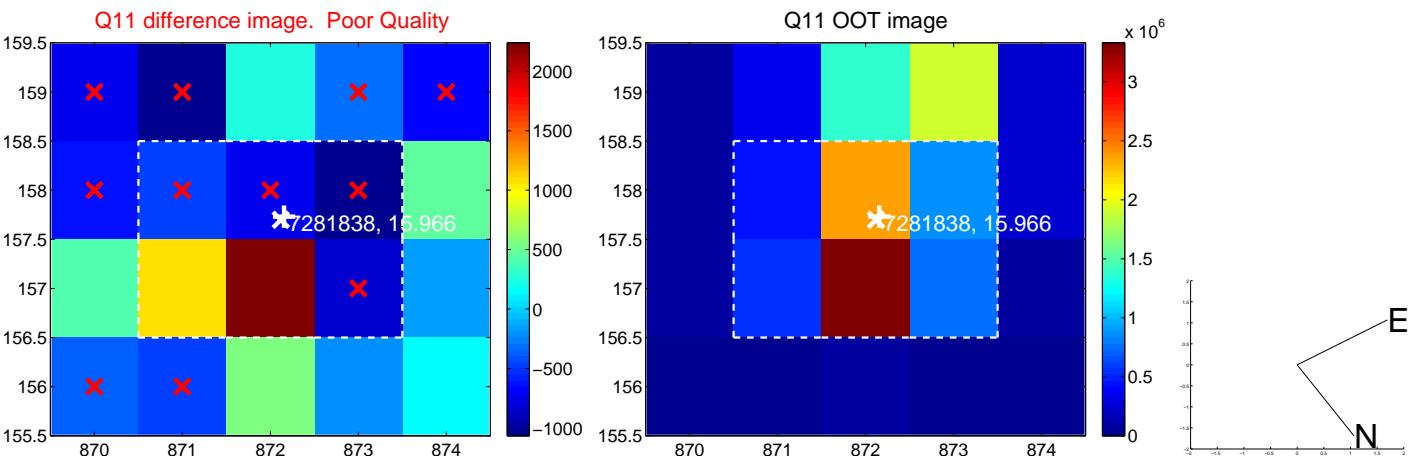
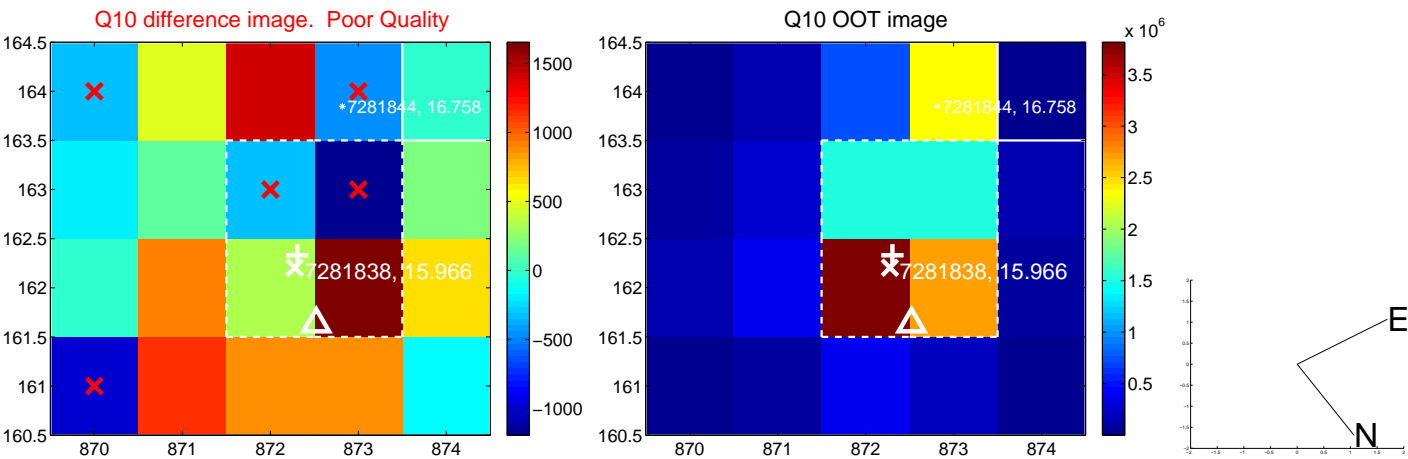
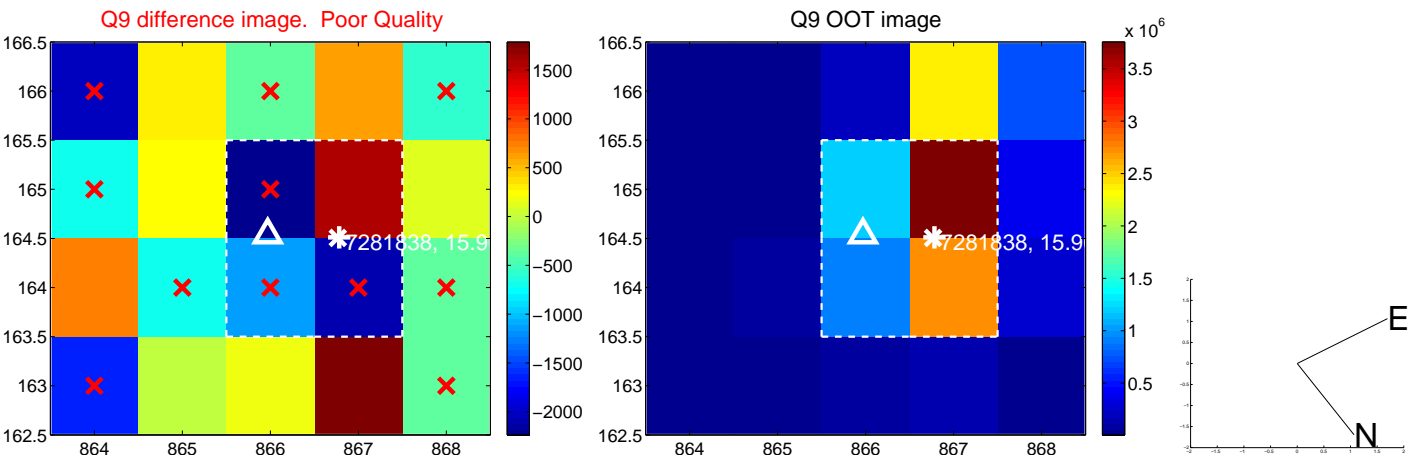
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



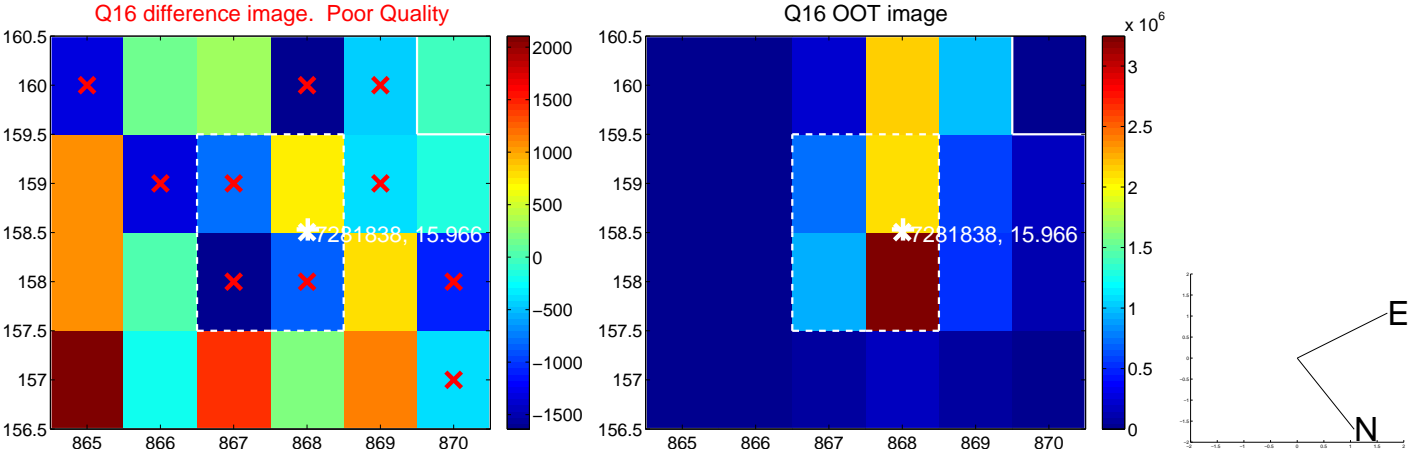
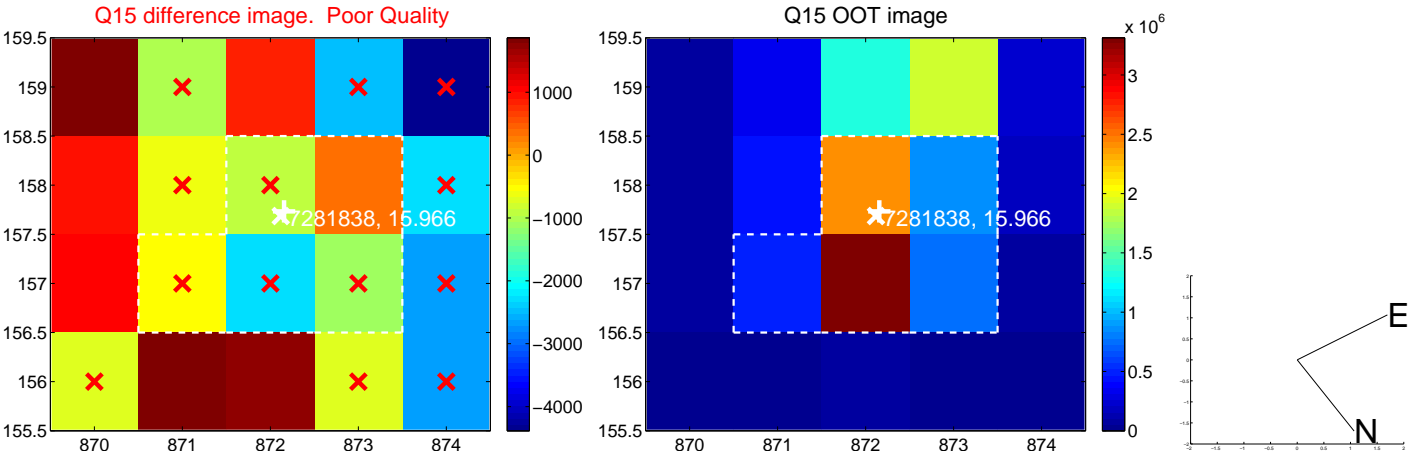
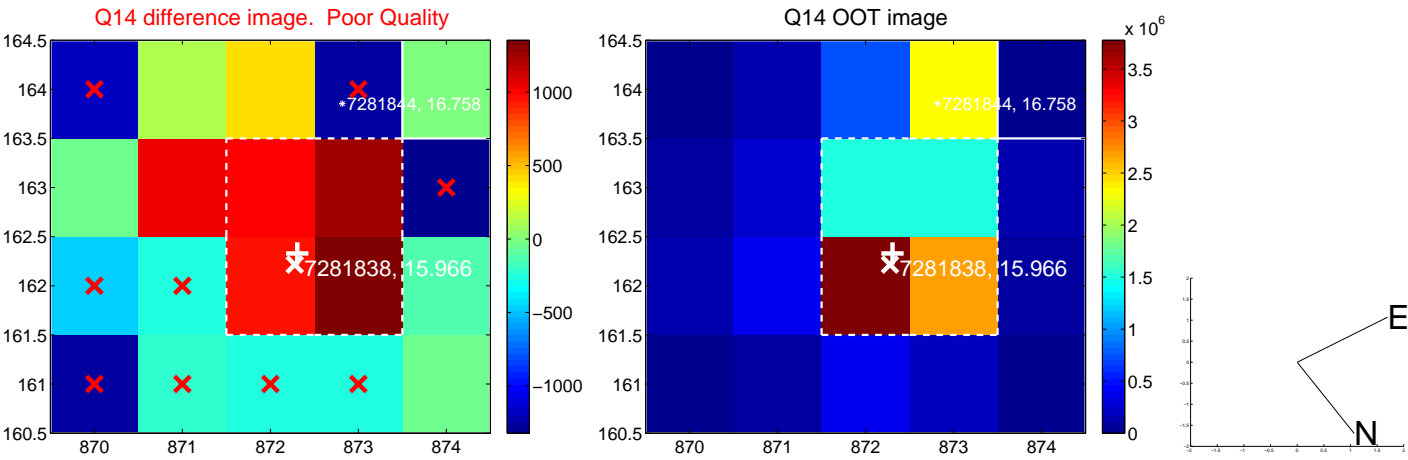
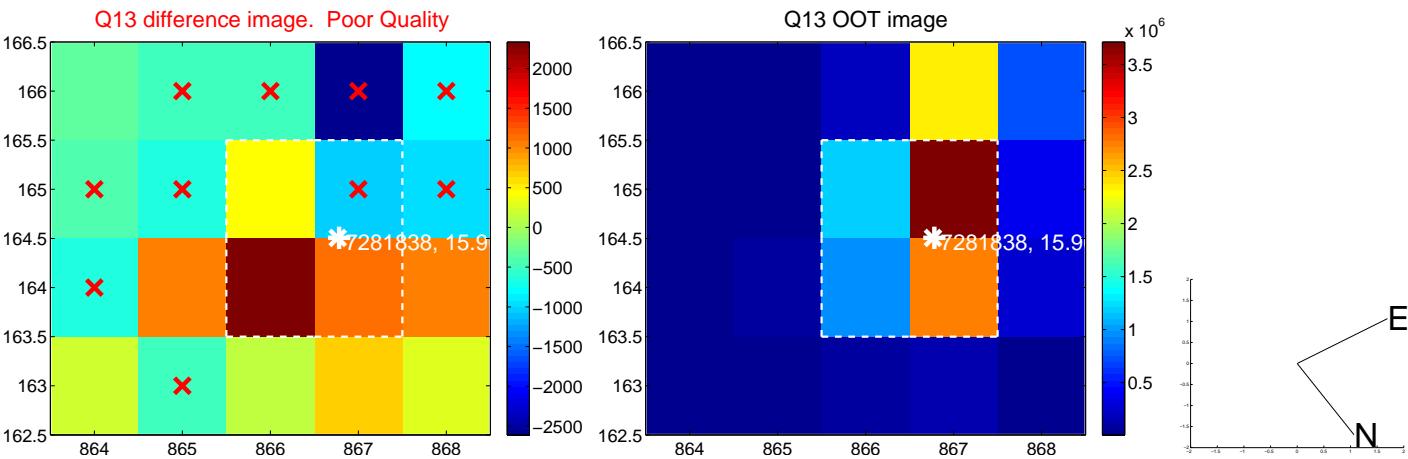
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

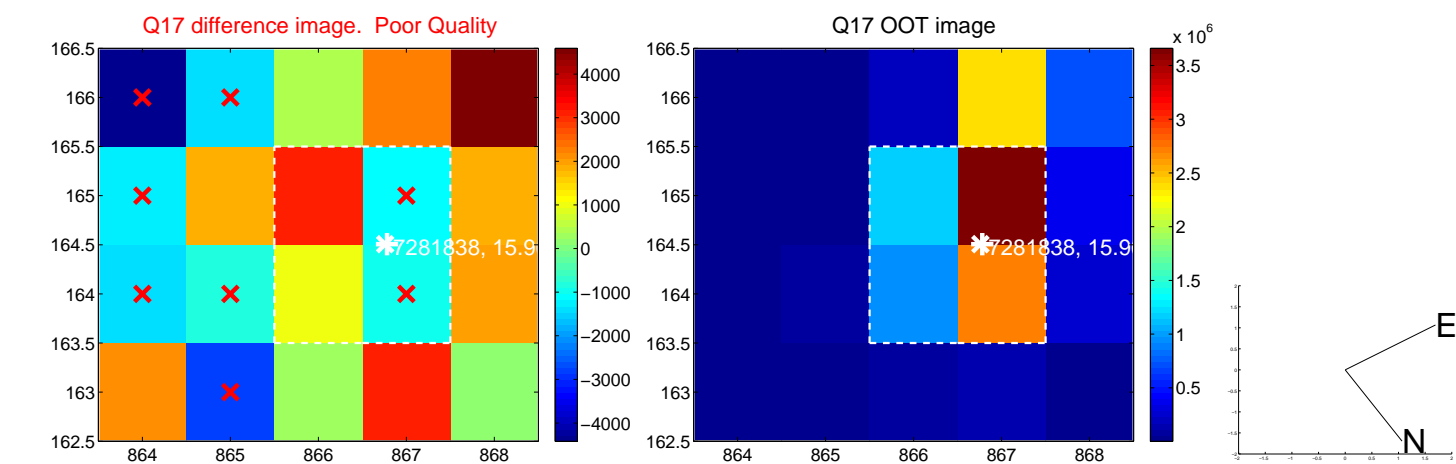


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

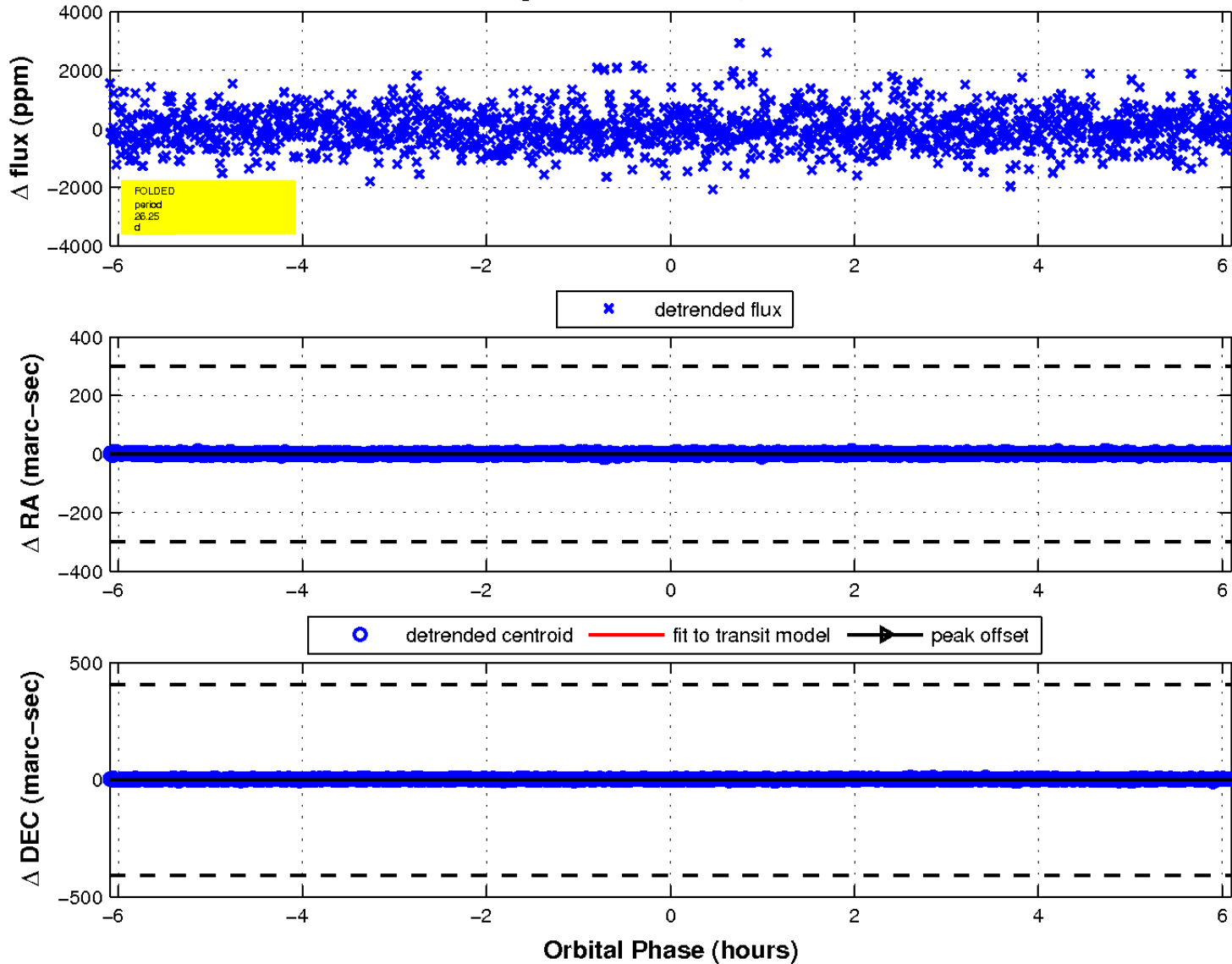




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

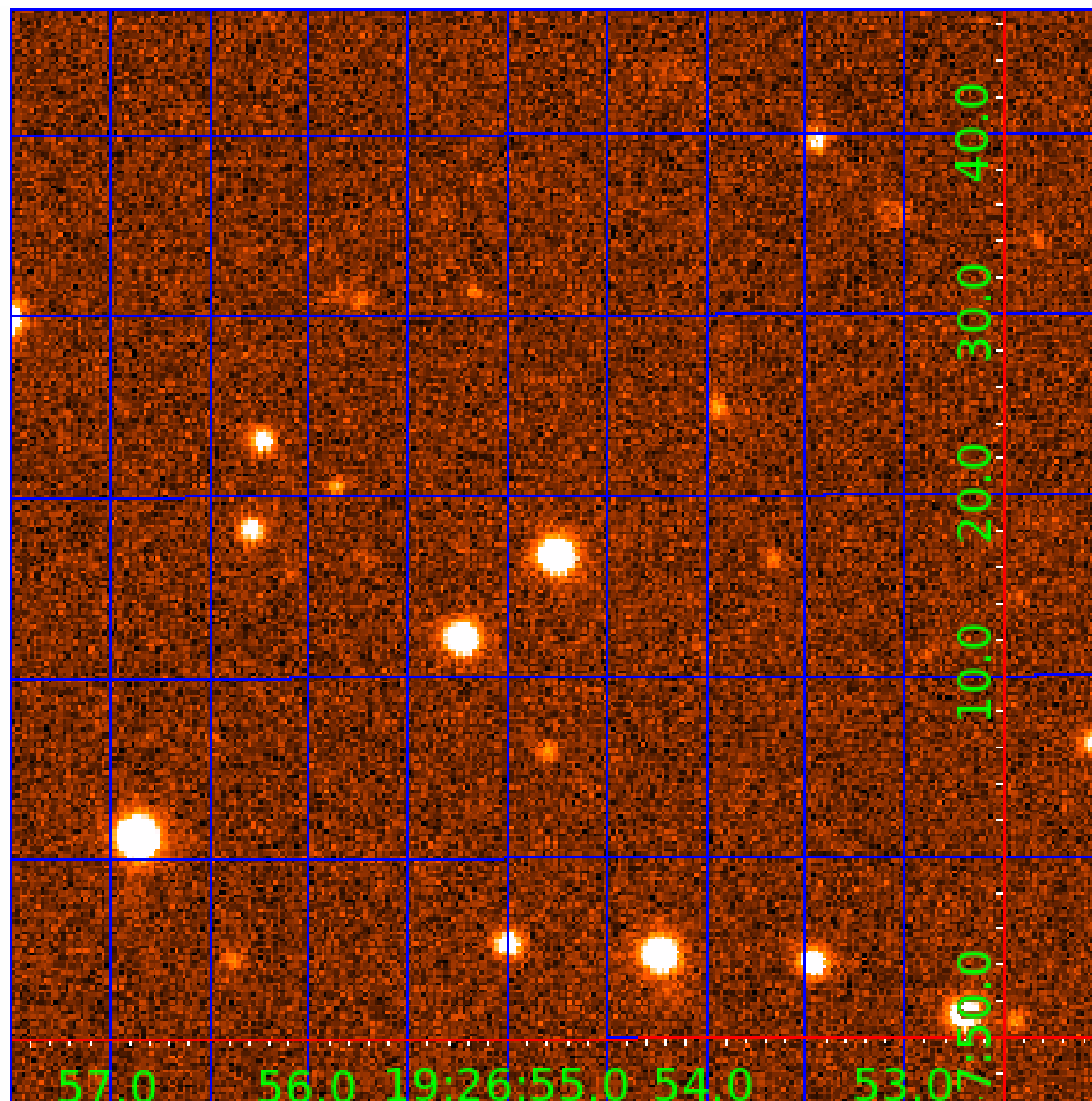


fluxWeightedCentroids, Planet 5 of 6



UKIRT Image

Declination



# KIC 007281838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007281838-01	OBS	No	0.566752	131.853725	45.4	3.967	13.0	7.8	1.08	6116	0.74	7338.25
007281838-02	OBS	No	23.034622	143.976175	1060.1	2.101	10.0	9.6	1.08	6116	3.53	52.51
007281838-03	OBS	No	25.395660	153.219359	1049.5	1.872	10.4	8.8	1.08	6116	3.93	46.11
007281838-04	OBS	No	33.933401	145.247478	1647.1	1.140	11.9	11.3	1.08	6116	4.41	31.33
007281838-05	OBS	No	26.251749	132.692163	1756.8	2.033	9.1	12.1	1.08	6116	8.73	44.11
007281838-06	OBS	No	12.662621	142.254739	1117.7	1.069	9.7	10.5	1.08	6116	4.00	116.61

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007281838-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
007281838-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007281838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST
007281838-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007281838-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_DIFFS

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

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

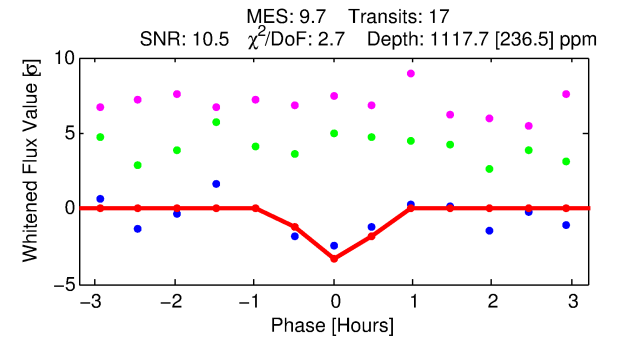
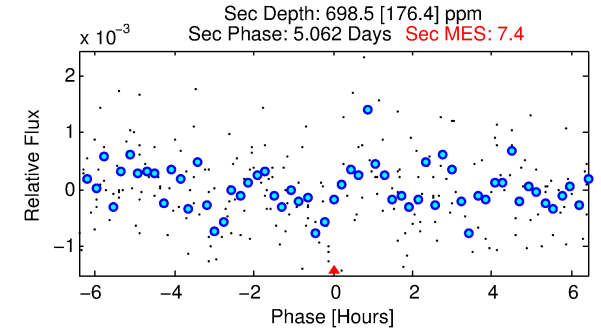
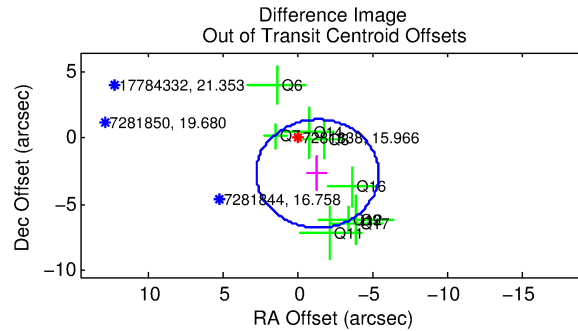
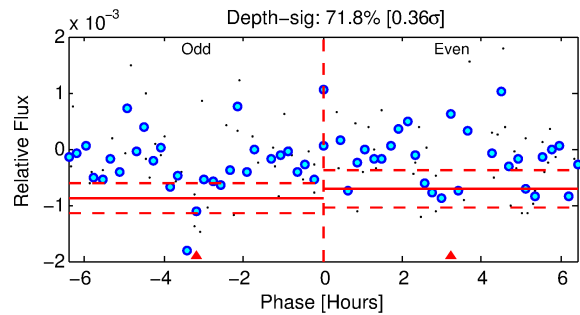
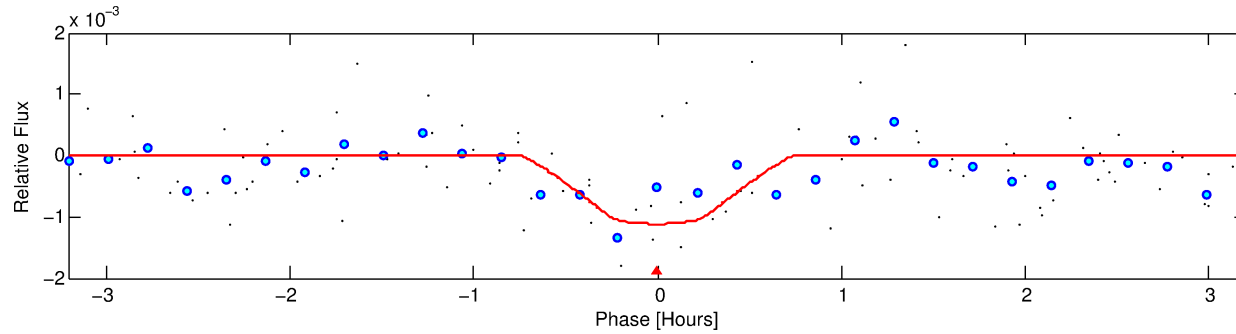
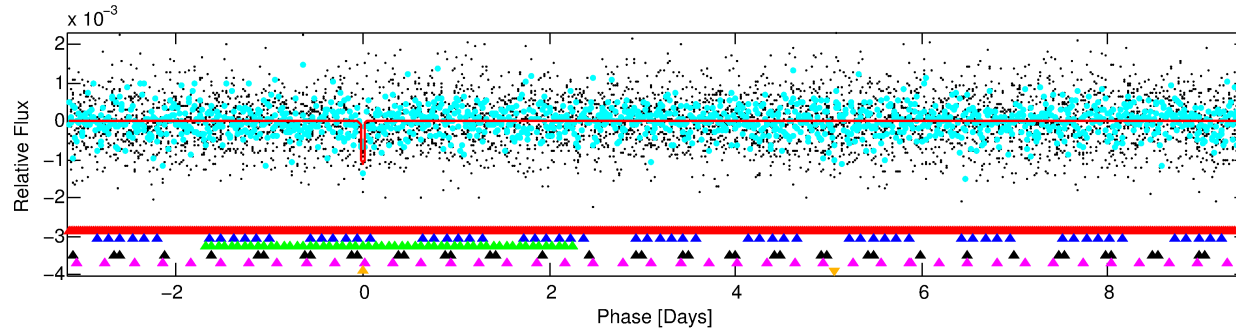
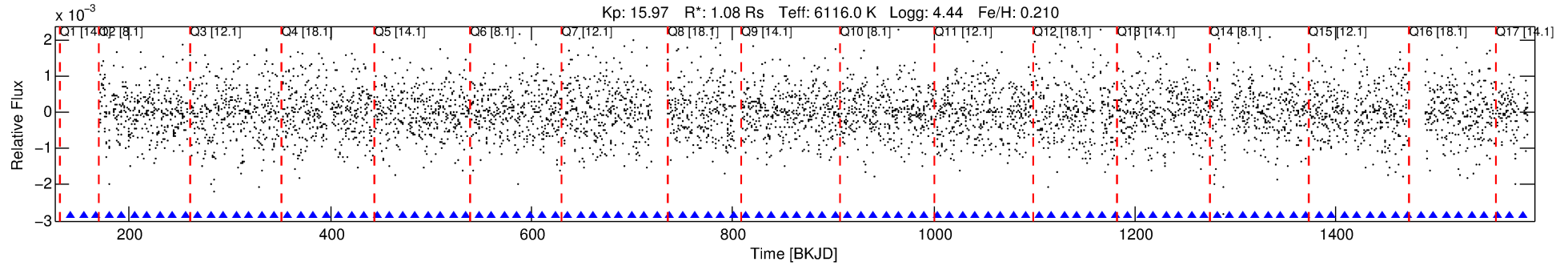
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007281838-06

No Significant Match Found

# DV One-Page Summary

KIC: 7281838 Candidate: 6 of 6 Period: 12.663 d



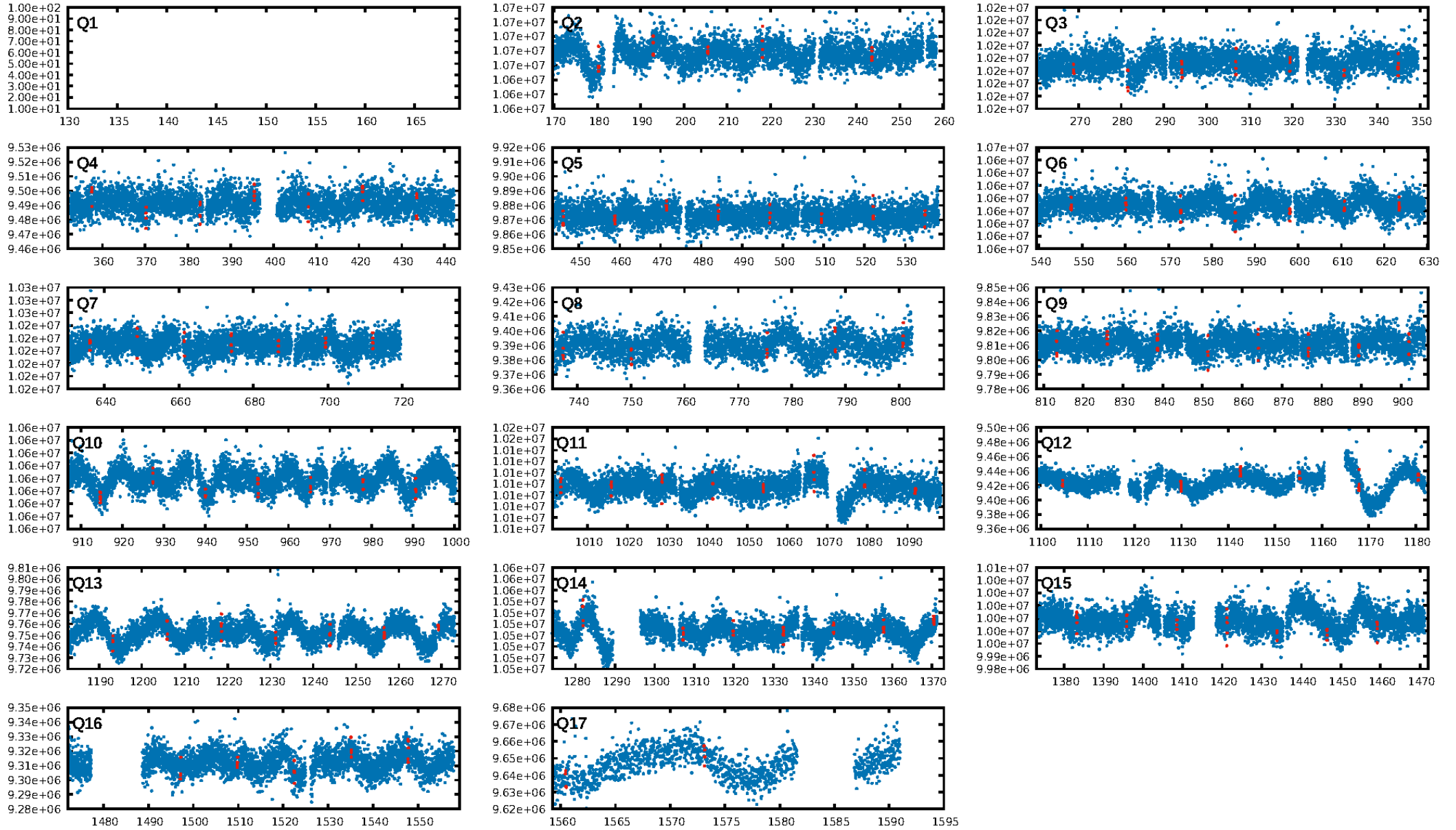
## DV Fit Results:

Period = 12.66262 [0.00012] d  
Epoch = 142.2547 [0.0074] BKJD  
Rp/R\* = 0.0338 [0.0755]  
a/R\* = 62.57 [658.08]  
b = 0.77 [5.68]  
Seff = 116.61 [42.89]  
Teq = 838 [77] K  
Rp = 4.00 [9.00] Re  
a = 0.1124 [0.0257] AU  
Ag = 303.68 [1363.04] [0.22 $\sigma$ ]  
Teffp = 5408 [6055] K [0.75 $\sigma$ ]

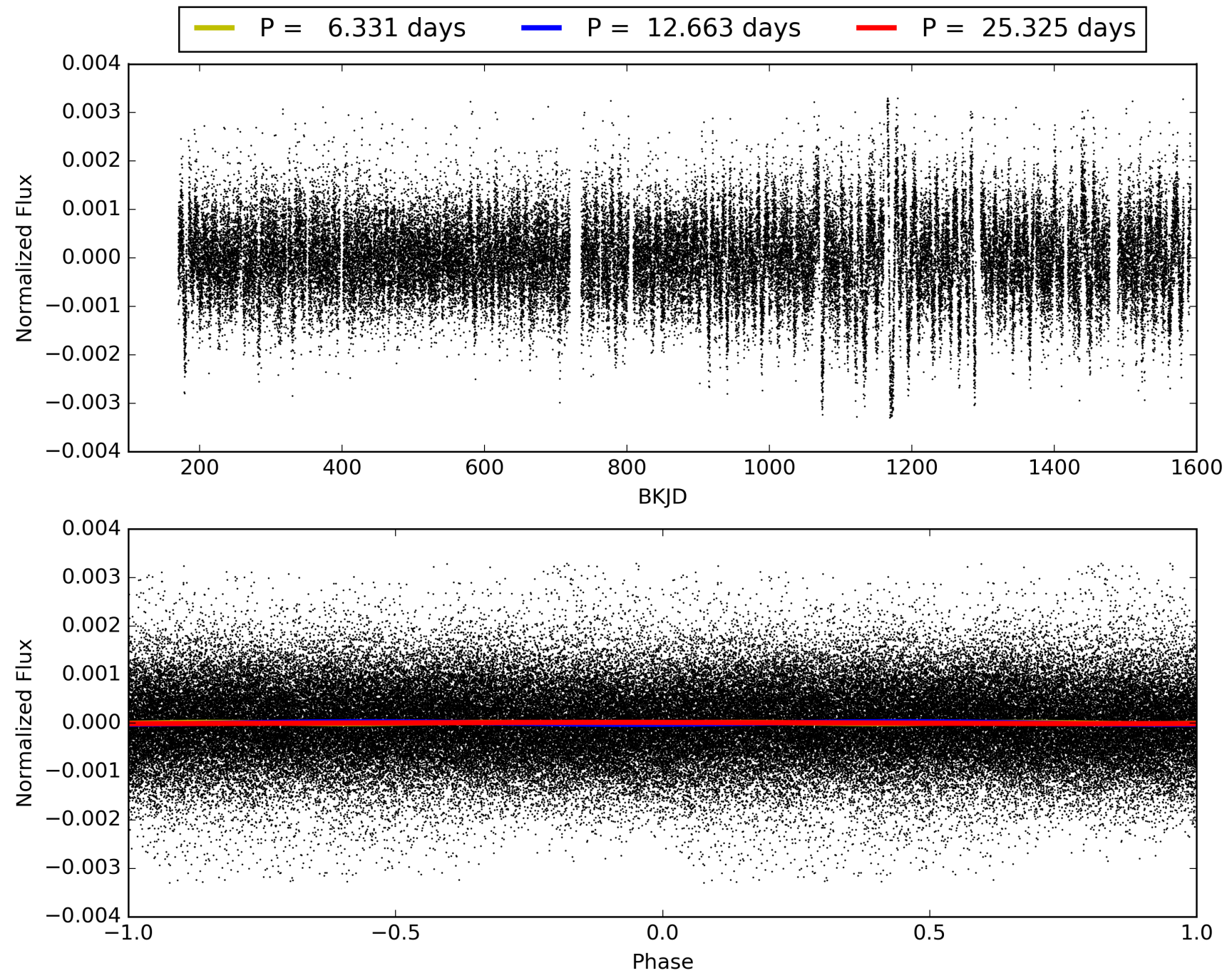
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [70.65 $\sigma$ ]  
LongPeriod-sig: 100.0% [105.60 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 95.2%  
Bootstrap-pfa: 2.99e-10  
RollingBand-fgt: 1.00 [17/17]  
GhostDiagnostic-chr: 0.562  
Centroid-sig: 34.2%  
Centroid-so: 1.911 arcsec [3.32 $\sigma$ ]  
OotOffset-rm: 3.009 arcsec [2.20 $\sigma$ ]  
KicOffset-rm: 3.017 arcsec [2.25 $\sigma$ ]  
OotOffset-st: 2/2/3/2 [9]  
KicOffset-st: 2/2/3/2 [9]  
DiffImageQuality-fgm: 0.00 [0/9]  
DiffImageOverlap-fno: 0.00 [0/16]

# TCE 007281838-06, PDC Light Curves

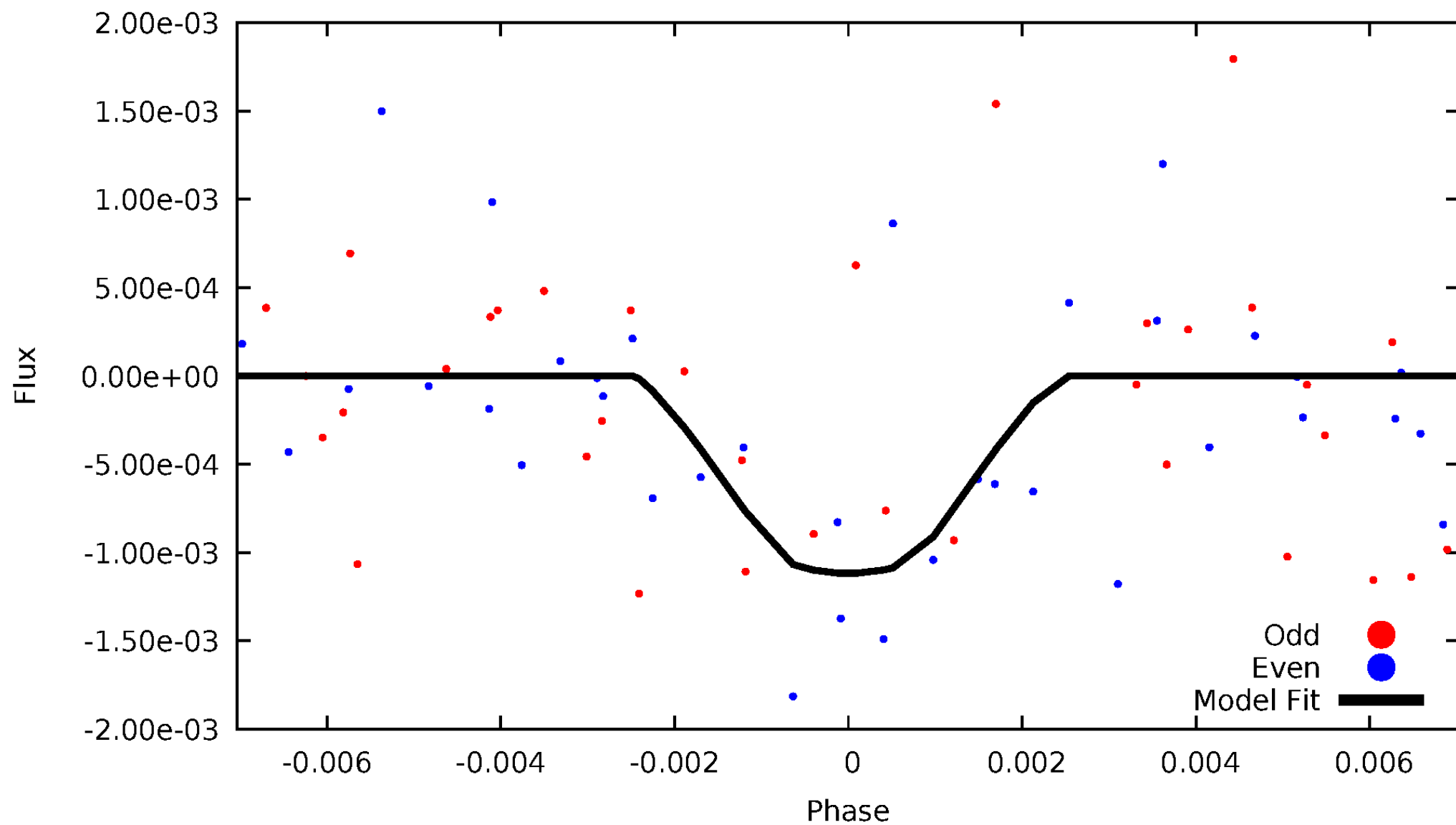


# TCE 007281838-06



# DV Odd/Even

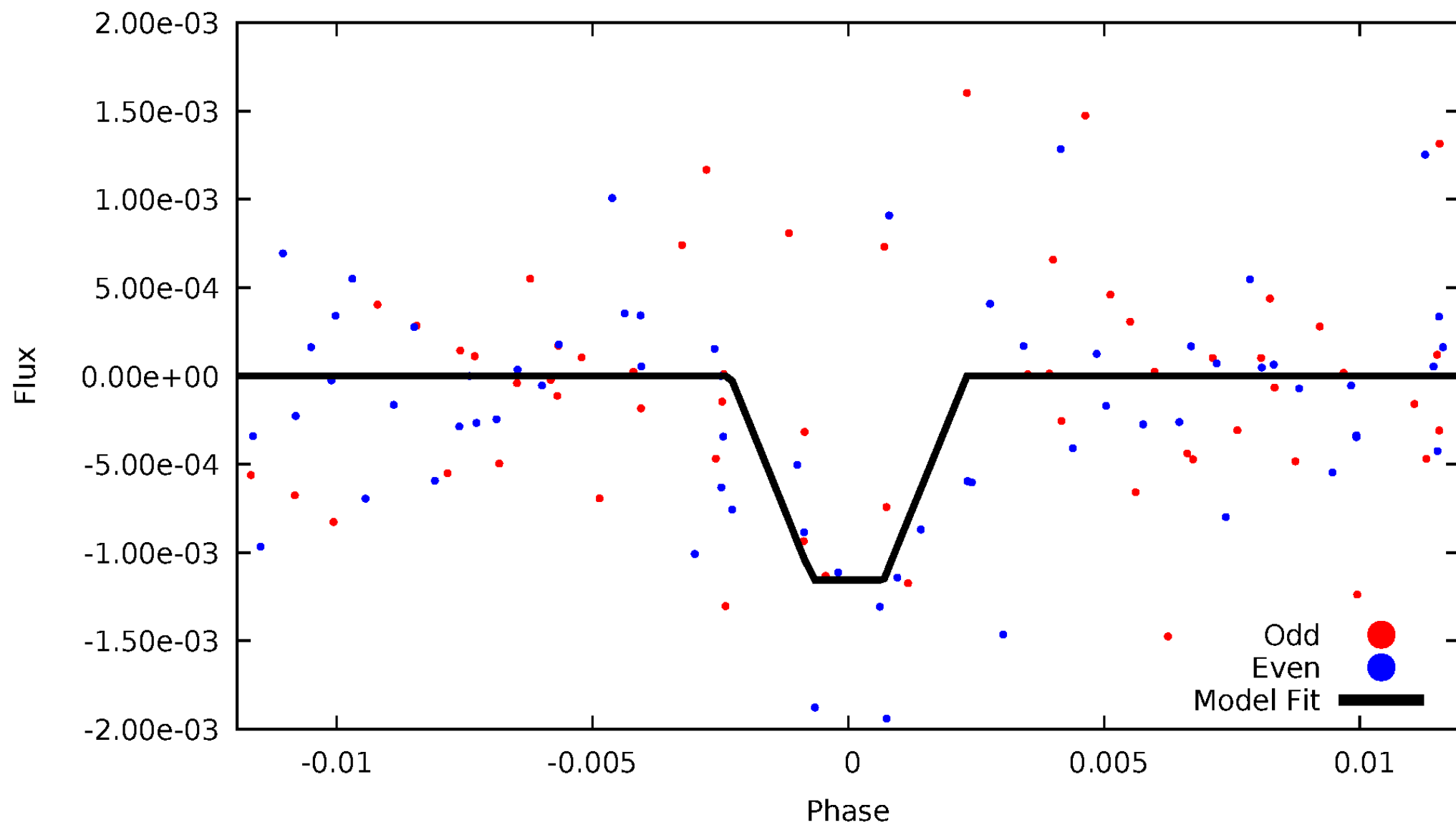
TCE 007281838-06





# ALT Odd/Even

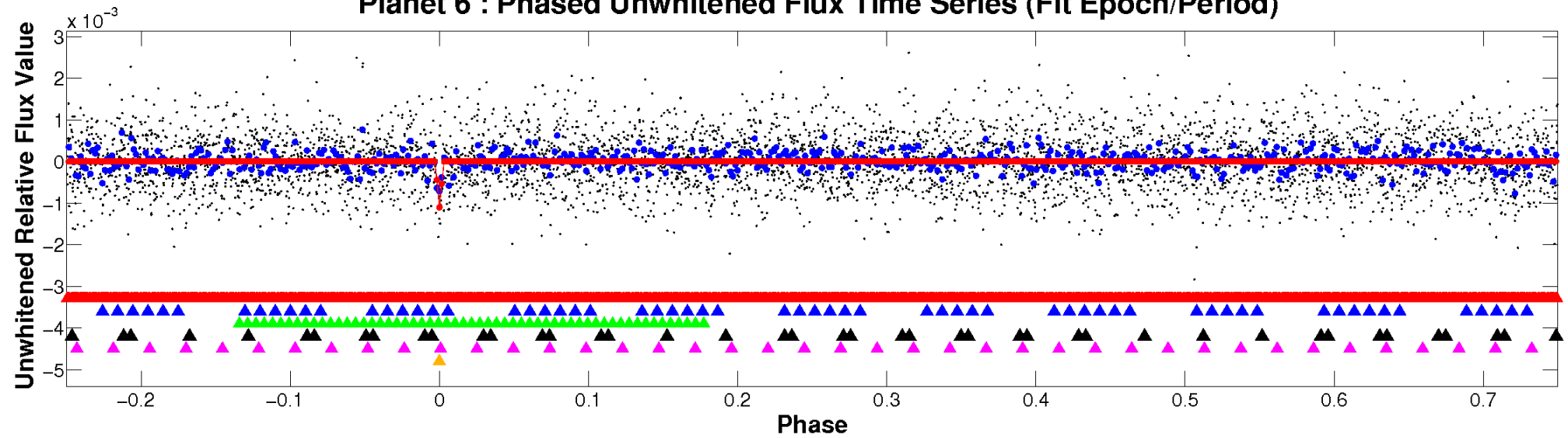
TCE 007281838-06



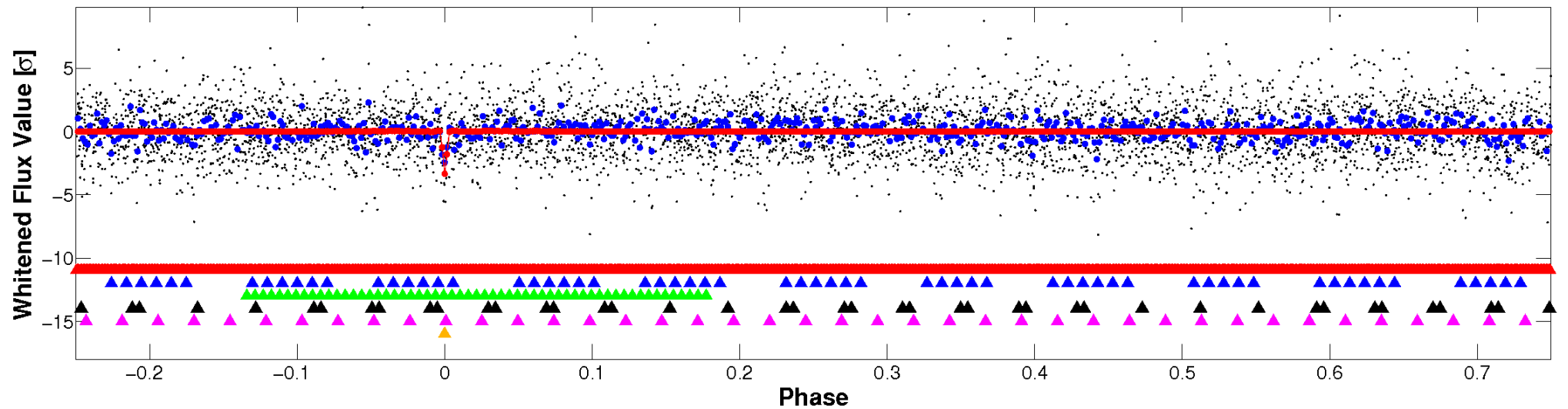


# Non-Whitened Vs. Whitened Light Curve

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

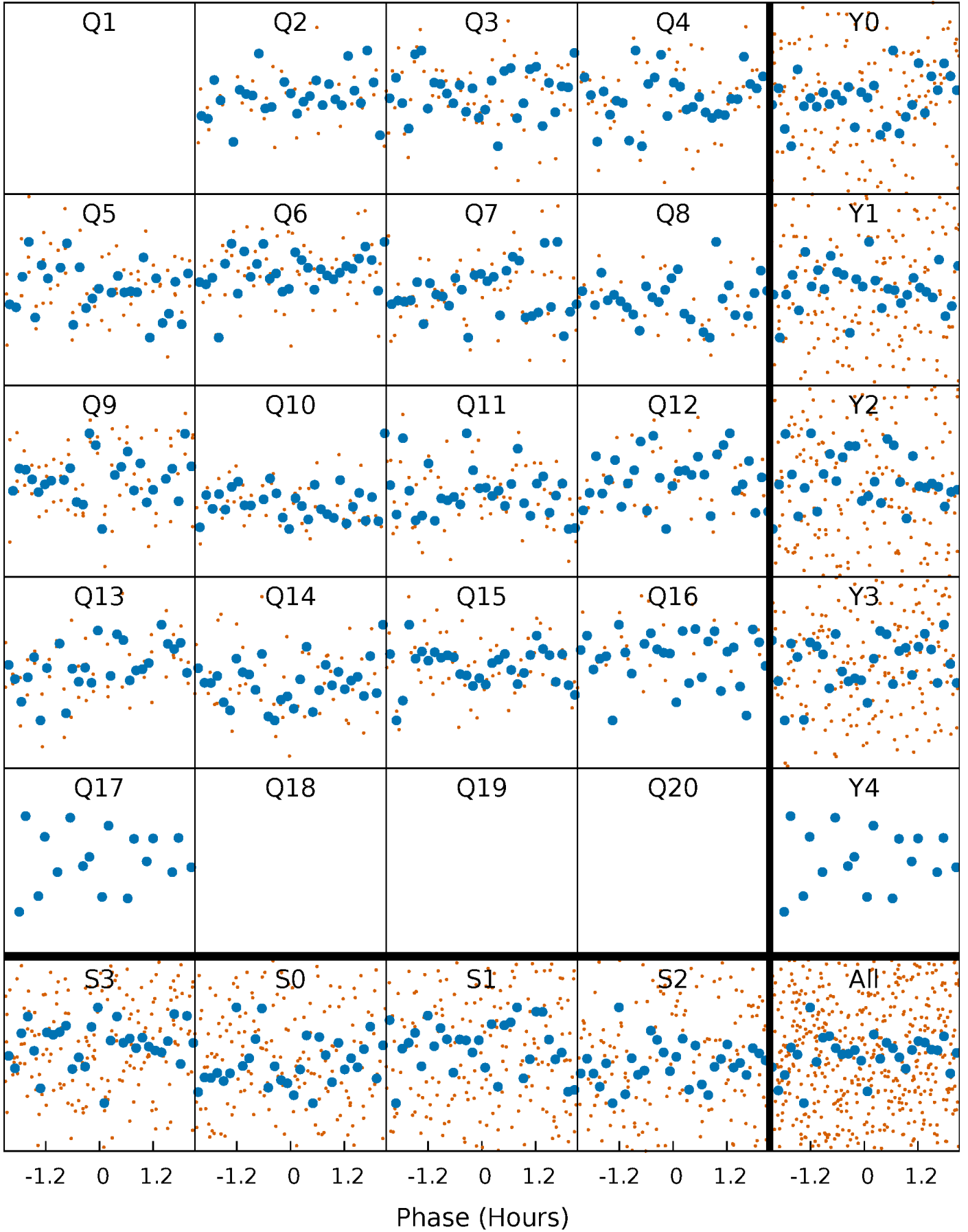


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



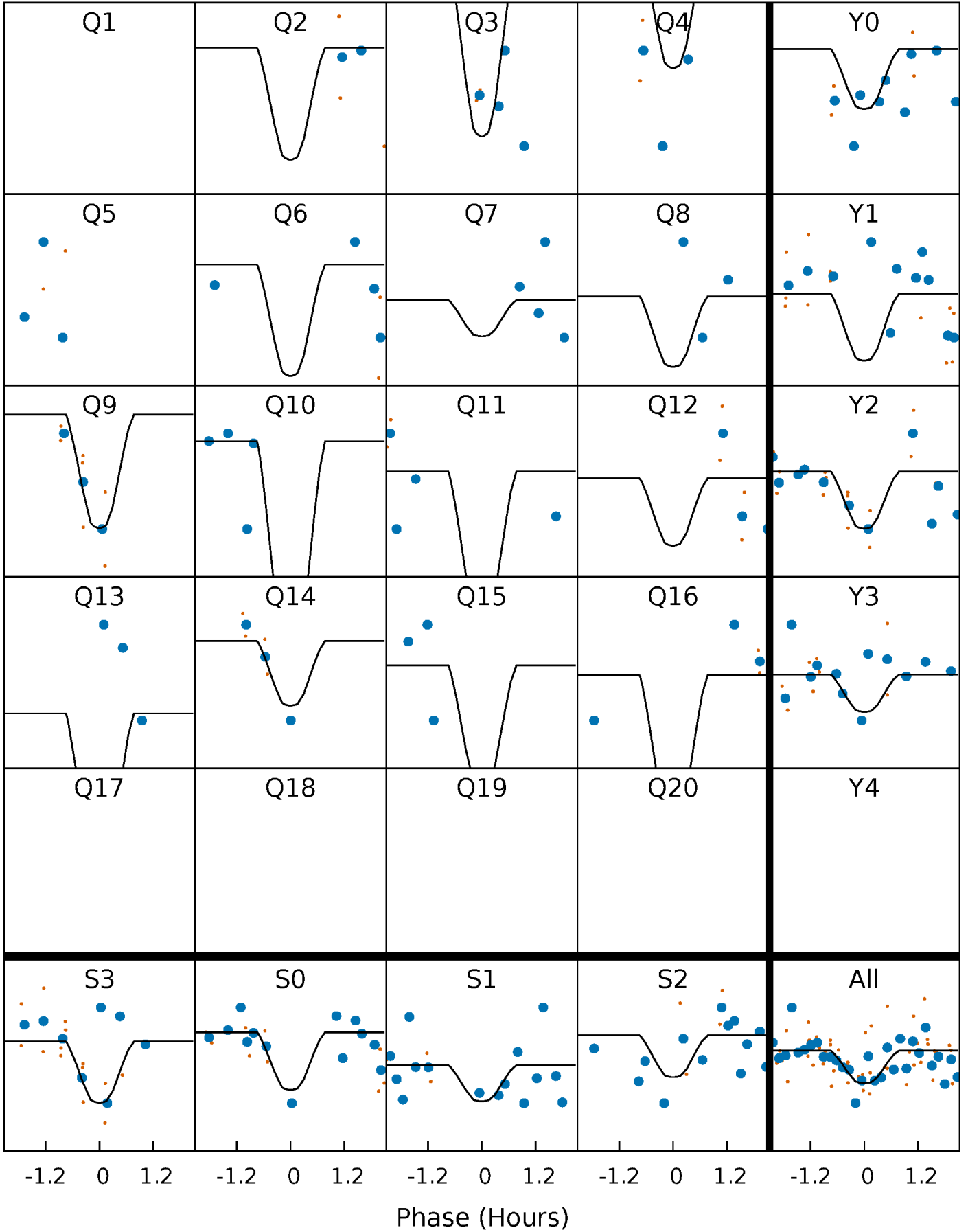
# PDC Quarter-Phased Transit Curves

TCE 007281838-06 P= 12.662621 Days  $T_0=142.254739$  (BKJD)



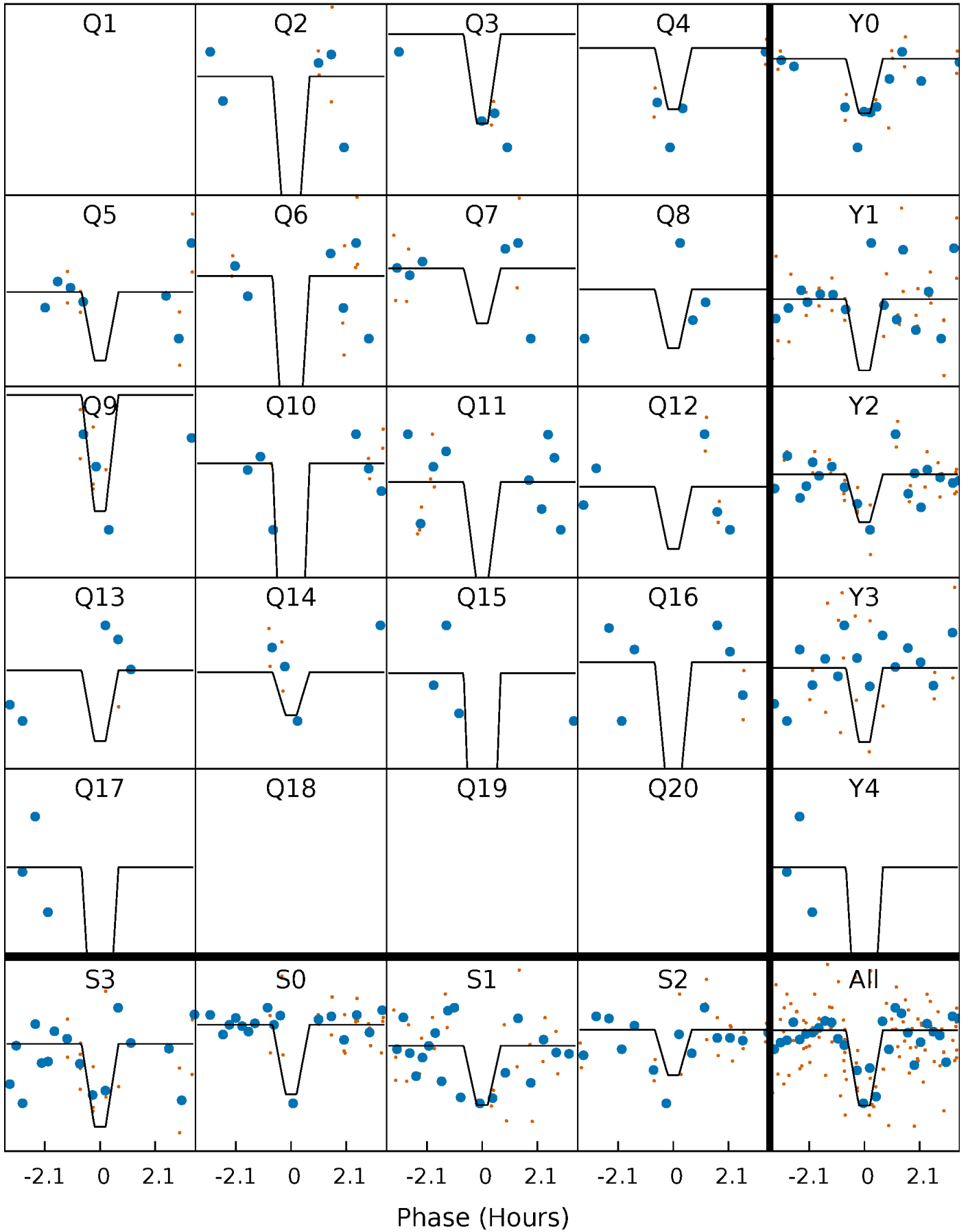
# DV Quarter-Phased Transit Curves

TCE 007281838-06   P= 12.662621 Days    $T_0=142.254739$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

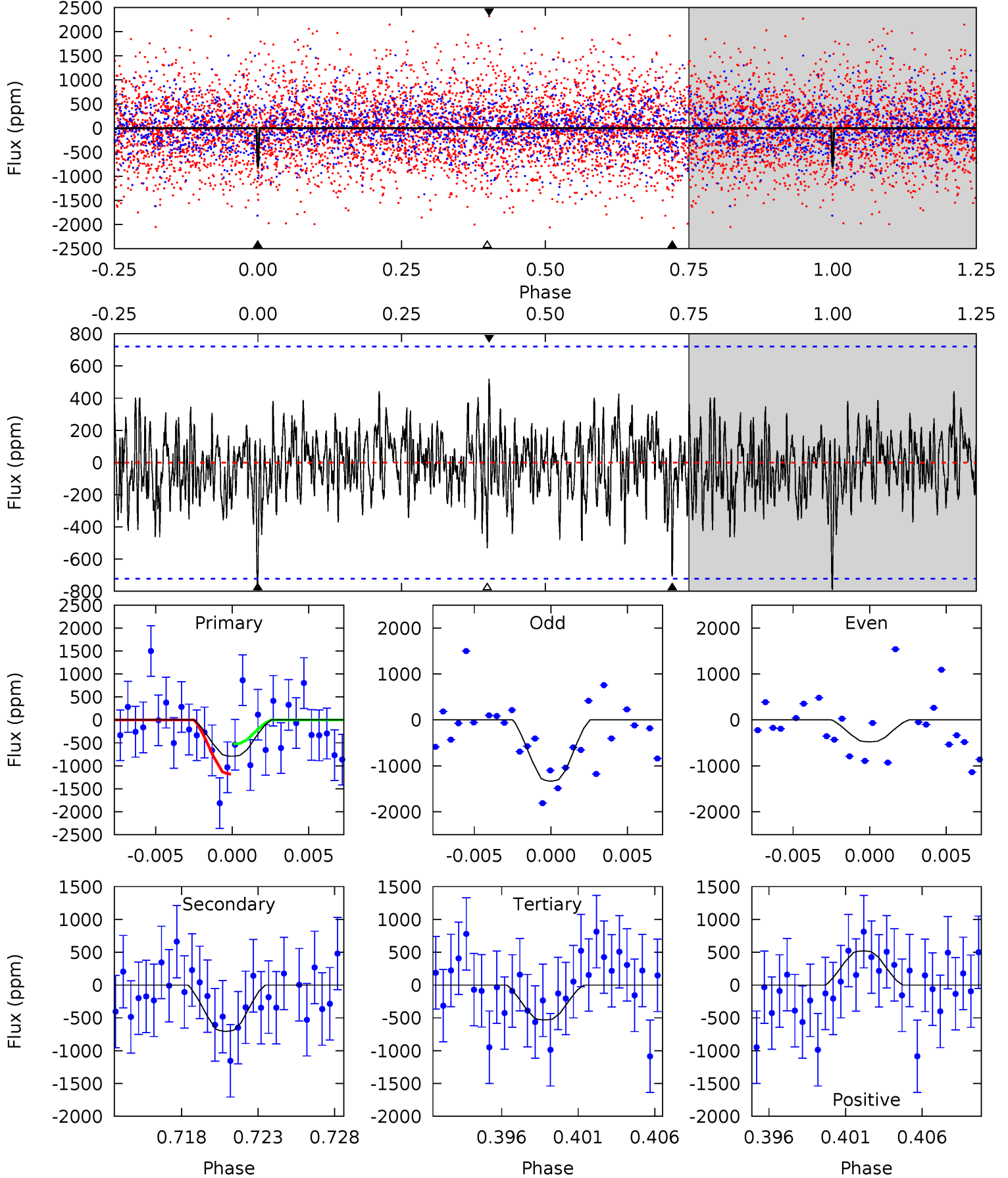
TCE 007281838-06 P= 12.662502 Days  $T_0=142.257114$  (BKJD)



# DV Model-Shift Uniqueness Test

007281838-06, P = 12.662621 Days, E = 142.254739 Days

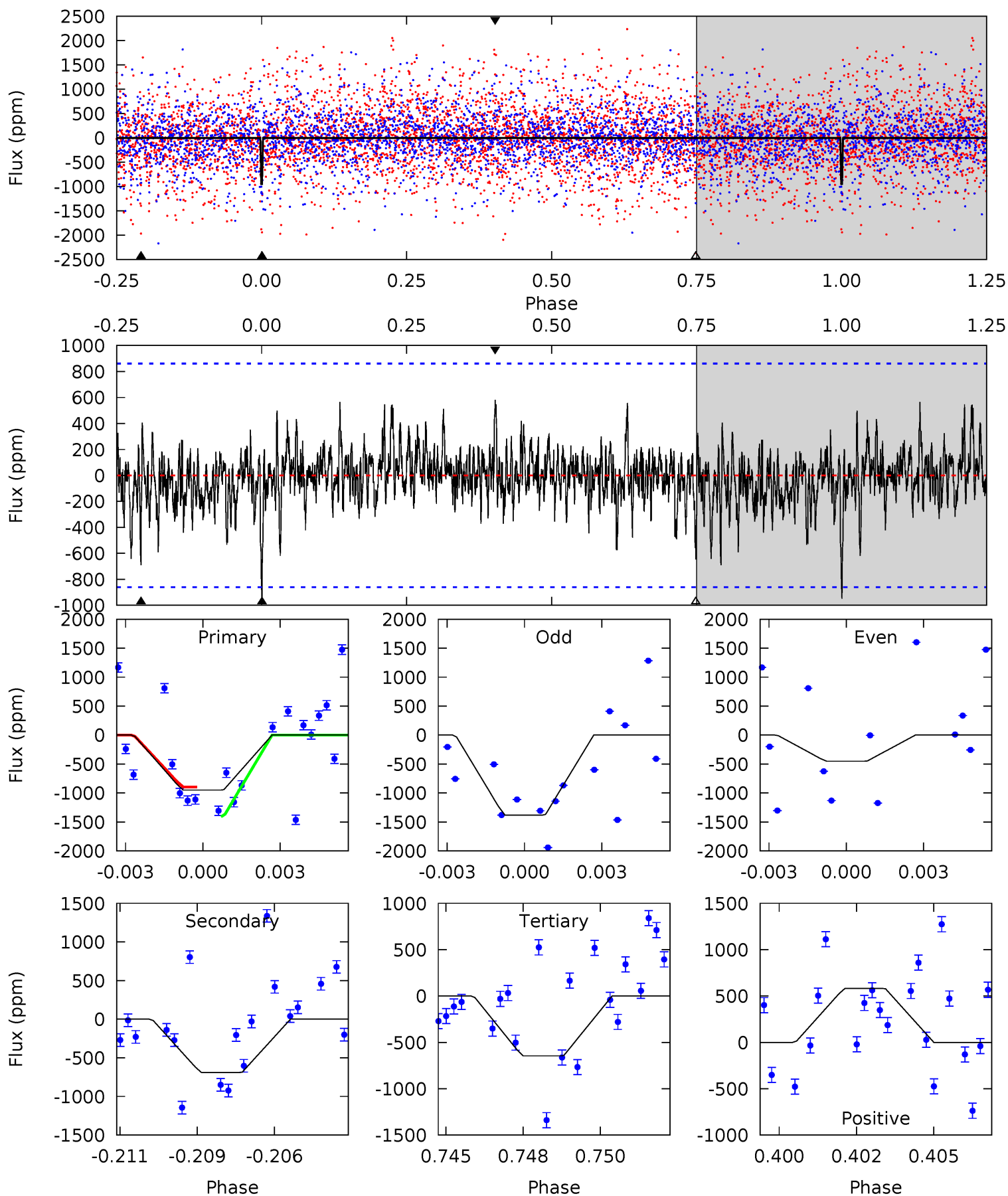
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.66	5.04	3.80	3.72	5.16	2.81	1.20	1.86	1.94	1.24	1.32	3.07	0.65	0.40	2.30



# Alt Model-Shift Uniqueness Test

007281838-06, P = 12.662502 Days, E = 142.257114 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.83	4.24	3.97	3.57	5.28	3.01	1.05	1.86	2.26	0.28	0.67	2.85	1.01	0.38	1.50



### Stellar Parameters For KIC 007281838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6116^{+170}_{-233}$	$4.440^{+0.058}_{-0.184}$	$0.210^{+0.150}_{-0.300}$	$1.084^{+0.292}_{-0.104}$	$1.181^{+0.119}_{-0.164}$	$1.307^{+0.321}_{-0.632}$
	+3%/-4%	+1%/-4%	+71%/-143%	+27%/-10%	+10%/-14%	+25%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007281838-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-705 \pm 140$	$8.03^{+7.23}_{-5.46}$	$1188^{+83}_{-58}$	$4168^{+2668}_{-820}$	$75^{+581}_{-55}$
Alt.	$-691 \pm 163$	$8.06^{+7.95}_{-5.39}$	$1185^{+76}_{-59}$	$4093^{+2555}_{-795}$	$70^{+551}_{-52}$

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

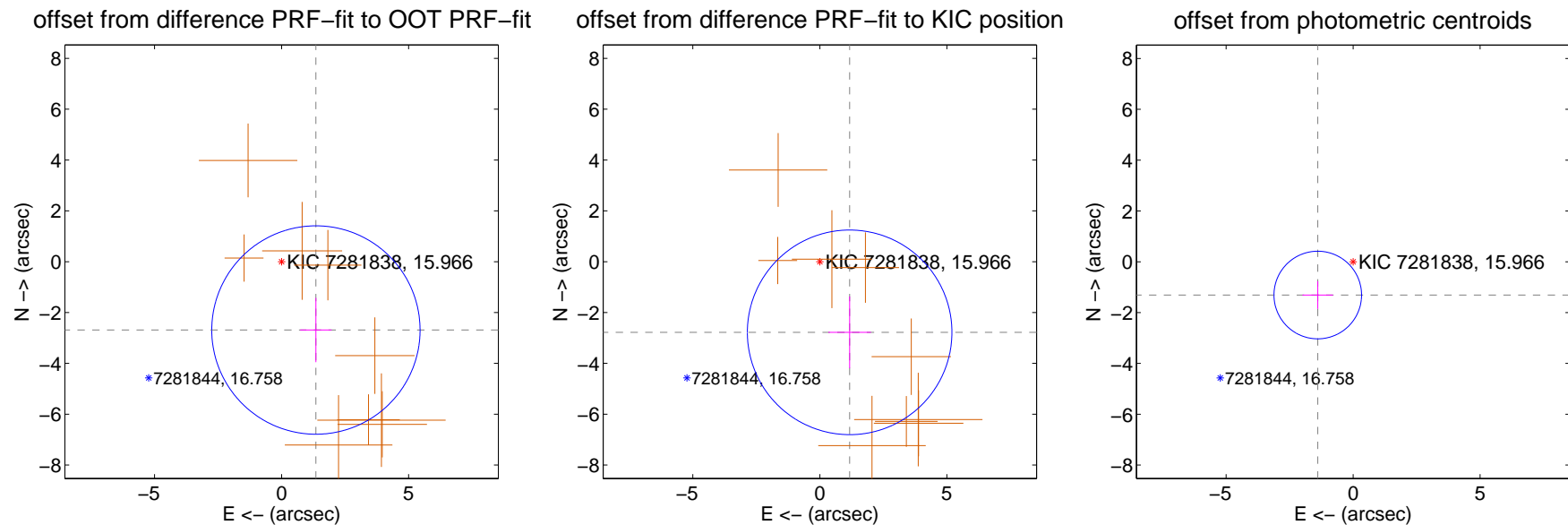
## DV Centroid Data

Supplemental centroid analysis for 007281838-06. Kepler magnitude: 15.97. Transit SNR 10.45

There are 0 quarters with good PRF difference image offsets

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

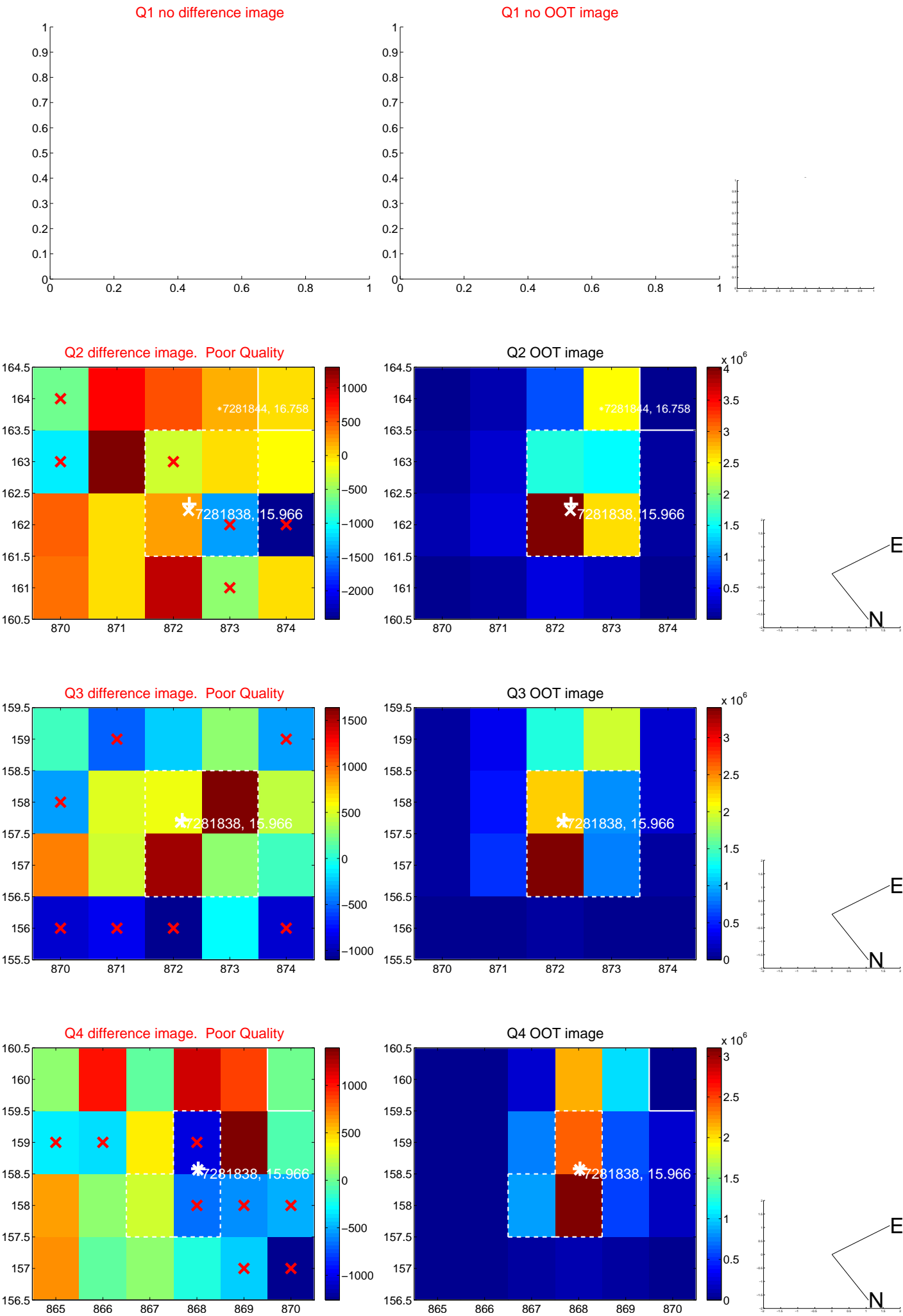
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.009 \pm 1.367$	2.20	$-1.351 \pm 0.617$	$-2.689 \pm 1.266$
PRF-fit source offset from KIC position	$3.017 \pm 1.342$	2.25	$-1.173 \pm 0.838$	$-2.780 \pm 1.413$
photometric centroid source offset	$1.91 \pm 0.57$	3.32	$1.39 \pm 0.60$	$-1.31 \pm 0.55$



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.

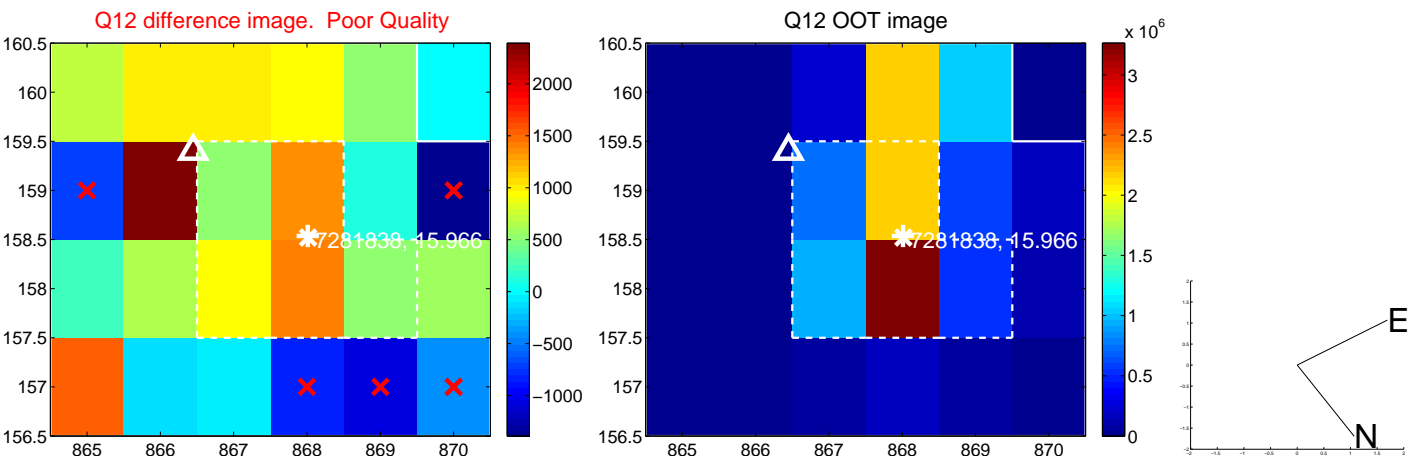
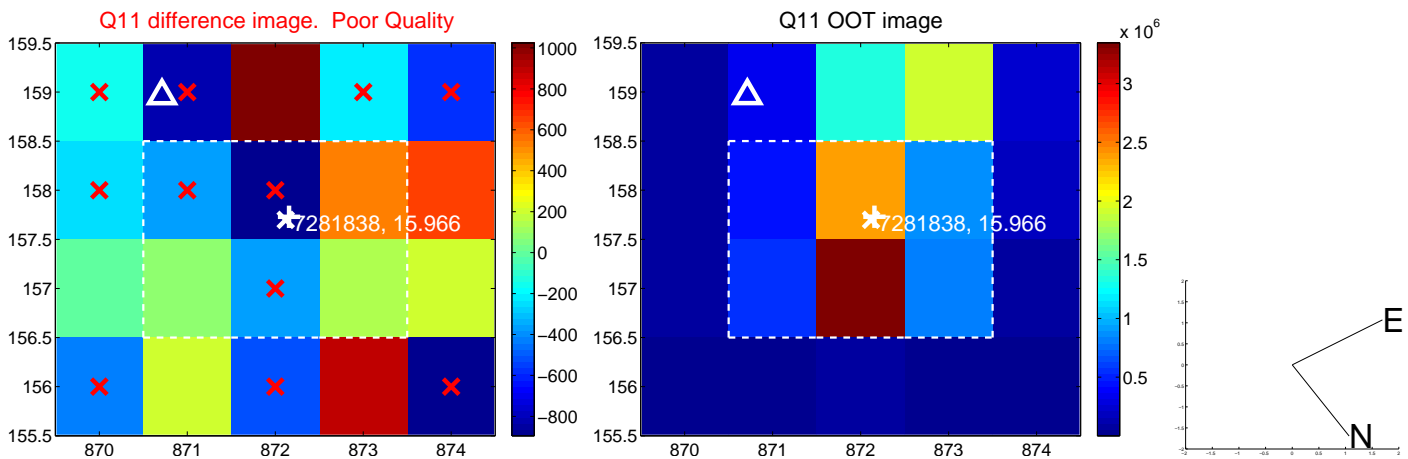
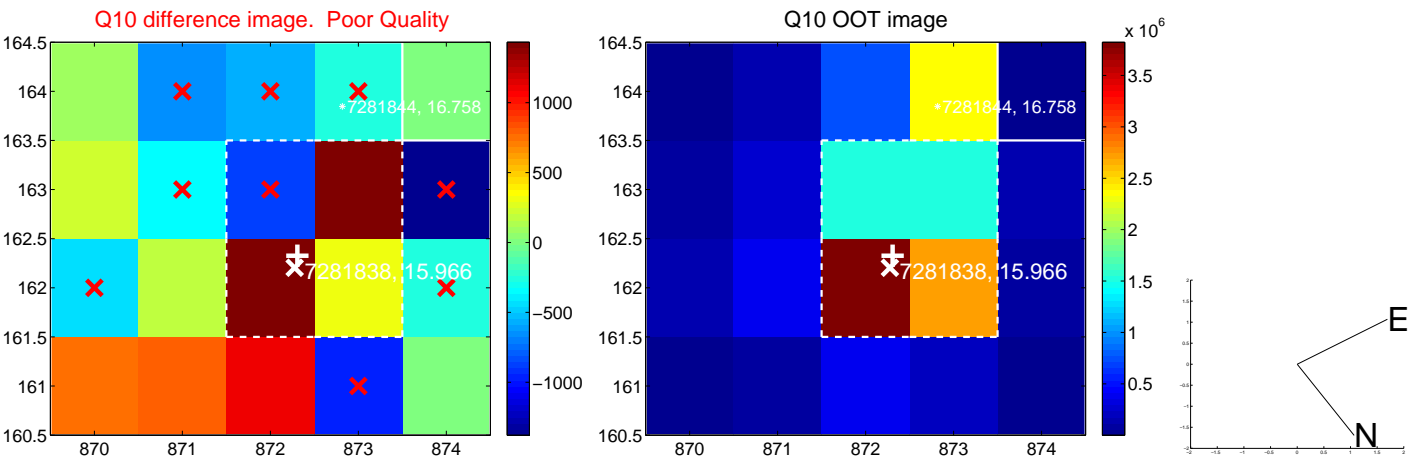
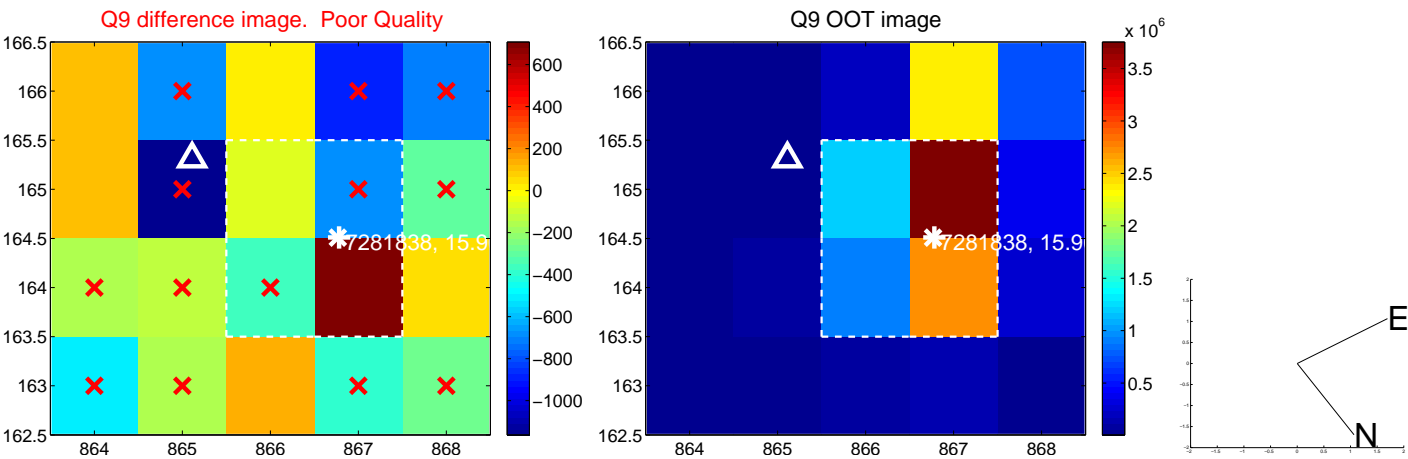


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

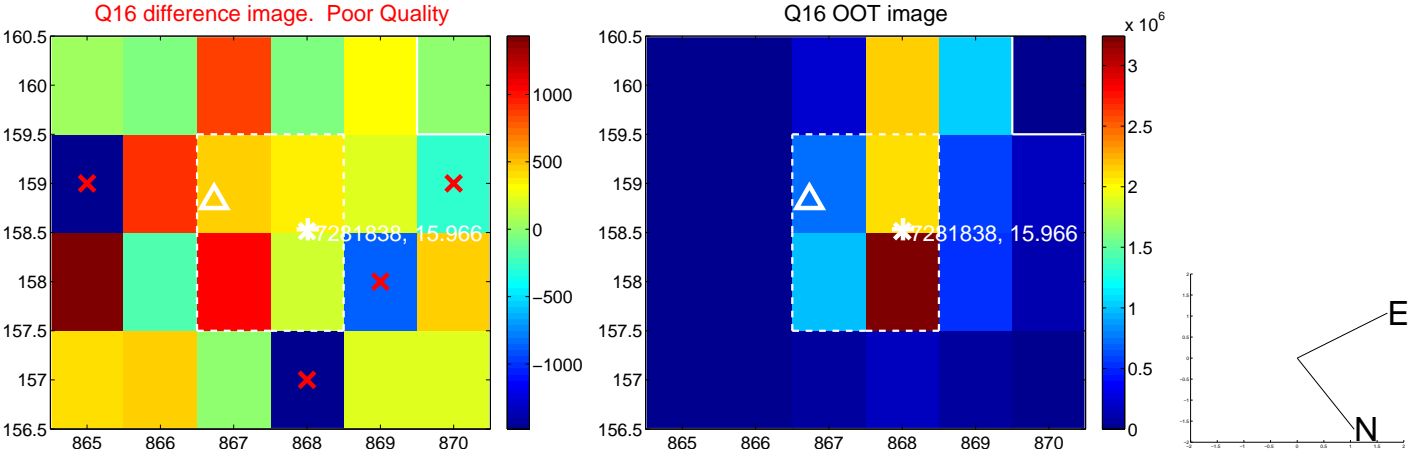
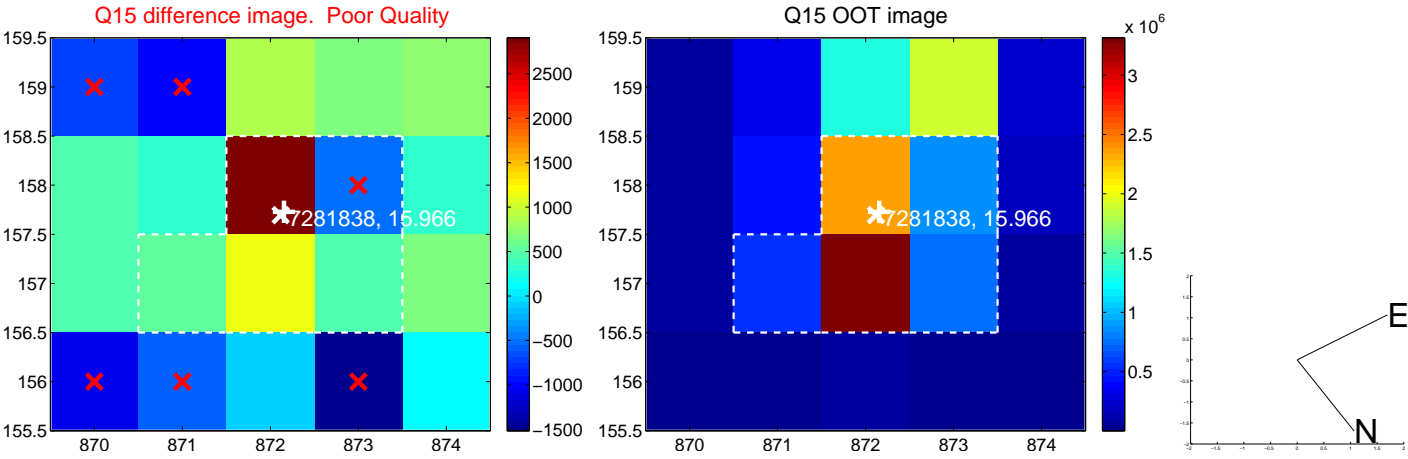
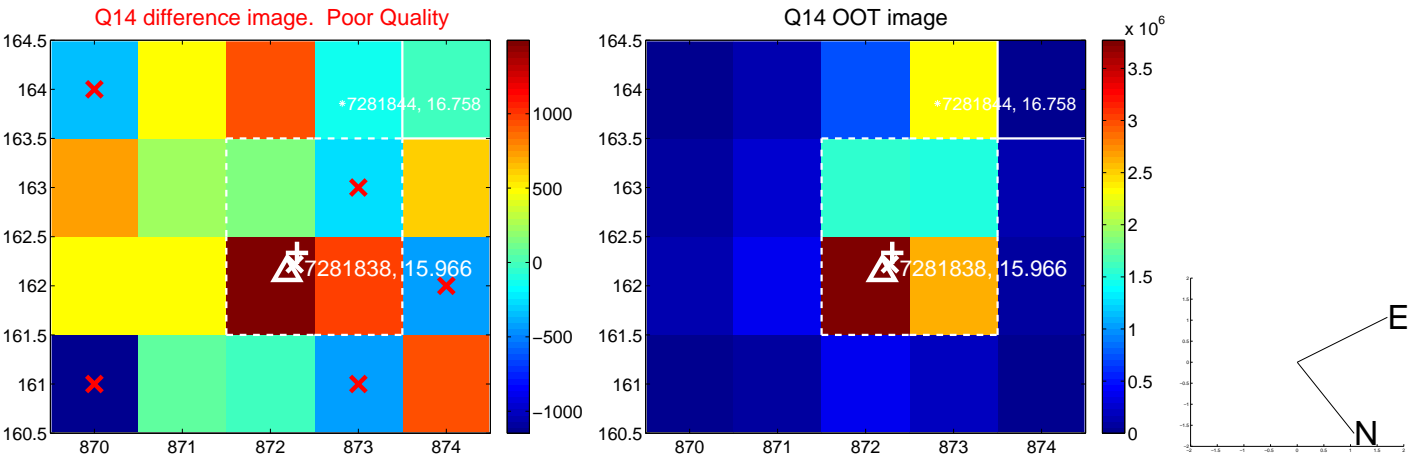
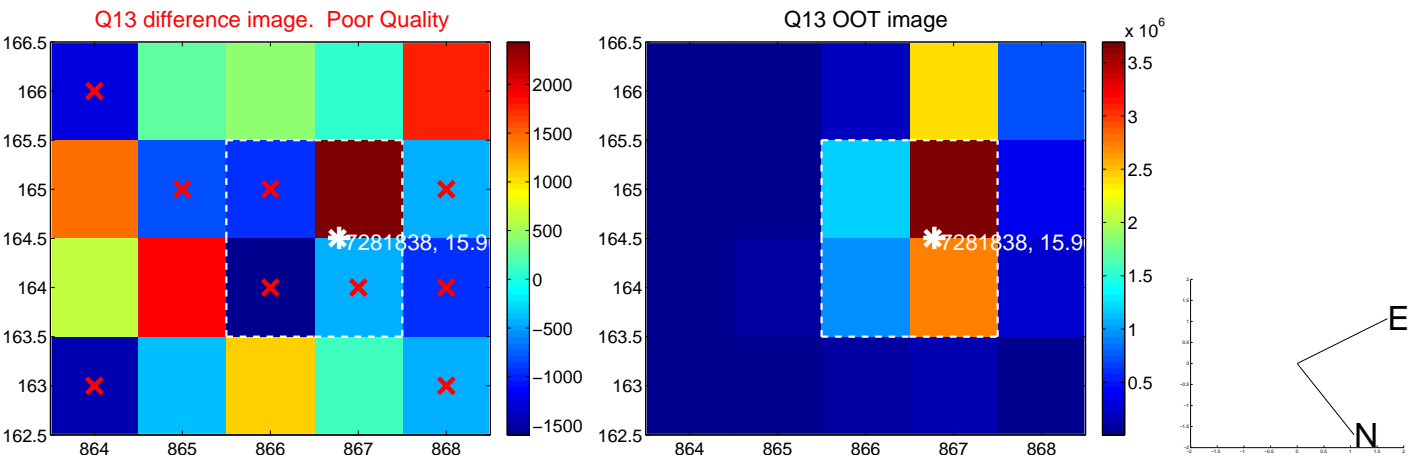




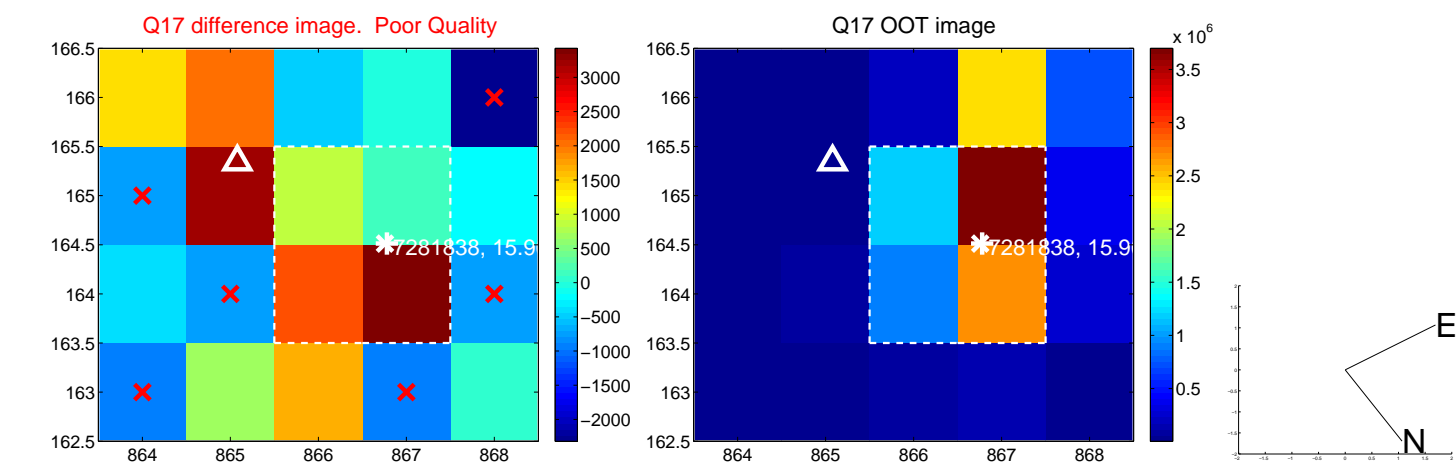
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



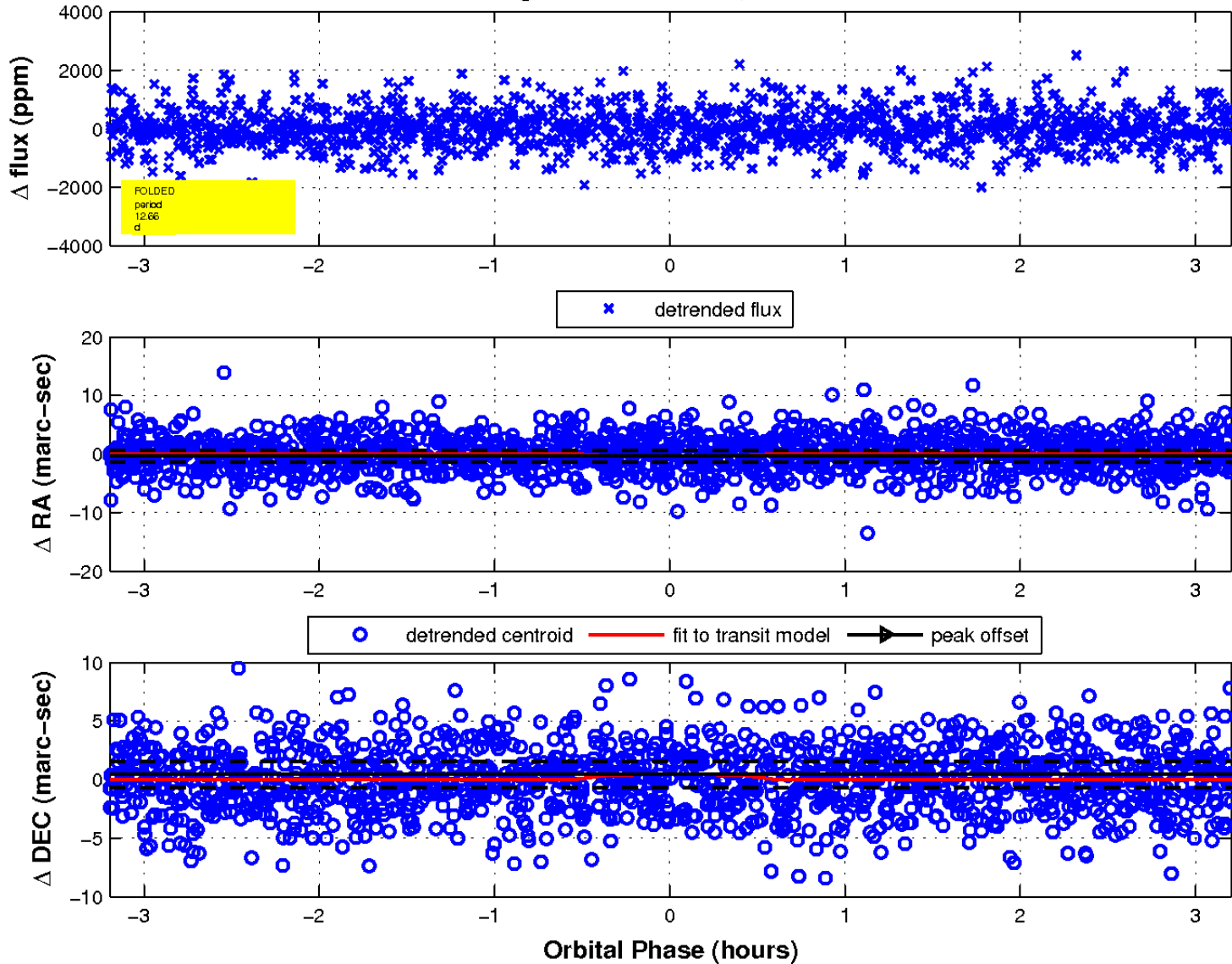
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 6 of 6



UKIRT Image

Declination

