

## KIC 007880676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007880676-01	OBS	No	74.700898	193.436167	18.8	1.598	31.4	2.9	1.96	6129	1.00	34.52
007880676-02	OBS	No	544.696610	418.947989	55.4	9.071	18.7	19.0	1.96	6129	1.69	2.44
007880676-03	OBS	No	93.437611	139.301041	58.6	0.868	19.0	28.0	1.96	6129	1.53	25.61
007880676-04	OBS	No	149.986976	136.477266	48.9	3.061	18.7	14.8	1.96	6129	1.37	13.63
007880676-05	OBS	No	49.327158	139.760525	11.7	11.019	14.0	6.8	1.96	6129	0.76	60.03
007880676-06	OBS	No	69.390592	165.569874	29.3	16.554	13.7	11.6	1.96	6129	1.17	38.08
007880676-07	OBS	No	64.361879	185.581530	60.1	2.287	19.3	24.3	1.96	6129	1.73	42.10
007880676-08	OBS	No	94.170624	203.456516	15.9	8.738	13.3	6.8	1.96	6129	0.91	25.35
007880676-09	OBS	No	75.849882	138.940758	46.7	1.755	17.5	8.4	1.96	6129	1.63	33.82
007880676-10	OBS	No	78.737554	157.099189	20.9	12.578	12.9	8.0	1.96	6129	1.05	32.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007880676-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007880676-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-05	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
007880676-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-08	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-09	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-10	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

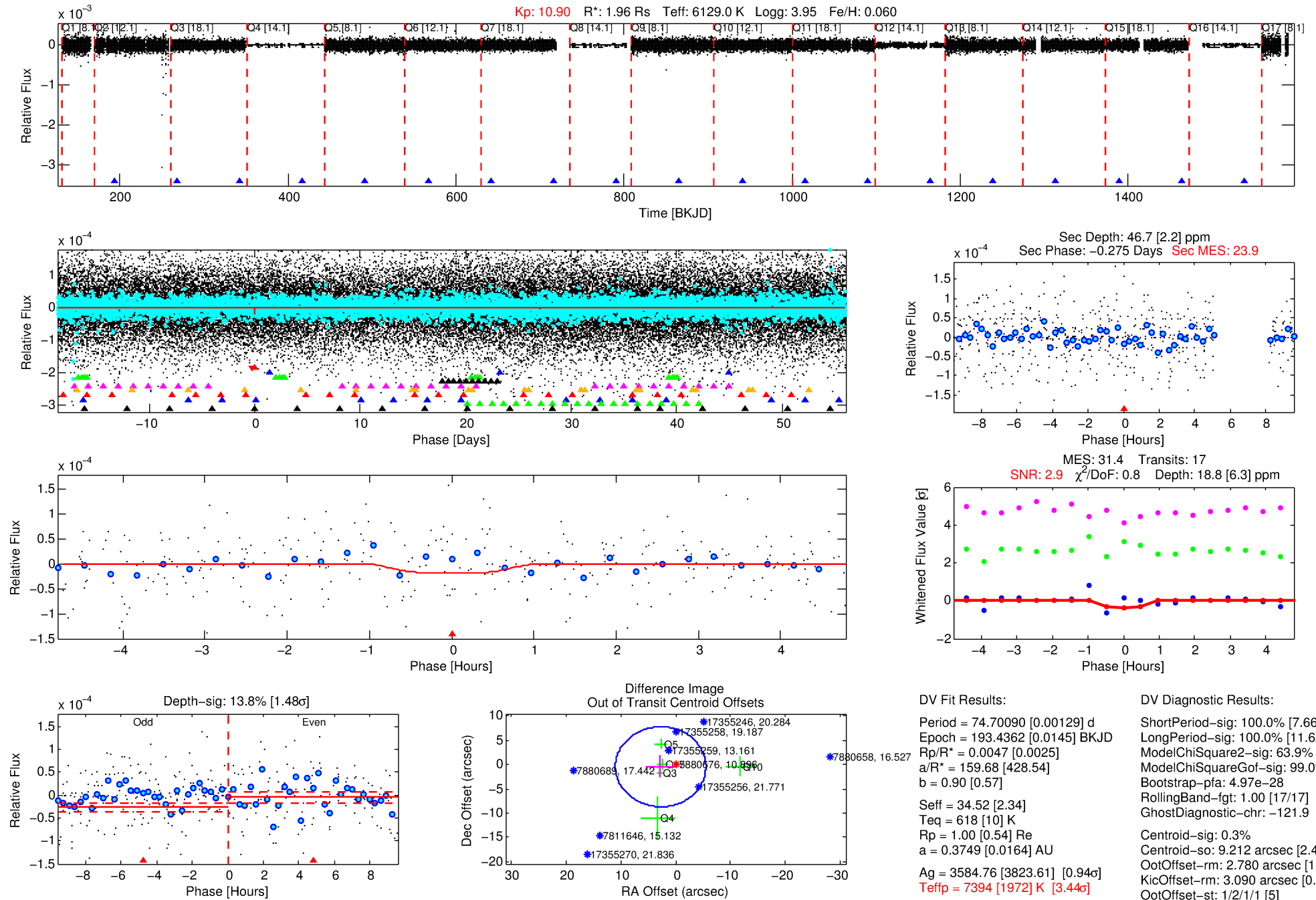
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-01

No Significant Match Found

# DV One-Page Summary

KIC: 7880676 Candidate: 1 of 10 Period: 74.701 d



## DV Fit Results:

Period = 74.70090 [0.00129] d  
Epoch = 193.4362 [0.0145] BKJD  
Rp/R\* = 0.0047 [0.0025]  
a/R\* = 159.68 [428.54]  
b = 0.90 [0.57]  
Seff = 34.52 [2.34]  
Teq = 618 [10] K  
Rp = 1.00 [0.54] Re  
a = 0.3749 [0.0164] AU  
Ag = 3584.76 [3823.61] [0.94 $\sigma$ ]  
Teff = 7394 [1972] K [3.44 $\sigma$ ]

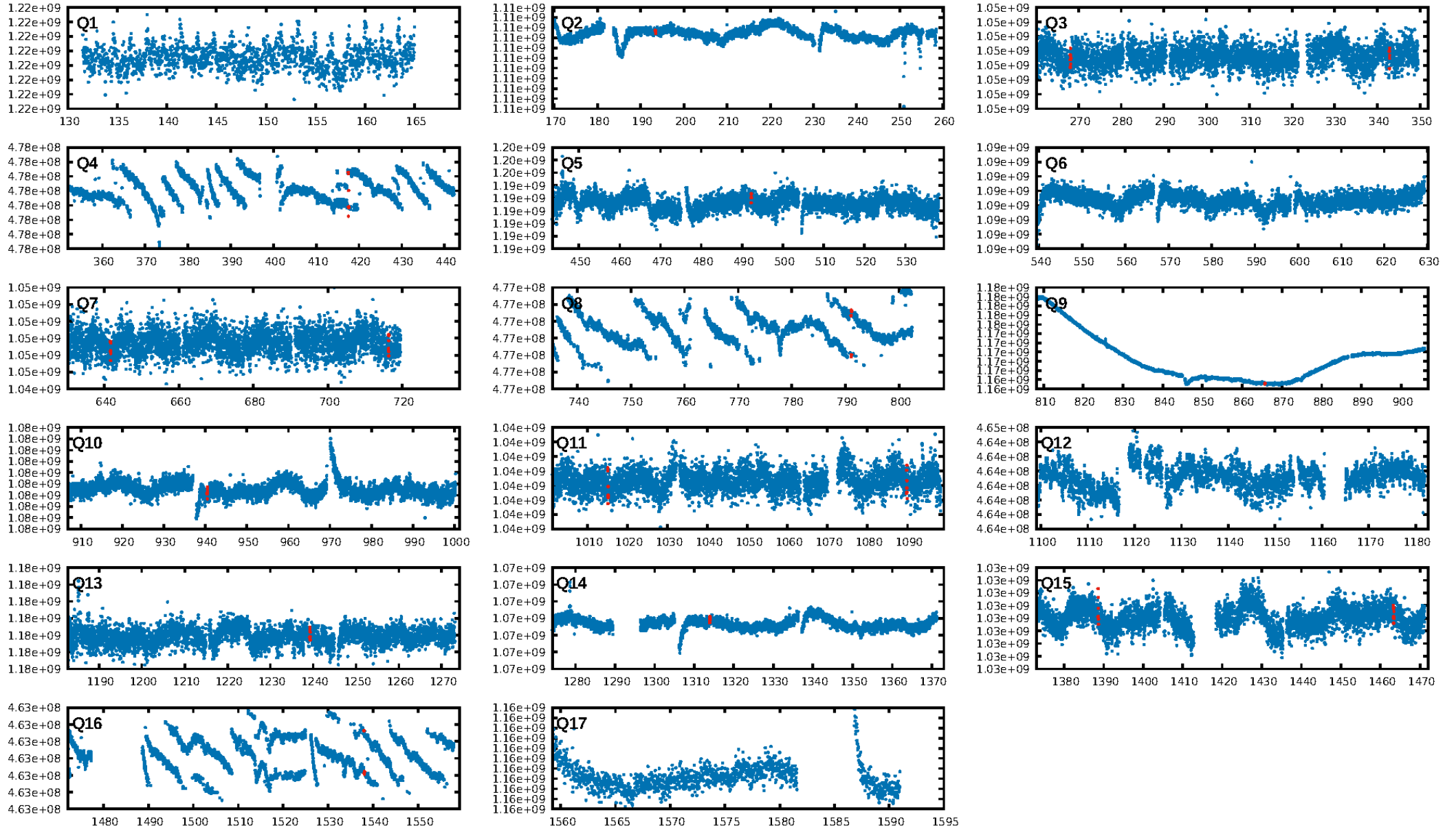
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.66 $\sigma$ ]  
LongPeriod-sig: 100.0% [11.62 $\sigma$ ]  
ModelChiSquare2-sig: 63.9%  
ModelChiSquareGof-sig: 99.0%  
Bootstrap-pfa: 4.97e-28  
RollingBand-fgt: 1.00 [17/17]  
GhostDiagnostic-chr: -121.9  
Centroid-sig: 0.3%  
Centroid-so: 9.212 arcsec [2.42 $\sigma$ ]  
OotOffset-rm: 2.780 arcsec [1.01 $\sigma$ ]  
KicOffset-rm: 3.090 arcsec [0.96 $\sigma$ ]  
OotOffset-st: 1/2/1/1 [5]  
KicOffset-st: 1/2/1/1 [5]  
DiffImageQuality-fgm: 0.00 [0/5]  
DiffImageOverlap-fno: 0.85 [11/13]

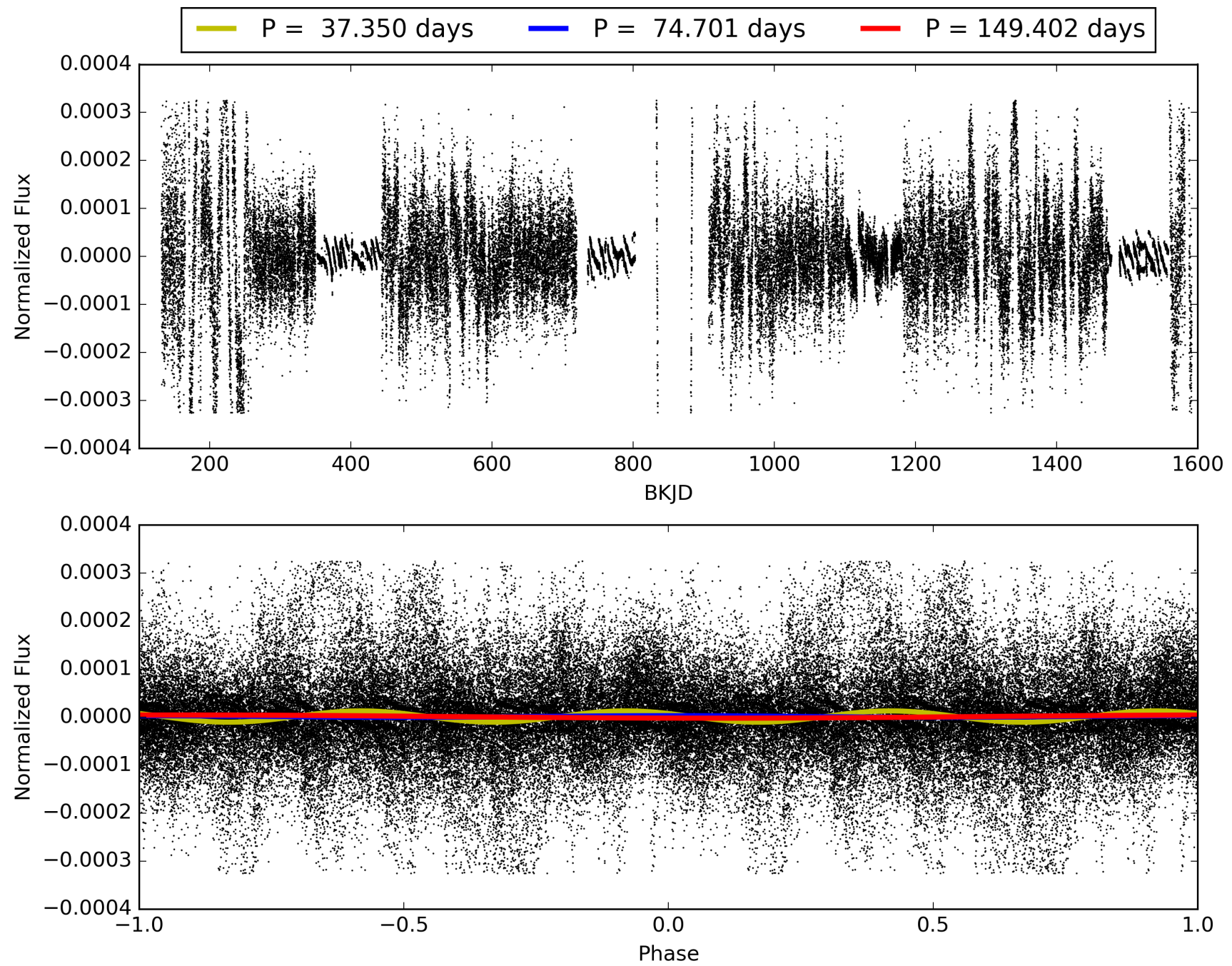
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:05:55 Z

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

# TCE 007880676-01, PDC Light Curves



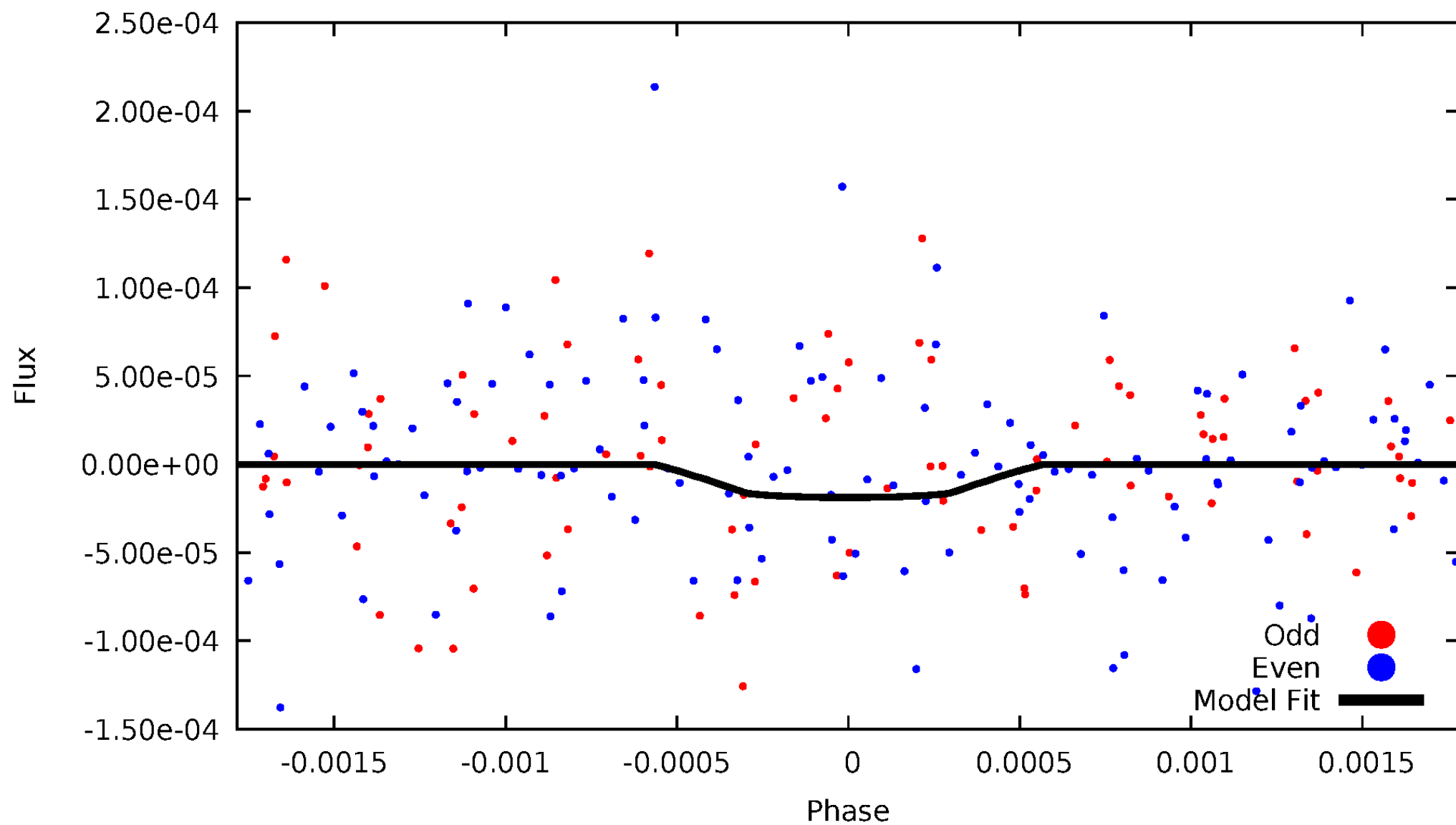
TCE 007880676-01





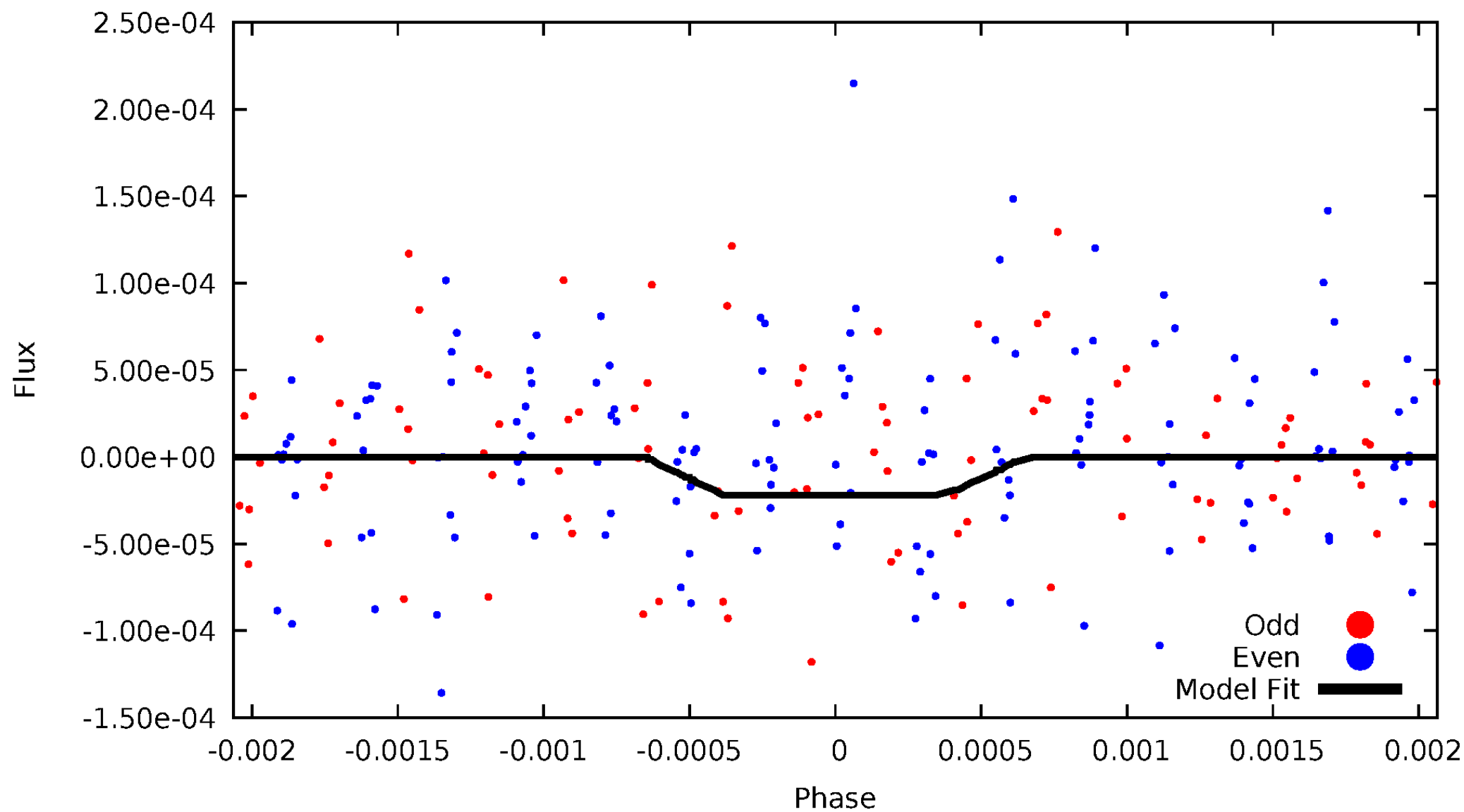
# DV Odd/Even

TCE 007880676-01



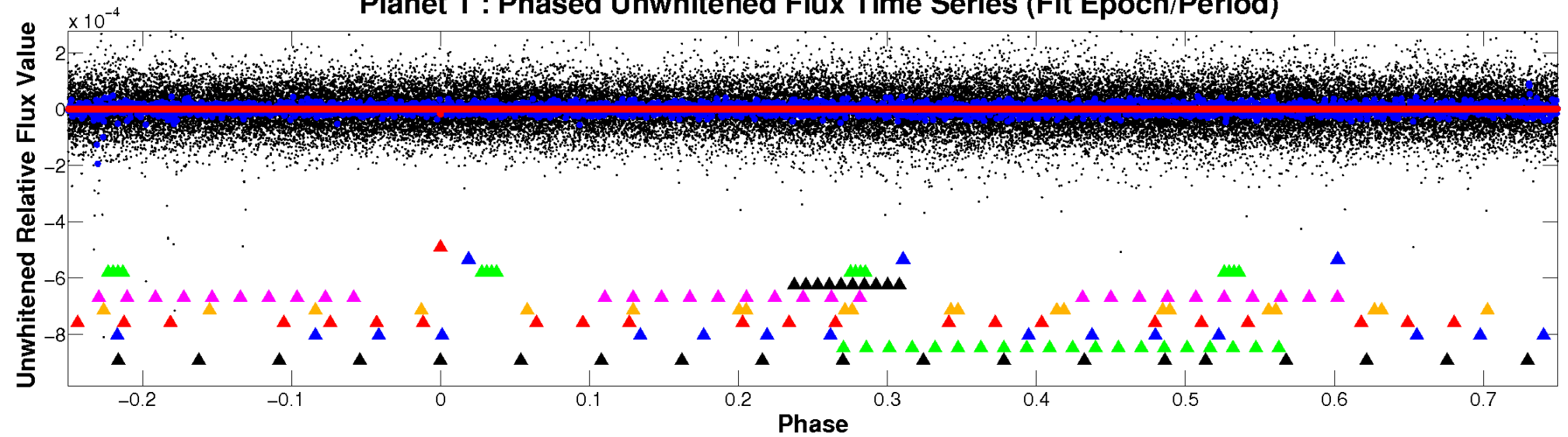
# ALT Odd/Even

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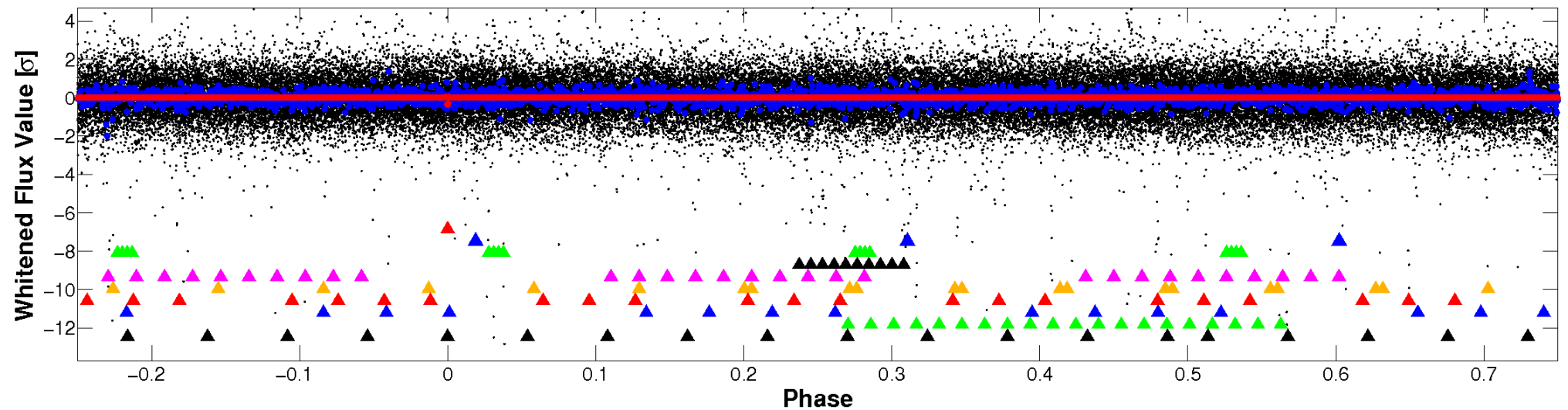


# Non-Whitened Vs. Whitened Light Curve

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

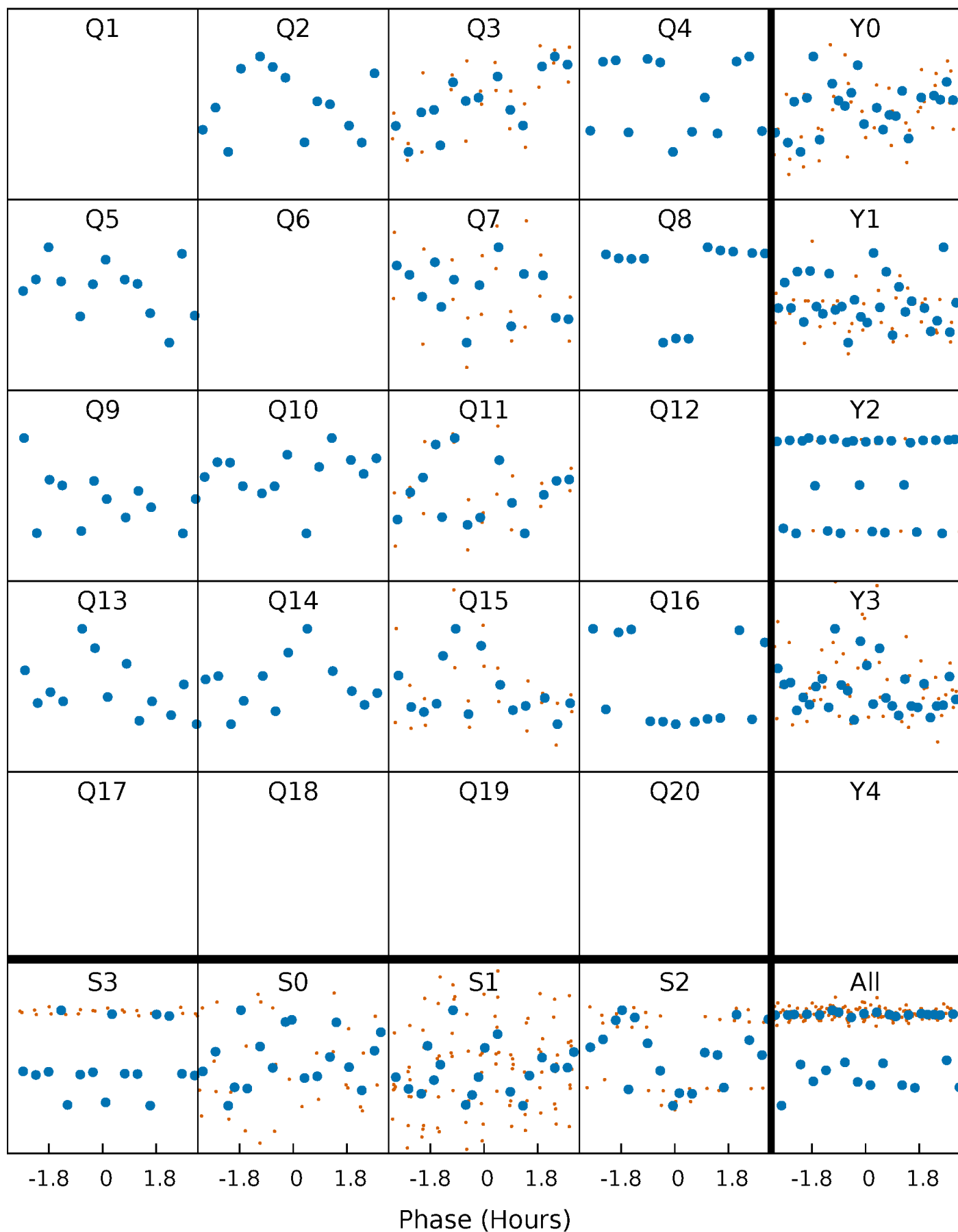


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

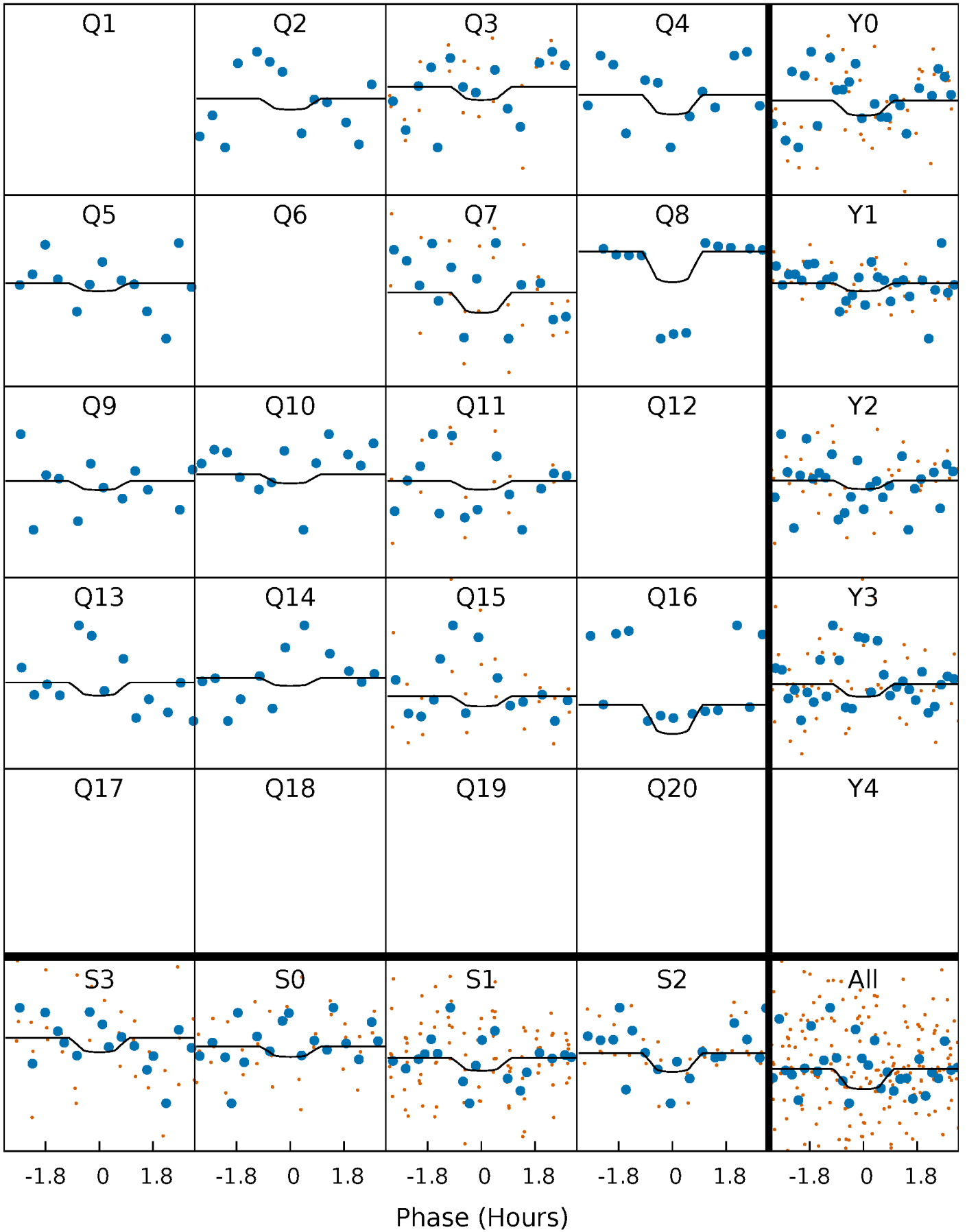
TCE 007880676-01 P= 74.700898 Days  $T_0=193.436167$  (BKJD)





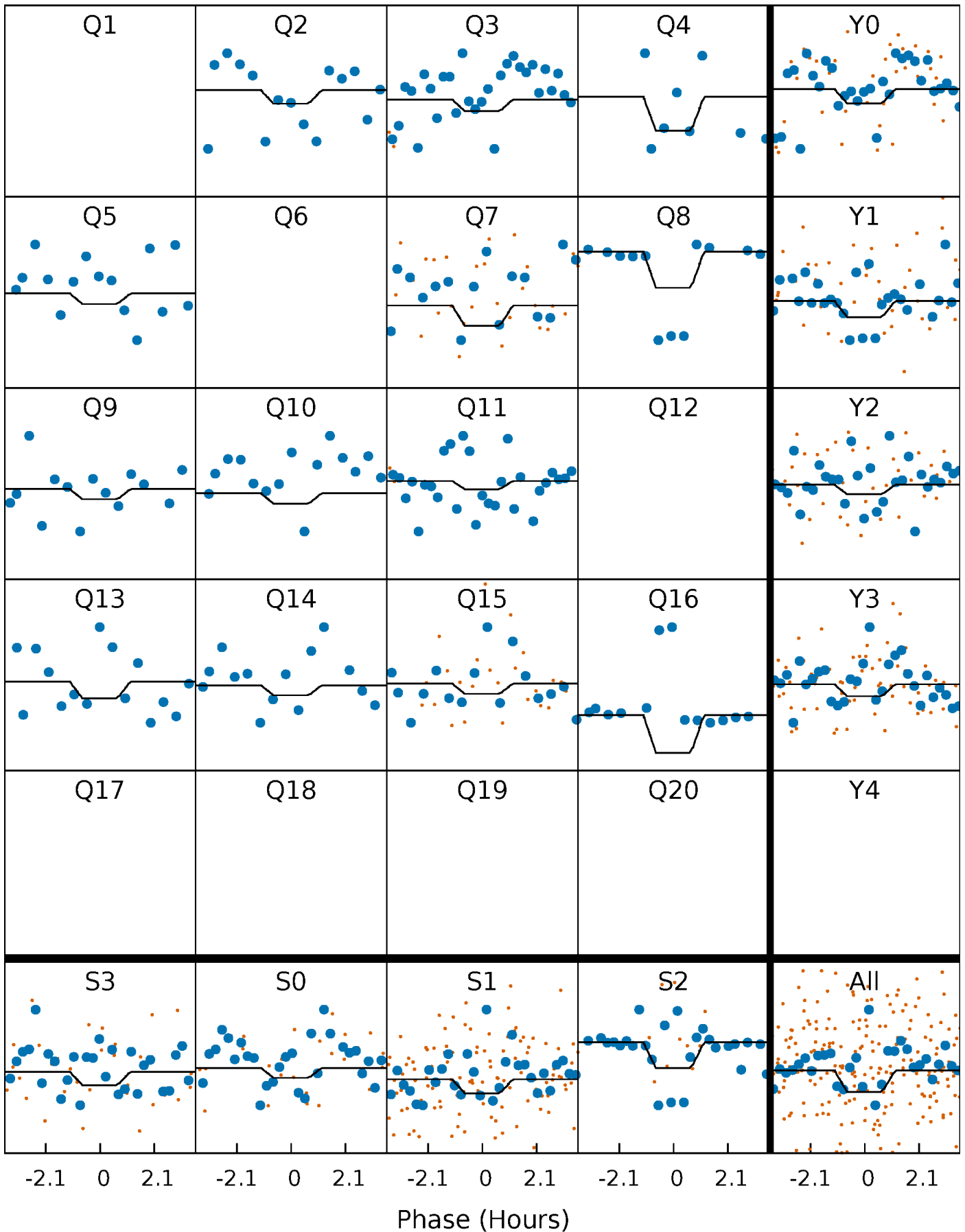
# DV Quarter-Phased Transit Curves

TCE 007880676-01 P= 74.700898 Days  $T_0=193.436167$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

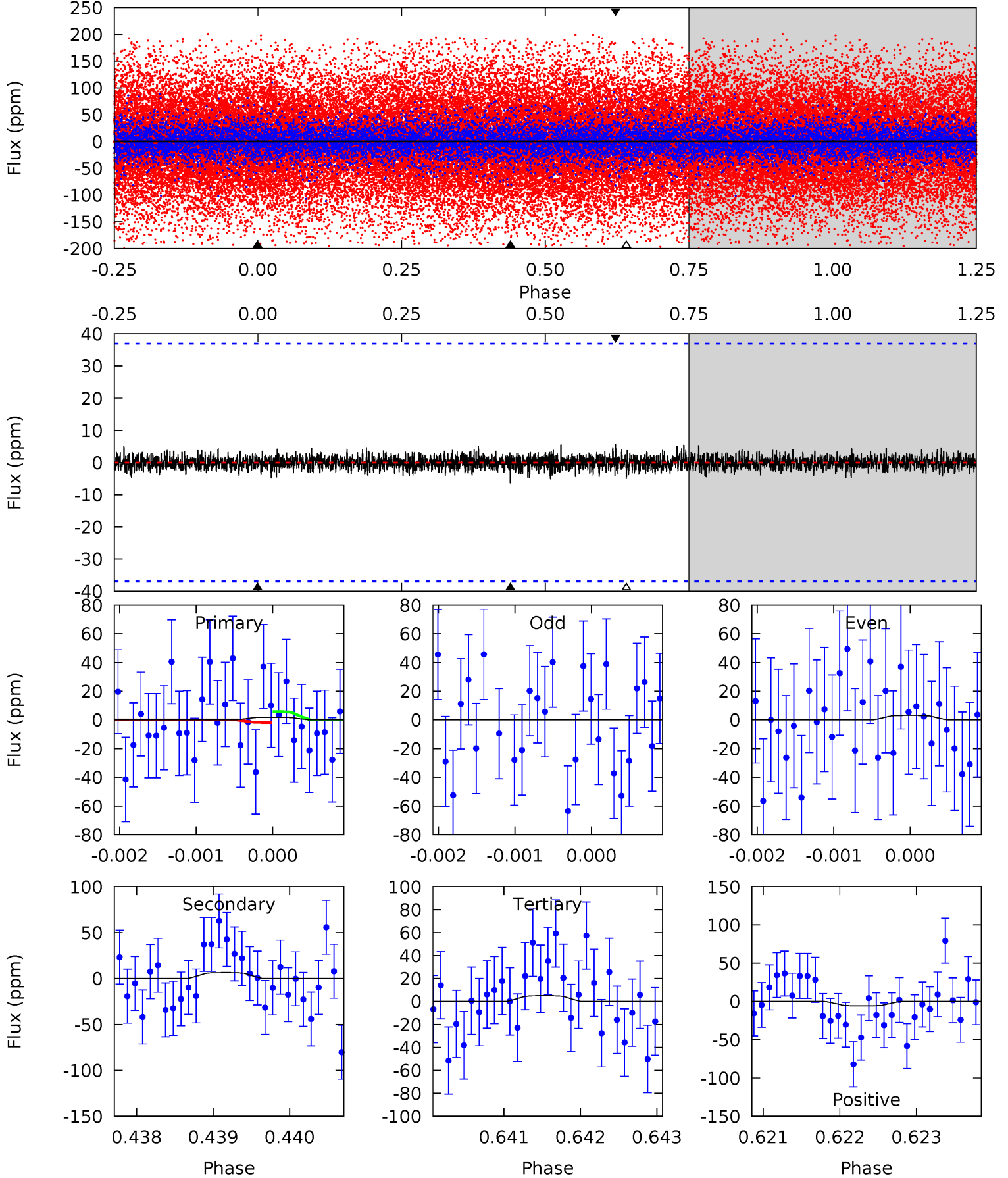
TCE 007880676-01 P= 74.694893 Days  $T_0=193.485360$  (BKJD)



# DV Model-Shift Uniqueness Test

007880676-01, P = 74.700898 Days, E = 118.735269 Days

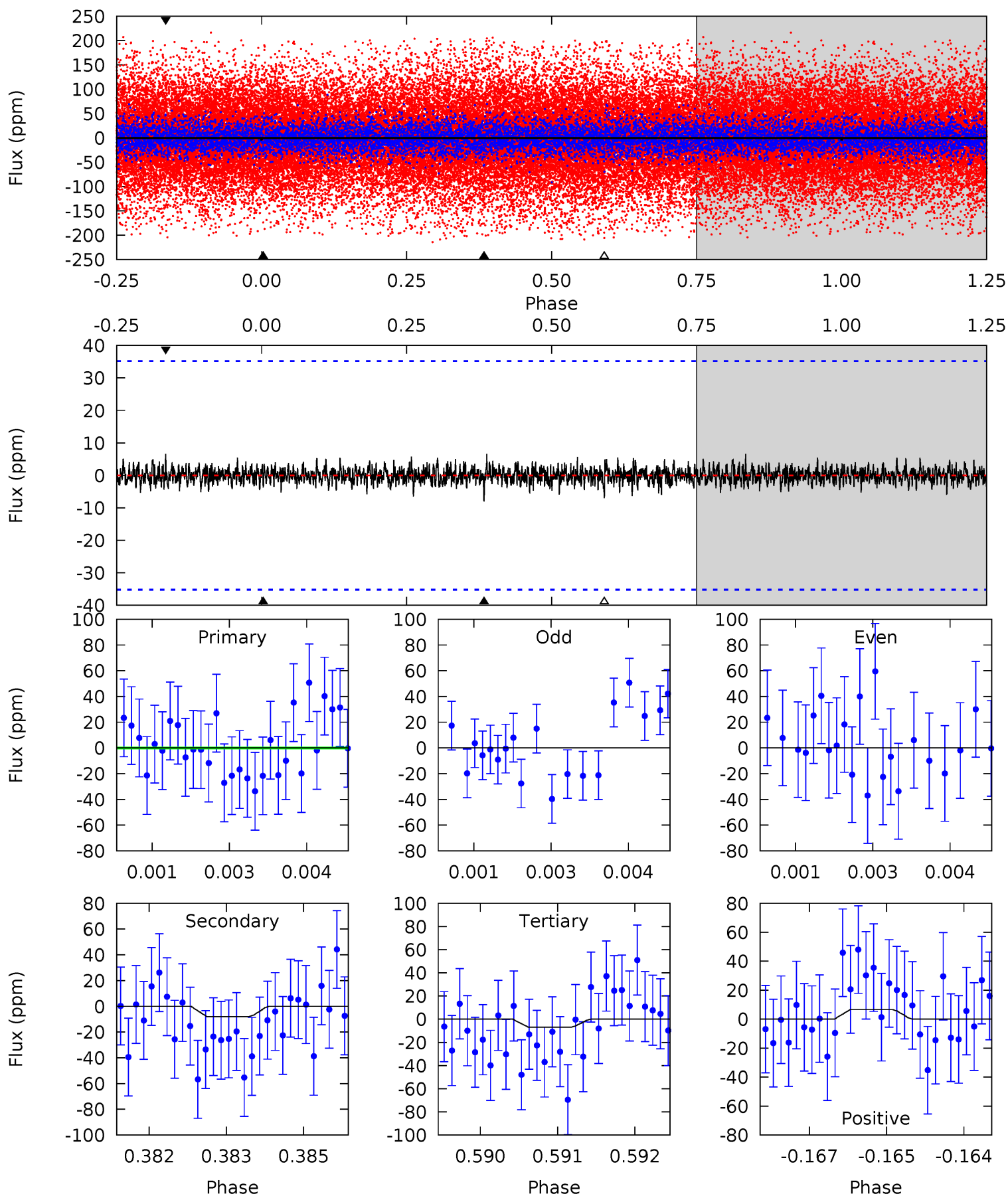
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.26	0.95	0.74	0.85	5.42	3.25	0.22	-0.48	-0.59	0.21	0.10	0.22	-5.12	0.47	0.30



# Alt Model-Shift Uniqueness Test

007880676-01, P = 74.694893 Days, E = 118.790467 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
0.51	1.23	1.07	1.02	5.40	3.21	0.29	-0.56	-0.51	0.16	0.21	0.35	-0.07	0.45	0.08





### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-6 \pm 7$	$1.02^{+0.54}_{-0.50}$	$863^{+12}_{-13}$	$4481^{+1906}_{-7697}$	$407^{+1588}_{-460}$
Alt.	$-8 \pm 7$	$1.04^{+0.54}_{-0.49}$	$864^{+11}_{-13}$	$4639^{+1769}_{-1459}$	$481^{+1598}_{-428}$

$T_{max}$  = 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

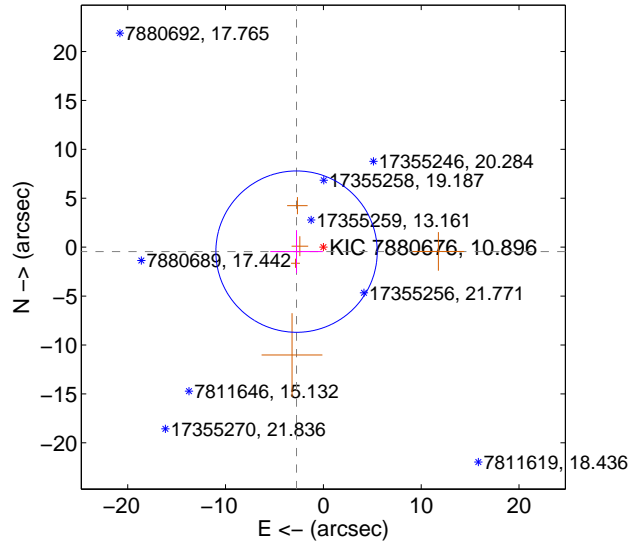
Supplemental centroid analysis for 007880676-01. **Kepler magnitude: 10.90.** Transit SNR 2.90

**There are 0 quarters with good PRF difference image offsets**

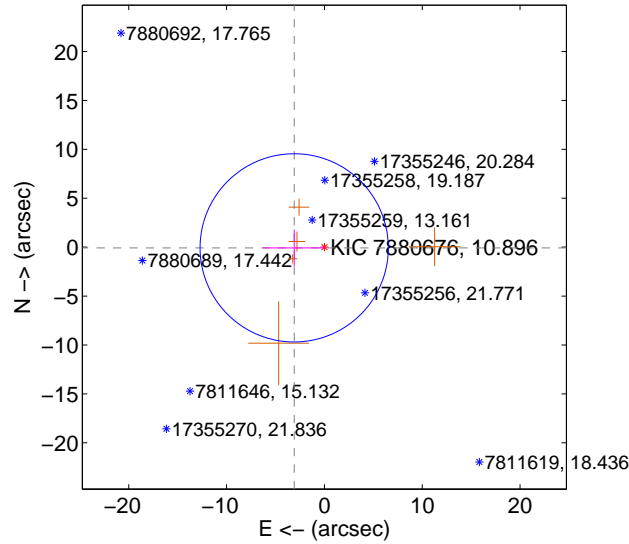
The direct PRF centroid is offset from the target star catalog position by about 0.63 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.780 \pm 2.749$	1.01	$2.743 \pm 2.688$	$-0.456 \pm 2.194$
PRF-fit source offset from KIC position	$3.090 \pm 3.208$	0.96	$3.089 \pm 3.198$	$-0.070 \pm 1.863$
photometric centroid source offset	$9.21 \pm 3.80$	2.42	$-8.57 \pm 3.69$	$-3.37 \pm 4.44$

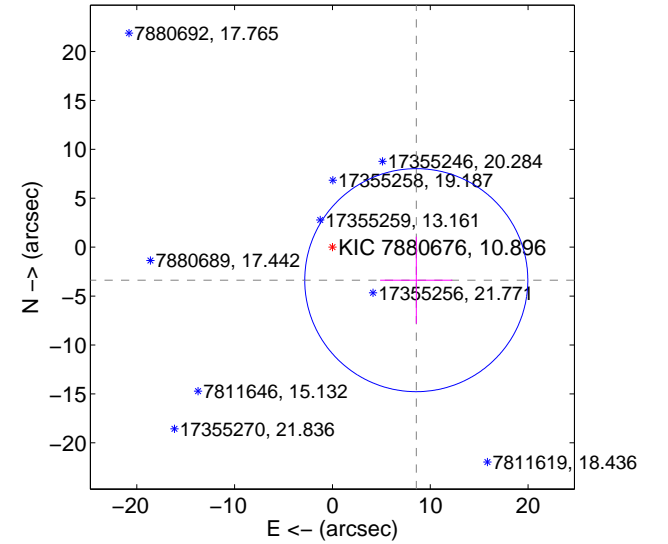
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

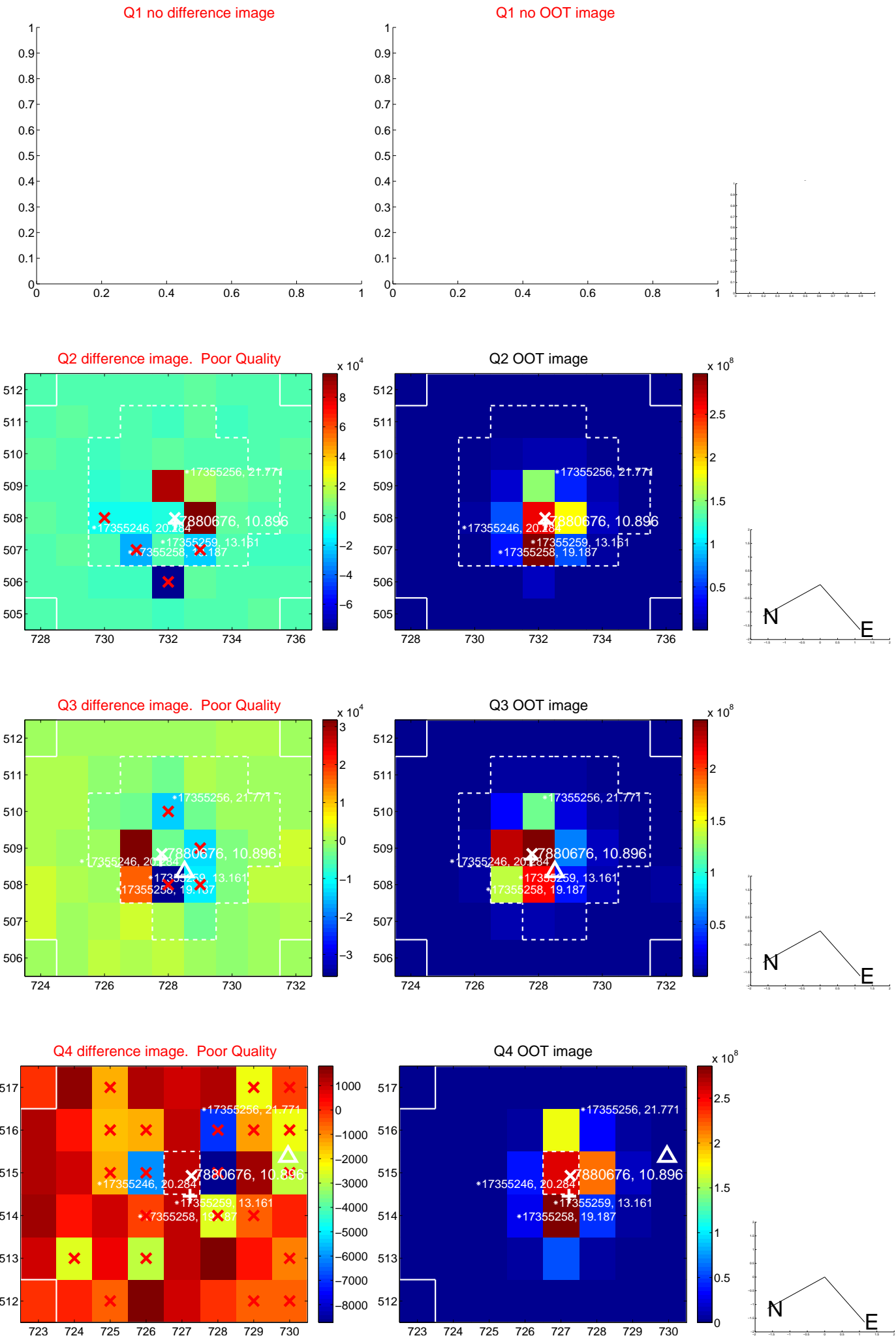


offset from photometric centroids

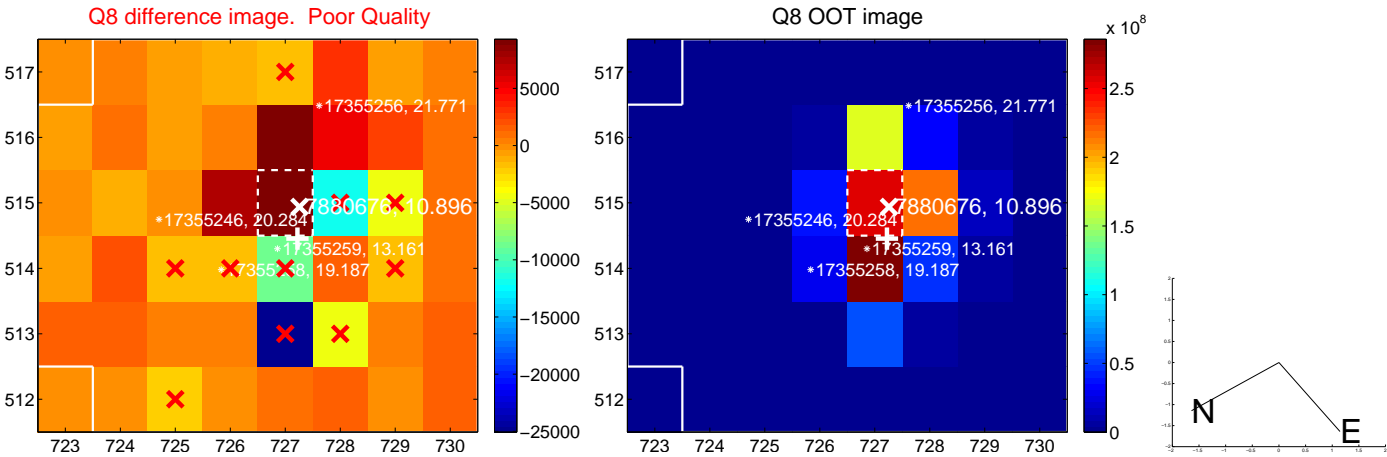
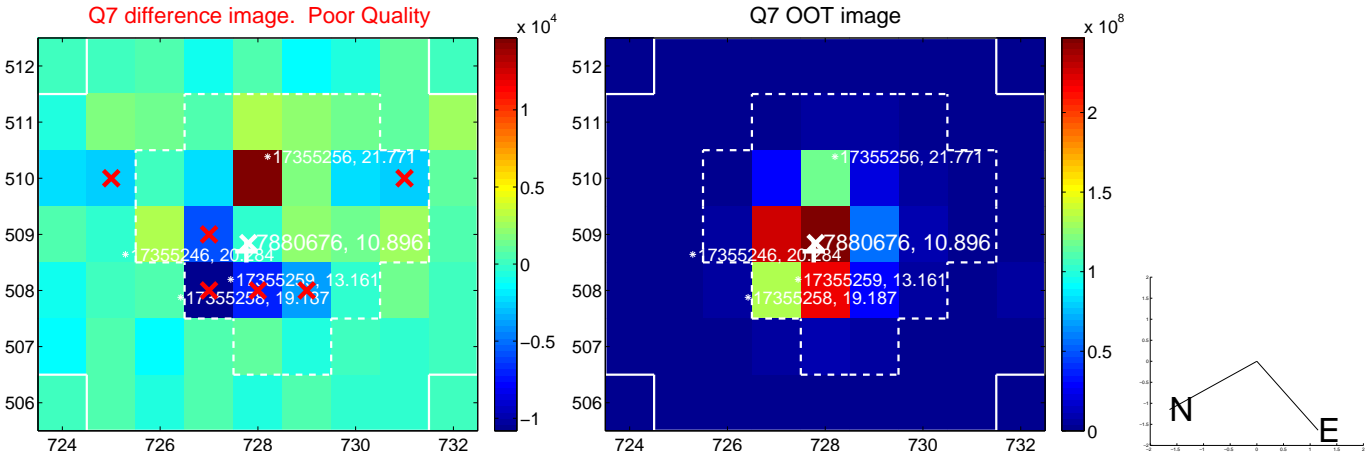
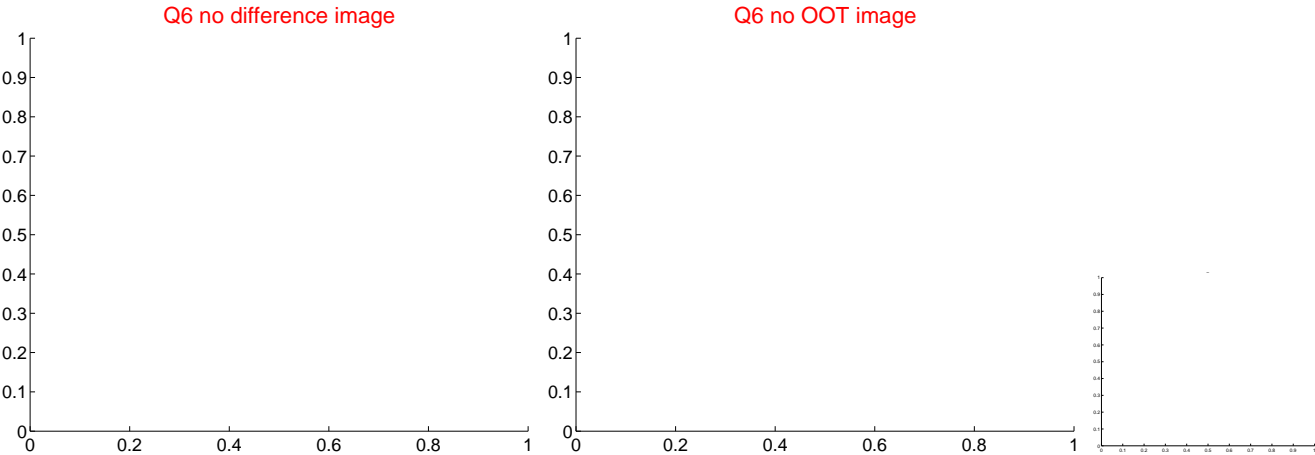
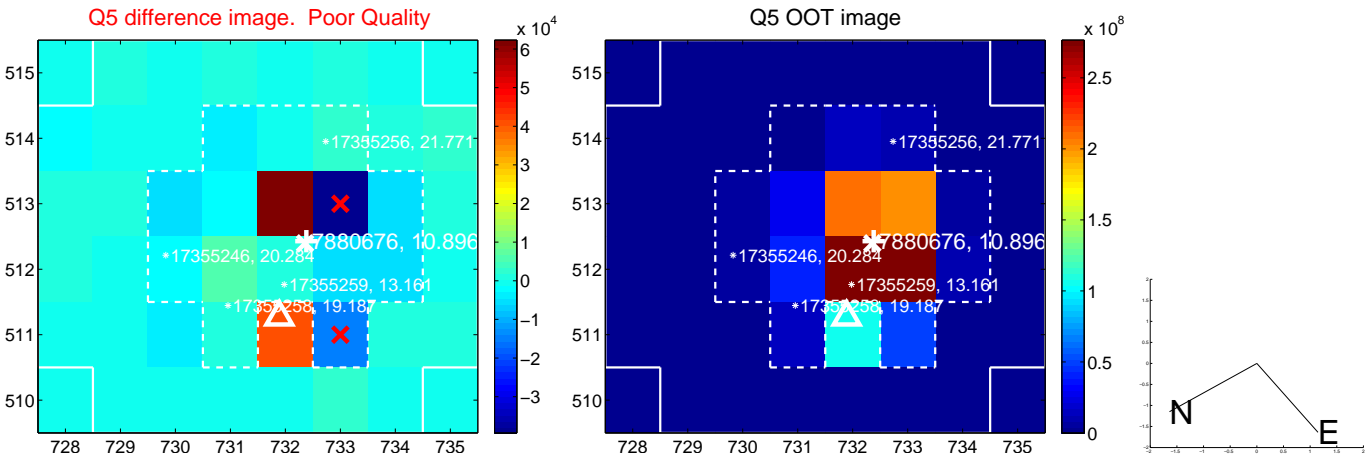


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

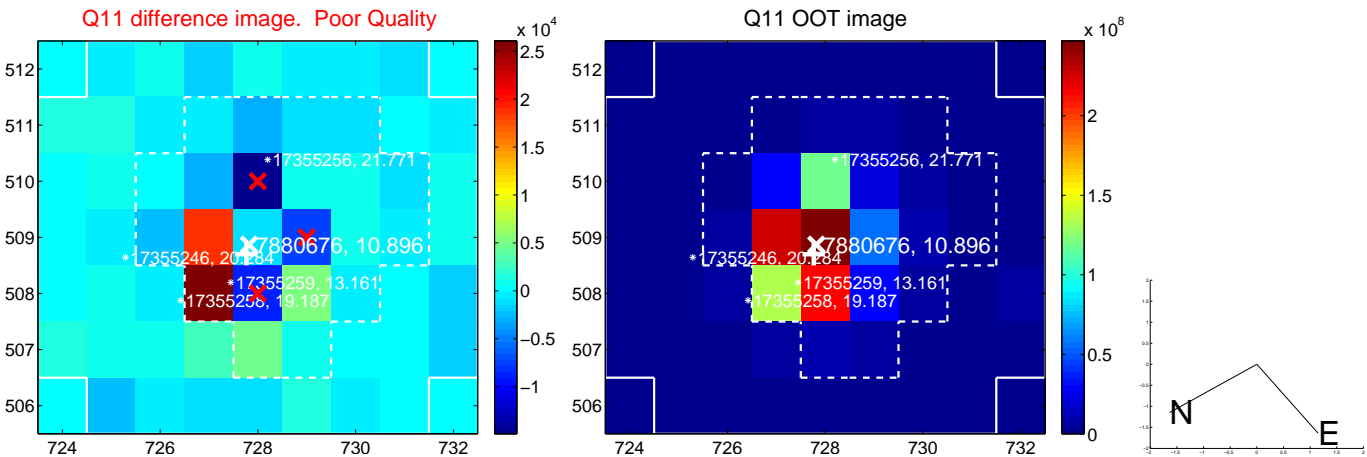
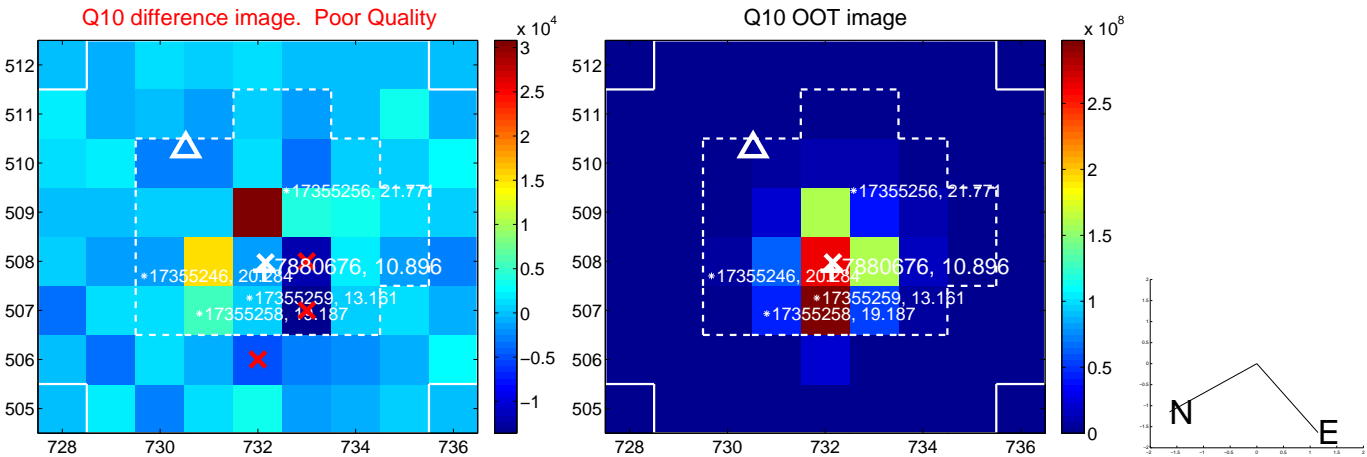
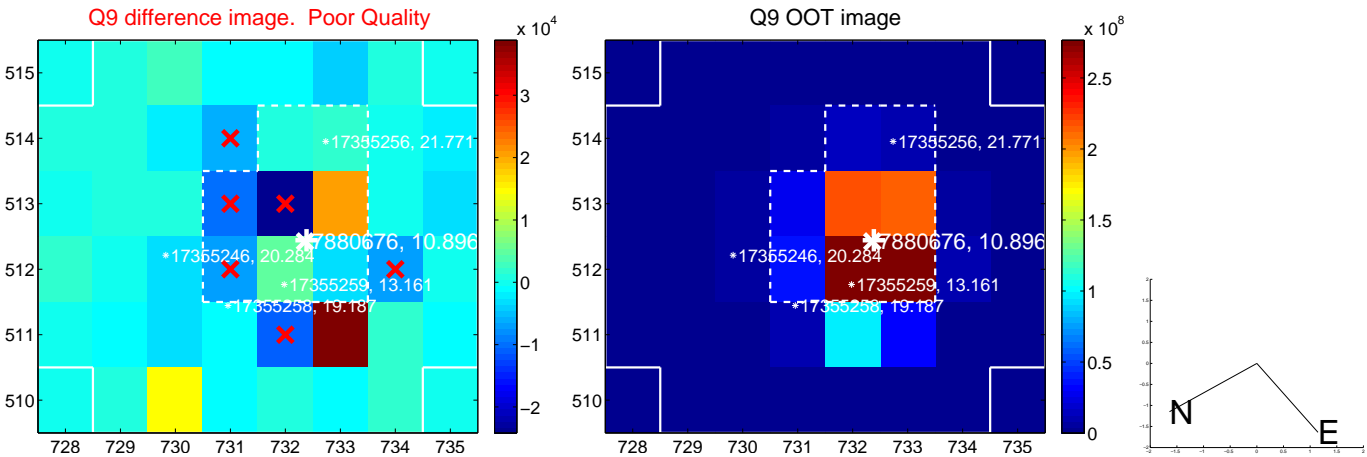


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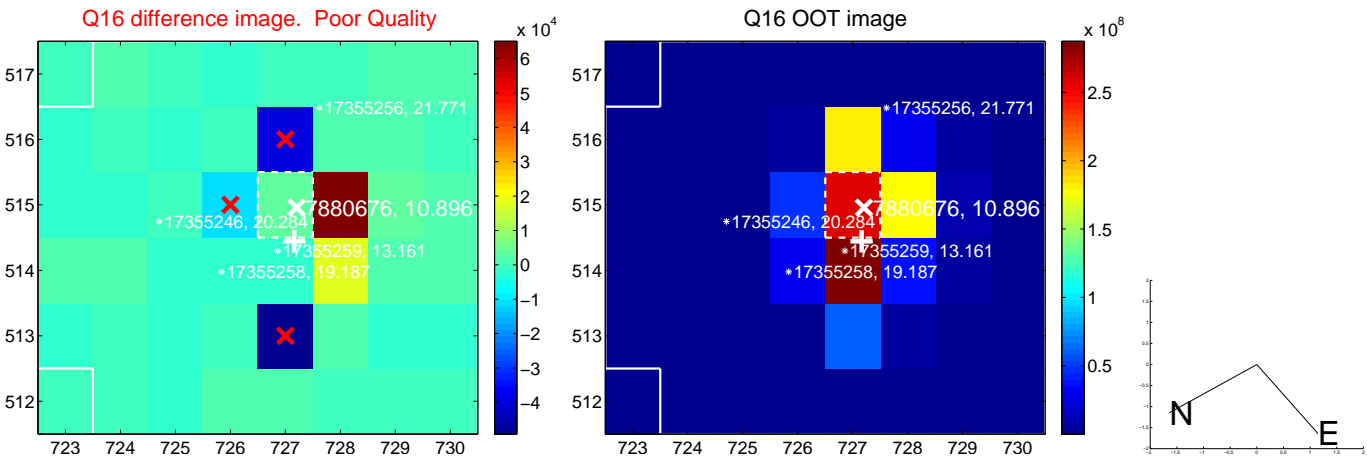
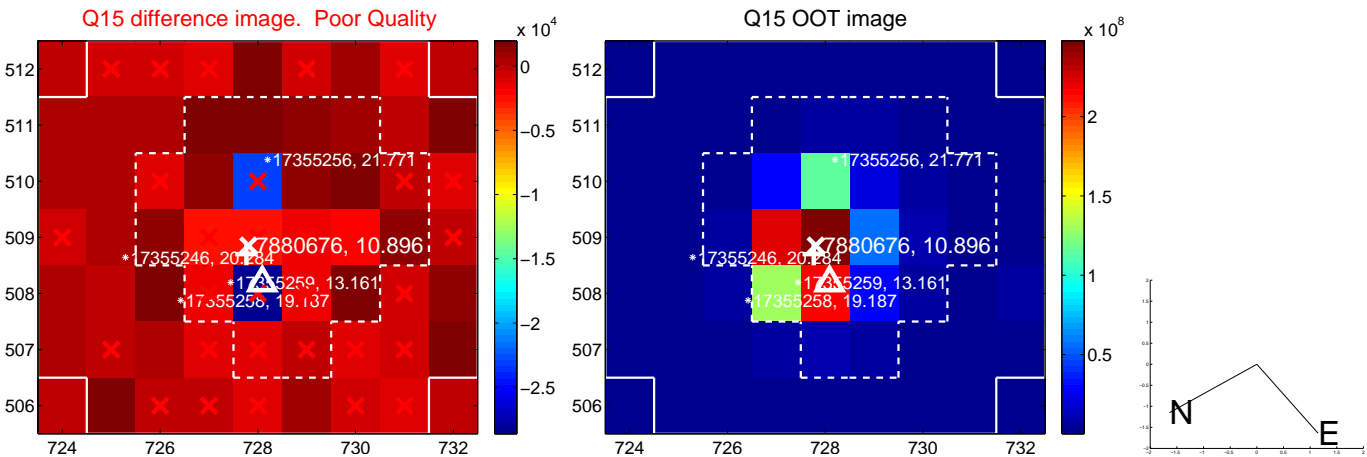
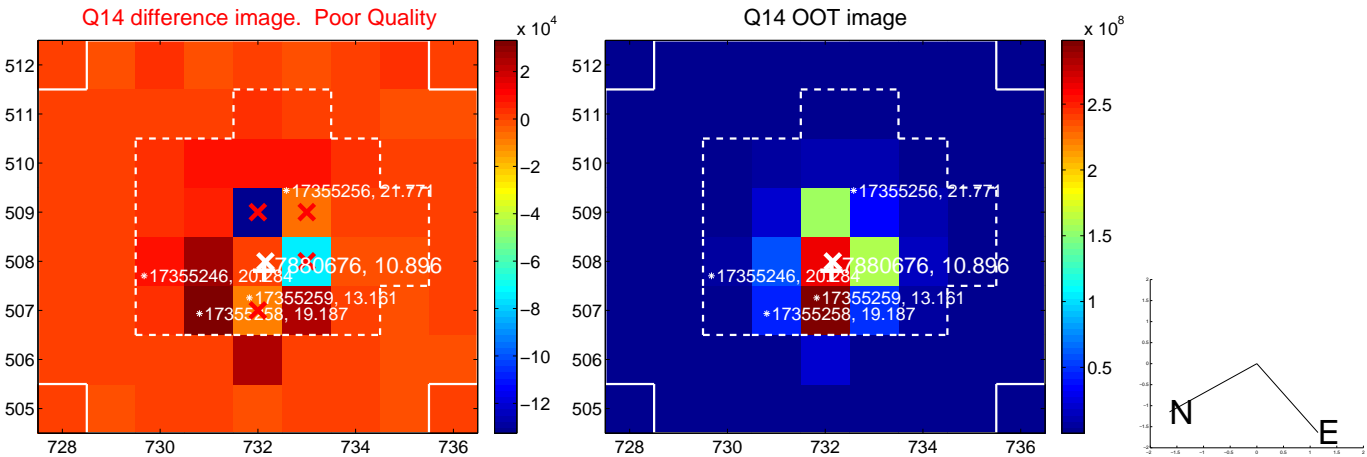
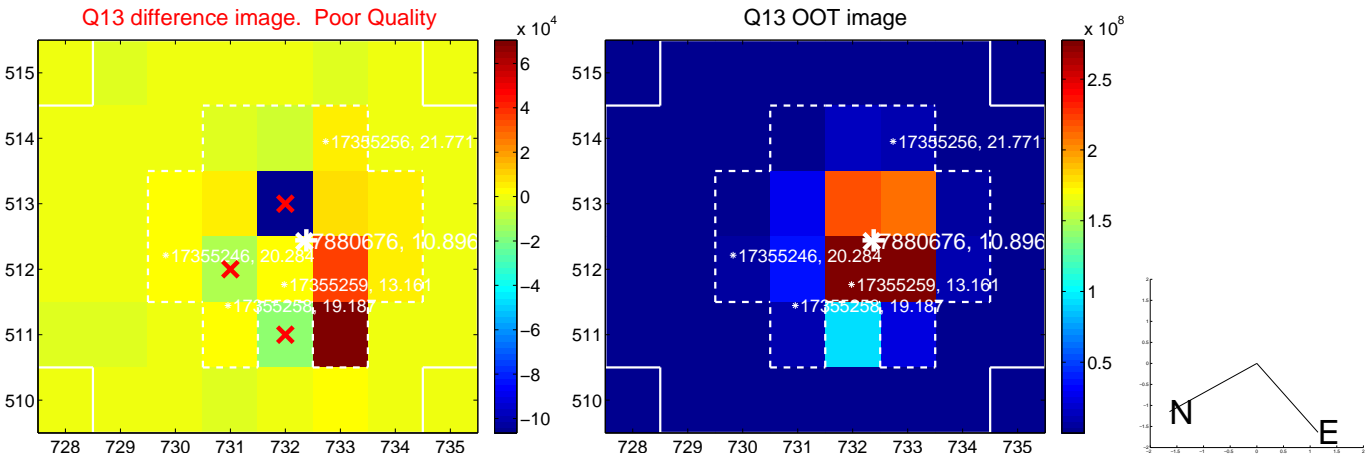




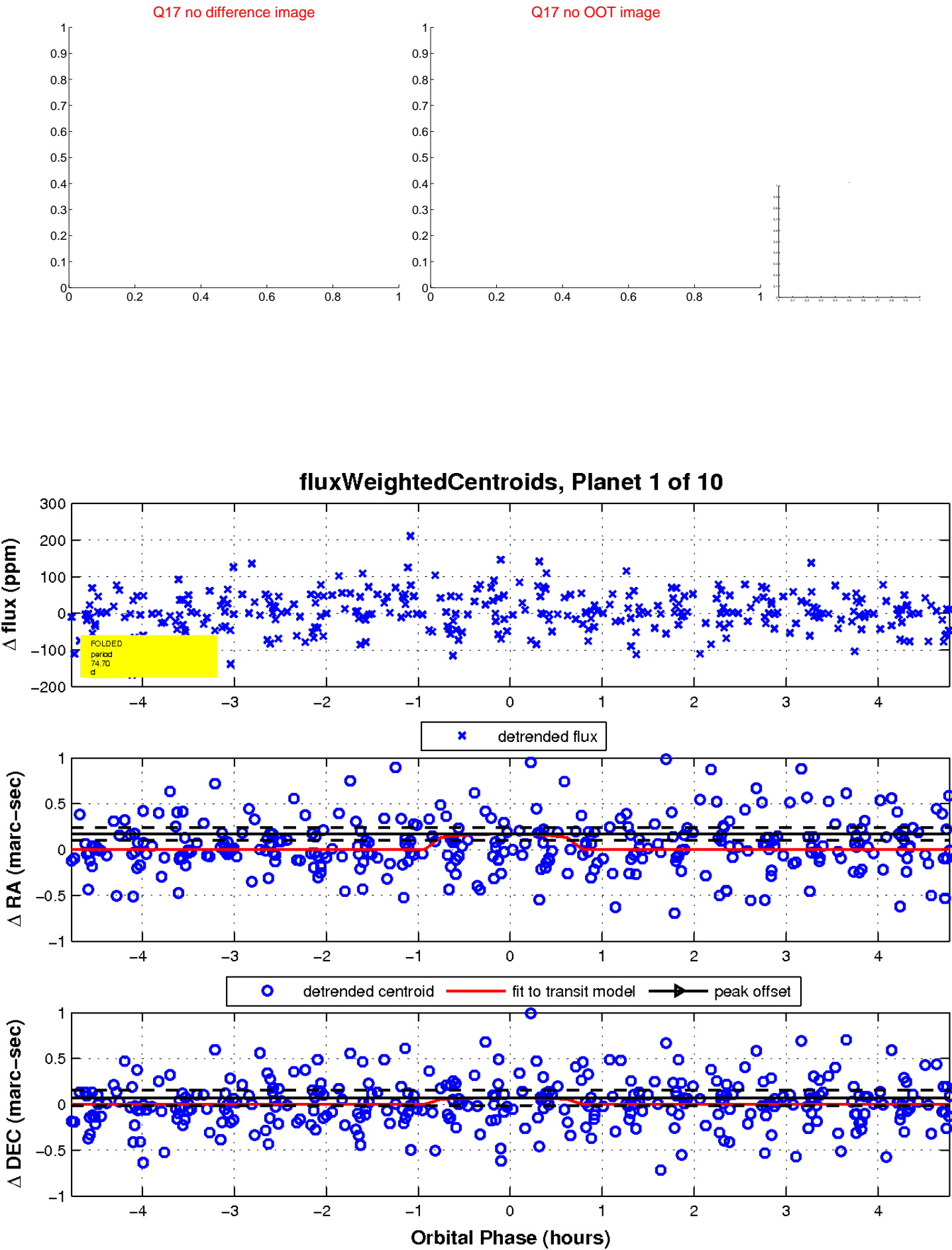
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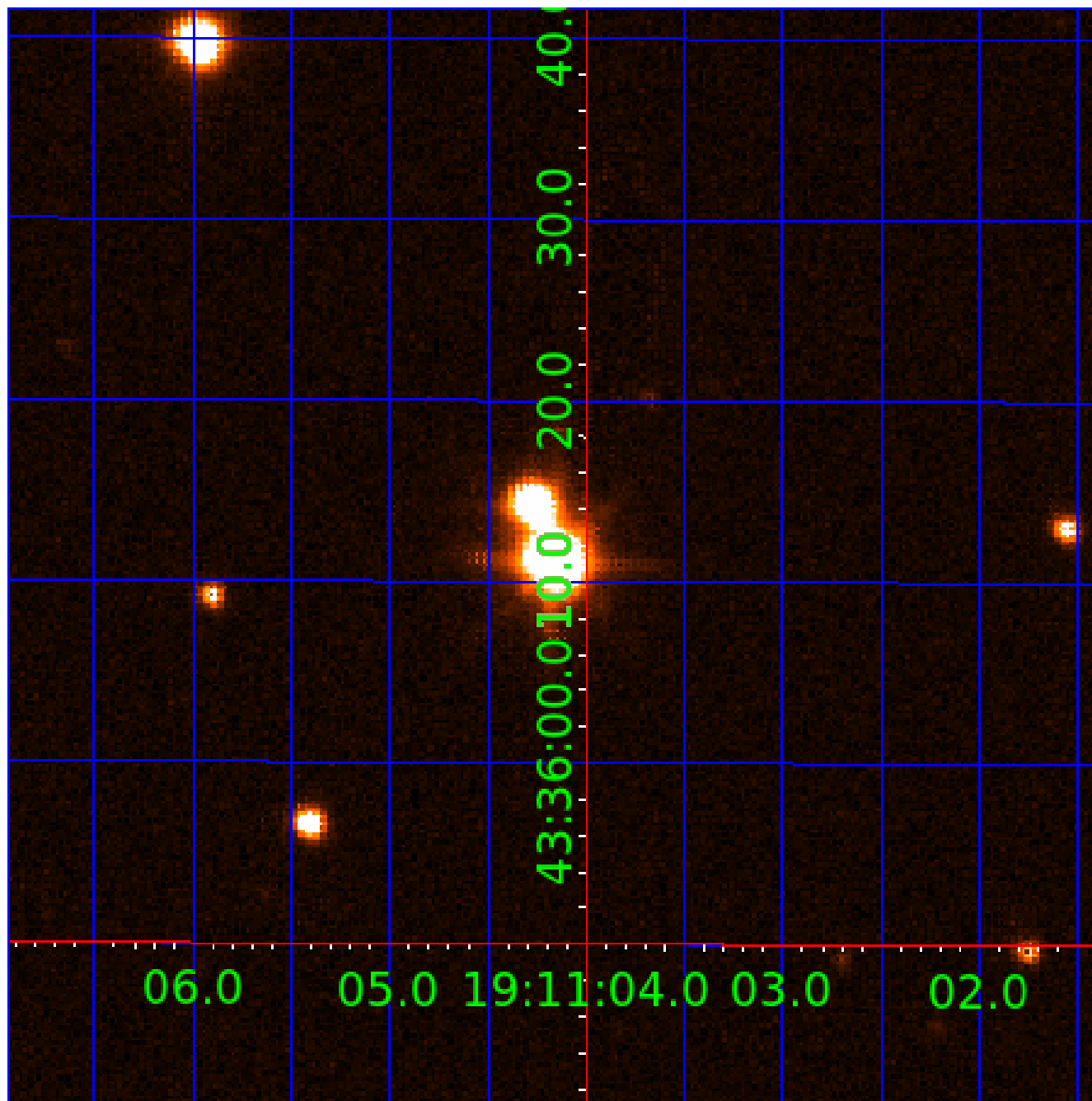


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UKIRT Image

Declination





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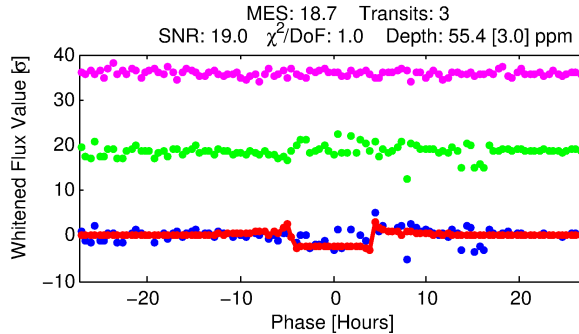
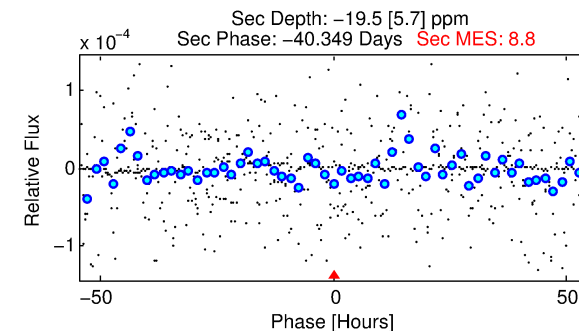
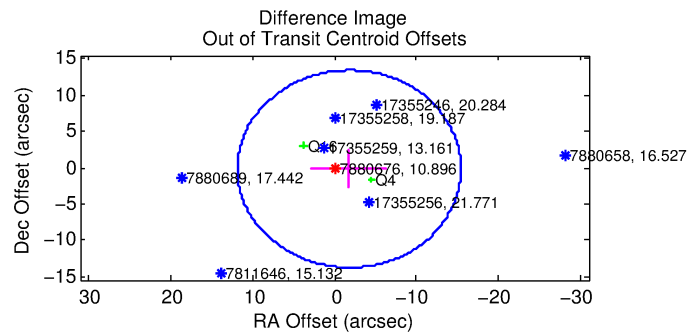
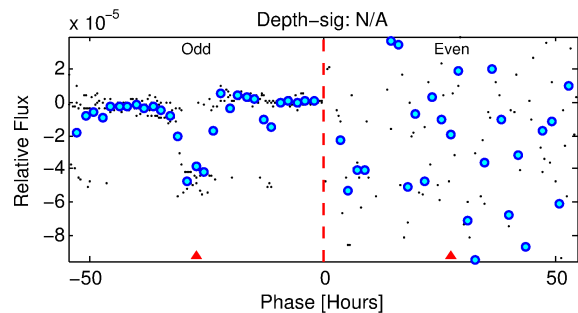
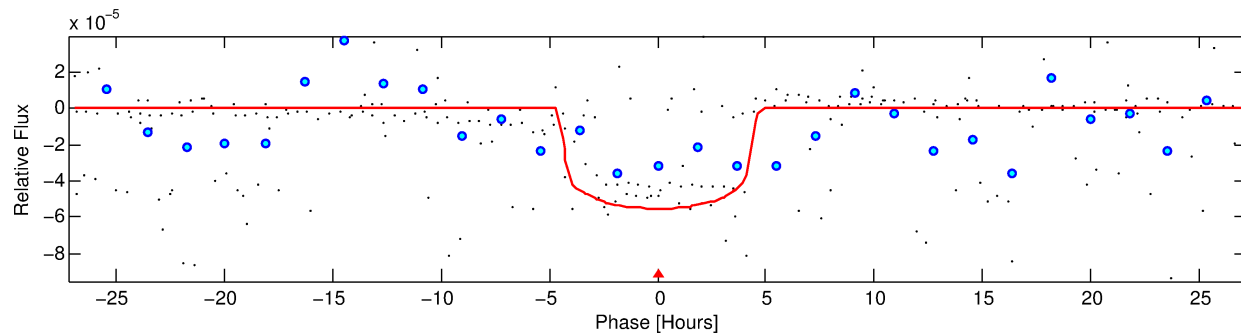
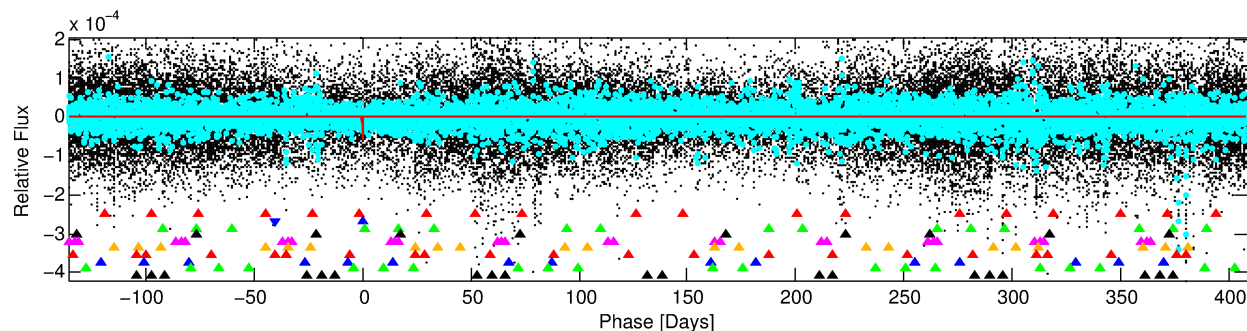
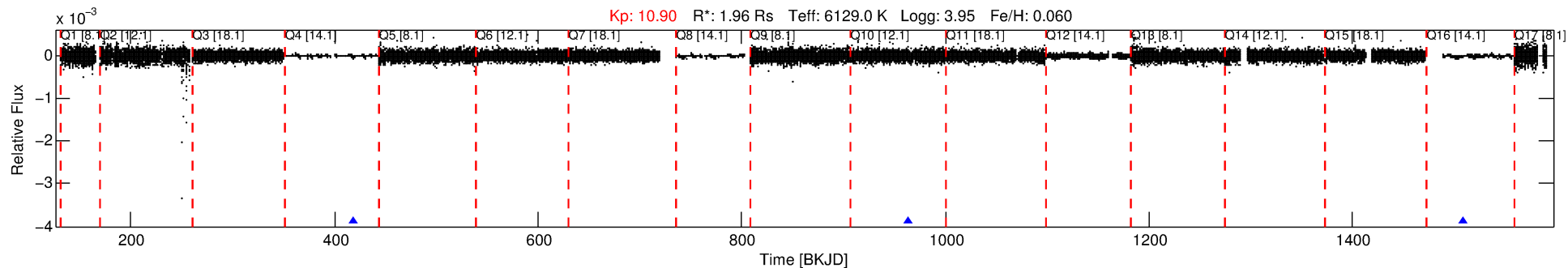
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-02

No Significant Match Found

# DV One-Page Summary

KIC: 7880676 Candidate: 2 of 10 Period: 544.697 d



## DV Fit Results:

Period = 544.69661 [0.00185] d  
Epoch = 418.9480 [0.0034] BKJD  
Rp/R\* = 0.0079 [0.0008]  
a/R\* = 222.39 [102.71]  
b = 0.88 [0.12]  
Seff = 2.44 [0.17]  
Teq = 319 [5] K  
Rp = 1.69 [0.19] Re  
a = 1.4098 [0.0617] AU  
Ag = N/A  
Teffp = N/A

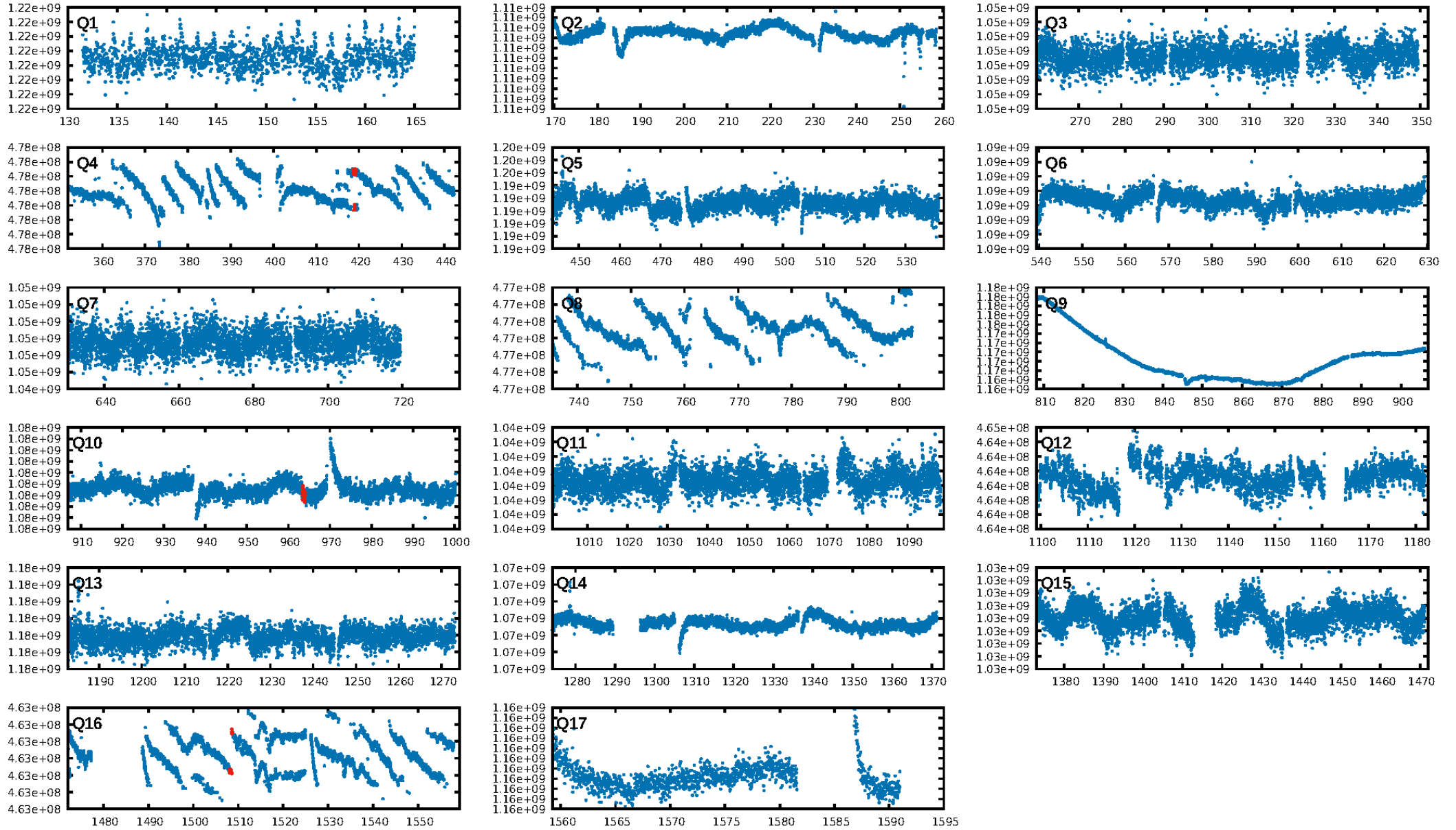
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [989.50σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 97.3%  
Bootstrap-pfa: 5.32e-22  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 6.214  
Centroid-sig: 2.8%  
Centroid-so: 1.820 arcsec [1.18σ]  
OotOffset-rm: 1.797 arcsec [0.40σ]  
KicOffset-rm: 1.171 arcsec [0.40σ]  
OotOffset-st: 0/0/2/0 [2]  
KicOffset-st: 0/0/2/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.67 [2/3]

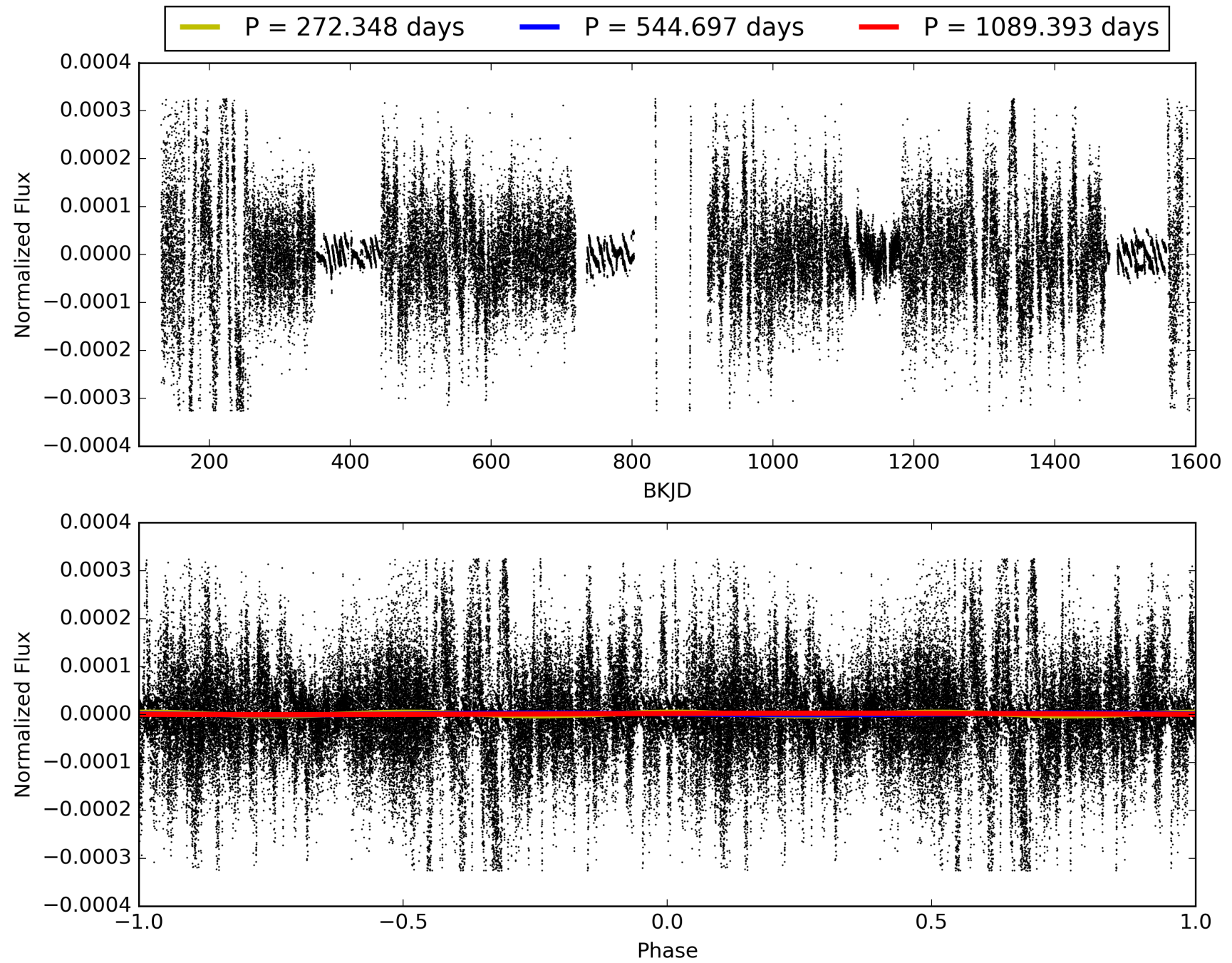
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:06:06 Z

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

# TCE 007880676-02, PDC Light Curves

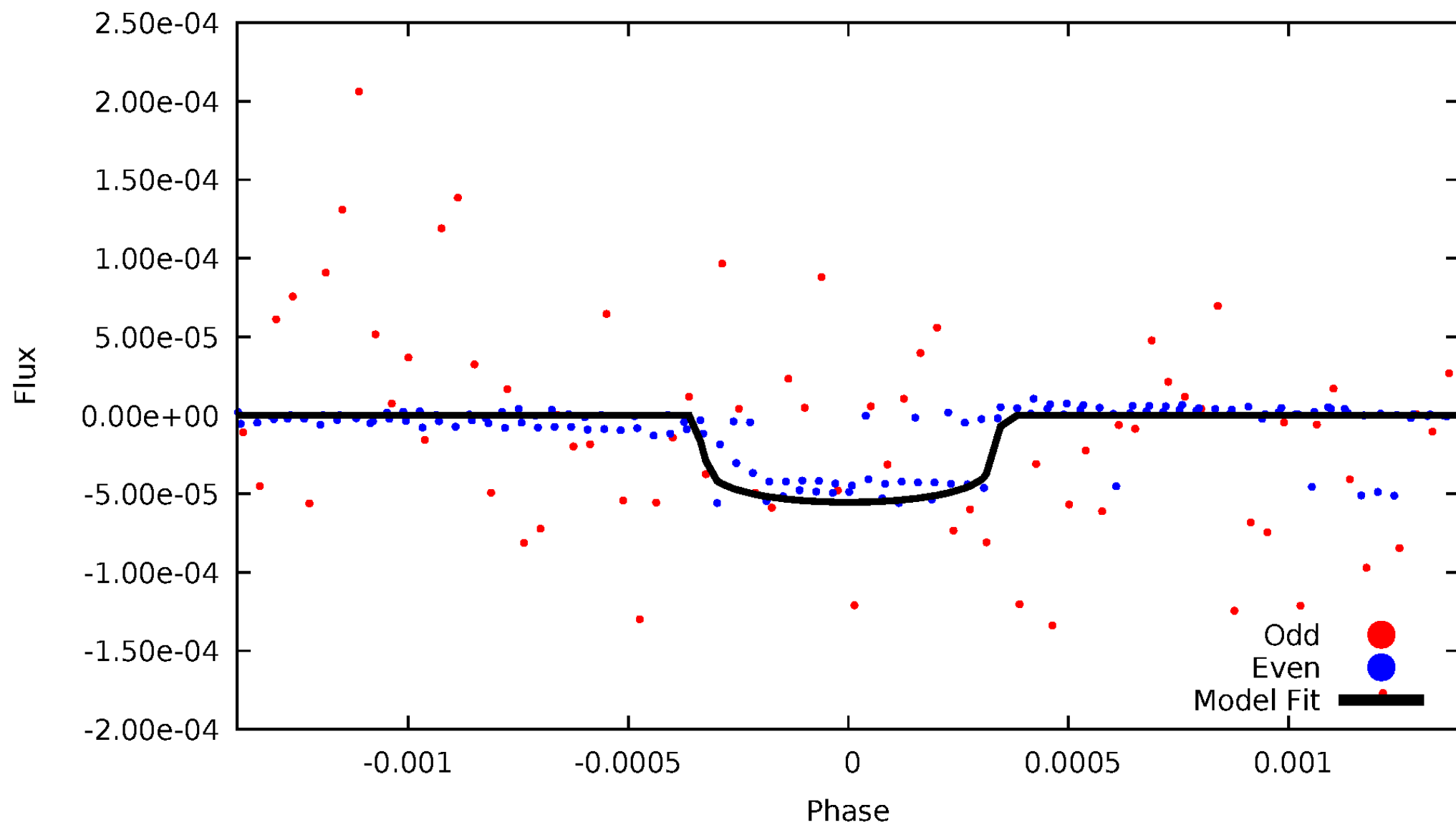


TCE 007880676-02



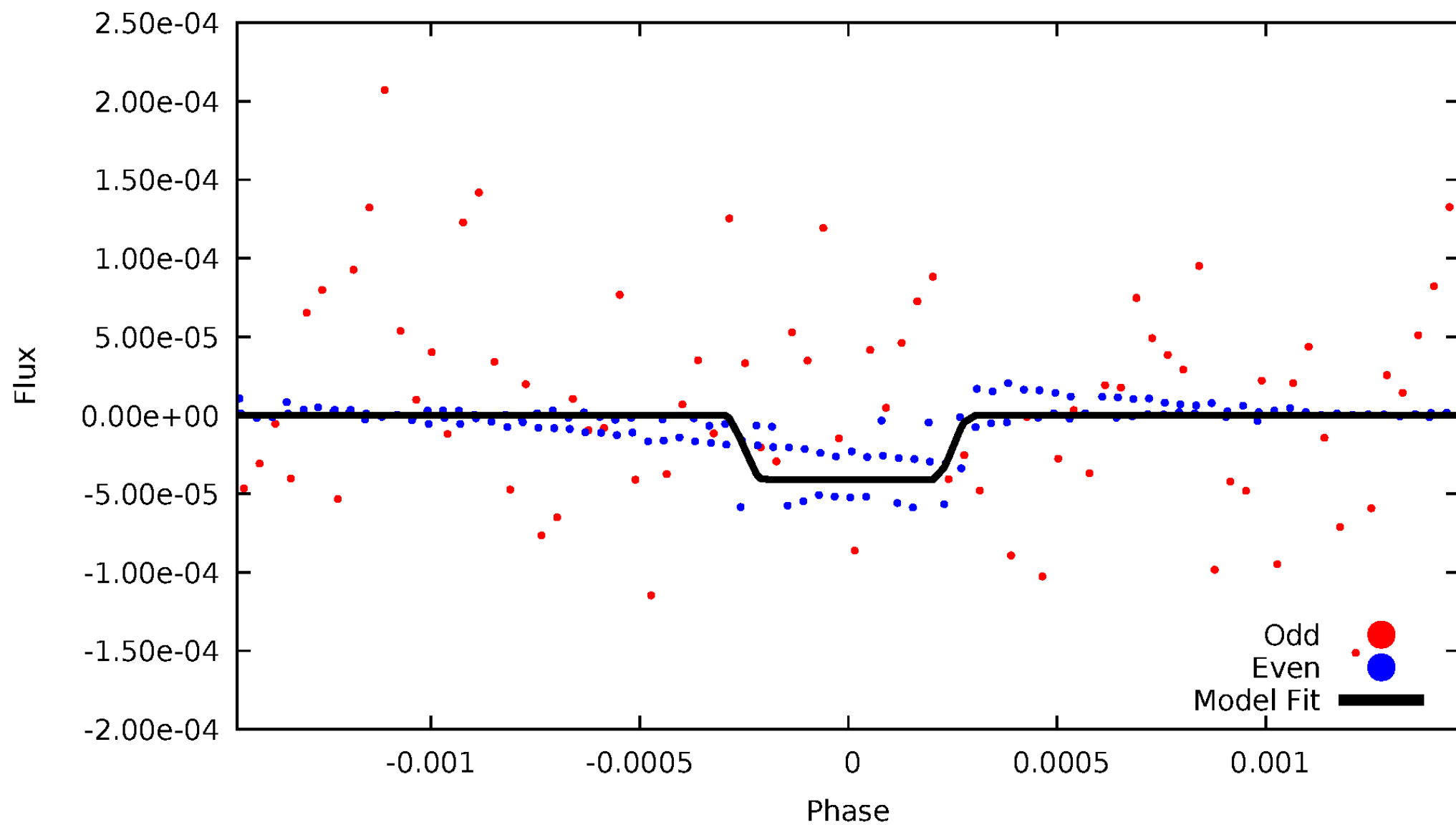
# DV Odd/Even

TCE 007880676-02



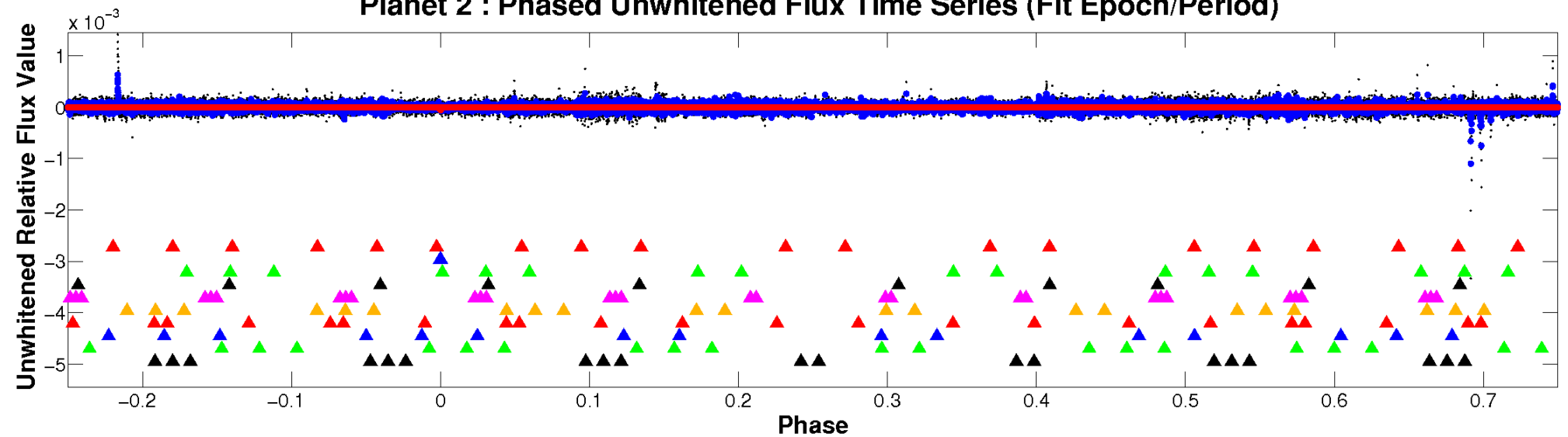
# ALT Odd/Even

TCE 007880676-02

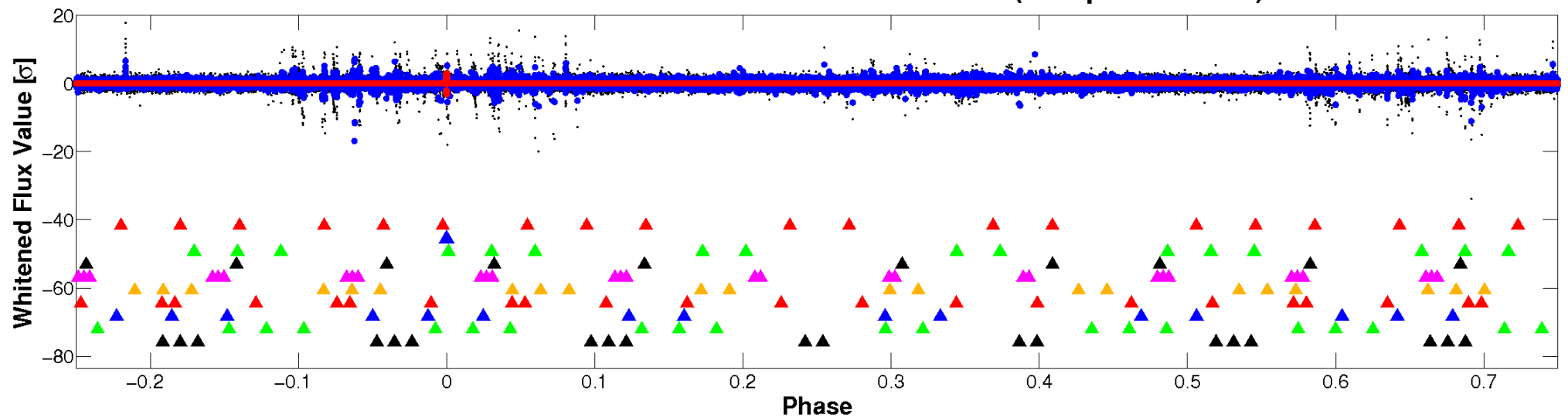


# Non-Whitened Vs. Whitened Light Curve

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



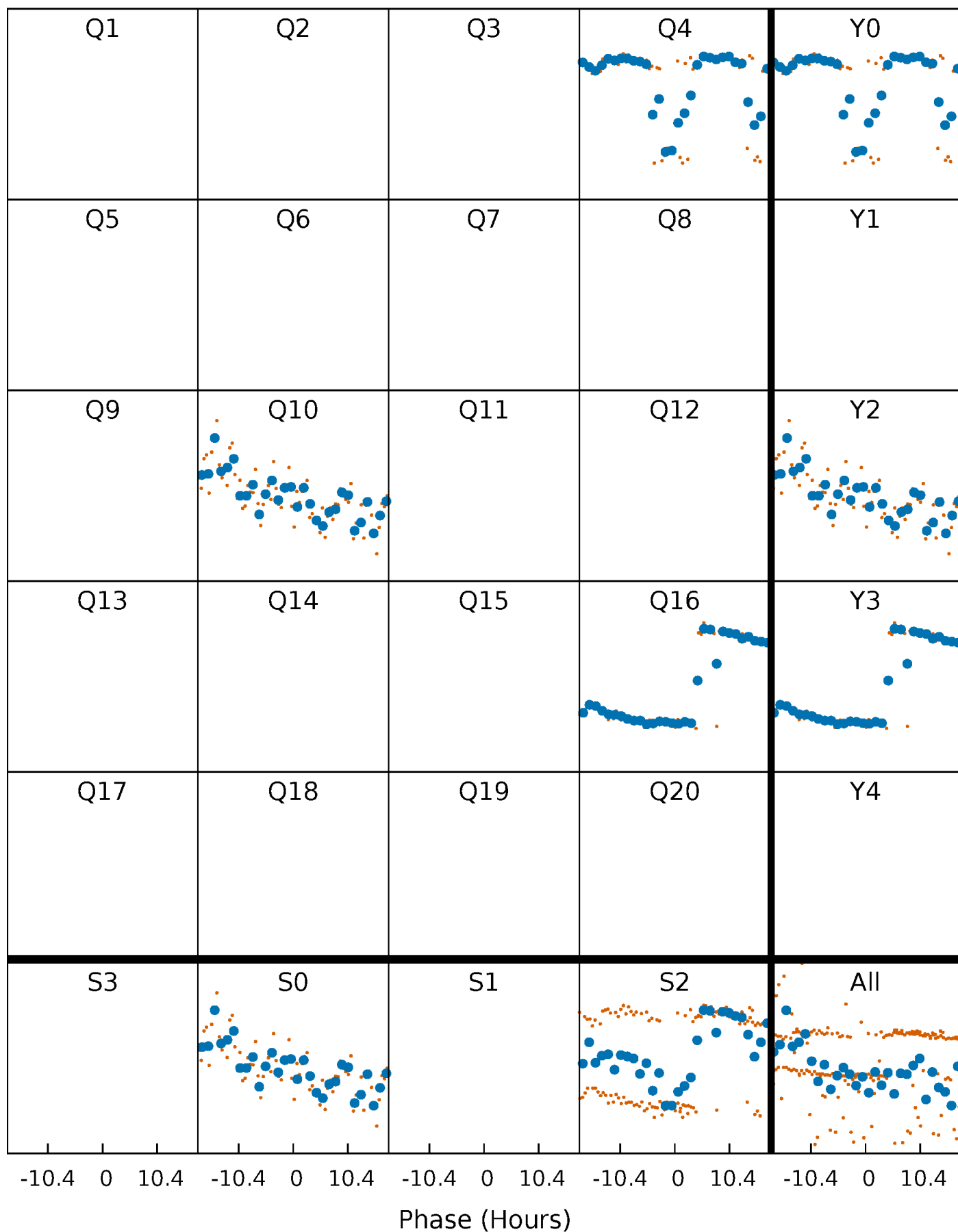
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

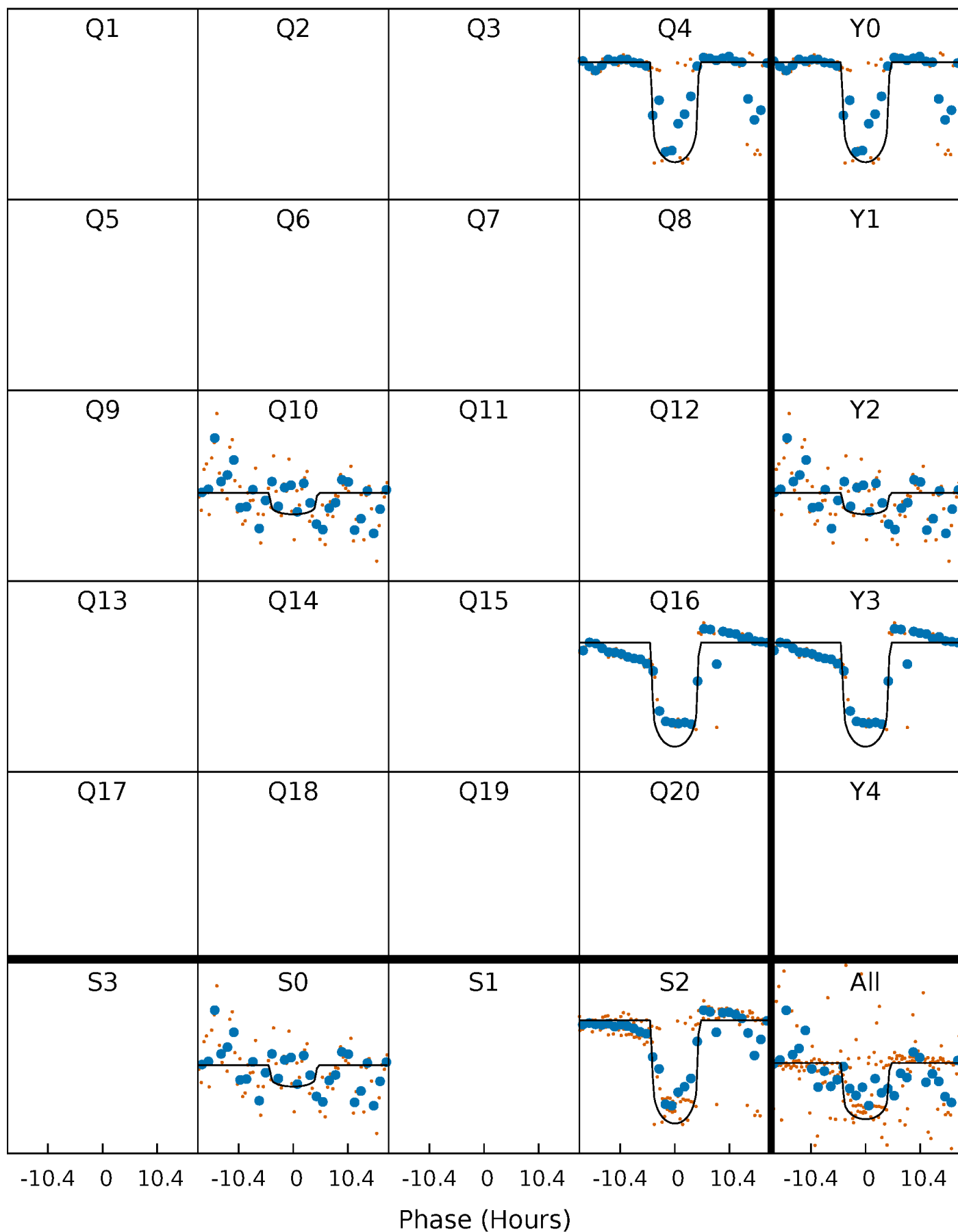
TCE 007880676-02     $P=544.696610$  Days     $T_0=418.947989$  (BKJD)





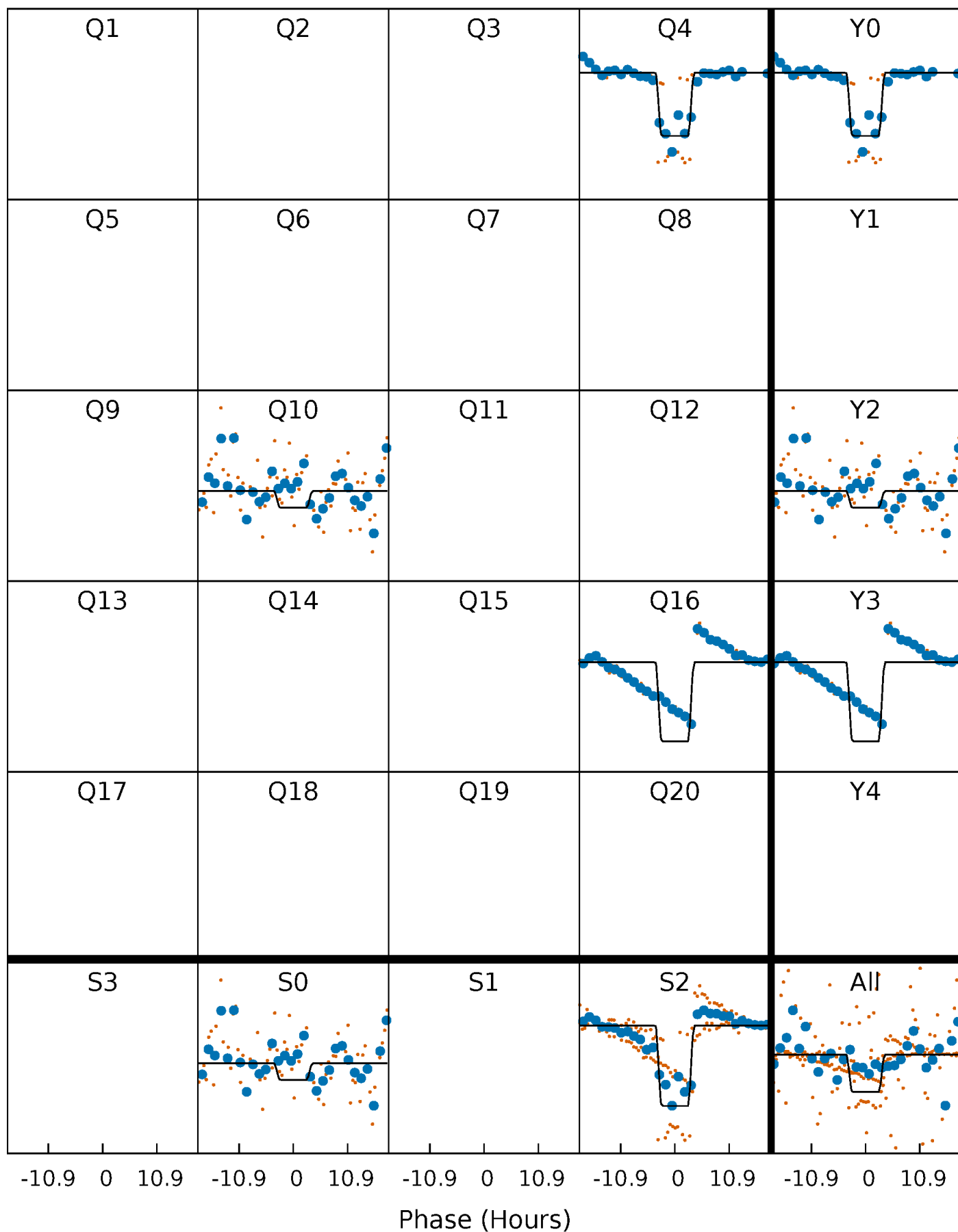
# DV Quarter-Phased Transit Curves

TCE 007880676-02 P=544.696610 Days  $T_0=418.947989$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

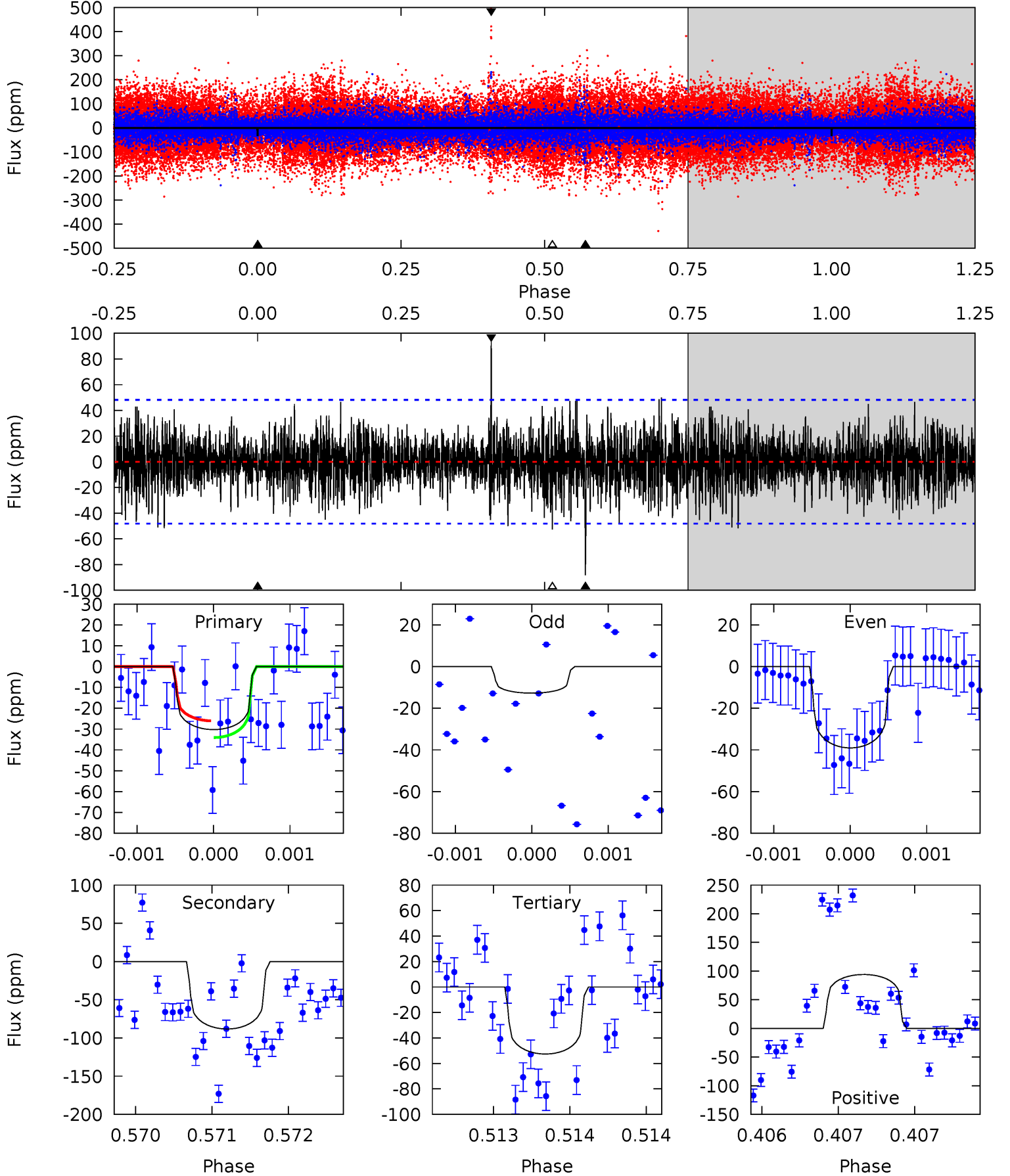
TCE 007880676-02 P=544.717842 Days  $T_0=418.926062$  (BKJD)



# DV Model-Shift Uniqueness Test

007880676-02, P = 544.696610 Days, E = 418.947989 Days

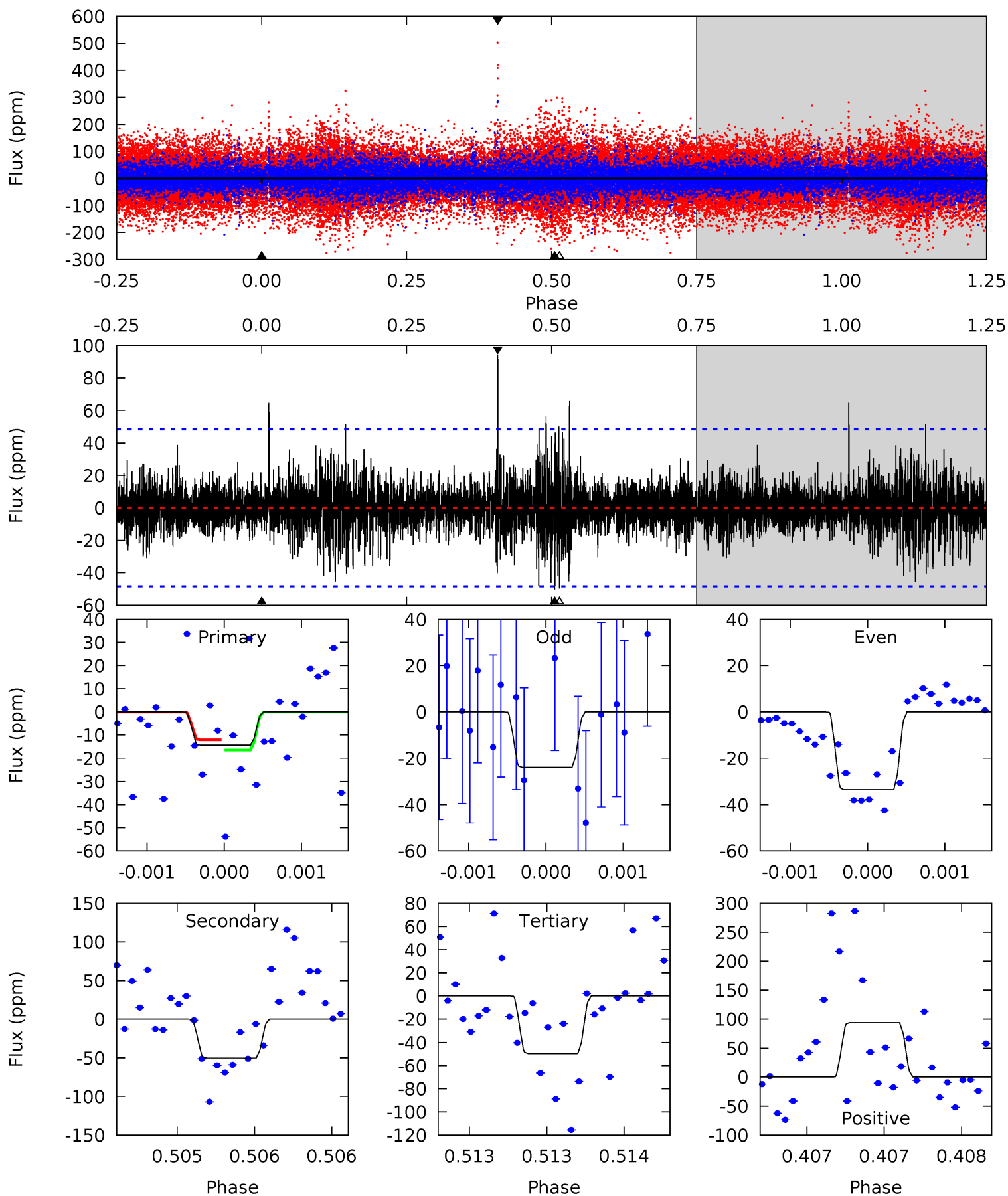
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.47	10.1	6.03	10.8	5.52	3.40	1.69	-2.56	-7.31	4.08	-0.67	1.35	0.88	0.52	0.46



# Alt Model-Shift Uniqueness Test

007880676-02, P = 544.717842 Days, E = 418.926062 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.65	5.76	5.69	10.8	5.54	3.43	1.28	-4.04	-9.14	0.07	-5.03	0.54	0.56	0.65	0.25



### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-88 \pm 9$	$1.70^{+0.17}_{-0.16}$	$445^{+6}_{-7}$	$6697^{+405}_{-379}$	$33703^{+8059}_{-6575}$
Alt.	$-50 \pm 9$	$1.38^{+0.16}_{-0.17}$	$445^{+7}_{-6}$	$6410^{+524}_{-470}$	$28286^{+10561}_{-7094}$

$T_{max}$  = 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

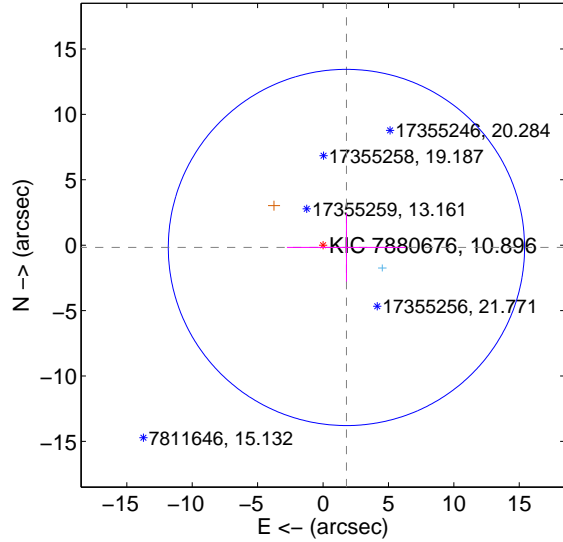
Supplemental centroid analysis for 007880676-02. **Kepler magnitude: 10.90.** Transit SNR 18.96

There are 1 quarters with good PRF difference image offsets

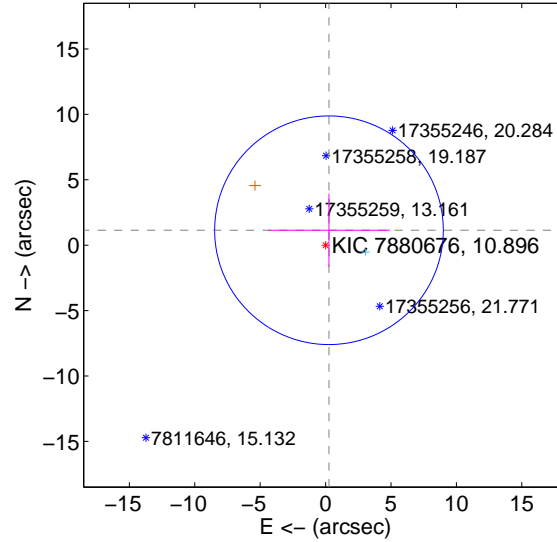
The OOT PRF centroid is offset from the target star catalog position by about 2.25 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.797 \pm 4.540$	0.40	$-1.789 \pm 4.554$	$-0.174 \pm 2.617$
PRF-fit source offset from KIC position	$1.171 \pm 2.914$	0.40	$-0.260 \pm 4.653$	$1.141 \pm 2.794$
photometric centroid source offset	$1.82 \pm 1.55$	1.18	$0.21 \pm 1.31$	$-1.81 \pm 1.55$

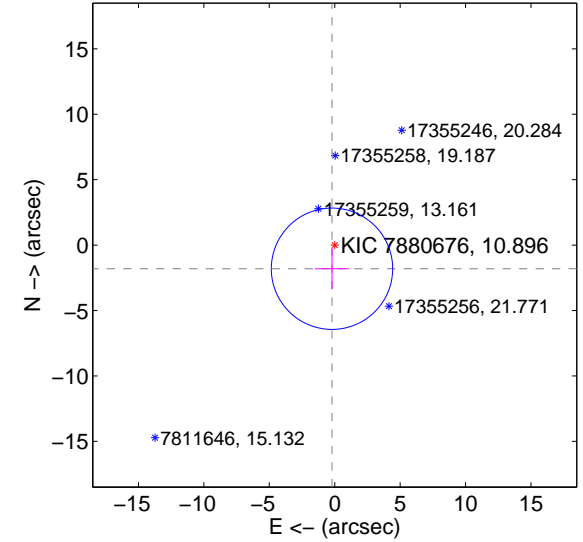
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

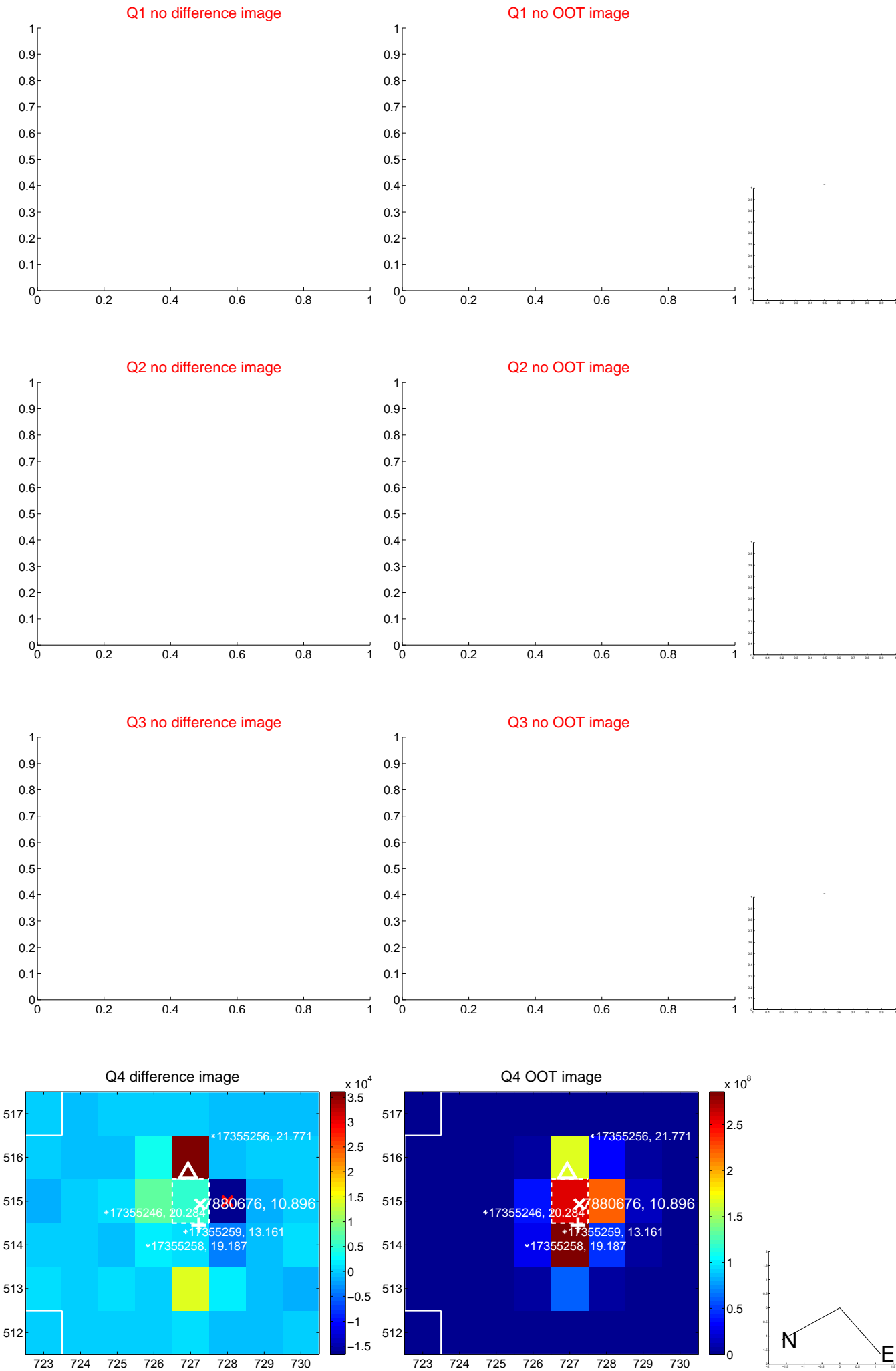


offset from photometric centroids



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

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

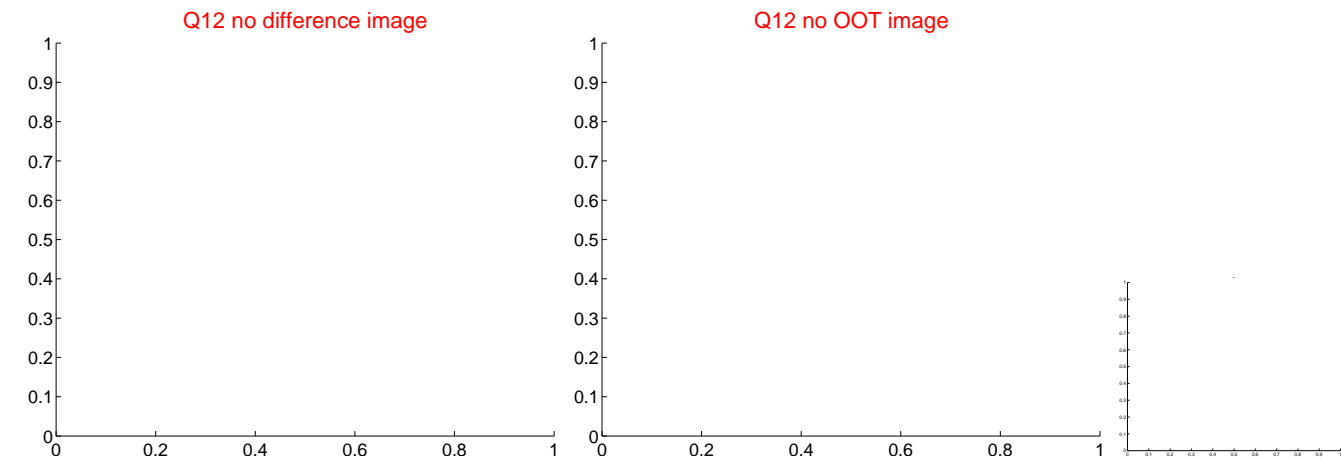
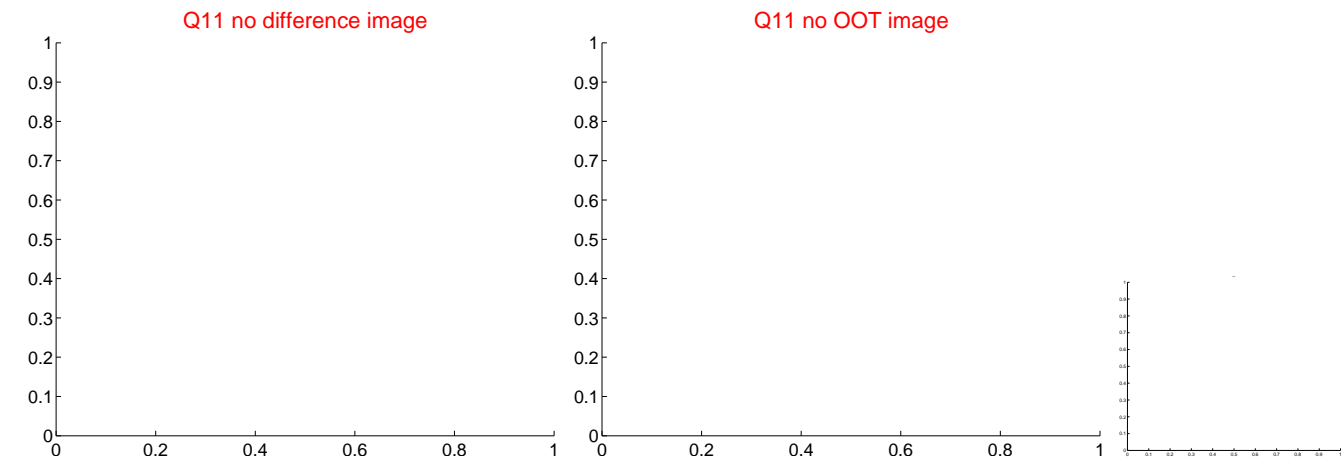
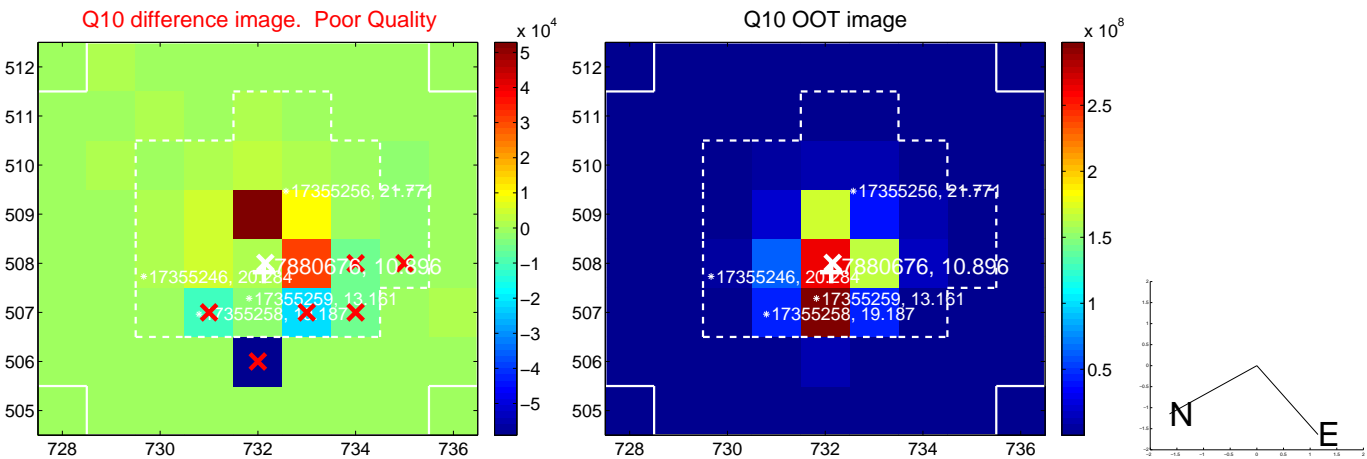


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

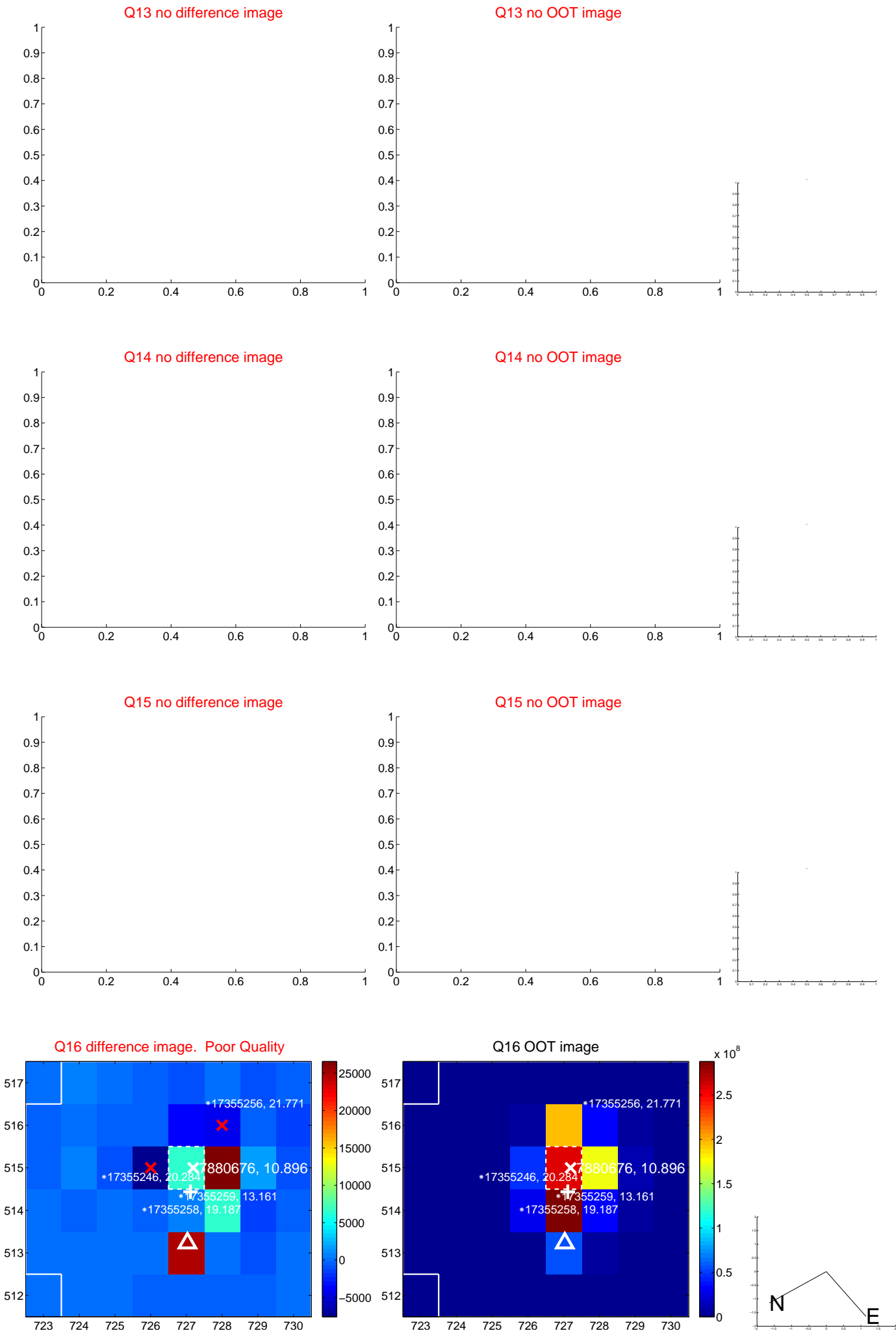




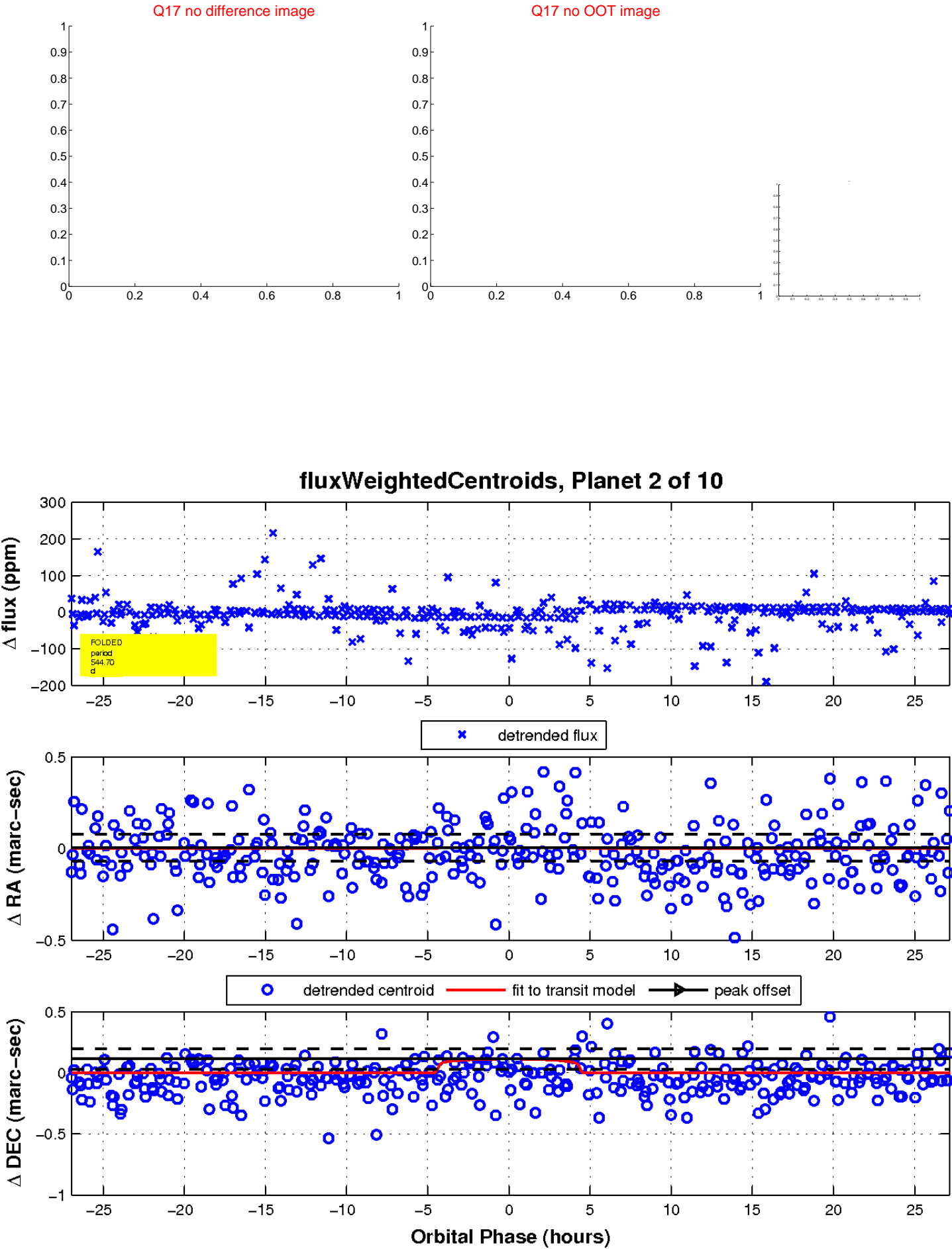
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

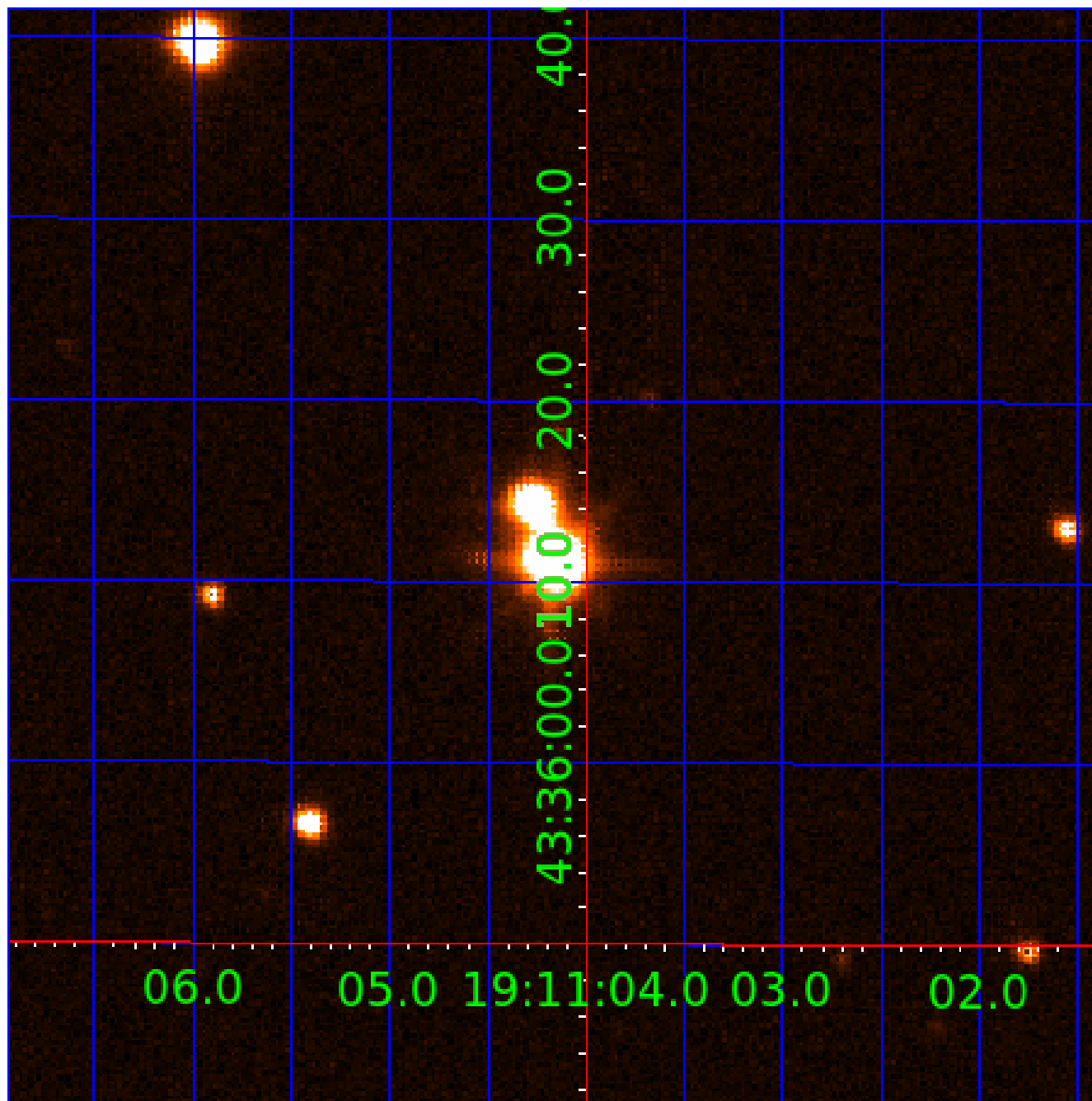


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## KIC 007880676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007880676-01	OBS	No	74.700898	193.436167	18.8	1.598	31.4	2.9	1.96	6129	1.00	34.52
007880676-02	OBS	No	544.696610	418.947989	55.4	9.071	18.7	19.0	1.96	6129	1.69	2.44
007880676-03	OBS	No	93.437611	139.301041	58.6	0.868	19.0	28.0	1.96	6129	1.53	25.61
007880676-04	OBS	No	149.986976	136.477266	48.9	3.061	18.7	14.8	1.96	6129	1.37	13.63
007880676-05	OBS	No	49.327158	139.760525	11.7	11.019	14.0	6.8	1.96	6129	0.76	60.03
007880676-06	OBS	No	69.390592	165.569874	29.3	16.554	13.7	11.6	1.96	6129	1.17	38.08
007880676-07	OBS	No	64.361879	185.581530	60.1	2.287	19.3	24.3	1.96	6129	1.73	42.10
007880676-08	OBS	No	94.170624	203.456516	15.9	8.738	13.3	6.8	1.96	6129	0.91	25.35
007880676-09	OBS	No	75.849882	138.940758	46.7	1.755	17.5	8.4	1.96	6129	1.63	33.82
007880676-10	OBS	No	78.737554	157.099189	20.9	12.578	12.9	8.0	1.96	6129	1.05	32.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007880676-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007880676-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-05	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
007880676-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-08	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-09	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-10	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

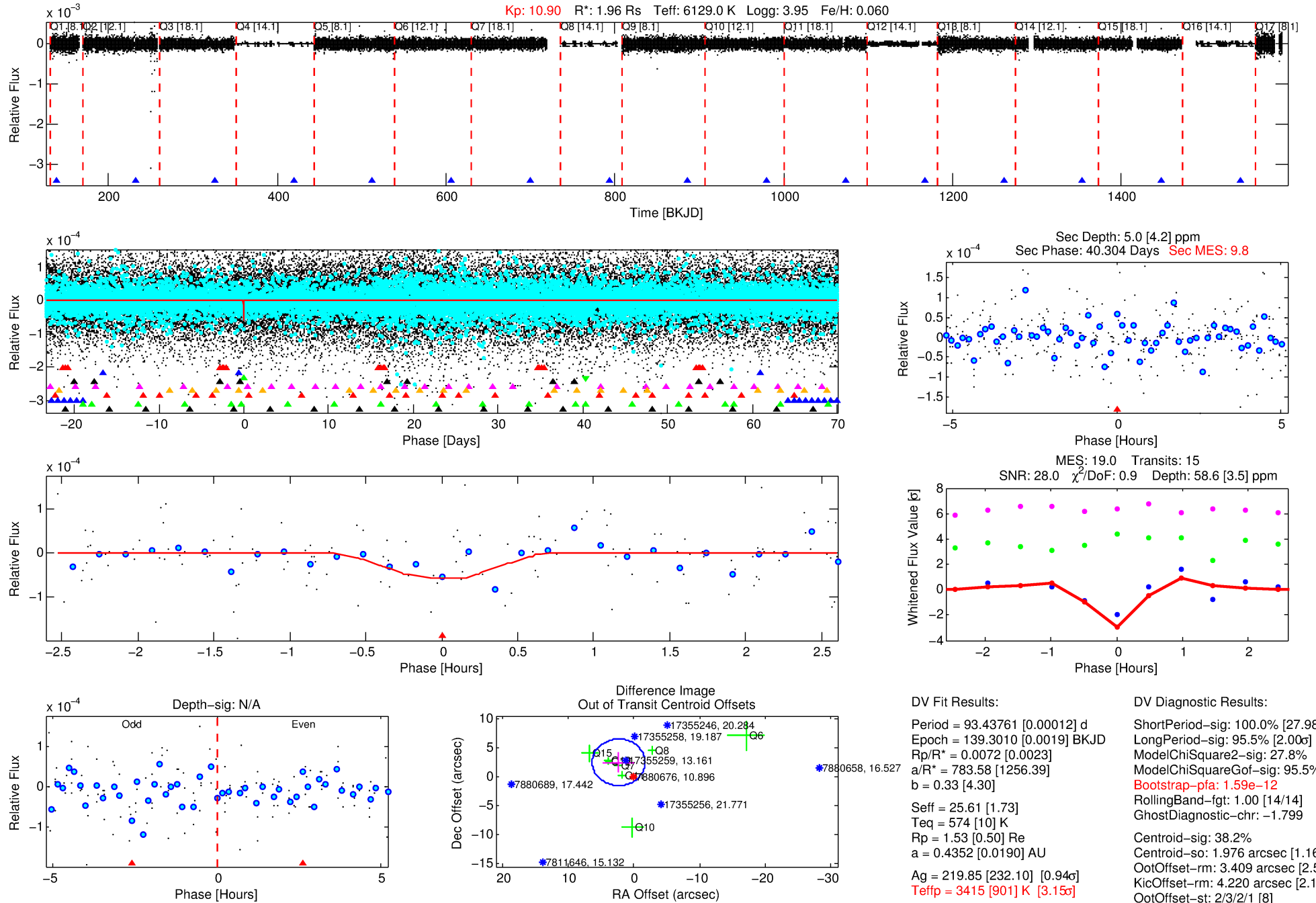
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-03

No Significant Match Found

# DV One-Page Summary

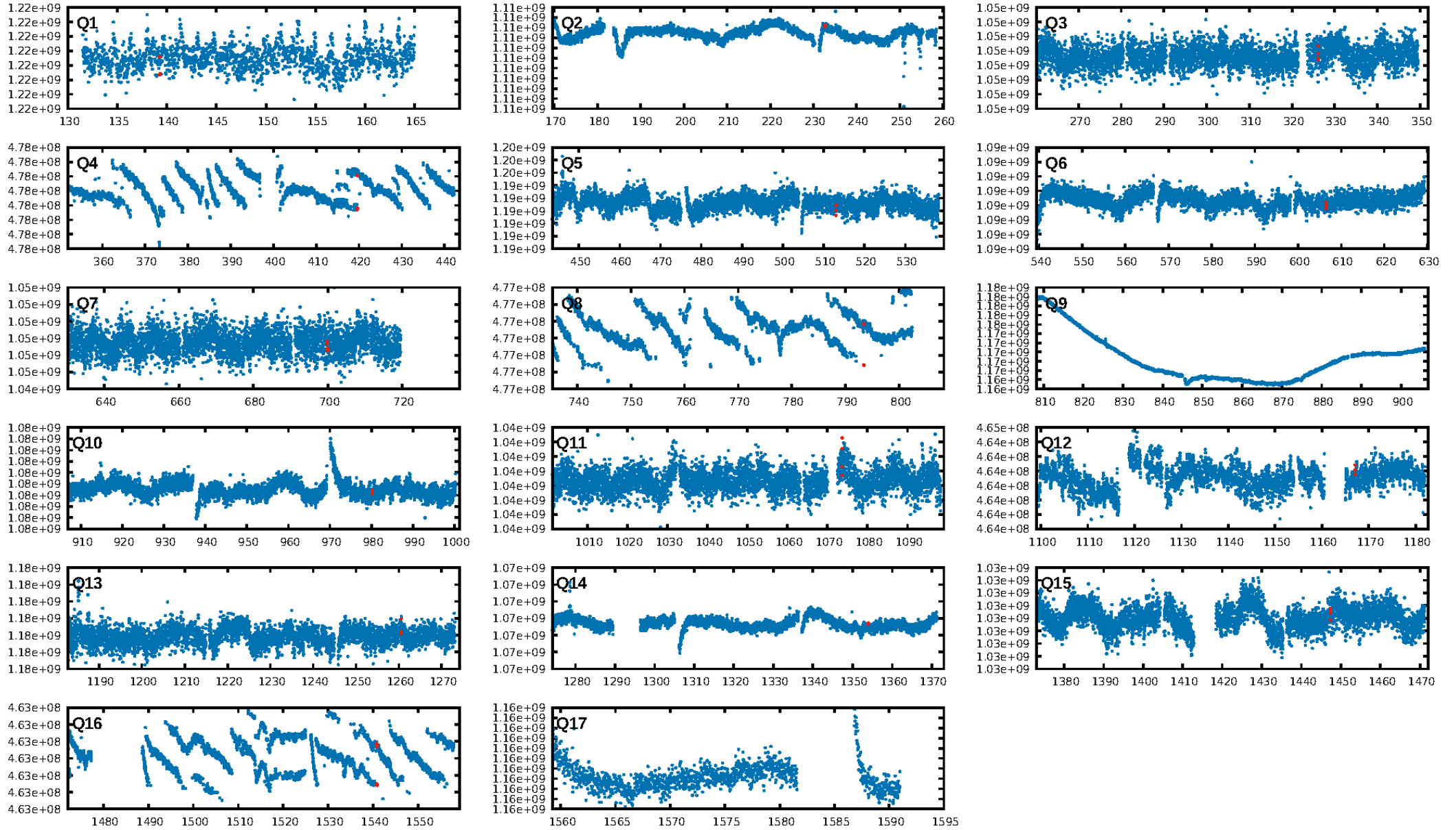
KIC: 7880676 Candidate: 3 of 10 Period: 93.438 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:06:22 Z

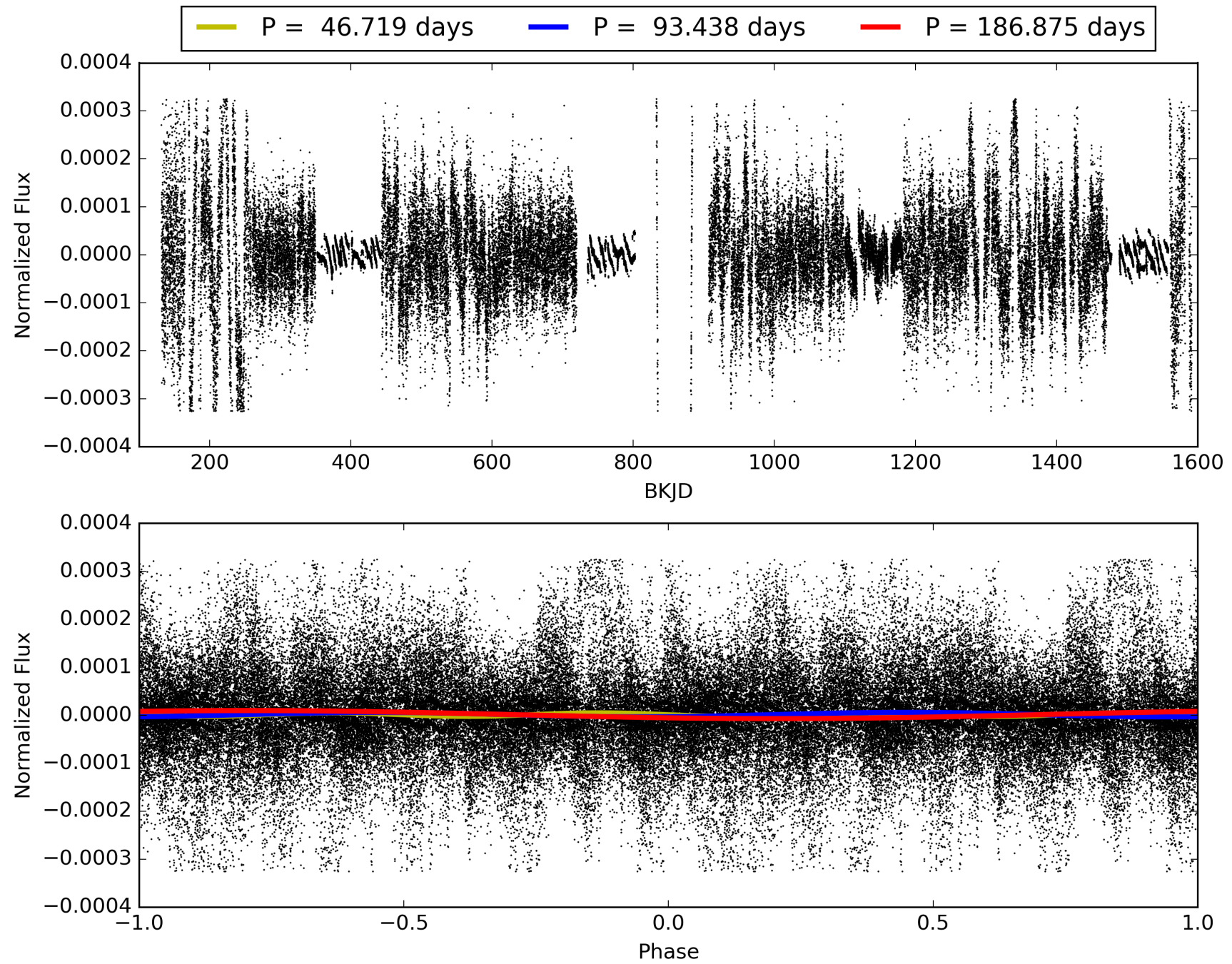
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007880676-03, PDC Light Curves





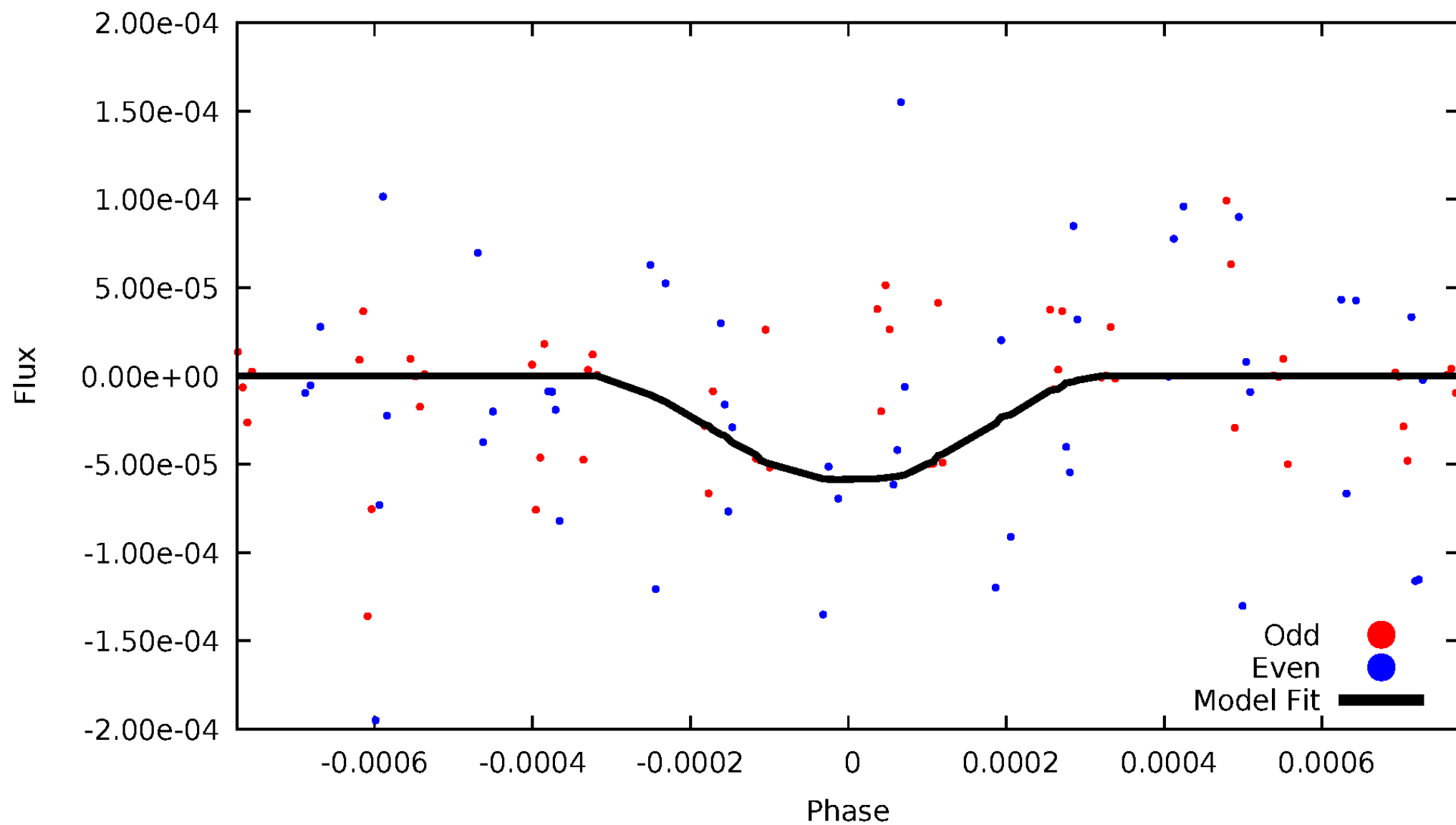
TCE 007880676-03





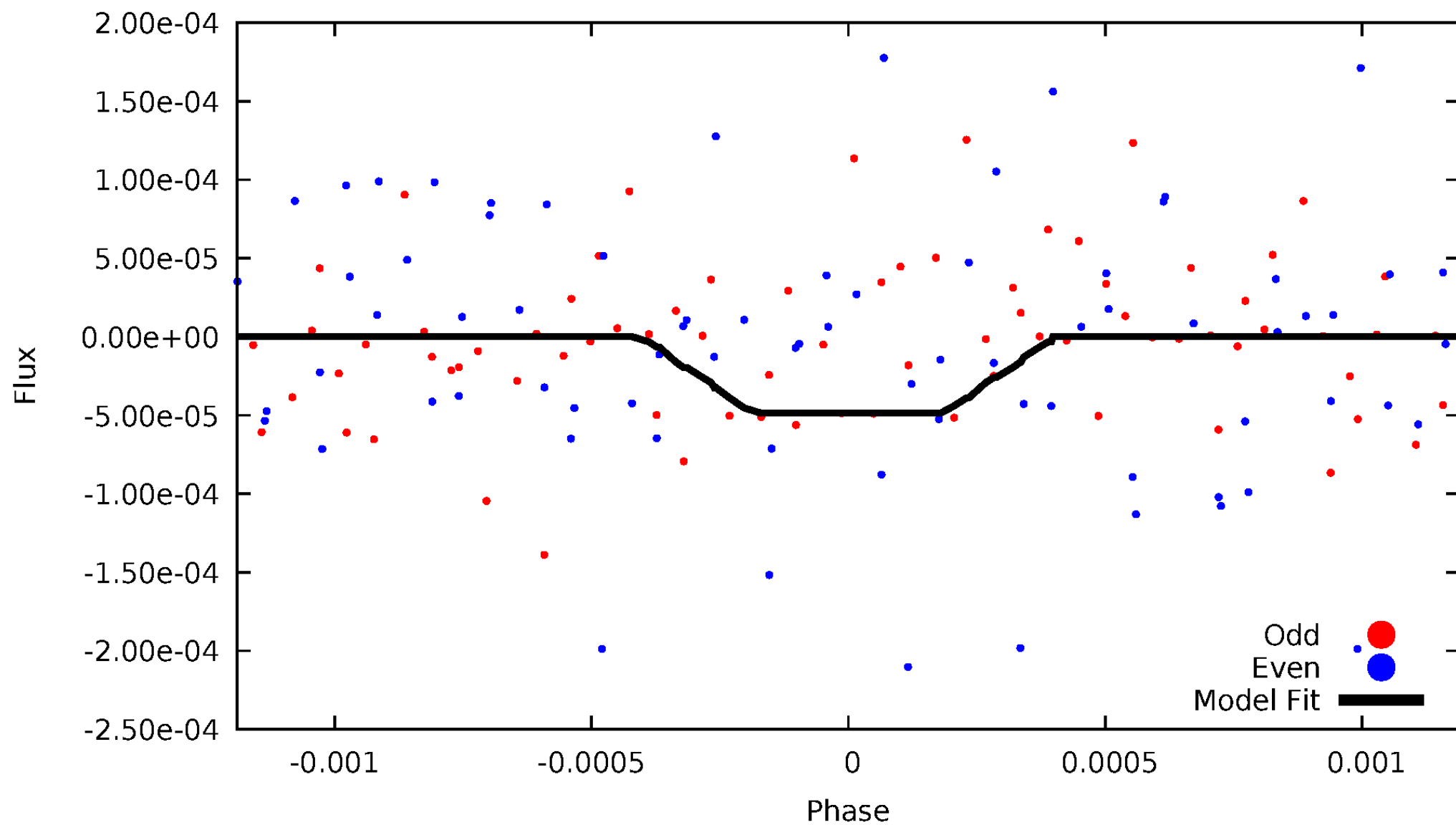
# DV Odd/Even

TCE 007880676-03



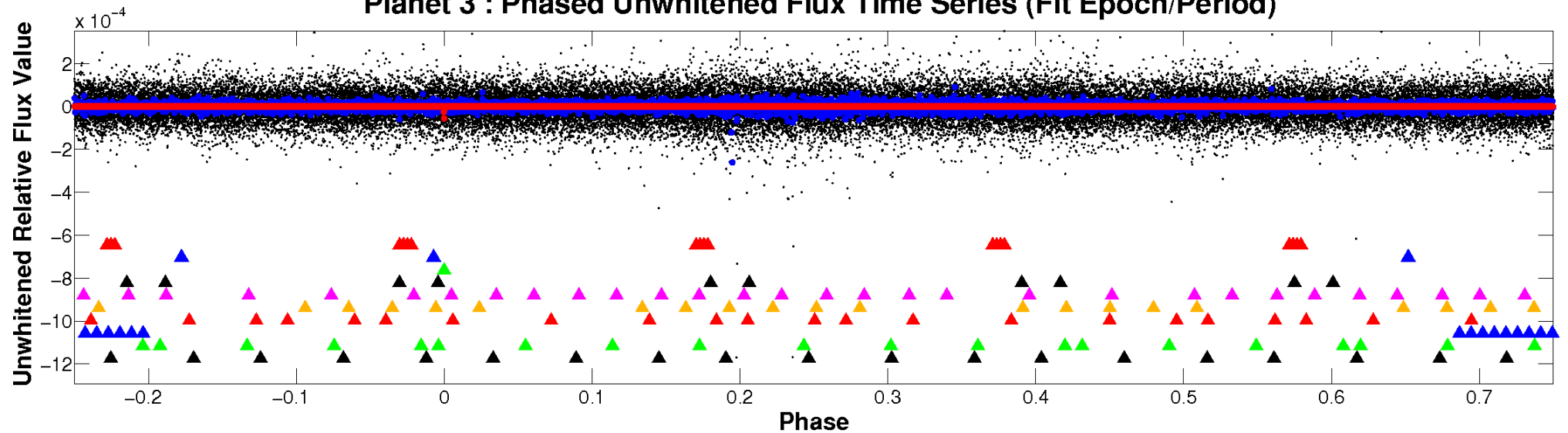
# ALT Odd/Even

TCE 007880676-03

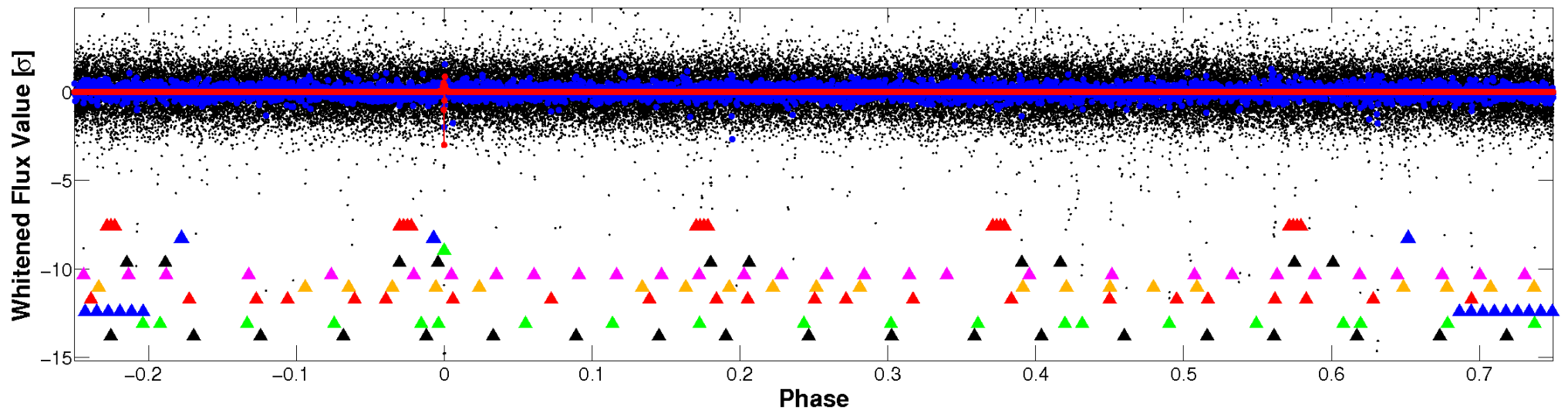


# Non-Whitened Vs. Whitened Light Curve

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

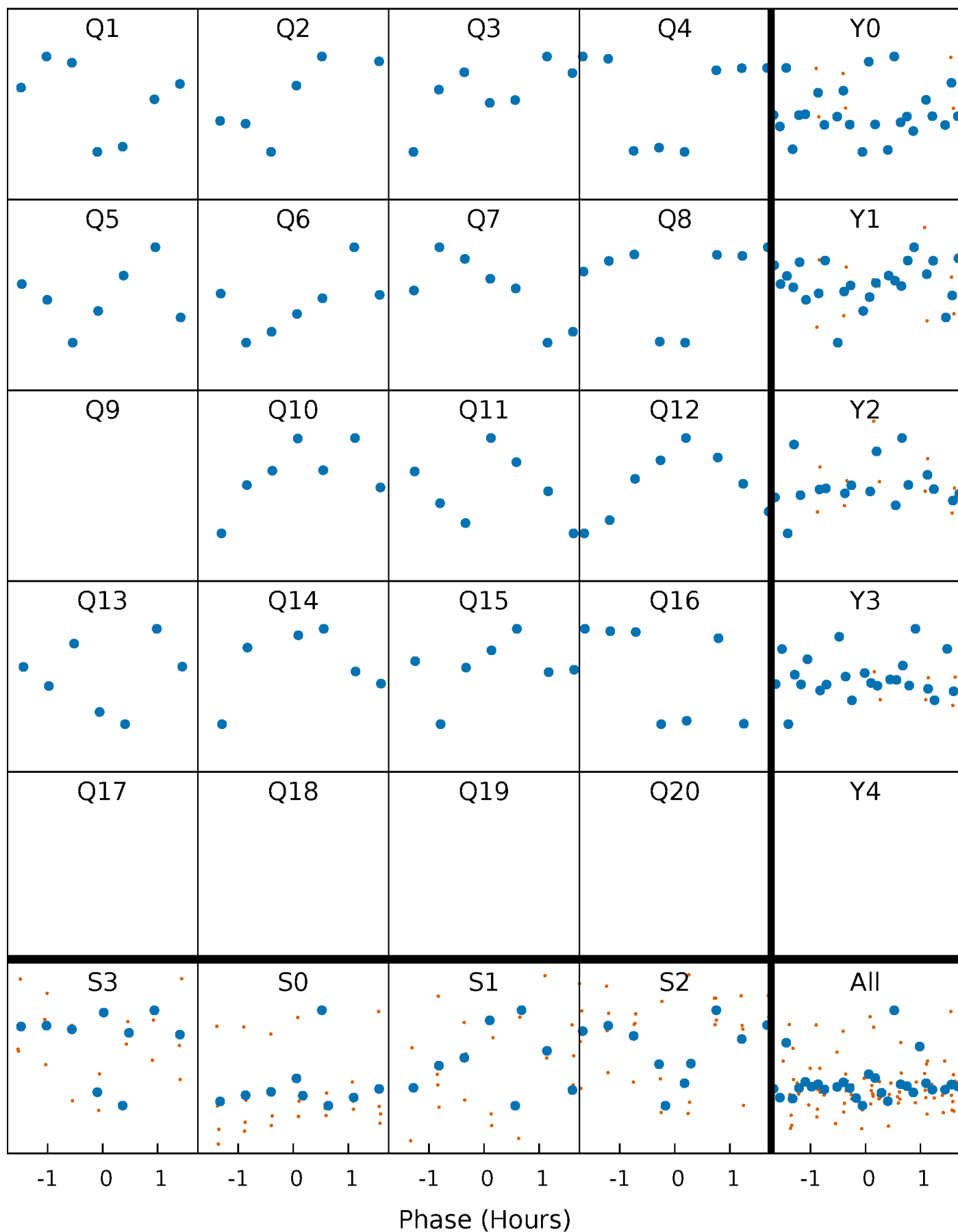


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



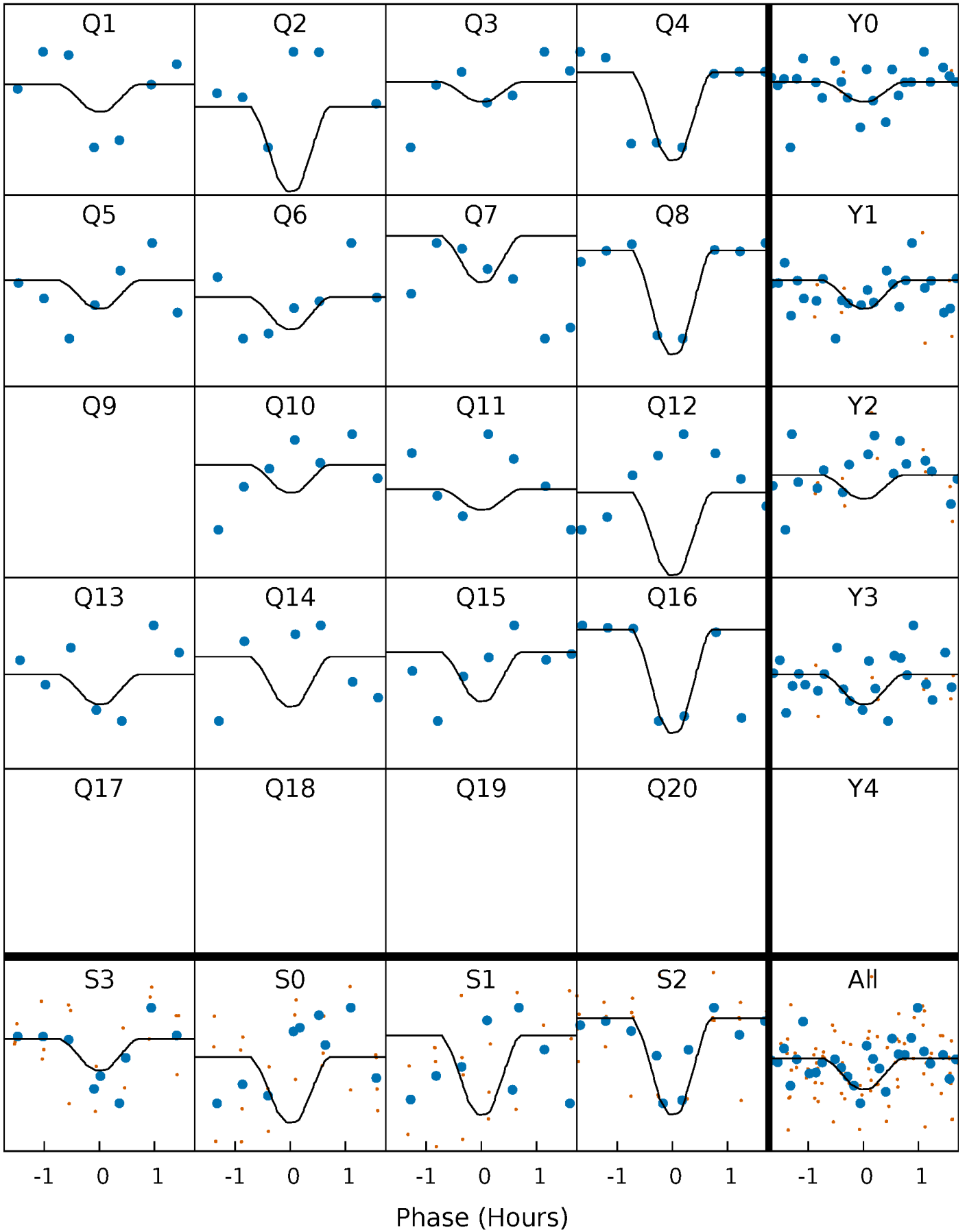
# PDC Quarter-Phased Transit Curves

TCE 007880676-03 P= 93.437611 Days  $T_0=139.301041$  (BKJD)



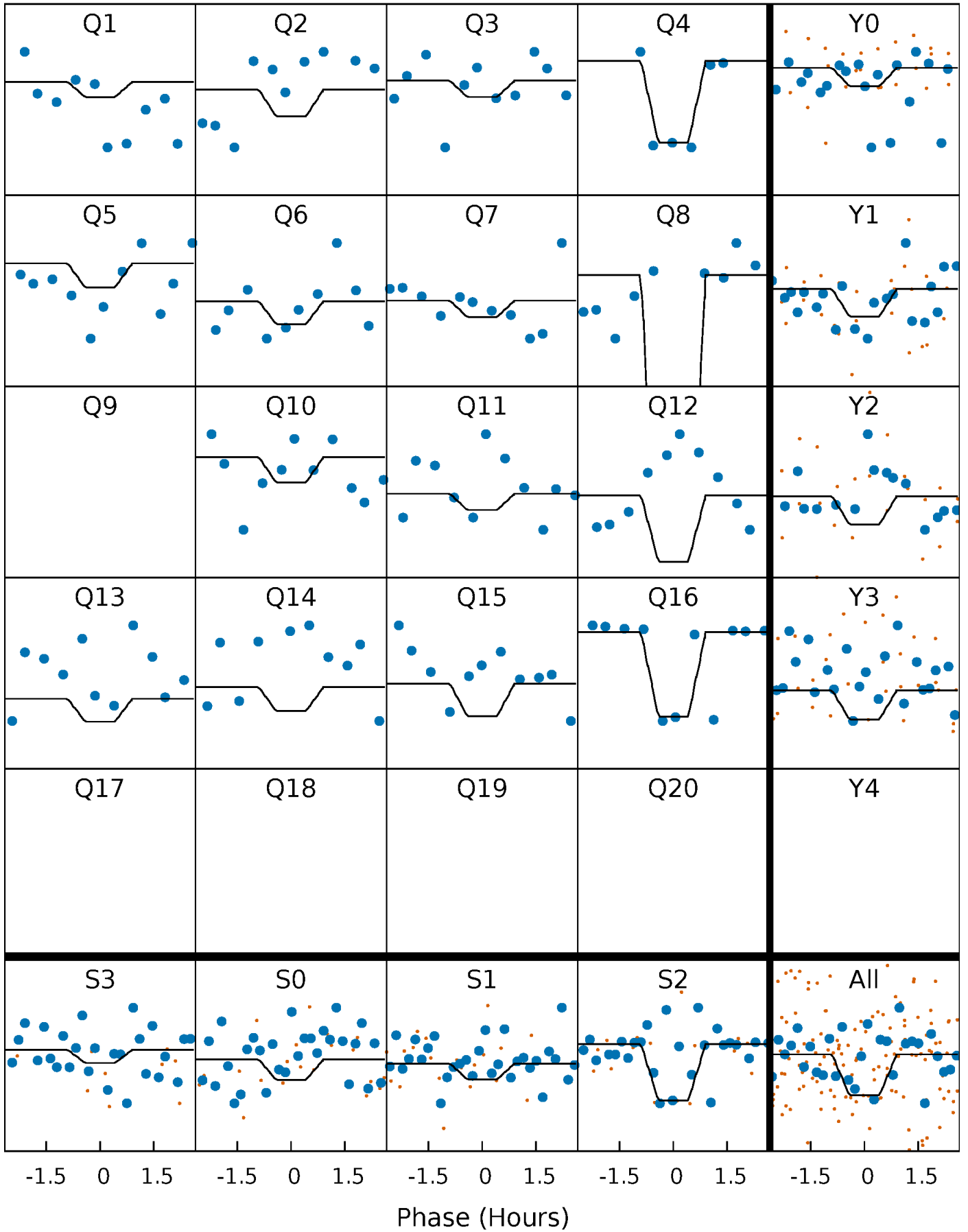
# DV Quarter-Phased Transit Curves

TCE 007880676-03 P= 93.437611 Days  $T_0=139.301041$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

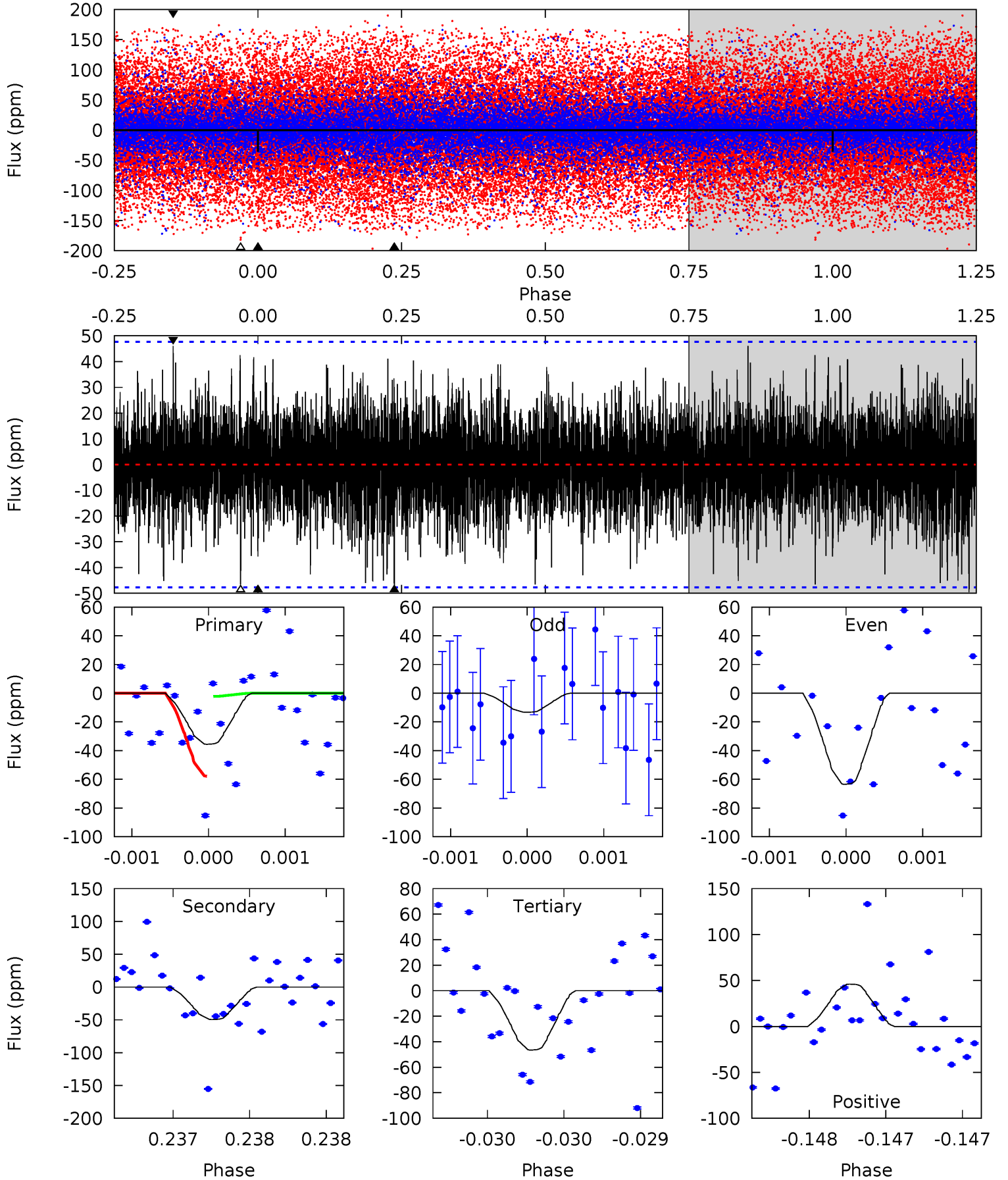
TCE 007880676-03 P= 93.438969 Days  $T_0=139.287213$  (BKJD)



# DV Model-Shift Uniqueness Test

007880676-03, P = 93.437611 Days, E = 45.863430 Days

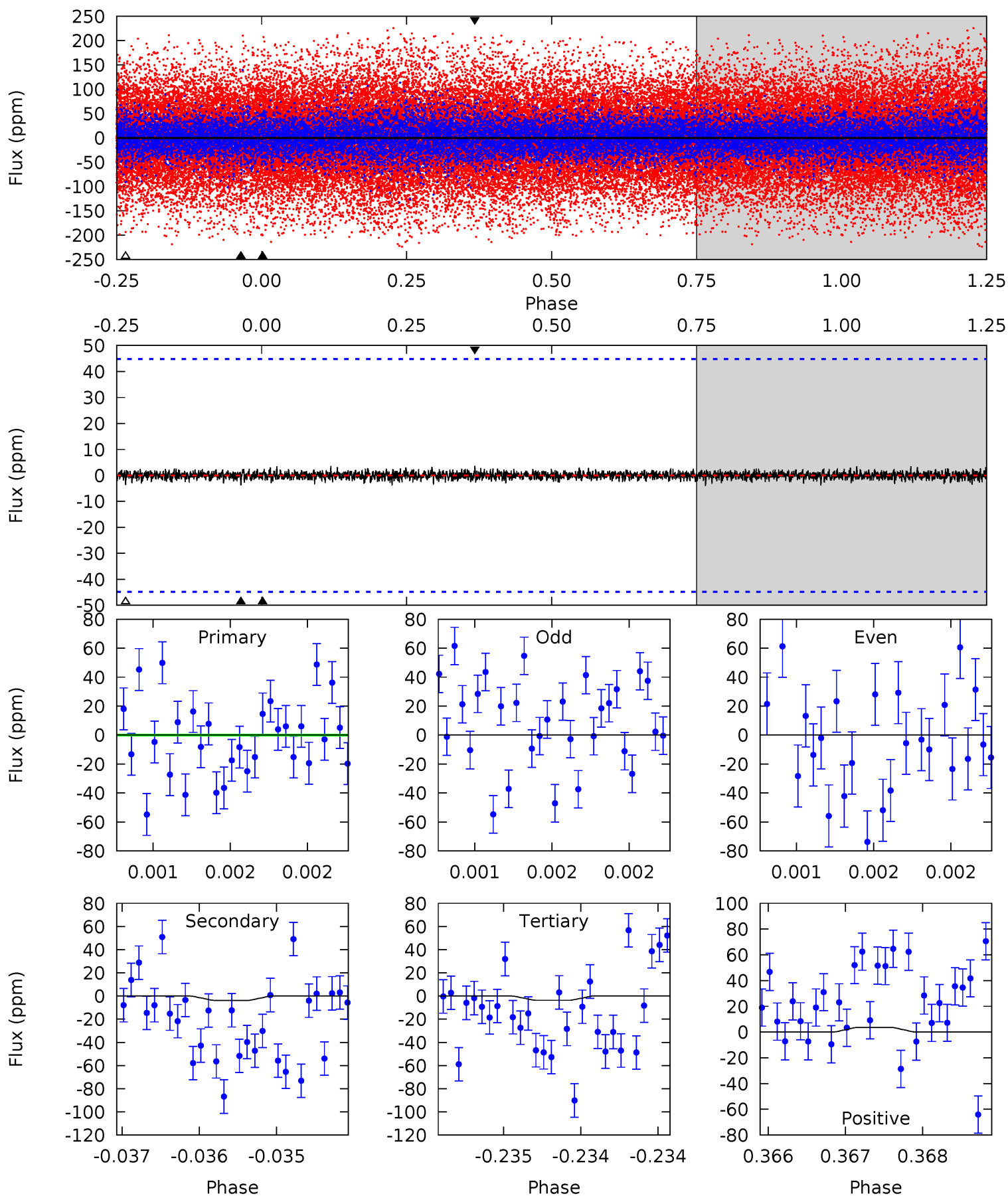
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.15	5.77	5.42	5.37	5.55	3.45	1.45	-1.27	-1.22	0.34	0.40	2.97	0.61	0.48	3.28



# Alt Model-Shift Uniqueness Test

007880676-03, P = 93.438969 Days, E = 45.848244 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
0.20	0.46	0.45	0.45	5.49	3.36	0.12	-0.26	-0.25	0.01	0.01	0.99	1.24	0.49	1.05





### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-50 \pm 9$	$1.55^{+0.47}_{-0.48}$	$801^{+11}_{-12}$	$6015^{+1397}_{-750}$	$2129^{+2621}_{-925}$
Alt.	$-4 \pm 8$	$1.50^{+0.46}_{-0.48}$	$801^{+11}_{-11}$	$3665^{+1038}_{-7347}$	$173^{+520}_{-355}$

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

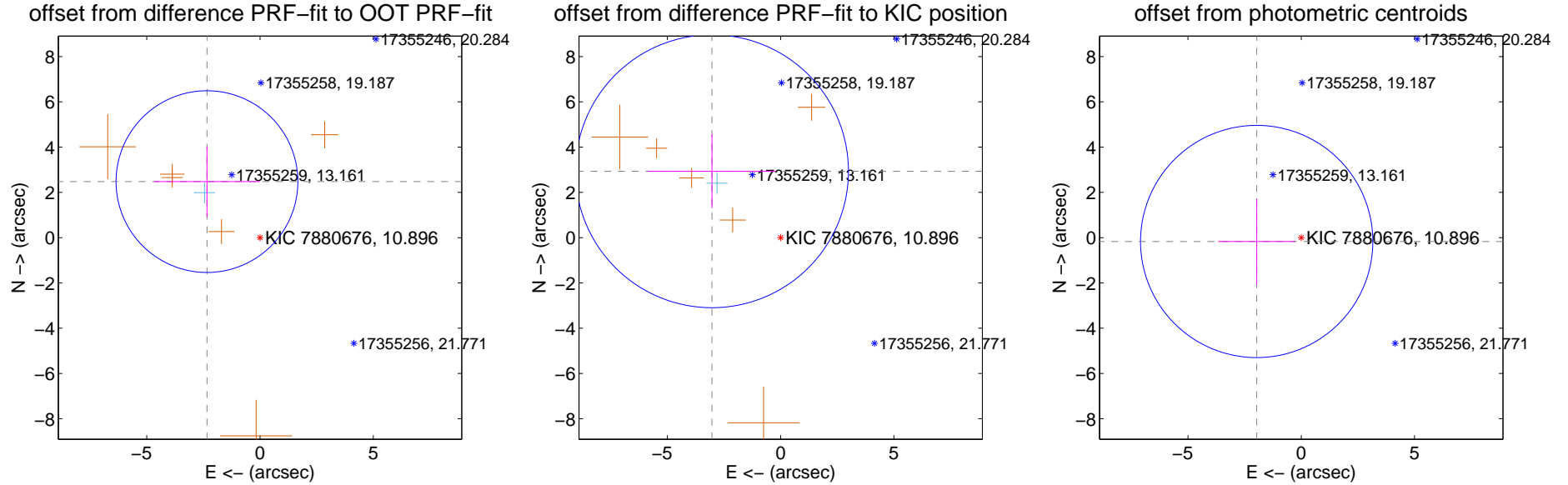
## DV Centroid Data

Supplemental centroid analysis for 007880676-03. **Kepler magnitude: 10.90.** Transit SNR 27.99

**There are 1 quarters with good PRF difference image offsets**

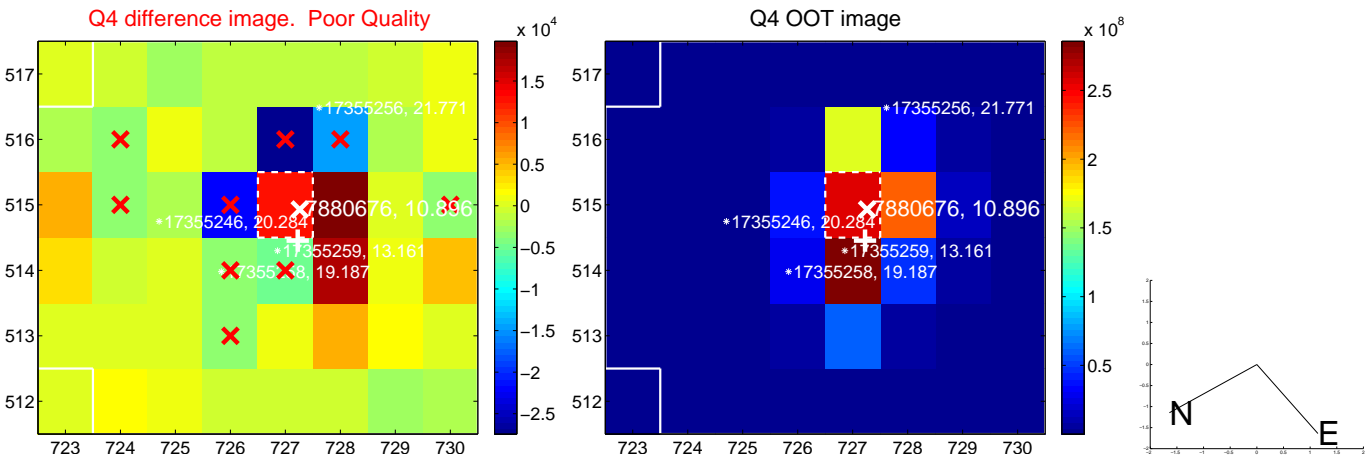
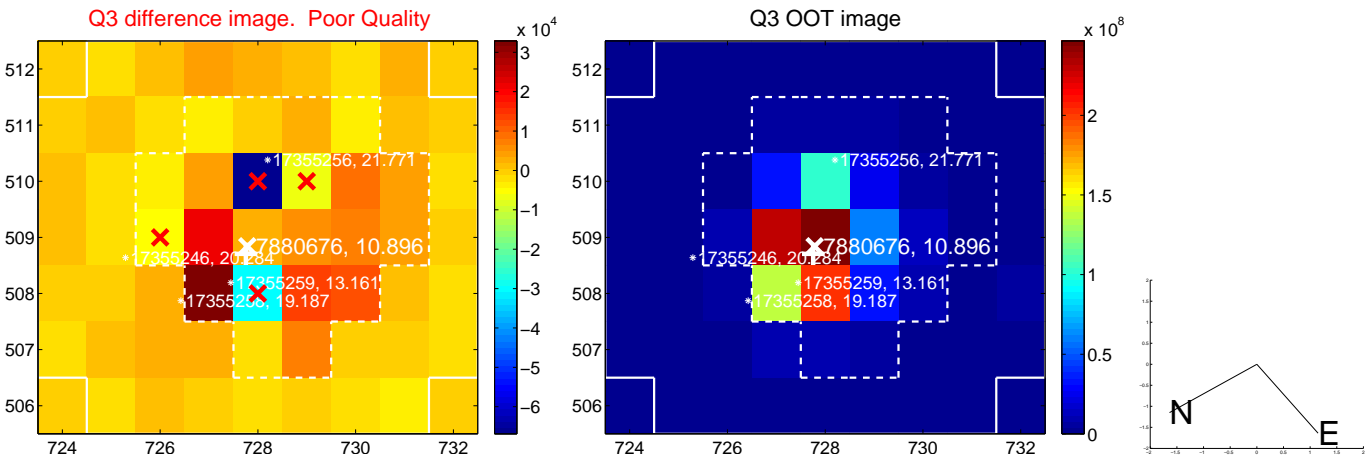
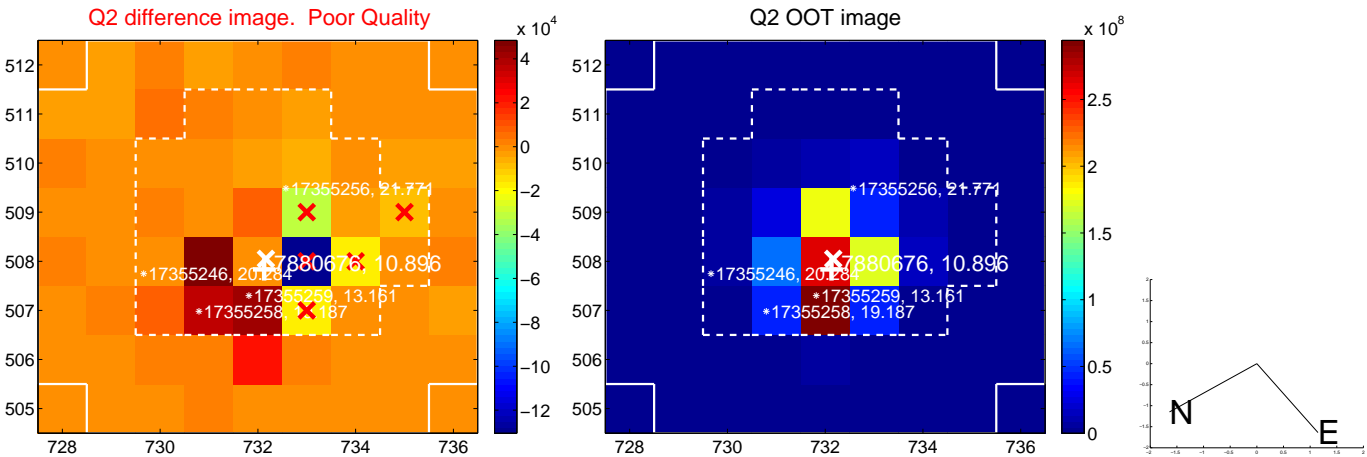
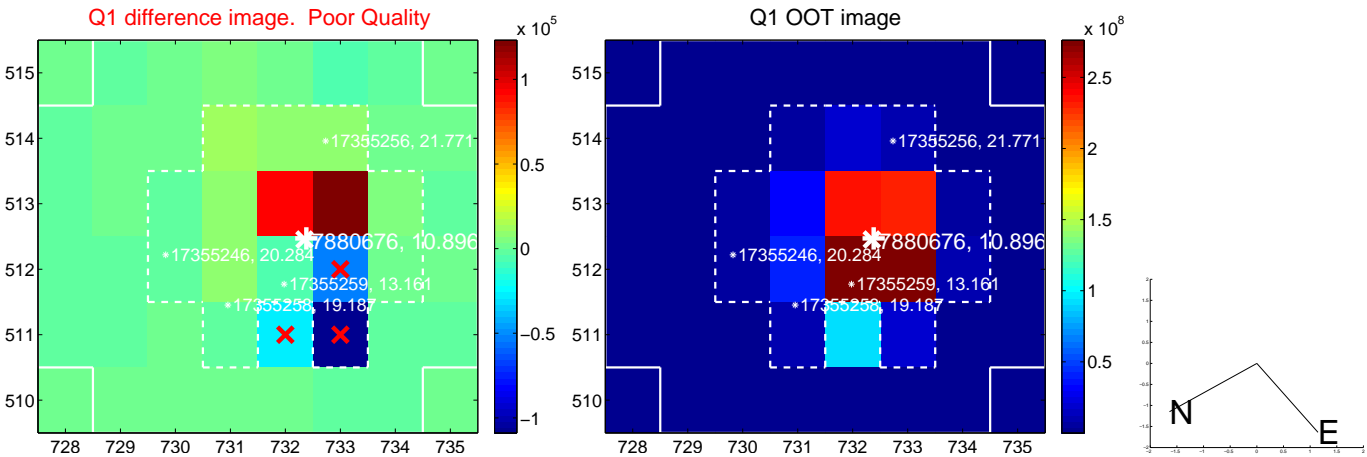
The direct PRF centroid is offset from the target star catalog position by about 0.57 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.409 \pm 1.338$	2.55	$2.344 \pm 2.332$	$2.476 \pm 1.553$
PRF-fit source offset from KIC position	$4.220 \pm 2.010$	2.10	$3.034 \pm 2.824$	$2.934 \pm 1.623$
photometric centroid source offset	$1.98 \pm 1.71$	1.16	$1.97 \pm 1.71$	$-0.17 \pm 1.89$

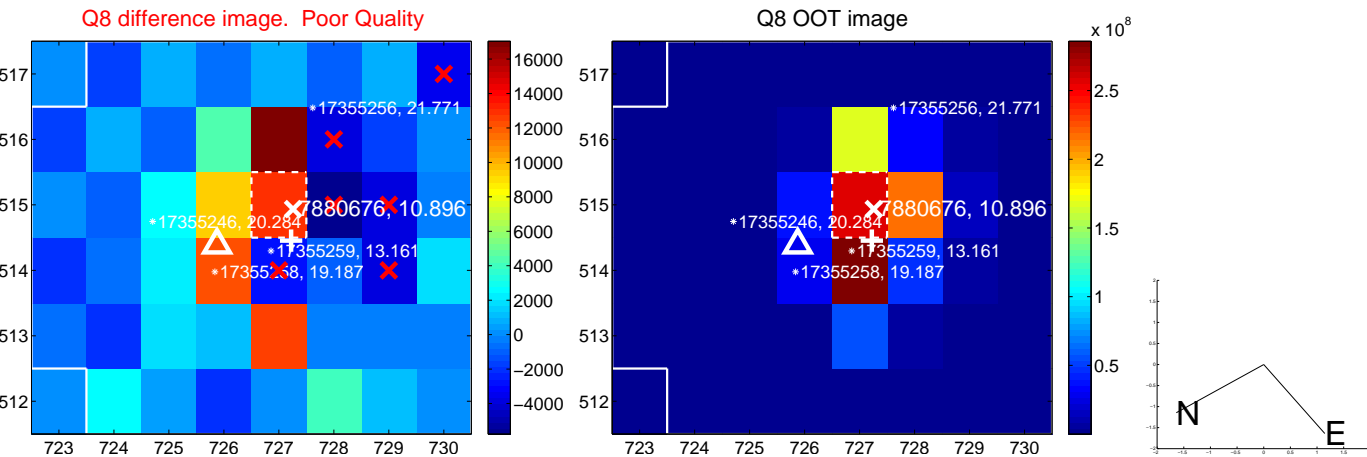
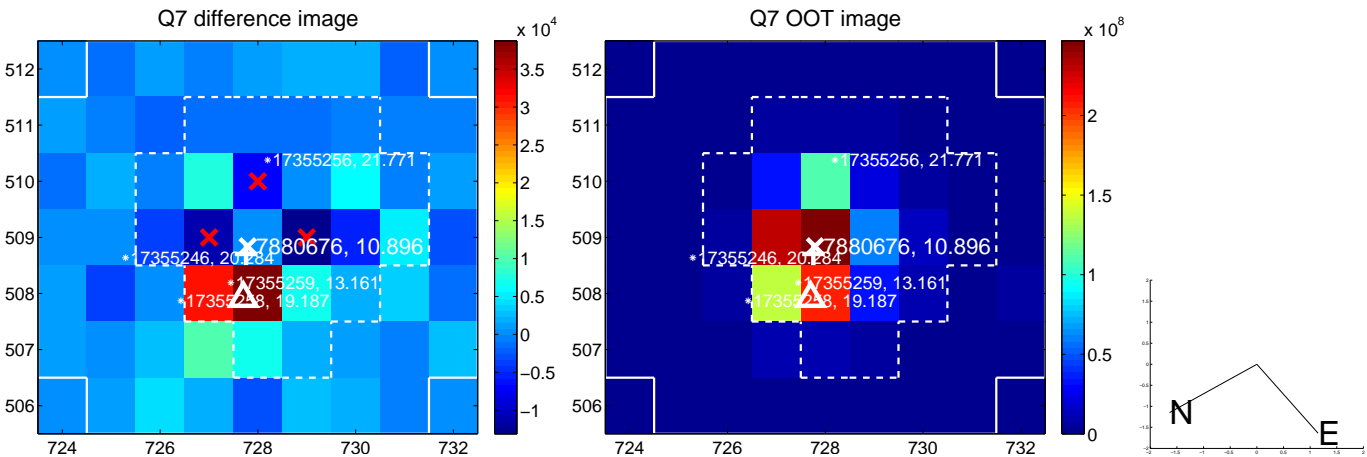
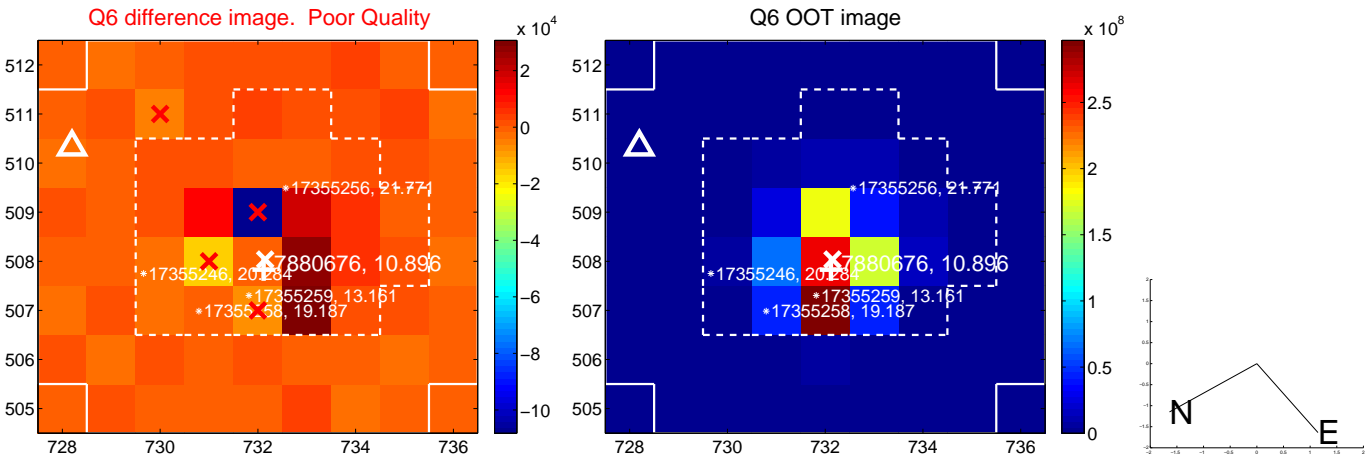
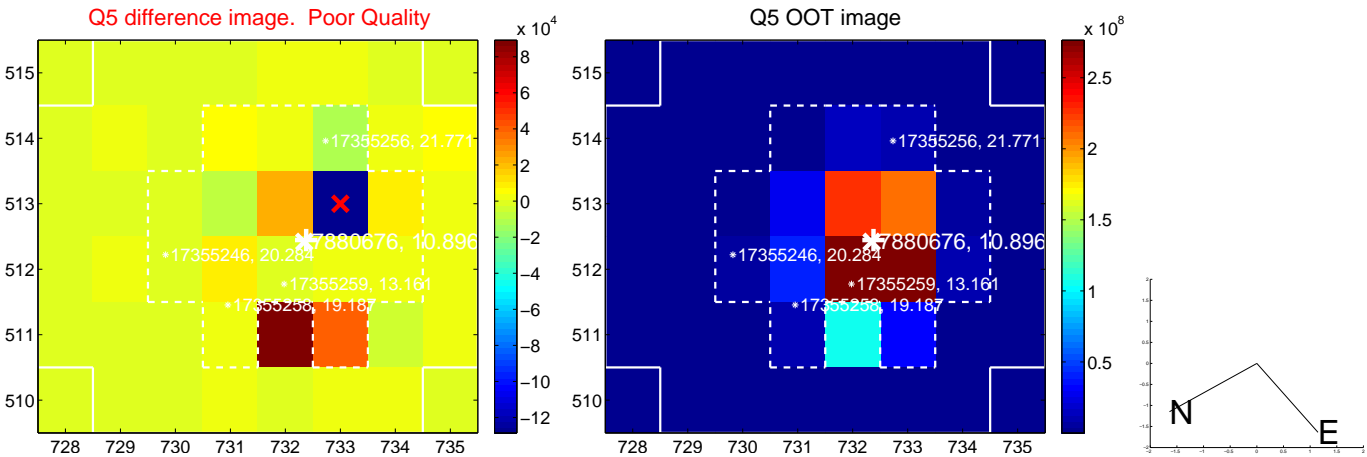


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

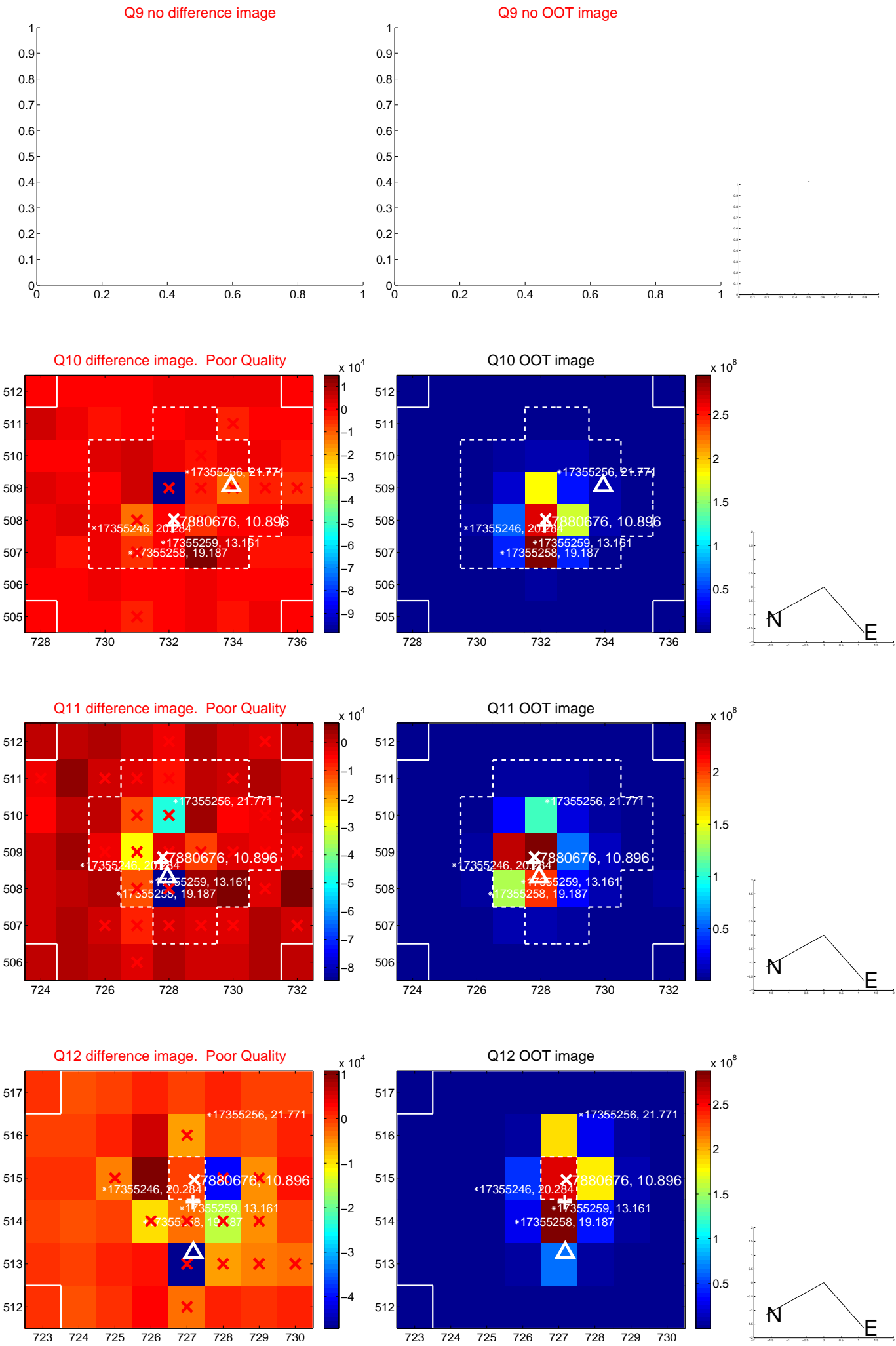
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



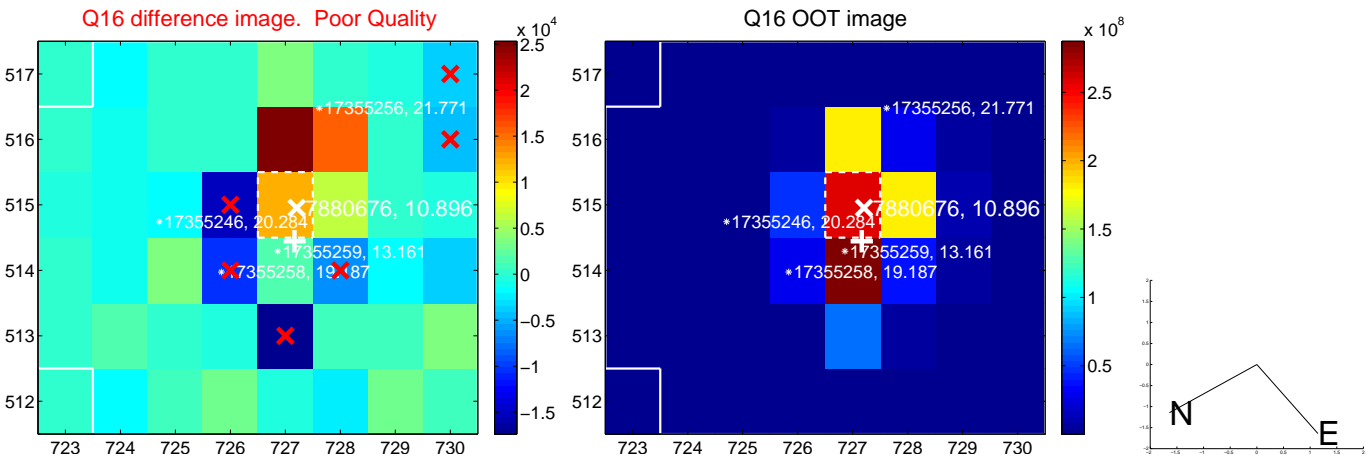
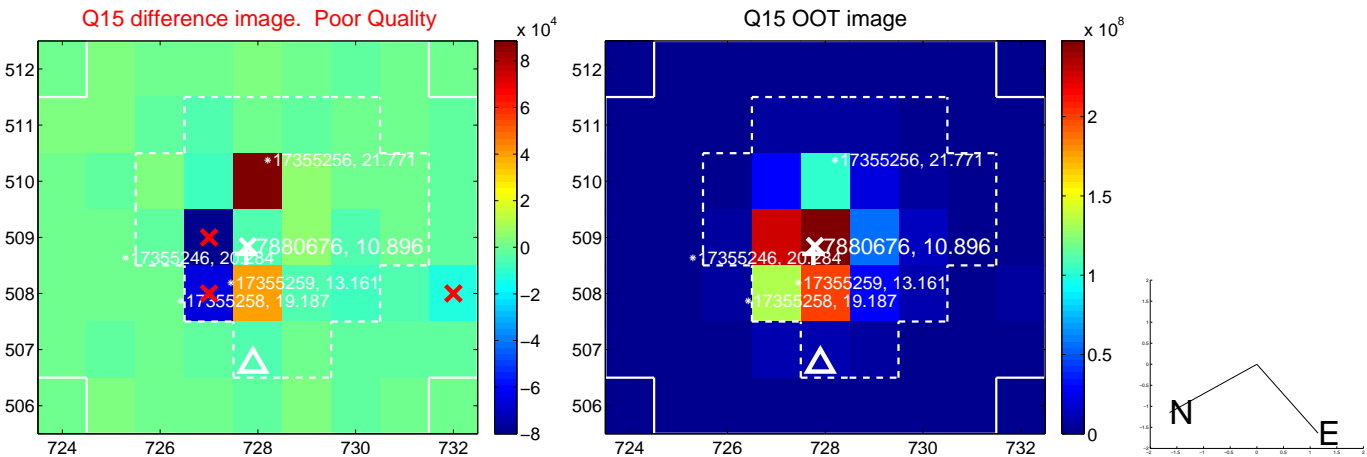
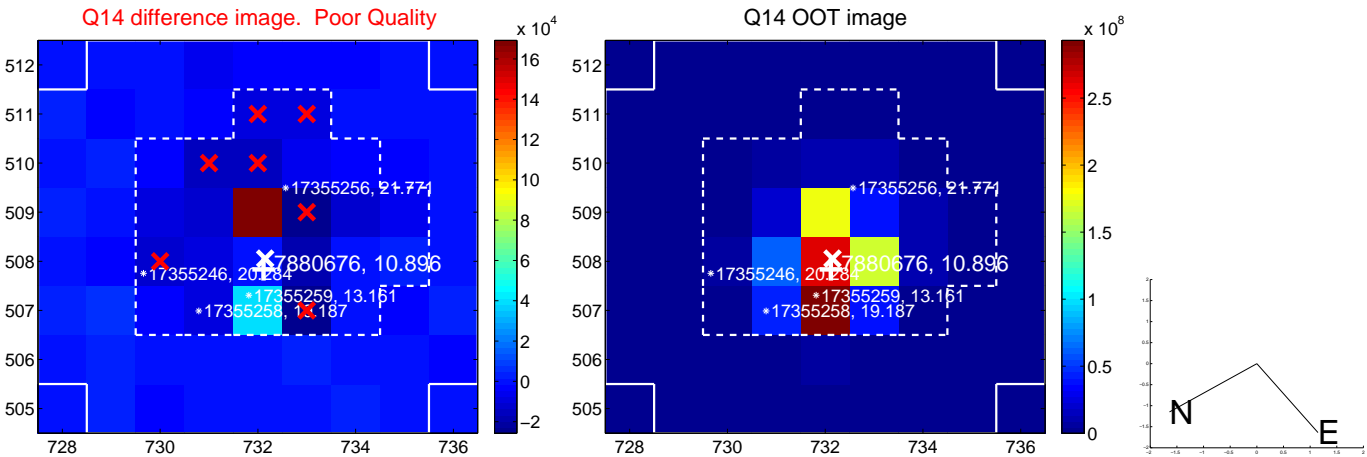
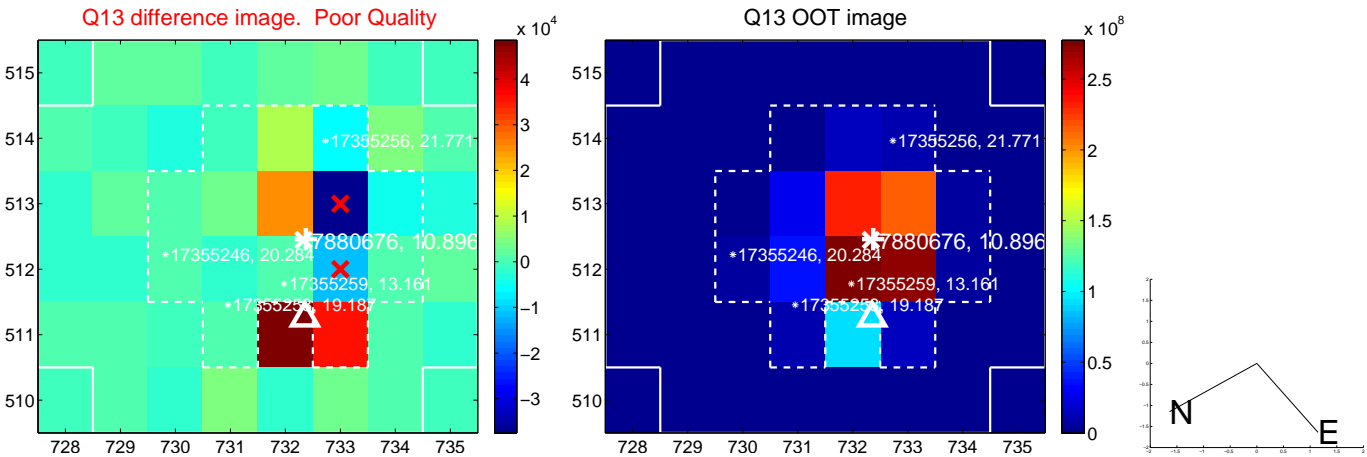
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



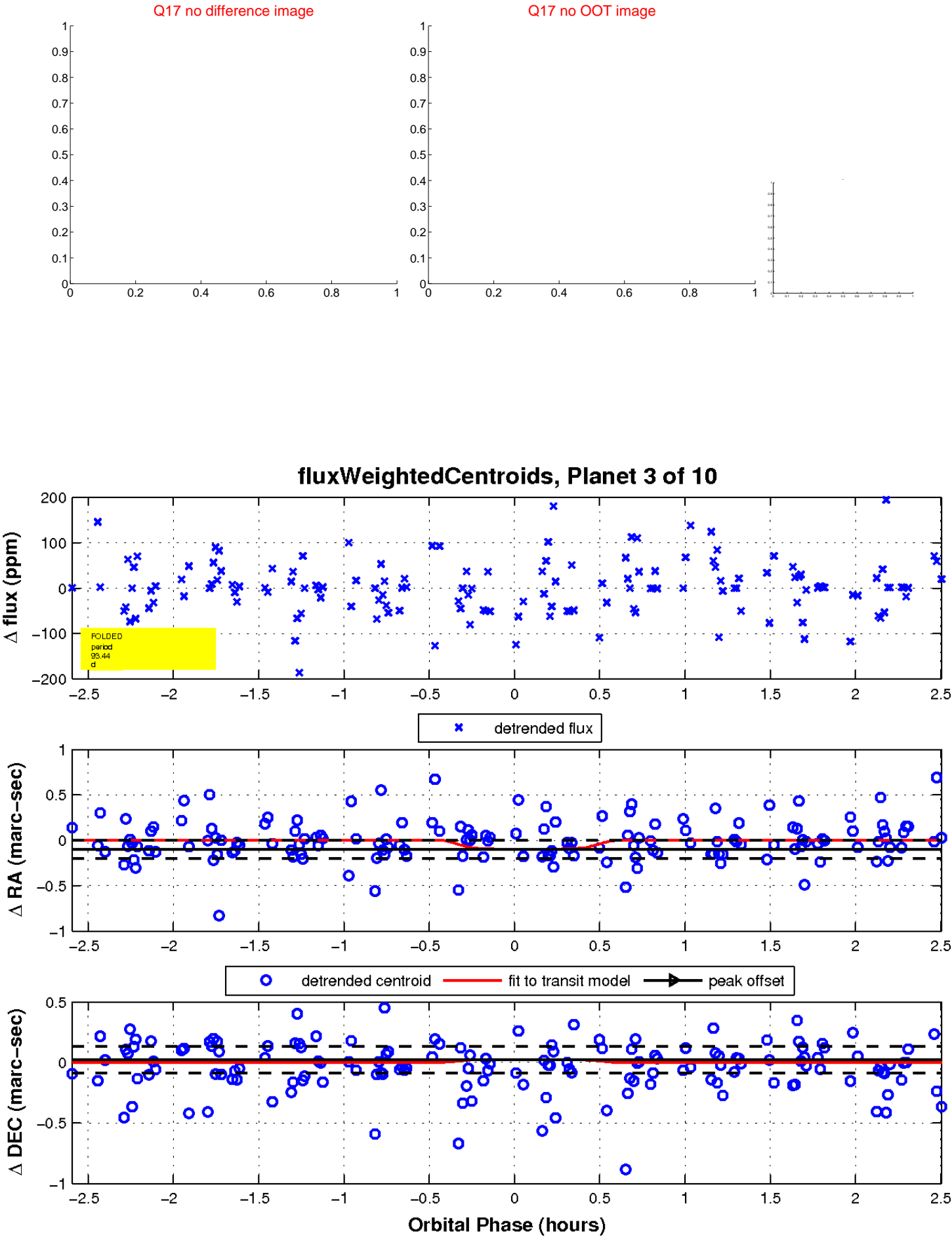
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

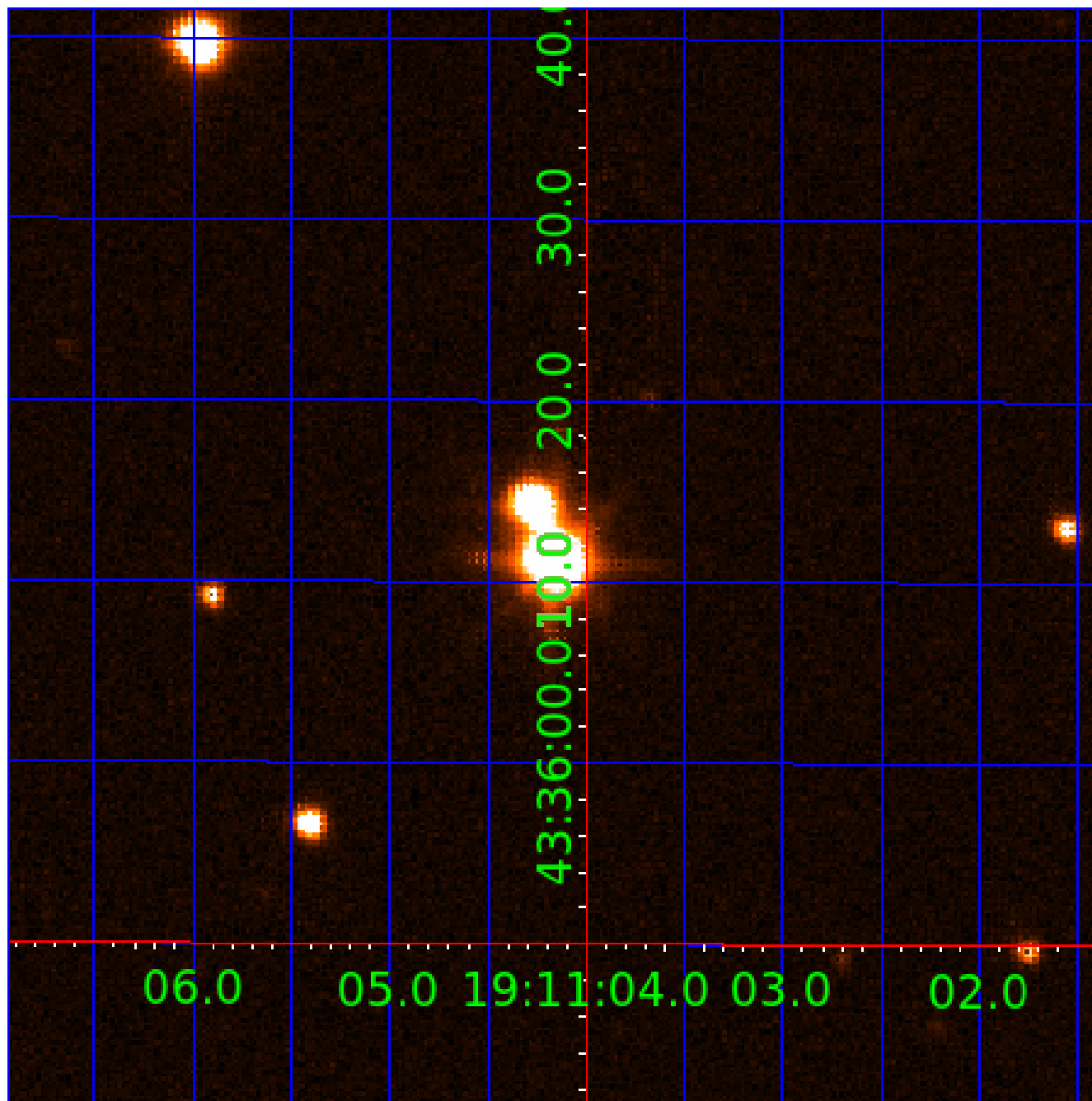


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





## KIC 007880676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007880676-01	OBS	No	74.700898	193.436167	18.8	1.598	31.4	2.9	1.96	6129	1.00	34.52
007880676-02	OBS	No	544.696610	418.947989	55.4	9.071	18.7	19.0	1.96	6129	1.69	2.44
007880676-03	OBS	No	93.437611	139.301041	58.6	0.868	19.0	28.0	1.96	6129	1.53	25.61
007880676-04	OBS	No	149.986976	136.477266	48.9	3.061	18.7	14.8	1.96	6129	1.37	13.63
007880676-05	OBS	No	49.327158	139.760525	11.7	11.019	14.0	6.8	1.96	6129	0.76	60.03
007880676-06	OBS	No	69.390592	165.569874	29.3	16.554	13.7	11.6	1.96	6129	1.17	38.08
007880676-07	OBS	No	64.361879	185.581530	60.1	2.287	19.3	24.3	1.96	6129	1.73	42.10
007880676-08	OBS	No	94.170624	203.456516	15.9	8.738	13.3	6.8	1.96	6129	0.91	25.35
007880676-09	OBS	No	75.849882	138.940758	46.7	1.755	17.5	8.4	1.96	6129	1.63	33.82
007880676-10	OBS	No	78.737554	157.099189	20.9	12.578	12.9	8.0	1.96	6129	1.05	32.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007880676-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007880676-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-05	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
007880676-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-08	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-09	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-10	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

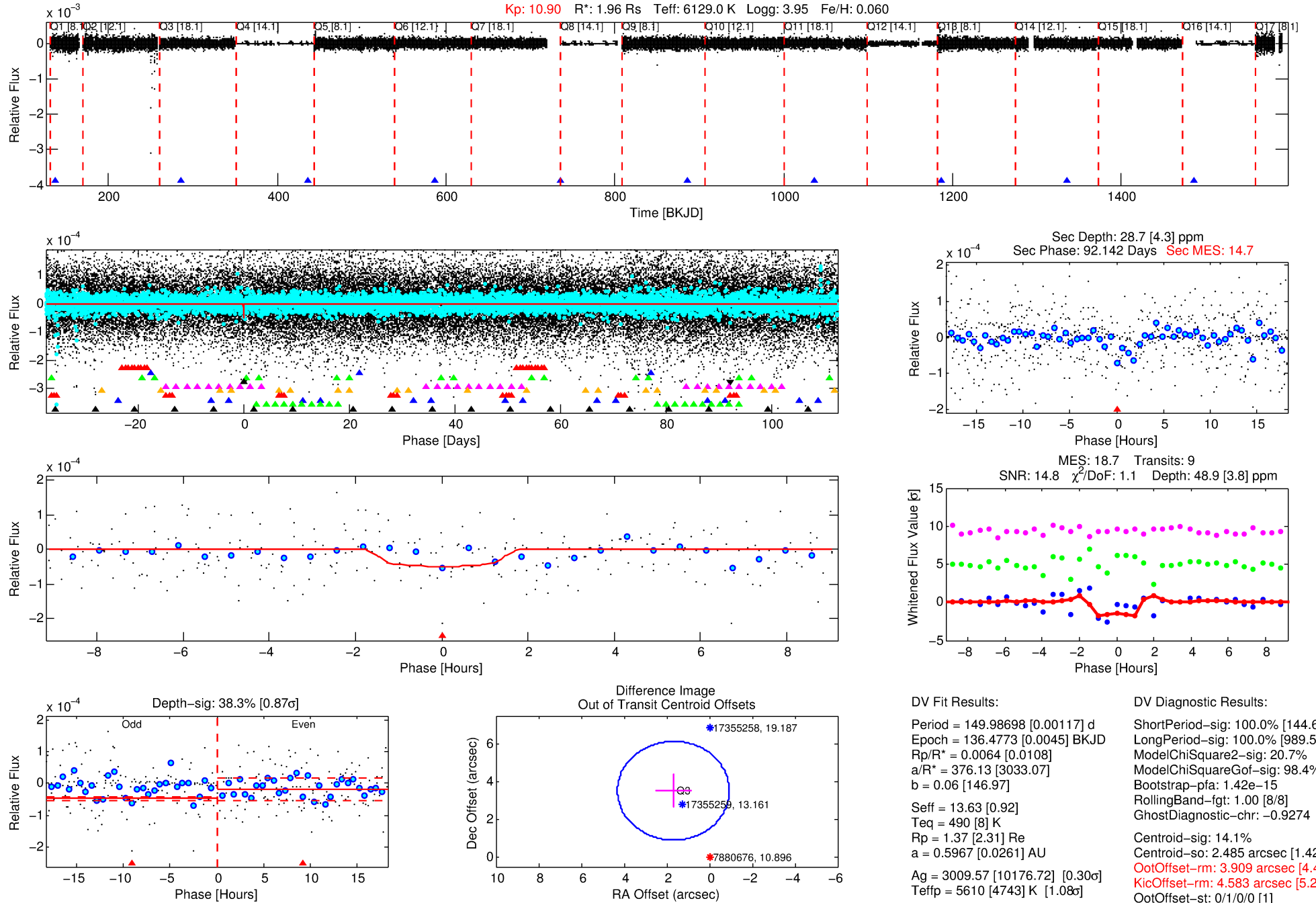
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-04

No Significant Match Found

# DV One-Page Summary

KIC: 7880676 Candidate: 4 of 10 Period: 149.987 d



## DV Fit Results:

Period = 149.98698 [0.00117] d  
Epoch = 136.4773 [0.0045] BKJD  
Rp/R\* = 0.0064 [0.0108]  
a/R\* = 376.13 [3033.07]  
b = 0.06 [146.97]  
Seff = 13.63 [0.92]  
Teq = 490 [8] K  
Rp = 1.37 [2.31] Re  
a = 0.5967 [0.0261] AU  
Ag = 3009.57 [10176.72] [0.30σ]  
Teffp = 5610 [4743] K [1.08σ]

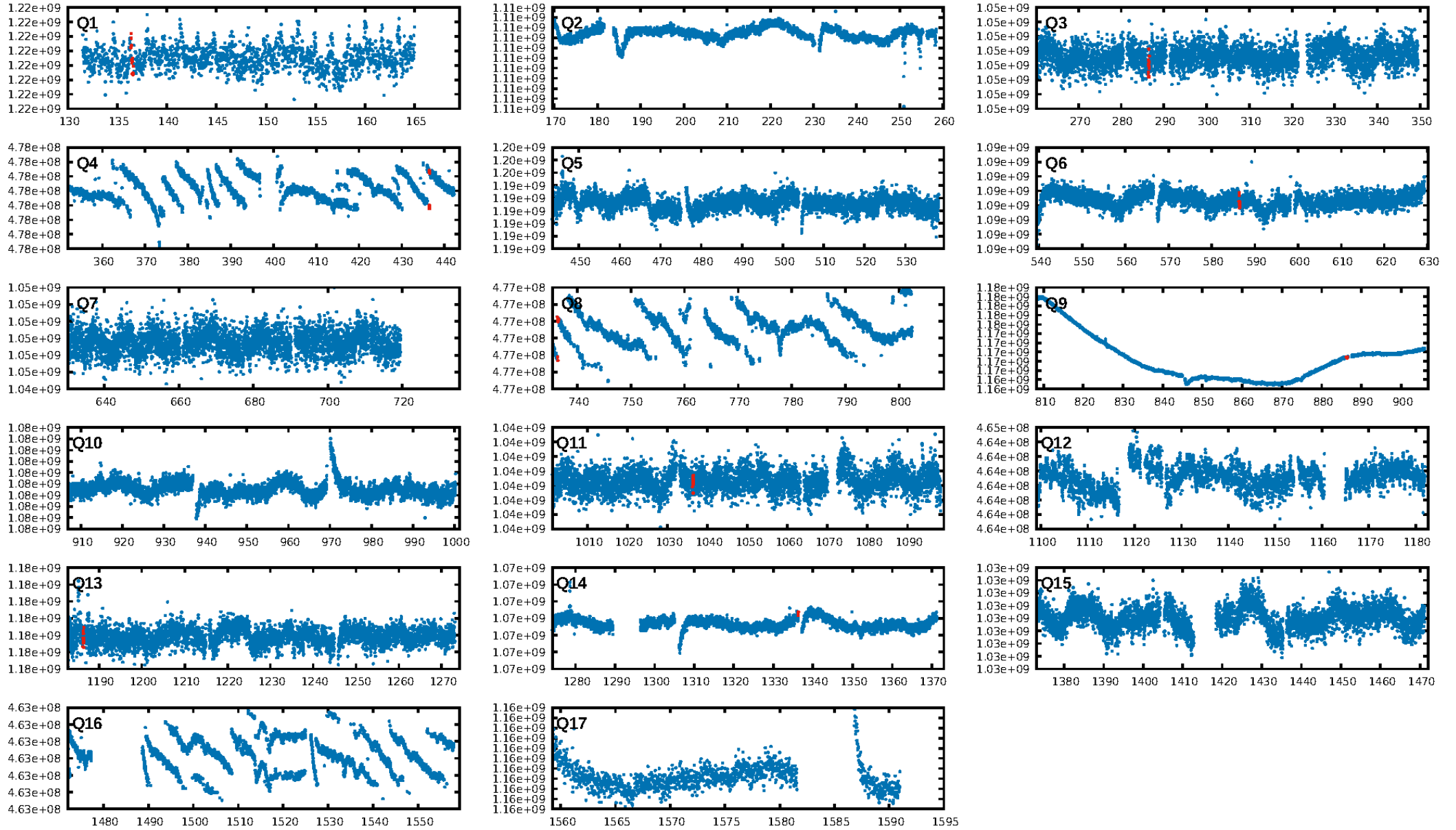
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [144.68σ]  
LongPeriod-sig: 100.0% [989.50σ]  
ModelChiSquare2-sig: 20.7%  
ModelChiSquareGof-sig: 98.4%  
Bootstrap-pfa: 1.42e-15  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: -0.9274  
Centroid-sig: 14.1%  
Centroid-so: 2.485 arcsec [1.42σ]  
OotOffset-rm: 3.909 arcsec [4.48σ]  
KicOffset-rm: 4.583 arcsec [5.27σ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [5/5]

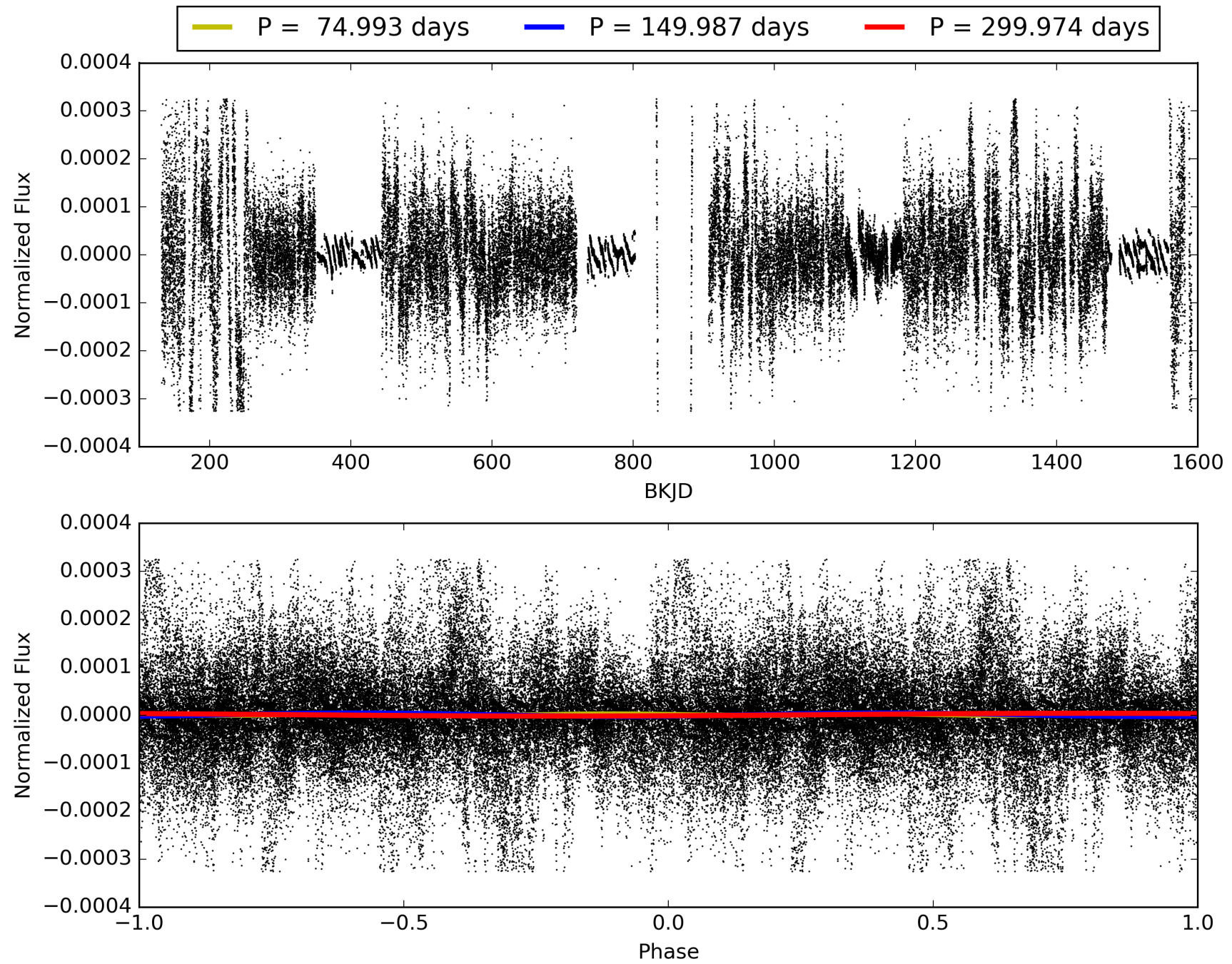
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:06:33 Z

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

# TCE 007880676-04, PDC Light Curves

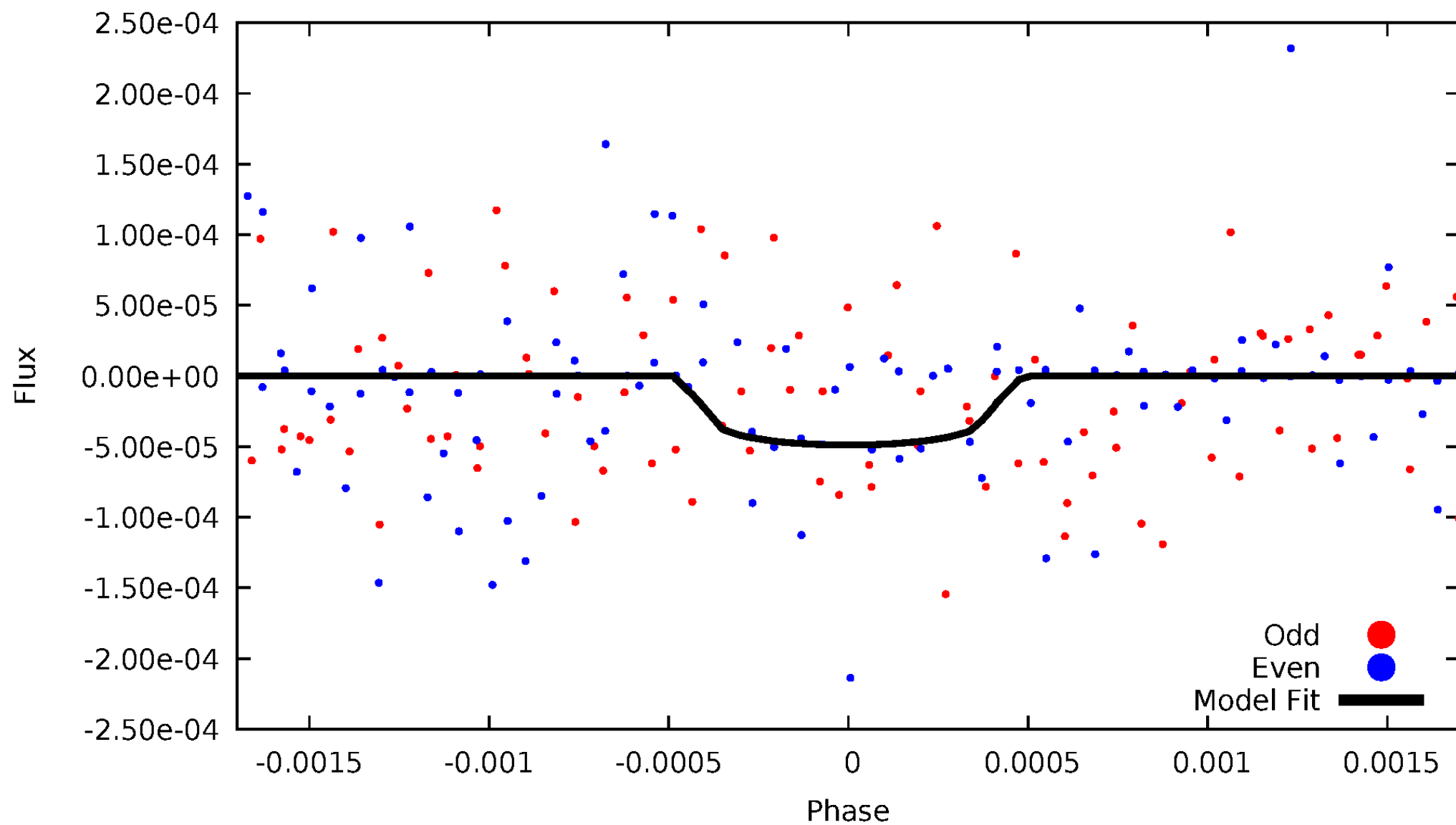


TCE 007880676-04



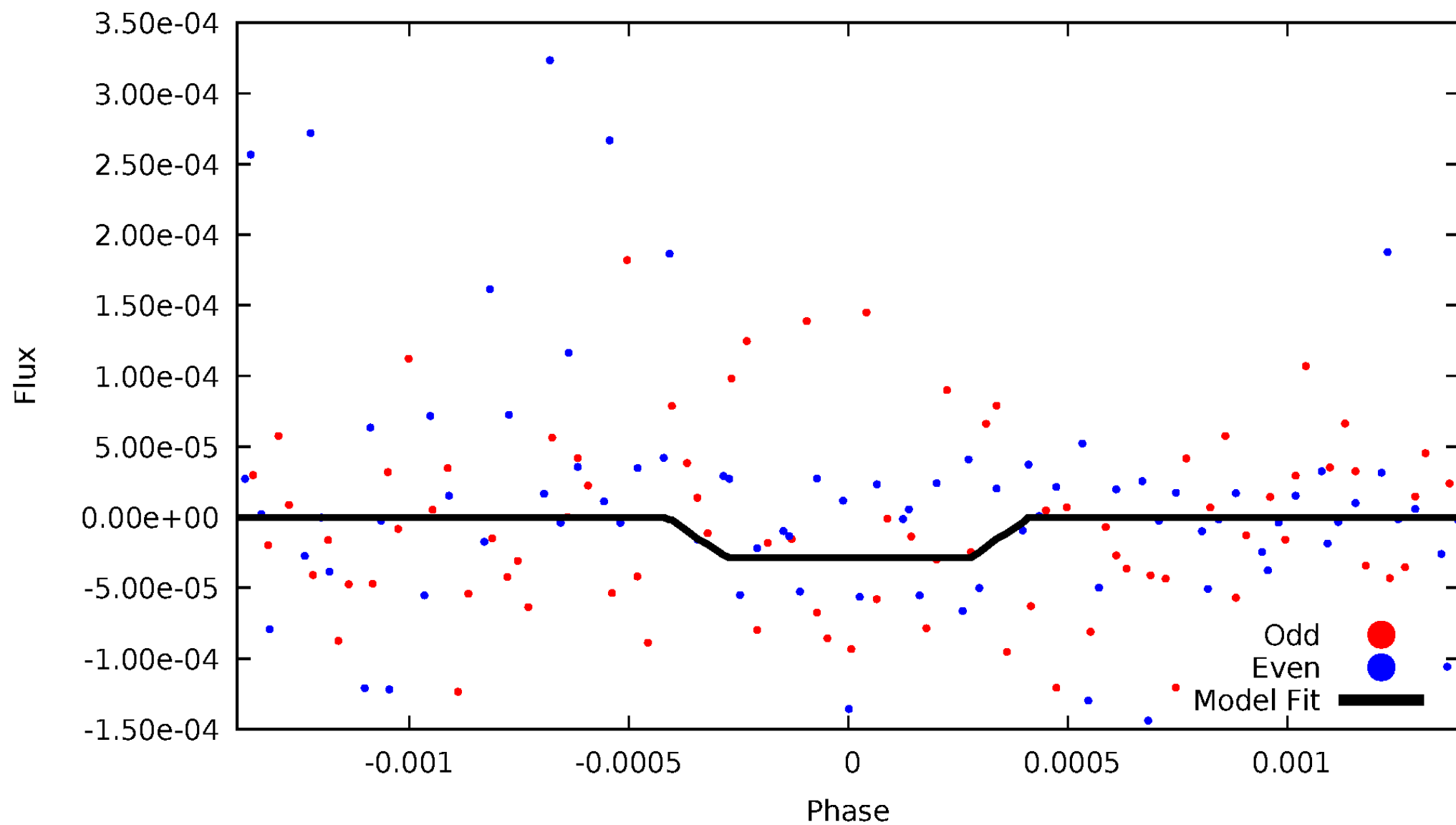
# DV Odd/Even

TCE 007880676-04



# ALT Odd/Even

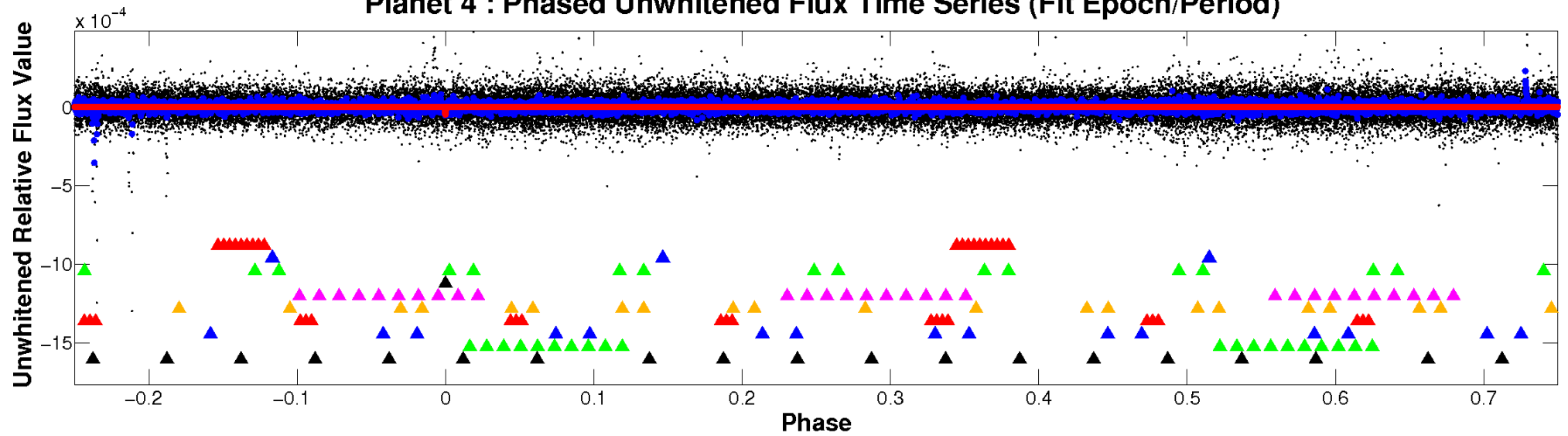
TCE 007880676-04



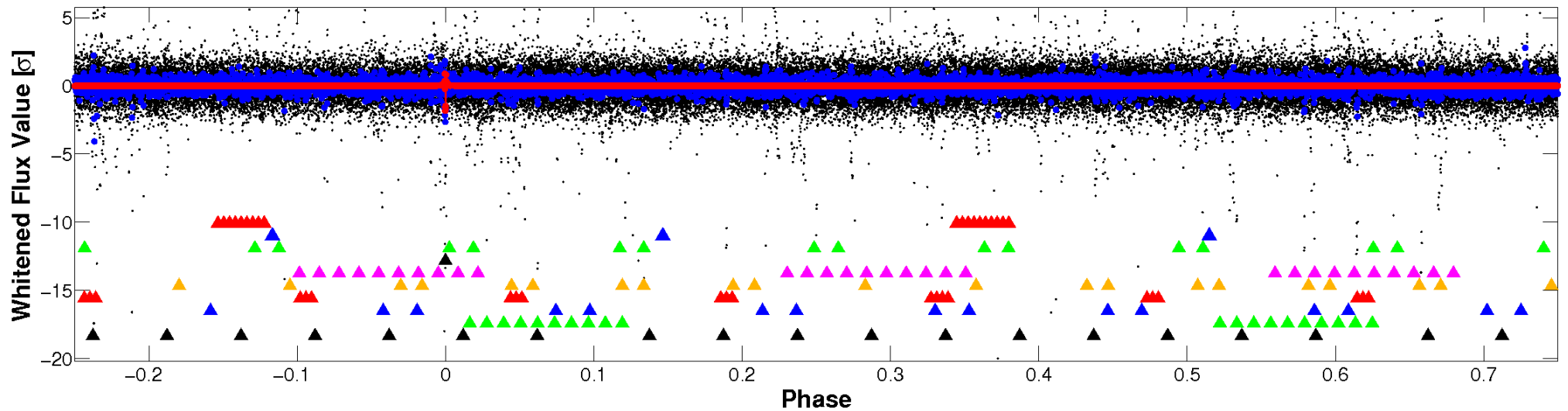


# Non-Whitened Vs. Whitened Light Curve

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

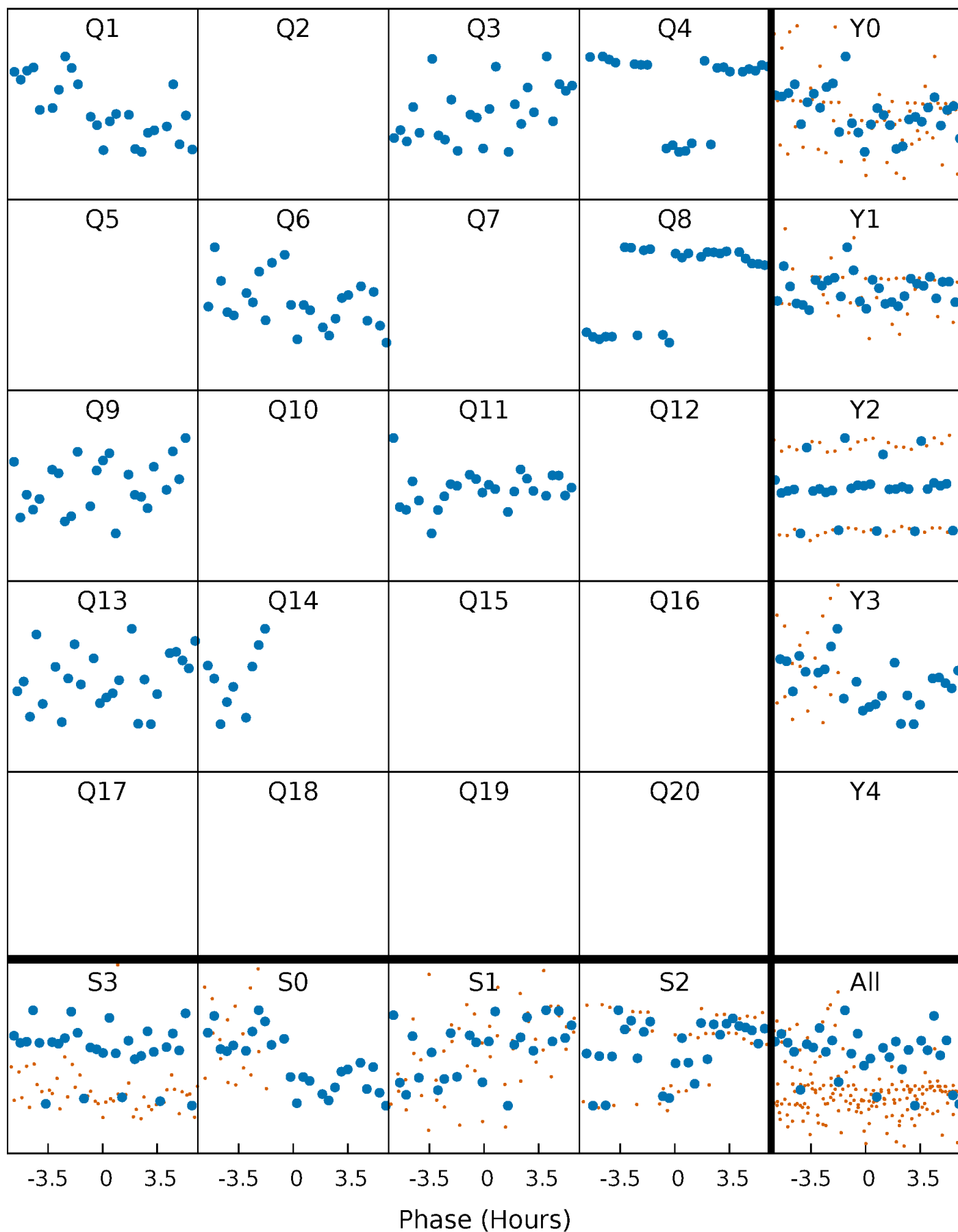


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

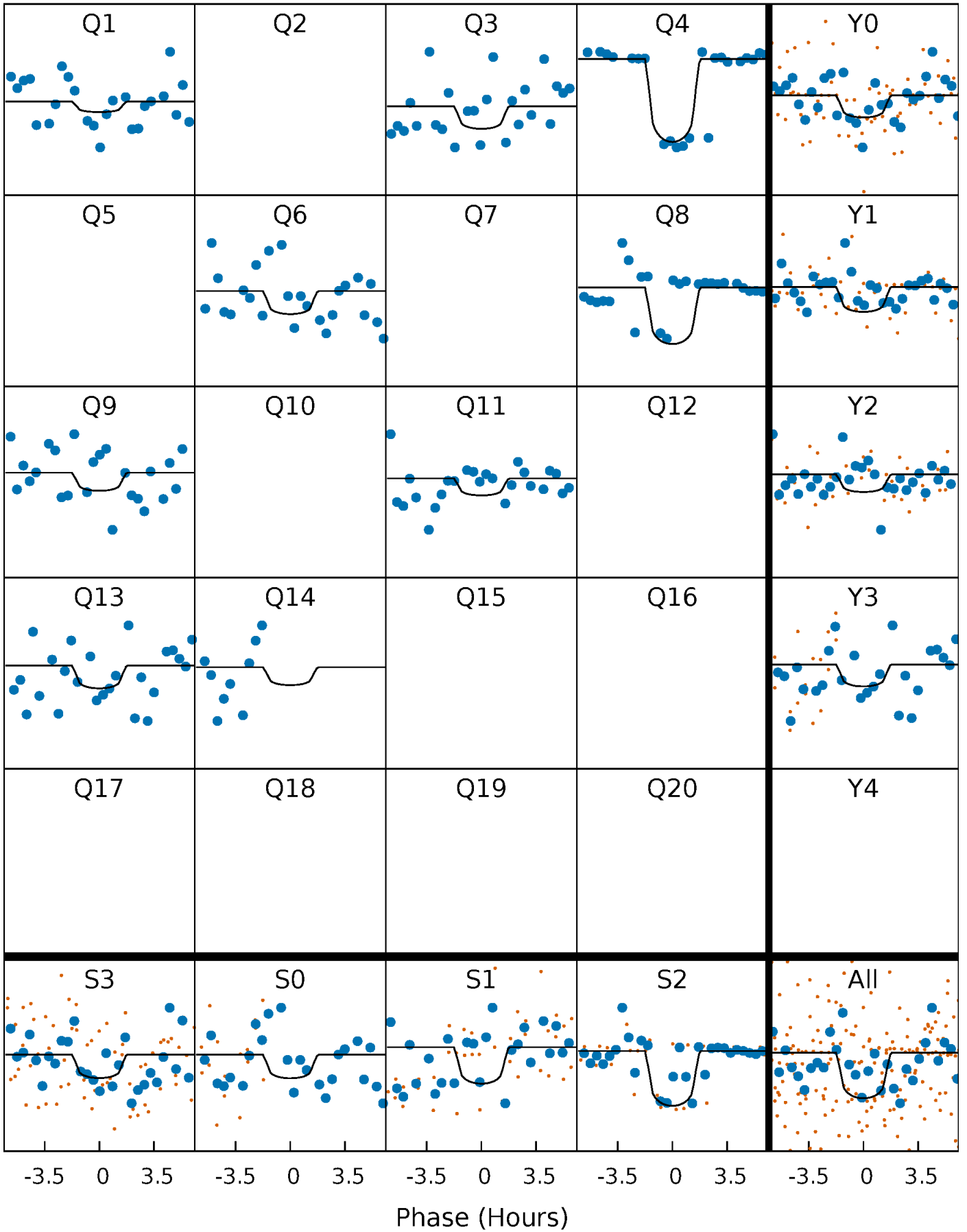
TCE 007880676-04   P=149.986976 Days    $T_0=136.477266$  (BKJD)





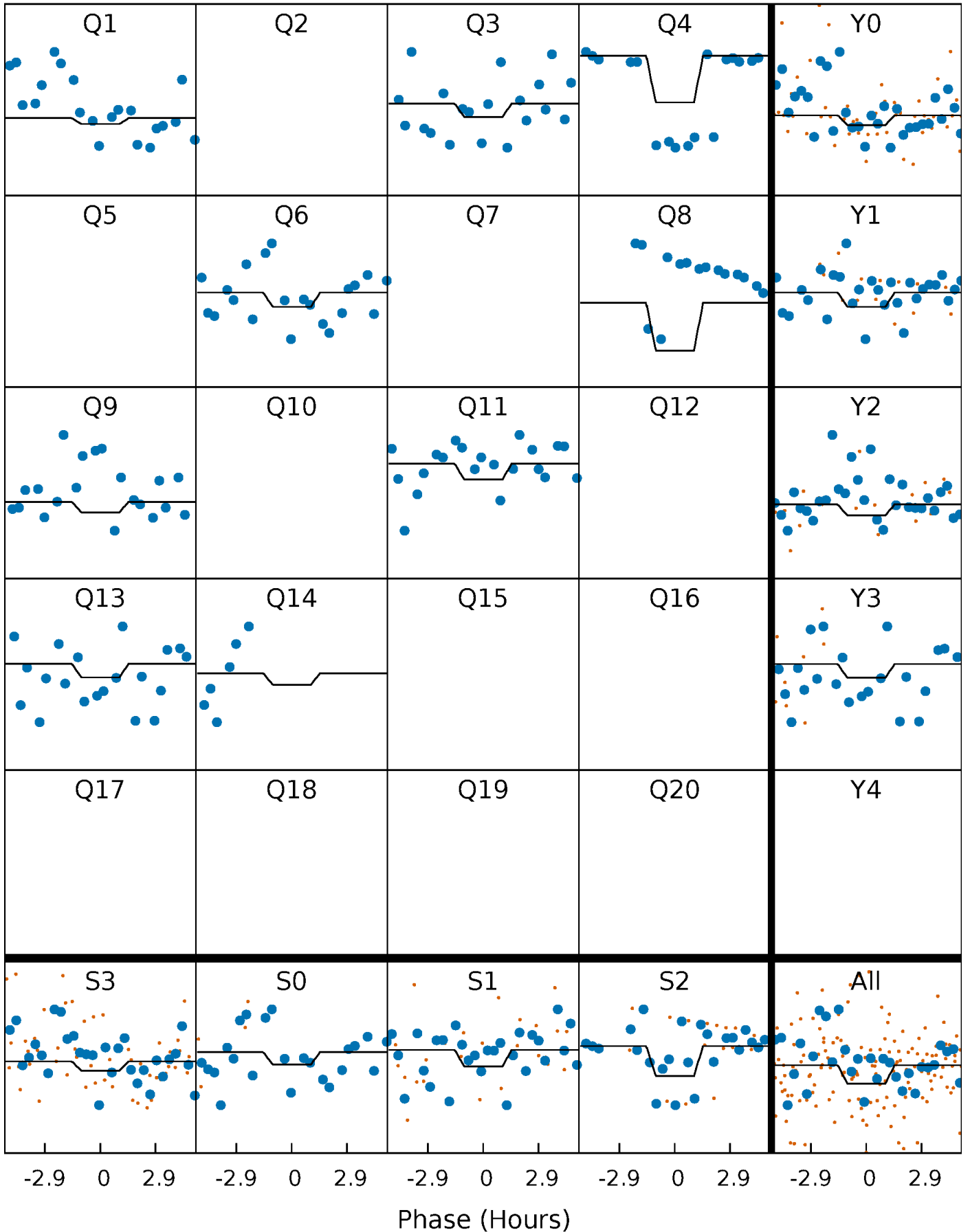
# DV Quarter-Phased Transit Curves

TCE 007880676-04   P=149.986976 Days    $T_0=136.477266$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

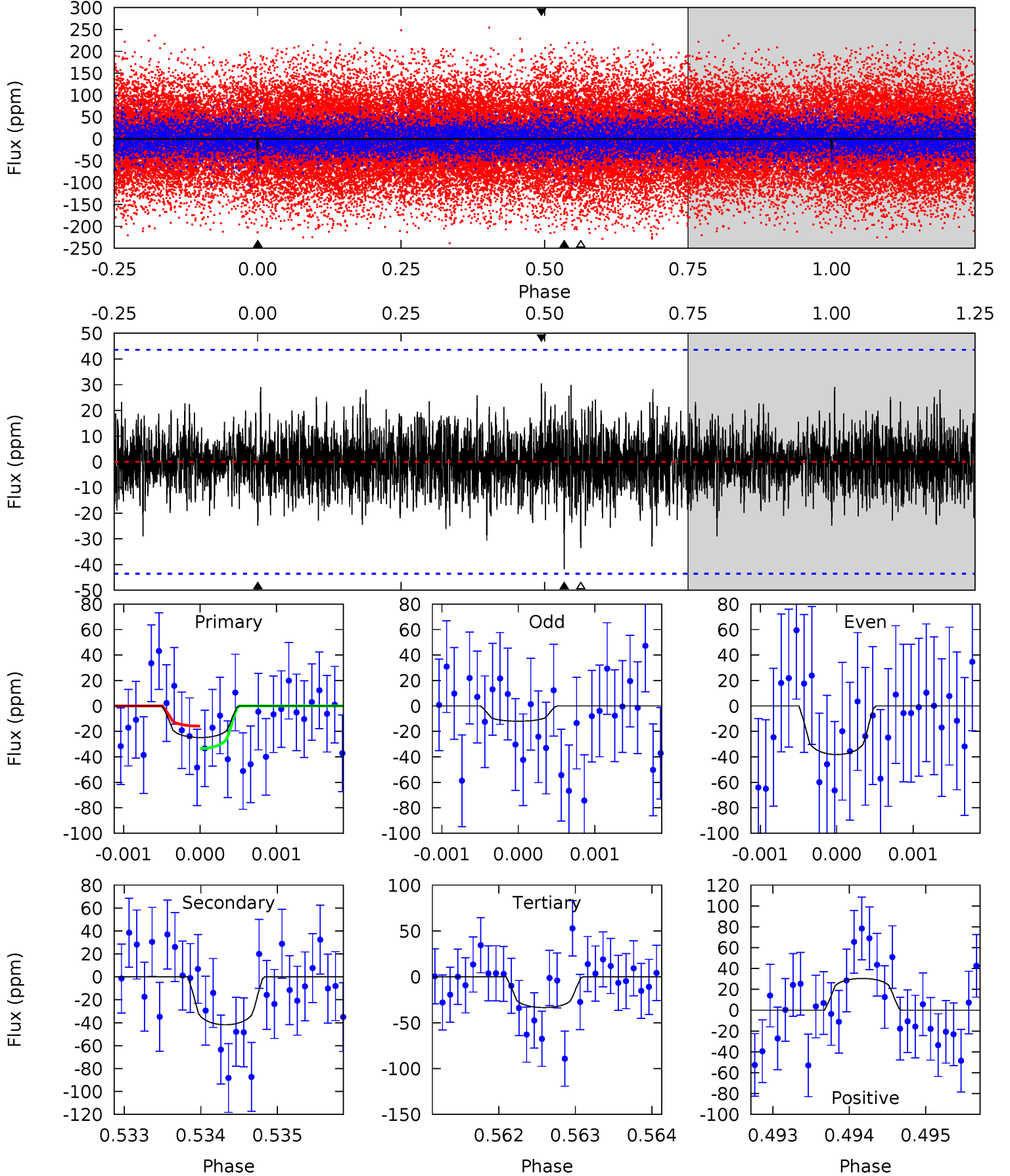
TCE 007880676-04 P=149.989653 Days  $T_0=136.477889$  (BKJD)



# DV Model-Shift Uniqueness Test

007880676-04, P = 149.986976 Days, E = 136.477266 Days

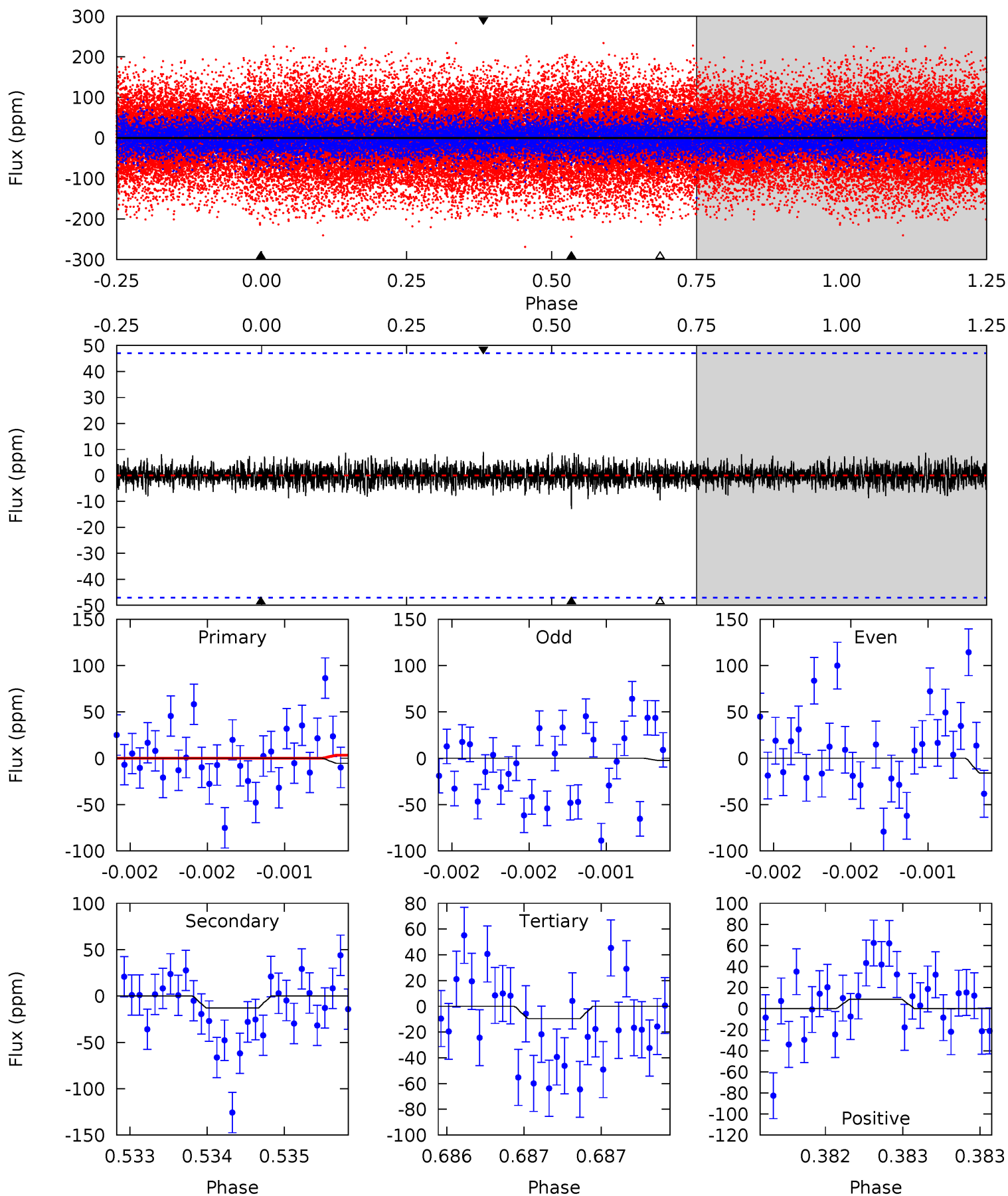
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.11	5.23	4.19	3.81	5.45	3.29	1.05	-1.09	-0.70	1.04	1.42	1.65	2.05	0.42	1.11



# Alt Model-Shift Uniqueness Test

007880676-04, P = 149.989653 Days, E = 136.477889 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
0.64	1.51	1.11	1.05	5.49	3.35	0.30	-0.48	-0.42	0.39	0.45	0.81	0.49	0.41	0.59



### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-42 \pm 8$	$2.19^{+1.89}_{-1.41}$	$685^{+9}_{-11}$	$4999^{+3426}_{-1094}$	$1742^{+11013}_{-1263}$
Alt.	$-13 \pm 9$	$2.03^{+1.90}_{-1.42}$	$685^{+10}_{-10}$	$3999^{+2697}_{-976}$	$568^{+5328}_{-474}$

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

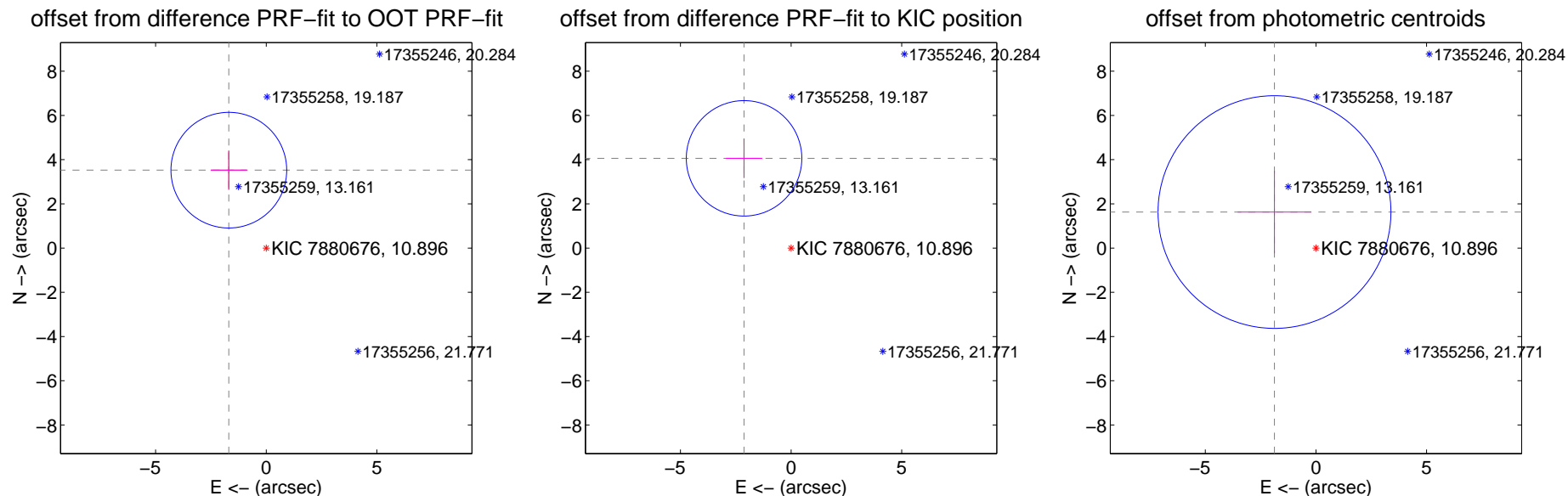
## DV Centroid Data

Supplemental centroid analysis for 007880676-04. **Kepler magnitude: 10.90.** Transit SNR 14.82

**There are 0 quarters with good PRF difference image offsets**

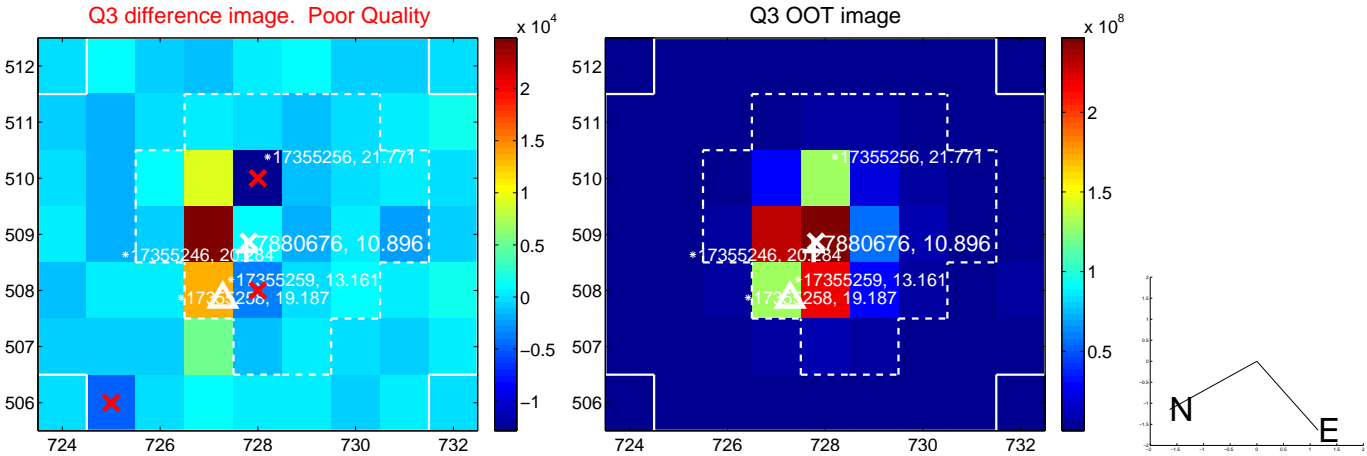
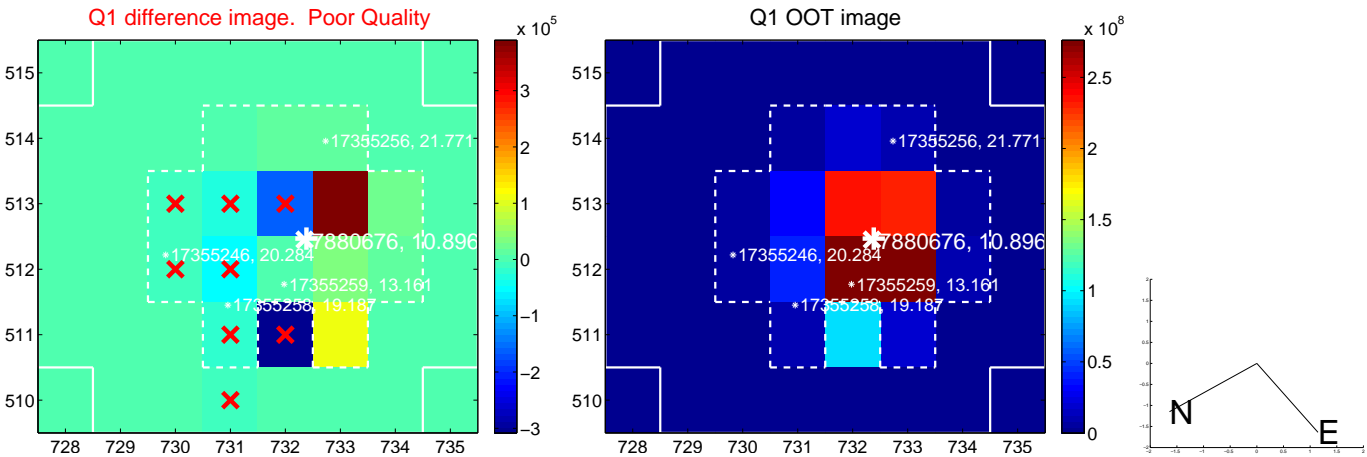
The direct PRF centroid is offset from the target star catalog position by about 0.69 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>3.909 \pm 0.872</math></b>	<b>4.48</b>	$1.691 \pm 0.818$	$3.525 \pm 0.884$
PRF-fit source offset from KIC position	<b><math>4.583 \pm 0.870</math></b>	<b>5.27</b>	$2.126 \pm 0.818$	$4.060 \pm 0.884$
photometric centroid source offset	$2.48 \pm 1.75$	1.42	$1.87 \pm 1.66$	$1.63 \pm 1.87$

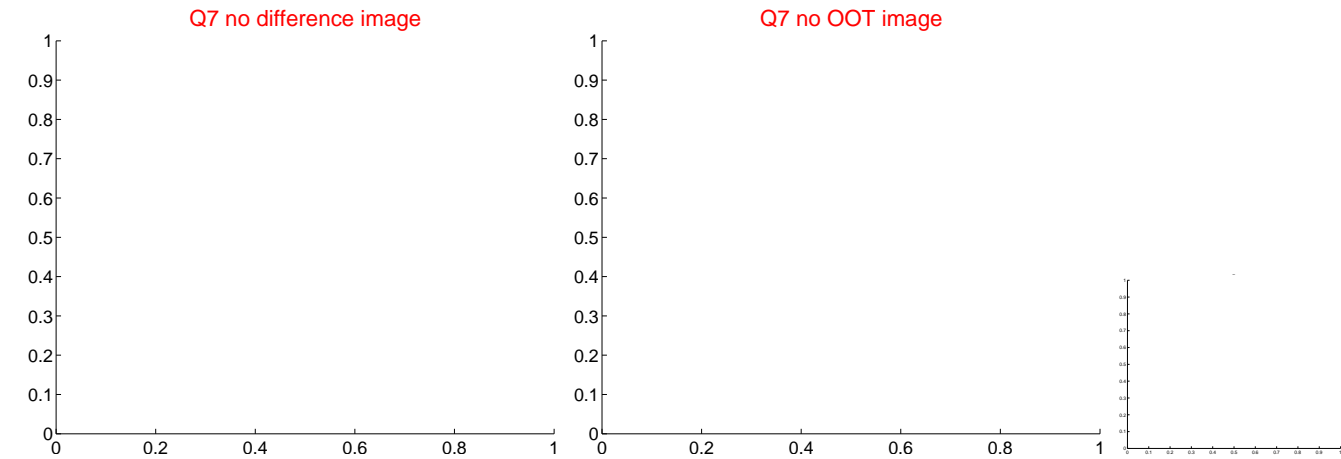
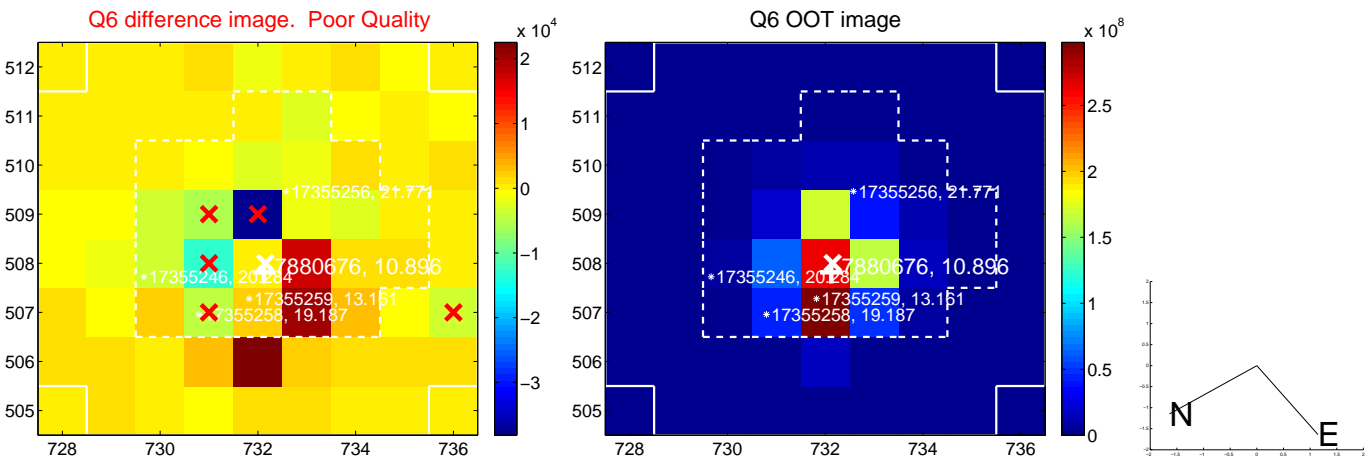


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

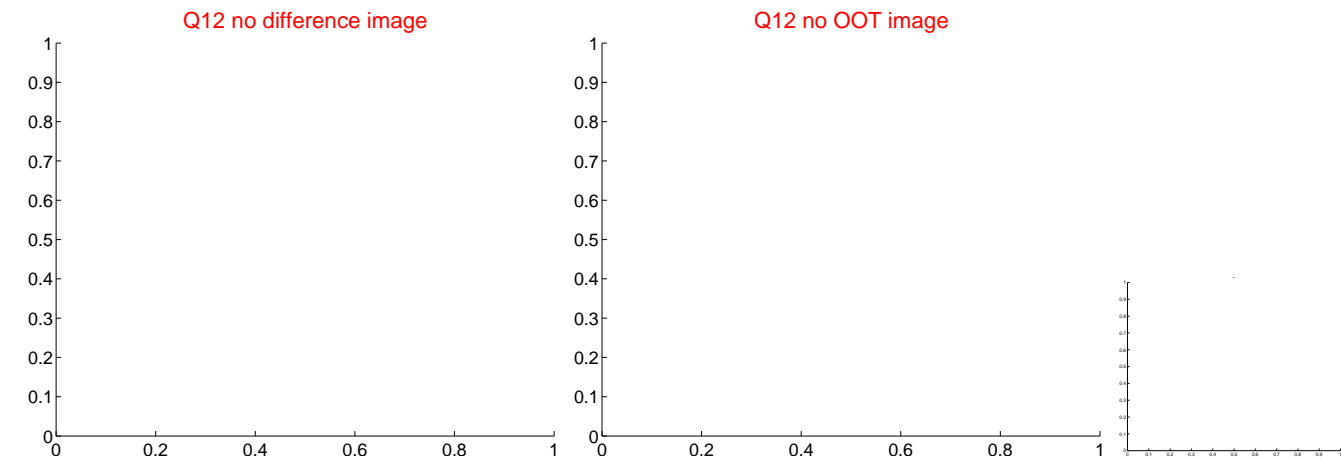
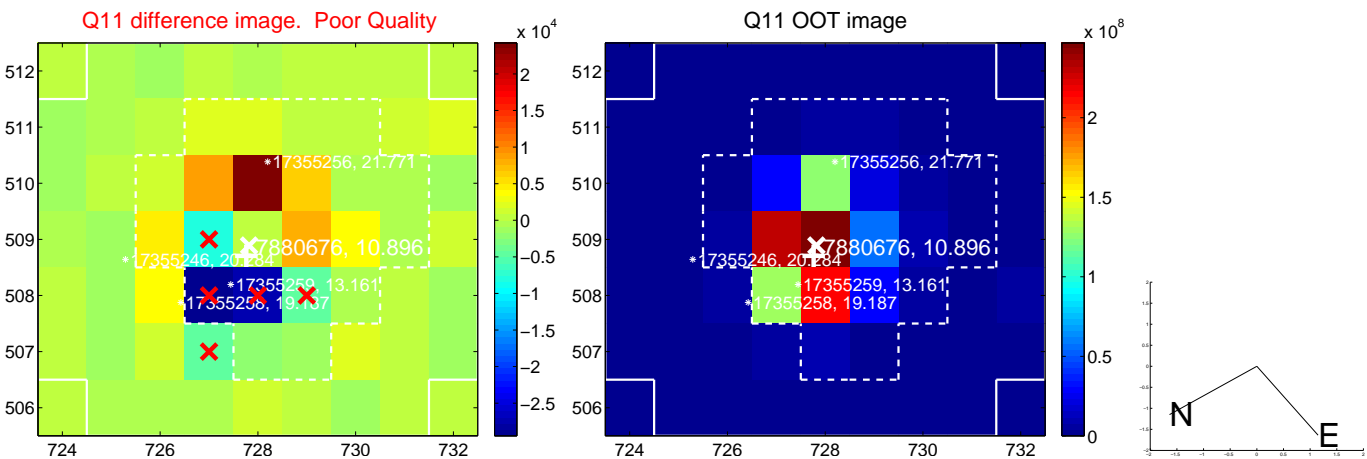


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

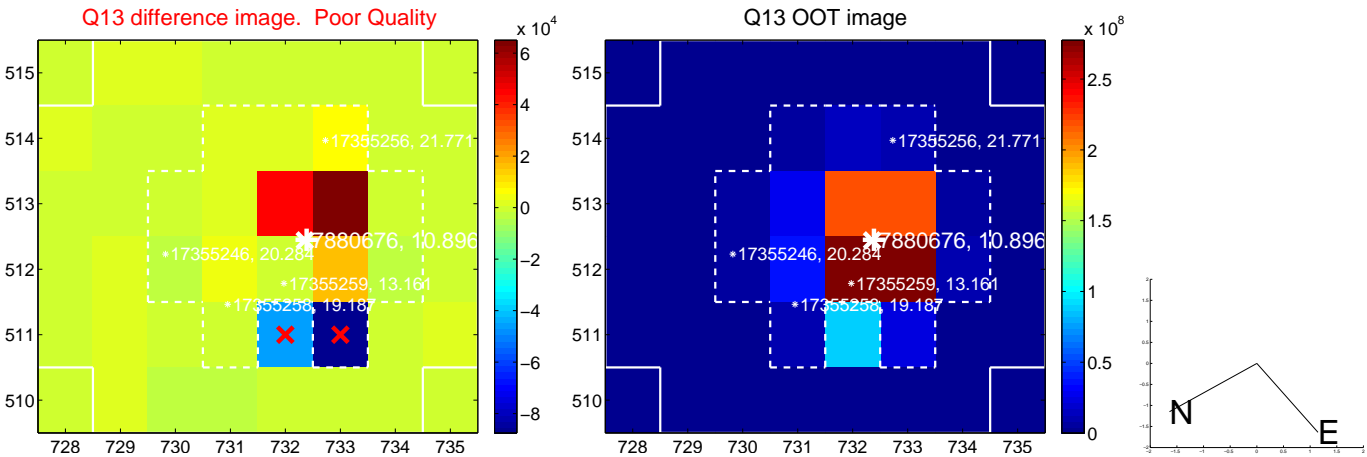




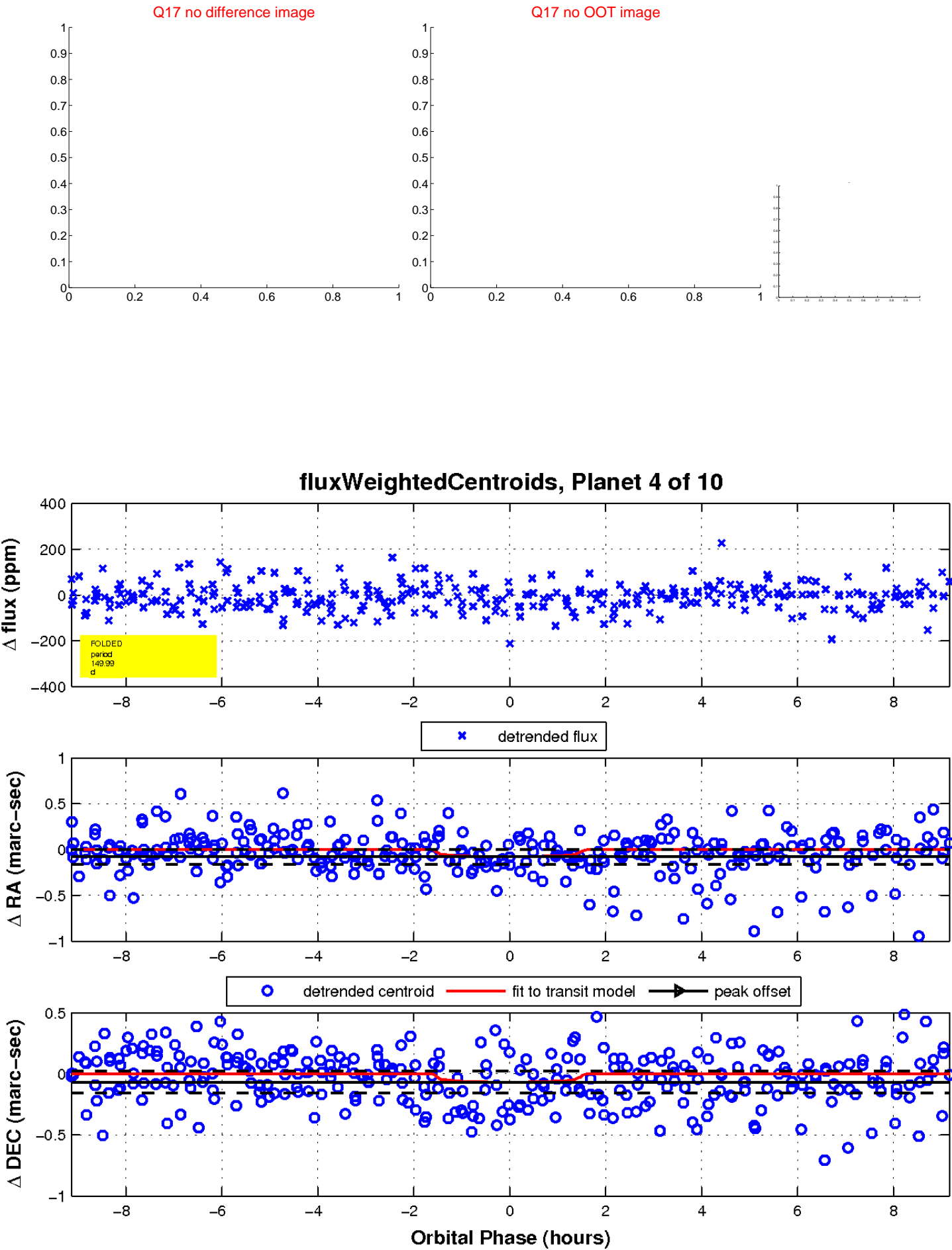
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

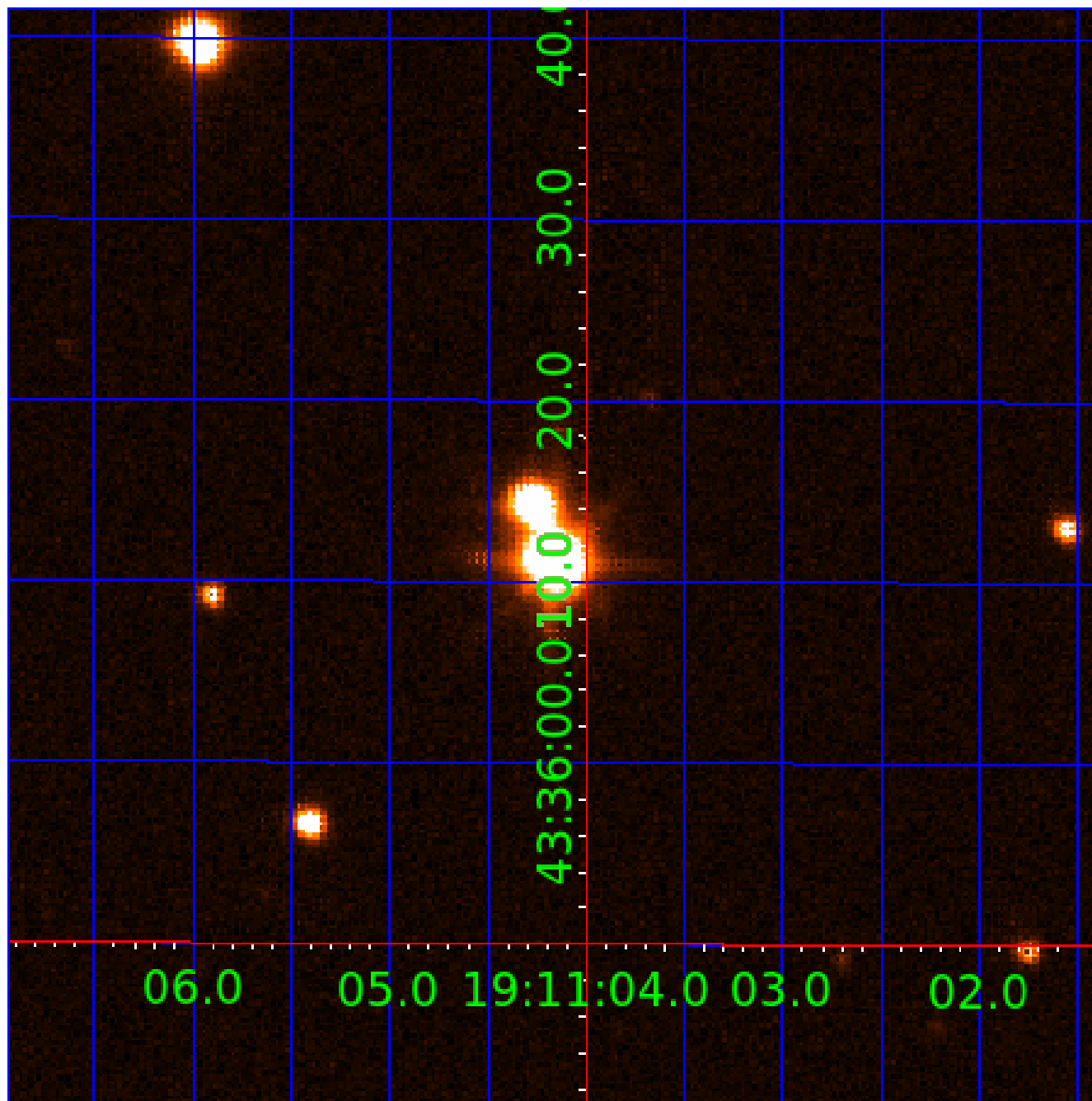


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## KIC 007880676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007880676-01	OBS	No	74.700898	193.436167	18.8	1.598	31.4	2.9	1.96	6129	1.00	34.52
007880676-02	OBS	No	544.696610	418.947989	55.4	9.071	18.7	19.0	1.96	6129	1.69	2.44
007880676-03	OBS	No	93.437611	139.301041	58.6	0.868	19.0	28.0	1.96	6129	1.53	25.61
007880676-04	OBS	No	149.986976	136.477266	48.9	3.061	18.7	14.8	1.96	6129	1.37	13.63
007880676-05	OBS	No	49.327158	139.760525	11.7	11.019	14.0	6.8	1.96	6129	0.76	60.03
007880676-06	OBS	No	69.390592	165.569874	29.3	16.554	13.7	11.6	1.96	6129	1.17	38.08
007880676-07	OBS	No	64.361879	185.581530	60.1	2.287	19.3	24.3	1.96	6129	1.73	42.10
007880676-08	OBS	No	94.170624	203.456516	15.9	8.738	13.3	6.8	1.96	6129	0.91	25.35
007880676-09	OBS	No	75.849882	138.940758	46.7	1.755	17.5	8.4	1.96	6129	1.63	33.82
007880676-10	OBS	No	78.737554	157.099189	20.9	12.578	12.9	8.0	1.96	6129	1.05	32.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007880676-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007880676-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-05	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
007880676-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-08	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-09	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-10	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

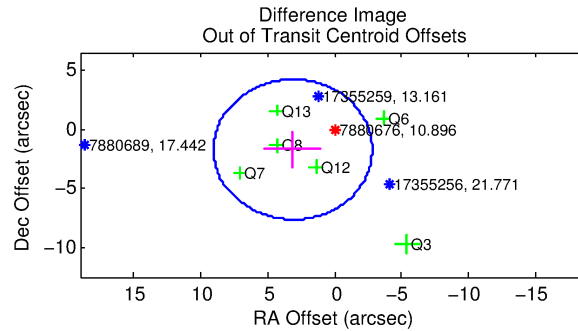
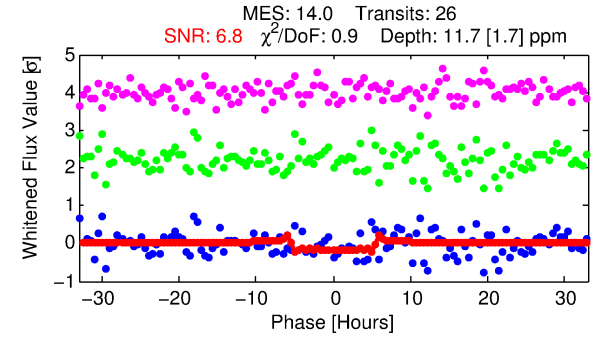
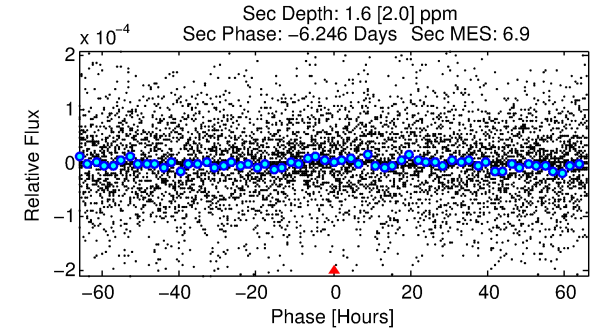
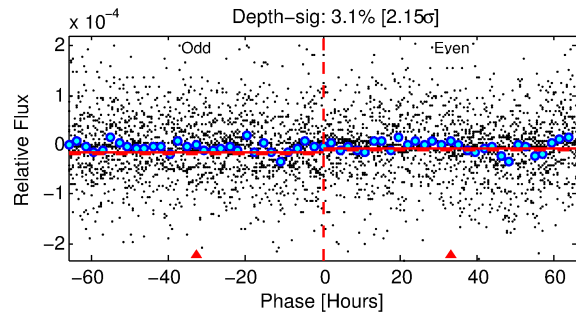
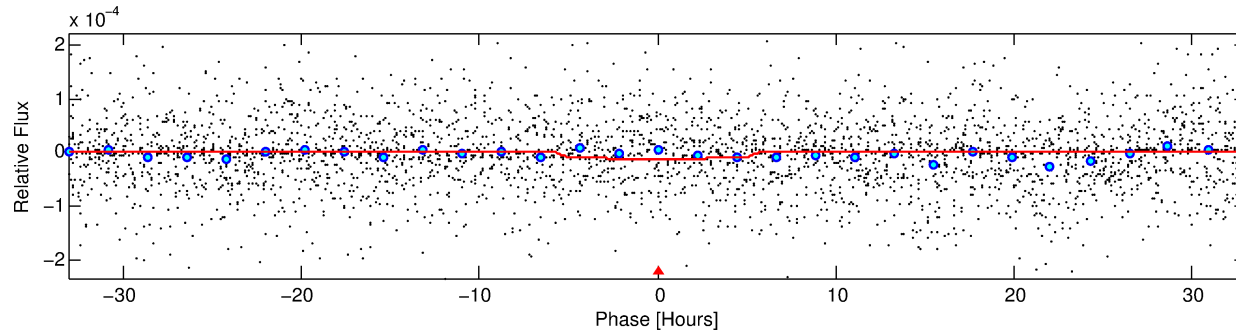
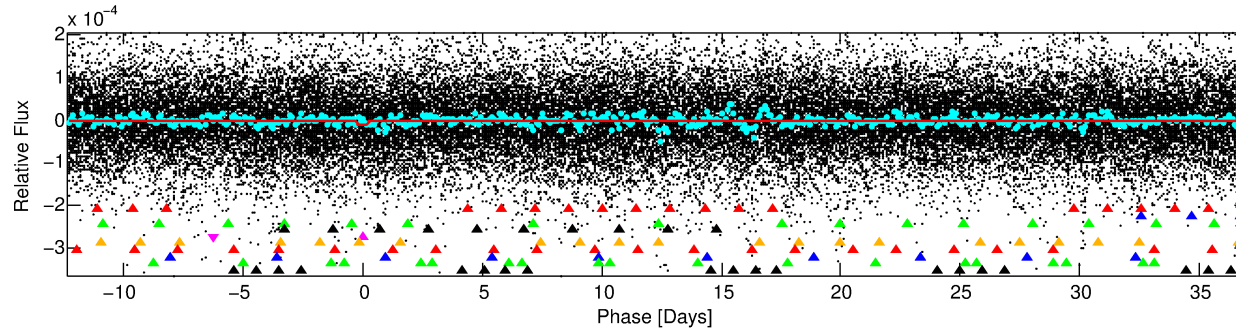
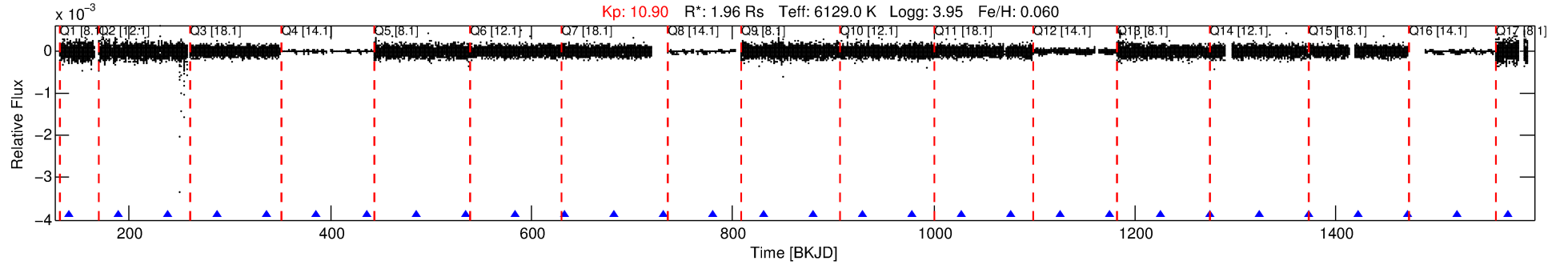
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-05

No Significant Match Found

# DV One-Page Summary

KIC: 7880676 Candidate: 5 of 10 Period: 49.327 d



## DV Fit Results:

Period = 49.32716 [0.00080] d  
Epoch = 139.7605 [0.0076] BKJD  
Rp/R\* = 0.0036 [0.0009]  
a/R\* = 18.62 [23.96]  
b = 0.84 [0.44]  
Seff = 60.03 [4.06]  
Teq = 710 [12] K  
Rp = 0.76 [0.19] Re  
a = 0.2843 [0.0124] AU  
Ag = 119.90 [165.79] [0.72 $\sigma$ ]  
Teffp = 3631 [1255] K [2.33 $\sigma$ ]

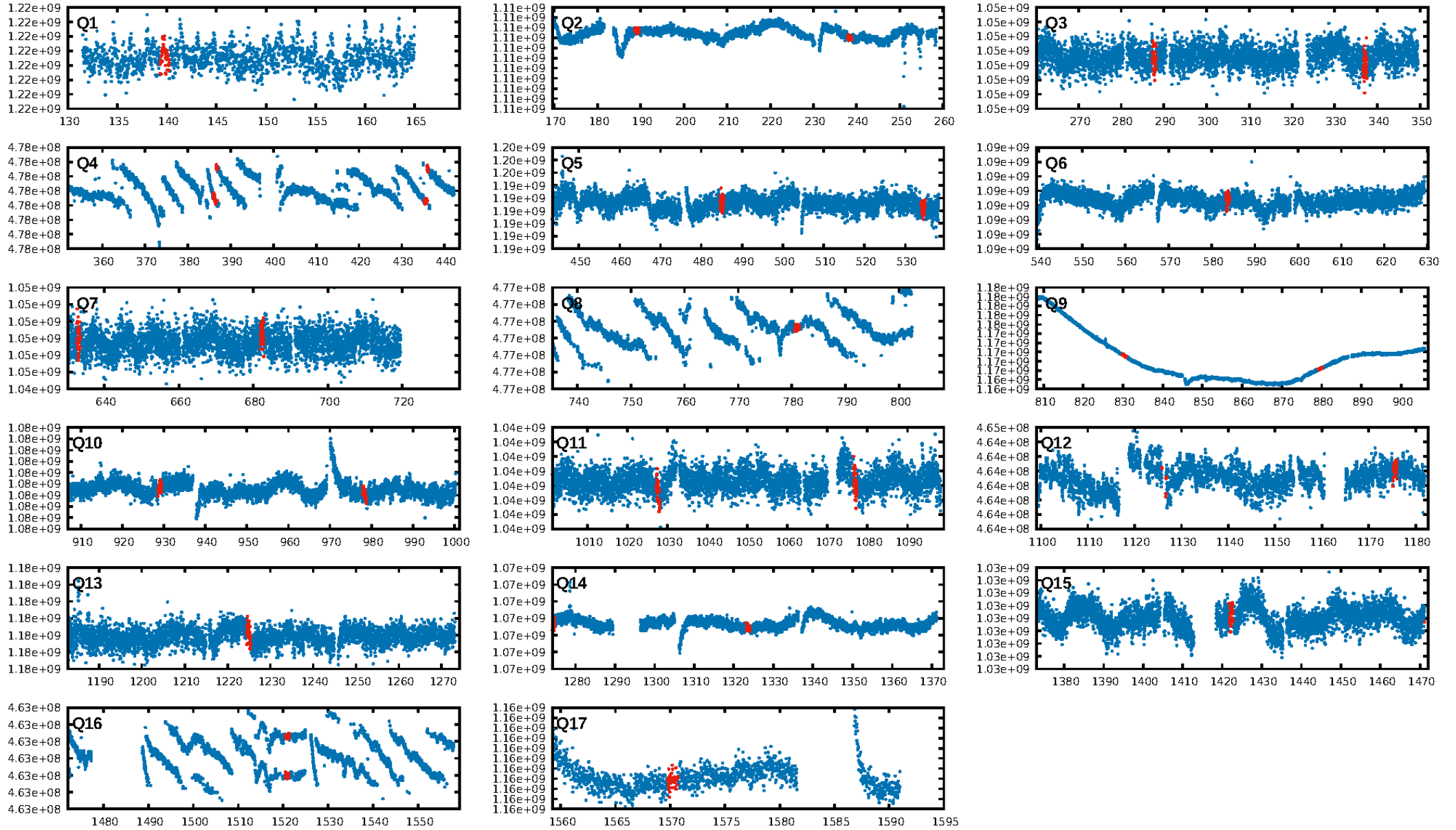
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [32.06 $\sigma$ ]  
ModelChiSquare2-sig: 3.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 7.13e-10**  
RollingBand-fgt: 1.00 [24/24]  
GhostDiagnostic-chr: -0.2038  
Centroid-sig: 16.3%  
Centroid-so: 3.363 arcsec [1.06 $\sigma$ ]  
OotOffset-rm: 3.555 arcsec [1.80 $\sigma$ ]  
KicOffset-rm: 4.067 arcsec [2.07 $\sigma$ ]  
OotOffset-st: 1/2/2/1 [6]  
KicOffset-st: 1/2/2/1 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 0.88 [15/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:06:39 Z

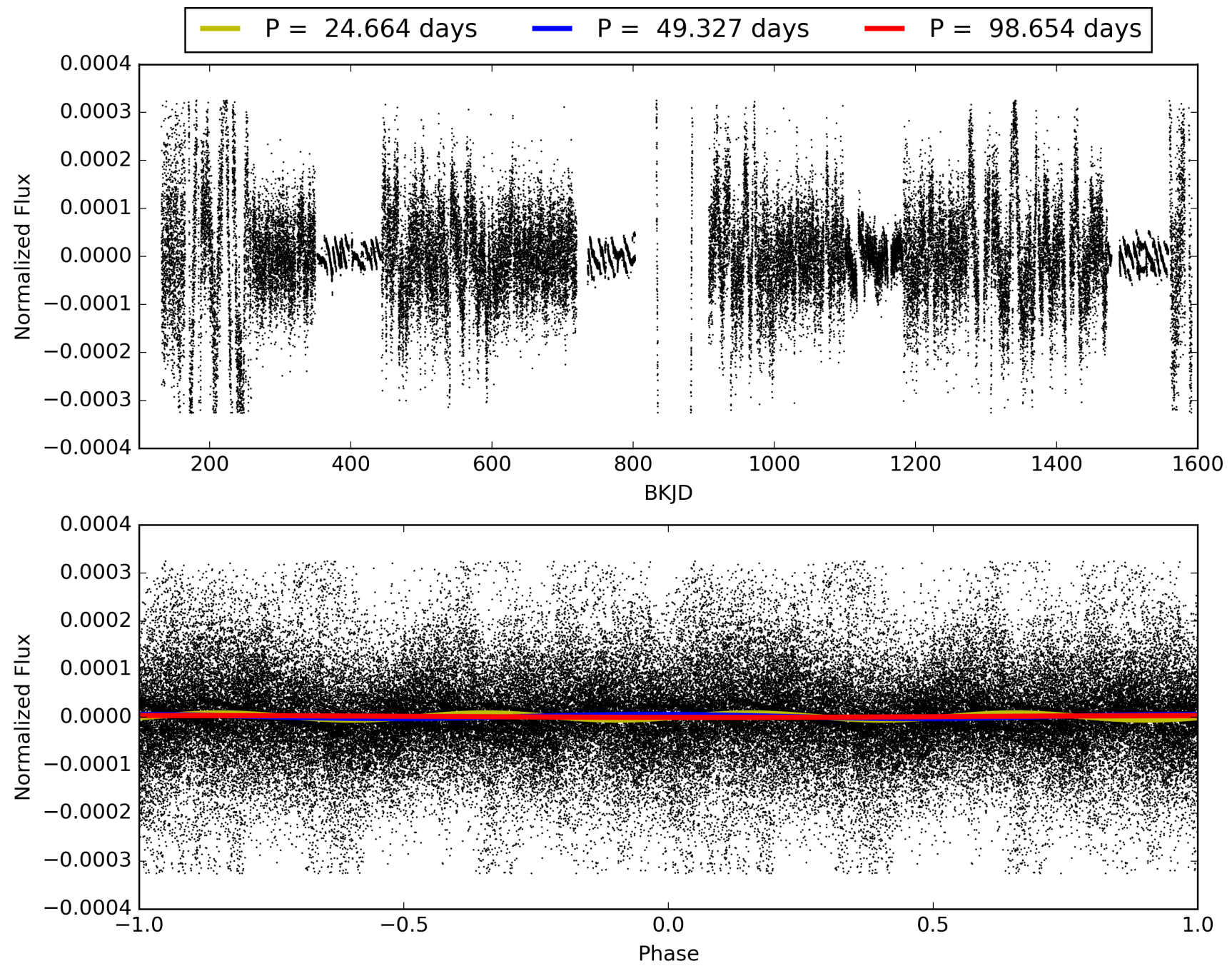
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007880676-05, PDC Light Curves





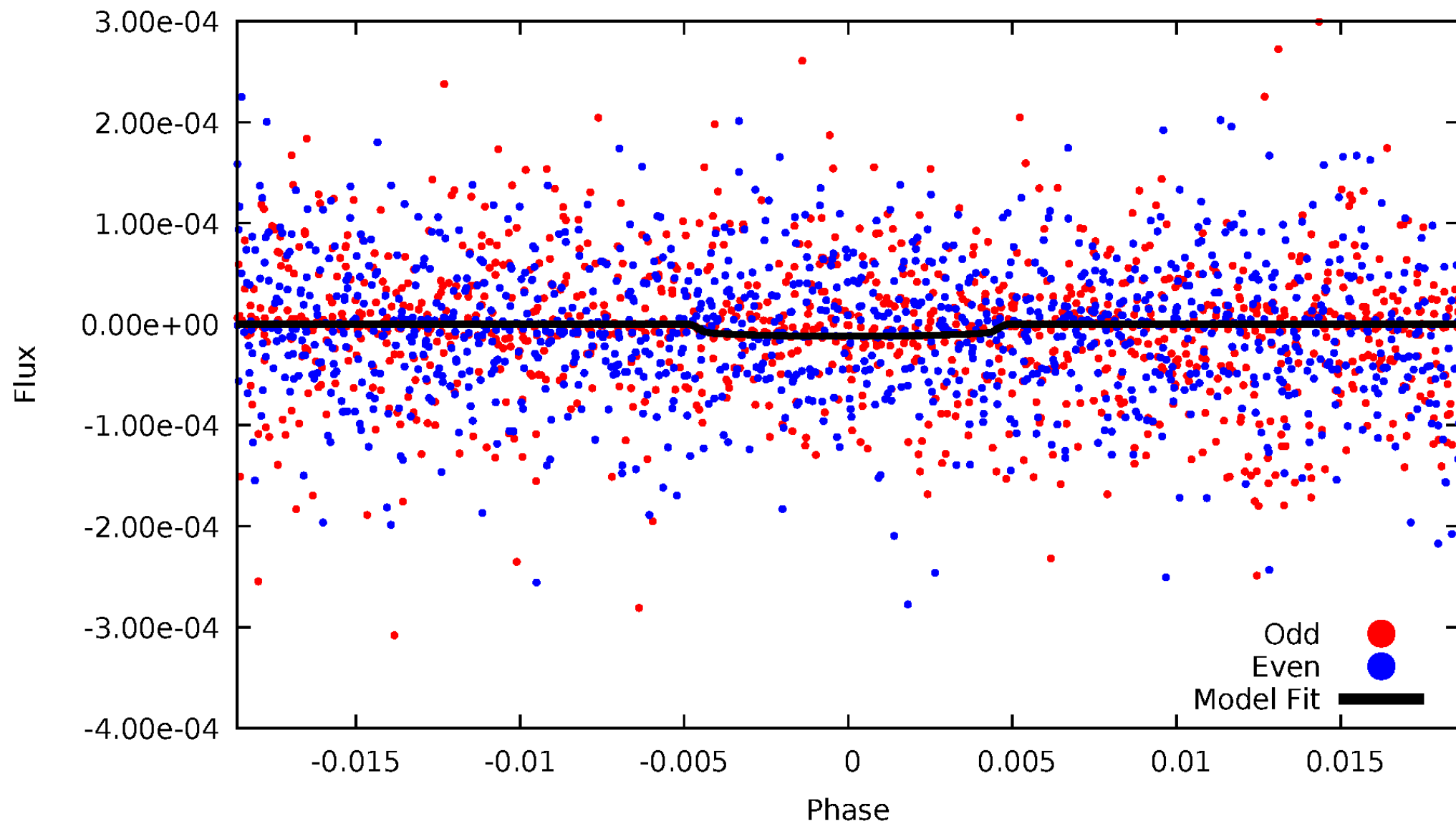
TCE 007880676-05





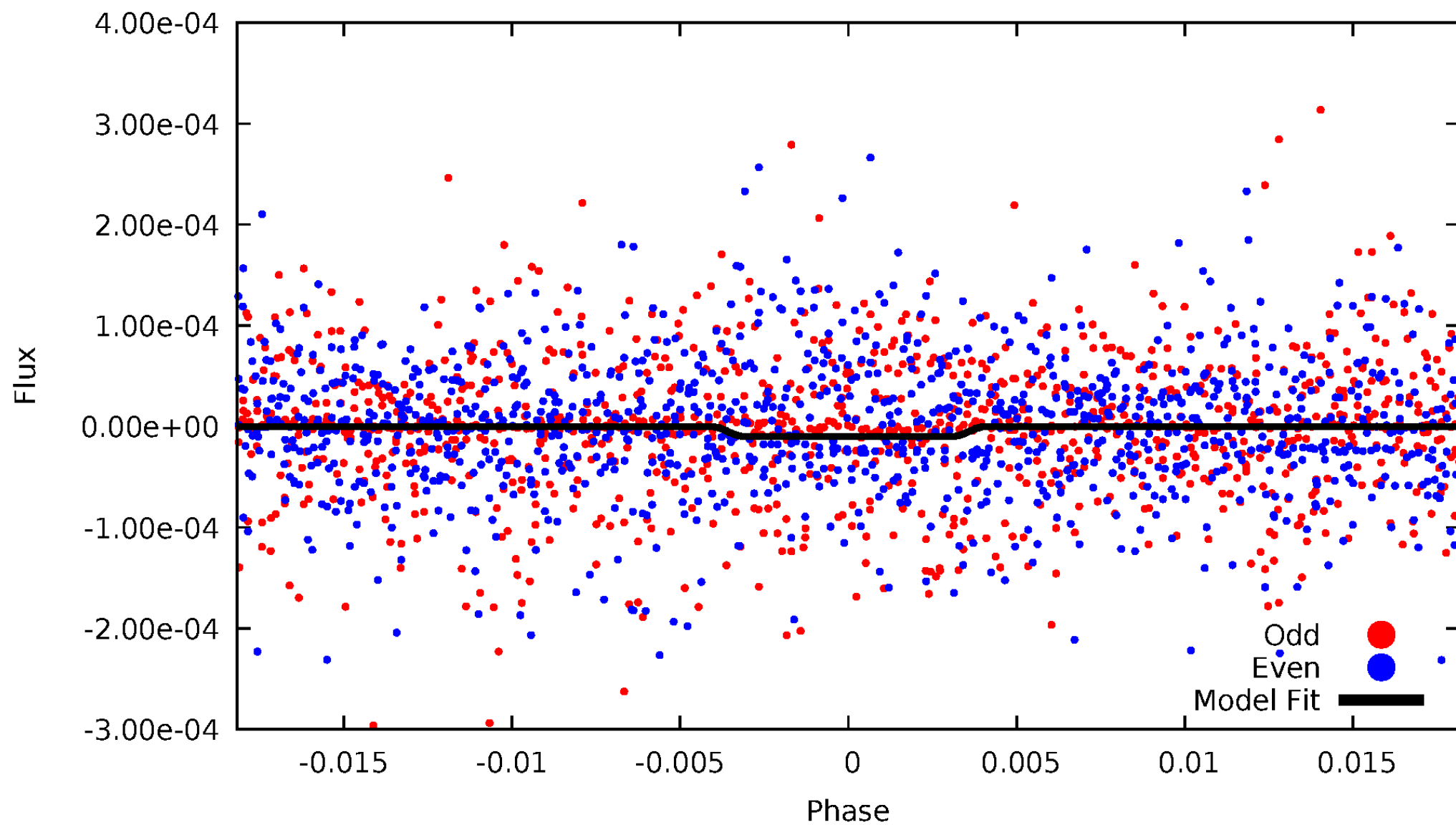
# DV Odd/Even

TCE 007880676-05



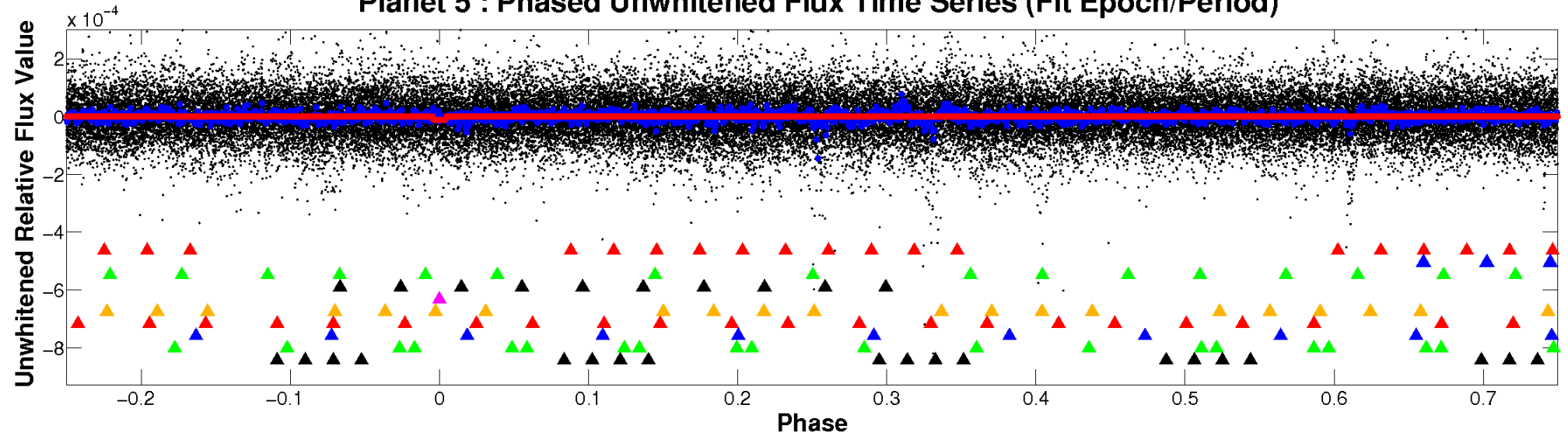
# ALT Odd/Even

TCE 007880676-05

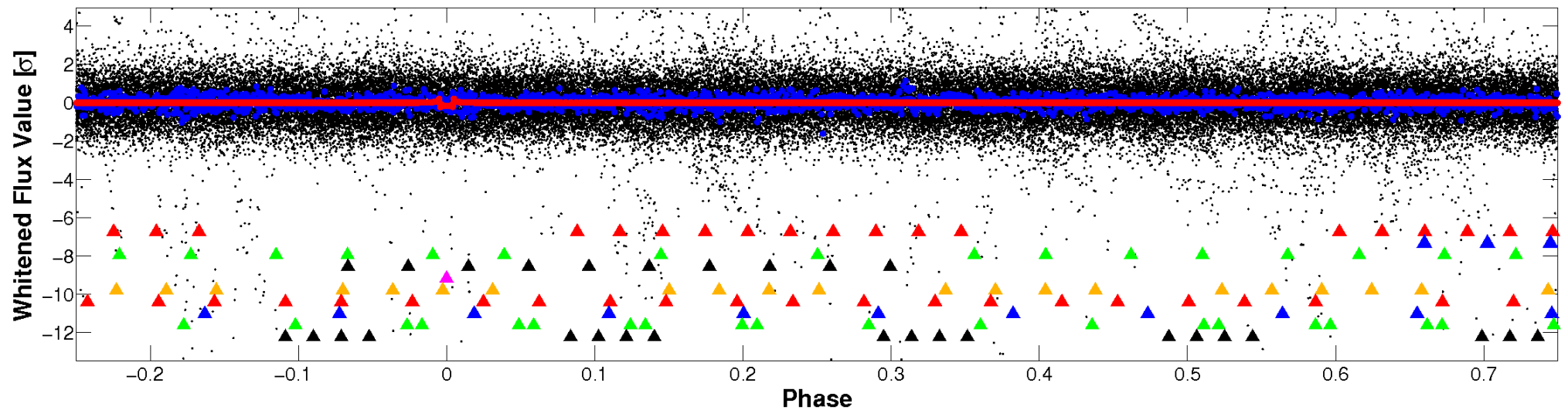


# Non-Whitened Vs. Whitened Light Curve

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

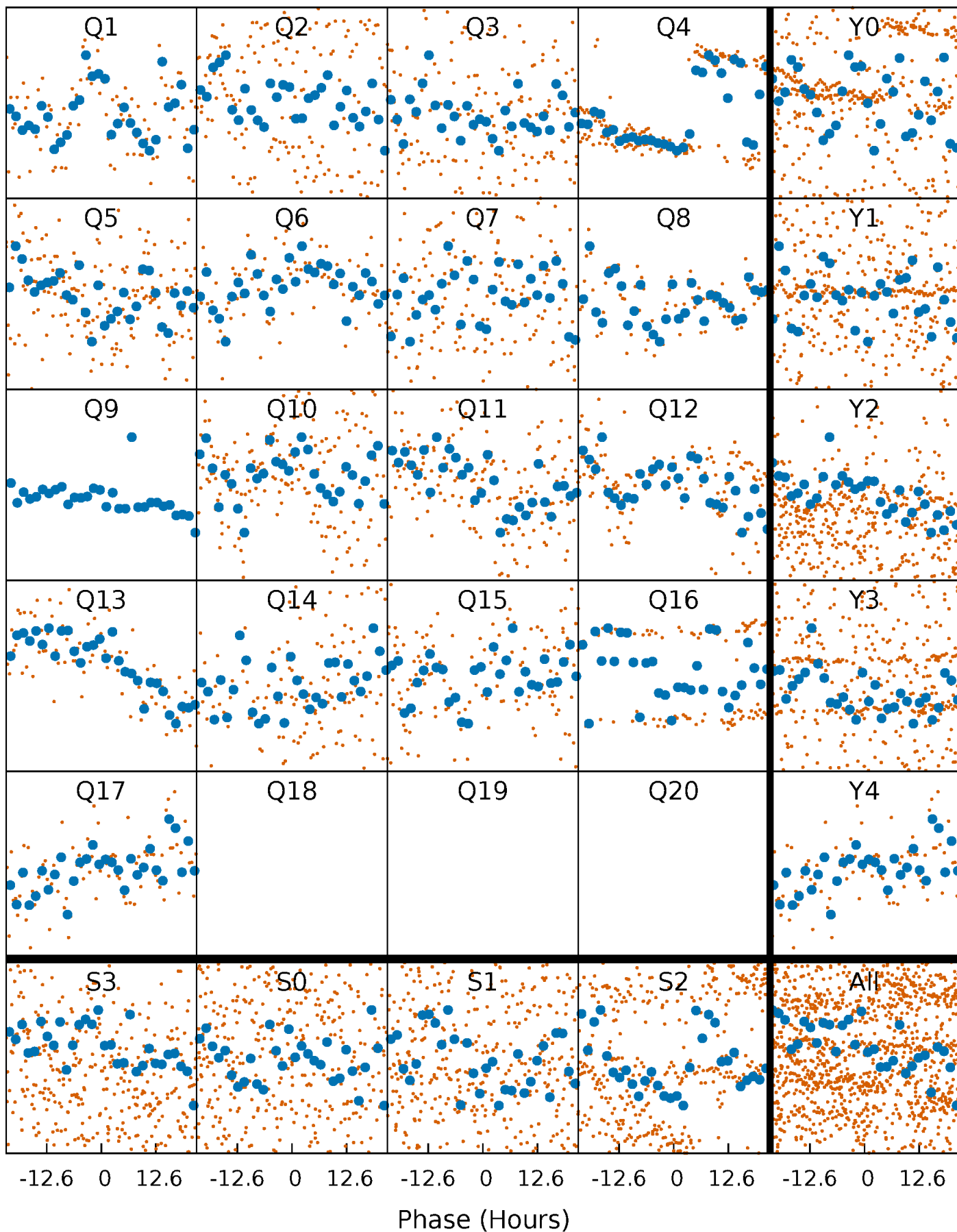


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



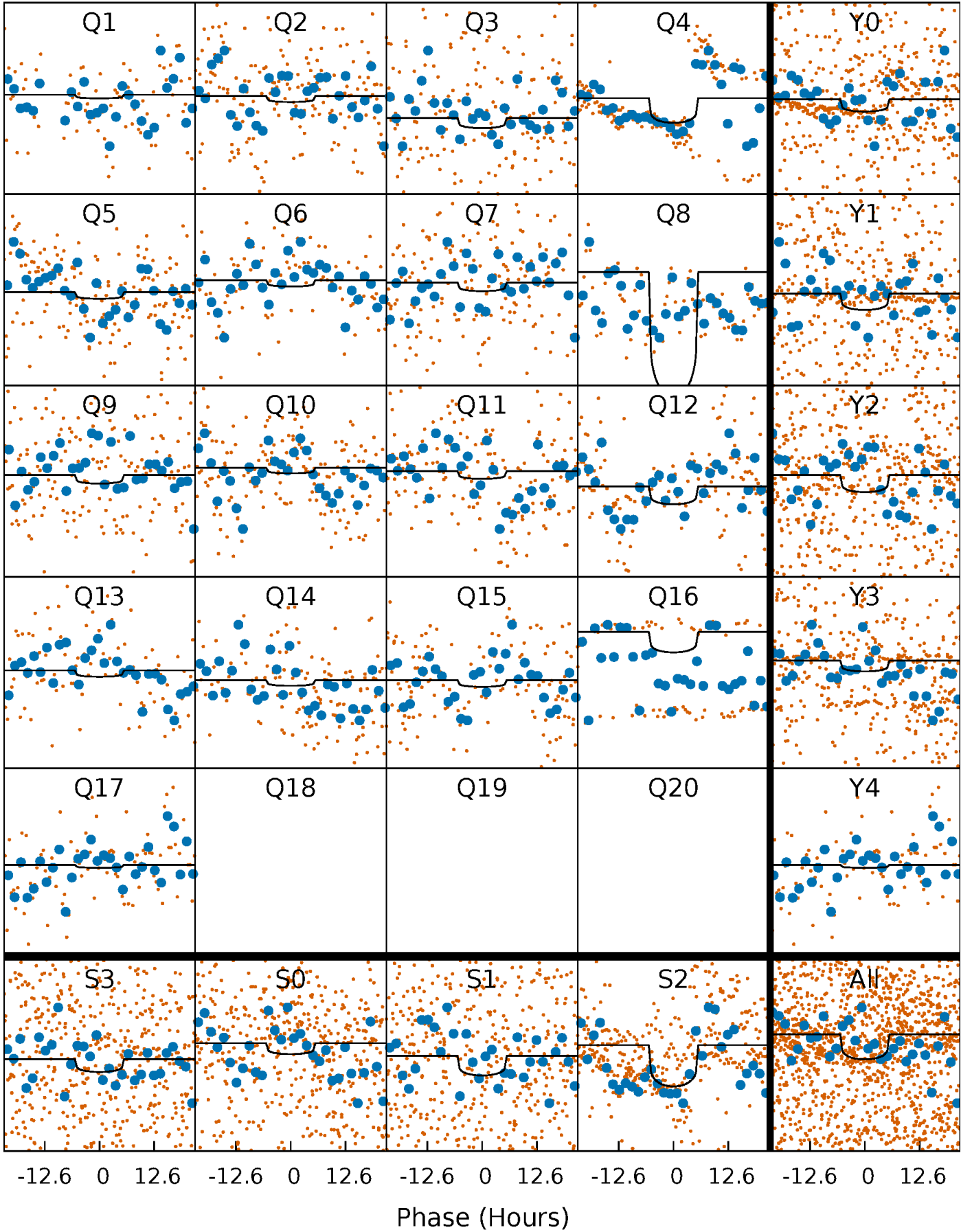
# PDC Quarter-Phased Transit Curves

TCE 007880676-05     $P = 49.327158$  Days     $T_0 = 139.760525$  (BKJD)



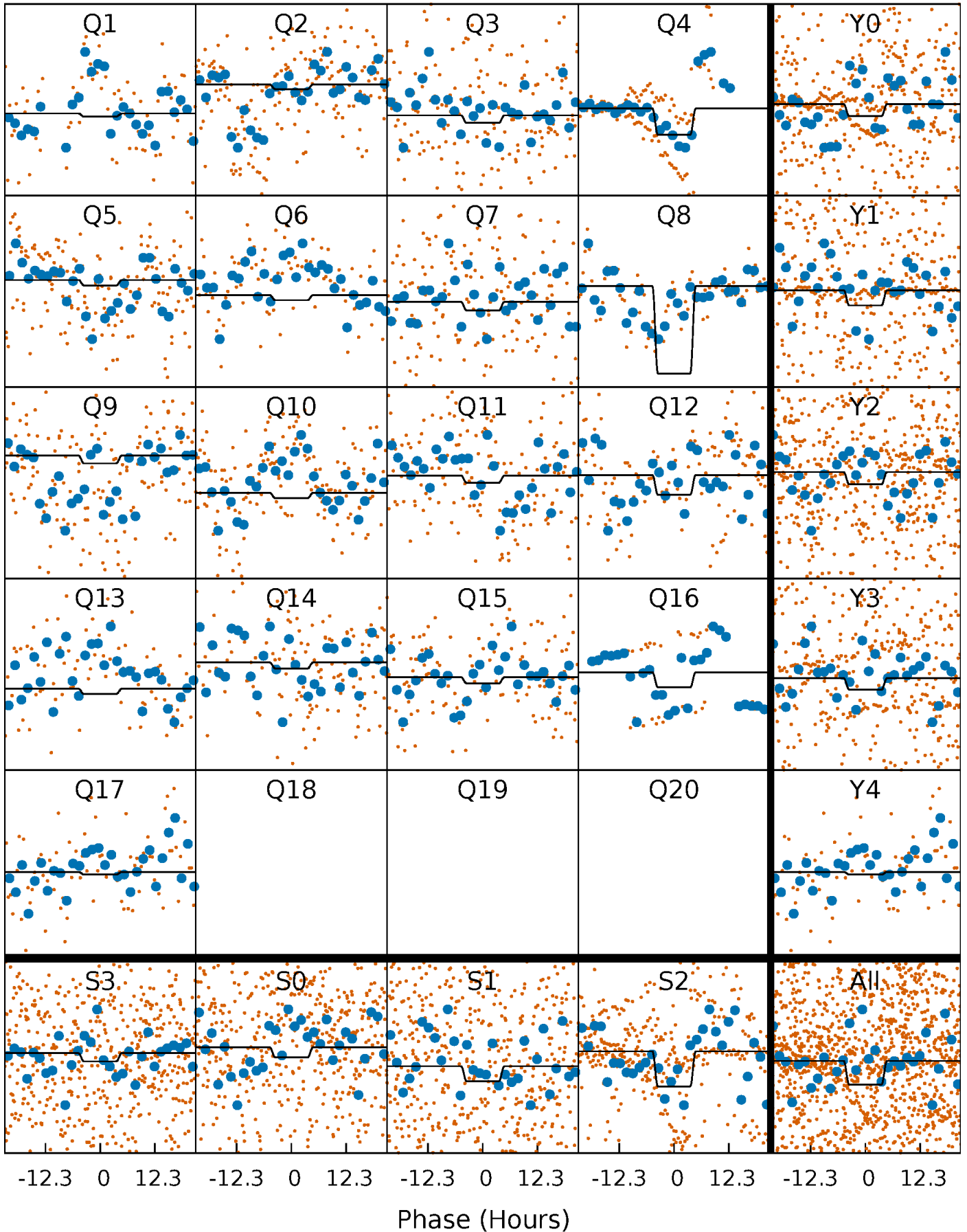
# DV Quarter-Phased Transit Curves

TCE 007880676-05     $P = 49.327158$  Days     $T_0 = 139.760525$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007880676-05     $P = 49.328515$  Days     $T_0 = 139.735731$  (BKJD)

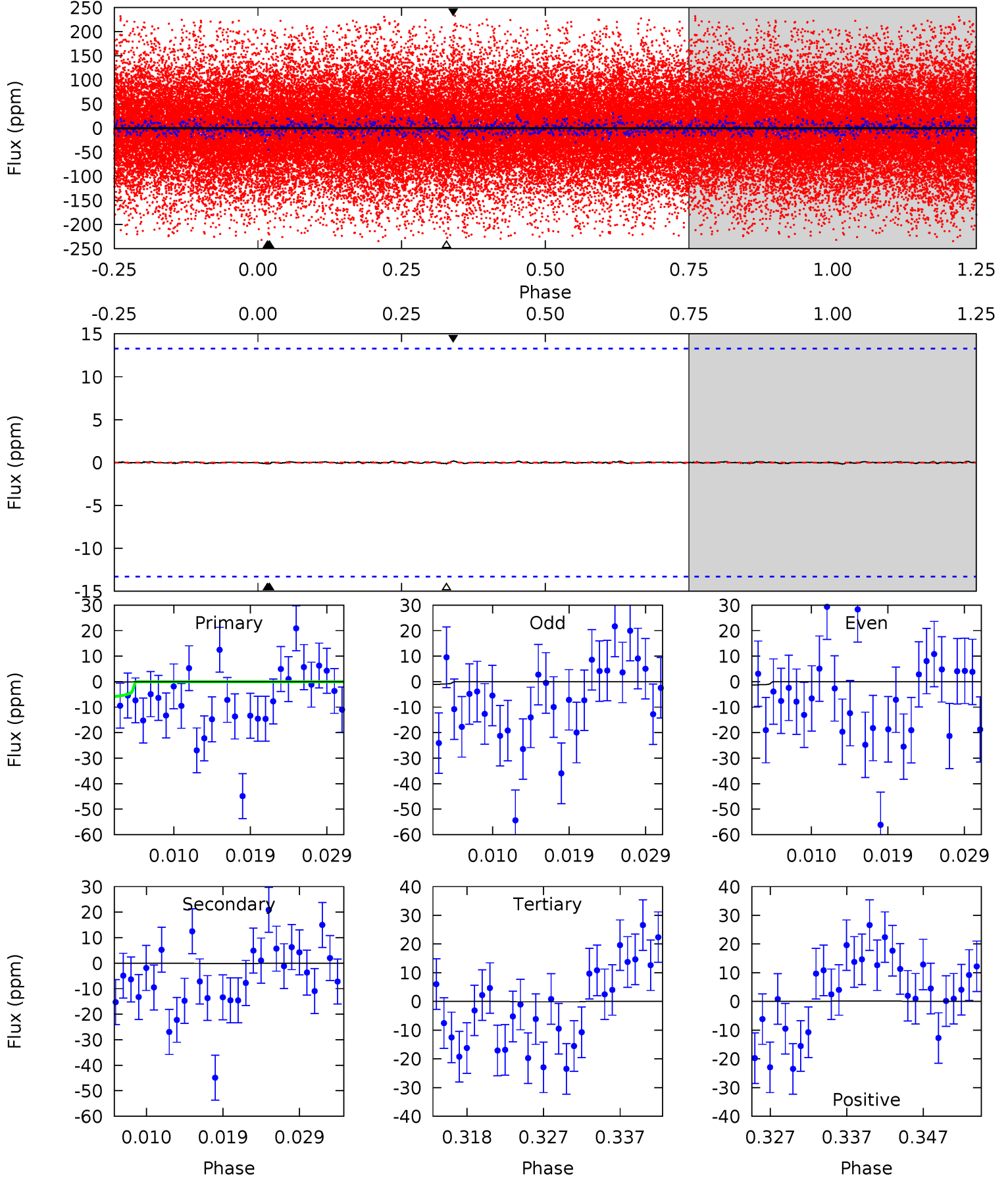




# DV Model-Shift Uniqueness Test

007880676-05, P = 49.327158 Days, E = 90.433367 Days

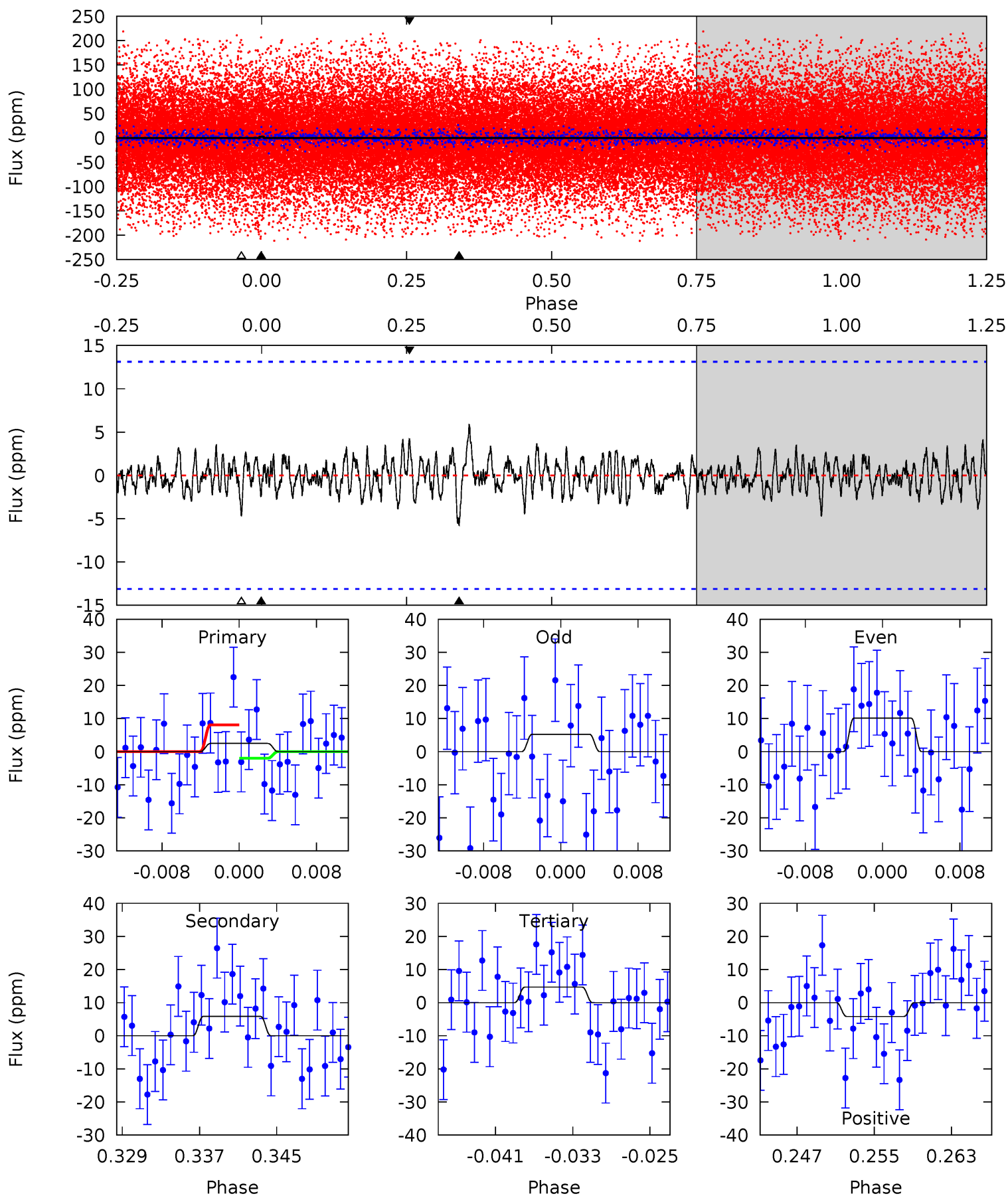
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.06	0.05	0.05	0.06	5.03	2.59	0.02	0.01	-0.00	0.00	-0.01	0.06	0.70	0.51	0.03



# Alt Model-Shift Uniqueness Test

007880676-05, P = 49.328515 Days, E = 90.407216 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
0.95	2.25	1.82	1.62	5.06	2.64	0.60	-0.87	-0.67	0.43	0.63	0.94	-2.24	0.50	1.18





### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-0 \pm 3$	$0.76^{+0.19}_{-0.18}$	$992^{+13}_{-14}$	$-2504^{+6914}_{-1874}$	$-4.710^{+216.526}_{-203.081}$
Alt.	$-6 \pm 3$	$0.68^{+0.19}_{-0.21}$	$991^{+14}_{-14}$	$5340^{+1075}_{-787}$	$541^{+625}_{-291}$

$T_{max}$  = 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

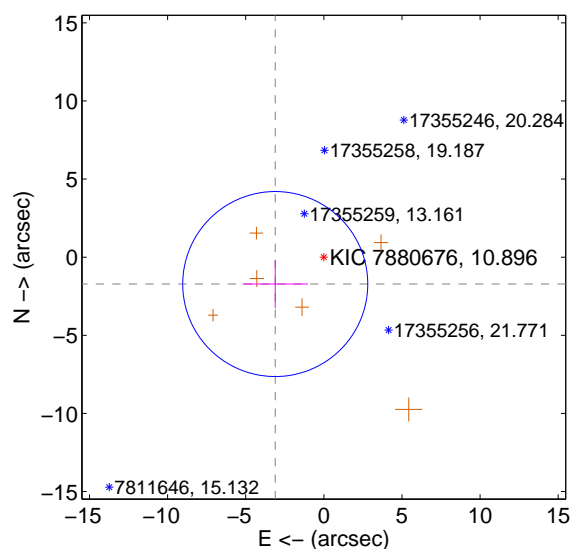
Supplemental centroid analysis for 007880676-05. **Kepler magnitude: 10.90.** Transit SNR 6.78

**There are 0 quarters with good PRF difference image offsets**

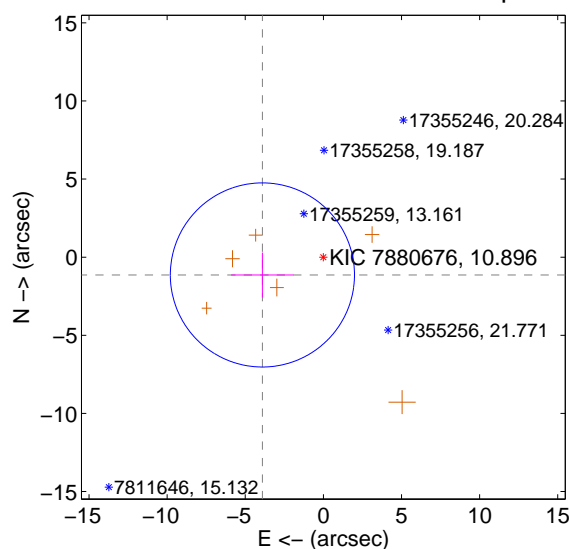
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.555 \pm 1.974$	1.80	$3.111 \pm 2.088$	$-1.720 \pm 1.546$
PRF-fit source offset from KIC position	$4.067 \pm 1.965$	2.07	$3.904 \pm 2.003$	$-1.138 \pm 1.437$
photometric centroid source offset	$3.36 \pm 3.18$	1.06	$-2.10 \pm 2.89$	$2.63 \pm 3.36$

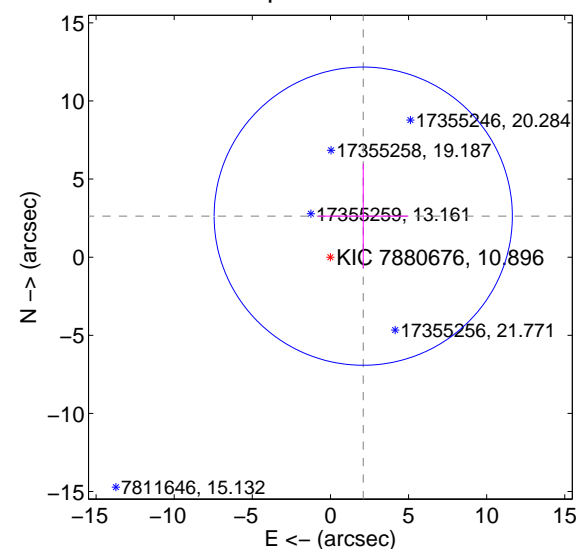
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

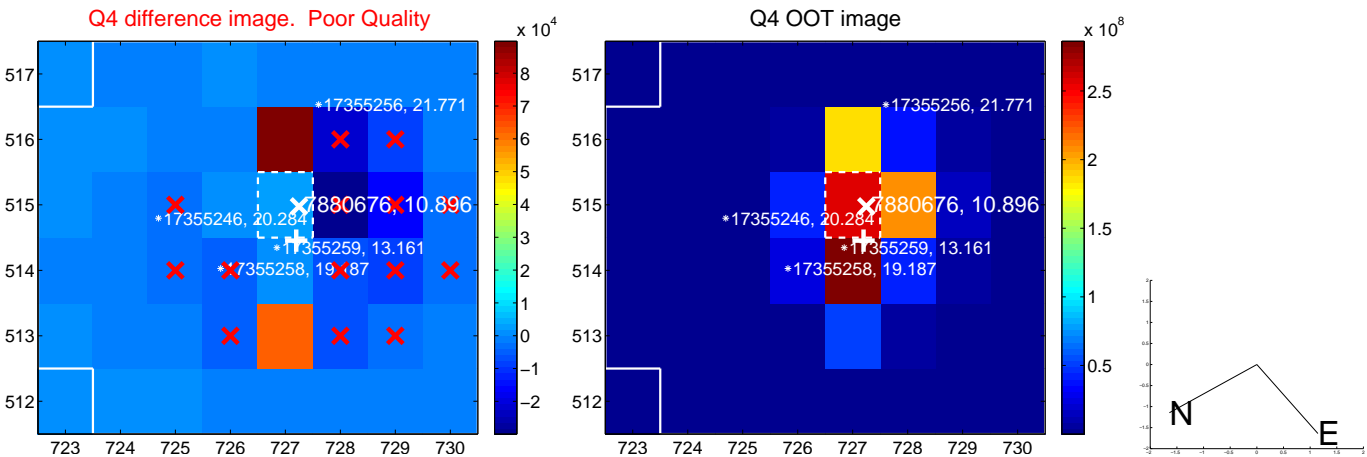
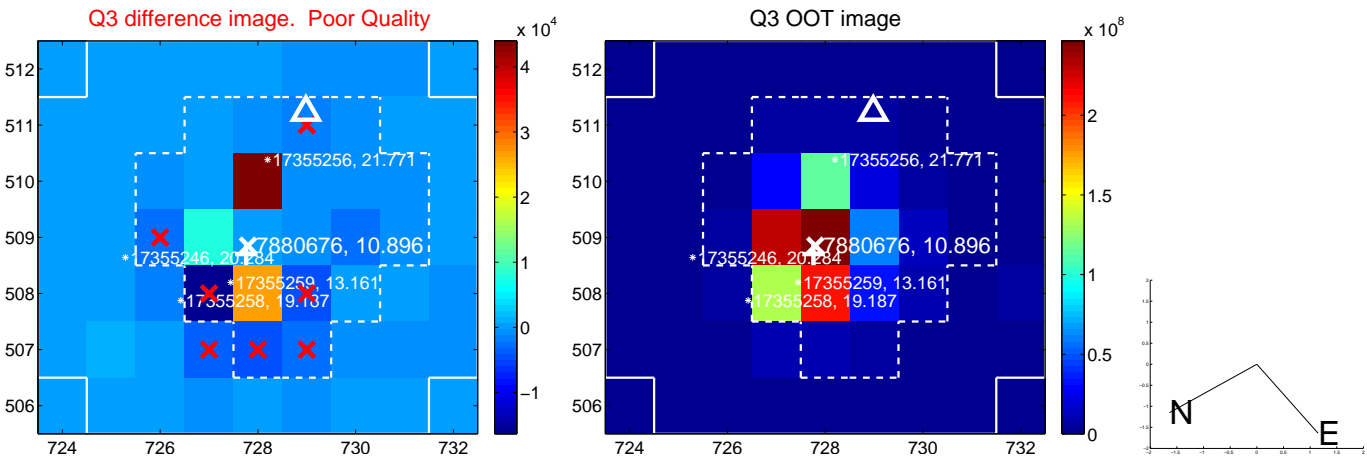
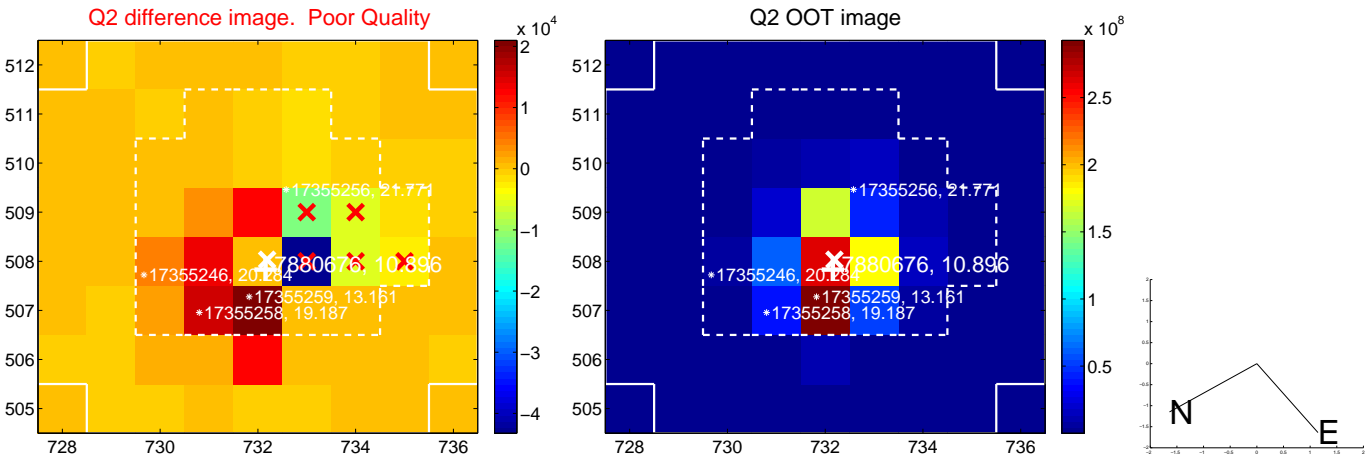
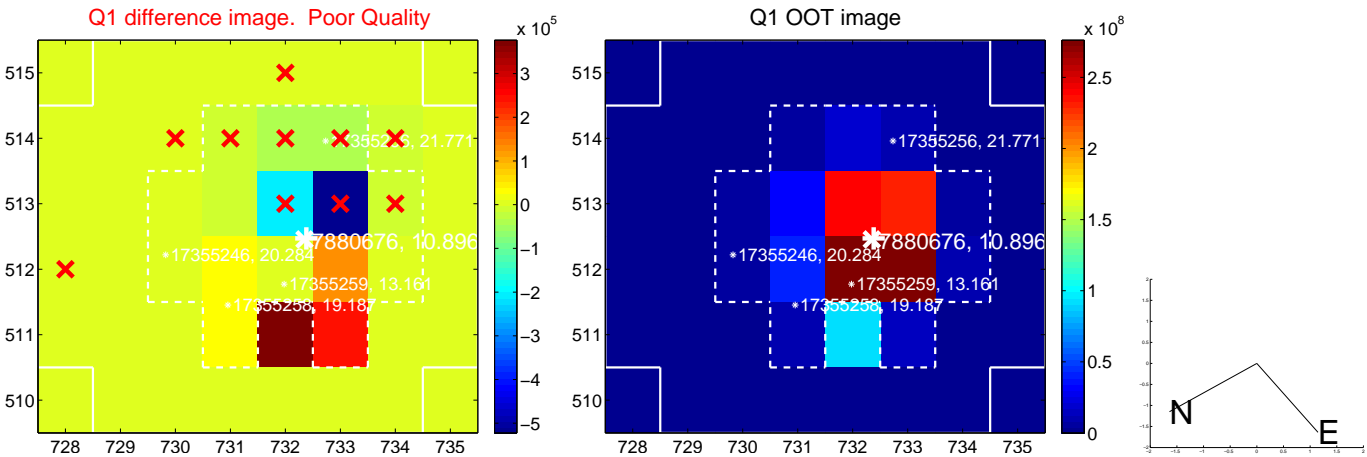


offset from photometric centroids

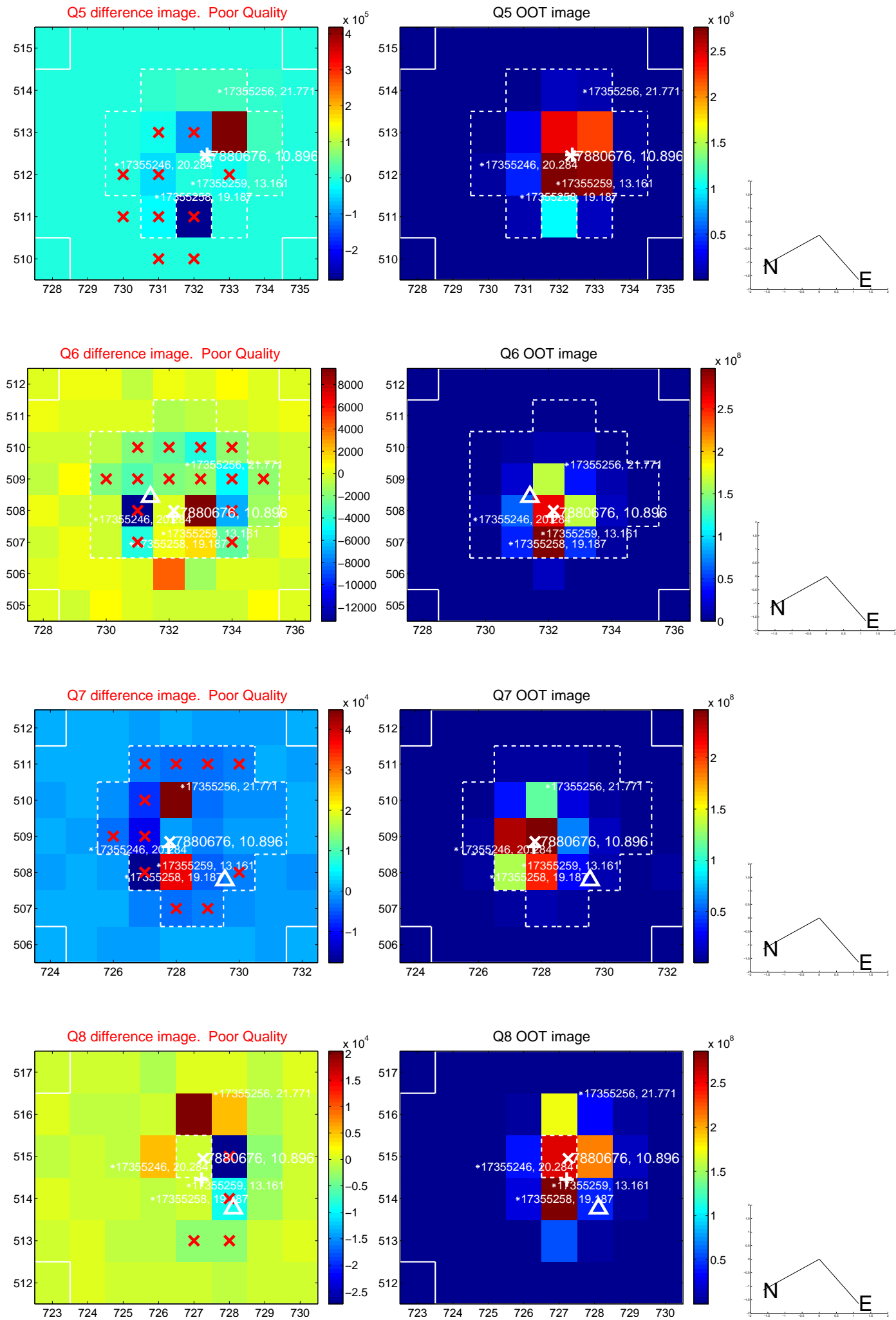


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

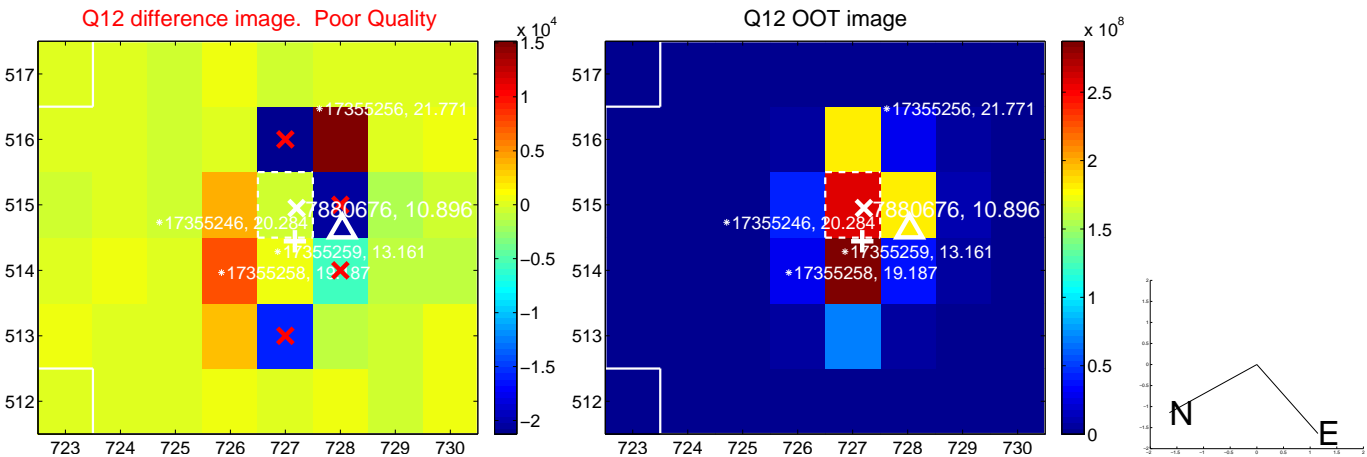
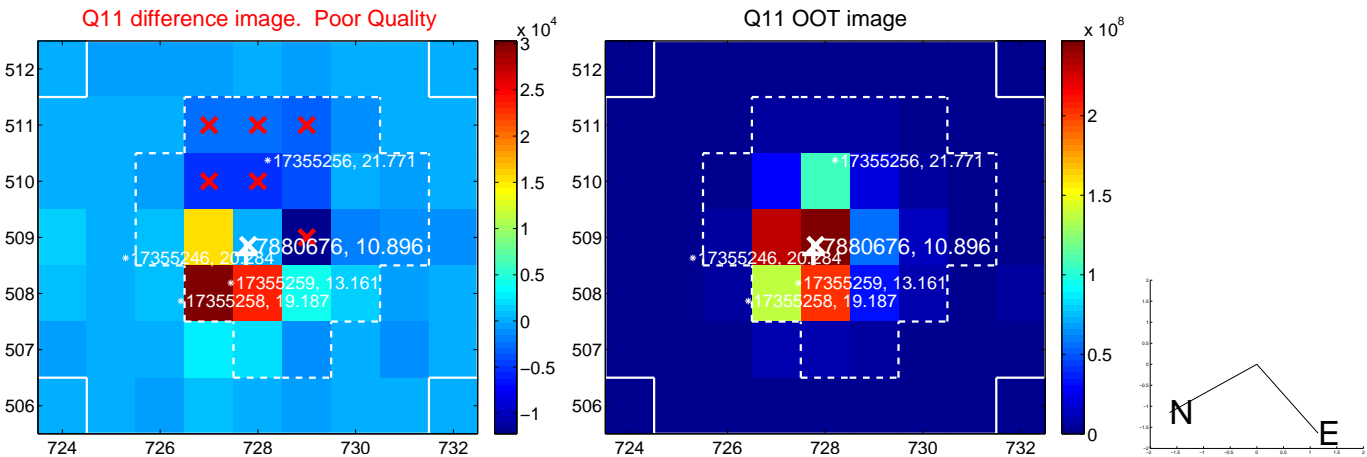
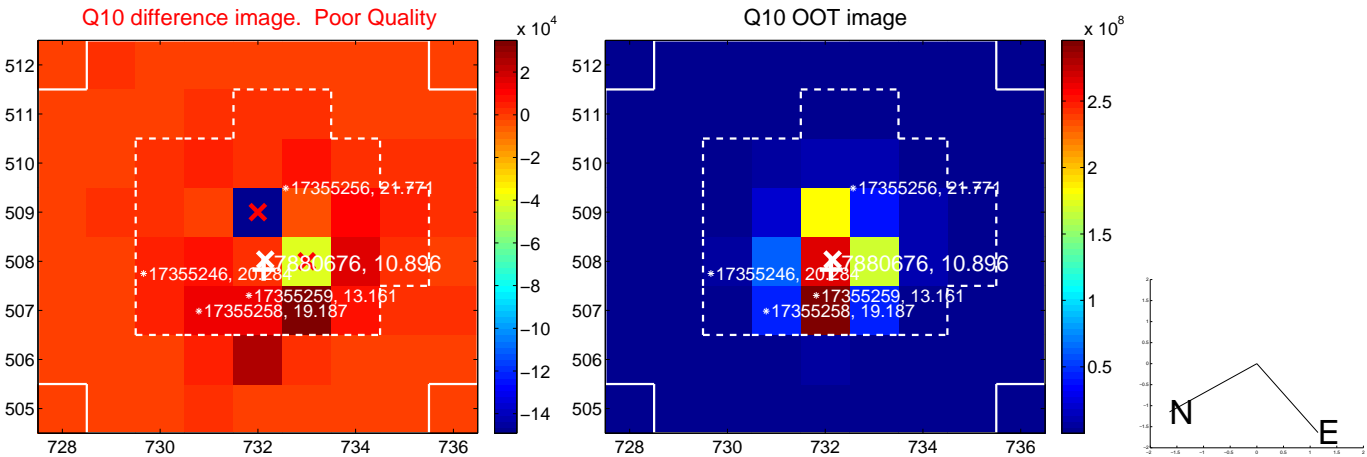
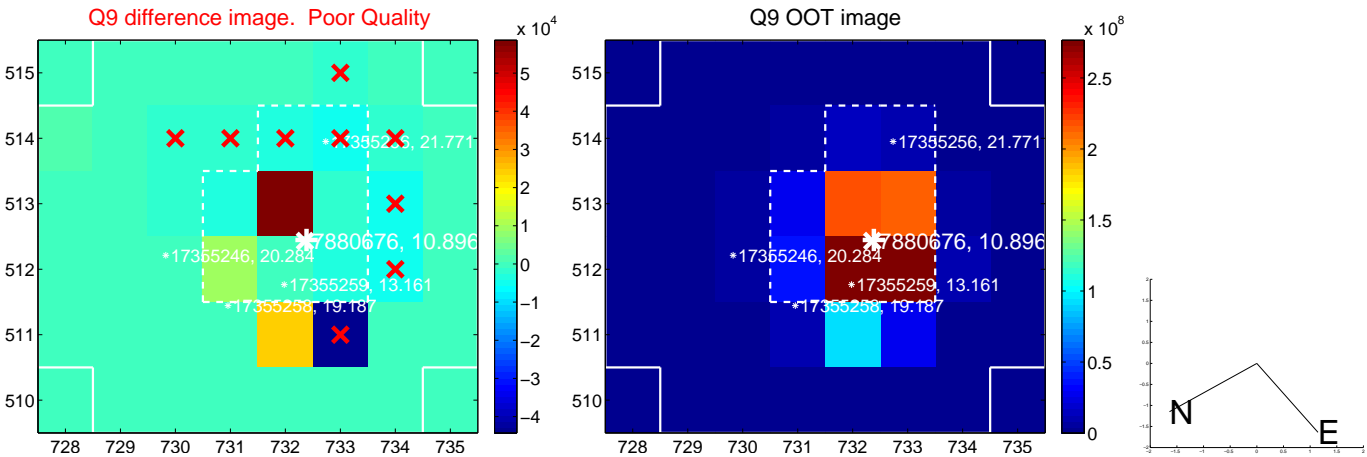
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



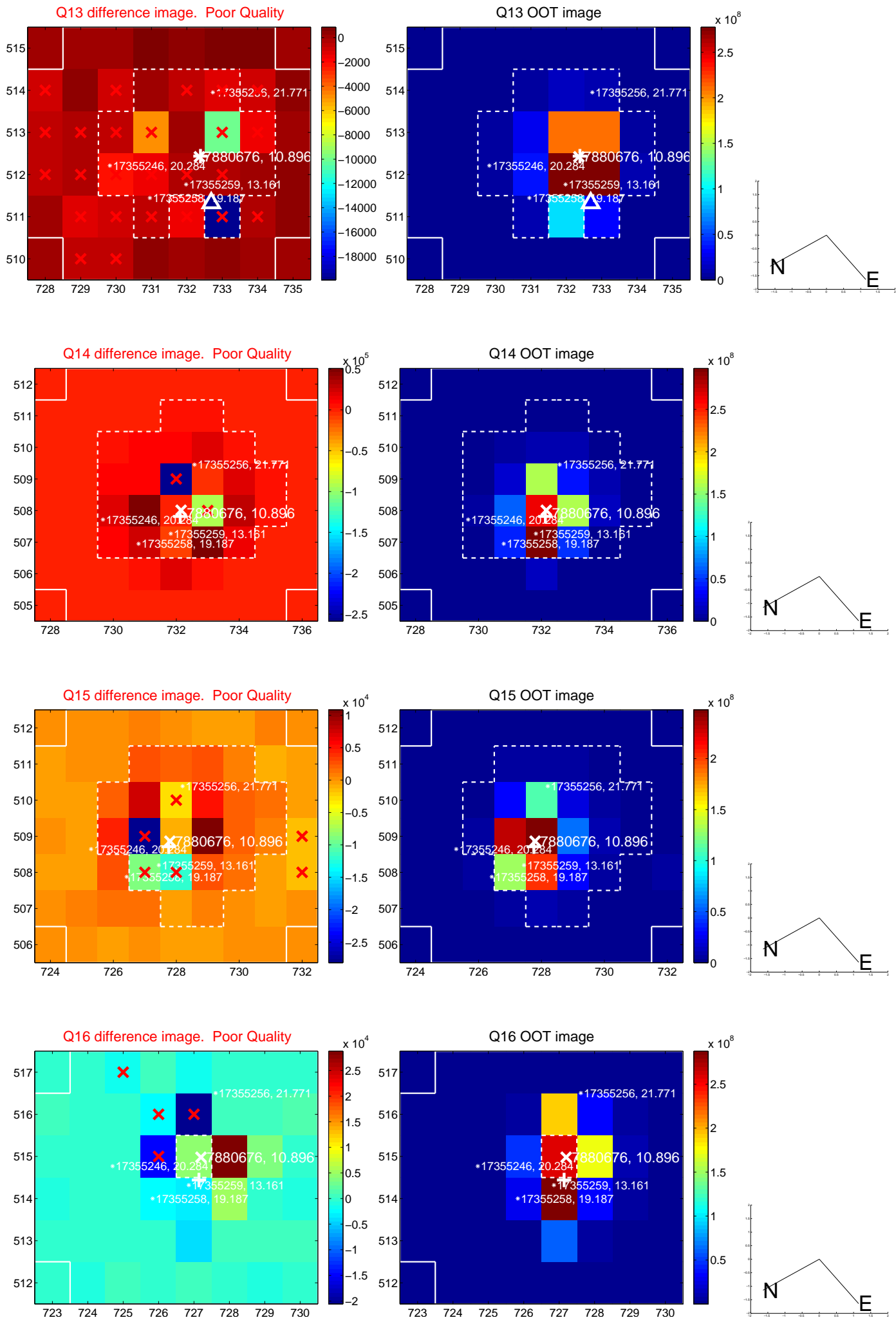
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



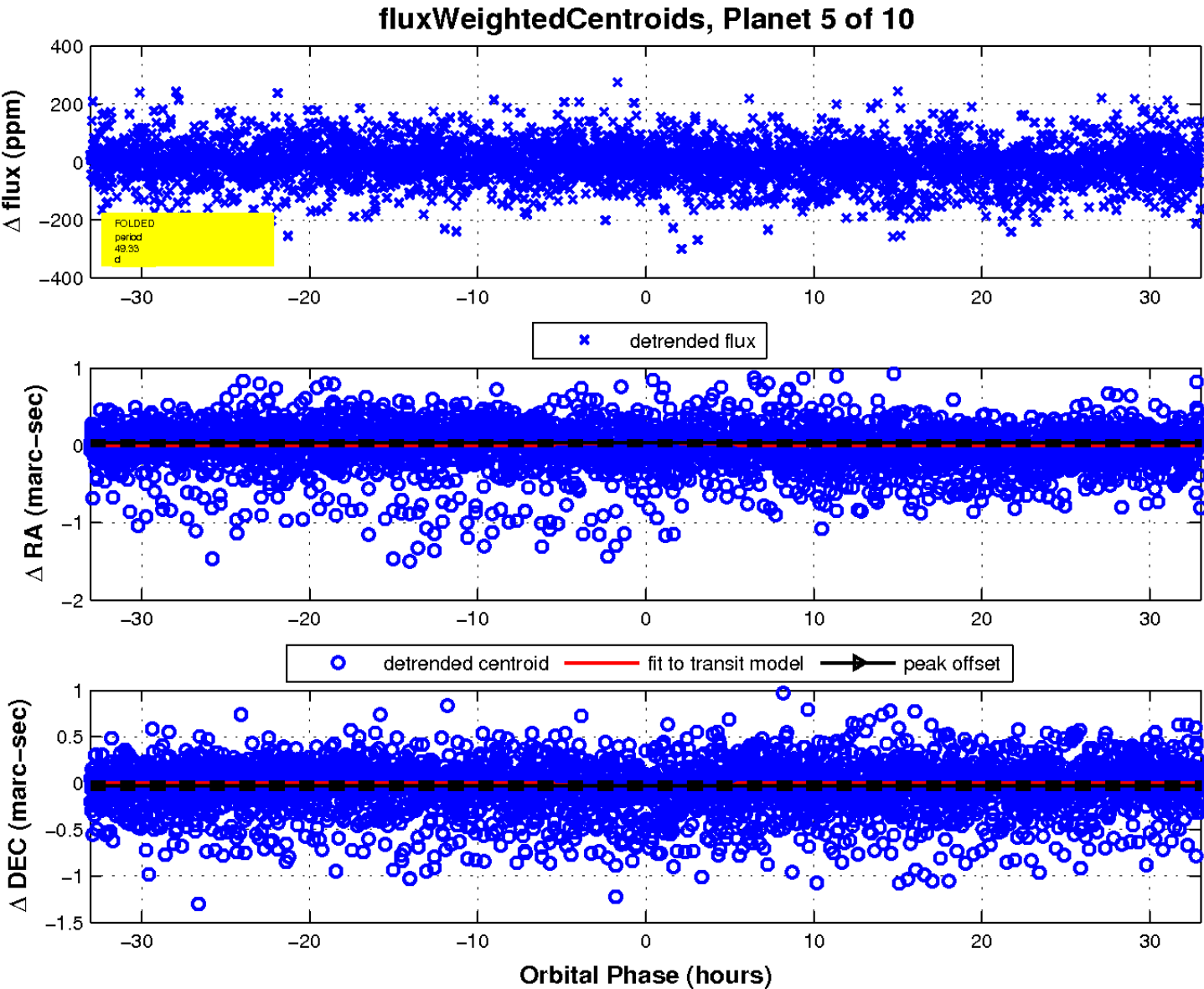
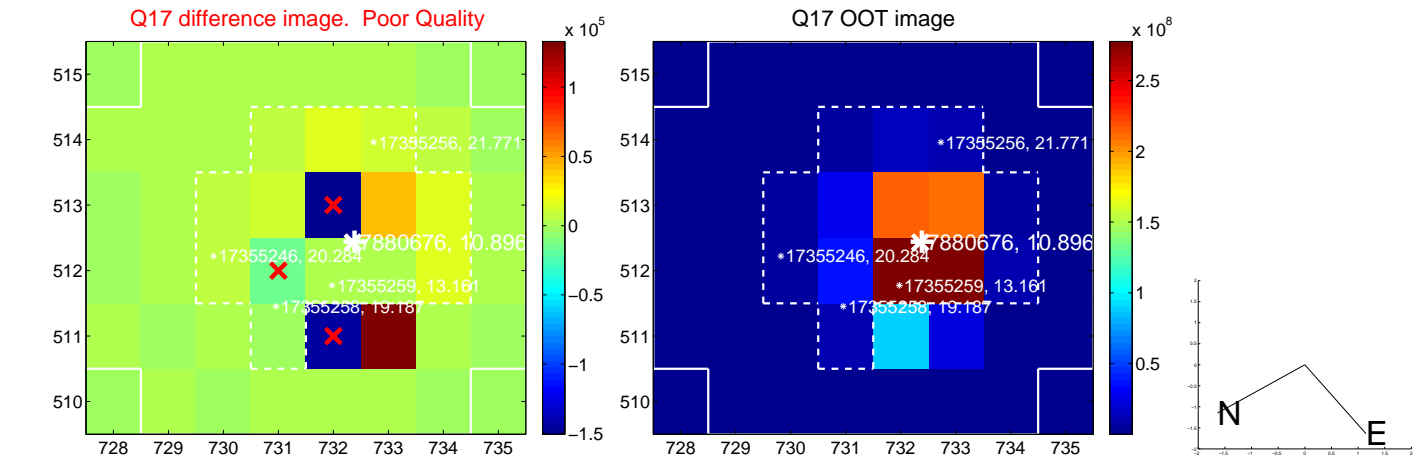
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

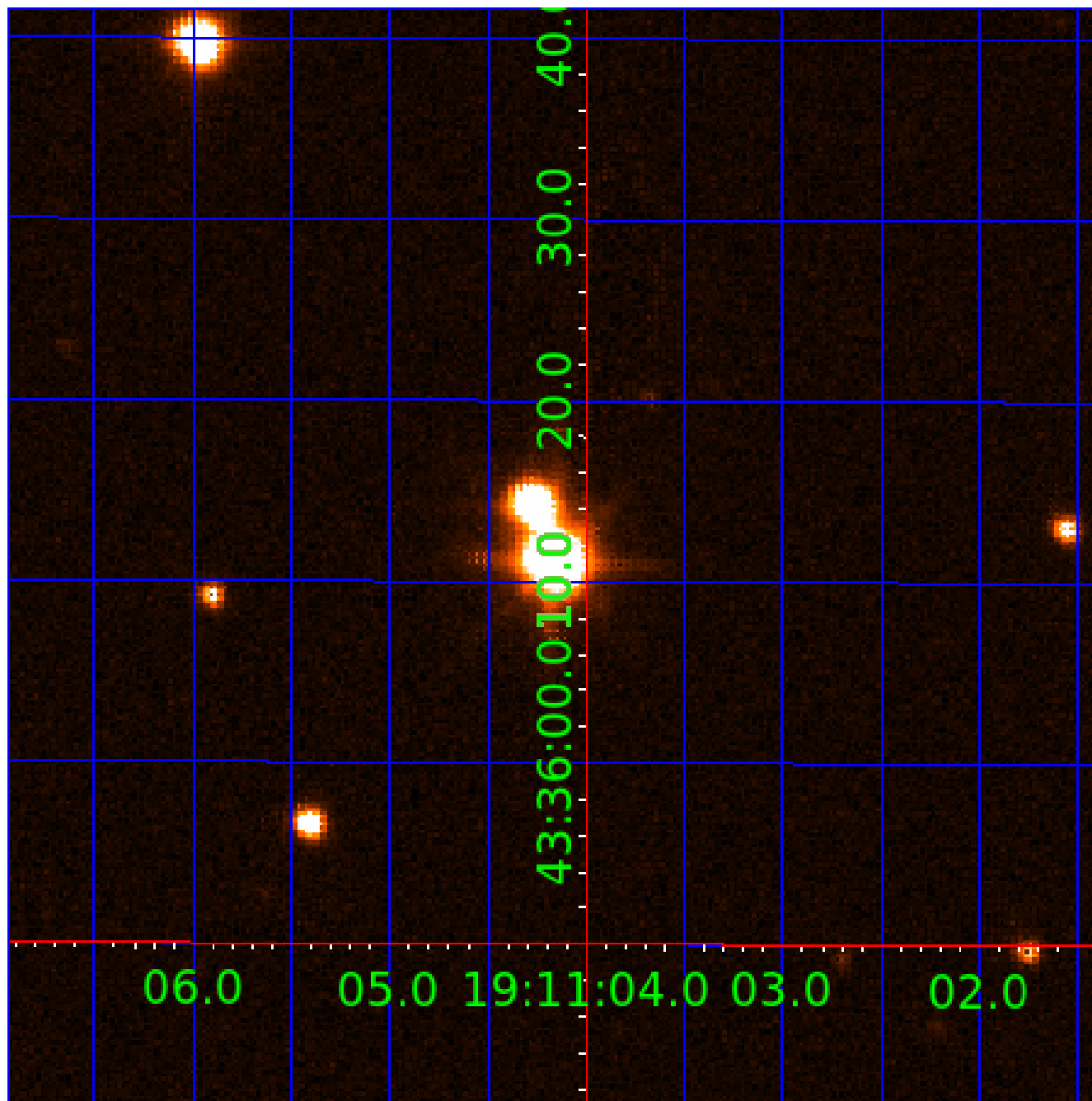


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





## KIC 007880676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007880676-01	OBS	No	74.700898	193.436167	18.8	1.598	31.4	2.9	1.96	6129	1.00	34.52
007880676-02	OBS	No	544.696610	418.947989	55.4	9.071	18.7	19.0	1.96	6129	1.69	2.44
007880676-03	OBS	No	93.437611	139.301041	58.6	0.868	19.0	28.0	1.96	6129	1.53	25.61
007880676-04	OBS	No	149.986976	136.477266	48.9	3.061	18.7	14.8	1.96	6129	1.37	13.63
007880676-05	OBS	No	49.327158	139.760525	11.7	11.019	14.0	6.8	1.96	6129	0.76	60.03
007880676-06	OBS	No	69.390592	165.569874	29.3	16.554	13.7	11.6	1.96	6129	1.17	38.08
007880676-07	OBS	No	64.361879	185.581530	60.1	2.287	19.3	24.3	1.96	6129	1.73	42.10
007880676-08	OBS	No	94.170624	203.456516	15.9	8.738	13.3	6.8	1.96	6129	0.91	25.35
007880676-09	OBS	No	75.849882	138.940758	46.7	1.755	17.5	8.4	1.96	6129	1.63	33.82
007880676-10	OBS	No	78.737554	157.099189	20.9	12.578	12.9	8.0	1.96	6129	1.05	32.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007880676-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007880676-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-05	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
007880676-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-08	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-09	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-10	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

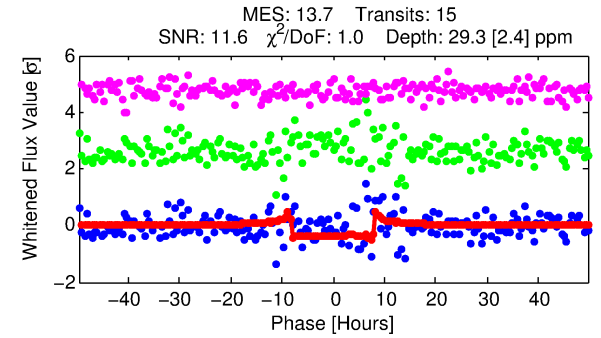
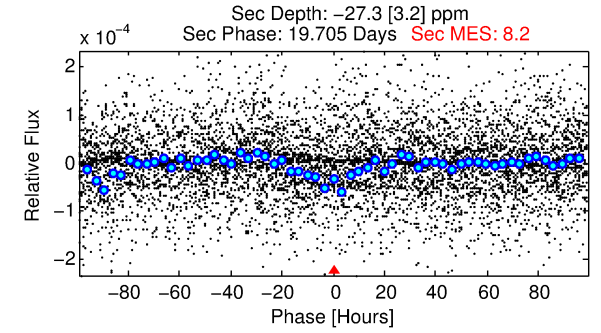
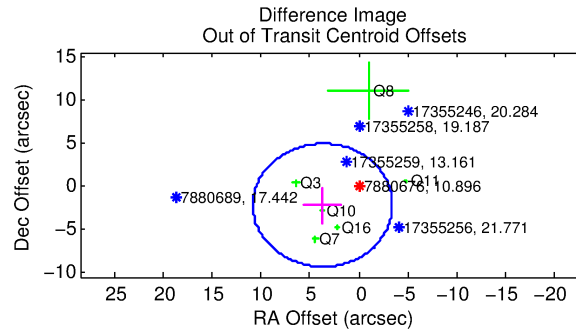
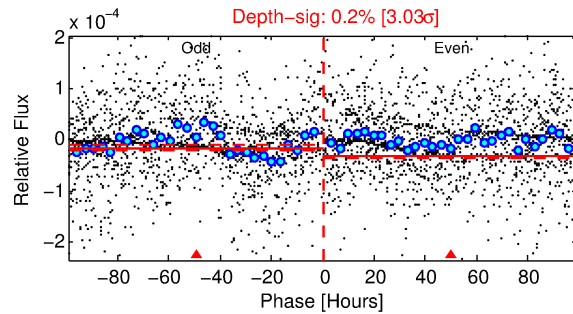
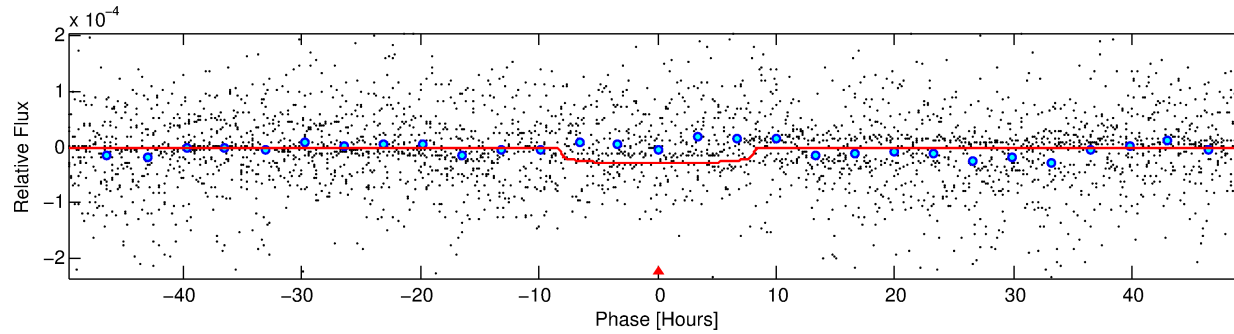
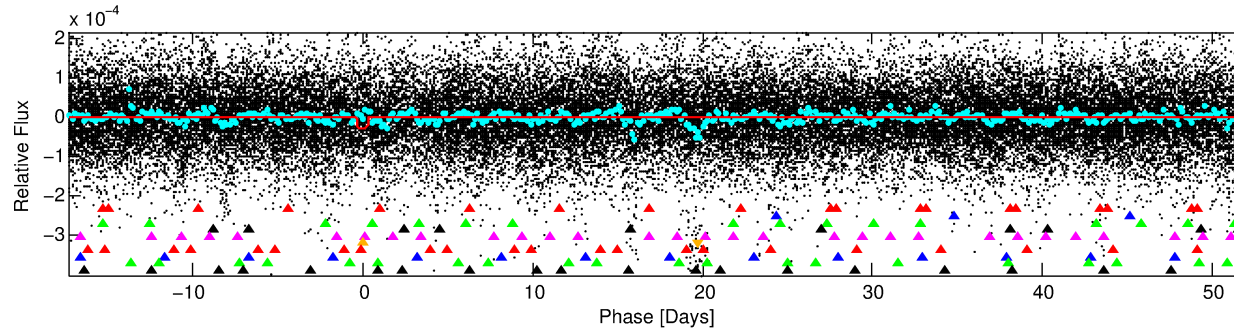
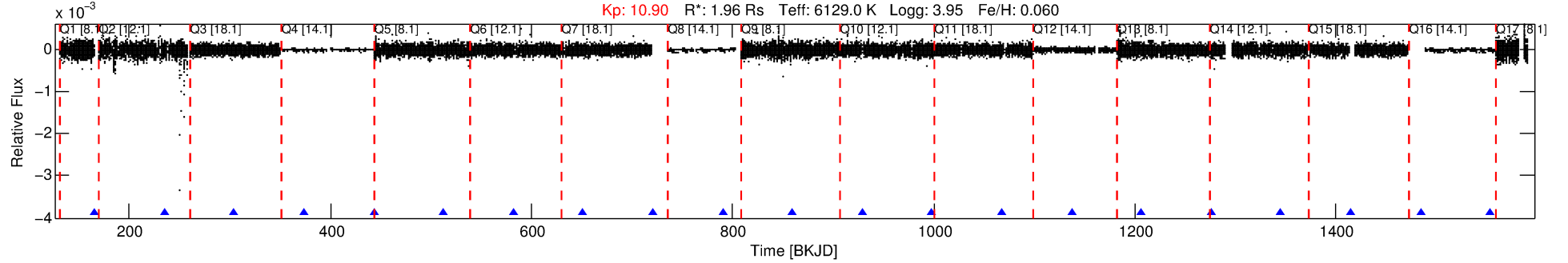
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-06

No Significant Match Found

# DV One-Page Summary

KIC: 7880676 Candidate: 6 of 10 Period: 69.391 d



## DV Fit Results:

Period = 69.39059 [0.00047] d  
Epoch = 165.5699 [0.0054] BKJD  
Rp/R\* = 0.0055 [0.0006]  
a/R\* = 19.99 [10.97]  
b = 0.79 [0.27]  
Seff = 38.08 [2.58]  
Teq = 633 [11] K  
Rp = 1.17 [0.16] Re  
a = 0.3569 [0.0156] AU  
Ag = N/A  
Teffp = N/A

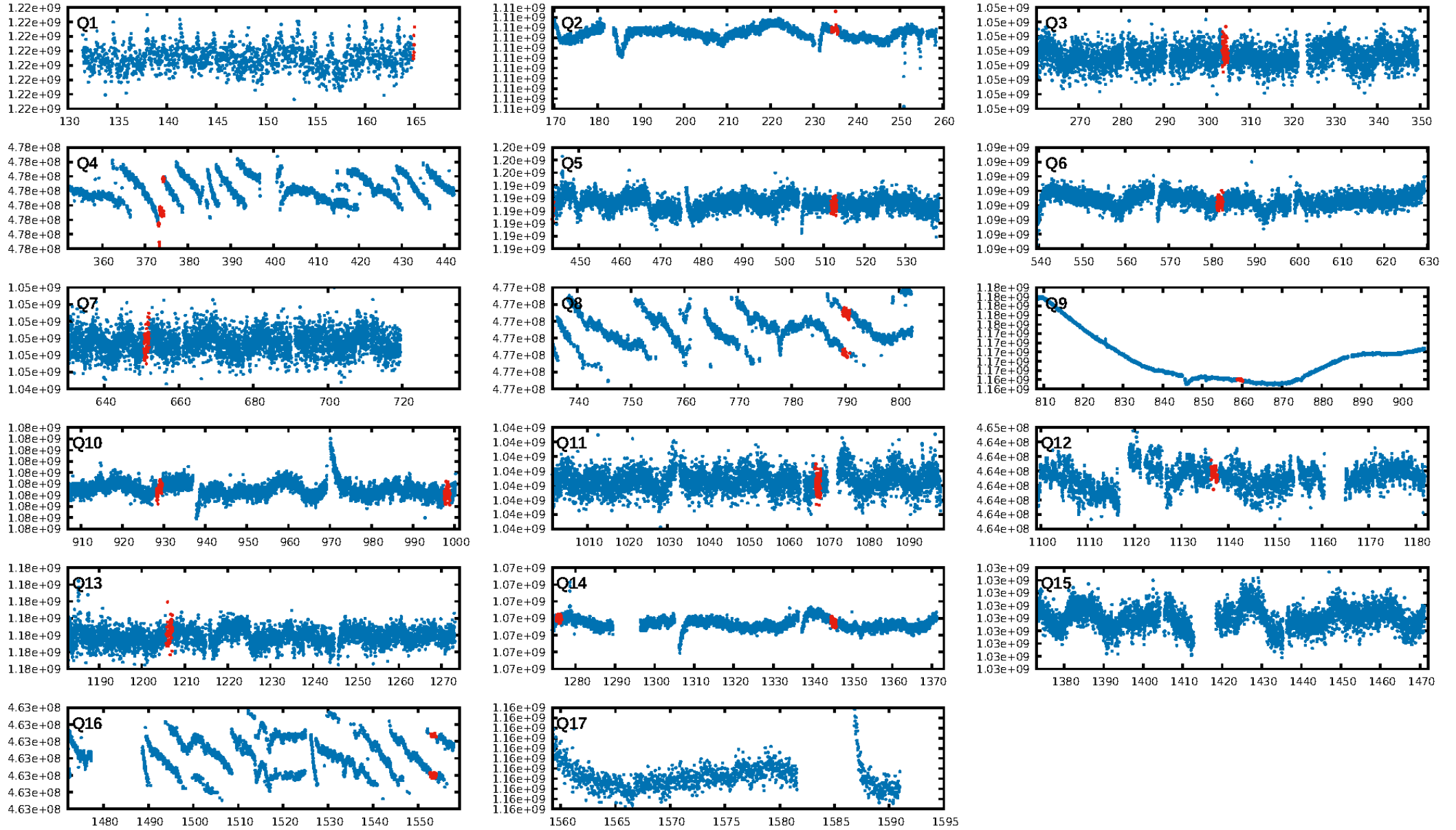
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.22σ]  
LongPeriod-sig: 100.0% [7.66σ]  
ModelChiSquare2-sig: 0.4%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.09e-09**  
RollingBand-fgt: 1.00 [15/15]  
GhostDiagnostic-chr: 4.48  
**Centroid-sig: 0.0%**  
Centroid-so: 3.370 arcsec [2.30σ]  
OotOffset-rm: 4.307 arcsec [1.81σ]  
KicOffset-rm: 4.750 arcsec [2.49σ]  
OotOffset-st: 1/3/2/0 [6]  
KicOffset-st: 1/3/2/0 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 0.67 [8/12]

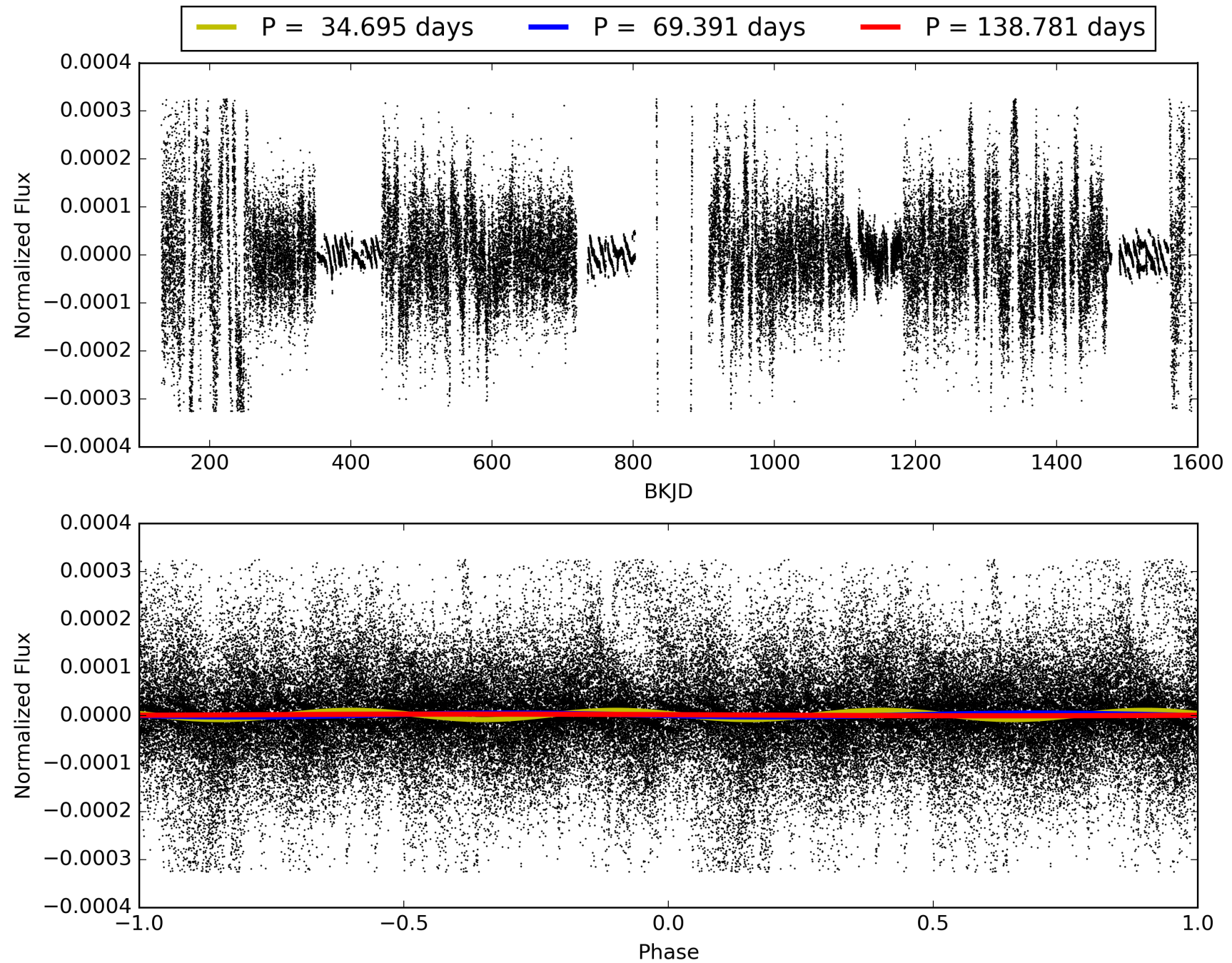
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:06:45 Z

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

# TCE 007880676-06, PDC Light Curves

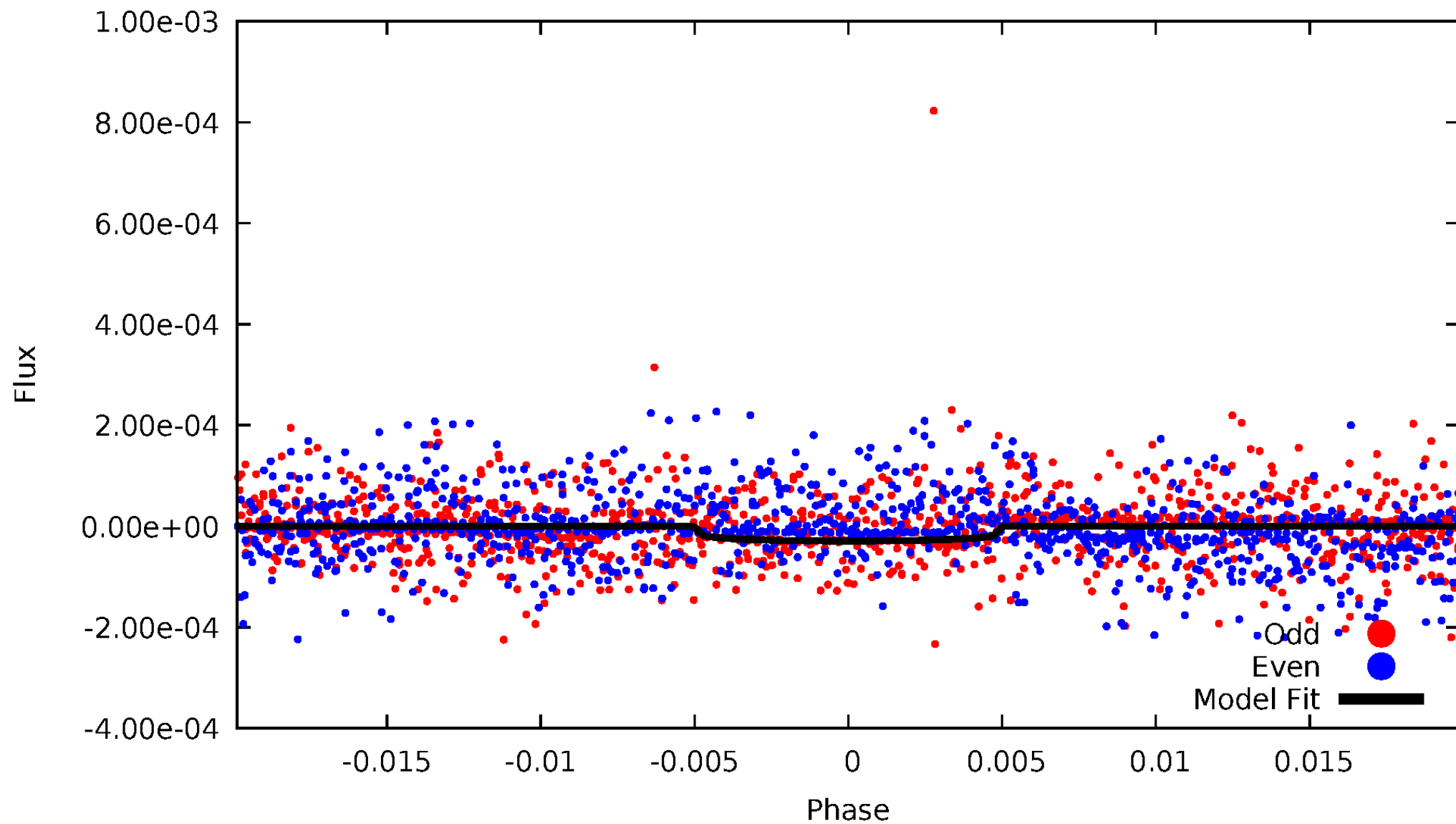


TCE 007880676-06



# DV Odd/Even

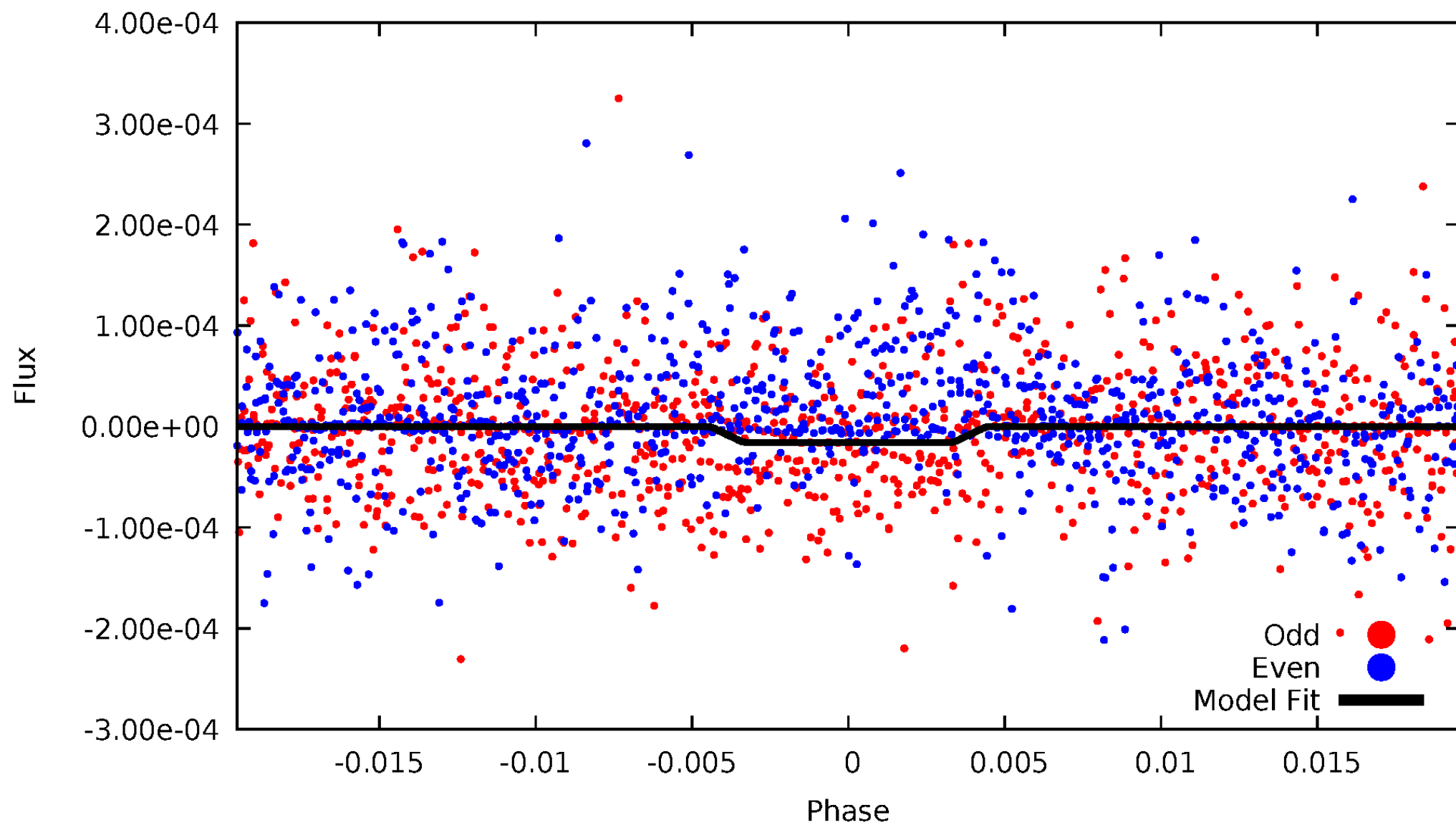
TCE 007880676-06





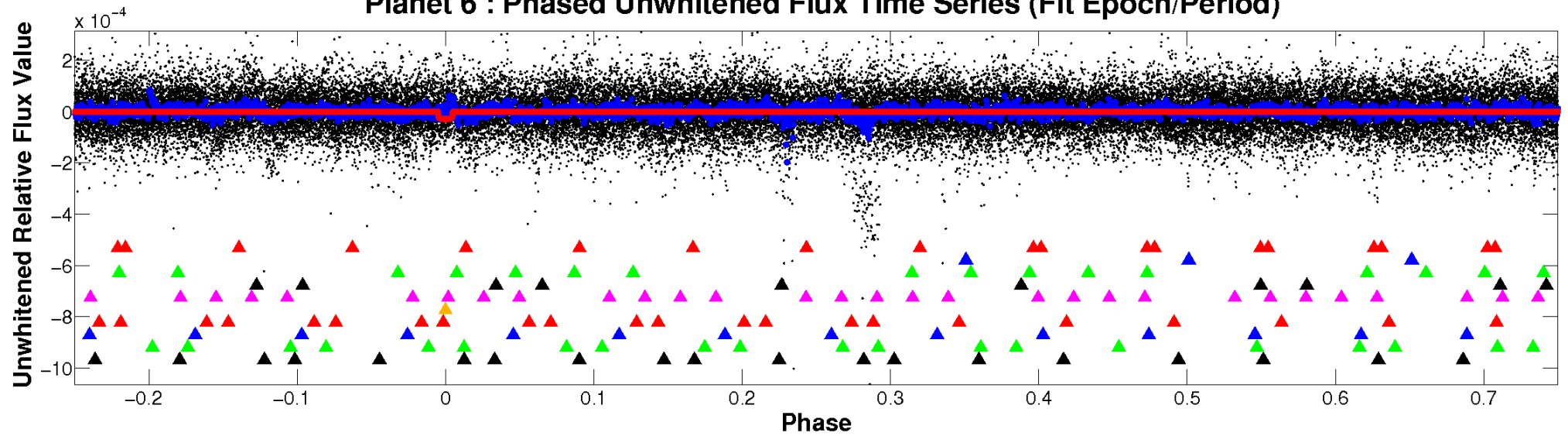
# ALT Odd/Even

TCE 007880676-06

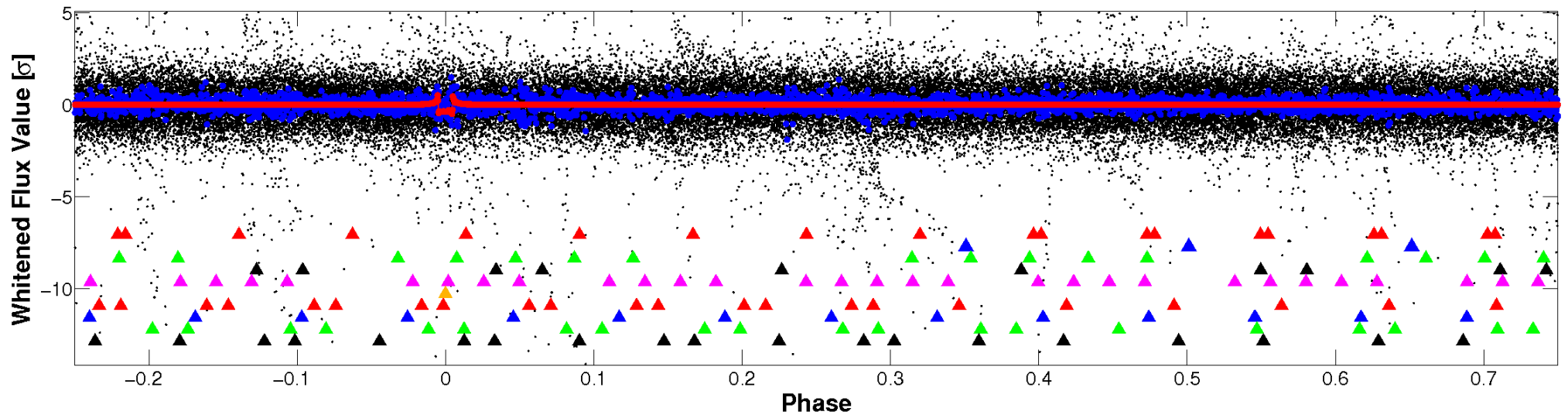


# Non-Whitened Vs. Whitened Light Curve

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

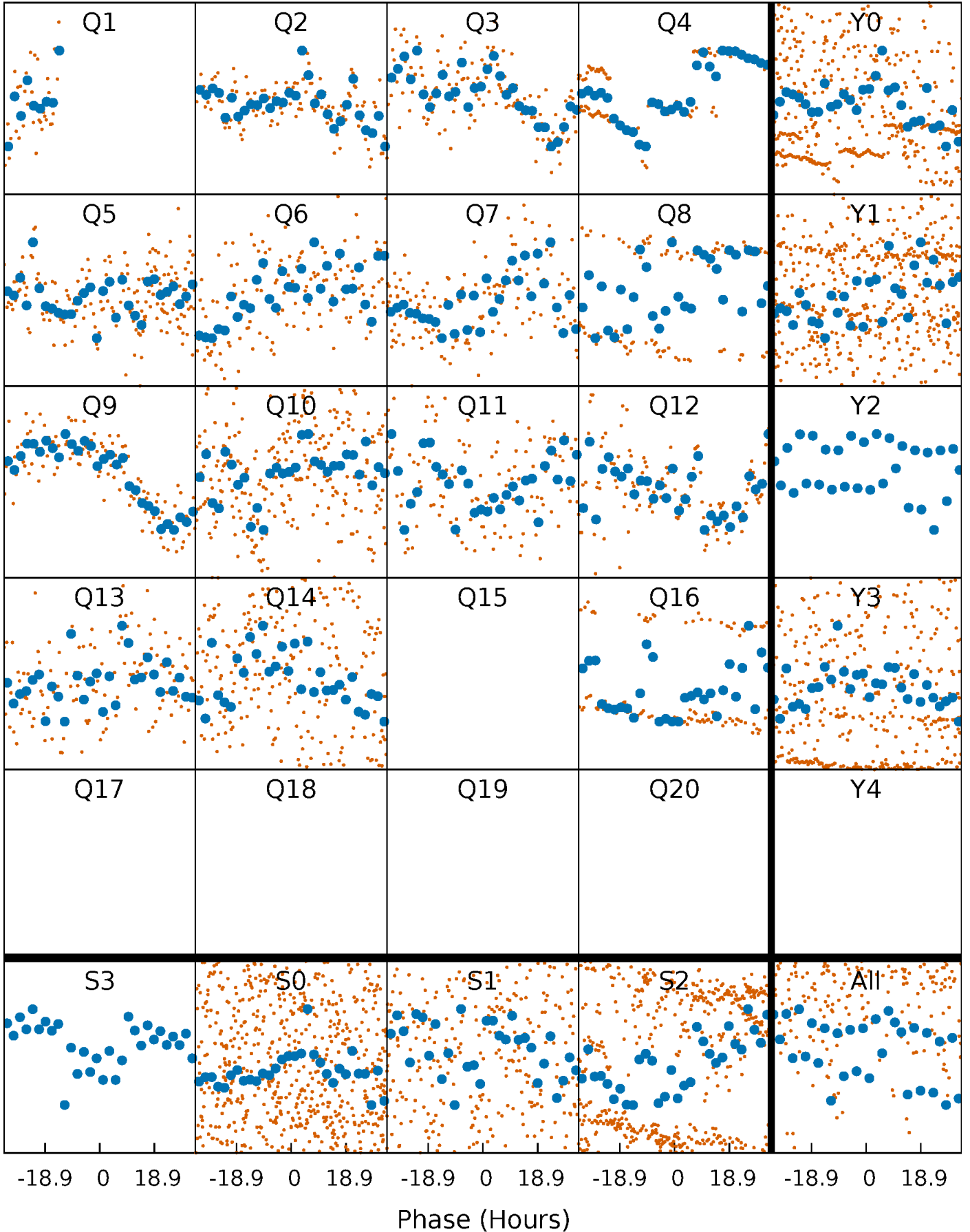


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

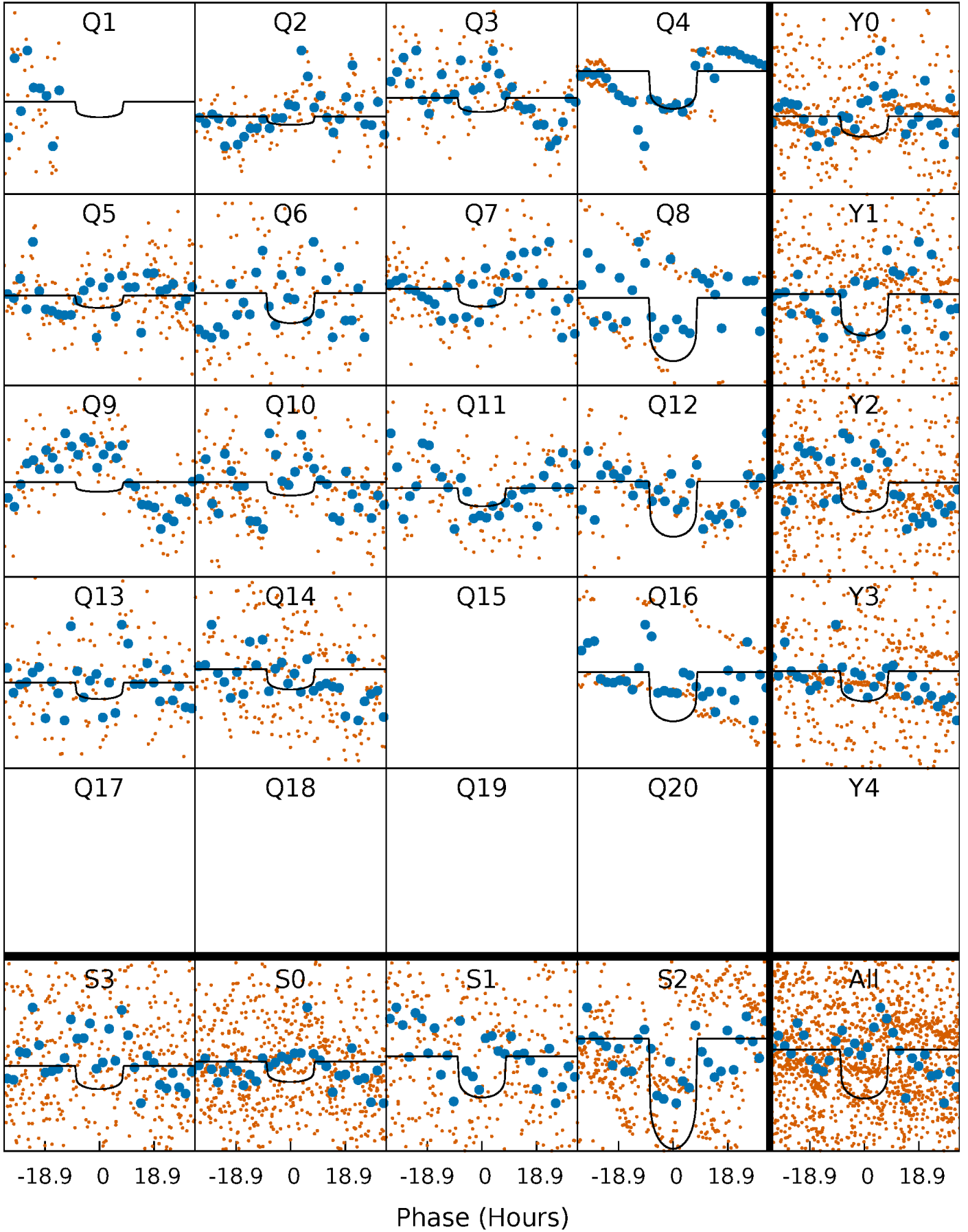
TCE 007880676-06 P= 69.390592 Days  $T_0=165.569874$  (BKJD)





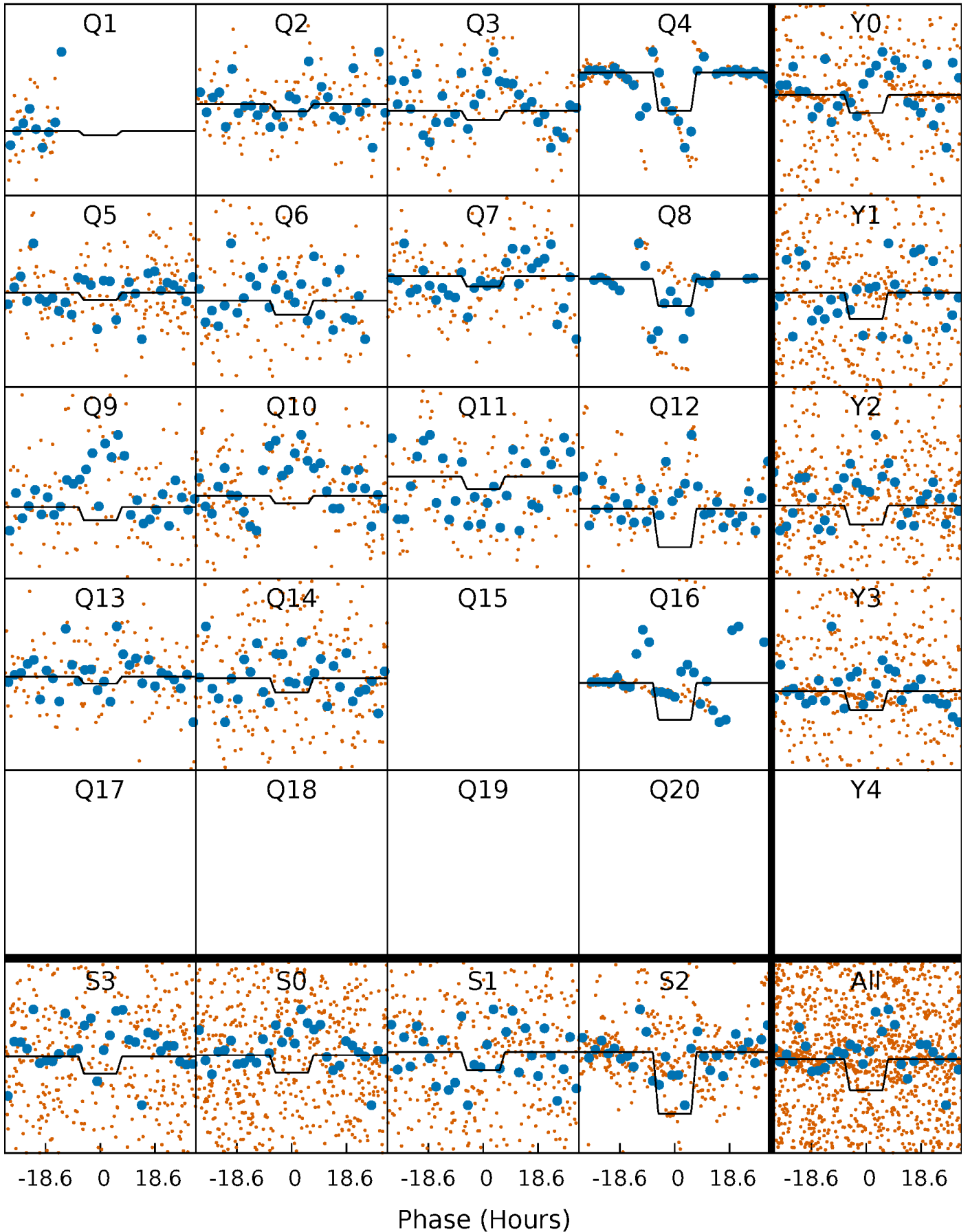
# DV Quarter-Phased Transit Curves

TCE 007880676-06     $P = 69.390592$  Days     $T_0 = 165.569874$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

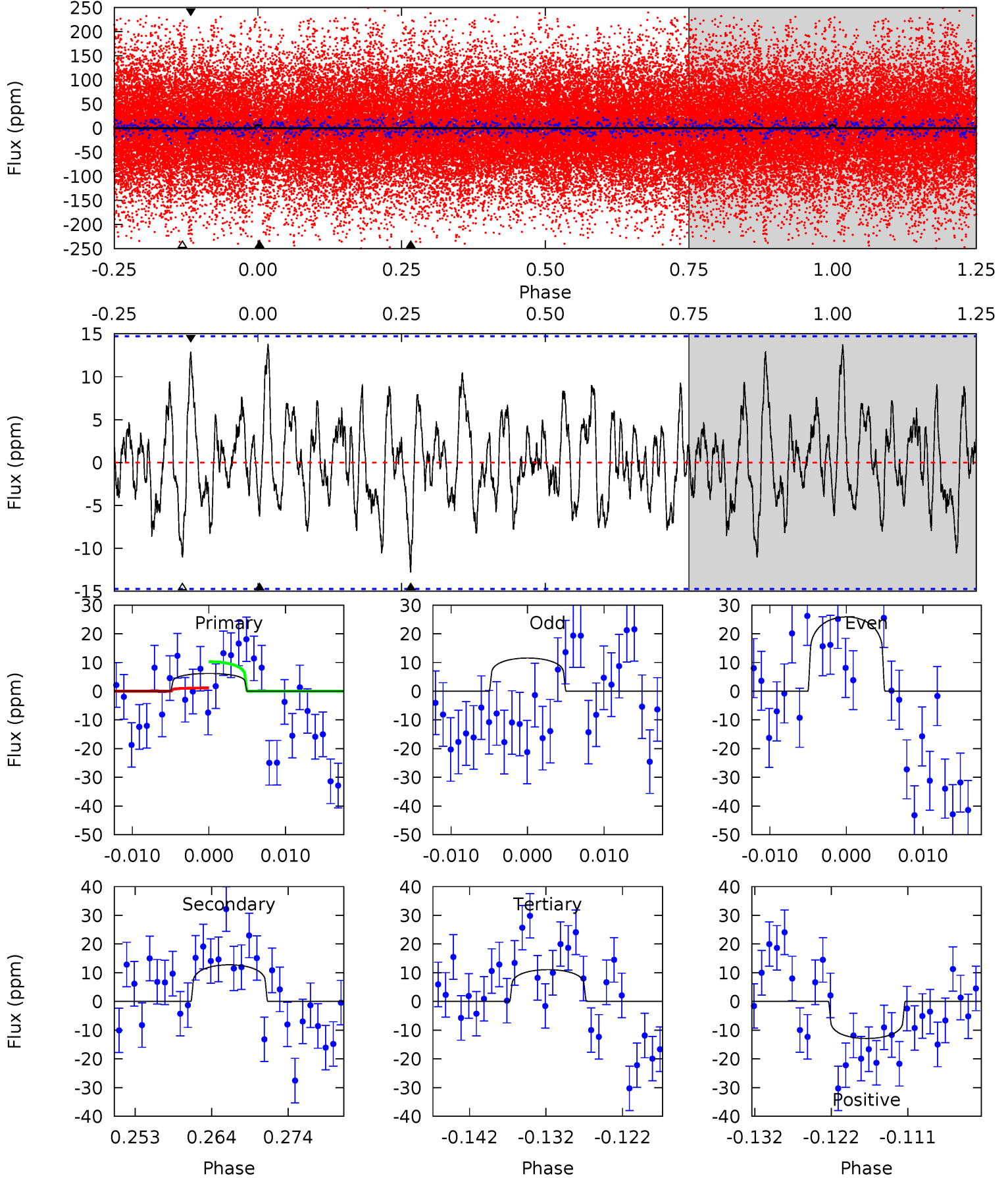
TCE 007880676-06 P= 69.395704 Days  $T_0=165.565150$  (BKJD)



# DV Model-Shift Uniqueness Test

007880676-06, P = 69.390592 Days, E = 96.179282 Days

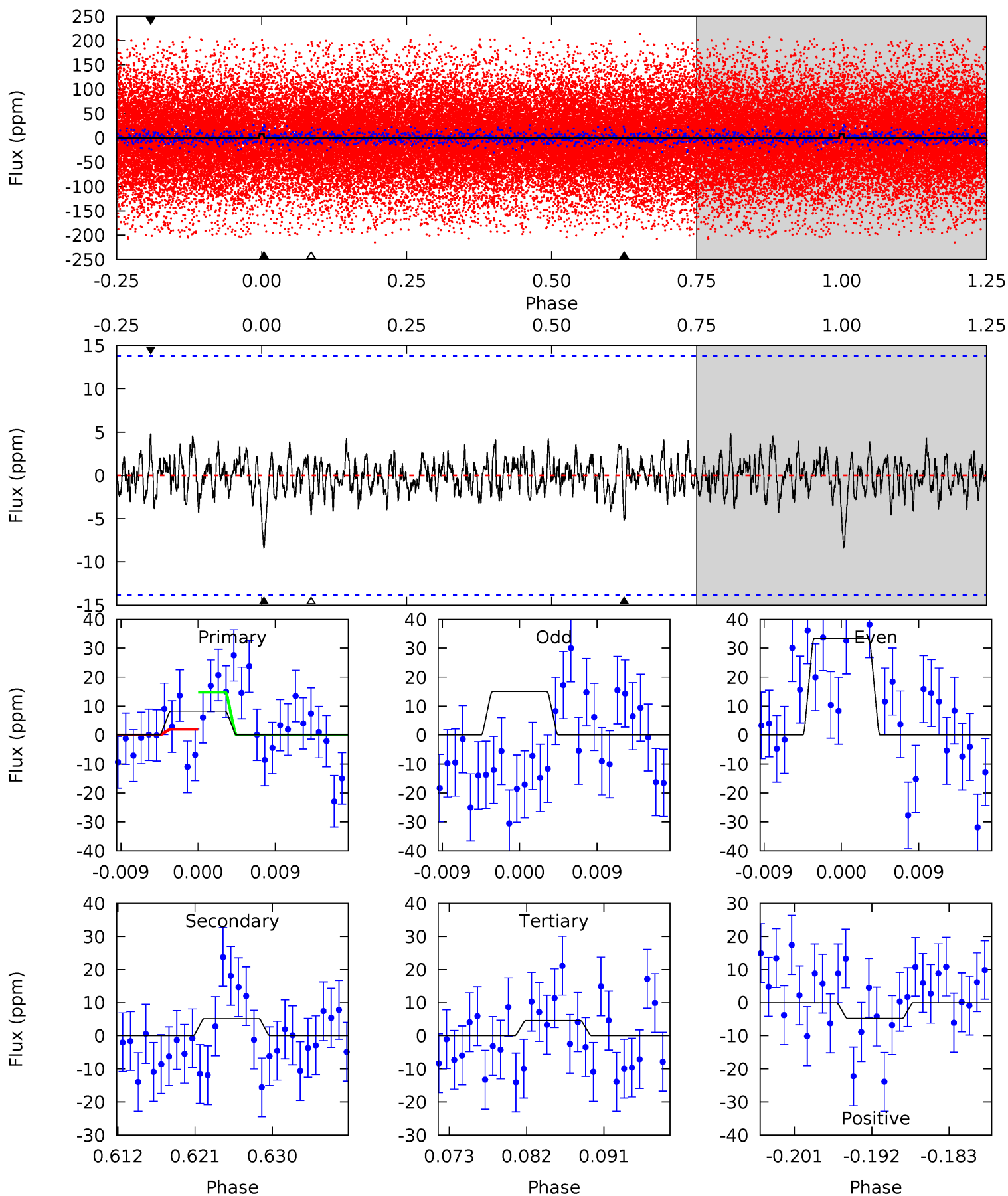
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.11	4.36	3.78	4.40	5.02	2.57	1.47	-1.67	-2.29	0.58	-0.04	2.44	-1.11	0.52	1.57



# Alt Model-Shift Uniqueness Test

007880676-06, P = 69.395704 Days, E = 96.169446 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.02	1.89	1.67	1.76	5.04	2.61	0.59	1.35	1.27	0.22	0.13	3.36	110.1	0.37	2.37



### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-13 \pm 3$	$1.17^{+0.14}_{-0.15}$	$884^{+13}_{-12}$	$5035^{+392}_{-347}$	$659^{+259}_{-193}$
Alt.	$-5 \pm 3$	$0.85^{+0.14}_{-0.14}$	$885^{+13}_{-13}$	$4750^{+641}_{-621}$	$500^{+381}_{-254}$

$T_{max}$  = 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

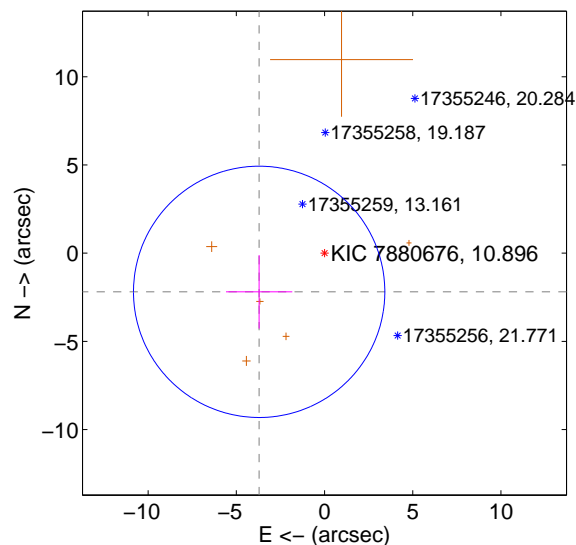
Supplemental centroid analysis for 007880676-06. **Kepler magnitude: 10.90.** Transit SNR 11.63

**There are 0 quarters with good PRF difference image offsets**

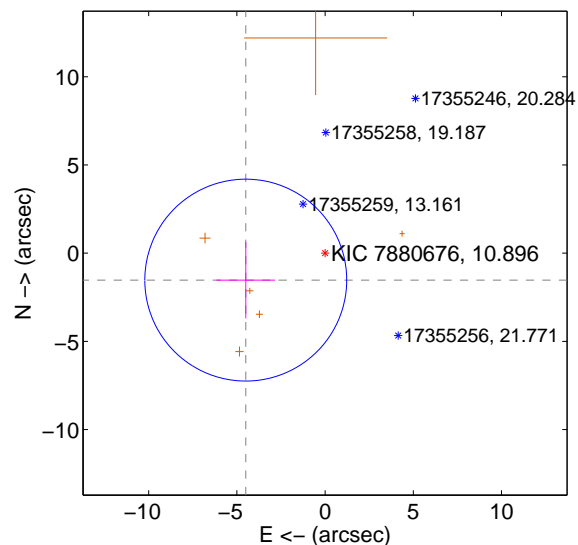
The direct PRF centroid is offset from the target star catalog position by about 1.99 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.307 \pm 2.375$	1.81	$3.707 \pm 1.881$	$-2.193 \pm 2.085$
PRF-fit source offset from KIC position	$4.750 \pm 1.908$	2.49	$4.498 \pm 1.665$	$-1.527 \pm 2.168$
photometric centroid source offset	$3.37 \pm 1.47$	2.30	$1.68 \pm 1.35$	$2.92 \pm 1.50$

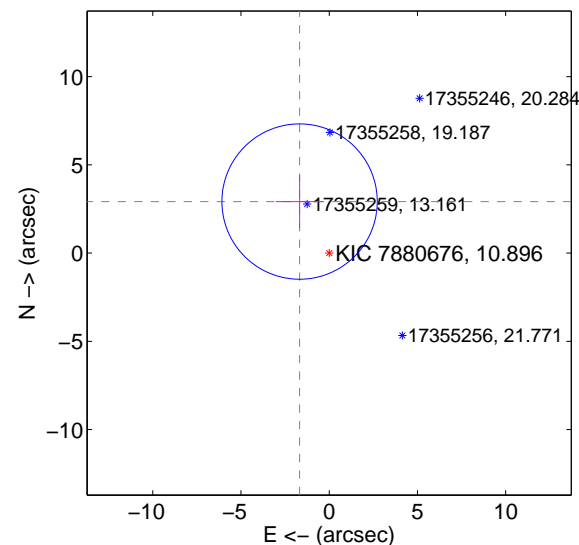
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

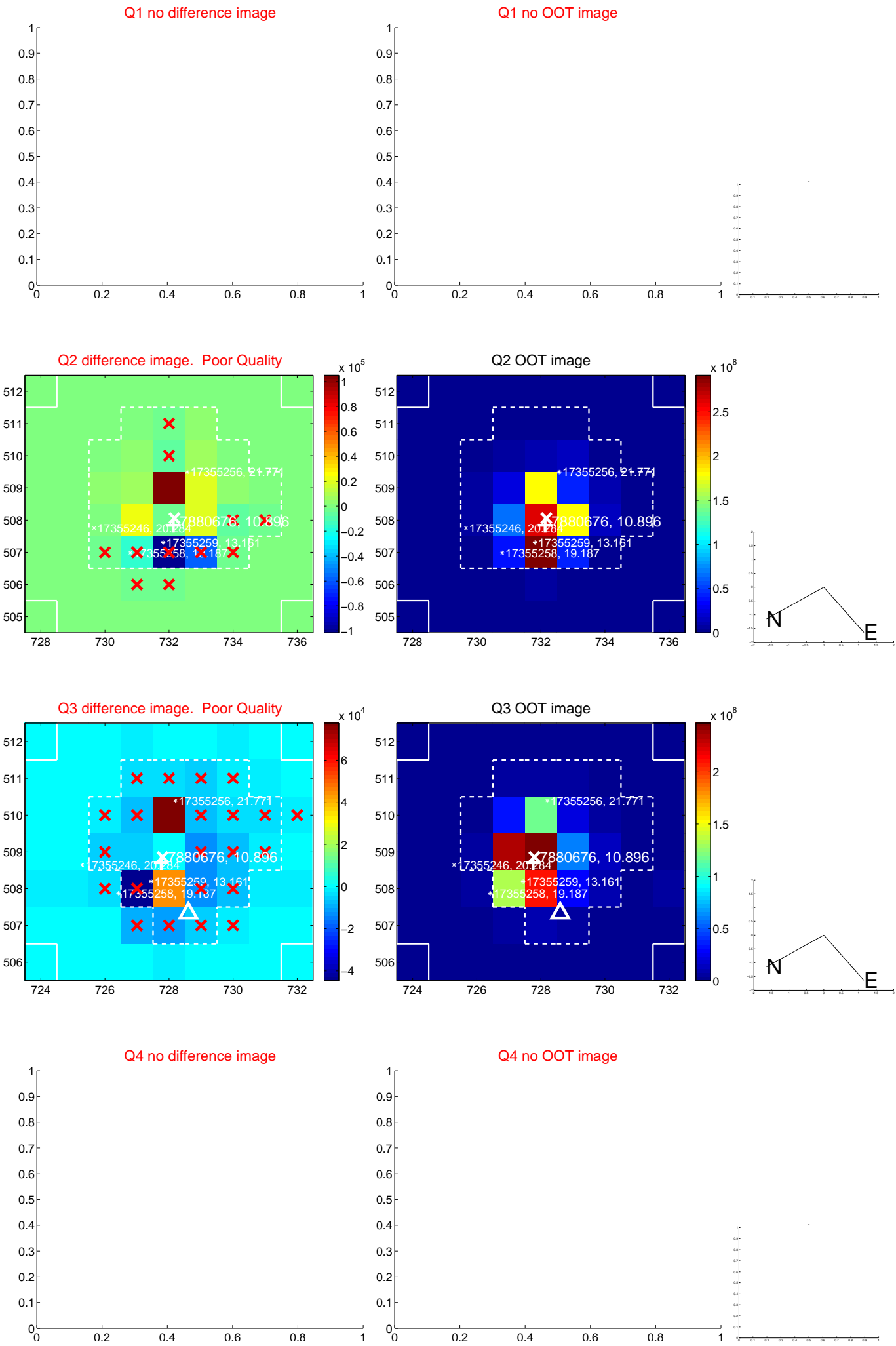


offset from photometric centroids

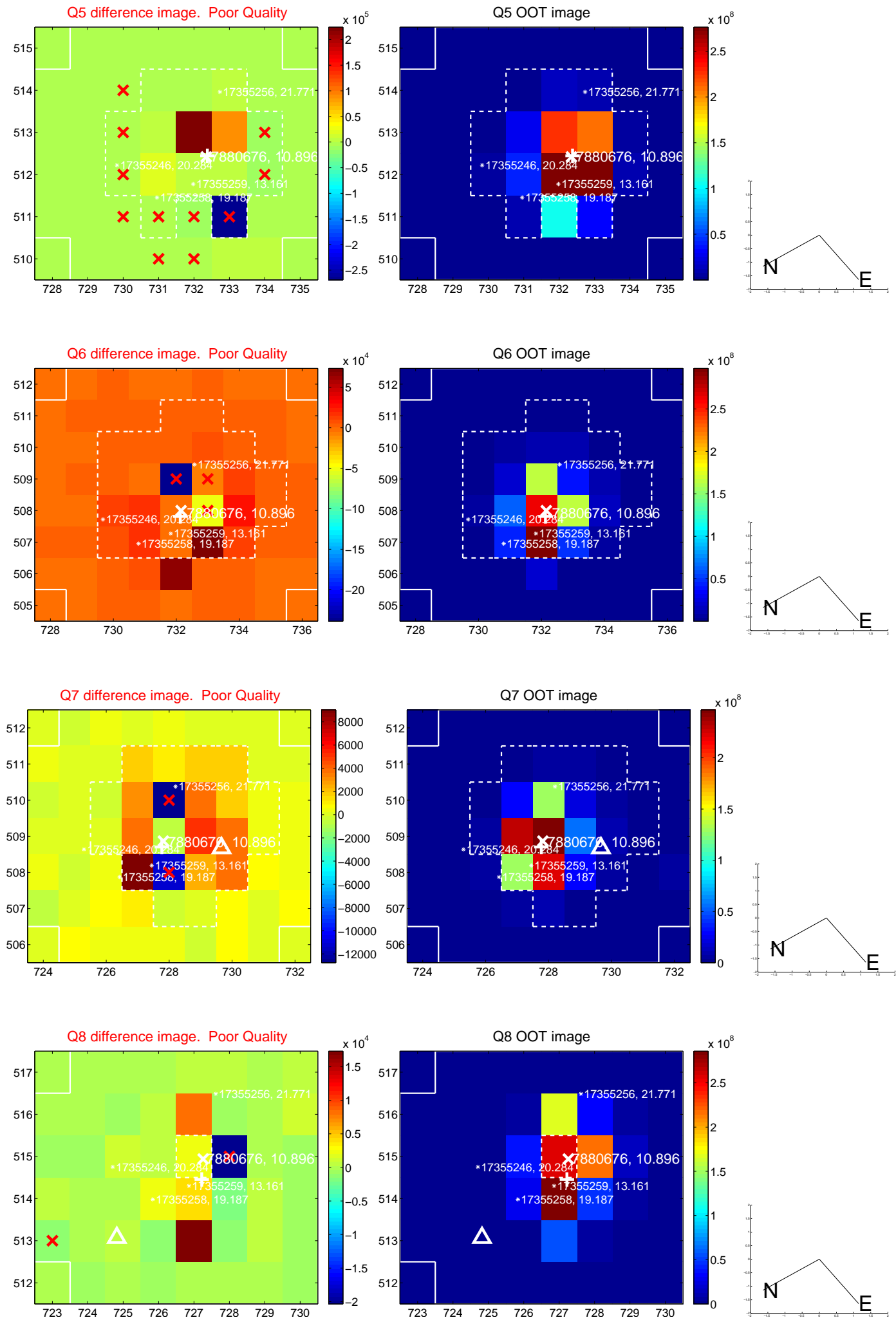


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

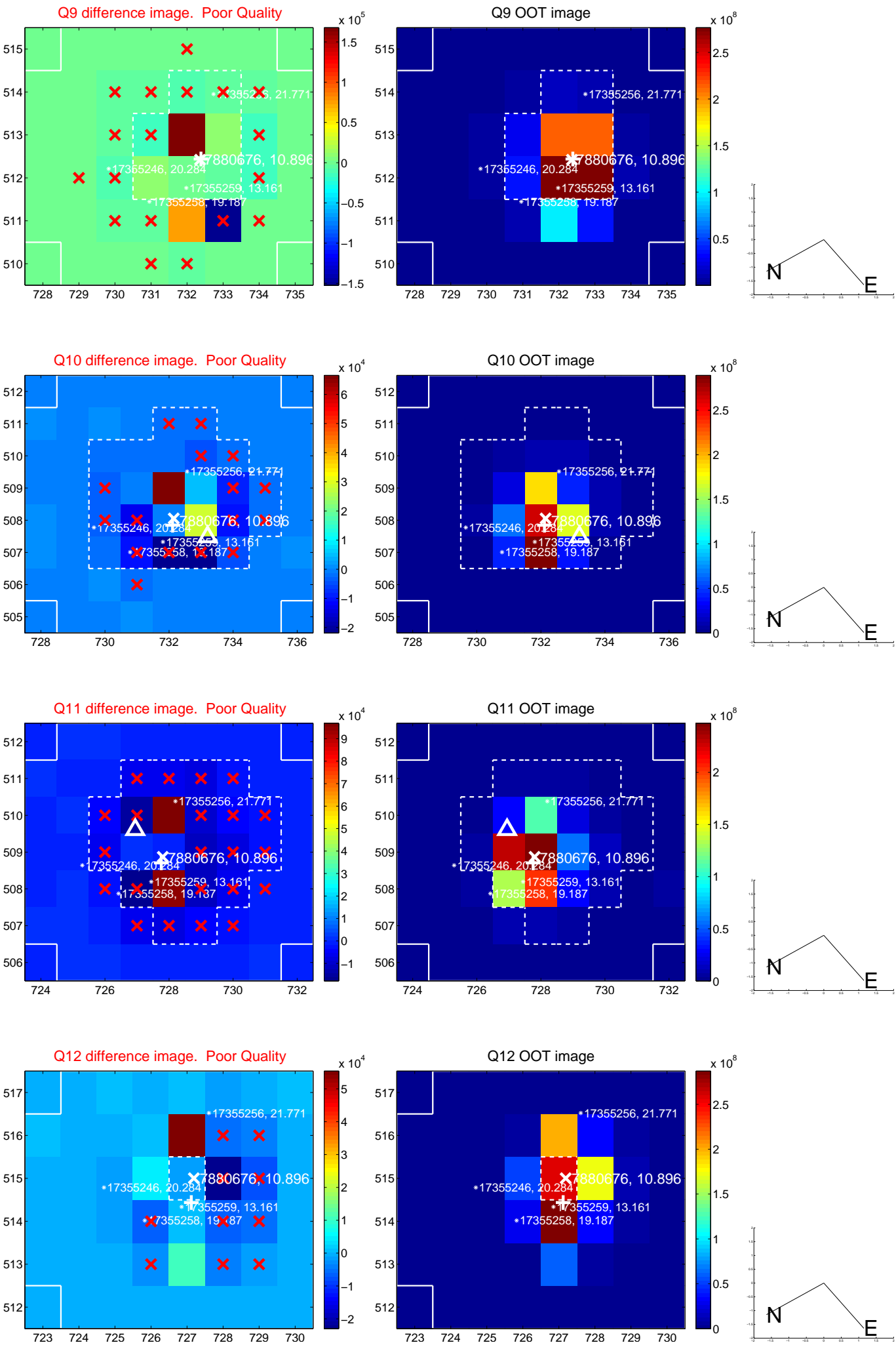


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

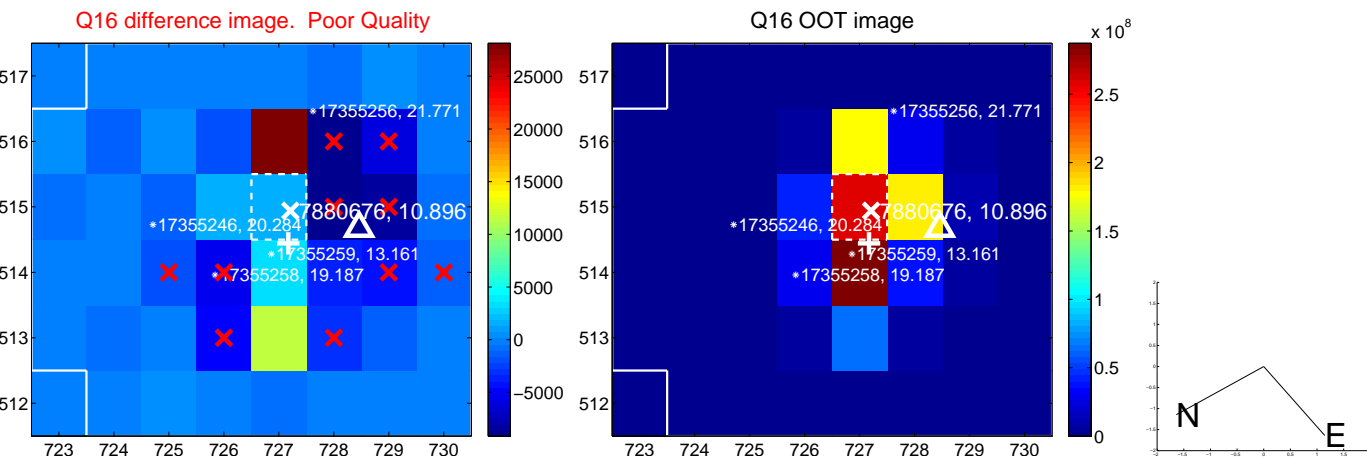
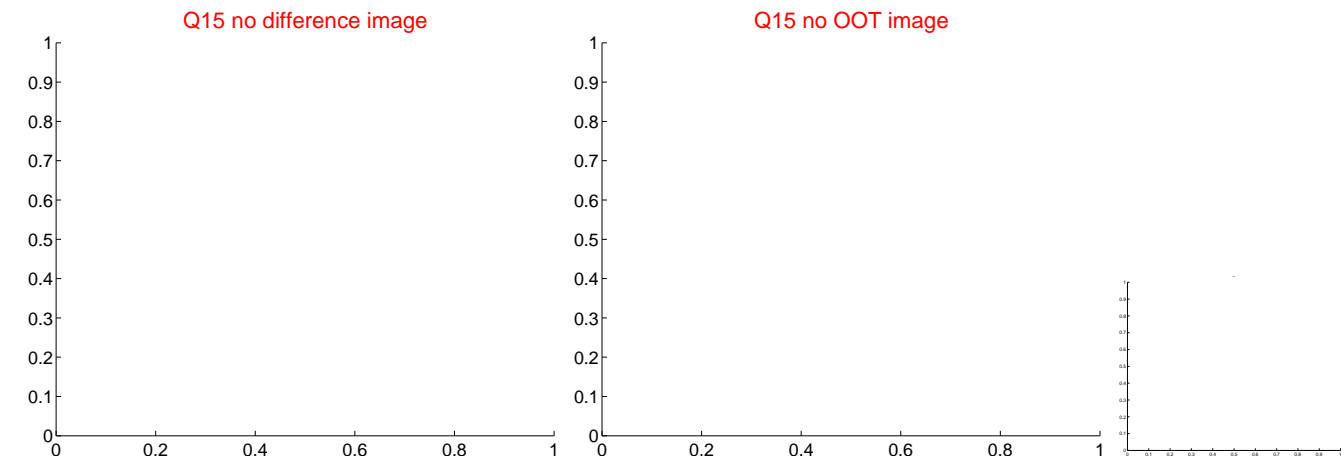
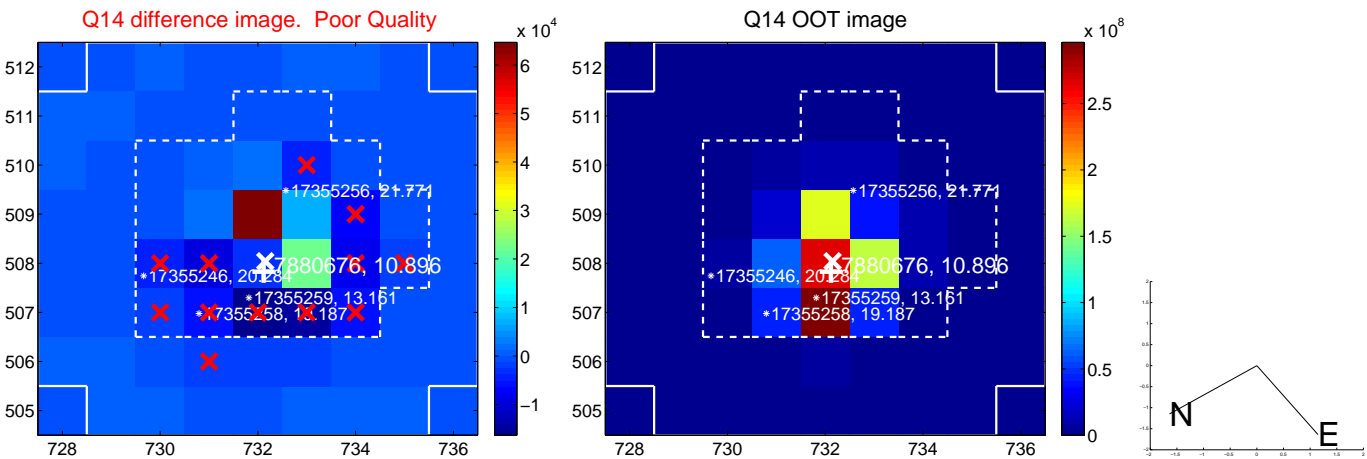




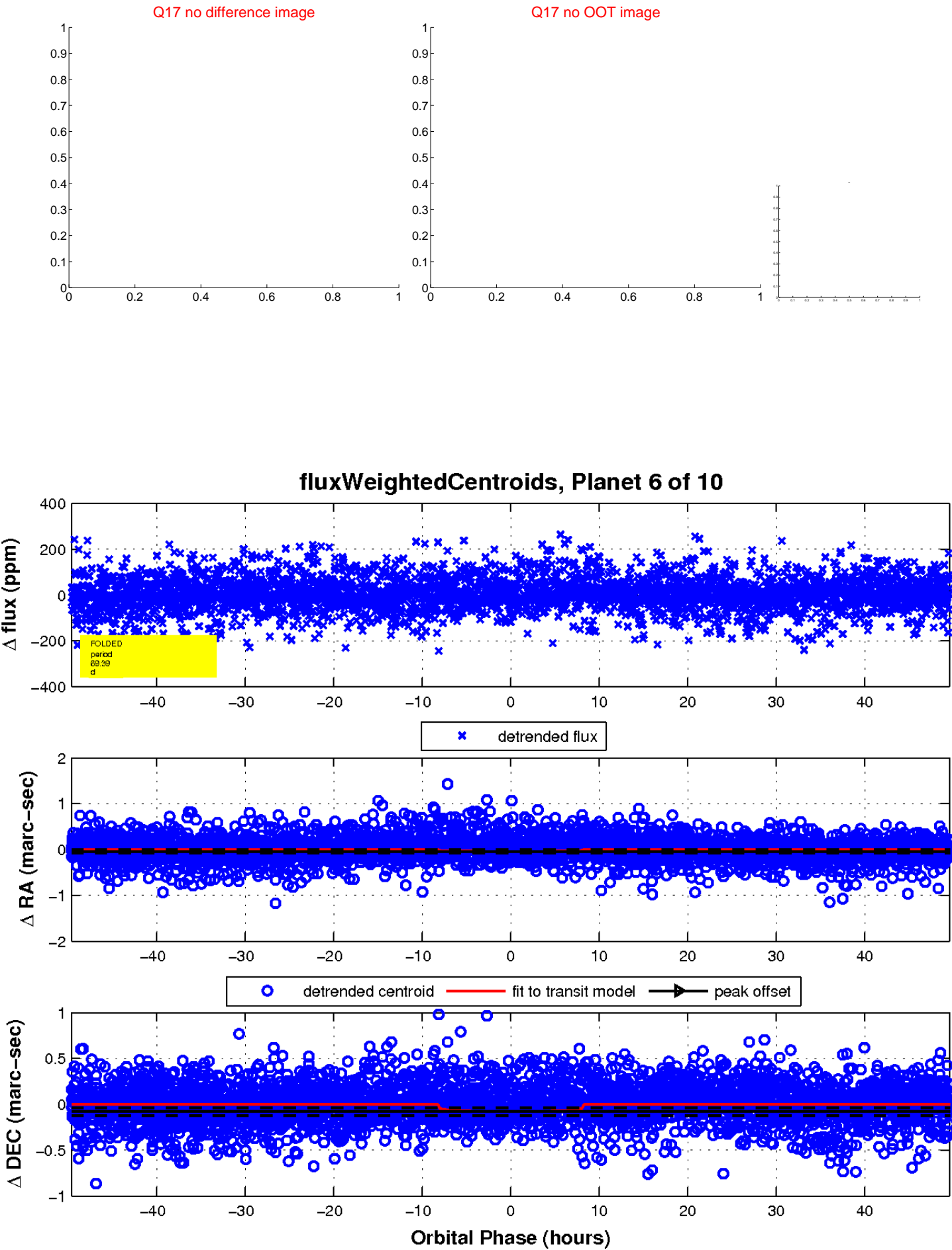
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

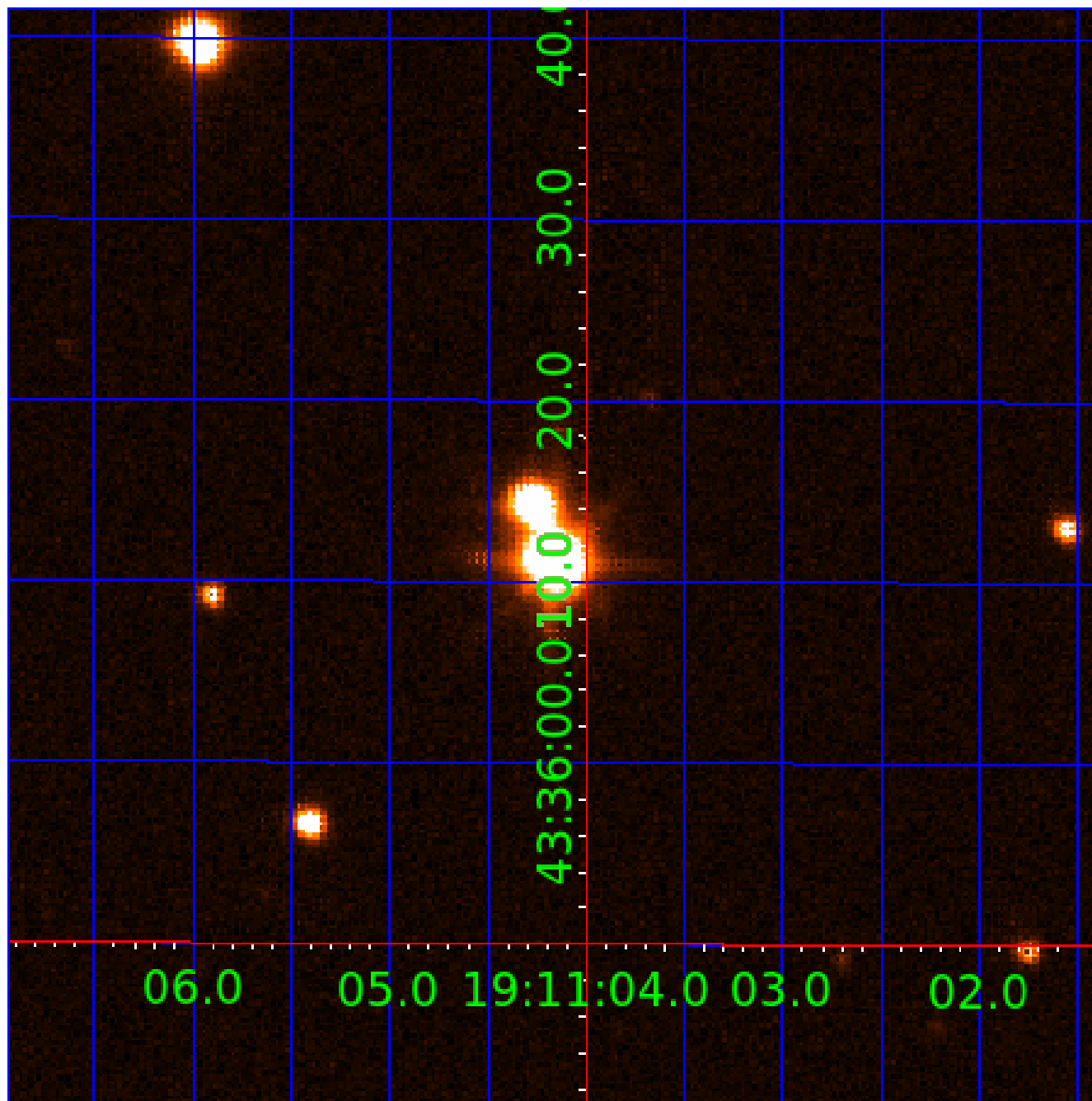


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## KIC 007880676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007880676-01	OBS	No	74.700898	193.436167	18.8	1.598	31.4	2.9	1.96	6129	1.00	34.52
007880676-02	OBS	No	544.696610	418.947989	55.4	9.071	18.7	19.0	1.96	6129	1.69	2.44
007880676-03	OBS	No	93.437611	139.301041	58.6	0.868	19.0	28.0	1.96	6129	1.53	25.61
007880676-04	OBS	No	149.986976	136.477266	48.9	3.061	18.7	14.8	1.96	6129	1.37	13.63
007880676-05	OBS	No	49.327158	139.760525	11.7	11.019	14.0	6.8	1.96	6129	0.76	60.03
007880676-06	OBS	No	69.390592	165.569874	29.3	16.554	13.7	11.6	1.96	6129	1.17	38.08
007880676-07	OBS	No	64.361879	185.581530	60.1	2.287	19.3	24.3	1.96	6129	1.73	42.10
007880676-08	OBS	No	94.170624	203.456516	15.9	8.738	13.3	6.8	1.96	6129	0.91	25.35
007880676-09	OBS	No	75.849882	138.940758	46.7	1.755	17.5	8.4	1.96	6129	1.63	33.82
007880676-10	OBS	No	78.737554	157.099189	20.9	12.578	12.9	8.0	1.96	6129	1.05	32.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007880676-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007880676-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-05	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
007880676-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-08	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-09	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-10	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

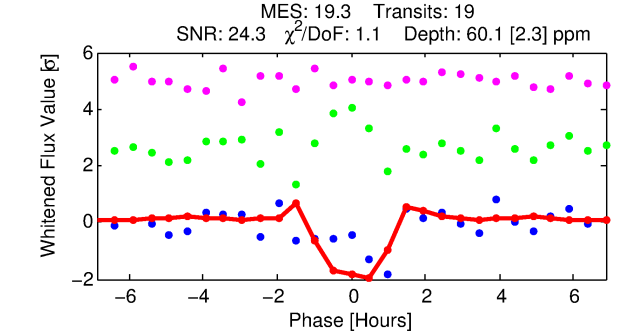
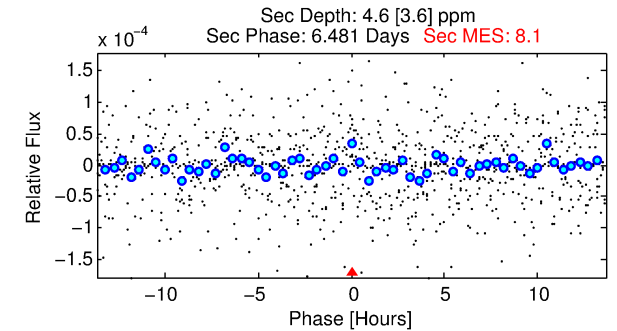
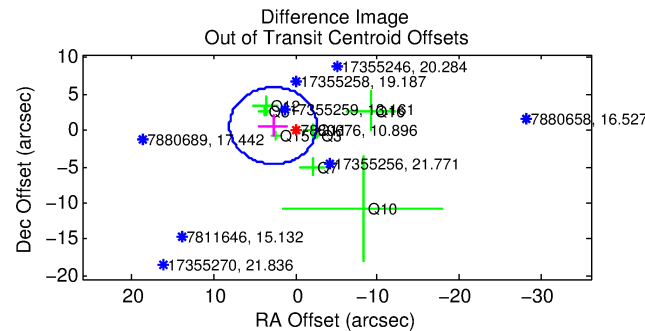
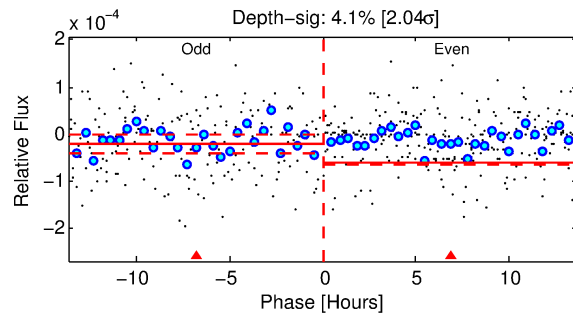
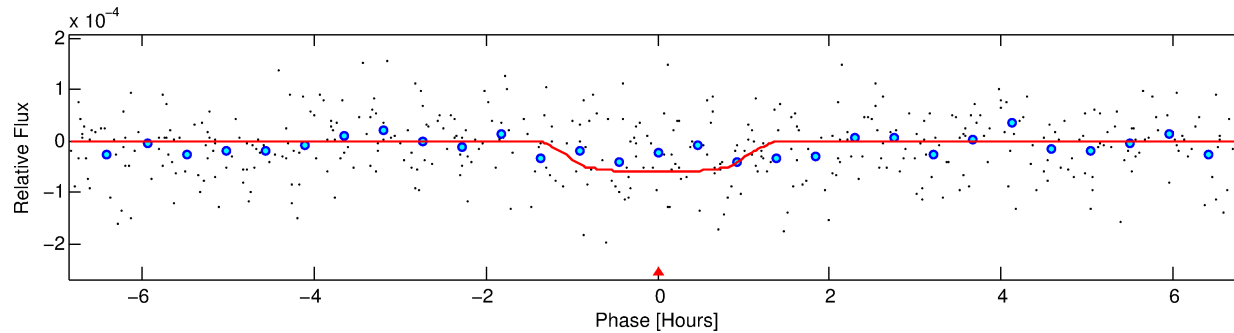
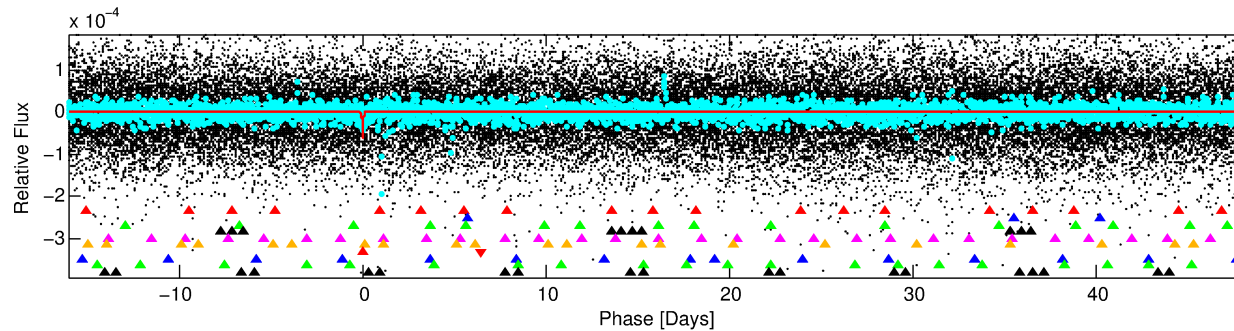
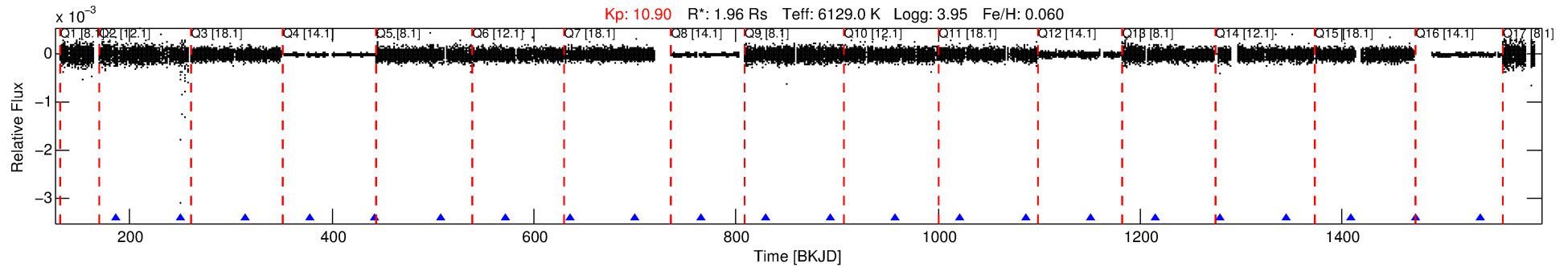
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-07

No Significant Match Found

# DV One-Page Summary

KIC: 7880676 Candidate: 7 of 10 Period: 64.362 d



## DV Fit Results:

Period = 64.36188 [0.00022] d  
Epoch = 185.5815 [0.0018] BKJD  
Rp/R\* = 0.0081 [0.0015]  
a/R\* = 114.83 [111.77]  
b = 0.86 [0.31]  
Seff = 42.10 [2.85]  
Teq = 650 [11] K  
Rp = 1.73 [0.35] Re  
a = 0.3395 [0.0148] AU  
Ag = 97.27 [85.14] [1.13σ]  
Teffp = 3154 [690] K [3.63σ]

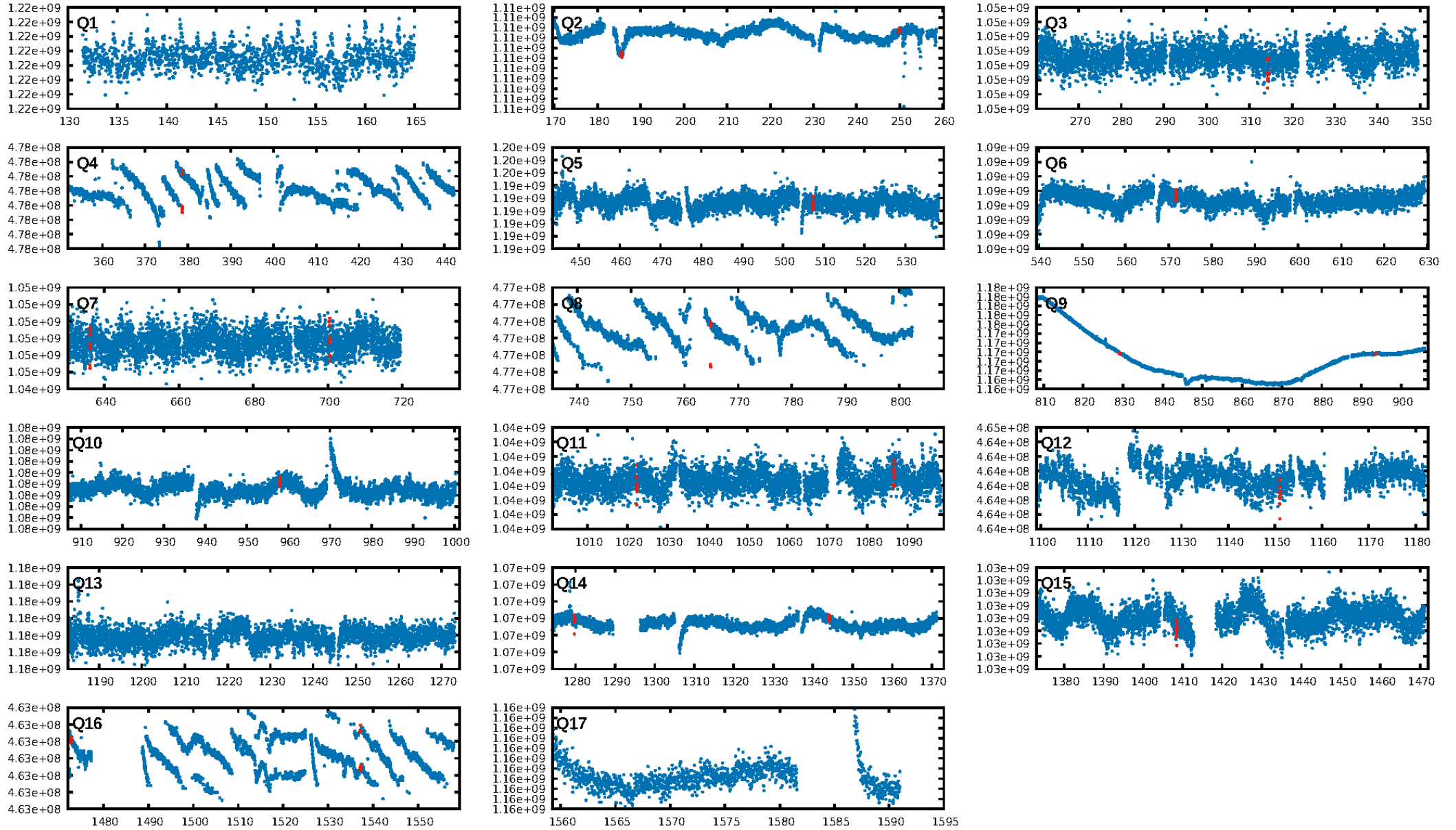
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [32.06σ]  
LongPeriod-sig: 100.0% [7.22σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 80.4%  
Bootstrap-pfa: 4.75e-11  
RollingBand-fgt: 1.00 [19/19]  
GhostDiagnostic-chr: -4.155  
Centroid-sig: 97.3%  
Centroid-so: 0.203 arcsec [0.19σ]  
OotOffset-rm: 2.817 arcsec [1.59σ]  
OotOffset-st: 2/4/2/1 [9]  
KicOffset-rm: 3.212 arcsec [1.85σ]  
KicOffset-st: 2/4/2/1 [9]  
DiffImageQuality-fgm: 0.33 [3/9]  
DiffImageOverlap-fno: 0.92 [12/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:06:53 Z

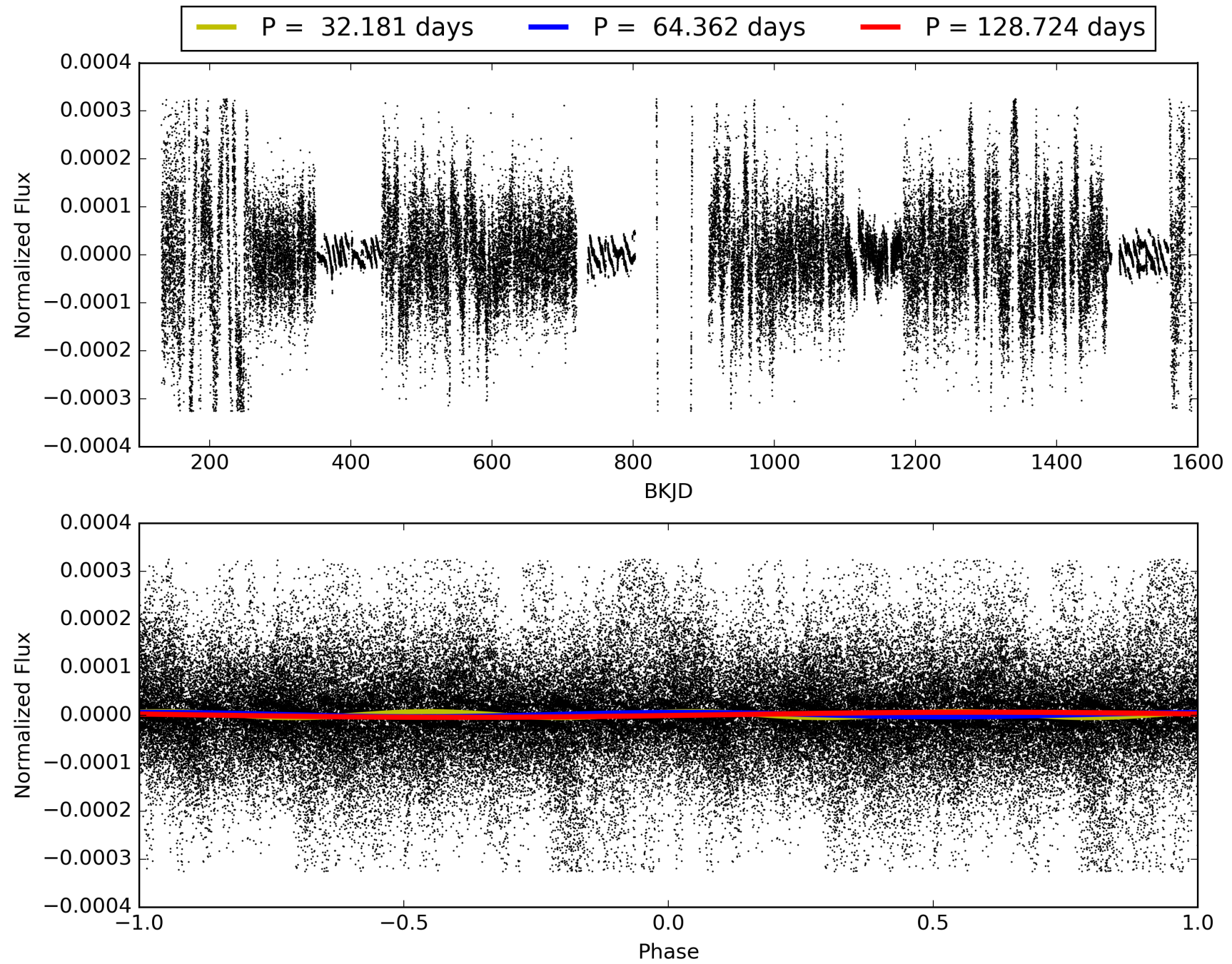
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007880676-07, PDC Light Curves





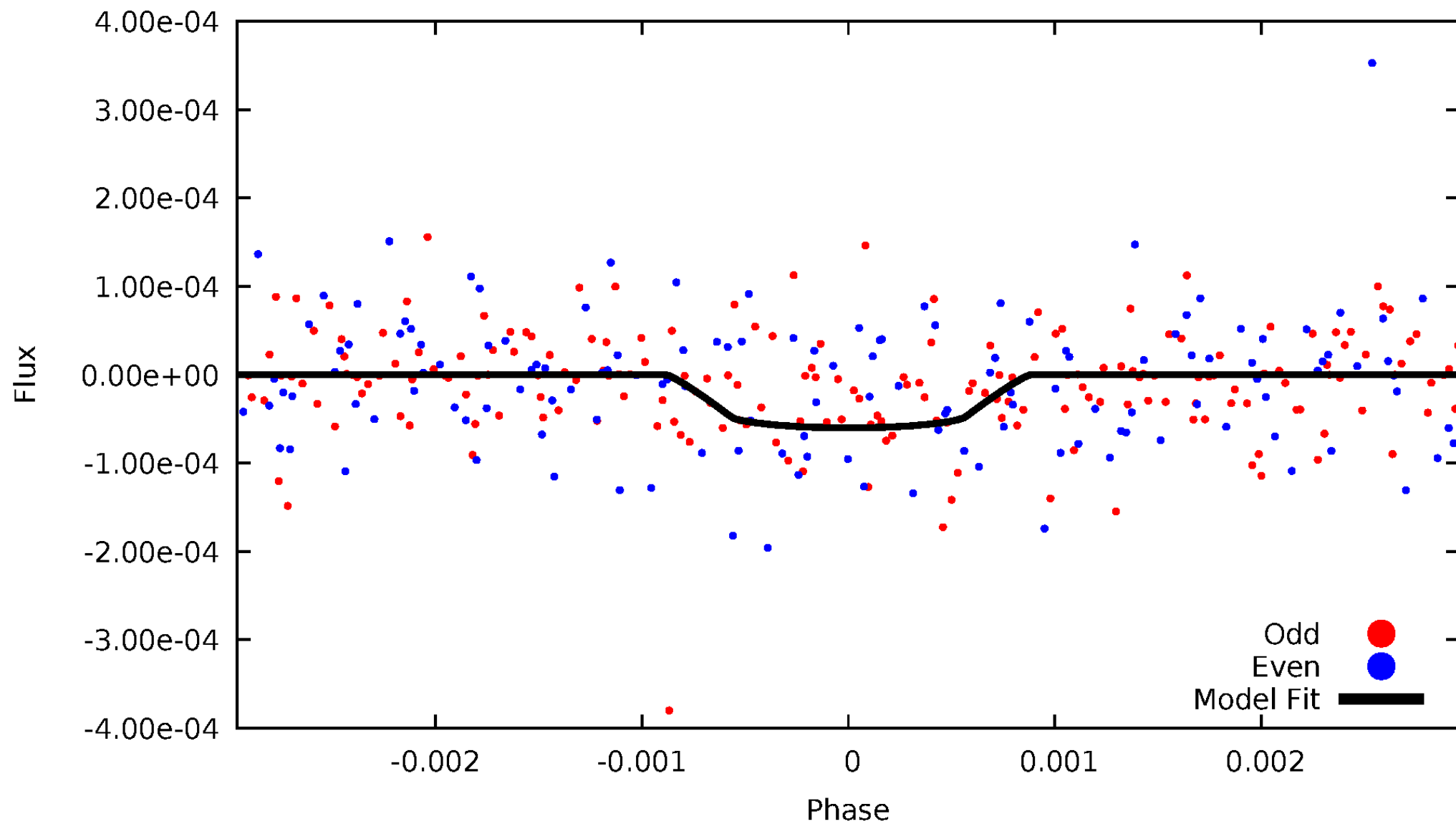
TCE 007880676-07





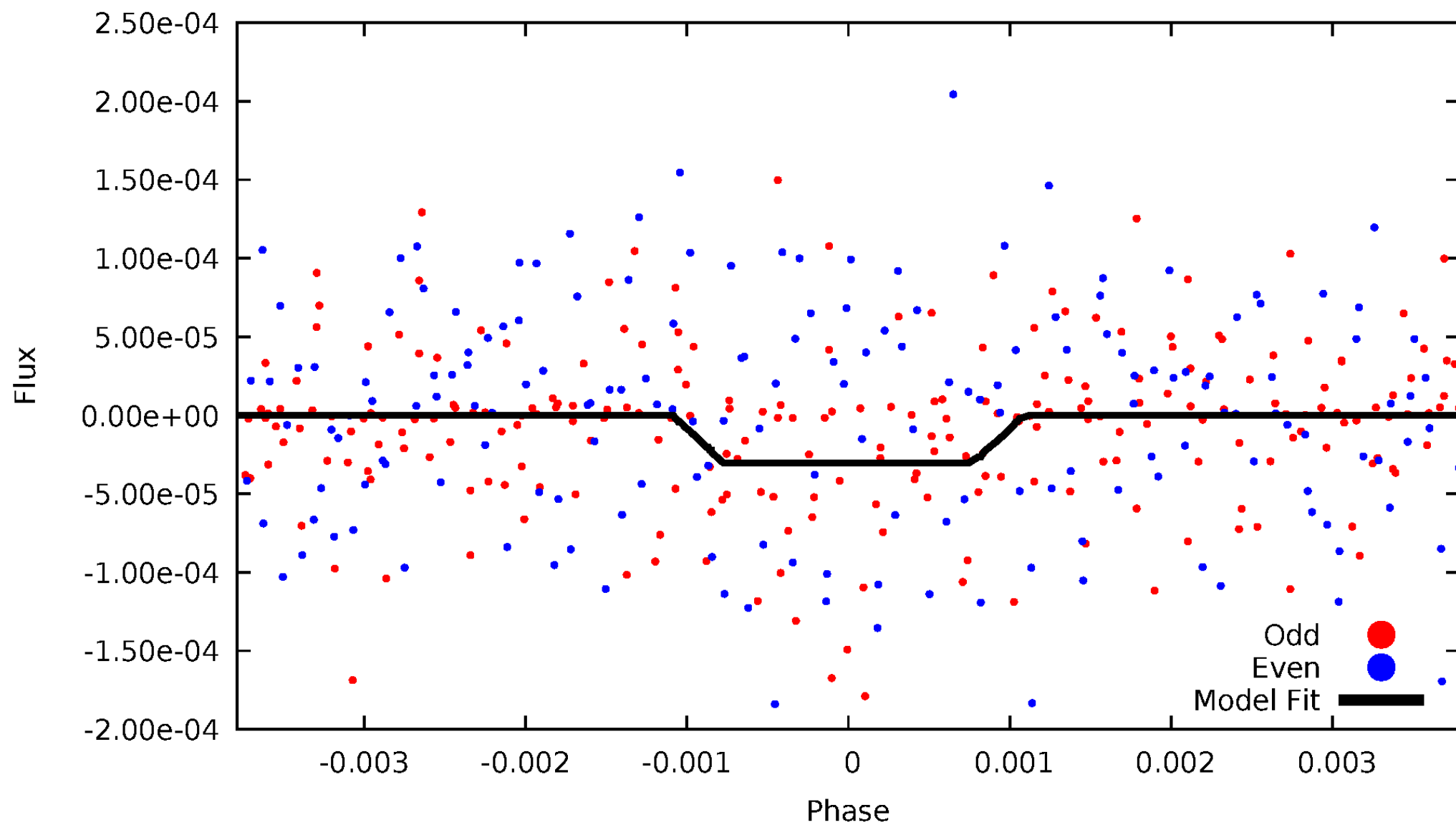
# DV Odd/Even

TCE 007880676-07



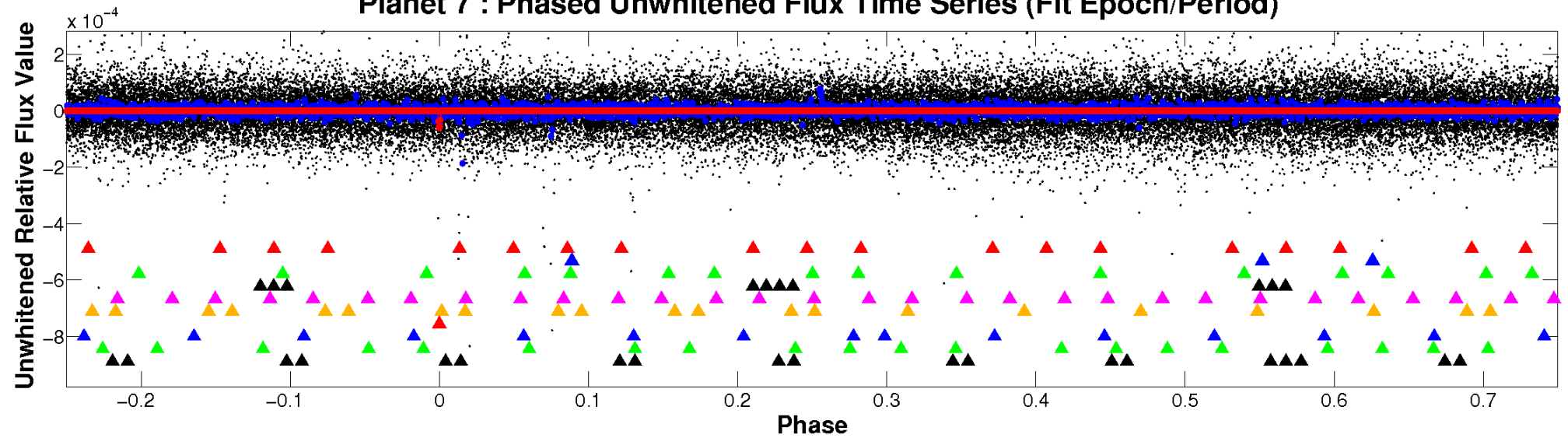
# ALT Odd/Even

TCE 007880676-07

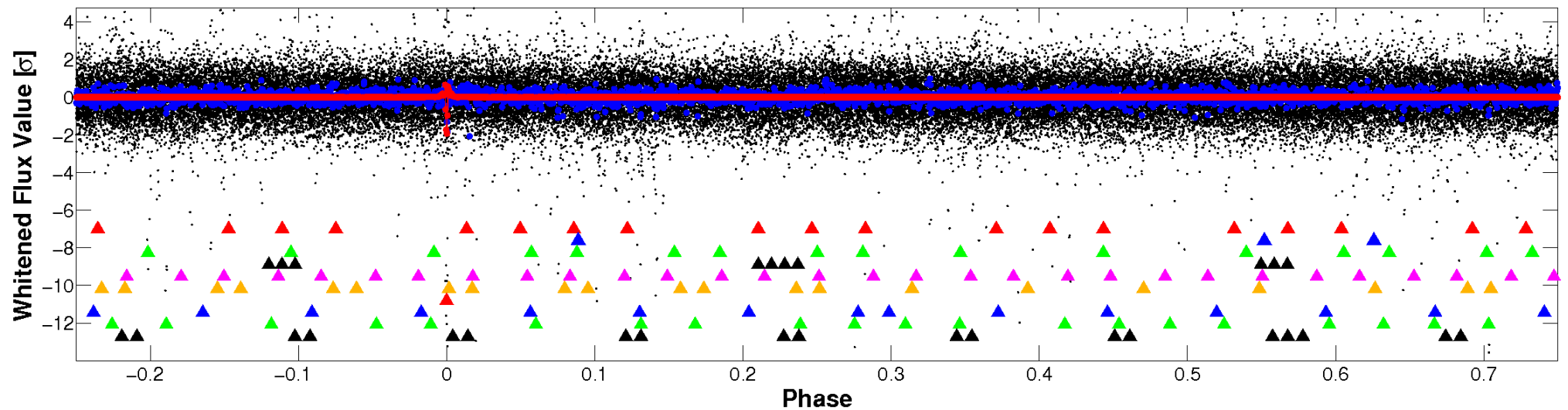


# Non-Whitened Vs. Whitened Light Curve

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

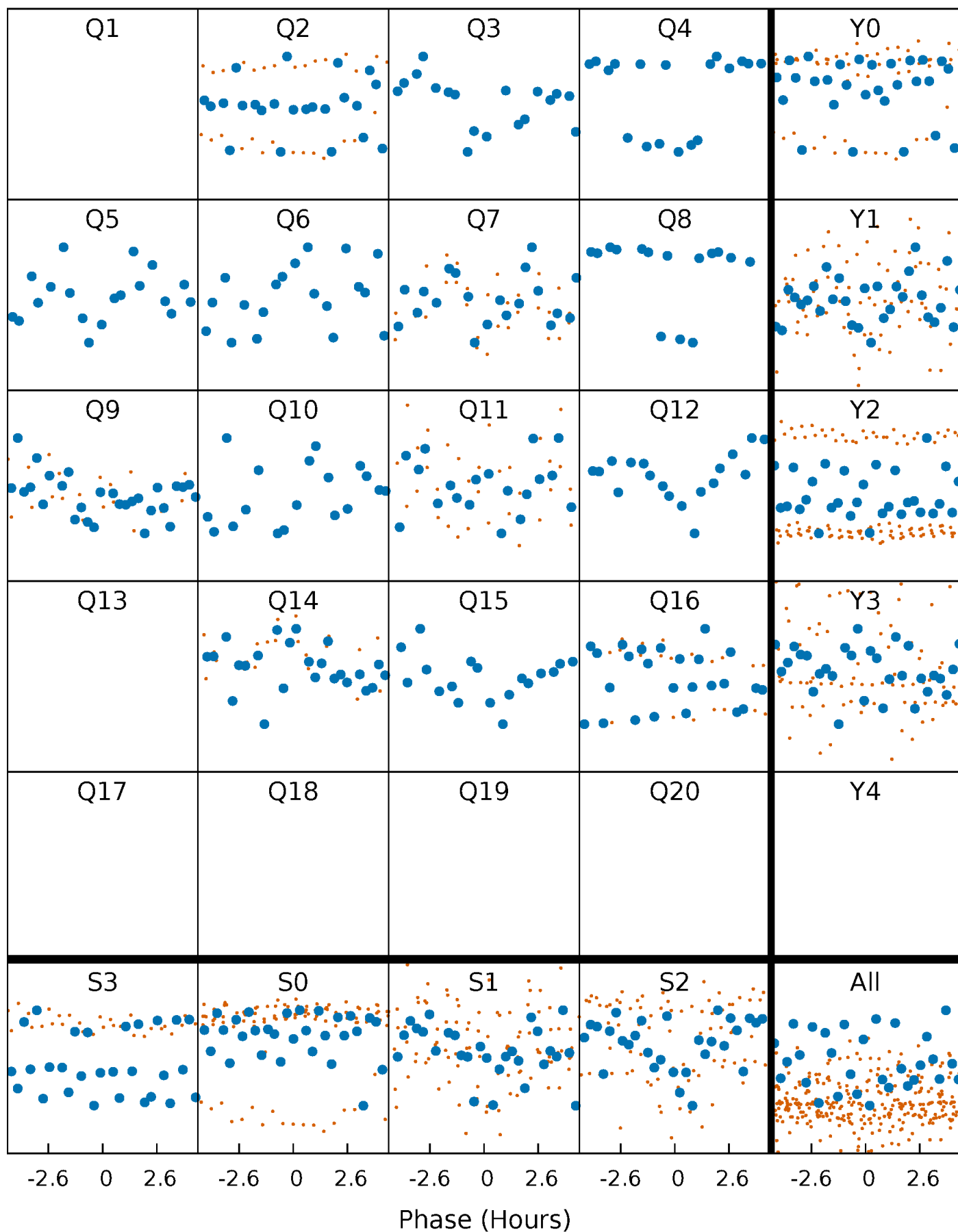


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



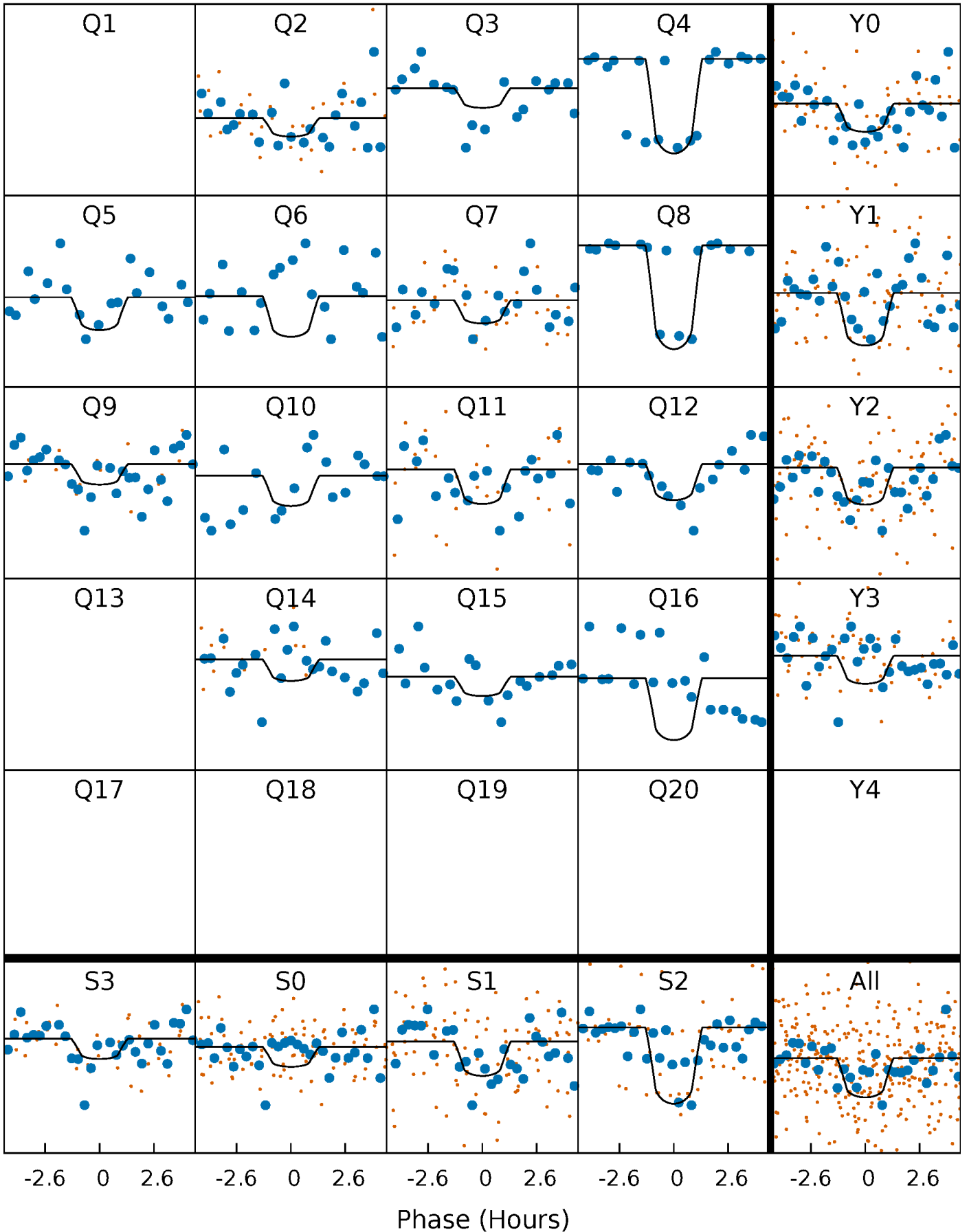
# PDC Quarter-Phased Transit Curves

TCE 007880676-07 P= 64.361879 Days  $T_0=185.581530$  (BKJD)



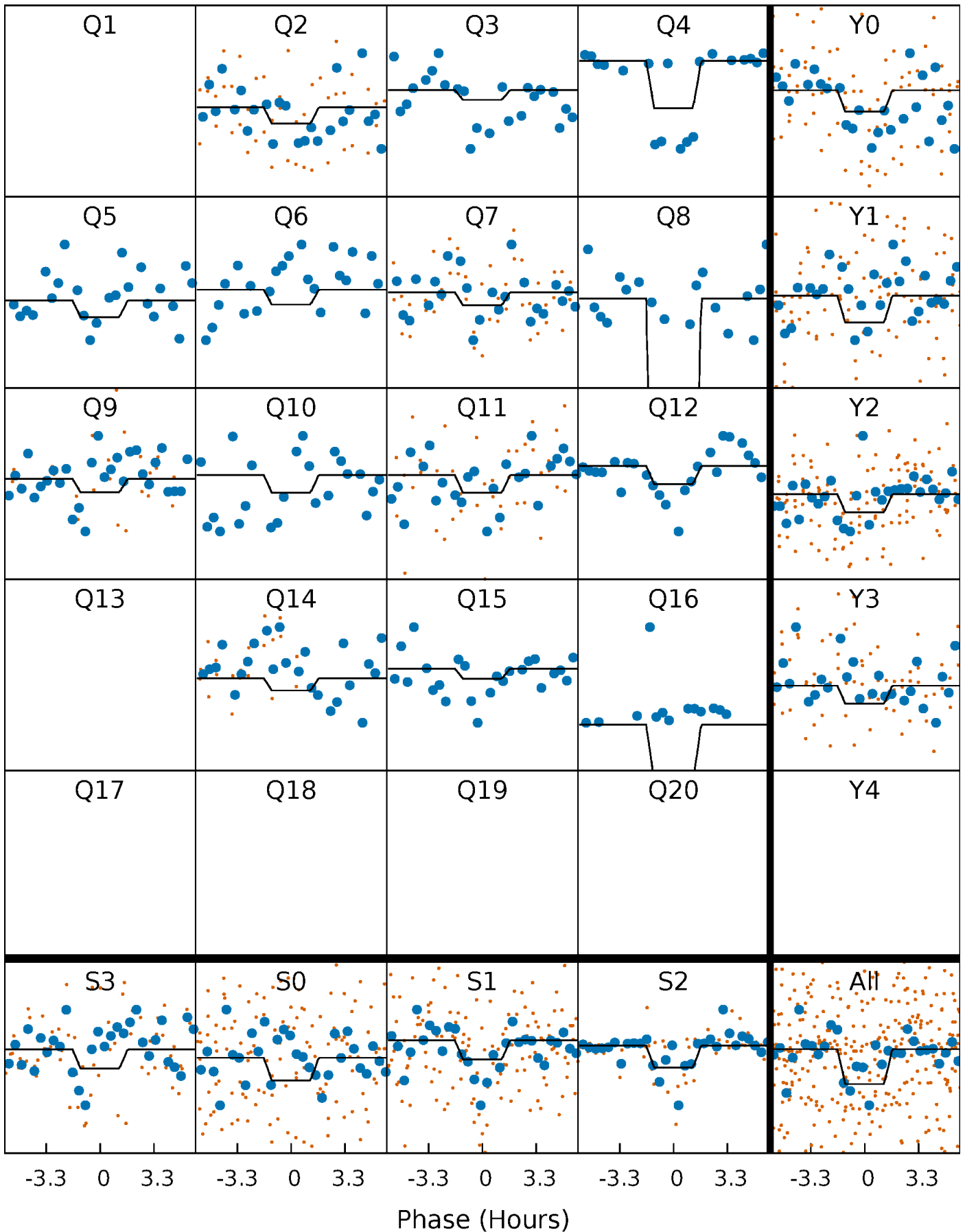
# DV Quarter-Phased Transit Curves

TCE 007880676-07     $P = 64.361879$  Days     $T_0 = 185.581530$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

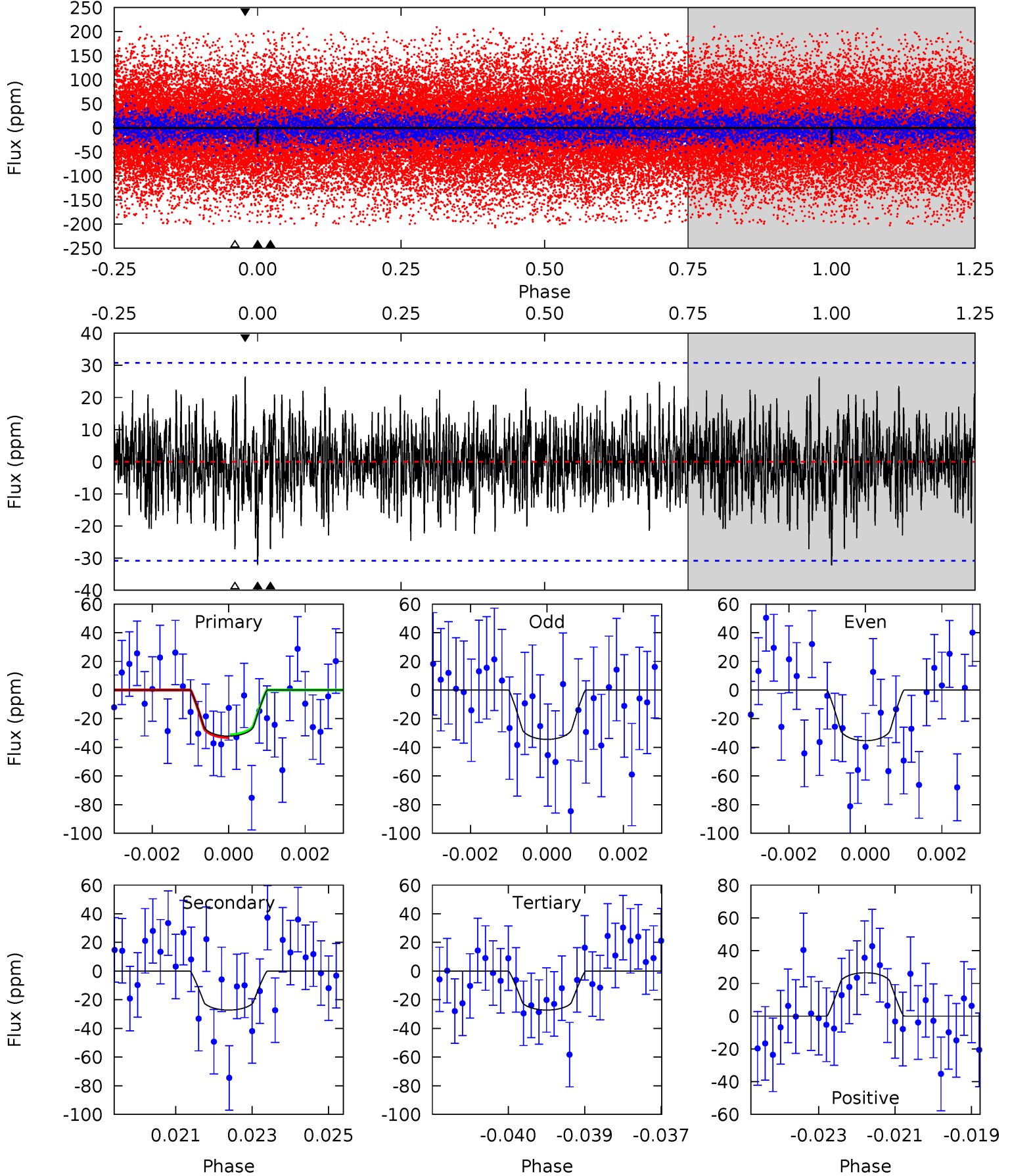
TCE 007880676-07     $P = 64.364558$  Days     $T_0 = 185.569450$  (BKJD)



# DV Model-Shift Uniqueness Test

007880676-07, P = 64.361879 Days, E = 121.219651 Days

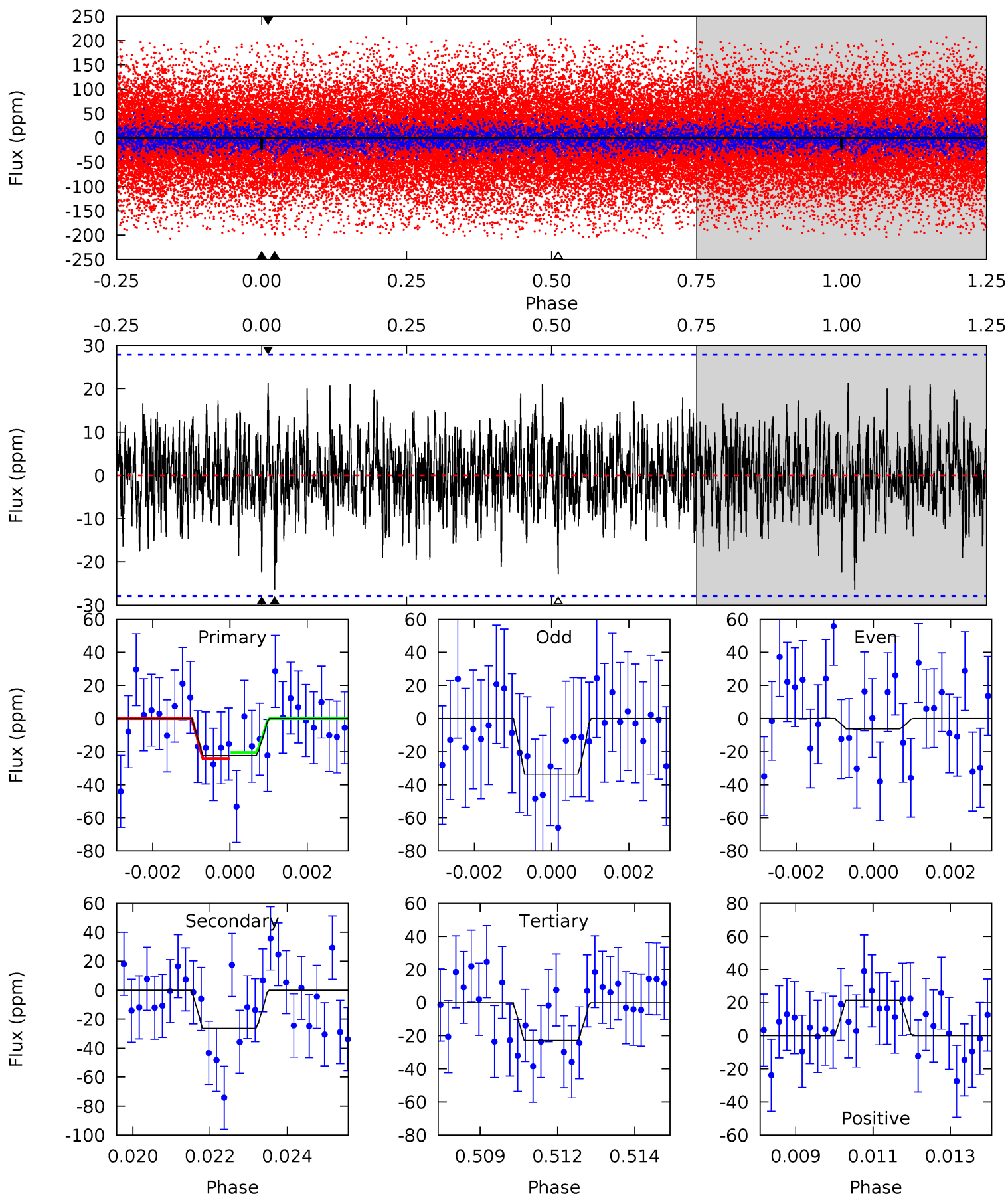
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.59	4.72	4.72	4.60	5.35	3.13	1.43	0.87	0.99	0.00	0.12	0.08	0.81	0.45	0.17



# Alt Model-Shift Uniqueness Test

007880676-07, P = 64.364558 Days, E = 121.204892 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
4.28	5.02	4.35	4.07	5.31	3.06	1.27	-0.07	0.21	0.67	0.95	2.57	1.41	0.45	0.35





### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-27 \pm 6$	$1.73^{+0.34}_{-0.33}$	$907^{+14}_{-13}$	$5000^{+540}_{-438}$	$568^{+336}_{-207}$
Alt.	$-26 \pm 5$	$1.18^{+0.33}_{-0.34}$	$909^{+12}_{-14}$	$5926^{+1152}_{-660}$	$1210^{+1186}_{-476}$

$T_{\text{max}}$  = 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

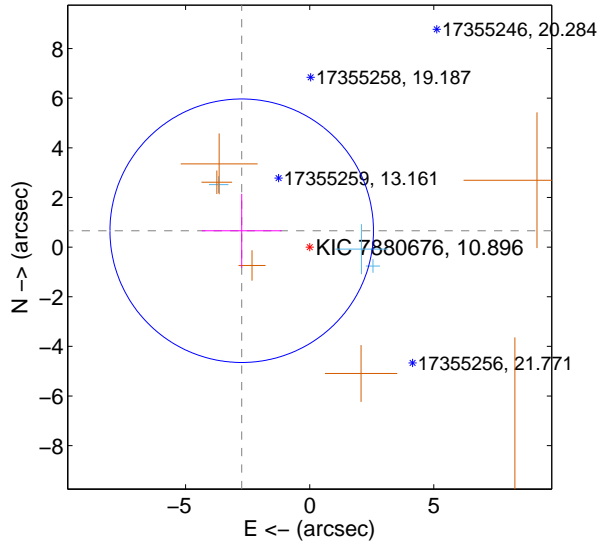
Supplemental centroid analysis for 007880676-07. **Kepler magnitude: 10.90.** Transit SNR 24.33

There are 3 quarters with good PRF difference image offsets

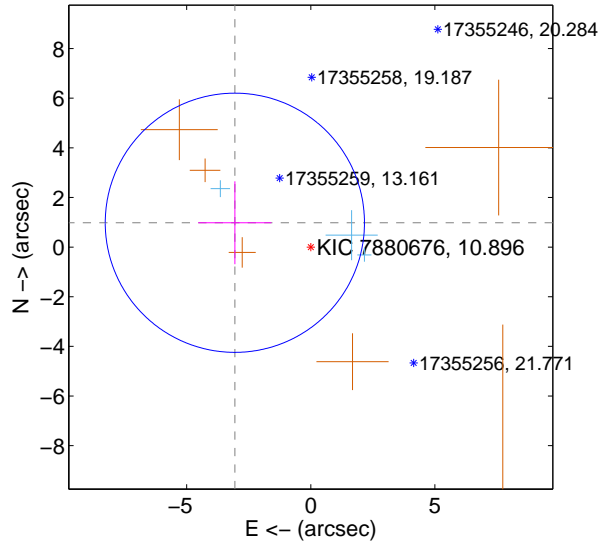
The OOT PRF centroid is offset from the target star catalog position by about 2.06 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.817 \pm 1.770$	1.59	$2.739 \pm 1.610$	$0.660 \pm 1.489$
PRF-fit source offset from KIC position	$3.212 \pm 1.741$	1.85	$3.059 \pm 1.473$	$0.981 \pm 1.672$
photometric centroid source offset	$0.20 \pm 1.08$	0.19	$0.12 \pm 0.97$	$0.16 \pm 1.13$

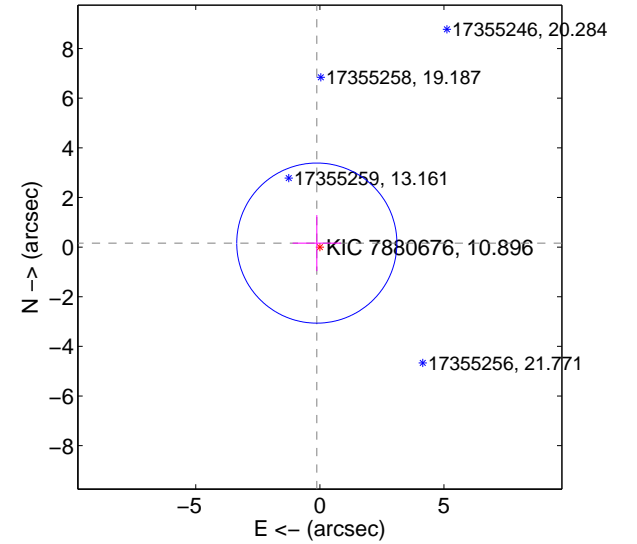
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

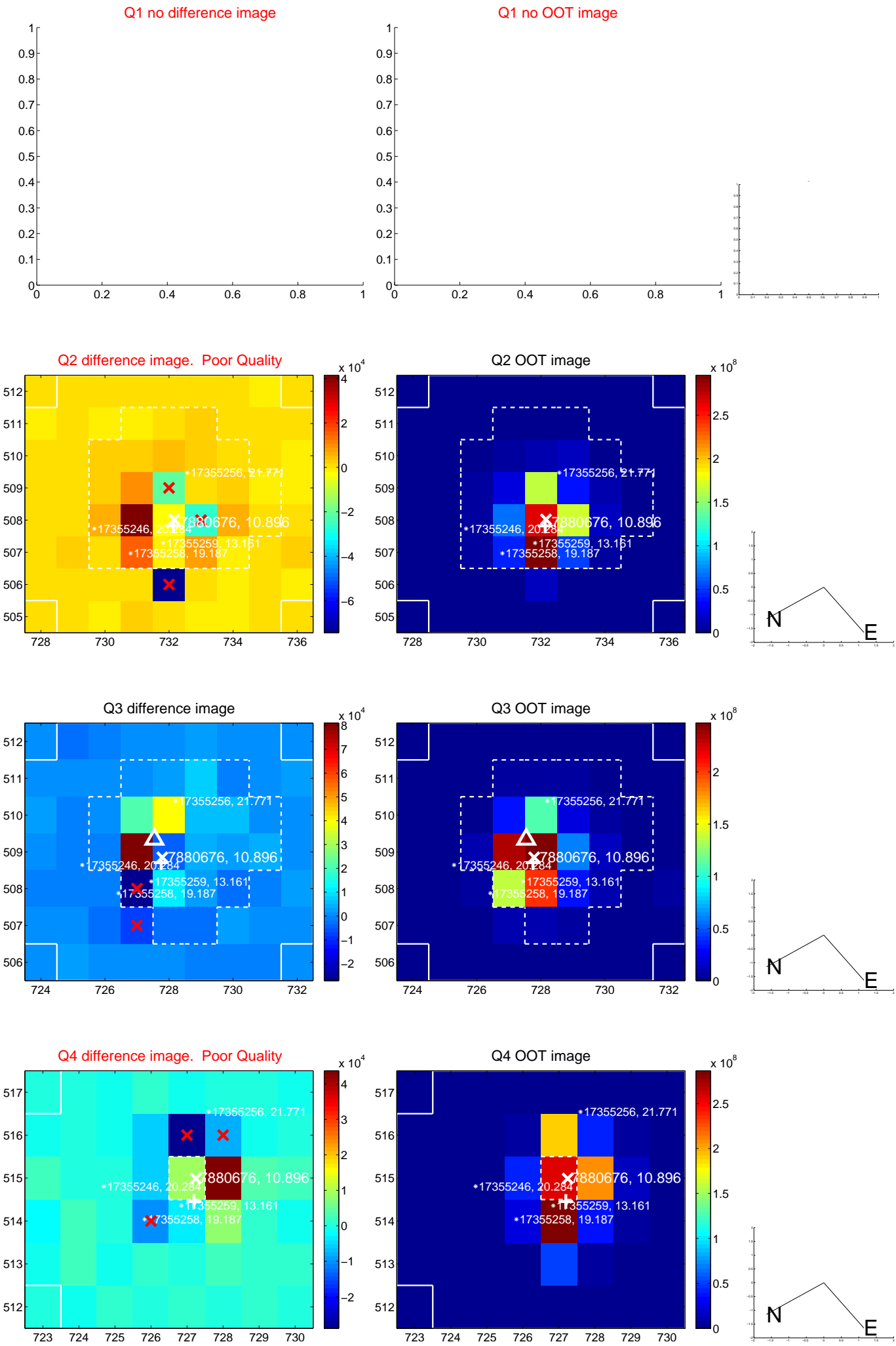


offset from photometric centroids

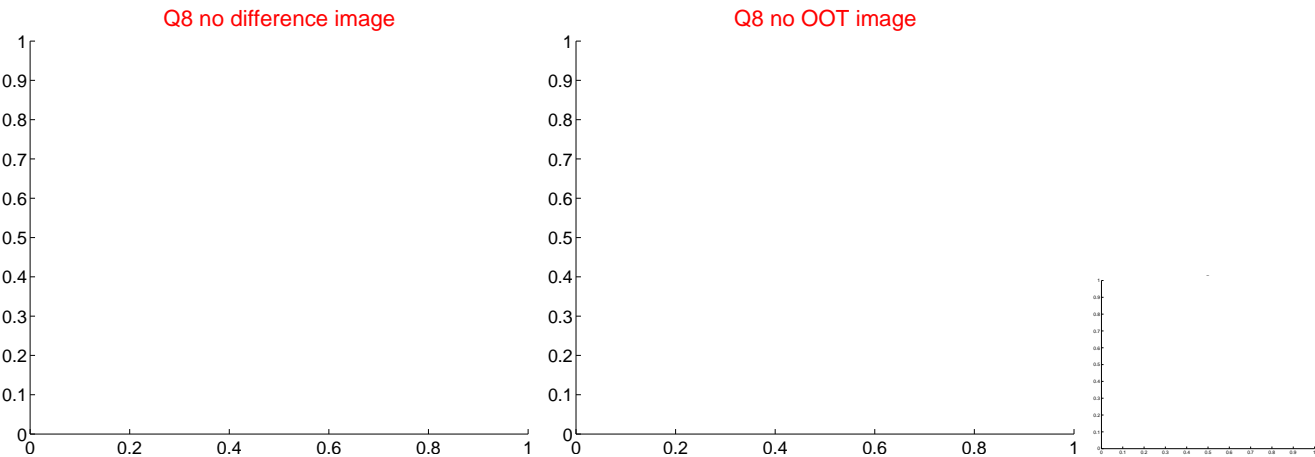
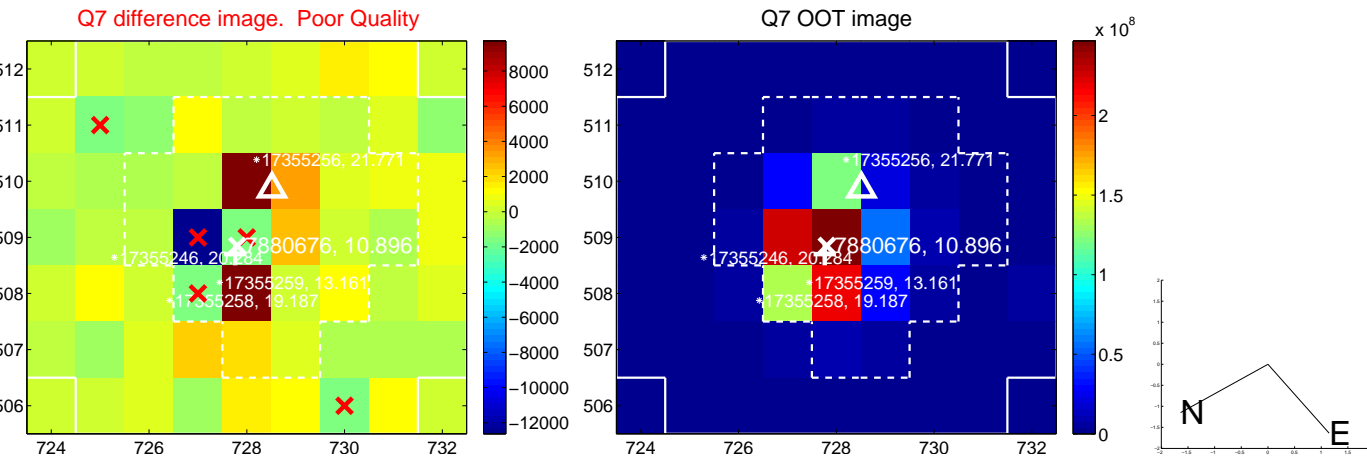
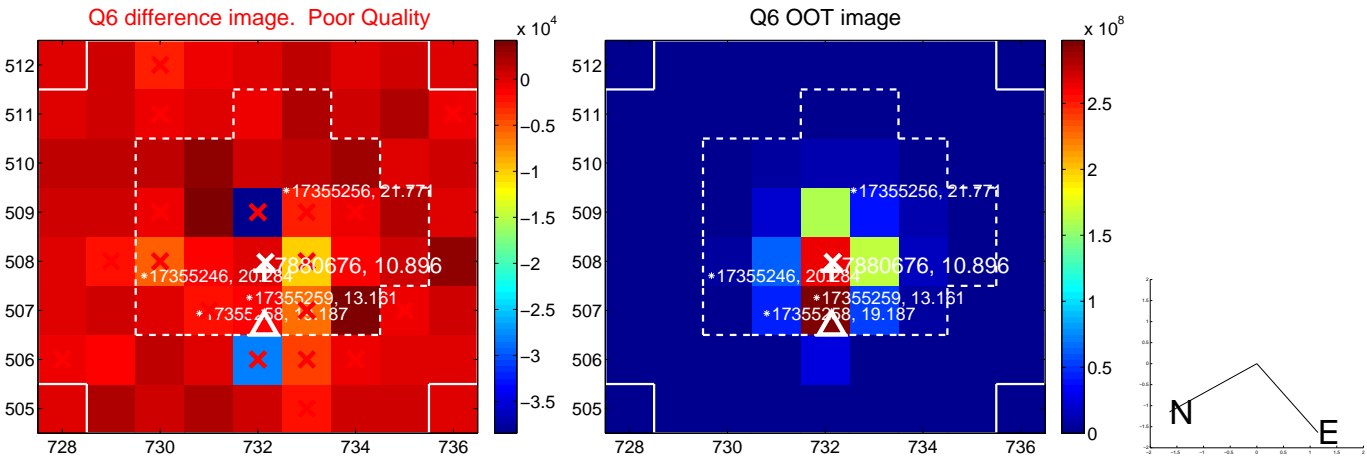
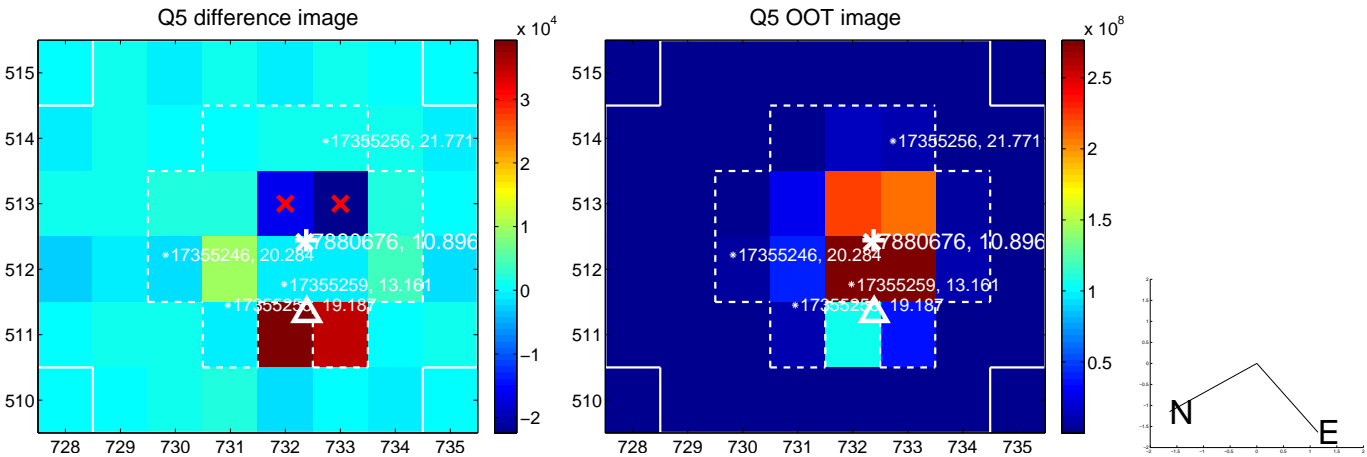


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

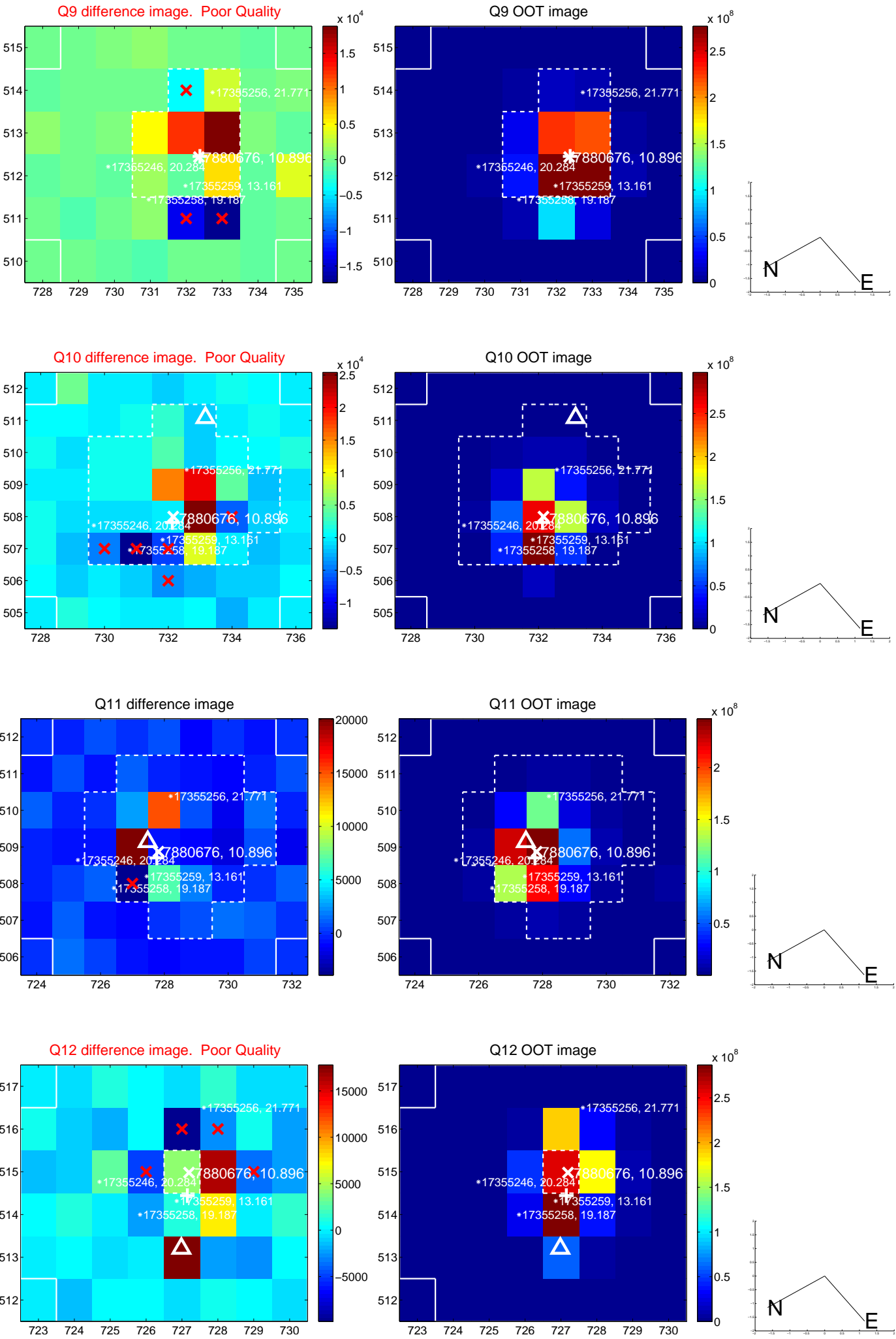
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



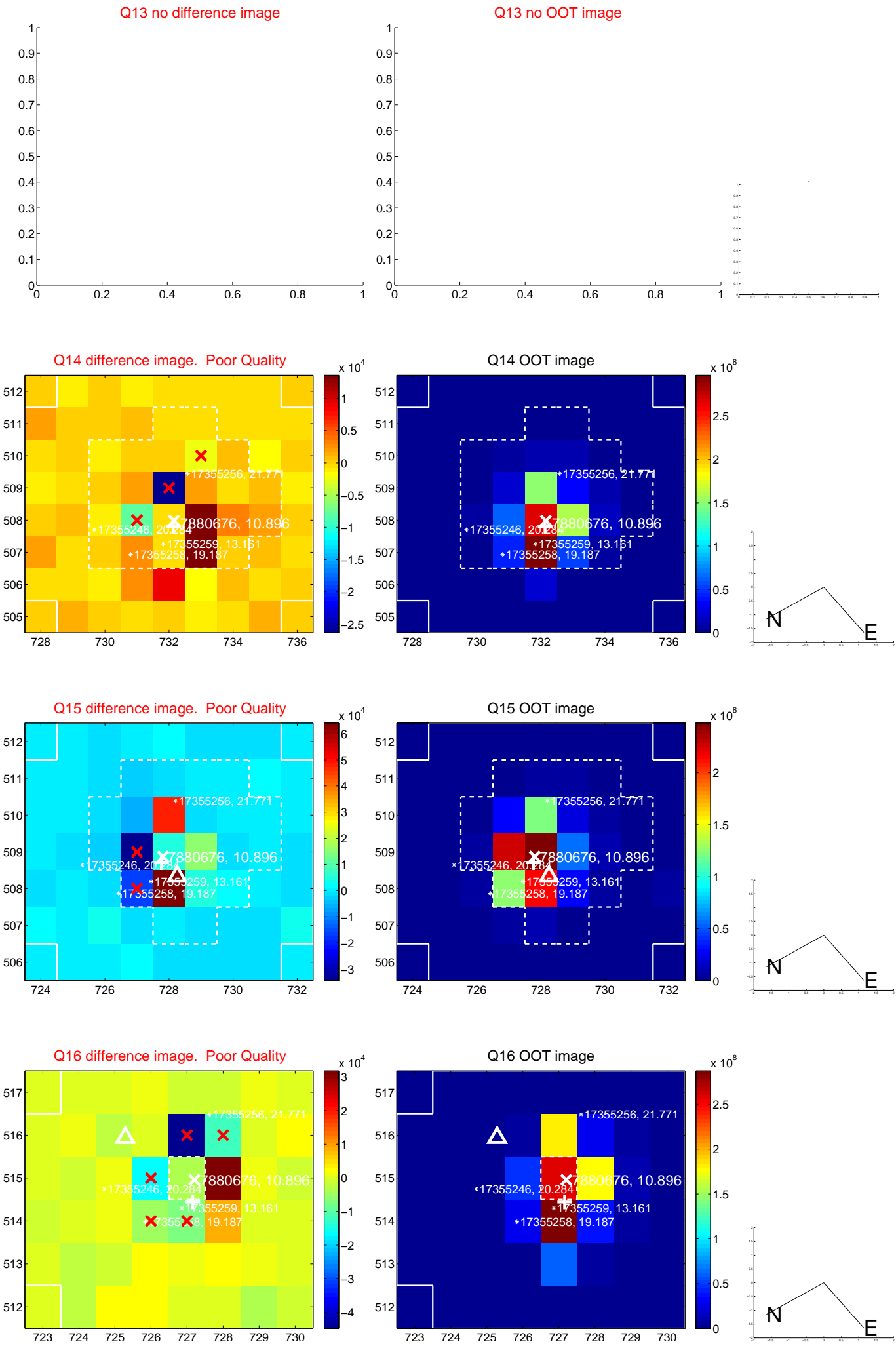
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



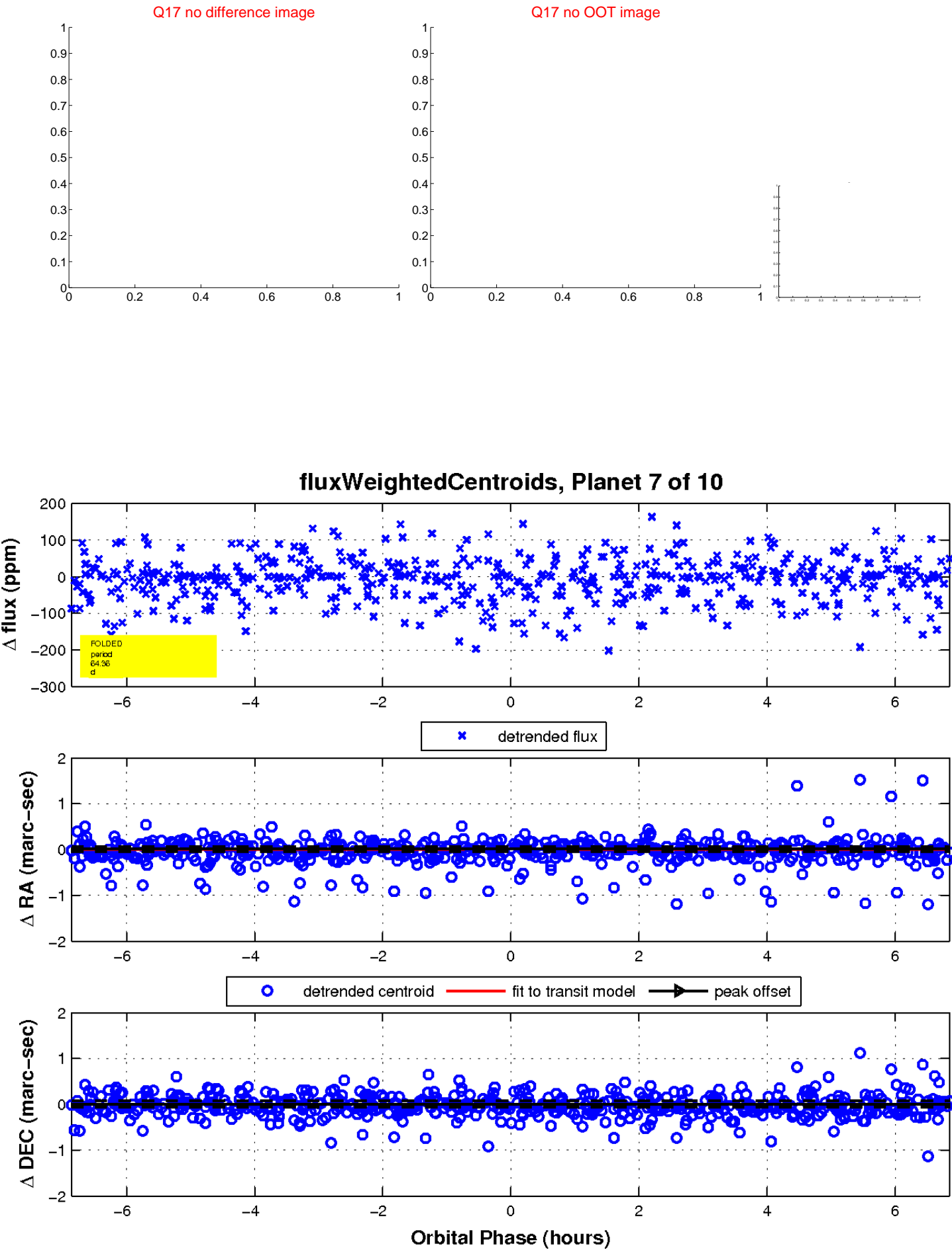
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

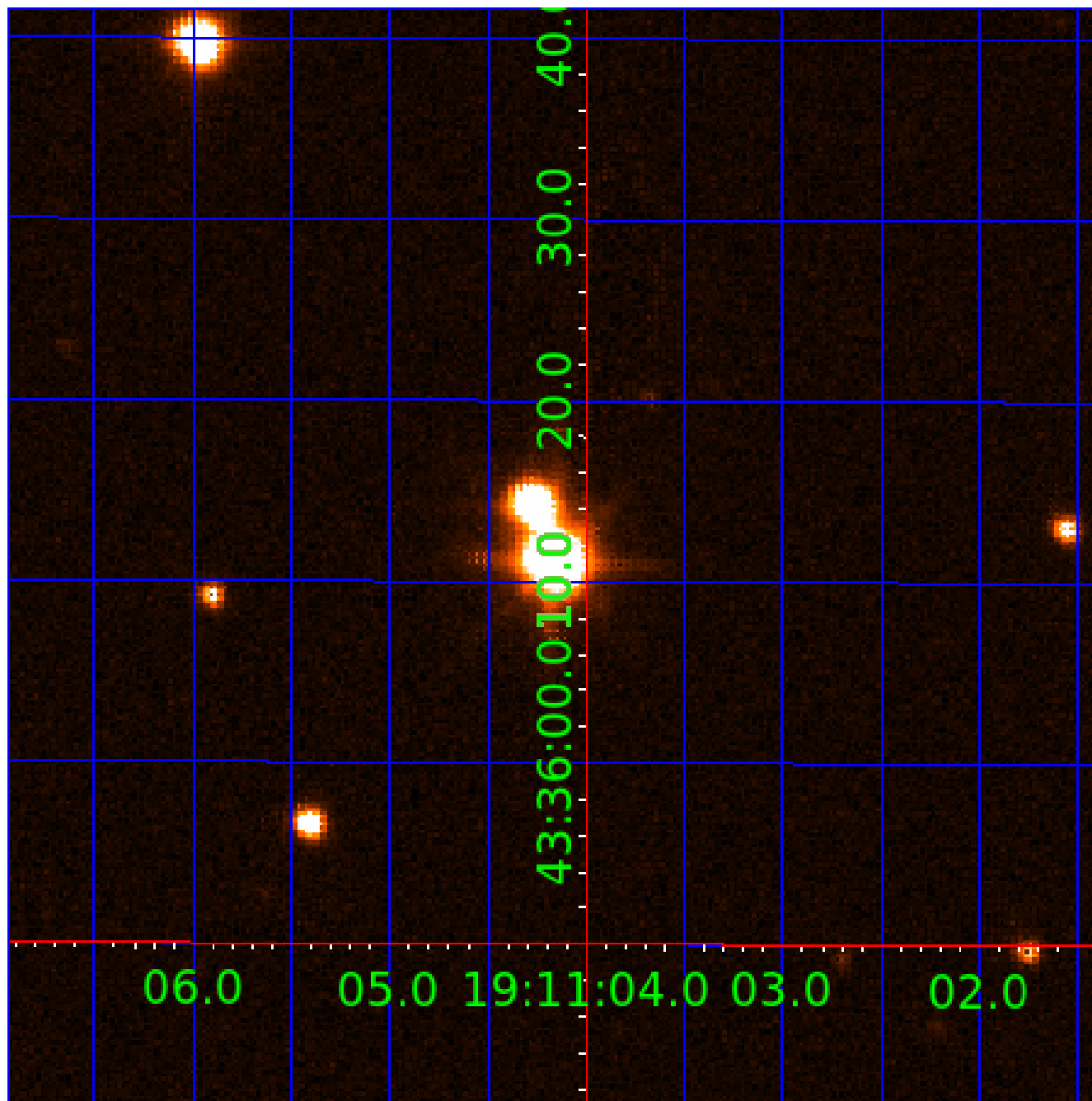


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





## KIC 007880676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007880676-01	OBS	No	74.700898	193.436167	18.8	1.598	31.4	2.9	1.96	6129	1.00	34.52
007880676-02	OBS	No	544.696610	418.947989	55.4	9.071	18.7	19.0	1.96	6129	1.69	2.44
007880676-03	OBS	No	93.437611	139.301041	58.6	0.868	19.0	28.0	1.96	6129	1.53	25.61
007880676-04	OBS	No	149.986976	136.477266	48.9	3.061	18.7	14.8	1.96	6129	1.37	13.63
007880676-05	OBS	No	49.327158	139.760525	11.7	11.019	14.0	6.8	1.96	6129	0.76	60.03
007880676-06	OBS	No	69.390592	165.569874	29.3	16.554	13.7	11.6	1.96	6129	1.17	38.08
007880676-07	OBS	No	64.361879	185.581530	60.1	2.287	19.3	24.3	1.96	6129	1.73	42.10
007880676-08	OBS	No	94.170624	203.456516	15.9	8.738	13.3	6.8	1.96	6129	0.91	25.35
007880676-09	OBS	No	75.849882	138.940758	46.7	1.755	17.5	8.4	1.96	6129	1.63	33.82
007880676-10	OBS	No	78.737554	157.099189	20.9	12.578	12.9	8.0	1.96	6129	1.05	32.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007880676-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007880676-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-05	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
007880676-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-08	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-09	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-10	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

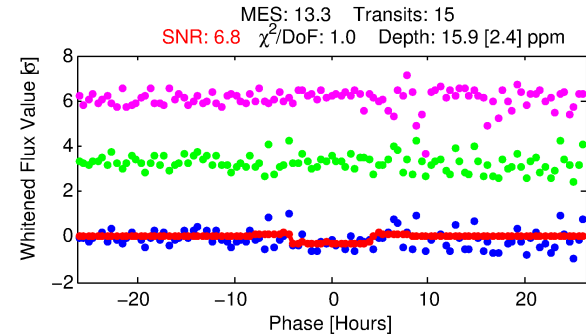
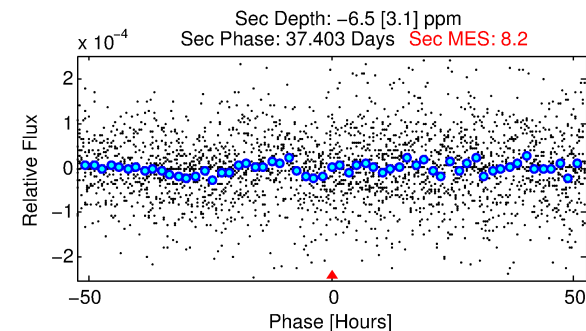
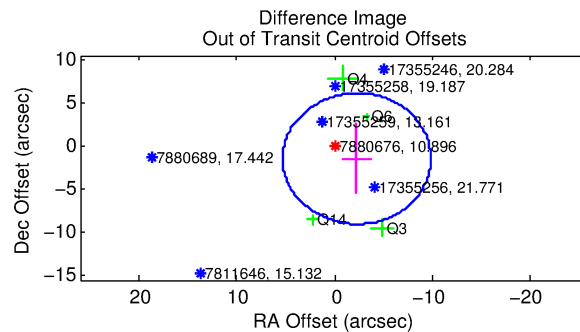
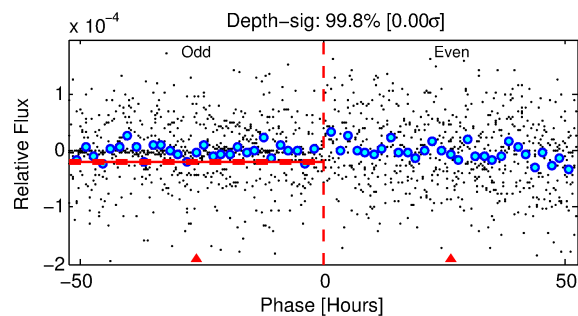
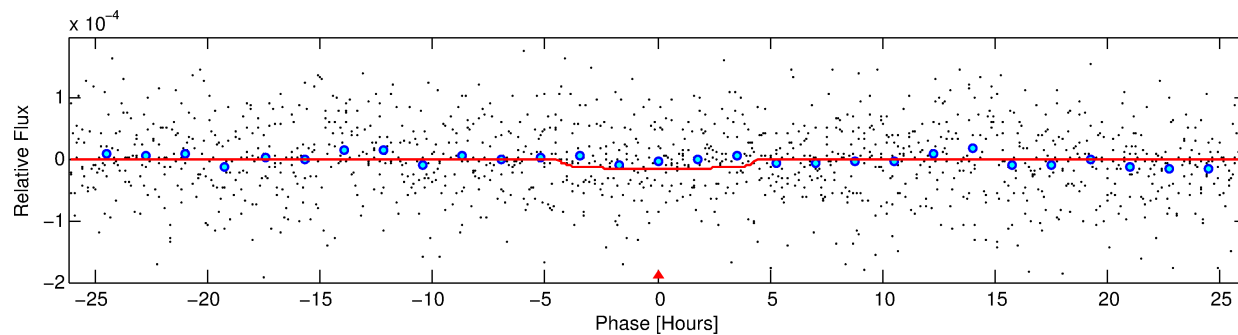
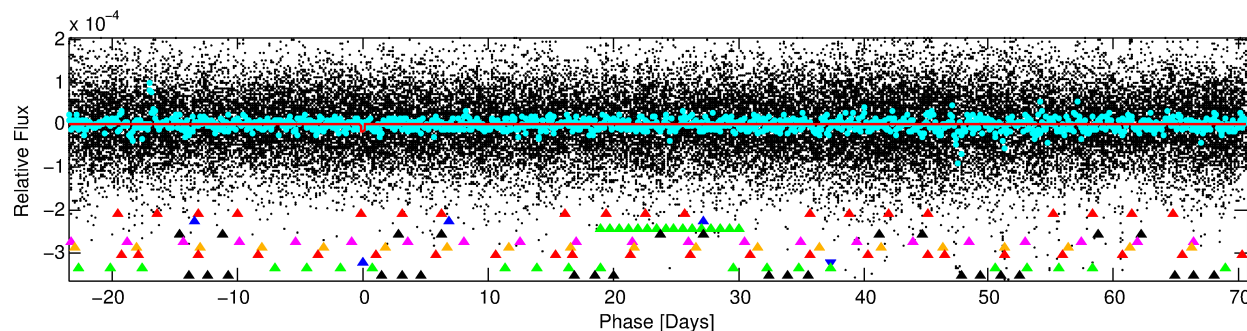
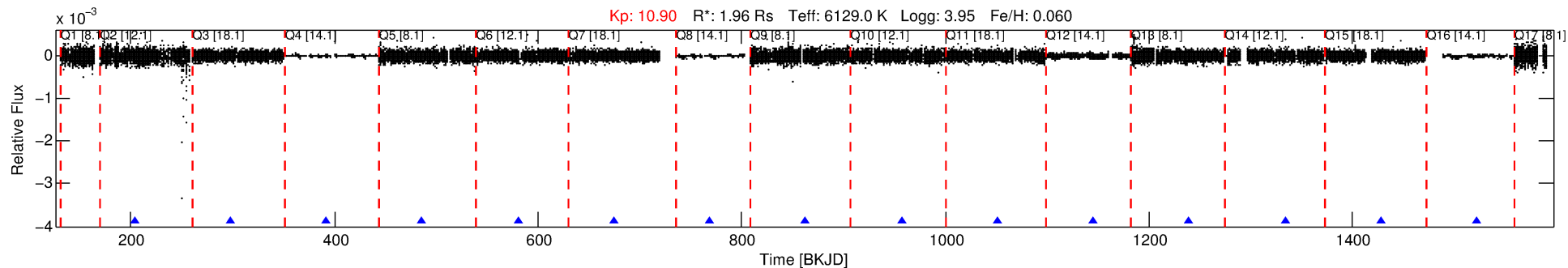
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-08

No Significant Match Found

# DV One-Page Summary

KIC: 7880676 Candidate: 8 of 10 Period: 94.171 d



## DV Fit Results:

Period = 94.17062 [0.00165] d  
Epoch = 203.4565 [0.0083] BKJD  
Rp/R\* = 0.0043 [0.0006]  
a/R\* = 38.07 [24.38]  
b = 0.89 [0.15]  
Seff = 25.35 [1.72]  
Teq = 572 [10] K  
Rp = 0.91 [0.15] Re  
a = 0.4375 [0.0191] AU  
Ag = N/A  
Teffp = N/A

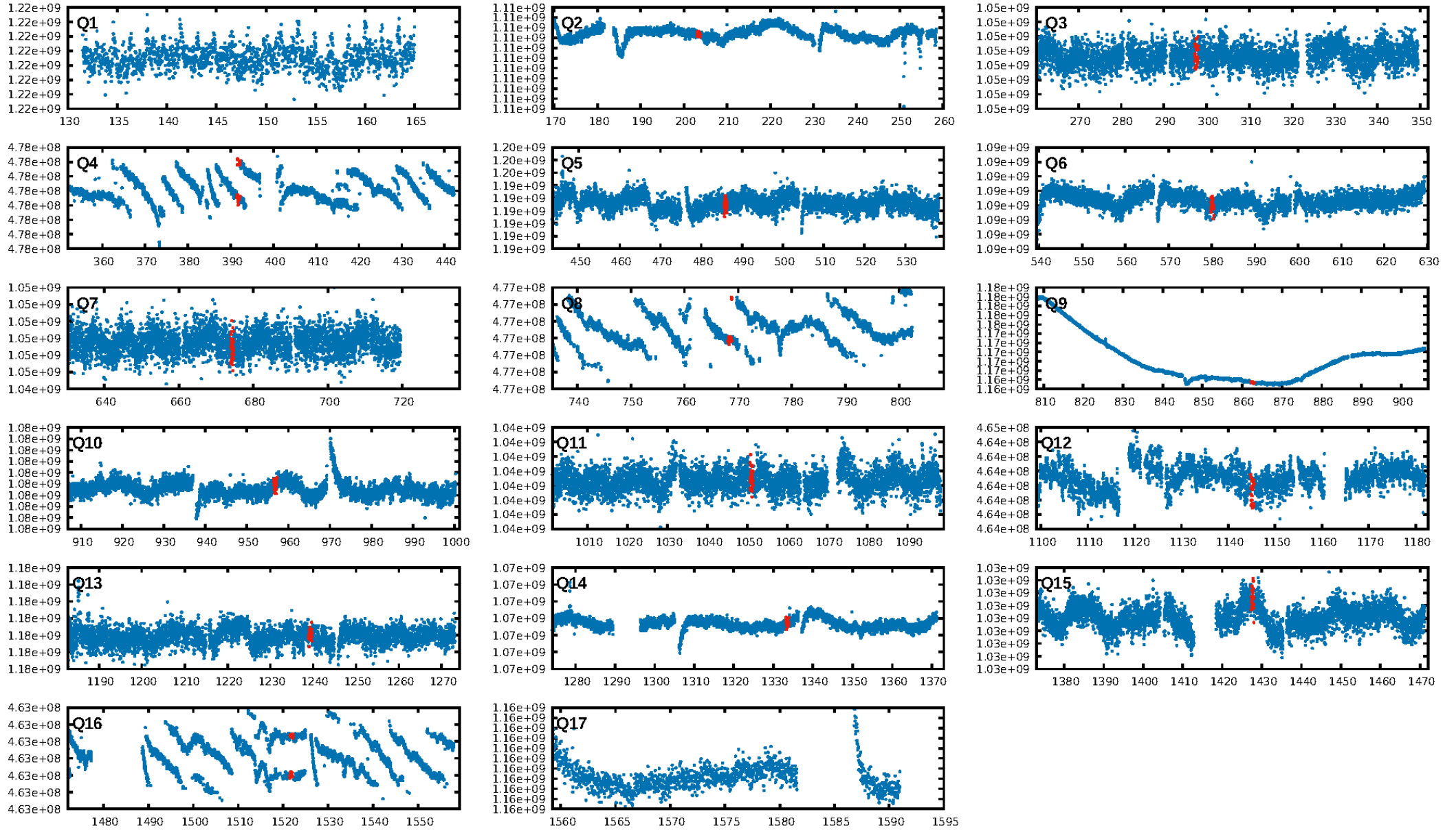
## DV Diagnostic Results:

ShortPeriod-sig: 95.5% [2.00 $\sigma$ ]  
LongPeriod-sig: 100.0% [144.68 $\sigma$ ]  
ModelChiSquare2-sig: 2.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.08e-09  
RollingBand-fgt: 1.00 [15/15]  
GhostDiagnostic-chr: 0.3373  
Centroid-sig: 64.4%  
Centroid-so: 1.349 arcsec [0.45 $\sigma$ ]  
OotOffset-rm: 2.705 arcsec [1.07 $\sigma$ ]  
KicOffset-rm: 1.911 arcsec [0.82 $\sigma$ ]  
OotOffset-st: 2/1/1/0 [4]  
KicOffset-st: 2/1/1/0 [4]  
DiffImageQuality-fgm: 0.00 [0/4]  
DiffImageOverlap-fno: 0.87 [13/15]

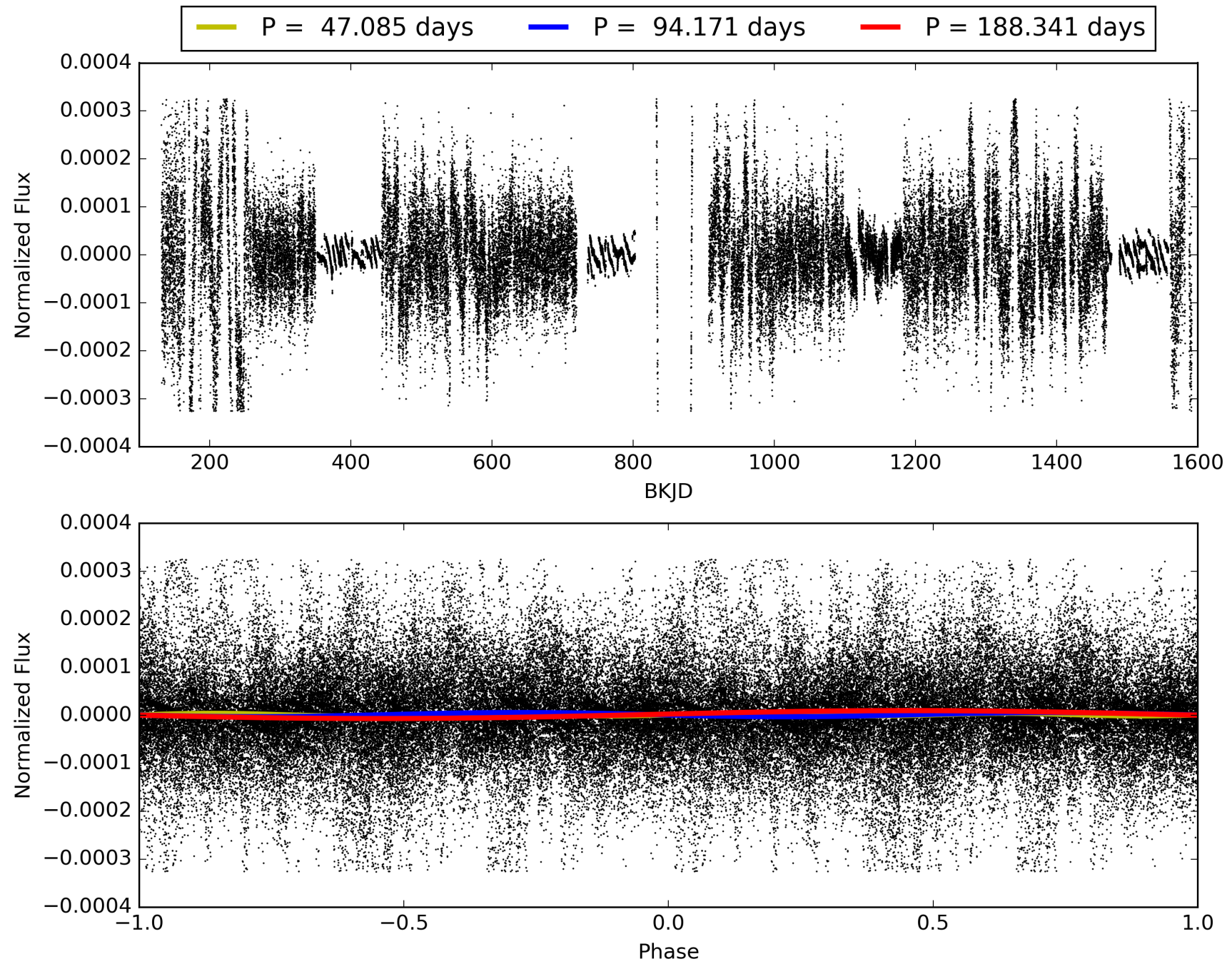
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:07:00 Z

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

# TCE 007880676-08, PDC Light Curves

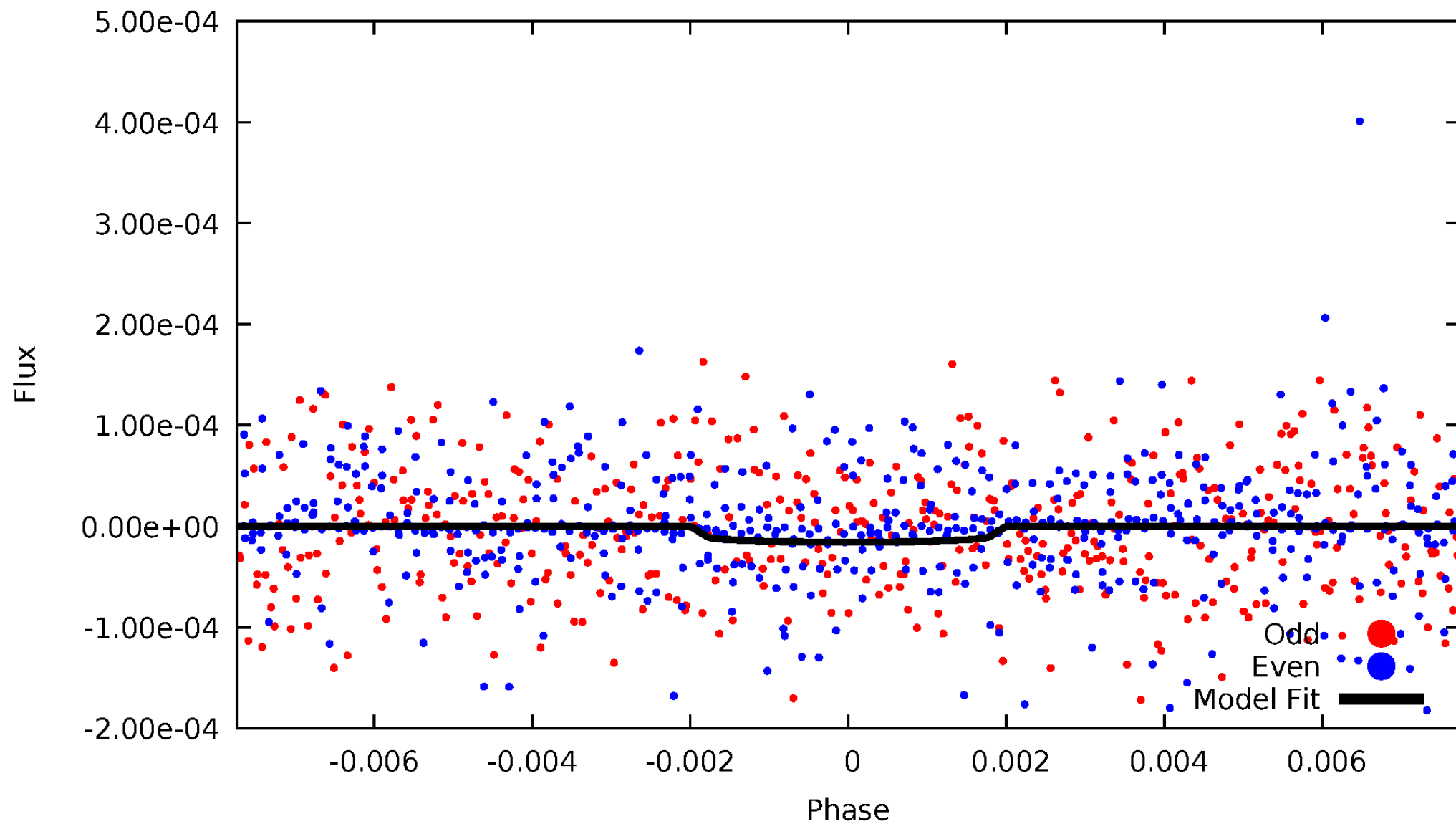


TCE 007880676-08



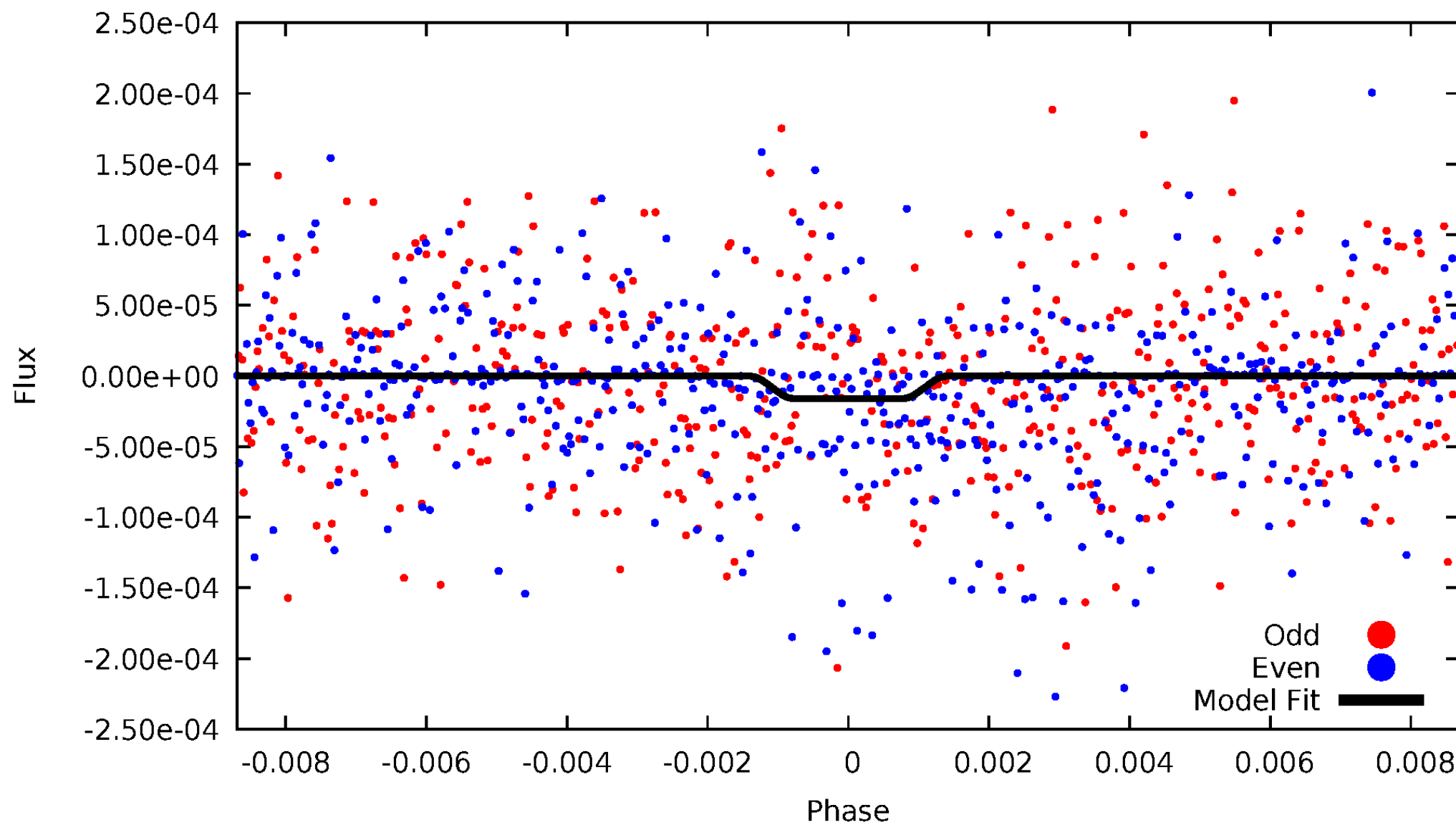
# DV Odd/Even

TCE 007880676-08



# ALT Odd/Even

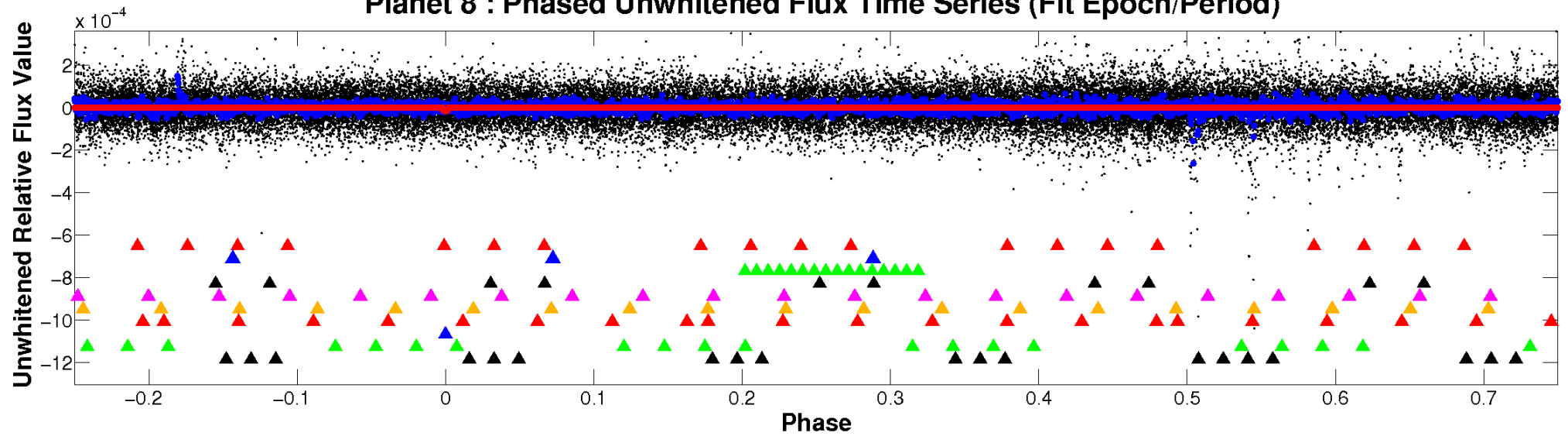
TCE 007880676-08



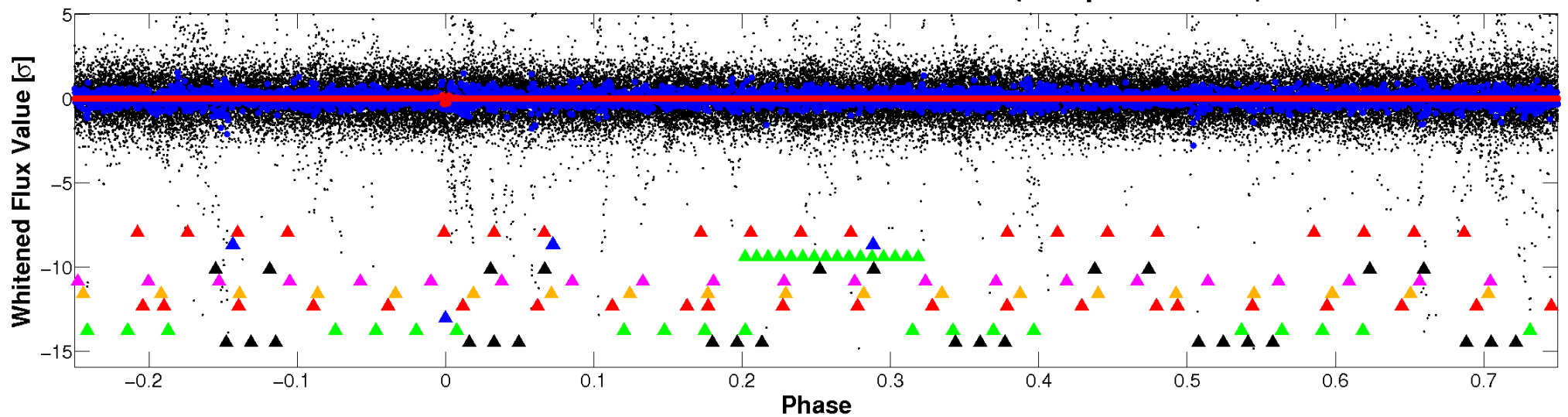


# Non-Whitened Vs. Whitened Light Curve

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

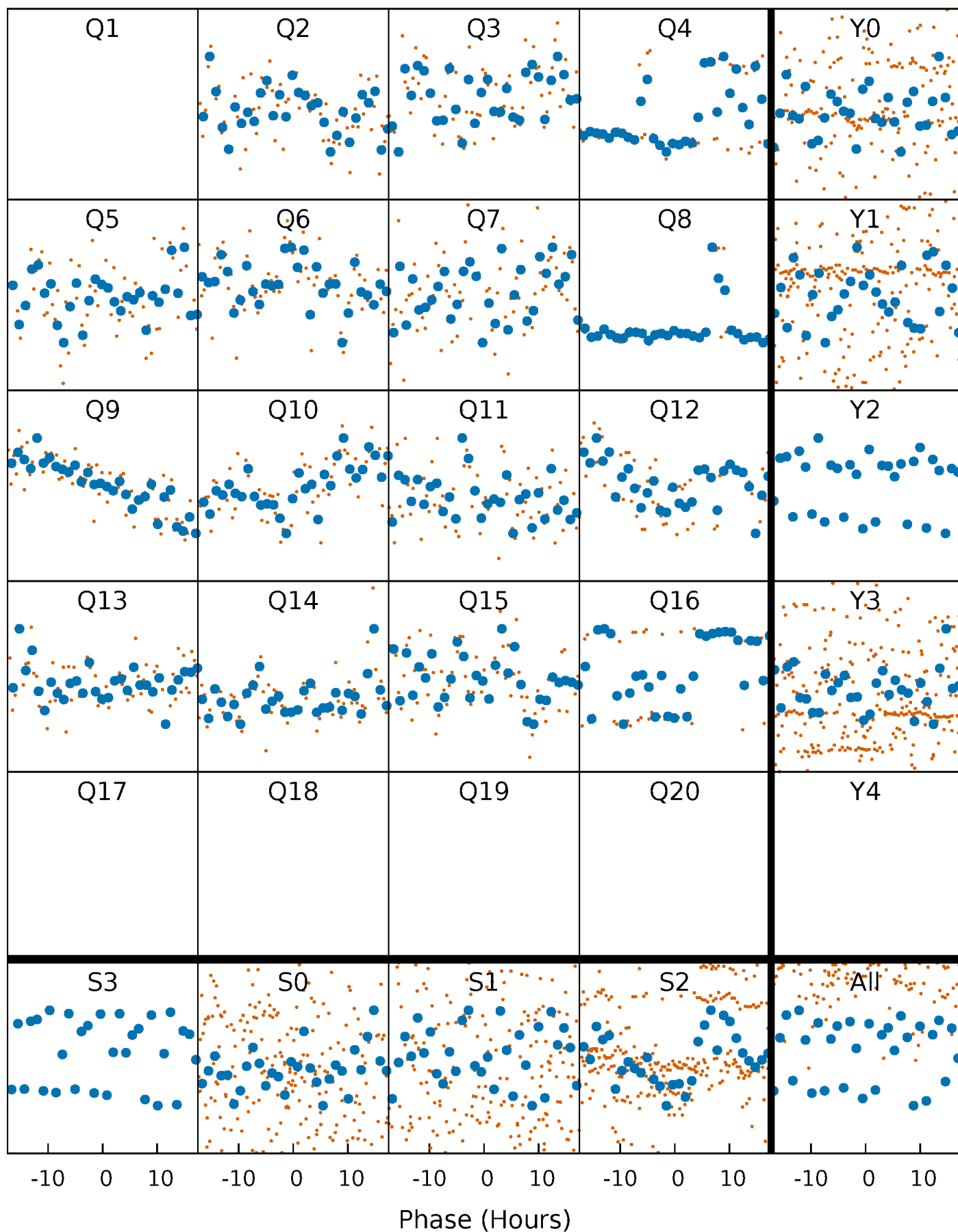


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

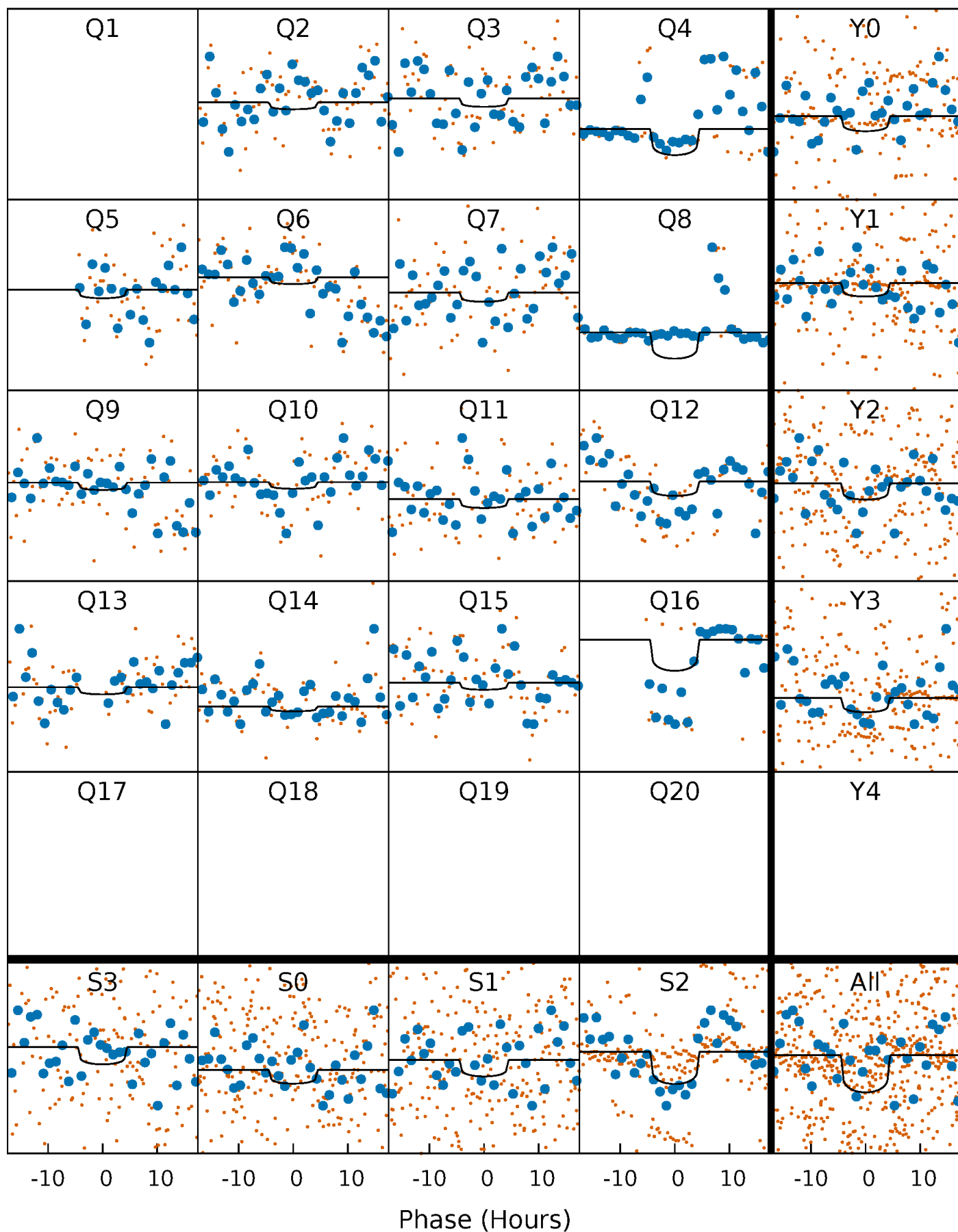
TCE 007880676-08 P= 94.170624 Days  $T_0=203.456516$  (BKJD)





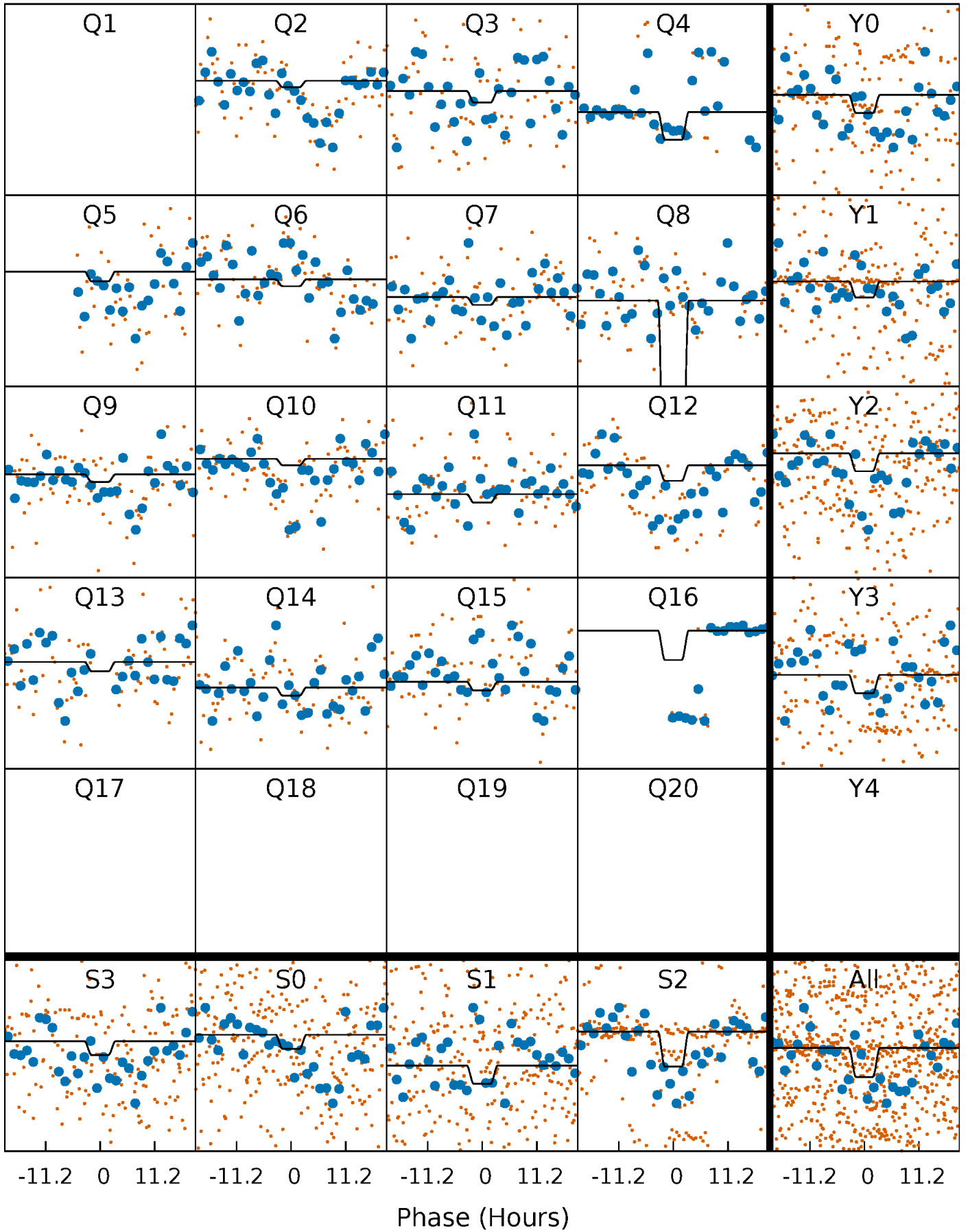
# DV Quarter-Phased Transit Curves

TCE 007880676-08   P= 94.170624 Days    $T_0=203.456516$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

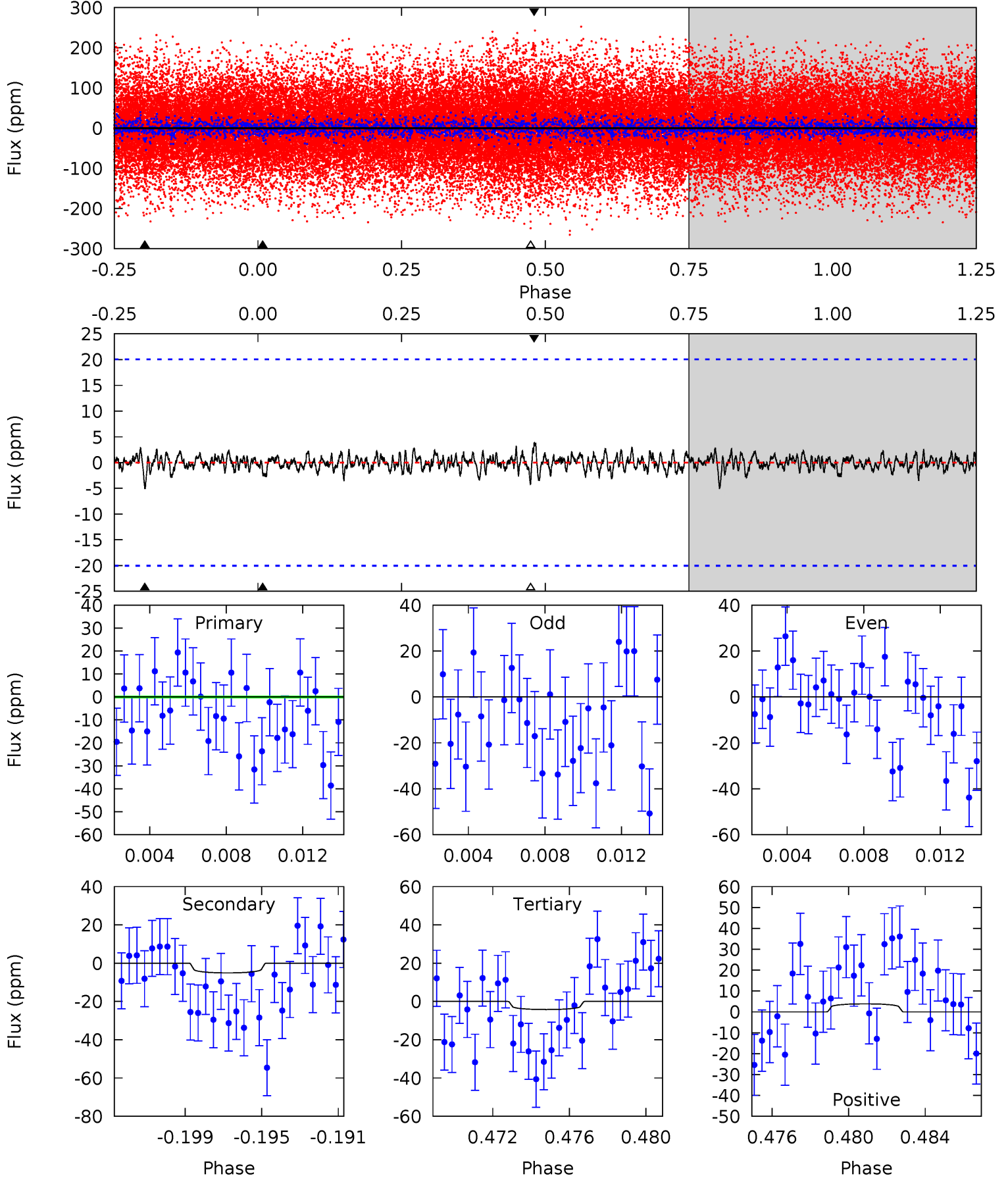
TCE 007880676-08 P= 94.154210 Days  $T_0=203.520631$  (BKJD)



# DV Model-Shift Uniqueness Test

007880676-08, P = 94.170624 Days, E = 109.285892 Days

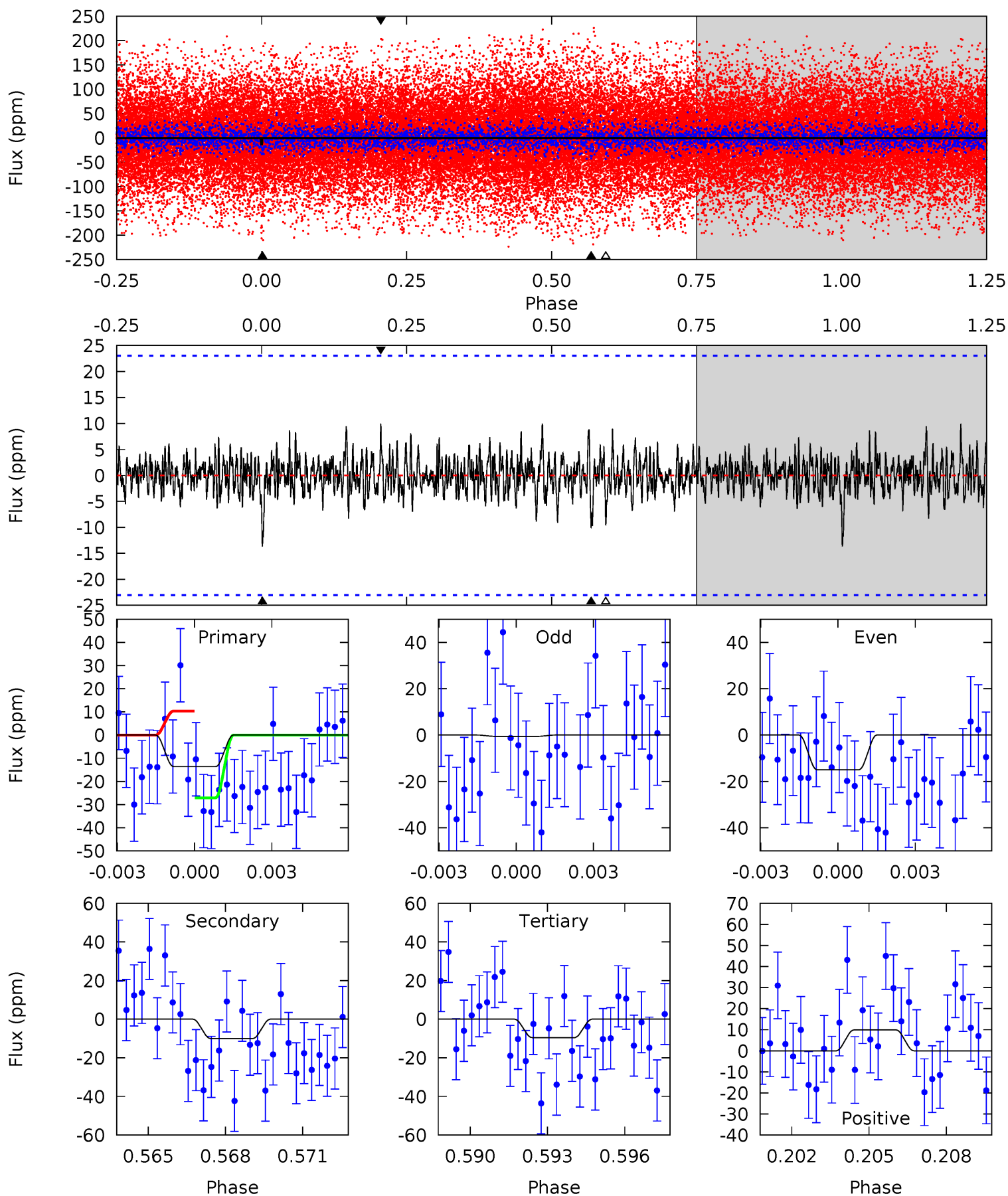
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.53	1.32	1.09	1.00	5.20	2.87	0.31	-0.56	-0.47	0.23	0.32	0.44	1.77	0.43	0.59



# Alt Model-Shift Uniqueness Test

007880676-08, P = 94.154210 Days, E = 109.366421 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.11	2.29	2.19	2.26	5.26	2.99	0.66	0.93	0.85	0.11	0.03	1.66	0.79	0.42	1.91



### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-5 \pm 4$	$0.91^{+0.14}_{-0.14}$	$799^{+11}_{-12}$	$4598^{+709}_{-1139}$	$635^{+620}_{-508}$
Alt.	$-10 \pm 4$	$0.86^{+0.13}_{-0.14}$	$799^{+11}_{-11}$	$5433^{+703}_{-622}$	$1394^{+925}_{-592}$

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

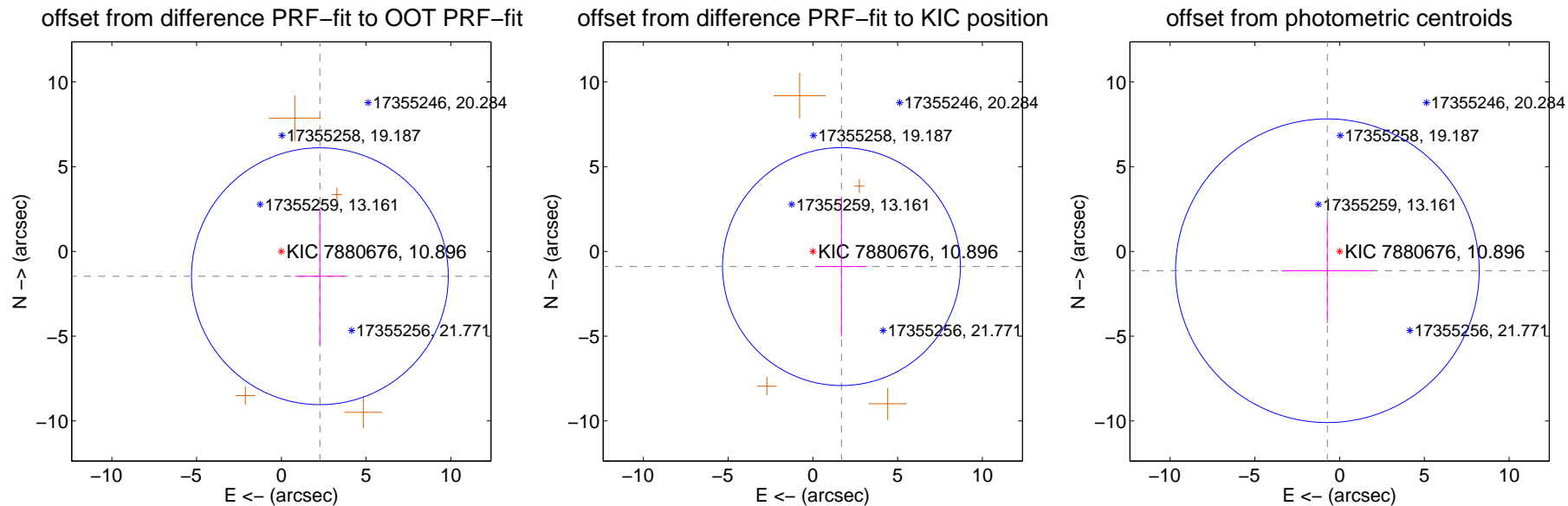
## DV Centroid Data

Supplemental centroid analysis for 007880676-08. **Kepler magnitude: 10.90.** Transit SNR 6.81

**There are 0 quarters with good PRF difference image offsets**

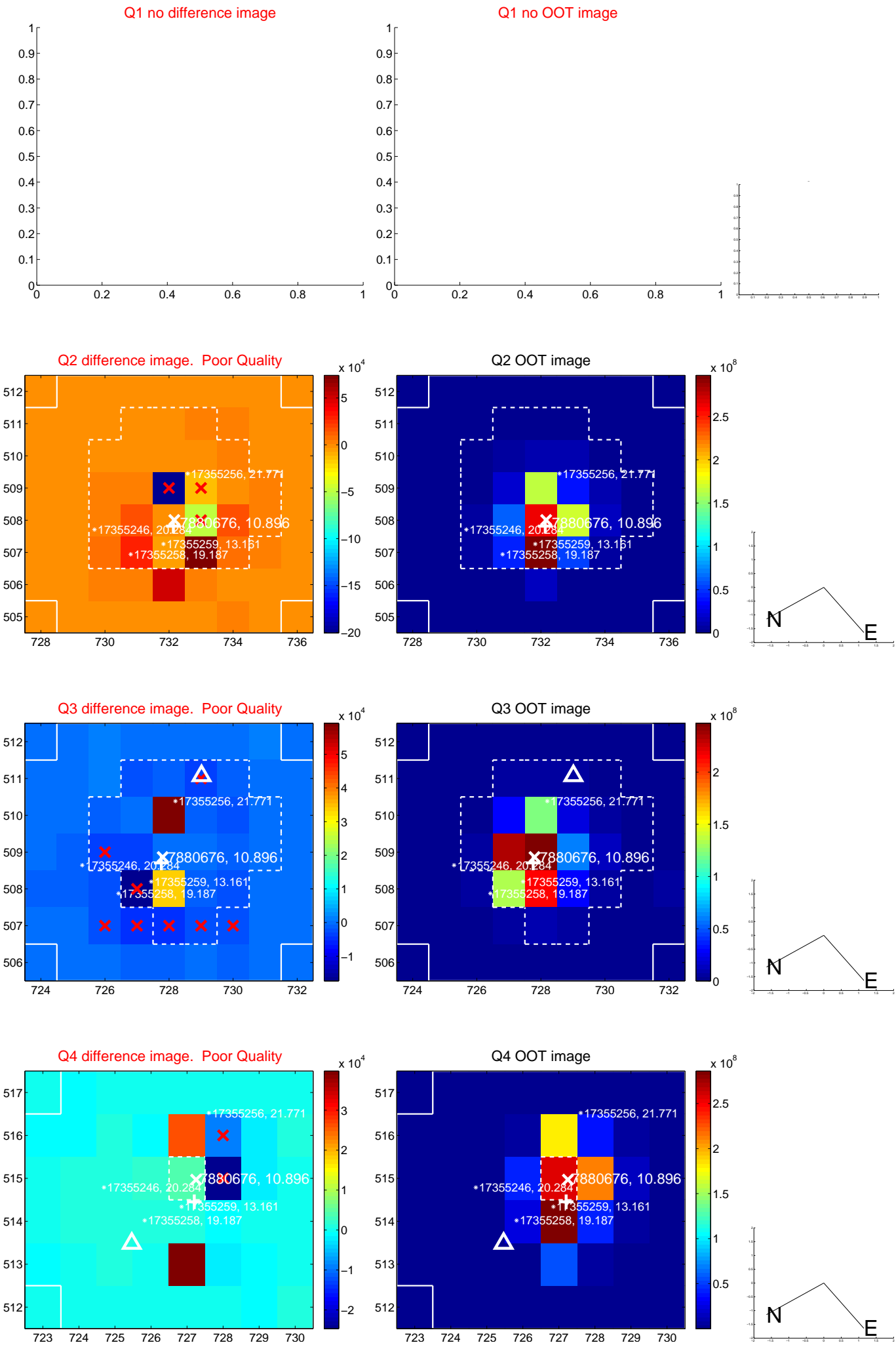
The direct PRF centroid is offset from the target star catalog position by about 0.81 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.705 \pm 2.526$	1.07	$-2.274 \pm 1.473$	$-1.465 \pm 4.066$
PRF-fit source offset from KIC position	$1.911 \pm 2.340$	0.82	$-1.688 \pm 1.514$	$-0.895 \pm 4.099$
photometric centroid source offset	$1.35 \pm 2.99$	0.45	$0.72 \pm 2.71$	$-1.14 \pm 3.09$

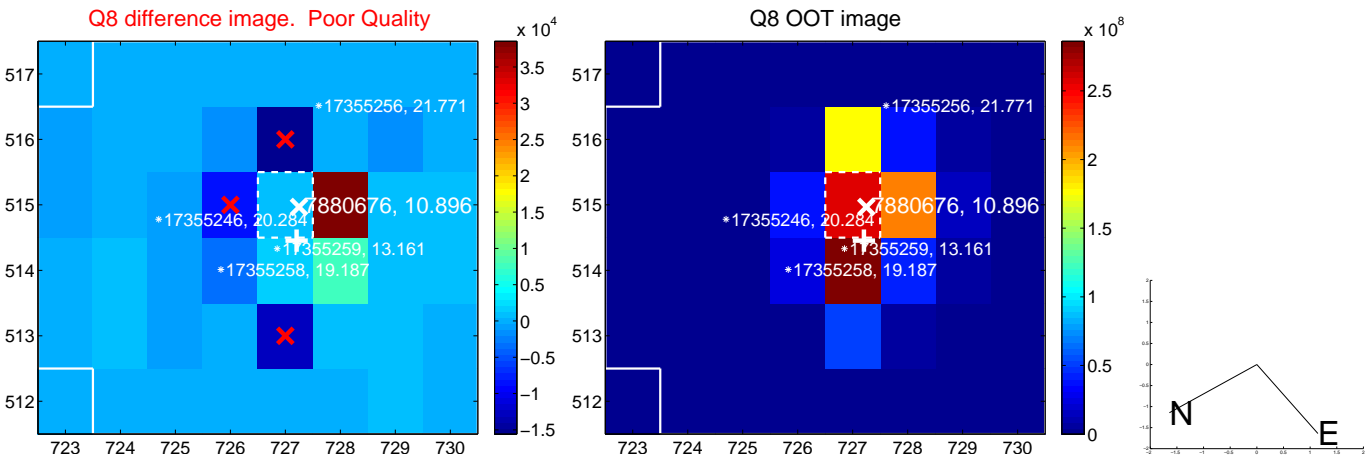
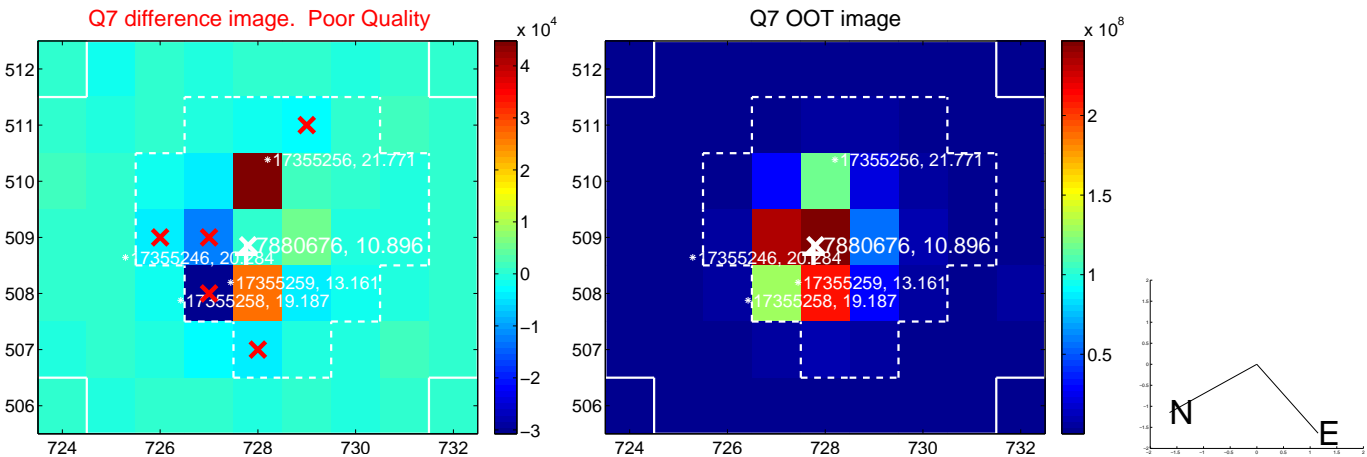
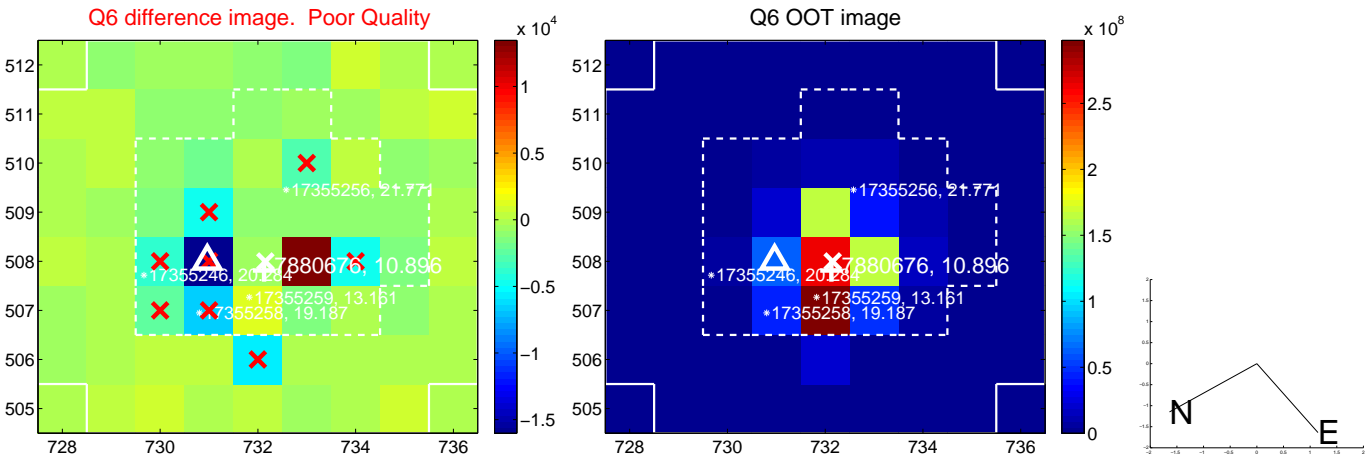
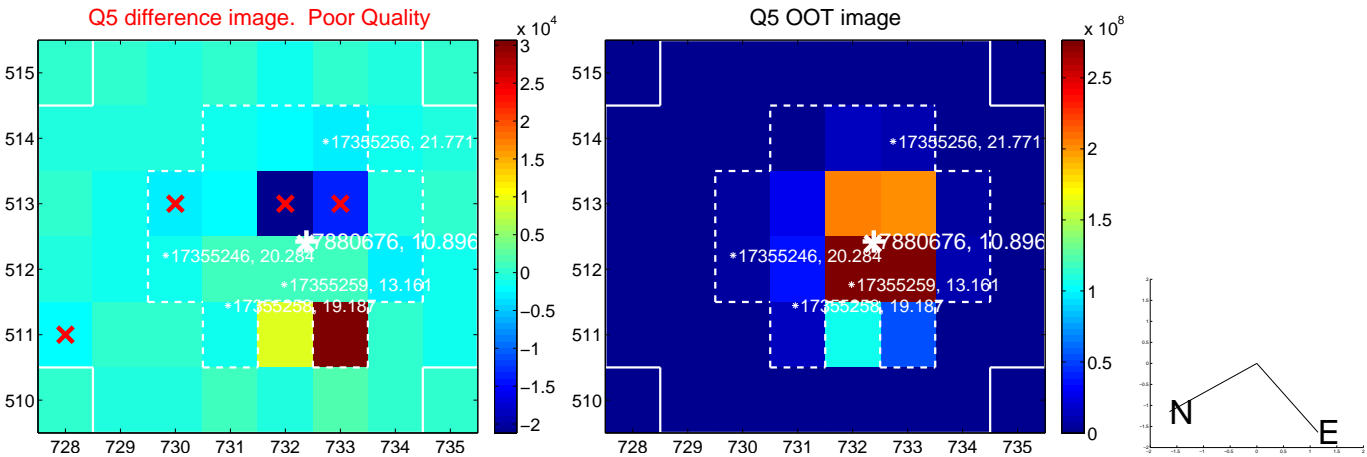


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

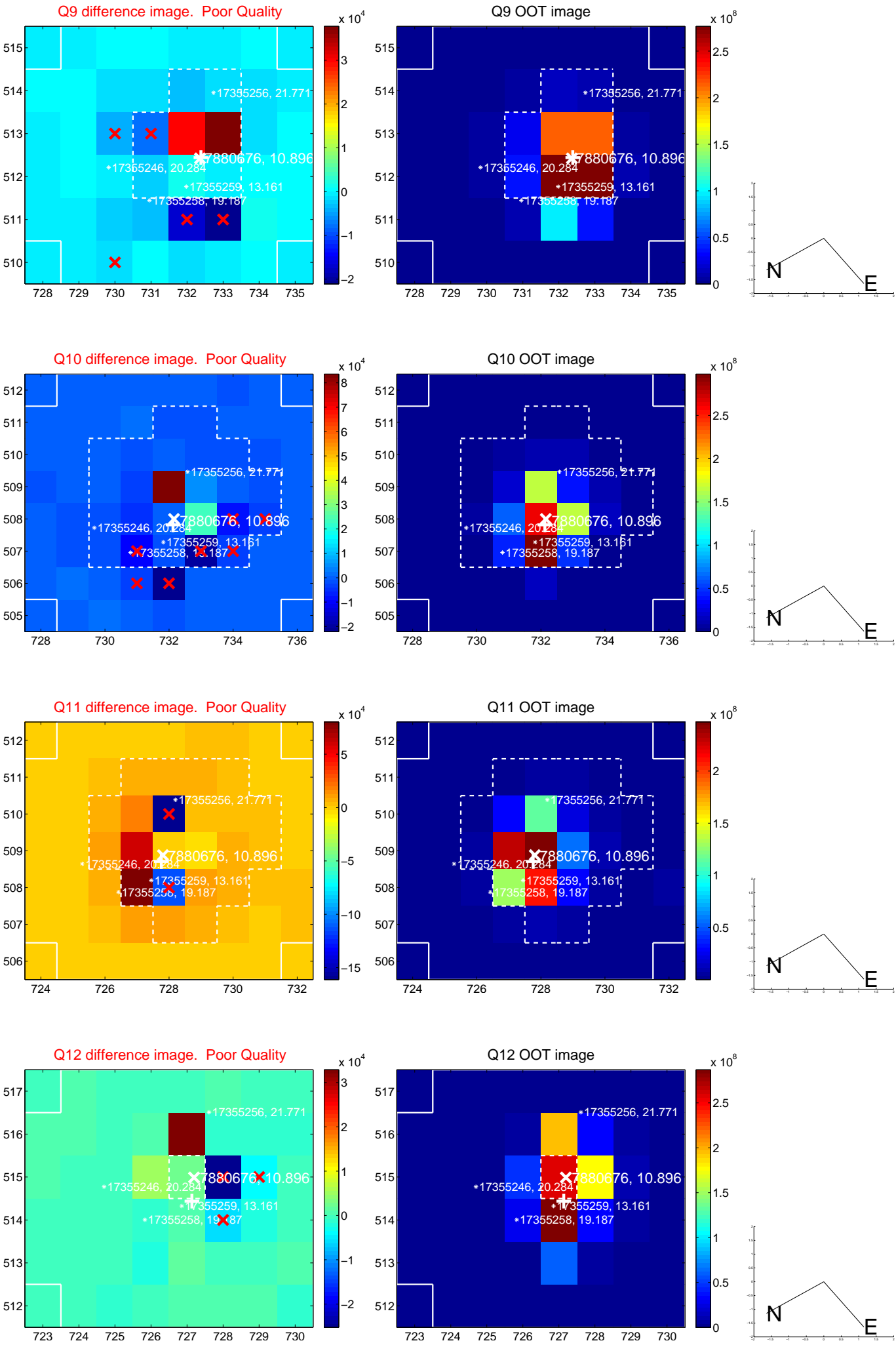


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

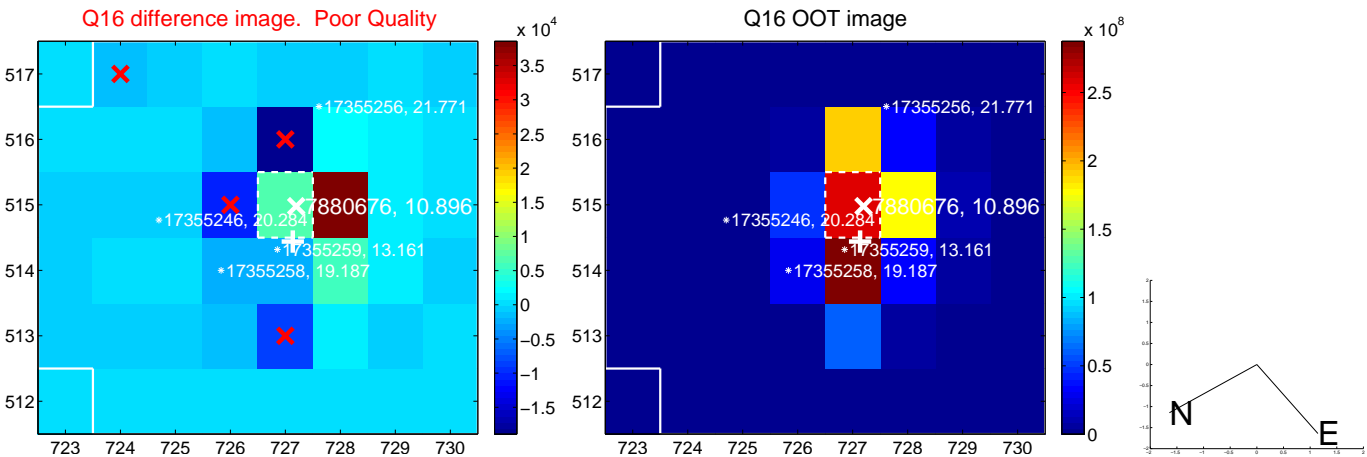
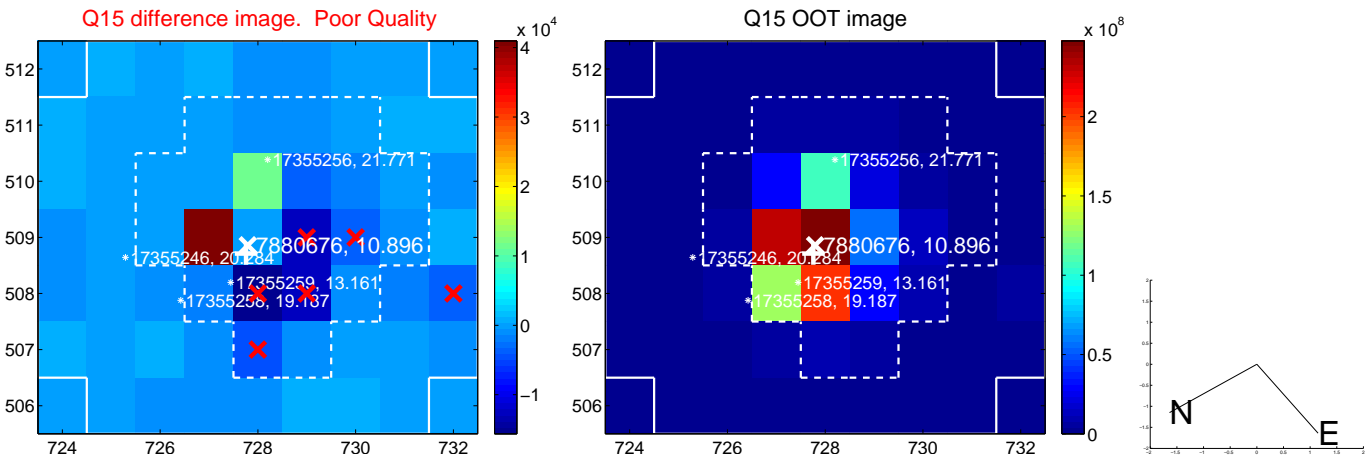
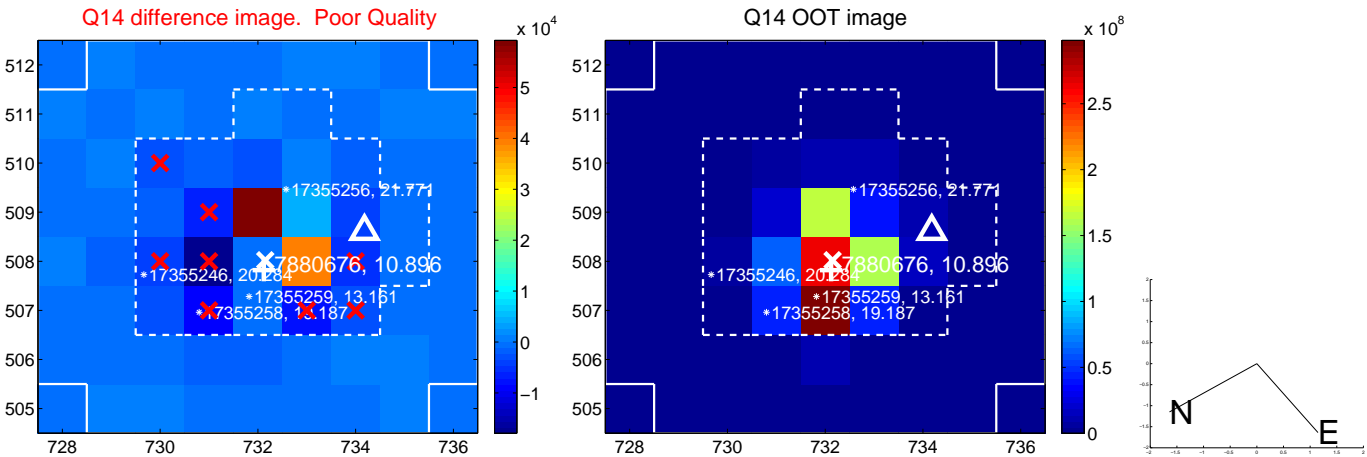
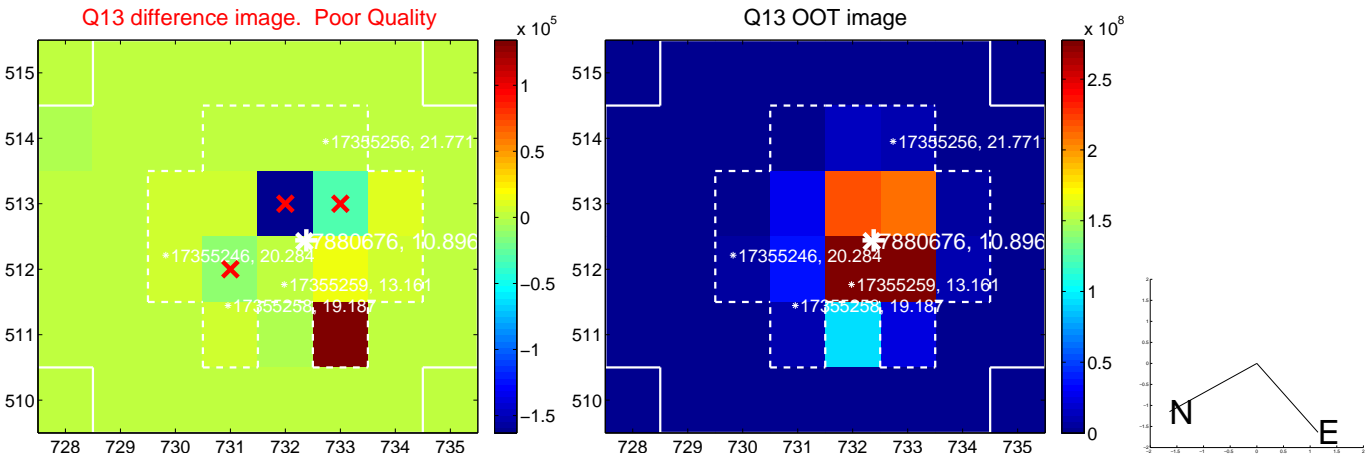




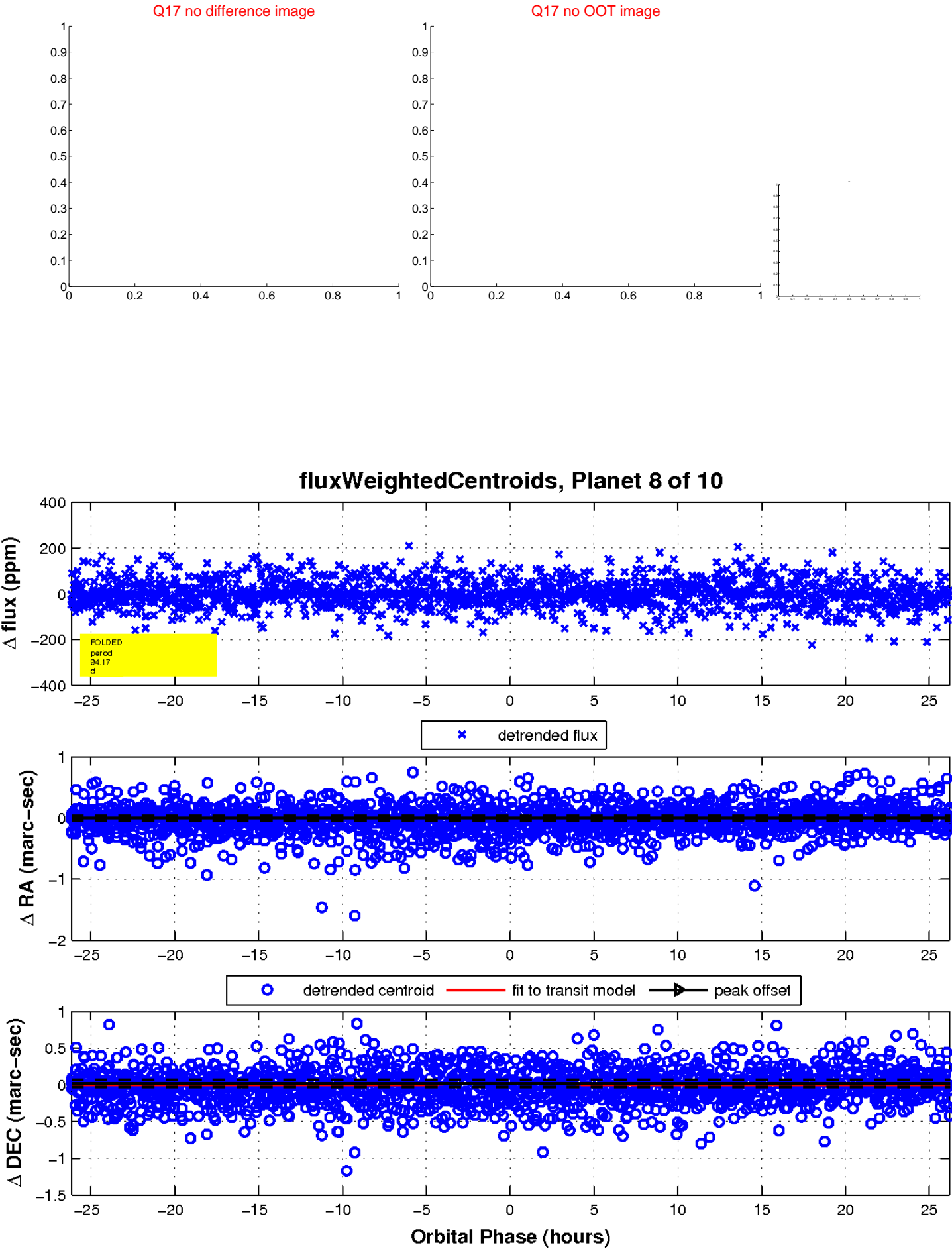
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

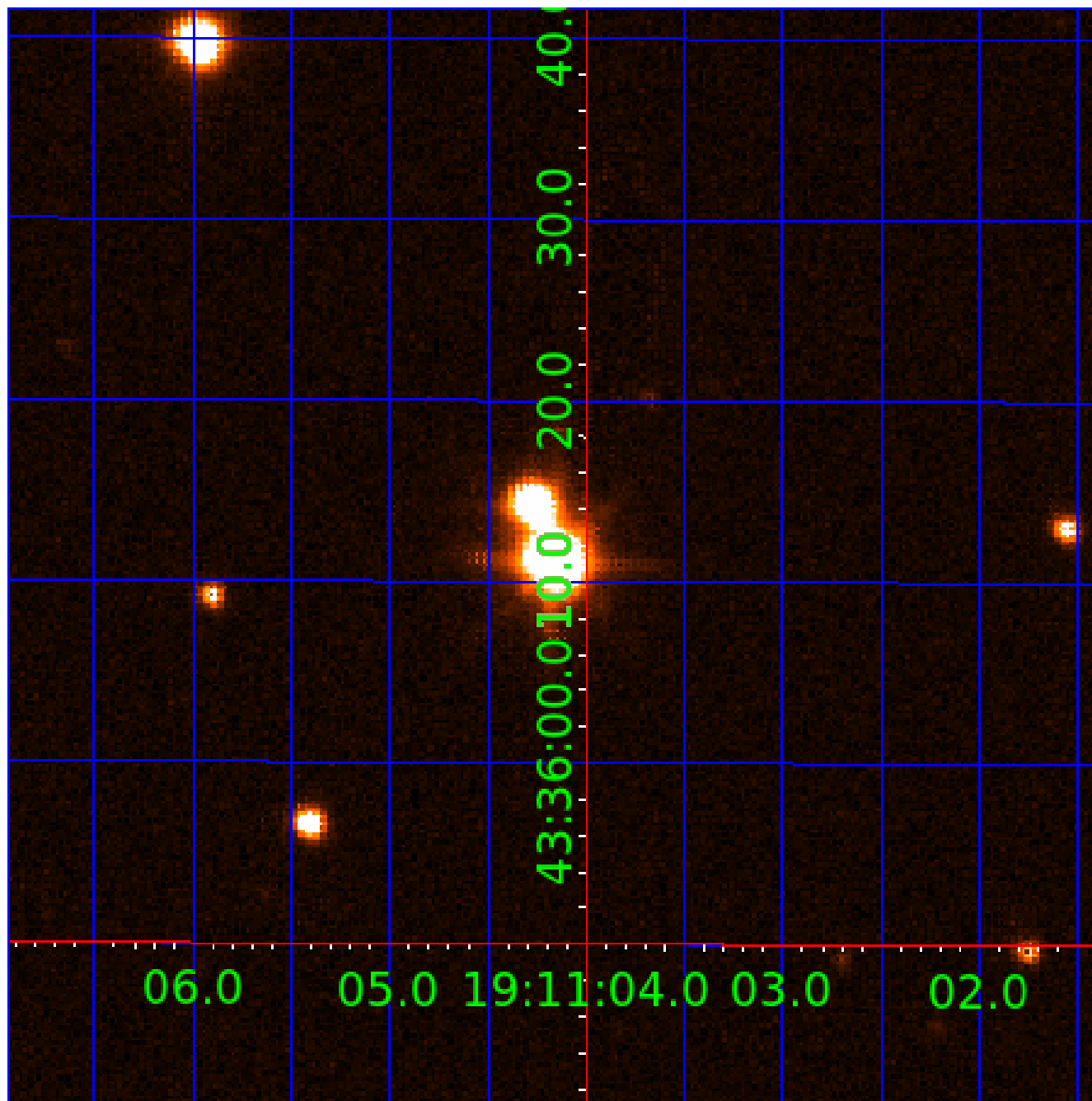


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## KIC 007880676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007880676-01	OBS	No	74.700898	193.436167	18.8	1.598	31.4	2.9	1.96	6129	1.00	34.52
007880676-02	OBS	No	544.696610	418.947989	55.4	9.071	18.7	19.0	1.96	6129	1.69	2.44
007880676-03	OBS	No	93.437611	139.301041	58.6	0.868	19.0	28.0	1.96	6129	1.53	25.61
007880676-04	OBS	No	149.986976	136.477266	48.9	3.061	18.7	14.8	1.96	6129	1.37	13.63
007880676-05	OBS	No	49.327158	139.760525	11.7	11.019	14.0	6.8	1.96	6129	0.76	60.03
007880676-06	OBS	No	69.390592	165.569874	29.3	16.554	13.7	11.6	1.96	6129	1.17	38.08
007880676-07	OBS	No	64.361879	185.581530	60.1	2.287	19.3	24.3	1.96	6129	1.73	42.10
007880676-08	OBS	No	94.170624	203.456516	15.9	8.738	13.3	6.8	1.96	6129	0.91	25.35
007880676-09	OBS	No	75.849882	138.940758	46.7	1.755	17.5	8.4	1.96	6129	1.63	33.82
007880676-10	OBS	No	78.737554	157.099189	20.9	12.578	12.9	8.0	1.96	6129	1.05	32.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007880676-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007880676-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-05	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
007880676-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-08	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-09	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-10	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

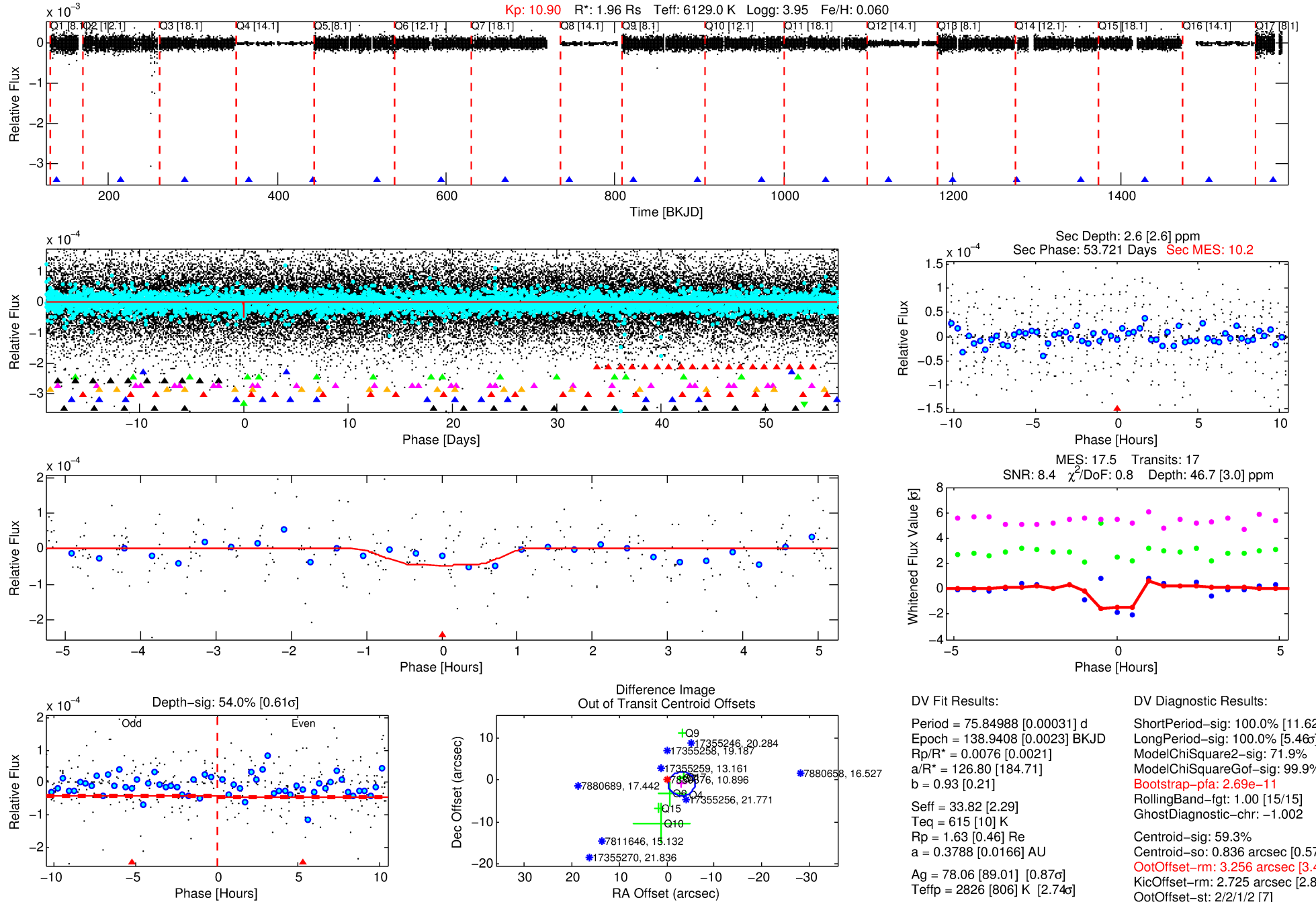
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-09

No Significant Match Found

# DV One-Page Summary

KIC: 7880676 Candidate: 9 of 10 Period: 75.850 d



## DV Fit Results:

Period = 75.84988 [0.00031] d  
Epoch = 138.9408 [0.0023] BKJD  
Rp/R\* = 0.0076 [0.0021]  
a/R\* = 126.80 [184.71]  
b = 0.93 [0.21]  
Seff = 33.82 [2.29]  
Teq = 615 [10] K  
Rp = 1.63 [0.46] Re  
a = 0.3788 [0.0166] AU  
Ag = 78.06 [89.01] [0.87 $\sigma$ ]  
Teff = 2826 [806] K [2.74 $\sigma$ ]

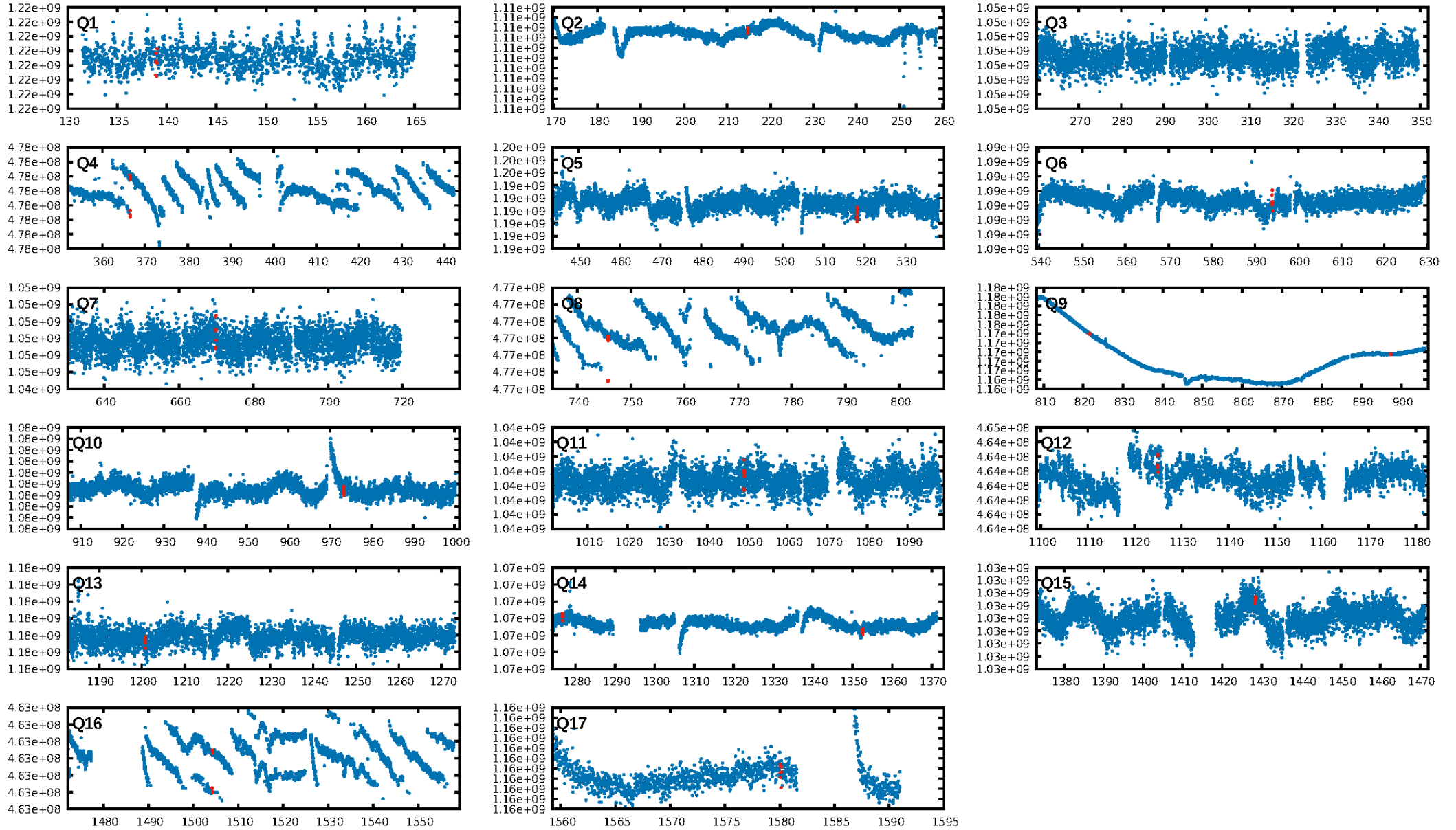
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [11.62 $\sigma$ ]  
LongPeriod-sig: 100.0% [5.46 $\sigma$ ]  
ModelChiSquare2-sig: 71.9%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 2.69e-11  
RollingBand-fgt: 1.00 [15/15]  
GhostDiagnostic-chr: -1.002  
Centroid-sig: 59.3%  
Centroid-so: 0.836 arcsec [0.57 $\sigma$ ]  
OOTOffset-rm: 3.256 arcsec [3.45 $\sigma$ ]  
KicOffset-rm: 2.725 arcsec [2.86 $\sigma$ ]  
OOTOffset-st: 2/2/1/2 [7]  
KicOffset-st: 2/2/1/2 [7]  
DiffImageQuality-fgm: 0.14 [1/7]  
DiffImageOverlap-fno: 1.00 [15/15]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:07:09 Z

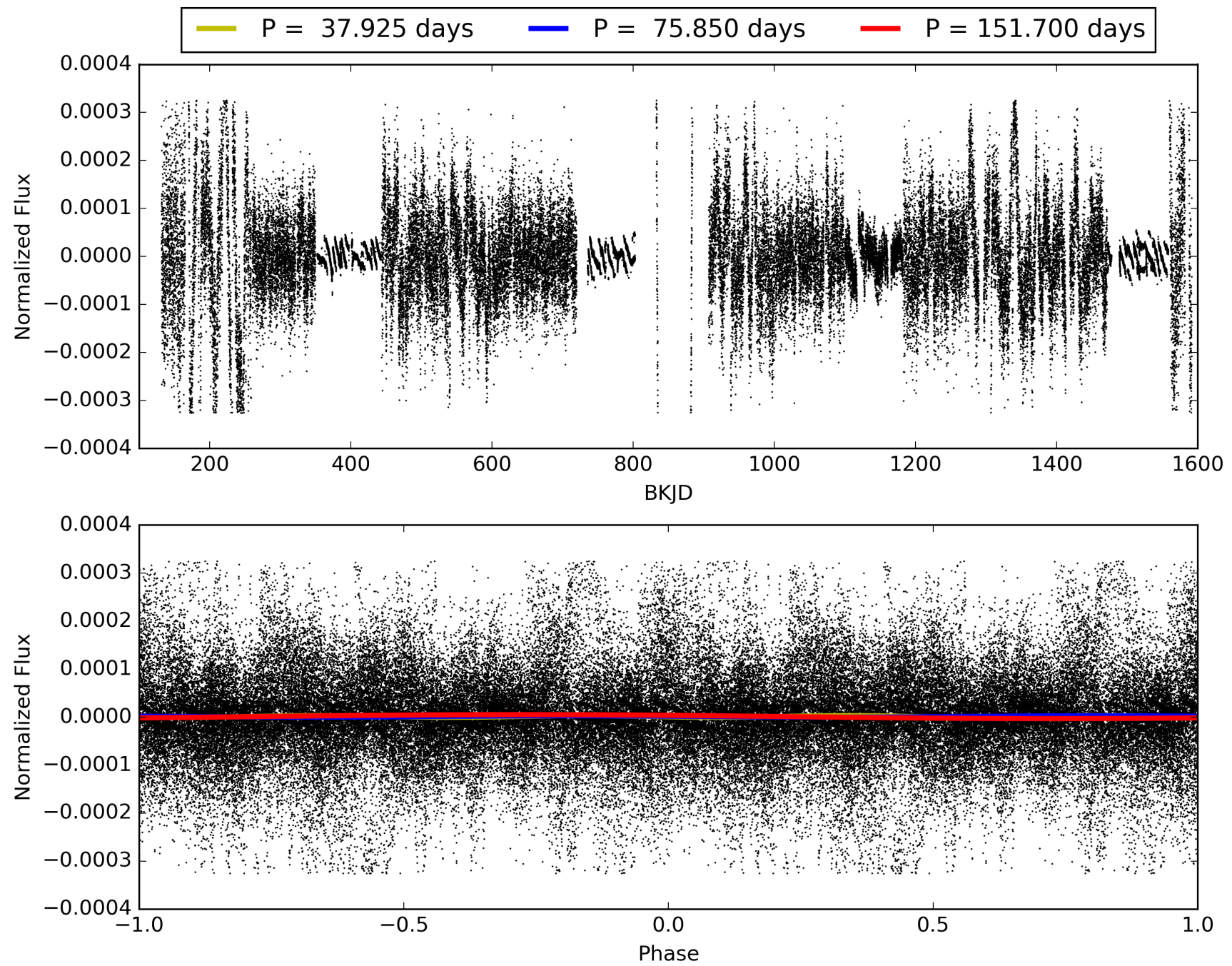
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007880676-09, PDC Light Curves





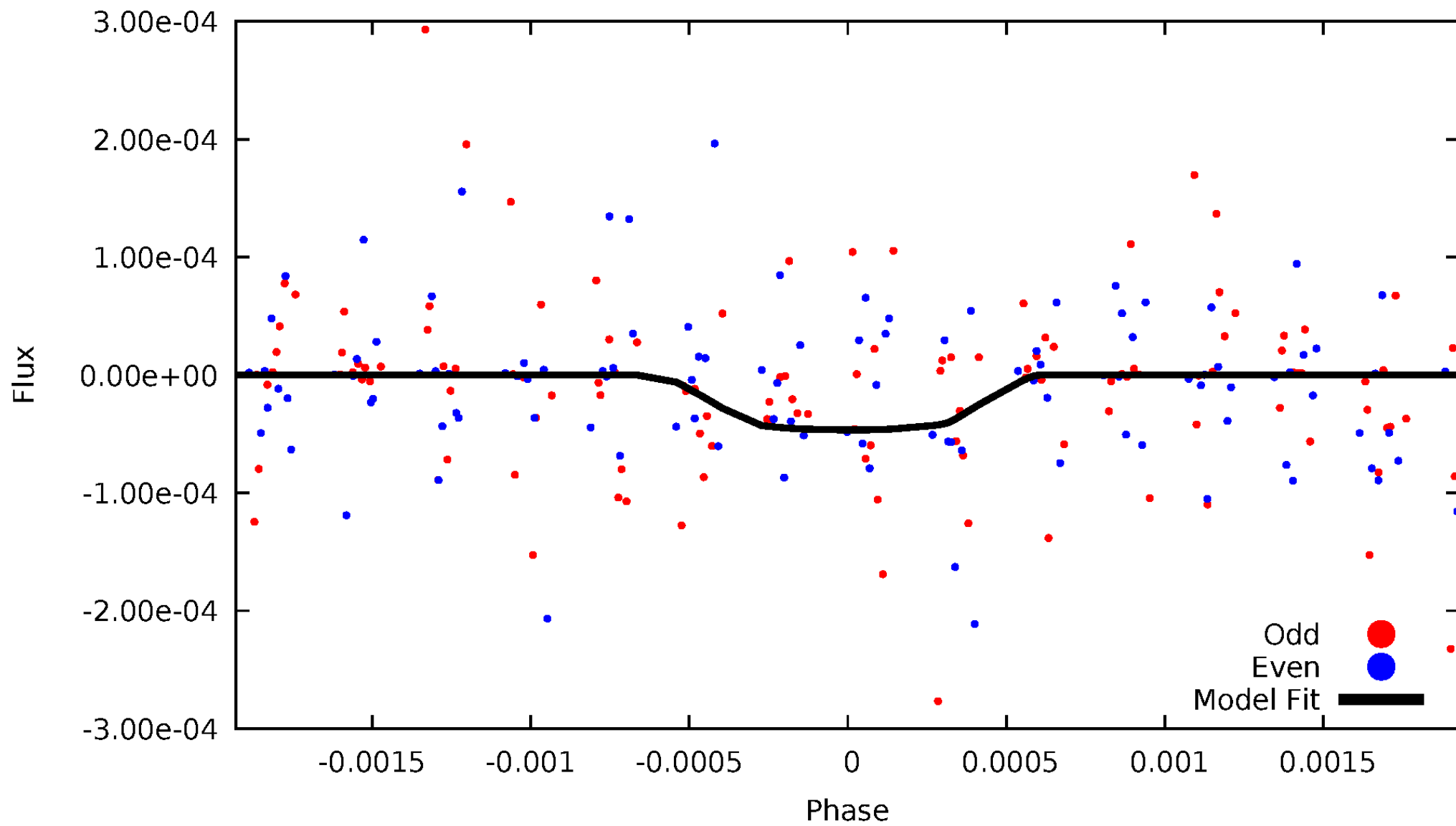
TCE 007880676-09





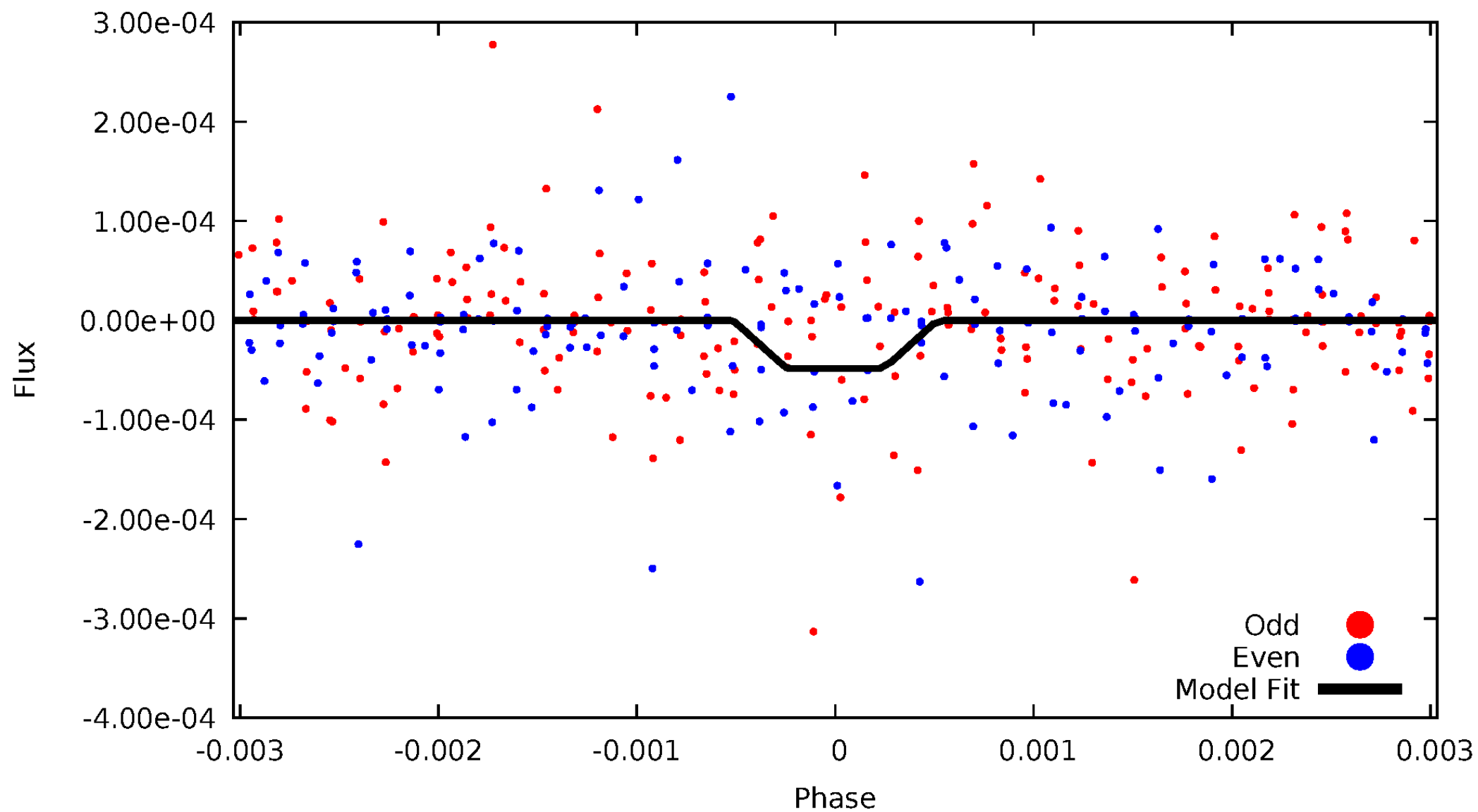
# DV Odd/Even

TCE 007880676-09



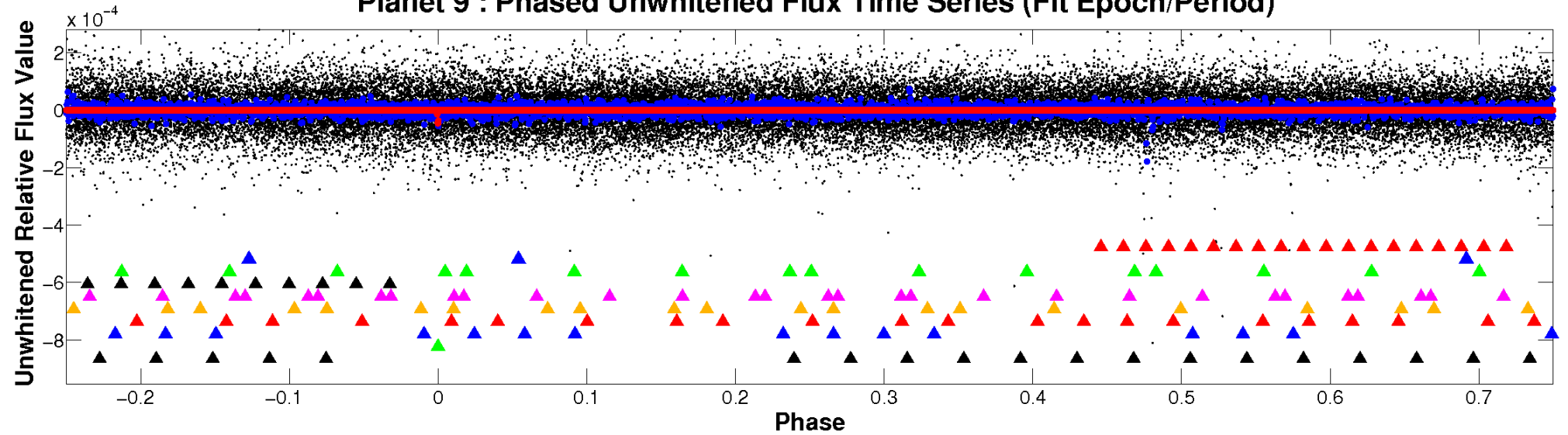
# ALT Odd/Even

TCE 007880676-09

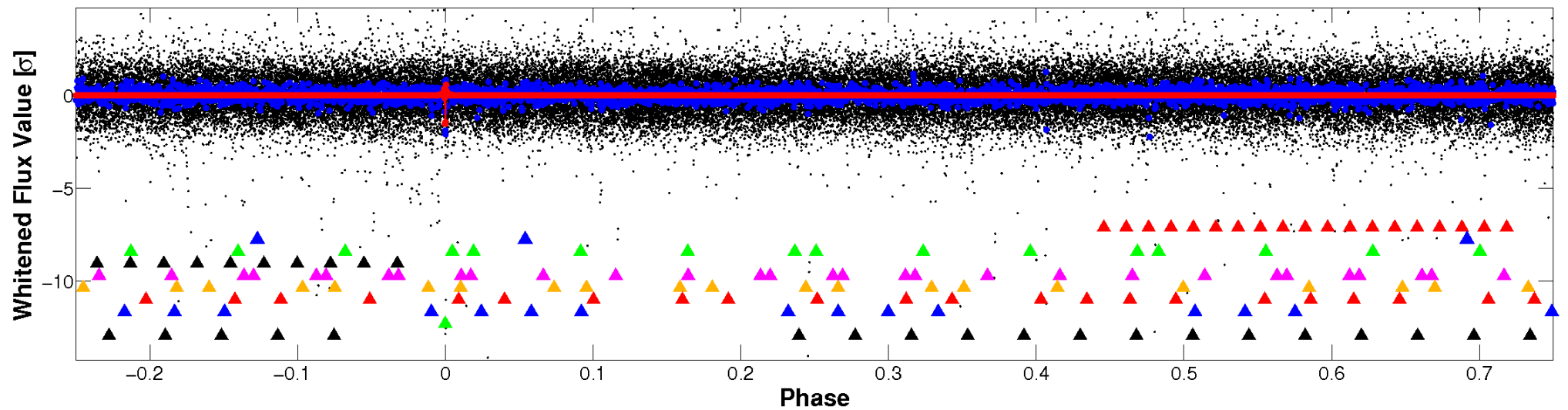


# Non-Whitened Vs. Whitened Light Curve

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

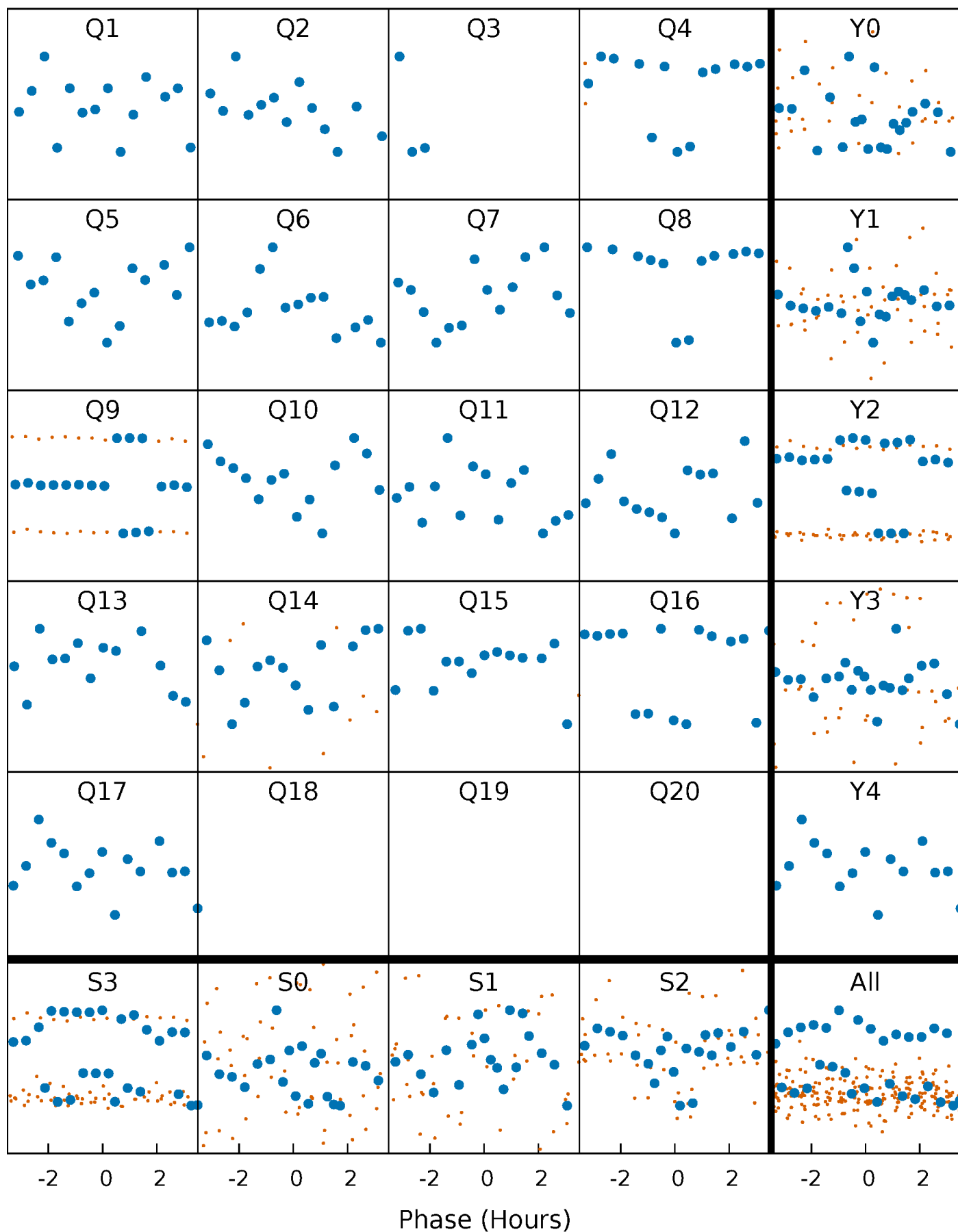


## Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)



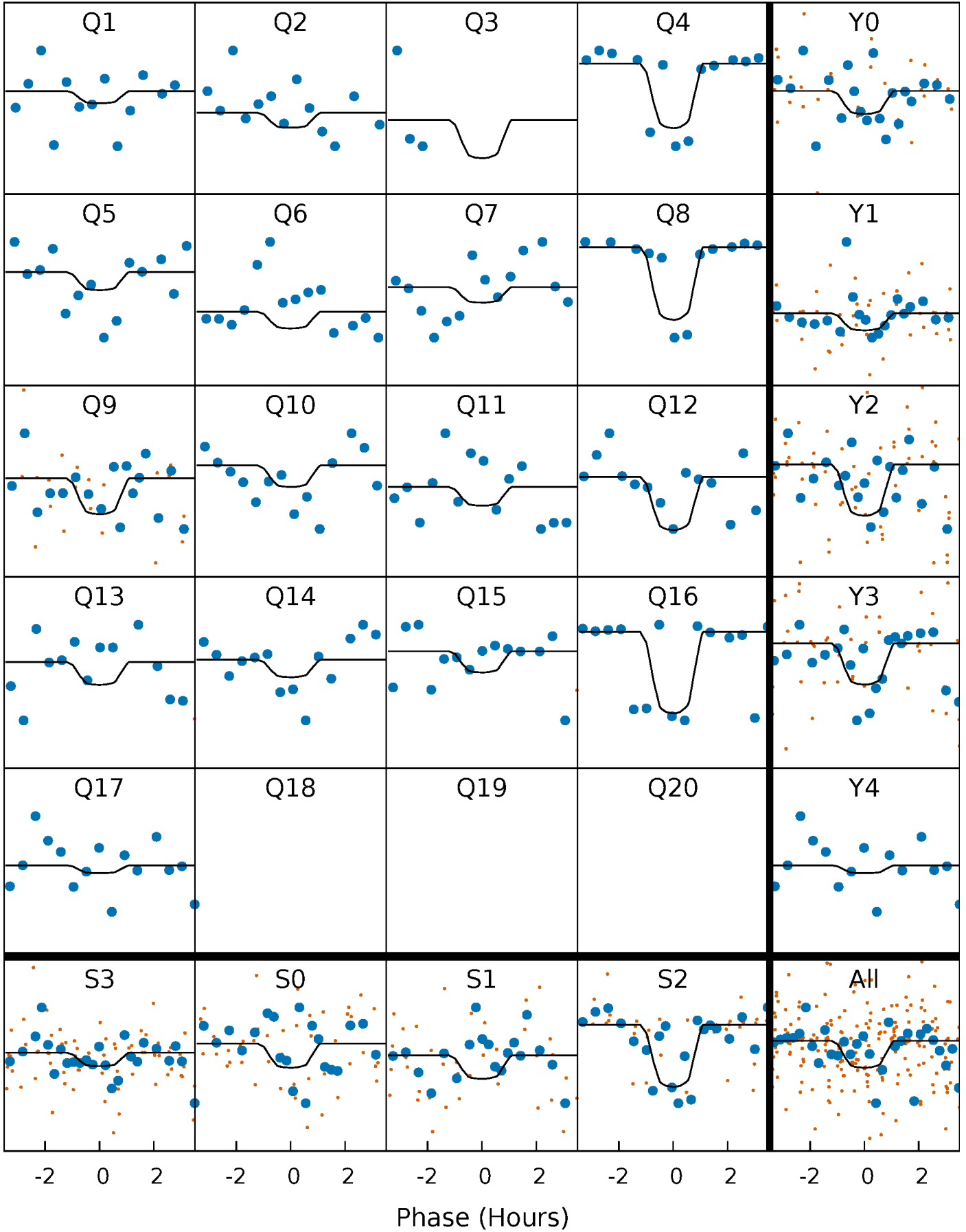
# PDC Quarter-Phased Transit Curves

TCE 007880676-09 P= 75.849882 Days  $T_0=138.940758$  (BKJD)



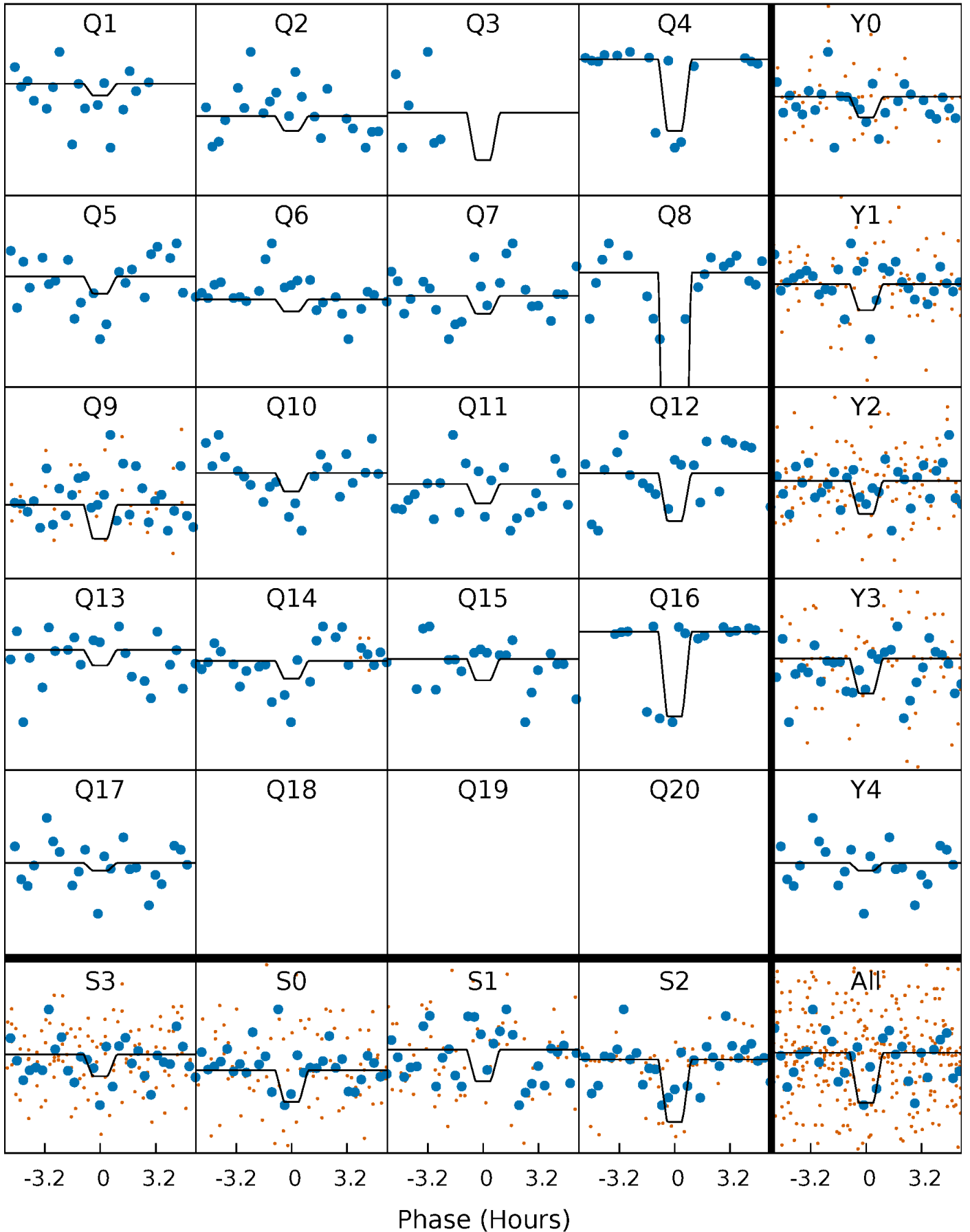
# DV Quarter-Phased Transit Curves

TCE 007880676-09 P= 75.849882 Days  $T_0=138.940758$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

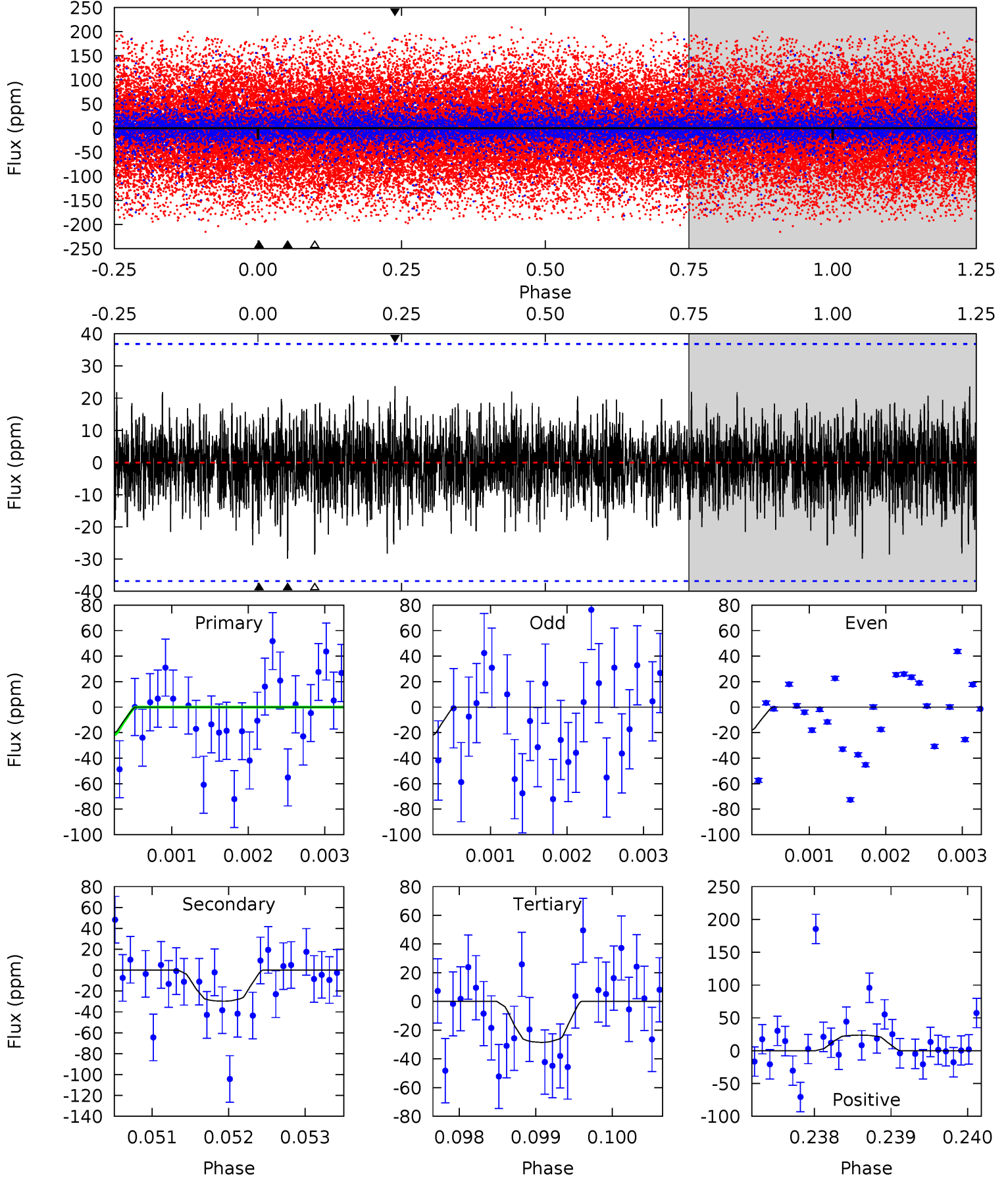
TCE 007880676-09 P= 75.851560 Days  $T_0=138.938802$  (BKJD)



# DV Model-Shift Uniqueness Test

007880676-09, P = 75.849882 Days, E = 63.090876 Days

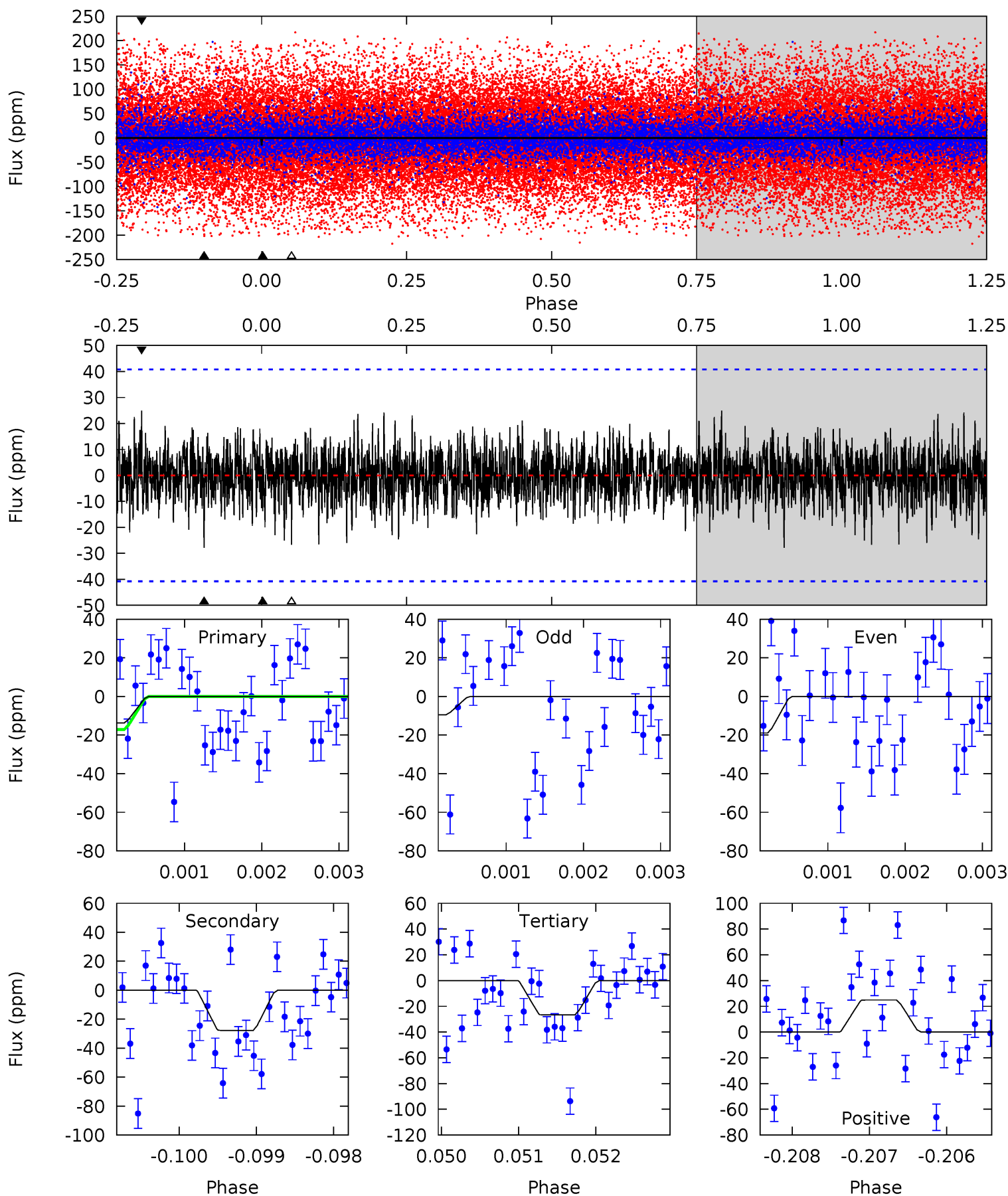
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.26	4.39	4.20	3.49	5.43	3.25	1.11	-0.94	-0.23	0.19	0.90	0.32	0.83	0.44	0.32



# Alt Model-Shift Uniqueness Test

007880676-09, P = 75.851560 Days, E = 63.087242 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.83	3.72	3.57	3.33	5.45	3.28	0.98	-1.74	-1.50	0.15	0.39	0.63	1.57	0.47	0.50





### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-30 \pm 7$	$1.62^{+0.46}_{-0.40}$	$860^{+13}_{-12}$	$5226^{+845}_{-538}$	$873^{+770}_{-355}$
Alt.	$-28 \pm 7$	$1.49^{+0.45}_{-0.48}$	$859^{+12}_{-12}$	$5328^{+1232}_{-627}$	$952^{+1317}_{-437}$

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

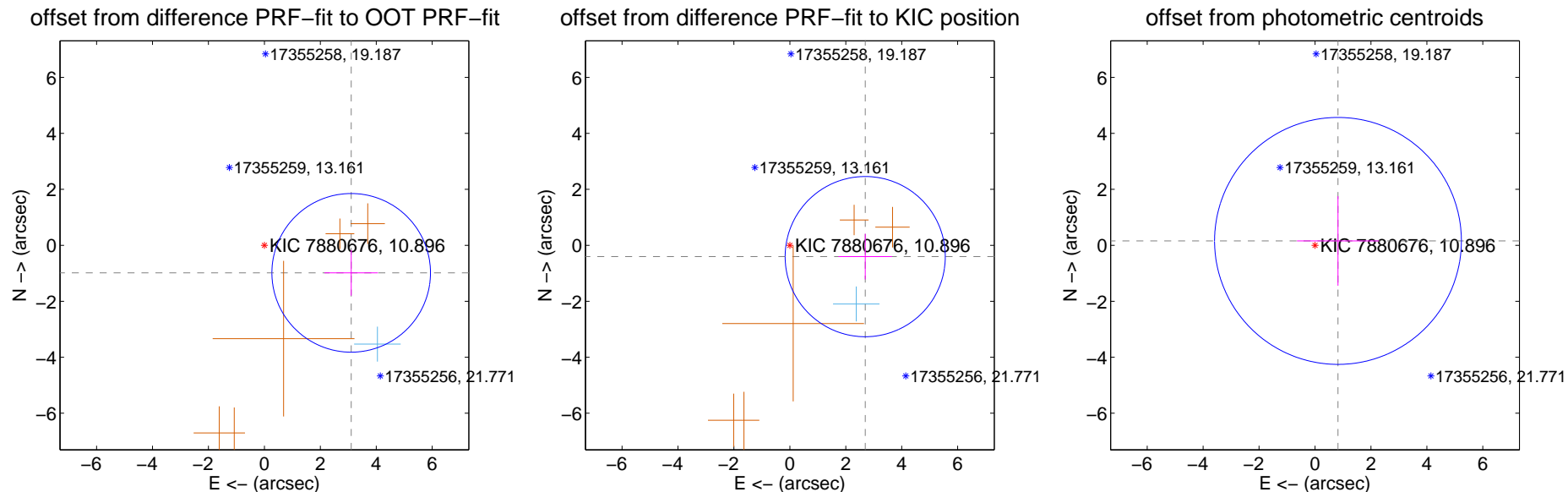
## DV Centroid Data

Supplemental centroid analysis for 007880676-09. **Kepler magnitude: 10.90.** Transit SNR 8.45

**There are 1 quarters with good PRF difference image offsets**

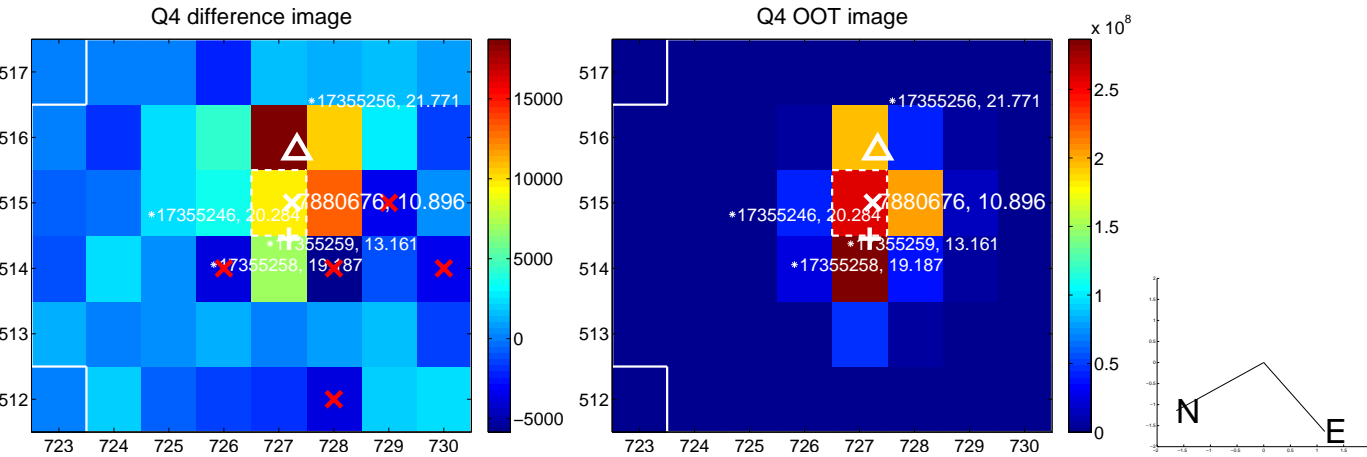
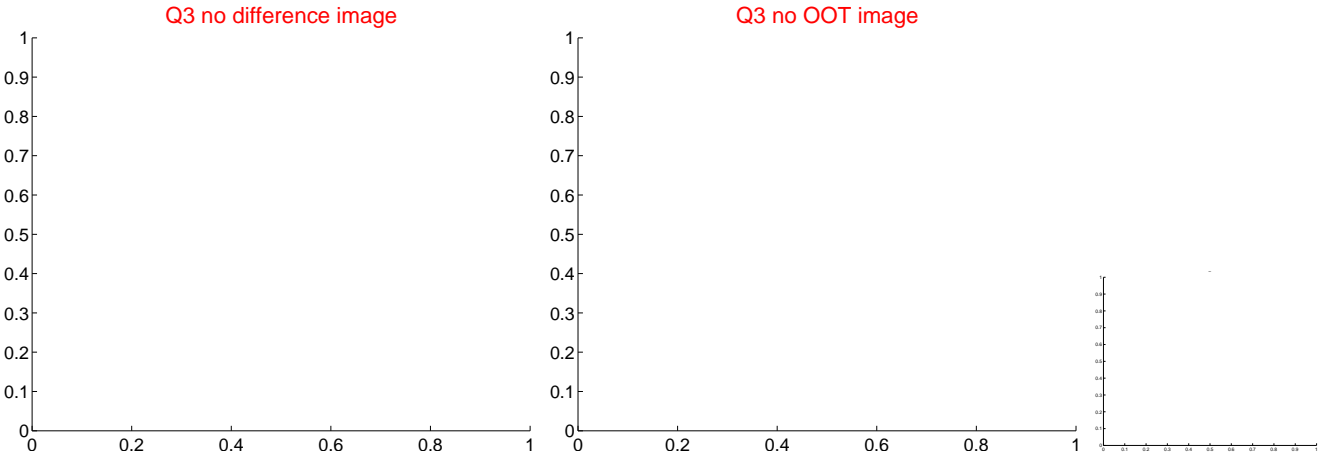
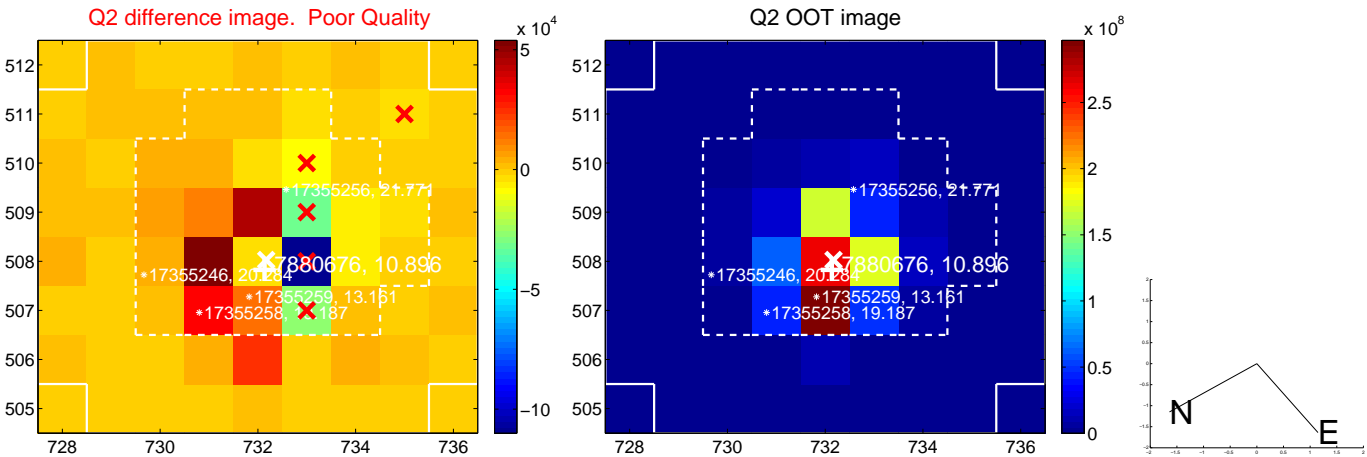
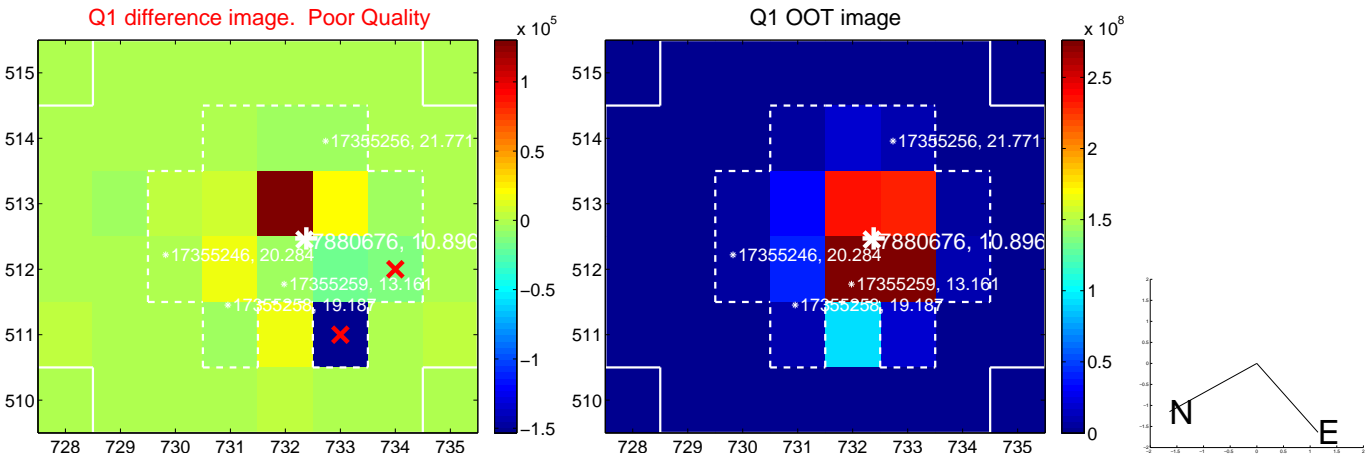
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>3.256 \pm 0.945</math></b>	<b>3.45</b>	$-3.103 \pm 0.957$	$-0.984 \pm 0.813$
PRF-fit source offset from KIC position	$2.725 \pm 0.954$	2.86	$-2.695 \pm 0.957$	$-0.404 \pm 0.813$
photometric centroid source offset	$0.84 \pm 1.47$	0.57	$-0.82 \pm 1.47$	$0.16 \pm 1.60$



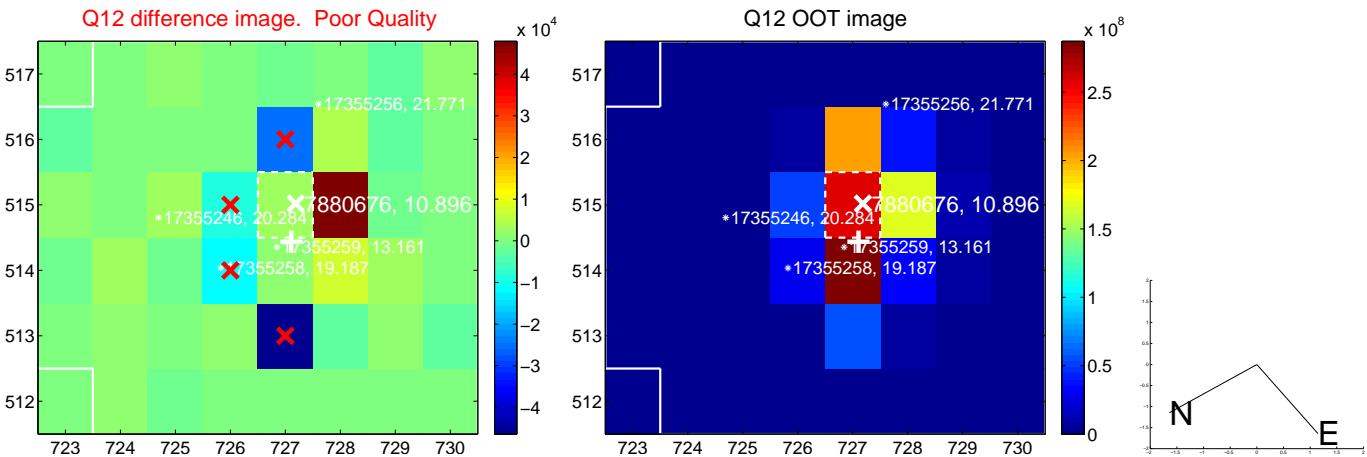
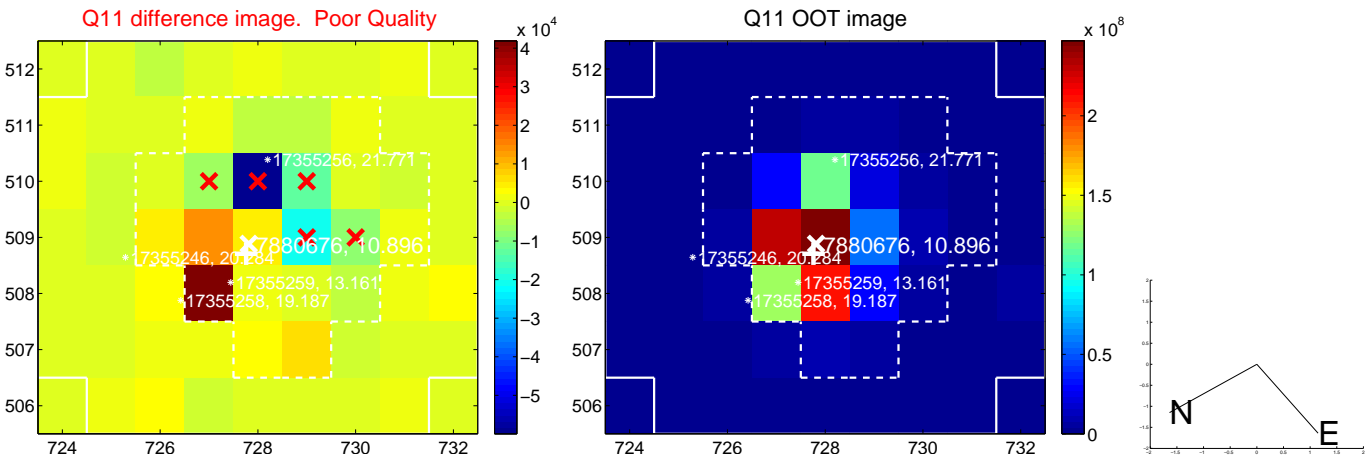
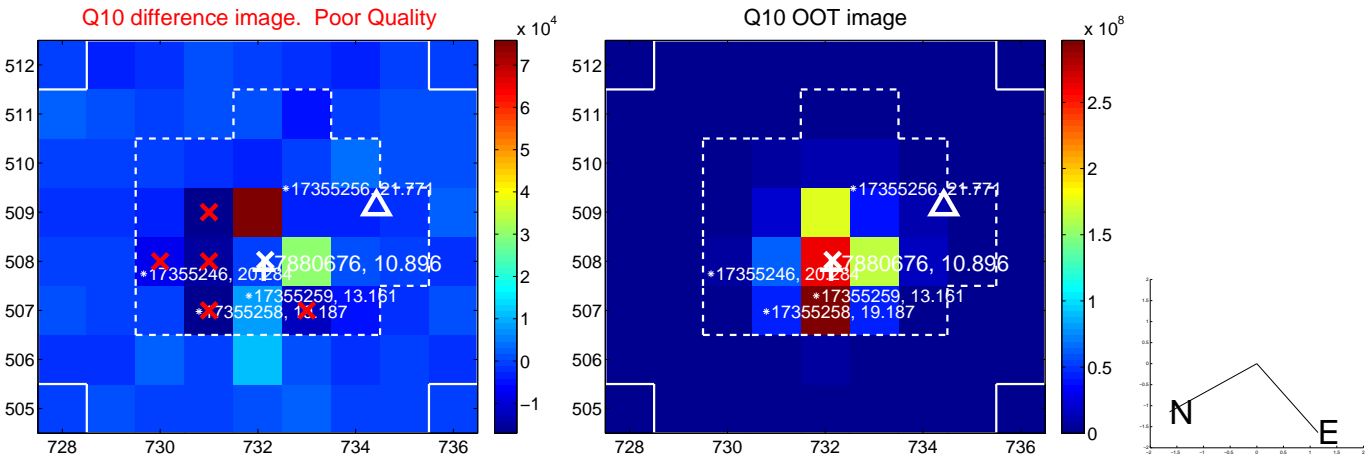
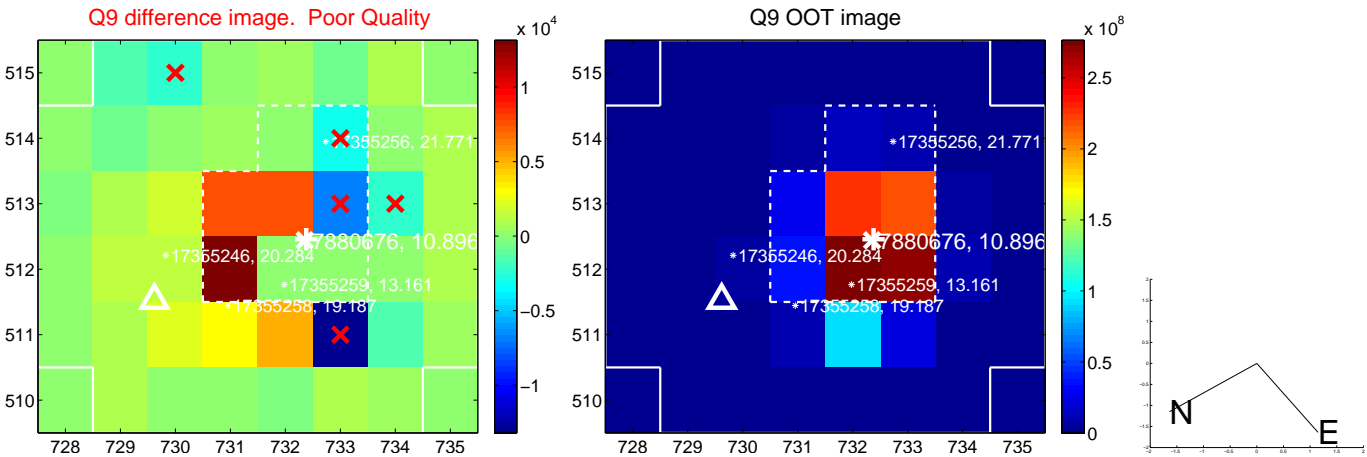
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

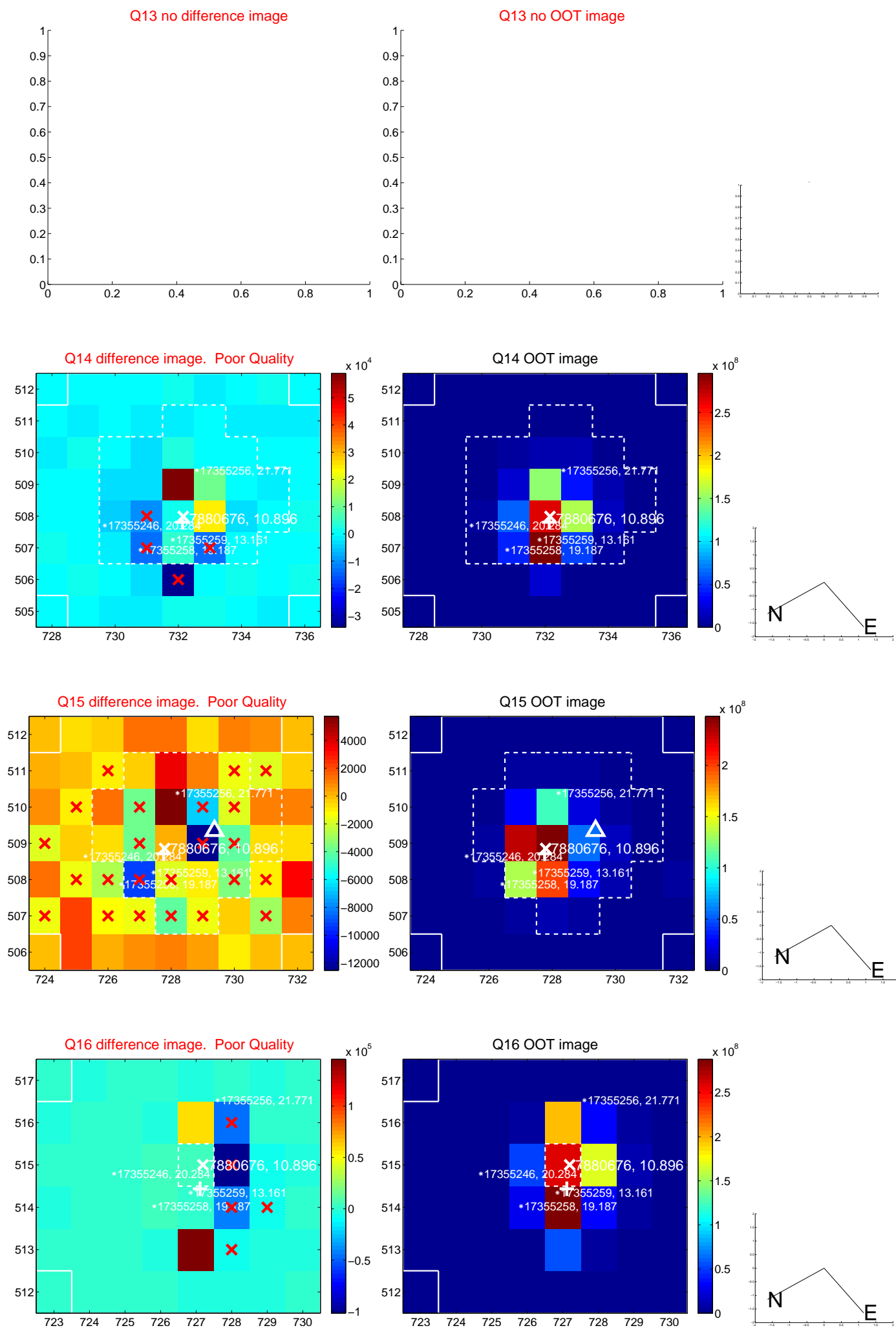




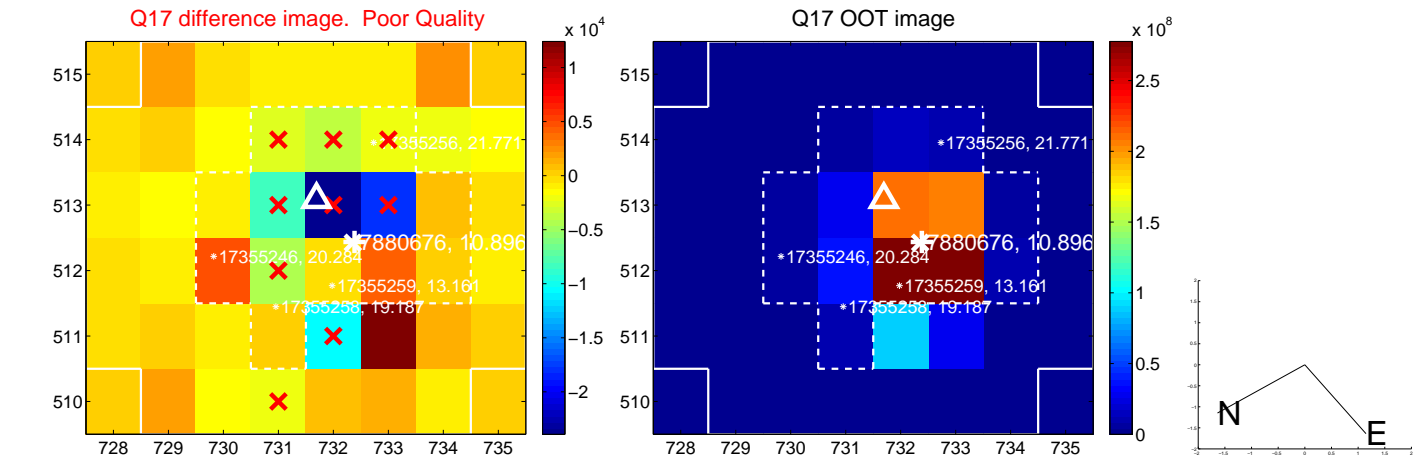
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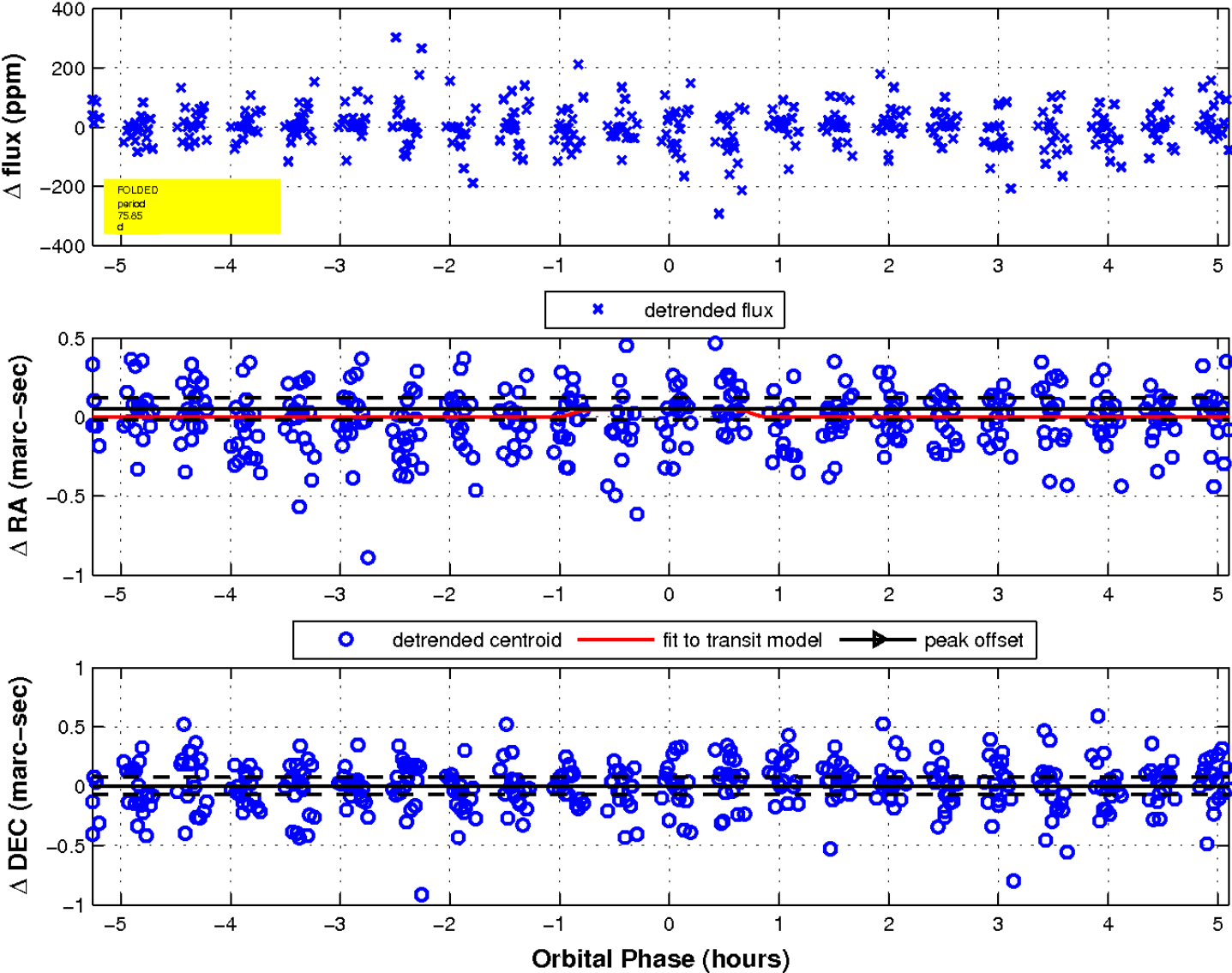
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

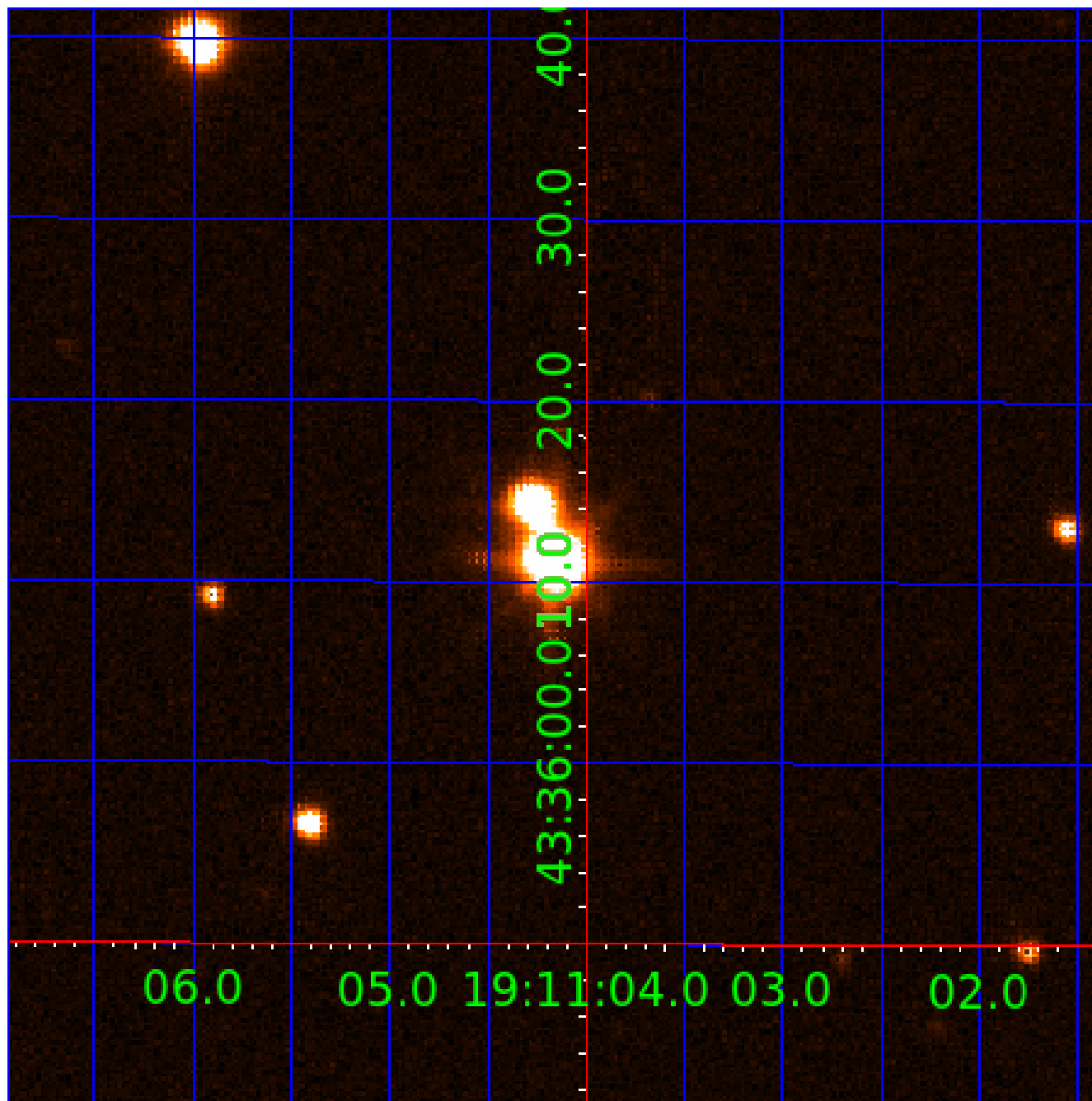


fluxWeightedCentroids, Planet 9 of 10



UKIRT Image

Declination





## KIC 007880676

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007880676-01	OBS	No	74.700898	193.436167	18.8	1.598	31.4	2.9	1.96	6129	1.00	34.52
007880676-02	OBS	No	544.696610	418.947989	55.4	9.071	18.7	19.0	1.96	6129	1.69	2.44
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007880676-05	OBS	No	49.327158	139.760525	11.7	11.019	14.0	6.8	1.96	6129	0.76	60.03
007880676-06	OBS	No	69.390592	165.569874	29.3	16.554	13.7	11.6	1.96	6129	1.17	38.08
007880676-07	OBS	No	64.361879	185.581530	60.1	2.287	19.3	24.3	1.96	6129	1.73	42.10
007880676-08	OBS	No	94.170624	203.456516	15.9	8.738	13.3	6.8	1.96	6129	0.91	25.35
007880676-09	OBS	No	75.849882	138.940758	46.7	1.755	17.5	8.4	1.96	6129	1.63	33.82
007880676-10	OBS	No	78.737554	157.099189	20.9	12.578	12.9	8.0	1.96	6129	1.05	32.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007880676-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007880676-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-05	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
007880676-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-08	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-09	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007880676-10	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

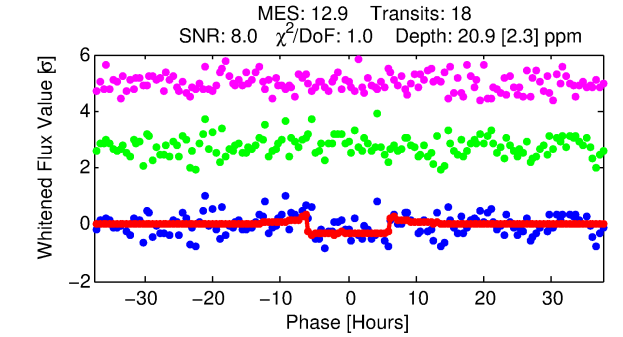
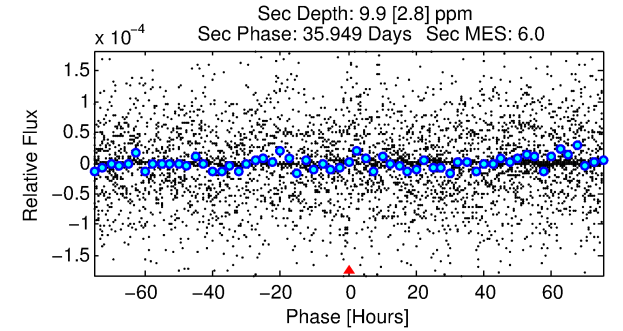
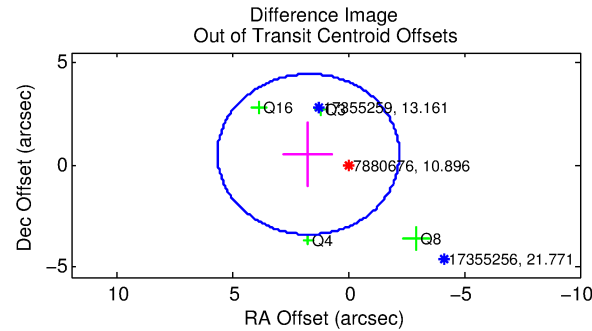
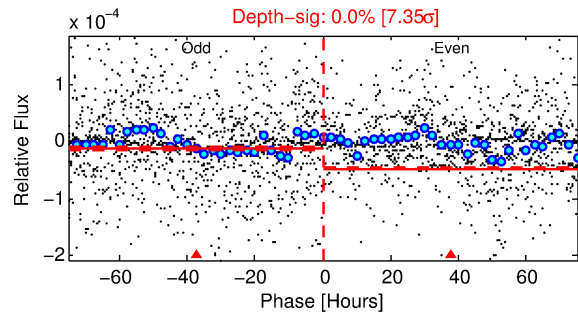
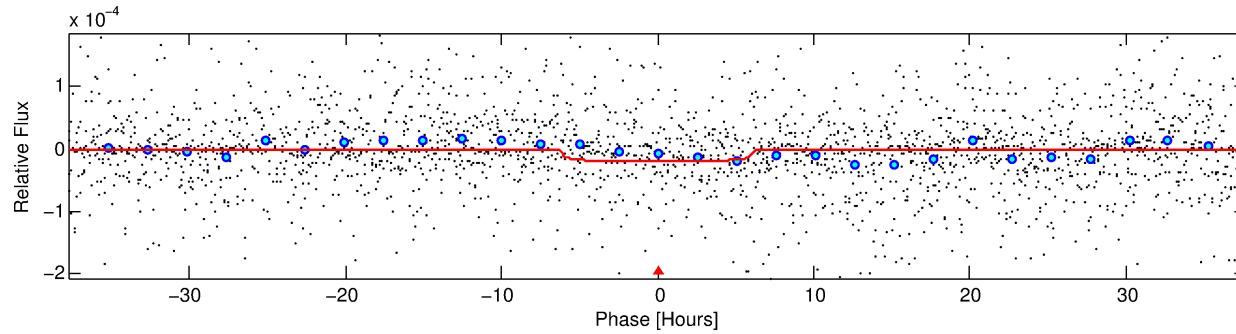
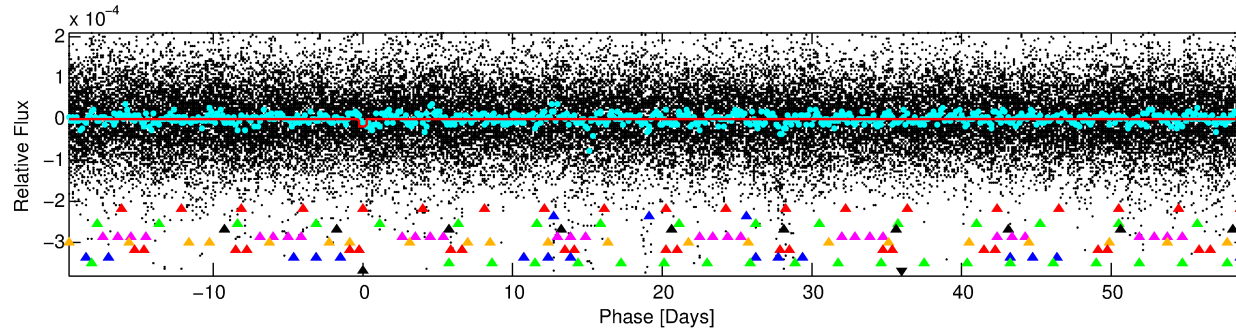
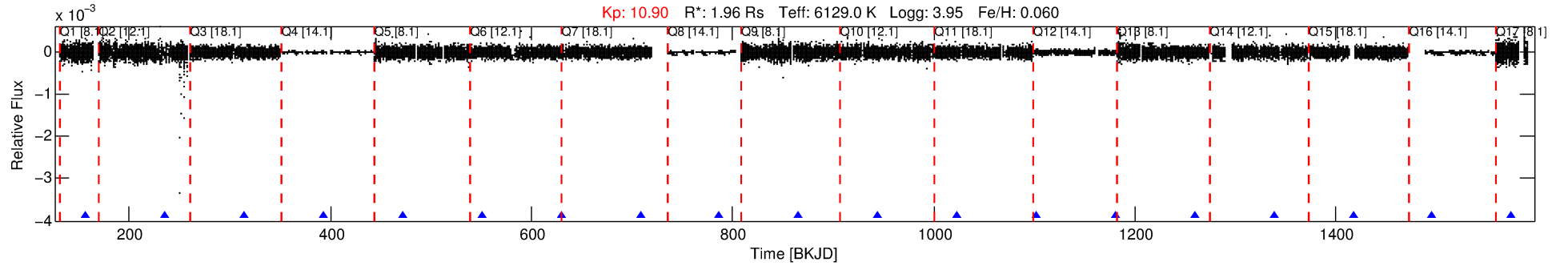
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007880676-10

No Significant Match Found

# DV One-Page Summary

KIC: 7880676 Candidate: 10 of 10 Period: 78.738 d



## DV Fit Results:

Period = 78.73755 [0.00074] d  
Epoch = 157.0992 [0.0073] BKJD  
Rp/R\* = 0.0049 [0.0004]  
a/R\* = 21.60 [7.79]  
b = 0.90 [0.08]  
Seff = 32.18 [2.18]  
Teq = 607 [10] K  
Rp = 1.05 [0.12] Re  
a = 0.3883 [0.0170] AU  
Ag = 741.24 [249.37] [2.97 $\sigma$ ]  
Teffp = 4899 [412] K [10.41 $\sigma$ ]

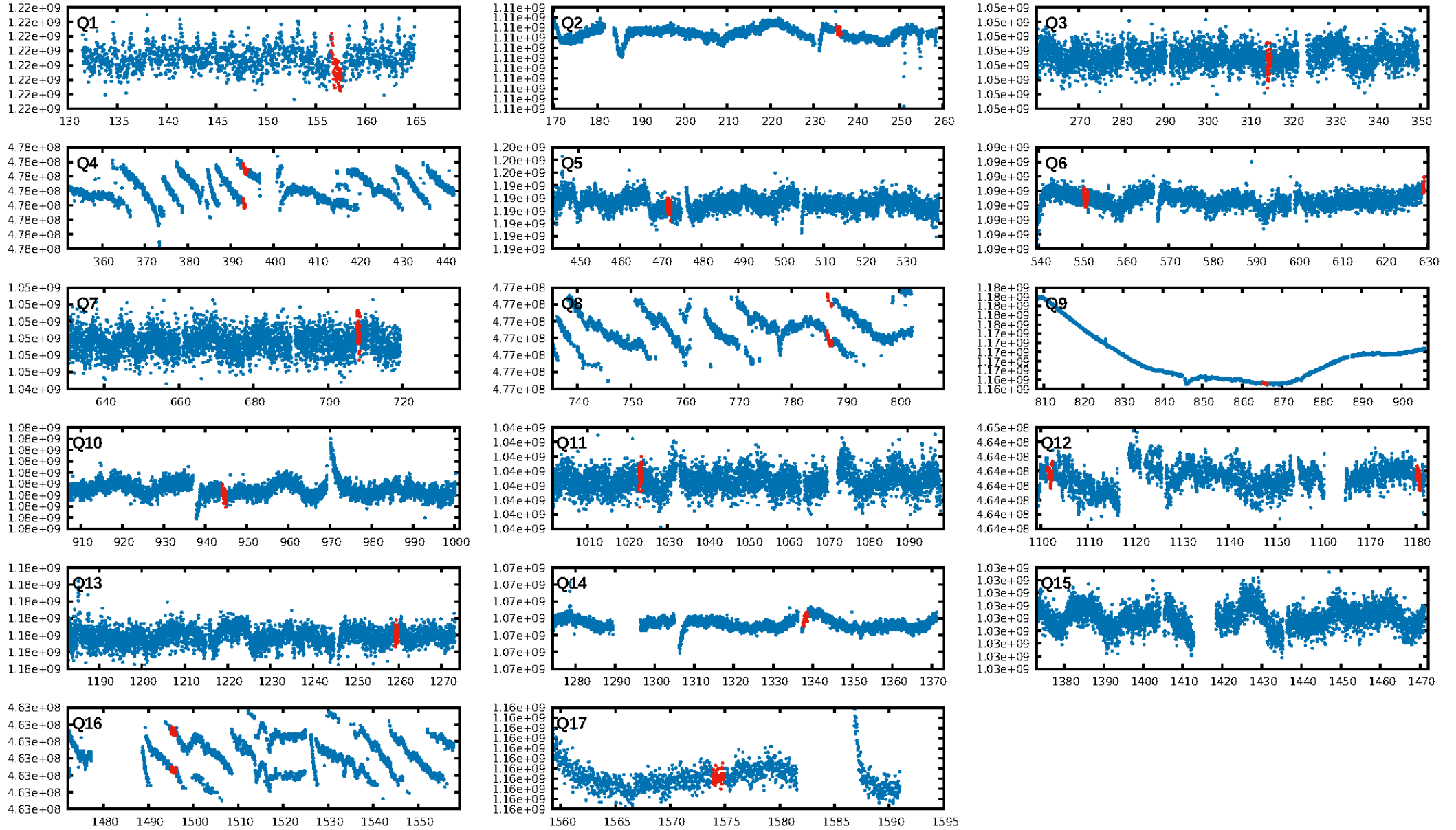
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.46 $\sigma$ ]  
LongPeriod-sig: 100.0% [27.98 $\sigma$ ]  
ModelChiSquare2-sig: 3.8%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 3.62e-09**  
RollingBand-fgt: 1.00 [16/16]  
GhostDiagnostic-chr: 45.22  
Centroid-sig: 1.4%  
Centroid-so: 2.877 arcsec [1.44 $\sigma$ ]  
OotOffset-rm: 1.811 arcsec [1.38 $\sigma$ ]  
KicOffset-rm: 3.328 arcsec [2.06 $\sigma$ ]  
OotOffset-st: 0/1/3/0 [4]  
KicOffset-st: 0/1/3/0 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.73 [11/15]

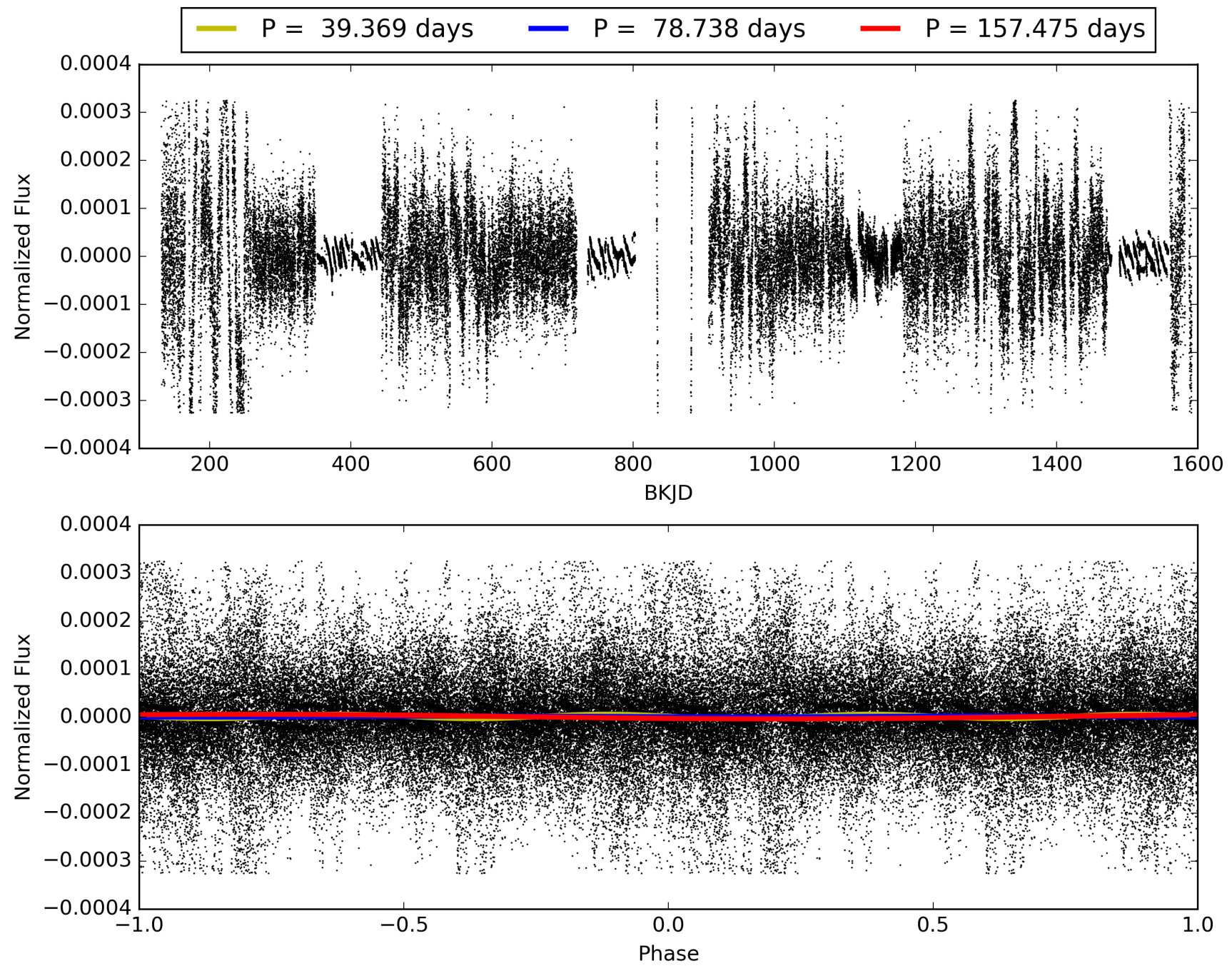
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 08:07:15 Z

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

# TCE 007880676-10, PDC Light Curves

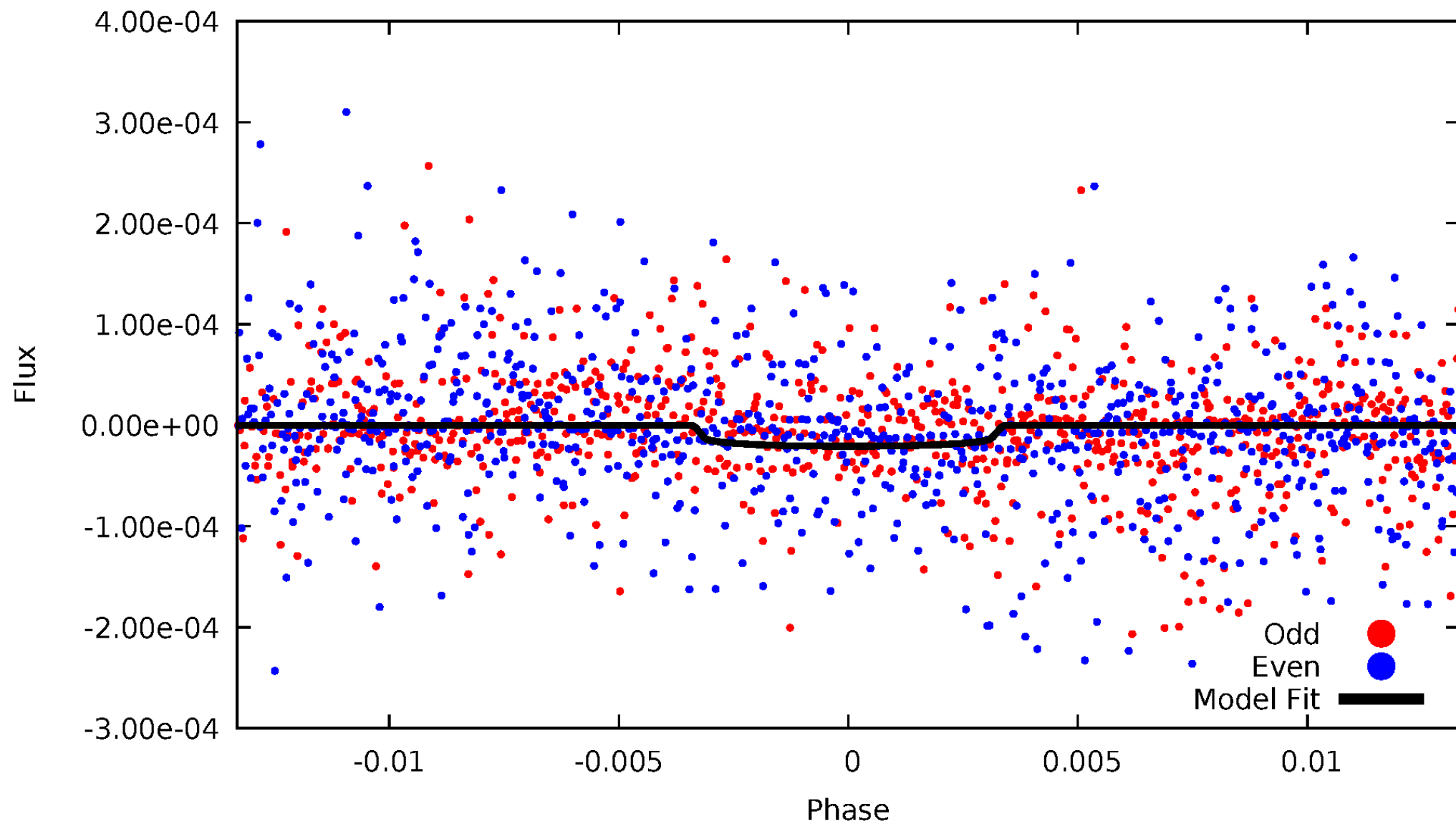


TCE 007880676-10



# DV Odd/Even

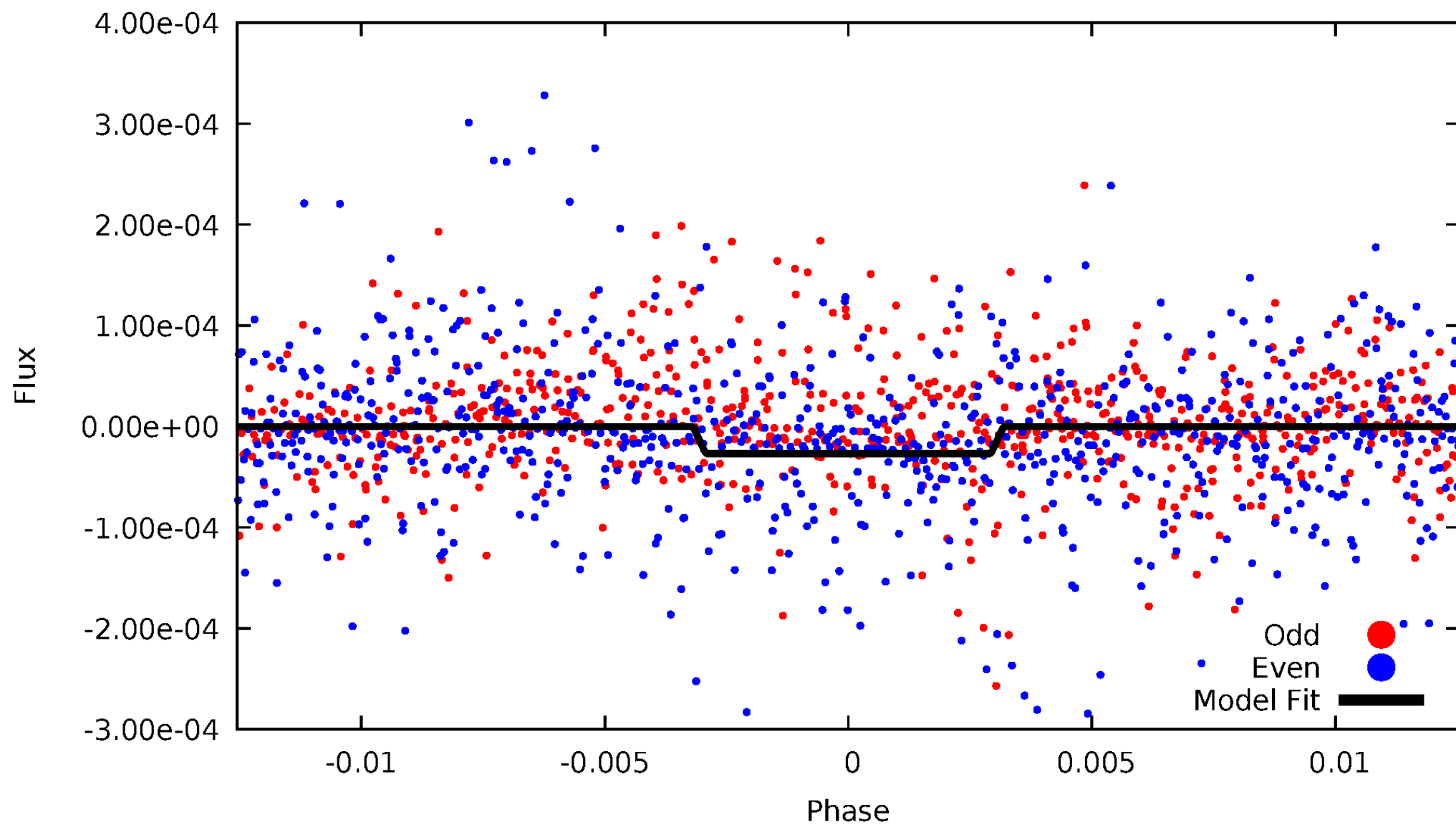
TCE 007880676-10





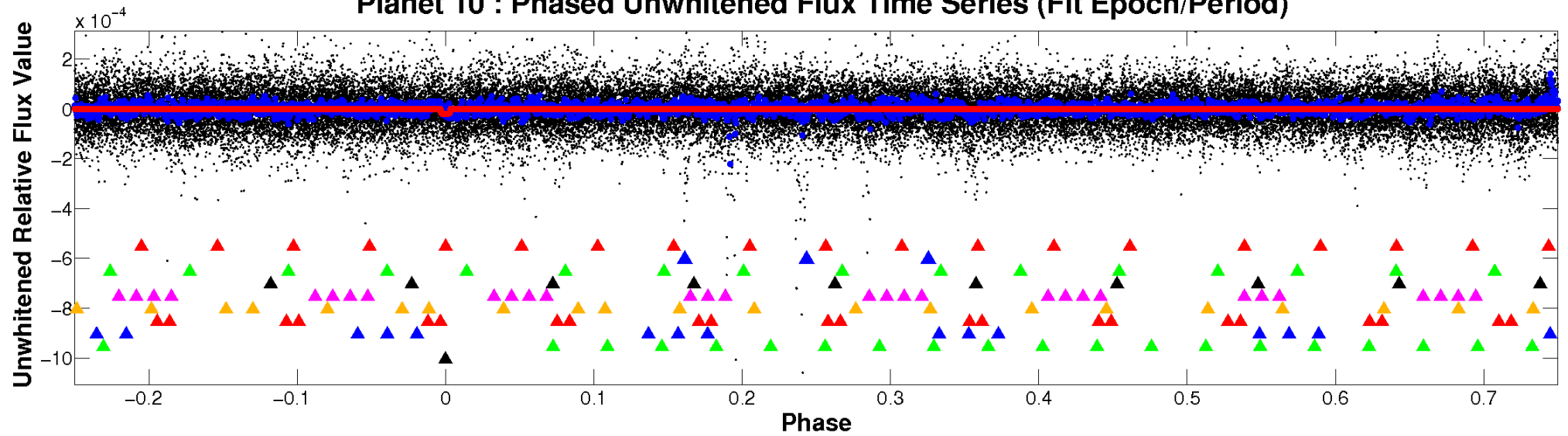
# ALT Odd/Even

TCE 007880676-10

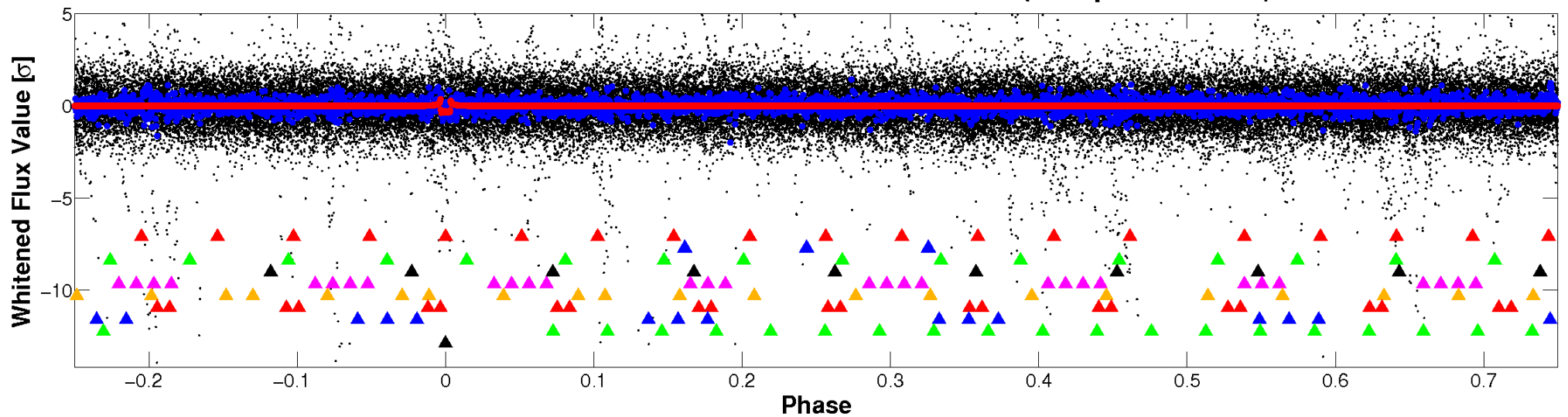


# Non-Whitened Vs. Whitened Light Curve

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

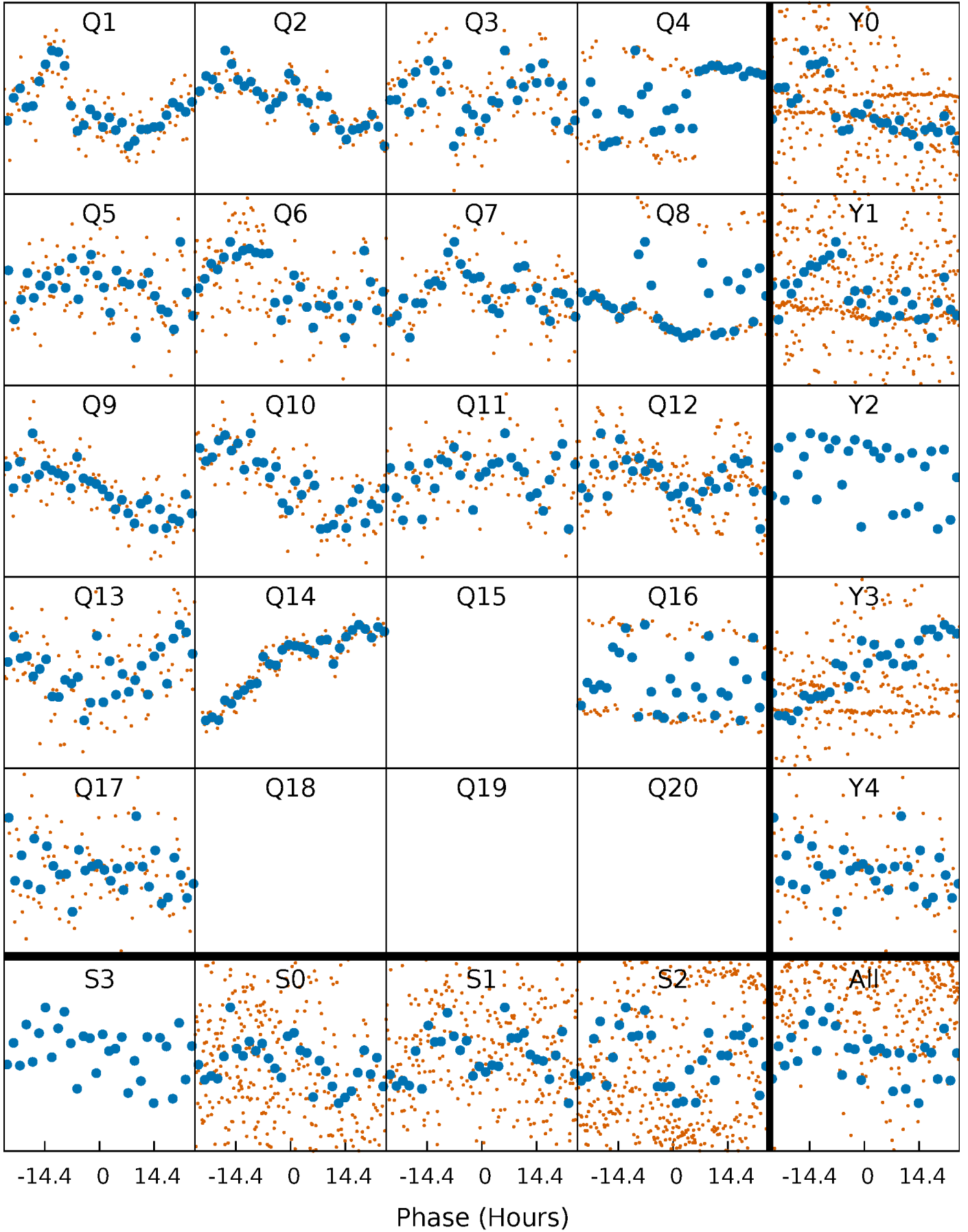


Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

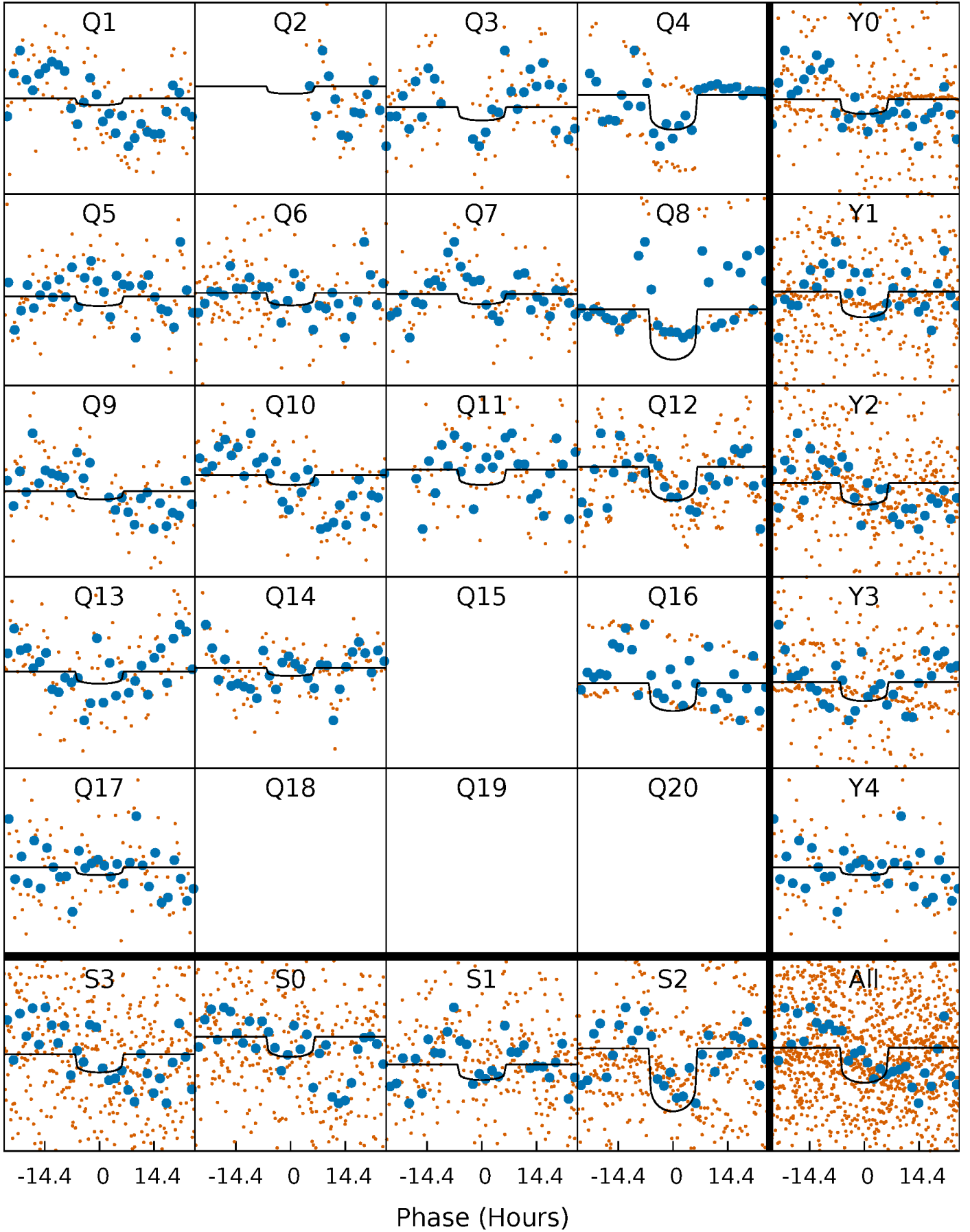
TCE 007880676-10 P= 78.737554 Days  $T_0=157.099189$  (BKJD)





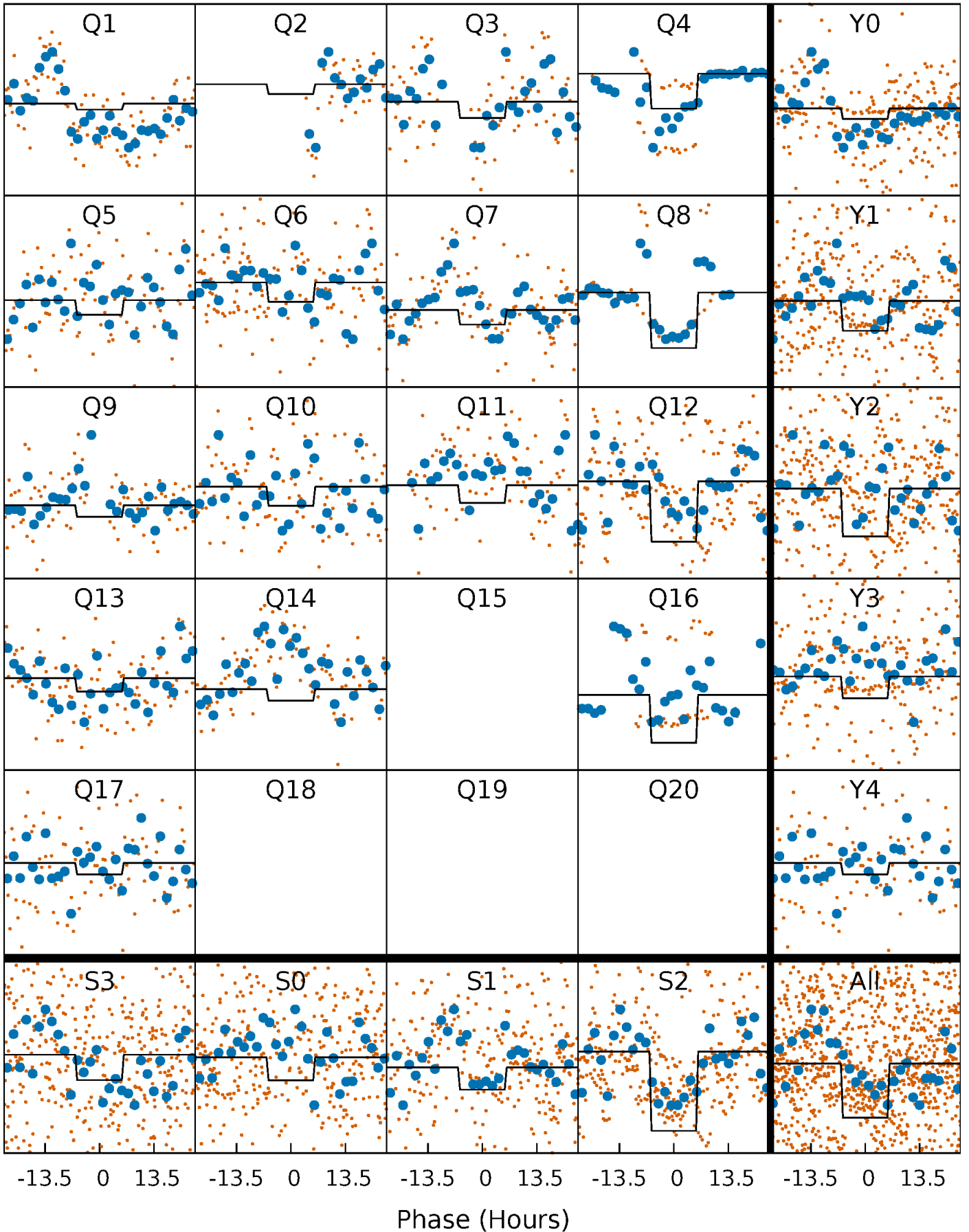
# DV Quarter-Phased Transit Curves

TCE 007880676-10   P= 78.737554 Days    $T_0=157.099189$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

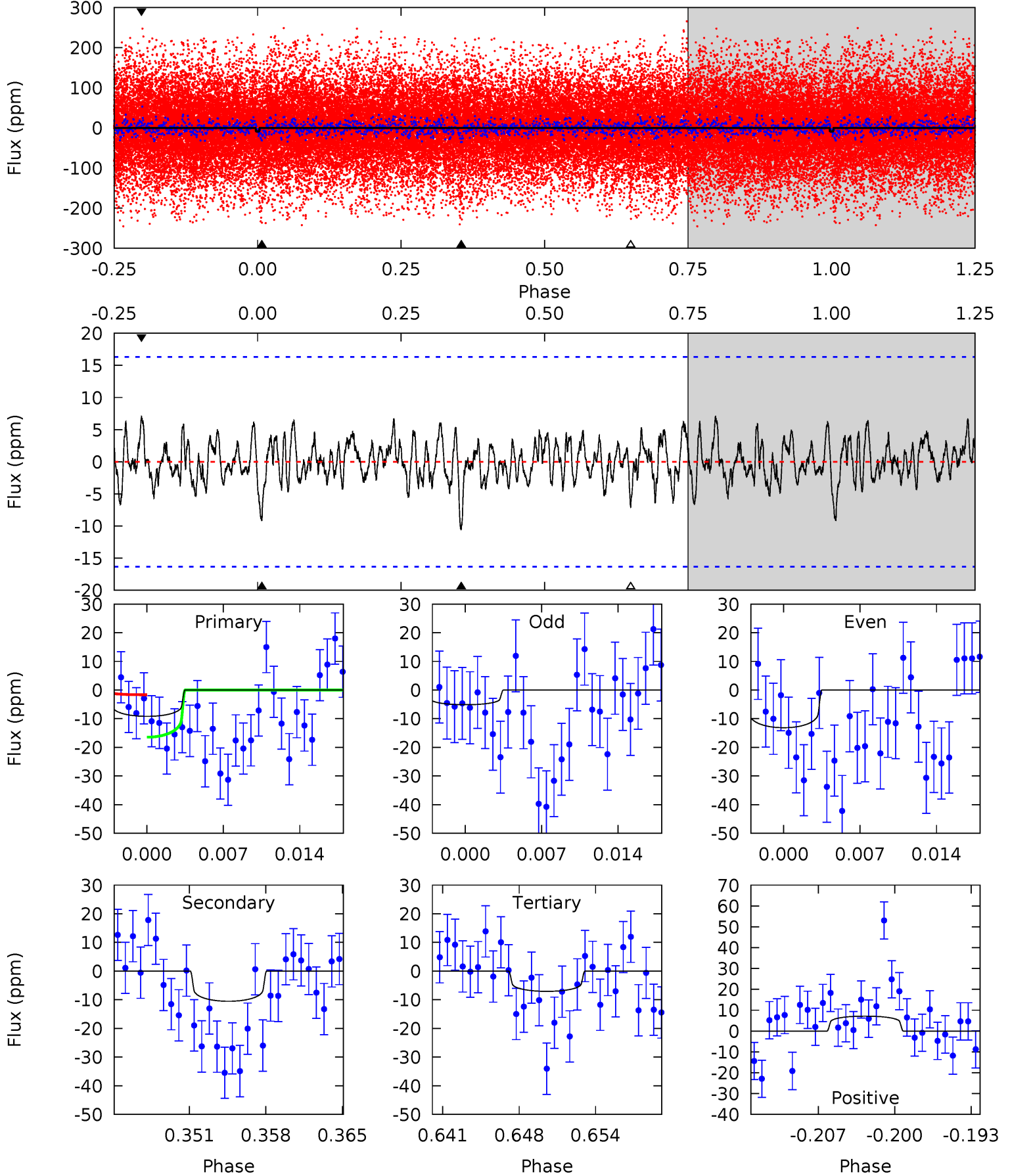
TCE 007880676-10   P= 78.736380 Days    $T_0=157.117822$  (BKJD)



# DV Model-Shift Uniqueness Test

007880676-10, P = 78.737554 Days, E = 78.361635 Days

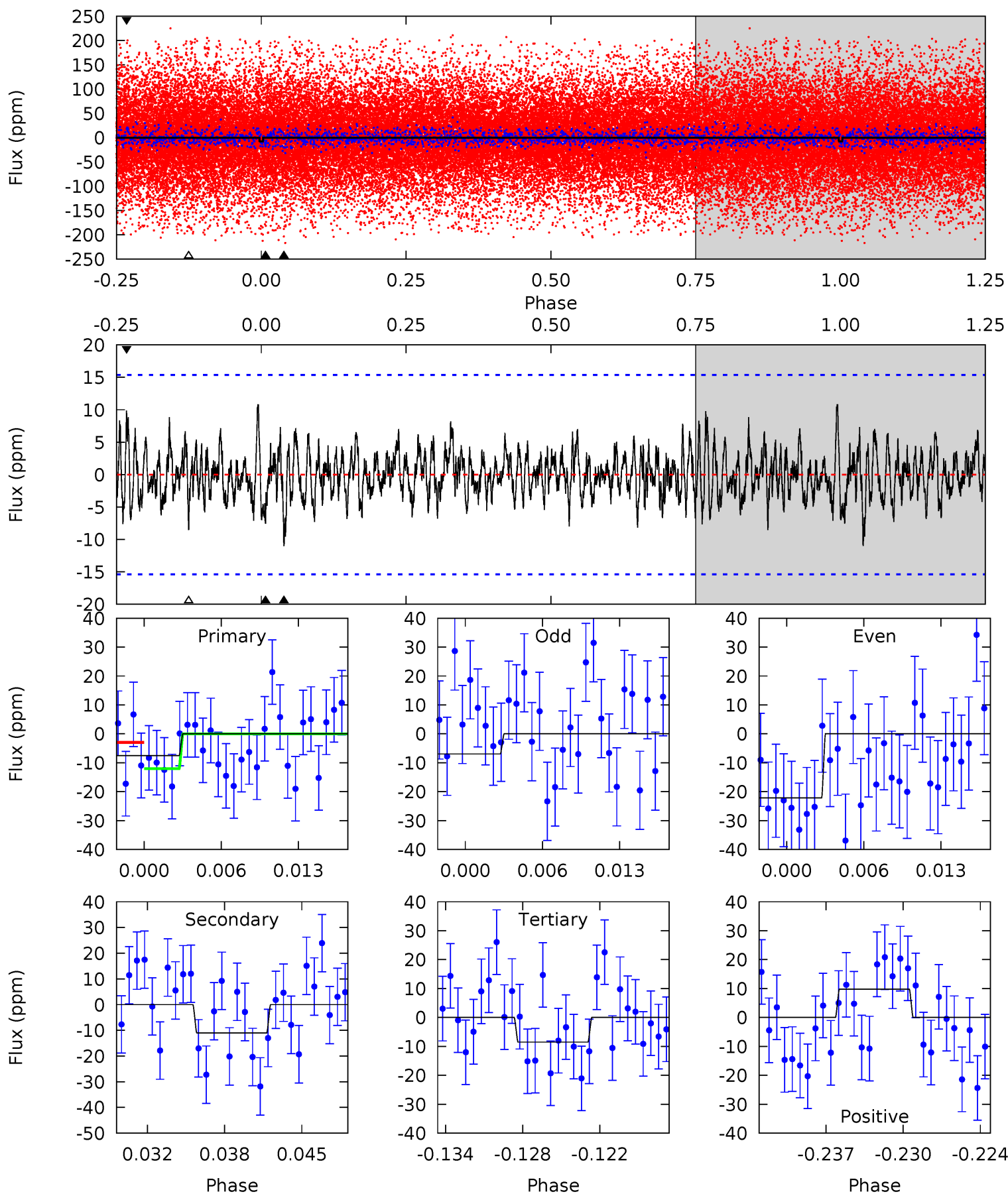
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.87	3.29	2.21	2.23	5.10	2.70	0.83	0.66	0.64	1.08	1.06	1.26	0.05	0.40	2.32



# Alt Model-Shift Uniqueness Test

007880676-10, P = 78.736380 Days, E = 78.381442 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.51	3.66	2.84	3.25	5.11	2.73	1.00	-0.33	-0.74	0.82	0.40	2.54	1.97	0.50	1.53



### Stellar Parameters For KIC 007880676

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6129^{+73}_{-73}$	$3.954^{+0.015}_{-0.013}$	$0.060^{+0.150}_{-0.100}$	$1.959^{+0.124}_{-0.083}$	$1.259^{+0.164}_{-0.076}$	$0.236^{+0.014}_{-0.018}$
	+1%/-1%	+0%/-0%	+250%/-167%	+6%/-4%	+13%/-6%	+6%/-8%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007880676-10 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-11 \pm 3$	$1.05^{+0.11}_{-0.10}$	$849^{+12}_{-12}$	$5044^{+401}_{-416}$	$780^{+326}_{-269}$
Alt.	$-11 \pm 3$	$1.11^{+0.10}_{-0.10}$	$849^{+13}_{-12}$	$4973^{+356}_{-363}$	$728^{+272}_{-221}$

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

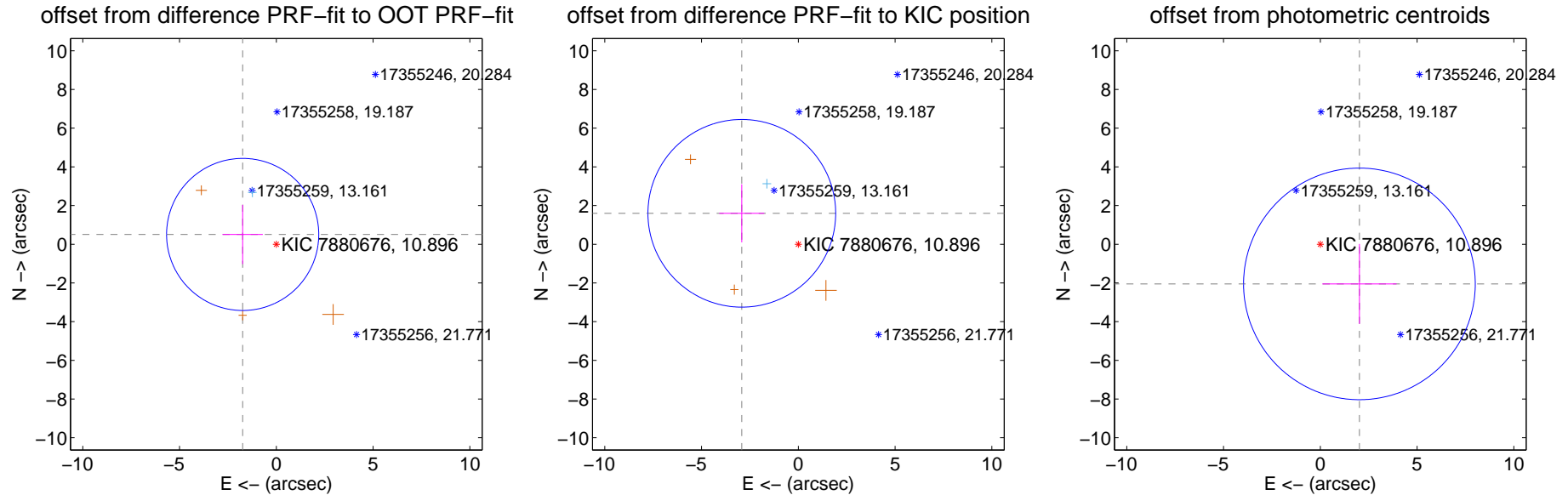
## DV Centroid Data

Supplemental centroid analysis for 007880676-10. **Kepler magnitude: 10.90.** Transit SNR 7.97

There are 1 quarters with good PRF difference image offsets

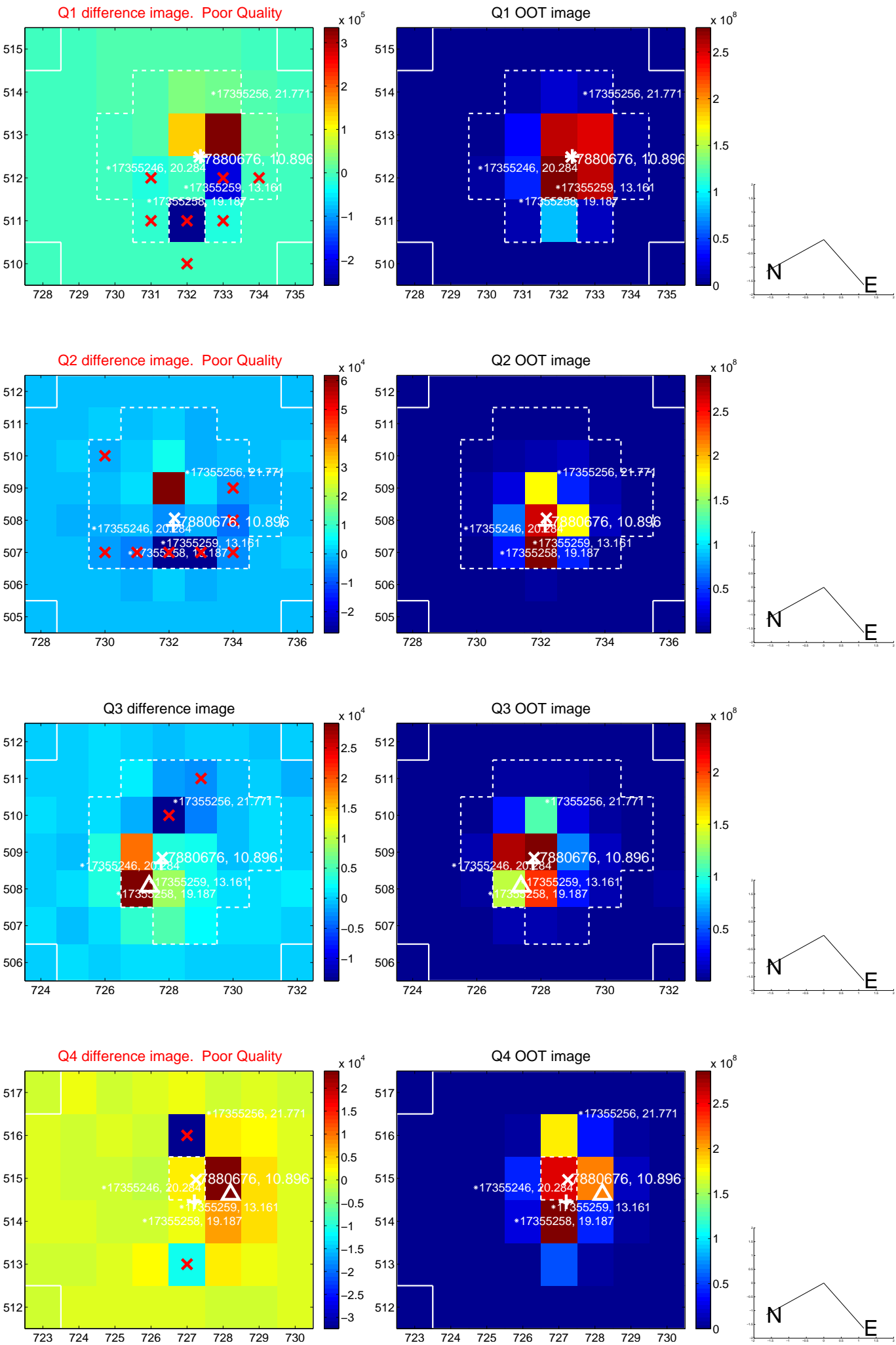
The OOT PRF centroid is offset from the target star catalog position by about 2.33 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.811 \pm 1.310$	1.38	$1.739 \pm 1.041$	$0.507 \pm 1.528$
PRF-fit source offset from KIC position	$3.328 \pm 1.616$	2.06	$2.919 \pm 1.163$	$1.599 \pm 1.501$
photometric centroid source offset	$2.88 \pm 1.99$	1.44	$-2.02 \pm 1.92$	$-2.05 \pm 2.07$

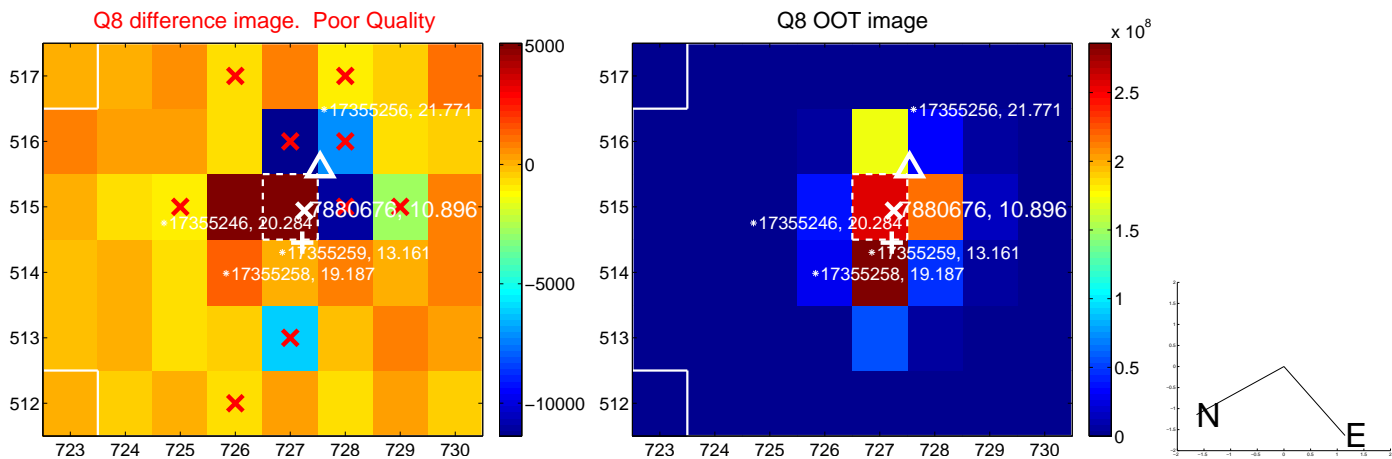
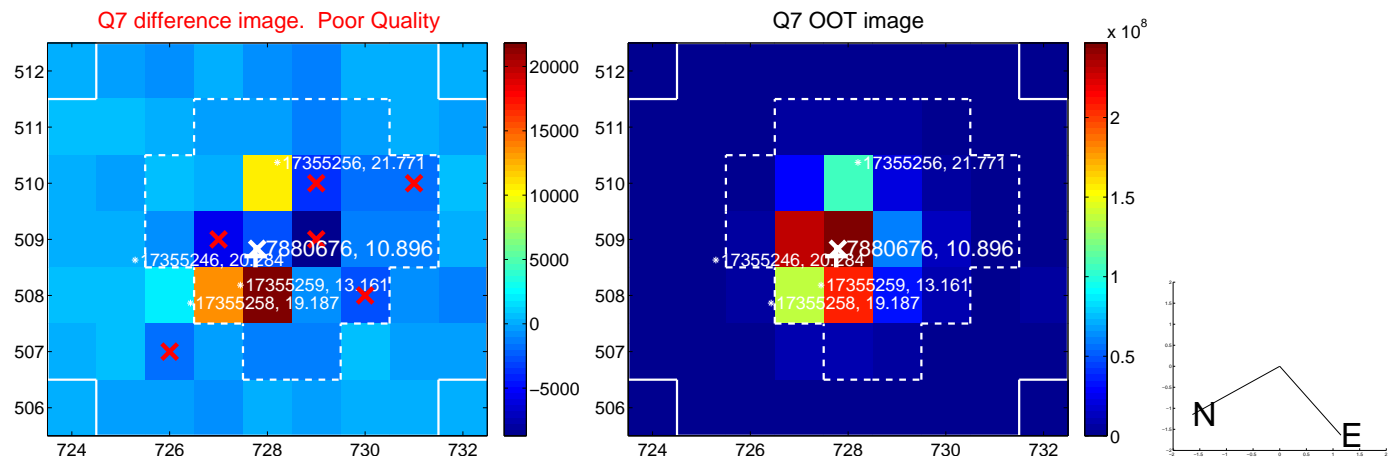
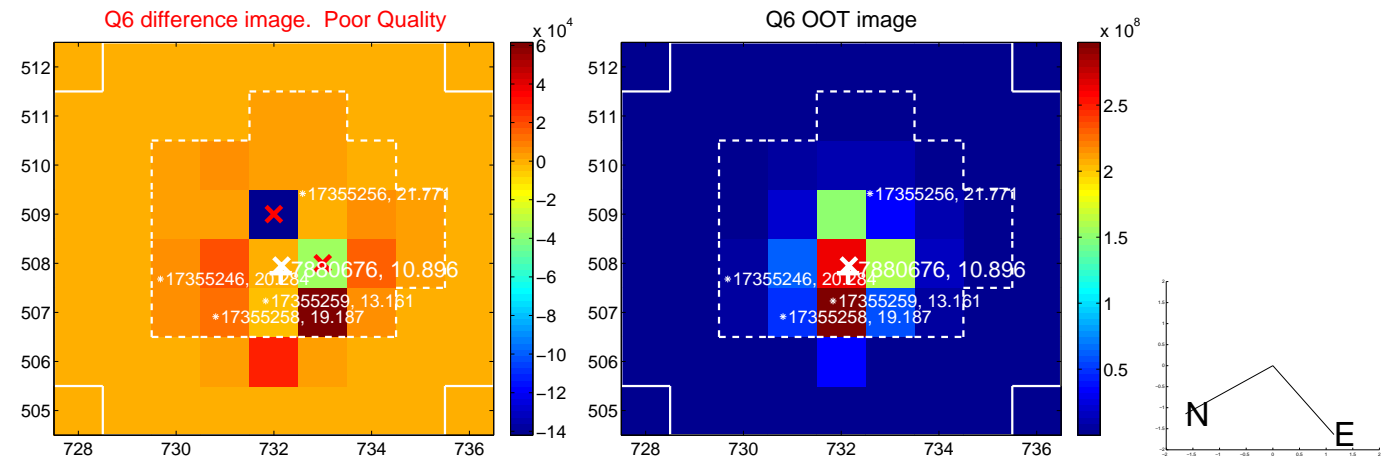
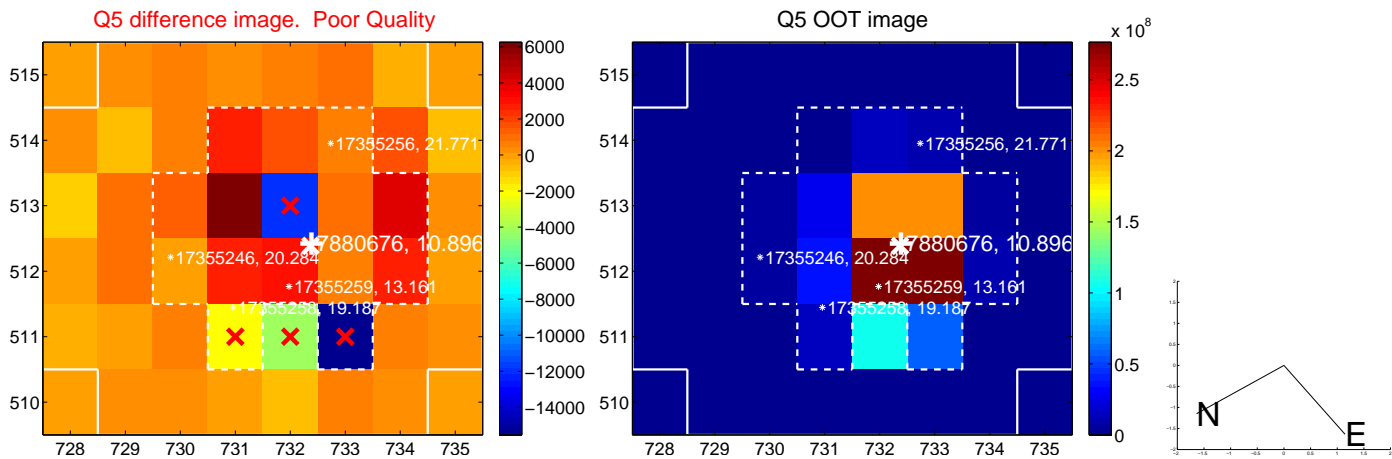


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

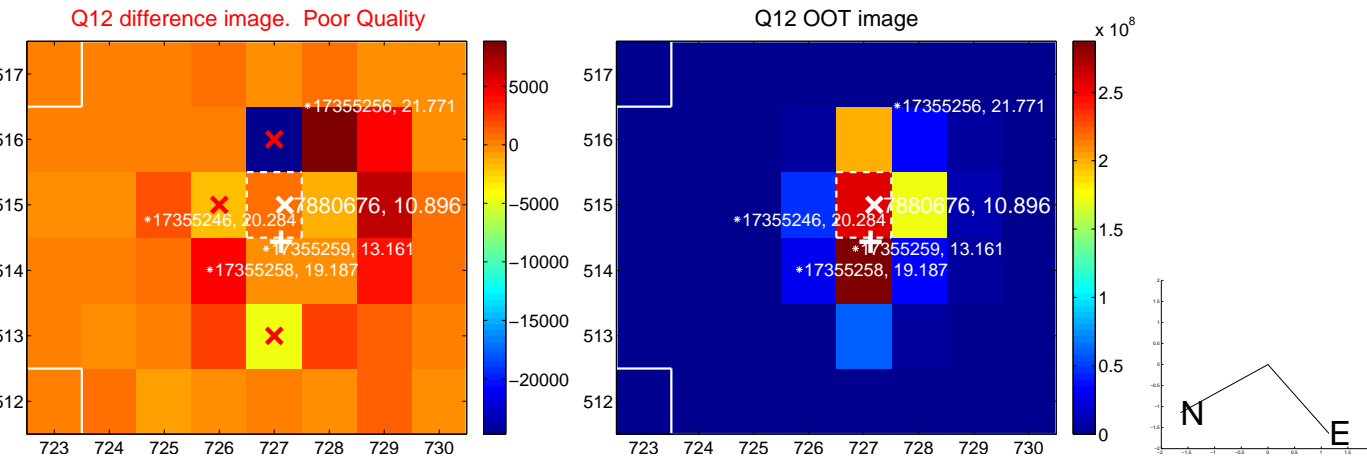
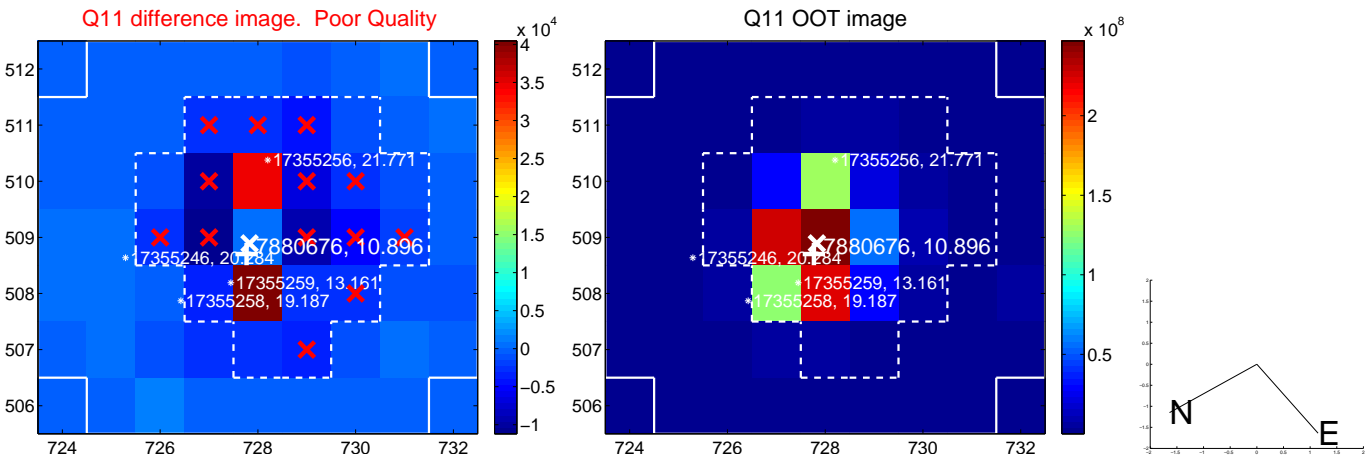
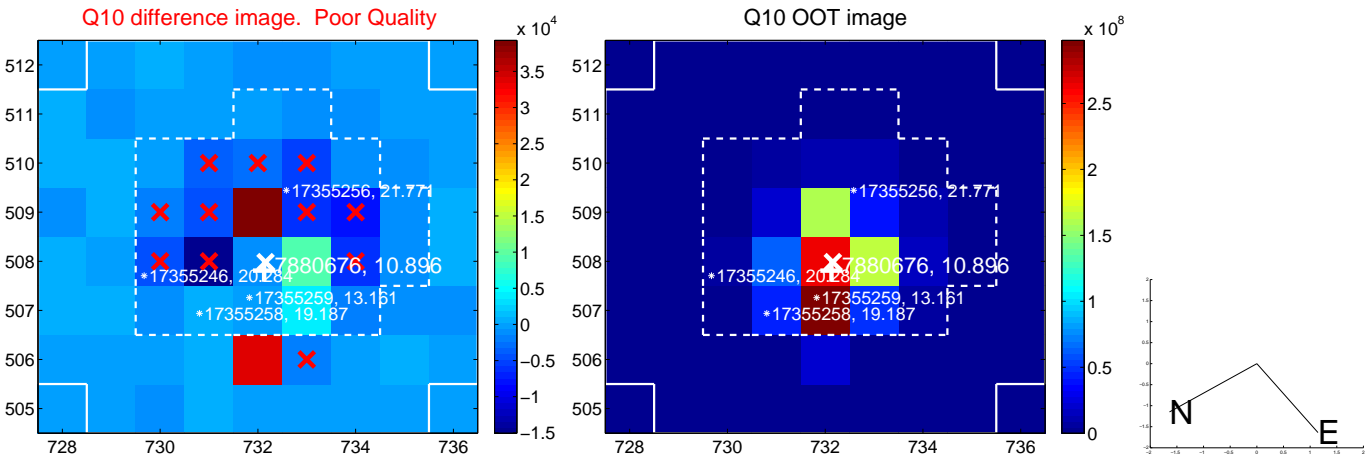
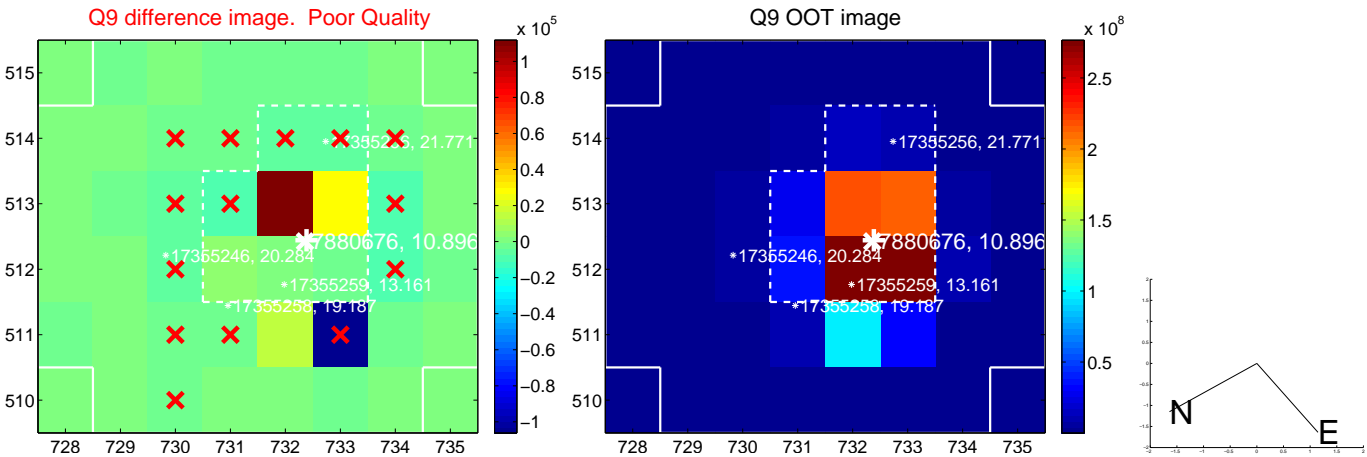


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

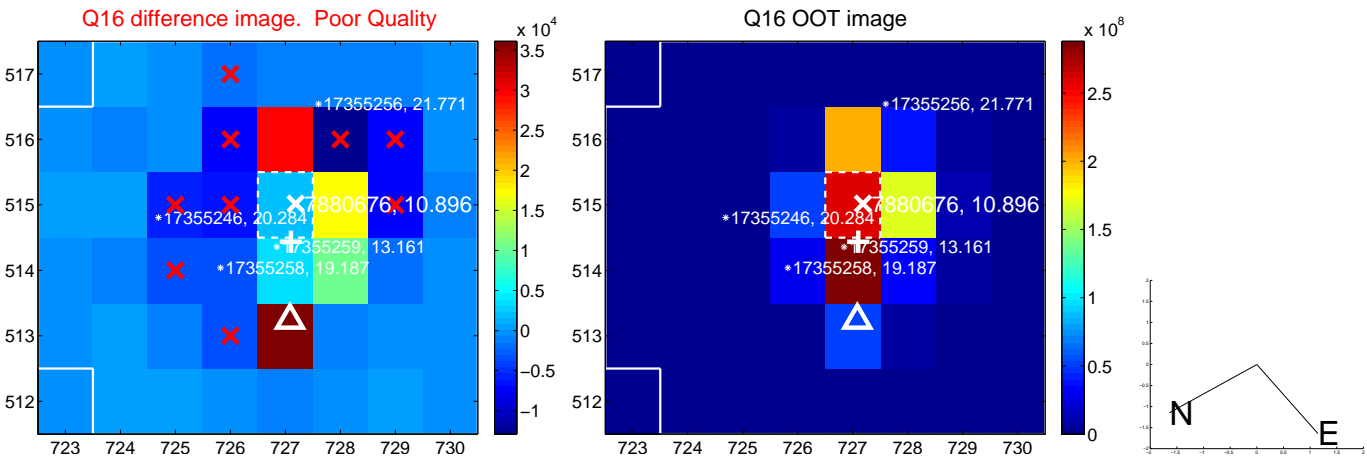
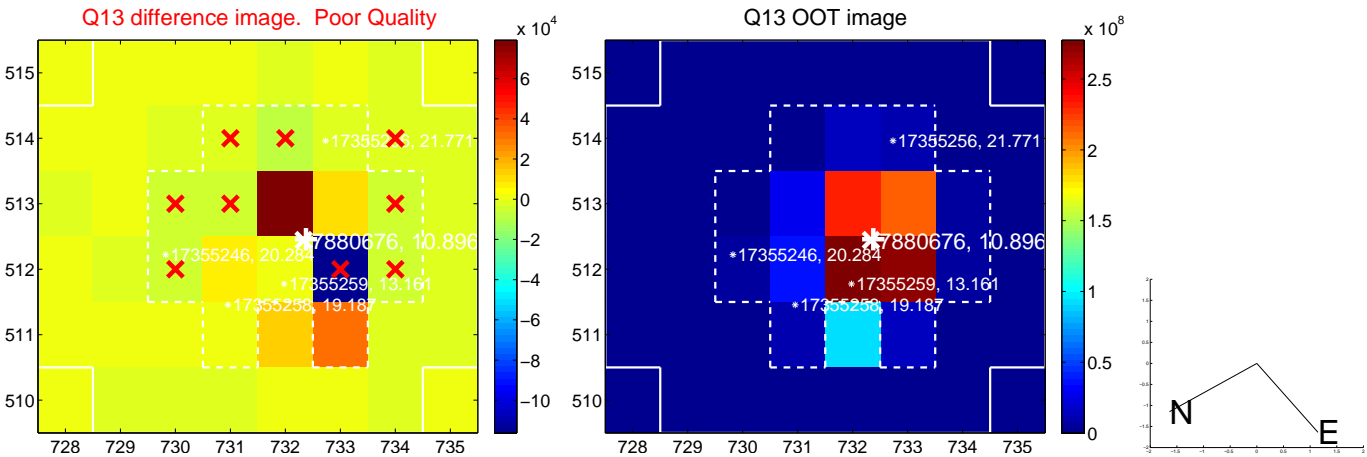




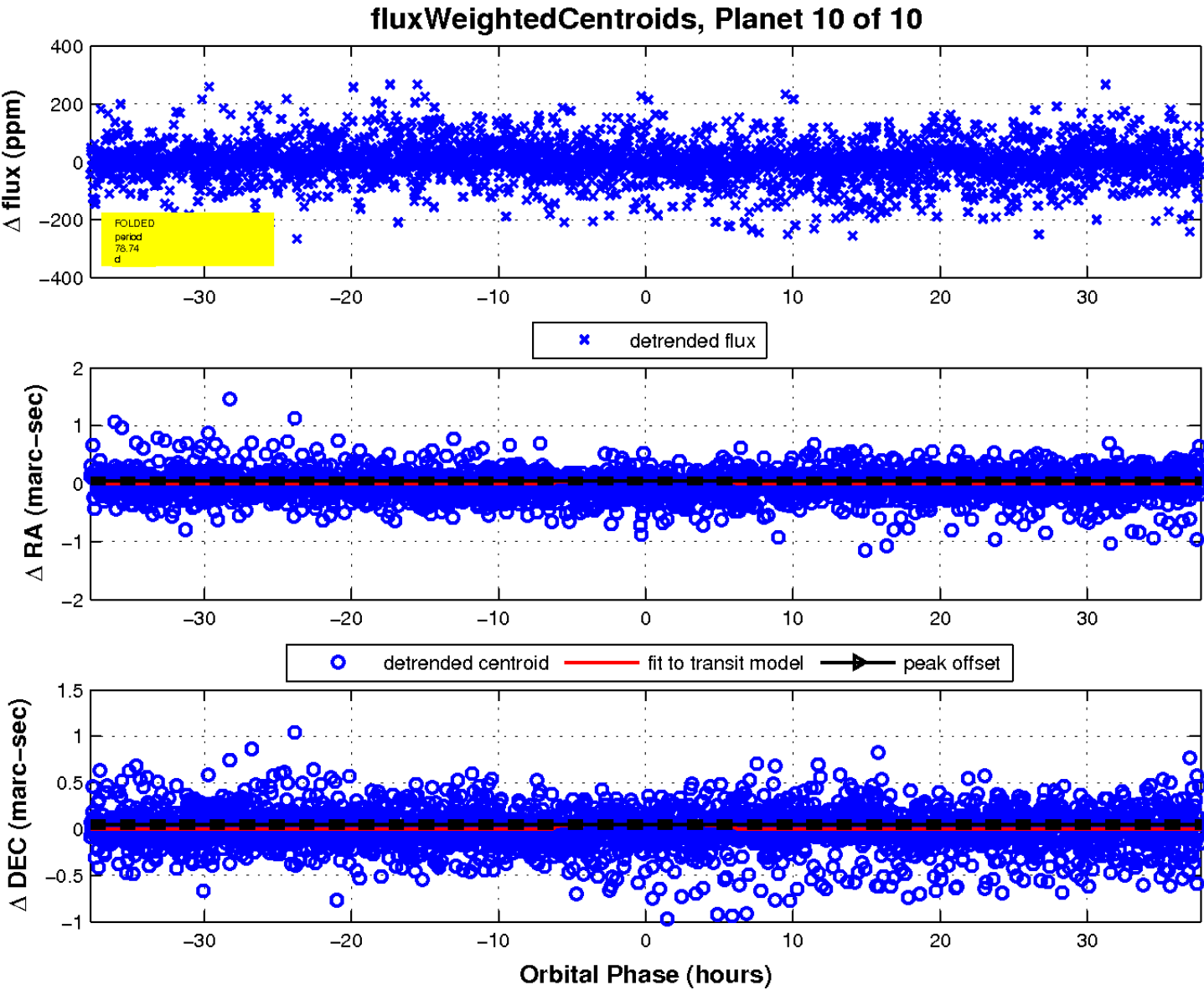
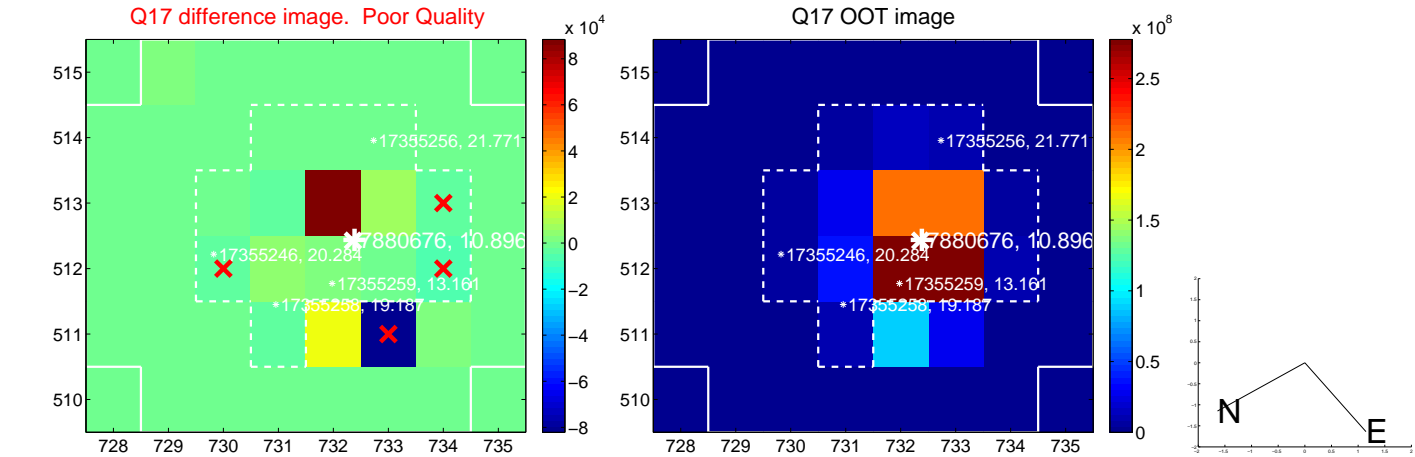
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

