

# KIC 007199756

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007199756-01	OBS	7823.01	0.566750	131.872608	62.7	3.099	11.2	9.3	0.46	3725	0.40	334.75
007199756-02	OBS	No	44.572714	133.325249	1203.7	1.948	8.2	9.2	0.46	3725	1.62	0.99

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007199756-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH
007199756-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

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

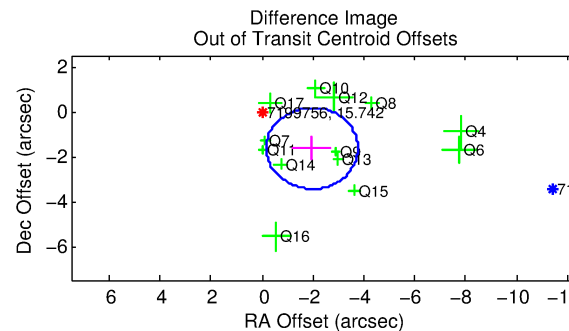
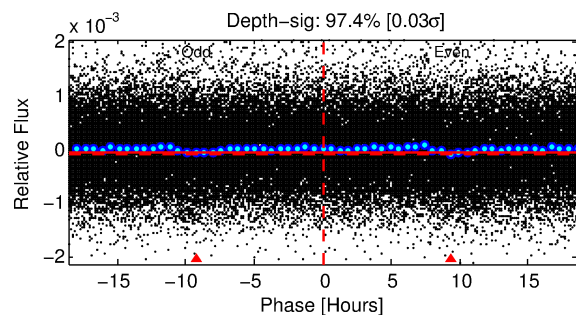
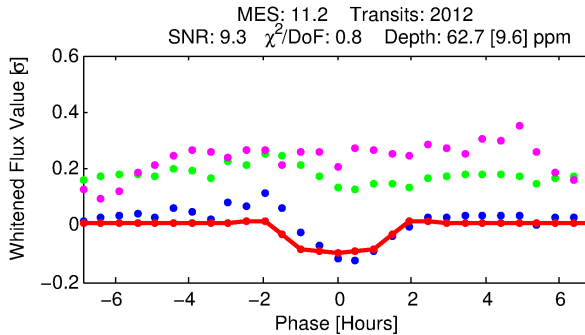
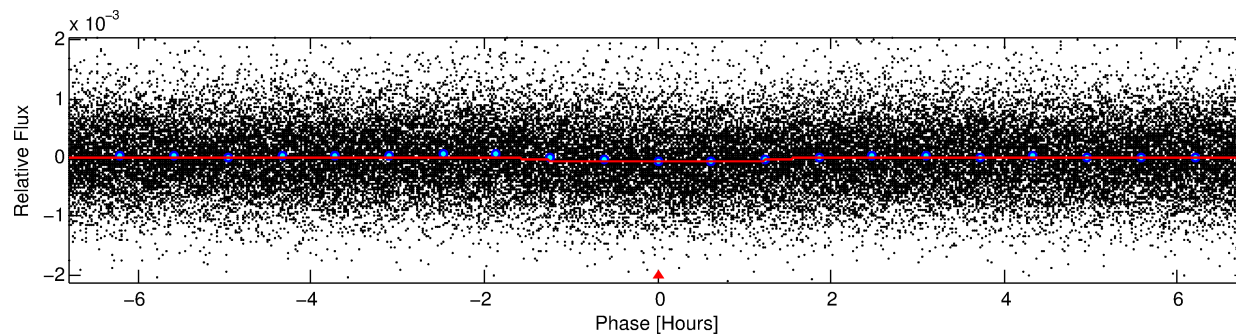
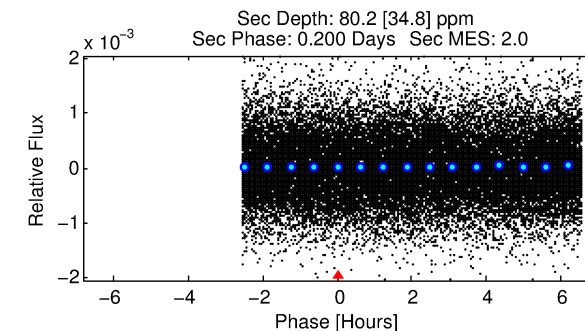
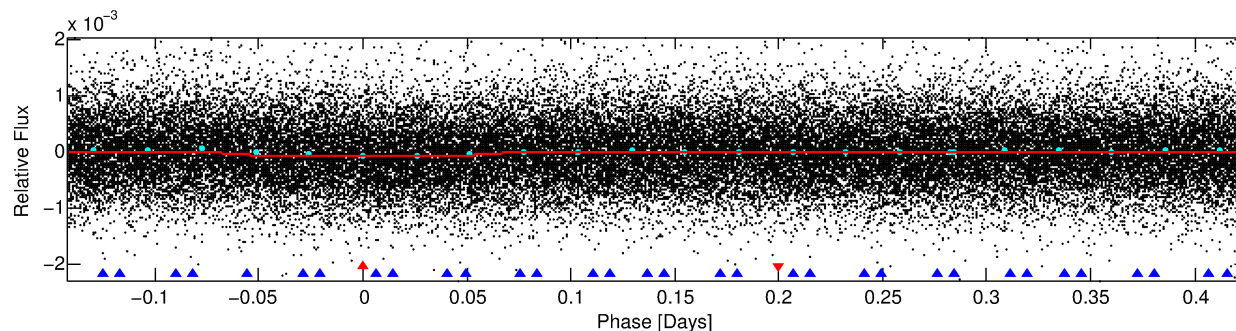
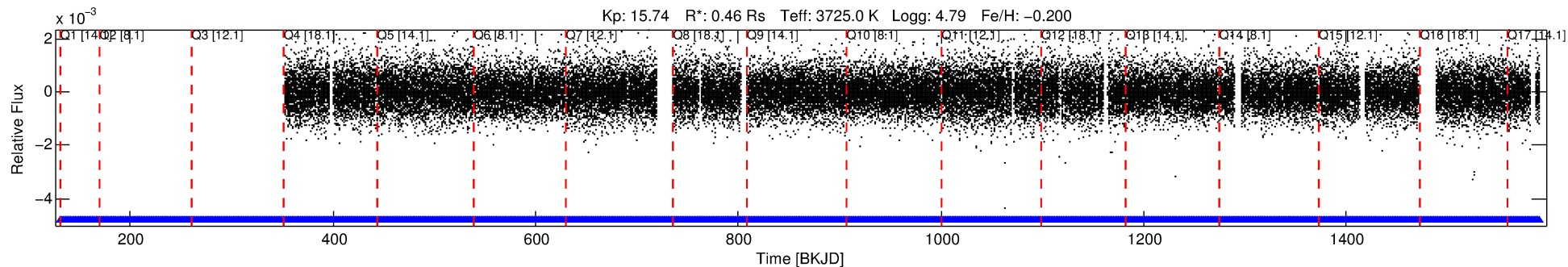
## Ephemeris Match Information For 007199756-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
007199756-01	7199756	RR-Lyr-pri	7198959	1:1	697.1	147	95	7.86	15.74	9893.60	Direct-PRF	0	0.39	21.25

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 7199756 Candidate: 1 of 2 Period: 0.567 d



## DV Fit Results:

Period = 0.56675 [0.00001] d  
Epoch = 131.8726 [0.0036] BKJD  
Rp/R\* = 0.0080 [0.0080]  
a/R\* = 1.24 [2.04]  
b = 0.79 [2.26]  
Seff = 334.75 [43.89]  
Teff = 1091 [36] K  
Rp = 0.40 [0.40] Re  
a = 0.0104 [0.0009] AU  
Ag = 29.84 [61.11] [0.47σ]  
Teffp = 3941 [2016] K [1.41σ]

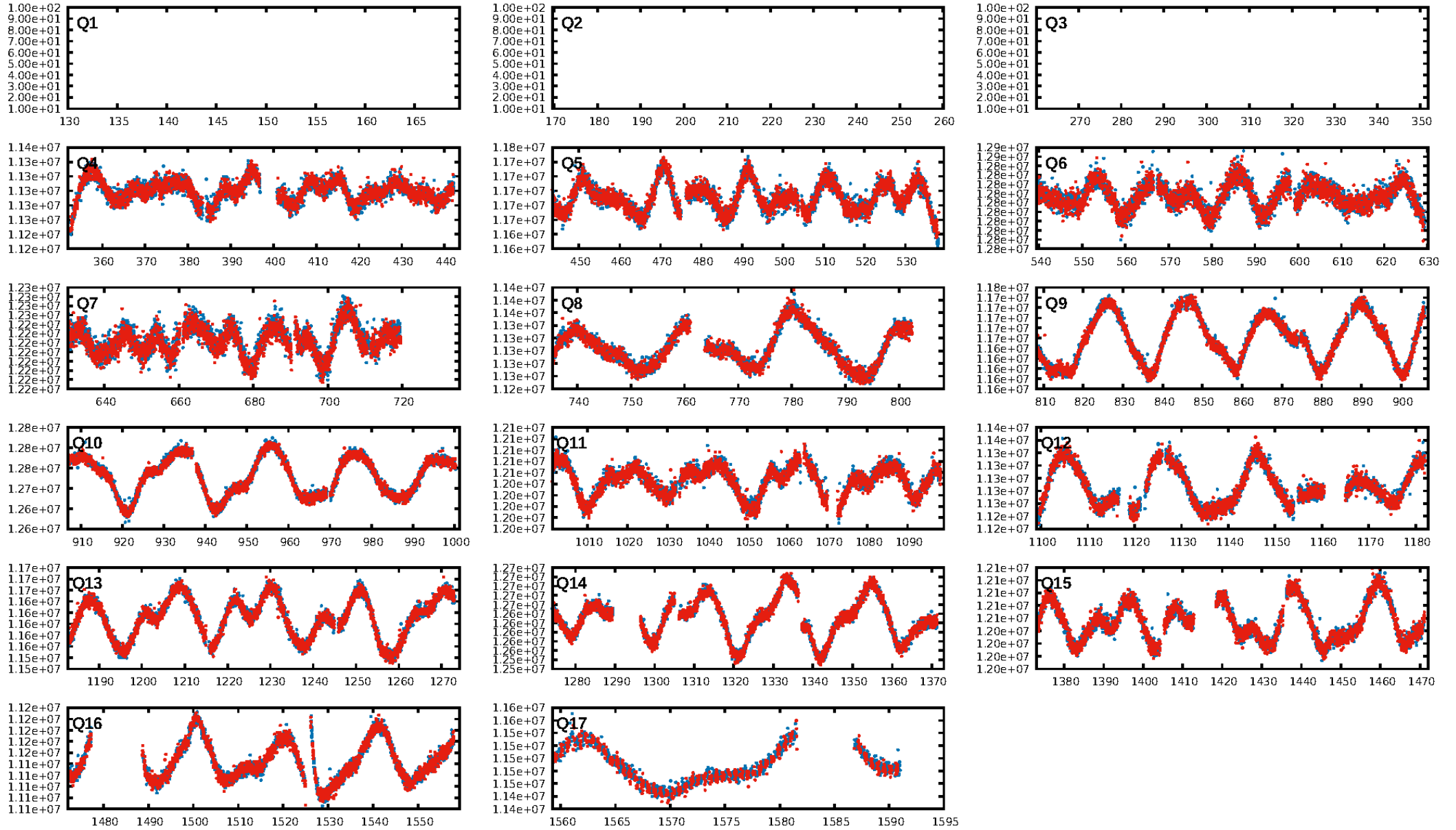
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [288.54σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.32e-25  
RollingBand-fgt: 1.00 [1965/1965]  
**GhostDiagnostic-chr: -0.5107**  
Centroid-sig: 41.9%  
Centroid-so: 0.595 arcsec [0.45σ]  
**OotOffset-rm: 2.564 arcsec [4.26σ]**  
**KicOffset-rm: 2.642 arcsec [4.96σ]**  
OotOffset-st: 3/3/4/3 [13]  
KicOffset-st: 3/3/4/3 [13]  
DiffImageQuality-fgm: 0.00 [0/13]  
DiffImageOverlap-fno: 1.00 [14/14]

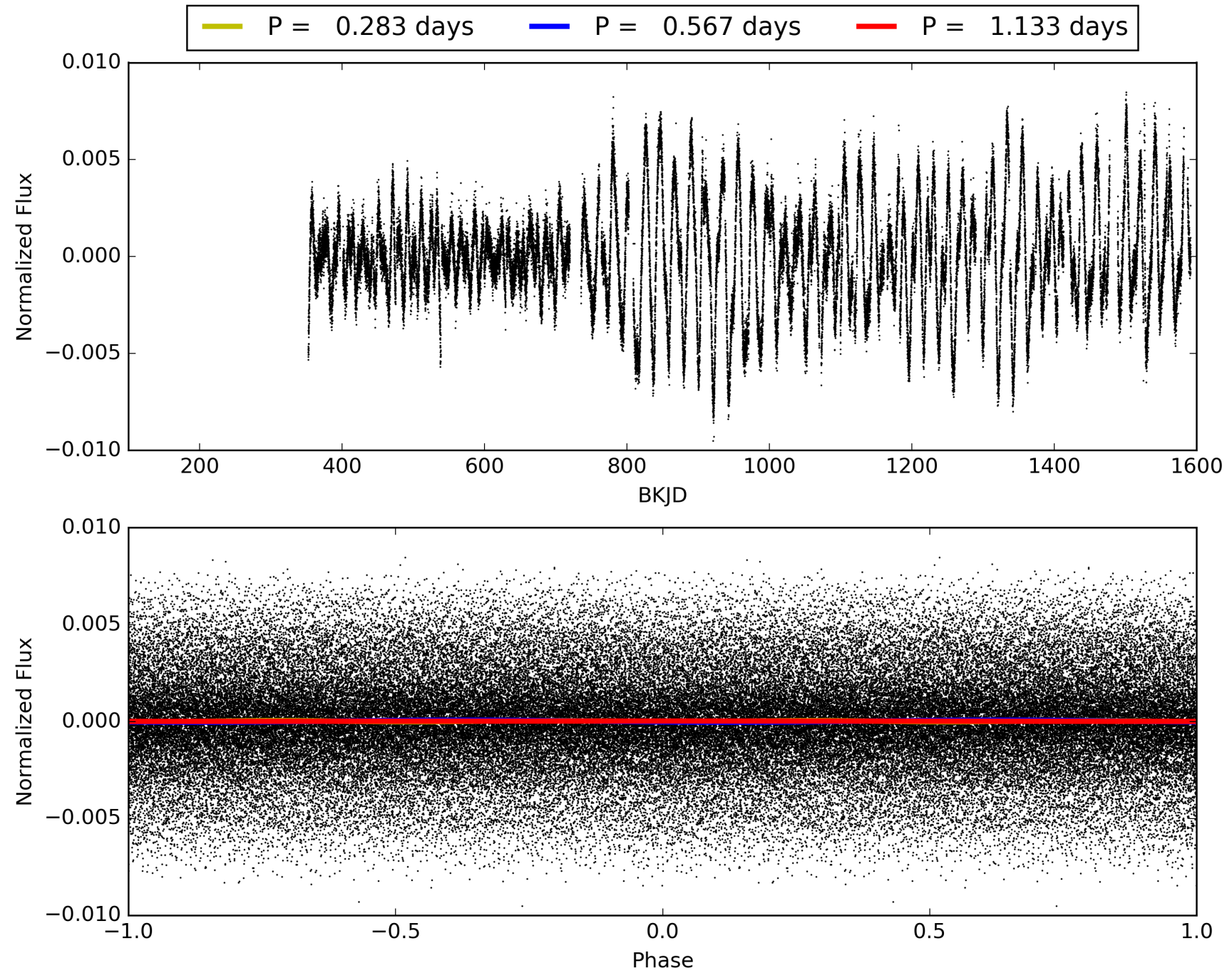
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 19:20:15 Z

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

# TCE 007199756-01, PDC Light Curves

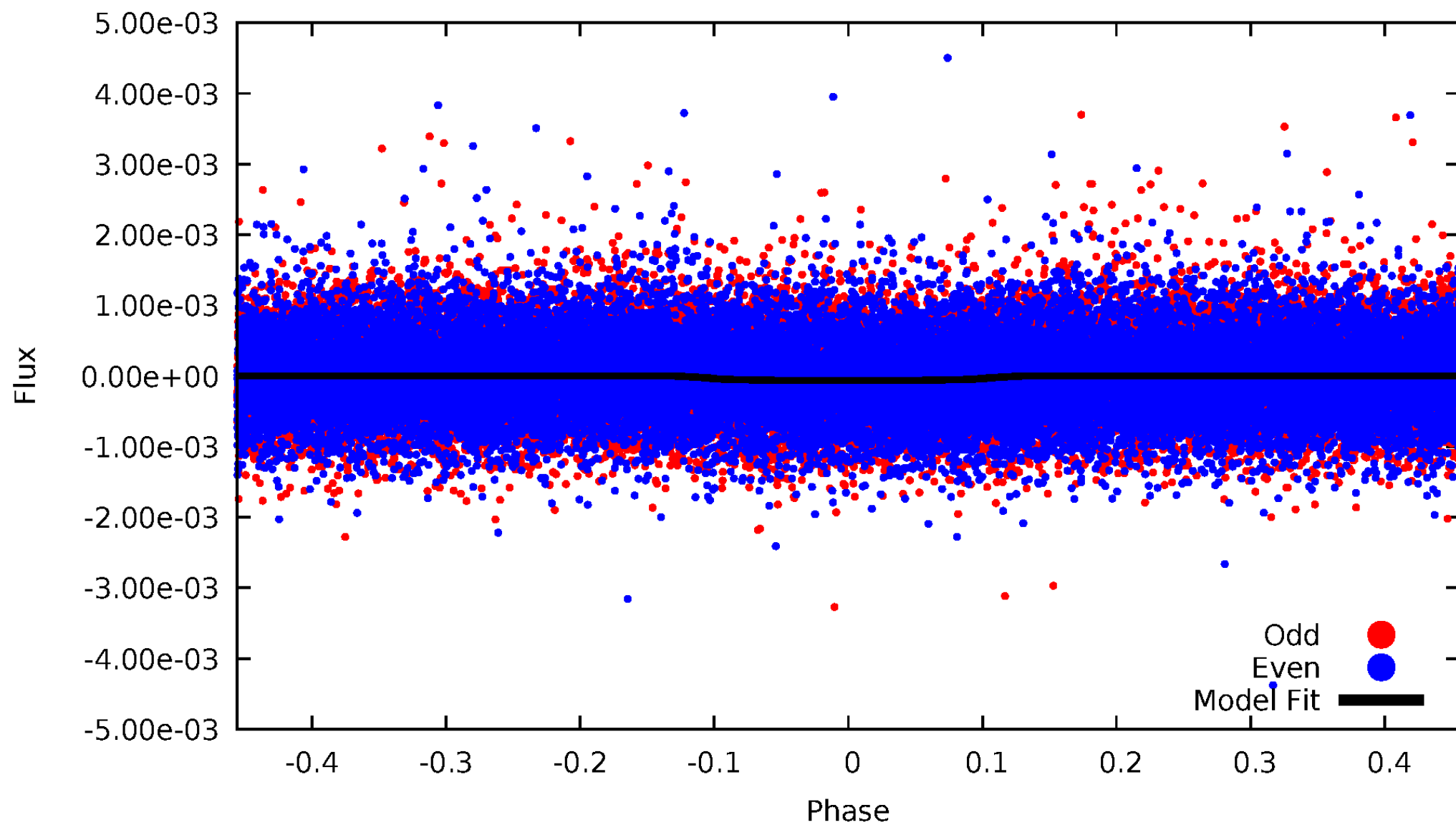


TCE 007199756-01



# DV Odd/Even

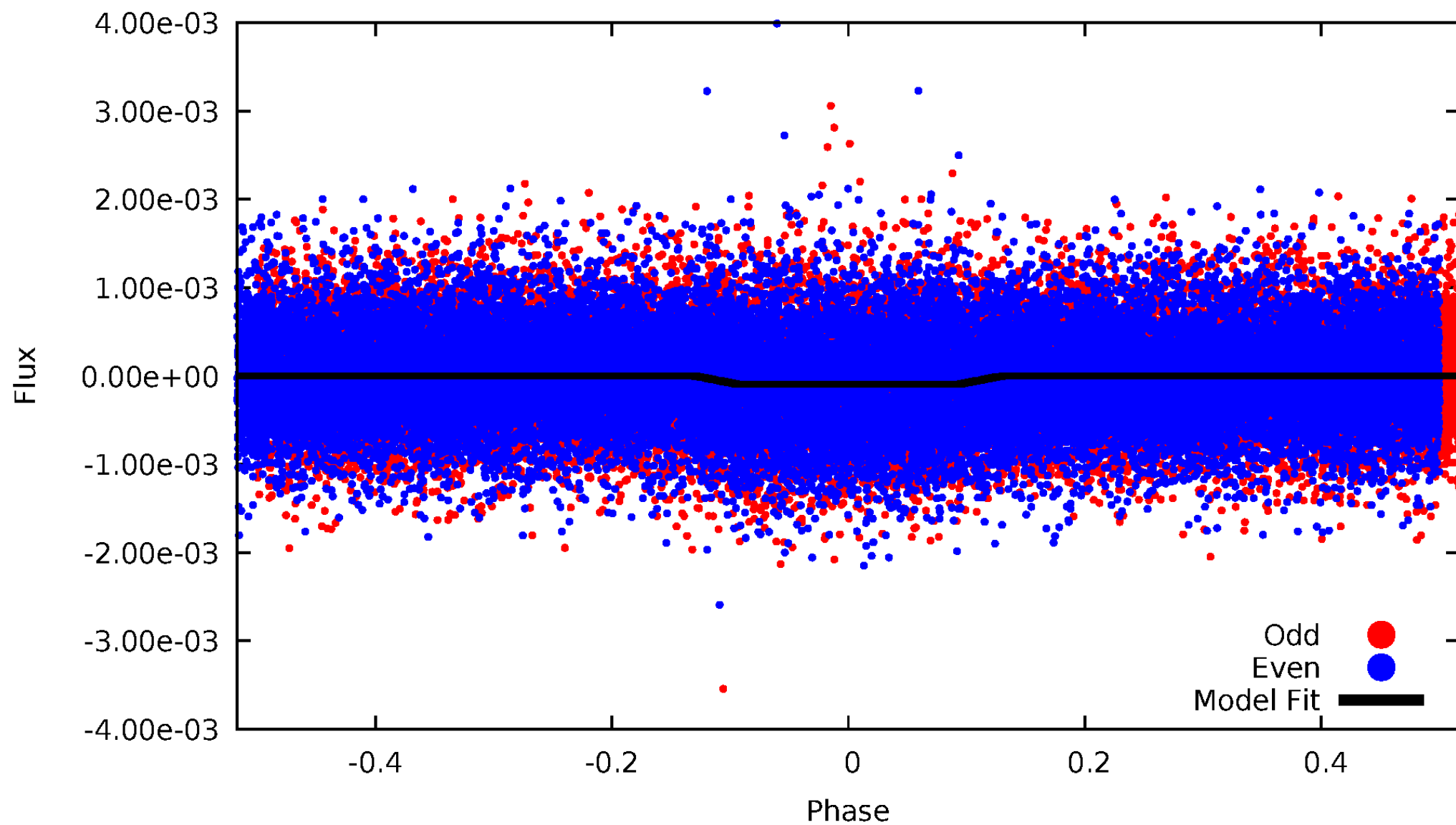
TCE 007199756-01





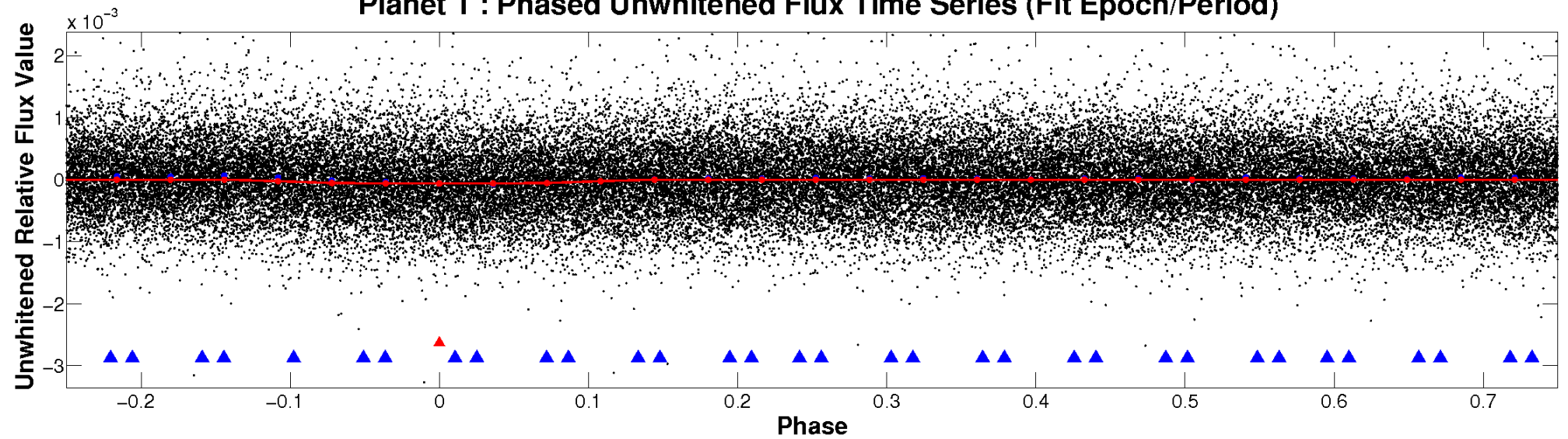
# ALT Odd/Even

TCE 007199756-01

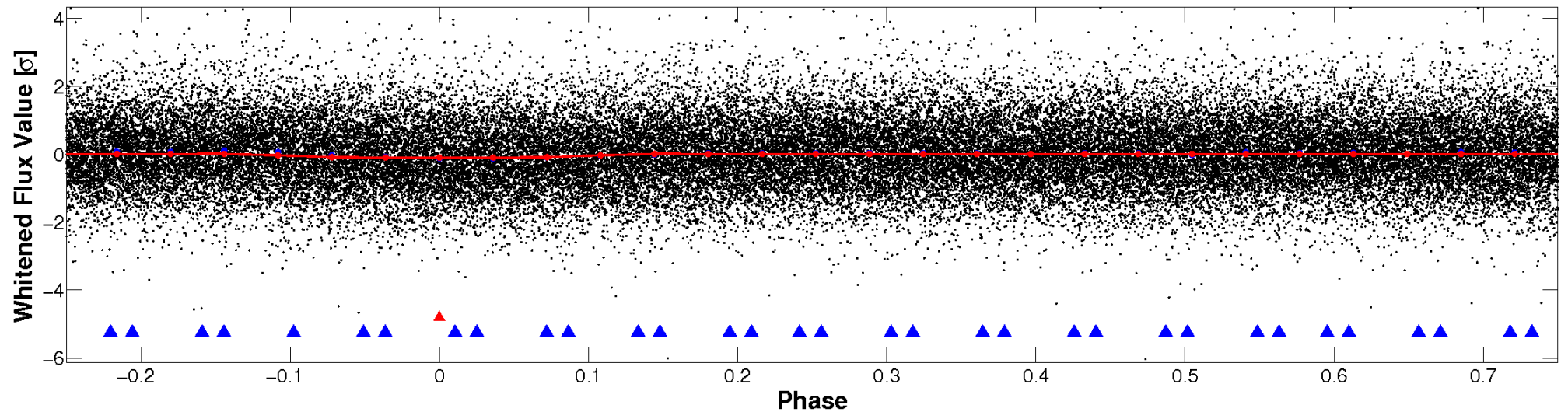


# Non-Whitened Vs. Whitened Light Curve

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

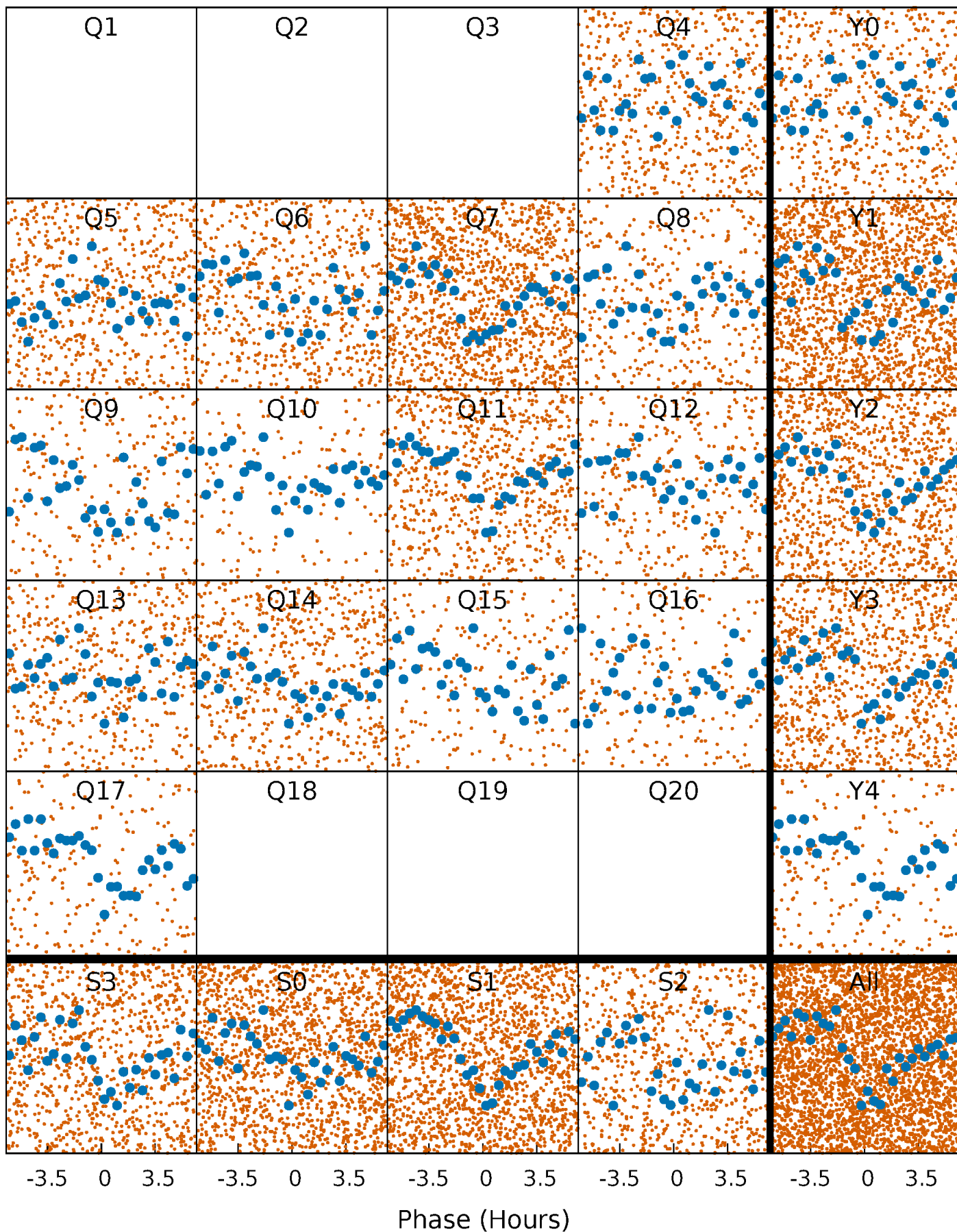


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

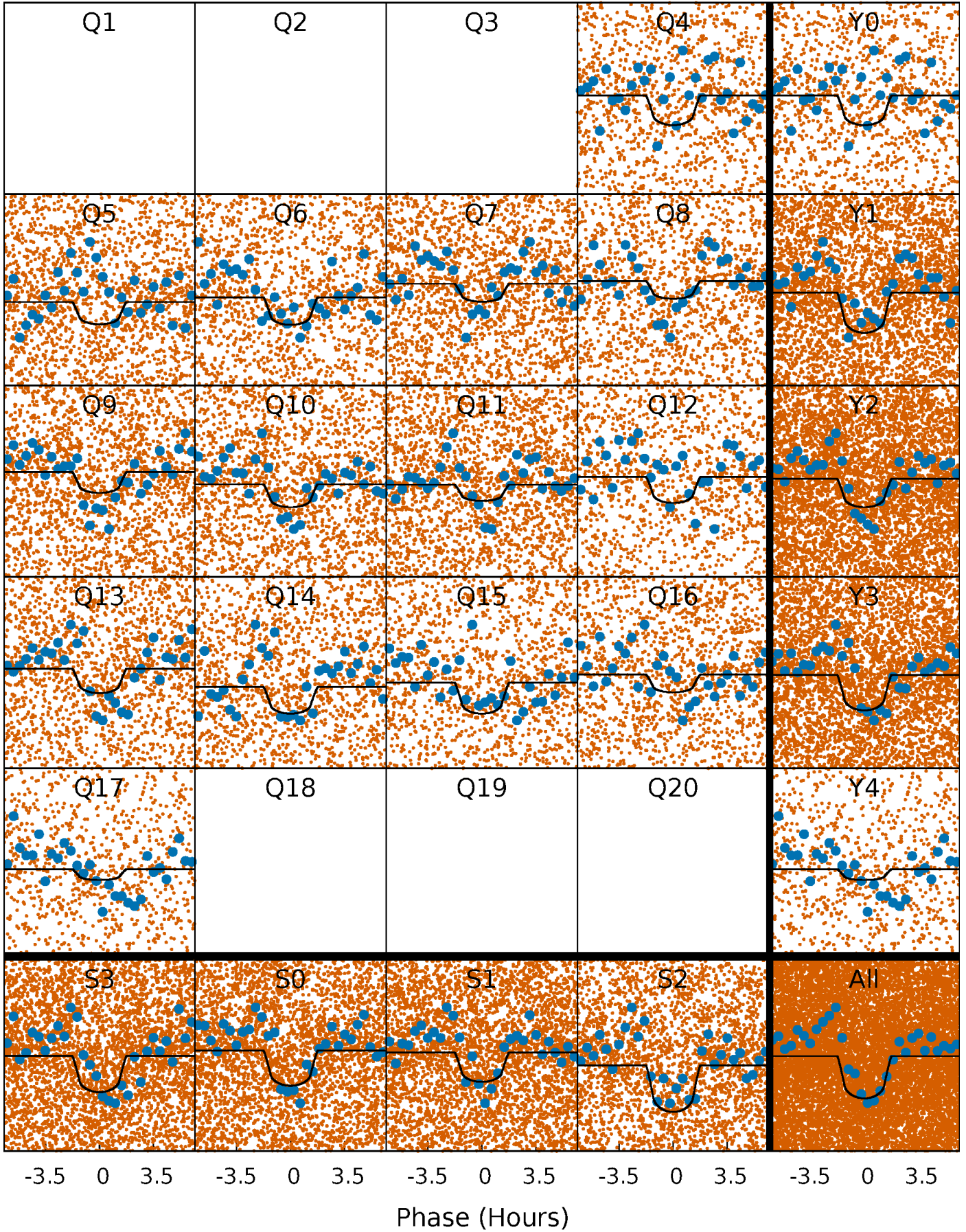
TCE 007199756-01 P= 0.566750 Days  $T_0=131.872608$  (BKJD)





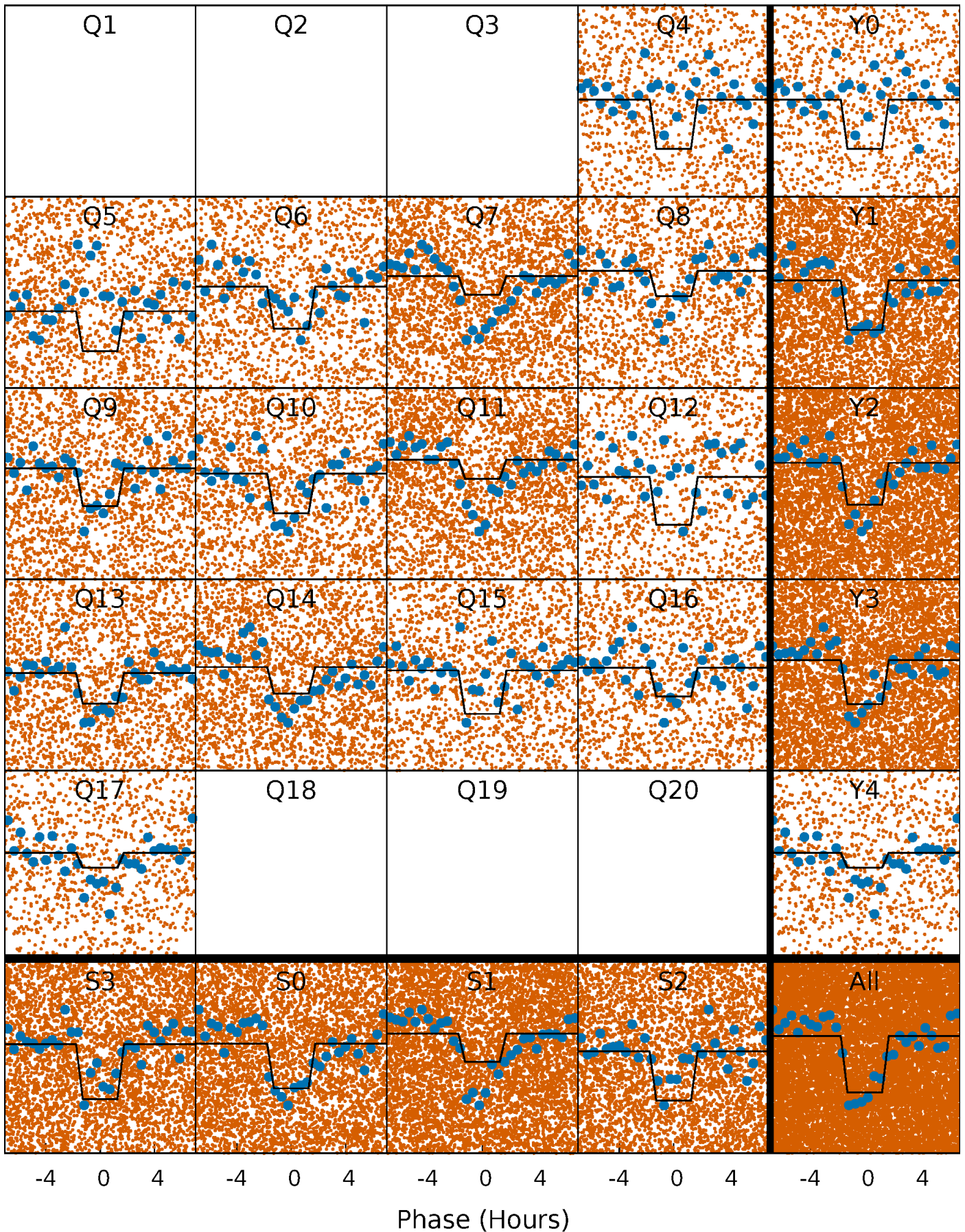
# DV Quarter-Phased Transit Curves

TCE 007199756-01 P= 0.566750 Days  $T_0=131.872608$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007199756-01 P= 0.566782 Days  $T_0=131.847957$  (BKJD)

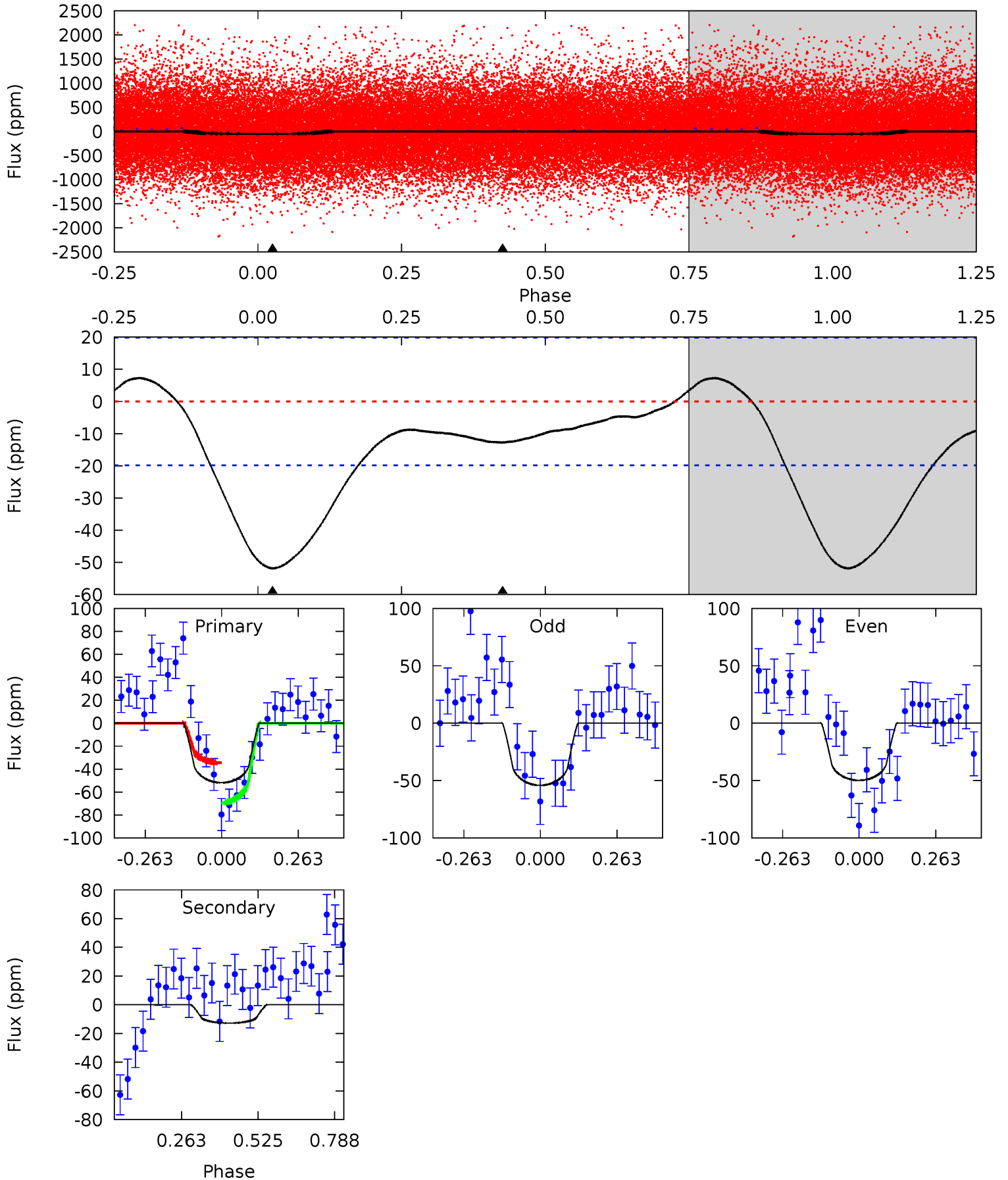




# DV Model-Shift Uniqueness Test

007199756-01, P = 0.566750 Days, E = 131.872608 Days

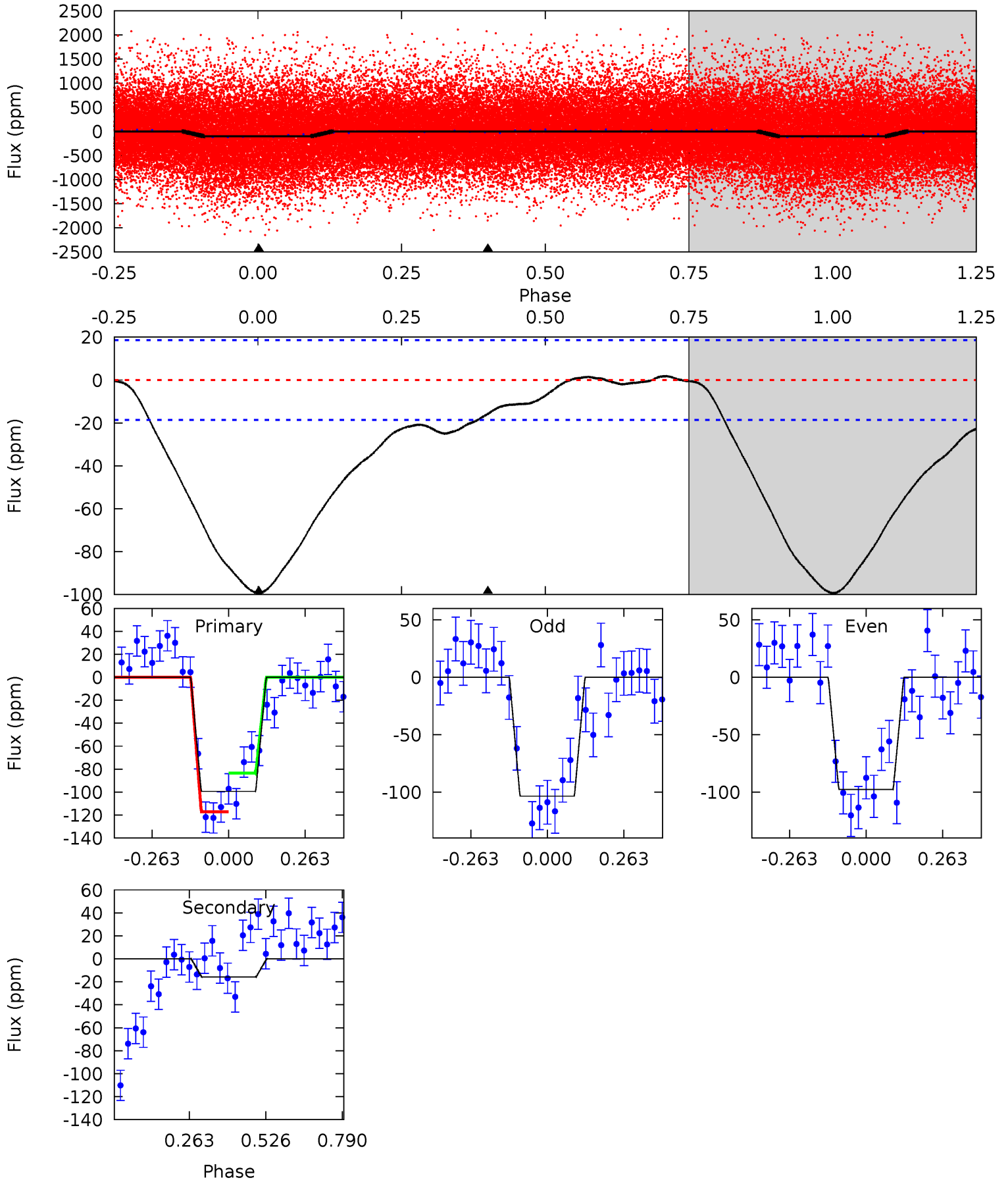
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	2.81	0	0	4.36	1.12	0.72	11.4	11.4	2.81	2.81	0.48	1.01	0.12	3.85



# Alt Model-Shift Uniqueness Test

007199756-01, P = 0.566782 Days, E = 131.847957 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
23.3	3.70	0	0	4.36	1.12	0.24	23.3	23.3	3.70	3.70	0.70	1.01	0.02	3.80





### Stellar Parameters For KIC 007199756

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3725^{+59}_{-66}$	$4.787^{+0.055}_{-0.035}$	$-0.200^{+0.200}_{-0.200}$	$0.460^{+0.040}_{-0.049}$	$0.473^{+0.043}_{-0.047}$	$6.845^{+1.944}_{-1.052}$
	+2%/-2%	+1%/-1%	+100%/-100%	+9%/-11%	+9%/-10%	+28%/-15%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 007199756-01 / KOI 7823.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-13 \pm 5$	$0.47^{+0.35}_{-0.28}$	$1520^{+36}_{-39}$	$2731^{+920}_{-451}$	$3.252^{+19.067}_{-2.273}$
Alt.	$-16 \pm 4$	$0.53^{+0.36}_{-0.31}$	$1518^{+38}_{-39}$	$2726^{+878}_{-389}$	$3.235^{+16.715}_{-2.091}$

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

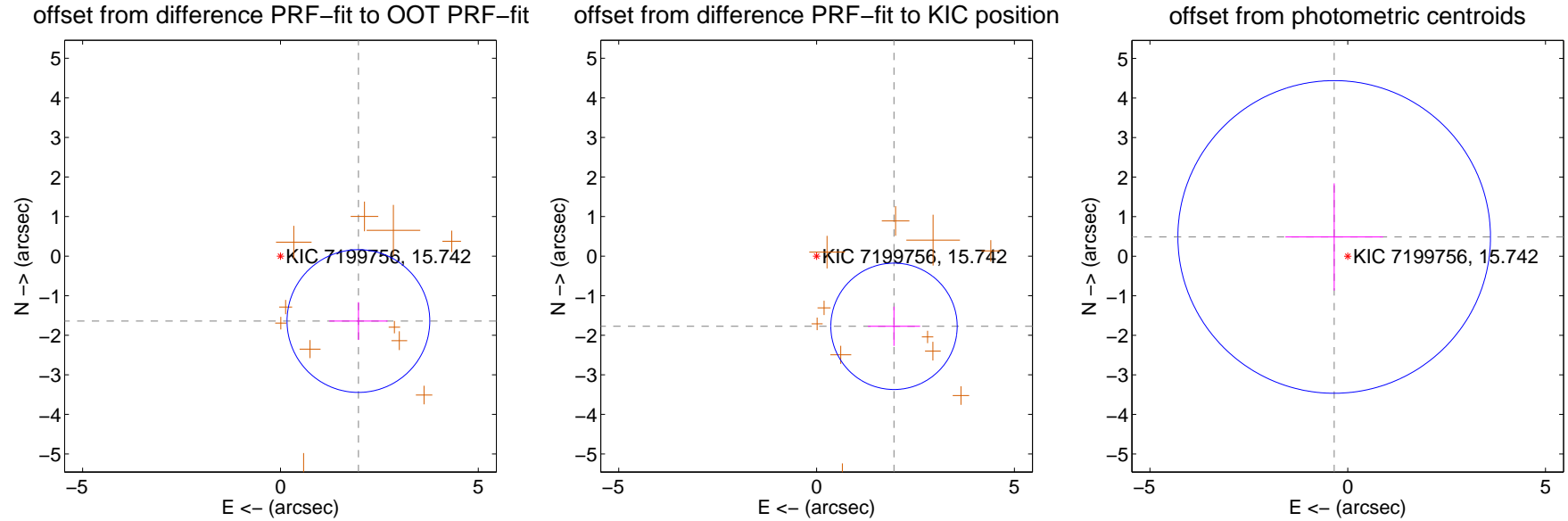
## DV Centroid Data

Supplemental centroid analysis for 007199756-01. Kepler magnitude: 15.74. Transit SNR 9.31

There are 0 quarters with good PRF difference image offsets

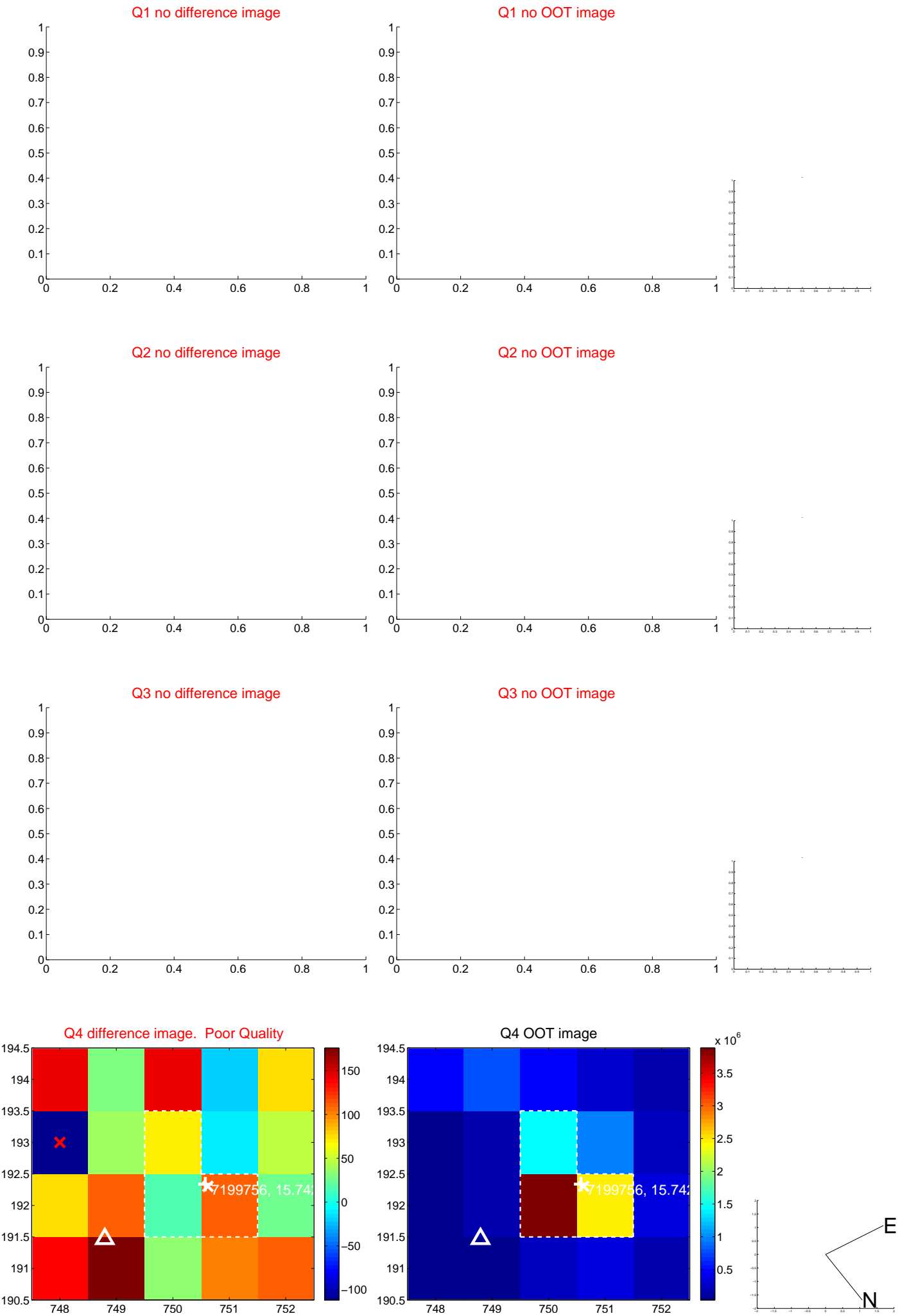
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.564 \pm 0.601$	4.26	$-1.971 \pm 0.738$	$-1.641 \pm 0.478$
PRF-fit source offset from KIC position	$2.642 \pm 0.532$	4.96	$-1.957 \pm 0.659$	$-1.774 \pm 0.496$
photometric centroid source offset	$0.60 \pm 1.32$	0.45	$0.34 \pm 1.23$	$0.49 \pm 1.36$

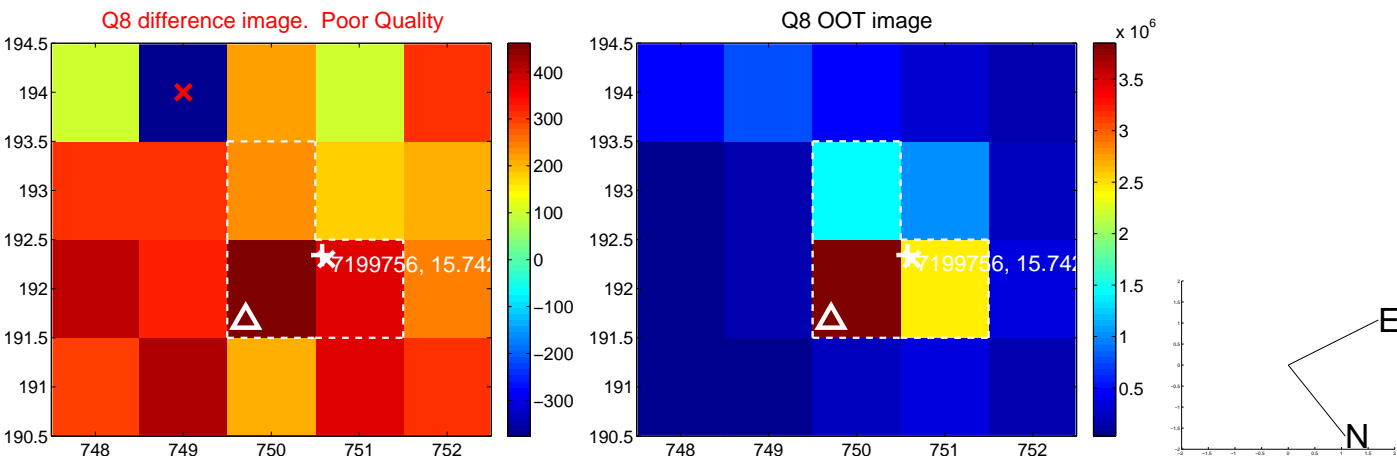
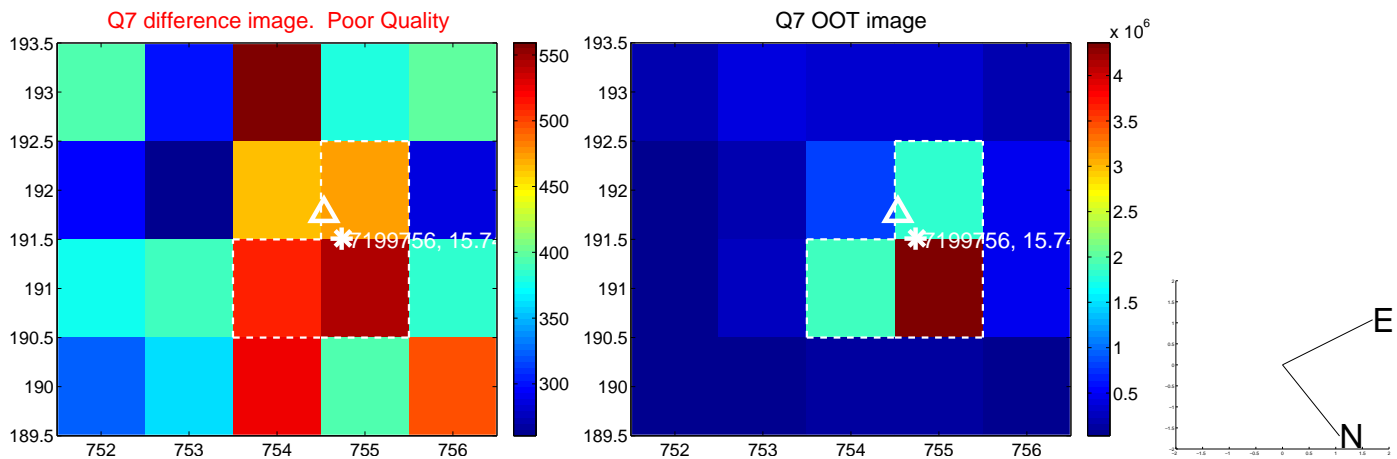
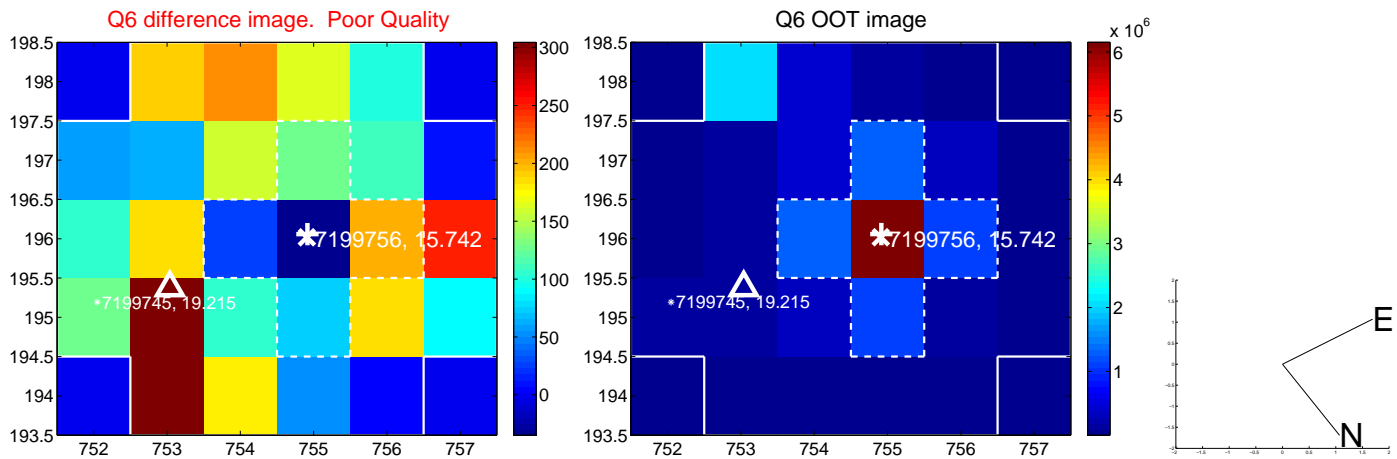
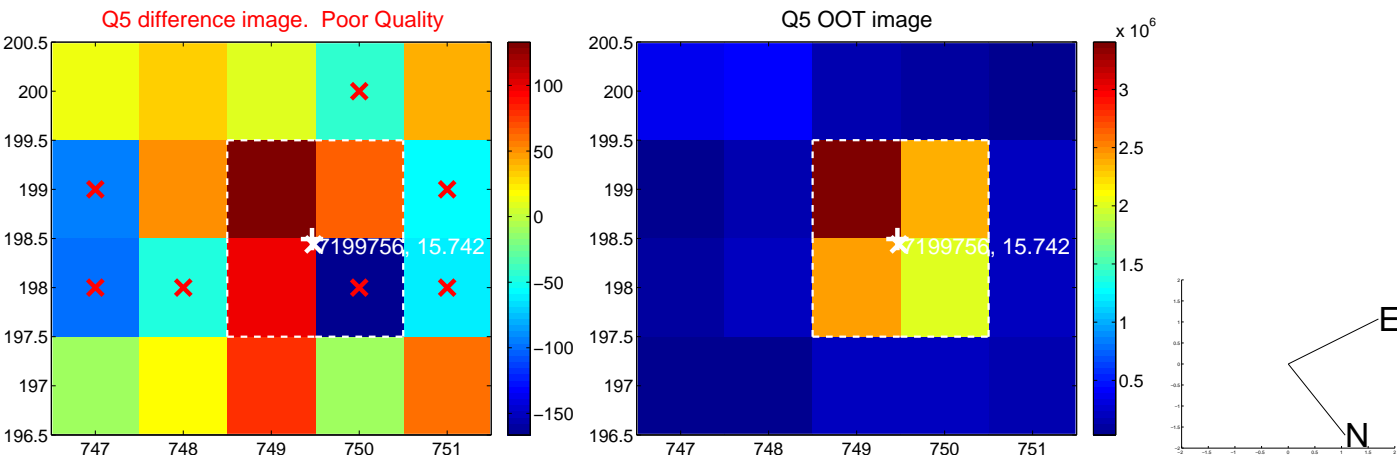


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

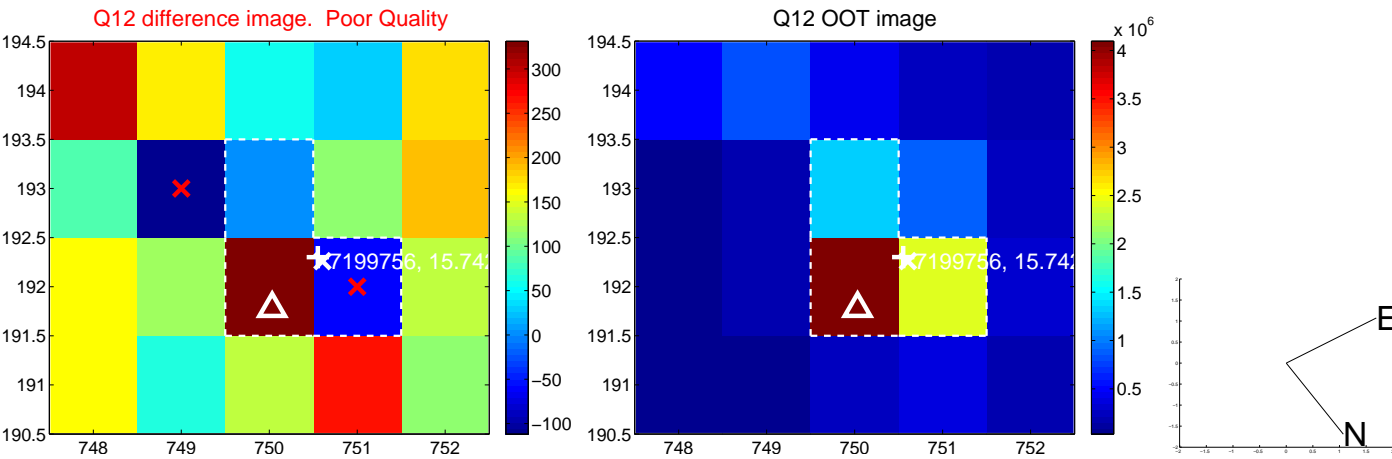
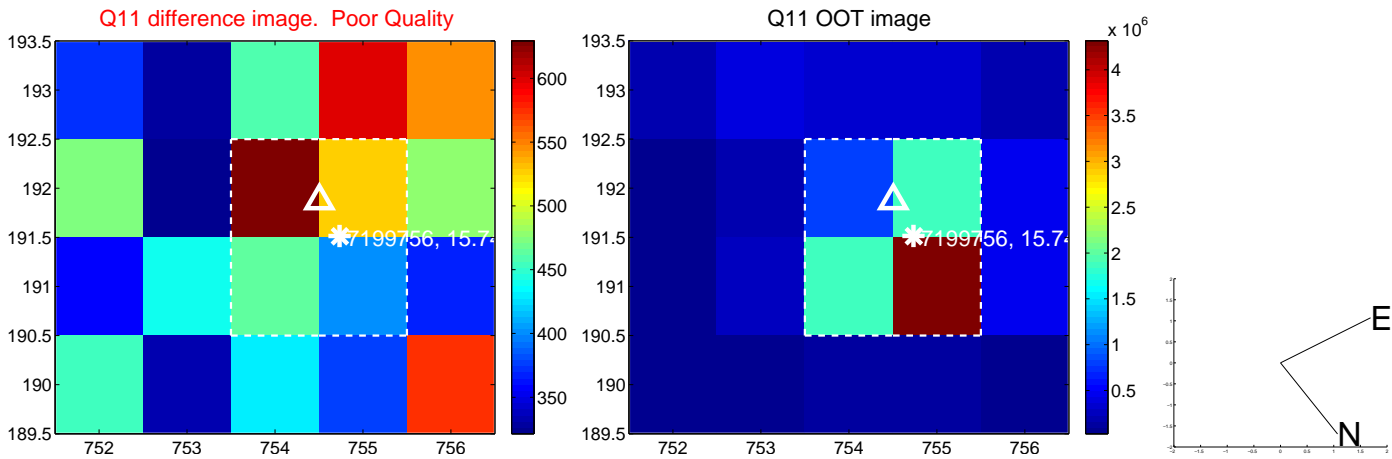
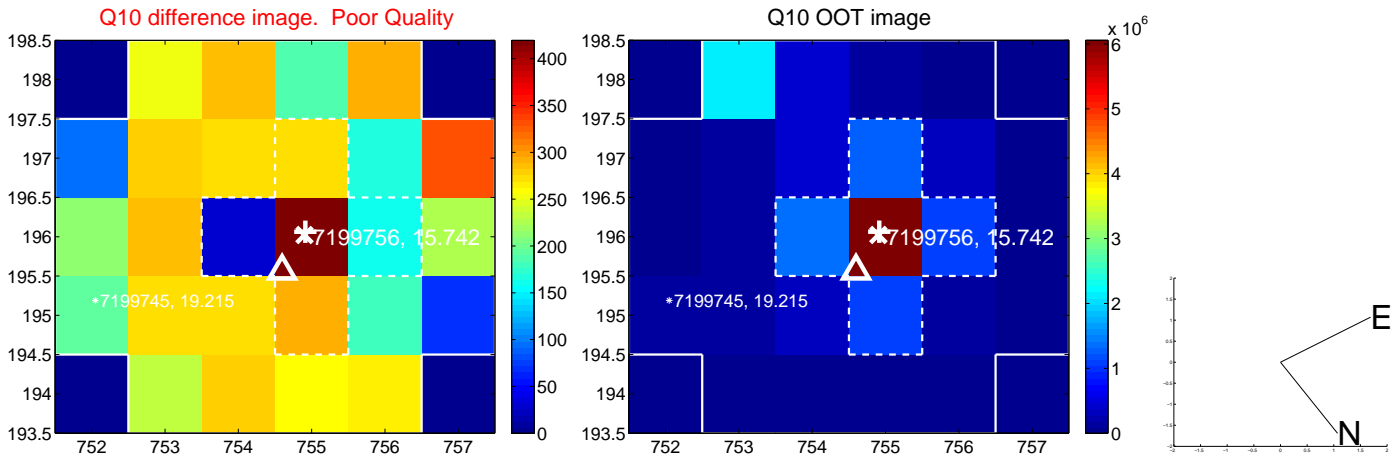
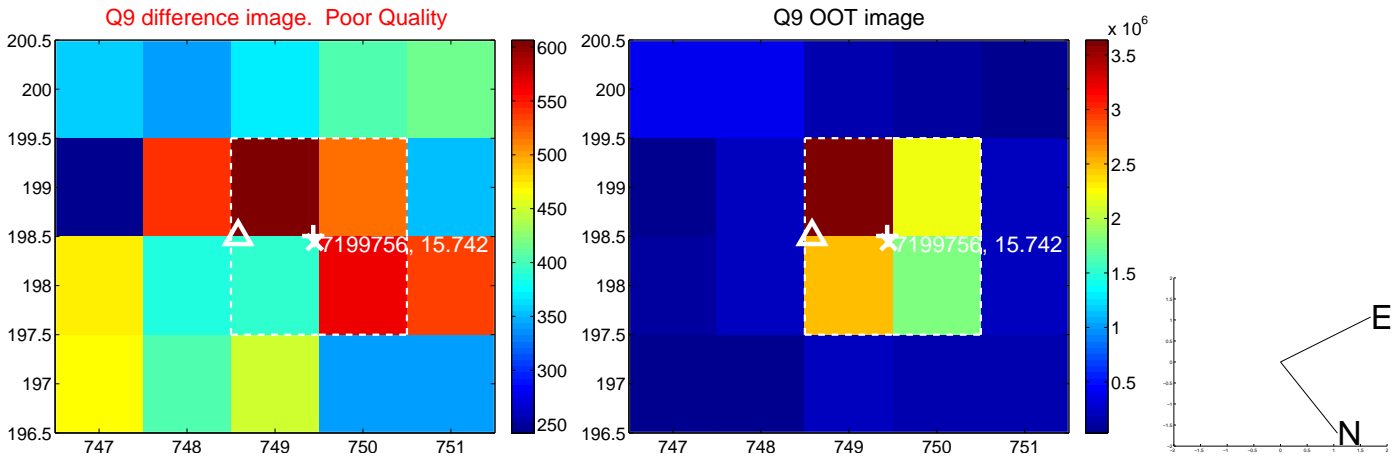


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

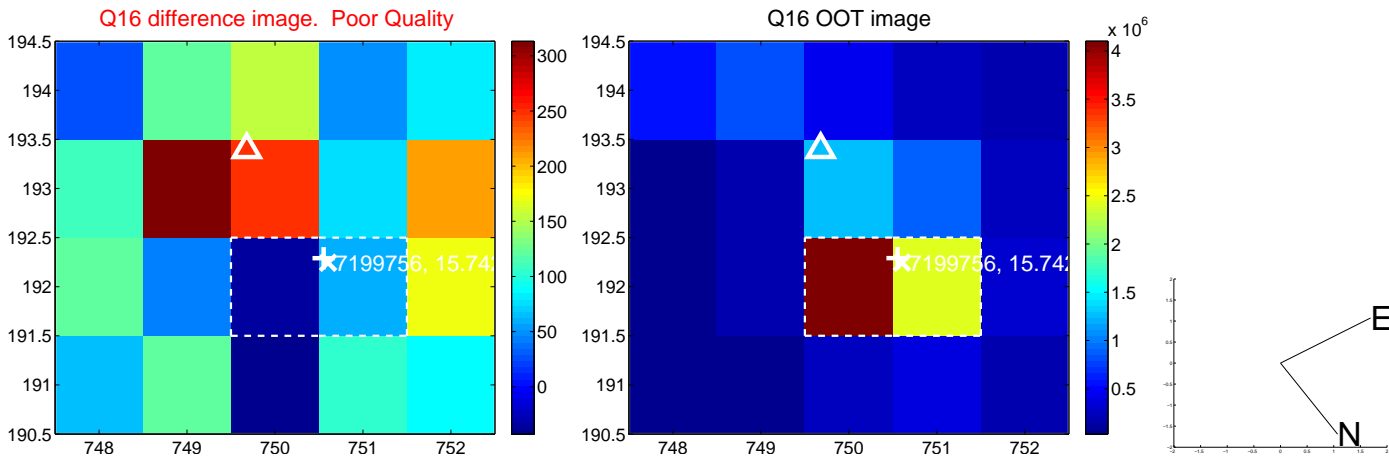
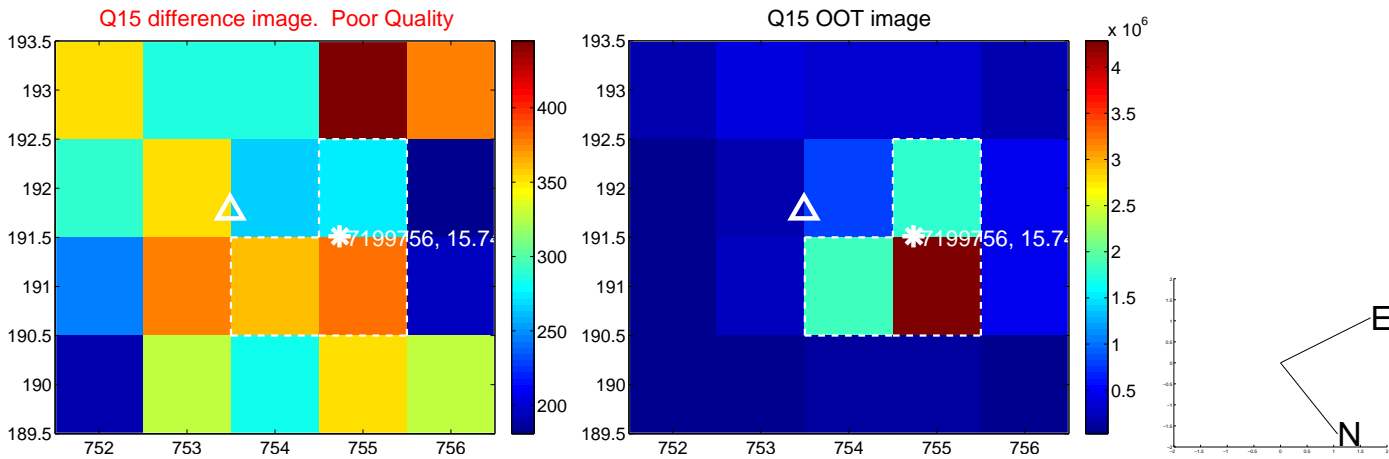
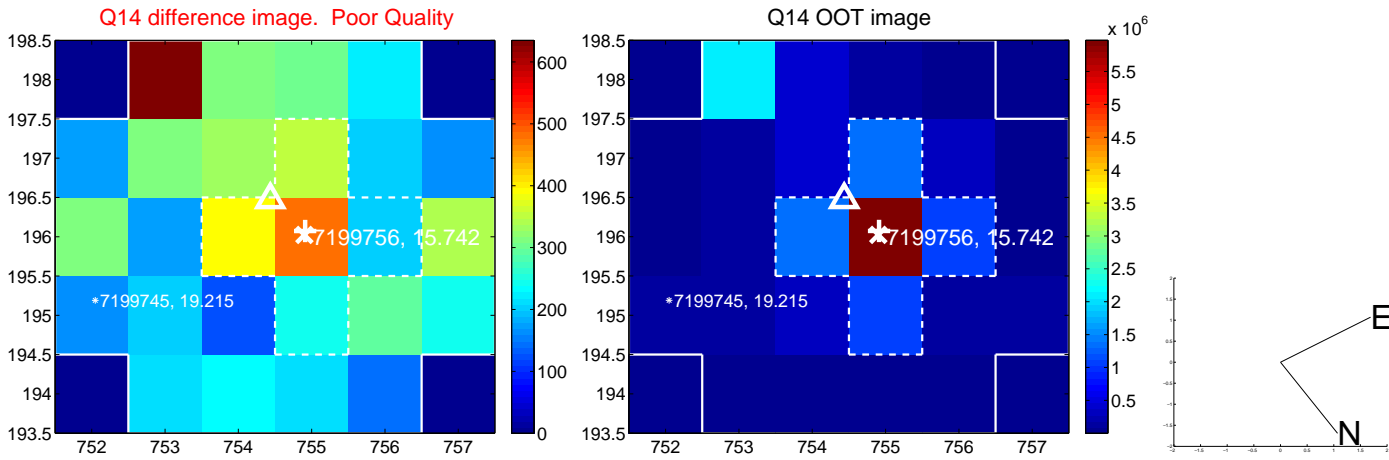
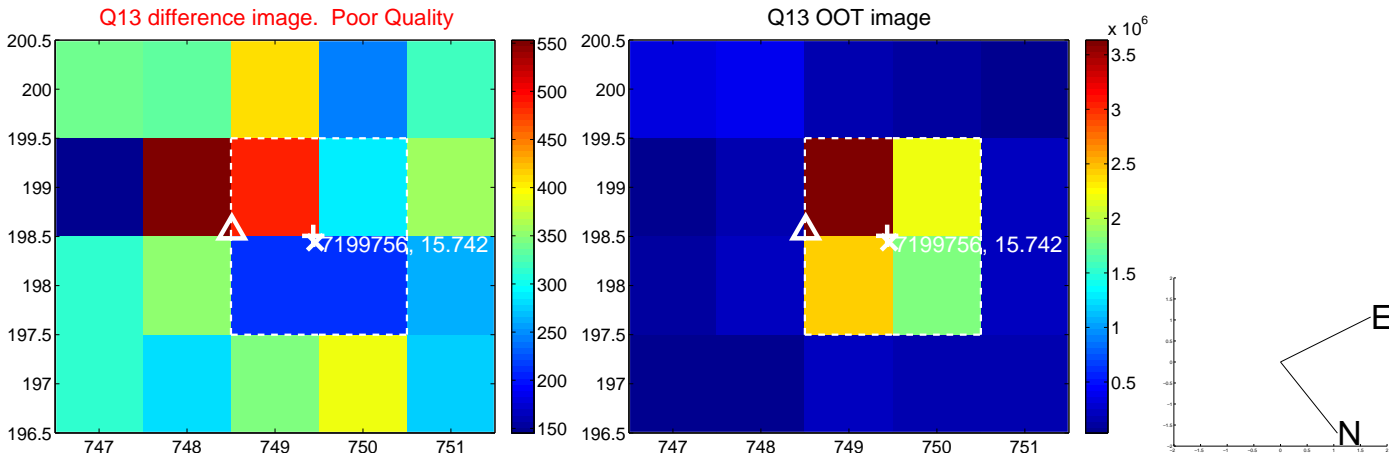




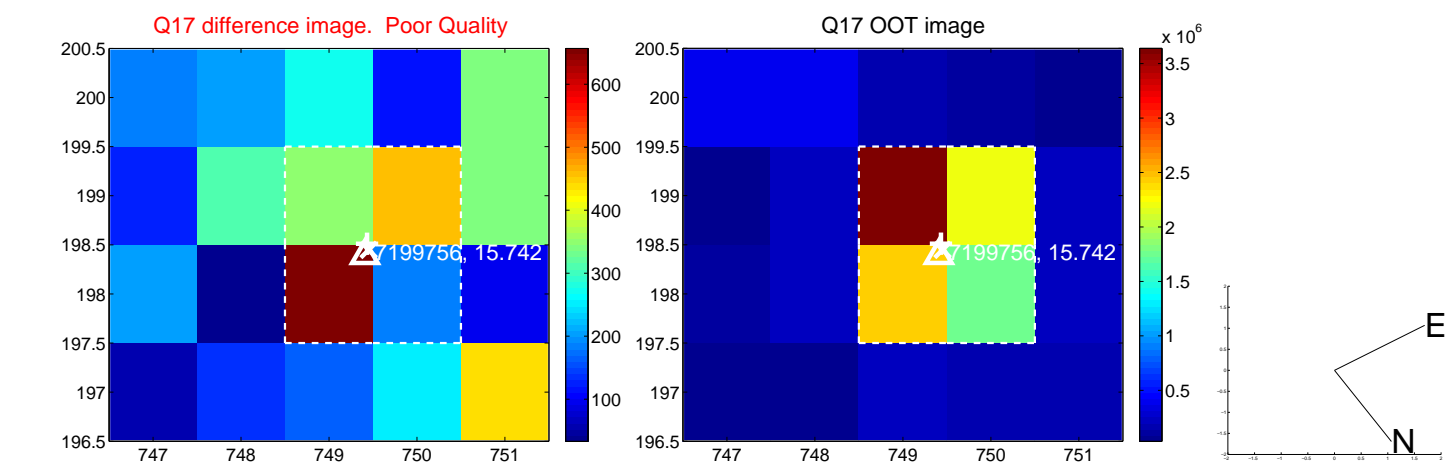
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



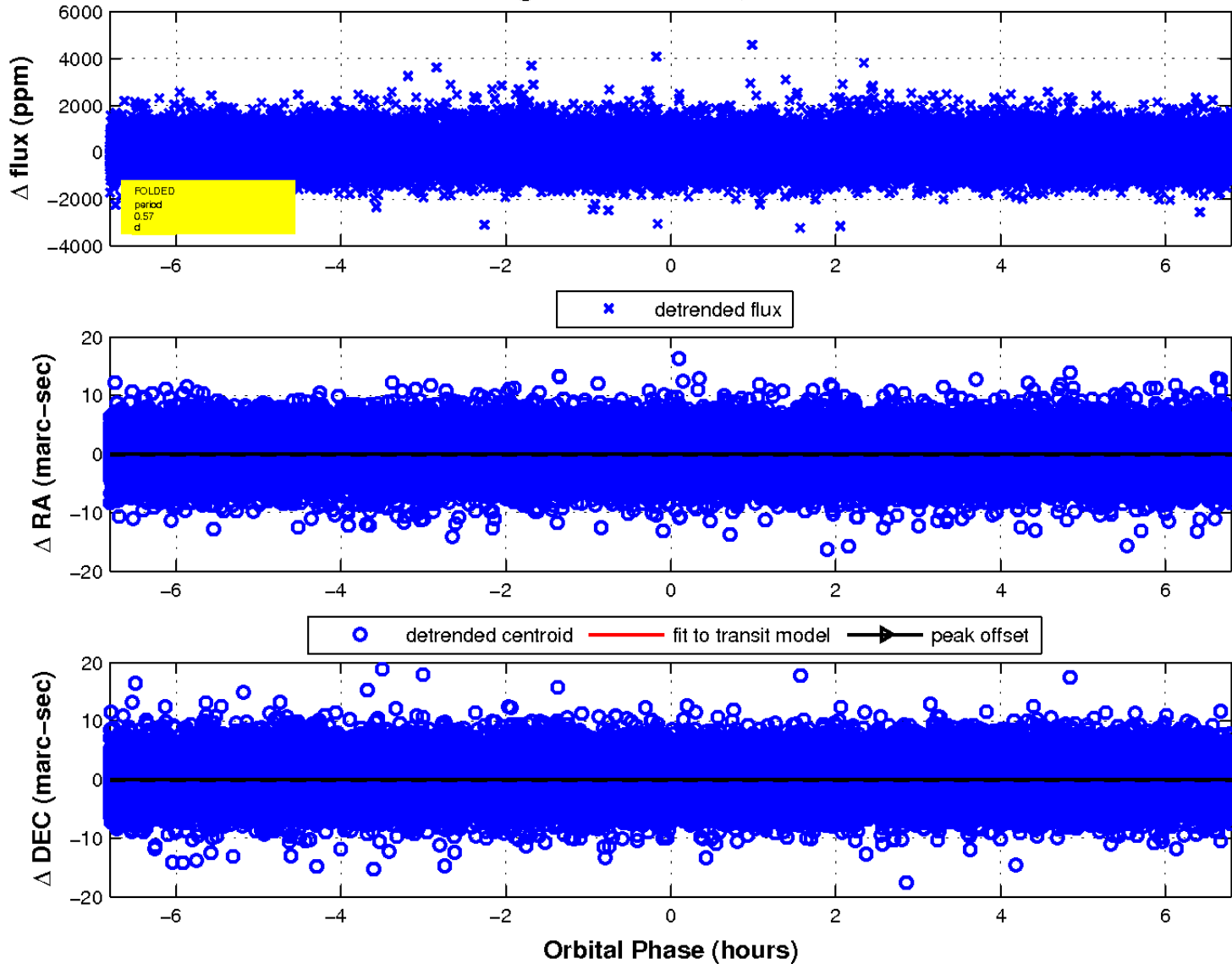
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

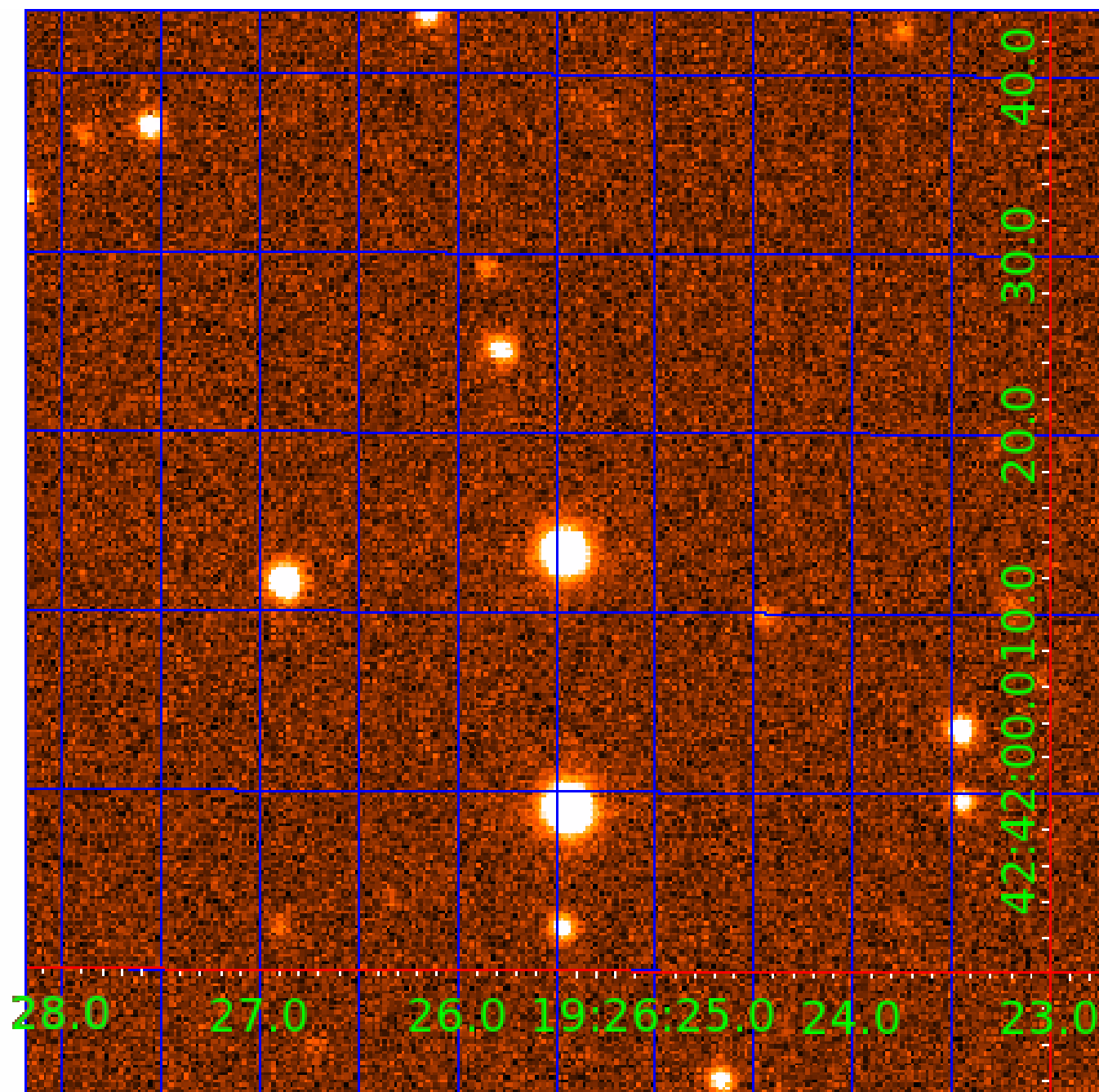


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 007199756

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007199756-01	OBS	7823.01	0.566750	131.872608	62.7	3.099	11.2	9.3	0.46	3725	0.40	334.75
007199756-02	OBS	No	44.572714	133.325249	1203.7	1.948	8.2	9.2	0.46	3725	1.62	0.99

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007199756-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH
007199756-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

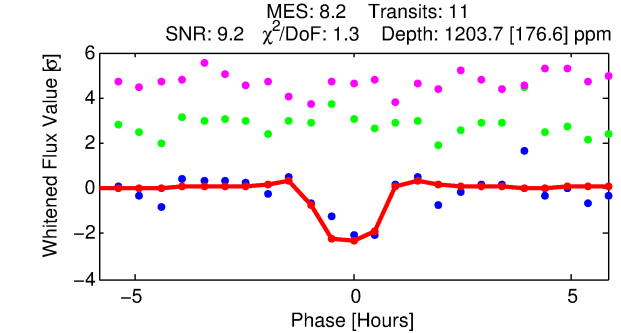
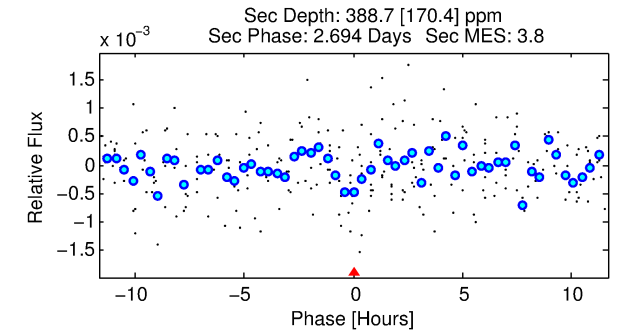
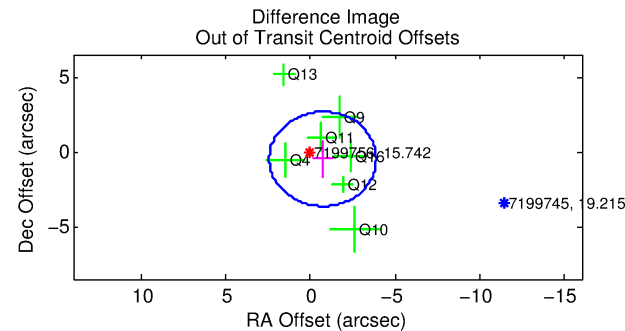
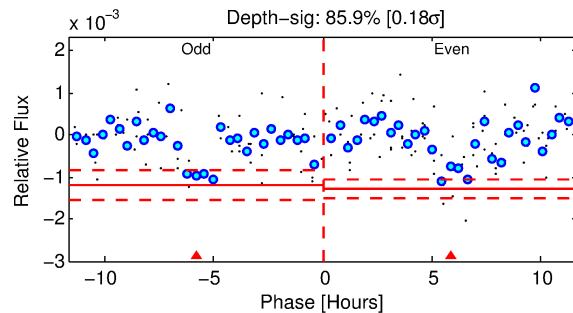
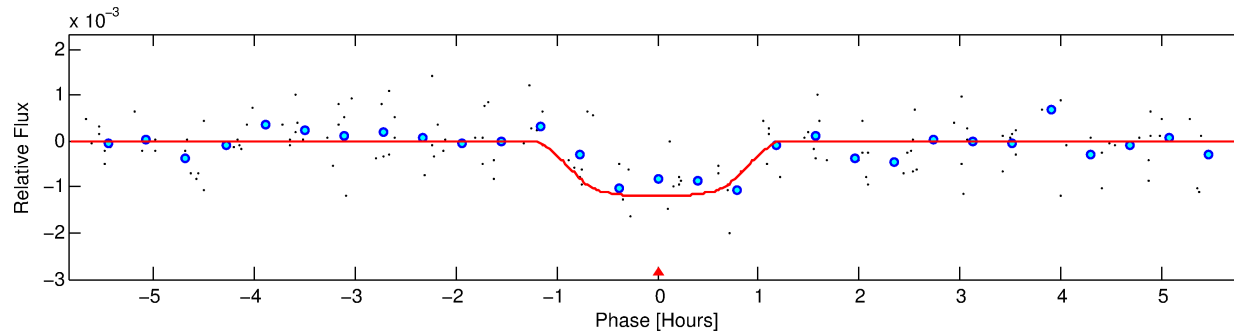
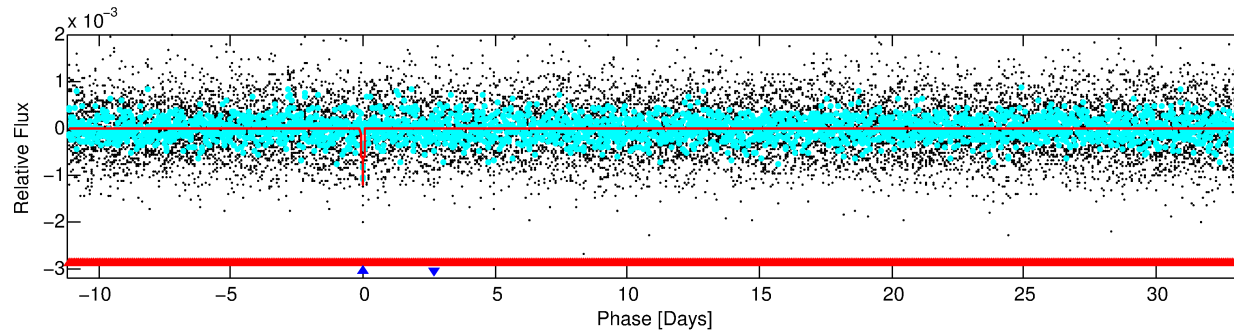
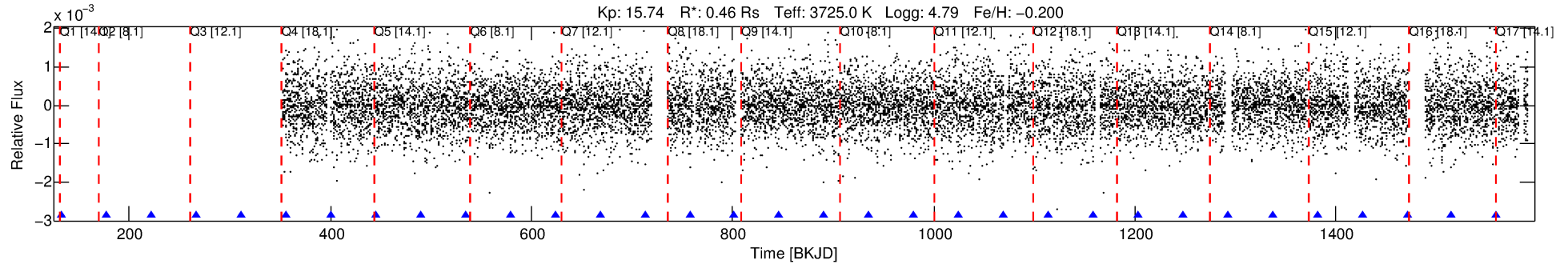
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007199756-02

No Significant Match Found

# DV One-Page Summary

KIC: 7199756 Candidate: 2 of 2 Period: 44.573 d



## DV Fit Results:

Period = 44.57271 [0.00040] d  
Epoch = 133.3252 [0.0083] BKJD  
Rp/R\* = 0.0323 [0.0732]  
a/R\* = 165.56 [1767.63]  
b = 0.41 [21.68]  
Seff = 0.99 [0.13]  
Teq = 255 [8] K  
Rp = 1.62 [3.68] Re  
a = 0.1917 [0.0158] AU  
Ag = 2992.47 [13647.72] [0.22 $\sigma$ ]  
Teffp = 2911 [3319] K [0.80 $\sigma$ ]

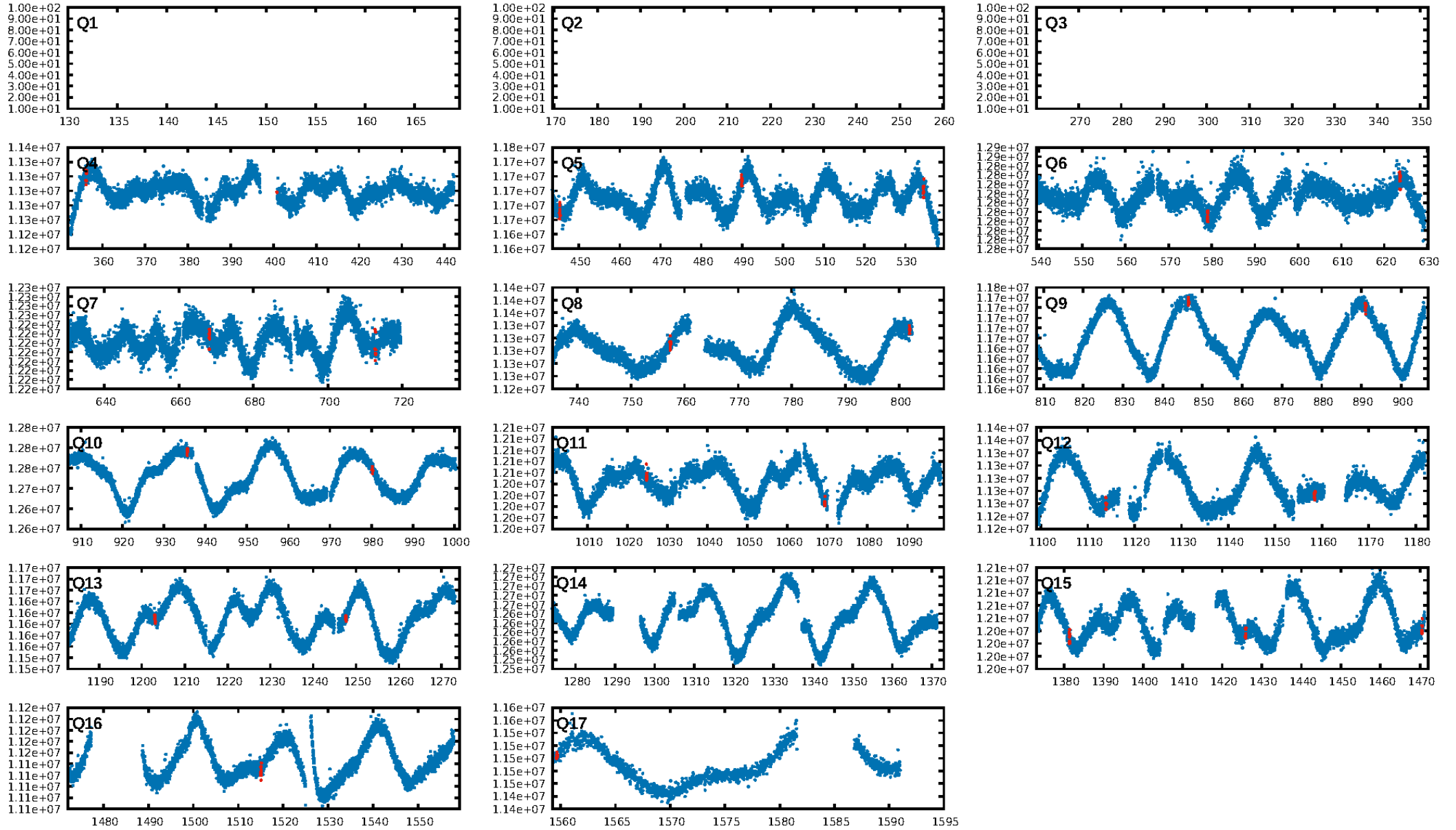
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [288.54 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 15.0%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.17e-10**  
RollingBand-fgt: 1.00 [11/11]  
**GhostDiagnostic-chr: 0.7825**  
Centroid-sig: 55.5%  
Centroid-so: 0.811 arcsec [1.04 $\sigma$ ]  
OotOffset-rm: 0.870 arcsec [0.83 $\sigma$ ]  
OotOffset-st: 1/1/3/2 [7]  
KicOffset-rm: 1.001 arcsec [1.00 $\sigma$ ]  
KicOffset-st: 1/1/3/2 [7]  
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DiffImageOverlap-fno: 0.00 [0/12]

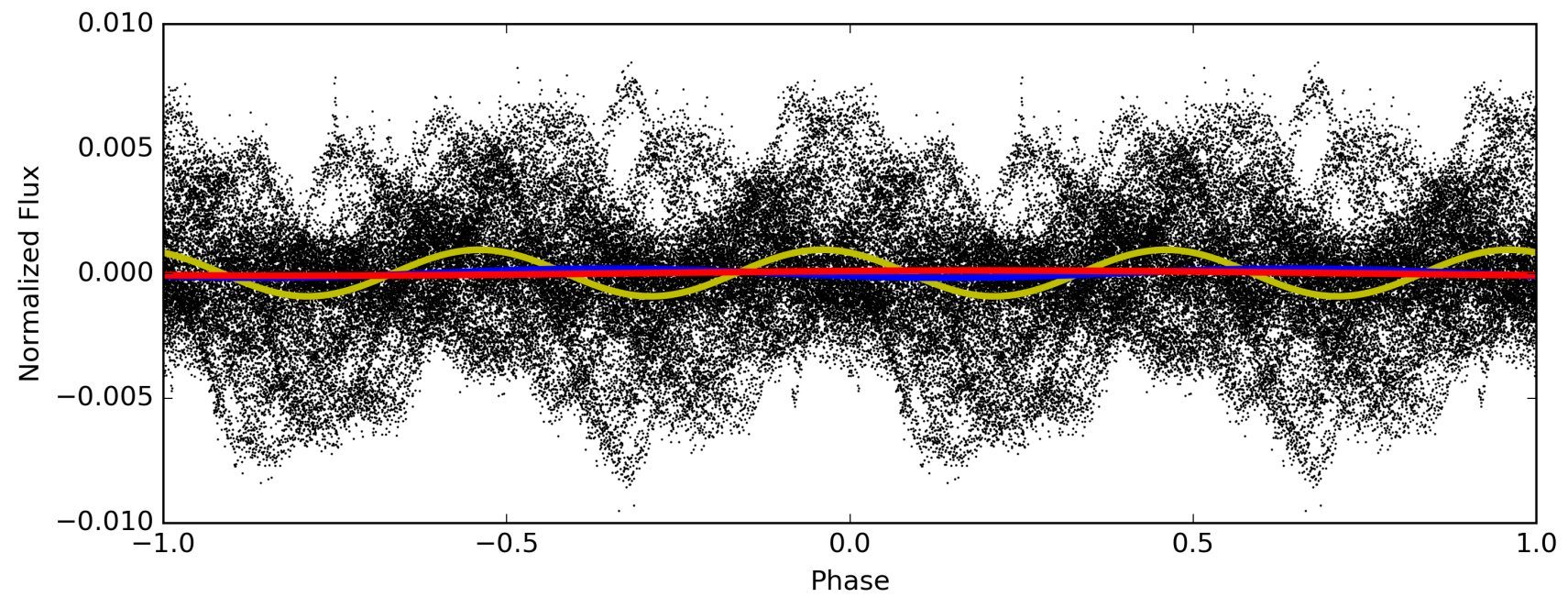
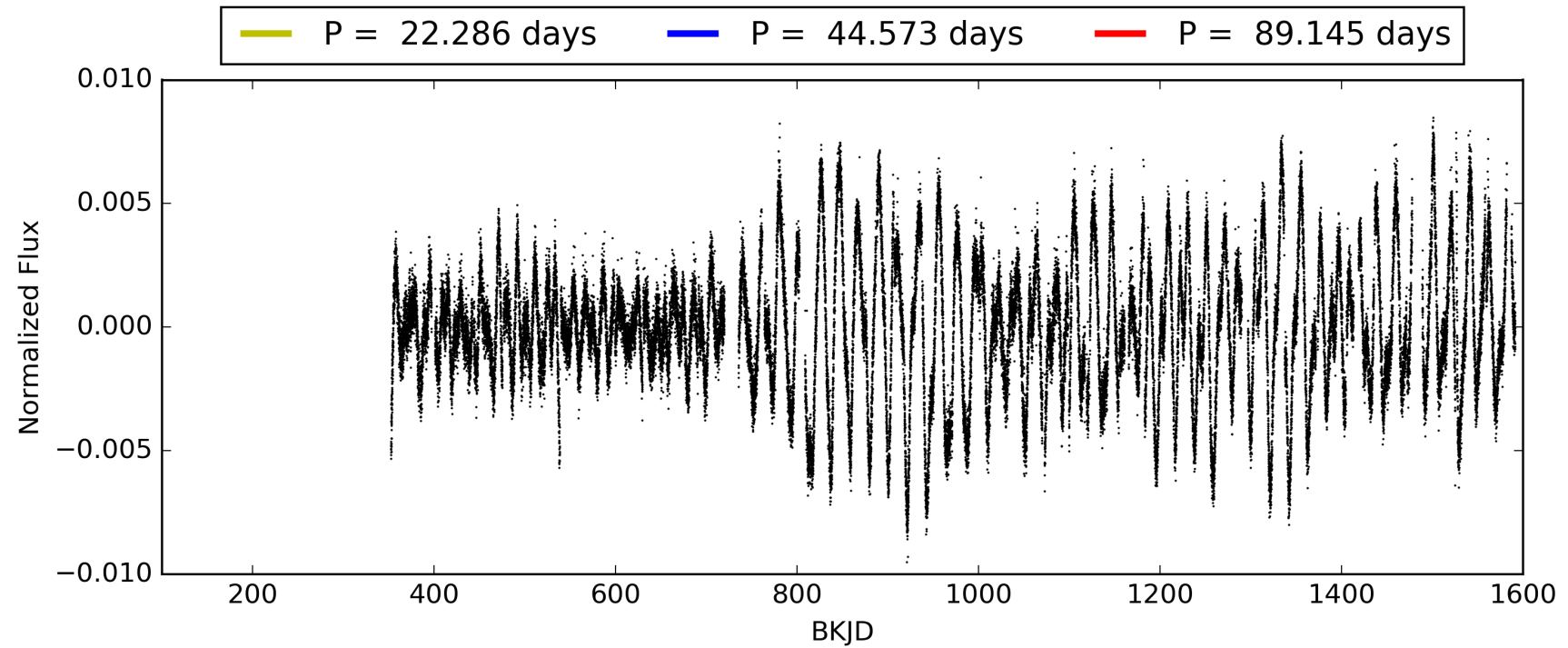
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007199756-02, PDC Light Curves



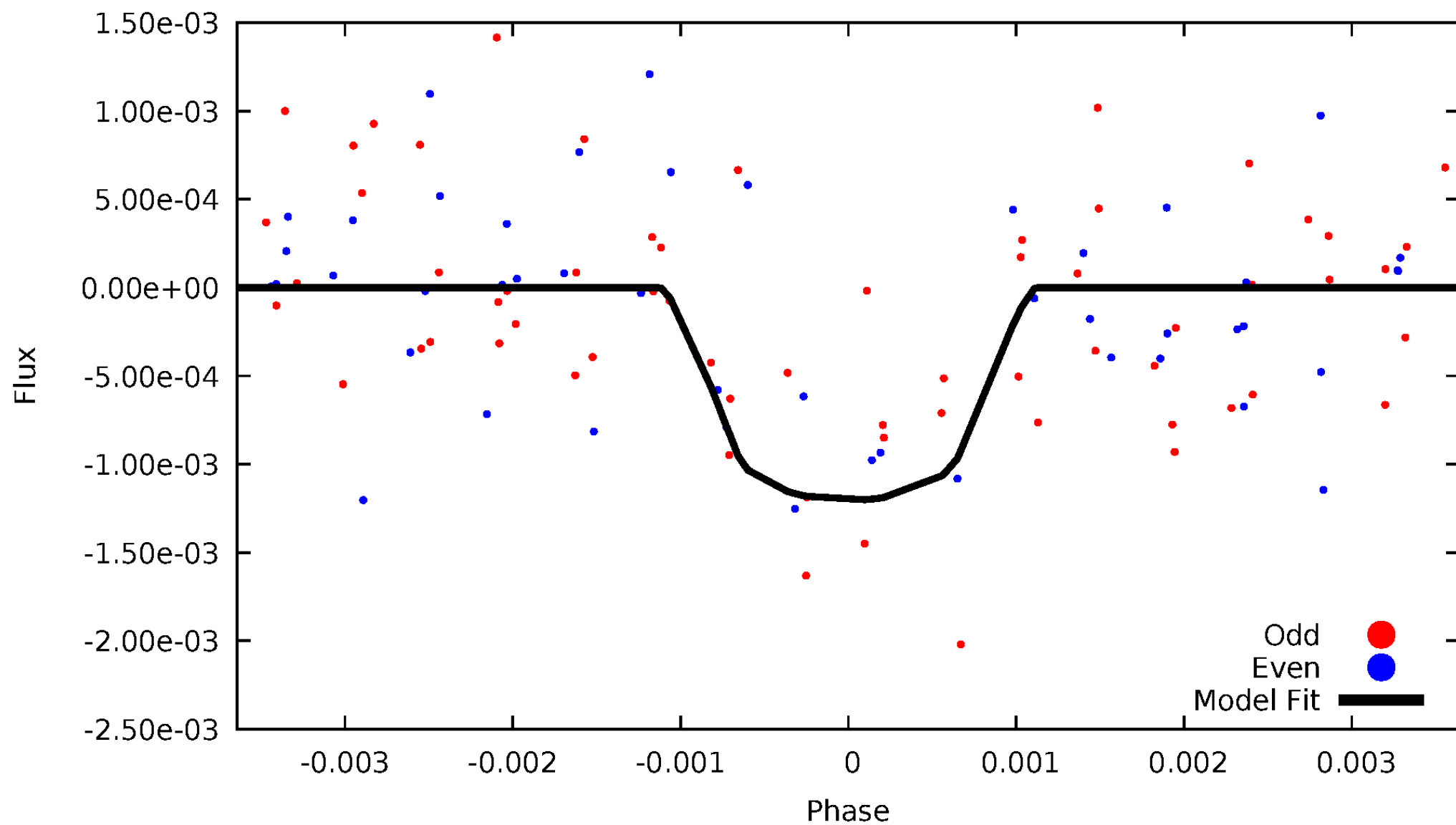
TCE 007199756-02





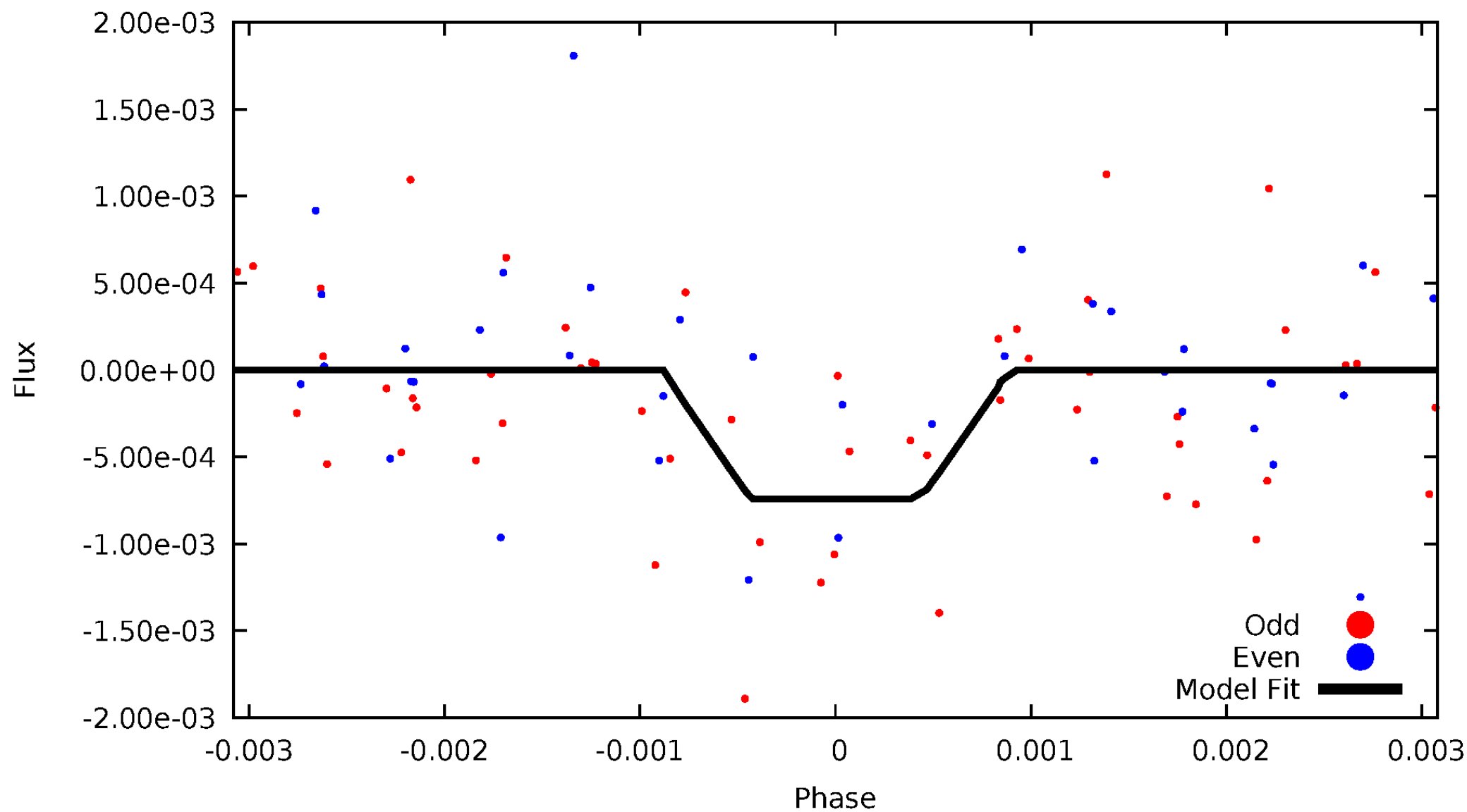
# DV Odd/Even

TCE 007199756-02



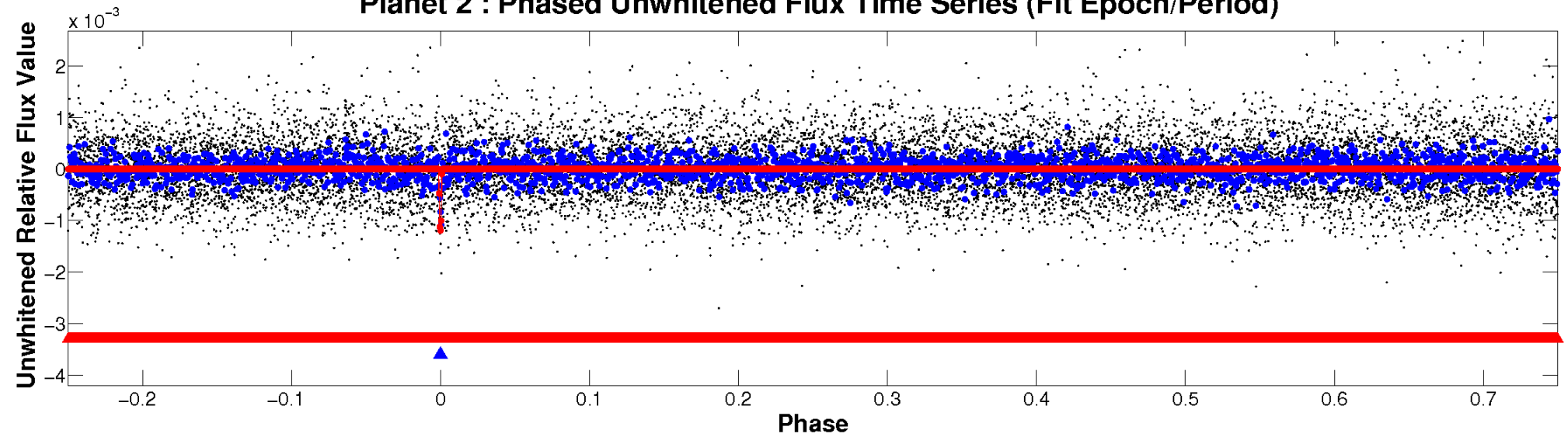
# ALT Odd/Even

TCE 007199756-02

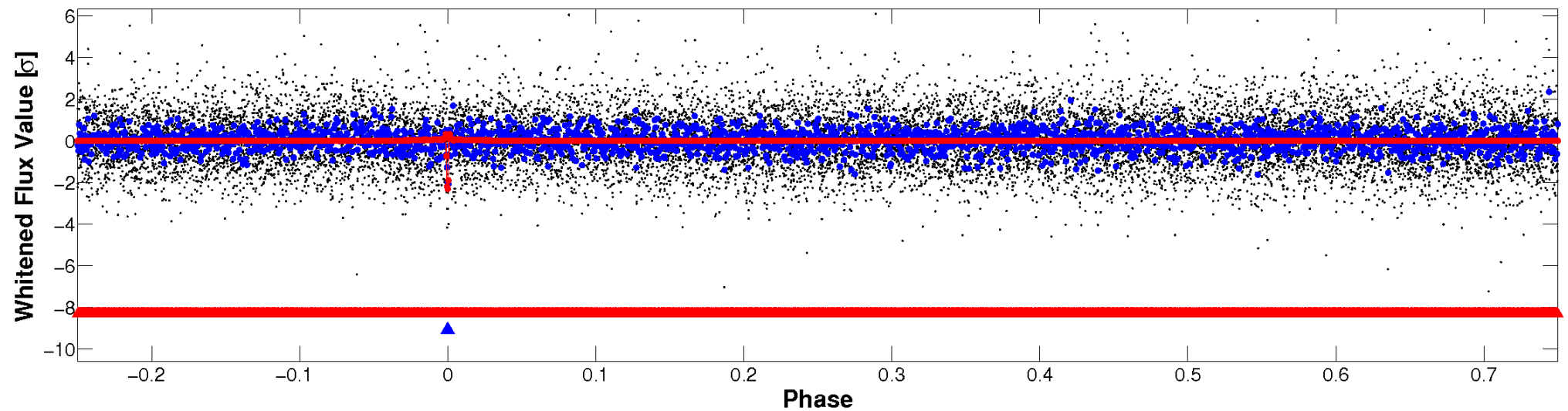


# Non-Whitened Vs. Whitened Light Curve

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

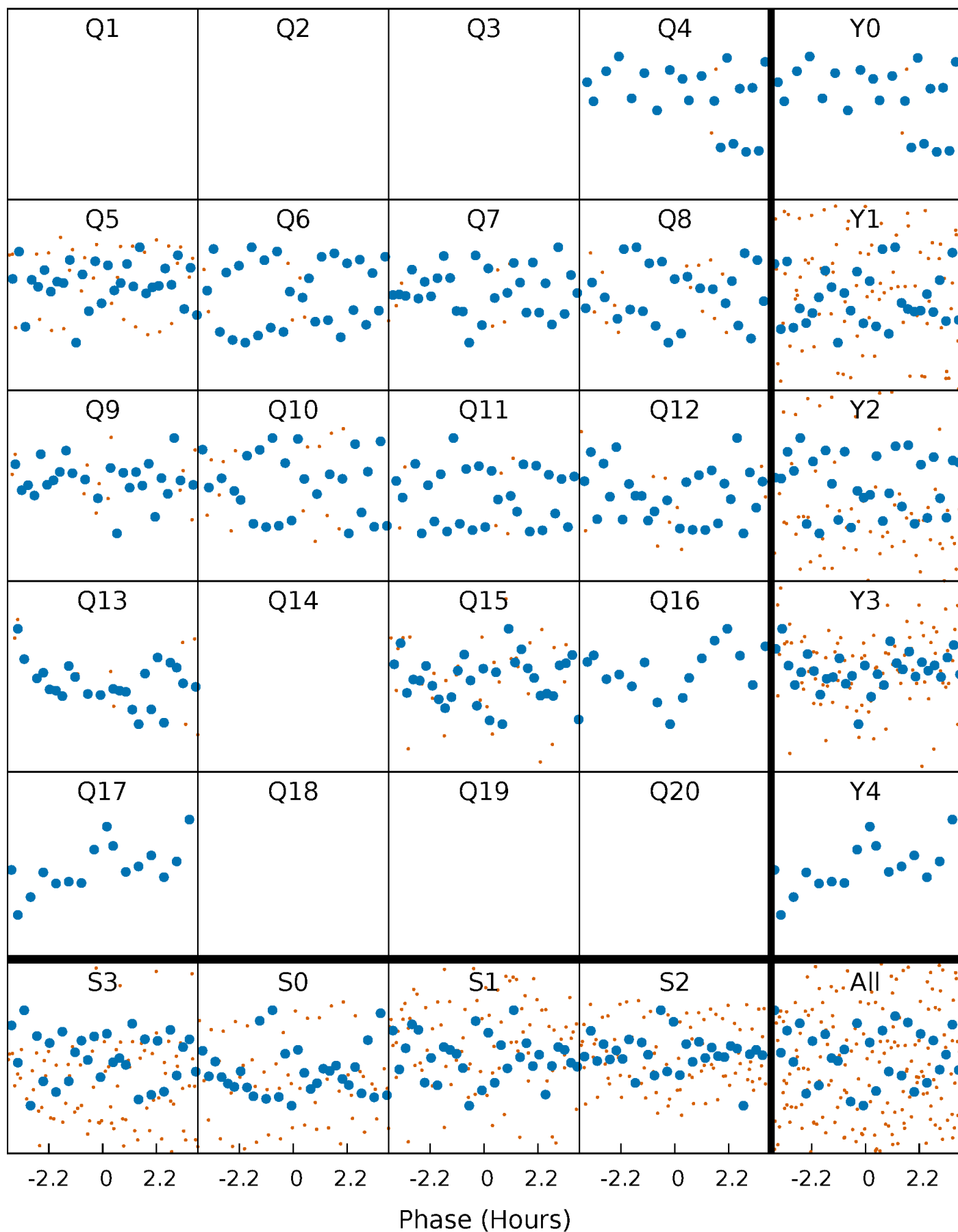


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



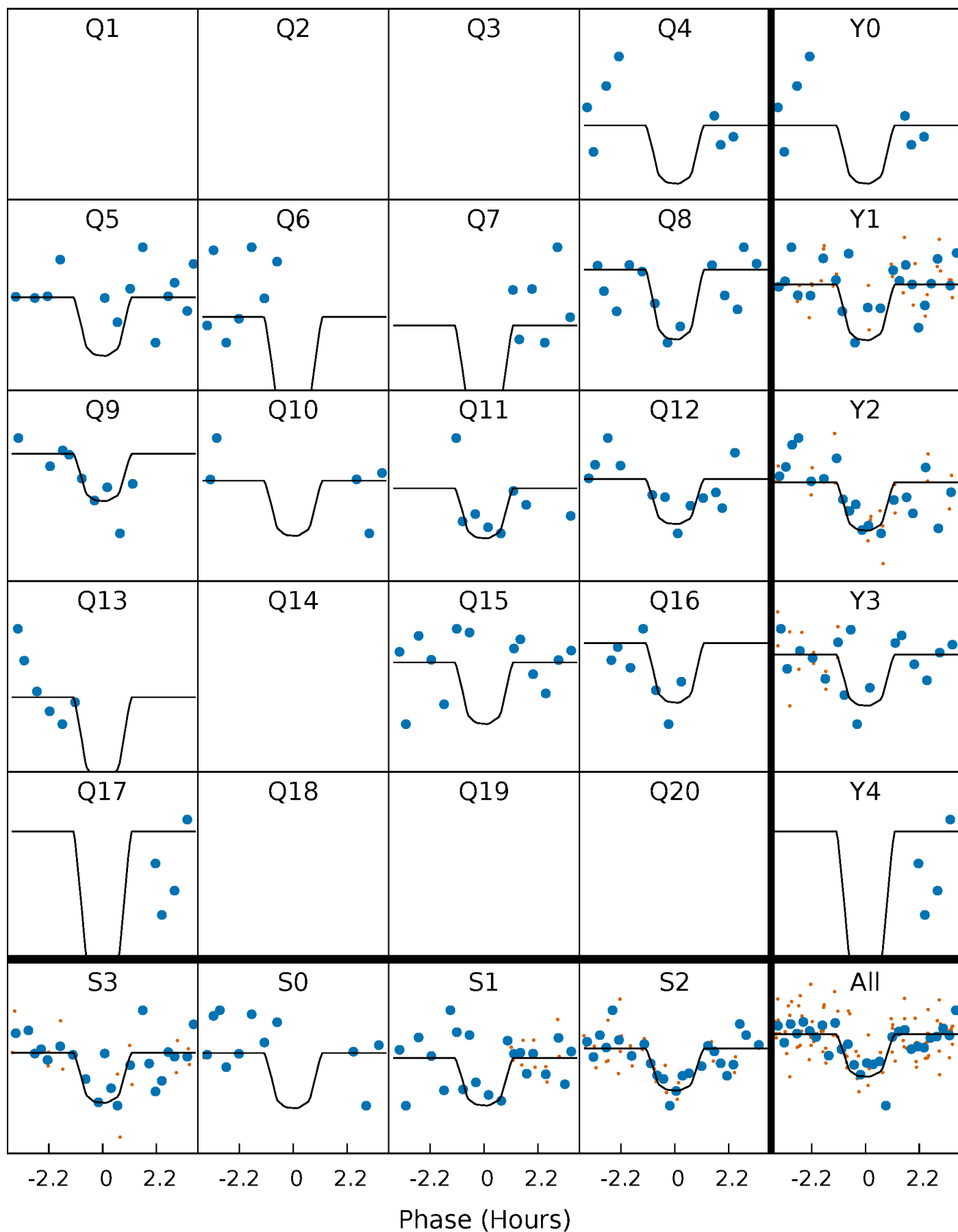
# PDC Quarter-Phased Transit Curves

TCE 007199756-02 P= 44.572714 Days  $T_0=133.325249$  (BKJD)



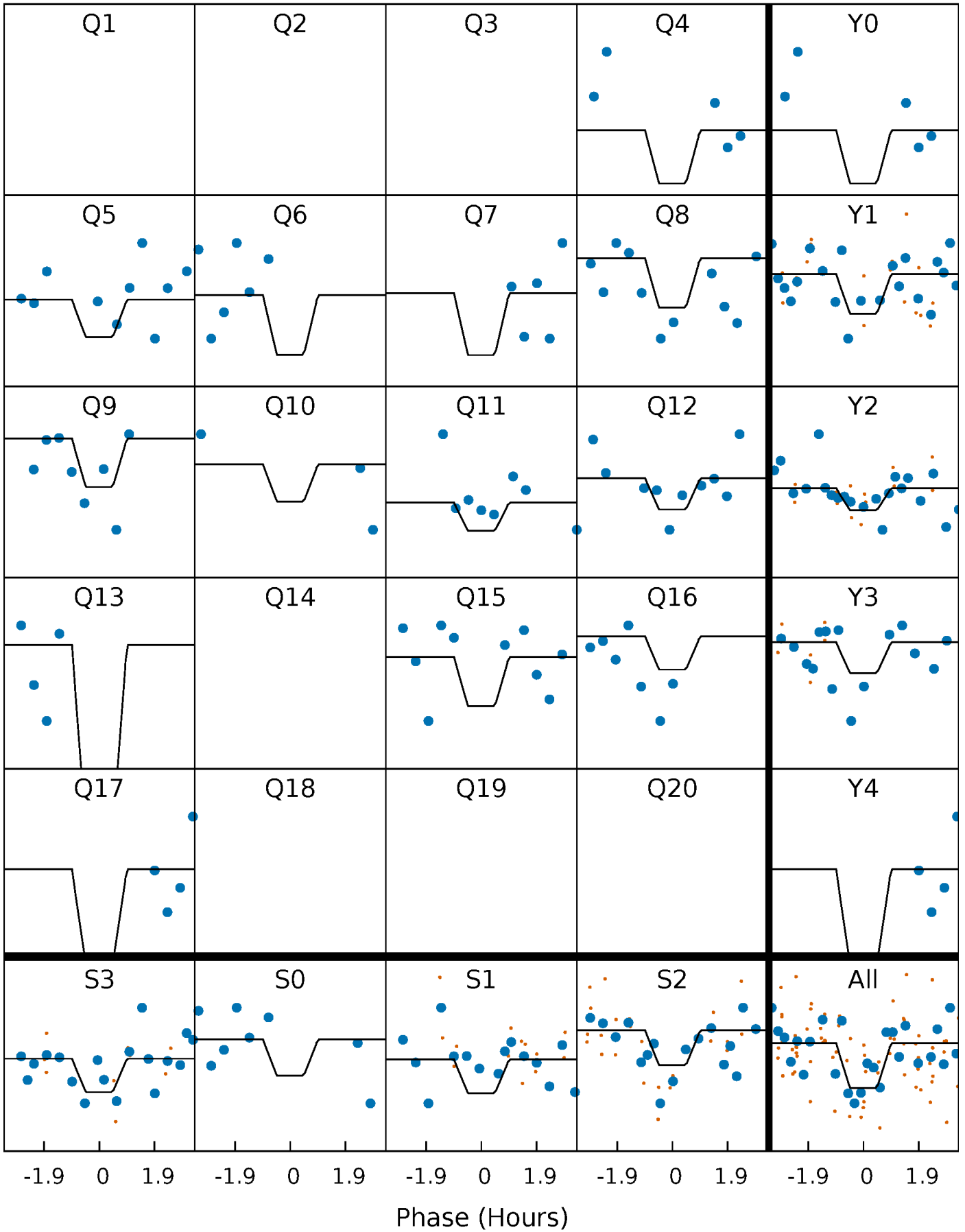
# DV Quarter-Phased Transit Curves

TCE 007199756-02   P= 44.572714 Days    $T_0=133.325249$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

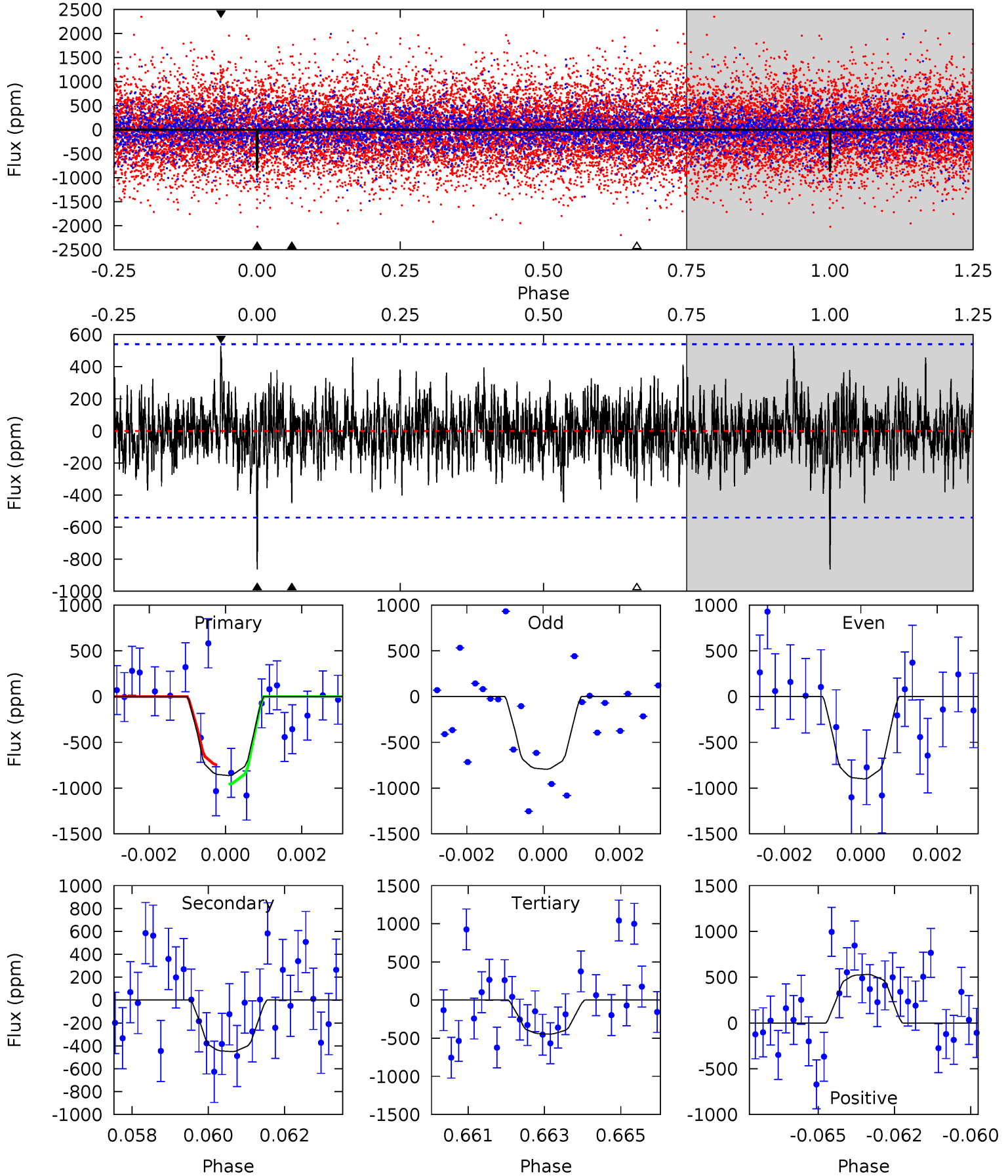
TCE 007199756-02 P= 44.572939 Days  $T_0=133.327667$  (BKJD)



# DV Model-Shift Uniqueness Test

007199756-02,  $P = 44.572714$  Days,  $E = 133.325249$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.47	4.42	4.38	5.20	5.31	3.06	1.31	4.09	3.27	0.04	-0.78	0.49	0.56	0.38	1.03

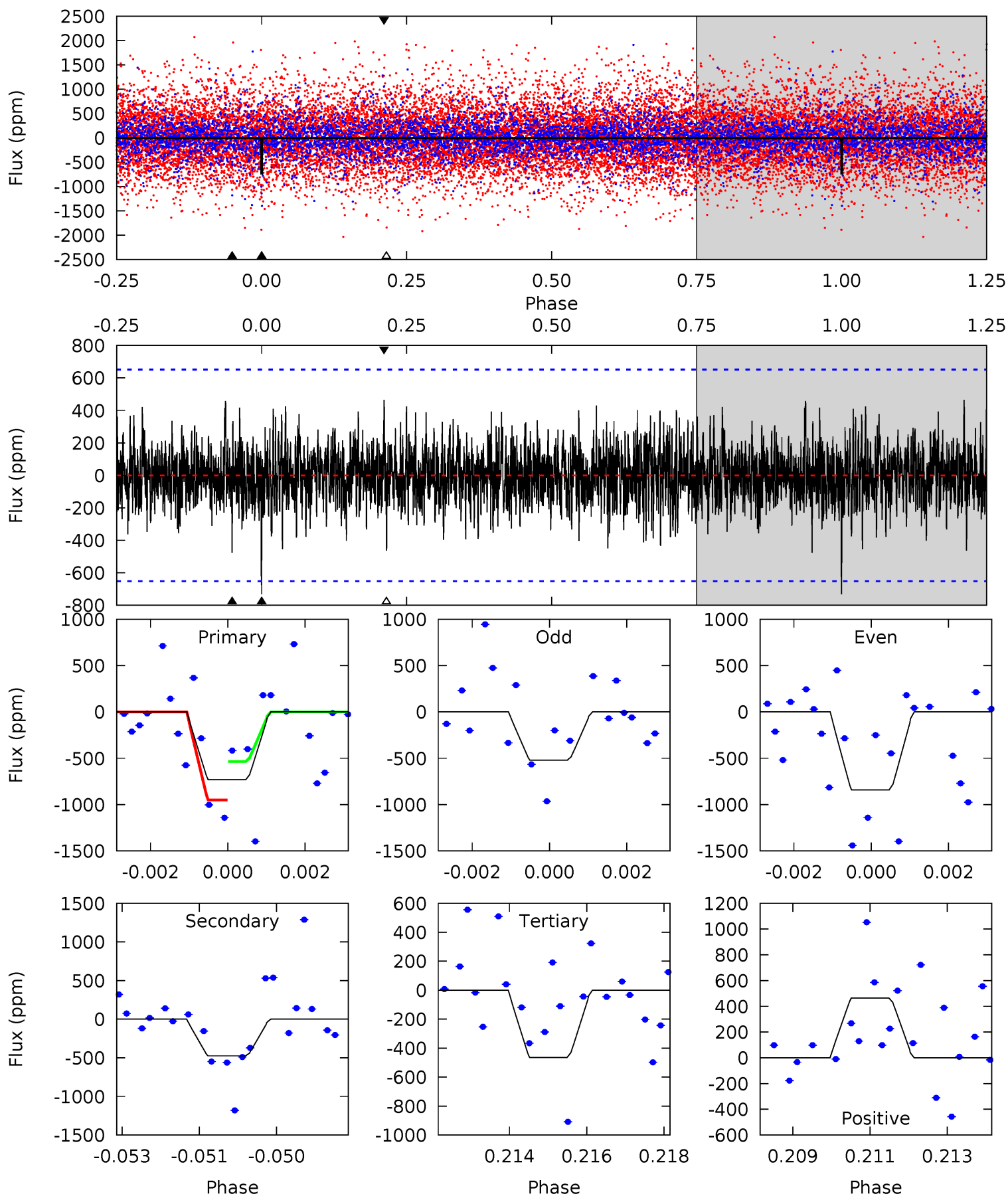




# Alt Model-Shift Uniqueness Test

007199756-02, P = 44.572939 Days, E = 133.327667 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.03	3.91	3.82	3.82	5.36	3.14	1.13	2.21	2.20	0.09	0.09	1.19	0.92	0.39	1.70



### Stellar Parameters For KIC 007199756

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3725^{+59}_{-66}$	$4.787^{+0.055}_{-0.035}$	$-0.200^{+0.200}_{-0.200}$	$0.460^{+0.040}_{-0.049}$	$0.473^{+0.043}_{-0.047}$	$6.845^{+1.944}_{-1.052}$
	+2%/-2%	+1%/-1%	+100%/-100%	+9%/-11%	+9%/-10%	+28%/-15%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 007199756-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-451 \pm 102$	$3.22^{+3.07}_{-2.15}$	$354^{+9}_{-10}$	$2665^{+1020}_{-387}$	$842^{+7422}_{-615}$
Alt.	$-476 \pm 121$	$3.03^{+2.84}_{-2.09}$	$354^{+9}_{-9}$	$2761^{+1184}_{-439}$	$1089^{+9783}_{-823}$

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

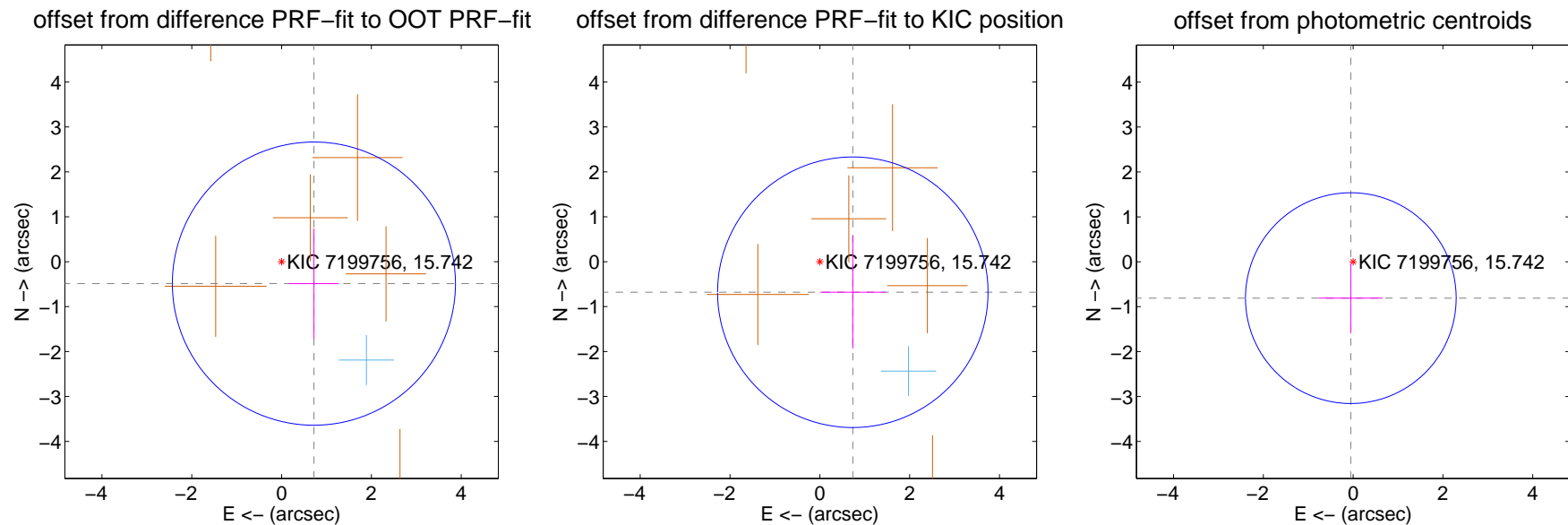
## DV Centroid Data

Supplemental centroid analysis for 007199756-02. Kepler magnitude: 15.74. Transit SNR 9.18

There are 1 quarters with good PRF difference image offsets

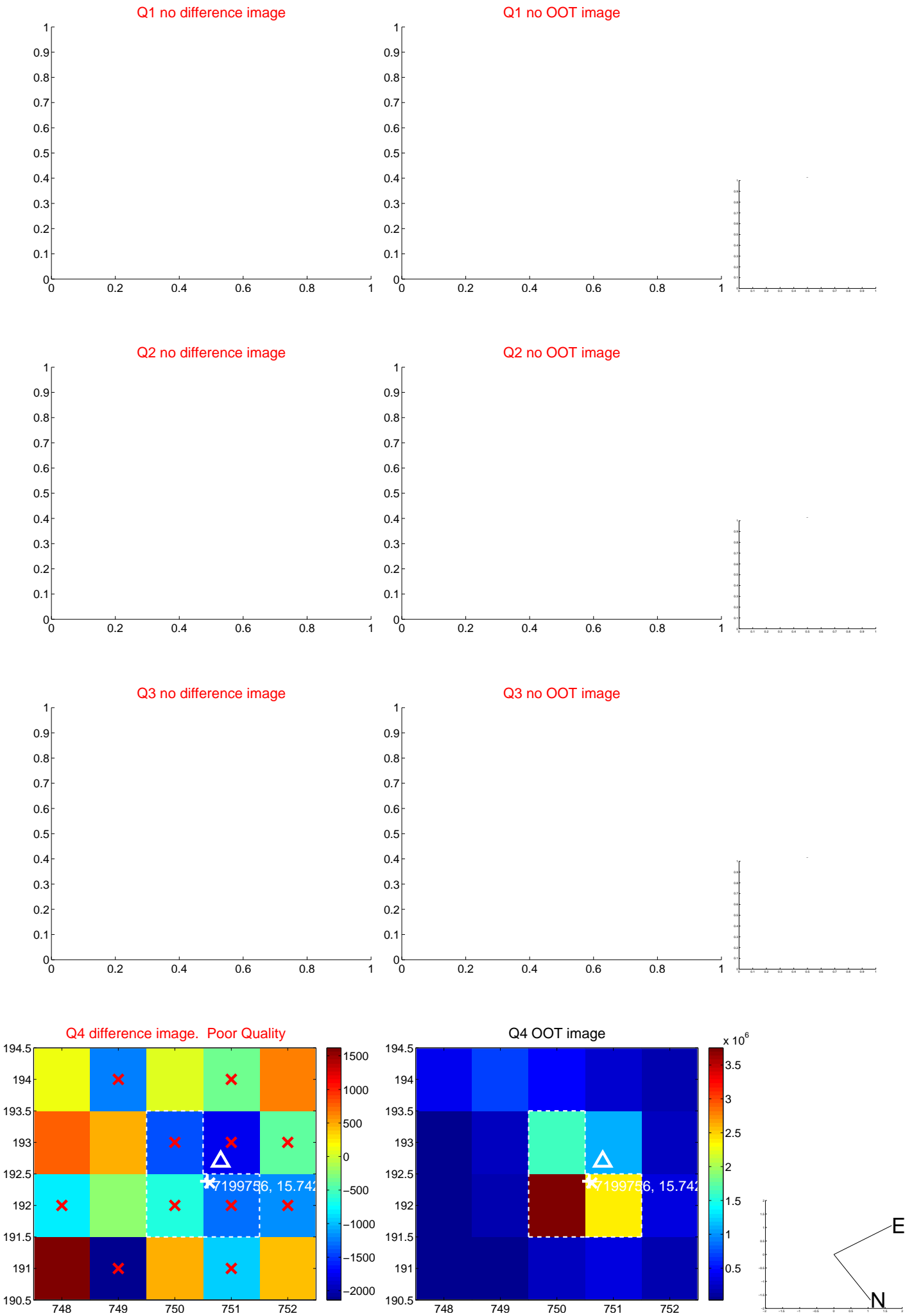
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.870 \pm 1.051$	0.83	$-0.720 \pm 0.549$	$-0.488 \pm 1.227$
PRF-fit source offset from KIC position	$1.001 \pm 1.004$	1.00	$-0.734 \pm 0.727$	$-0.680 \pm 1.251$
photometric centroid source offset	$0.81 \pm 0.78$	1.04	$0.05 \pm 0.71$	$-0.81 \pm 0.78$

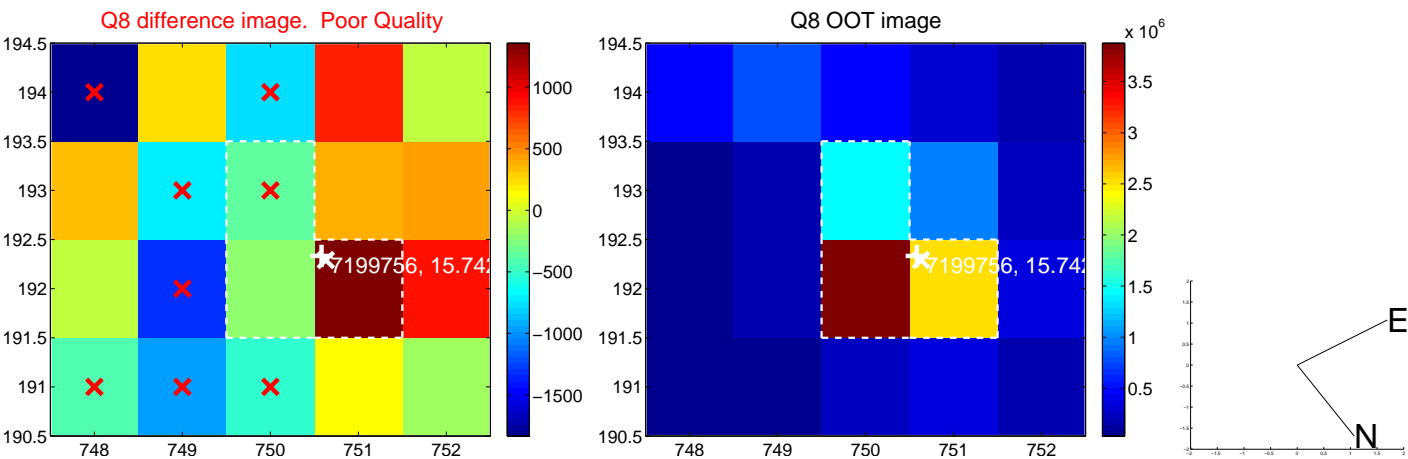
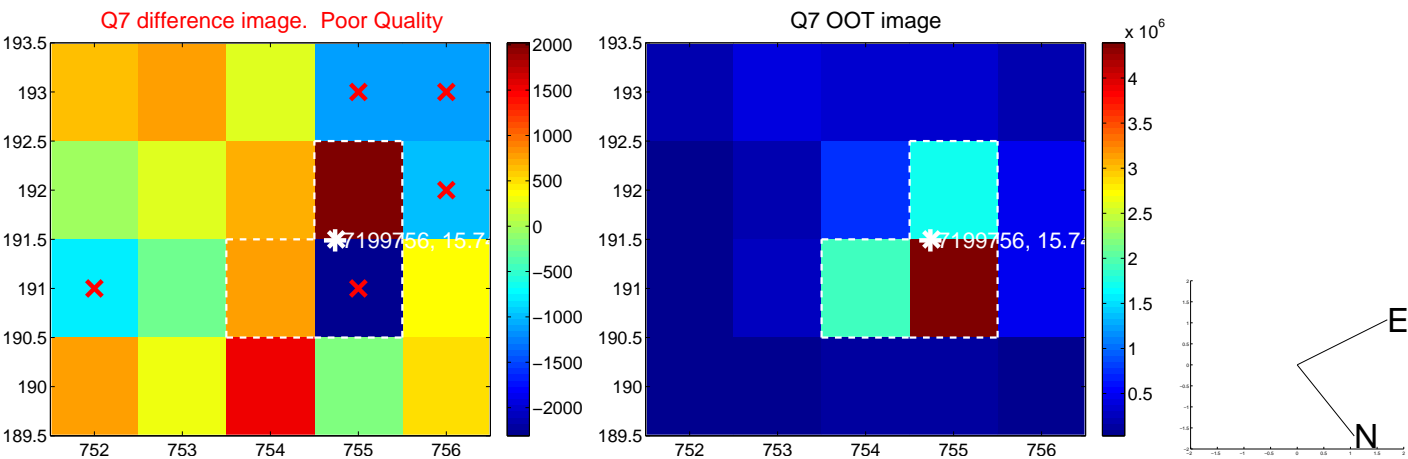
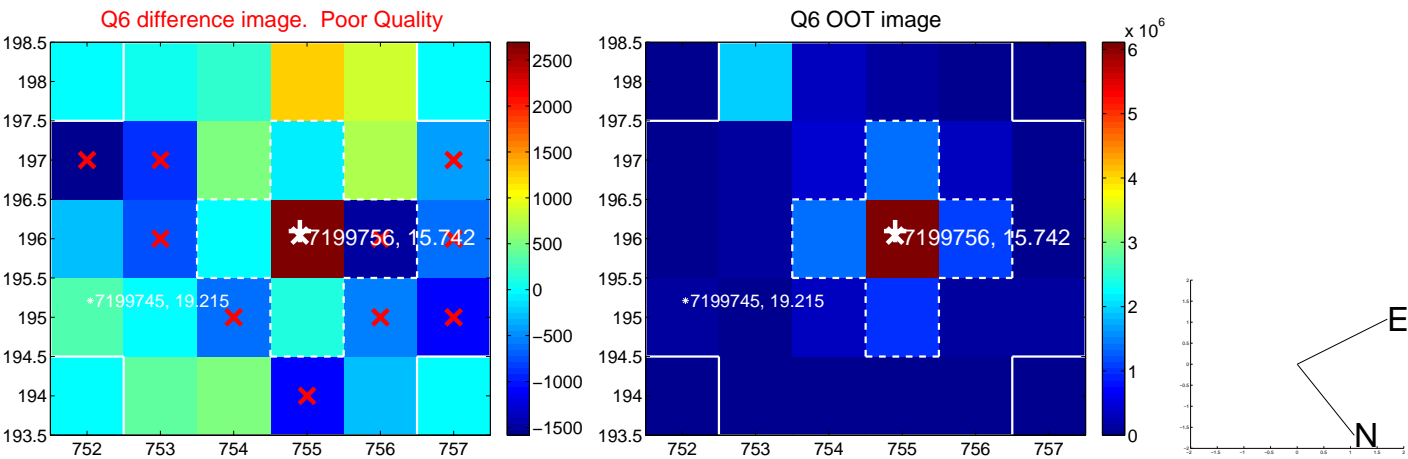
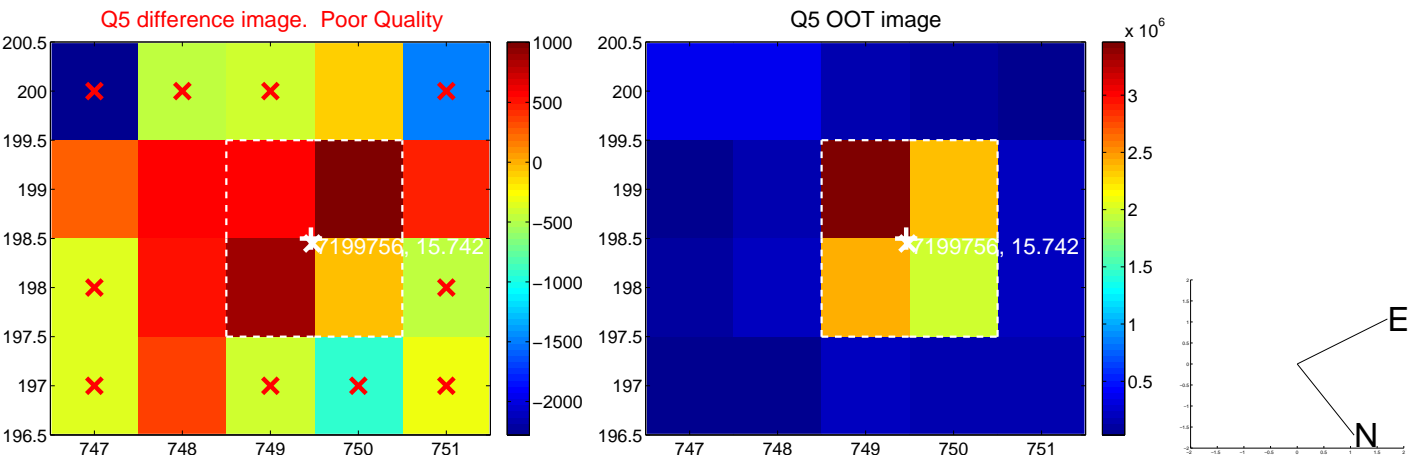


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

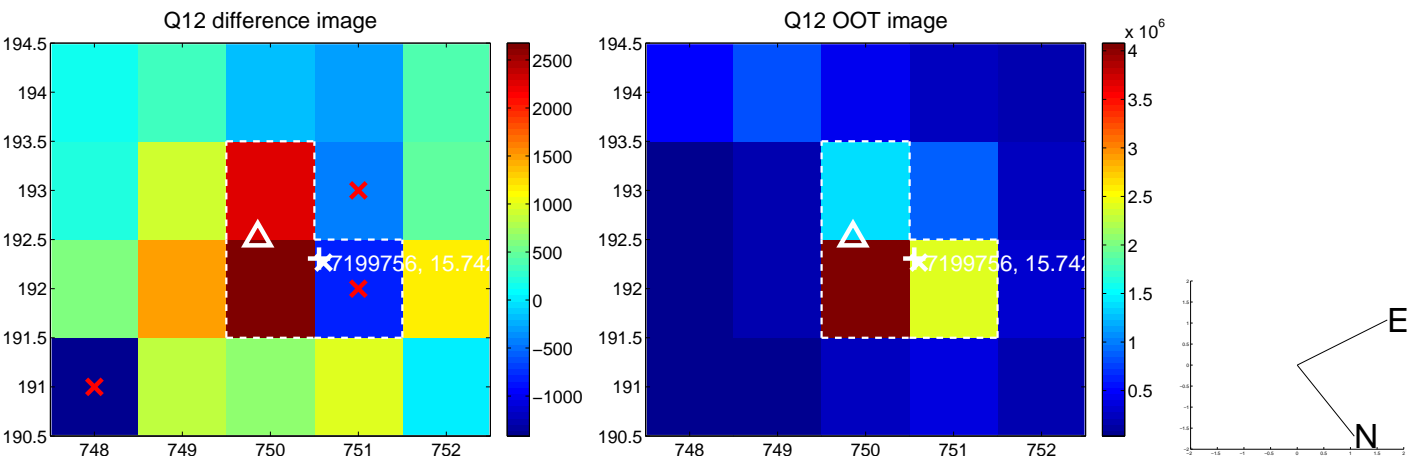
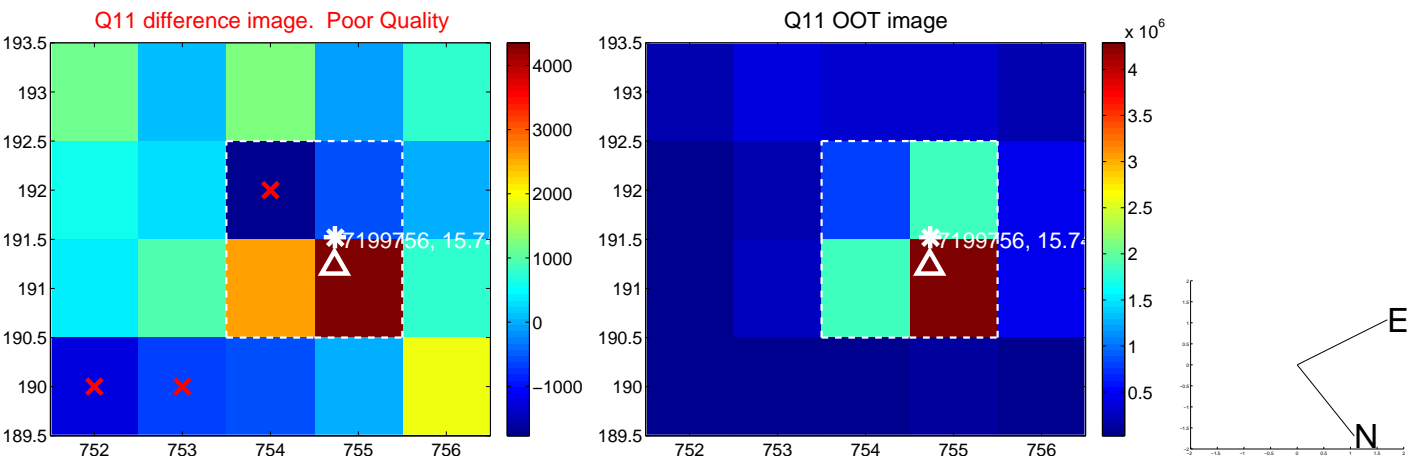
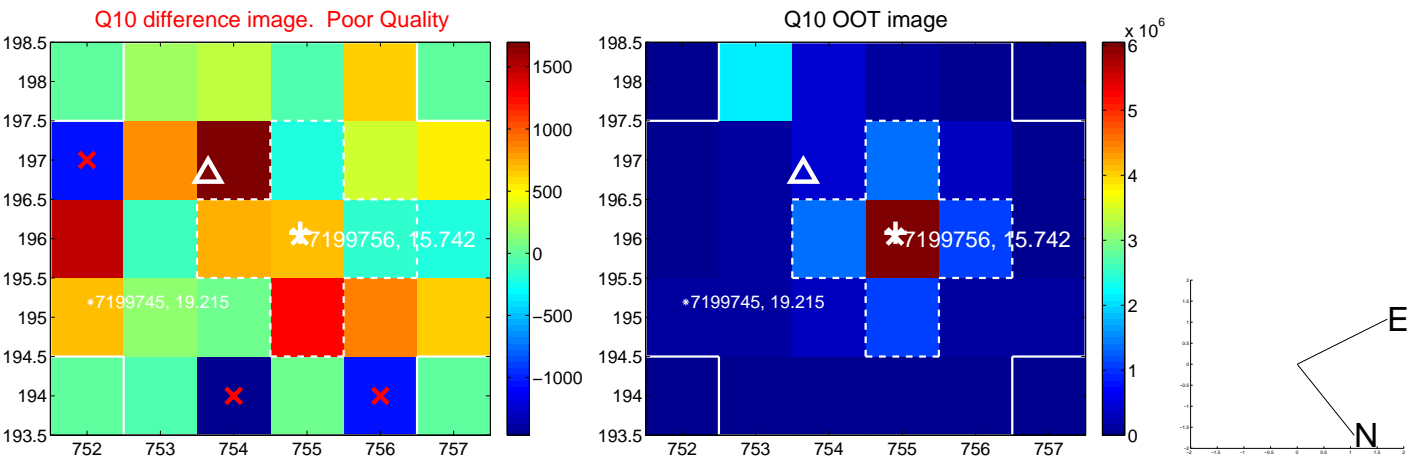
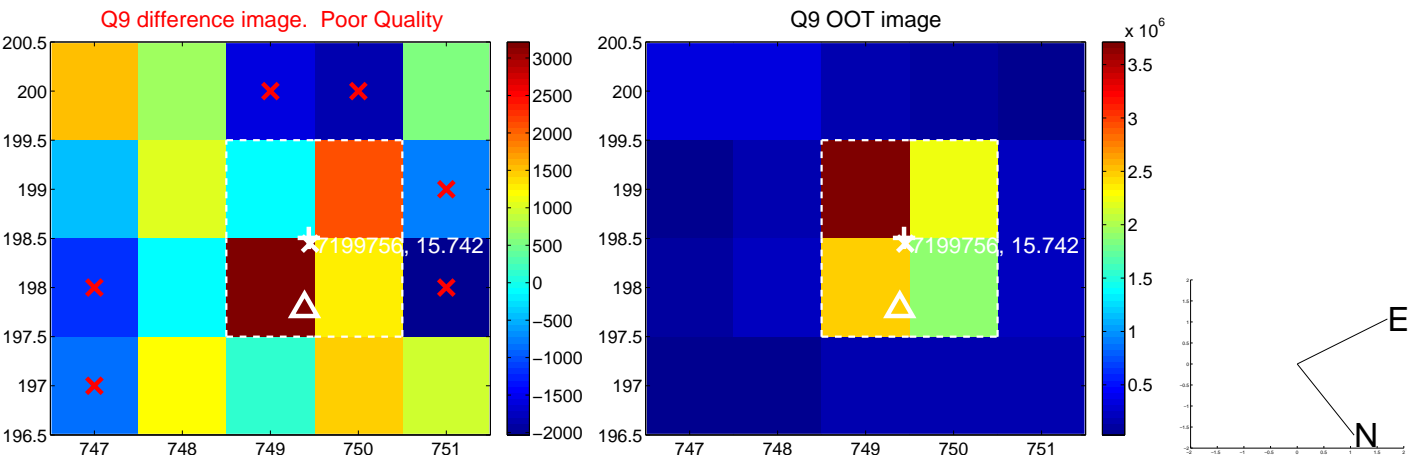
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



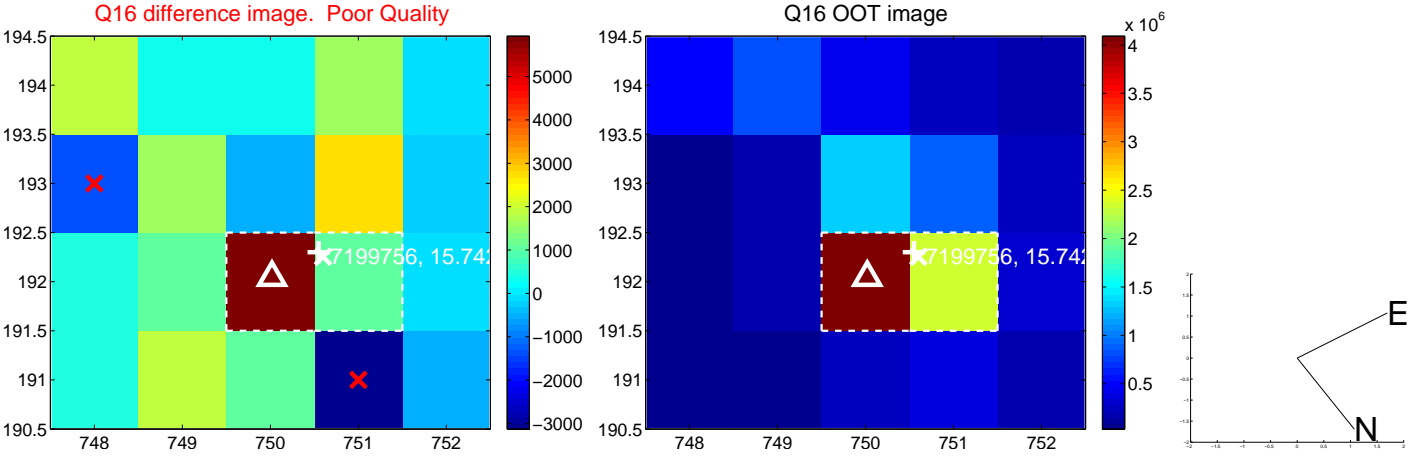
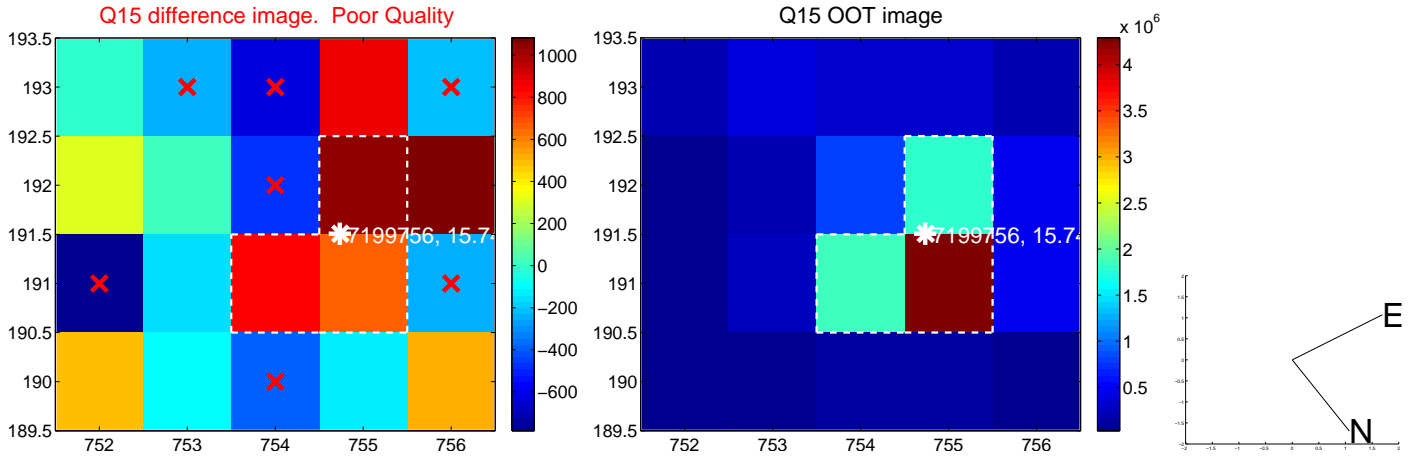
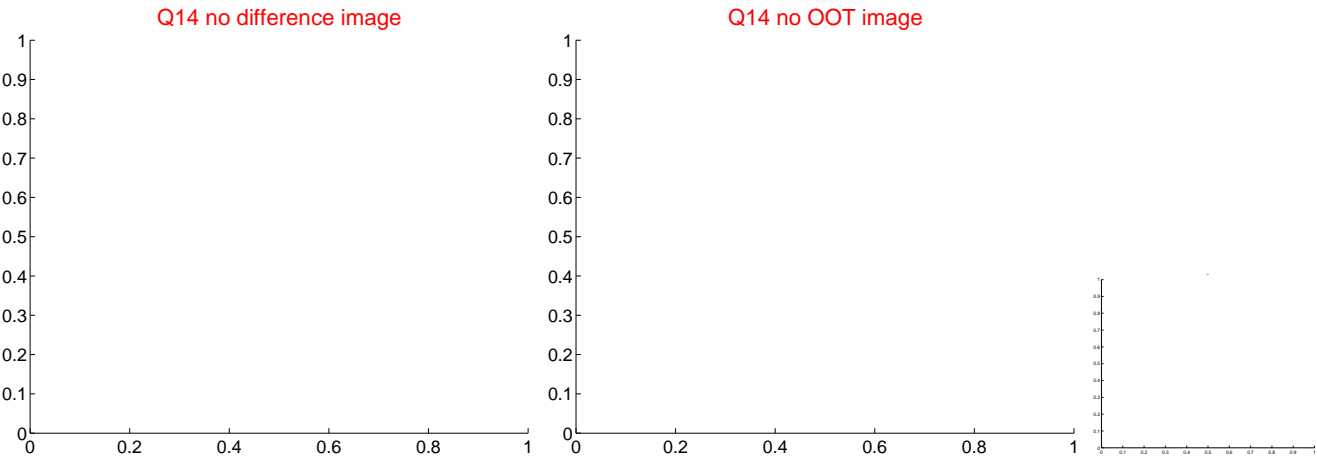
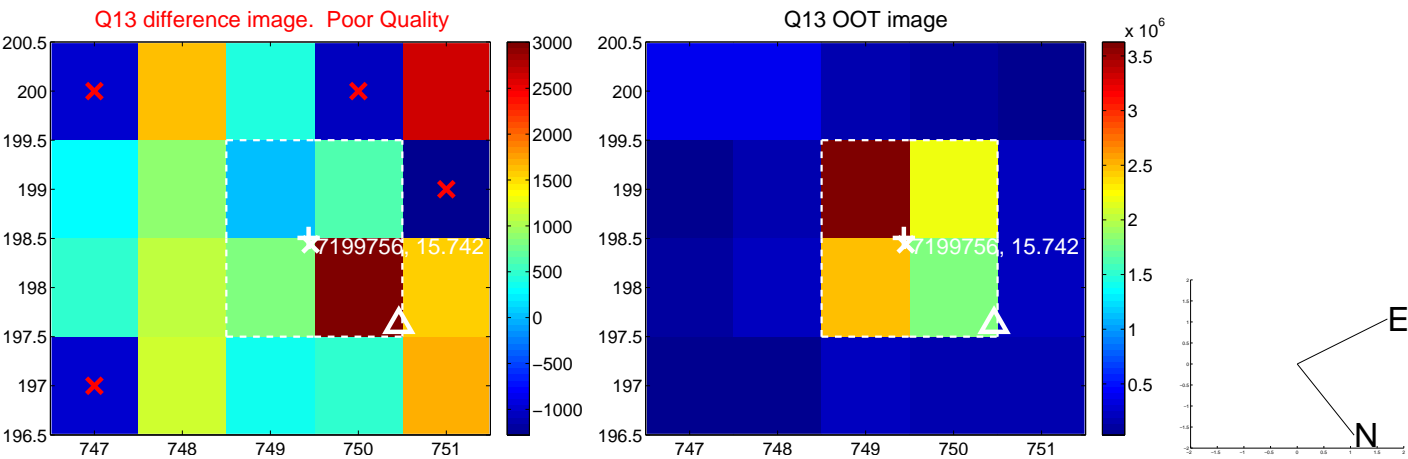
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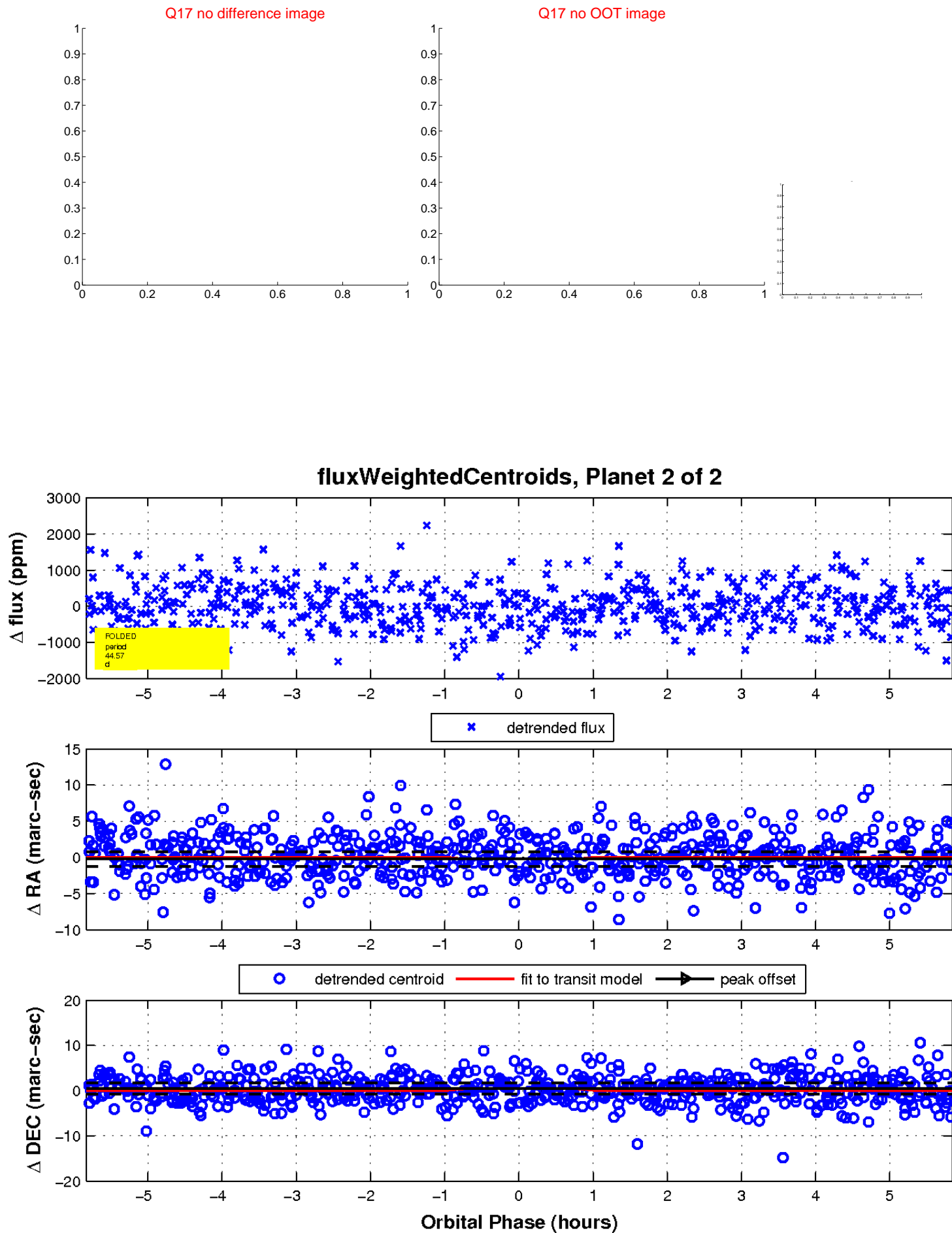


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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UKIRT Image

Declination

