

# KIC 007957881

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007957881-01	OBS	No	277.558338	339.254829	1929.7	3.233	11.1	4.8	0.66	4638	3.72	0.35
007957881-02	OBS	No	1.037913	131.922533	123.8	8.318	11.1	4.3	0.66	4638	0.72	600.30

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007957881-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007957881-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

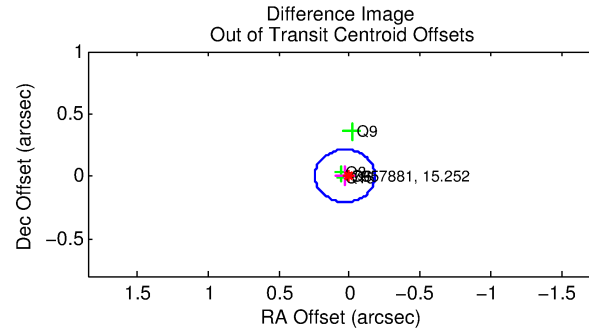
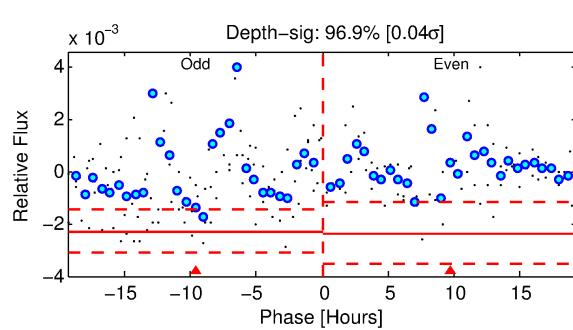
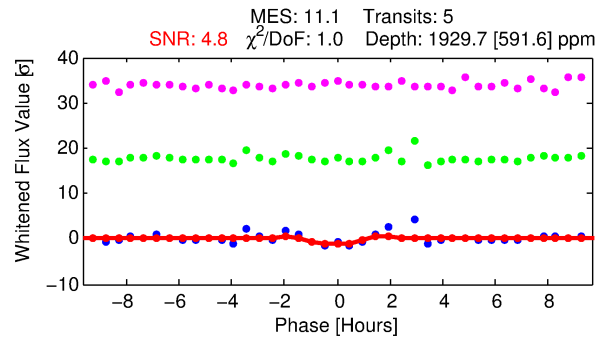
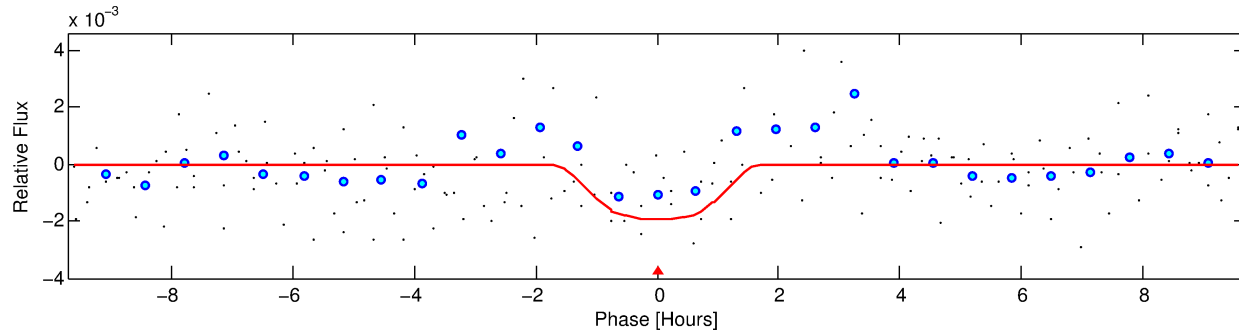
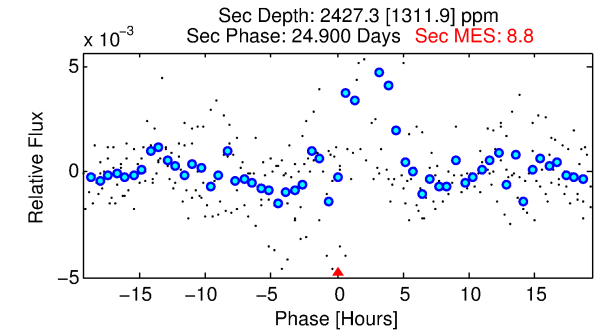
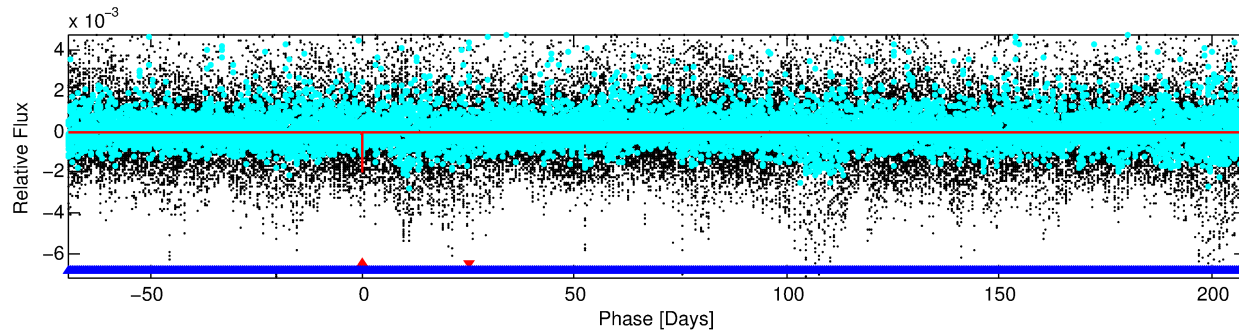
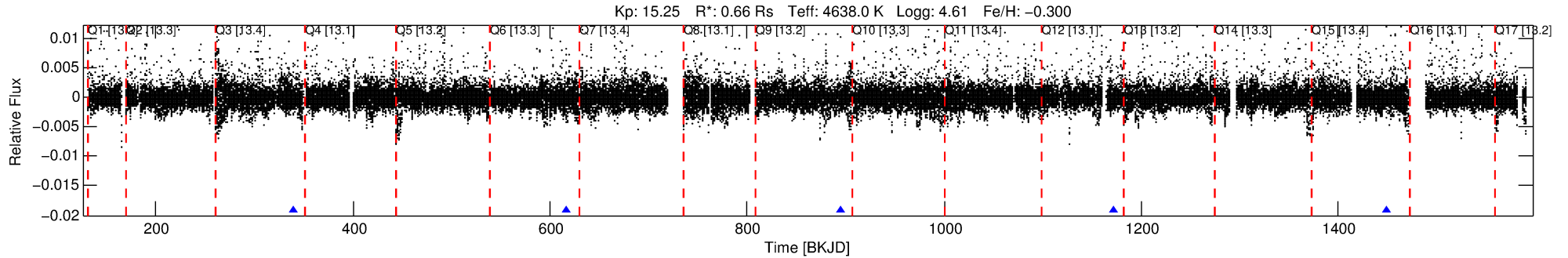
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007957881-01

No Significant Match Found

# DV One-Page Summary

KIC: 7957881 Candidate: 1 of 2 Period: 277.558 d



## DV Fit Results:

Period = 277.55834 [0.00465] d  
Epoch = 339.2548 [0.0115] BKJD  
Rp/R\* = 0.0516 [0.0114]  
a/R\* = 324.58 [126.03]  
b = 0.93 [0.06]  
Seff = 0.35 [0.06]  
Teq = 196 [9] K  
Rp = 3.72 [0.89] Re  
a = 0.7199 [0.0562] AU  
Ag = 50135.19 [35443.19] [1.41σ]  
**Teff = 4532 [808] K [5.37σ]**

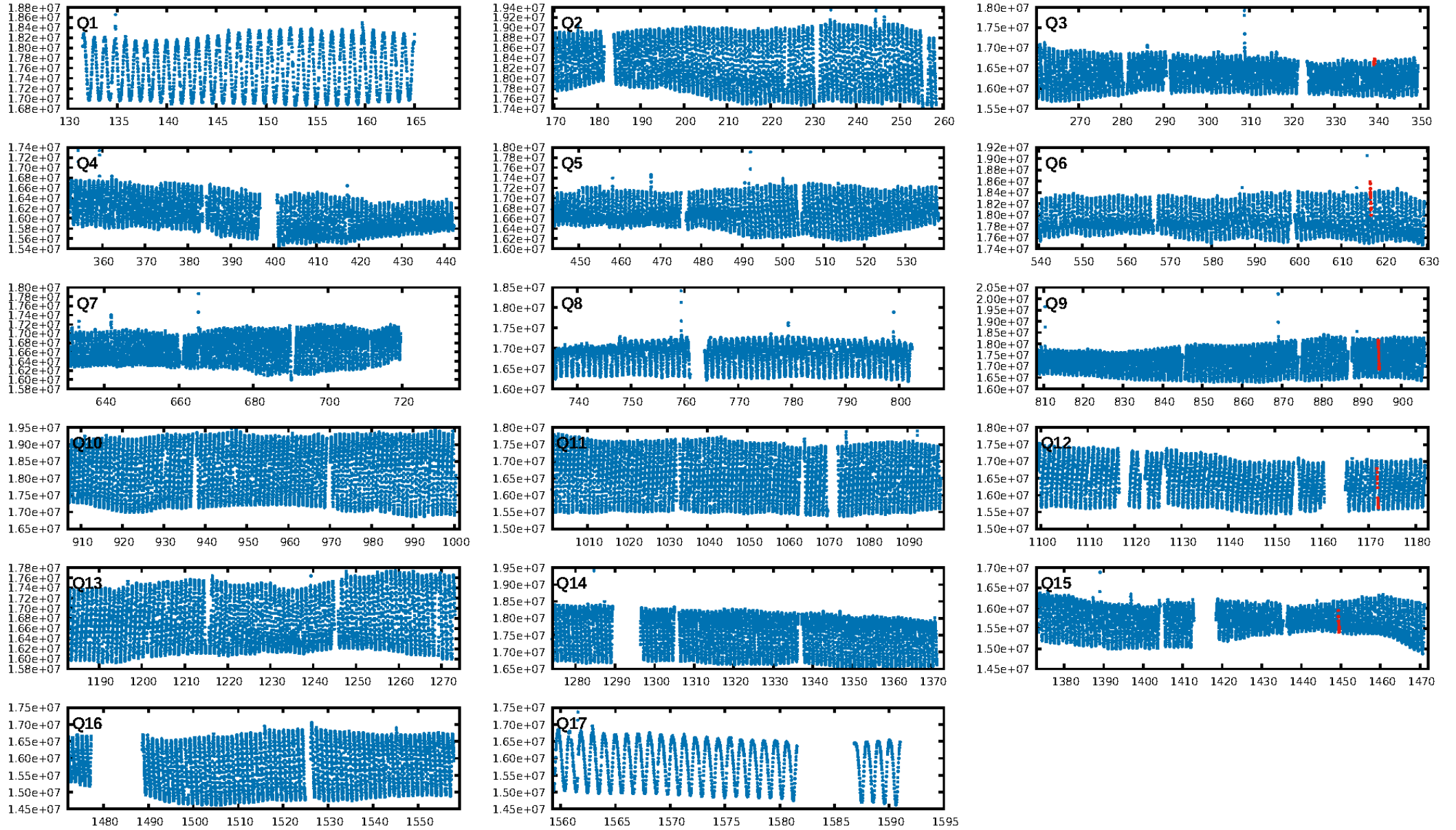
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [743.62σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 22.0%  
ModelChiSquareGof-sig: 94.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -0.4908  
Centroid-sig: 94.4%  
Centroid-so: 0.446 arcsec [0.42σ]  
OotOffset-rm: 0.032 arcsec [0.45σ]  
KicOffset-rm: 0.055 arcsec [0.73σ]  
OotOffset-st: 1/2/0/1 [4]  
KicOffset-st: 1/2/0/1 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.00 [0/4]

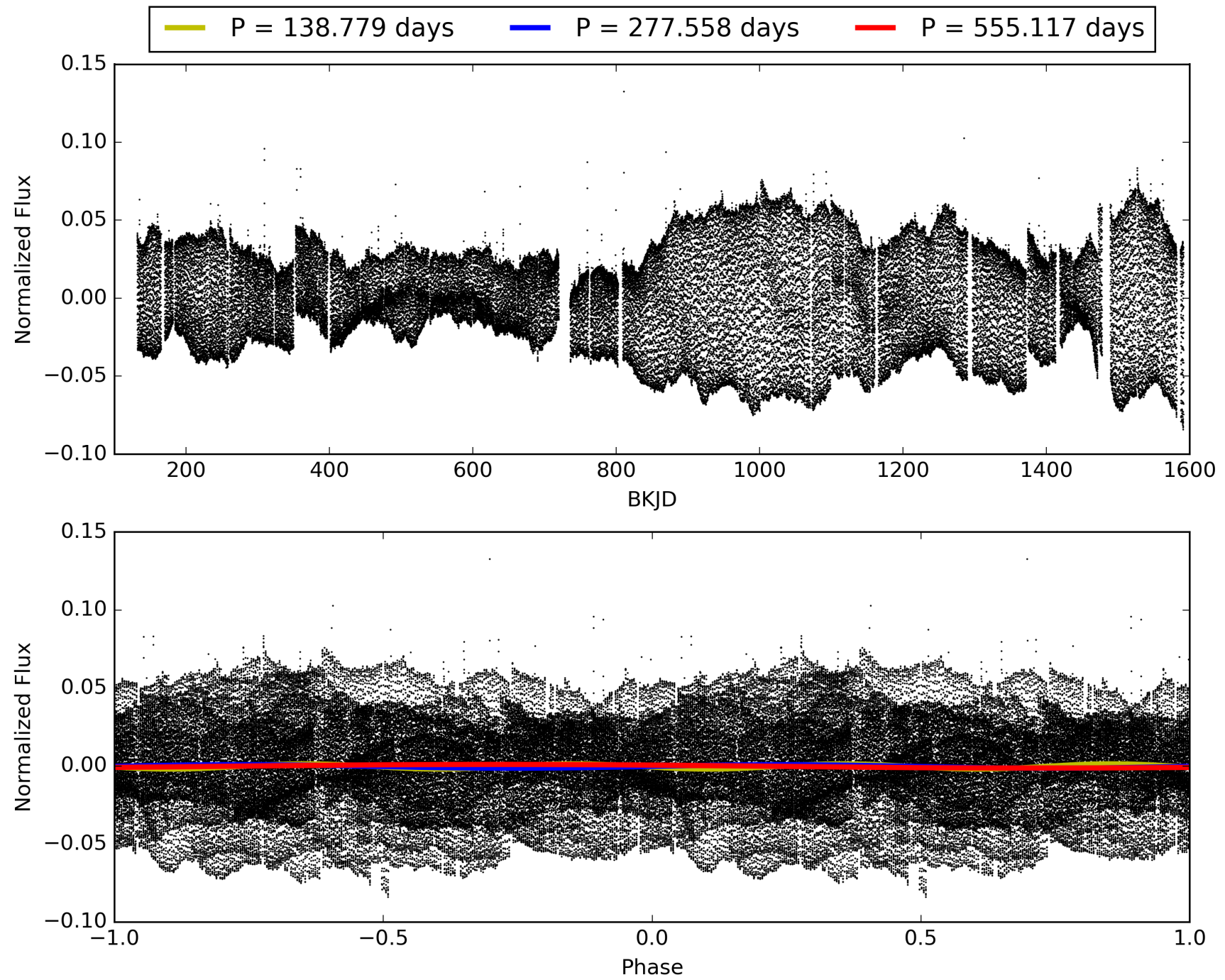
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:37:11 Z

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

# TCE 007957881-01, PDC Light Curves

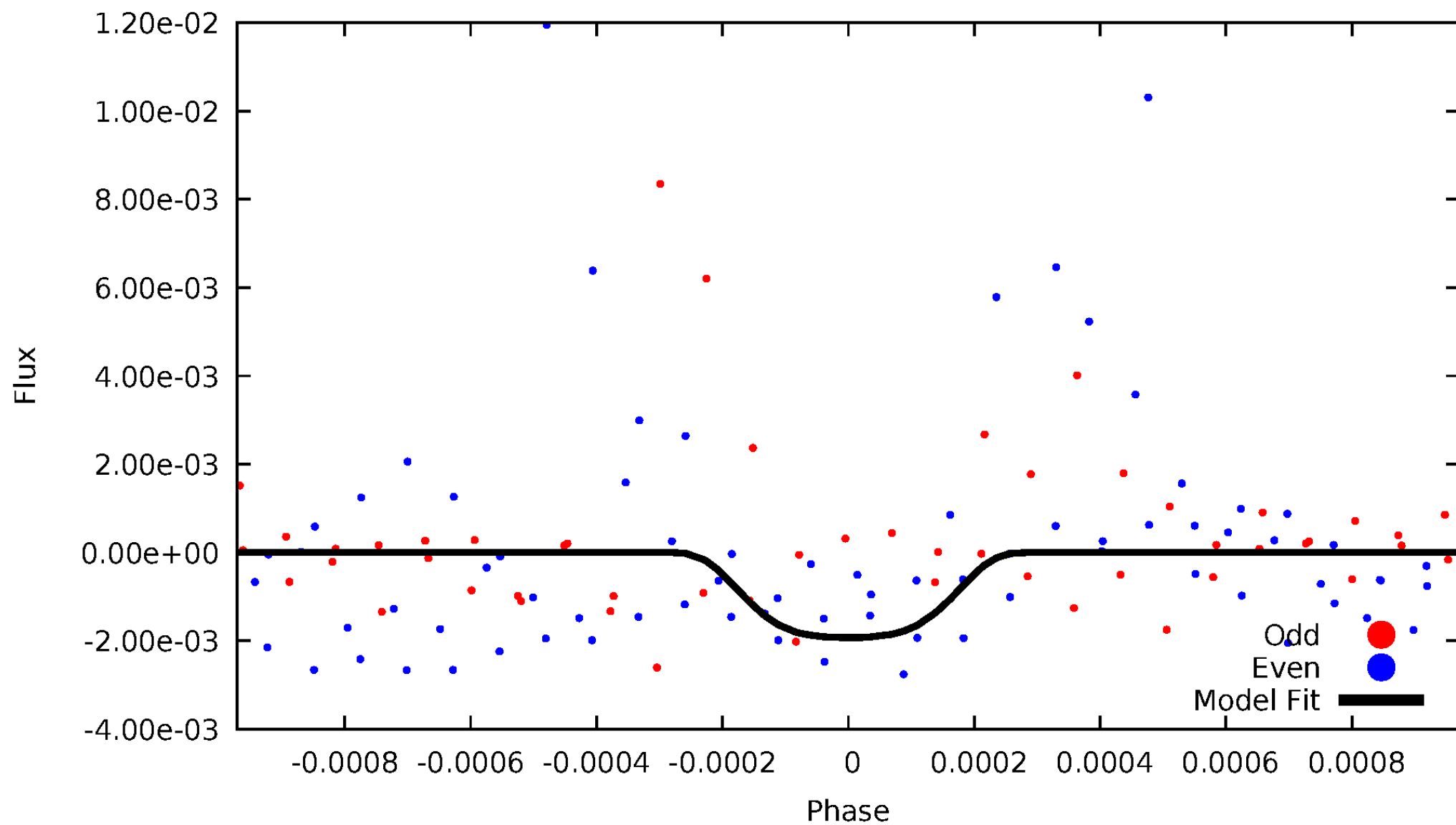


TCE 007957881-01



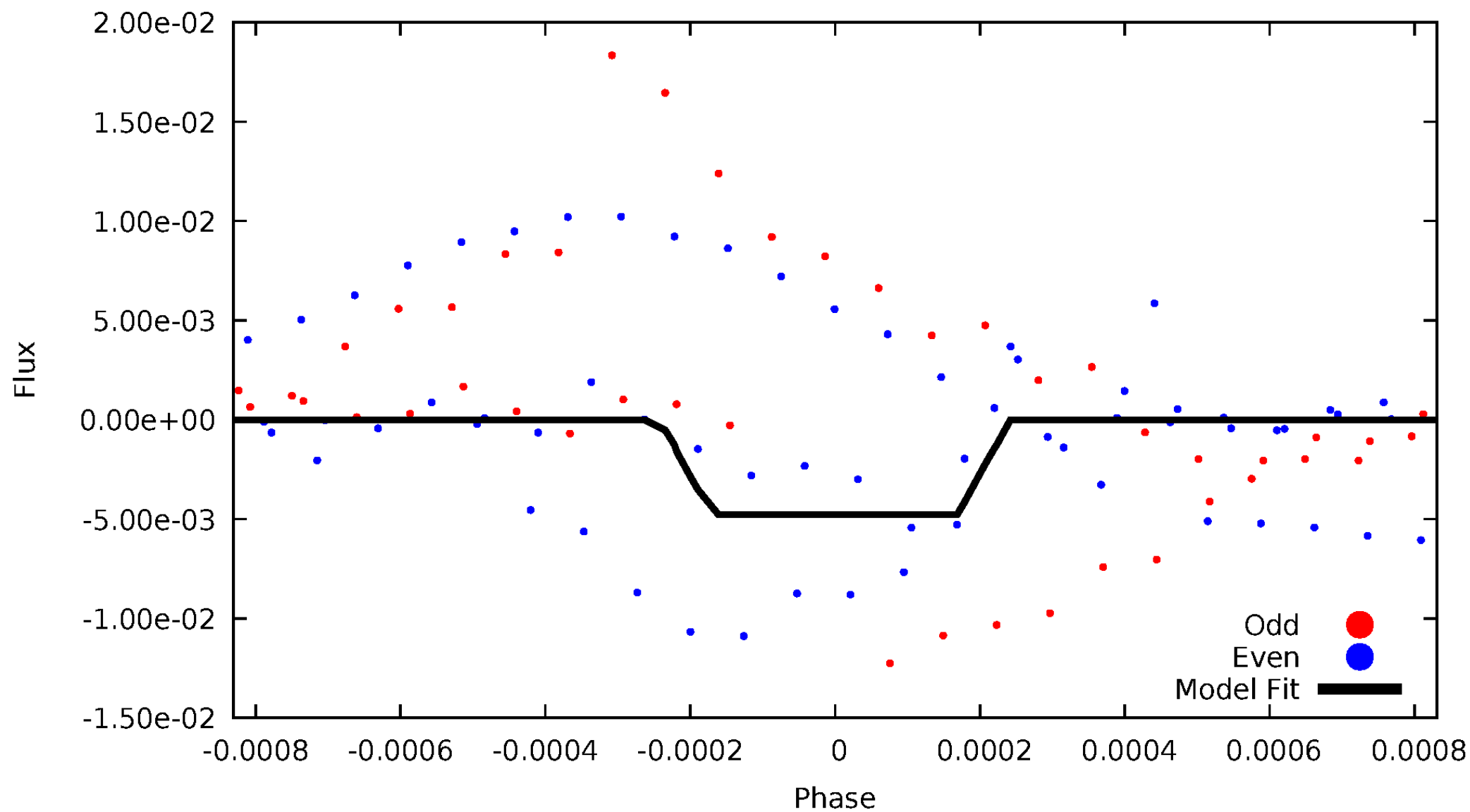
# DV Odd/Even

TCE 007957881-01



# ALT Odd/Even

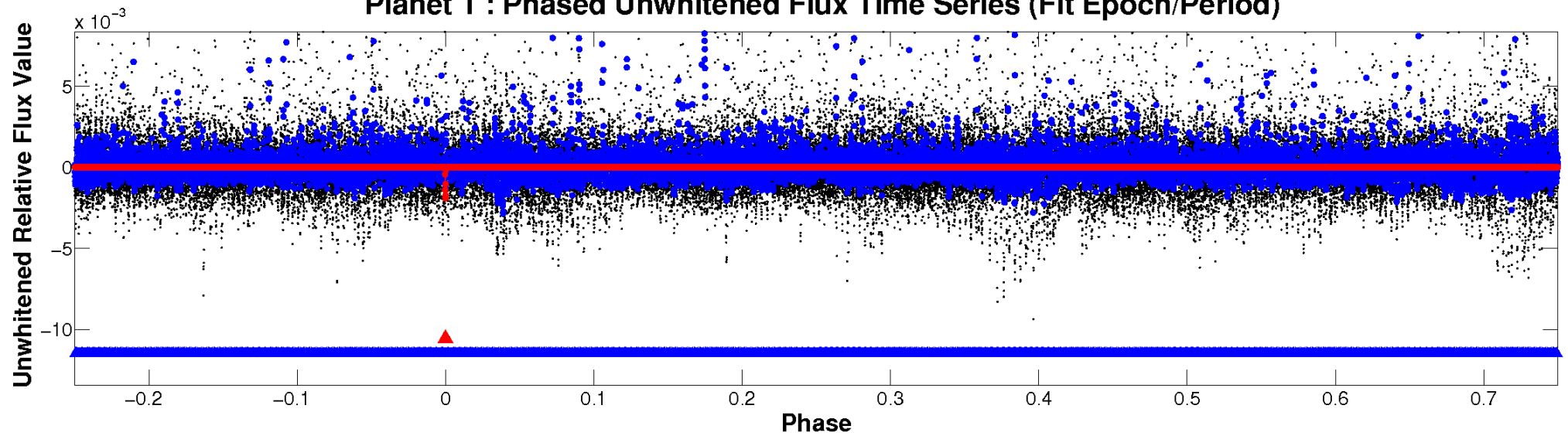
TCE 007957881-01



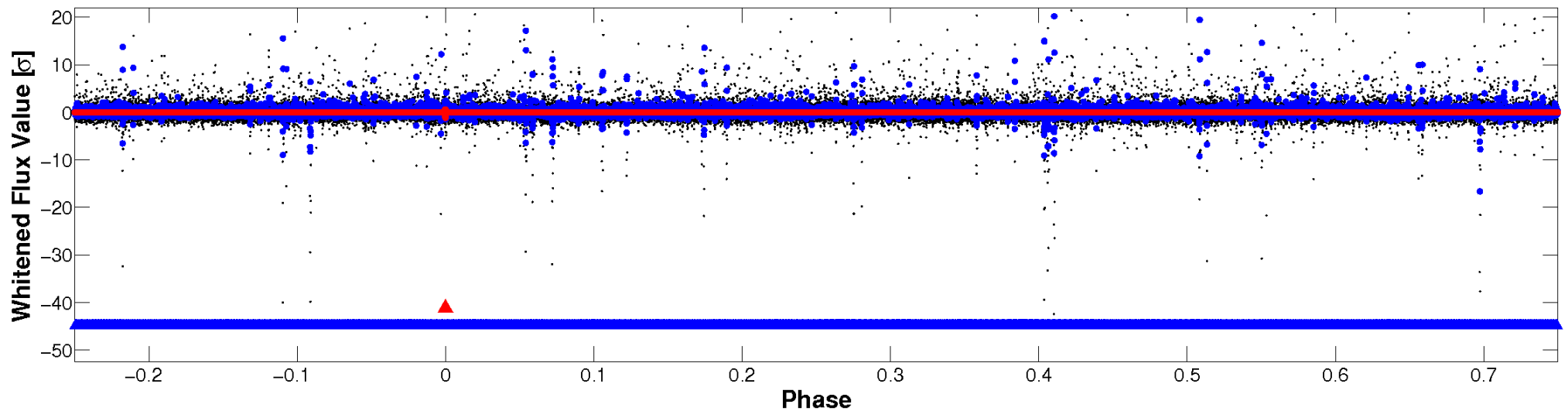


# Non-Whitened Vs. Whitened Light Curve

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

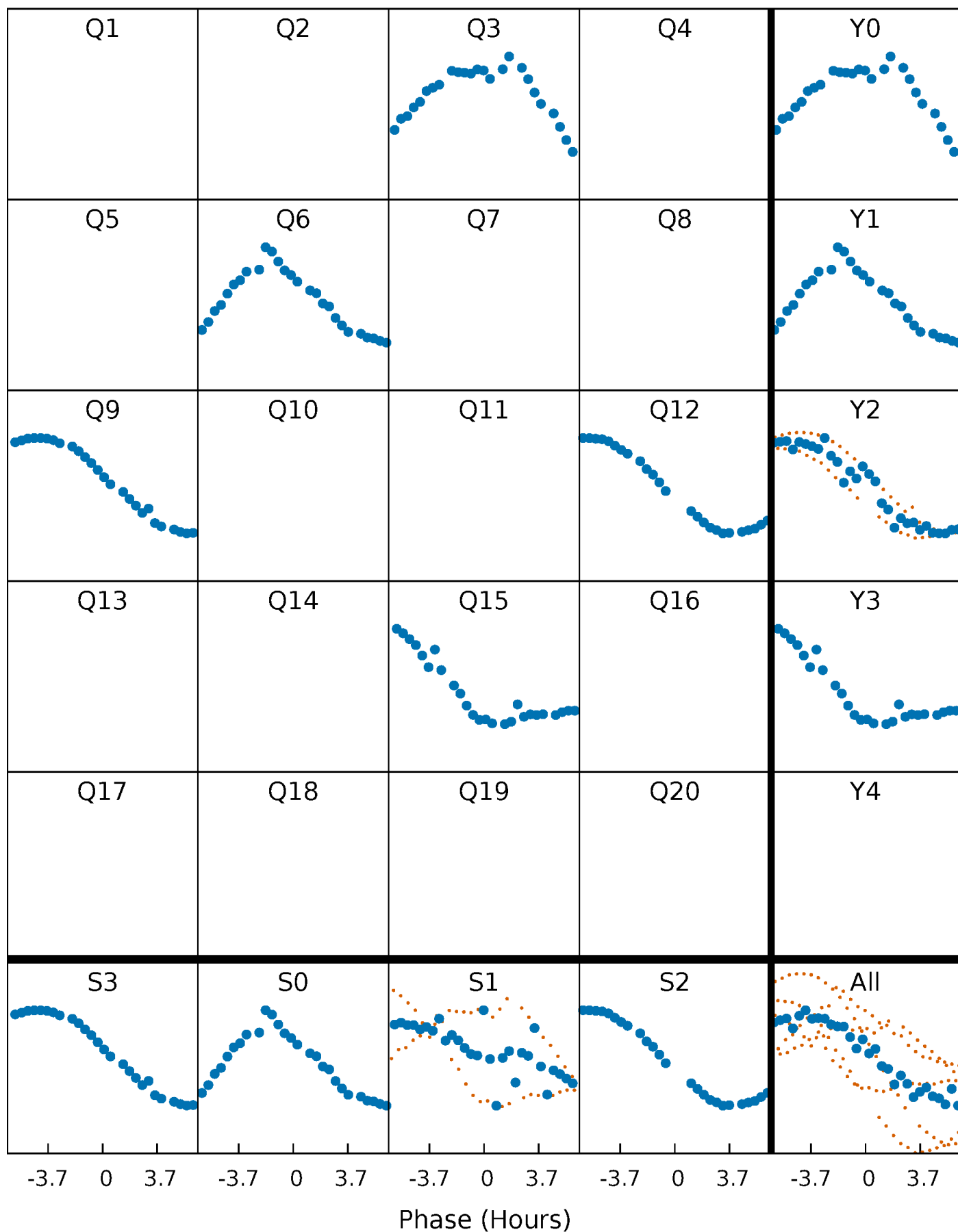


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

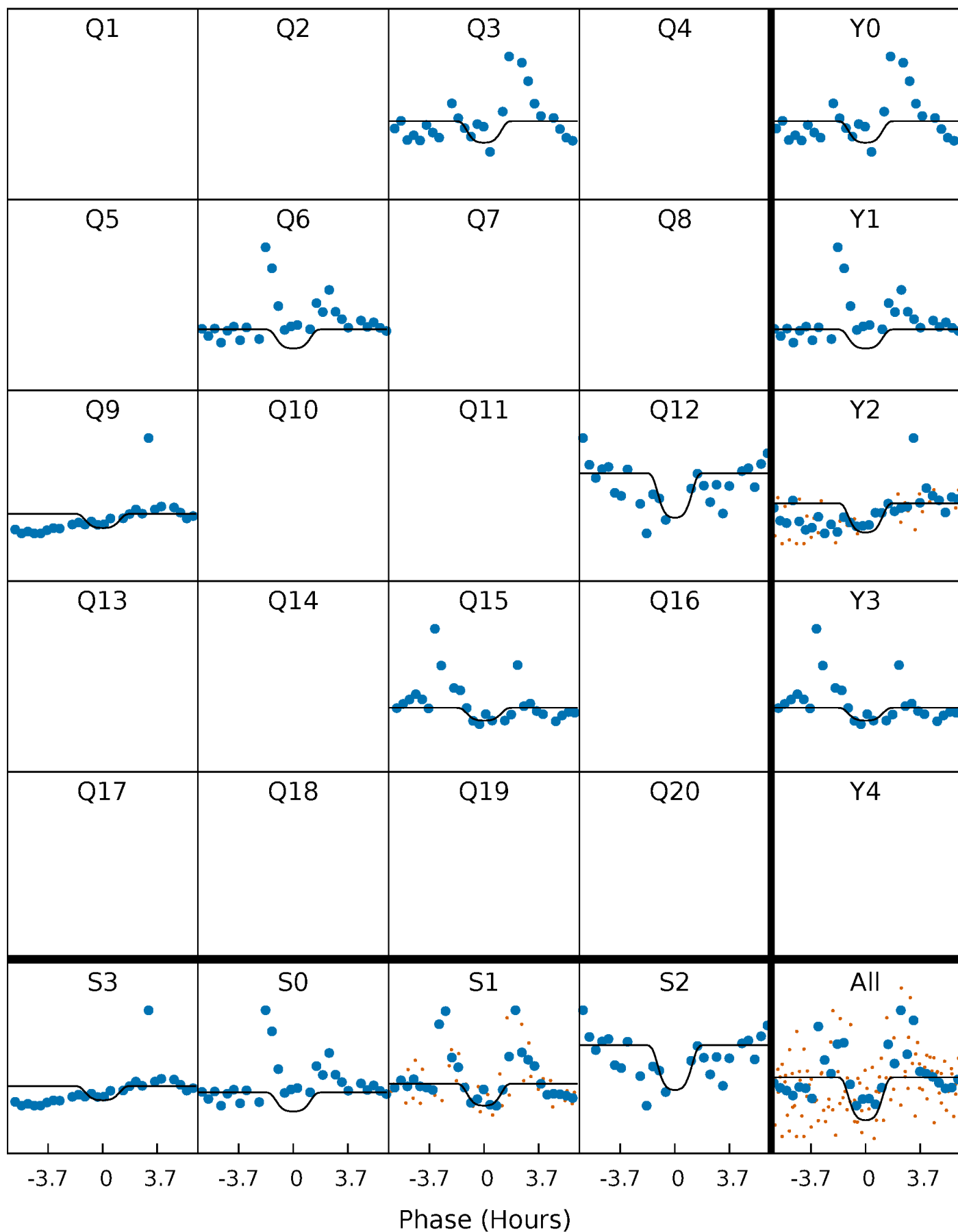
TCE 007957881-01 P=277.558338 Days  $T_0=339.254829$  (BKJD)





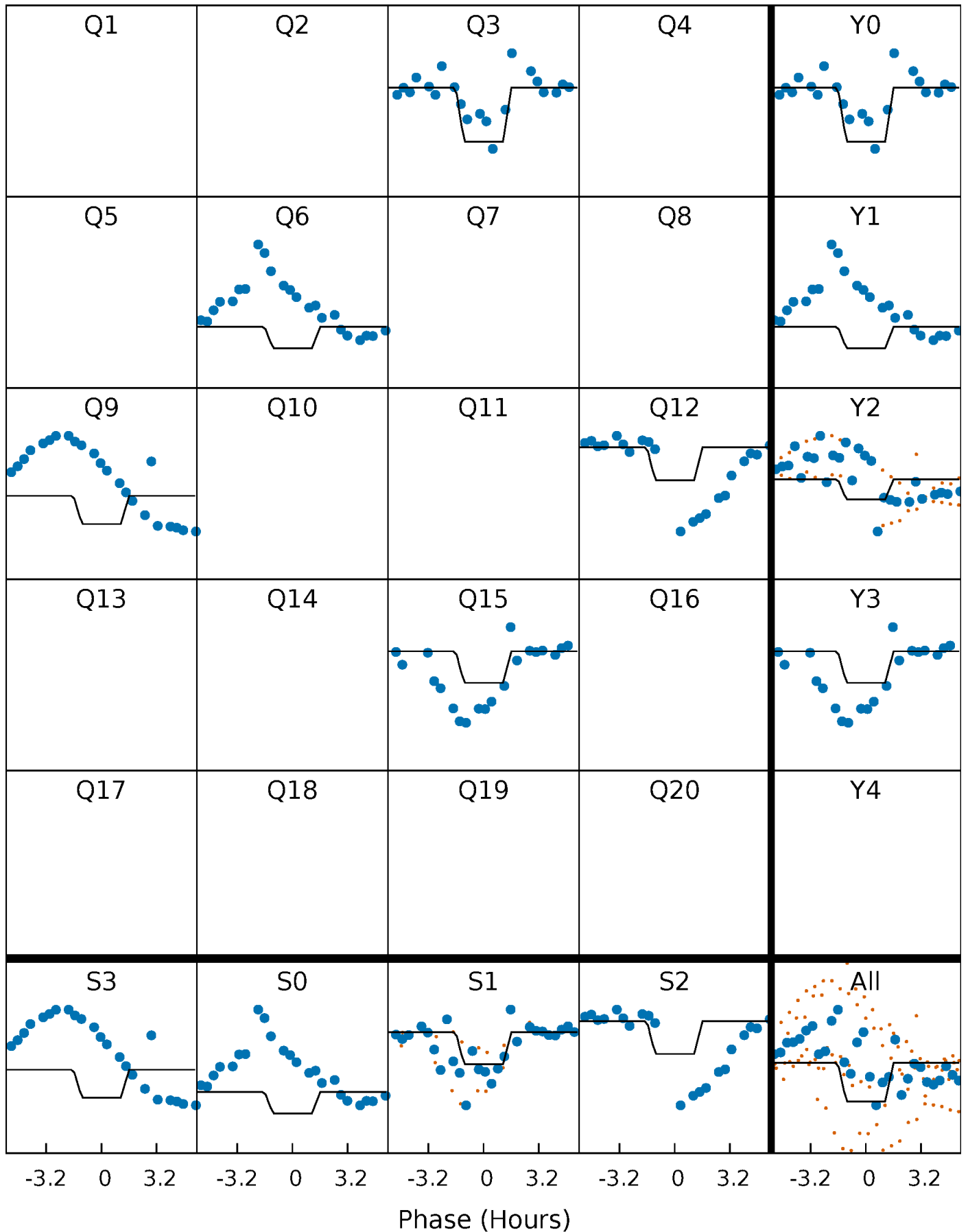
# DV Quarter-Phased Transit Curves

TCE 007957881-01 P=277.558338 Days  $T_0=339.254829$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

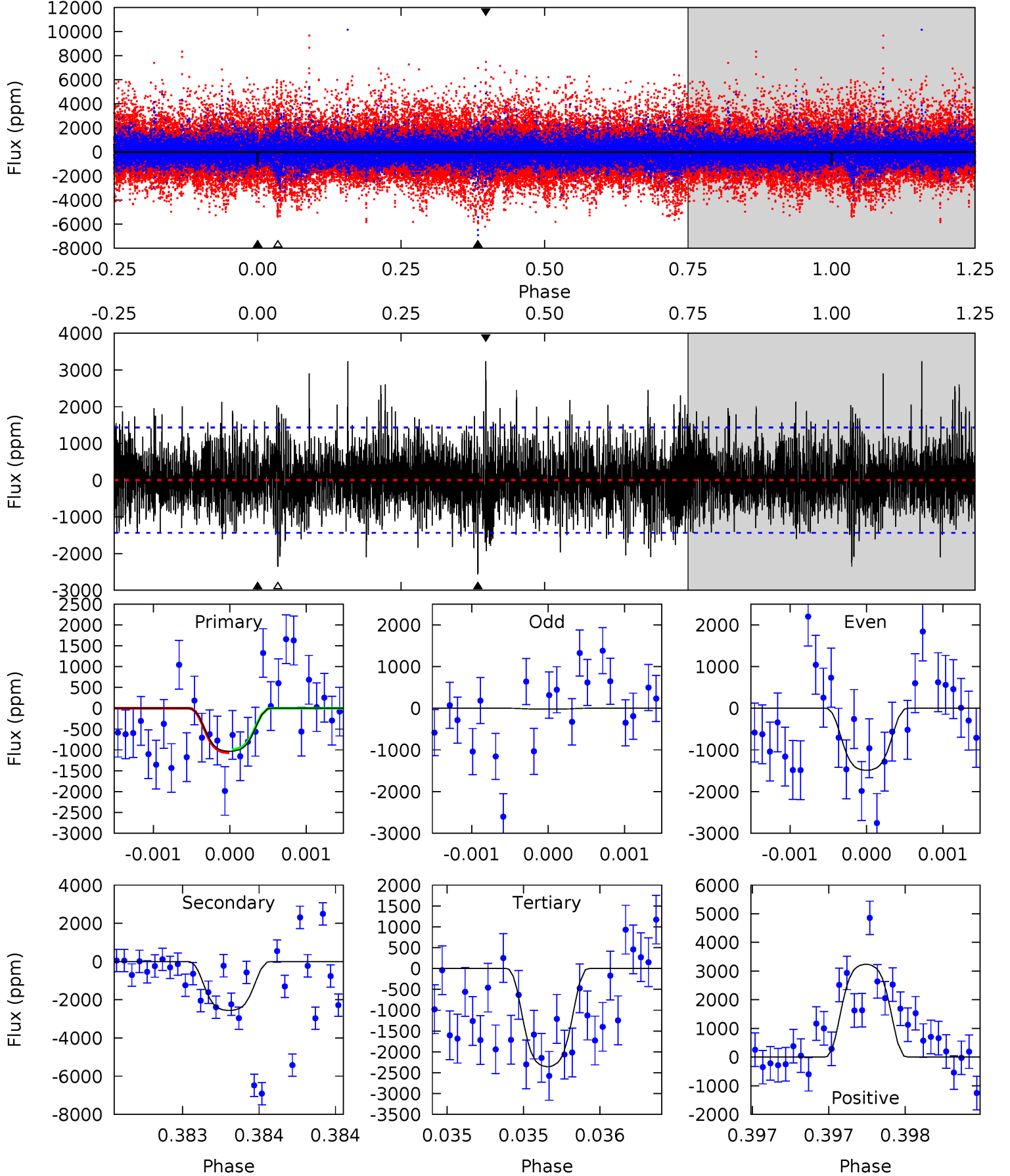
TCE 007957881-01 P=277.565666 Days  $T_0=339.250057$  (BKJD)



# DV Model-Shift Uniqueness Test

007957881-01,  $P = 277.558338$  Days,  $E = 61.696491$  Days

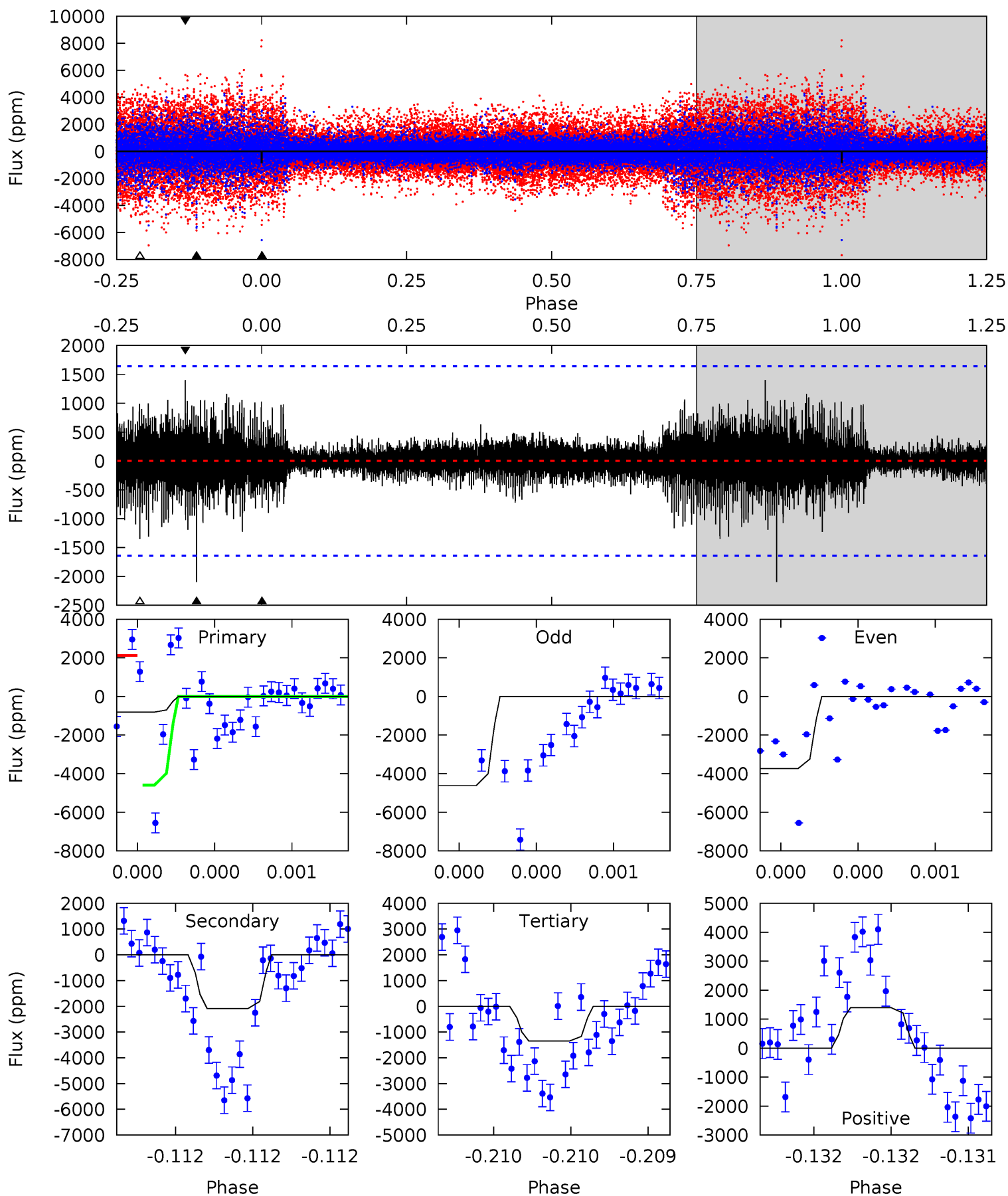
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.01	9.94	9.15	12.6	5.57	3.47	2.51	-5.14	-8.57	0.80	-2.64	2.71	0.77	0.56	0.15



# Alt Model-Shift Uniqueness Test

007957881-01,  $P = 277.565666$  Days,  $E = 61.684391$  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
2.76	7.12	4.59	4.76	5.58	3.49	0.86	-1.83	-2.00	2.53	2.36	1.63	0.37	0.40	3.84



### Stellar Parameters For KIC 007957881

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4638^{+166}_{-166}$	$4.609^{+0.059}_{-0.027}$	$-0.300^{+0.300}_{-0.300}$	$0.660^{+0.052}_{-0.063}$	$0.645^{+0.078}_{-0.052}$	$3.163^{+0.785}_{-0.435}$
	+4%/-4%	+1%/-1%	+100%/-100%	+8%/-10%	+12%/-8%	+25%/-14%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007957881-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2562 \pm 258$	$3.69^{+0.83}_{-0.85}$	$272^{+11}_{-11}$	$4595^{+522}_{-367}$	$54069^{+36854}_{-18367}$
Alt.	$-2093 \pm 294$	$4.90^{+0.91}_{-0.78}$	$272^{+11}_{-11}$	$3992^{+308}_{-274}$	$25253^{+11000}_{-7800}$

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

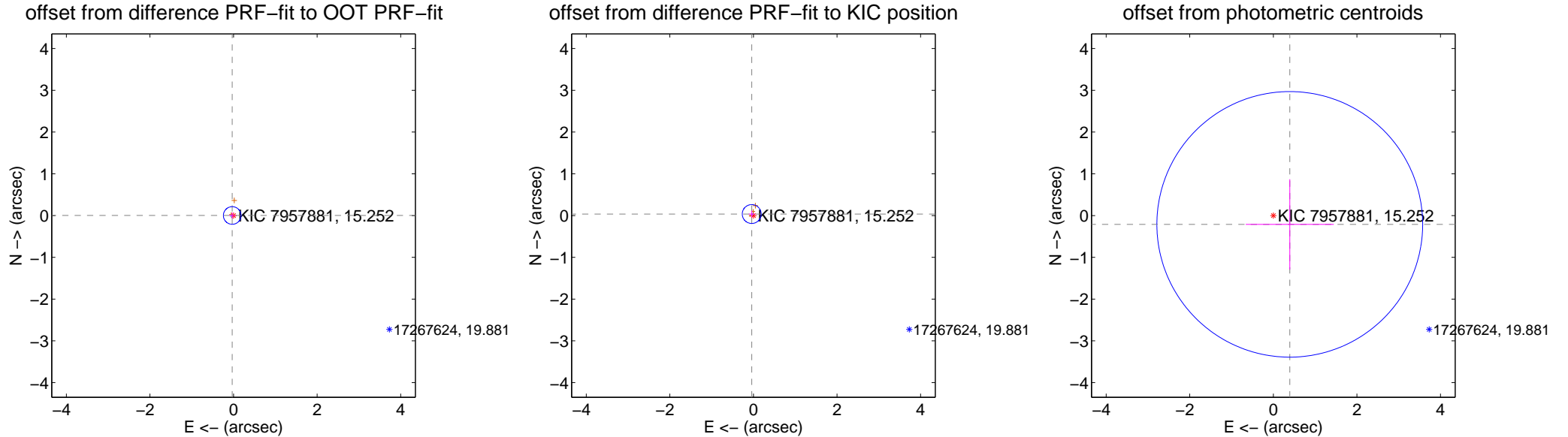
## DV Centroid Data

Supplemental centroid analysis for 007957881-01. Kepler magnitude: 15.25. Transit SNR 4.76

There are 1 quarters with good PRF difference image offsets

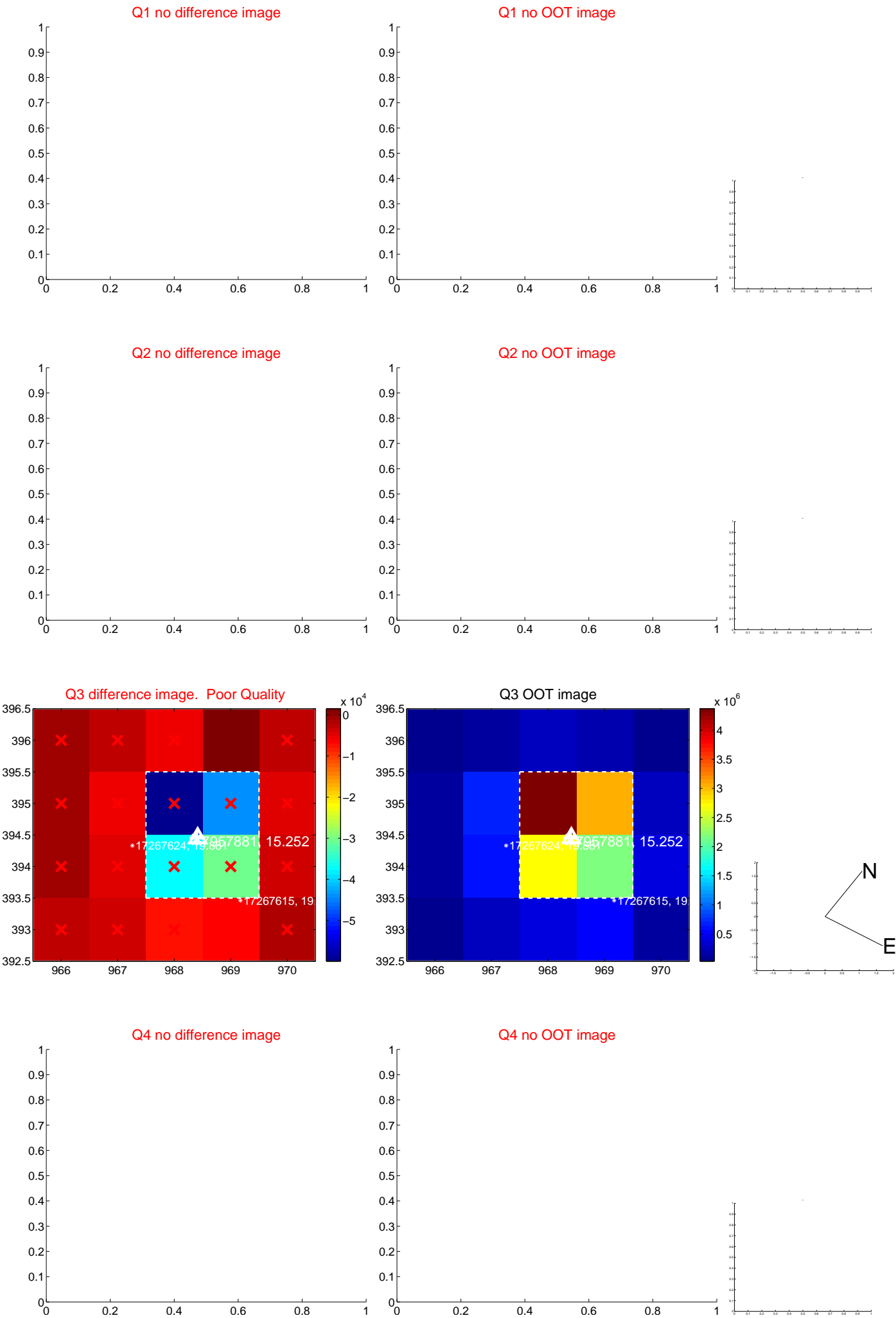
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.032 \pm 0.070$	0.45	$0.032 \pm 0.070$	$0.002 \pm 0.071$
PRF-fit source offset from KIC position	$0.055 \pm 0.075$	0.73	$0.041 \pm 0.072$	$0.037 \pm 0.080$
photometric centroid source offset	$0.45 \pm 1.06$	0.42	$-0.39 \pm 1.05$	$-0.21 \pm 1.08$



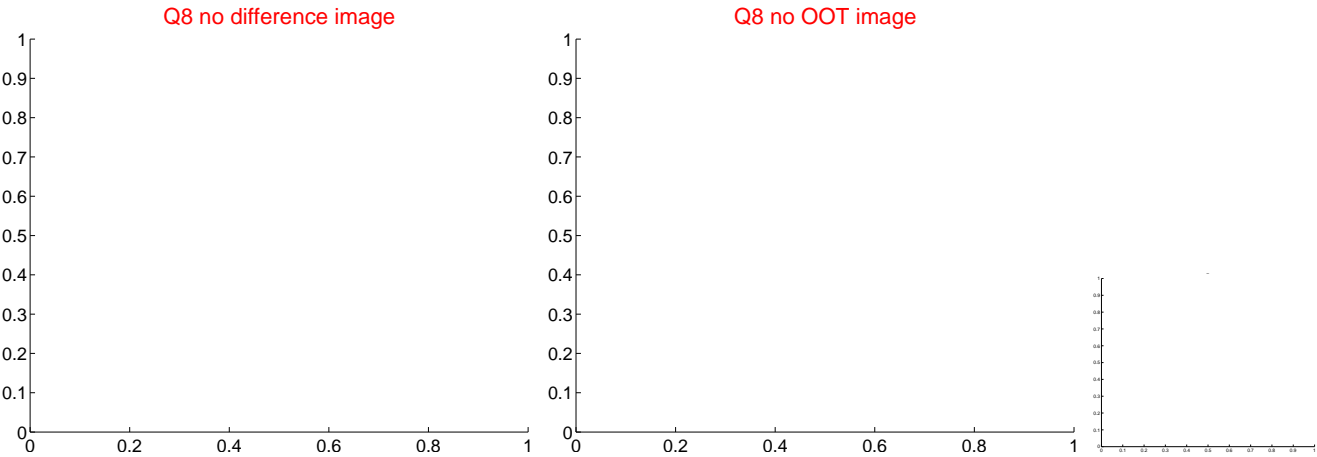
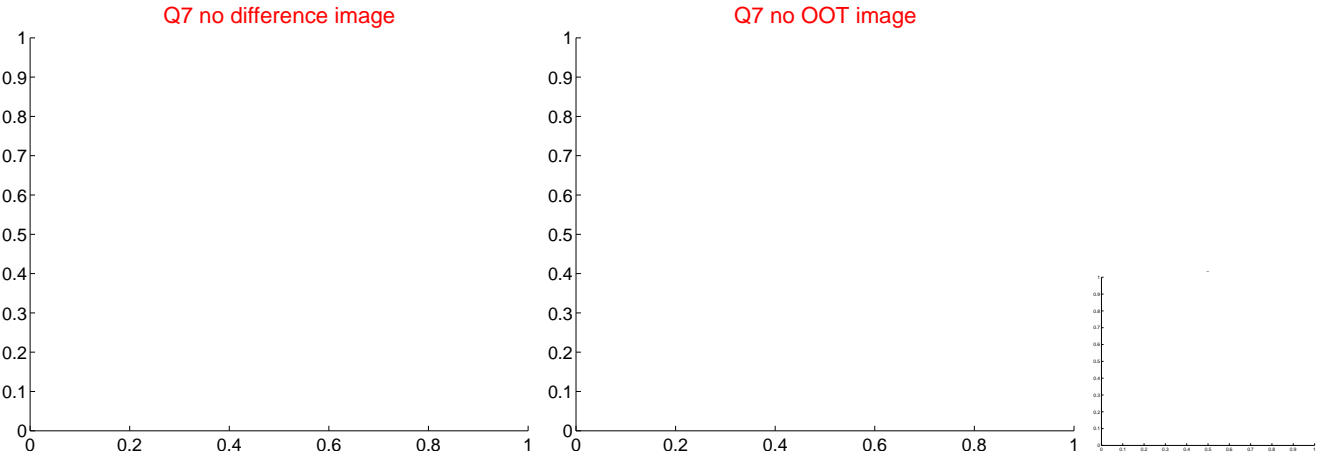
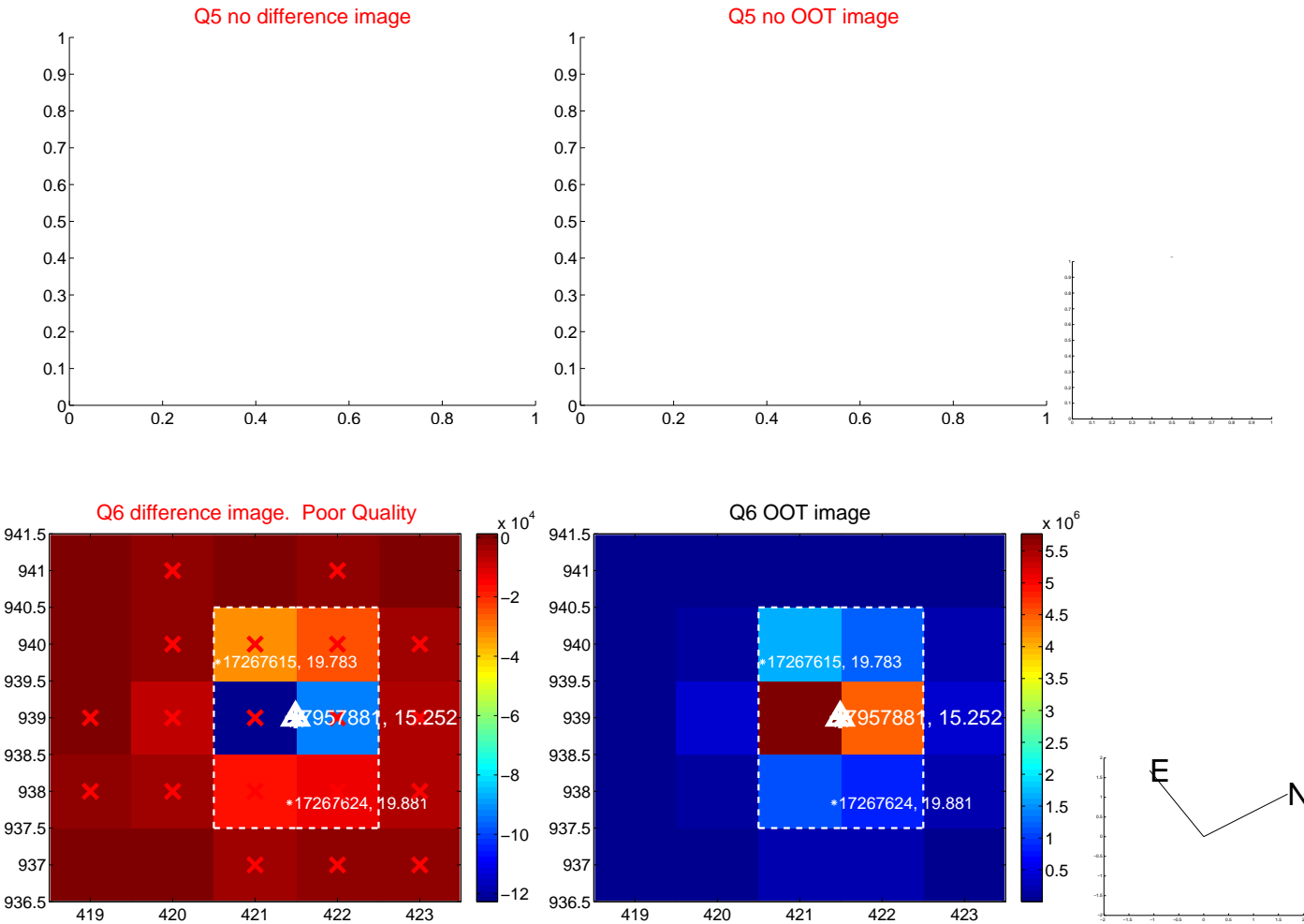
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

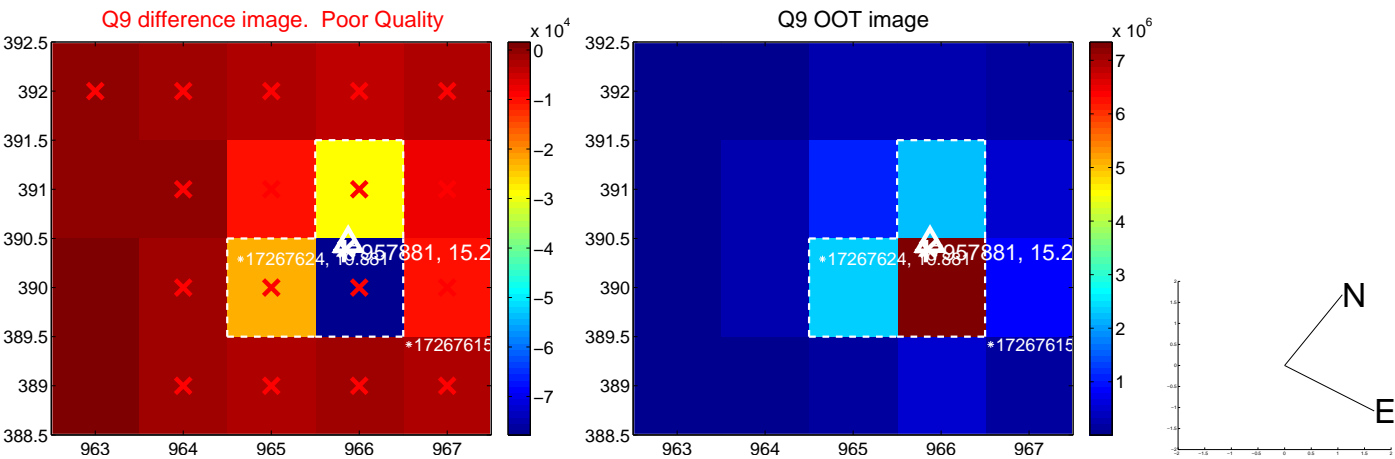




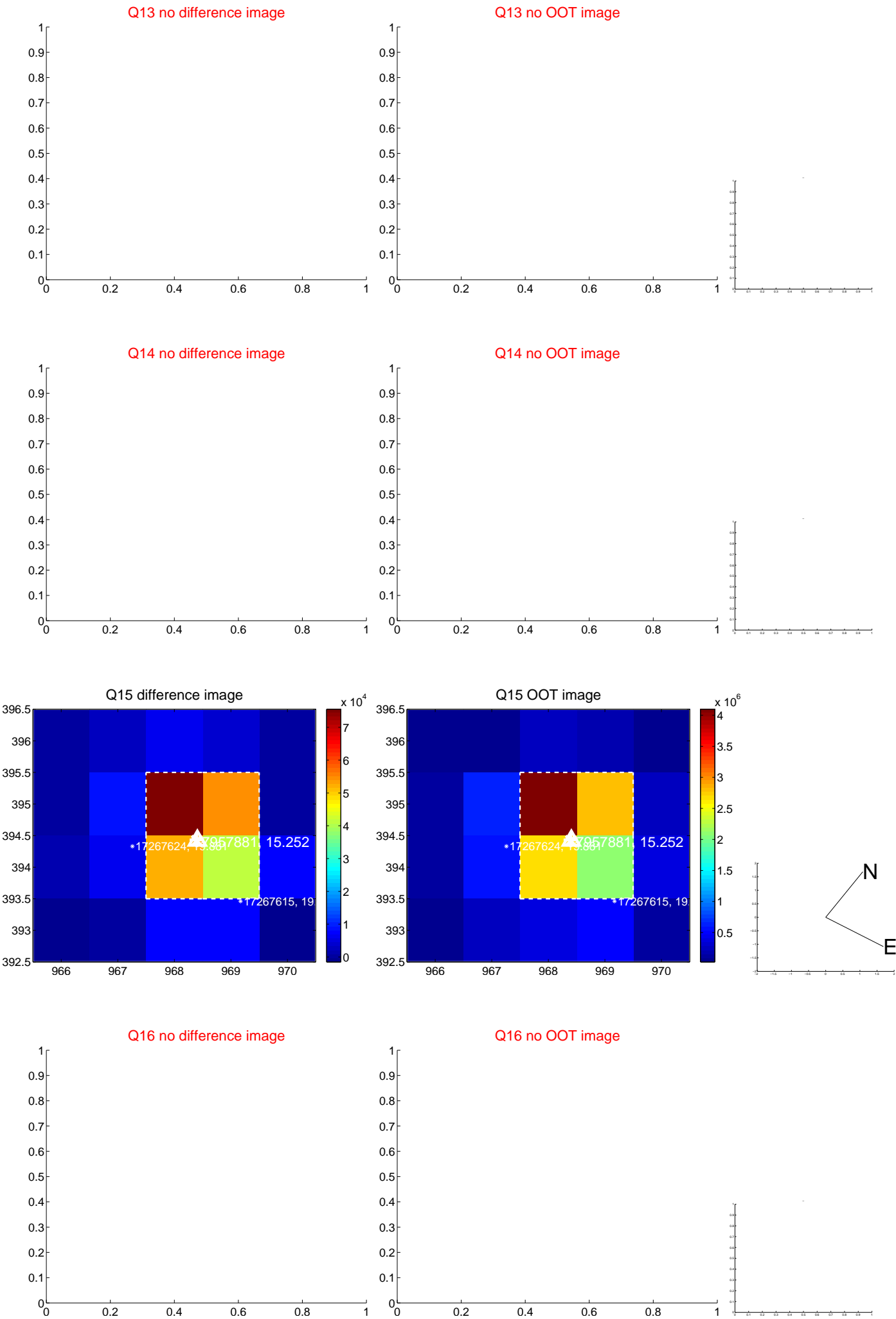
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



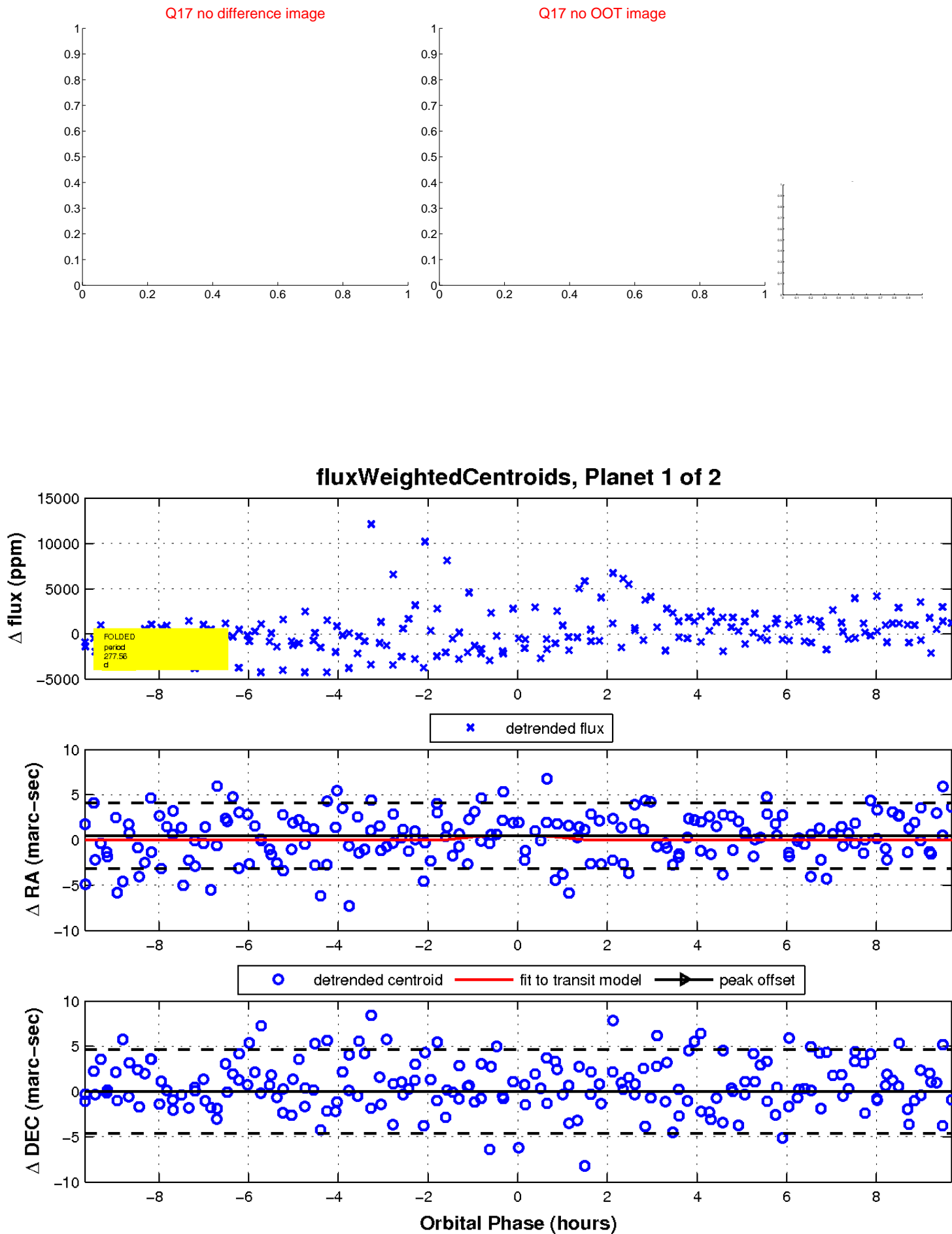
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



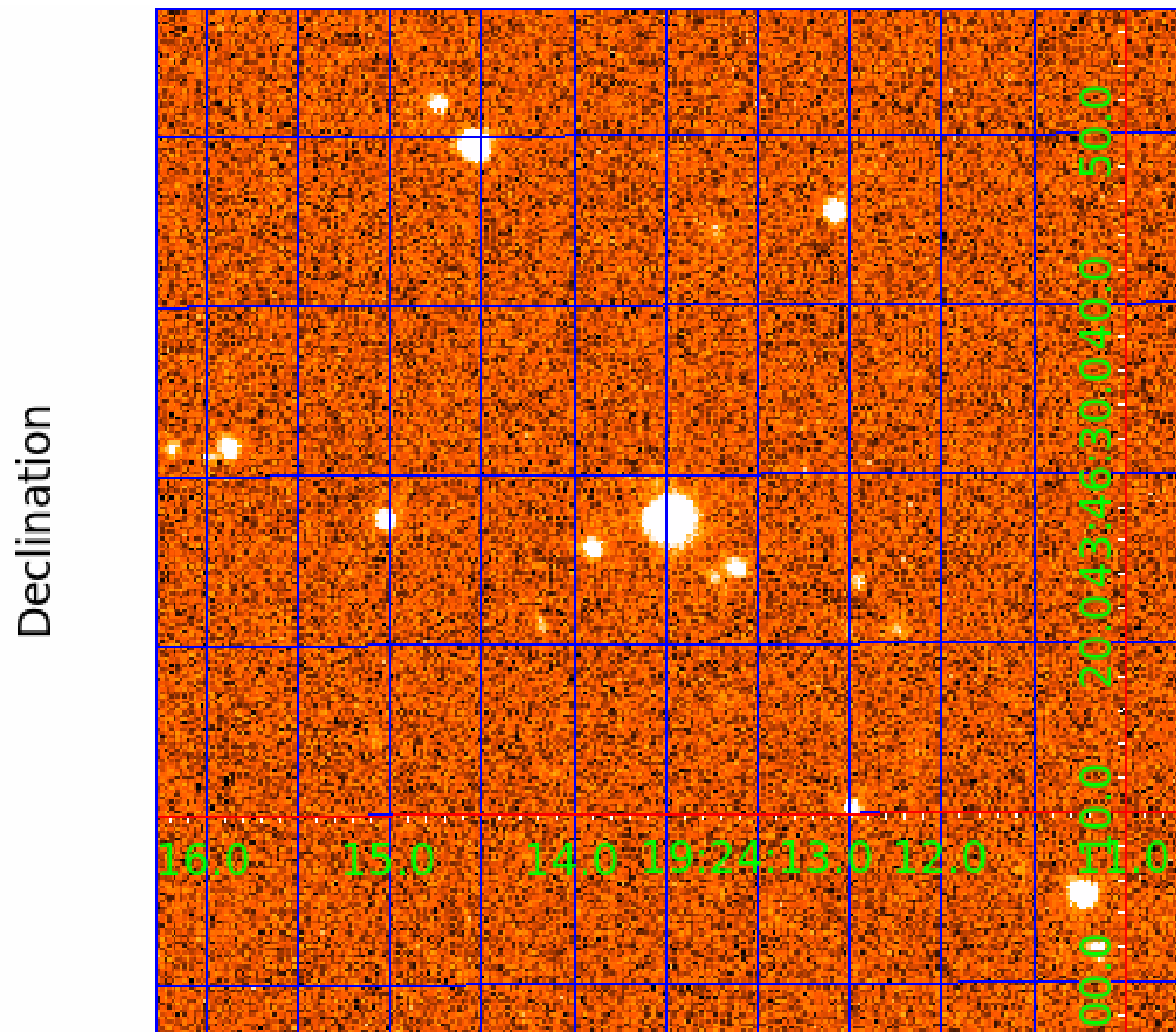
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 007957881

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007957881-01	OBS	No	277.558338	339.254829	1929.7	3.233	11.1	4.8	0.66	4638	3.72	0.35
007957881-02	OBS	No	1.037913	131.922533	123.8	8.318	11.1	4.3	0.66	4638	0.72	600.30

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007957881-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007957881-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

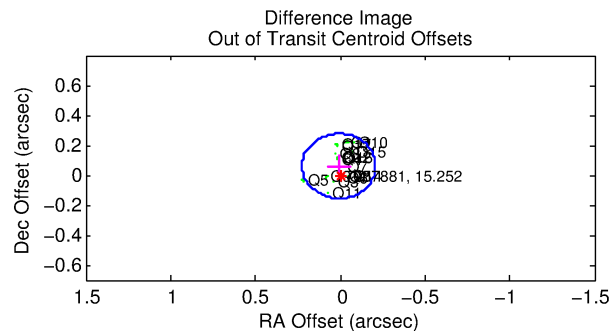
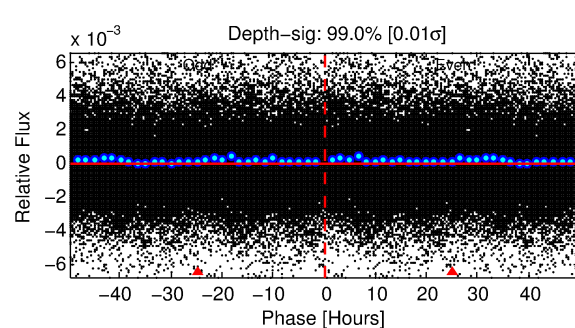
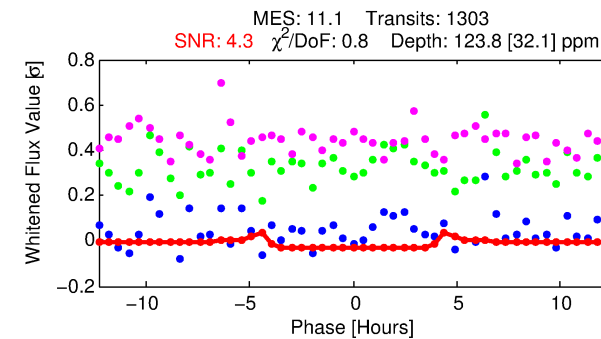
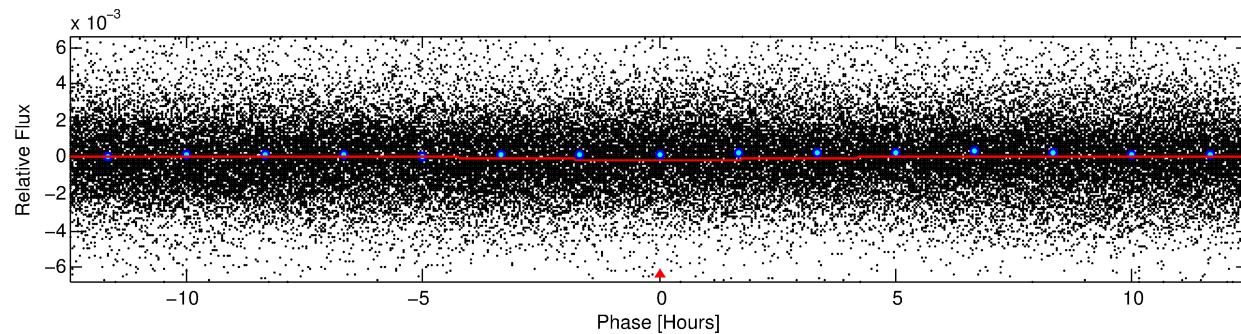
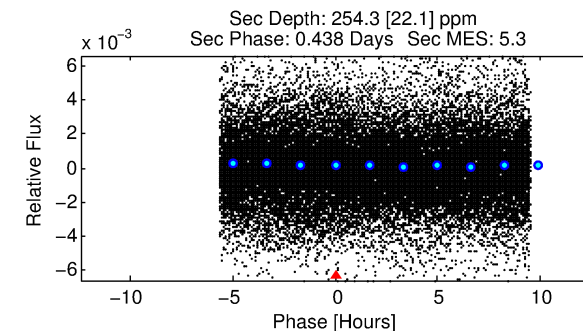
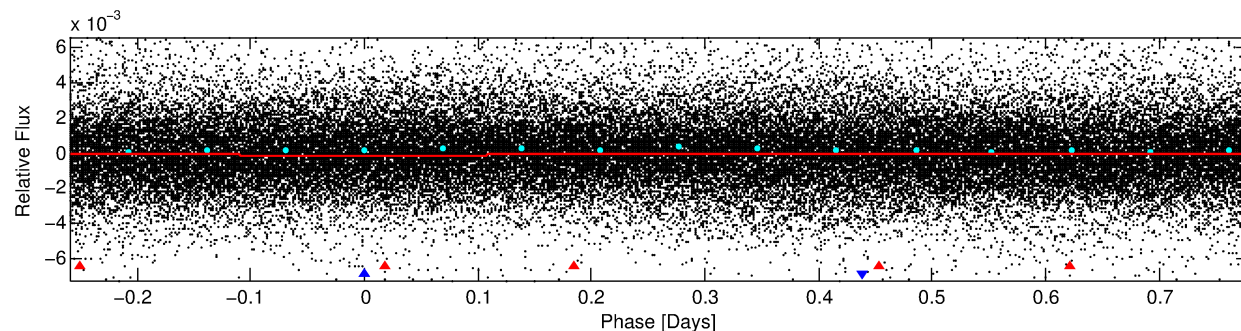
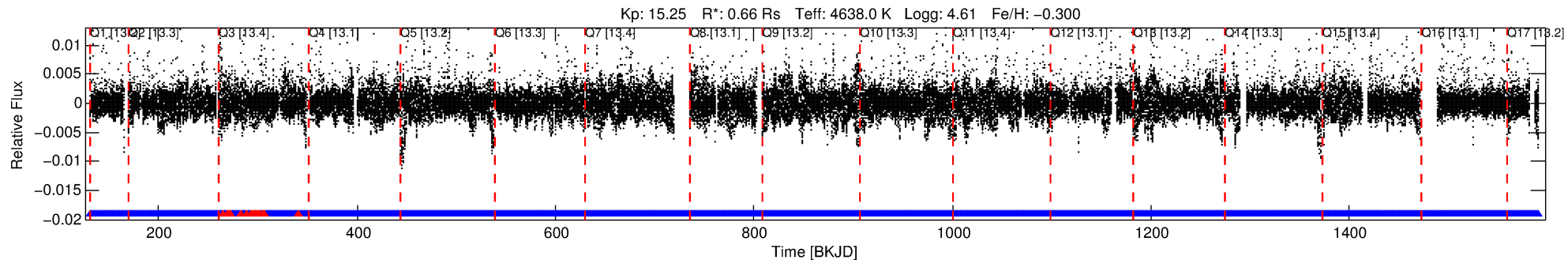
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007957881-02

No Significant Match Found

# DV One-Page Summary

KIC: 7957881 Candidate: 2 of 2 Period: 1.038 d



## DV Fit Results:

Period = 1.03791 [0.00003] d  
Epoch = 131.9225 [0.0065] BKJD  
Rp/R\* = 0.0100 [0.0079]  
a/R\* = 1.15 [0.71]  
b = 0.34 [6.92]  
Seff = 600.30 [108.63]  
Teff = 1262 [57] K  
Rp = 0.72 [0.57] Re  
a = 0.0173 [0.0014] AU  
Ag = 81.35 [129.13] [0.62σ]  
Teffp = 5861 [2330] K [1.97σ]

## DV Diagnostic Results:

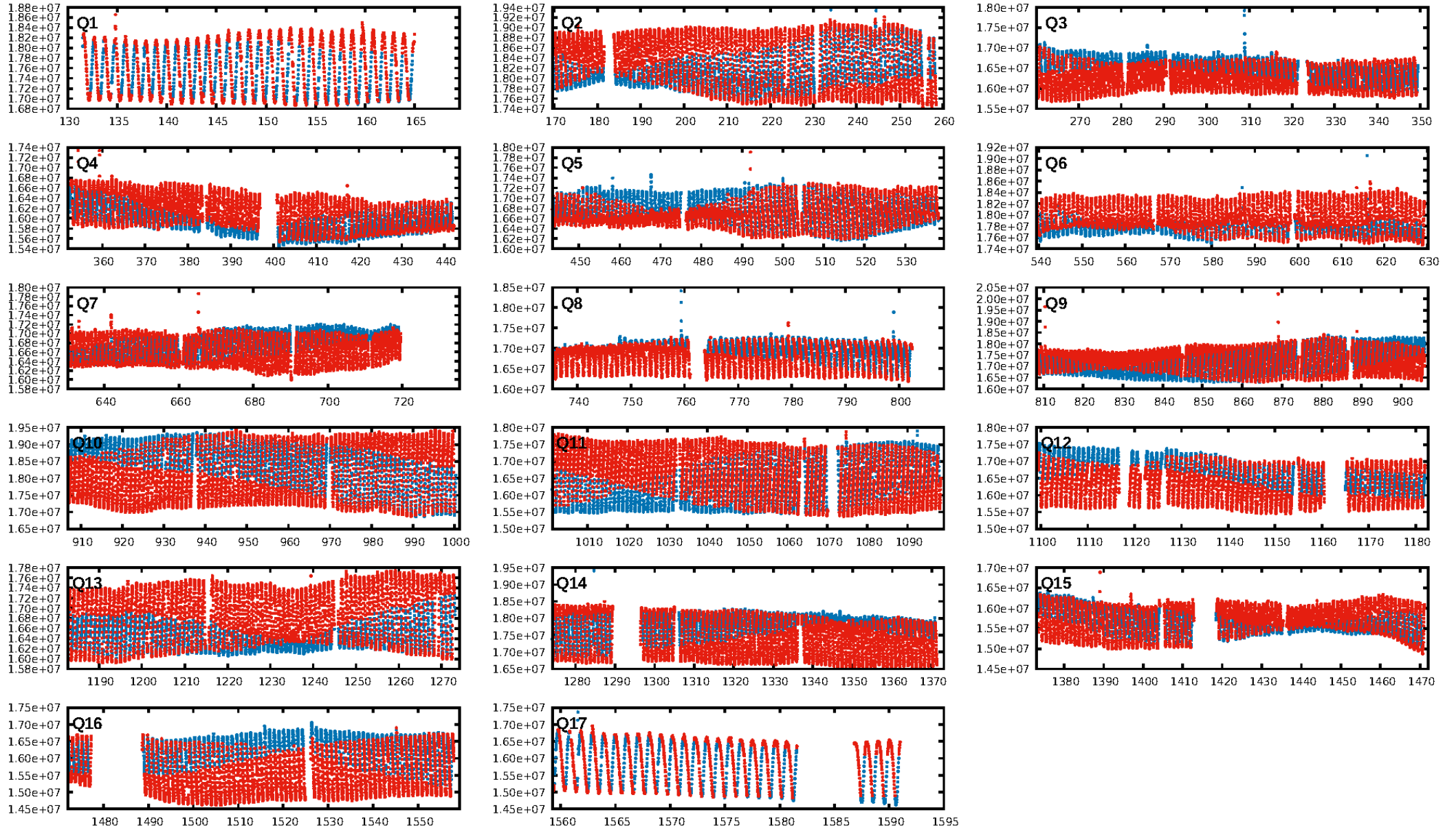
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [743.62σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.98 [1225/1245]  
GhostDiagnostic-chr: -0.05637  
Centroid-sig: 99.5%  
Centroid-so: 0.241 arcsec [0.44σ]  
OotOffset-rm: 0.061 arcsec [0.85σ]  
KicOffset-rm: 0.046 arcsec [0.66σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.47 [8/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:37:22 Z

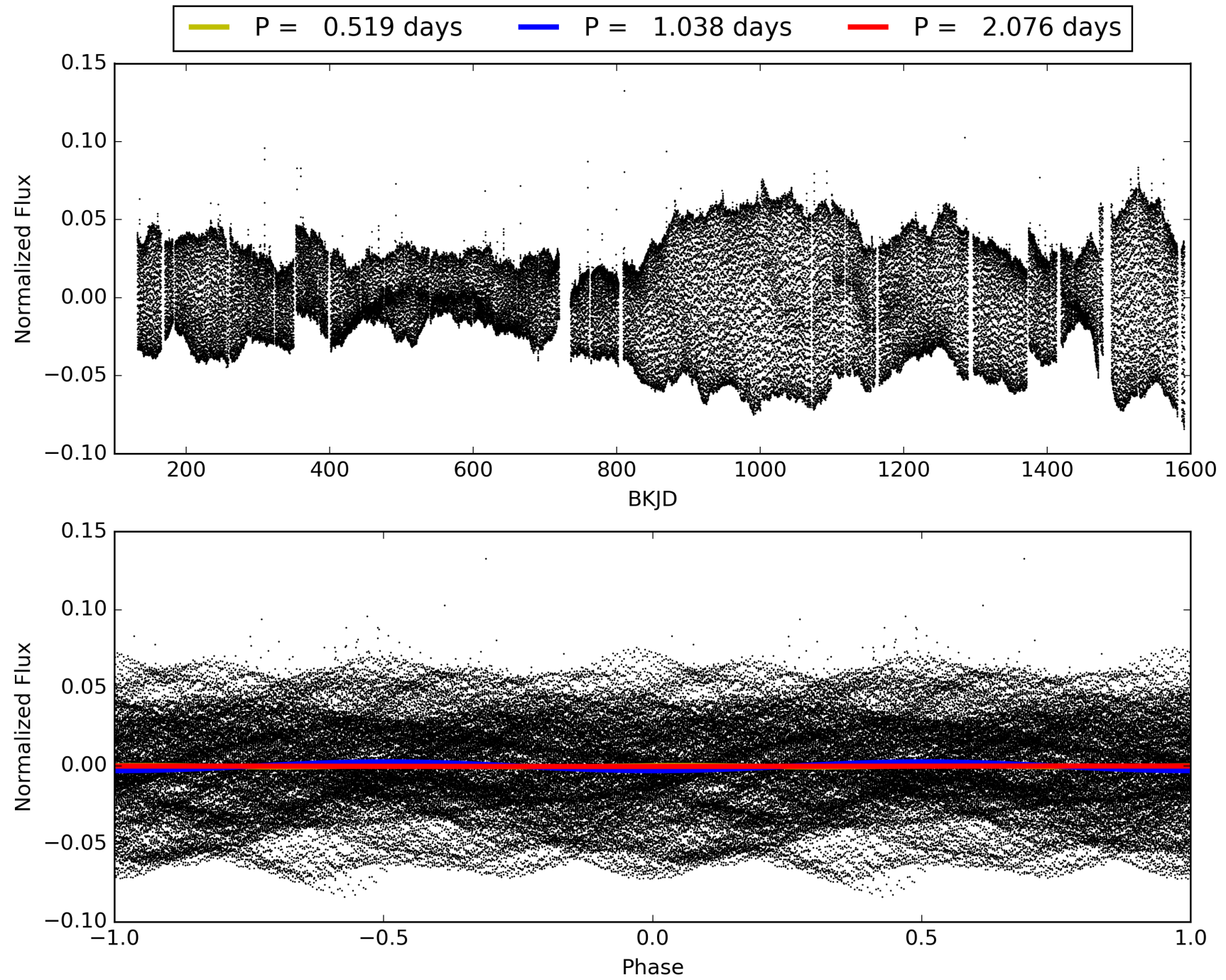
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 007957881-02, PDC Light Curves

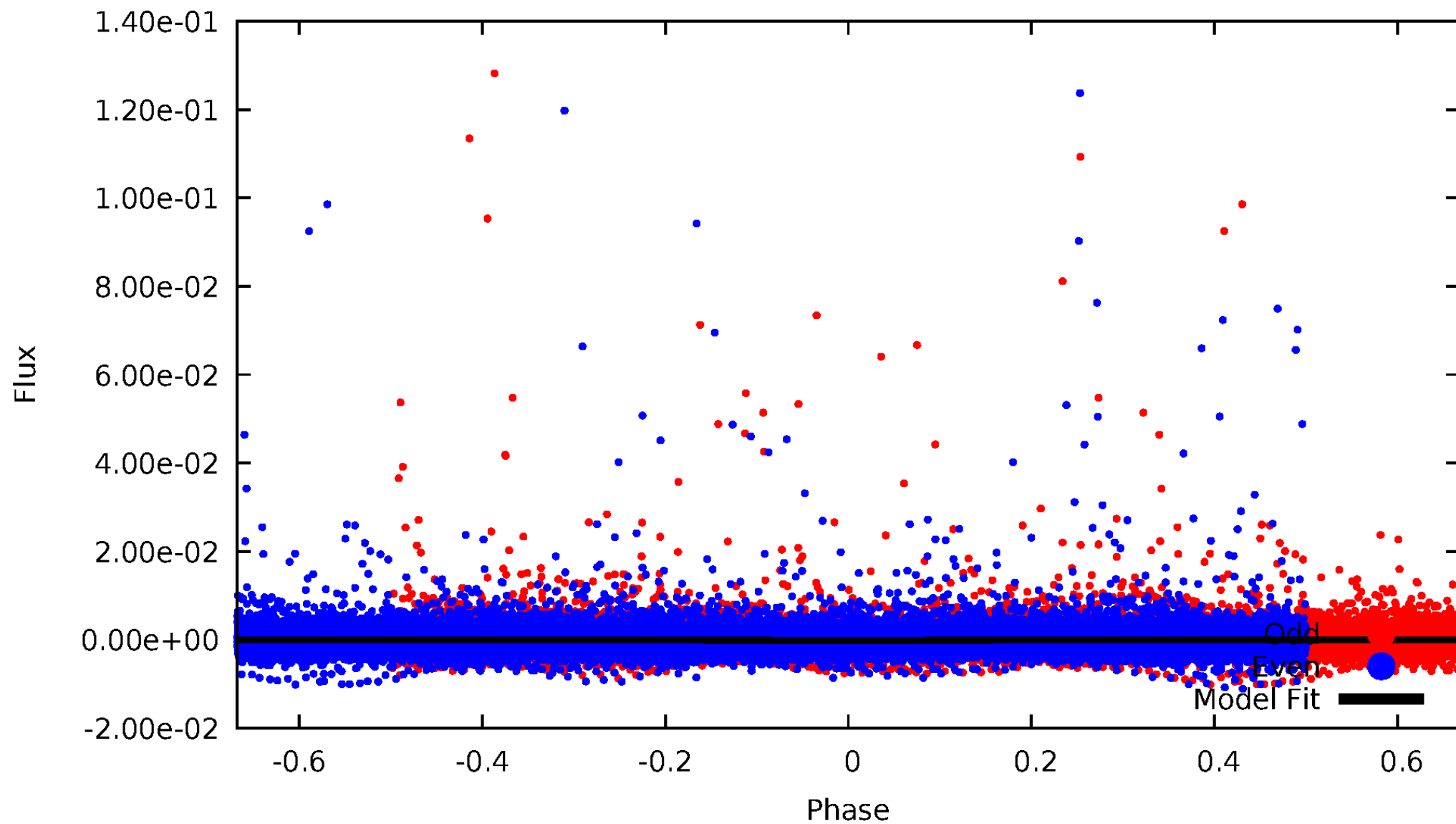


TCE 007957881-02



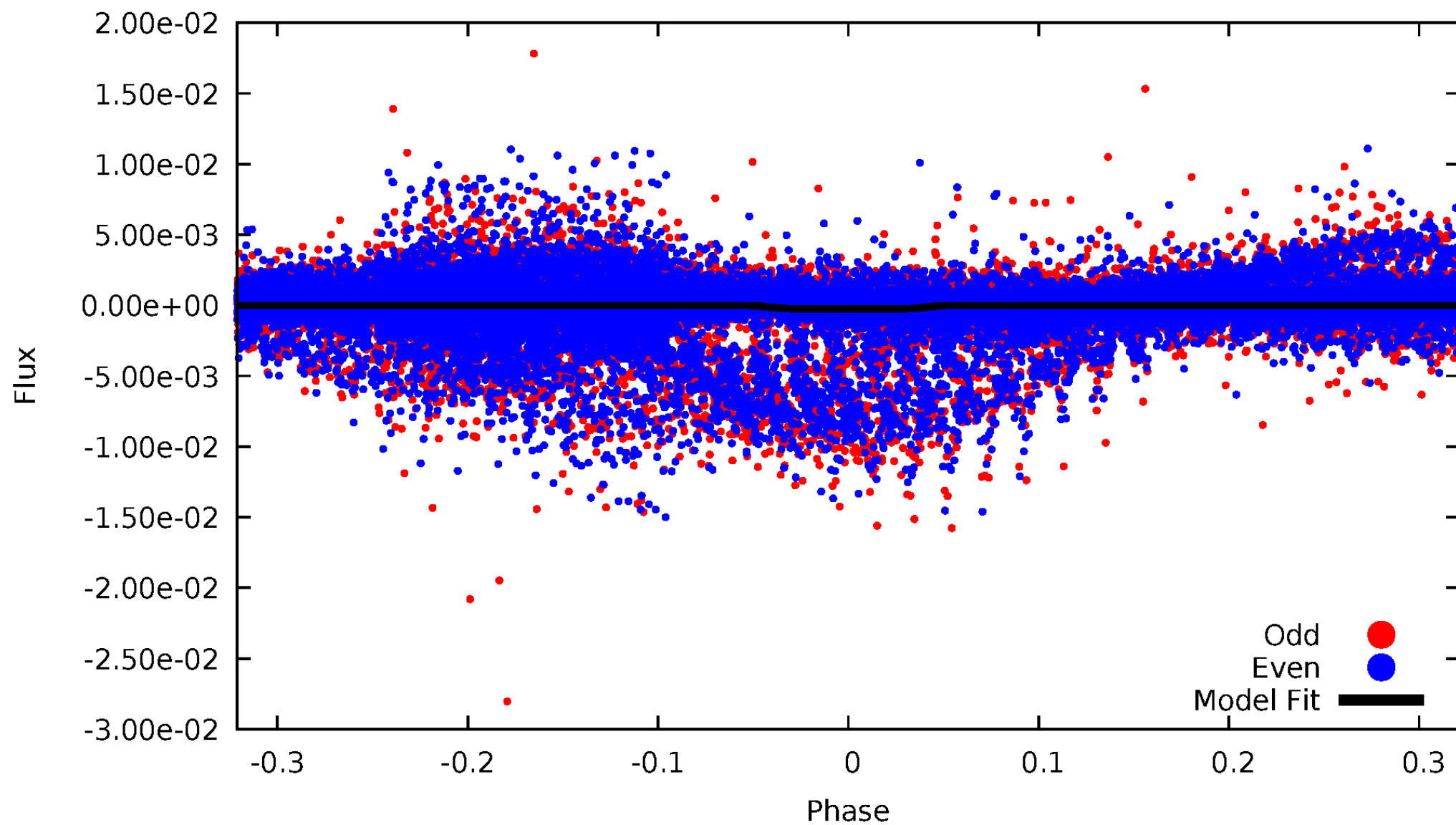
# DV Odd/Even

TCE 007957881-02



ALT Odd/Even

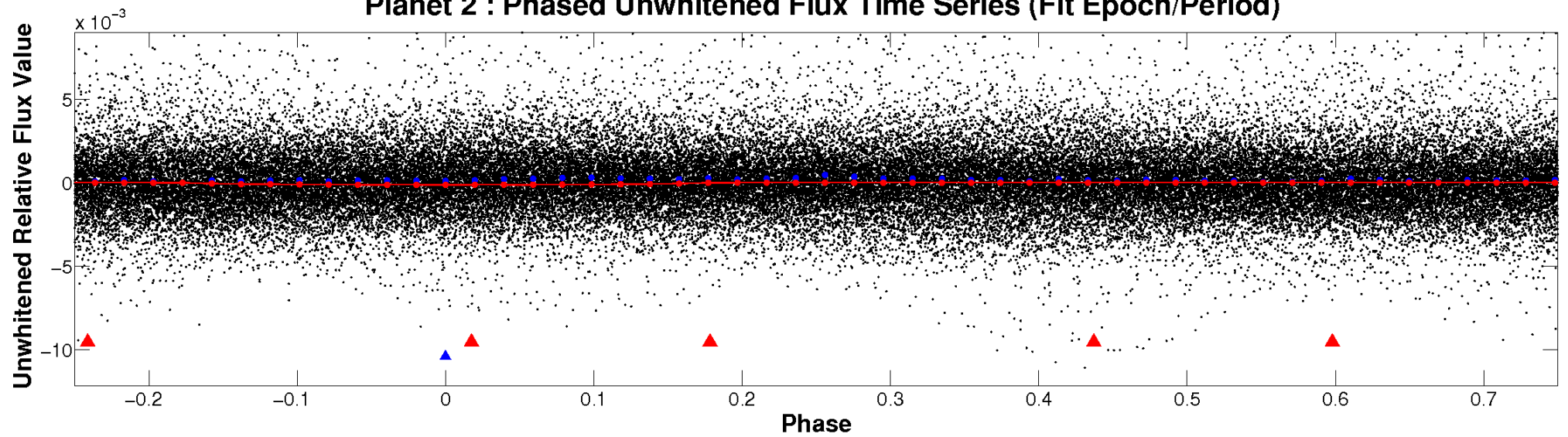
TCE 007957881-02



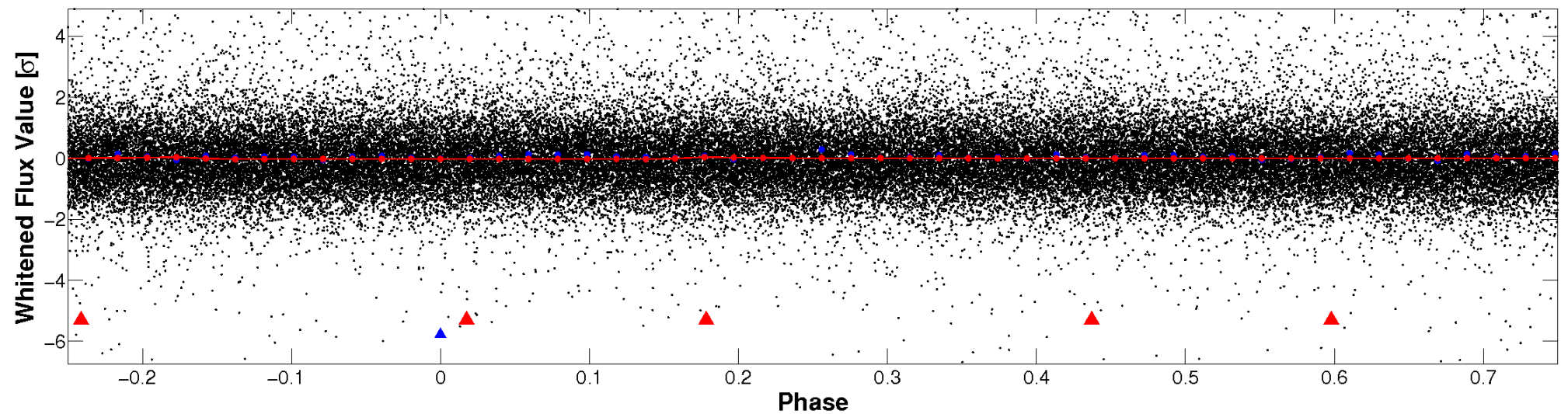


# Non-Whitened Vs. Whitened Light Curve

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

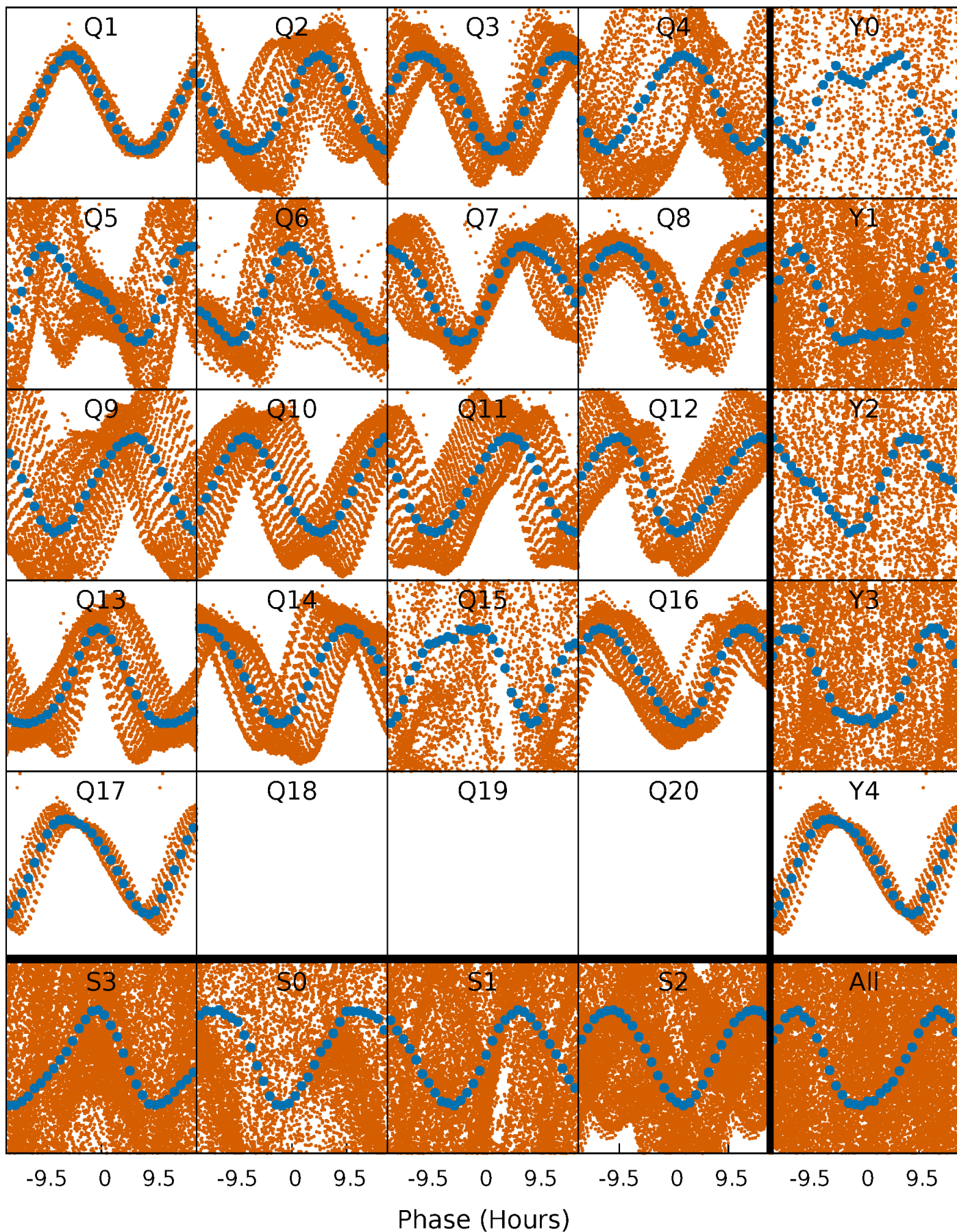


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

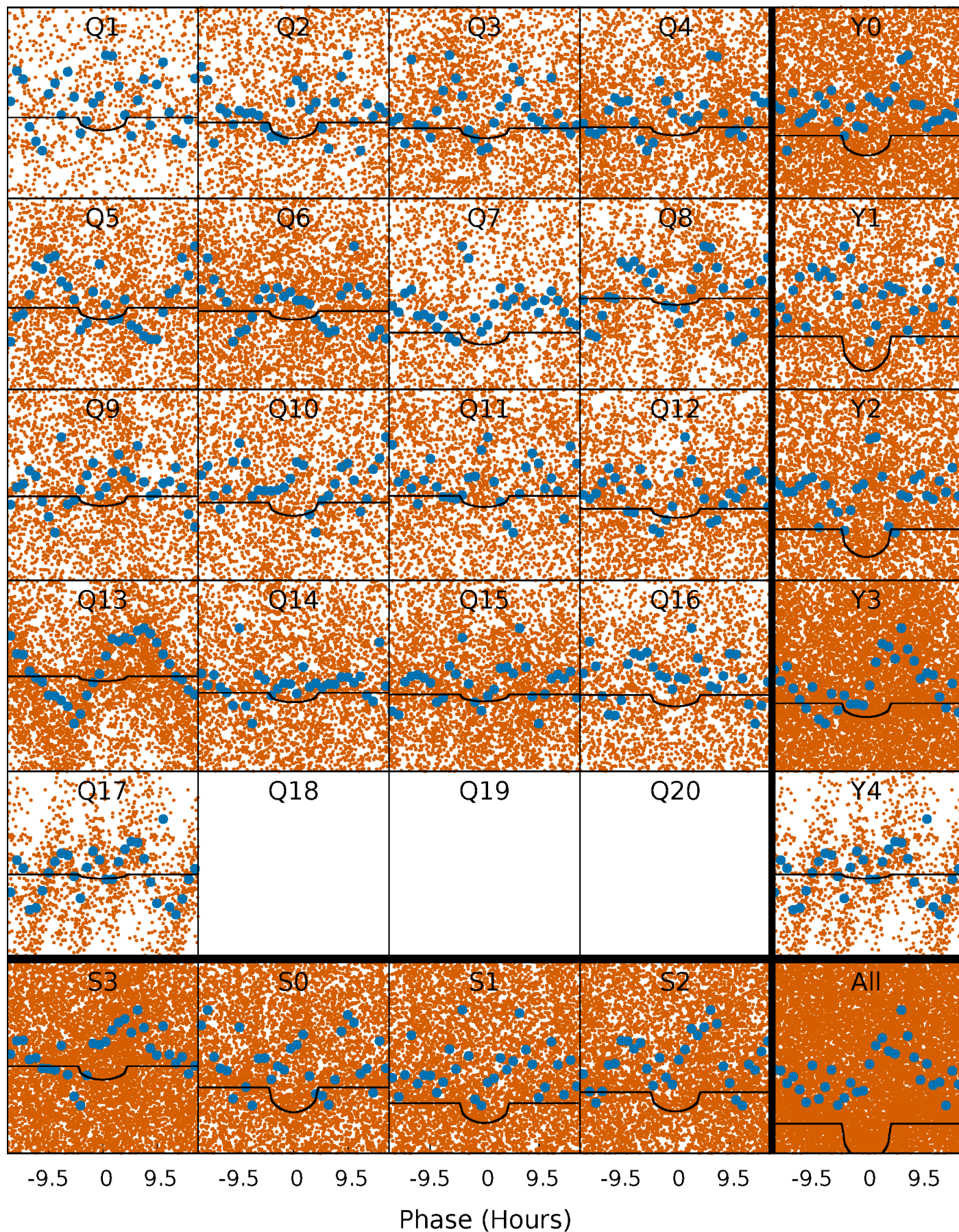
TCE 007957881-02   P= 1.037913 Days    $T_0=131.922533$  (BKJD)





# DV Quarter-Phased Transit Curves

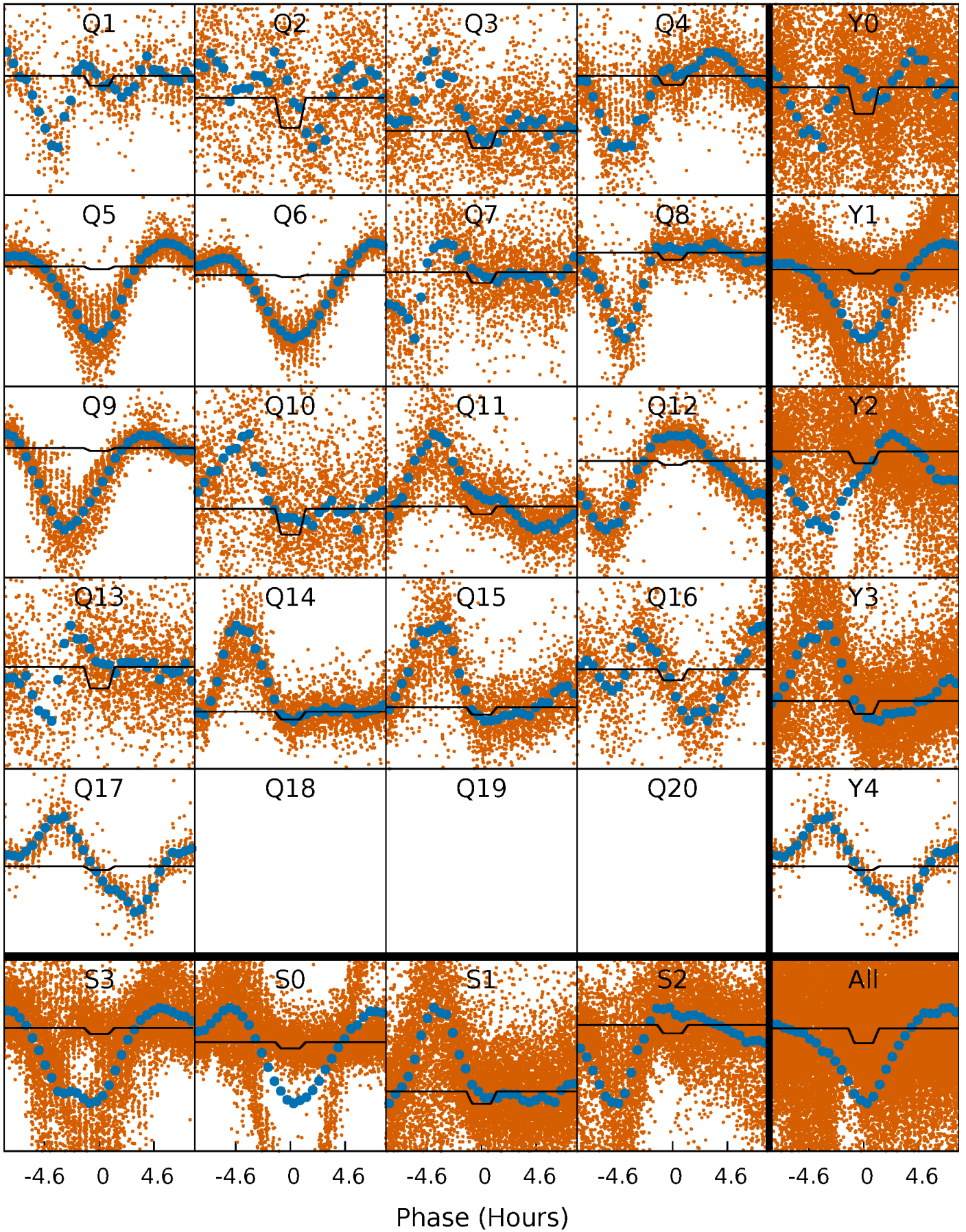
TCE 007957881-02   P= 1.037913 Days    $T_0=131.922533$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

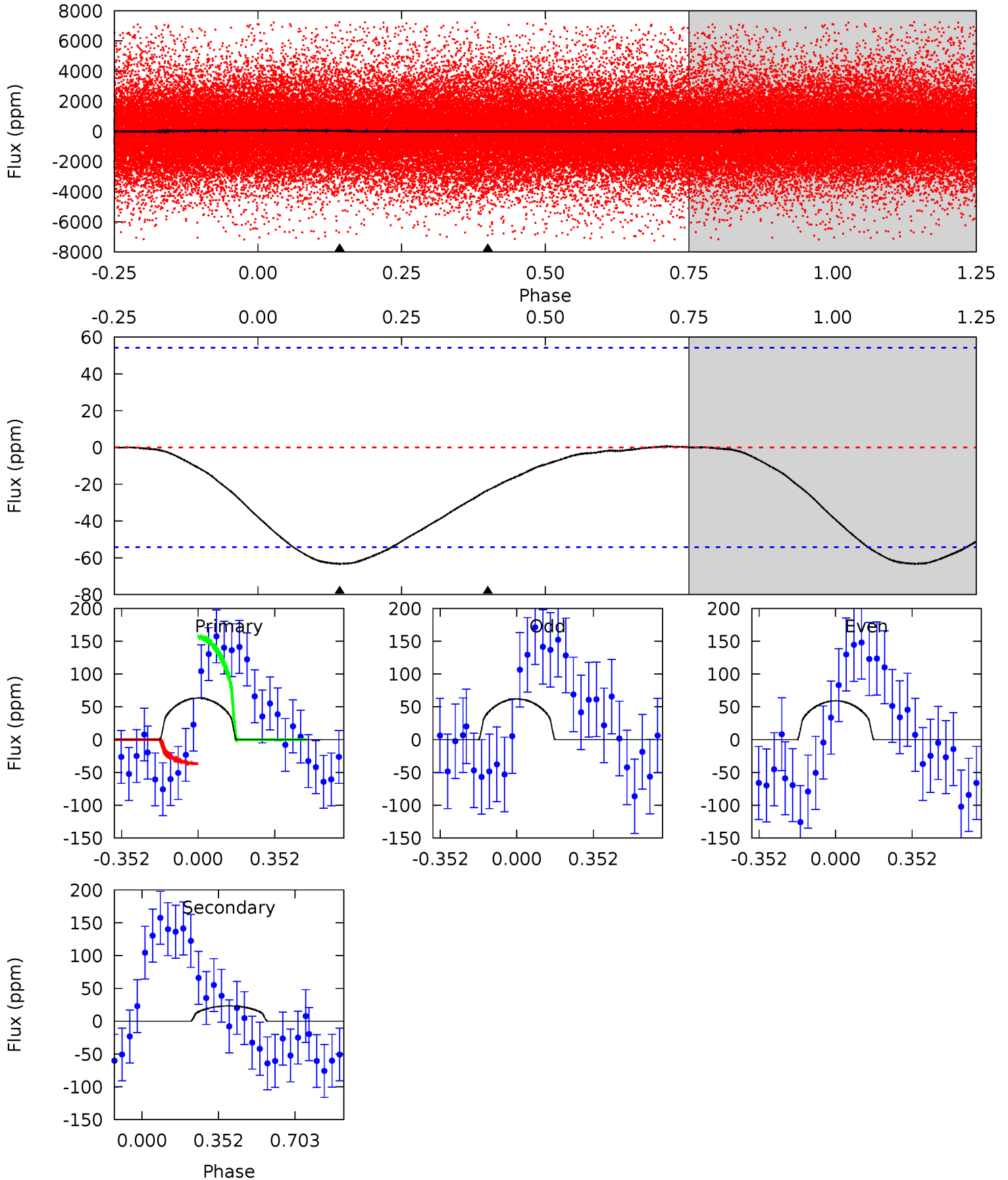
TCE 007957881-02   P= 1.041825 Days    $T_0=131.975981$  (BKJD)



# DV Model-Shift Uniqueness Test

007957881-02, P = 1.037913 Days, E = 130.884620 Days

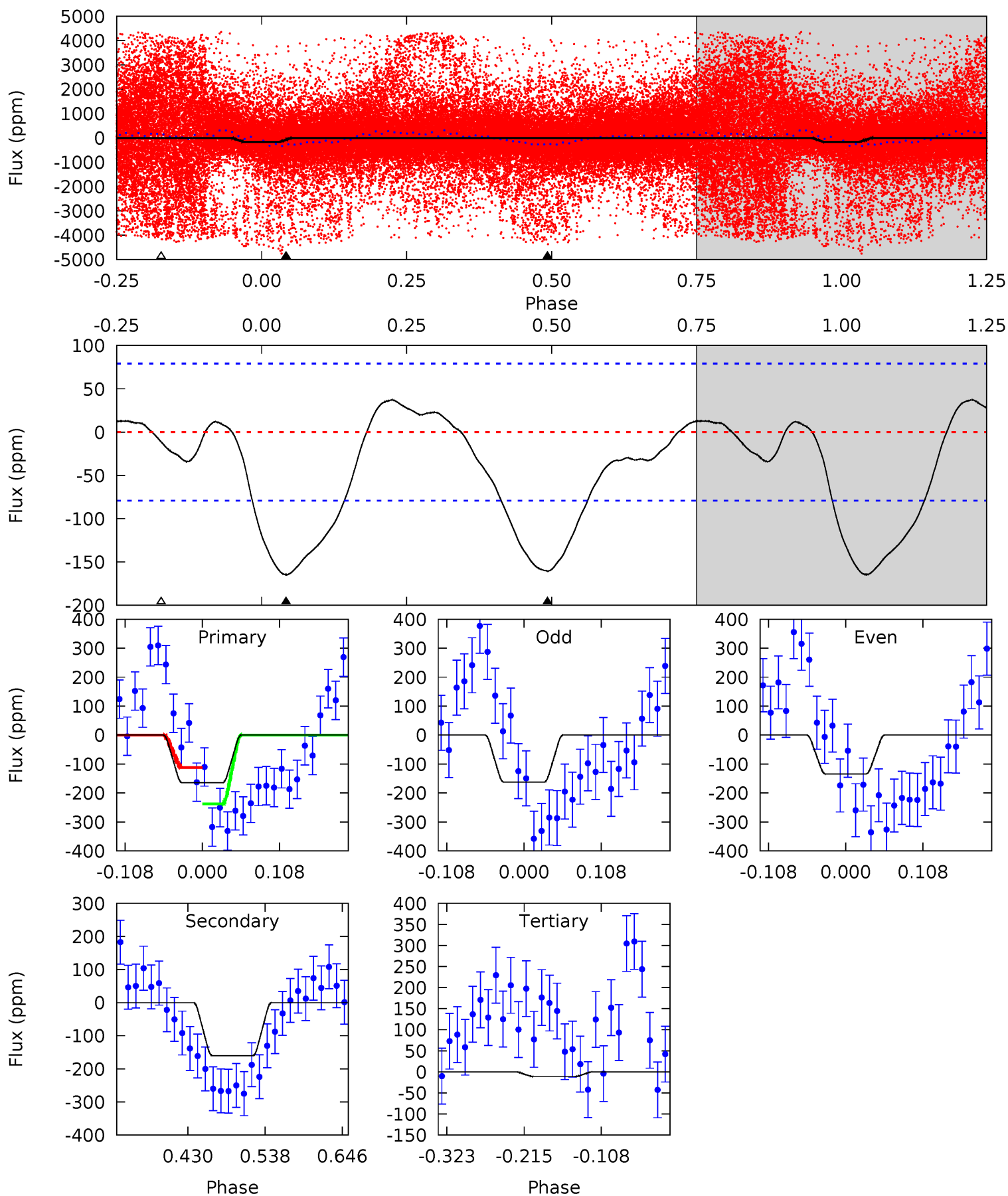
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.01	1.84	0	0	4.29	0.93	0.03	5.01	5.01	1.84	1.84	0.11	1.79	0.01	4.76



# Alt Model-Shift Uniqueness Test

007957881-02, P = 1.041825 Days, E = 130.934156 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.45	9.22	0.64	0	4.55	1.61	1.36	8.81	9.45	8.58	9.22	0.82	9.24	0.18	3.56



### Stellar Parameters For KIC 007957881

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4638^{+166}_{-166}$	$4.609^{+0.059}_{-0.027}$	$-0.300^{+0.300}_{-0.300}$	$0.660^{+0.052}_{-0.063}$	$0.645^{+0.078}_{-0.052}$	$3.163^{+0.785}_{-0.435}$
	+4%/-4%	+1%/-1%	+100%/-100%	+8%/-10%	+12%/-8%	+25%/-14%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007957881-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-23 \pm 13$	$0.80^{+0.53}_{-0.44}$	$1751^{+67}_{-68}$	$3372^{+1208}_{-641}$	$5.673^{+27.932}_{-4.120}$
Alt.	$-160 \pm 17$	$1.13^{+0.59}_{-0.52}$	$1749^{+68}_{-72}$	$4244^{+1276}_{-617}$	$21^{+53}_{-13}$

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

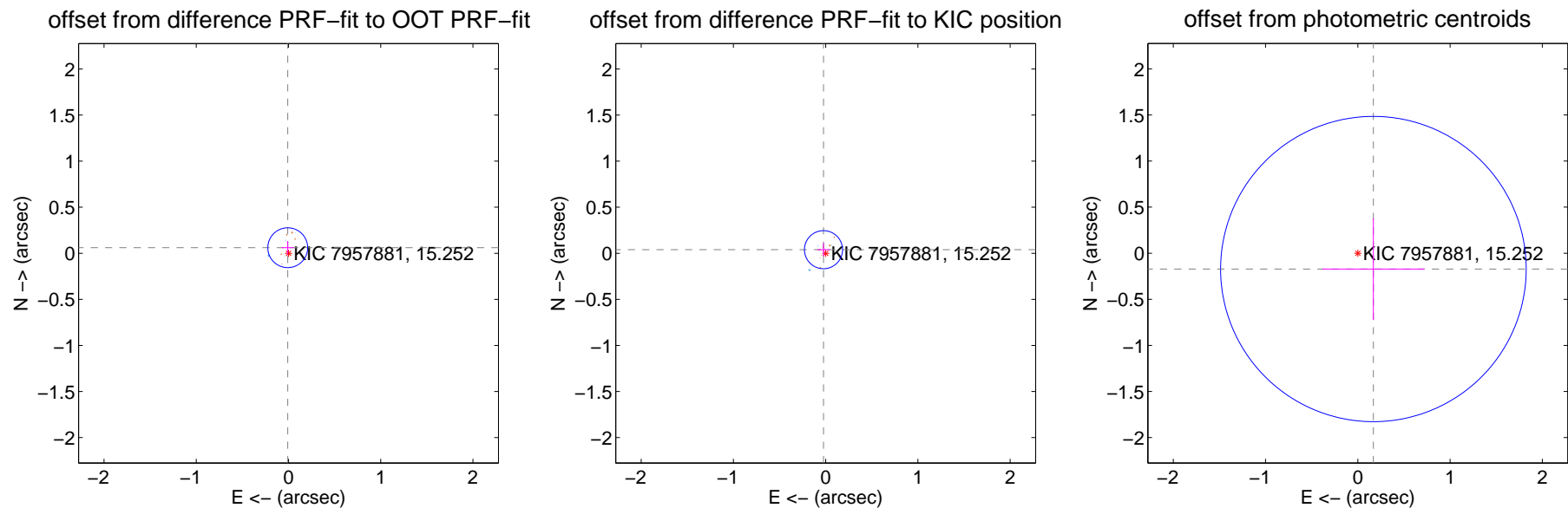
## DV Centroid Data

Supplemental centroid analysis for 007957881-02. Kepler magnitude: 15.25. Transit SNR 4.30

There are 8 quarters with good PRF difference image offsets

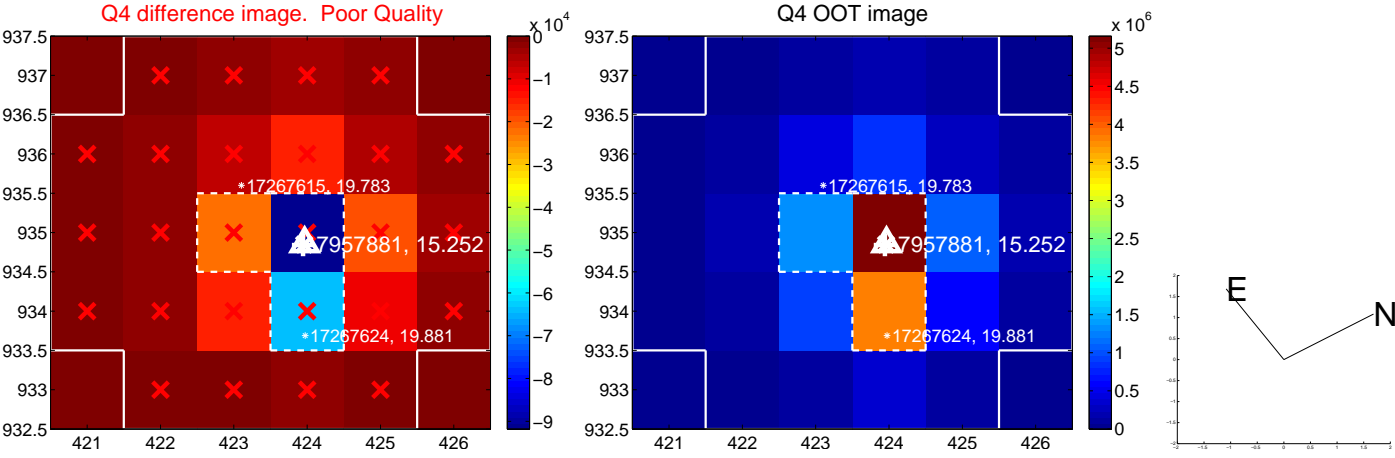
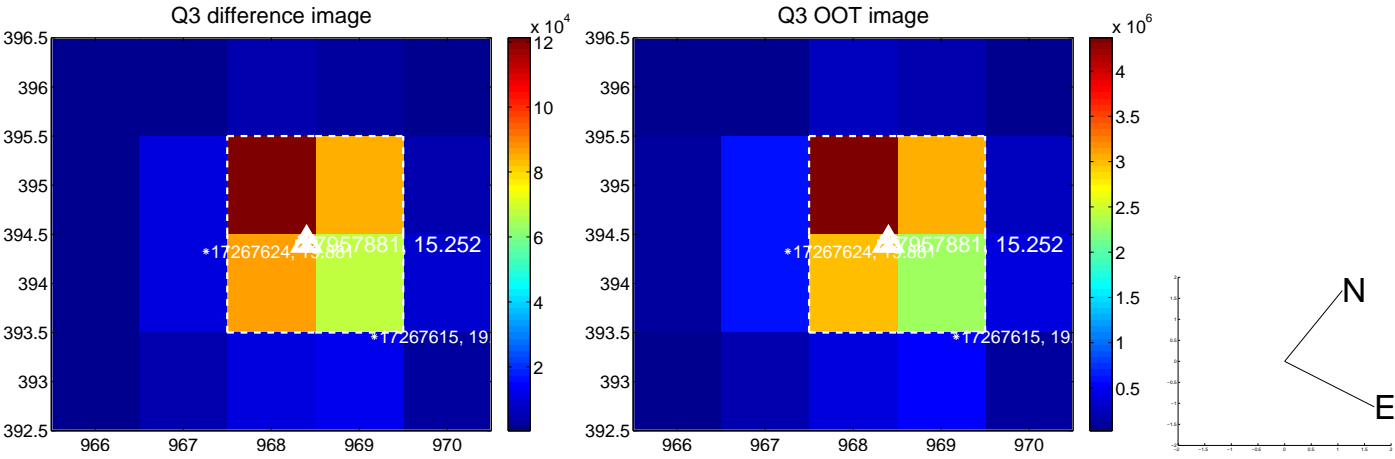
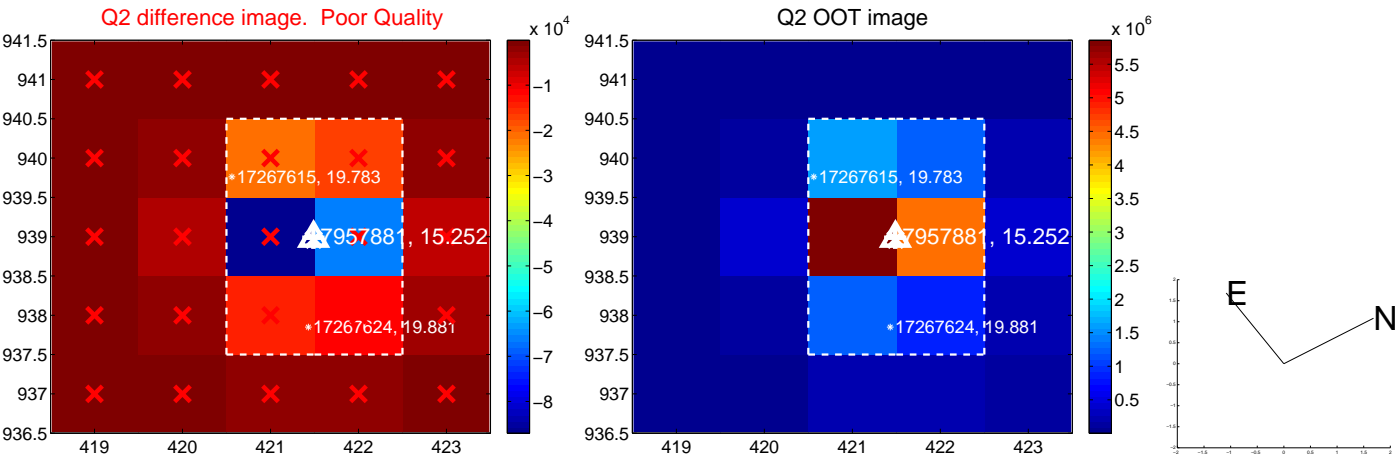
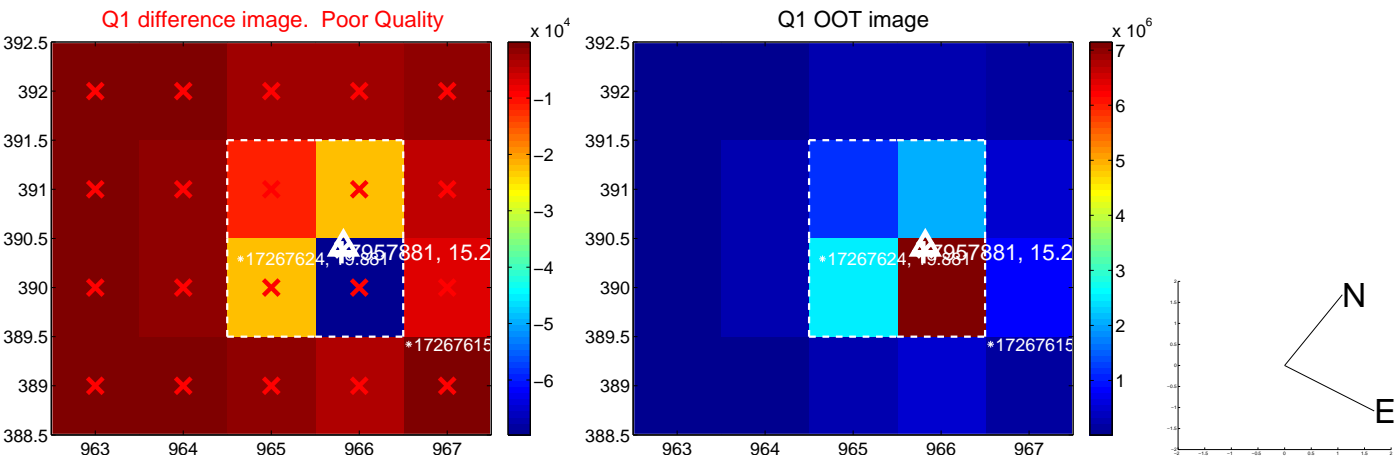
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.061 \pm 0.072$	0.85	$0.008 \pm 0.067$	$0.060 \pm 0.072$
PRF-fit source offset from KIC position	$0.046 \pm 0.069$	0.66	$0.023 \pm 0.068$	$0.039 \pm 0.071$
photometric centroid source offset	$0.24 \pm 0.55$	0.44	$-0.17 \pm 0.55$	$-0.17 \pm 0.55$

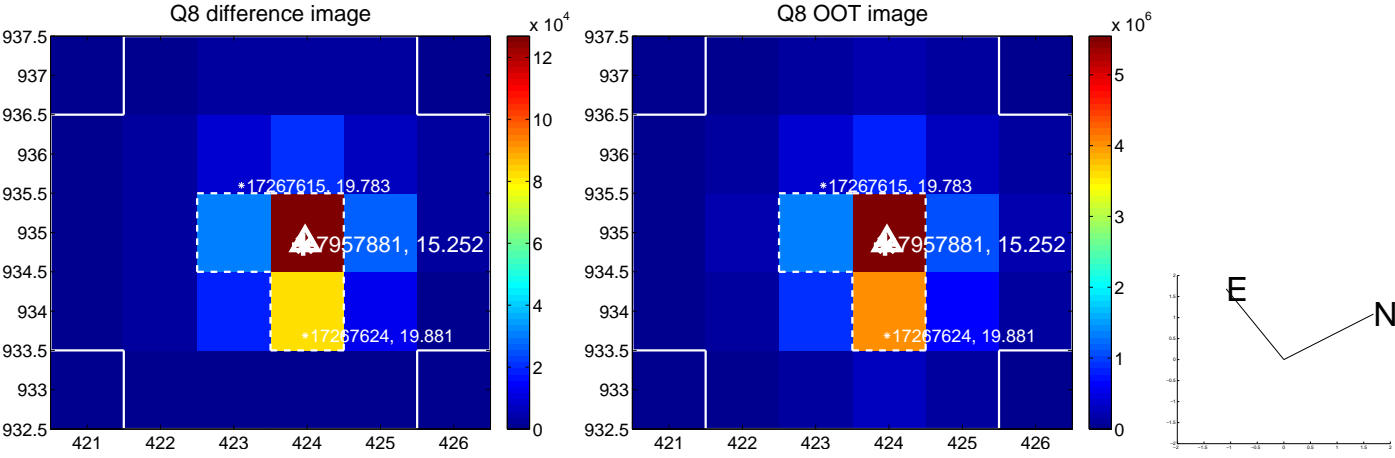
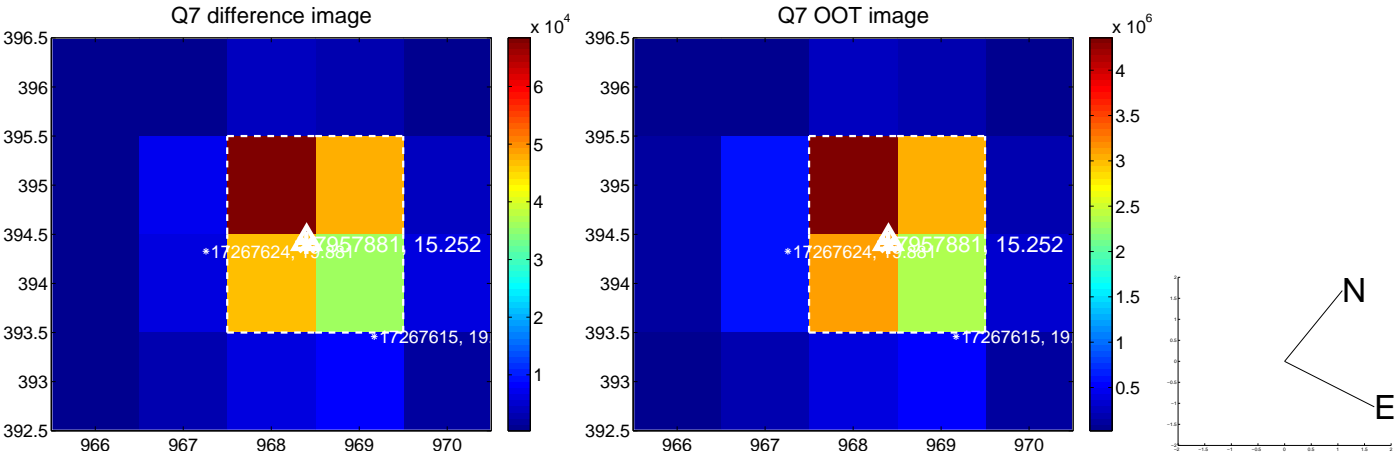
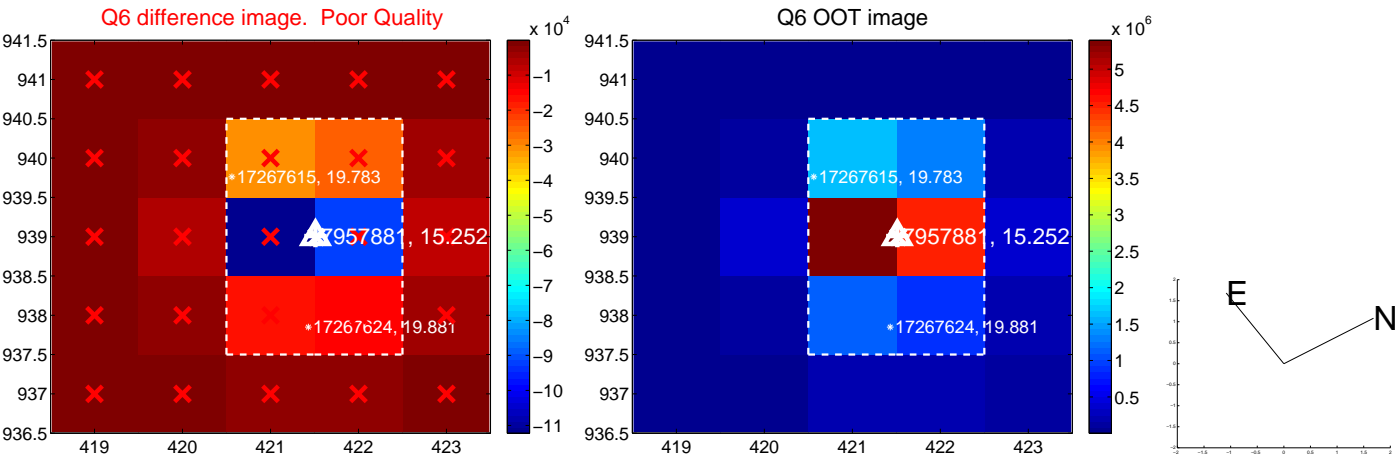
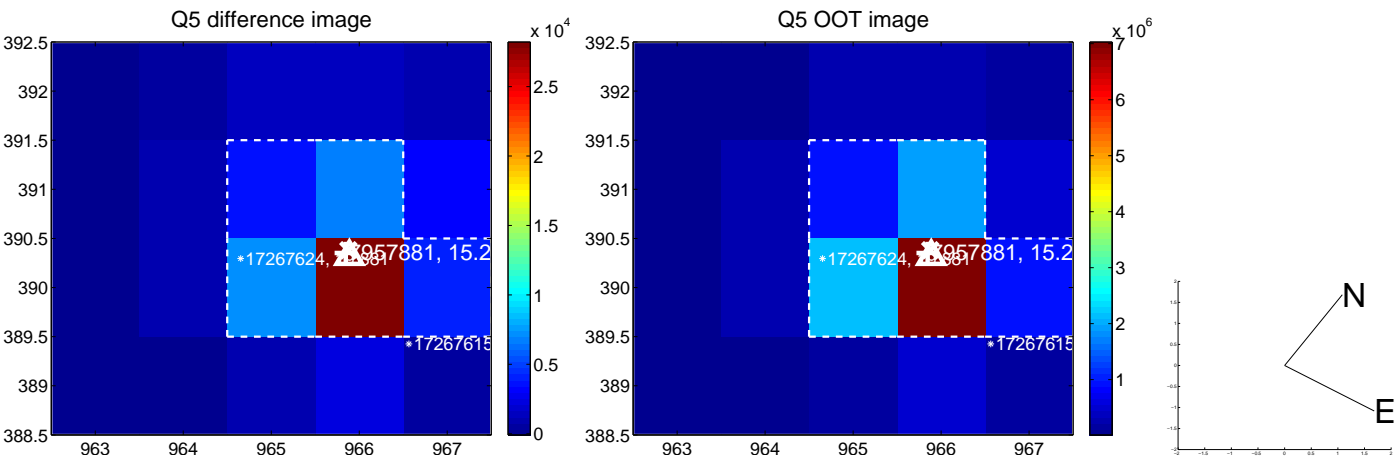


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

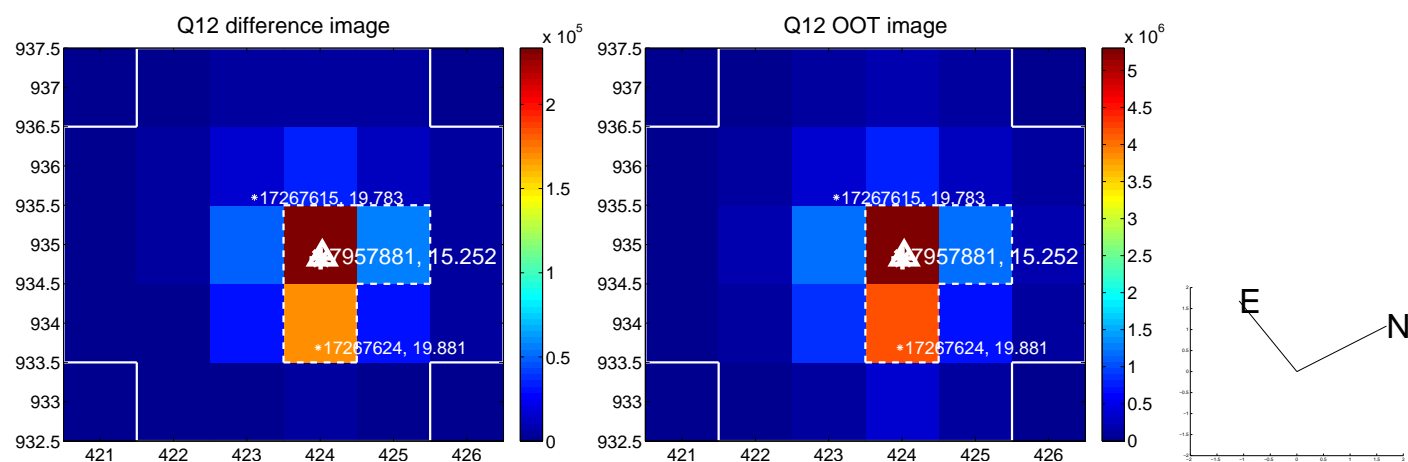
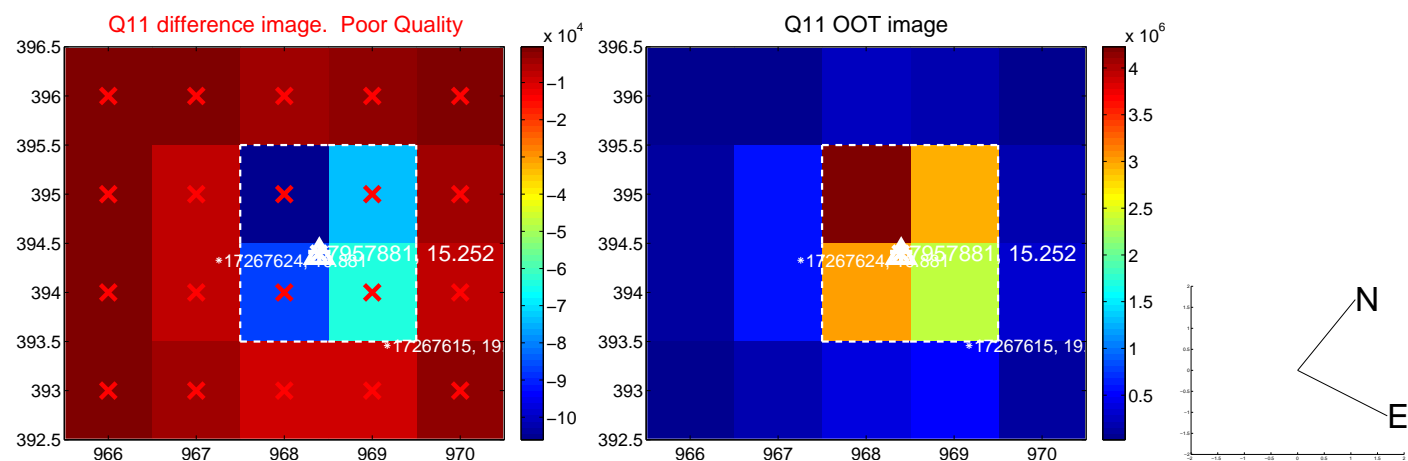
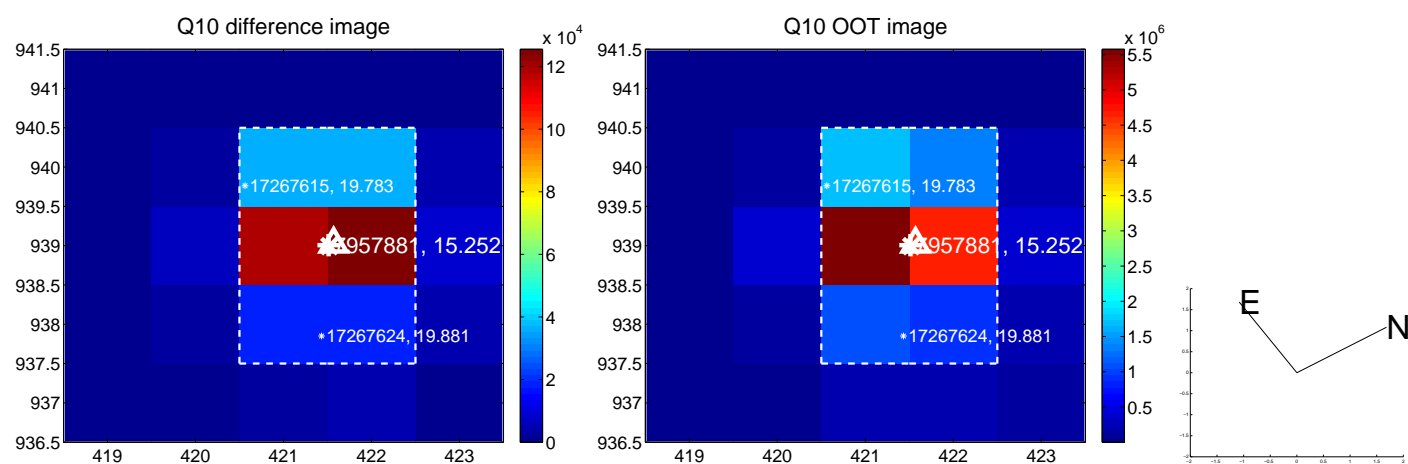
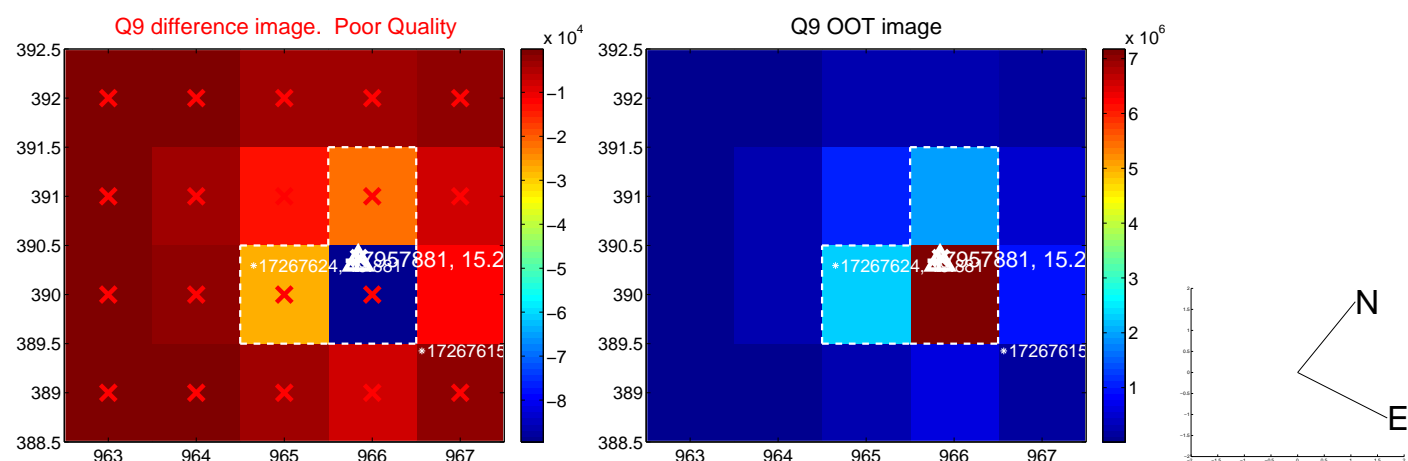


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



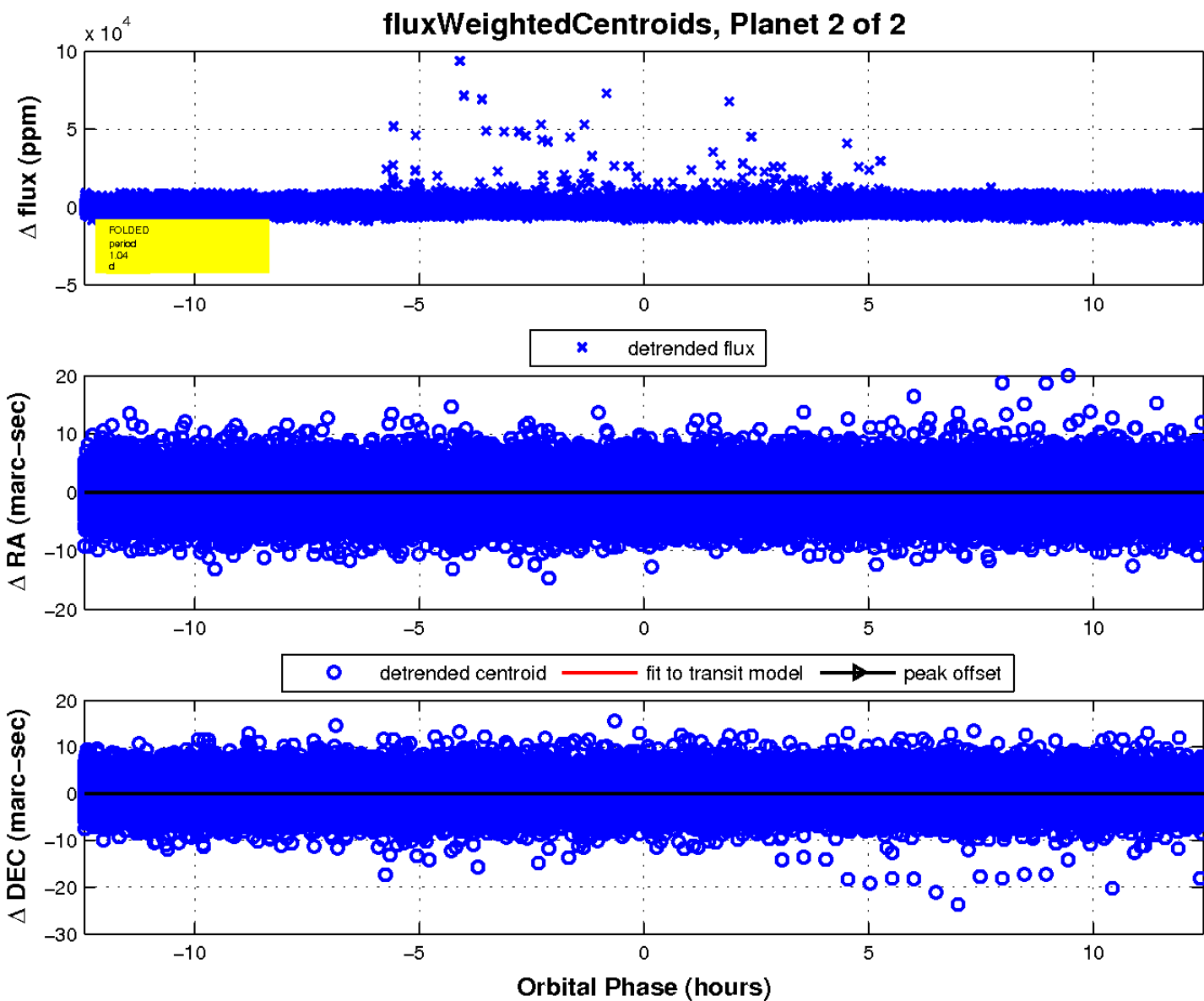
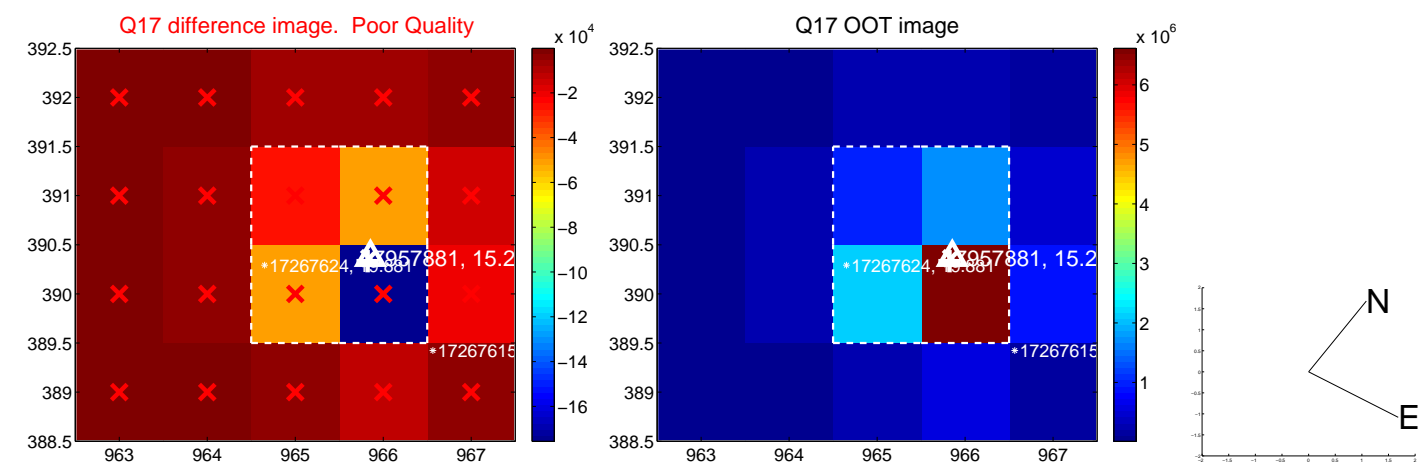


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

