

# KIC 008581240

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008581240-01	OBS	3111.01	10.768012	138.505058	66.5	3.625	11.9	13.0	1.10	5874	1.05	145.10
008581240-02	OBS	3111.02	4.328529	132.510210	38.1	2.971	10.0	10.9	1.10	5874	0.81	489.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008581240-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008581240-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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

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

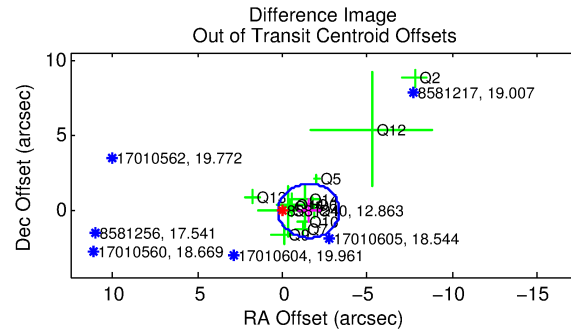
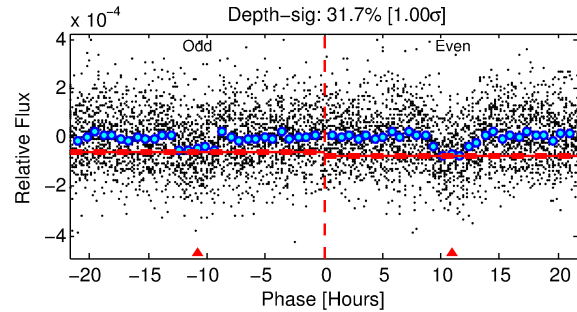
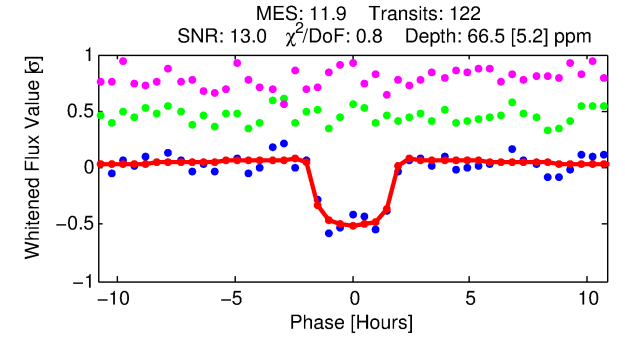
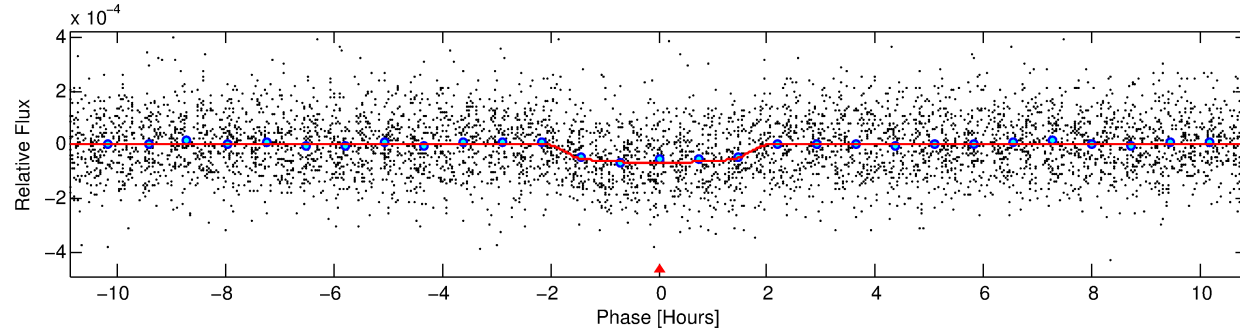
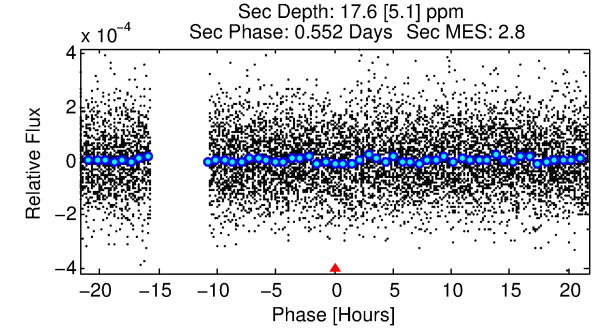
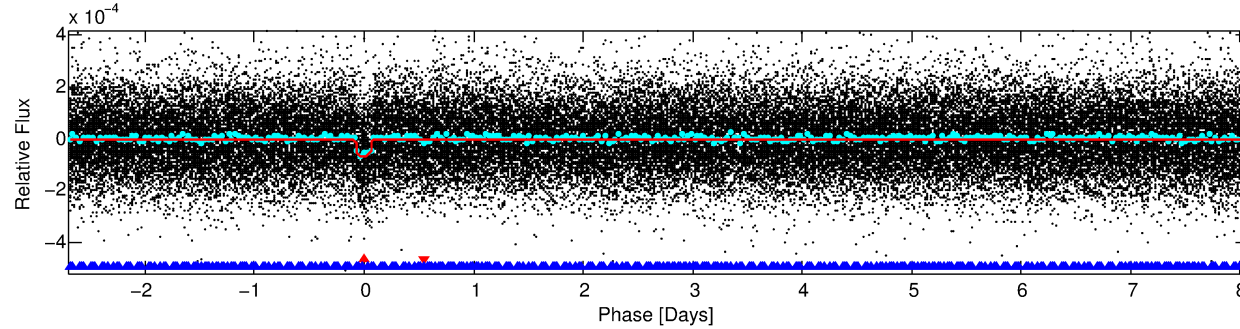
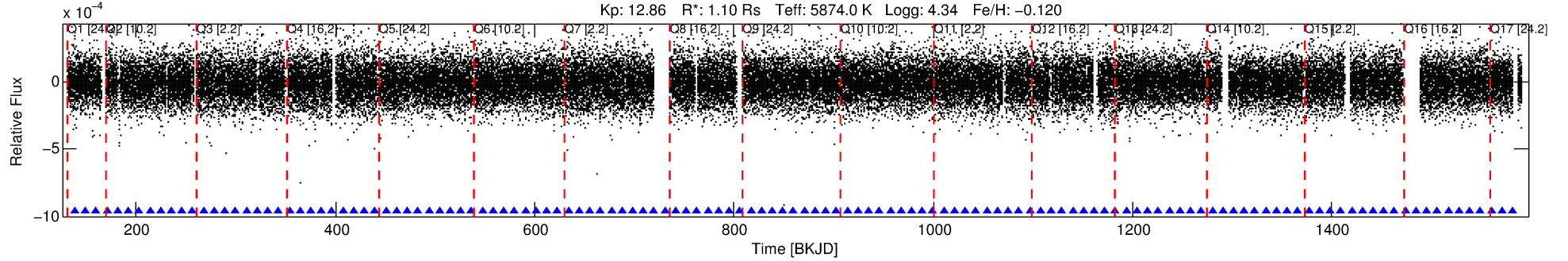
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008581240-01

No Significant Match Found

# DV One-Page Summary

KIC: 8581240 Candidate: 1 of 2 Period: 10.768 d  
KOI: K03111.01 Corr: 0.979



## DV Fit Results:

Period = 10.76801 [0.00007] d  
Epoch = 138.5051 [0.0056] BKJD  
Rp/R\* = 0.0088 [0.0037]  
a/R\* = 10.87 [22.71]  
b = 0.89 [0.51]  
Seff = 145.10 [33.48]  
Teq = 885 [51] K  
Rp = 1.05 [0.47] Re  
a = 0.0940 [0.0129] AU  
Ag = 77.95 [71.62] [1.07σ]  
Teffp = 4066 [911] K [3.49σ]

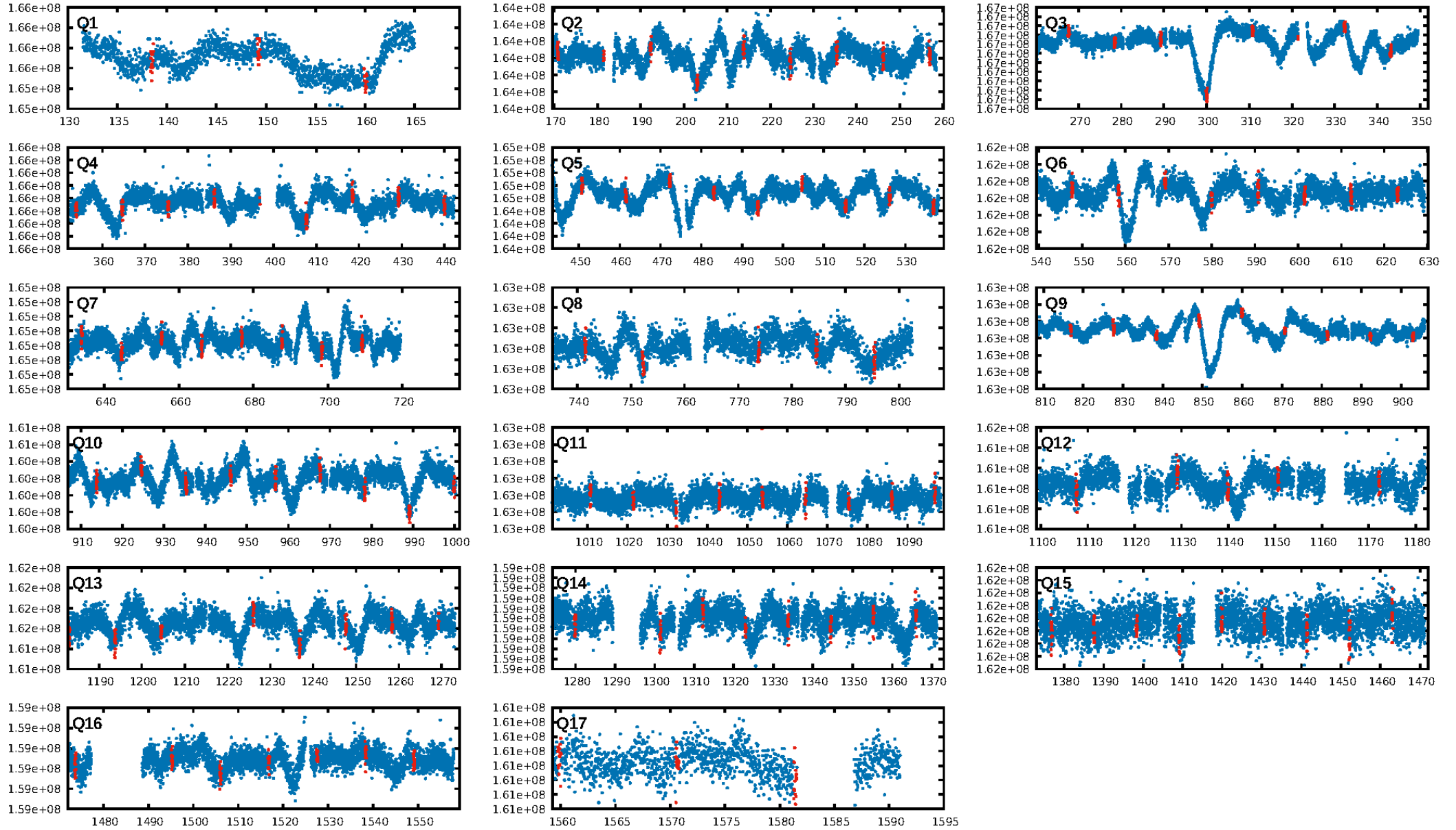
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [32.98σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 97.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.23e-32  
RollingBand-fgt: 1.00 [116/116]  
GhostDiagnostic-chr: 5.206  
Centroid-sig: 0.2%  
Centroid-so: 1.636 arcsec [1.79σ]  
OotOffset-rm: 1.566 arcsec [2.60σ]  
KicOffset-rm: 1.442 arcsec [2.45σ]  
OotOffset-st: 4/4/2/3 [13]  
KicOffset-st: 4/4/2/3 [13]  
DiffImageQuality-fgm: 0.69 [9/13]  
DiffImageOverlap-fno: 1.00 [17/17]

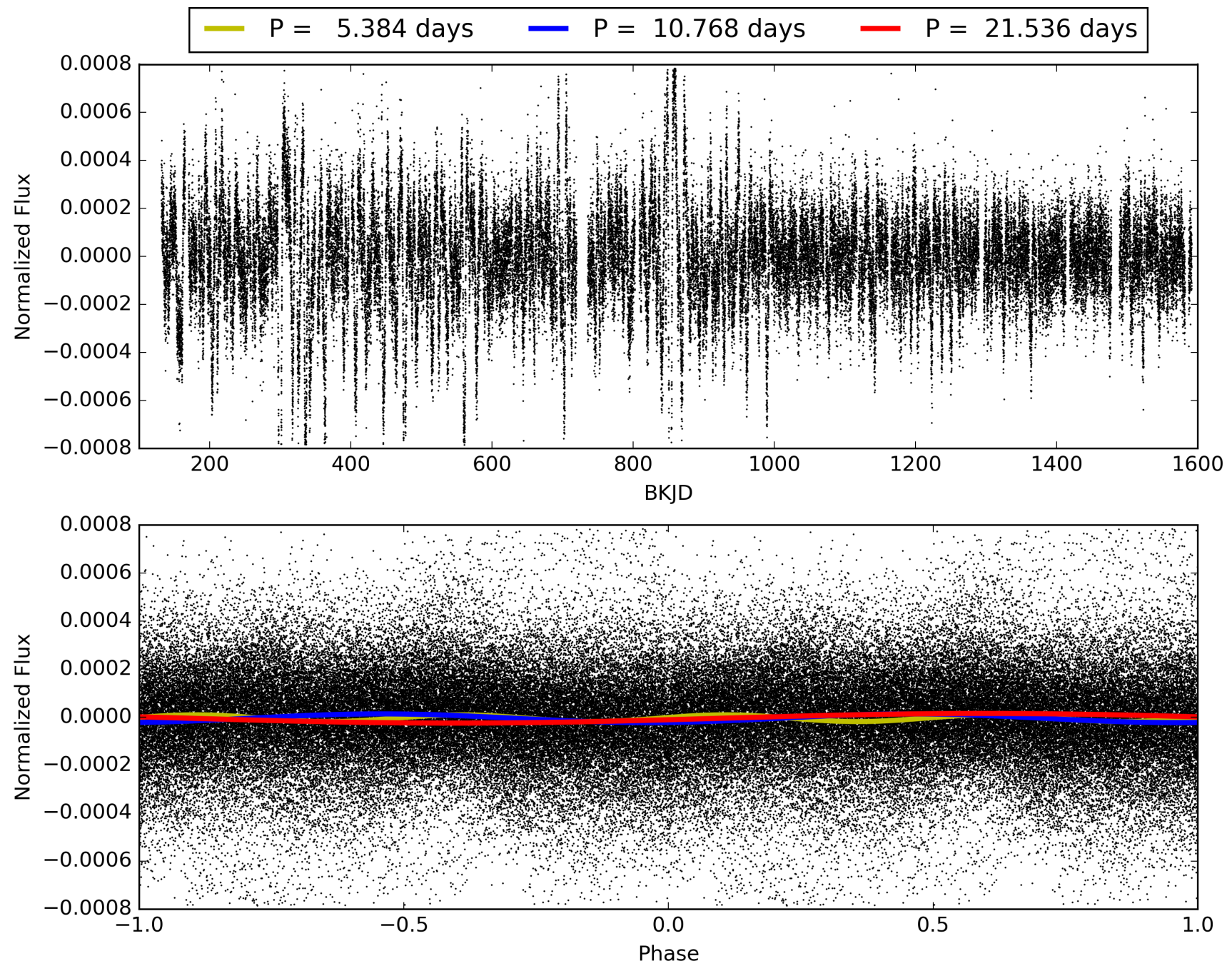
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:55:31 Z

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

# TCE 008581240-01, PDC Light Curves



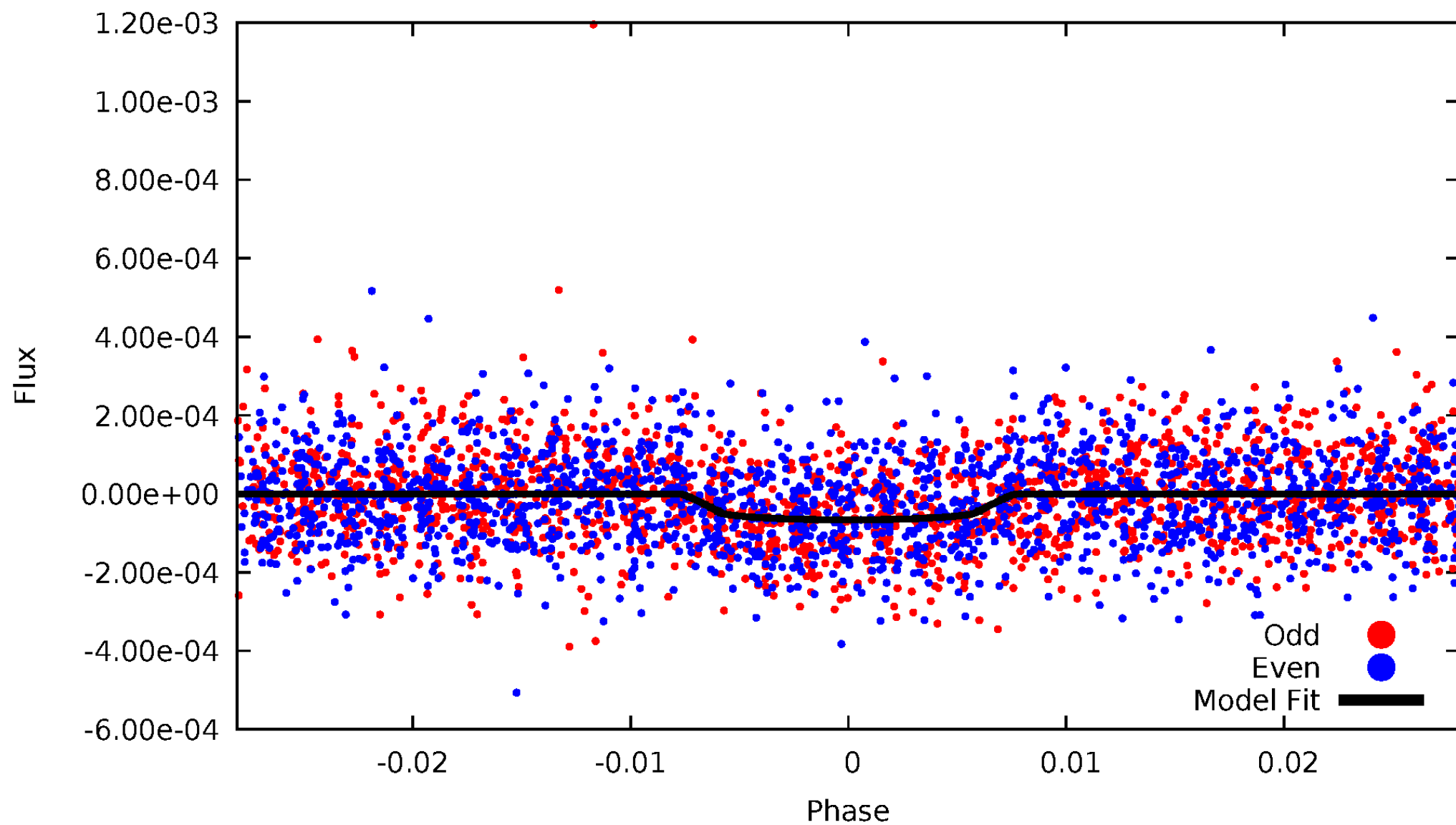
# TCE 008581240-01





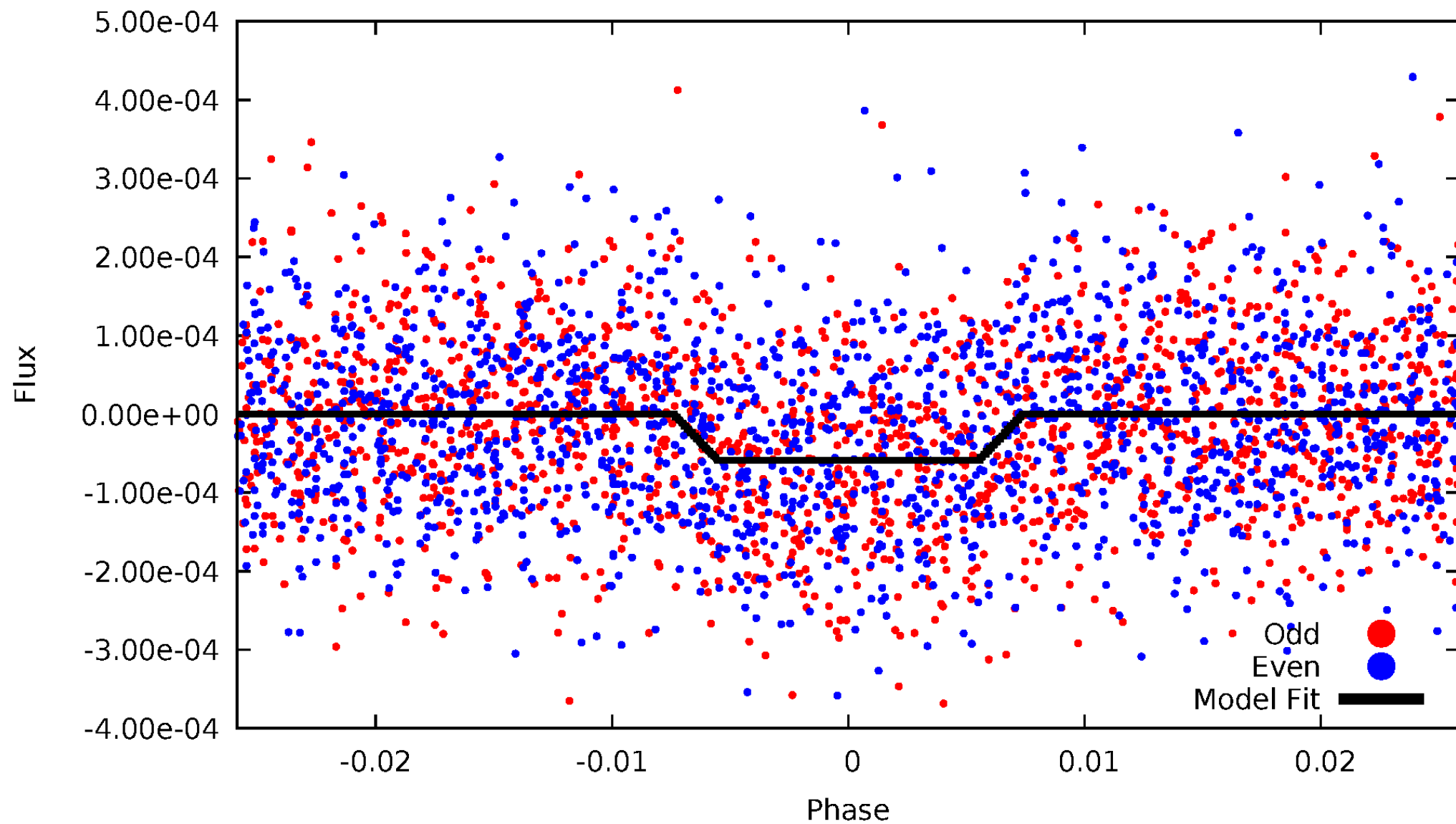
# DV Odd/Even

TCE 008581240-01

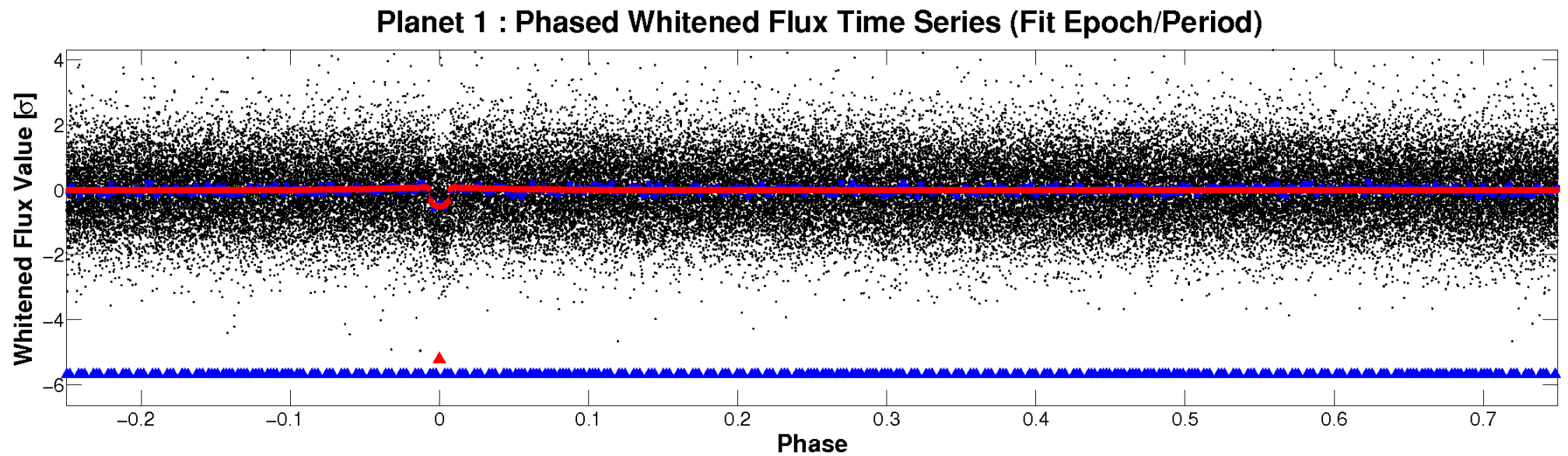
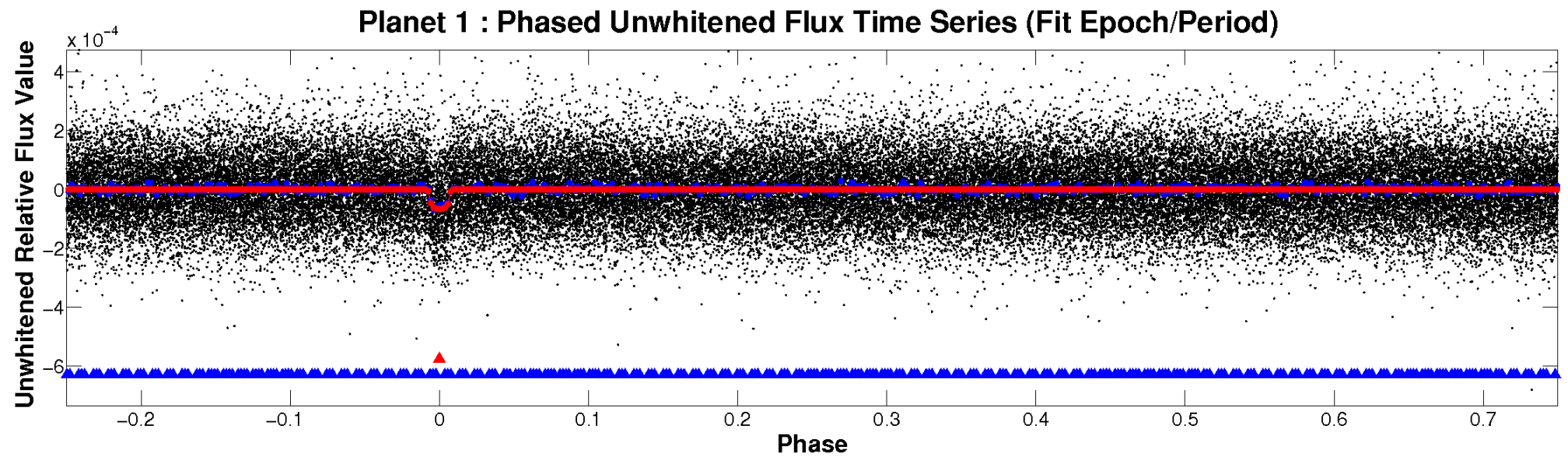


# ALT Odd/Even

TCE 008581240-01

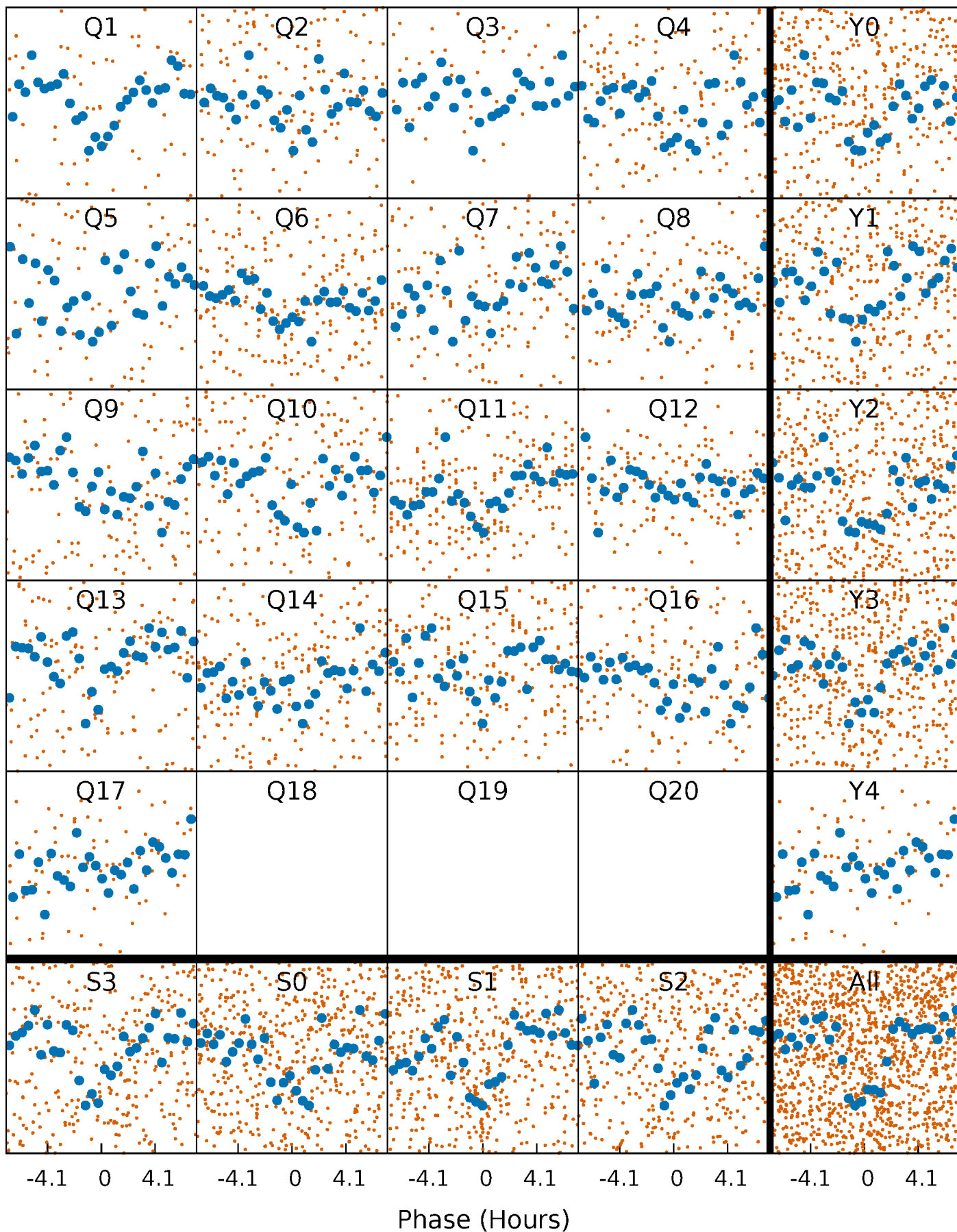


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

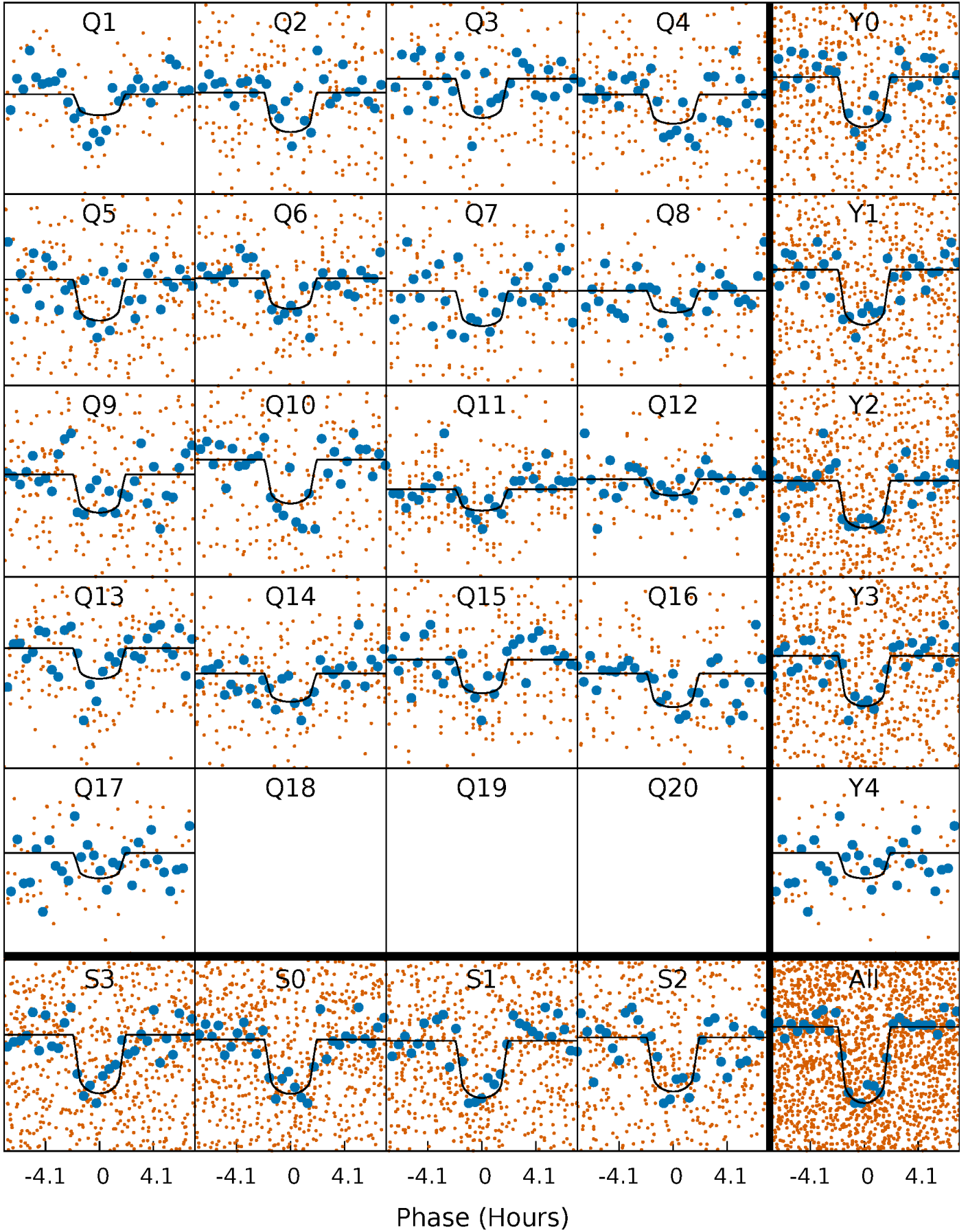
TCE 008581240-01 P= 10.768012 Days  $T_0=138.505058$  (BKJD)





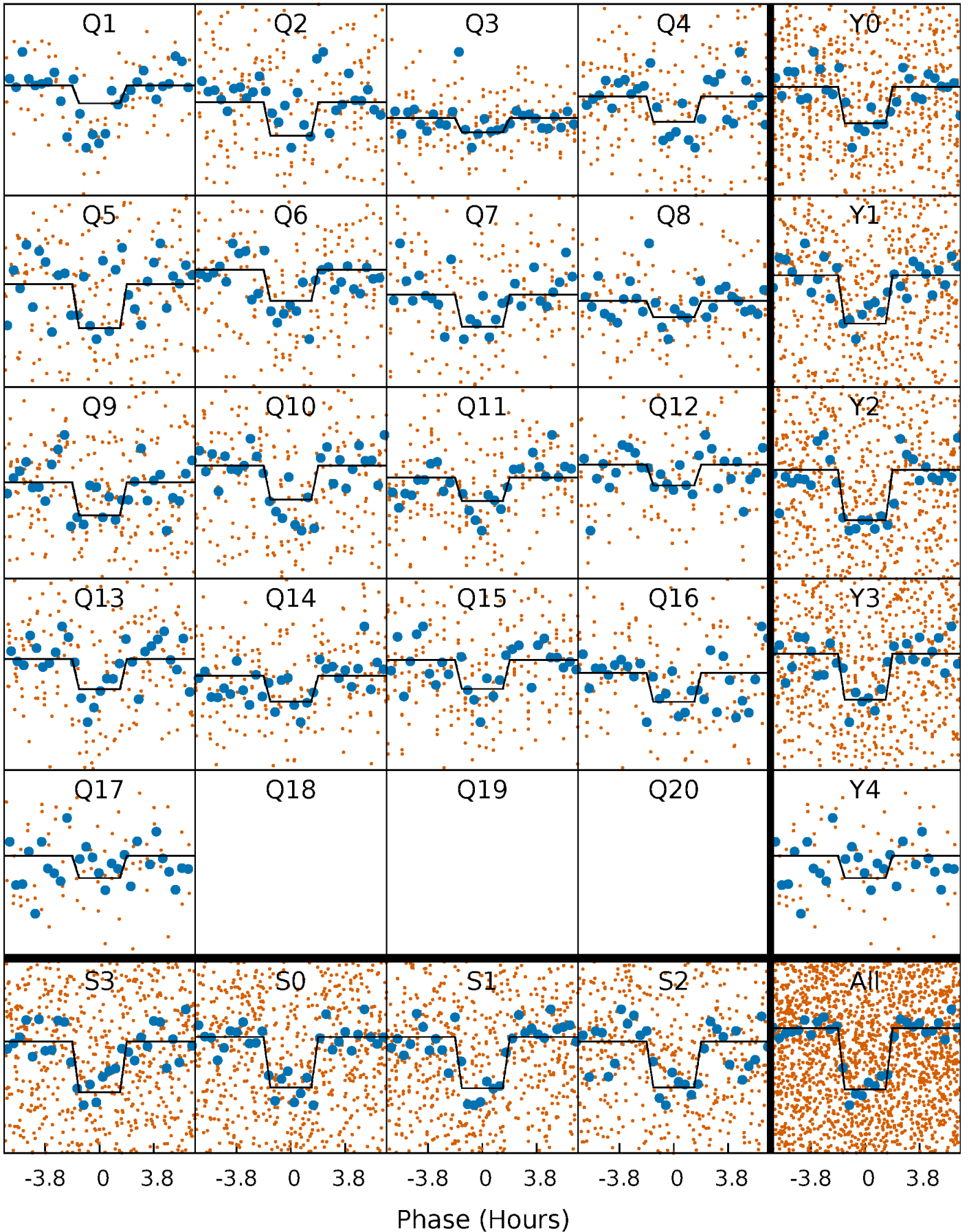
# DV Quarter-Phased Transit Curves

TCE 008581240-01 P= 10.768012 Days  $T_0=138.505058$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

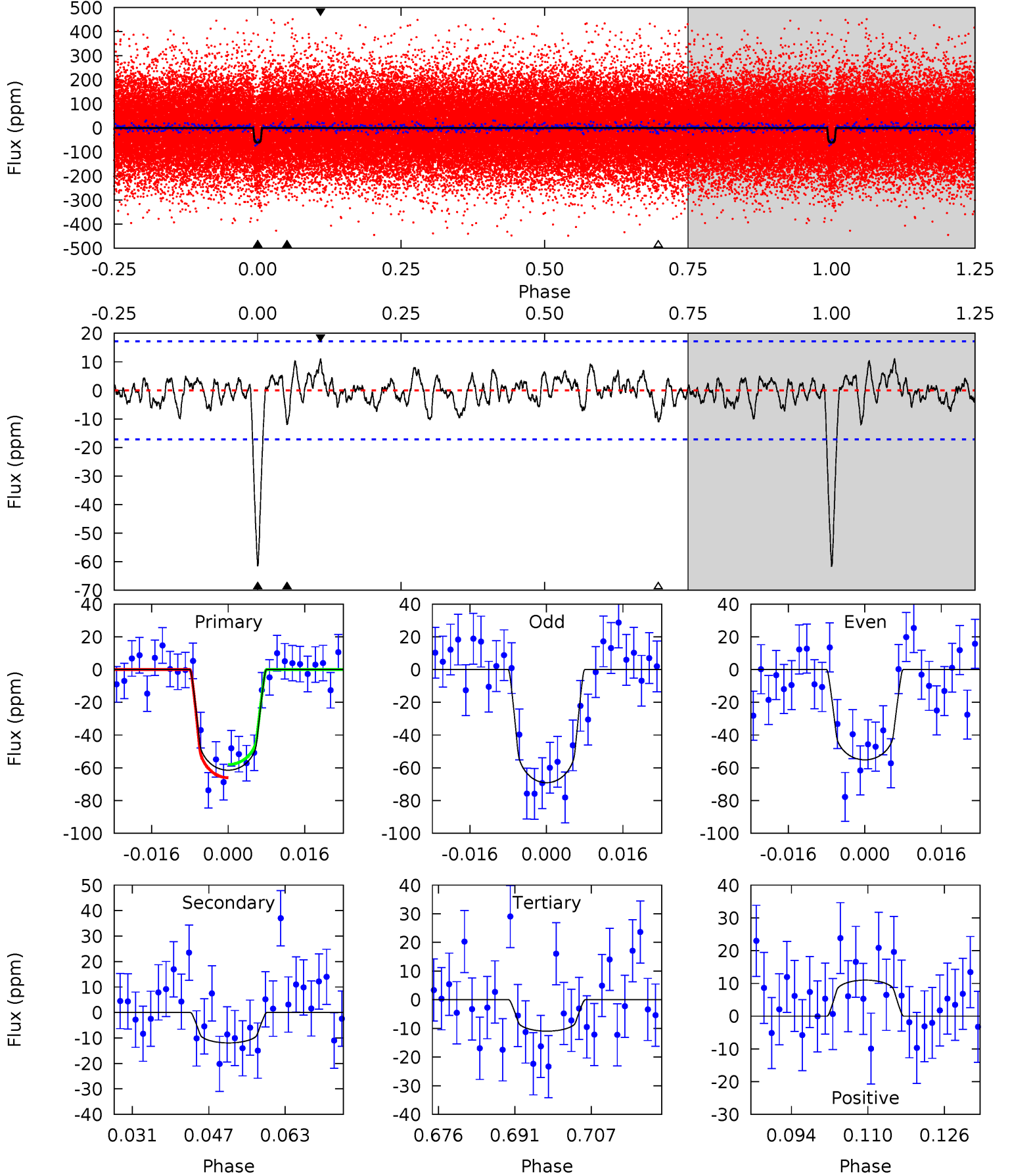
TCE 008581240-01 P= 10.768024 Days  $T_0=138.505583$  (BKJD)



# DV Model-Shift Uniqueness Test

008581240-01,  $P = 10.768012$  Days,  $E = 127.737046$  Days

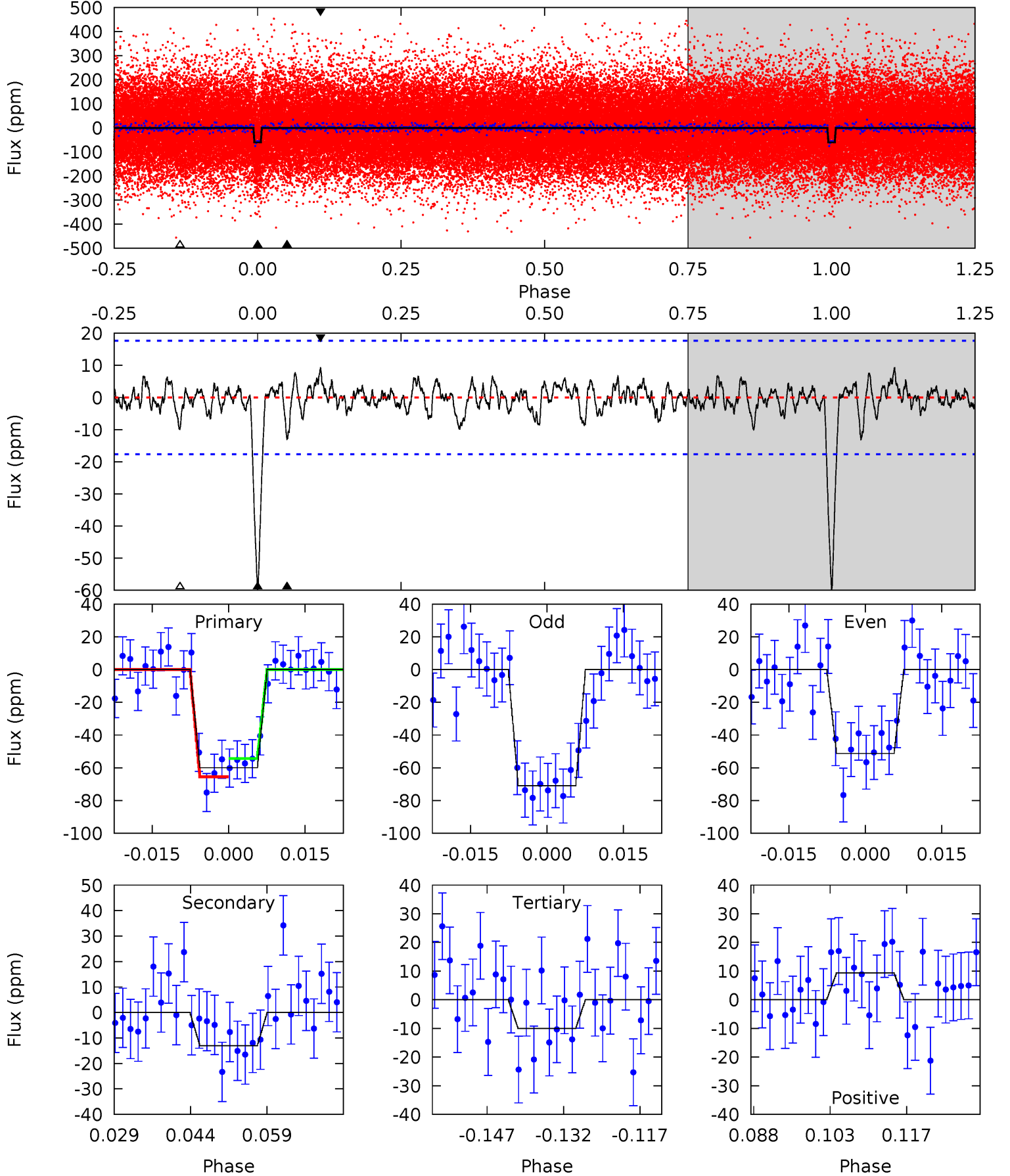
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.7	3.44	3.15	3.17	4.94	2.42	1.10	14.5	14.5	0.28	0.27	2.01	0.95	0.15	1.16



# Alt Model-Shift Uniqueness Test

008581240-01,  $P = 10.768024$  Days,  $E = 127.737559$  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
16.8	3.66	2.82	2.62	4.95	2.44	0.94	14.0	14.2	0.84	1.03	2.76	0.97	0.14	1.57



### Stellar Parameters For KIC 008581240

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5874^{+105}_{-117}$	$4.338^{+0.126}_{-0.115}$	$-0.120^{+0.150}_{-0.150}$	$1.096^{+0.160}_{-0.144}$	$0.954^{+0.074}_{-0.061}$	$1.020^{+0.583}_{-0.314}$
	+2%/-2%	+3%/-3%	+125%/-125%	+15%/-13%	+8%/-6%	+57%/-31%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 008581240-01 / KOI 3111.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-12 \pm 3$	$1.06^{+0.43}_{-0.44}$	$1233^{+54}_{-58}$	$3990^{+849}_{-511}$	$53^{+98}_{-31}$
Alt.	$-13 \pm 4$	$0.93^{+0.47}_{-0.42}$	$1235^{+59}_{-57}$	$4236^{+1238}_{-599}$	$72^{+172}_{-41}$

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



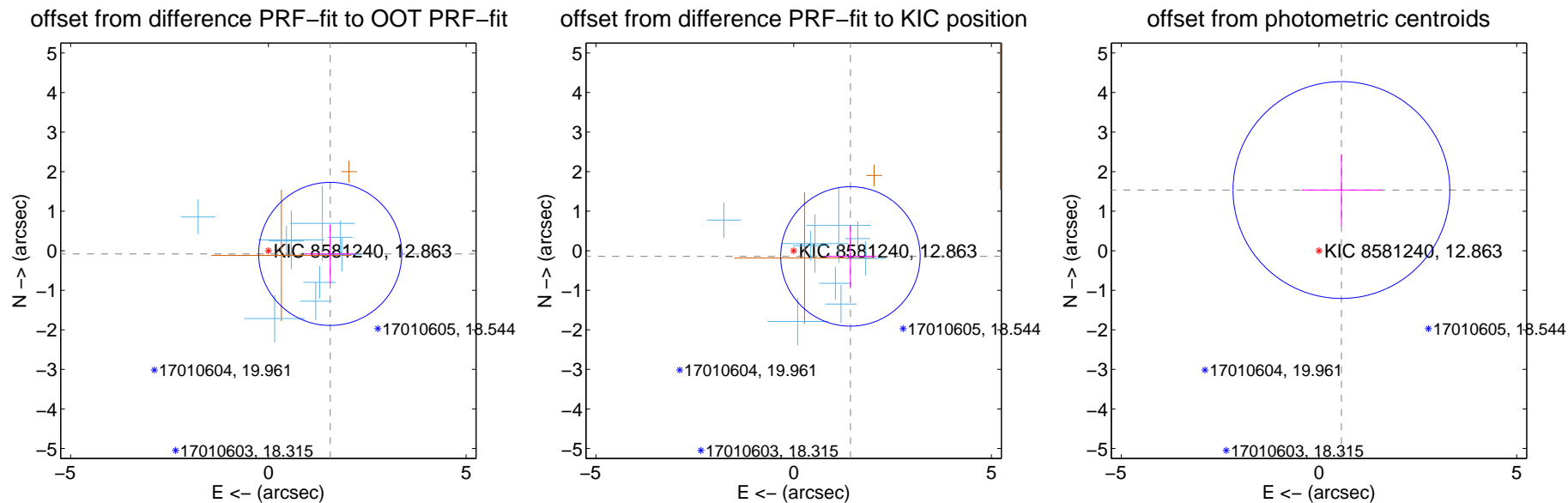
## DV Centroid Data

Supplemental centroid analysis for 008581240-01. Kepler magnitude: 12.86. Transit SNR 13.01

There are 9 quarters with good PRF difference image offsets

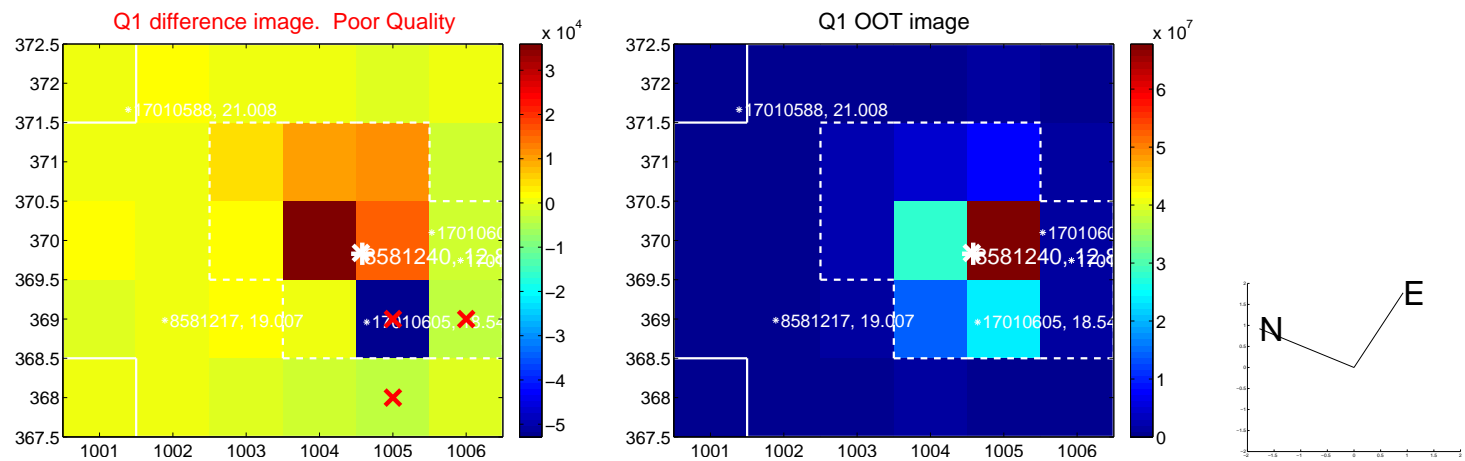
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.566 \pm 0.603$	2.60	$-1.564 \pm 0.636$	$-0.080 \pm 0.749$
PRF-fit source offset from KIC position	$1.442 \pm 0.588$	2.45	$-1.435 \pm 0.656$	$-0.144 \pm 0.779$
photometric centroid source offset	$1.64 \pm 0.91$	1.79	$-0.57 \pm 1.01$	$1.53 \pm 0.90$

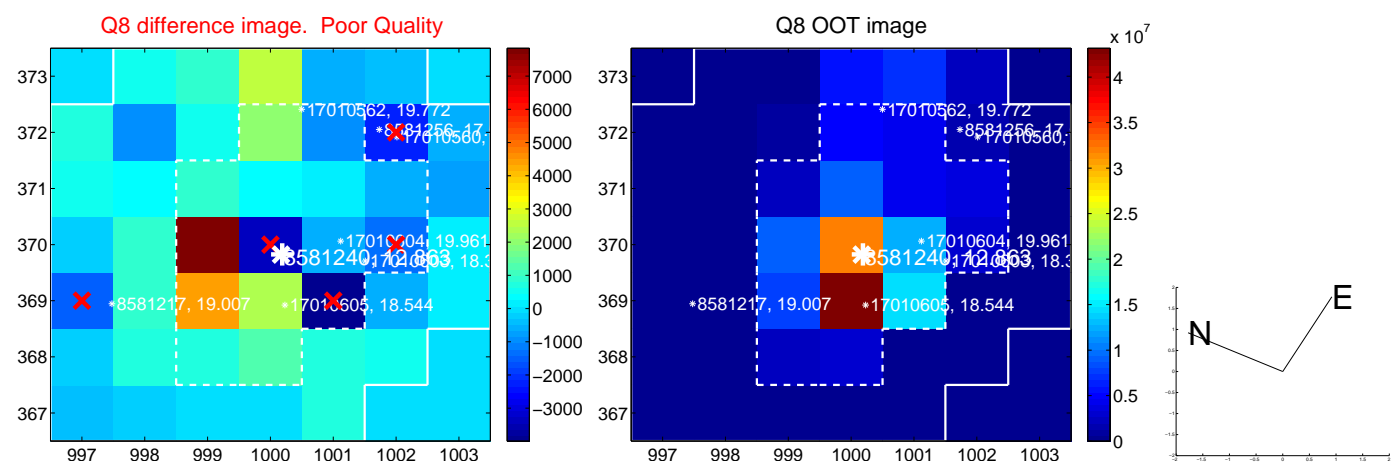
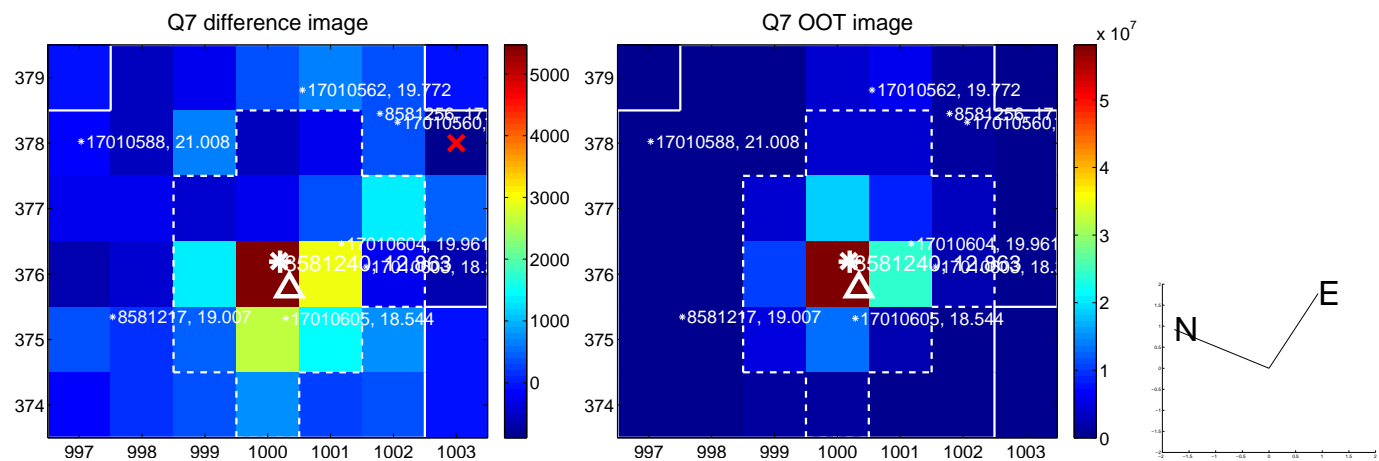
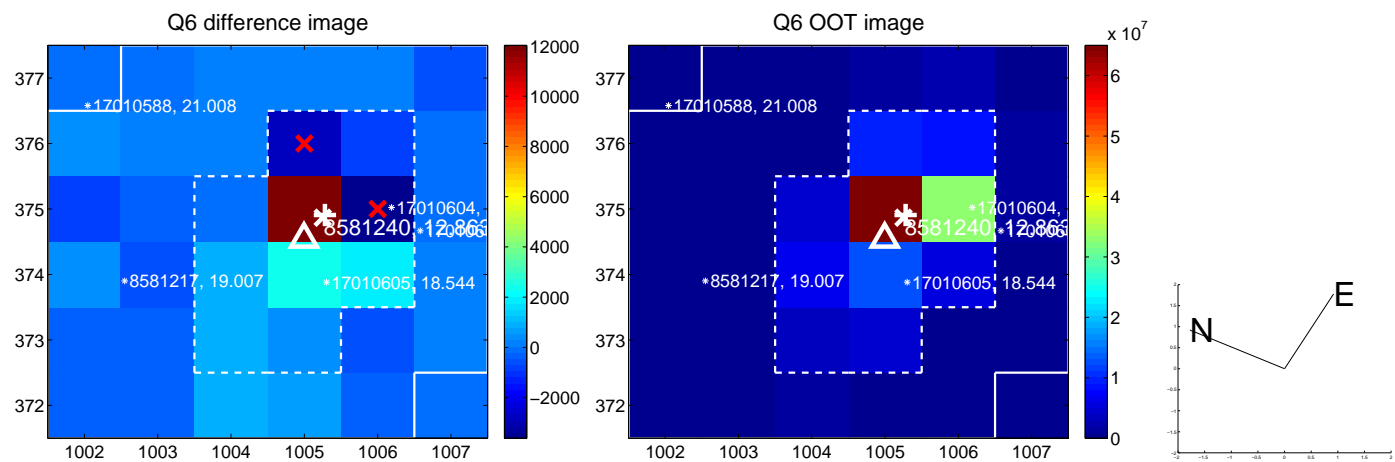
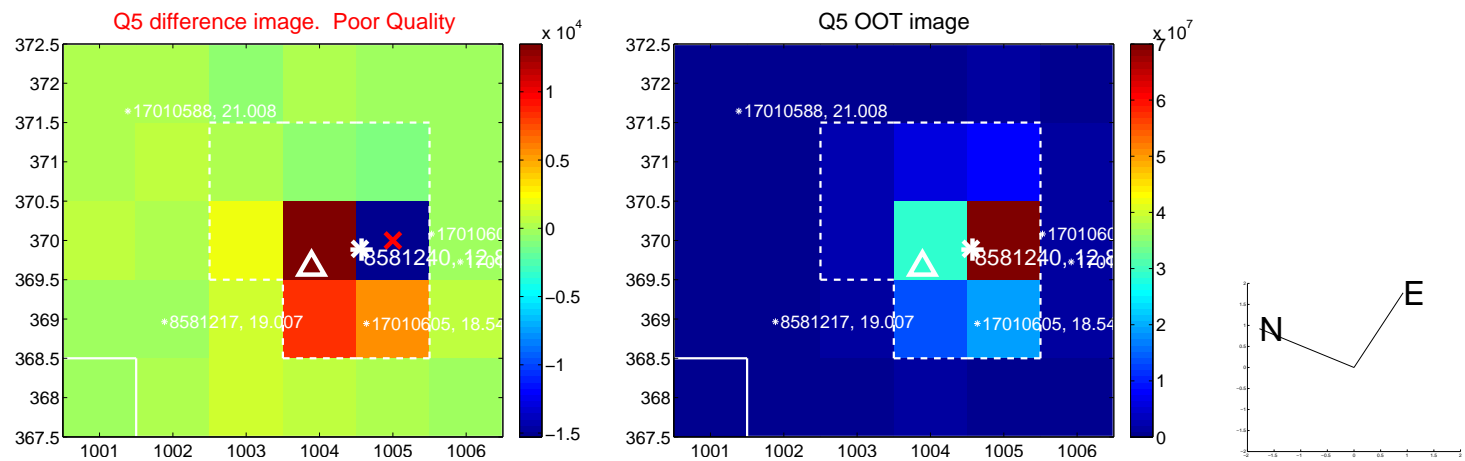


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

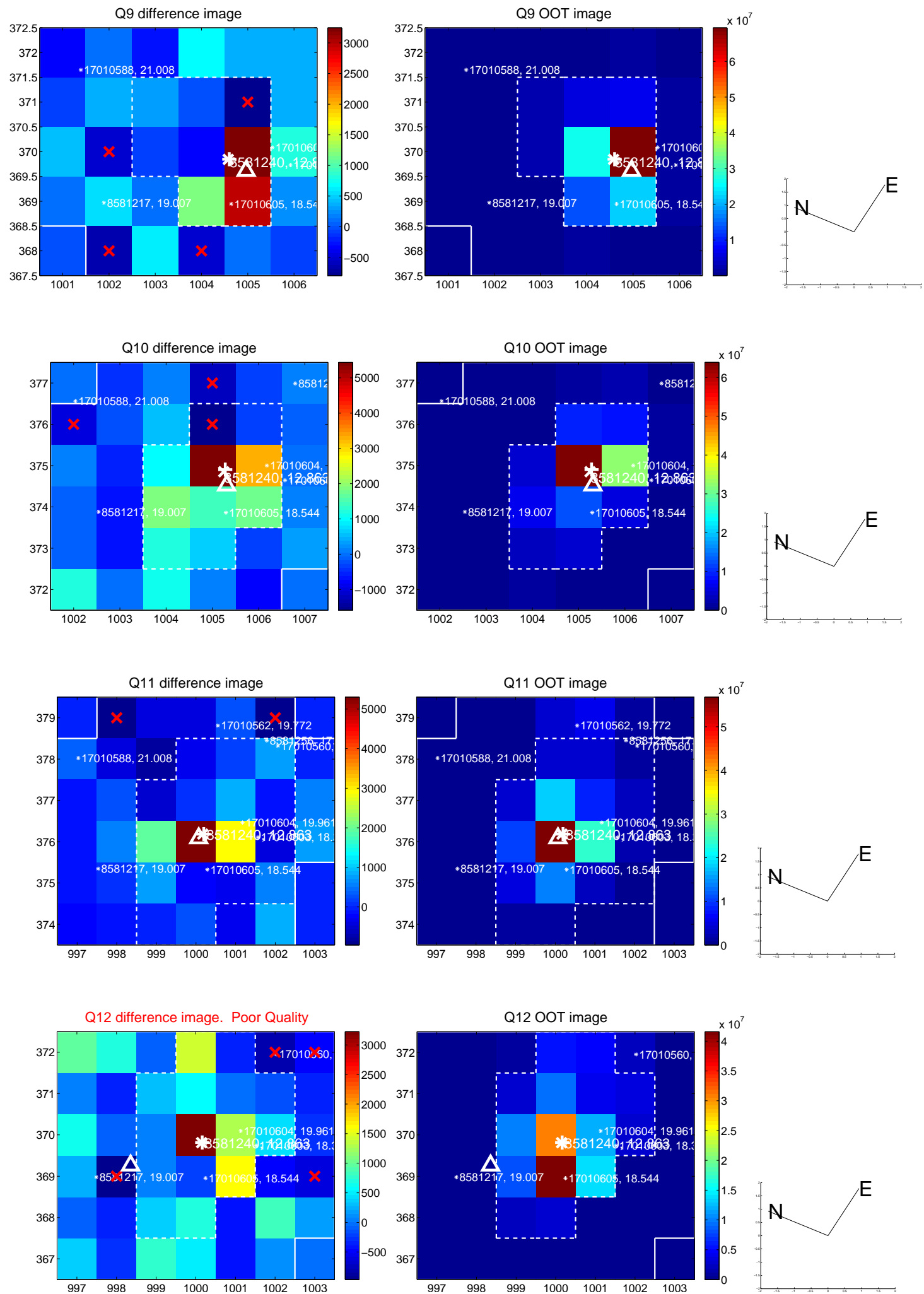
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



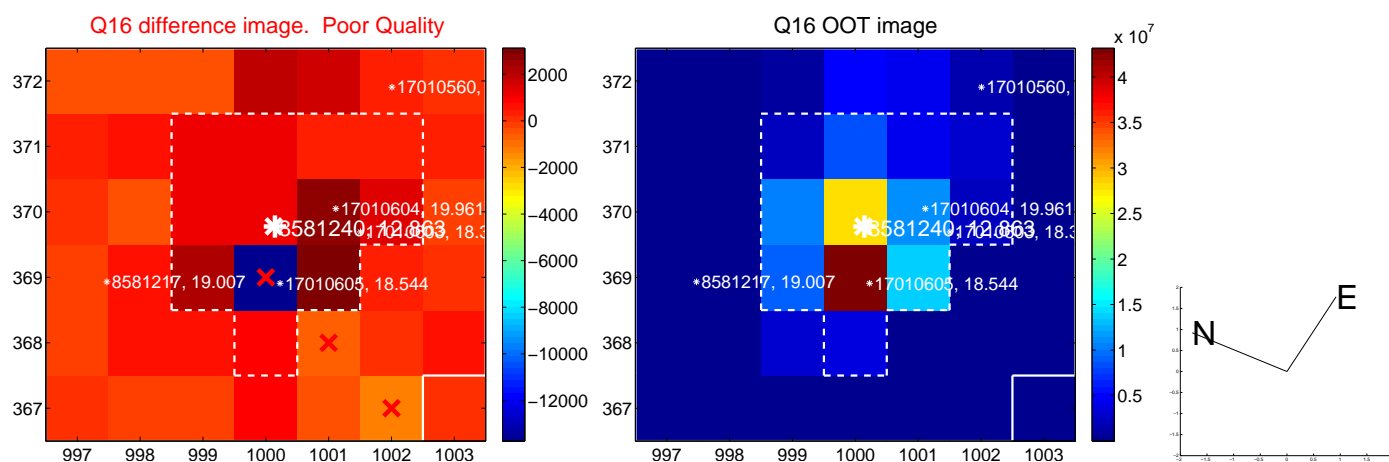
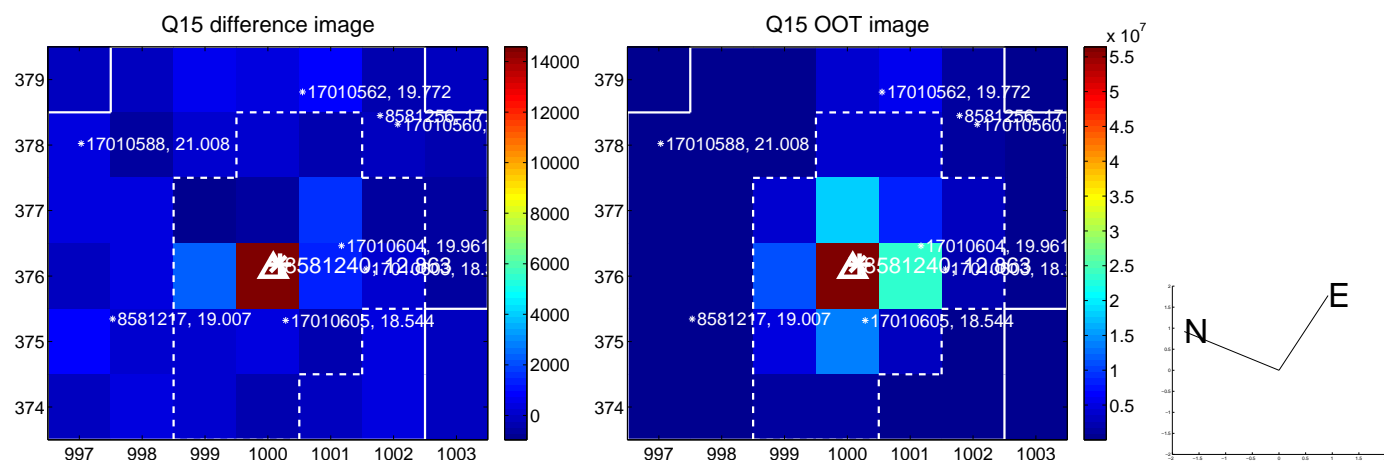
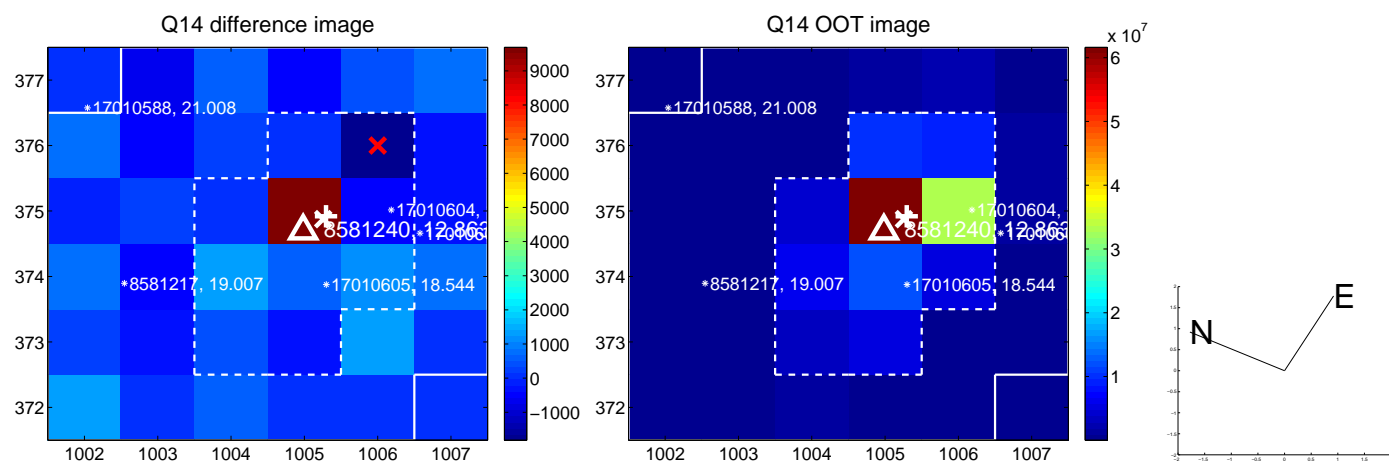
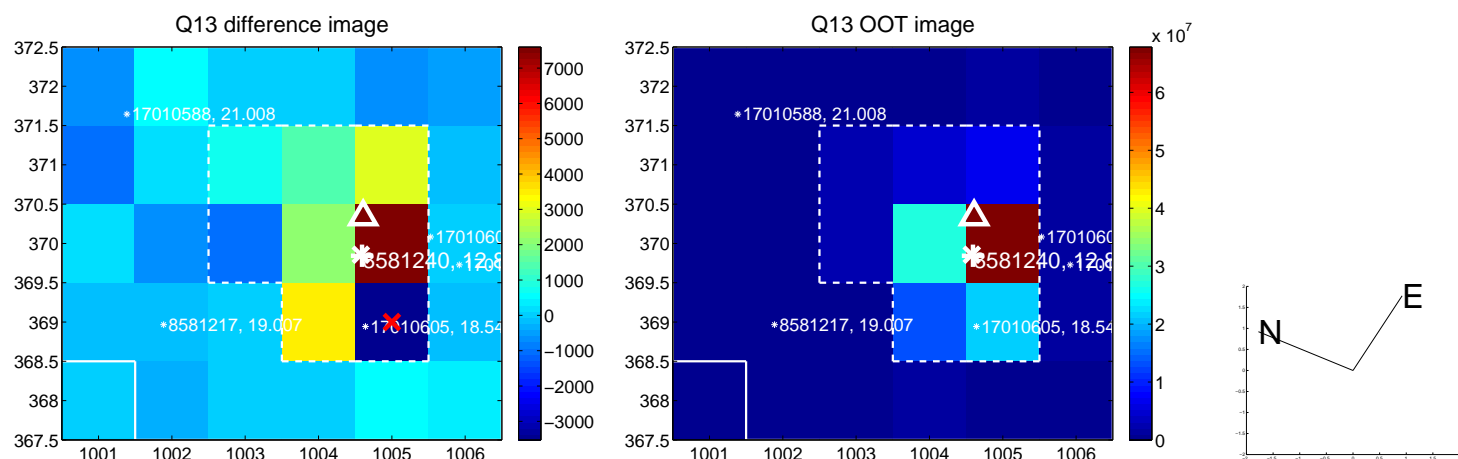
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

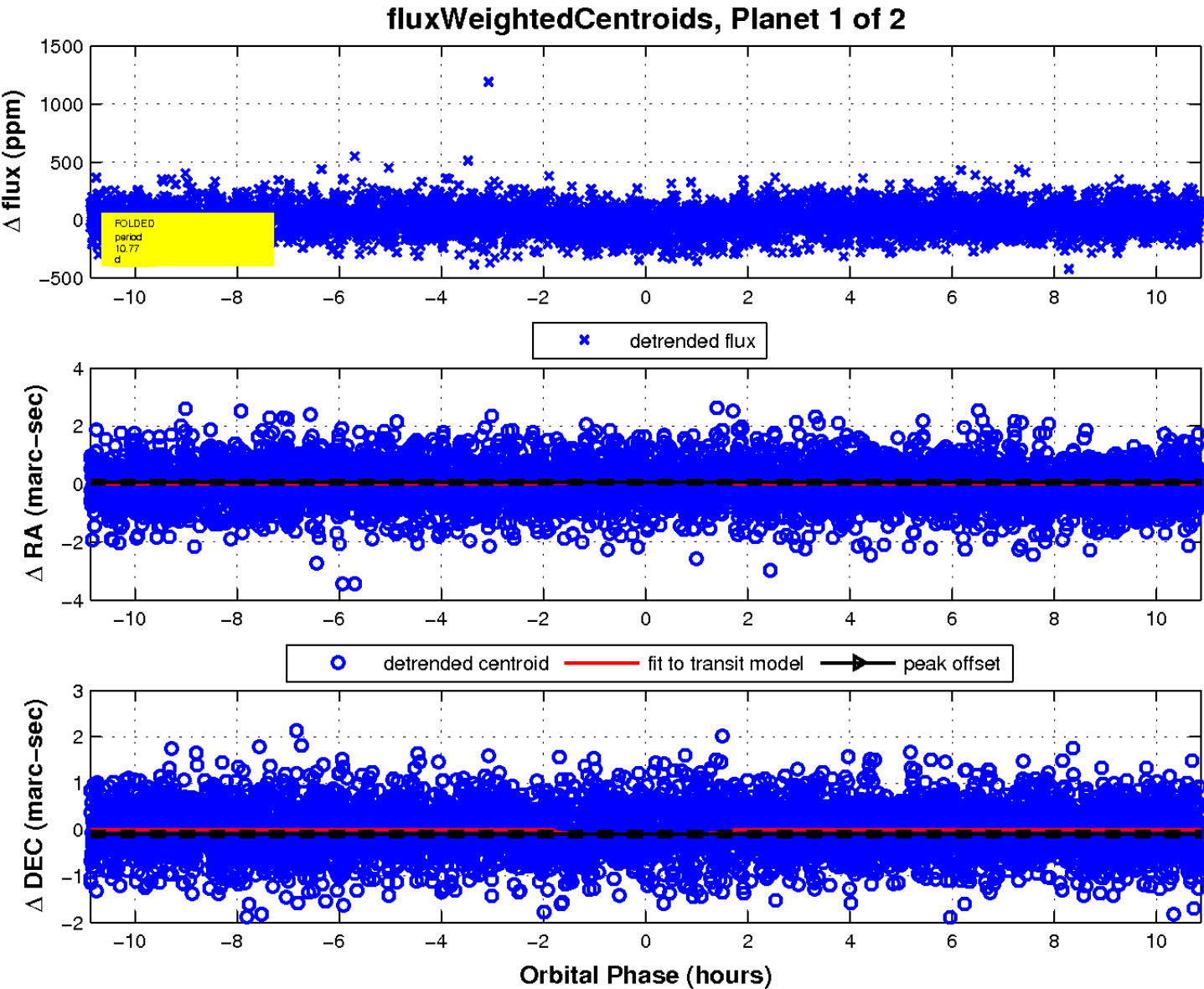
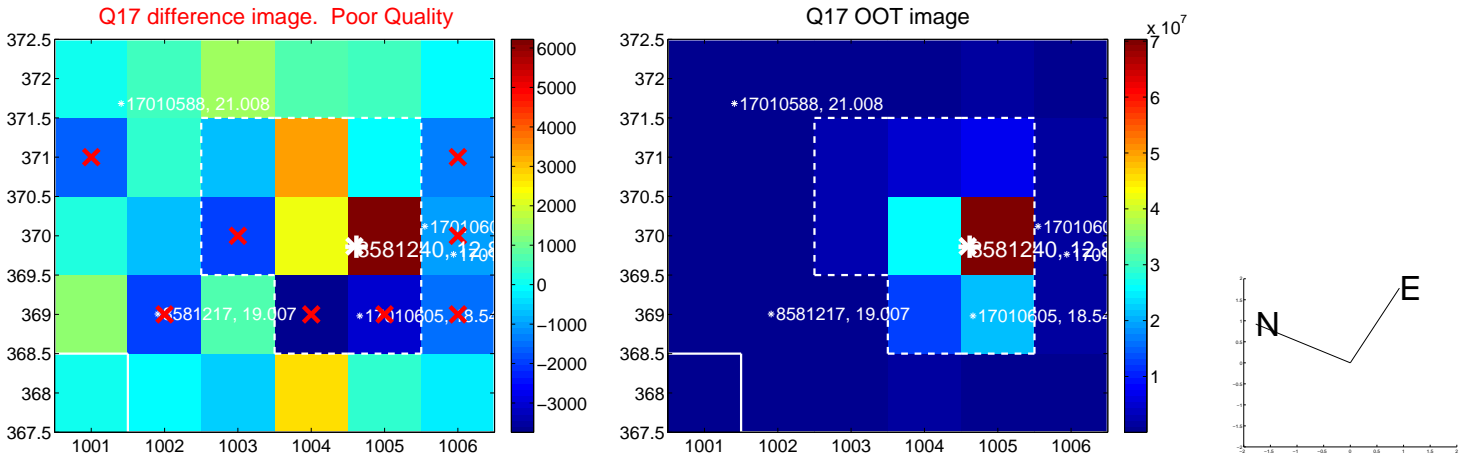


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



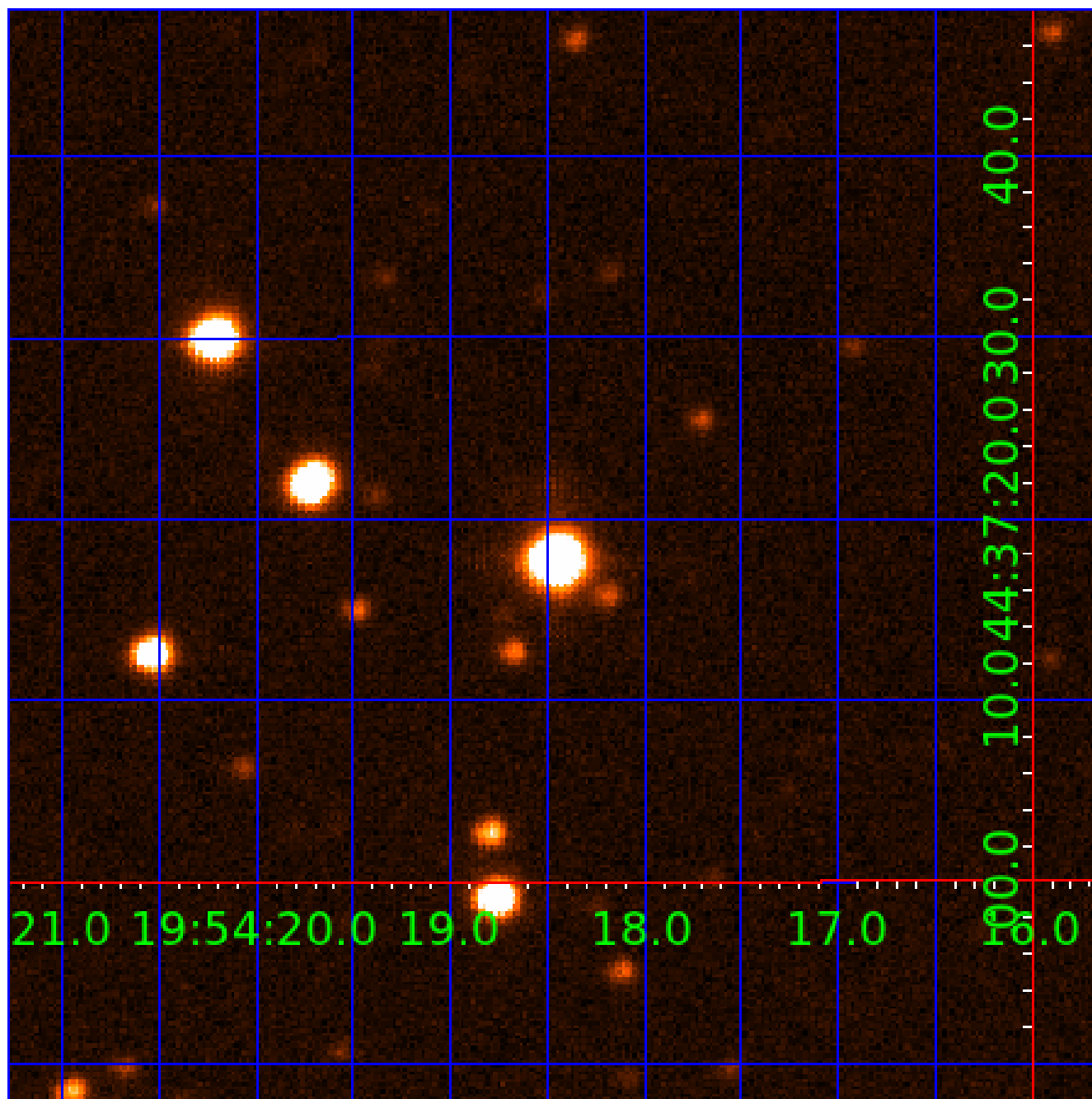


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008581240

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008581240-01	OBS	3111.01	10.768012	138.505058	66.5	3.625	11.9	13.0	1.10	5874	1.05	145.10
008581240-02	OBS	3111.02	4.328529	132.510210	38.1	2.971	10.0	10.9	1.10	5874	0.81	489.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008581240-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008581240-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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

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

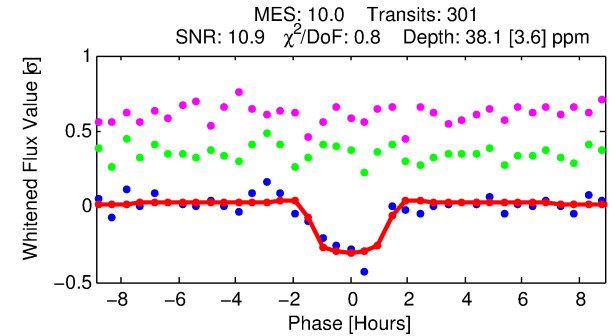
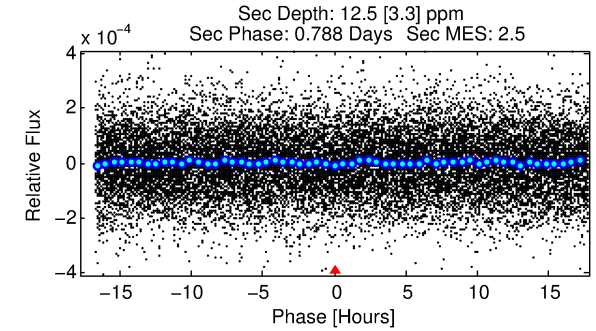
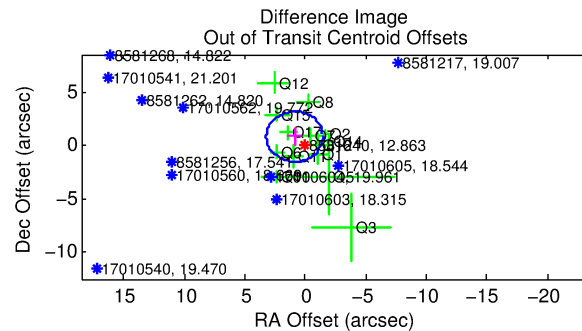
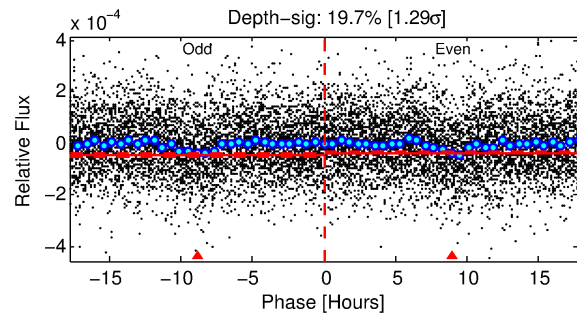
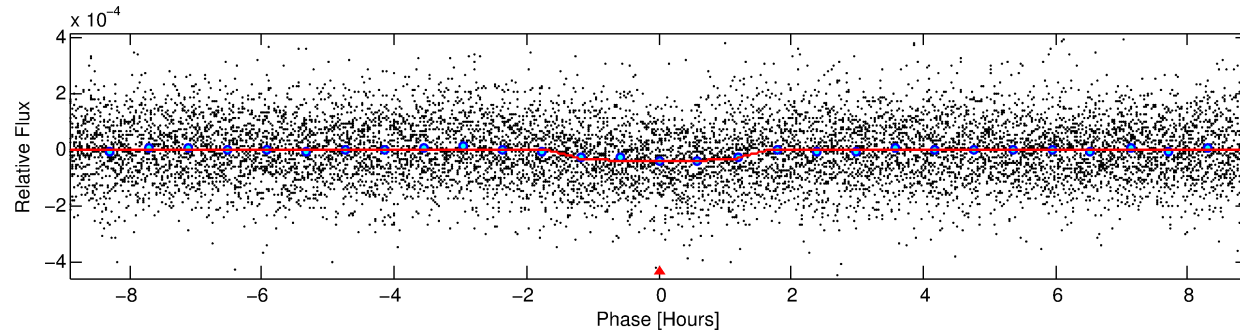
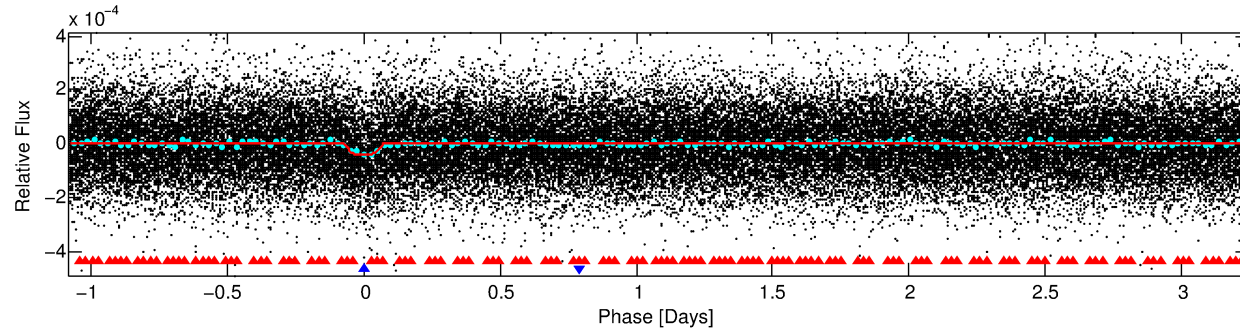
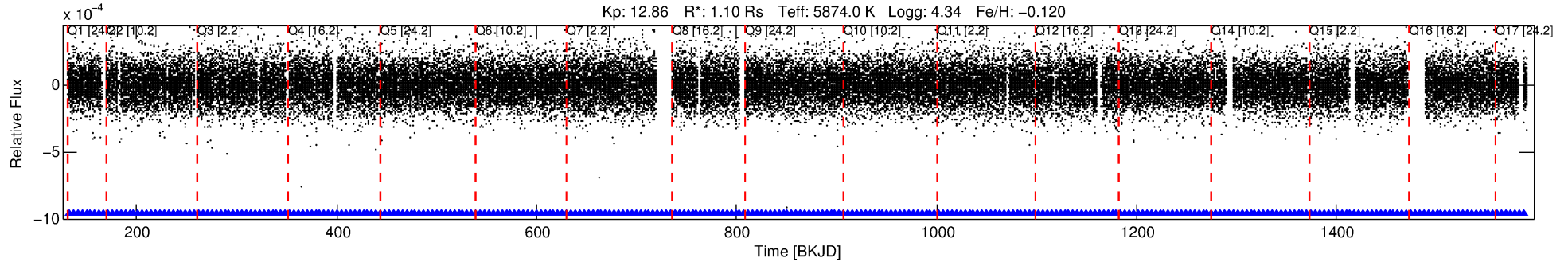
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008581240-02

No Significant Match Found

# DV One-Page Summary

KIC: 8581240 Candidate: 2 of 2 Period: 4.329 d  
KOI: K03111.02 Corr: 0.954



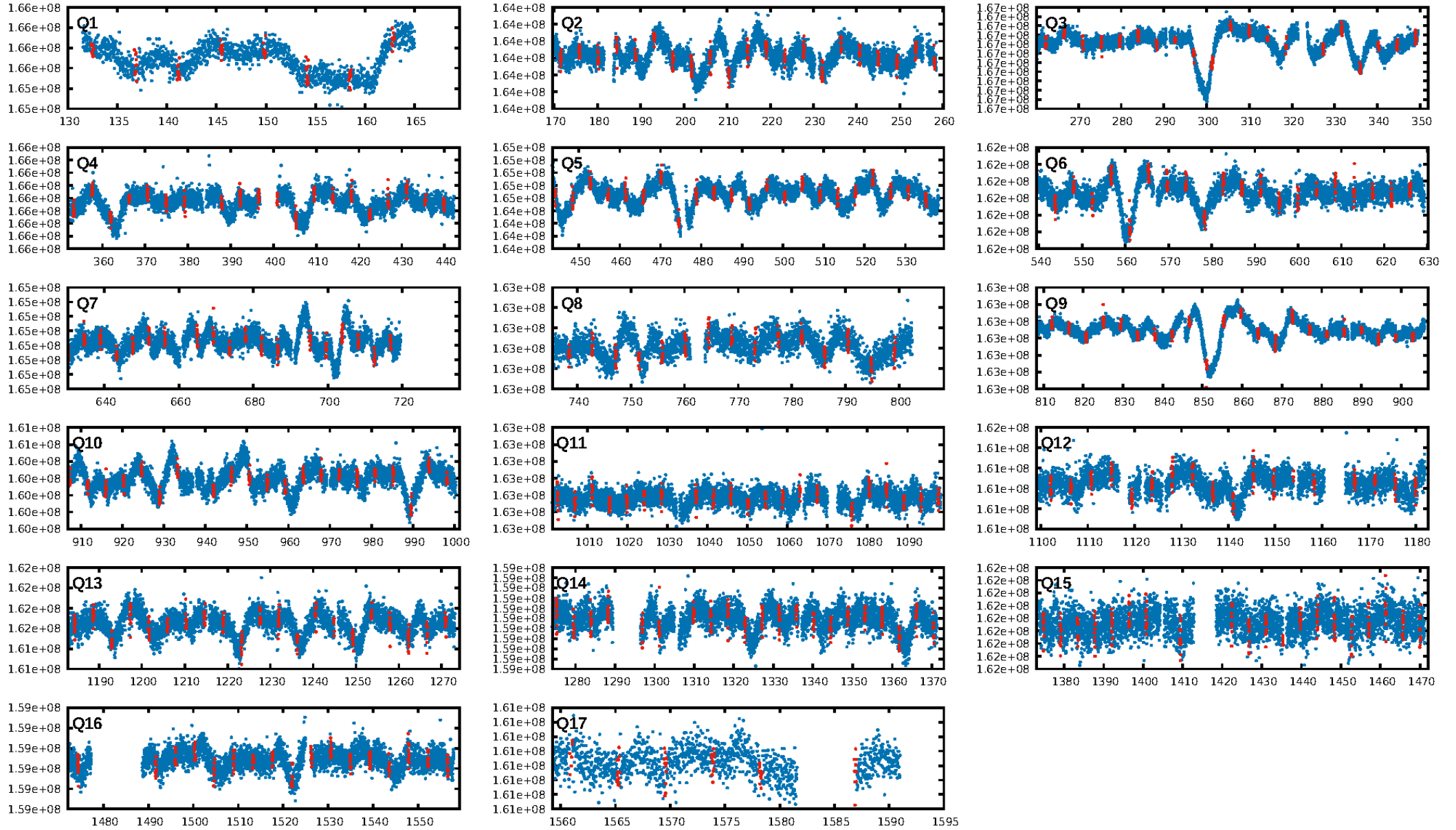
## DV Fit Results:

Period = 4.32853 [0.00003] d  
Epoch = 132.5102 [0.0042] BKJD  
Rp/R\* = 0.0067 [0.0032]  
a/R\* = 4.96 [11.62]  
b = 0.91 [0.49]  
Seff = 489.08 [112.84]  
Teq = 1199 [69] K  
Rp = 0.81 [0.40] Re  
a = 0.0512 [0.0070] AU  
Ag = 27.86 [28.36] [0.95 $\sigma$ ]  
Teffp = 4259 [1063] K [2.87 $\sigma$ ]

## DV Diagnostic Results:

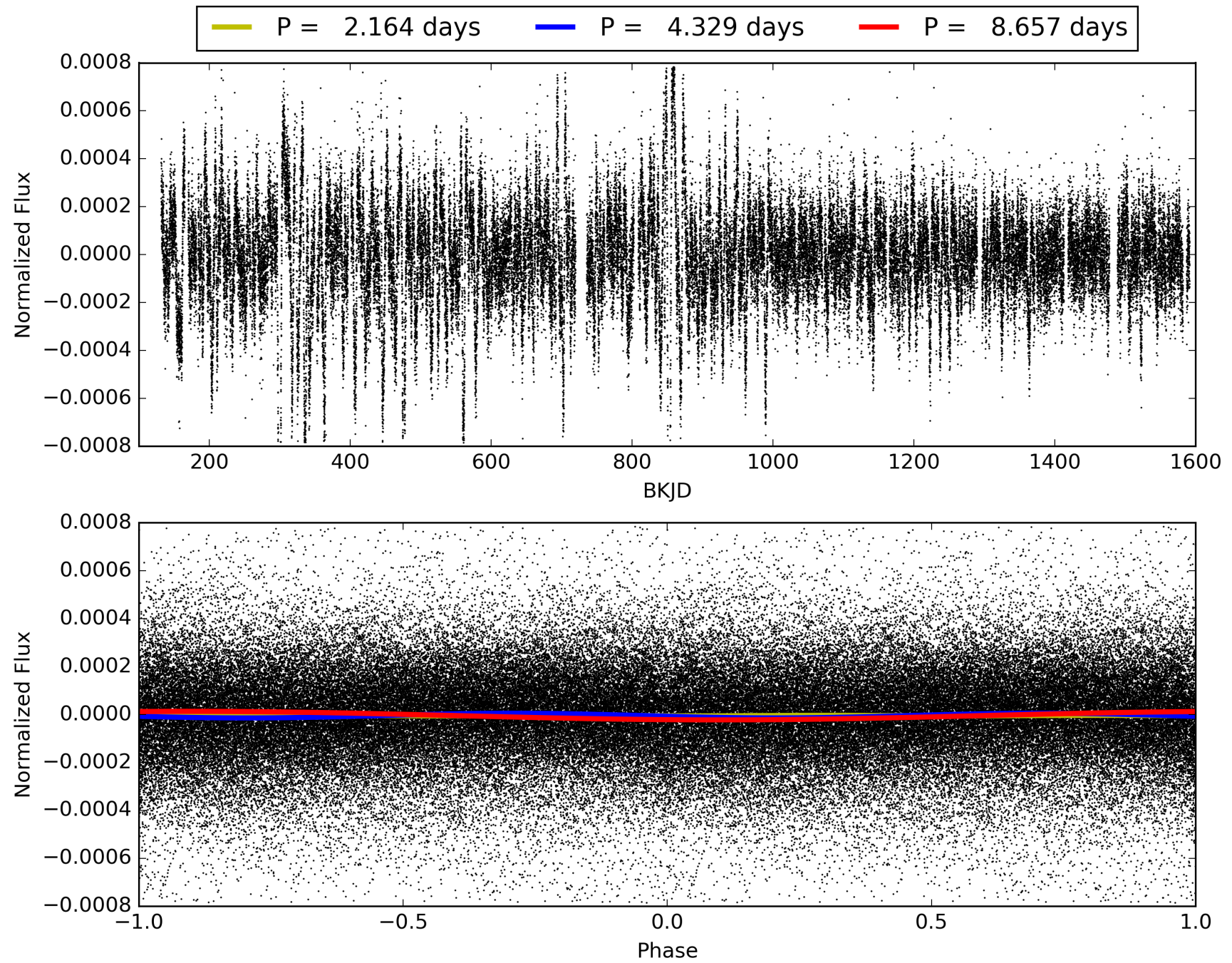
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [32.98 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.45e-23  
RollingBand-fgt: 1.00 [287/287]  
GhostDiagnostic-chr: 81.15  
Centroid-sig: 10.4%  
Centroid-so: 1.449 arcsec [1.24 $\sigma$ ]  
OotOffset-rm: 1.206 arcsec [1.55 $\sigma$ ]  
KicOffset-rm: 0.776 arcsec [0.92 $\sigma$ ]  
OotOffset-st: 4/4/3/3 [14]  
KicOffset-st: 4/4/3/3 [14]  
DiffImageQuality-fgm: 0.57 [8/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 00581240-02, PDC Light Curves



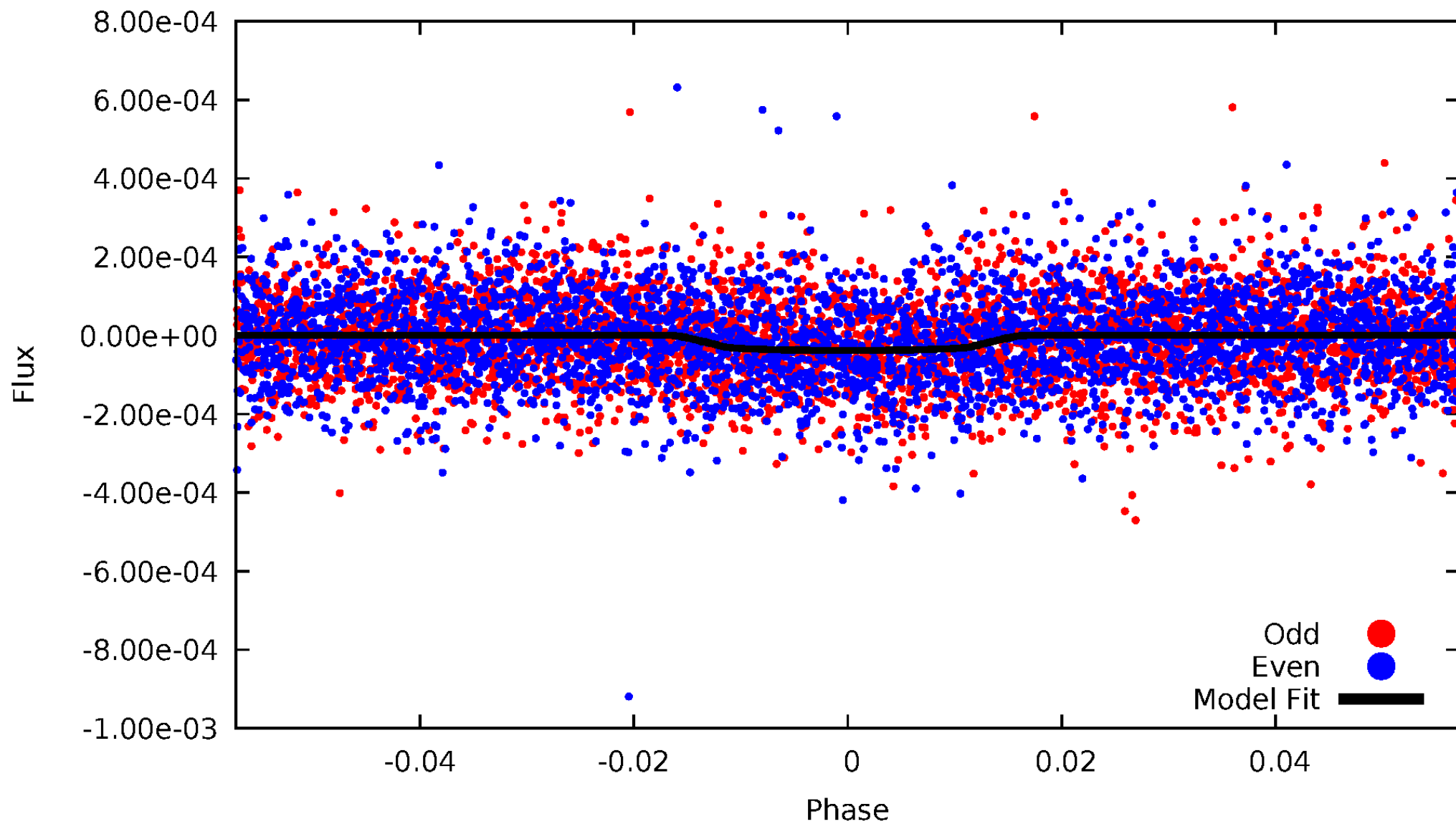


TCE 008581240-02



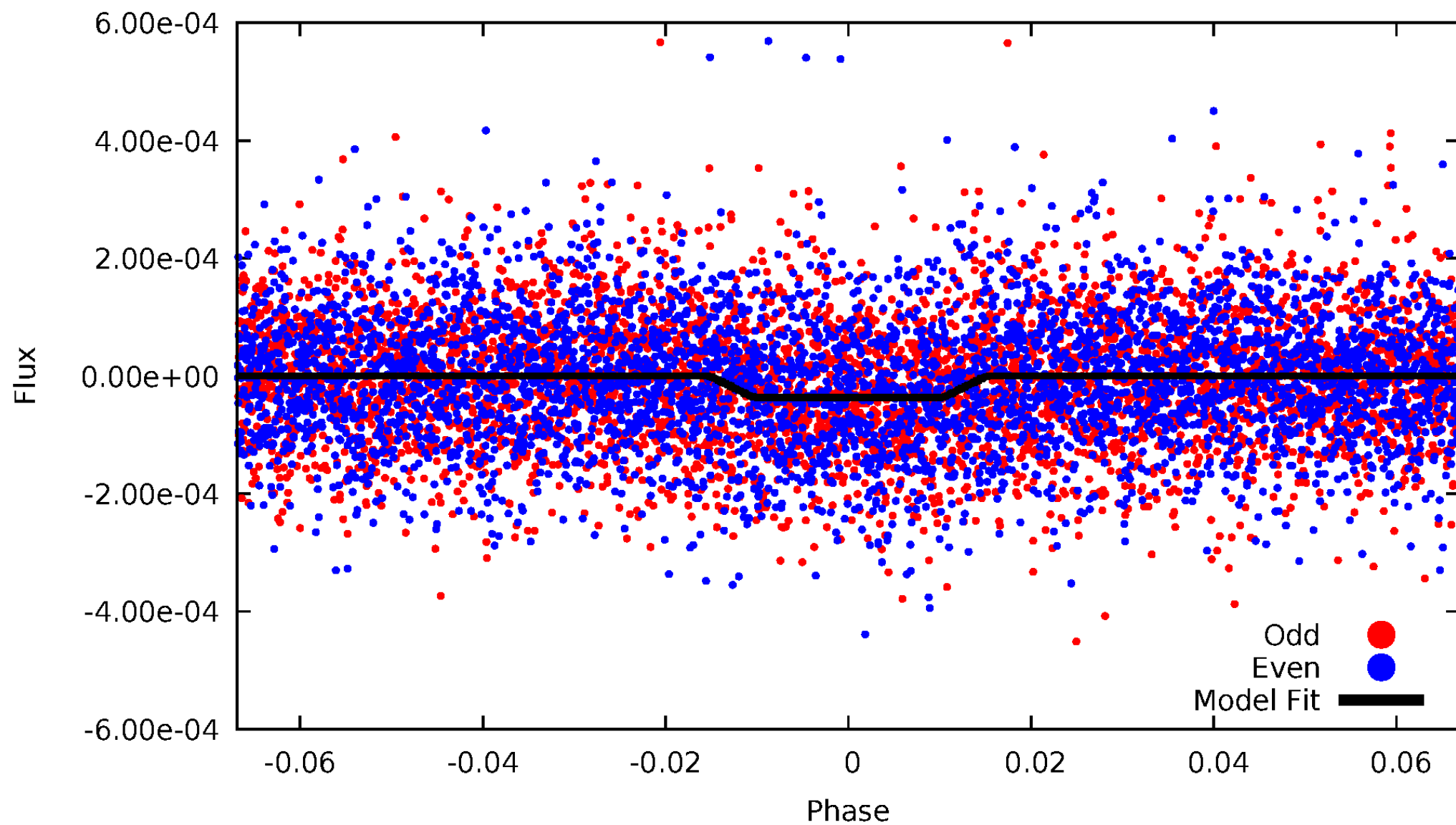
# DV Odd/Even

TCE 008581240-02



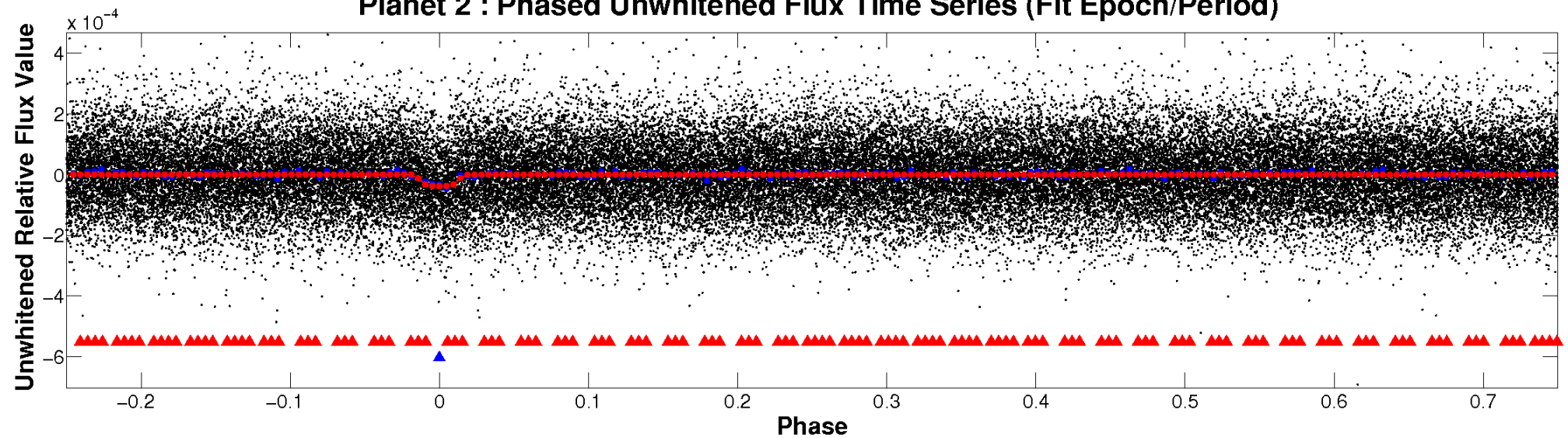
# ALT Odd/Even

TCE 008581240-02

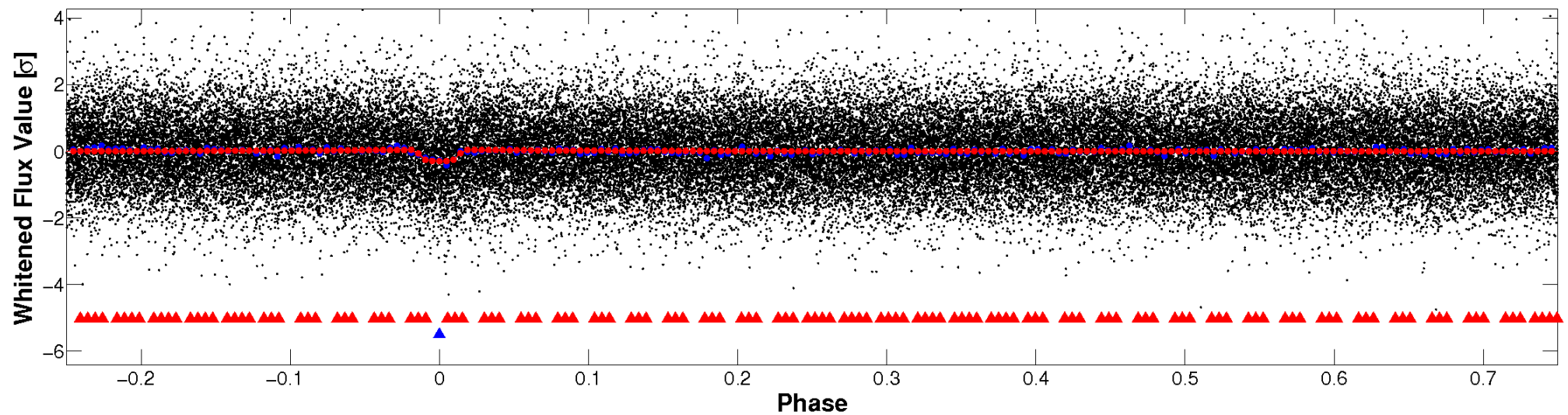


# Non-Whitened Vs. Whitened Light Curve

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



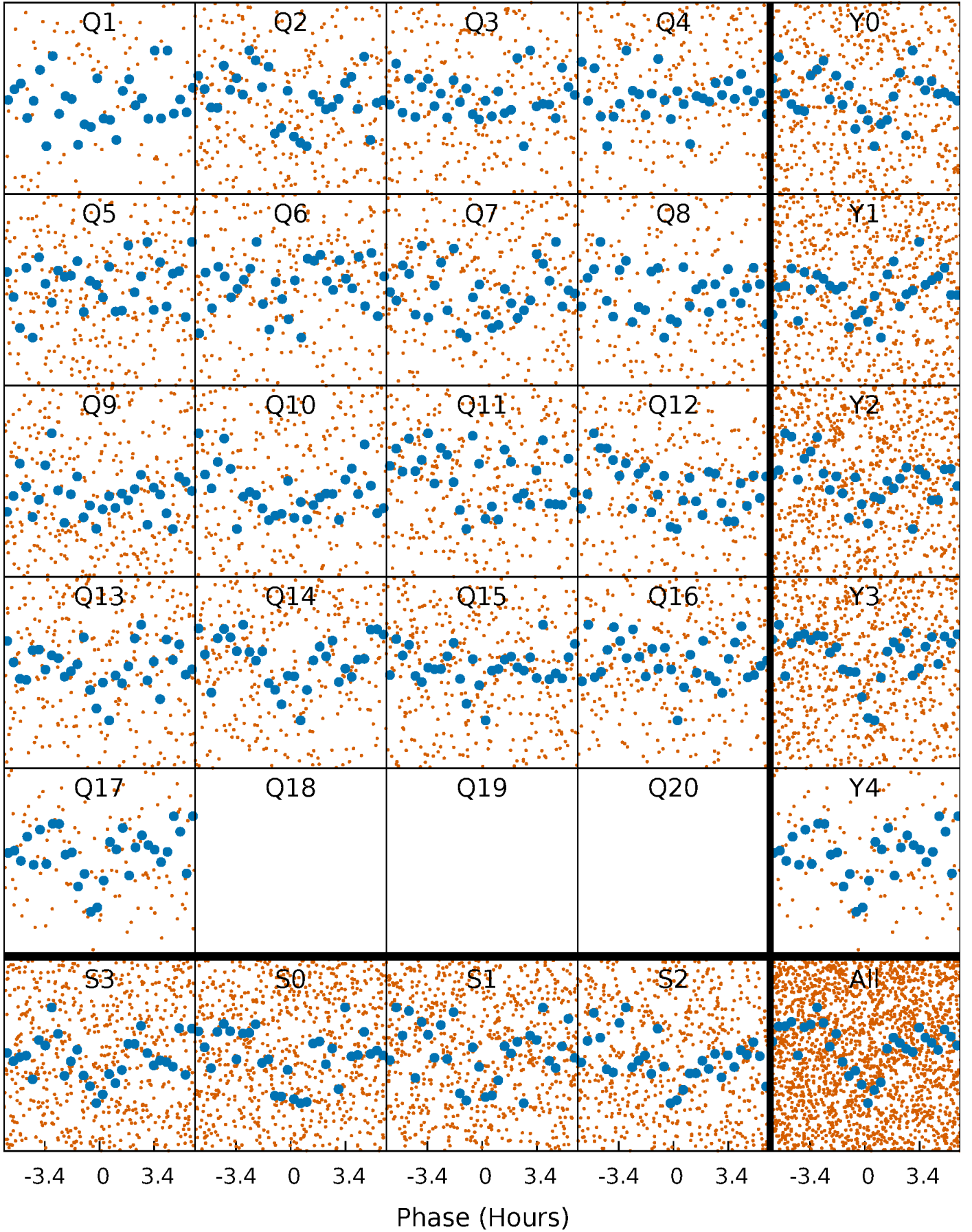
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





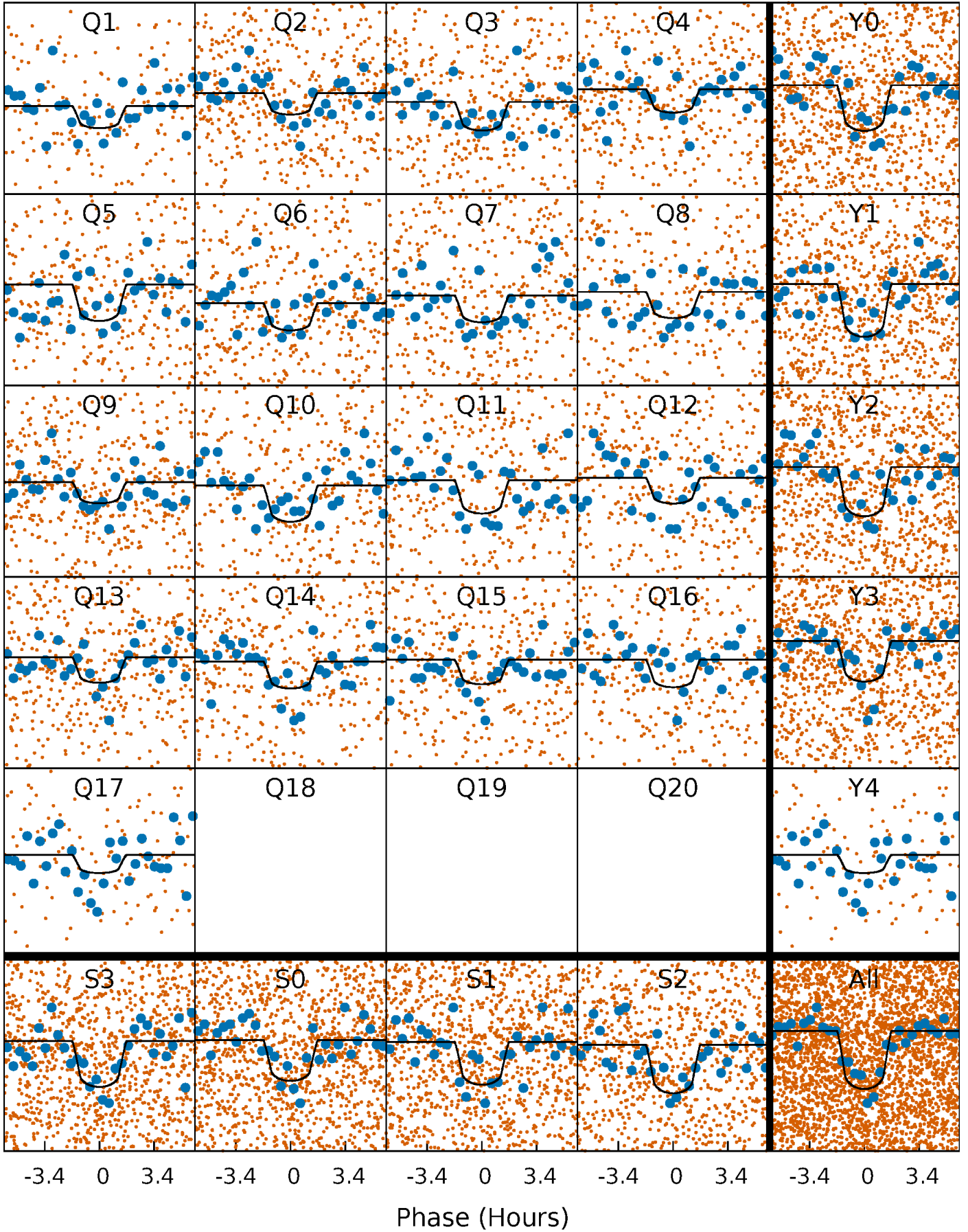
# PDC Quarter-Phased Transit Curves

TCE 008581240-02   P= 4.328529 Days    $T_0=132.510210$  (BKJD)



# DV Quarter-Phased Transit Curves

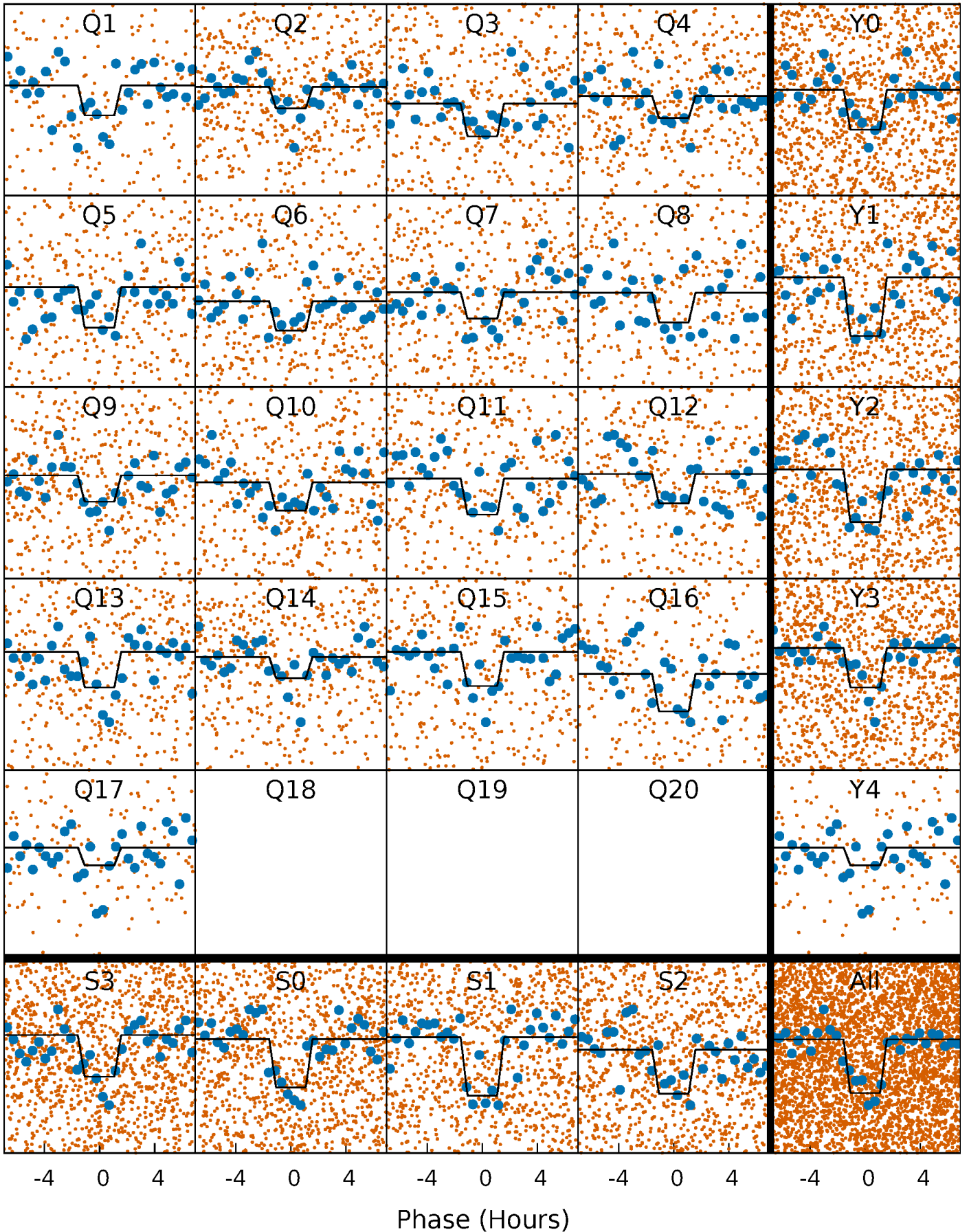
TCE 008581240-02   P= 4.328529 Days    $T_0=132.510210$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

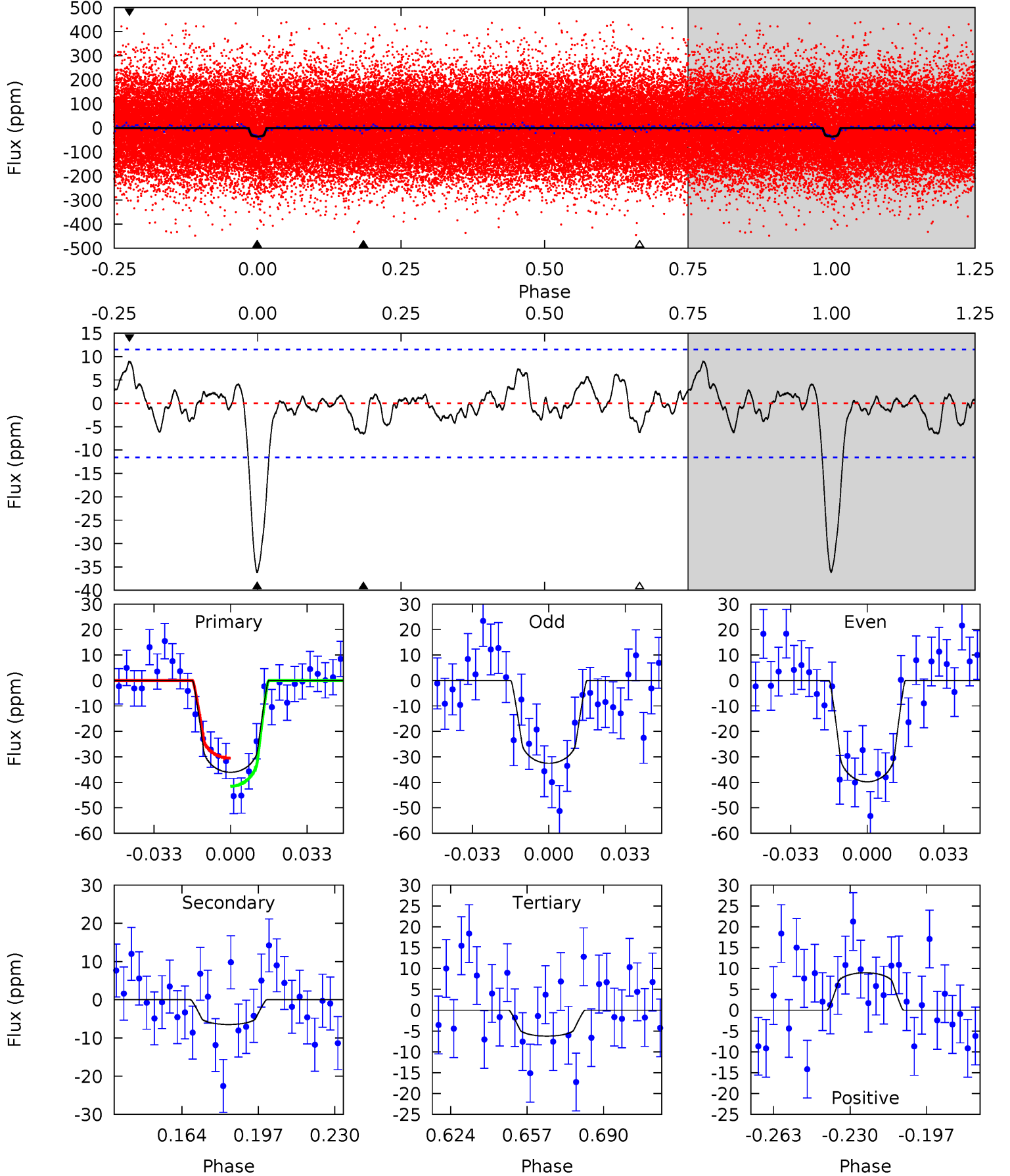
TCE 008581240-02   P= 4.328454 Days    $T_0=132.518642$  (BKJD)



# DV Model-Shift Uniqueness Test

008581240-02, P = 4.328529 Days, E = 128.181681 Days

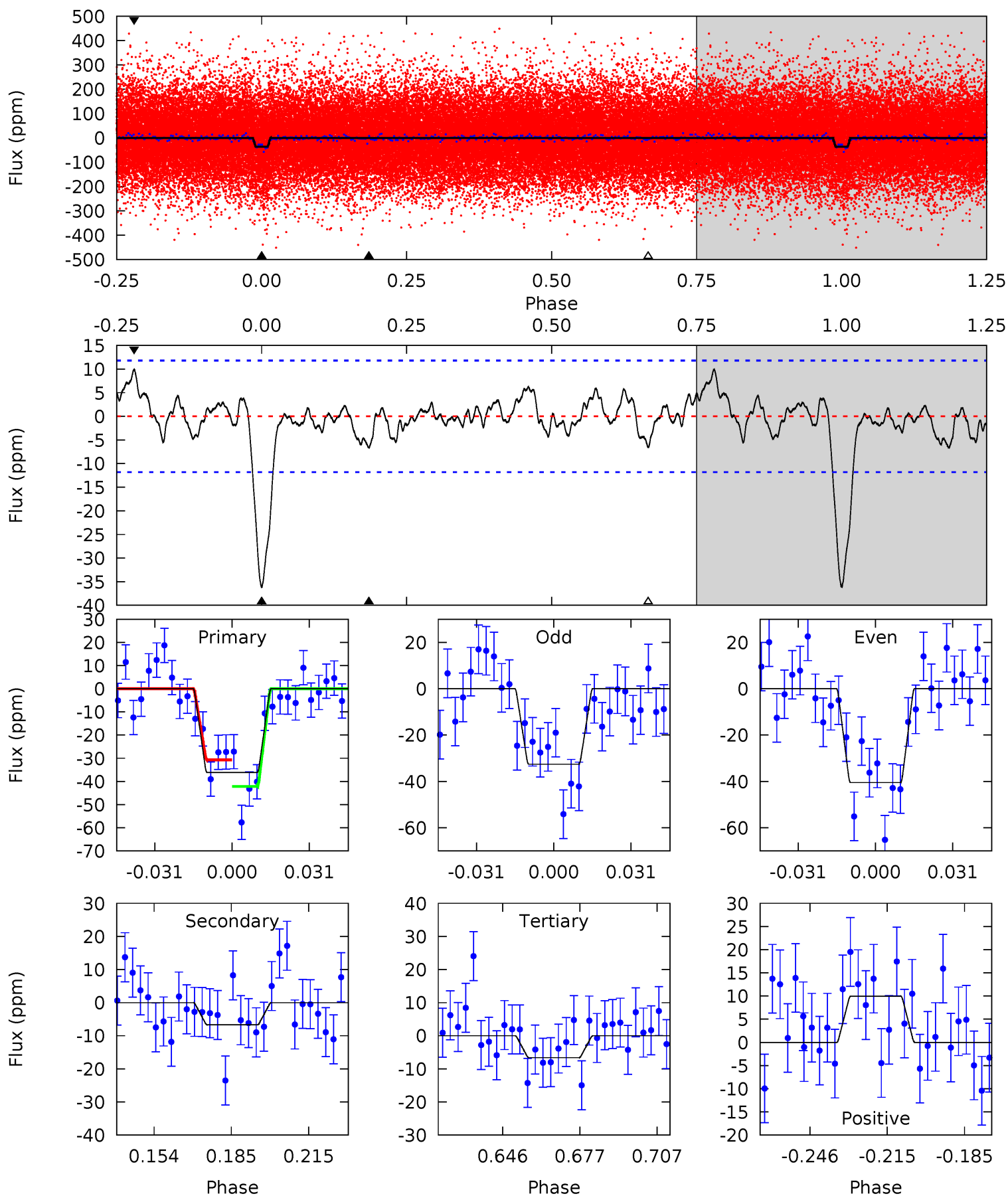
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	2.69	2.58	3.73	4.79	2.13	1.17	12.4	11.2	0.11	-1.04	1.51	0.99	0.20	2.30



# Alt Model-Shift Uniqueness Test

008581240-02, P = 4.328454 Days, E = 128.190188 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
14.7	2.72	2.70	4.05	4.81	2.16	1.15	12.0	10.7	0.02	-1.33	1.61	0.93	0.22	2.33



### Stellar Parameters For KIC 008581240

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5874^{+105}_{-117}$	$4.338^{+0.126}_{-0.115}$	$-0.120^{+0.150}_{-0.150}$	$1.096^{+0.160}_{-0.144}$	$0.954^{+0.074}_{-0.061}$	$1.020^{+0.583}_{-0.314}$
	+2%/-2%	+3%/-3%	+125%/-125%	+15%/-13%	+8%/-6%	+57%/-31%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 008581240-02 / KOI 3111.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-6 \pm 2$	$0.83^{+0.39}_{-0.38}$	$1676^{+75}_{-72}$	$3895^{+1039}_{-564}$	$13^{+33}_{-8}$
Alt.	$-7 \pm 2$	$0.73^{+0.41}_{-0.37}$	$1672^{+75}_{-77}$	$4094^{+1352}_{-675}$	$18^{+59}_{-12}$

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

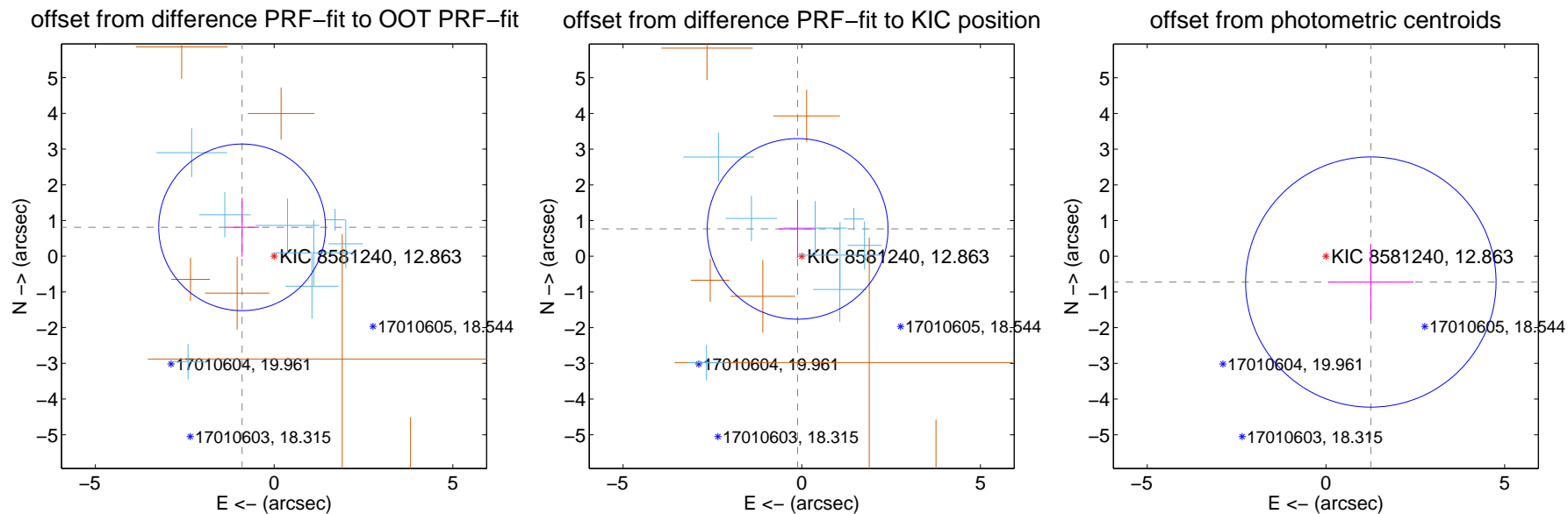
## DV Centroid Data

Supplemental centroid analysis for 008581240-02. Kepler magnitude: 12.86. Transit SNR 10.93

There are 8 quarters with good PRF difference image offsets

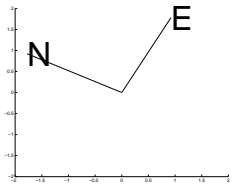
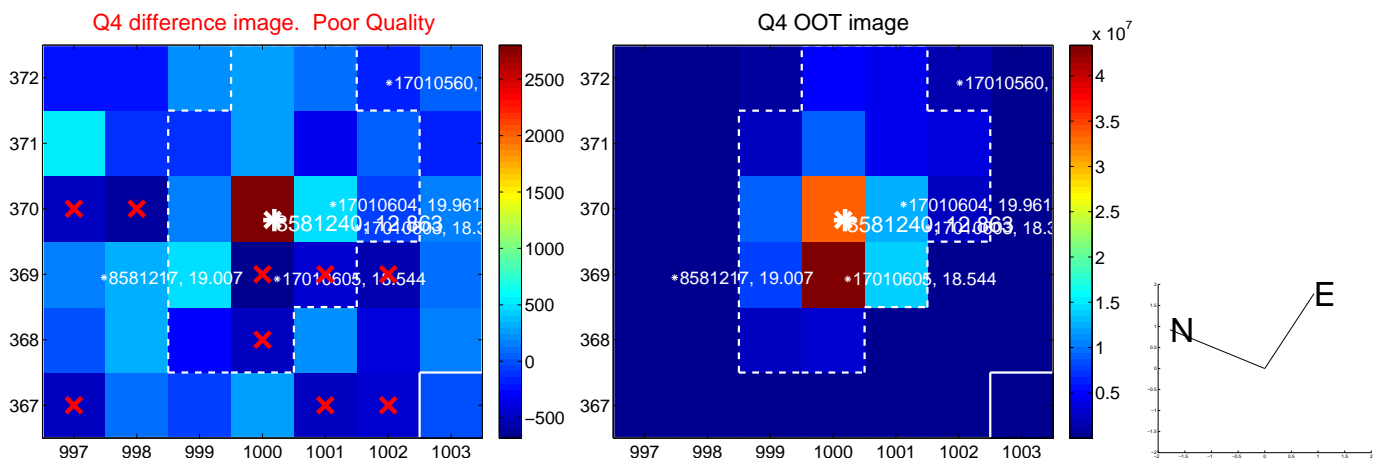
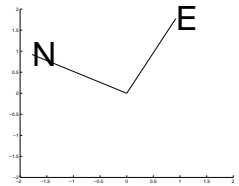
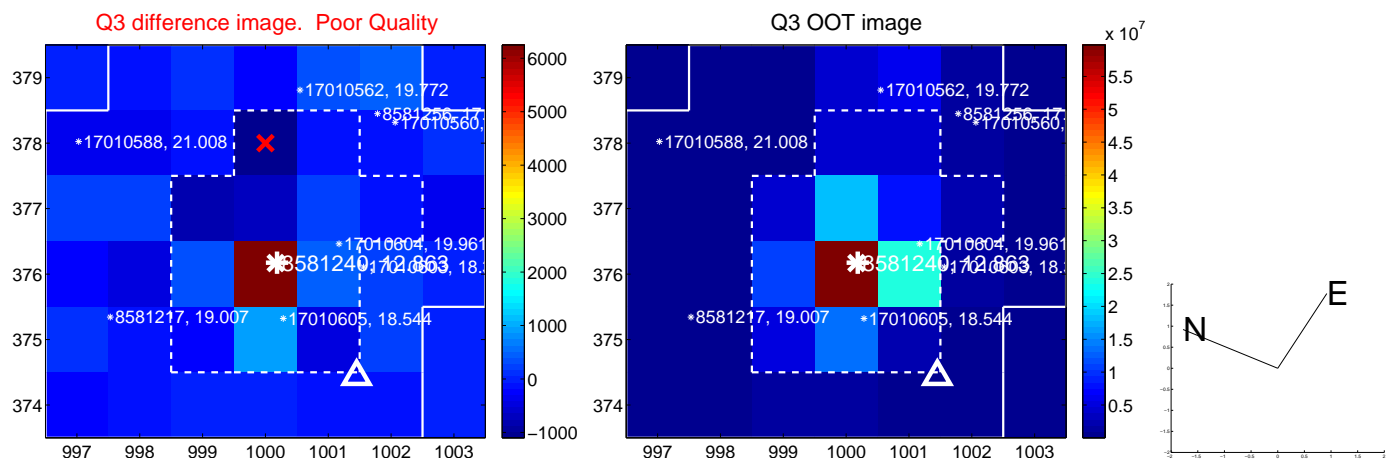
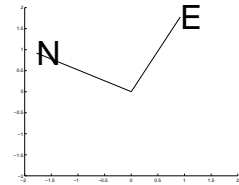
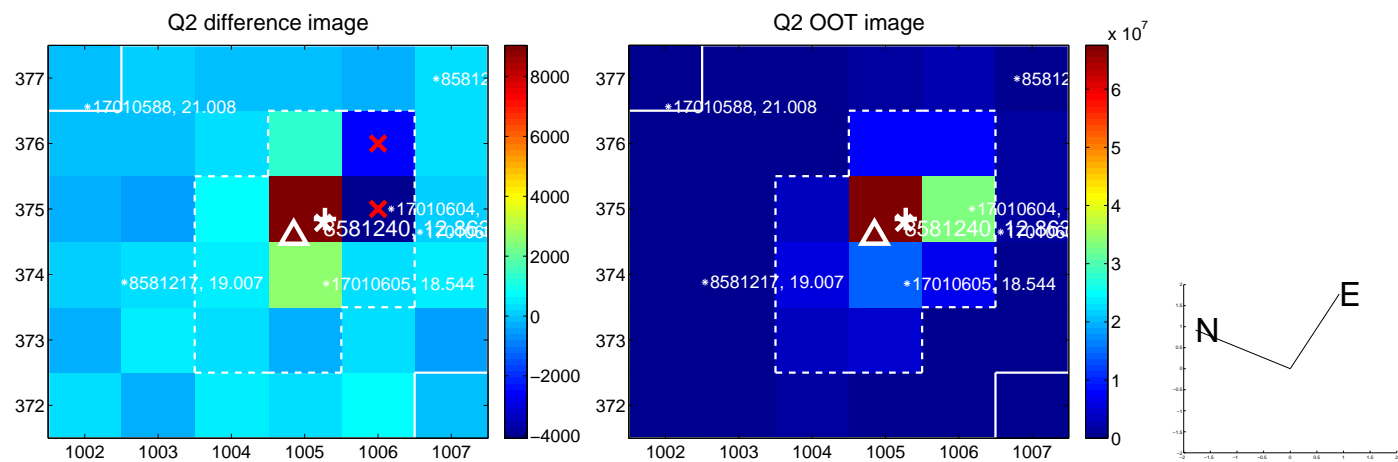
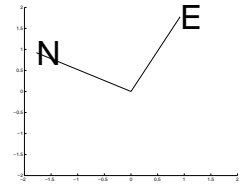
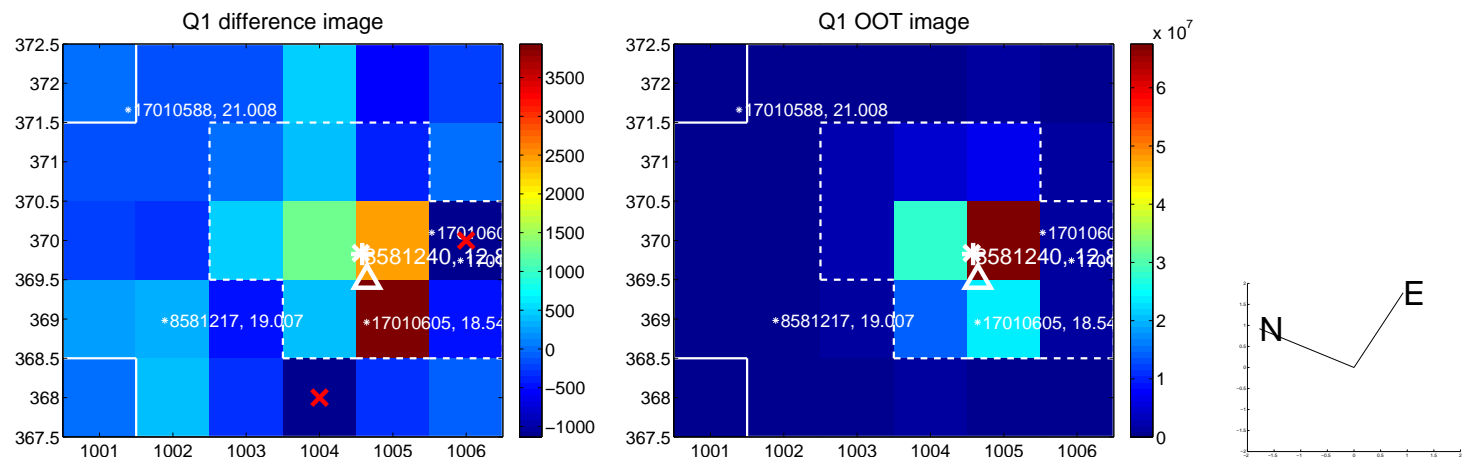
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.206 \pm 0.778$	1.55	$0.895 \pm 0.477$	$0.808 \pm 0.824$
PRF-fit source offset from KIC position	$0.776 \pm 0.843$	0.92	$0.116 \pm 0.512$	$0.768 \pm 0.816$
photometric centroid source offset	$1.45 \pm 1.17$	1.24	$-1.26 \pm 1.20$	$-0.72 \pm 1.07$



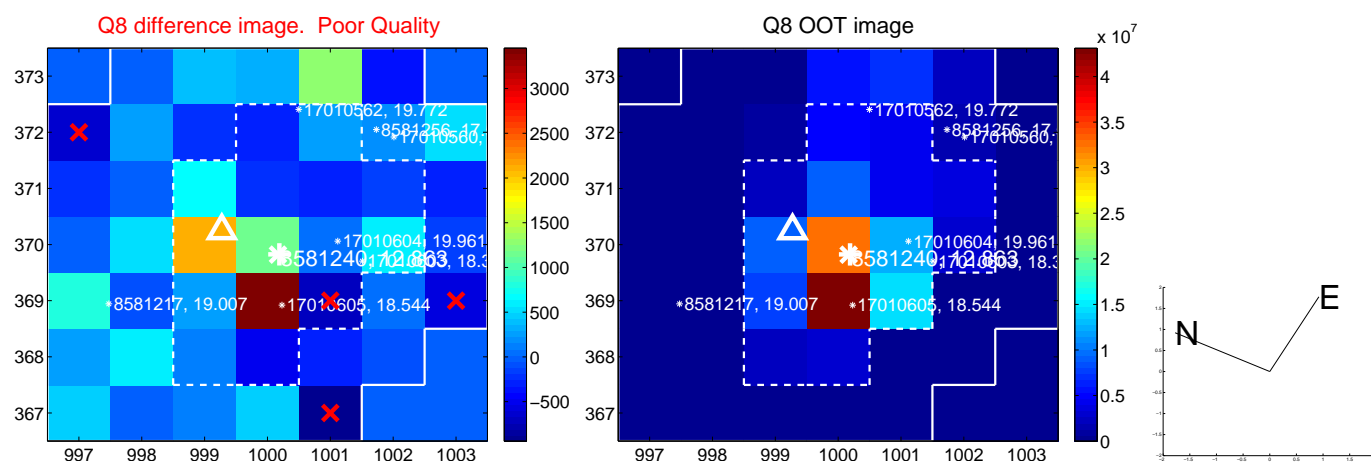
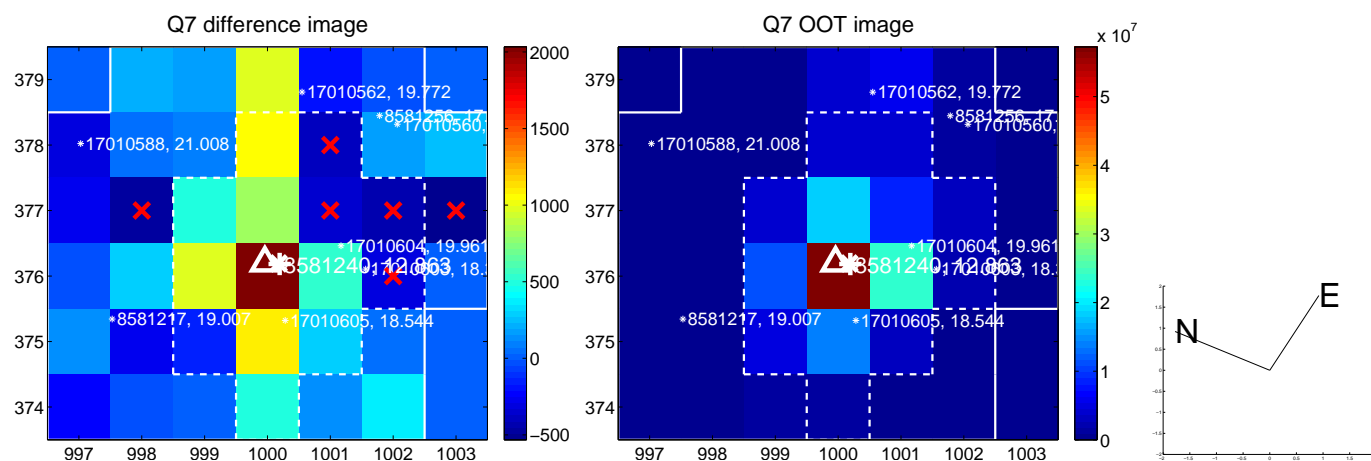
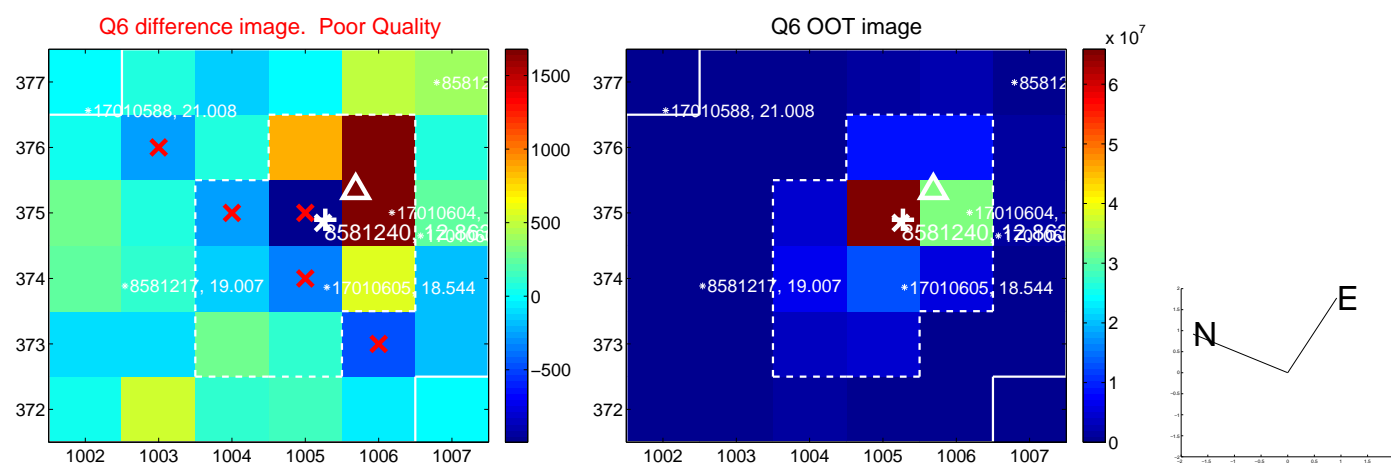
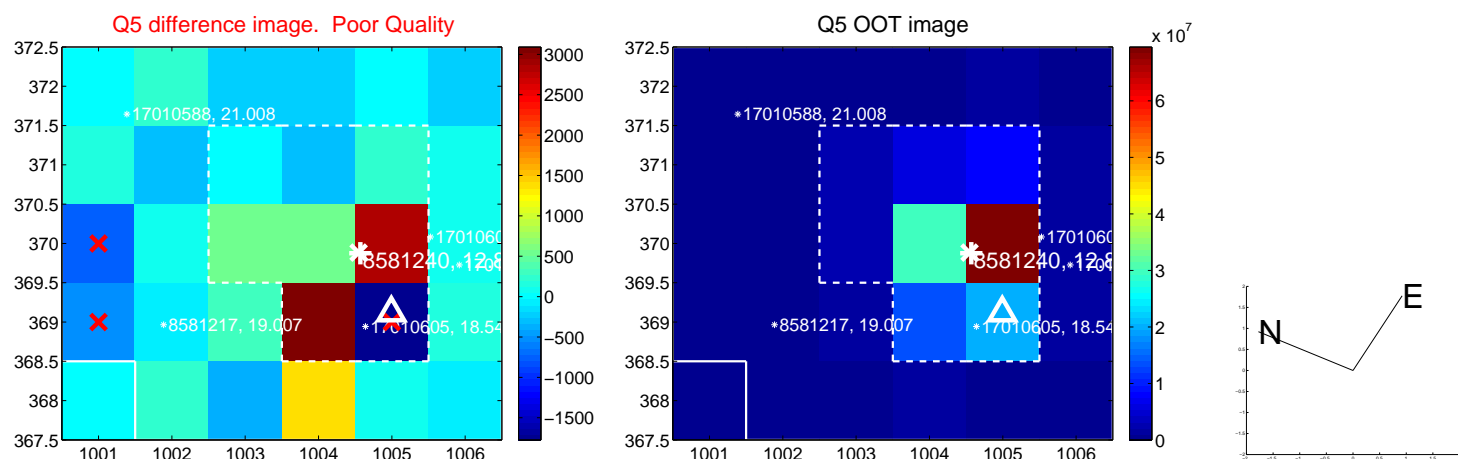
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

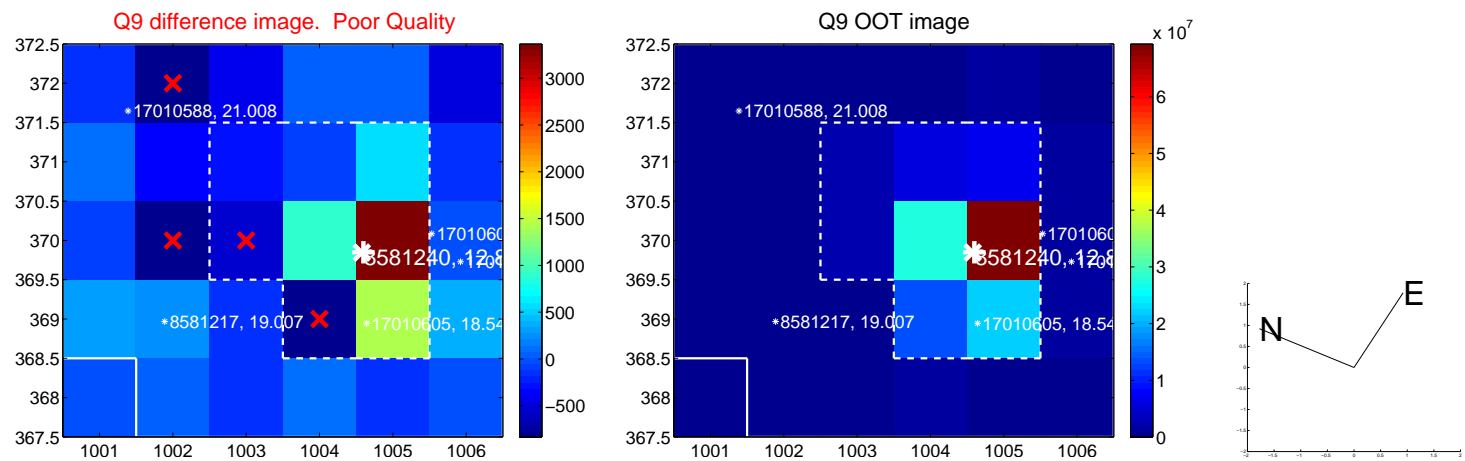




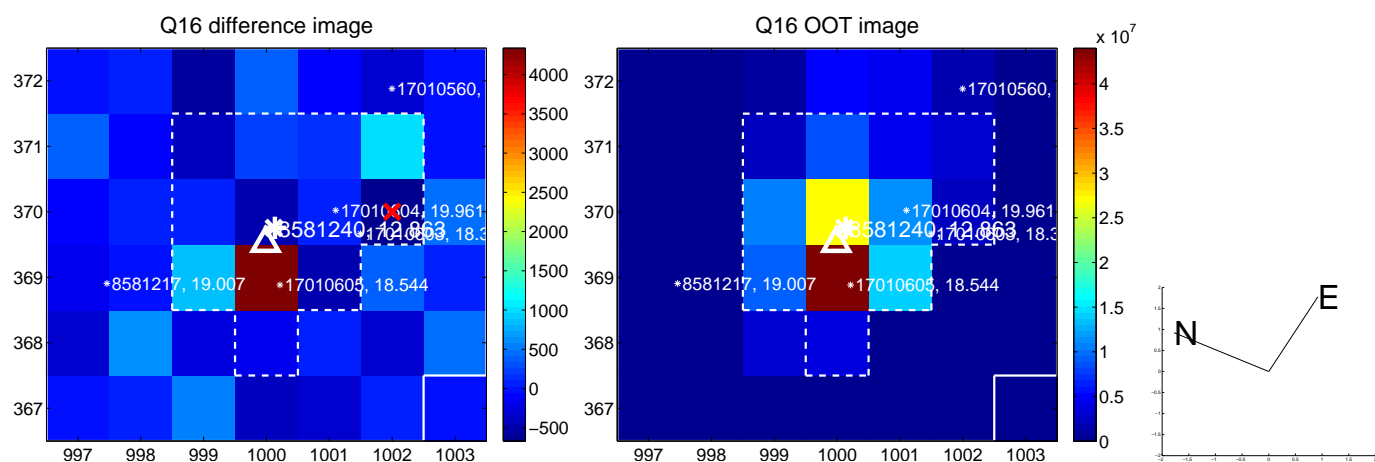
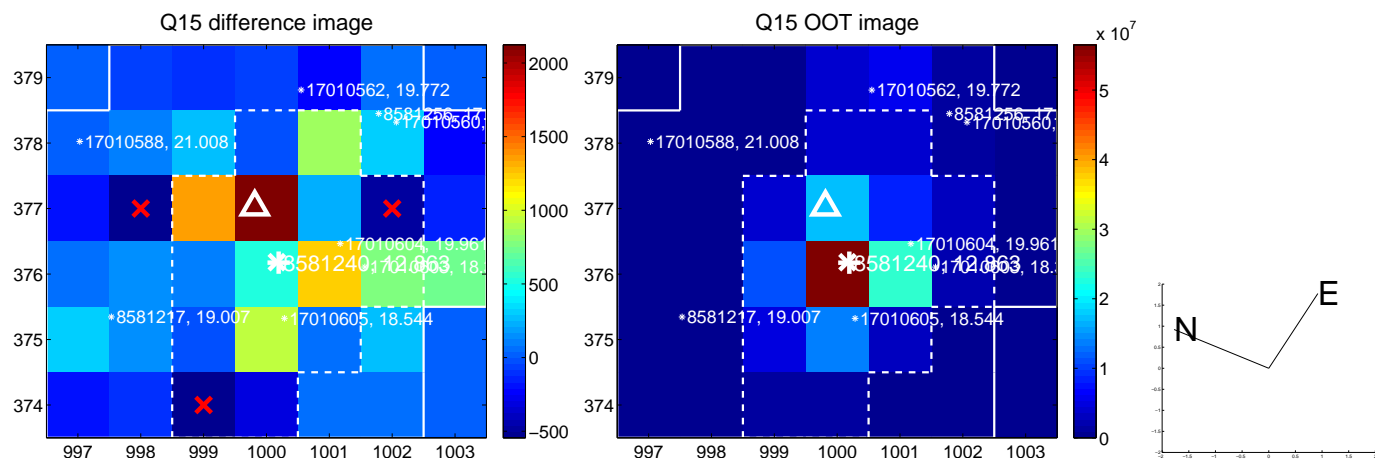
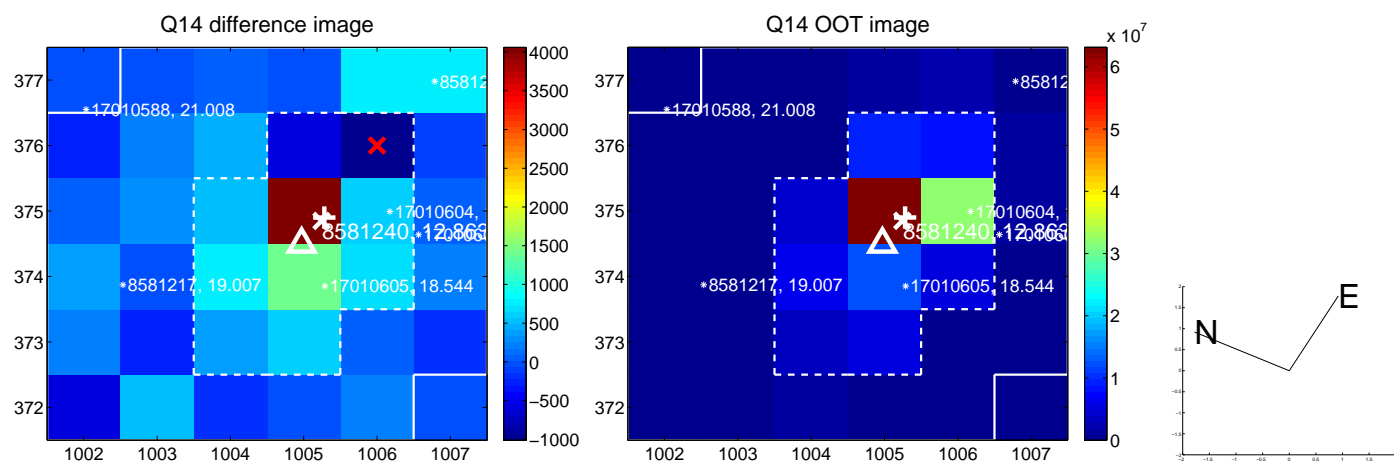
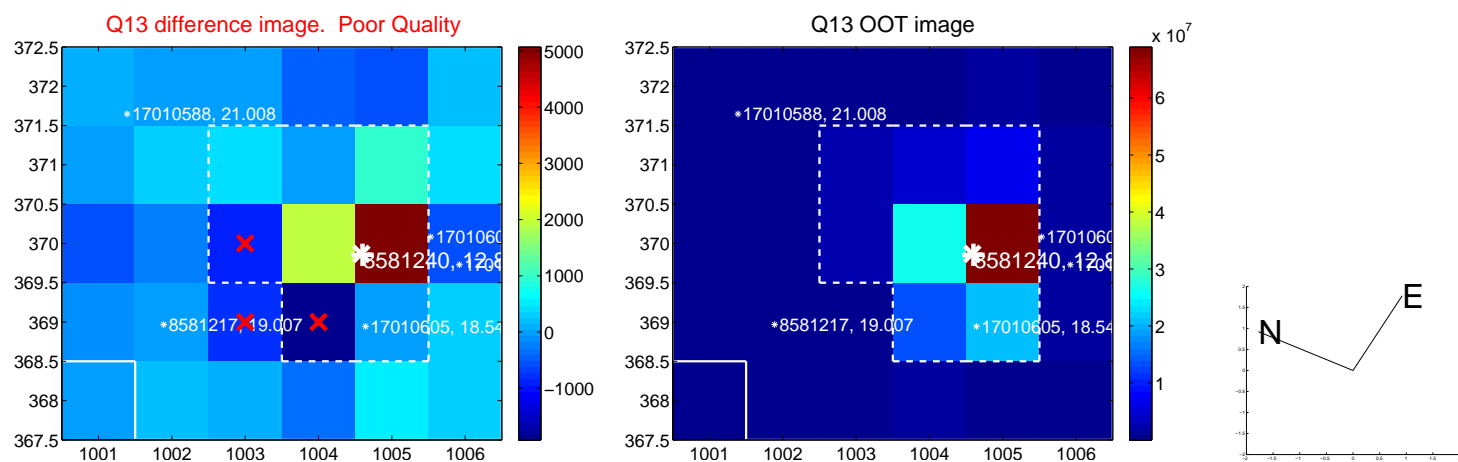
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



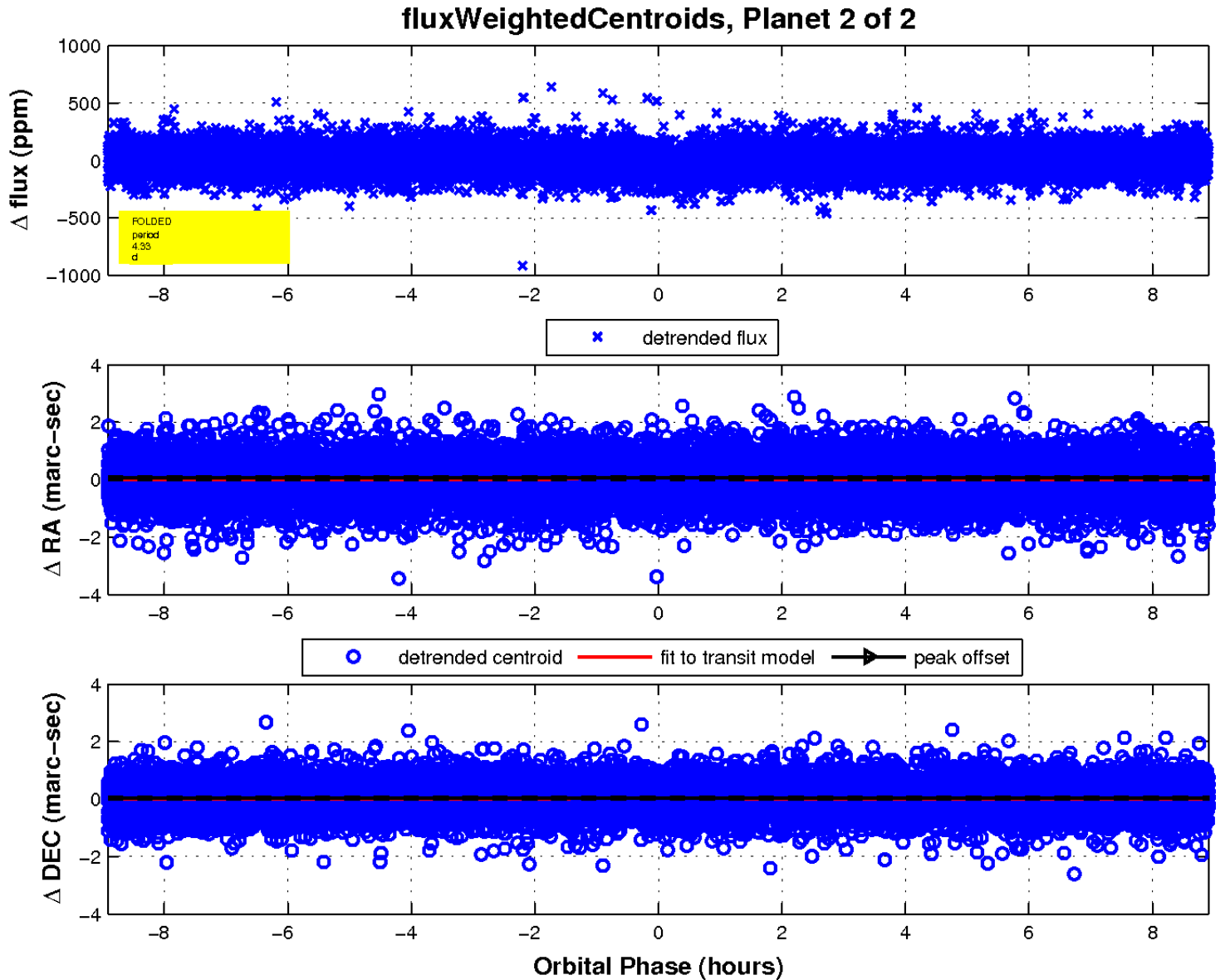
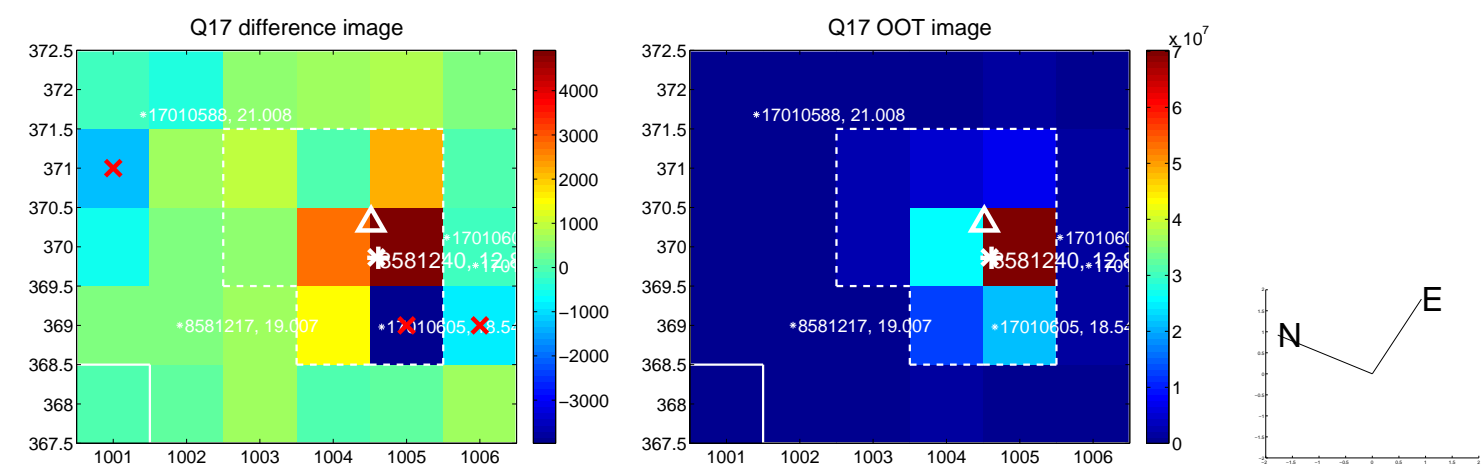
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

