

# KIC 005282049

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005282049-01	OBS	1545.01	5.910372	135.691059	17102.9	3.921	876.3	782.7	0.96	6200	12.64	291.00
005282049-02	OBS	1545.02	5.910266	132.756447	223.4	4.446	11.6	12.0	0.96	6200	1.68	291.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005282049-01	OBS	PC	0.93	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_OCCULT_ALT—HAS_SEC_TCE—CENT_KIC_POS
005282049-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

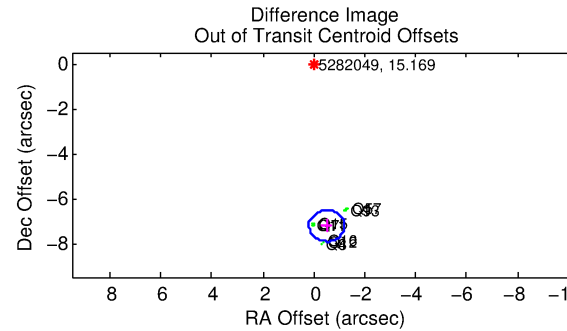
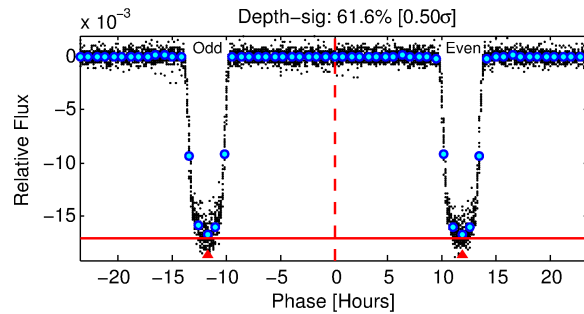
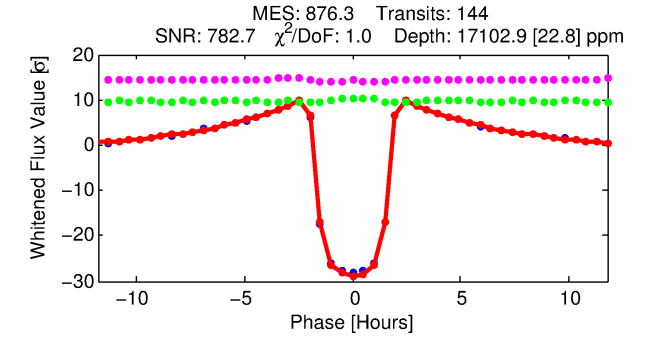
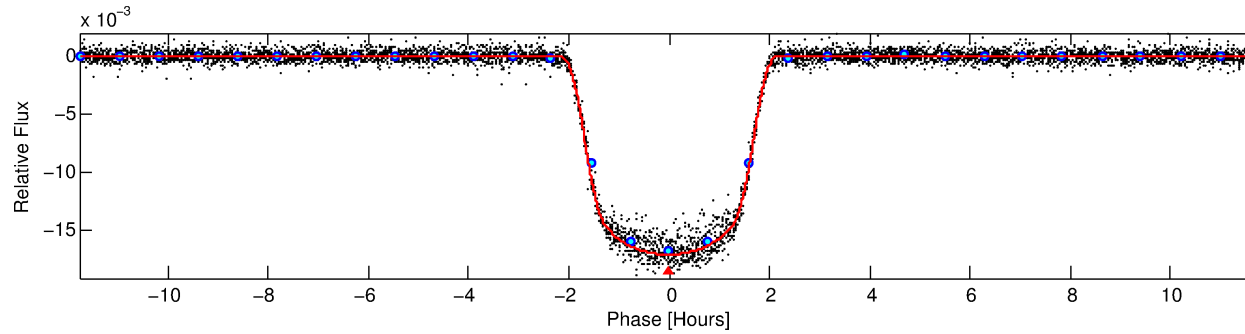
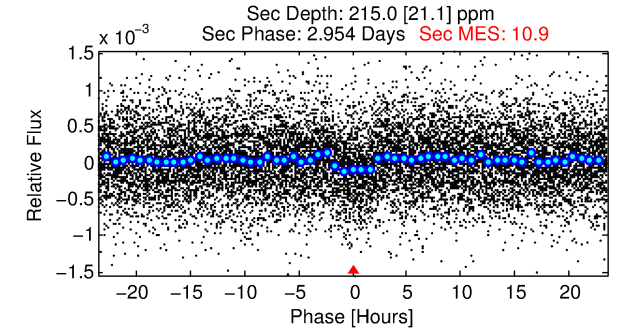
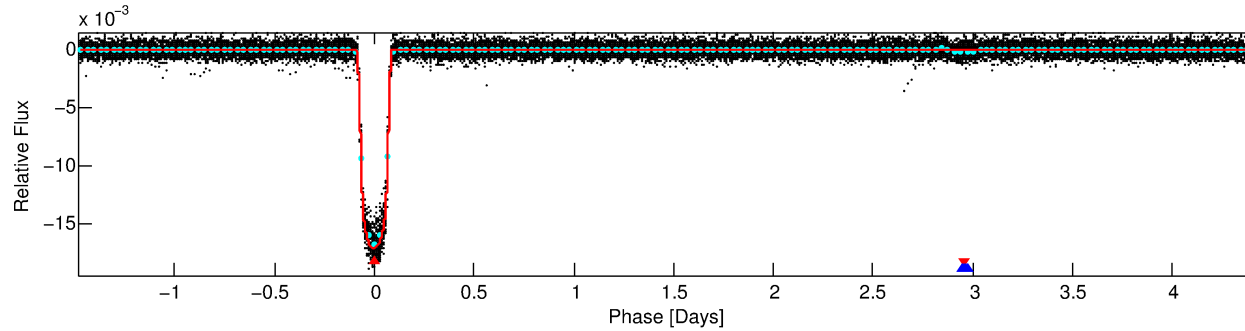
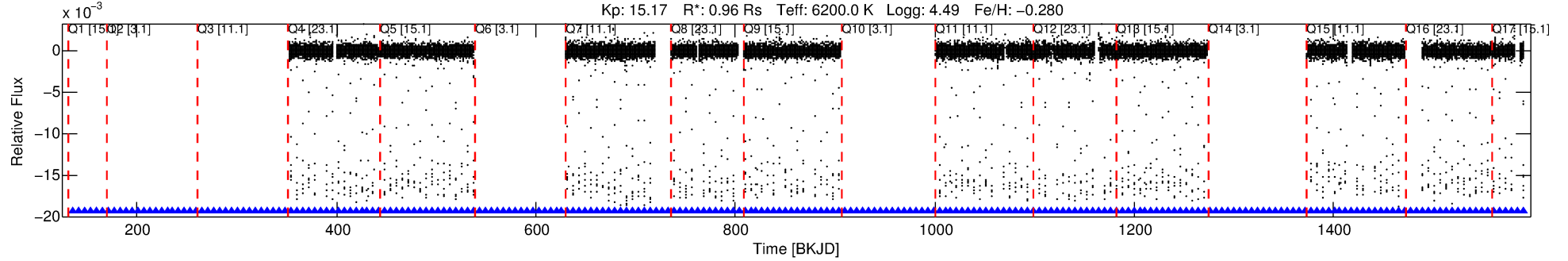
## Ephemeris Match Information For 005282049-01

No Significant Match Found

# DV One-Page Summary

KIC: 5282049 Candidate: 1 of 2 Period: 5.910 d  
KOI: K01545.01 Corr: 0.999

Kp: 15.17 R\*: 0.96 Rs Teff: 6200.0 K Logg: 4.49 Fe/H: -0.280



## DV Fit Results:

Period = 5.91037 [0.00000] d  
Epoch = 135.6911 [0.0001] BKJD  
Rp/R\* = 0.1209 [0.0003]  
a/R\* = 12.61 [0.16]  
b = 0.25 [0.05]  
Seff = 290.99 [116.86]  
Teq = 1053 [106] K  
Rp = 12.64 [3.84] Re  
a = 0.0646 [0.0164] AU  
Ag = 3.09 [1.18] [1.78σ]  
Teffp = 2159 [102] K [7.53σ]

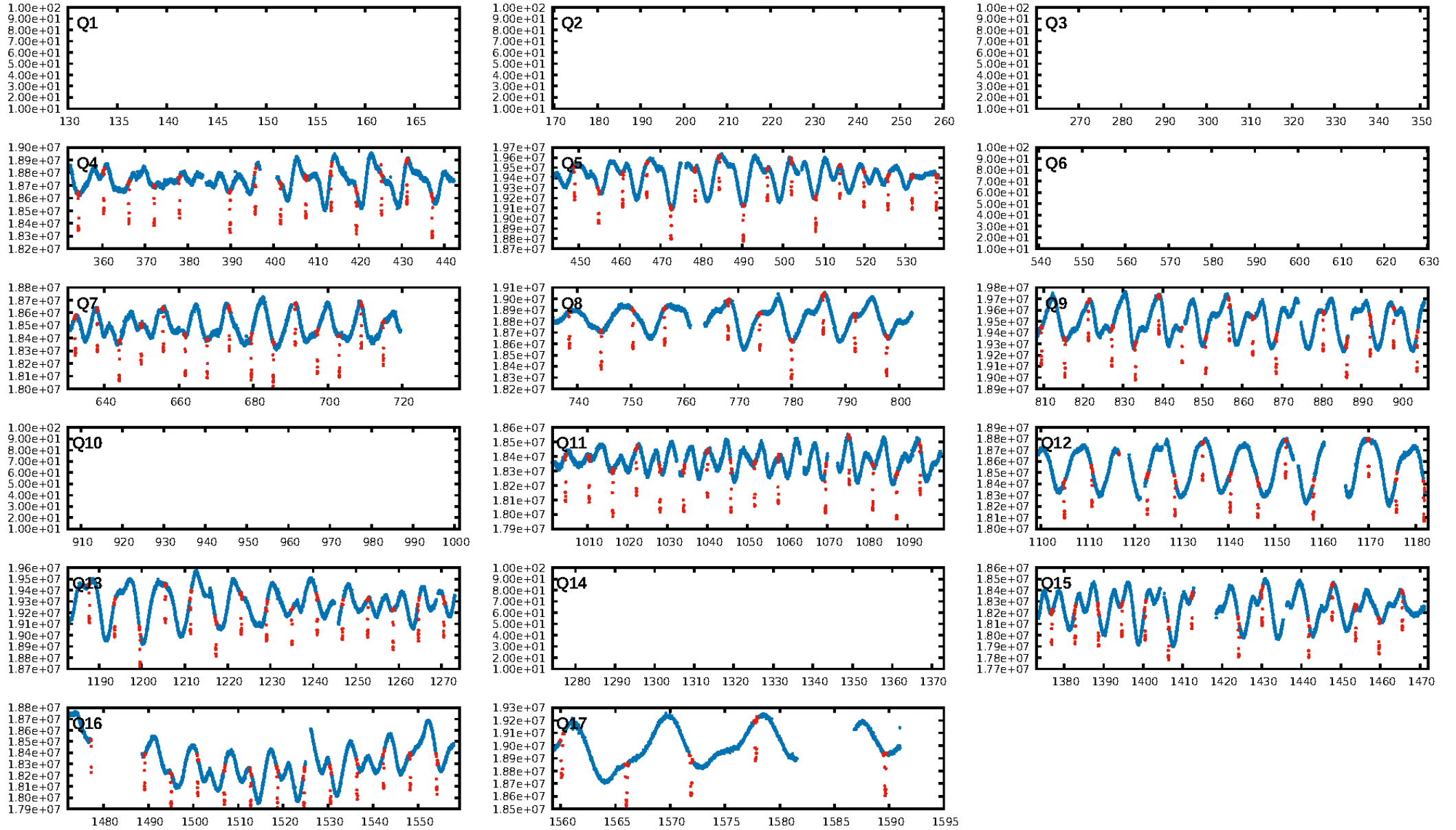
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [139/139]  
GhostDiagnostic-chr: 3.477  
Centroid-sig: 0.0%  
Centroid-so: 2.764 arcsec [193.12σ]  
OotOffset-rm: 7.246 arcsec [31.35σ]  
KicOffset-rm: 0.220 arcsec [3.21σ]  
OotOffset-st: 0/3/4/4 [11]  
KicOffset-st: 0/3/4/4 [11]  
DiffImageQuality-fgm: 1.00 [11/11]  
DiffImageOverlap-fno: 1.00 [11/11]

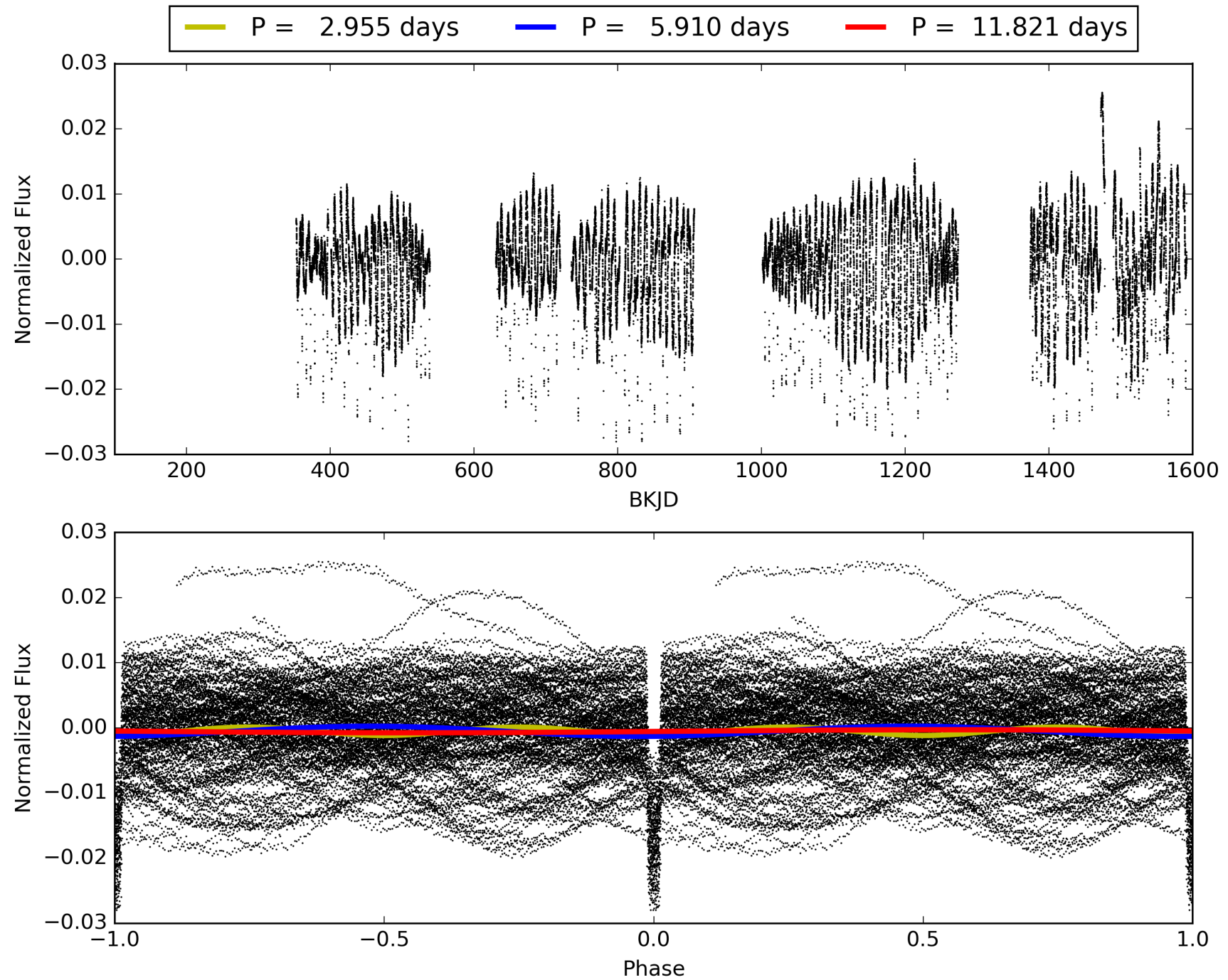
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:05:37 Z

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

# TCE 005282049-01, PDC Light Curves

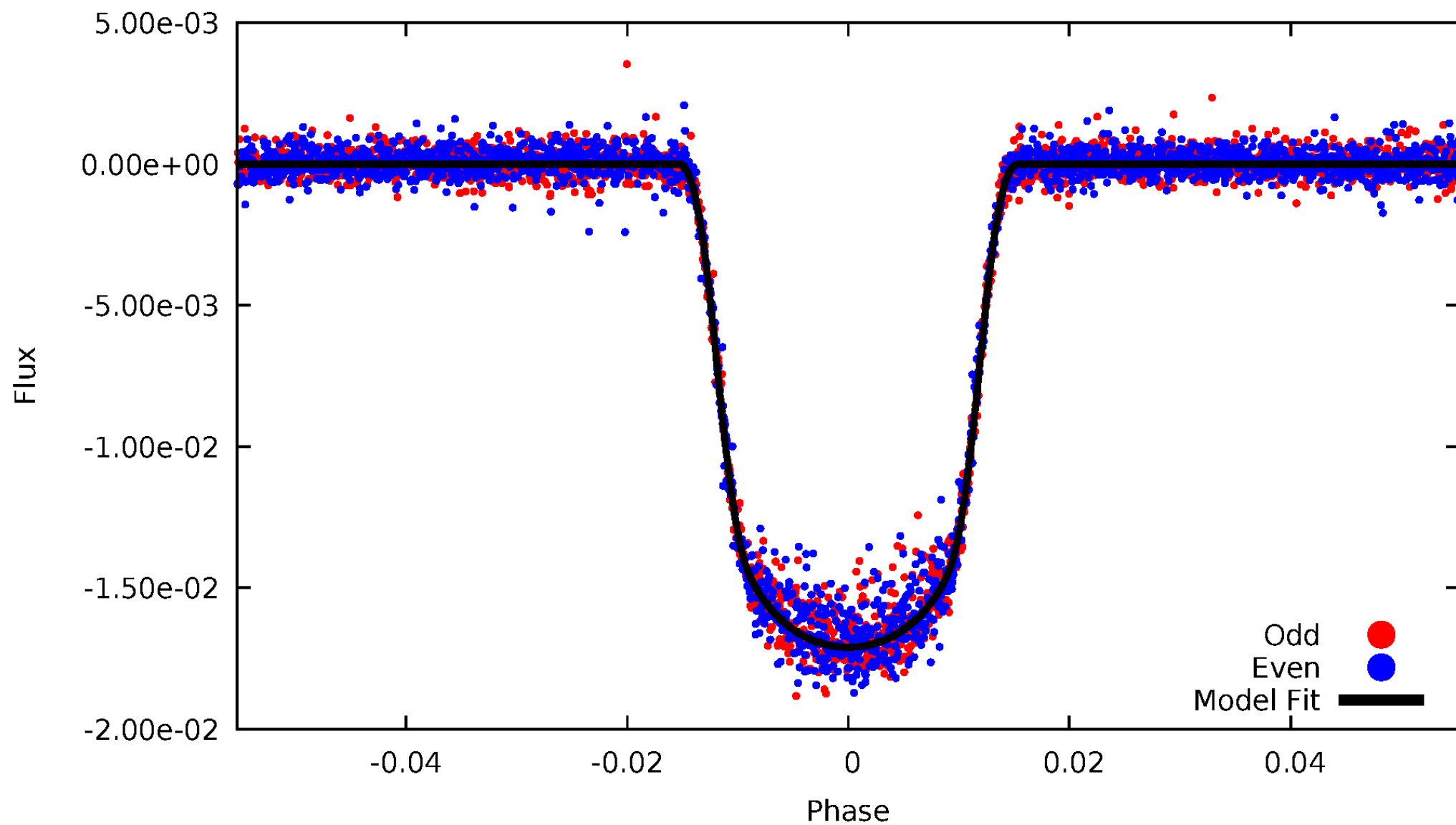


TCE 005282049-01



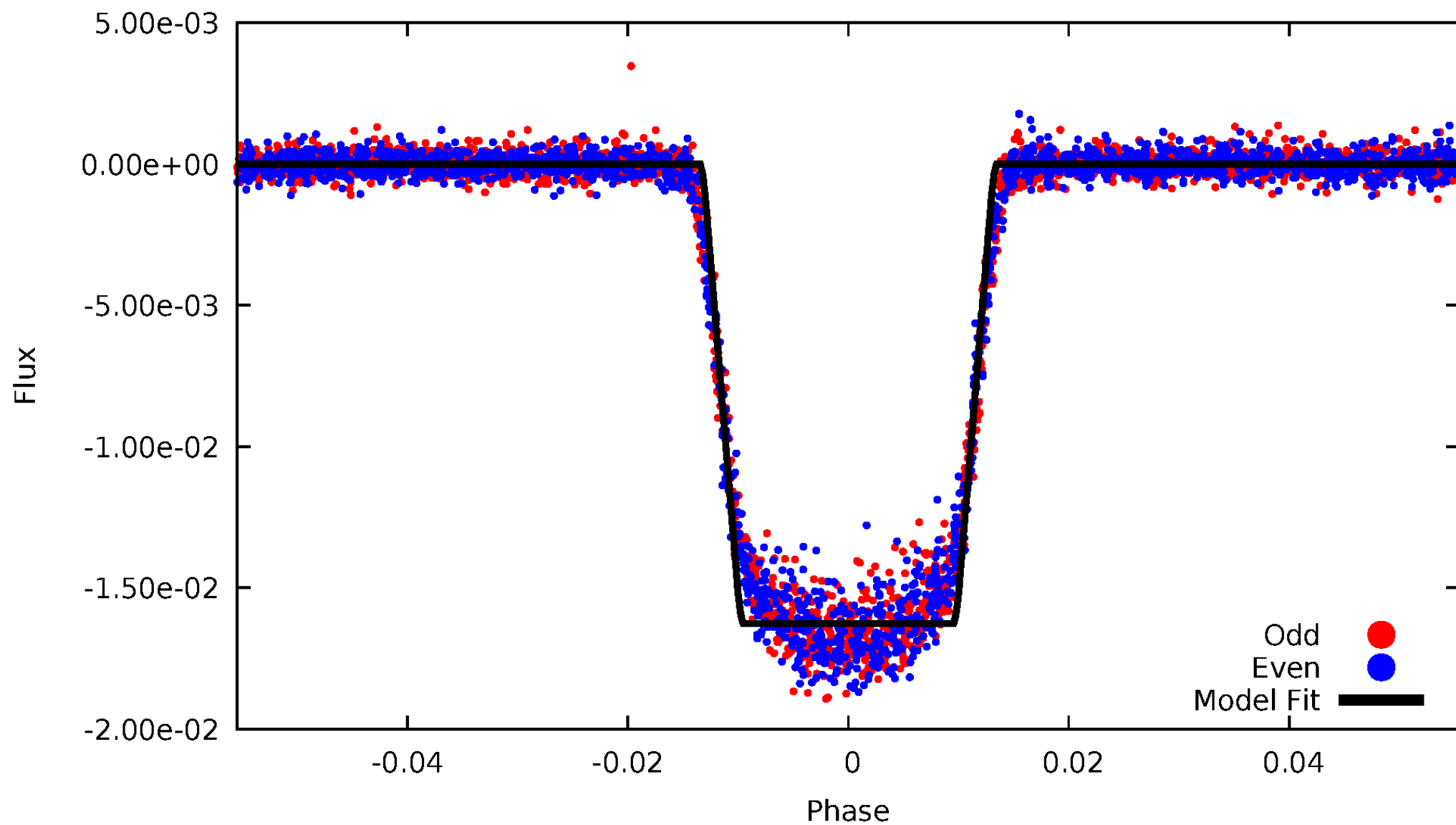
# DV Odd/Even

TCE 005282049-01



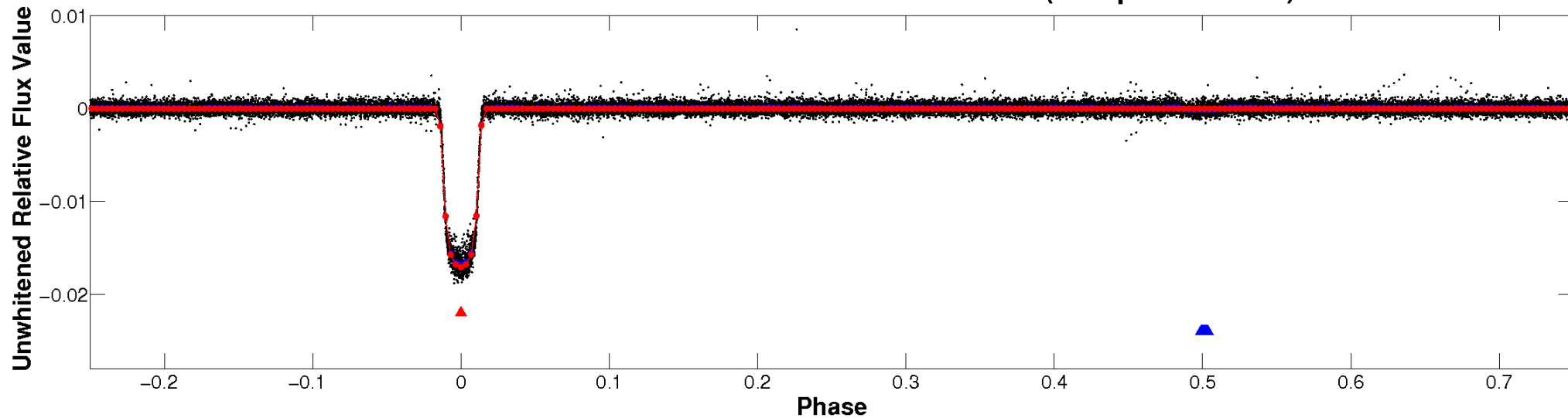
# ALT Odd/Even

TCE 005282049-01

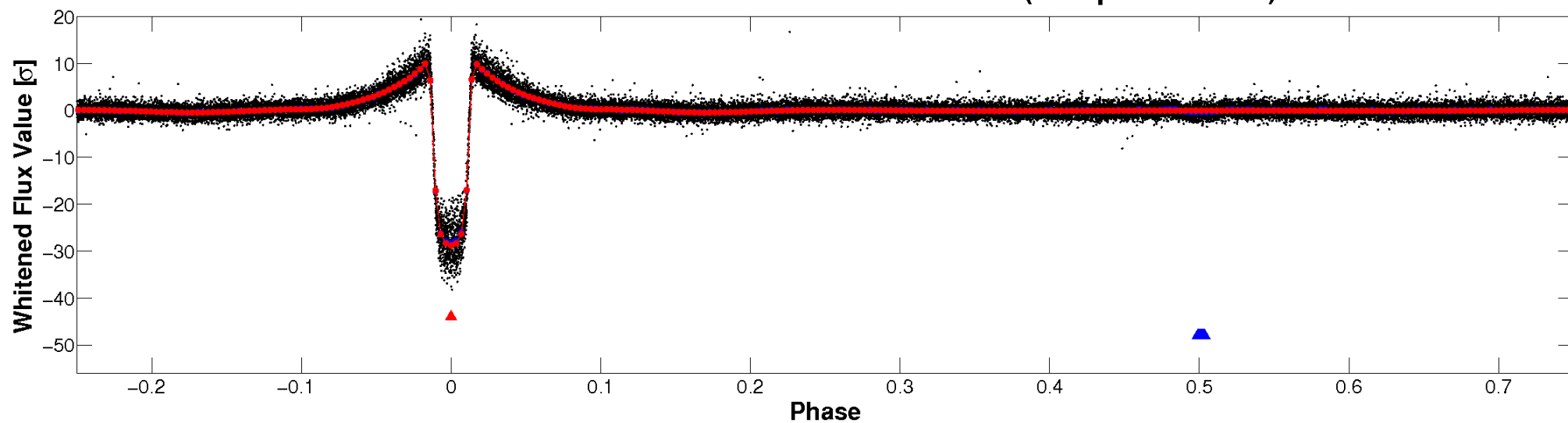


# Non-Whitened Vs. Whitened Light Curve

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



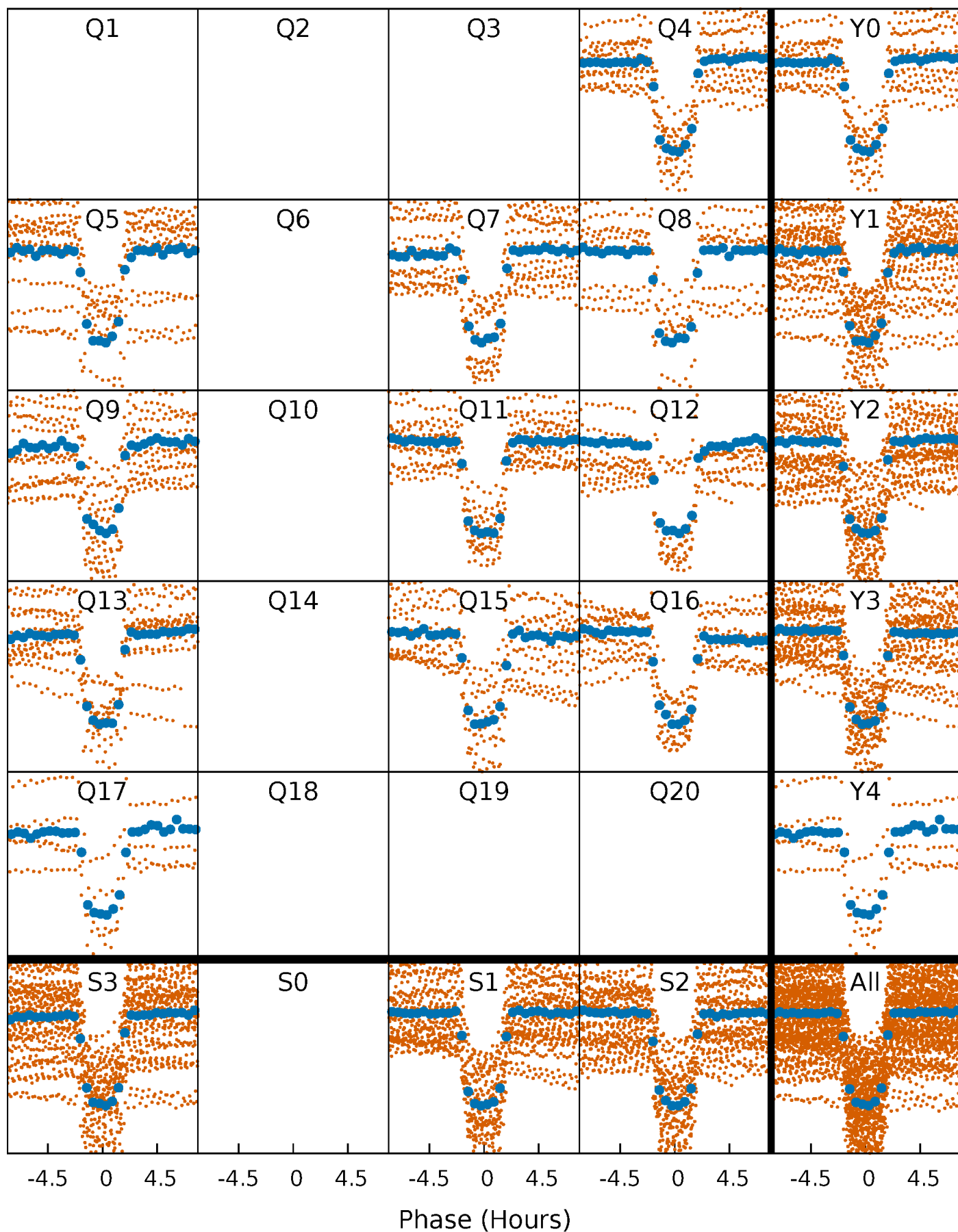
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

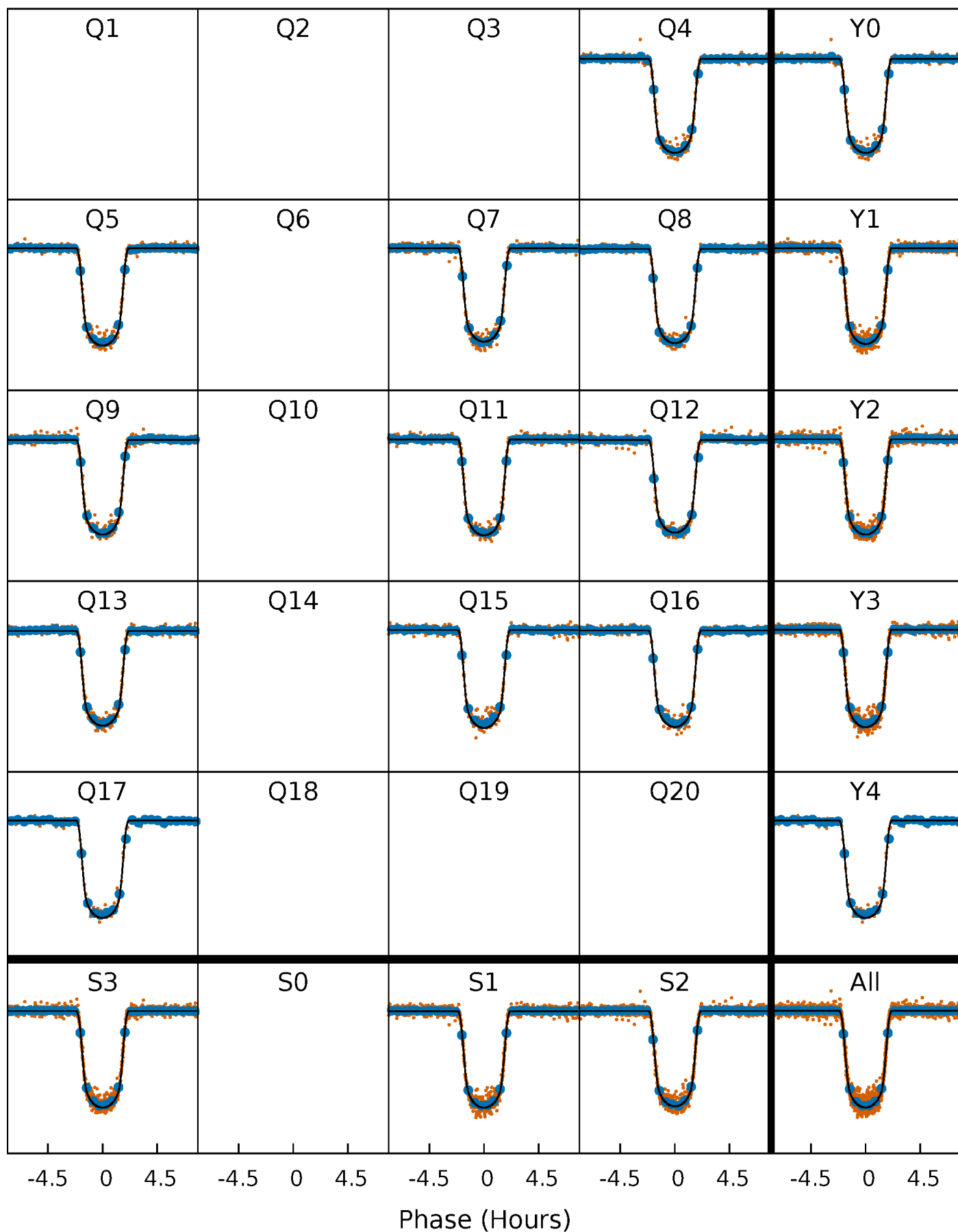
TCE 005282049-01 P= 5.910372 Days  $T_0=135.691059$  (BKJD)





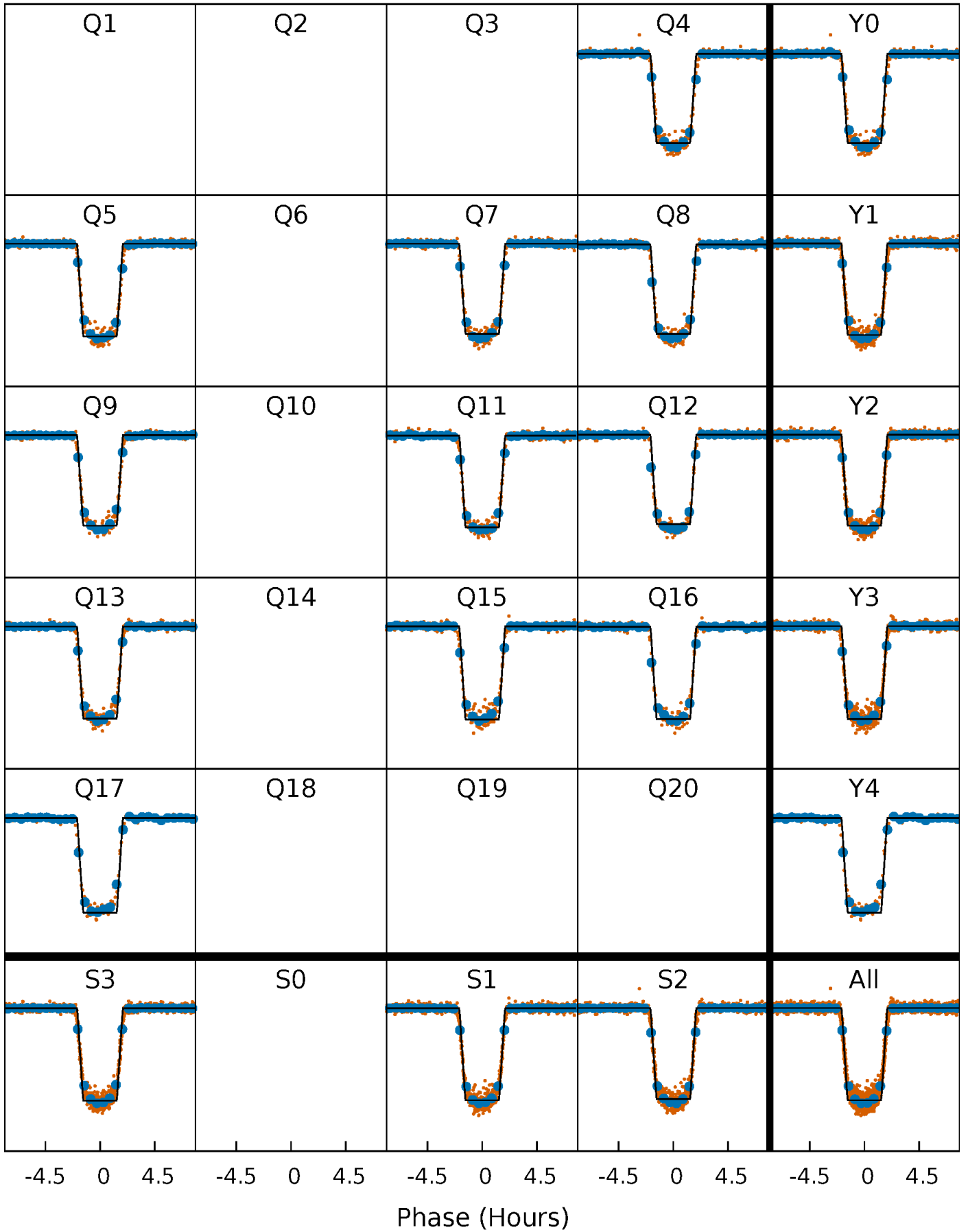
# DV Quarter-Phased Transit Curves

TCE 005282049-01 P= 5.910372 Days  $T_0=135.691059$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

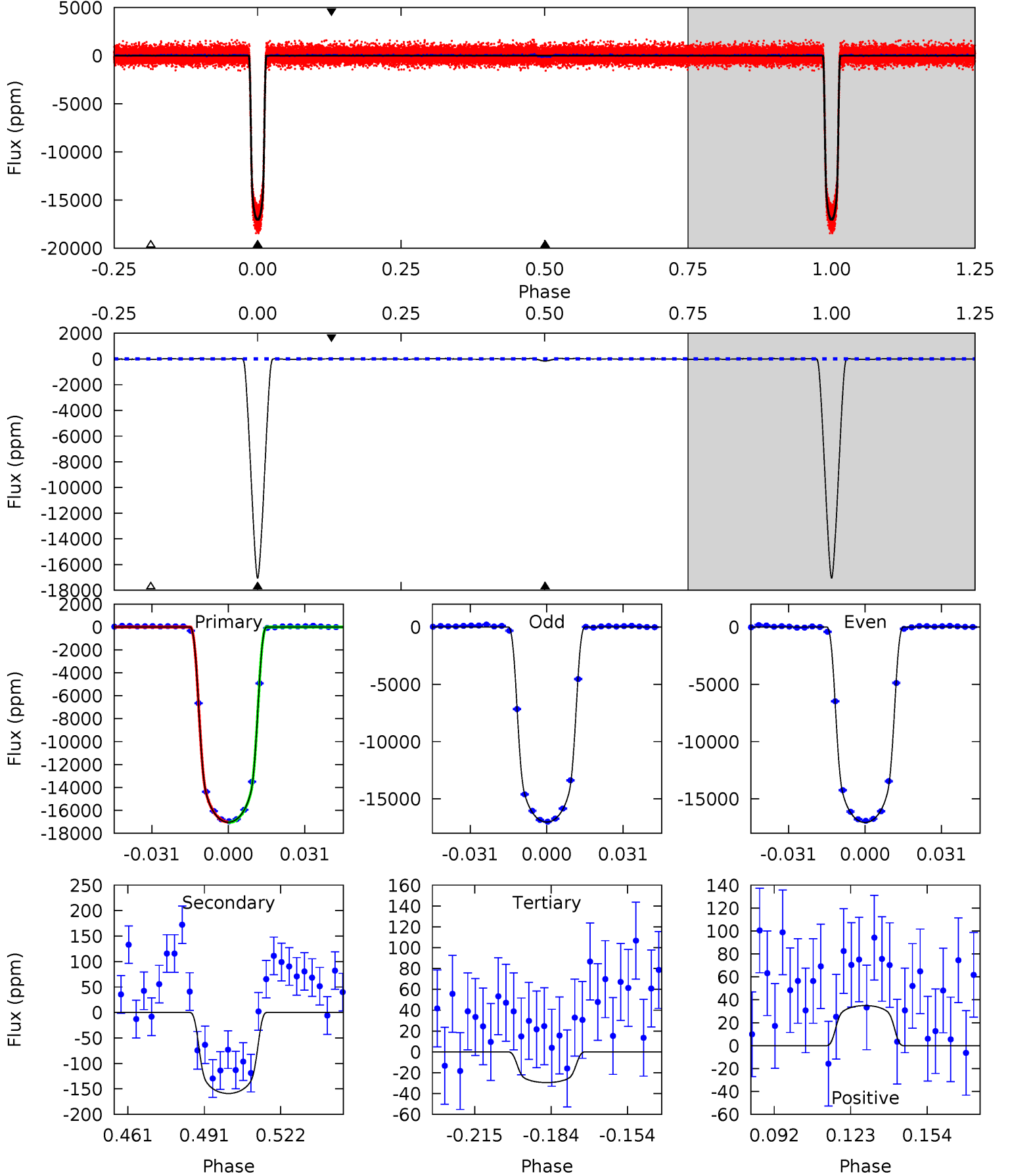
TCE 005282049-01 P= 5.910392 Days  $T_0=135.688244$  (BKJD)



# DV Model-Shift Uniqueness Test

005282049-01, P = 5.910372 Days, E = 135.691059 Days

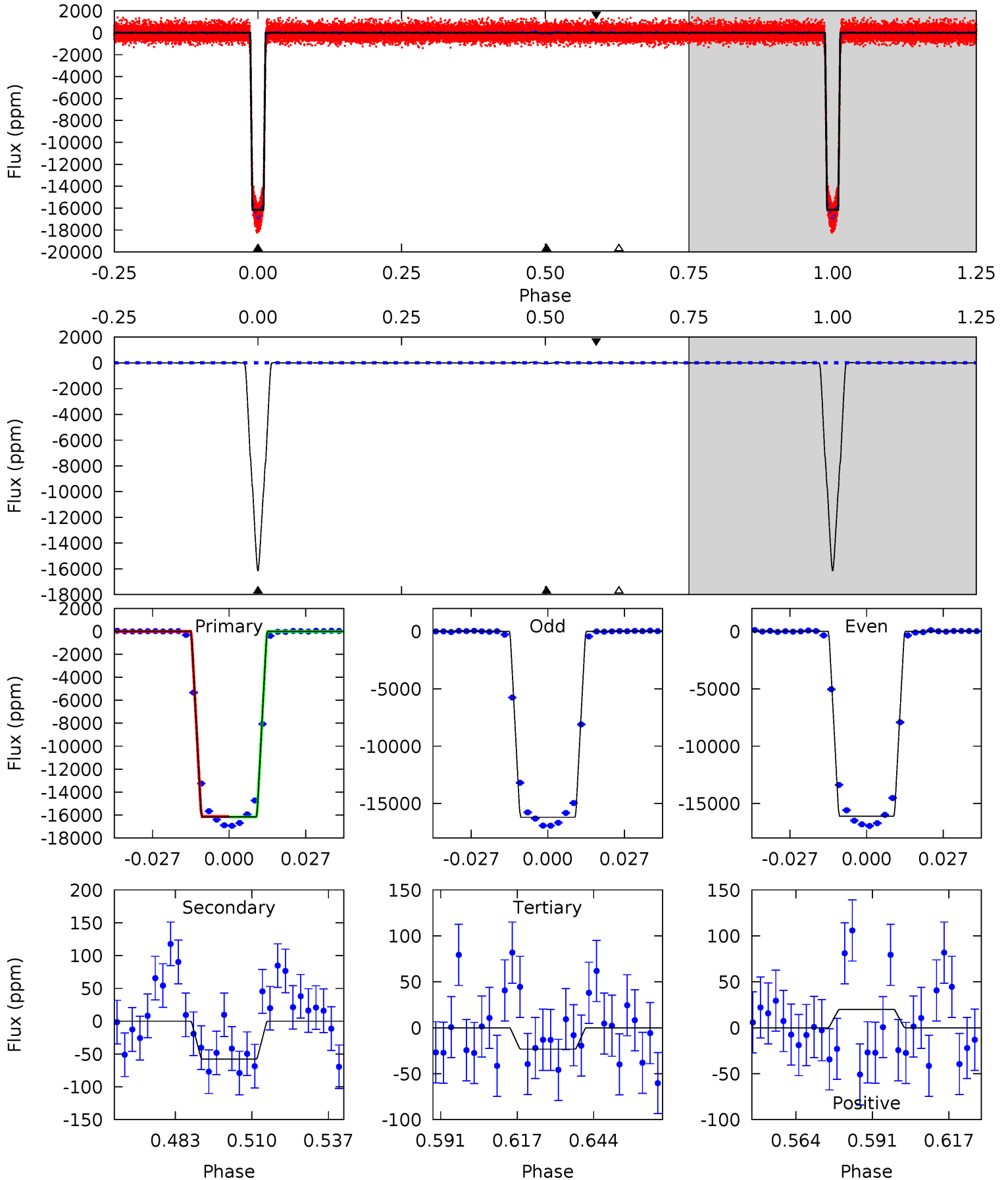
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1441	13.4	2.49	2.95	4.81	2.16	1.28	1438	1438	11.0	10.5	1.40	1.00	0.00	1.85



# Alt Model-Shift Uniqueness Test

005282049-01, P = 5.910392 Days, E = 135.688244 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
1360	4.87	1.97	1.68	4.83	2.21	0.67	1358	1359	2.90	3.19	3.73	1.00	0.00	1.12



### Stellar Parameters For KIC 005282049

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6200^{+200}_{-250}$	$4.488^{+0.050}_{-0.200}$	$-0.280^{+0.300}_{-0.300}$	$0.958^{+0.291}_{-0.097}$	$1.029^{+0.134}_{-0.134}$	$1.650^{+0.451}_{-0.850}$
	+3%/-4%	+1%/-4%	+107%/-107%	+30%/-10%	+13%/-13%	+27%/-51%
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 005282049-01 / KOI 1545.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	-159±12	$13.02^{+2.00}_{-1.07}$	$1500^{+106}_{-78}$	$2700^{+60}_{-69}$	$2.079^{+0.376}_{-0.438}$
Alt.	-58±12	$13.75^{+2.14}_{-1.12}$	$1504^{+107}_{-76}$	$2234^{+98}_{-144}$	$0.670^{+0.191}_{-0.204}$

$T_{max}$  = 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

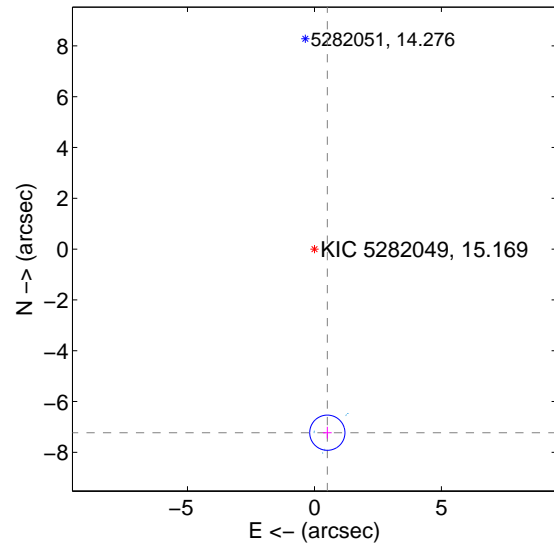
Supplemental centroid analysis for 005282049-01. Kepler magnitude: 15.17. Transit SNR 782.67

There are 11 quarters with good PRF difference image offsets

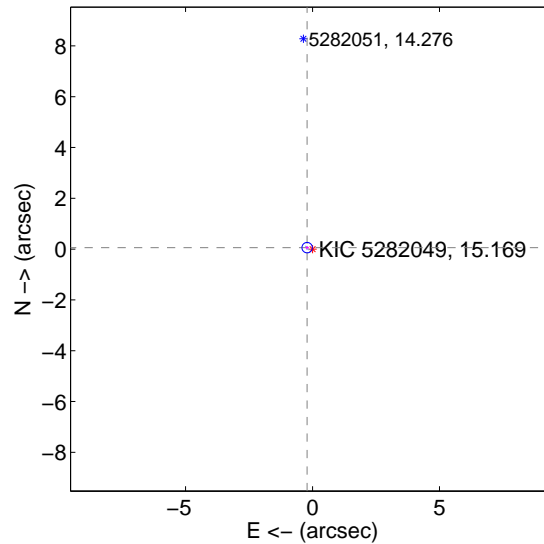
The OOT PRF centroid is offset from the target star catalog position by about 6.76 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$7.246 \pm 0.231$	31.35	$-0.507 \pm 0.170$	$-7.228 \pm 0.231$
PRF-fit source offset from KIC position	$0.220 \pm 0.068$	3.21	$0.212 \pm 0.068$	$0.057 \pm 0.068$
photometric centroid source offset	$2.76 \pm 0.01$	193.12	$0.28 \pm 0.01$	$2.75 \pm 0.01$

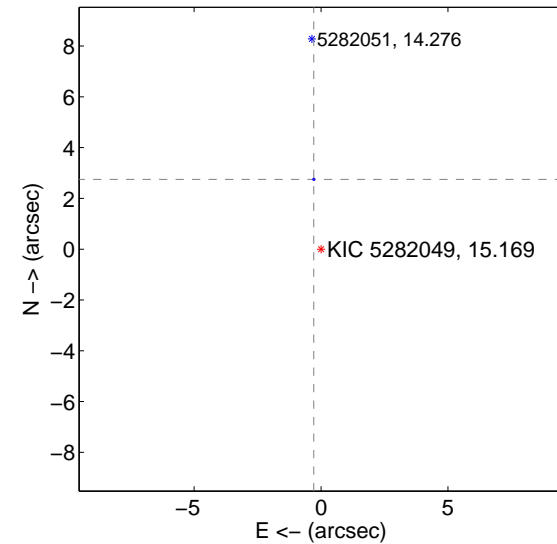
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

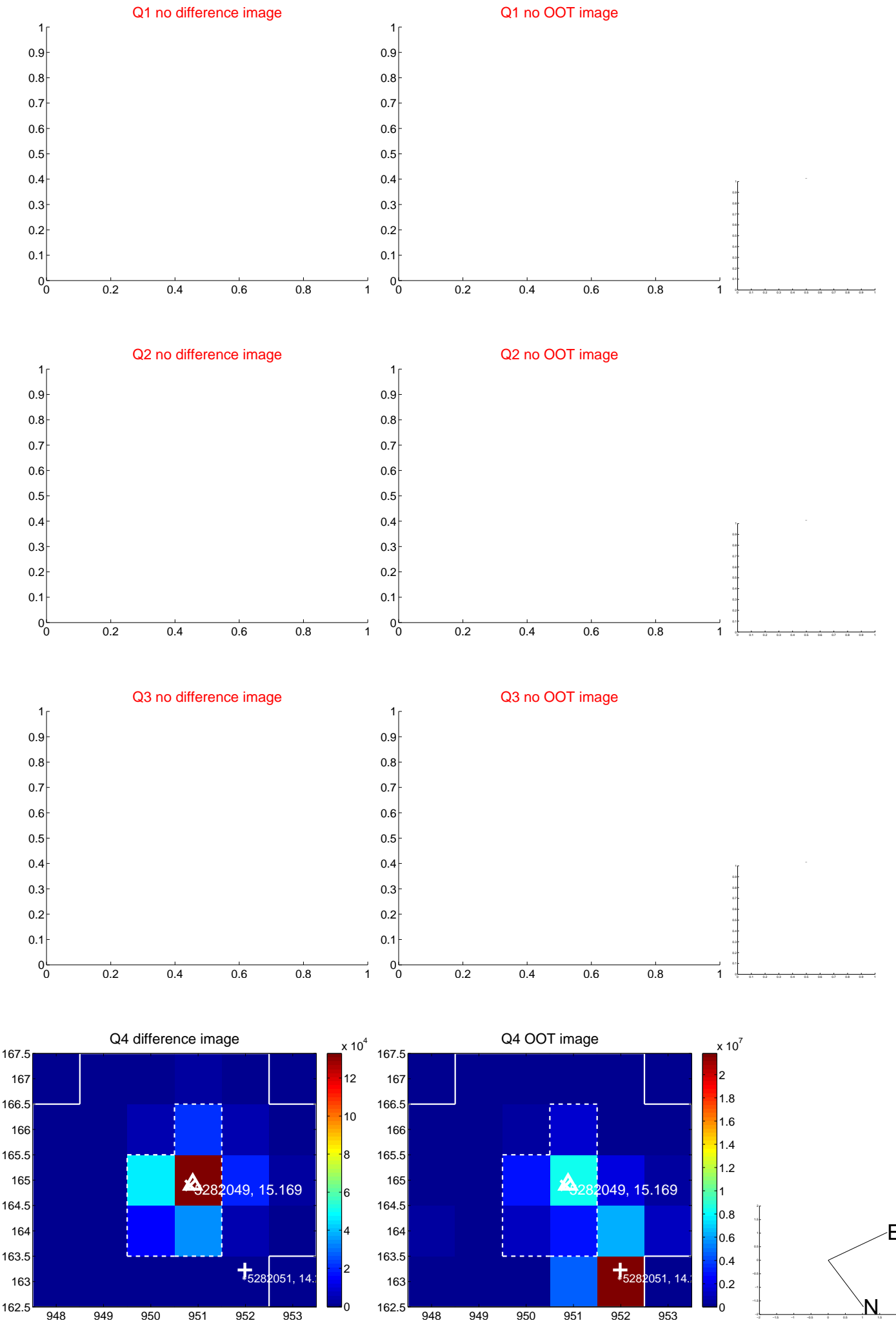


offset from photometric centroids



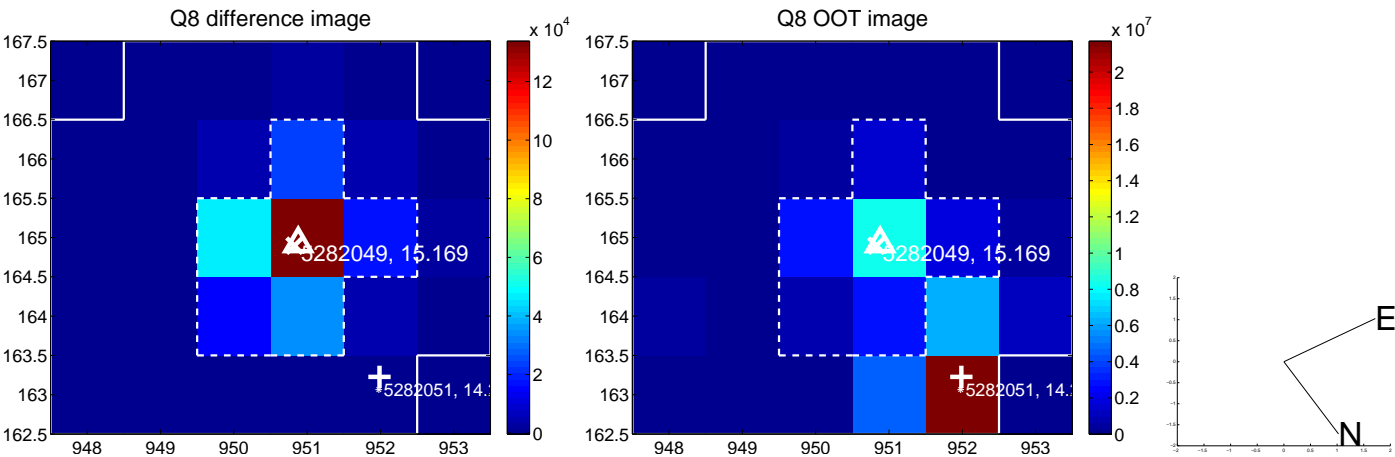
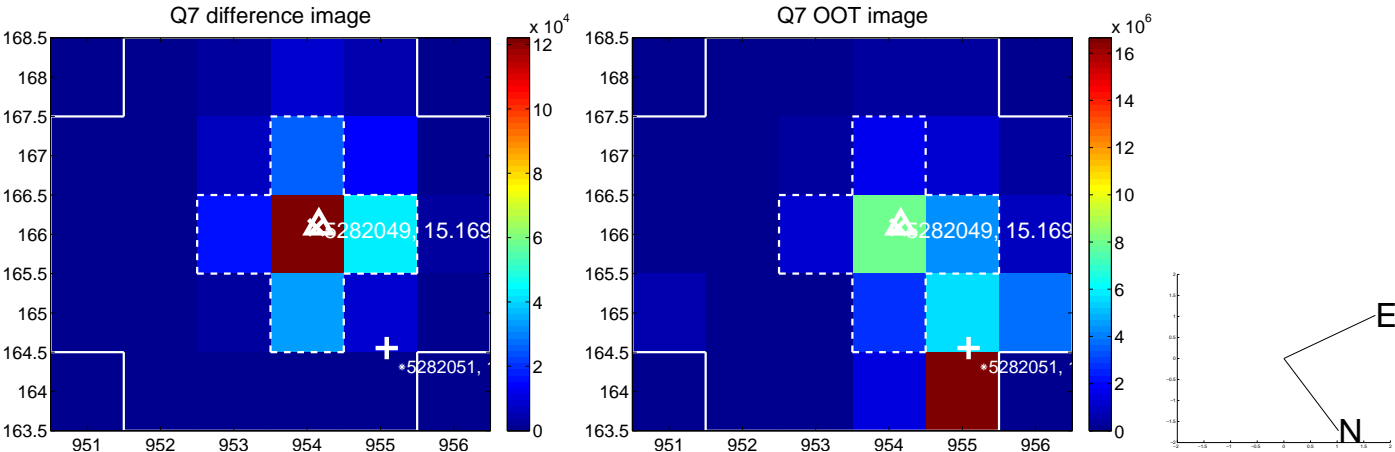
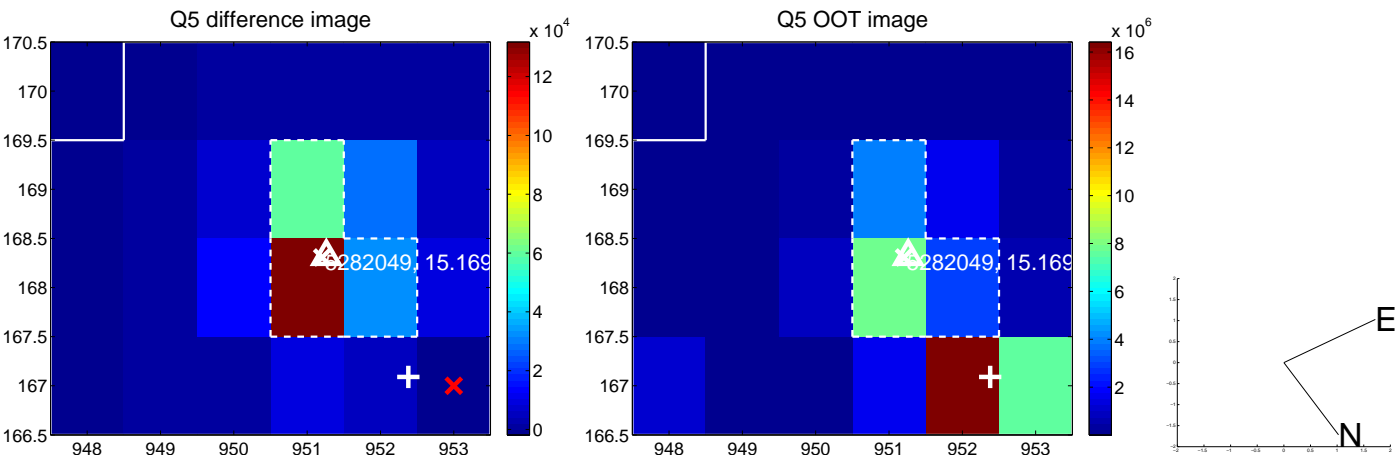
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

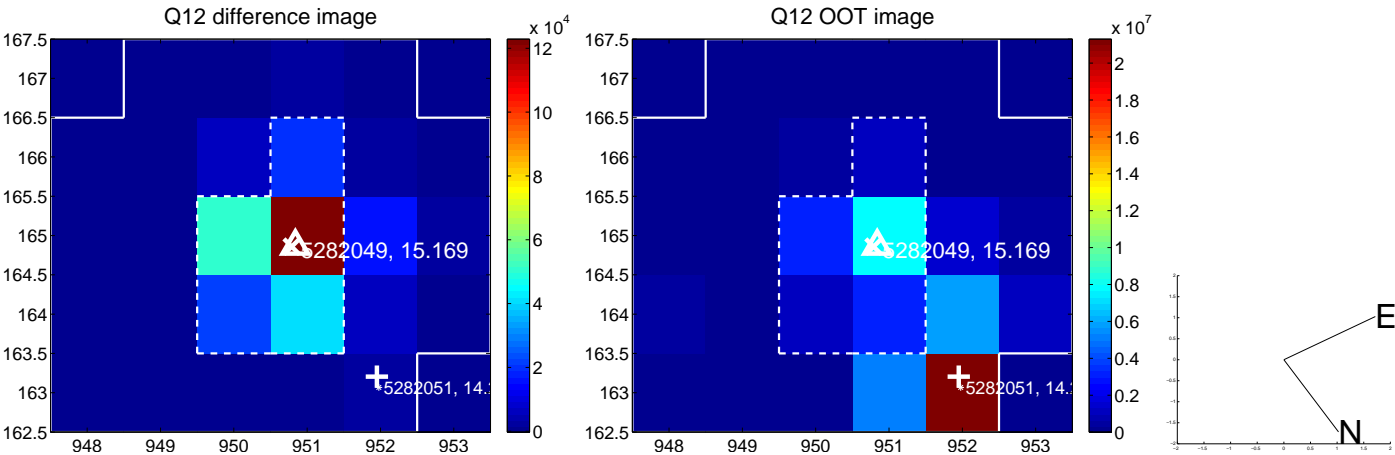
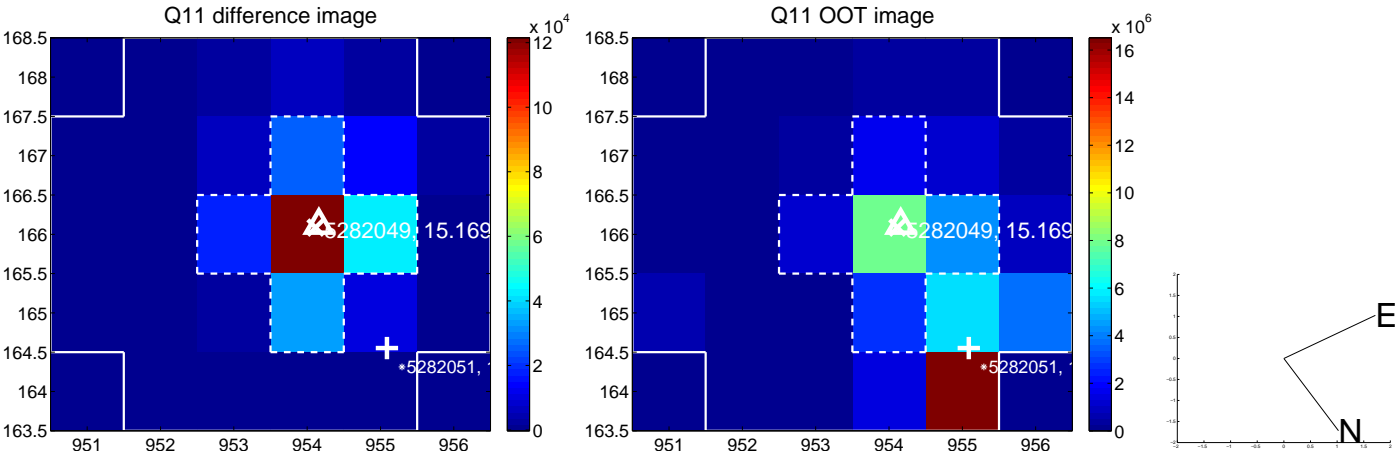
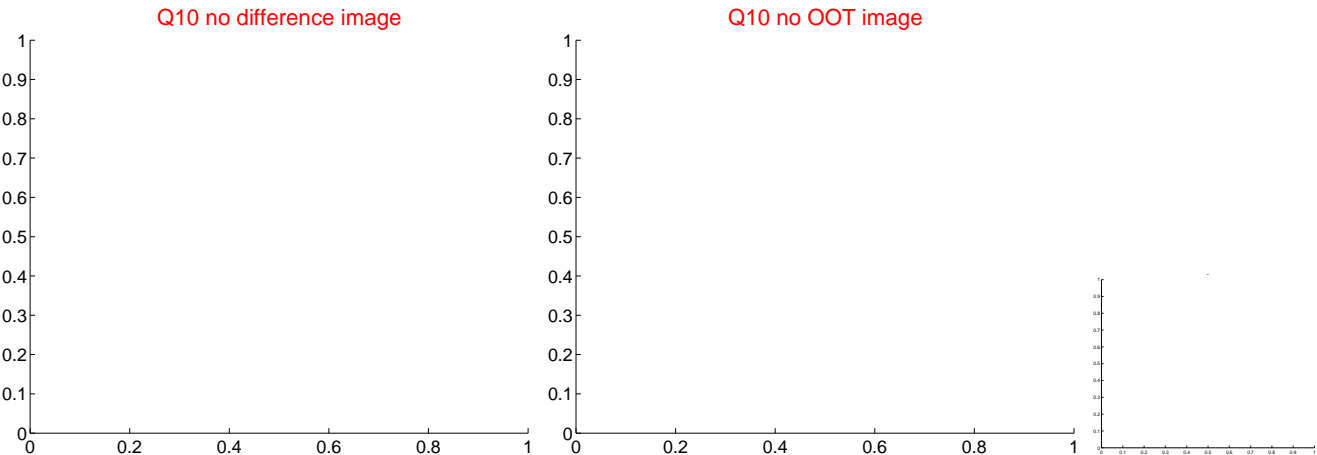
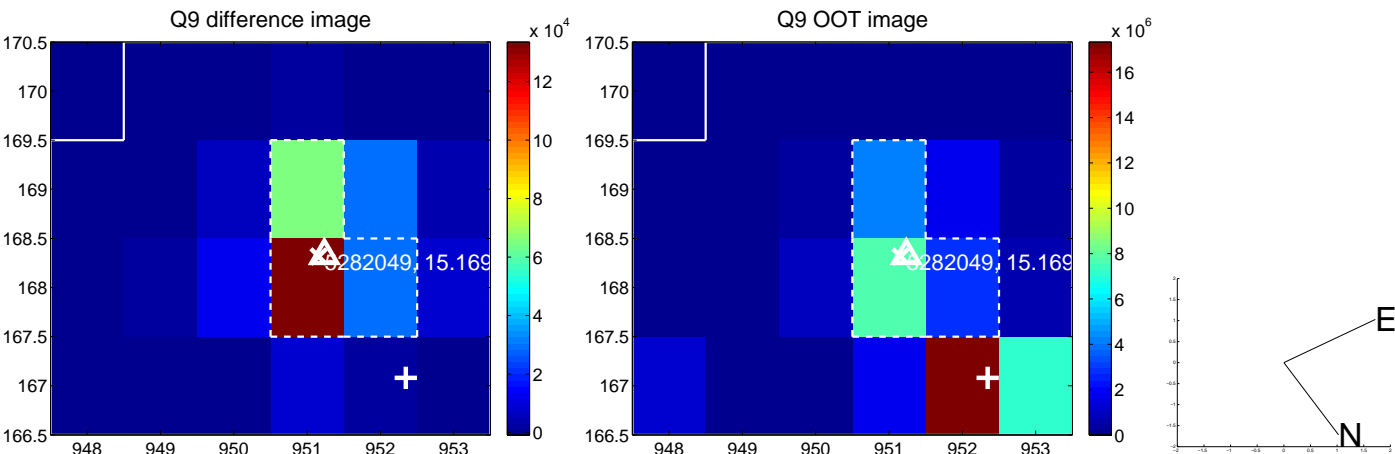




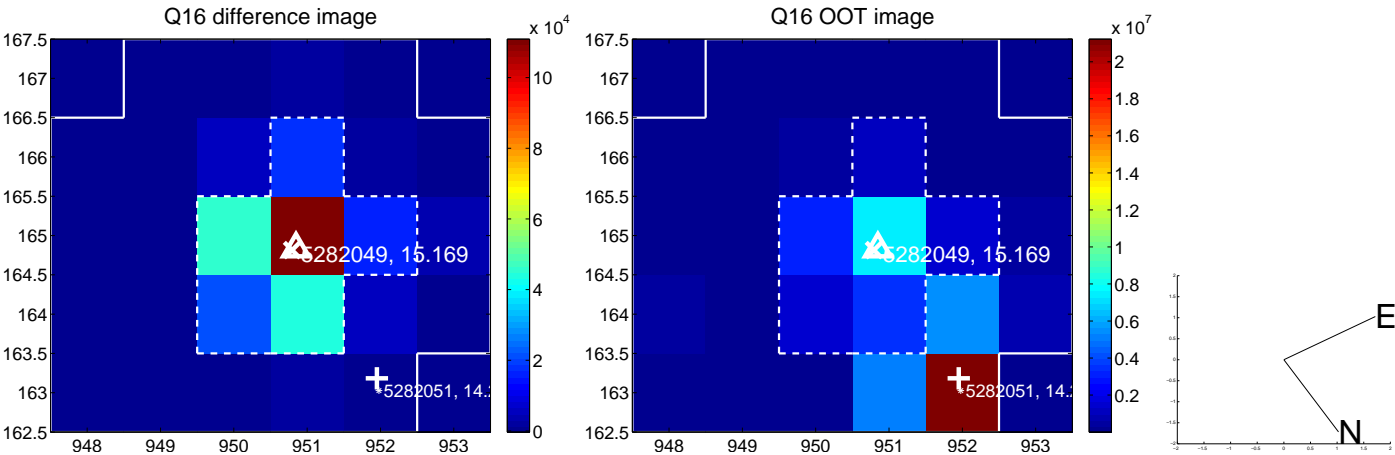
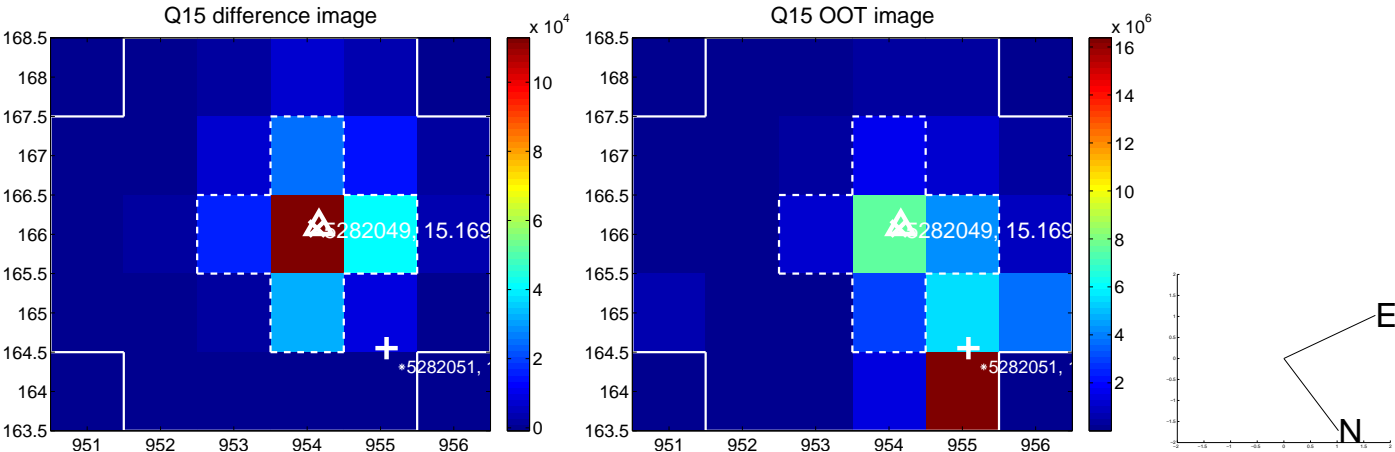
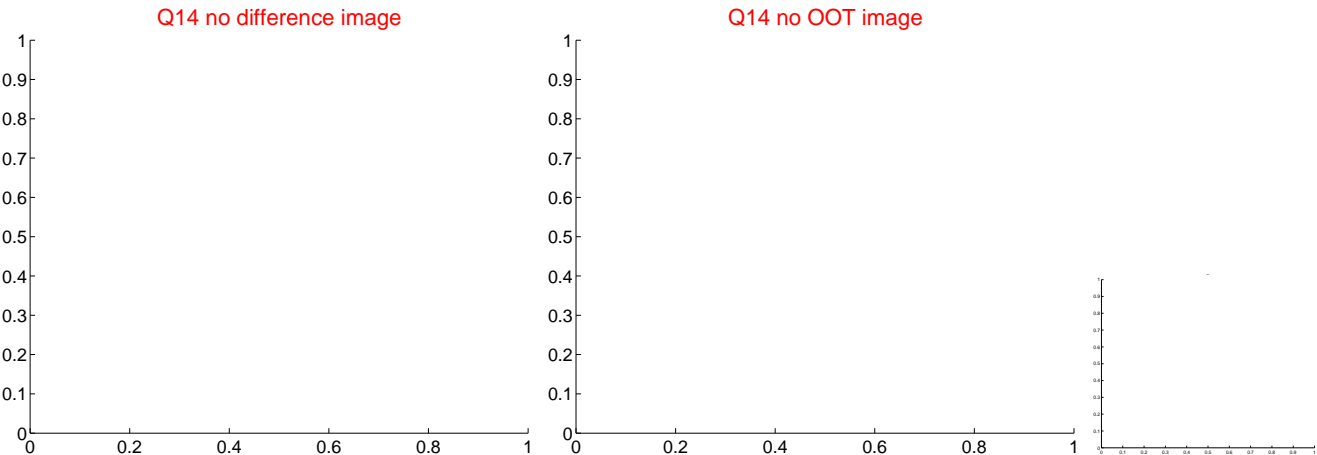
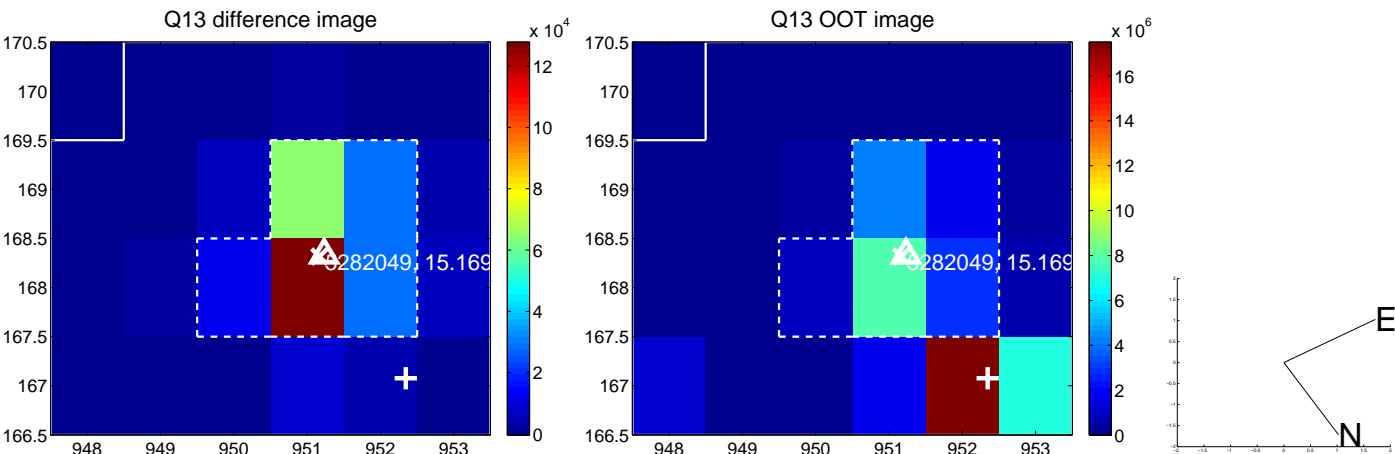
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



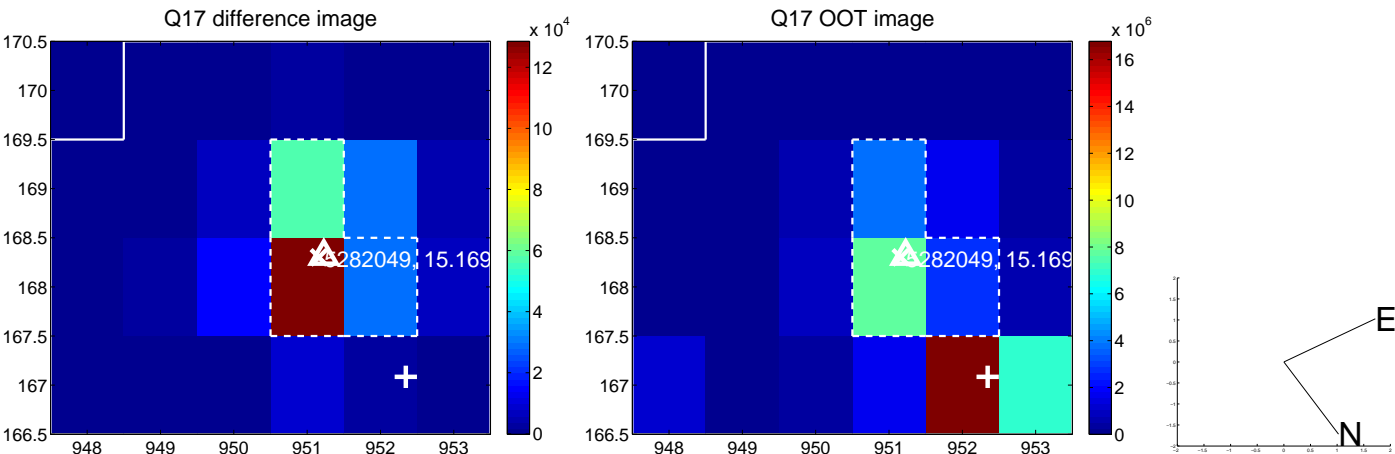
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



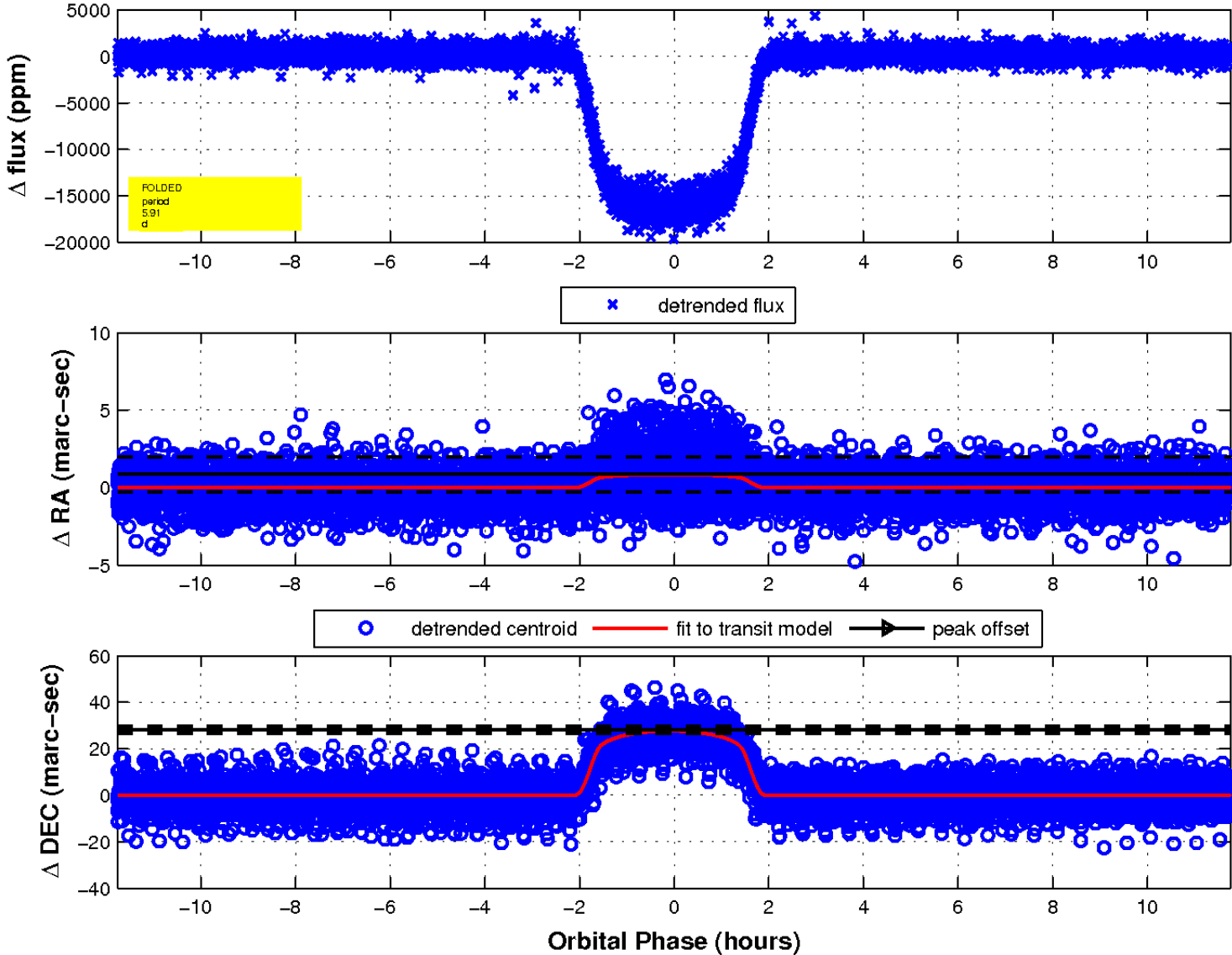
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

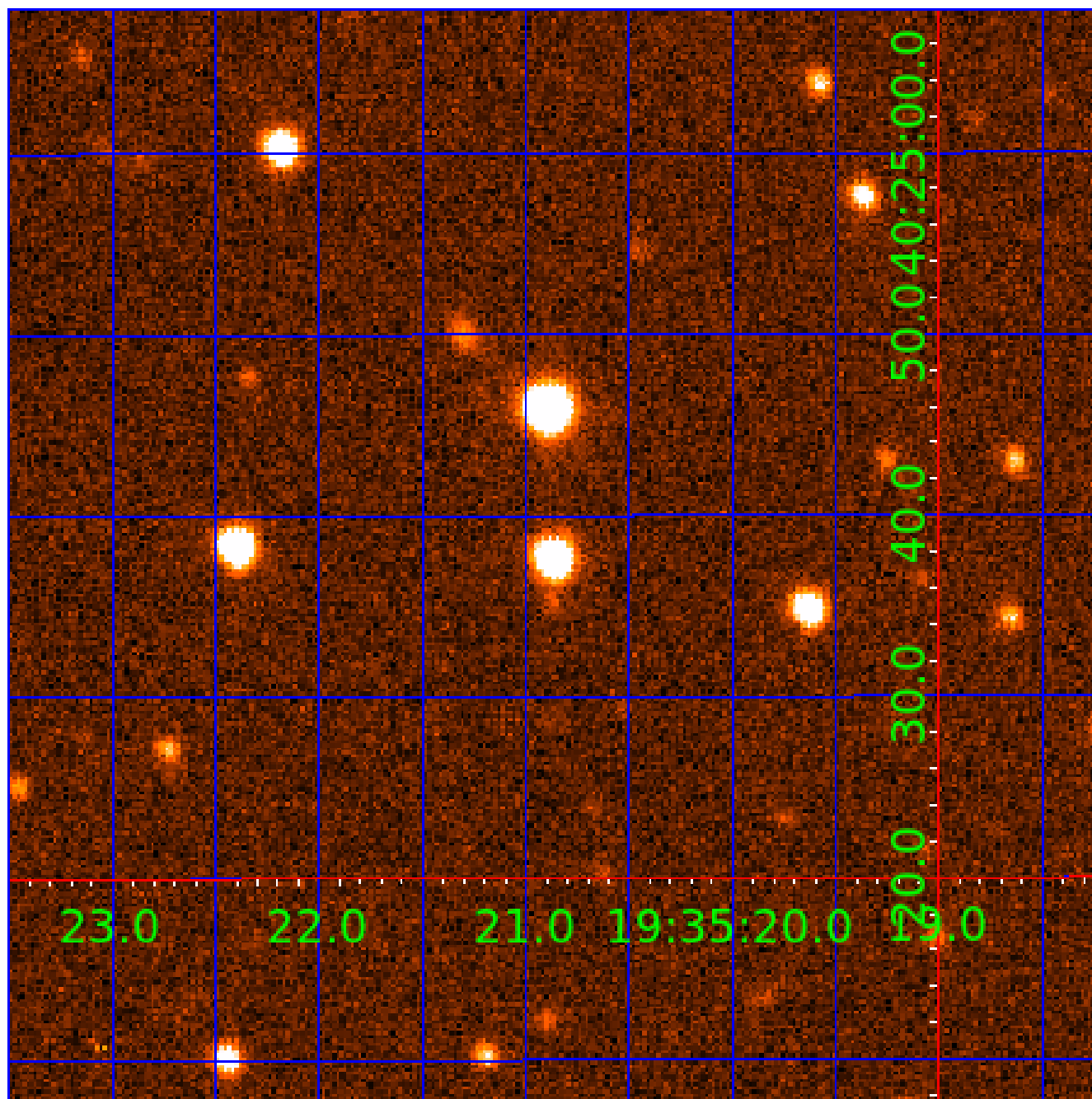


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



# KIC 005282049

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005282049-01	OBS	1545.01	5.910372	135.691059	17102.9	3.921	876.3	782.7	0.96	6200	12.64	291.00
005282049-02	OBS	1545.02	5.910266	132.756447	223.4	4.446	11.6	12.0	0.96	6200	1.68	291.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005282049-01	OBS	PC	0.93	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_OCCULT_ALT—HAS_SEC_TCE—CENT_KIC_POS
005282049-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

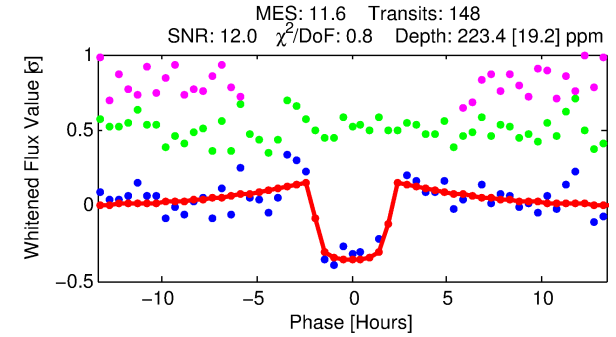
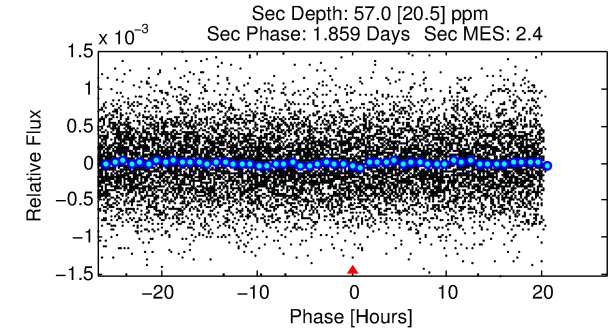
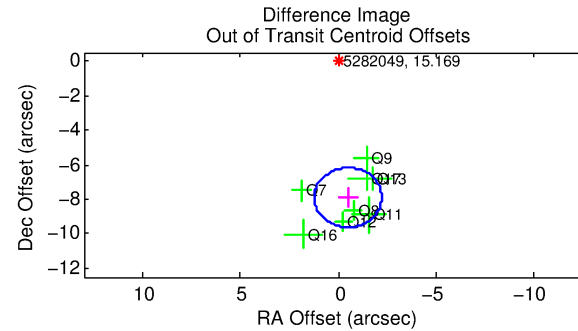
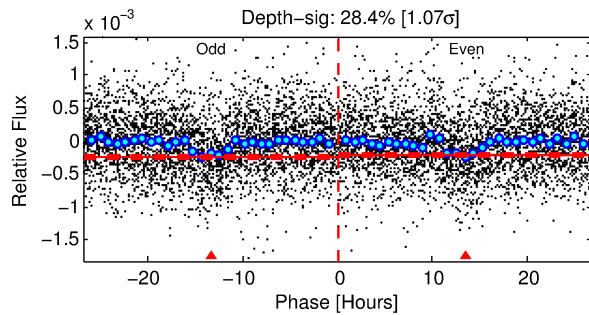
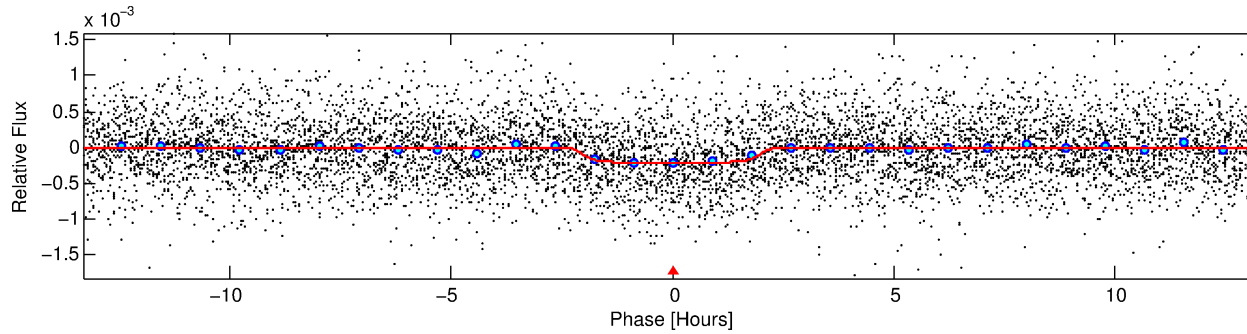
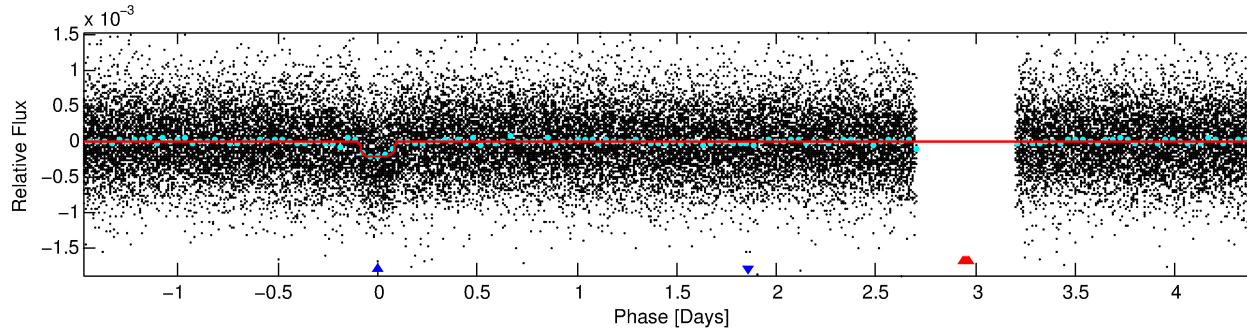
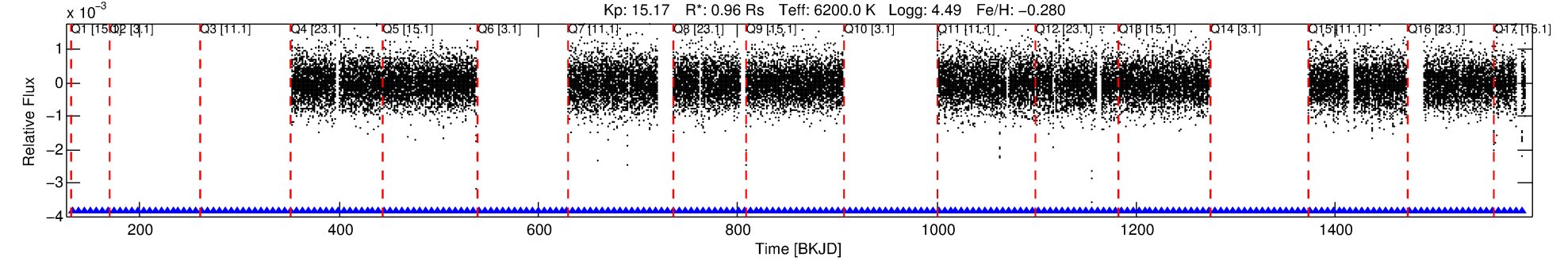
## Ephemeris Match Information For 005282049-02

No Significant Match Found

# DV One-Page Summary

KIC: 5282049 Candidate: 2 of 2 Period: 5.910 d  
KOI: K01545.02 Corr: 0.907

Kp: 15.17 R\*: 0.96 Rs Teff: 6200.0 K Logg: 4.49 Fe/H: -0.280



## DV Fit Results:

Period = 5.91027 [0.00004] d  
Epoch = 132.7564 [0.0053] BKJD  
Rp/R\* = 0.0161 [0.0032]  
a/R\* = 4.85 [4.90]  
b = 0.90 [0.22]  
Seff = 291.00 [116.86]  
Teq = 1053 [106] K  
Rp = 1.68 [0.61] Re  
a = 0.0646 [0.0164] AU  
Ag = 46.24 [30.12] [1.50σ]  
Teffp = 4246 [596] K [5.28σ]

## DV Diagnostic Results:

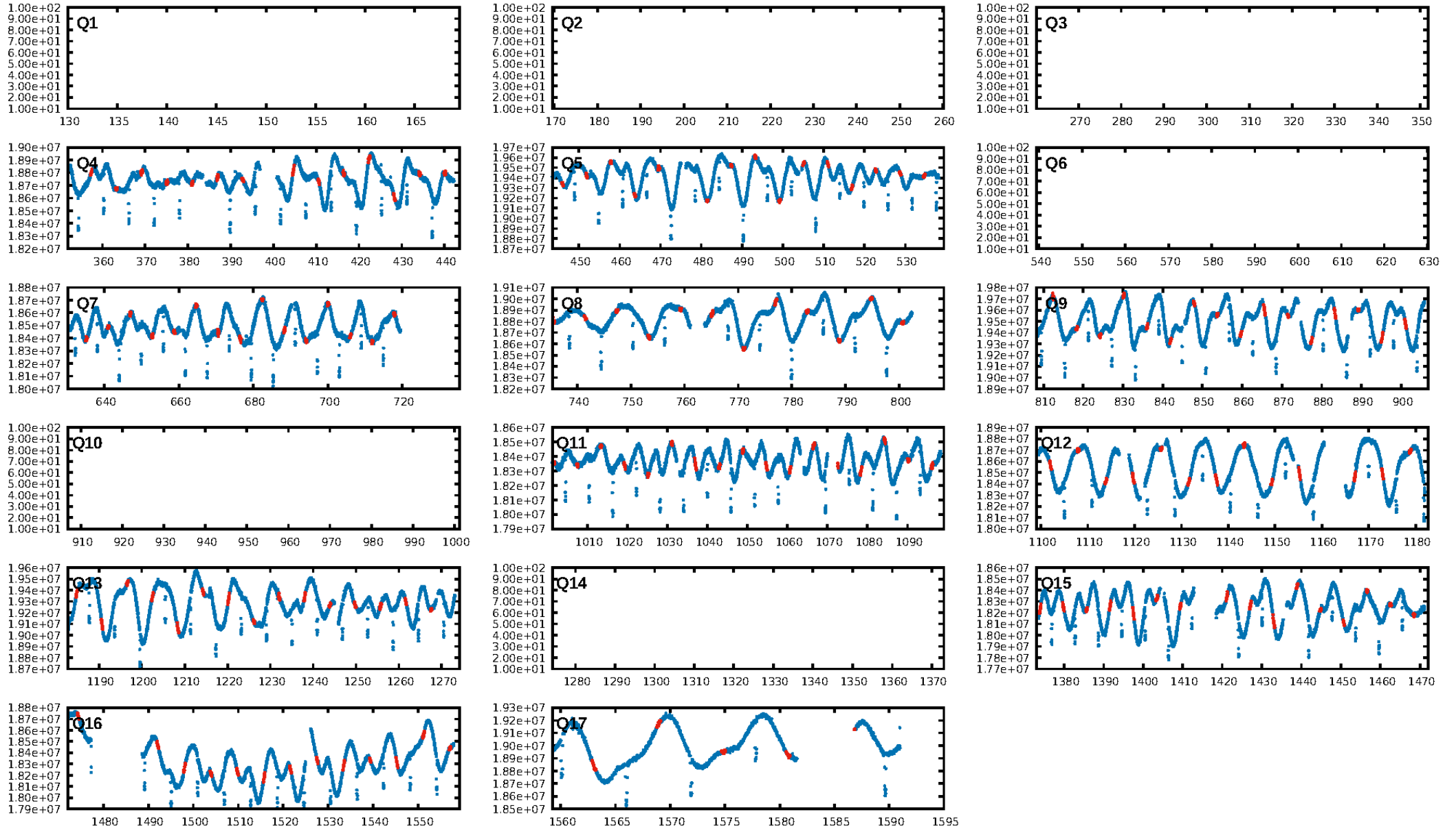
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 99.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.69e-29  
RollingBand-fgt: 1.00 [144/144]  
GhostDiagnostic-chr: -300.7  
Centroid-sig: 0.0%  
Centroid-so: 1.300 arcsec [1.33σ]  
OotOffset-rm: 7.921 arcsec [13.78σ]  
KicOffset-rm: 0.574 arcsec [1.57σ]  
OotOffset-st: 0/2/3/3 [8]  
KicOffset-st: 0/2/3/3 [8]  
DiffImageQuality-fgm: 0.75 [6/8]  
DiffImageOverlap-fno: 1.00 [11/11]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:05:43 Z

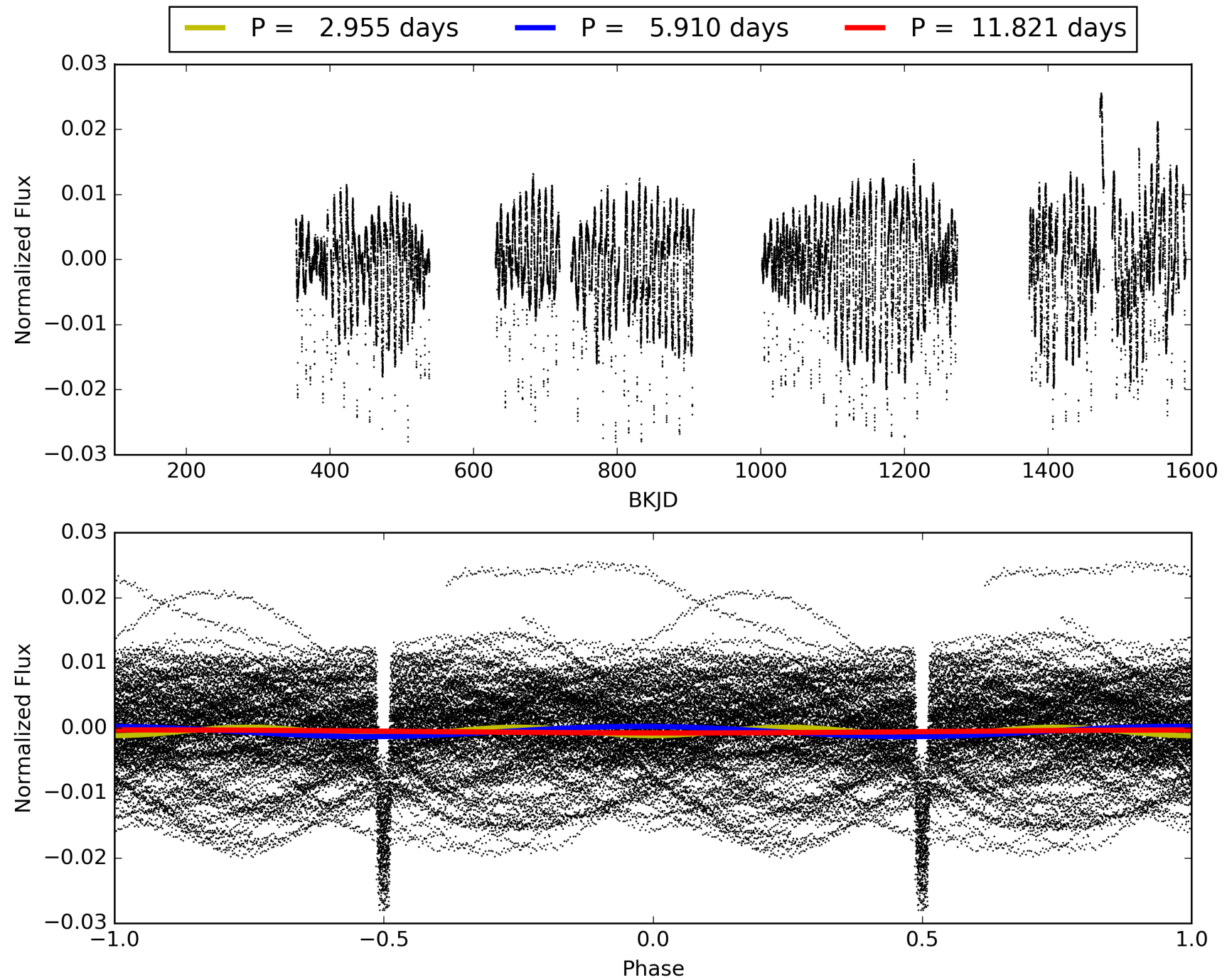
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005282049-02, PDC Light Curves

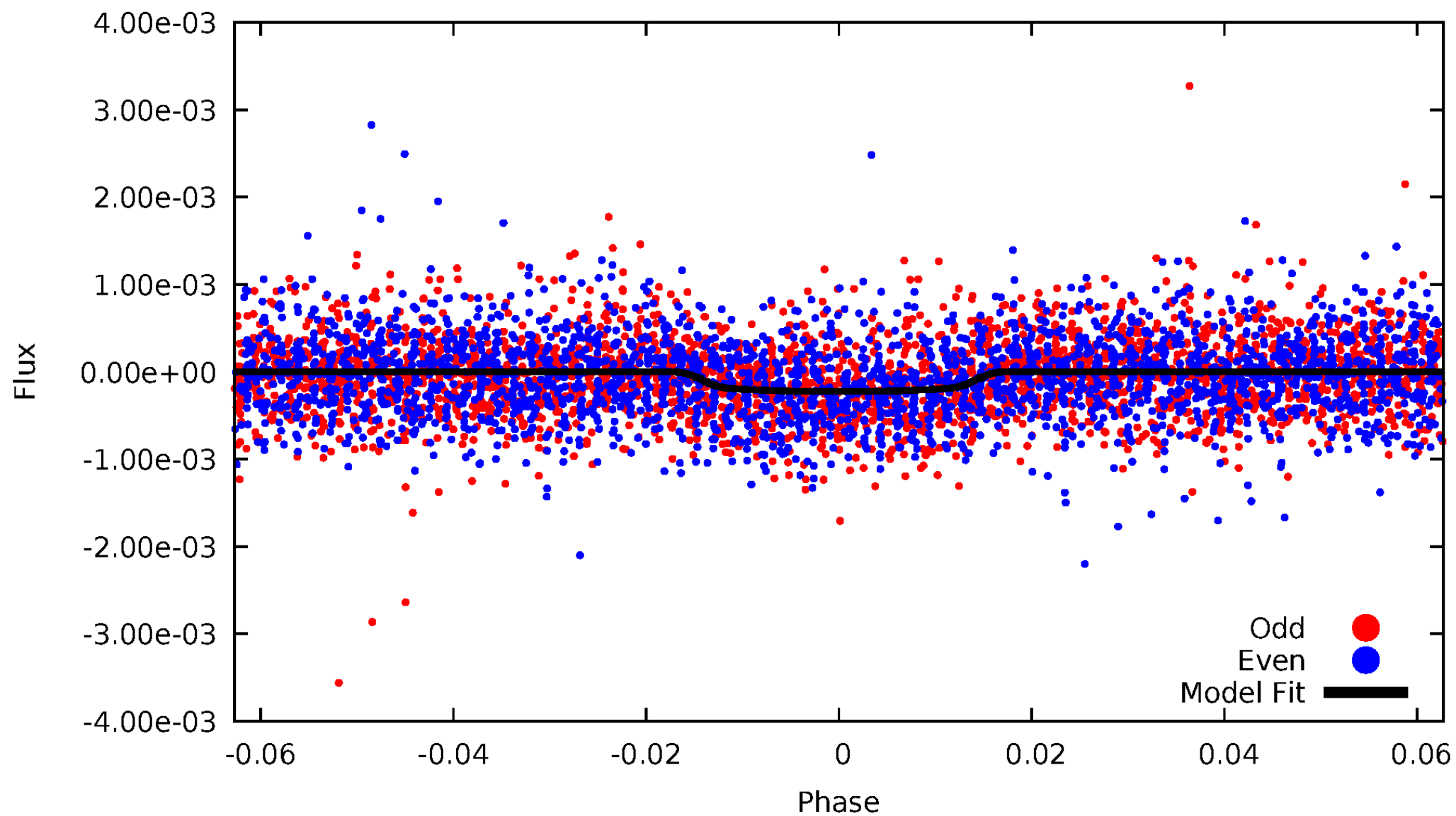


TCE 005282049-02



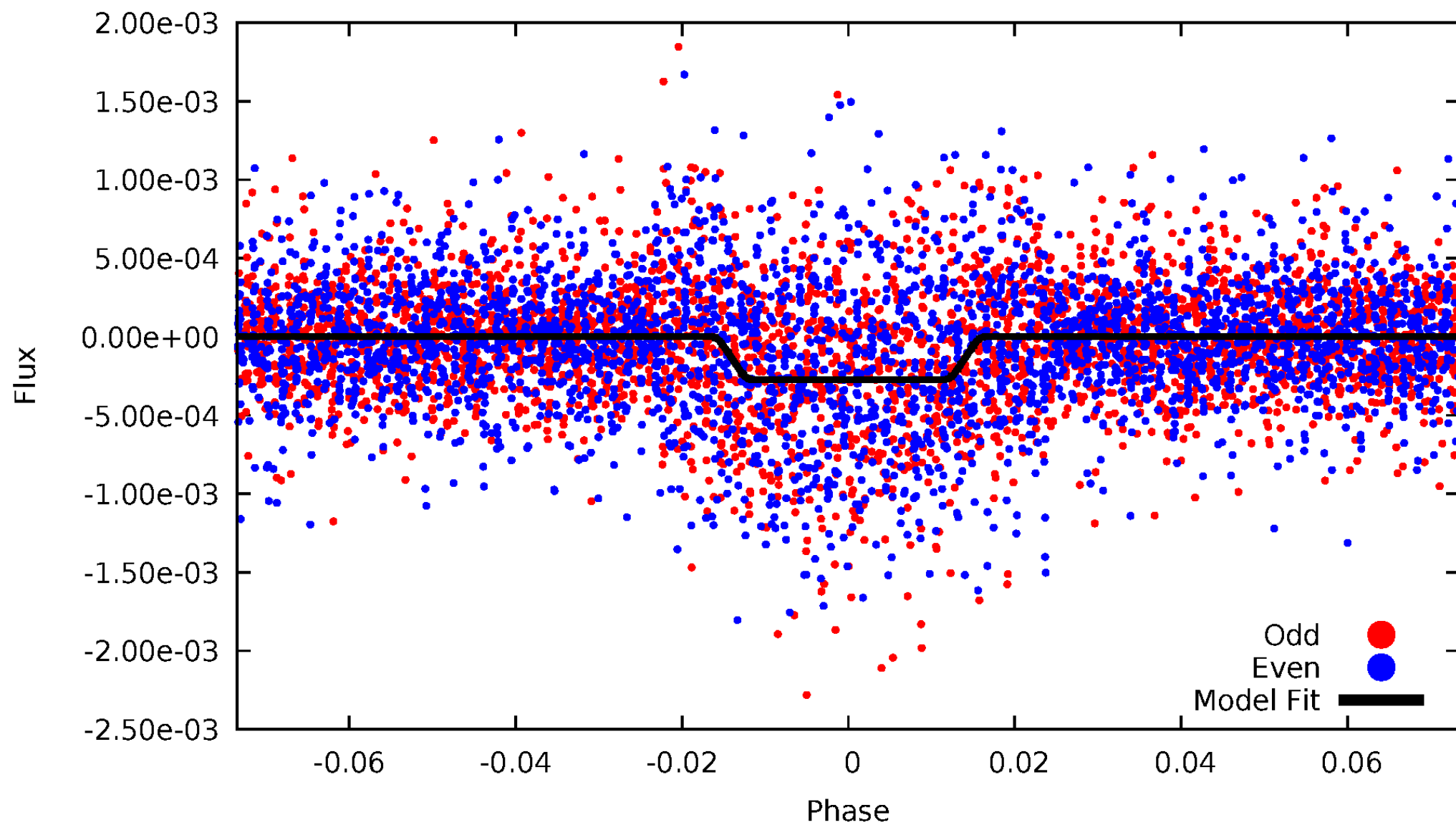
DV Odd/Even

TCE 005282049-02



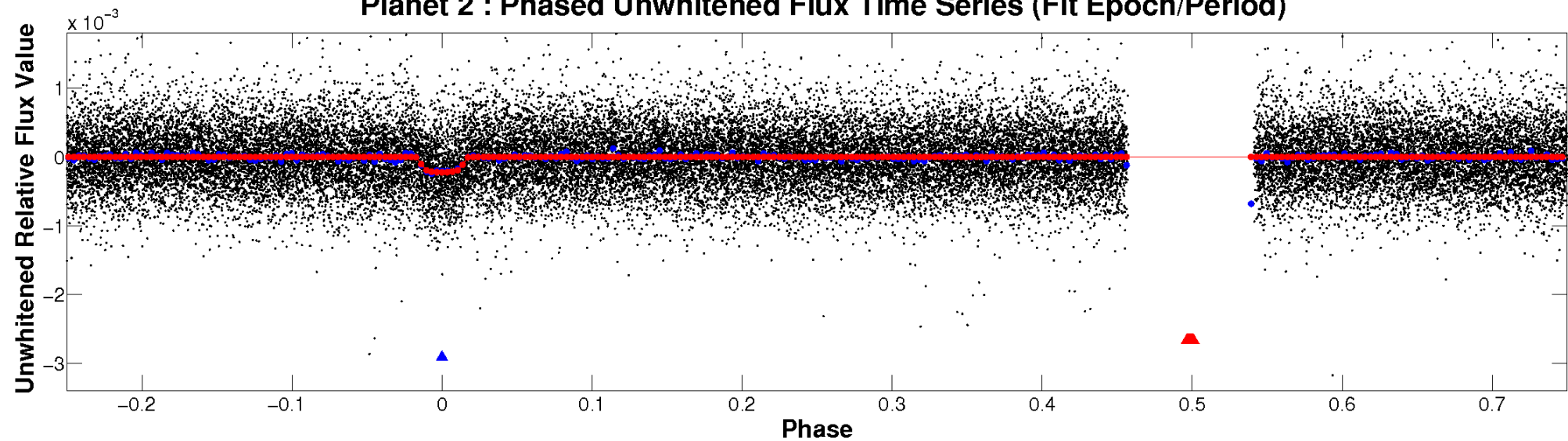
# ALT Odd/Even

TCE 005282049-02

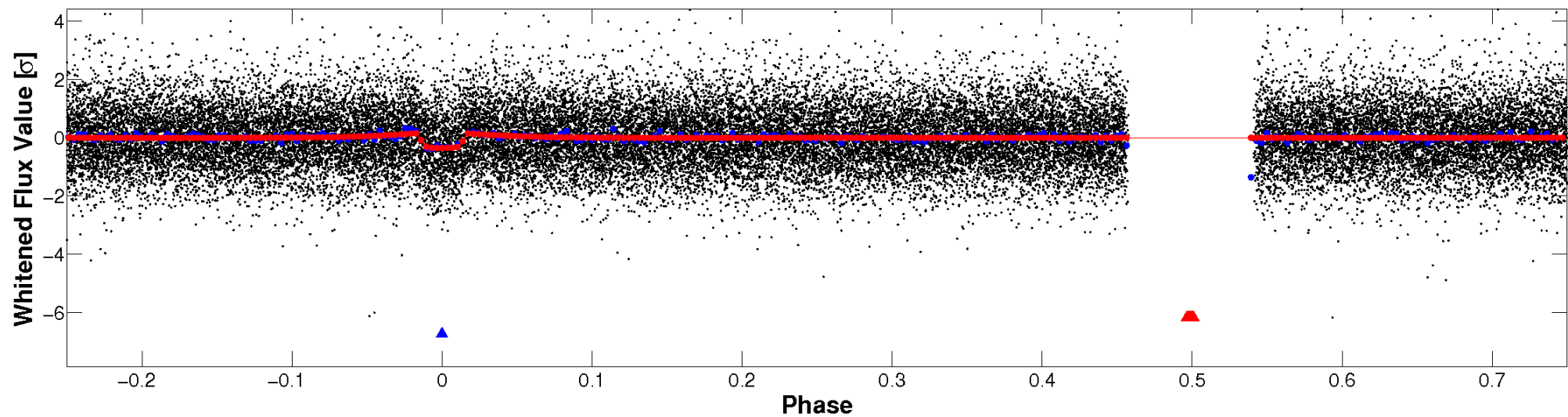


# Non-Whitened Vs. Whitened Light Curve

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

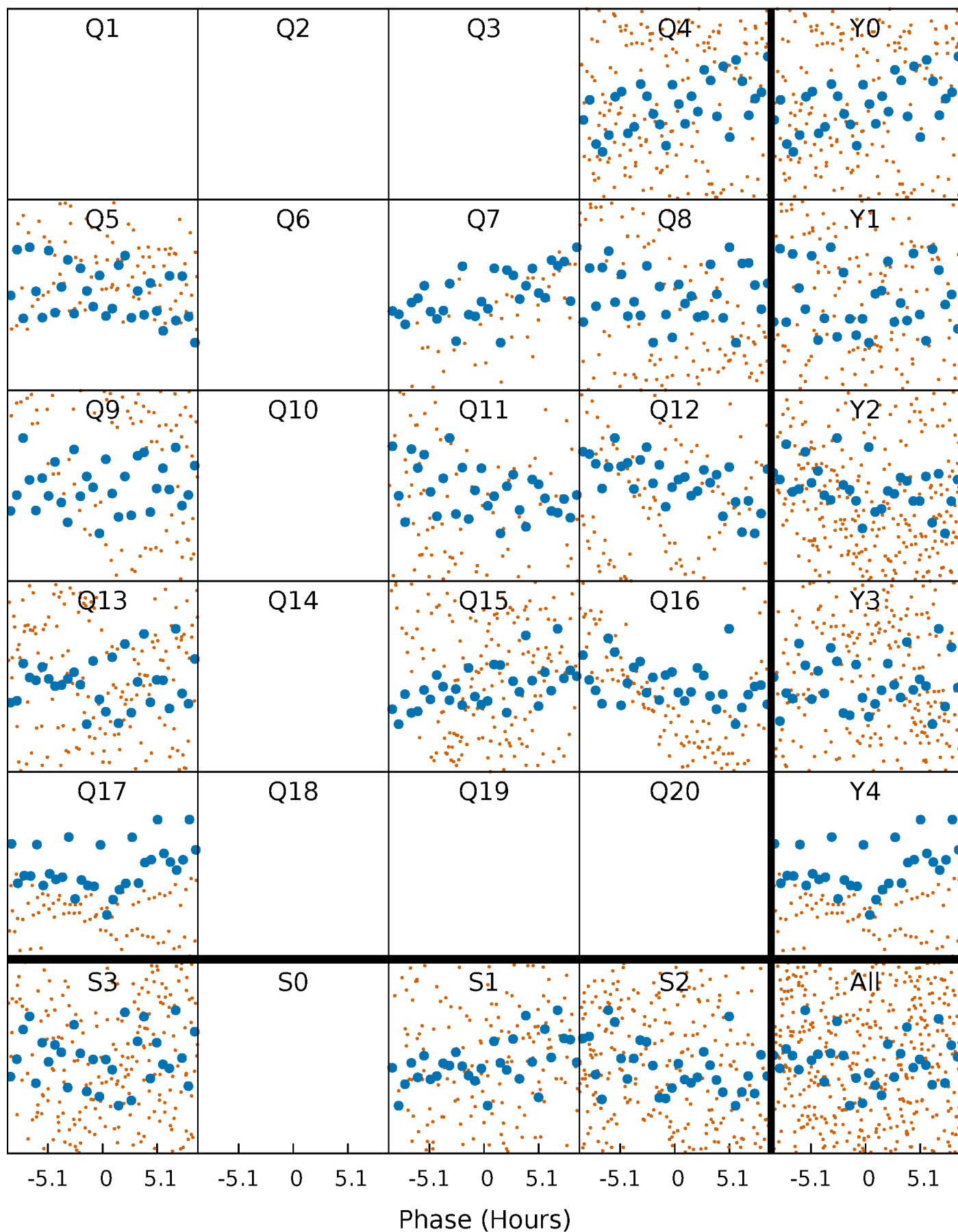


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

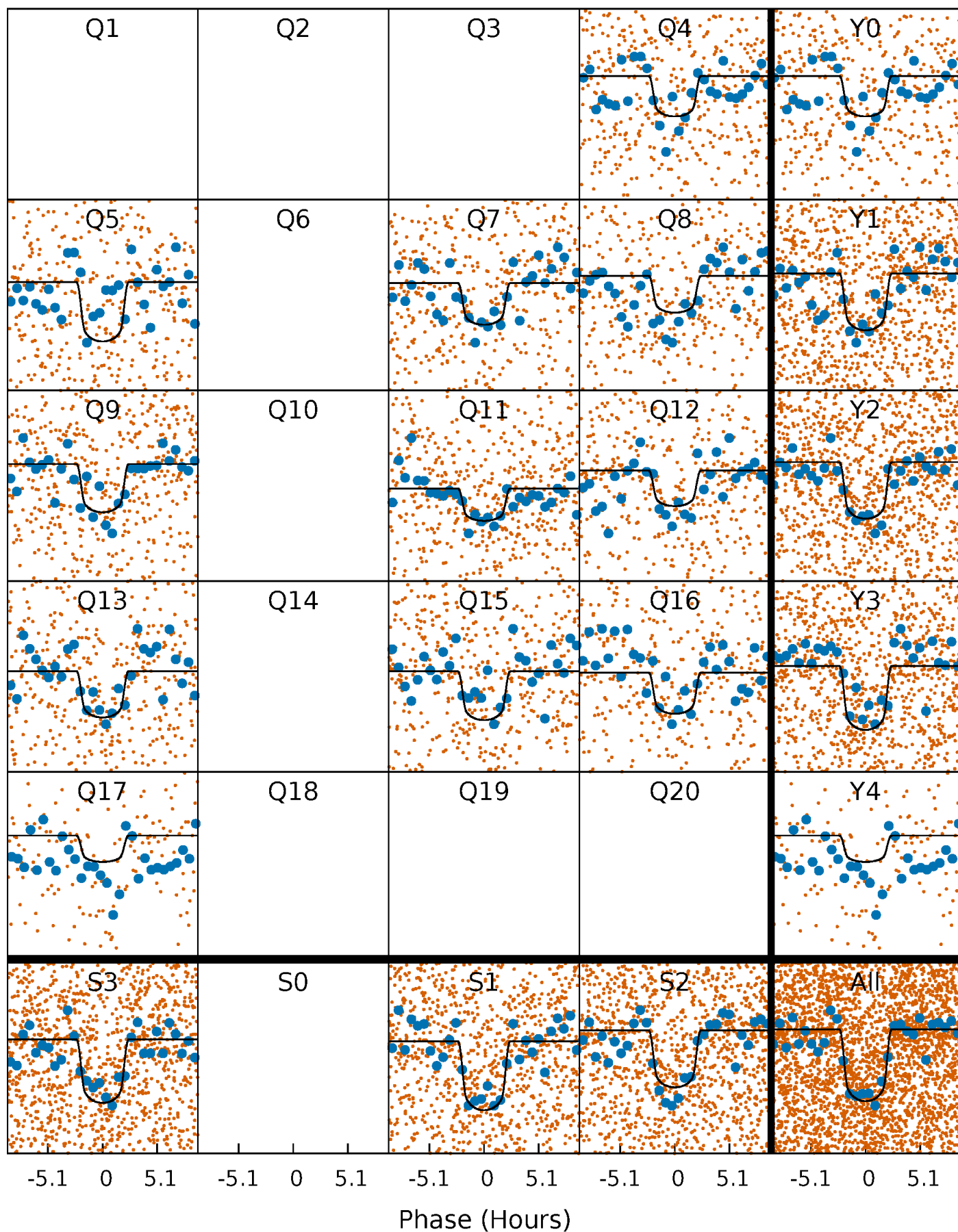
TCE 005282049-02   P= 5.910266 Days    $T_0=132.756447$  (BKJD)





# DV Quarter-Phased Transit Curves

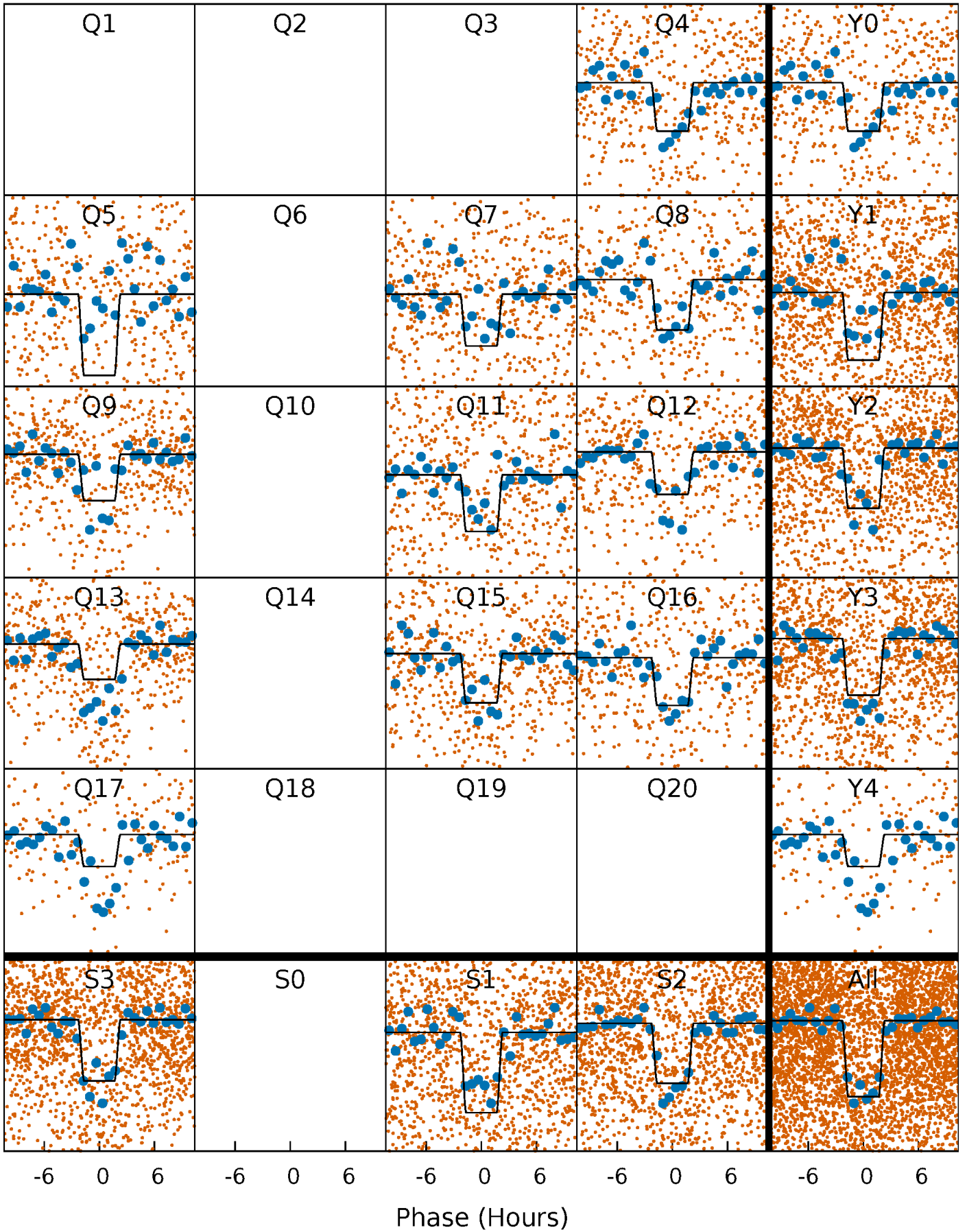
TCE 005282049-02   P= 5.910266 Days    $T_0=132.756447$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

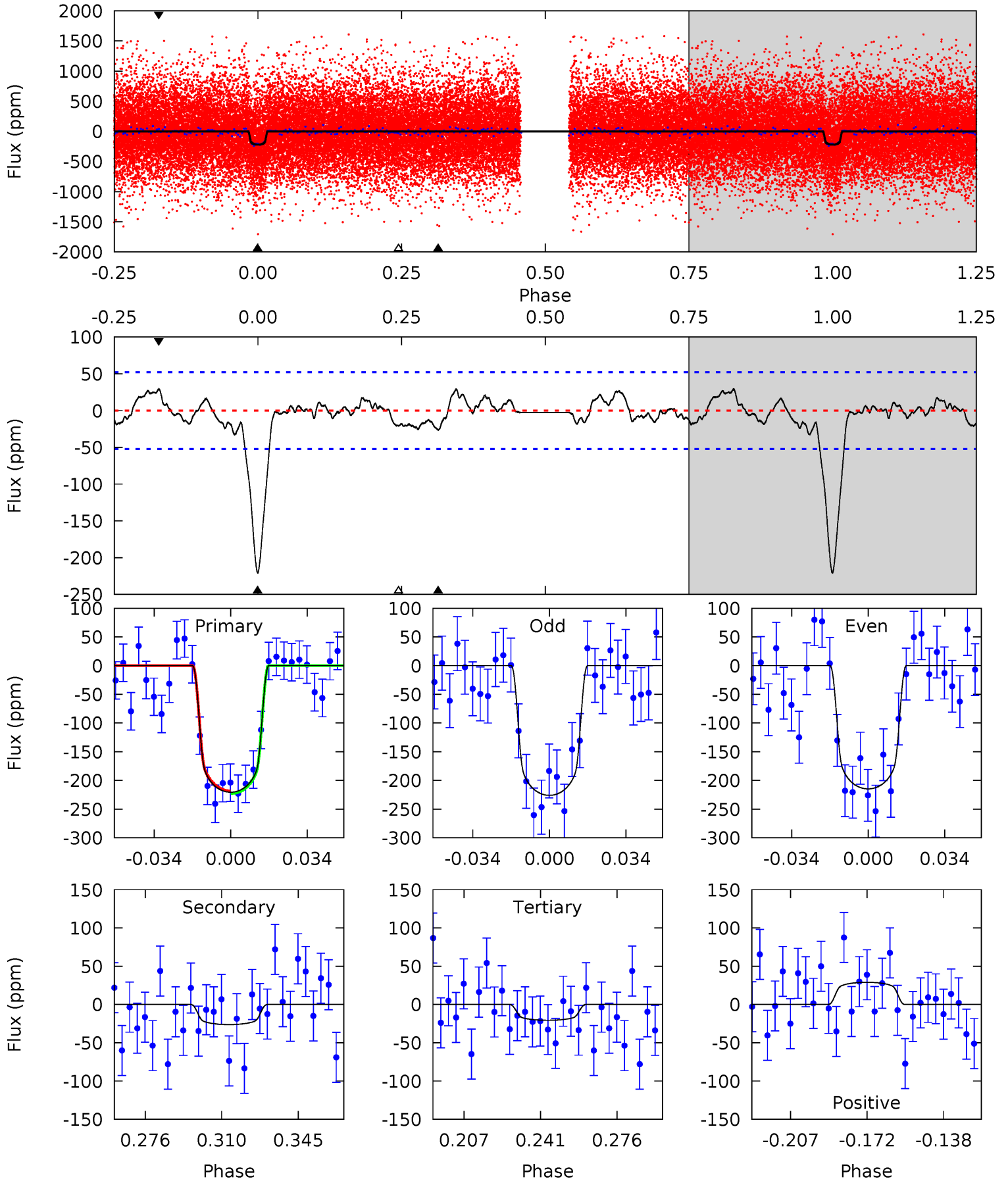
TCE 005282049-02 P= 5.910261 Days  $T_0=132.755615$  (BKJD)



# DV Model-Shift Uniqueness Test

005282049-02, P = 5.910266 Days, E = 132.756447 Days

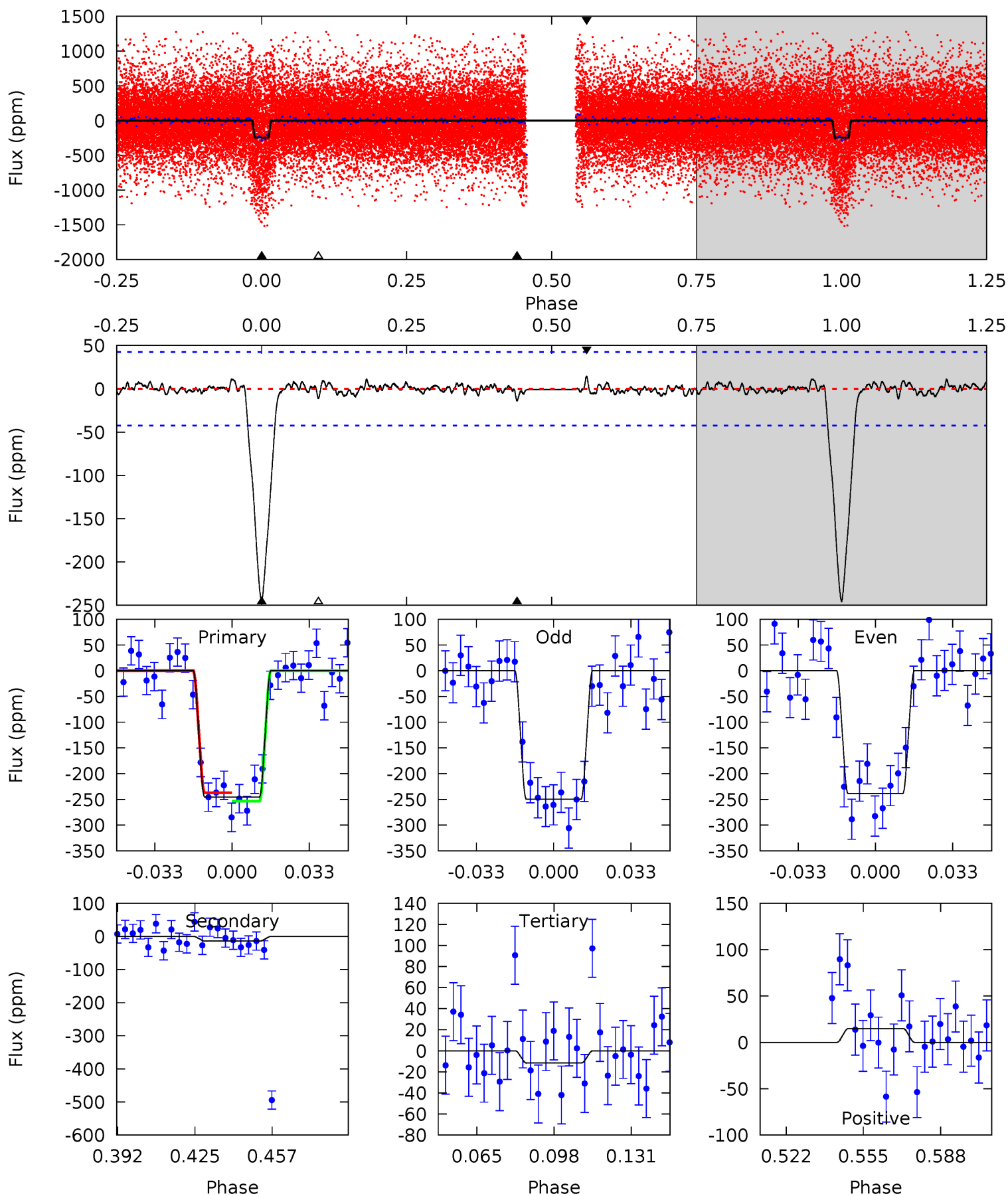
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.2	2.40	1.89	2.66	4.78	2.11	1.17	18.3	17.6	0.51	-0.26	0.52	0.90	0.12	0.19



# Alt Model-Shift Uniqueness Test

005282049-02, P = 5.910261 Days, E = 132.755615 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
27.7	1.59	1.30	1.67	4.79	2.14	0.44	26.4	26.0	0.29	-0.08	0.61	1.08	0.06	0.93



### Stellar Parameters For KIC 005282049

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6200^{+200}_{-250}$	$4.488^{+0.050}_{-0.200}$	$-0.280^{+0.300}_{-0.300}$	$0.958^{+0.291}_{-0.097}$	$1.029^{+0.134}_{-0.134}$	$1.650^{+0.451}_{-0.850}$
	+3%/-4%	+1%/-4%	+107%/-107%	+30%/-10%	+13%/-13%	+27%/-51%
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 005282049-02 / KOI 1545.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-26 \pm 11$	$1.76^{+0.42}_{-0.35}$	$1504^{+98}_{-80}$	$3803^{+420}_{-383}$	$18^{+15}_{-9}$
Alt.	$-14 \pm 9$	$1.80^{+0.42}_{-0.39}$	$1506^{+102}_{-81}$	$3435^{+440}_{-475}$	$9.556^{+10.430}_{-6.054}$

$T_{\text{max}}$  = 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

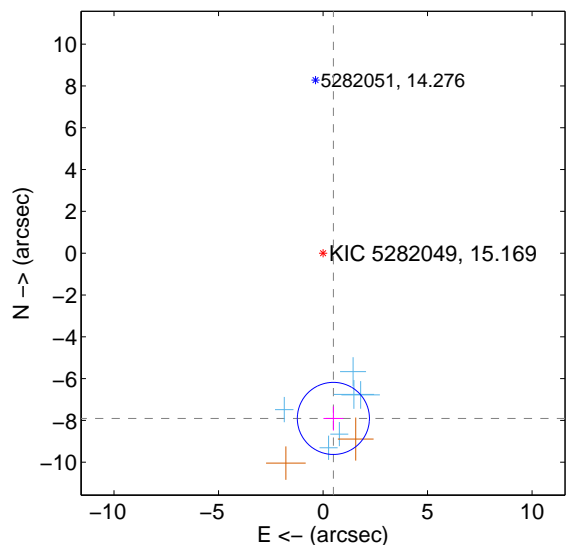
Supplemental centroid analysis for 005282049-02. Kepler magnitude: 15.17. Transit SNR 12.02

There are 6 quarters with good PRF difference image offsets

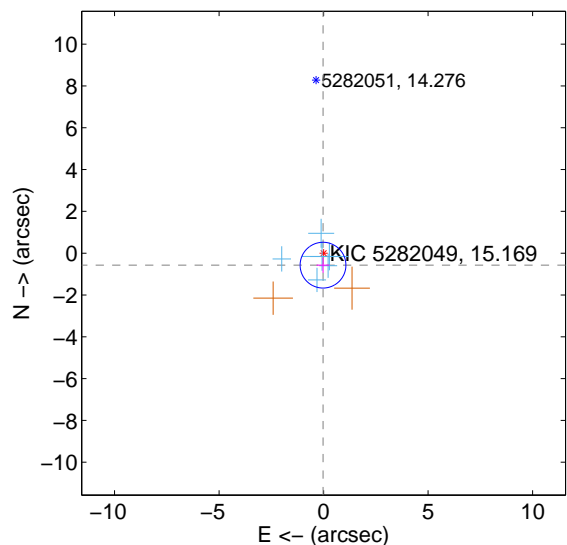
The OOT PRF centroid is offset from the target star catalog position by about 6.78 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$7.921 \pm 0.575$	13.78	$-0.495 \pm 0.476$	$-7.906 \pm 0.575$
PRF-fit source offset from KIC position	$0.574 \pm 0.365$	1.57	$0.027 \pm 0.309$	$-0.573 \pm 0.365$
photometric centroid source offset	$1.30 \pm 0.98$	1.33	$0.52 \pm 0.42$	$1.19 \pm 1.06$

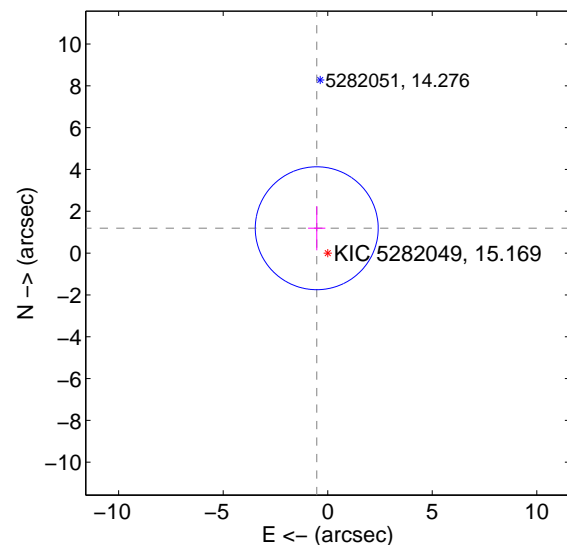
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

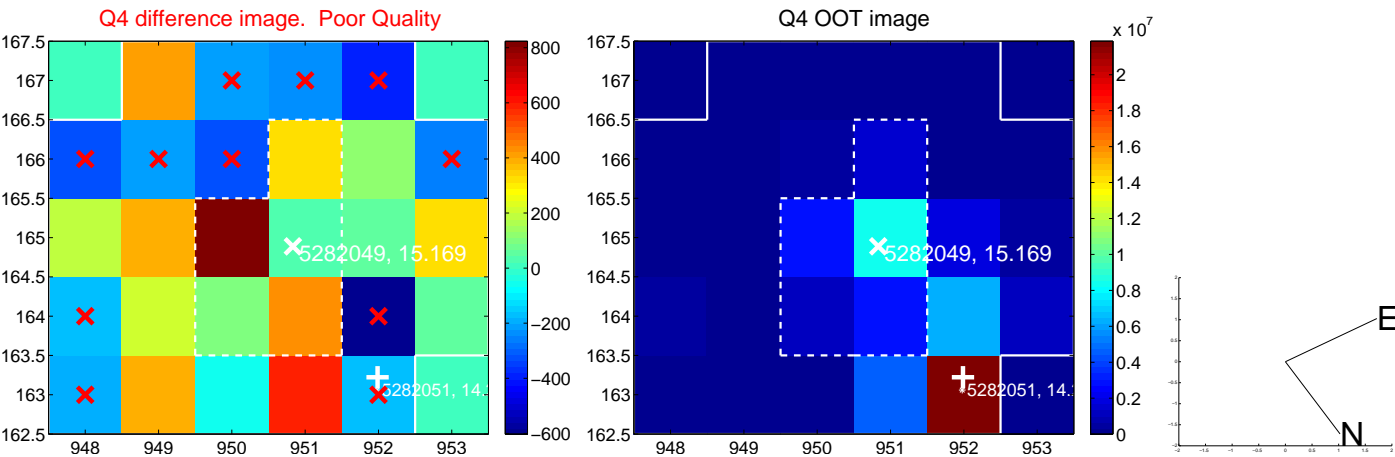
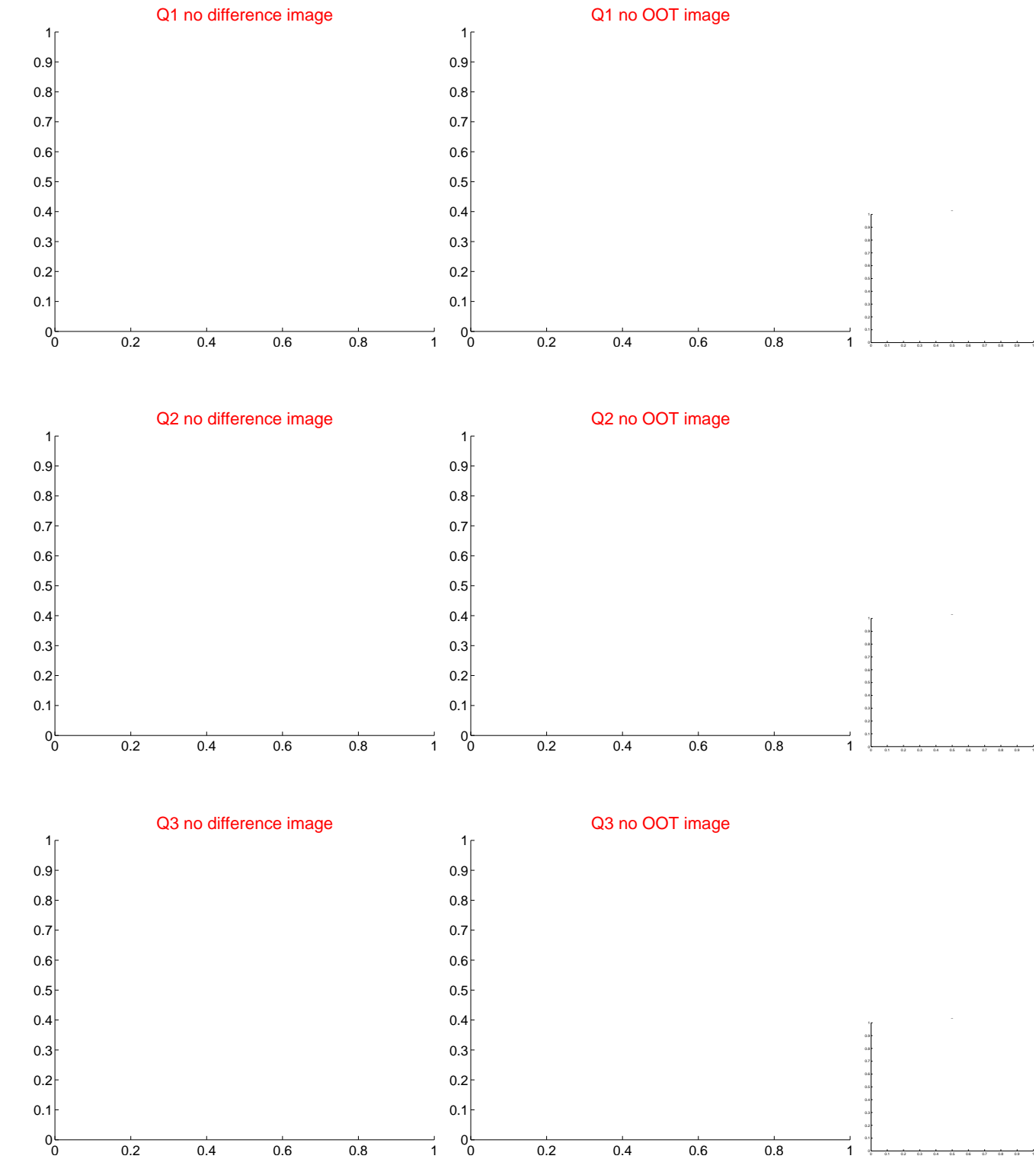


offset from photometric centroids

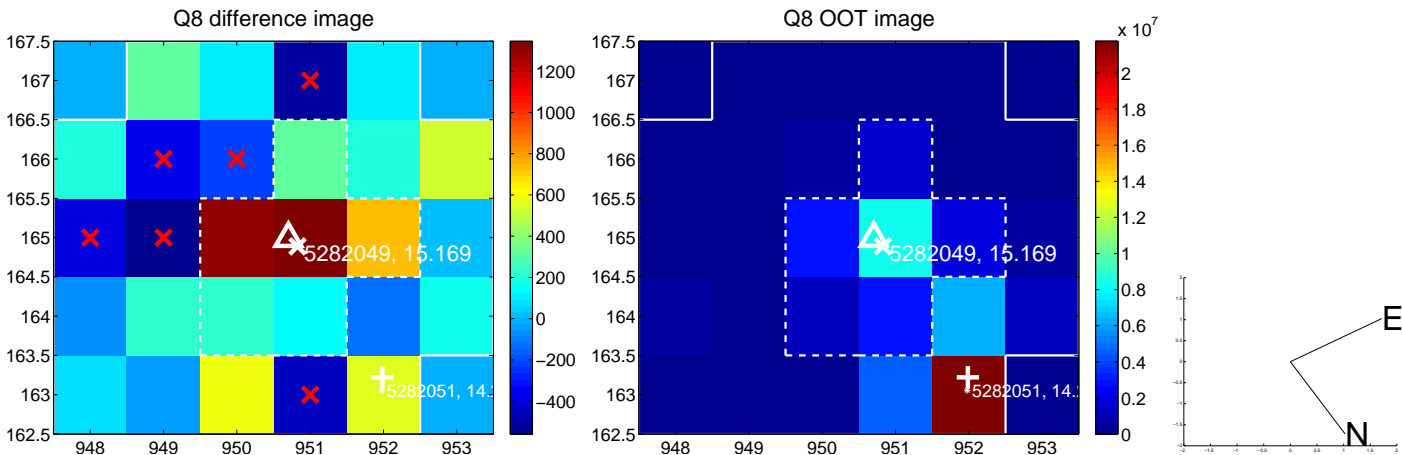
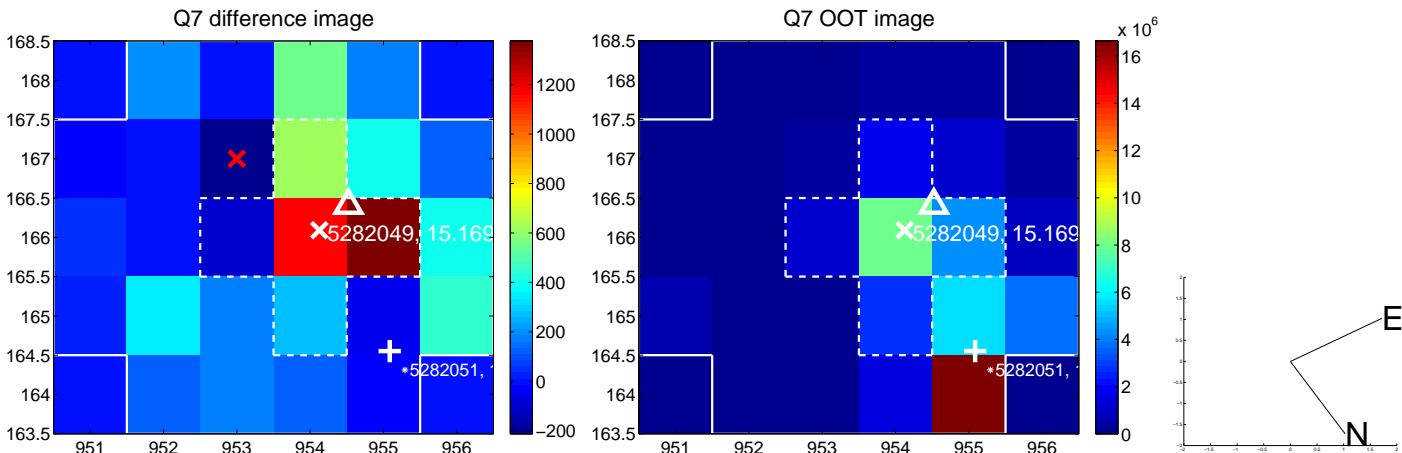
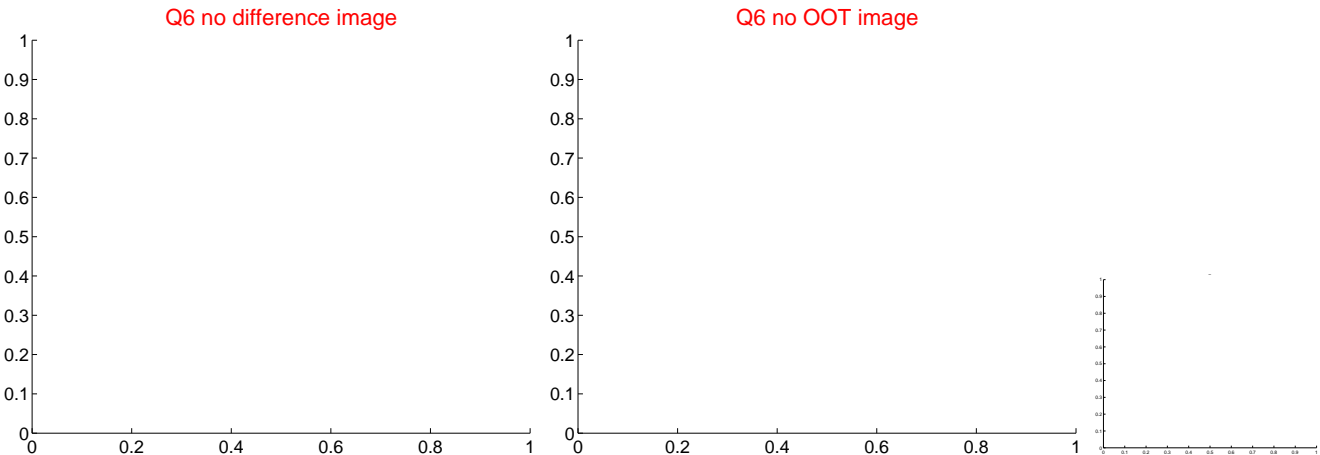
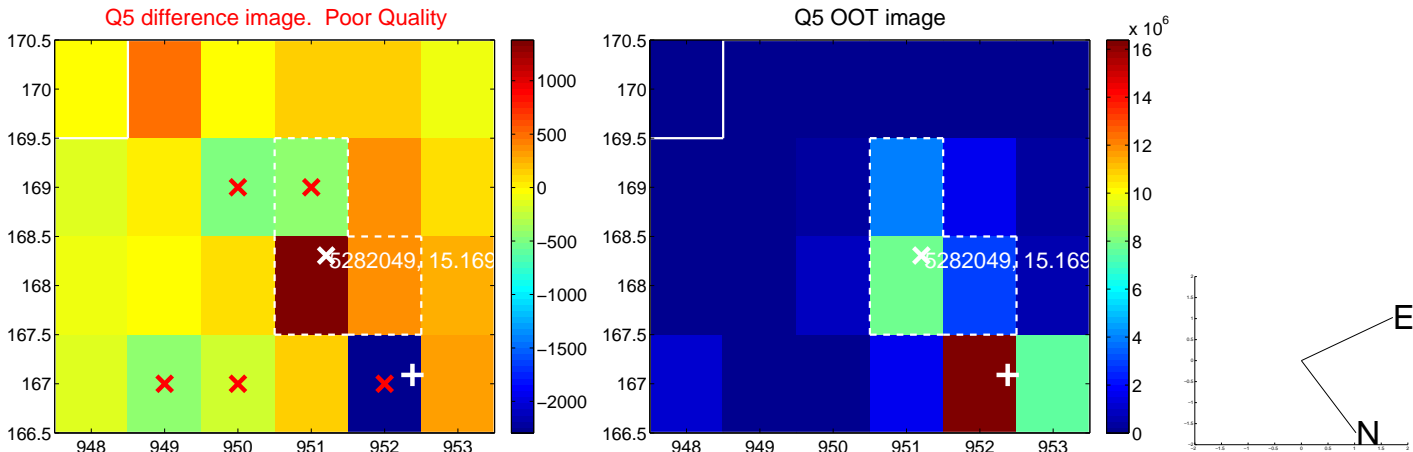


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

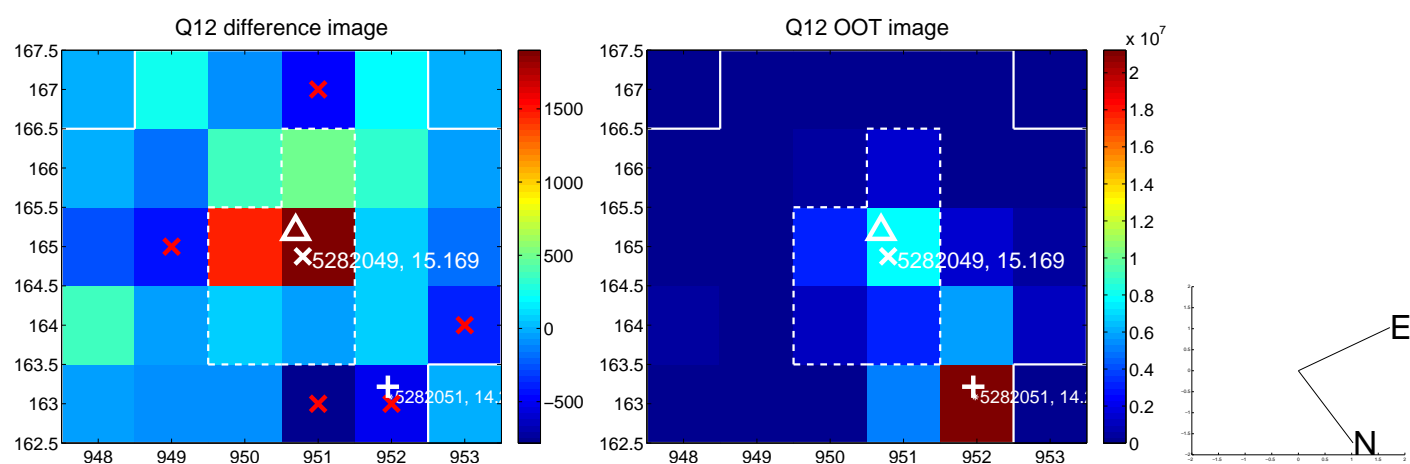
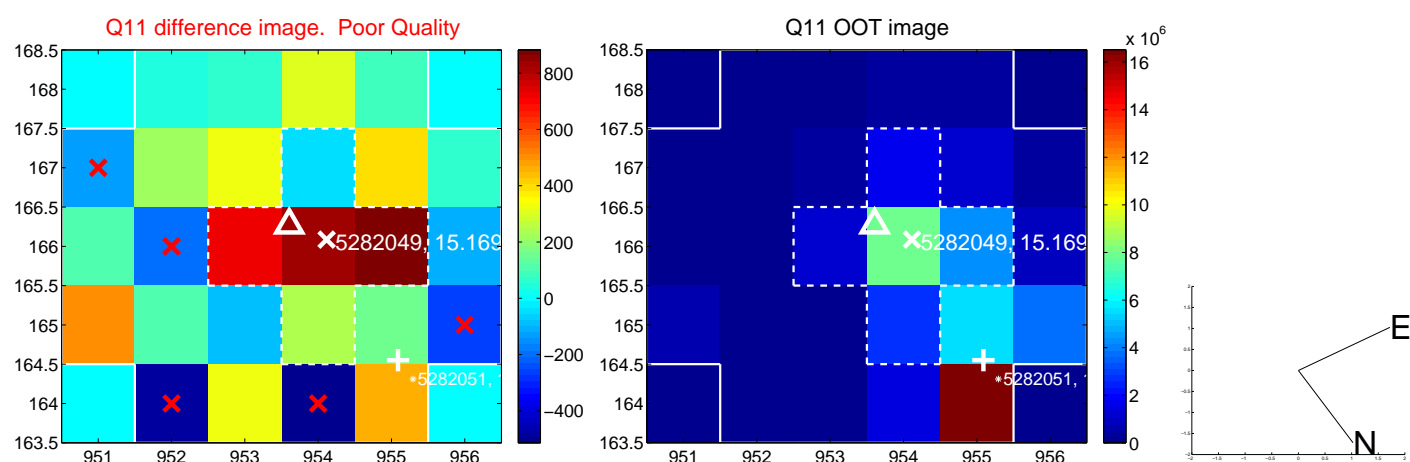
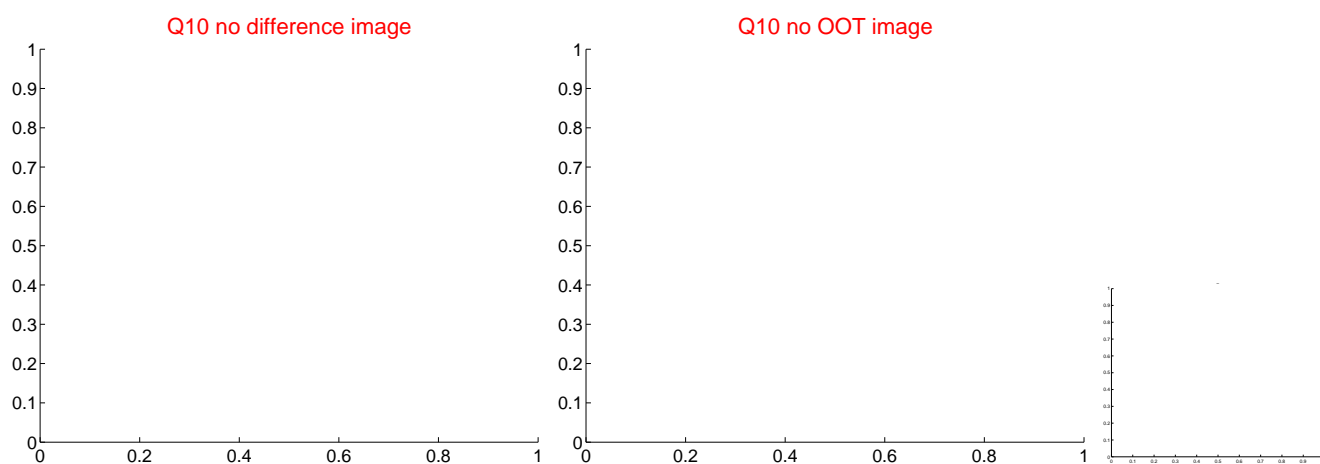
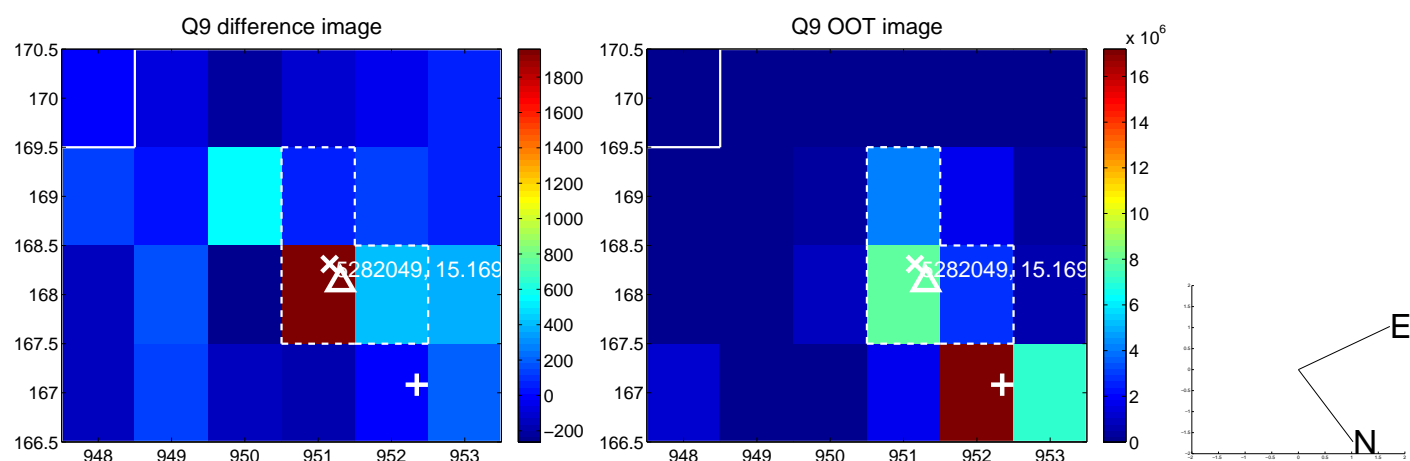


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

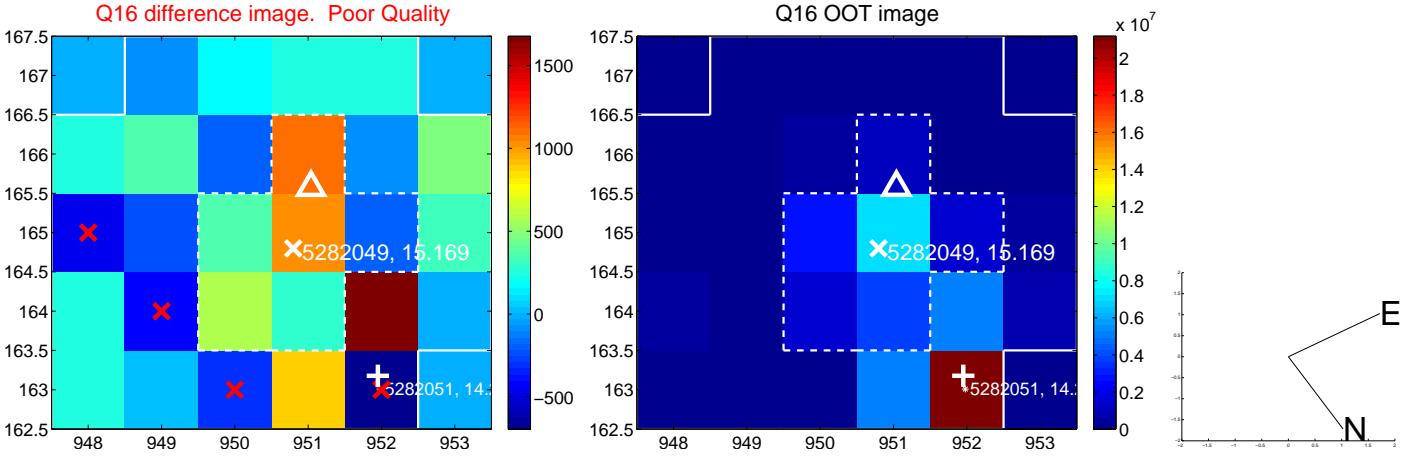
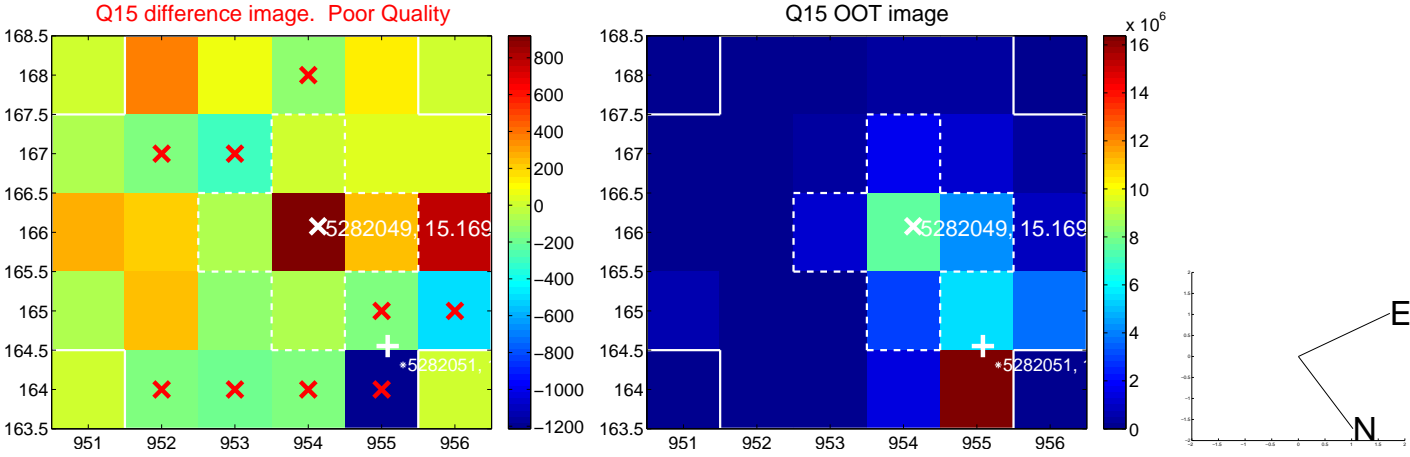
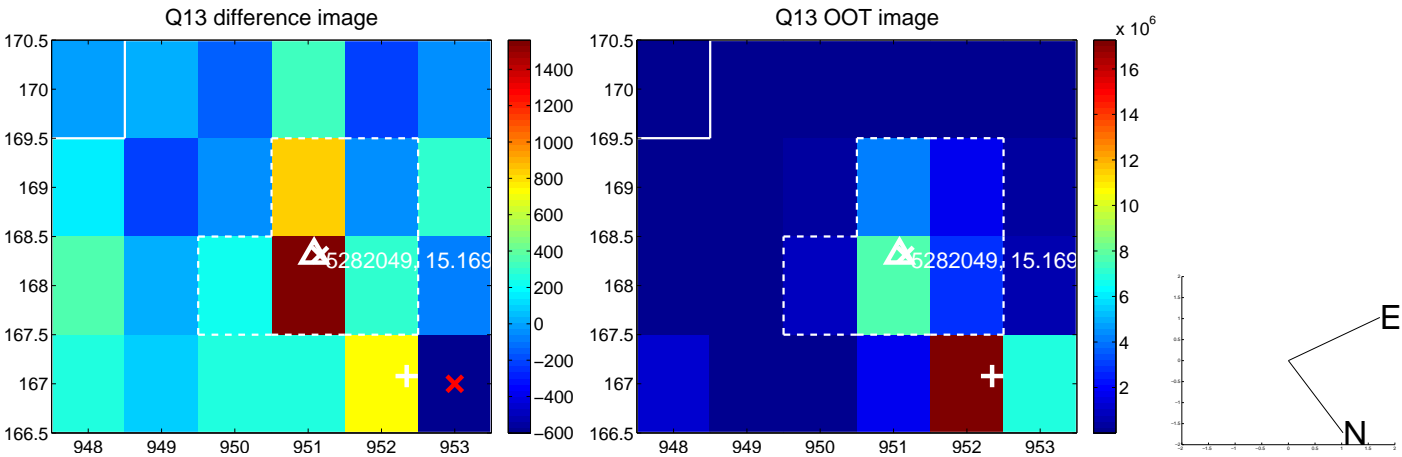




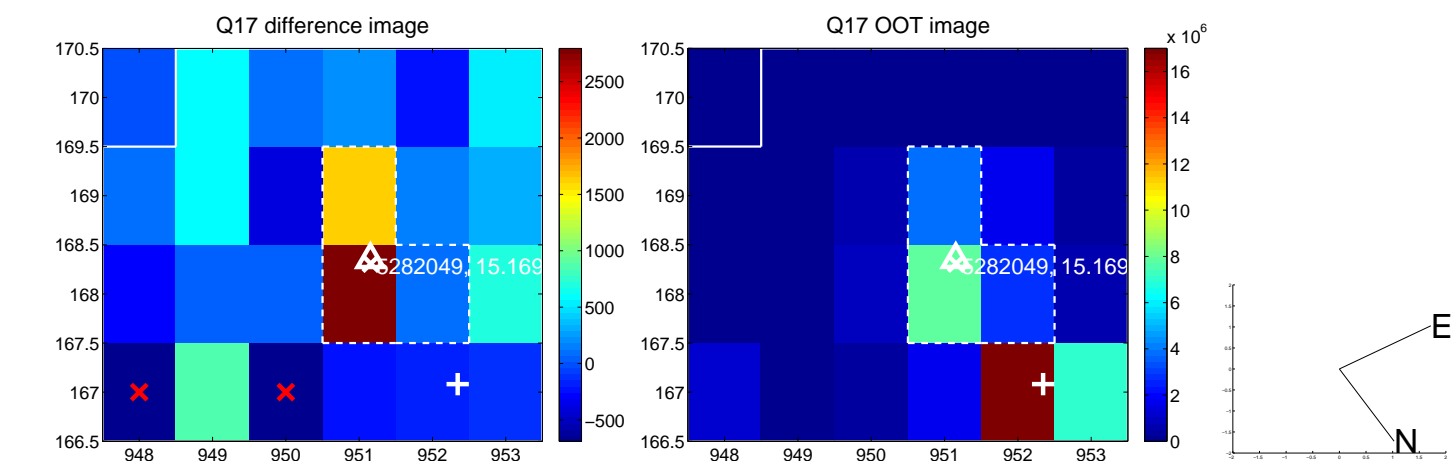
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



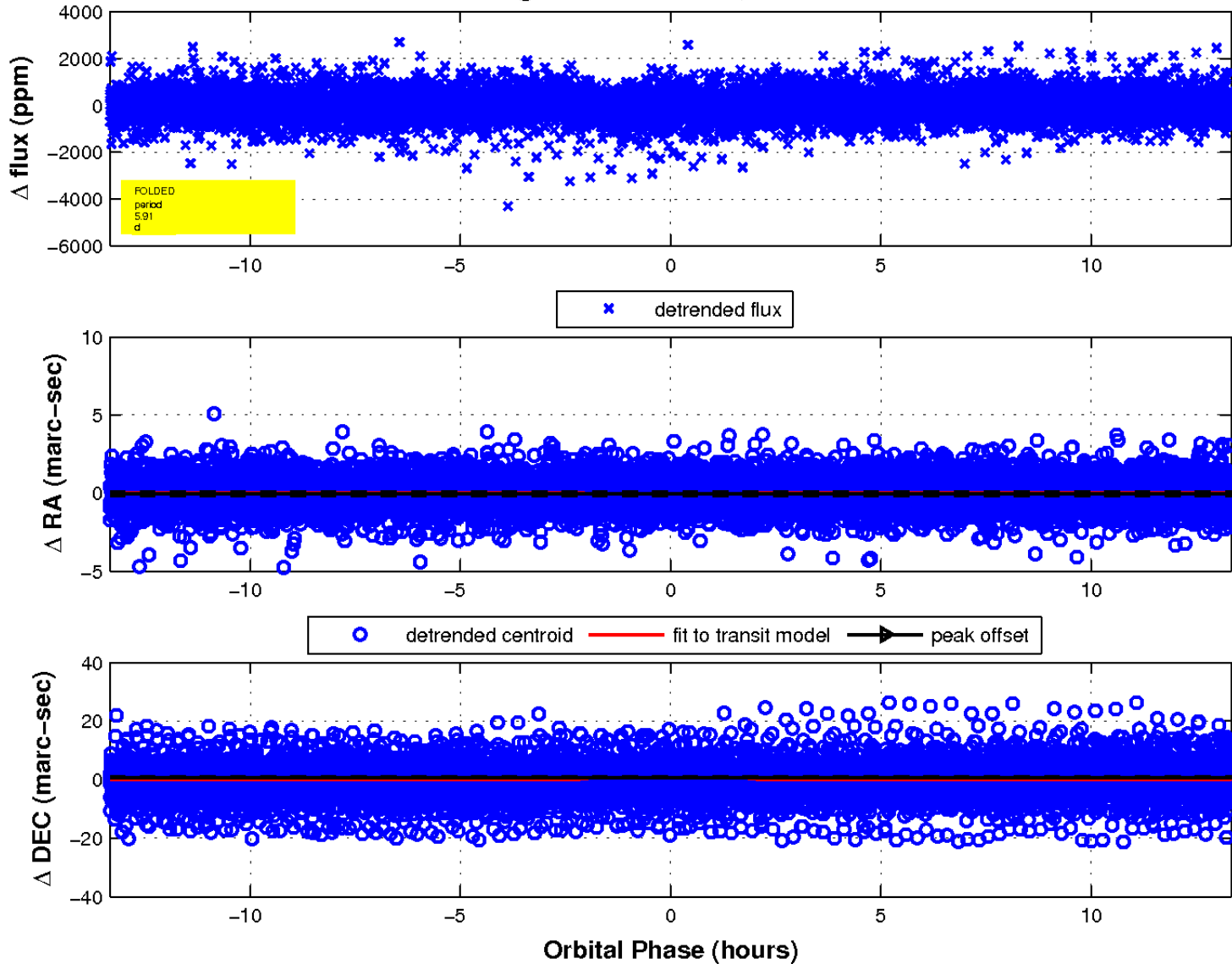
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

