

# KIC 011705004

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011705004-01	OBS	2199.01	9.033316	137.177062	640.6	2.837	16.6	17.3	0.79	5311	2.48	67.01
011705004-02	OBS	2199.02	3.052934	132.967814	222.4	2.285	8.2	9.9	0.79	5311	1.27	284.66

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011705004-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
011705004-02	OBS	PC	1.00	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.

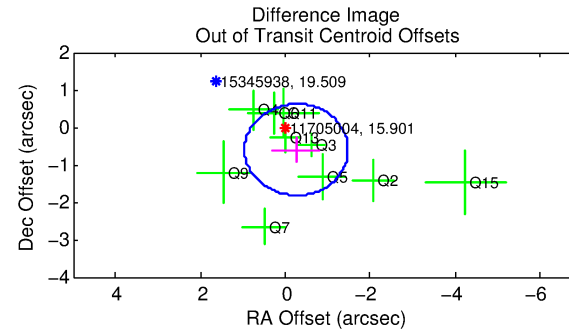
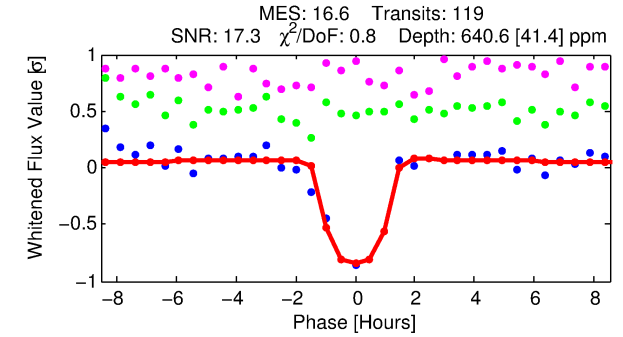
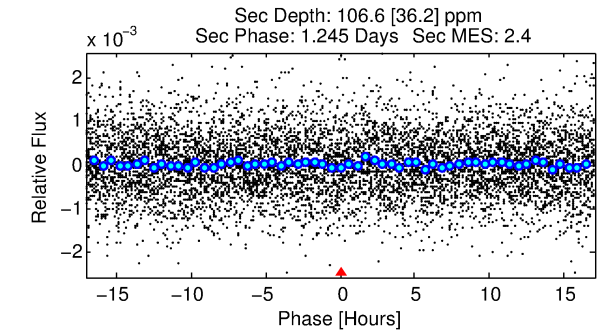
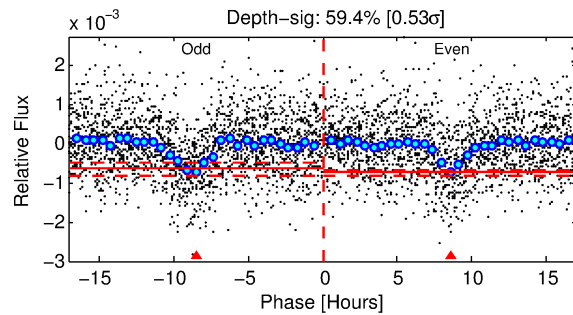
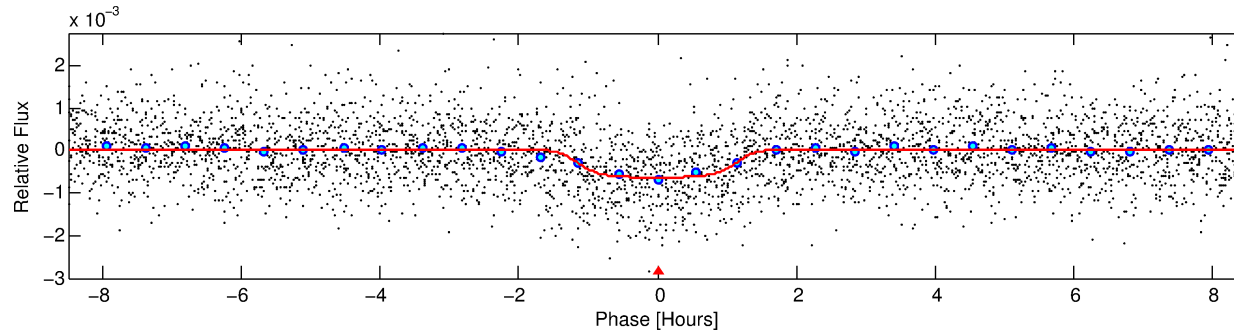
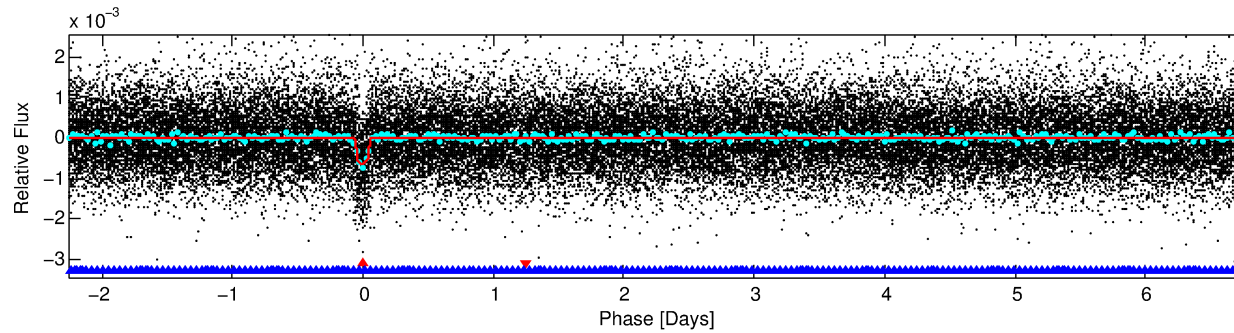
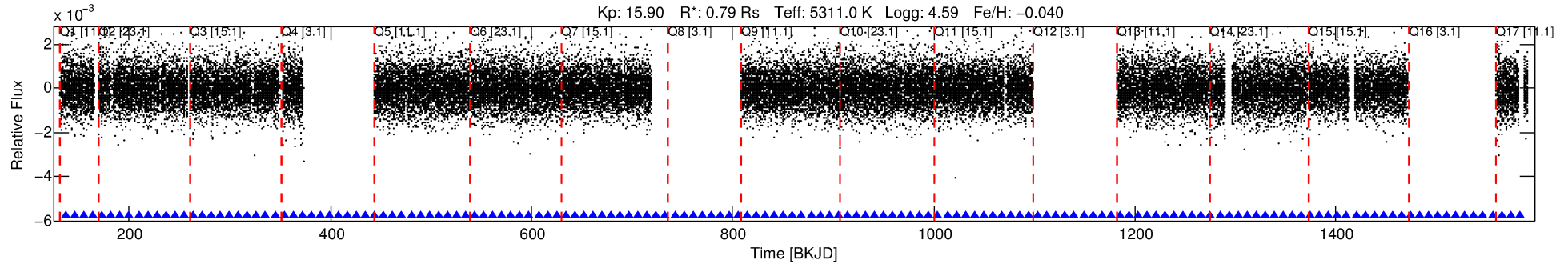
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011705004-01

No Significant Match Found

# DV One-Page Summary

KIC: 11705004 Candidate: 1 of 2 Period: 9.033 d  
KOI: K02199.01 Corr: 0.936



## DV Fit Results:

Period = 9.03332 [0.00004] d  
Epoch = 137.1771 [0.0036] BKJD  
Rp/R\* = 0.0288 [0.0037]  
a/R\* = 11.09 [5.64]  
b = 0.92 [0.08]  
Seff = 67.01 [16.33]  
Teq = 730 [44] K  
Rp = 2.48 [0.53] Re  
a = 0.0813 [0.0115] AU  
Ag = 63.14 [29.94] [2.08 $\sigma$ ]  
Teffp = 3180 [356] K [6.84 $\sigma$ ]

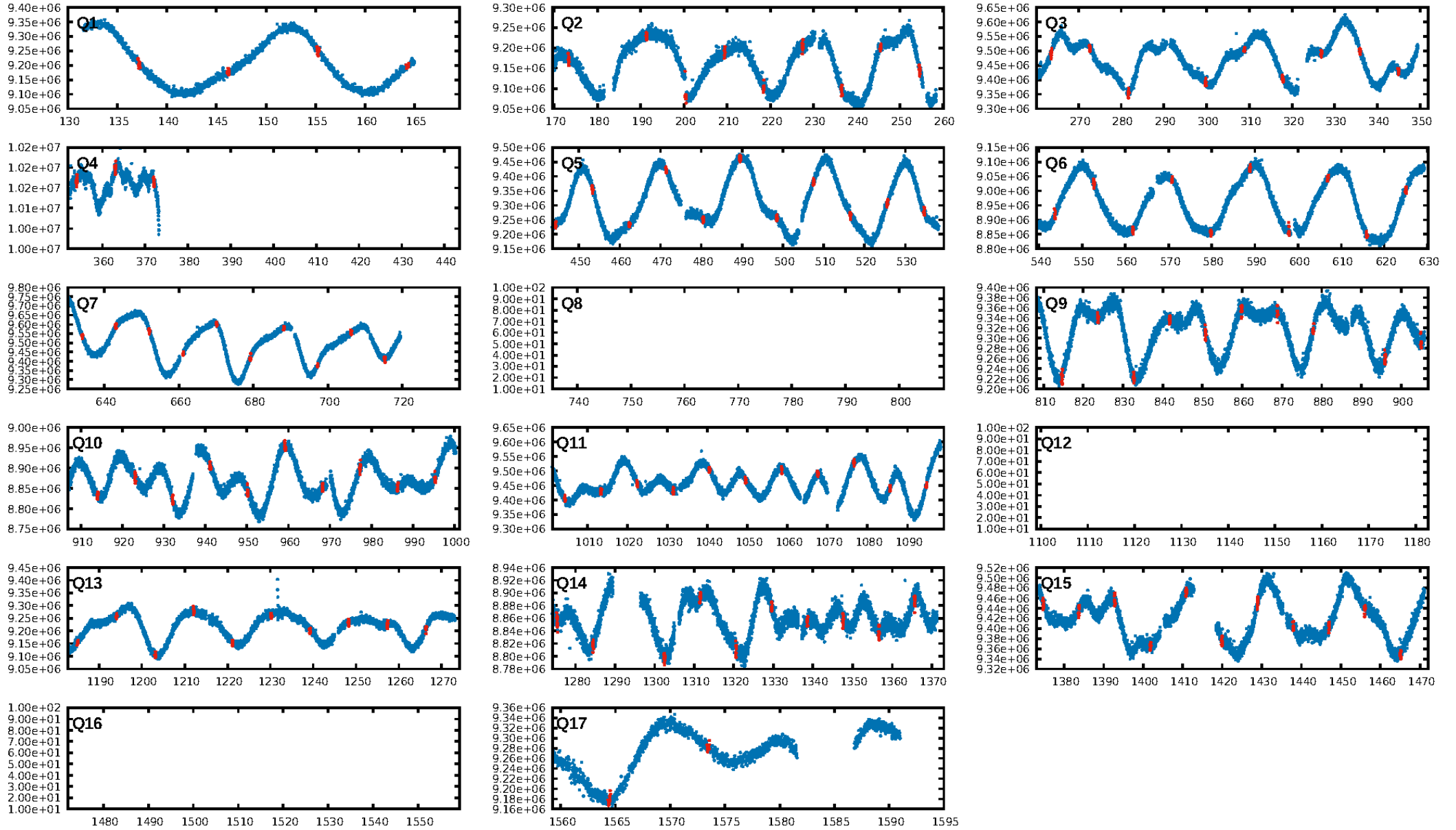
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [39.40 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 94.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.89e-61  
RollingBand-fgt: 1.00 [110/110]  
GhostDiagnostic-chr: 5.506  
Centroid-sig: 51.3%  
Centroid-so: 0.772 arcsec [0.98 $\sigma$ ]  
OotOffset-rm: 0.656 arcsec [1.61 $\sigma$ ]  
OotOffset-st: 2/4/1/3 [10]  
KicOffset-rm: 0.535 arcsec [1.03 $\sigma$ ]  
KicOffset-st: 2/4/1/3 [10]  
DiffImageQuality-fgm: 0.70 [7/10]  
DiffImageOverlap-fno: 1.00 [14/14]

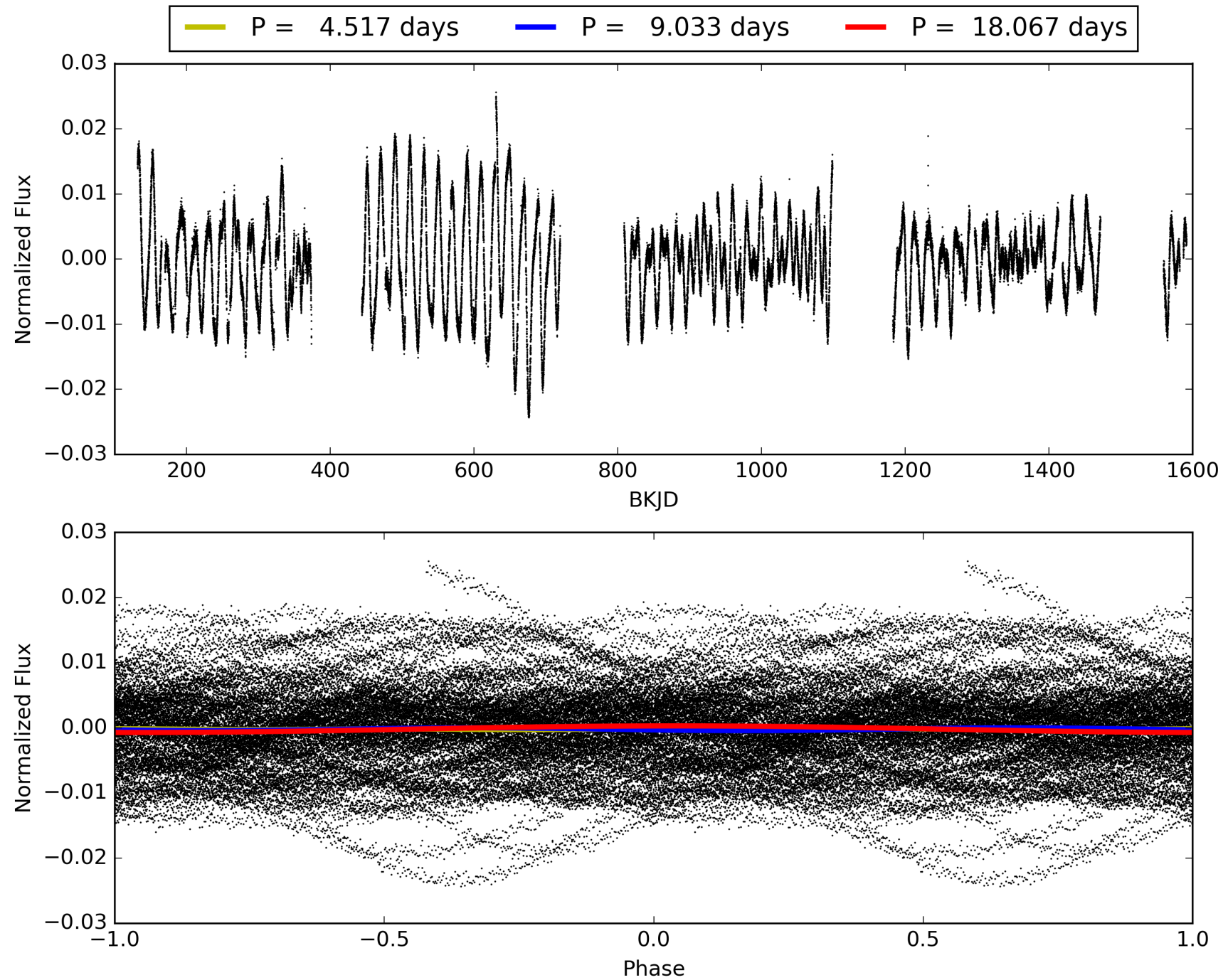
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:28:25 Z

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

# TCE 011705004-01, PDC Light Curves

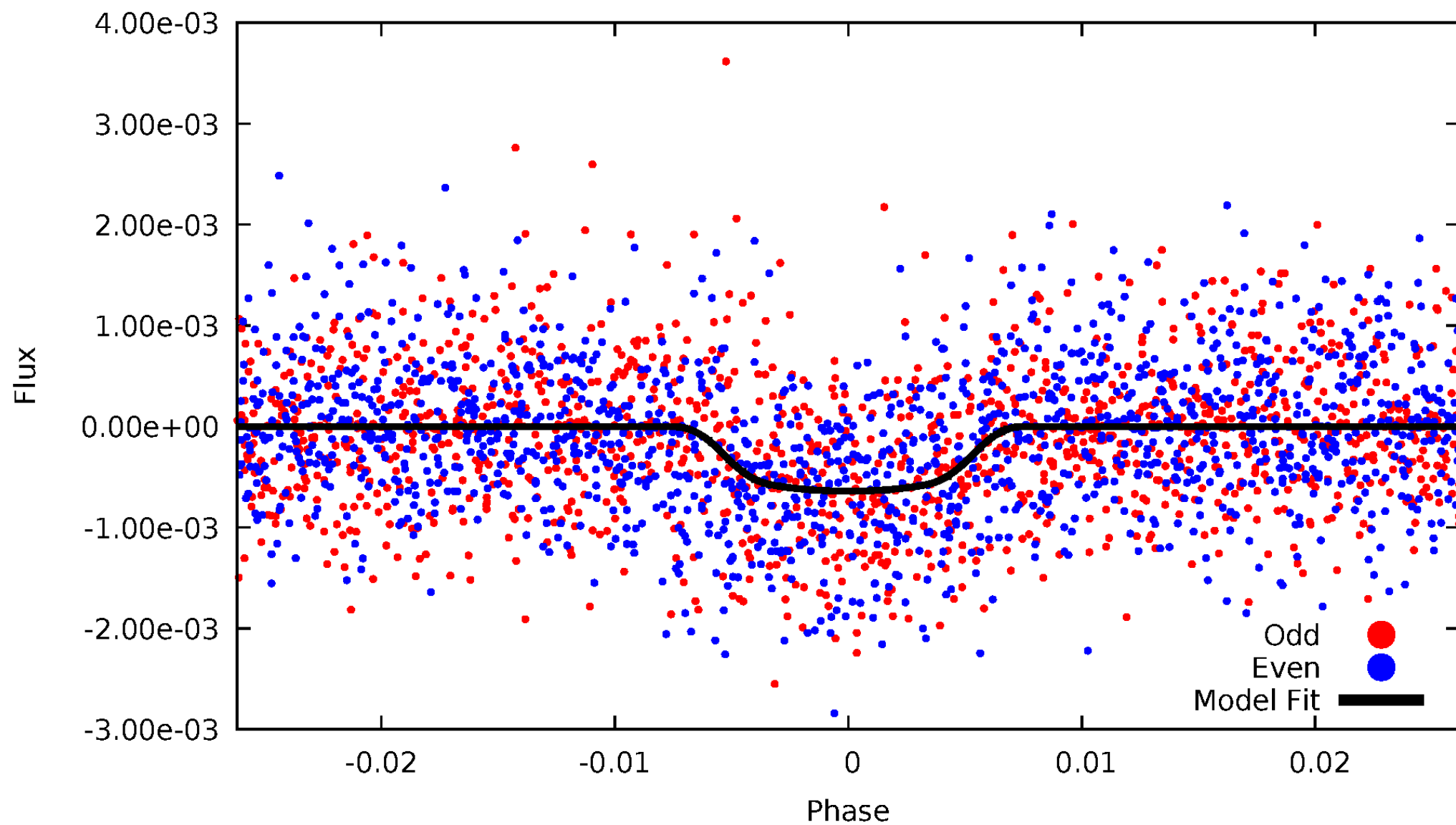


# TCE 011705004-01



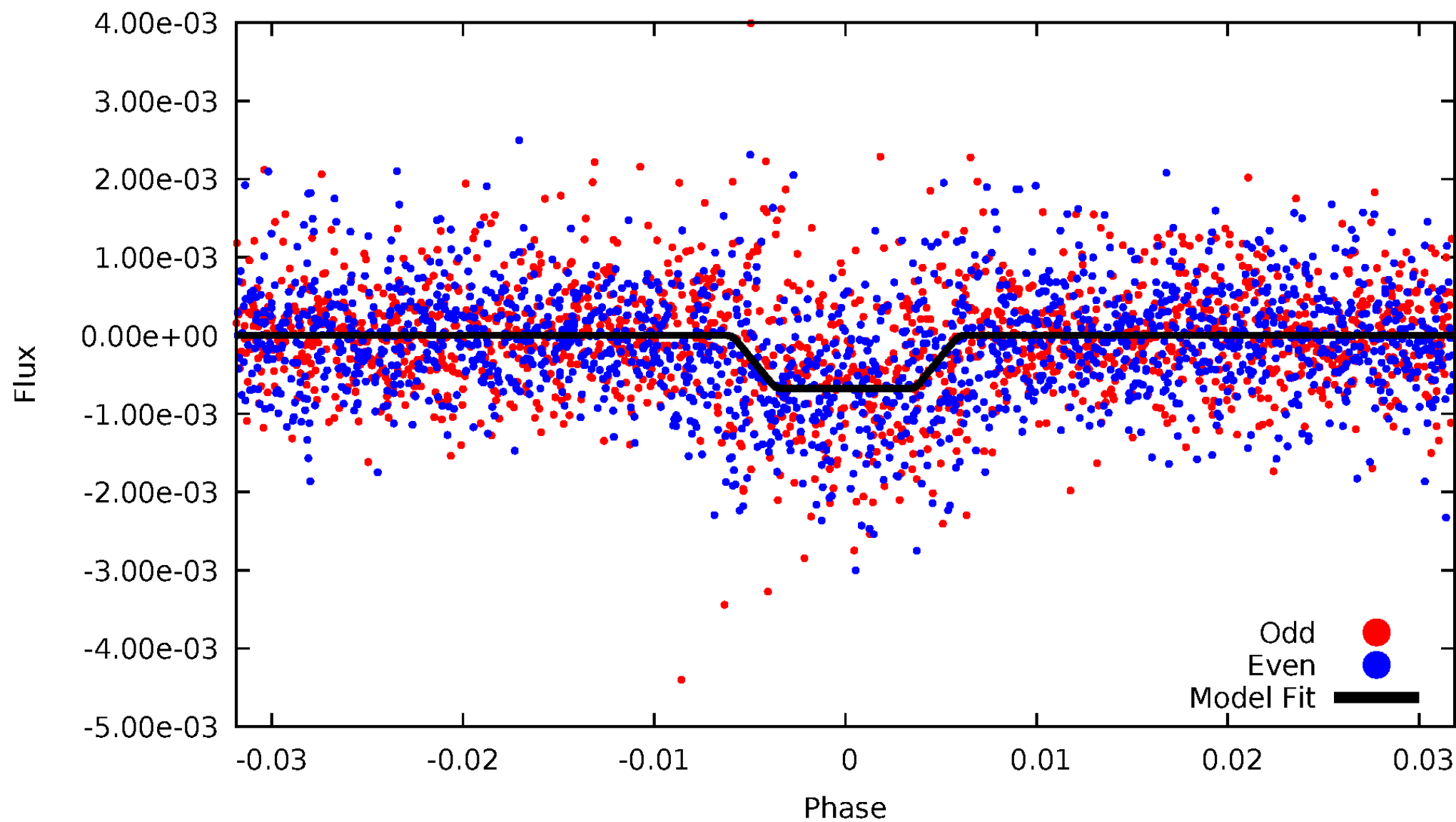
# DV Odd/Even

TCE 011705004-01



# ALT Odd/Even

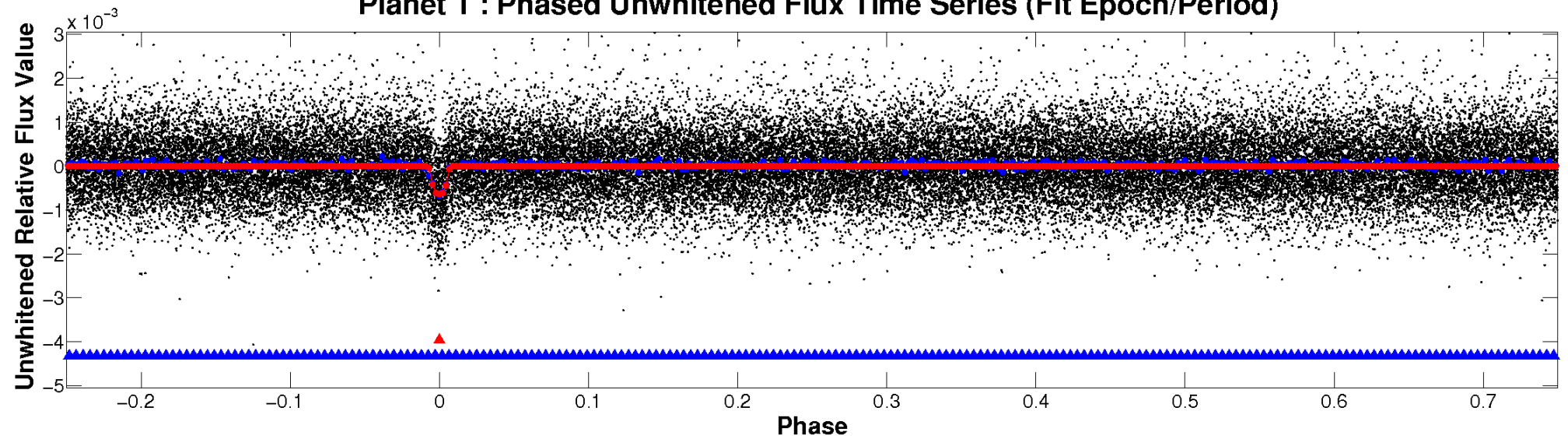
TCE 011705004-01



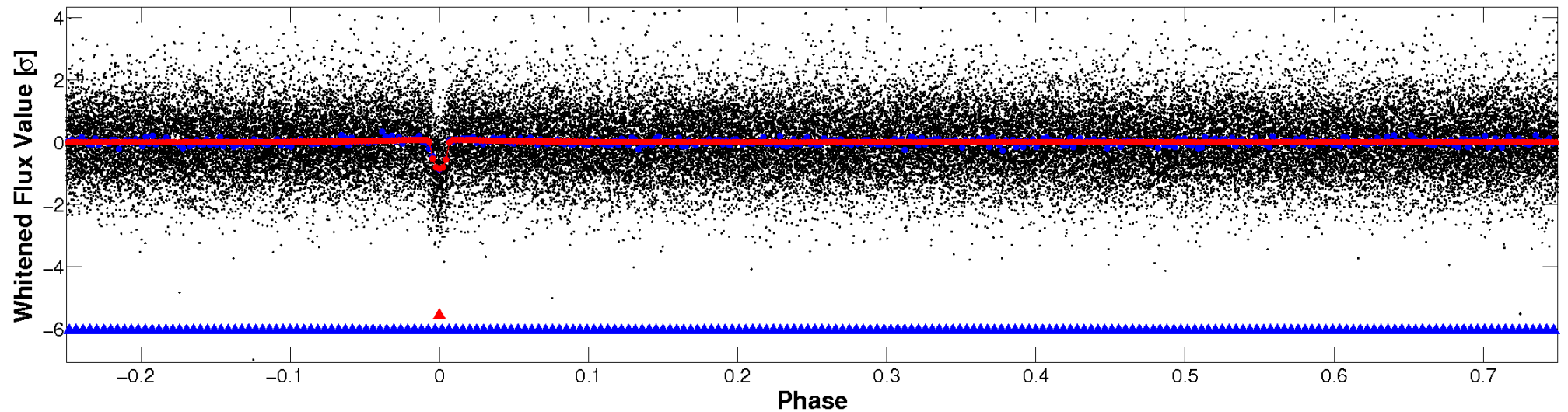


# Non-Whitened Vs. Whitened Light Curve

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

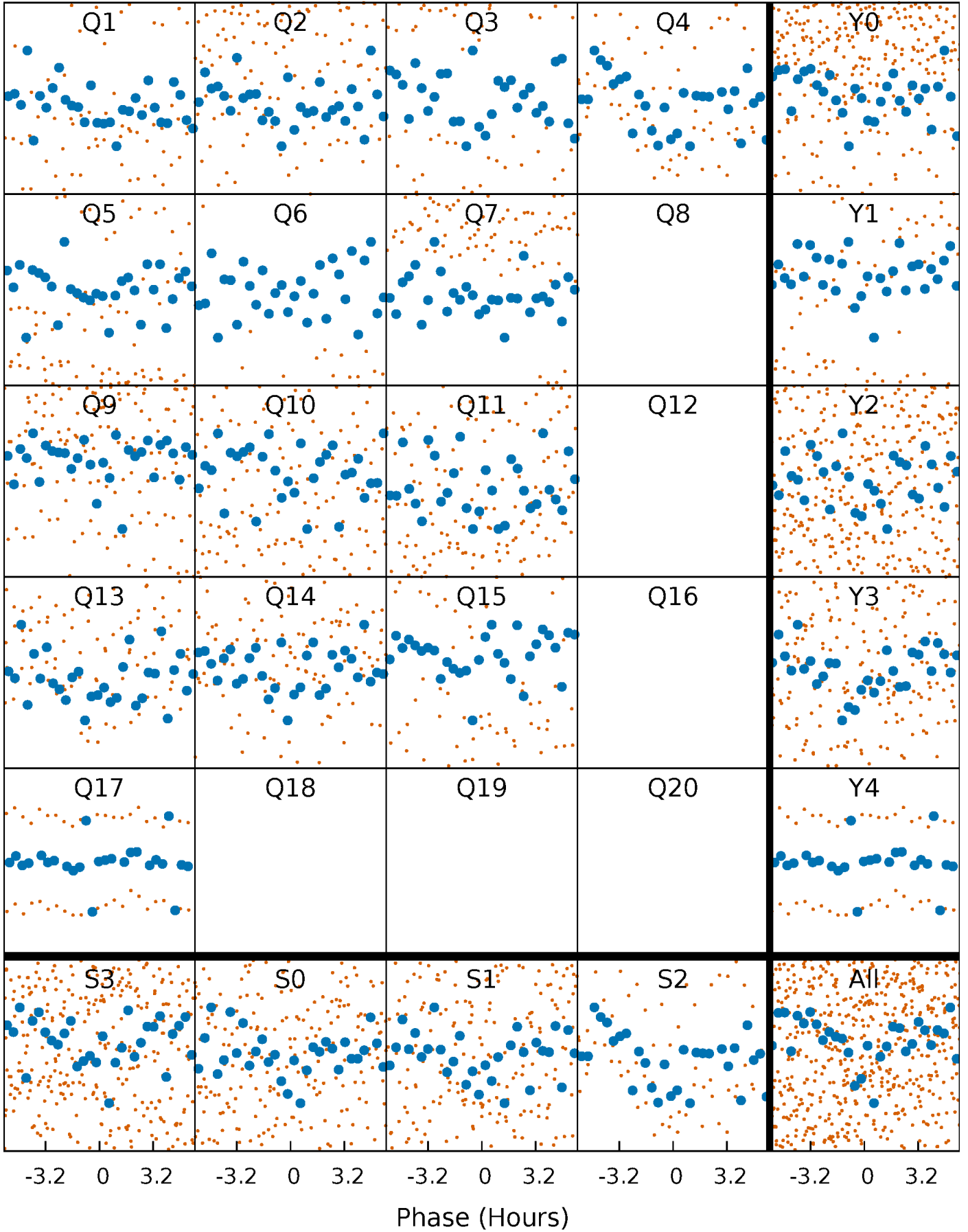


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

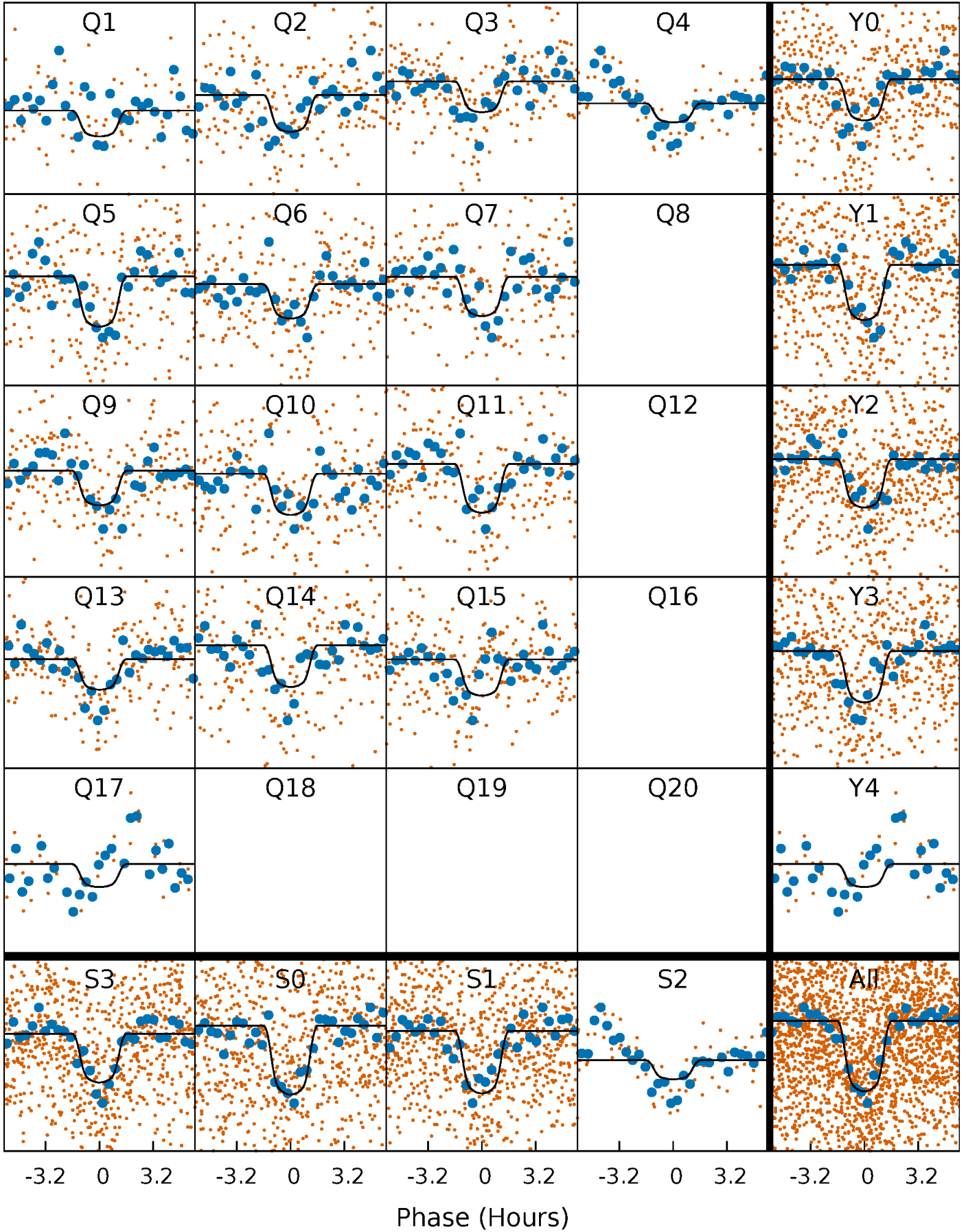
TCE 011705004-01 P= 9.033316 Days  $T_0=137.177062$  (BKJD)





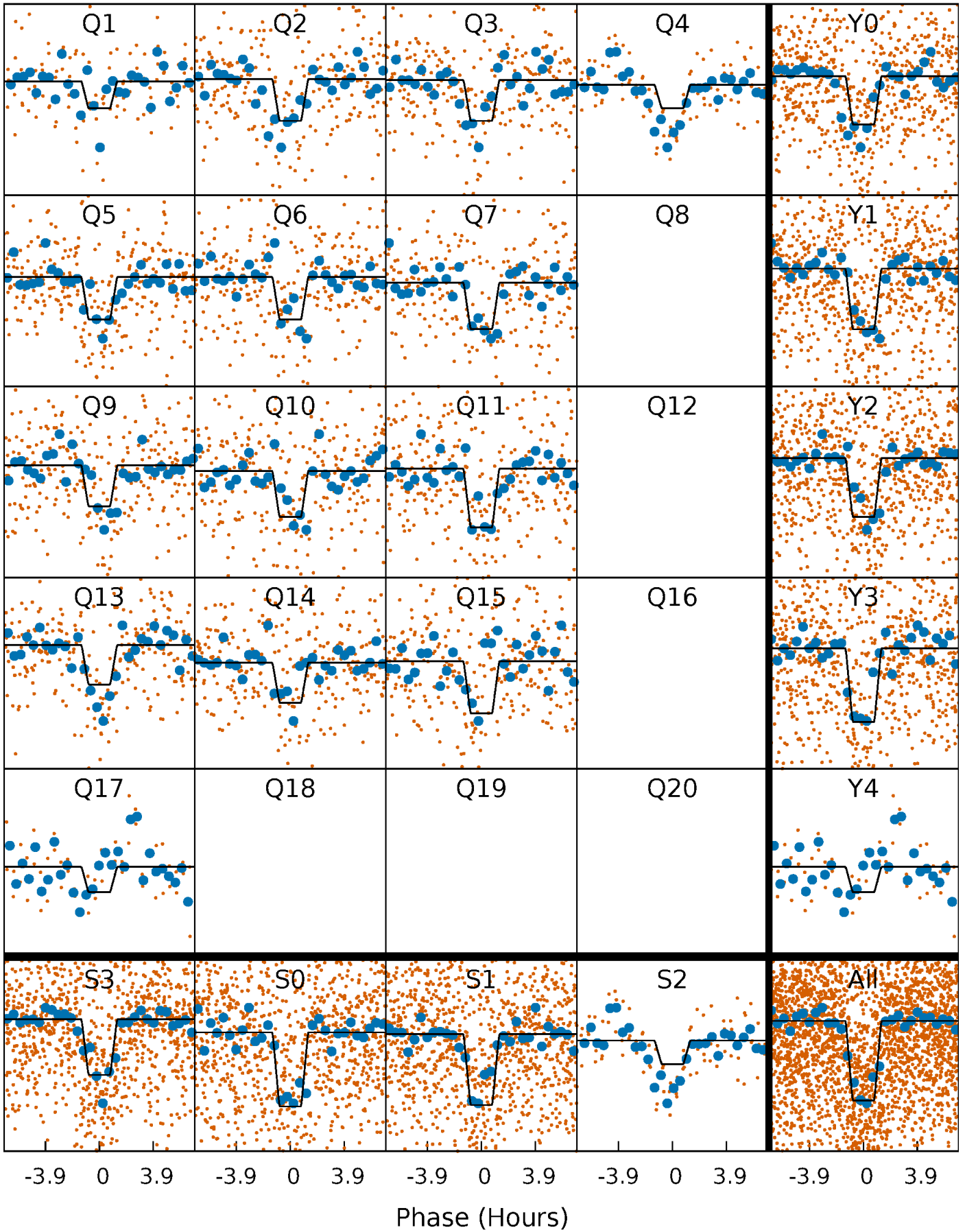
# DV Quarter-Phased Transit Curves

TCE 011705004-01 P= 9.033316 Days  $T_0=137.177062$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

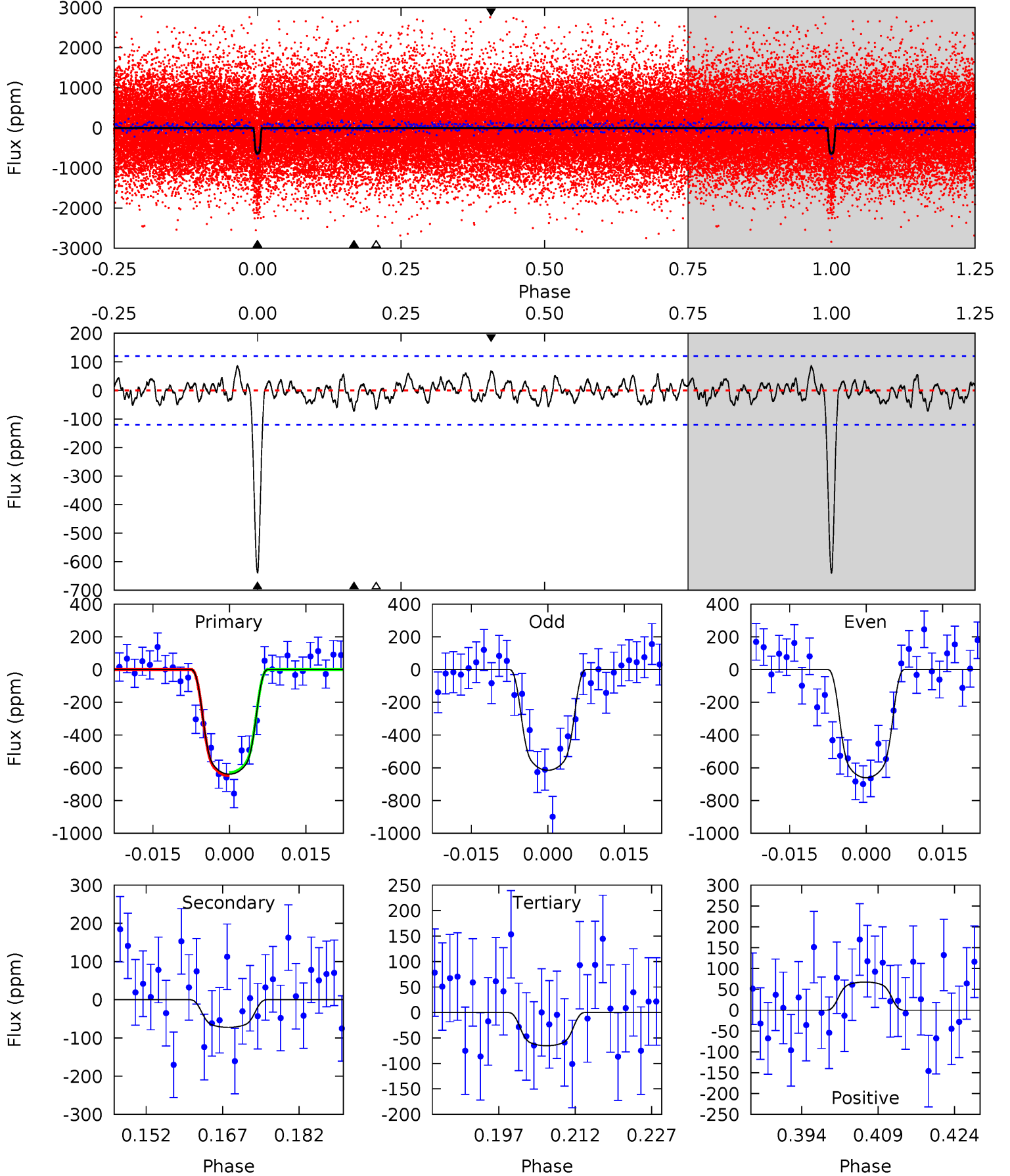
TCE 011705004-01 P= 9.033228 Days  $T_0=137.178961$  (BKJD)



# DV Model-Shift Uniqueness Test

011705004-01, P = 9.033316 Days, E = 128.143746 Days

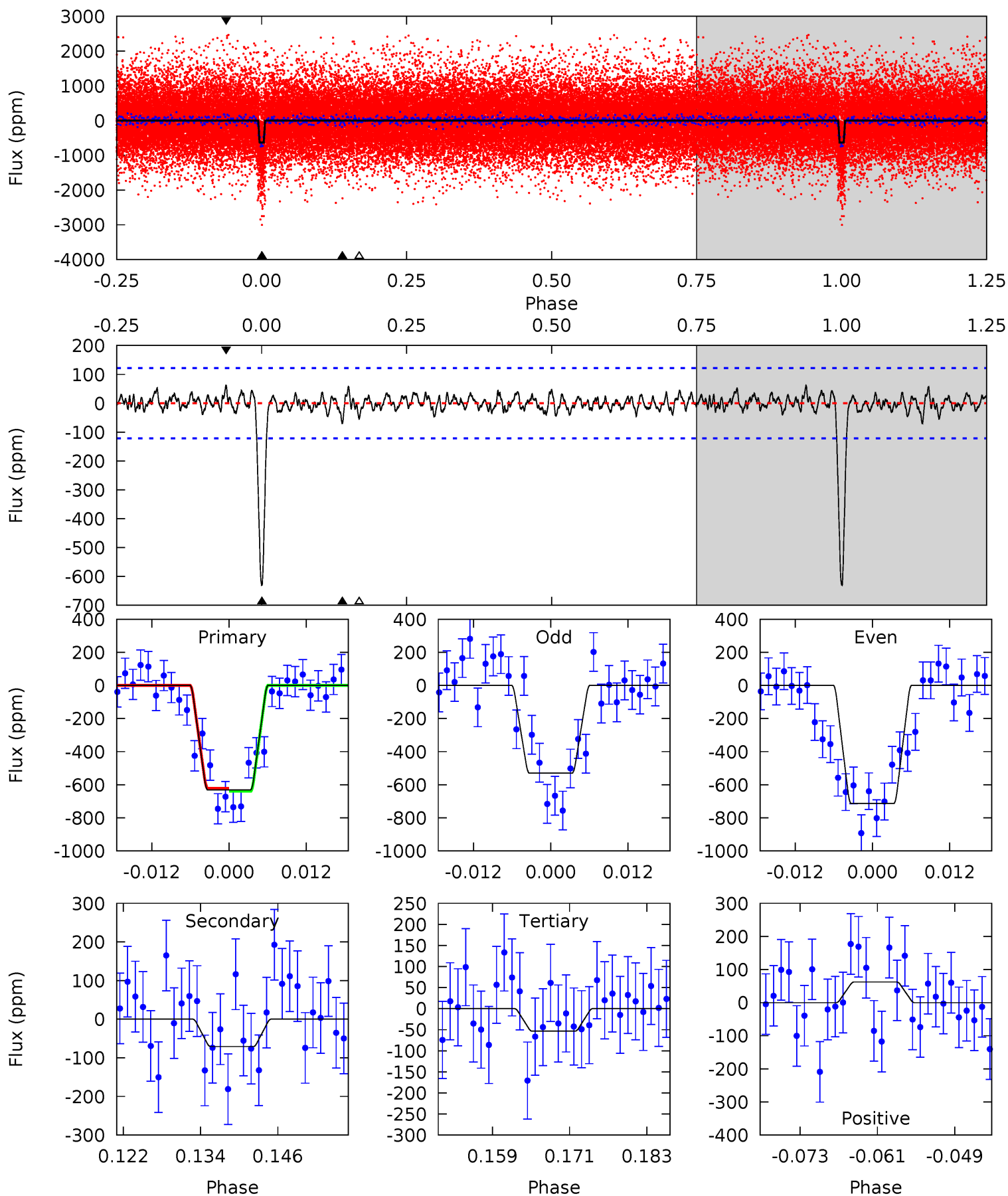
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.3	2.98	2.69	2.78	4.95	2.43	1.10	23.6	23.5	0.29	0.19	0.94	1.05	0.12	0.38



# Alt Model-Shift Uniqueness Test

011705004-01, P = 9.033228 Days, E = 128.145733 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
25.8	2.90	2.19	2.55	4.99	2.51	0.79	23.6	23.3	0.71	0.35	3.74	1.03	0.09	0.38



### Stellar Parameters For KIC 011705004

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5311^{+175}_{-159}$	$4.588^{+0.030}_{-0.112}$	$-0.040^{+0.300}_{-0.300}$	$0.788^{+0.132}_{-0.066}$	$0.884^{+0.070}_{-0.104}$	$2.546^{+0.399}_{-0.904}$
	+3%/-3%	+1%/-2%	+750%/-750%	+17%/-8%	+8%/-12%	+16%/-36%
Source	PHO1	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 011705004-01 / KOI 2199.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-72 \pm 24$	$2.55^{+0.37}_{-0.36}$	$1033^{+53}_{-39}$	$3368^{+245}_{-245}$	$39^{+21}_{-15}$
Alt.	$-71 \pm 24$	$2.30^{+0.37}_{-0.35}$	$1035^{+48}_{-42}$	$3475^{+255}_{-260}$	$48^{+25}_{-19}$

$T_{\text{max}}$  = 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

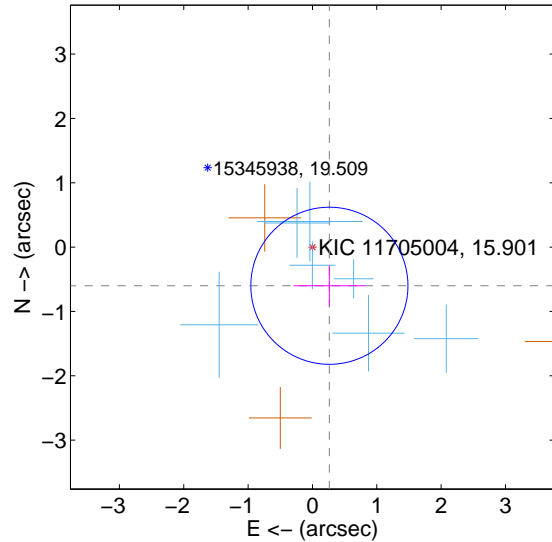
Supplemental centroid analysis for 011705004-01. Kepler magnitude: 15.90. Transit SNR 17.29

There are 7 quarters with good PRF difference image offsets

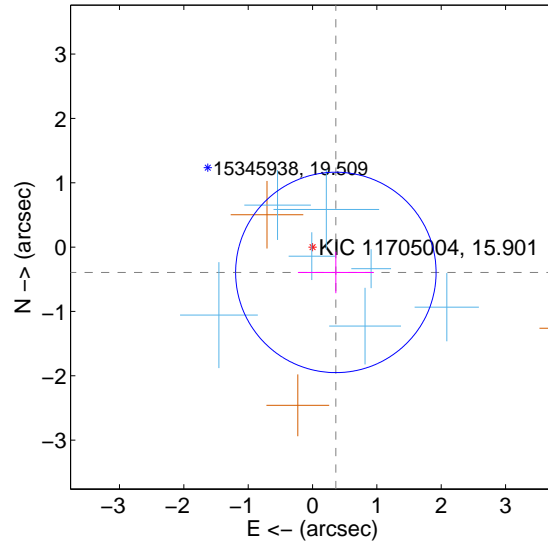
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.656 \pm 0.407$	1.61	$-0.263 \pm 0.557$	$-0.601 \pm 0.314$
PRF-fit source offset from KIC position	$0.535 \pm 0.519$	1.03	$-0.362 \pm 0.590$	$-0.393 \pm 0.322$
photometric centroid source offset	$0.77 \pm 0.79$	0.98	$0.45 \pm 0.76$	$0.63 \pm 0.80$

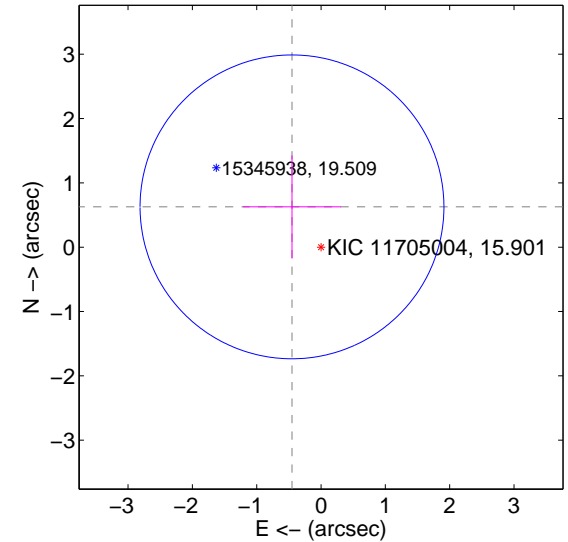
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



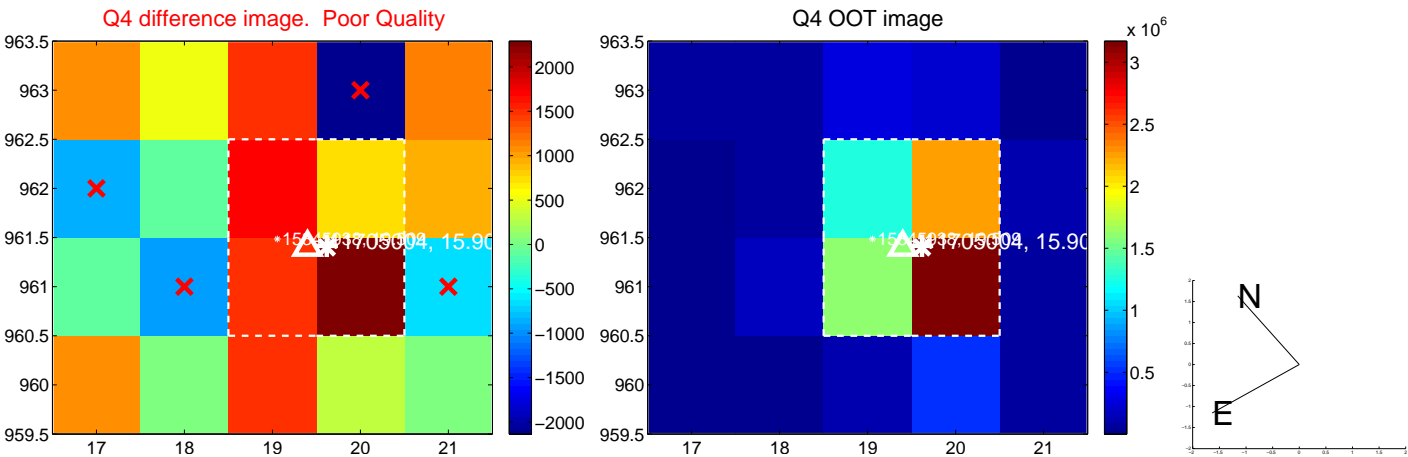
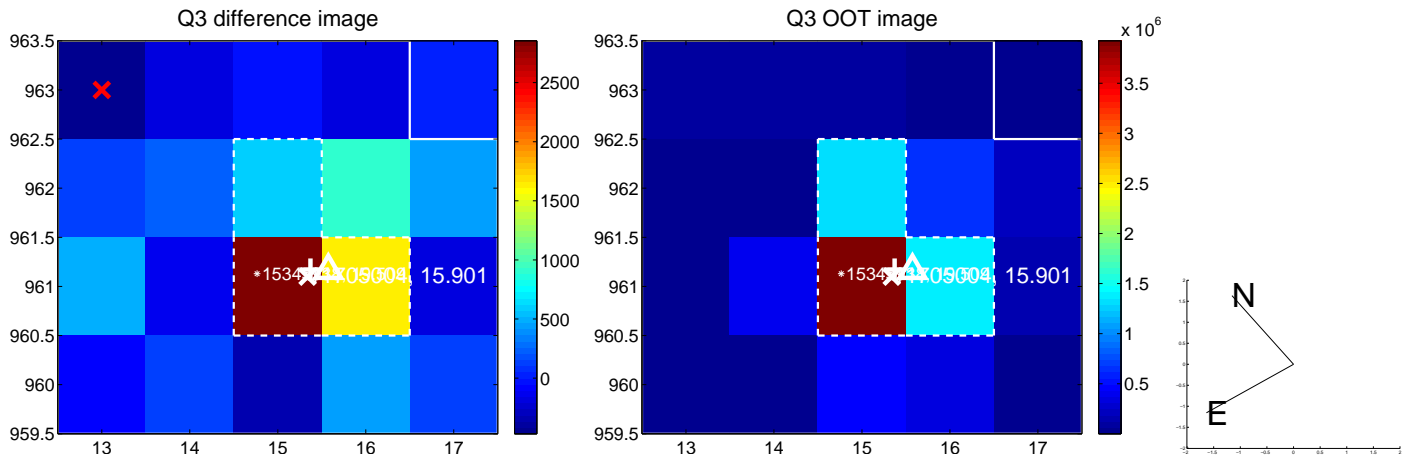
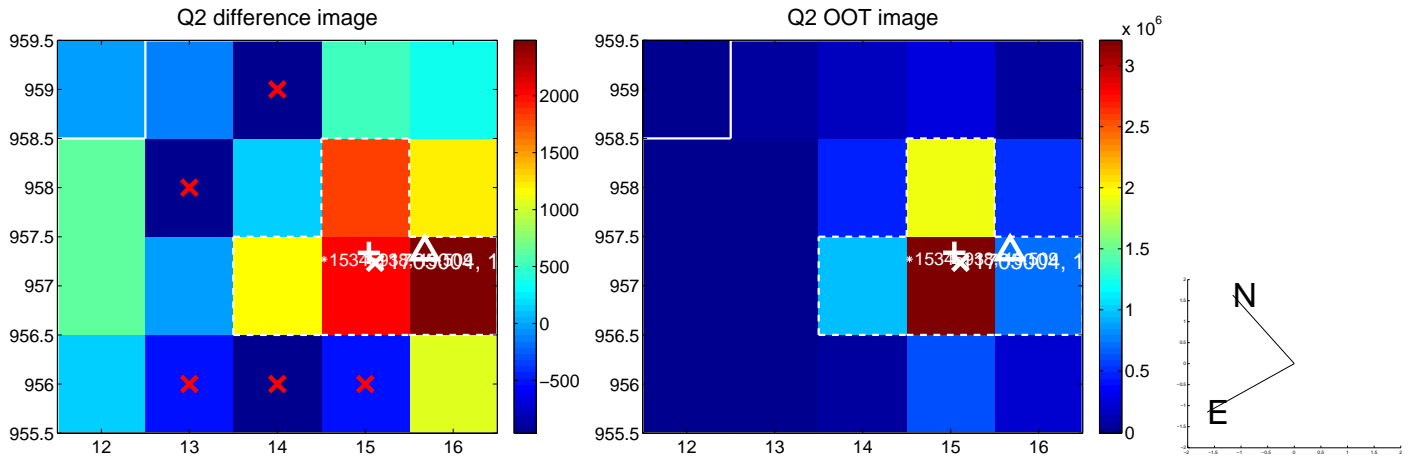
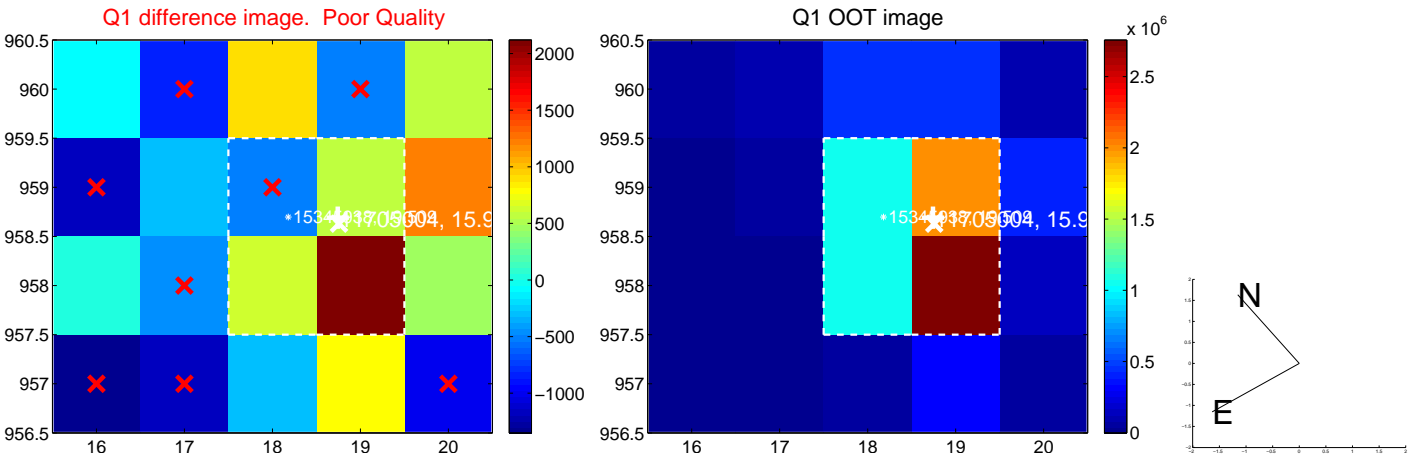
offset from photometric centroids



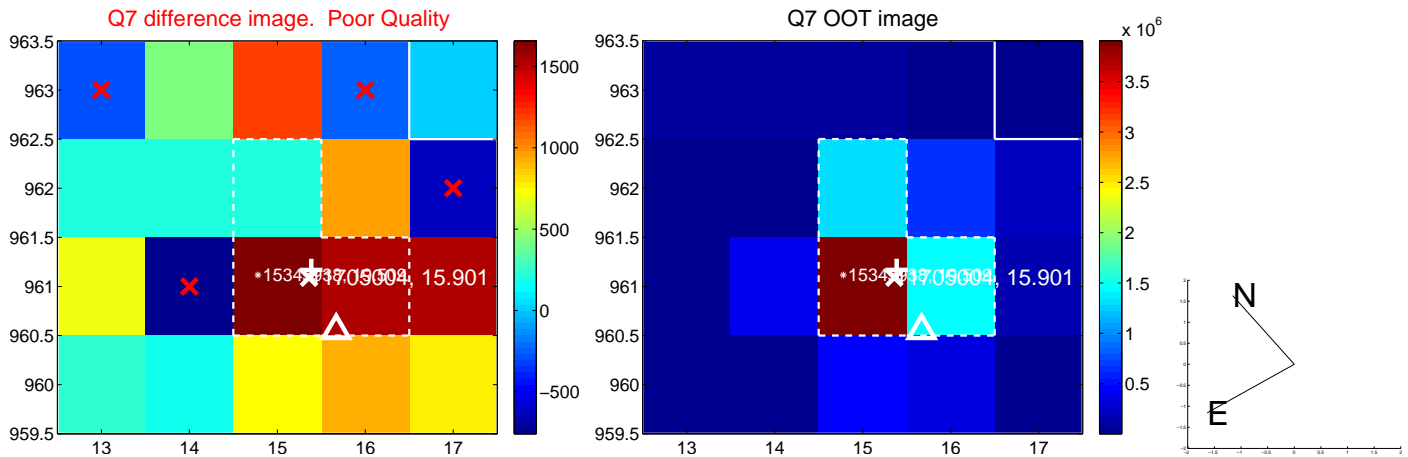
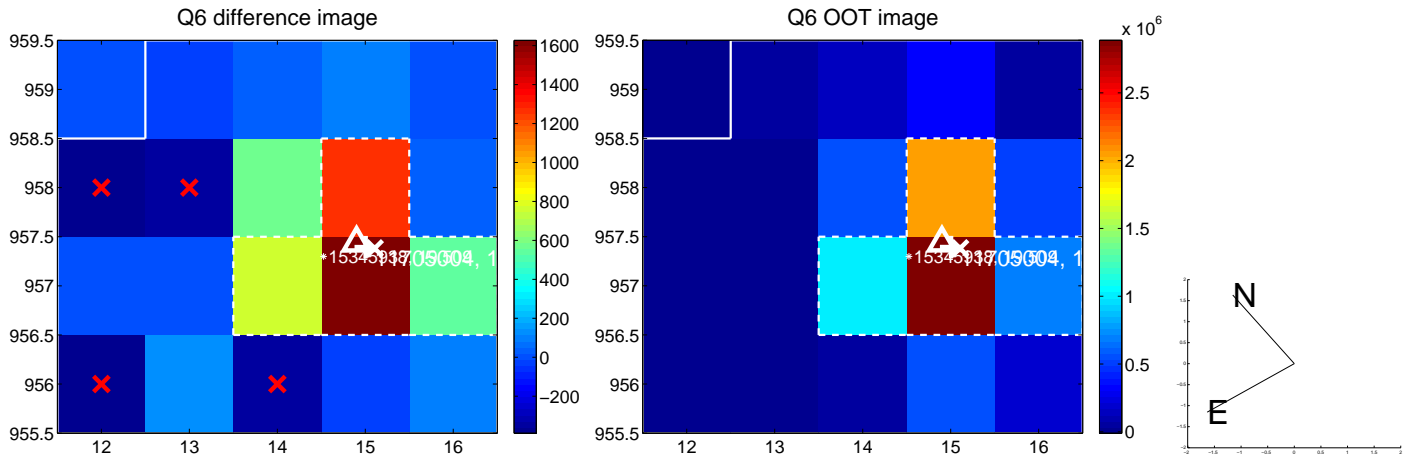
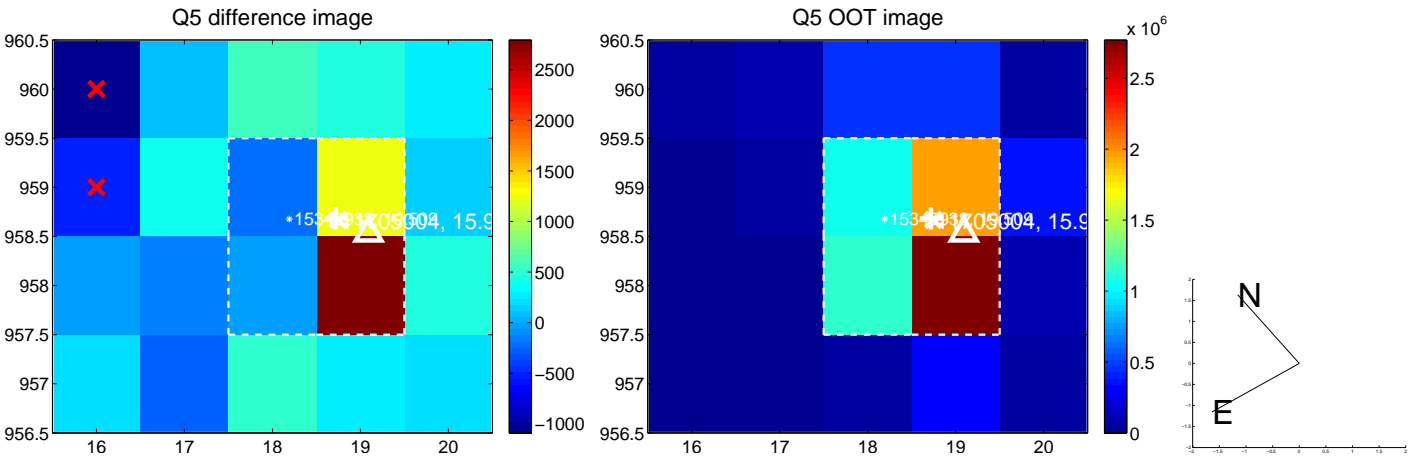
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



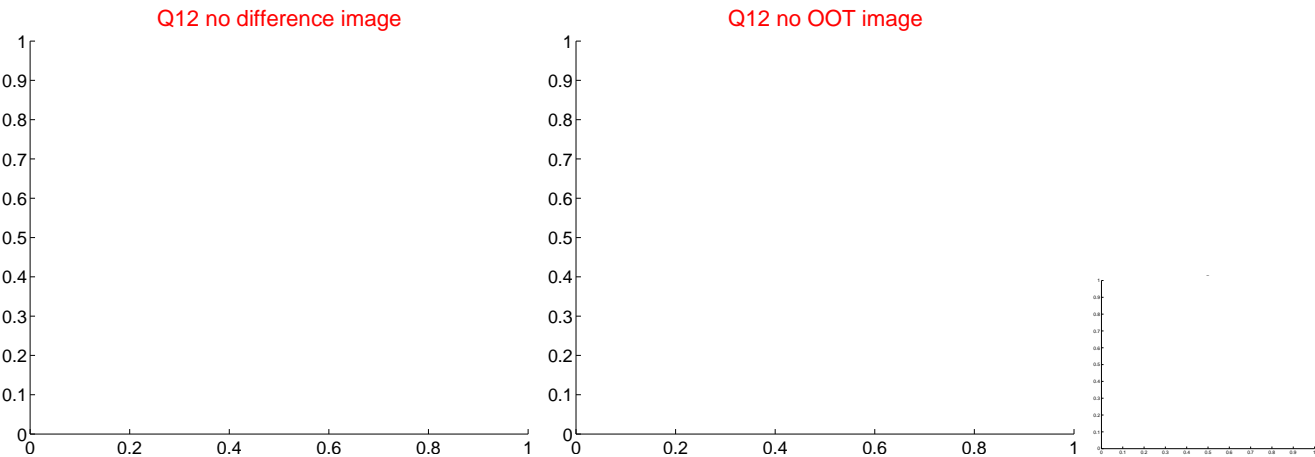
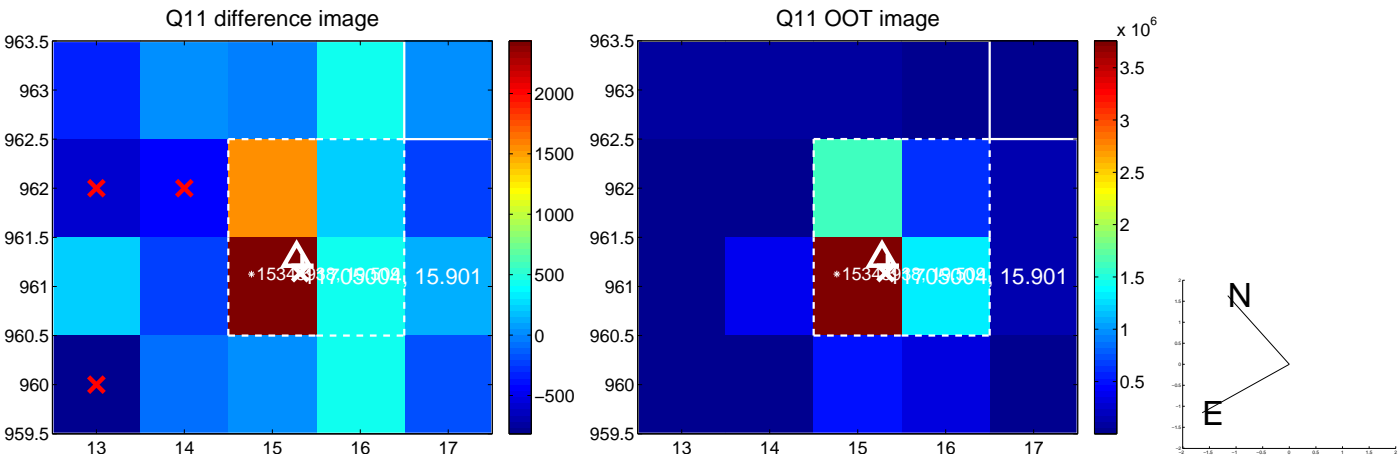
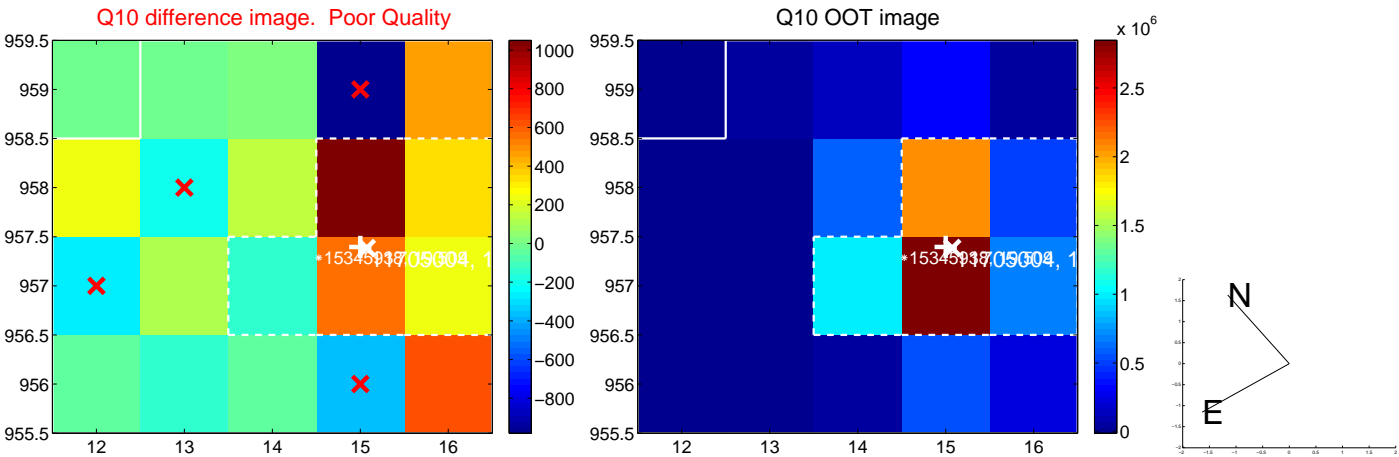
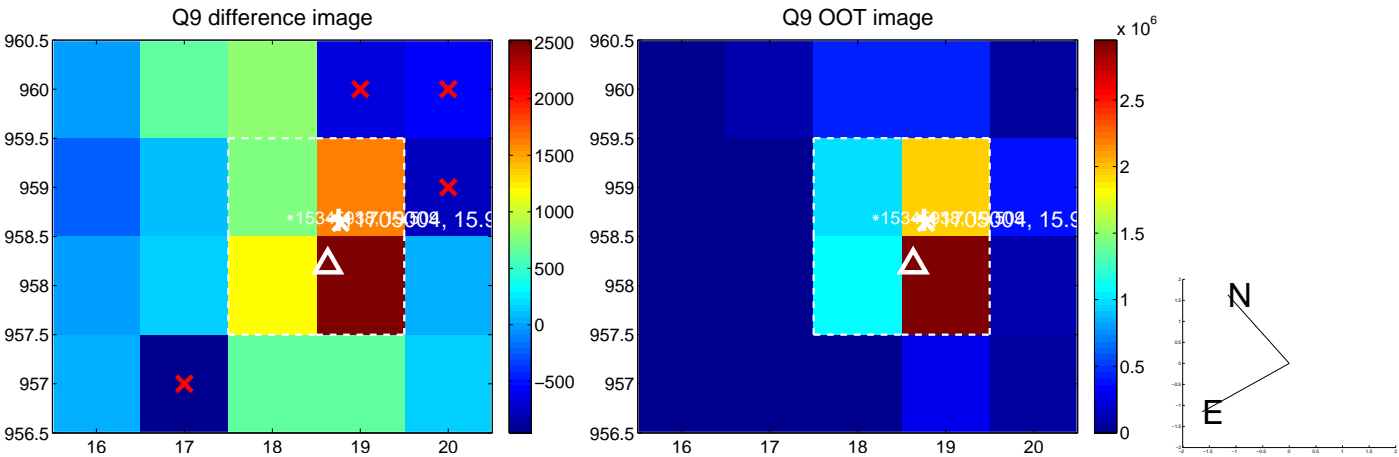
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



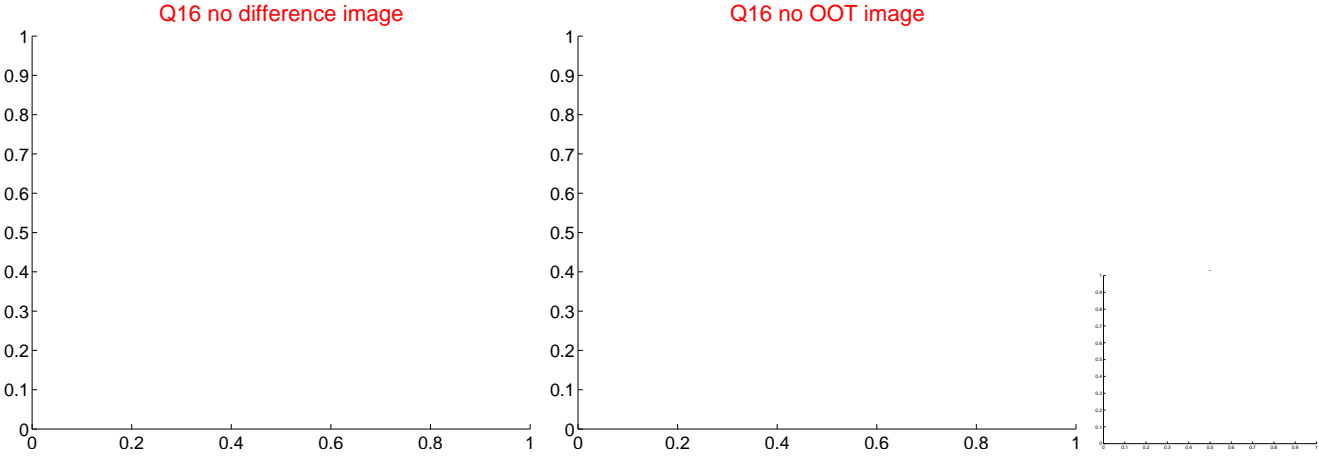
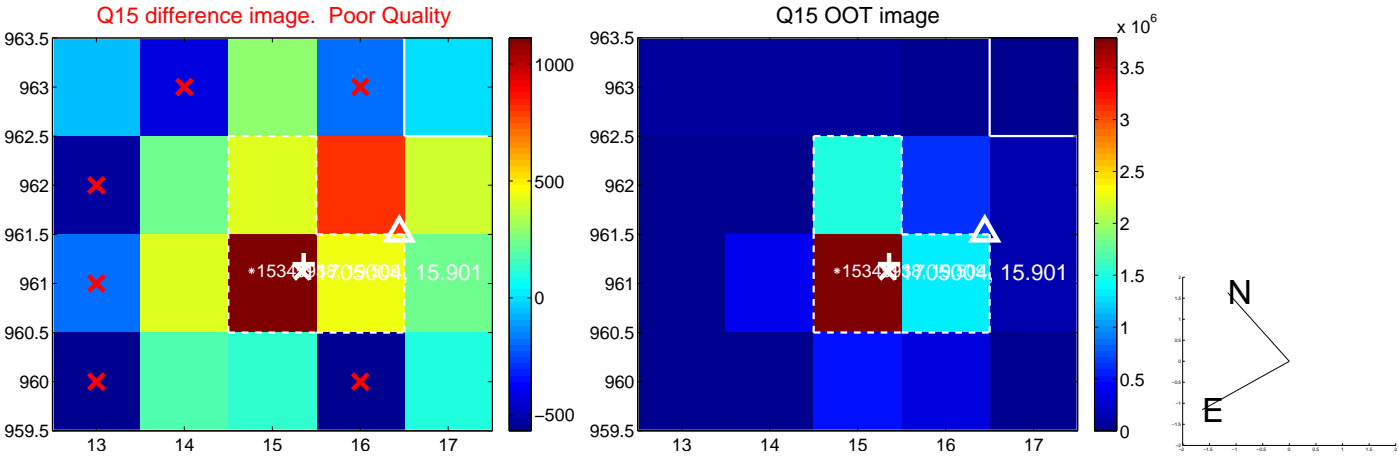
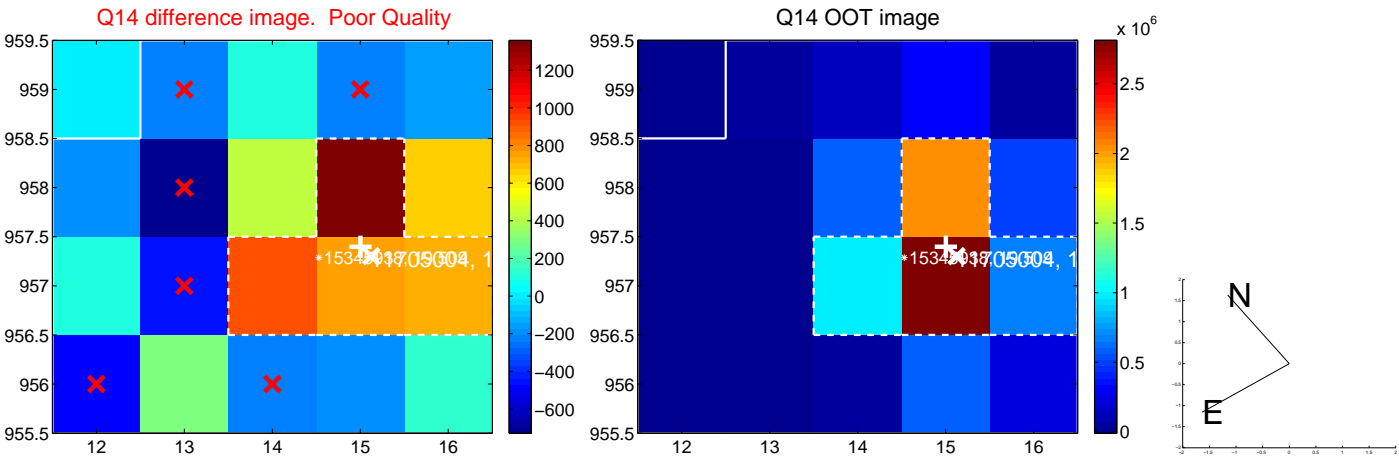
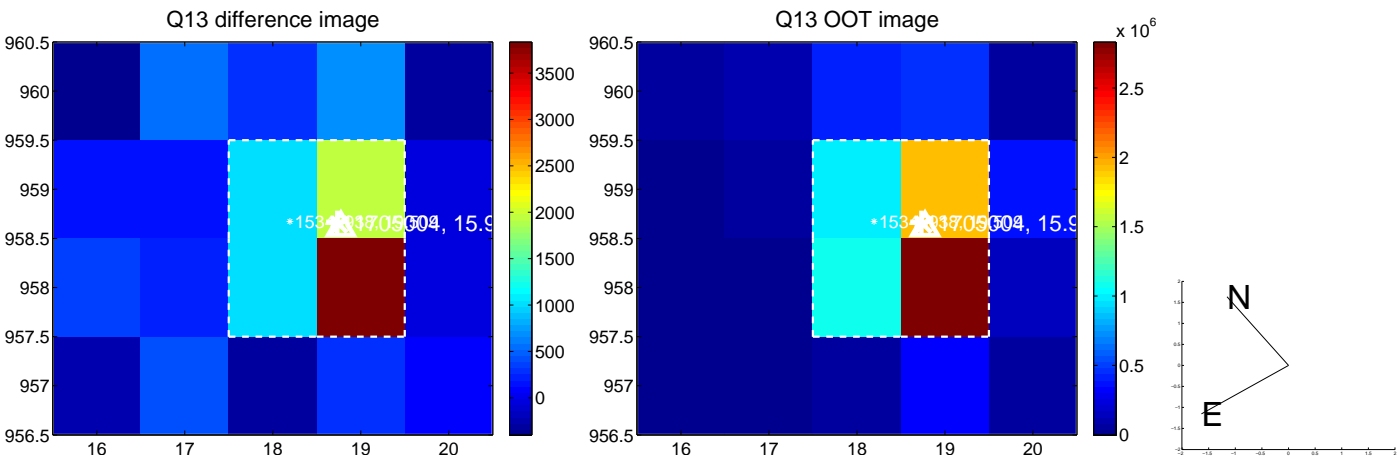
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



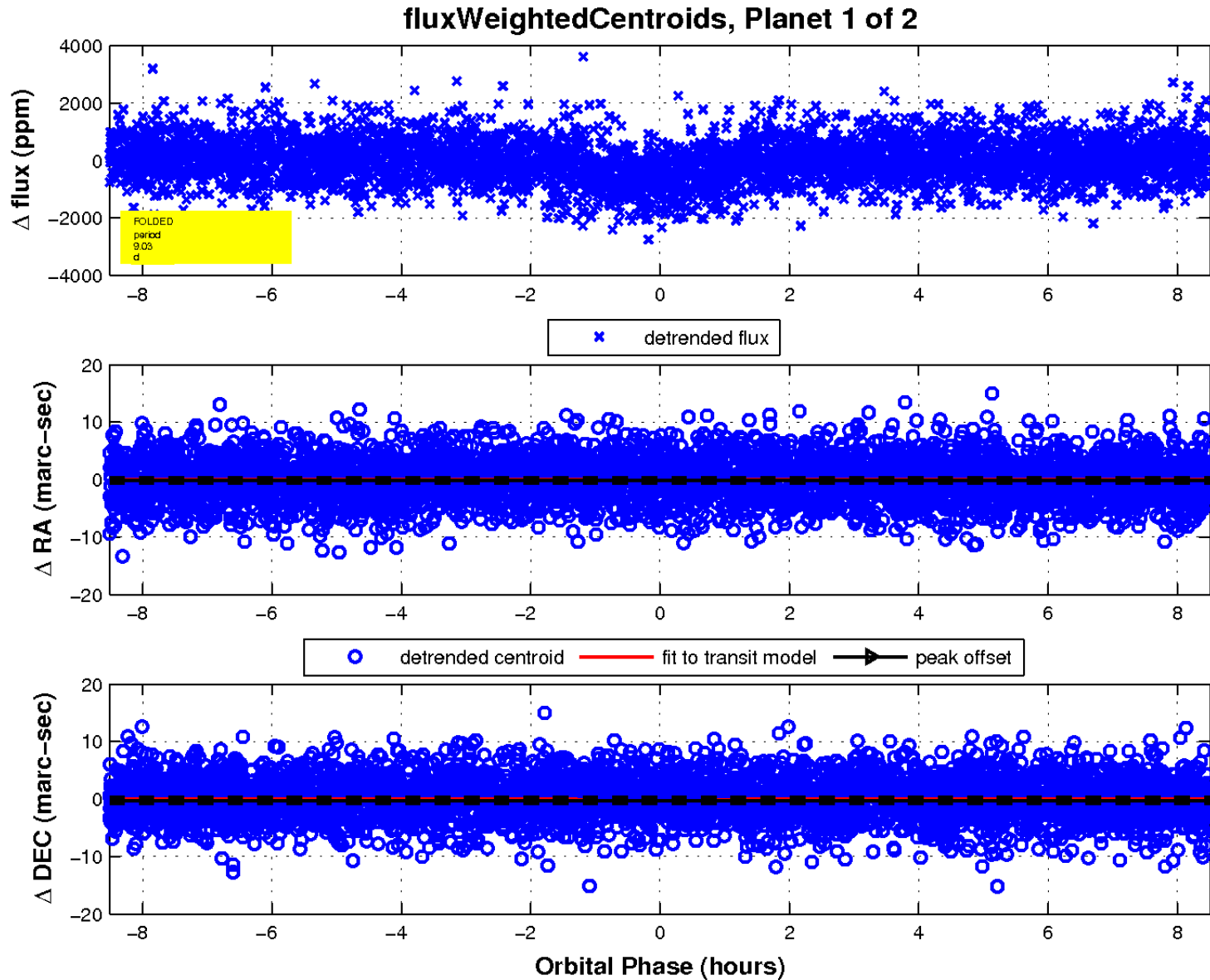
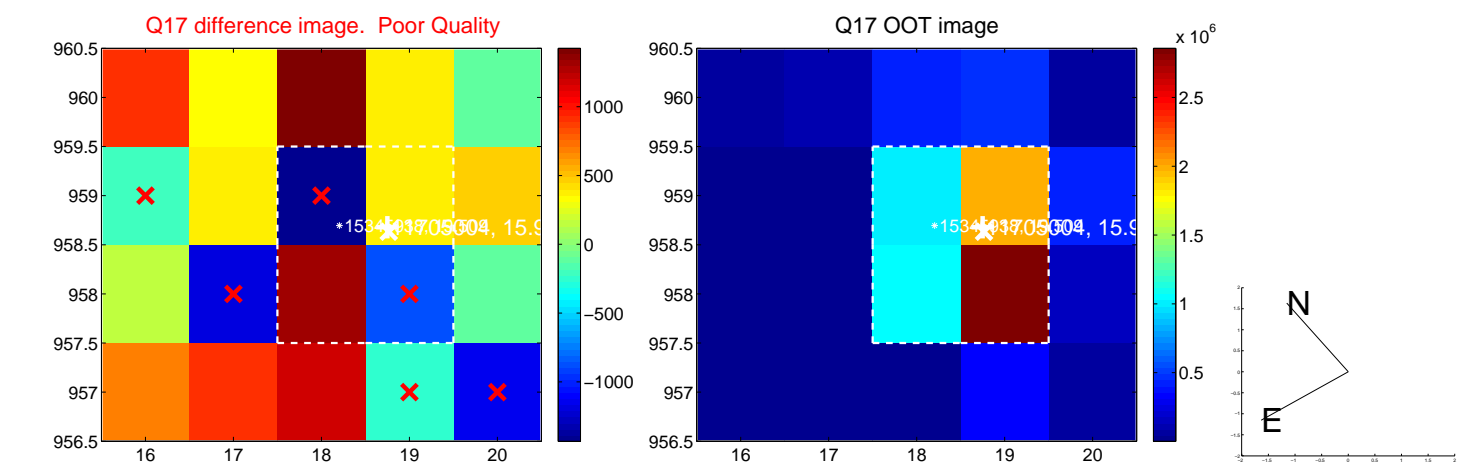
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



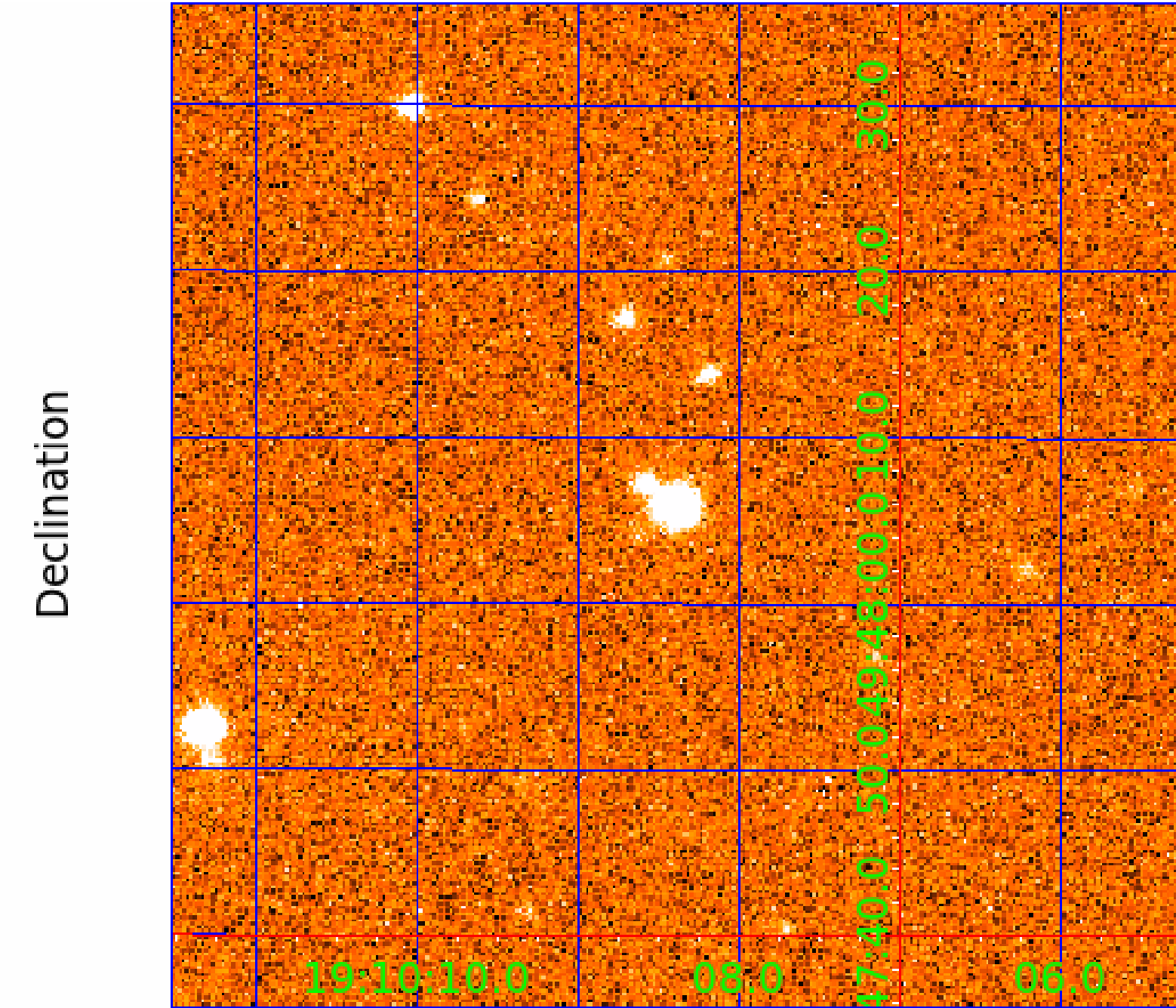
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 011705004

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011705004-01	OBS	2199.01	9.033316	137.177062	640.6	2.837	16.6	17.3	0.79	5311	2.48	67.01
011705004-02	OBS	2199.02	3.052934	132.967814	222.4	2.285	8.2	9.9	0.79	5311	1.27	284.66

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011705004-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
011705004-02	OBS	PC	1.00	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.

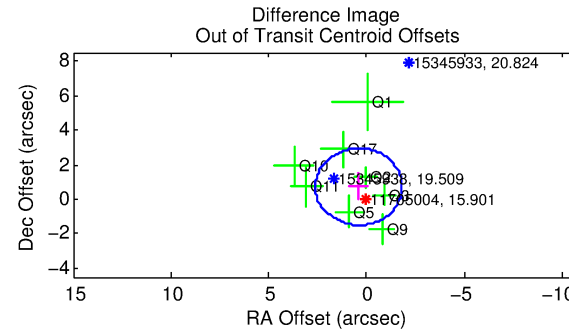
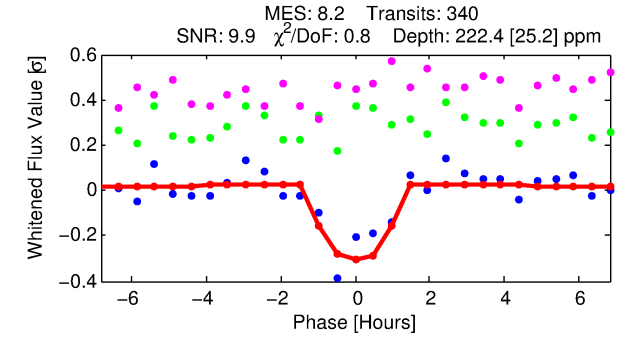
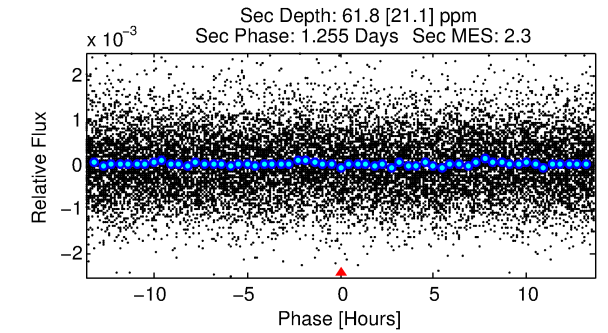
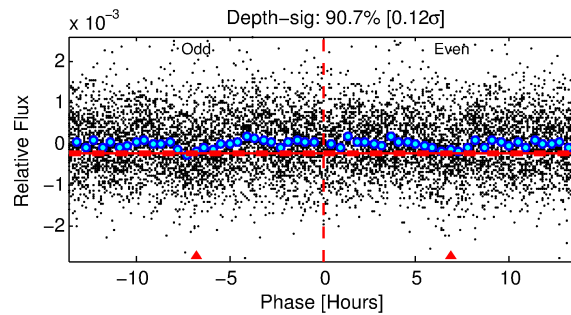
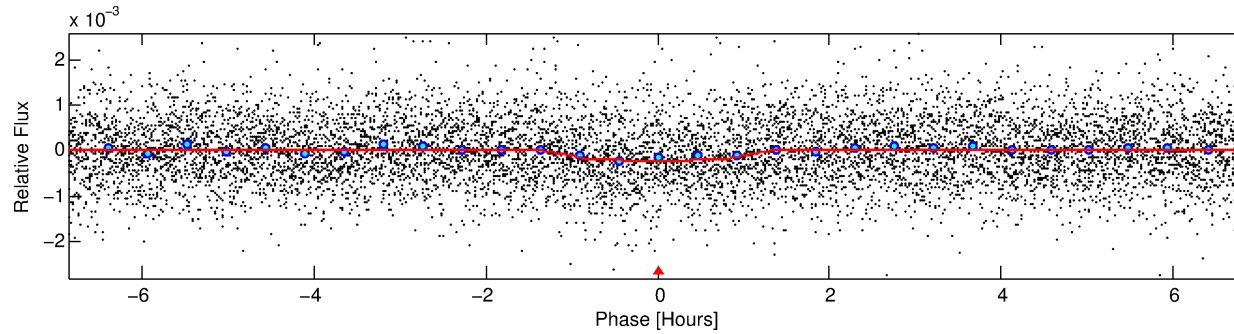
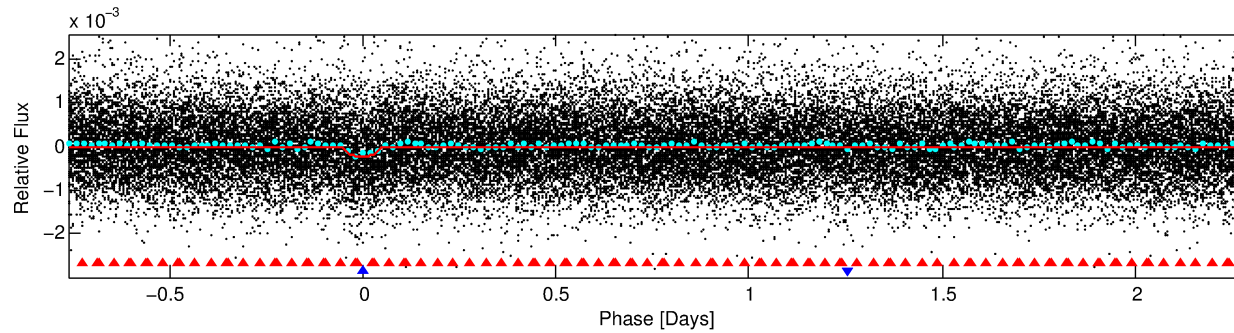
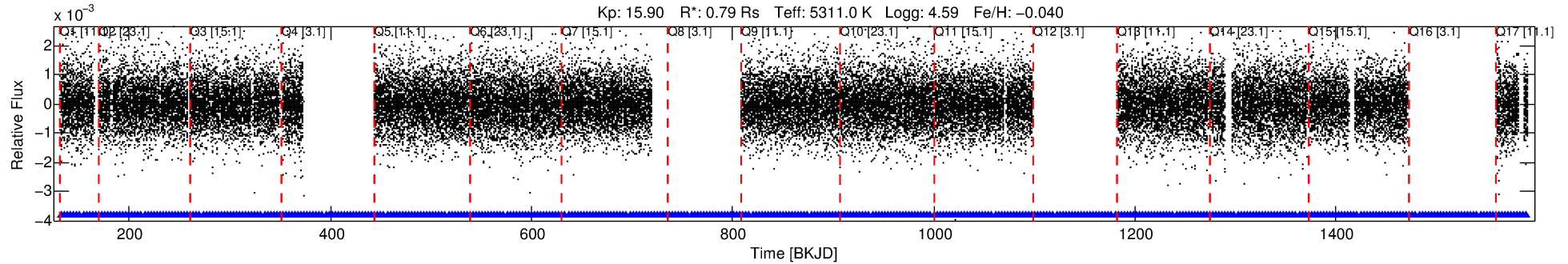
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011705004-02

No Significant Match Found

# DV One-Page Summary

KIC: 11705004 Candidate: 2 of 2 Period: 3.053 d  
KOI: K02199.02 Corr: 0.957



## DV Fit Results:

Period = 3.05293 [0.00002] d  
Epoch = 132.9678 [0.0039] BKJD  
Rp/R\* = 0.0148 [0.0185]  
a/R\* = 7.16 [33.76]  
b = 0.74 [3.03]  
Seff = 284.66 [69.38]  
Teq = 1047 [64] K  
Rp = 1.27 [1.60] Re  
a = 0.0394 [0.0056] AU  
Ag = 32.56 [82.26] [0.38 $\sigma$ ]  
Teffp = 3868 [2439] K [1.16 $\sigma$ ]

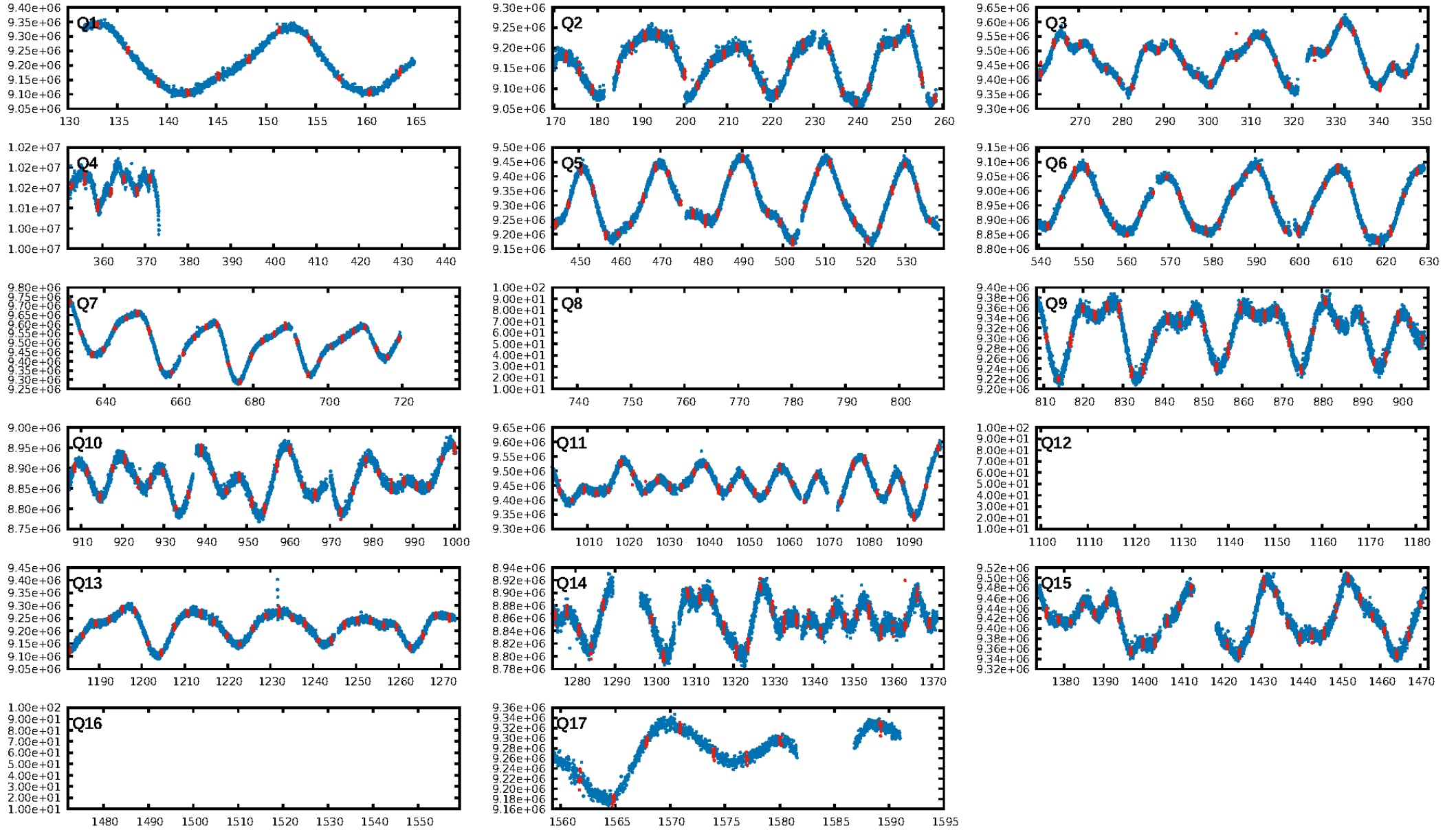
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [39.40 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.77e-16  
RollingBand-fgt: 1.00 [314/314]  
GhostDiagnostic-chr: 9.809  
Centroid-sig: 33.0%  
Centroid-so: 1.866 arcsec [1.38 $\sigma$ ]  
OotOffset-rm: 0.829 arcsec [1.12 $\sigma$ ]  
KicOffset-rm: 1.034 arcsec [1.19 $\sigma$ ]  
OotOffset-st: 2/2/0/4 [8]  
KicOffset-st: 2/2/0/4 [8]  
DiffImageQuality-fgm: 0.62 [5/8]  
DiffImageOverlap-fno: 1.00 [14/14]

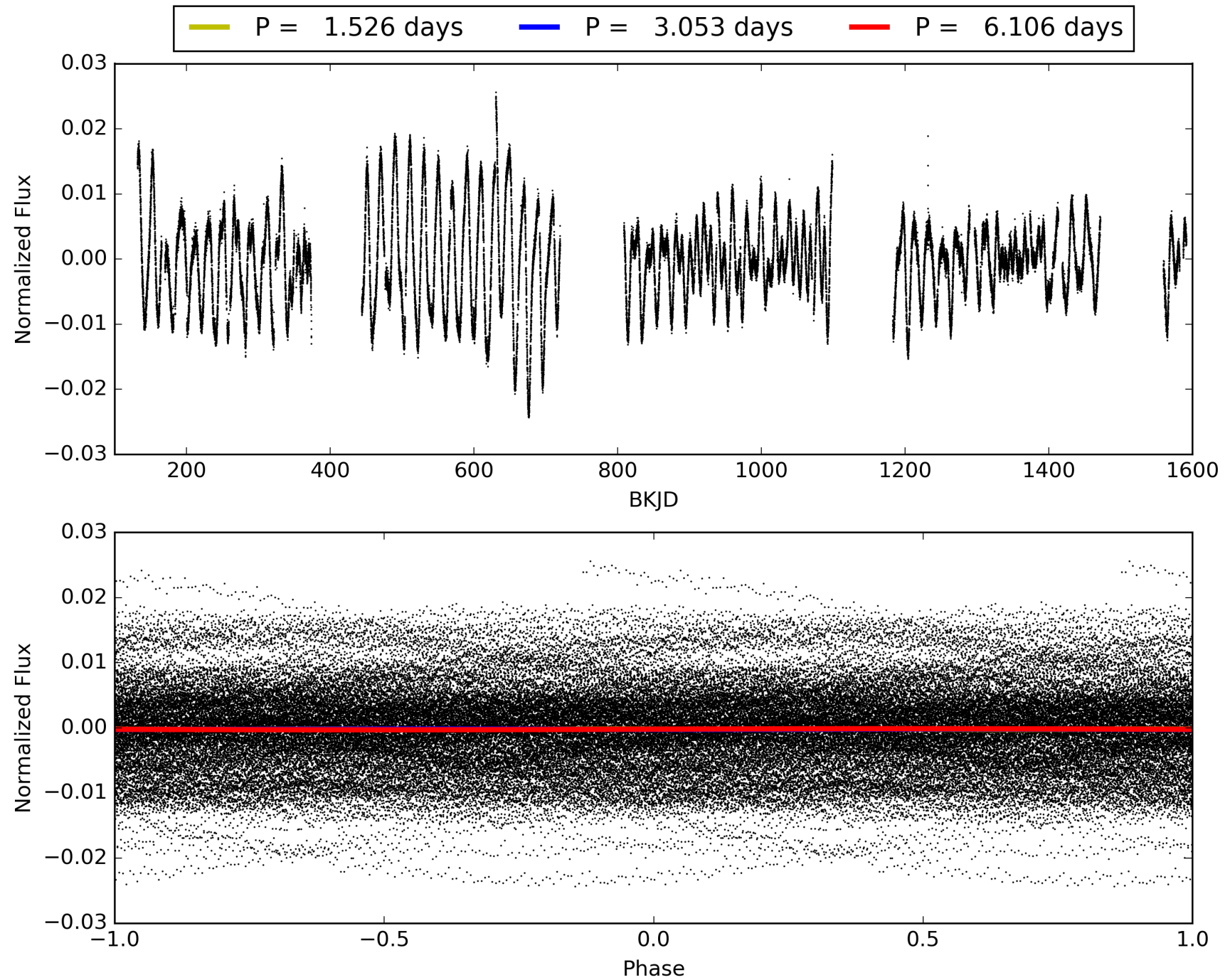
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:28:31 Z

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

# TCE 011705004-02, PDC Light Curves

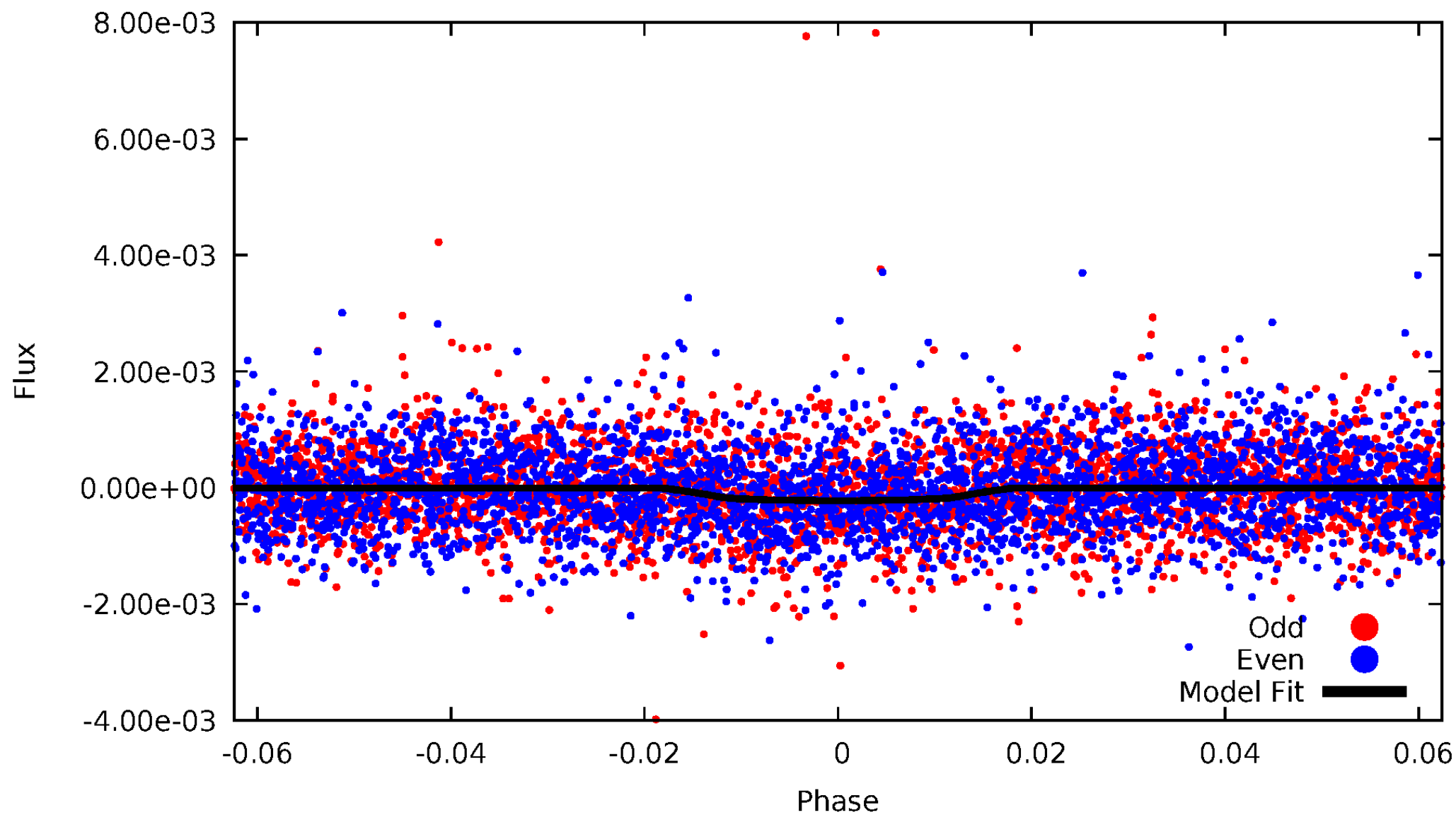


# TCE 011705004-02



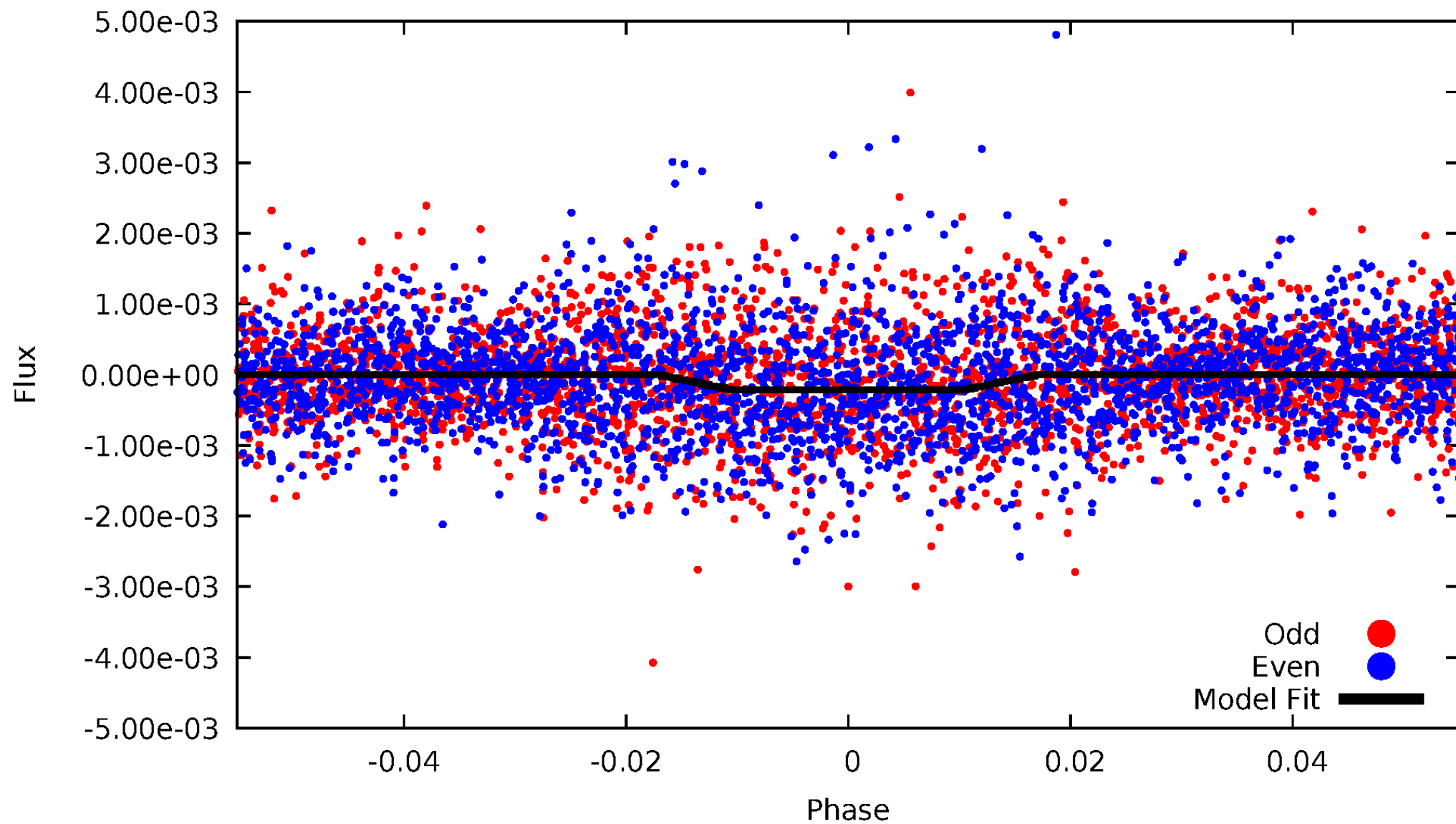
# DV Odd/Even

TCE 011705004-02



# ALT Odd/Even

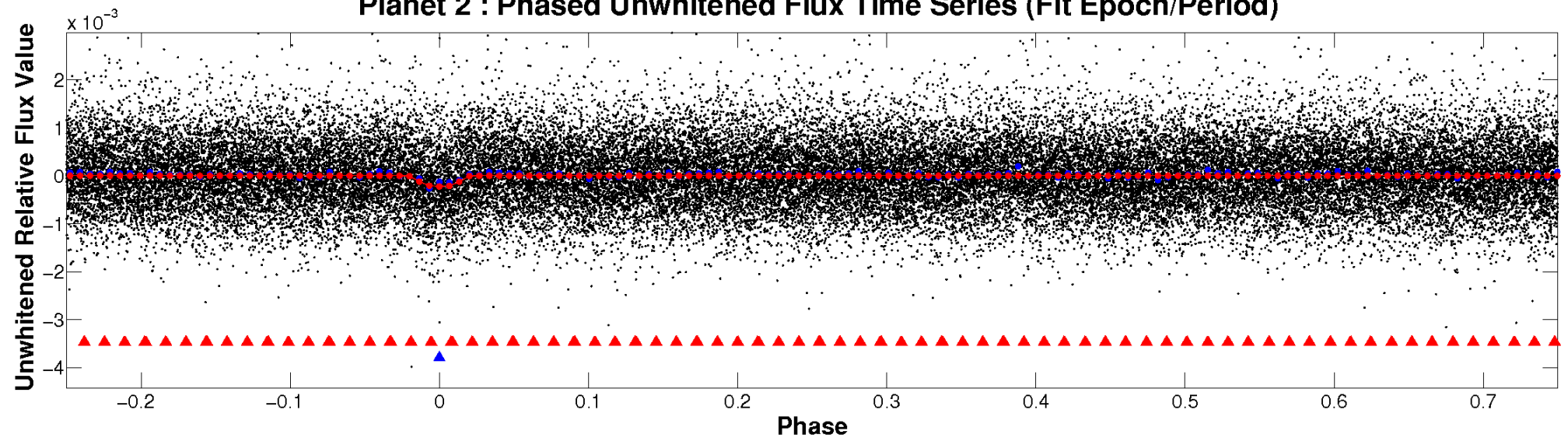
TCE 011705004-02



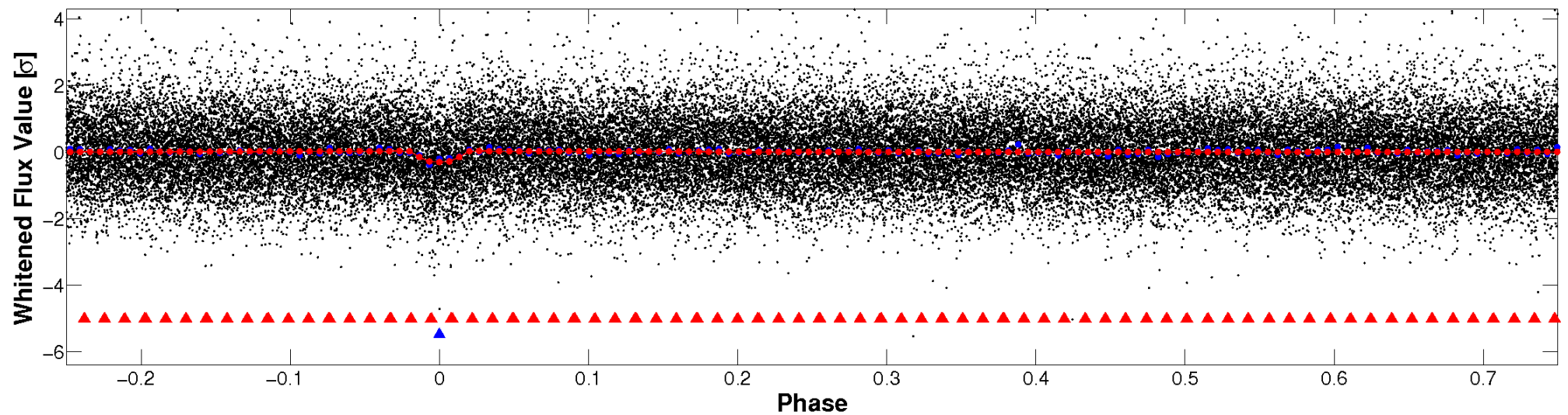


# Non-Whitened Vs. Whitened Light Curve

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

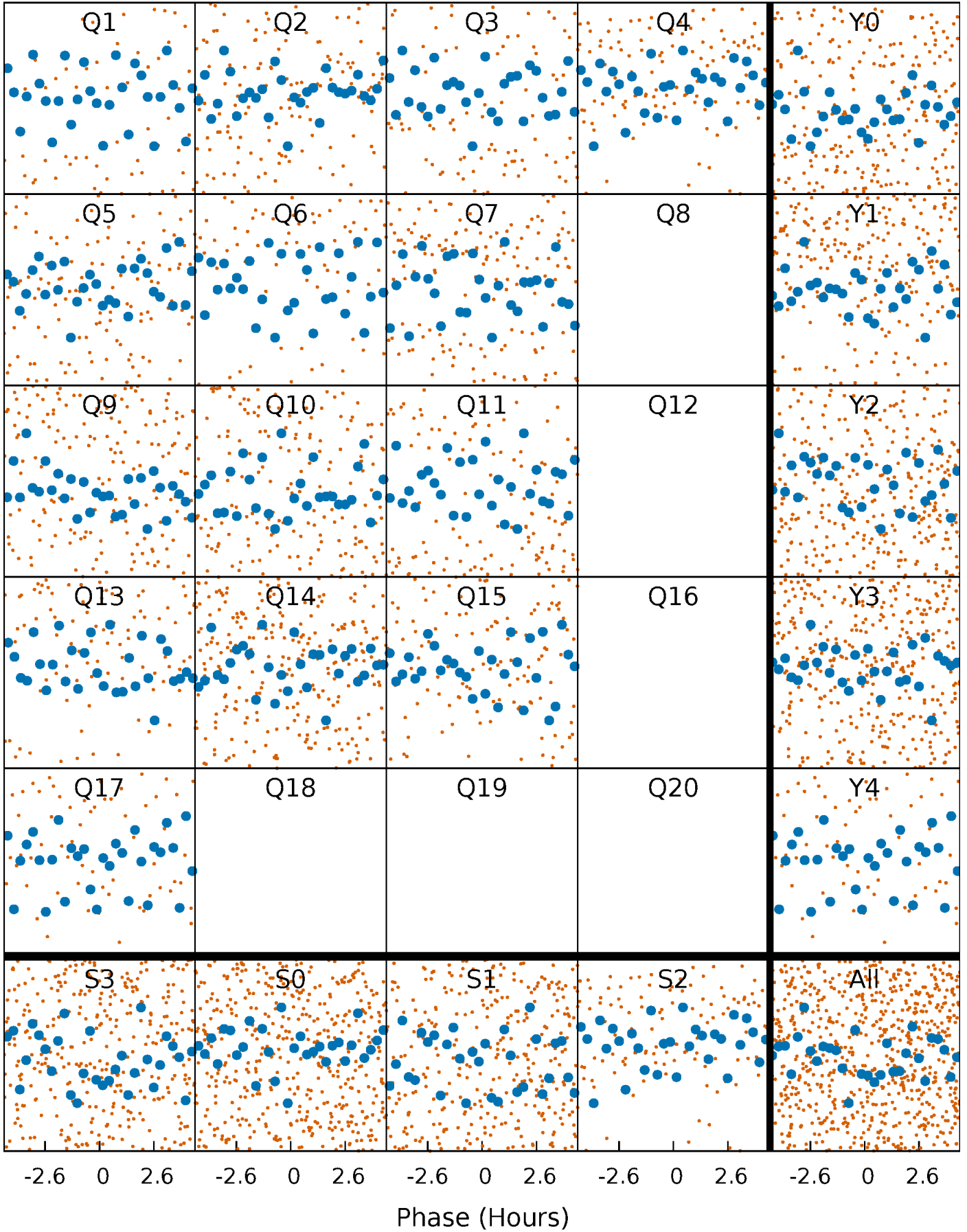


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



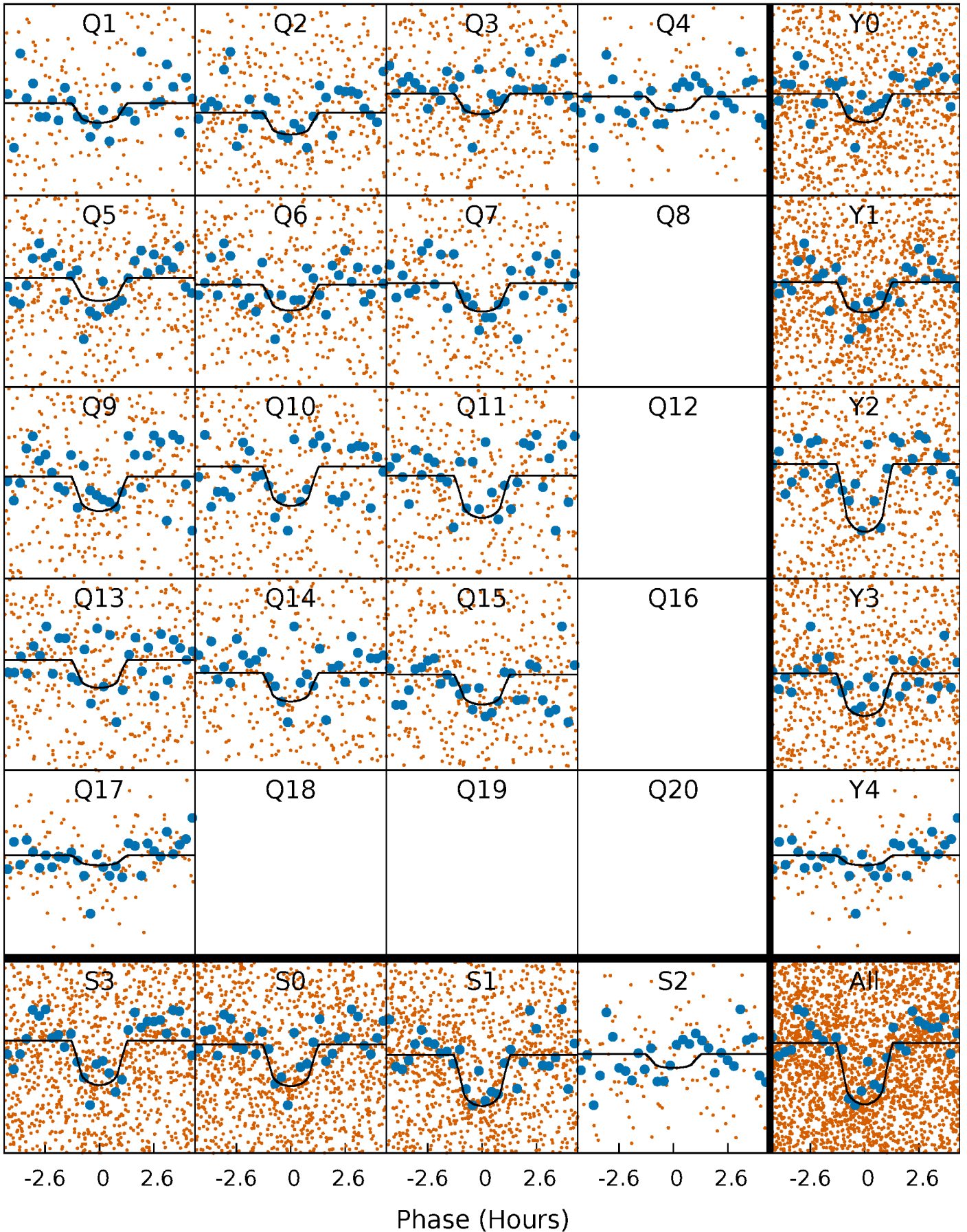
# PDC Quarter-Phased Transit Curves

TCE 011705004-02 P= 3.052934 Days  $T_0=132.967814$  (BKJD)



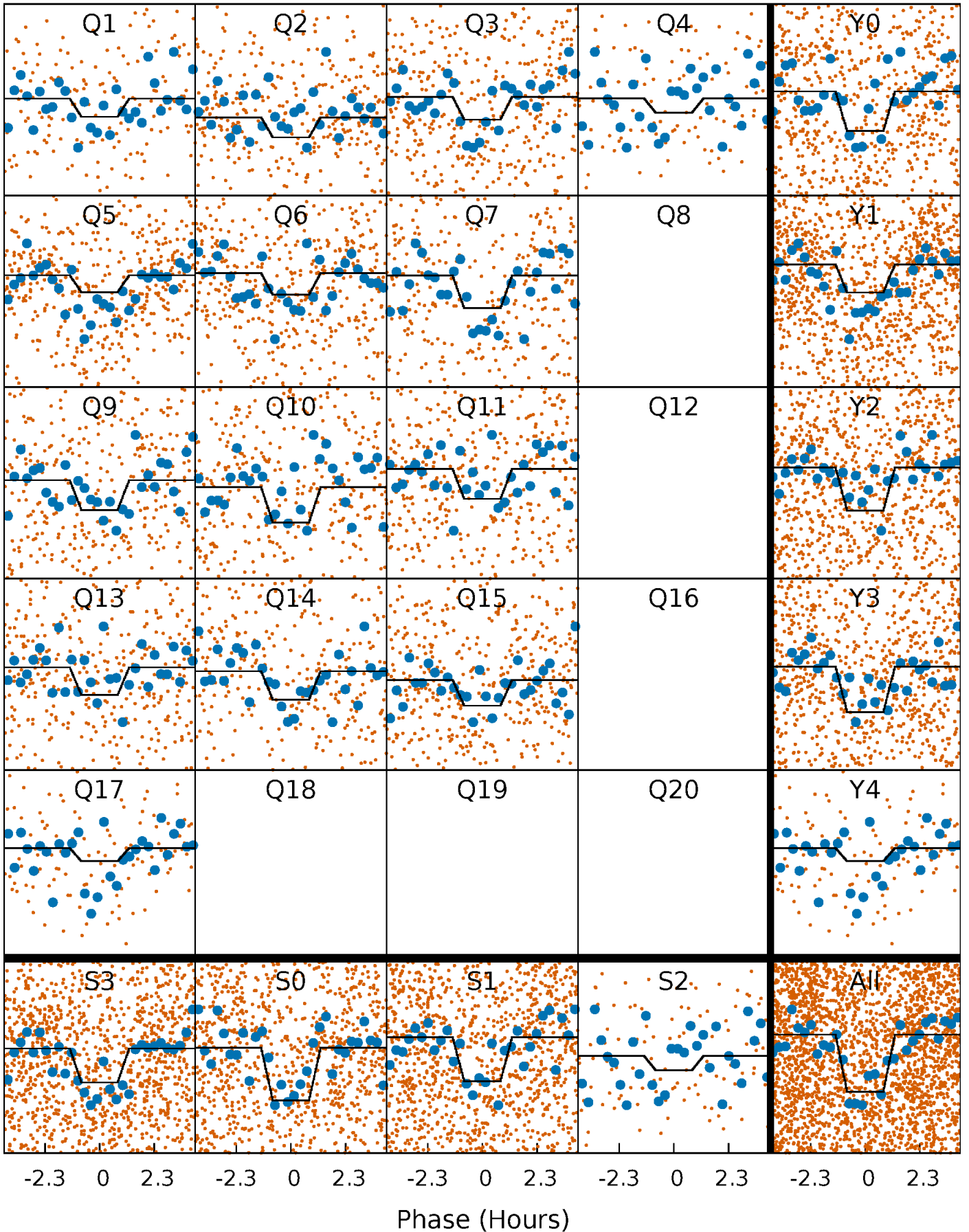
# DV Quarter-Phased Transit Curves

TCE 011705004-02    P= 3.052934 Days     $T_0=132.967814$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011705004-02 P= 3.052914 Days  $T_0=132.969742$  (BKJD)

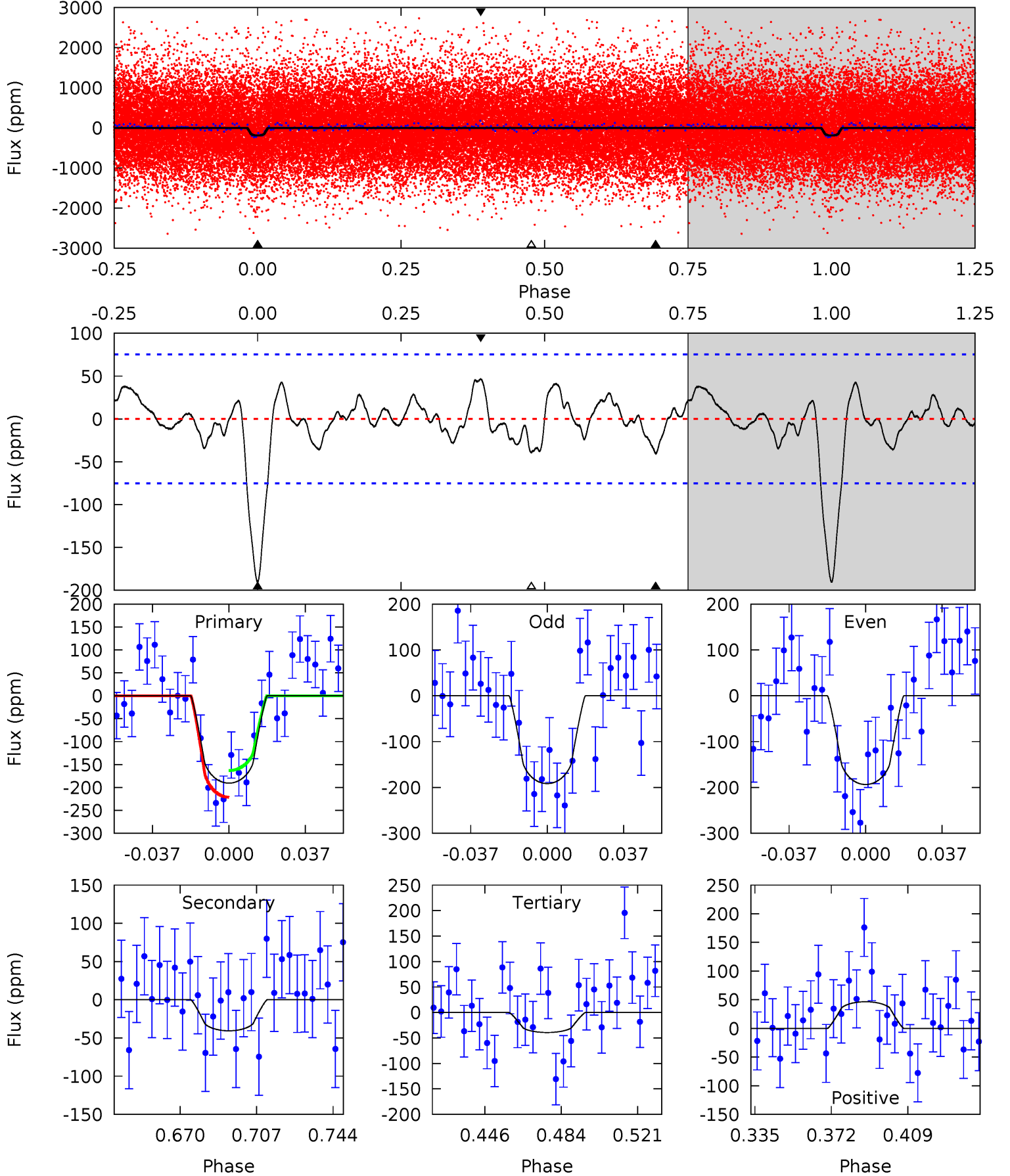




# DV Model-Shift Uniqueness Test

011705004-02, P = 3.052934 Days, E = 129.914880 Days

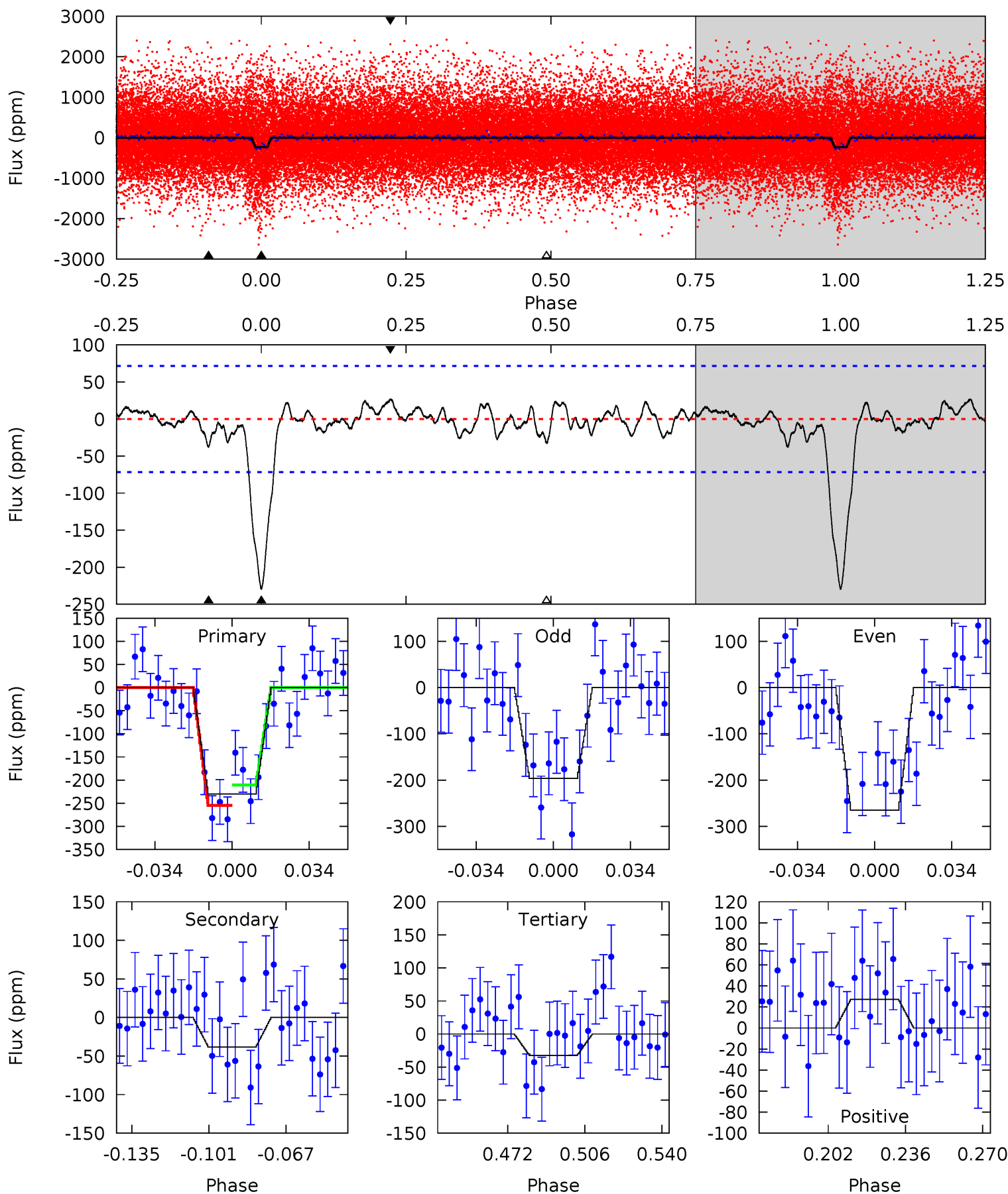
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	2.58	2.49	2.95	4.77	2.08	1.22	9.59	9.13	0.09	-0.38	0.06	0.91	0.20	1.85



# Alt Model-Shift Uniqueness Test

011705004-02, P = 3.052914 Days, E = 129.916828 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
15.4	2.56	2.17	1.82	4.79	2.12	0.83	13.2	13.6	0.39	0.74	2.29	1.01	0.11	1.48





### Stellar Parameters For KIC 011705004

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5311^{+175}_{-159}$	$4.588^{+0.030}_{-0.112}$	$-0.040^{+0.300}_{-0.300}$	$0.788^{+0.132}_{-0.066}$	$0.884^{+0.070}_{-0.104}$	$2.546^{+0.399}_{-0.904}$
	+3%/-3%	+1%/-2%	+750%/-750%	+17%/-8%	+8%/-12%	+16%/-36%
Source	PHO1	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 011705004-02 / KOI 2199.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-41 \pm 16$	$1.82^{+1.49}_{-1.16}$	$1487^{+71}_{-59}$	$3369^{+1513}_{-588}$	$9.342^{+64.874}_{-6.644}$
Alt.	$-38 \pm 15$	$1.78^{+1.35}_{-1.14}$	$1486^{+69}_{-60}$	$3356^{+1700}_{-572}$	$9.083^{+73.407}_{-6.266}$

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

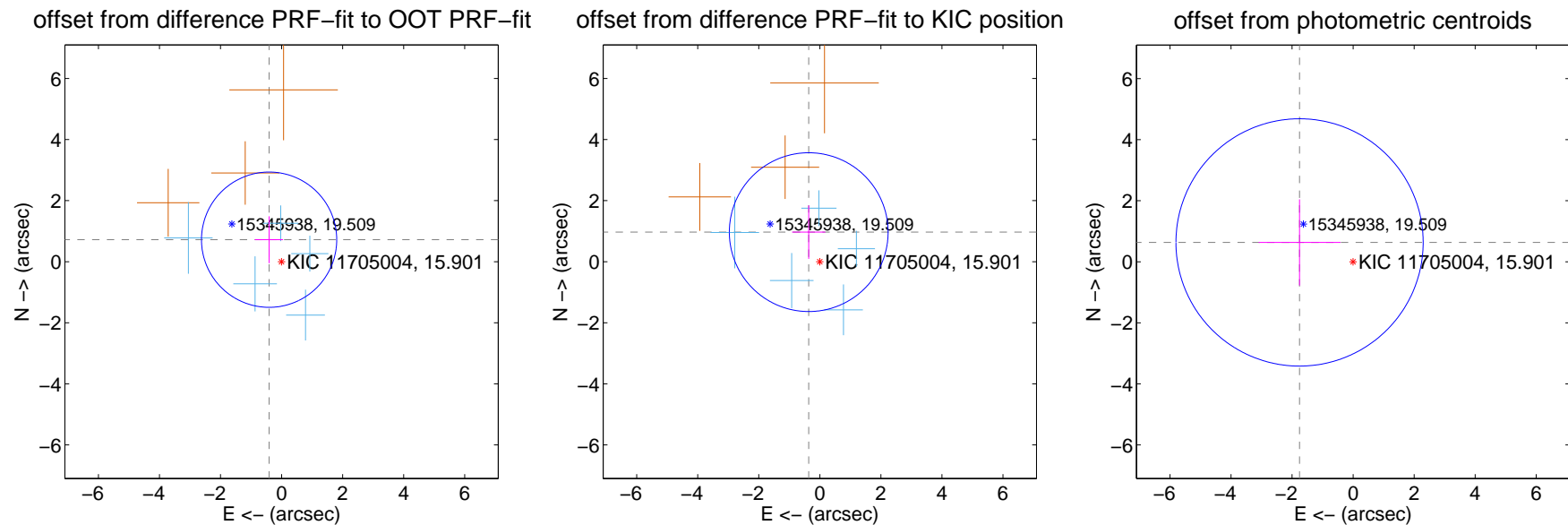
## DV Centroid Data

Supplemental centroid analysis for 011705004-02. Kepler magnitude: 15.90. Transit SNR 9.89

There are 5 quarters with good PRF difference image offsets

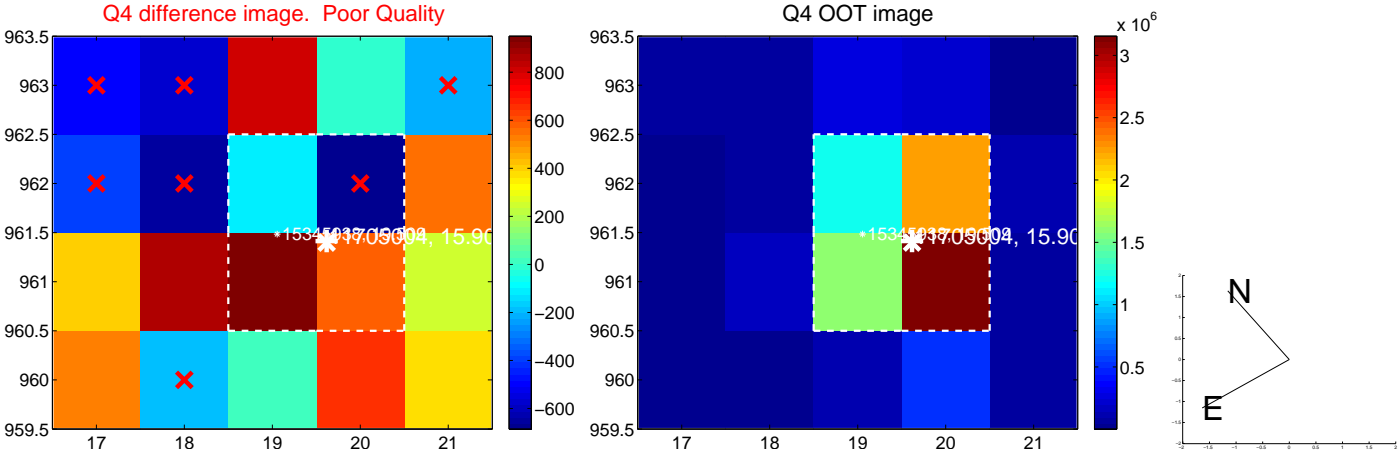
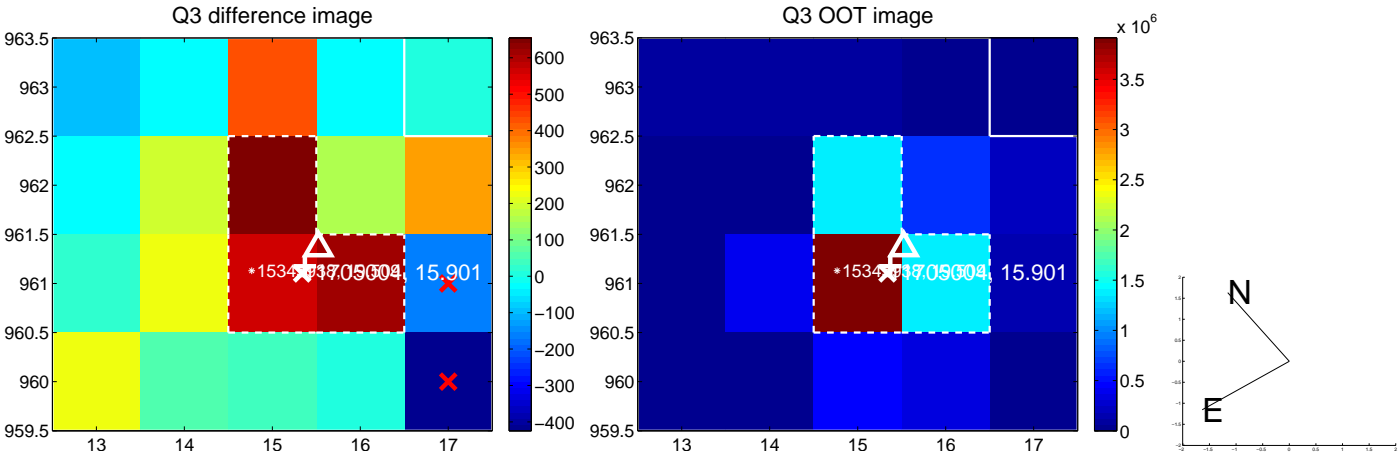
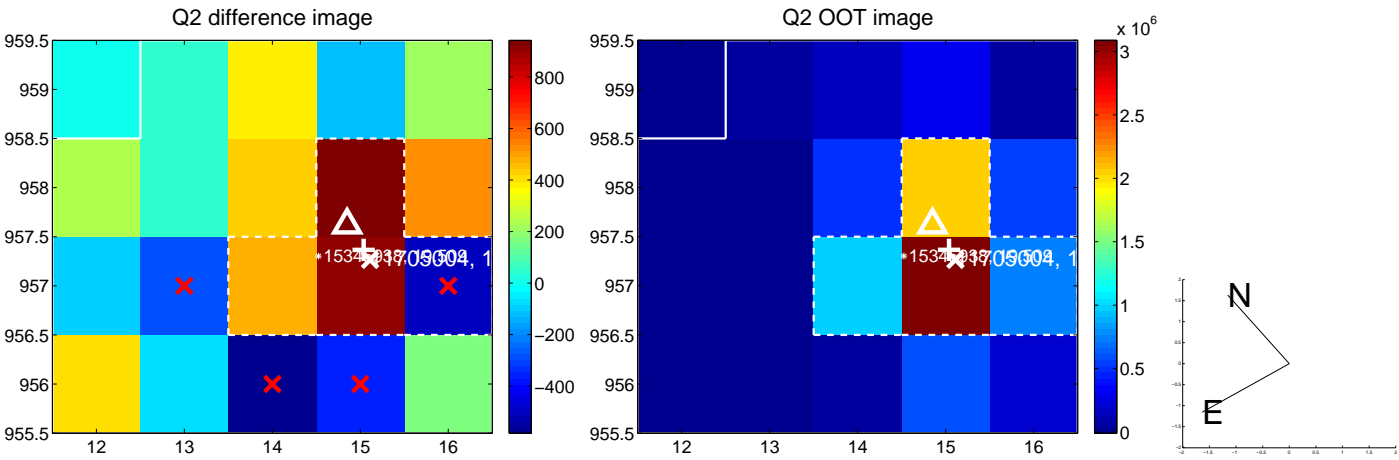
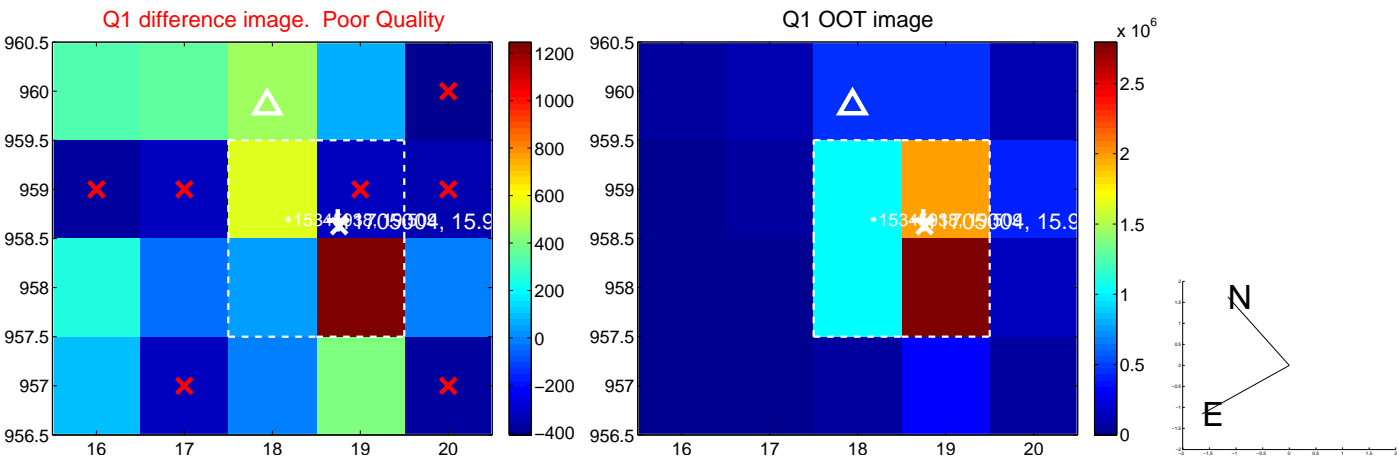
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.829 \pm 0.739$	1.12	$0.409 \pm 0.459$	$0.721 \pm 0.768$
PRF-fit source offset from KIC position	$1.034 \pm 0.867$	1.19	$0.364 \pm 0.545$	$0.968 \pm 0.875$
photometric centroid source offset	$1.87 \pm 1.35$	1.38	$1.76 \pm 1.34$	$0.63 \pm 1.41$

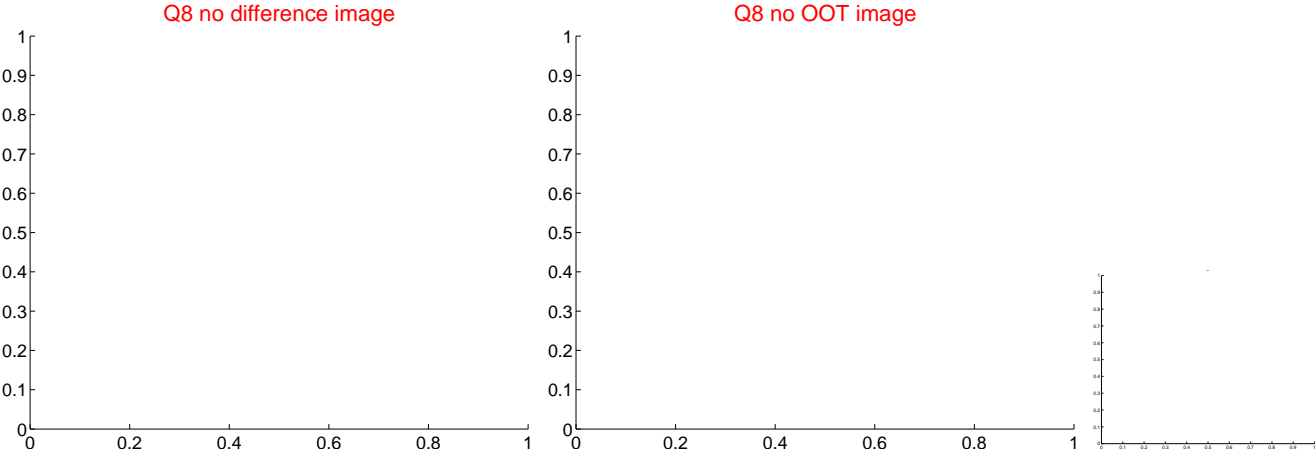
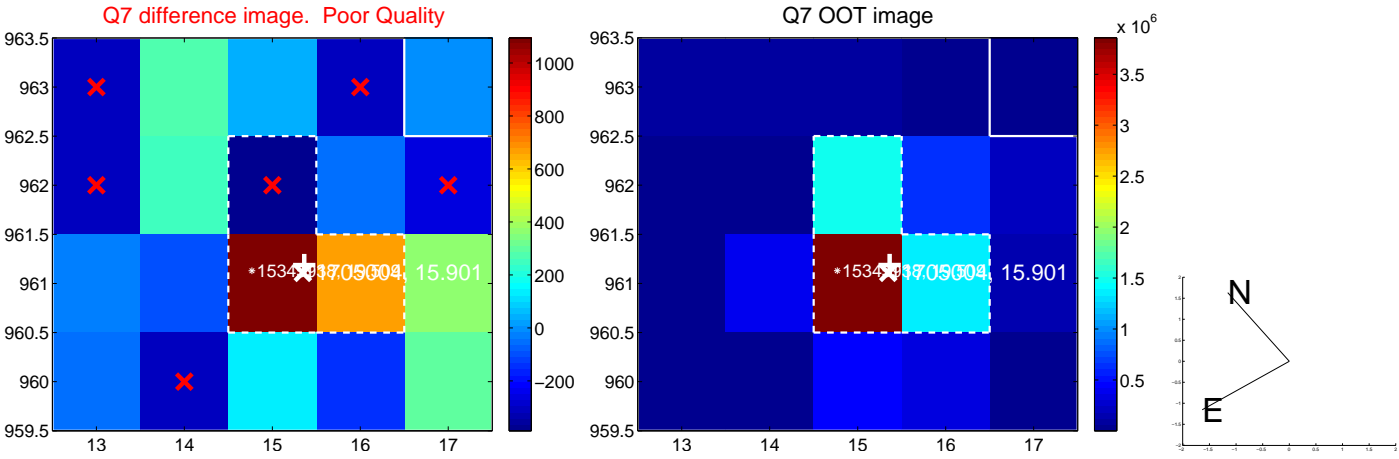
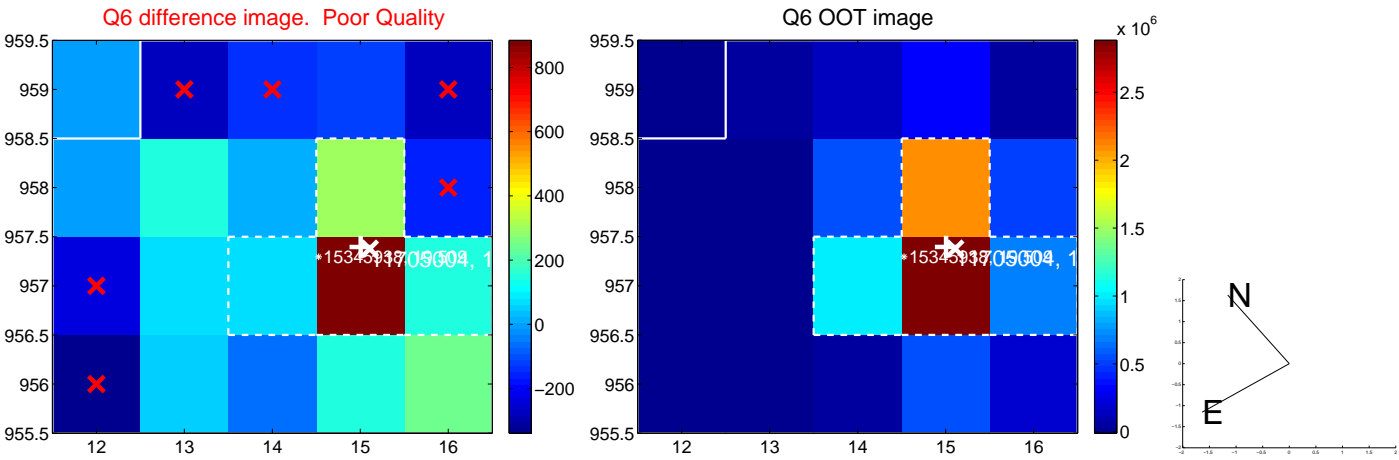
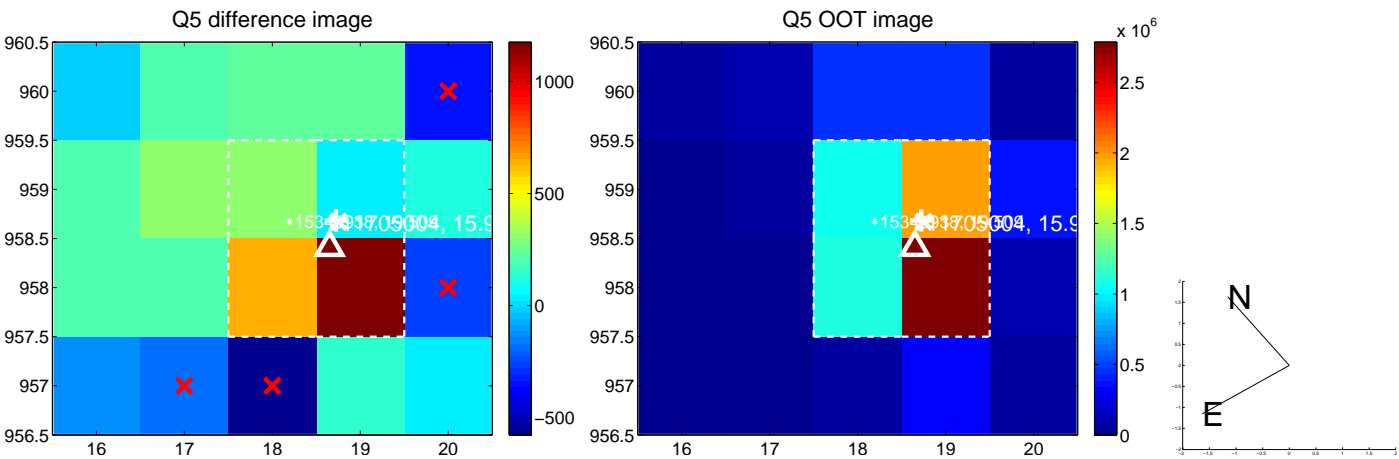


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

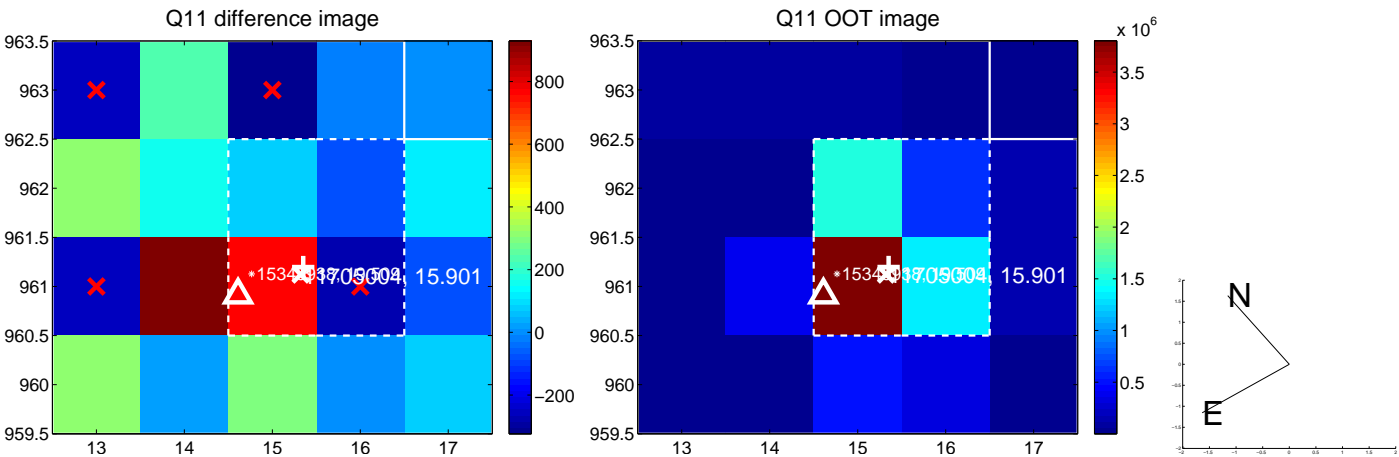
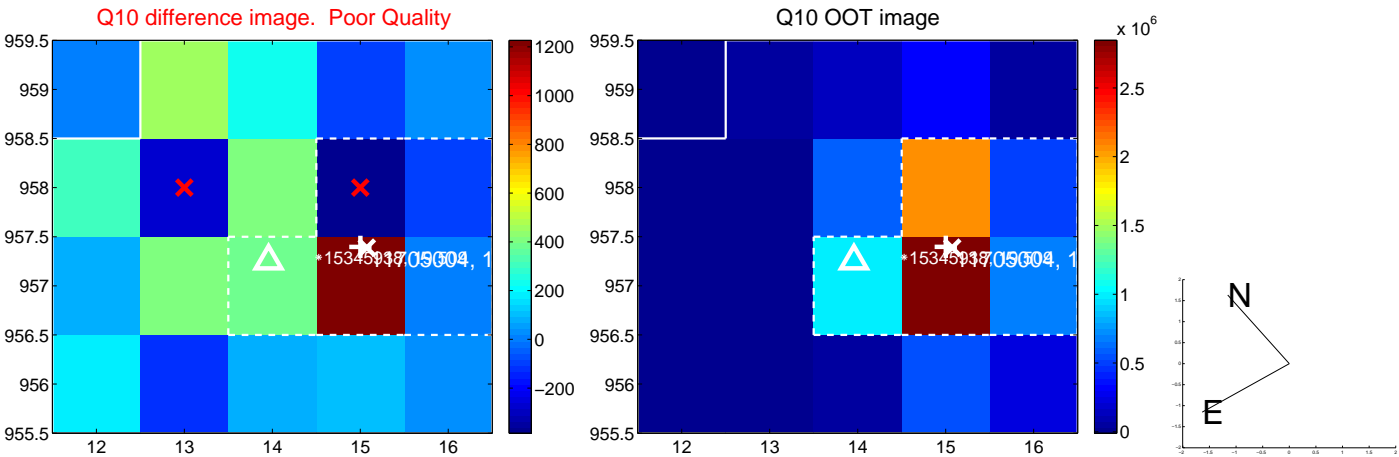
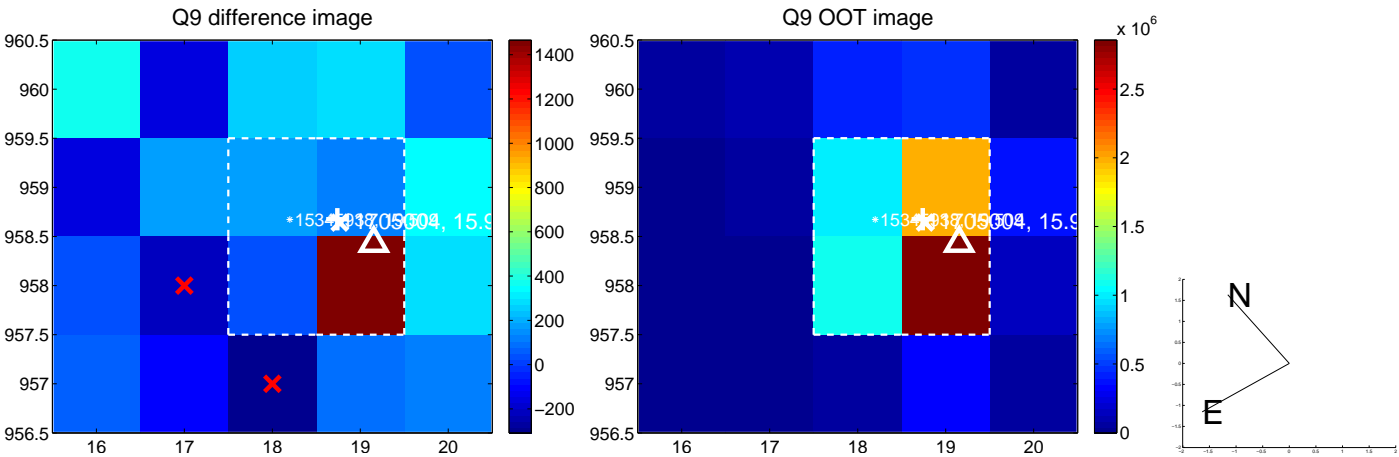
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



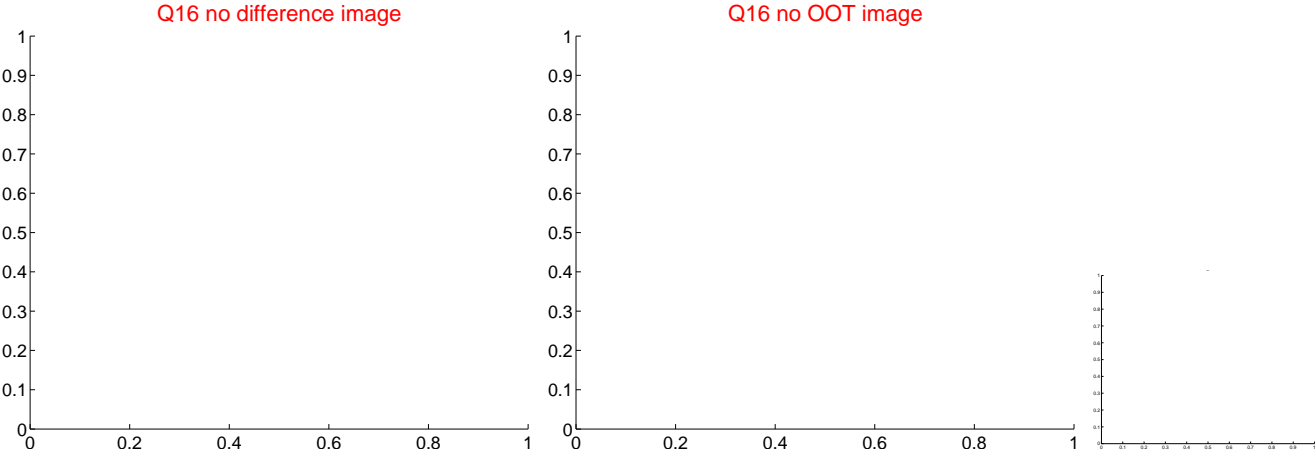
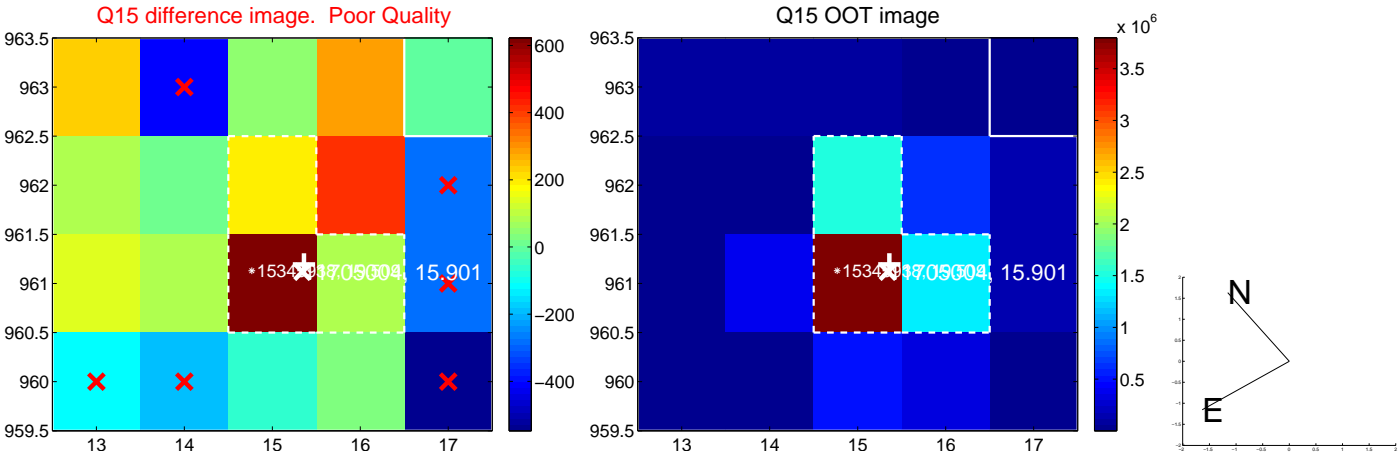
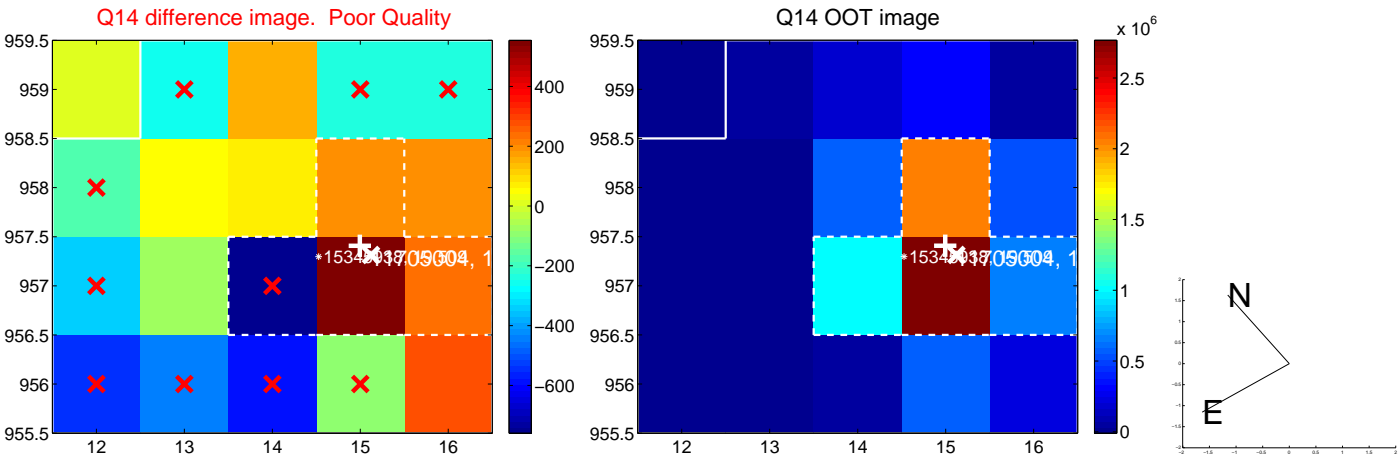
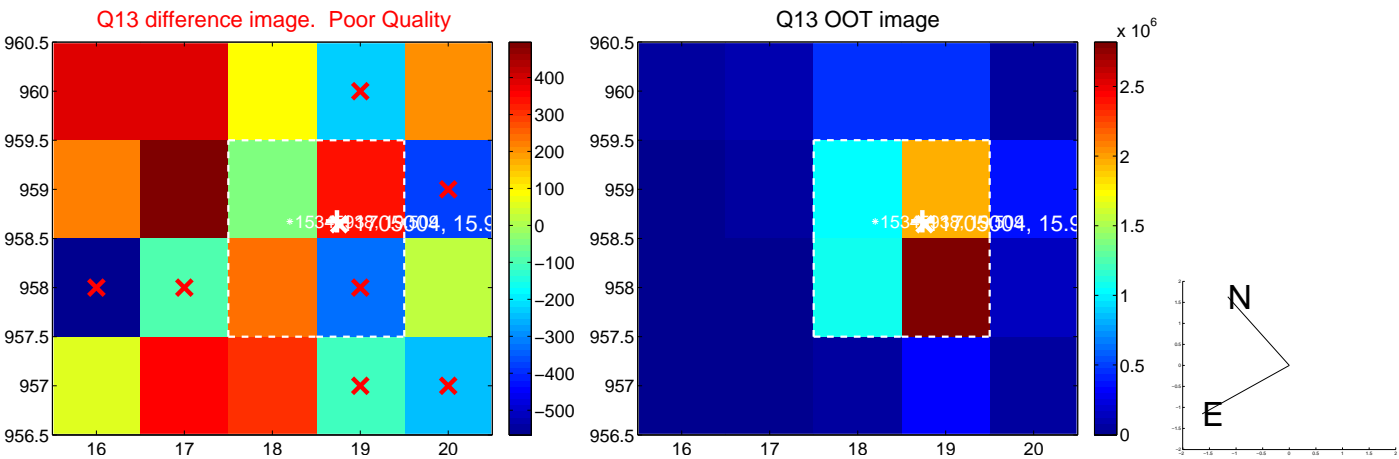
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



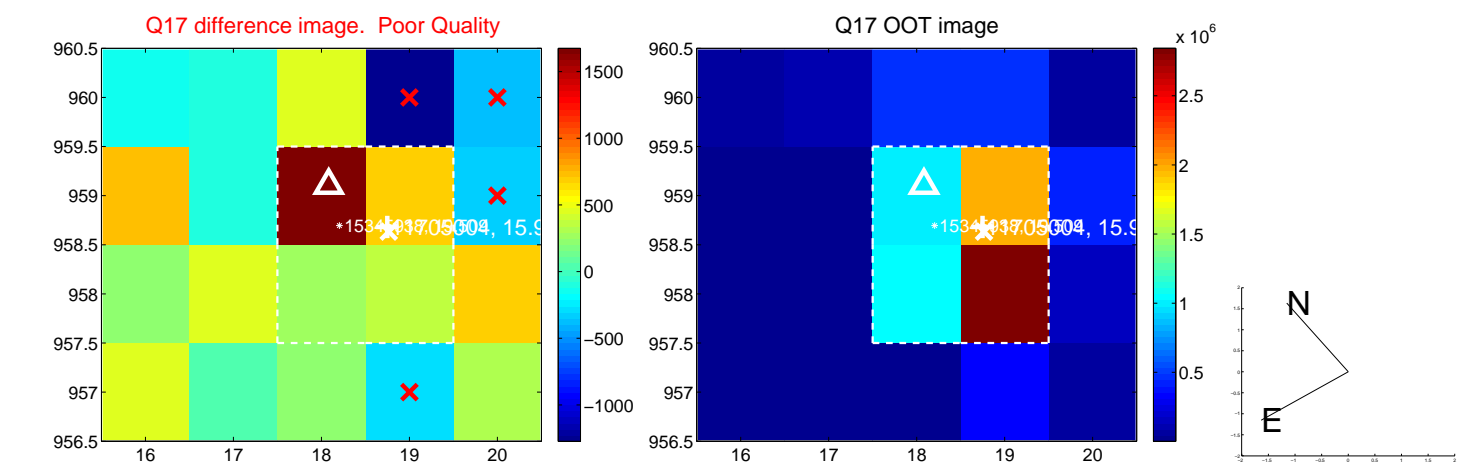
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



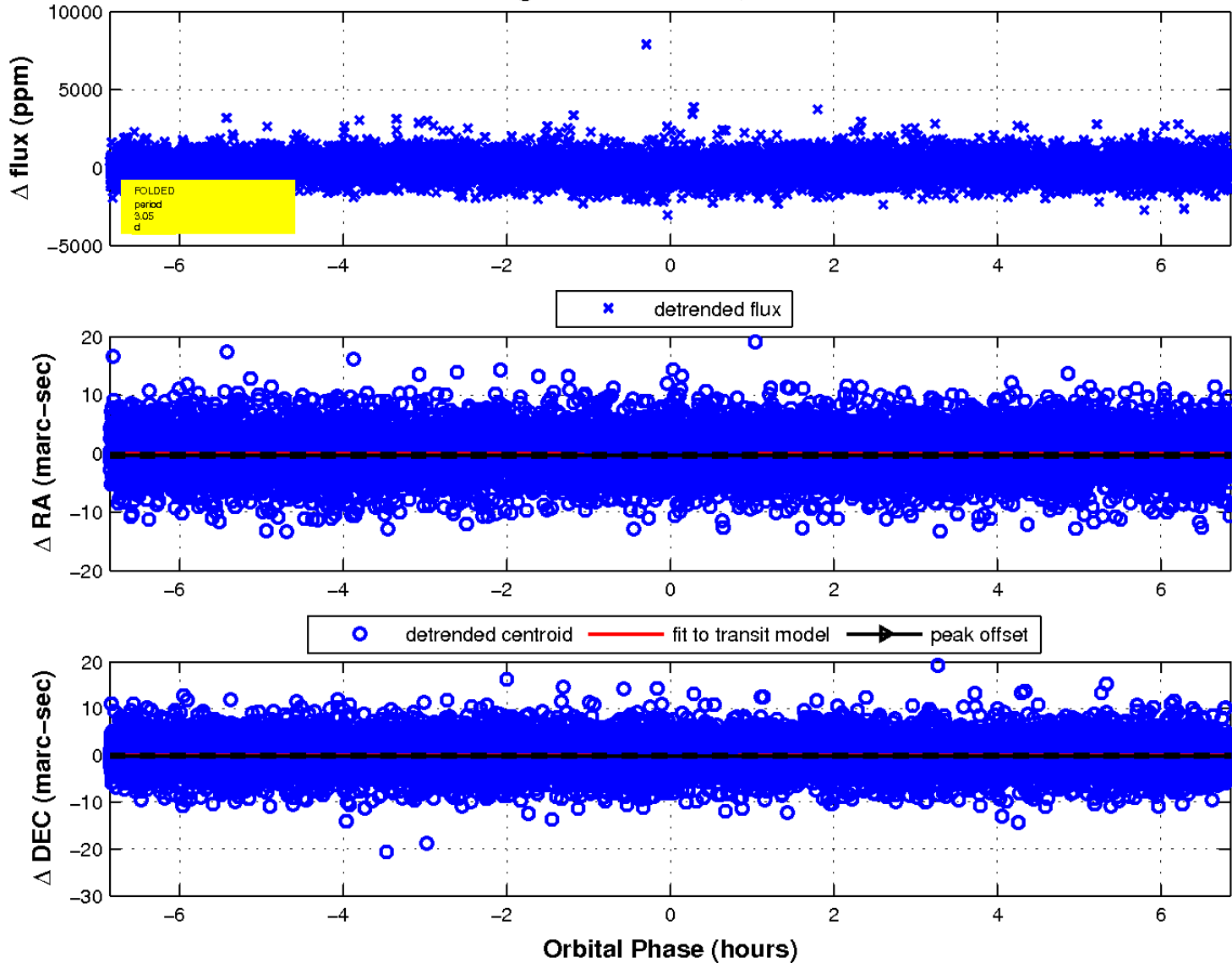
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2





UKIRT Image

