

# KIC 005545321

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005545321-01	OBS	No	1.150639	131.945394	8.0	4.989	11.9	9.9	3.71	7550	1.06	51792.62
005545321-02	OBS	No	111.369259	186.402767	47.7	8.970	7.1	5.7	3.71	7550	2.98	116.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005545321-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
005545321-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

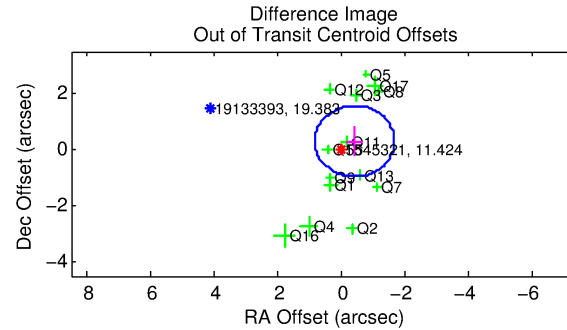
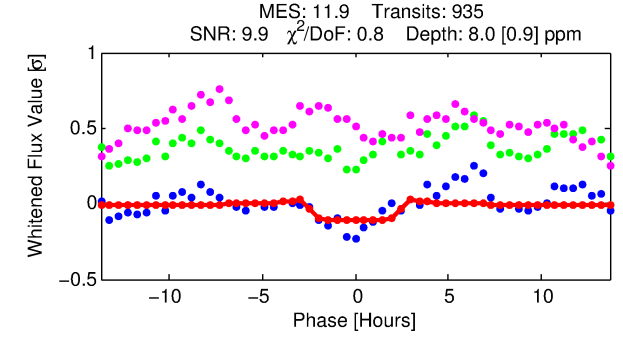
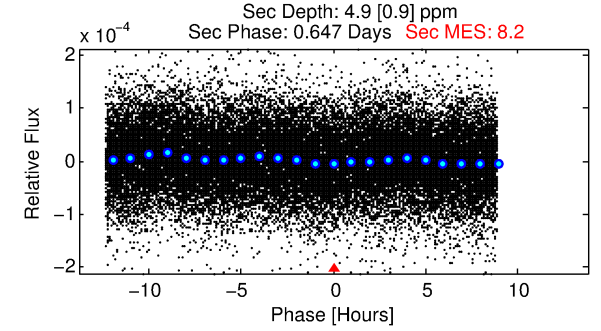
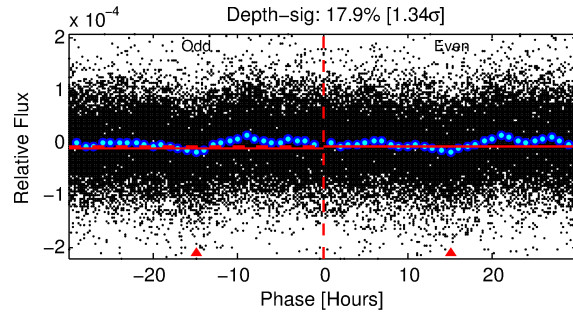
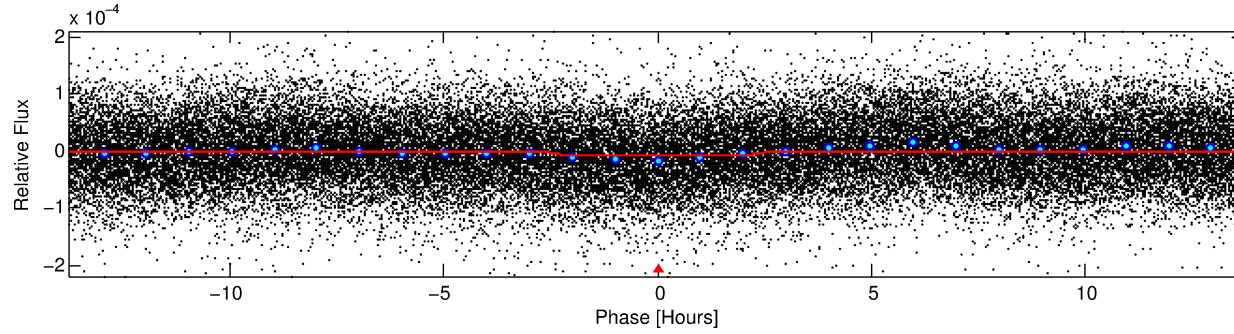
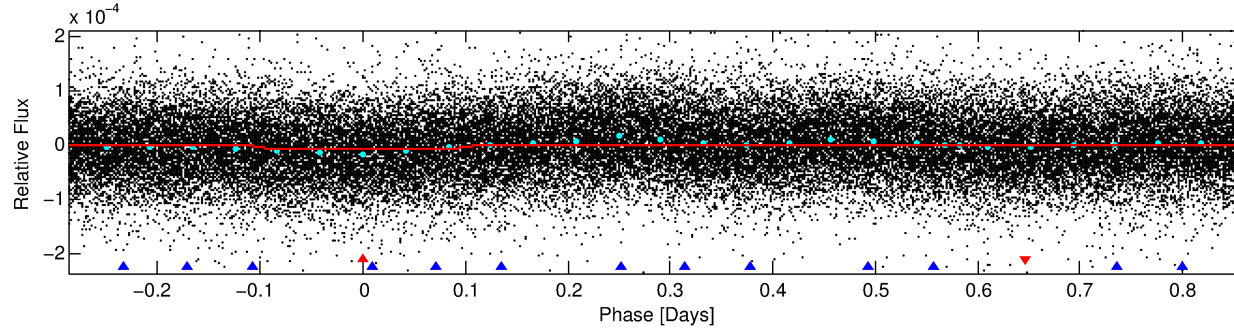
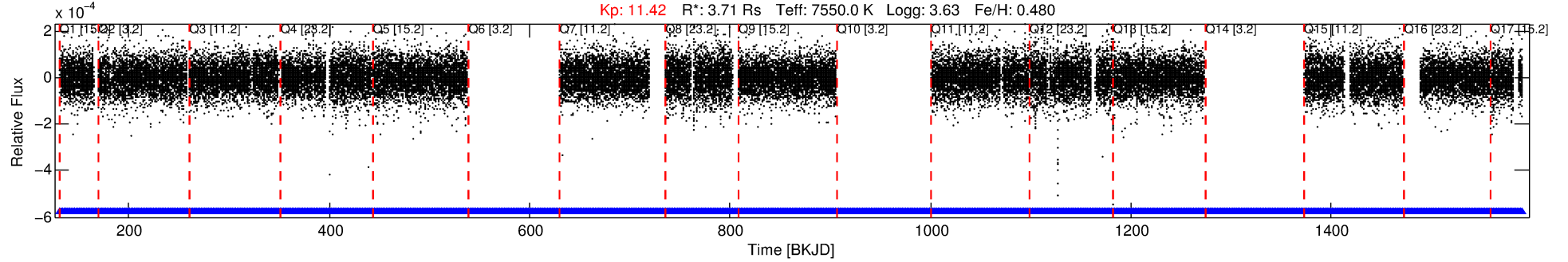
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005545321-01

No Significant Match Found

# DV One-Page Summary

KIC: 5545321 Candidate: 1 of 2 Period: 1.151 d



## DV Fit Results:

Period = 1.15064 [0.00001] d  
Epoch = 131.9454 [0.0045] BKJD  
Rp/R\* = 0.0026 [0.0028]  
a/R\* = 1.85 [7.95]  
b = 0.13 [46.05]  
Seff = 51792.62 [45708.31]  
Teq = 3847 [849] K  
Rp = 1.06 [1.24] Re  
a = 0.0278 [0.0133] AU  
Ag = 1.85 [4.23] [0.20 $\sigma$ ]  
Teffp = 6932 [3802] K [0.79 $\sigma$ ]

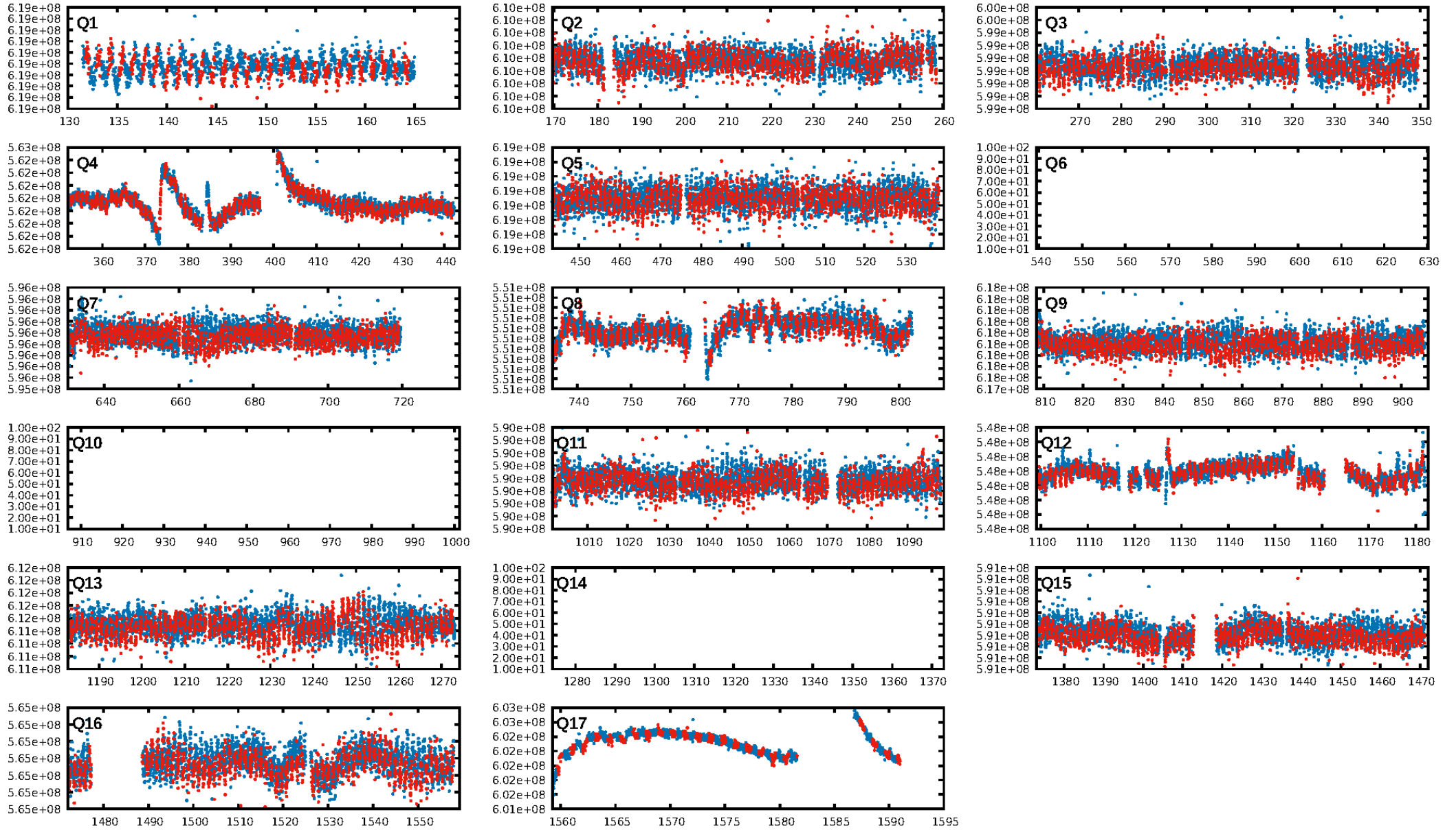
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [257.72 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.31e-24  
RollingBand-fgt: 1.00 [883/883]  
GhostDiagnostic-chr: 1.252  
Centroid-sig: 60.6%  
Centroid-so: 0.738 arcsec [0.74 $\sigma$ ]  
OotOffset-rm: 0.508 arcsec [1.21 $\sigma$ ]  
KicOffset-rm: 0.623 arcsec [1.42 $\sigma$ ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 0.71 [10/14]  
DiffImageOverlap-fno: 1.00 [14/14]

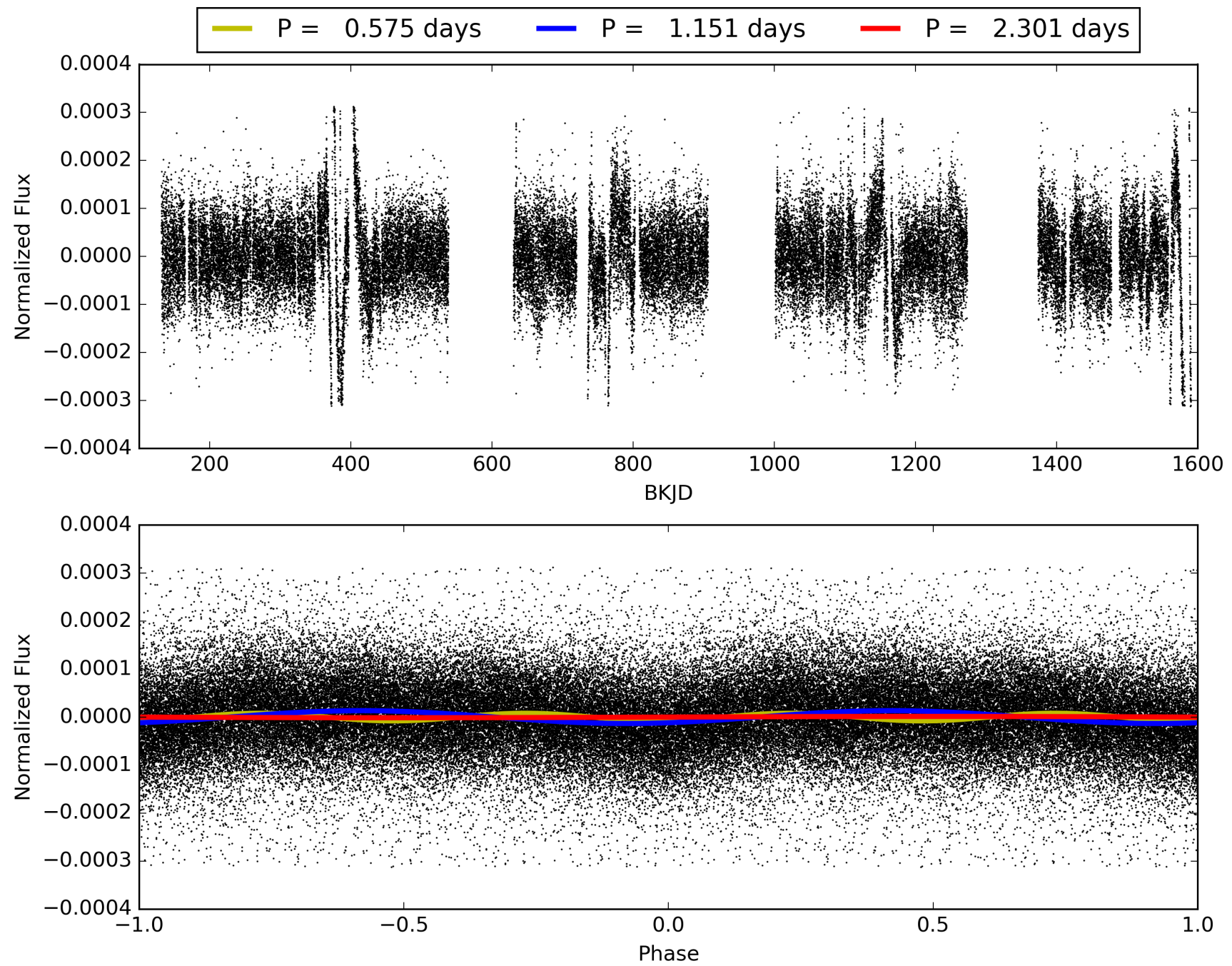
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:57:10 Z

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

# TCE 005545321-01, PDC Light Curves

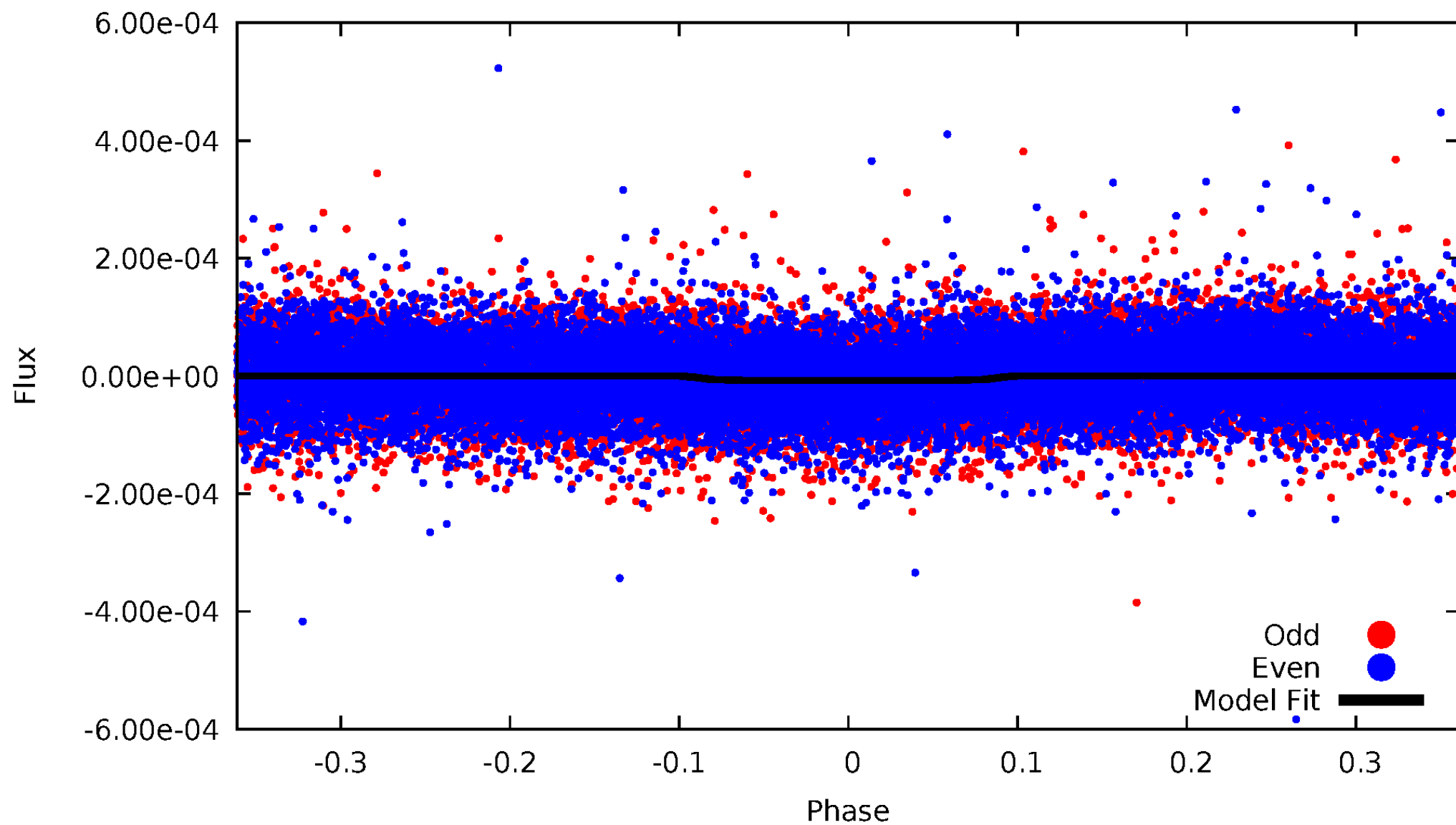


TCE 005545321-01



# DV Odd/Even

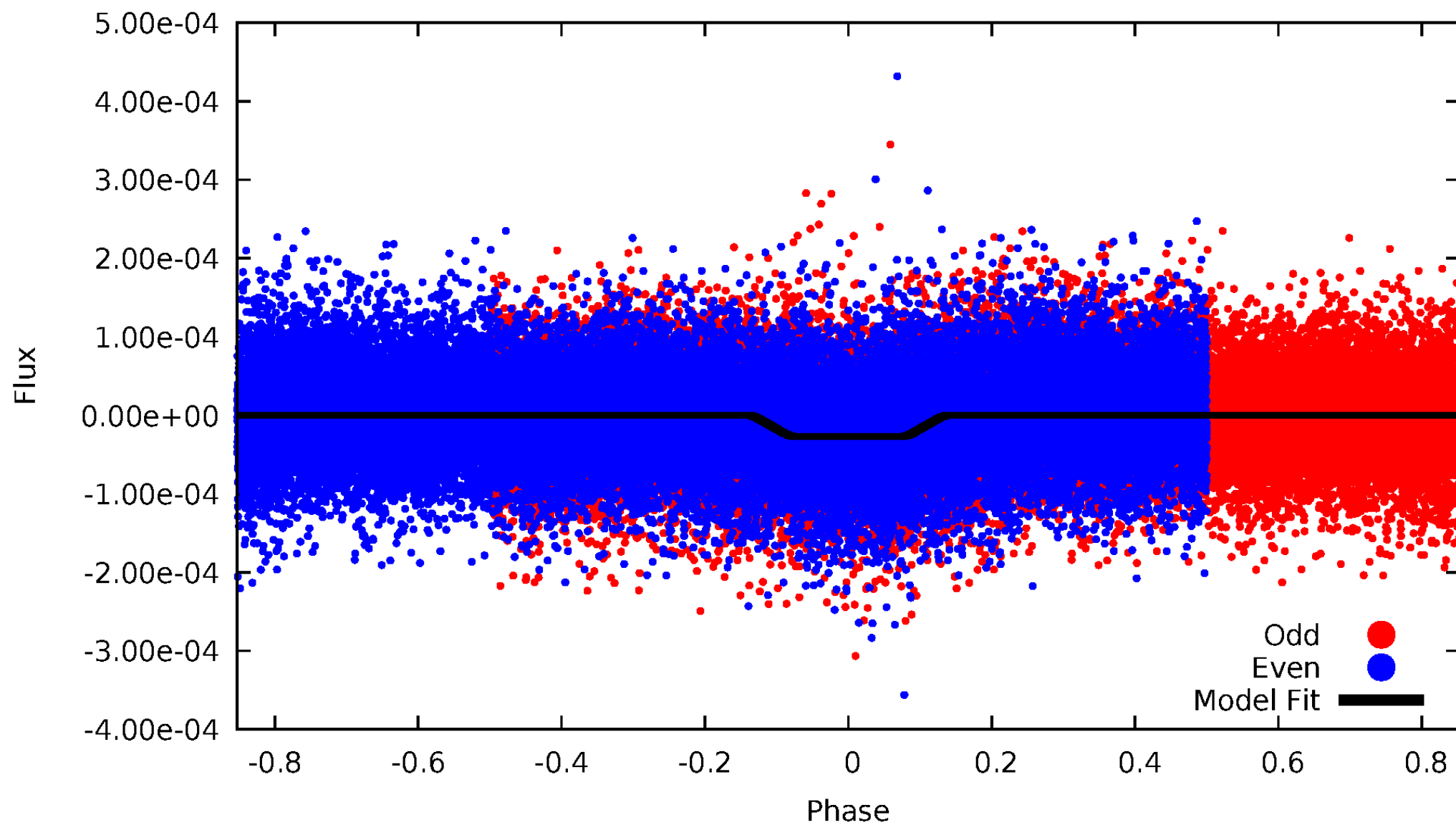
TCE 005545321-01





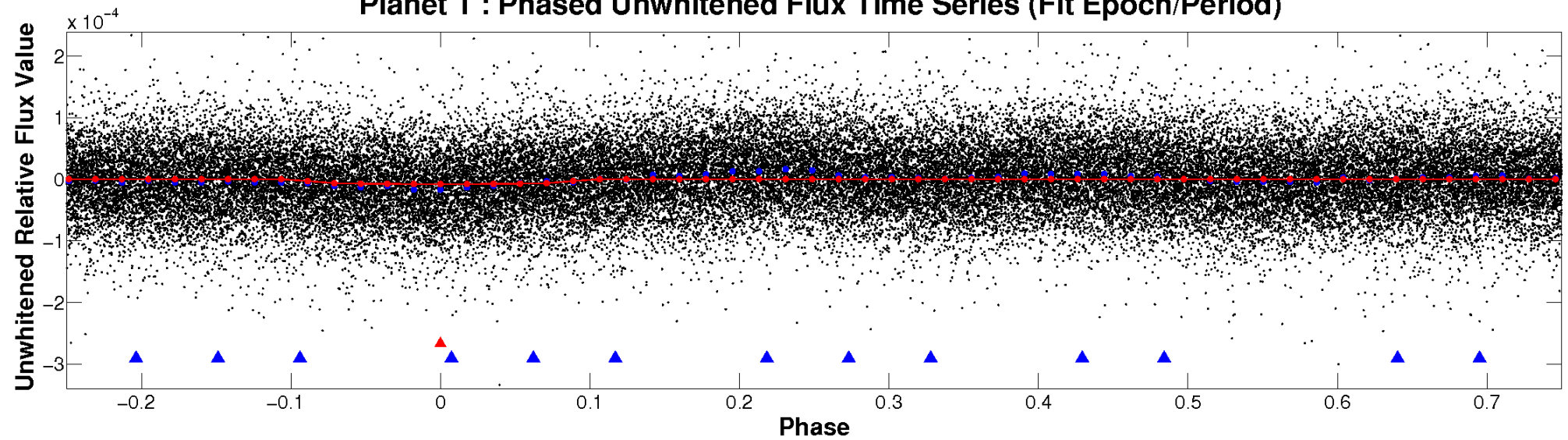
# ALT Odd/Even

TCE 005545321-01

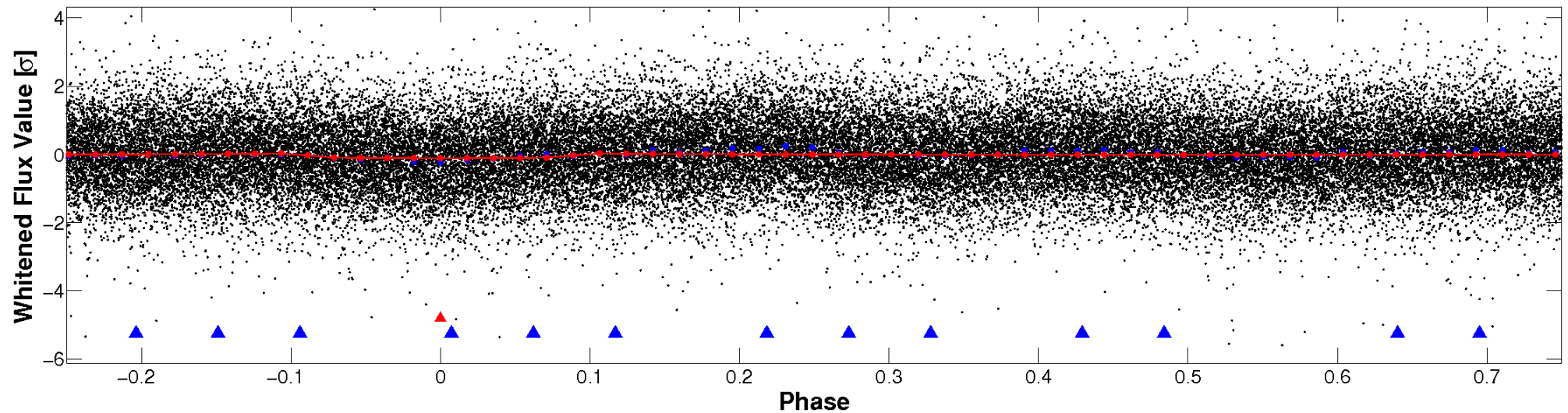


# Non-Whitened Vs. Whitened Light Curve

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

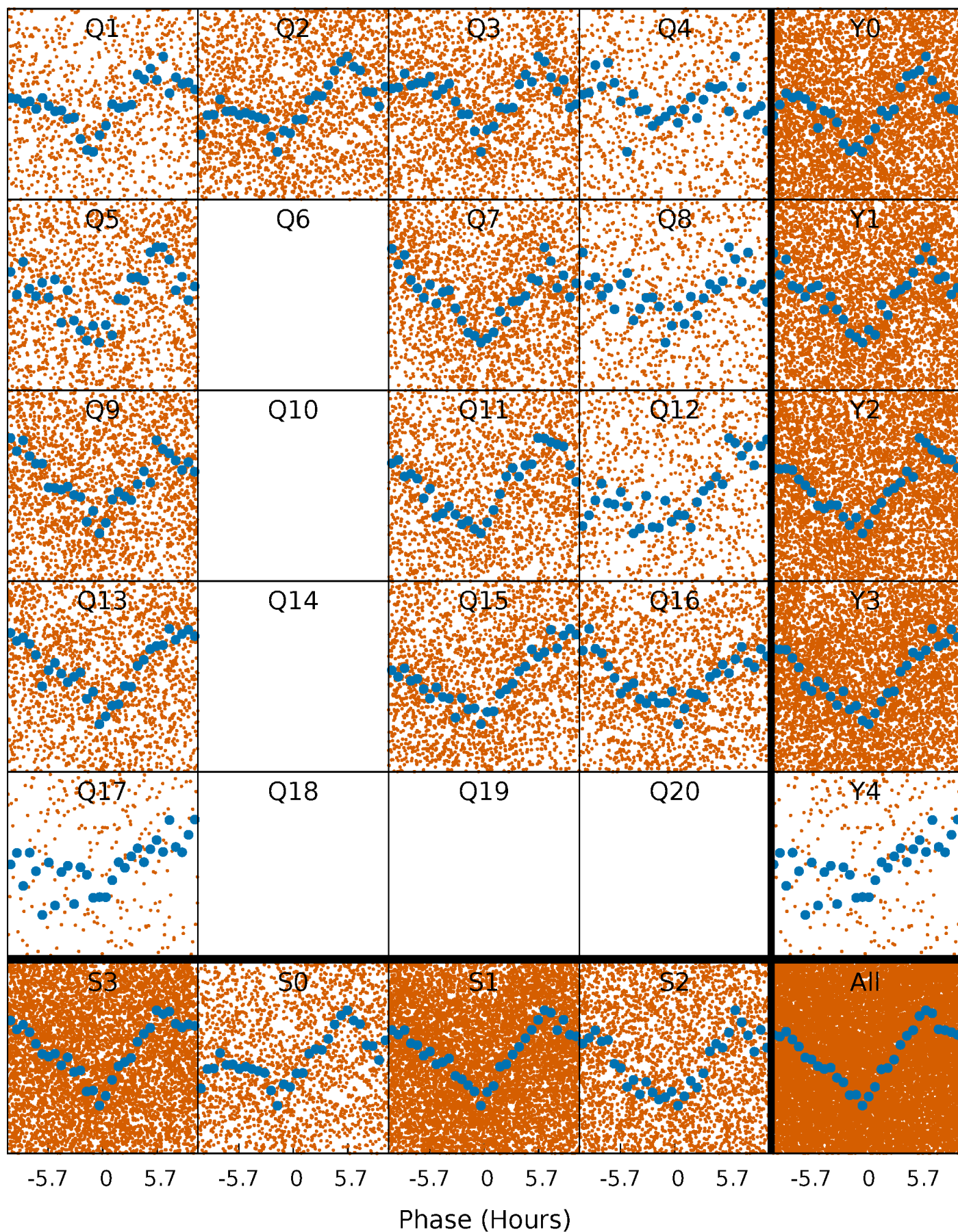


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

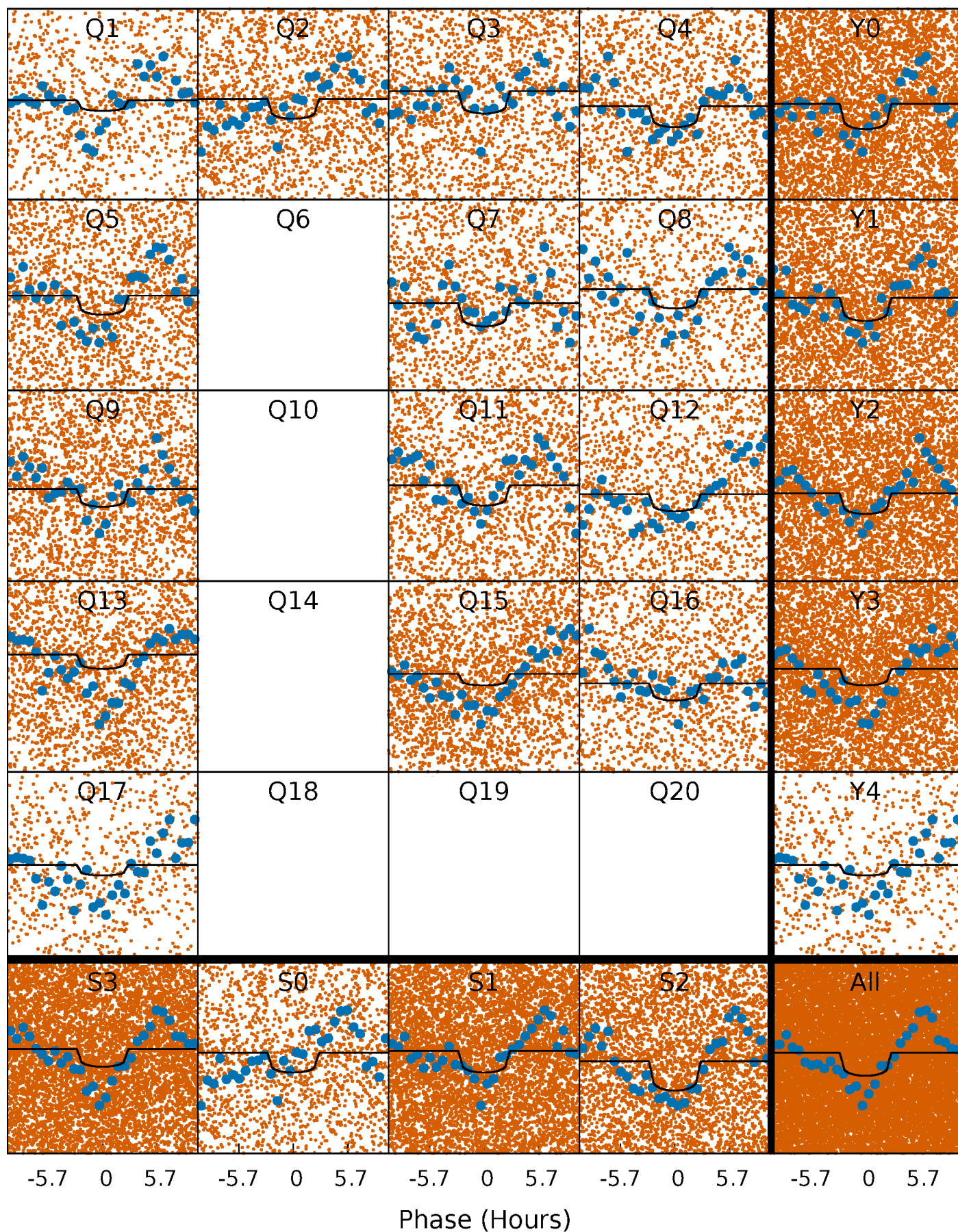
TCE 005545321-01 P= 1.150639 Days  $T_0=131.945394$  (BKJD)





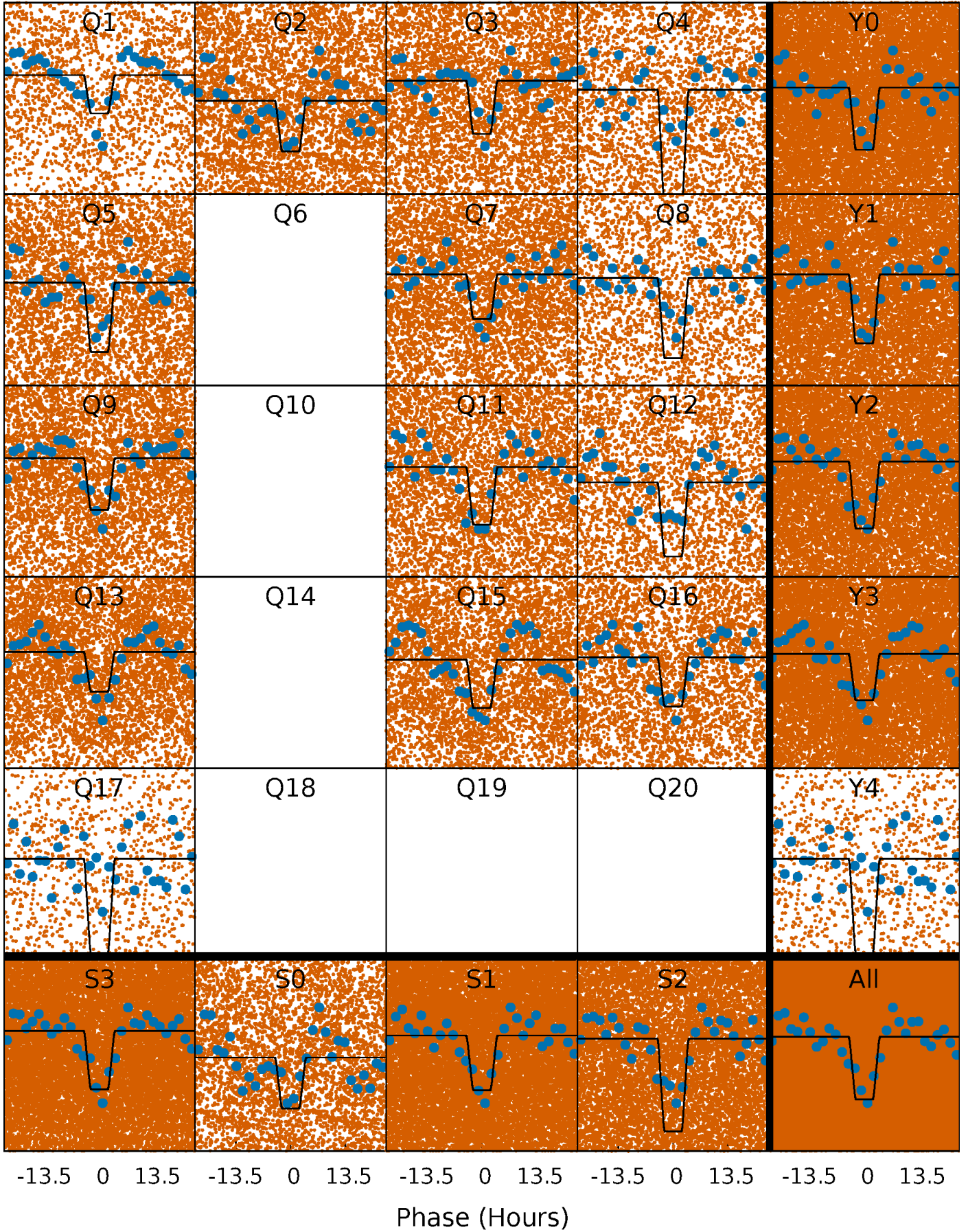
# DV Quarter-Phased Transit Curves

TCE 005545321-01 P= 1.150639 Days  $T_0=131.945394$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005545321-01 P= 1.150686 Days  $T_0=131.880588$  (BKJD)

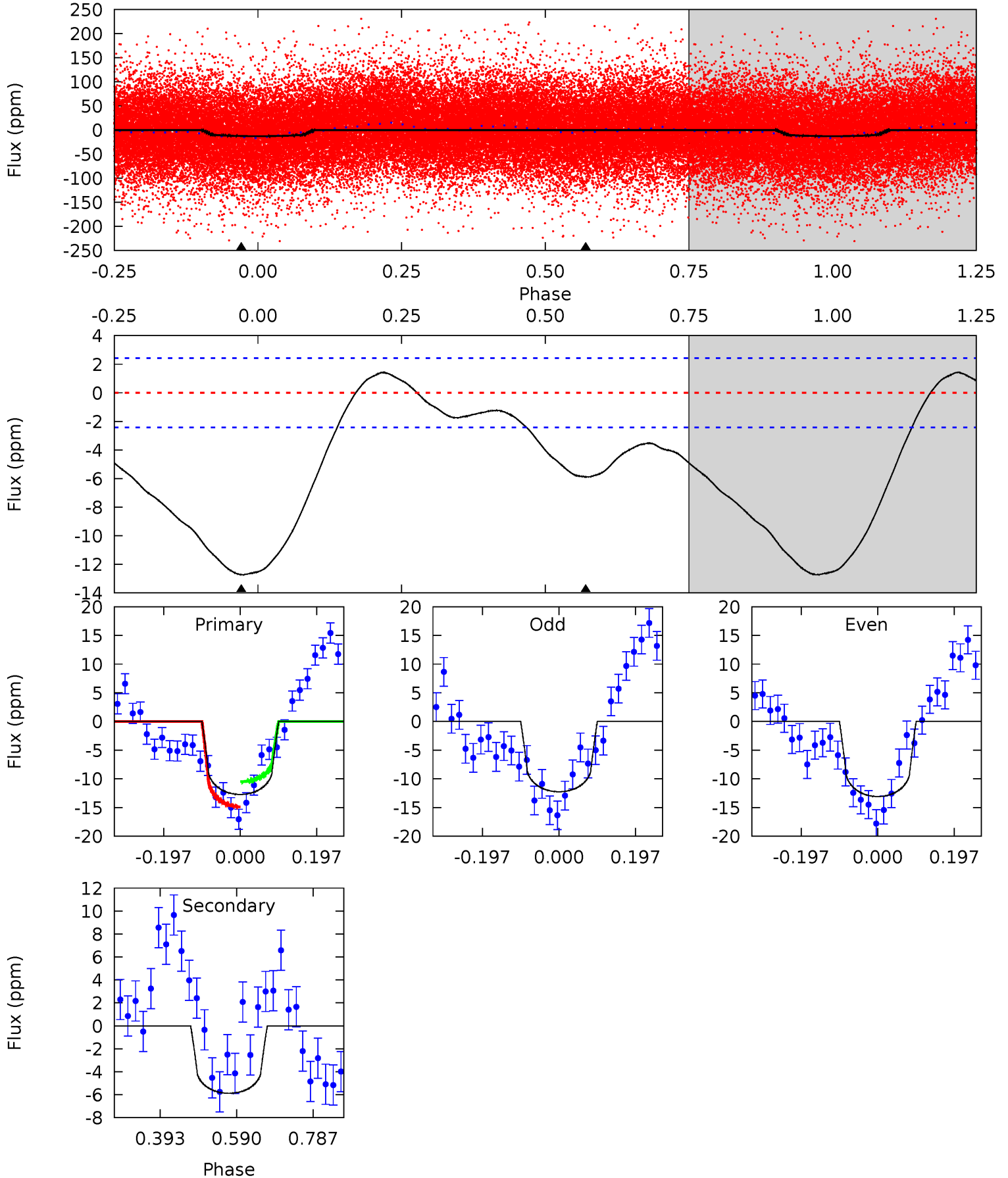




# DV Model-Shift Uniqueness Test

005545321-01, P = 1.150639 Days, E = 130.794755 Days

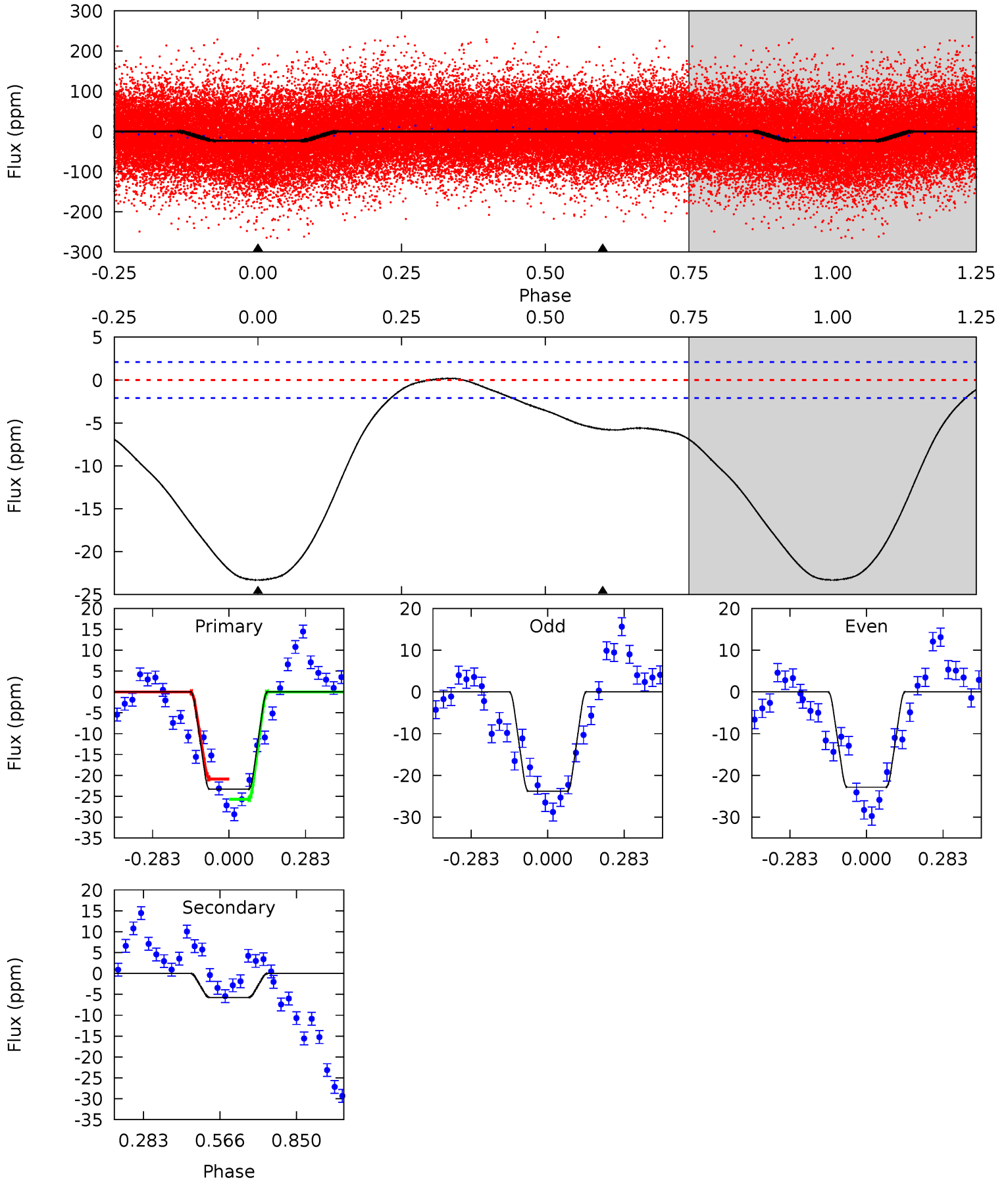
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.2	10.7	0	0	4.42	1.29	2.74	23.2	23.2	10.7	10.7	0.76	0.98	0.10	4.09



# Alt Model-Shift Uniqueness Test

005545321-01, P = 1.150686 Days, E = 130.729902 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
48.1	11.8	0	0	4.34	1.07	0.75	48.1	48.1	11.8	11.8	0.98	0.99	0.01	4.82





### Stellar Parameters For KIC 005545321

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7550^{+417}_{-775}$	$3.635^{+0.464}_{-0.116}$	$0.480^{+0.050}_{-0.150}$	$3.709^{+0.765}_{-1.785}$	$2.164^{+0.285}_{-0.488}$	$0.060^{+0.264}_{-0.020}$
	+6%/-10%	+13%/-3%	+10%/-31%	+21%/-48%	+13%/-23%	+443%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 005545321-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-6 \pm 1$	$1.15^{+1.11}_{-0.74}$	$5149^{+558}_{-738}$	$6174^{+6182}_{-2156}$	$1.896^{+12.797}_{-1.379}$
Alt.	$-6 \pm 0$	$1.91^{+1.25}_{-0.99}$	$5100^{+618}_{-703}$	$4373^{+2289}_{-7670}$	$0.650^{+2.161}_{-0.407}$

$T_{max}$  = 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

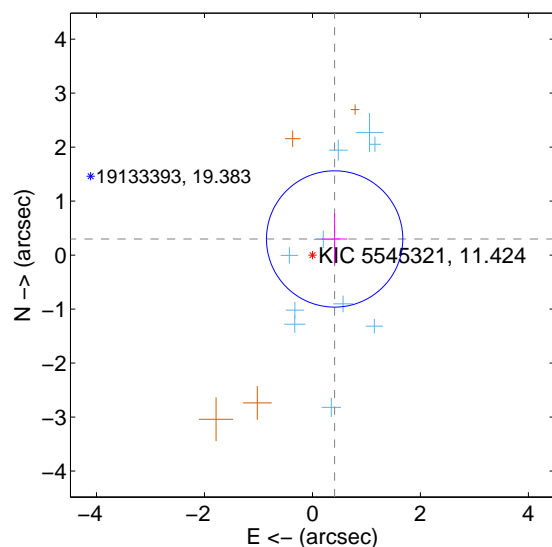
Supplemental centroid analysis for 005545321-01. **Kepler magnitude: 11.42.** Transit SNR 9.87

There are 10 quarters with good PRF difference image offsets

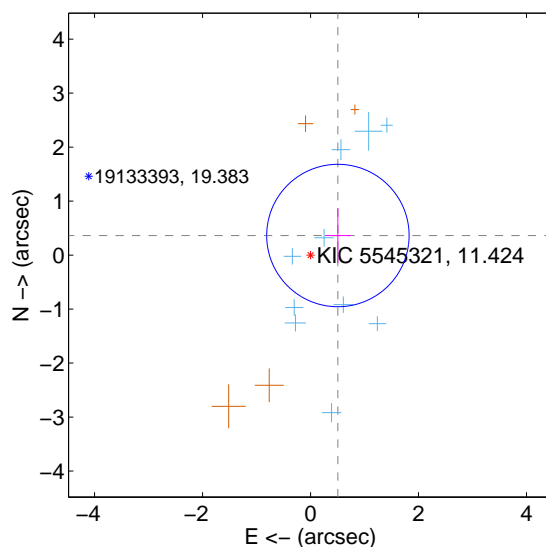
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.508 \pm 0.421$	1.21	$-0.411 \pm 0.234$	$0.299 \pm 0.475$
PRF-fit source offset from KIC position	$0.623 \pm 0.440$	1.42	$-0.507 \pm 0.239$	$0.362 \pm 0.509$
photometric centroid source offset	$0.74 \pm 1.00$	0.74	$-0.68 \pm 0.97$	$0.30 \pm 1.15$

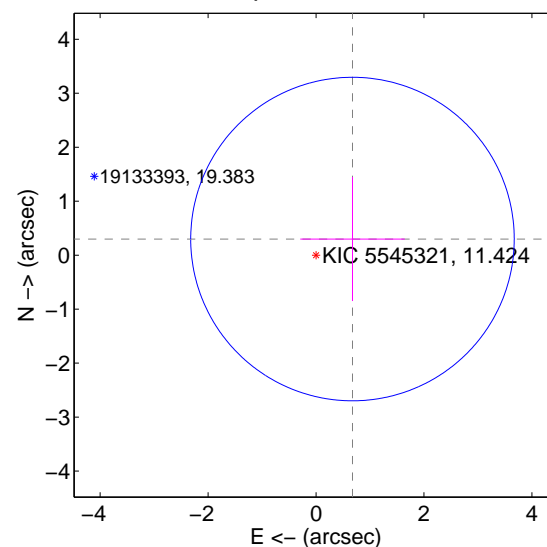
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

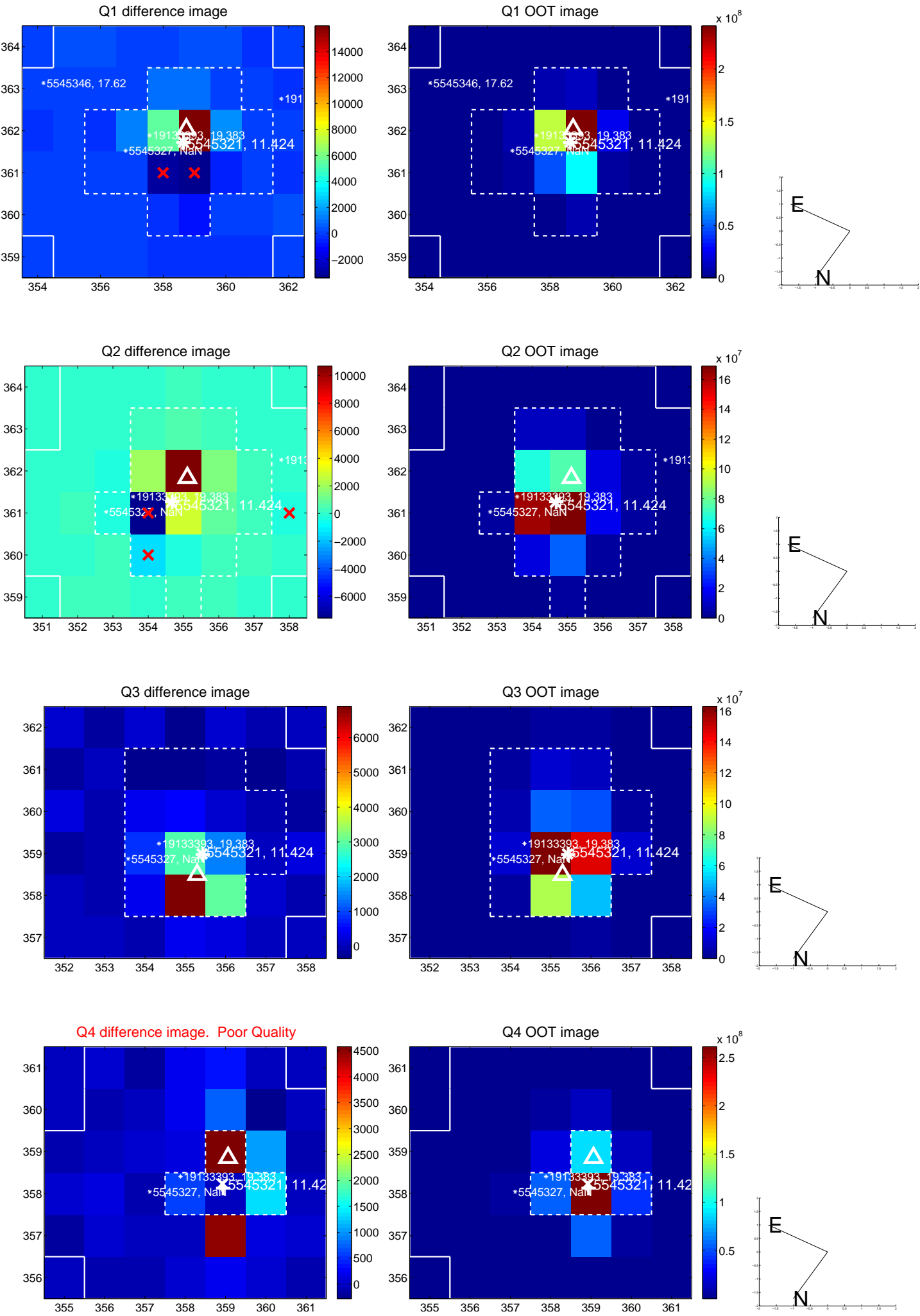


offset from photometric centroids

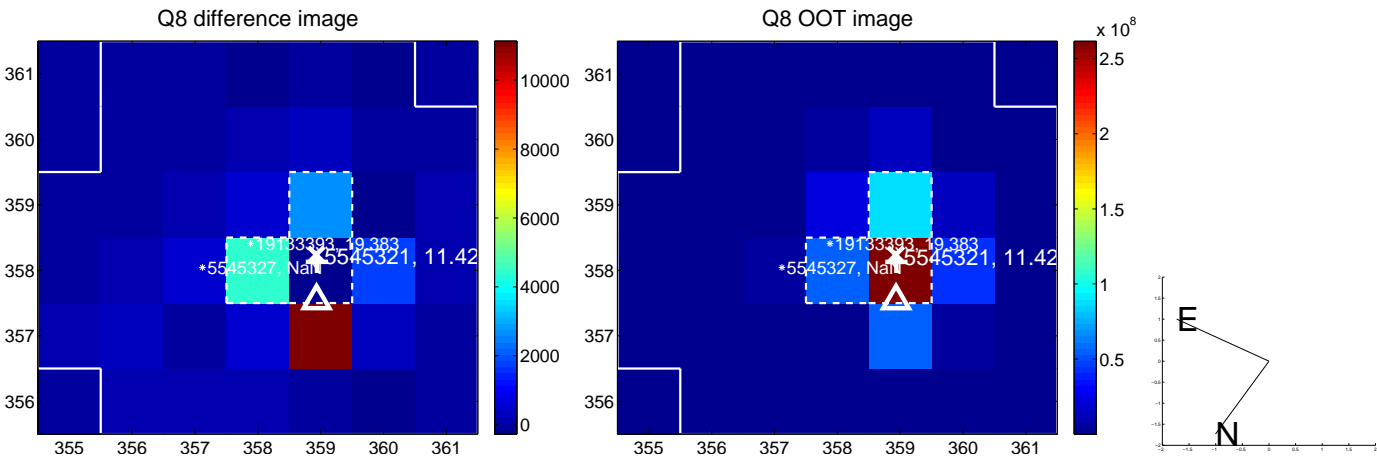
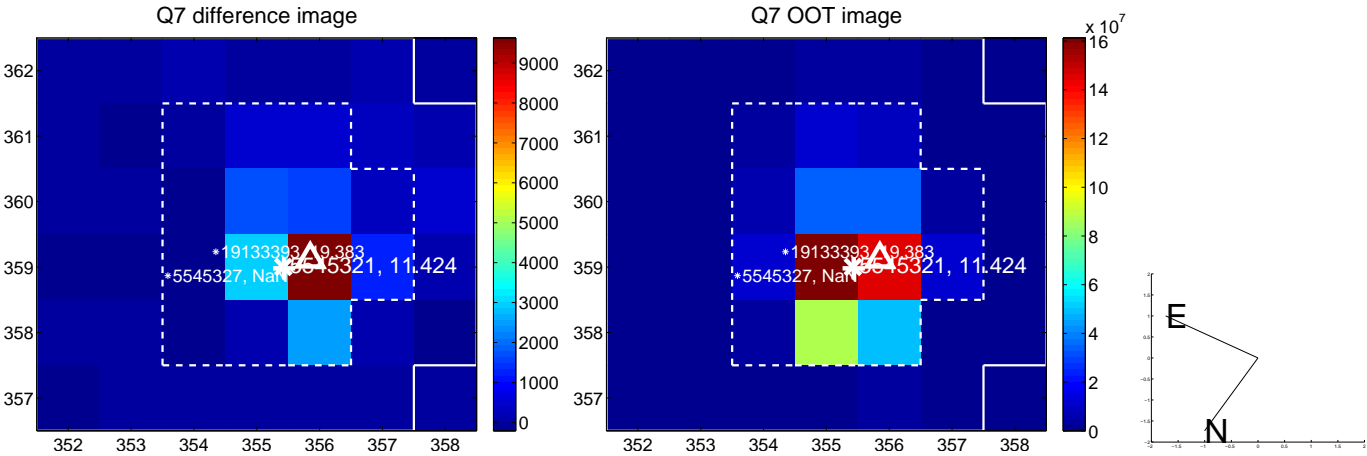
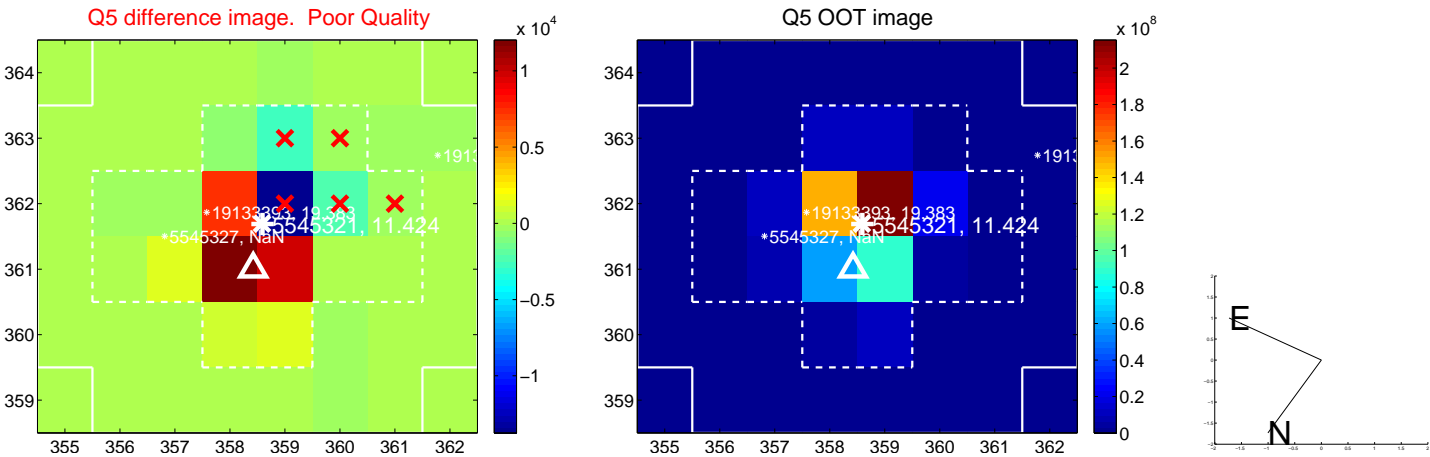


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

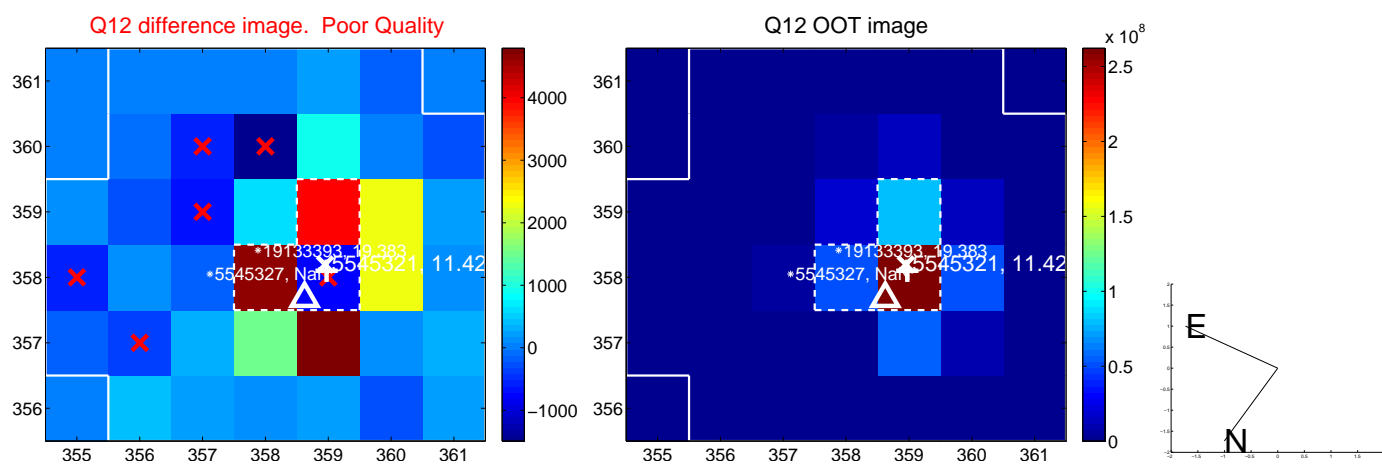
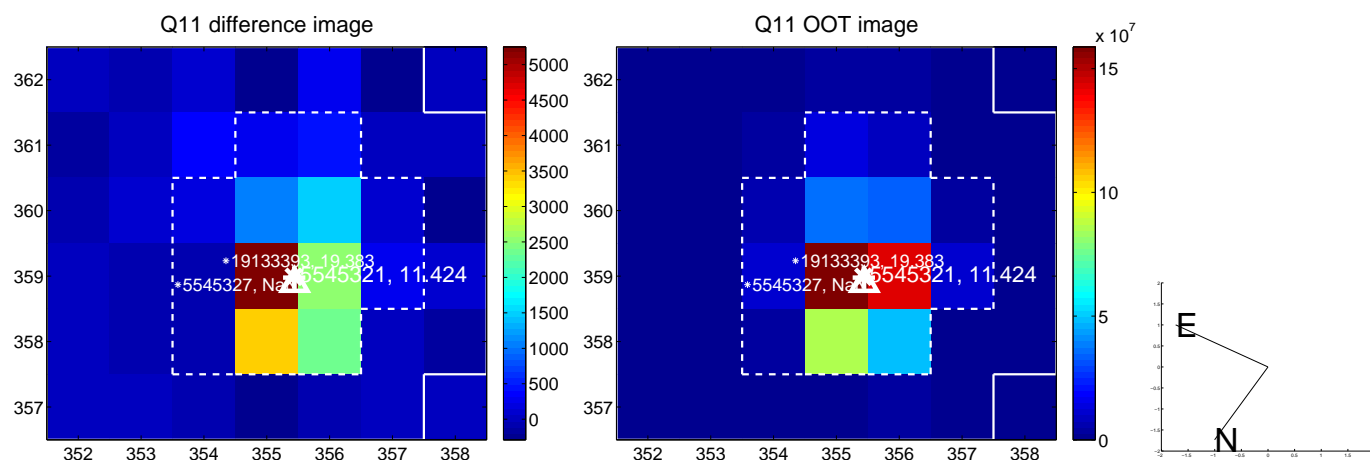
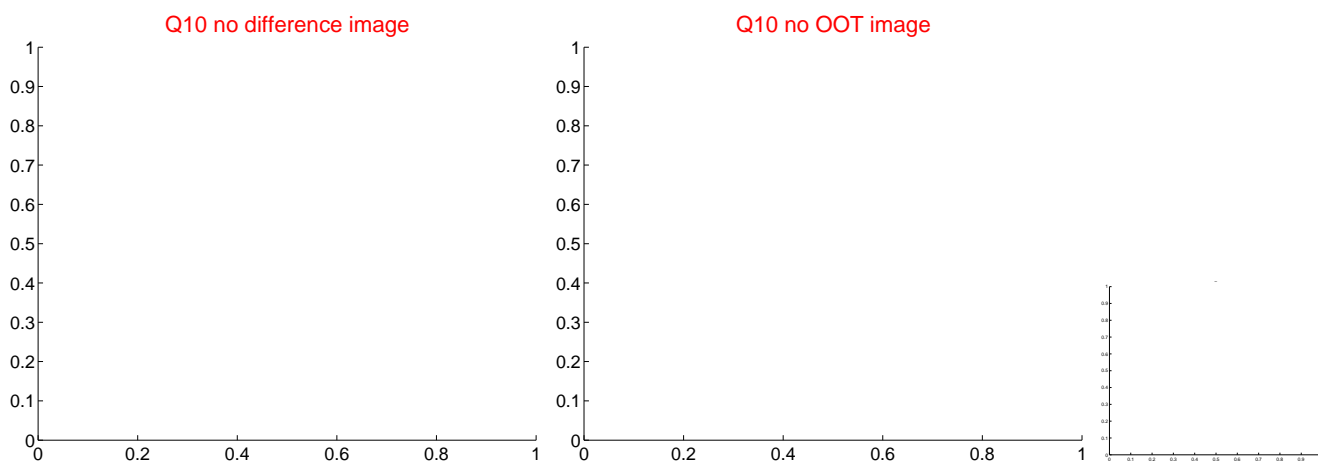
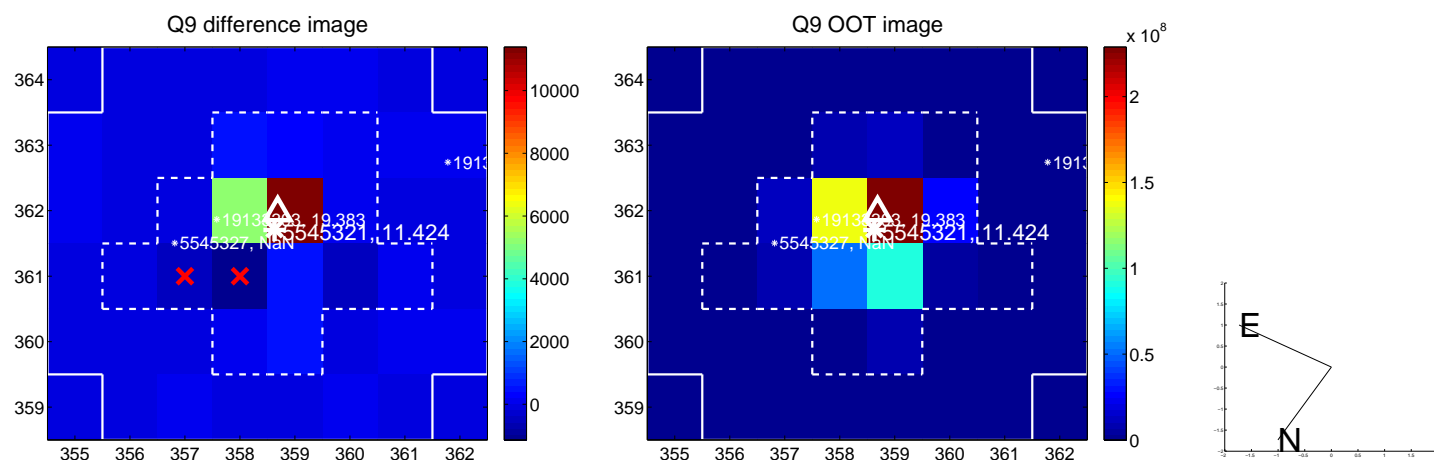


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

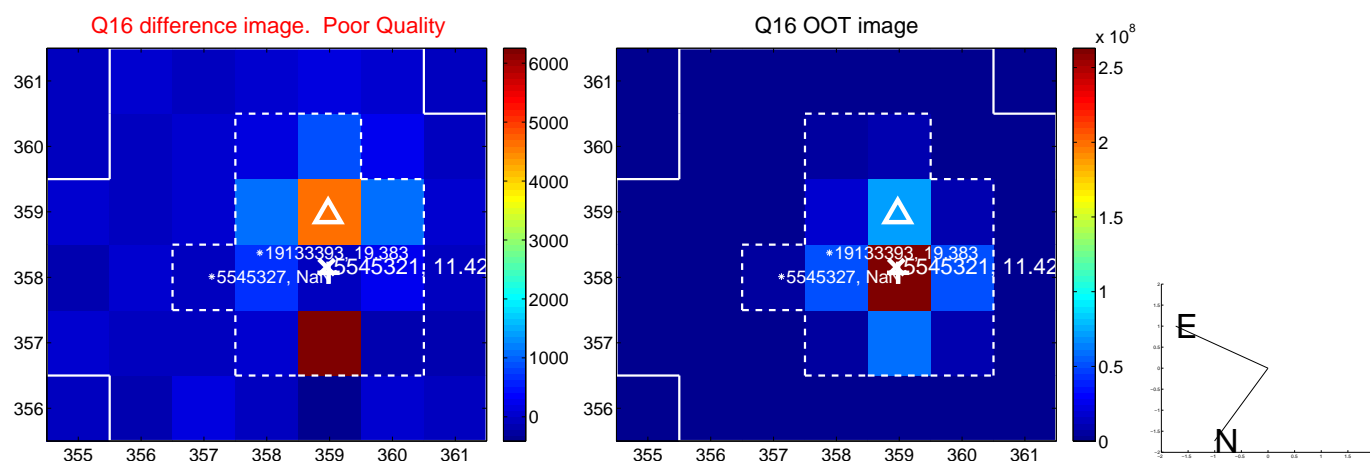
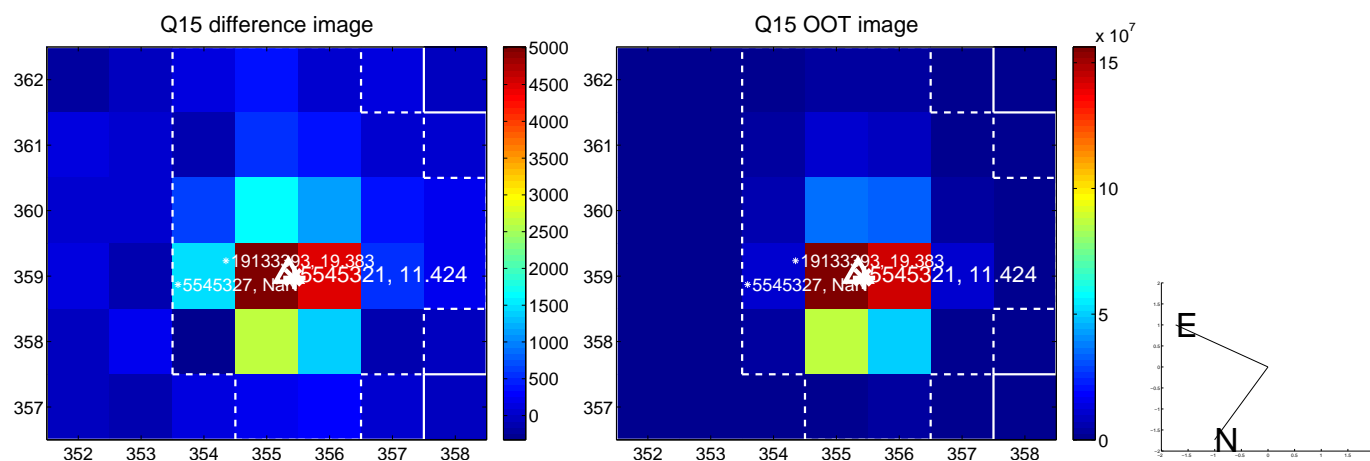
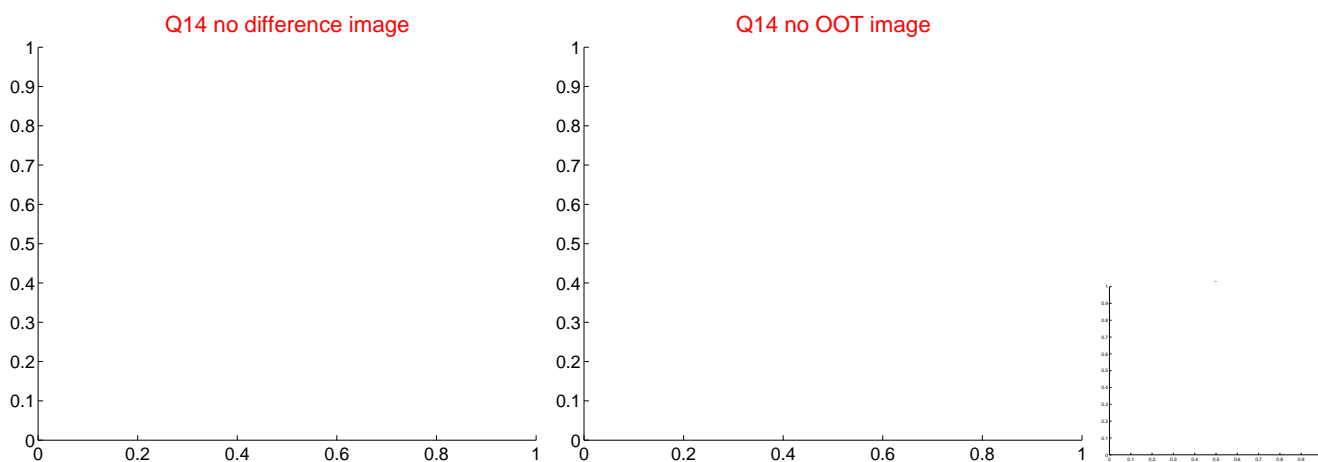
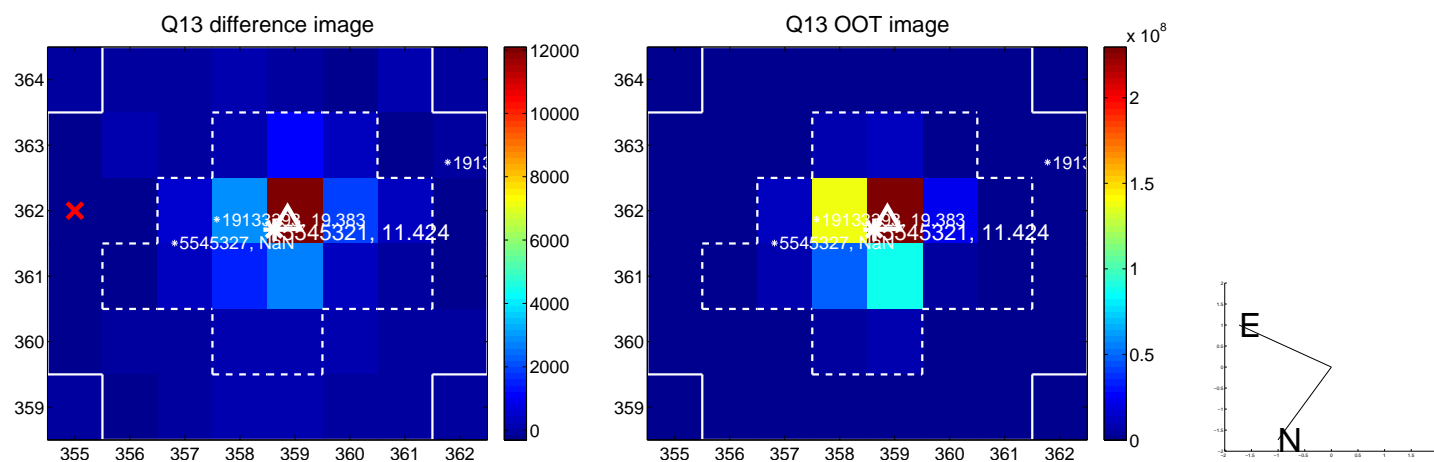




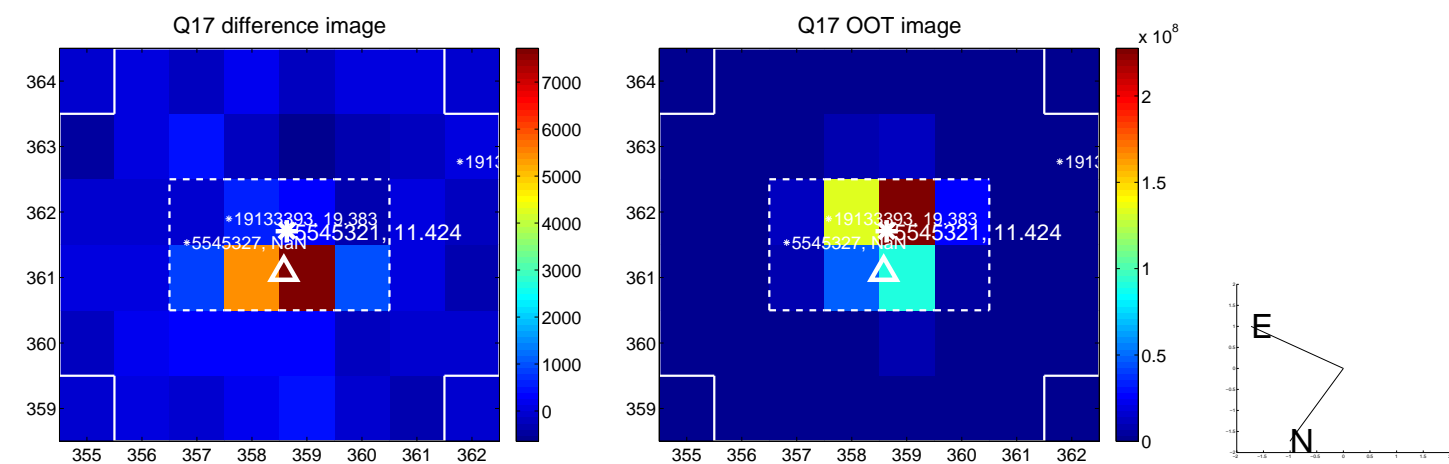
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



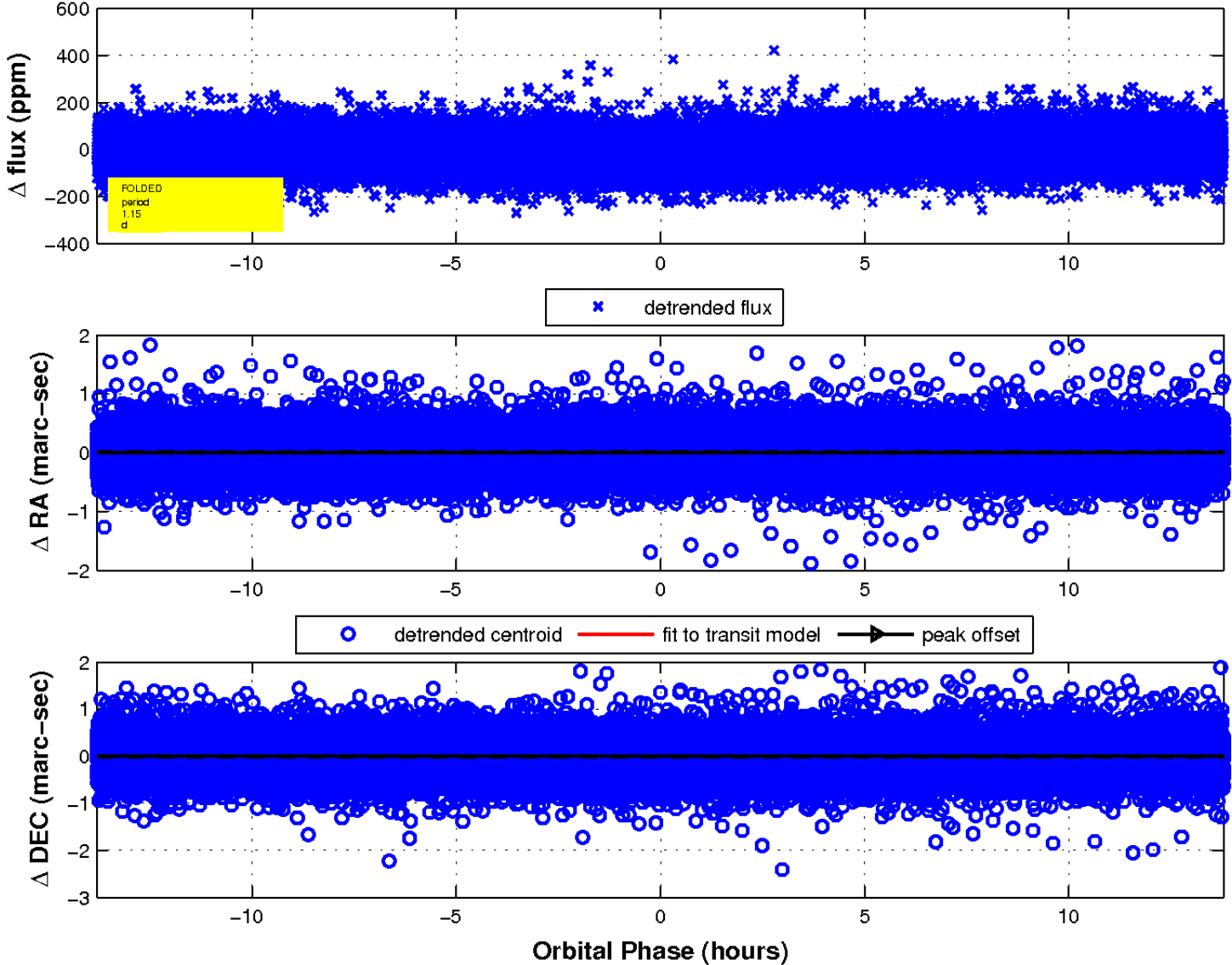
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

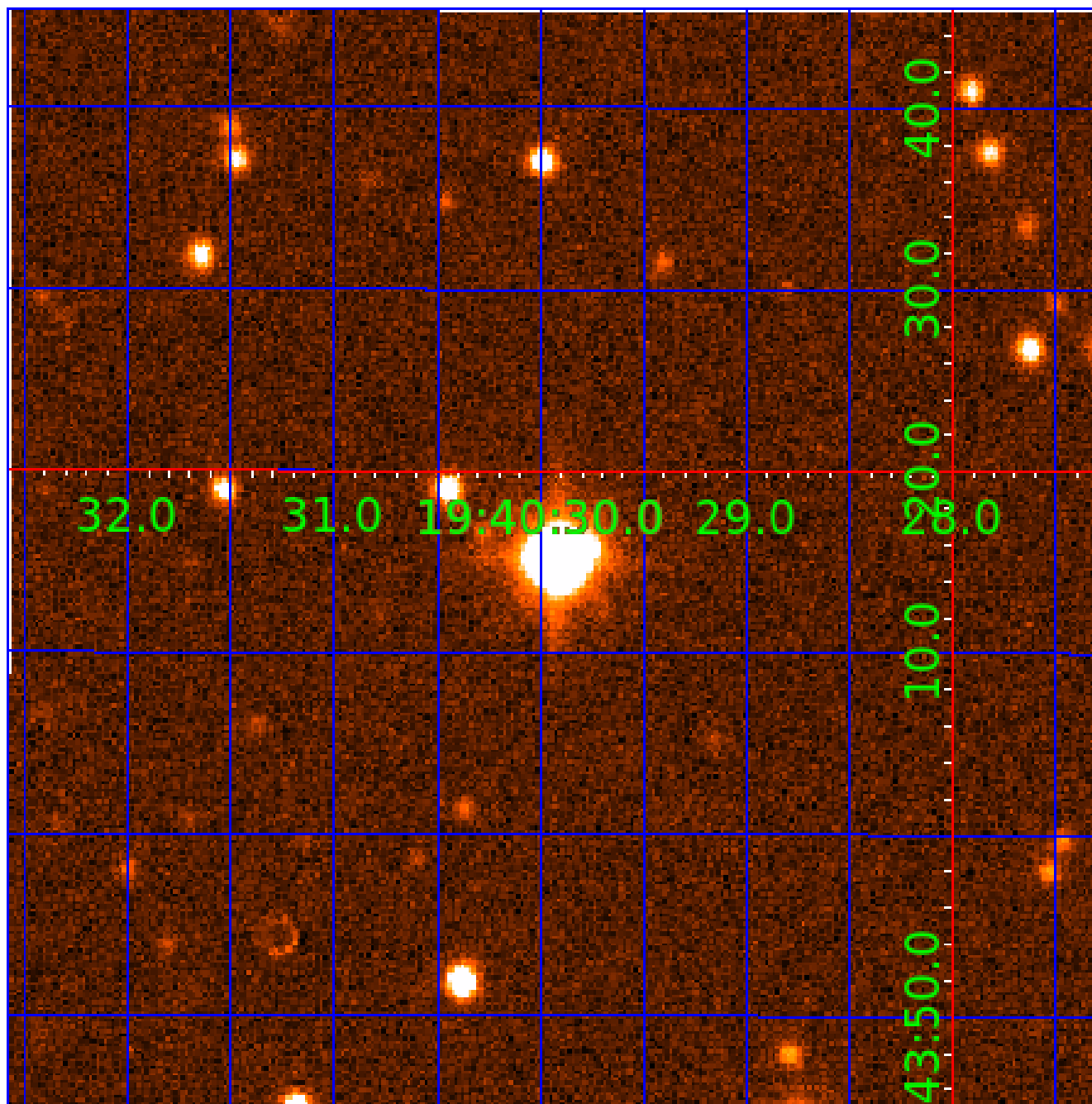


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 005545321

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005545321-01	OBS	No	1.150639	131.945394	8.0	4.989	11.9	9.9	3.71	7550	1.06	51792.62
005545321-02	OBS	No	111.369259	186.402767	47.7	8.970	7.1	5.7	3.71	7550	2.98	116.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005545321-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
005545321-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

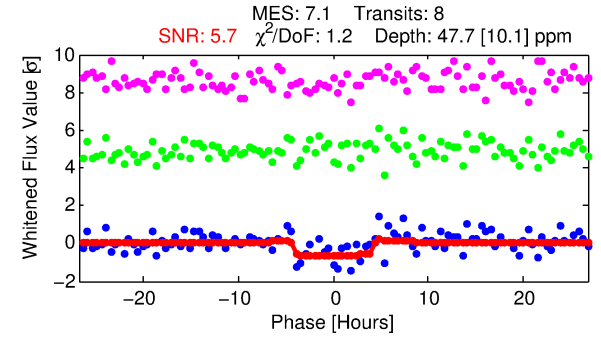
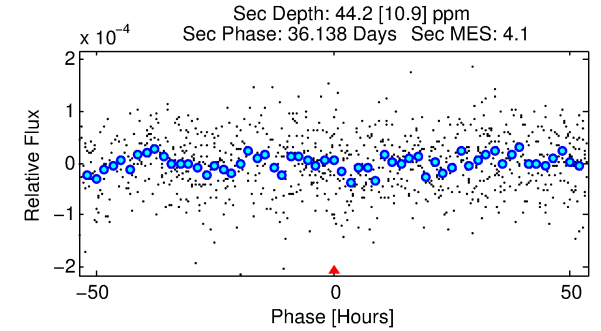
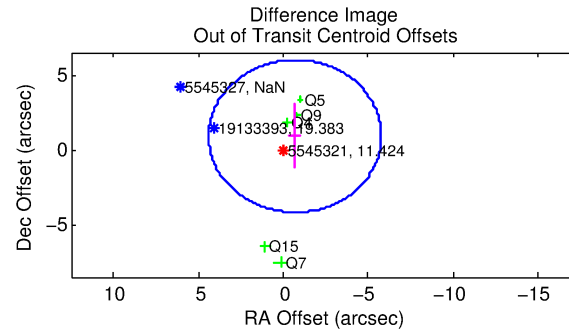
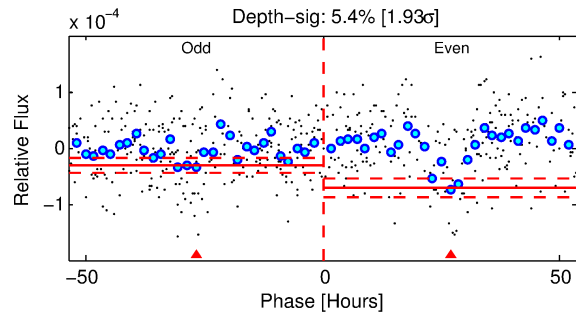
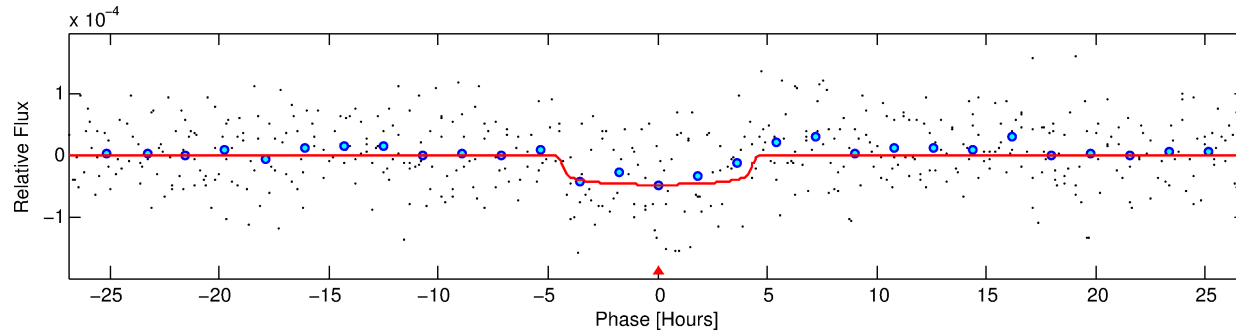
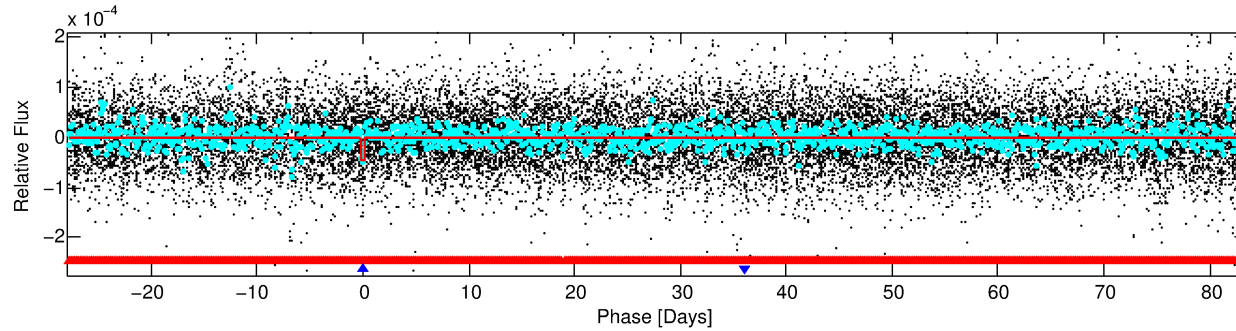
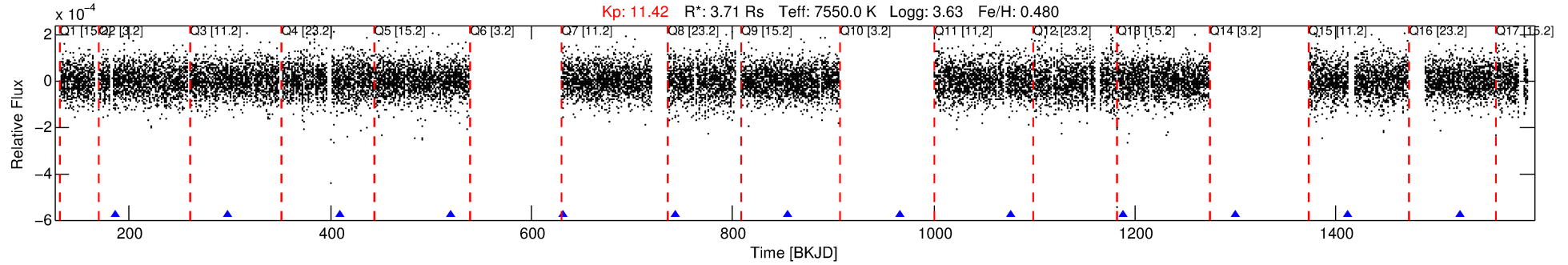
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005545321-02

No Significant Match Found

# DV One-Page Summary

KIC: 5545321 Candidate: 2 of 2 Period: 111.369 d



## DV Fit Results:

Period = 111.36926 [0.00321] d  
Epoch = 186.4028 [0.0216] BKJD  
Rp/R\* = 0.0074 [0.0033]  
a/R\* = 42.93 [112.76]  
b = 0.90 [0.56]  
Seff = 116.55 [102.86]  
Teq = 838 [185] K  
Rp = 2.98 [1.96] Re  
a = 0.5862 [0.2810] AU  
Ag = 940.72 [1139.54] [0.82σ]  
Teffp = 7174 [1816] K [3.47σ]

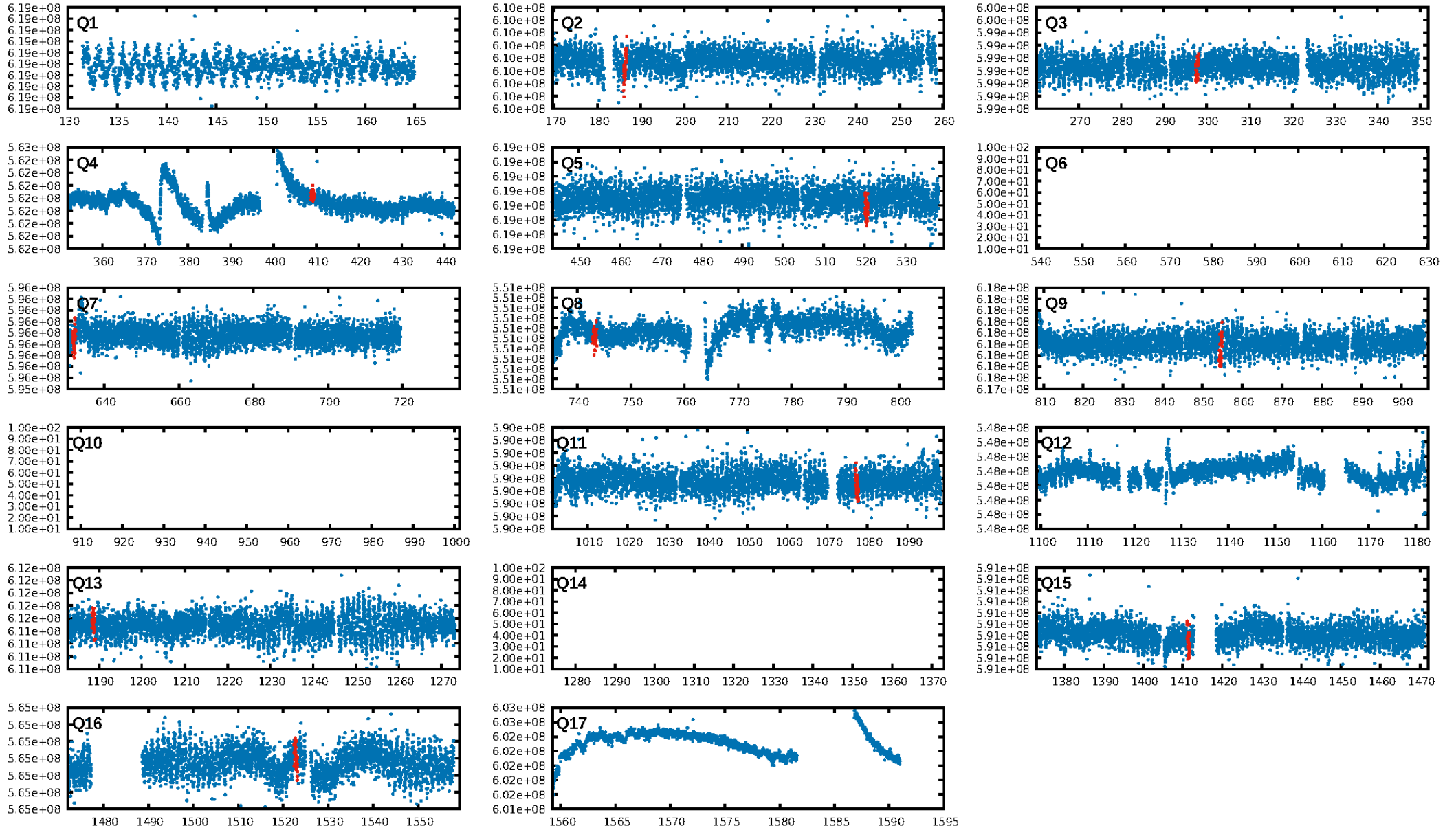
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [257.72σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 3.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 8.31e-09  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: -1.878  
Centroid-sig: 0.0%  
Centroid-so: 3.853 arcsec [2.30σ]  
OotOffset-rm: 1.142 arcsec [0.67σ]  
KicOffset-rm: 1.223 arcsec [0.64σ]  
OotOffset-st: 0/2/1/2 [5]  
KicOffset-st: 0/2/1/2 [5]  
DiffImageQuality-fgm: 0.00 [0/5]  
DiffImageOverlap-fno: 0.00 [0/11]

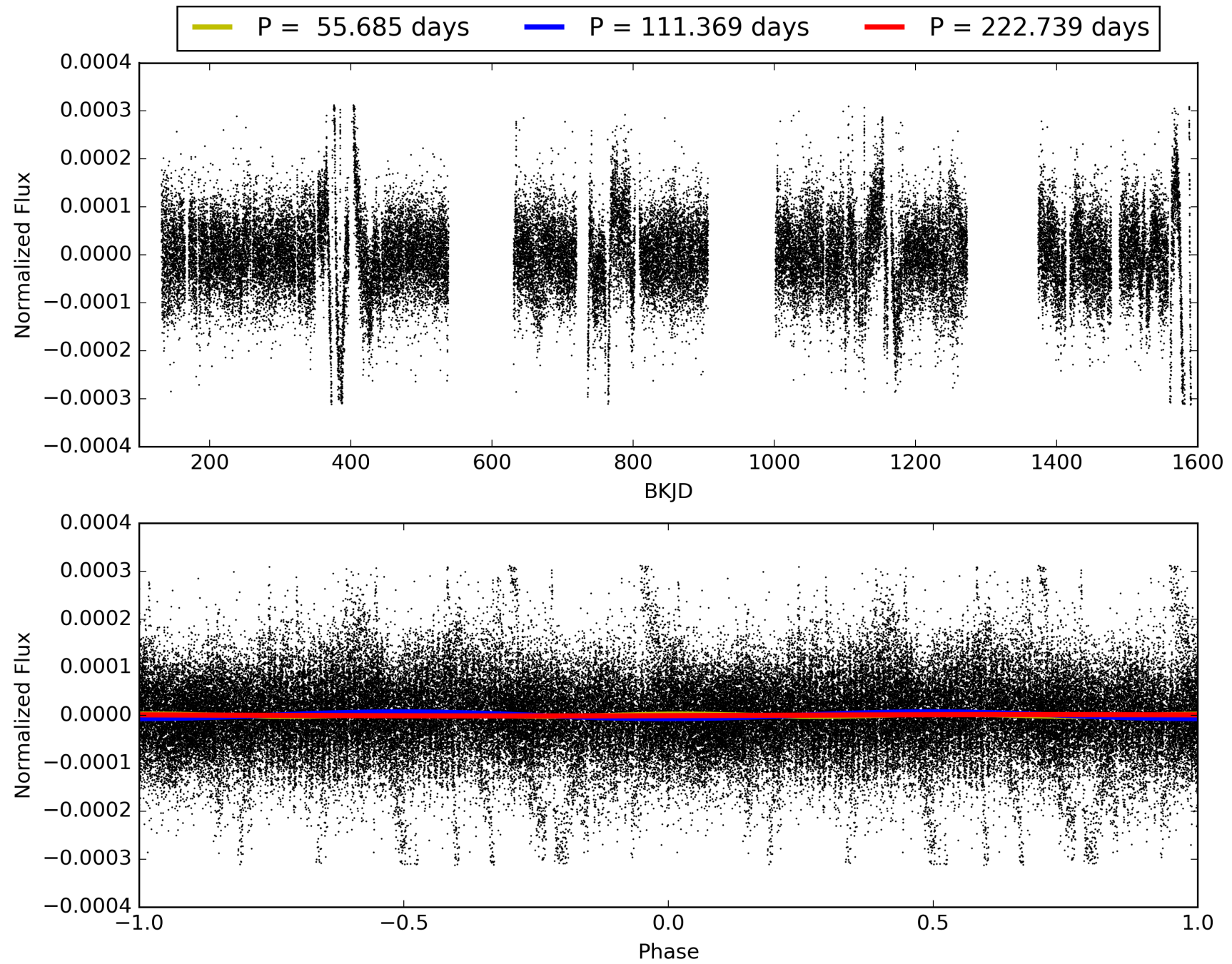
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:57:19 Z

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

# TCE 005545321-02, PDC Light Curves

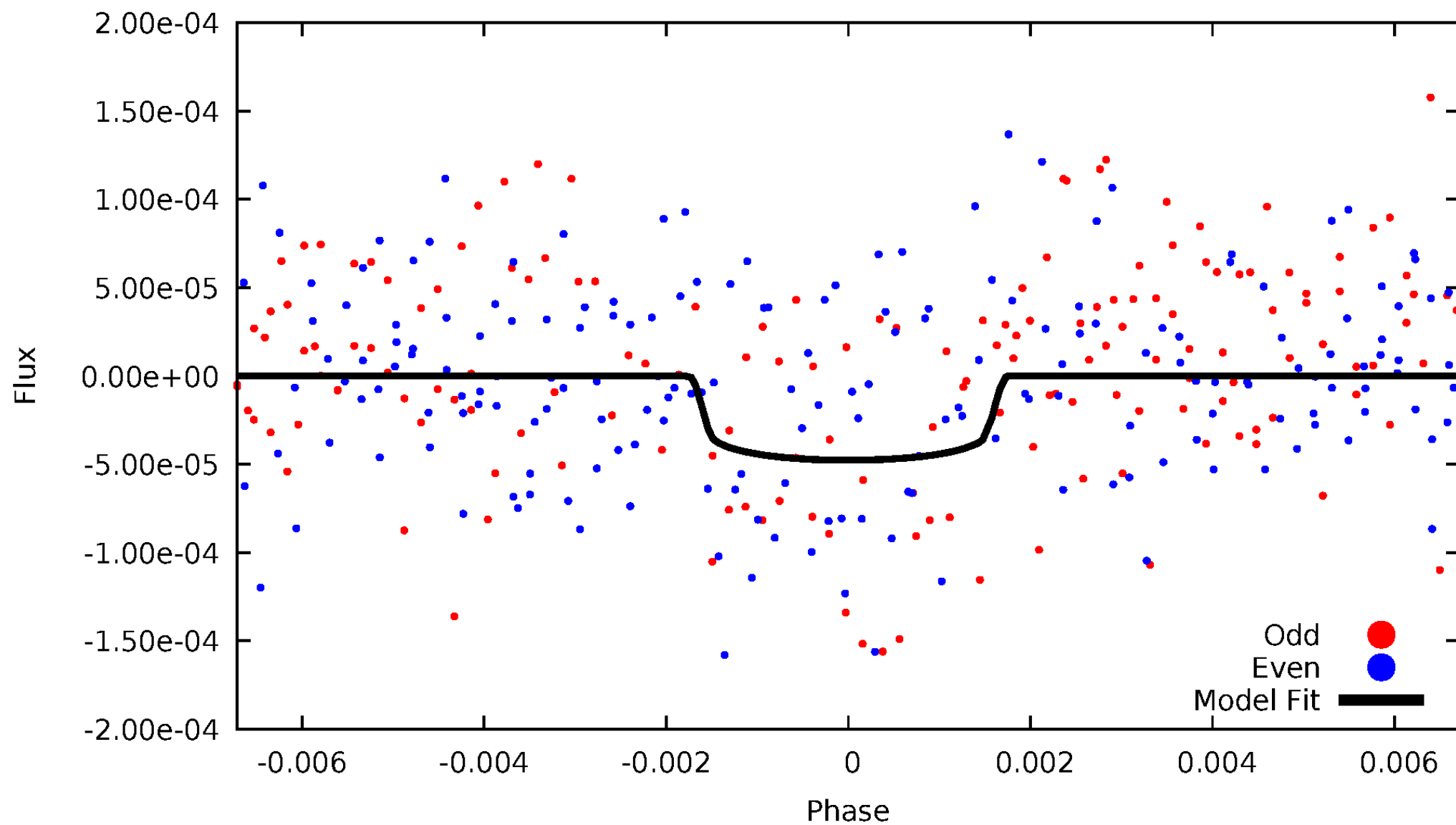


TCE 005545321-02



# DV Odd/Even

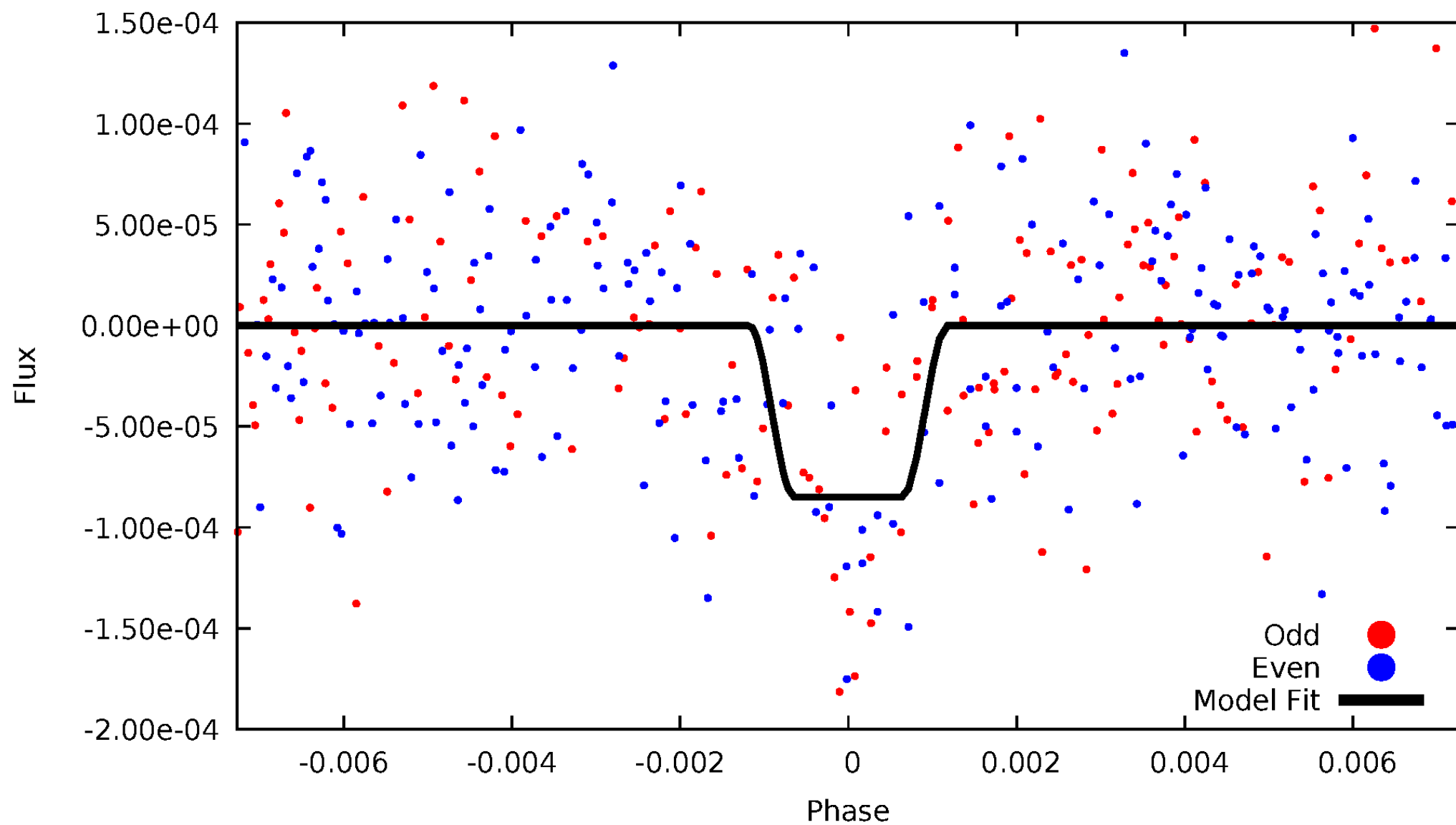
TCE 005545321-02





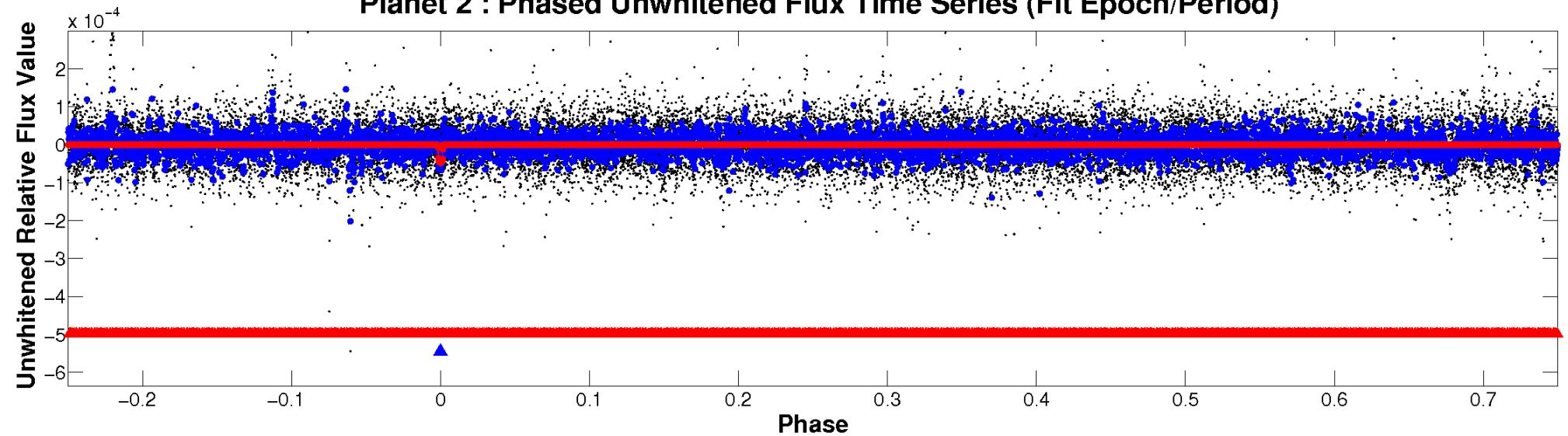
# ALT Odd/Even

TCE 005545321-02

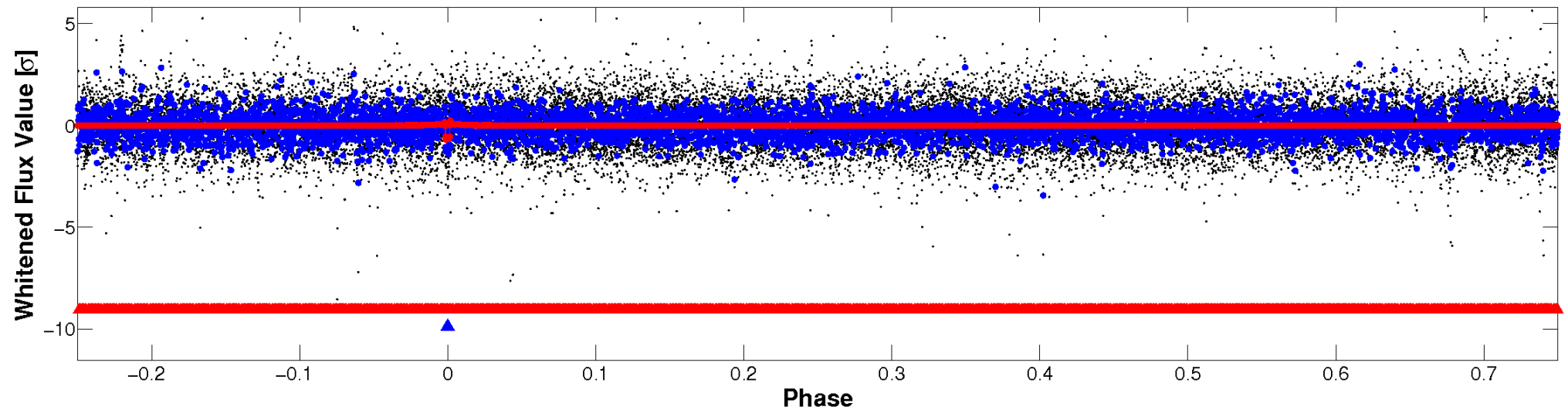


# Non-Whitened Vs. Whitened Light Curve

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

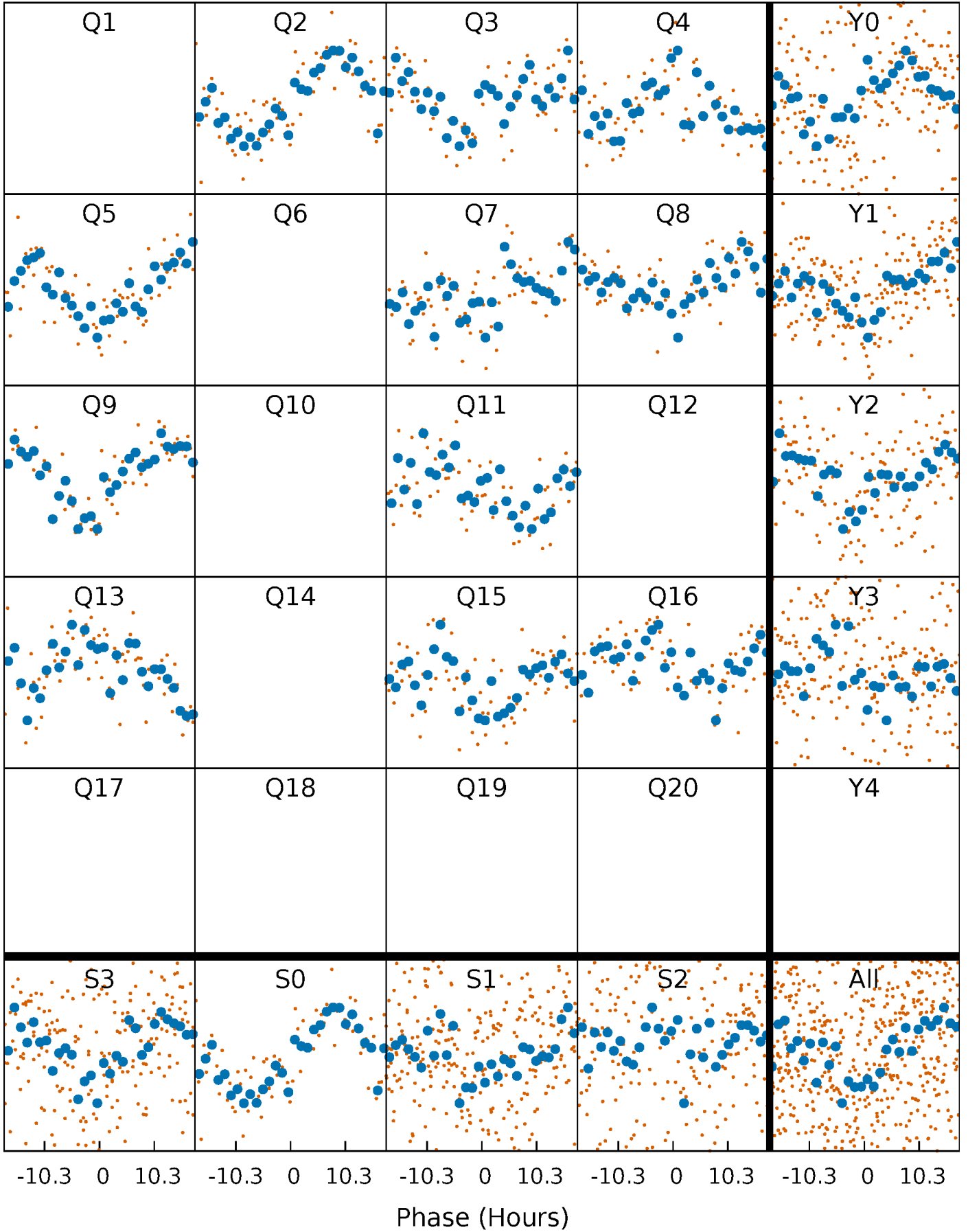


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



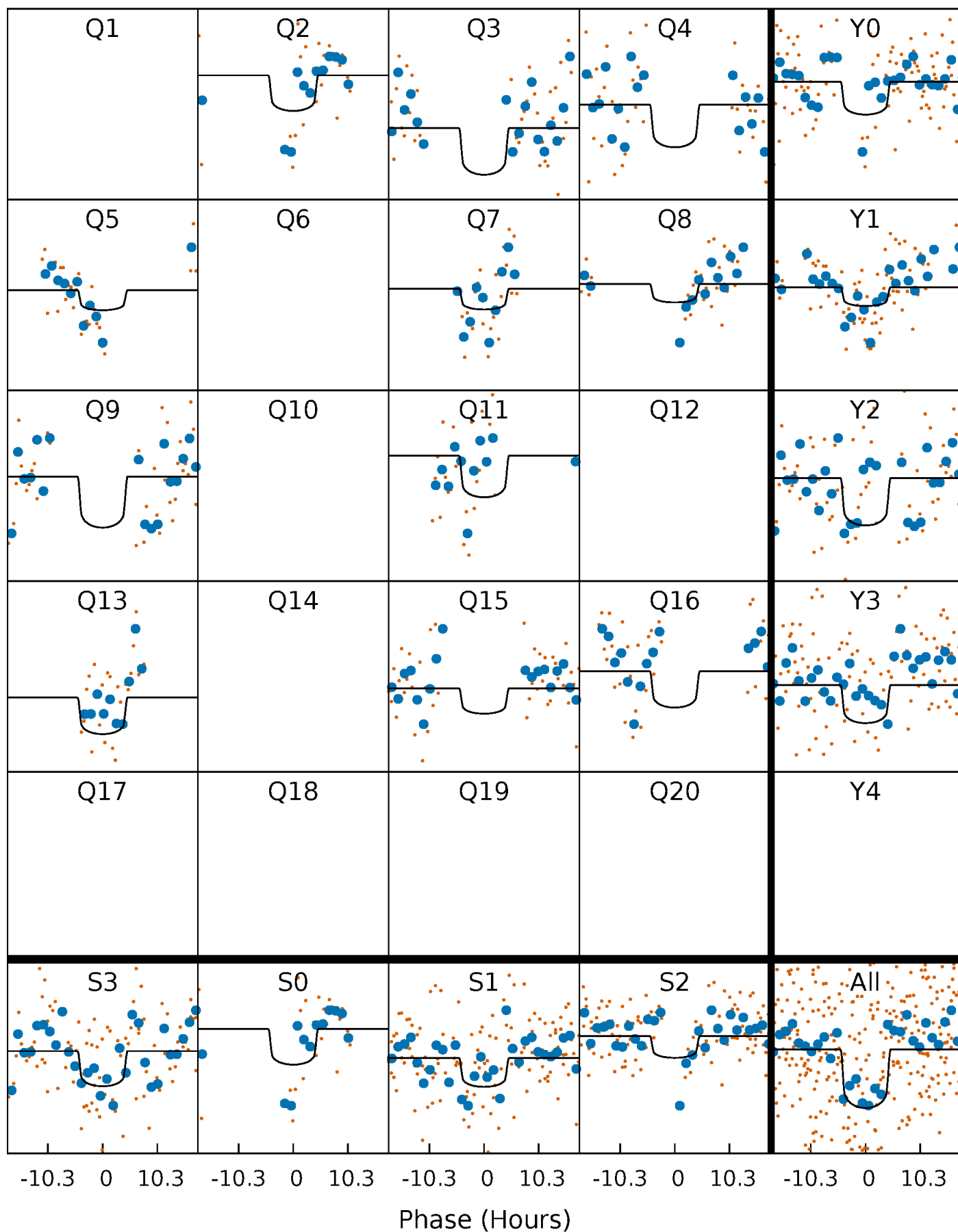
# PDC Quarter-Phased Transit Curves

TCE 005545321-02   P=111.369259 Days    $T_0=186.402767$  (BKJD)



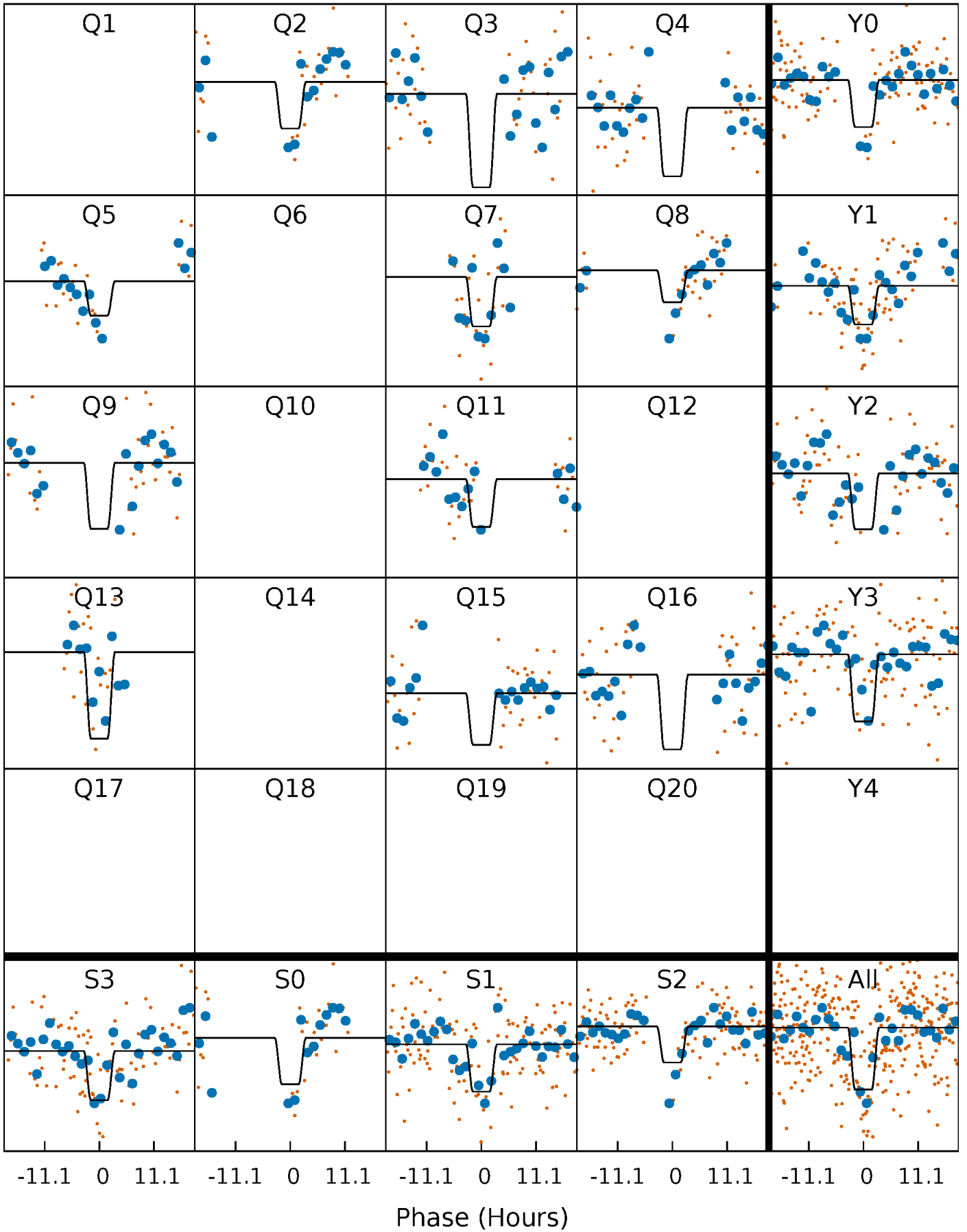
# DV Quarter-Phased Transit Curves

TCE 005545321-02 P=111.369259 Days  $T_0=186.402767$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

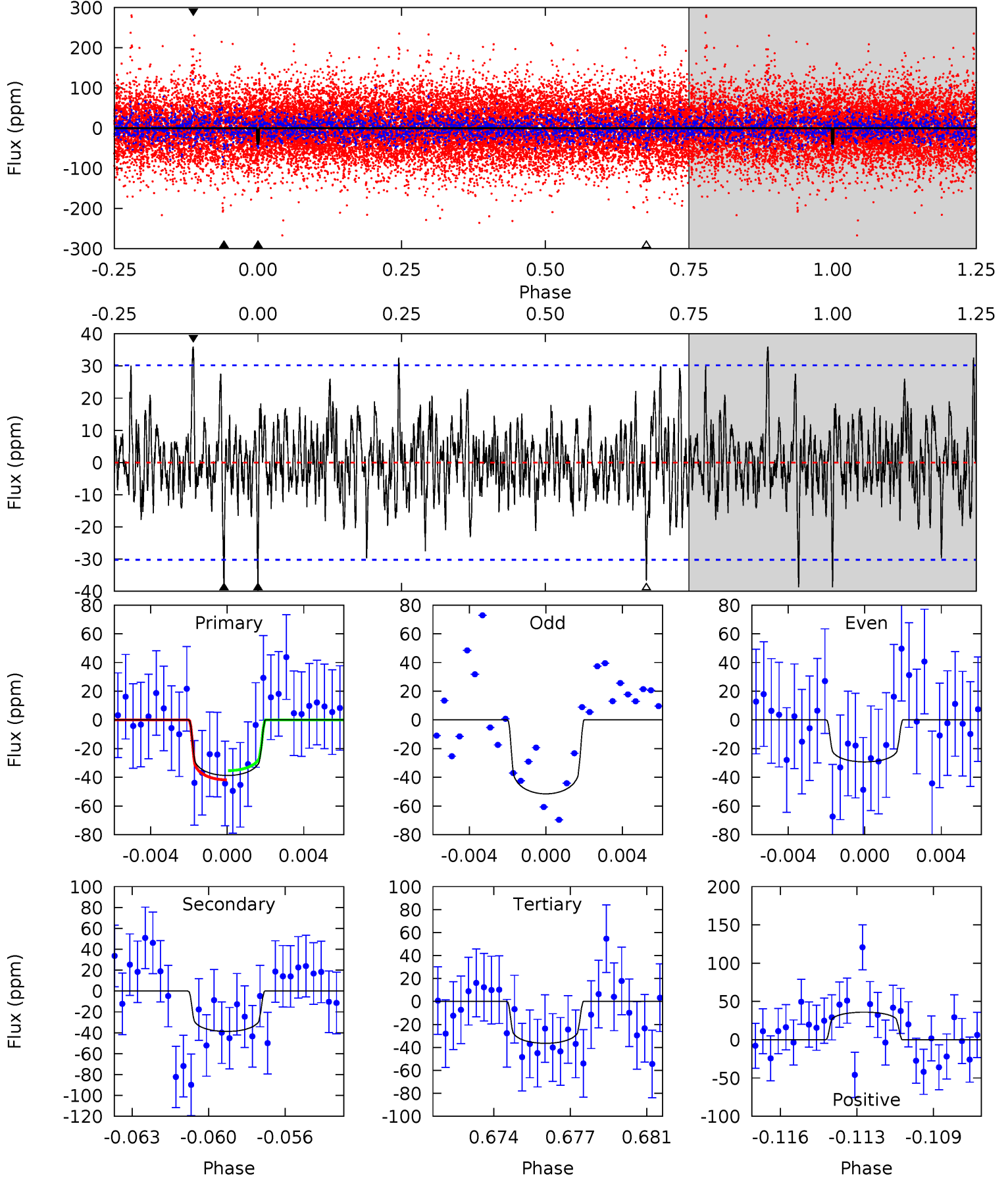
TCE 005545321-02 P=111.388560 Days  $T_0=186.360160$  (BKJD)



# DV Model-Shift Uniqueness Test

005545321-02,  $P = 111.369259$  Days,  $E = 75.033508$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.69	6.69	6.29	6.22	5.22	2.92	1.59	0.40	0.47	0.39	0.47	1.88	0.95	0.48	0.56

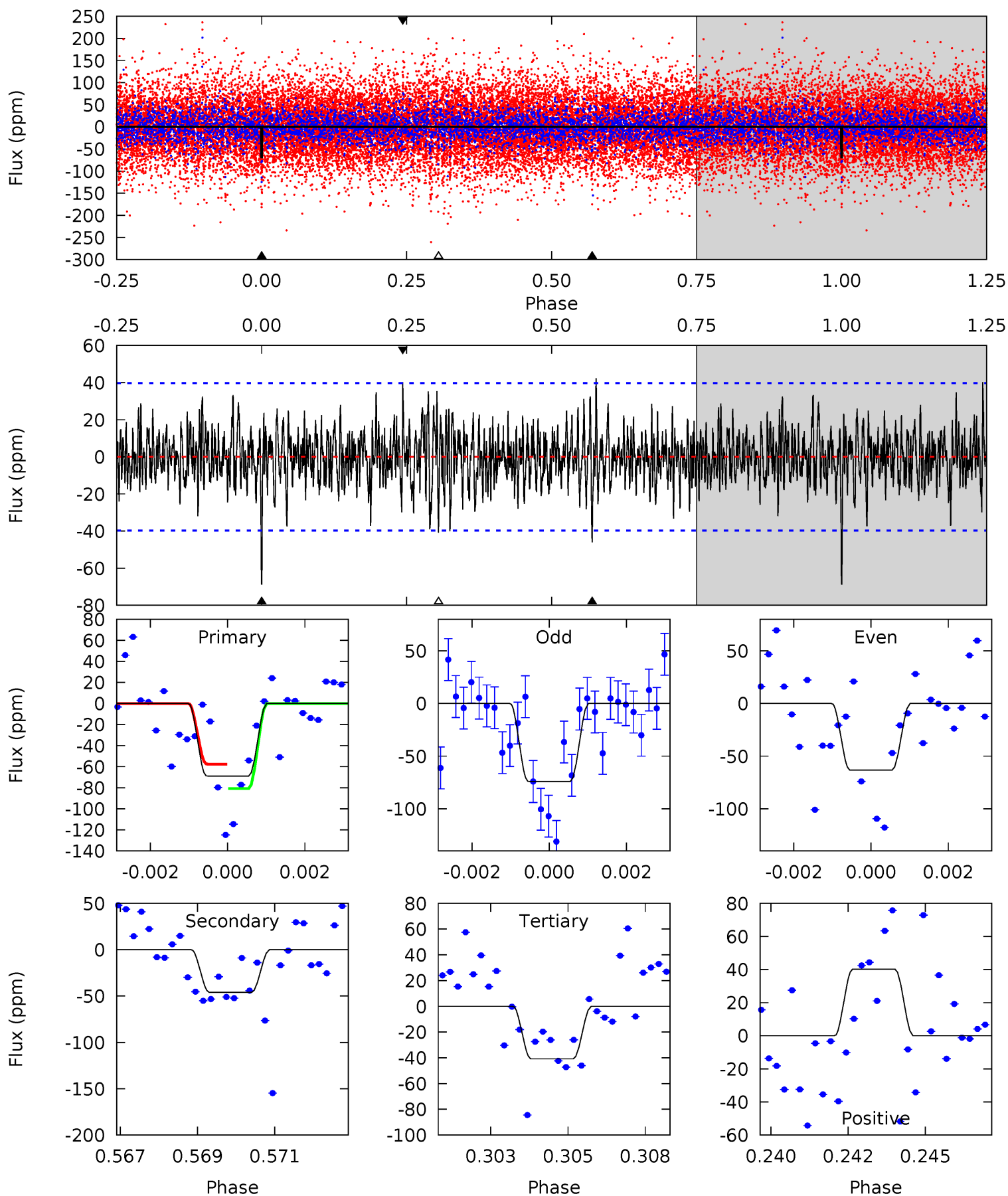




# Alt Model-Shift Uniqueness Test

005545321-02, P = 111.388560 Days, E = 74.971600 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
9.18	6.14	5.44	5.36	5.30	3.04	1.60	3.74	3.82	0.70	0.78	0.71	0.95	0.38	1.55



### Stellar Parameters For KIC 005545321

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7550^{+417}_{-775}$	$3.635^{+0.464}_{-0.116}$	$0.480^{+0.050}_{-0.150}$	$3.709^{+0.765}_{-1.785}$	$2.164^{+0.285}_{-0.488}$	$0.060^{+0.264}_{-0.020}$
	+6%/-10%	+13%/-3%	+10%/-31%	+21%/-48%	+13%/-23%	+443%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 005545321-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-39 \pm 6$	$2.69^{+1.46}_{-1.22}$	$1111^{+128}_{-167}$	$6705^{+2983}_{-1238}$	$1027^{+2368}_{-610}$
Alt.	$-46 \pm 8$	$3.44^{+1.59}_{-1.37}$	$1119^{+120}_{-161}$	$6196^{+1991}_{-953}$	$714^{+1279}_{-377}$

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

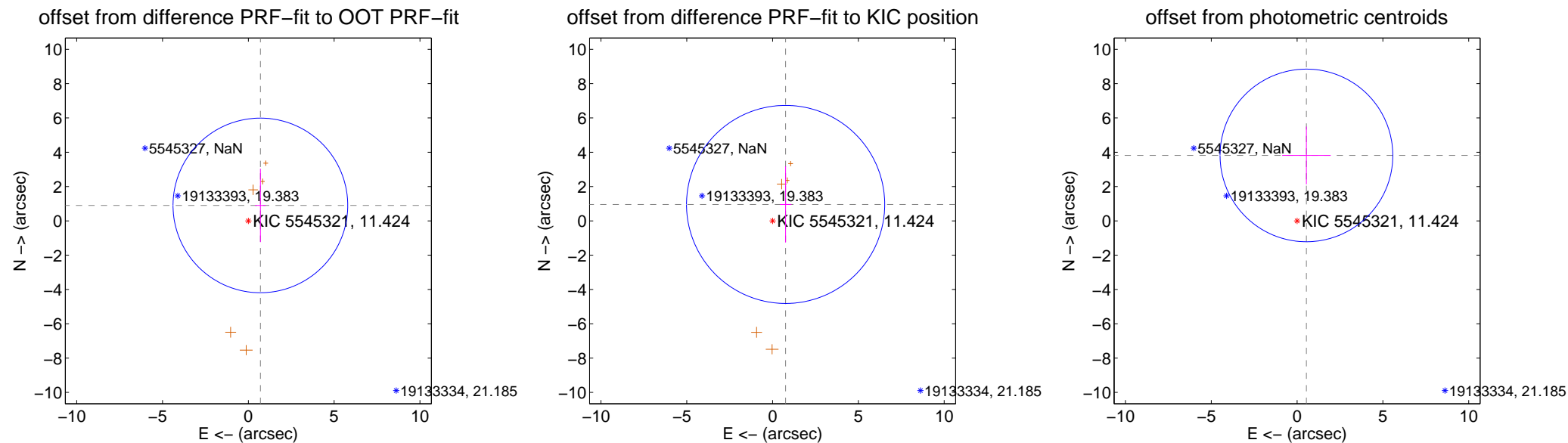
## DV Centroid Data

Supplemental centroid analysis for 005545321-02. **Kepler magnitude: 11.42.** Transit SNR 5.70

**There are 0 quarters with good PRF difference image offsets**

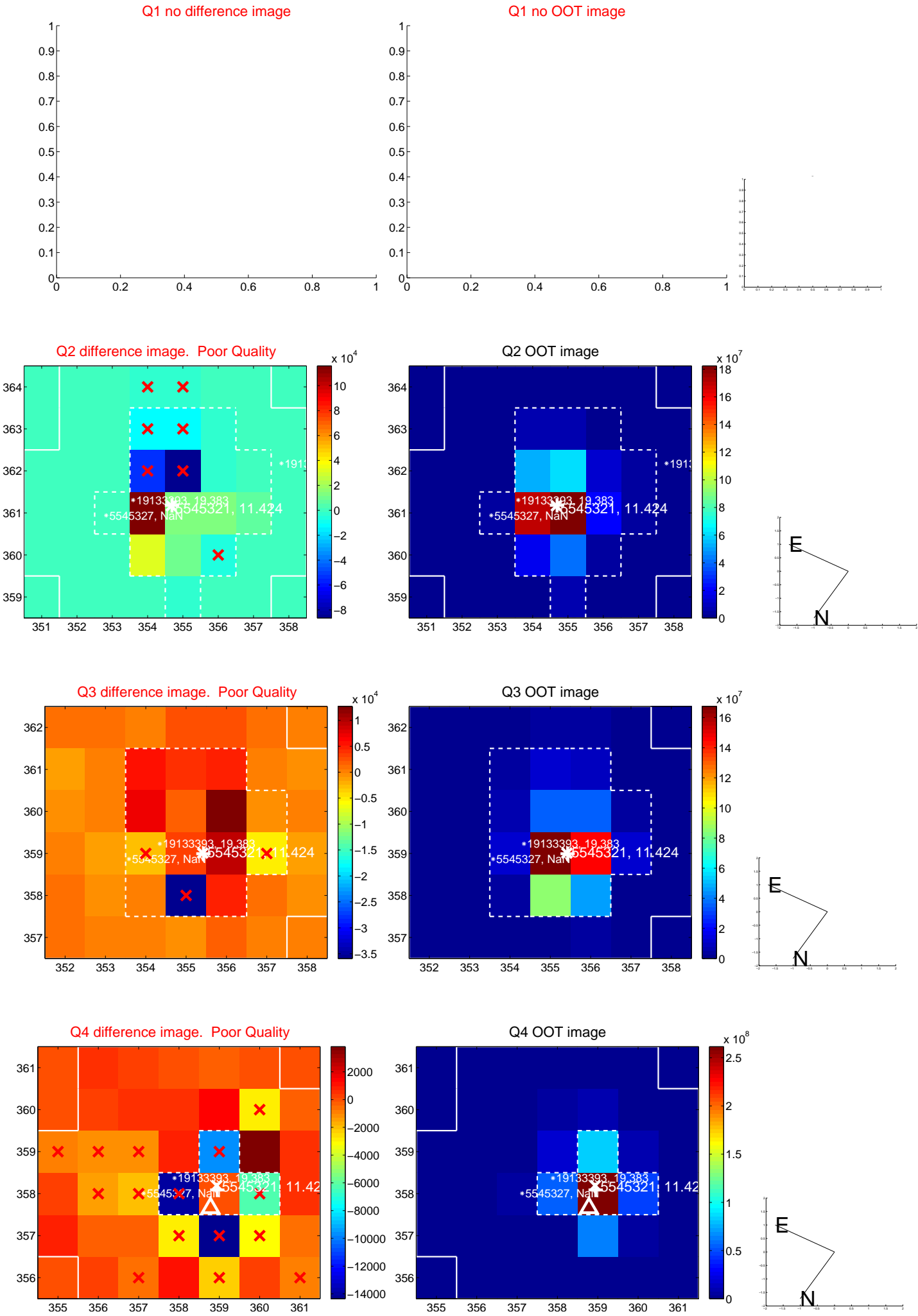
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.142 \pm 1.696$	0.67	$-0.702 \pm 0.310$	$0.901 \pm 2.137$
PRF-fit source offset from KIC position	$1.223 \pm 1.924$	0.64	$-0.760 \pm 0.330$	$0.958 \pm 2.224$
photometric centroid source offset	$3.85 \pm 1.68$	2.30	$-0.54 \pm 1.42$	$3.81 \pm 1.68$

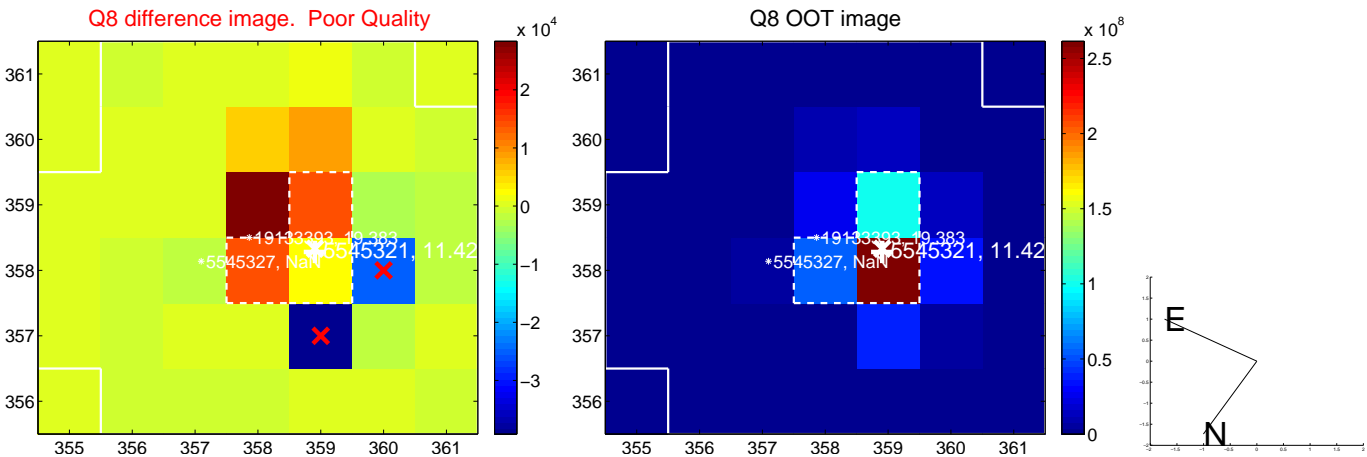
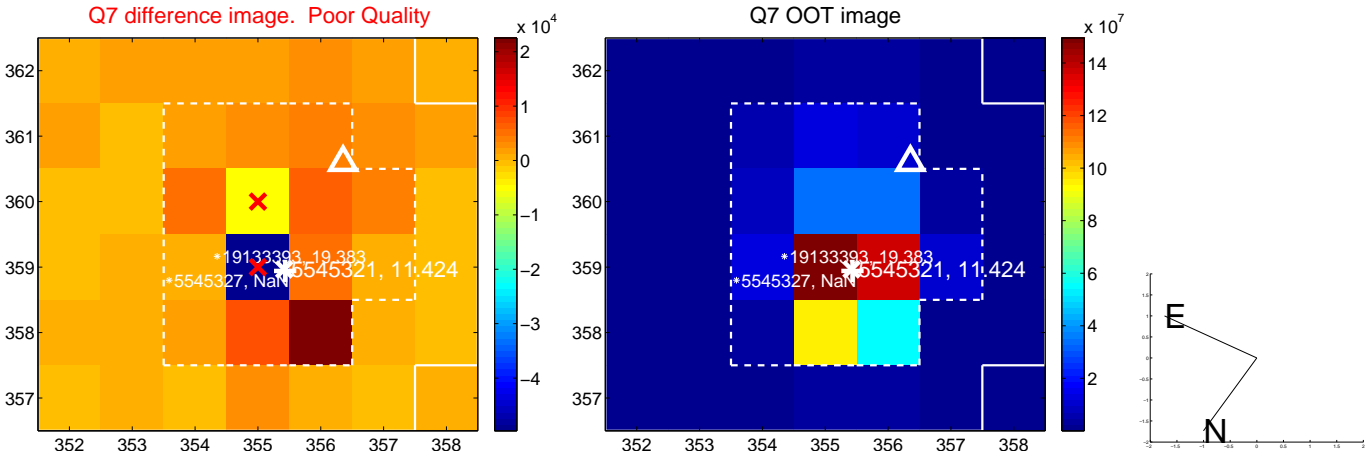
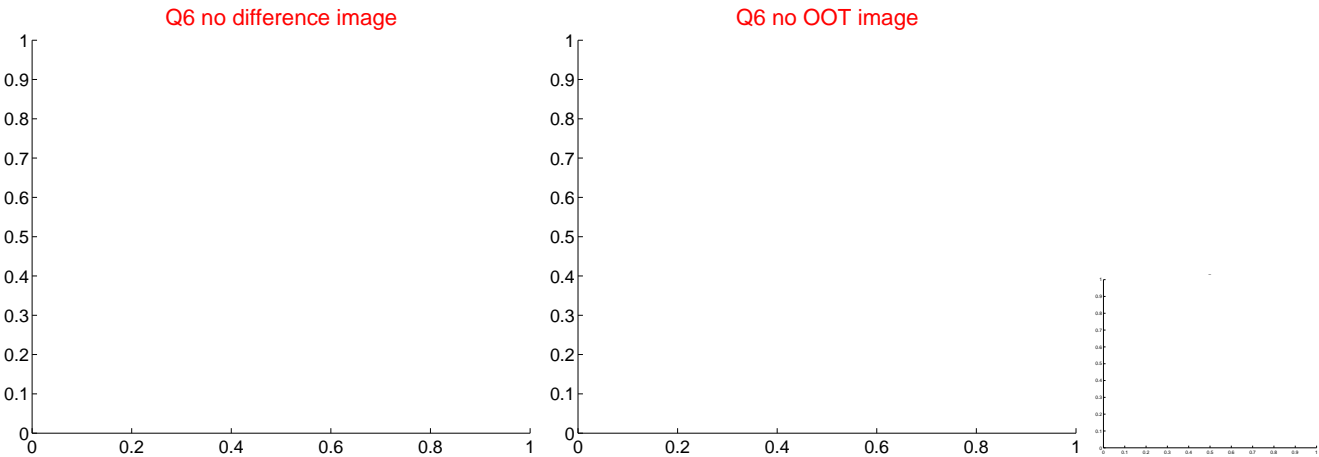
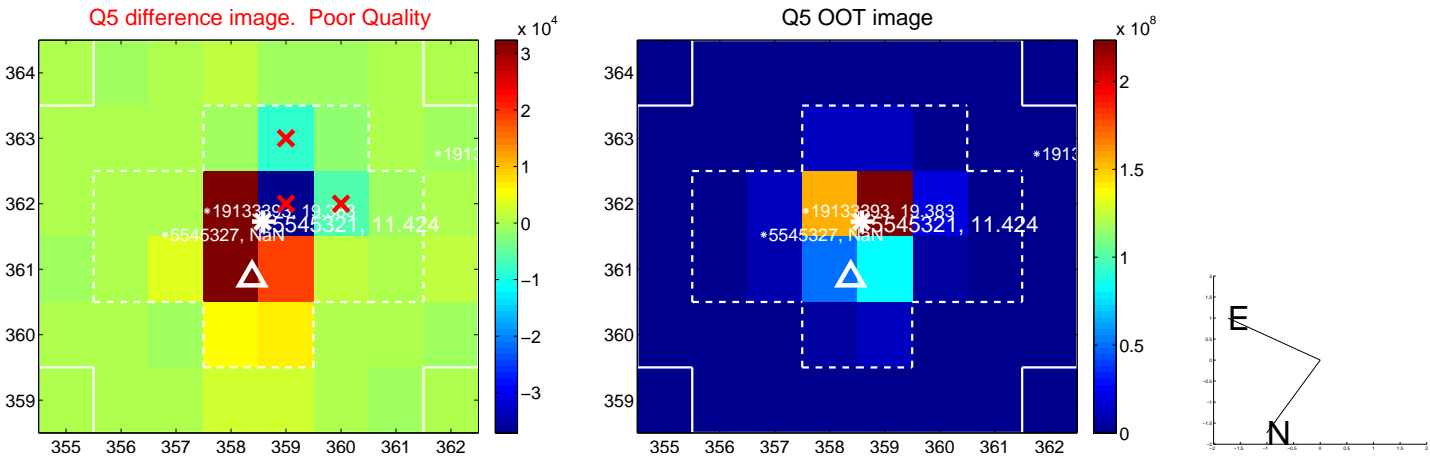


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

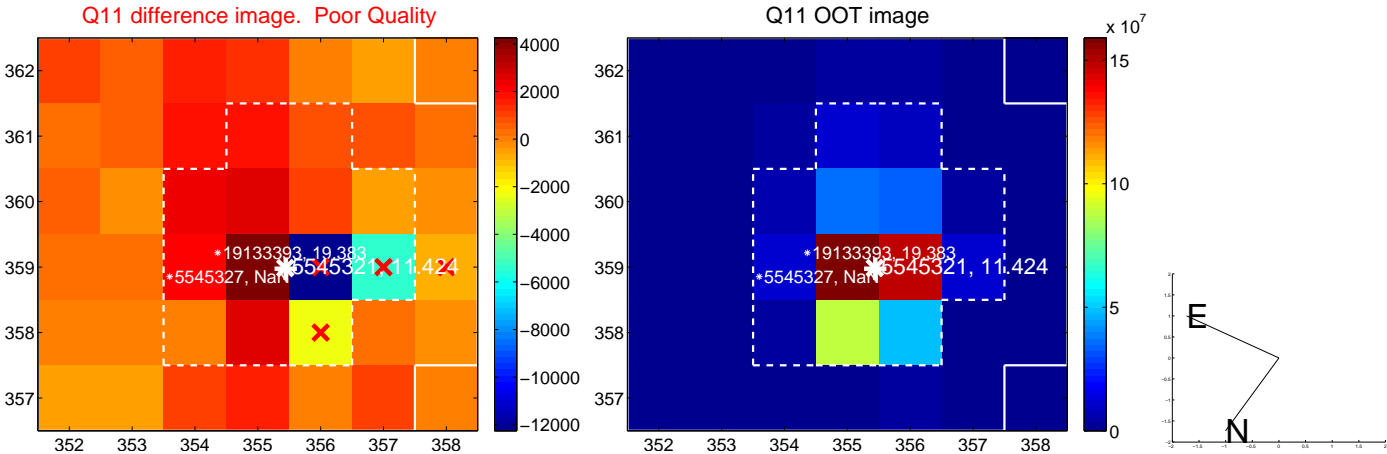
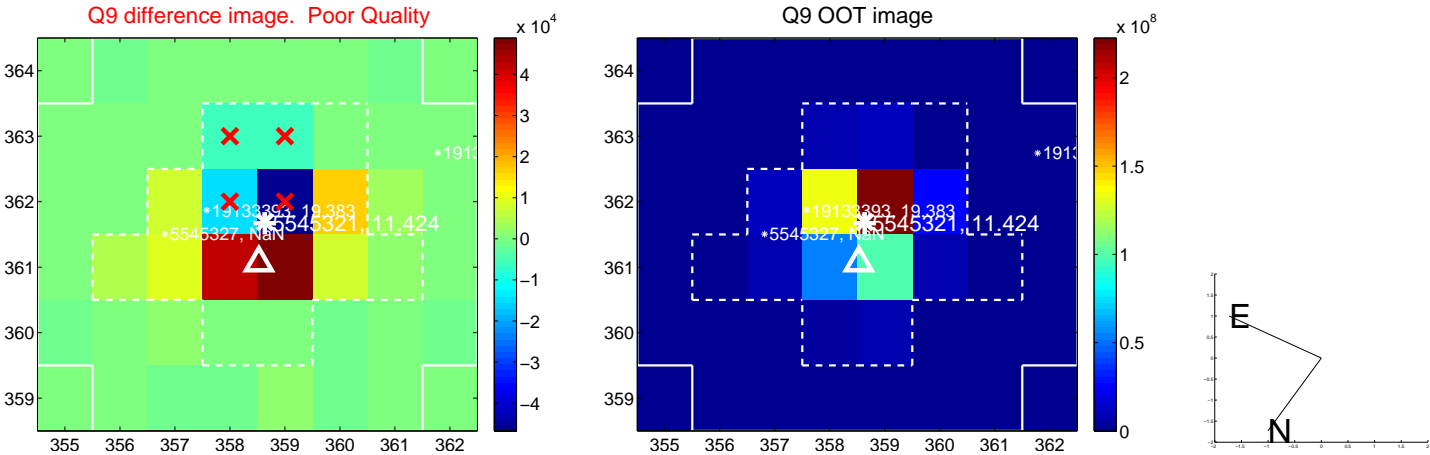


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

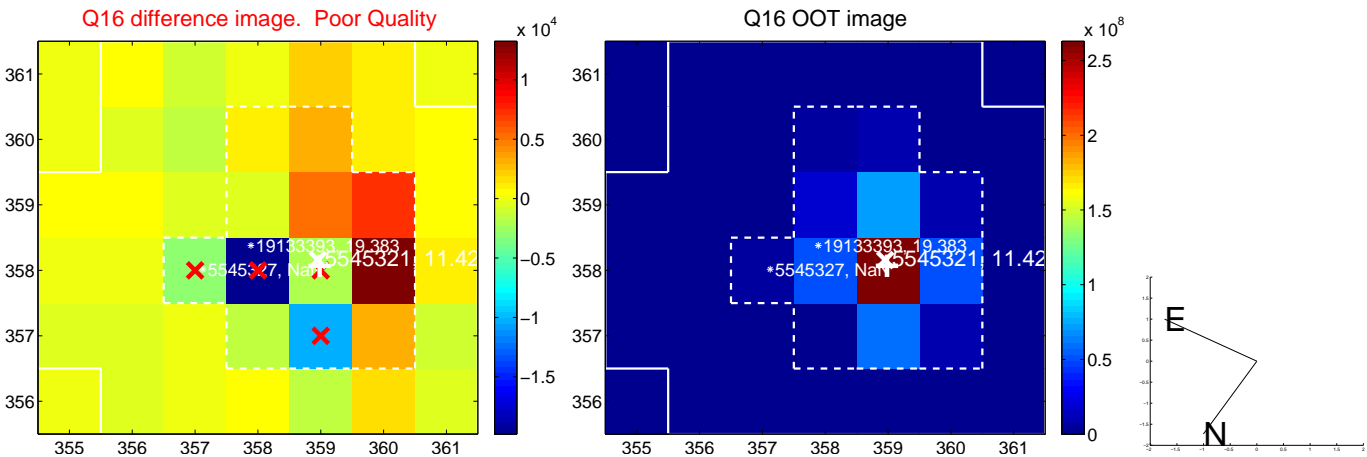
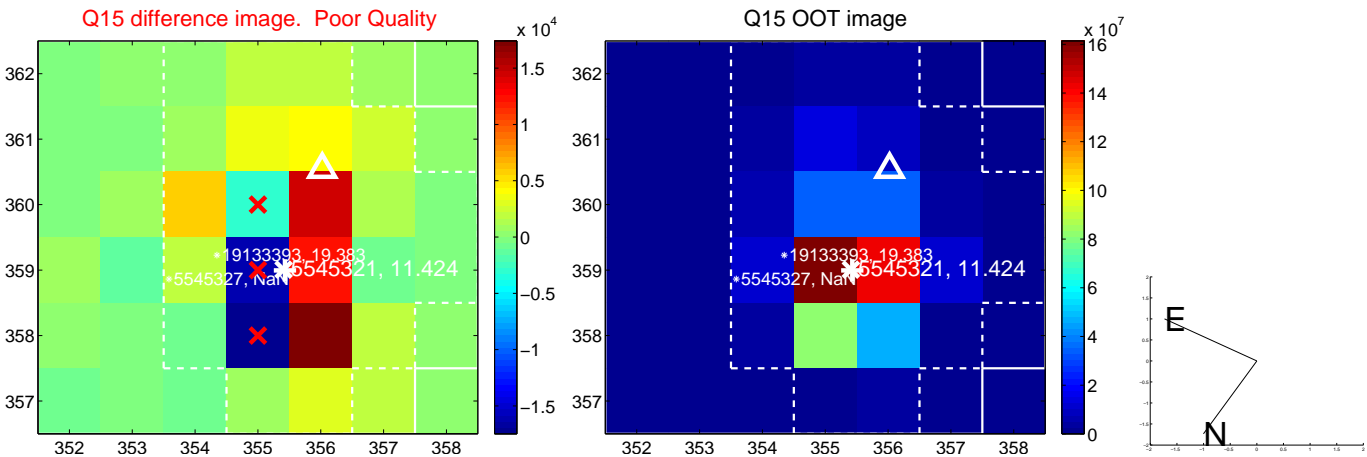
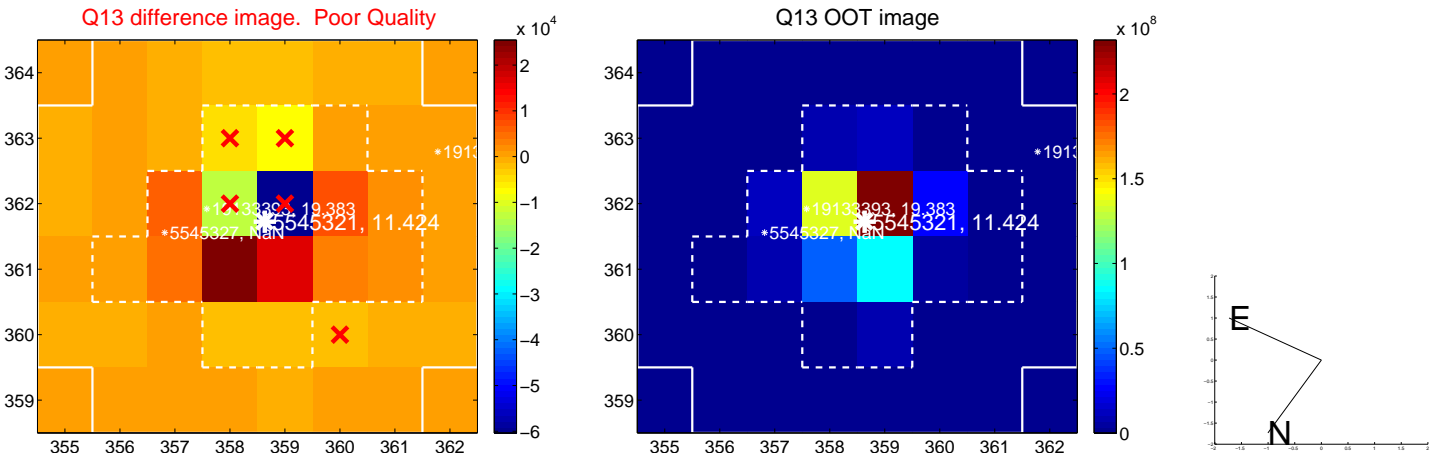




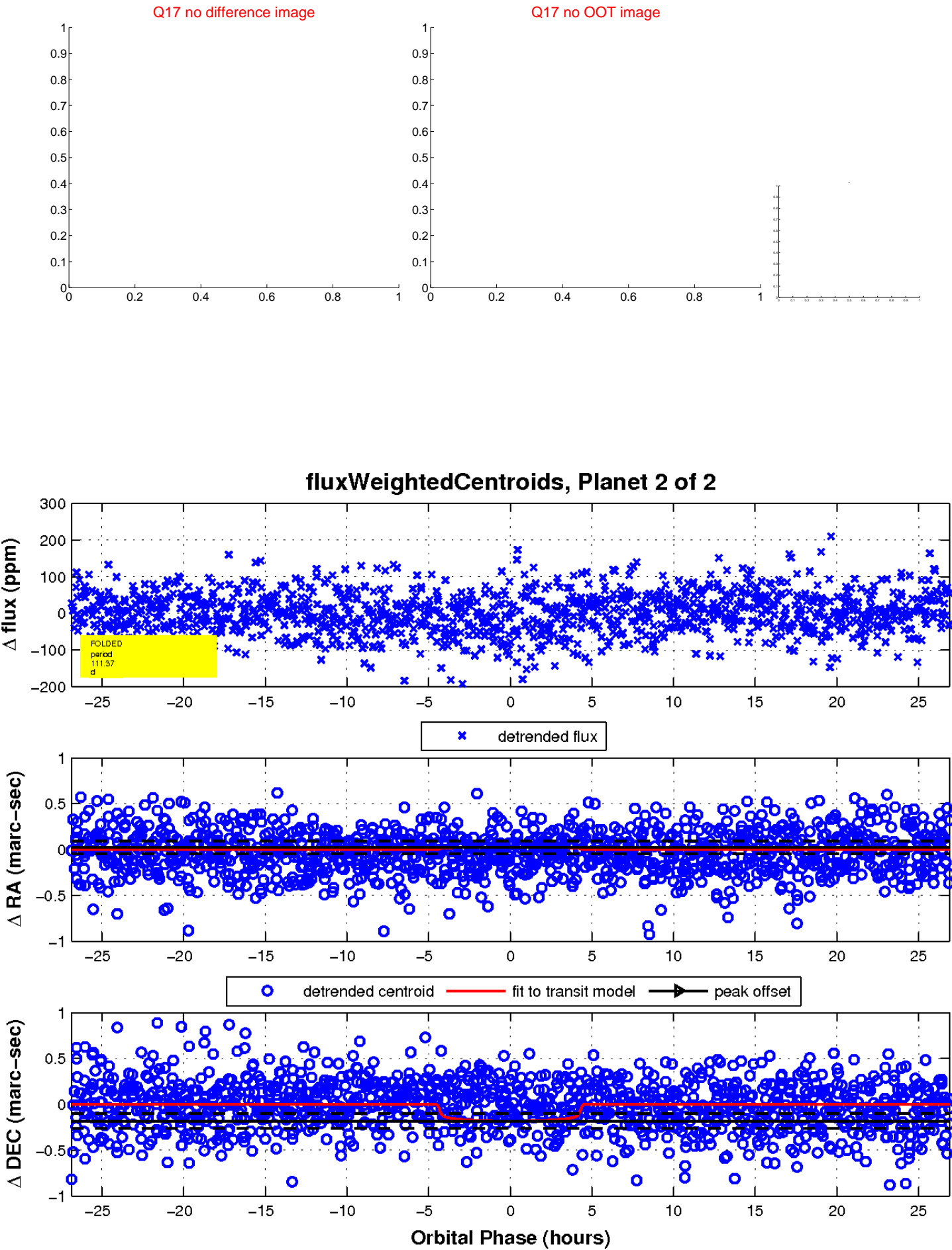
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

