

# KIC 005545566

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005545566-01	OBS	No	0.700095	131.789373	72.5	3.043	11.1	10.6	1.94	7668	1.90	34153.15
005545566-02	OBS	No	1.555375	132.499949	119.0	7.287	8.4	7.9	1.94	7668	2.45	11781.30

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005545566-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
005545566-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT

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

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

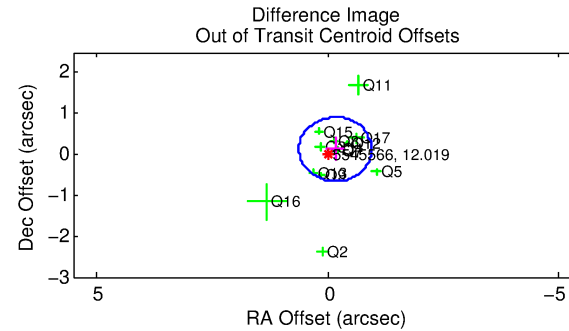
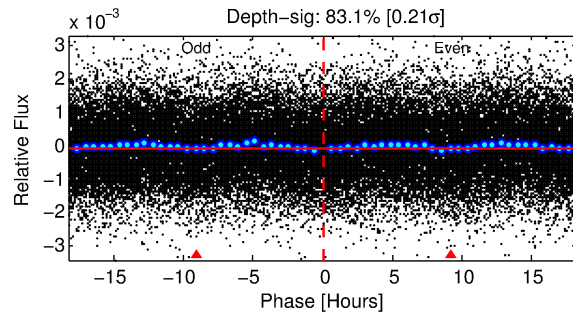
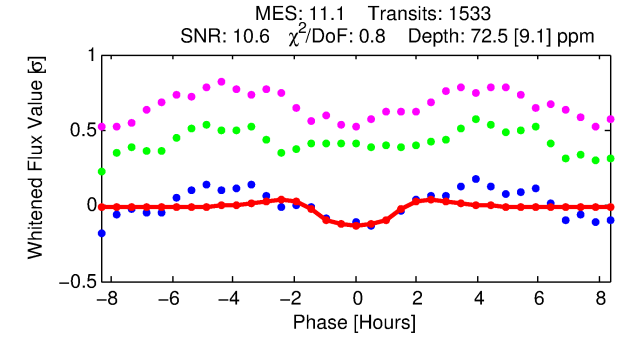
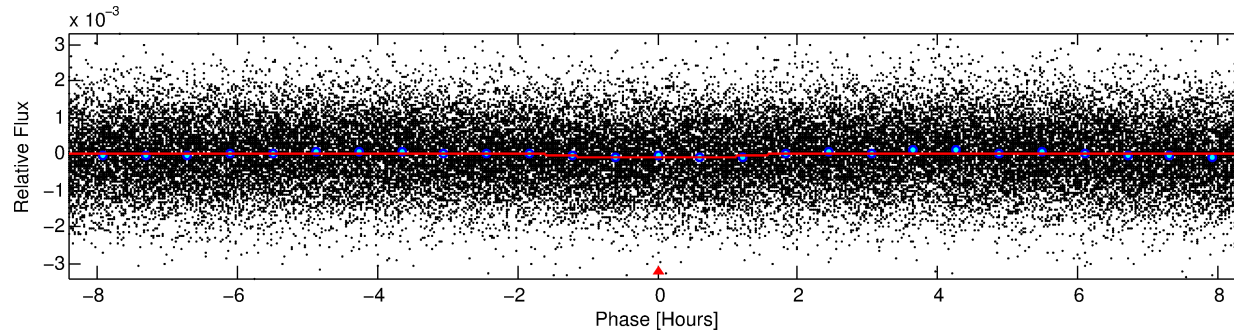
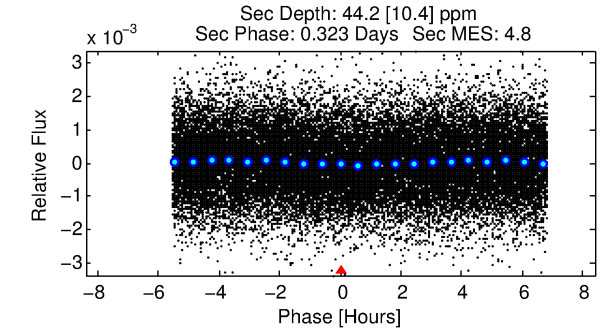
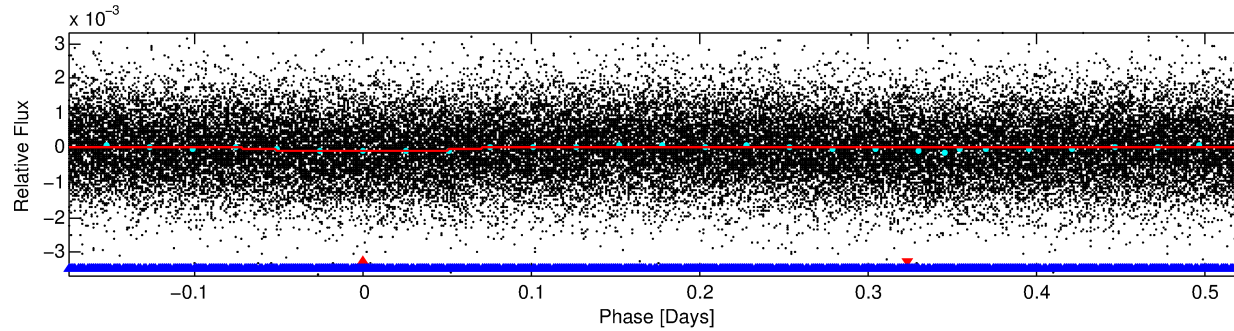
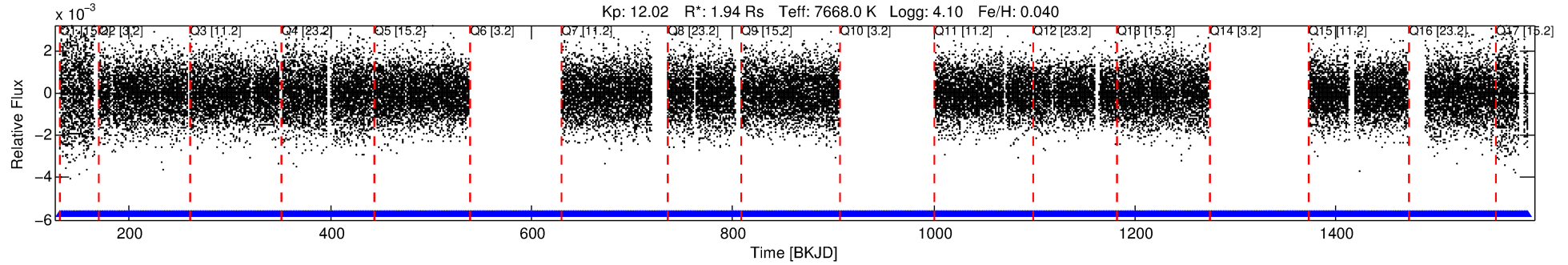
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005545566-01

No Significant Match Found

# DV One-Page Summary

KIC: 5545566 Candidate: 1 of 2 Period: 0.700 d



## DV Fit Results:

Period = 0.70009 [0.00001] d  
Epoch = 131.7894 [0.0034] BKJD  
Rp/R\* = 0.0090 [0.0064]  
a/R\* = 1.25 [2.07]  
b = 0.89 [1.07]  
Seff = 34153.15 [8069.92]  
Teq = 3466 [205] K  
Rp = 1.90 [1.40] Re  
a = 0.0185 [0.0030] AU  
Ag = 2.29 [3.34] [0.39 $\sigma$ ]  
Teffp = 6595 [2374] K [1.31 $\sigma$ ]

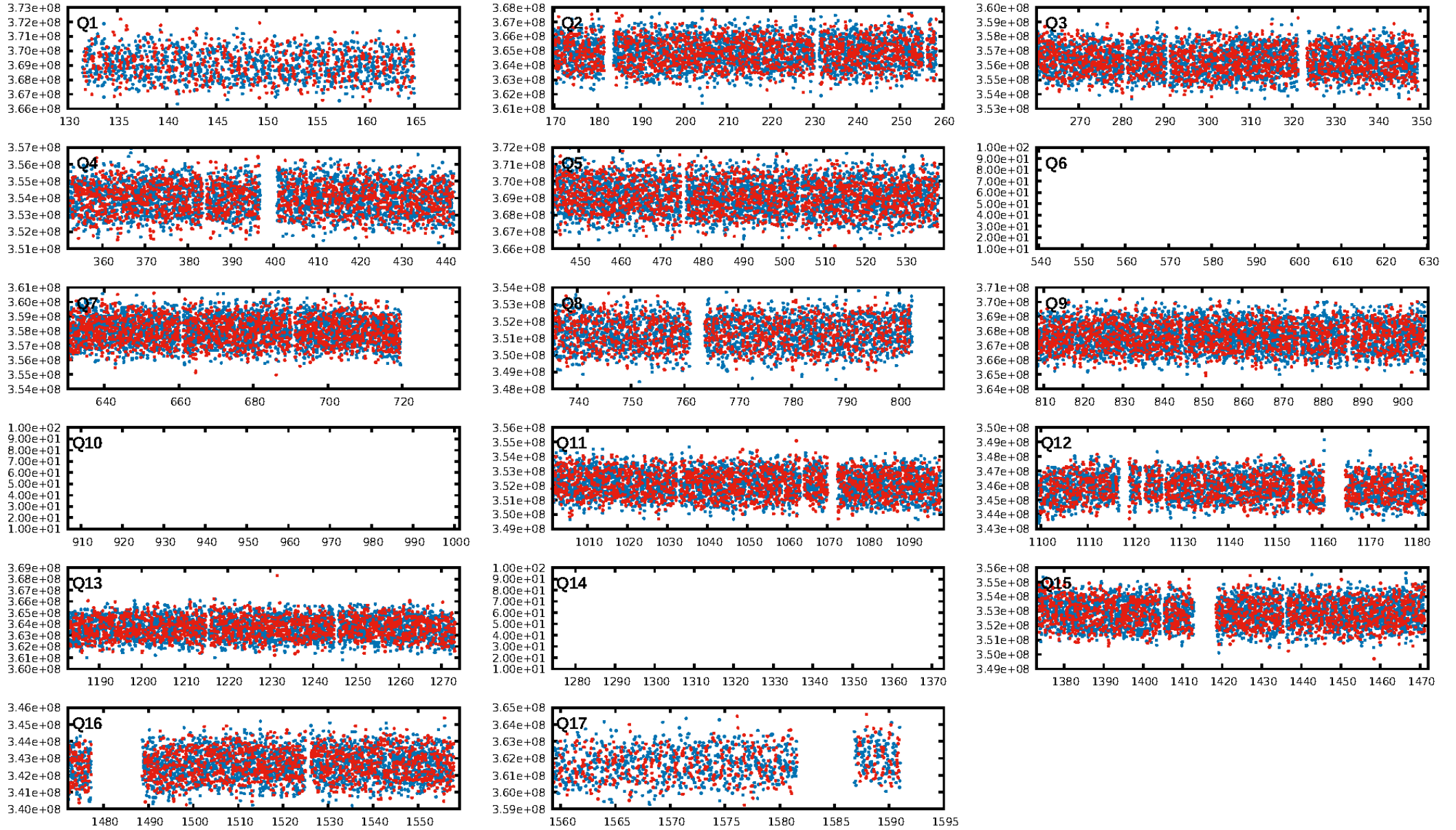
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.1% [2.60 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.03e-19  
RollingBand-fgt: 1.00 [1447/1447]  
GhostDiagnostic-chr: 2.447  
Centroid-sig: 7.2%  
Centroid-so: 0.151 arcsec [0.96 $\sigma$ ]  
OotOffset-rm: 0.210 arcsec [0.80 $\sigma$ ]  
KicOffset-rm: 0.268 arcsec [1.03 $\sigma$ ]  
OotOffset-st: 1/4/4/4 [13]  
KicOffset-st: 1/4/4/4 [13]  
DiffImageQuality-fgm: 0.92 [12/13]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:08:44 Z

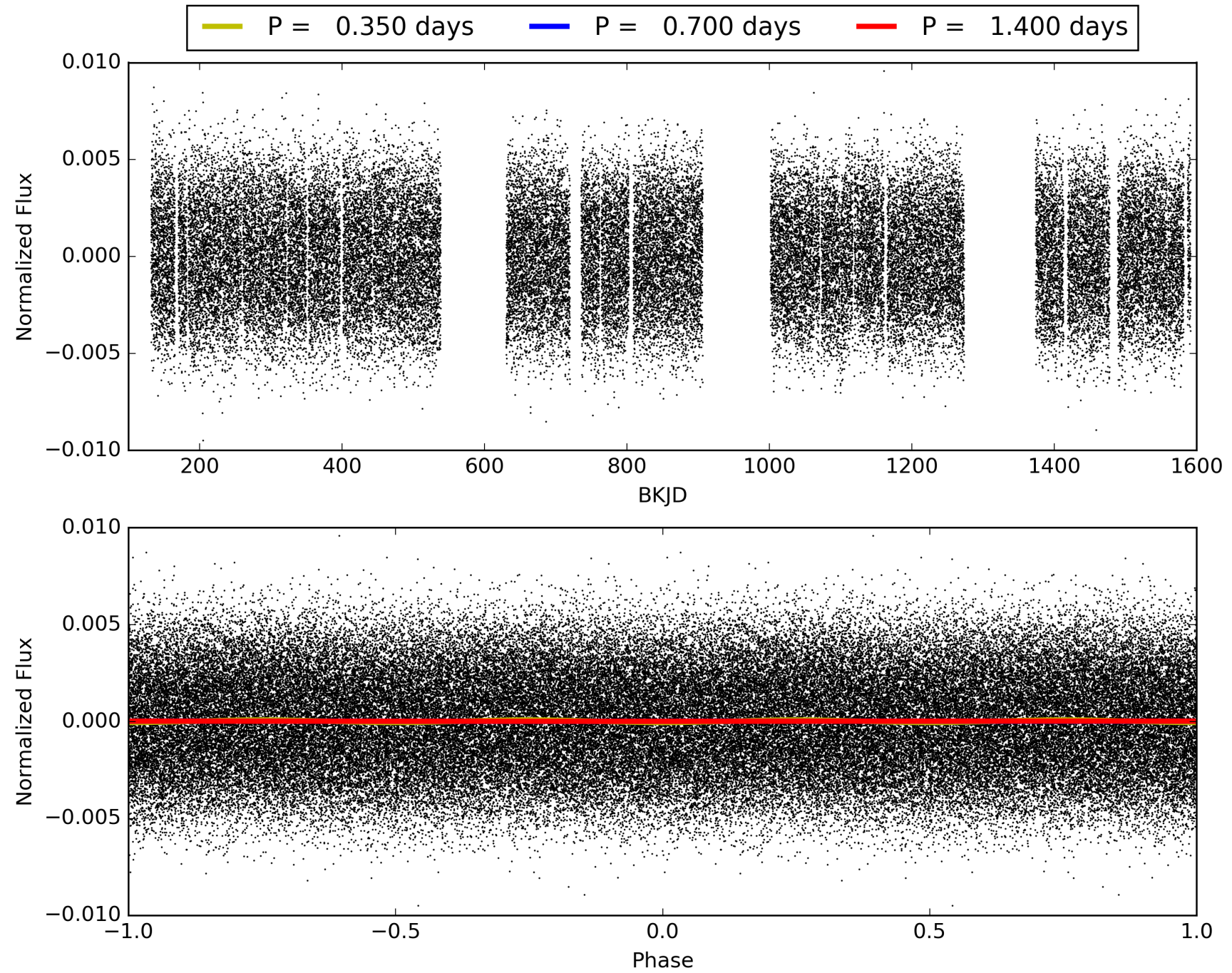
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005545566-01, PDC Light Curves



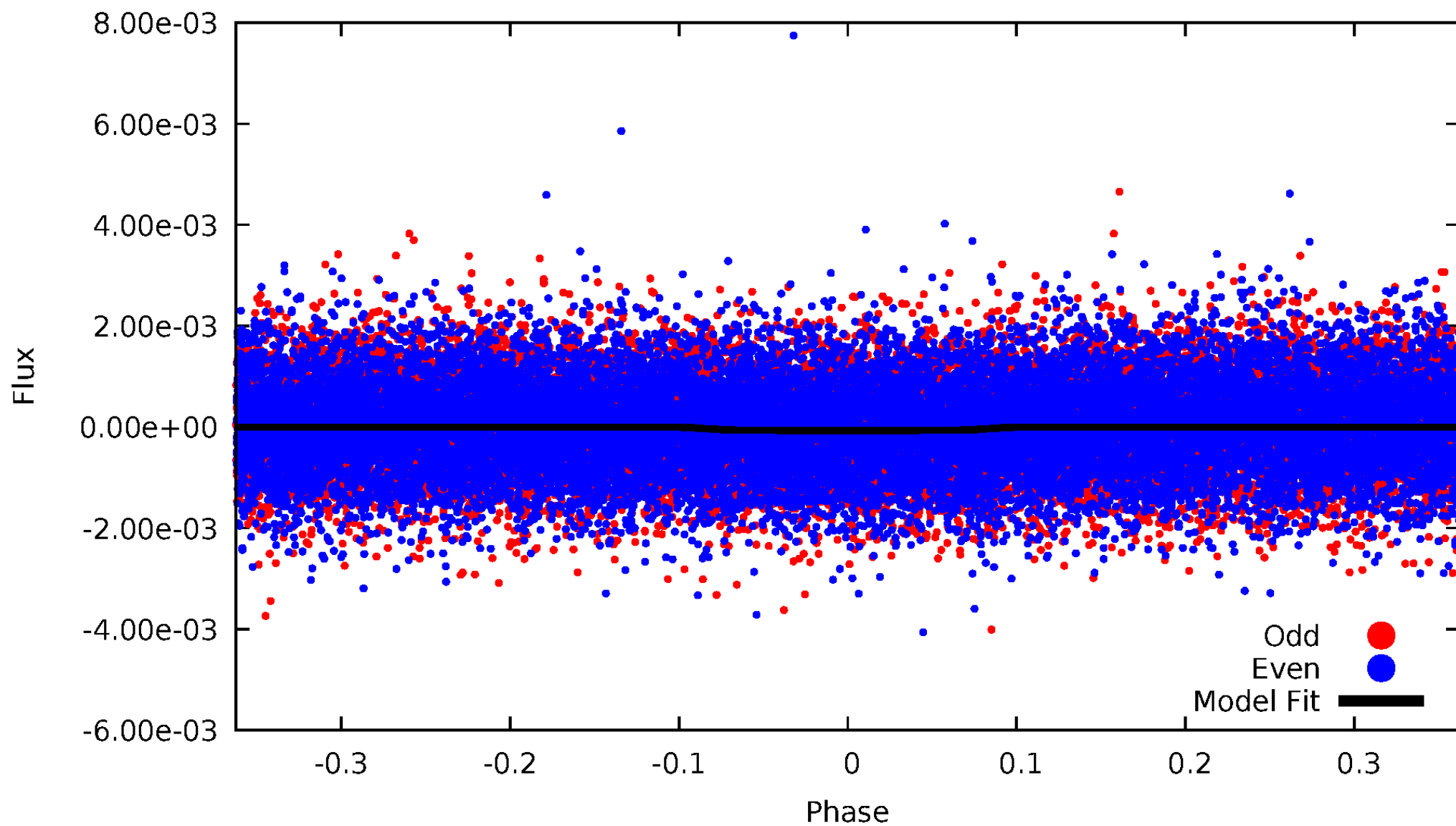


TCE 005545566-01



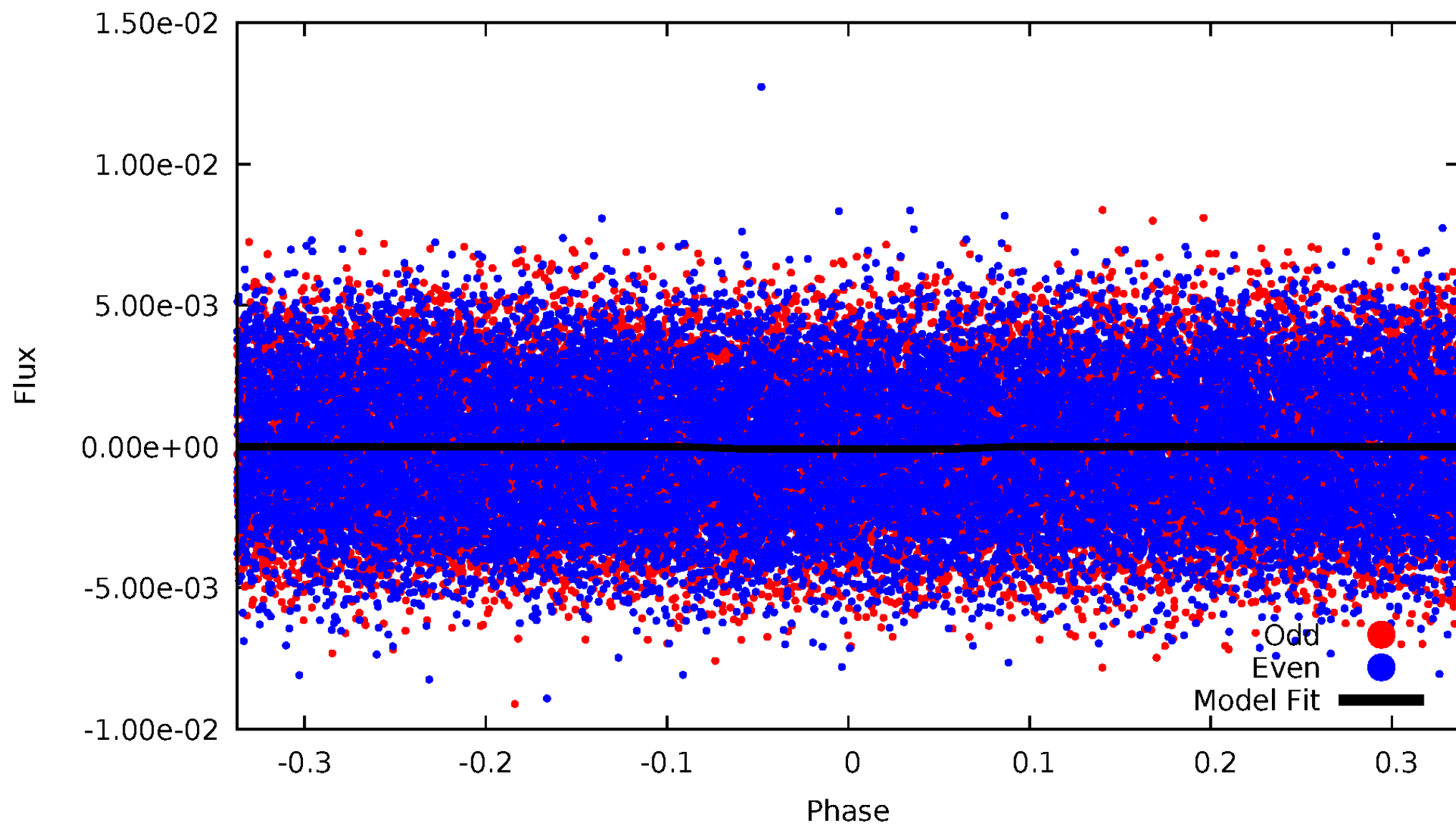
# DV Odd/Even

TCE 005545566-01



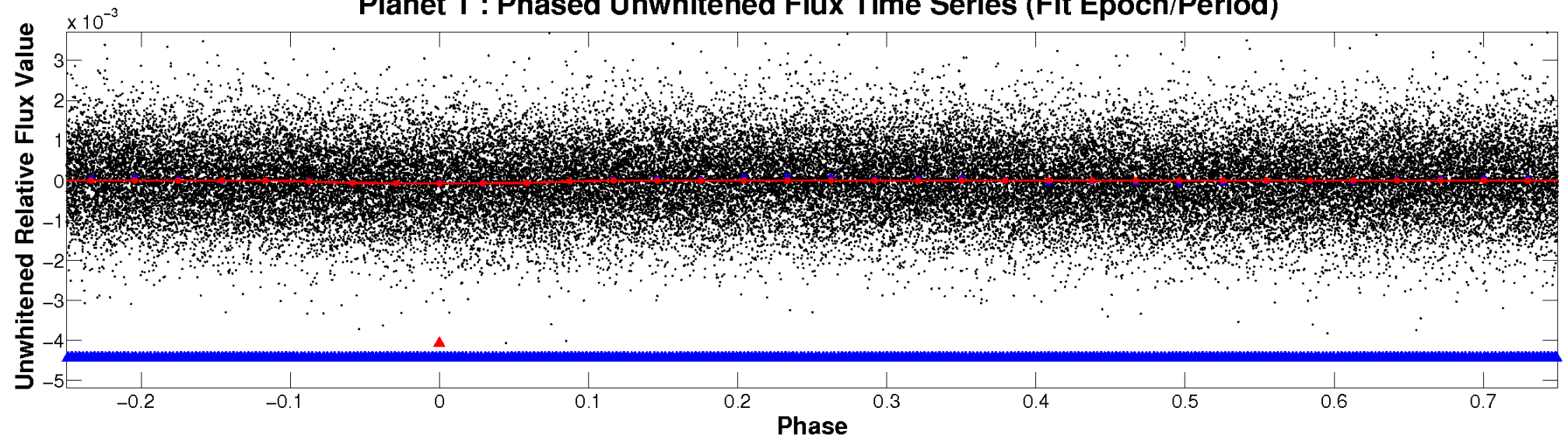
# ALT Odd/Even

TCE 005545566-01

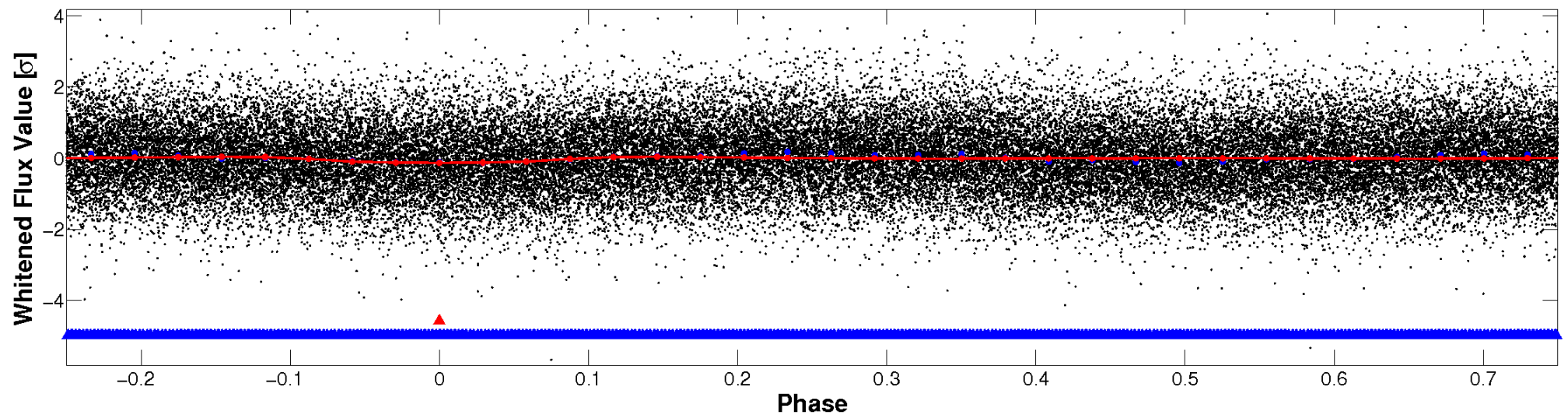


# Non-Whitened Vs. Whitened Light Curve

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



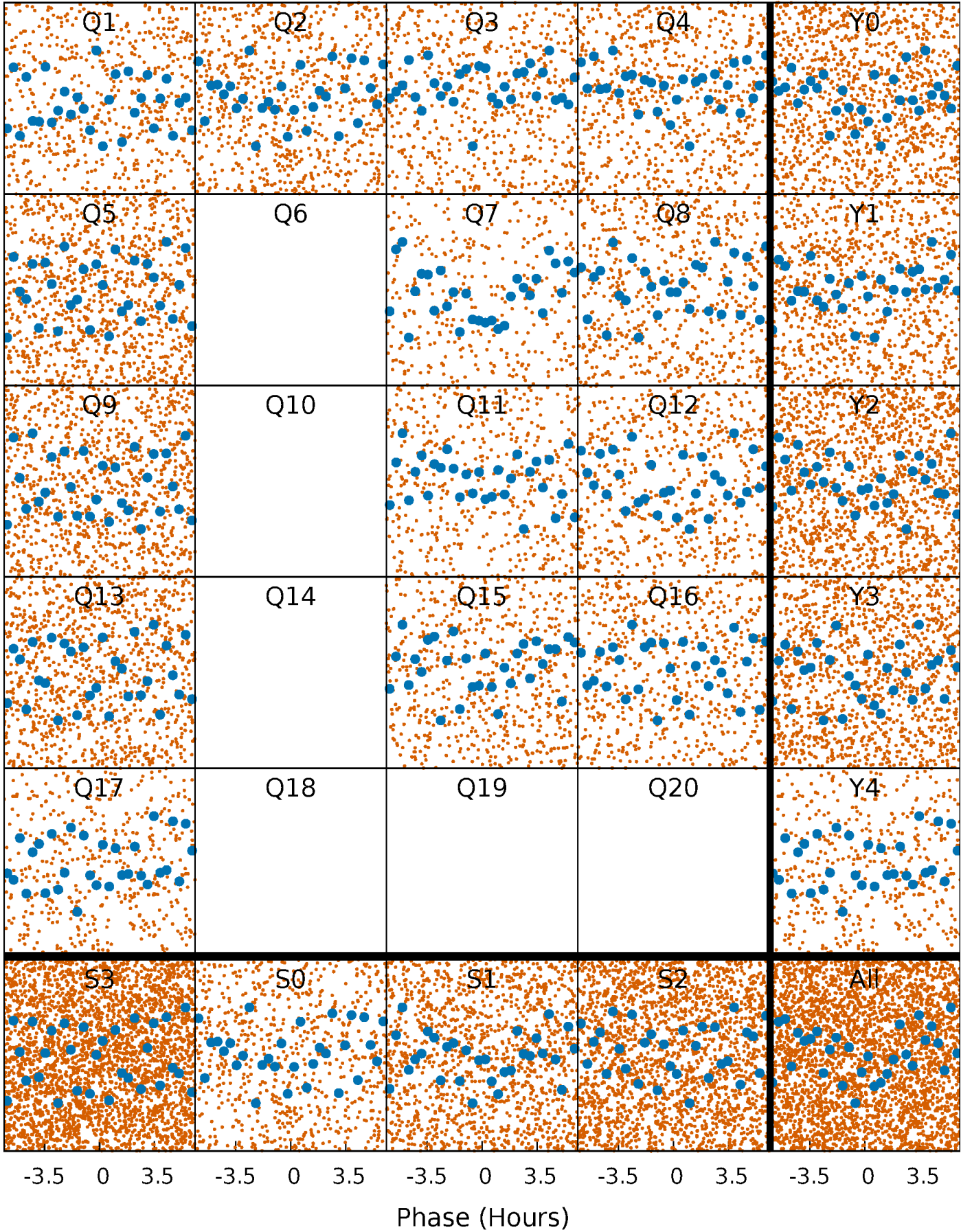
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

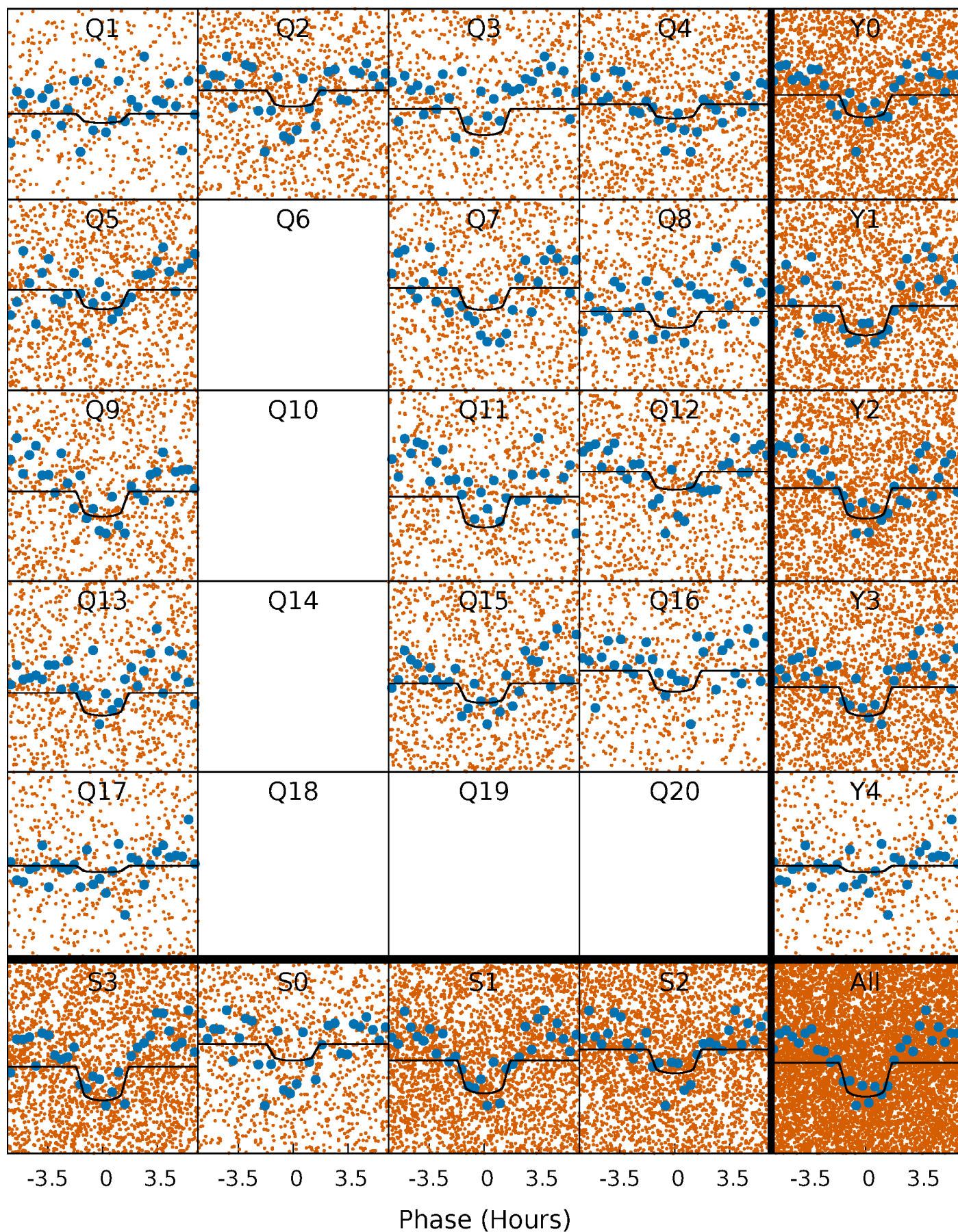
TCE 005545566-01 P= 0.700095 Days  $T_0=131.789373$  (BKJD)





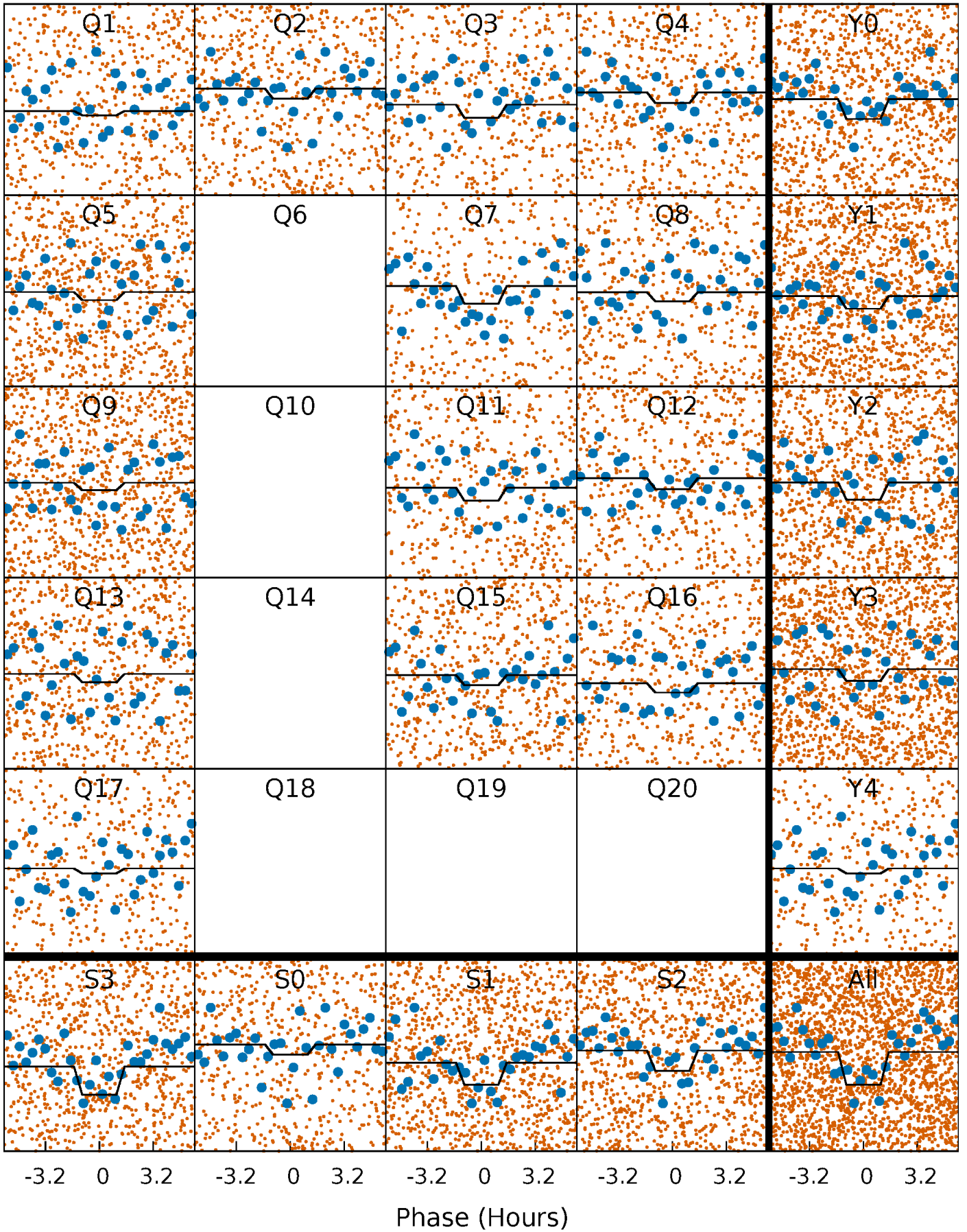
# DV Quarter-Phased Transit Curves

TCE 005545566-01 P= 0.700095 Days  $T_0=131.789373$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

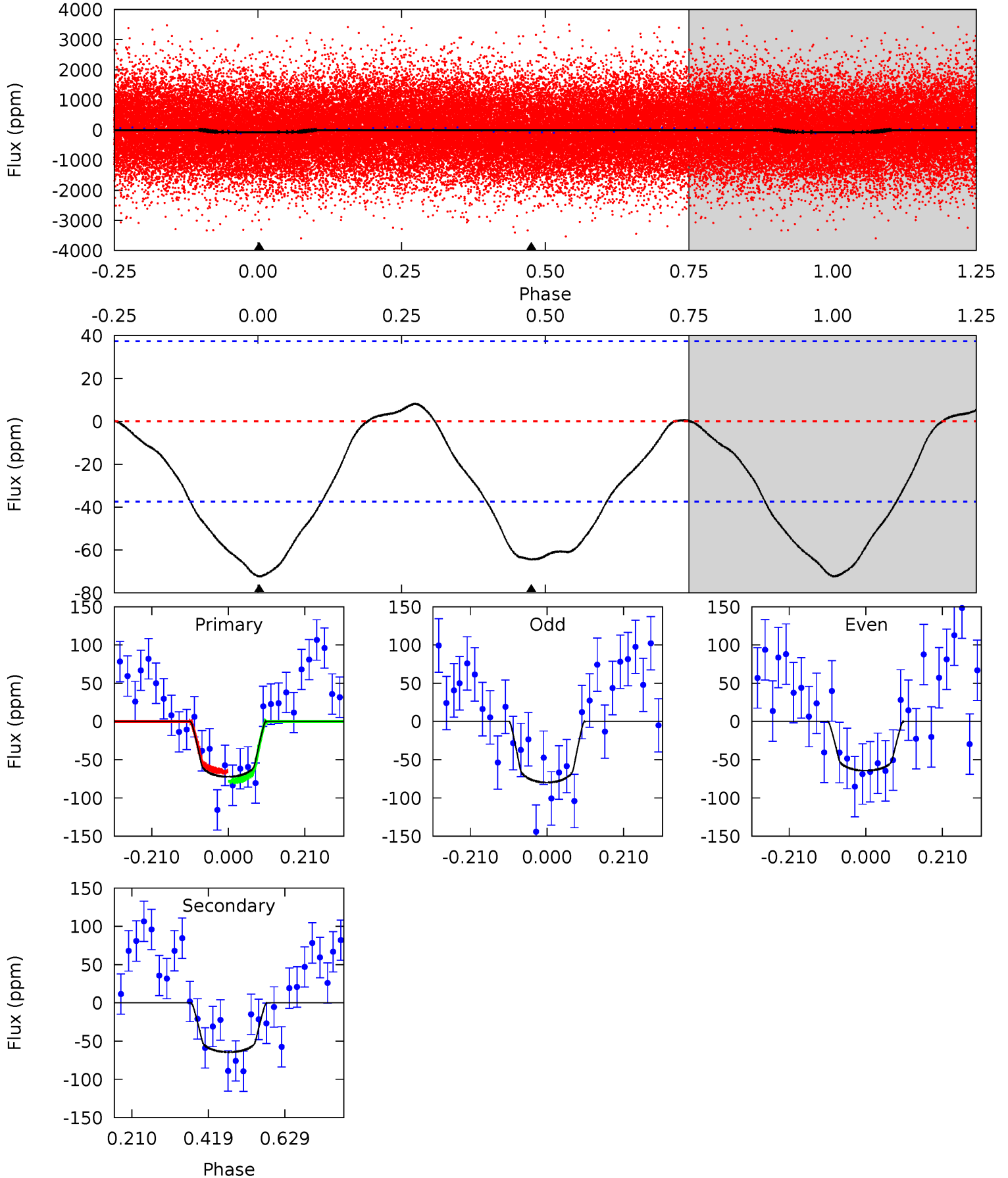
TCE 005545566-01 P= 0.700102 Days  $T_0=131.788623$  (BKJD)



# DV Model-Shift Uniqueness Test

005545566-01, P = 0.700095 Days, E = 131.089278 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
8.51	7.58	0	0	4.41	1.25	0.58	8.51	8.51	7.58	7.58	0.91	0.87	0.10	0.74

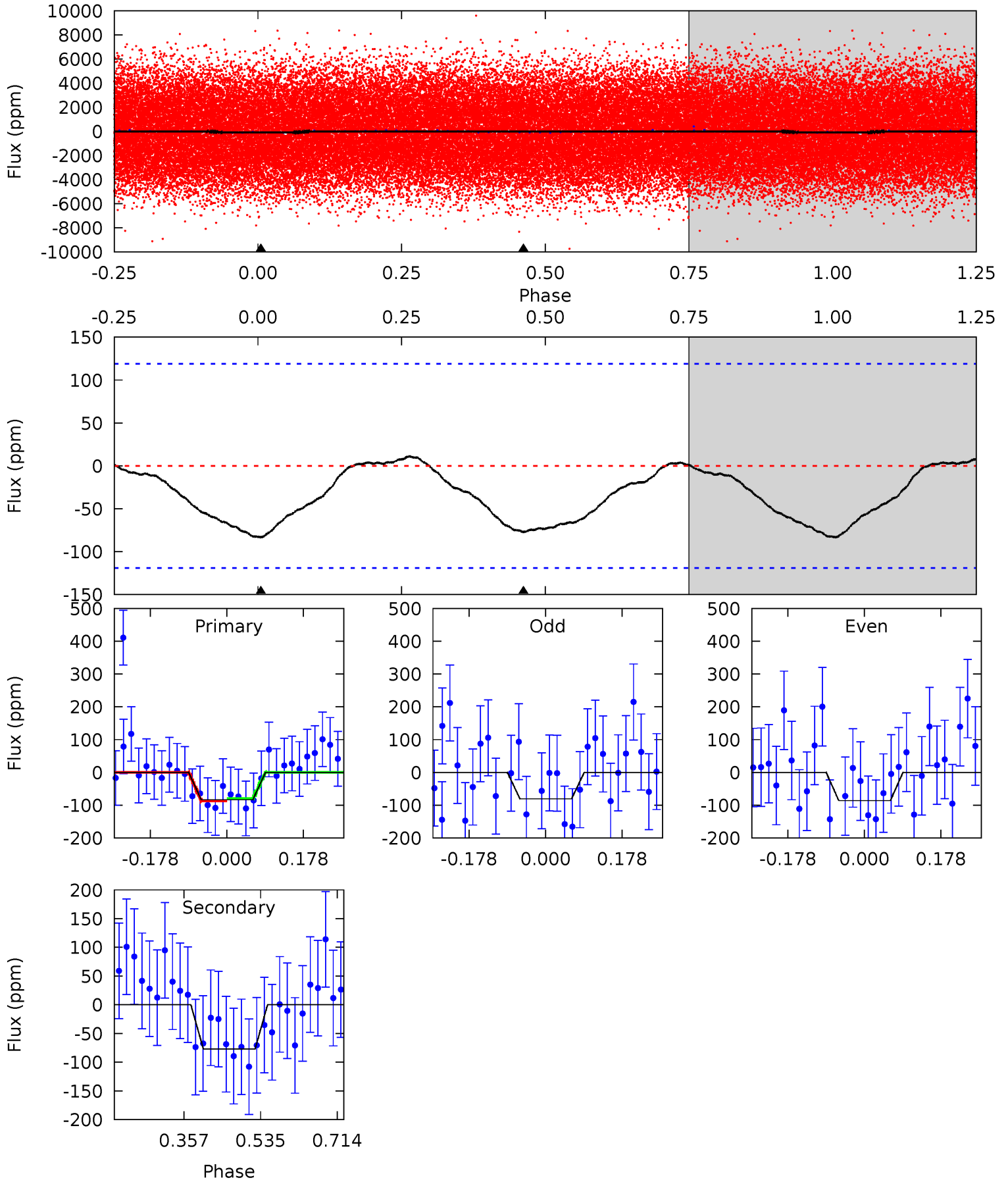




# Alt Model-Shift Uniqueness Test

005545566-01, P = 0.700102 Days, E = 131.088521 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
3.11	2.88	0	0	4.44	1.35	0.35	3.11	3.11	2.88	2.88	0.10	0.98	0.12	0.14





### Stellar Parameters For KIC 005545566

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7668^{+76}_{-84}$	$4.097^{+0.084}_{-0.126}$	$0.040^{+0.050}_{-0.200}$	$1.941^{+0.374}_{-0.249}$	$1.718^{+0.162}_{-0.145}$	$0.331^{+0.139}_{-0.123}$
	+1%/-1%	+2%/-3%	+125%/-500%	+19%/-13%	+9%/-8%	+42%/-37%
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 005545566-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-64 \pm 8$	$2.06^{+1.31}_{-1.18}$	$4860^{+227}_{-171}$	$6768^{+5228}_{-1747}$	$2.907^{+13.163}_{-1.843}$
Alt.	$-77 \pm 27$	$2.11^{+1.35}_{-1.17}$	$4876^{+234}_{-180}$	$6893^{+5111}_{-1820}$	$3.204^{+11.399}_{-2.145}$

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

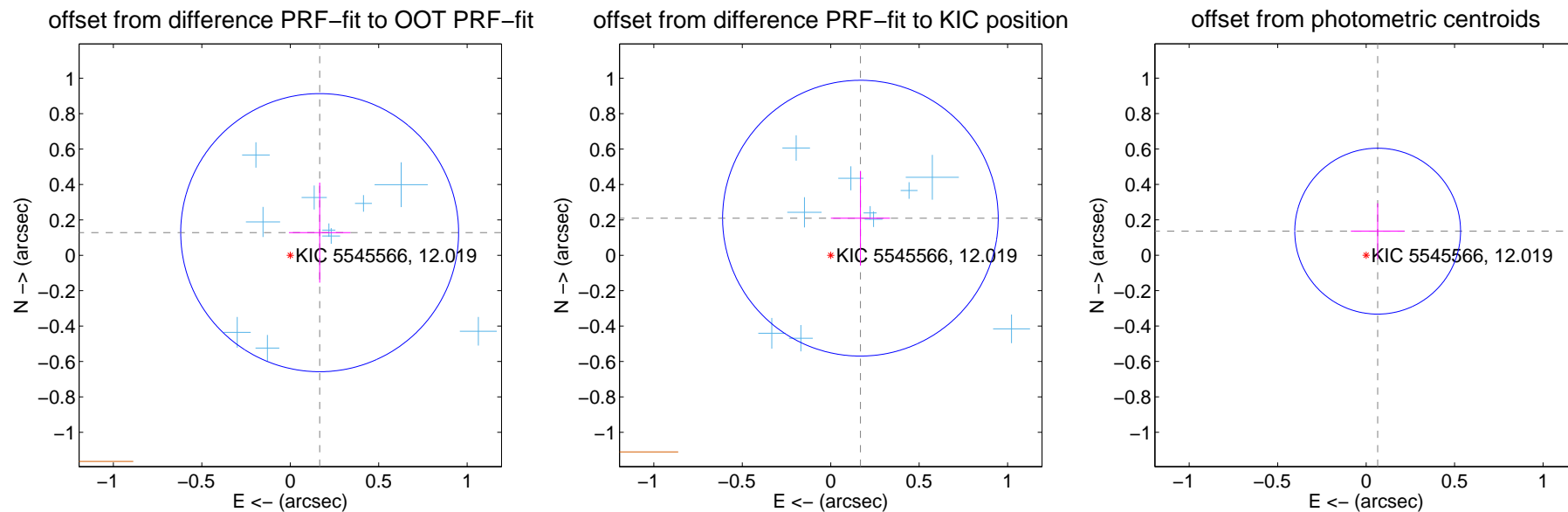
## DV Centroid Data

Supplemental centroid analysis for 005545566-01. Kepler magnitude: 12.02. Transit SNR 10.56

There are 12 quarters with good PRF difference image offsets

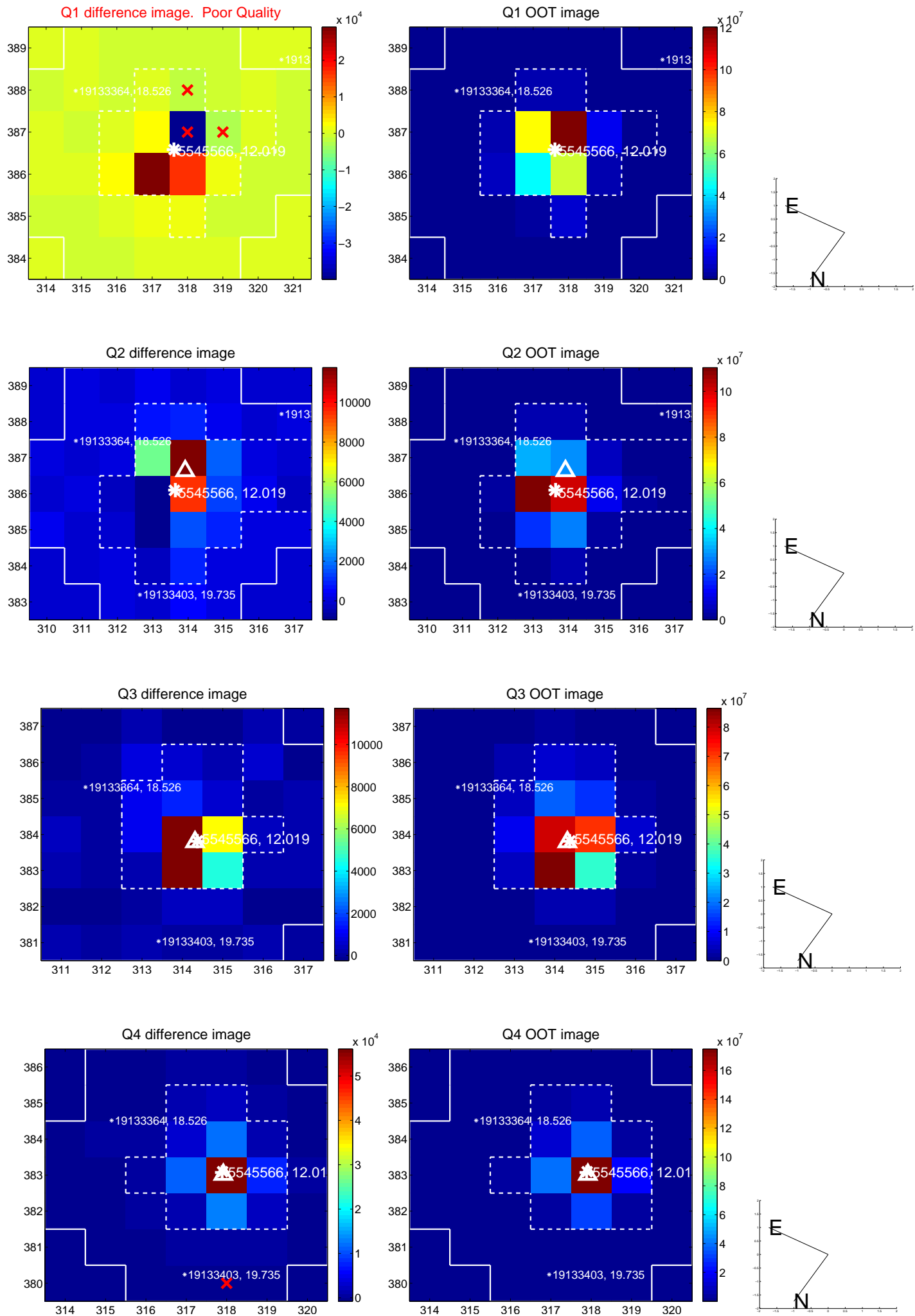
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.210 \pm 0.262$	0.80	$-0.166 \pm 0.174$	$0.128 \pm 0.282$
PRF-fit source offset from KIC position	$0.268 \pm 0.260$	1.03	$-0.168 \pm 0.167$	$0.210 \pm 0.267$
photometric centroid source offset	$0.15 \pm 0.16$	0.96	$-0.07 \pm 0.15$	$0.14 \pm 0.16$

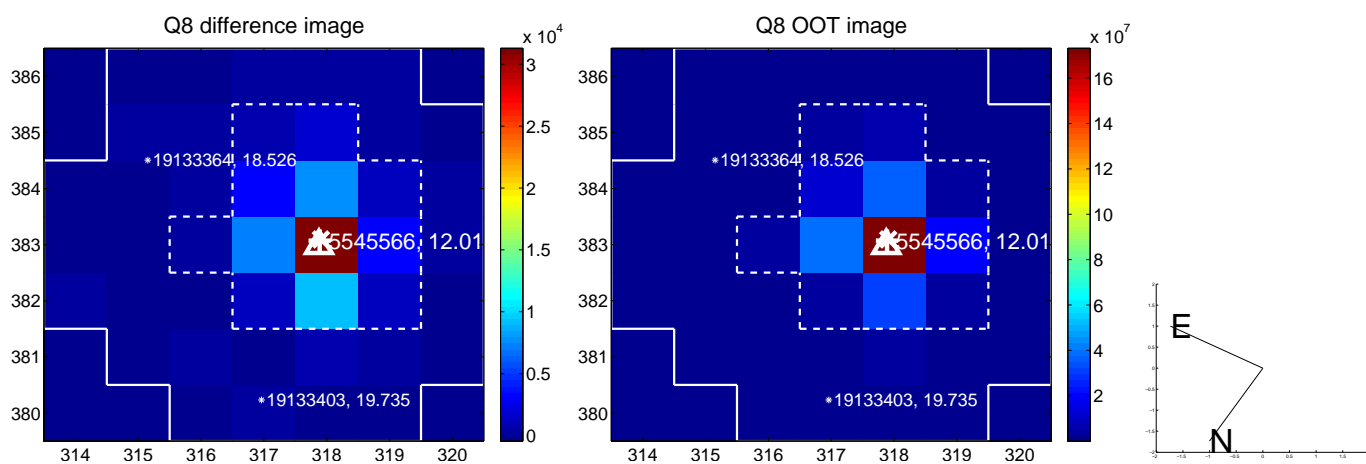
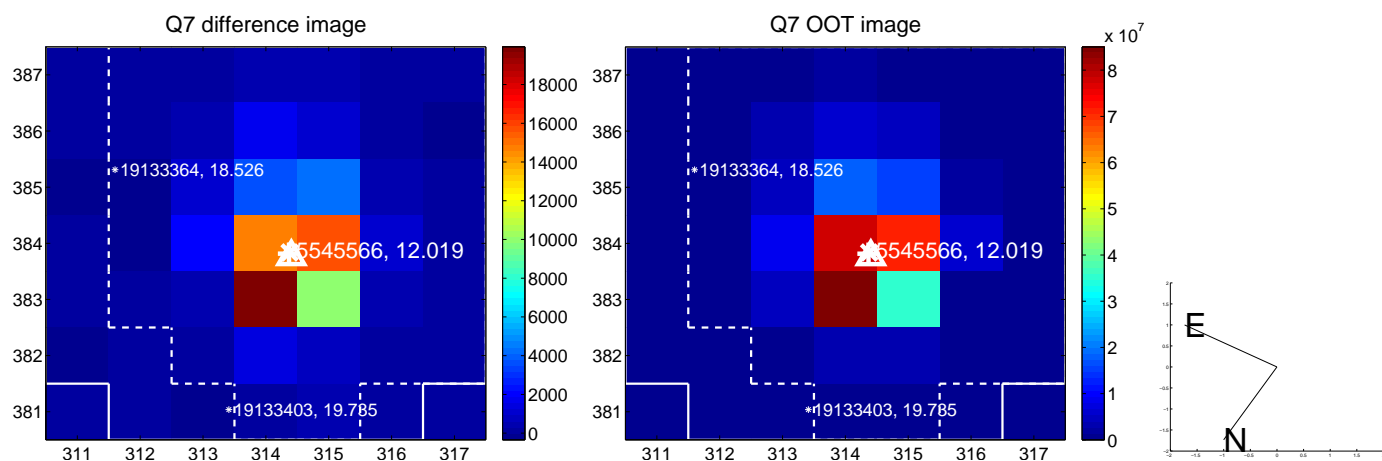
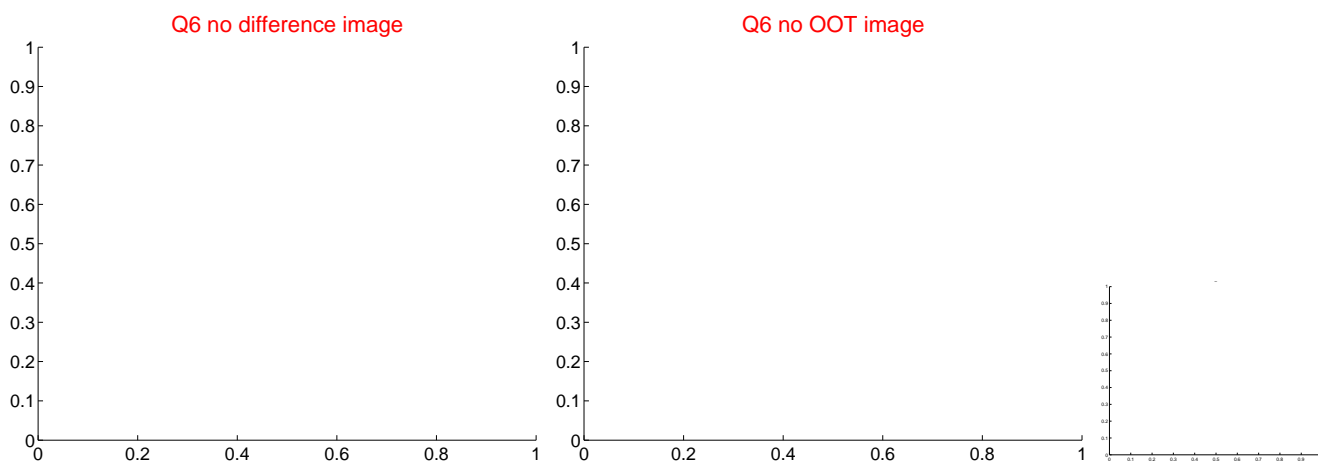
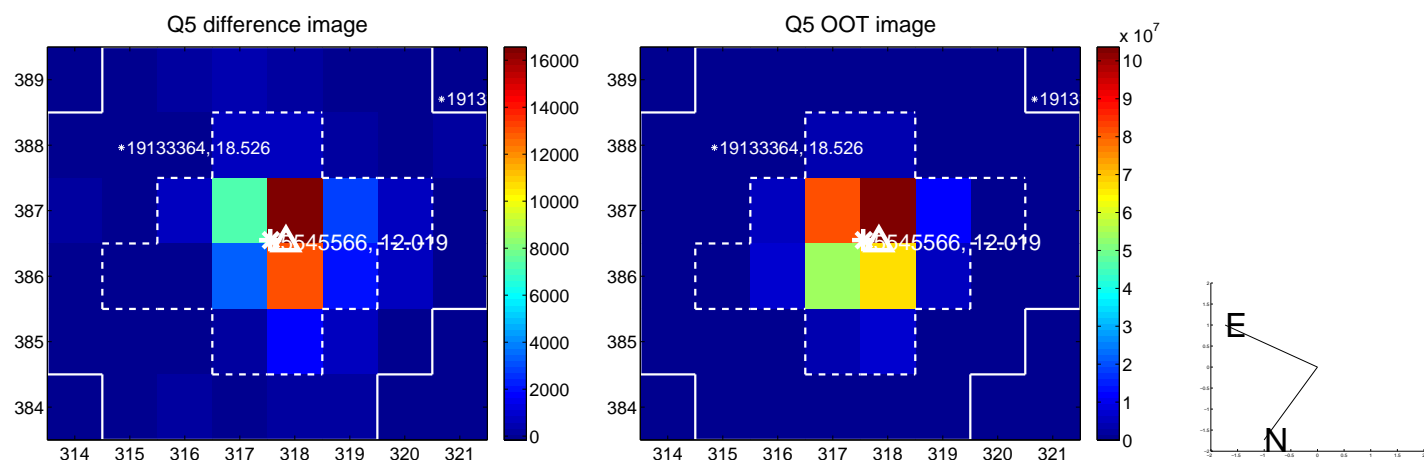


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

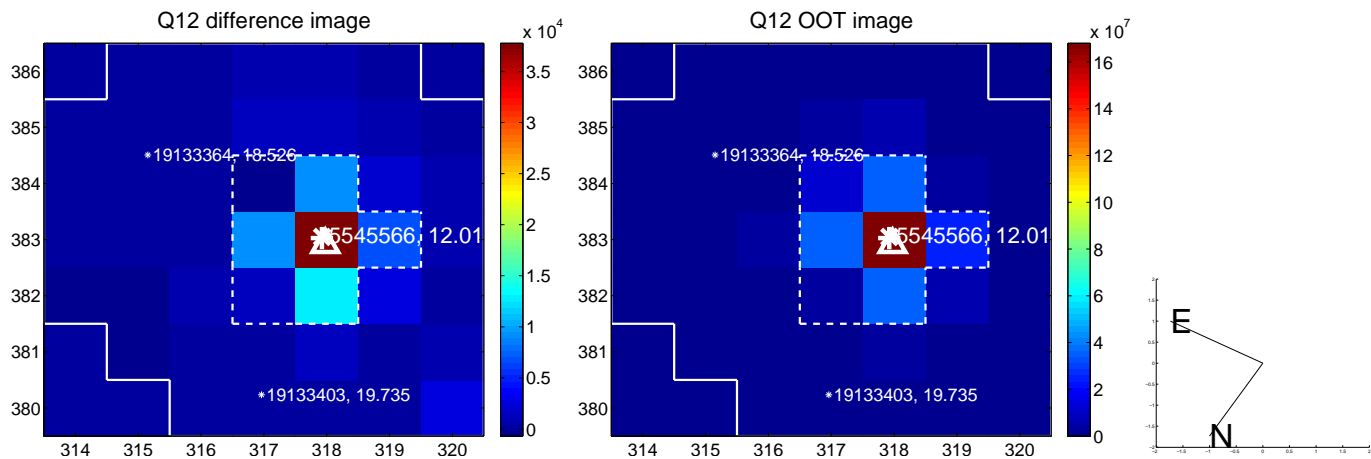
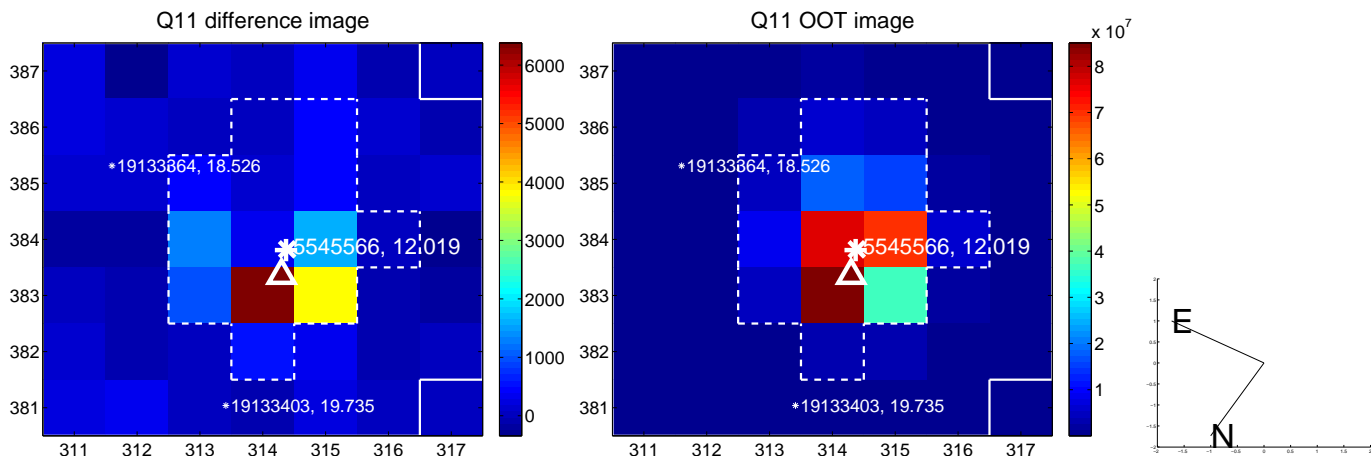
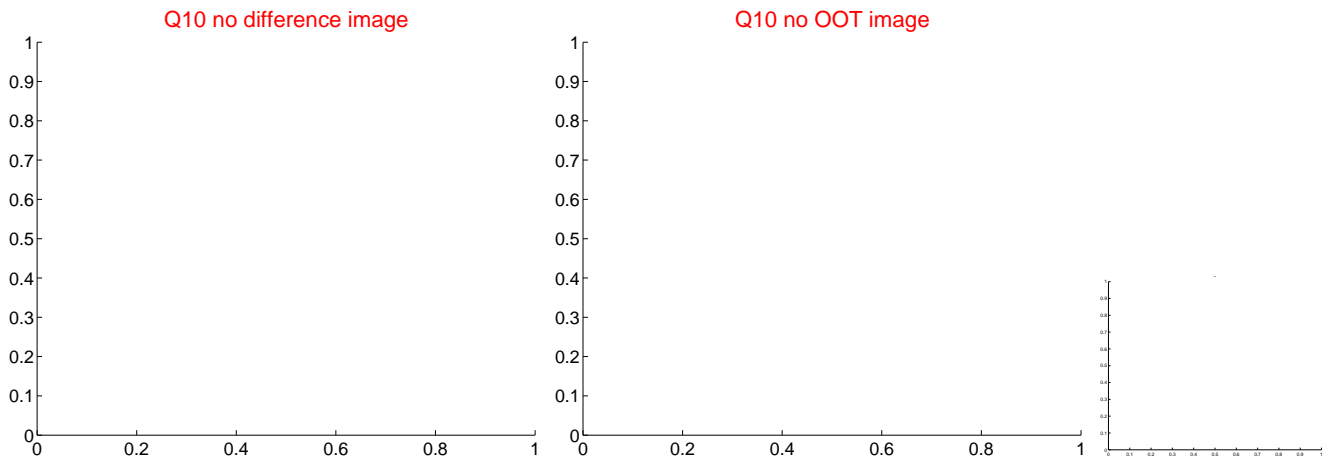
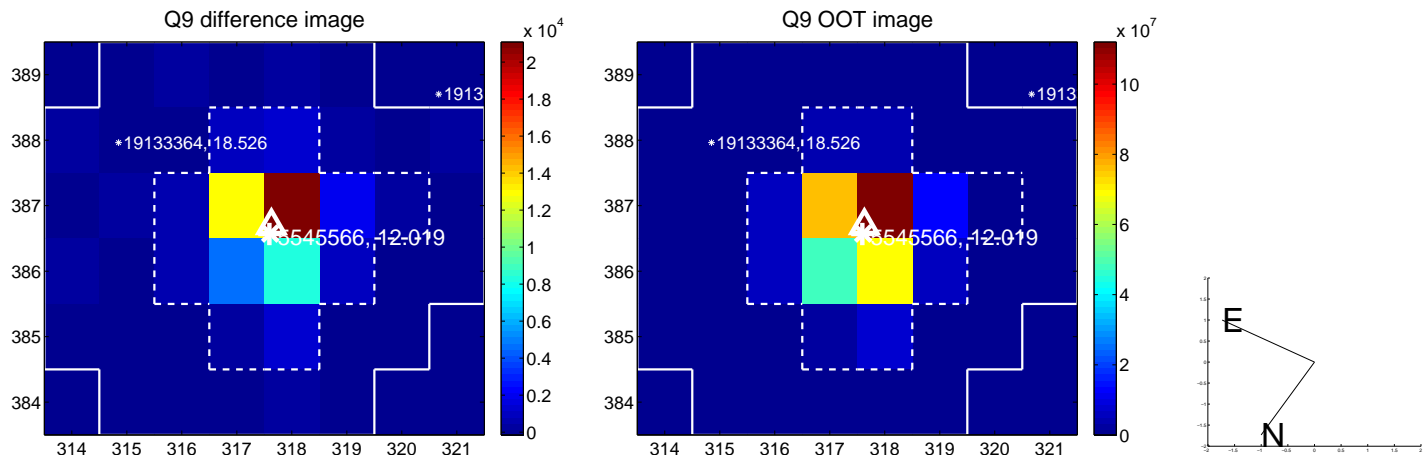


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

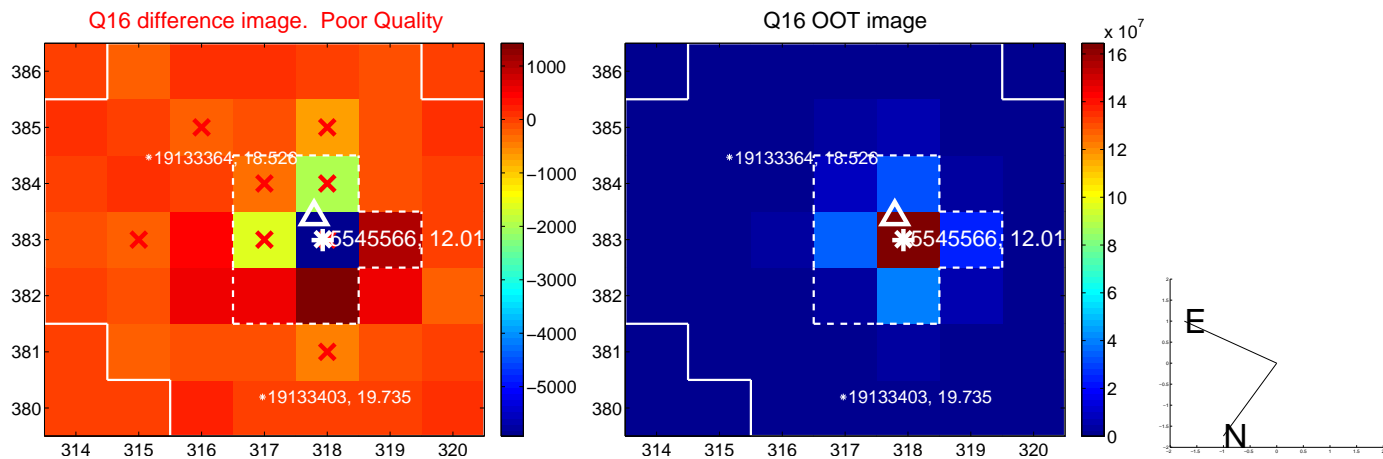
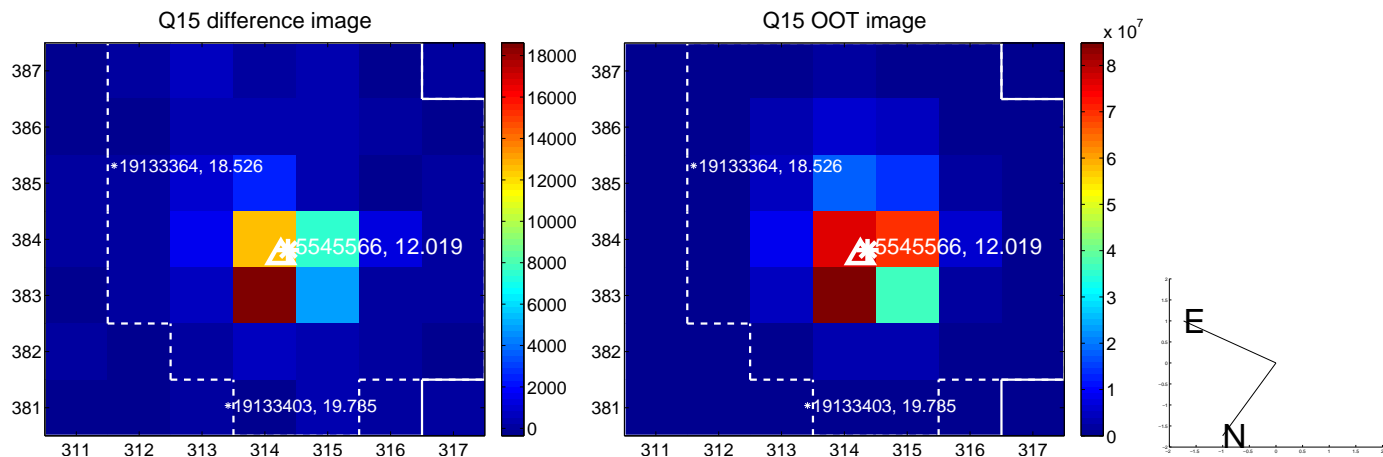
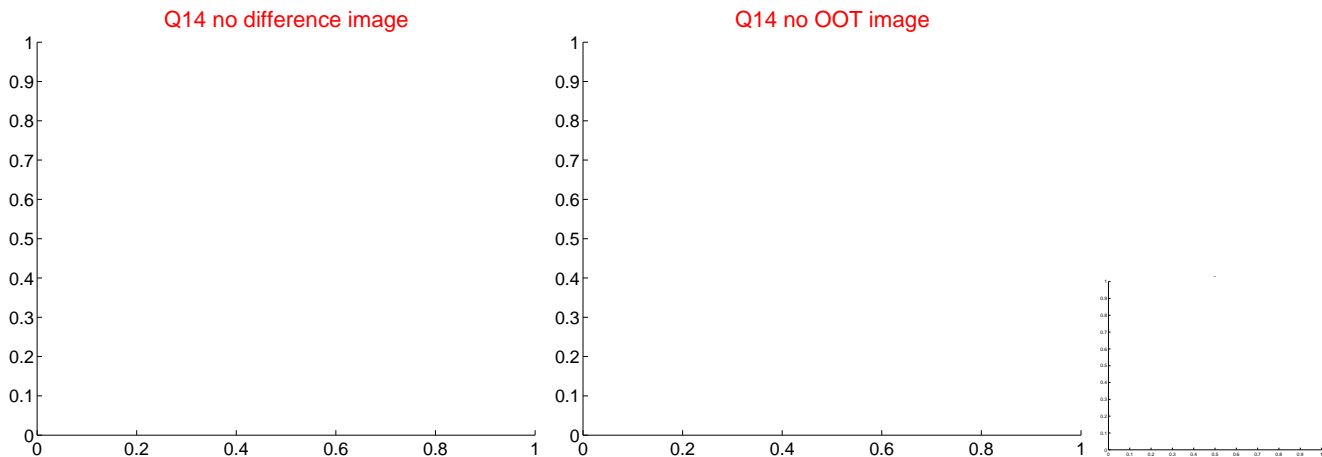
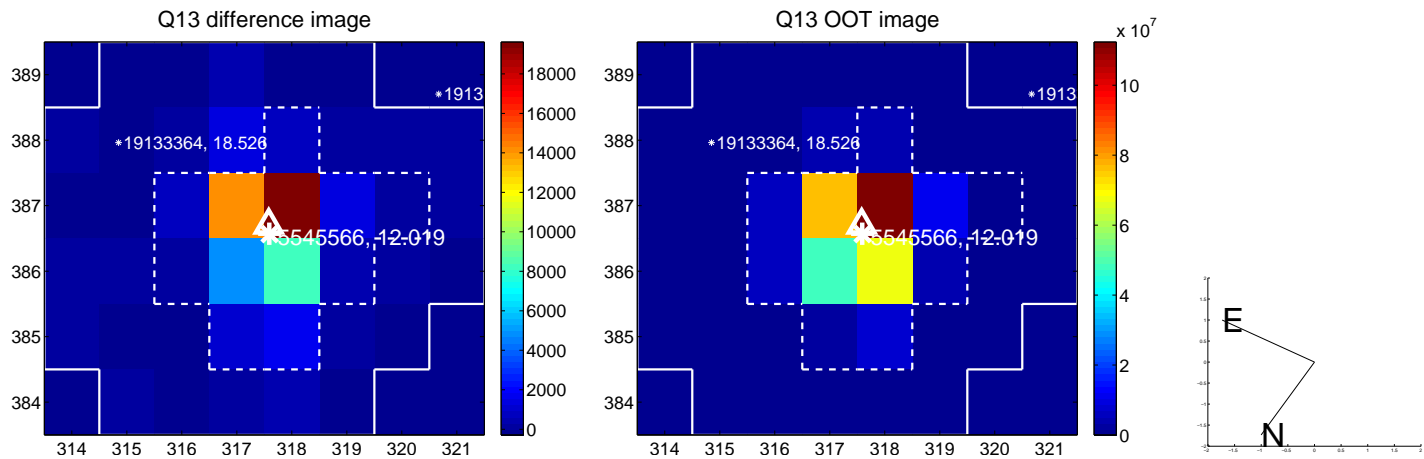




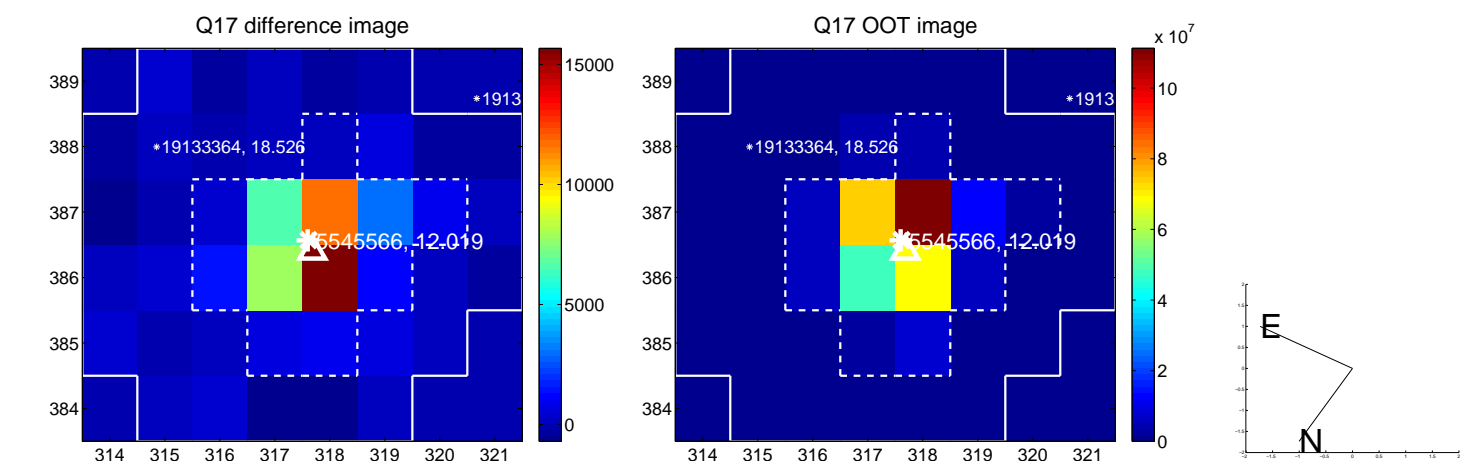
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



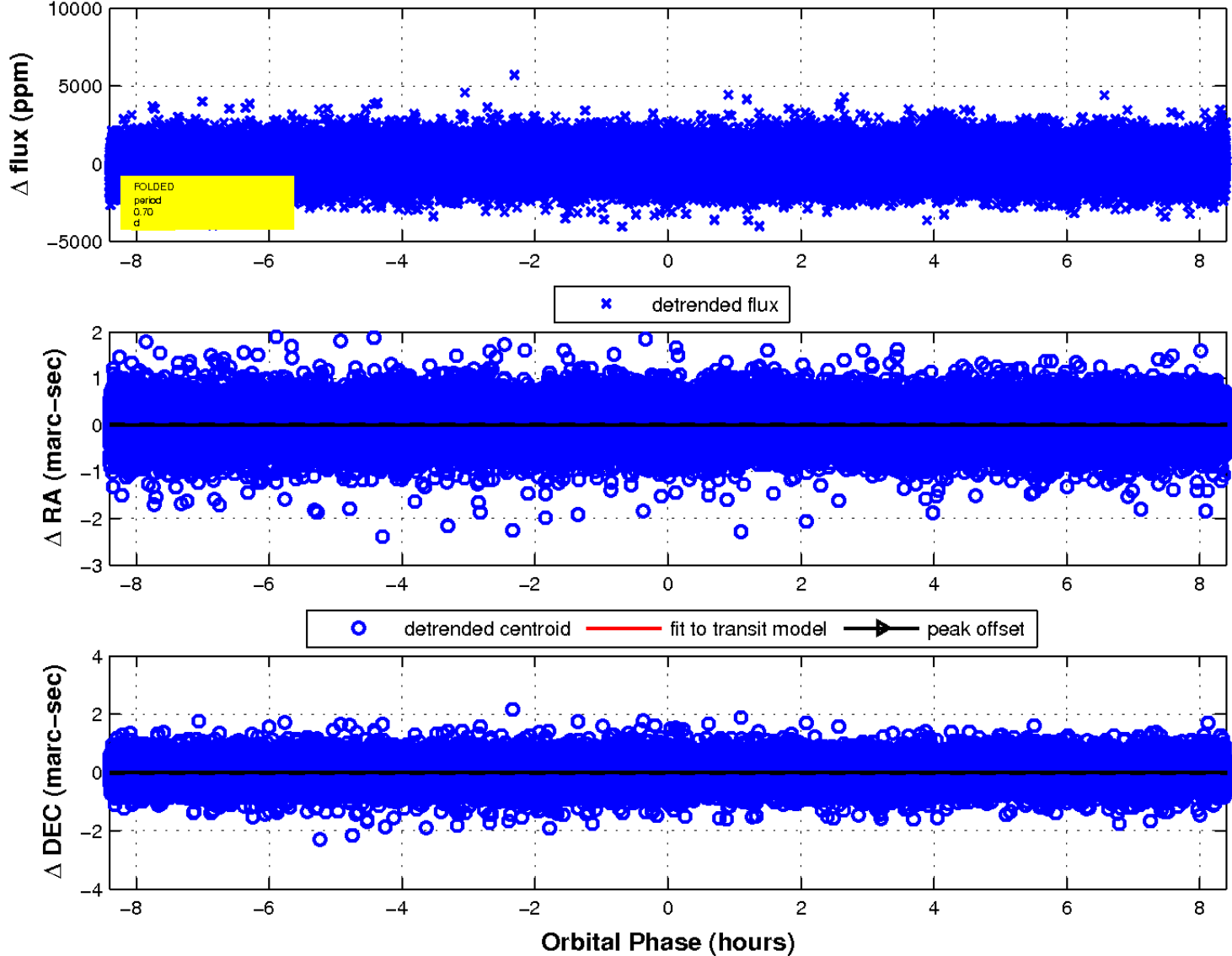
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



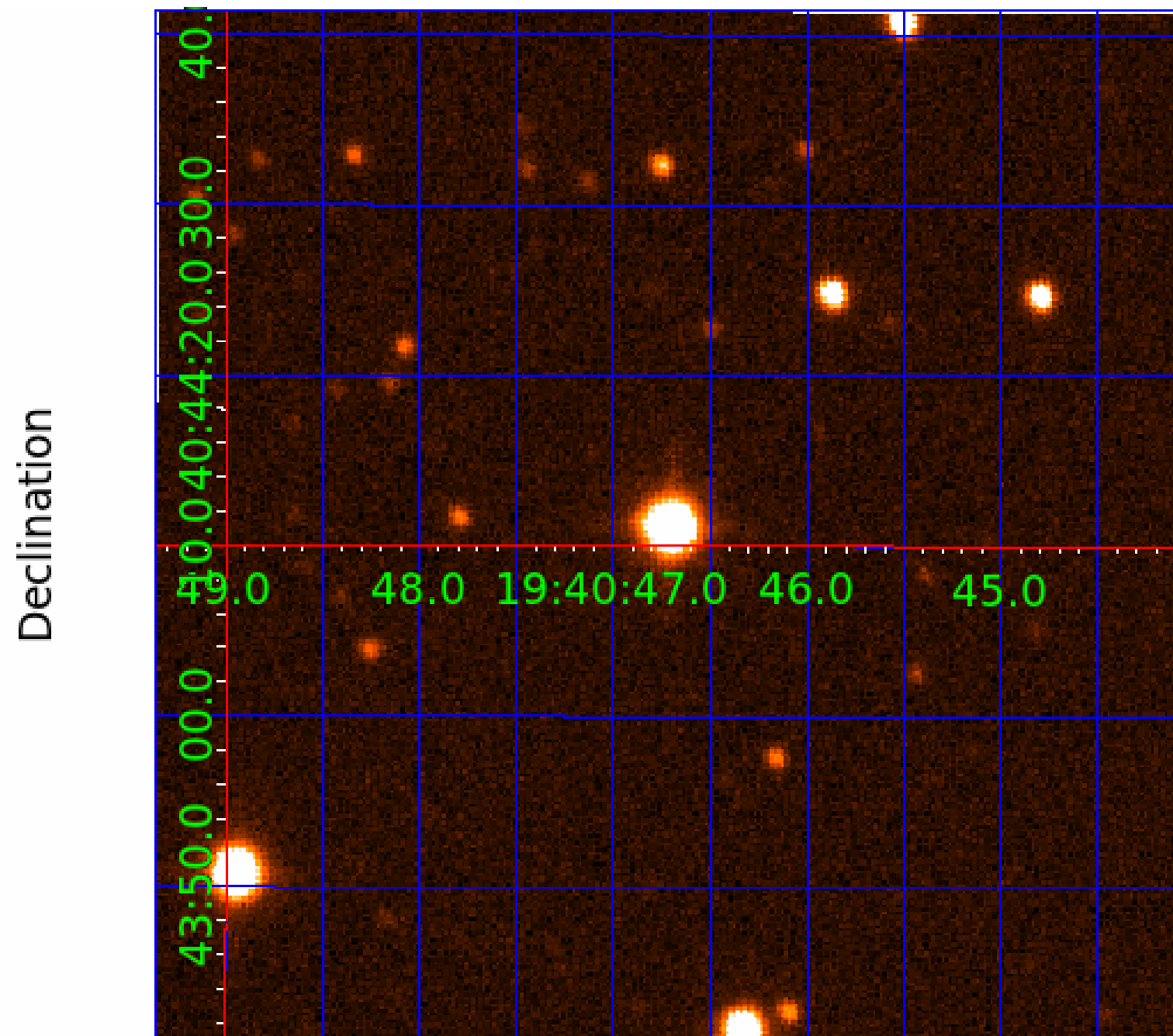
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image





# KIC 005545566

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005545566-01	OBS	No	0.700095	131.789373	72.5	3.043	11.1	10.6	1.94	7668	1.90	34153.15
005545566-02	OBS	No	1.555375	132.499949	119.0	7.287	8.4	7.9	1.94	7668	2.45	11781.30

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005545566-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
005545566-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT

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

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

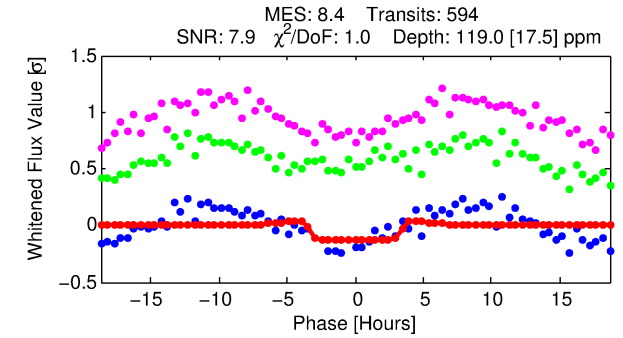
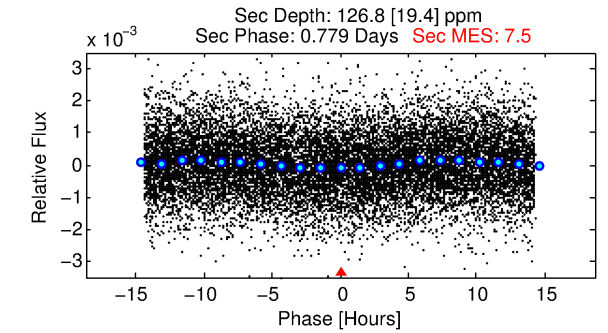
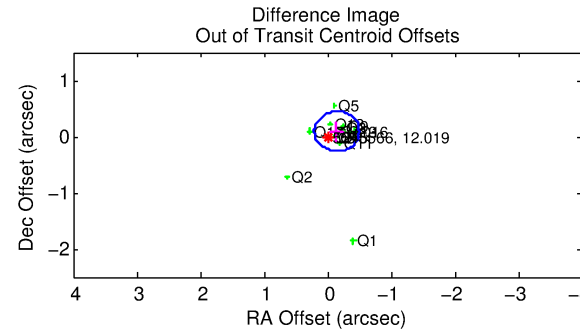
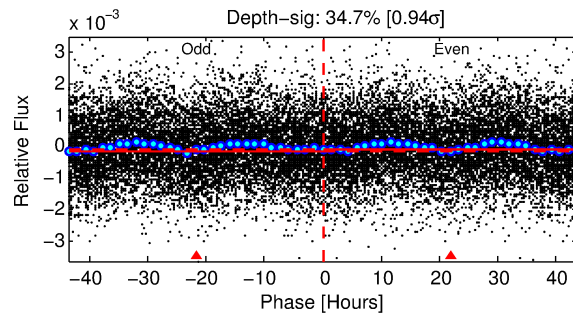
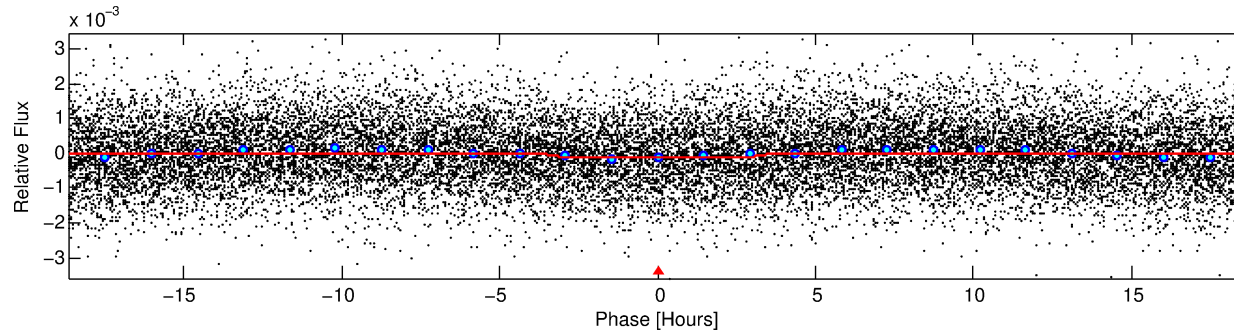
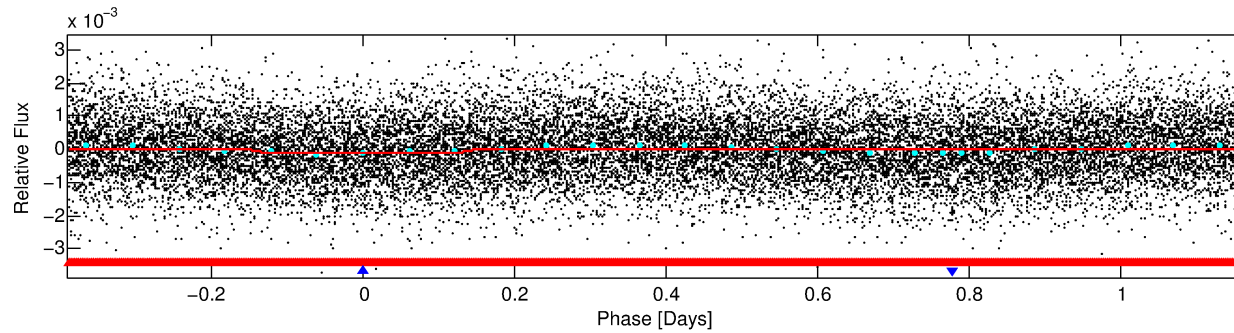
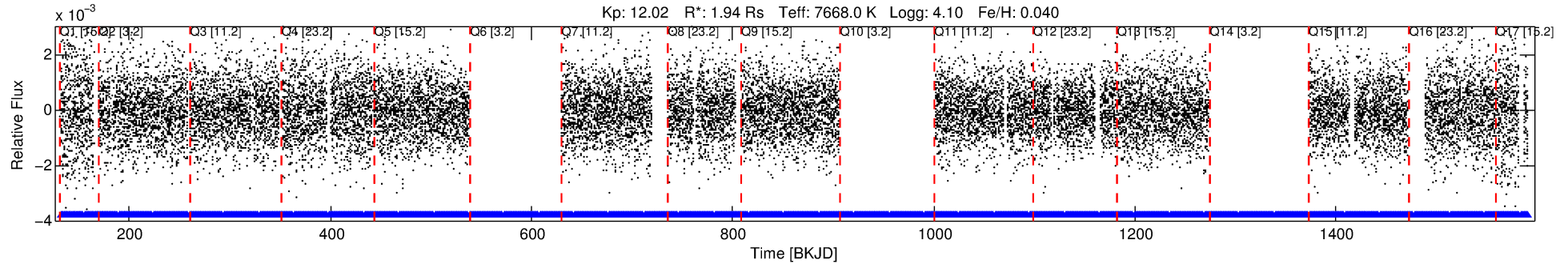
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005545566-02

No Significant Match Found

# DV One-Page Summary

KIC: 5545566 Candidate: 2 of 2 Period: 1.555 d



## DV Fit Results:

Period = 1.55537 [0.00003] d  
Epoch = 132.4999 [0.0089] BKJD  
Rp/R\* = 0.0116 [0.0034]  
a/R\* = 1.20 [0.70]  
b = 0.90 [0.39]  
Seff = 11781.30 [2783.76]  
Teq = 2657 [157] K  
Rp = 2.45 [0.87] Re  
a = 0.0315 [0.0051] AU  
Ag = 11.51 [7.54] [1.39 $\sigma$ ]  
Teffp = 7565 [1161] K [4.19 $\sigma$ ]

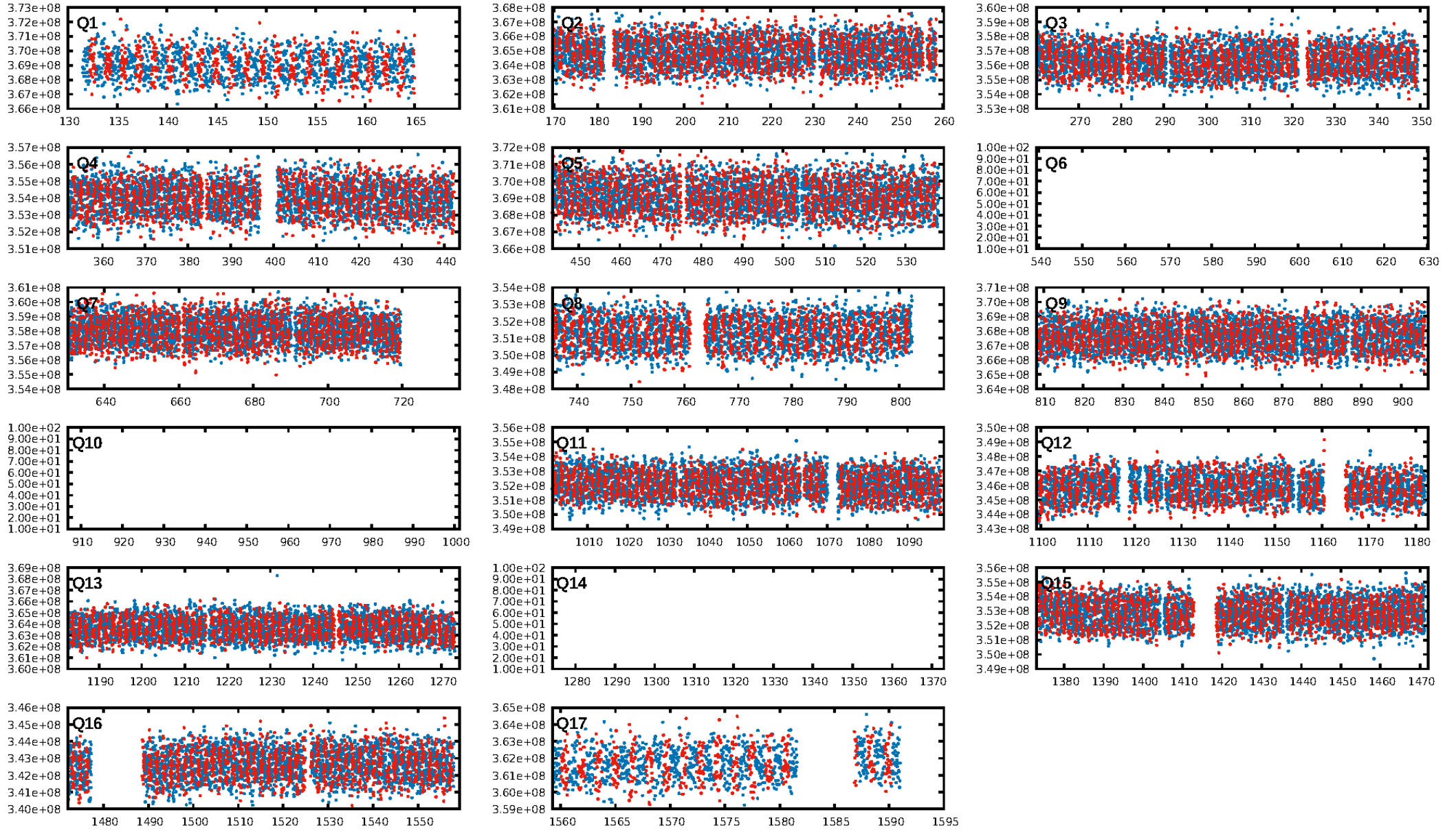
## DV Diagnostic Results:

ShortPeriod-sig: 99.1% [2.60 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.21e-10  
RollingBand-fgt: 1.00 [562/562]  
GhostDiagnostic-chr: 1.82  
Centroid-sig: 0.7%  
Centroid-so: 0.135 arcsec [1.30 $\sigma$ ]  
OotOffset-rm: 0.173 arcsec [1.47 $\sigma$ ]  
KicOffset-rm: 0.211 arcsec [1.43 $\sigma$ ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:08:56 Z

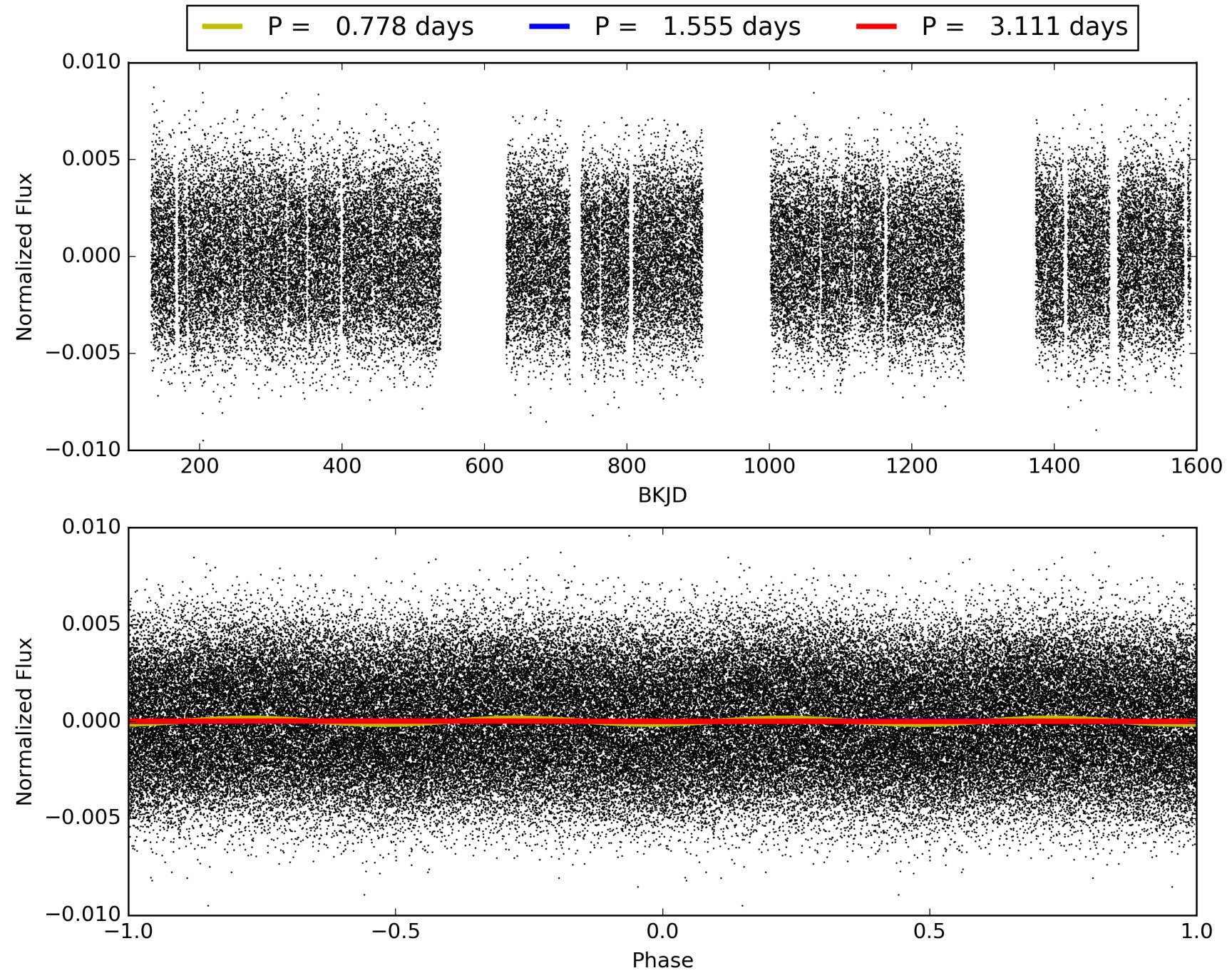
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005545566-02, PDC Light Curves





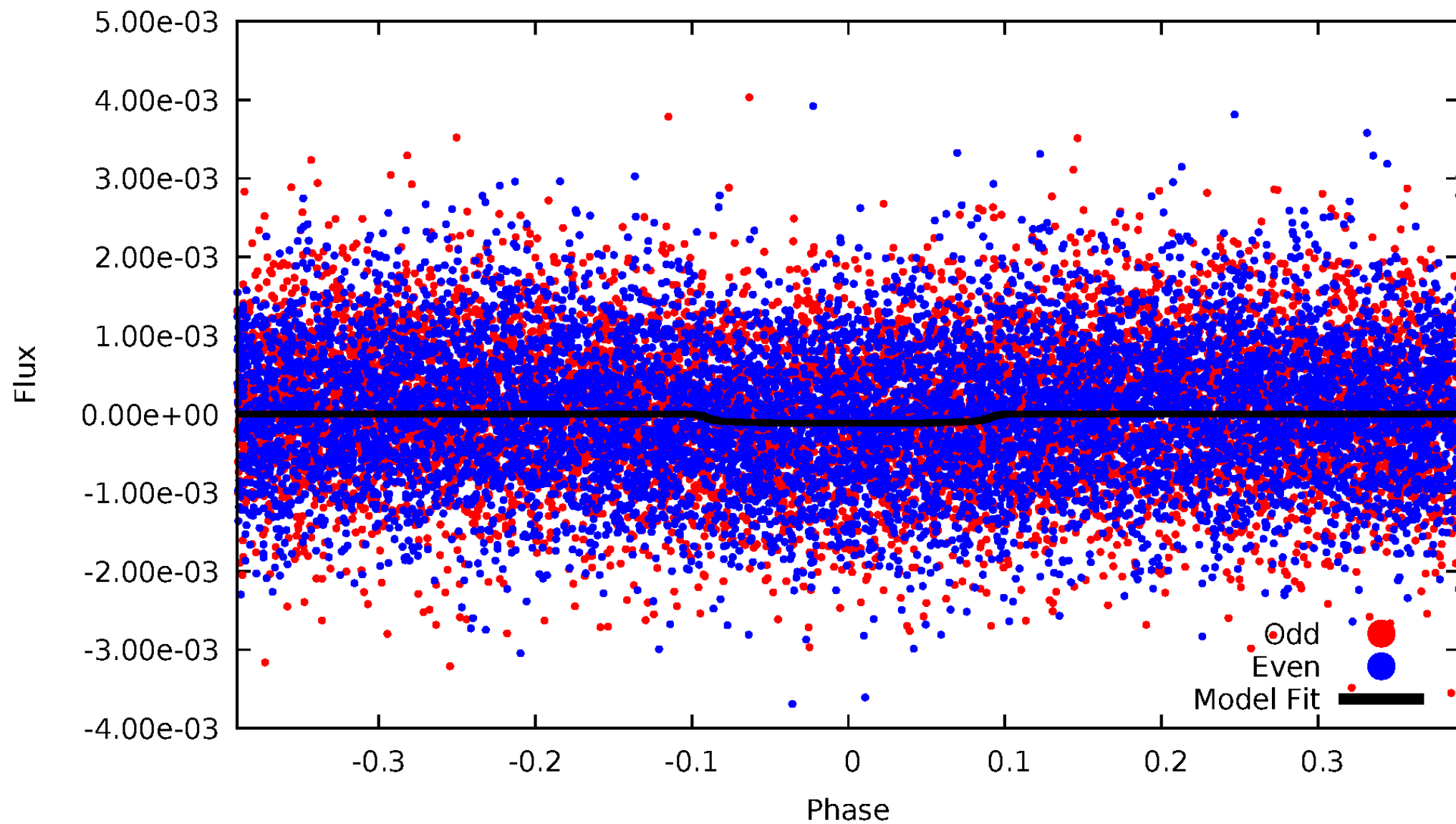
TCE 005545566-02





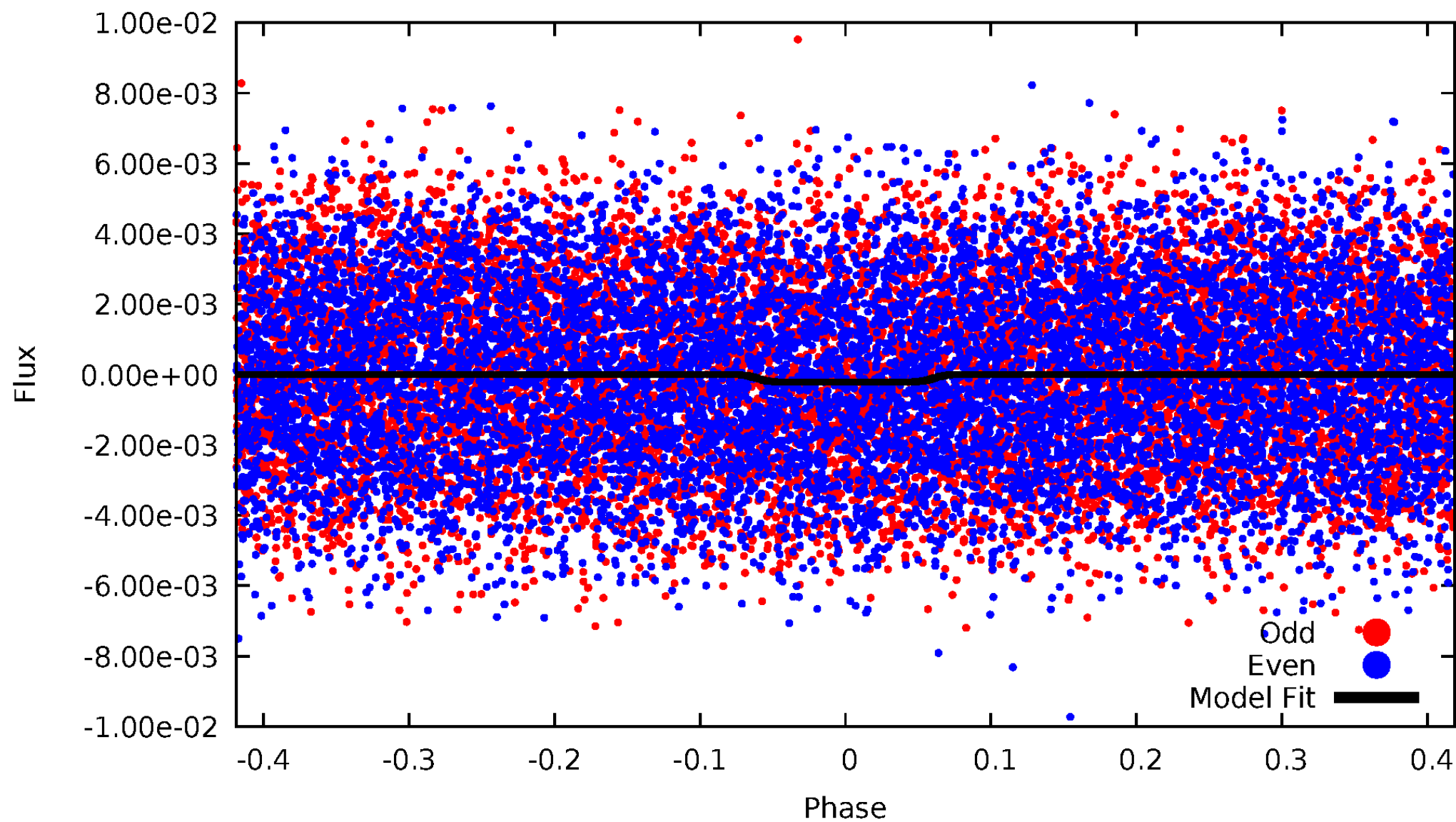
# DV Odd/Even

TCE 005545566-02



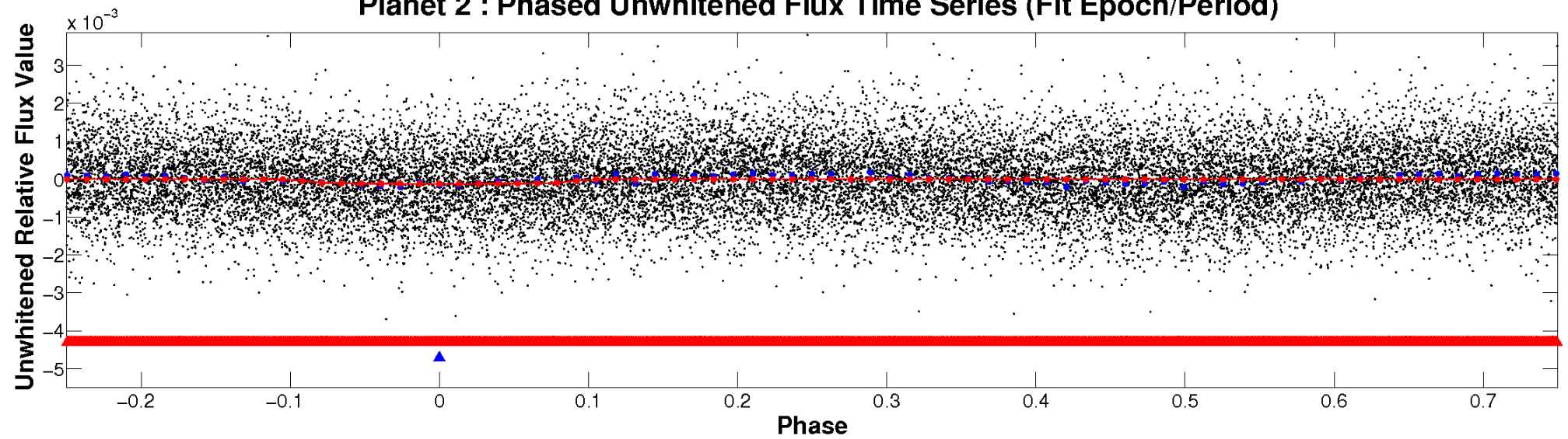
# ALT Odd/Even

TCE 005545566-02

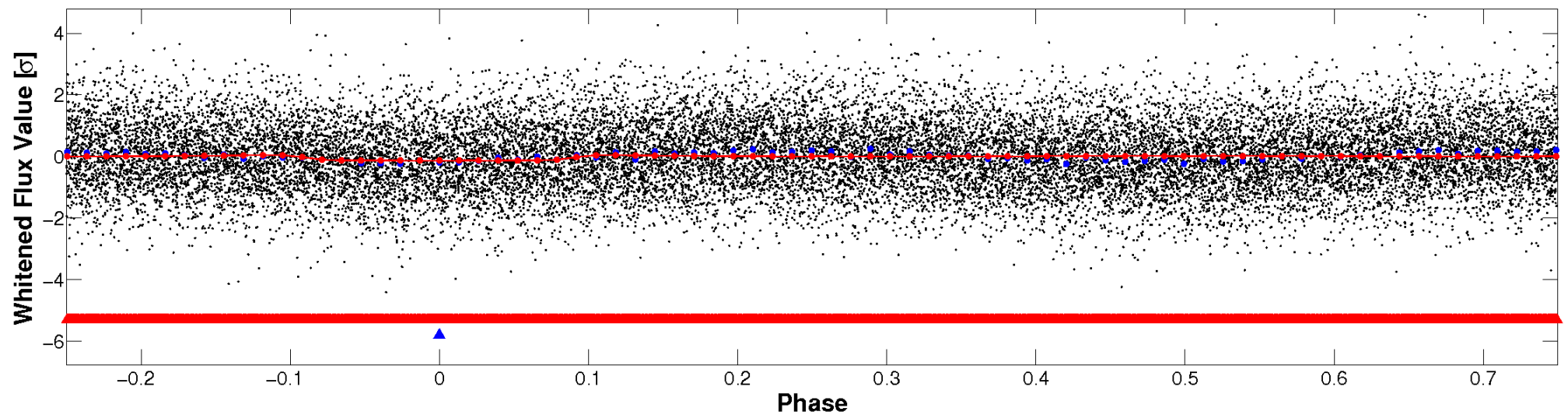


# Non-Whitened Vs. Whitened Light Curve

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

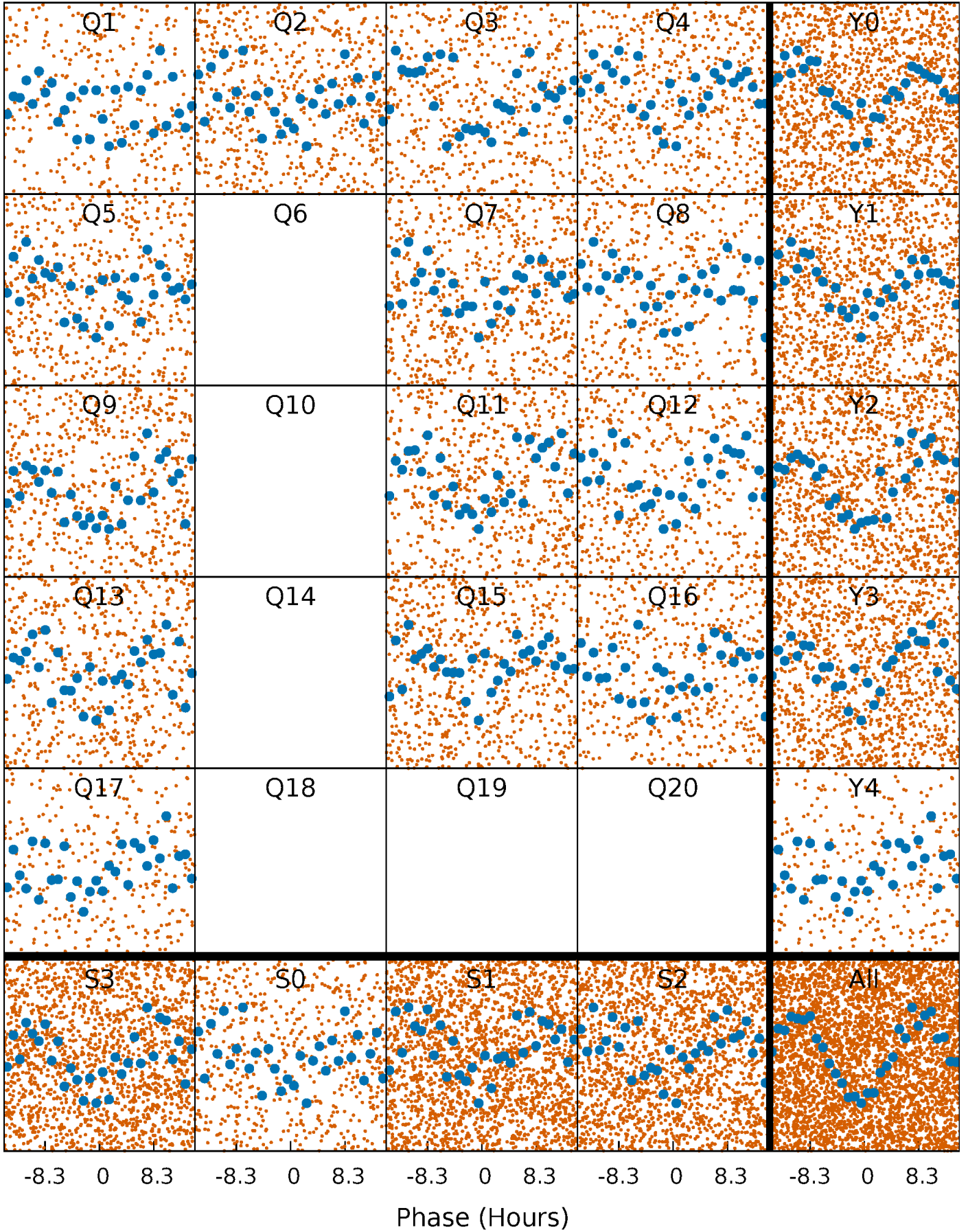


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

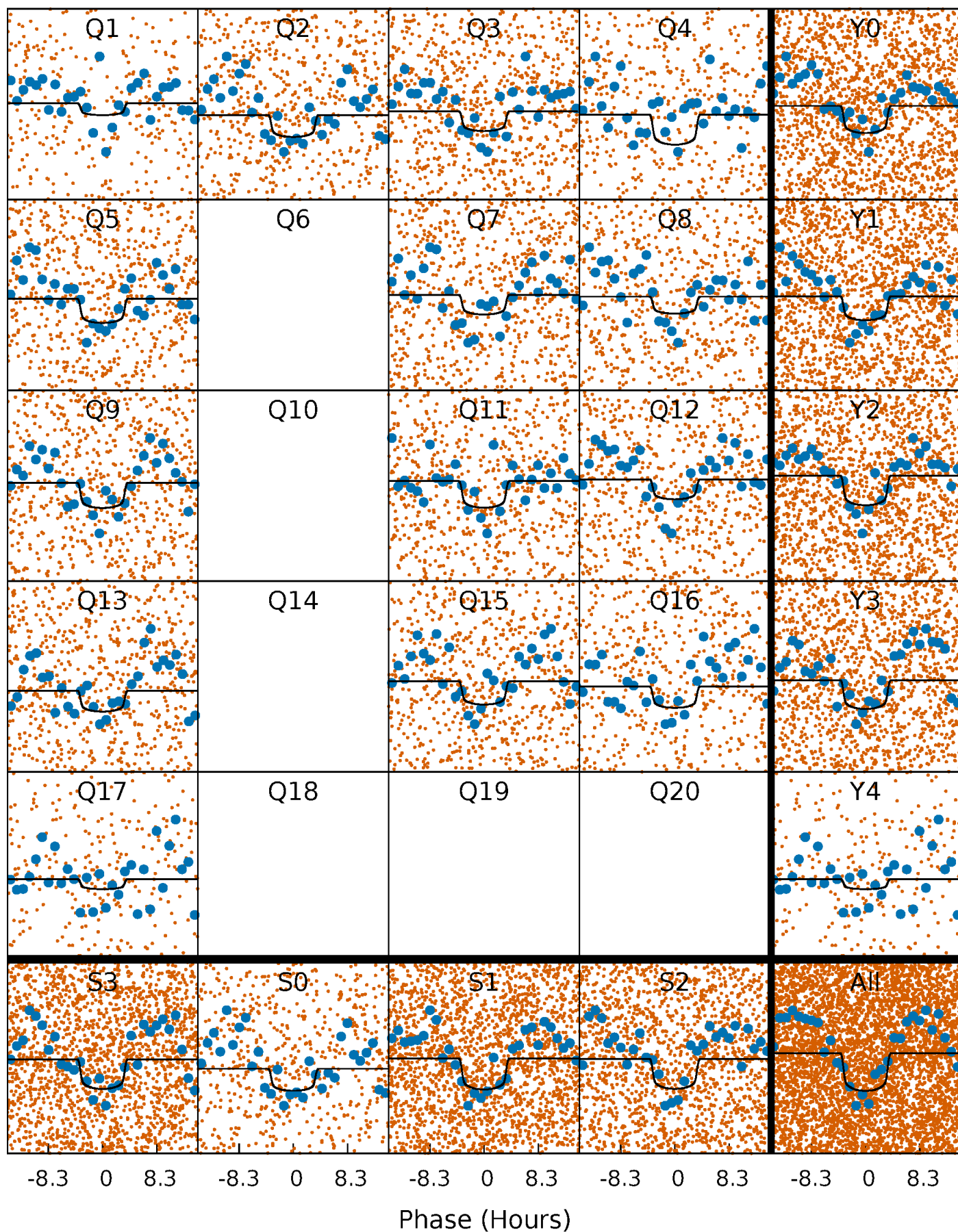
TCE 005545566-02   P= 1.555375 Days    $T_0=132.499949$  (BKJD)





# DV Quarter-Phased Transit Curves

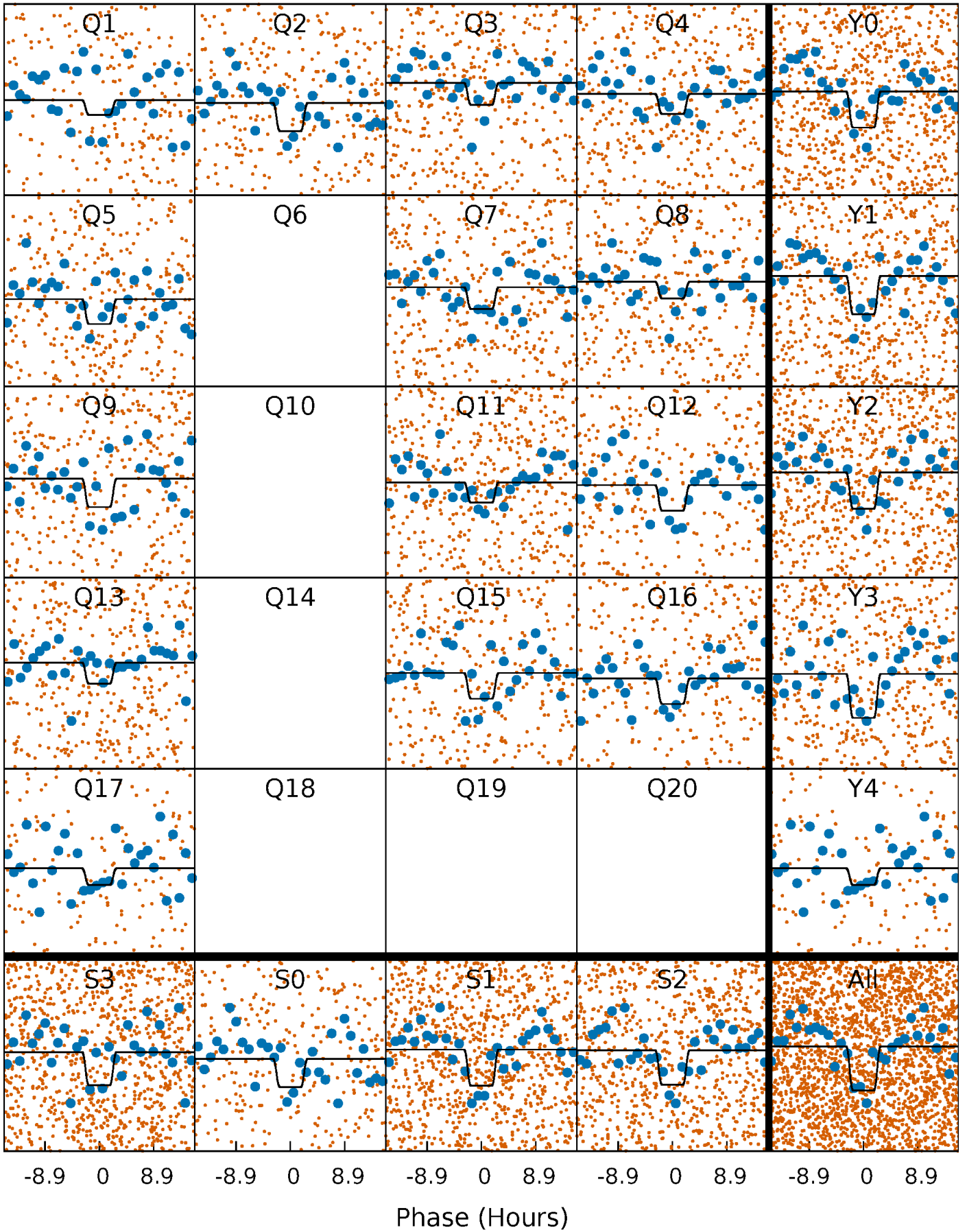
TCE 005545566-02 P= 1.555375 Days  $T_0=132.499949$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

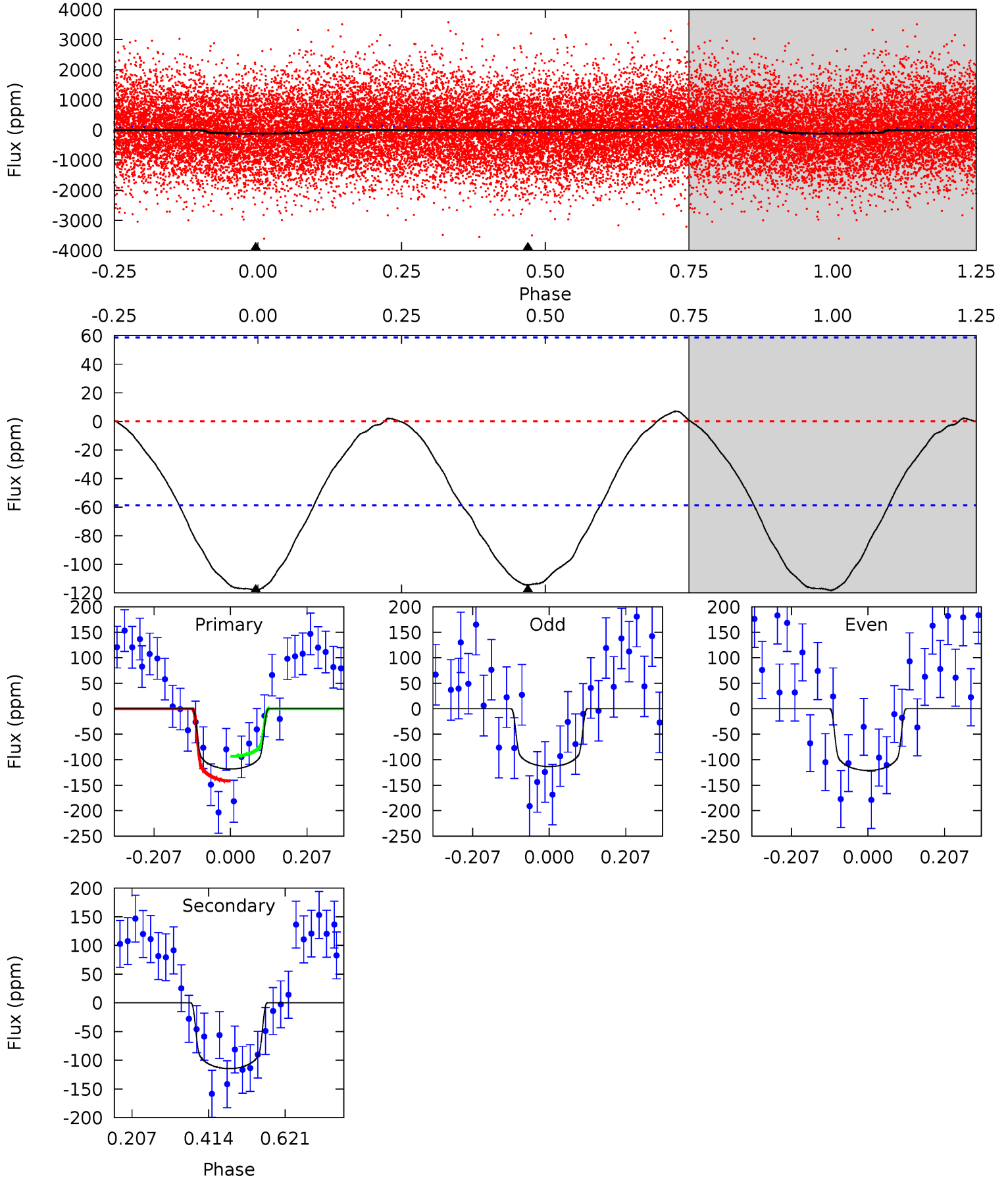
TCE 005545566-02 P= 1.555312 Days  $T_0=132.493971$  (BKJD)



# DV Model-Shift Uniqueness Test

005545566-02, P = 1.555375 Days, E = 130.944574 Days

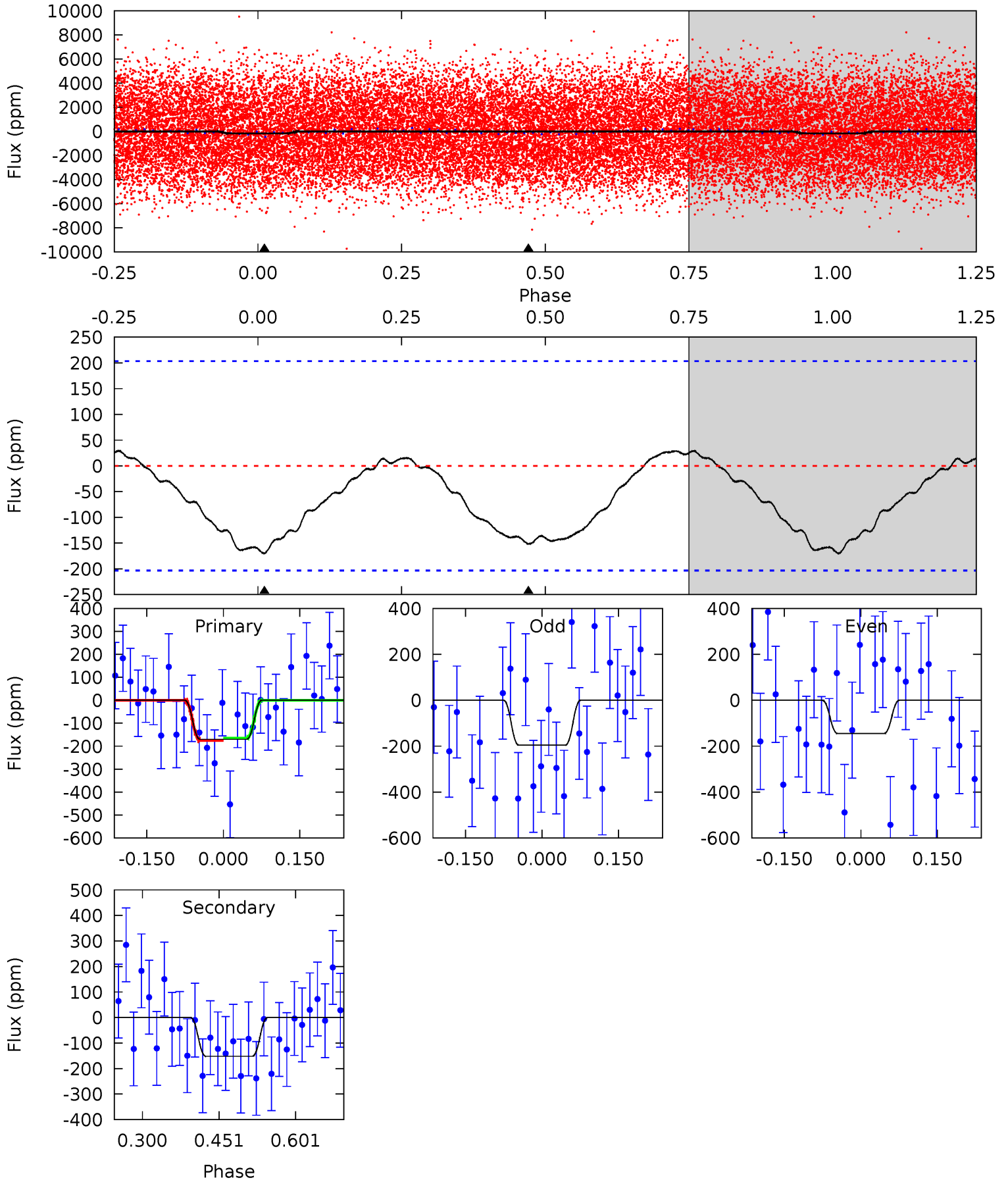
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.89	8.61	0	0	4.41	1.26	0.33	8.89	8.89	8.61	8.61	0.29	0.89	0.06	1.78



# Alt Model-Shift Uniqueness Test

005545566-02, P = 1.555312 Days, E = 130.938659 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
3.74	3.34	0	0	4.48	1.44	0.46	3.74	3.74	3.34	3.34	0.56	0.85	0.15	0.11



### Stellar Parameters For KIC 005545566

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7668^{+76}_{-84}$	$4.097^{+0.084}_{-0.126}$	$0.040^{+0.050}_{-0.200}$	$1.941^{+0.374}_{-0.249}$	$1.718^{+0.162}_{-0.145}$	$0.331^{+0.139}_{-0.123}$
	+1%/-1%	+2%/-3%	+125%/-500%	+19%/-13%	+9%/-8%	+42%/-37%
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 005545566-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-115 \pm 13$	$2.47^{+0.80}_{-0.75}$	$3728^{+166}_{-138}$	$7257^{+1864}_{-1043}$	$10^{+11}_{-4}$
Alt.	$-152 \pm 45$	$3.10^{+0.79}_{-0.75}$	$3736^{+173}_{-133}$	$6941^{+1375}_{-991}$	$8.431^{+7.198}_{-3.585}$

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

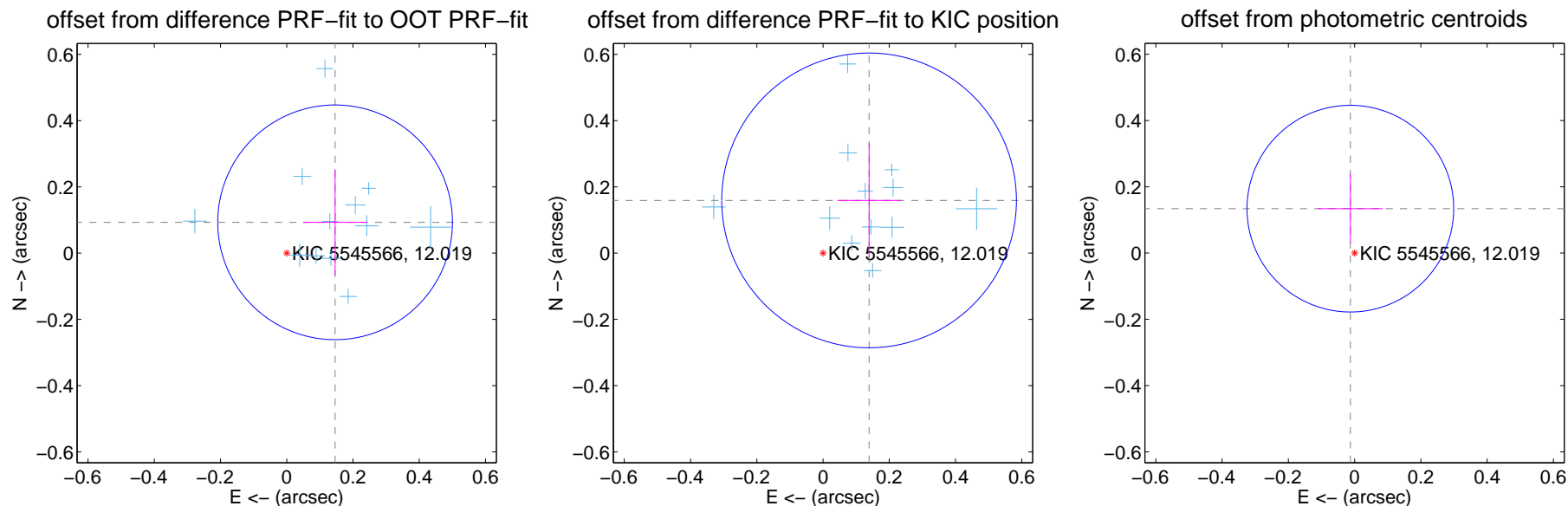
## DV Centroid Data

Supplemental centroid analysis for 005545566-02. Kepler magnitude: 12.02. Transit SNR 7.94

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

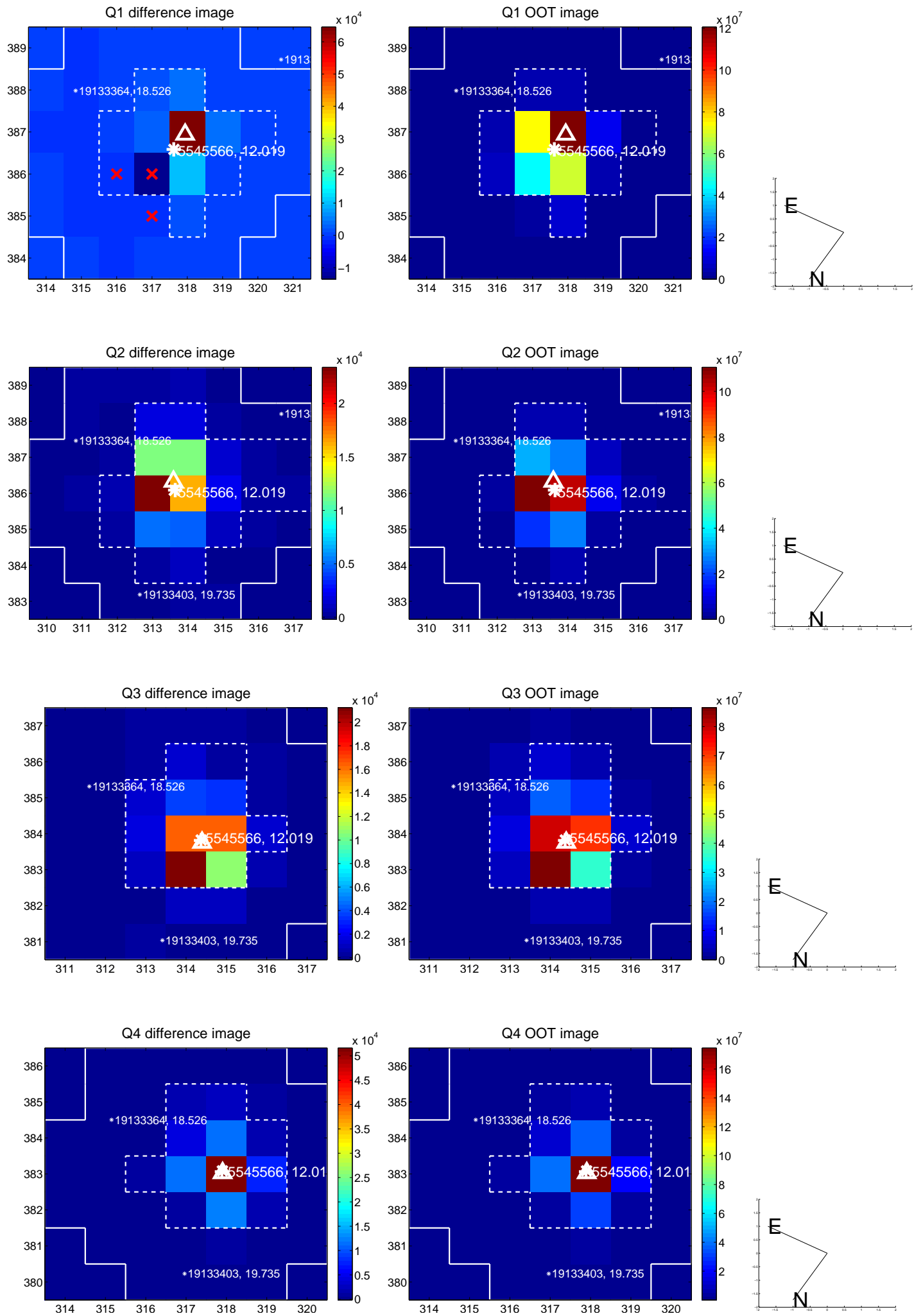
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.173 \pm 0.118$	1.47	$-0.146 \pm 0.097$	$0.093 \pm 0.160$
PRF-fit source offset from KIC position	$0.211 \pm 0.148$	1.43	$-0.139 \pm 0.096$	$0.159 \pm 0.173$
photometric centroid source offset	$0.13 \pm 0.10$	1.30	$0.01 \pm 0.10$	$0.13 \pm 0.10$



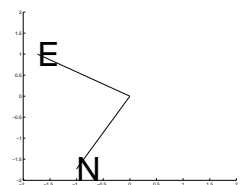
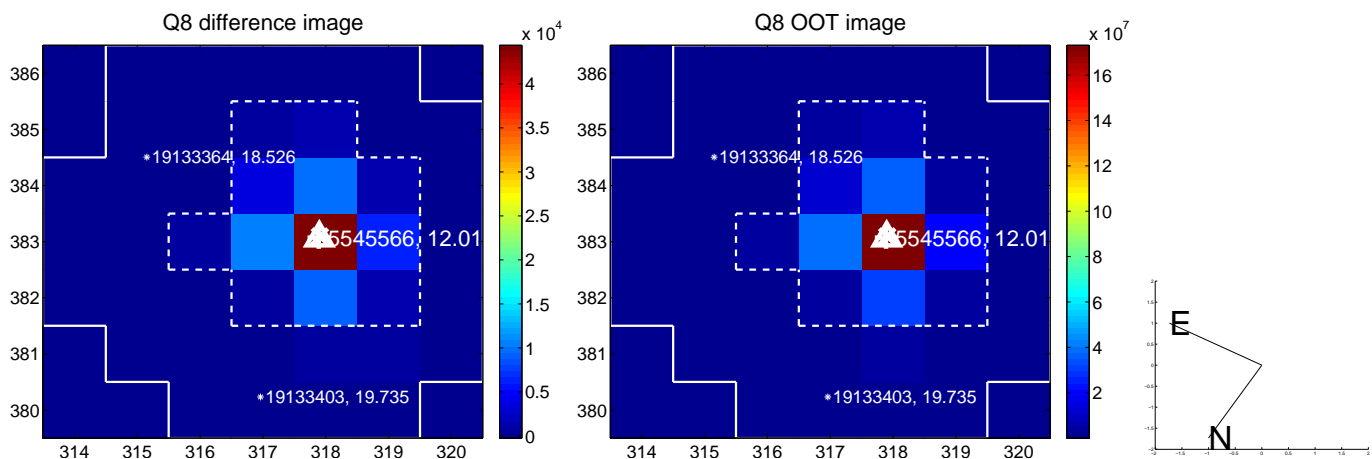
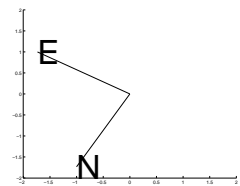
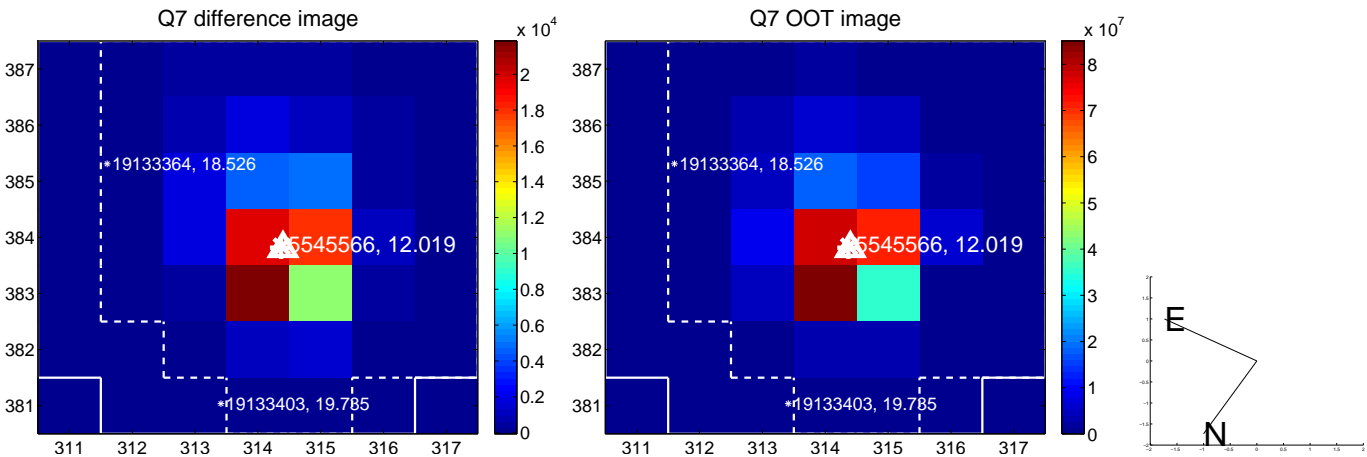
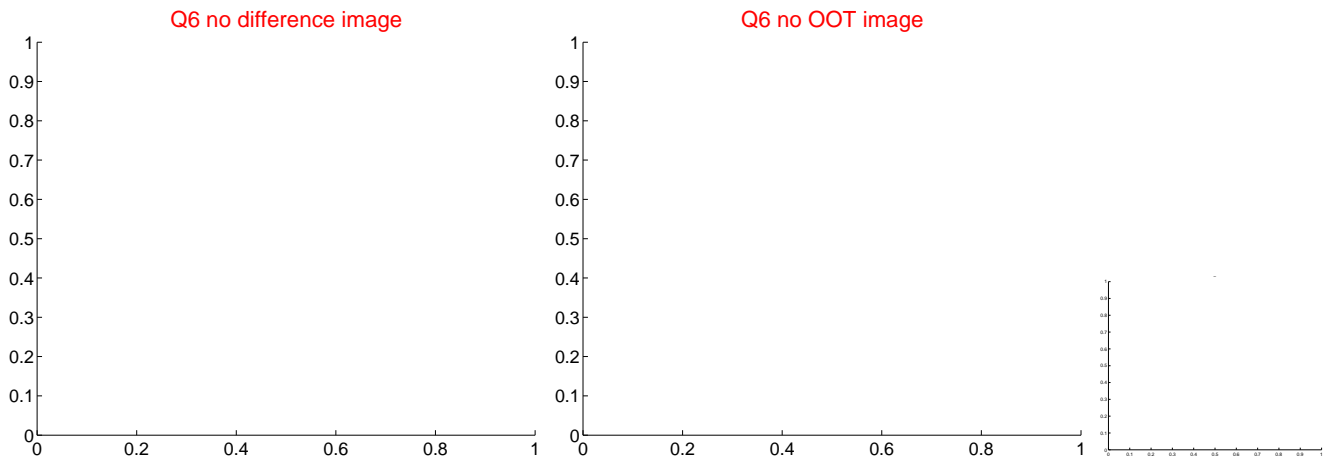
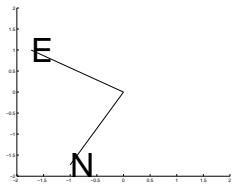
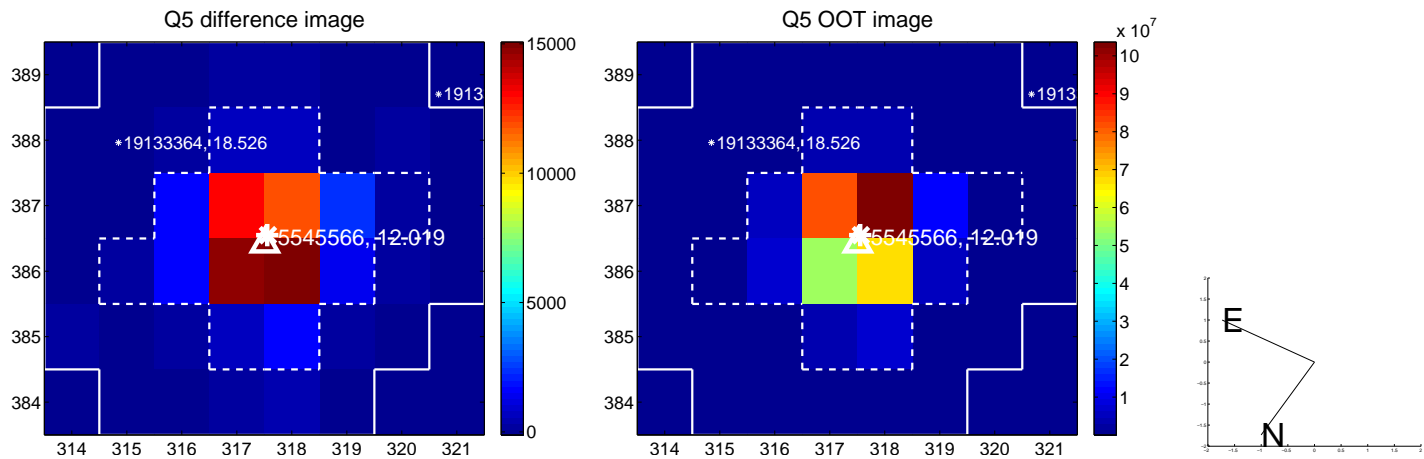
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



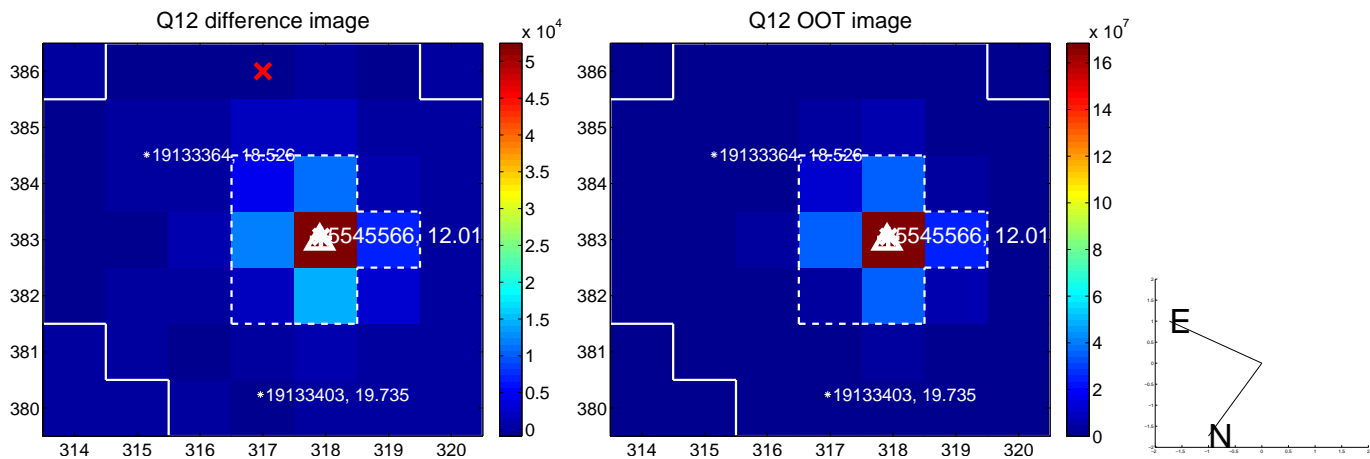
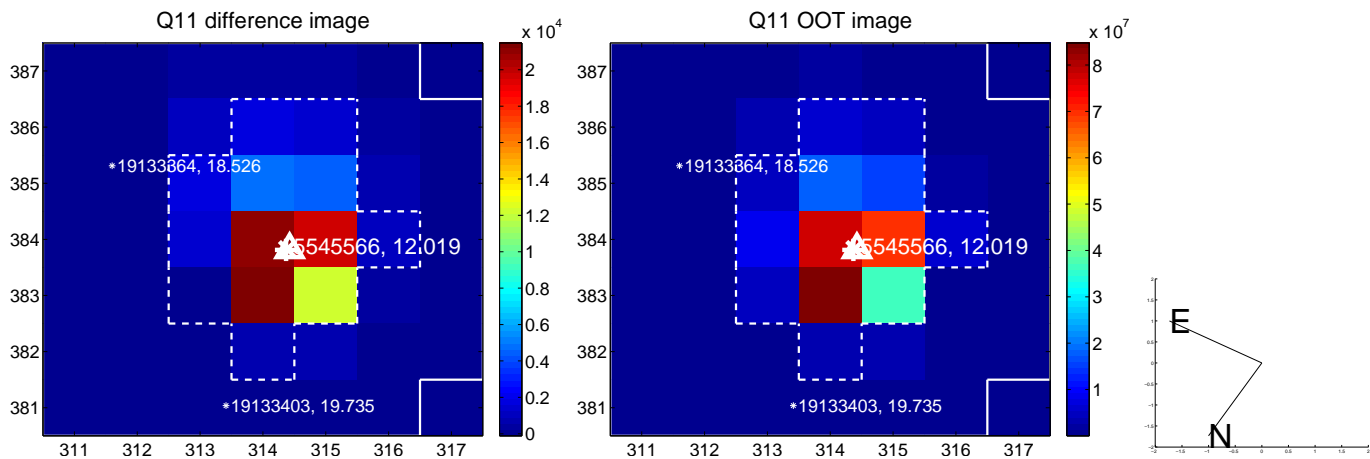
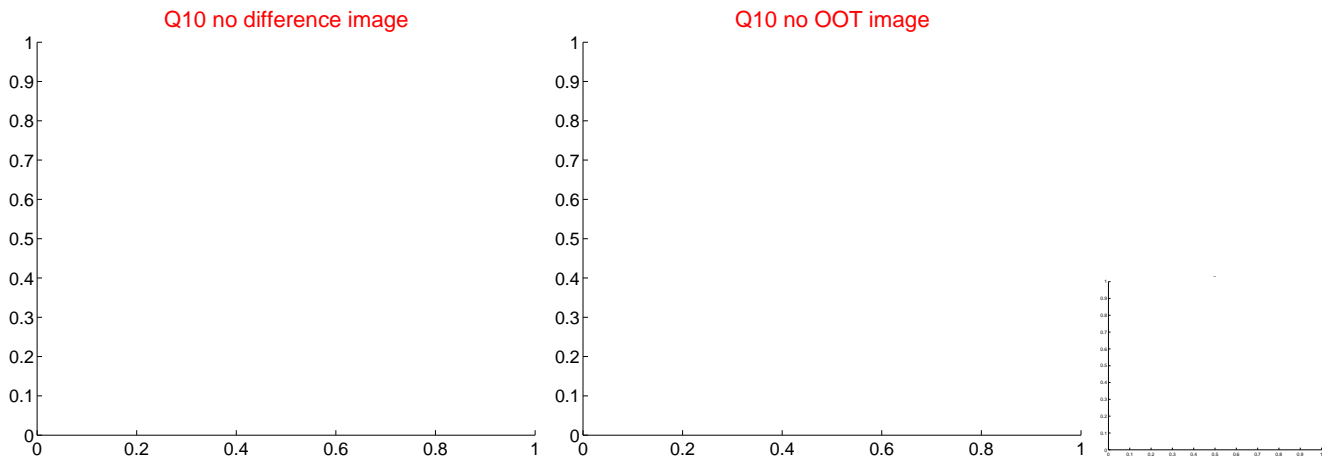
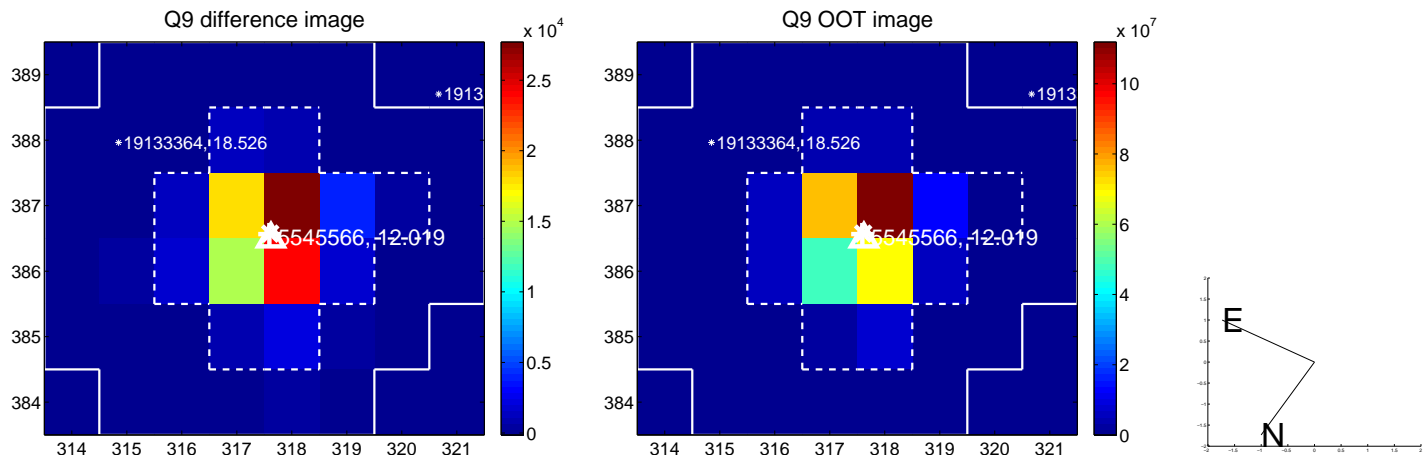
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



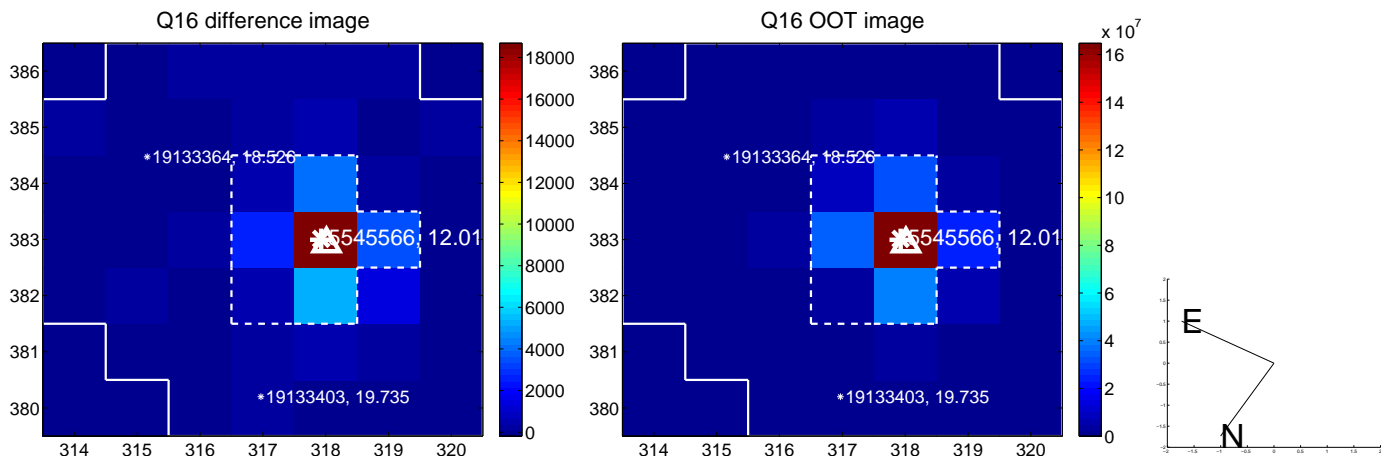
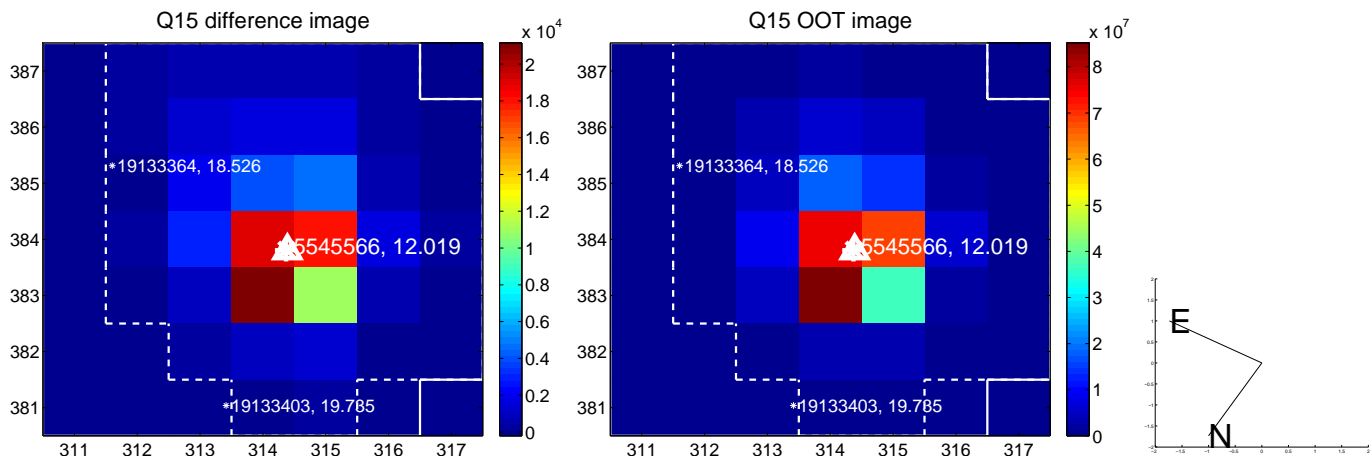
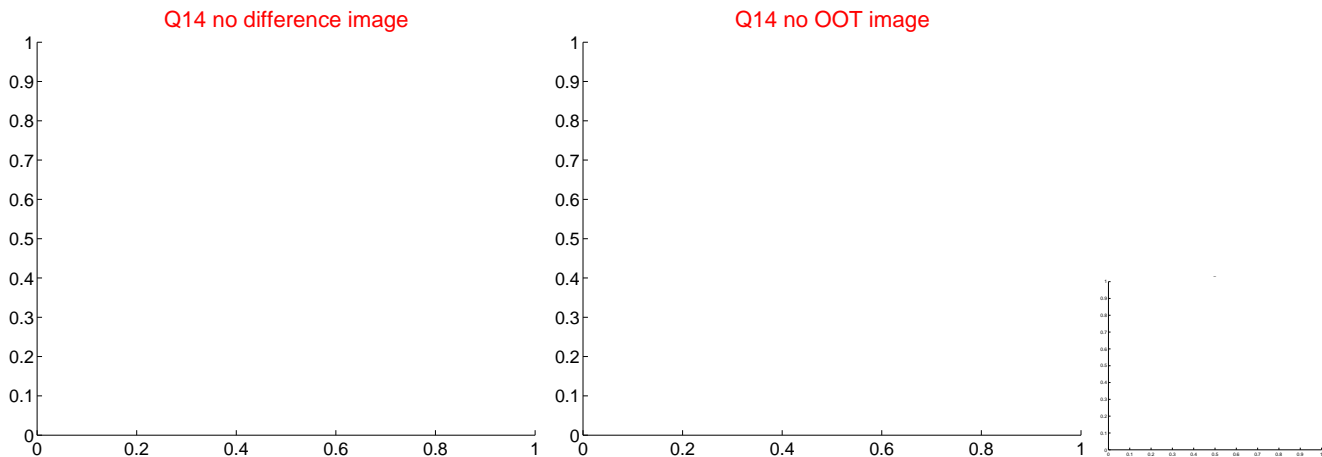
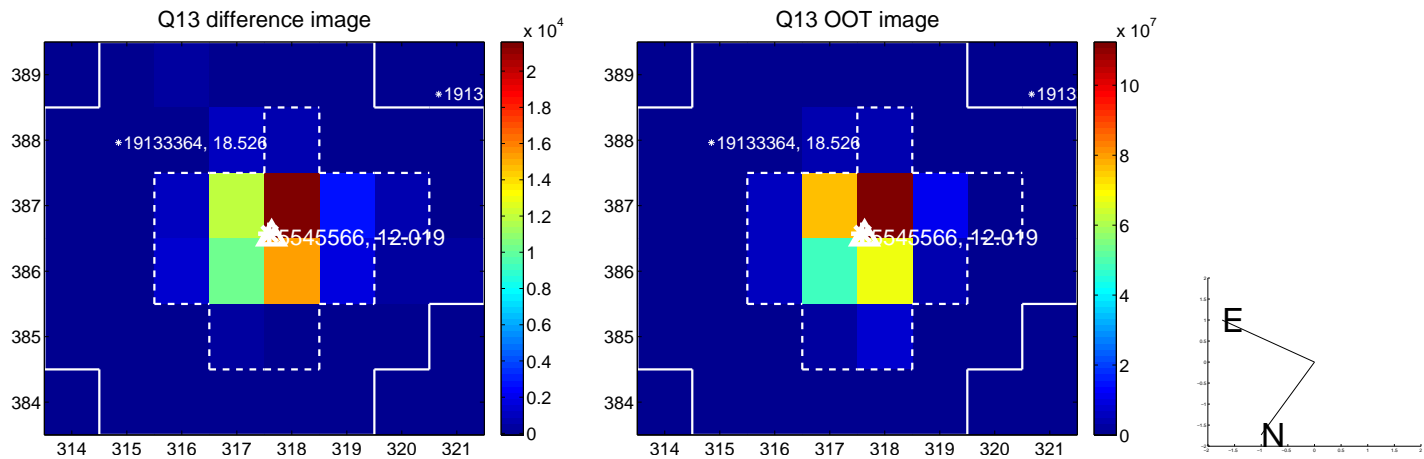
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



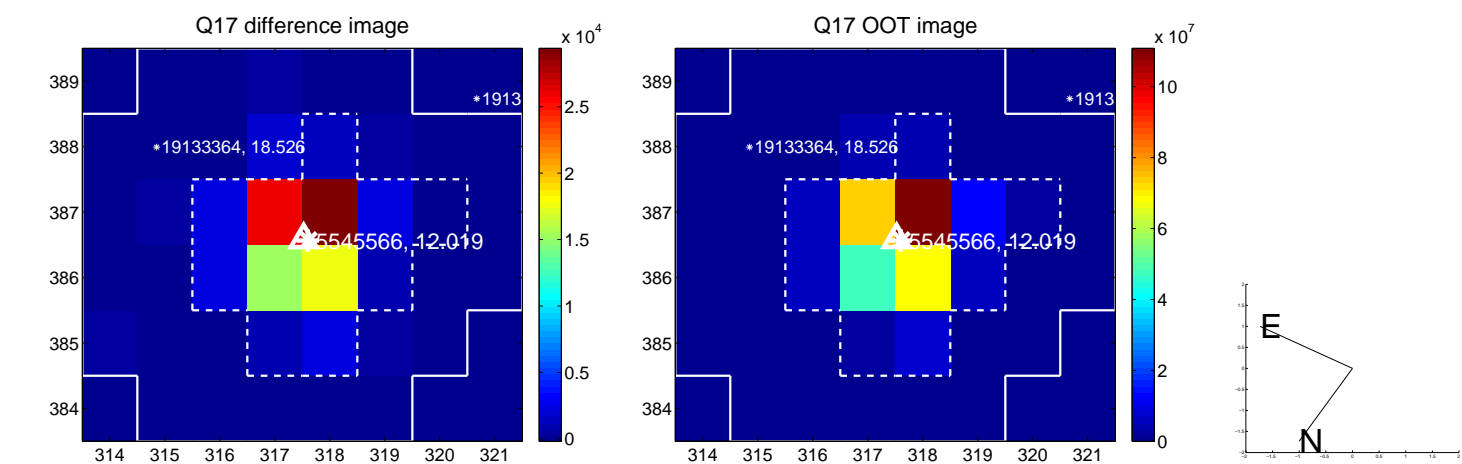
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



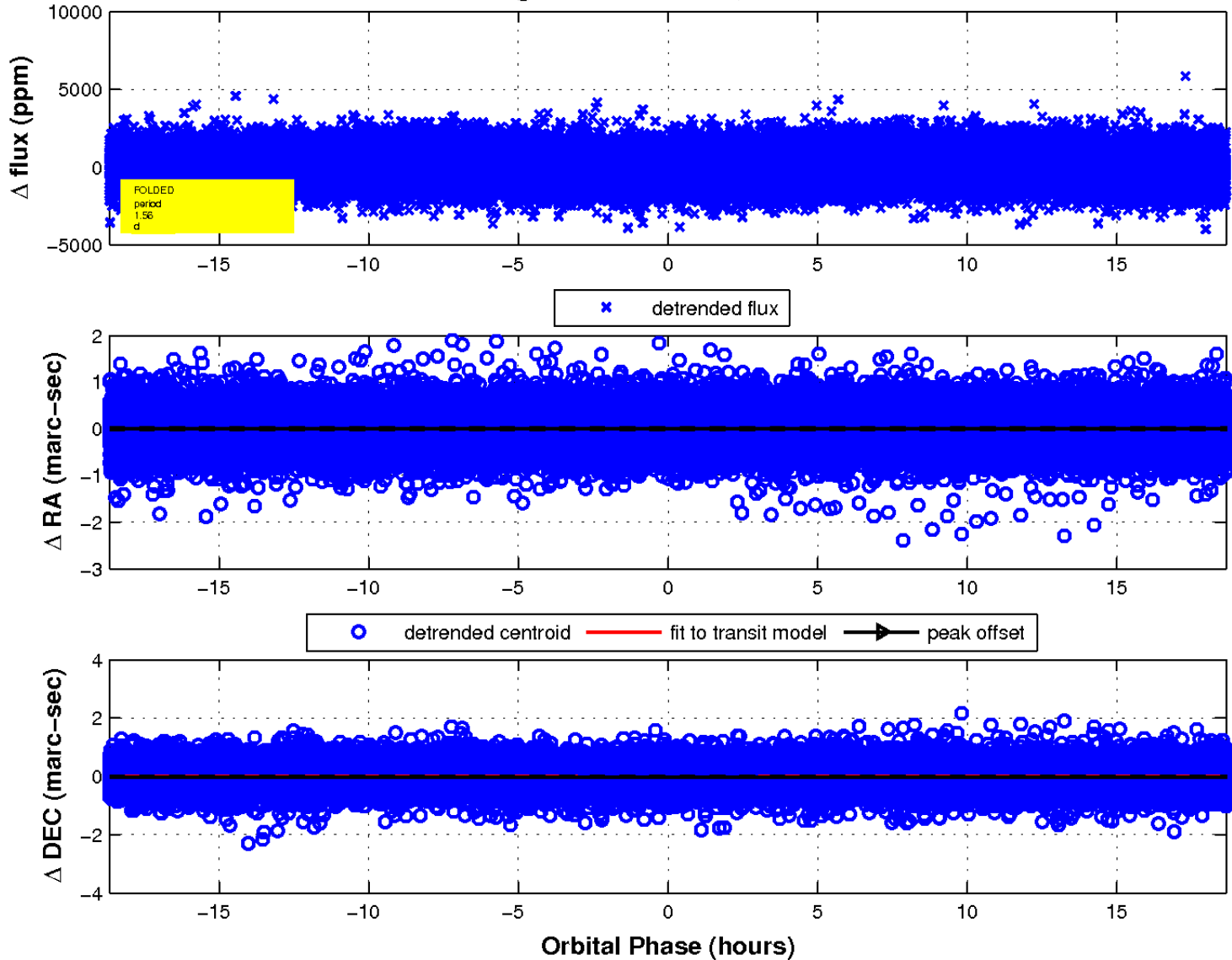
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2





UKIRT Image

