

# KIC 011546211

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011546211-01	OBS	1654.01	1.097203	131.521182	33932.1	1.626	1357.0	827.2	0.33	3497	6.64	70.98
011546211-02	OBS	No	356.921262	280.287680	653.8	2.531	12.8	2.2	0.33	3497	0.89	0.03
011546211-03	OBS	No	304.408608	256.428099	101.7	4.536	12.0	0.3	0.33	3497	0.34	0.04
011546211-04	OBS	No	334.949840	271.870183	2407.5	5.509	13.3	7.1	0.33	3497	1.67	0.04
011546211-05	OBS	No	206.226906	336.876001	4129.3	2.894	12.8	9.0	0.33	3497	2.17	0.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011546211-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_ODDEVEN_ALT—CENT_KIC_POS
011546211-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011546211-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011546211-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_FEW_DIFFS
011546211-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS

**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.

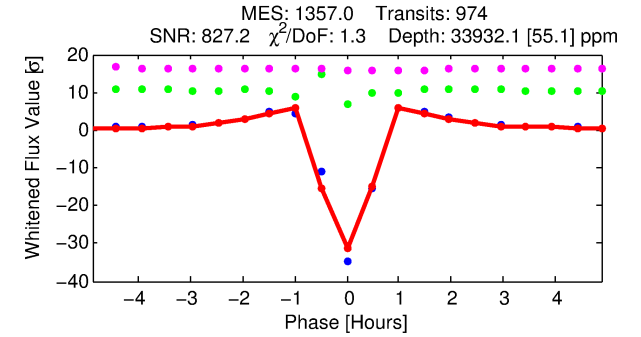
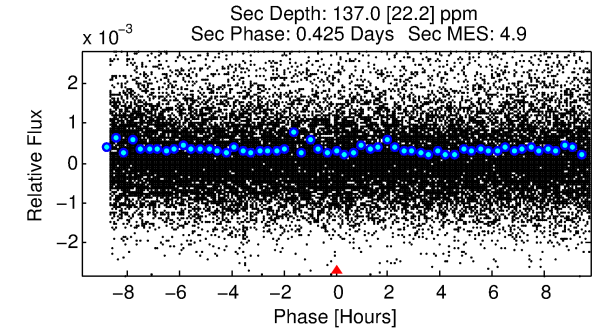
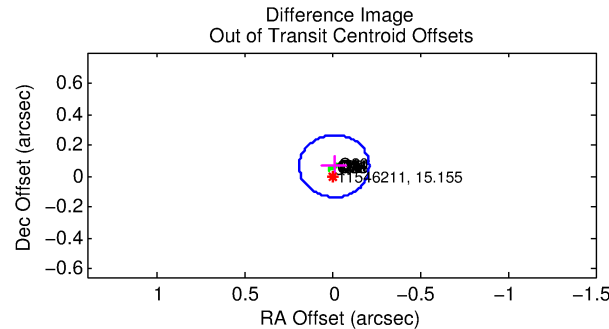
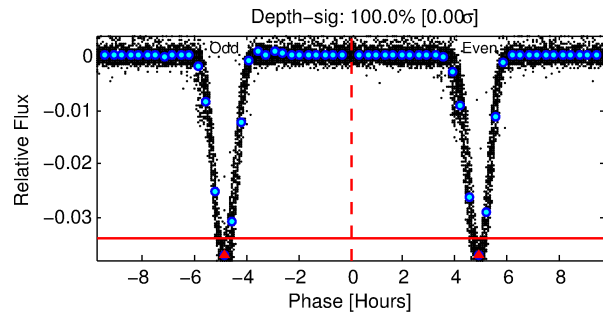
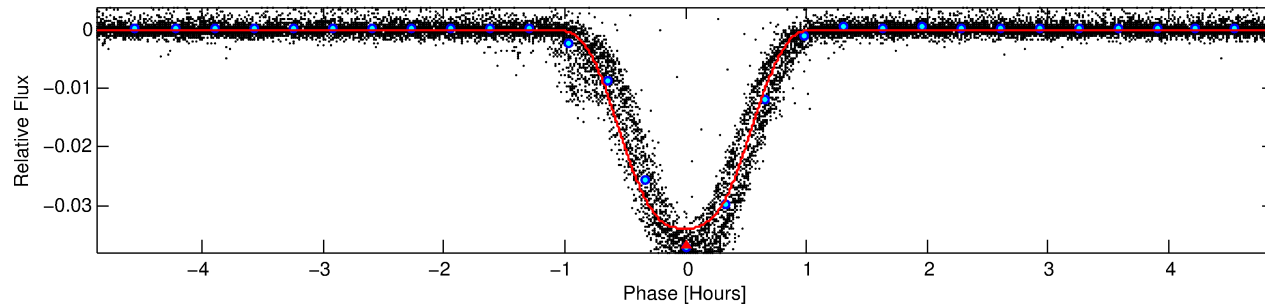
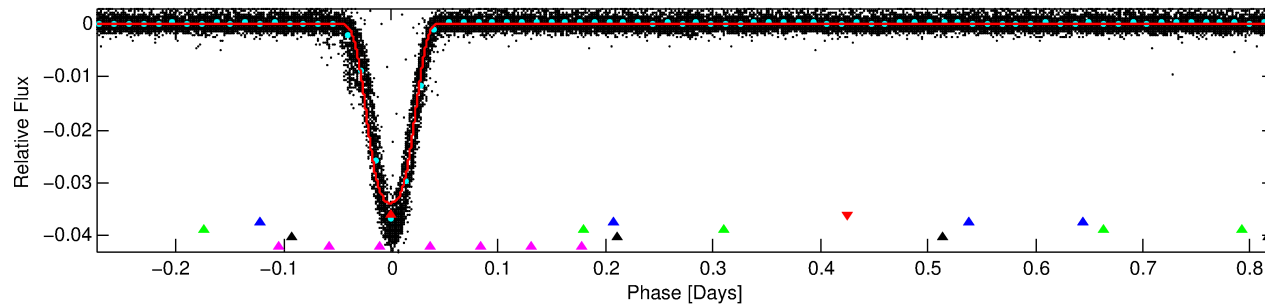
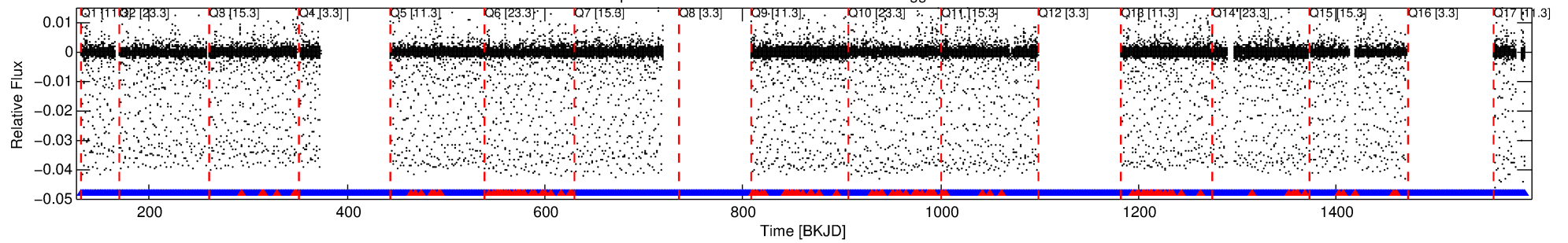
Ephemeris Match Information For 011546211-01

No Significant Match Found

# DV One-Page Summary

KIC: 11546211 Candidate: 1 of 5 Period: 1.097 d  
KOI: K01654.01 Corr: 0.954

Kp: 15.15 R\*: 0.33 Rs Teff: 3497.0 K Logg: 4.92 Fe/H: -0.200



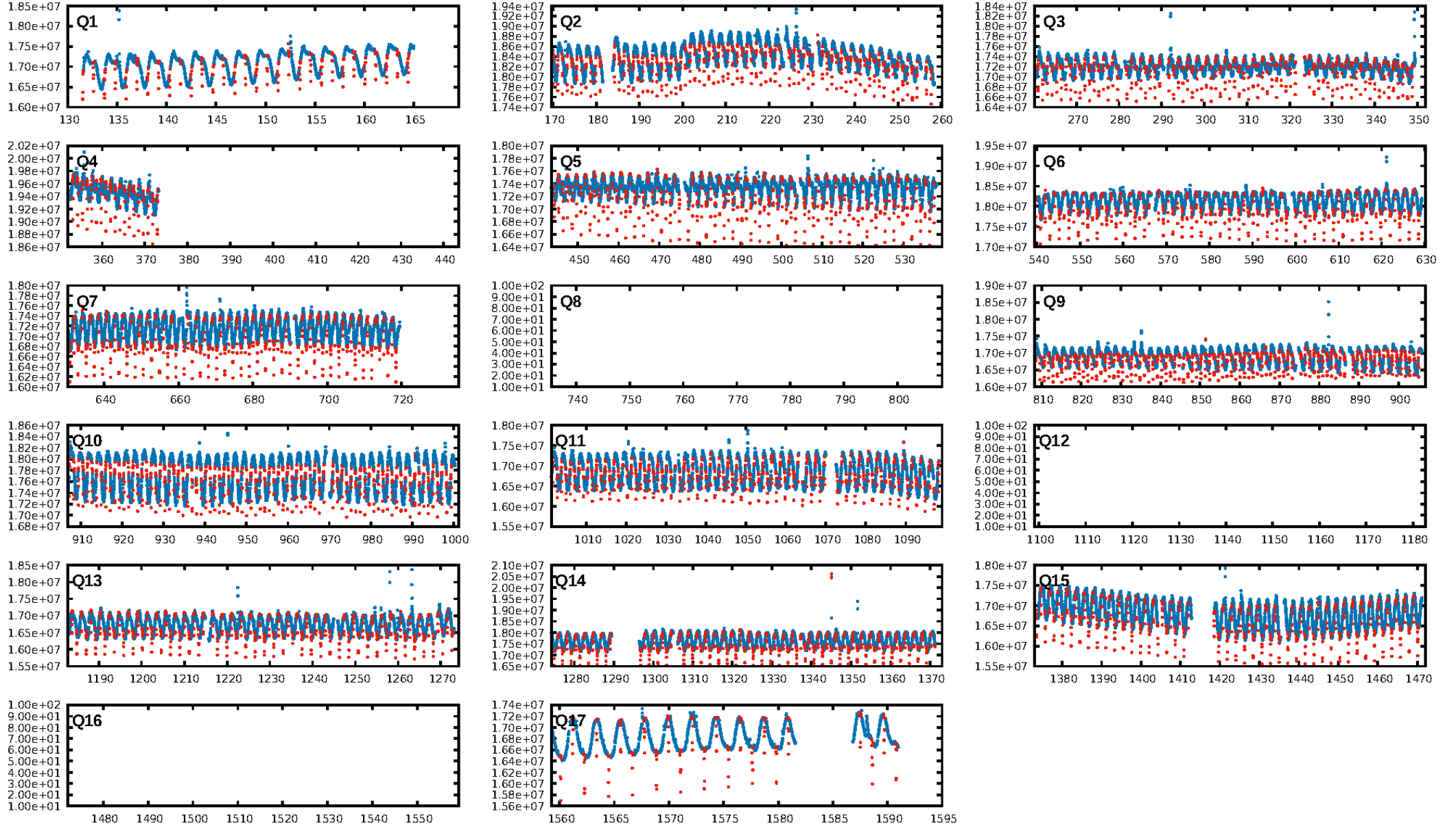
## DV Fit Results:

Period = 1.09720 [0.00000] d  
Epoch = 131.5212 [0.0000] BKJD  
Rp/R\* = 0.1823 [0.0003]  
a/R\* = 4.99 [0.02]  
b = 0.70 [0.00]  
Seff = 70.98 [10.01]  
Teq = 740 [26] K  
Rp = 6.64 [0.88] Re  
a = 0.0145 [0.0014] AU  
Ag = 0.36 [0.07] [-8.78σ]  
Teffp = 886 [39] K [3.10σ]

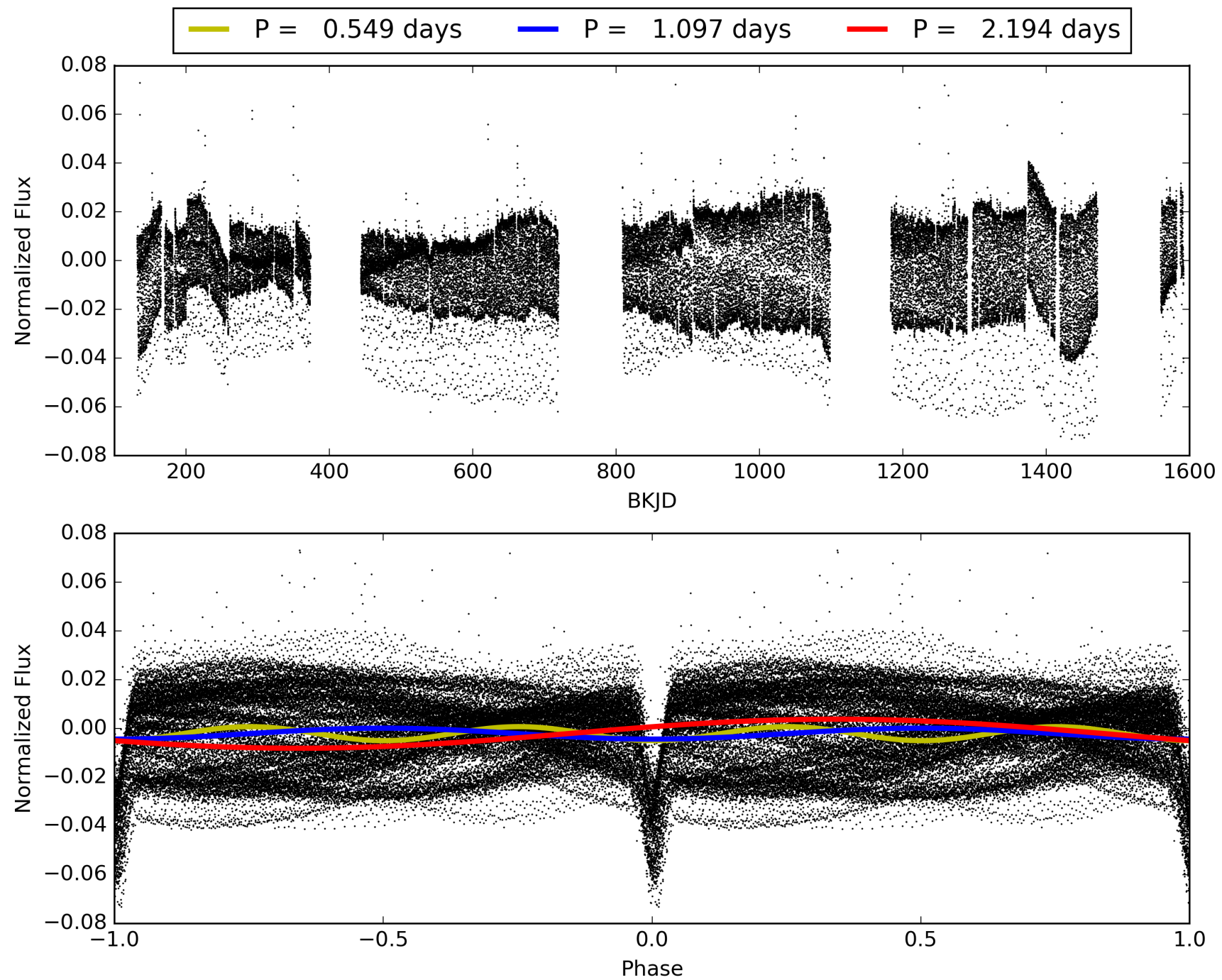
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1482.96σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.87 [783/900]  
GhostDiagnostic-chr: 1.21  
Centroid-sig: 0.0%  
Centroid-so: 0.639 arcsec [125.75σ]  
OotOffset-rm: 0.066 arcsec [0.99σ]  
KicOffset-rm: 0.533 arcsec [7.53σ]  
OotOffset-st: 4/4/1/5 [14]  
KicOffset-st: 4/4/1/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 011546211-01, PDC Light Curves



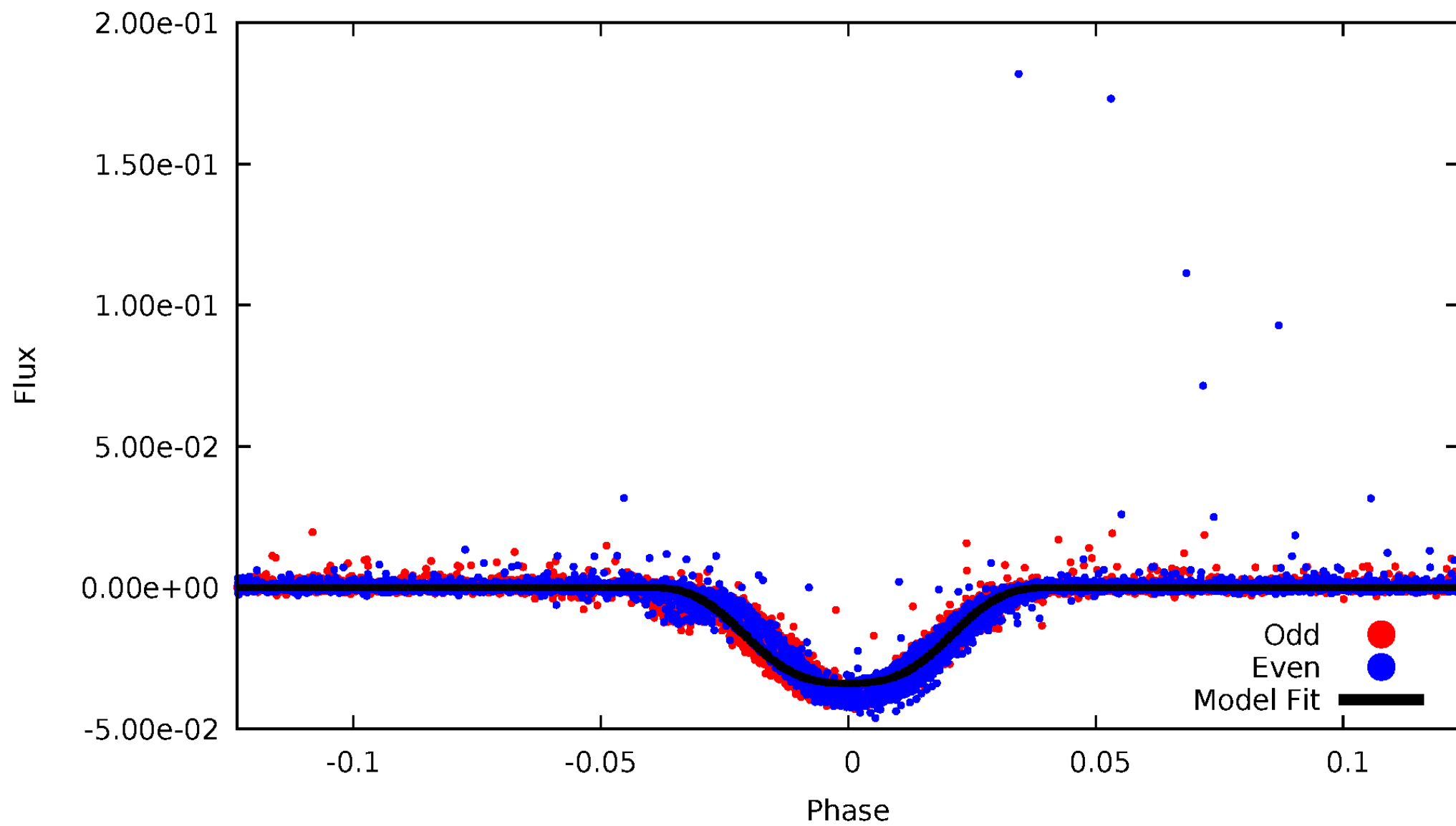
TCE 011546211-01





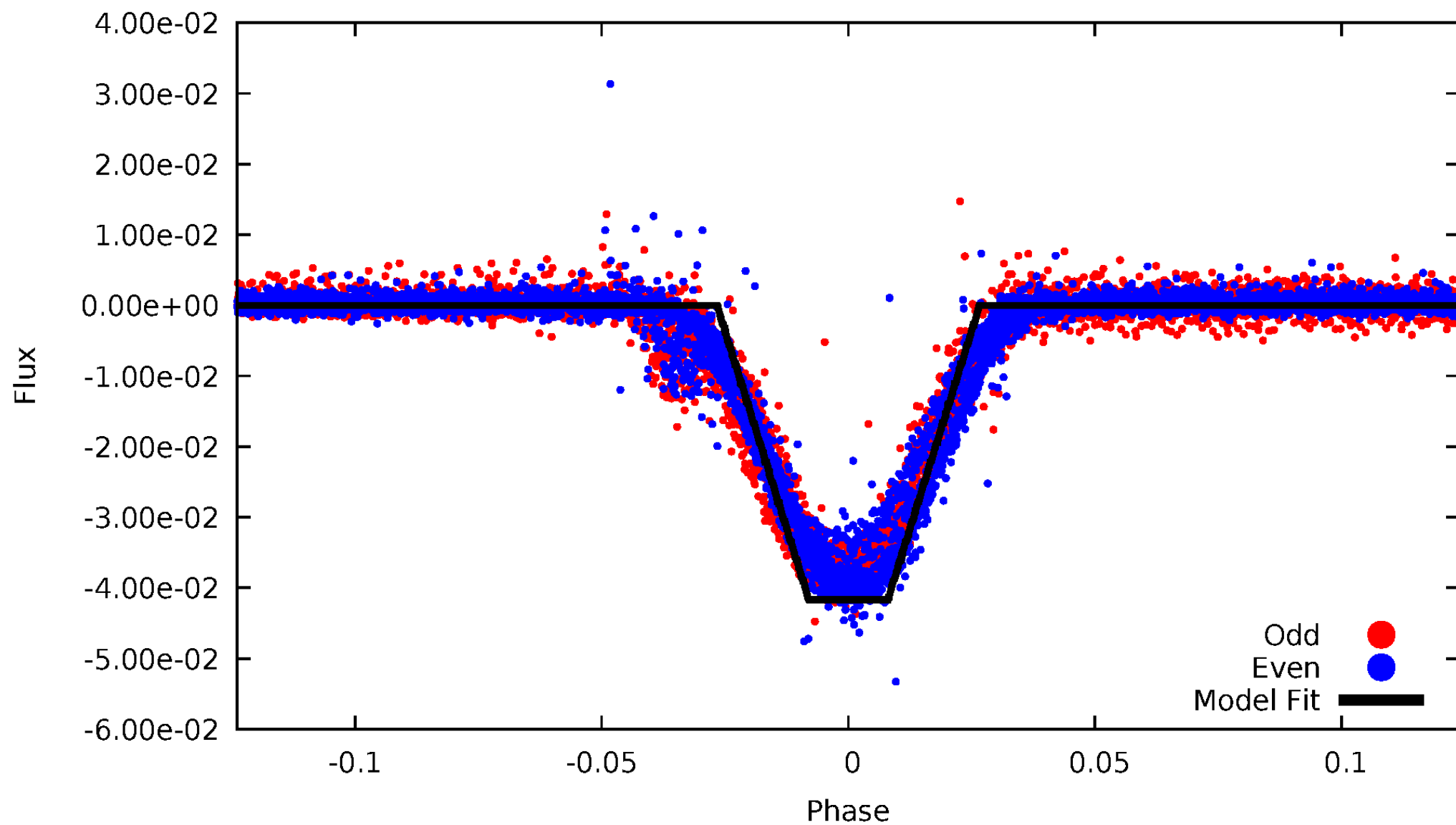
# DV Odd/Even

TCE 011546211-01



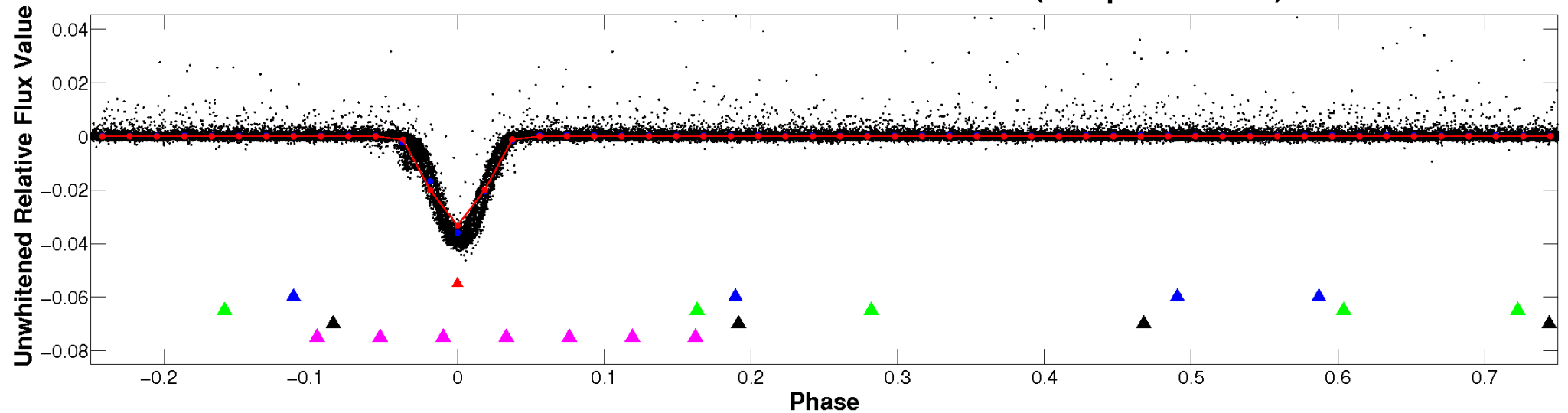
# ALT Odd/Even

TCE 011546211-01

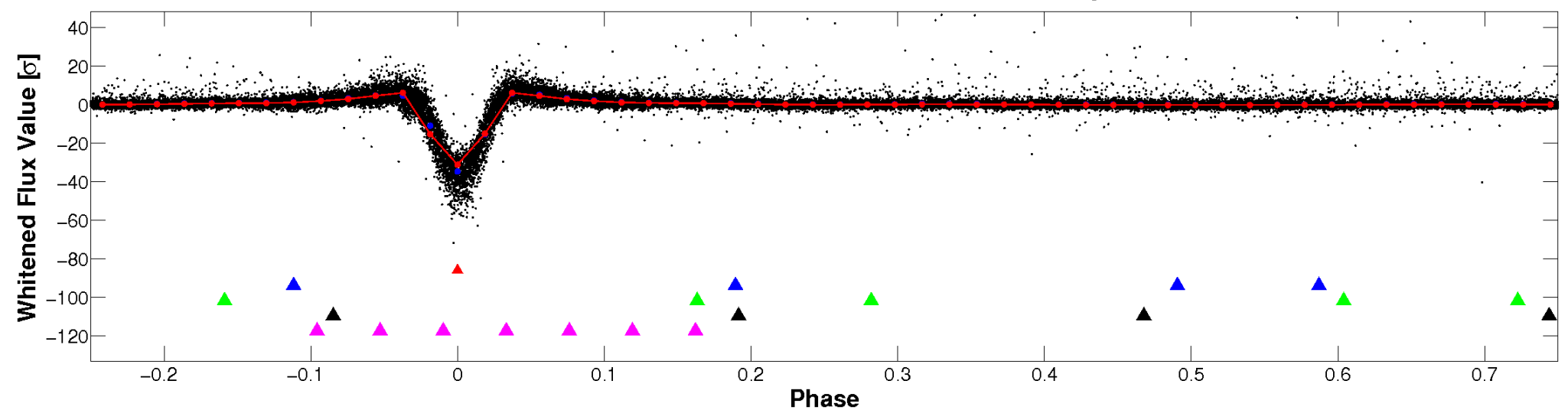


# Non-Whitened Vs. Whitened Light Curve

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

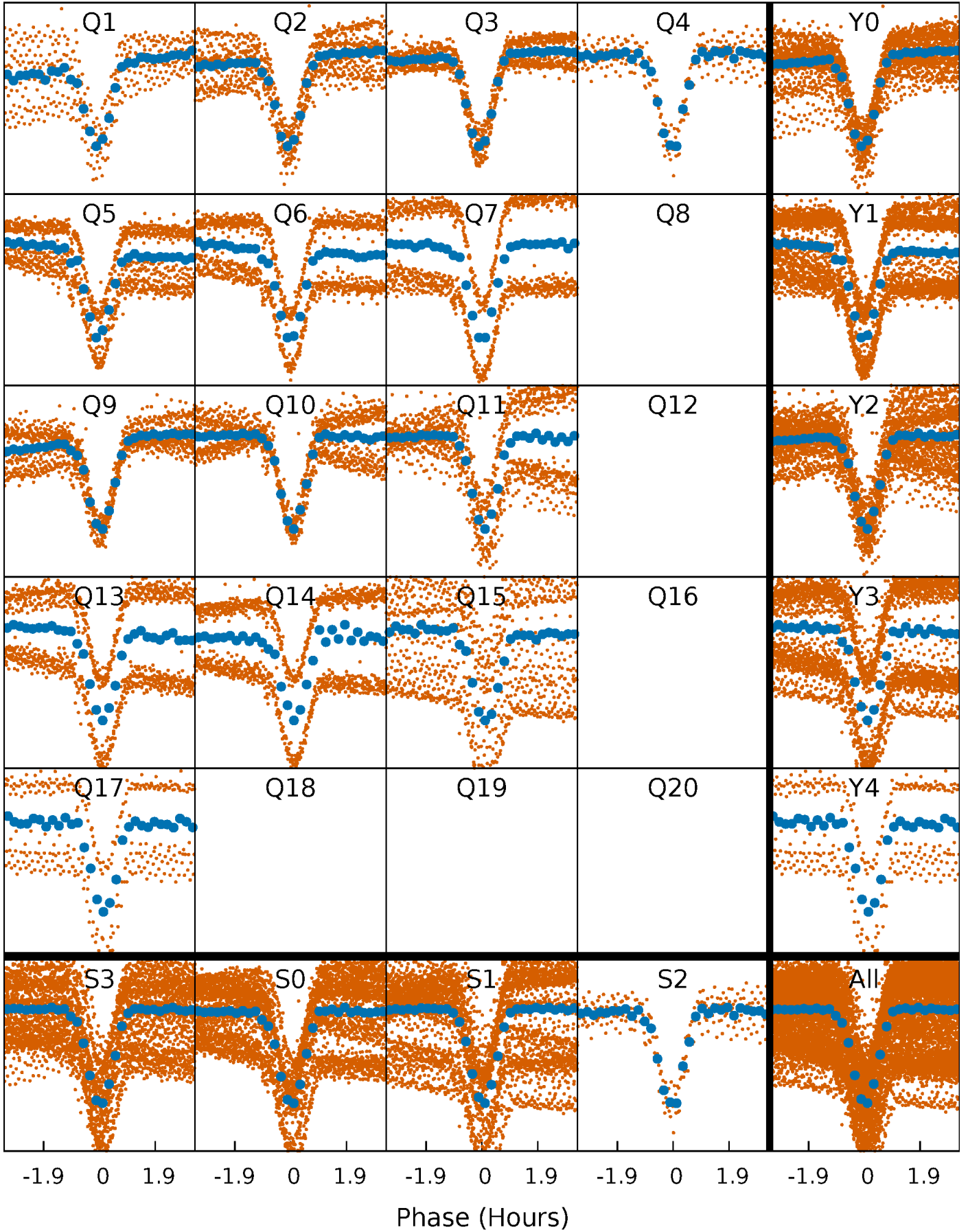


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



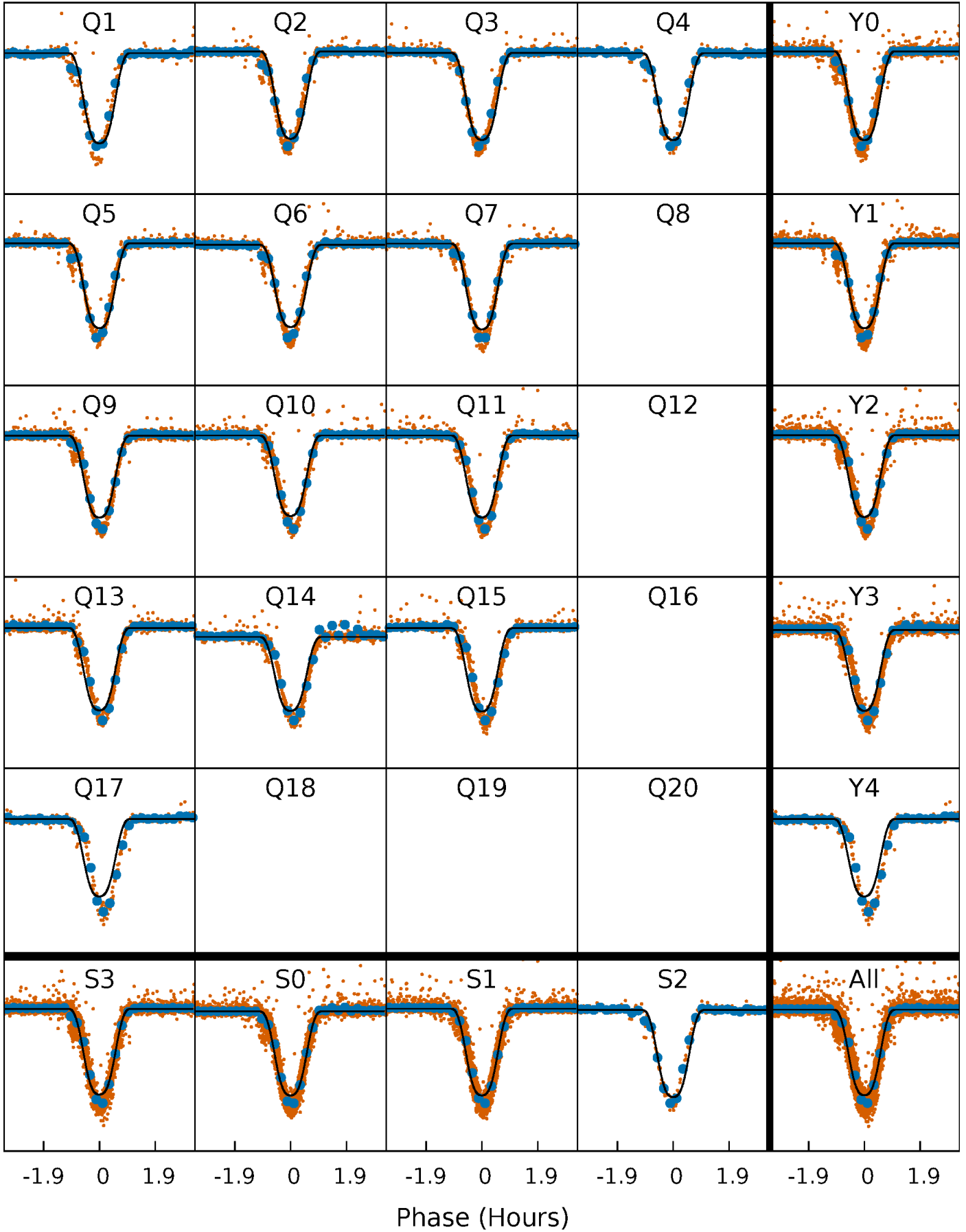
# PDC Quarter-Phased Transit Curves

TCE 011546211-01   P= 1.097203 Days    $T_0=131.521182$  (BKJD)



# DV Quarter-Phased Transit Curves

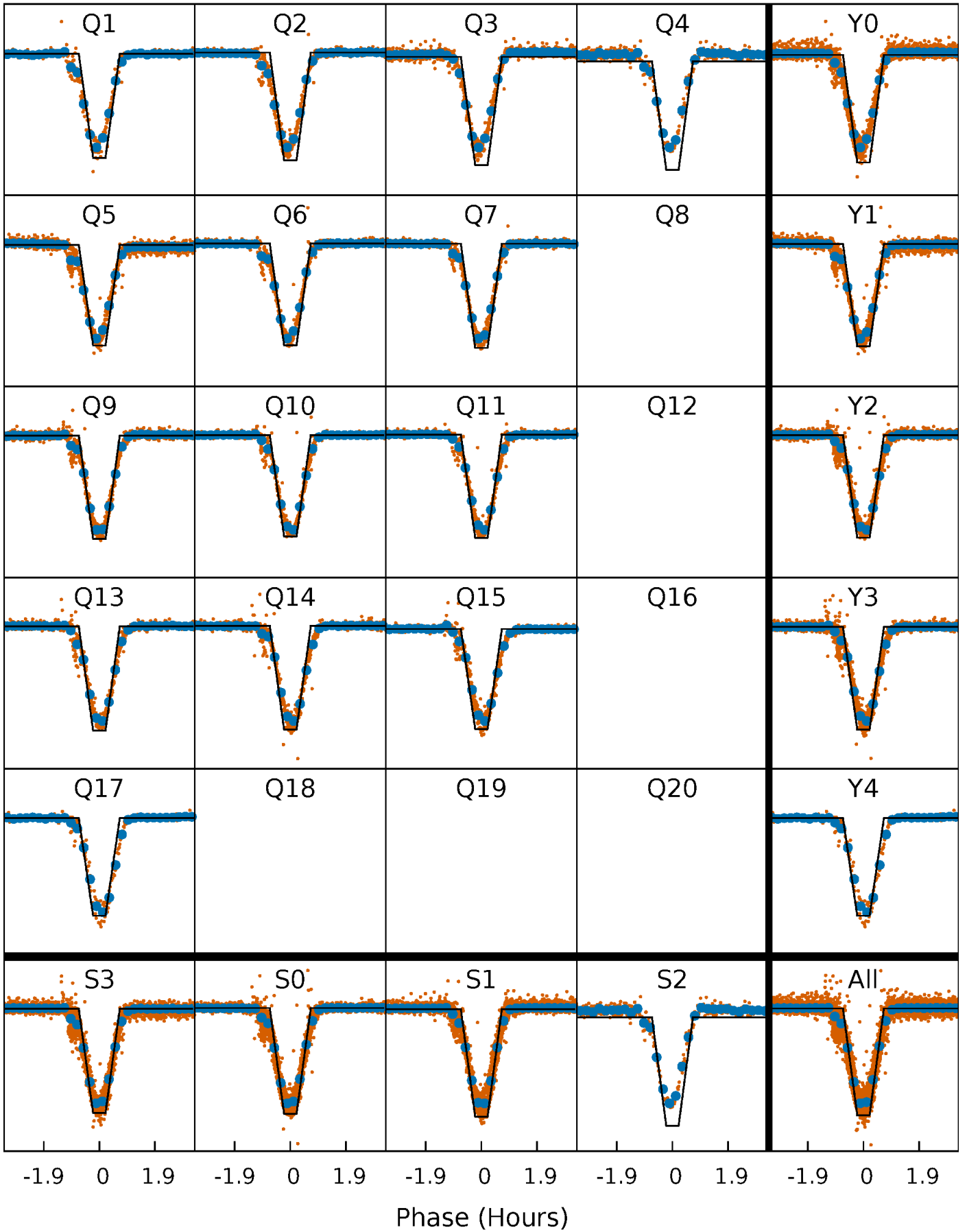
TCE 011546211-01 P= 1.097203 Days  $T_0=131.521182$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

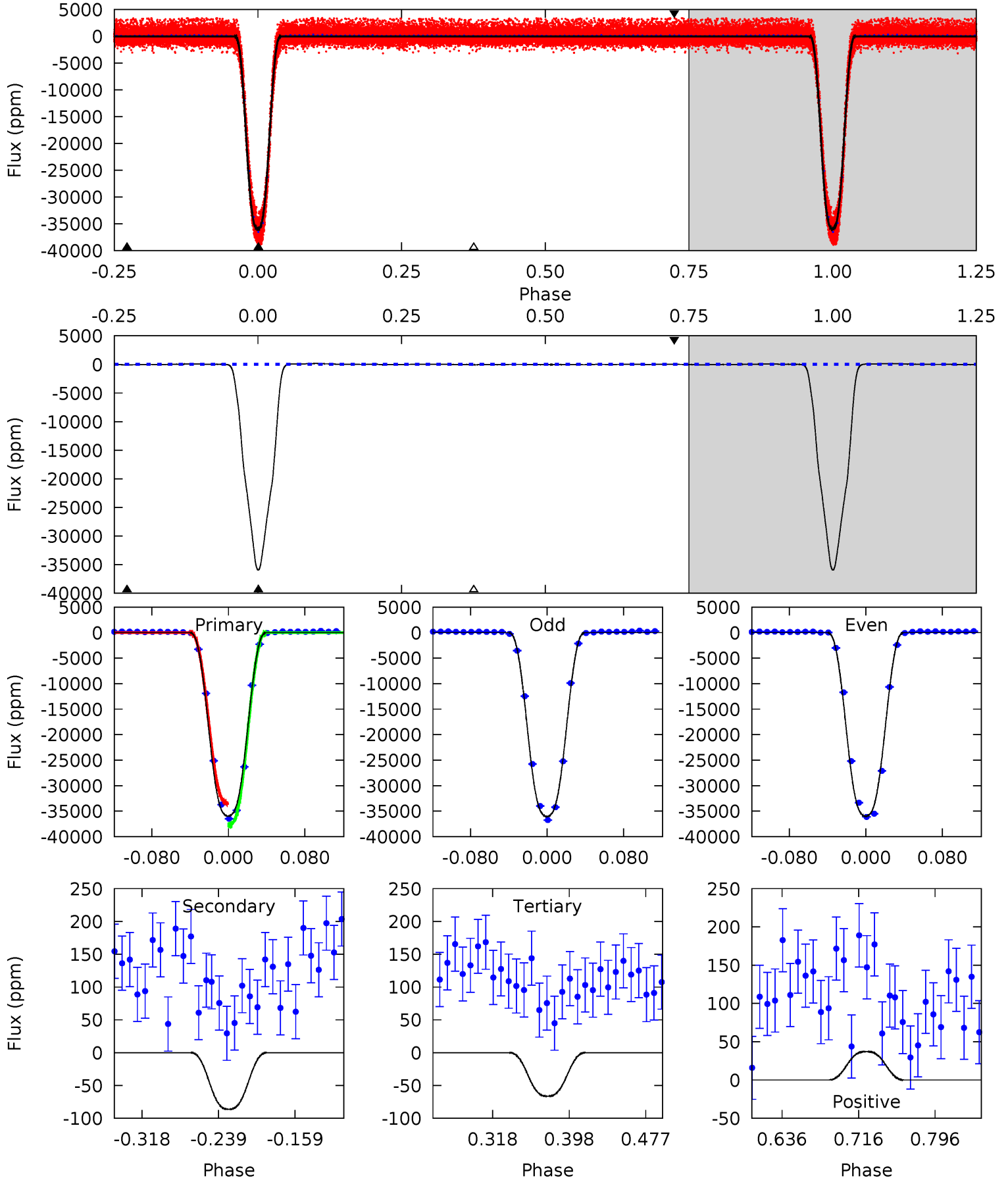
TCE 011546211-01 P= 1.097205 Days  $T_0=131.521327$  (BKJD)



# DV Model-Shift Uniqueness Test

011546211-01, P = 1.097203 Days, E = 130.423979 Days

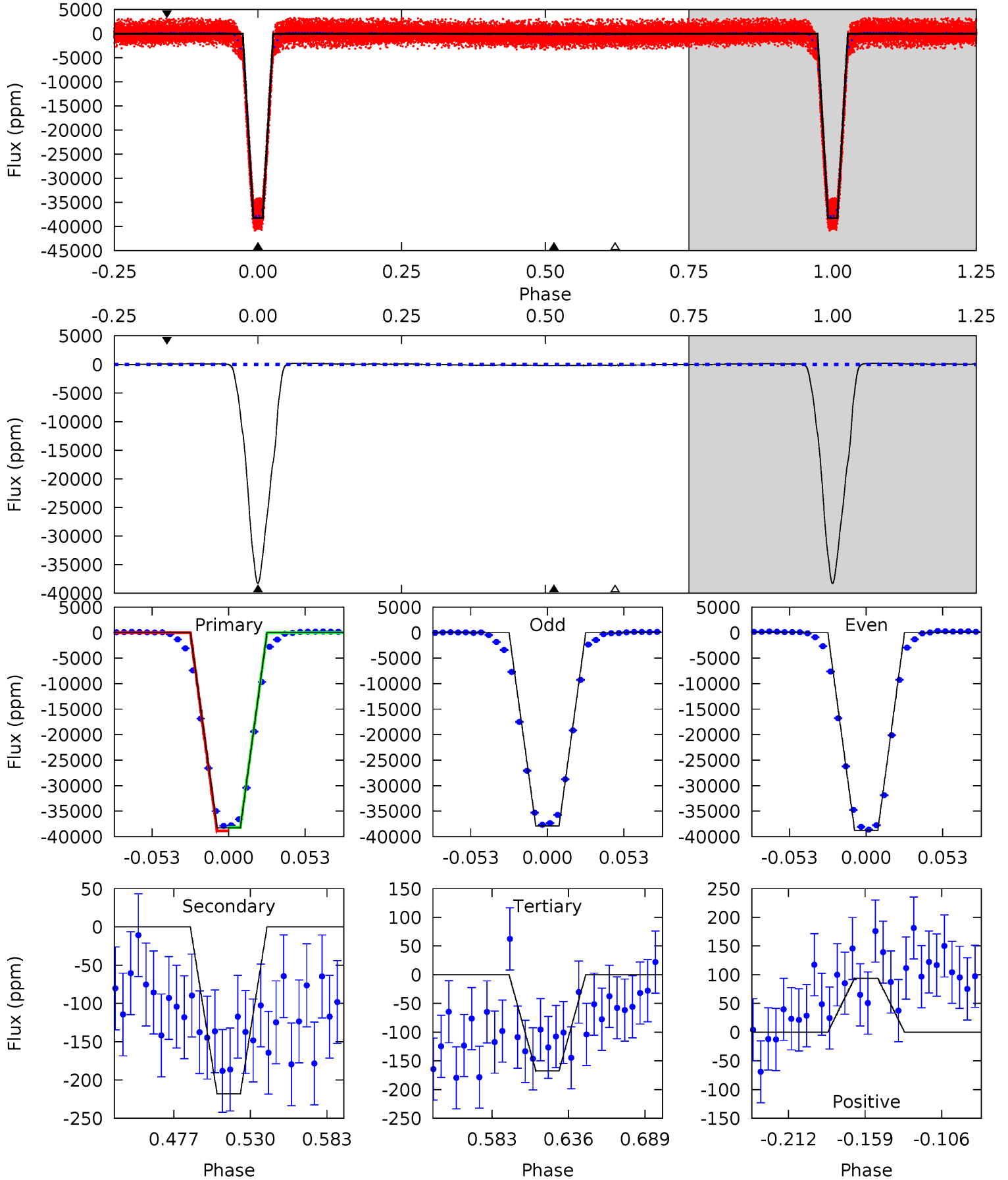
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2065	4.95	3.81	2.14	4.61	1.75	2.54	2061	2063	1.14	2.81	1.92	0.99	0.00	0



# Alt Model-Shift Uniqueness Test

011546211-01, P = 1.097205 Days, E = 130.424122 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
1808	10.3	7.90	4.44	4.70	1.93	4.57	1800	1804	2.40	5.86	20.5	1.00	0.00	0



### Stellar Parameters For KIC 011546211

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3497^{+62}_{-55}$	$4.920^{+0.055}_{-0.040}$	$-0.200^{+0.100}_{-0.100}$	$0.334^{+0.039}_{-0.044}$	$0.339^{+0.051}_{-0.051}$	$12.780^{+4.046}_{-2.139}$
	+2%/-2%	+1%/-1%	+50%/-50%	+12%/-13%	+15%/-15%	+32%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011546211-01 / KOI 1654.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-86 \pm 17$	$6.67^{+0.44}_{-0.54}$	$1031^{+29}_{-29}$	$-1554^{+166}_{-80}$	$0.232^{+0.051}_{-0.051}$
Alt.	$-218 \pm 21$	$7.44^{+0.49}_{-0.54}$	$1030^{+28}_{-27}$	$1674^{+49}_{-62}$	$0.461^{+0.067}_{-0.057}$

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

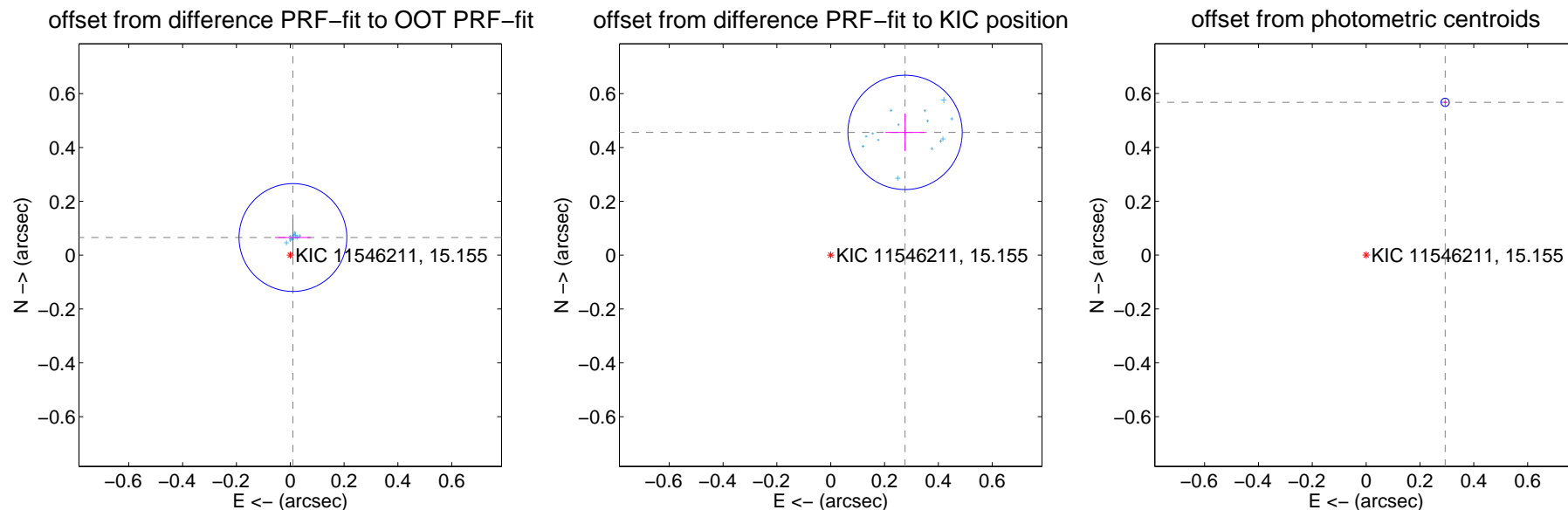
## DV Centroid Data

Supplemental centroid analysis for 011546211-01. Kepler magnitude: 15.15. Transit SNR 827.17

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.64 arcsec

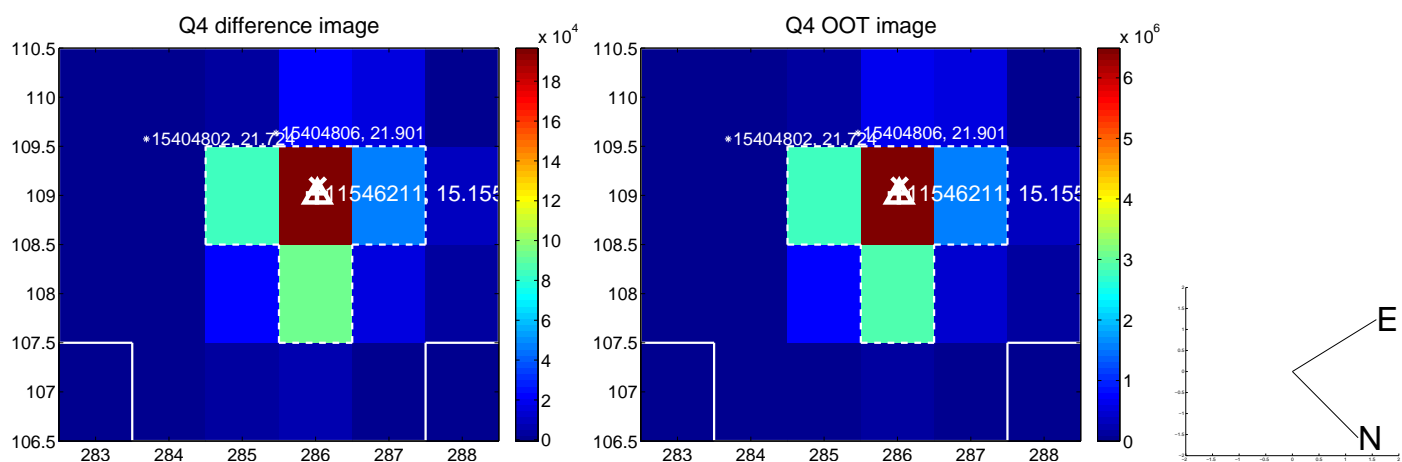
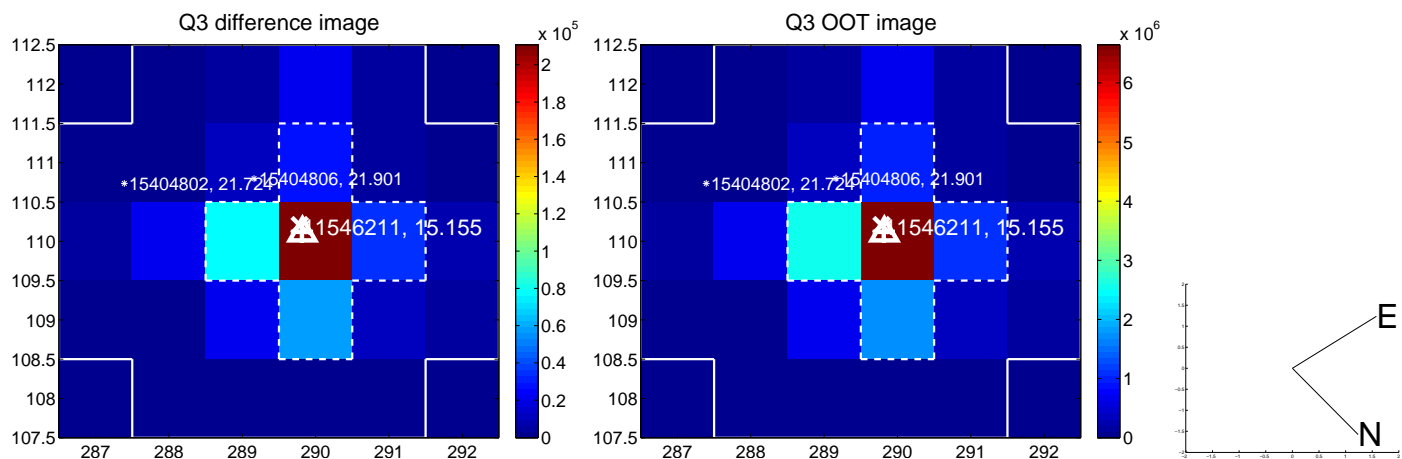
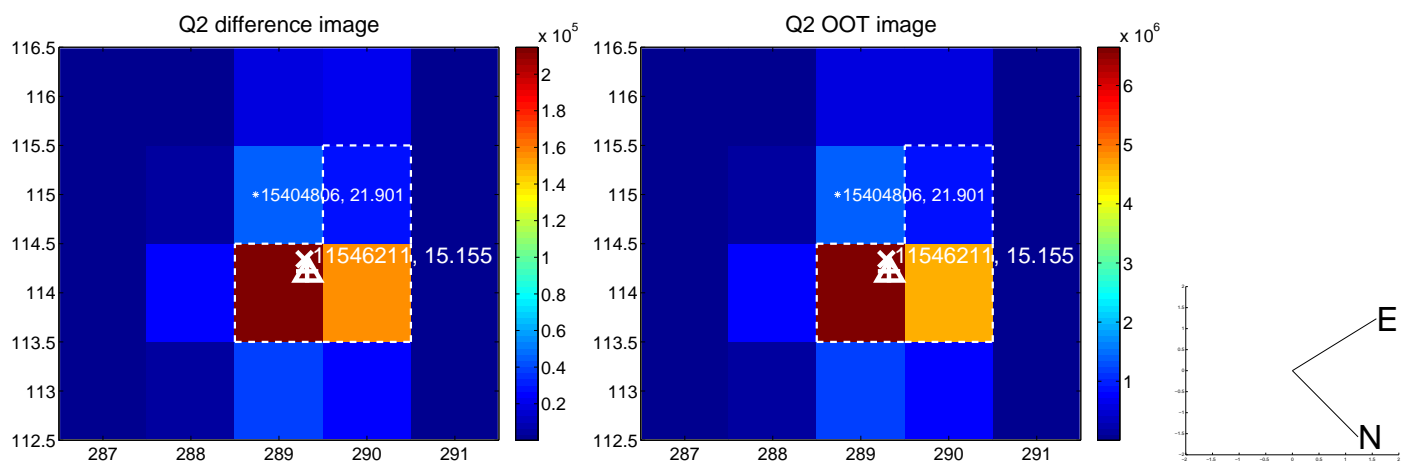
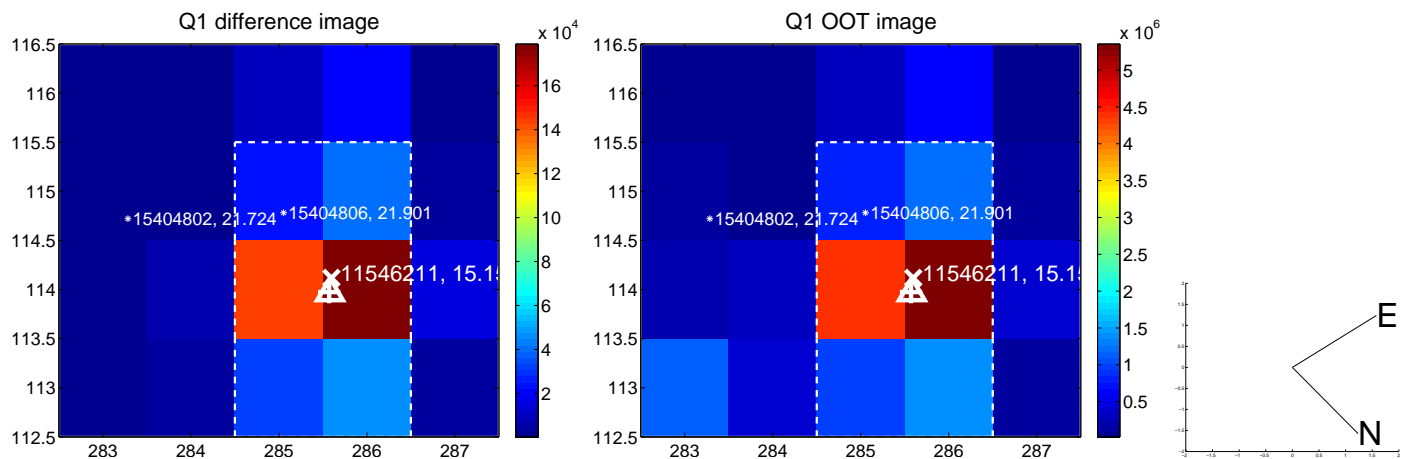
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.066 \pm 0.067$	0.99	$-0.010 \pm 0.067$	$0.066 \pm 0.067$
PRF-fit source offset from KIC position	$0.533 \pm 0.071$	7.53	$-0.276 \pm 0.073$	$0.456 \pm 0.069$
photometric centroid source offset	$0.64 \pm 0.01$	125.75	$-0.29 \pm 0.01$	$0.57 \pm 0.00$



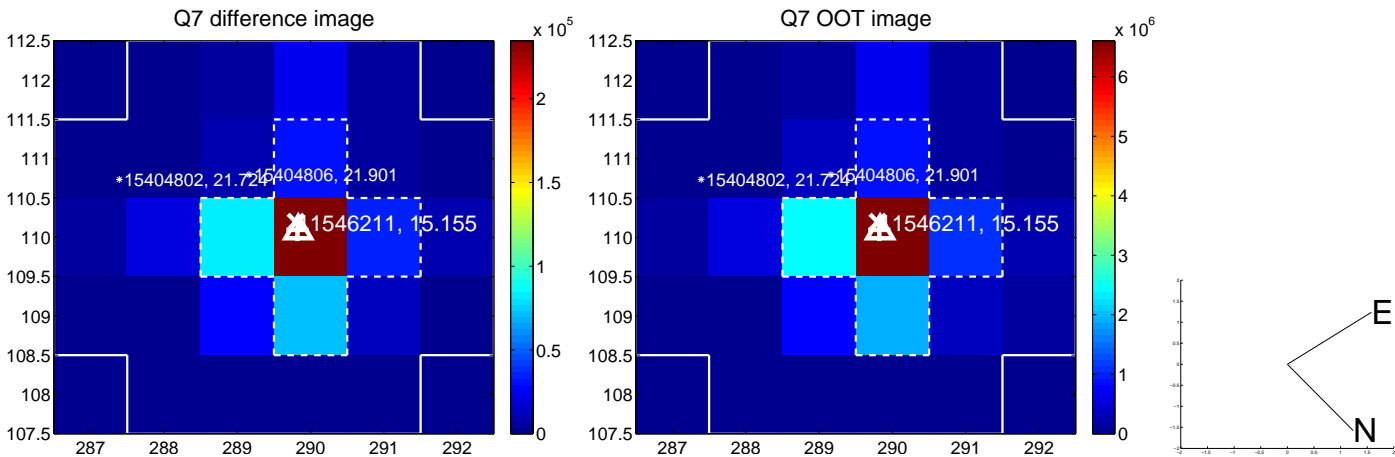
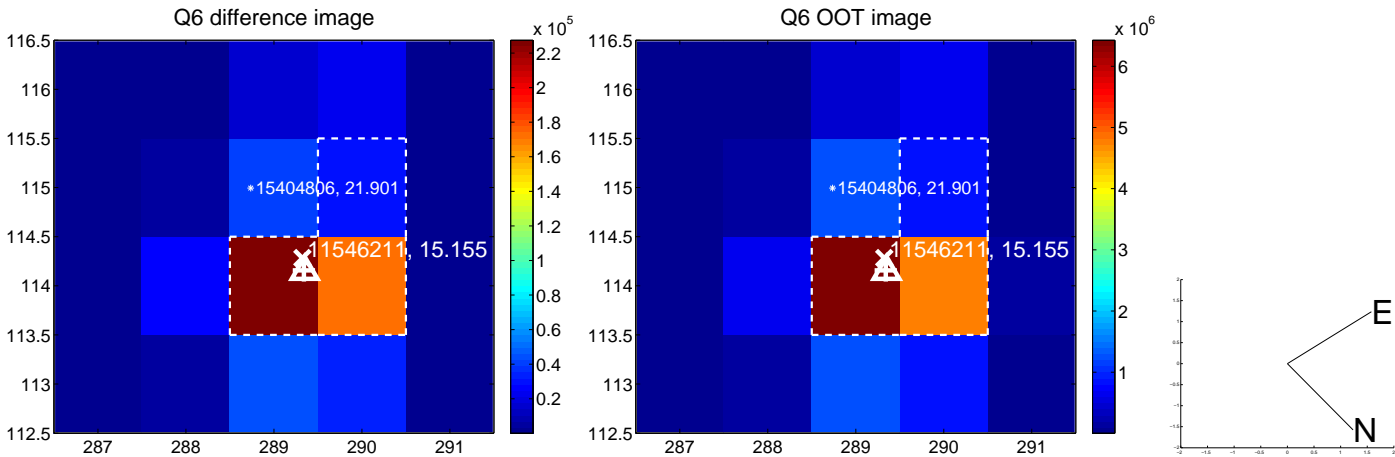
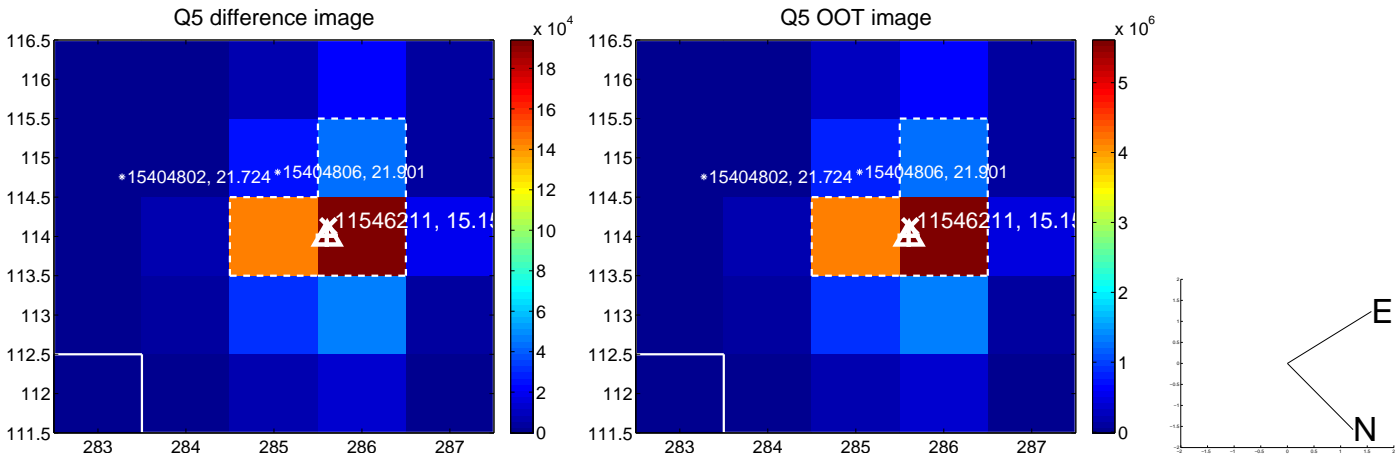
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



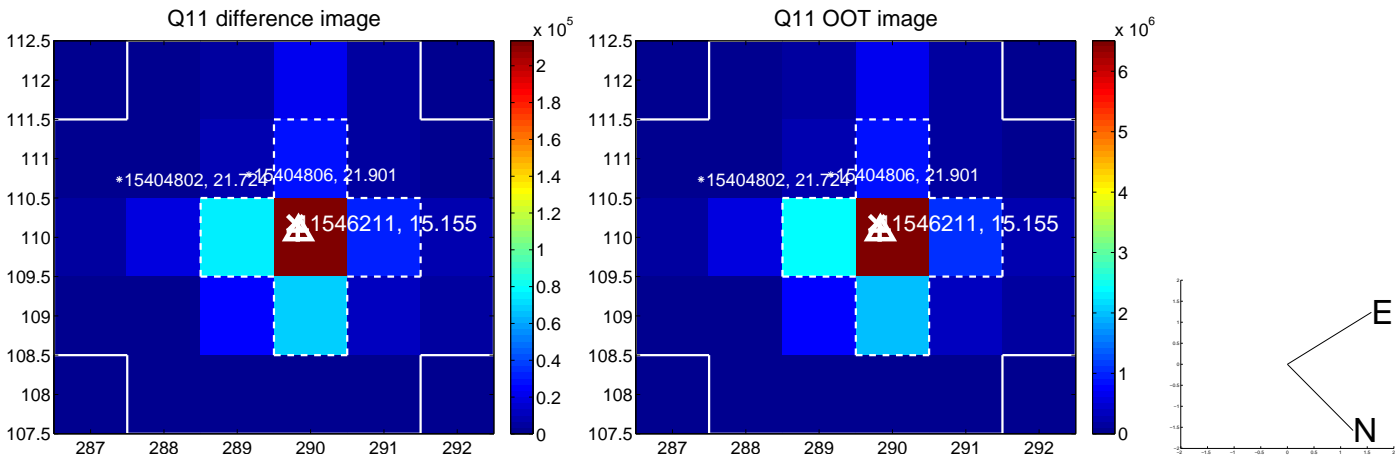
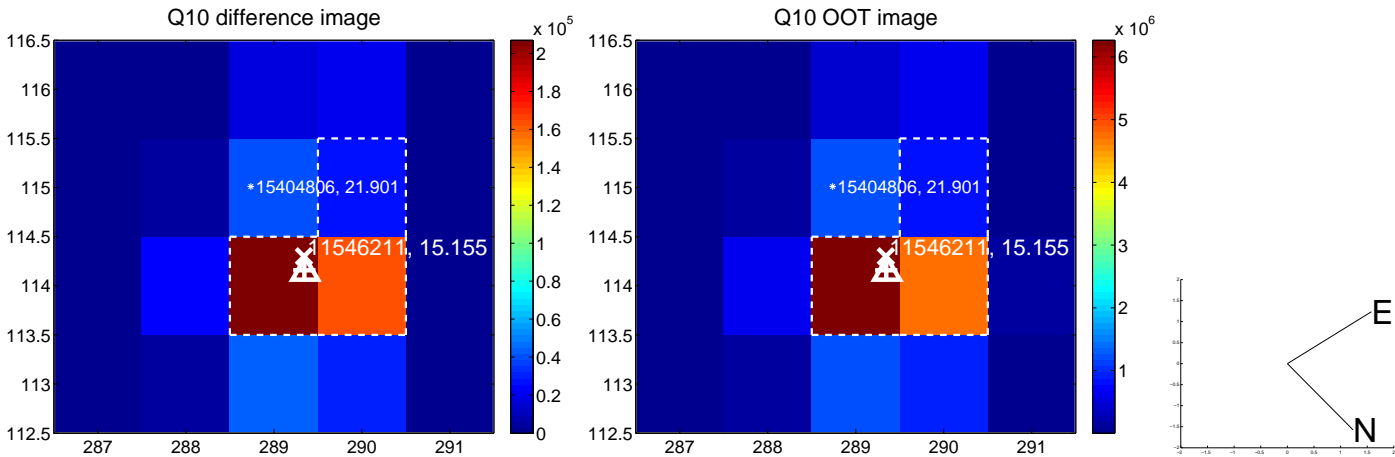
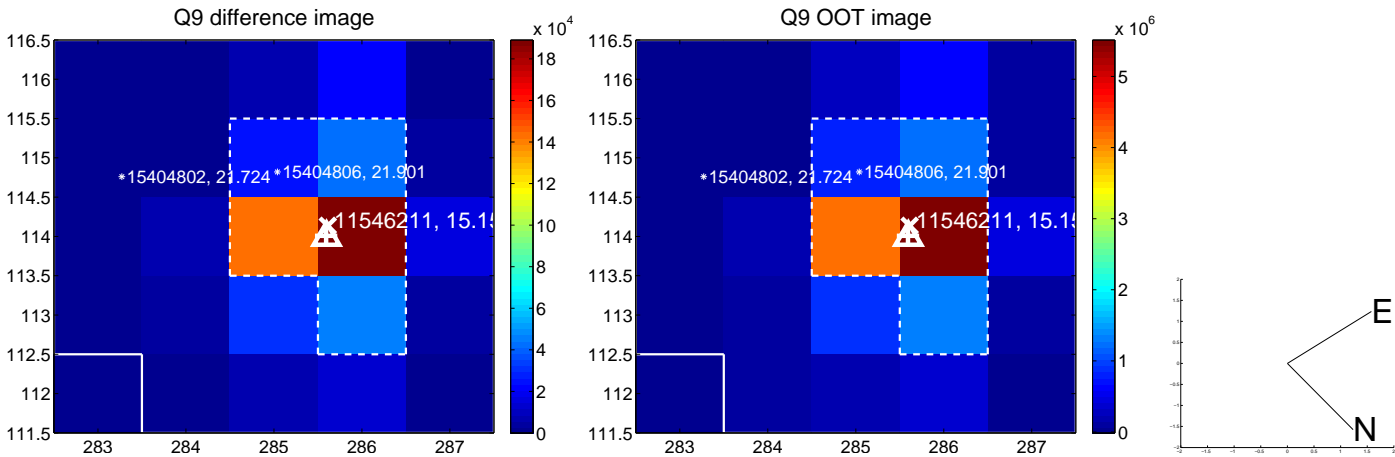
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



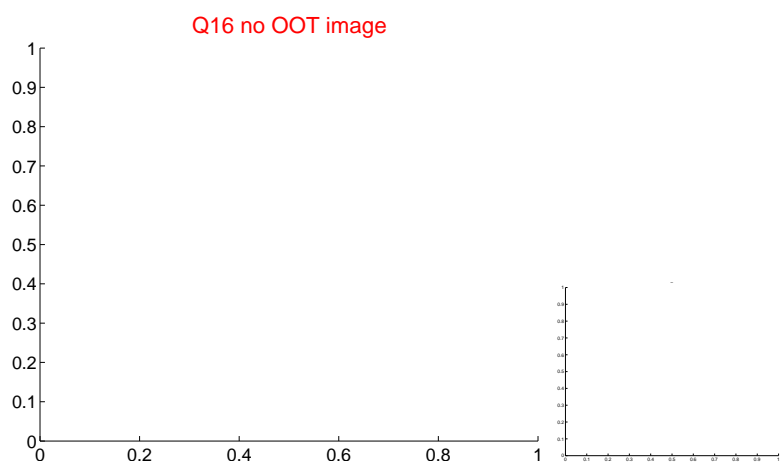
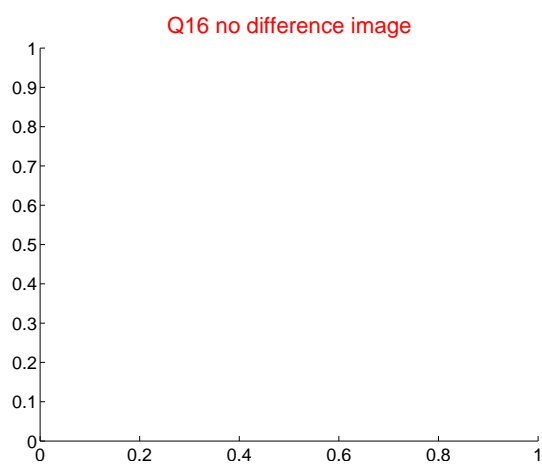
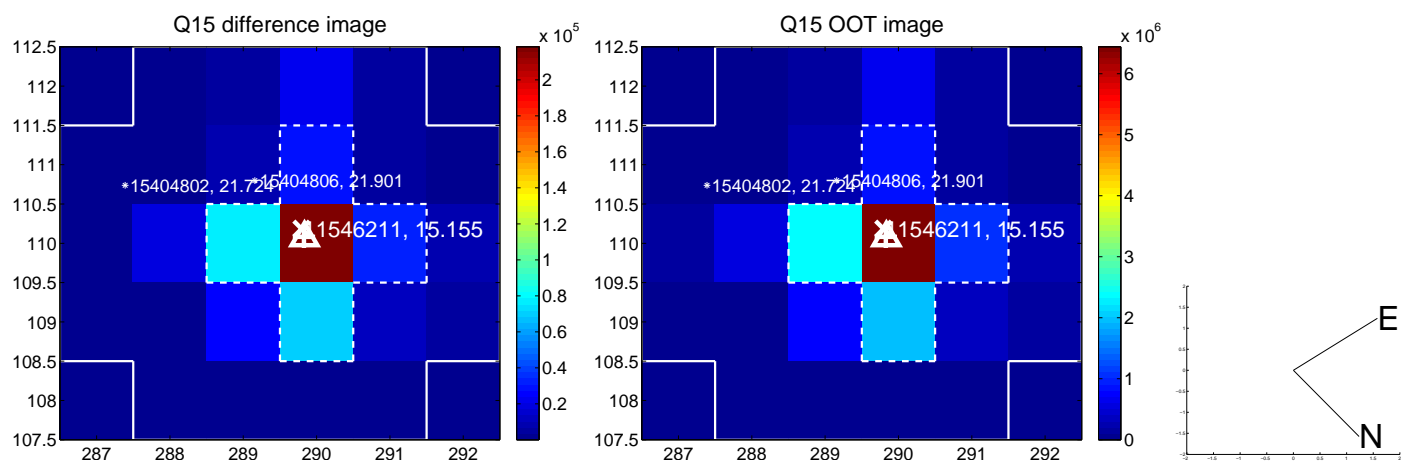
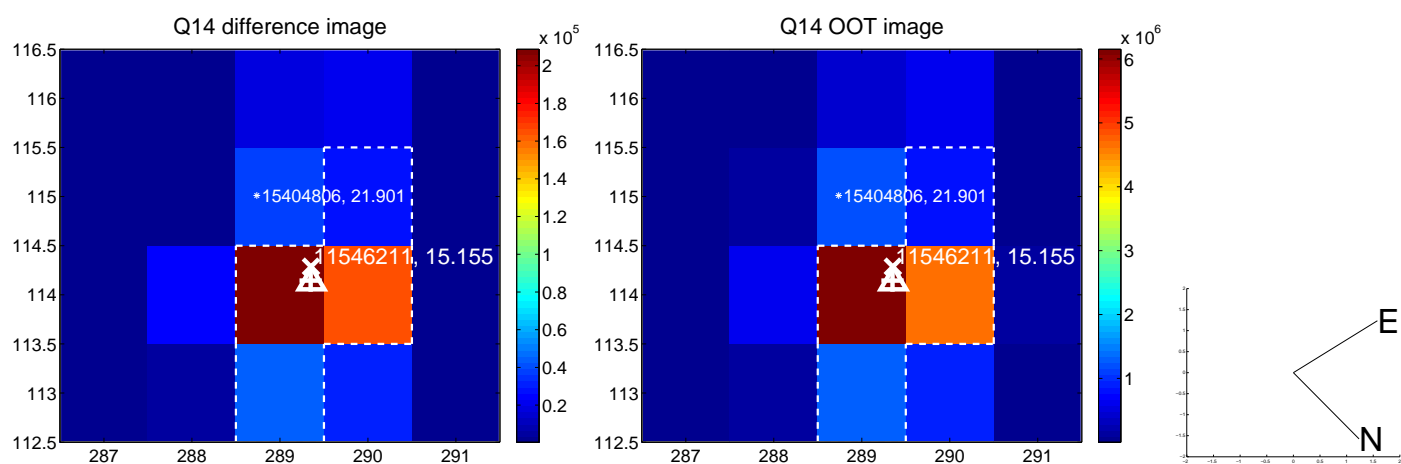
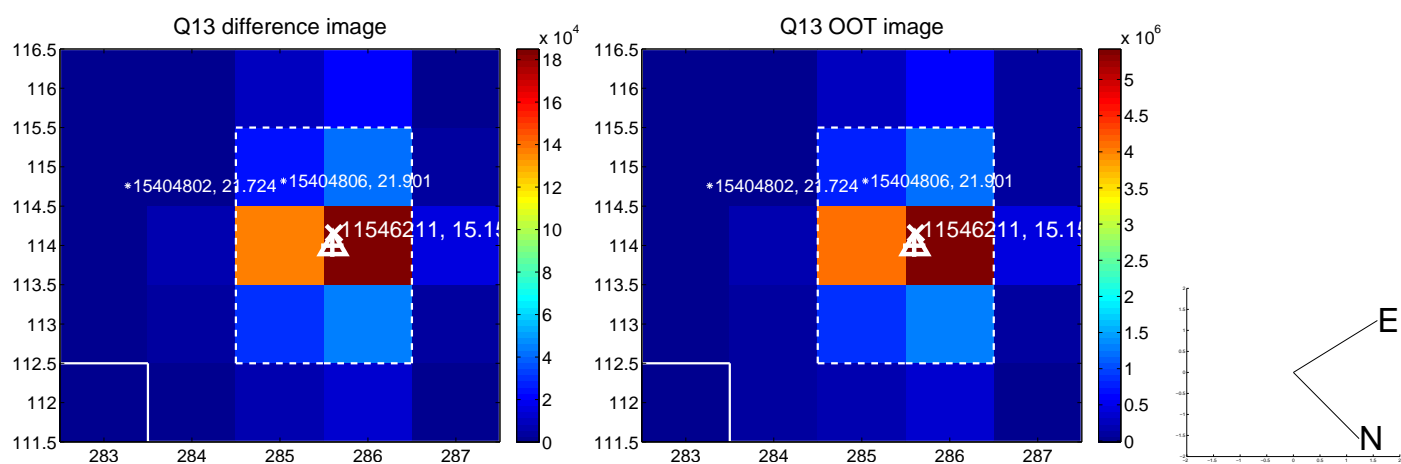
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



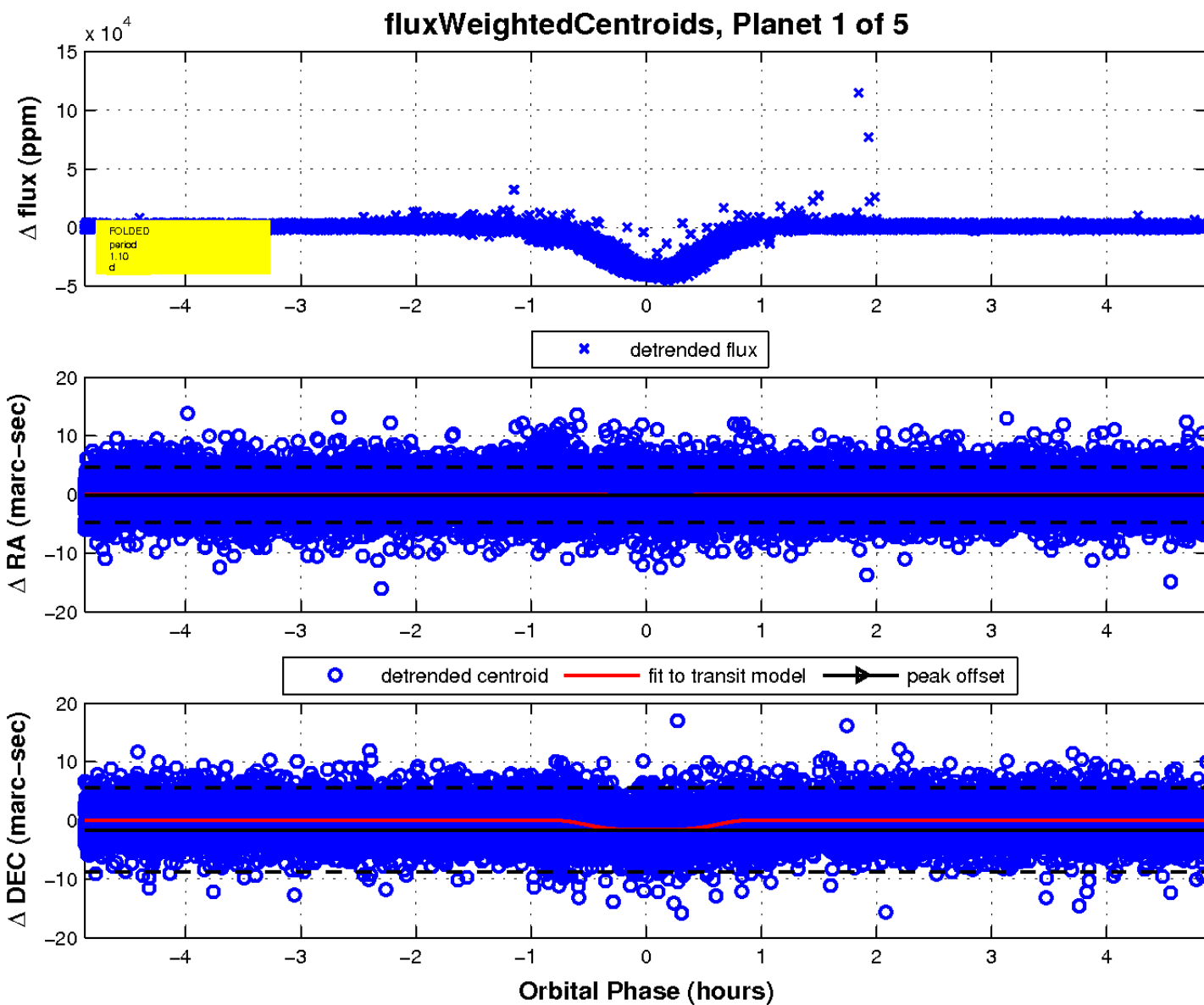
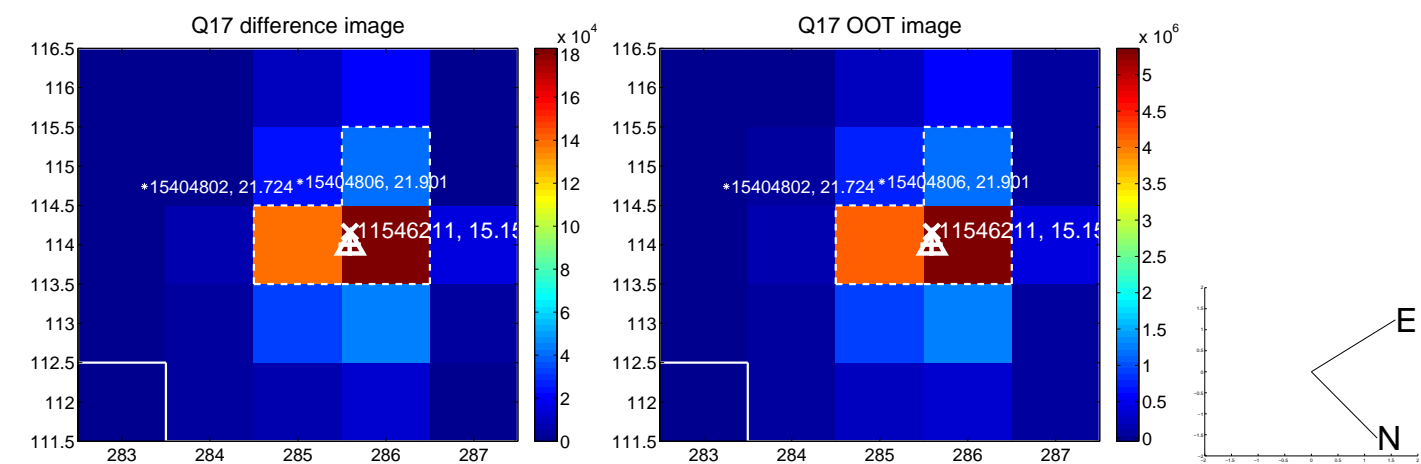
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



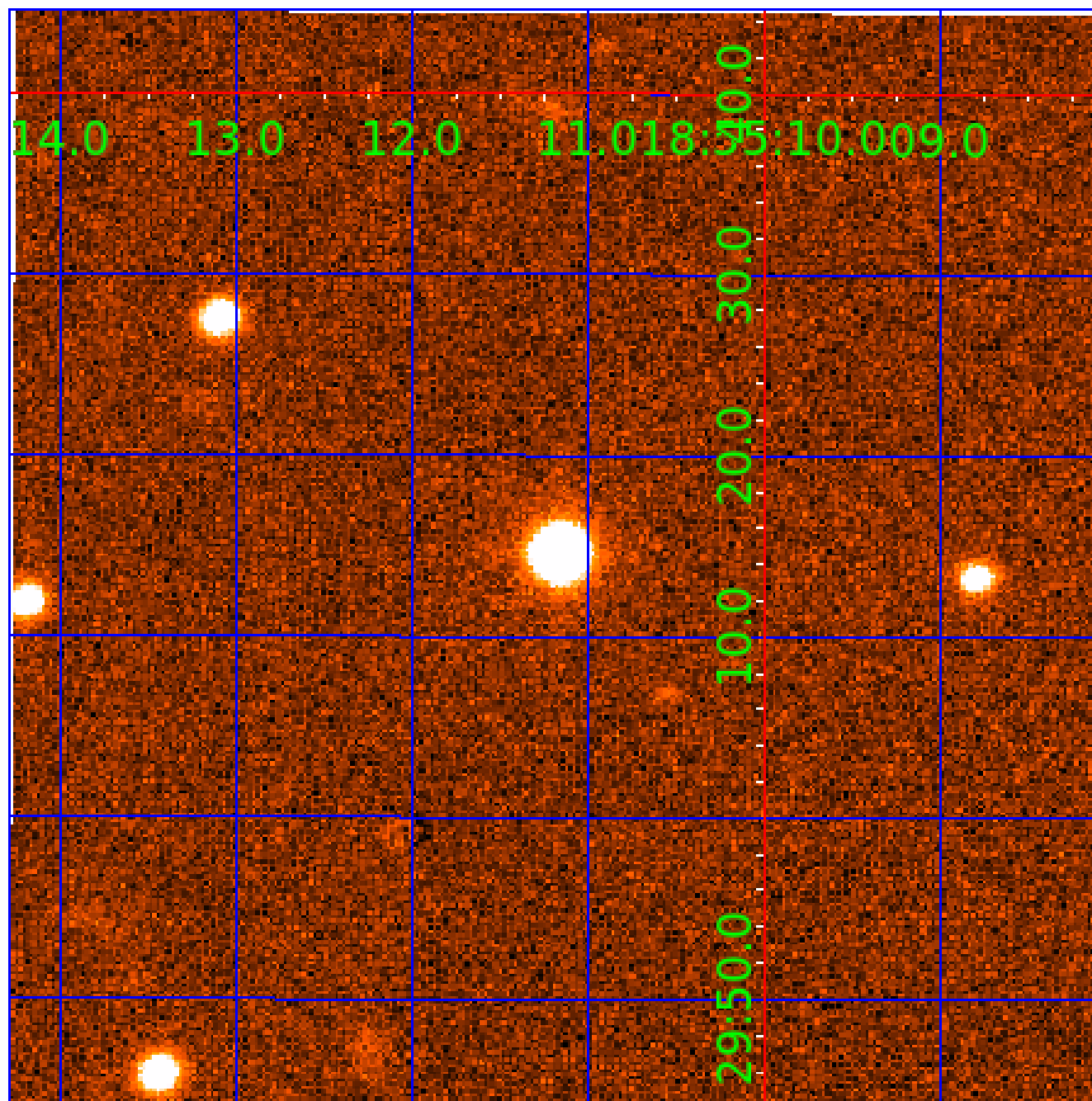
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 011546211

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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011546211-03	OBS	No	304.408608	256.428099	101.7	4.536	12.0	0.3	0.33	3497	0.34	0.04
011546211-04	OBS	No	334.949840	271.870183	2407.5	5.509	13.3	7.1	0.33	3497	1.67	0.04
011546211-05	OBS	No	206.226906	336.876001	4129.3	2.894	12.8	9.0	0.33	3497	2.17	0.07

## Robovetter Results

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011546211-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011546211-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_FEW_DIFFS
011546211-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS

**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 011546211-02

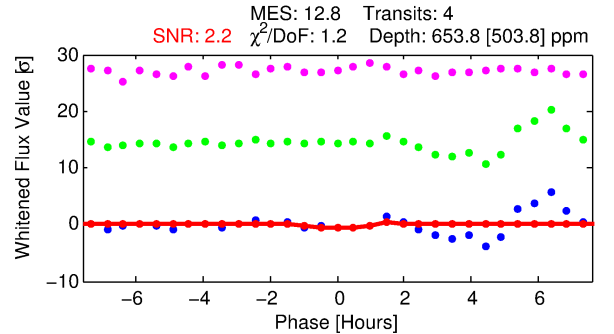
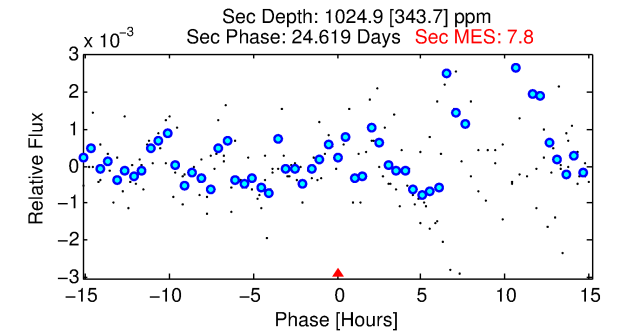
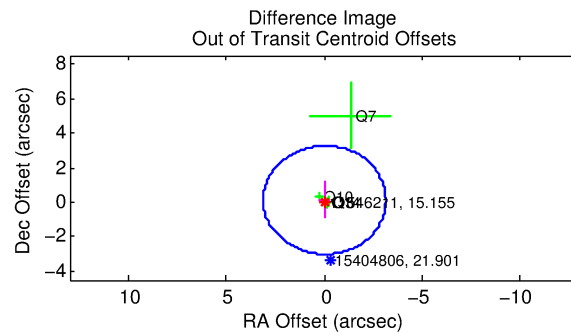
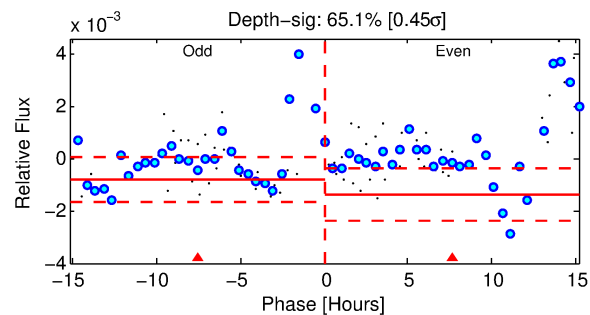
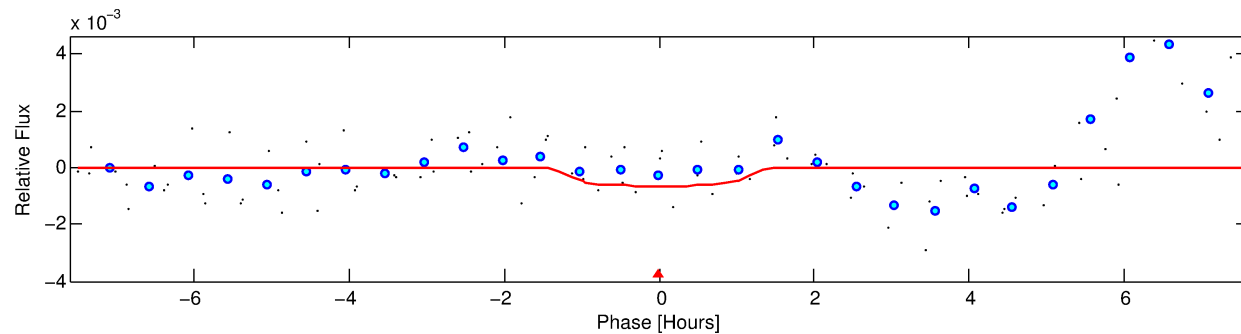
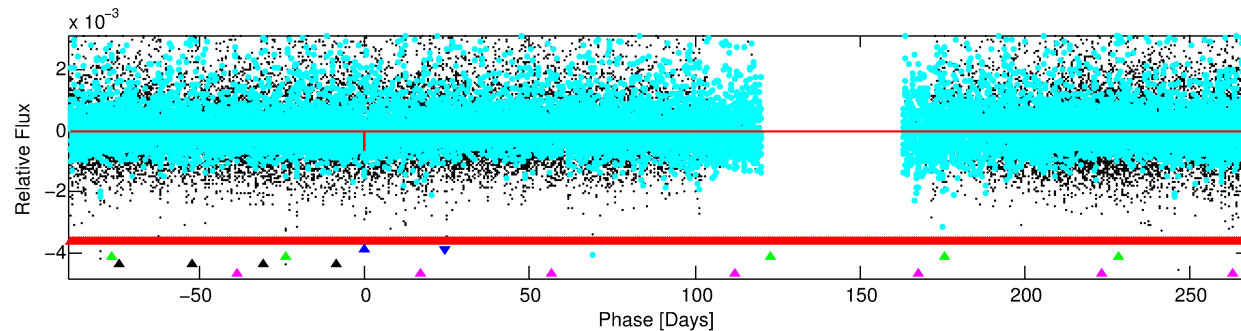
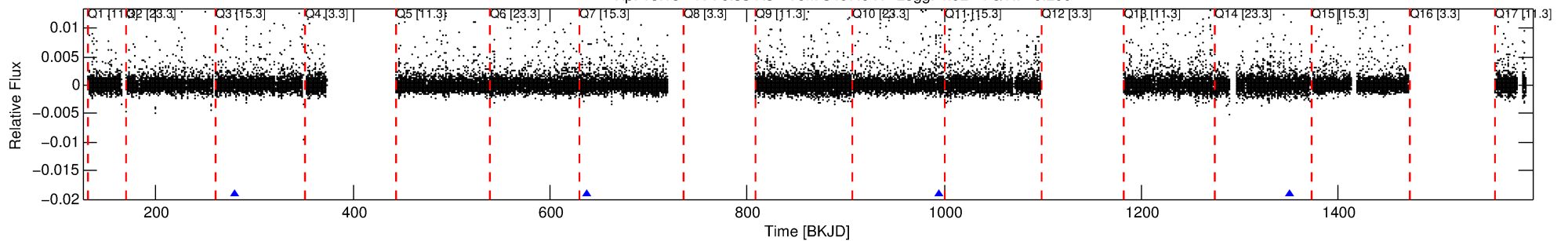
No Significant Match Found

# DV One-Page Summary

KIC: 11546211 Candidate: 2 of 5 Period: 356.921 d

KOI: K01654 Corr: No Ephemeris Match

Kp: 15.15 R\*: 0.33 Rs Teff: 3497.0 K Logg: 4.92 Fe/H: -0.200



## DV Fit Results:

Period = 356.92126 [0.01494] d  
Epoch = 280.2877 [0.0330] BKJD  
Rp/R\* = 0.0244 [0.1563]  
a/R\* = 894.09 [25732.00]  
b = 0.60 [30.85]  
Seff = 0.03 [0.00]  
Teq = 108 [4] K  
Rp = 0.89 [5.70] Re  
a = 0.6864 [0.0669] AU  
Ag = 336217.29 [4311149.95] [0.08σ]  
Teff = 4007 [12843] K [0.30σ]

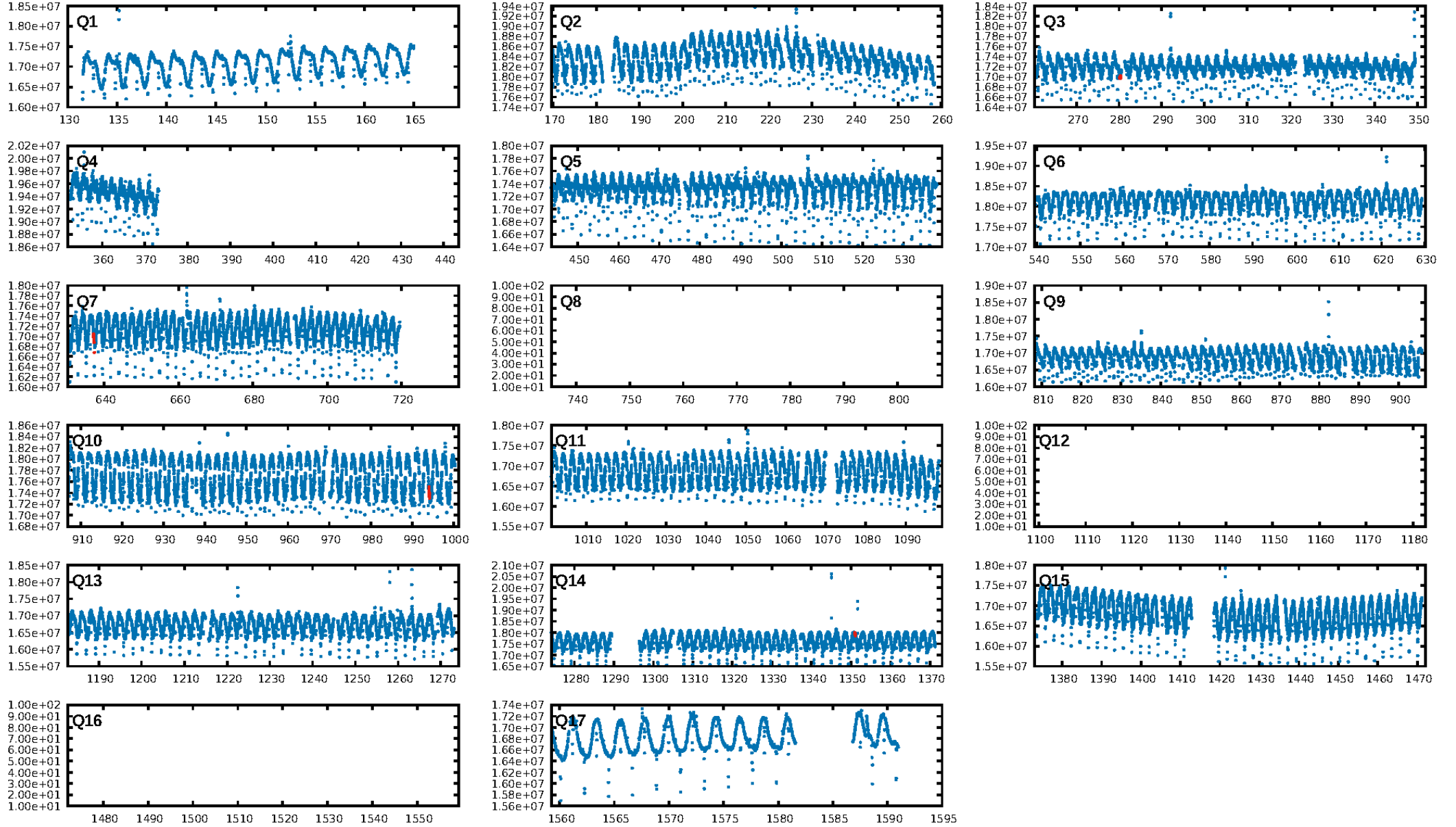
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [86.98σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 34.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.95e-11  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -4.607  
Centroid-sig: 0.2%  
Centroid-so: 6.921 arcsec [2.38σ]  
OotOffset-rm: 0.126 arcsec [0.12σ]  
KicOffset-rm: 0.573 arcsec [0.46σ]  
OotOffset-st: 2/2/0/0 [4]  
KicOffset-st: 2/2/0/0 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.50 [2/4]

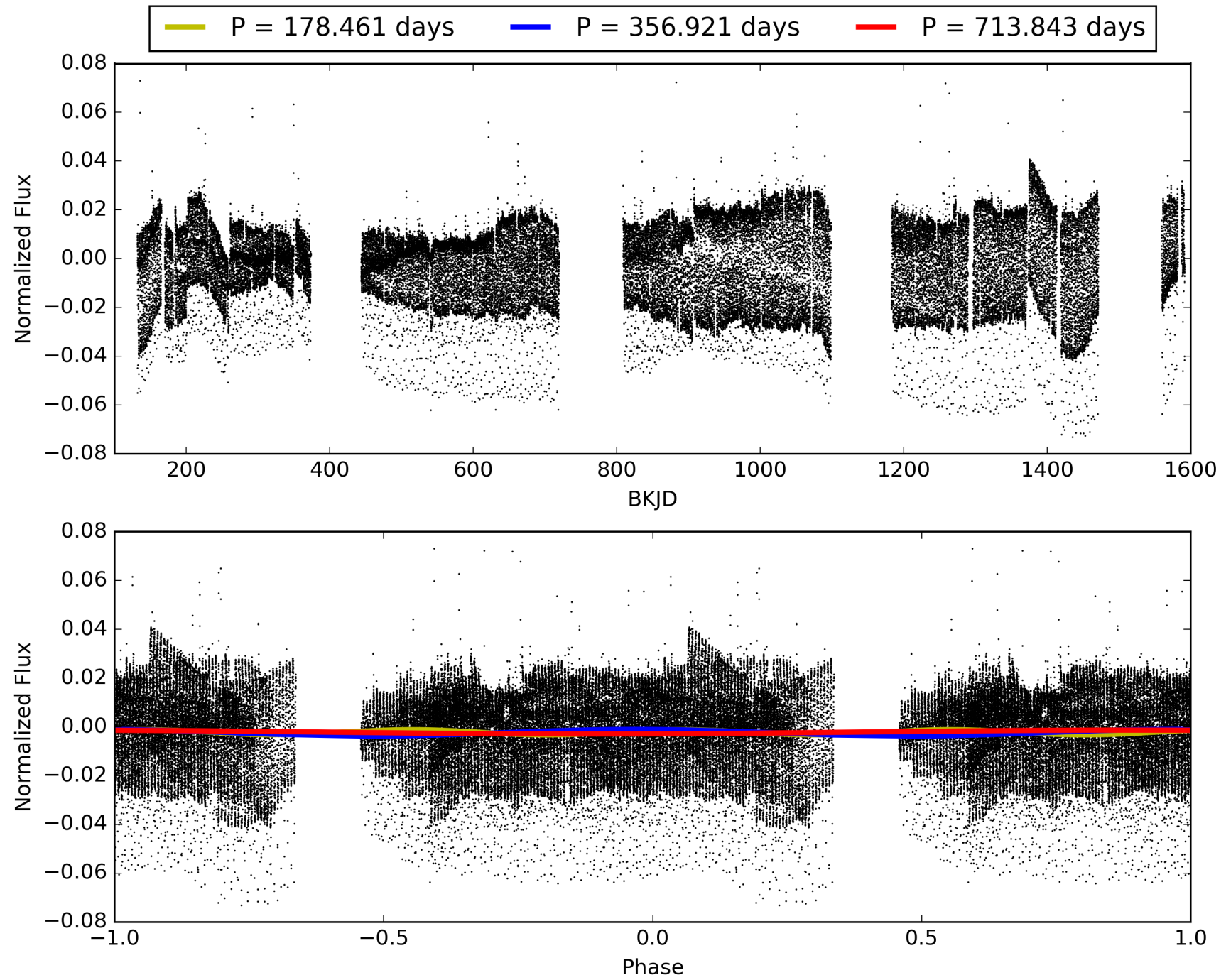
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:39:14 Z

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

# TCE 011546211-02, PDC Light Curves

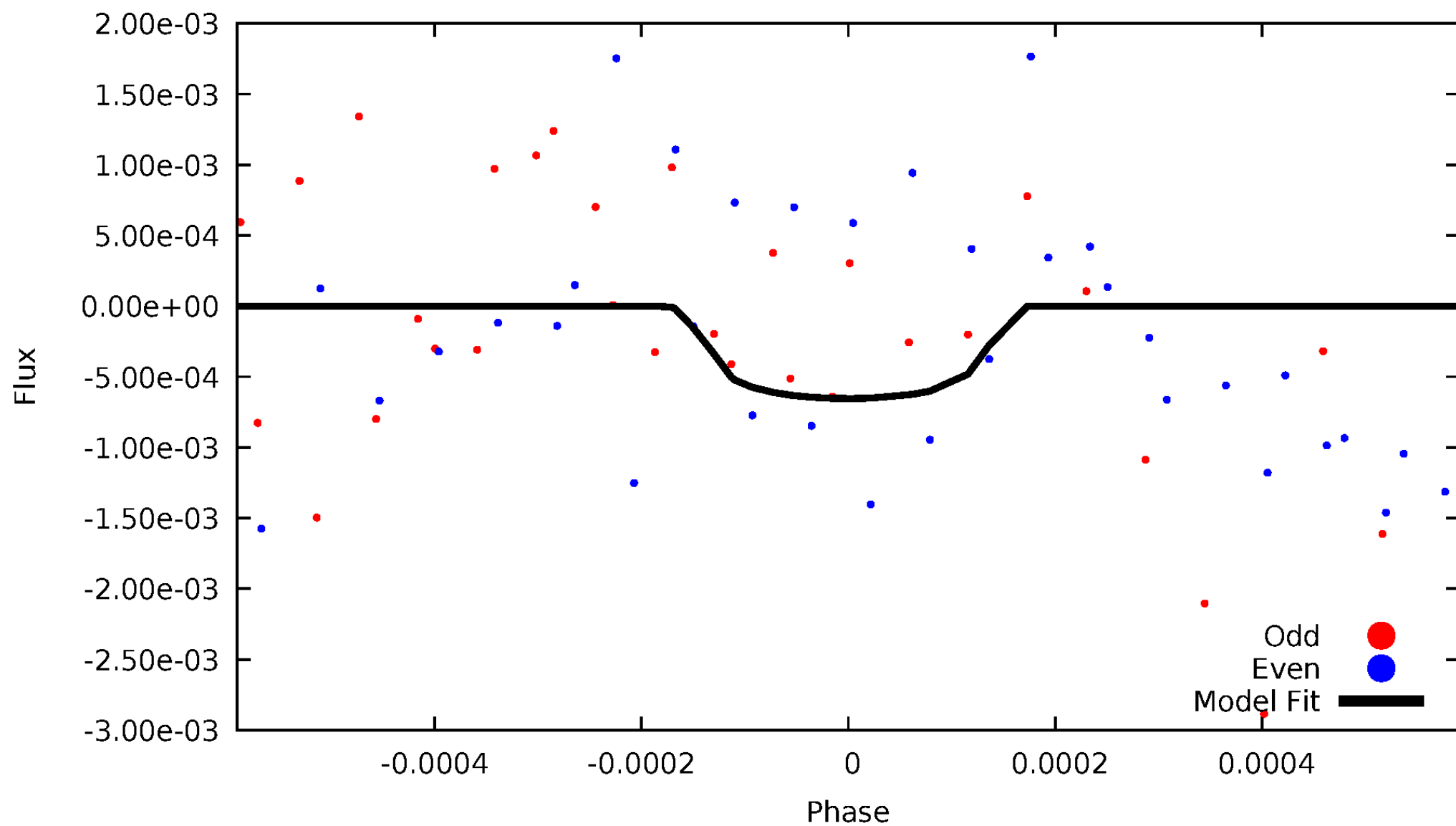


TCE 011546211-02



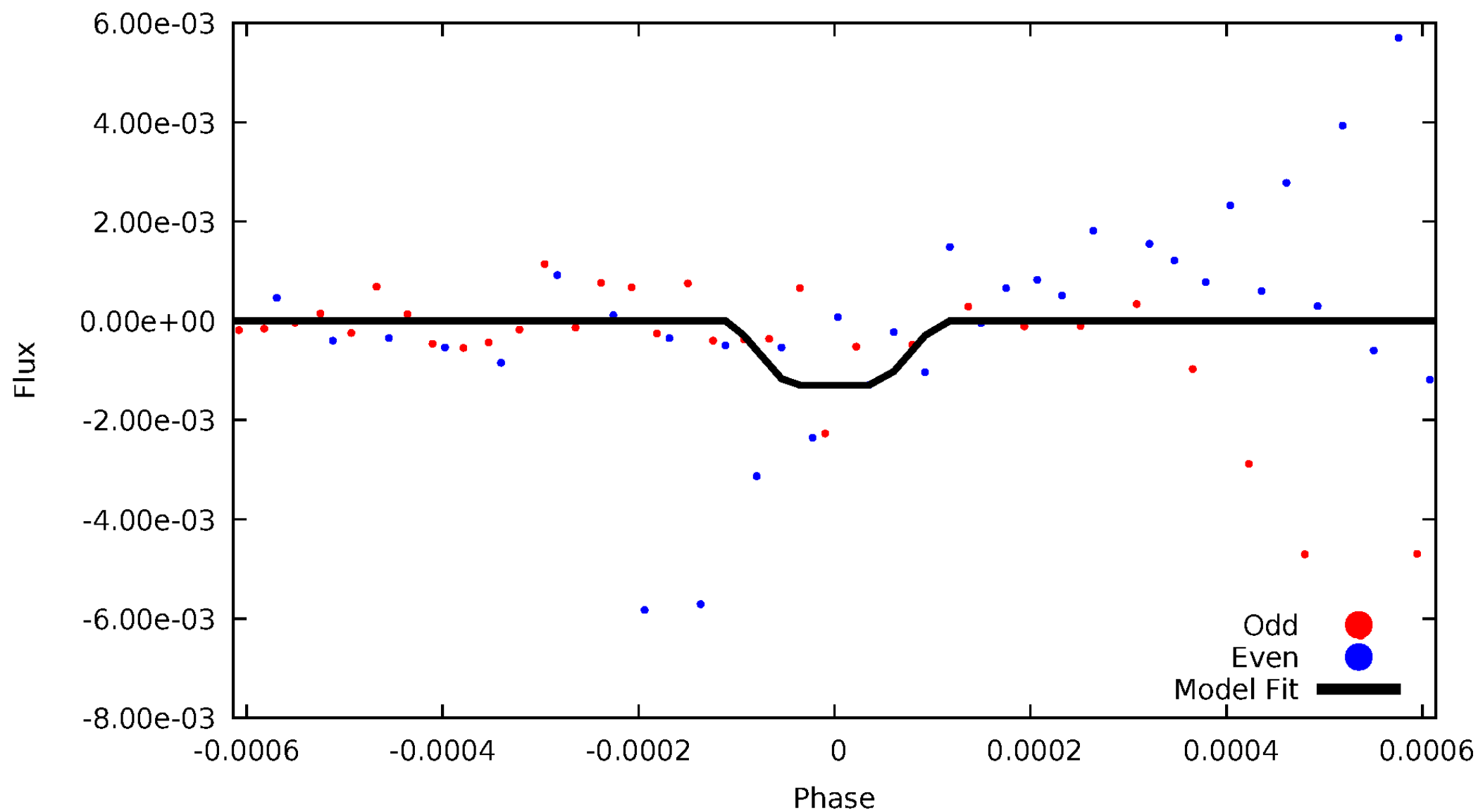
# DV Odd/Even

TCE 011546211-02



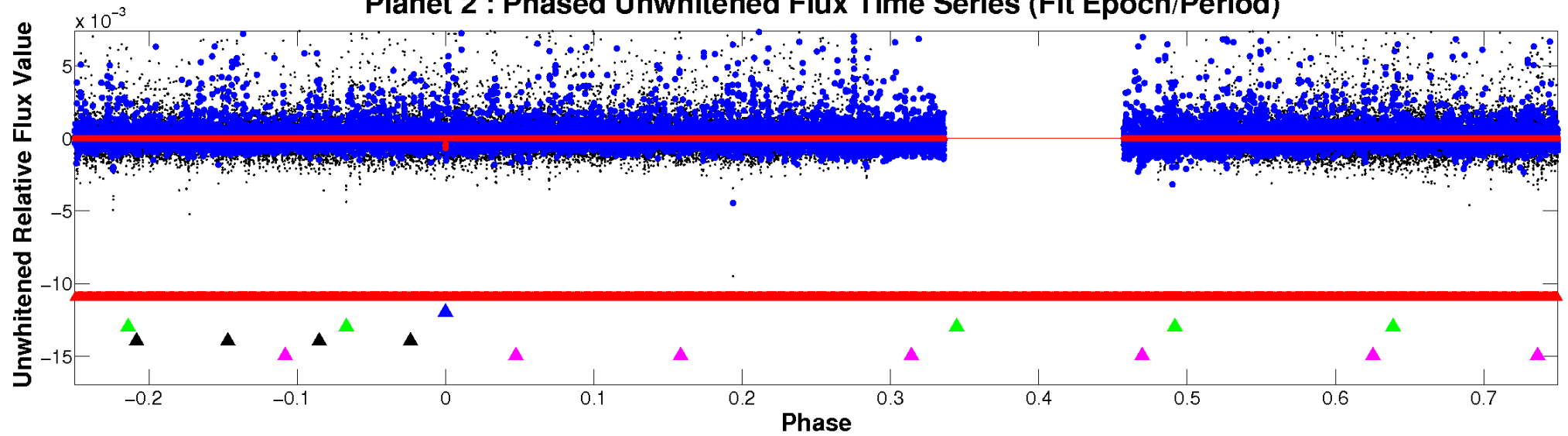
# ALT Odd/Even

TCE 011546211-02

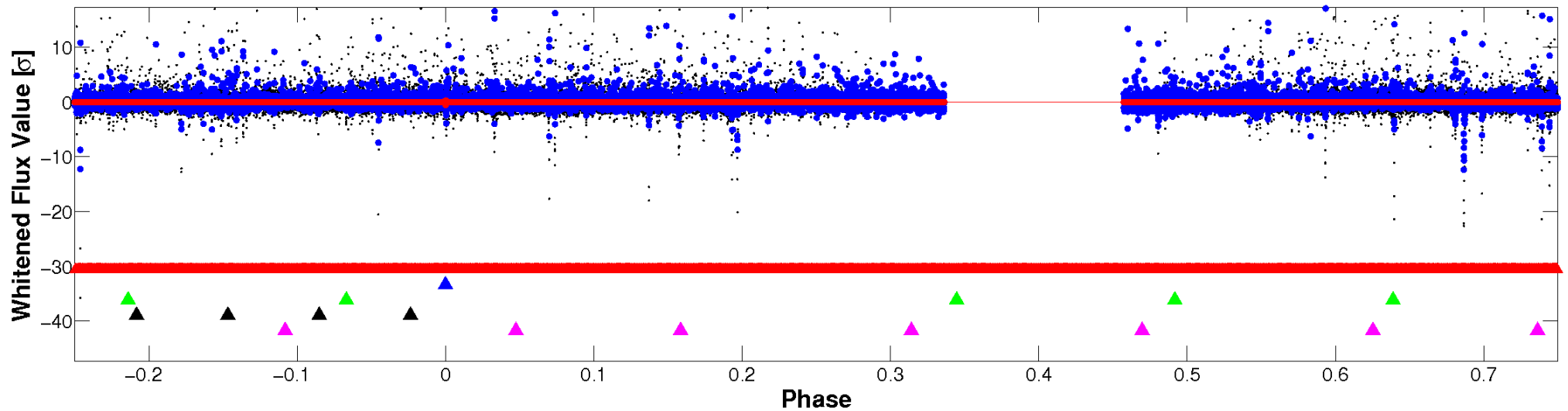


# Non-Whitened Vs. Whitened Light Curve

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



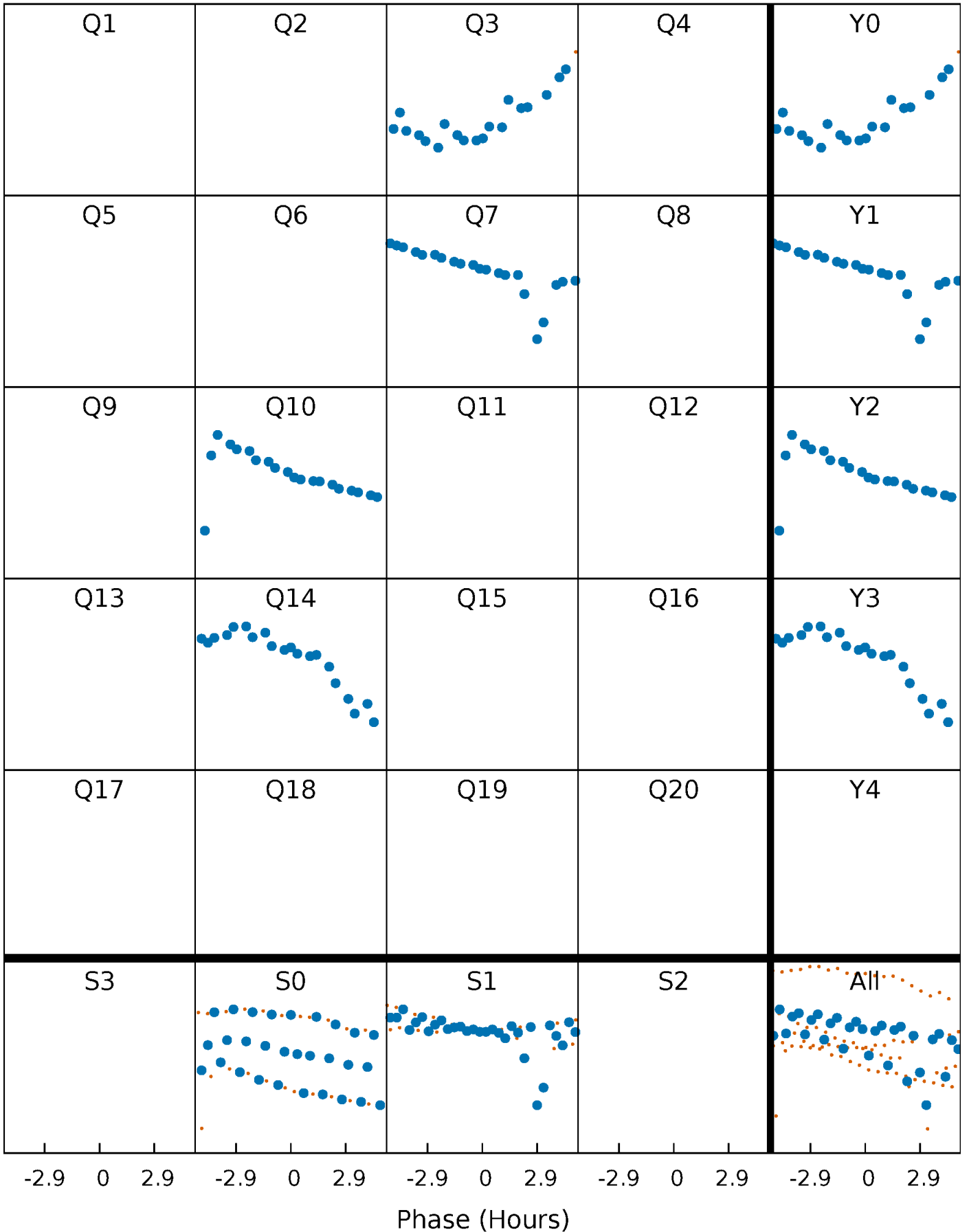
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





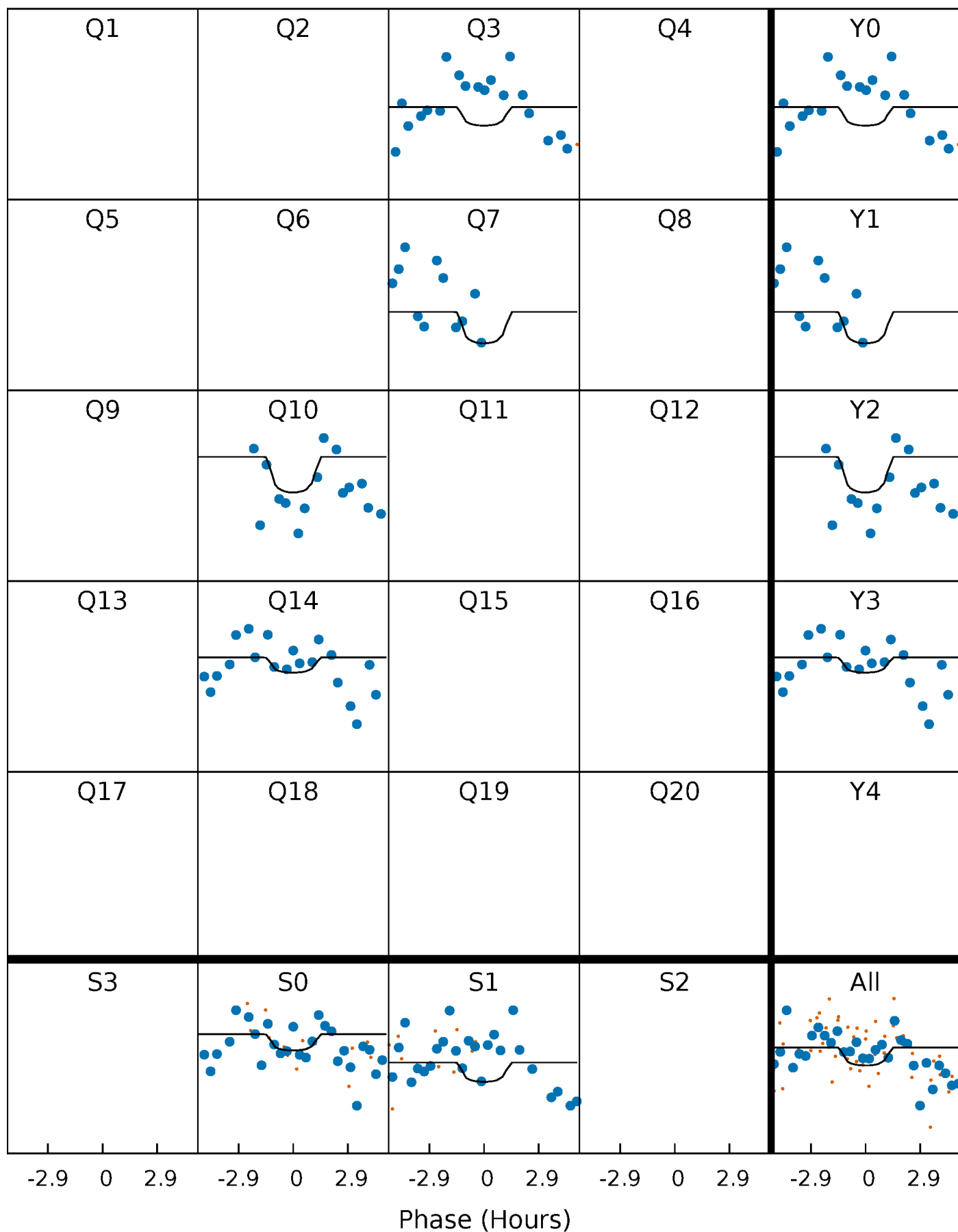
# PDC Quarter-Phased Transit Curves

TCE 011546211-02     $P=356.921262$  Days     $T_0=280.287680$  (BKJD)



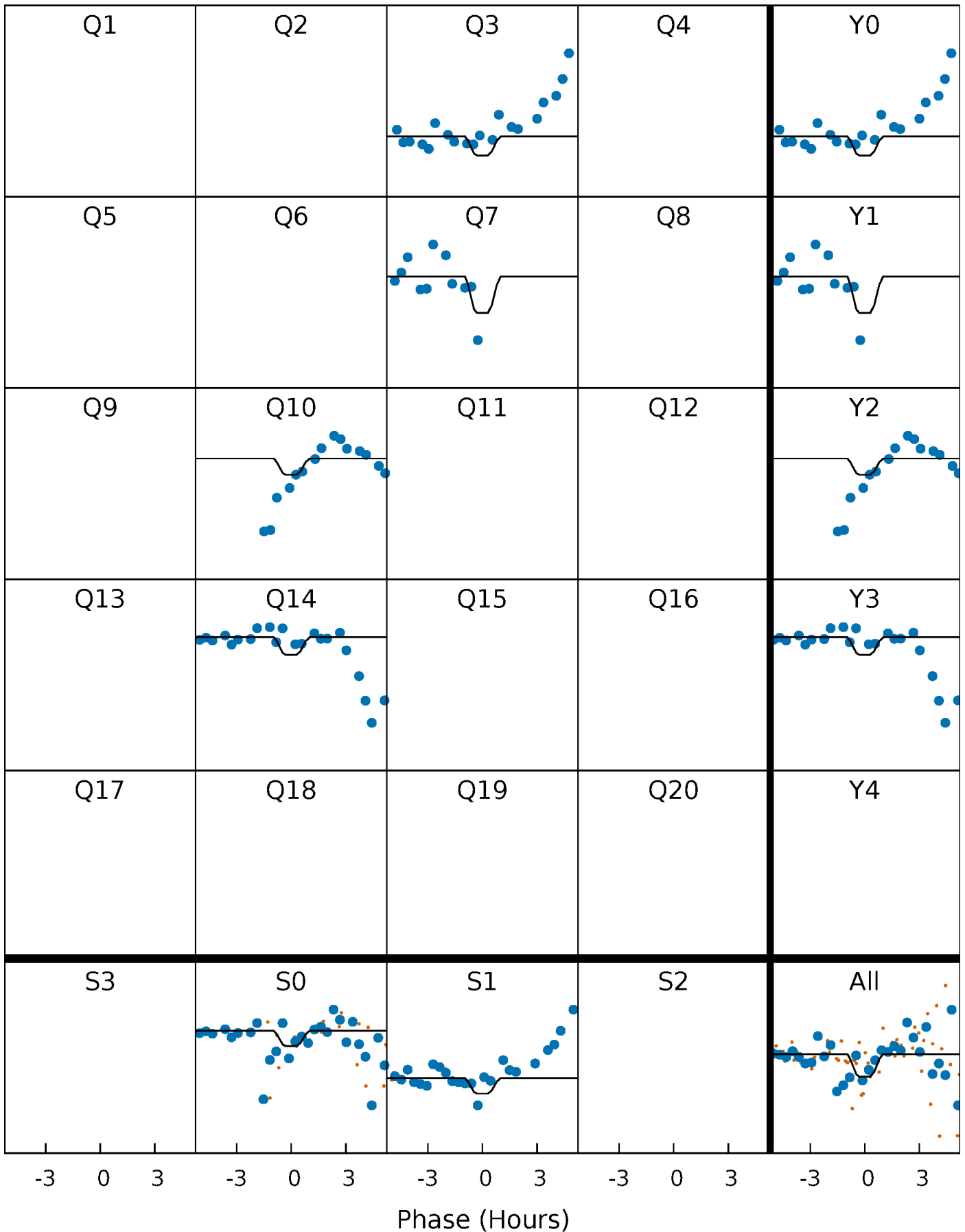
# DV Quarter-Phased Transit Curves

TCE 011546211-02 P=356.921262 Days  $T_0=280.287680$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

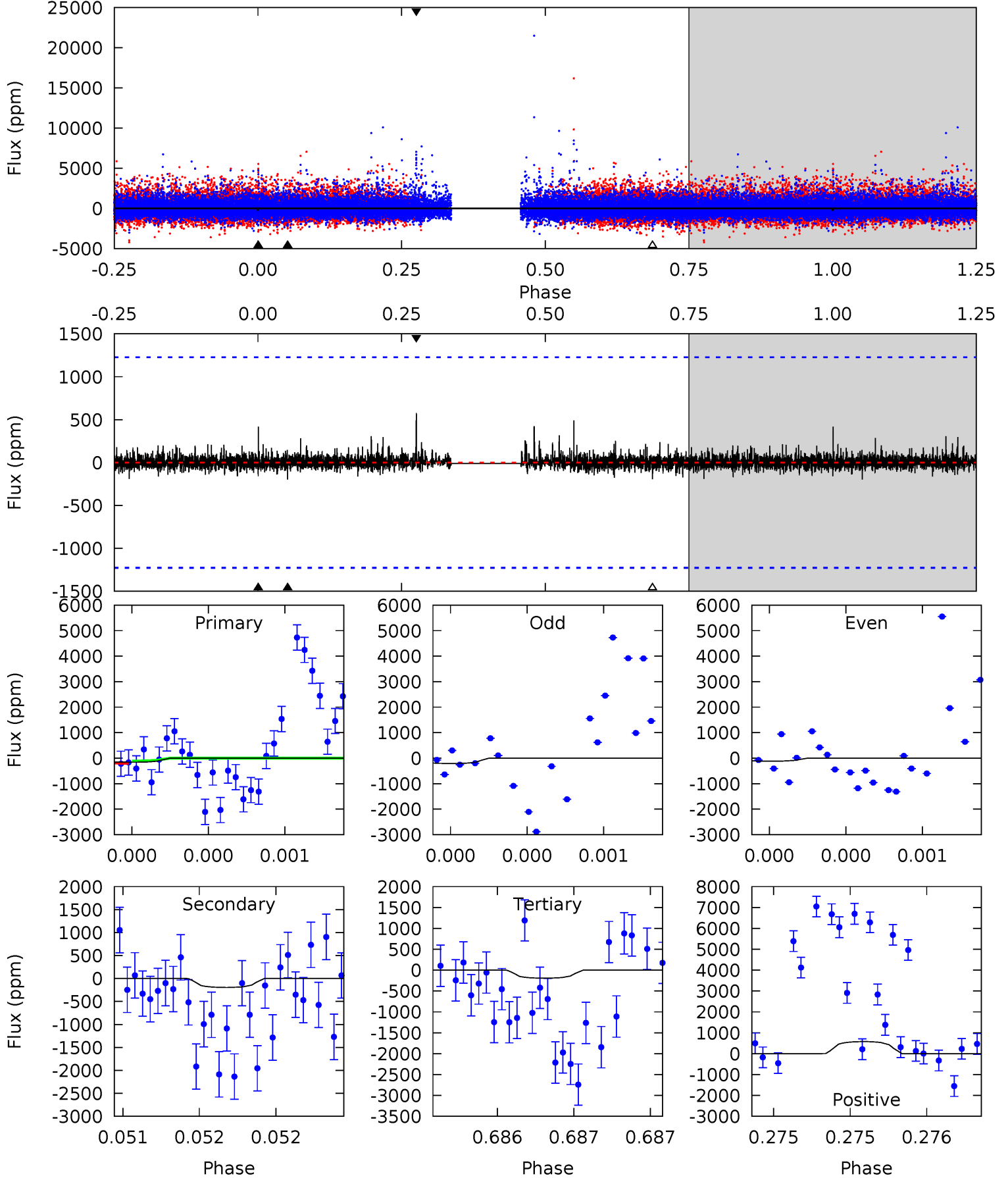
TCE 011546211-02 P=356.898185 Days  $T_0=280.308606$  (BKJD)



# DV Model-Shift Uniqueness Test

011546211-02, P = 356.921262 Days, E = 280.287680 Days

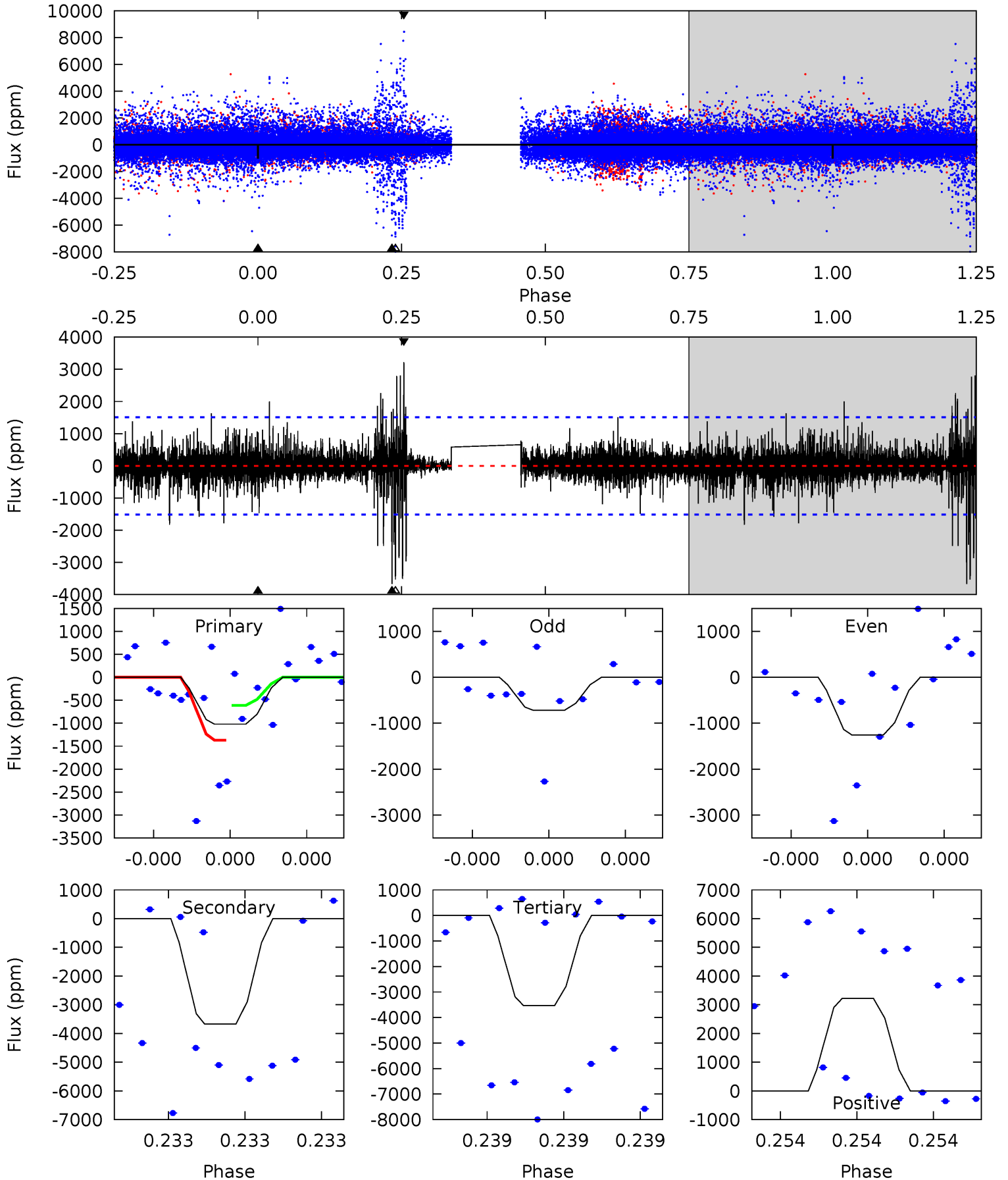
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.72	0.90	0.88	2.65	5.64	3.58	0.25	-0.16	-1.93	0.01	-1.76	0.16	0.83	0.75	0.22



# Alt Model-Shift Uniqueness Test

011546211-02, P = 356.898185 Days, E = 280.308606 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
3.88	14.0	13.4	12.2	5.76	3.76	1.34	-9.54	-8.37	0.55	1.72	0.82	1.12	0.47	1.45



### Stellar Parameters For KIC 011546211

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3497^{+62}_{-55}$	$4.920^{+0.055}_{-0.040}$	$-0.200^{+0.100}_{-0.100}$	$0.334^{+0.039}_{-0.044}$	$0.339^{+0.051}_{-0.051}$	$12.780^{+4.046}_{-2.139}$
	+2%/-2%	+1%/-1%	+50%/-50%	+12%/-13%	+15%/-15%	+32%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011546211-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-195 \pm 218$	$4.25^{+4.43}_{-2.97}$	$150^{+4}_{-5}$	$1974^{+647}_{-3477}$	$2151^{+22937}_{-2246}$
Alt.	$-3671 \pm 263$	$4.59^{+4.67}_{-3.13}$	$150^{+4}_{-4}$	$2817^{+1250}_{-443}$	$45315^{+407740}_{-33729}$

$T_{\text{max}}$  = 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

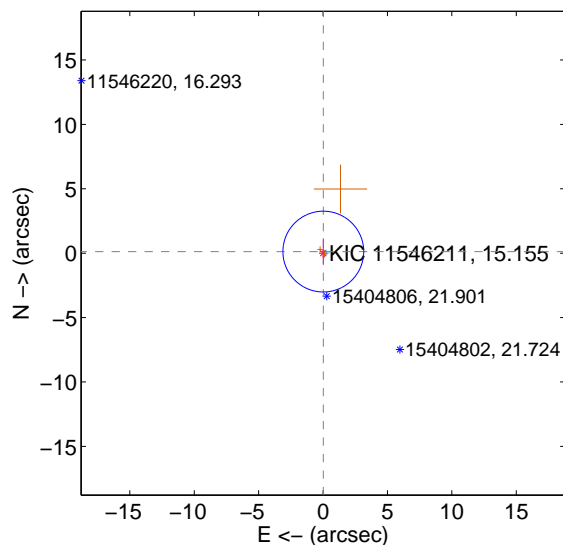
Supplemental centroid analysis for 011546211-02. Kepler magnitude: 15.15. Transit SNR 2.16

There are 1 quarters with good PRF difference image offsets

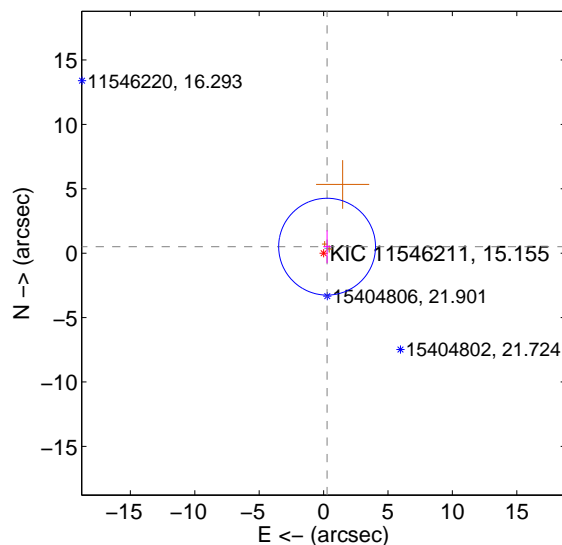
The direct PRF centroid is offset from the target star catalog position by about 0.50 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.126 \pm 1.045$	0.12	$-0.022 \pm 0.237$	$0.124 \pm 1.023$
PRF-fit source offset from KIC position	$0.573 \pm 1.253$	0.46	$-0.273 \pm 0.303$	$0.504 \pm 1.273$
photometric centroid source offset	$6.92 \pm 2.91$	2.38	$4.20 \pm 3.19$	$5.50 \pm 2.74$

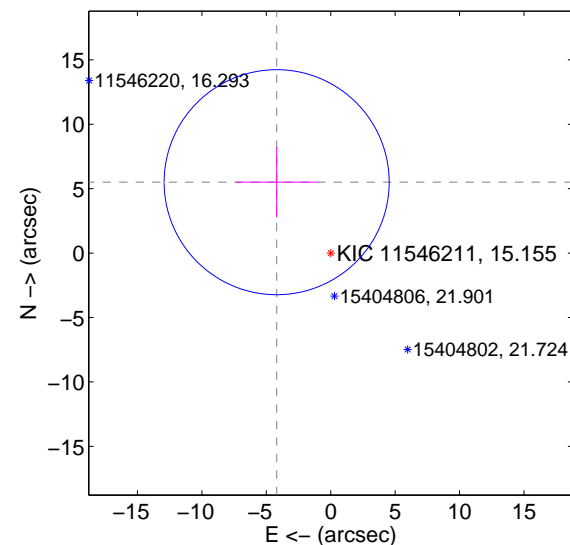
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

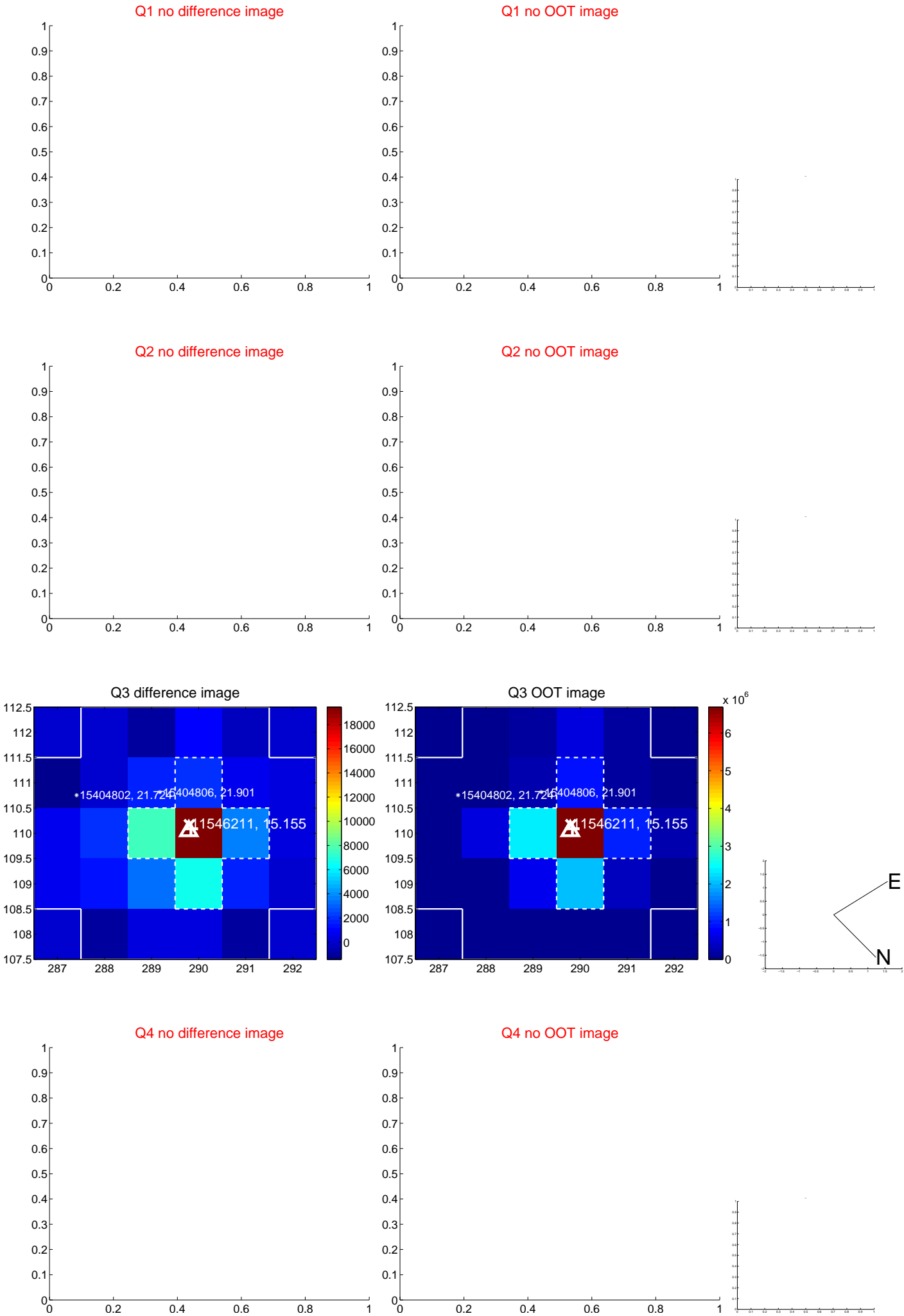


offset from photometric centroids



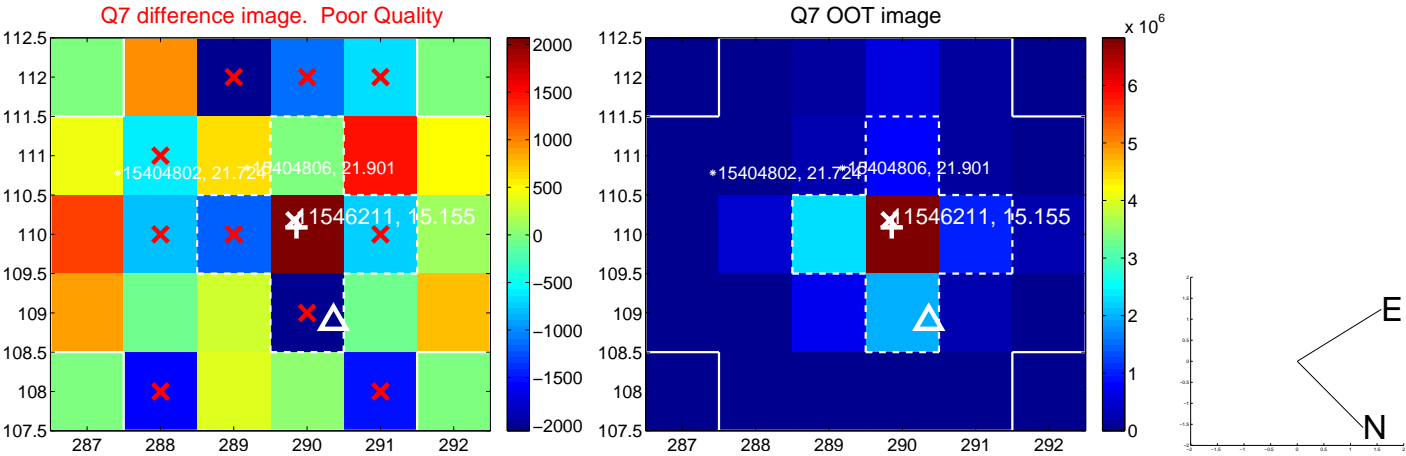
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

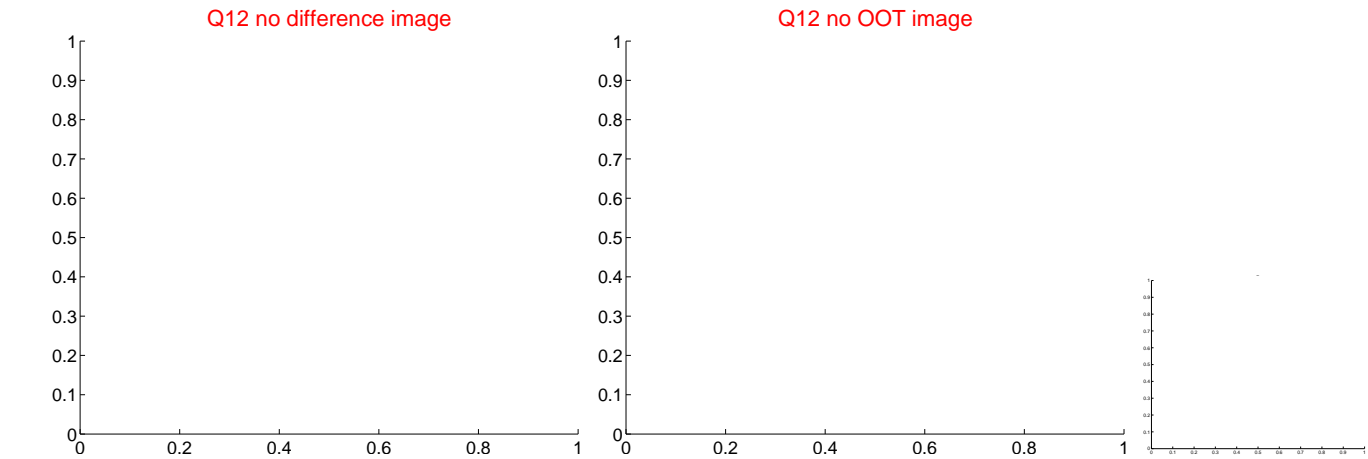
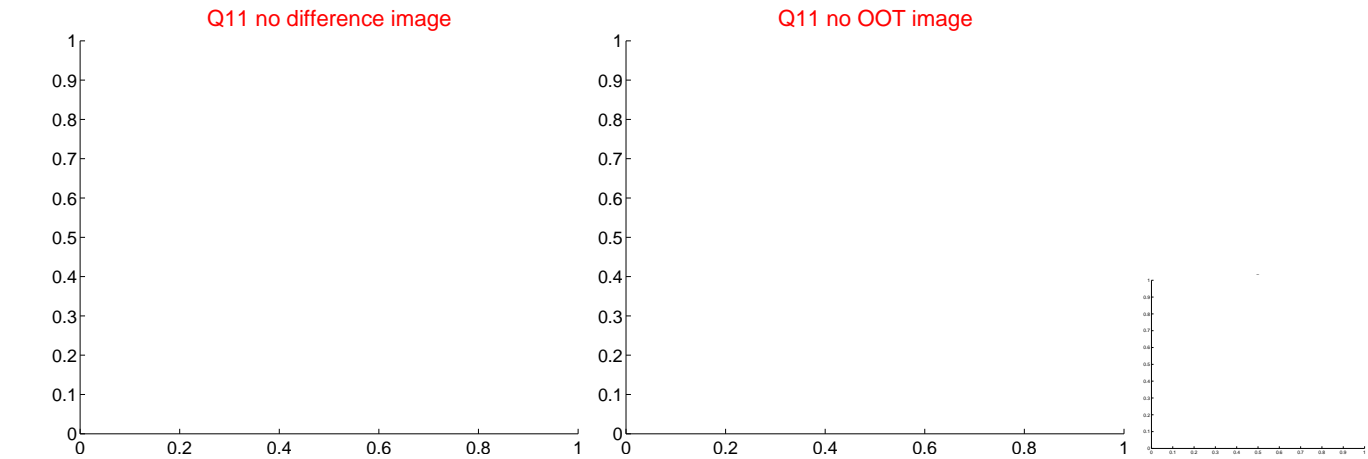
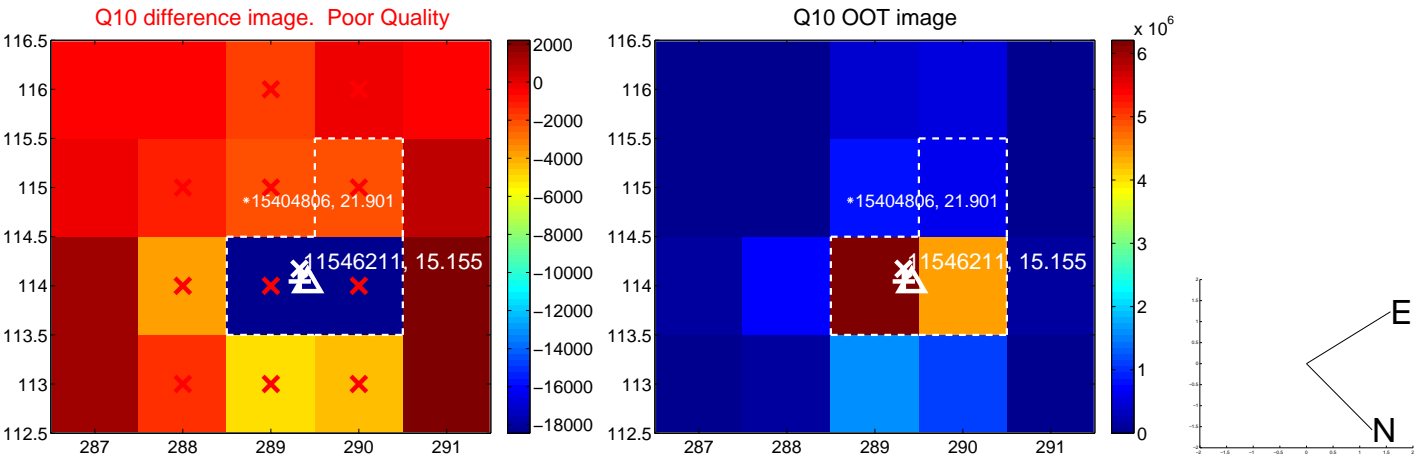
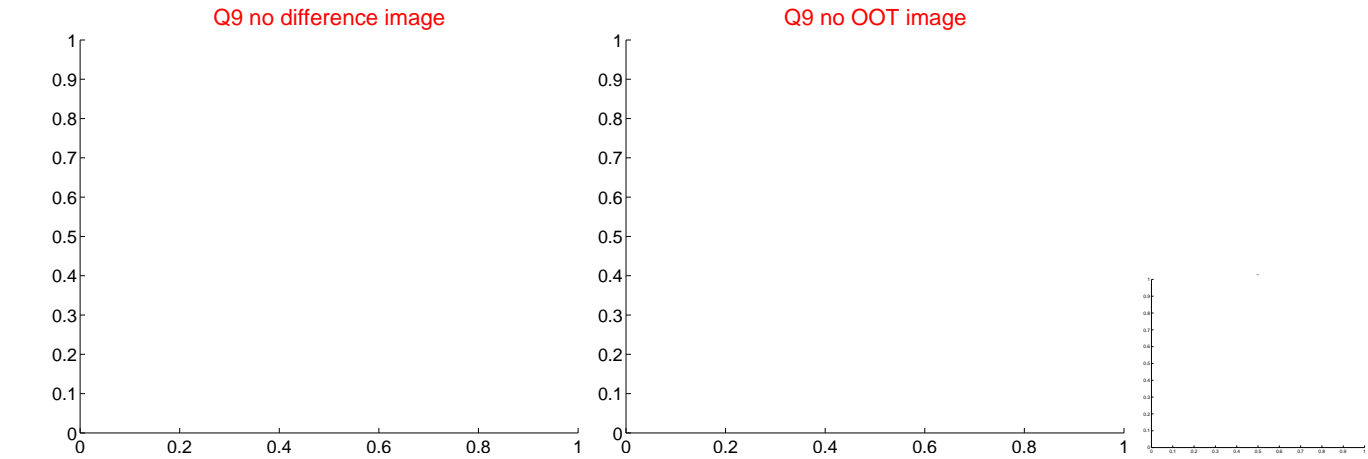




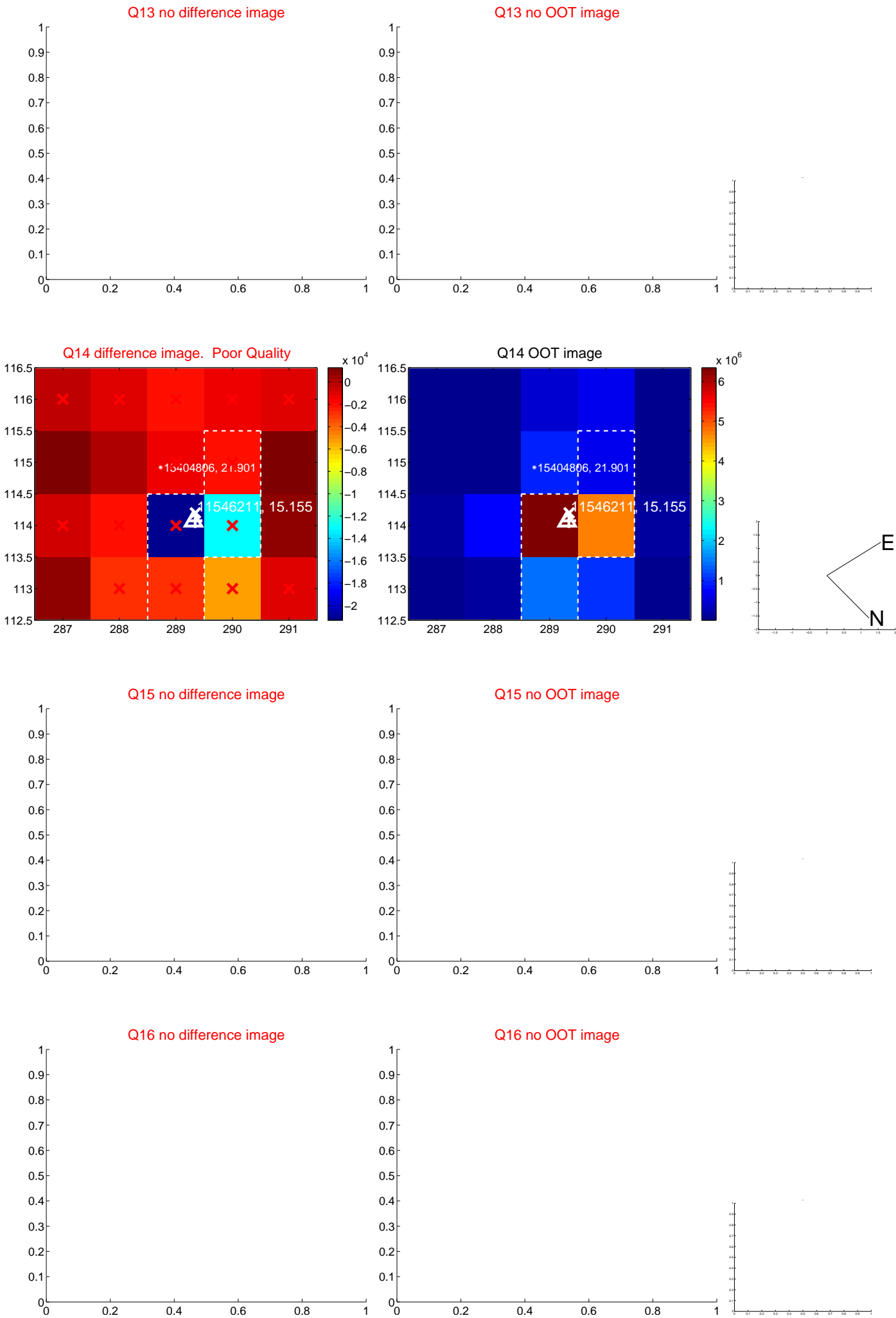
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



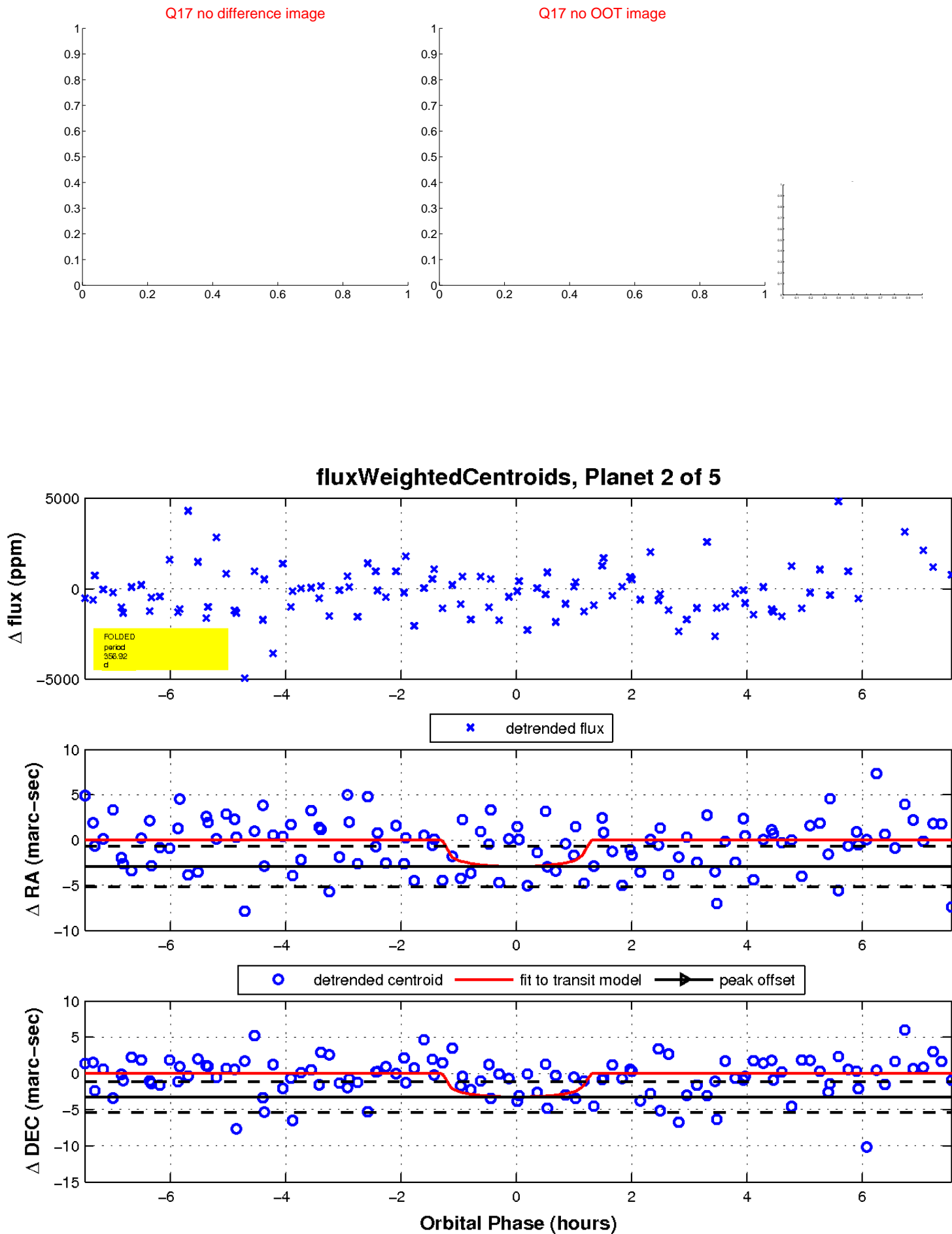
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

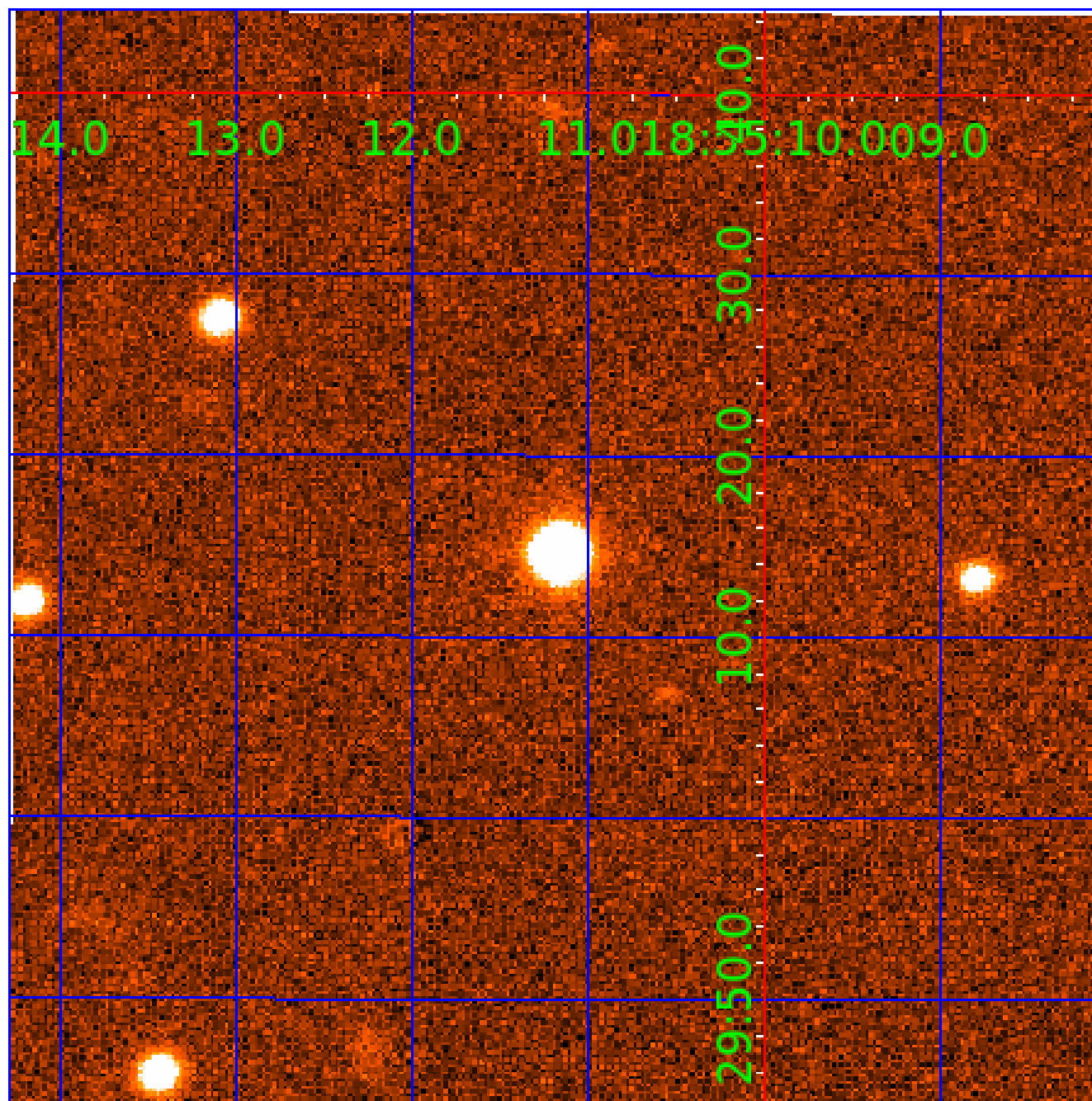


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011546211

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011546211-01	OBS	1654.01	1.097203	131.521182	33932.1	1.626	1357.0	827.2	0.33	3497	6.64	70.98
011546211-02	OBS	No	356.921262	280.287680	653.8	2.531	12.8	2.2	0.33	3497	0.89	0.03
011546211-03	OBS	No	304.408608	256.428099	101.7	4.536	12.0	0.3	0.33	3497	0.34	0.04
011546211-04	OBS	No	334.949840	271.870183	2407.5	5.509	13.3	7.1	0.33	3497	1.67	0.04
011546211-05	OBS	No	206.226906	336.876001	4129.3	2.894	12.8	9.0	0.33	3497	2.17	0.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011546211-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_ODDEVEN_ALT—CENT_KIC_POS
011546211-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011546211-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011546211-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_FEW_DIFFS
011546211-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS

**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 011546211-03

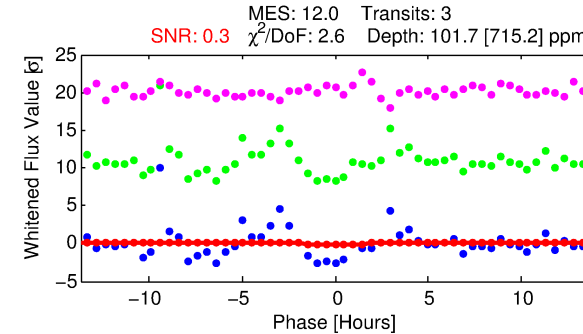
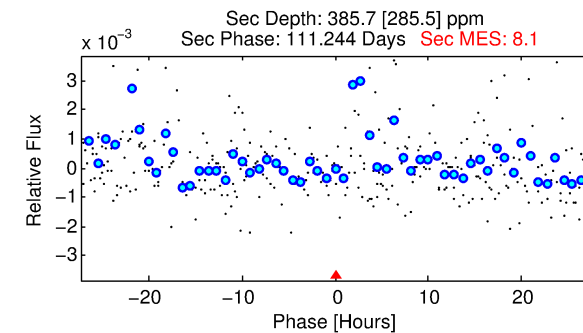
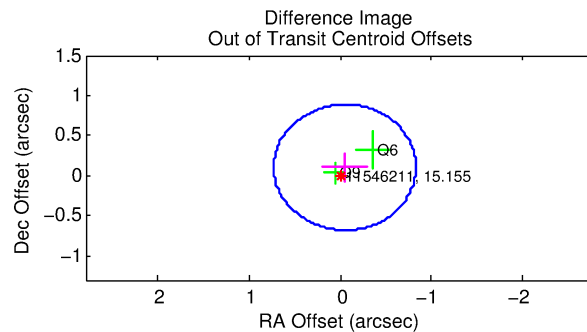
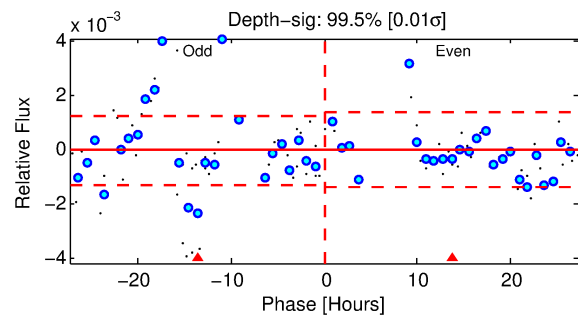
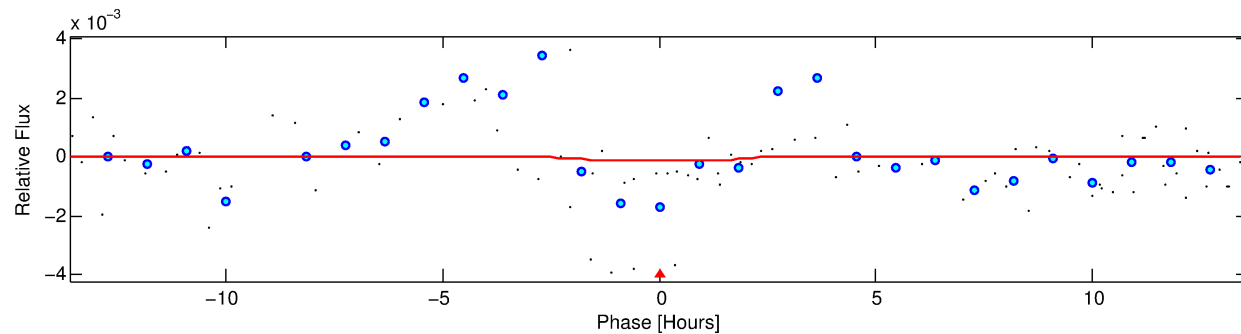
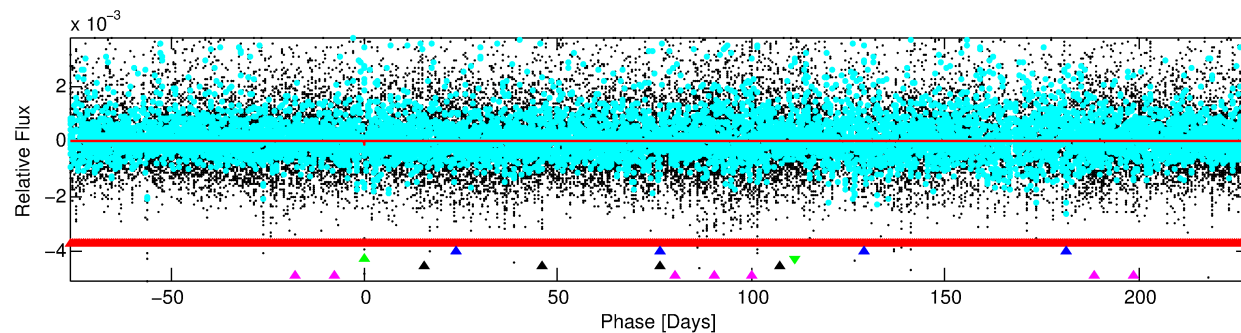
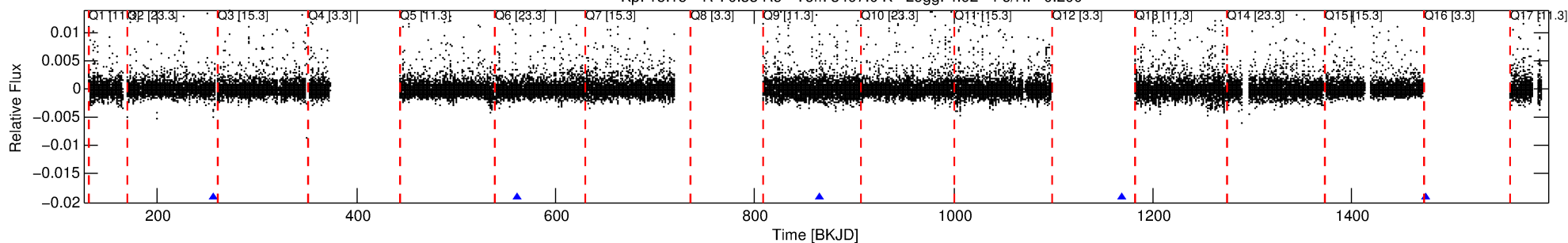
No Significant Match Found

# DV One-Page Summary

KIC: 11546211 Candidate: 3 of 5 Period: 304.409 d

KOI: K01654 Corr: No Ephemeris Match

Kp: 15.15 R\*: 0.33 Rs Teff: 3497.0 K Logg: 4.92 Fe/H: -0.200



## DV Fit Results:

Period = 304.40861 [0.40859] d  
Epoch = 256.4281 [0.6249] BKJD  
Rp/R\* = 0.0092 [1.2998]  
a/R\* = 500.53 [327506.90]  
b = 0.26 [2381.05]  
Seff = 0.04 [0.01]  
Teq = 113 [4] K  
Rp = 0.34 [47.38] Re  
a = 0.6173 [0.0602] AU  
Ag = 715430.07 [201628950.04] [0.00σ]  
Teff = 5103 [359521] K [0.01σ]

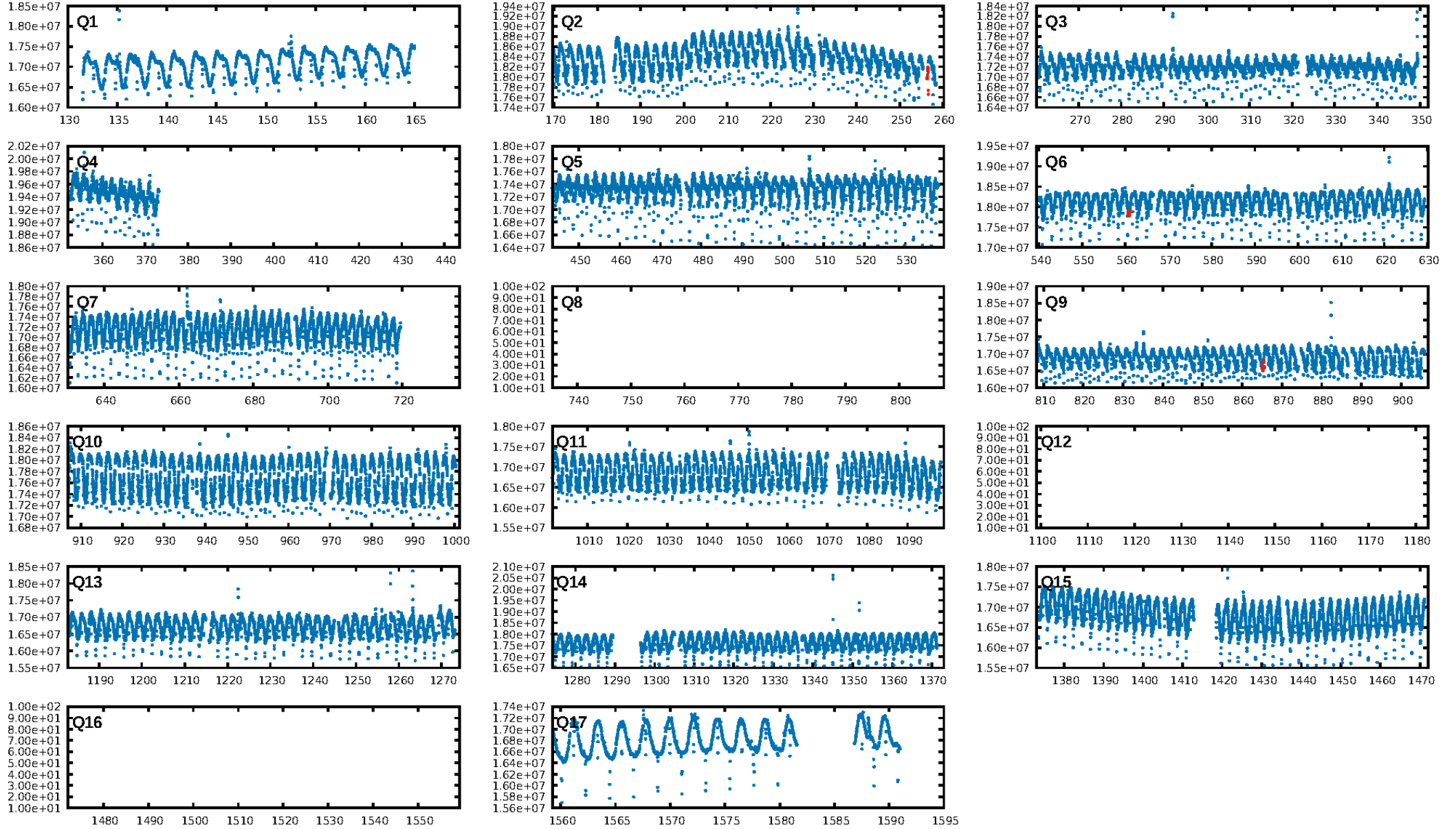
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [437.92σ]  
LongPeriod-sig: 100.0% [102.72σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 19.0%  
Bootstrap-pfa: 6.19e-11  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.714  
Centroid-sig: 29.9%  
Centroid-so: 15.245 arcsec [1.00σ]  
OptOffset-rm: 0.115 arcsec [0.44σ]  
OptOffset-st: 1/0/0/1 [2]  
KicOffset-rm: 0.619 arcsec [3.05σ]  
KicOffset-st: 1/0/0/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 0.00 [0/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:39:23 Z

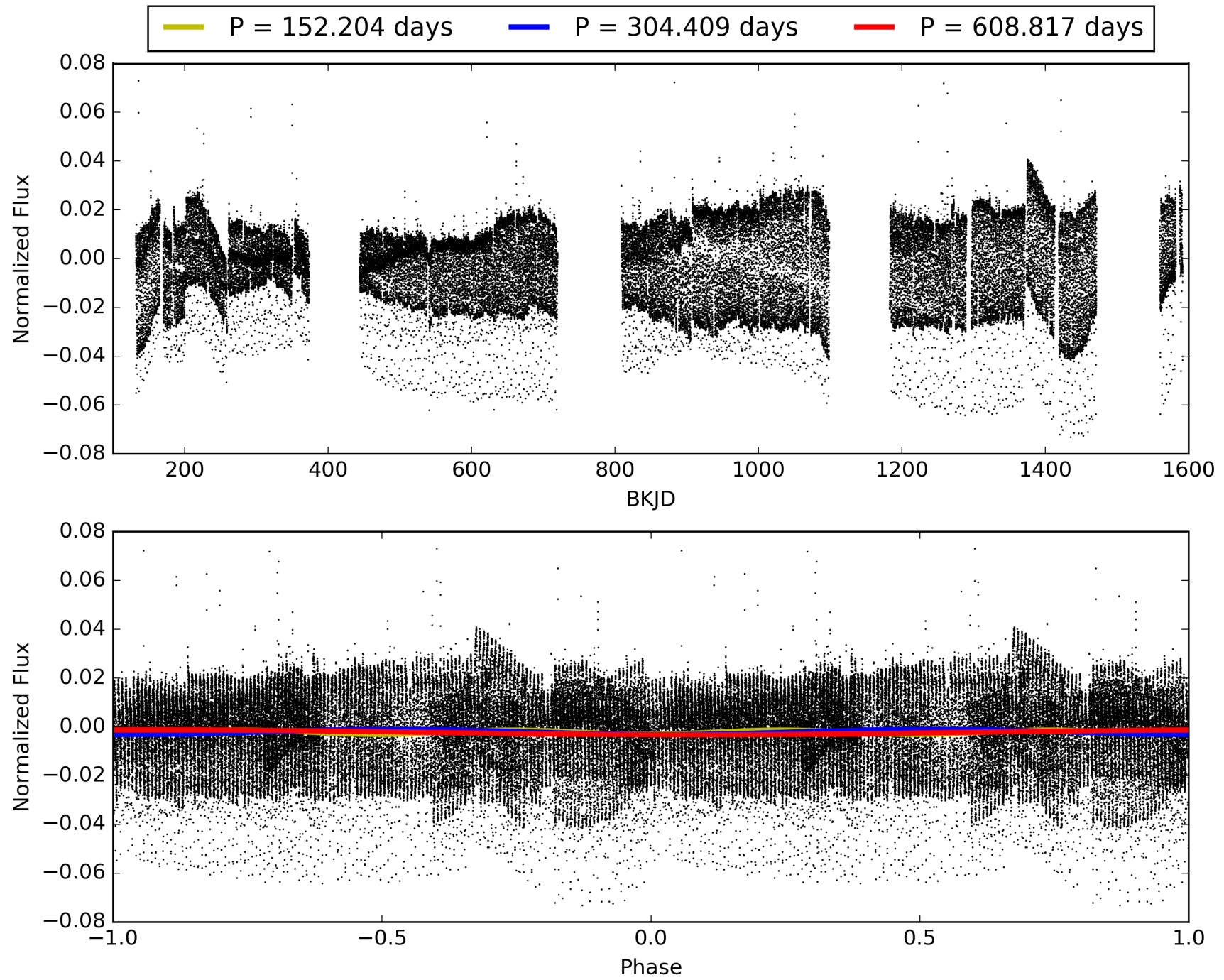
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011546211-03, PDC Light Curves



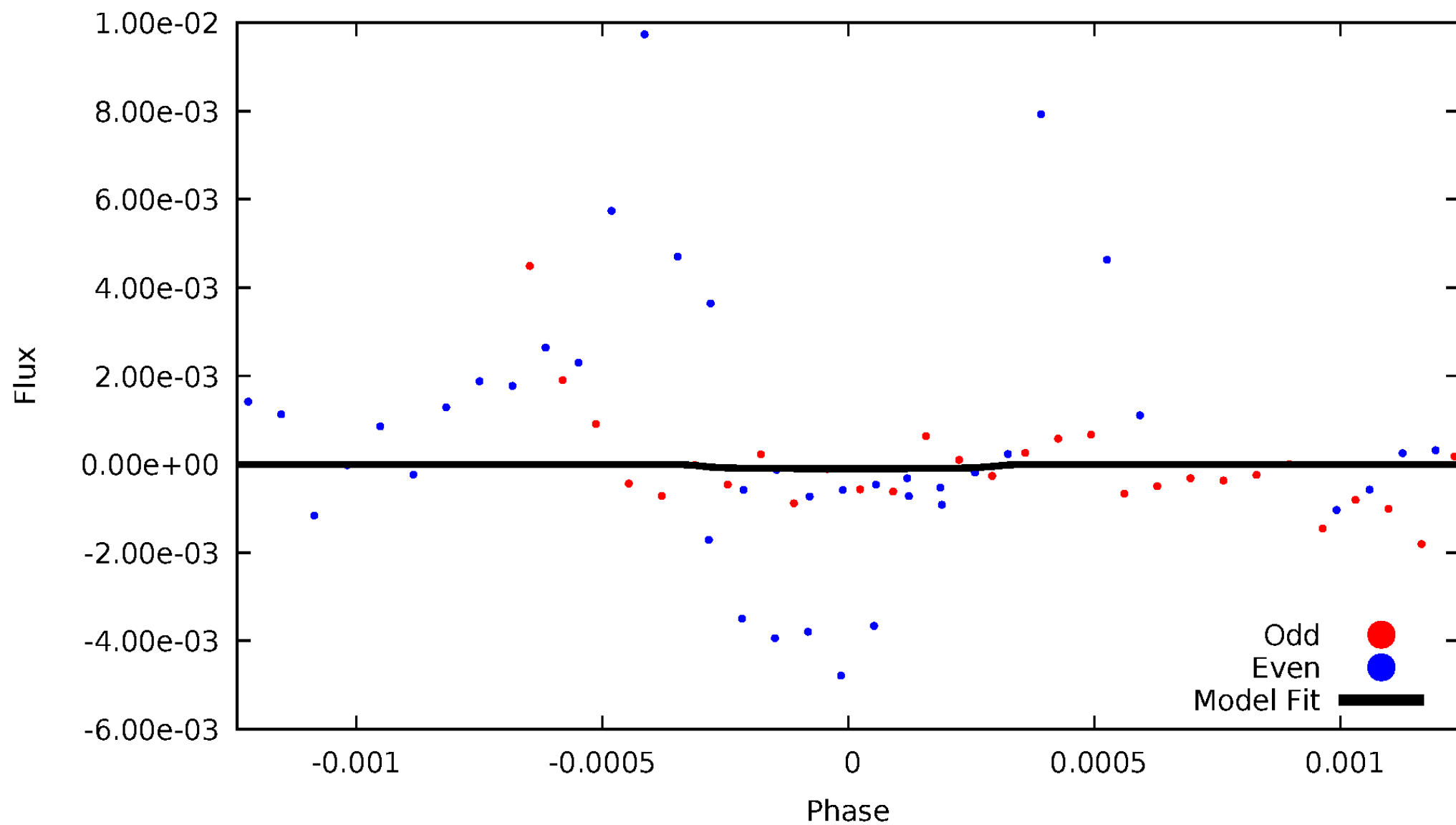


TCE 011546211-03



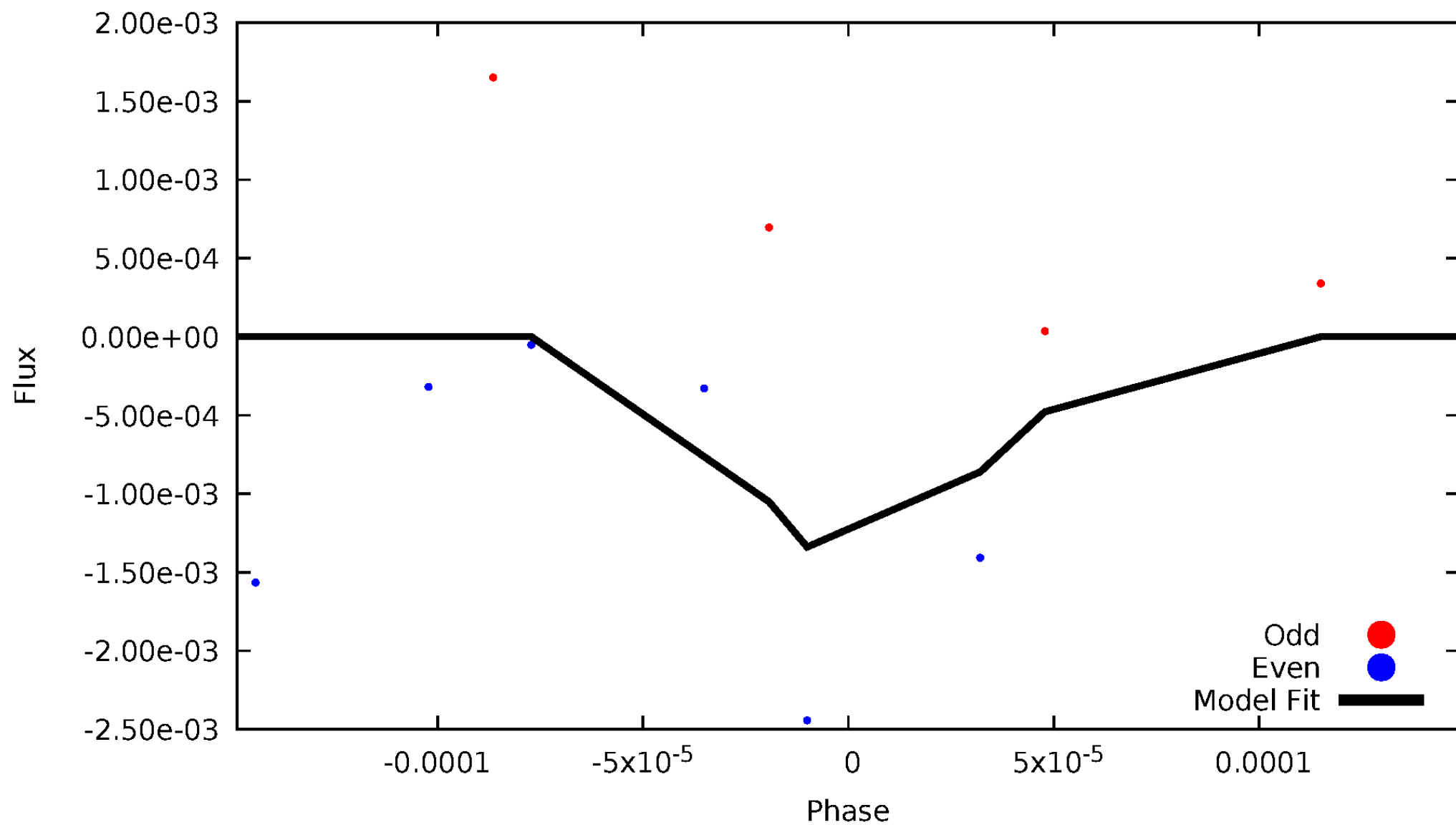
# DV Odd/Even

TCE 011546211-03



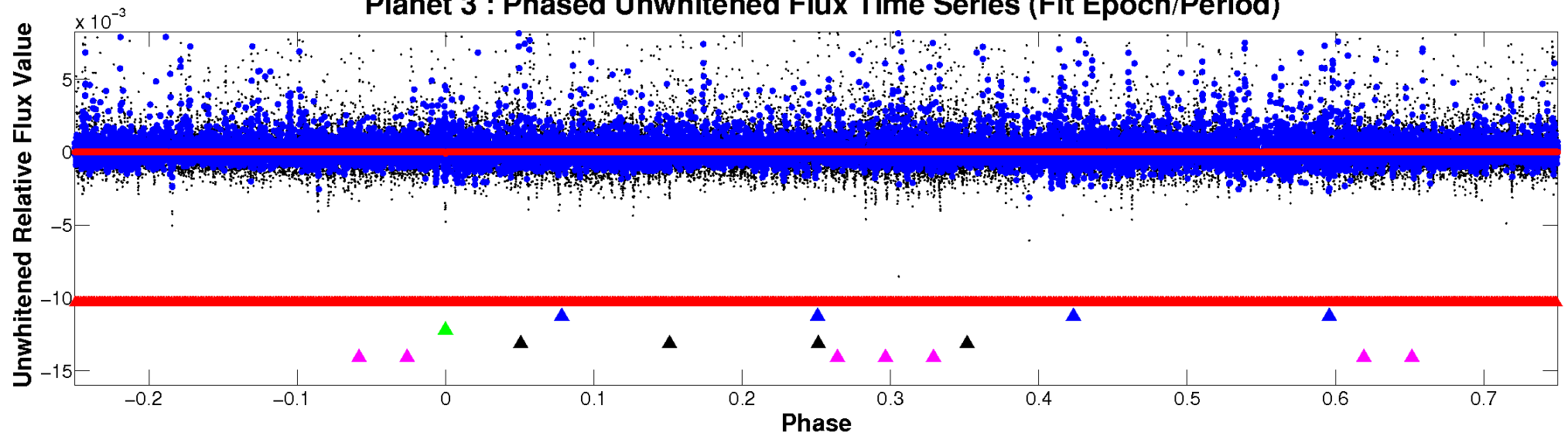
# ALT Odd/Even

TCE 011546211-03

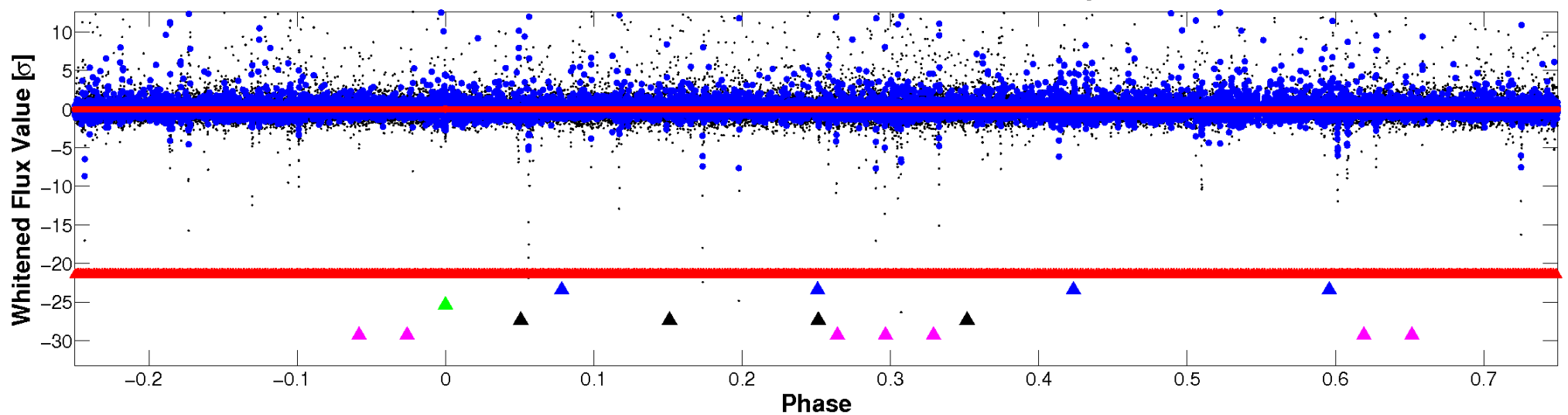


# Non-Whitened Vs. Whitened Light Curve

**Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

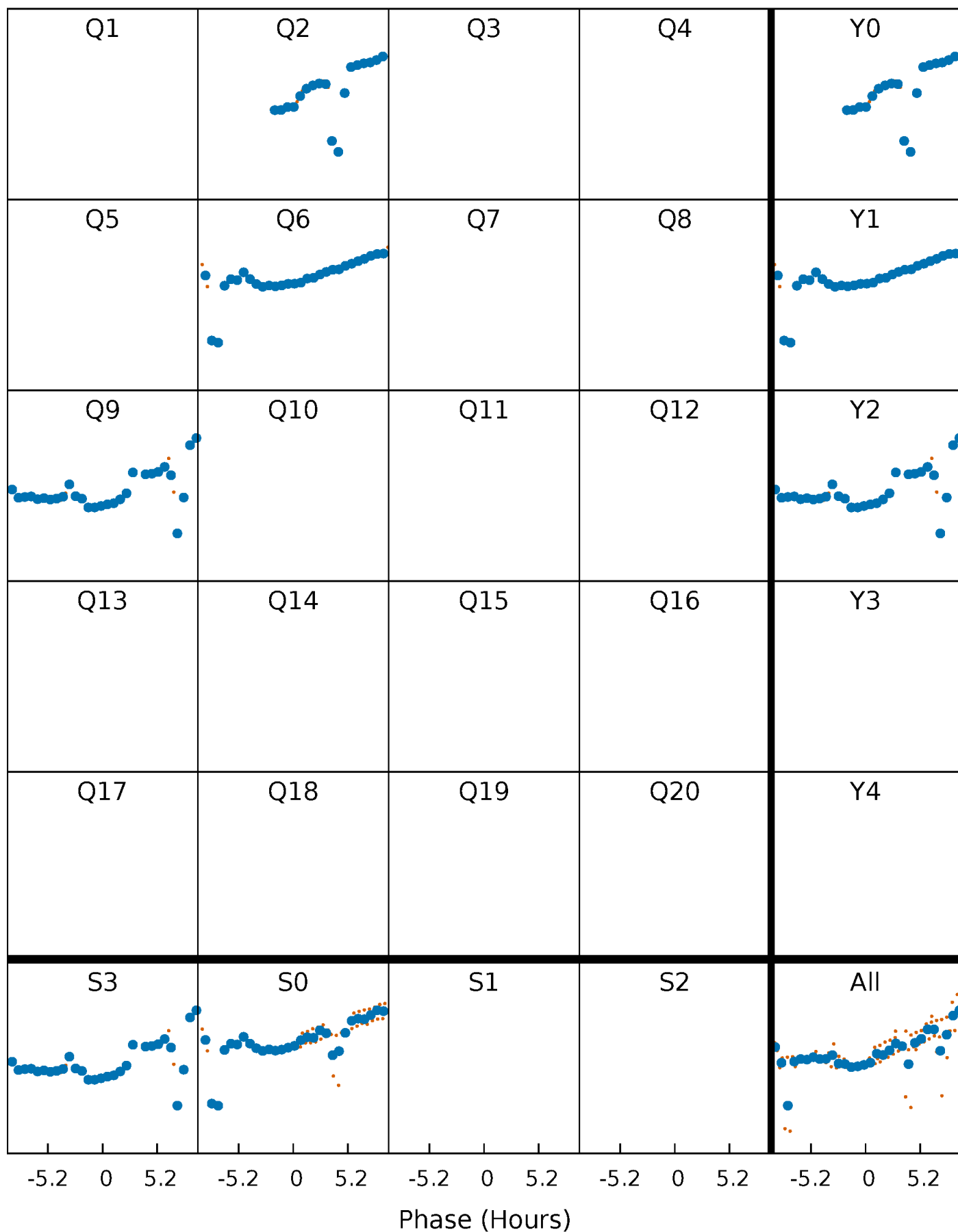


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



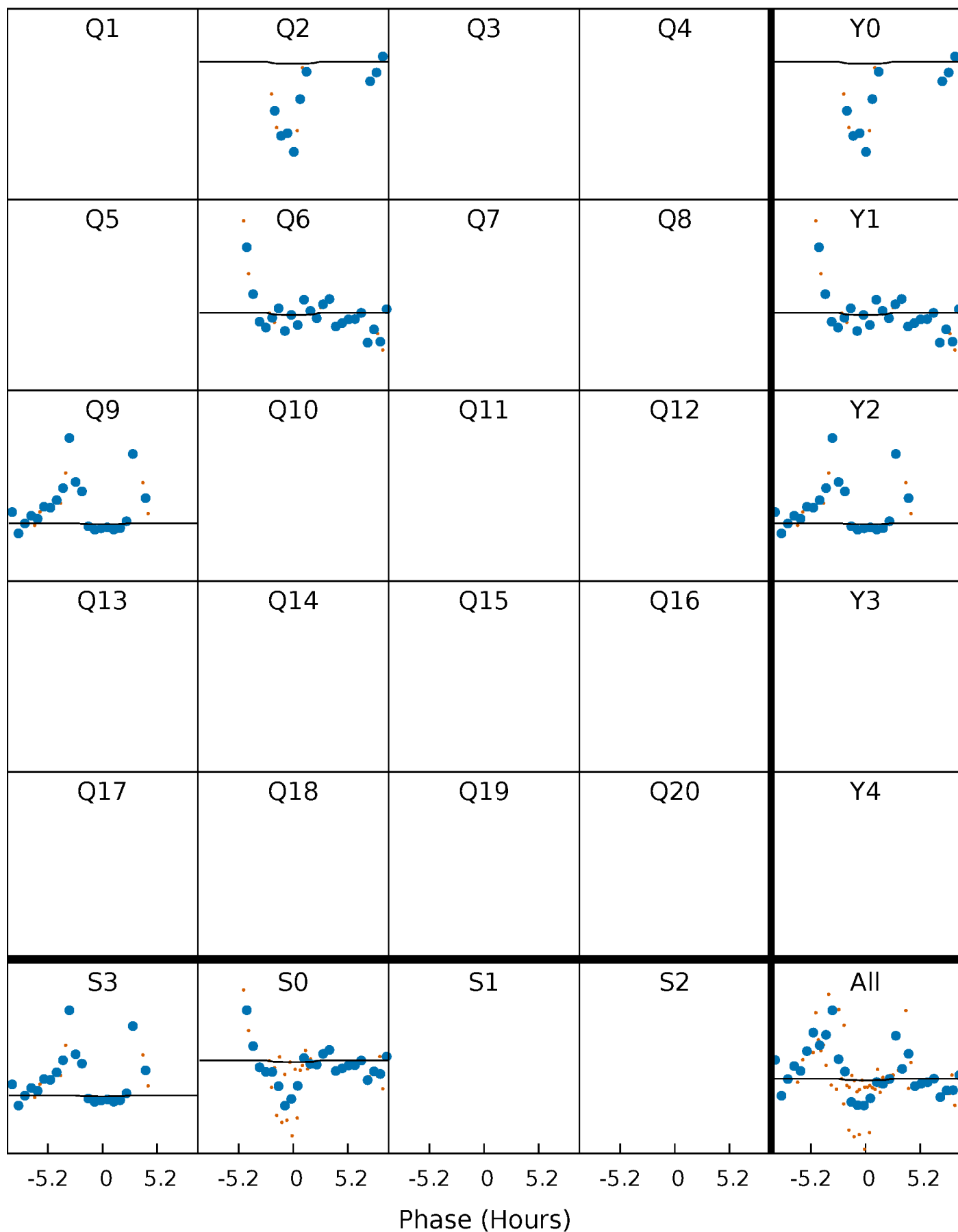
# PDC Quarter-Phased Transit Curves

TCE 011546211-03 P=304.408608 Days  $T_0=256.428098$  (BKJD)



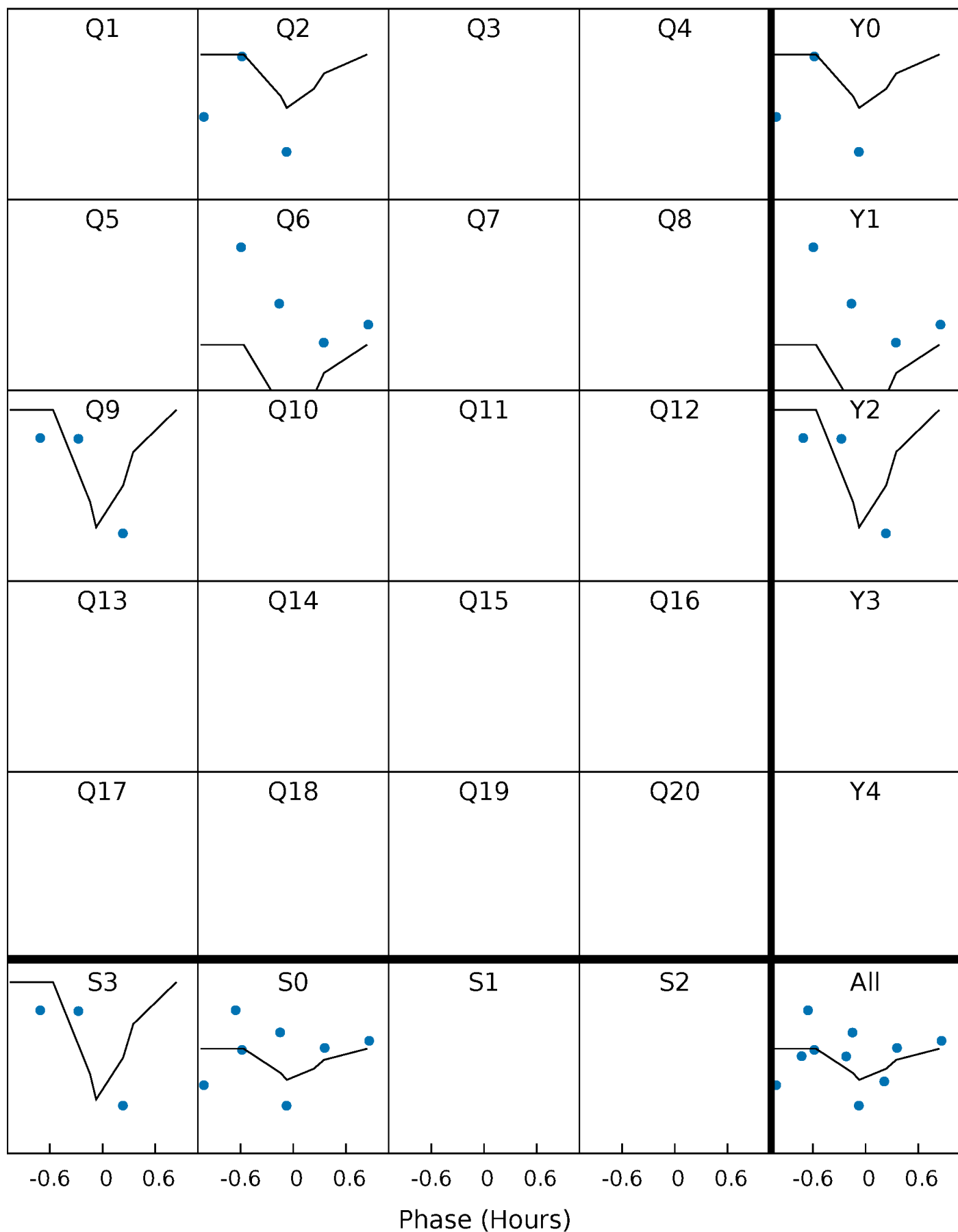
# DV Quarter-Phased Transit Curves

TCE 011546211-03     $P=304.408608$  Days     $T_0=256.428098$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

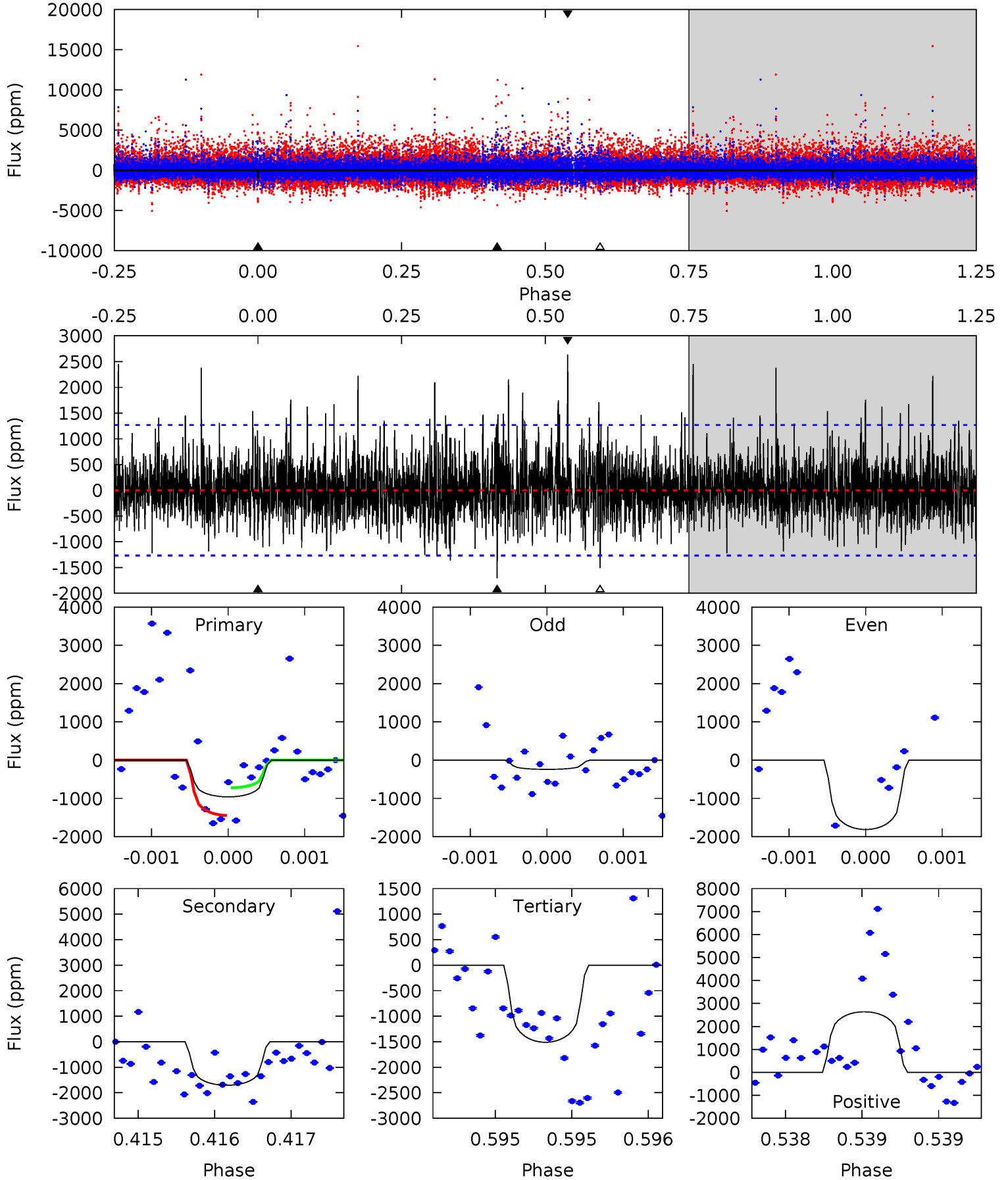
TCE 011546211-03 P=304.423172 Days  $T_0=256.487942$  (BKJD)



# DV Model-Shift Uniqueness Test

011546211-03, P = 304.408608 Days, E = 256.428098 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
4.19	7.45	6.59	11.5	5.53	3.42	1.93	-2.41	-7.32	0.85	-4.06	2.44	4.87	0.61	1.55

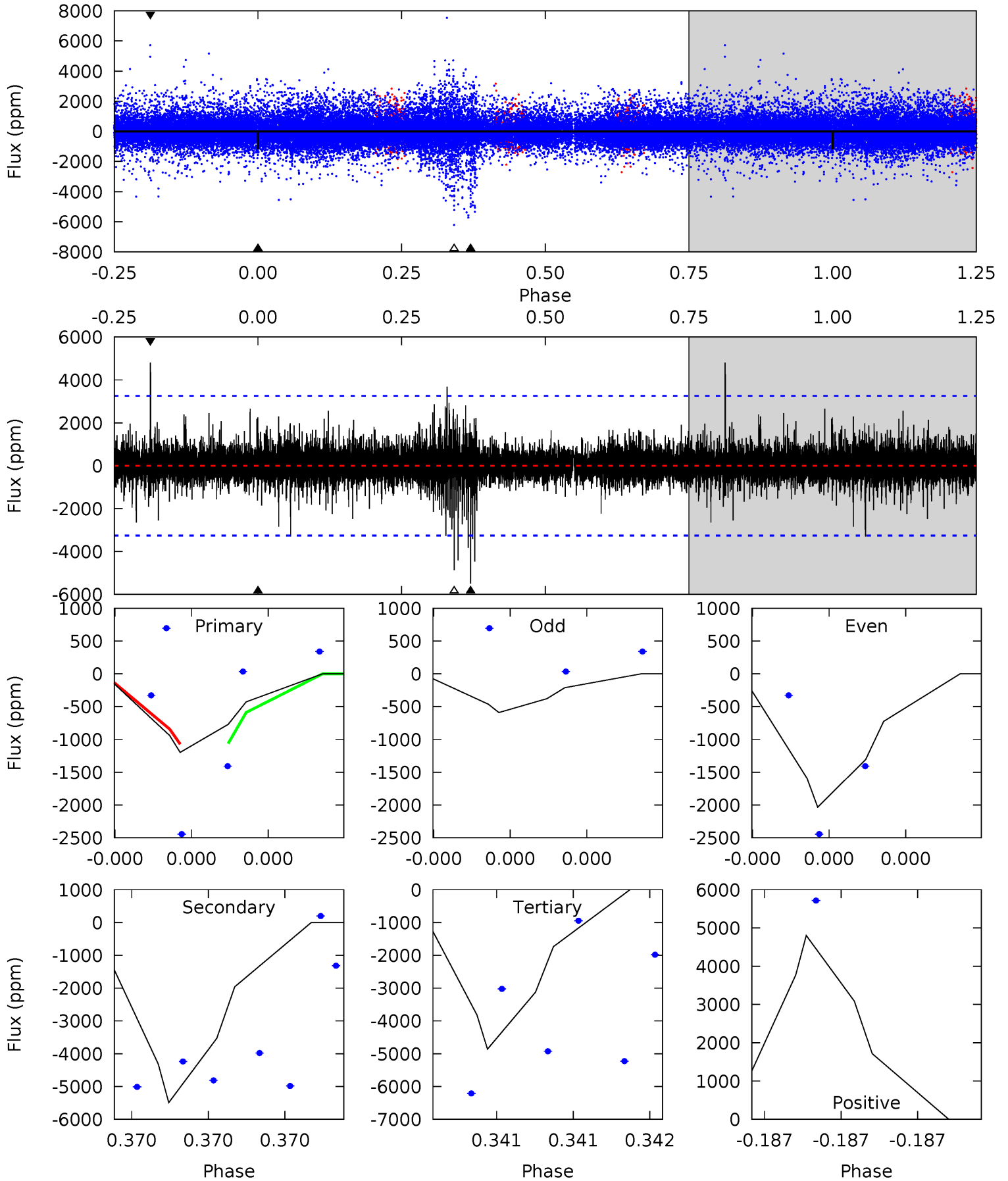




# Alt Model-Shift Uniqueness Test

011546211-03, P = 304.423172 Days, E = 256.487942 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
2.18	9.97	8.83	8.72	5.91	3.99	0.93	-6.65	-6.55	1.14	1.25	1.27	1.00	0.47	0.01



### Stellar Parameters For KIC 011546211

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3497^{+62}_{-55}$	$4.920^{+0.055}_{-0.040}$	$-0.200^{+0.100}_{-0.100}$	$0.334^{+0.039}_{-0.044}$	$0.339^{+0.051}_{-0.051}$	$12.780^{+4.046}_{-2.139}$
	+2%/-2%	+1%/-1%	+50%/-50%	+12%/-13%	+15%/-15%	+32%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011546211-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1706 \pm 229$	$31.55^{+33.59}_{-22.19}$	$158^{+4}_{-5}$	$1702^{+456}_{-191}$	$349^{+3858}_{-263}$
Alt.	$-5491 \pm 551$	$32.53^{+36.02}_{-21.24}$	$158^{+4}_{-4}$	$1885^{+484}_{-240}$	$1072^{+8379}_{-823}$

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

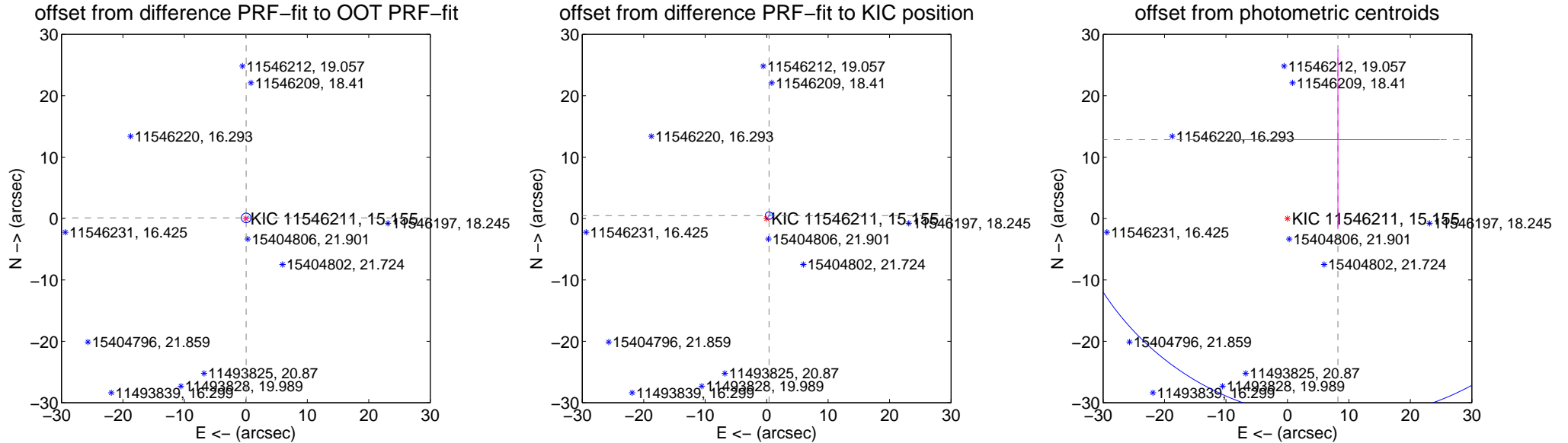
## DV Centroid Data

Supplemental centroid analysis for 011546211-03. Kepler magnitude: 15.15. Transit SNR 0.28

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.52 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.115 \pm 0.261$	0.44	$-0.051 \pm 0.252$	$0.103 \pm 0.174$
PRF-fit source offset from KIC position	$0.619 \pm 0.203$	3.05	$-0.393 \pm 0.136$	$0.479 \pm 0.166$
photometric centroid source offset	$15.24 \pm 15.18$	1.00	$-8.21 \pm 16.56$	$12.85 \pm 14.59$

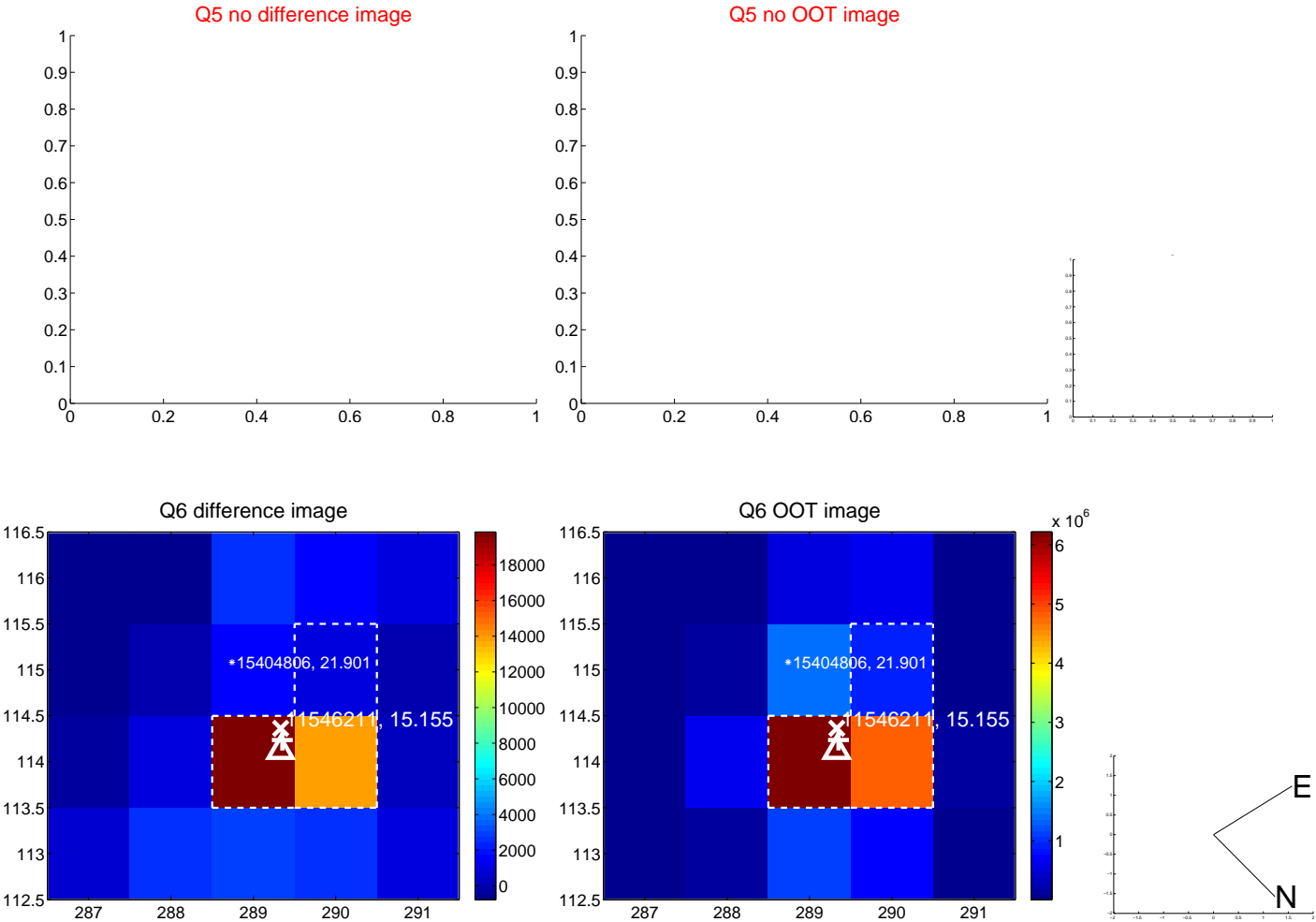


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

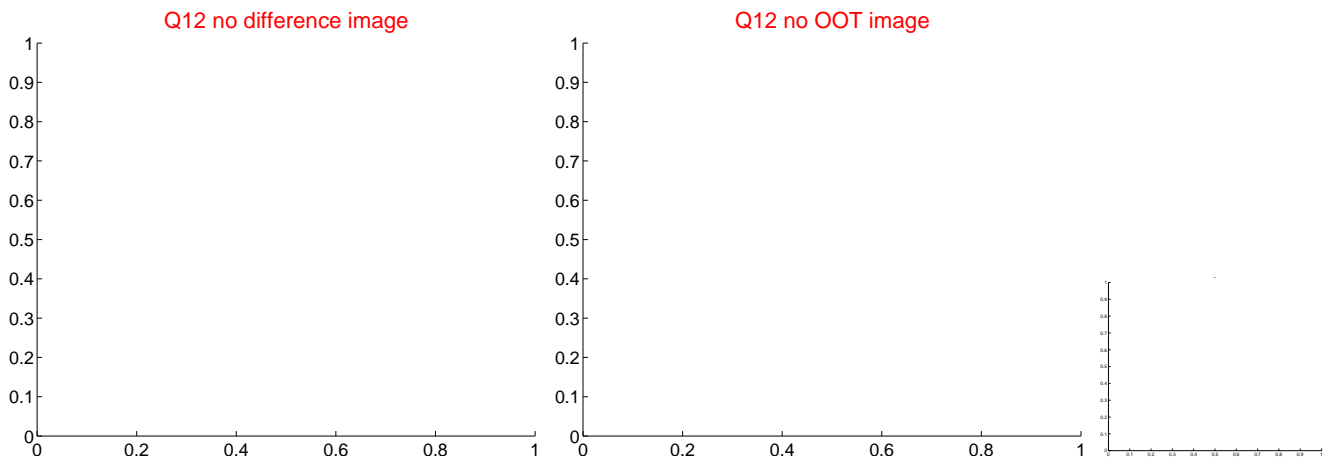
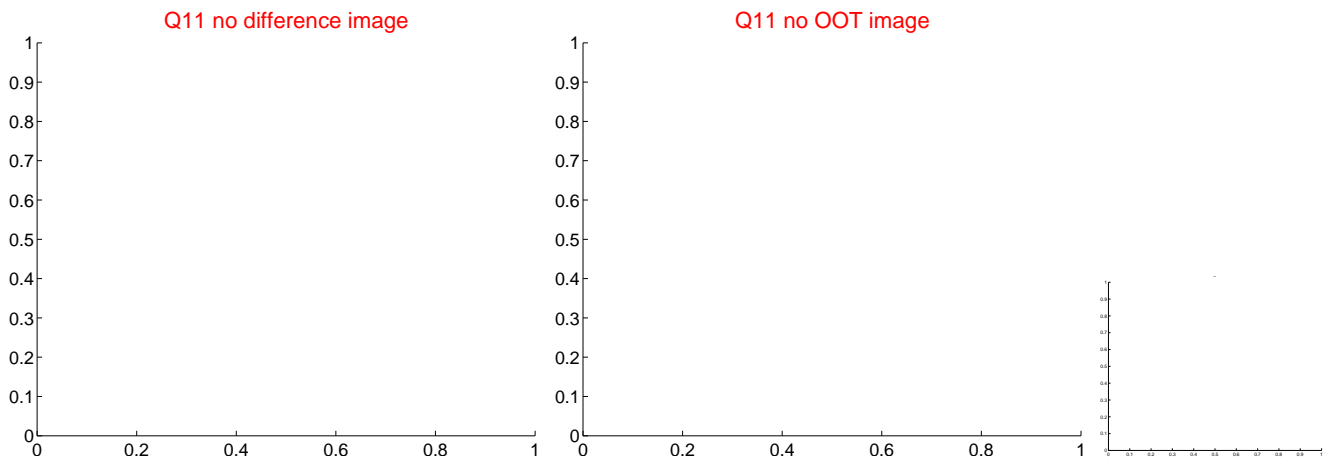
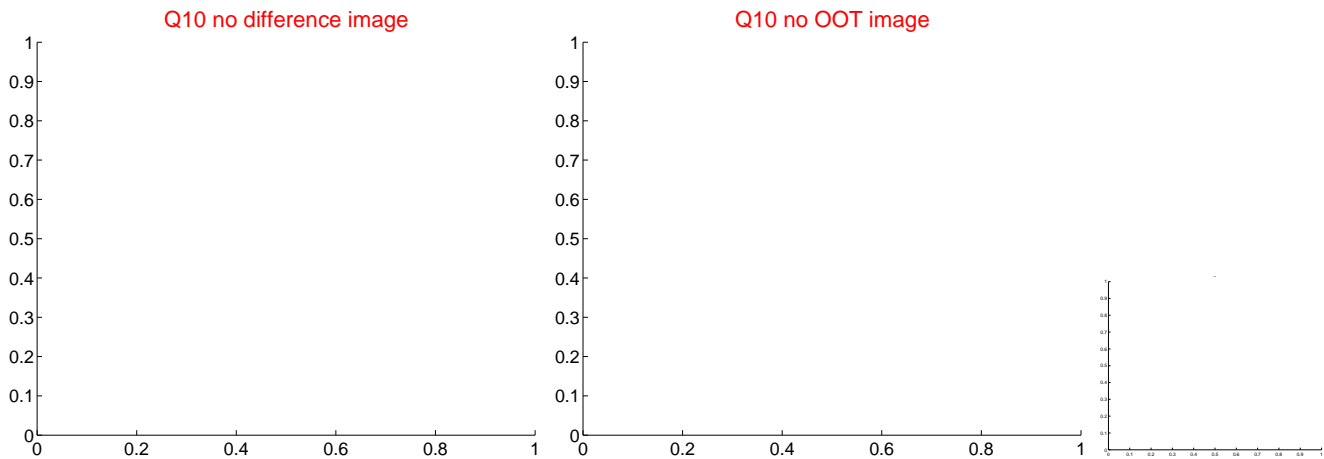
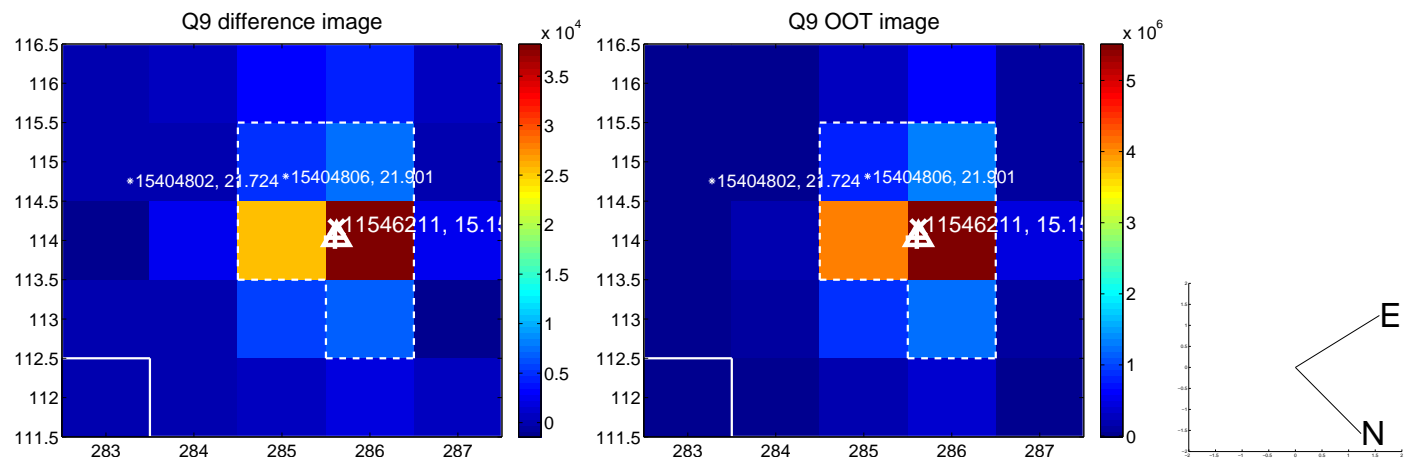
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



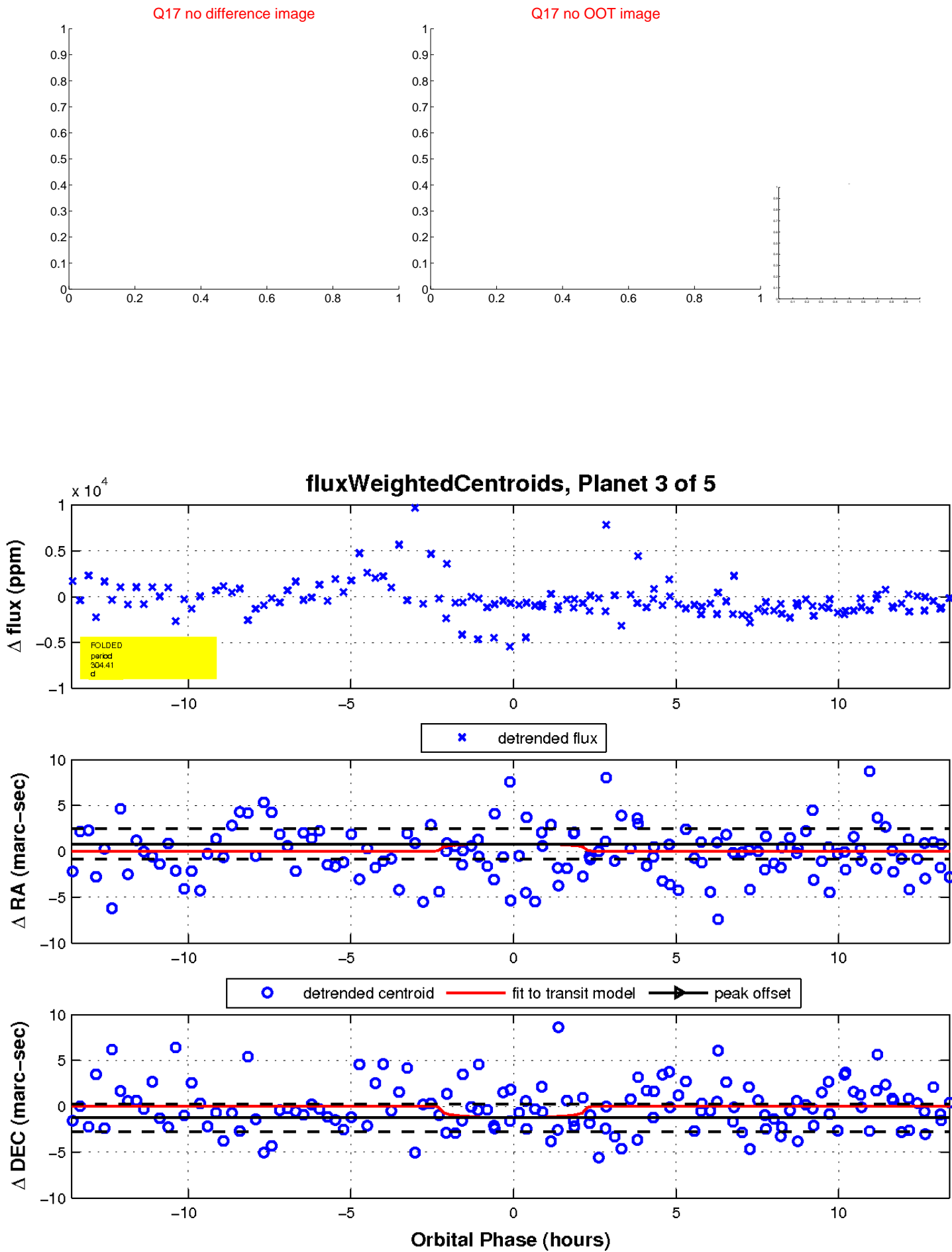
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

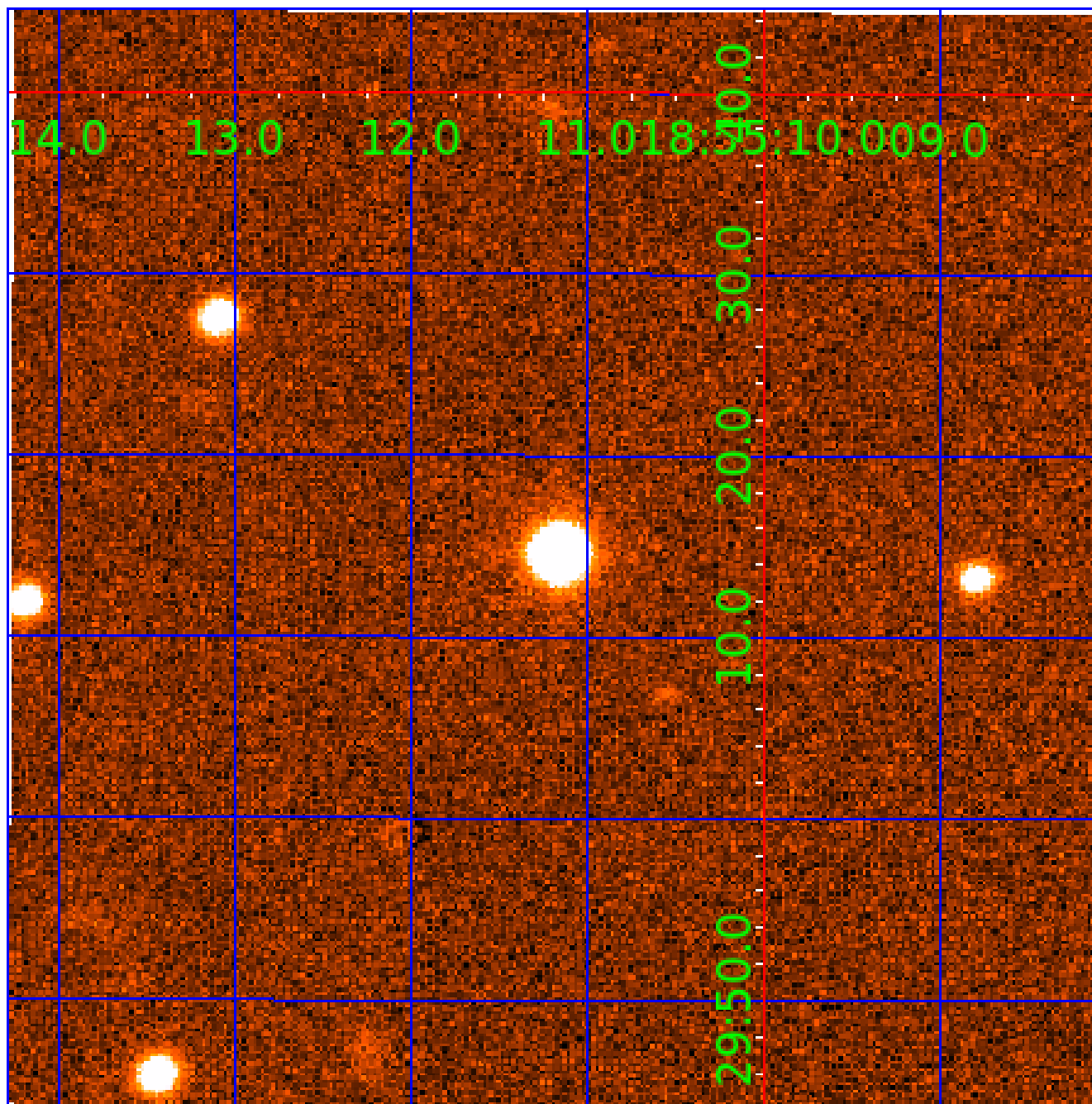


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image



# KIC 011546211

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011546211-01	OBS	1654.01	1.097203	131.521182	33932.1	1.626	1357.0	827.2	0.33	3497	6.64	70.98
011546211-02	OBS	No	356.921262	280.287680	653.8	2.531	12.8	2.2	0.33	3497	0.89	0.03
011546211-03	OBS	No	304.408608	256.428099	101.7	4.536	12.0	0.3	0.33	3497	0.34	0.04
011546211-04	OBS	No	334.949840	271.870183	2407.5	5.509	13.3	7.1	0.33	3497	1.67	0.04
011546211-05	OBS	No	206.226906	336.876001	4129.3	2.894	12.8	9.0	0.33	3497	2.17	0.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011546211-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_ODDEVEN_ALT—CENT_KIC_POS
011546211-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011546211-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011546211-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_FEW_DIFFS
011546211-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS

**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 011546211-04

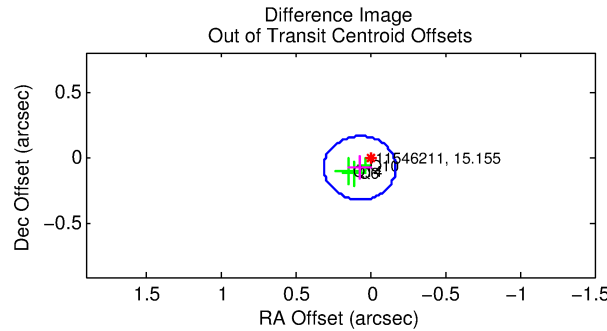
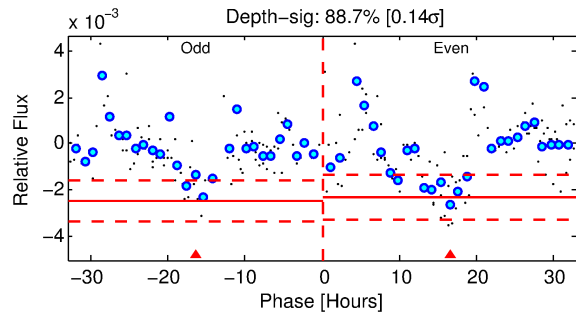
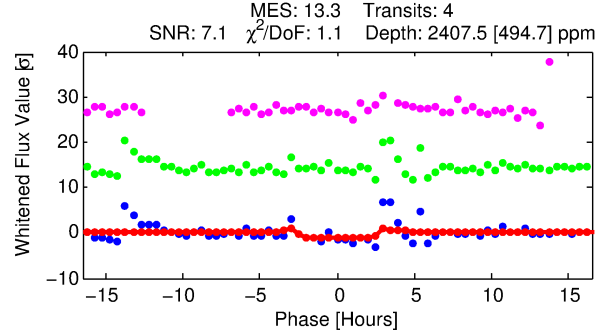
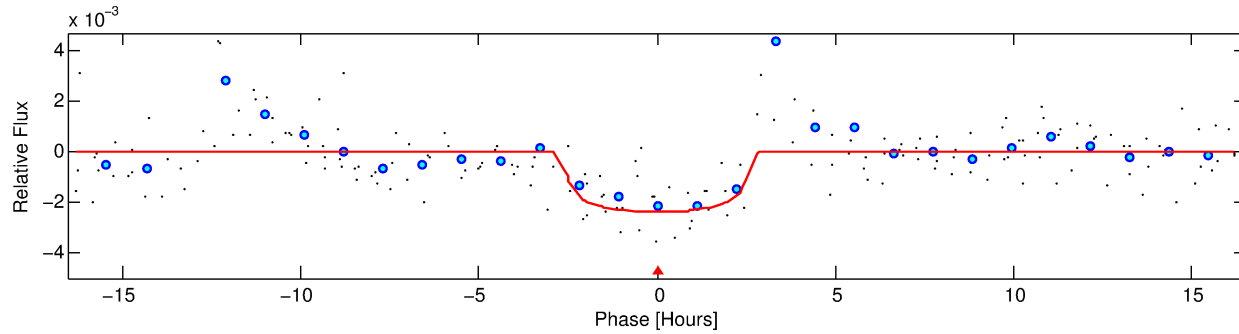
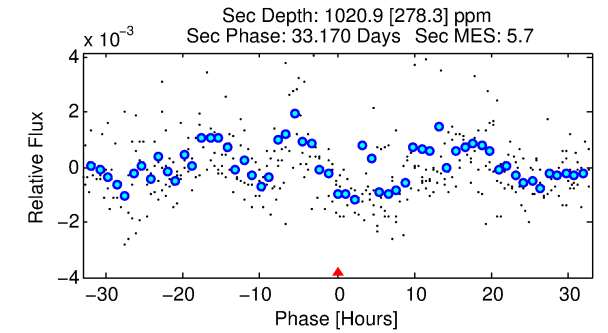
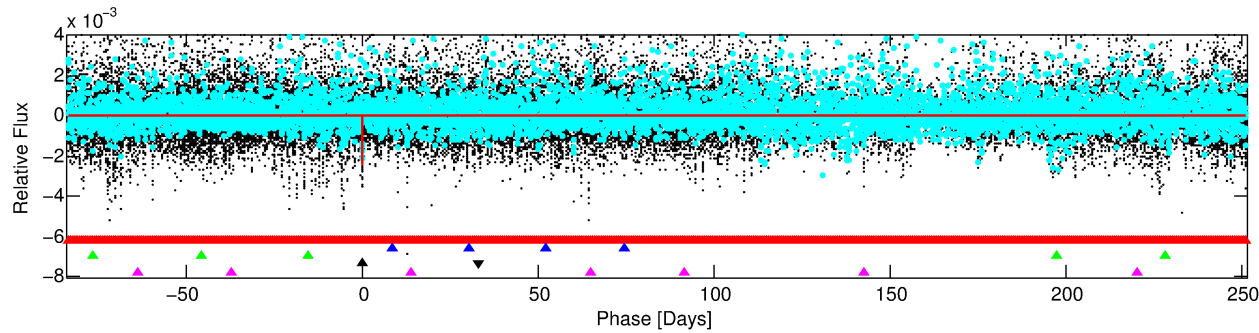
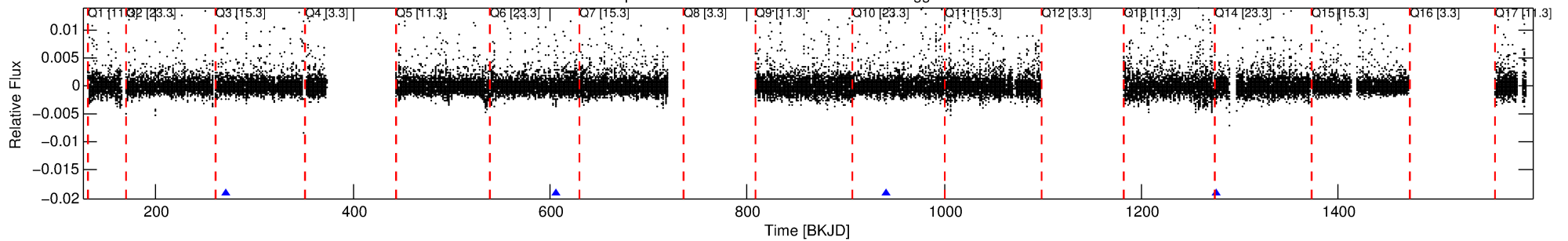
No Significant Match Found

# DV One-Page Summary

KIC: 11546211 Candidate: 4 of 5 Period: 334.950 d

KOI: K01654 Corr: No Ephemeris Match

Kp: 15.15 R\*: 0.33 Rs Teff: 3497.0 K Logg: 4.92 Fe/H: -0.200



## DV Fit Results:

Period = 334.94984 [0.00654] d  
Epoch = 271.8702 [0.0135] BKJD  
Rp/R\* = 0.0458 [0.0266]  
a/R\* = 430.67 [1083.98]  
b = 0.48 [3.97]  
Seff = 0.03 [0.00]  
Teq = 110 [4] K  
Rp = 1.67 [0.99] Re  
a = 0.6579 [0.0641] AU  
Ag = 87073.50 [104357.93] [0.83 sigma]  
Teff = 2919 [872] K [3.22 sigma]

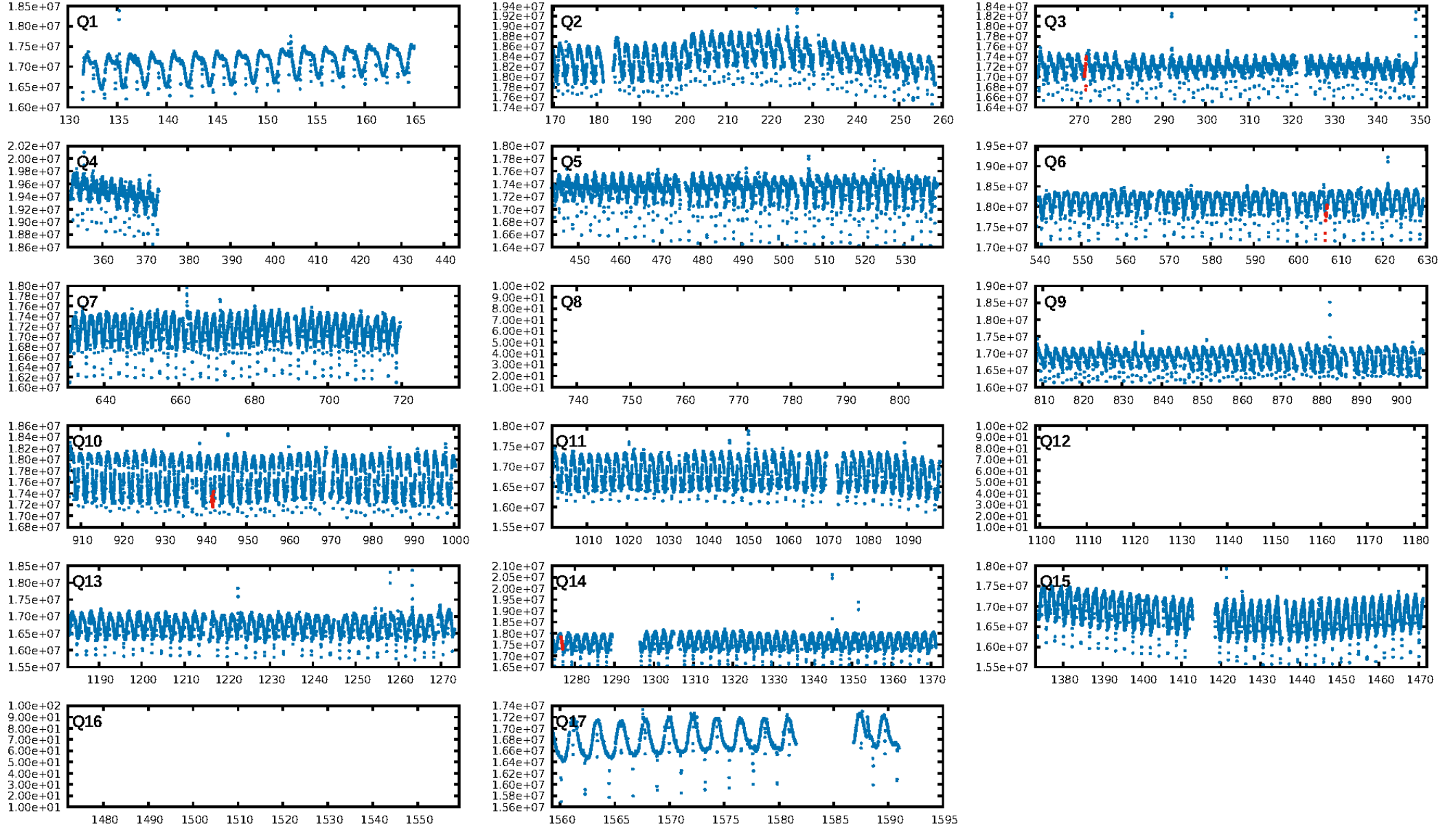
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [102.72 sigma]  
LongPeriod-sig: 100.0% [86.98 sigma]  
ModelChiSquare2-sig: 27.5%  
ModelChiSquareGof-sig: 99.9%  
**Bootstrap-pfa: 6.18e-12**  
RollingBand-fgt: 1.00 [4/4]  
**GhostDiagnostic-chr: 0.8213**  
Centroid-sig: 43.1%  
Centroid-so: 0.745 arcsec [1.20 sigma]  
OotOffset-rm: 0.101 arcsec [1.26 sigma]  
**KicOffset-rm: 0.438 arcsec [5.42 sigma]**  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/3]

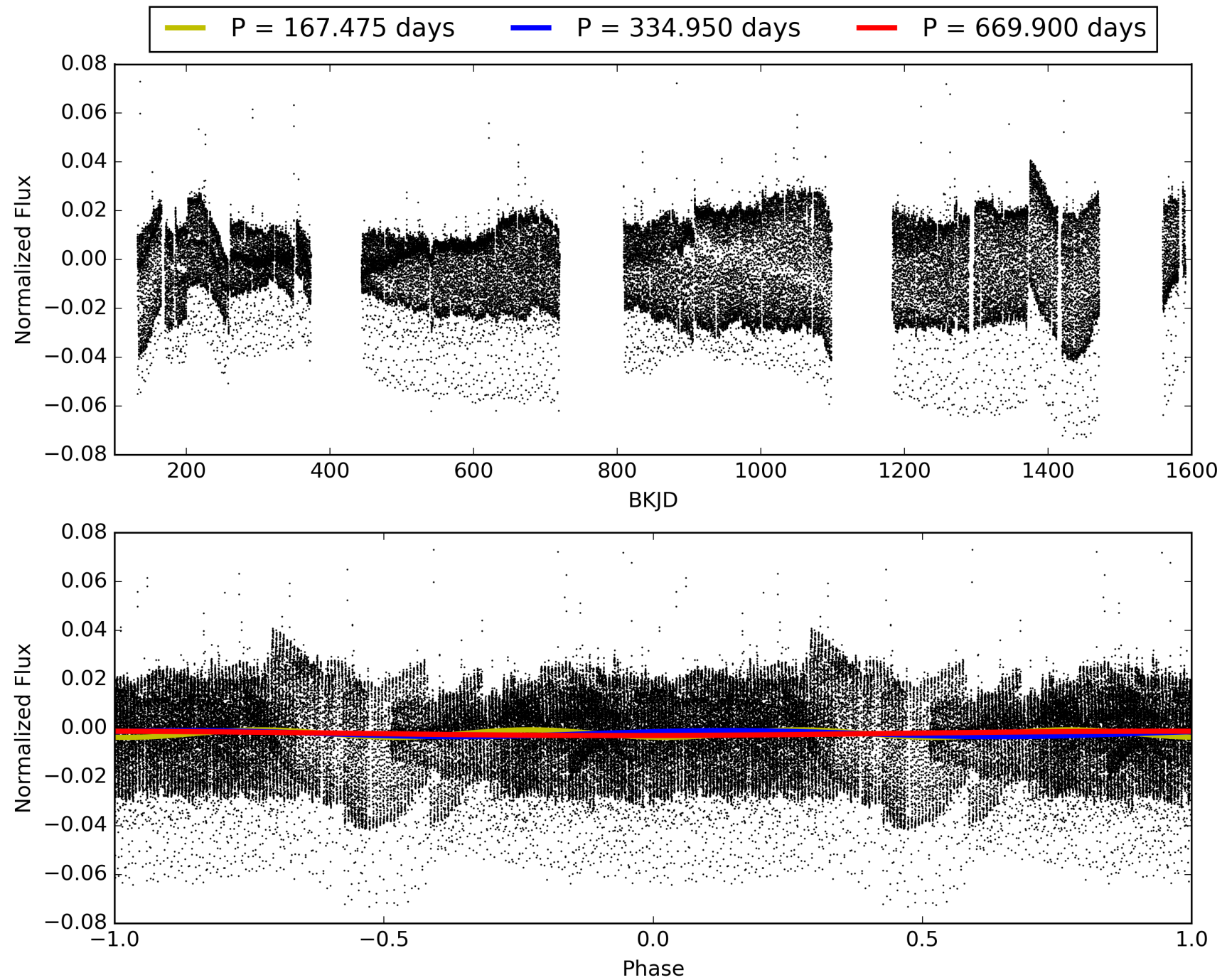
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:39:32 Z

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

# TCE 011546211-04, PDC Light Curves

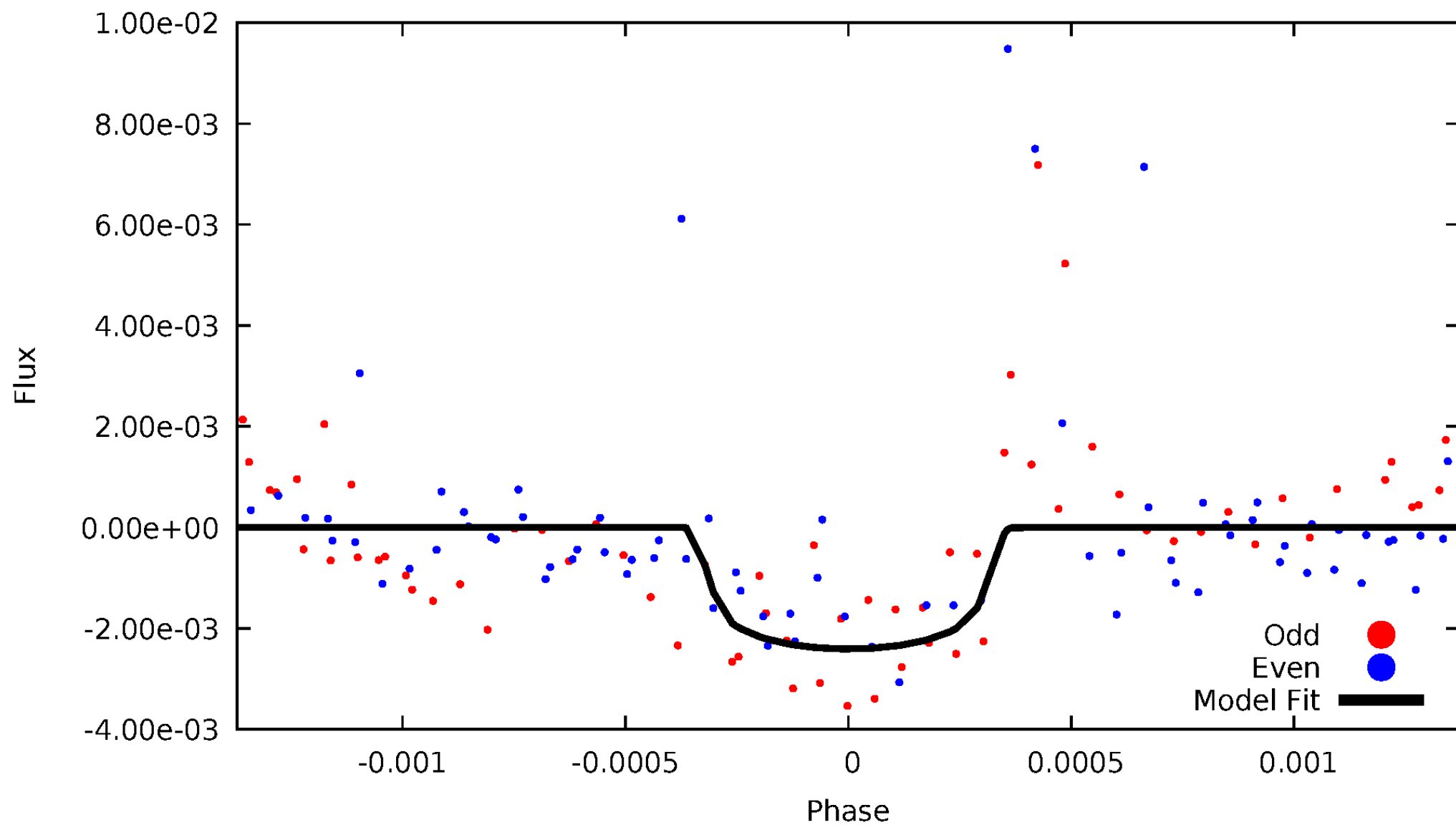


# TCE 011546211-04



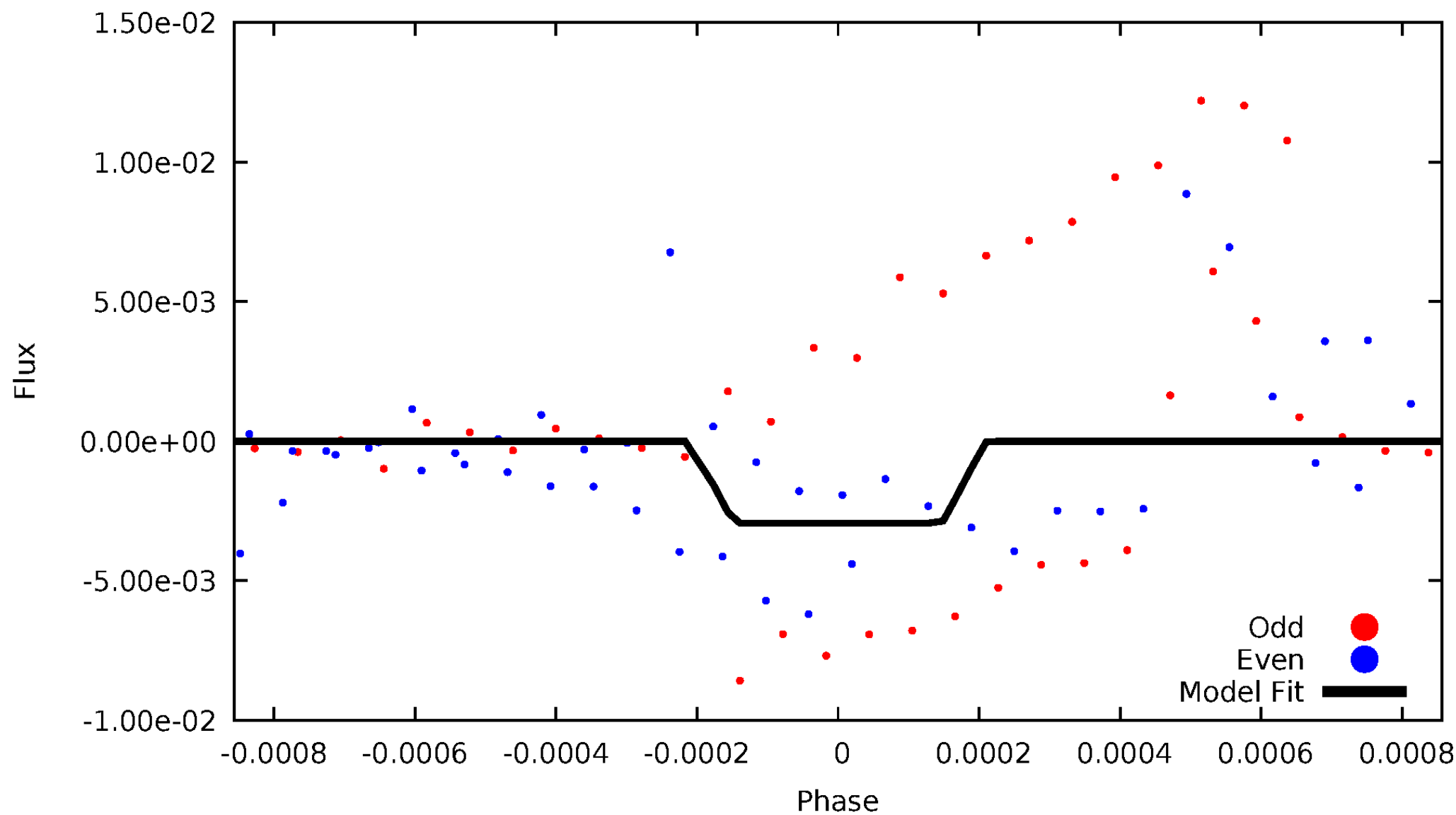
# DV Odd/Even

TCE 011546211-04



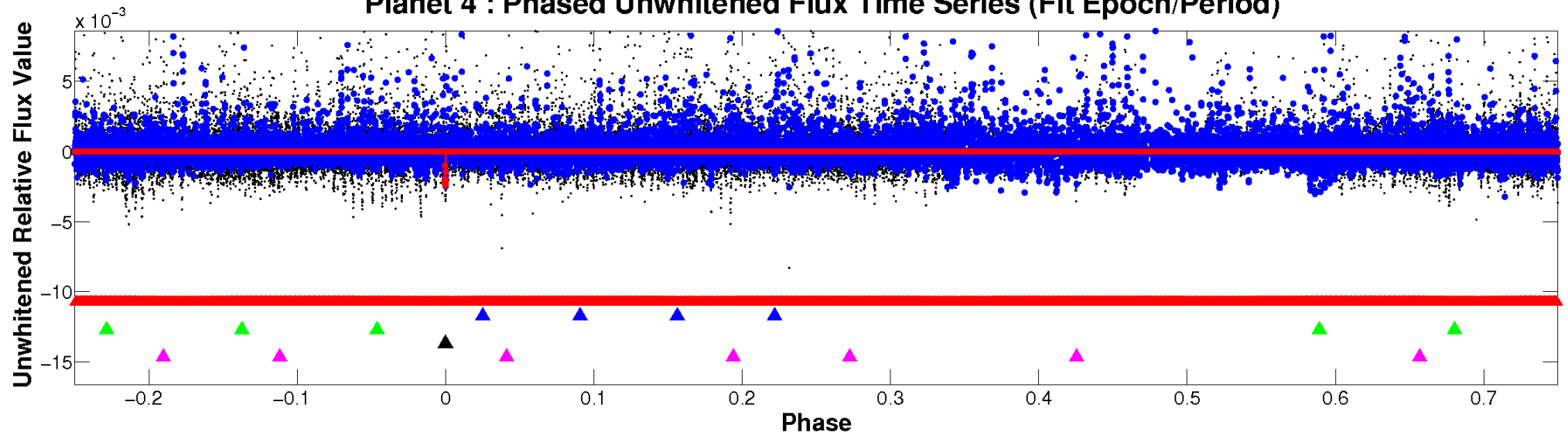
# ALT Odd/Even

TCE 011546211-04

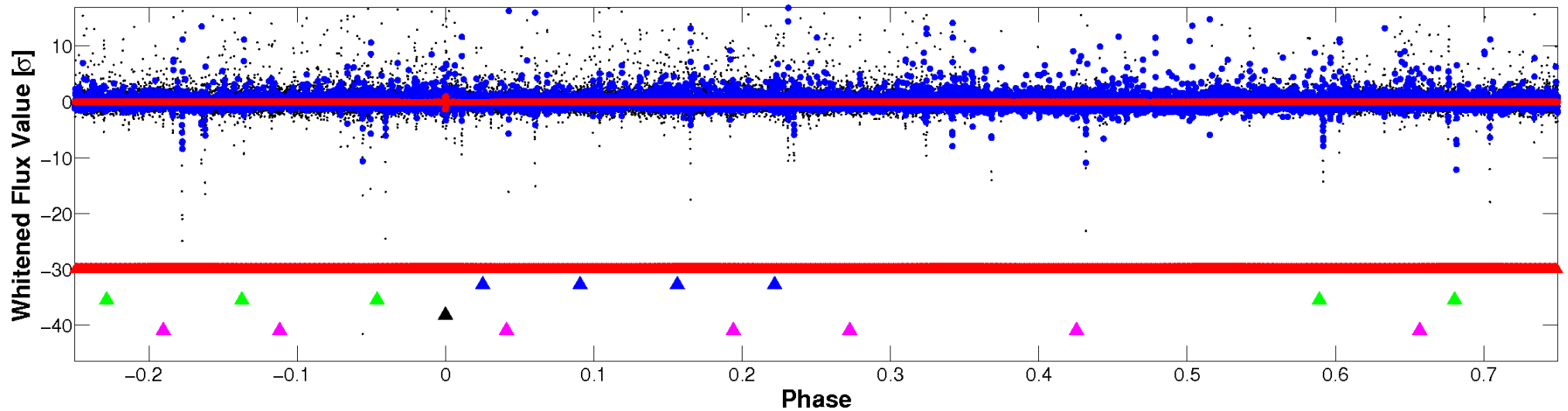


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



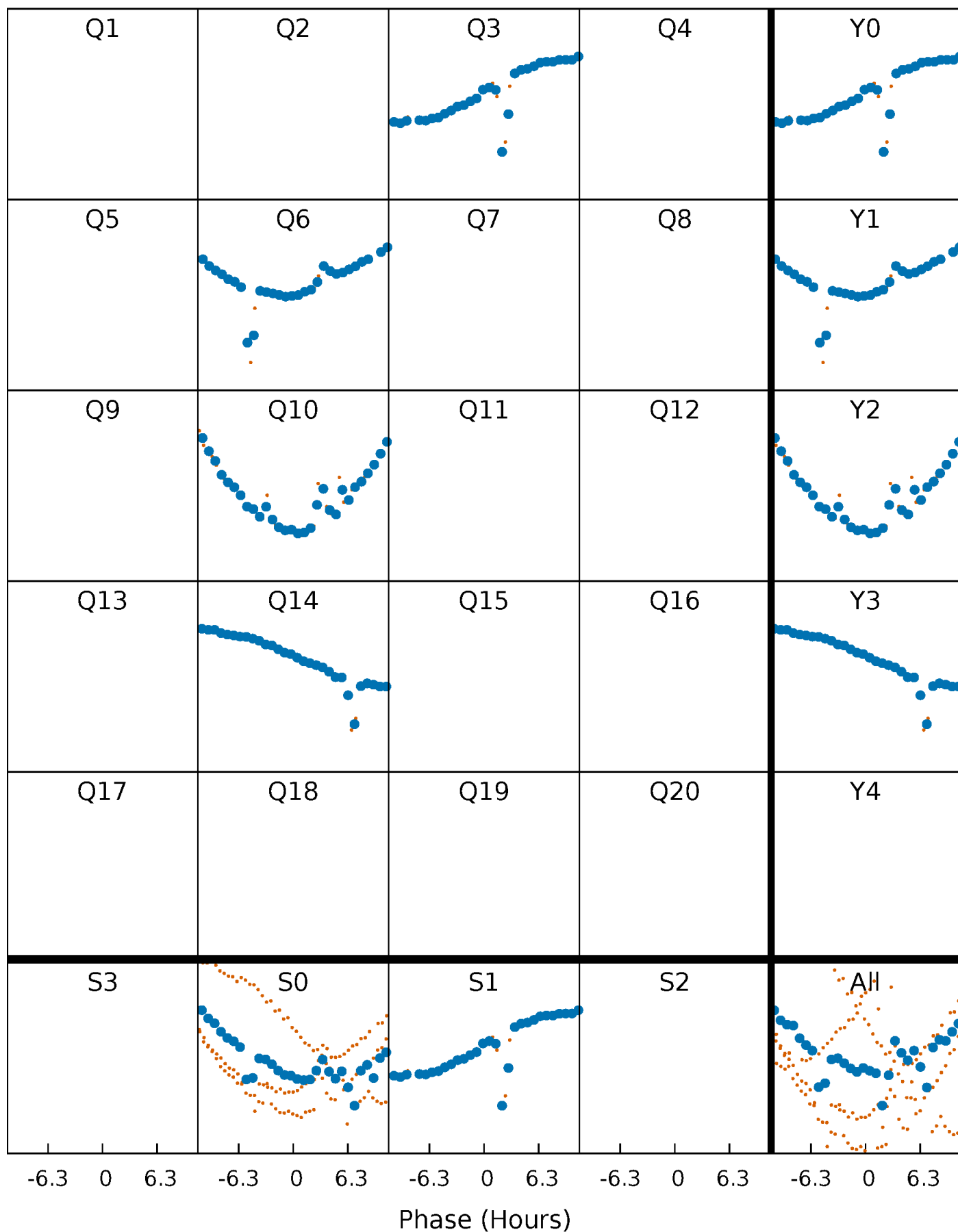
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





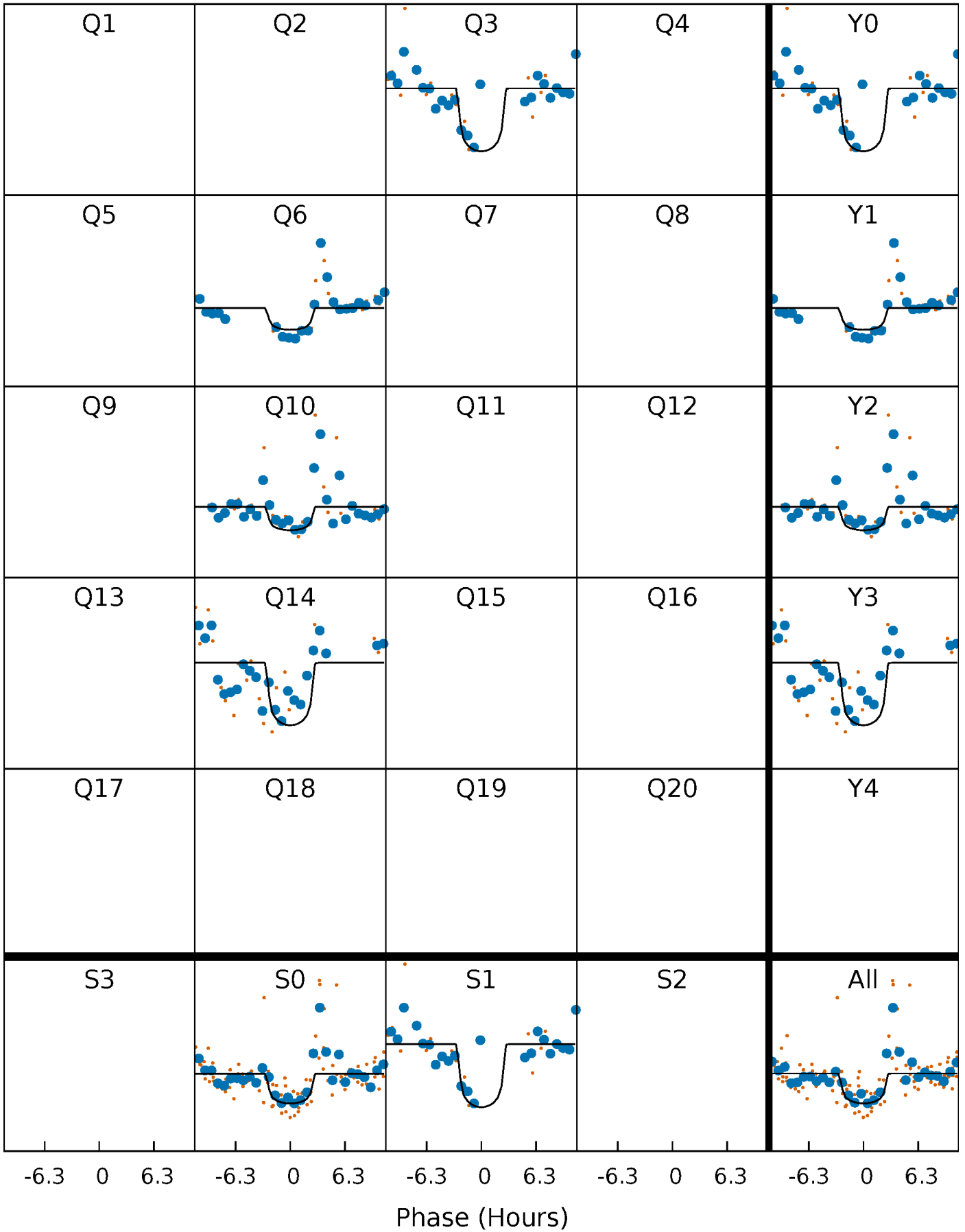
# PDC Quarter-Phased Transit Curves

TCE 011546211-04 P=334.949840 Days  $T_0=271.870183$  (BKJD)



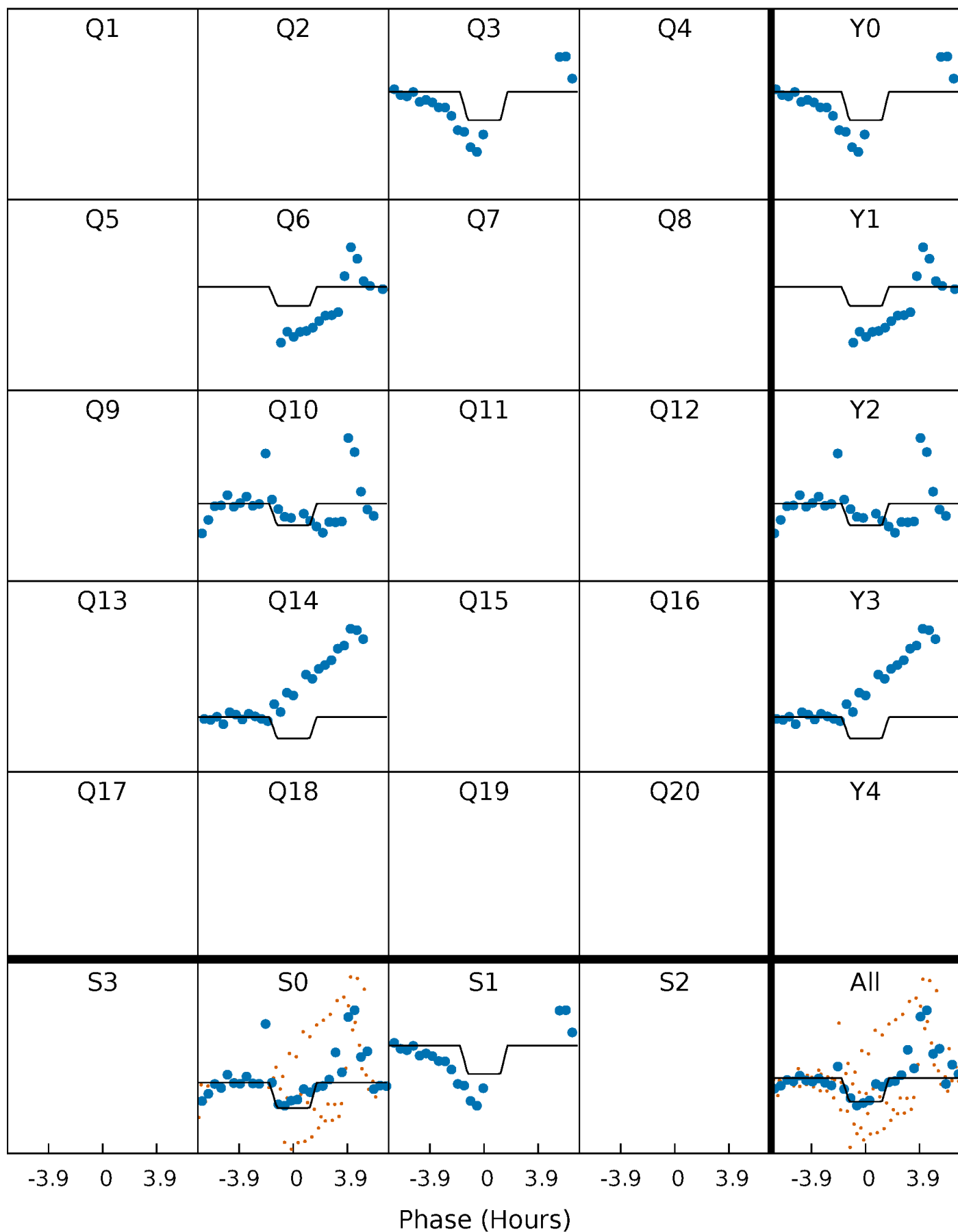
# DV Quarter-Phased Transit Curves

TCE 011546211-04     $P=334.949840$  Days     $T_0=271.870183$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

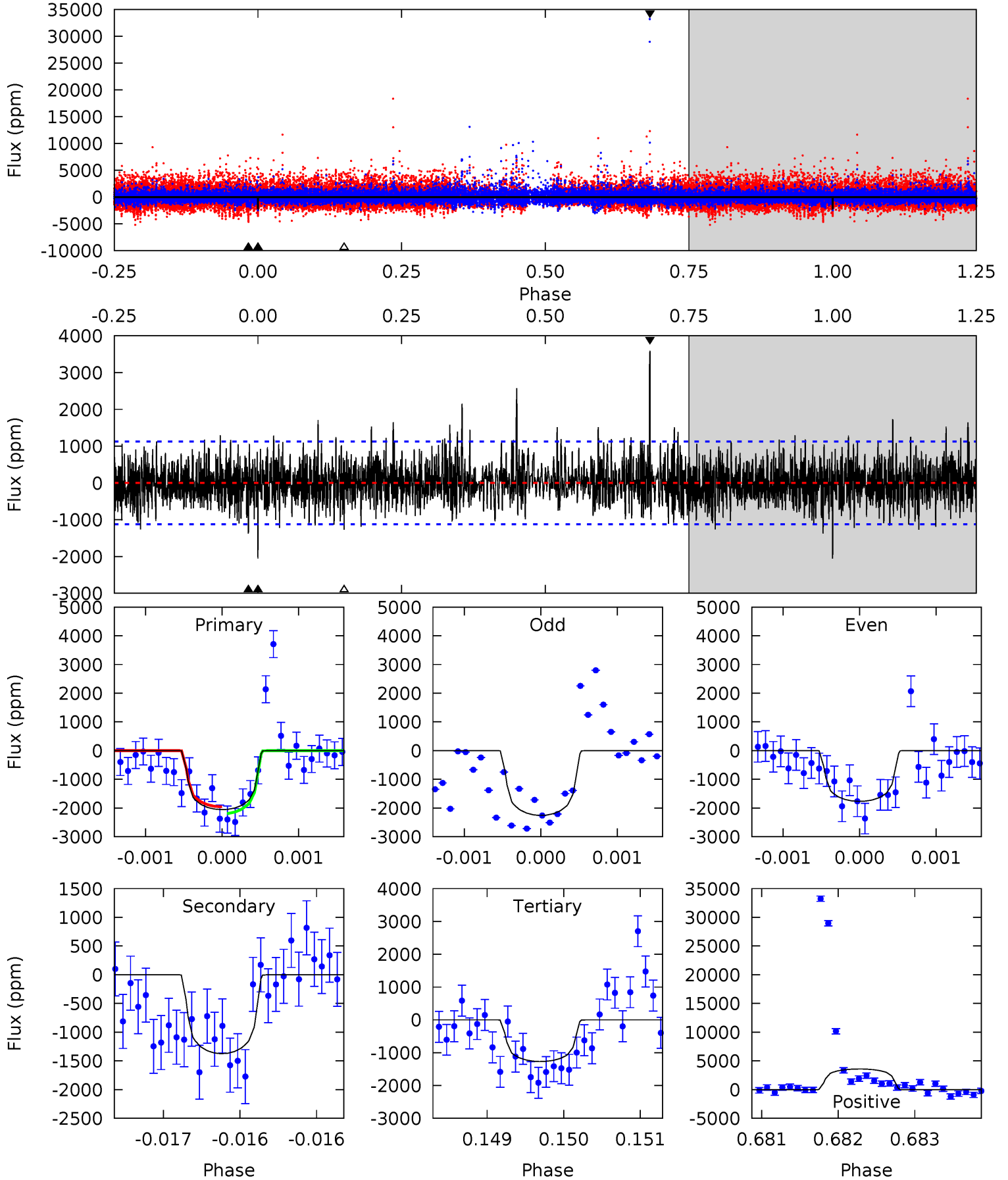
TCE 011546211-04   P=334.940104 Days    $T_0=271.844047$  (BKJD)



# DV Model-Shift Uniqueness Test

011546211-04, P = 334.949840 Days, E = 271.870183 Days

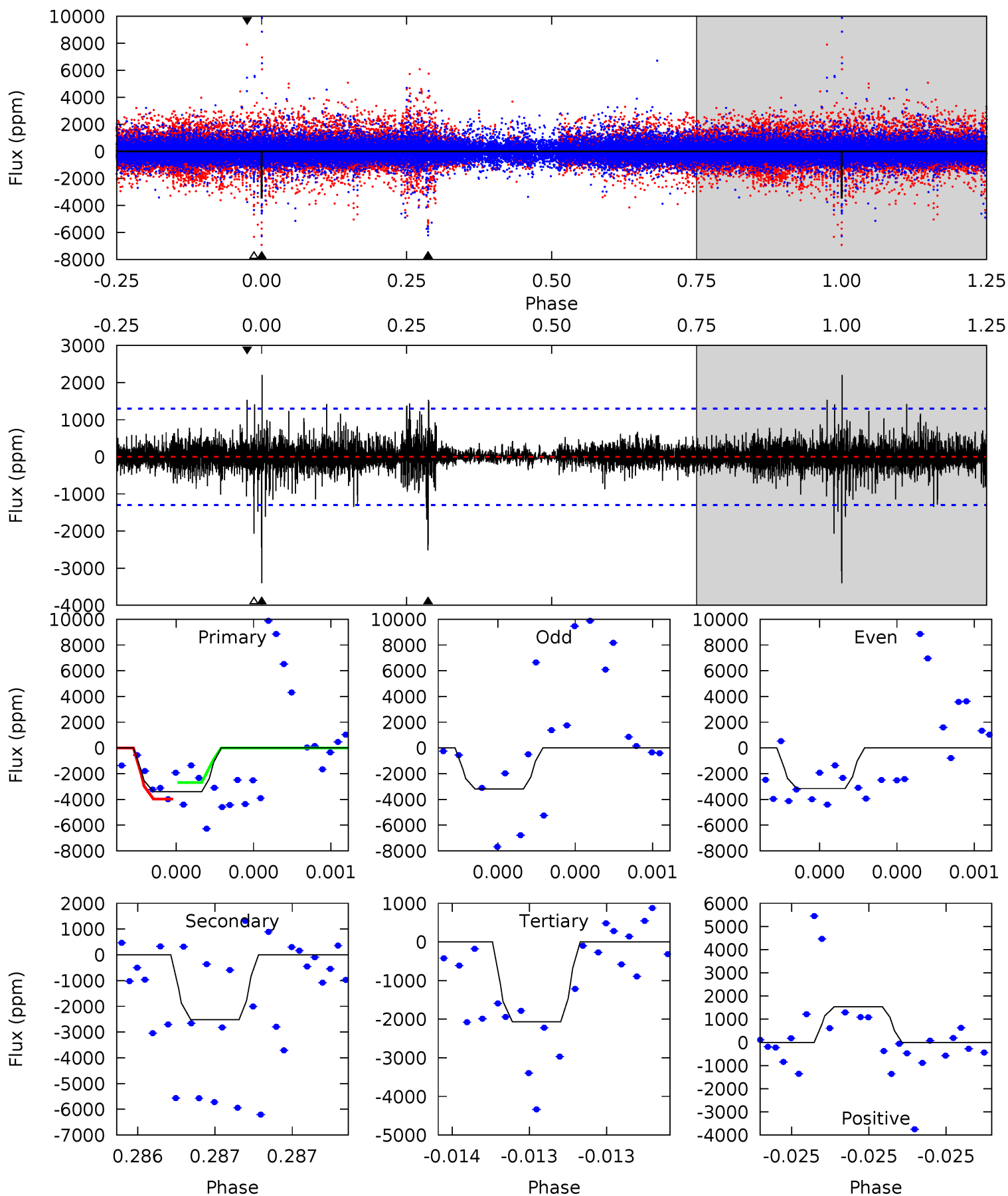
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	6.73	6.22	17.6	5.52	3.40	2.21	3.86	-7.51	0.52	-10.9	0.88	1.16	0.64	0.58



# Alt Model-Shift Uniqueness Test

011546211-04, P = 334.940104 Days, E = 271.844047 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.7	10.9	8.96	6.64	5.62	3.55	1.04	5.77	8.08	1.95	4.27	0.08	0.79	0.39	2.77



### Stellar Parameters For KIC 011546211

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3497^{+62}_{-55}$	$4.920^{+0.055}_{-0.040}$	$-0.200^{+0.100}_{-0.100}$	$0.334^{+0.039}_{-0.044}$	$0.339^{+0.051}_{-0.051}$	$12.780^{+4.046}_{-2.139}$
	+2%/-2%	+1%/-1%	+50%/-50%	+12%/-13%	+15%/-15%	+32%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011546211-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1375 \pm 204$	$1.69^{+1.00}_{-0.91}$	$153^{+4}_{-4}$	$3260^{+960}_{-403}$	$113854^{+424093}_{-69797}$
Alt.	$-2520 \pm 231$	$2.05^{+0.97}_{-0.98}$	$154^{+4}_{-4}$	$3389^{+822}_{-377}$	$148267^{+378852}_{-82818}$

$T_{\text{max}}$  = 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

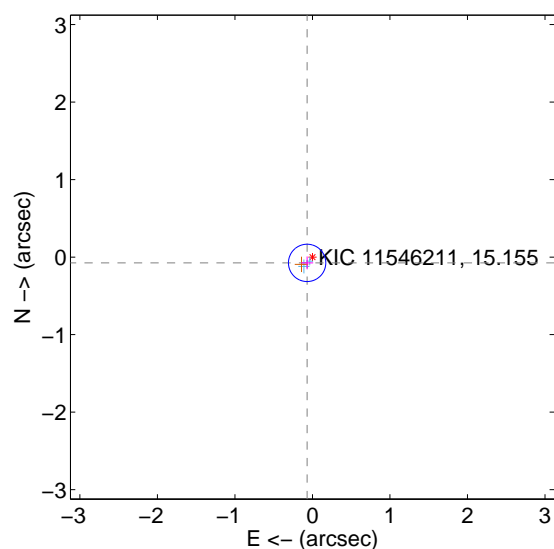
Supplemental centroid analysis for 011546211-04. Kepler magnitude: 15.15. Transit SNR 7.10

There are 2 quarters with good PRF difference image offsets

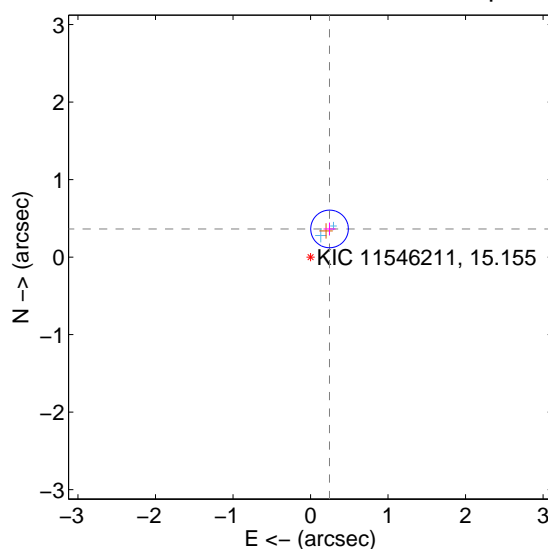
The direct PRF centroid is offset from the target star catalog position by about 0.55 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.101 \pm 0.080$	1.26	$0.069 \pm 0.078$	$-0.075 \pm 0.082$
PRF-fit source offset from KIC position	$0.438 \pm 0.081$	5.42	$-0.245 \pm 0.078$	$0.363 \pm 0.082$
photometric centroid source offset	$0.74 \pm 0.62$	1.20	$-0.71 \pm 0.63$	$0.22 \pm 0.52$

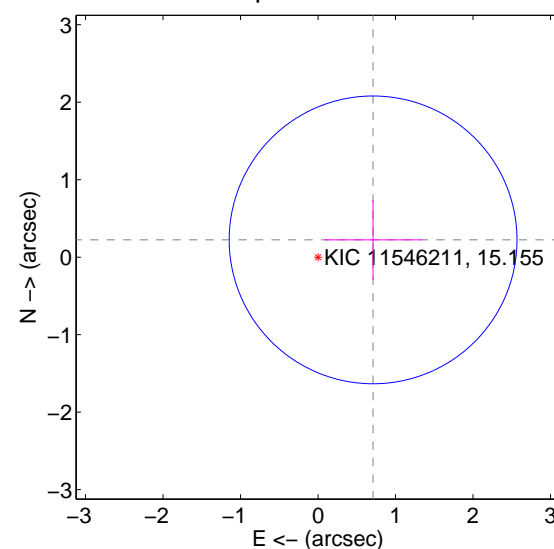
offset from difference PRF-fit to OOT PRF-fit



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.

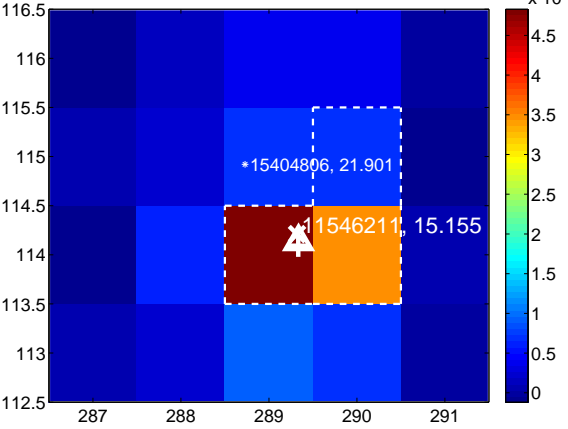
Q5 no difference image



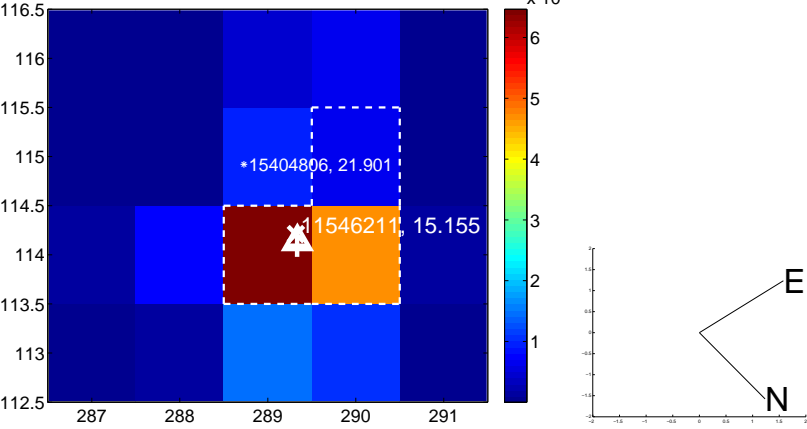
Q5 no OOT image



Q6 difference image



Q6 OOT image



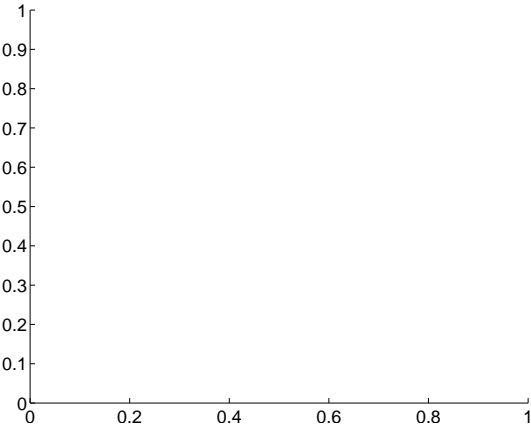
Q7 no difference image



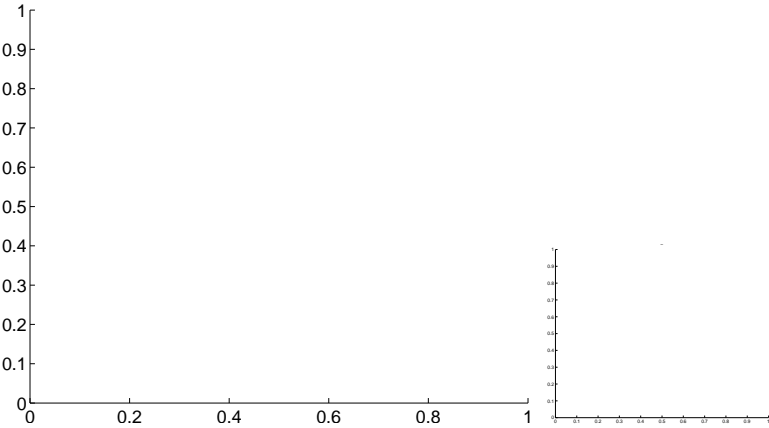
Q7 no OOT image



Q8 no difference image



Q8 no OOT image



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

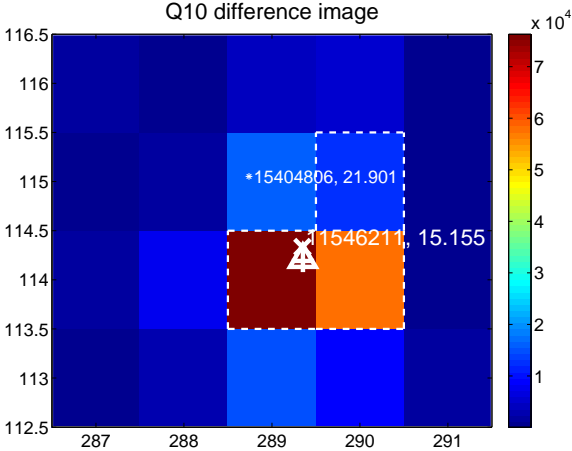
Q9 no difference image



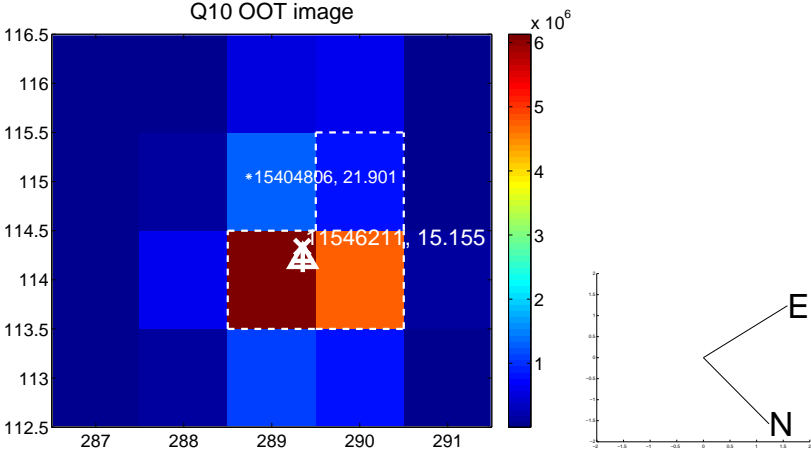
Q9 no OOT image



Q10 difference image



Q10 OOT image



Q11 no difference image



Q11 no OOT image



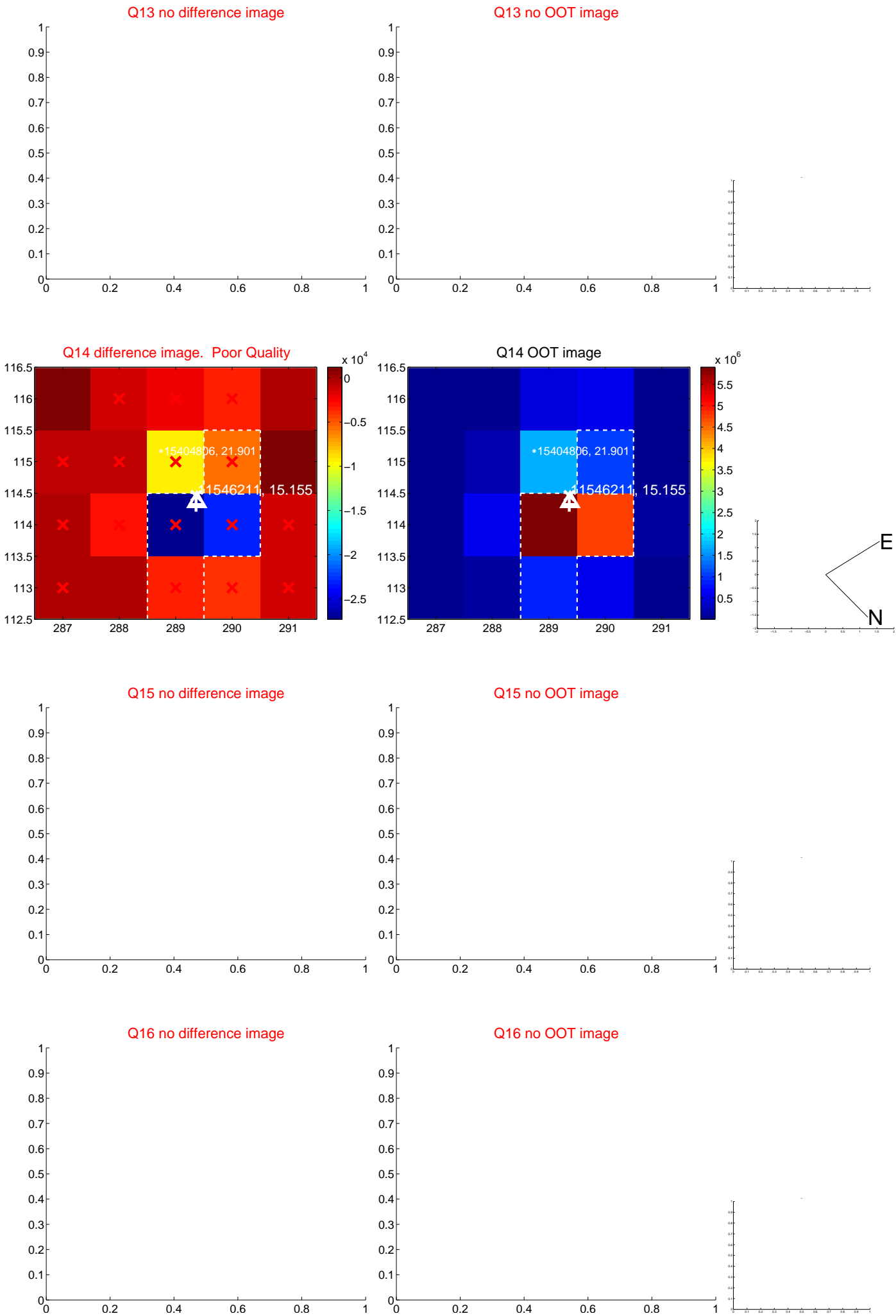
Q12 no difference image



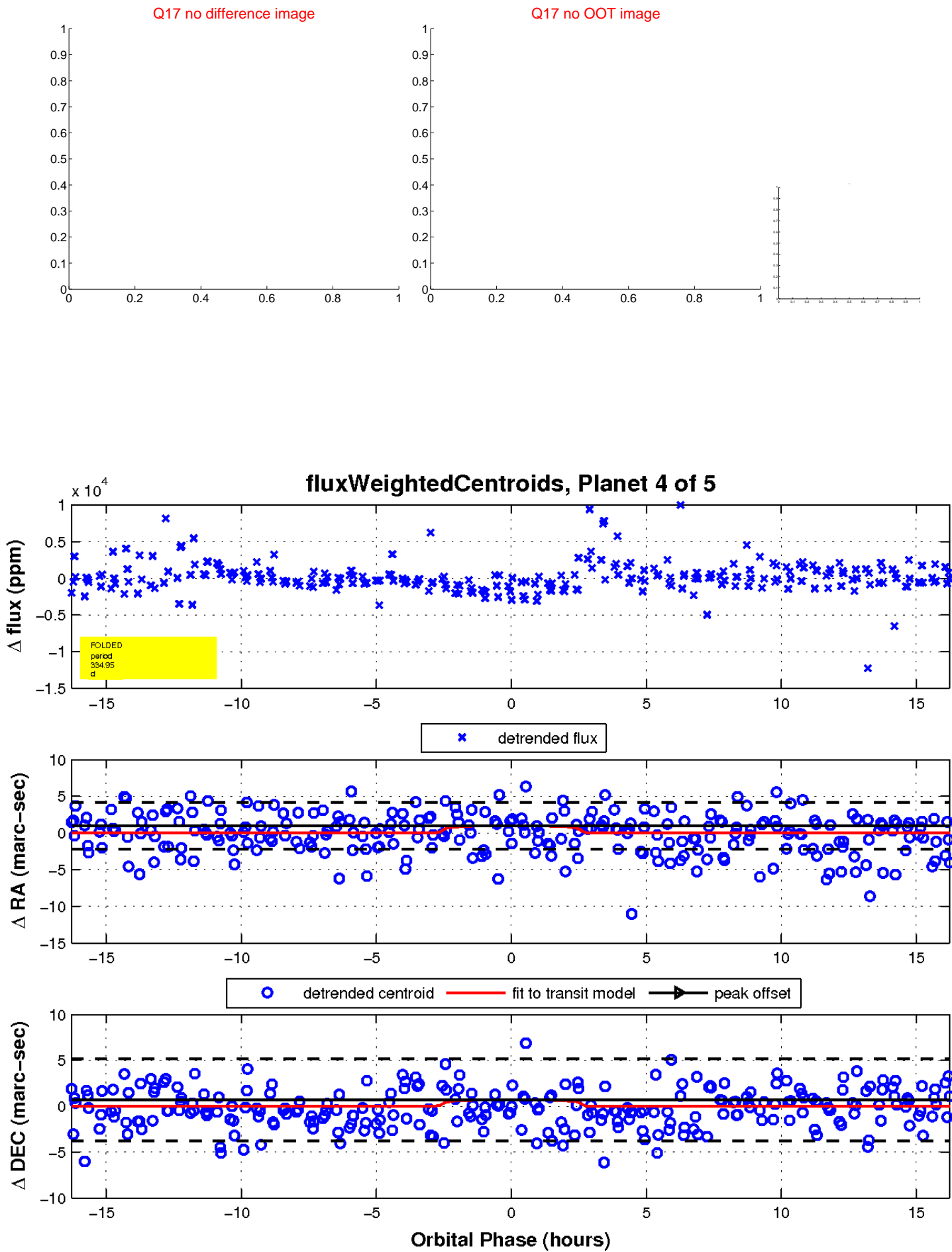
Q12 no OOT image



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

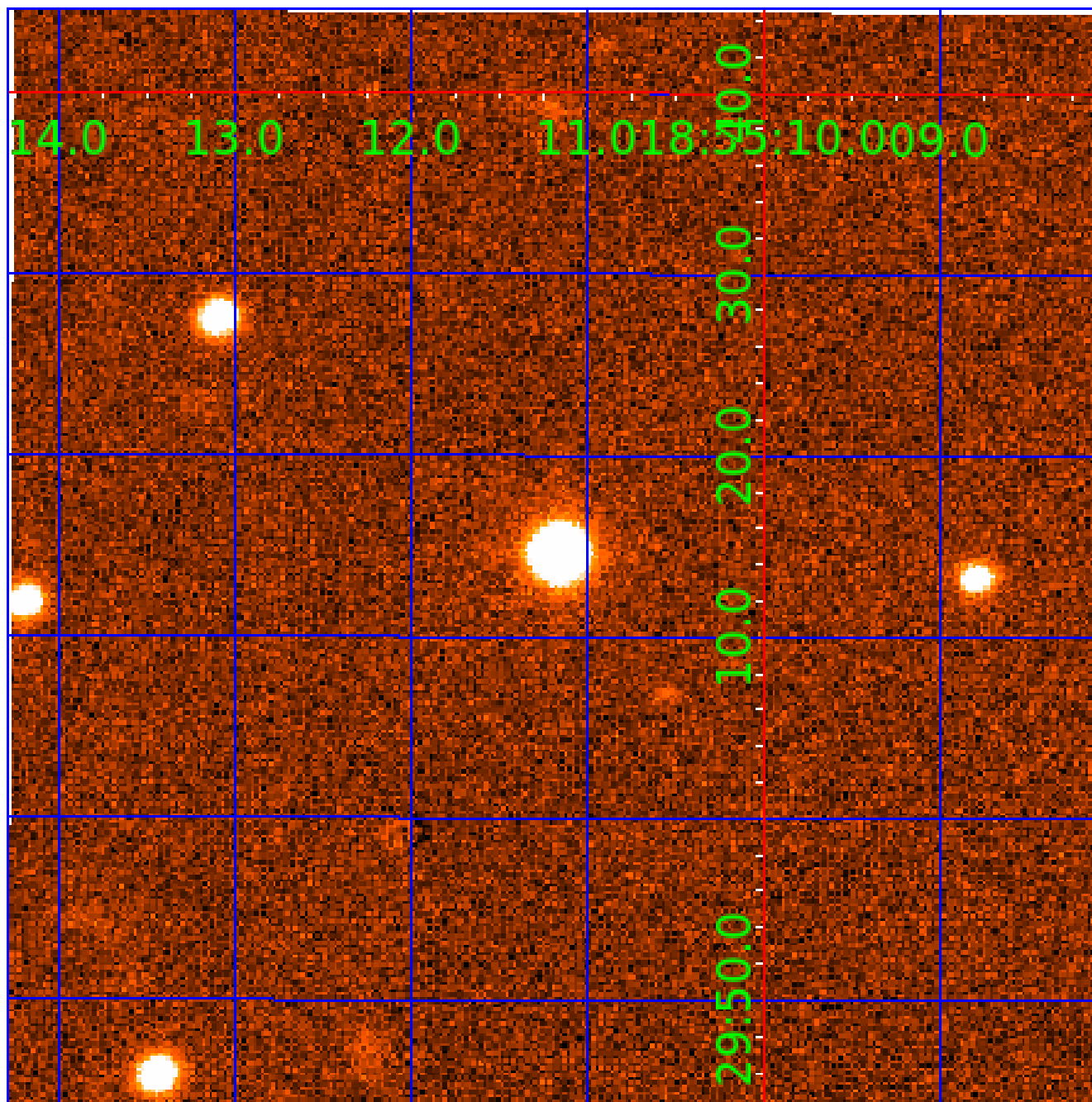


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011546211

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011546211-01	OBS	1654.01	1.097203	131.521182	33932.1	1.626	1357.0	827.2	0.33	3497	6.64	70.98
011546211-02	OBS	No	356.921262	280.287680	653.8	2.531	12.8	2.2	0.33	3497	0.89	0.03
011546211-03	OBS	No	304.408608	256.428099	101.7	4.536	12.0	0.3	0.33	3497	0.34	0.04
011546211-04	OBS	No	334.949840	271.870183	2407.5	5.509	13.3	7.1	0.33	3497	1.67	0.04
011546211-05	OBS	No	206.226906	336.876001	4129.3	2.894	12.8	9.0	0.33	3497	2.17	0.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011546211-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_ODDEVEN_ALT—CENT_KIC_POS
011546211-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011546211-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011546211-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_FEW_DIFFS
011546211-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS

**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 011546211-05

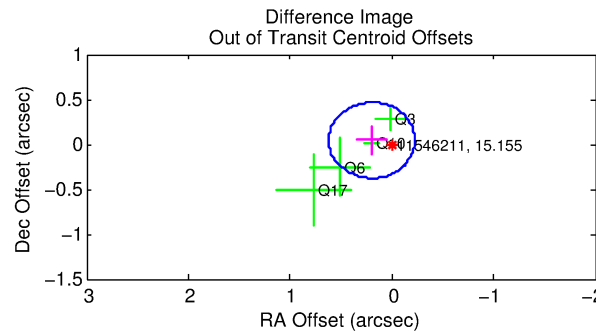
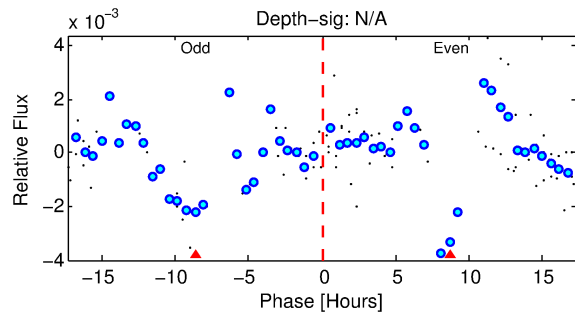
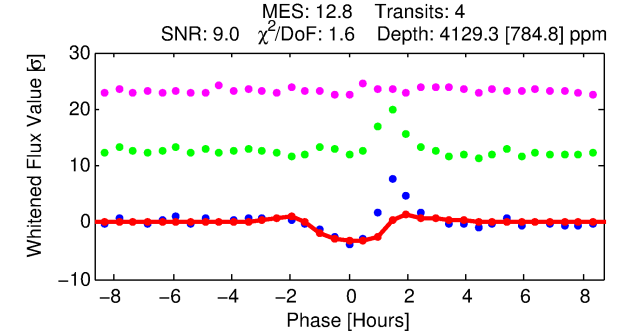
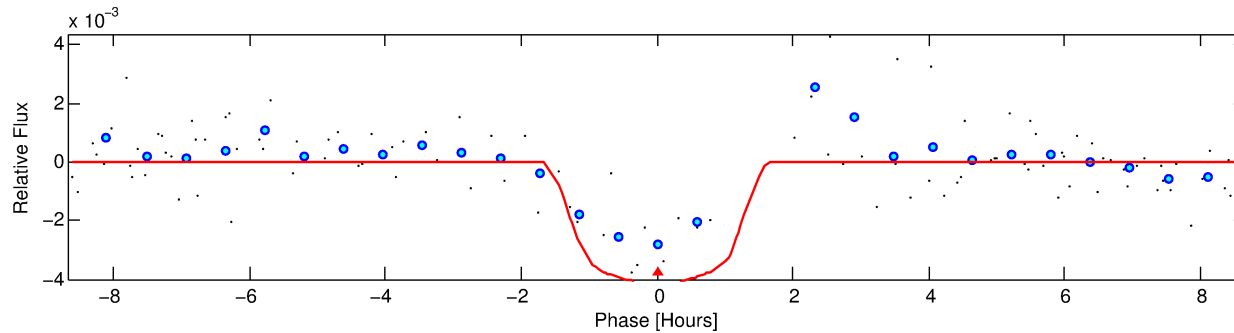
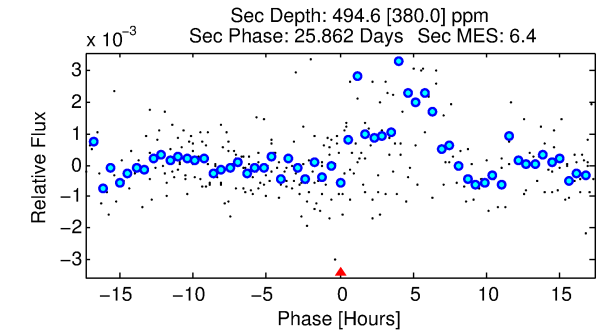
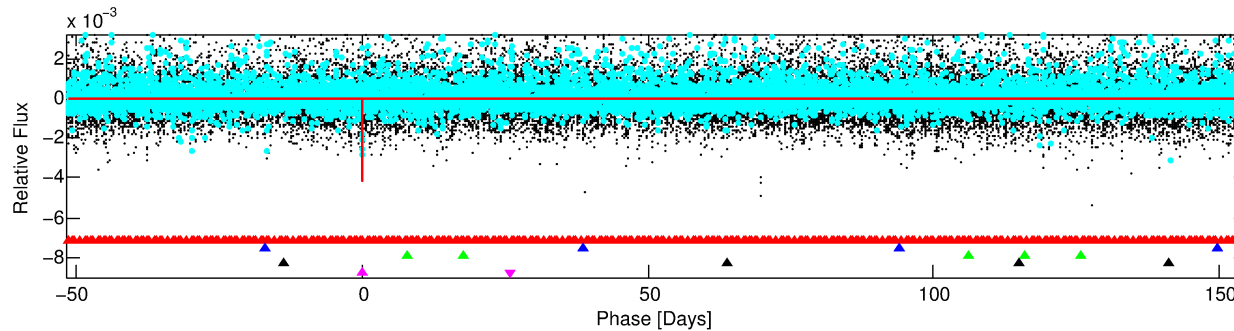
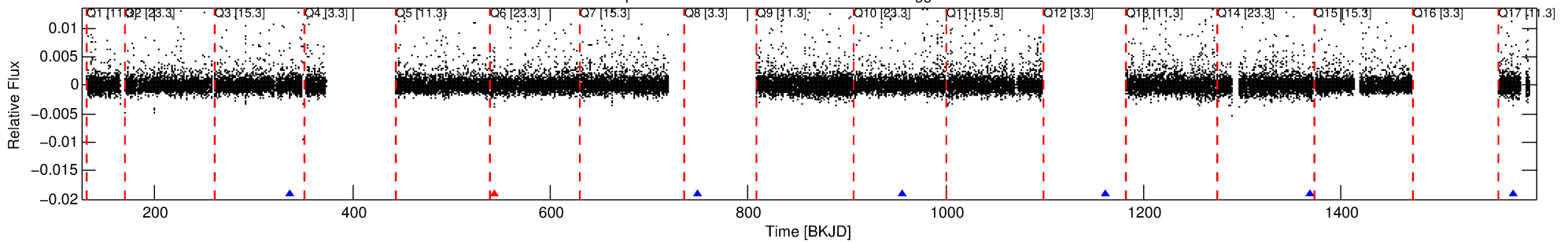
No Significant Match Found

# DV One-Page Summary

KIC: 11546211 Candidate: 5 of 5 Period: 206.227 d

KOI: K01654 Corr: No Ephemeris Match

Kp: 15.15 R\*: 0.33 Rs Teff: 3497.0 K Logg: 4.92 Fe/H: -0.200



## DV Fit Results:

Period = 206.22691 [0.00193] d  
Epoch = 336.8760 [0.0058] BKJD  
Rp/R\* = 0.0595 [0.0645]  
a/R\* = 532.67 [2596.07]  
b = 0.41 [9.98]  
Seff = 0.07 [0.01]  
Teq = 129 [5] K  
Rp = 2.17 [2.37] Re  
a = 0.4762 [0.0464] AU  
Ag = 13101.25 [30152.42] [0.43σ]  
Teffp = 2137 [1229] K [1.63σ]

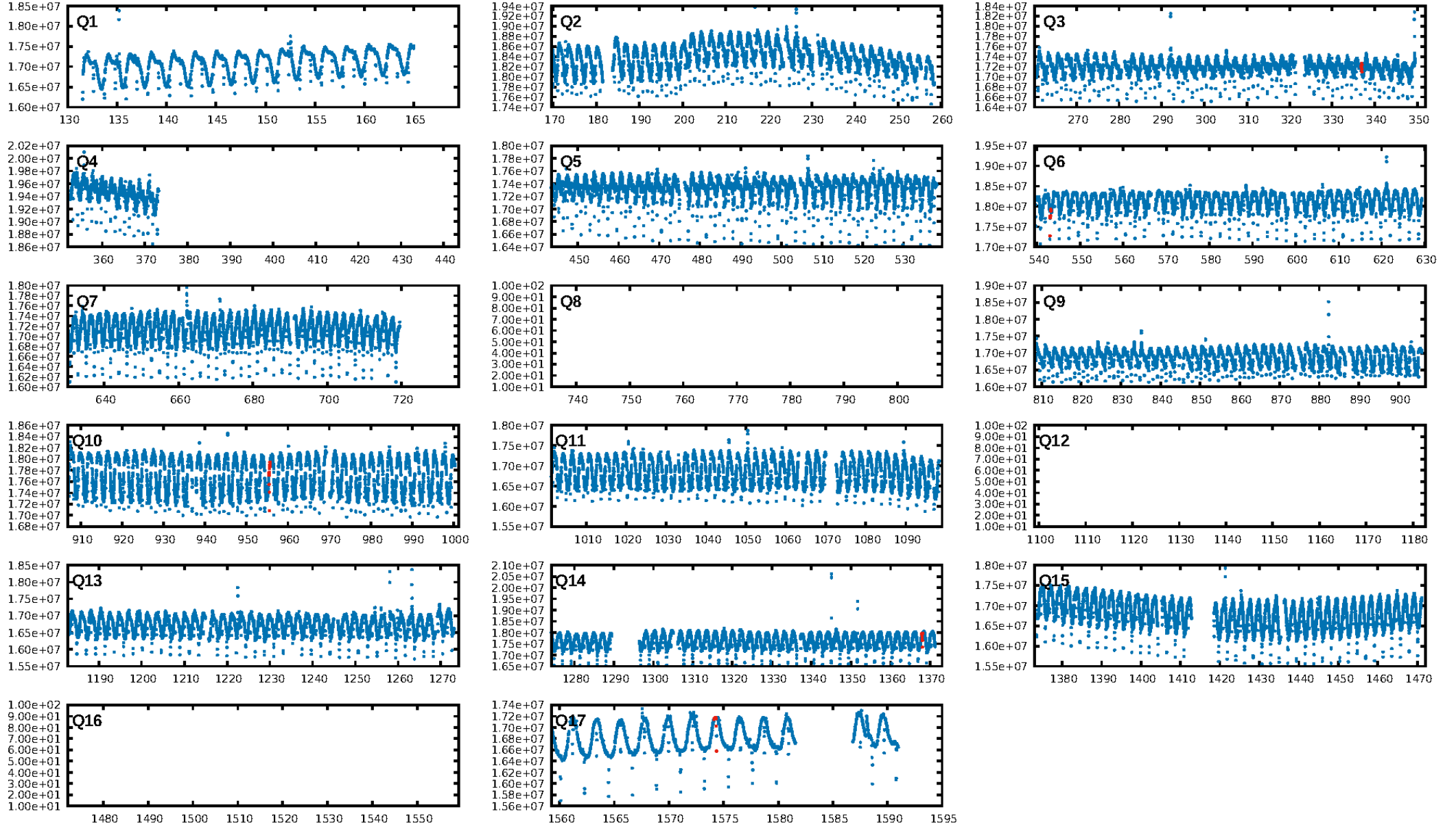
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1482.96σ]  
LongPeriod-sig: 100.0% [437.92σ]  
ModelChiSquare2-sig: 4.6%  
ModelChiSquareGof-sig: 99.7%  
Bootstrap-pfa: 9.34e-13  
RollingBand-fgt: 0.67 [2/3]  
GhostDiagnostic-chr: -6.552  
Centroid-sig: 38.1%  
Centroid-so: 0.948 arcsec [2.61σ]  
OotOffset-rm: 0.202 arcsec [1.44σ]  
KicOffset-rm: 0.483 arcsec [2.77σ]  
OotOffset-st: 2/1/0/1 [4]  
KicOffset-st: 2/1/0/1 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 0.00 [0/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:39:41 Z

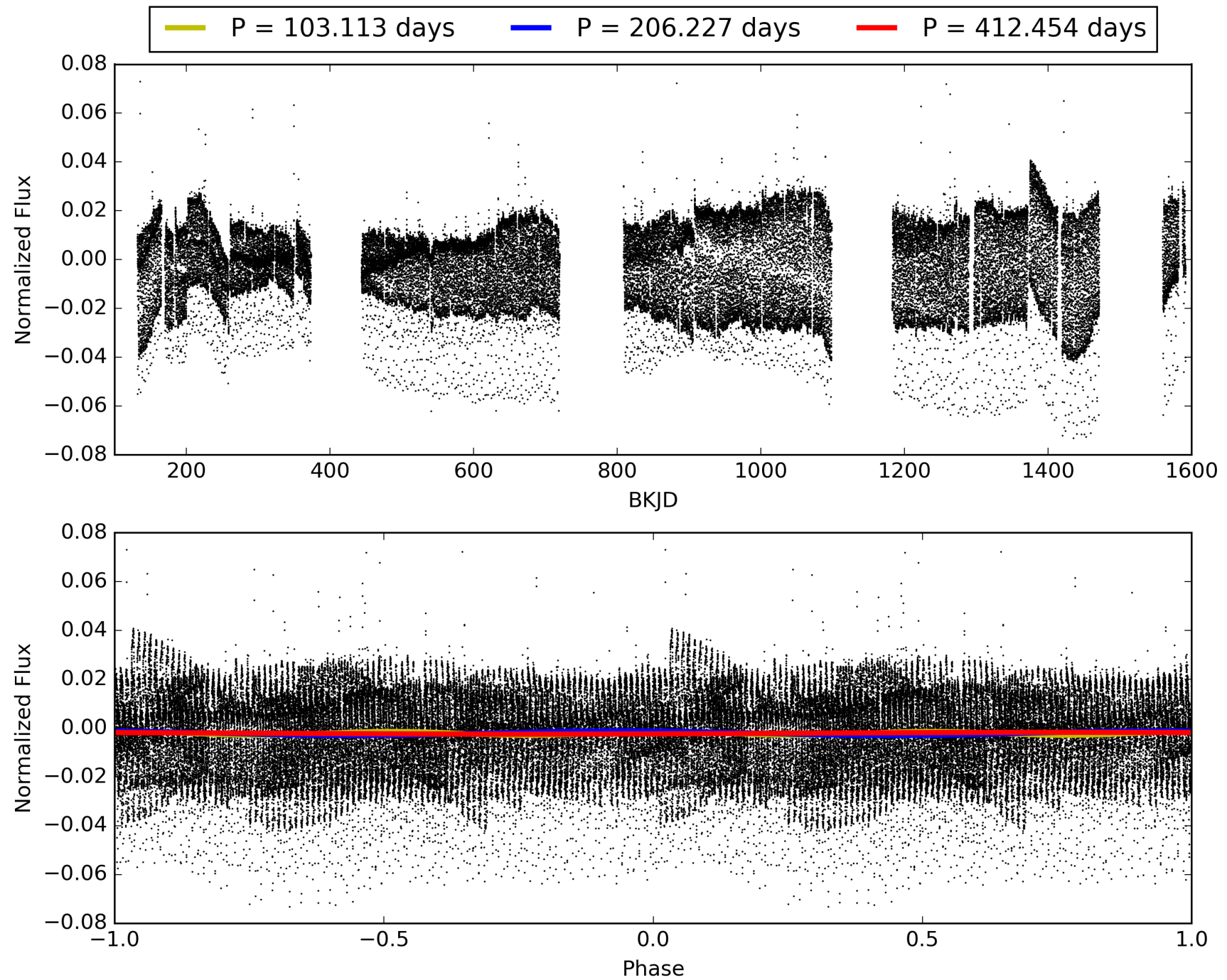
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011546211-05, PDC Light Curves



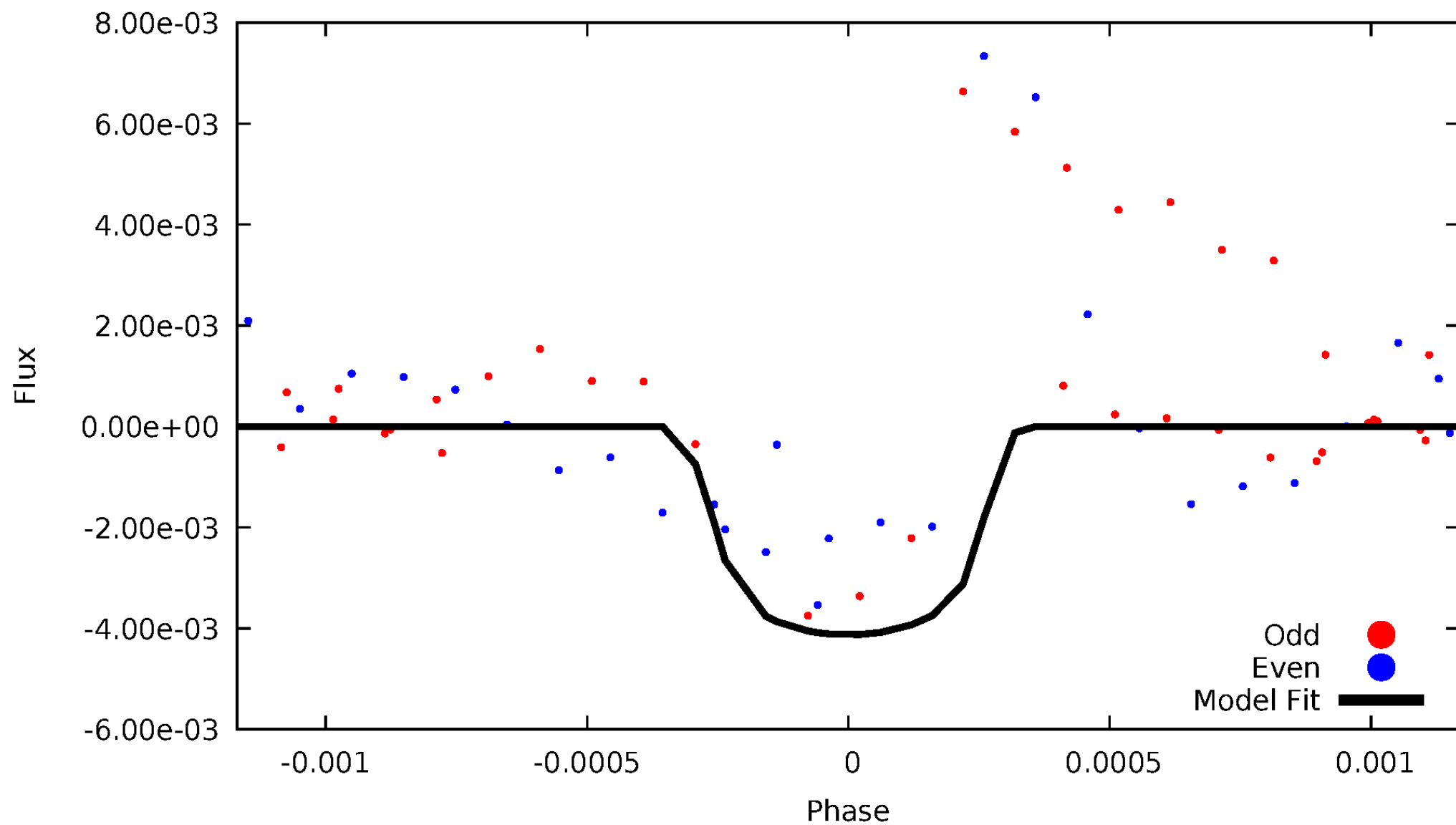


TCE 011546211-05



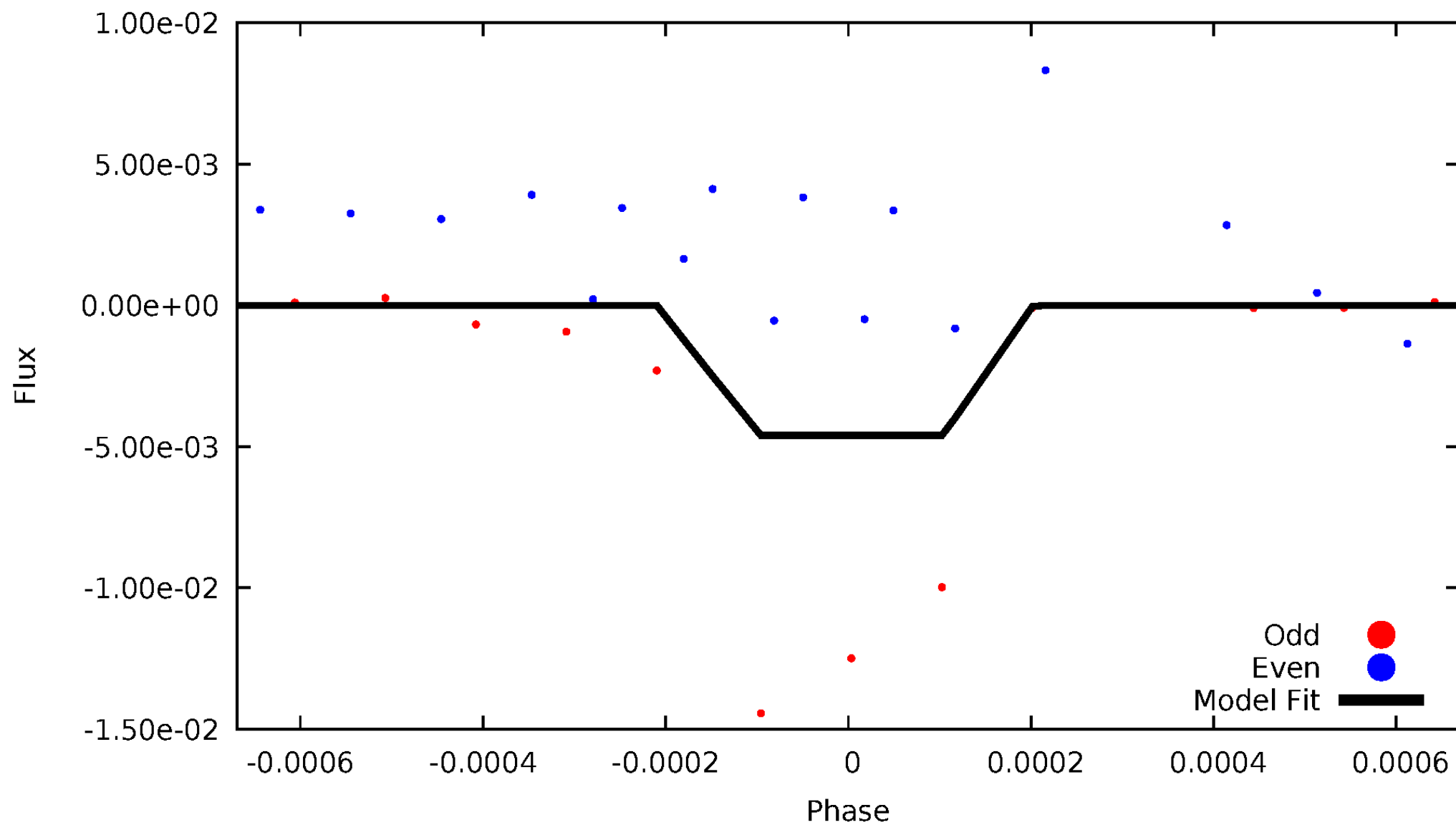
# DV Odd/Even

TCE 011546211-05



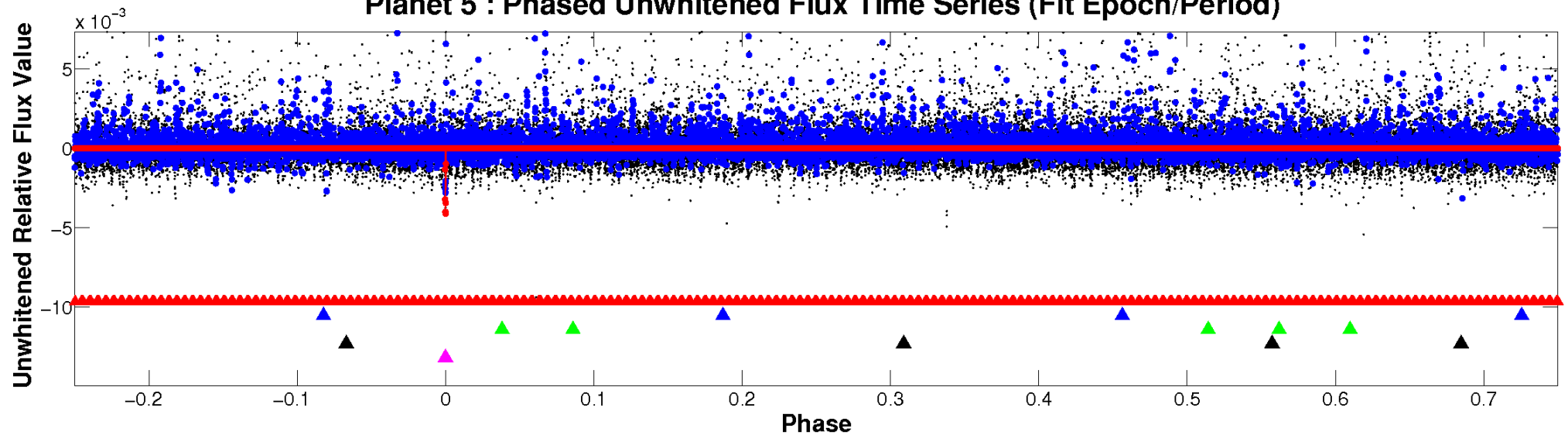
# ALT Odd/Even

TCE 011546211-05

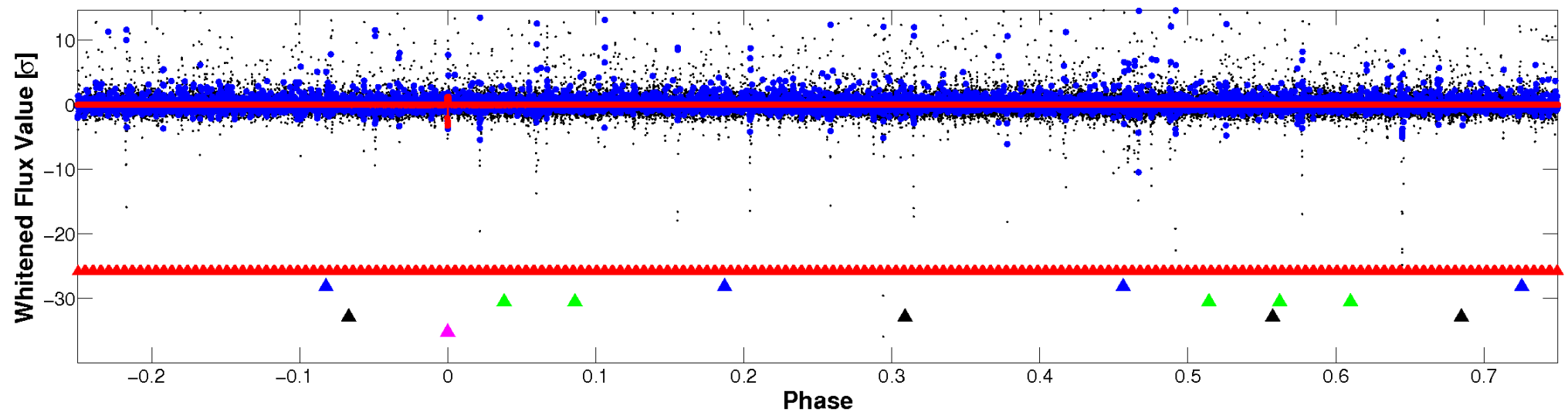


# Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

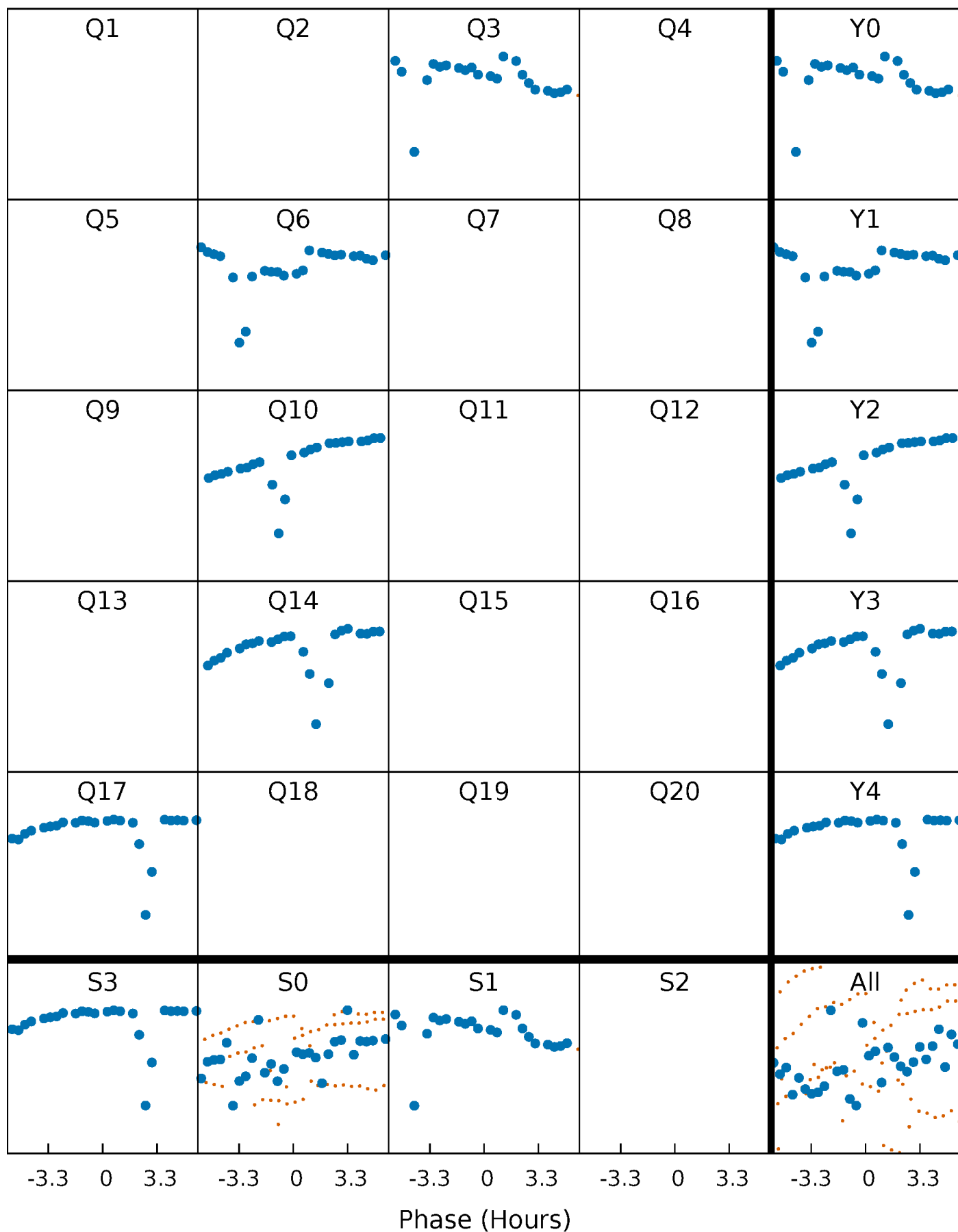


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



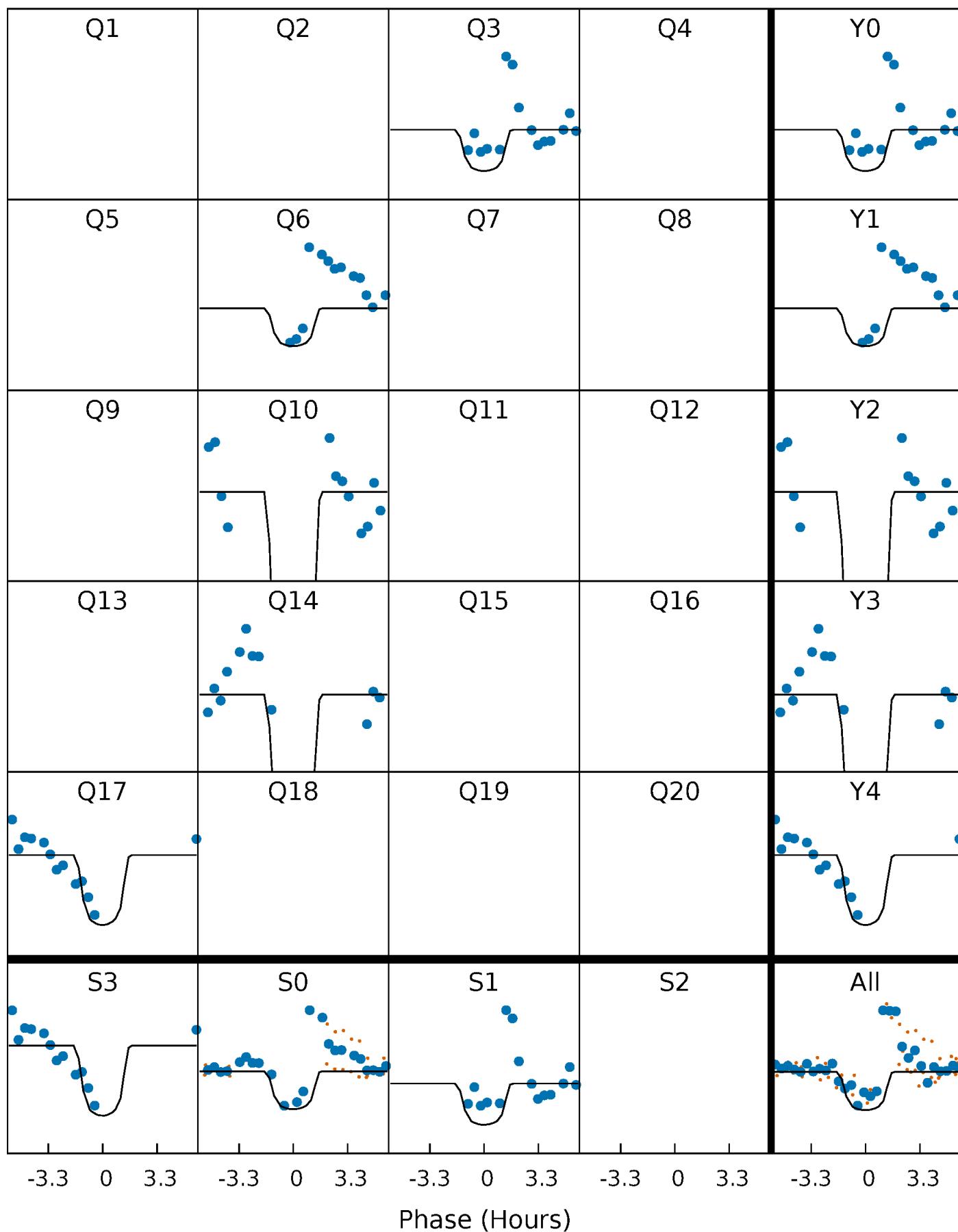
# PDC Quarter-Phased Transit Curves

TCE 011546211-05 P=206.226906 Days  $T_0=336.876001$  (BKJD)



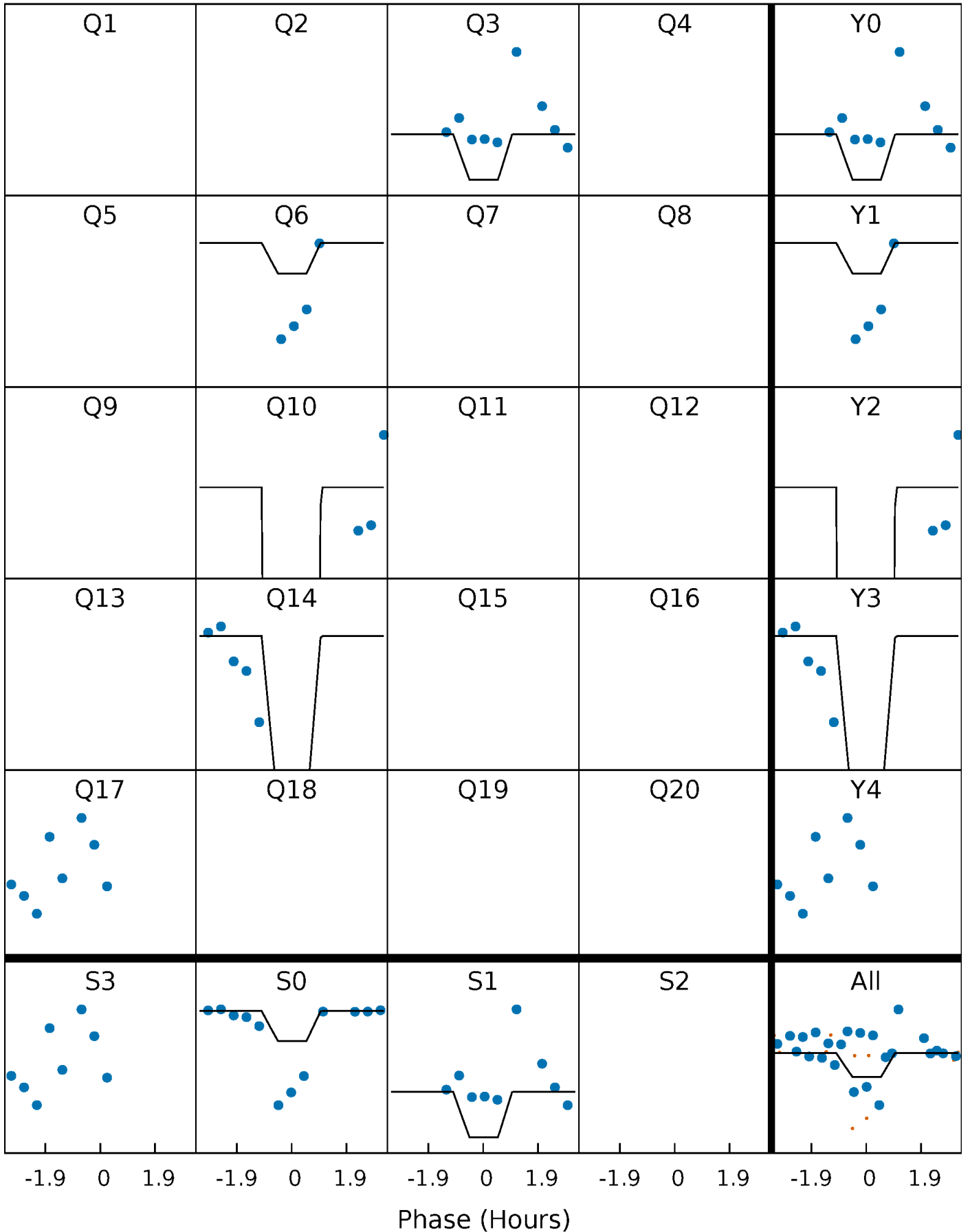
# DV Quarter-Phased Transit Curves

TCE 011546211-05     $P=206.226906$  Days     $T_0=336.876001$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

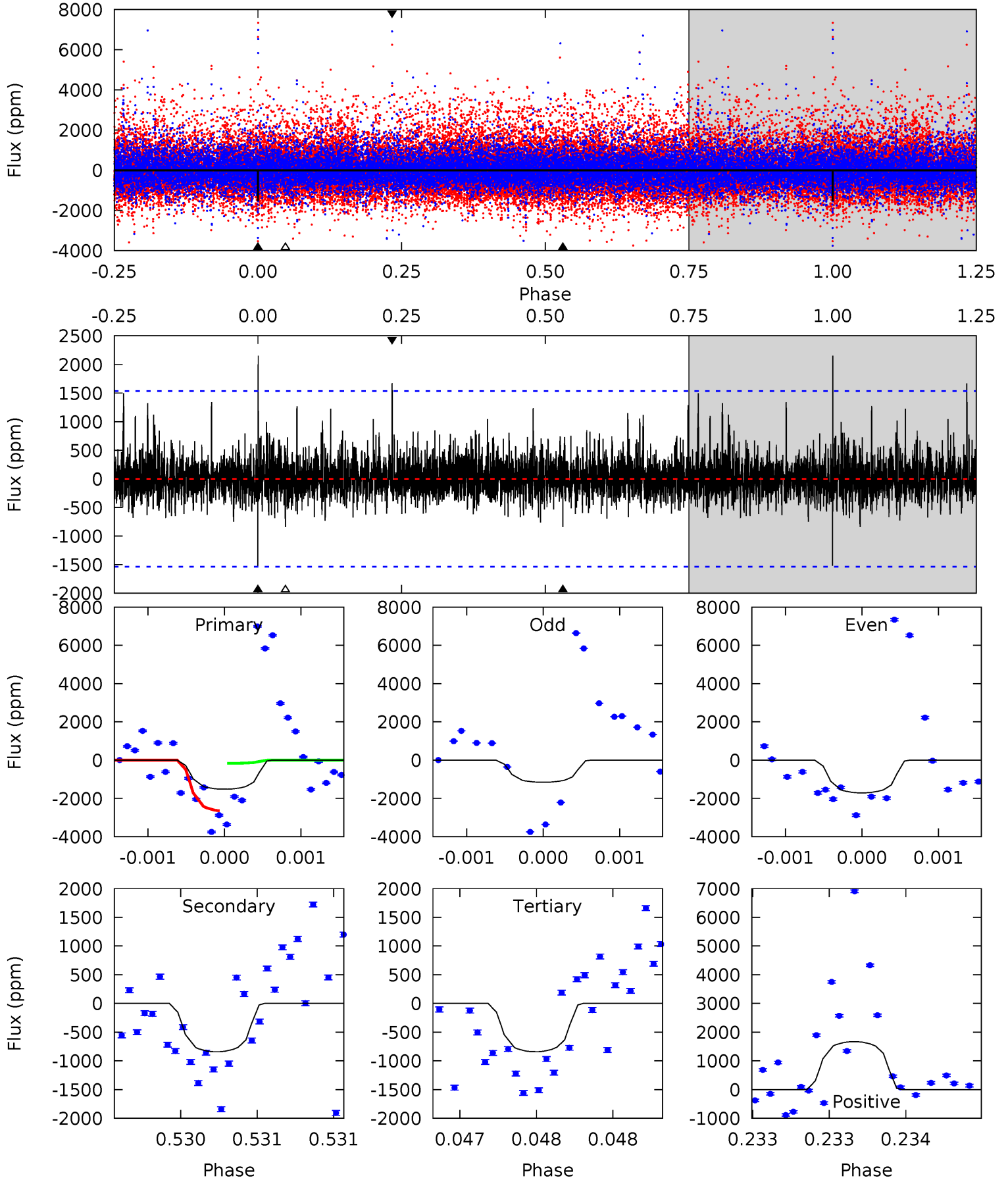
TCE 011546211-05     $P=206.221680$  Days     $T_0=336.885012$  (BKJD)



# DV Model-Shift Uniqueness Test

011546211-05, P = 206.226906 Days, E = 130.649095 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
5.48	3.04	3.04	6.03	5.55	3.44	0.90	2.44	-0.55	0.00	-2.99	0.83	1.56	0.59	4.52

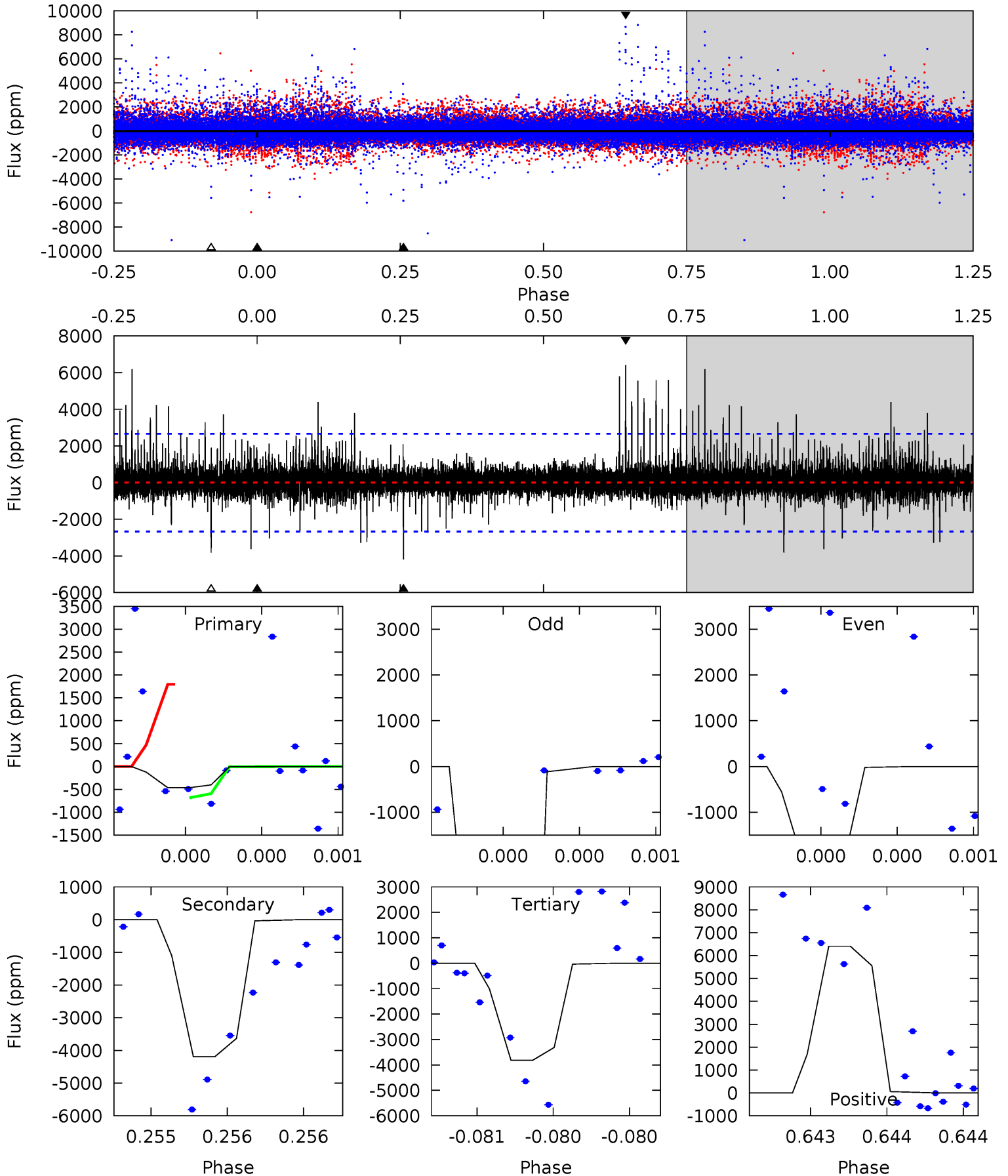




# Alt Model-Shift Uniqueness Test

011546211-05, P = 206.221680 Days, E = 130.663332 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
0.98	8.85	8.07	13.5	5.64	3.58	1.00	-7.09	-12.6	0.78	-4.68	14.0	6.24	0.60	1.38



### Stellar Parameters For KIC 011546211

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3497^{+62}_{-55}$	$4.920^{+0.055}_{-0.040}$	$-0.200^{+0.100}_{-0.100}$	$0.334^{+0.039}_{-0.044}$	$0.339^{+0.051}_{-0.051}$	$12.780^{+4.046}_{-2.139}$
	+2%/-2%	+1%/-1%	+50%/-50%	+12%/-13%	+15%/-15%	+32%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011546211-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-841 \pm 277$	$2.63^{+2.31}_{-1.77}$	$180^{+5}_{-5}$	$2671^{+970}_{-365}$	$15101^{+111623}_{-10953}$
Alt.	$-4191 \pm 474$	$2.97^{+2.08}_{-1.73}$	$180^{+5}_{-5}$	$3245^{+1121}_{-430}$	$60033^{+281367}_{-38838}$

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

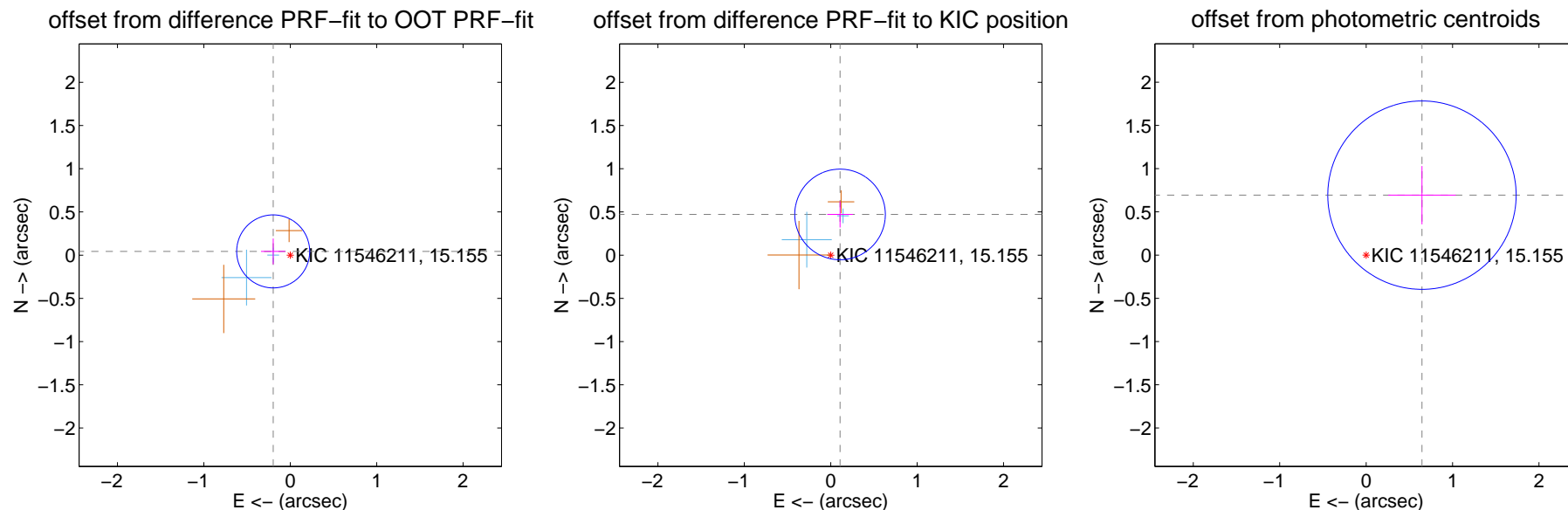
## DV Centroid Data

Supplemental centroid analysis for 011546211-05. Kepler magnitude: 15.15. Transit SNR 9.05

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.65 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.202 \pm 0.141$	1.44	$0.198 \pm 0.140$	$0.043 \pm 0.149$
PRF-fit source offset from KIC position	$0.483 \pm 0.175$	2.77	$-0.108 \pm 0.148$	$0.471 \pm 0.151$
photometric centroid source offset	$0.95 \pm 0.36$	2.61	$-0.65 \pm 0.39$	$0.69 \pm 0.34$



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.

Q1 no difference image



Q1 no OOT image



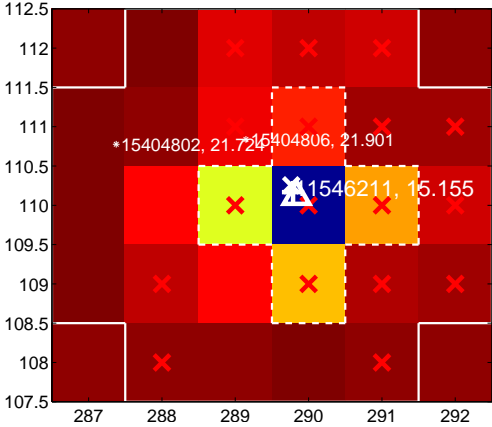
Q2 no difference image



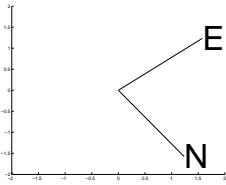
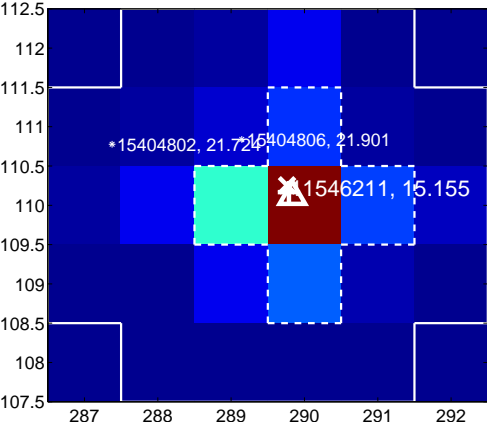
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



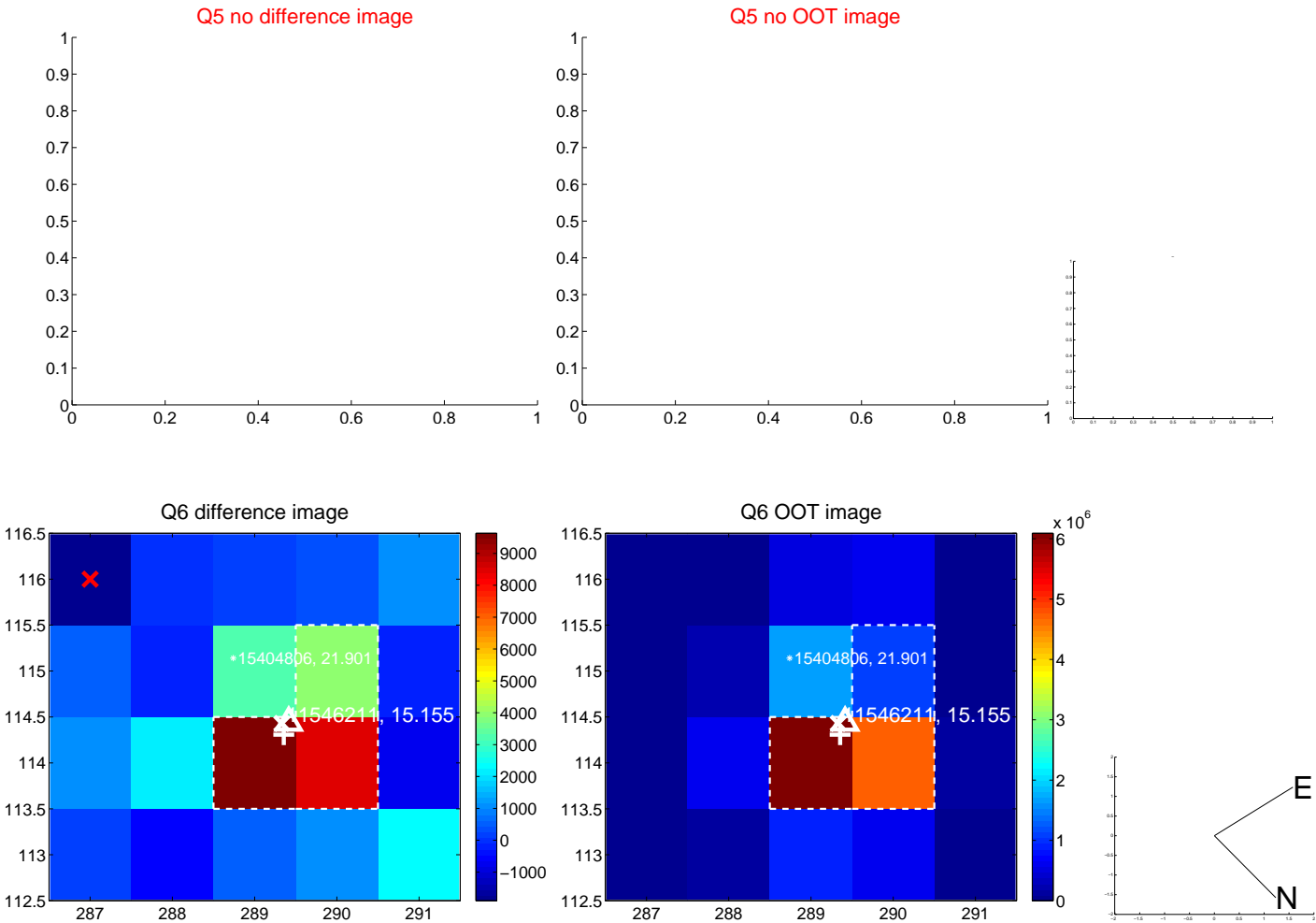
Q4 no difference image



Q4 no OOT image

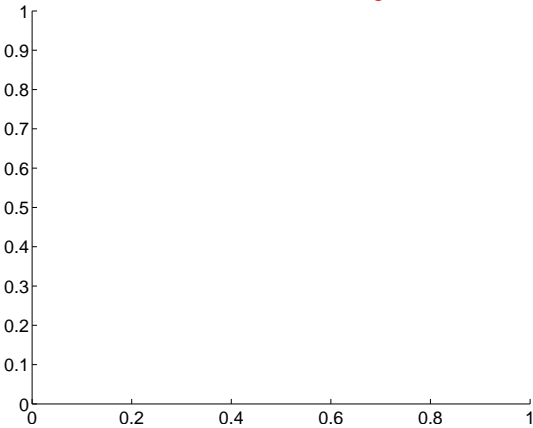


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

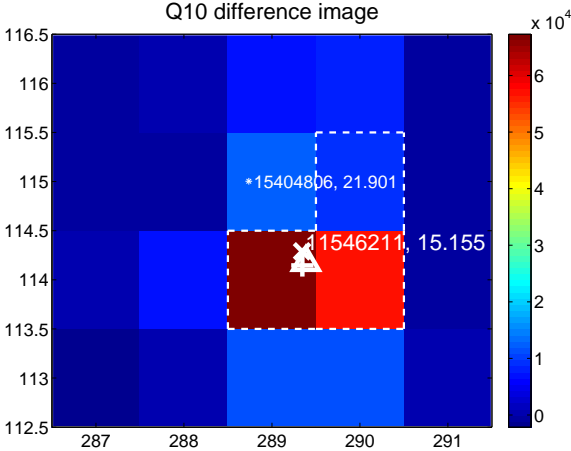
Q9 no difference image



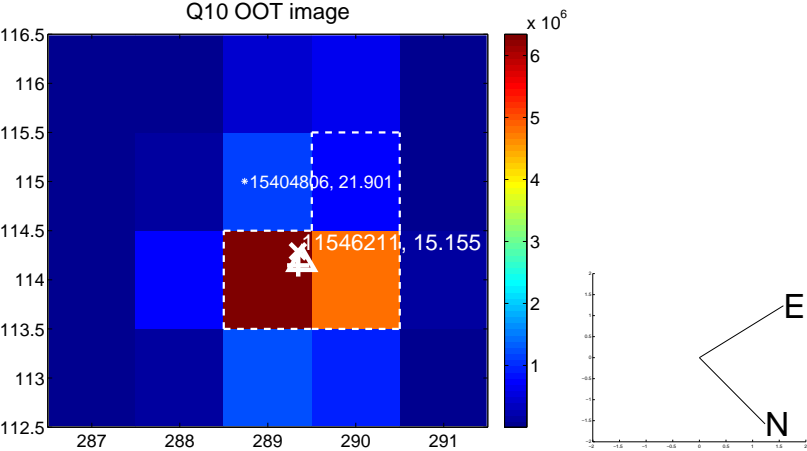
Q9 no OOT image



Q10 difference image



Q10 OOT image



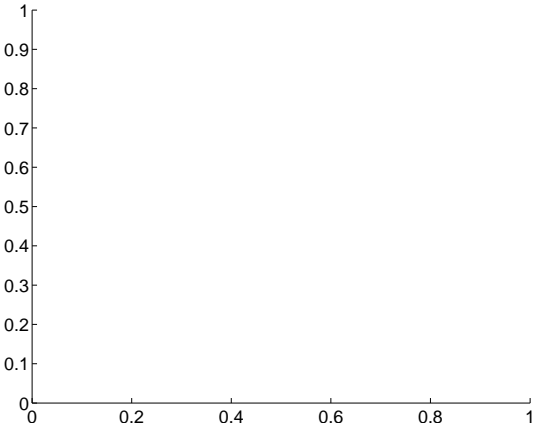
Q11 no difference image



Q11 no OOT image



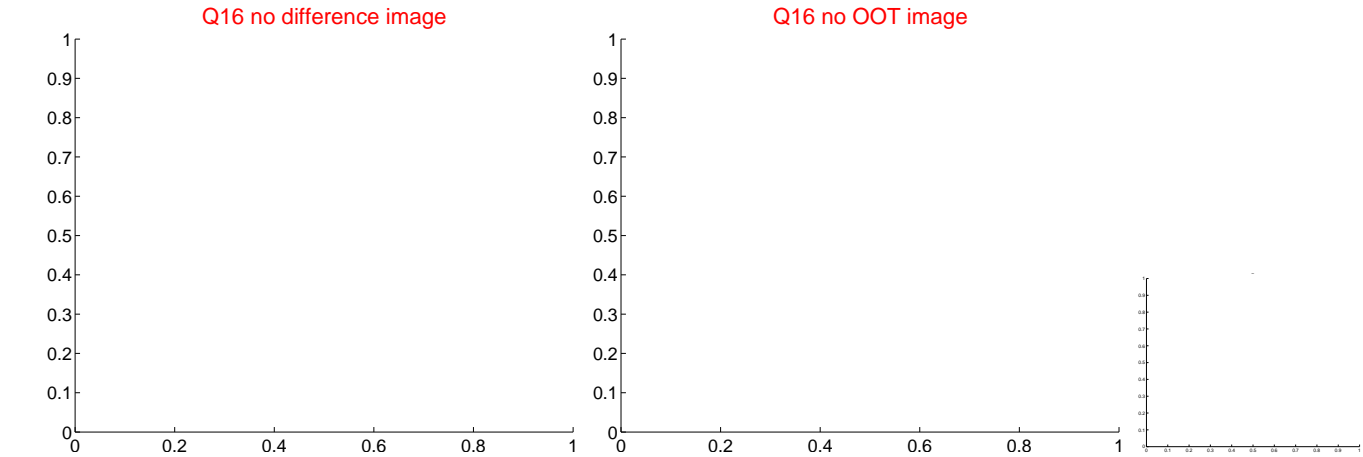
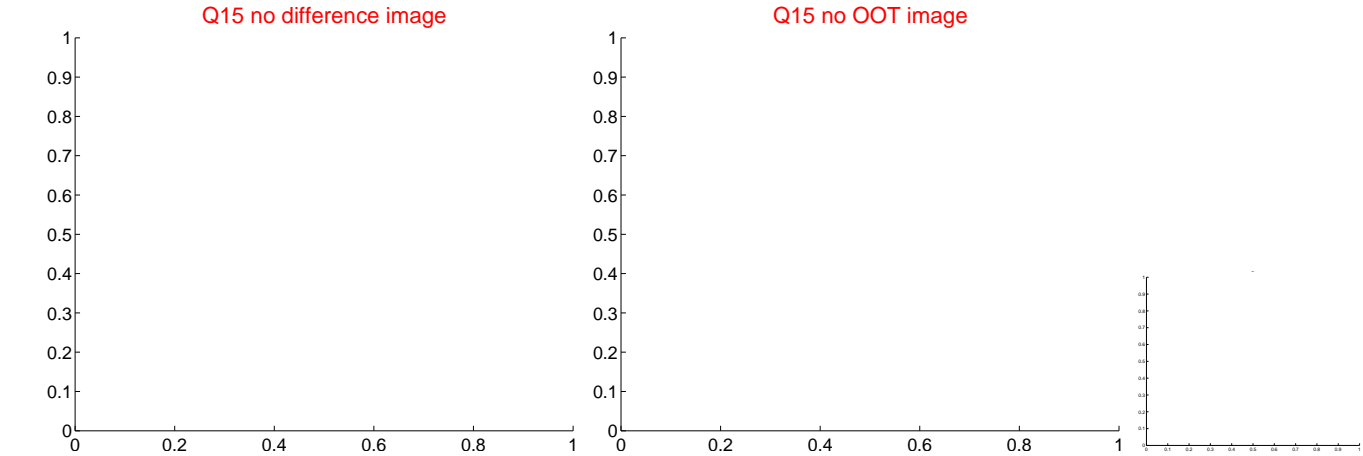
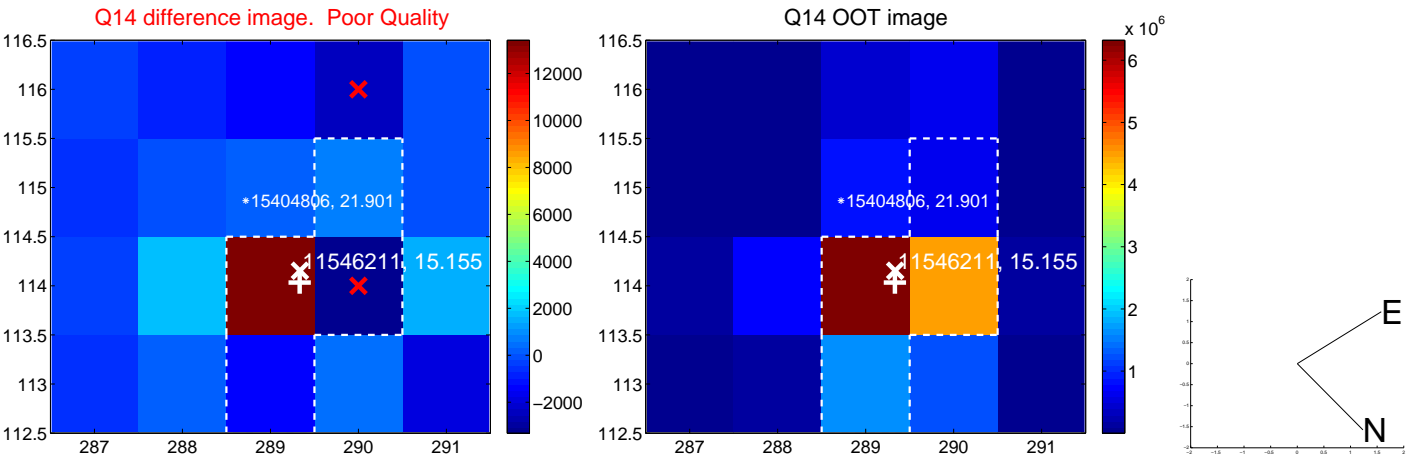
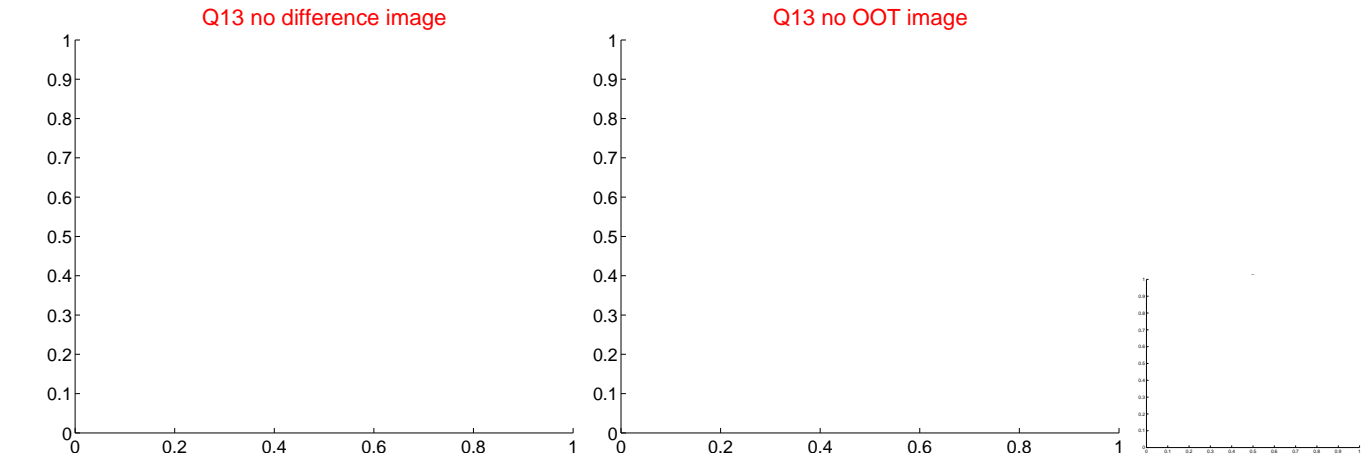
Q12 no difference image



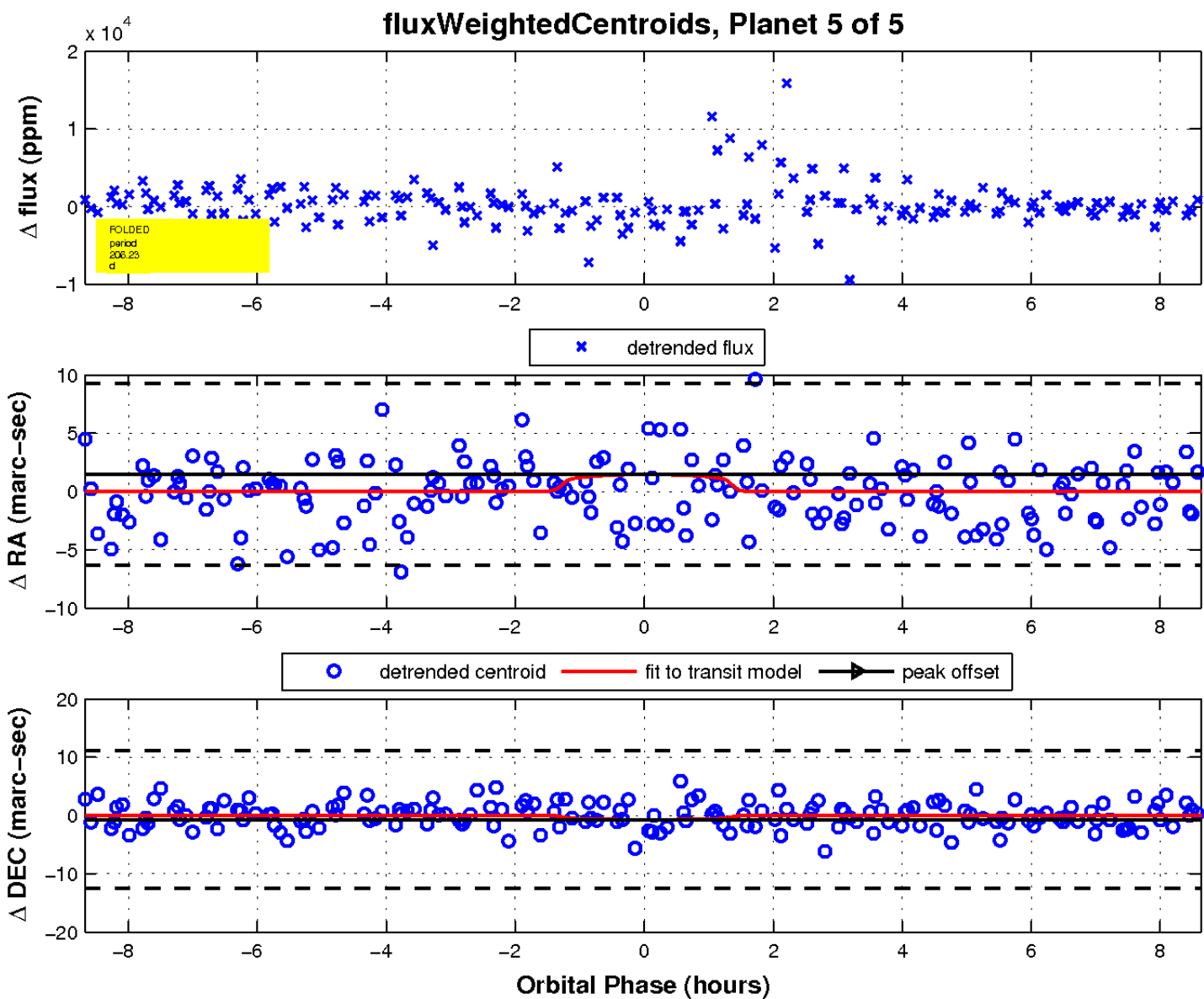
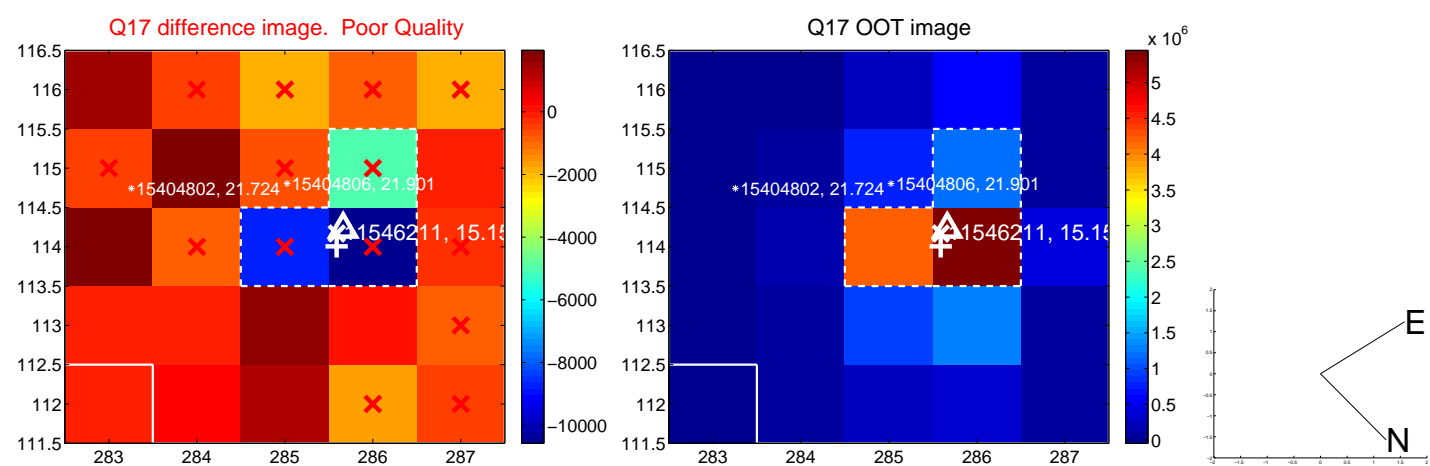
Q12 no OOT image



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



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





UKIRT Image

Declination

