

# KIC 011515276

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011515276-01	OBS	No	403.712205	513.461034	3886.9	5.507	14.0	11.4	0.40	3618	3.06	0.04
011515276-03	OBS	No	489.164999	227.101526	3054.4	8.467	11.6	9.0	0.40	3618	2.61	0.03
011515276-04	OBS	No	418.095298	135.336485	2037.4	9.242	11.0	6.6	0.40	3618	1.82	0.04
011515276-05	OBS	No	652.627829	133.728275	2506.4	5.376	12.2	7.2	0.40	3618	2.00	0.02
011515276-06	OBS	No	385.371365	377.127951	3194.4	12.673	10.0	7.9	0.40	3618	2.25	0.04
011515276-07	OBS	No	464.331649	247.258780	2764.8	16.928	10.7	6.5	0.40	3618	2.22	0.03
011515276-08	OBS	No	347.438632	467.537482	2204.6	6.000	9.6	-1.0	0.40	3618	1.87	0.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011515276-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

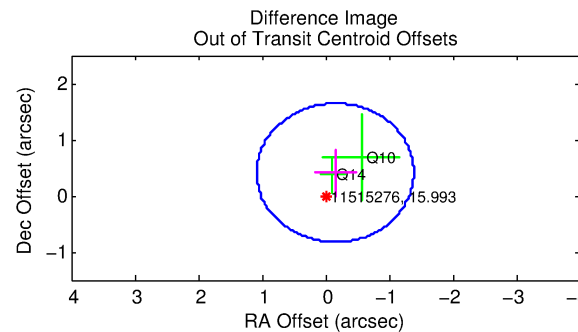
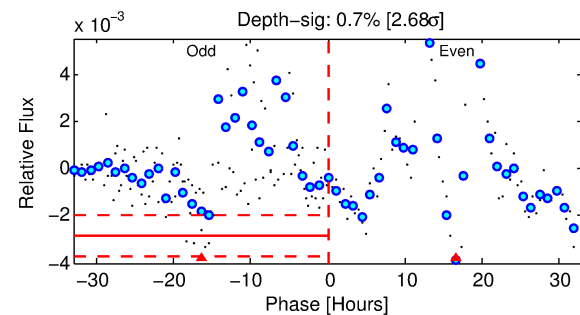
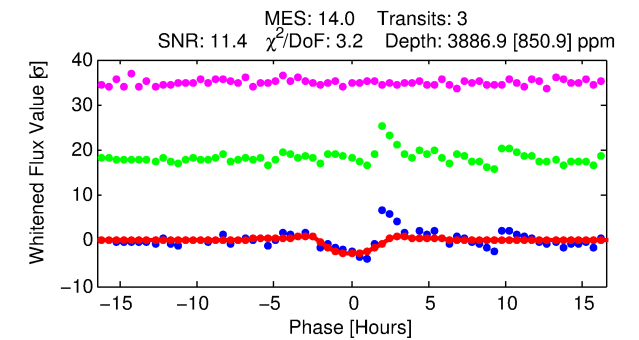
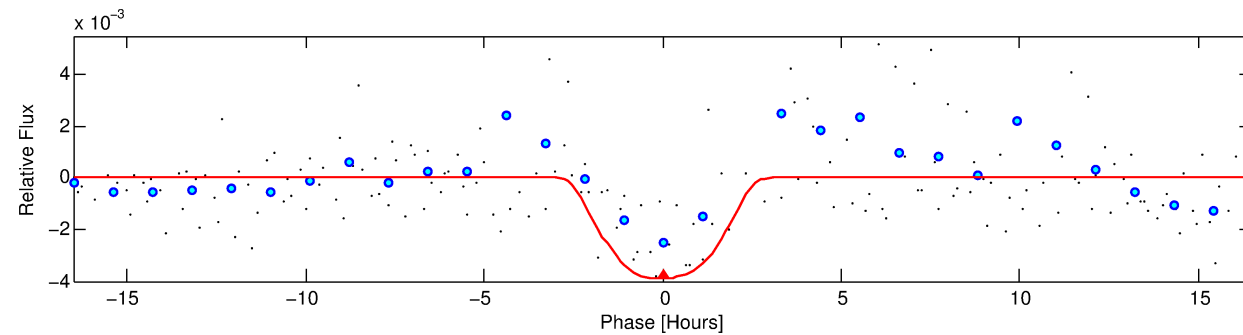
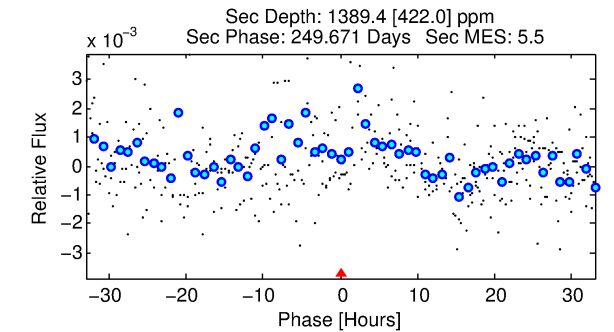
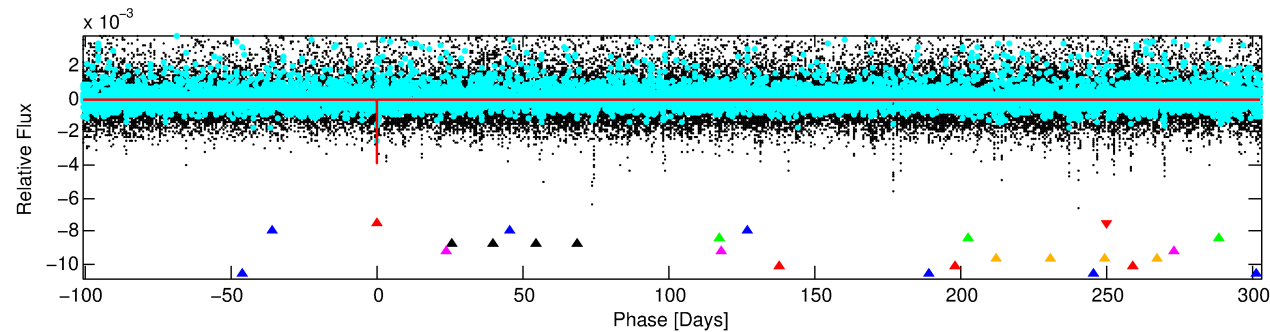
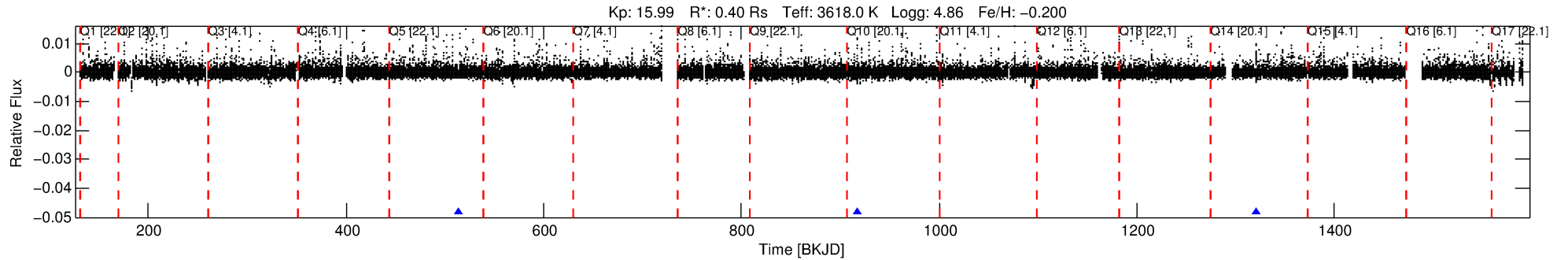
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011515276-01

No Significant Match Found

# DV One-Page Summary

KIC: 11515276 Candidate: 1 of 8 Period: 403.712 d



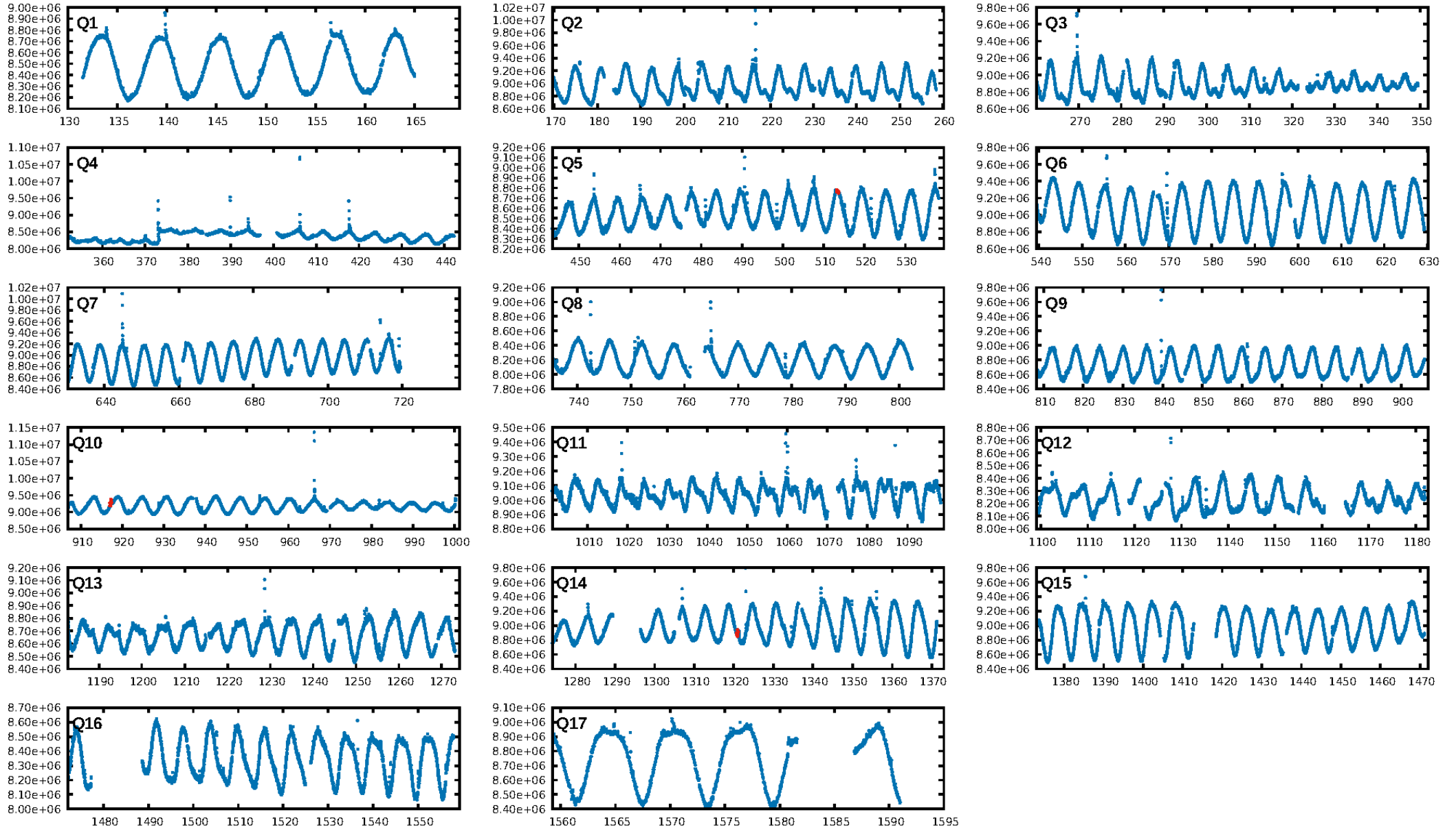
## DV Fit Results:

Period = 403.71220 [0.01047] d  
Epoch = 513.4610 [0.0150] BKJD  
Rp/R\* = 0.0698 [0.0116]  
a/R\* = 306.45 [82.70]  
b = 0.92 [0.05]  
Seff = 0.04 [0.00]  
Teq = 113 [3] K  
Rp = 3.05 [0.56] Re  
a = 0.8026 [0.0473] AU  
Ag = 52770.57 [24078.95] [2.19σ]  
Teffp = 2644 [300] K [8.44σ]

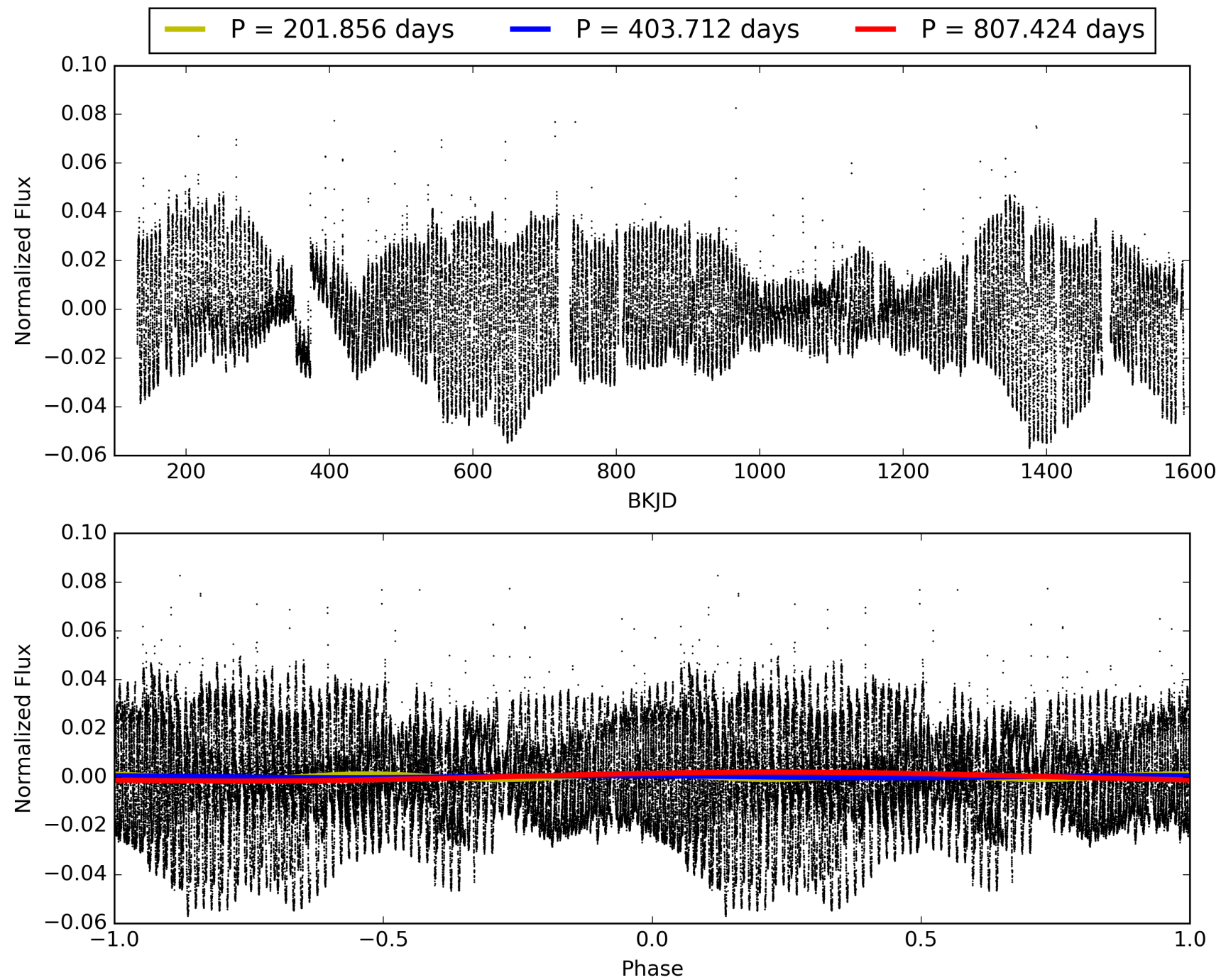
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [31.86σ]  
LongPeriod-sig: 100.0% [32.09σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.5783  
Centroid-sig: 12.3%  
Centroid-so: 1.058 arcsec [1.37σ]  
OotOffset-rm: 0.437 arcsec [1.06σ]  
KicOffset-rm: 0.520 arcsec [1.24σ]  
OotOffset-st: 2/0/0/0 [2]  
KicOffset-st: 2/0/0/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 011515276-01, PDC Light Curves



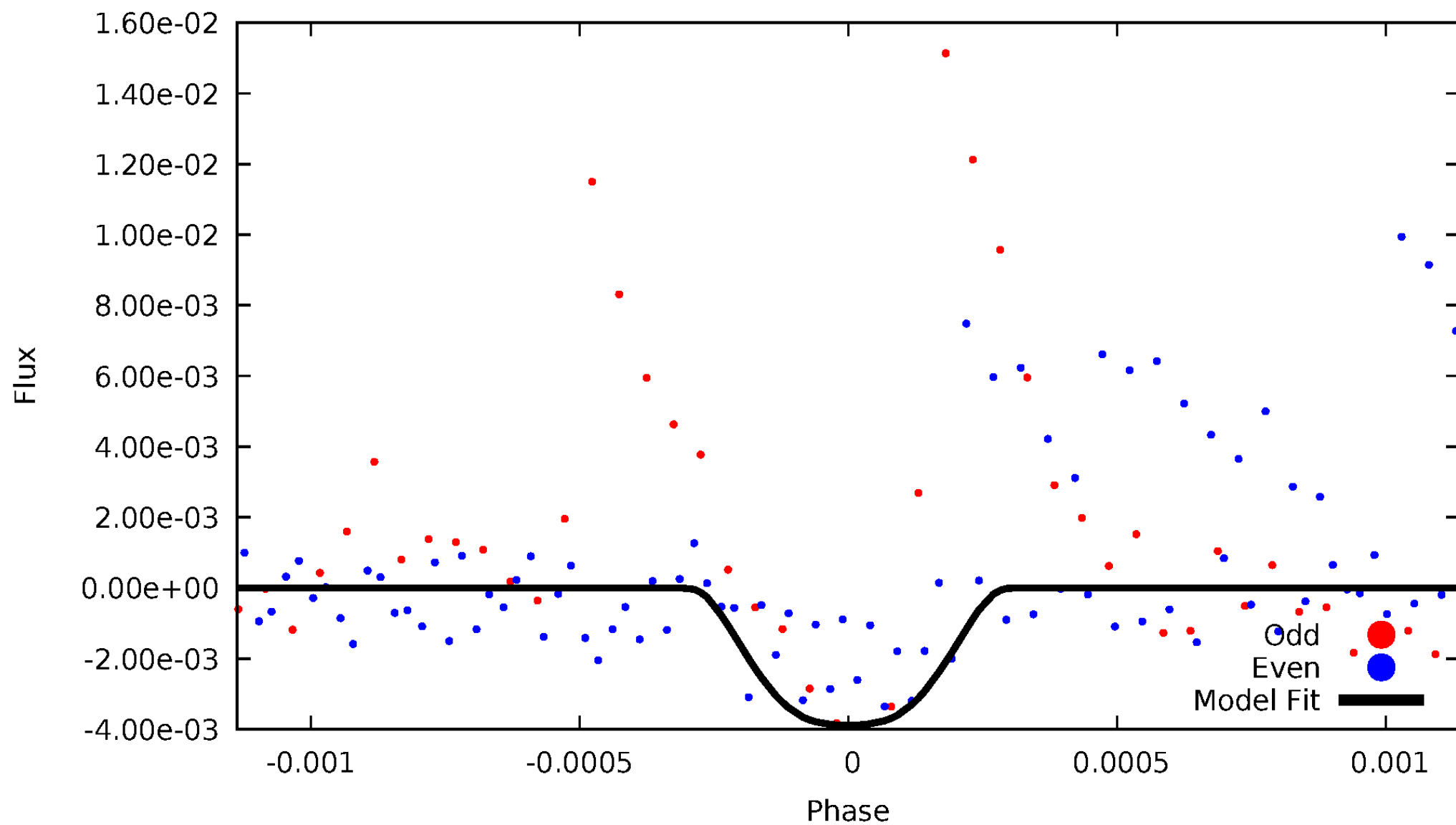
# TCE 011515276-01





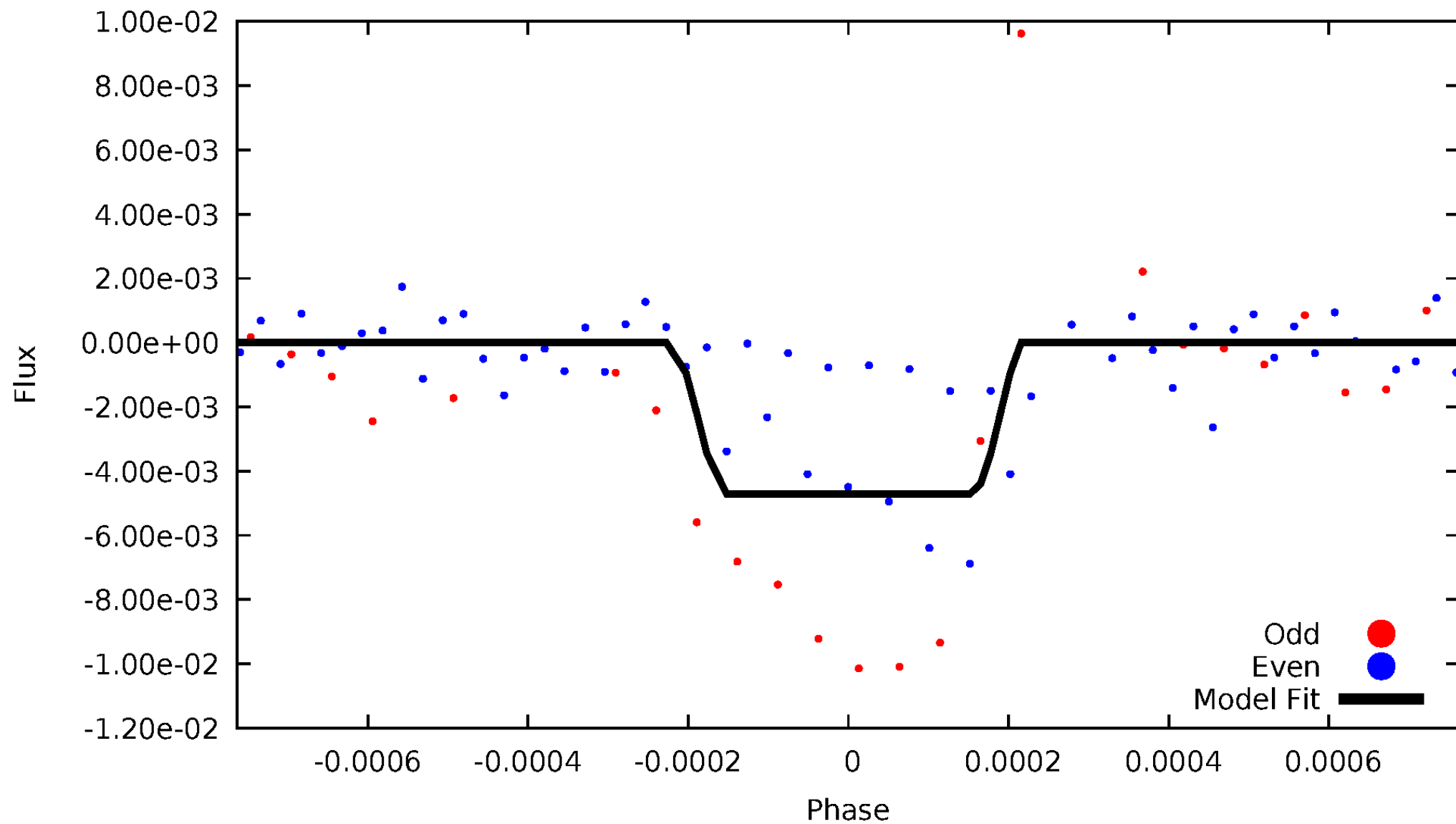
# DV Odd/Even

TCE 011515276-01

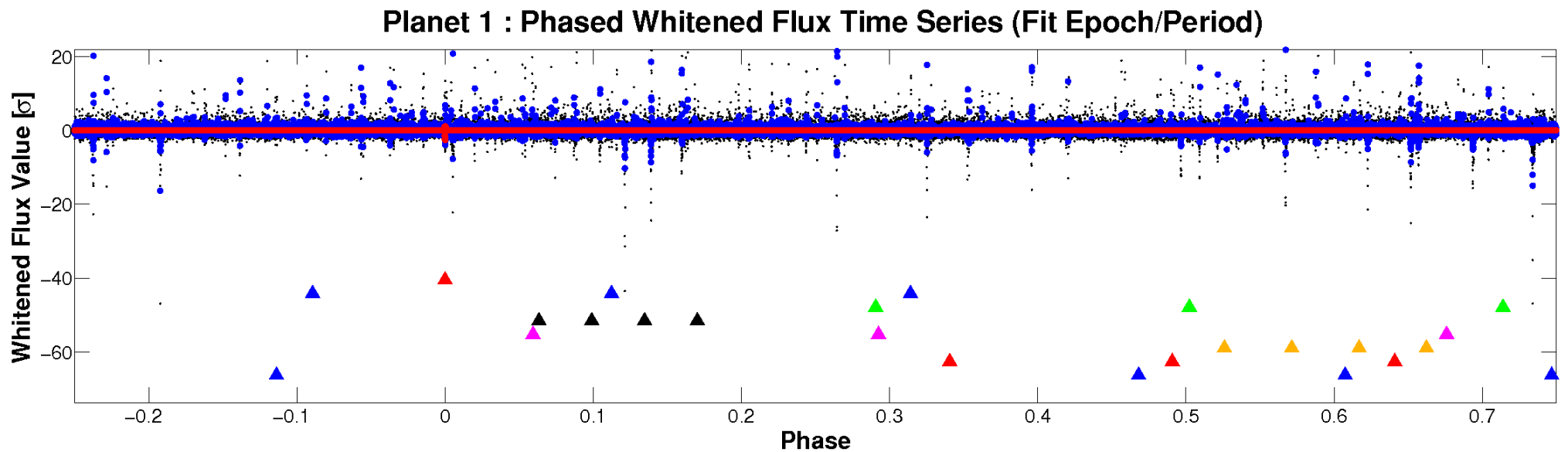
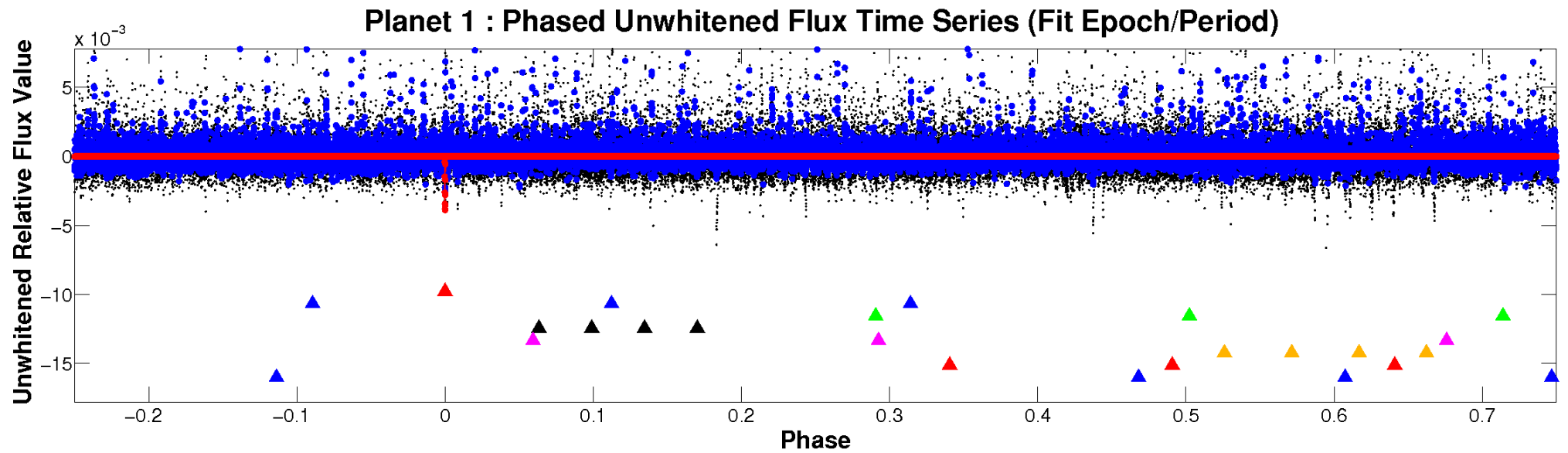


# ALT Odd/Even

TCE 011515276-01

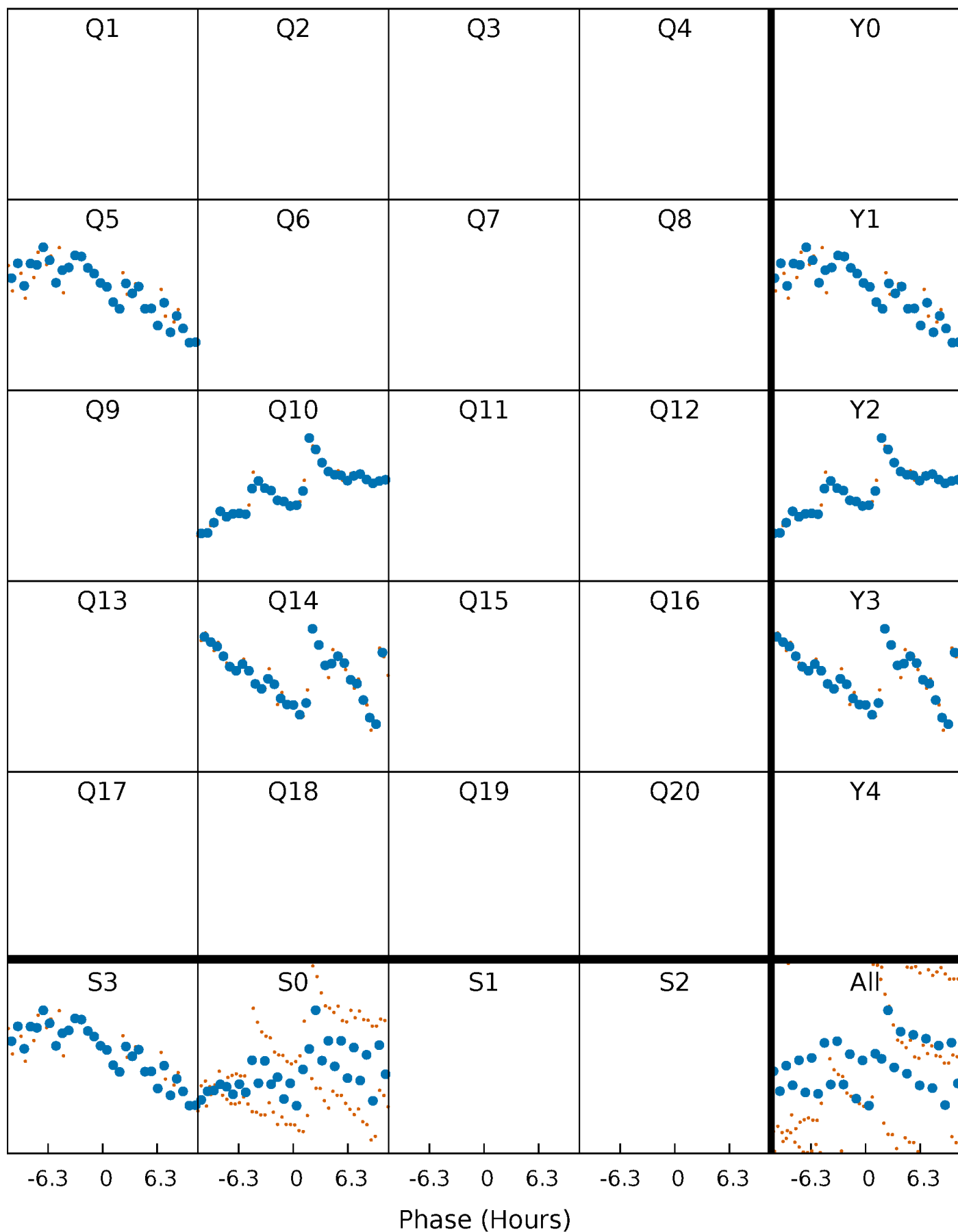


# Non-Whitened Vs. Whitened Light Curve



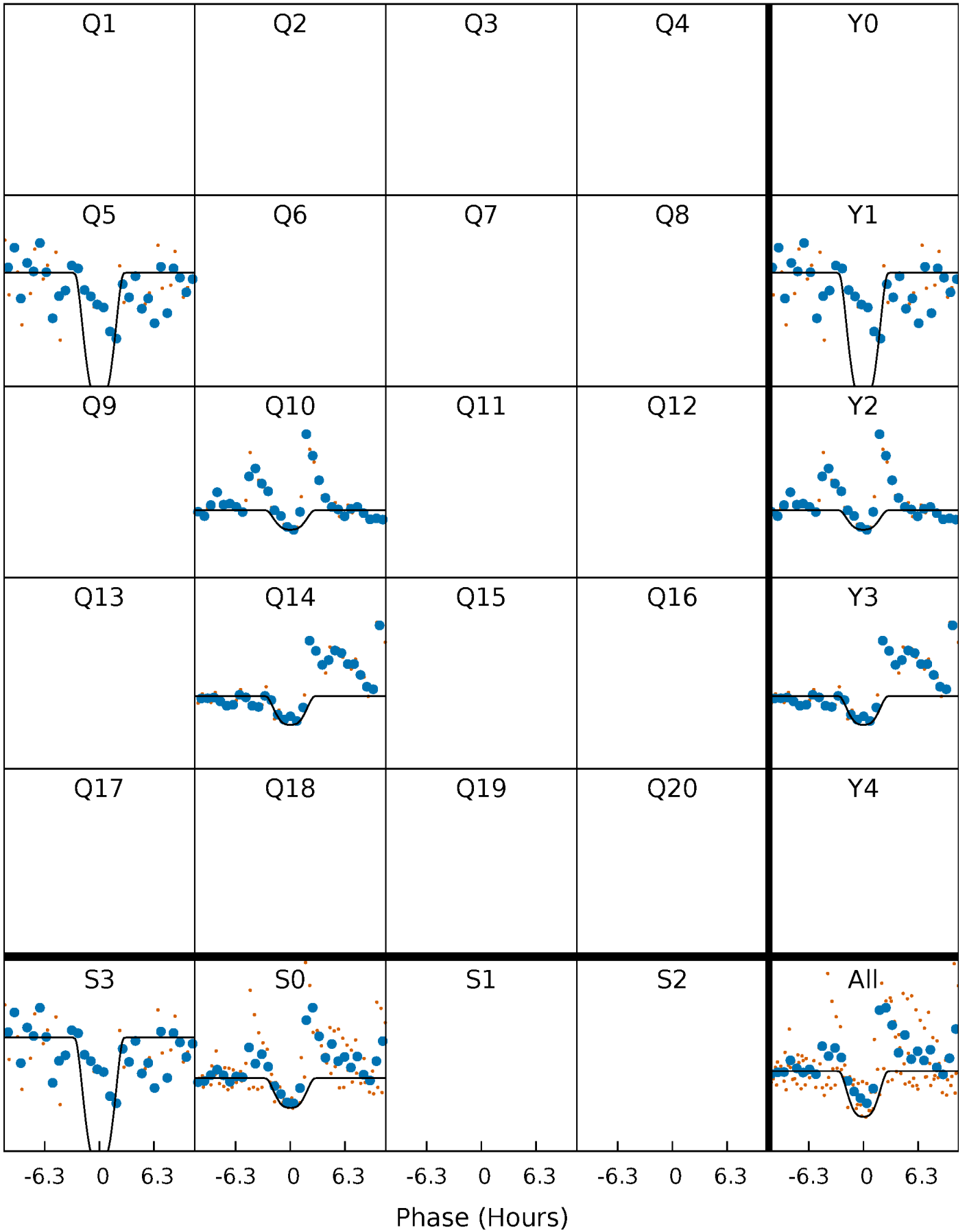
# PDC Quarter-Phased Transit Curves

TCE 011515276-01 P=403.712205 Days  $T_0=513.461034$  (BKJD)



# DV Quarter-Phased Transit Curves

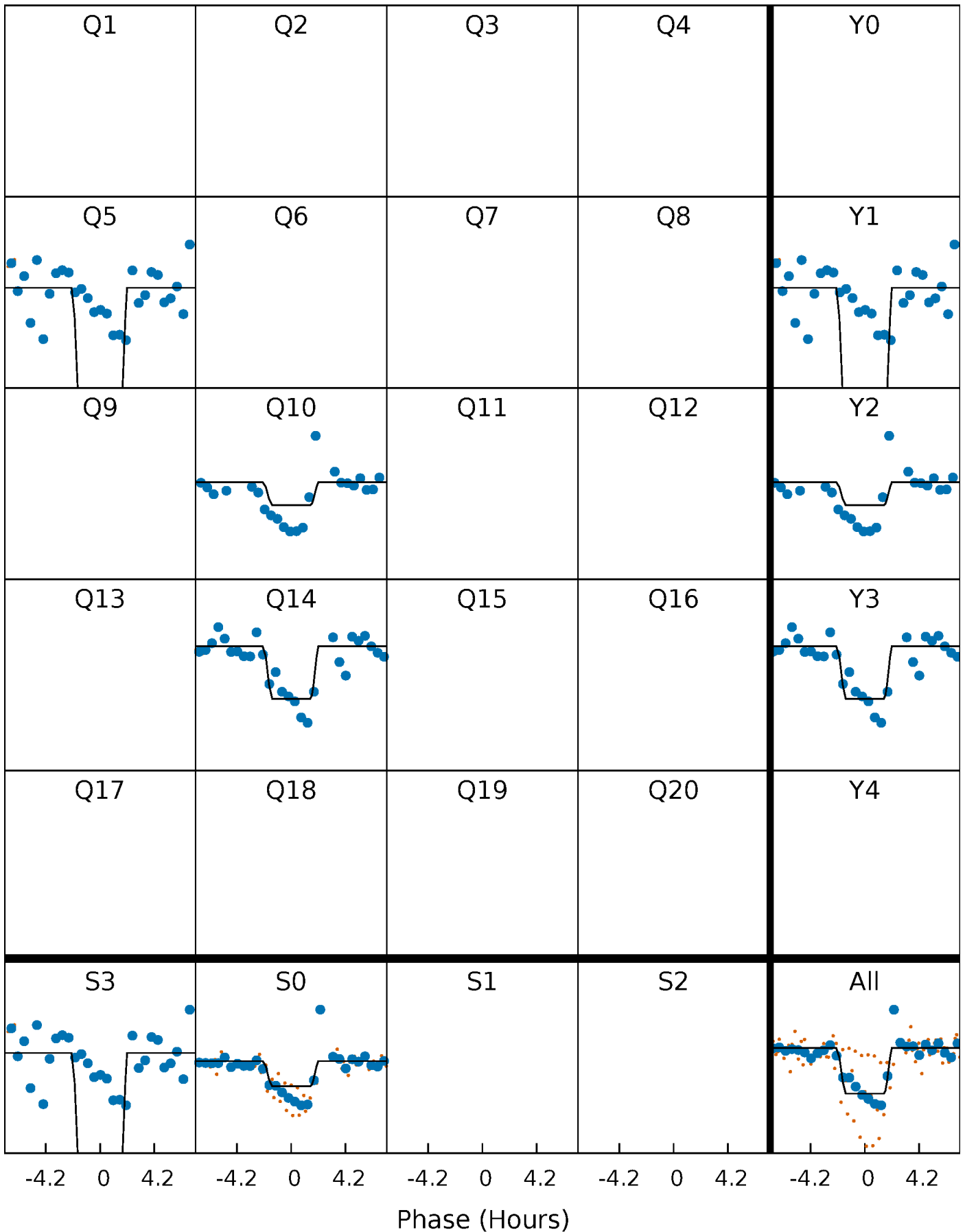
TCE 011515276-01     $P=403.712205$  Days     $T_0=513.461034$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

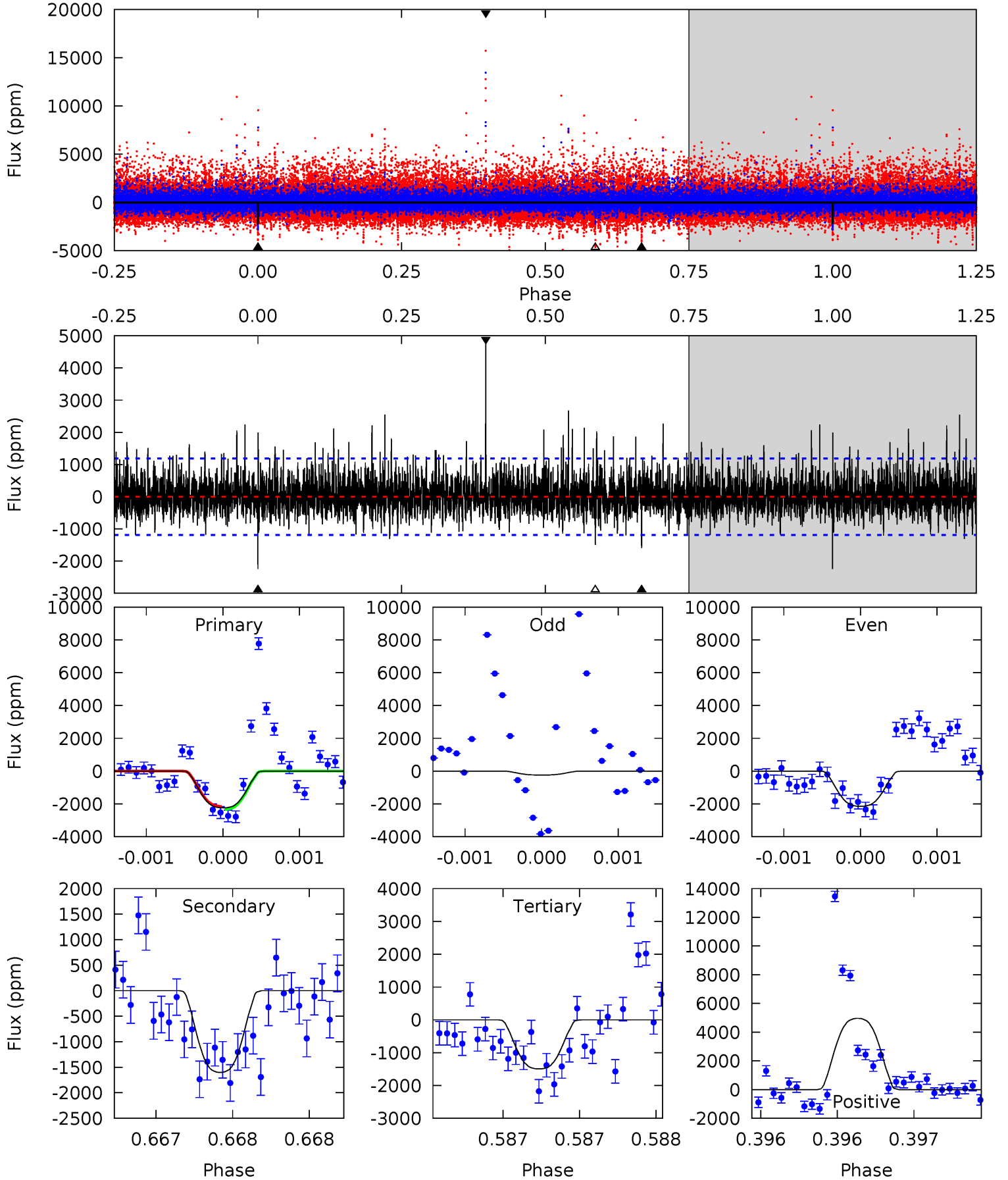
TCE 011515276-01 P=403.712656 Days  $T_0=513.446604$  (BKJD)



# DV Model-Shift Uniqueness Test

011515276-01, P = 403.712205 Days, E = 109.748829 Days

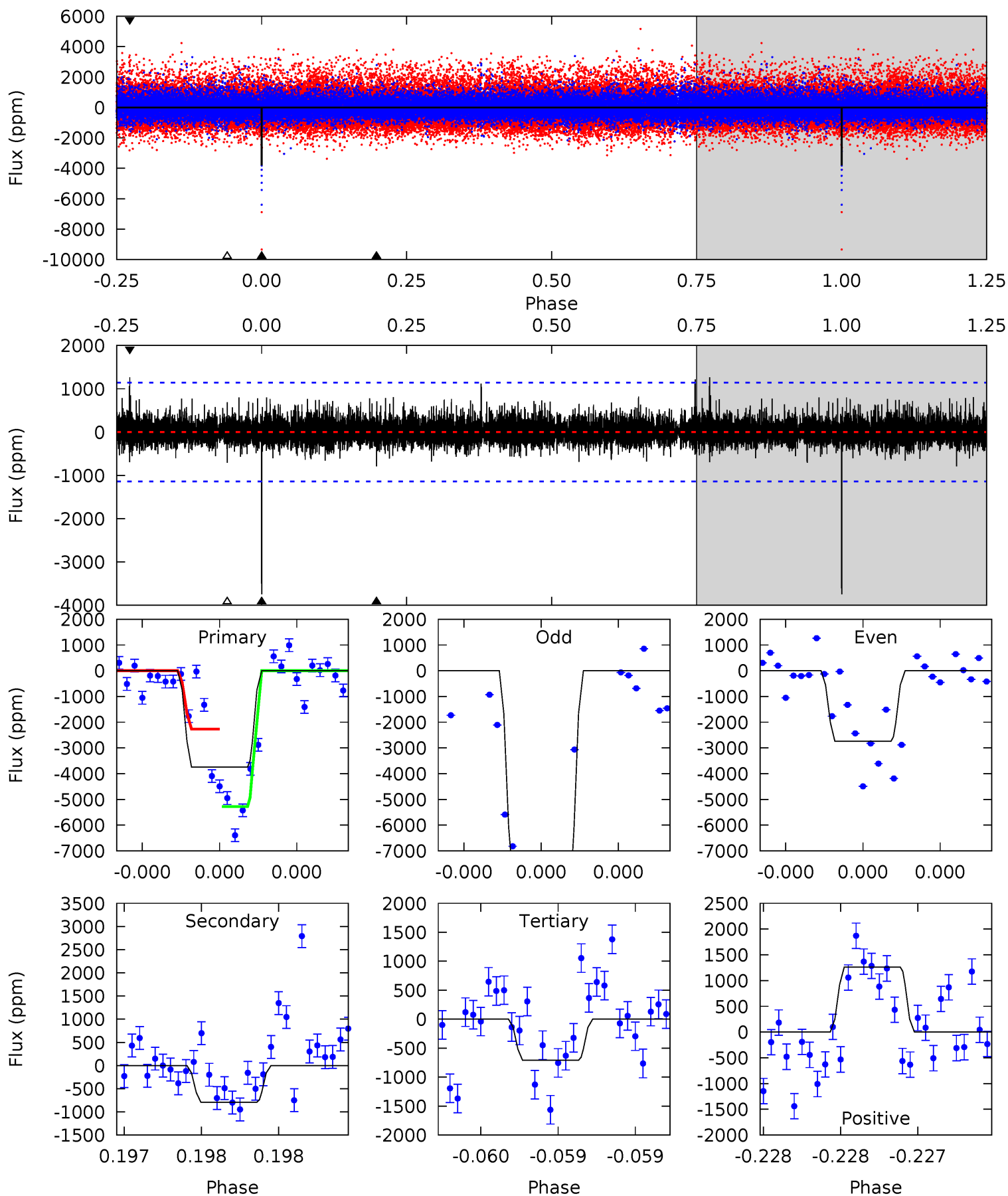
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	7.48	6.98	23.2	5.54	3.43	2.11	3.49	-12.7	0.49	-15.7	3.20	1.02	0.69	0.41



# Alt Model-Shift Uniqueness Test

011515276-01, P = 403.712656 Days, E = 109.733948 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
18.4	3.89	3.47	6.20	5.60	3.53	0.93	14.9	12.2	0.42	-2.31	15.8	0.97	0.25	7.17



### Stellar Parameters For KIC 011515276

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3618^{+43}_{-48}$	$4.858^{+0.033}_{-0.033}$	$-0.200^{+0.100}_{-0.100}$	$0.401^{+0.029}_{-0.032}$	$0.423^{+0.027}_{-0.038}$	$9.278^{+1.660}_{-1.289}$
	+1%/-1%	+1%/-1%	+50%/-50%	+7%/-8%	+6%/-9%	+18%/-14%
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 011515276-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1601 \pm 214$	$3.07^{+0.52}_{-0.55}$	$158^{+3}_{-3}$	$3054^{+183}_{-142}$	$60160^{+30904}_{-16650}$
Alt.	$-791 \pm 203$	$2.98^{+0.48}_{-0.51}$	$157^{+3}_{-3}$	$2782^{+179}_{-150}$	$31165^{+17975}_{-10519}$

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

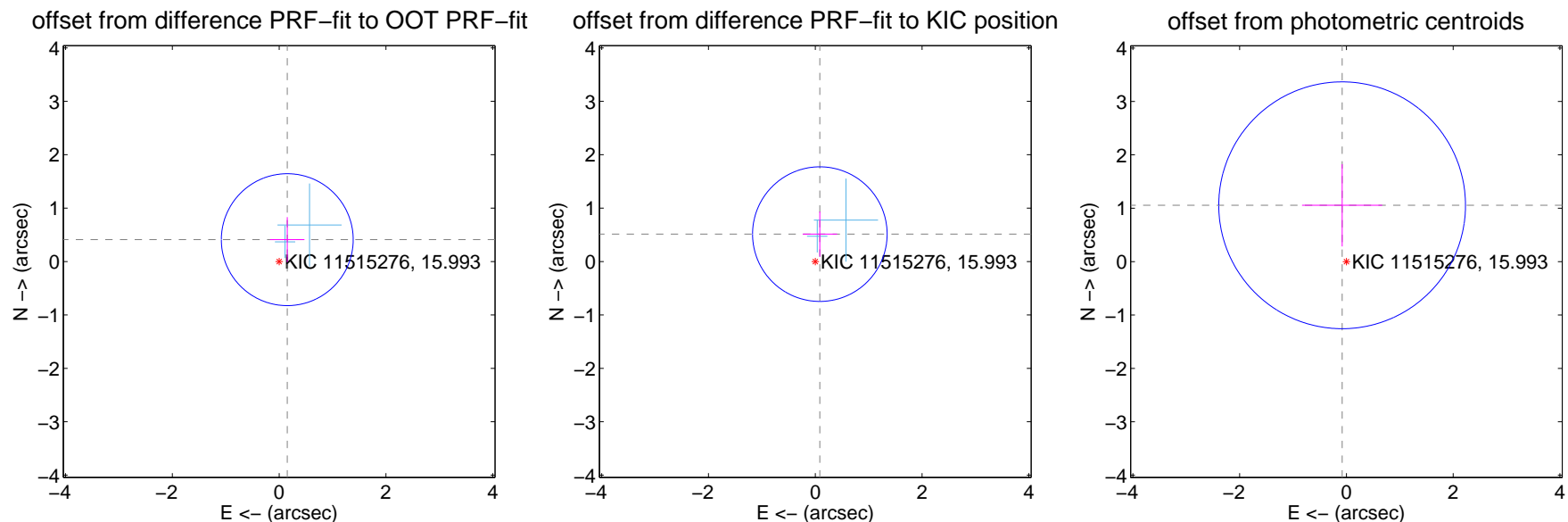
## DV Centroid Data

Supplemental centroid analysis for 011515276-01. Kepler magnitude: 15.99. Transit SNR 11.37

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

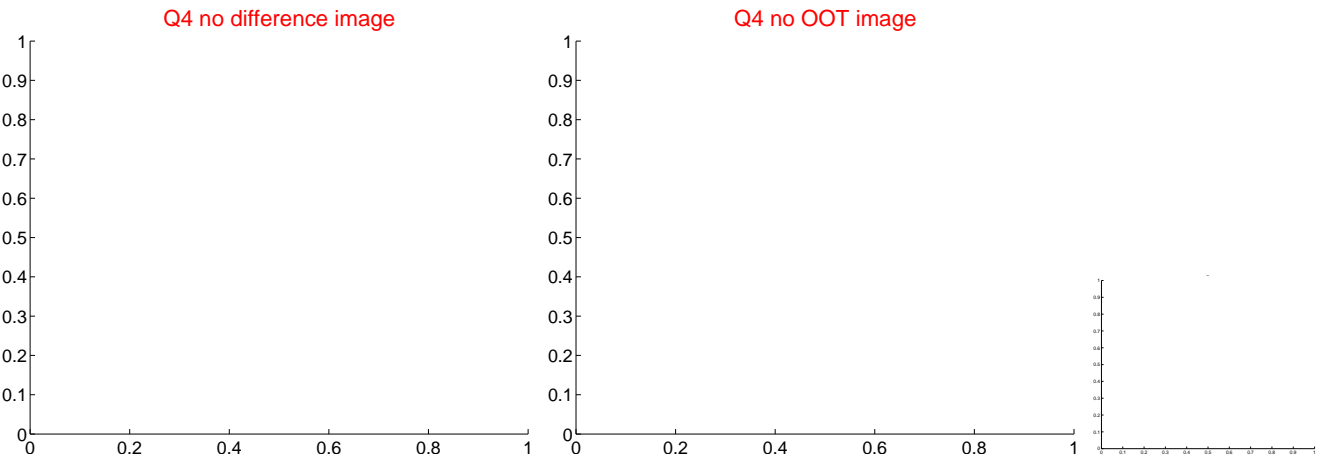
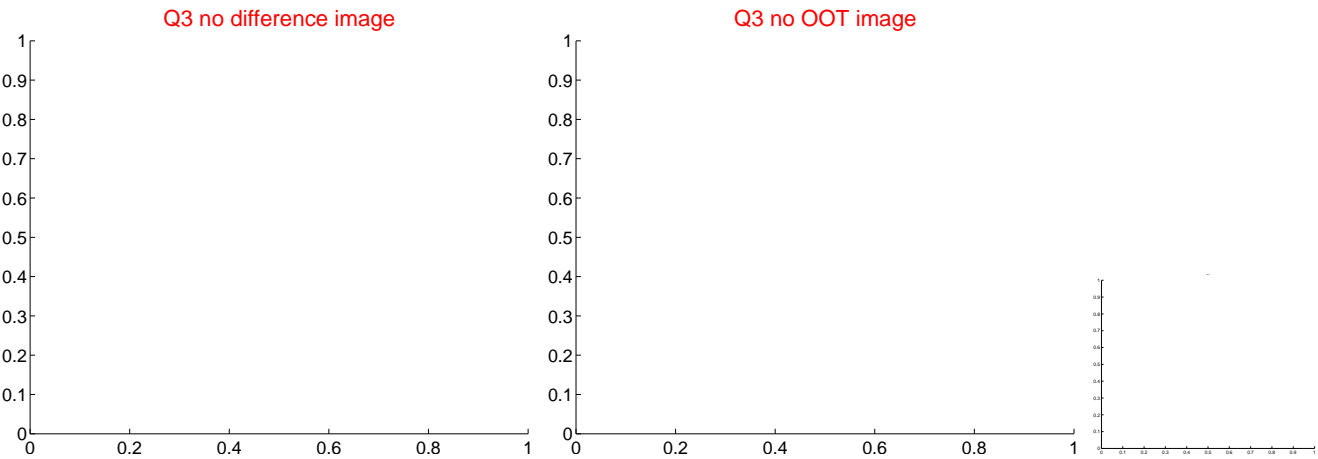
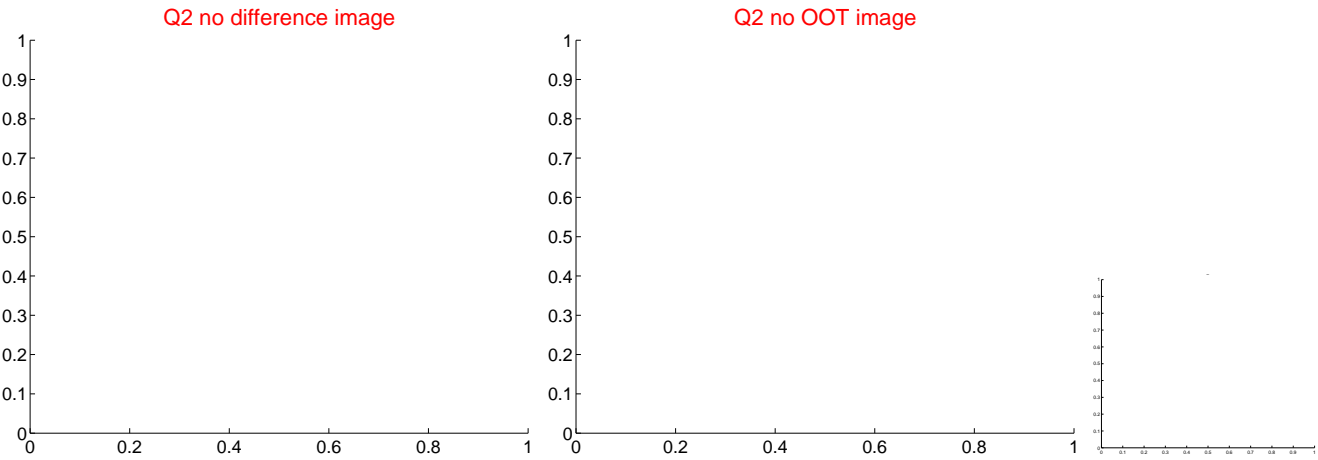
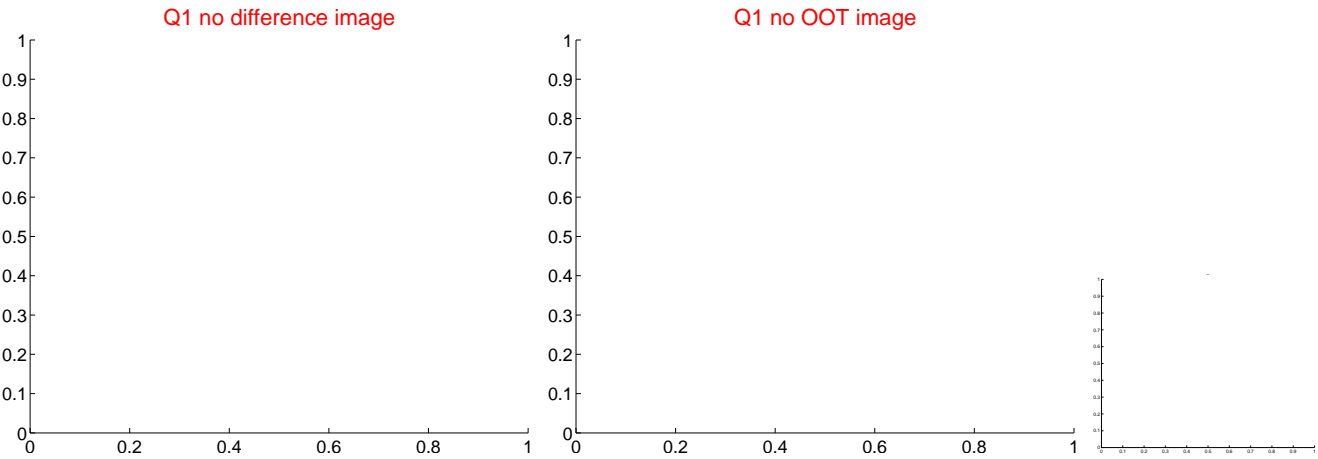
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.437 \pm 0.412$	1.06	$-0.152 \pm 0.322$	$0.409 \pm 0.422$
PRF-fit source offset from KIC position	$0.520 \pm 0.420$	1.24	$-0.086 \pm 0.322$	$0.513 \pm 0.422$
photometric centroid source offset	$1.06 \pm 0.77$	1.37	$0.08 \pm 0.75$	$1.05 \pm 0.77$



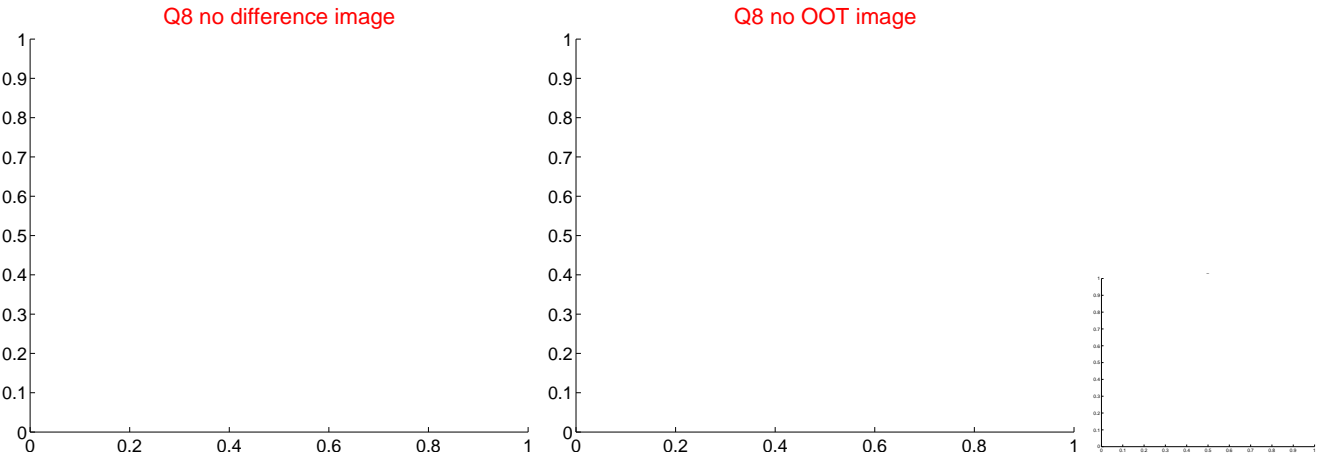
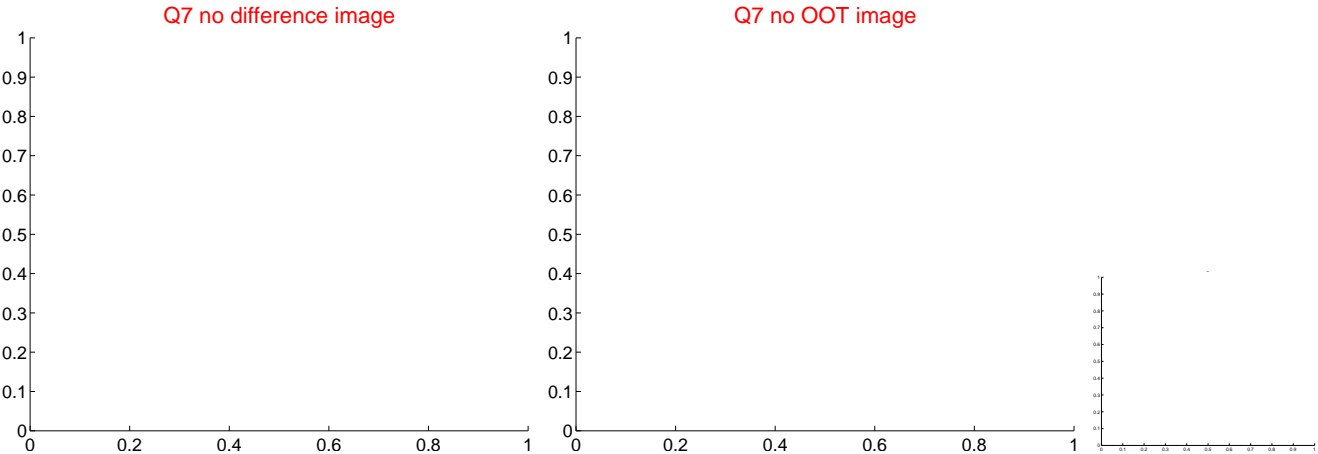
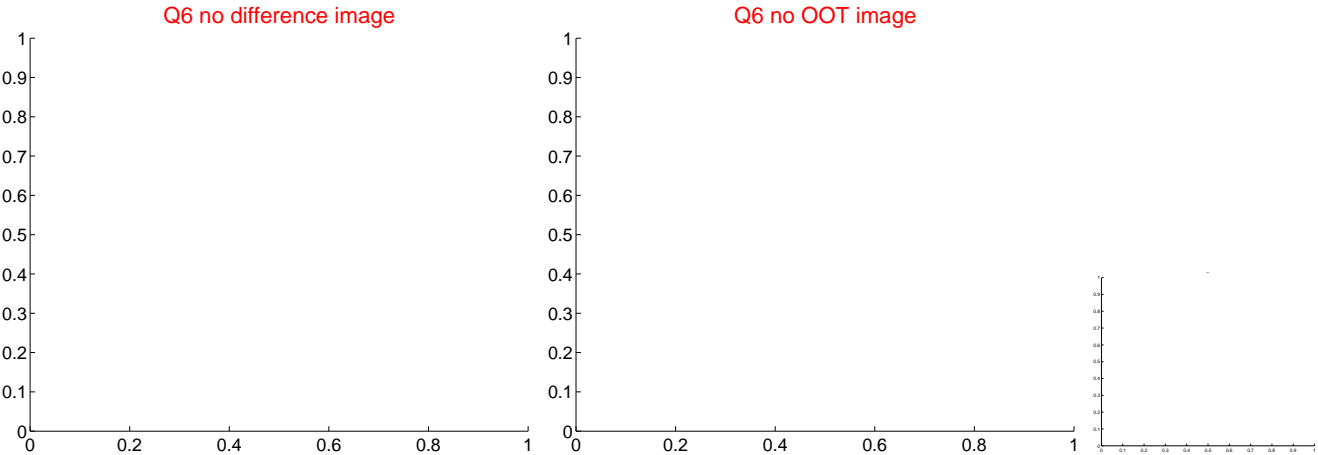
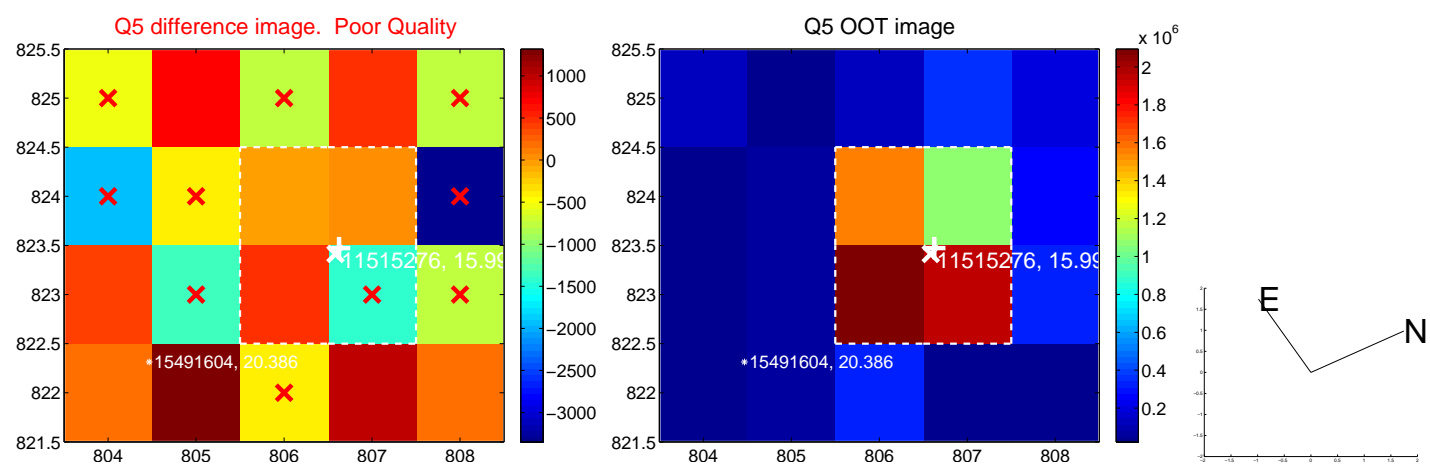
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



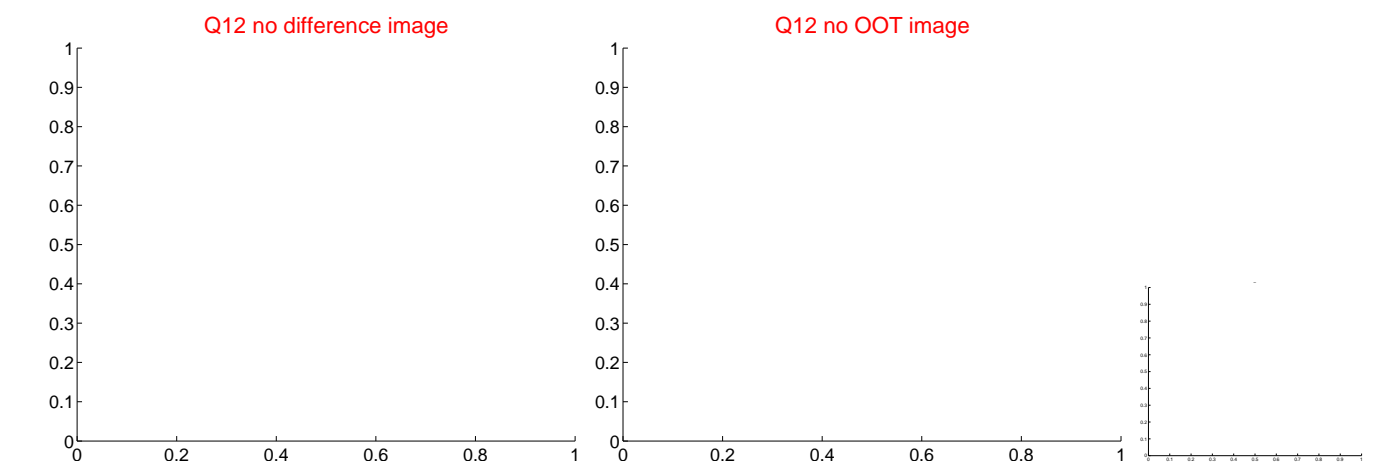
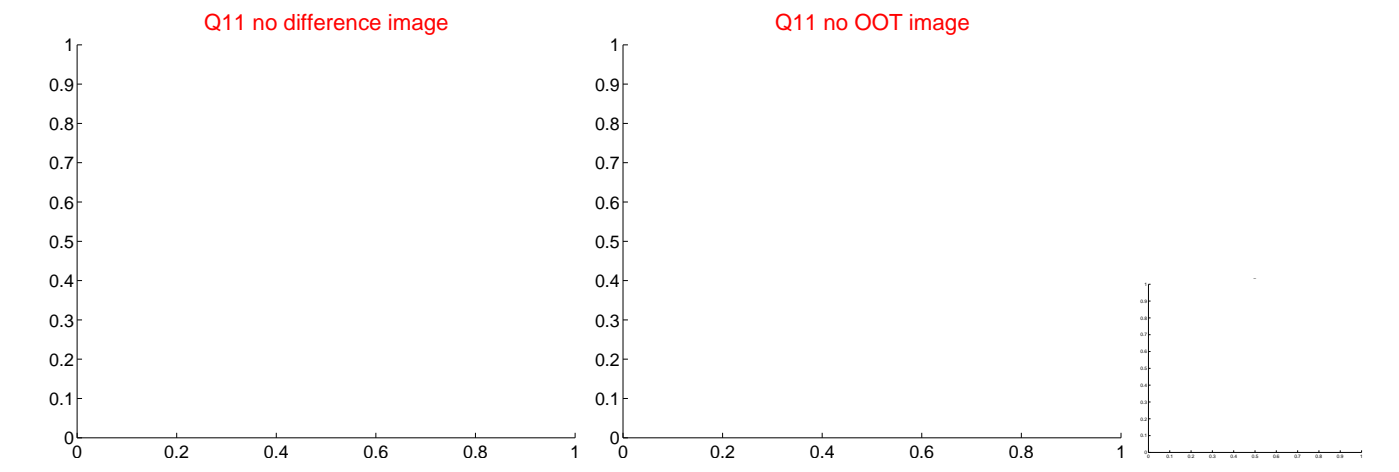
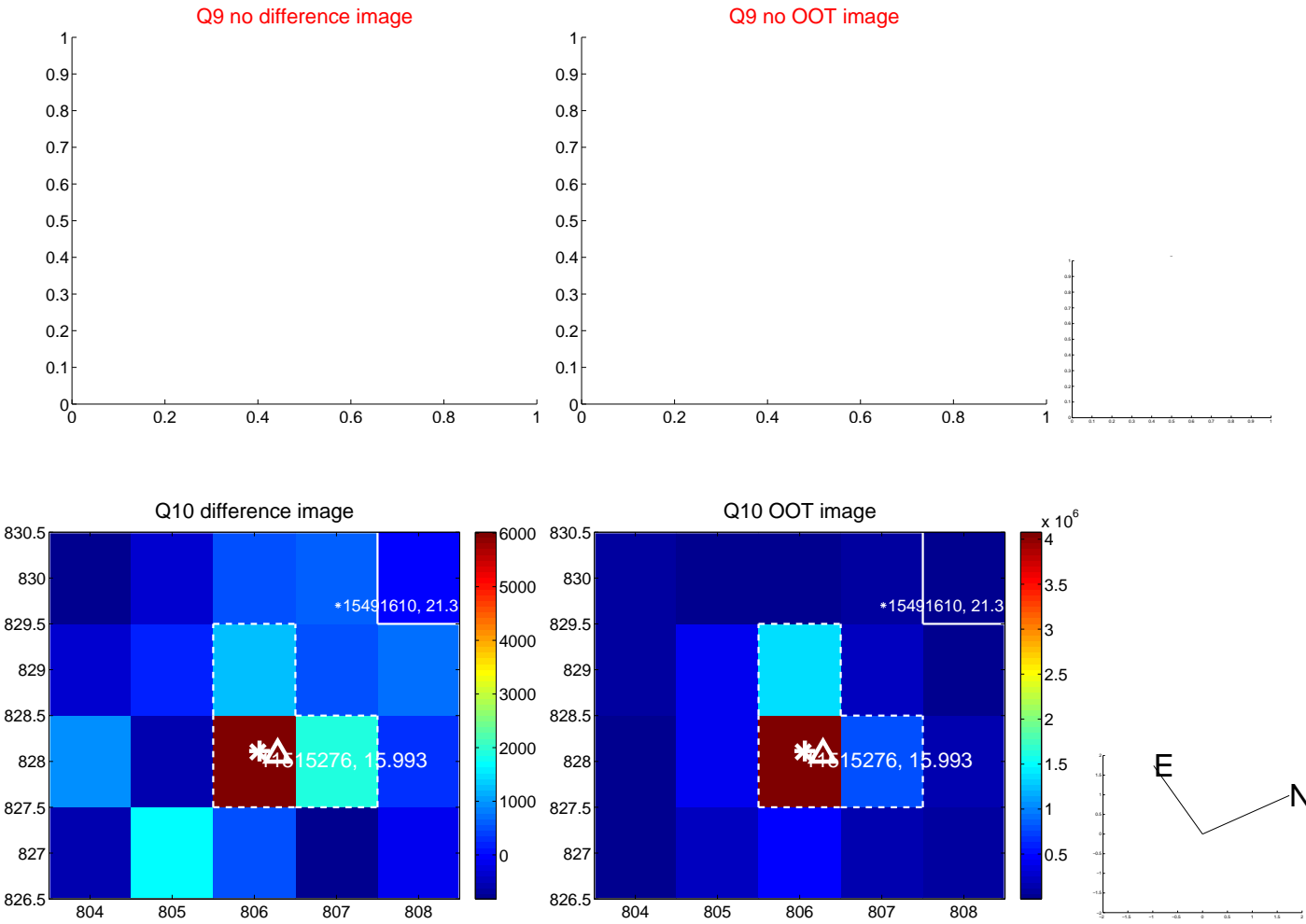
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

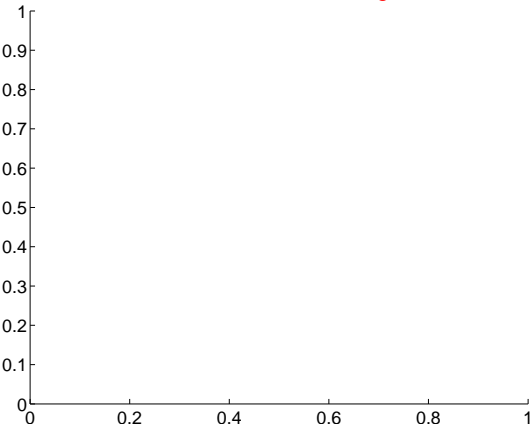


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

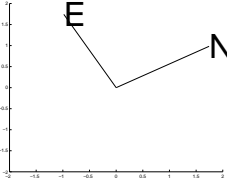
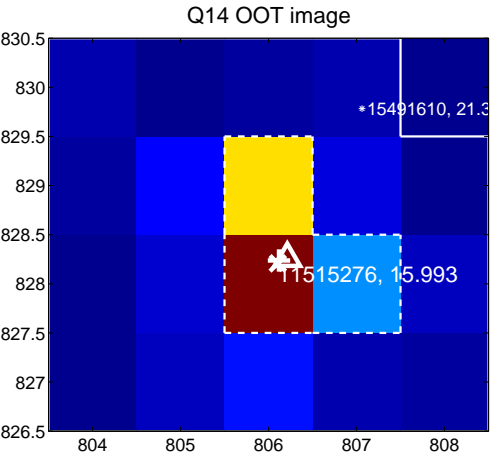
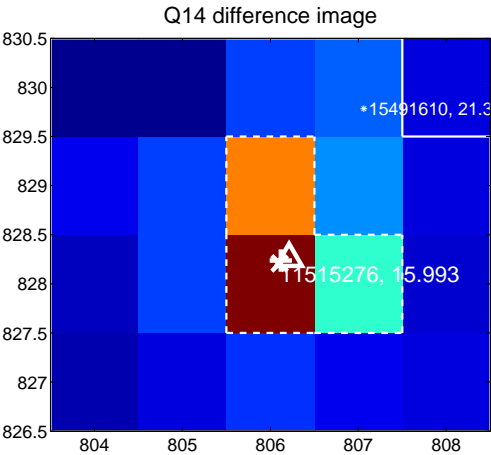
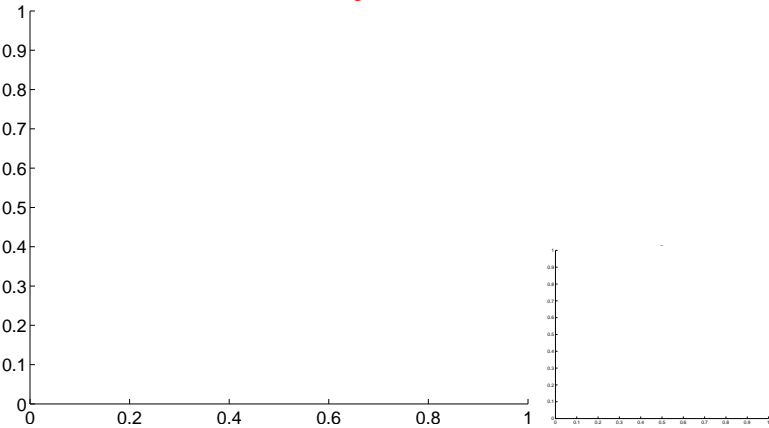


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

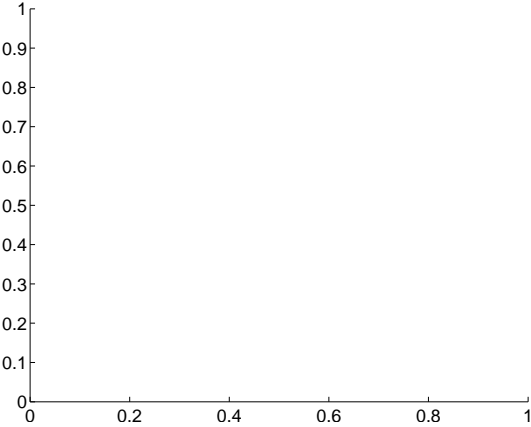
Q13 no difference image



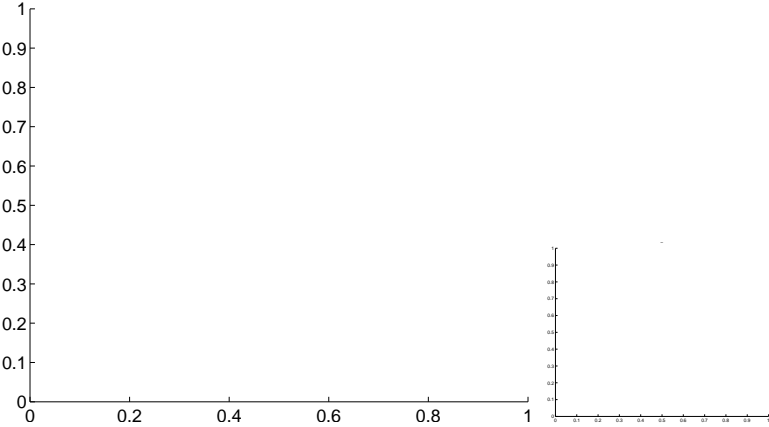
Q13 no OOT image



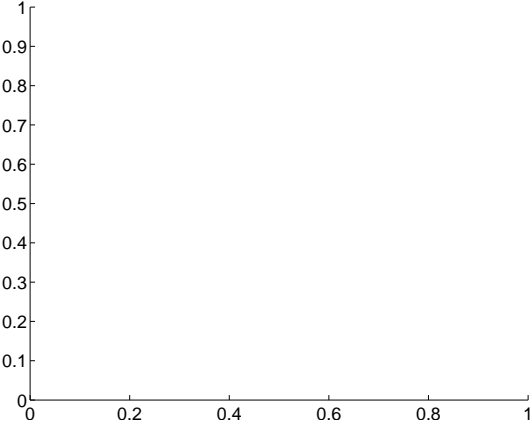
Q15 no difference image



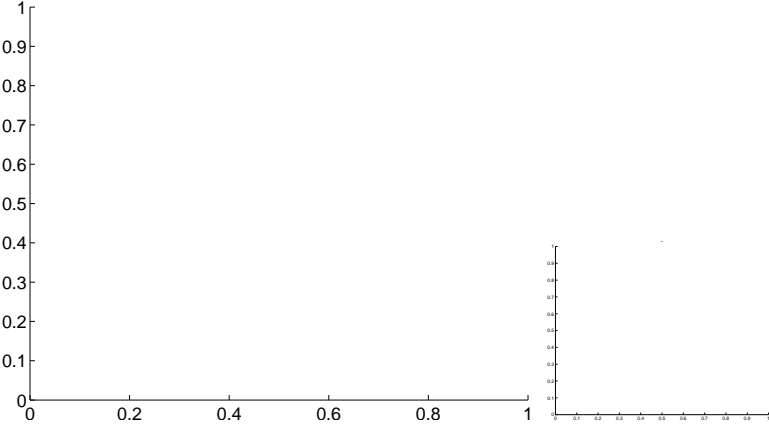
Q15 no OOT image



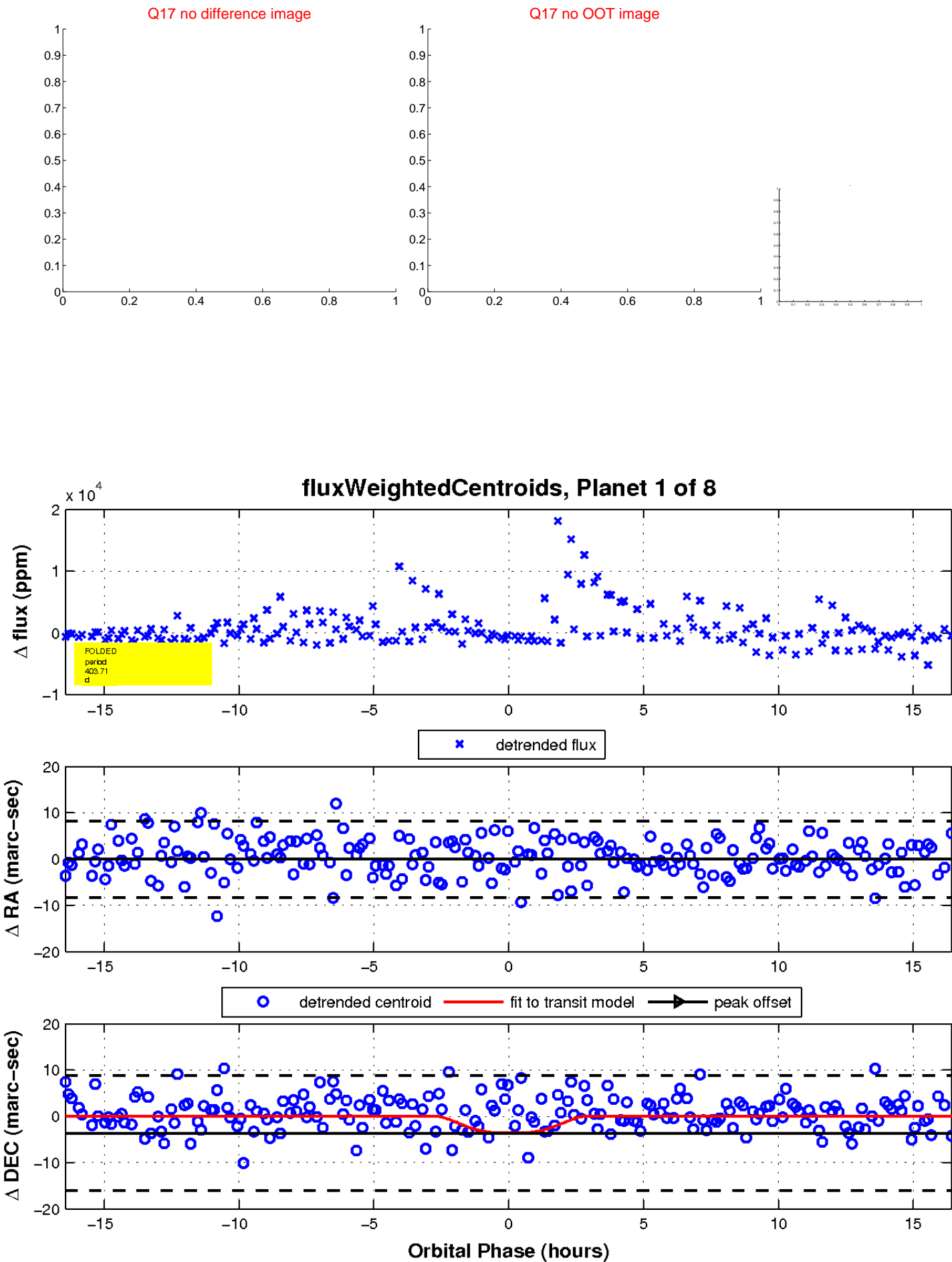
Q16 no difference image



Q16 no OOT image



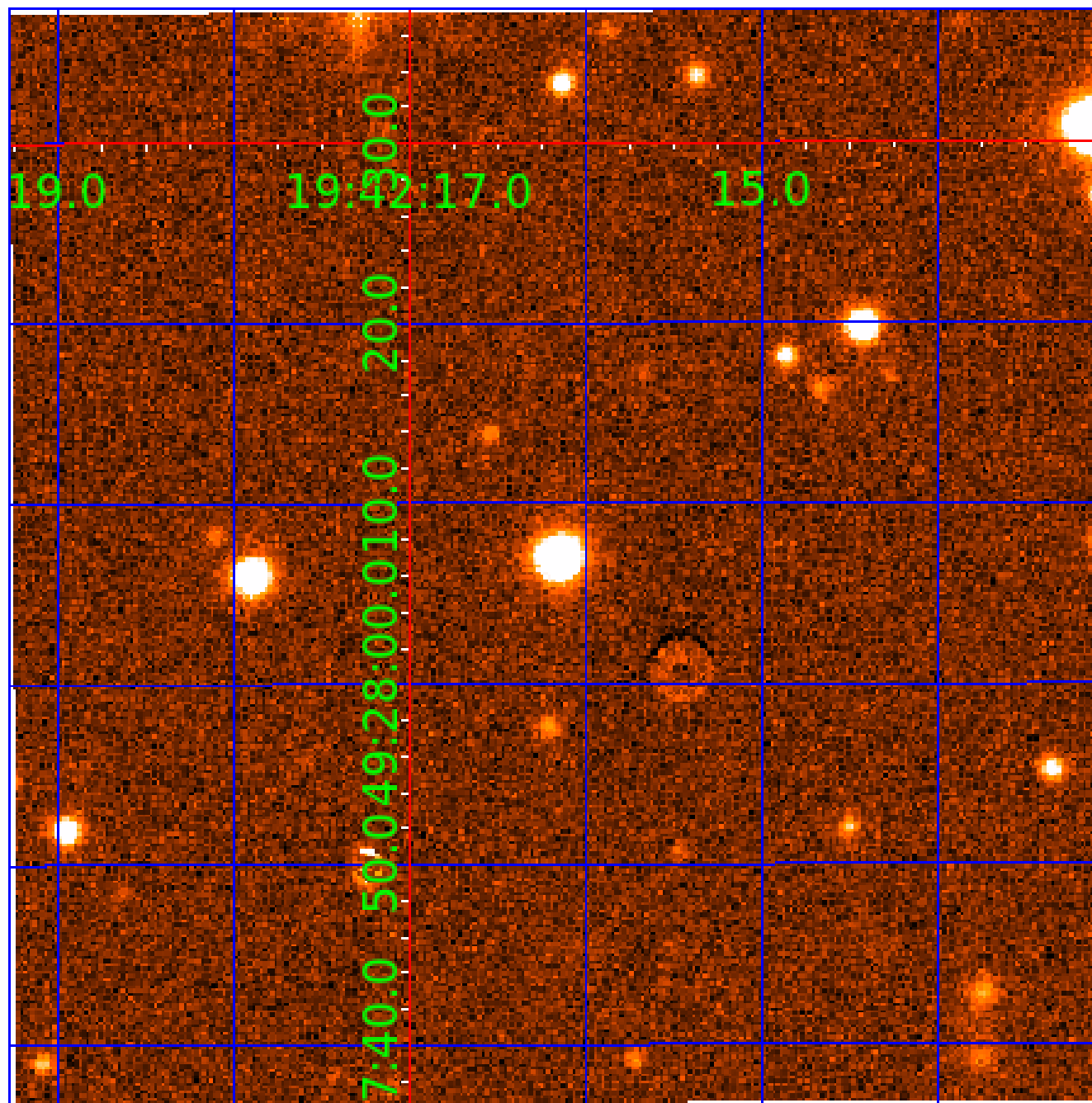
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





# UKIRT Image

Declination



# KIC 011515276

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011515276-01	OBS	No	403.712205	513.461034	3886.9	5.507	14.0	11.4	0.40	3618	3.06	0.04
011515276-03	OBS	No	489.164999	227.101526	3054.4	8.467	11.6	9.0	0.40	3618	2.61	0.03
011515276-04	OBS	No	418.095298	135.336485	2037.4	9.242	11.0	6.6	0.40	3618	1.82	0.04
011515276-05	OBS	No	652.627829	133.728275	2506.4	5.376	12.2	7.2	0.40	3618	2.00	0.02
011515276-06	OBS	No	385.371365	377.127951	3194.4	12.673	10.0	7.9	0.40	3618	2.25	0.04
011515276-07	OBS	No	464.331649	247.258780	2764.8	16.928	10.7	6.5	0.40	3618	2.22	0.03
011515276-08	OBS	No	347.438632	467.537482	2204.6	6.000	9.6	-1.0	0.40	3618	1.87	0.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011515276-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

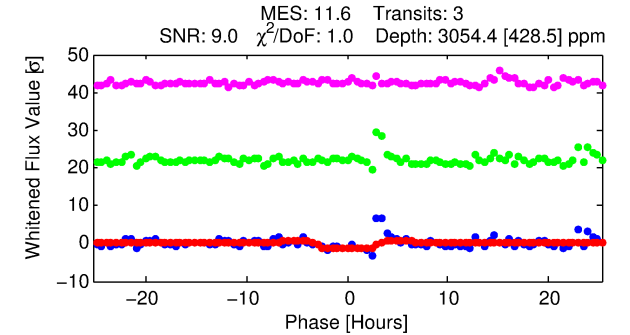
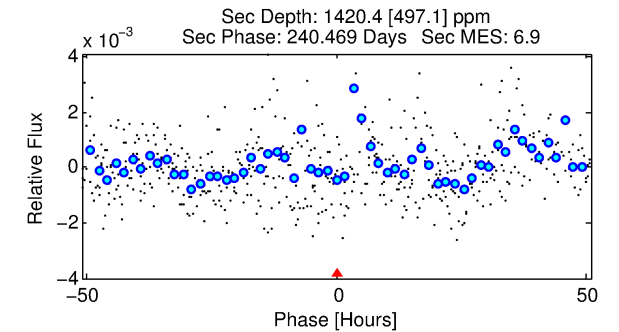
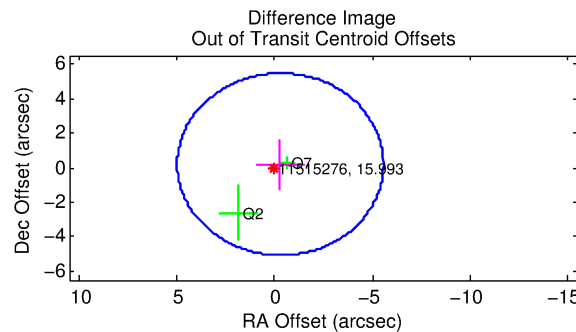
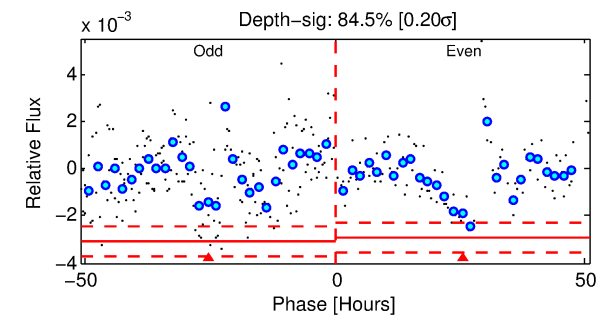
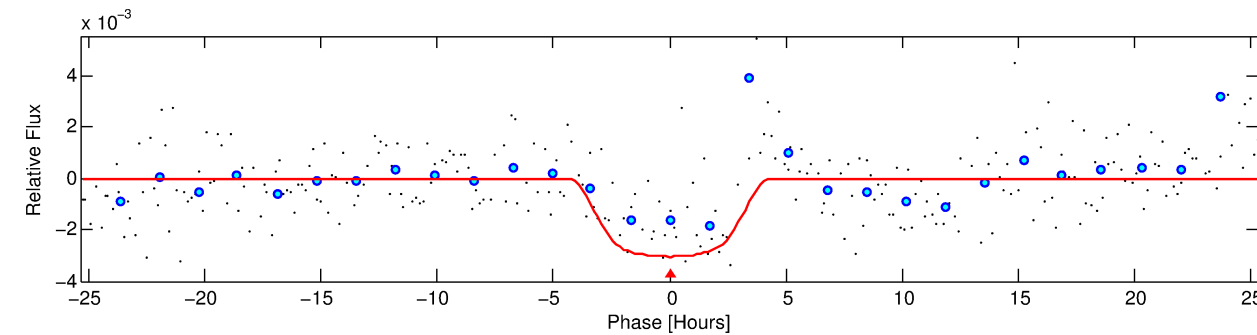
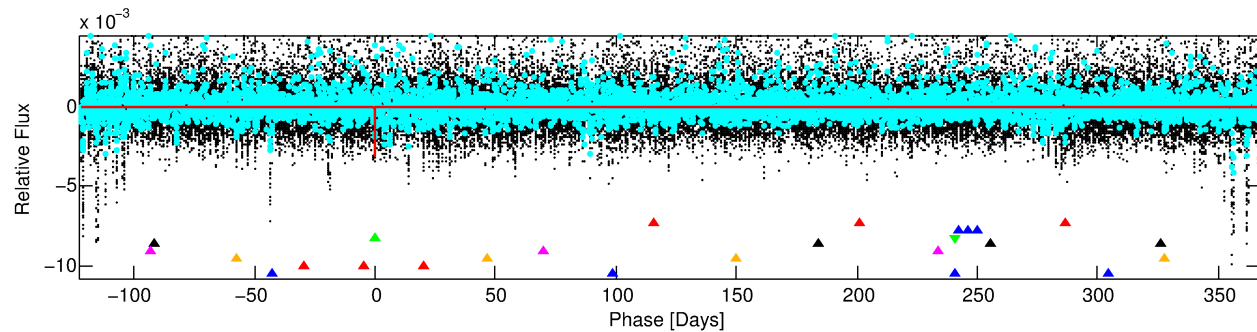
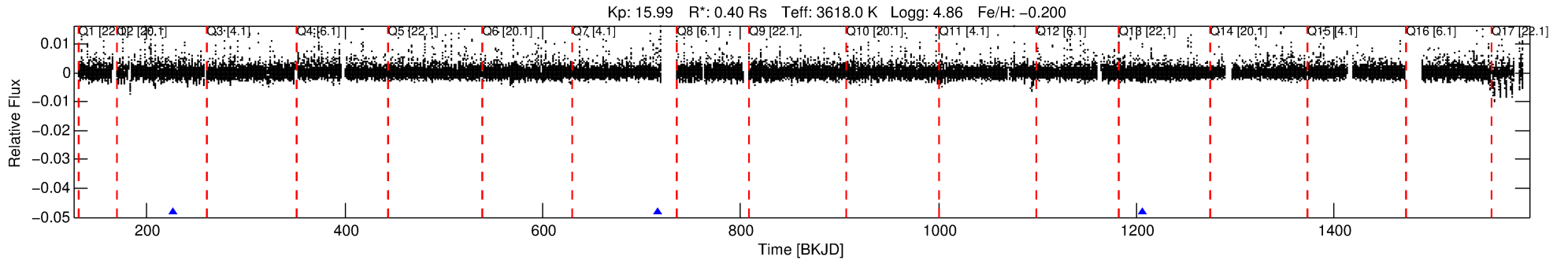
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011515276-03

No Significant Match Found

# DV One-Page Summary

KIC: 11515276 Candidate: 3 of 8 Period: 489.165 d



## DV Fit Results:

Period = 489.16500 [0.01141] d  
Epoch = 227.1015 [0.0150] BKJD  
Rp/R\* = 0.0597 [0.0058]  
a/R\* = 252.53 [55.69]  
b = 0.89 [0.05]  
Seff = 0.03 [0.00]  
Teq = 106 [2] K  
Rp = 2.61 [0.33] Re  
a = 0.9122 [0.0537] AU  
Ag = 95304.93 [38813.90] [2.46 $\sigma$ ]  
Teffp = 2875 [290] K [9.53 $\sigma$ ]

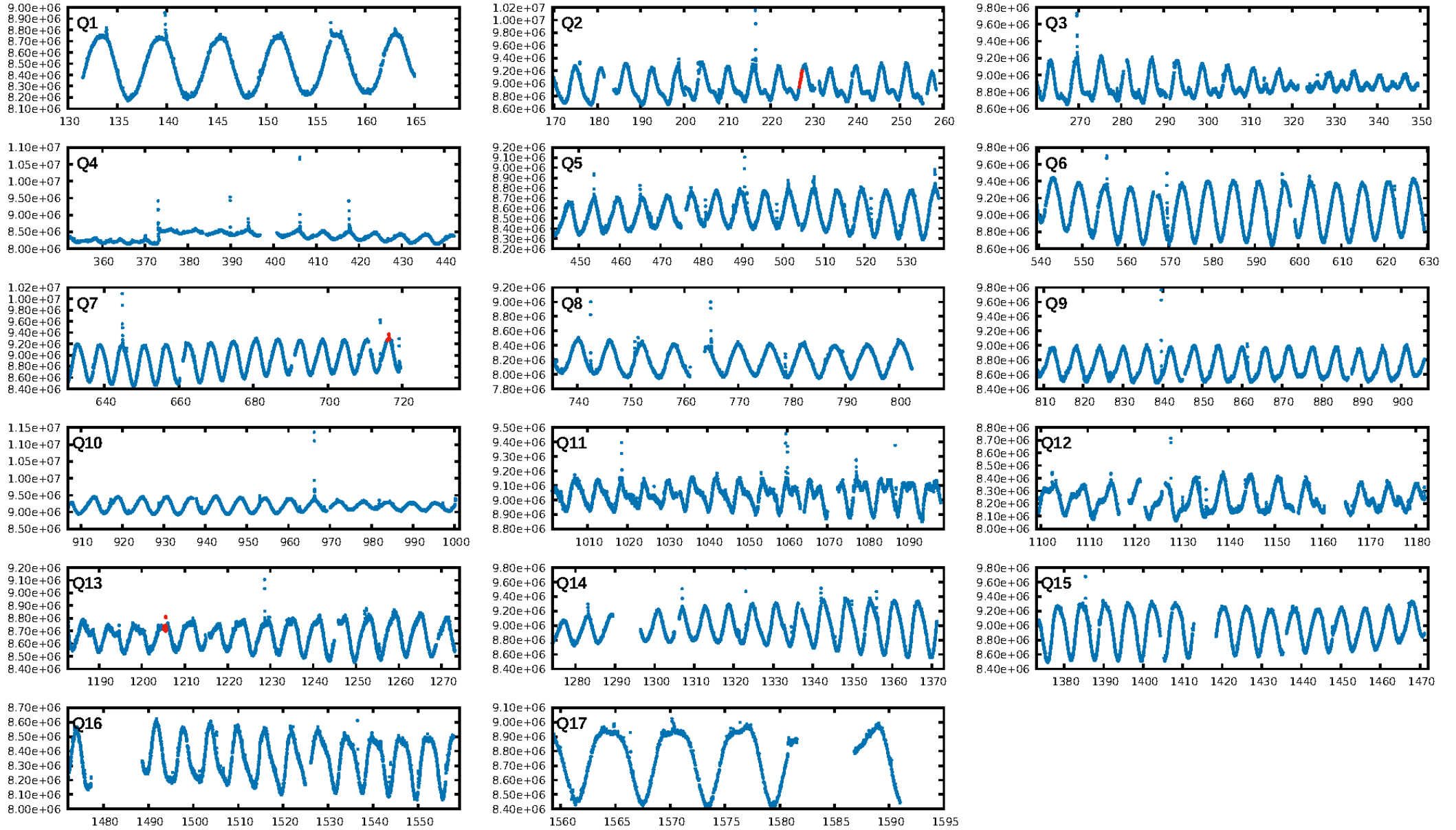
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [9.61 $\sigma$ ]  
LongPeriod-sig: 100.0% [391.15 $\sigma$ ]  
ModelChiSquare2-sig: 35.6%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -18.42  
Centroid-sig: 66.3%  
Centroid-so: 0.235 arcsec [0.30 $\sigma$ ]  
OotOffset-rm: 0.352 arcsec [0.20 $\sigma$ ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-rm: 0.435 arcsec [0.40 $\sigma$ ]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [2/2]

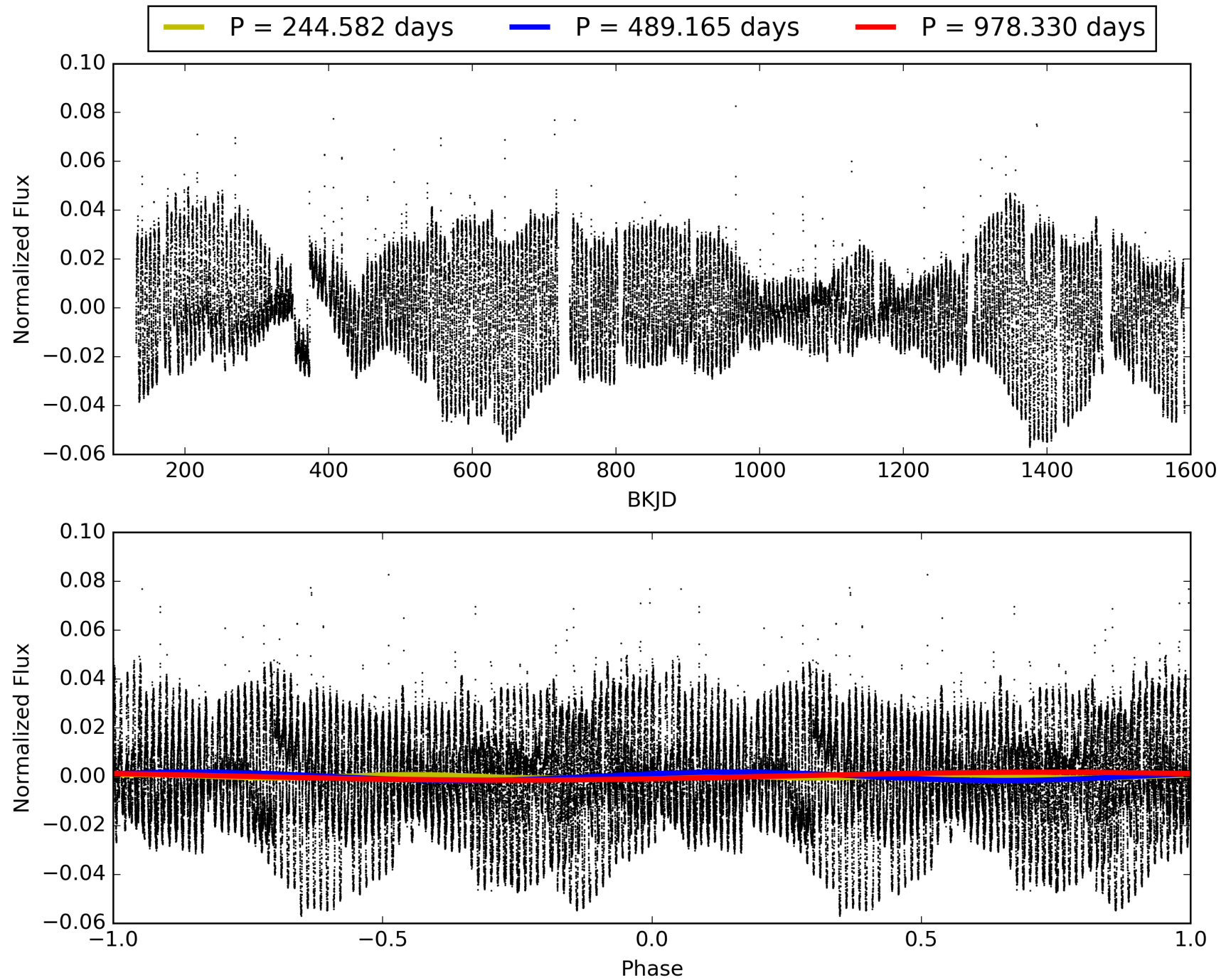
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:48:07 Z

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

# TCE 011515276-03, PDC Light Curves

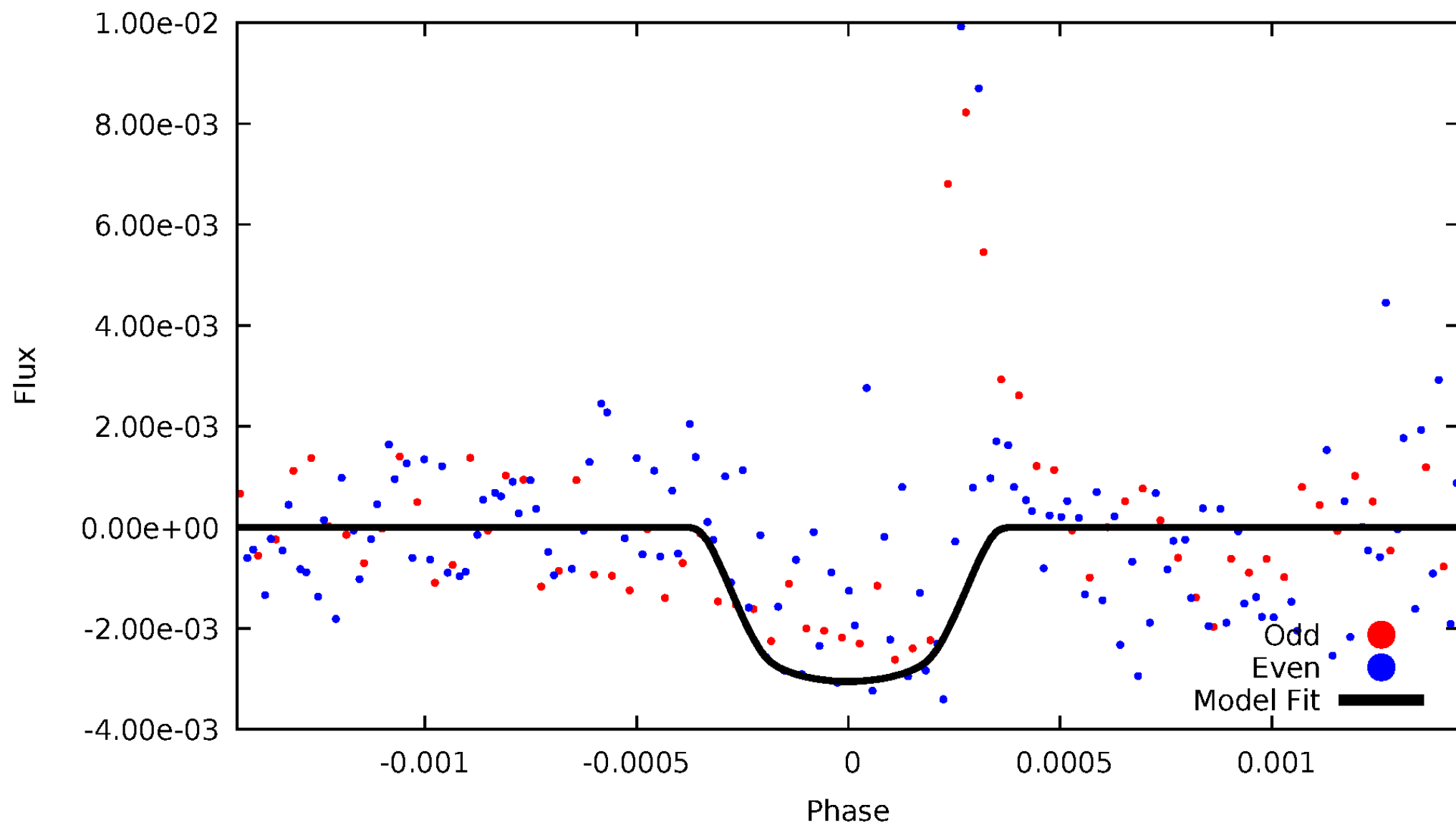


# TCE 011515276-03



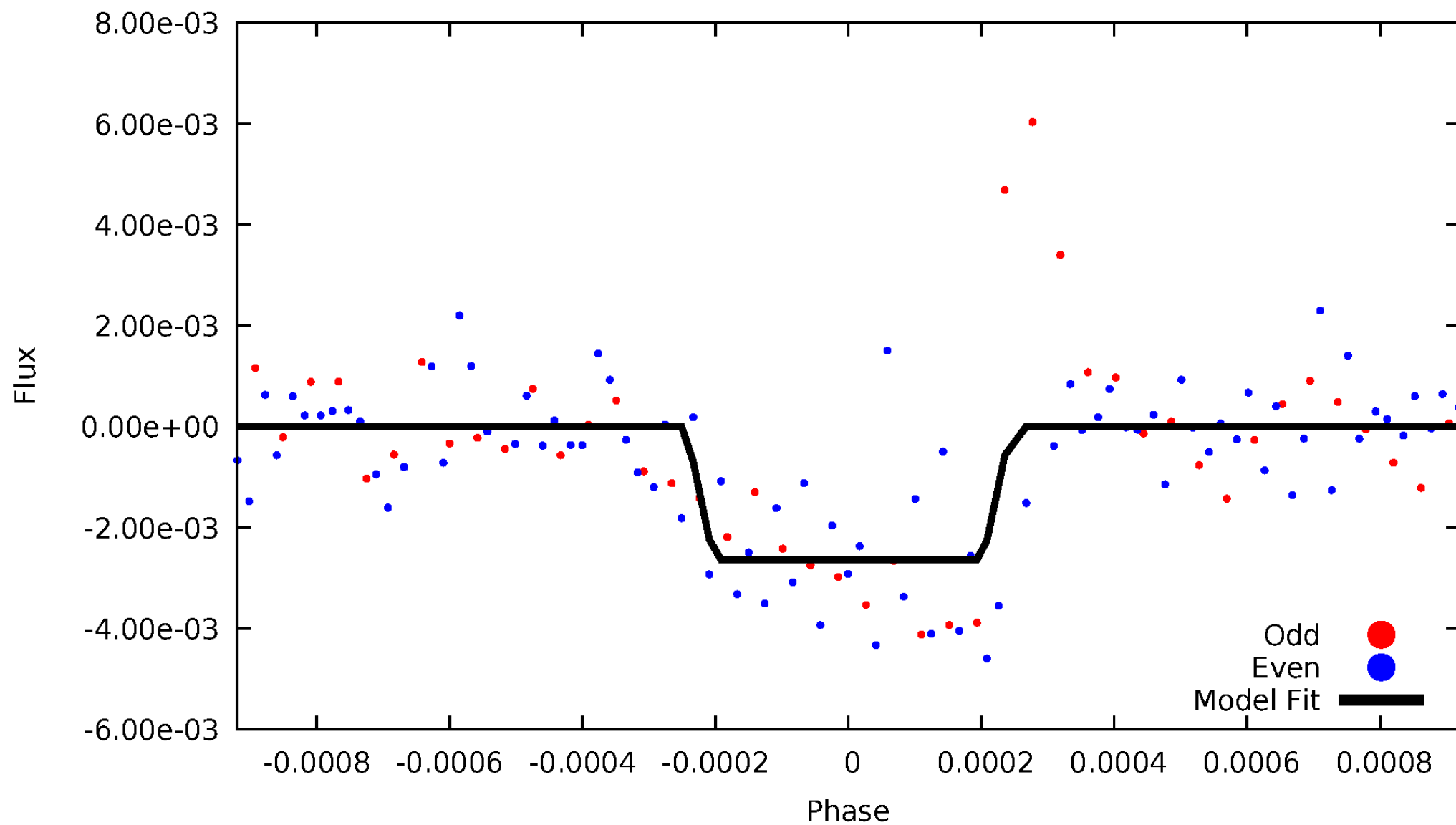
# DV Odd/Even

TCE 011515276-03



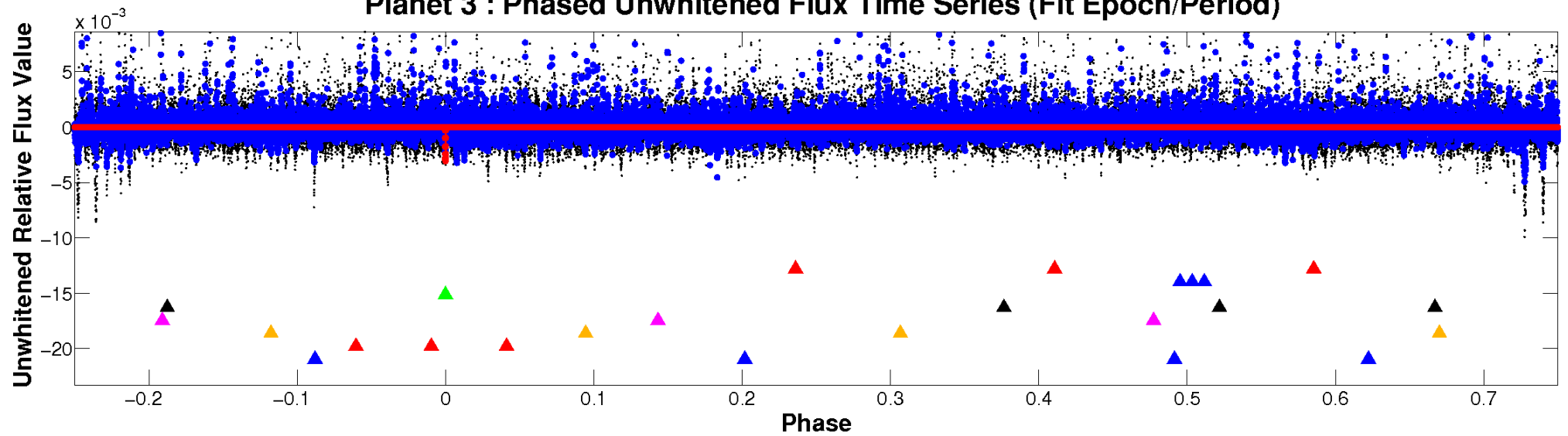
# ALT Odd/Even

TCE 011515276-03

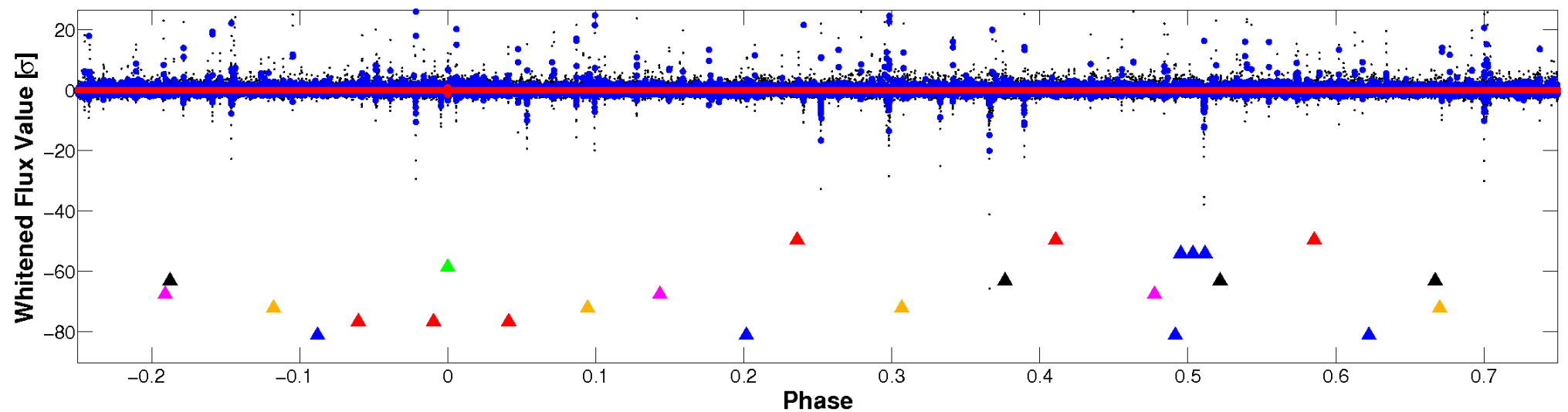


# Non-Whitened Vs. Whitened Light Curve

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



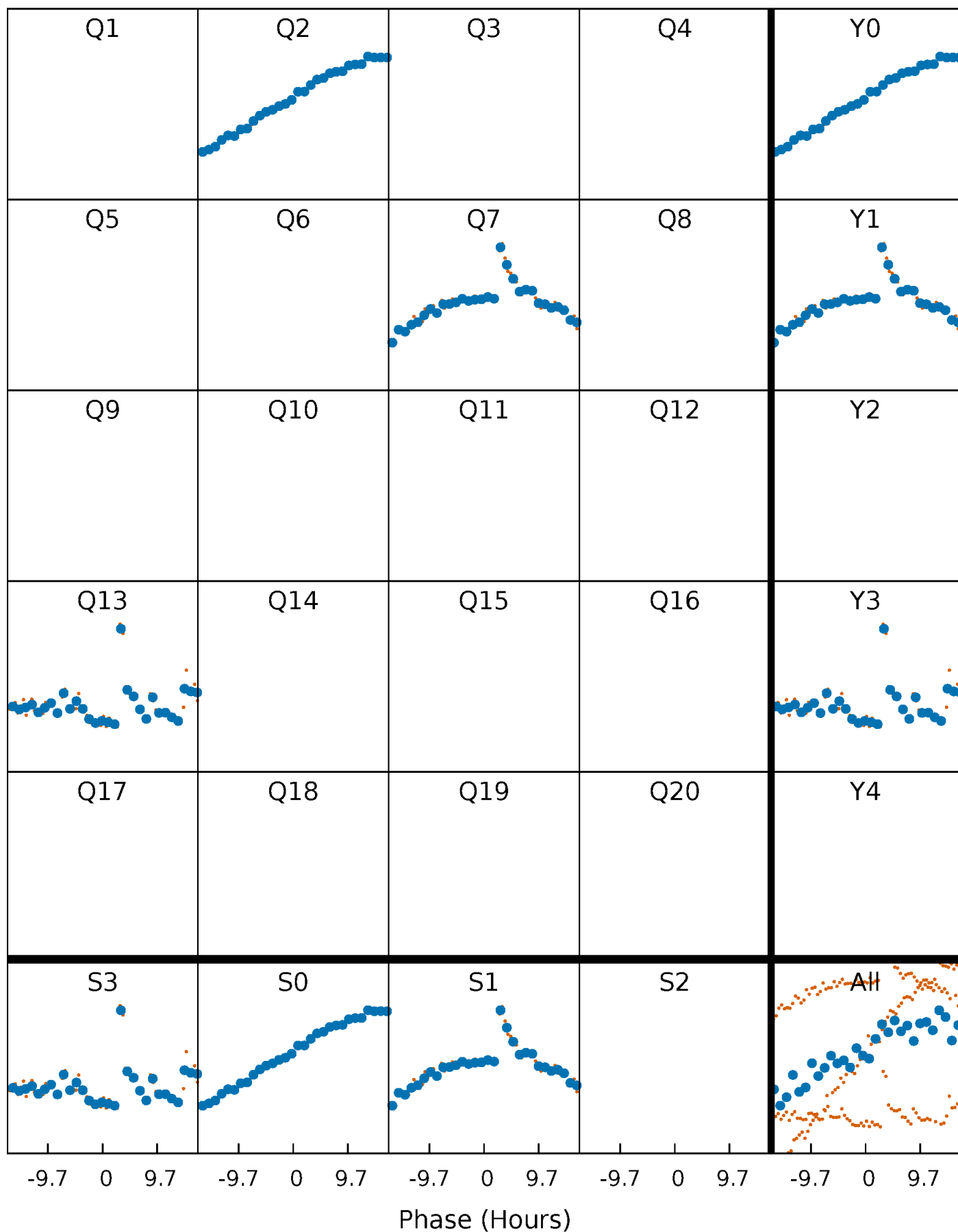
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





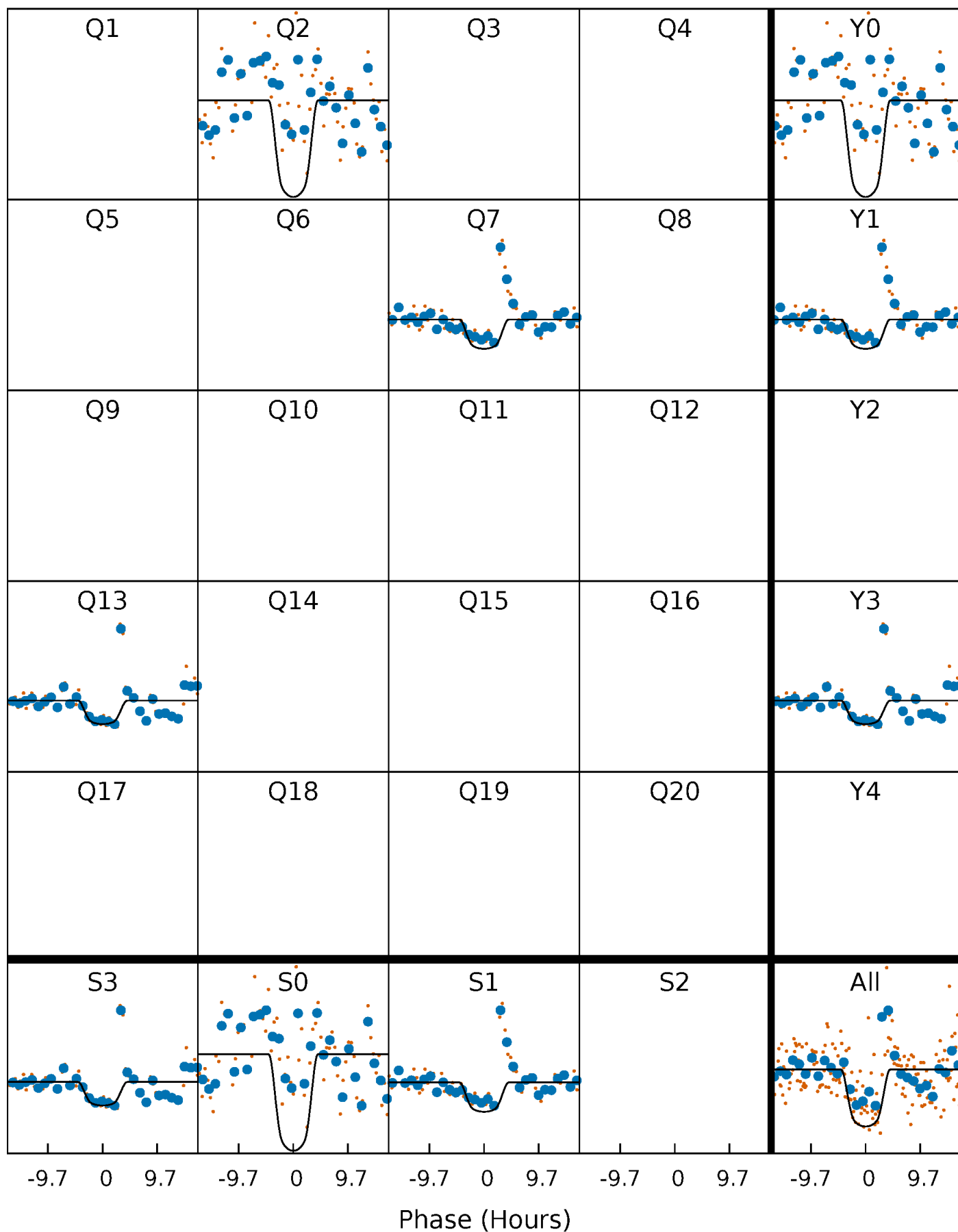
# PDC Quarter-Phased Transit Curves

TCE 011515276-03 P=489.164999 Days  $T_0=227.101526$  (BKJD)



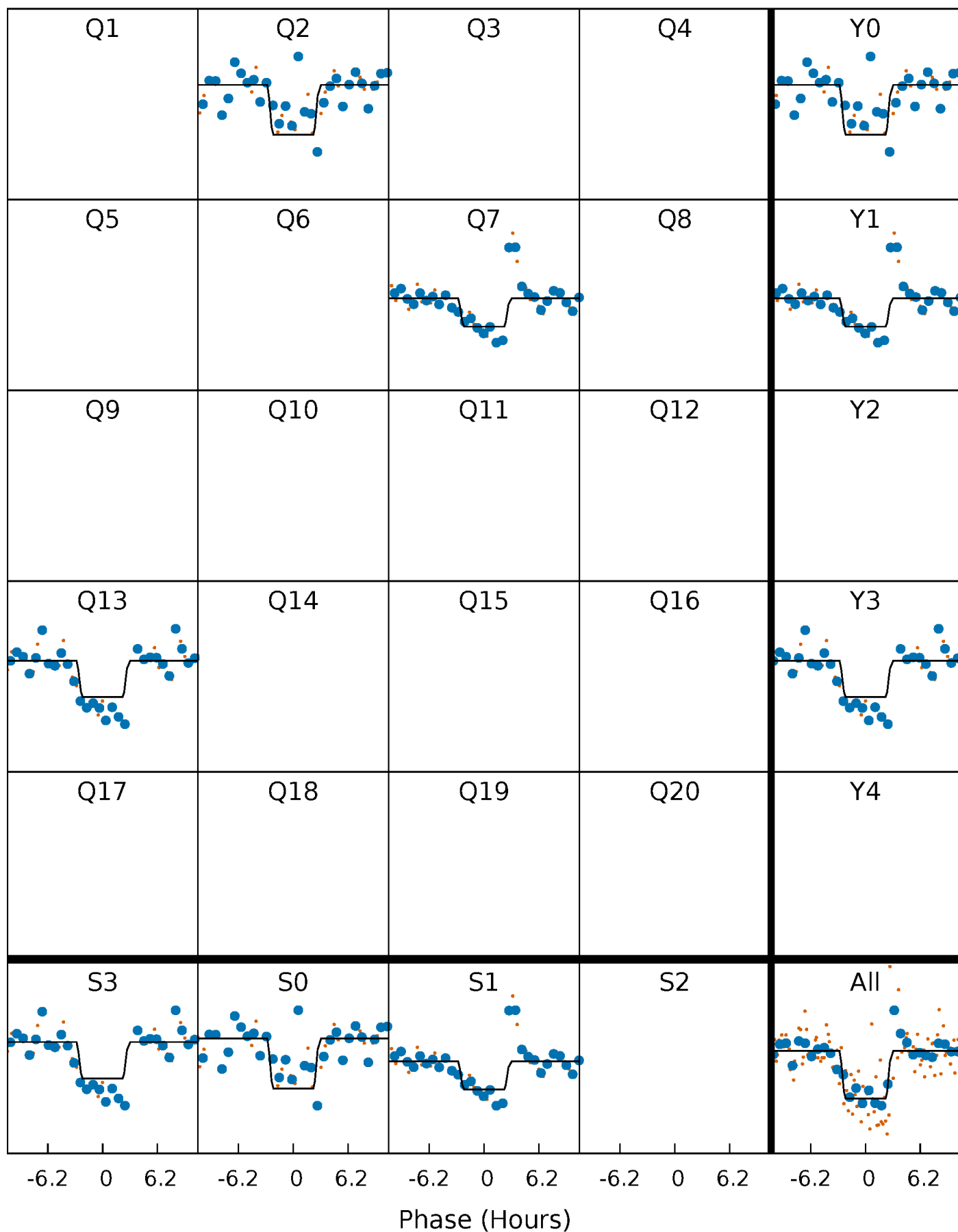
# DV Quarter-Phased Transit Curves

TCE 011515276-03     $P=489.164999$  Days     $T_0=227.101526$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

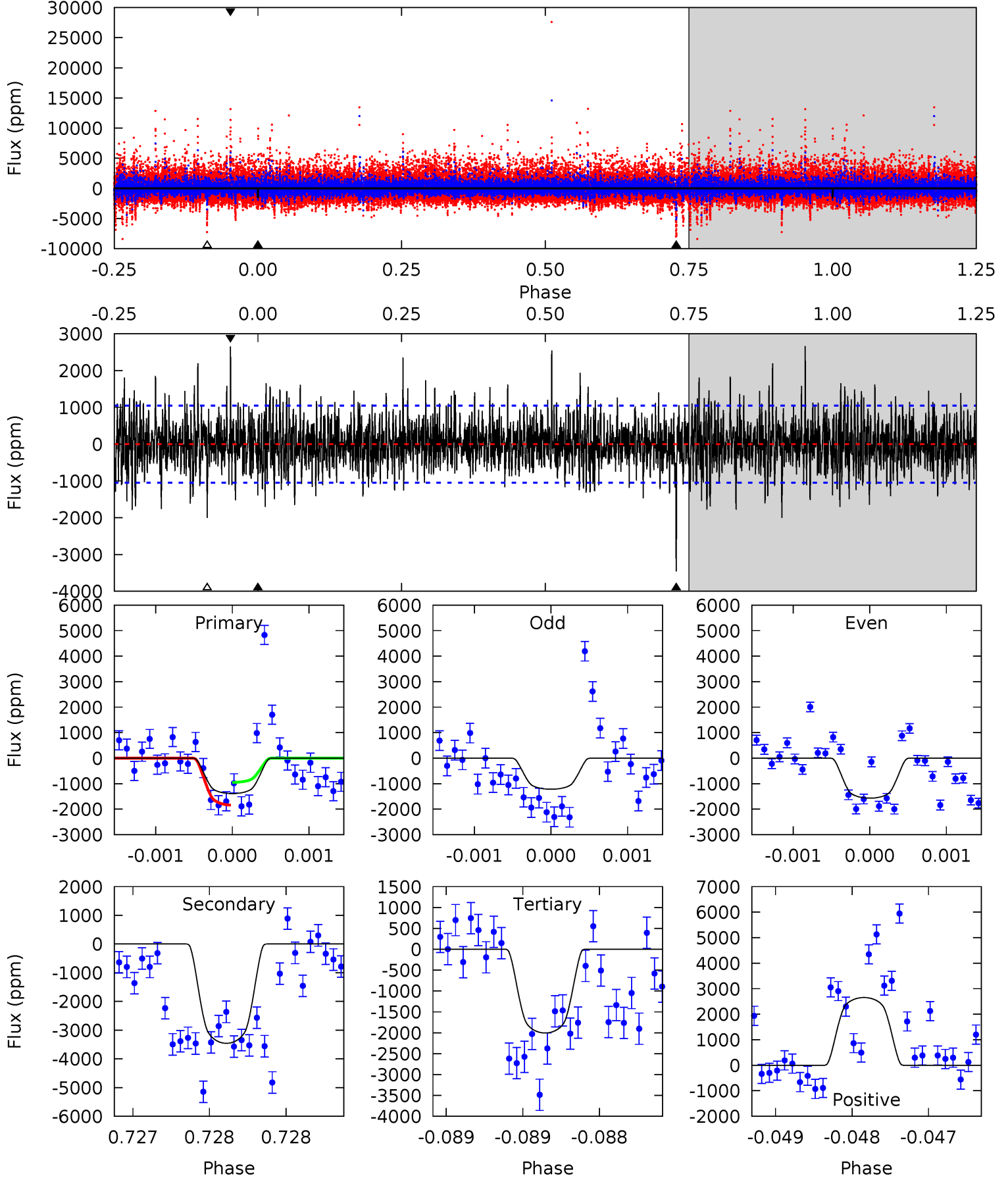
TCE 011515276-03 P=489.172615 Days  $T_0=227.093937$  (BKJD)



# DV Model-Shift Uniqueness Test

011515276-03, P = 489.164999 Days, E = 227.101526 Days

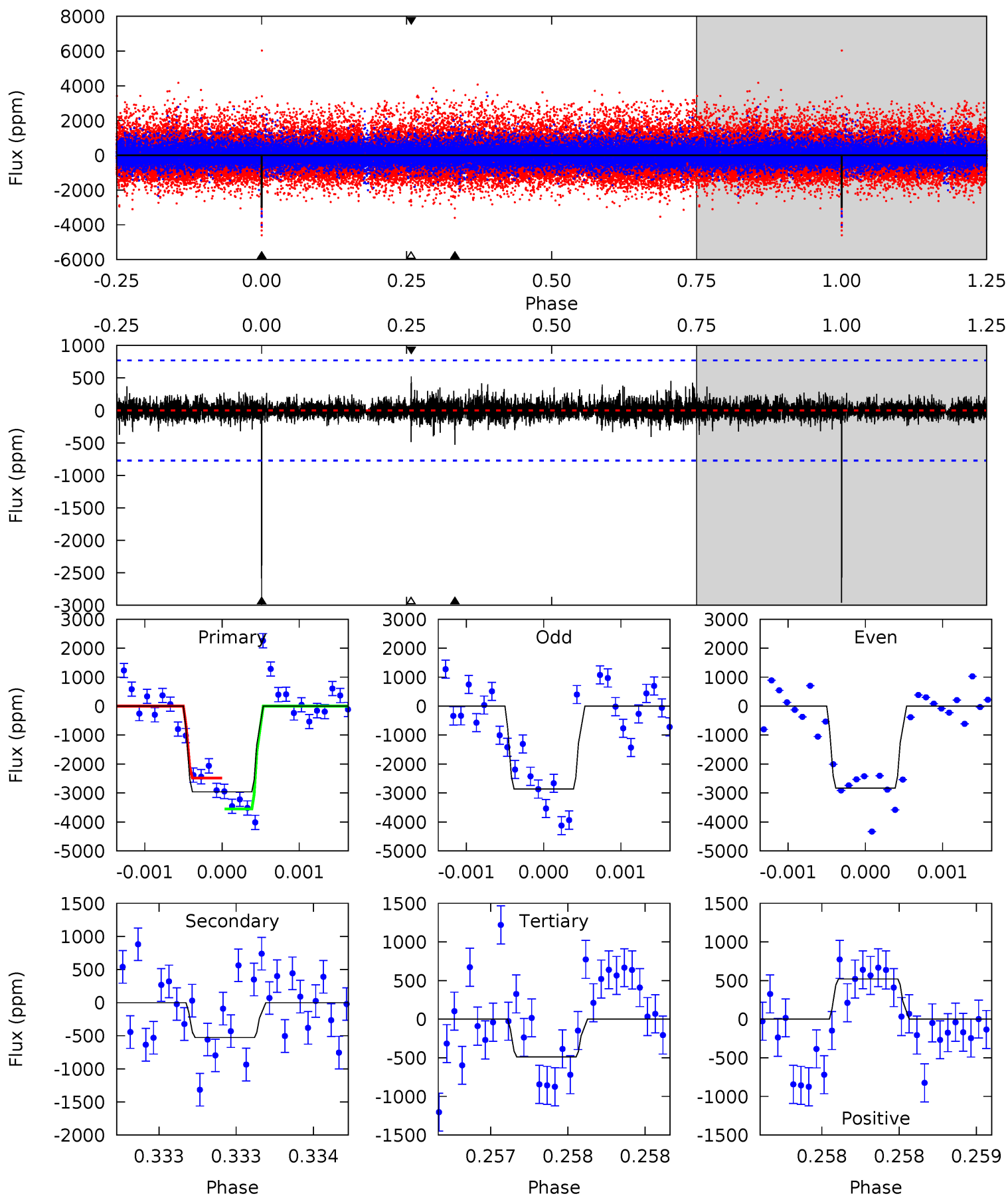
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.29	18.1	10.5	13.9	5.51	3.38	2.68	-3.23	-6.64	7.62	4.21	0.56	1.01	0.43	2.35



# Alt Model-Shift Uniqueness Test

011515276-03, P = 489.172615 Days, E = 227.093937 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
21.4	3.81	3.52	3.76	5.57	3.48	0.61	17.9	17.6	0.29	0.05	0.13	0.94	0.15	3.85



### Stellar Parameters For KIC 011515276

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3618^{+43}_{-48}$	$4.858^{+0.033}_{-0.033}$	$-0.200^{+0.100}_{-0.100}$	$0.401^{+0.029}_{-0.032}$	$0.423^{+0.027}_{-0.038}$	$9.278^{+1.660}_{-1.289}$
	+1%/-1%	+1%/-1%	+50%/-50%	+7%/-8%	+6%/-9%	+18%/-14%
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 011515276-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-3458 \pm 191$	$2.61^{+0.29}_{-0.28}$	$148^{+3}_{-3}$	$3601^{+142}_{-119}$	$232625^{+58333}_{-43113}$
Alt.	$-527 \pm 138$	$2.25^{+0.27}_{-0.28}$	$148^{+3}_{-3}$	$2854^{+129}_{-138}$	$47733^{+19475}_{-14226}$

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

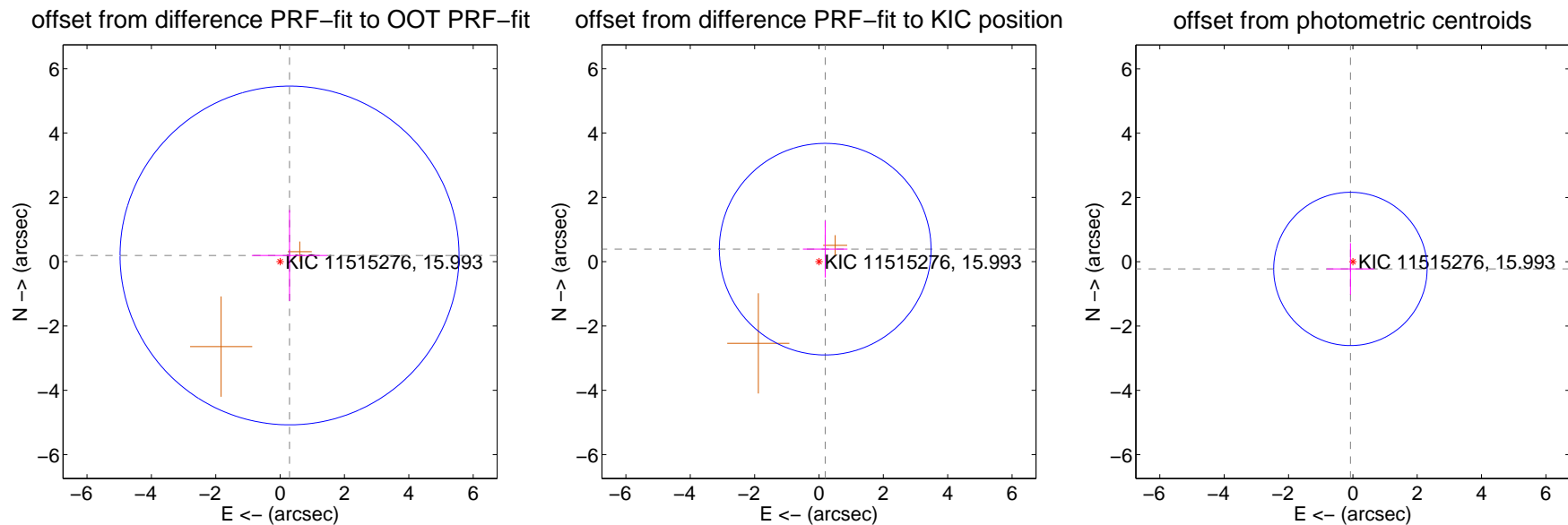
## DV Centroid Data

Supplemental centroid analysis for 011515276-03. Kepler magnitude: 15.99. Transit SNR 8.99

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

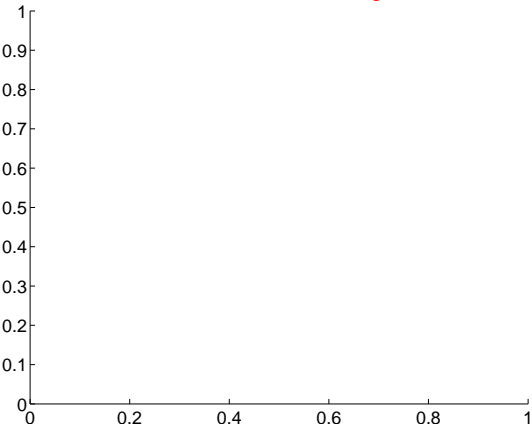
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.352 \pm 1.755$	0.20	$-0.293 \pm 1.171$	$0.194 \pm 1.414$
PRF-fit source offset from KIC position	$0.435 \pm 1.096$	0.40	$-0.193 \pm 0.692$	$0.390 \pm 0.883$
photometric centroid source offset	$0.24 \pm 0.79$	0.30	$0.08 \pm 0.74$	$-0.22 \pm 0.80$



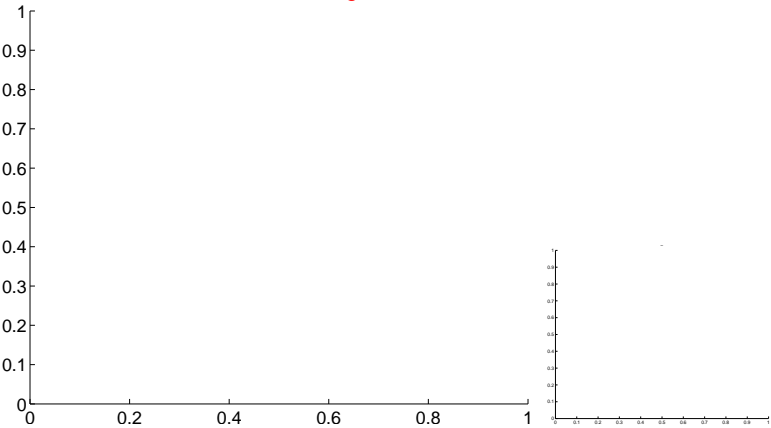
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

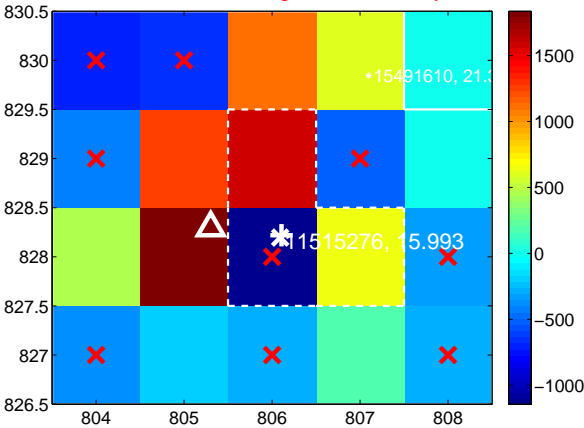
Q1 no difference image



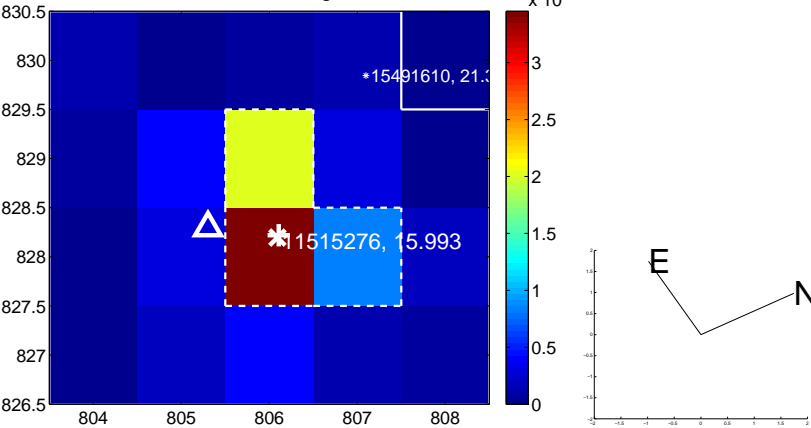
Q1 no OOT image



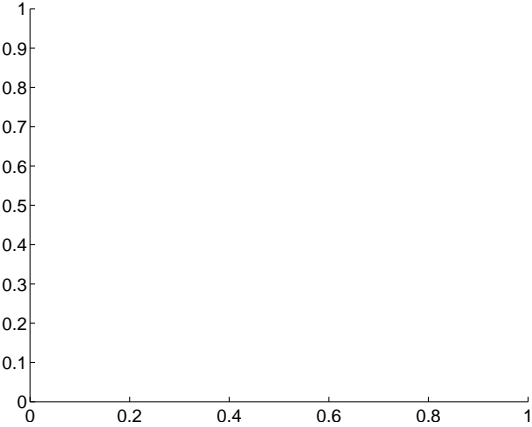
Q2 difference image. Poor Quality



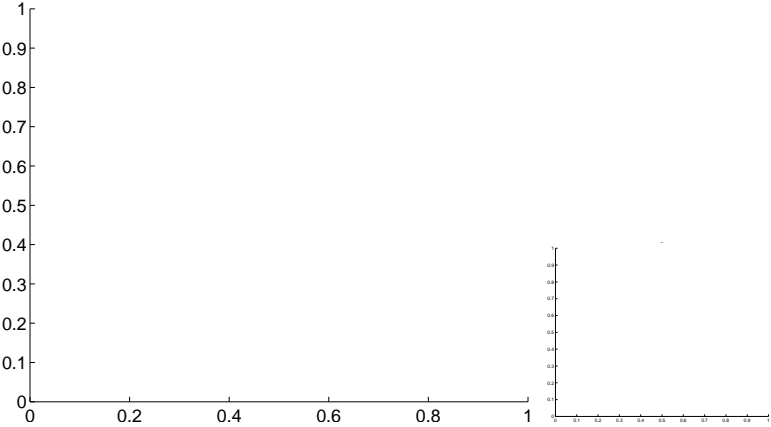
Q2 OOT image



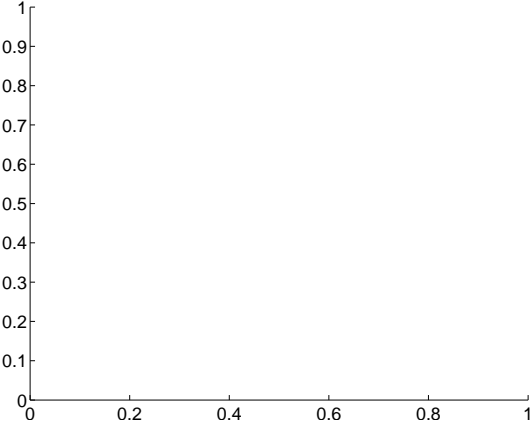
Q3 no difference image



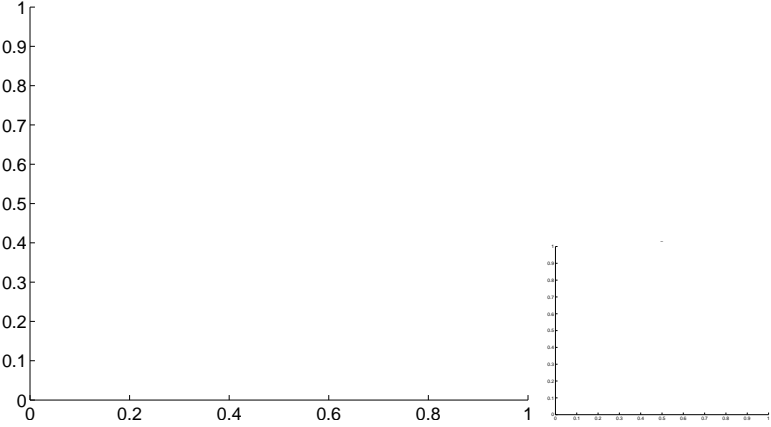
Q3 no OOT image



Q4 no difference image

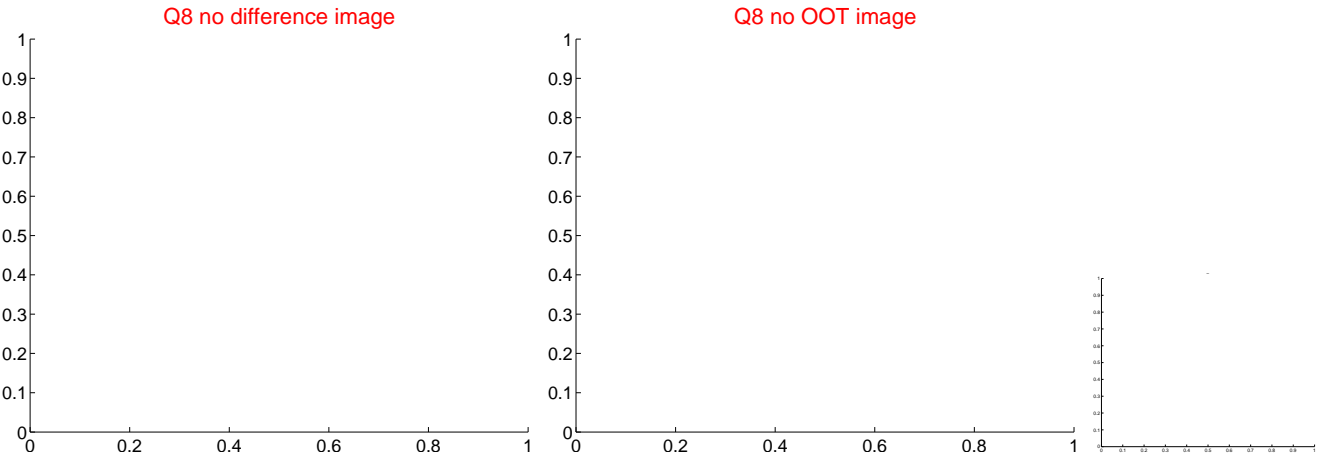
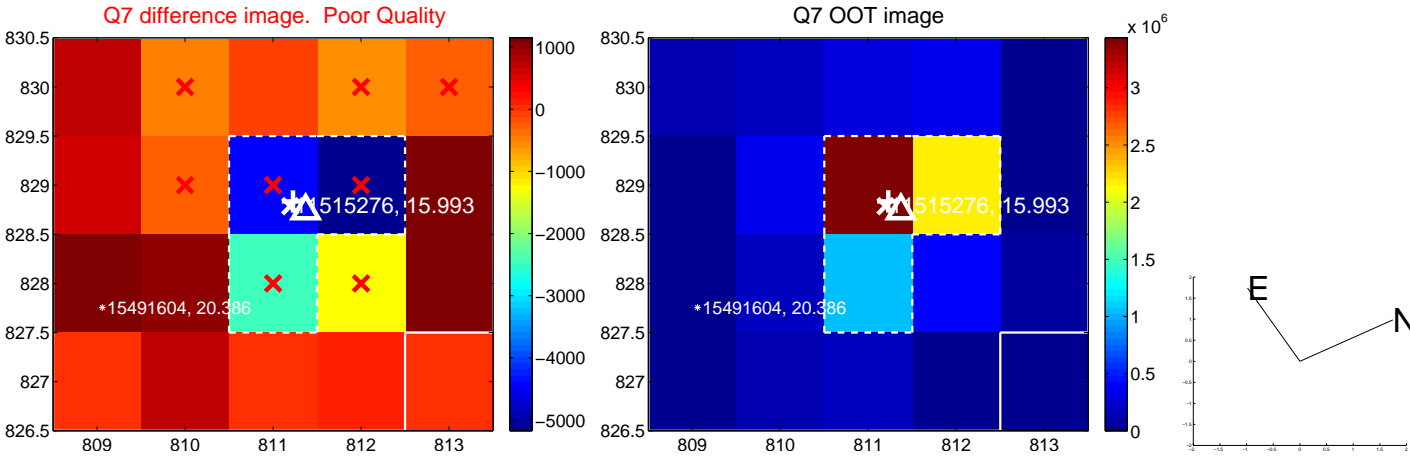
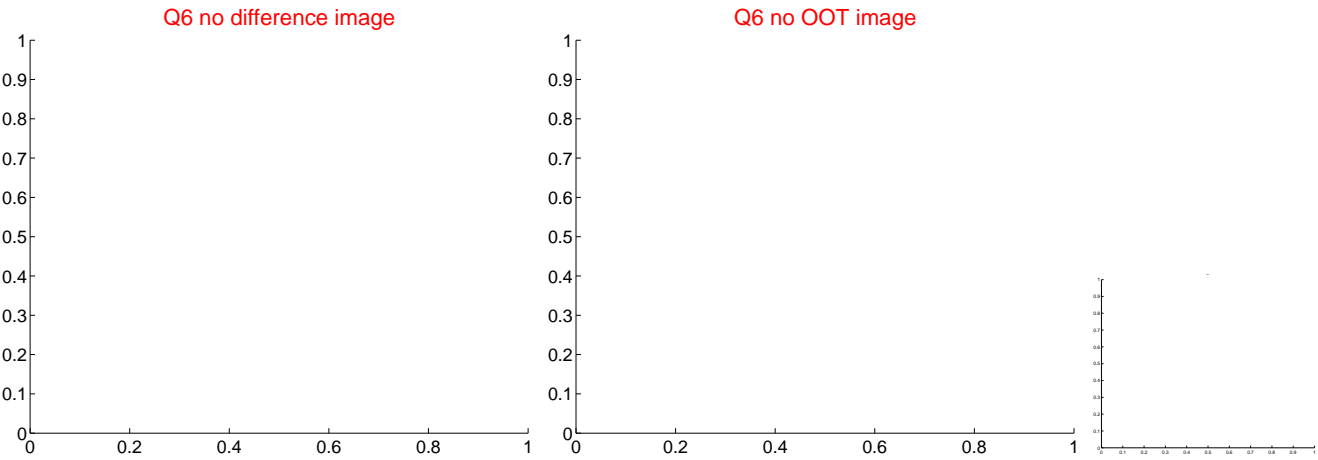
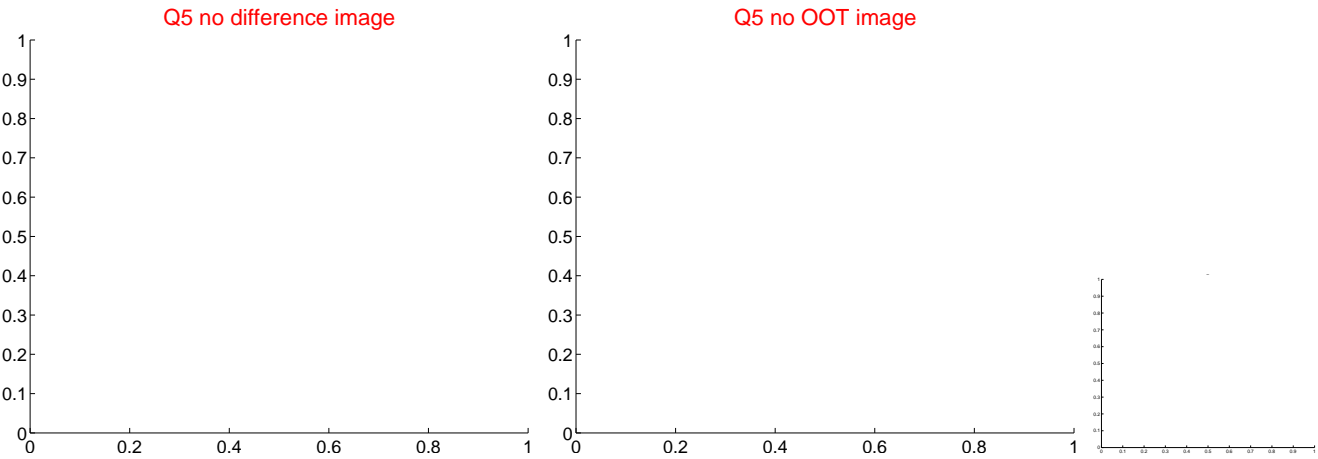


Q4 no OOT image

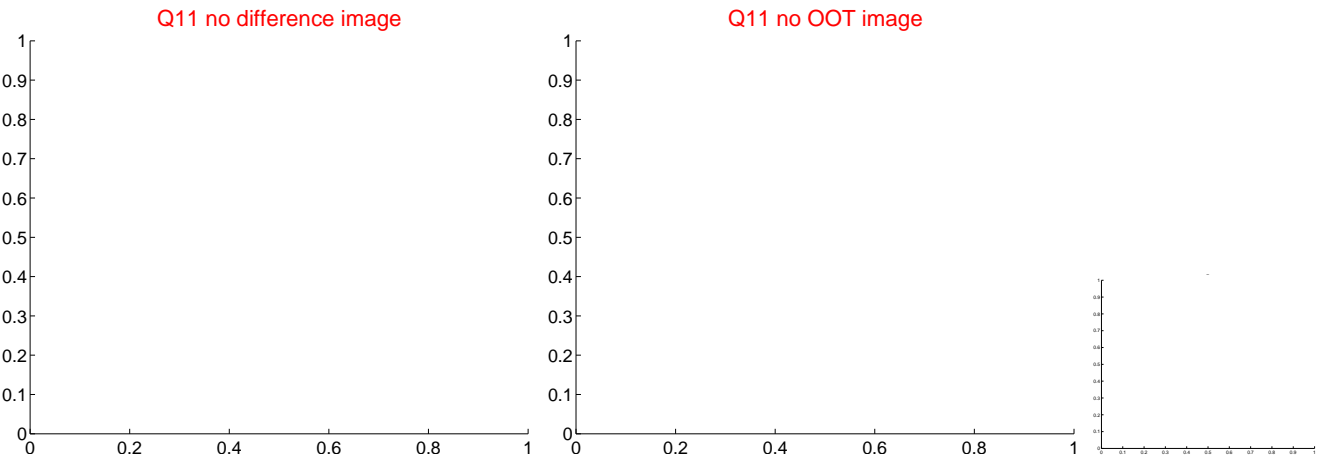




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



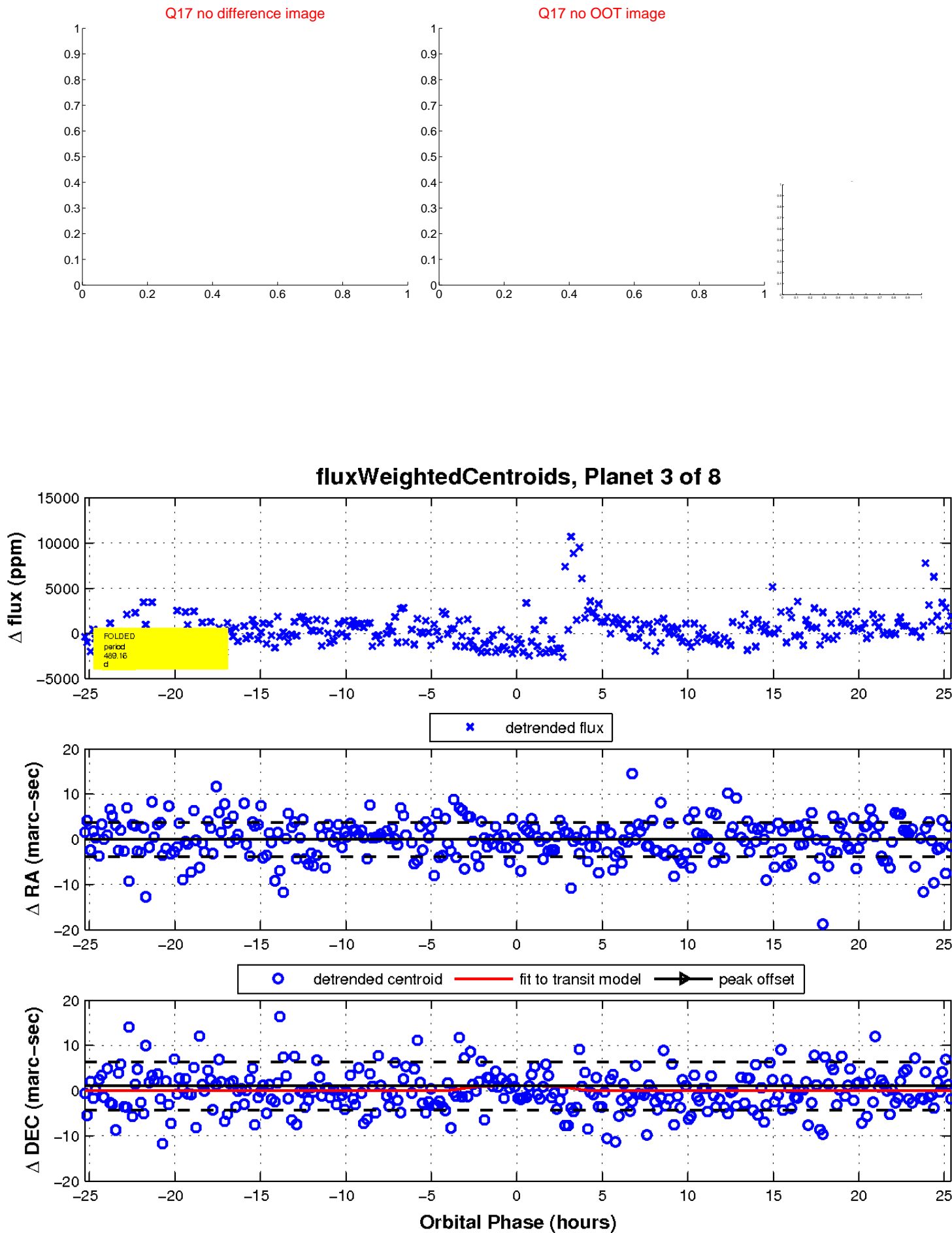
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

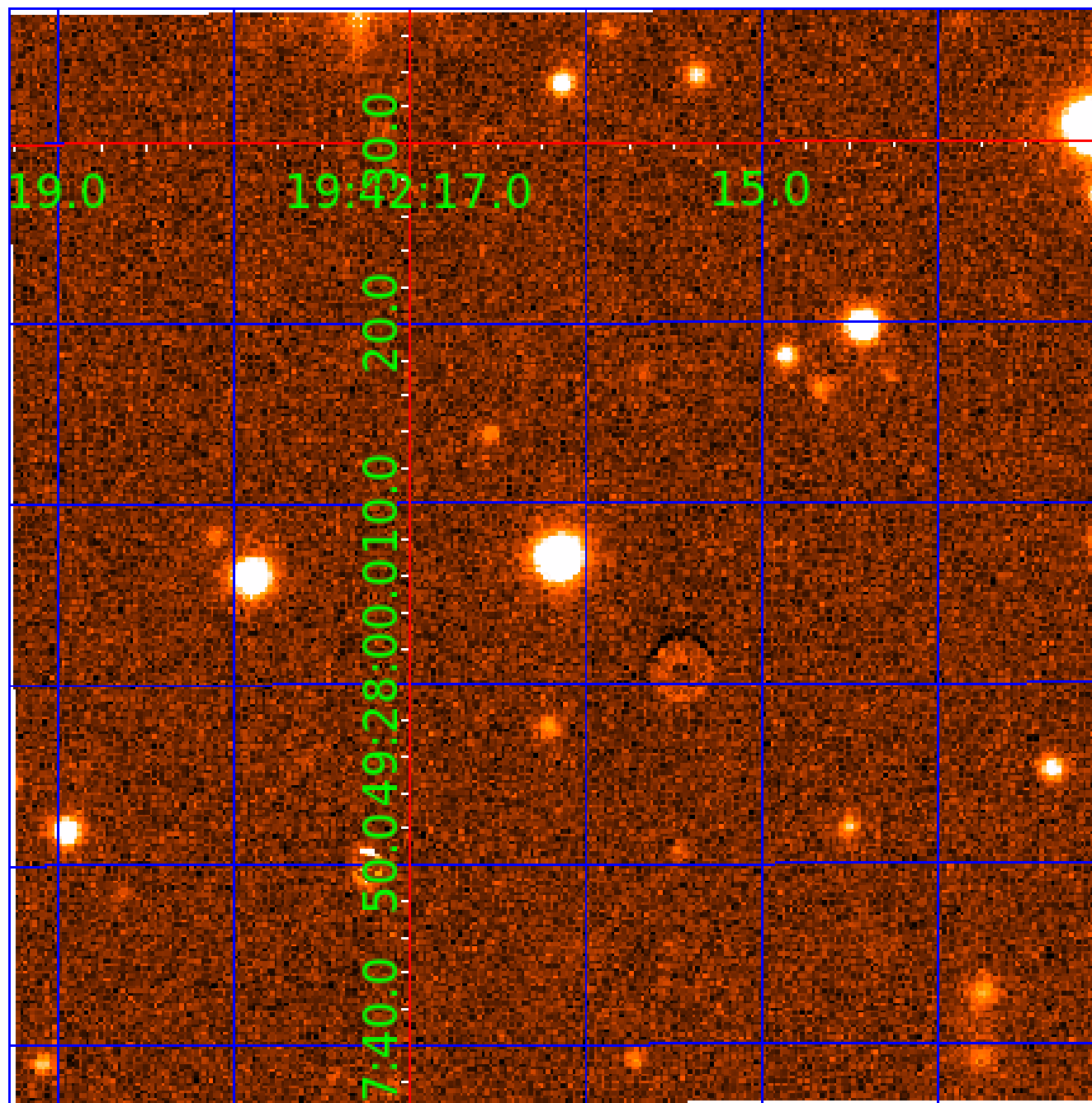


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 011515276

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011515276-01	OBS	No	403.712205	513.461034	3886.9	5.507	14.0	11.4	0.40	3618	3.06	0.04
011515276-03	OBS	No	489.164999	227.101526	3054.4	8.467	11.6	9.0	0.40	3618	2.61	0.03
011515276-04	OBS	No	418.095298	135.336485	2037.4	9.242	11.0	6.6	0.40	3618	1.82	0.04
011515276-05	OBS	No	652.627829	133.728275	2506.4	5.376	12.2	7.2	0.40	3618	2.00	0.02
011515276-06	OBS	No	385.371365	377.127951	3194.4	12.673	10.0	7.9	0.40	3618	2.25	0.04
011515276-07	OBS	No	464.331649	247.258780	2764.8	16.928	10.7	6.5	0.40	3618	2.22	0.03
011515276-08	OBS	No	347.438632	467.537482	2204.6	6.000	9.6	-1.0	0.40	3618	1.87	0.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011515276-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

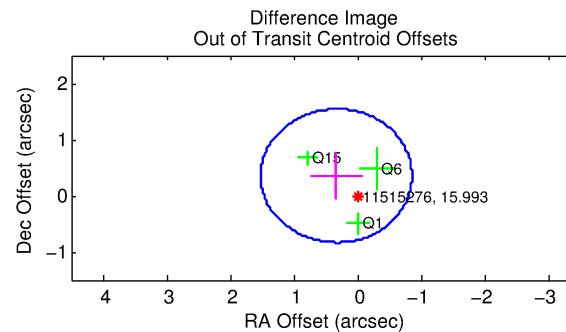
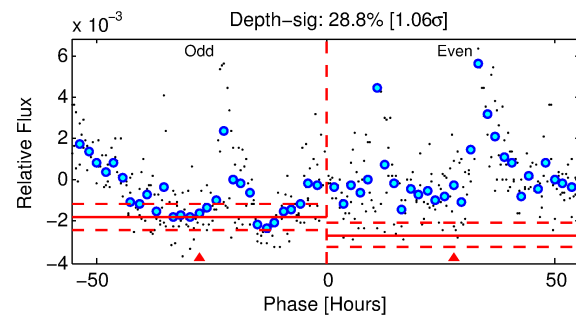
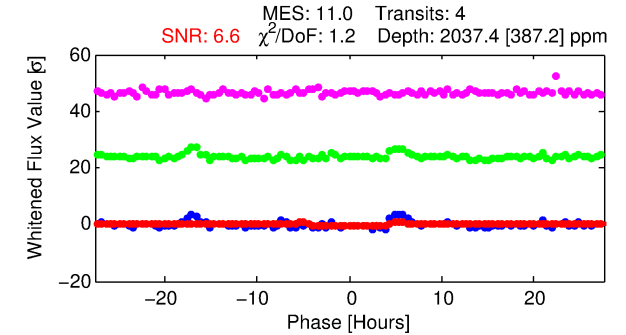
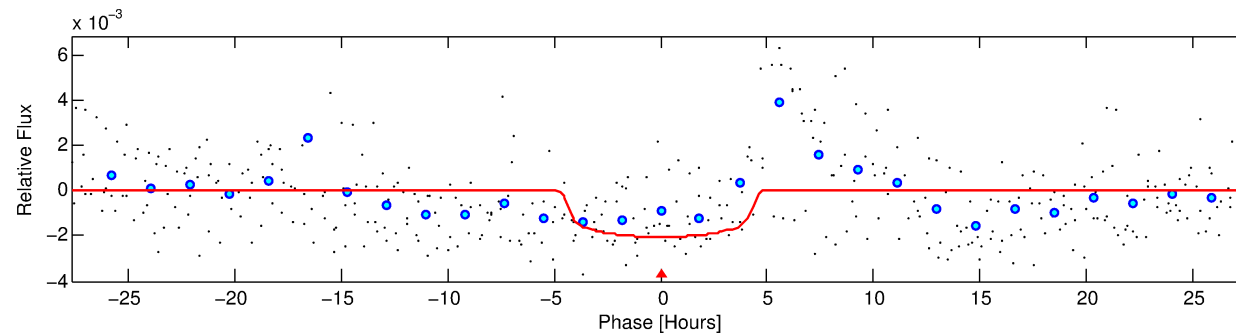
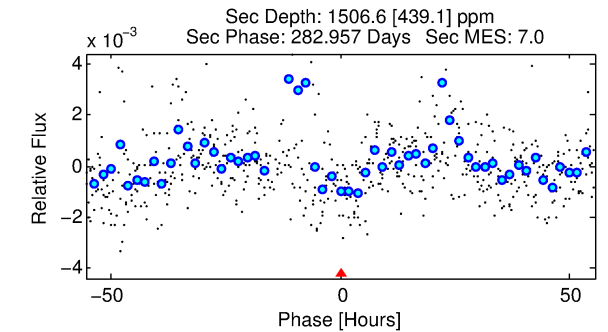
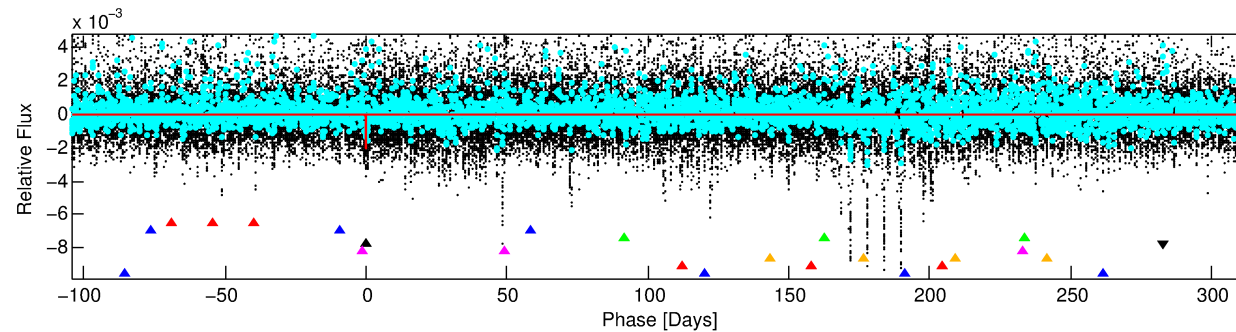
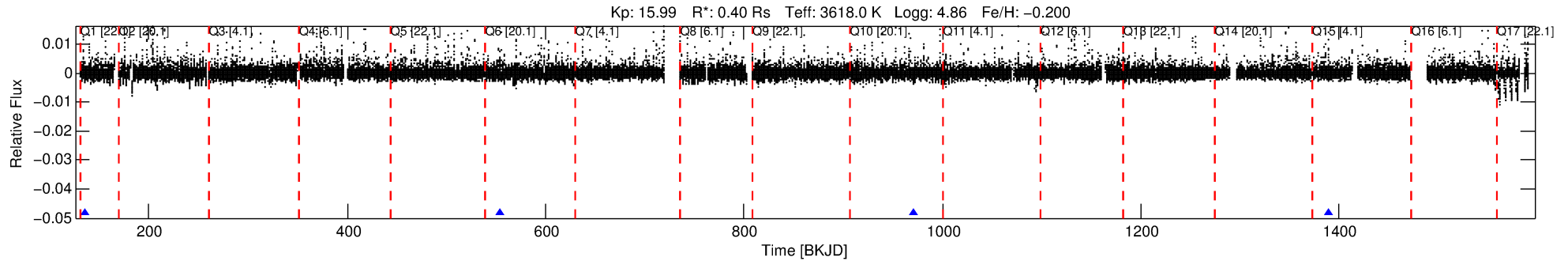
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011515276-04

No Significant Match Found

# DV One-Page Summary

KIC: 11515276 Candidate: 4 of 8 Period: 418.095 d



## DV Fit Results:

Period = 418.09530 [0.00664] d  
Epoch = 135.3365 [0.0128] BKJD  
Rp/R\* = 0.0417 [0.0152]  
a/R\* = 336.75 [519.12]  
b = 0.37 [3.61]  
Seff = 0.04 [0.00]  
Teq = 112 [3] K  
Rp = 1.82 [0.68] Re  
a = 0.8216 [0.0484] AU  
Ag = 168263.34 [133067.80] [1.26σ]  
Teffp = 3492 [689] K [4.91σ]

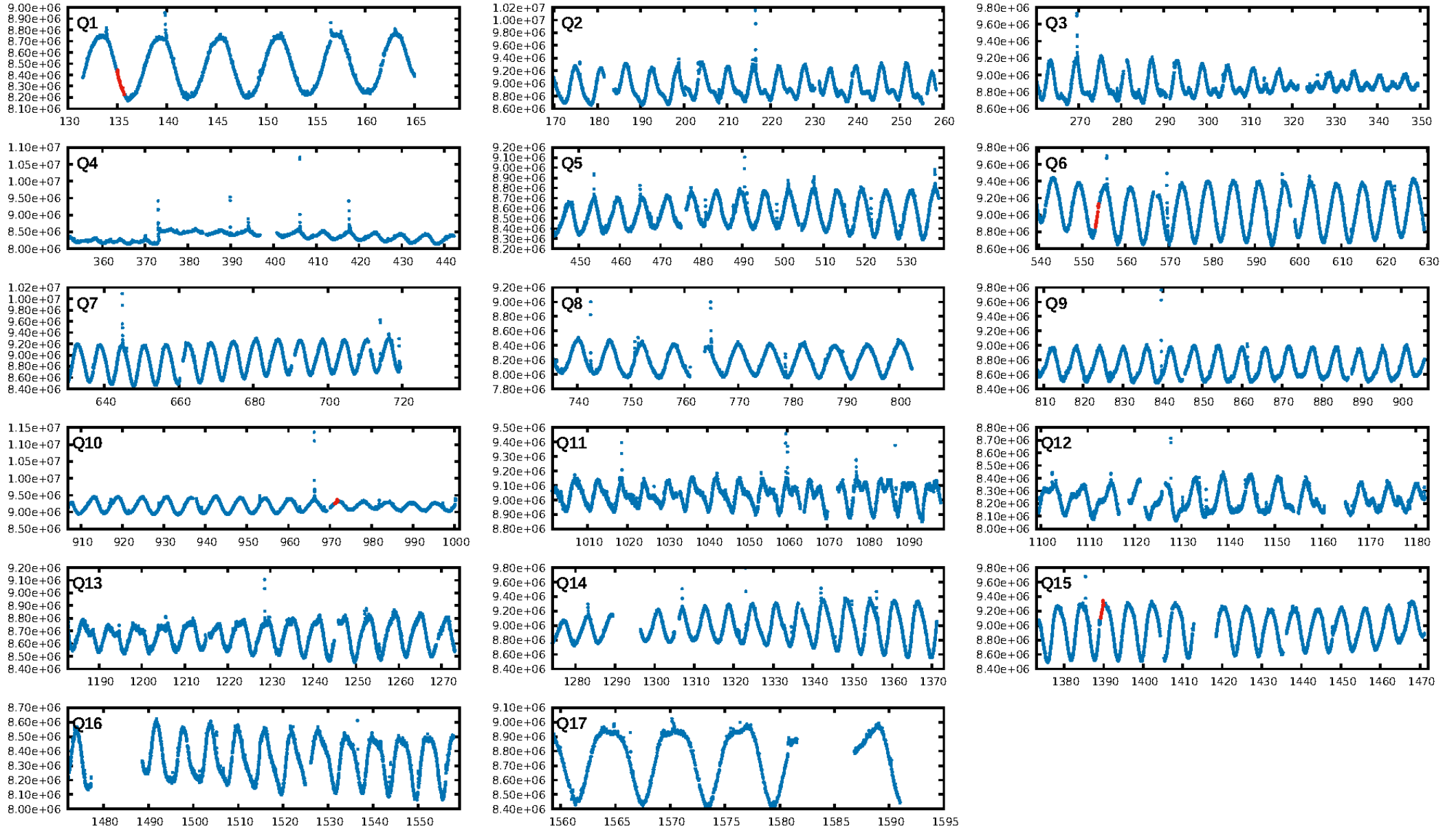
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [32.09σ]  
LongPeriod-sig: 100.0% [57.54σ]  
ModelChiSquare2-sig: 22.8%  
ModelChiSquareGof-sig: 97.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.159  
Centroid-sig: 40.3%  
Centroid-so: 0.507 arcsec [0.61σ]  
OotOffset-rm: 0.486 arcsec [1.23σ]  
KicOffset-rm: 0.680 arcsec [1.83σ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:48:17 Z

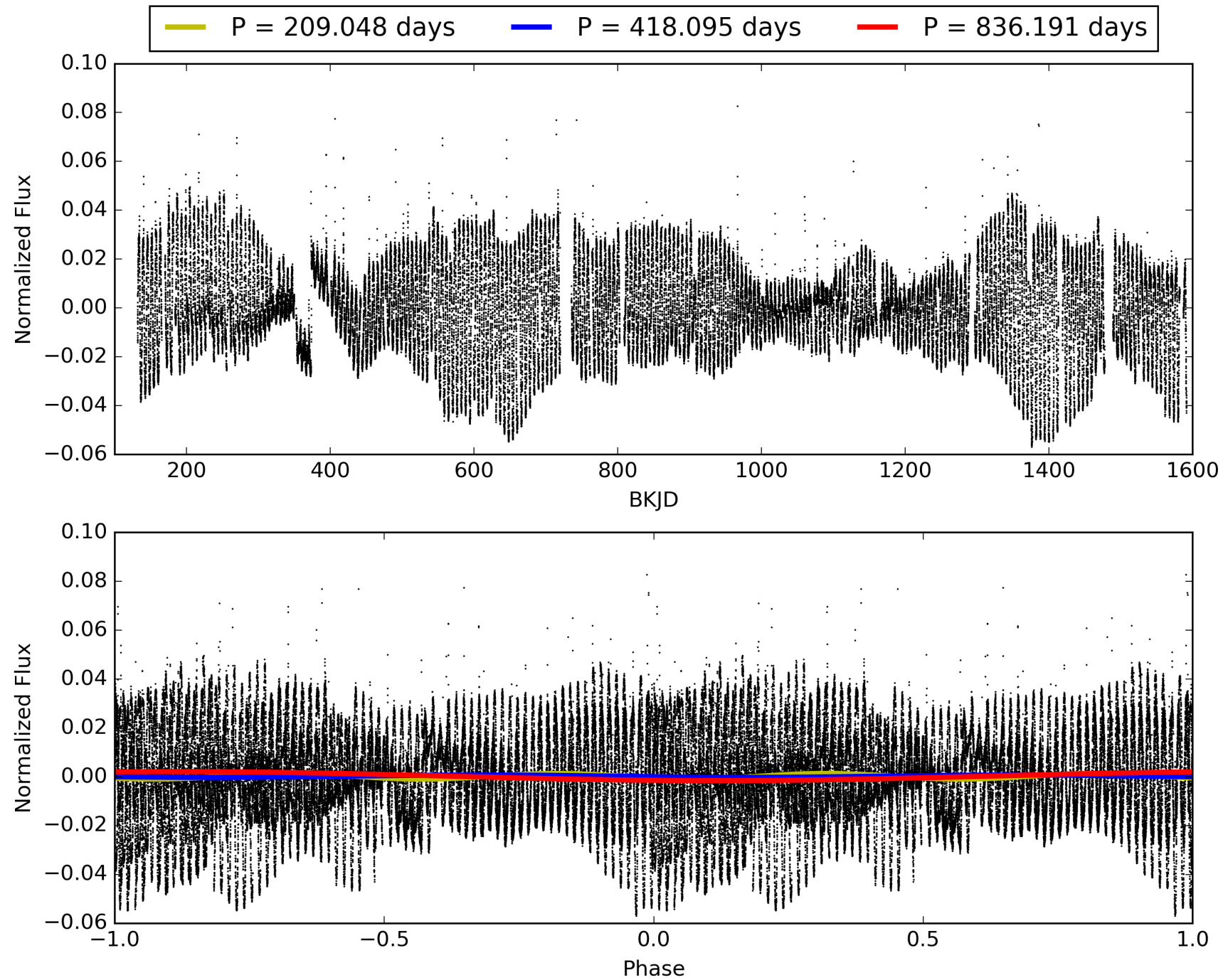
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011515276-04, PDC Light Curves



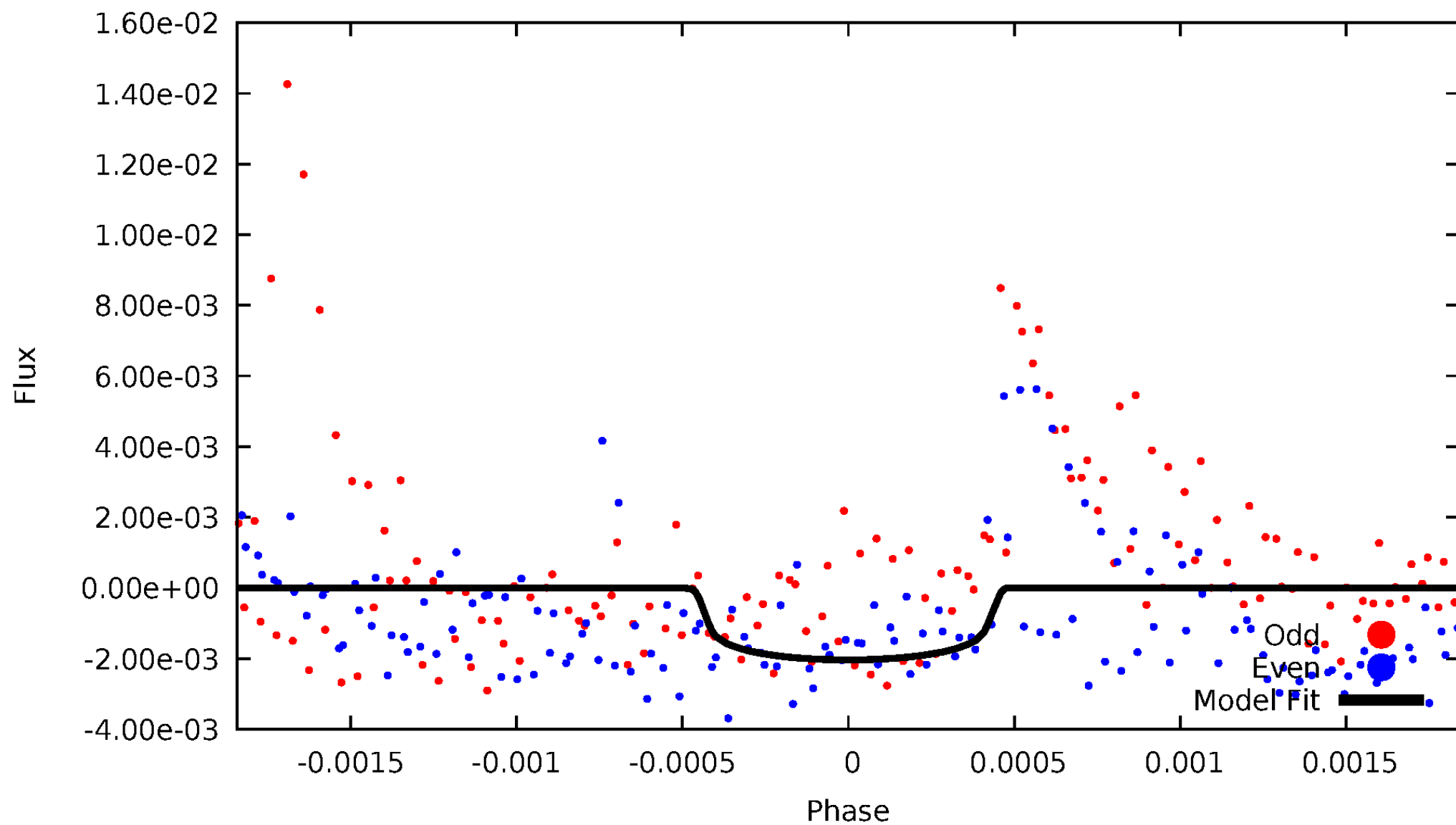


# TCE 011515276-04



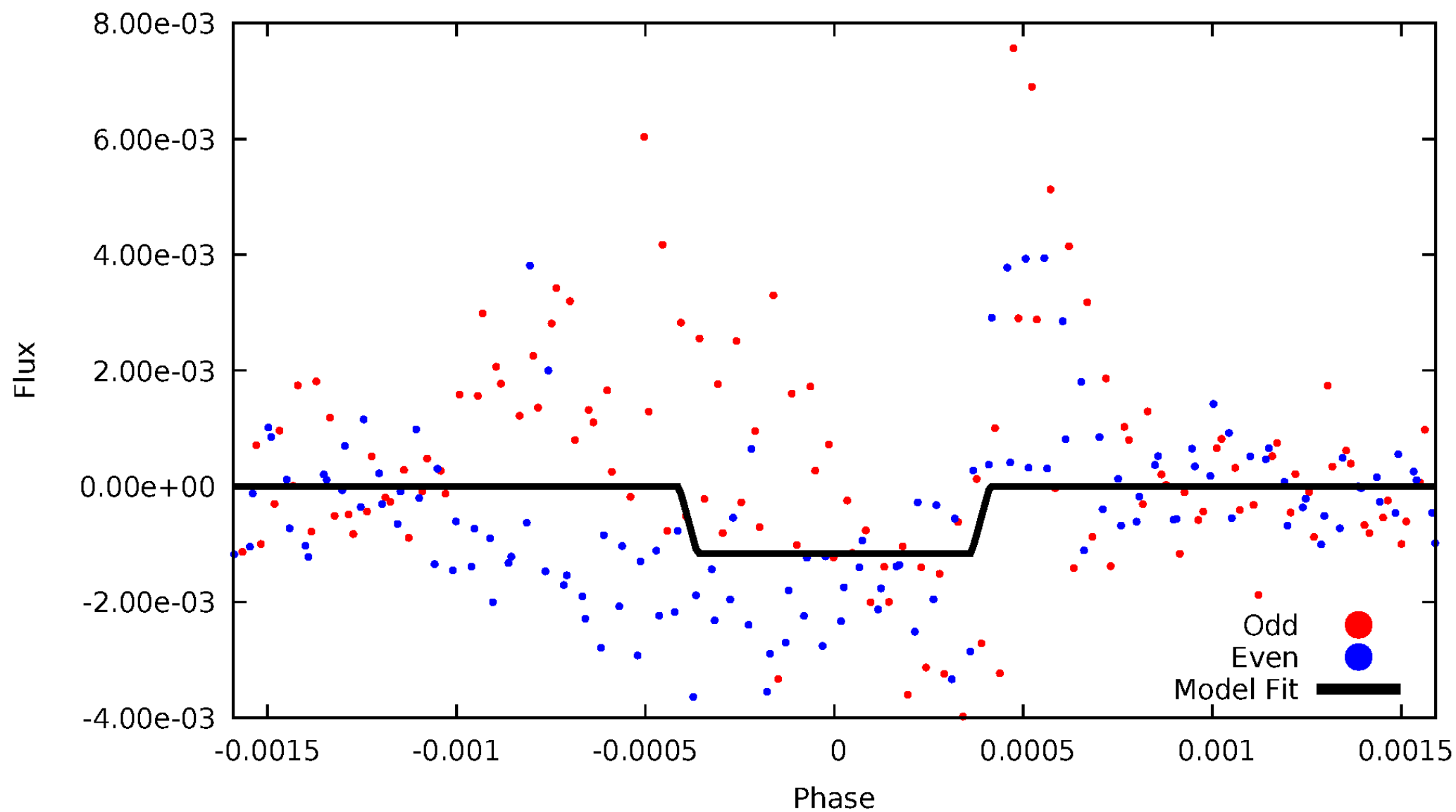
# DV Odd/Even

TCE 011515276-04



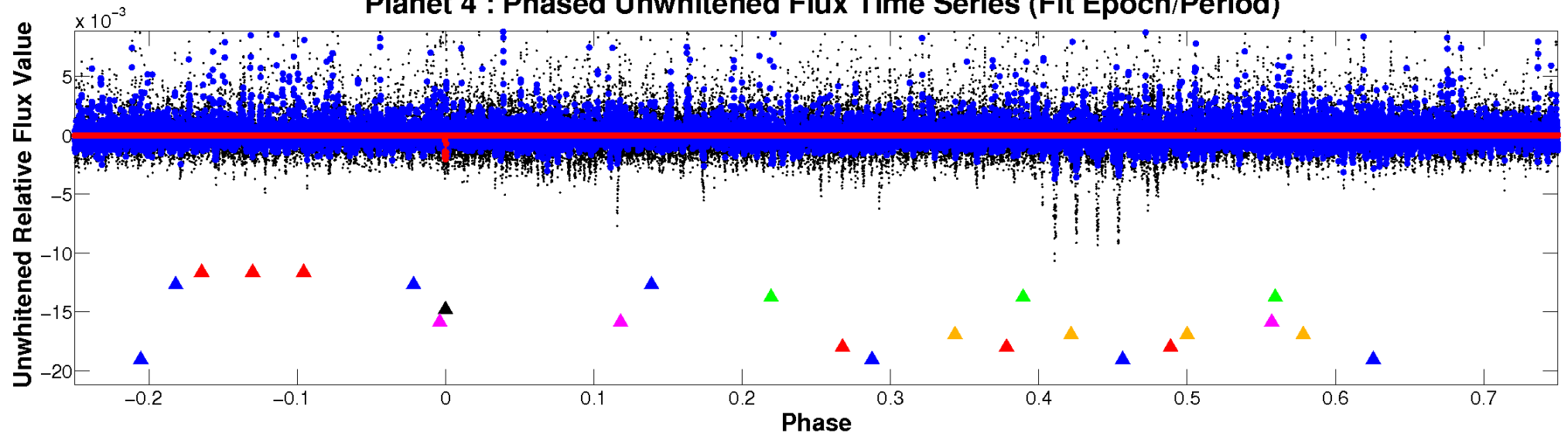
# ALT Odd/Even

TCE 011515276-04

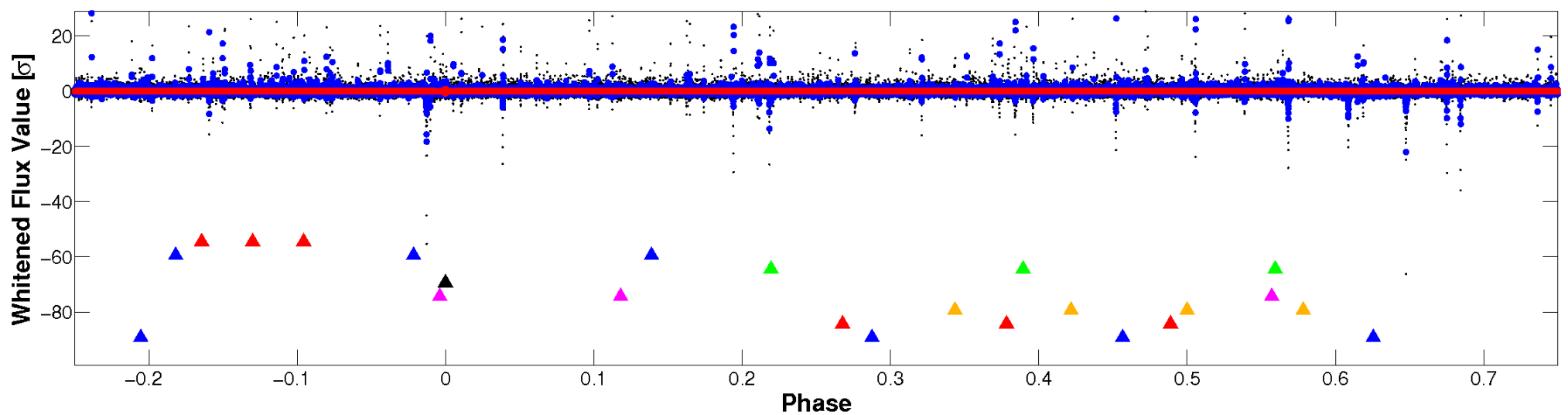


# Non-Whitened Vs. Whitened Light Curve

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

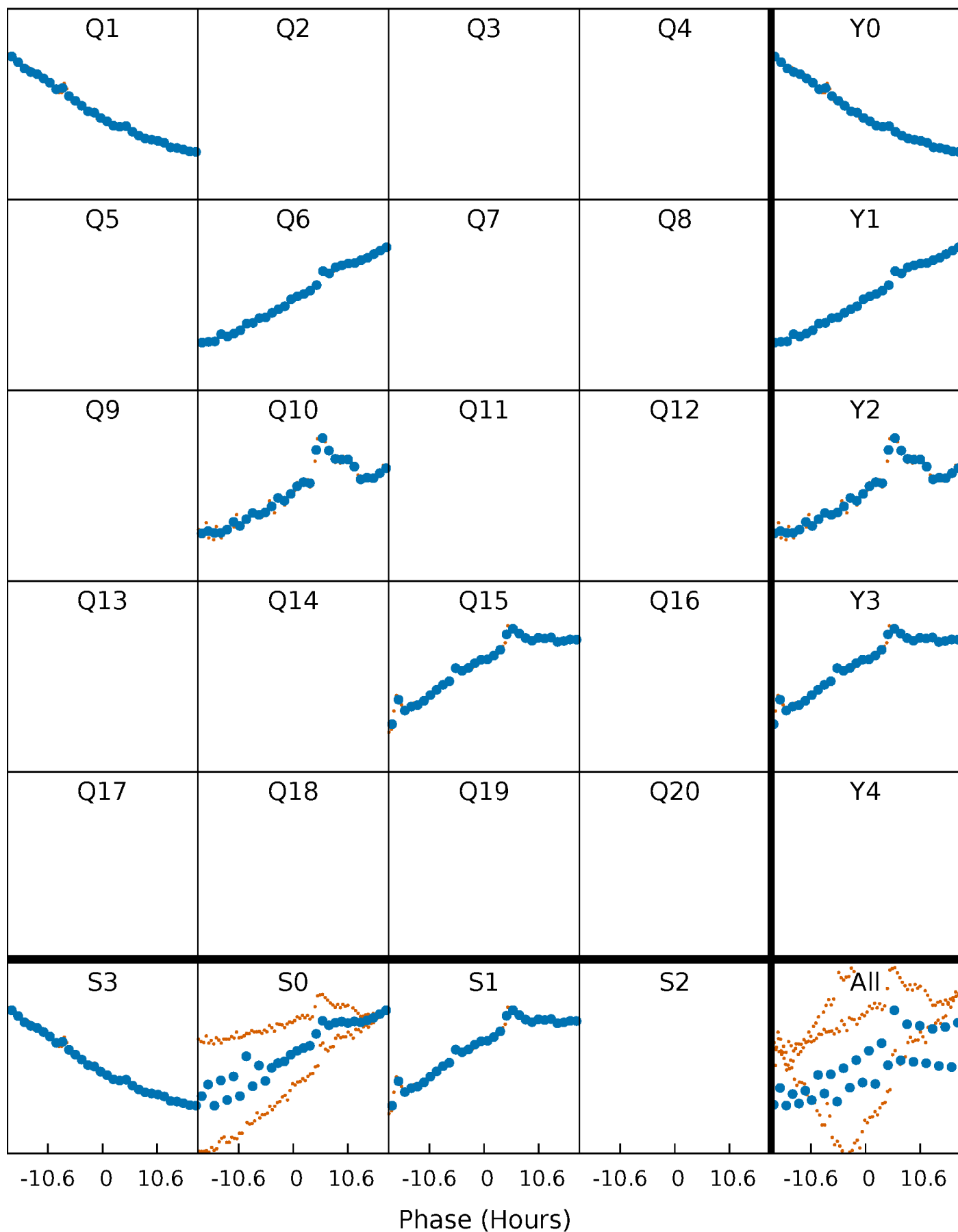


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



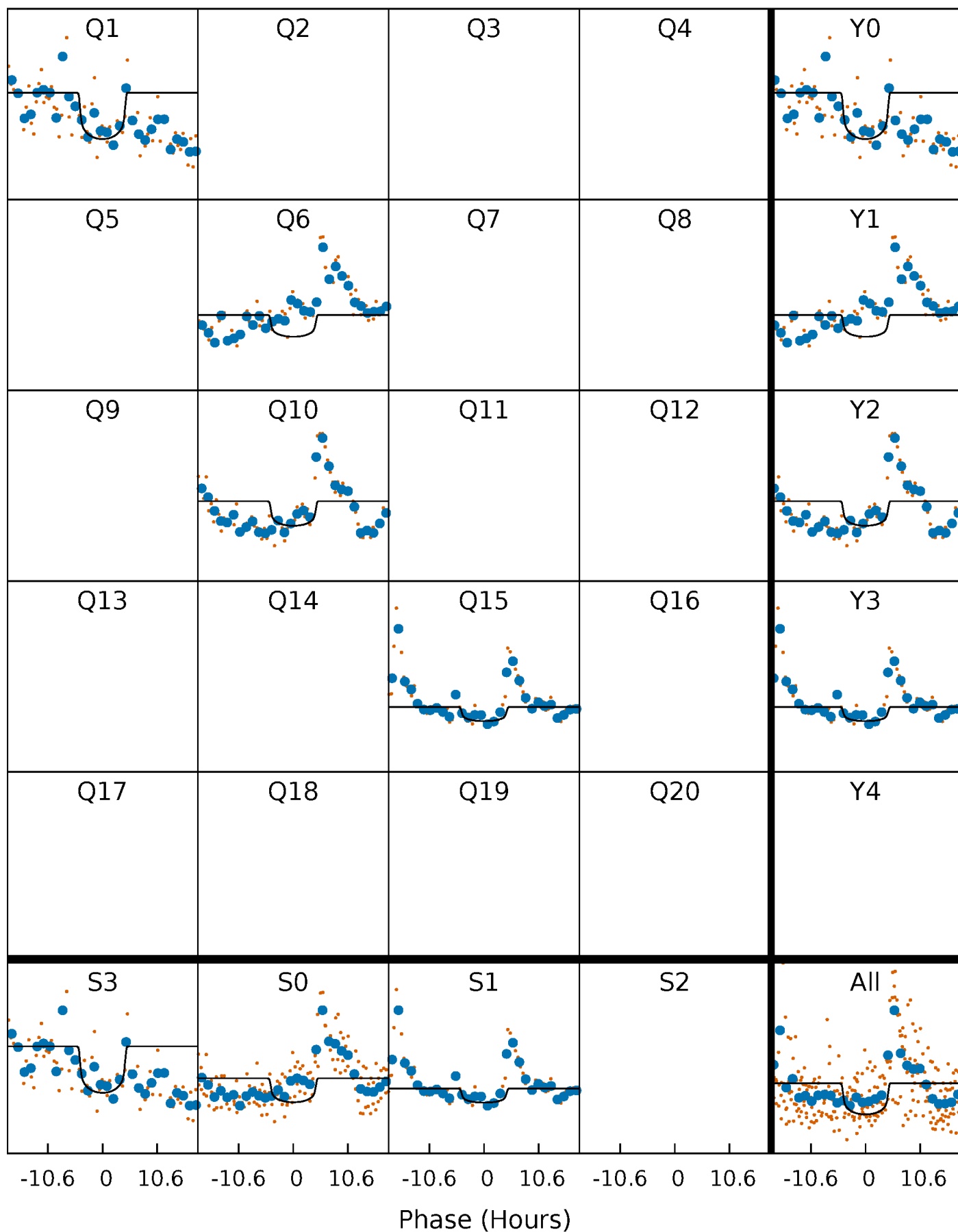
# PDC Quarter-Phased Transit Curves

TCE 011515276-04 P=418.095298 Days  $T_0=135.336485$  (BKJD)



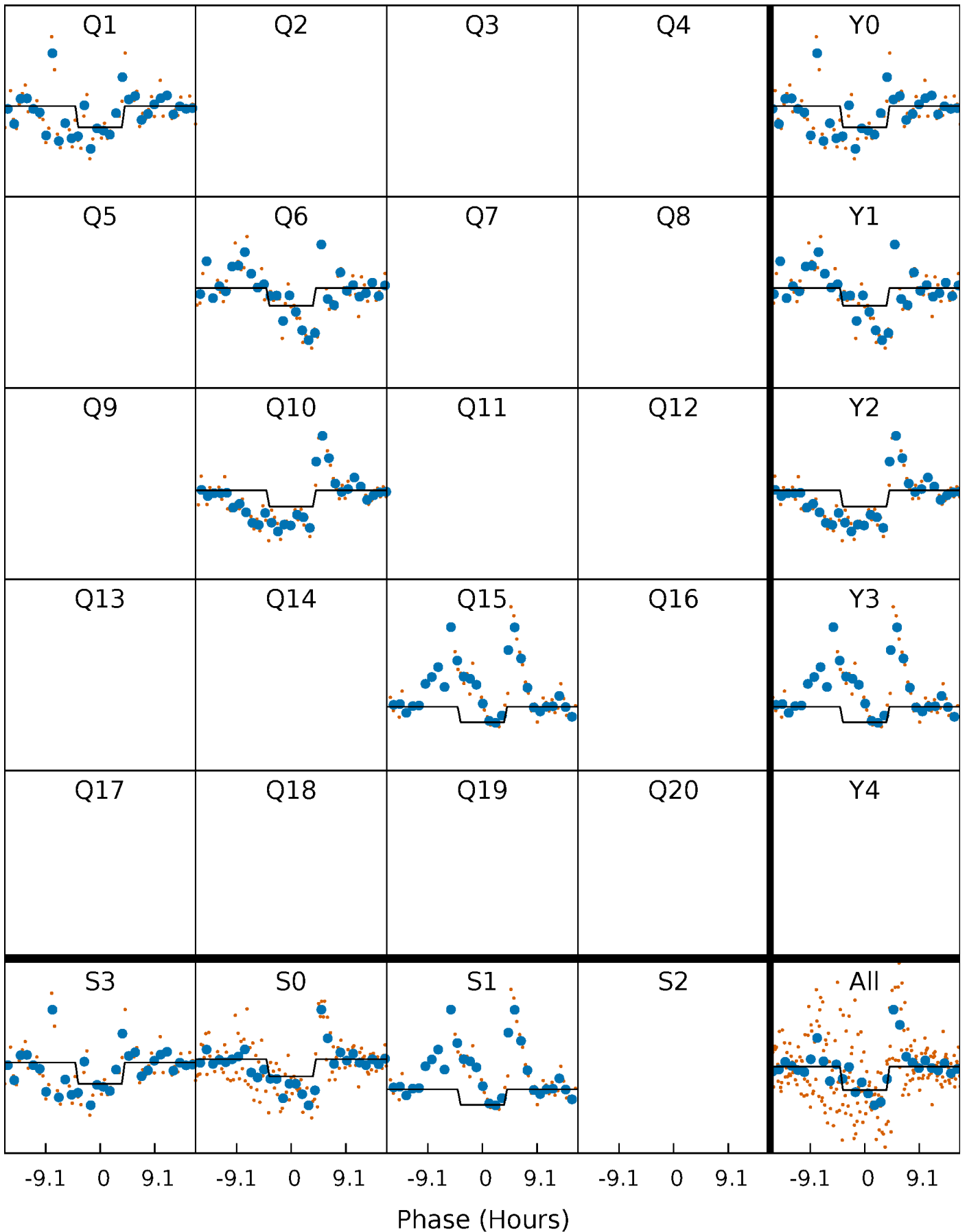
# DV Quarter-Phased Transit Curves

TCE 011515276-04 P=418.095298 Days  $T_0=135.336485$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

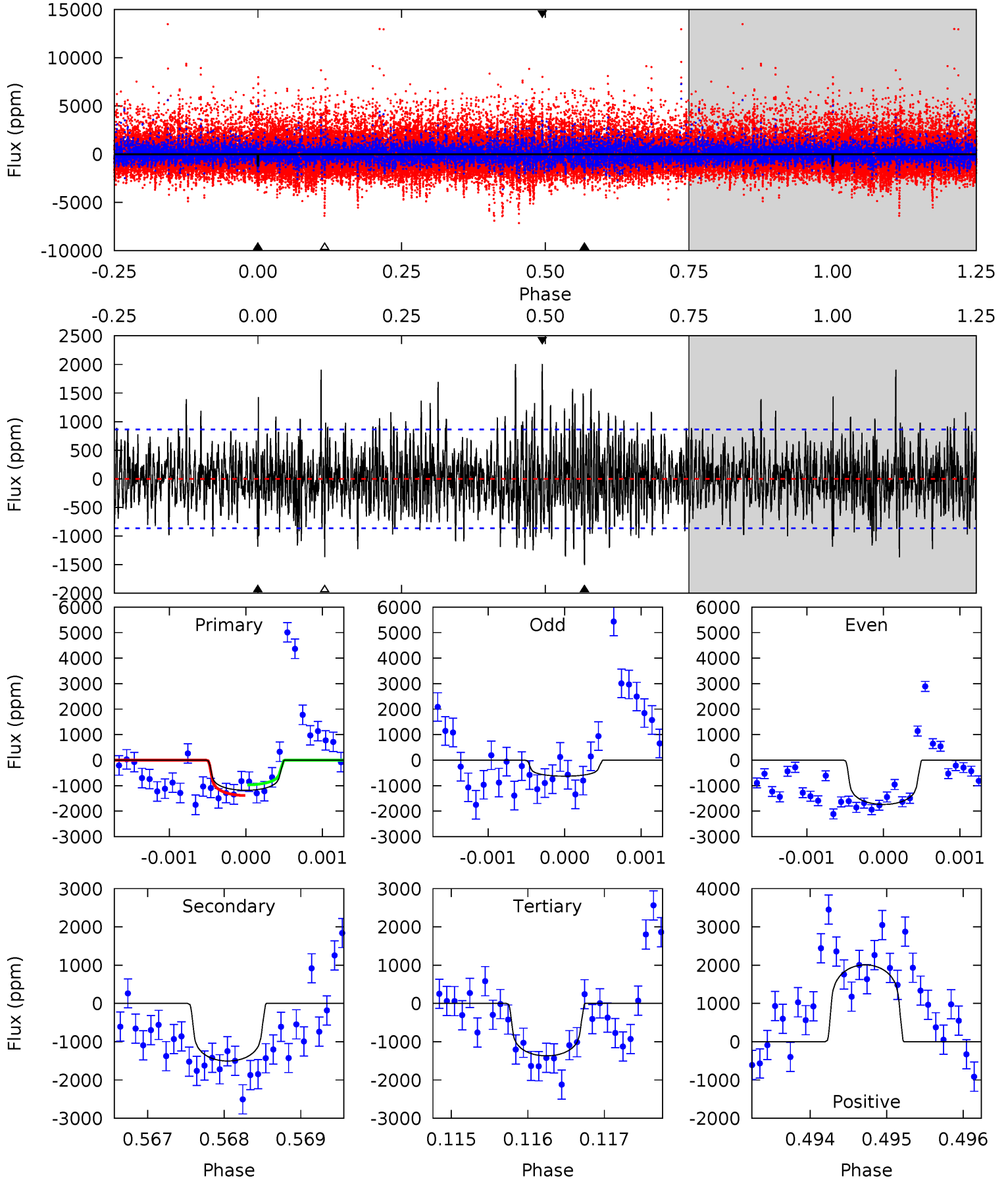
TCE 011515276-04     $P=418.084260$  Days     $T_0=135.363336$  (BKJD)



# DV Model-Shift Uniqueness Test

011515276-04, P = 418.095298 Days, E = 135.336485 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
7.47	9.50	8.65	12.7	5.46	3.30	2.79	-1.18	-5.21	0.86	-3.18	2.38	0.72	0.57	1.33

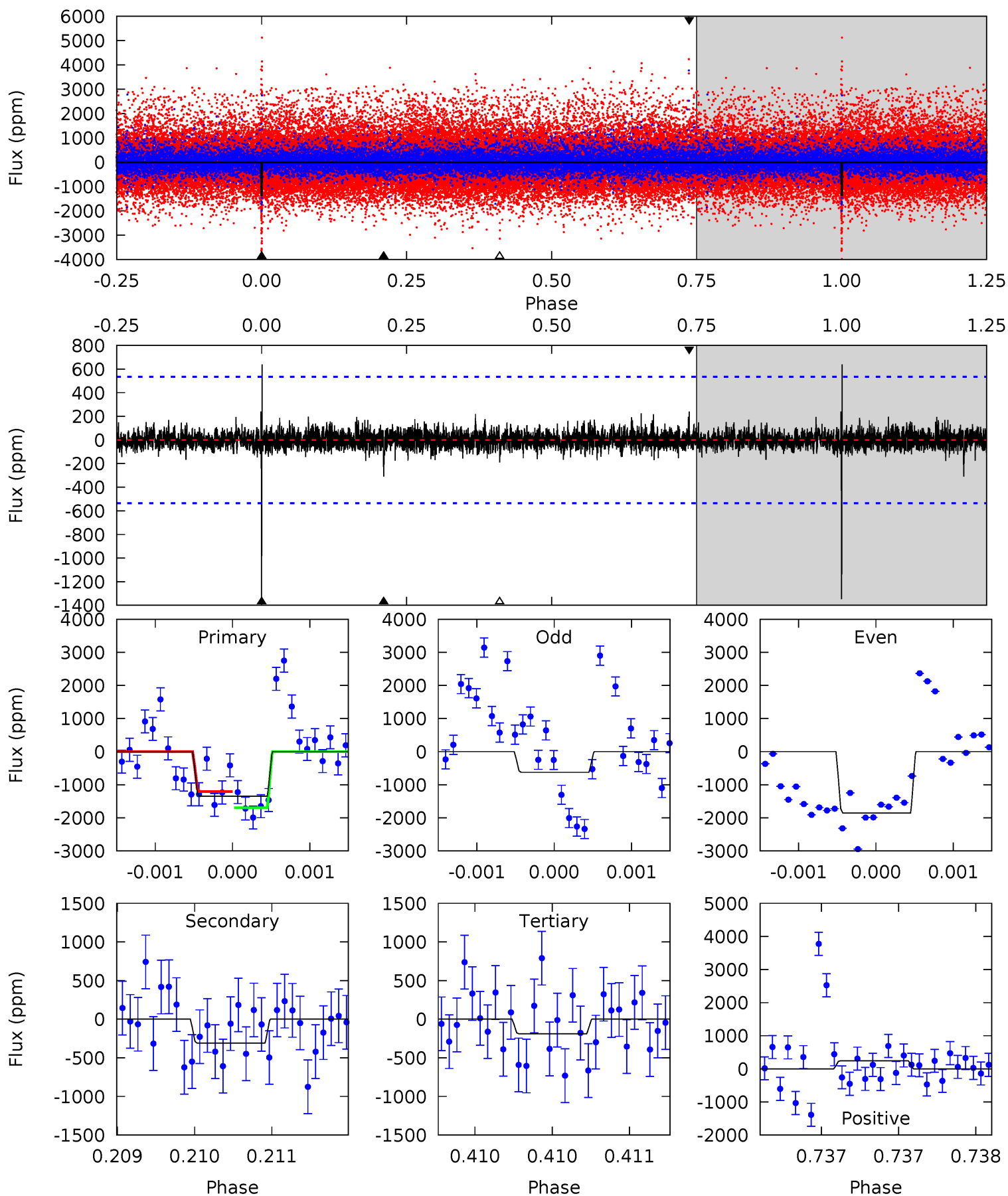




# Alt Model-Shift Uniqueness Test

011515276-04, P = 418.084260 Days, E = 135.363336 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
13.8	3.18	1.94	2.48	5.49	3.35	0.51	11.9	11.4	1.24	0.70	6.15	0.82	0.32	2.49



### Stellar Parameters For KIC 011515276

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3618^{+43}_{-48}$	$4.858^{+0.033}_{-0.033}$	$-0.200^{+0.100}_{-0.100}$	$0.401^{+0.029}_{-0.032}$	$0.423^{+0.027}_{-0.038}$	$9.278^{+1.660}_{-1.289}$
	+1%/-1%	+1%/-1%	+50%/-50%	+7%/-8%	+6%/-9%	+18%/-14%
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 011515276-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1504 \pm 158$	$1.84^{+0.67}_{-0.67}$	$156^{+3}_{-3}$	$3529^{+551}_{-330}$	$170000^{+238499}_{-81224}$
Alt.	$-310 \pm 97$	$1.51^{+0.71}_{-0.63}$	$156^{+3}_{-3}$	$2954^{+532}_{-322}$	$49778^{+98300}_{-29119}$

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

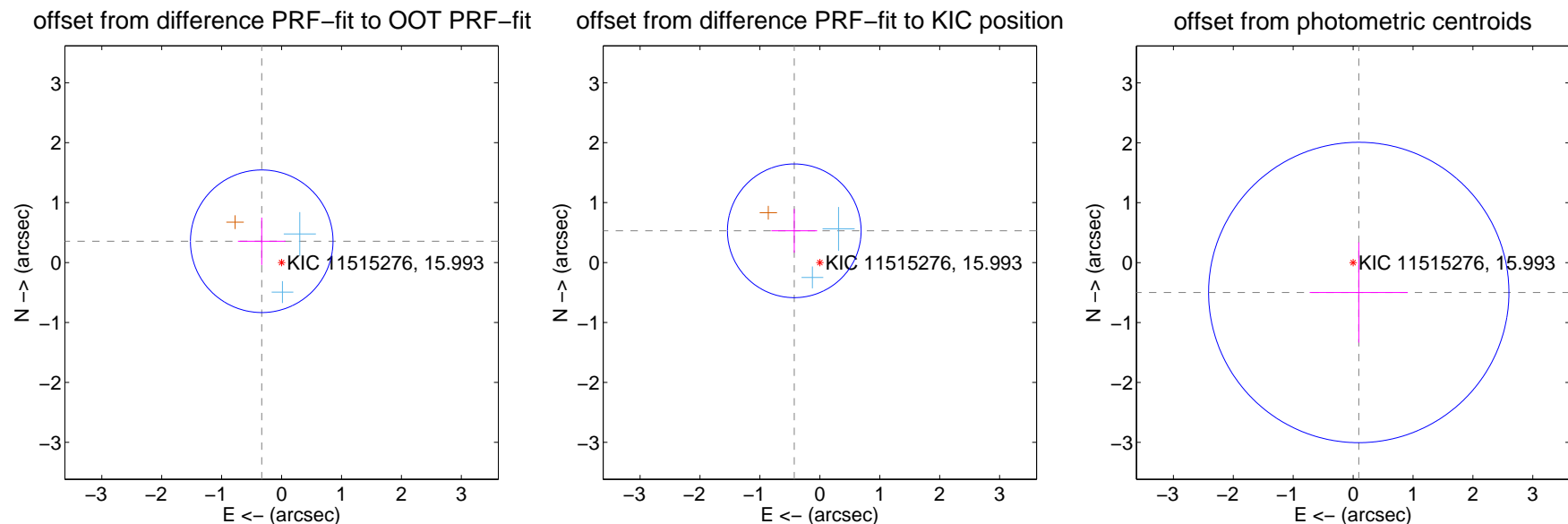
## DV Centroid Data

Supplemental centroid analysis for 011515276-04. Kepler magnitude: 15.99. Transit SNR 6.57

There are 2 quarters with good PRF difference image offsets

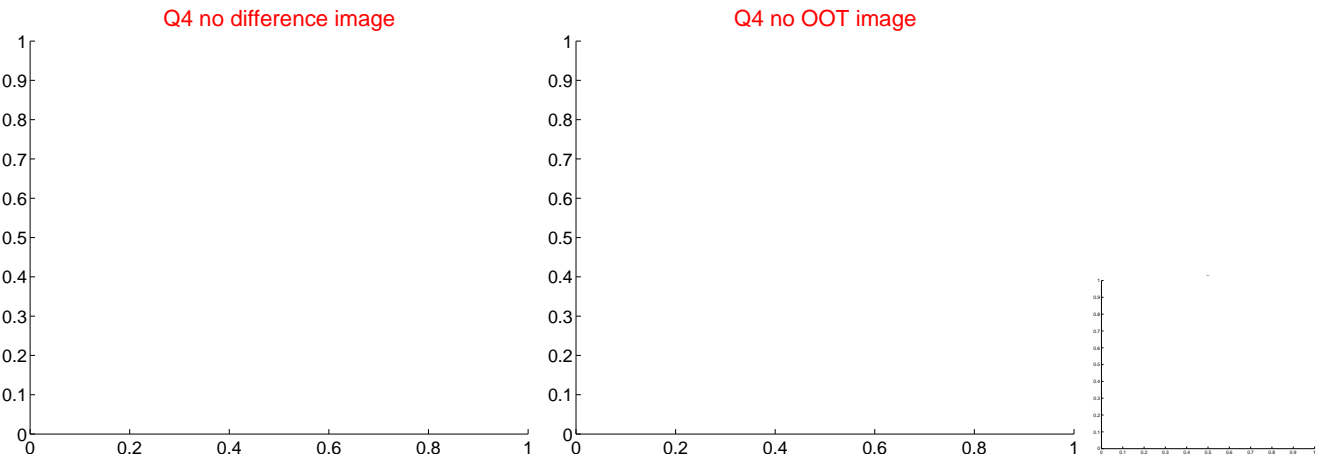
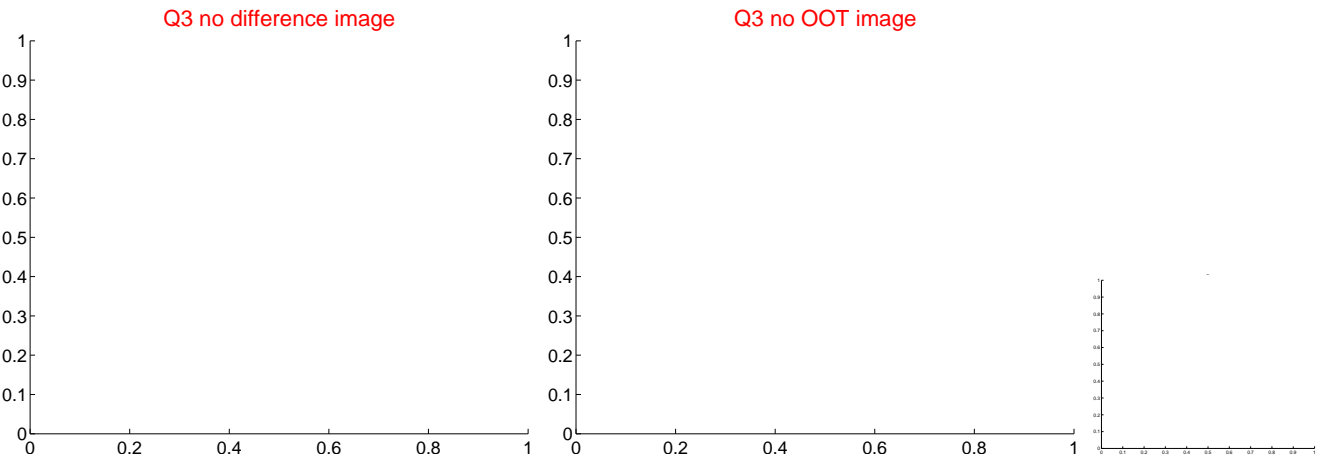
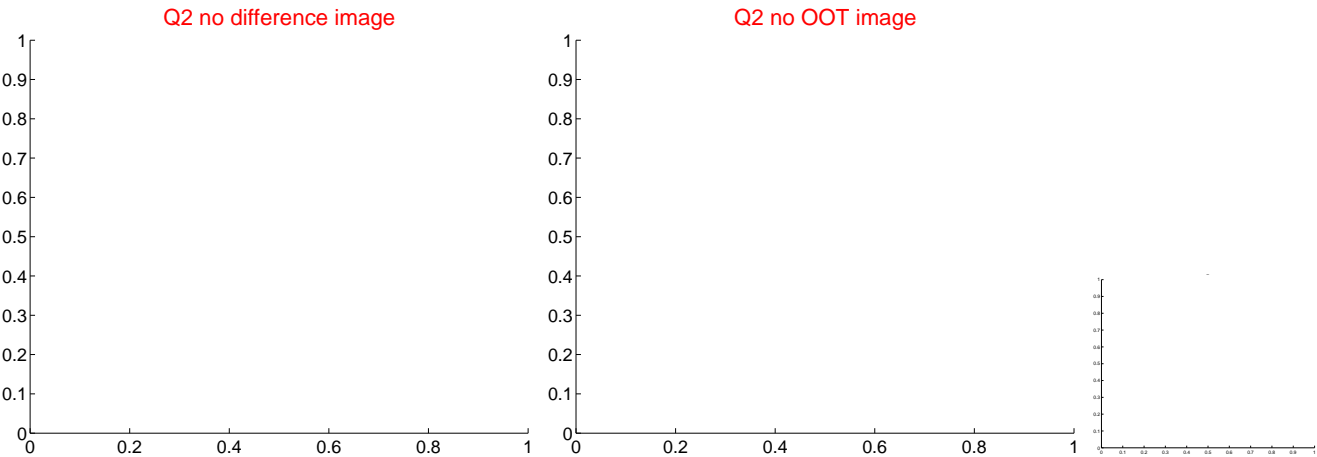
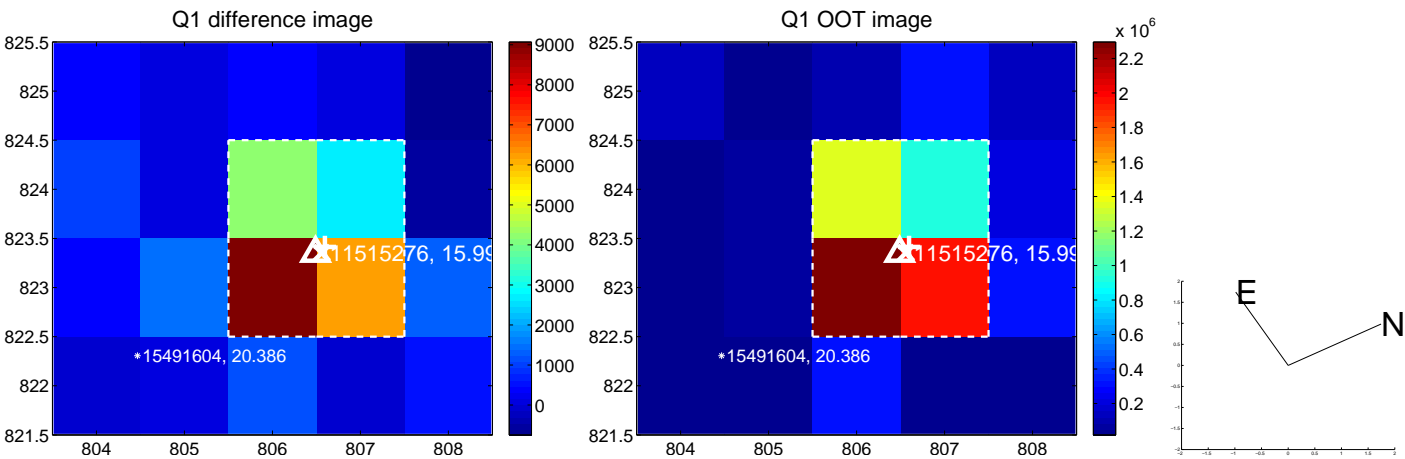
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.486 \pm 0.397$	1.23	$0.331 \pm 0.397$	$0.355 \pm 0.396$
PRF-fit source offset from KIC position	$0.680 \pm 0.372$	1.83	$0.427 \pm 0.382$	$0.529 \pm 0.365$
photometric centroid source offset	$0.51 \pm 0.84$	0.61	$-0.09 \pm 0.82$	$-0.50 \pm 0.84$

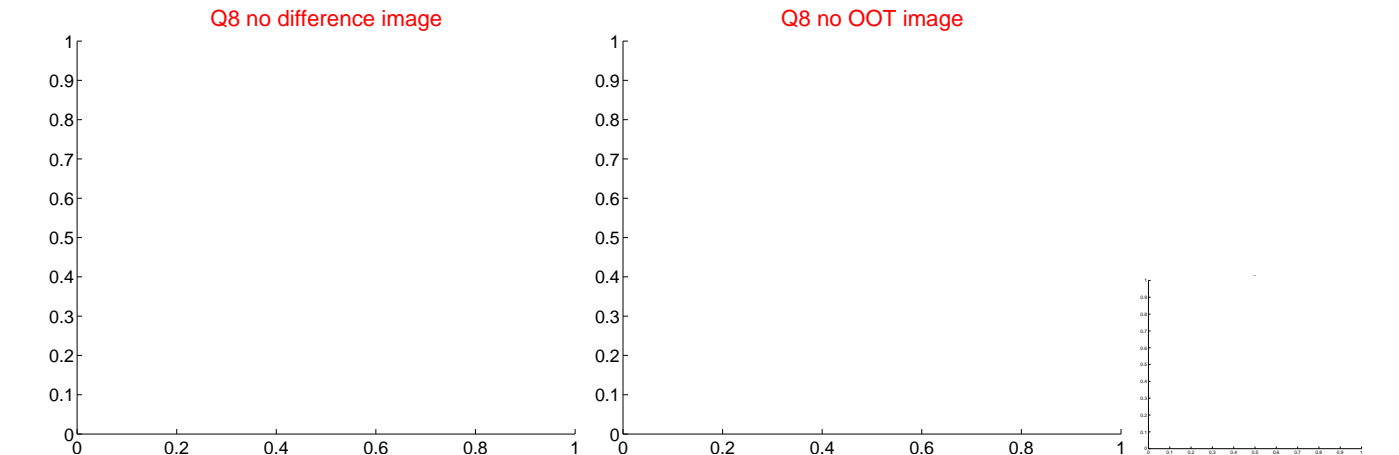
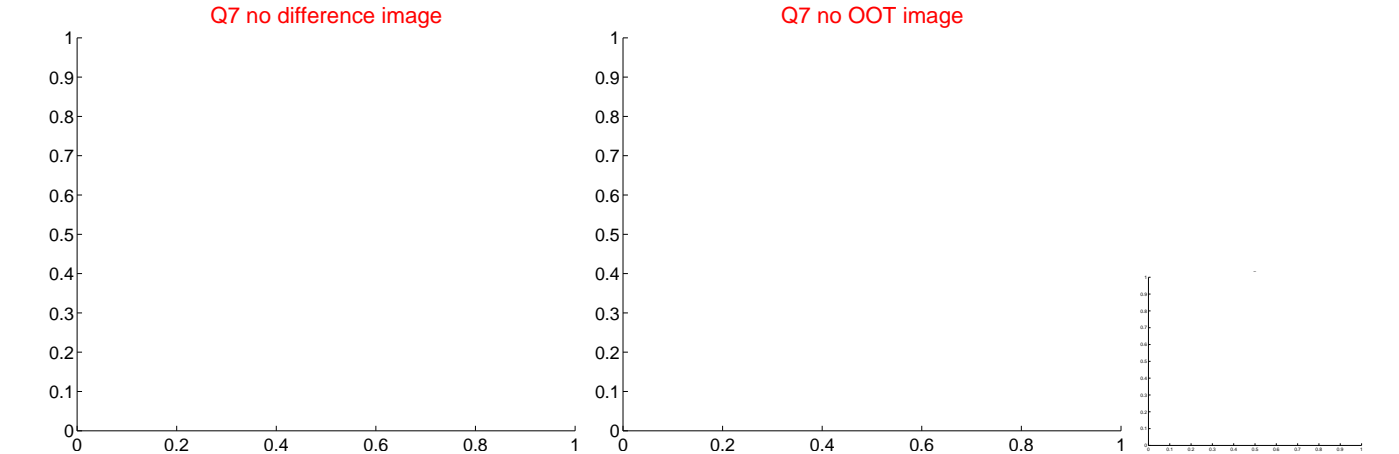
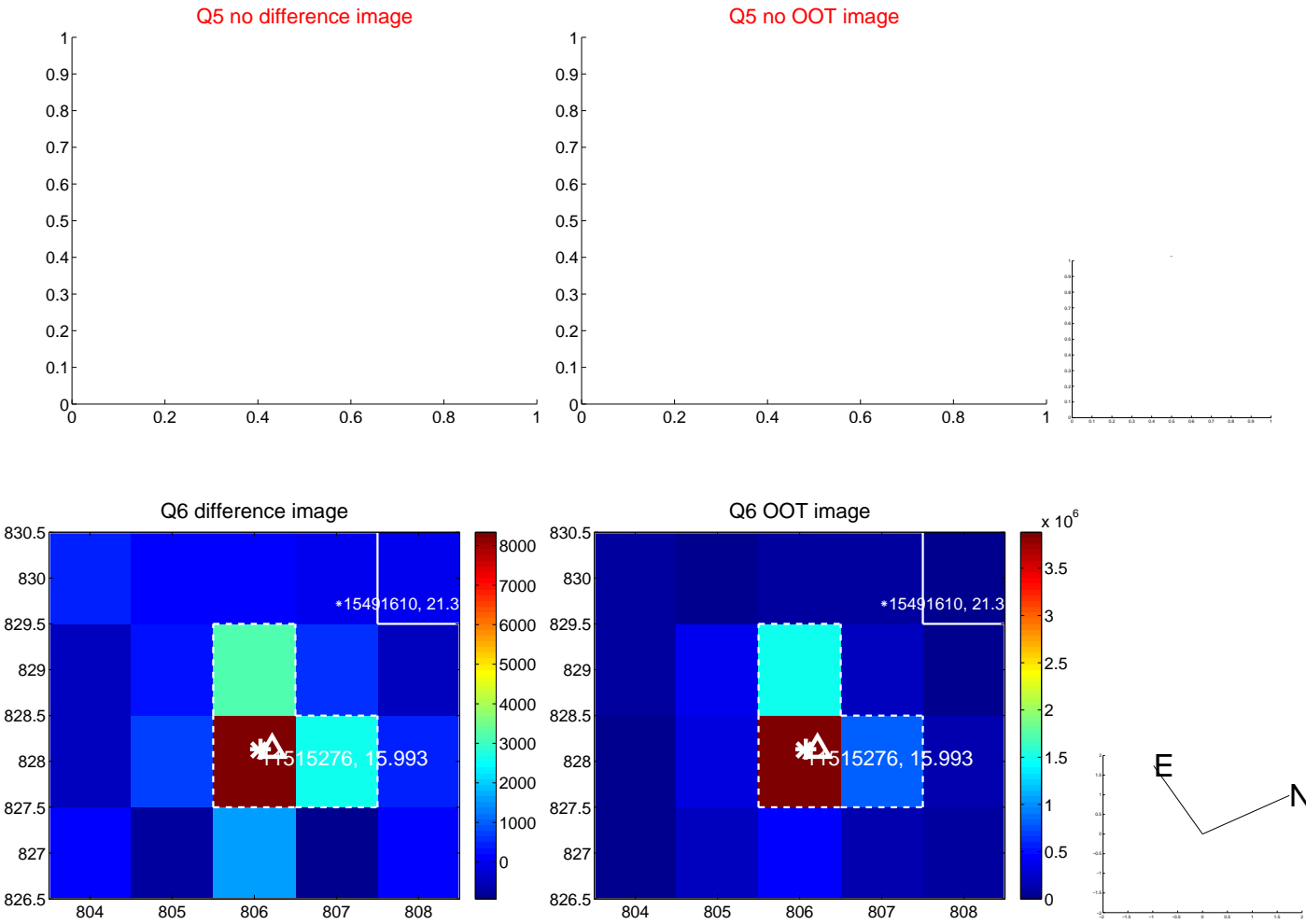


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

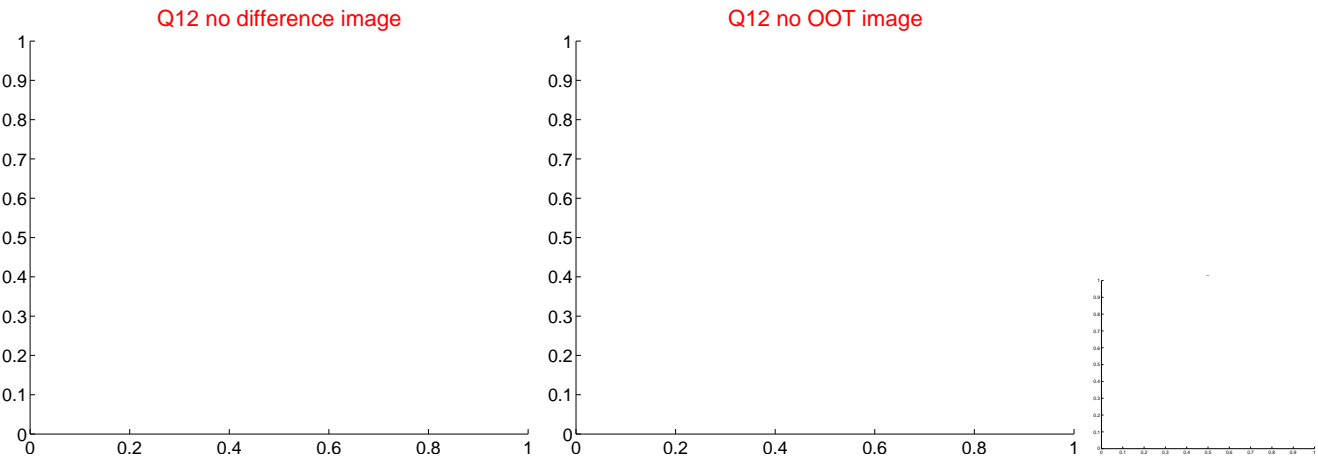
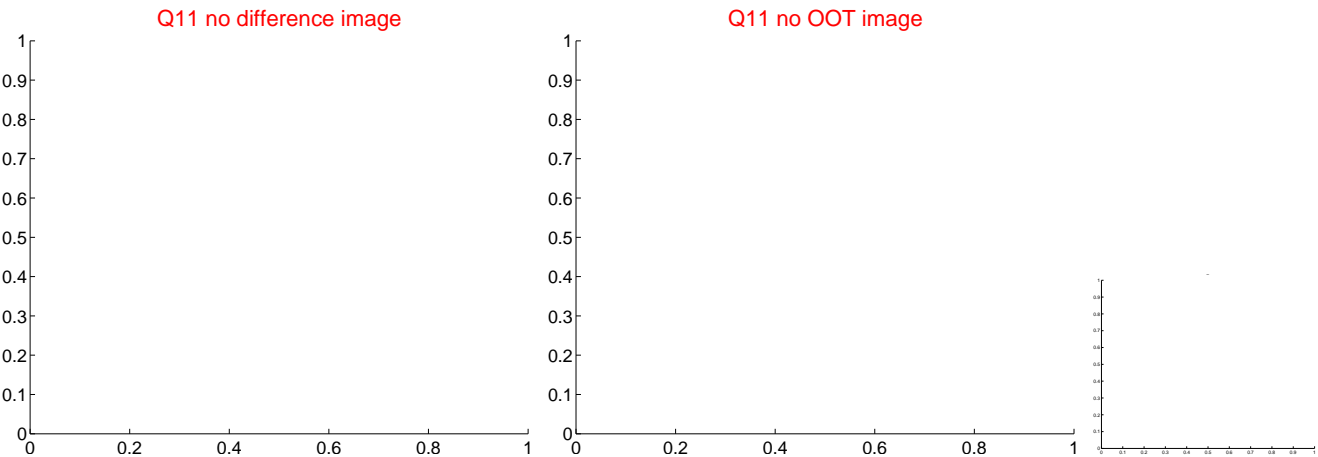
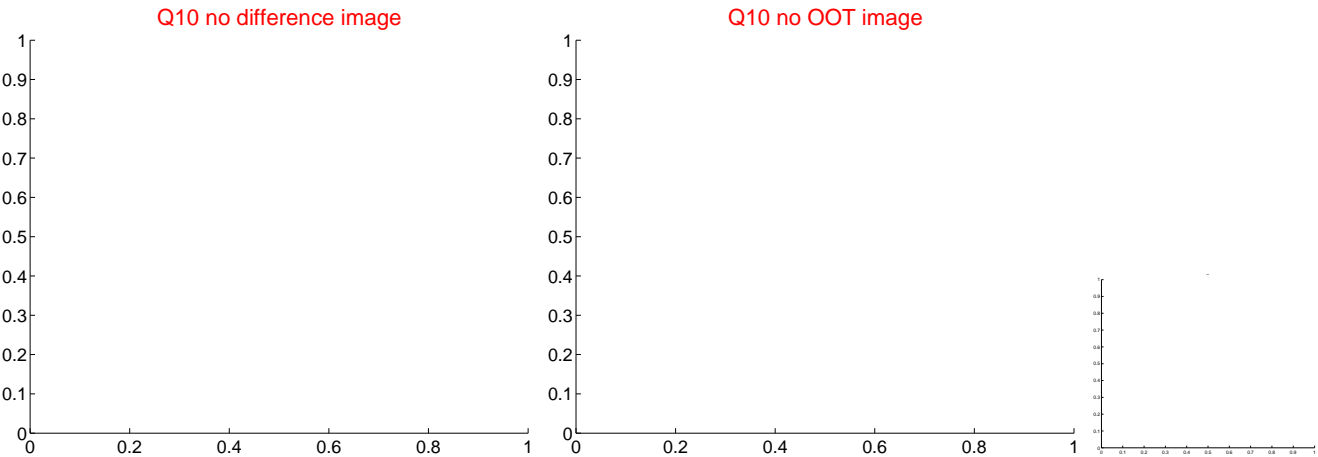
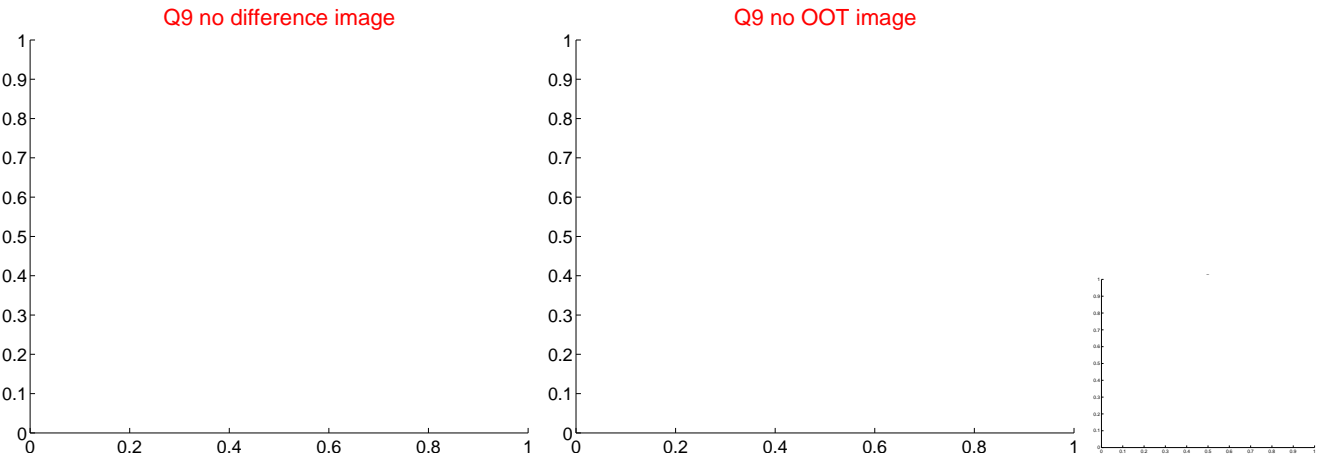
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



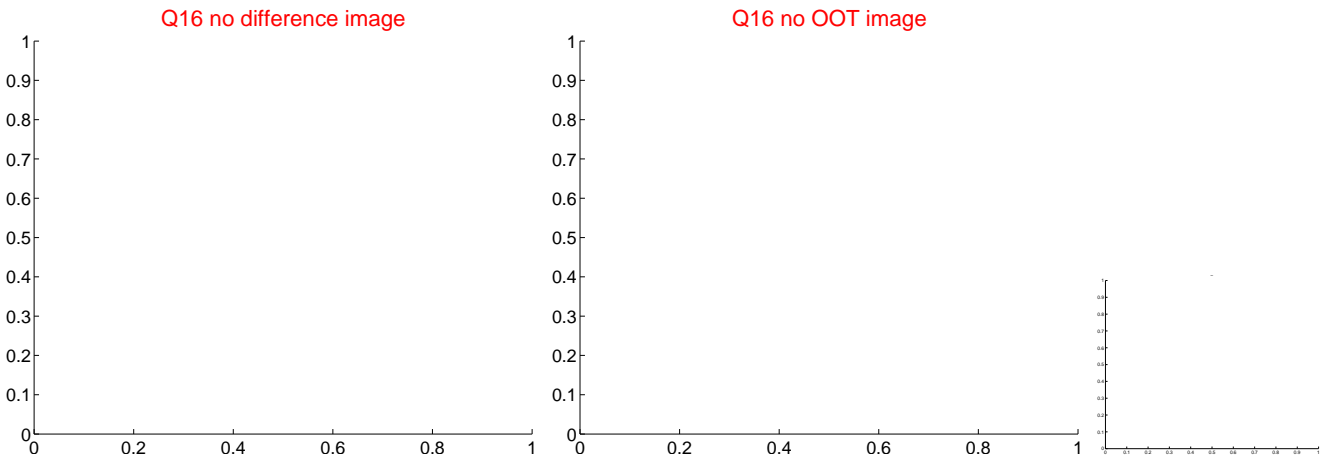
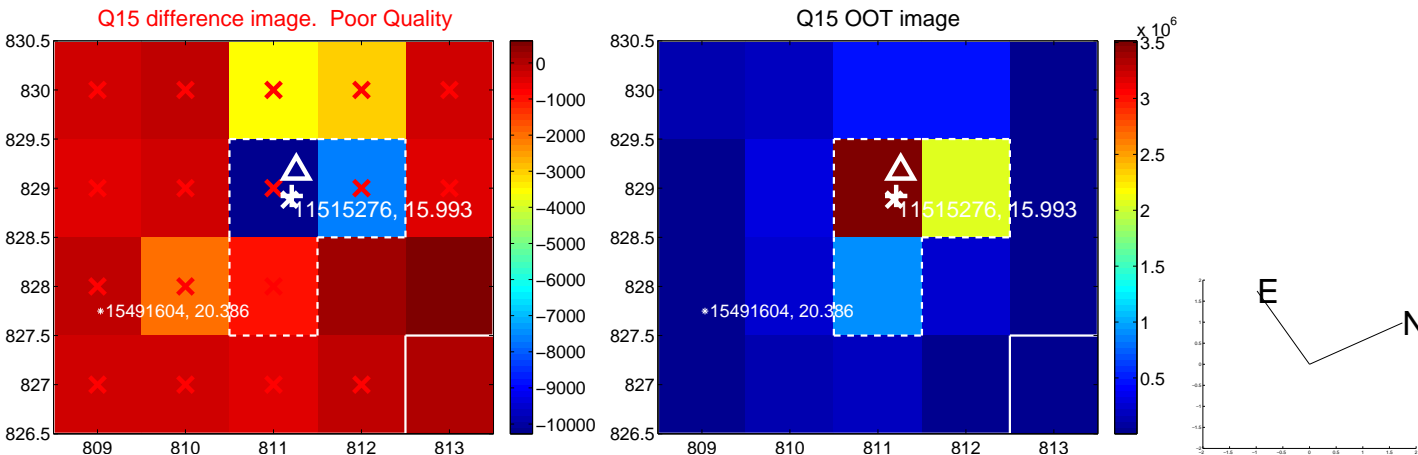
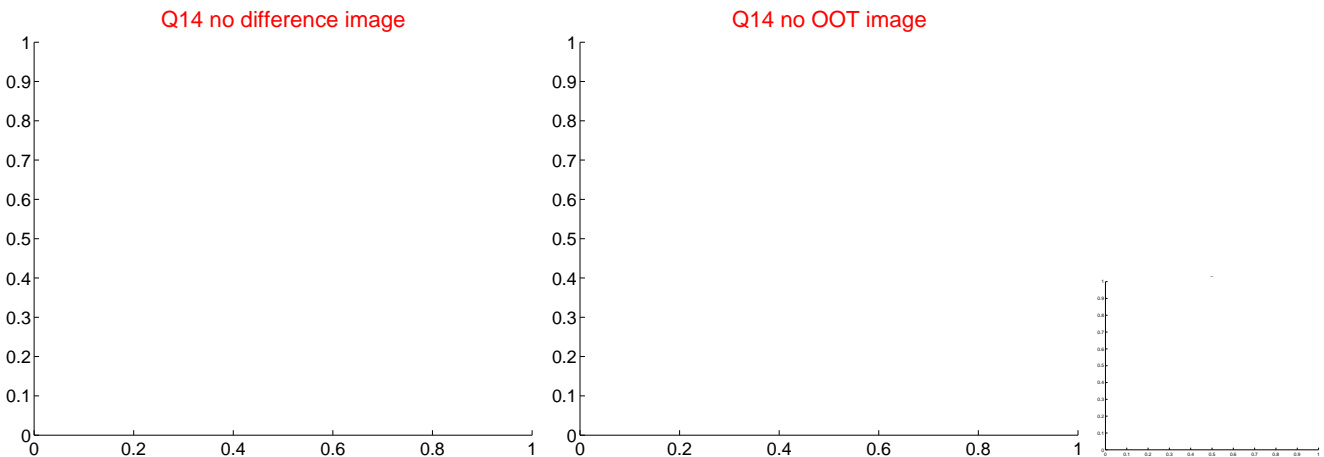
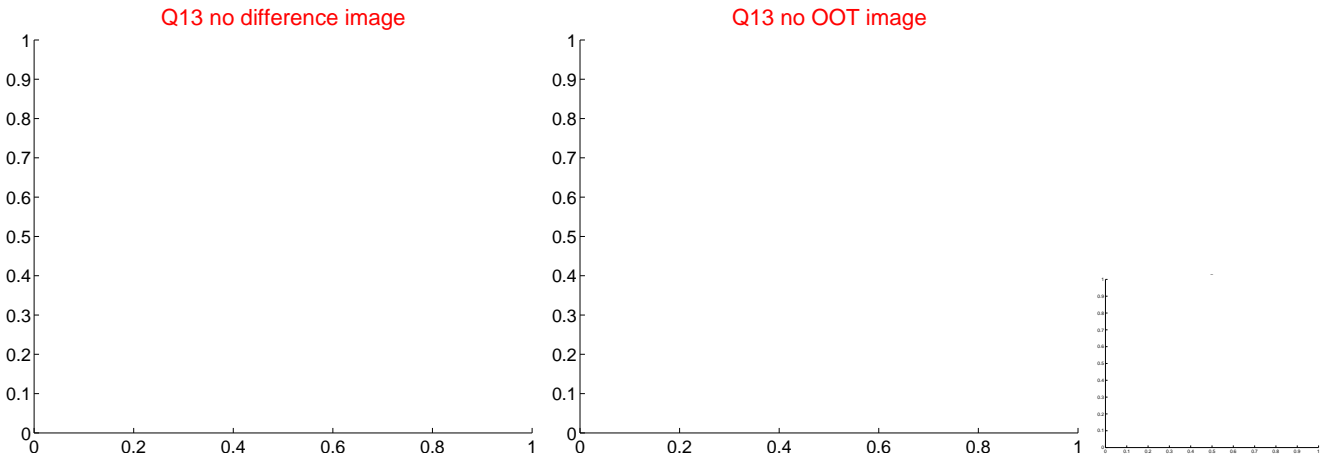
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



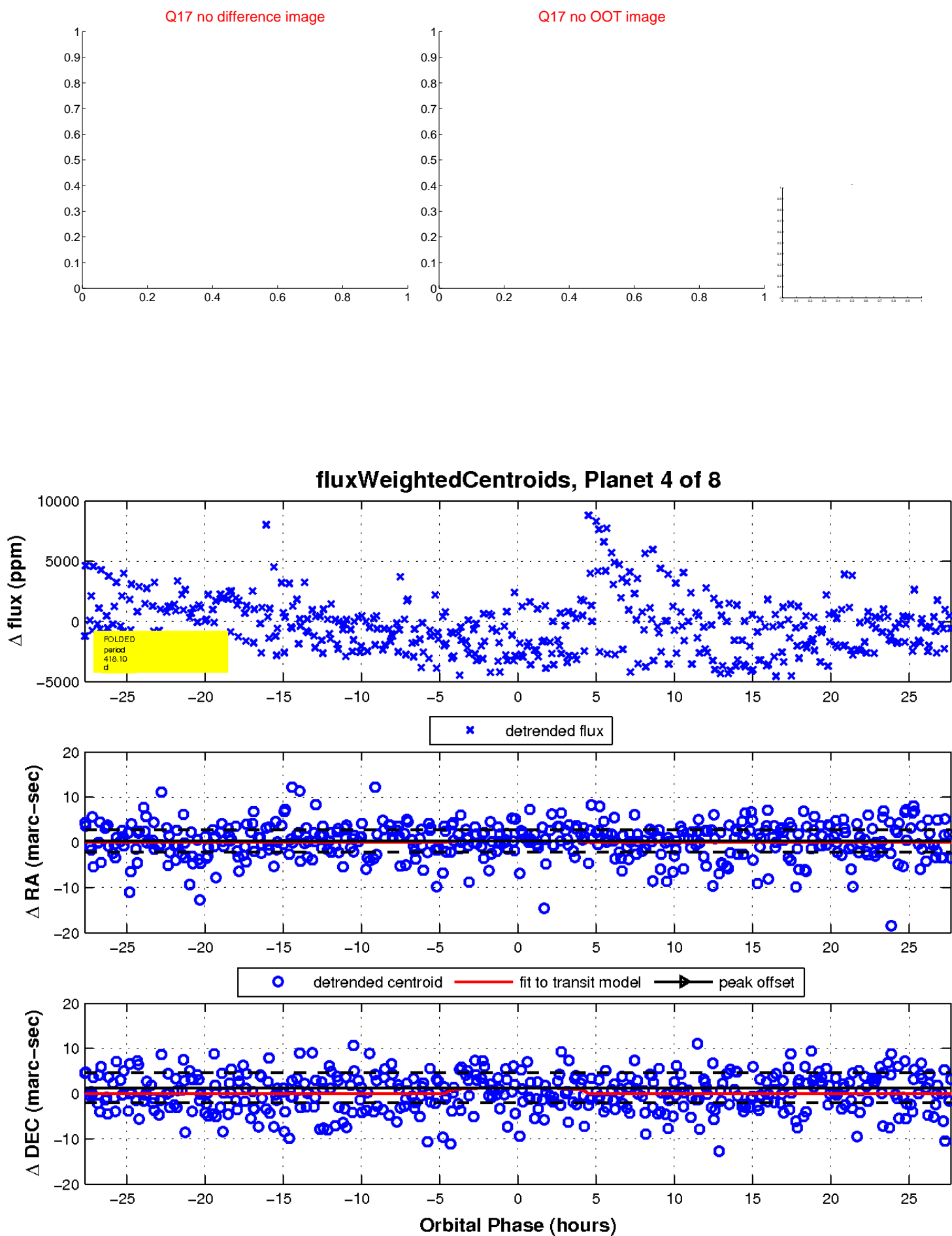
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



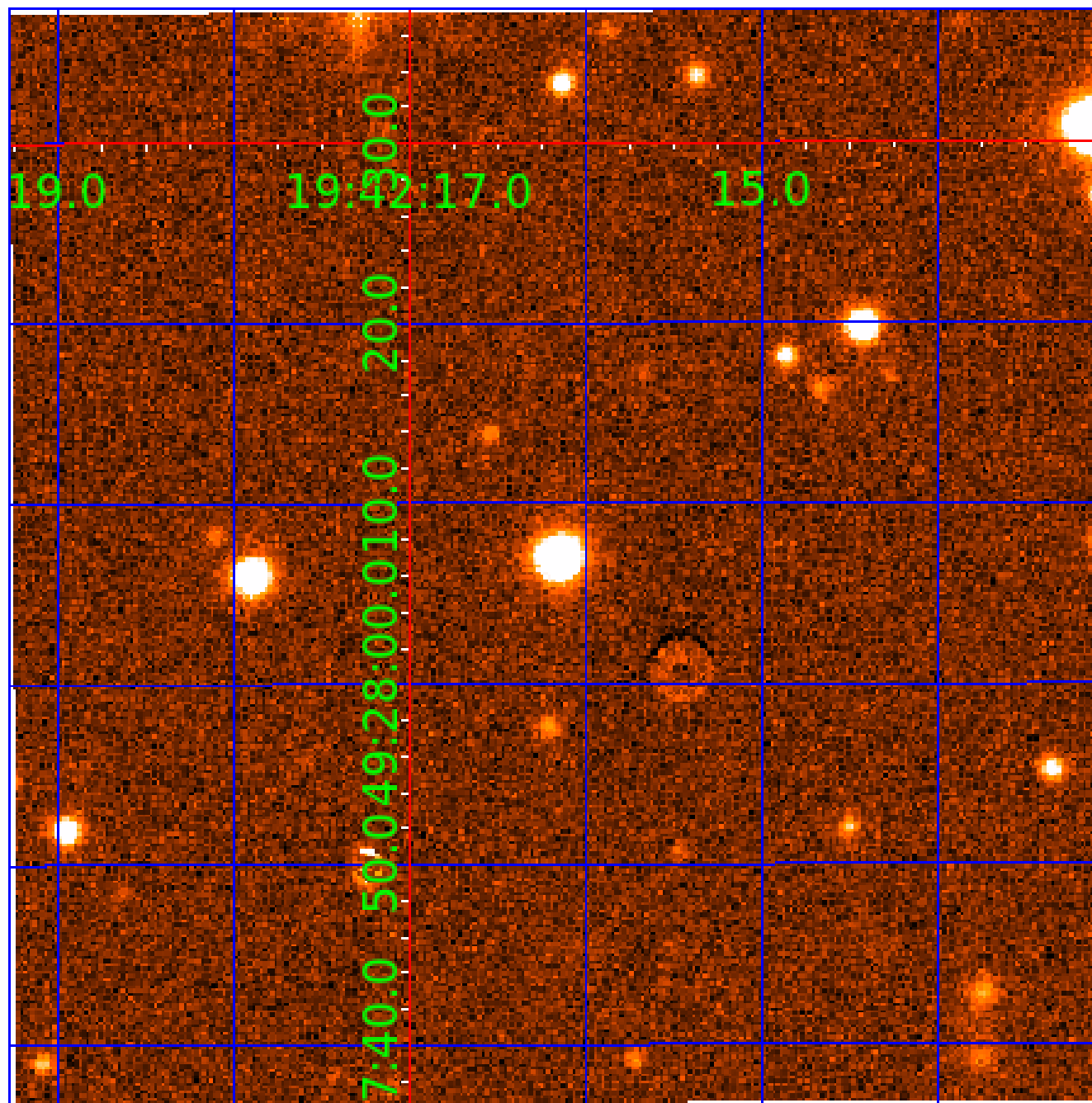
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





# UKIRT Image

Declination



# KIC 011515276

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011515276-01	OBS	No	403.712205	513.461034	3886.9	5.507	14.0	11.4	0.40	3618	3.06	0.04
011515276-03	OBS	No	489.164999	227.101526	3054.4	8.467	11.6	9.0	0.40	3618	2.61	0.03
011515276-04	OBS	No	418.095298	135.336485	2037.4	9.242	11.0	6.6	0.40	3618	1.82	0.04
011515276-05	OBS	No	652.627829	133.728275	2506.4	5.376	12.2	7.2	0.40	3618	2.00	0.02
011515276-06	OBS	No	385.371365	377.127951	3194.4	12.673	10.0	7.9	0.40	3618	2.25	0.04
011515276-07	OBS	No	464.331649	247.258780	2764.8	16.928	10.7	6.5	0.40	3618	2.22	0.03
011515276-08	OBS	No	347.438632	467.537482	2204.6	6.000	9.6	-1.0	0.40	3618	1.87	0.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011515276-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

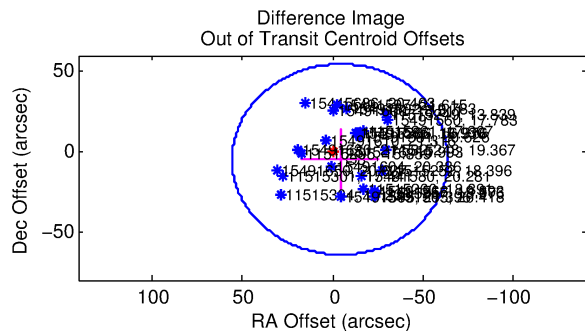
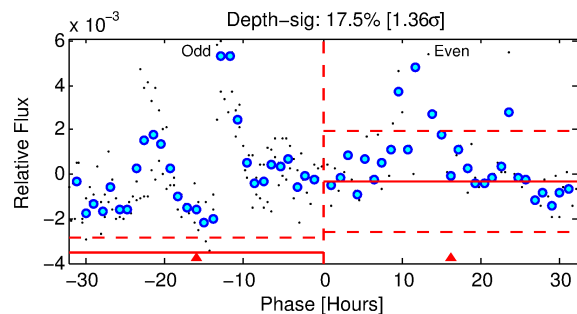
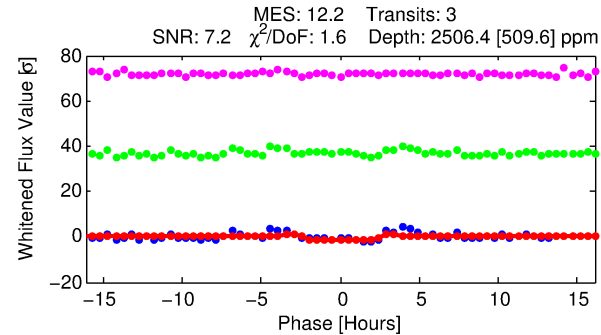
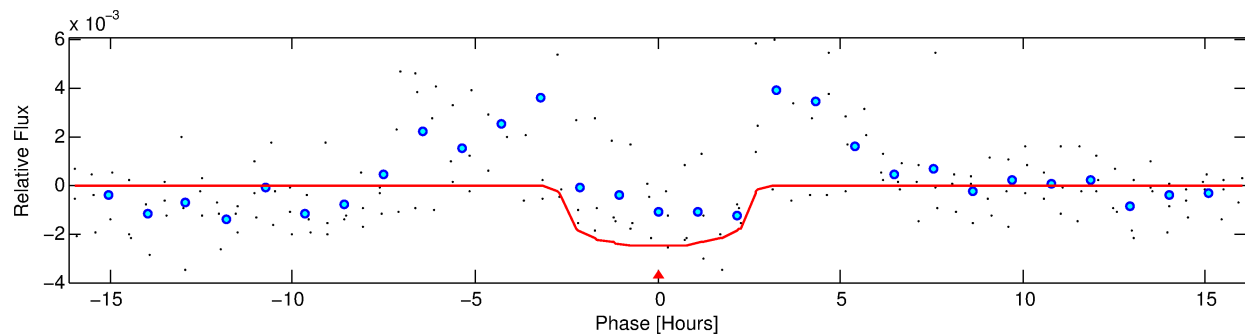
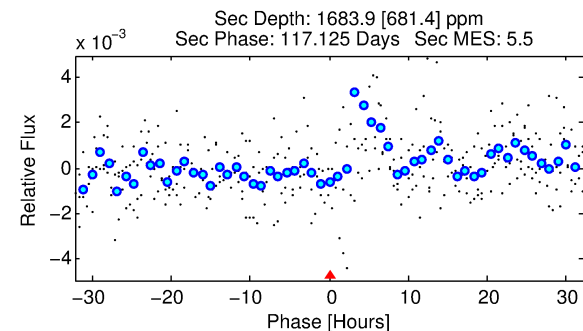
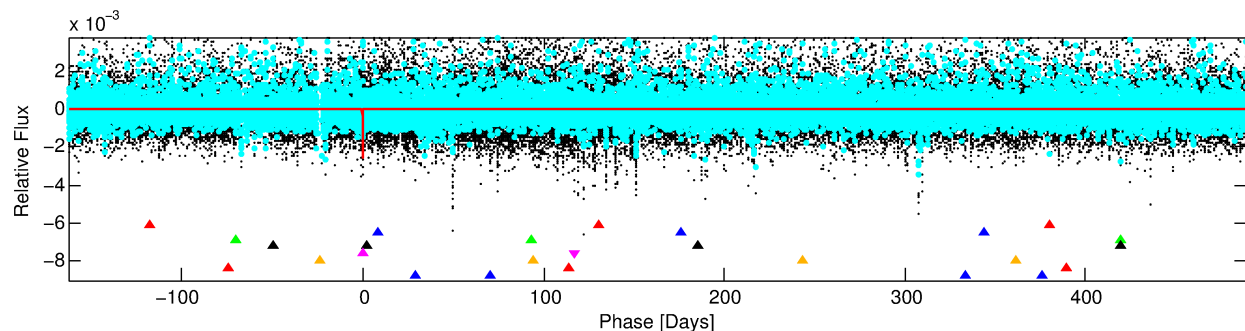
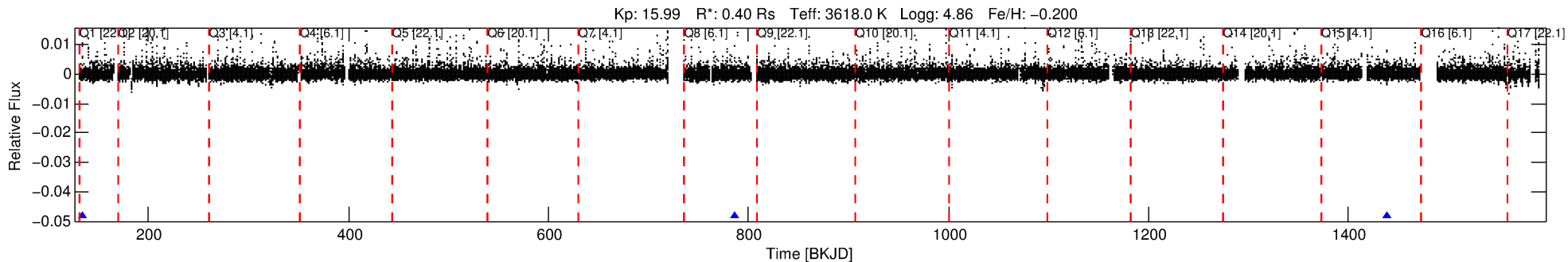
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011515276-05

No Significant Match Found

# DV One-Page Summary

KIC: 11515276 Candidate: 5 of 8 Period: 652.628 d



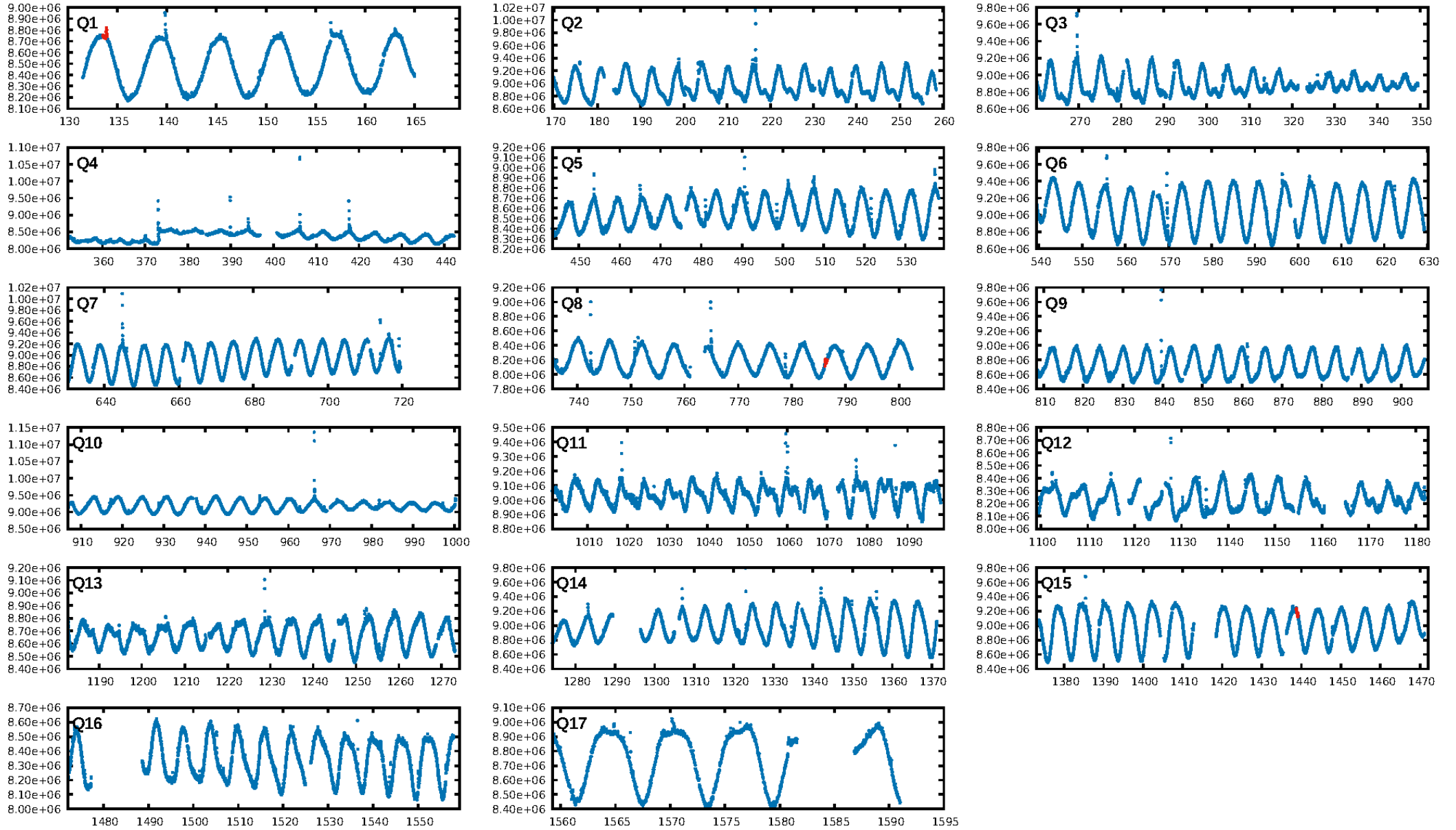
## DV Fit Results:

Period = 652.62783 [0.00891] d  
Epoch = 133.7283 [0.0109] BKJD  
Rp/R\* = 0.0457 [0.0584]  
a/R\* = 956.16 [5536.99]  
b = 0.17 [32.28]  
Seff = 0.02 [0.00]  
Teq = 96 [2] K  
Rp = 2.00 [2.56] Re  
a = 1.1055 [0.0651] AU  
Ag = 283221.44 [733649.48] [0.39σ]  
Teffp = 3429 [2220] K [1.50σ]

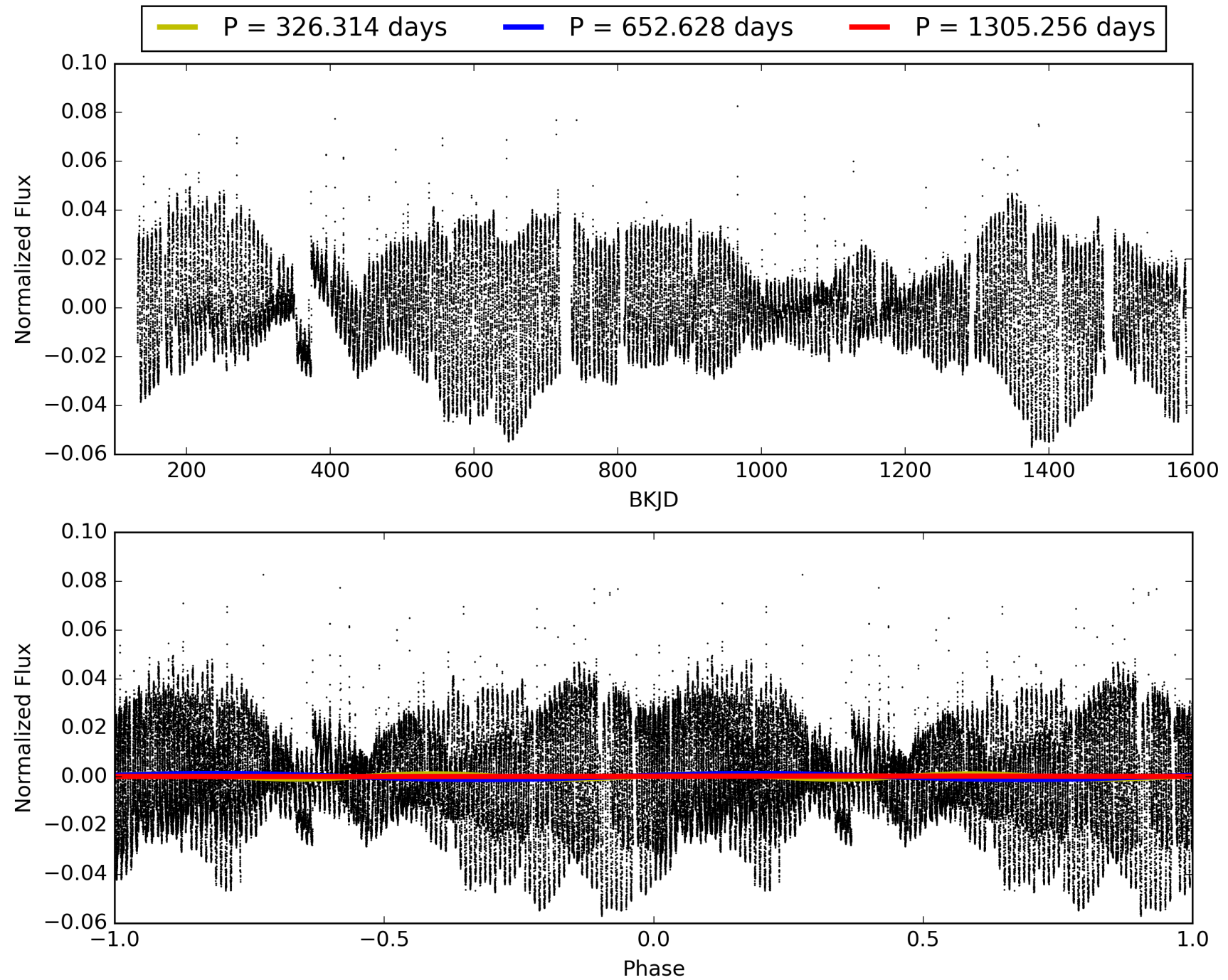
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [391.15σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 3.4%  
ModelChiSquareGof-sig: 58.2%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 0.7042  
Centroid-sig: 23.5%  
Centroid-so: 1.277 arcsec [1.29σ]  
OotOffset-rm: 6.382 arcsec [0.32σ]  
KicOffset-rm: 6.232 arcsec [0.31σ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 011515276-05, PDC Light Curves

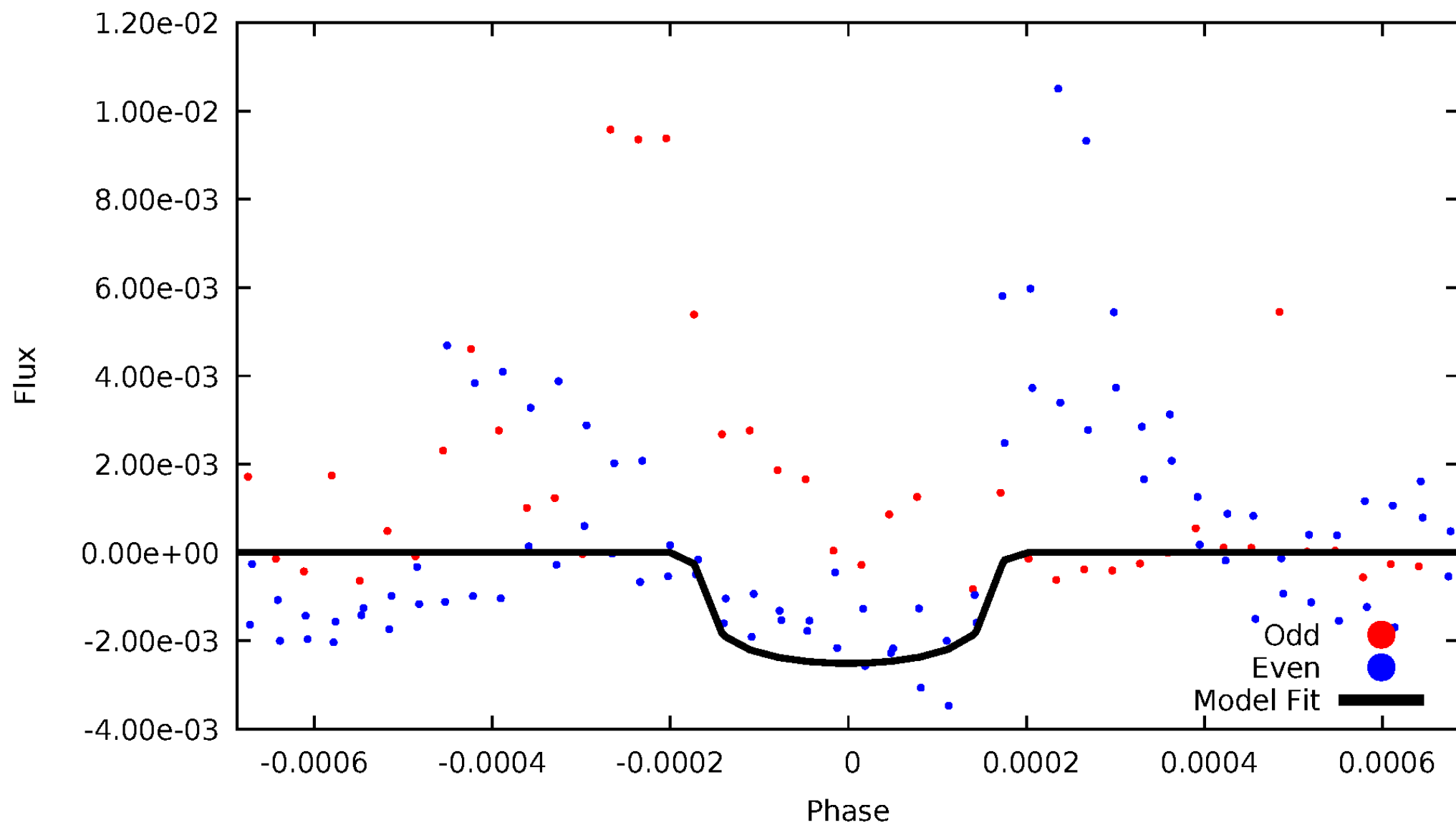


# TCE 011515276-05



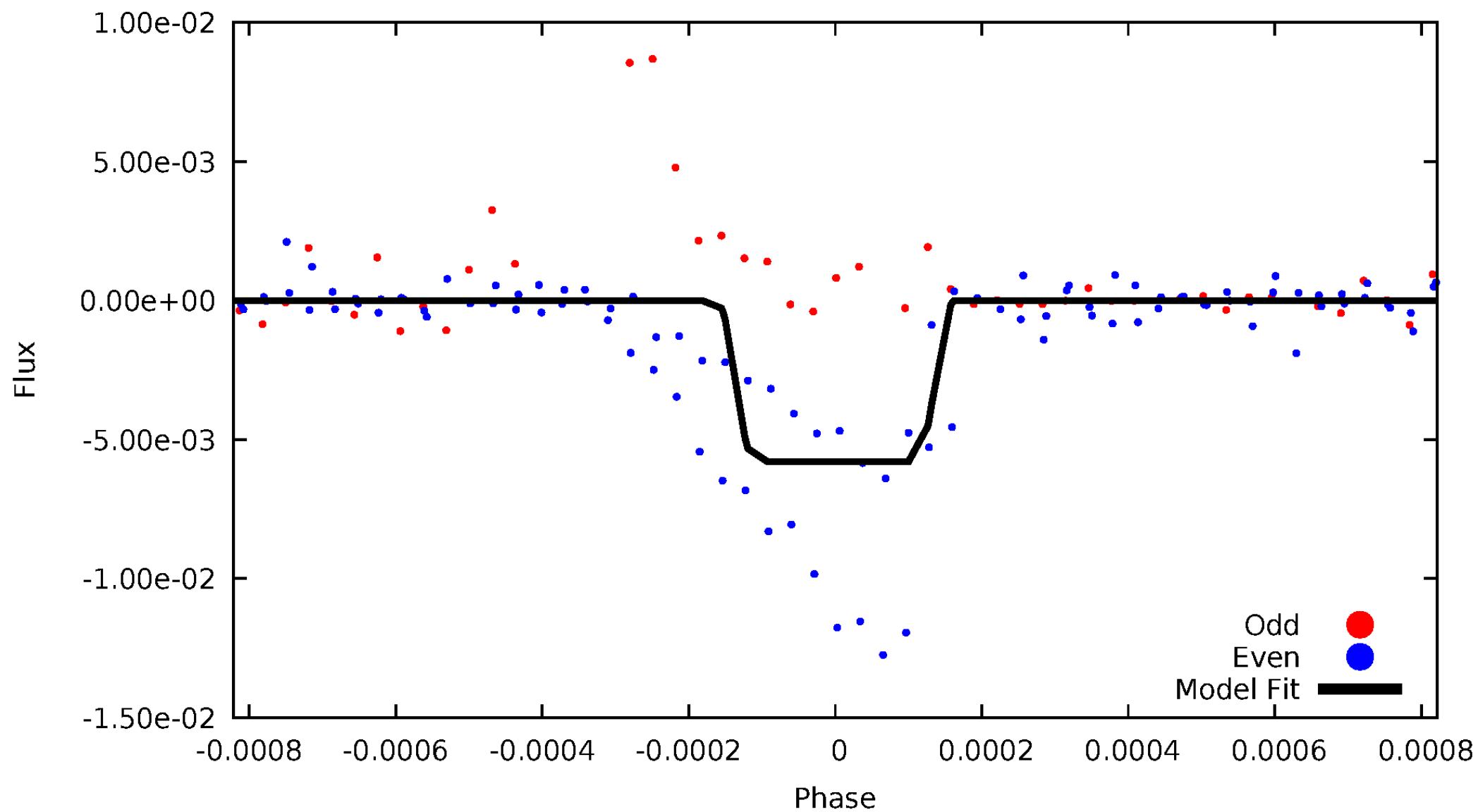
# DV Odd/Even

TCE 011515276-05



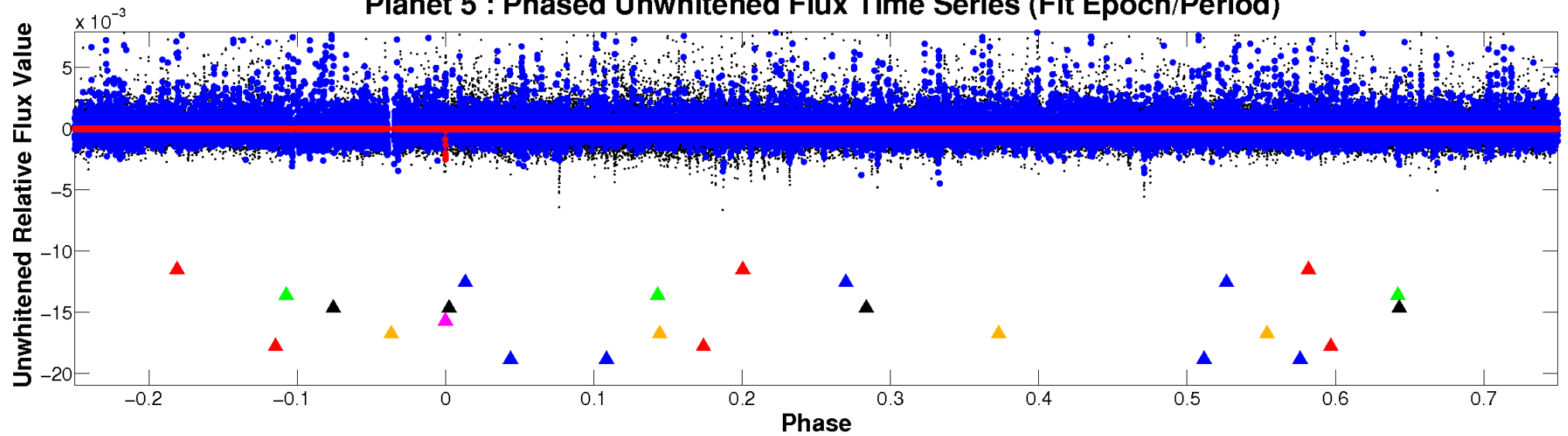
# ALT Odd/Even

TCE 011515276-05

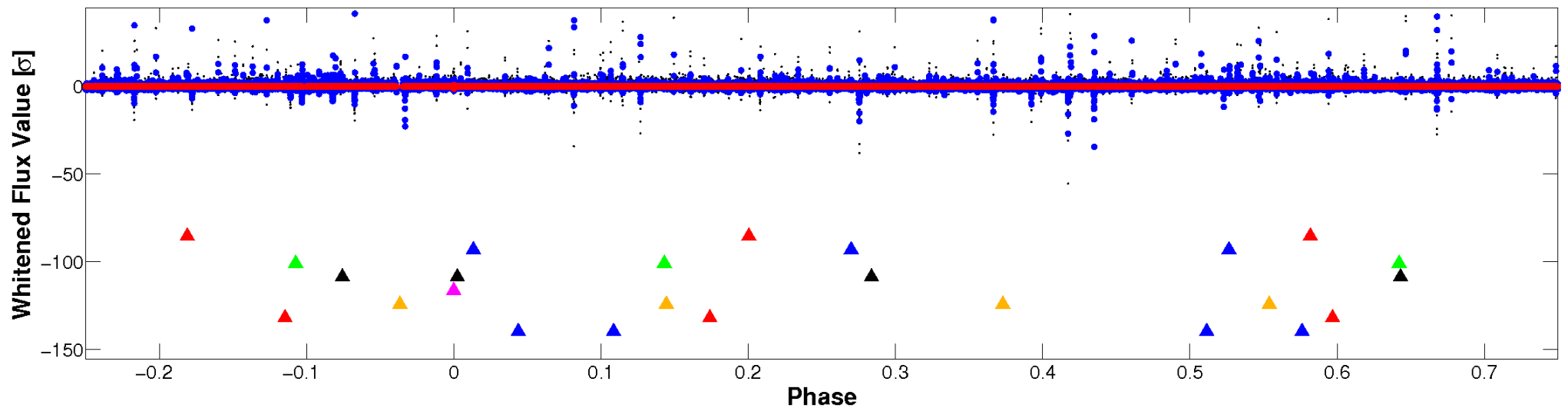


# Non-Whitened Vs. Whitened Light Curve

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



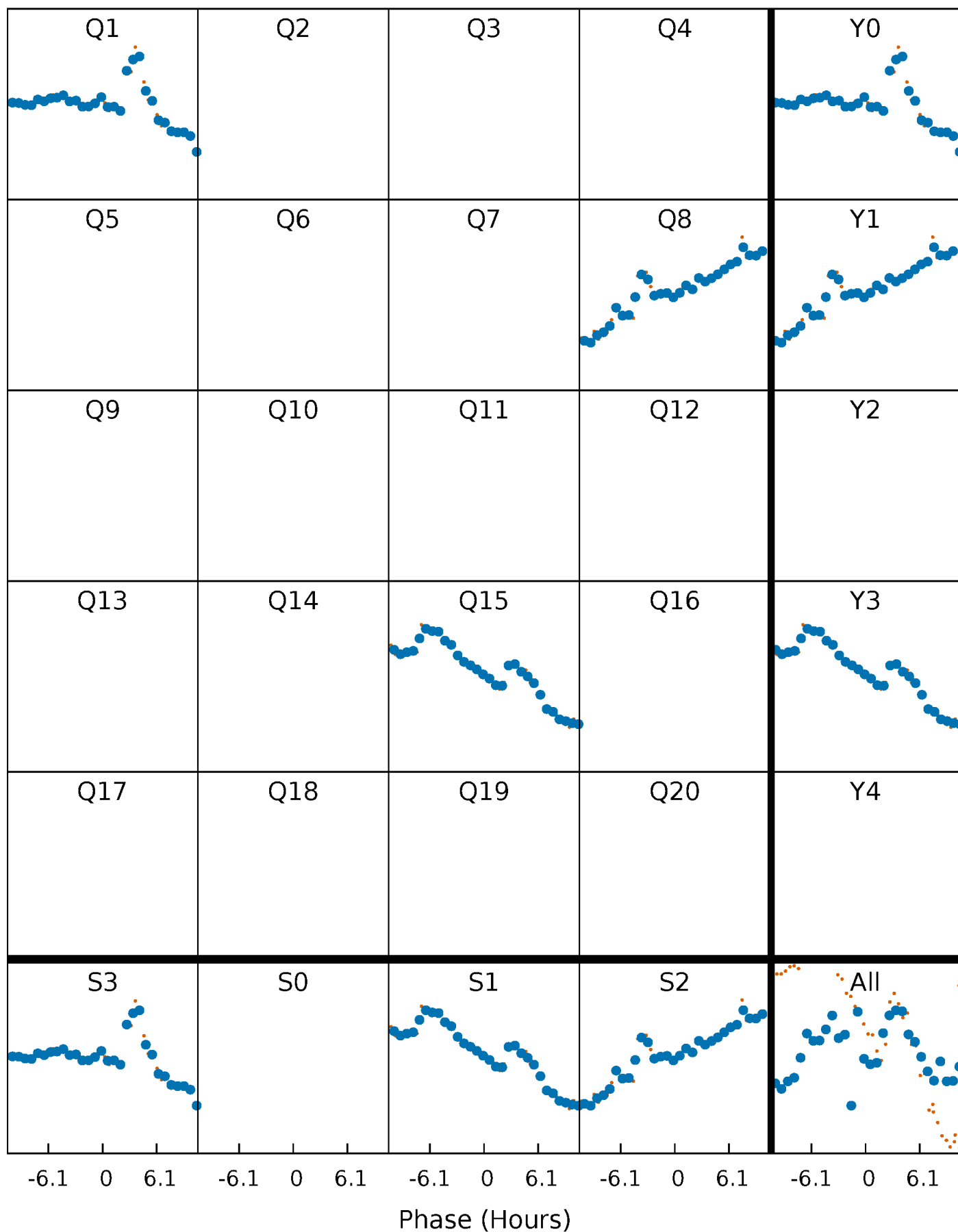
## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)





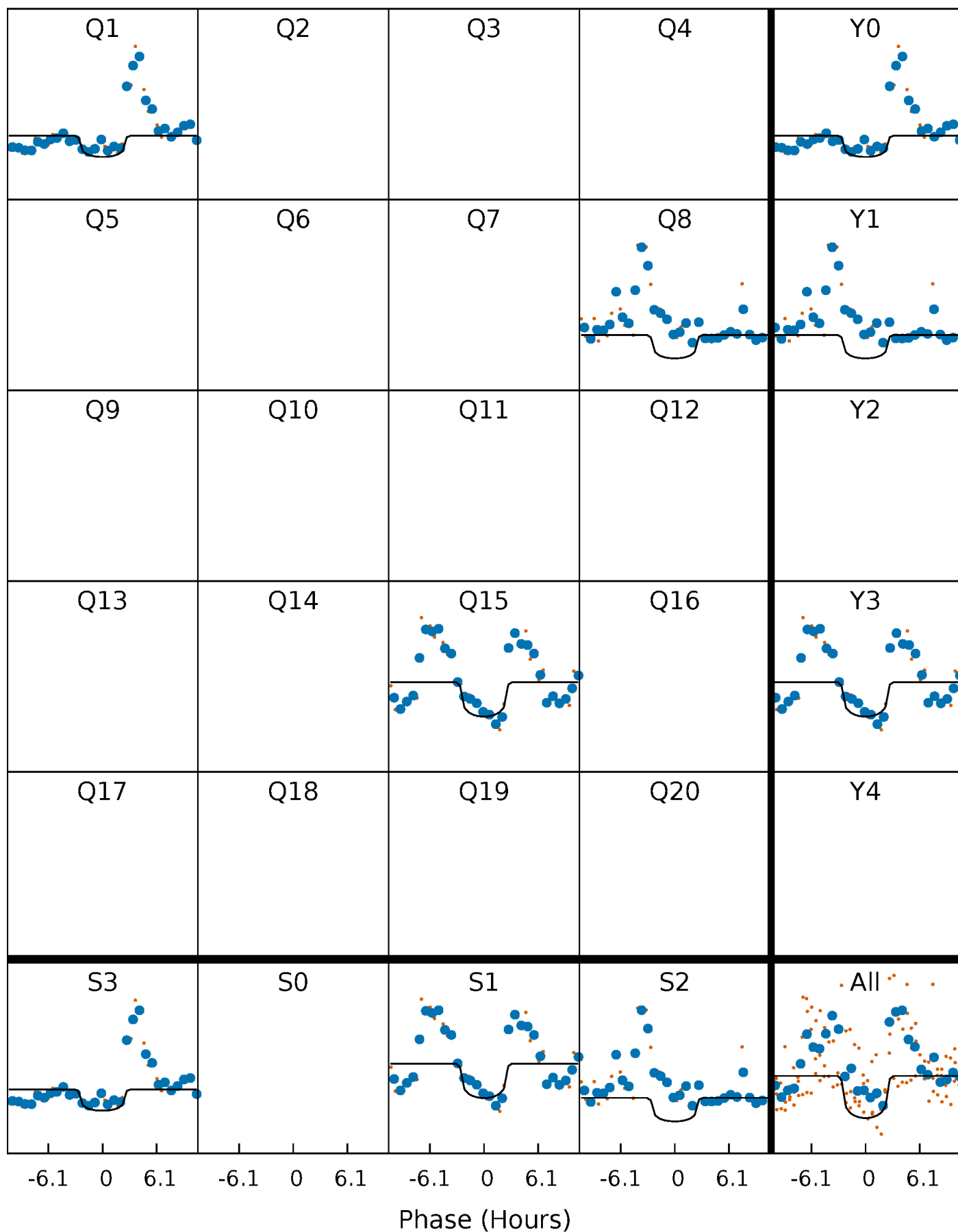
# PDC Quarter-Phased Transit Curves

TCE 011515276-05     $P=652.627829$  Days     $T_0=133.728275$  (BKJD)



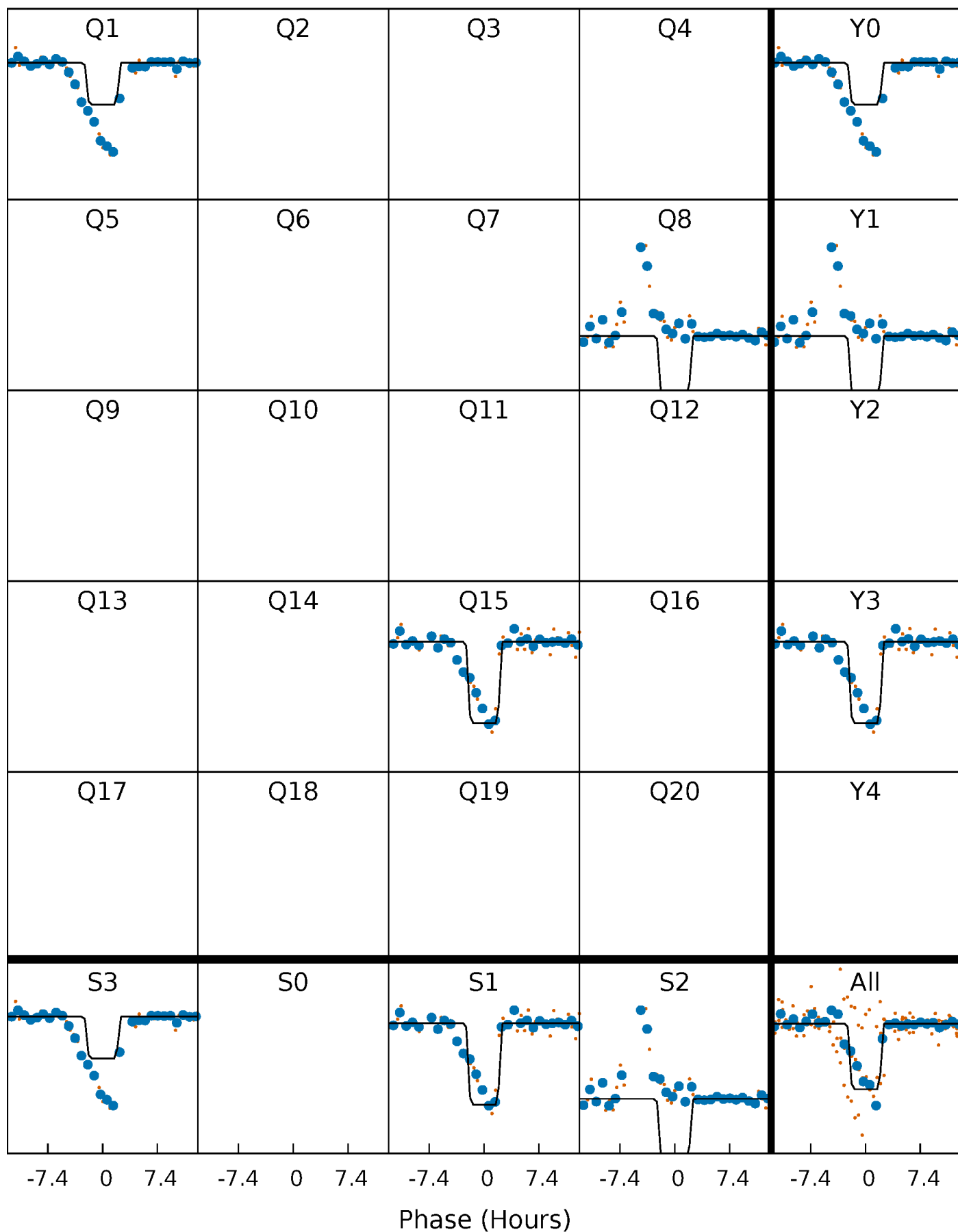
# DV Quarter-Phased Transit Curves

TCE 011515276-05     $P=652.627829$  Days     $T_0=133.728275$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

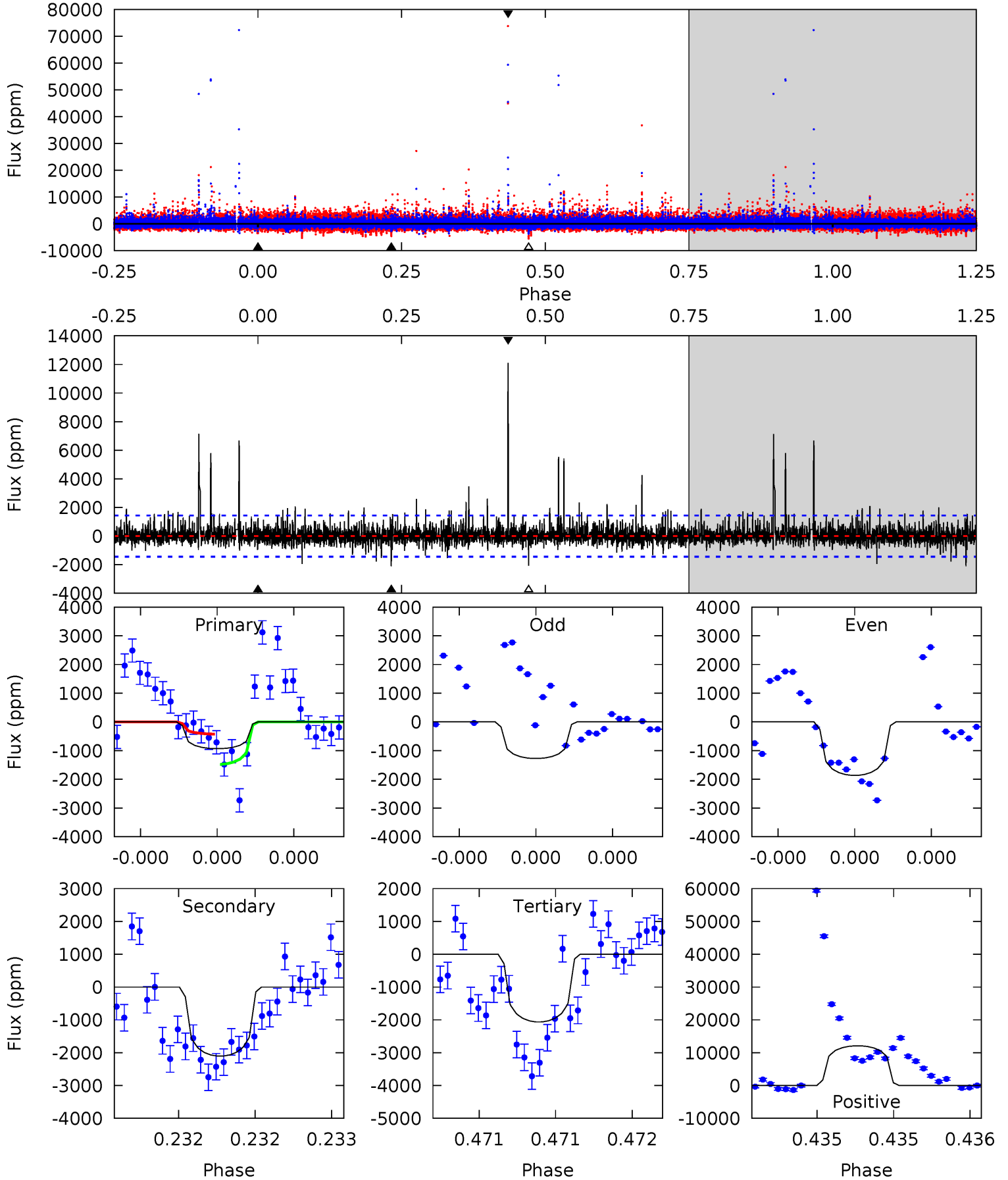
TCE 011515276-05     $P=652.627473$  Days     $T_0=133.757793$  (BKJD)



# DV Model-Shift Uniqueness Test

011515276-05, P = 652.627829 Days, E = 133.728275 Days

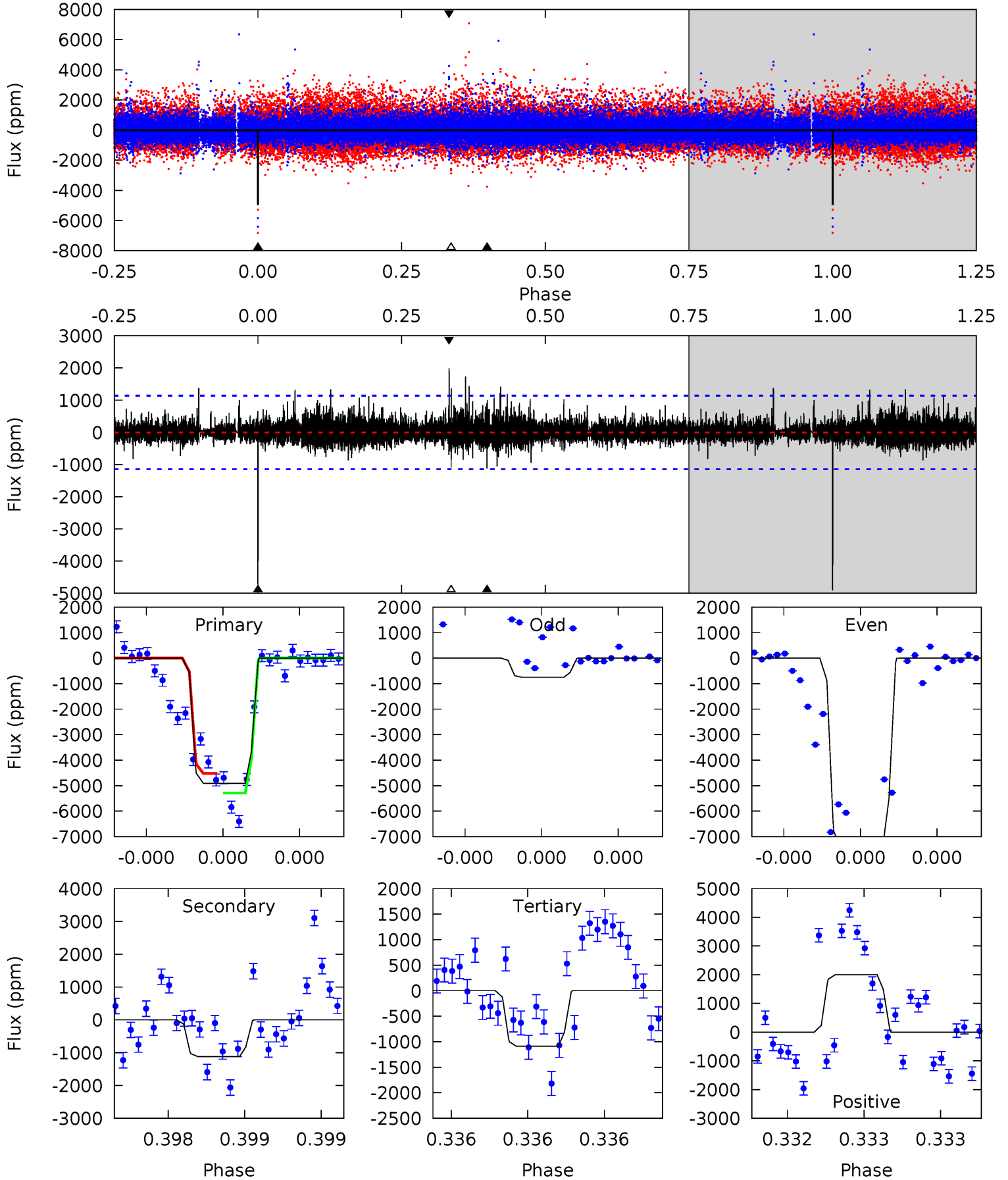
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.65	8.22	8.07	47.3	5.62	3.56	2.17	-4.42	-43.6	0.16	-39.1	0.67	0.53	0.85	2.10



# Alt Model-Shift Uniqueness Test

011515276-05, P = 652.627473 Days, E = 133.757793 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
24.3	5.53	5.40	9.92	5.64	3.58	0.98	18.9	14.4	0.14	-4.39	20.2	1.03	0.29	2.02



### Stellar Parameters For KIC 011515276

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$3618^{+43}_{-48}$	$4.858^{+0.033}_{-0.033}$	$-0.200^{+0.100}_{-0.100}$	$0.401^{+0.029}_{-0.032}$	$0.423^{+0.027}_{-0.038}$	$9.278^{+1.660}_{-1.289}$
	+1%/-1%	+1%/-1%	+50%/-50%	+7%/-8%	+6%/-9%	+18%/-14%
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 011515276-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2103 \pm 256$	$2.76^{+2.18}_{-1.73}$	$134^{+2}_{-3}$	$3276^{+1345}_{-499}$	$189992^{+1202637}_{-132466}$
Alt.	$-1117 \pm 202$	$3.78^{+2.16}_{-2.29}$	$134^{+3}_{-3}$	$2742^{+809}_{-305}$	$52958^{+249570}_{-32258}$

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

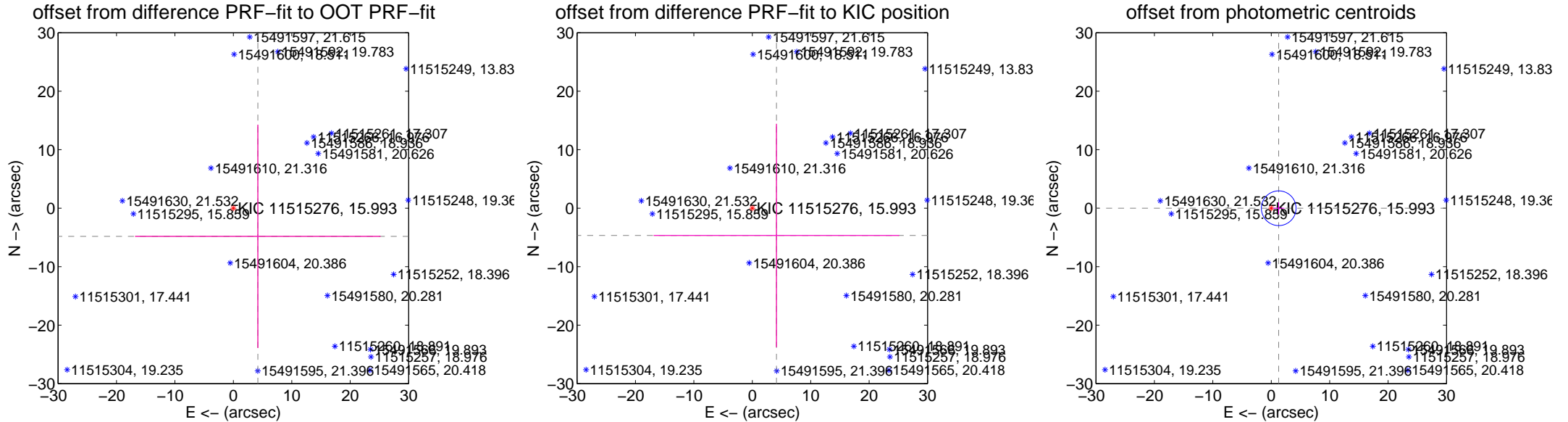
## DV Centroid Data

Supplemental centroid analysis for 011515276-05. Kepler magnitude: 15.99. Transit SNR 7.16

There are 0 quarters with good PRF difference image offsets

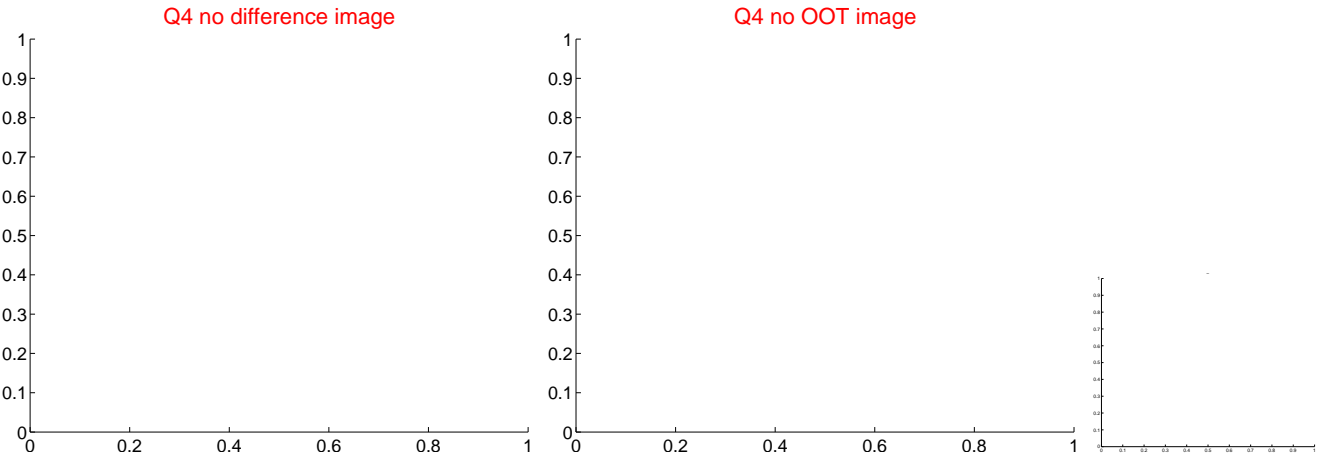
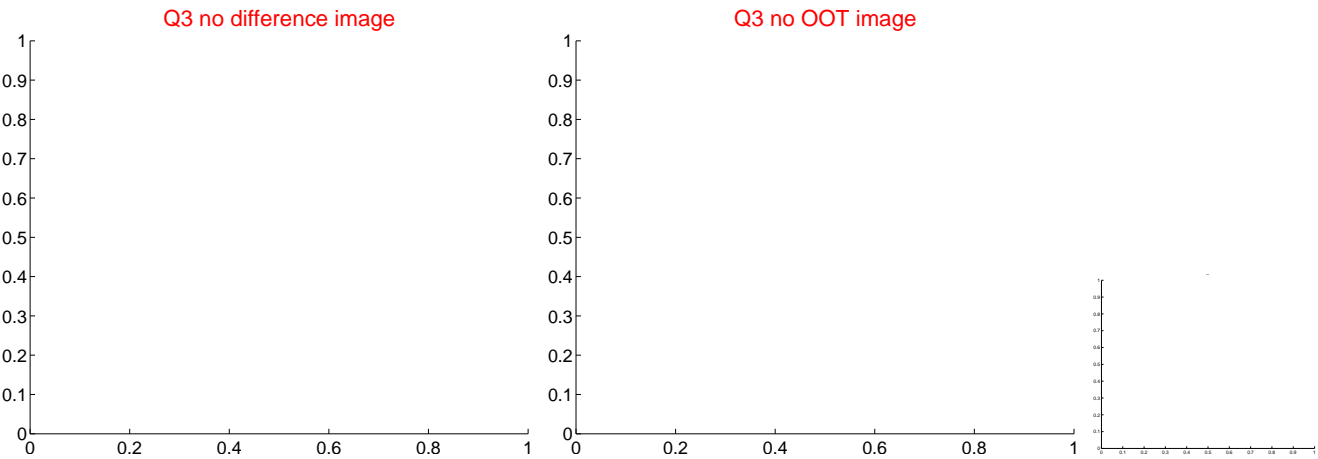
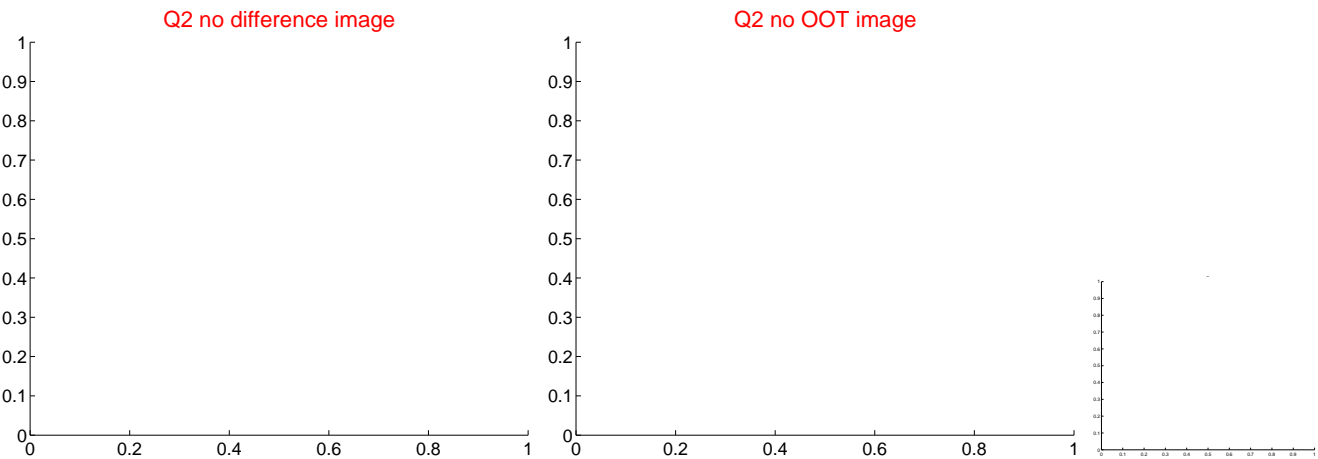
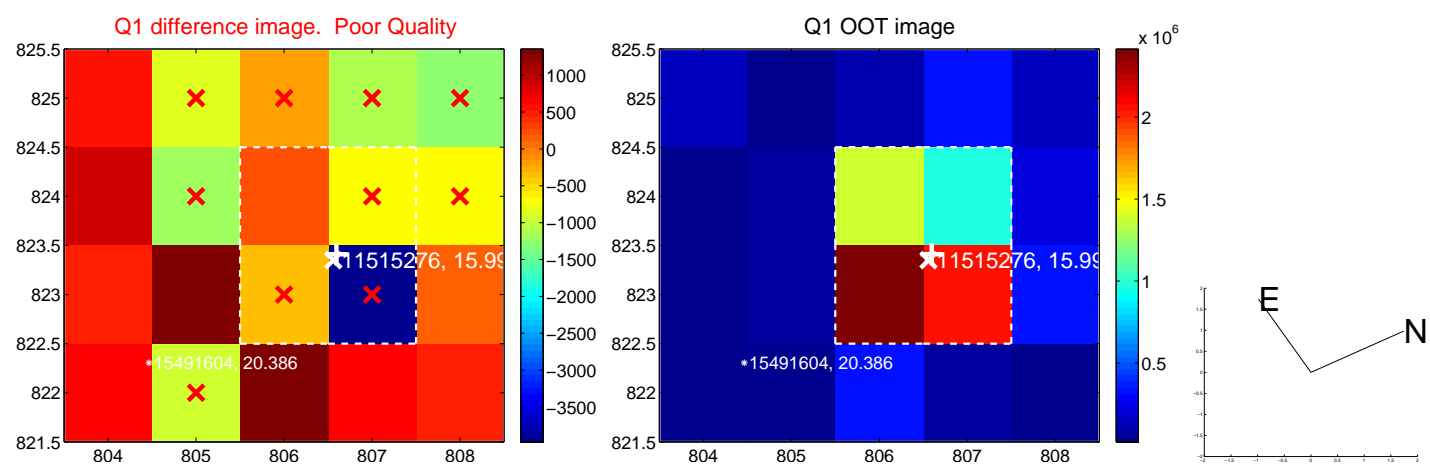
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.382 \pm 19.939$	0.32	$-4.189 \pm 21.008$	$-4.815 \pm 19.090$
PRF-fit source offset from KIC position	$6.232 \pm 19.956$	0.31	$-4.132 \pm 21.008$	$-4.665 \pm 19.090$
photometric centroid source offset	$1.28 \pm 0.99$	1.29	$-1.28 \pm 0.99$	$-0.01 \pm 1.06$



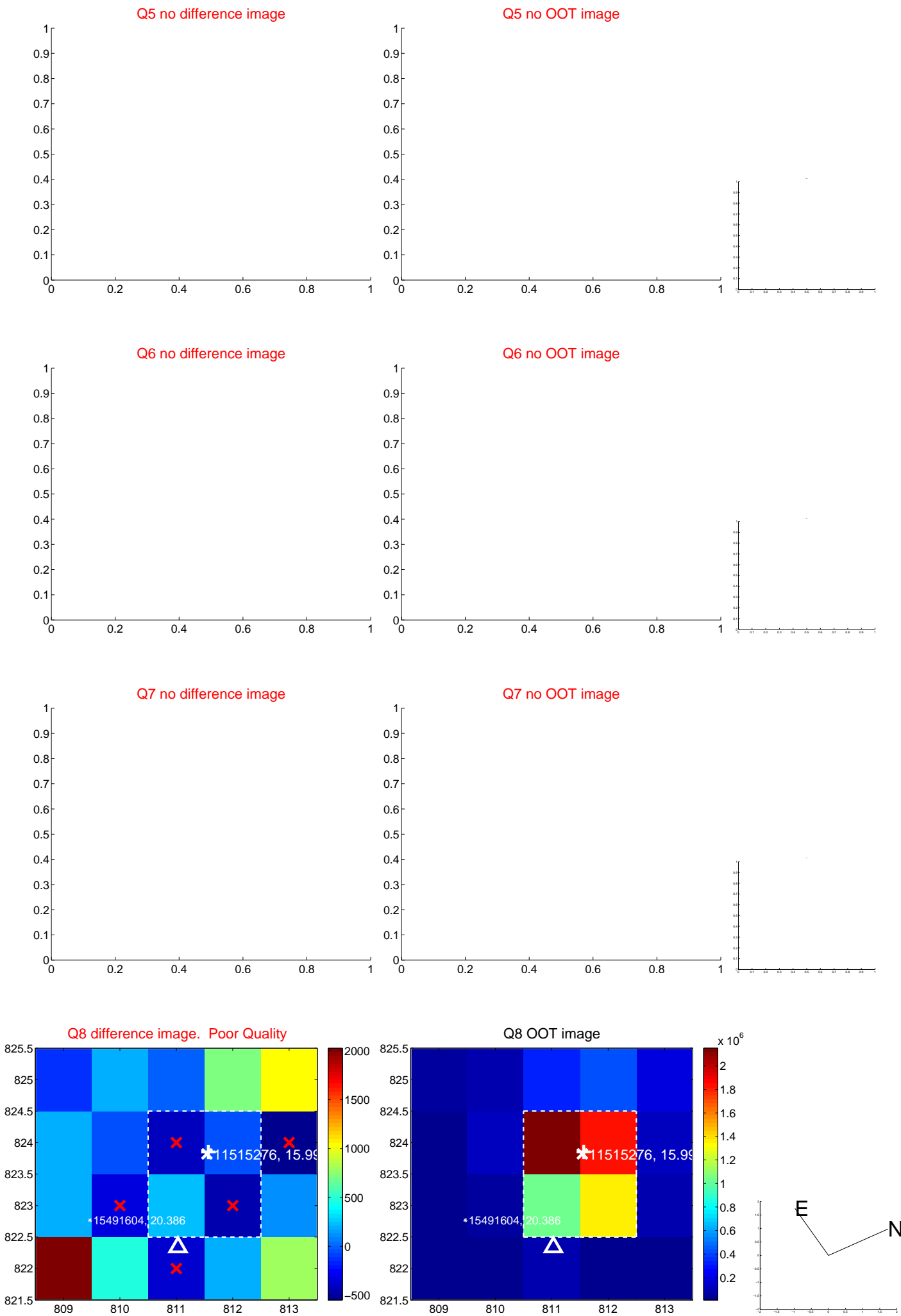
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

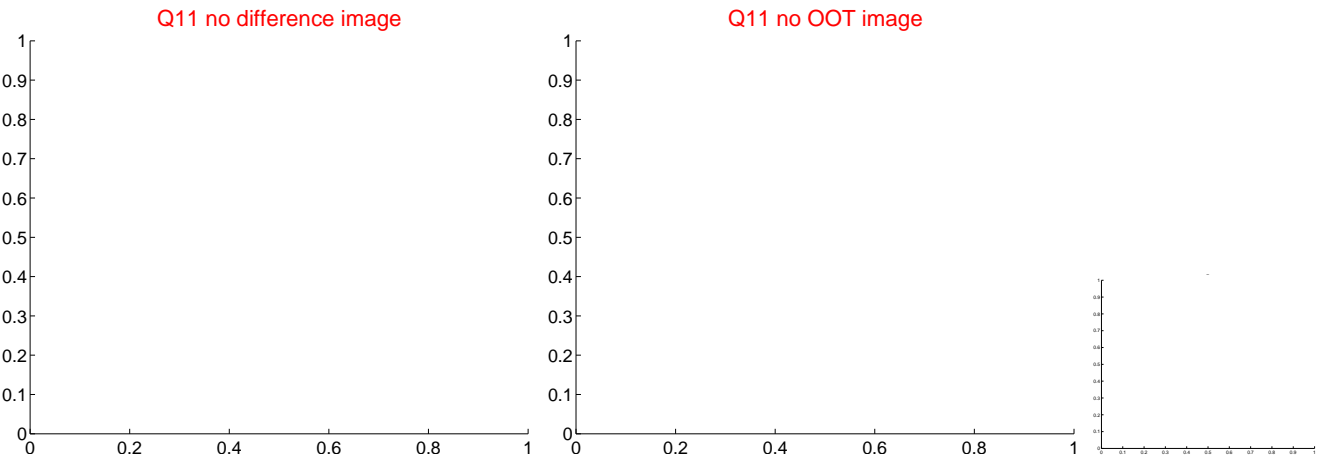




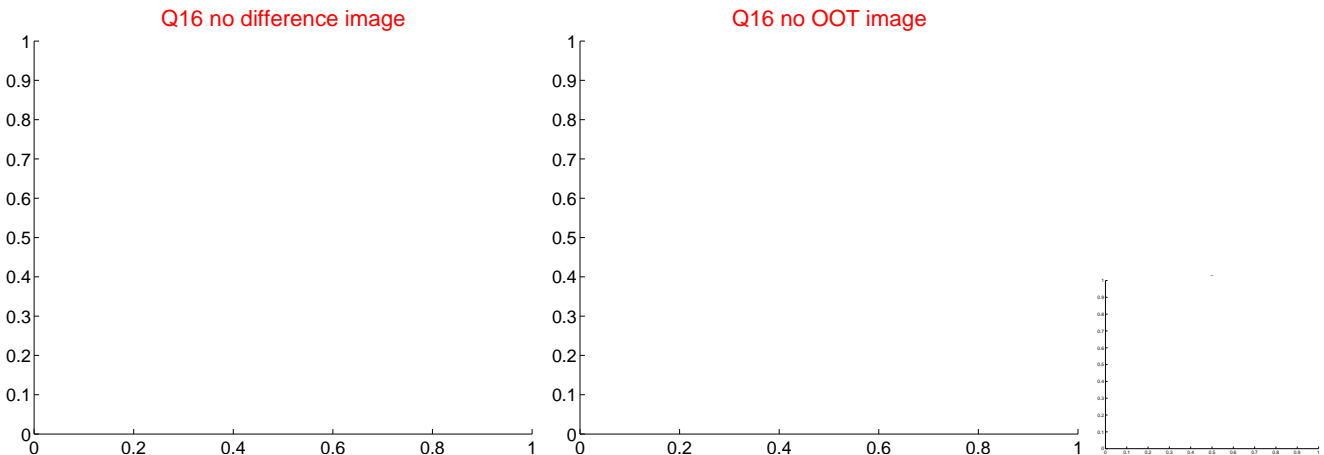
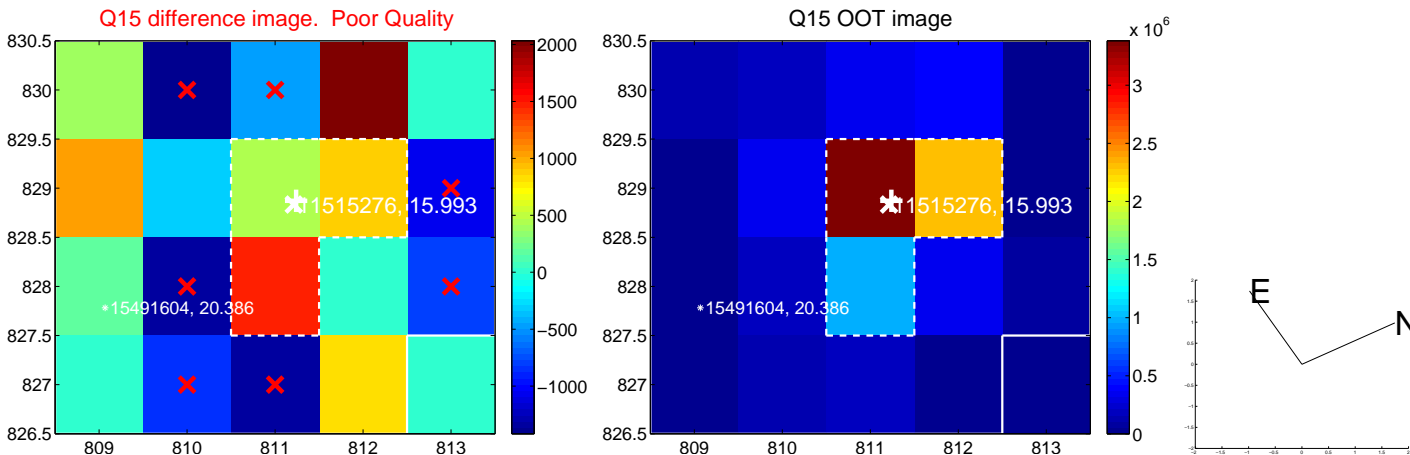
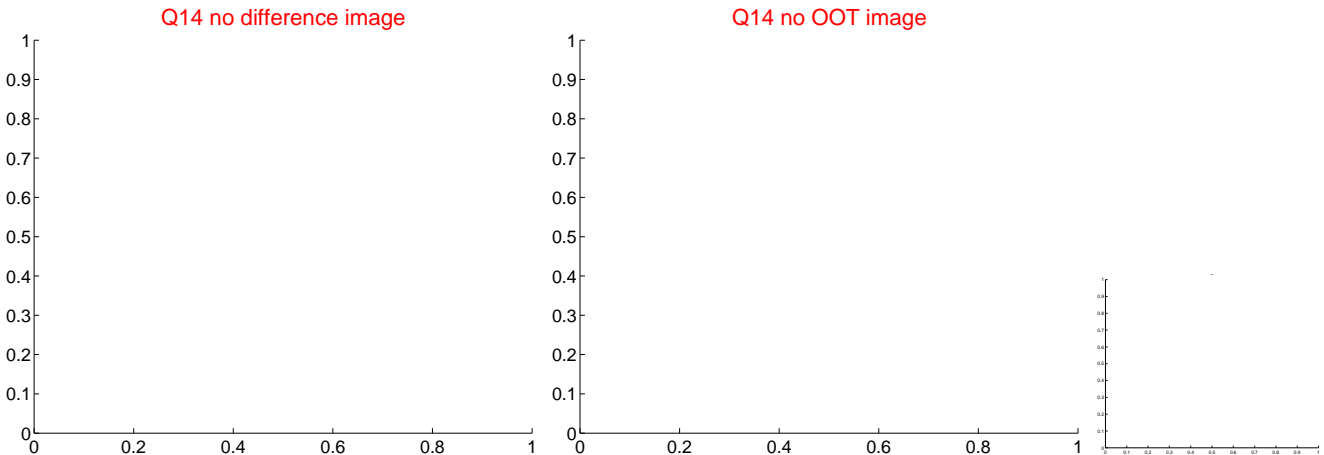
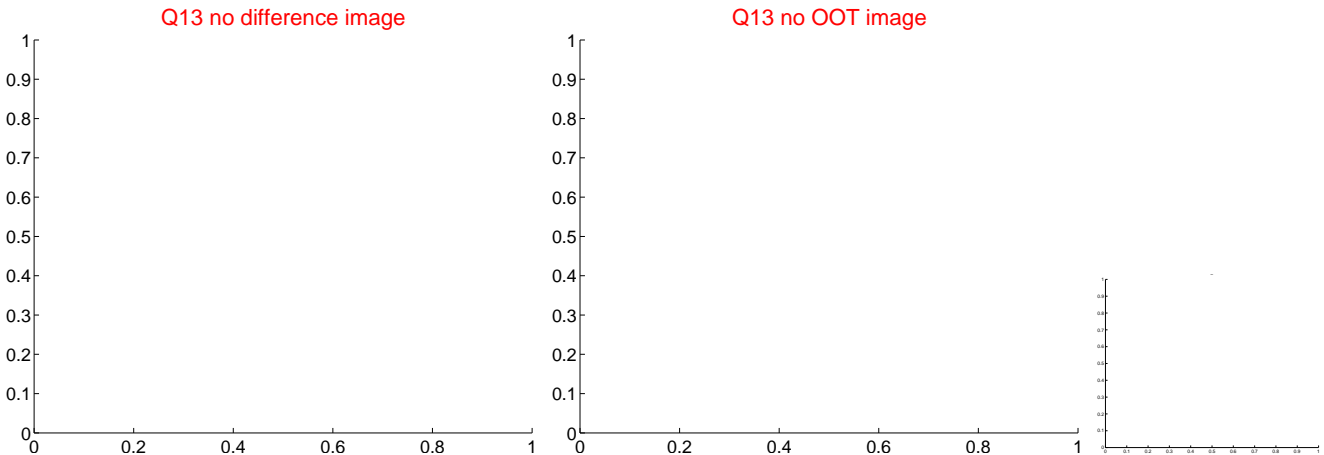
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



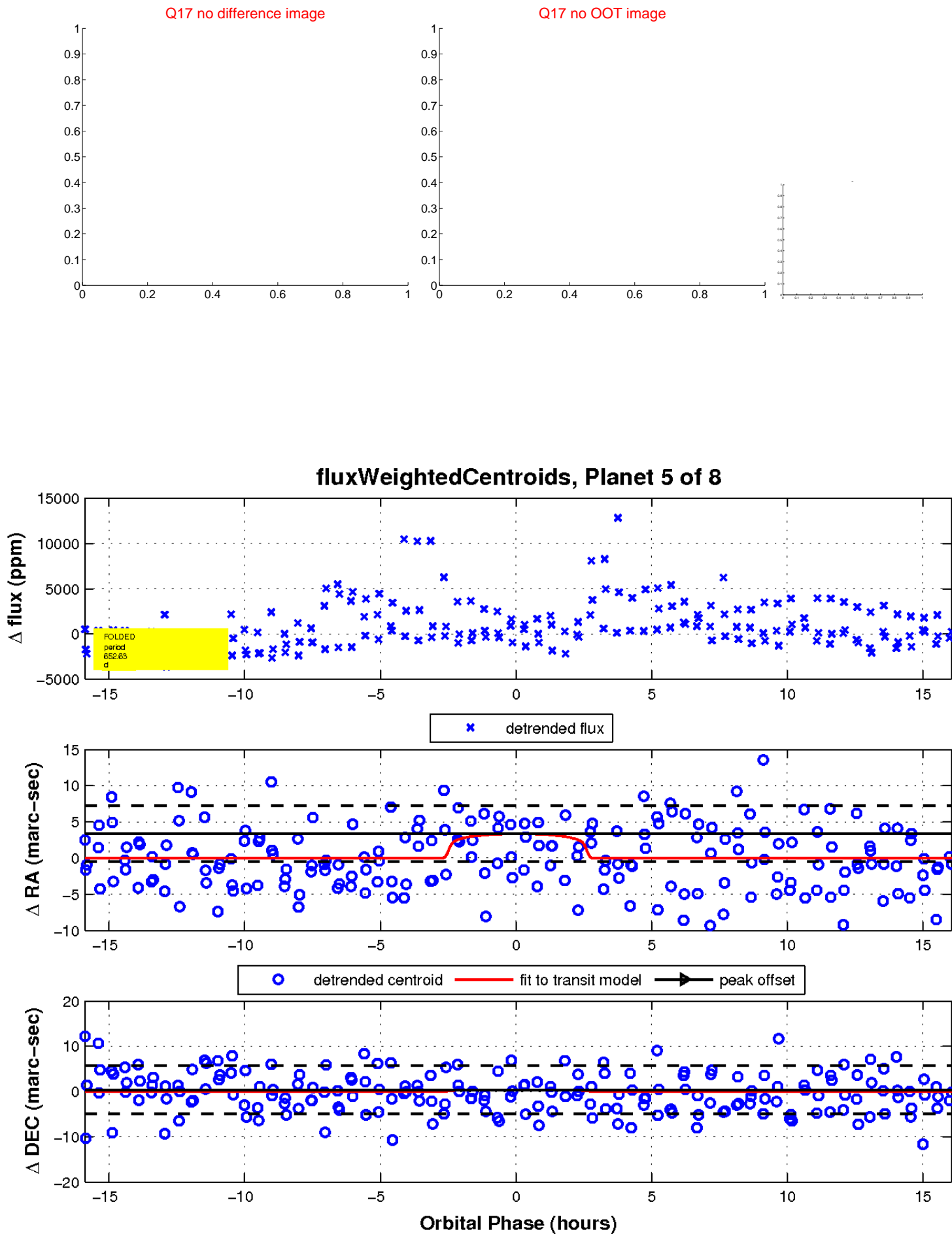
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

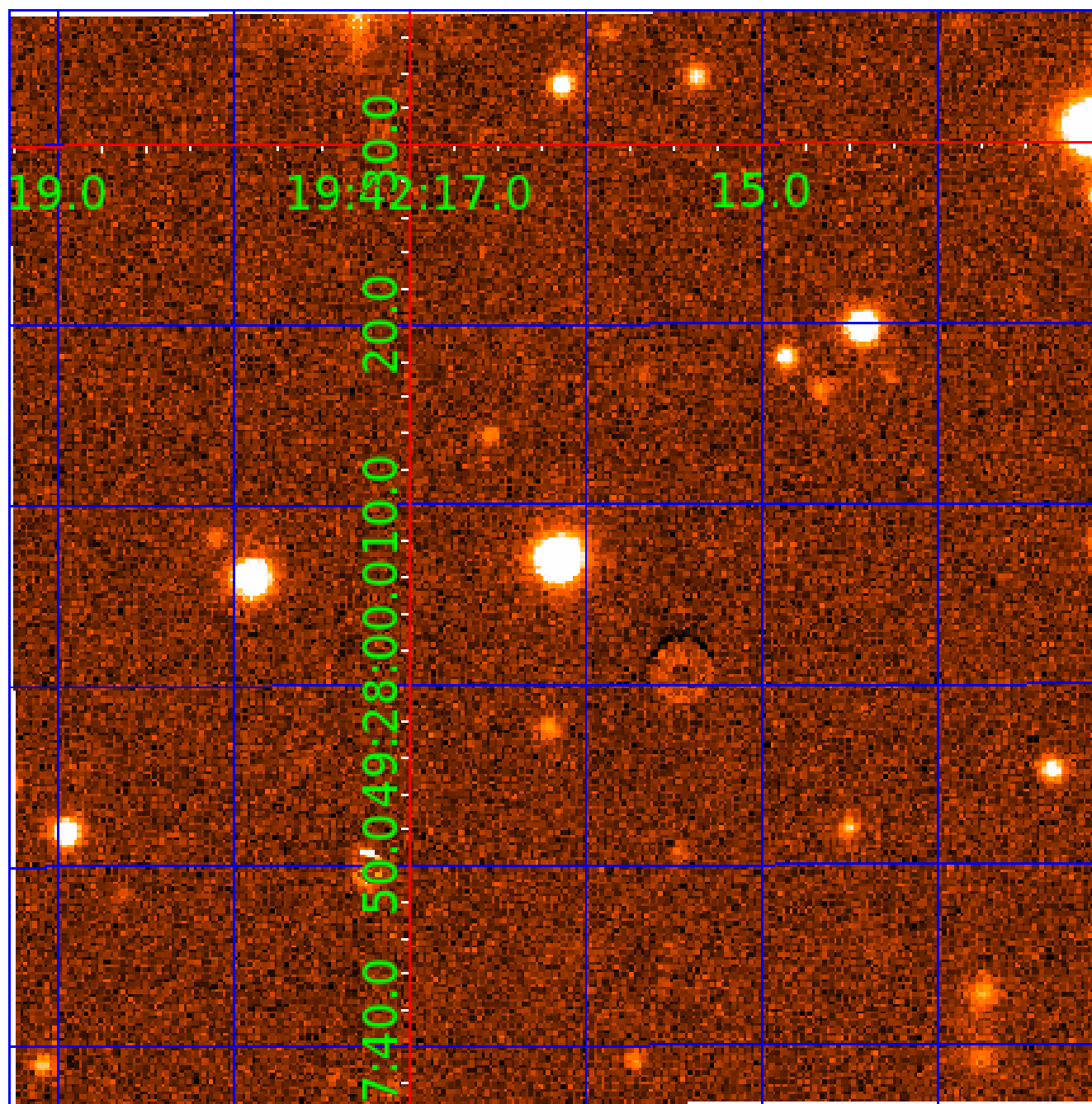


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 011515276

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011515276-01	OBS	No	403.712205	513.461034	3886.9	5.507	14.0	11.4	0.40	3618	3.06	0.04
011515276-03	OBS	No	489.164999	227.101526	3054.4	8.467	11.6	9.0	0.40	3618	2.61	0.03
011515276-04	OBS	No	418.095298	135.336485	2037.4	9.242	11.0	6.6	0.40	3618	1.82	0.04
011515276-05	OBS	No	652.627829	133.728275	2506.4	5.376	12.2	7.2	0.40	3618	2.00	0.02
011515276-06	OBS	No	385.371365	377.127951	3194.4	12.673	10.0	7.9	0.40	3618	2.25	0.04
011515276-07	OBS	No	464.331649	247.258780	2764.8	16.928	10.7	6.5	0.40	3618	2.22	0.03
011515276-08	OBS	No	347.438632	467.537482	2204.6	6.000	9.6	-1.0	0.40	3618	1.87	0.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011515276-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

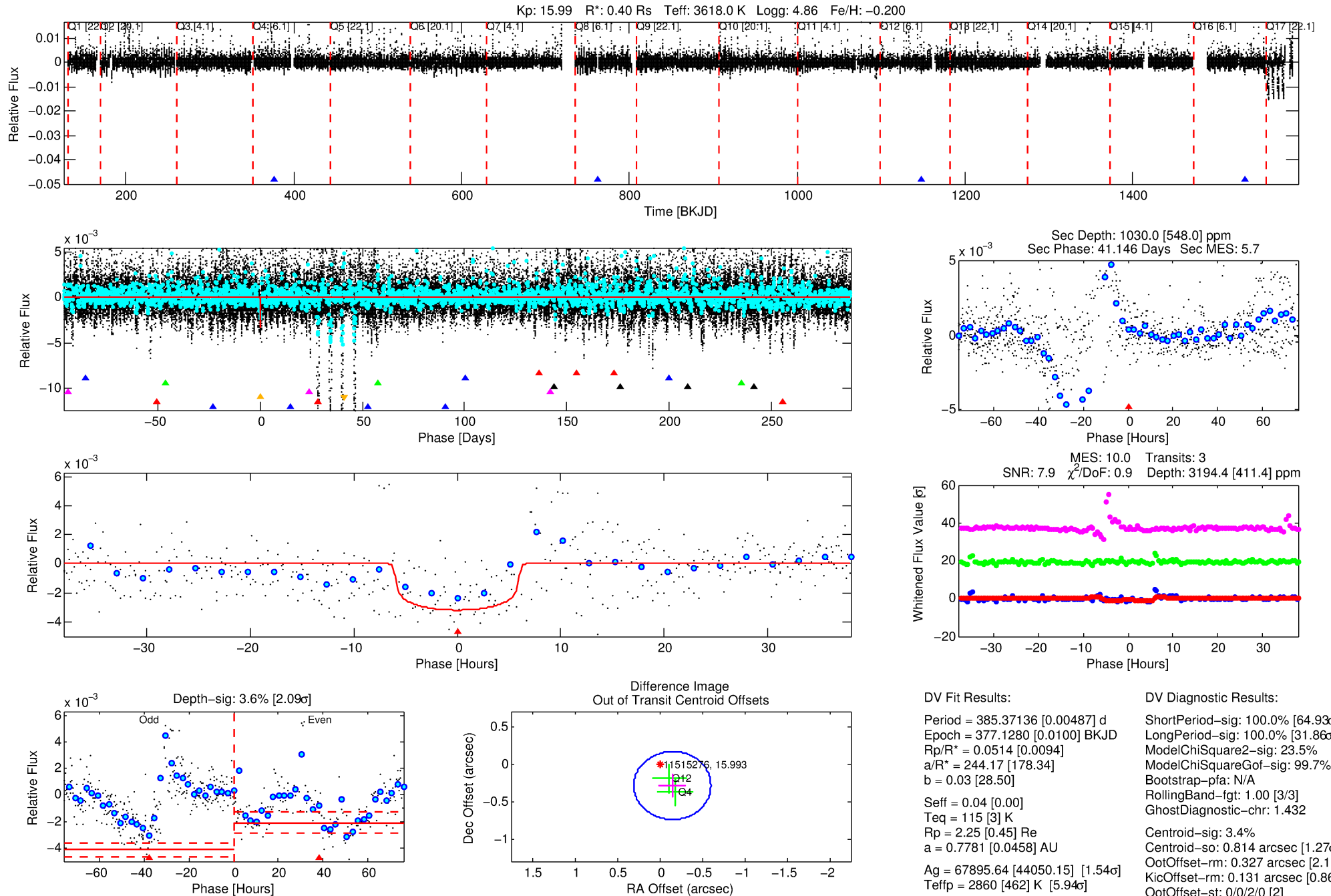
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011515276-06

No Significant Match Found

# DV One-Page Summary

KIC: 11515276 Candidate: 6 of 8 Period: 385.371 d



## DV Fit Results:

Period = 385.37136 [0.00487] d  
Epoch = 377.1280 [0.0100] BKJD  
Rp/R\* = 0.0514 [0.0094]  
a/R\* = 244.17 [178.34]  
b = 0.03 [28.50]  
Seff = 0.04 [0.00]  
Teq = 115 [3] K  
Rp = 2.25 [0.45] Re  
a = 0.7781 [0.0458] AU  
Ag = 67895.64 [44050.15] [1.54σ]  
Teffp = 2860 [462] K [5.94σ]

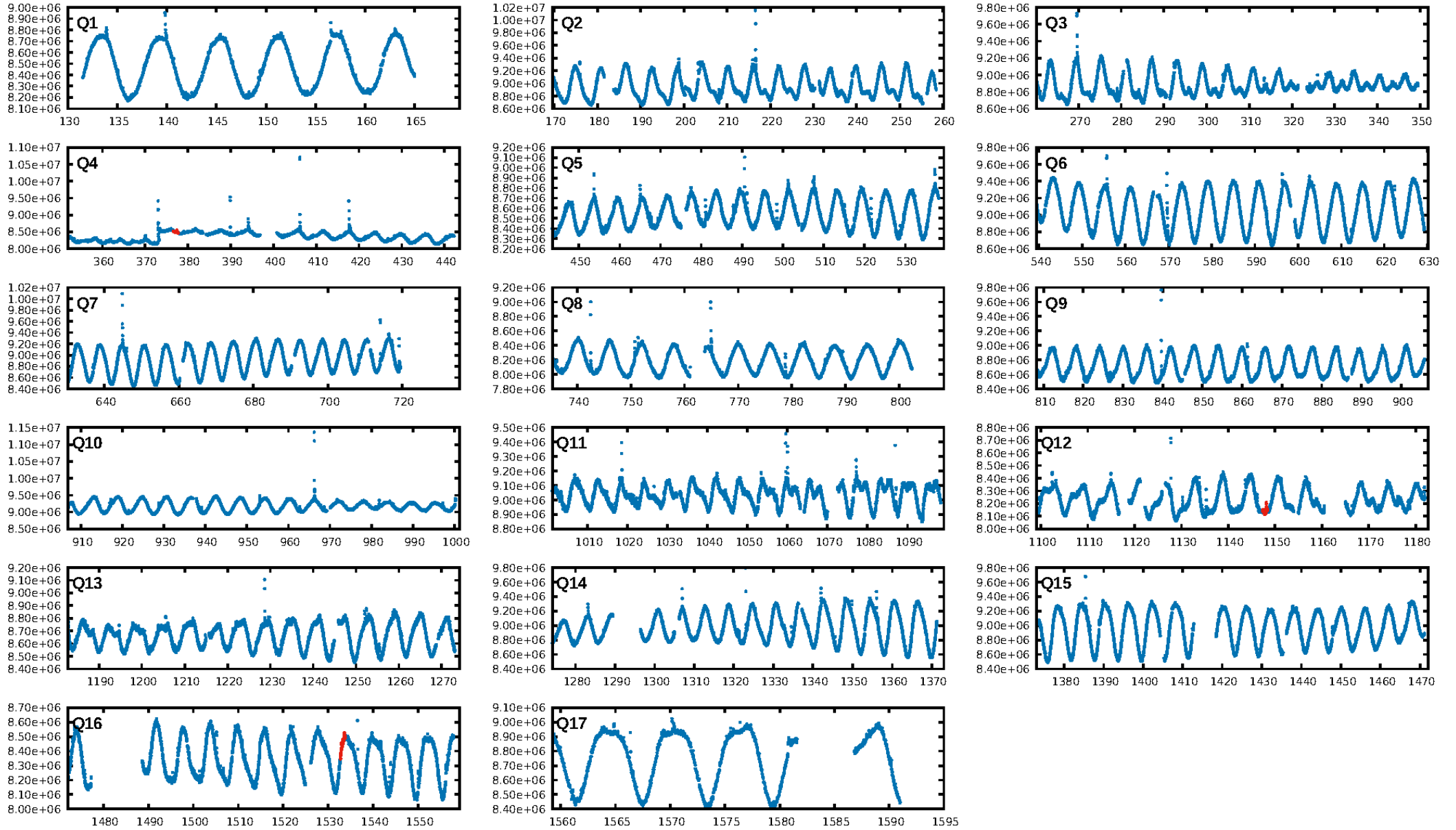
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [64.93σ]  
LongPeriod-sig: 100.0% [31.86σ]  
ModelChiSquare2-sig: 23.5%  
ModelChiSquareGof-sig: 99.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.432  
Centroid-sig: 3.4%  
Centroid-so: 0.814 arcsec [1.27σ]  
OotOffset-rm: 0.327 arcsec [2.16σ]  
KicOffset-rm: 0.131 arcsec [0.86σ]  
OotOffset-st: 0/0/2/0 [2]  
KicOffset-st: 0/0/2/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [2/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:48:44 Z

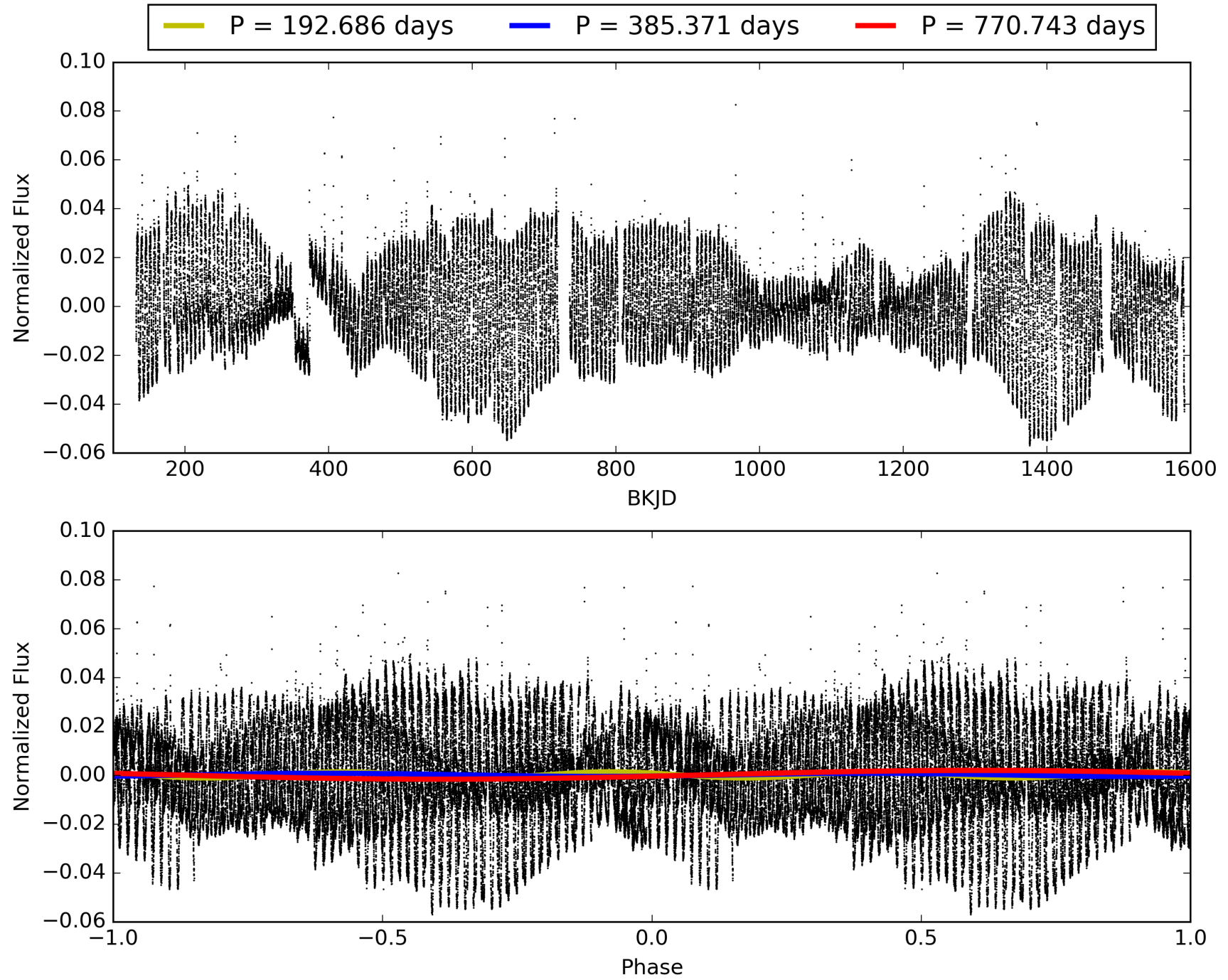
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011515276-06, PDC Light Curves



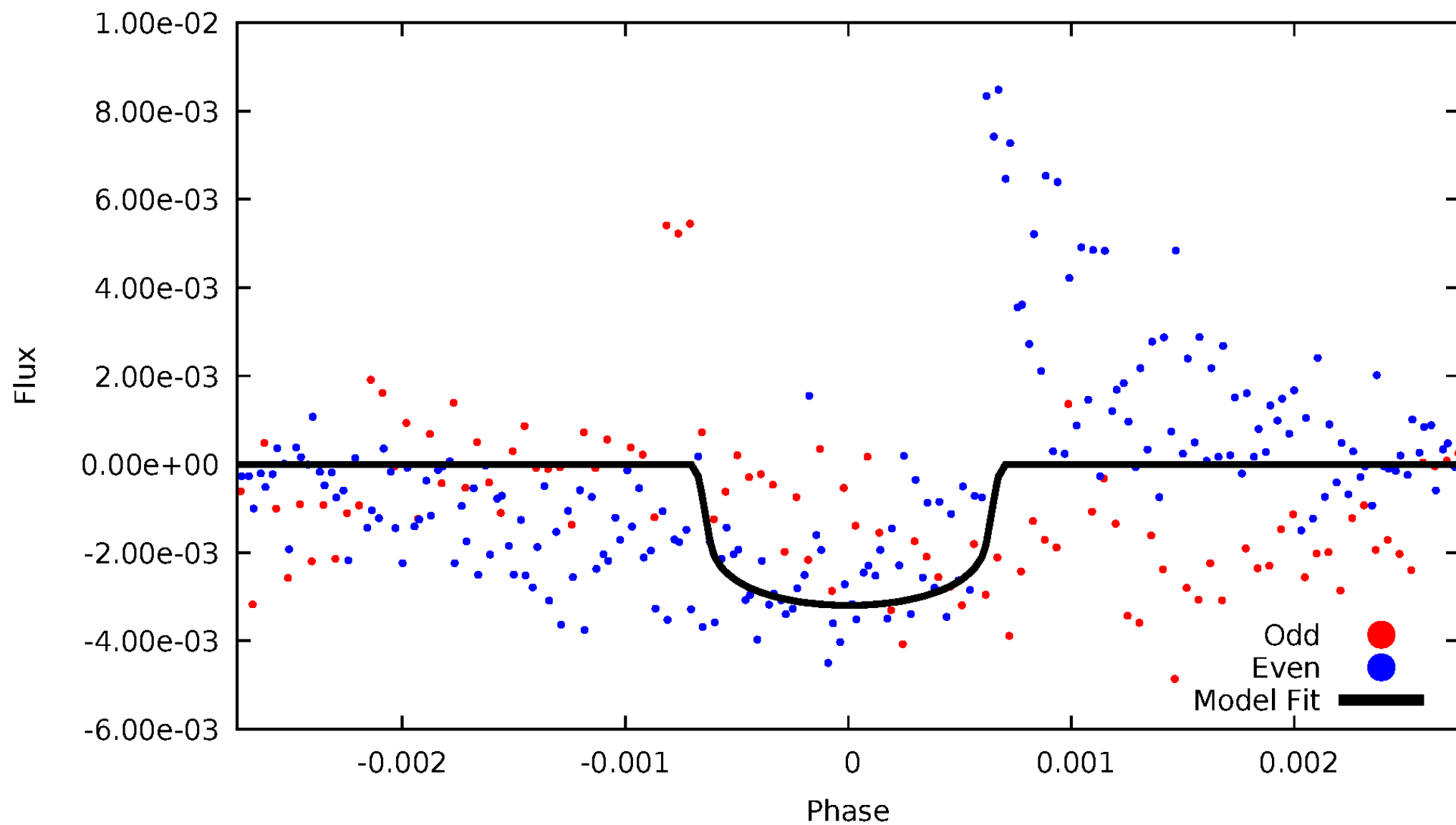


TCE 011515276-06



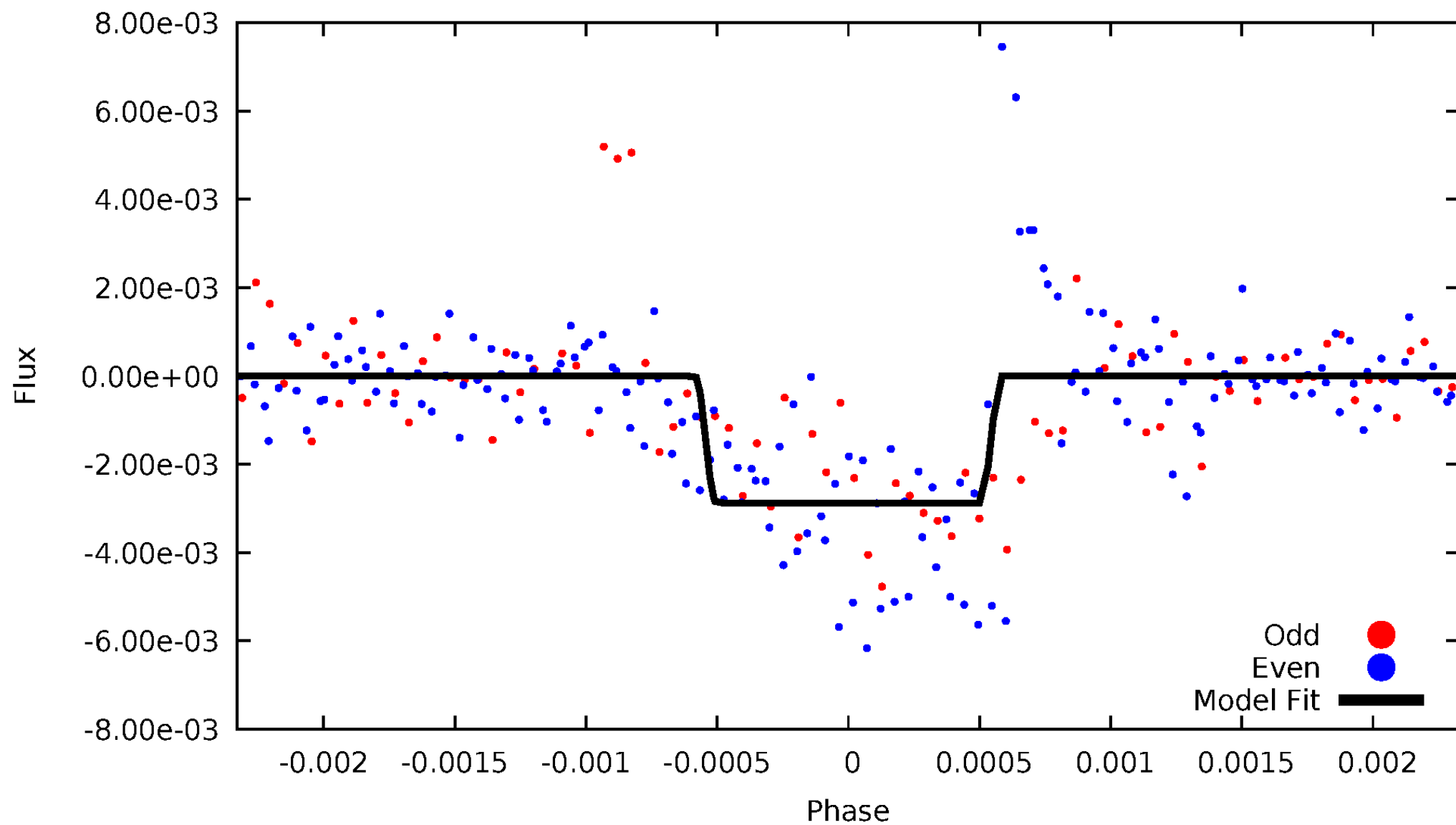
# DV Odd/Even

TCE 011515276-06



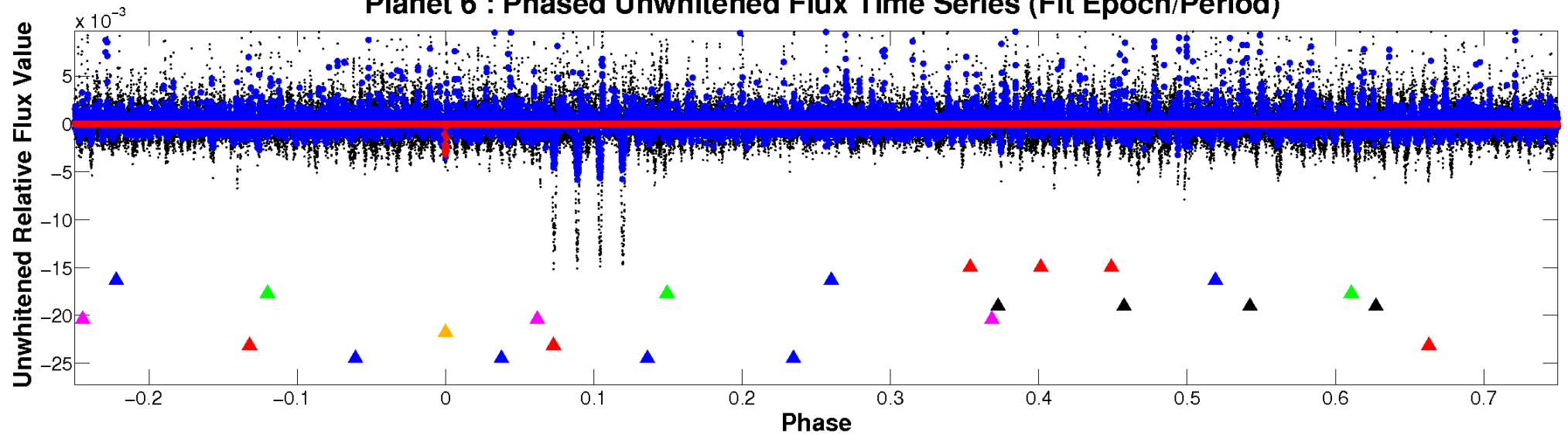
# ALT Odd/Even

TCE 011515276-06

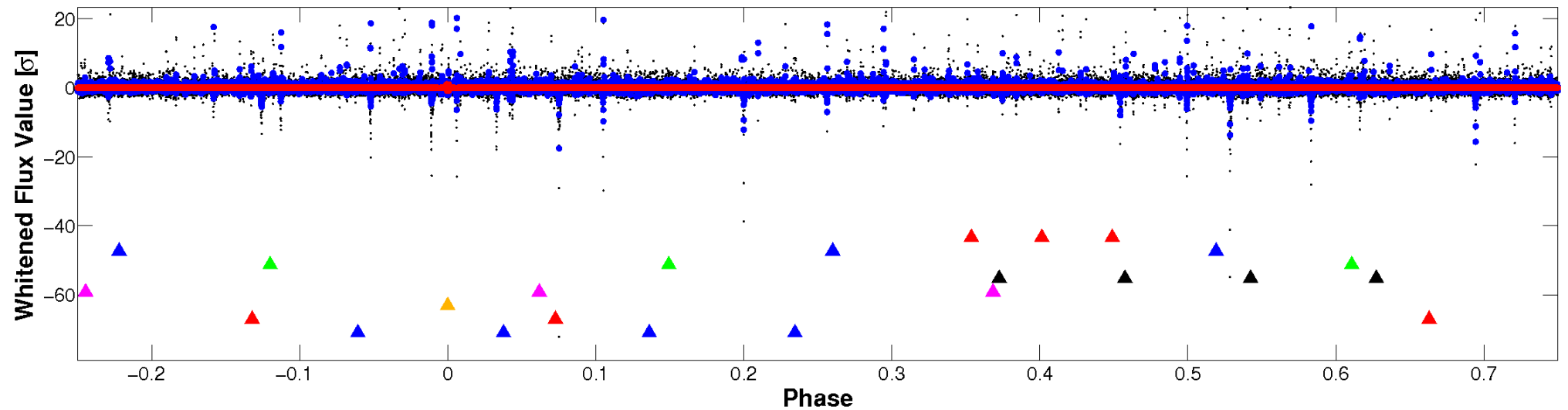


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

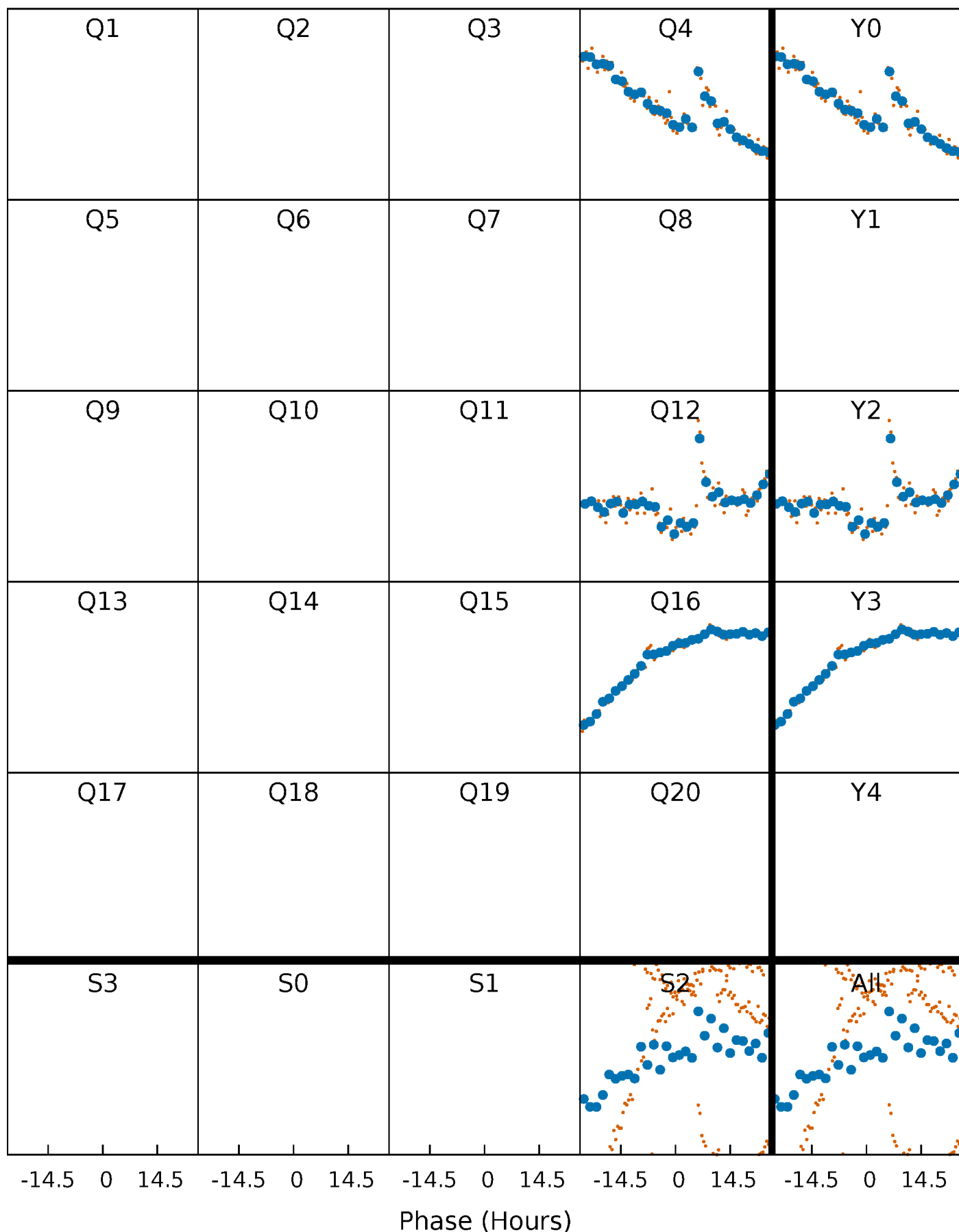


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



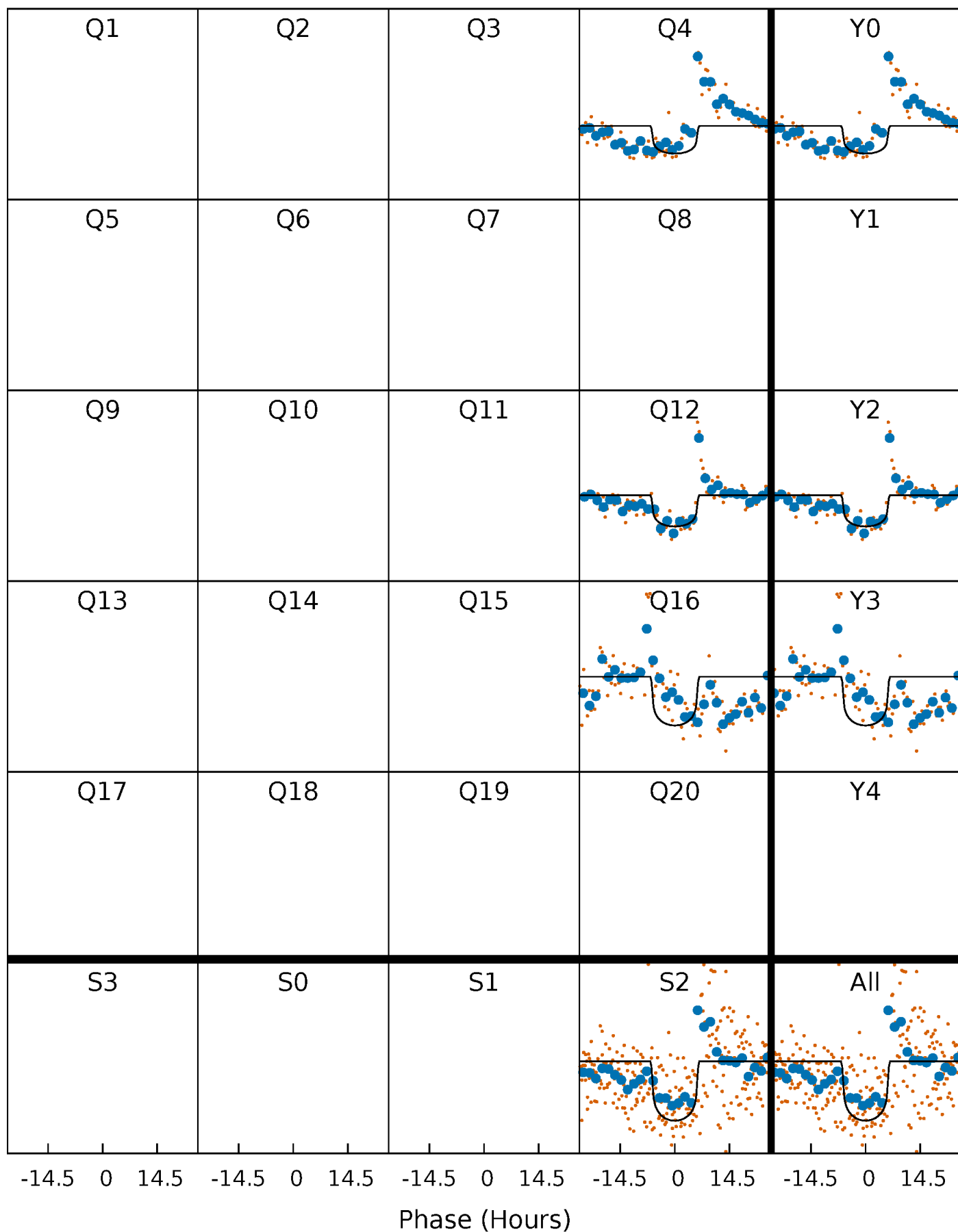
# PDC Quarter-Phased Transit Curves

TCE 011515276-06 P=385.371365 Days  $T_0=377.127951$  (BKJD)



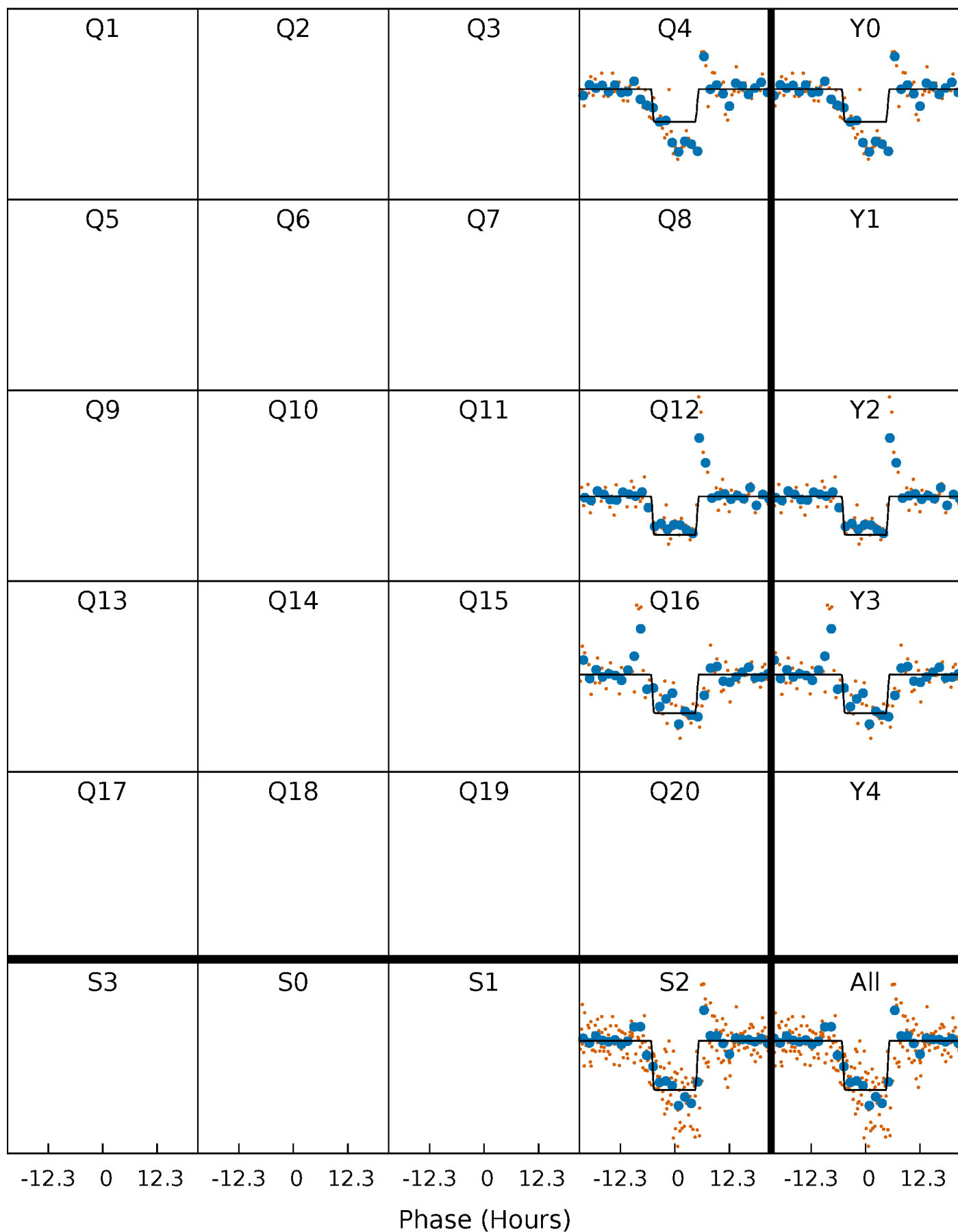
# DV Quarter-Phased Transit Curves

TCE 011515276-06     $P=385.371365$  Days     $T_0=377.127951$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

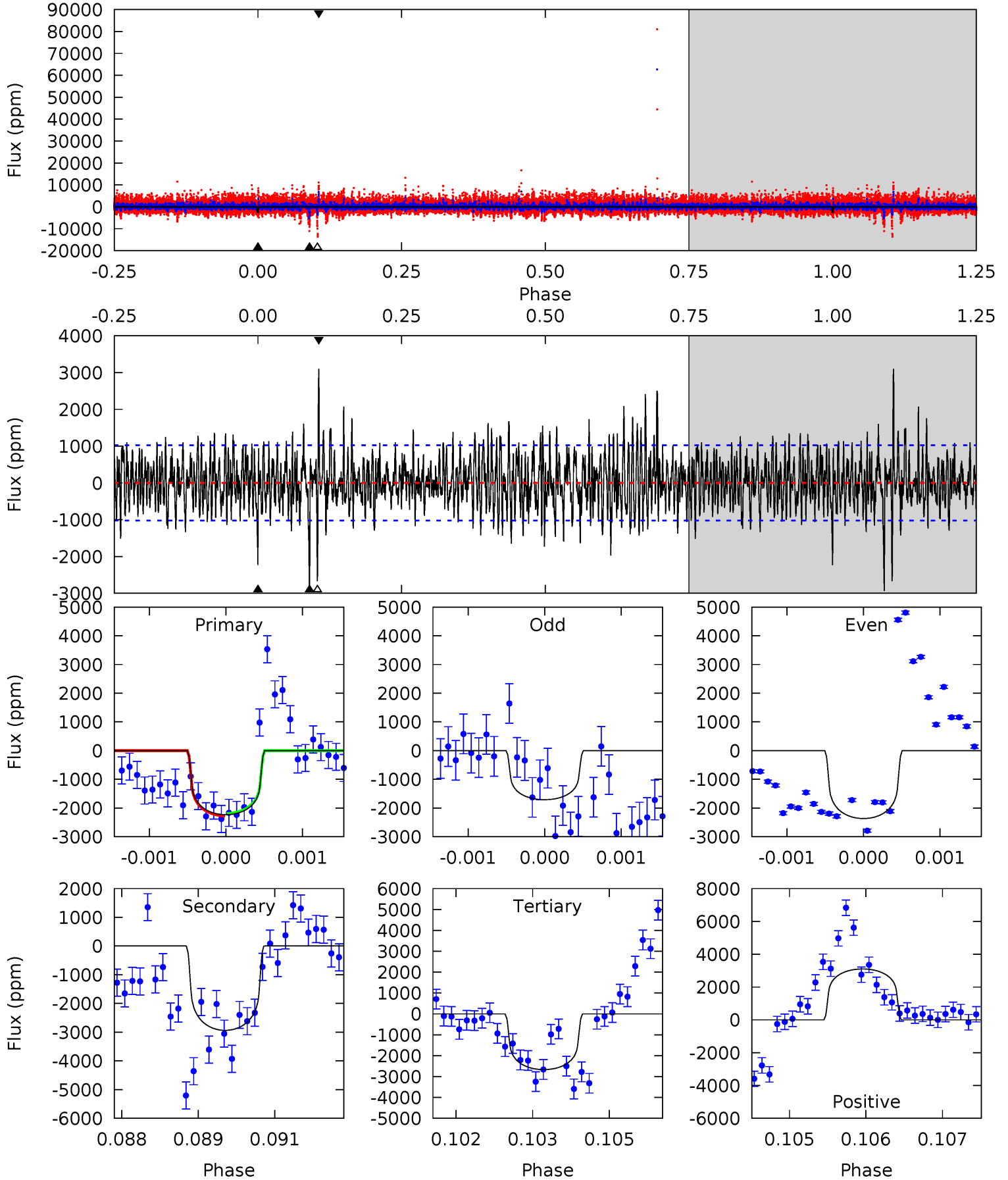
TCE 011515276-06 P=385.390564 Days  $T_0=377.115113$  (BKJD)



# DV Model-Shift Uniqueness Test

011515276-06, P = 385.371365 Days, E = 377.127951 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
11.8	15.5	14.1	16.3	5.39	3.20	3.26	-2.30	-4.58	1.42	-0.87	1.24	1.26	0.51	0.23

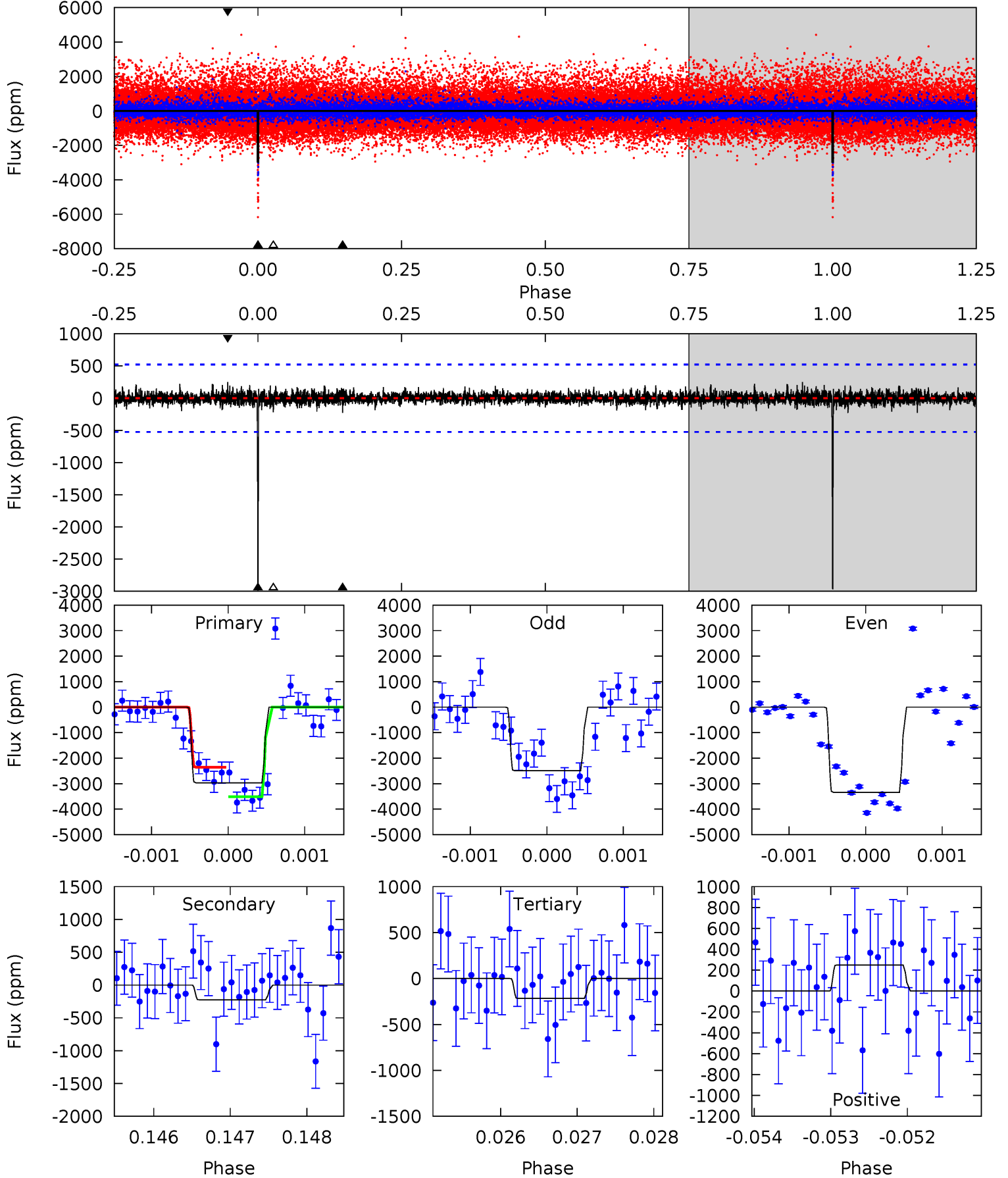




# Alt Model-Shift Uniqueness Test

011515276-06, P = 385.390564 Days, E = 377.115113 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
30.8	2.34	2.25	2.58	5.43	3.26	0.52	28.5	28.2	0.09	-0.25	4.22	1.19	0.08	6.02



### Stellar Parameters For KIC 011515276

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3618^{+43}_{-48}$	$4.858^{+0.033}_{-0.033}$	$-0.200^{+0.100}_{-0.100}$	$0.401^{+0.029}_{-0.032}$	$0.423^{+0.027}_{-0.038}$	$9.278^{+1.660}_{-1.289}$
	+1%/-1%	+1%/-1%	+50%/-50%	+7%/-8%	+6%/-9%	+18%/-14%
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 011515276-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-2937 \pm 190$	$2.25^{+0.40}_{-0.42}$	$160^{+3}_{-3}$	$3675^{+261}_{-185}$	$191580^{+96307}_{-53377}$
Alt.	$-225 \pm 96$	$2.34^{+0.43}_{-0.41}$	$160^{+3}_{-3}$	$2526^{+165}_{-190}$	$13670^{+9300}_{-6405}$

$T_{max}$  = 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

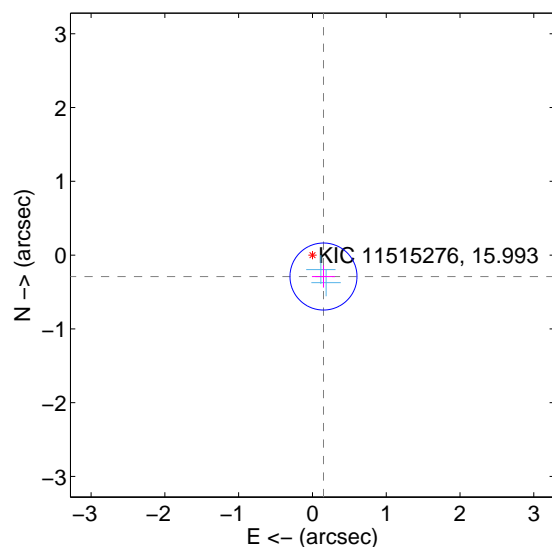
Supplemental centroid analysis for 011515276-06. Kepler magnitude: 15.99. Transit SNR 7.91

There are 2 quarters with good PRF difference image offsets

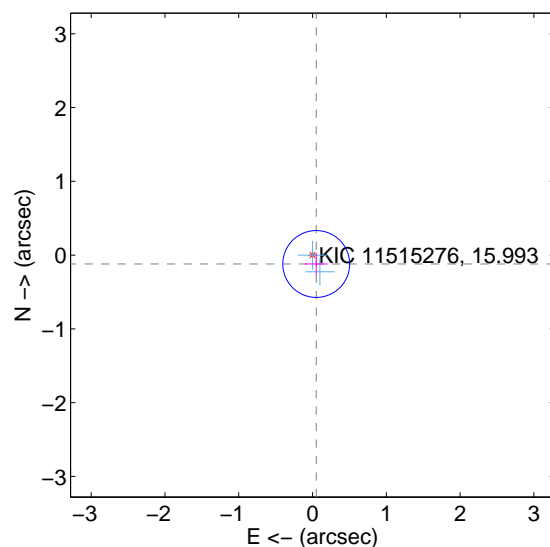
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.327 \pm 0.151$	2.16	$-0.150 \pm 0.156$	$-0.290 \pm 0.150$
PRF-fit source offset from KIC position	$0.131 \pm 0.151$	0.86	$-0.050 \pm 0.156$	$-0.121 \pm 0.150$
photometric centroid source offset	$0.81 \pm 0.64$	1.27	$-0.47 \pm 0.60$	$-0.66 \pm 0.66$

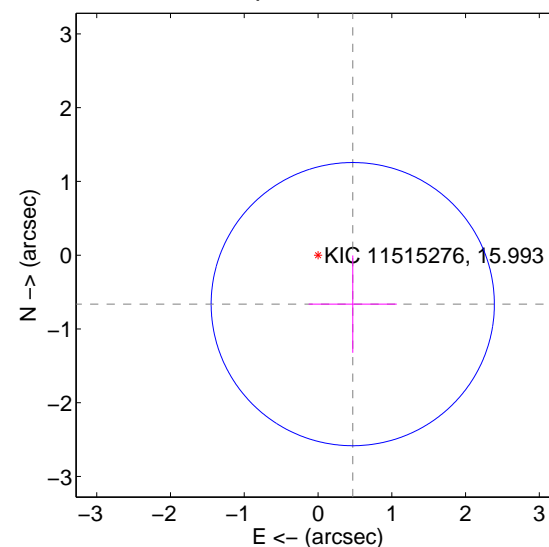
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

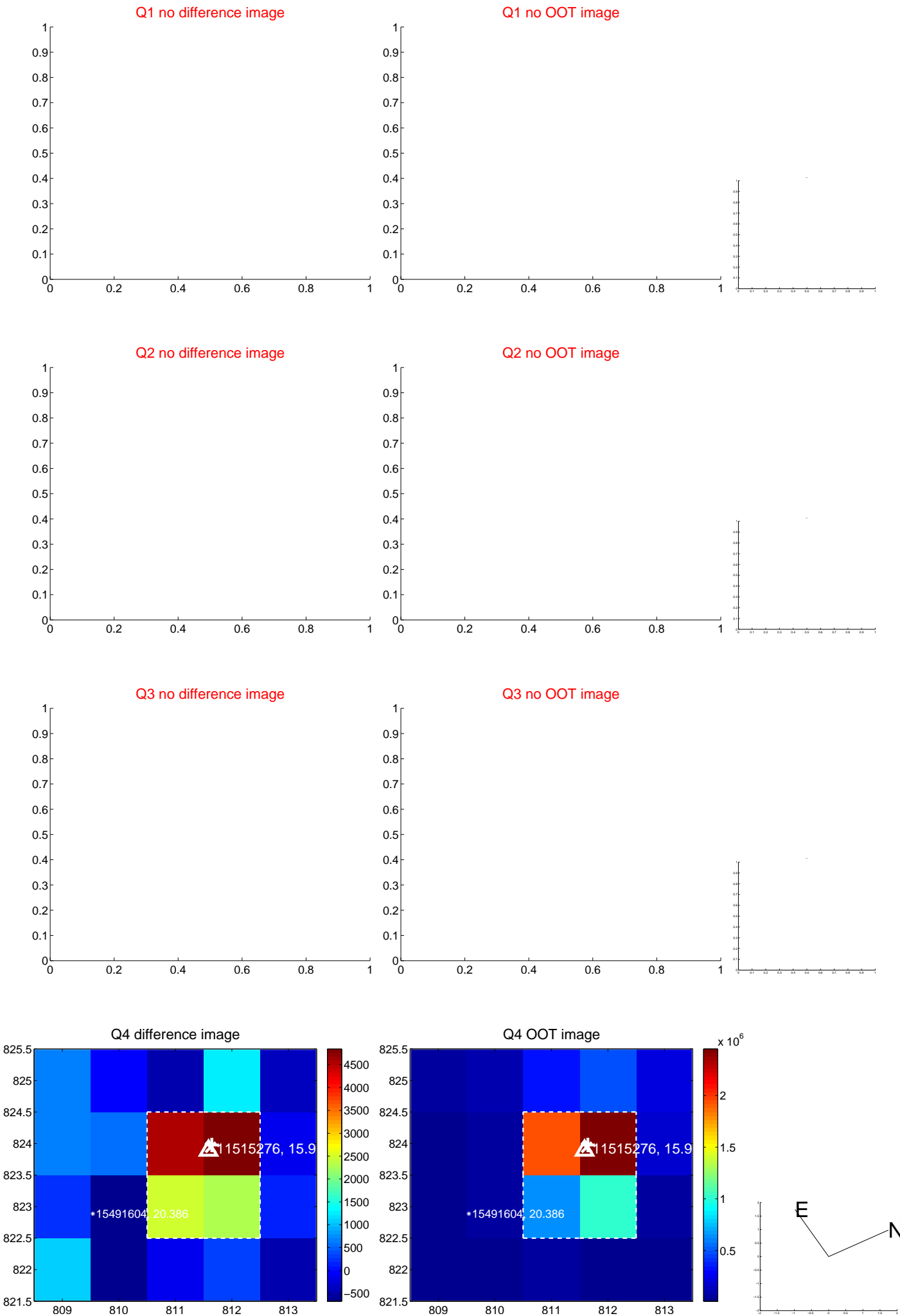


offset from photometric centroids

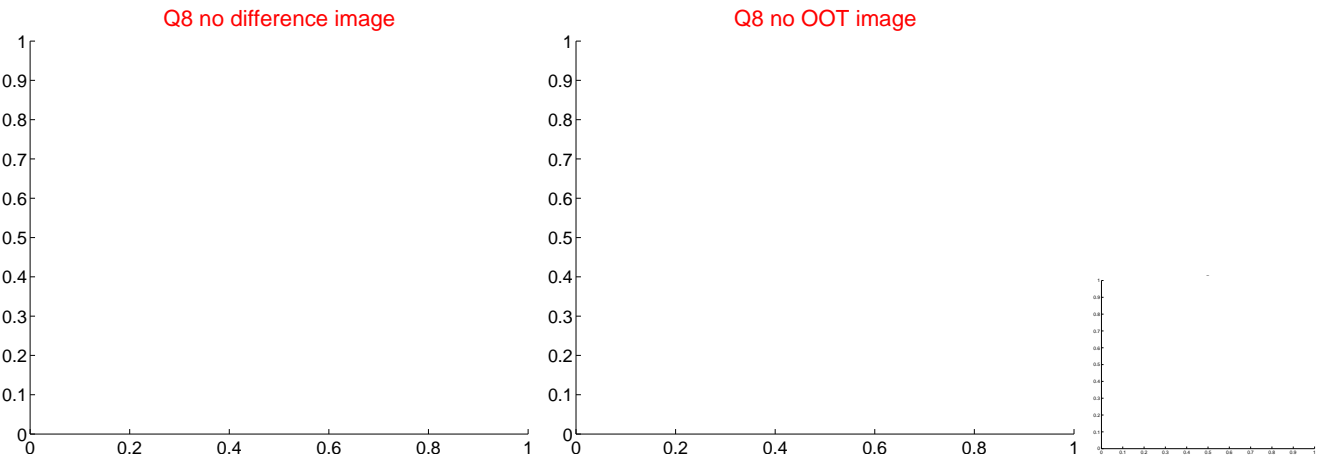
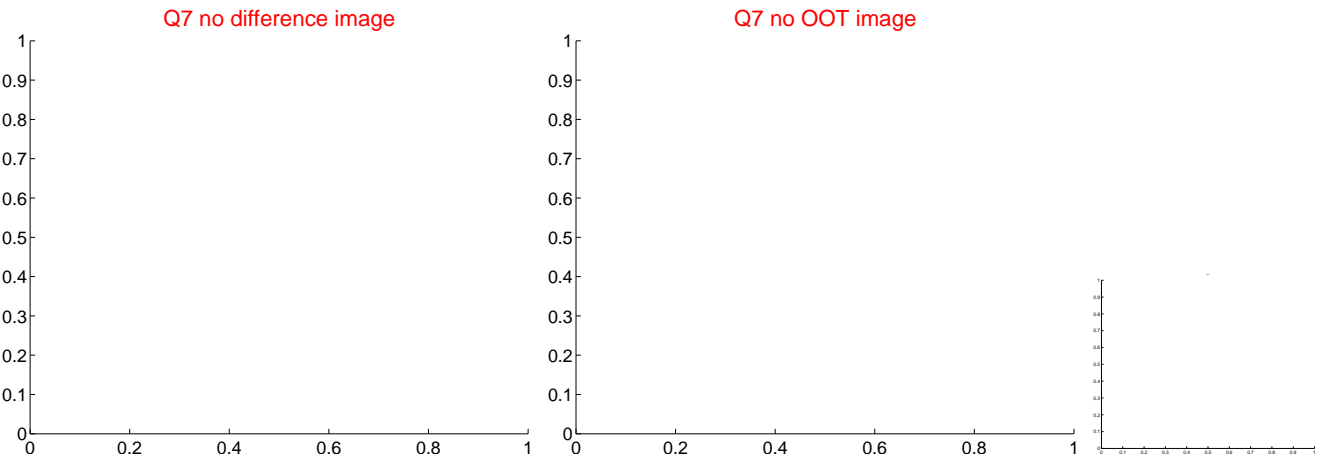
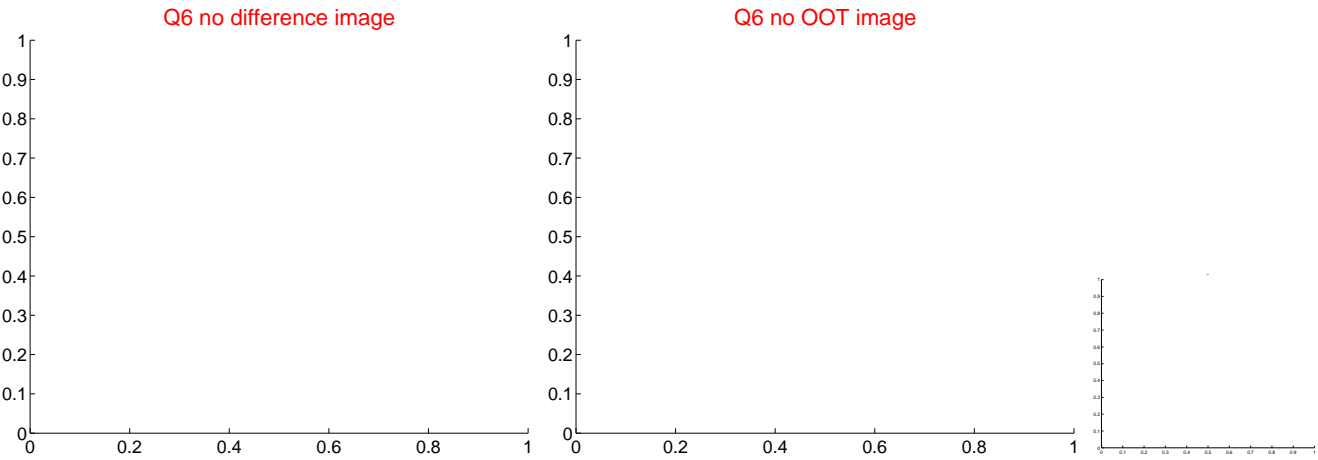
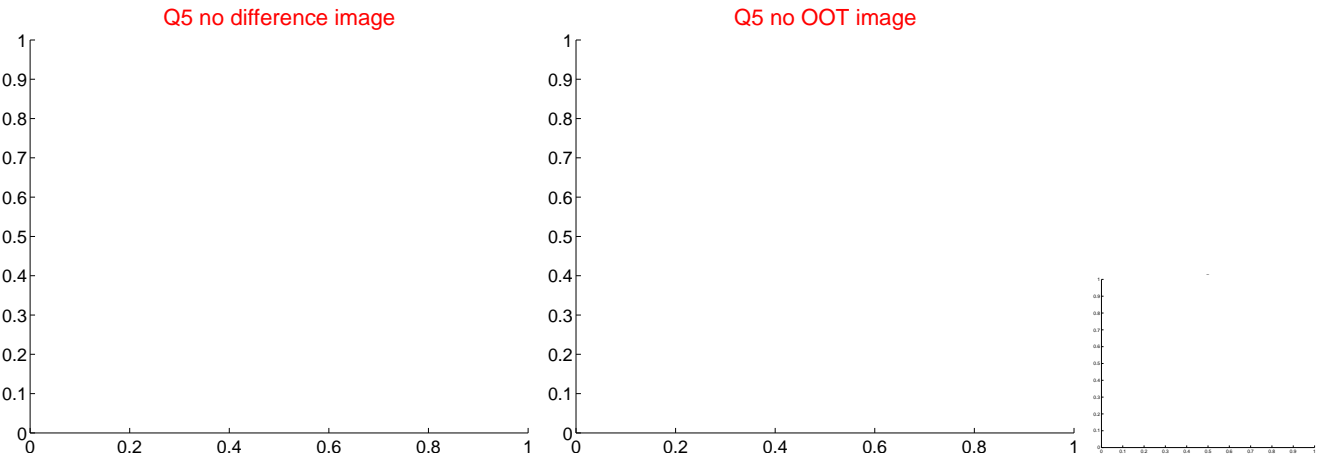


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

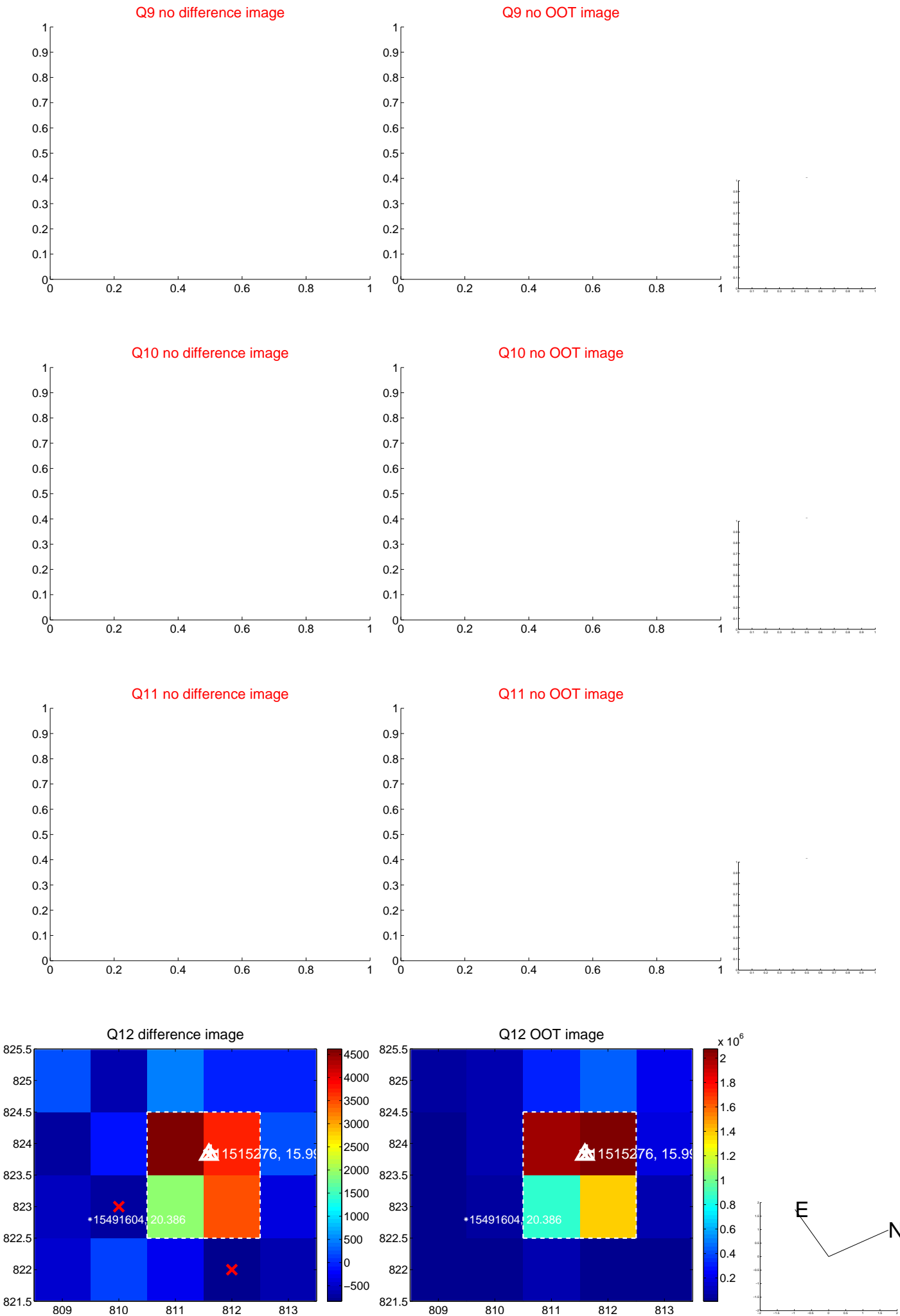
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



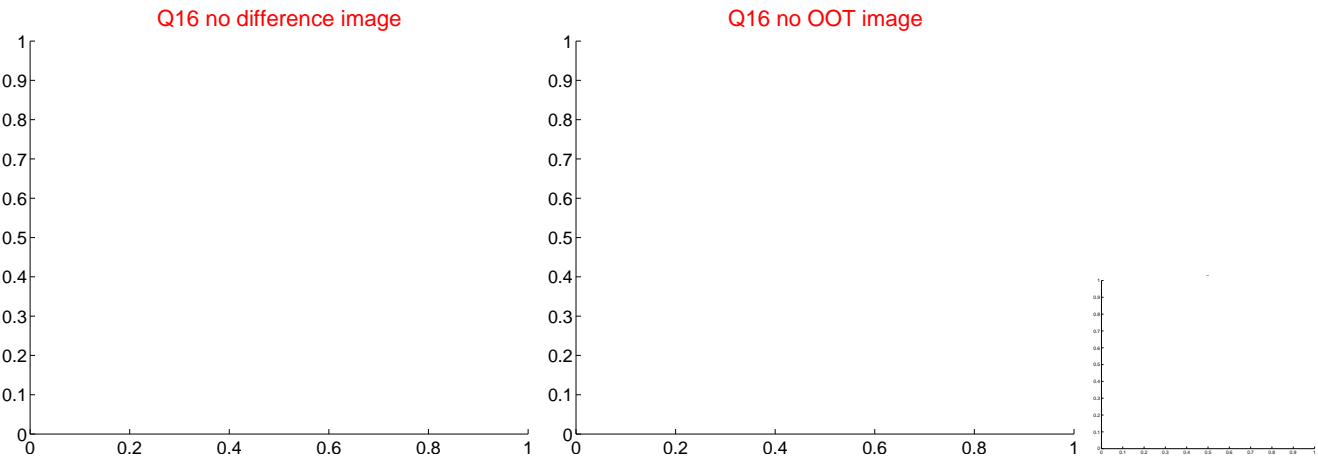
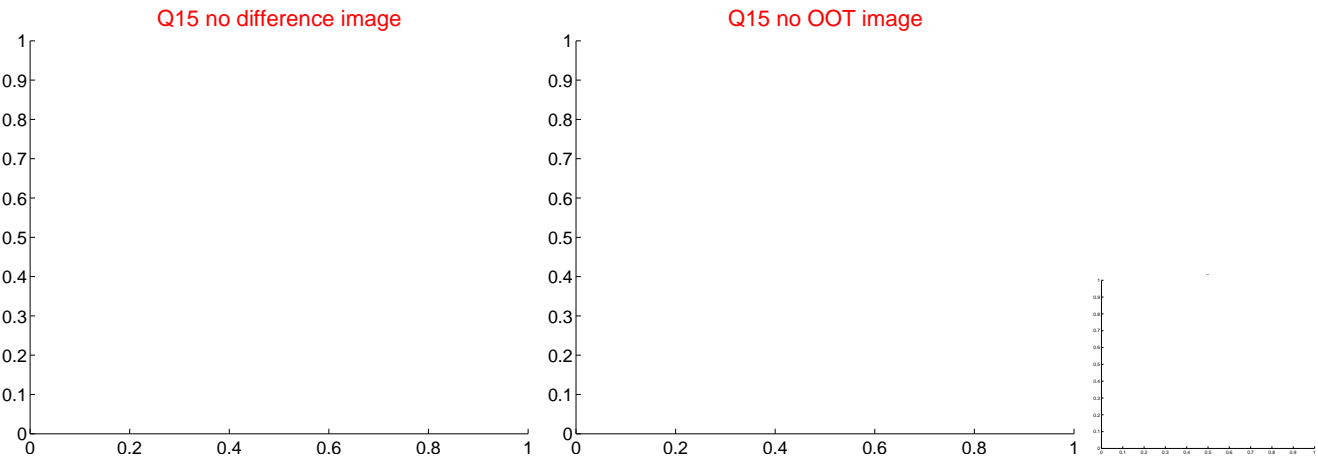
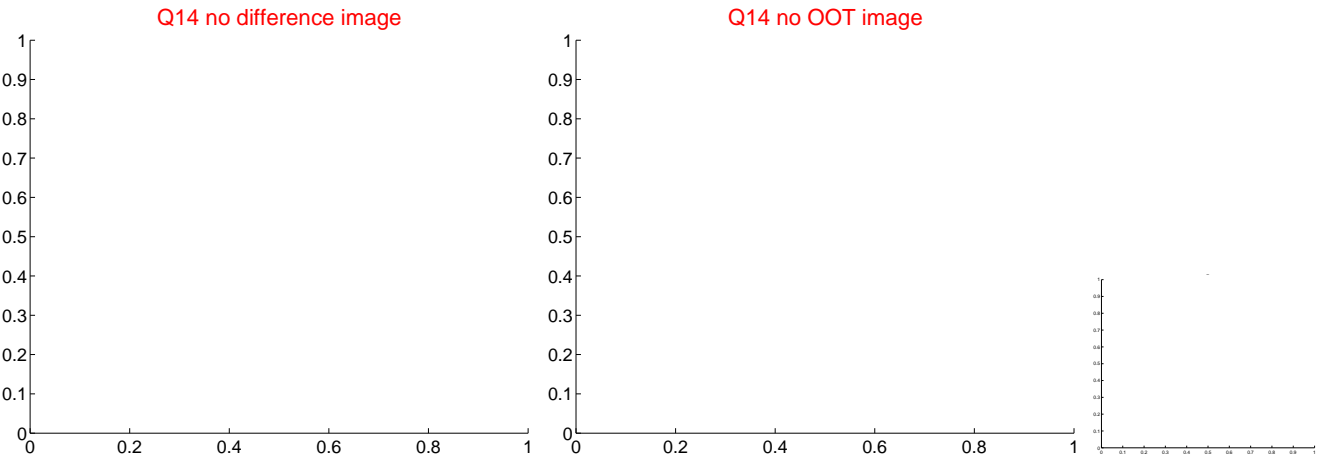
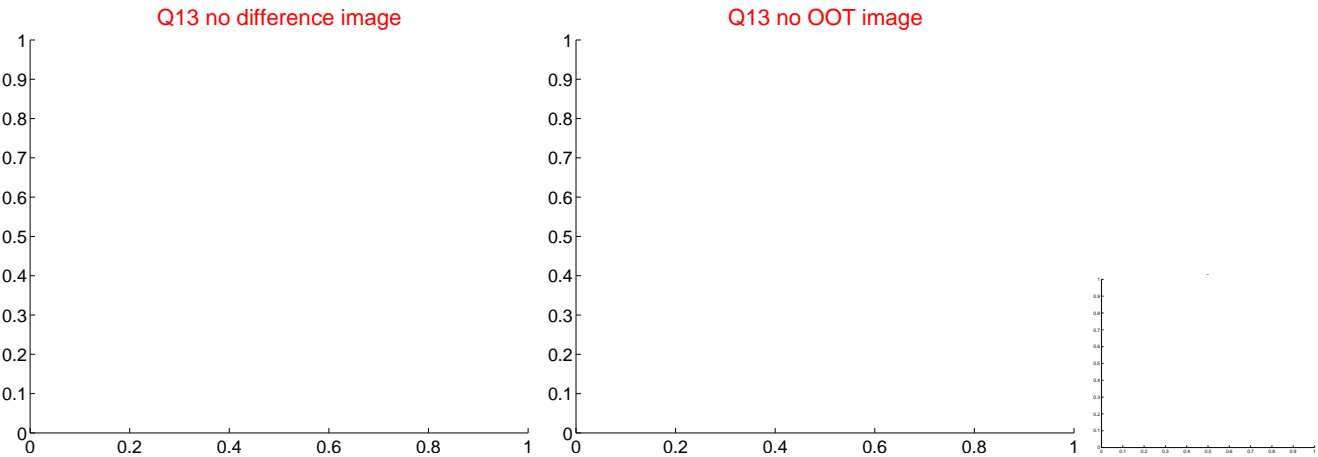
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



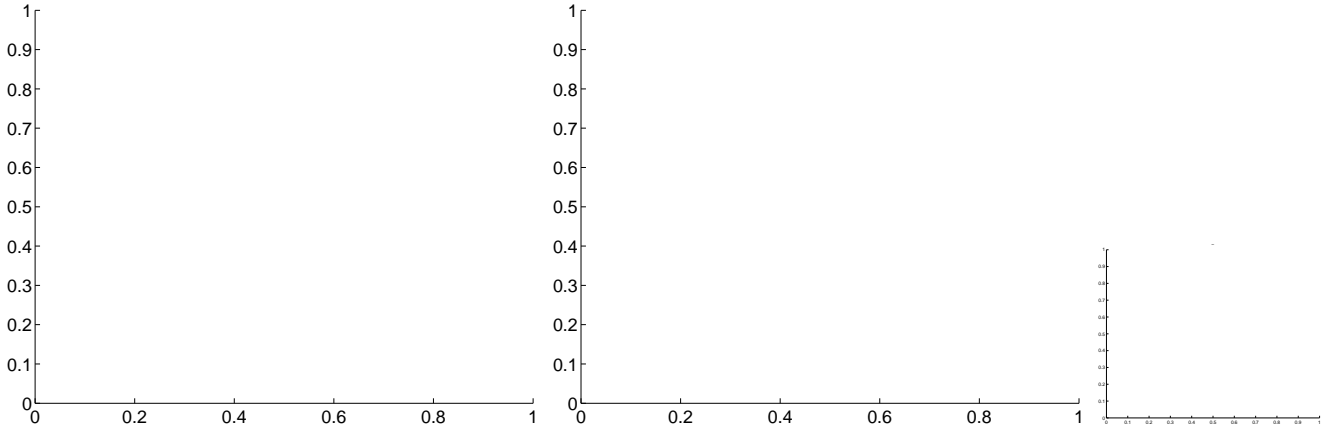
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



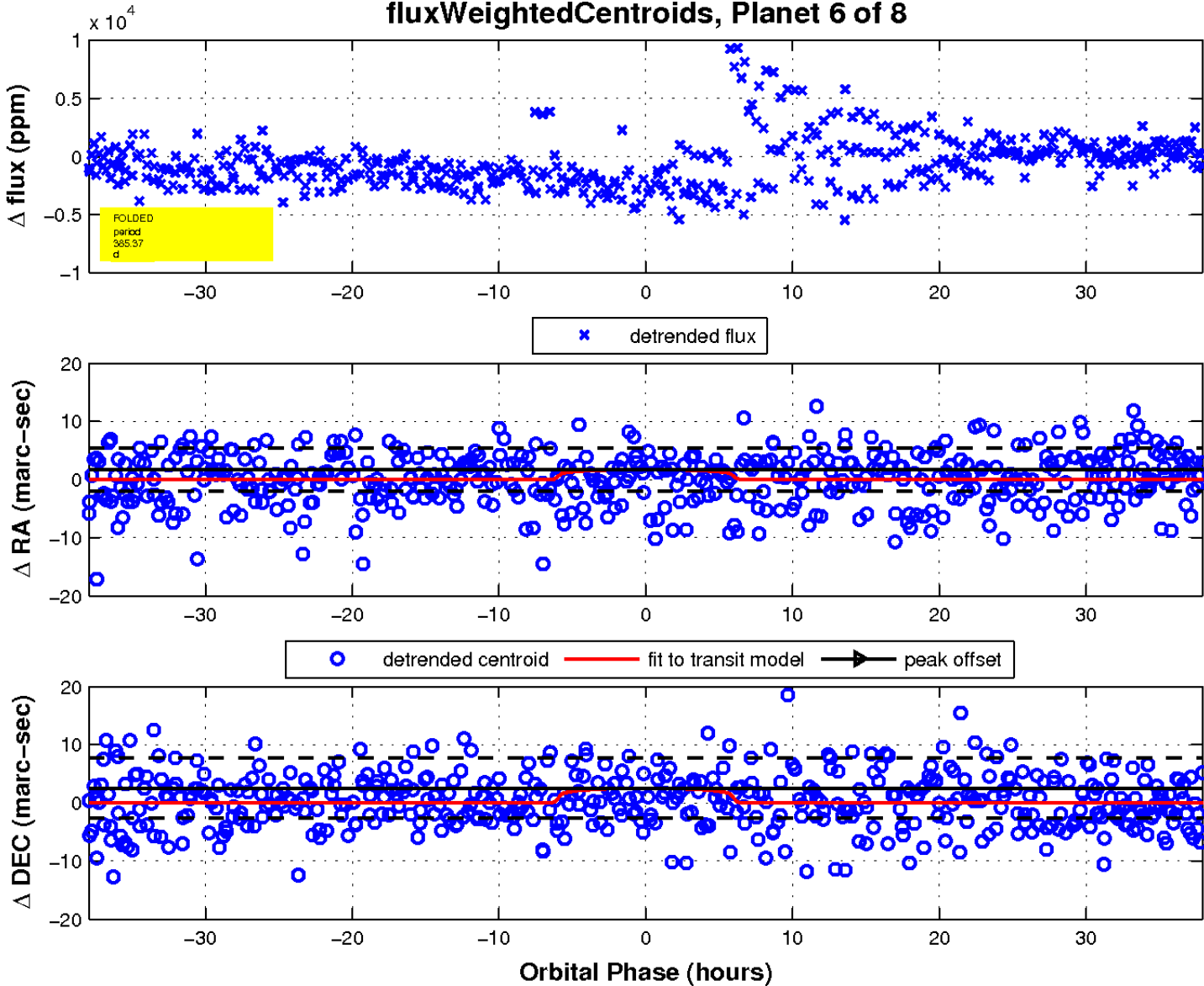
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q17 no difference image

Q17 no OOT image



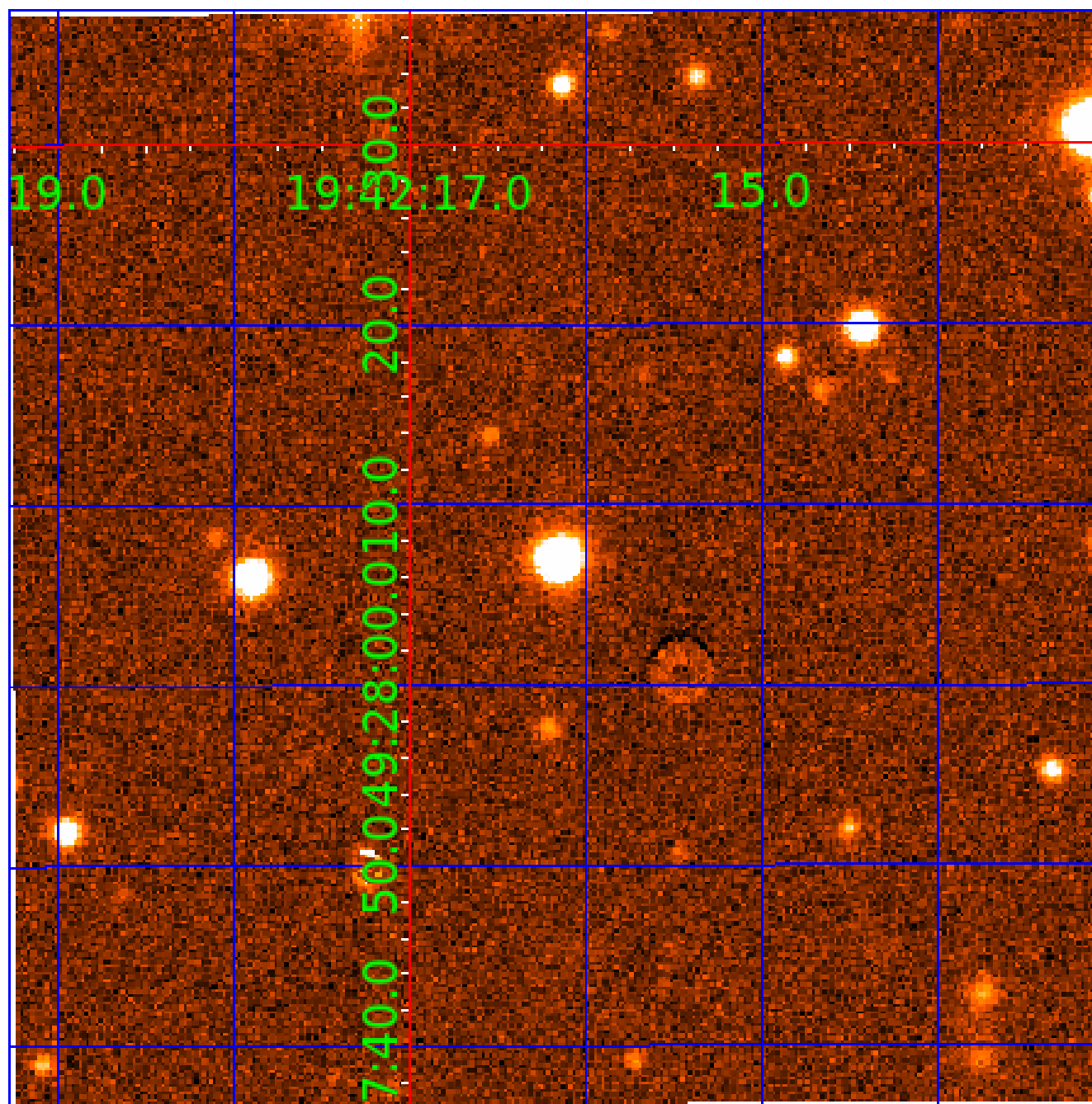
fluxWeightedCentroids, Planet 6 of 8





# UKIRT Image

Declination



# KIC 011515276

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011515276-01	OBS	No	403.712205	513.461034	3886.9	5.507	14.0	11.4	0.40	3618	3.06	0.04
011515276-03	OBS	No	489.164999	227.101526	3054.4	8.467	11.6	9.0	0.40	3618	2.61	0.03
011515276-04	OBS	No	418.095298	135.336485	2037.4	9.242	11.0	6.6	0.40	3618	1.82	0.04
011515276-05	OBS	No	652.627829	133.728275	2506.4	5.376	12.2	7.2	0.40	3618	2.00	0.02
011515276-06	OBS	No	385.371365	377.127951	3194.4	12.673	10.0	7.9	0.40	3618	2.25	0.04
011515276-07	OBS	No	464.331649	247.258780	2764.8	16.928	10.7	6.5	0.40	3618	2.22	0.03
011515276-08	OBS	No	347.438632	467.537482	2204.6	6.000	9.6	-1.0	0.40	3618	1.87	0.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011515276-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

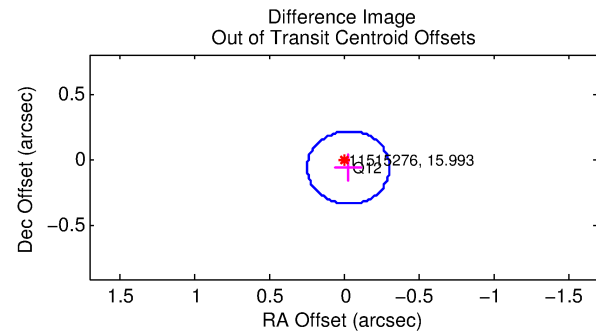
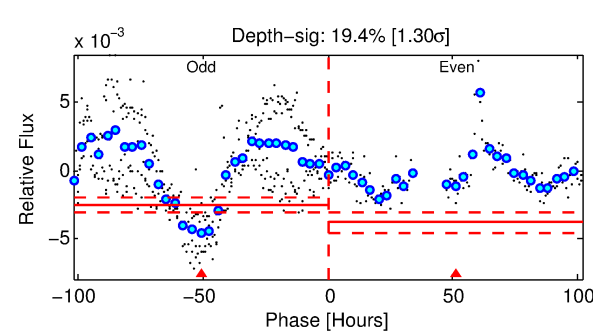
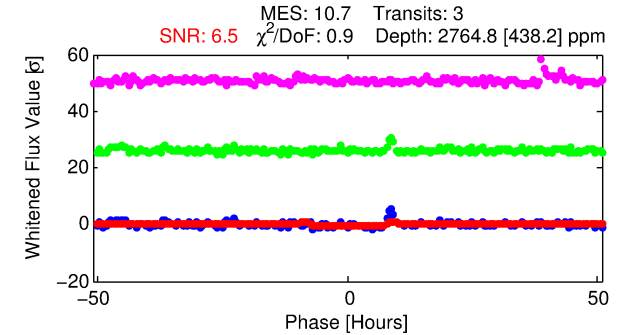
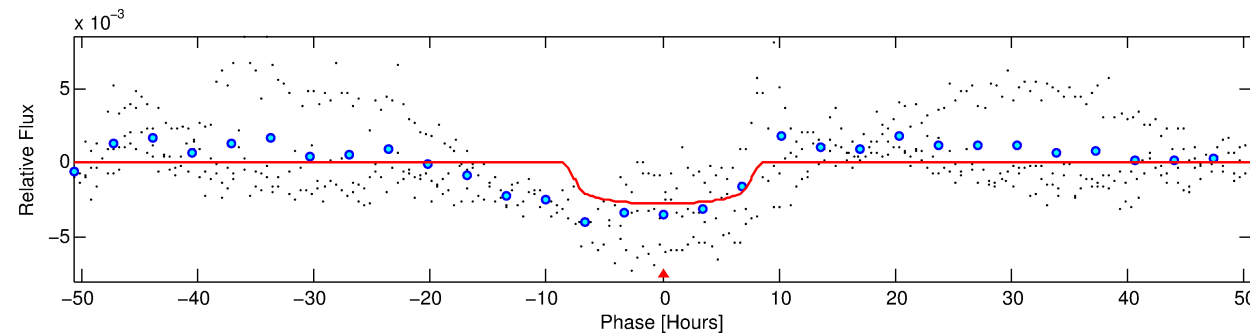
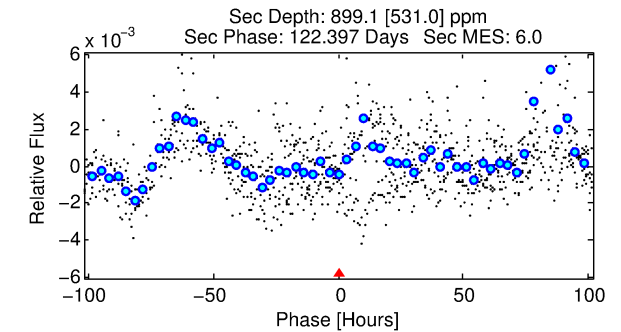
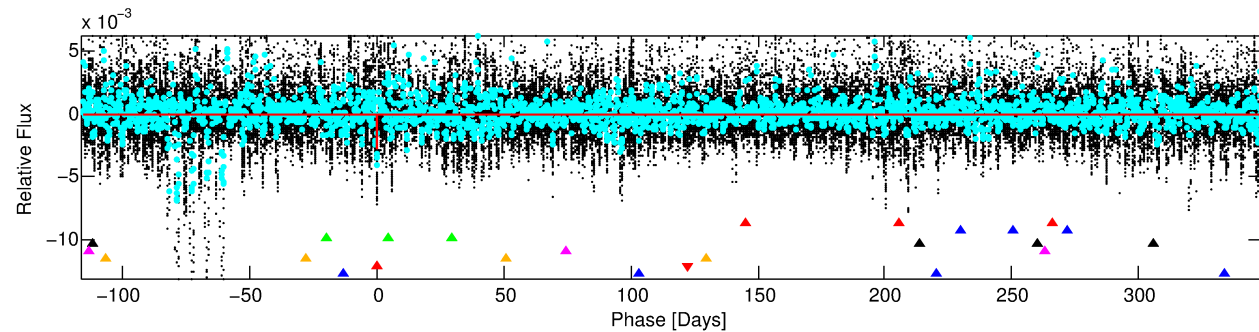
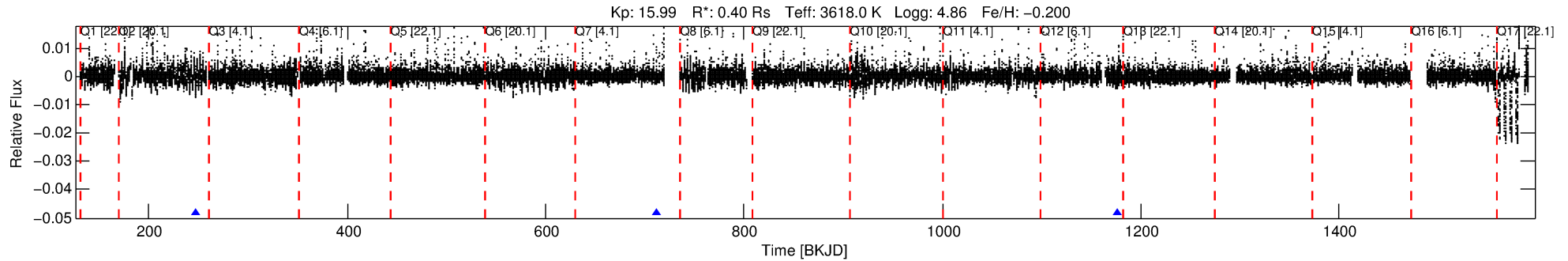
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011515276-07

No Significant Match Found

# DV One-Page Summary

KIC: 11515276 Candidate: 7 of 8 Period: 464.332 d



## DV Fit Results:

Period = 464.33165 [0.01213] d  
Epoch = 247.2588 [0.0150] BKJD  
Rp/R\* = 0.0508 [0.0060]  
a/R\* = 171.98 [58.95]  
b = 0.66 [0.30]  
Seff = 0.03 [0.00]  
Teq = 108 [2] K  
Rp = 2.22 [0.32] Re  
a = 0.8811 [0.0519] AU  
Ag = 77823.97 [49862.10] [1.56σ]  
Teffp = 2781 [444] K [6.02σ]

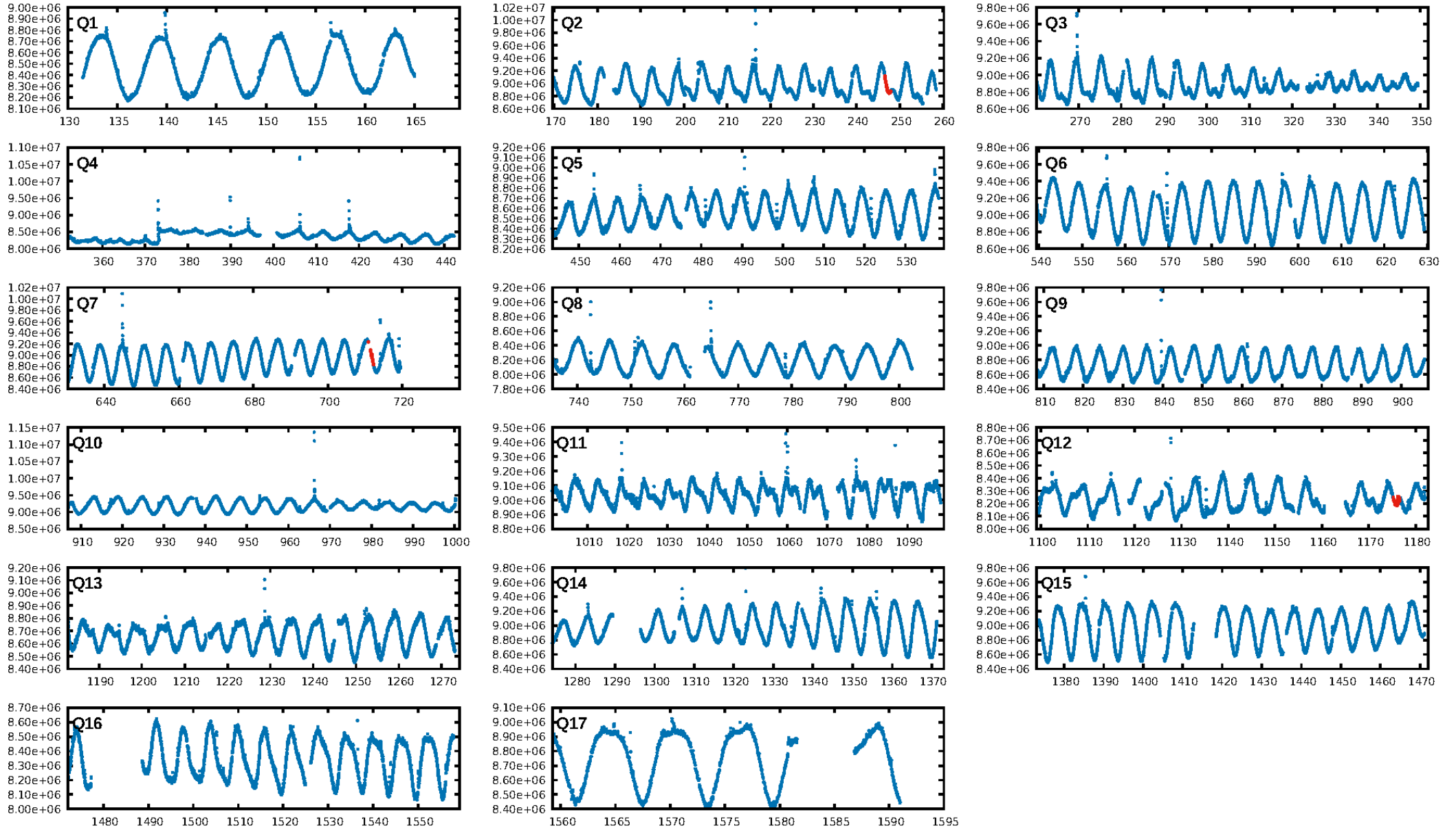
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [57.54σ]  
LongPeriod-sig: 100.0% [28.18σ]  
ModelChiSquare2-sig: 53.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.7249  
Centroid-sig: 79.6%  
Centroid-so: 0.373 arcsec [0.50σ]  
OotOffset-rm: 0.066 arcsec [0.72σ]  
KicOffset-rm: 0.161 arcsec [1.75σ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [1/1]

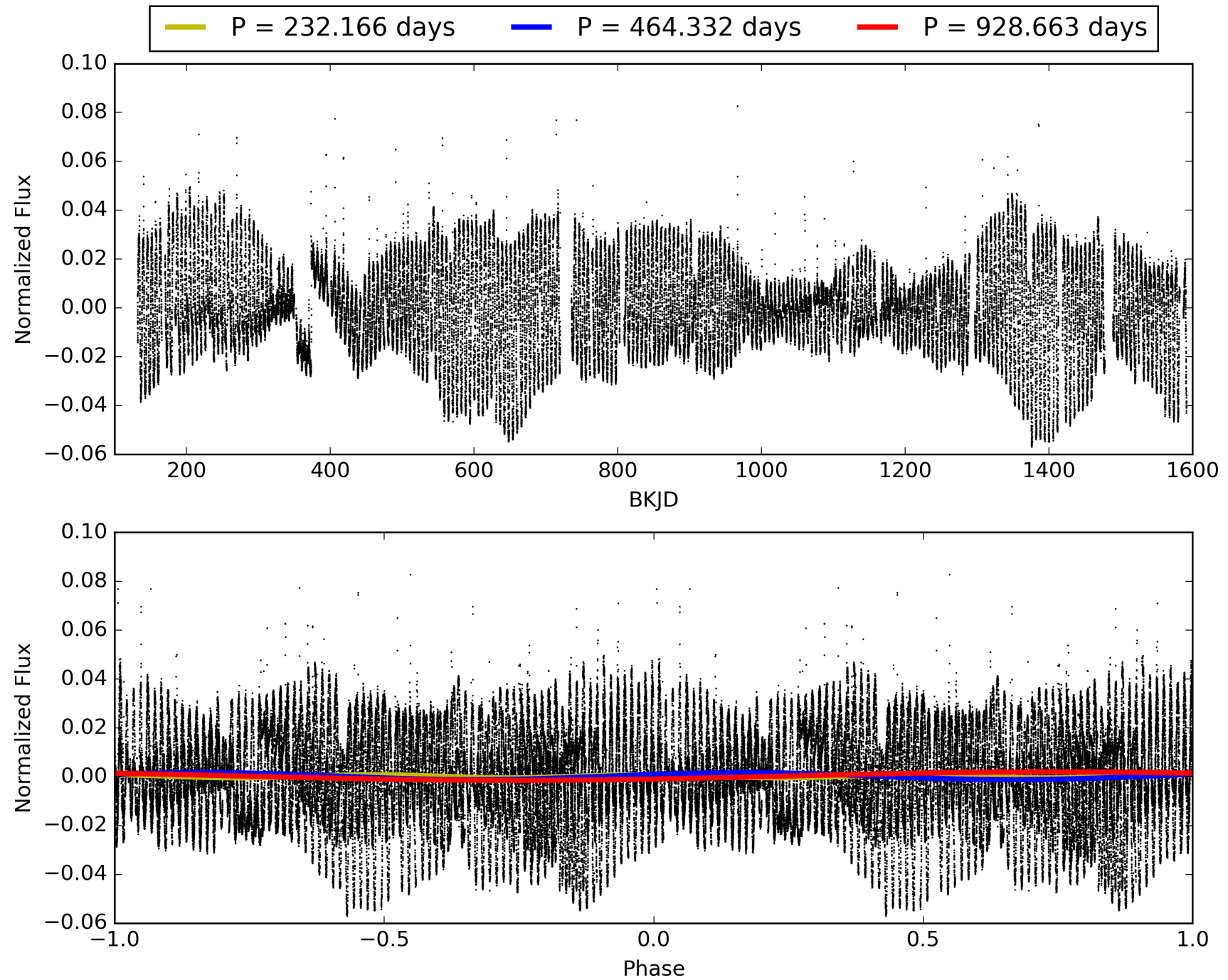
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:48:53 Z

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

# TCE 011515276-07, PDC Light Curves

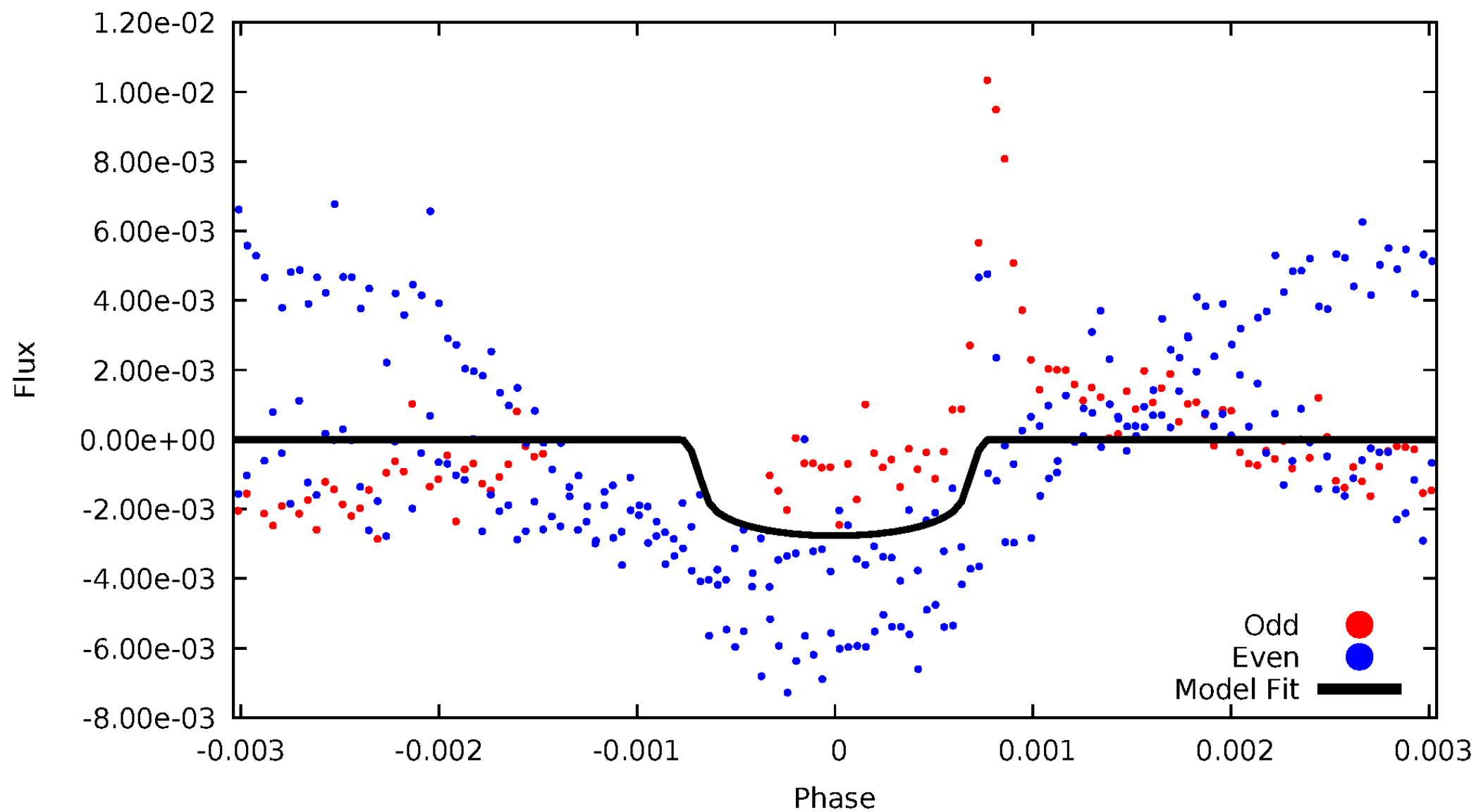


TCE 011515276-07



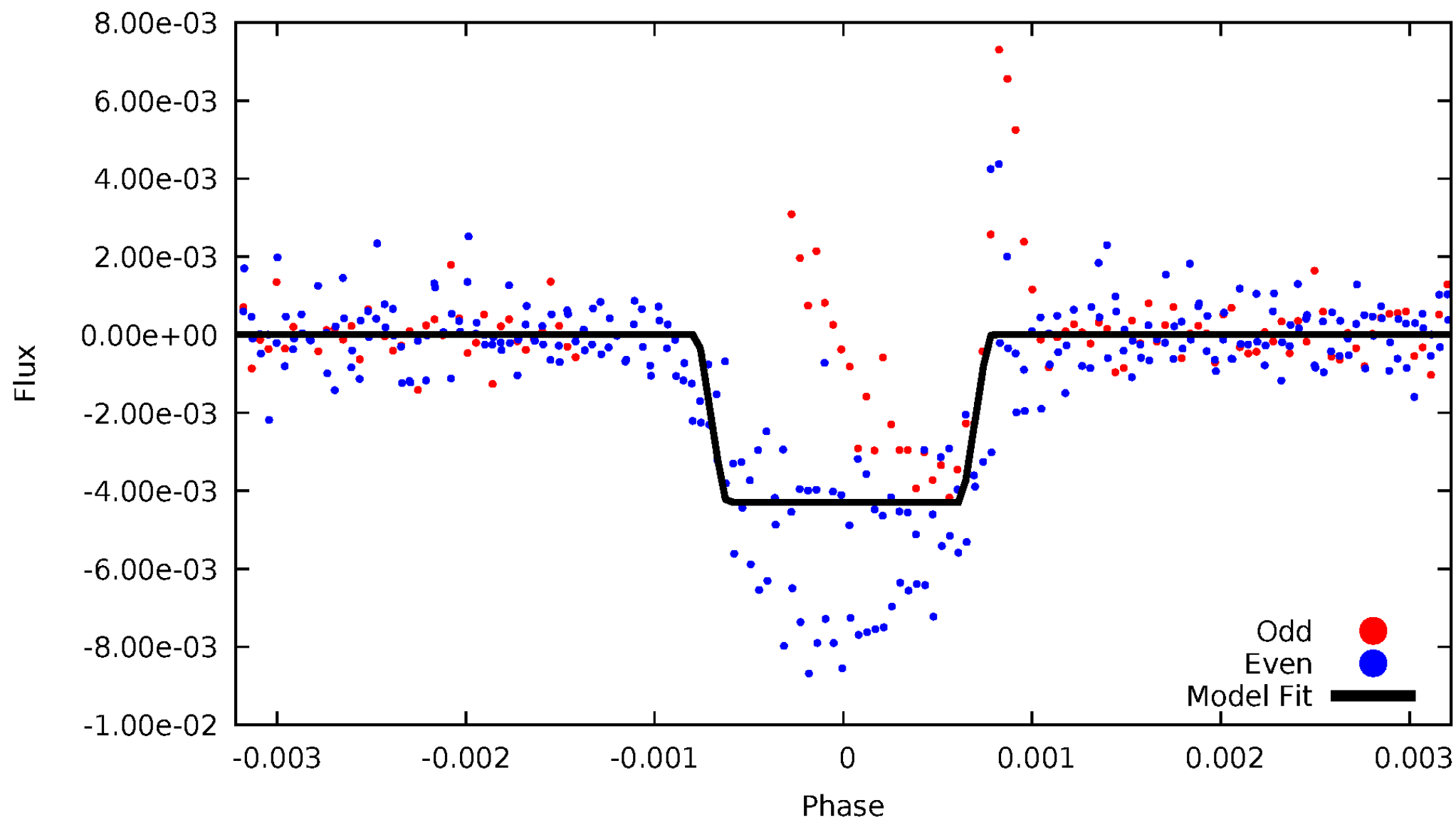
# DV Odd/Even

TCE 011515276-07



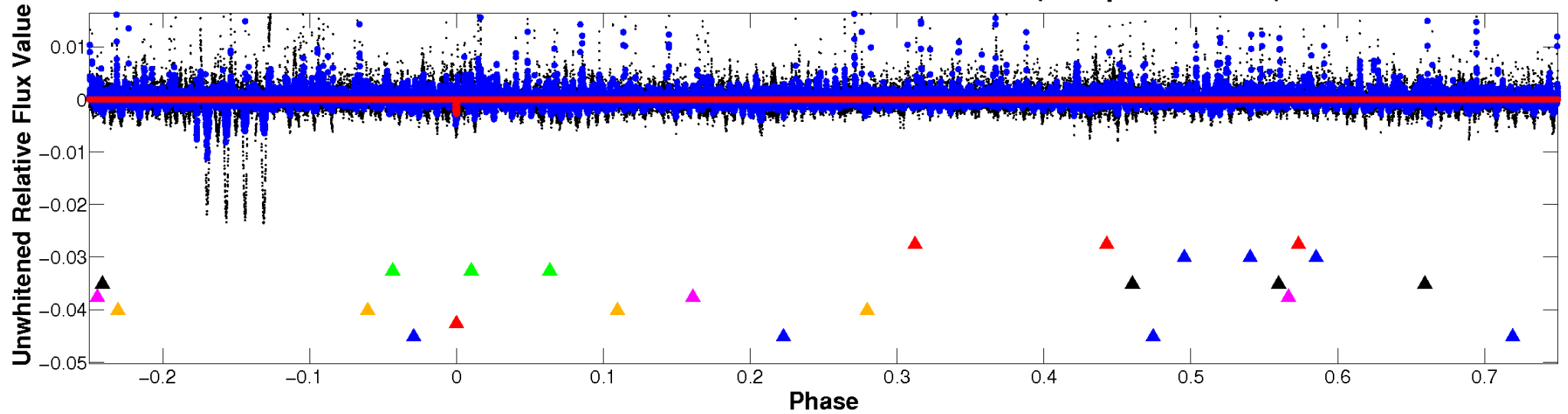
# ALT Odd/Even

TCE 011515276-07

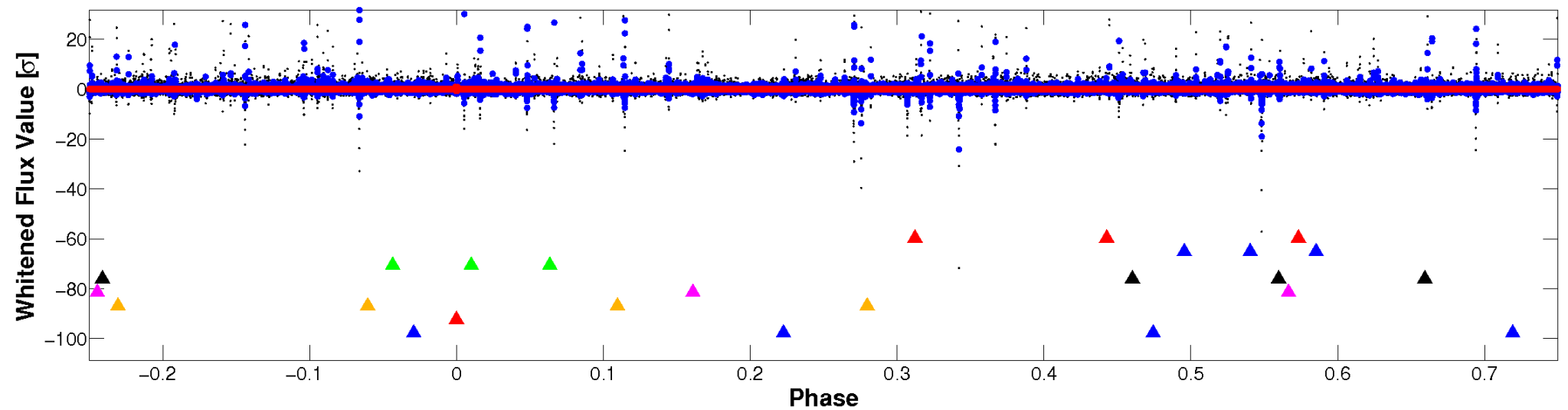


# Non-Whitened Vs. Whitened Light Curve

## Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



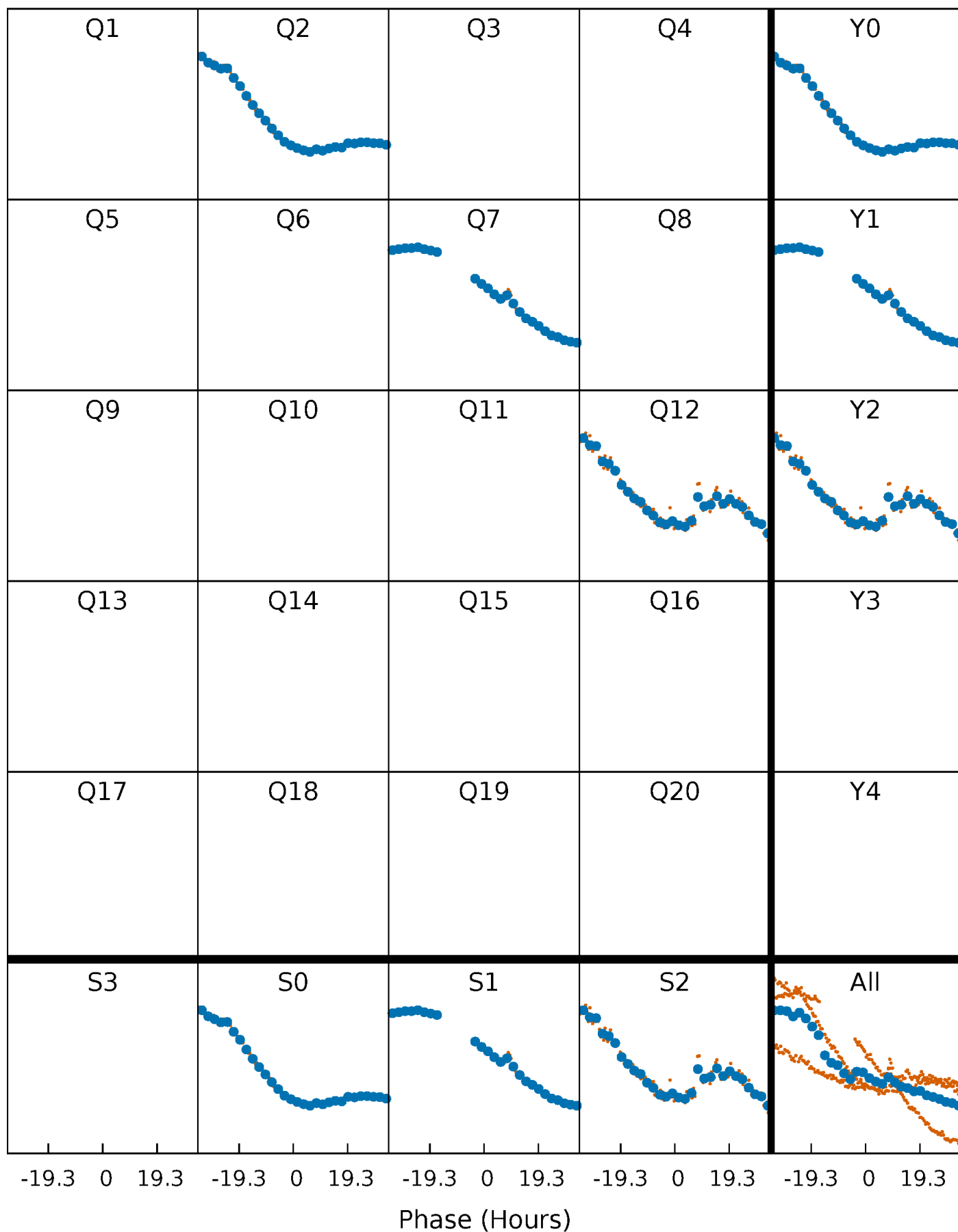
## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)





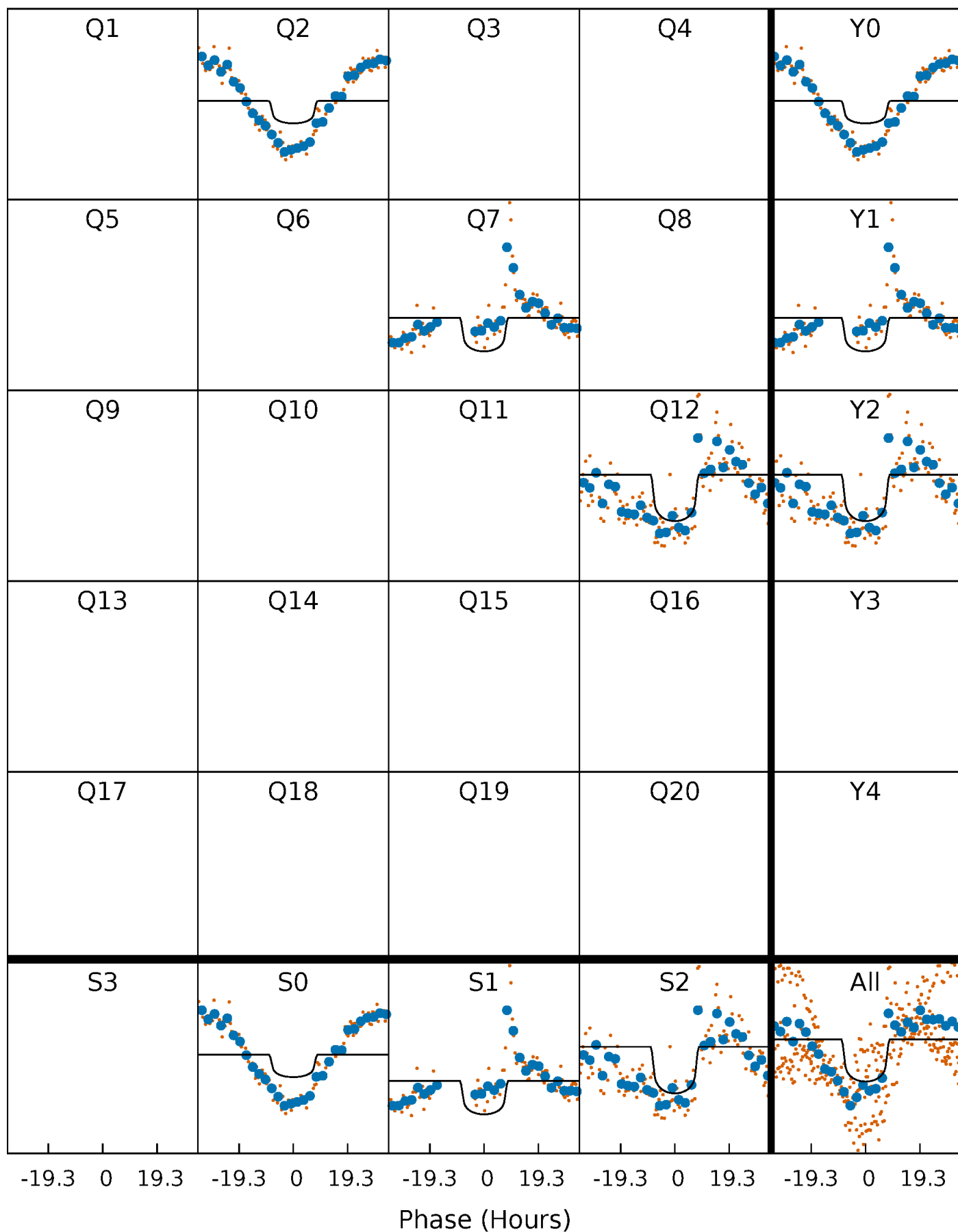
# PDC Quarter-Phased Transit Curves

TCE 011515276-07 P=464.331649 Days  $T_0=247.258780$  (BKJD)



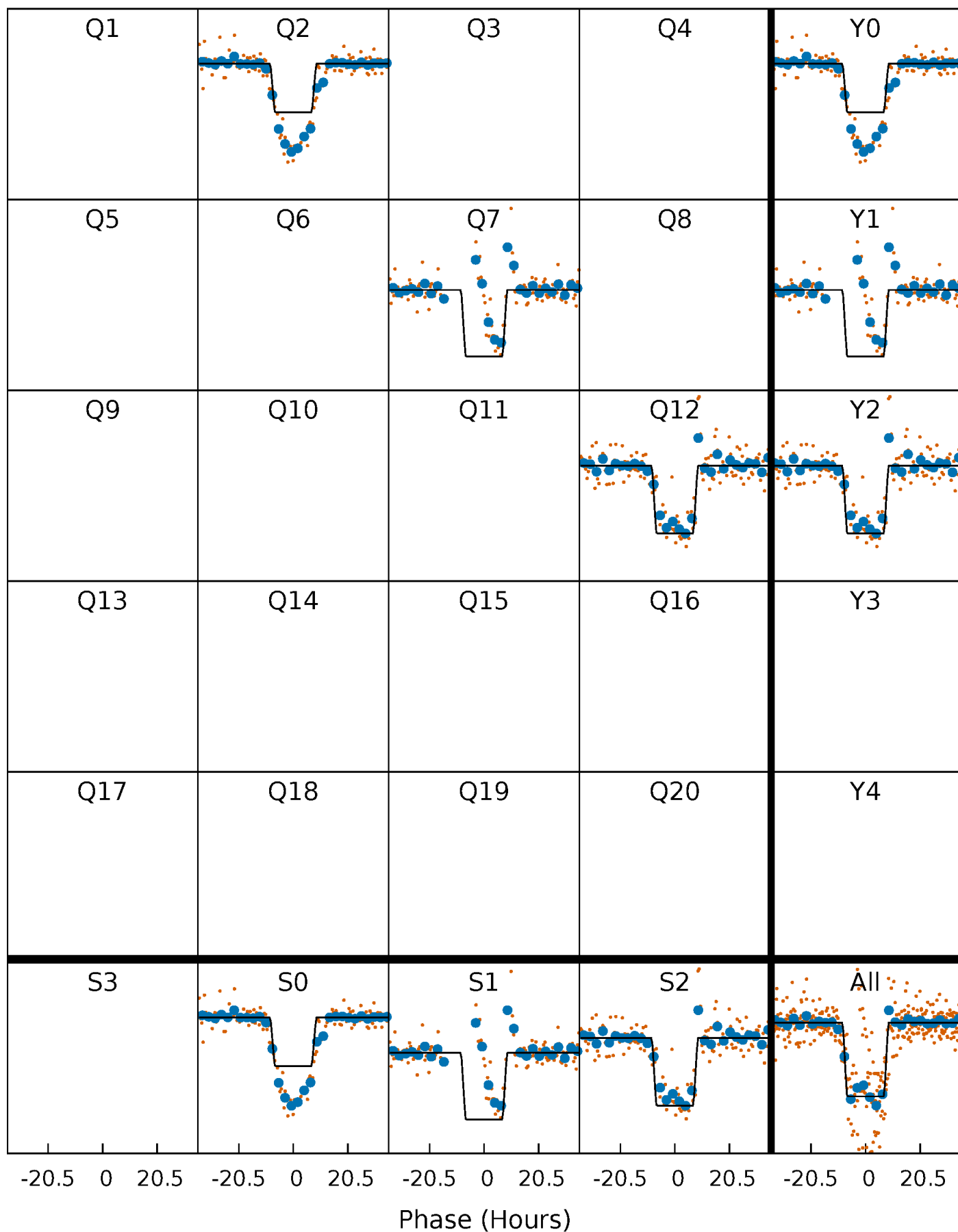
# DV Quarter-Phased Transit Curves

TCE 011515276-07     $P=464.331649$  Days     $T_0=247.258780$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

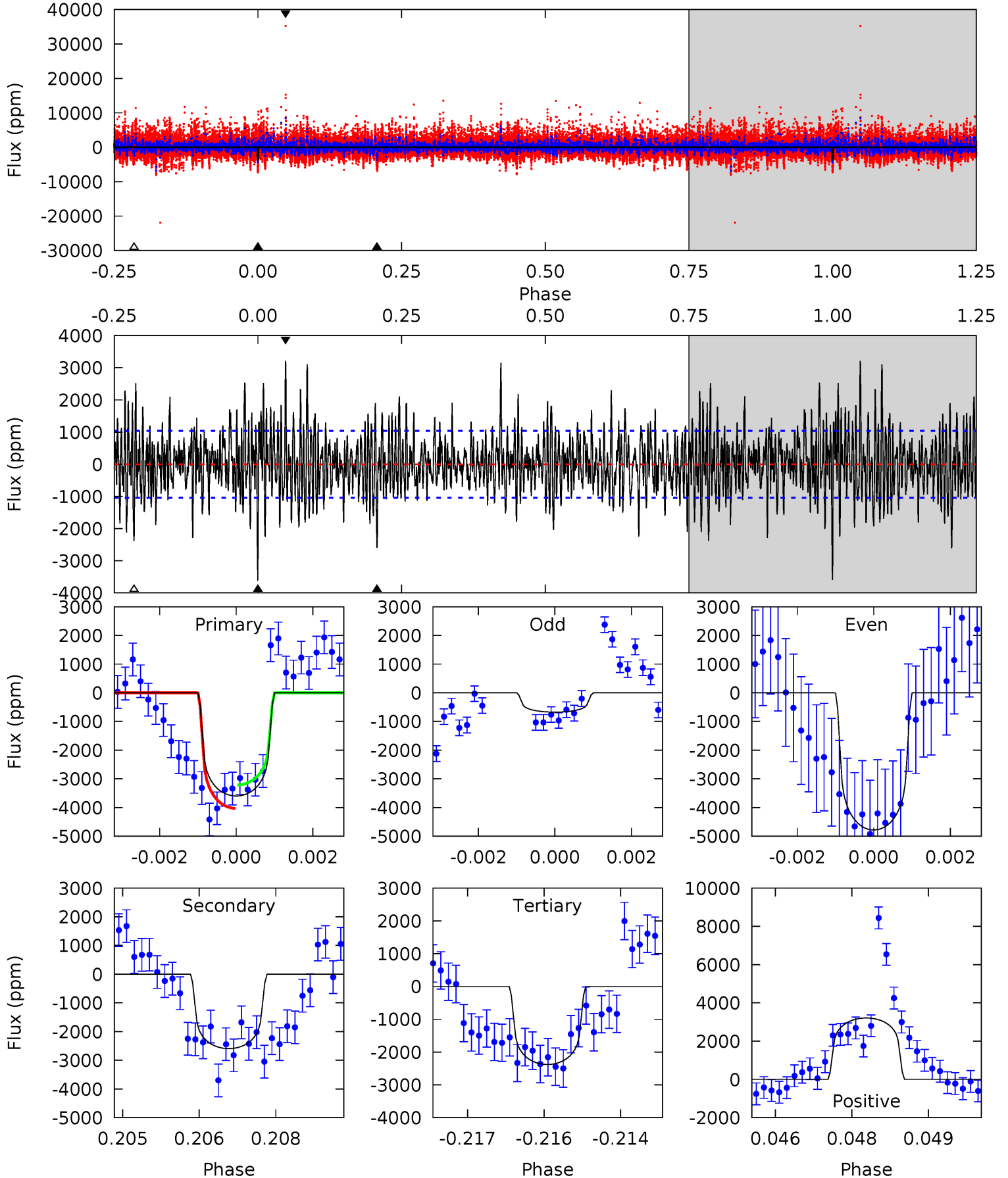
TCE 011515276-07 P=464.332217 Days  $T_0=247.232312$  (BKJD)



# DV Model-Shift Uniqueness Test

011515276-07, P = 464.331649 Days, E = 247.258780 Days

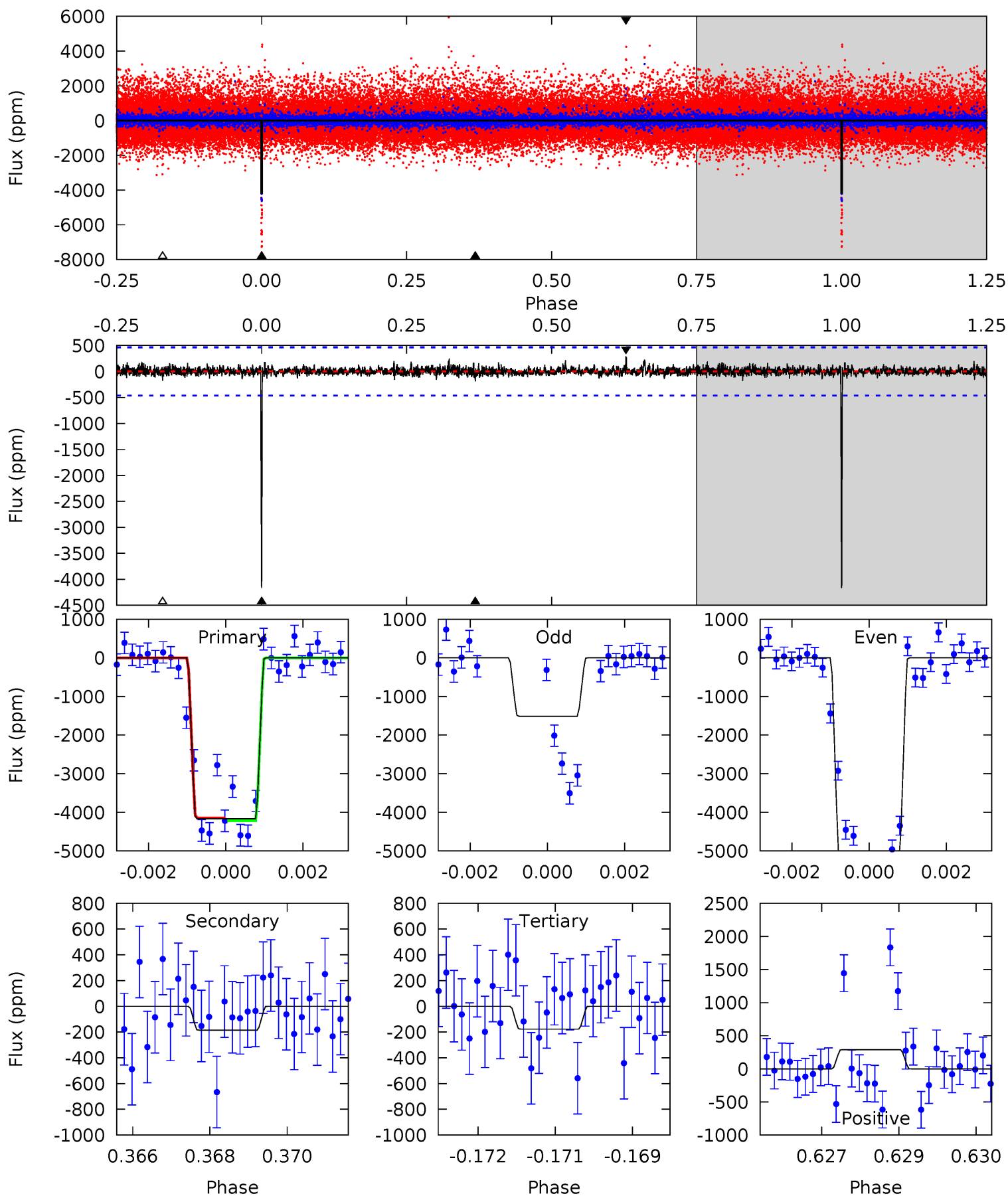
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.6	13.4	12.3	16.6	5.37	3.17	4.03	6.29	2.00	1.11	-3.18	6.22	1.02	0.47	2.10



# Alt Model-Shift Uniqueness Test

011515276-07, P = 464.332217 Days, E = 247.232312 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
48.3	2.14	2.05	3.35	5.37	3.16	0.52	46.2	44.9	0.10	-1.21	20.7	1.09	0.06	0.40



### Stellar Parameters For KIC 011515276

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3618^{+43}_{-48}$	$4.858^{+0.033}_{-0.033}$	$-0.200^{+0.100}_{-0.100}$	$0.401^{+0.029}_{-0.032}$	$0.423^{+0.027}_{-0.038}$	$9.278^{+1.660}_{-1.289}$
	+1%/-1%	+1%/-1%	+50%/-50%	+7%/-8%	+6%/-9%	+18%/-14%
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 011515276-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-2594 \pm 194$	$2.21^{+0.30}_{-0.28}$	$151^{+3}_{-3}$	$3623^{+166}_{-145}$	$225154^{+67555}_{-48628}$
Alt.	$-185 \pm 86$	$2.87^{+0.31}_{-0.28}$	$151^{+3}_{-3}$	$2351^{+119}_{-147}$	$9644^{+4847}_{-4391}$

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

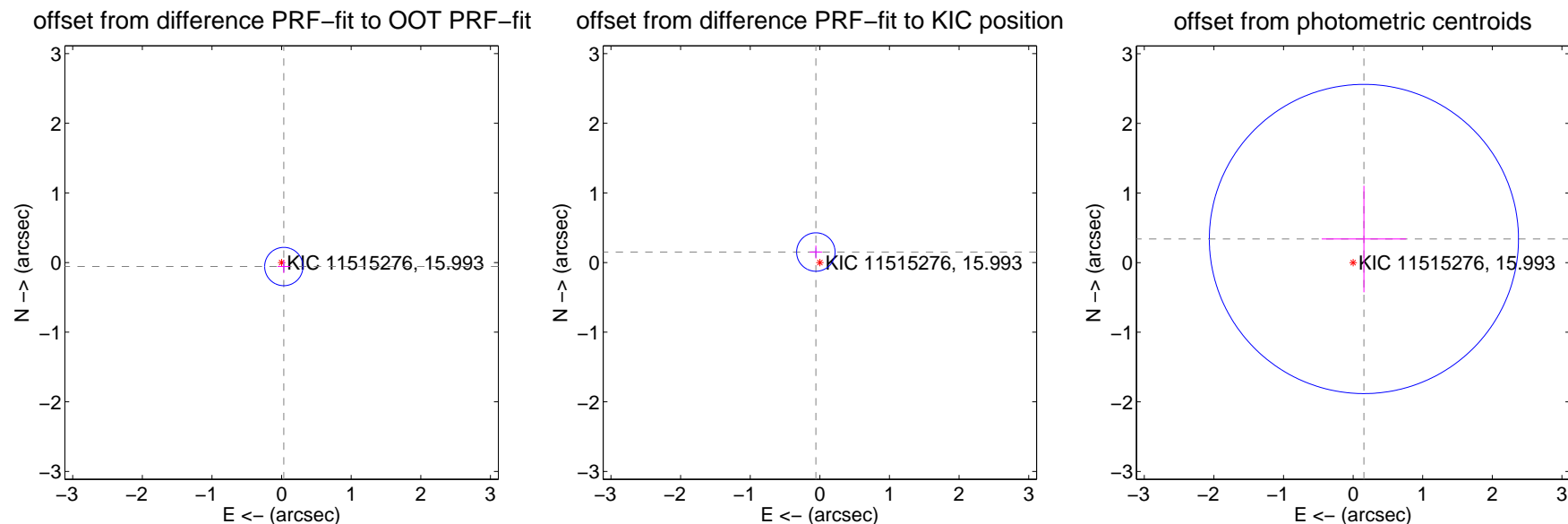
## DV Centroid Data

Supplemental centroid analysis for 011515276-07. Kepler magnitude: 15.99. Transit SNR 6.52

There are 1 quarters with good PRF difference image offsets

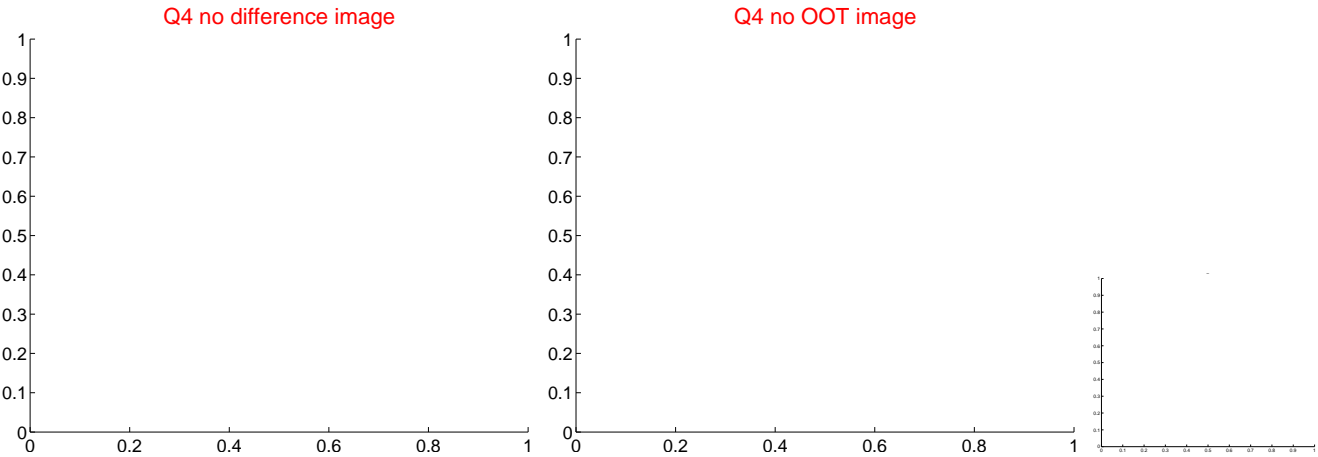
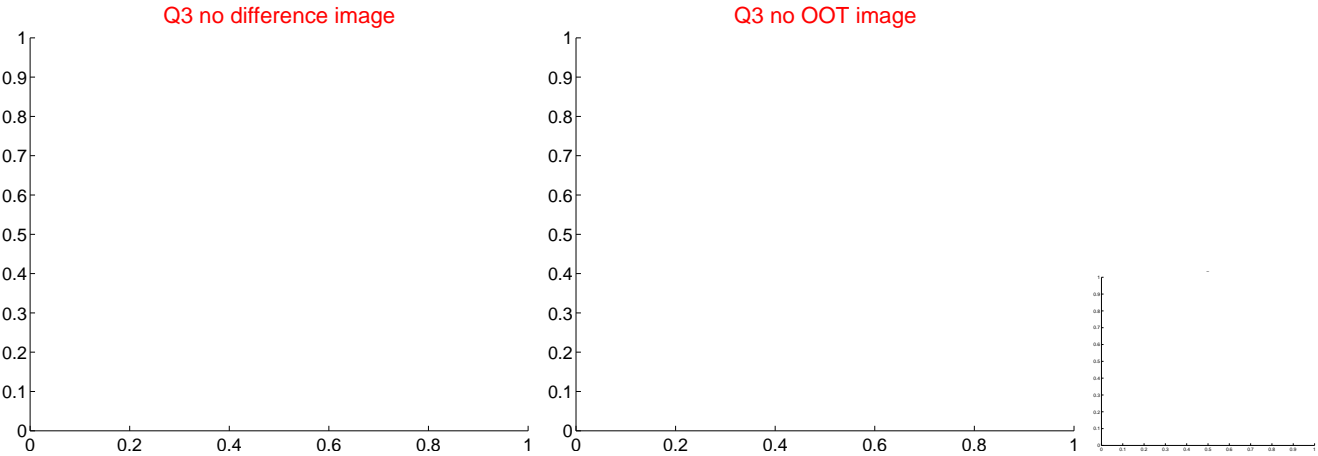
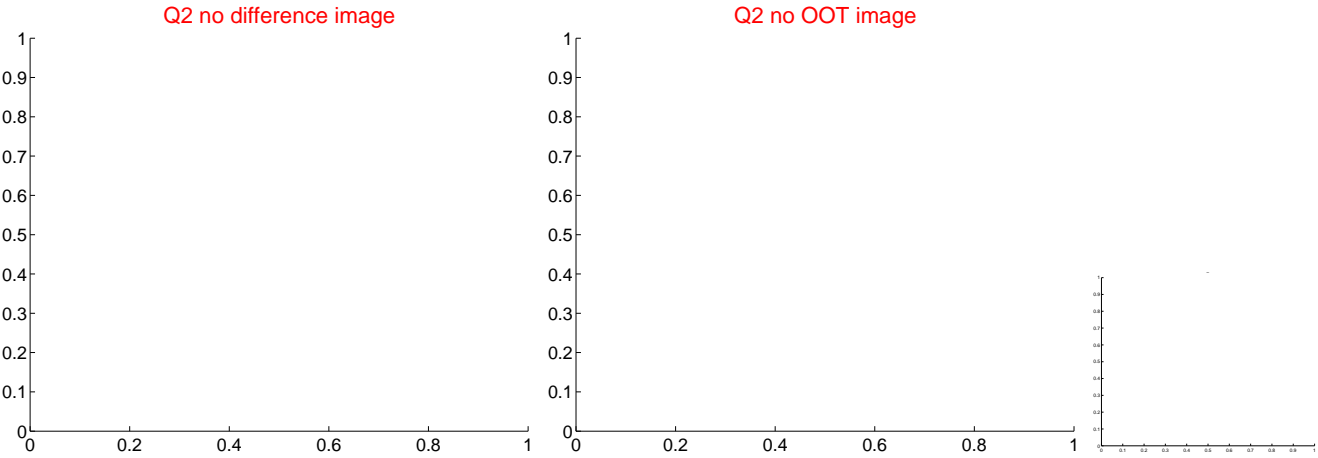
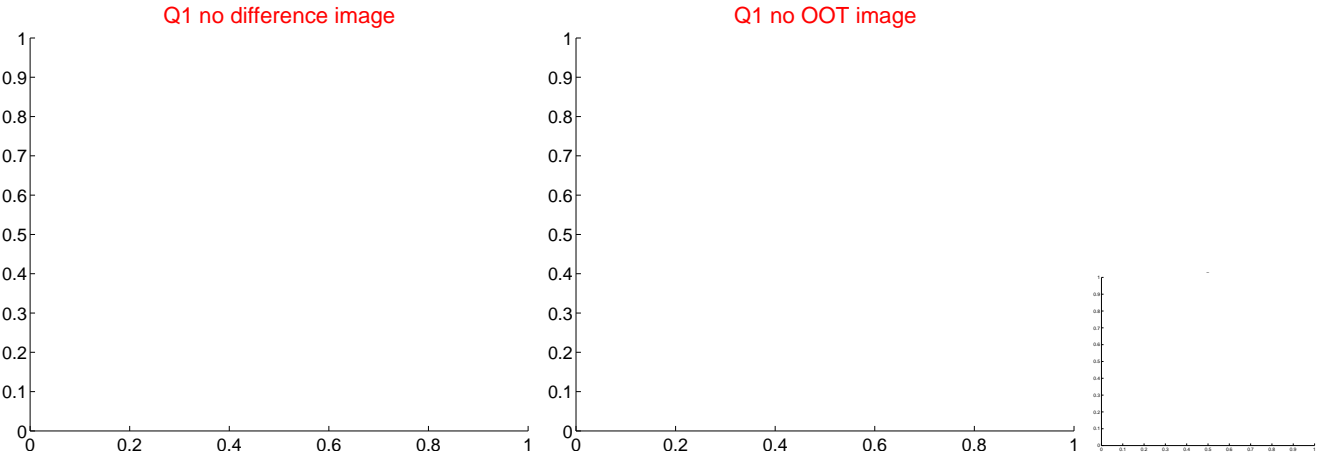
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.066 \pm 0.092$	0.72	$-0.032 \pm 0.089$	$-0.057 \pm 0.092$
PRF-fit source offset from KIC position	$0.161 \pm 0.092$	1.75	$0.057 \pm 0.089$	$0.151 \pm 0.092$
photometric centroid source offset	$0.37 \pm 0.74$	0.50	$-0.16 \pm 0.61$	$0.34 \pm 0.77$



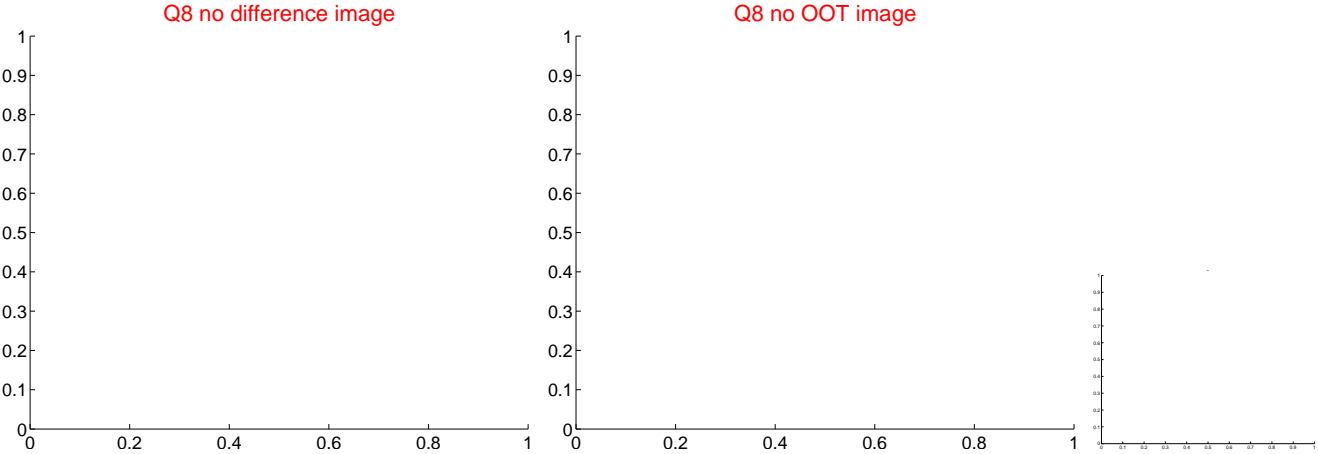
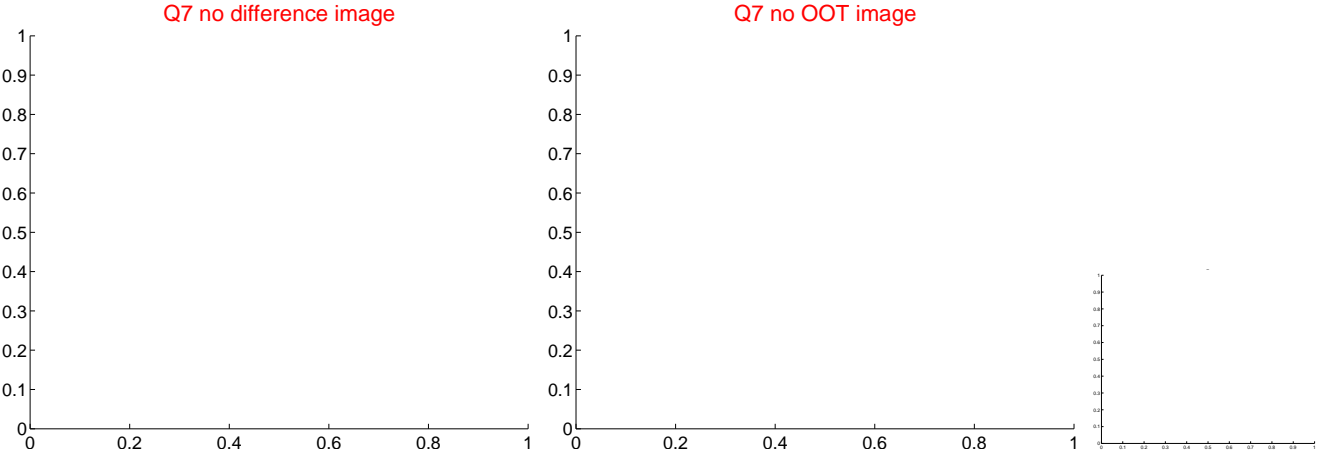
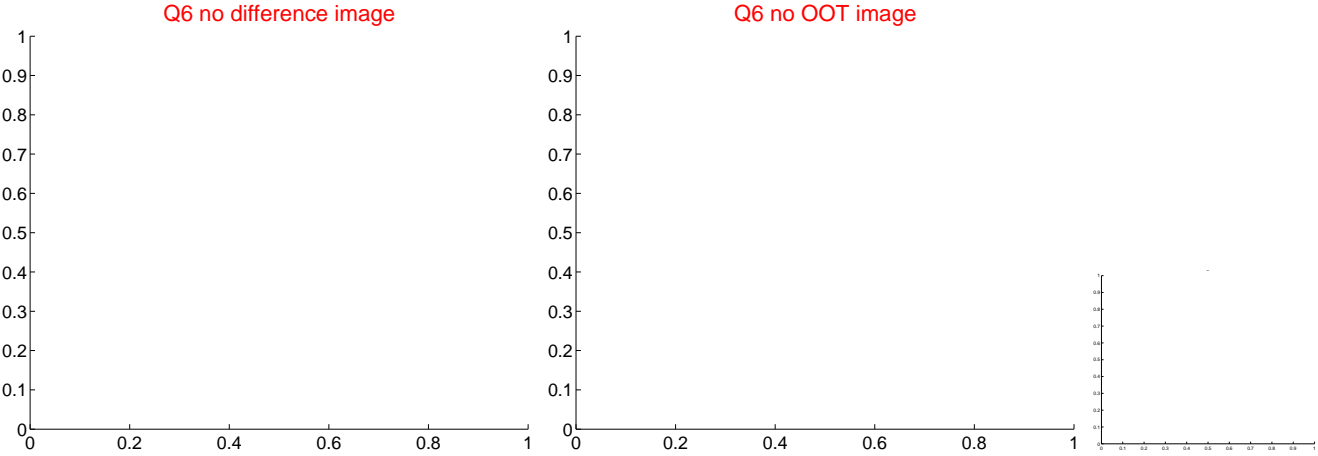
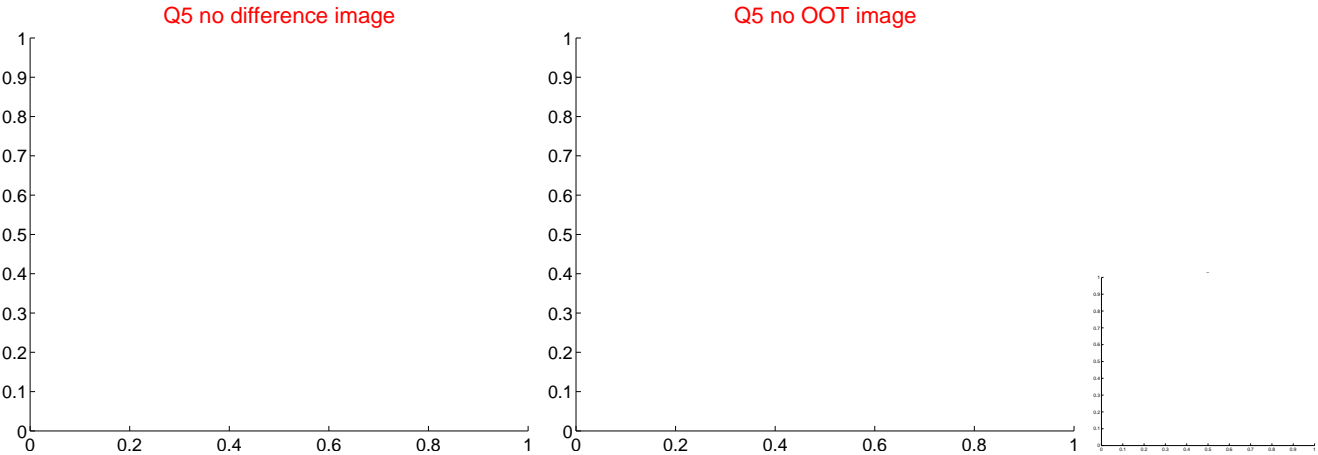
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

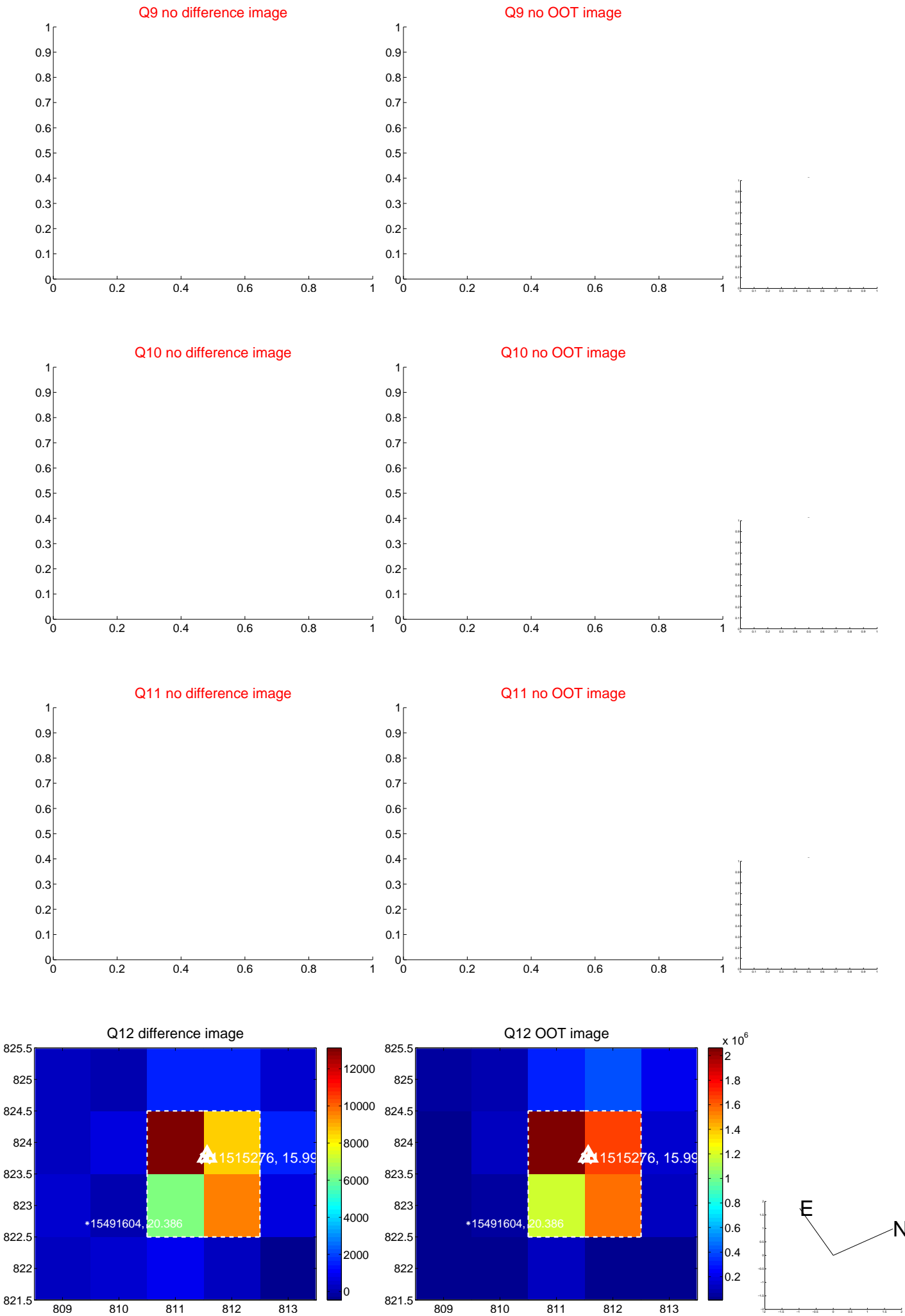




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



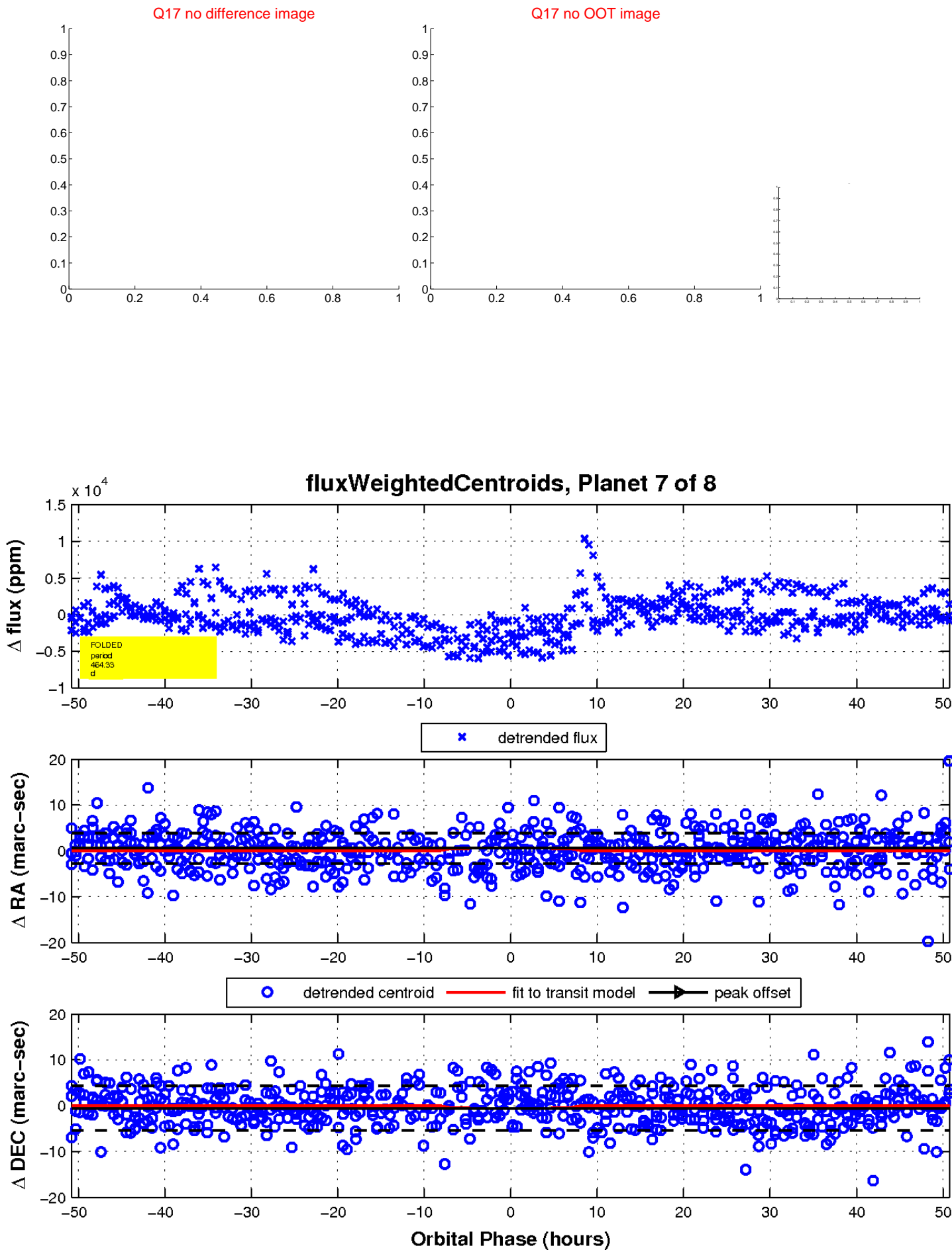
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

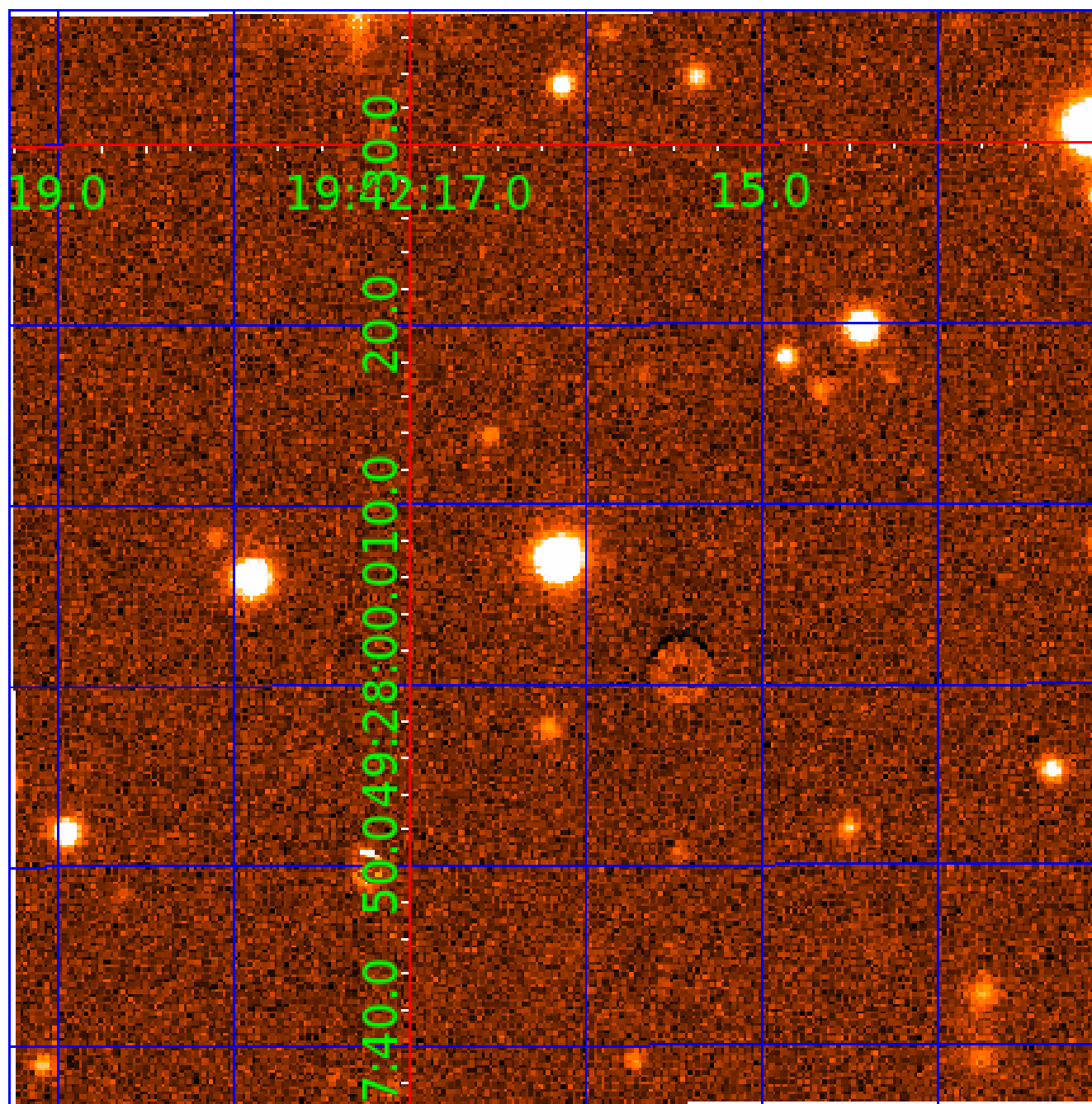


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 011515276

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011515276-01	OBS	No	403.712205	513.461034	3886.9	5.507	14.0	11.4	0.40	3618	3.06	0.04
011515276-03	OBS	No	489.164999	227.101526	3054.4	8.467	11.6	9.0	0.40	3618	2.61	0.03
011515276-04	OBS	No	418.095298	135.336485	2037.4	9.242	11.0	6.6	0.40	3618	1.82	0.04
011515276-05	OBS	No	652.627829	133.728275	2506.4	5.376	12.2	7.2	0.40	3618	2.00	0.02
011515276-06	OBS	No	385.371365	377.127951	3194.4	12.673	10.0	7.9	0.40	3618	2.25	0.04
011515276-07	OBS	No	464.331649	247.258780	2764.8	16.928	10.7	6.5	0.40	3618	2.22	0.03
011515276-08	OBS	No	347.438632	467.537482	2204.6	6.000	9.6	-1.0	0.40	3618	1.87	0.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011515276-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
011515276-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011515276-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

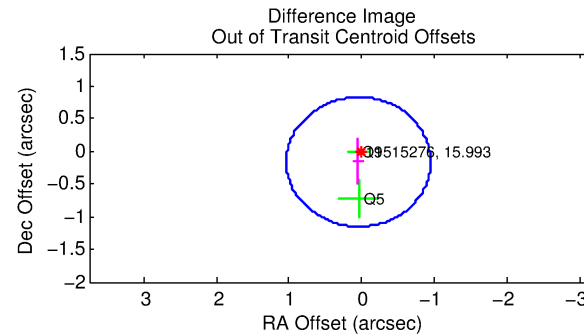
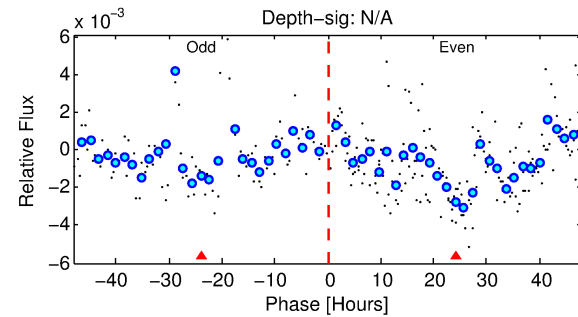
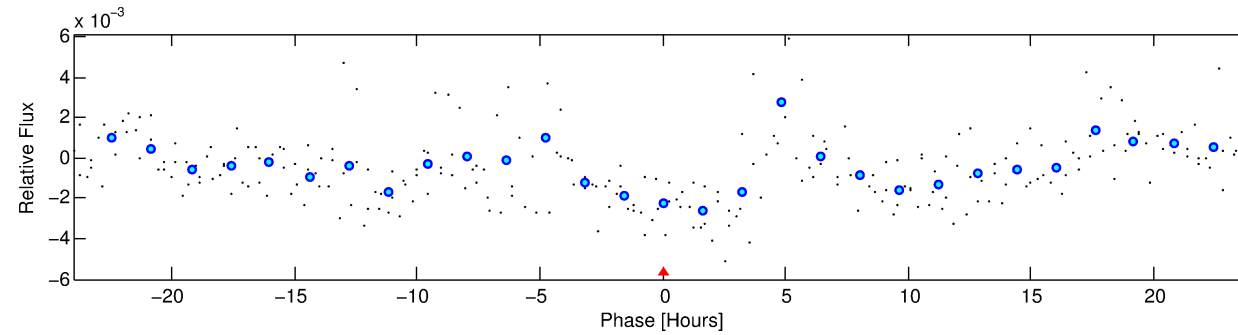
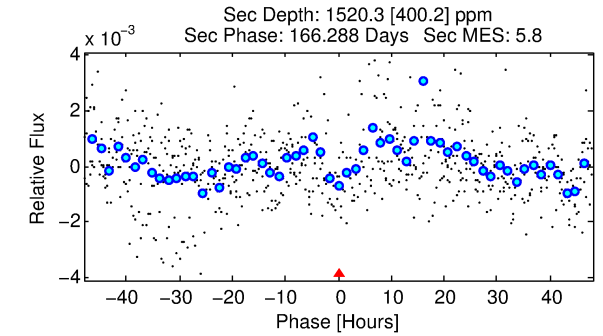
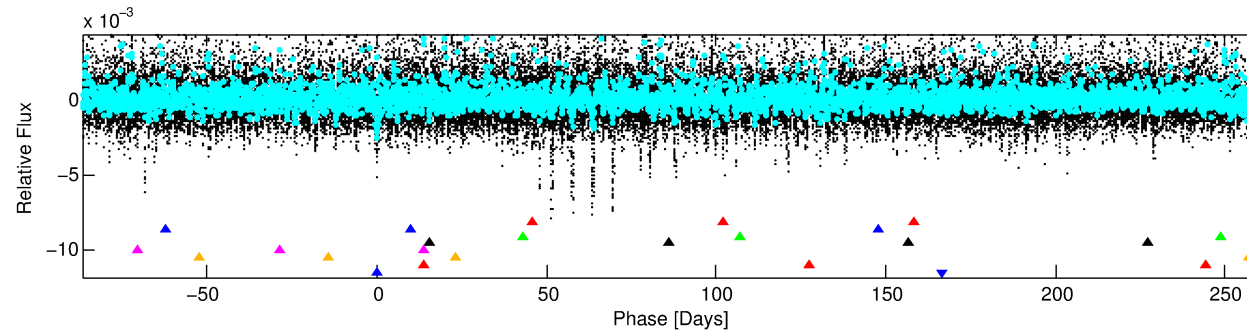
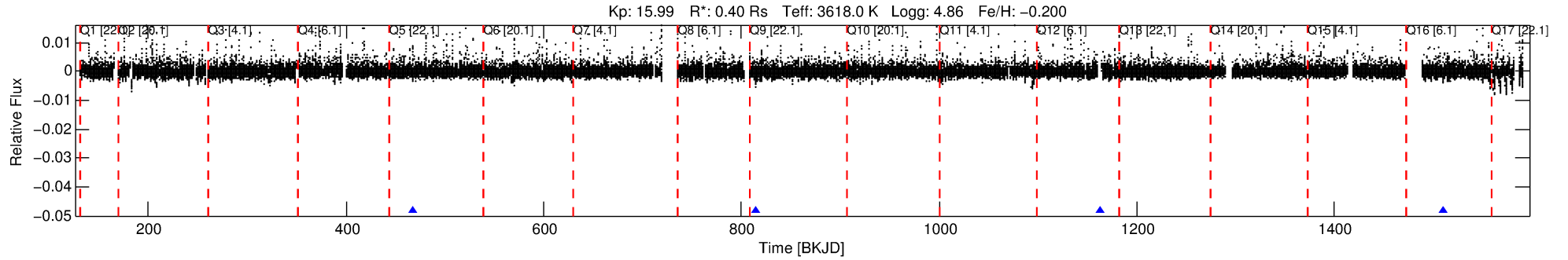
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011515276-08

No Significant Match Found

# DV One-Page Summary

KIC: 11515276 Candidate: 8 of 8 Period: 347.439 d



## TPS TCE Results:

Period = 347.43863 d  
Epoch = 467.5375 BKJD

DV fit results are unavailable

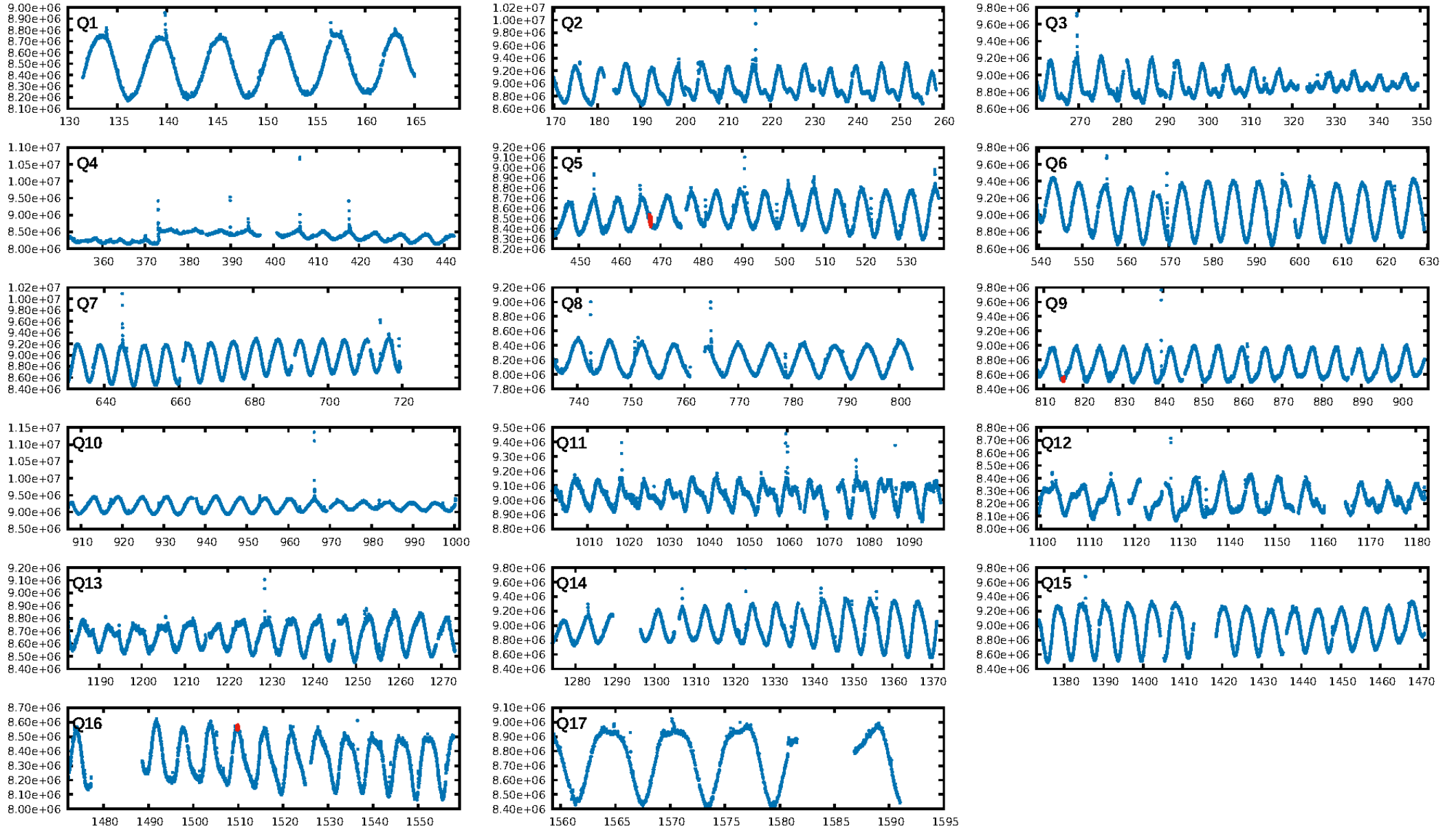
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [64.93σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -19.26  
Centroid-sig: 66.5%  
Centroid-so: 0.269 arcsec [0.52σ]  
OotOffset-rm: 0.166 arcsec [0.50σ]  
KicOffset-rm: 0.225 arcsec [1.36σ]  
OotOffset-st: 0/0/0/2 [2]  
KicOffset-st: 0/0/0/2 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [2/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:49:02 Z

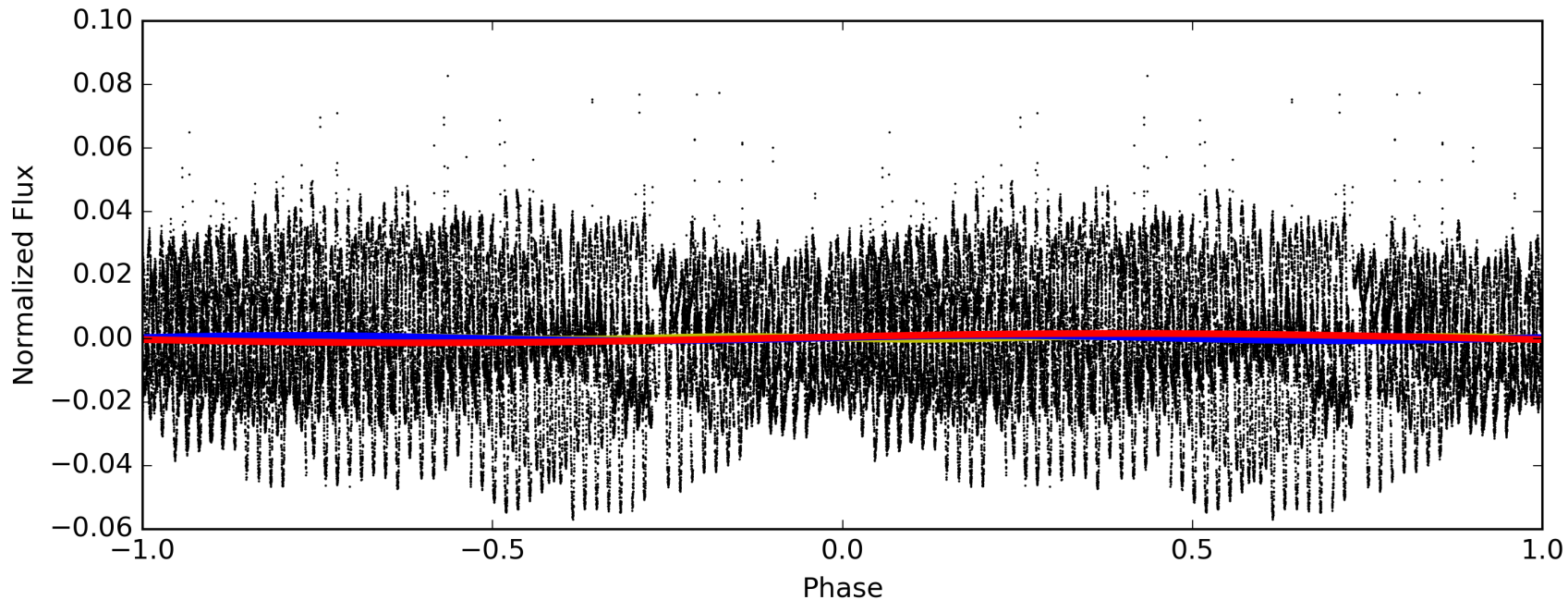
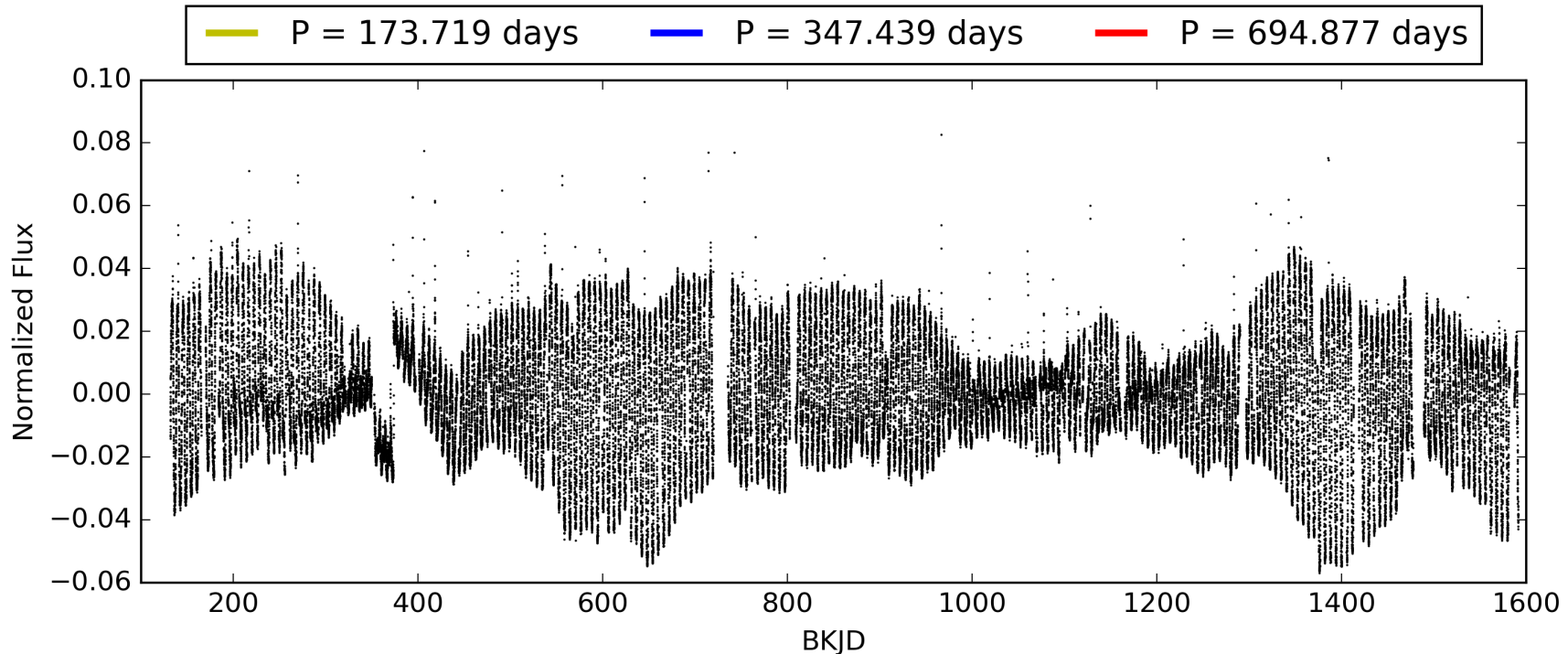
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011515276-08, PDC Light Curves



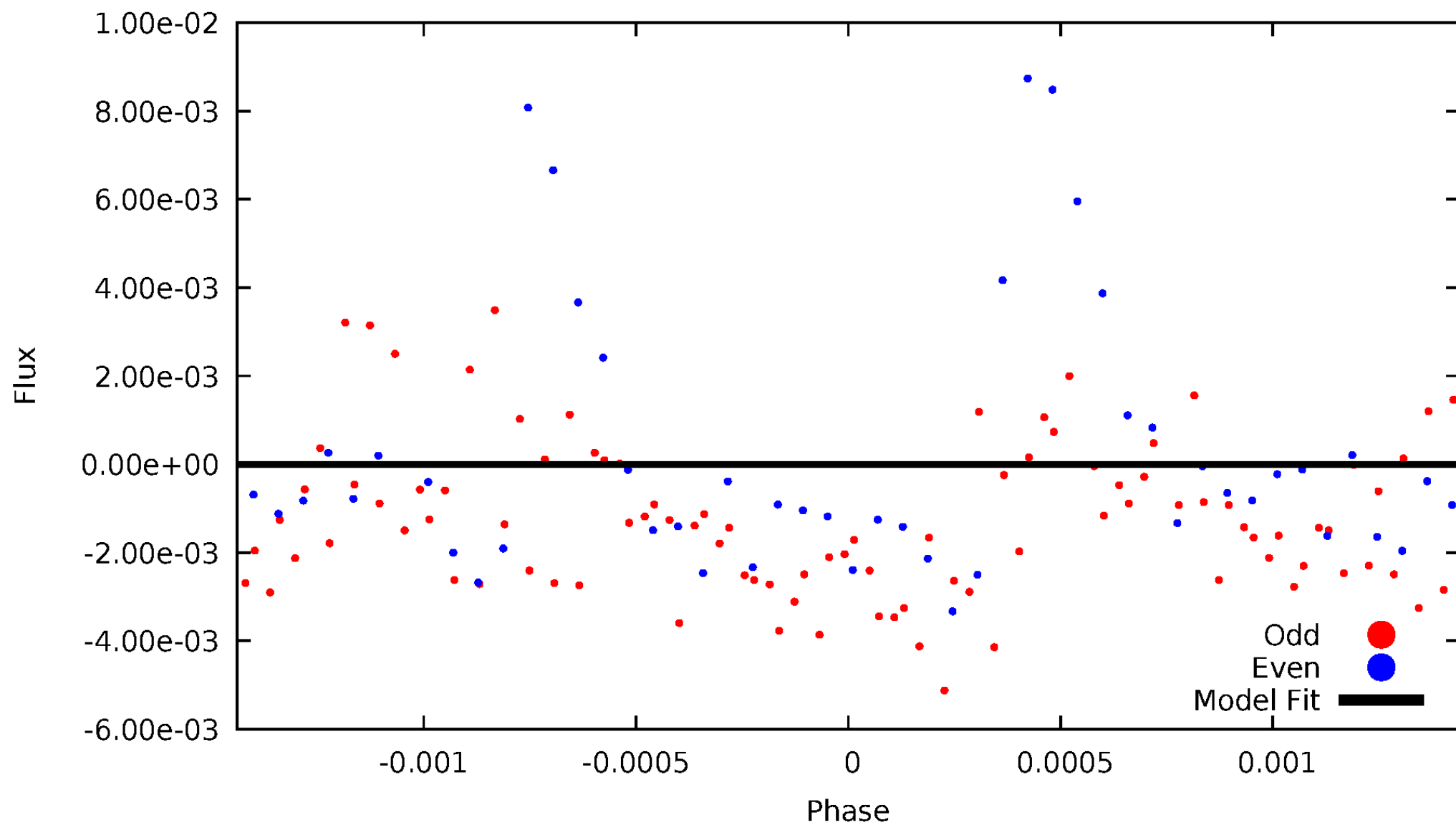


TCE 011515276-08



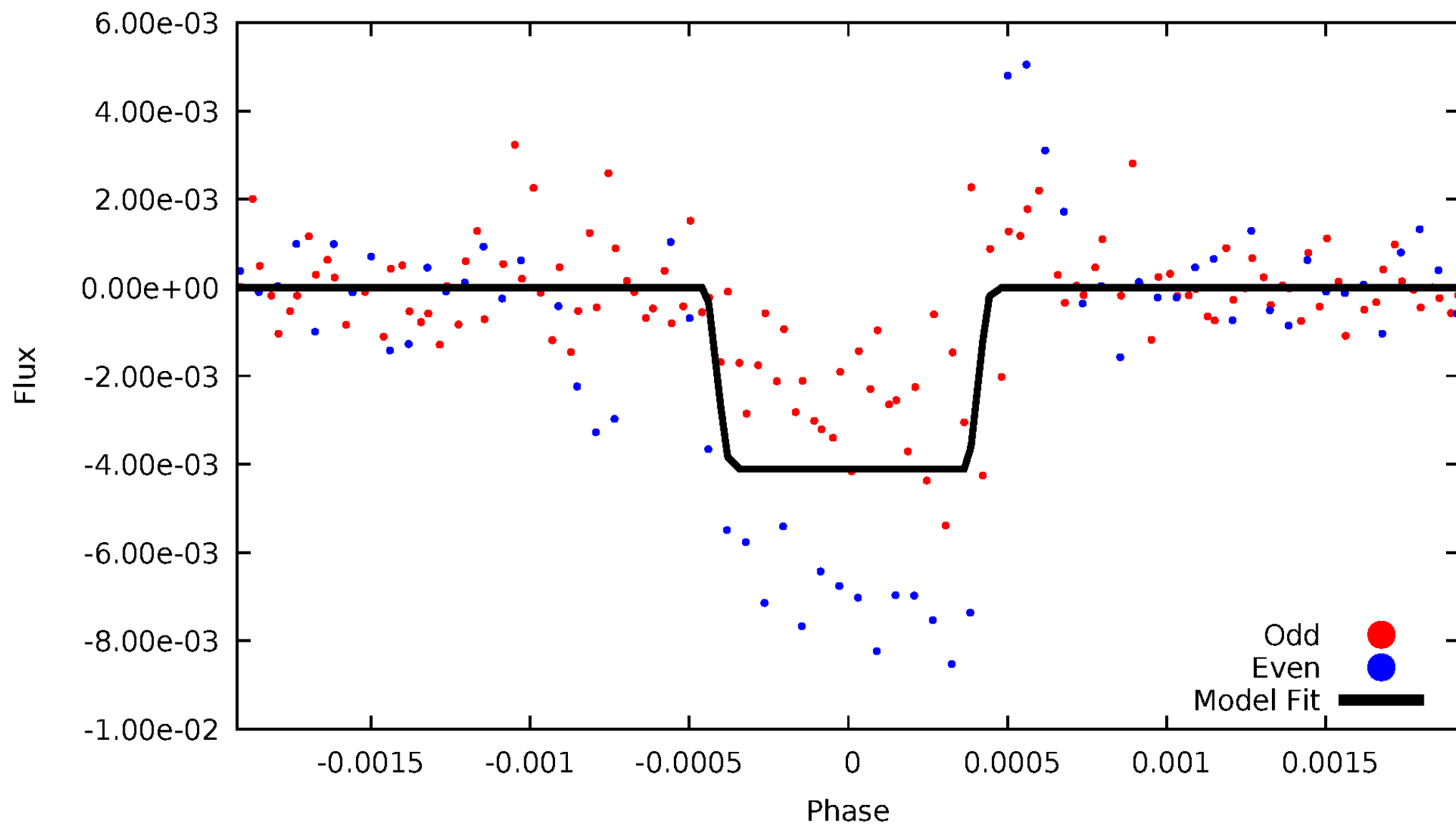
# DV Odd/Even

TCE 011515276-08



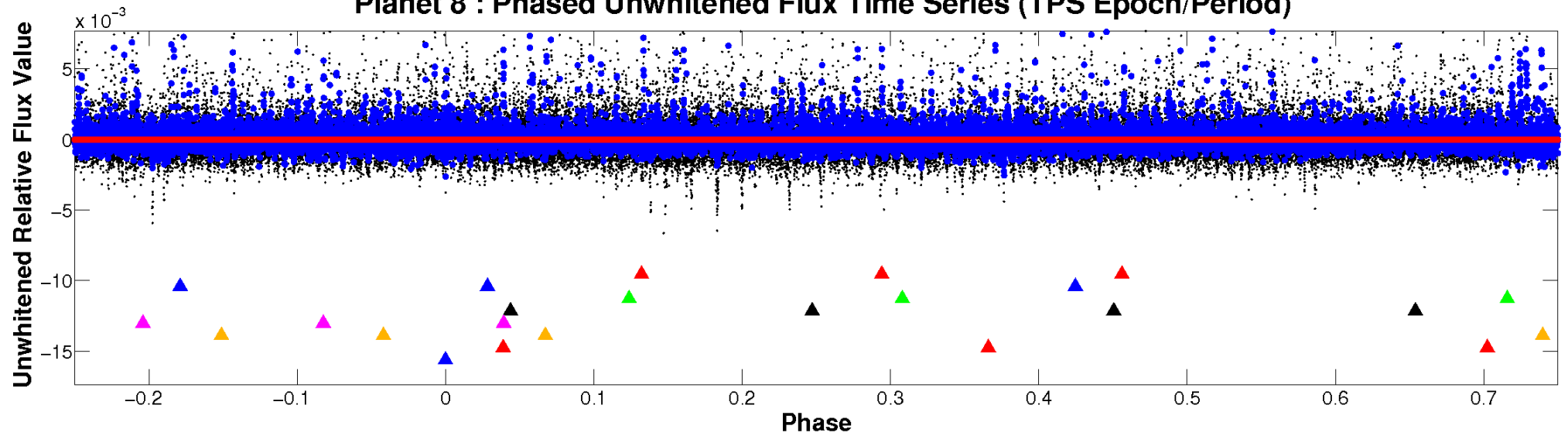
# ALT Odd/Even

TCE 011515276-08

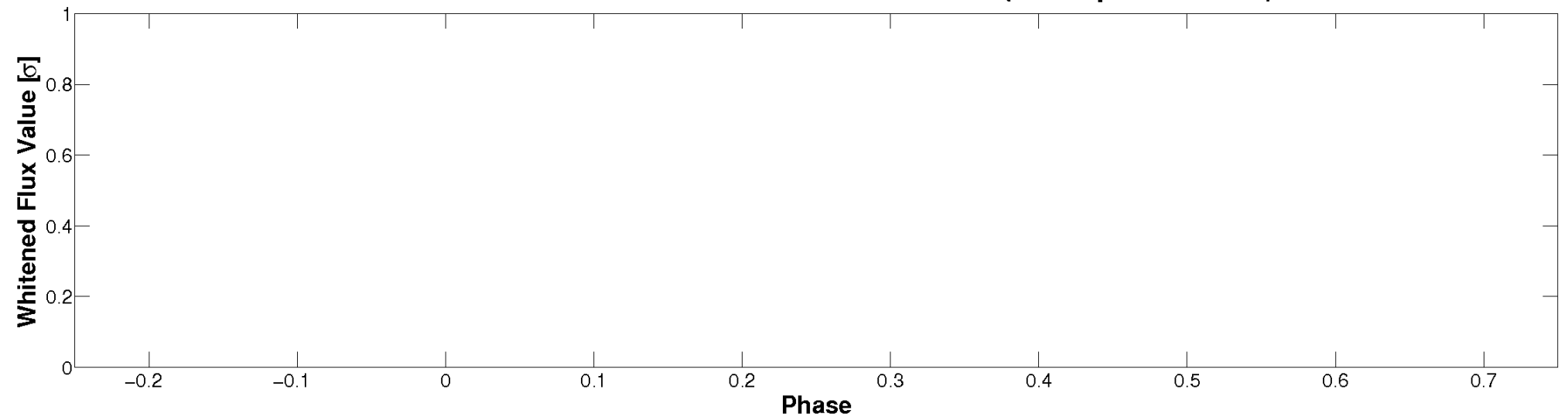


# Non-Whitened Vs. Whitened Light Curve

**Planet 8 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

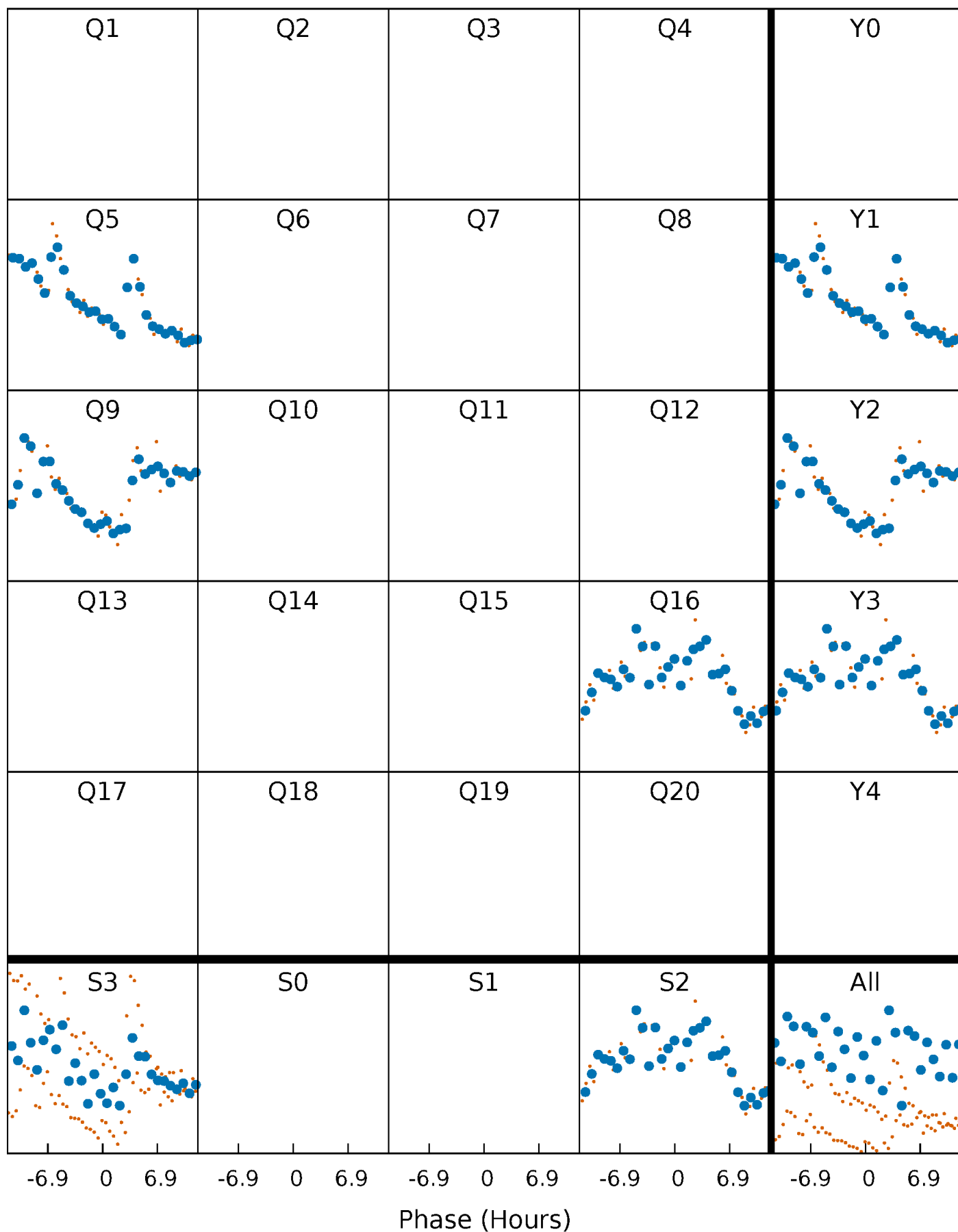


**Planet 8 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



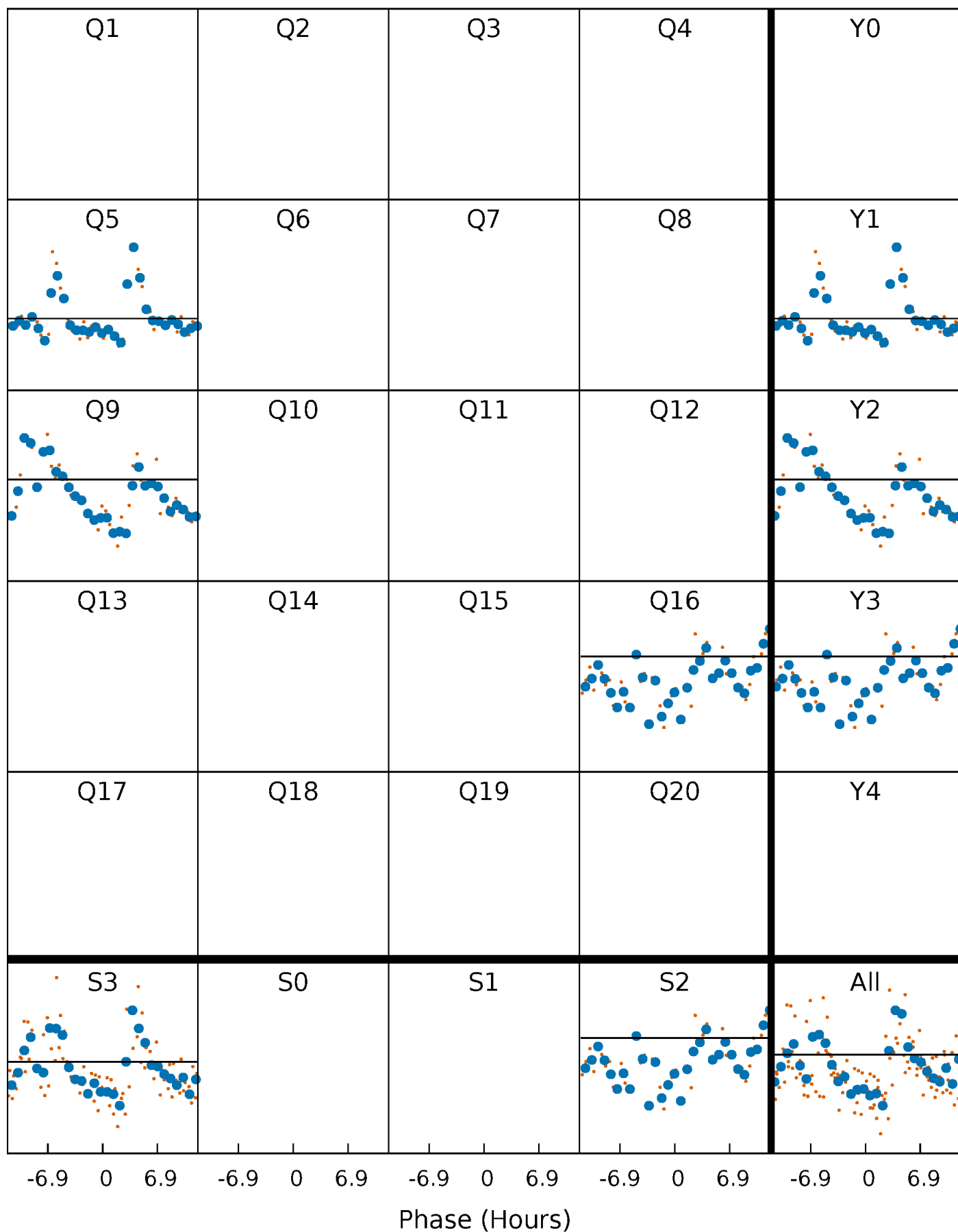
# PDC Quarter-Phased Transit Curves

TCE 011515276-08     $P=347.438632$  Days     $T_0=467.537482$  (BKJD)



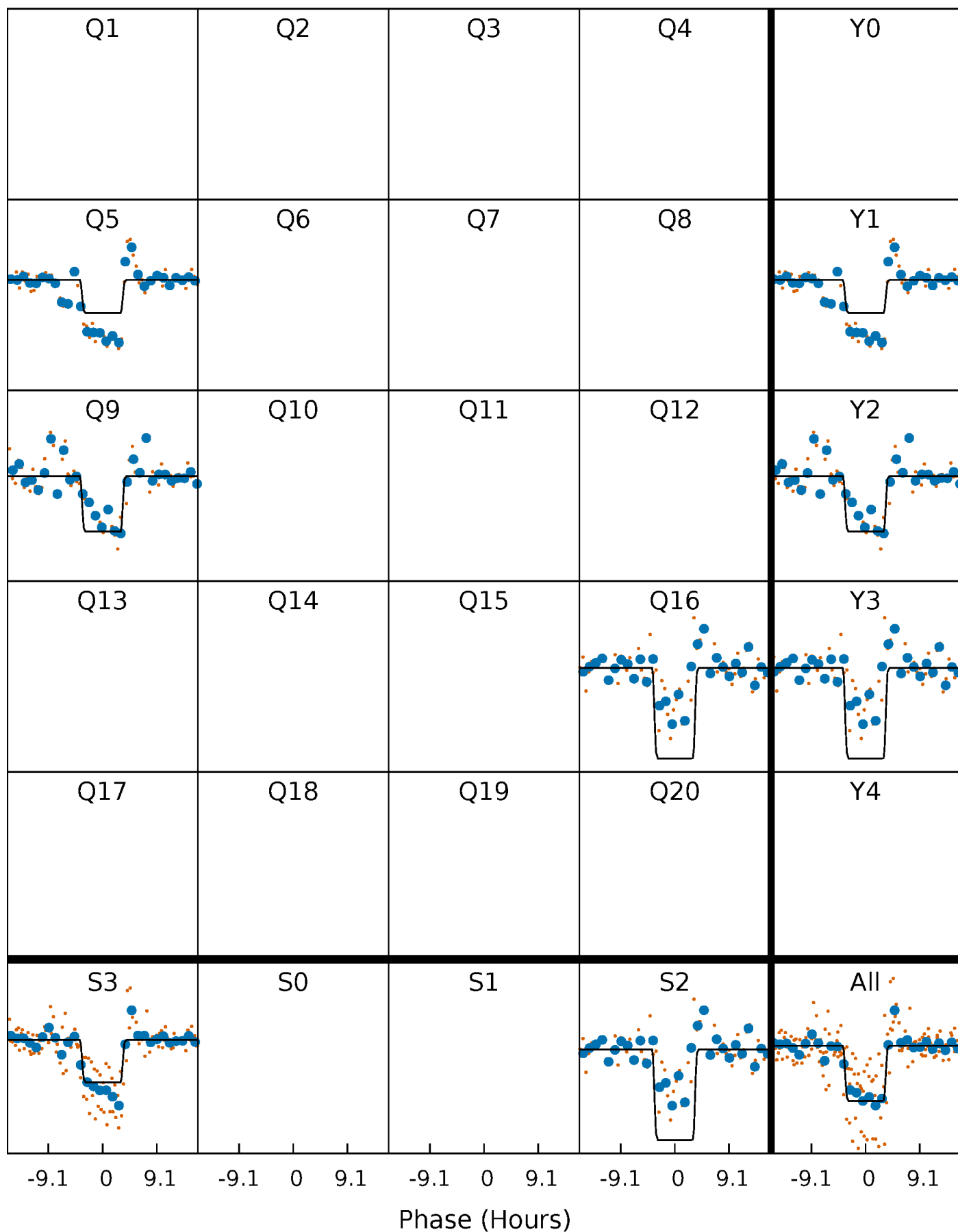
# DV Quarter-Phased Transit Curves

TCE 011515276-08     $P=347.438632$  Days     $T_0=467.537482$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

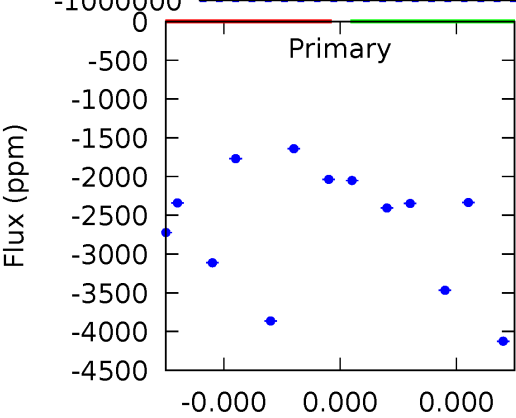
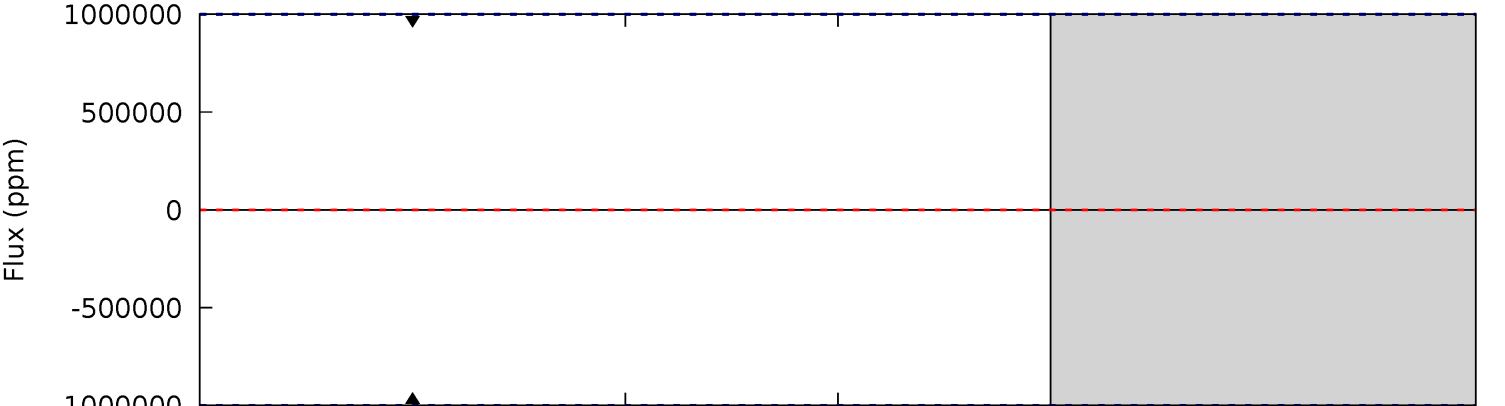
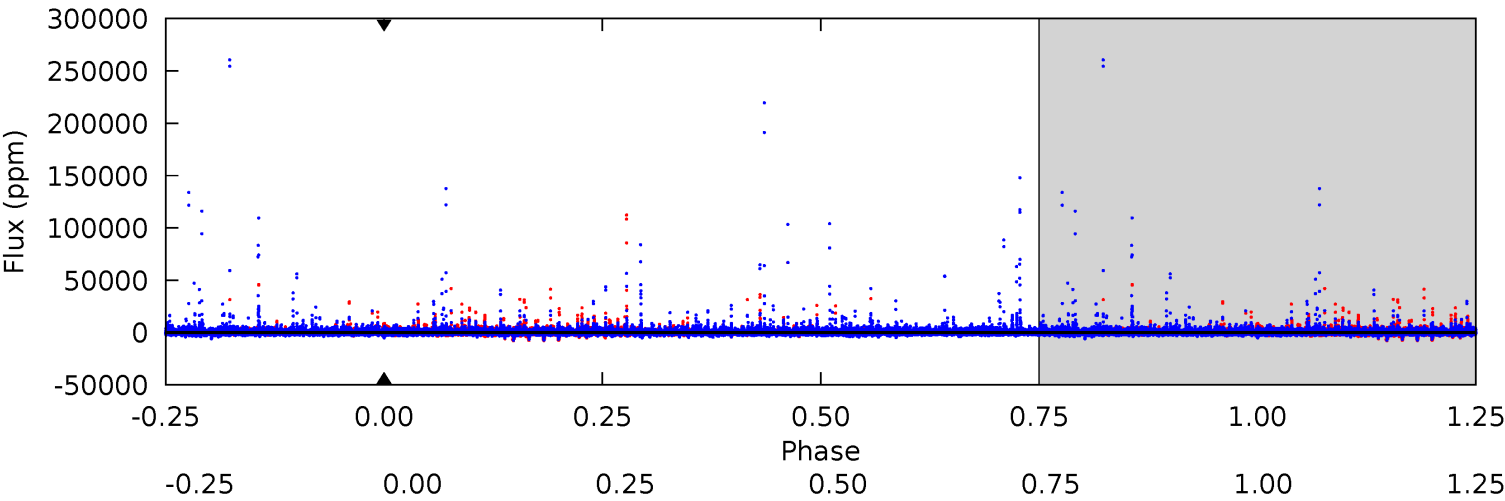
TCE 011515276-08 P=347.438632 Days  $T_0=467.510173$  (BKJD)



# DV Model-Shift Uniqueness Test

011515276-08, P = 347.438632 Days, E = 120.098850 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	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0

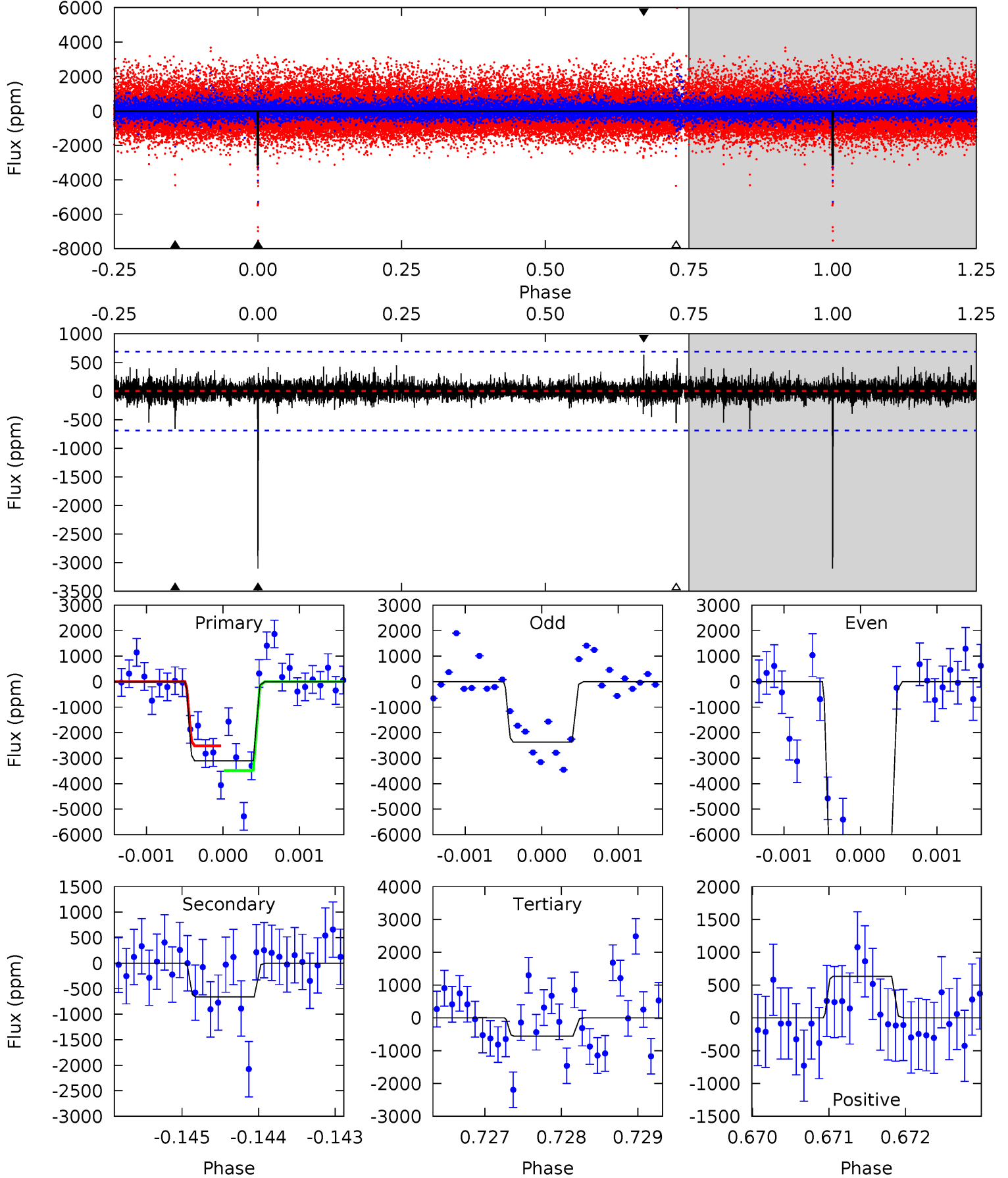




# Alt Model-Shift Uniqueness Test

011515276-08, P = 347.438632 Days, E = 120.071541 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
24.6	5.24	4.45	5.03	5.47	3.31	0.70	20.2	19.6	0.80	0.21	20.1	1.22	0.17	3.81



### Stellar Parameters For KIC 011515276

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$3618^{+43}_{-48}$	$4.858^{+0.033}_{-0.033}$	$-0.200^{+0.100}_{-0.100}$	$0.401^{+0.029}_{-0.032}$	$0.423^{+0.027}_{-0.038}$	$9.278^{+1.660}_{-1.289}$
	+1%/-1%	+1%/-1%	+50%/-50%	+7%/-8%	+6%/-9%	+18%/-14%
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 011515276-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$3.88^{+3.62}_{-2.50}$	$166^{+3}_{-3}$	$-3197^{+10161}_{-3495}$	$-67710.946^{+3292153.136}_{-3127386.261}$
Alt.	$-661 \pm 126$	$3.99^{+3.70}_{-2.67}$	$165^{+3}_{-3}$	$2514^{+939}_{-340}$	$11423^{+102932}_{-8111}$

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

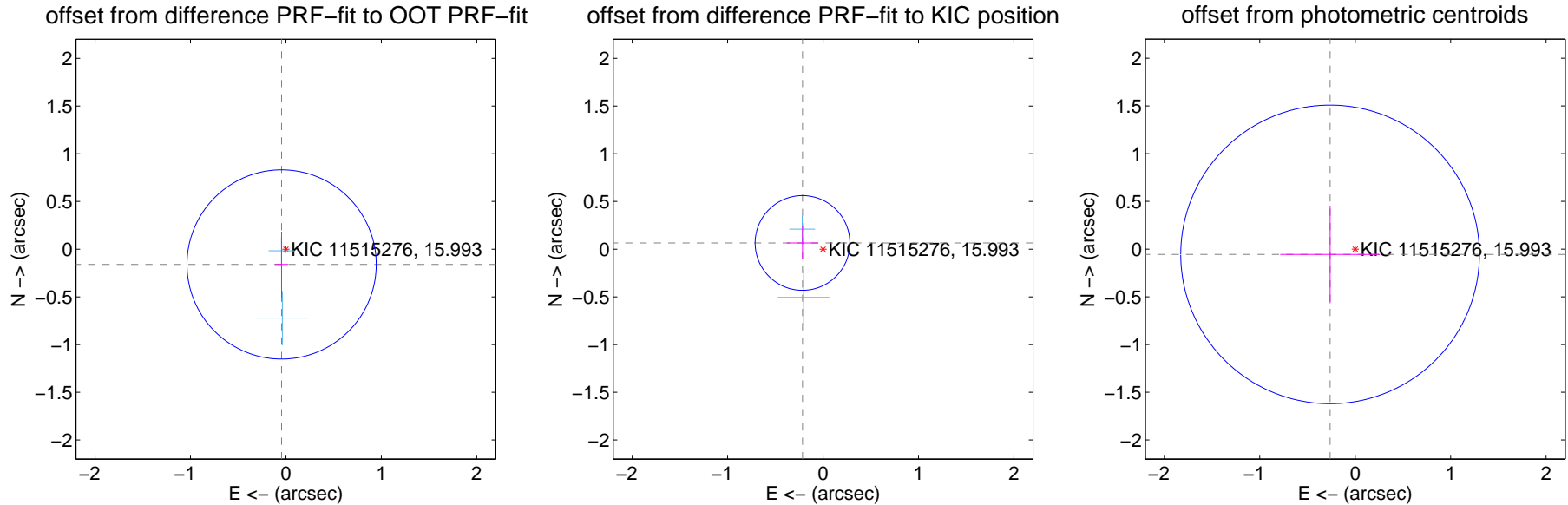
## DV Centroid Data

Supplemental centroid analysis for 011515276-08. Kepler magnitude: 15.99. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

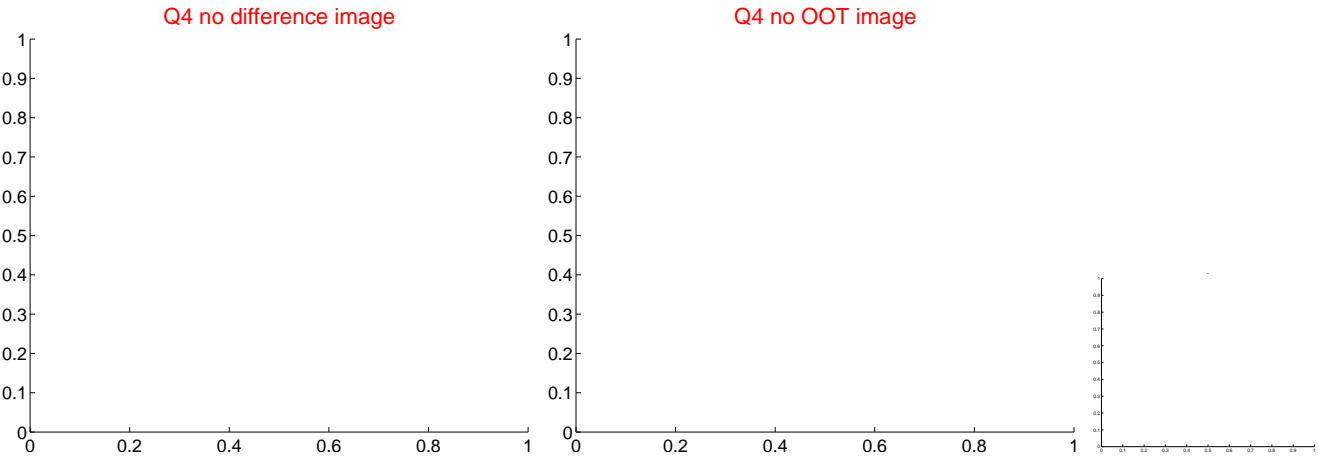
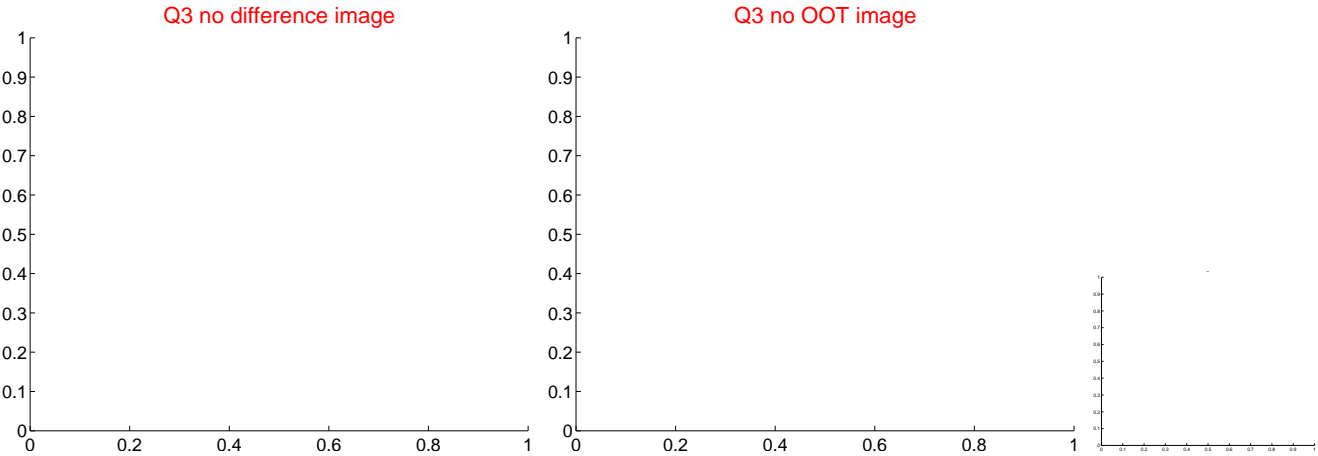
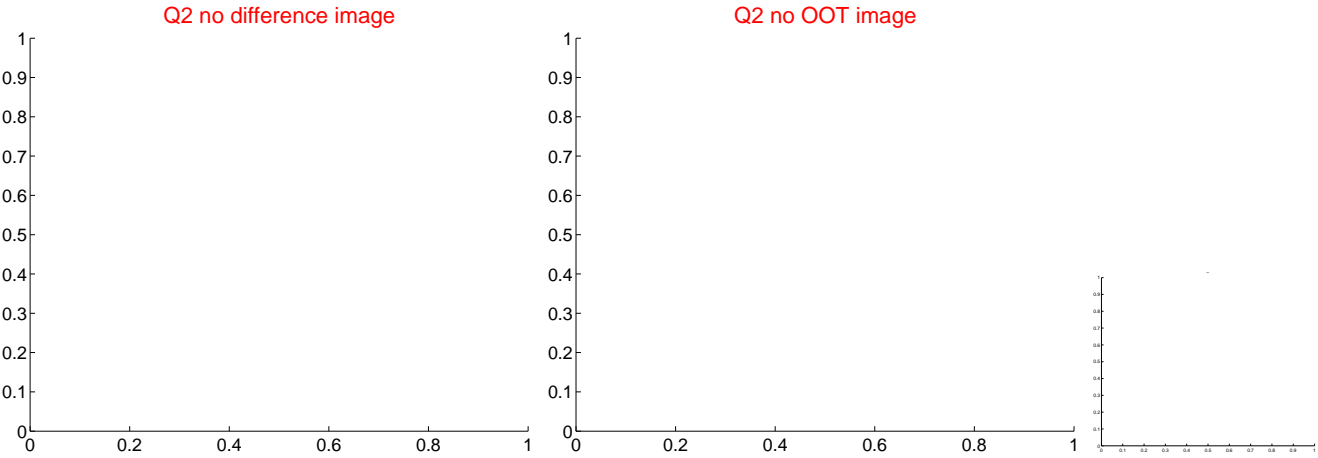
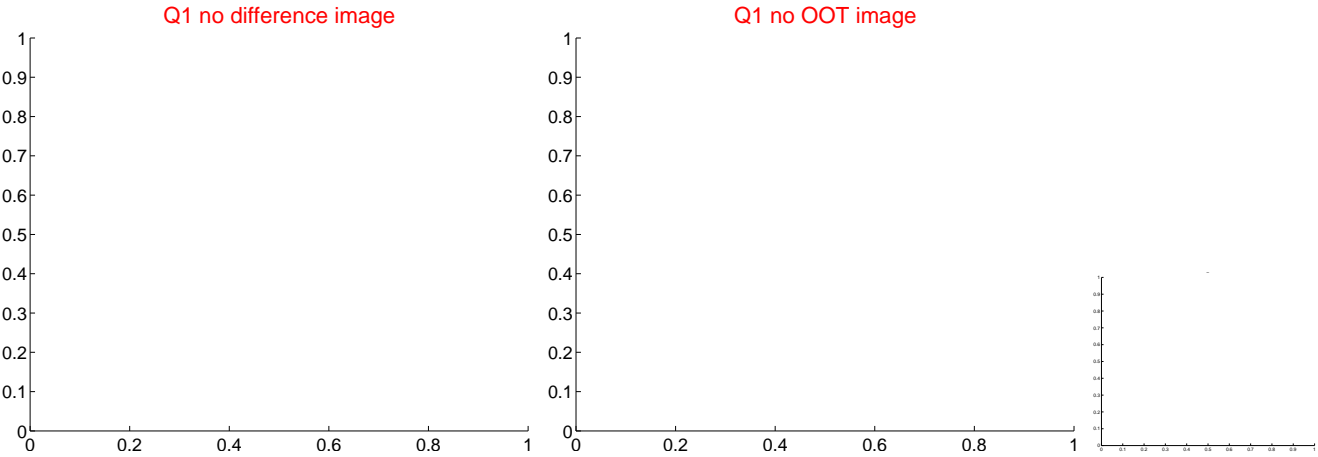
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.166 \pm 0.331$	0.50	$0.045 \pm 0.067$	$-0.160 \pm 0.344$
PRF-fit source offset from KIC position	$0.225 \pm 0.165$	1.36	$0.215 \pm 0.165$	$0.065 \pm 0.172$
photometric centroid source offset	$0.27 \pm 0.52$	0.52	$0.26 \pm 0.52$	$-0.06 \pm 0.51$

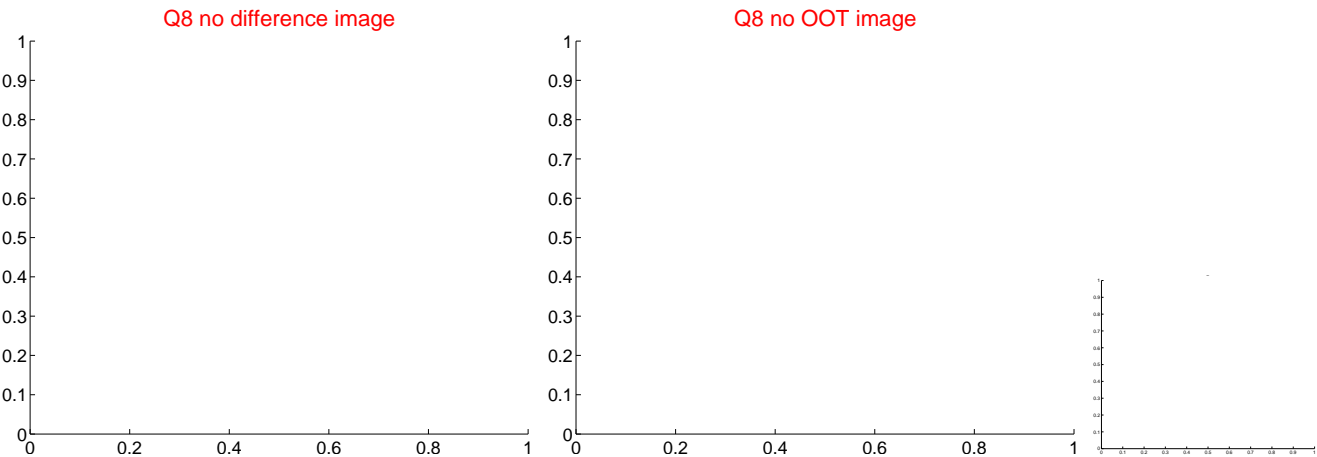
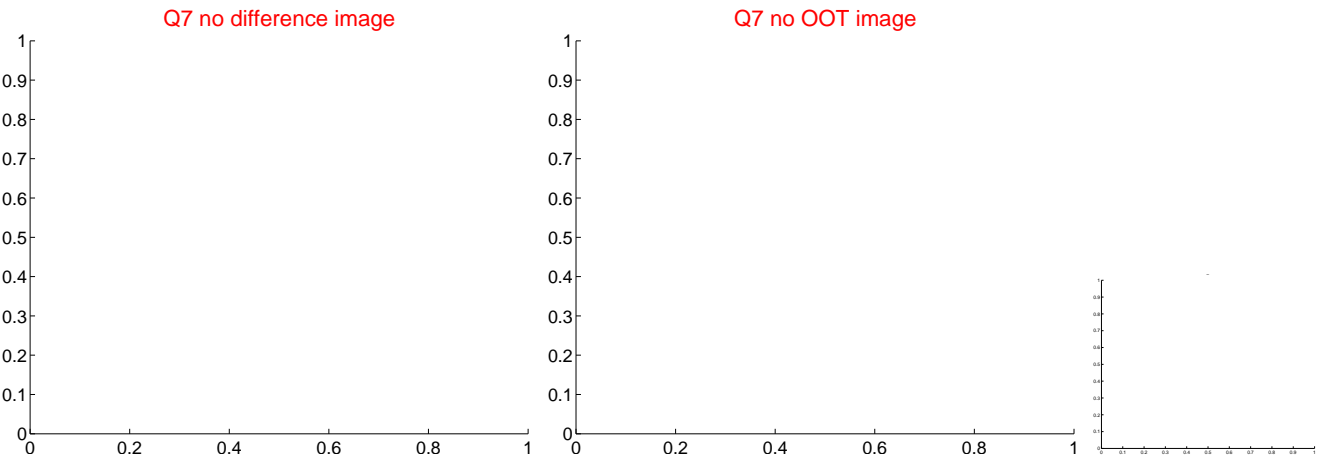
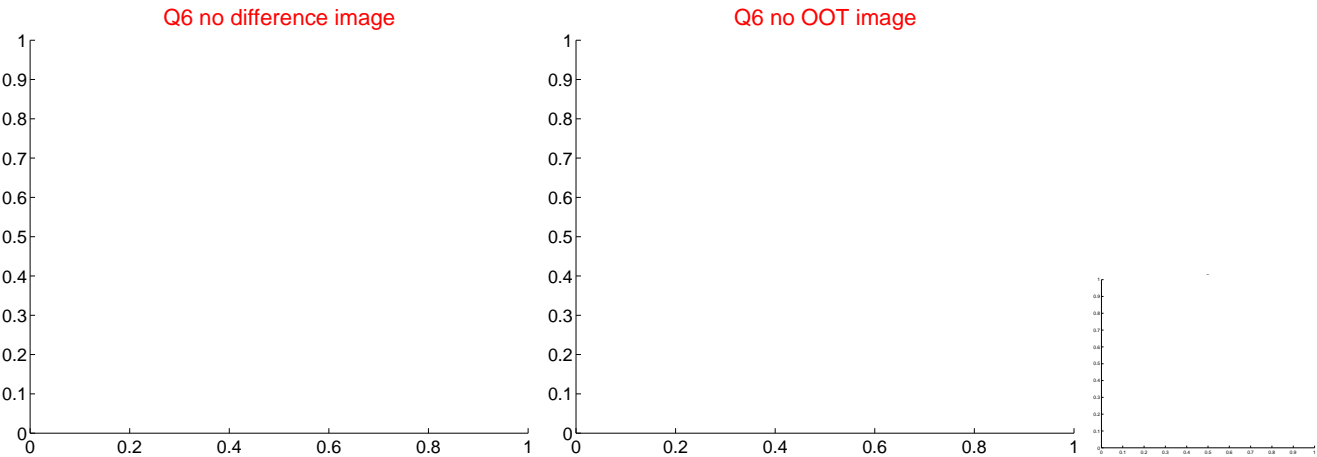
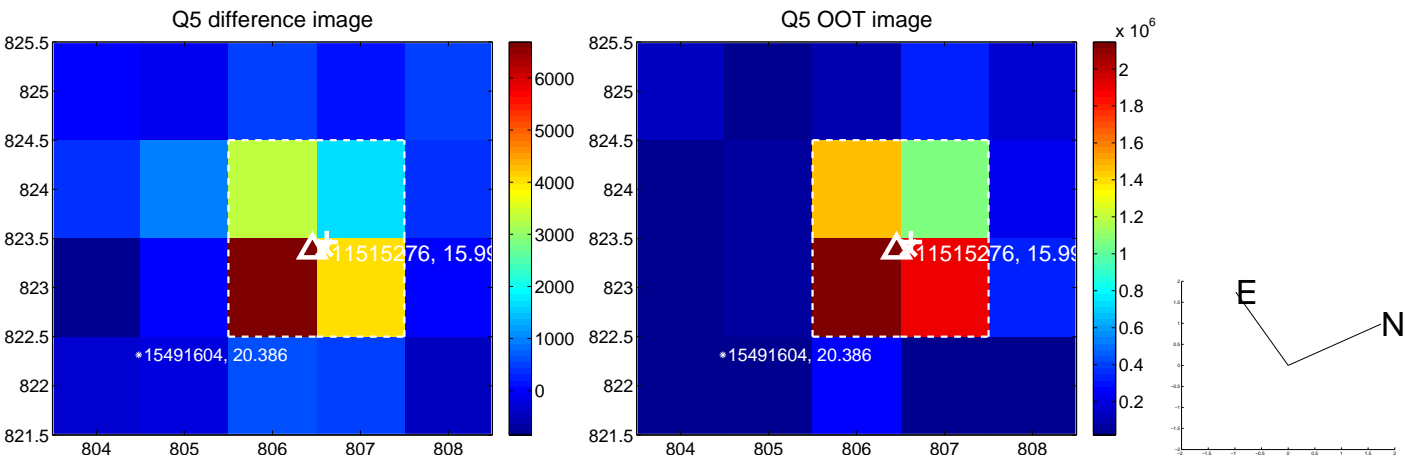


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

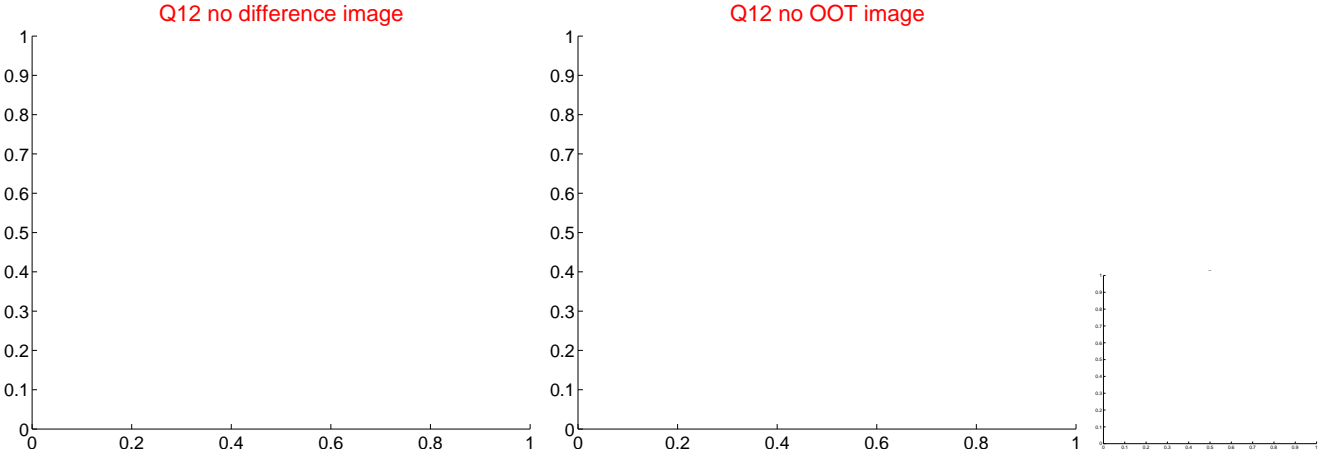
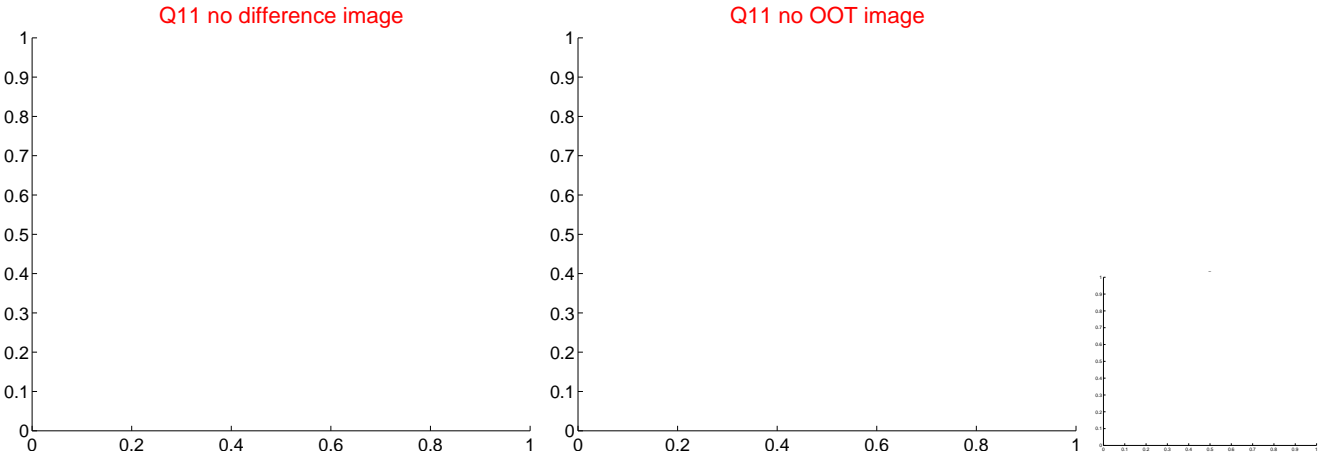
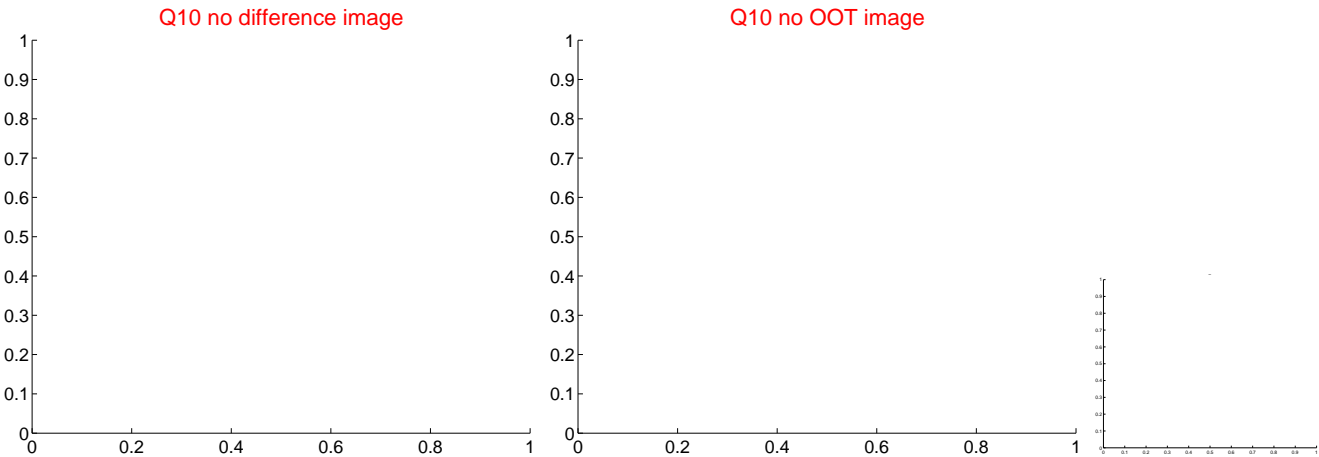
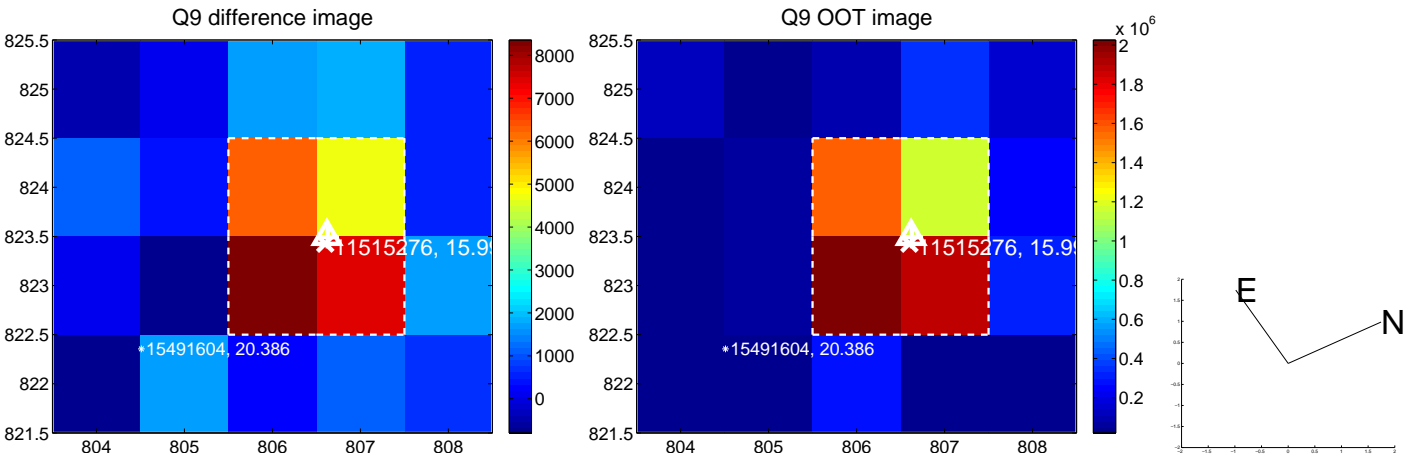
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



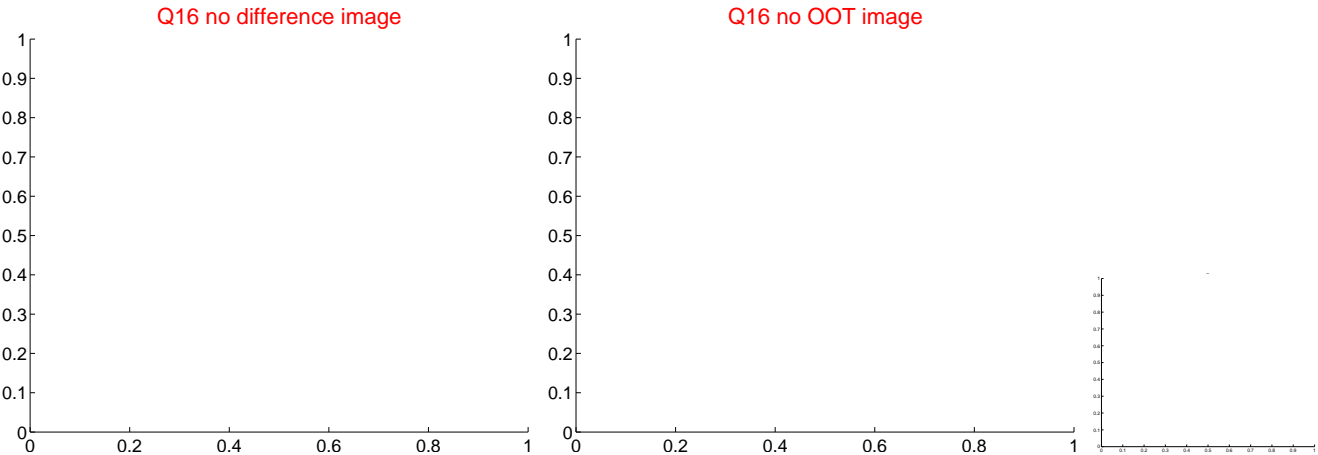
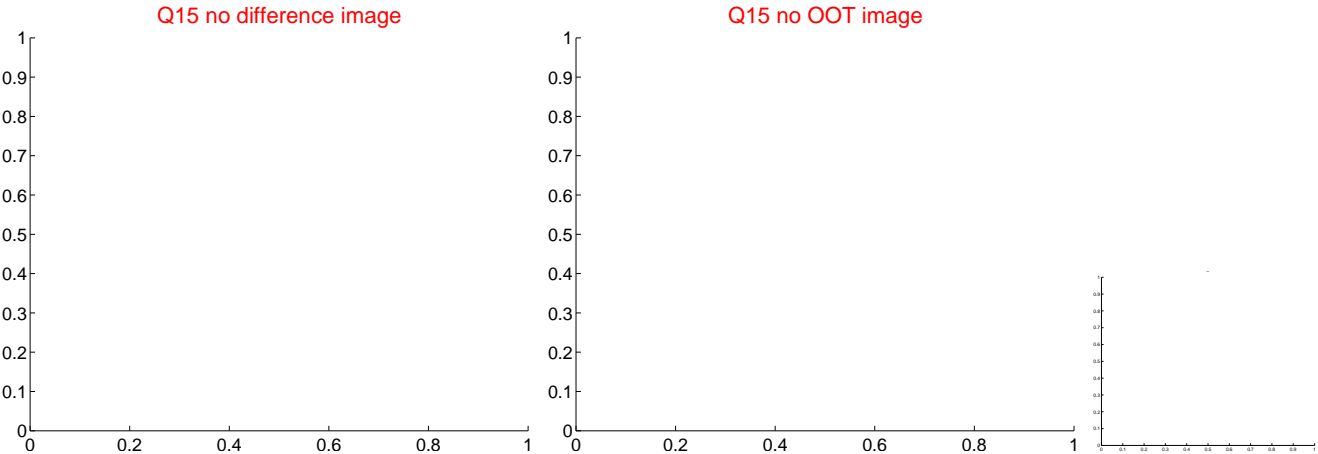
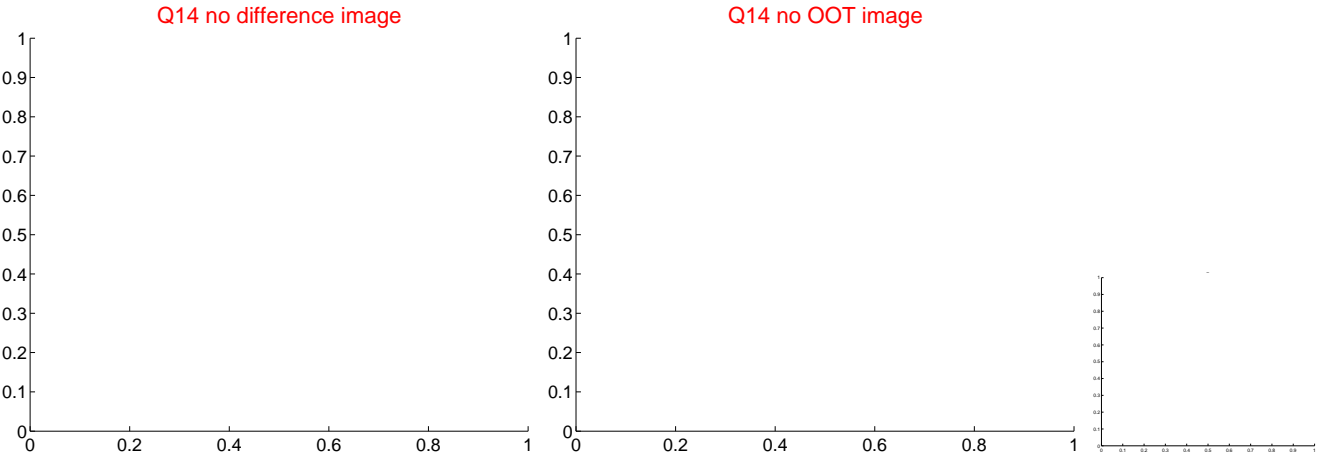
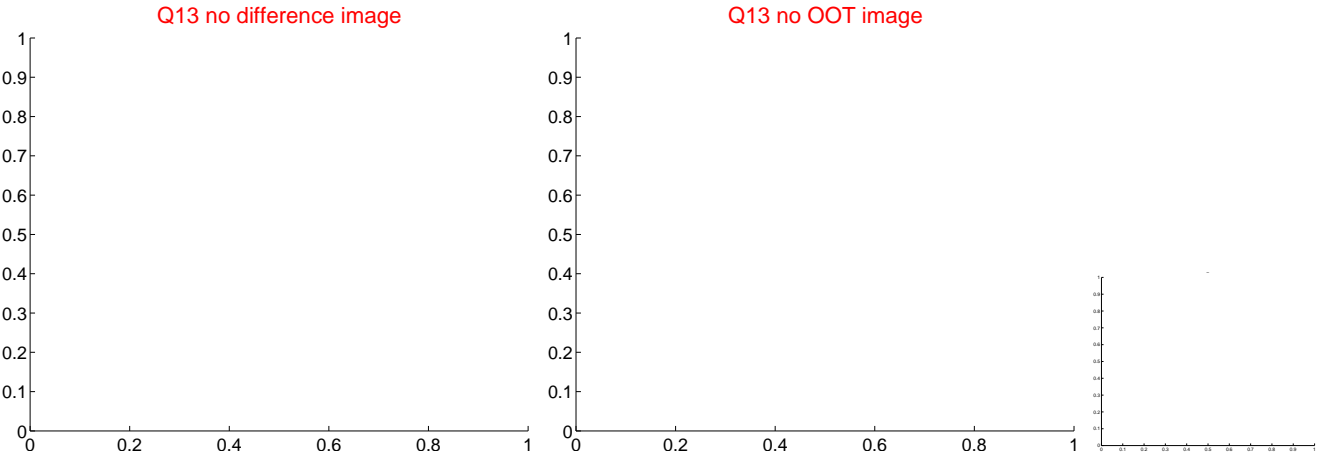
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



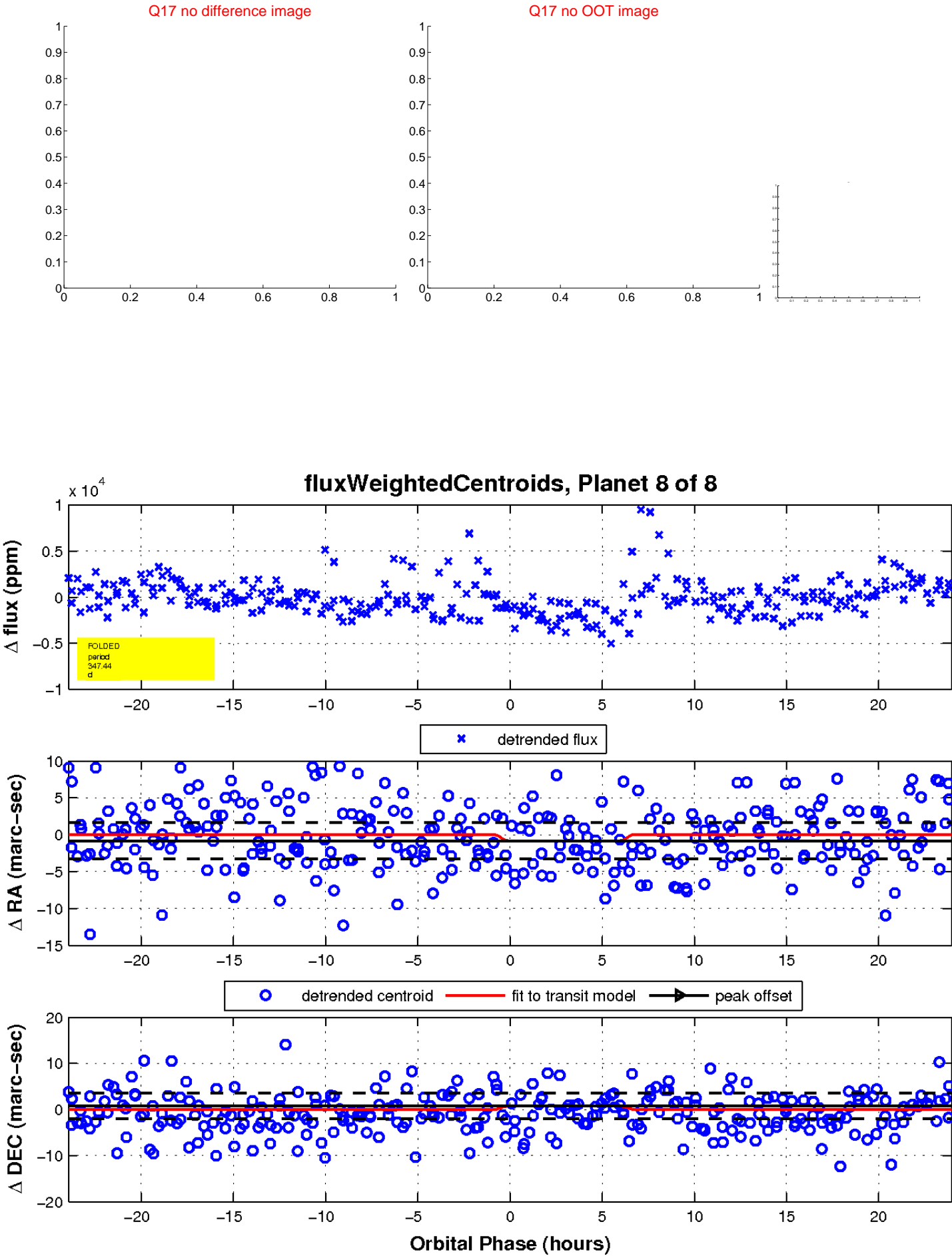
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

