

# KIC 011654113

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654113-01	OBS	No	4.603252	134.638898	39.1	16.875	10.1	9.6	1.25	6429	0.92	708.64
011654113-04	OBS	No	77.125192	165.031632	135.0	6.443	8.5	8.3	1.25	6429	1.71	16.53
011654113-05	OBS	No	235.731487	210.797346	194.1	4.994	8.3	8.5	1.25	6429	1.99	3.73
011654113-07	OBS	No	129.742351	175.453993	189.2	3.960	8.3	8.0	1.25	6429	1.88	8.26
011654113-08	OBS	No	322.256003	384.322642	269.4	9.485	8.0	8.1	1.25	6429	2.50	2.46
011654113-09	OBS	No	469.585699	343.535747	232.5	8.058	8.0	8.7	1.25	6429	2.51	1.49
011654113-10	OBS	No	222.082184	241.171086	204.5	9.098	8.1	7.6	1.25	6429	2.29	4.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011654113-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
011654113-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—CENT_SATURATED
011654113-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
011654113-07	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
011654113-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
011654113-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011654113-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

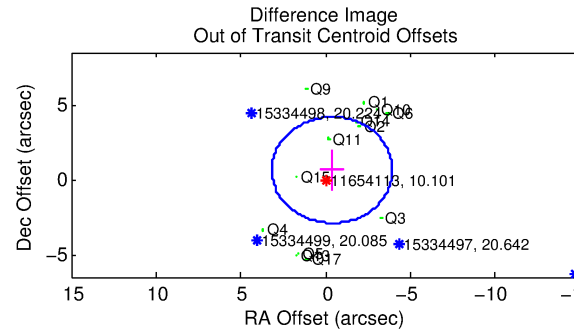
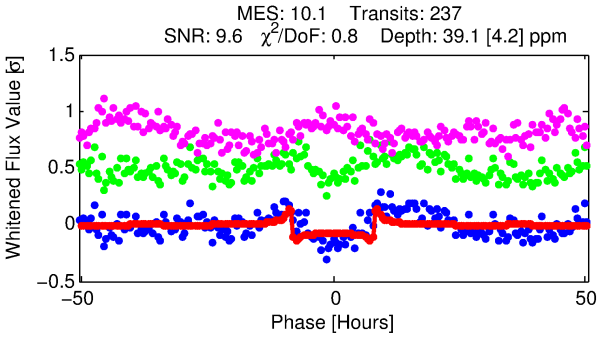
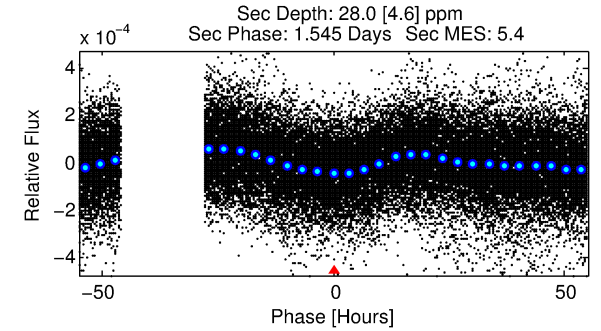
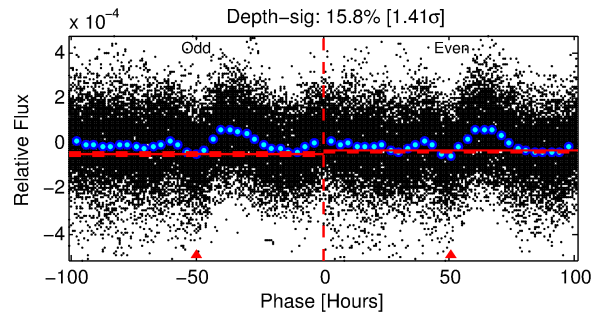
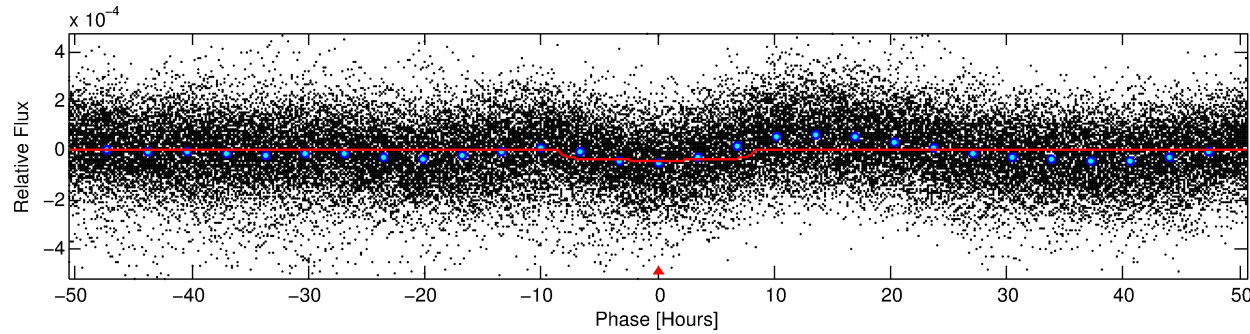
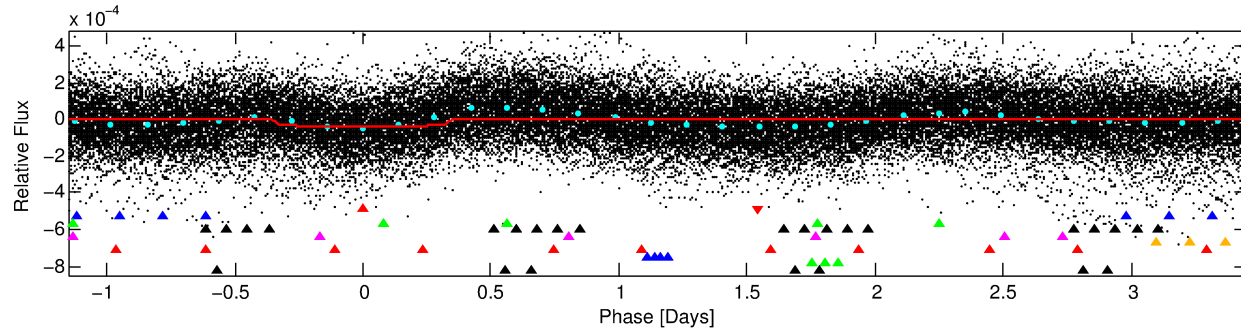
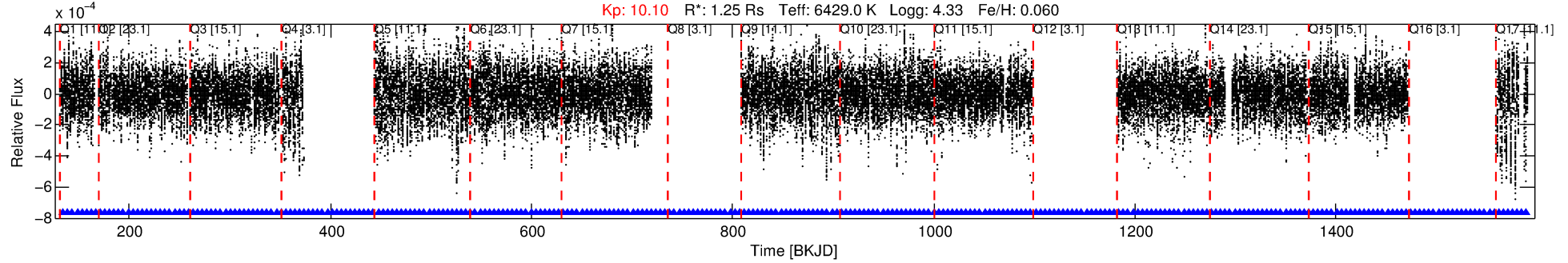
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Ephemeris Match Information For 011654113-01

No Significant Match Found

# DV One-Page Summary

KIC: 11654113 Candidate: 1 of 10 Period: 4.603 d



## DV Fit Results:

Period = 4.60325 [0.00003] d  
Epoch = 134.6389 [0.0046] BKJD  
 $R_p/R^* = 0.0067$  [0.0005]  
 $a/R^* = 1.32$  [0.12]  
 $b = 0.90$  [0.04]  
 $\text{Seff} = 708.64$  [307.91]  
 $T_{\text{eq}} = 1316$  [143] K  
 $R_p = 0.92$  [0.33]  $R_e$   
 $a = 0.0580$  [0.0166] AU  
 $\text{Ag} = 61.52$  [28.26] [2.14 $\sigma$ ]  
 $T_{\text{eff}} = 5697$  [374] K [10.94 $\sigma$ ]

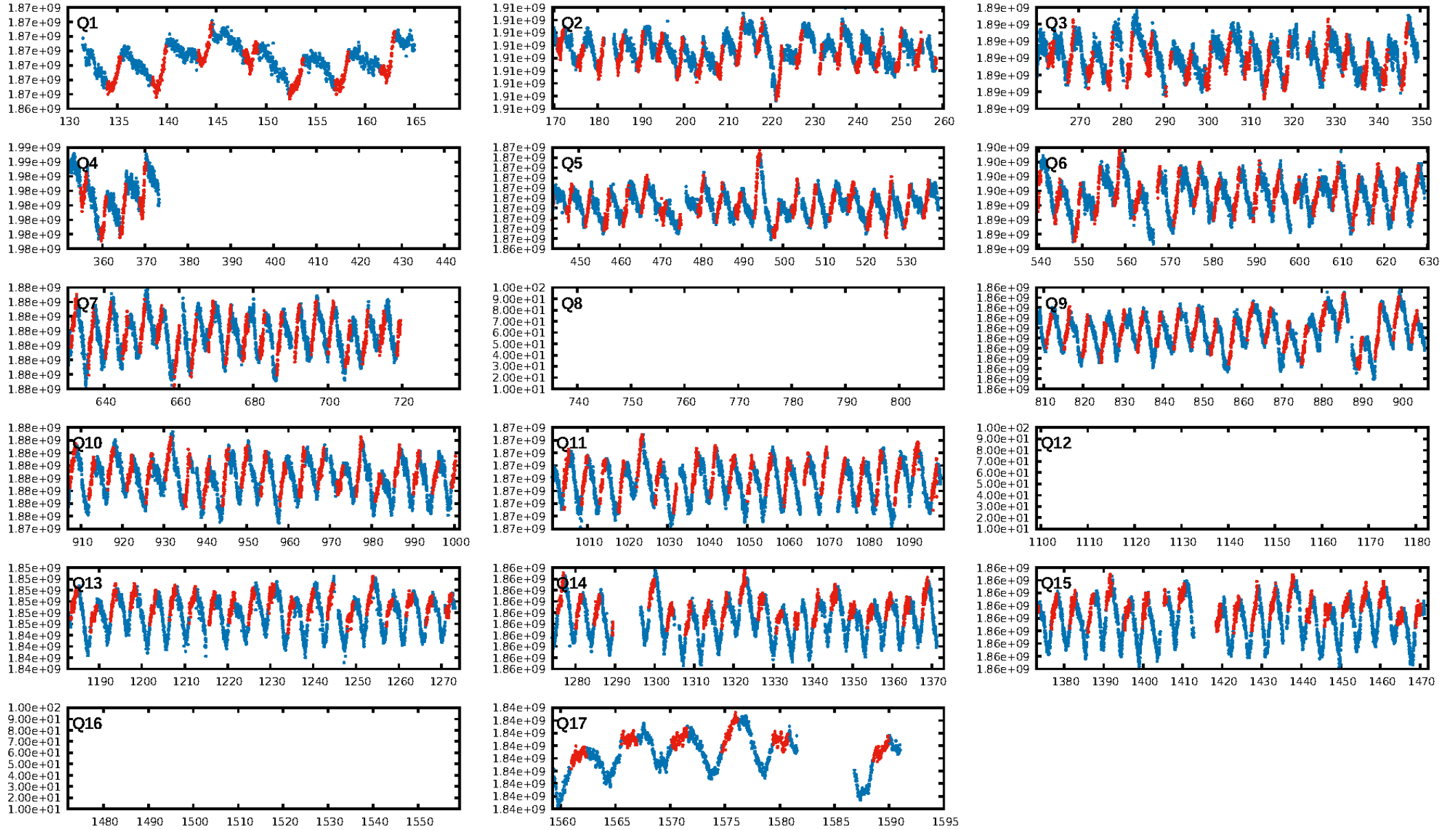
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [96.36 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [220/220]  
GhostDiagnostic-chr: 1.817  
Centroid-sig: 12.0%  
Centroid-so: 0.964 arcsec [1.77 $\sigma$ ]  
OotOffset-rm: 0.748 arcsec [0.63 $\sigma$ ]  
KicOffset-rm: 0.633 arcsec [0.47 $\sigma$ ]  
OotOffset-st: 4/3/1/5 [13]  
KicOffset-st: 4/3/1/5 [13]  
DiffImageQuality-fgm: 0.23 [3/13]  
DiffImageOverlap-fno: 1.00 [14/14]

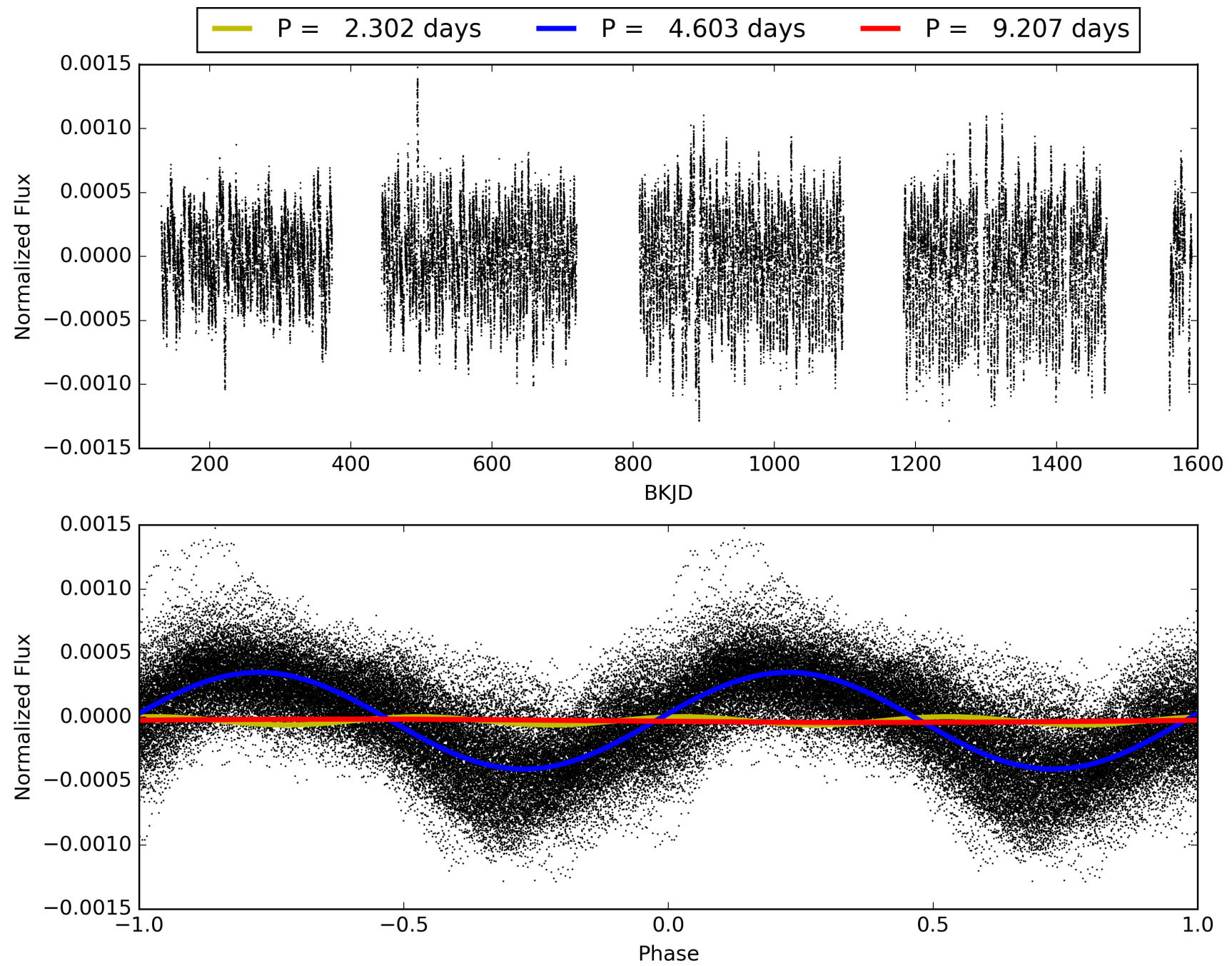
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011654113-01, PDC Light Curves



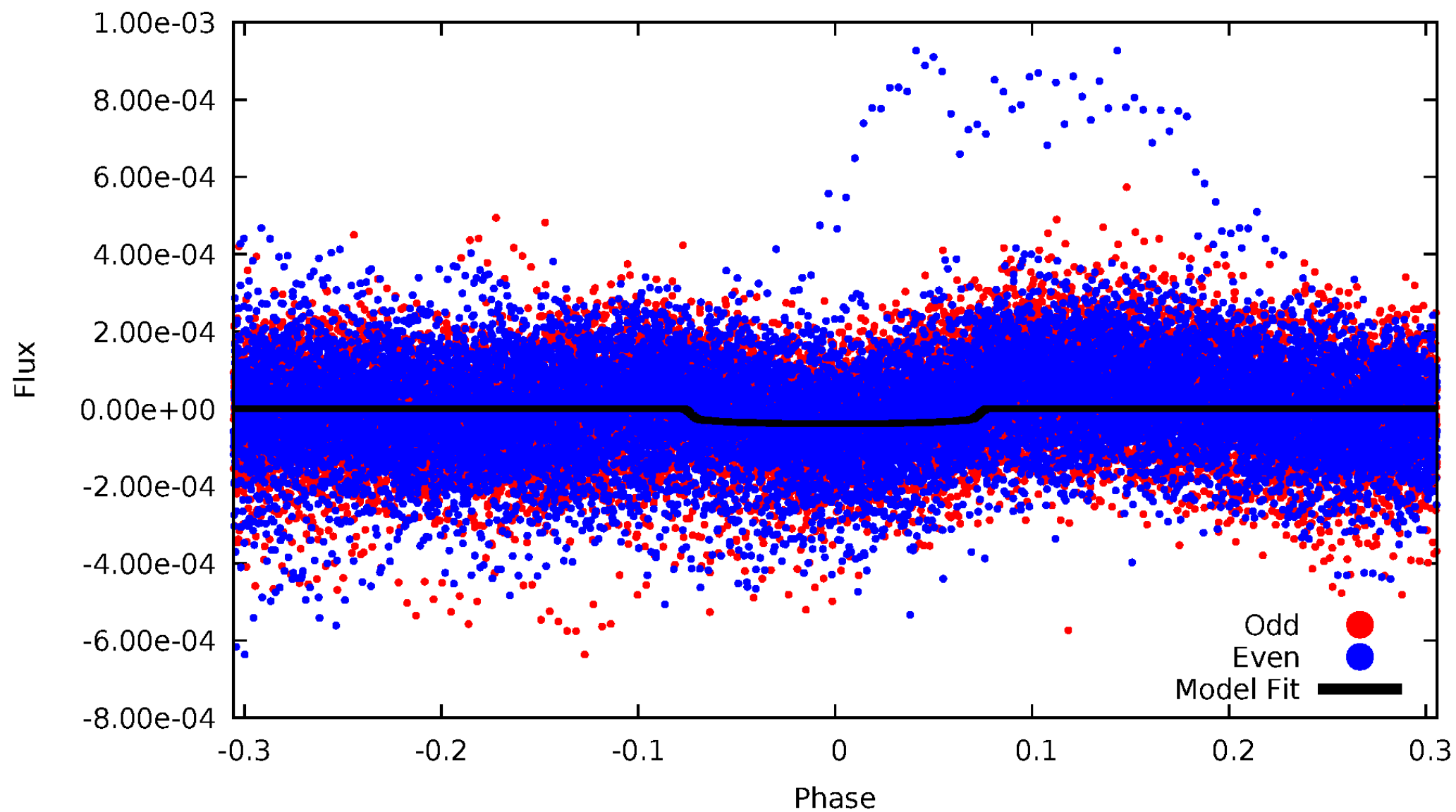
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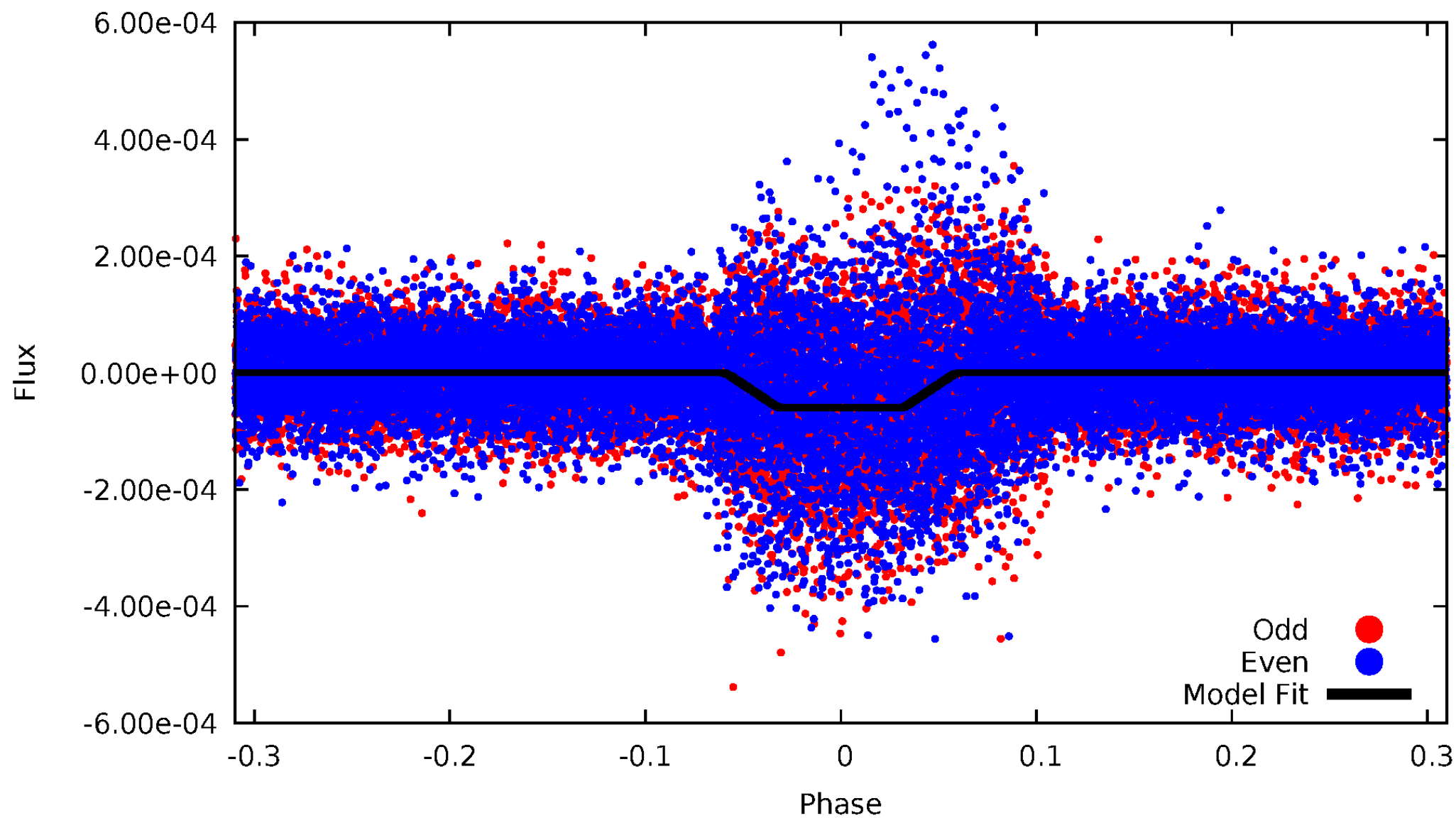
# DV Odd/Even

TCE 011654113-01



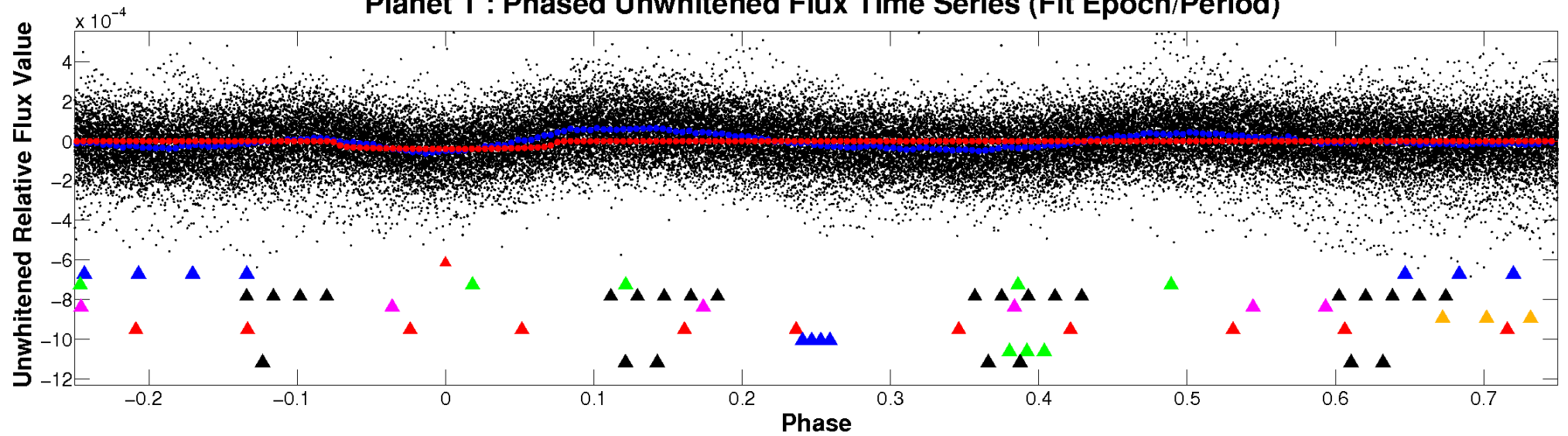
# ALT Odd/Even

TCE 011654113-01

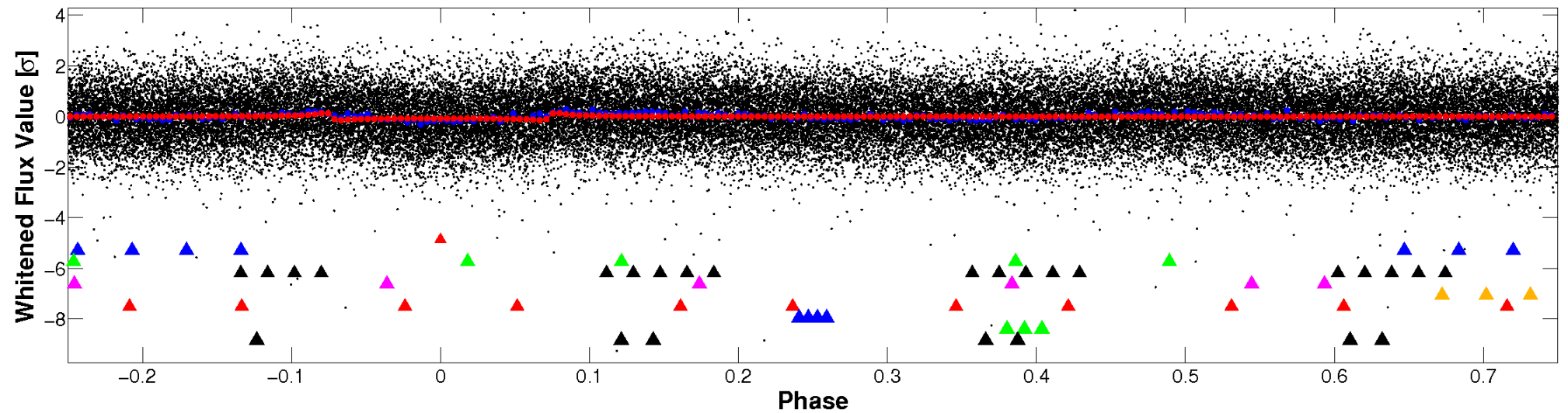


# Non-Whitened Vs. Whitened Light Curve

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

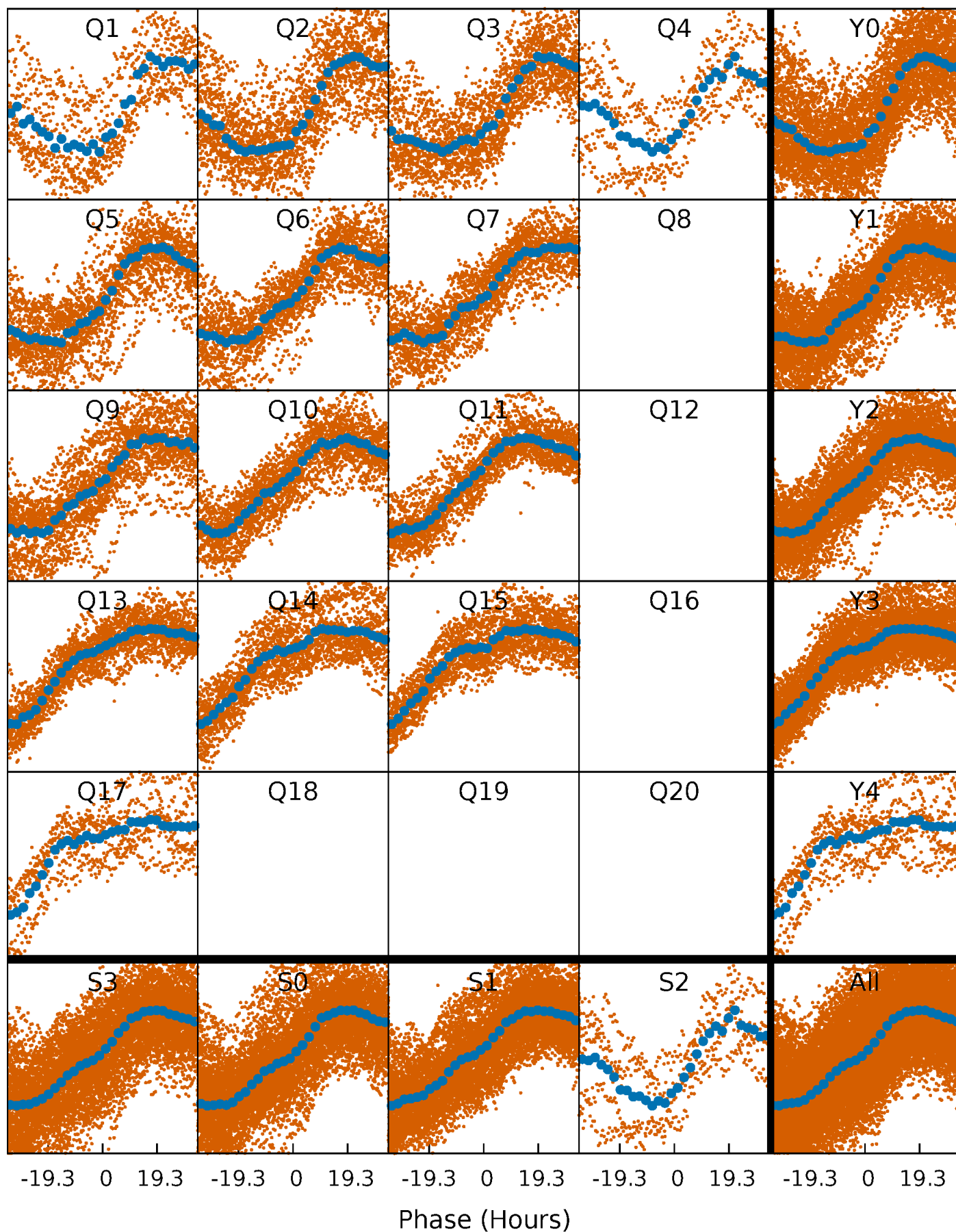


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



## PDC Quarter-Phased Transit Curves

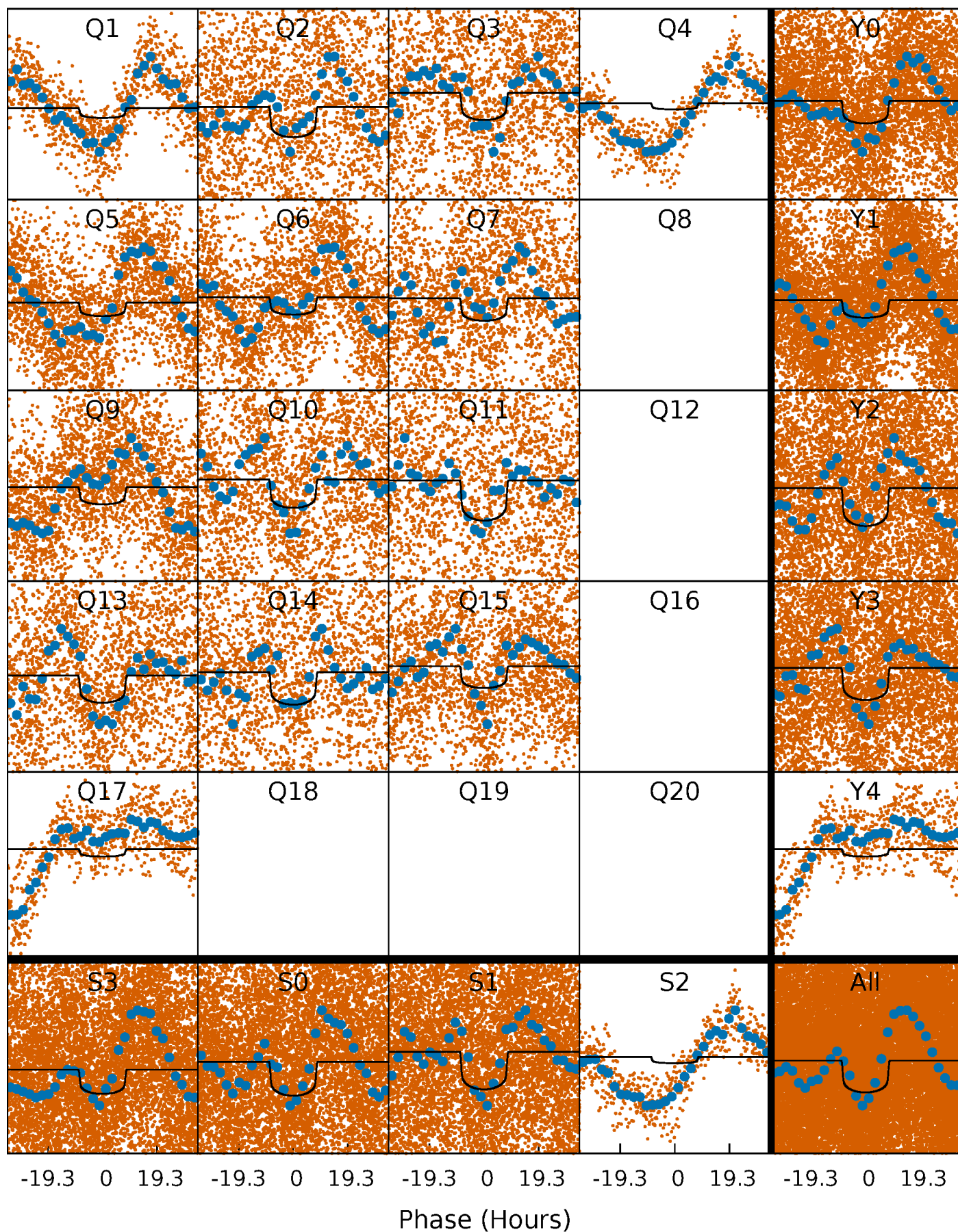
TCE 011654113-01 P= 4.603252 Days  $T_0=134.638898$  (BKJD)





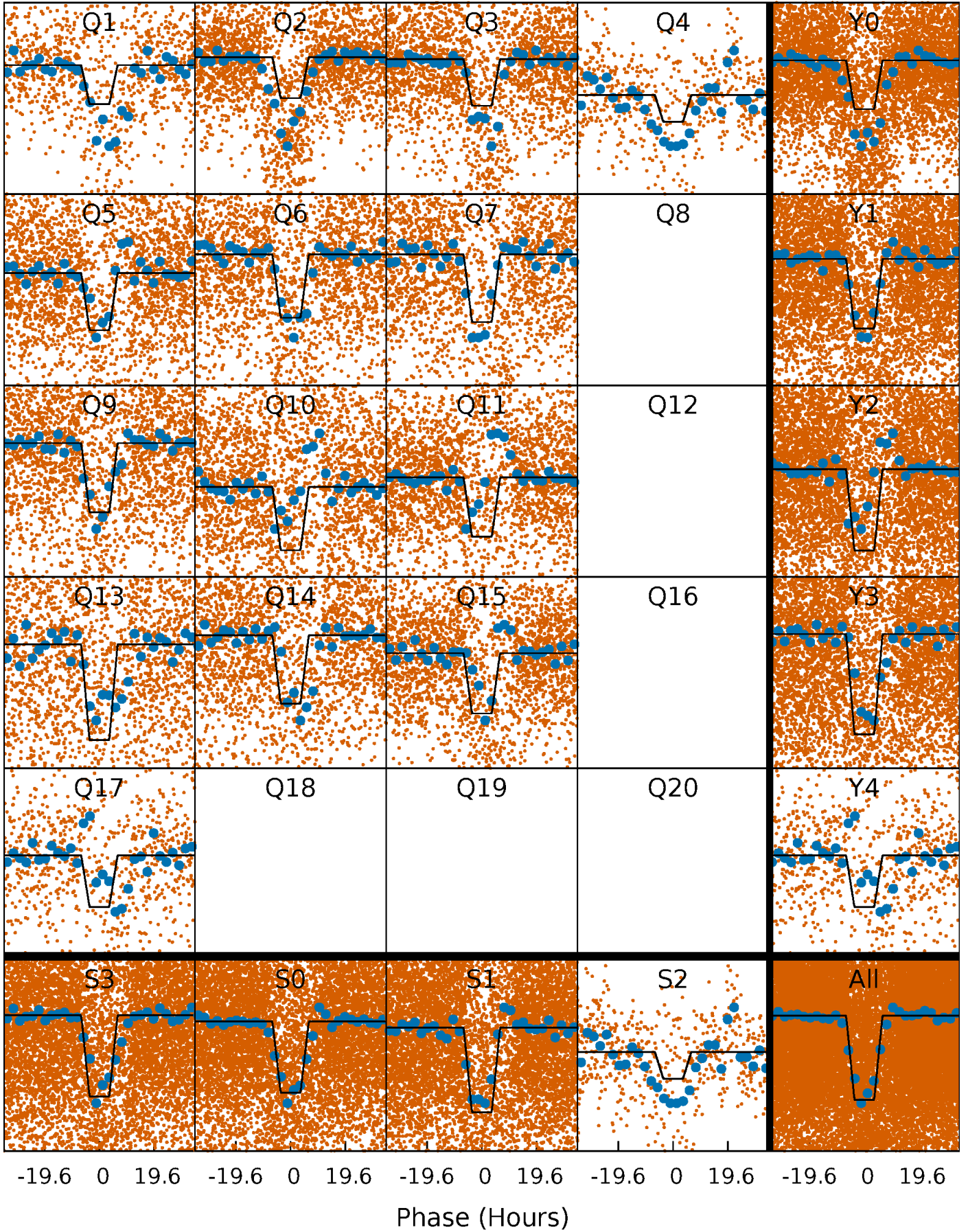
# DV Quarter-Phased Transit Curves

TCE 011654113-01 P= 4.603252 Days  $T_0=134.638898$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

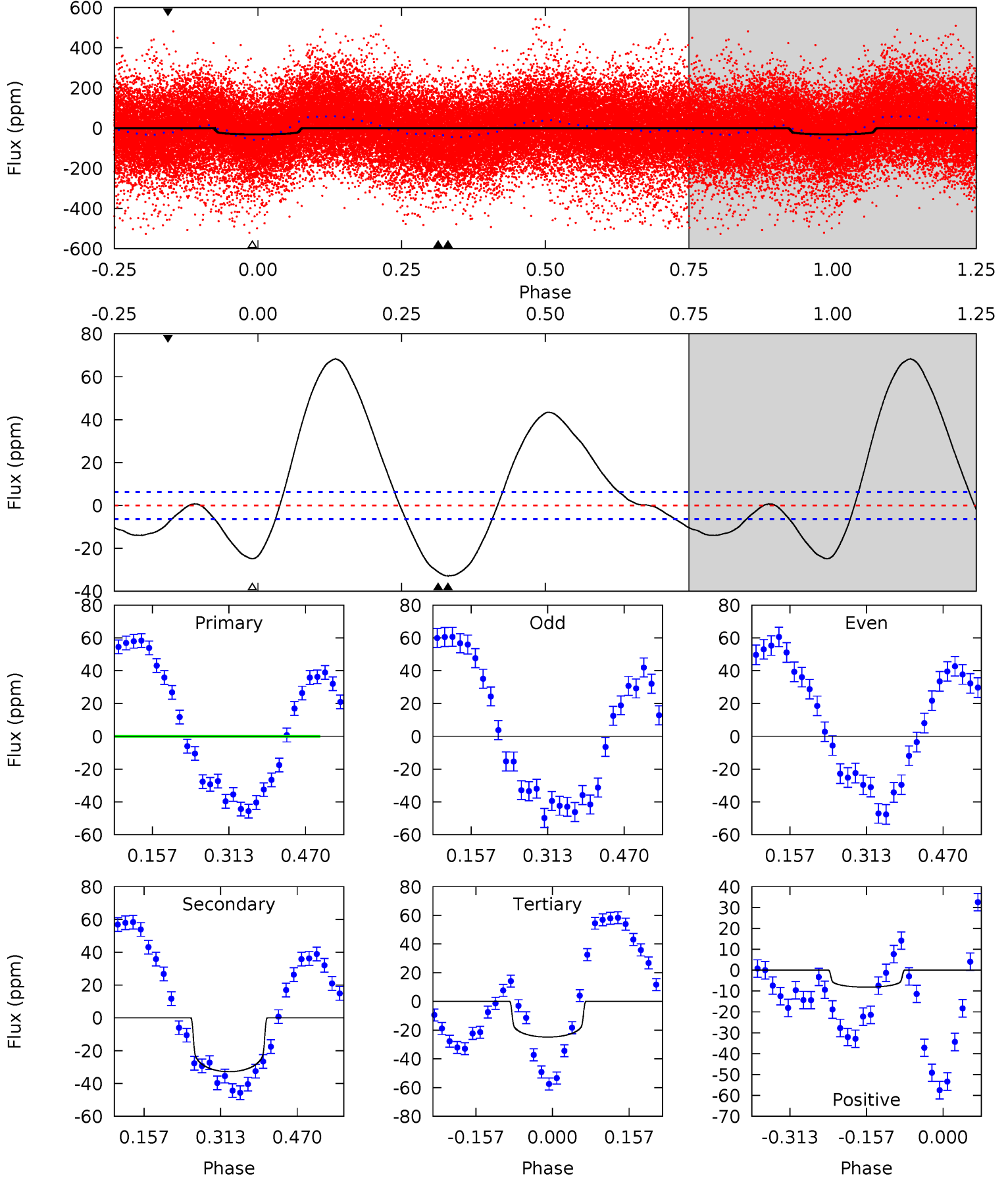
TCE 011654113-01 P= 4.603037 Days  $T_0=134.644569$  (BKJD)



# DV Model-Shift Uniqueness Test

011654113-01, P = 4.603252 Days, E = 130.035646 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
22.0	23.3	17.7	-5.80	4.47	1.42	18.4	4.37	27.8	5.68	29.1	2.37	1.14	0.68	5.51

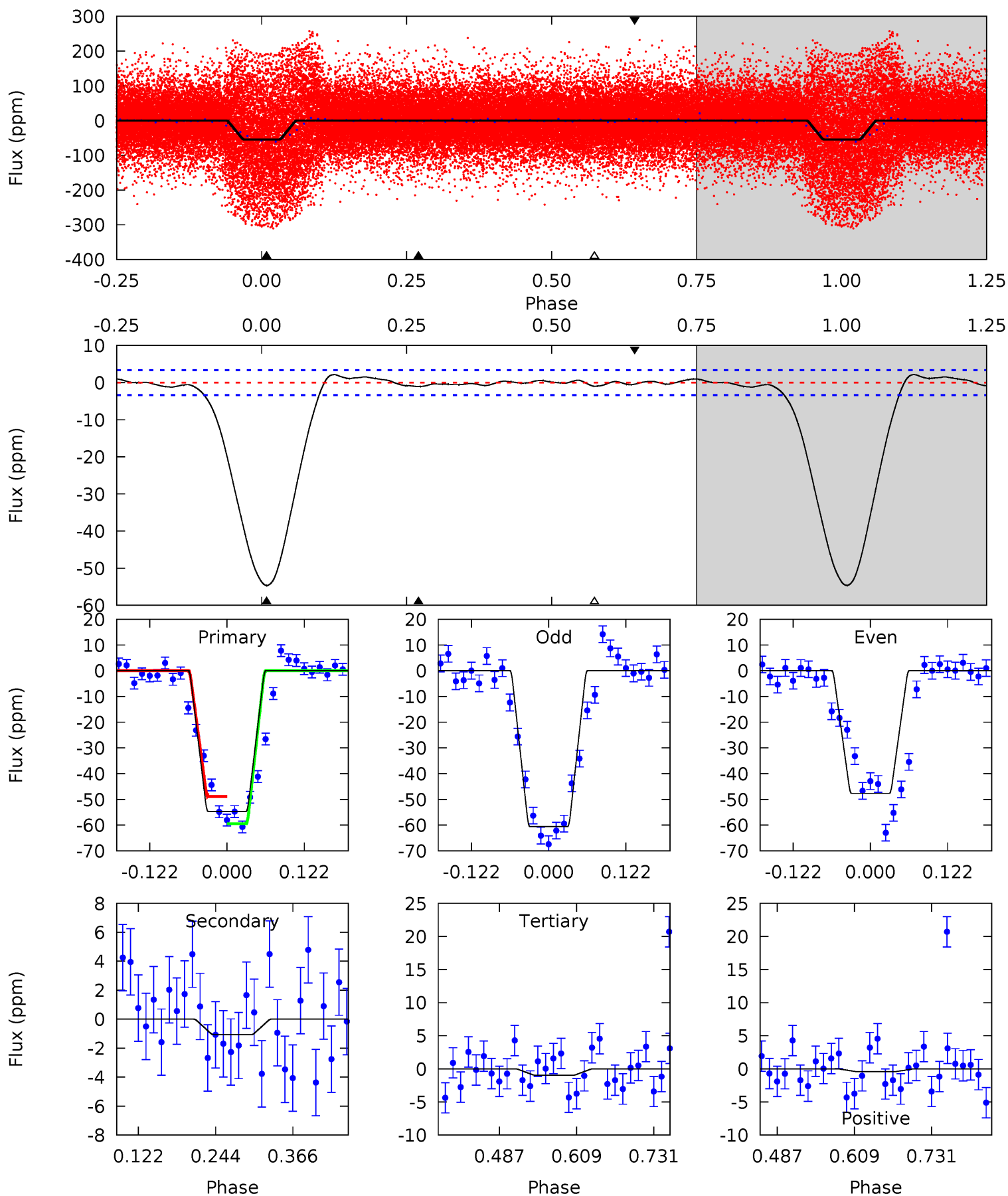




# Alt Model-Shift Uniqueness Test

011654113-01, P = 4.603037 Days, E = 130.041532 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
73.9	1.44	1.30	-0.56	4.52	1.55	0.79	72.6	74.4	0.15	2.00	8.65	0.95	0.04	7.08





### Stellar Parameters For KIC 011654113

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6429^{+179}_{-246}$	$4.335^{+0.072}_{-0.217}$	$0.060^{+0.250}_{-0.350}$	$1.249^{+0.437}_{-0.175}$	$1.231^{+0.180}_{-0.180}$	$0.890^{+0.352}_{-0.483}$
	+3%/-4%	+2%/-5%	+417%/-583%	+35%/-14%	+15%/-15%	+40%/-54%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011654113-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-33 \pm 1$	$0.95^{+0.17}_{-0.11}$	$1868^{+140}_{-97}$	$5898^{+275}_{-271}$	$66^{+18}_{-17}$
Alt.	$-1 \pm 1$	$1.08^{+0.21}_{-0.12}$	$1866^{+150}_{-97}$	$2926^{+266}_{-611}$	$1.614^{+1.242}_{-1.114}$

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

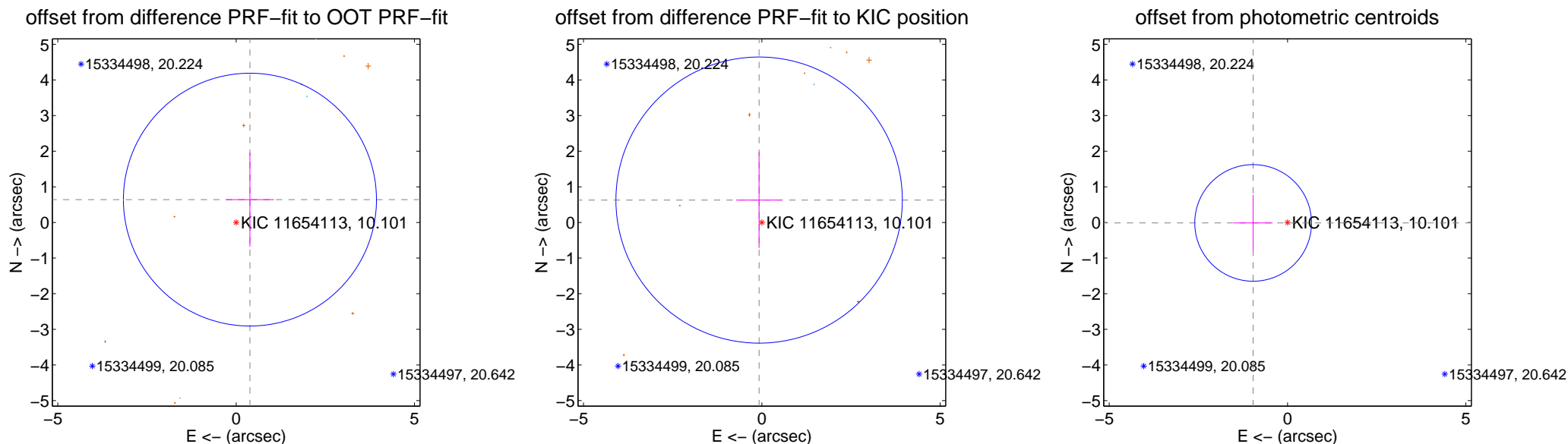
## DV Centroid Data

Supplemental centroid analysis for 011654113-01. **Kepler magnitude: 10.10.** Transit SNR 9.56

**There are 3 quarters with good PRF difference image offsets**

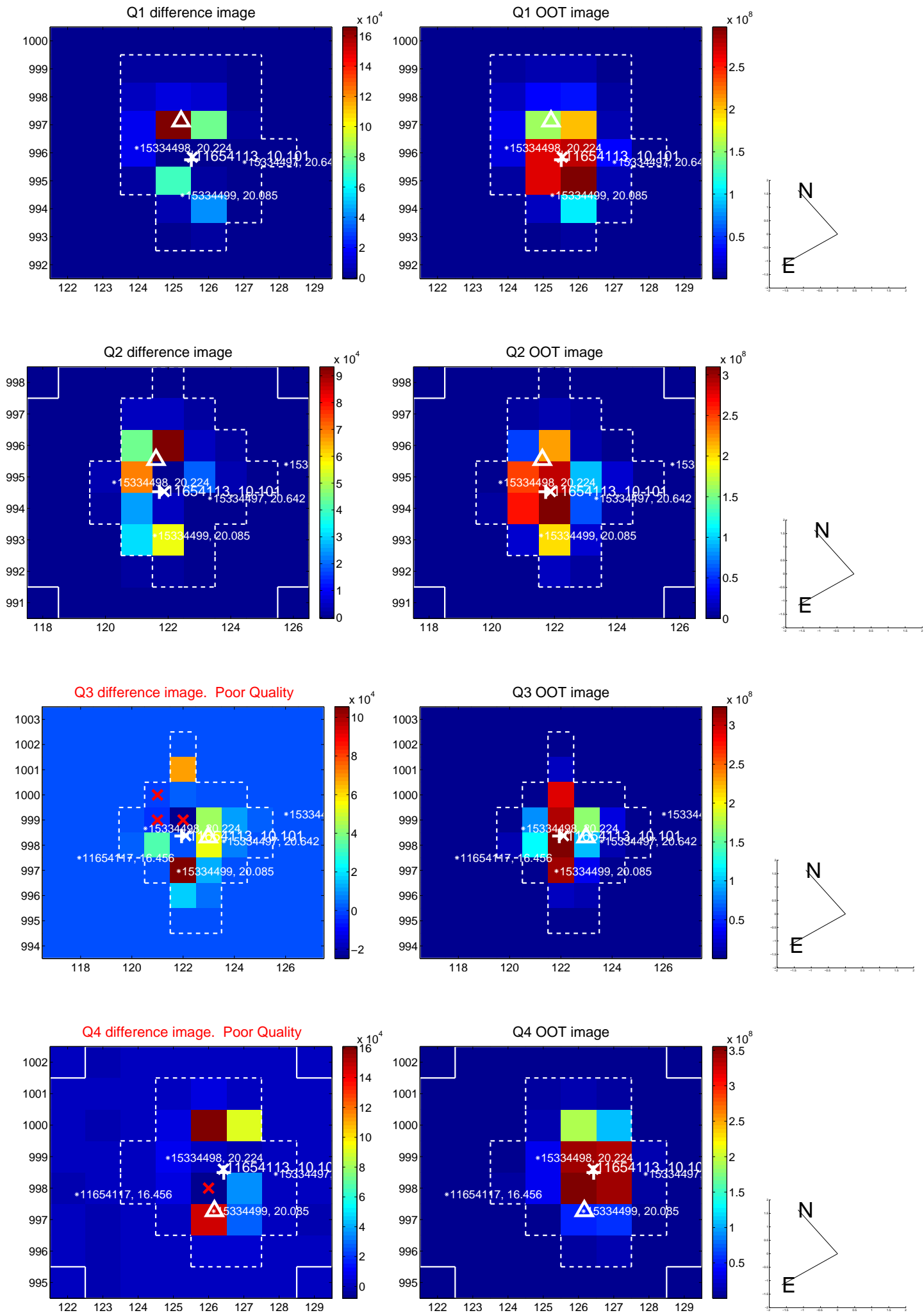
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.748 \pm 1.182$	0.63	$-0.387 \pm 0.673$	$0.641 \pm 1.320$
PRF-fit source offset from KIC position	$0.633 \pm 1.338$	0.47	$0.076 \pm 0.644$	$0.628 \pm 1.346$
photometric centroid source offset	$0.96 \pm 0.55$	1.77	$0.96 \pm 0.55$	$-0.01 \pm 0.79$

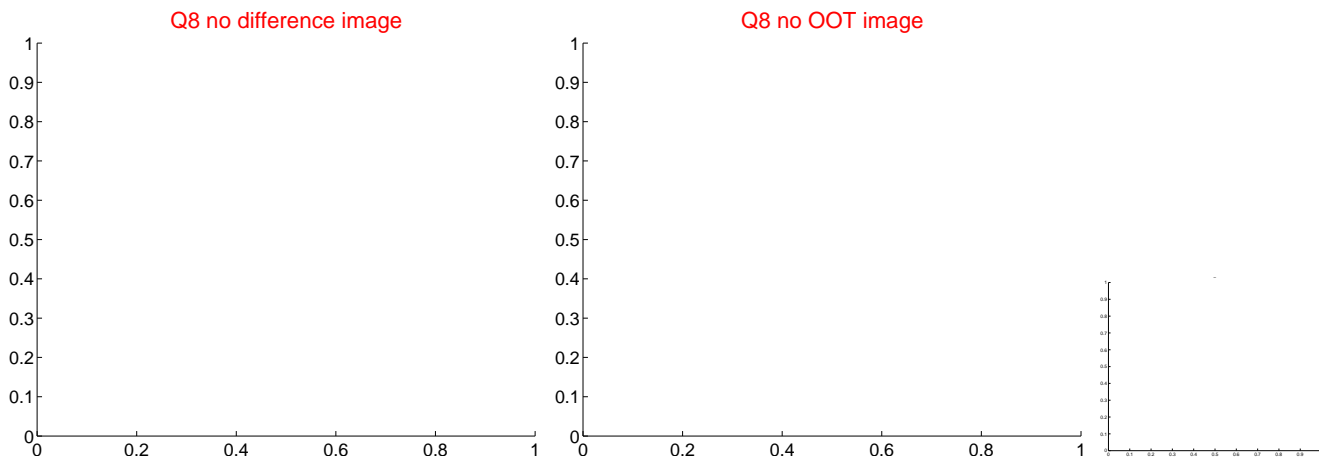
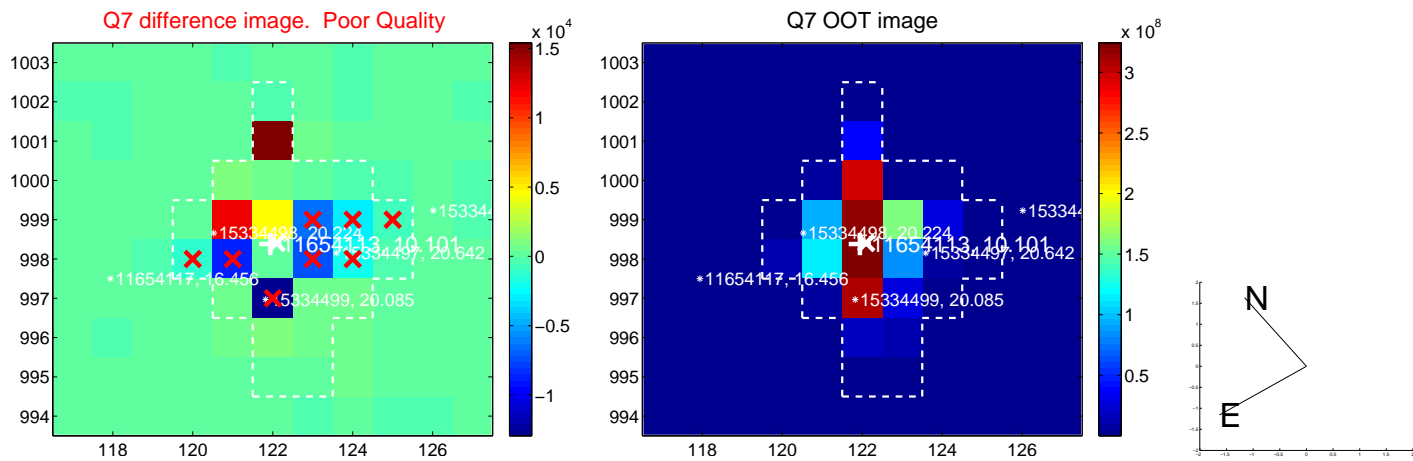
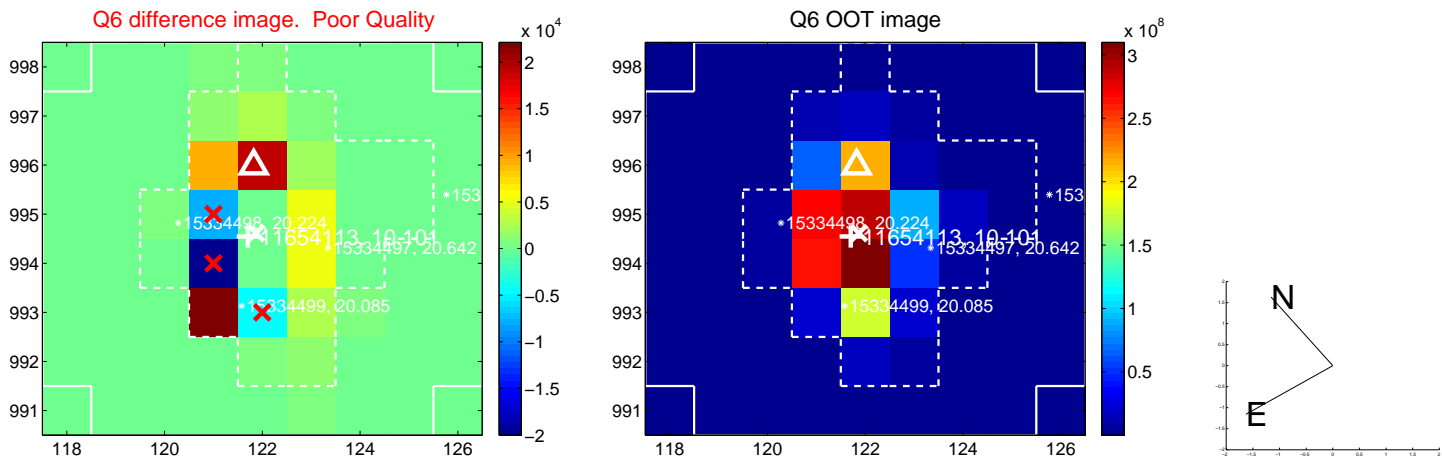
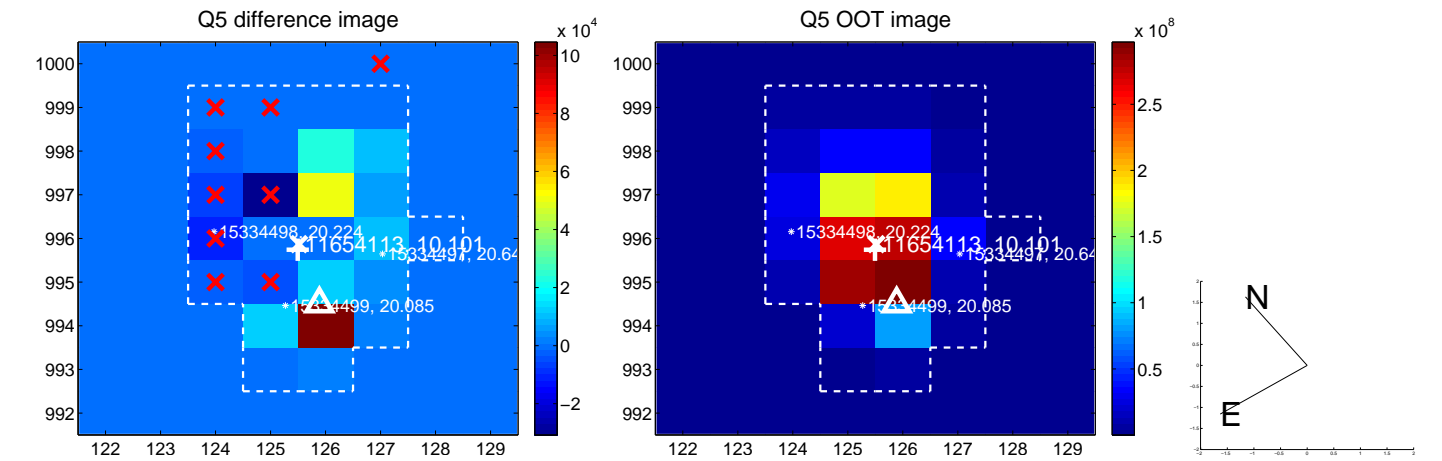


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

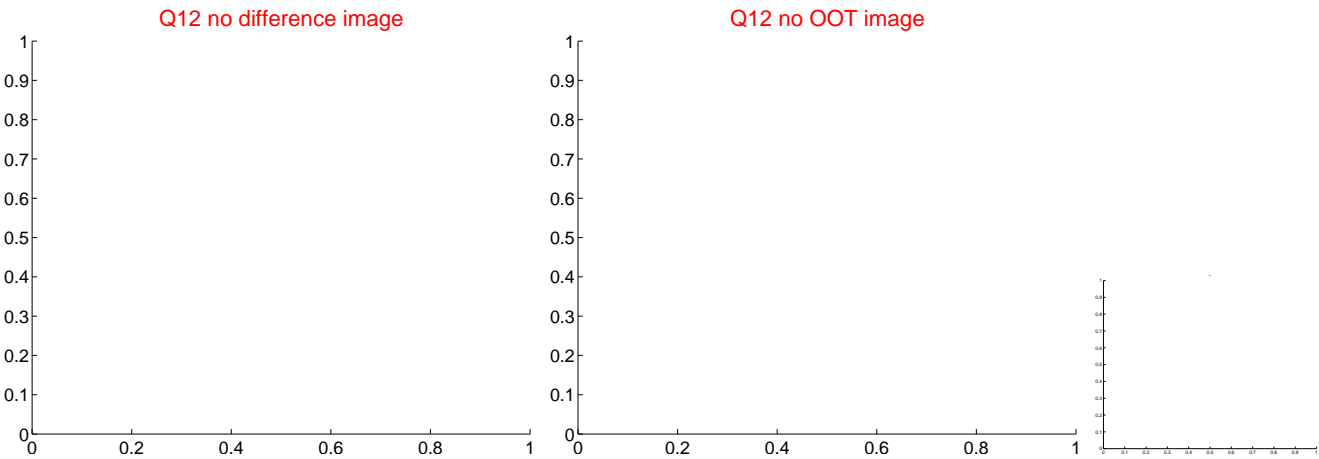
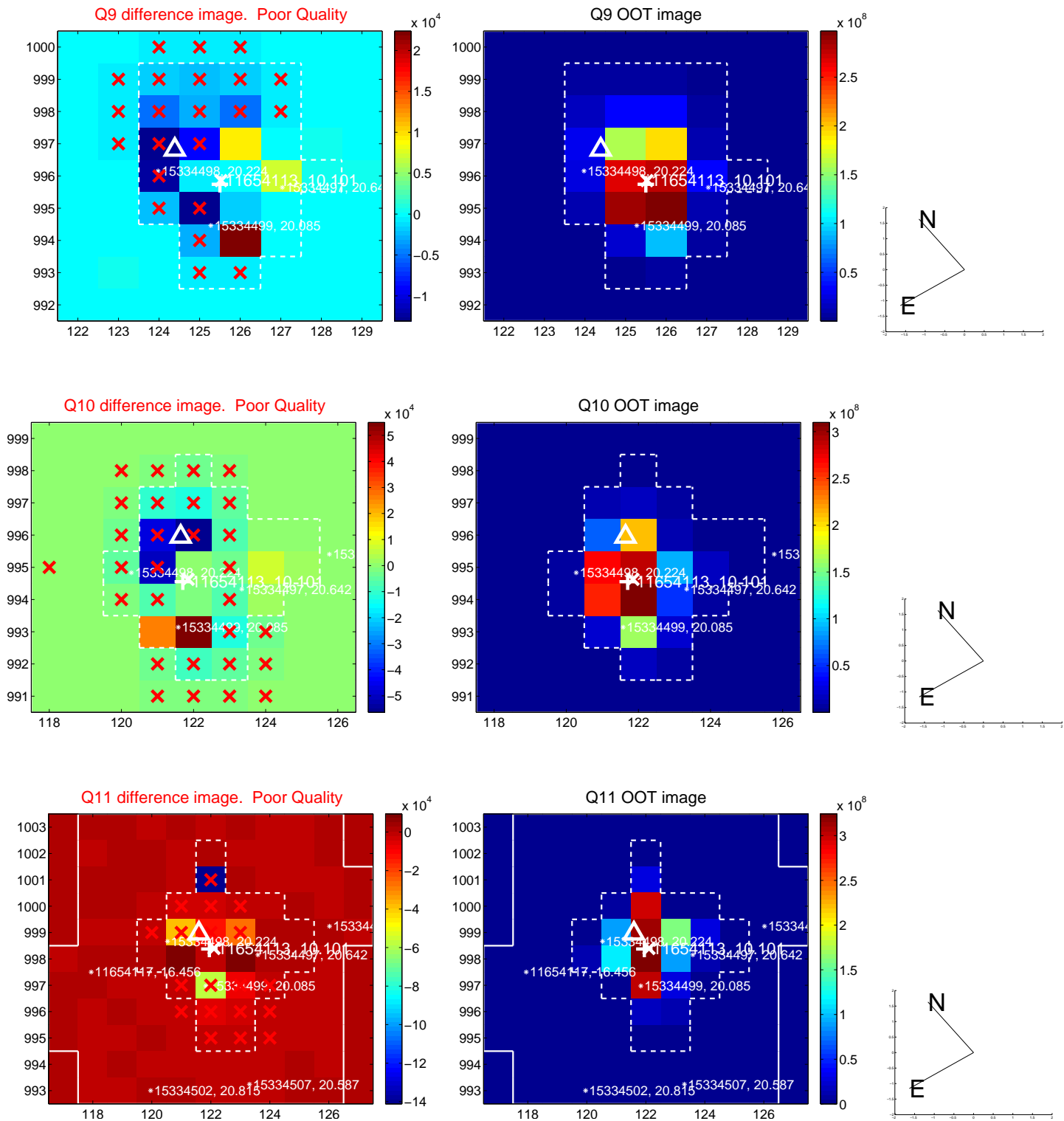


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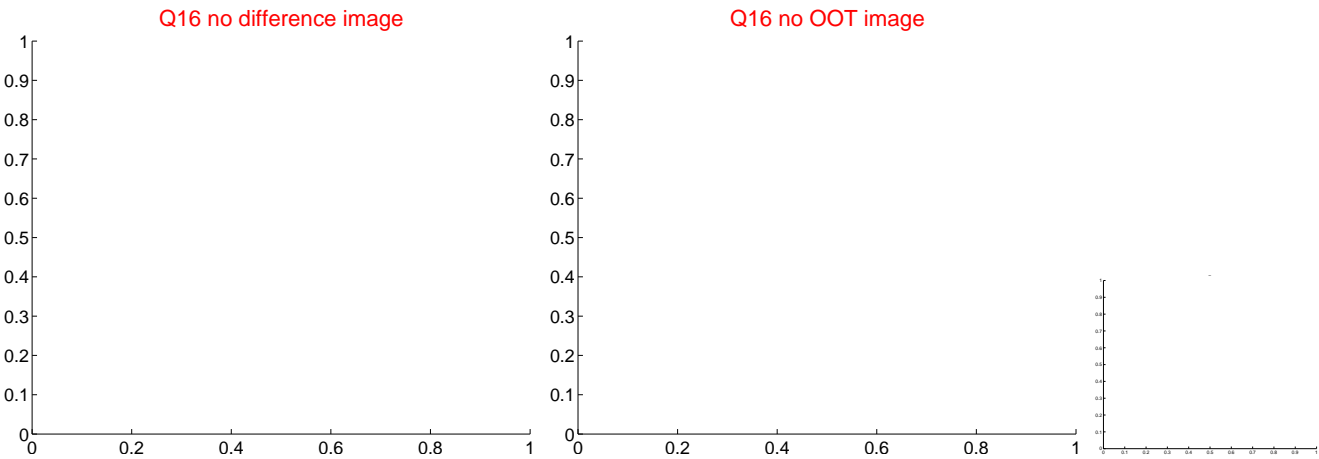
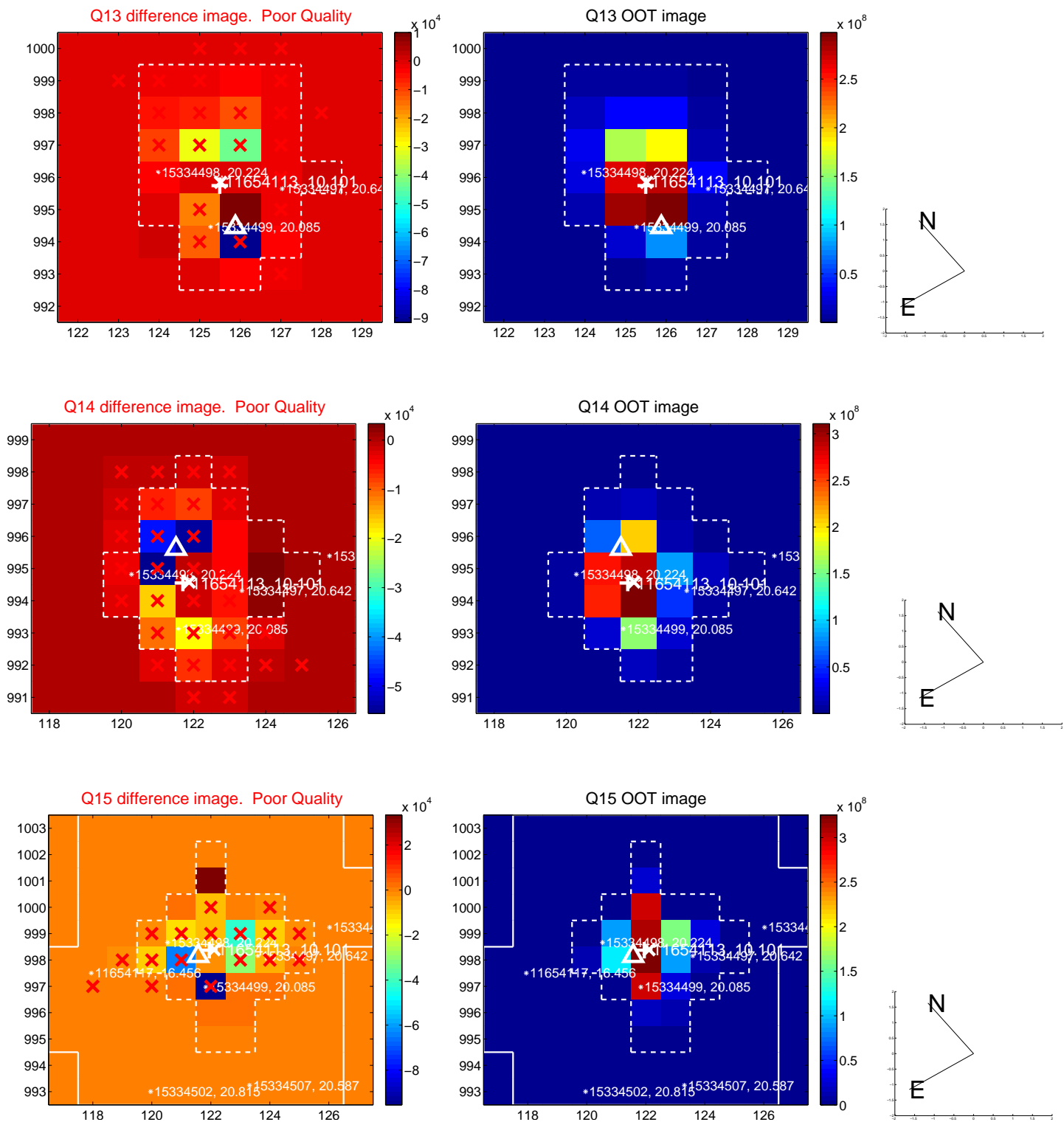




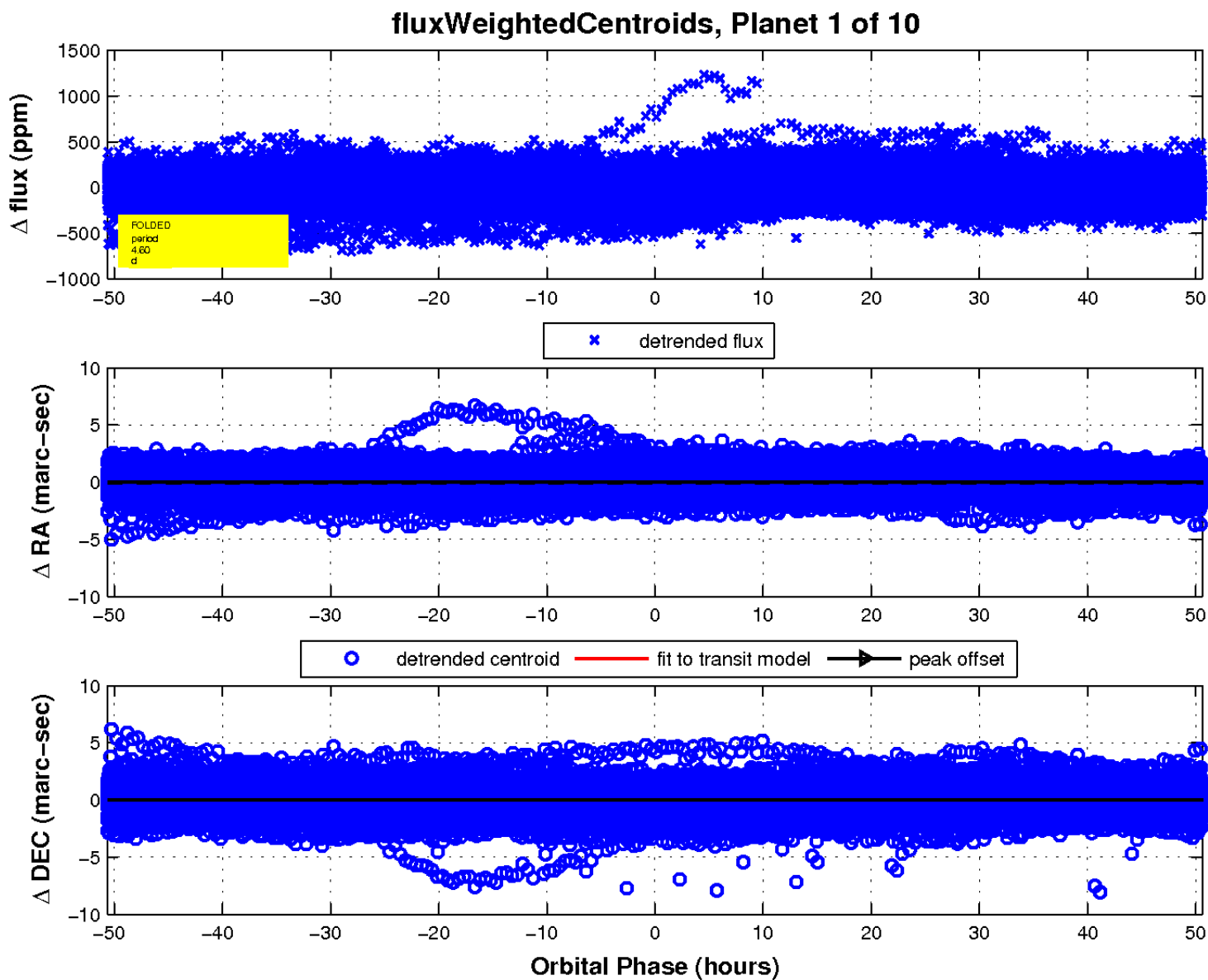
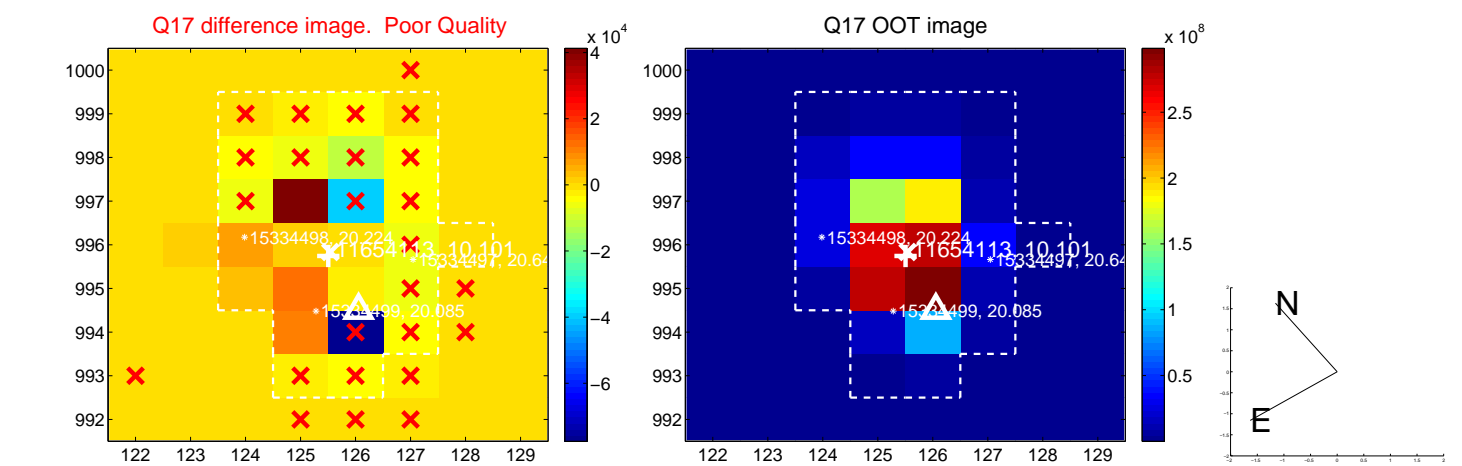
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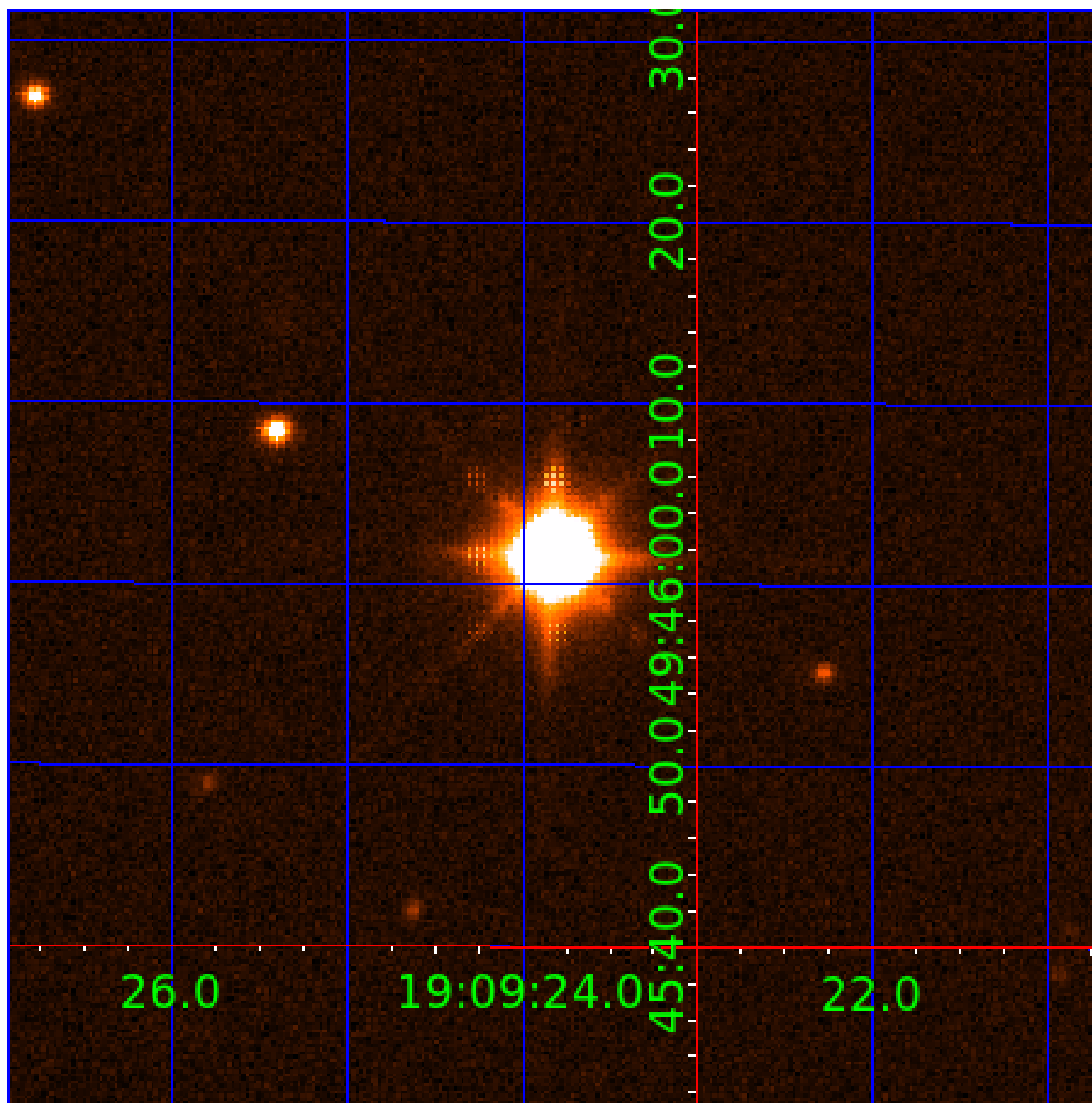


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UKIRT Image

Declination





# KIC 011654113

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654113-01	OBS	No	4.603252	134.638898	39.1	16.875	10.1	9.6	1.25	6429	0.92	708.64
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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011654113-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—CENT_SATURATED
011654113-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
011654113-07	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
011654113-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
011654113-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011654113-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

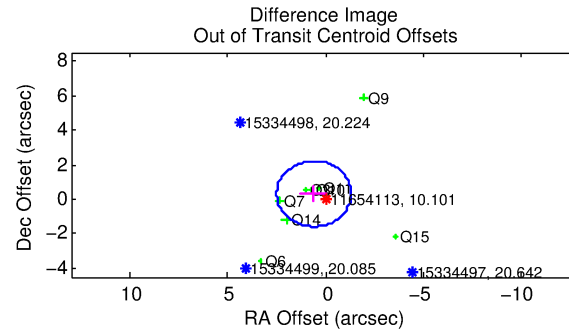
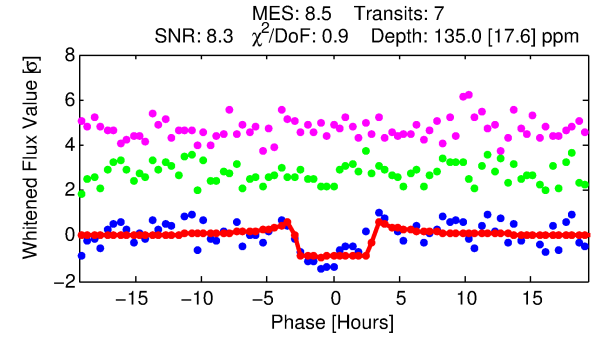
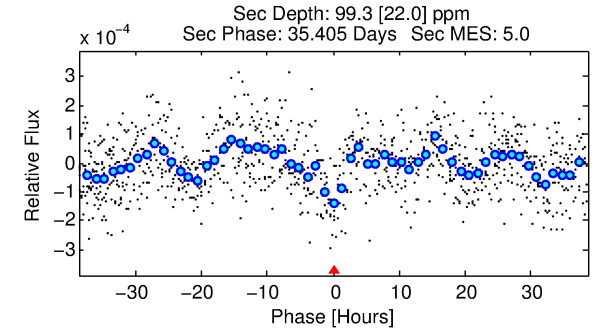
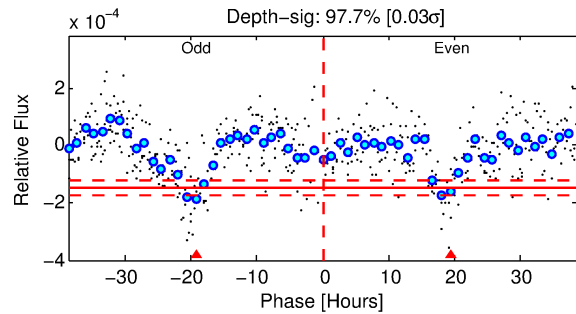
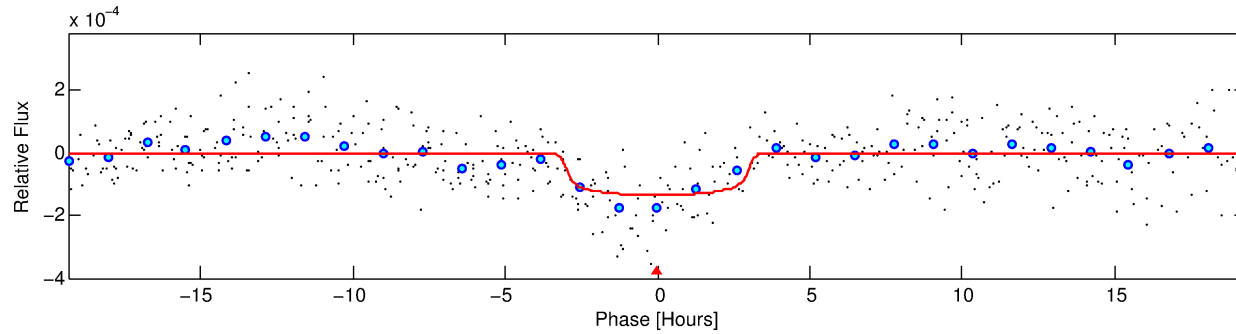
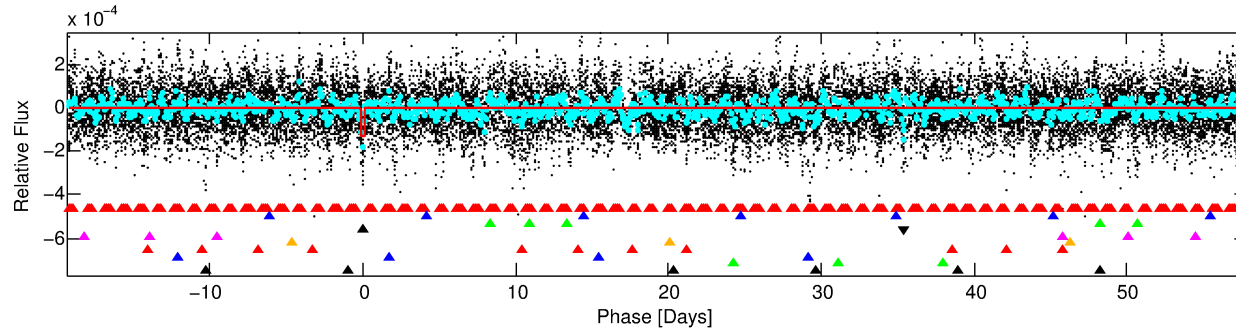
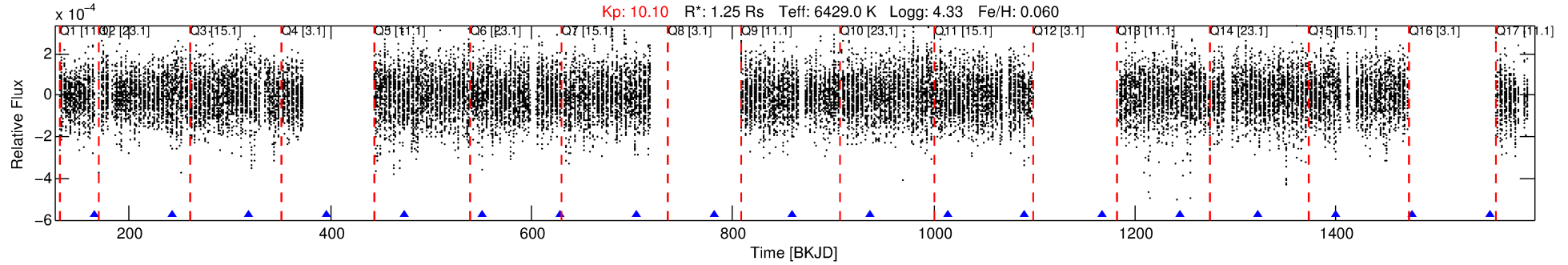
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## Ephemeris Match Information For 011654113-04

No Significant Match Found

# DV One-Page Summary

KIC: 11654113 Candidate: 4 of 10 Period: 77.125 d



## DV Fit Results:

Period = 77.12519 [0.00077] d  
Epoch = 165.0316 [0.0077] BKJD  
 $R_p/R^*$  = 0.0125 [0.0021]  
 $a/R^*$  = 41.81 [32.62]  
 $b$  = 0.90 [0.16]  
 $\text{Seff}$  = 16.53 [7.18]  
 $T_{\text{eq}}$  = 514 [56] K  
 $R_p$  = 1.70 [0.66]  $R_e$   
 $a$  = 0.3801 [0.1089] AU  
 $A_g$  = 2715.63 [1543.22] [1.76 $\sigma$ ]  
 $T_{\text{eff}}$  = 5738 [610] K [8.52 $\sigma$ ]

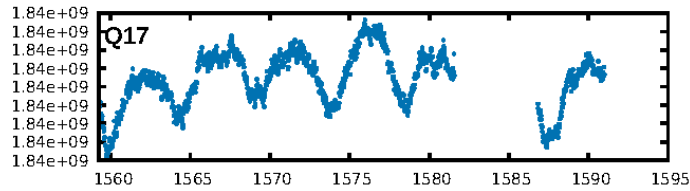
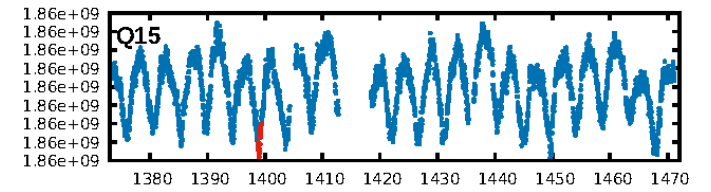
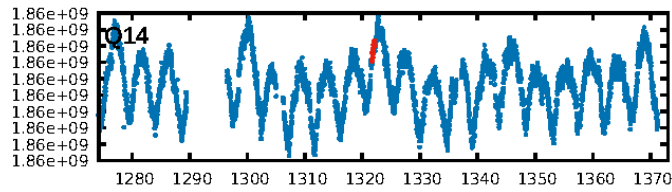
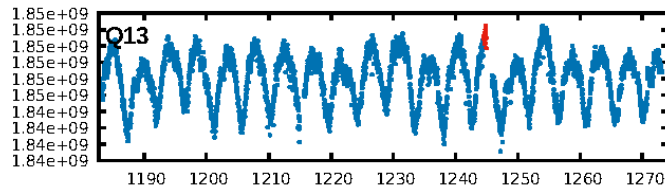
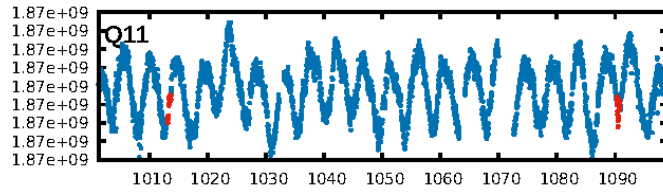
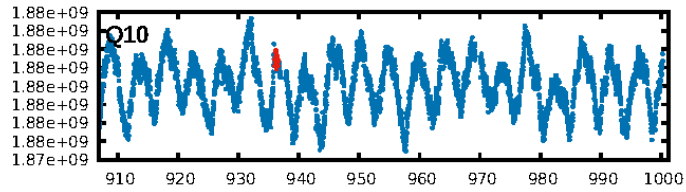
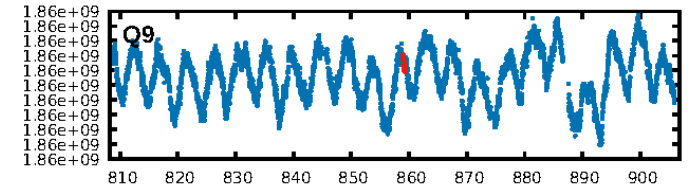
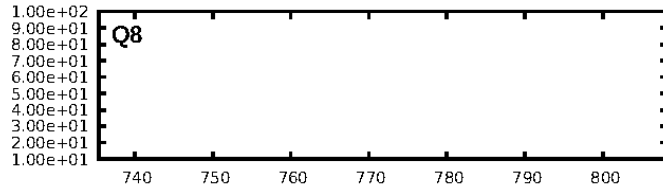
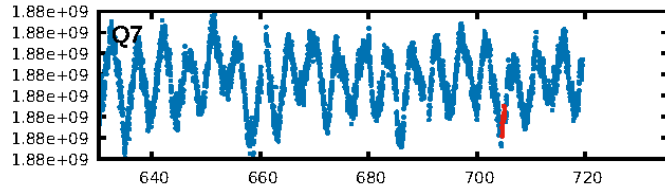
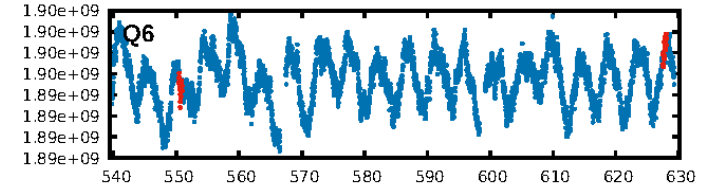
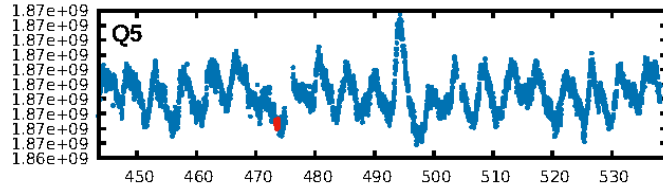
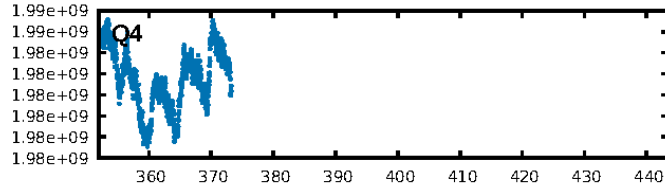
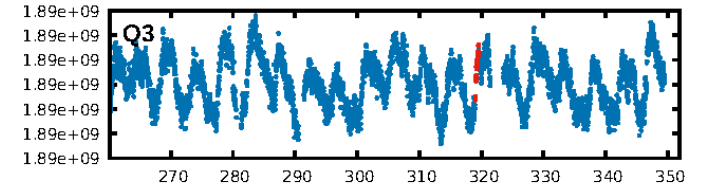
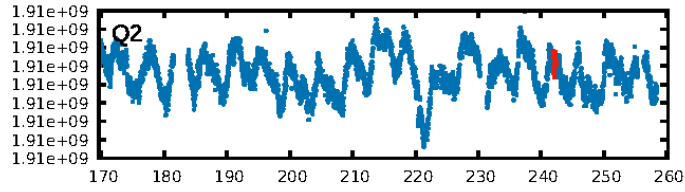
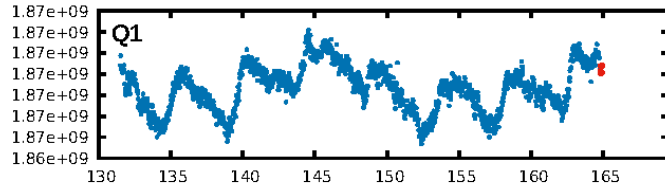
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [96.36 $\sigma$ ]  
LongPeriod-sig: 100.0% [166.98 $\sigma$ ]  
ModelChiSquare2-sig: 22.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 1.599  
Centroid-sig: 70.1%  
Centroid-so: 0.559 arcsec [0.59 $\sigma$ ]  
OotOffset-rm: 0.672 arcsec [1.06 $\sigma$ ]  
OotOffset-st: 3/4/0/1 [8]  
KicOffset-rm: 1.226 arcsec [1.71 $\sigma$ ]  
KicOffset-st: 3/4/0/1 [8]  
DiffImageQuality-fgm: 0.25 [2/8]  
DiffImageOverlap-fno: 0.60 [6/10]

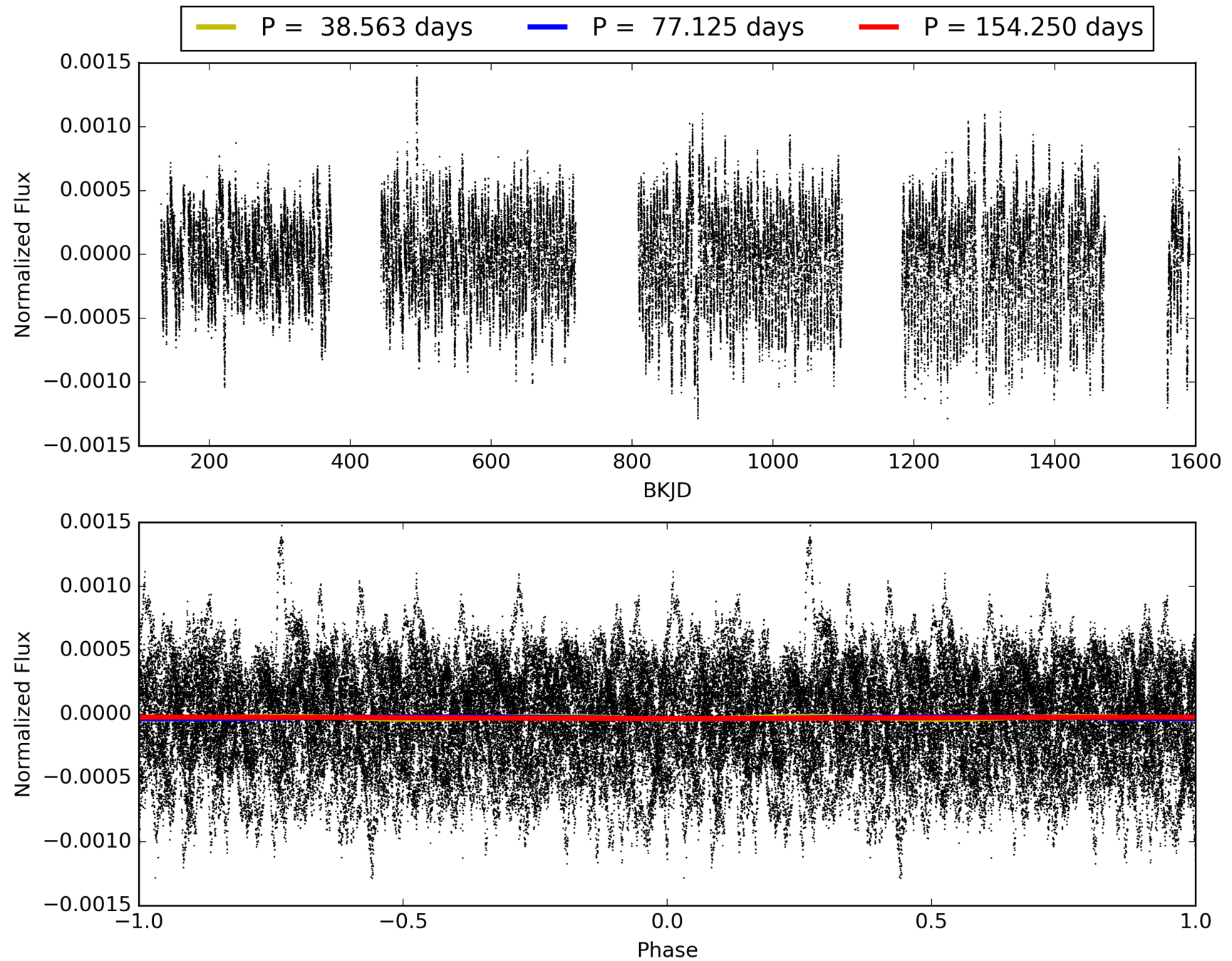
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:34:36 Z

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

# TCE 011654113-04, PDC Light Curves

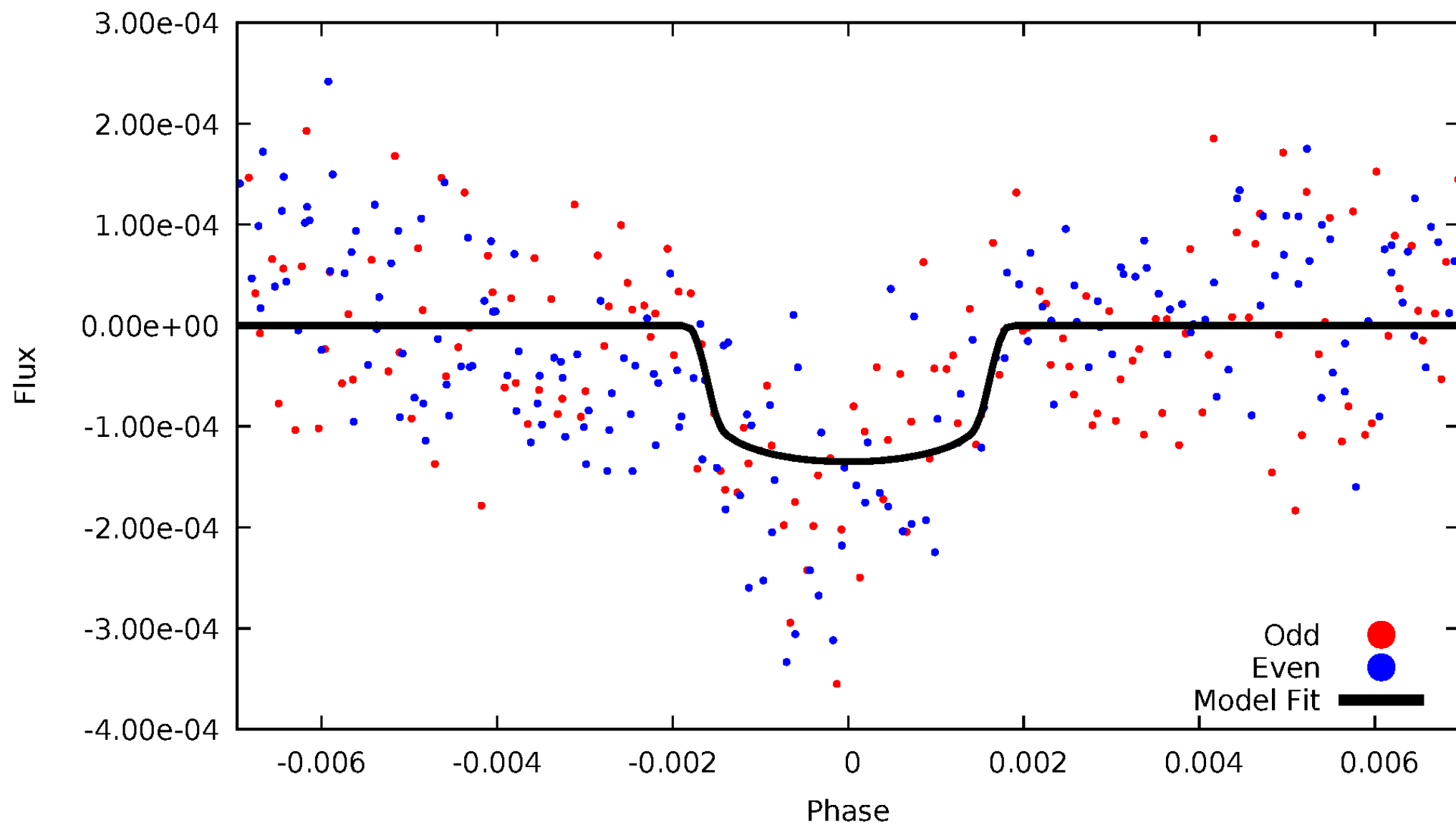


# TCE 011654113-04



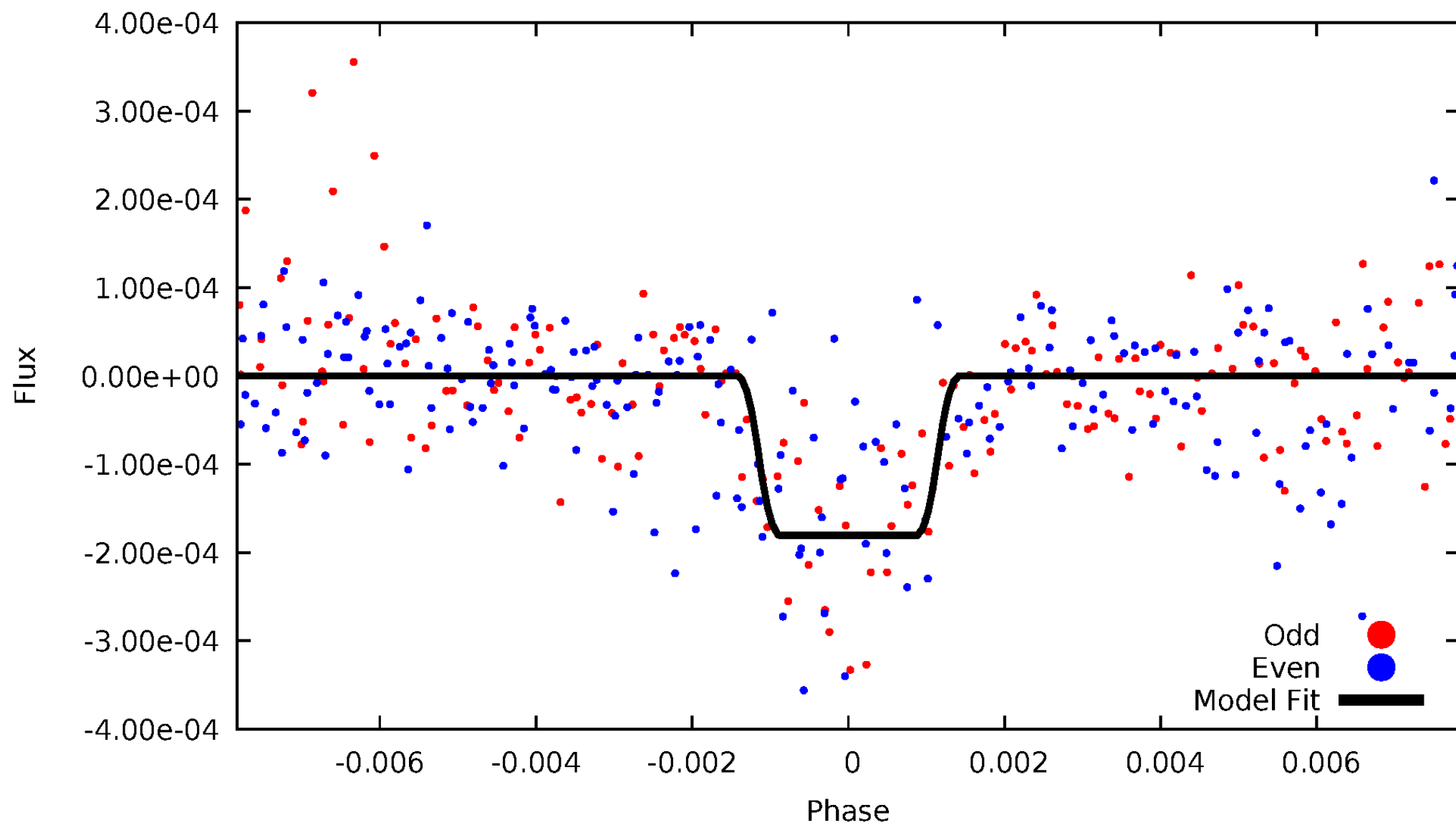
# DV Odd/Even

TCE 011654113-04



# ALT Odd/Even

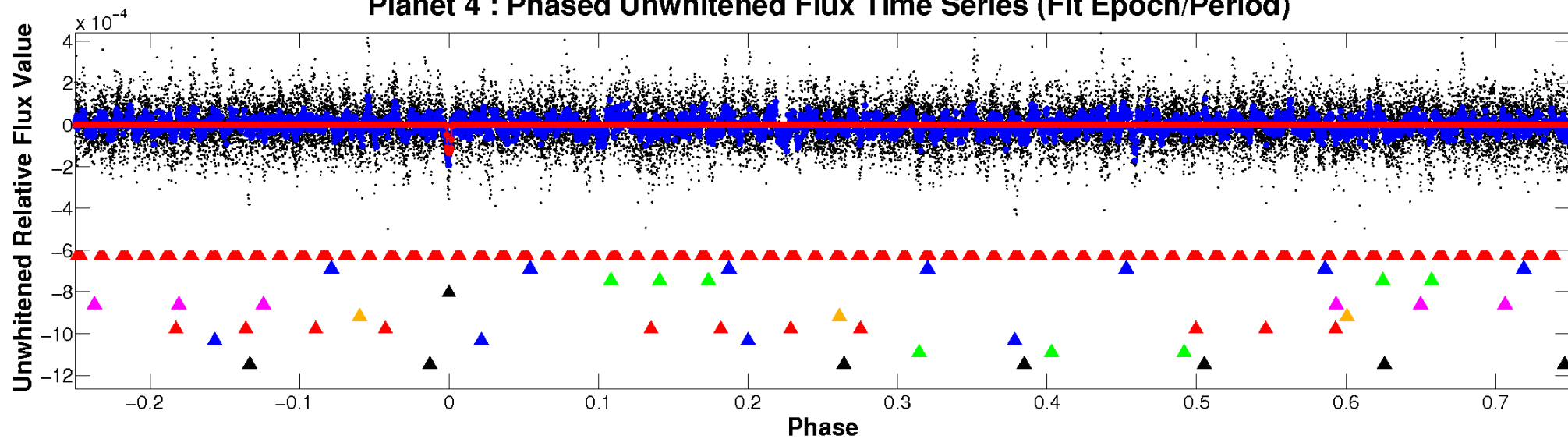
TCE 011654113-04



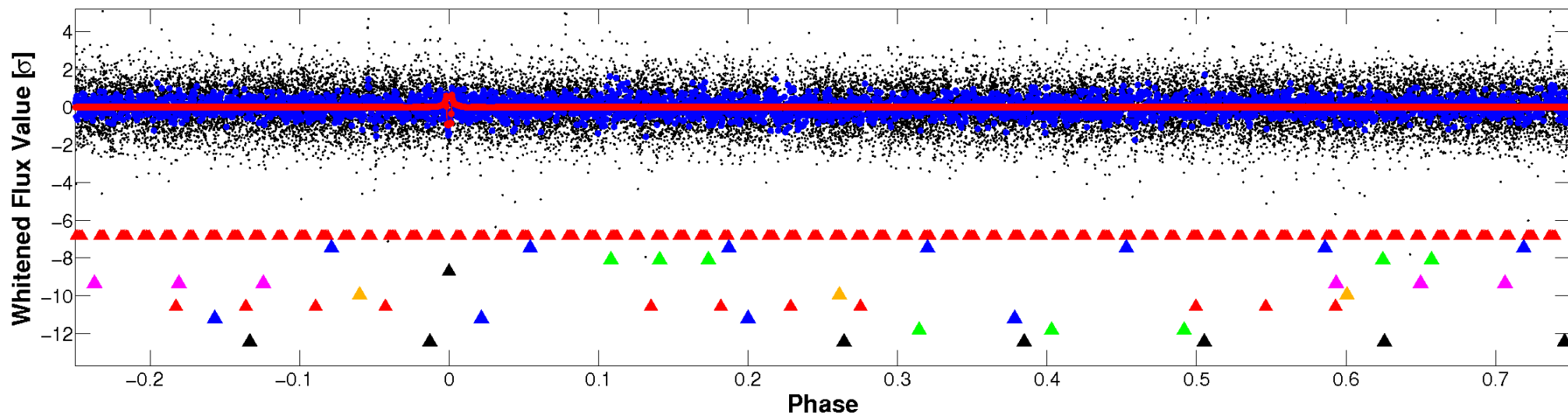


# Non-Whitened Vs. Whitened Light Curve

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



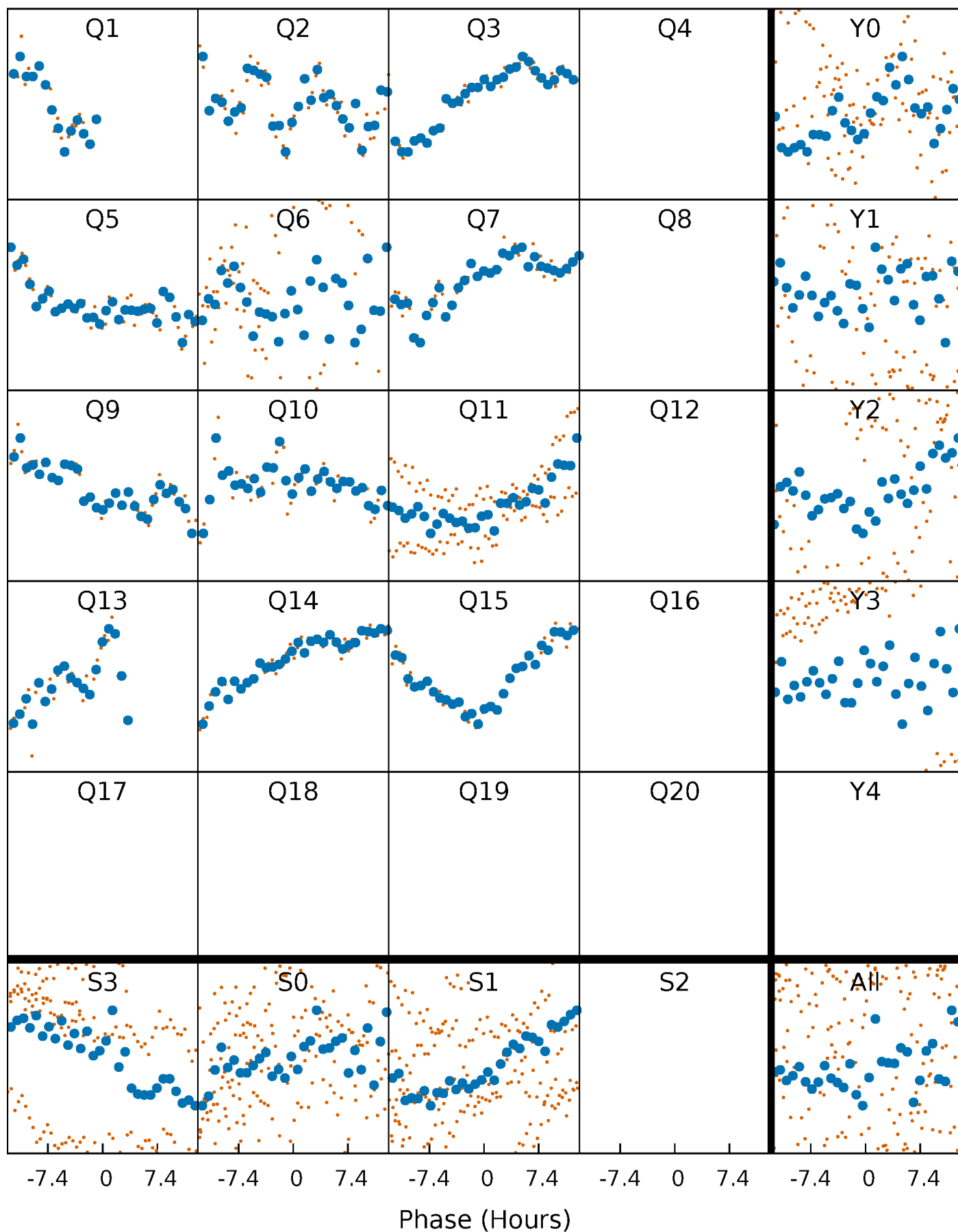
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





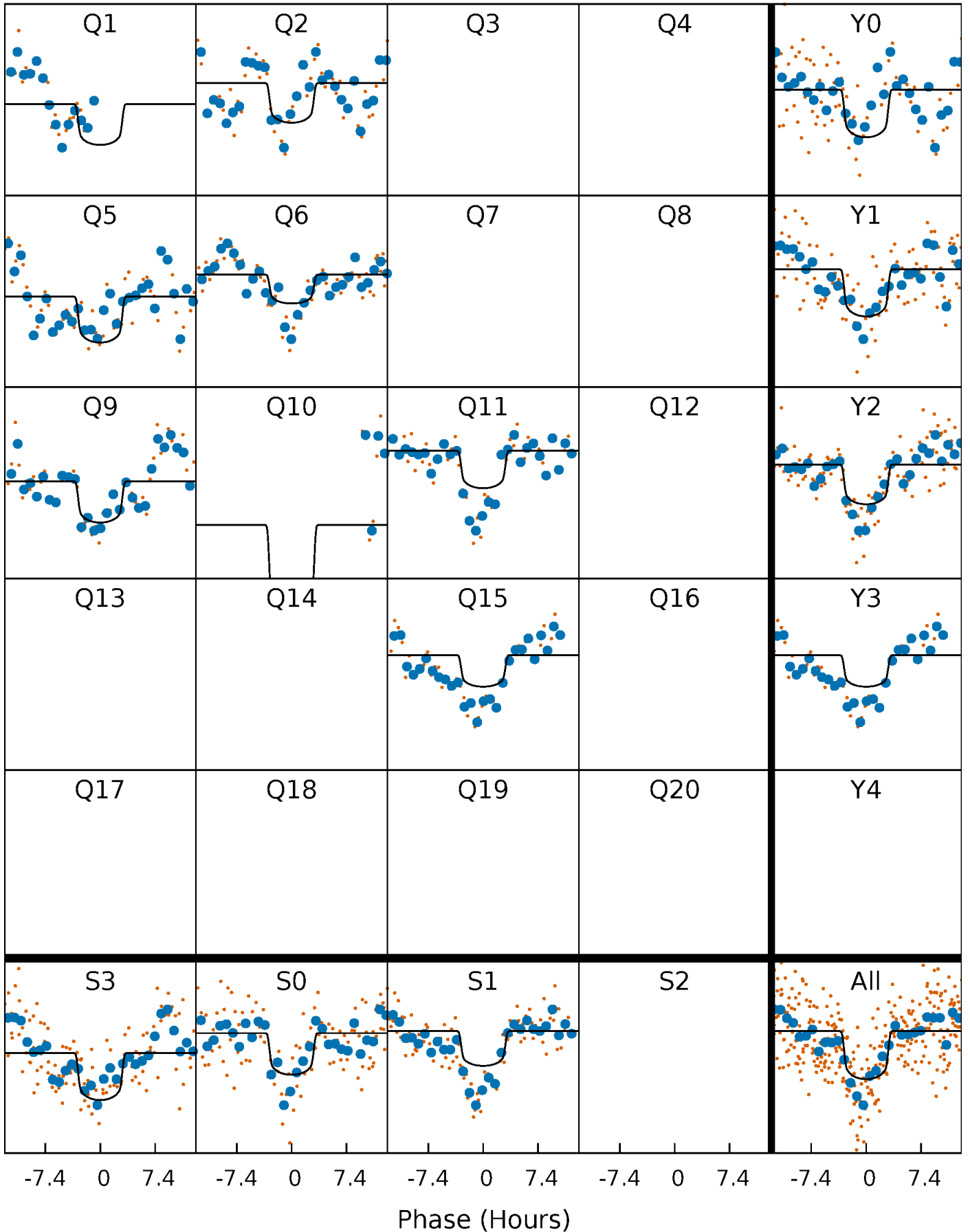
# PDC Quarter-Phased Transit Curves

TCE 011654113-04 P= 77.125192 Days  $T_0=165.031632$  (BKJD)



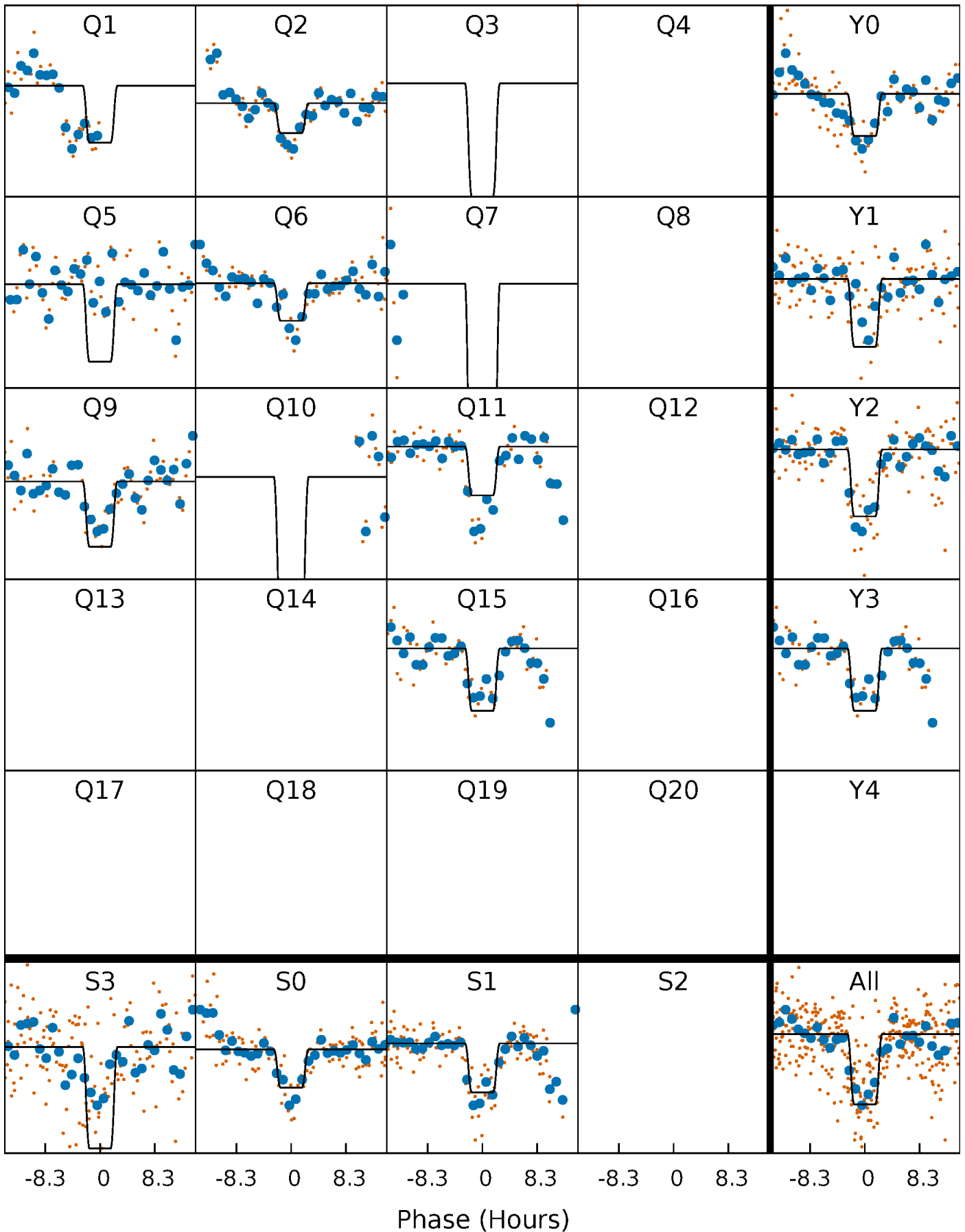
# DV Quarter-Phased Transit Curves

TCE 011654113-04 P= 77.125192 Days  $T_0=165.031632$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

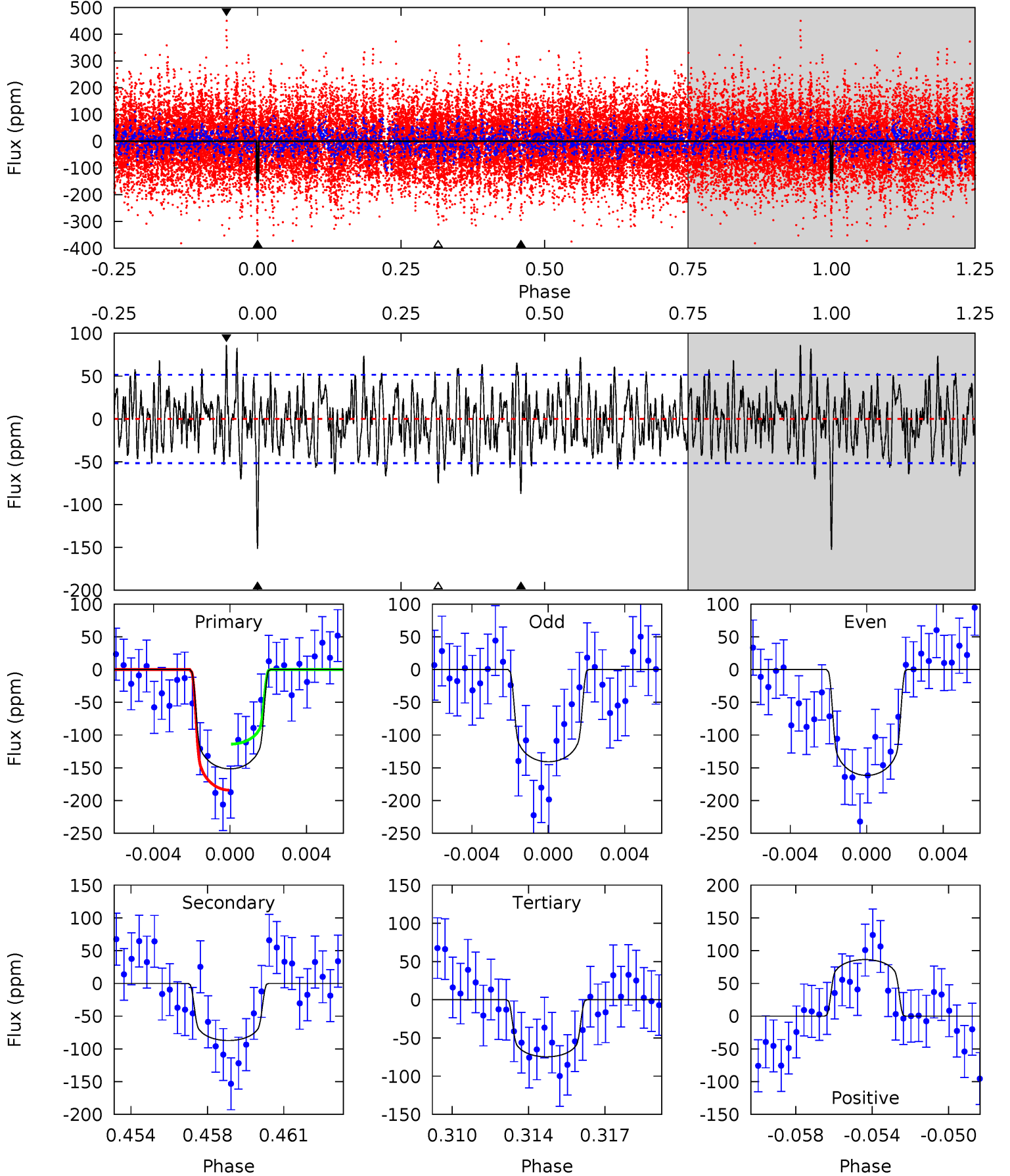
TCE 011654113-04 P= 77.127729 Days  $T_0=164.991005$  (BKJD)



# DV Model-Shift Uniqueness Test

011654113-04, P = 77.125192 Days, E = 87.906440 Days

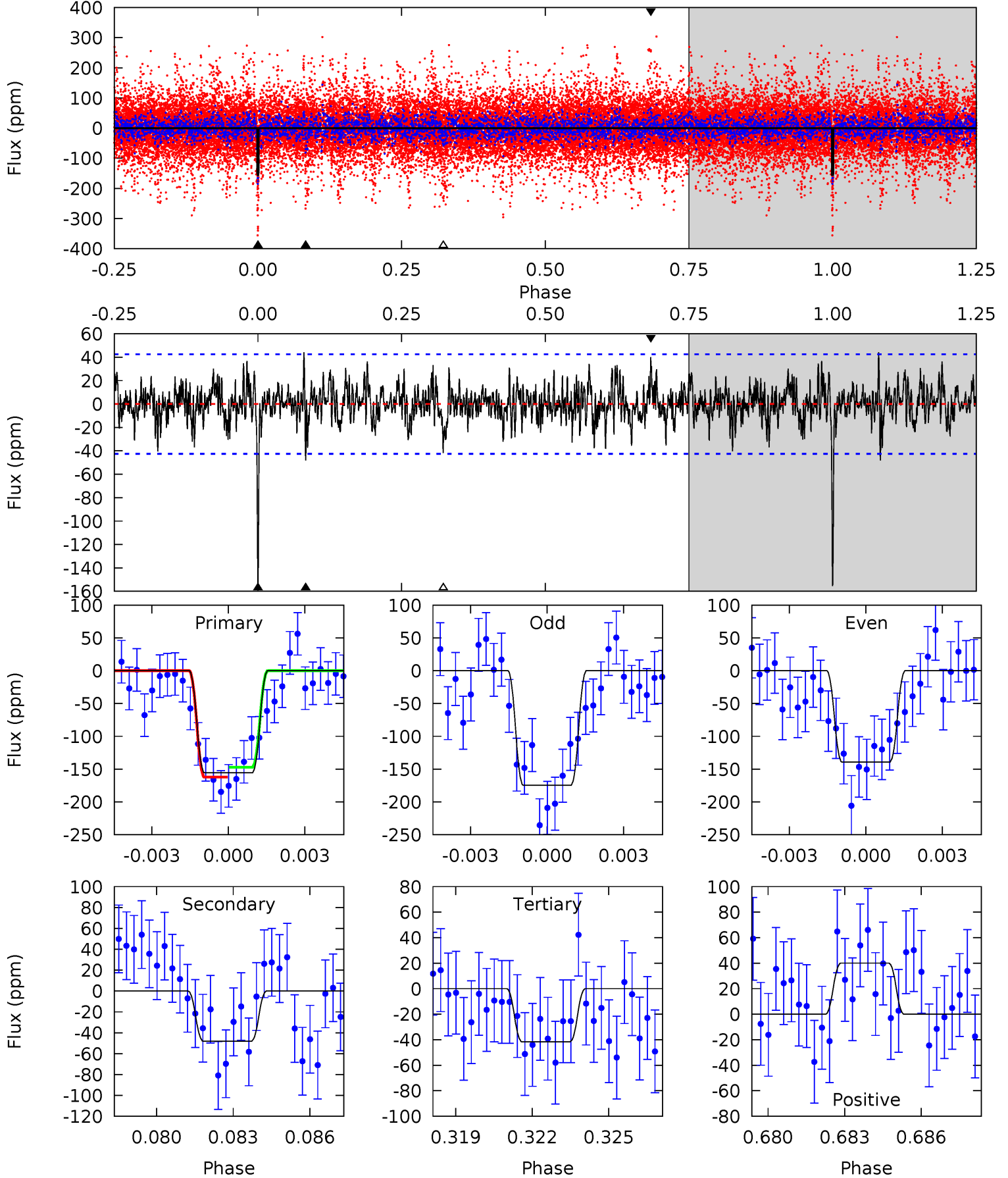
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.3	8.81	7.55	8.72	5.22	2.91	2.68	7.77	6.60	1.27	0.10	1.05	1.06	0.36	3.55



# Alt Model-Shift Uniqueness Test

011654113-04, P = 77.127729 Days, E = 87.863276 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
19.3	5.96	5.17	4.96	5.27	2.99	1.53	14.1	14.3	0.80	1.00	2.18	0.95	0.22	0.94



### Stellar Parameters For KIC 011654113

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6429^{+179}_{-246}$	$4.335^{+0.072}_{-0.217}$	$0.060^{+0.250}_{-0.350}$	$1.249^{+0.437}_{-0.175}$	$1.231^{+0.180}_{-0.180}$	$0.890^{+0.352}_{-0.483}$
	+3%/-4%	+2%/-5%	+417%/-583%	+35%/-14%	+15%/-15%	+40%/-54%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011654113-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-87 \pm 10$	$1.77^{+0.42}_{-0.35}$	$732^{+56}_{-41}$	$5546^{+563}_{-419}$	$2136^{+1179}_{-755}$
Alt.	$-48 \pm 8$	$1.88^{+0.45}_{-0.33}$	$732^{+61}_{-39}$	$4767^{+398}_{-339}$	$1054^{+517}_{-375}$

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

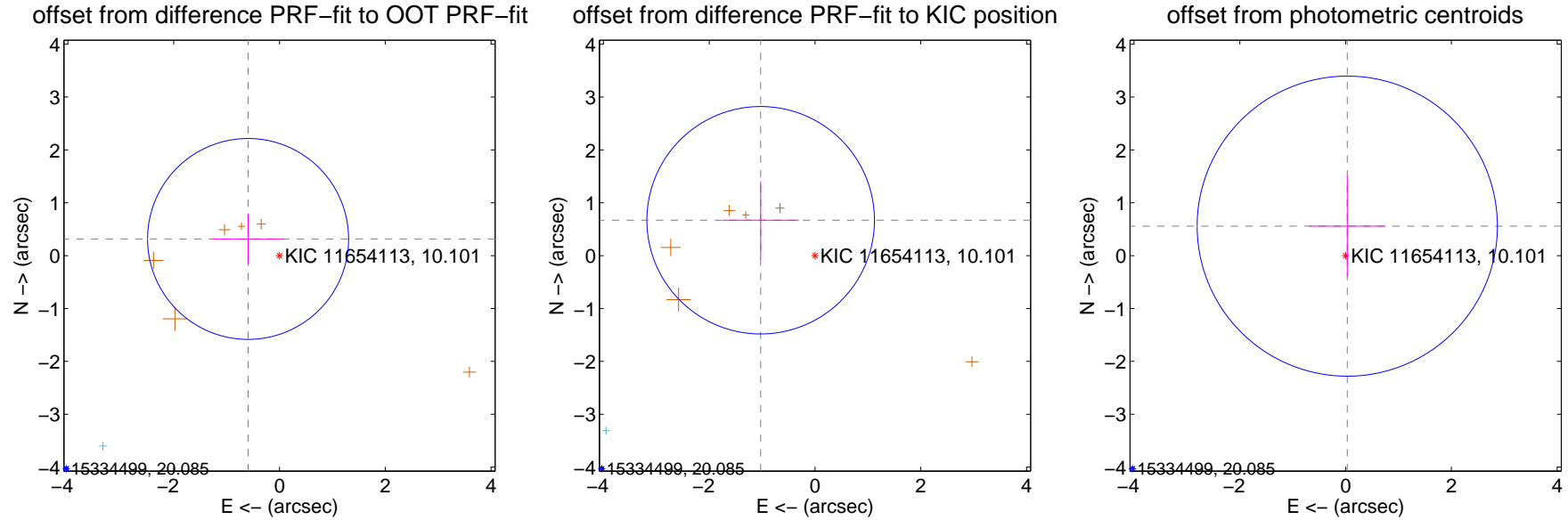
## DV Centroid Data

Supplemental centroid analysis for 011654113-04. **Kepler magnitude: 10.10.** Transit SNR 8.29

**There are 2 quarters with good PRF difference image offsets**

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

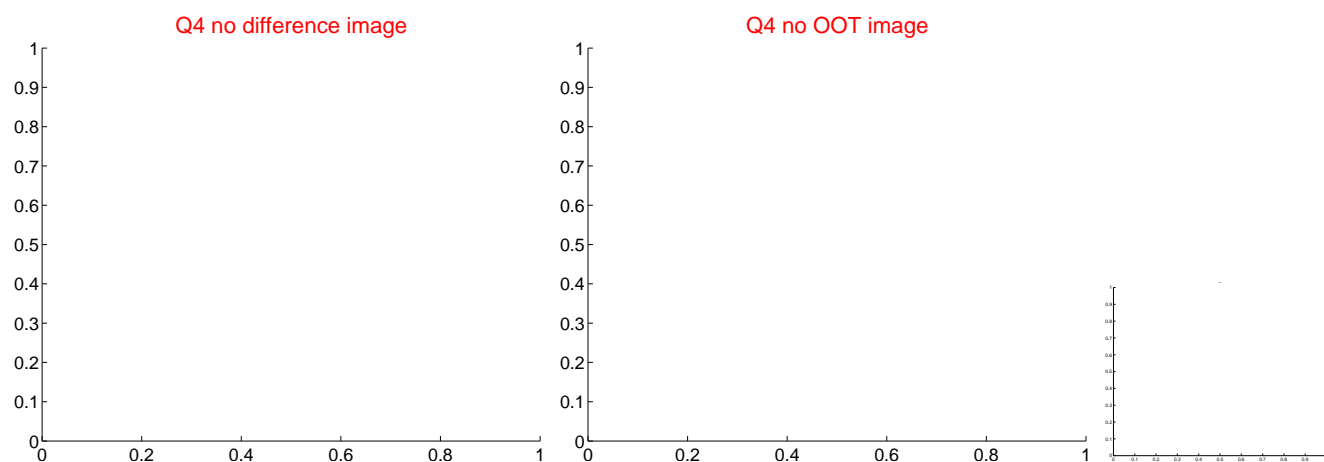
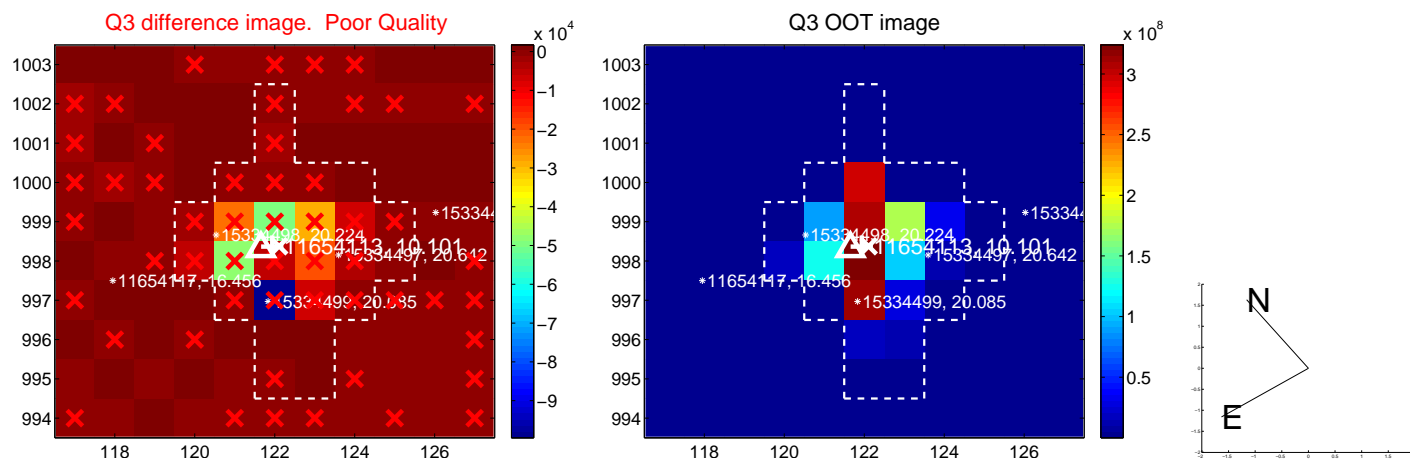
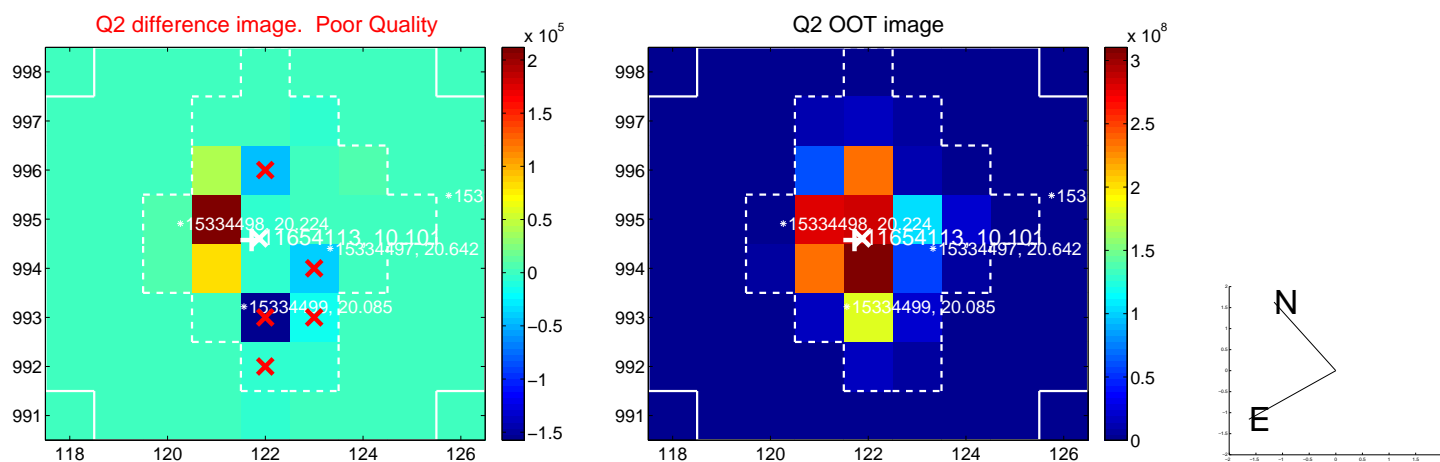
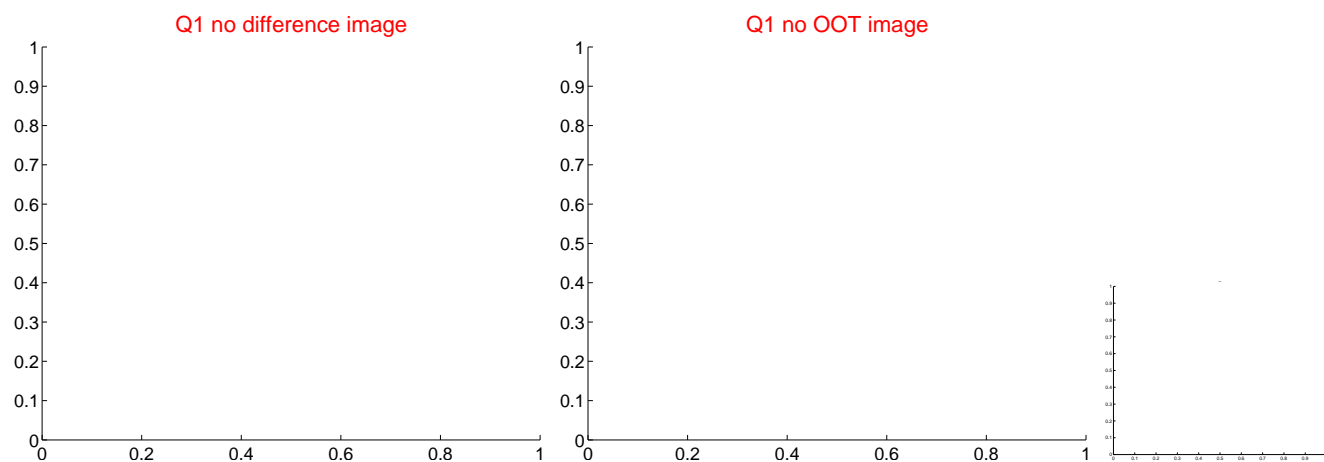
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.672 \pm 0.633$	1.06	$0.594 \pm 0.671$	$0.316 \pm 0.475$
PRF-fit source offset from KIC position	$1.226 \pm 0.717$	1.71	$1.027 \pm 0.721$	$0.670 \pm 0.737$
photometric centroid source offset	$0.56 \pm 0.95$	0.59	$-0.03 \pm 0.72$	$0.56 \pm 0.95$



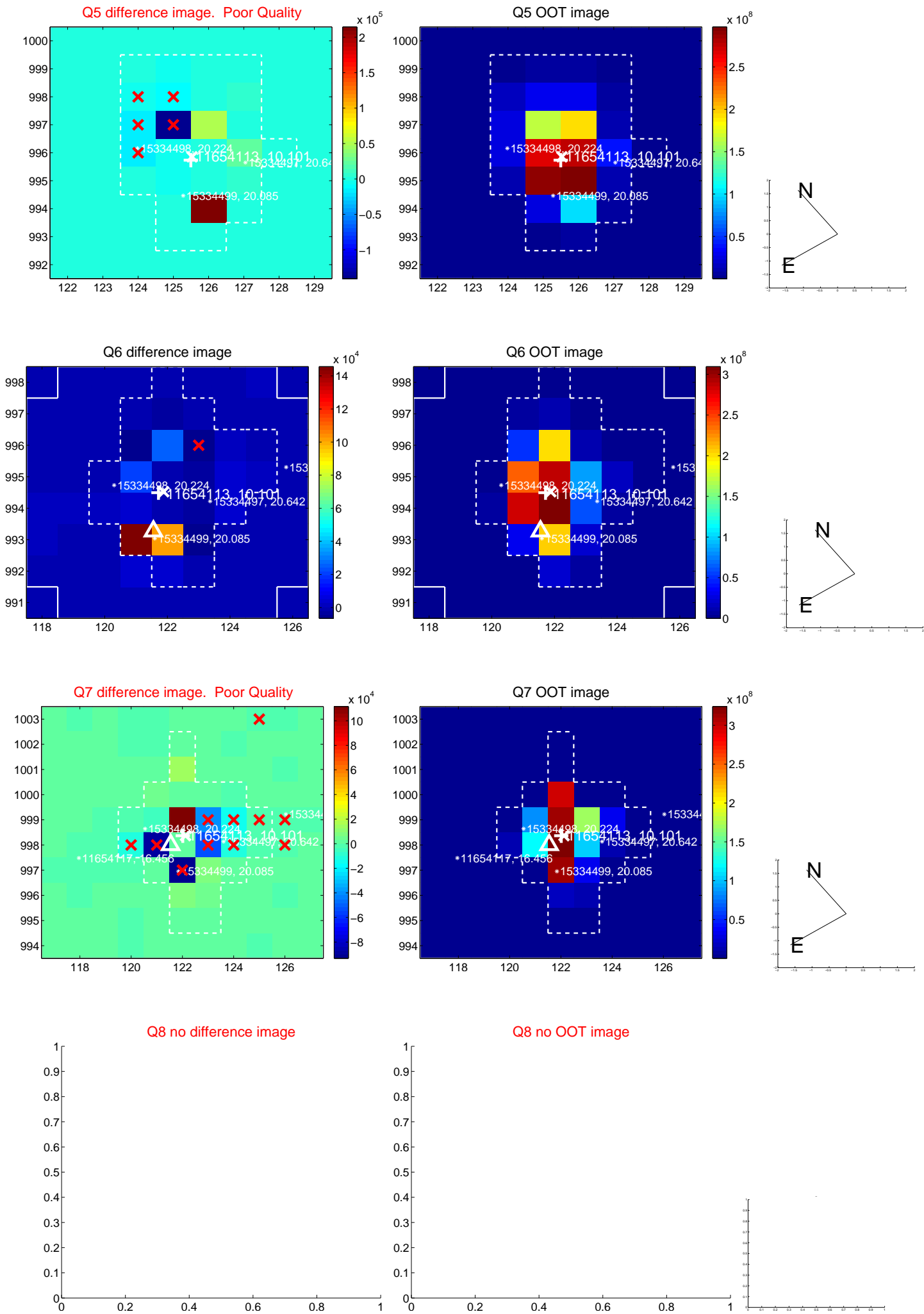
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



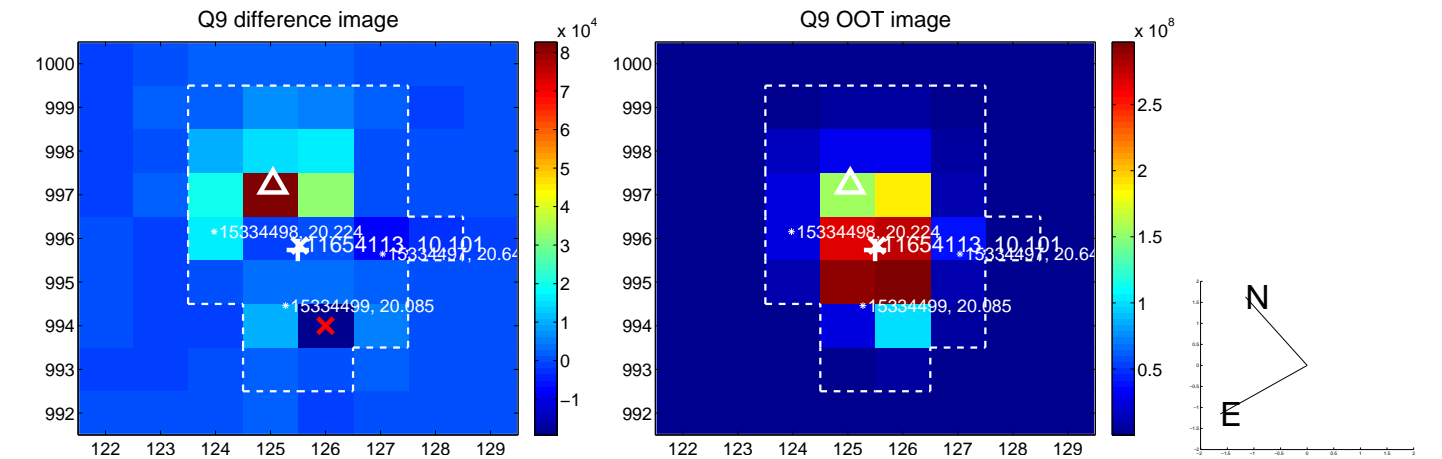
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

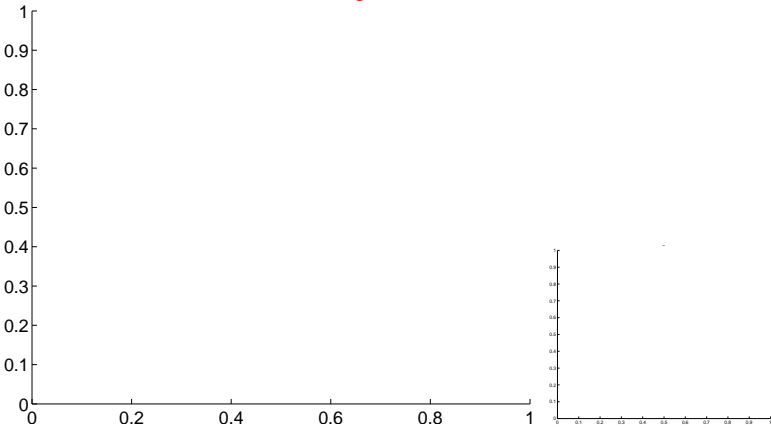


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

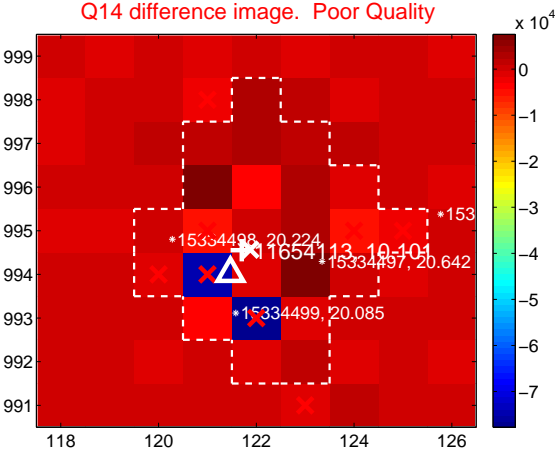
Q13 no difference image



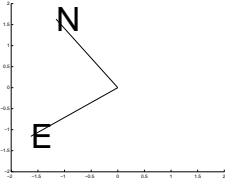
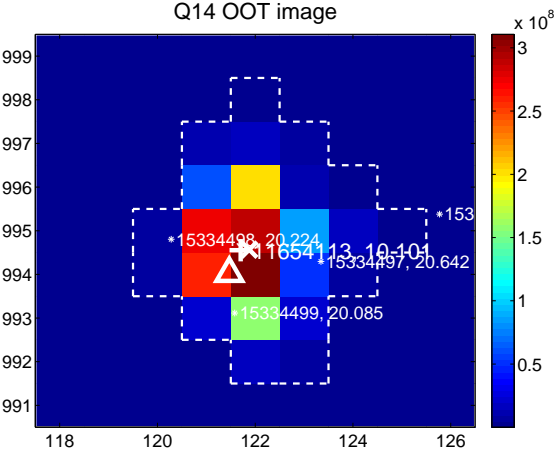
Q13 no OOT image



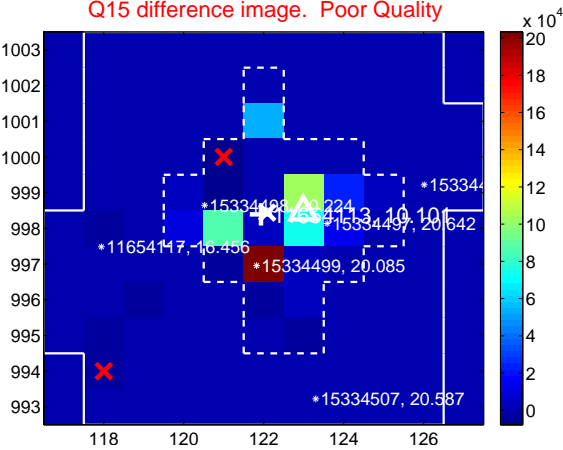
Q14 difference image. Poor Quality



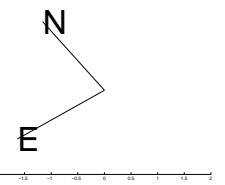
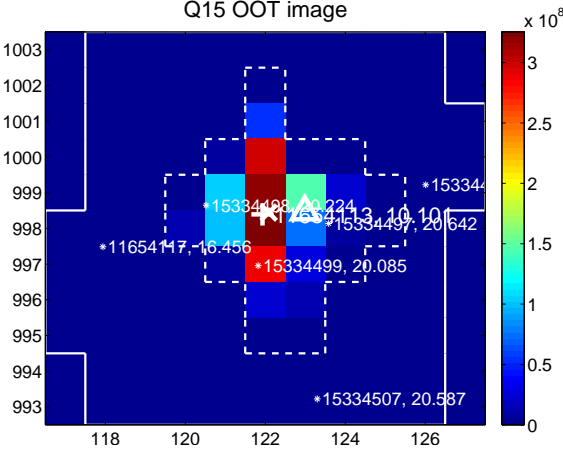
Q14 OOT image



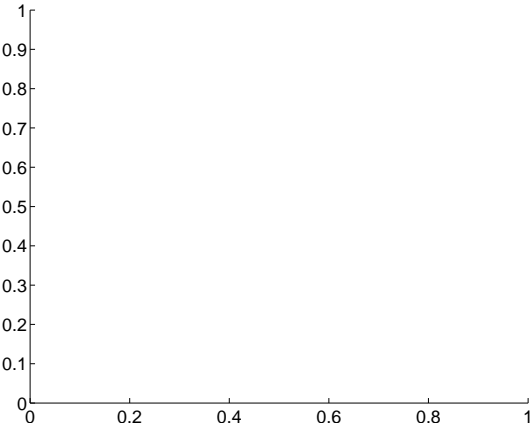
Q15 difference image. Poor Quality



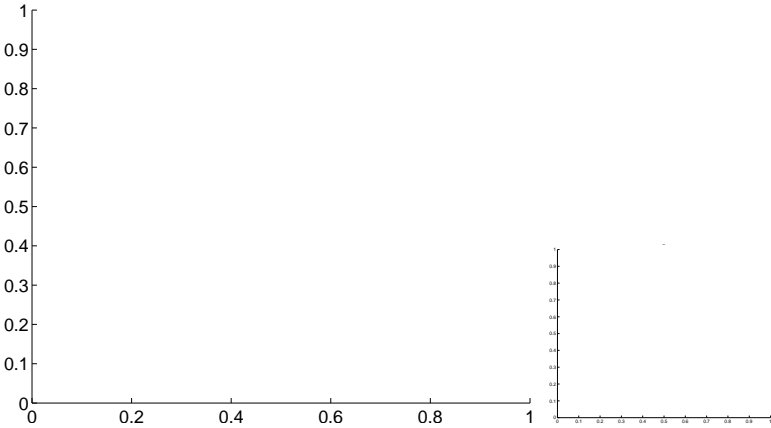
Q15 OOT image



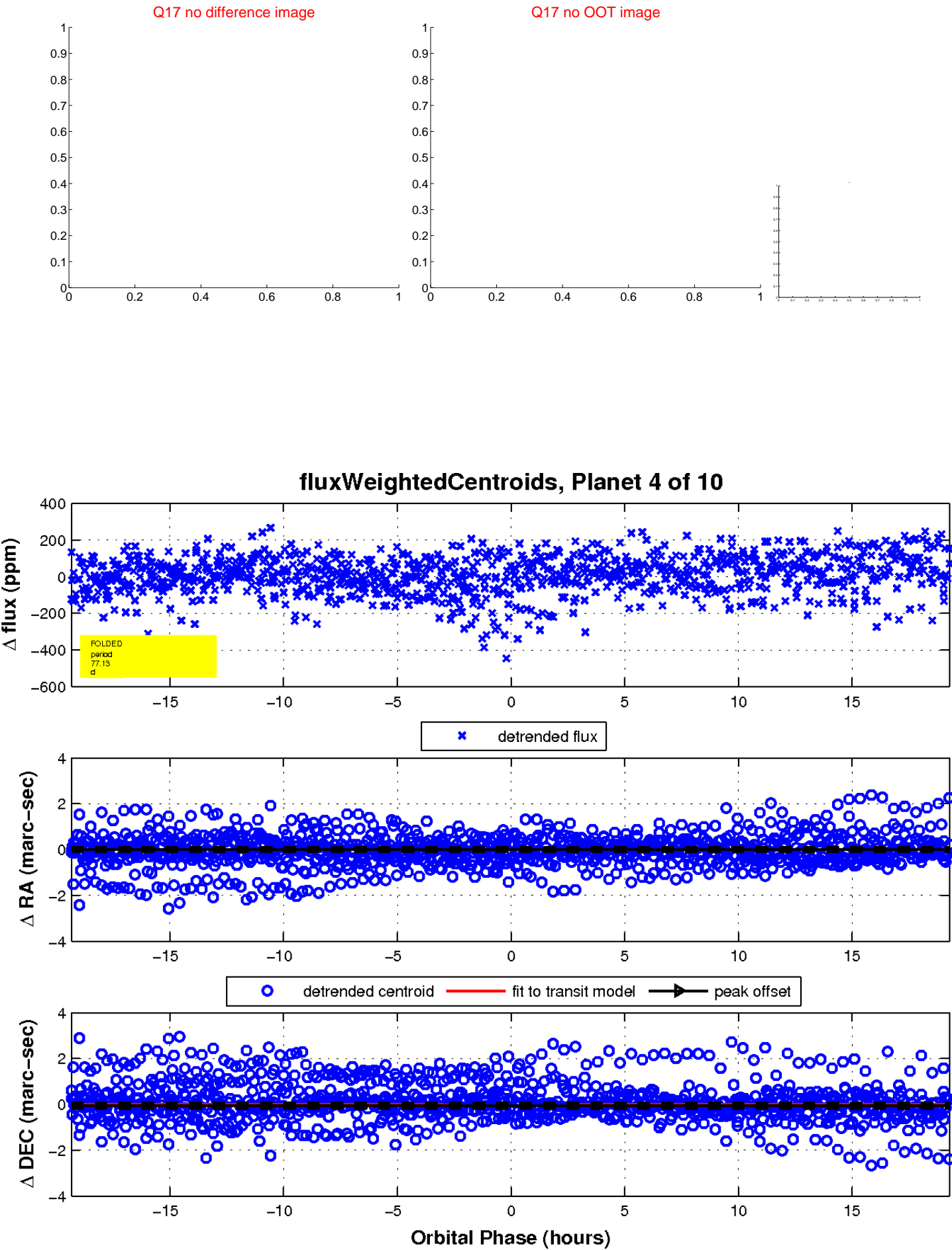
Q16 no difference image



Q16 no OOT image

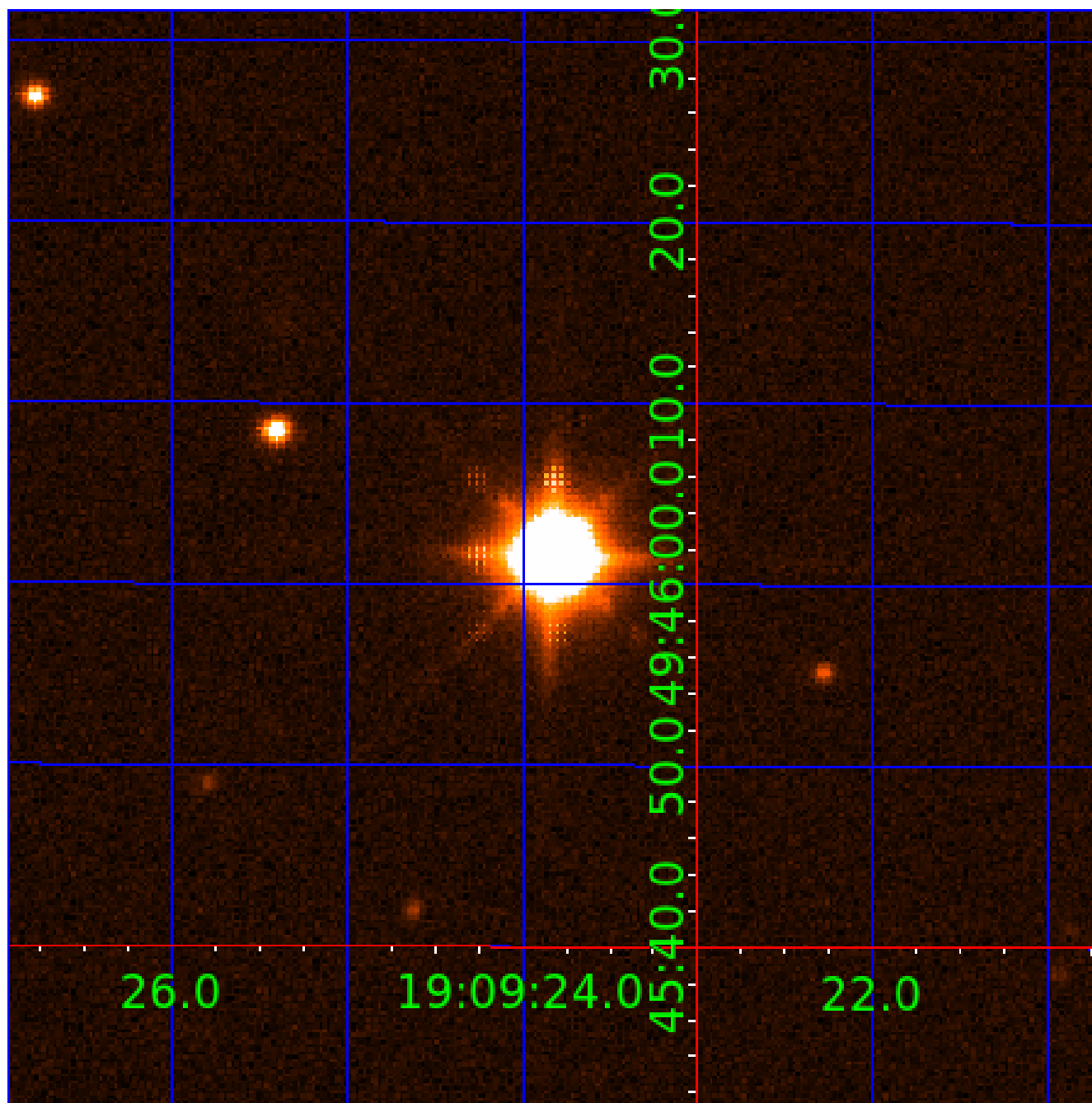


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011654113

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654113-01	OBS	No	4.603252	134.638898	39.1	16.875	10.1	9.6	1.25	6429	0.92	708.64
011654113-04	OBS	No	77.125192	165.031632	135.0	6.443	8.5	8.3	1.25	6429	1.71	16.53
011654113-05	OBS	No	235.731487	210.797346	194.1	4.994	8.3	8.5	1.25	6429	1.99	3.73
011654113-07	OBS	No	129.742351	175.453993	189.2	3.960	8.3	8.0	1.25	6429	1.88	8.26
011654113-08	OBS	No	322.256003	384.322642	269.4	9.485	8.0	8.1	1.25	6429	2.50	2.46
011654113-09	OBS	No	469.585699	343.535747	232.5	8.058	8.0	8.7	1.25	6429	2.51	1.49
011654113-10	OBS	No	222.082184	241.171086	204.5	9.098	8.1	7.6	1.25	6429	2.29	4.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011654113-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
011654113-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—CENT_SATURATED
011654113-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
011654113-07	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
011654113-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
011654113-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011654113-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

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

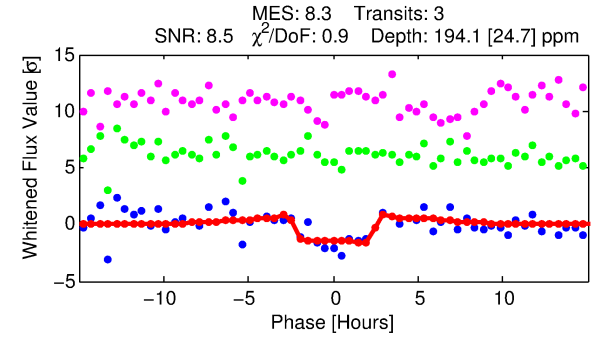
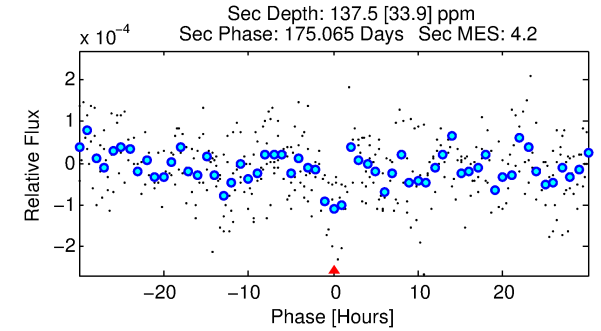
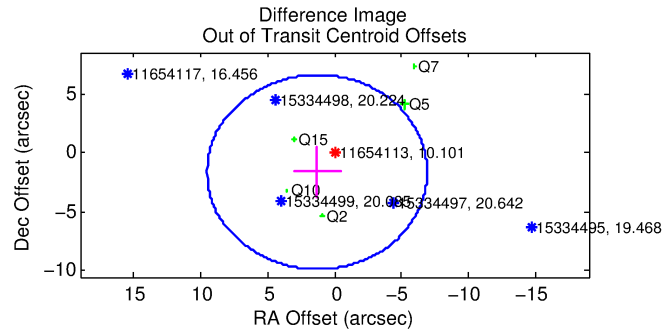
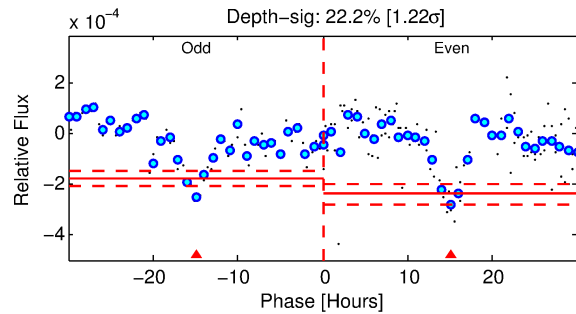
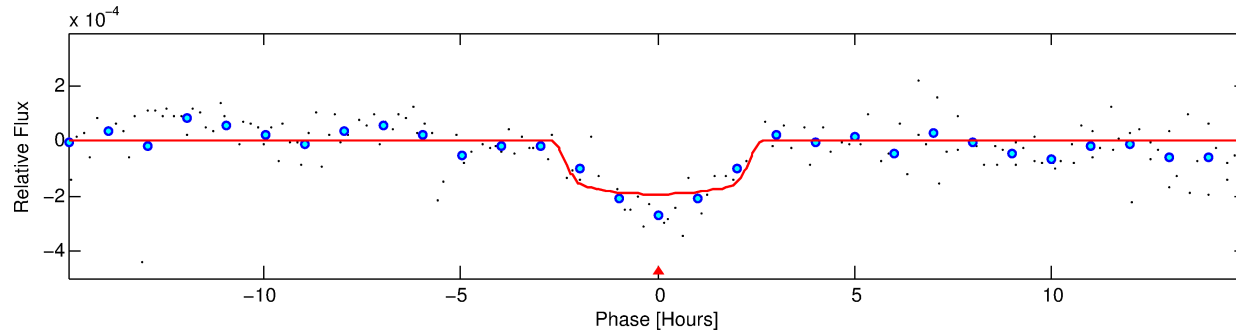
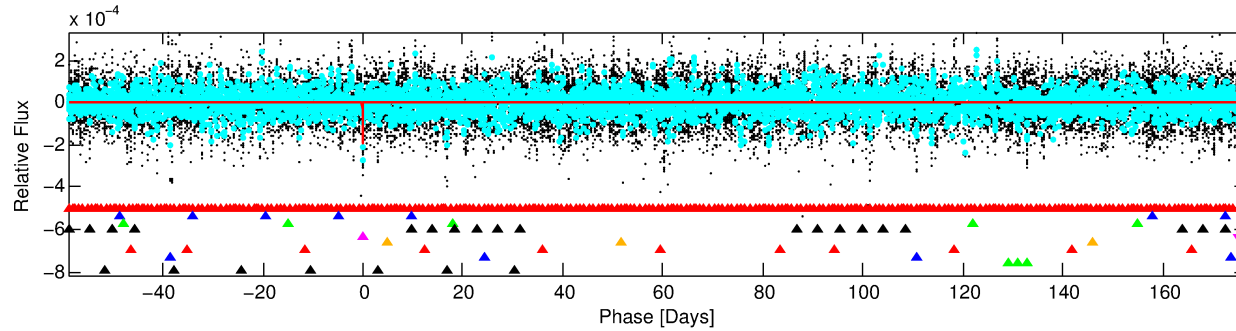
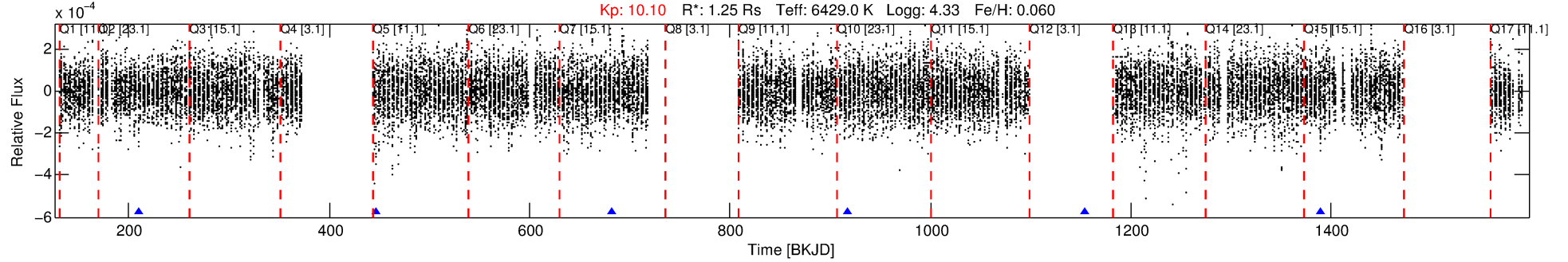
Ephemeris Match Information For 011654113-05

No Significant Match Found



# DV One-Page Summary

KIC: 11654113 Candidate: 5 of 10 Period: 235.731 d



## DV Fit Results:

Period = 235.73149 [0.00183] d  
Epoch = 210.7973 [0.0055] BKJD  
Rp/R\* = 0.0146 [0.0074]  
a/R\* = 191.13 [524.83]  
b = 0.87 [0.81]  
Seff = 3.73 [1.62]  
Teq = 354 [38] K  
Rp = 1.99 [1.23] Re  
a = 0.8005 [0.2294] AU  
Ag = 12264.44 [13754.67] [0.89 $\sigma$ ]  
Teffp = 5764 [1522] K [3.55 $\sigma$ ]

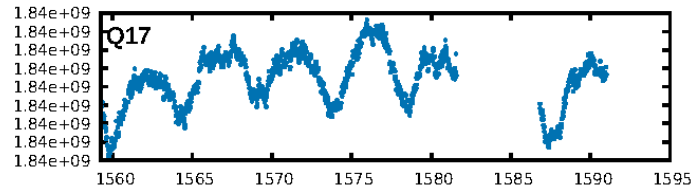
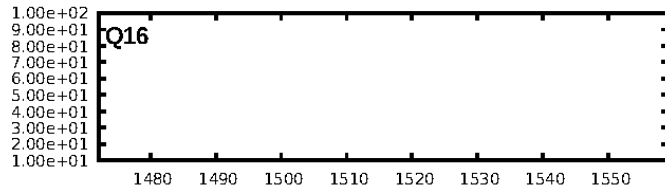
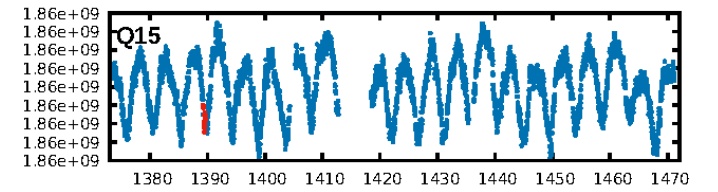
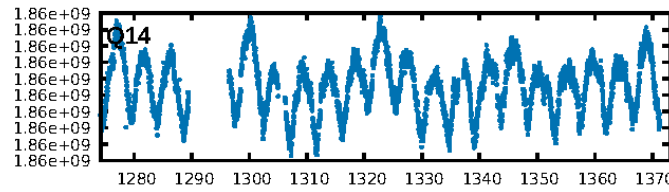
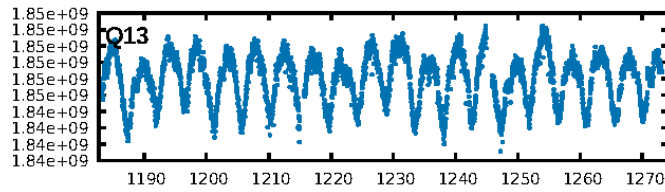
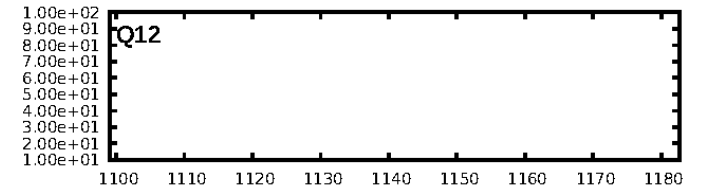
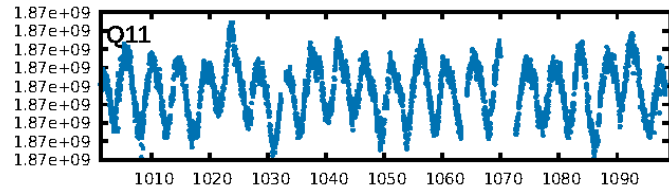
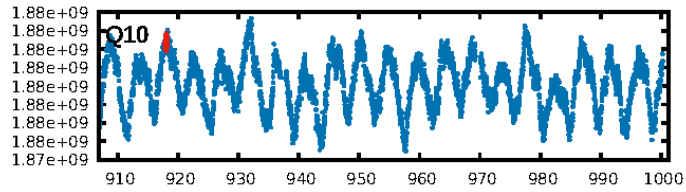
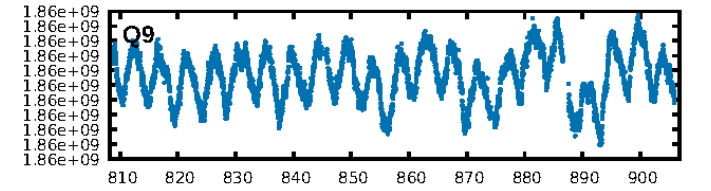
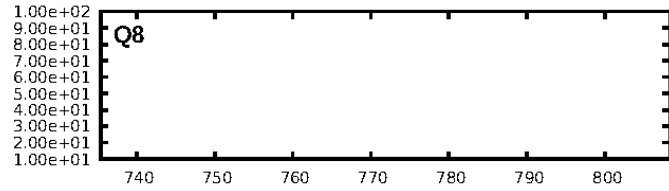
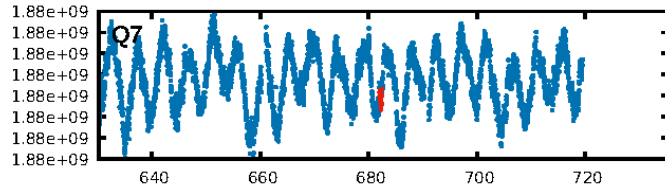
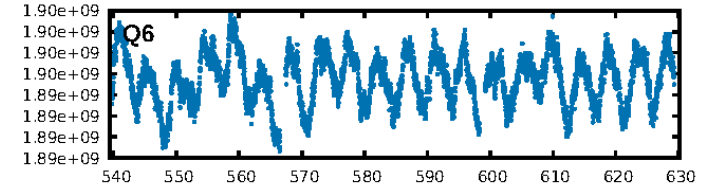
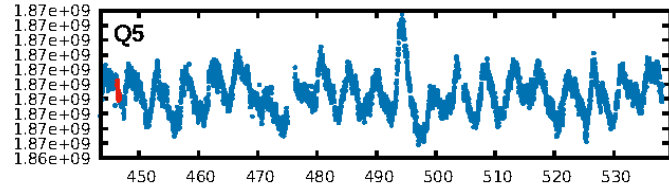
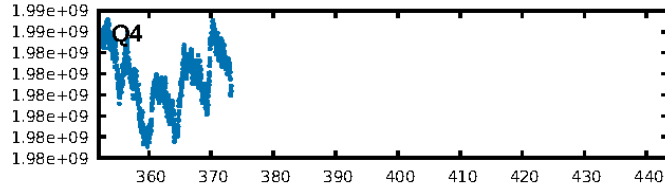
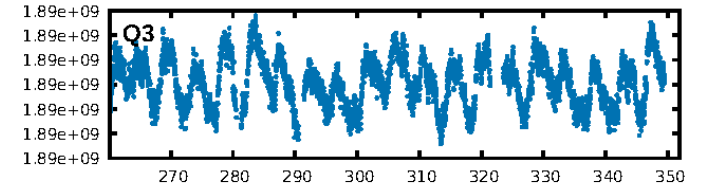
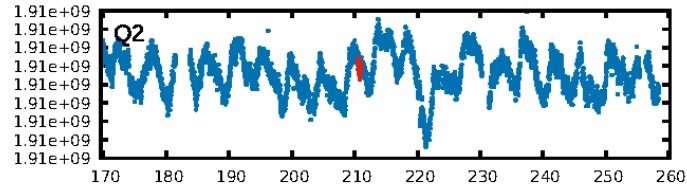
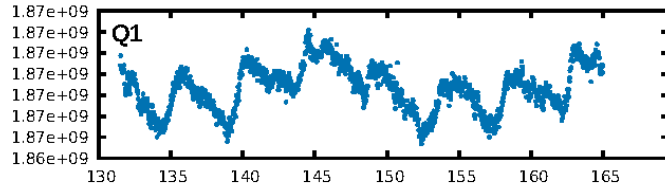
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [31.57 $\sigma$ ]  
LongPeriod-sig: 100.0% [20.00 $\sigma$ ]  
ModelChiSquare2-sig: 68.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.6493**  
Centroid-sig: 24.0%  
Centroid-so: 1.027 arcsec [1.07 $\sigma$ ]  
OotOffset-rm: 2.083 arcsec [0.76 $\sigma$ ]  
OotOffset-st: 2/2/0/1 [5]  
KicOffset-rm: 2.279 arcsec [1.00 $\sigma$ ]  
KicOffset-st: 2/2/0/1 [5]  
DiffImageQuality-fgm: 0.20 [1/5]  
DiffImageOverlap-fno: 0.60 [3/5]

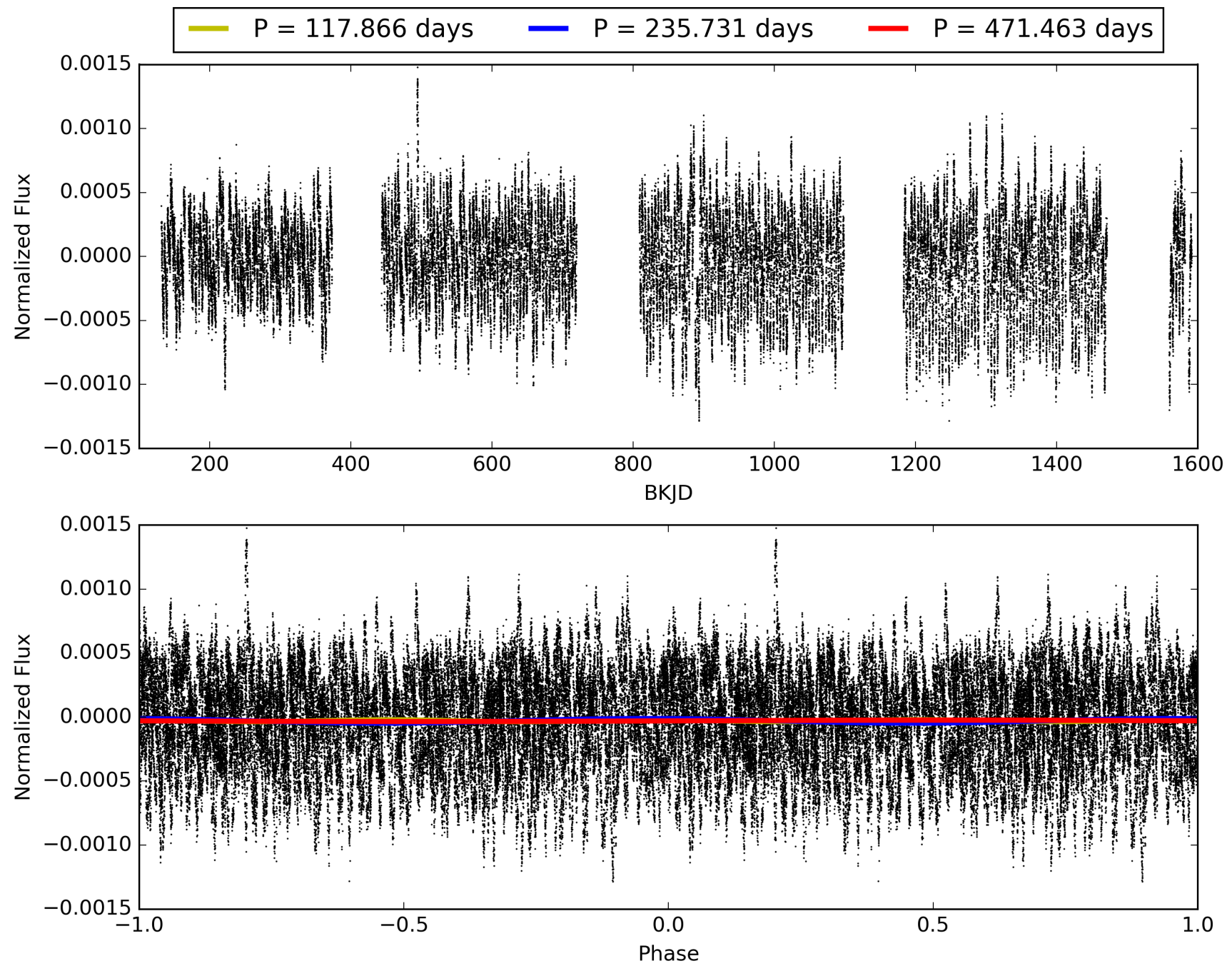
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:34:42 Z

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

# TCE 011654113-05, PDC Light Curves

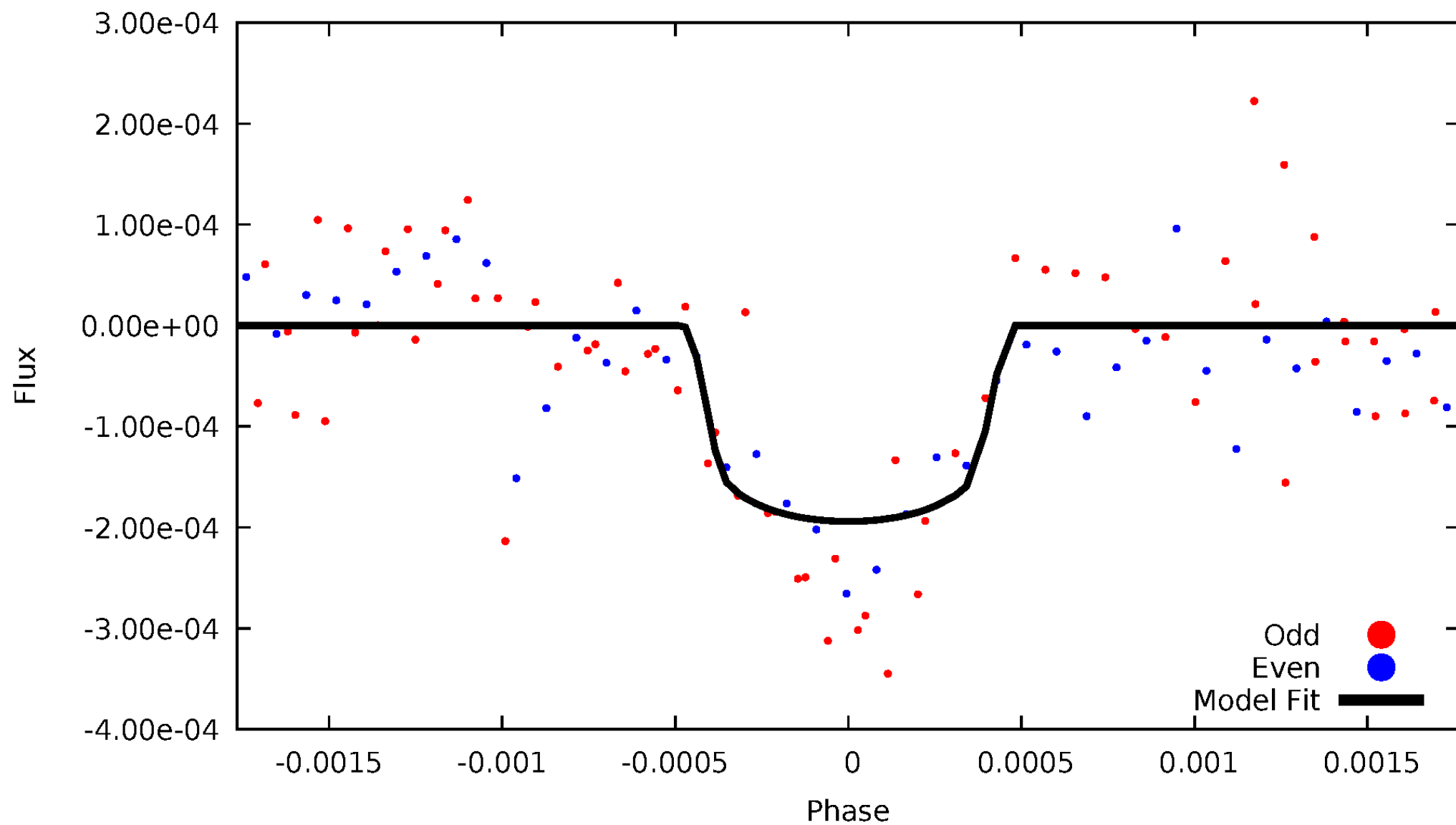


# TCE 011654113-05



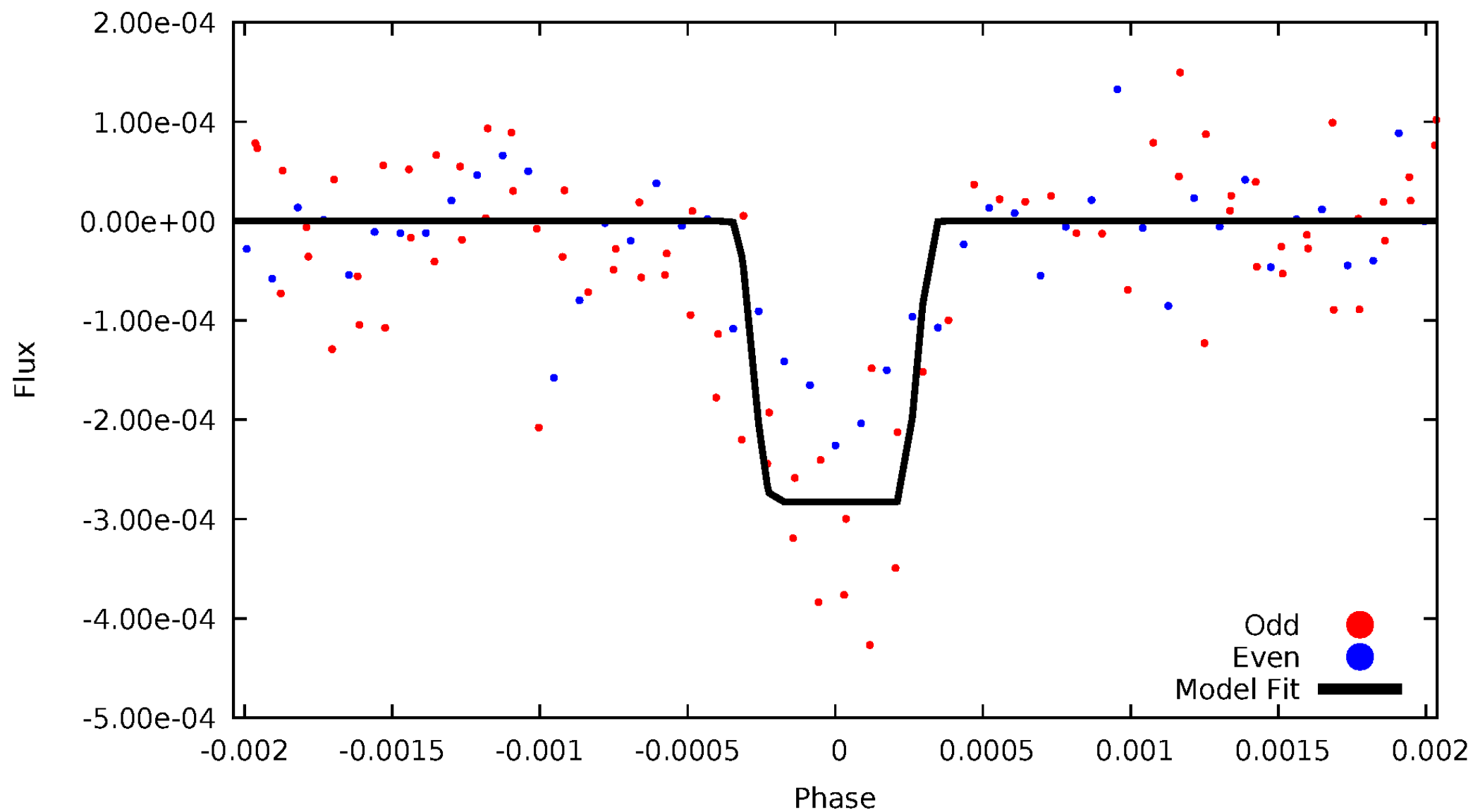
# DV Odd/Even

TCE 011654113-05



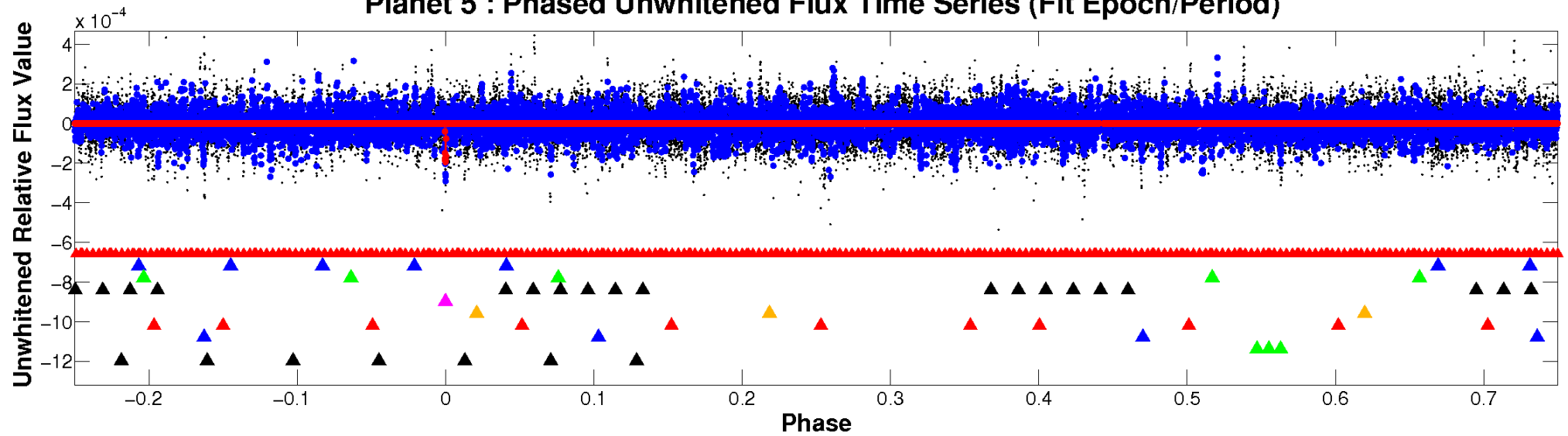
# ALT Odd/Even

TCE 011654113-05

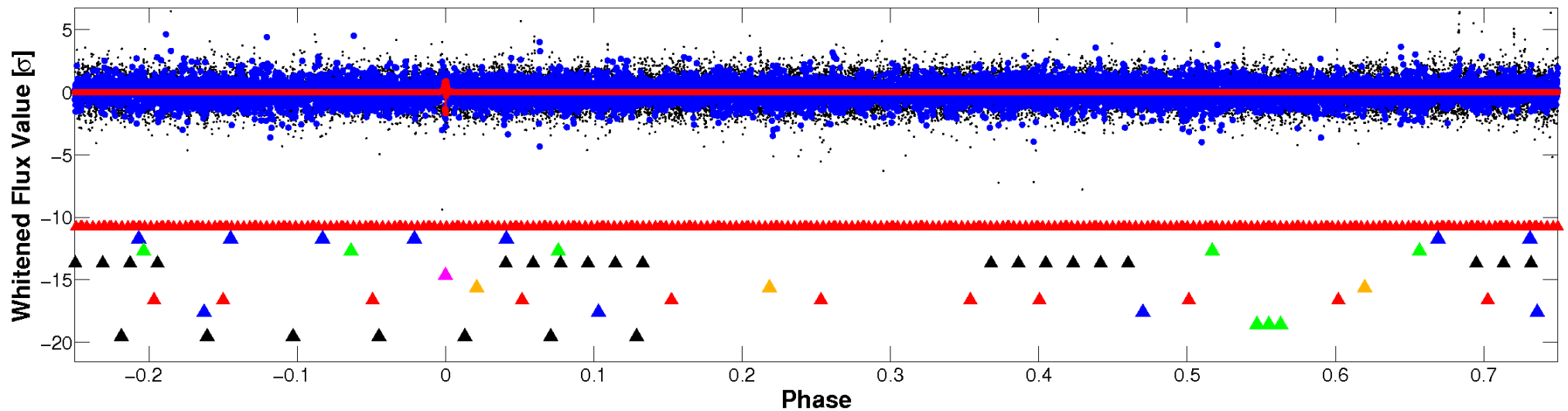


# Non-Whitened Vs. Whitened Light Curve

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



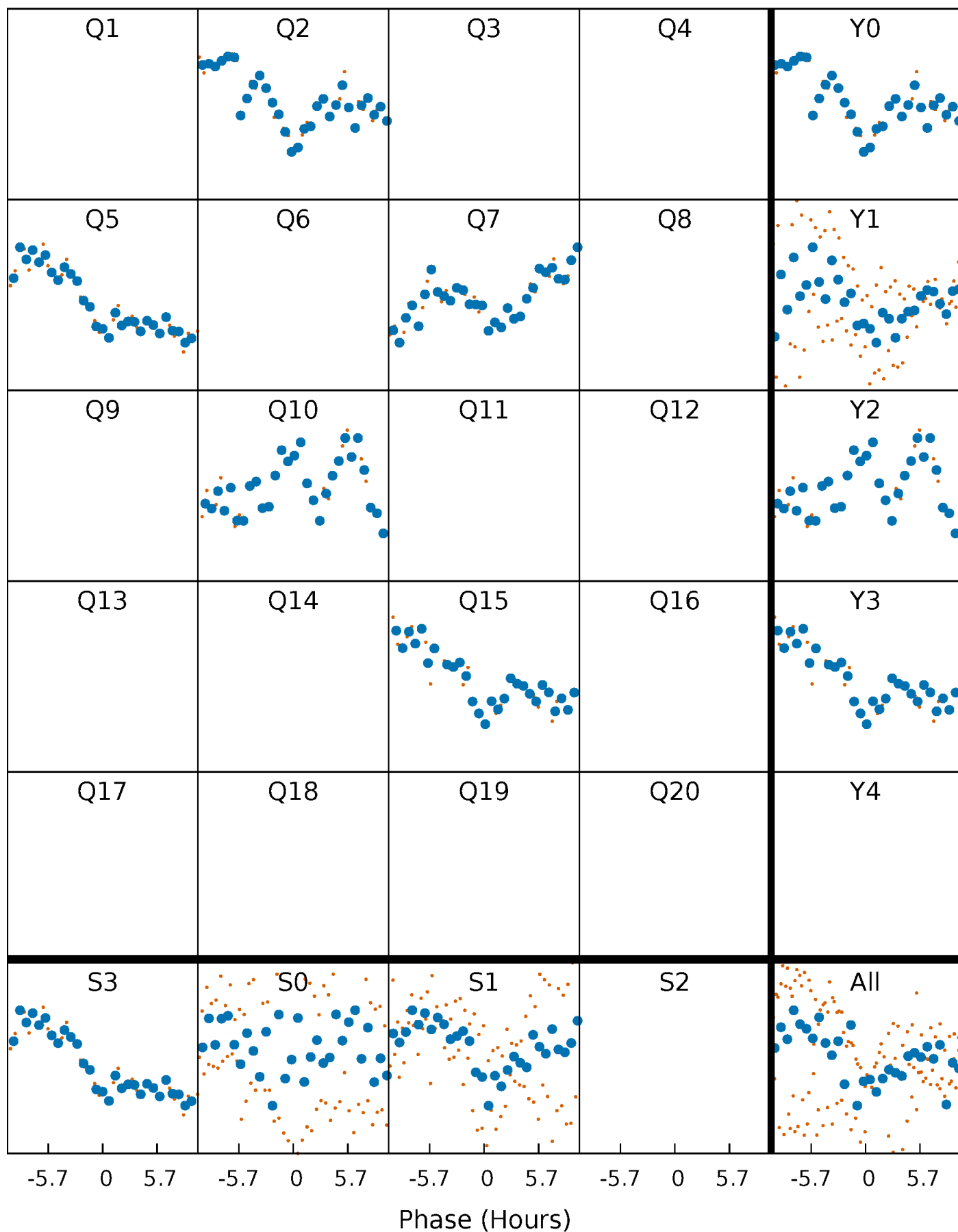
## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)





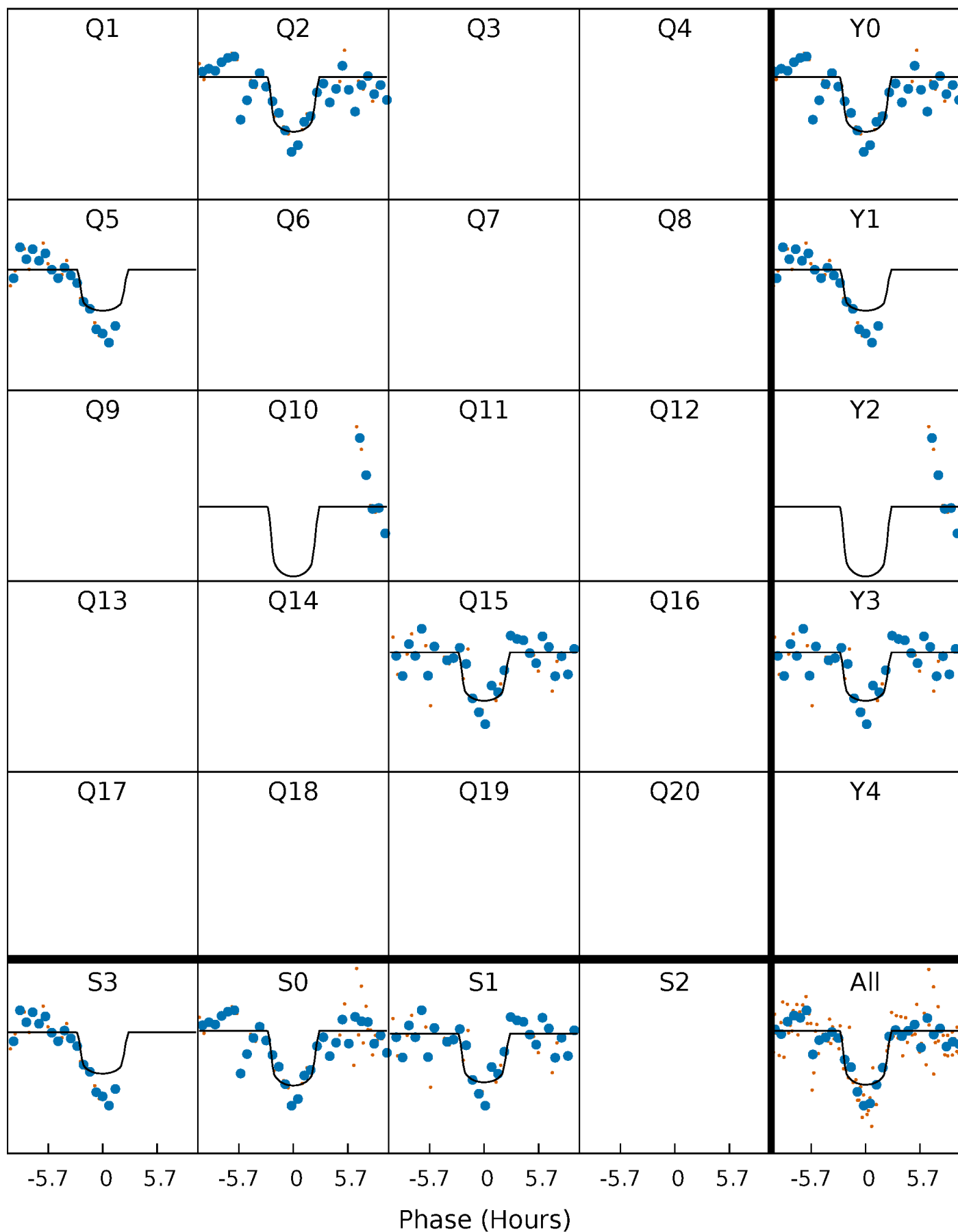
# PDC Quarter-Phased Transit Curves

TCE 011654113-05   P=235.731487 Days    $T_0=210.797346$  (BKJD)



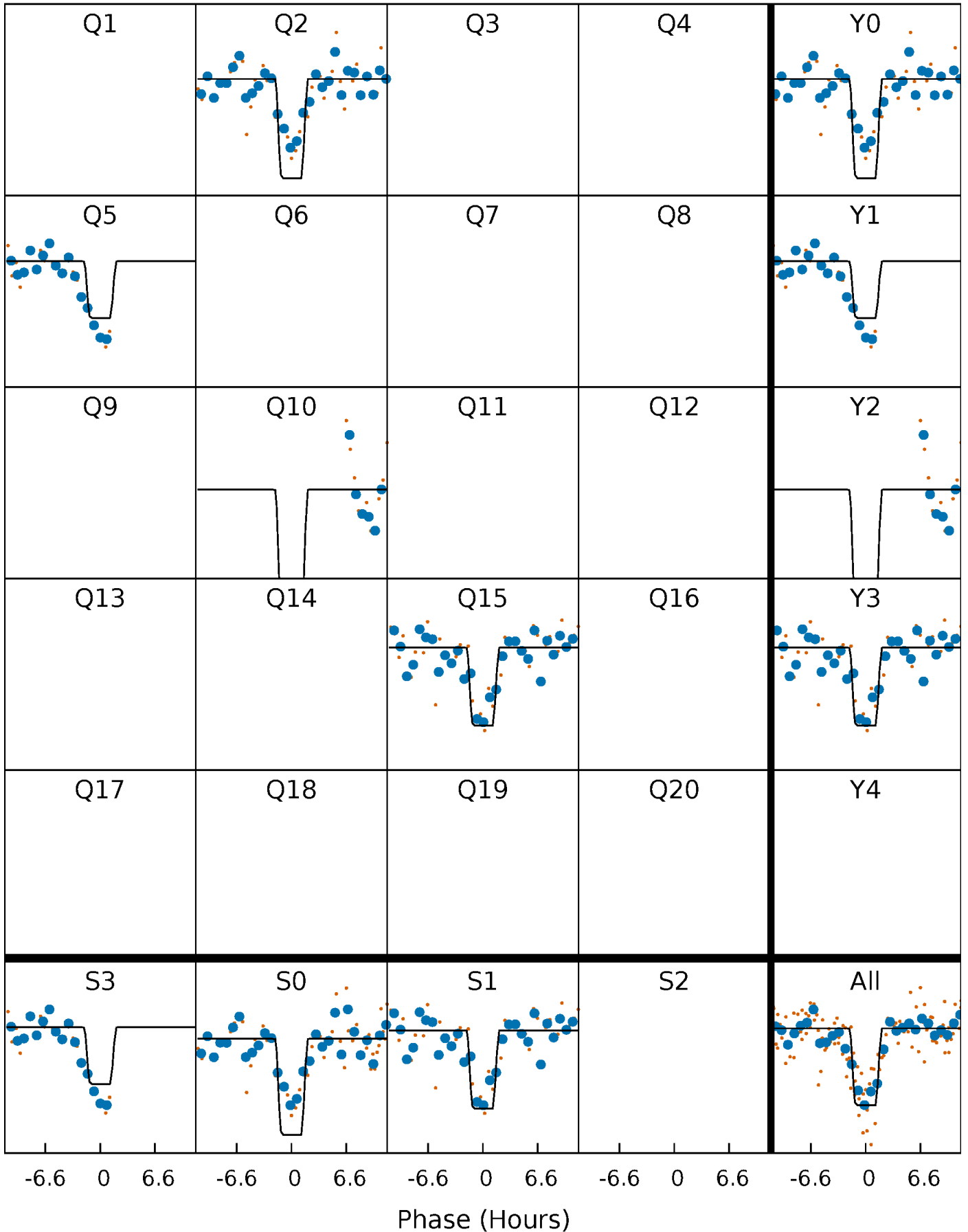
# DV Quarter-Phased Transit Curves

TCE 011654113-05     $P=235.731487$  Days     $T_0=210.797346$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

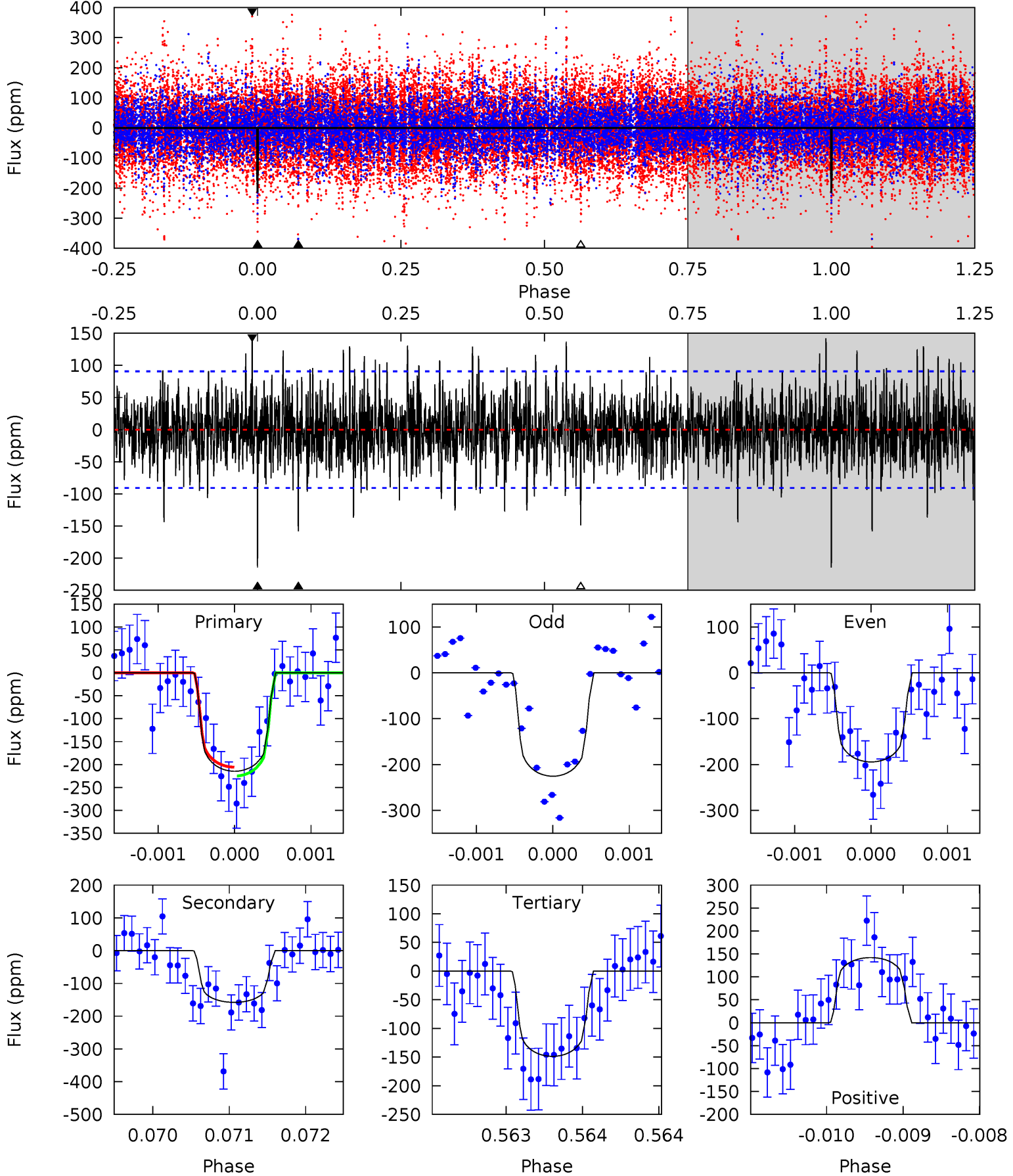
TCE 011654113-05     $P=235.732383$  Days     $T_0=210.795835$  (BKJD)



# DV Model-Shift Uniqueness Test

011654113-05,  $P = 235.731487$  Days,  $E = 210.797346$  Days

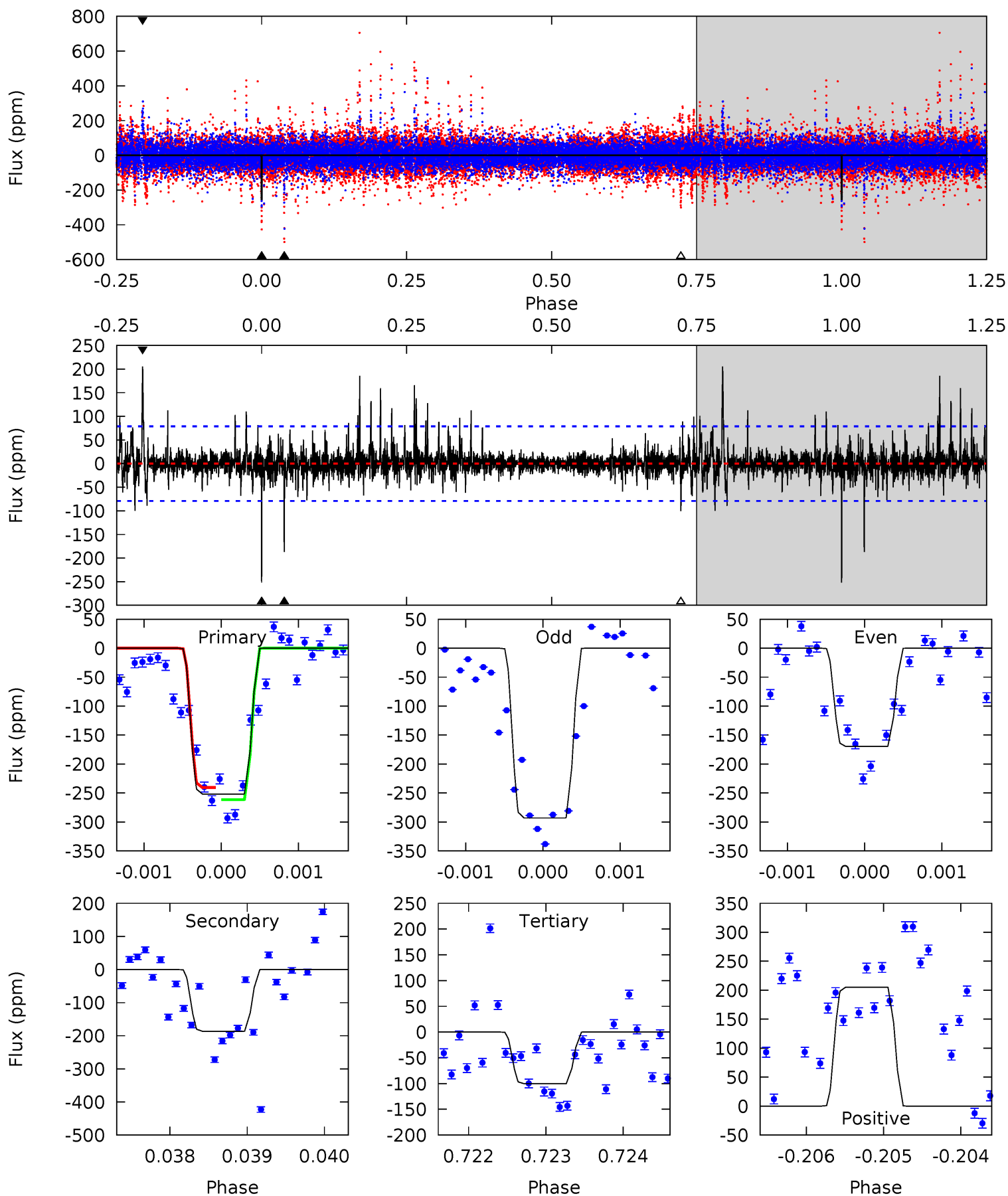
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	9.53	8.97	8.56	5.47	3.32	2.24	3.98	4.39	0.55	0.96	0.90	1.12	0.40	0.57



# Alt Model-Shift Uniqueness Test

011654113-05, P = 235.732383 Days, E = 210.795835 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
17.6	13.0	6.99	14.3	5.51	3.39	1.58	10.6	3.24	6.02	-1.31	4.04	1.10	0.45	0.73



### Stellar Parameters For KIC 011654113

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6429^{+179}_{-246}$	$4.335^{+0.072}_{-0.217}$	$0.060^{+0.250}_{-0.350}$	$1.249^{+0.437}_{-0.175}$	$1.231^{+0.180}_{-0.180}$	$0.890^{+0.352}_{-0.483}$
	+3%/-4%	+2%/-5%	+417%/-583%	+35%/-14%	+15%/-15%	+40%/-54%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011654113-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-158 \pm 17$	$2.14^{+1.05}_{-1.00}$	$504^{+38}_{-28}$	$5858^{+2595}_{-997}$	$12257^{+30990}_{-7096}$
Alt.	$-187 \pm 14$	$2.35^{+1.12}_{-1.03}$	$502^{+37}_{-29}$	$5807^{+2055}_{-922}$	$11524^{+25433}_{-6293}$

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

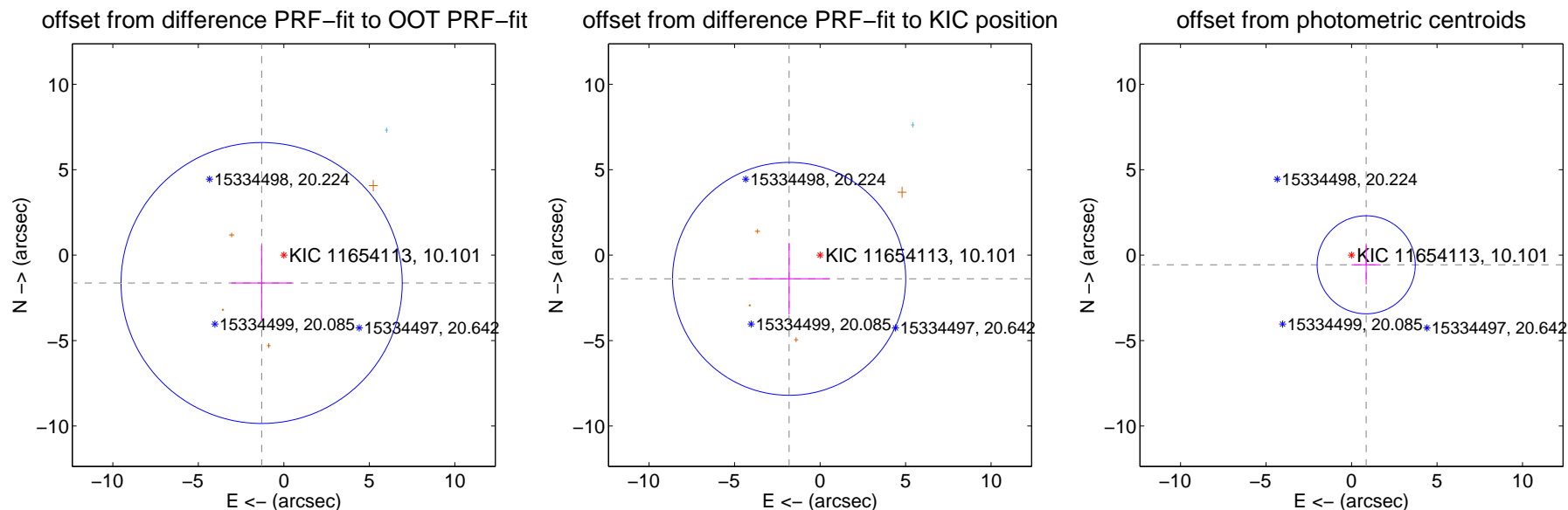
## DV Centroid Data

Supplemental centroid analysis for 011654113-05. **Kepler magnitude: 10.10.** Transit SNR 8.48

**There are 1 quarters with good PRF difference image offsets**

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.083 \pm 2.740$	0.76	$1.298 \pm 1.772$	$-1.630 \pm 2.192$
PRF-fit source offset from KIC position	$2.279 \pm 2.272$	1.00	$1.809 \pm 2.372$	$-1.386 \pm 2.090$
photometric centroid source offset	$1.03 \pm 0.96$	1.07	$-0.86 \pm 0.86$	$-0.56 \pm 1.16$



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



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

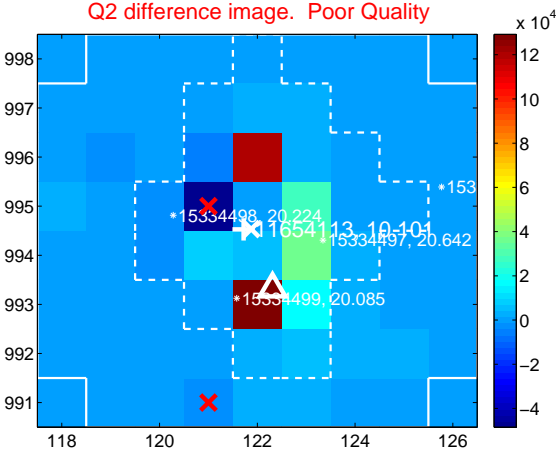
Q1 no difference image



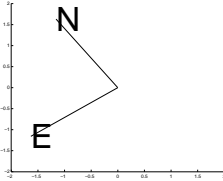
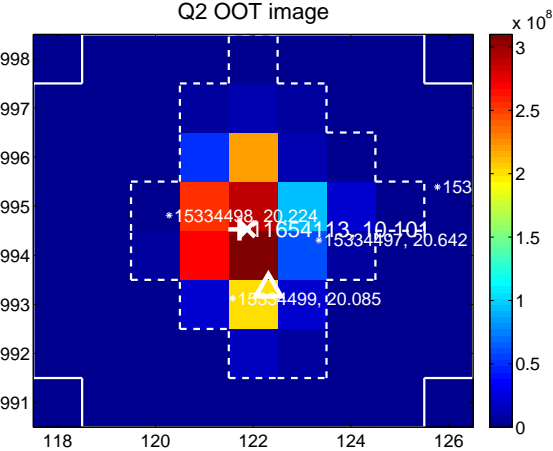
Q1 no OOT image



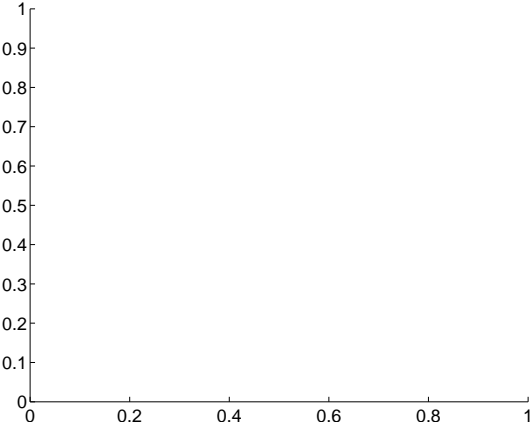
Q2 difference image. Poor Quality



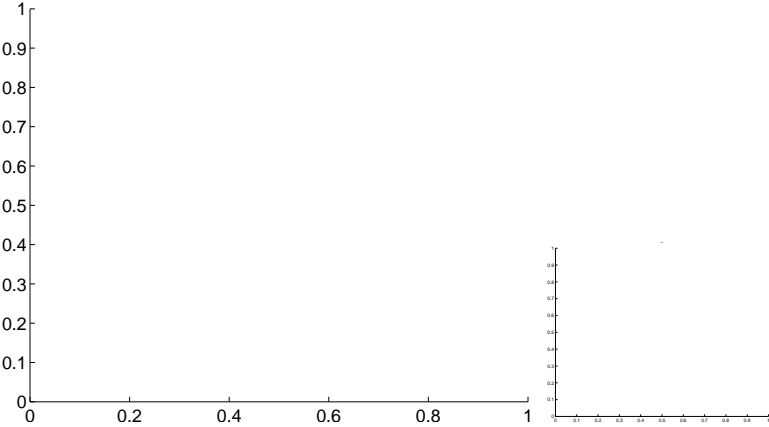
Q2 OOT image



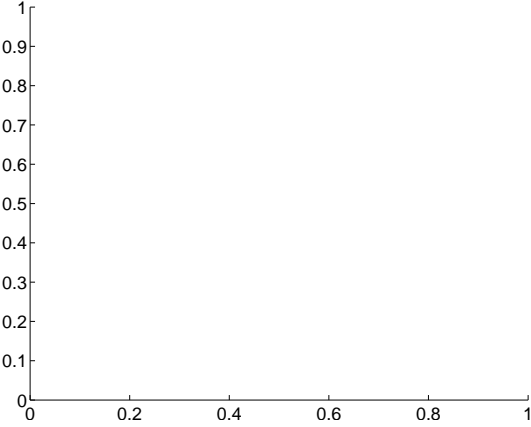
Q3 no difference image



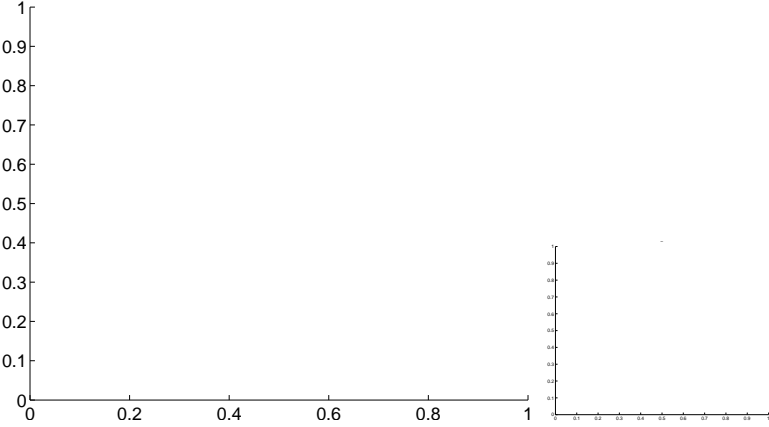
Q3 no OOT image



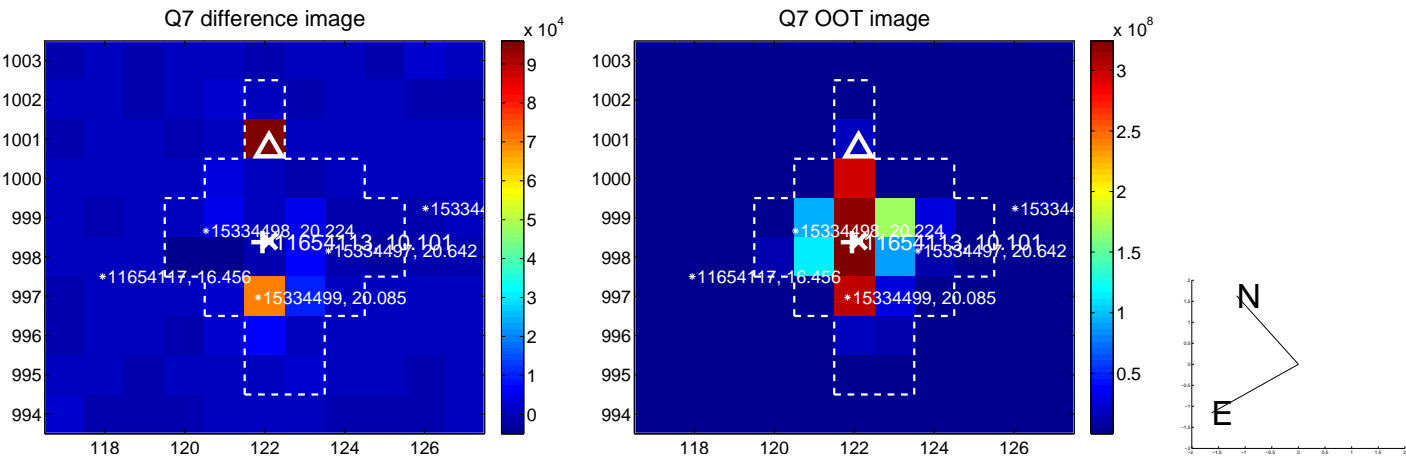
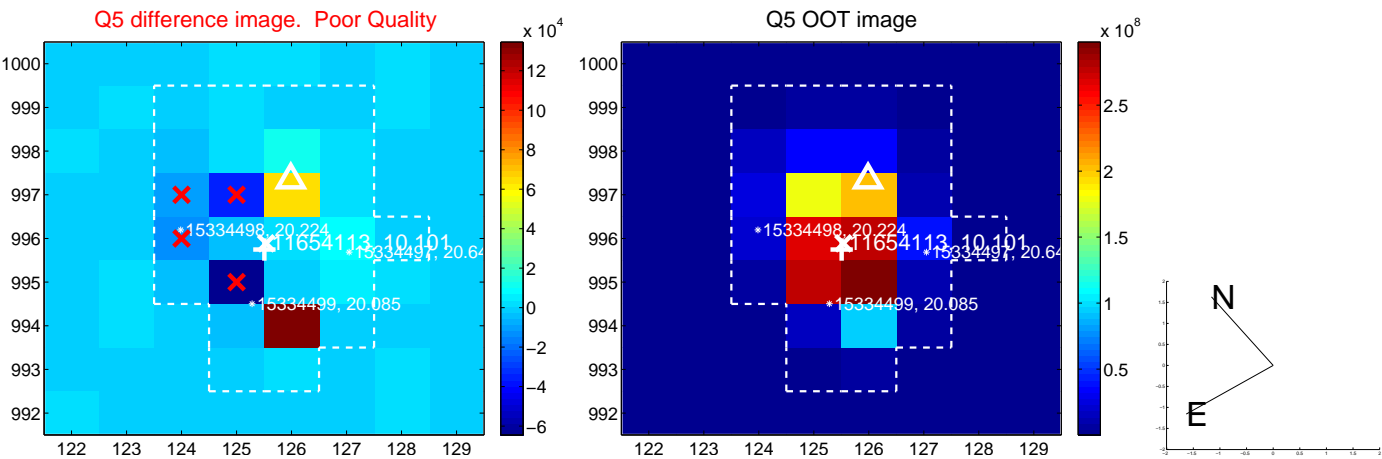
Q4 no difference image



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.

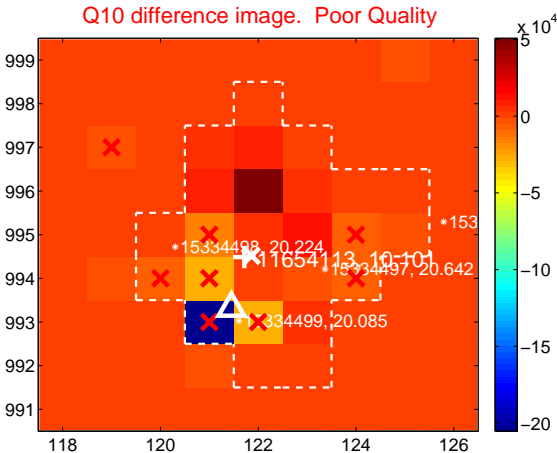
Q9 no difference image



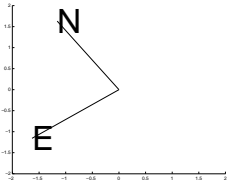
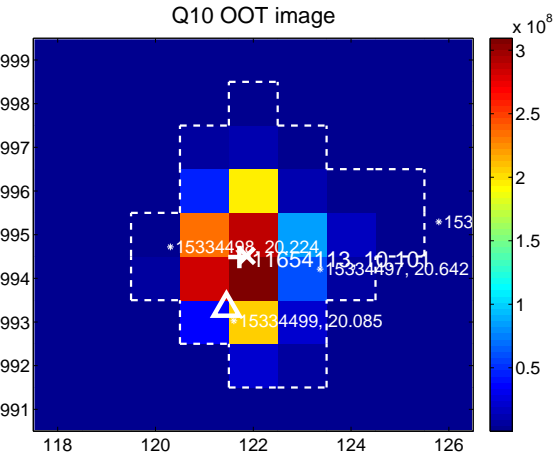
Q9 no OOT image



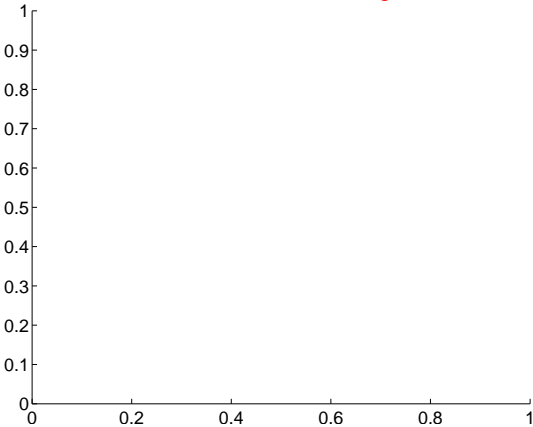
Q10 difference image. Poor Quality



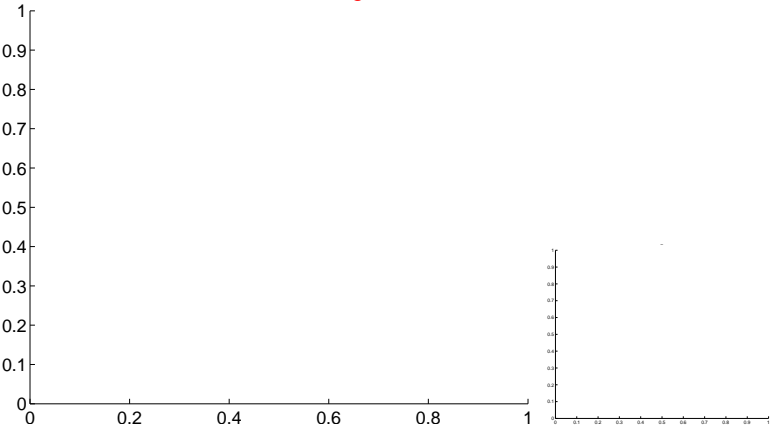
Q10 OOT image



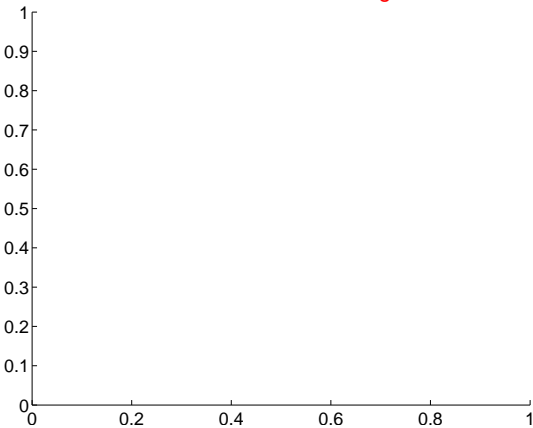
Q11 no difference image



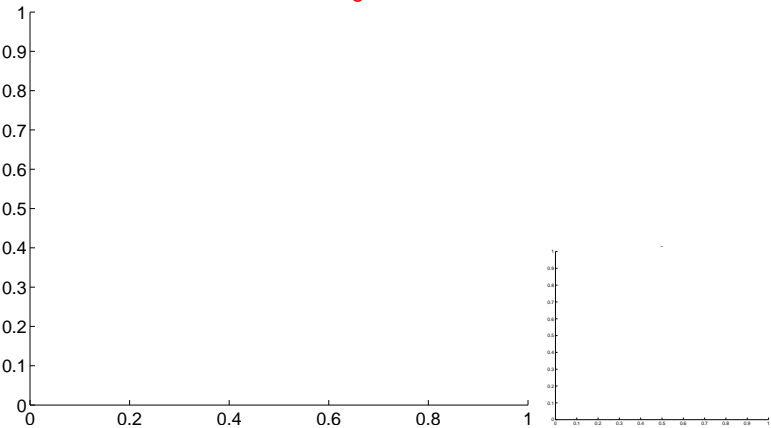
Q11 no OOT image



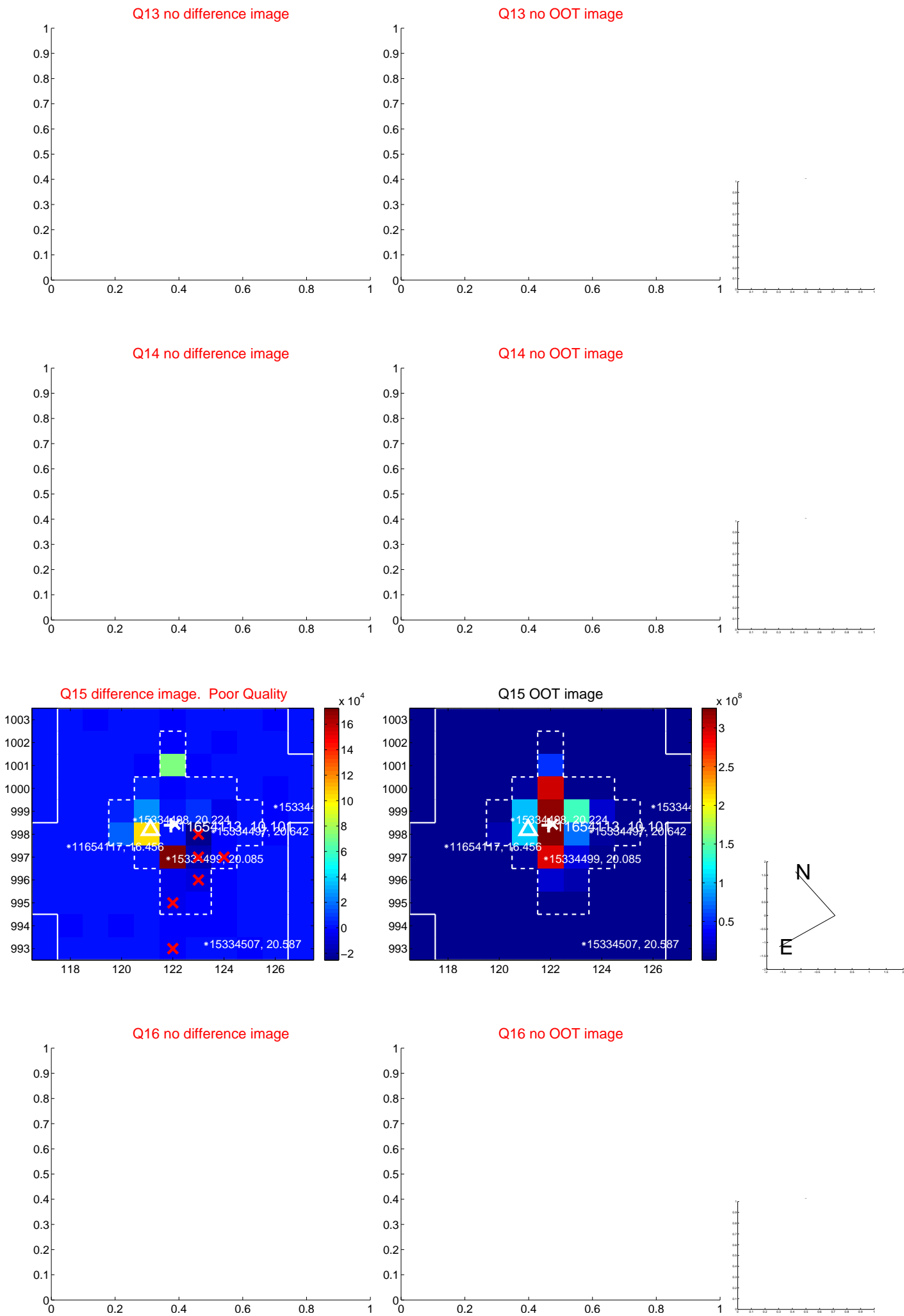
Q12 no difference image



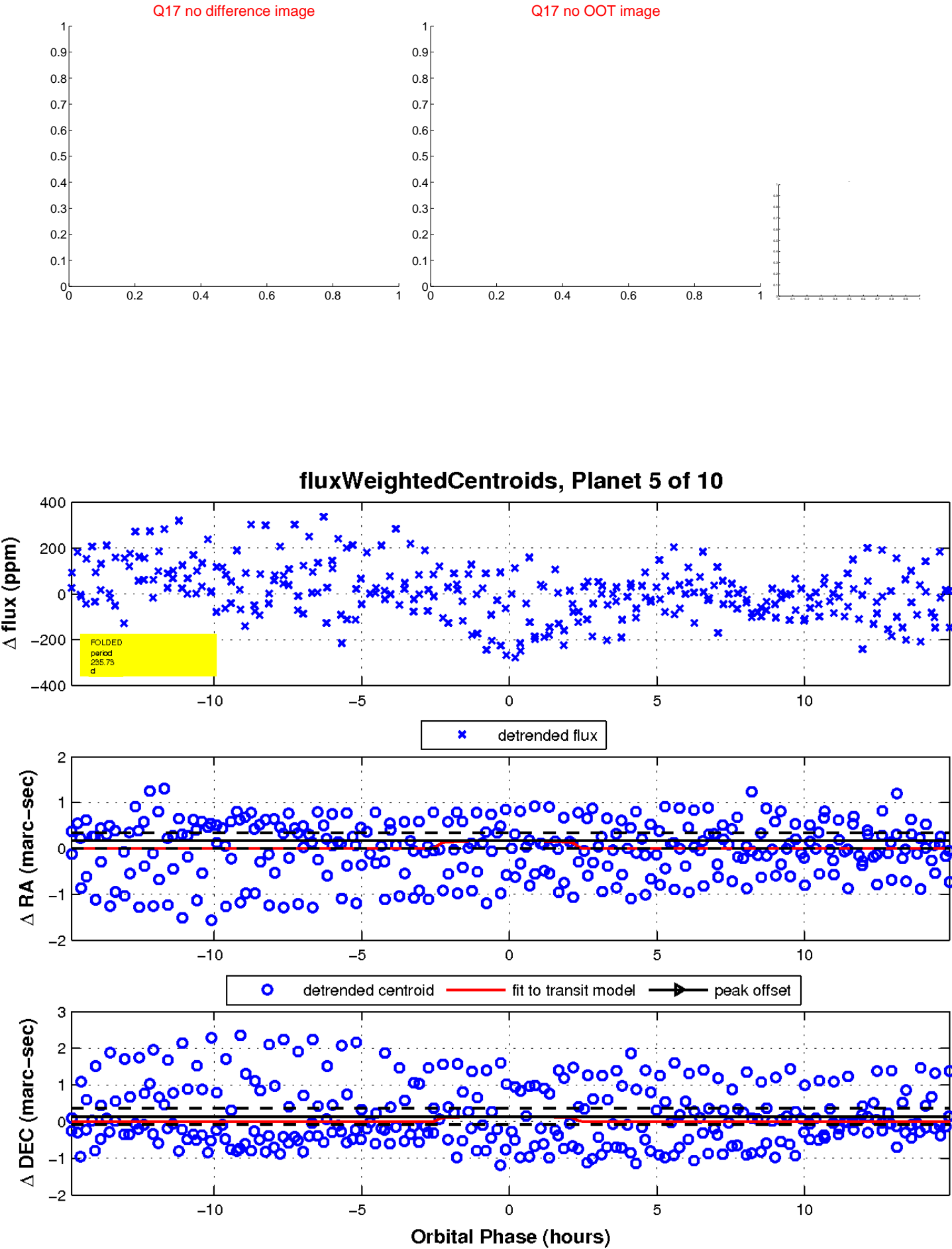
Q12 no OOT image



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

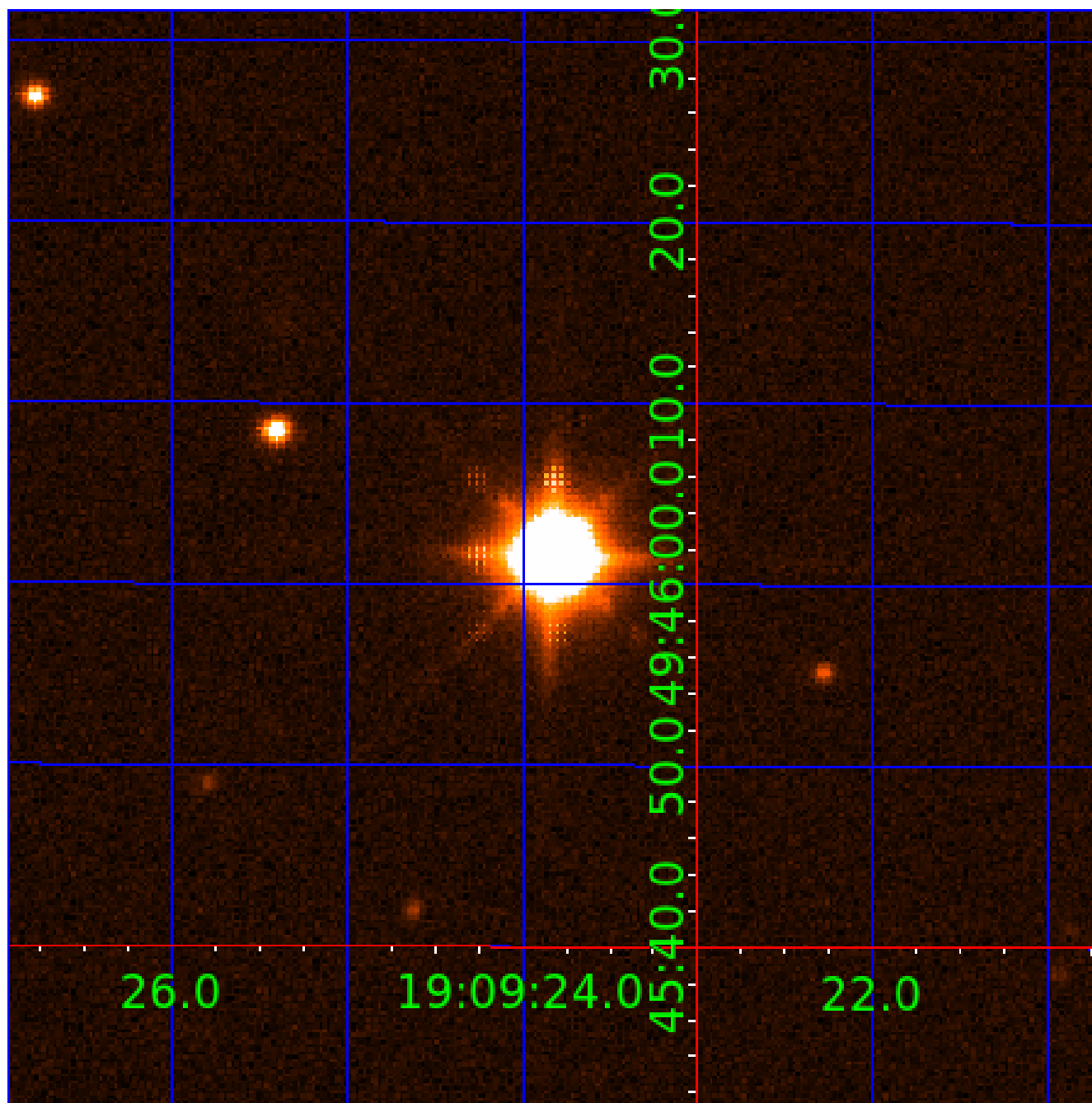


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011654113

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654113-01	OBS	No	4.603252	134.638898	39.1	16.875	10.1	9.6	1.25	6429	0.92	708.64
011654113-04	OBS	No	77.125192	165.031632	135.0	6.443	8.5	8.3	1.25	6429	1.71	16.53
011654113-05	OBS	No	235.731487	210.797346	194.1	4.994	8.3	8.5	1.25	6429	1.99	3.73
011654113-07	OBS	No	129.742351	175.453993	189.2	3.960	8.3	8.0	1.25	6429	1.88	8.26
011654113-08	OBS	No	322.256003	384.322642	269.4	9.485	8.0	8.1	1.25	6429	2.50	2.46
011654113-09	OBS	No	469.585699	343.535747	232.5	8.058	8.0	8.7	1.25	6429	2.51	1.49
011654113-10	OBS	No	222.082184	241.171086	204.5	9.098	8.1	7.6	1.25	6429	2.29	4.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011654113-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
011654113-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—CENT_SATURATED
011654113-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
011654113-07	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
011654113-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
011654113-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011654113-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

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

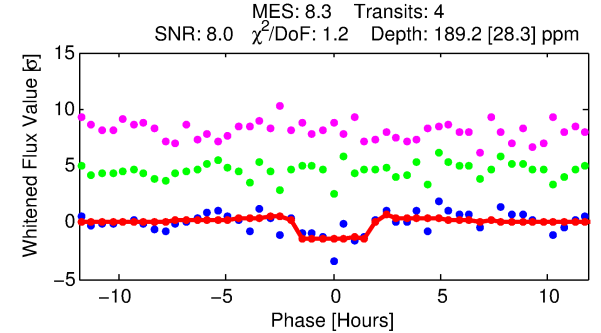
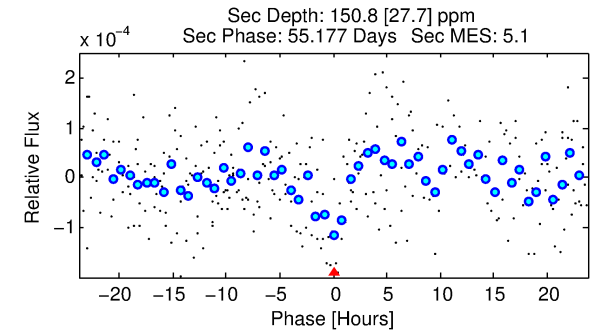
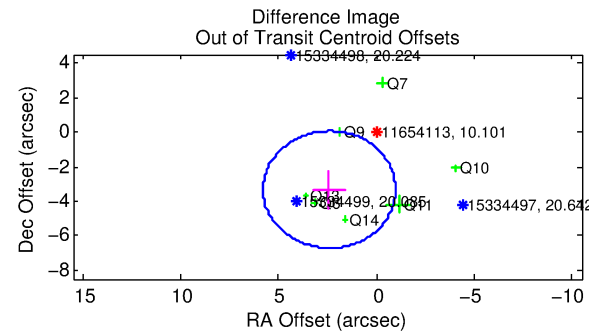
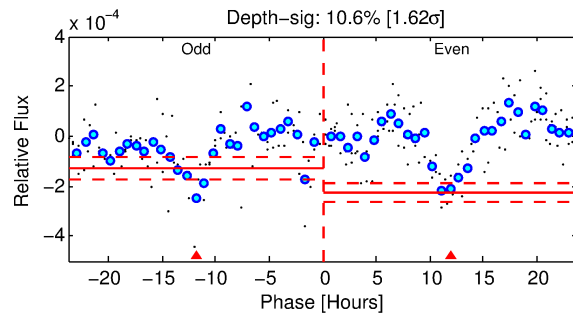
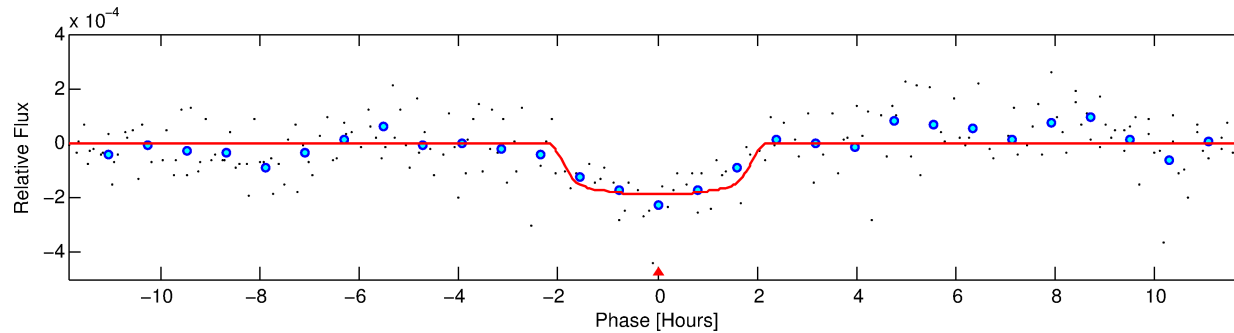
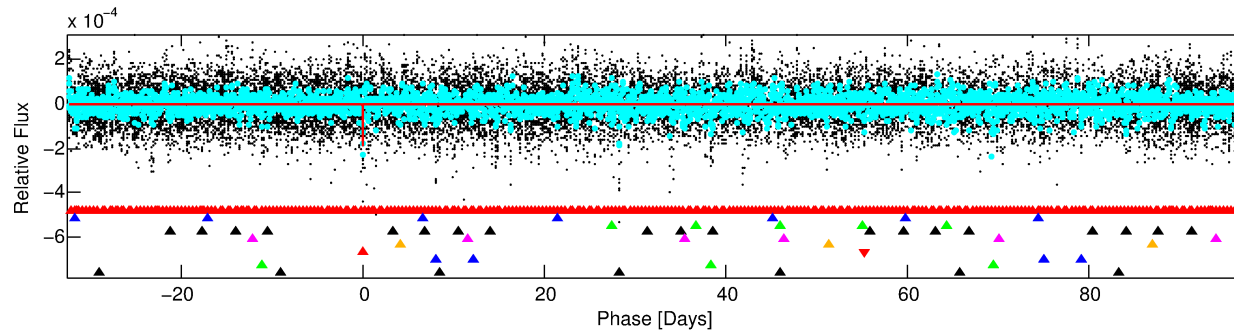
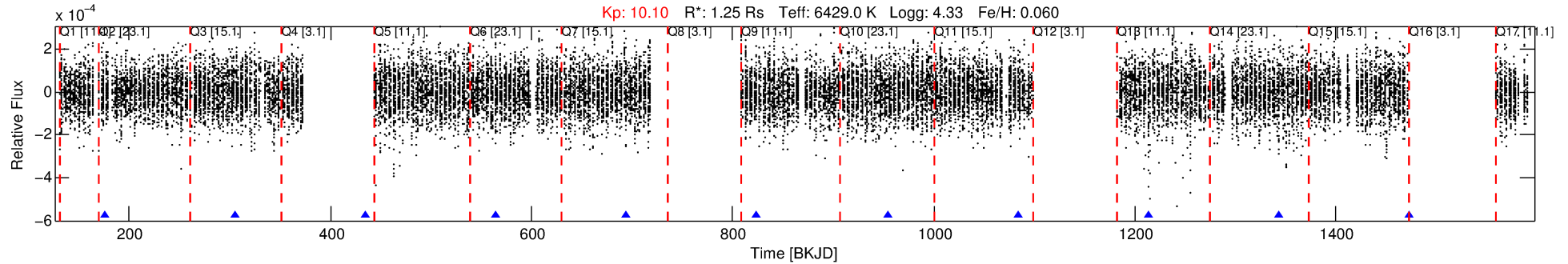
Ephemeris Match Information For 011654113-07

No Significant Match Found



# DV One-Page Summary

KIC: 11654113 Candidate: 7 of 10 Period: 129.742 d



## DV Fit Results:

Period = 129.74235 [0.00249] d  
Epoch = 175.4540 [0.0157] BKJD  
Rp/R\* = 0.0138 [0.0139]  
a/R\* = 165.71 [894.21]  
b = 0.77 [2.91]  
Seff = 8.26 [3.59]  
Teq = 432 [47] K  
Rp = 1.88 [2.01] Re  
a = 0.5376 [0.1541] AU  
Ag = 6811.87 [14109.44] [0.48 $\sigma$ ]  
Teffp = 6072 [3092] K [1.82 $\sigma$ ]

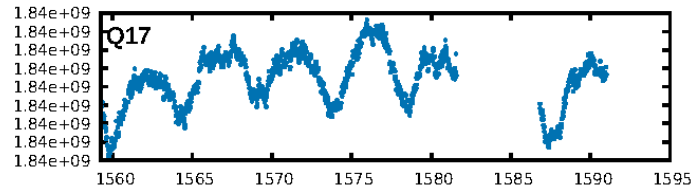
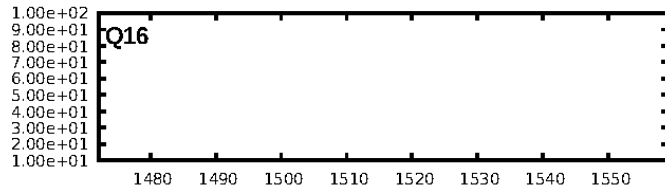
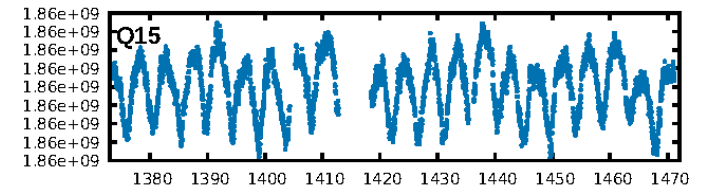
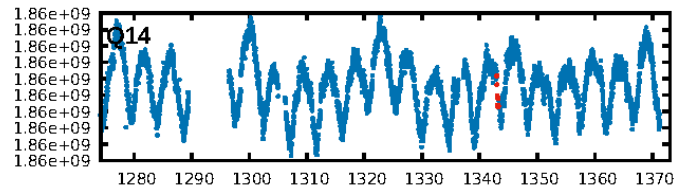
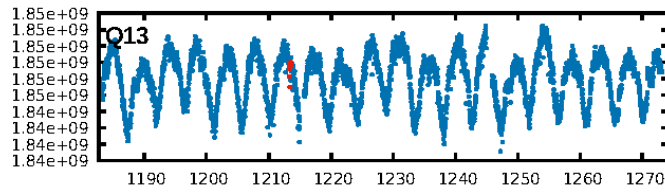
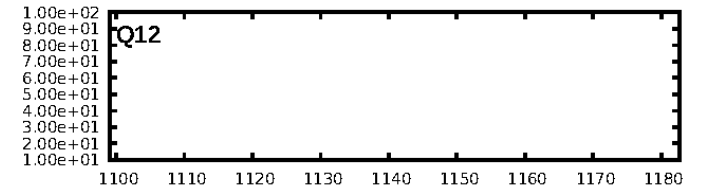
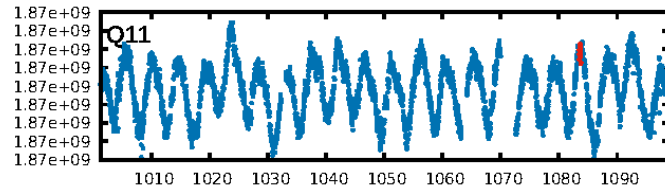
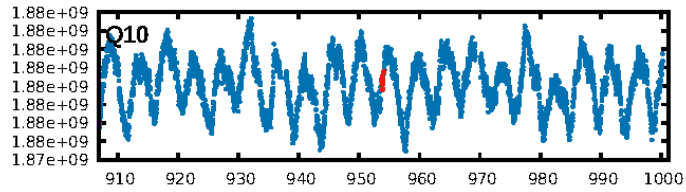
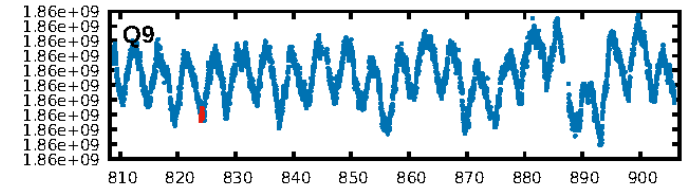
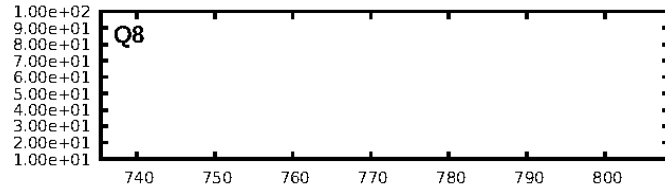
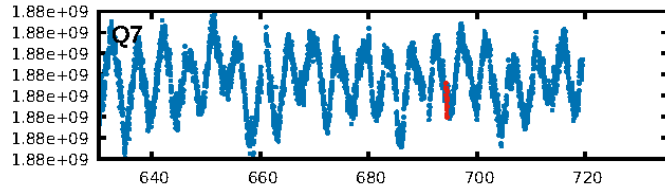
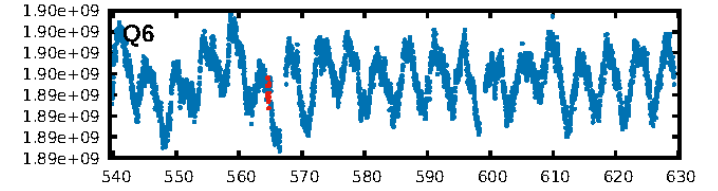
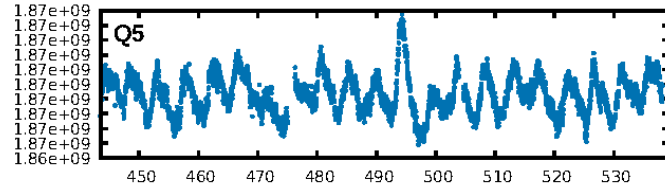
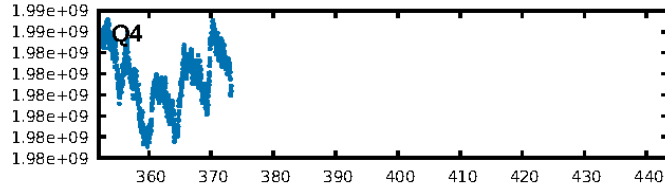
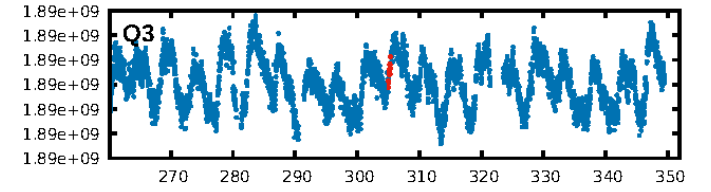
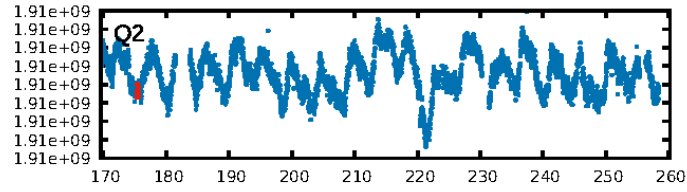
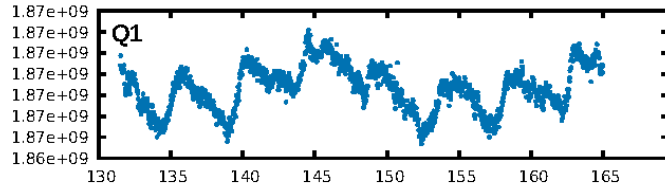
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [166.98 $\sigma$ ]  
LongPeriod-sig: 100.0% [375.27 $\sigma$ ]  
ModelChiSquare2-sig: 32.0%  
ModelChiSquareGof-sig: 90.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.132  
Centroid-sig: 33.3%  
Centroid-so: 0.875 arcsec [1.09 $\sigma$ ]  
OotOffset-rm: 4.106 arcsec [3.64 $\sigma$ ]  
KicOffset-rm: 4.456 arcsec [4.06 $\sigma$ ]  
OotOffset-st: 3/2/0/2 [7]  
KicOffset-st: 3/2/0/2 [7]  
DiffImageQuality-fgm: 0.29 [2/7]  
DiffImageOverlap-fno: 0.67 [6/9]

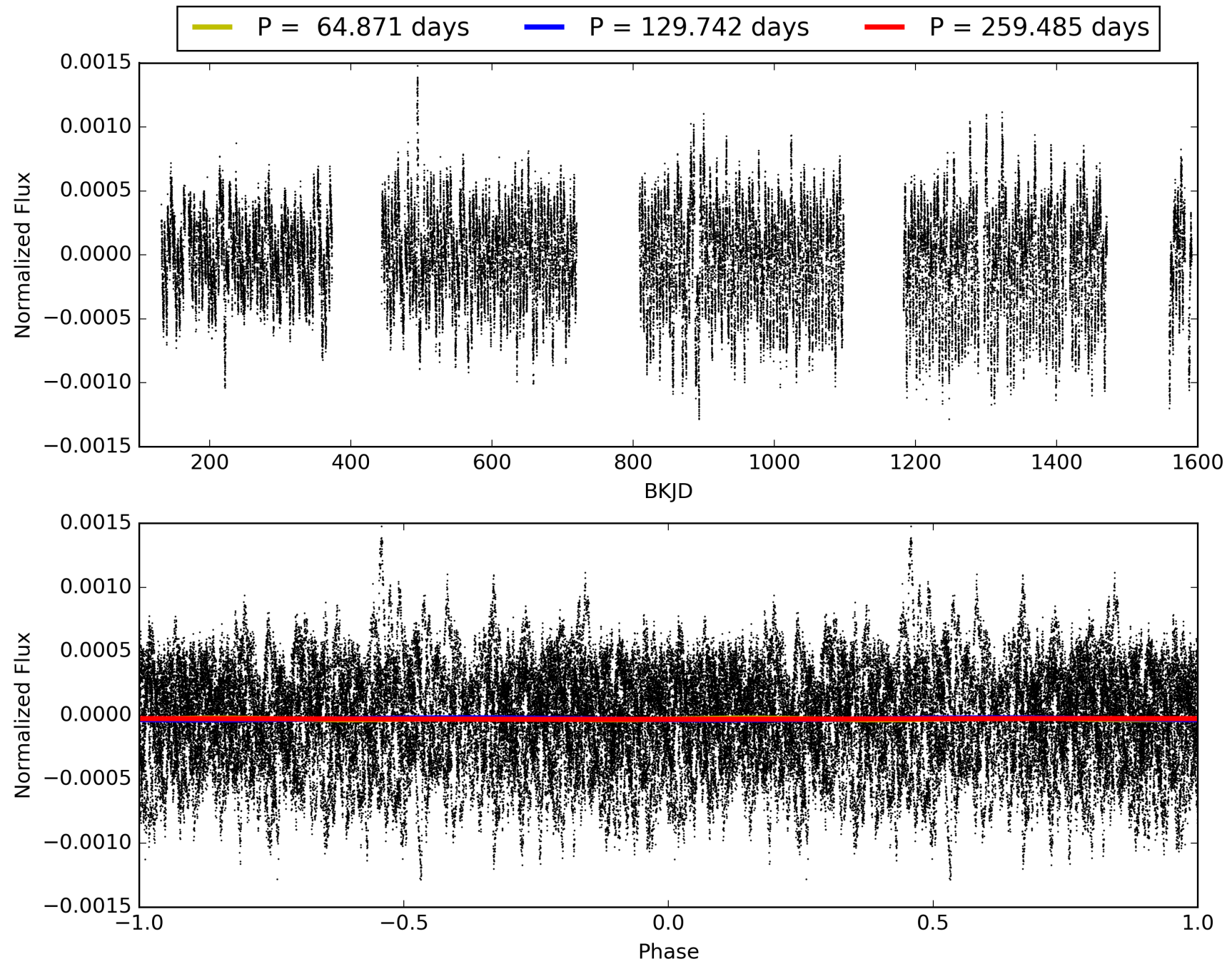
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:34:55 Z

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

# TCE 011654113-07, PDC Light Curves

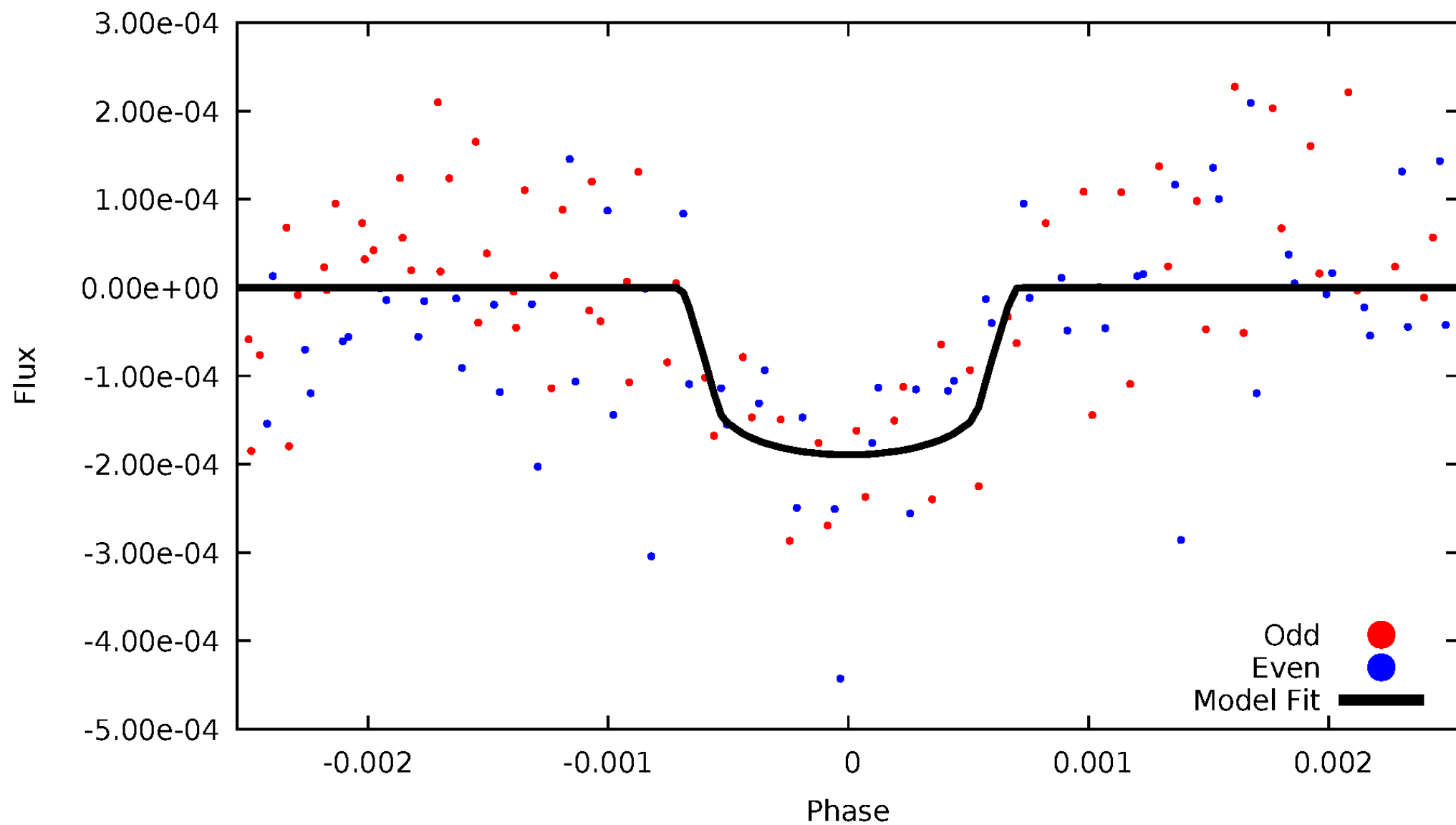


TCE 011654113-07



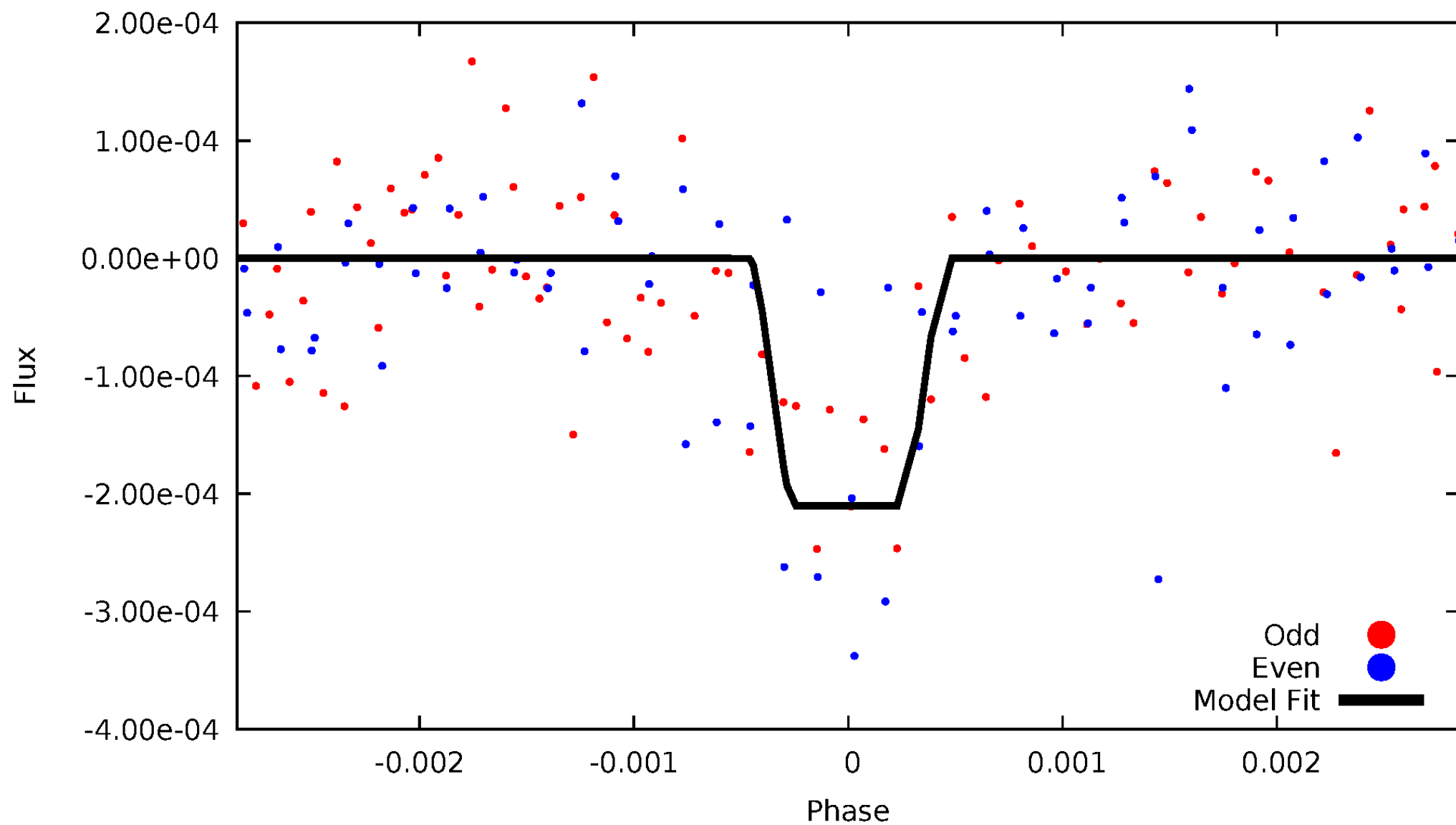
# DV Odd/Even

TCE 011654113-07



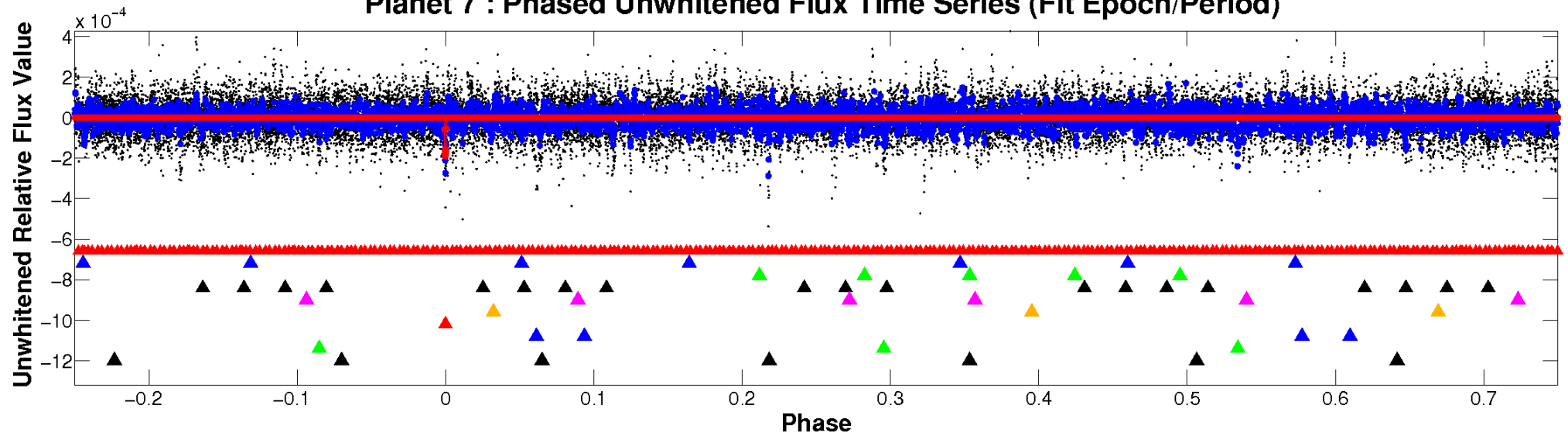
# ALT Odd/Even

TCE 011654113-07

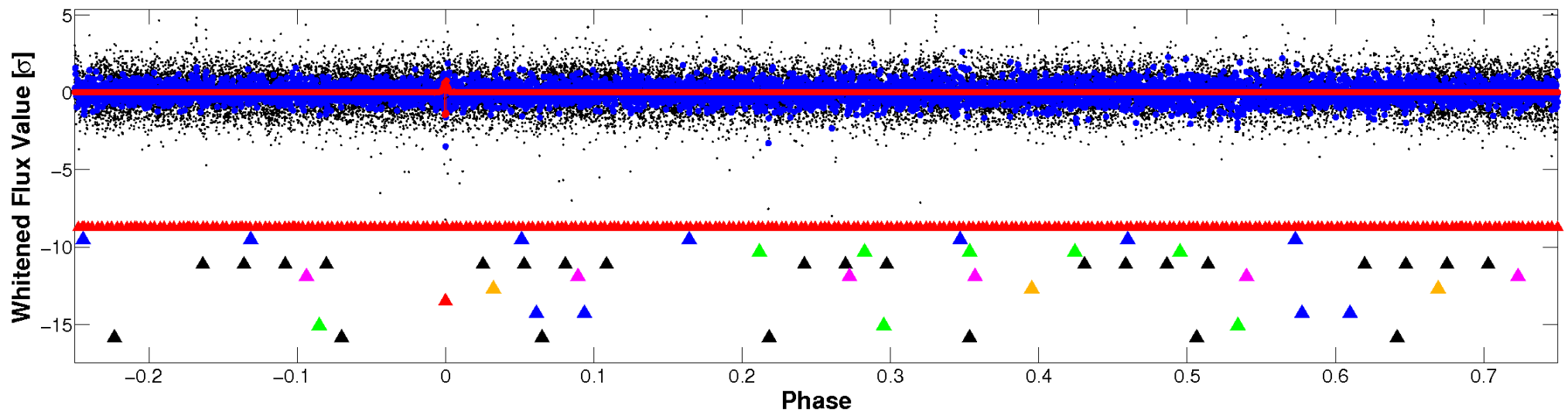


# Non-Whitened Vs. Whitened Light Curve

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

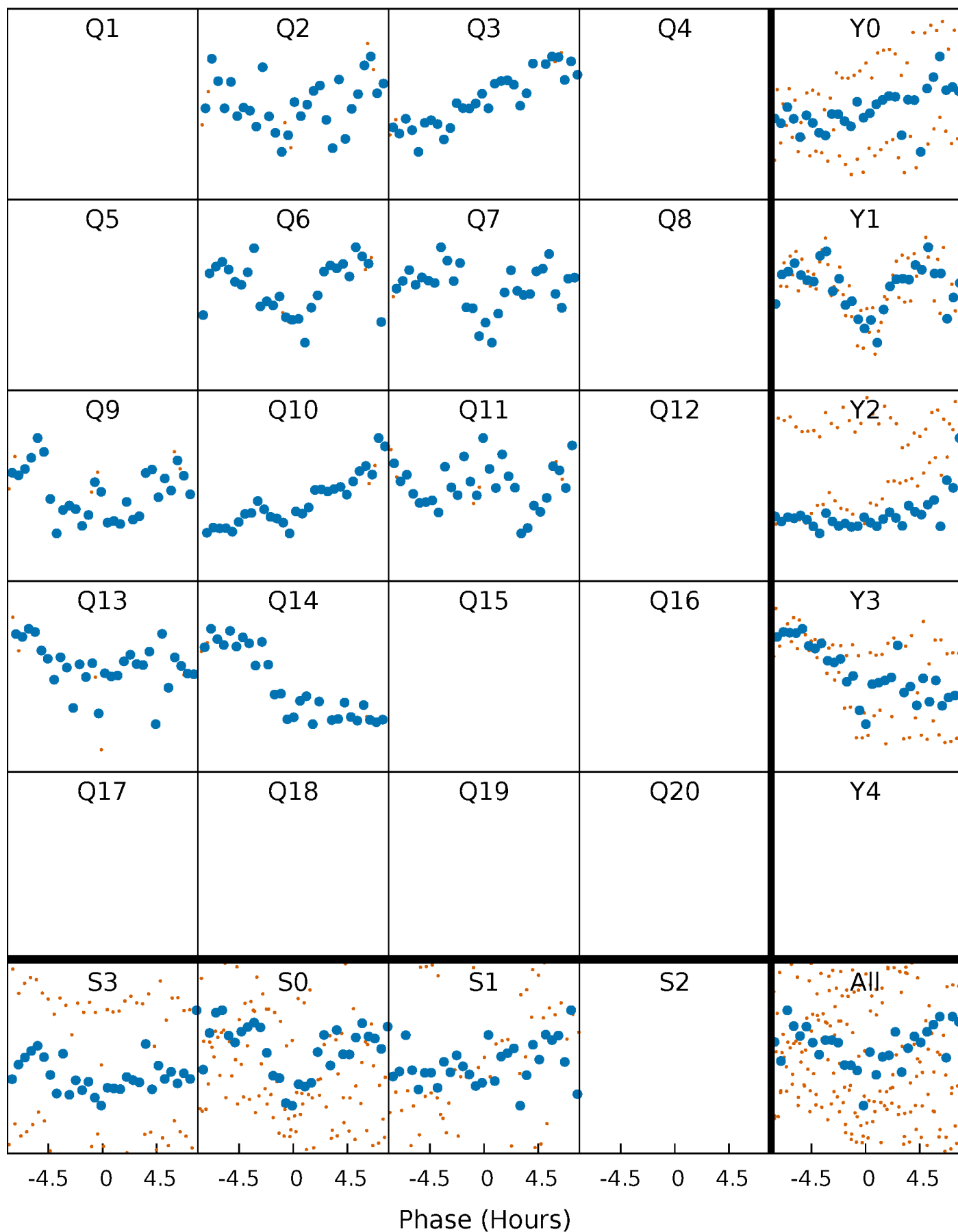


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

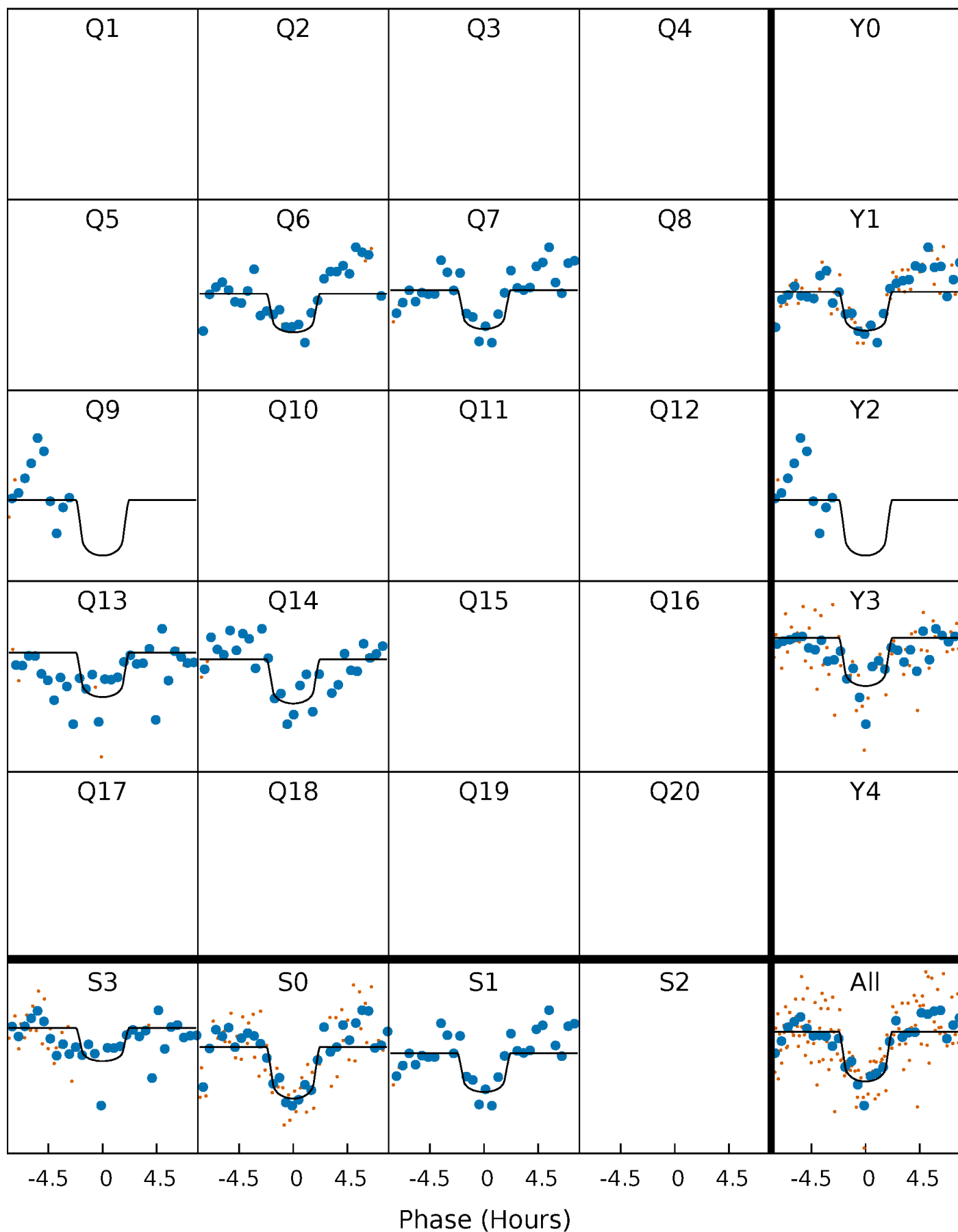
TCE 011654113-07 P=129.742351 Days  $T_0=175.453993$  (BKJD)





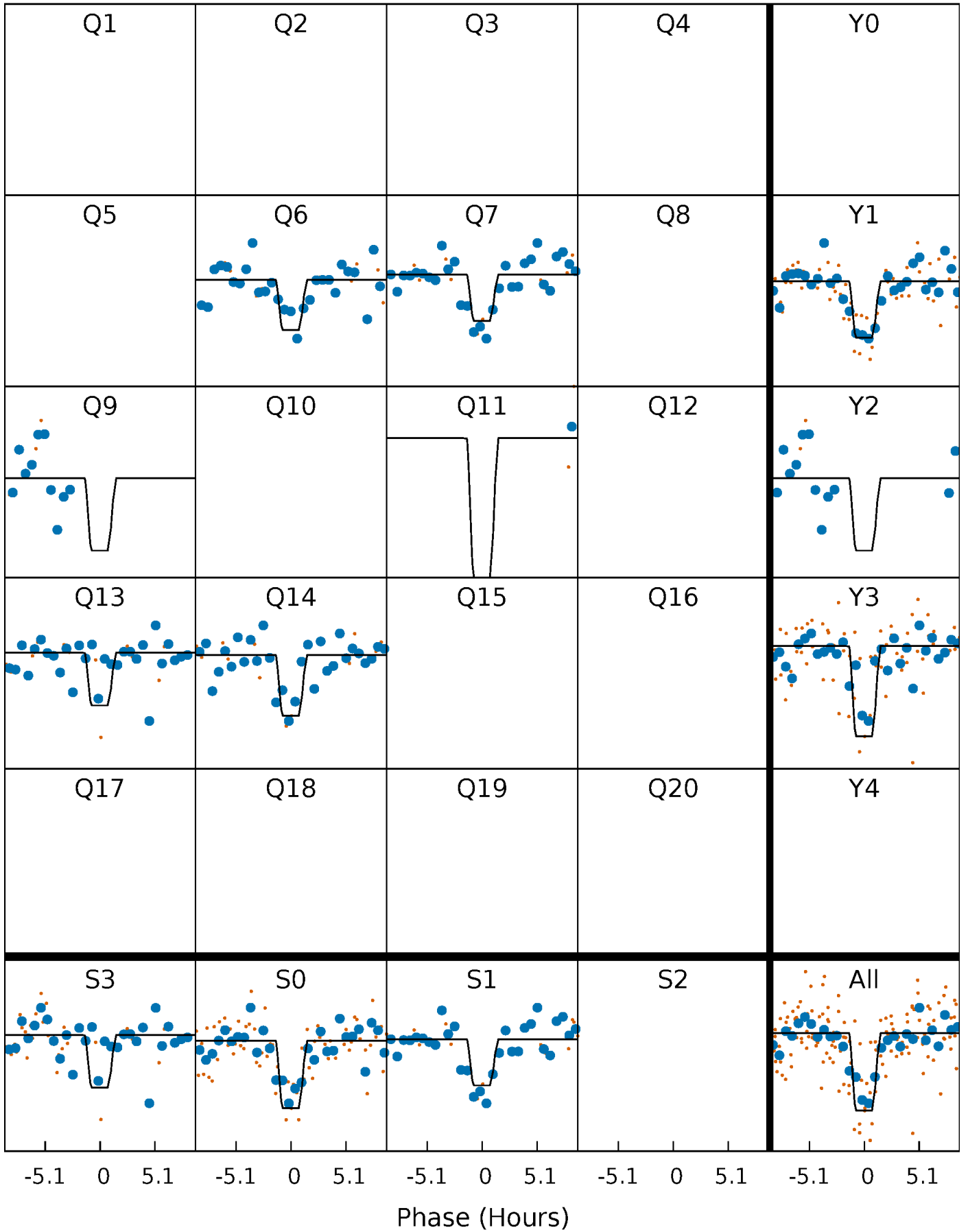
# DV Quarter-Phased Transit Curves

TCE 011654113-07 P=129.742351 Days  $T_0=175.453993$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

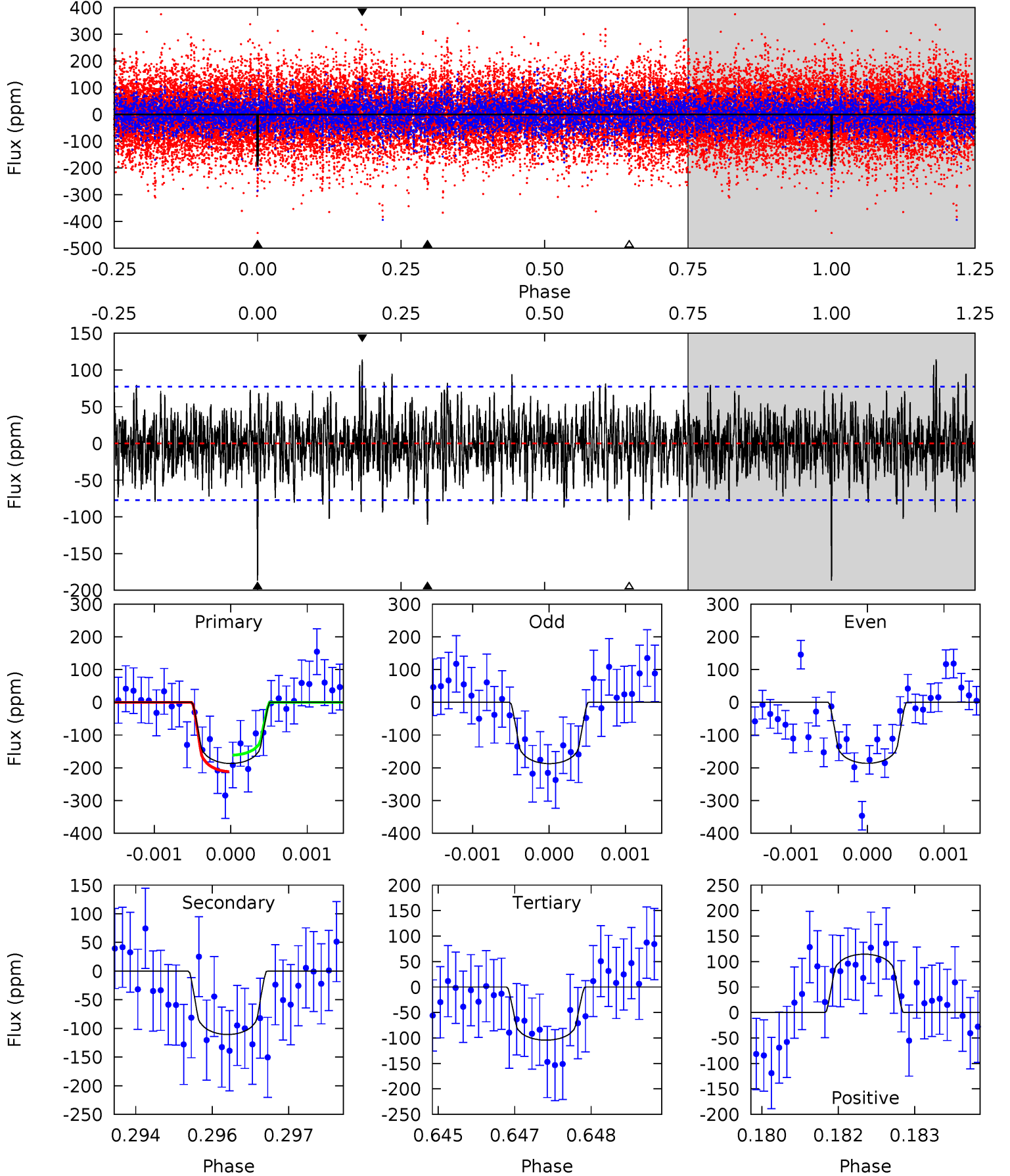
TCE 011654113-07     $P=129.737603$  Days     $T_0=175.483963$  (BKJD)



# DV Model-Shift Uniqueness Test

011654113-07, P = 129.742351 Days, E = 45.711642 Days

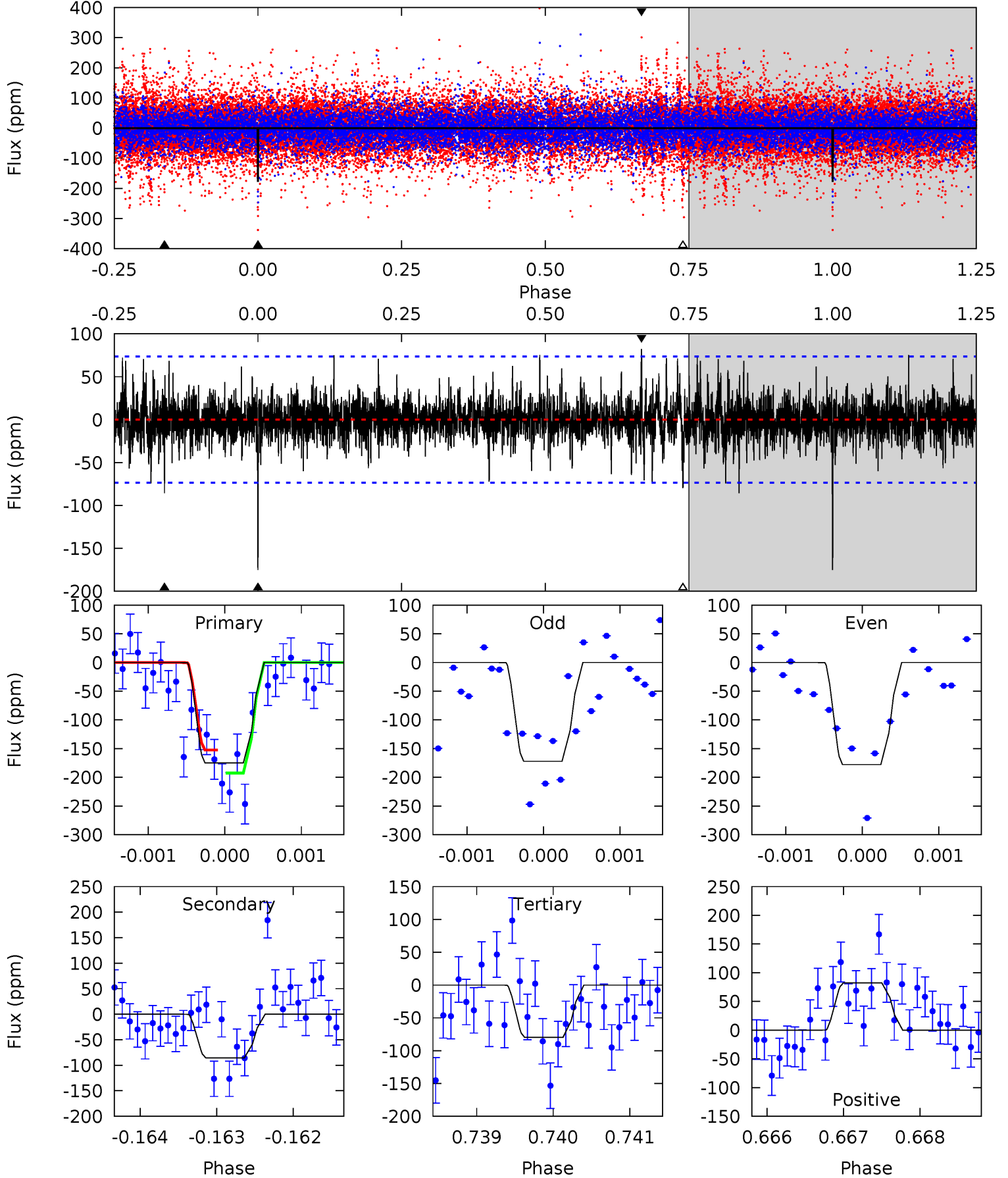
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	7.72	7.28	7.99	5.39	3.20	2.09	5.76	5.05	0.44	-0.27	0.03	1.00	0.38	1.76



# Alt Model-Shift Uniqueness Test

011654113-07, P = 129.737603 Days, E = 45.746360 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
13.0	6.35	5.91	6.12	5.46	3.31	1.35	7.08	6.88	0.43	0.23	0.20	1.02	0.32	1.48



### Stellar Parameters For KIC 011654113

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6429^{+179}_{-246}$	$4.335^{+0.072}_{-0.217}$	$0.060^{+0.250}_{-0.350}$	$1.249^{+0.437}_{-0.175}$	$1.231^{+0.180}_{-0.180}$	$0.890^{+0.352}_{-0.483}$
	+3%/-4%	+2%/-5%	+417%/-583%	+35%/-14%	+15%/-15%	+40%/-54%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011654113-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-111 \pm 14$	$2.44^{+1.81}_{-1.53}$	$614^{+50}_{-36}$	$5095^{+3550}_{-984}$	$2843^{+17404}_{-1897}$
Alt.	$-85 \pm 13$	$2.47^{+1.82}_{-1.45}$	$616^{+46}_{-36}$	$4769^{+2646}_{-890}$	$2128^{+10676}_{-1436}$

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

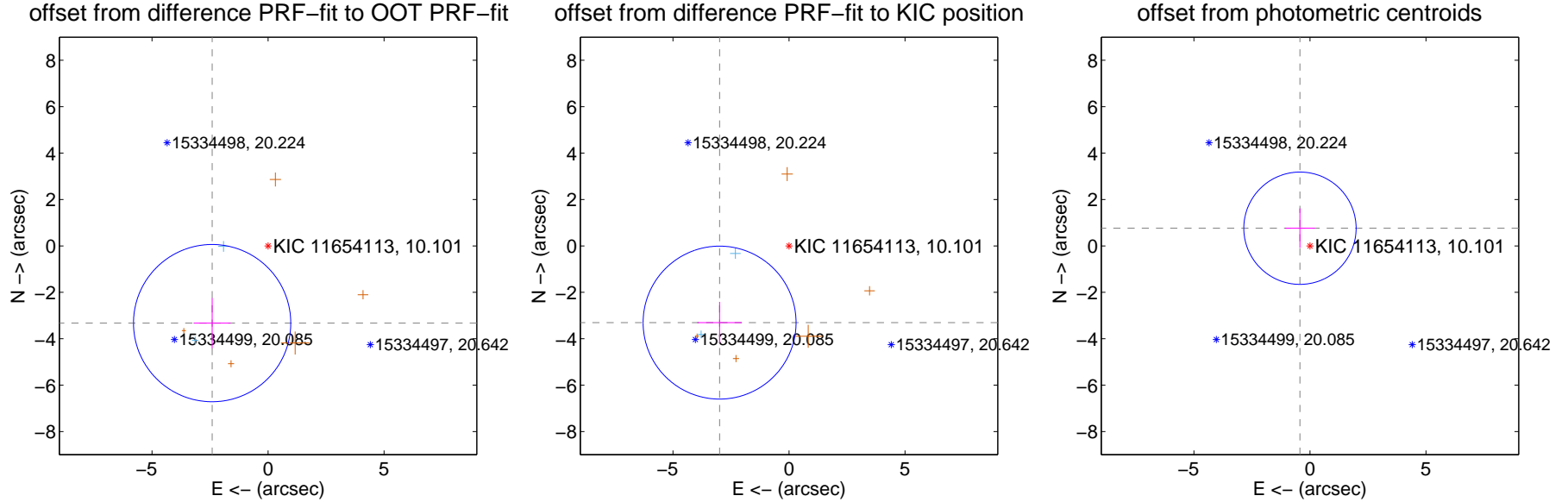
## DV Centroid Data

Supplemental centroid analysis for 011654113-07. **Kepler magnitude: 10.10.** Transit SNR 8.02

**There are 2 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 0.72 arcsec

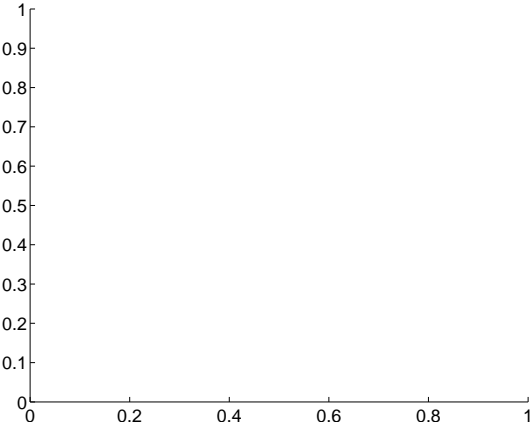
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.106 \pm 1.129</math></b>	<b>3.64</b>	$2.409 \pm 0.797$	$-3.325 \pm 1.079$
PRF-fit source offset from KIC position	<b><math>4.456 \pm 1.098</math></b>	<b>4.06</b>	$2.990 \pm 0.961$	$-3.304 \pm 0.892$
photometric centroid source offset	$0.88 \pm 0.81$	1.09	$0.43 \pm 0.64$	$0.76 \pm 0.85$



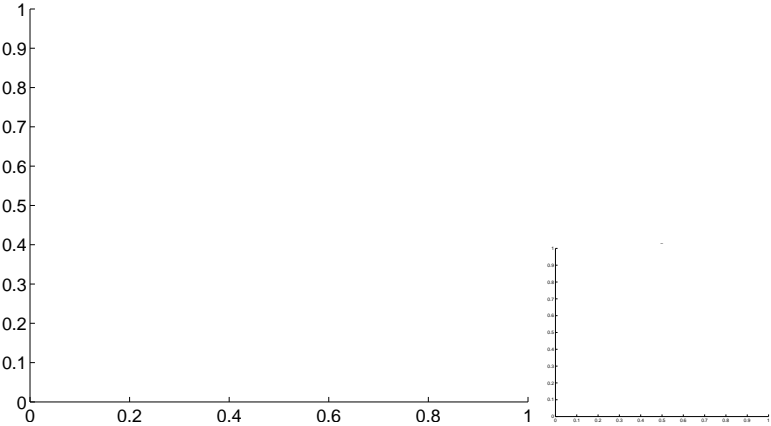
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

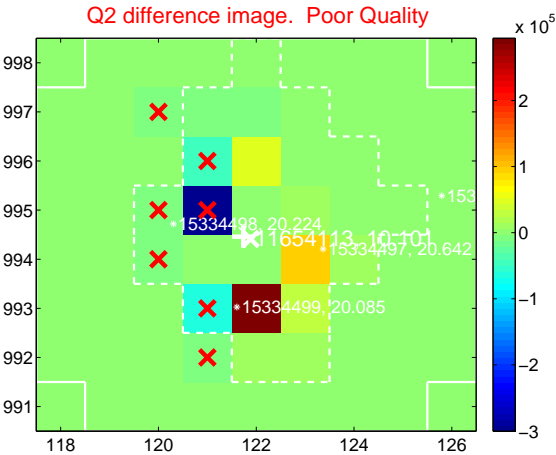
Q1 no difference image



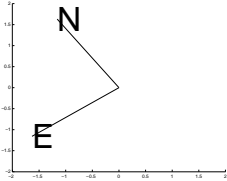
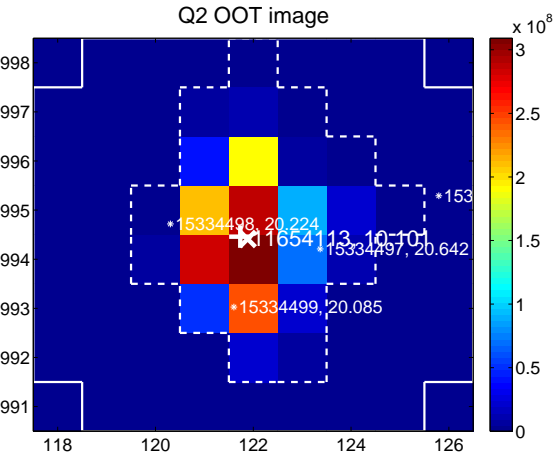
Q1 no OOT image



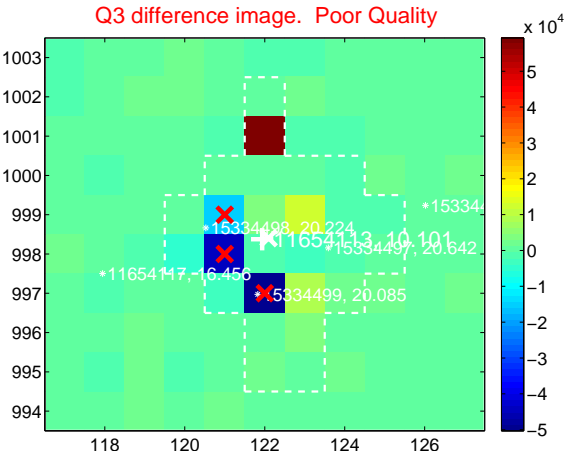
Q2 difference image. Poor Quality



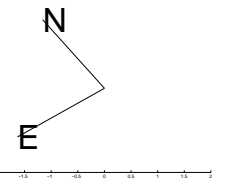
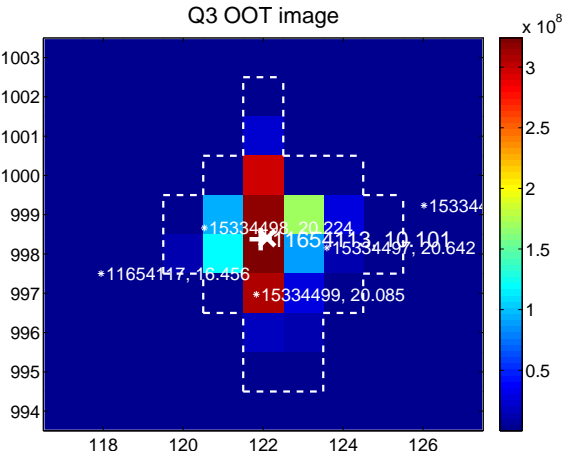
Q2 OOT image



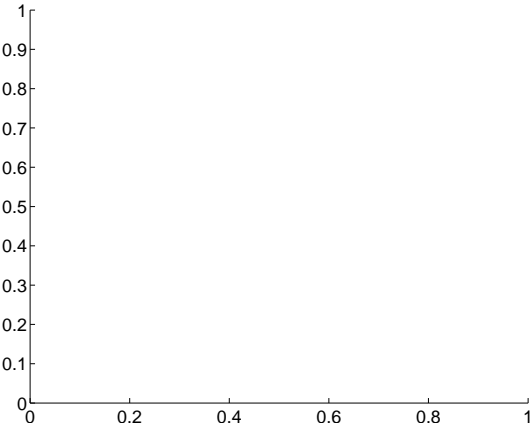
Q3 difference image. Poor Quality



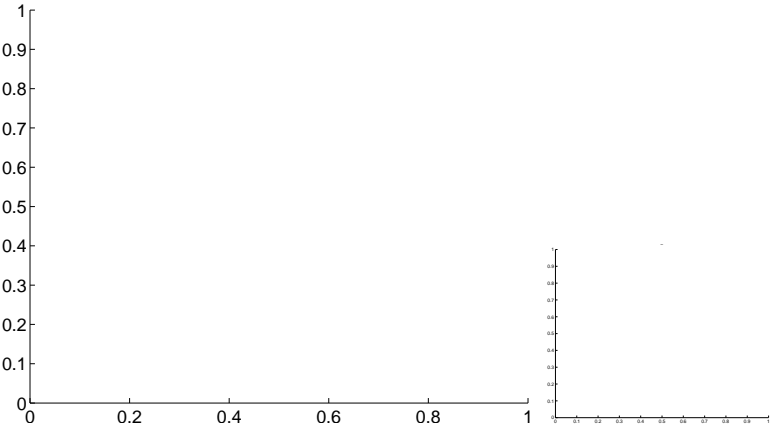
Q3 OOT image



Q4 no difference image



Q4 no OOT image





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

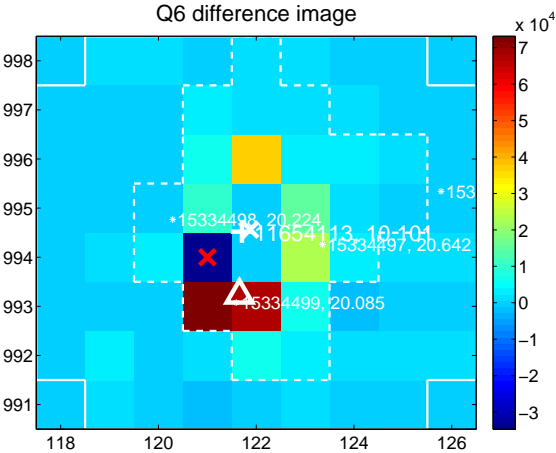
Q5 no difference image



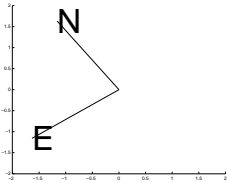
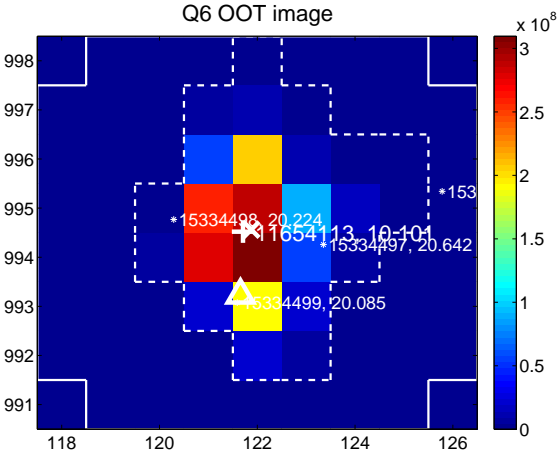
Q5 no OOT image



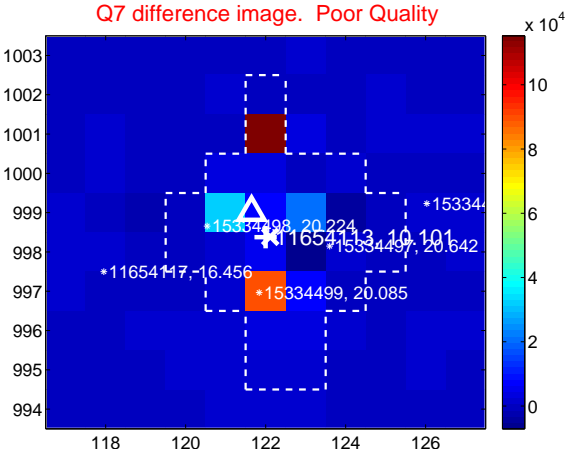
Q6 difference image



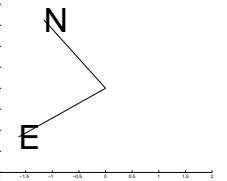
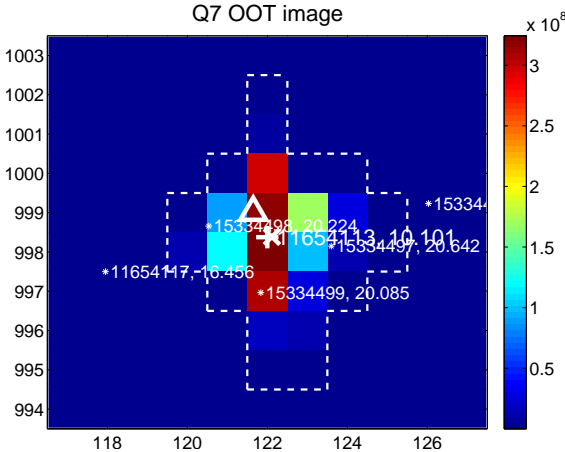
Q6 OOT image



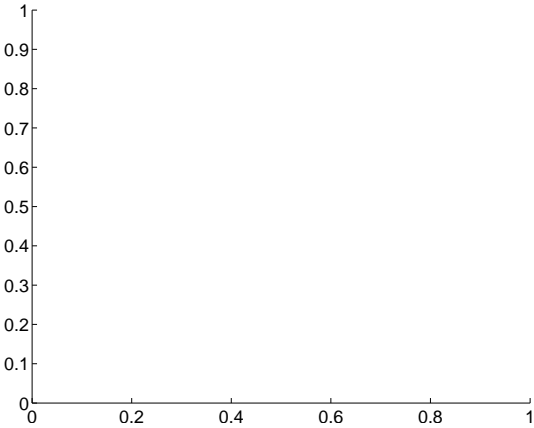
Q7 difference image. Poor Quality



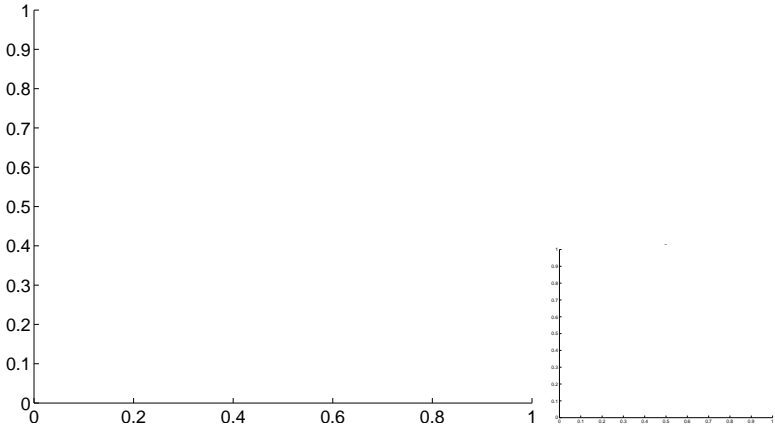
Q7 OOT image



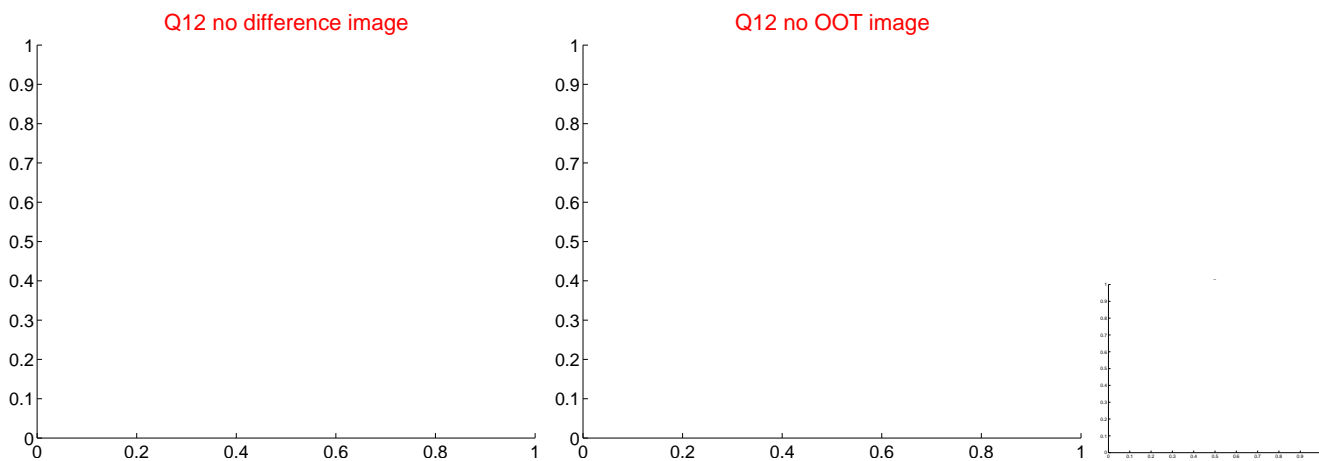
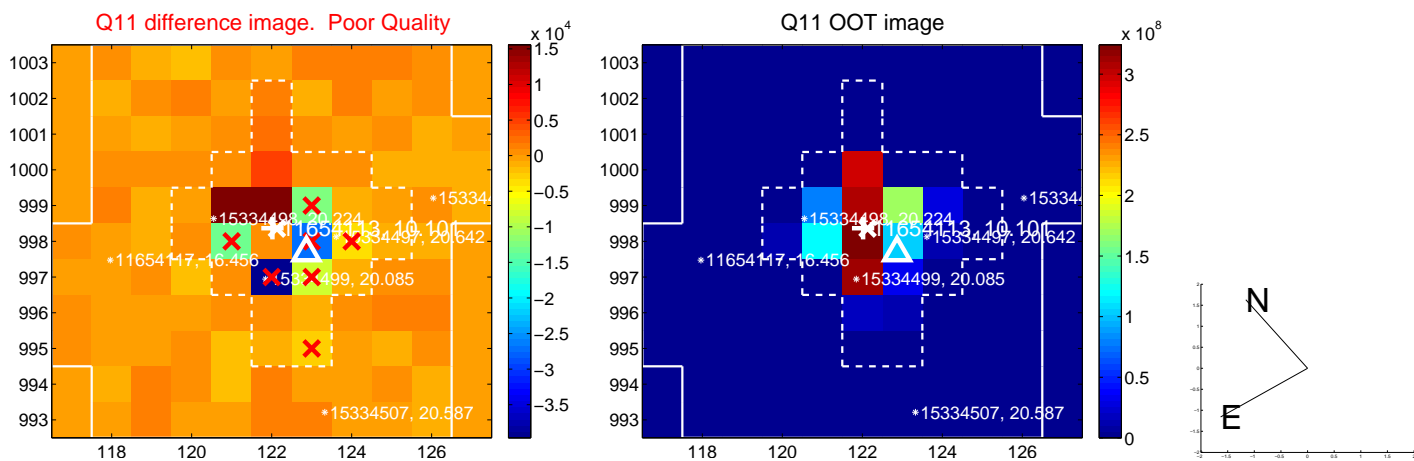
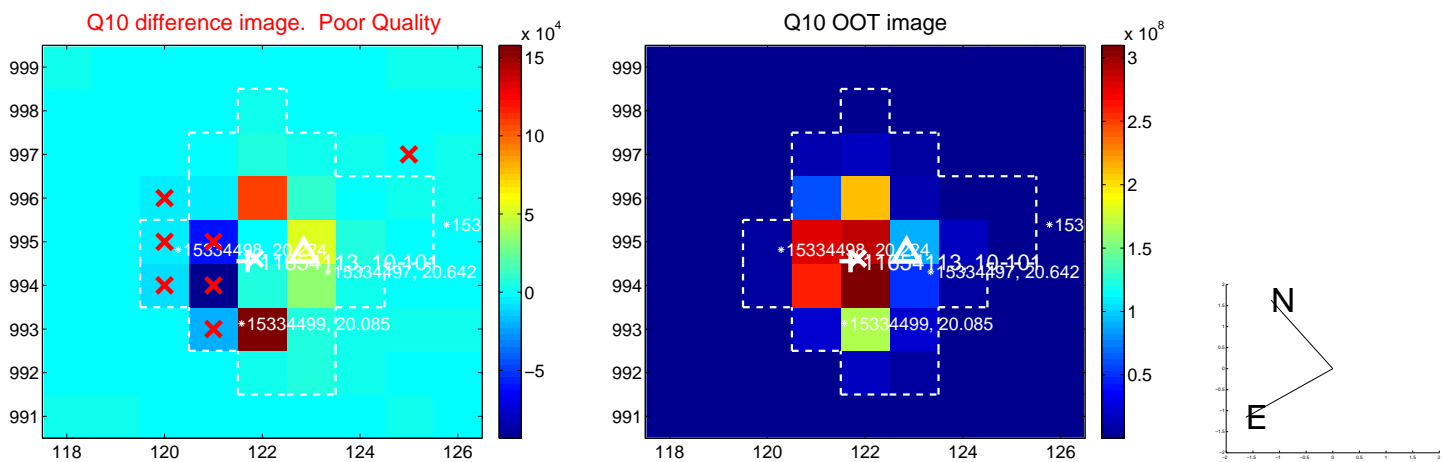
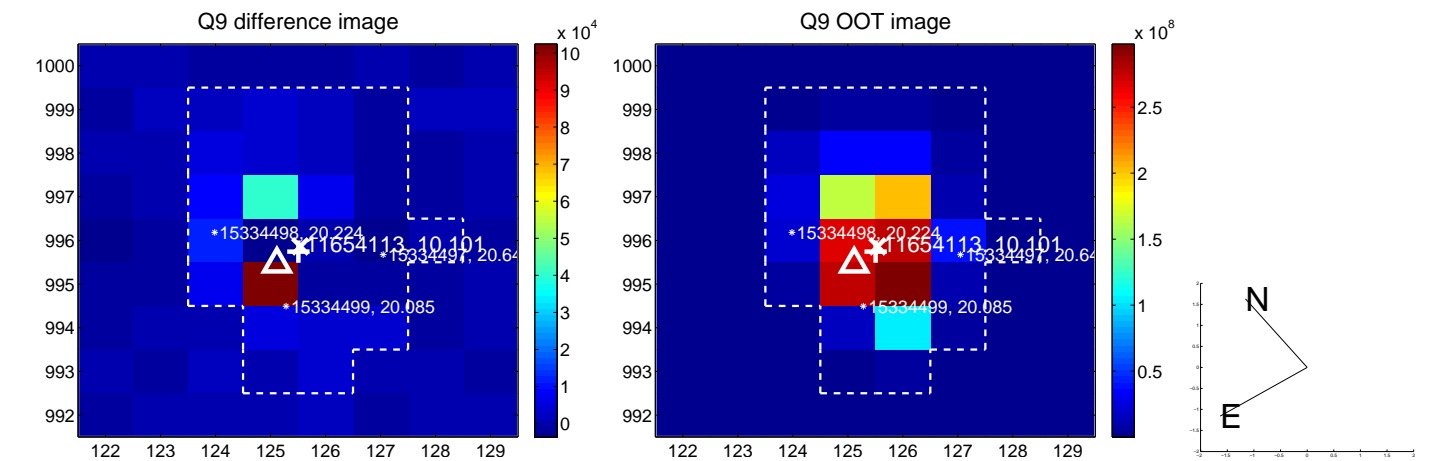
Q8 no difference image



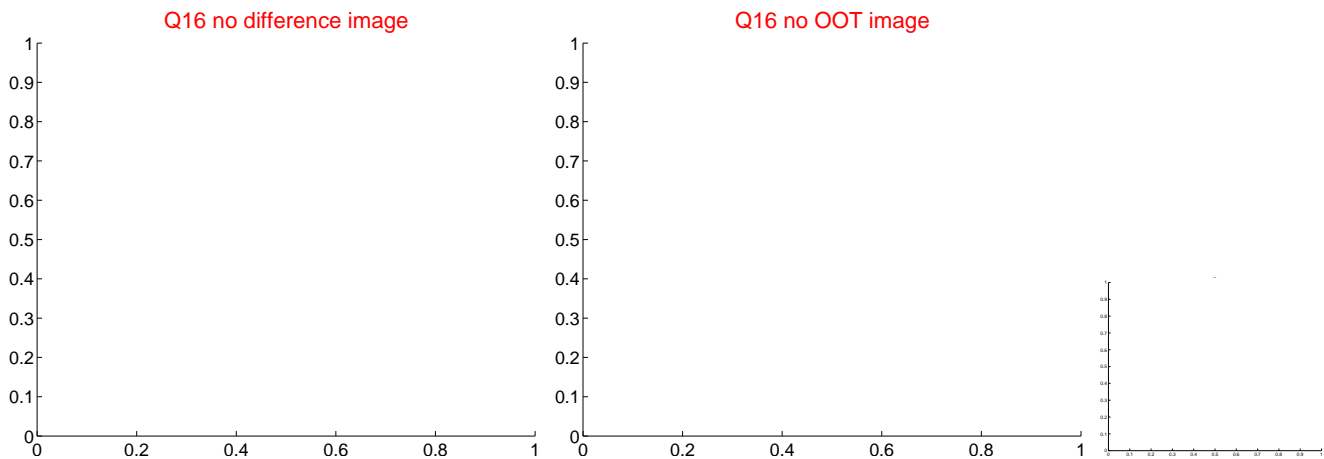
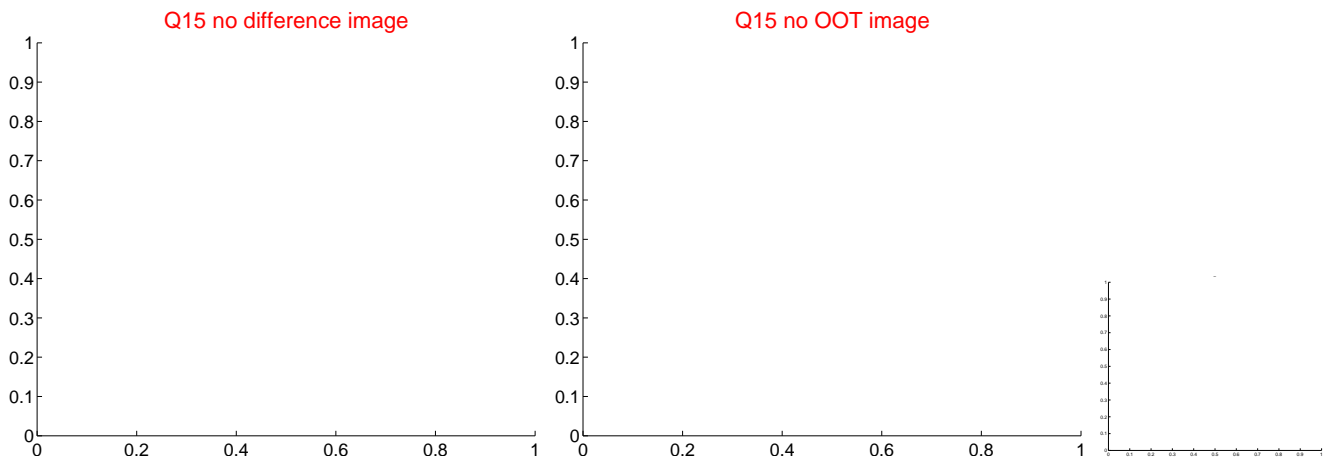
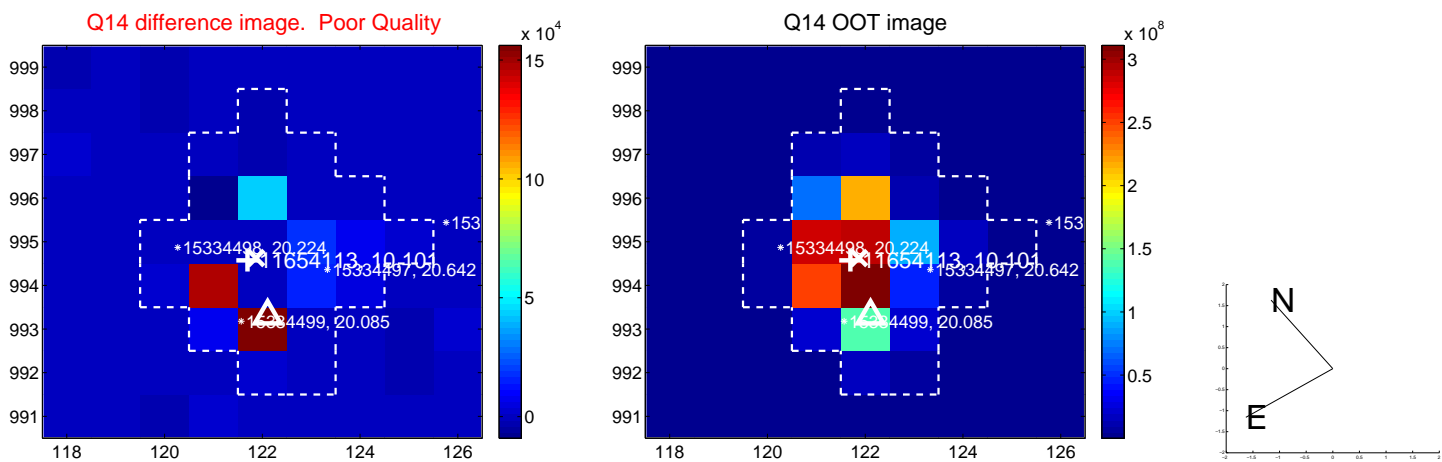
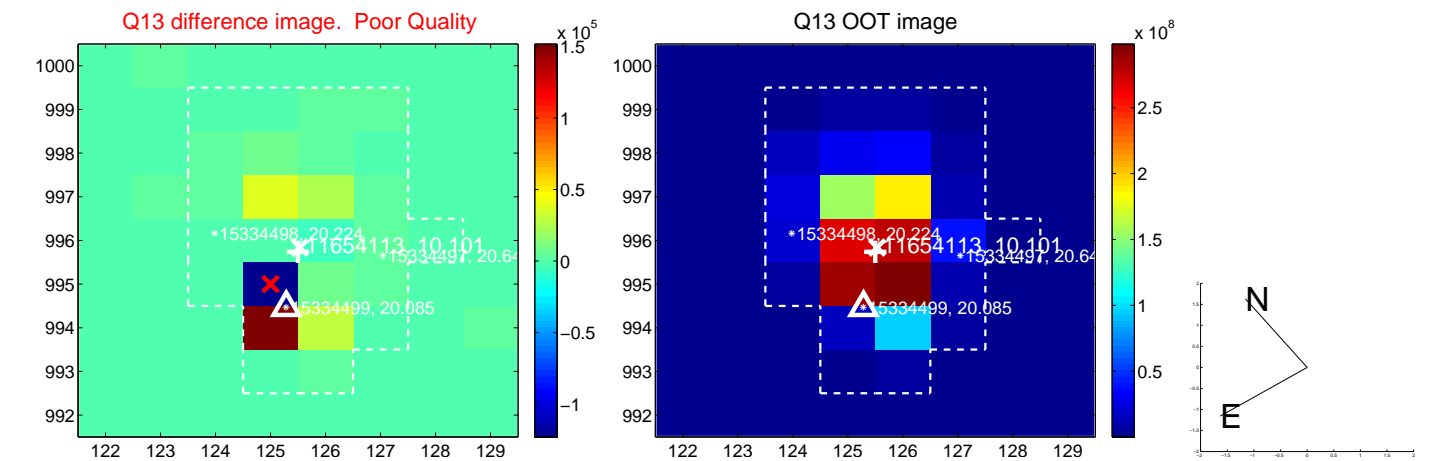
Q8 no OOT image



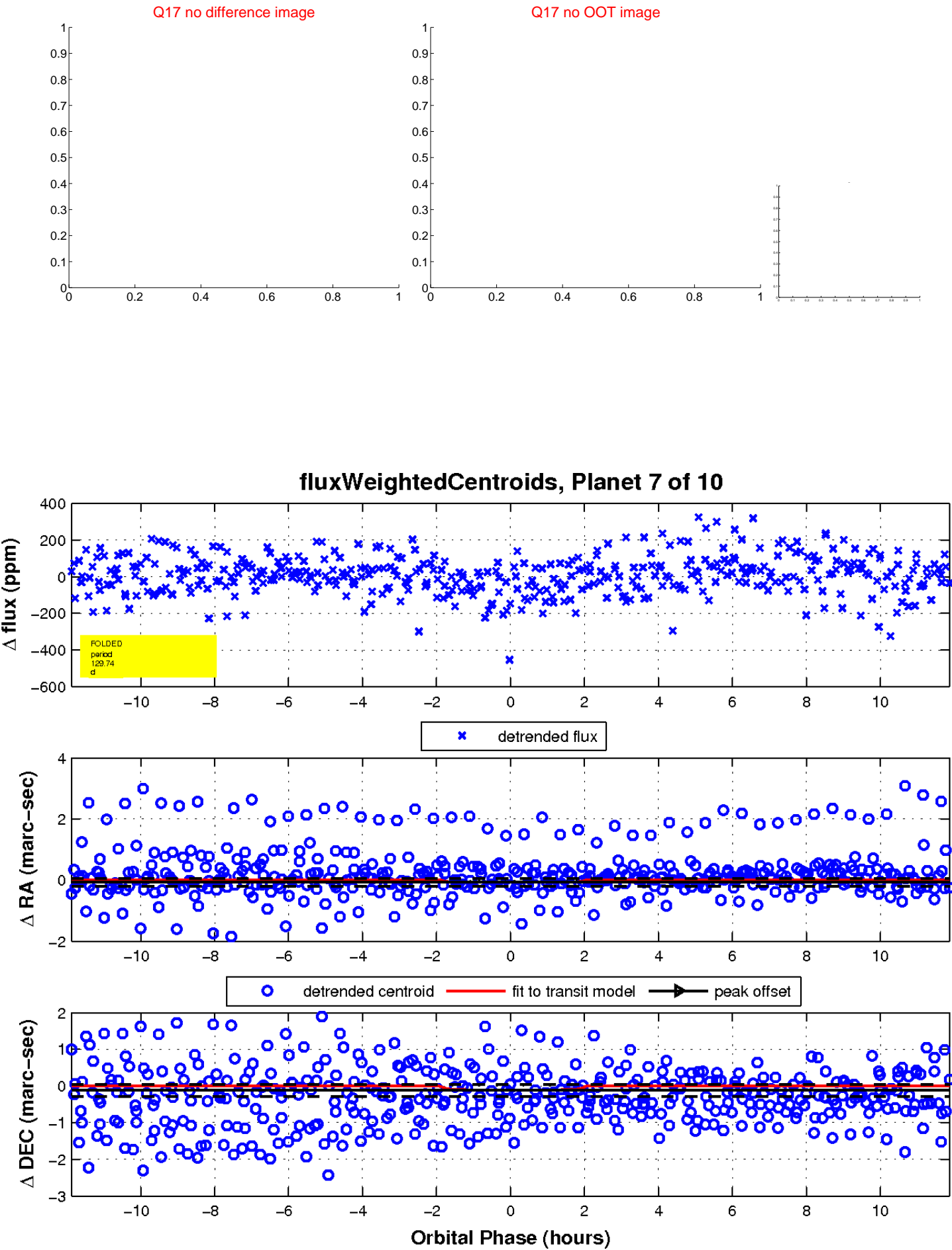
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

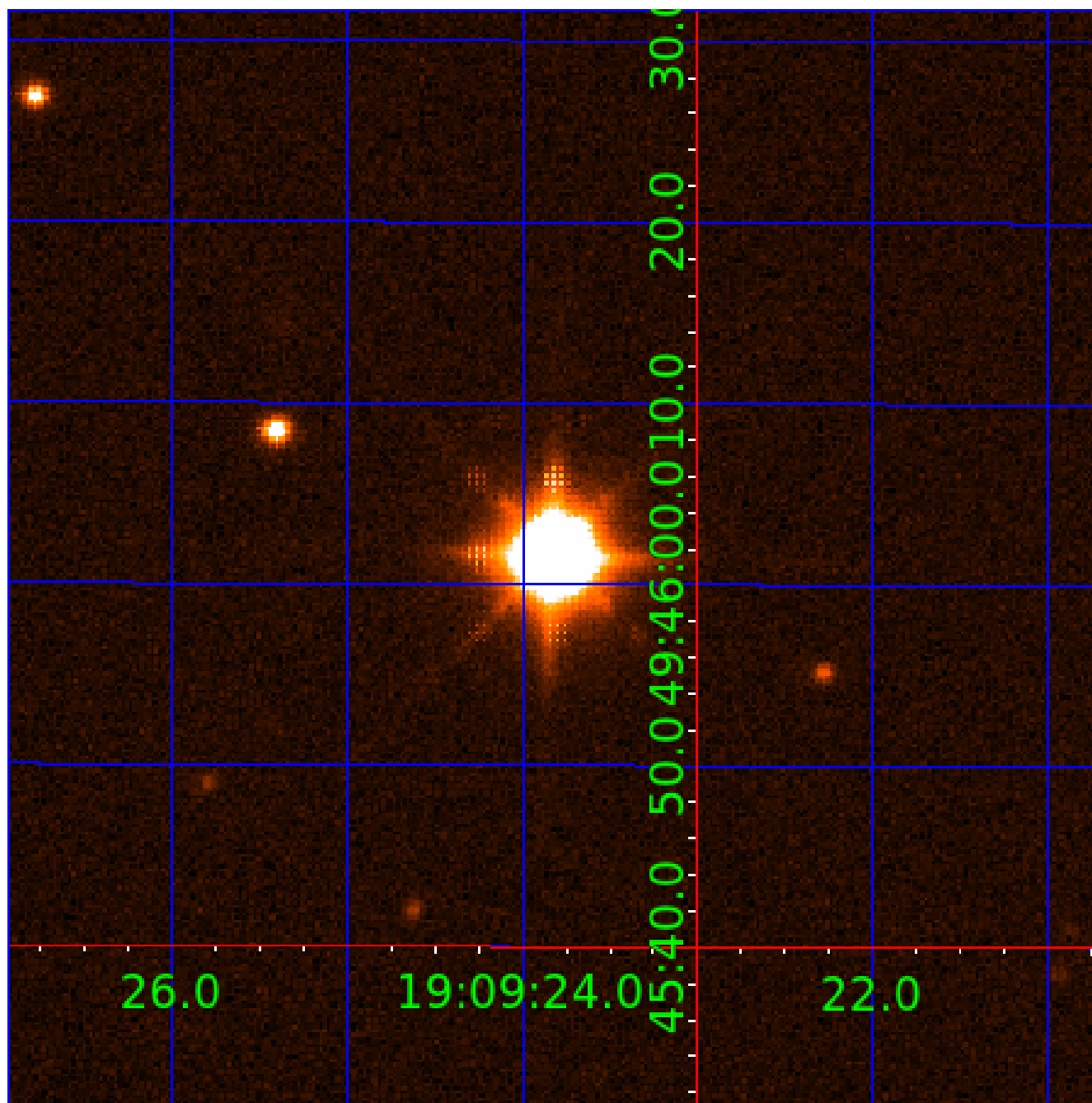


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011654113

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654113-01	OBS	No	4.603252	134.638898	39.1	16.875	10.1	9.6	1.25	6429	0.92	708.64
011654113-04	OBS	No	77.125192	165.031632	135.0	6.443	8.5	8.3	1.25	6429	1.71	16.53
011654113-05	OBS	No	235.731487	210.797346	194.1	4.994	8.3	8.5	1.25	6429	1.99	3.73
011654113-07	OBS	No	129.742351	175.453993	189.2	3.960	8.3	8.0	1.25	6429	1.88	8.26
011654113-08	OBS	No	322.256003	384.322642	269.4	9.485	8.0	8.1	1.25	6429	2.50	2.46
011654113-09	OBS	No	469.585699	343.535747	232.5	8.058	8.0	8.7	1.25	6429	2.51	1.49
011654113-10	OBS	No	222.082184	241.171086	204.5	9.098	8.1	7.6	1.25	6429	2.29	4.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011654113-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
011654113-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—CENT_SATURATED
011654113-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
011654113-07	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
011654113-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
011654113-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011654113-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

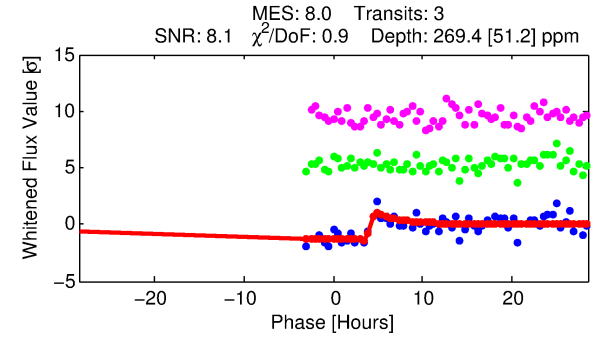
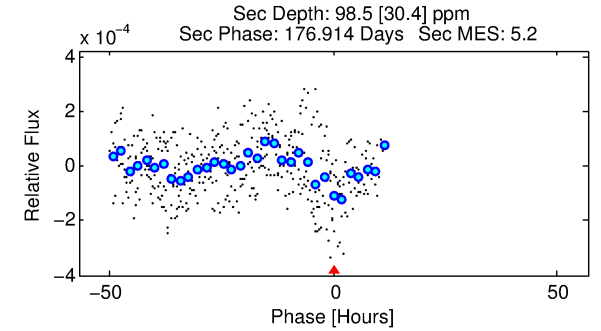
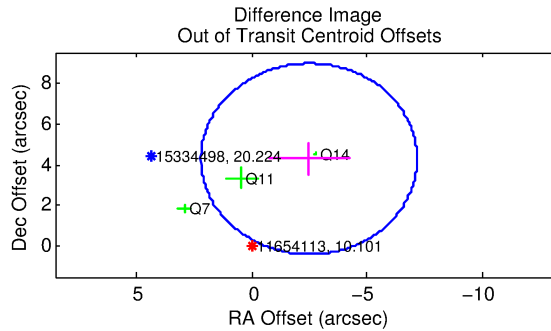
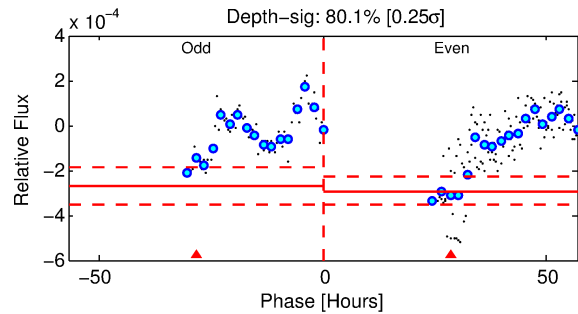
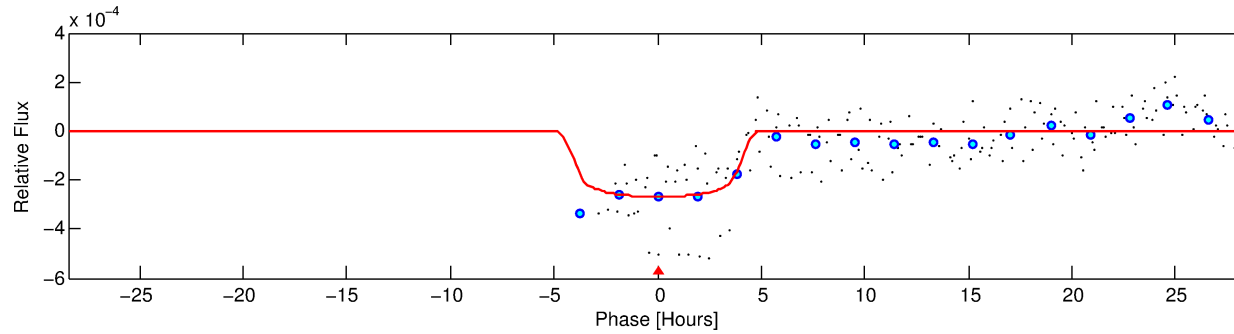
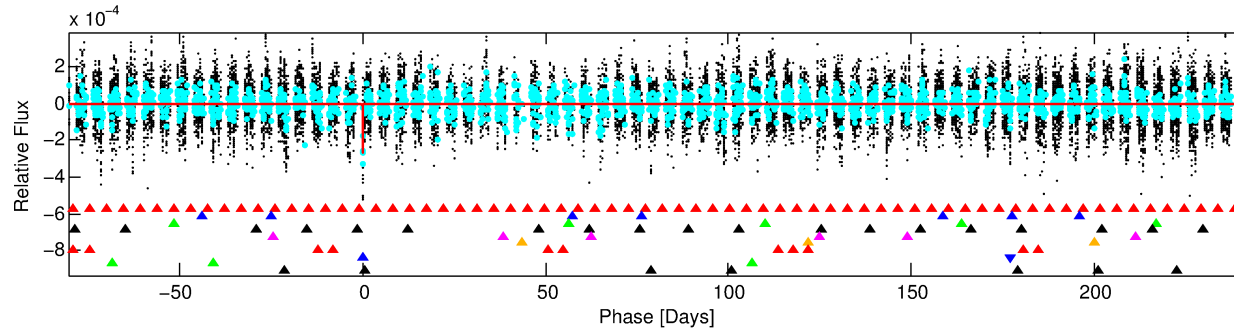
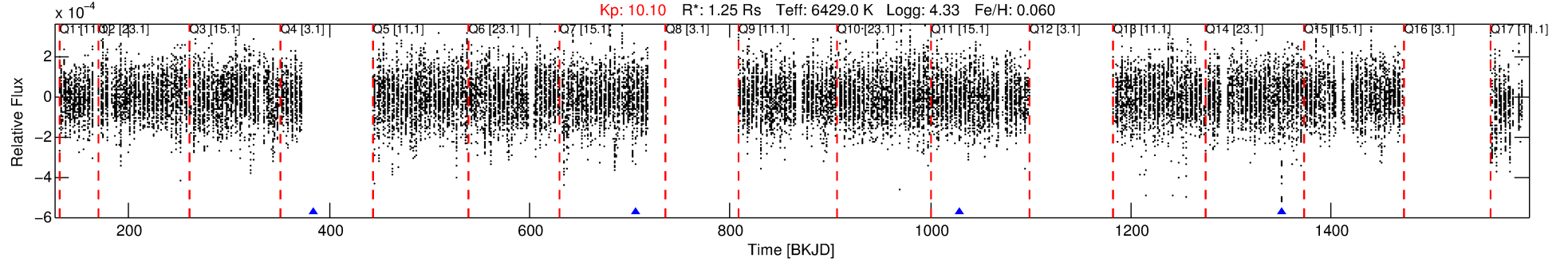
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011654113-08

No Significant Match Found

# DV One-Page Summary

KIC: 11654113 Candidate: 8 of 10 Period: 322.256 d



## DV Fit Results:

Period = 322.25600 [0.01133] d  
Epoch = 384.3226 [0.0469] BKJD  
Rp/R\* = 0.0184 [0.0021]  
a/R\* = 102.36 [40.58]  
b = 0.94 [0.03]  
Seff = 2.46 [1.07]  
Teq = 319 [35] K  
Rp = 2.50 [0.92] Re  
a = 0.9860 [0.2826] AU  
Ag = 8412.56 [4701.21] [1.79 $\sigma$ ]  
Teffp = 4727 [488] K [9.01 $\sigma$ ]

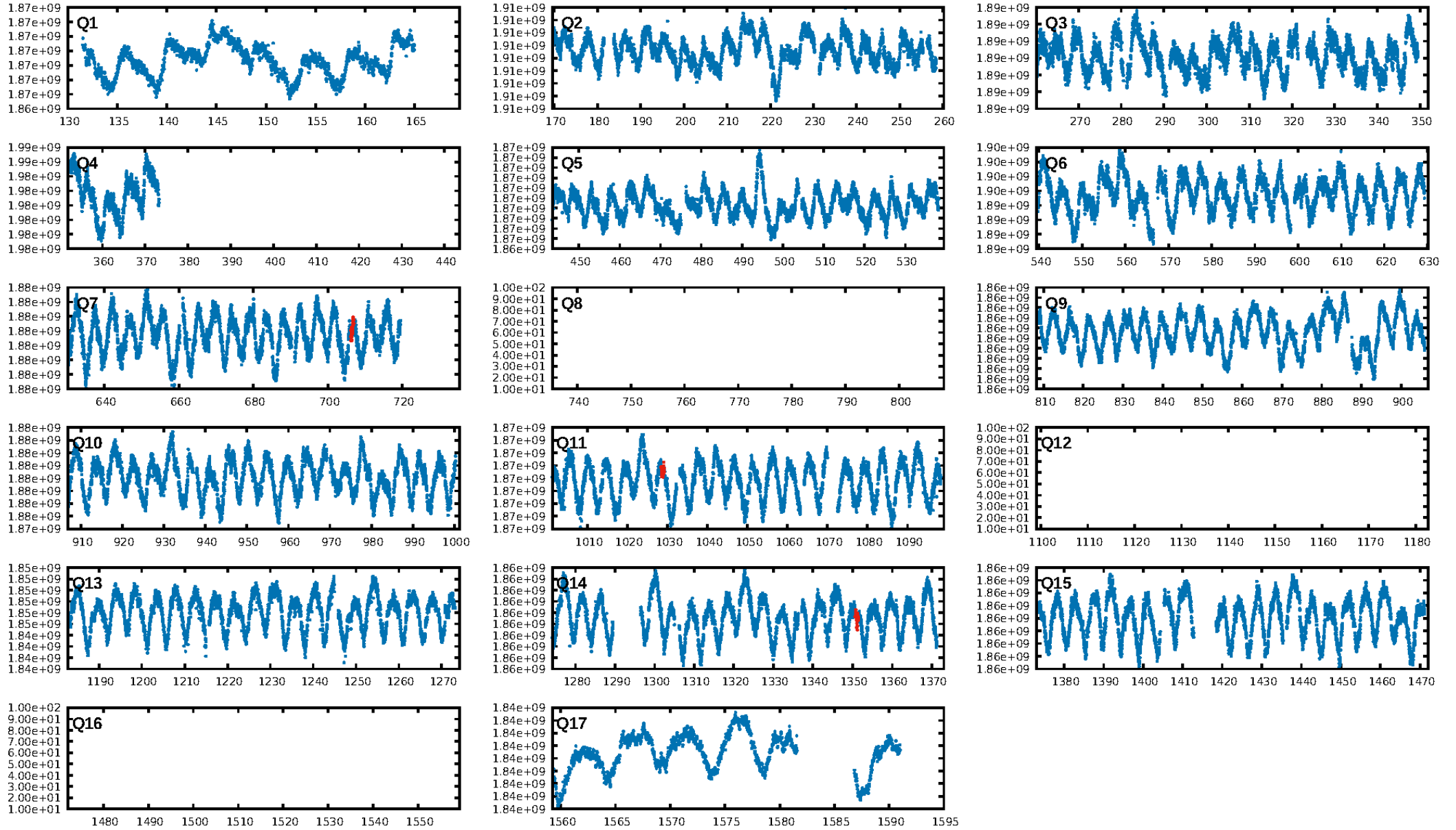
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [31.86 $\sigma$ ]  
LongPeriod-sig: 100.0% [284.11 $\sigma$ ]  
ModelChiSquare2-sig: 3.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.7954**  
Centroid-sig: 88.6%  
Centroid-so: 0.392 arcsec [0.39 $\sigma$ ]  
**OotOffset-rm: 4.949 arcsec [3.18 $\sigma$ ]**  
**KicOffset-rm: 4.804 arcsec [5.85 $\sigma$ ]**  
OotOffset-st: 1/2/0/0 [3]  
KicOffset-st: 1/2/0/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.67 [2/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:35:00 Z

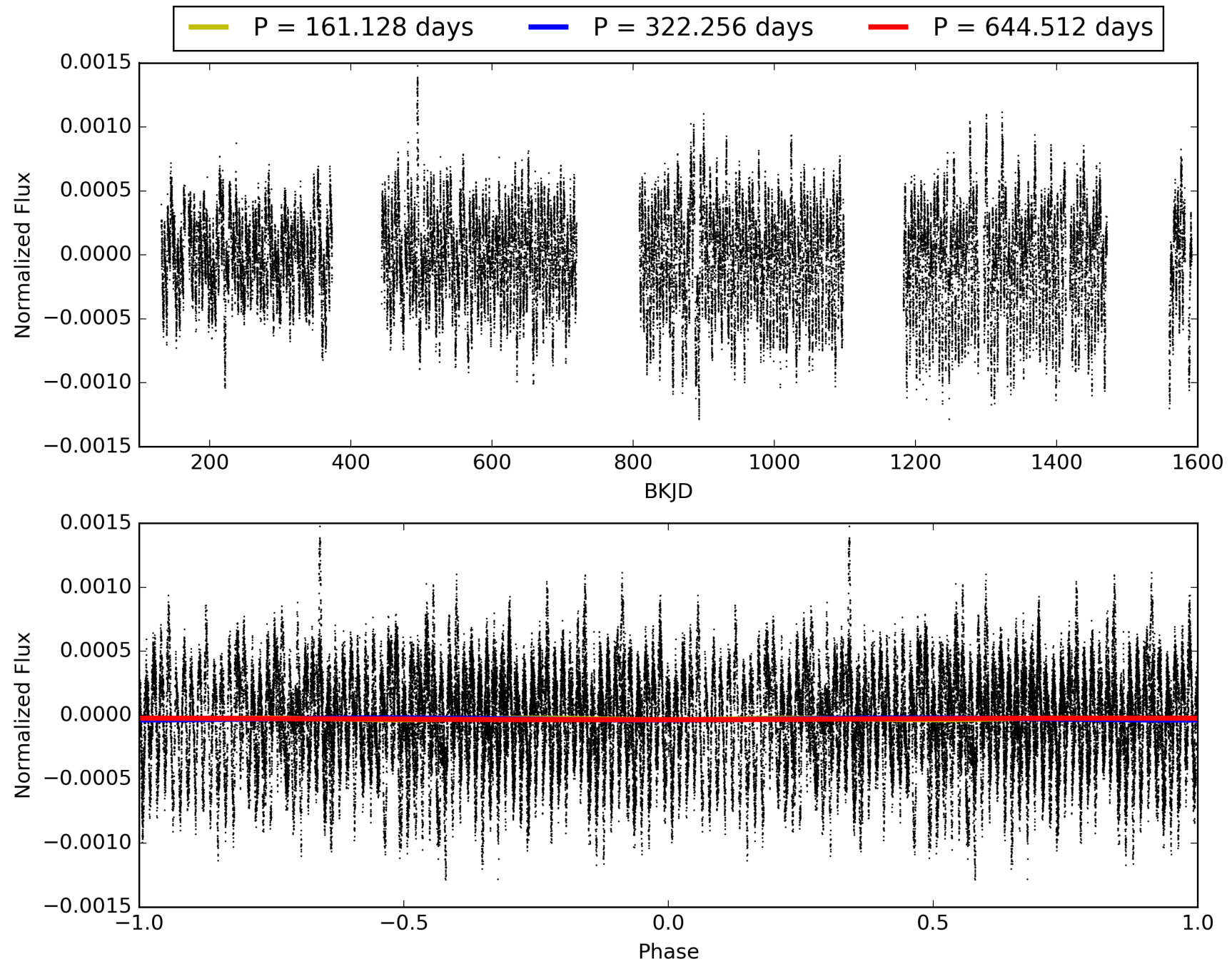
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011654113-08, PDC Light Curves



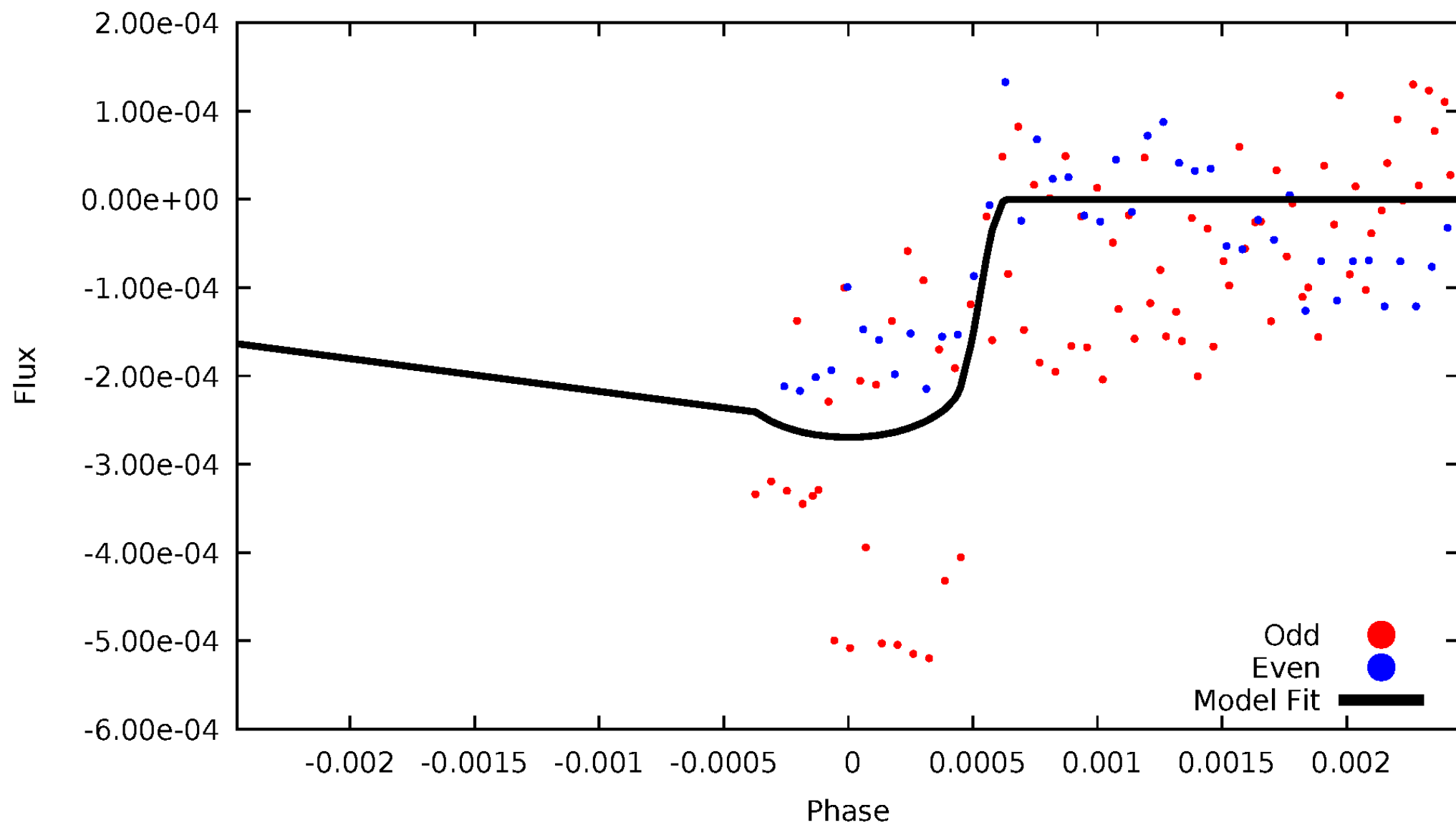


# TCE 011654113-08



# DV Odd/Even

TCE 011654113-08



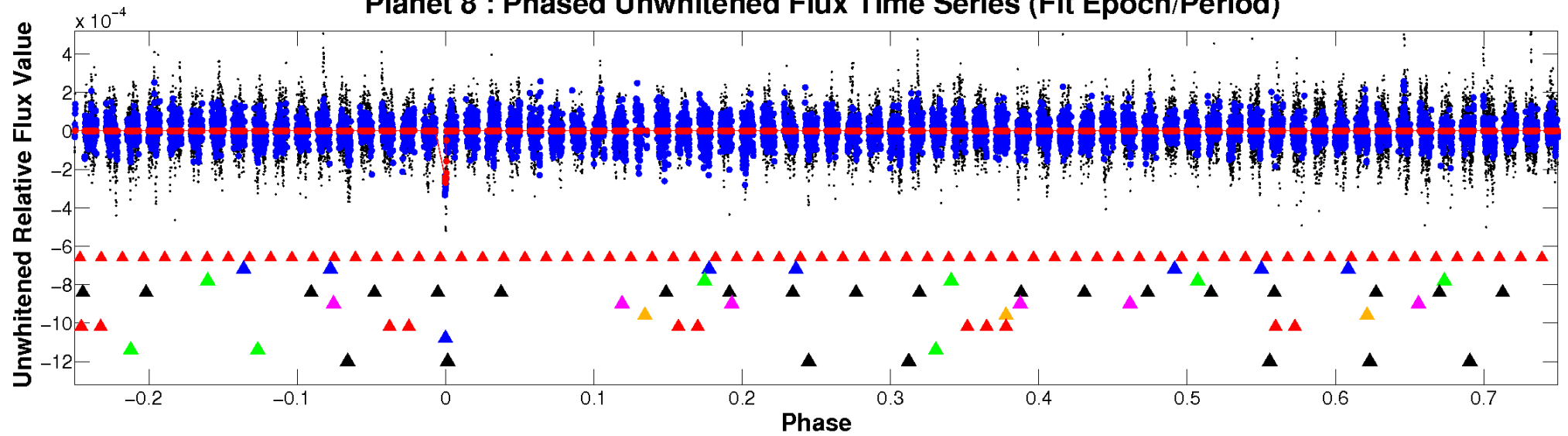


ALT Odd/Even

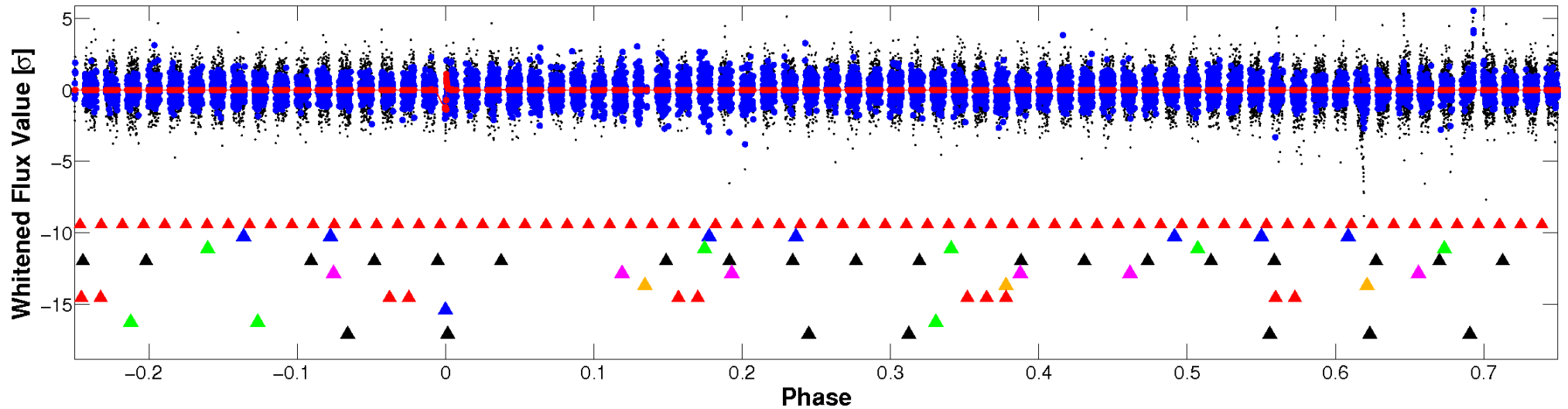
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

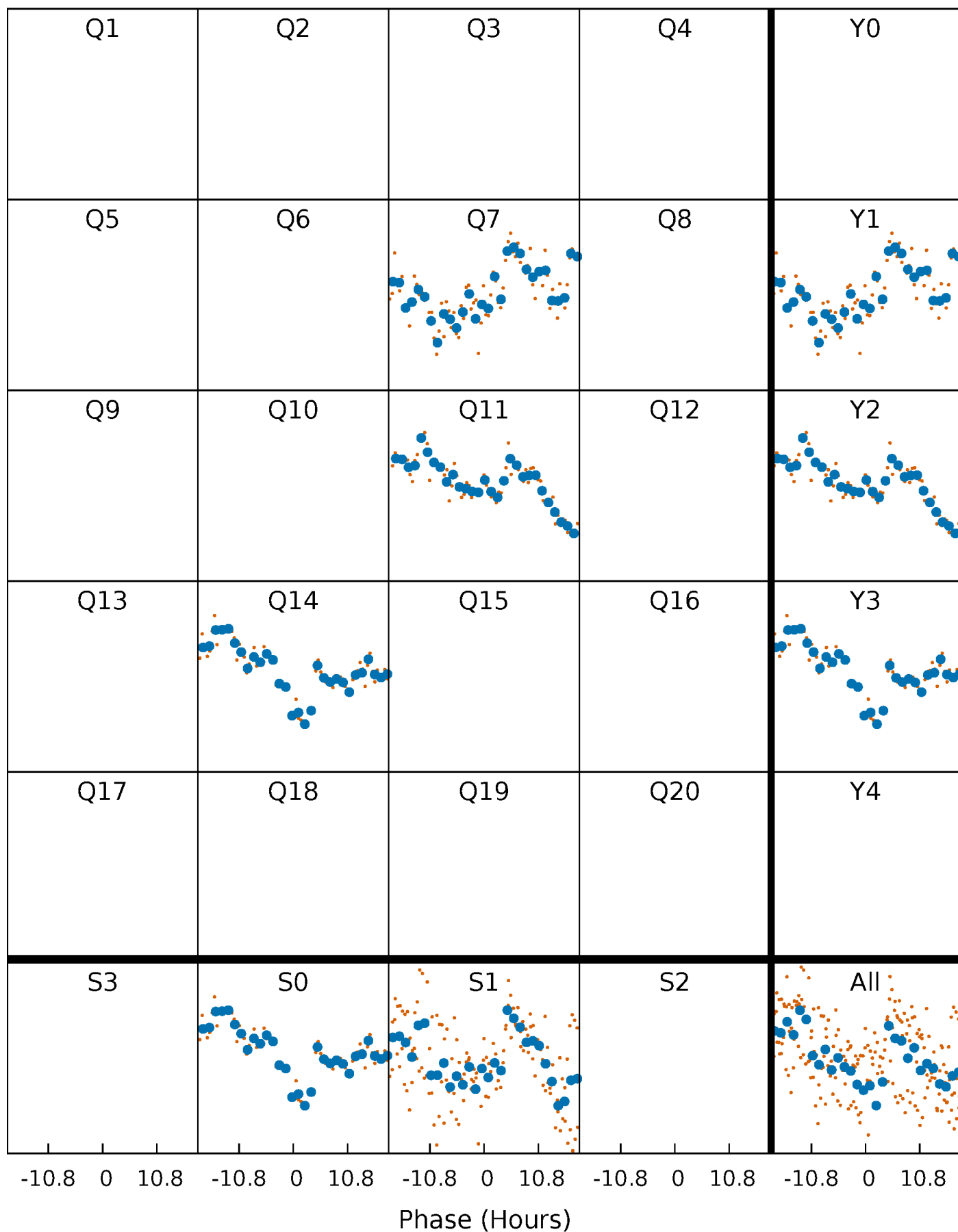


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



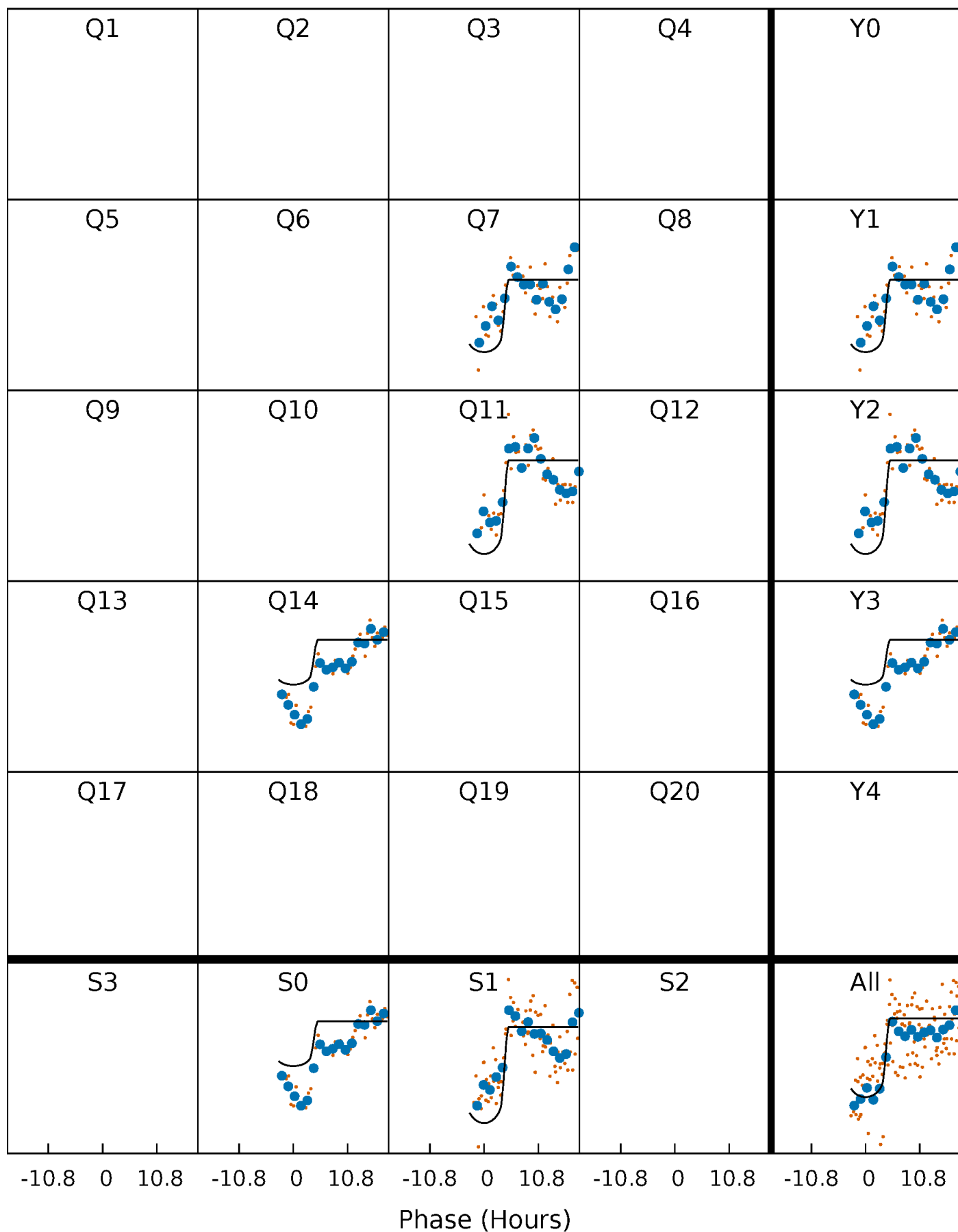
# PDC Quarter-Phased Transit Curves

TCE 011654113-08     $P=322.256003$  Days     $T_0=384.322642$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 011654113-08     $P=322.256003$  Days     $T_0=384.322642$  (BKJD)



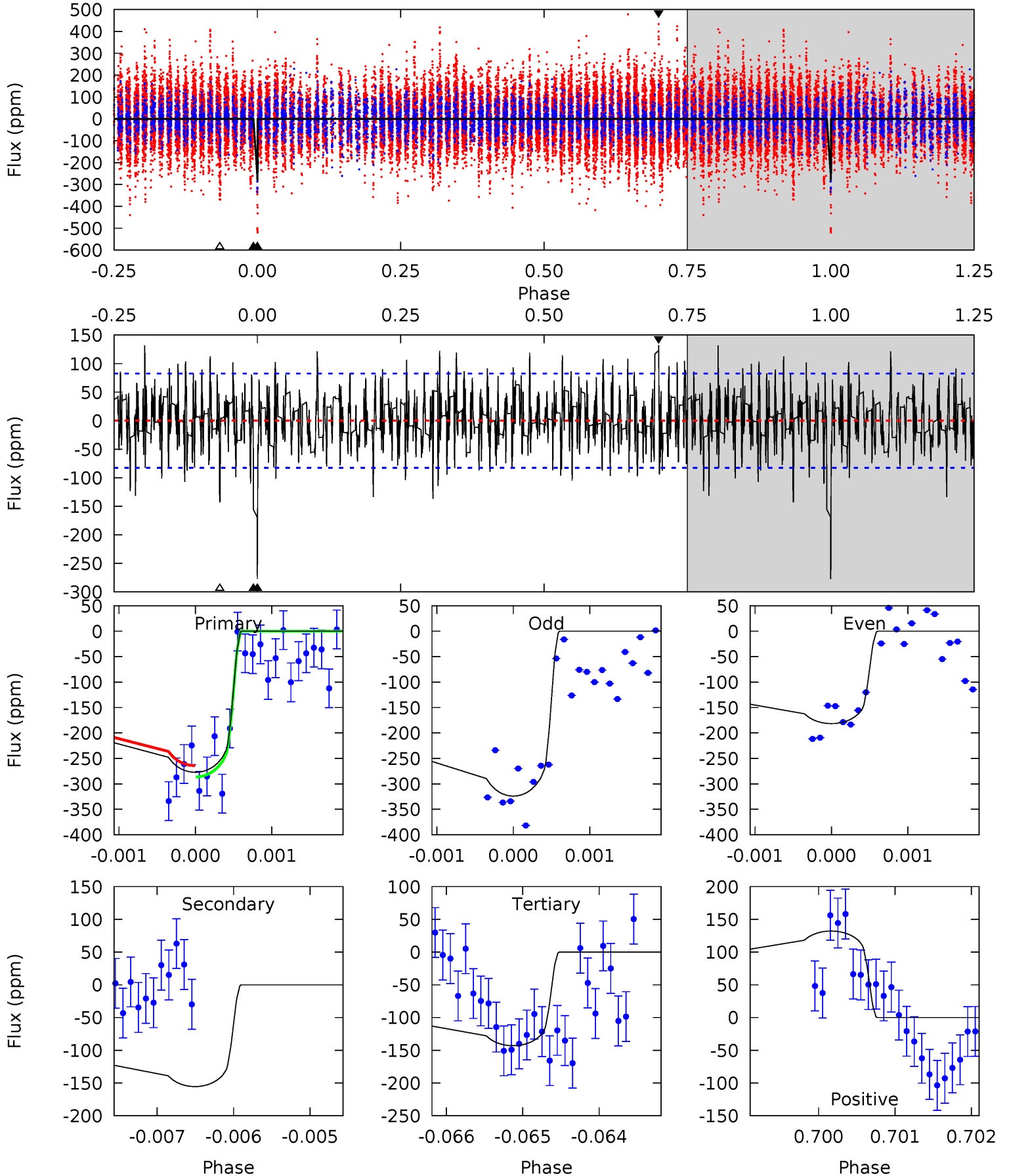
This plot does not exist for this TCE.



# DV Model-Shift Uniqueness Test

011654113-08, P = 322.256003 Days, E = 62.066639 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
18.2	10.2	9.41	8.69	5.44	3.28	2.77	8.83	9.56	0.82	1.54	4.42	1.48	0.32	0.67



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 011654113

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6429^{+179}_{-246}$	$4.335^{+0.072}_{-0.217}$	$0.060^{+0.250}_{-0.350}$	$1.249^{+0.437}_{-0.175}$	$1.231^{+0.180}_{-0.180}$	$0.890^{+0.352}_{-0.483}$
	+3%/-4%	+2%/-5%	+417%/-583%	+35%/-14%	+15%/-15%	+40%/-54%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011654113-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-155 \pm 15$	$2.60^{+0.48}_{-0.40}$	$455^{+36}_{-26}$	$5339^{+366}_{-313}$	$12017^{+4850}_{-3419}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{\text{max}}$  = 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

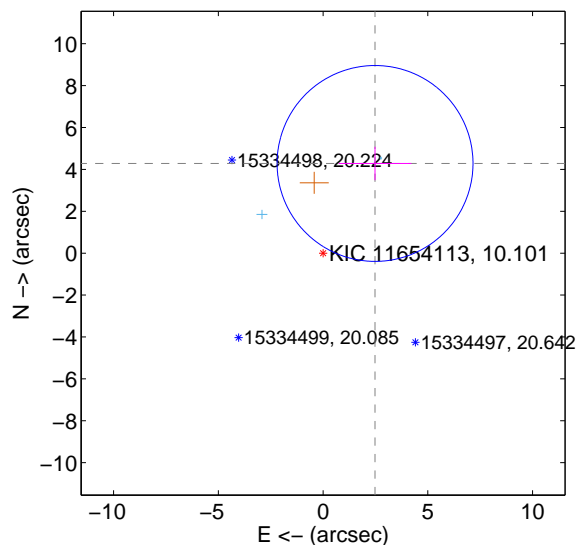
Supplemental centroid analysis for 011654113-08. **Kepler magnitude: 10.10.** Transit SNR 8.12

**There are 2 quarters with good PRF difference image offsets**

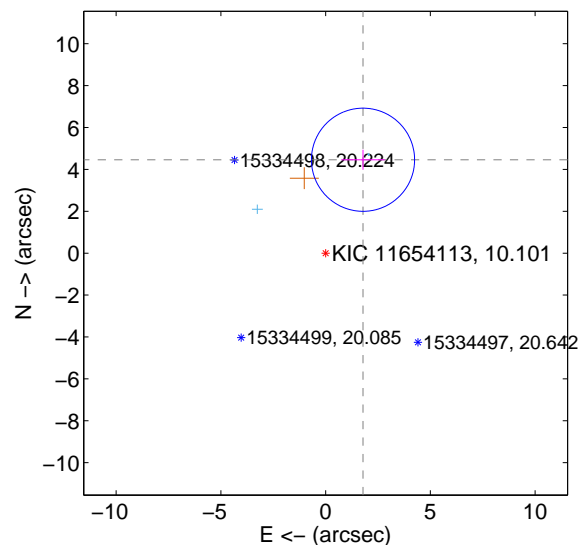
The direct PRF centroid is offset from the target star catalog position by about 0.73 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.949 \pm 1.558</math></b>	<b>3.18</b>	$-2.481 \pm 1.735$	$4.282 \pm 0.799$
PRF-fit source offset from KIC position	<b><math>4.804 \pm 0.821</math></b>	<b>5.85</b>	$-1.785 \pm 1.039$	$4.460 \pm 0.476$
photometric centroid source offset	$0.39 \pm 1.00$	0.39	$0.39 \pm 0.99$	$-0.05 \pm 1.30$

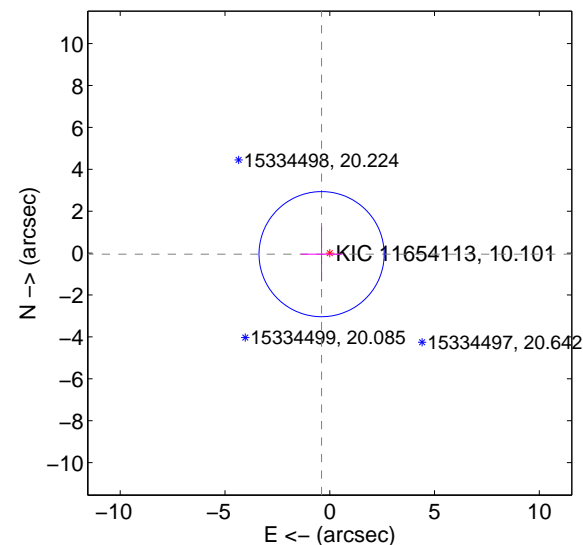
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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

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



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

Q5 no difference image



Q5 no OOT image



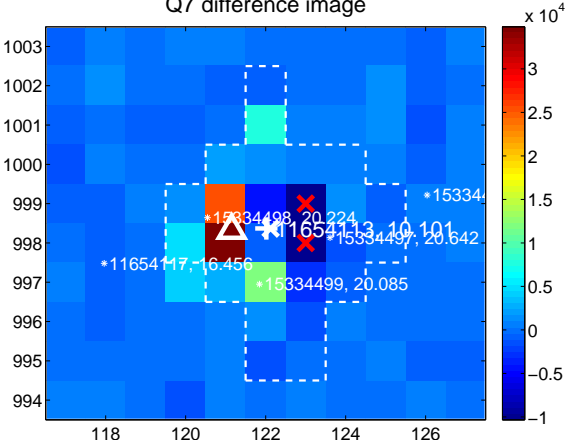
Q6 no difference image



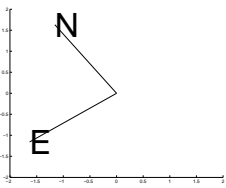
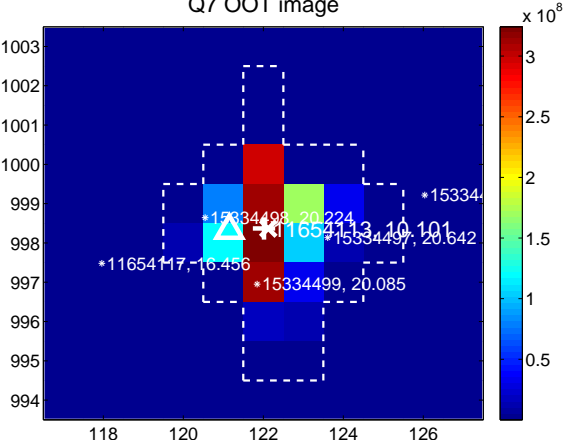
Q6 no OOT image



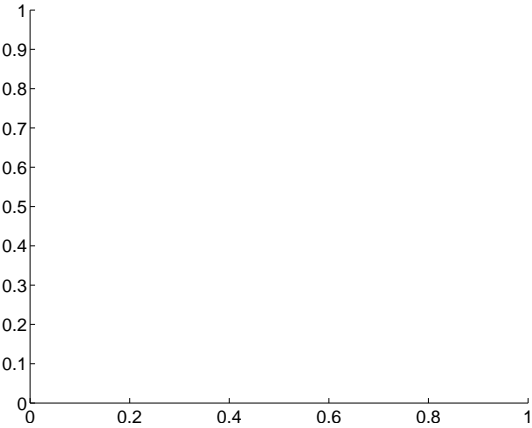
Q7 difference image



Q7 OOT image



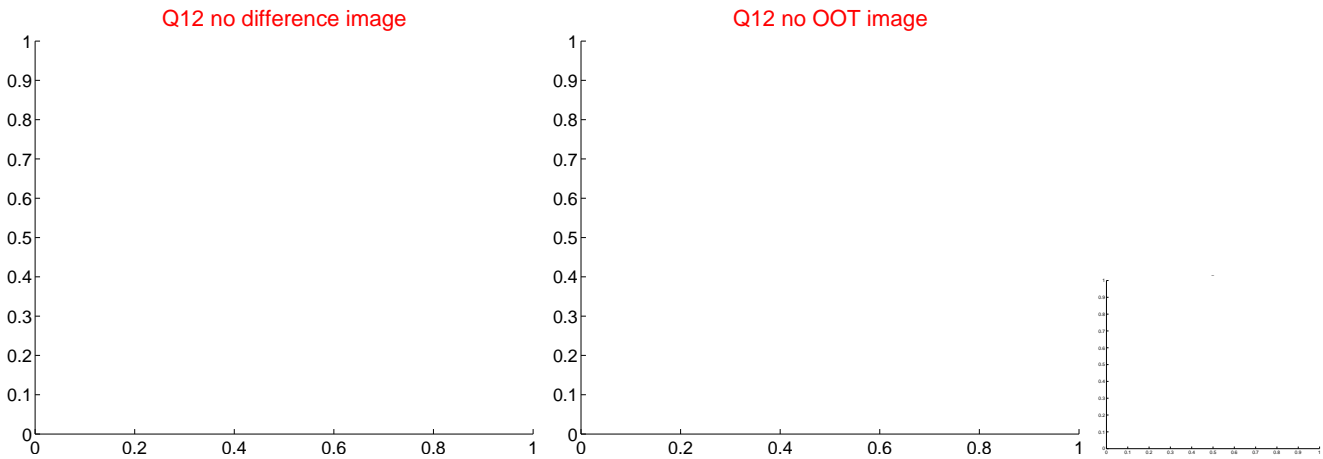
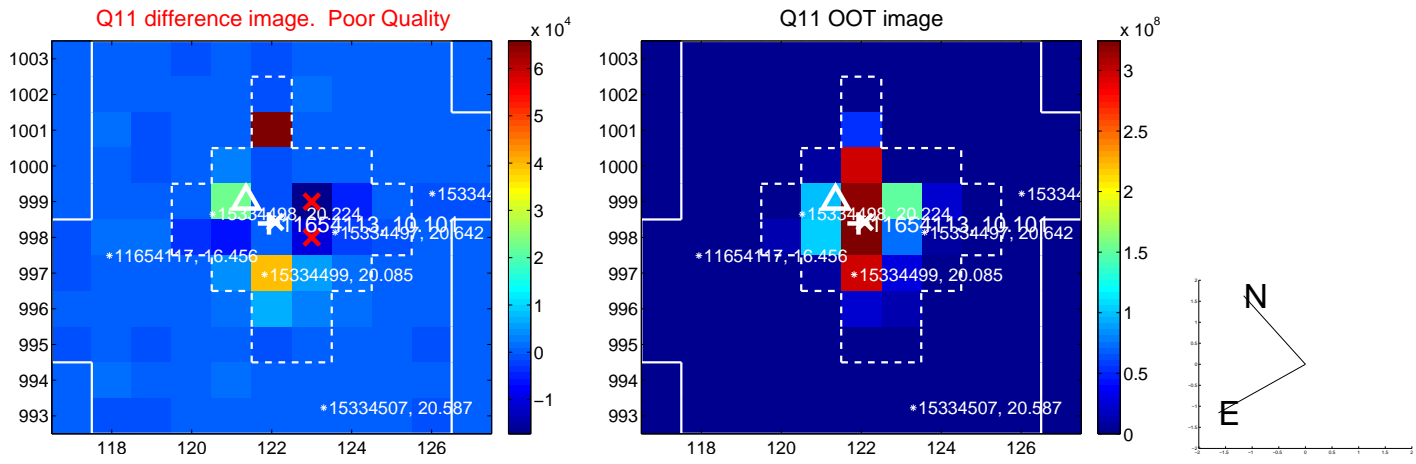
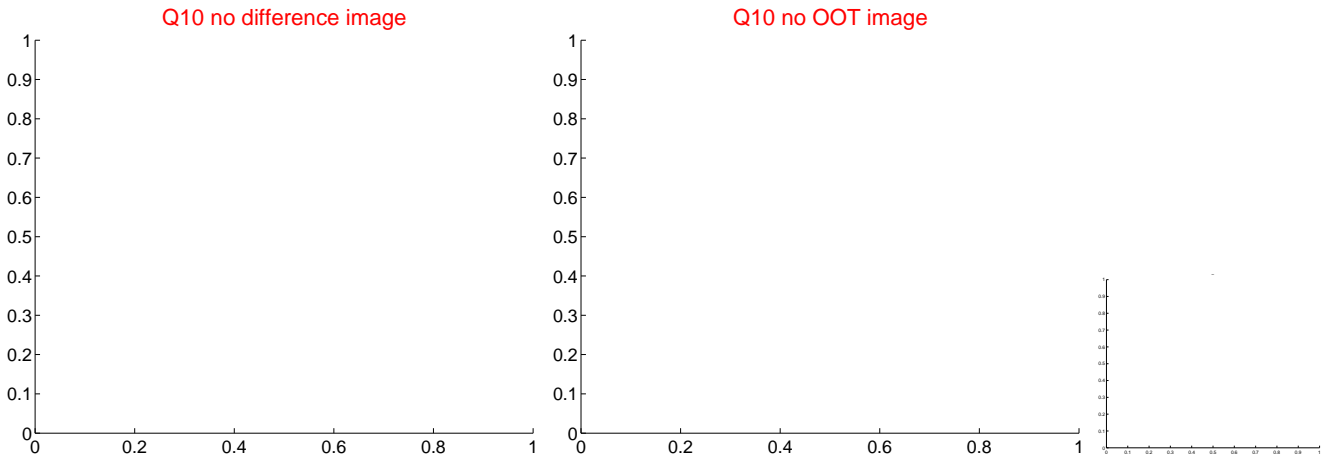
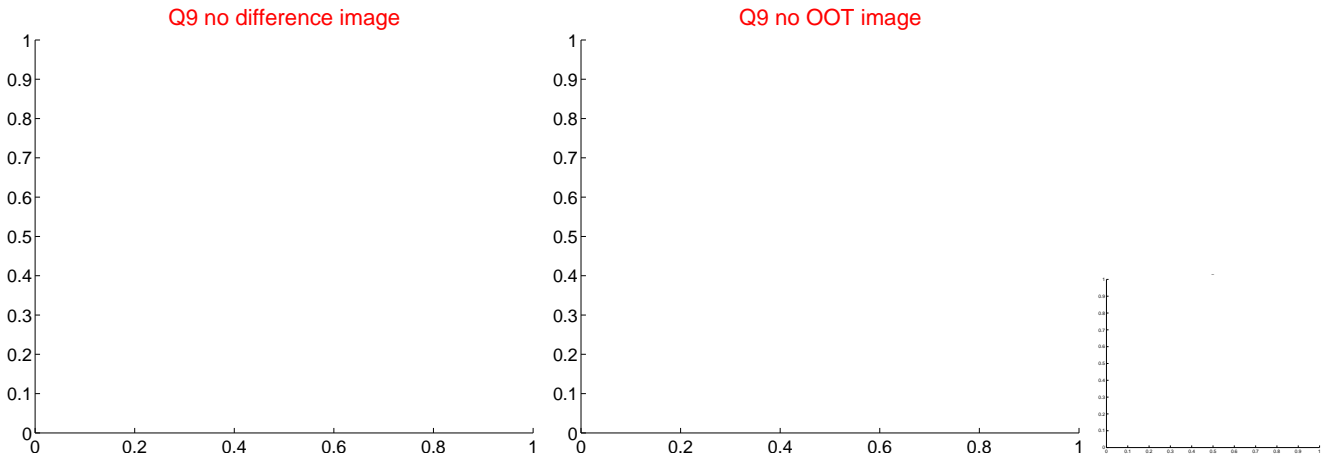
Q8 no difference image



Q8 no OOT image

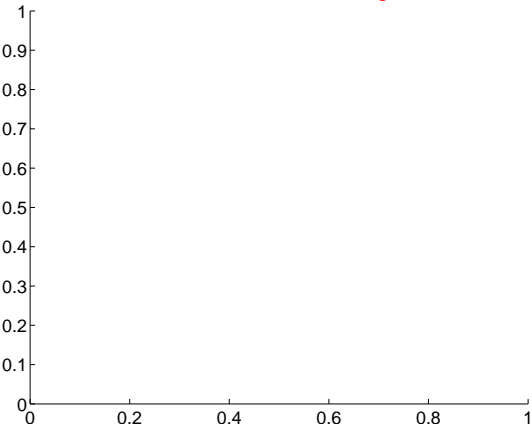


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

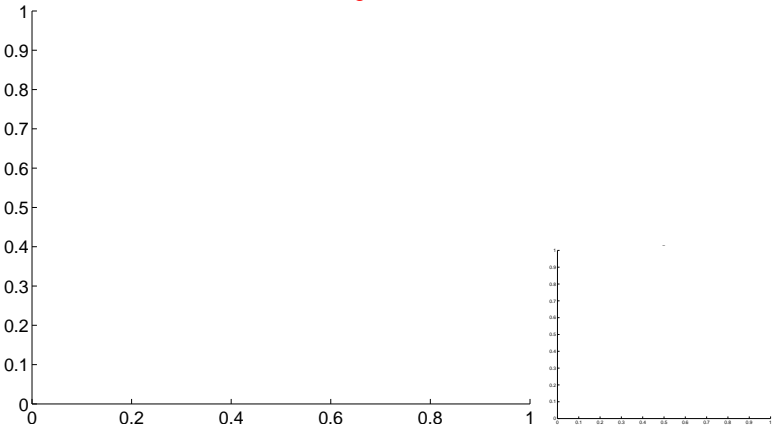


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

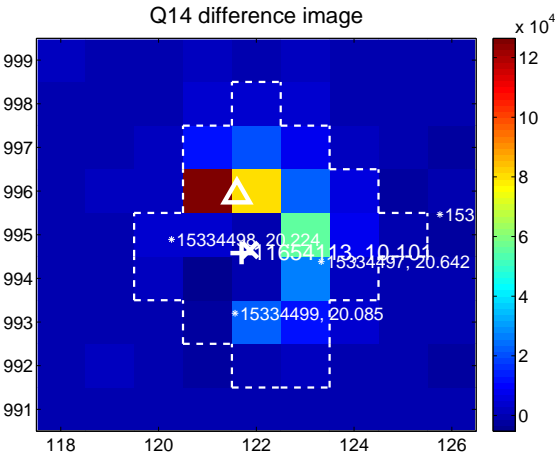
Q13 no difference image



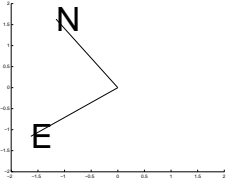
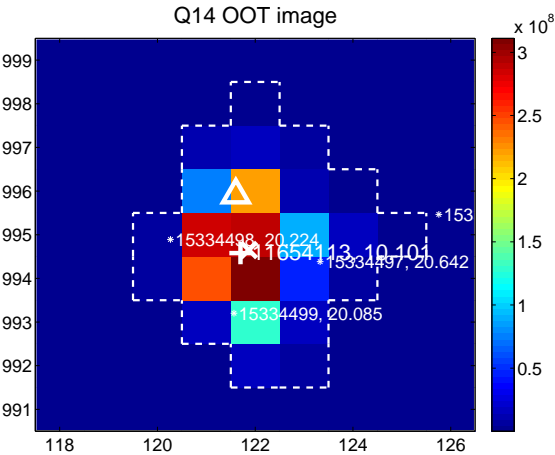
Q13 no OOT image



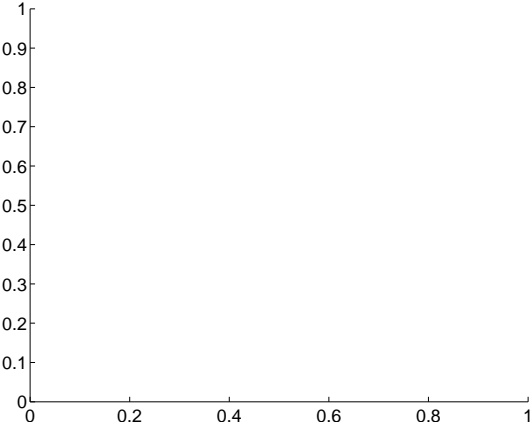
Q14 difference image



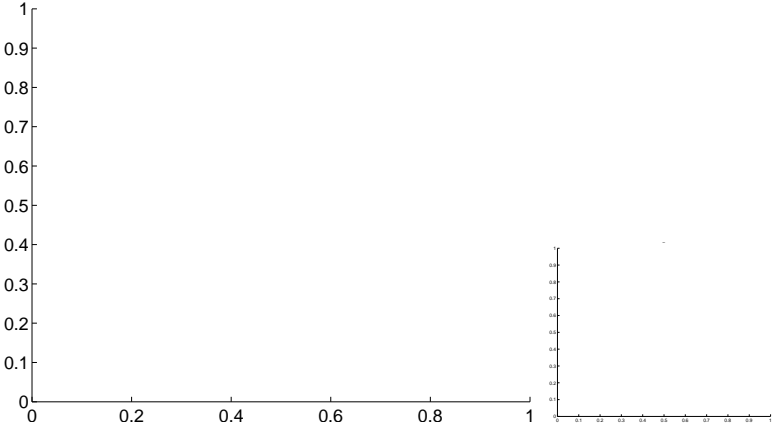
Q14 OOT image



Q15 no difference image



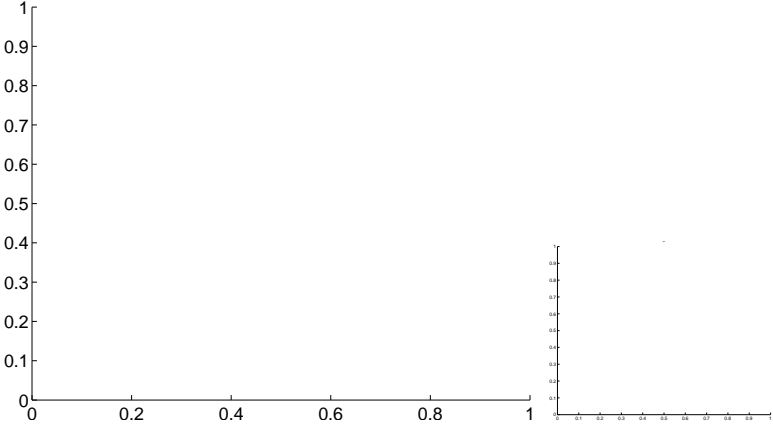
Q15 no OOT image



Q16 no difference image

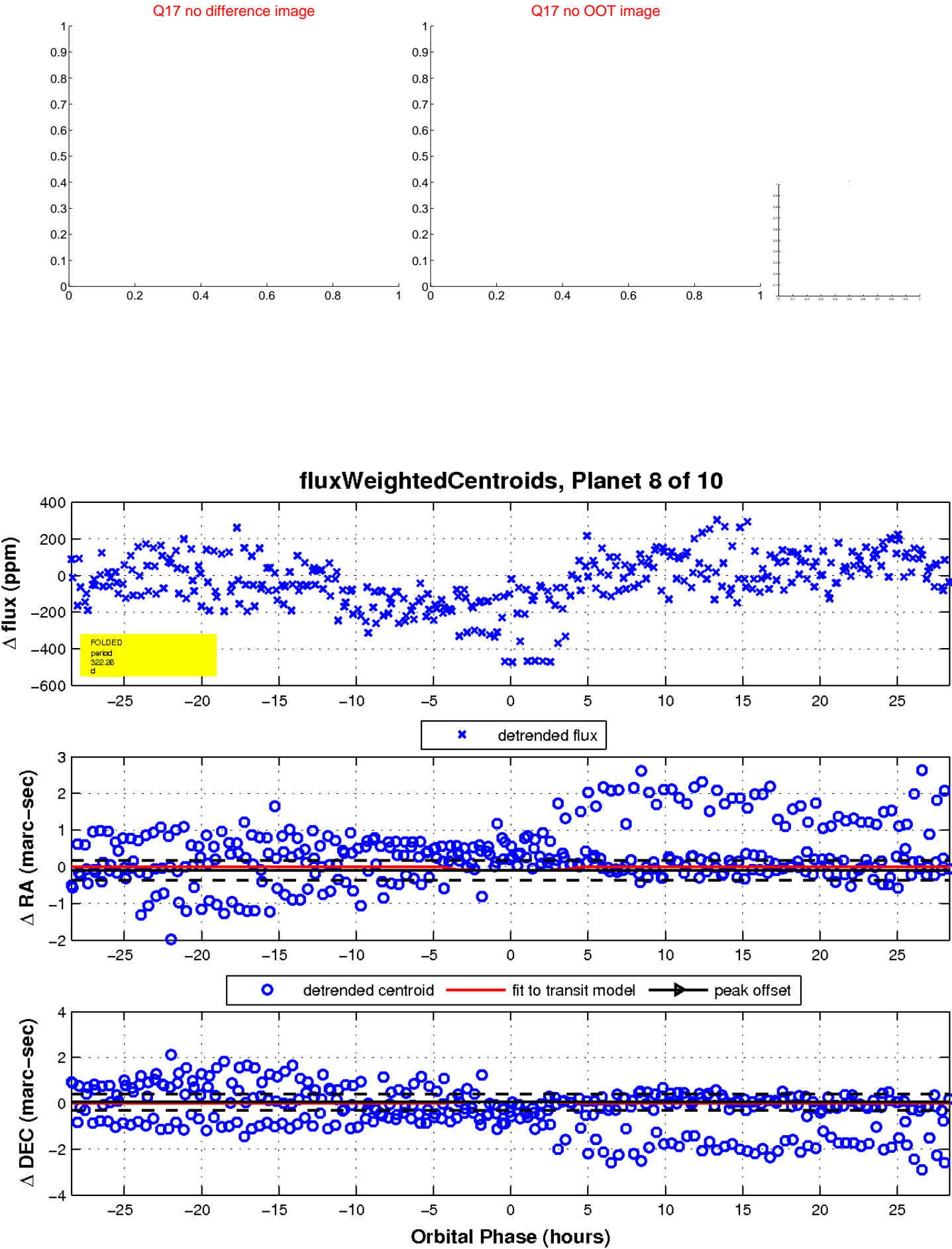


Q16 no OOT image



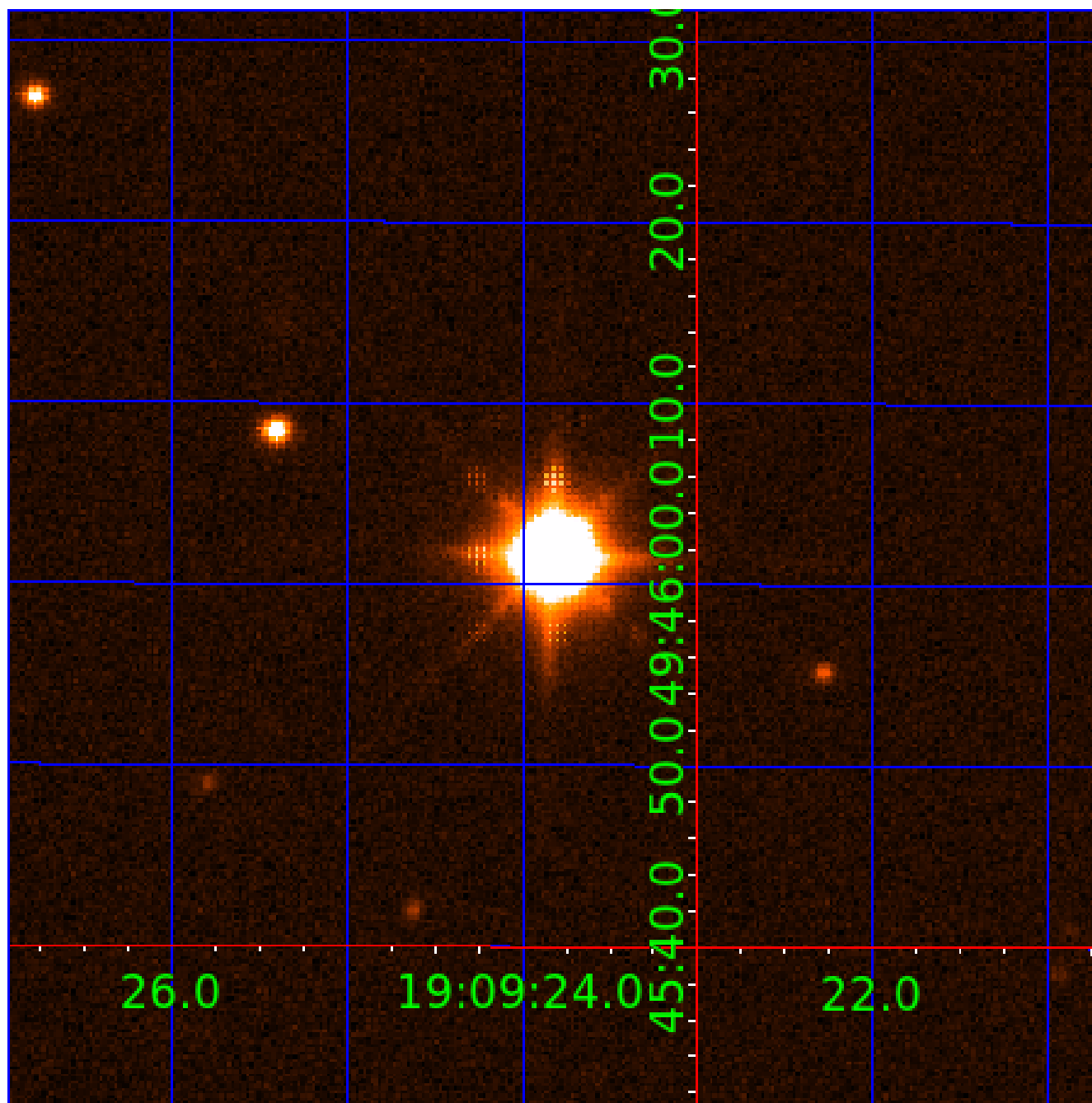


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011654113

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654113-01	OBS	No	4.603252	134.638898	39.1	16.875	10.1	9.6	1.25	6429	0.92	708.64
011654113-04	OBS	No	77.125192	165.031632	135.0	6.443	8.5	8.3	1.25	6429	1.71	16.53
011654113-05	OBS	No	235.731487	210.797346	194.1	4.994	8.3	8.5	1.25	6429	1.99	3.73
011654113-07	OBS	No	129.742351	175.453993	189.2	3.960	8.3	8.0	1.25	6429	1.88	8.26
011654113-08	OBS	No	322.256003	384.322642	269.4	9.485	8.0	8.1	1.25	6429	2.50	2.46
011654113-09	OBS	No	469.585699	343.535747	232.5	8.058	8.0	8.7	1.25	6429	2.51	1.49
011654113-10	OBS	No	222.082184	241.171086	204.5	9.098	8.1	7.6	1.25	6429	2.29	4.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011654113-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
011654113-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—CENT_SATURATED
011654113-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
011654113-07	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
011654113-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
011654113-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011654113-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

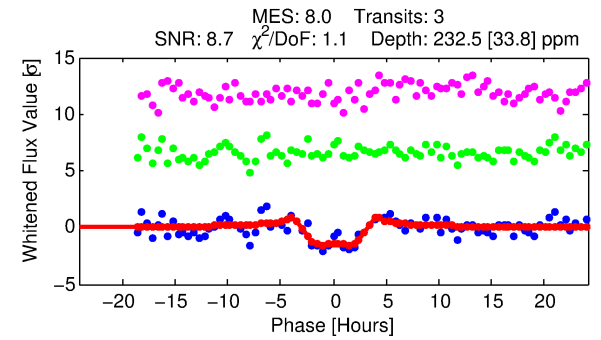
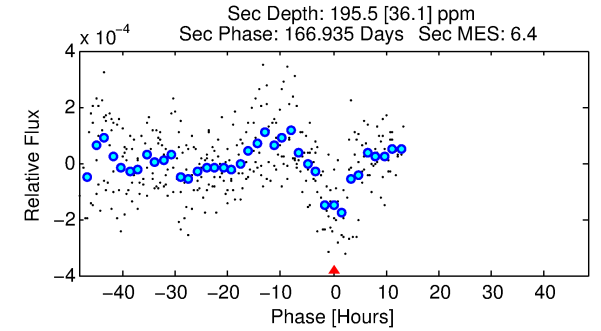
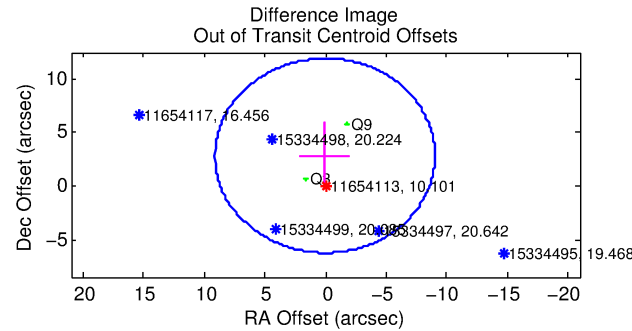
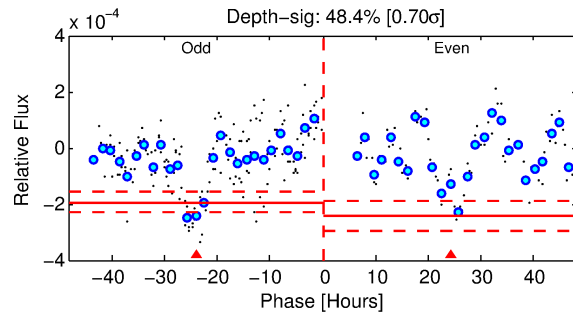
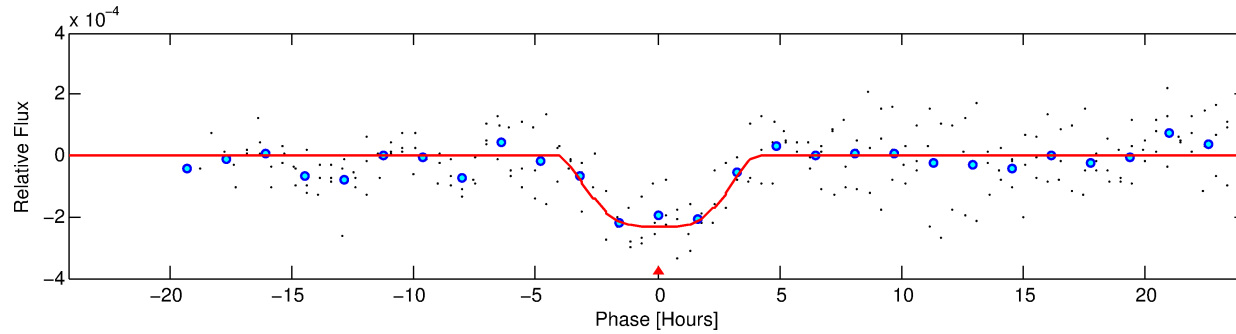
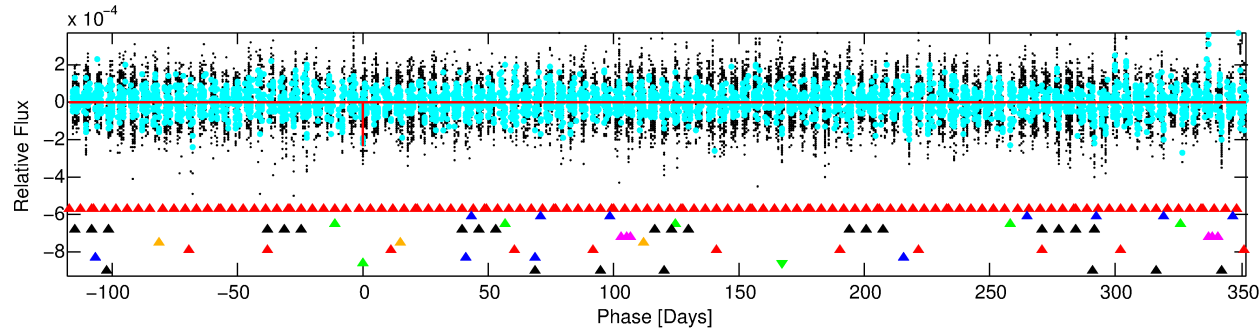
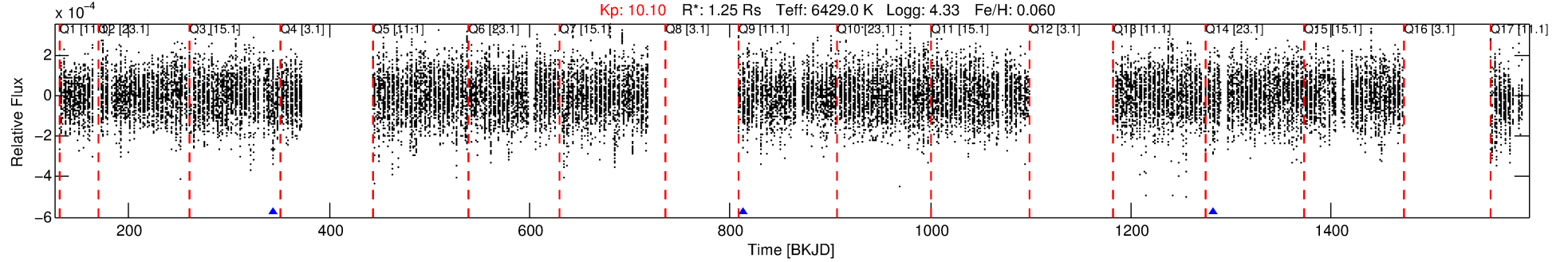
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011654113-09

No Significant Match Found

# DV One-Page Summary

KIC: 11654113 Candidate: 9 of 10 Period: 469.586 d



## DV Fit Results:

Period = 469.58570 [0.00978] d  
Epoch = 343.5357 [0.0128] BKJD  
 $R_p/R^* = 0.0184$  [0.0015]  
 $a/R^* = 128.94$  [17.77]  
 $b = 0.98$  [0.01]  
 $\text{Seff} = 1.49$  [0.65]  
 $T_{\text{eq}} = 282$  [31] K  
 $R_p = 2.51$  [0.90]  $R_{\text{e}}$   
 $a = 1.2673$  [0.3632] AU  
 $A_g = 27326.63$  [13034.35] [2.10 $\sigma$ ]  
 $T_{\text{eff}} = 5597$  [409] K [12.95 $\sigma$ ]

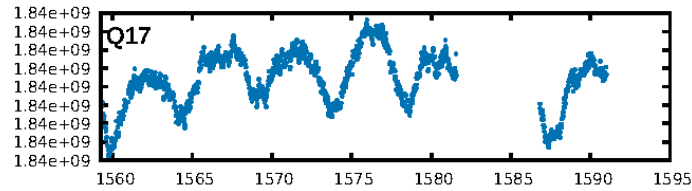
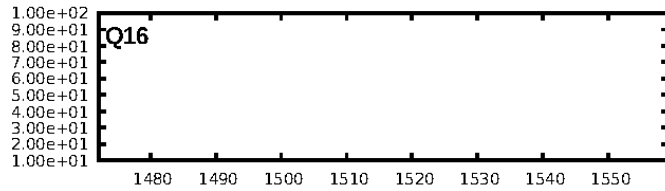
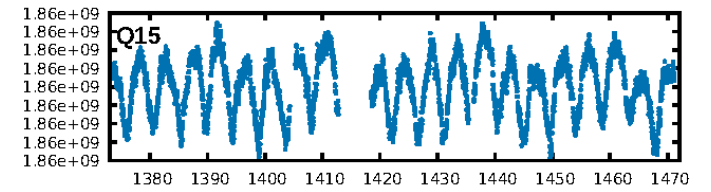
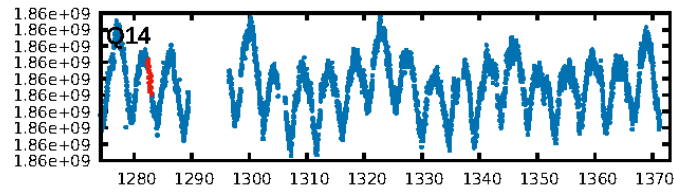
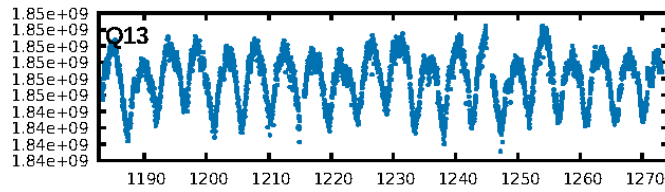
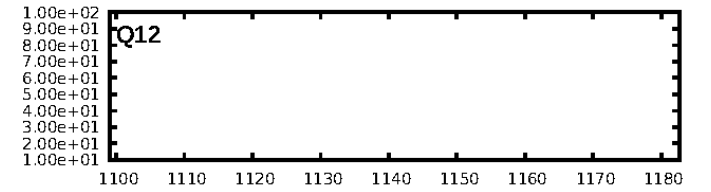
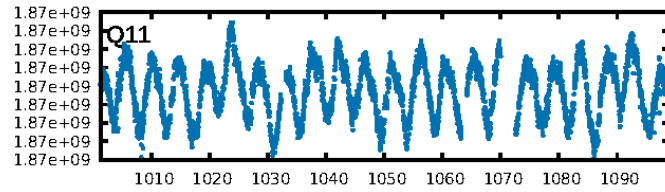
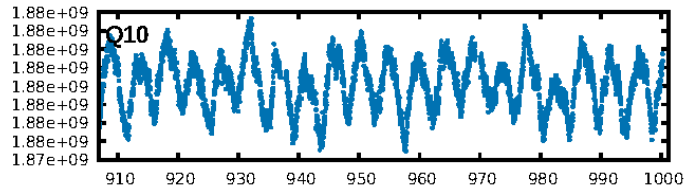
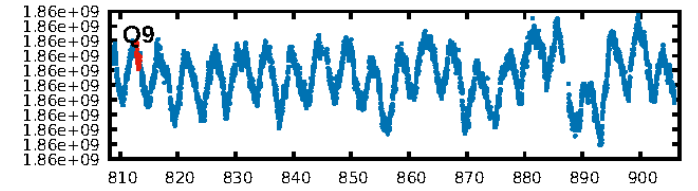
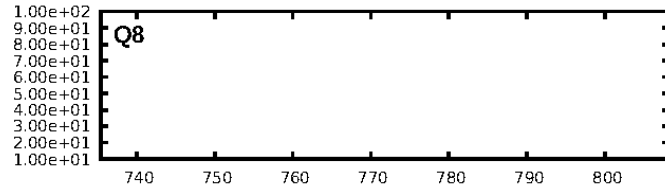
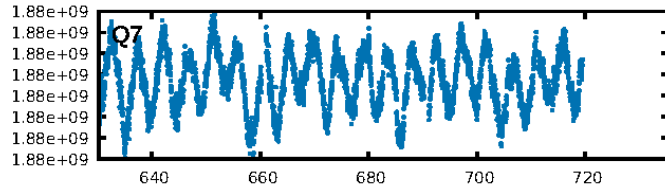
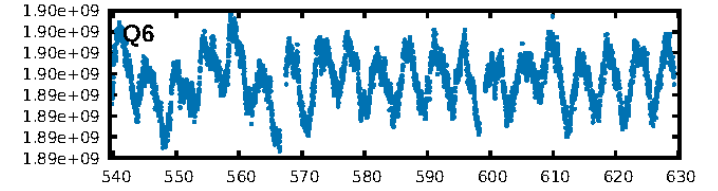
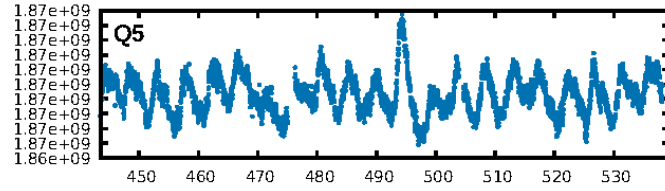
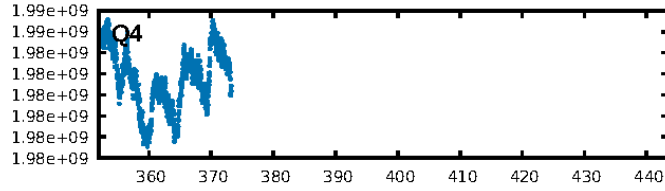
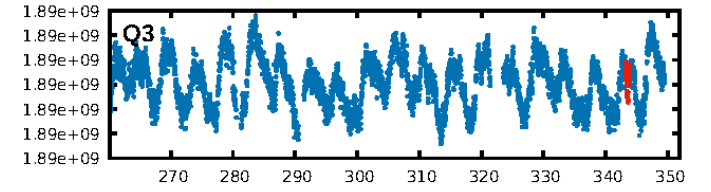
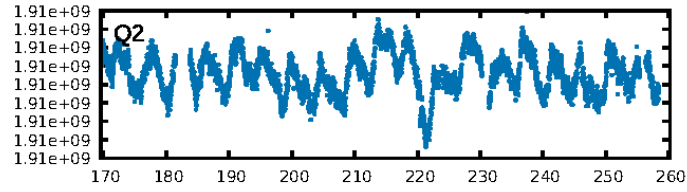
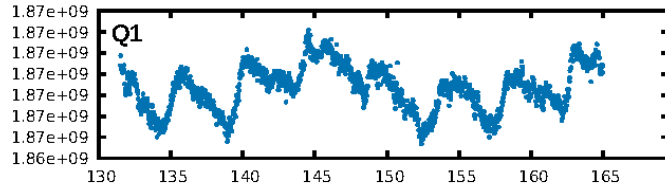
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [284.11 $\sigma$ ]  
LongPeriod-sig: 100.0% [177.80 $\sigma$ ]  
ModelChiSquare2-sig: 66.1%  
ModelChiSquareGof-sig: 98.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.3534**  
**Centroid-sig: 0.1%**  
Centroid-so: 2.884 arcsec [2.16 $\sigma$ ]  
OotOffset-rm: 2.836 arcsec [0.94 $\sigma$ ]  
KicOffset-rm: 2.883 arcsec [1.09 $\sigma$ ]  
OotOffset-st: 0/1/0/1 [2]  
KicOffset-st: 0/1/0/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [2/2]

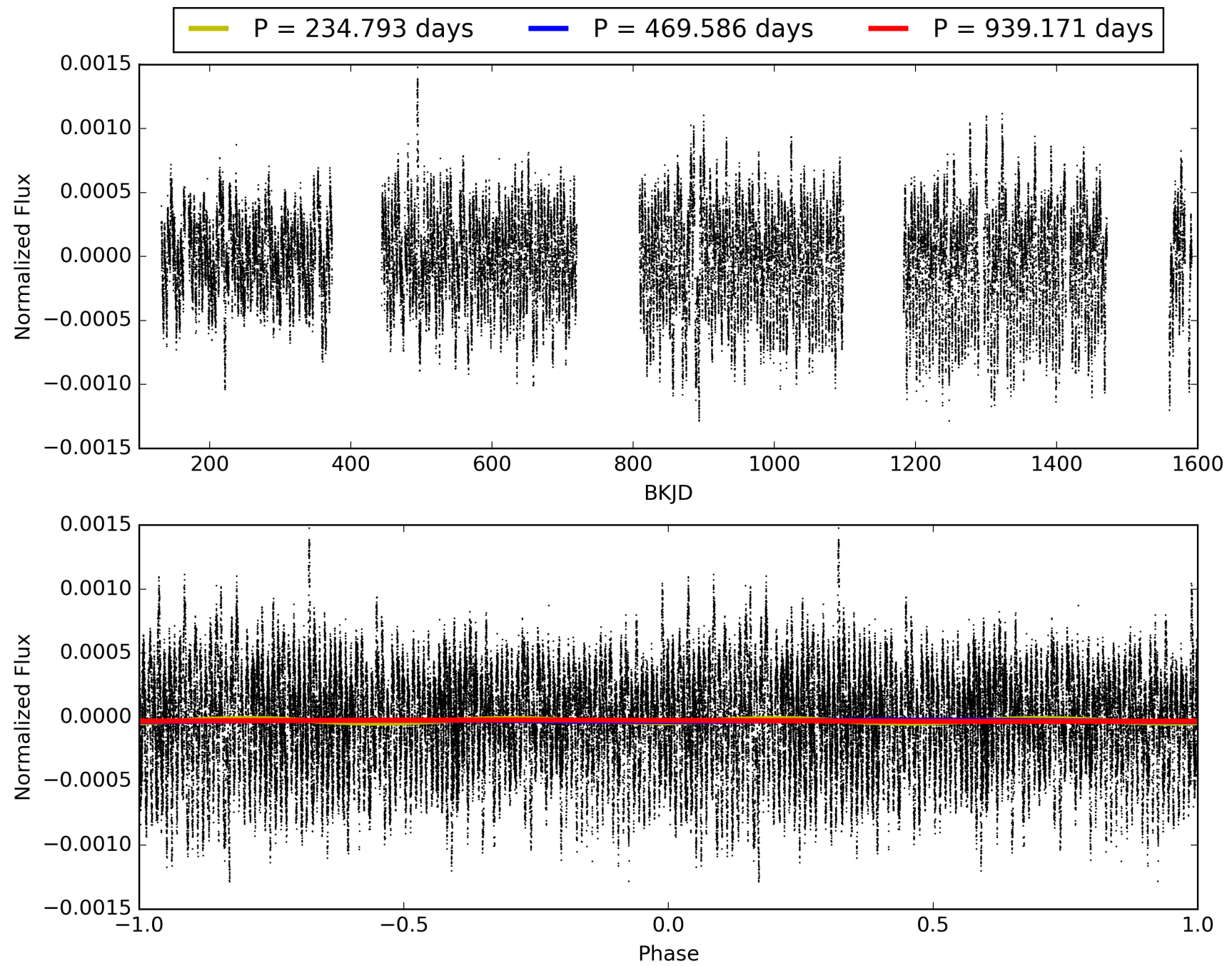
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:35:07 Z

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

# TCE 011654113-09, PDC Light Curves

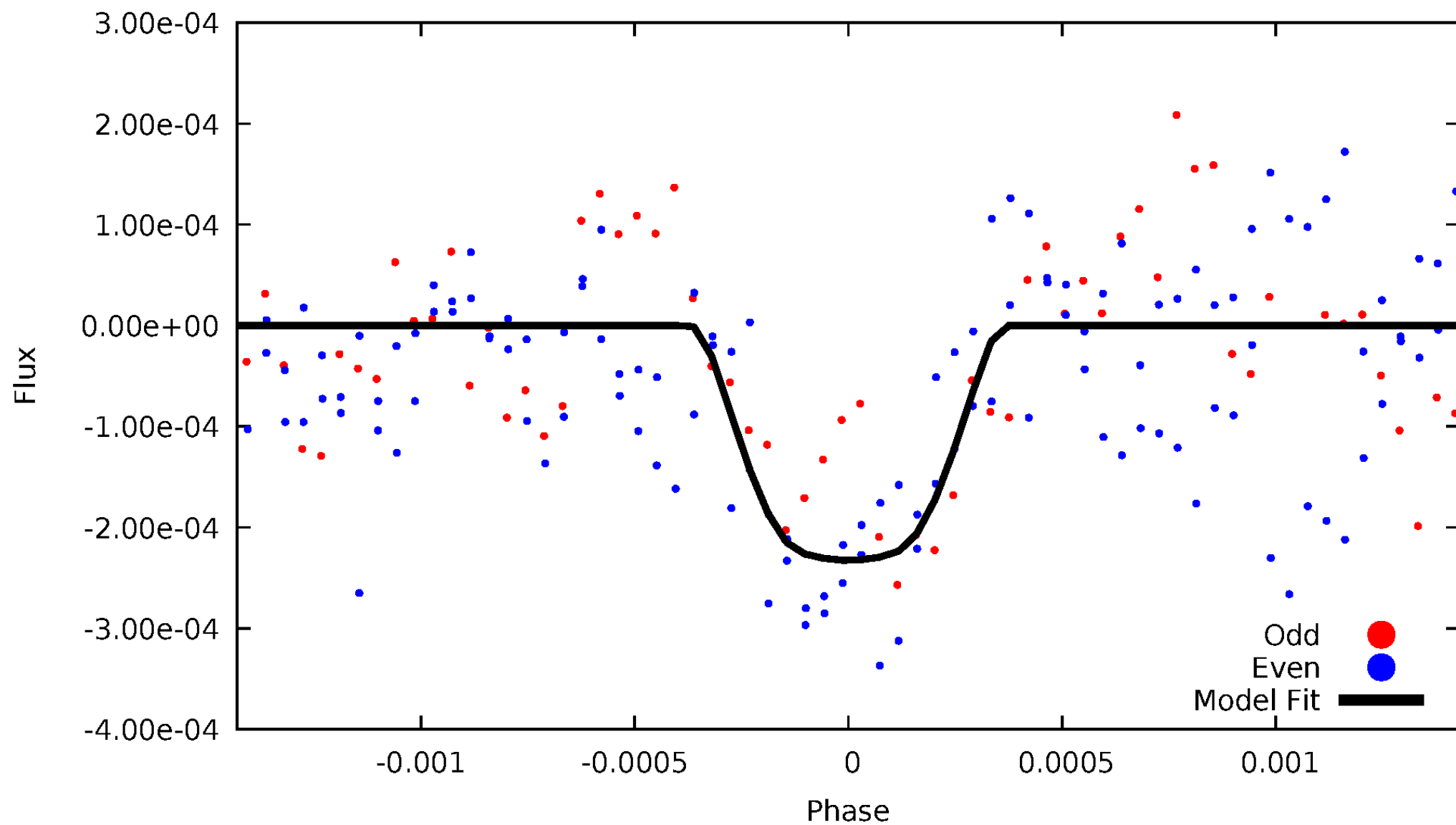


TCE 011654113-09



# DV Odd/Even

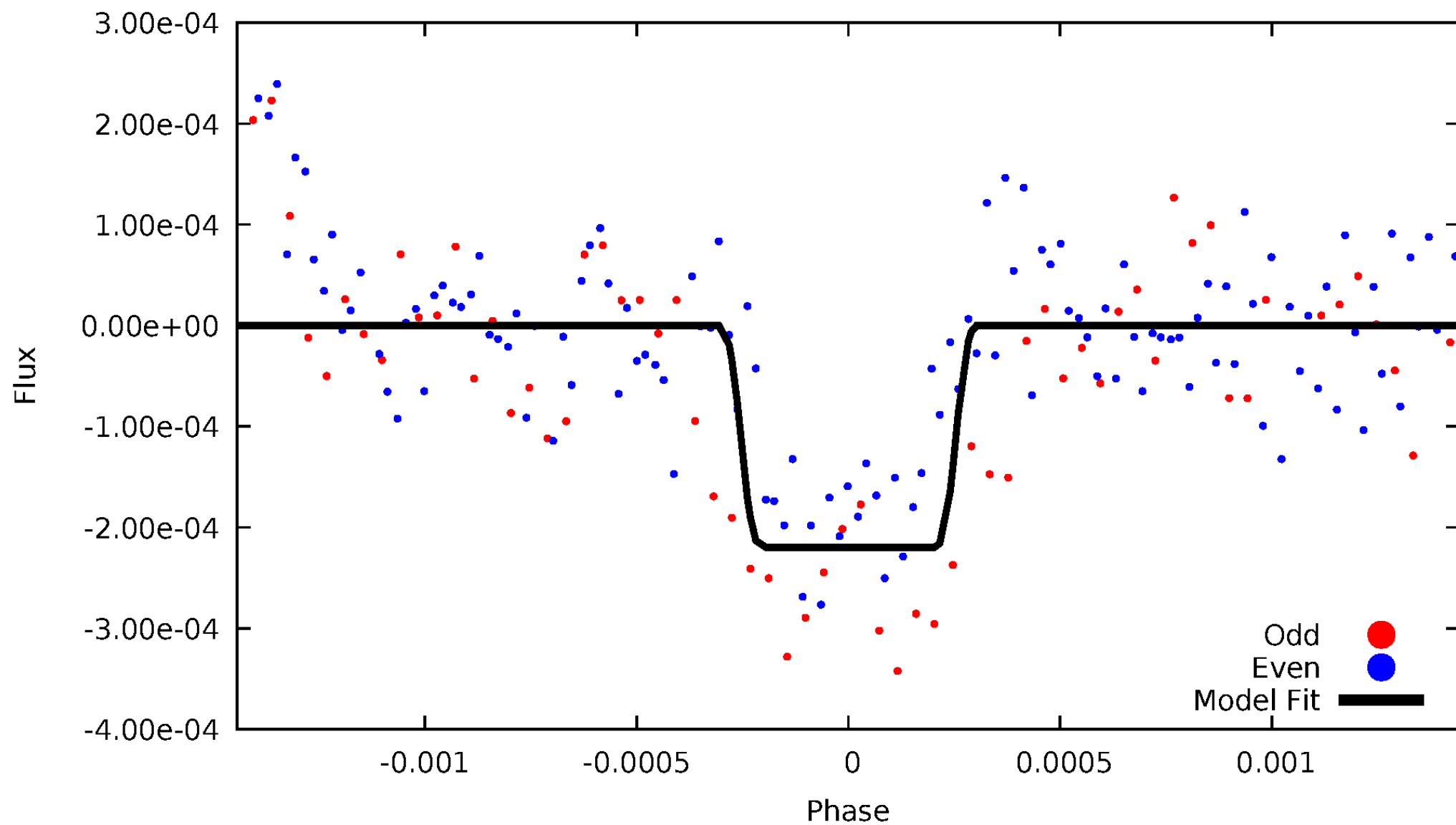
TCE 011654113-09





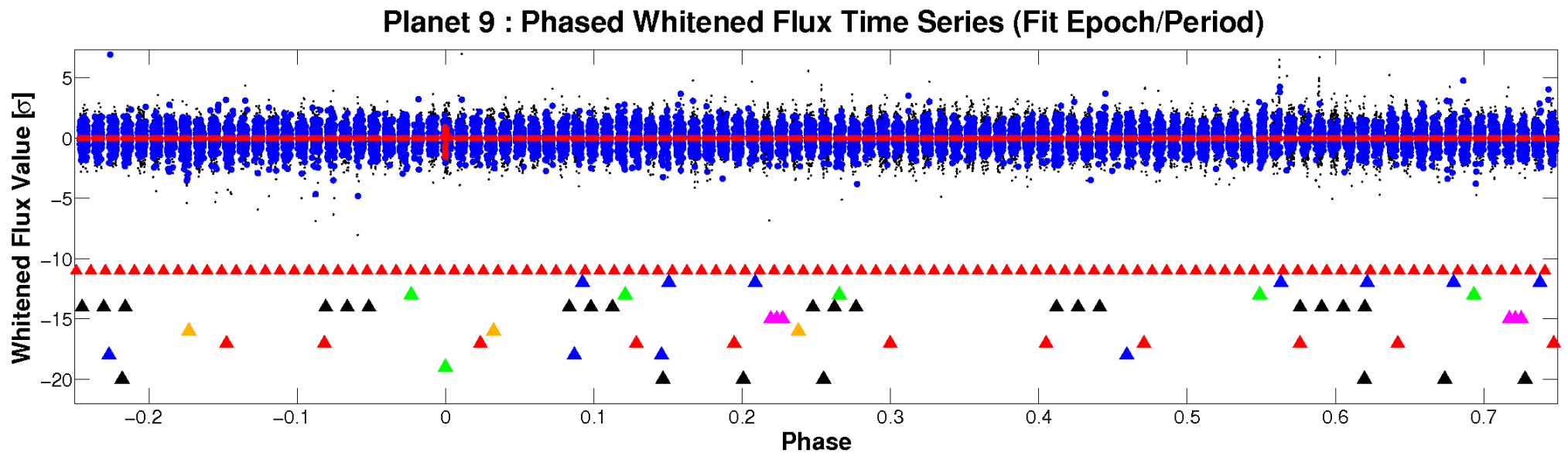
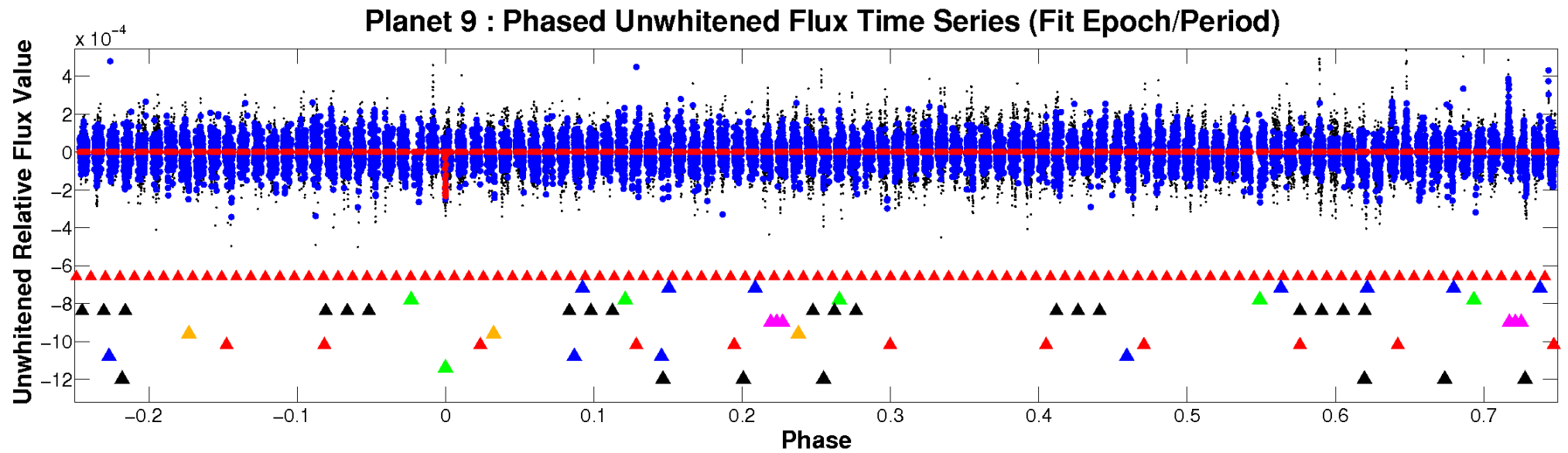
# ALT Odd/Even

TCE 011654113-09



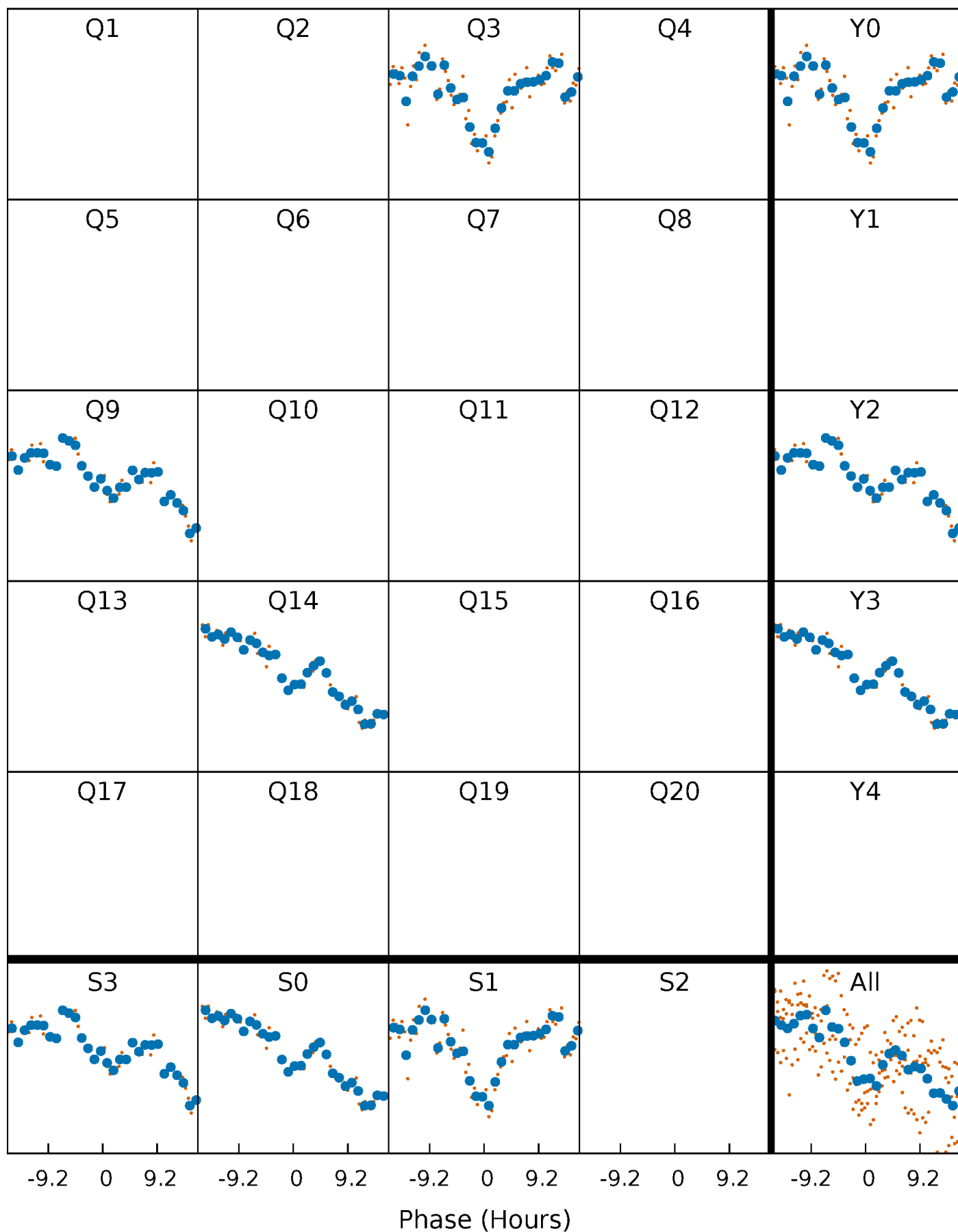


# Non-Whitened Vs. Whitened Light Curve



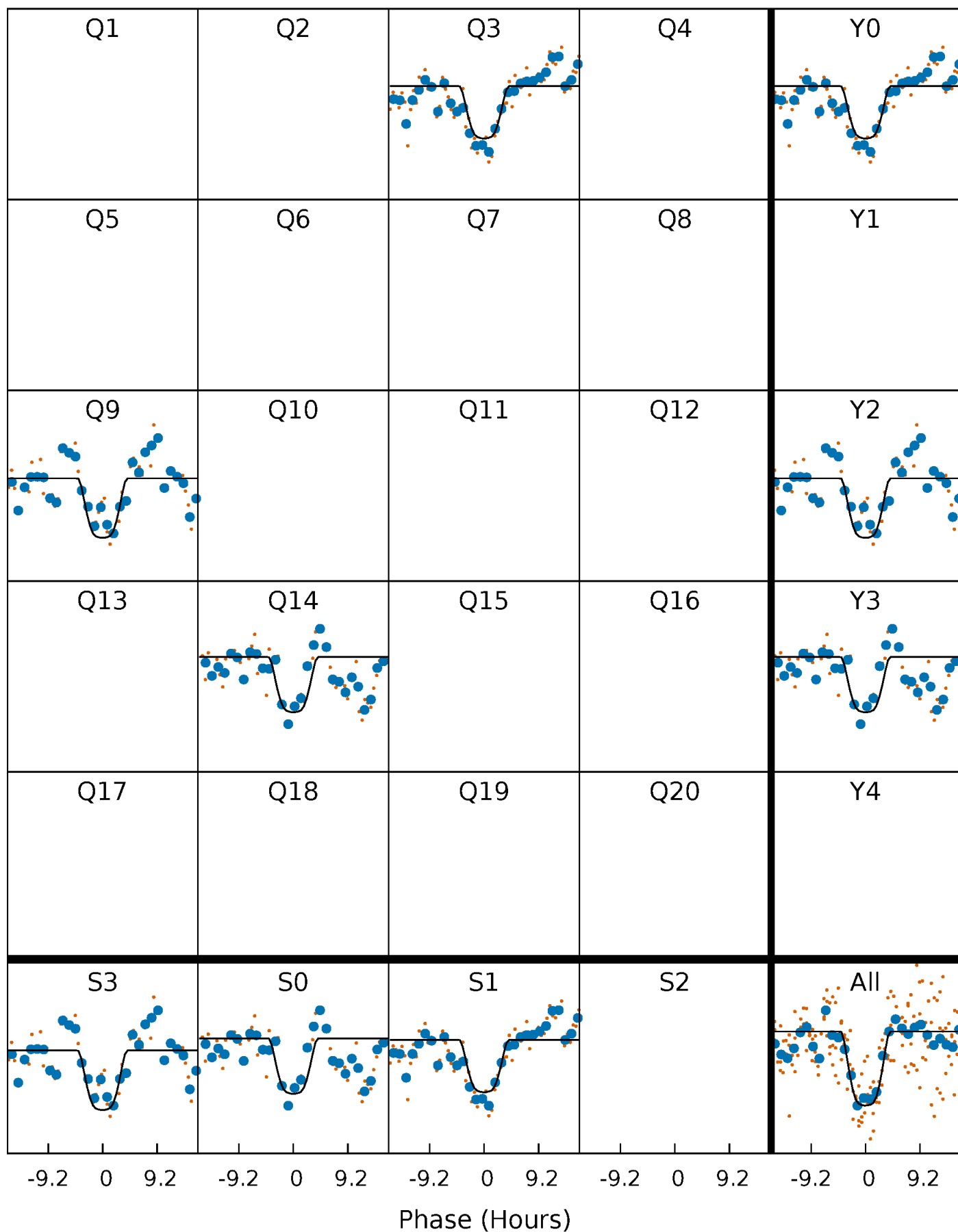
# PDC Quarter-Phased Transit Curves

TCE 011654113-09     $P=469.585699$  Days     $T_0=343.535747$  (BKJD)



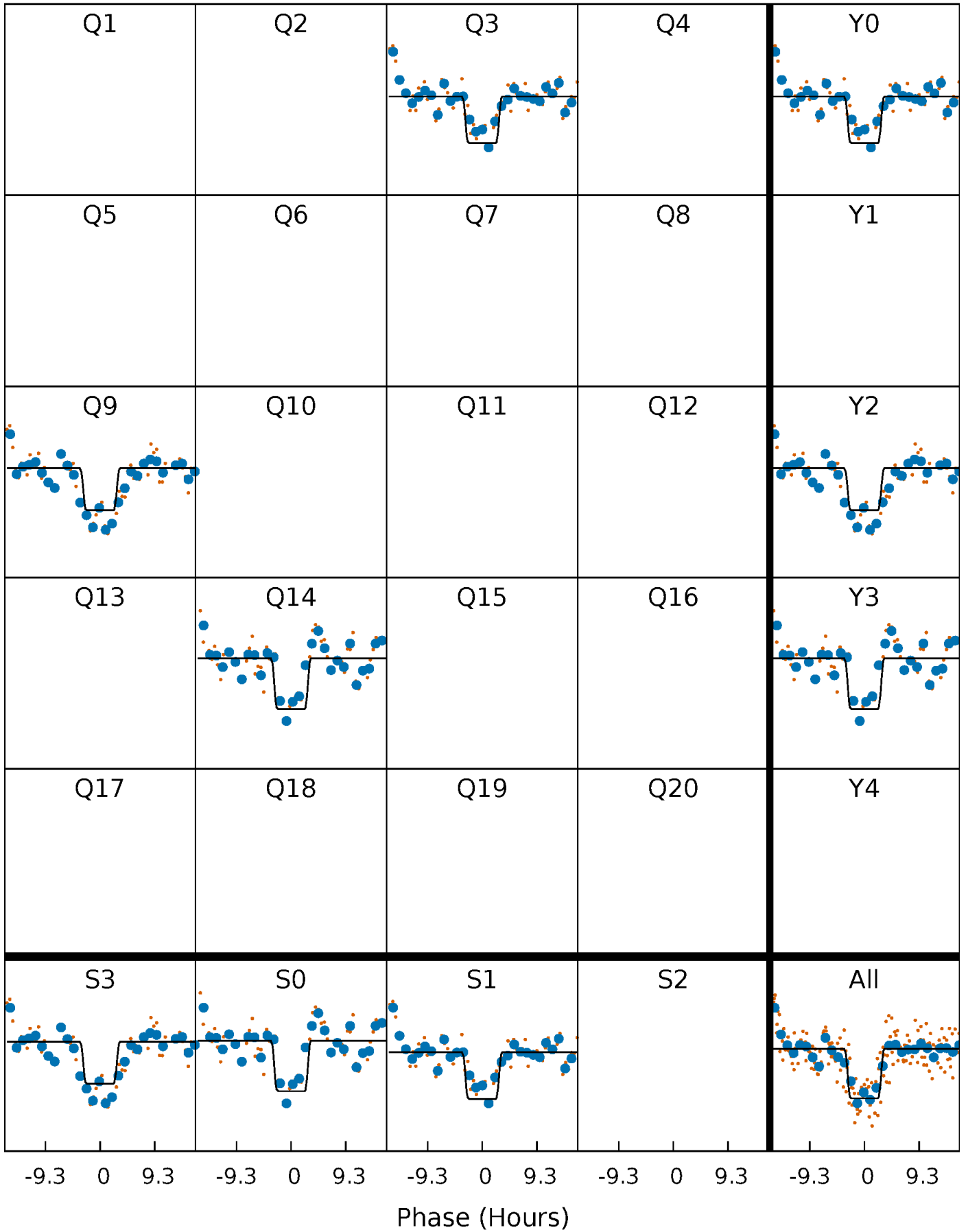
# DV Quarter-Phased Transit Curves

TCE 011654113-09     $P=469.585699$  Days     $T_0=343.535747$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

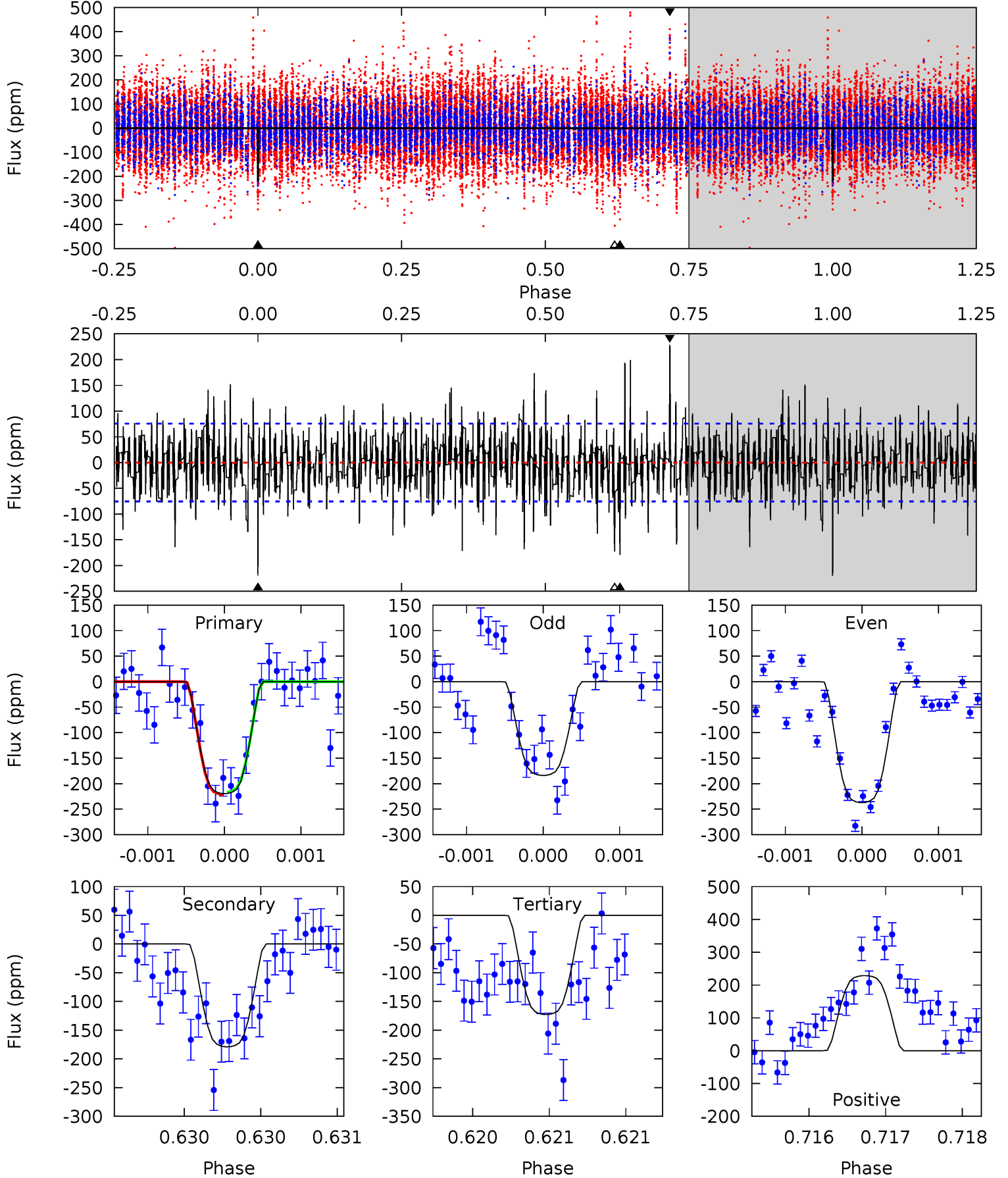
TCE 011654113-09     $P=469.590454$  Days     $T_0=343.530174$  (BKJD)



# DV Model-Shift Uniqueness Test

011654113-09, P = 469.585699 Days, E = 343.535747 Days

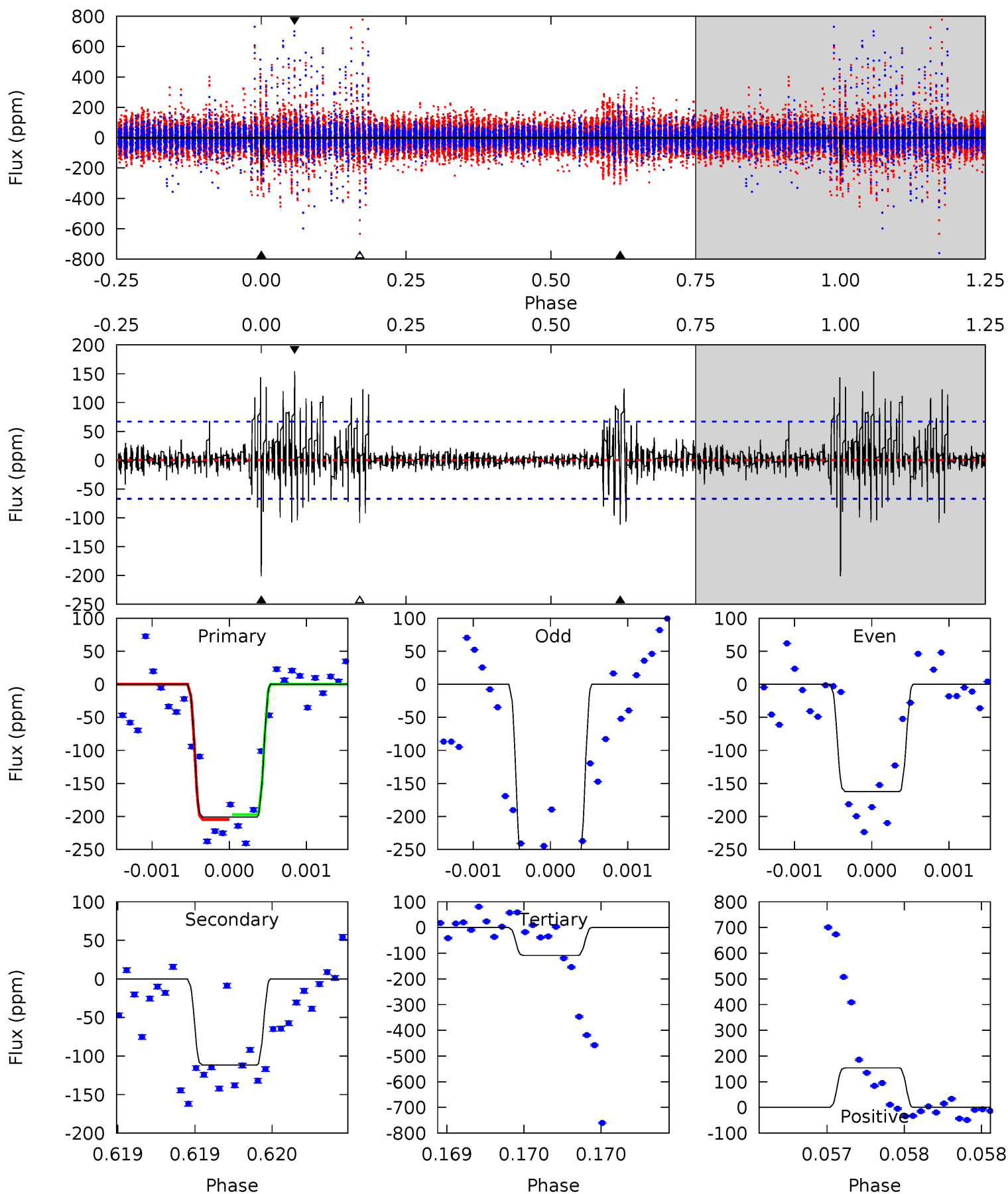
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	13.0	12.6	16.6	5.50	3.37	3.46	3.40	-0.67	0.45	-3.62	1.76	1.12	0.51	0.17



# Alt Model-Shift Uniqueness Test

011654113-09, P = 469.590454 Days, E = 343.530174 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
16.6	9.25	8.99	12.8	5.55	3.45	1.56	7.64	3.88	0.25	-3.50	4.28	1.21	0.43	0.30



### Stellar Parameters For KIC 011654113

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6429^{+179}_{-246}$	$4.335^{+0.072}_{-0.217}$	$0.060^{+0.250}_{-0.350}$	$1.249^{+0.437}_{-0.175}$	$1.231^{+0.180}_{-0.180}$	$0.890^{+0.352}_{-0.483}$
	+3%/-4%	+2%/-5%	+417%/-583%	+35%/-14%	+15%/-15%	+40%/-54%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011654113-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-179 \pm 14$	$2.61^{+0.51}_{-0.34}$	$401^{+31}_{-22}$	$5476^{+324}_{-286}$	$22855^{+7026}_{-6472}$
Alt.	$-112 \pm 12$	$2.10^{+0.40}_{-0.31}$	$400^{+35}_{-23}$	$5438^{+344}_{-324}$	$21818^{+7615}_{-6309}$

$T_{max}$  = 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

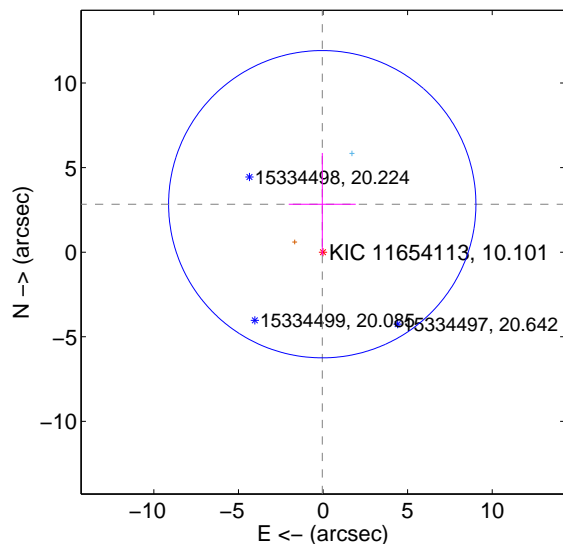
Supplemental centroid analysis for 011654113-09. **Kepler magnitude: 10.10.** Transit SNR 8.72

**There are 1 quarters with good PRF difference image offsets**

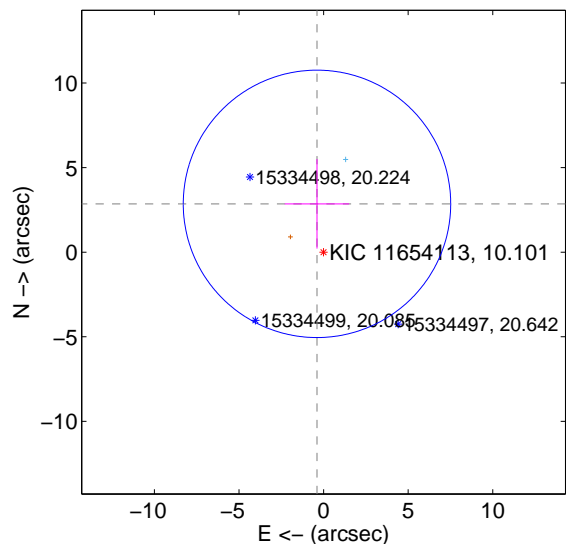
The direct PRF centroid is offset from the target star catalog position by about 0.54 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.836 \pm 3.028$	0.94	$0.046 \pm 1.978$	$2.836 \pm 3.028$
PRF-fit source offset from KIC position	$2.883 \pm 2.635$	1.09	$0.390 \pm 1.905$	$2.857 \pm 2.646$
photometric centroid source offset	$2.88 \pm 1.33$	2.16	$1.67 \pm 0.95$	$-2.35 \pm 1.49$

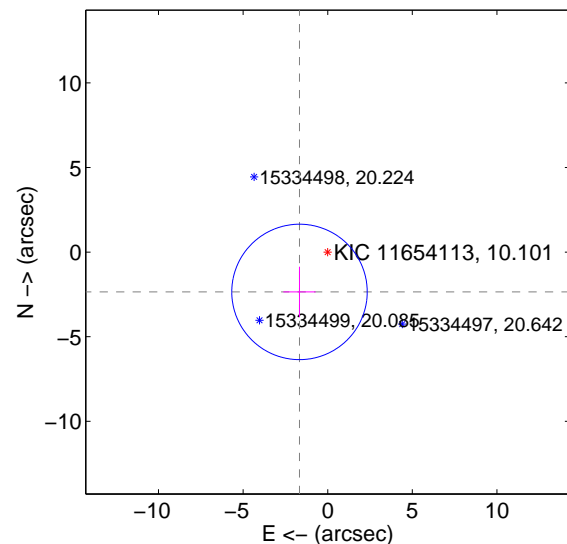
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



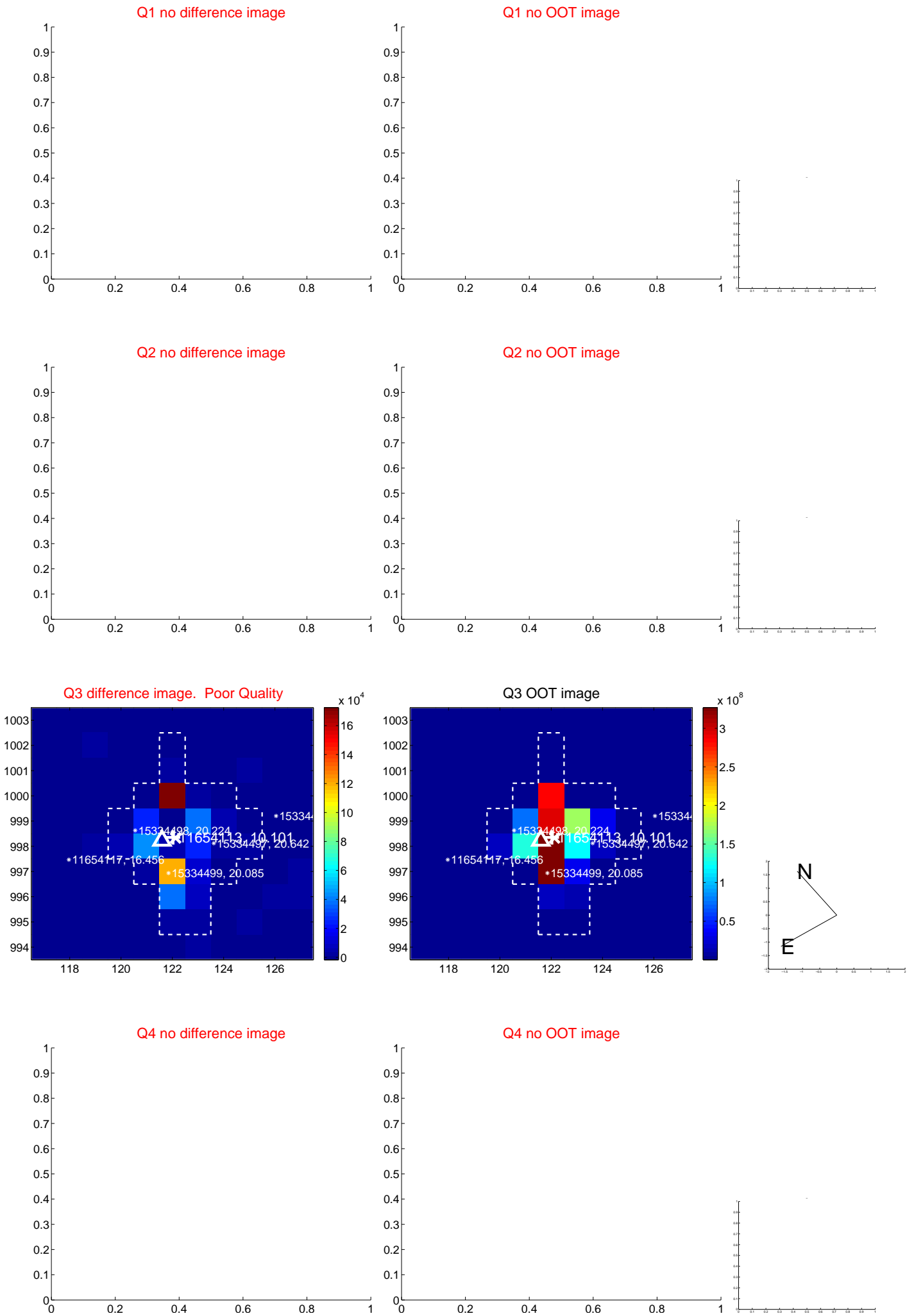
offset from photometric centroids



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



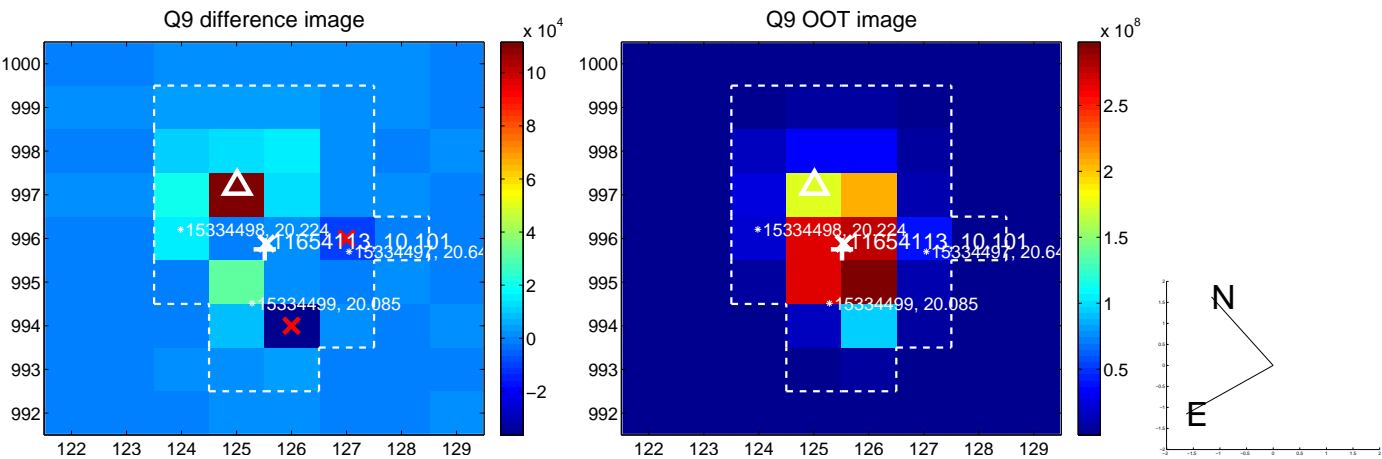
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



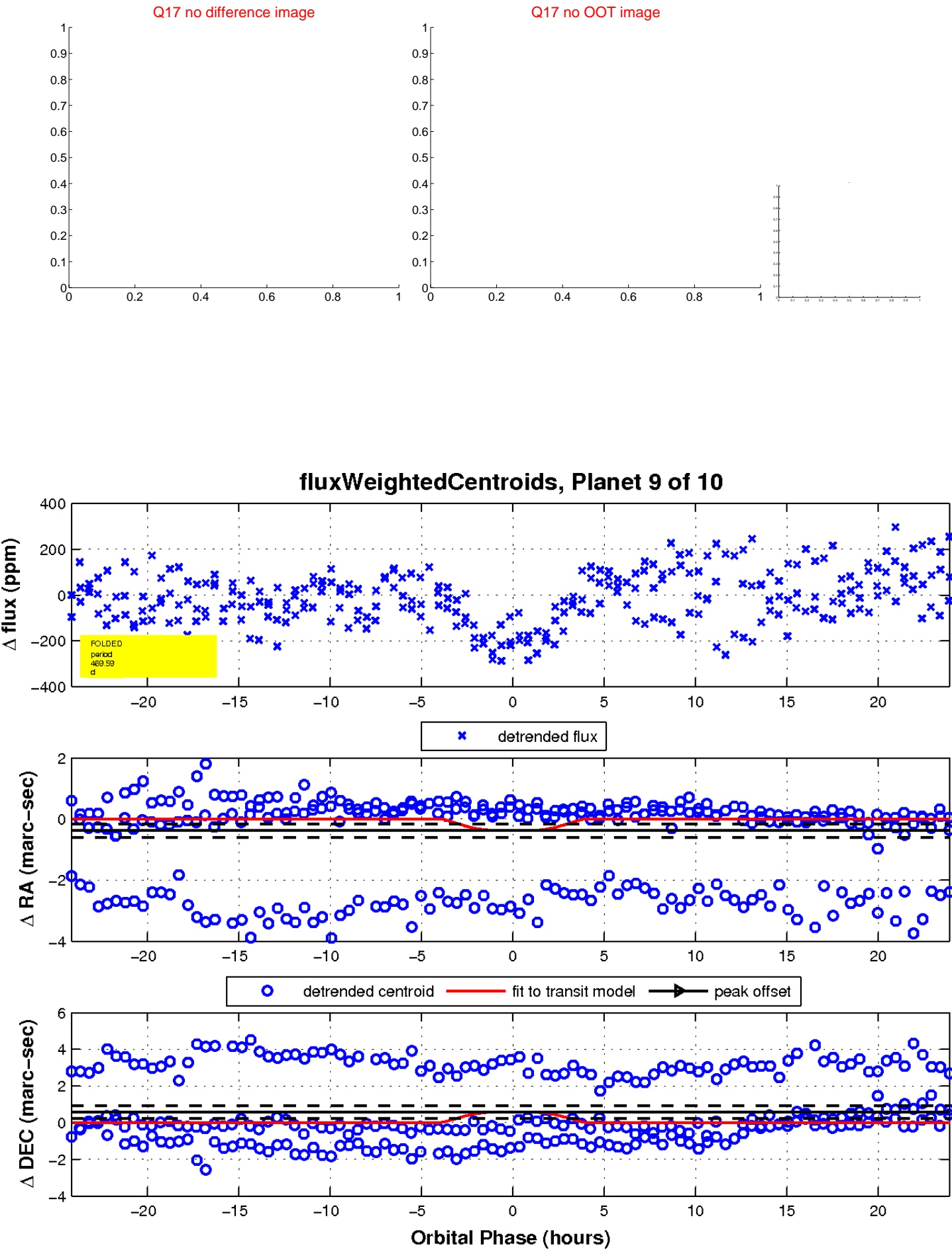
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

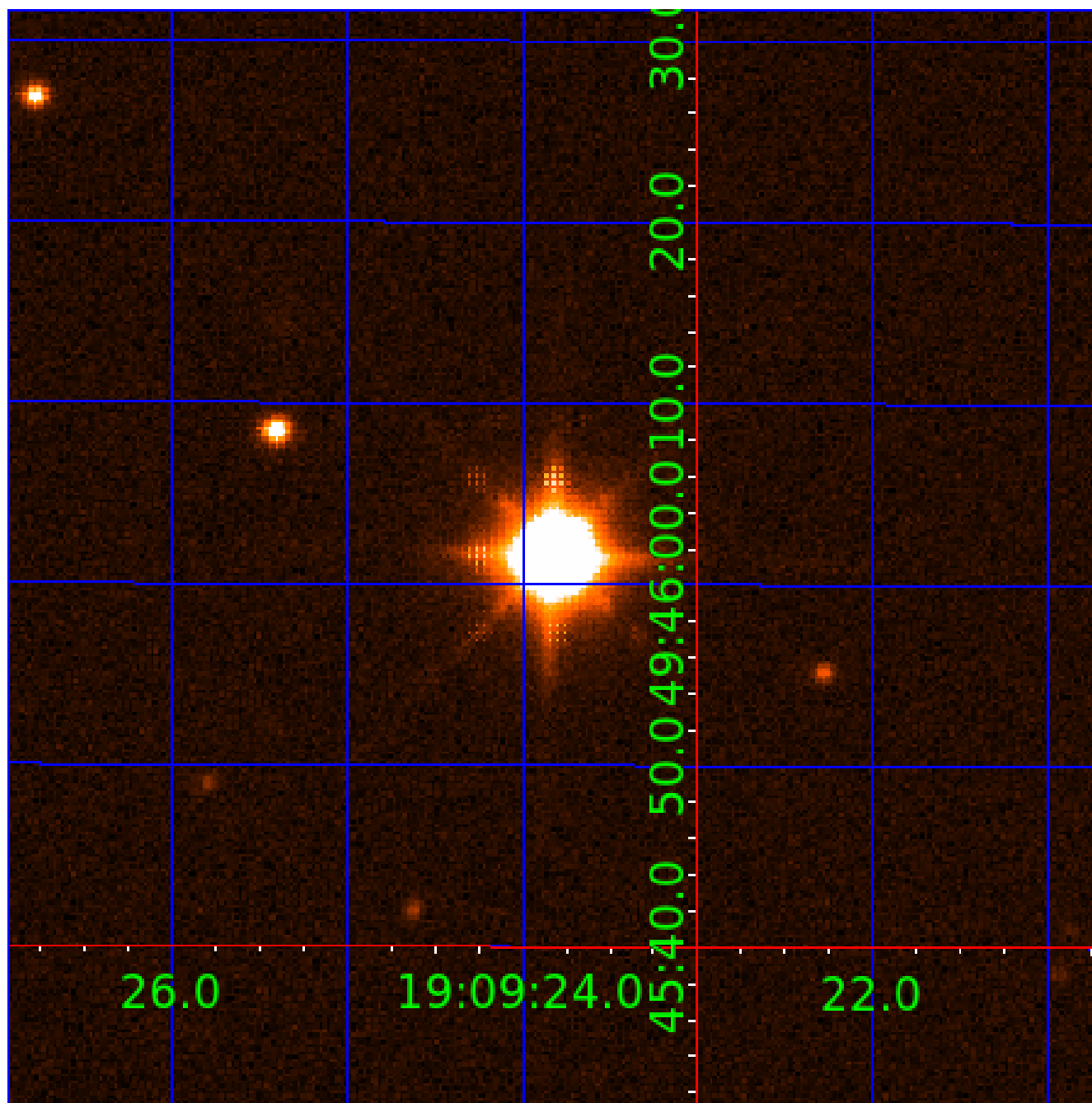


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011654113

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654113-01	OBS	No	4.603252	134.638898	39.1	16.875	10.1	9.6	1.25	6429	0.92	708.64
011654113-04	OBS	No	77.125192	165.031632	135.0	6.443	8.5	8.3	1.25	6429	1.71	16.53
011654113-05	OBS	No	235.731487	210.797346	194.1	4.994	8.3	8.5	1.25	6429	1.99	3.73
011654113-07	OBS	No	129.742351	175.453993	189.2	3.960	8.3	8.0	1.25	6429	1.88	8.26
011654113-08	OBS	No	322.256003	384.322642	269.4	9.485	8.0	8.1	1.25	6429	2.50	2.46
011654113-09	OBS	No	469.585699	343.535747	232.5	8.058	8.0	8.7	1.25	6429	2.51	1.49
011654113-10	OBS	No	222.082184	241.171086	204.5	9.098	8.1	7.6	1.25	6429	2.29	4.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011654113-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
011654113-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—CENT_SATURATED
011654113-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
011654113-07	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
011654113-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
011654113-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011654113-10	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

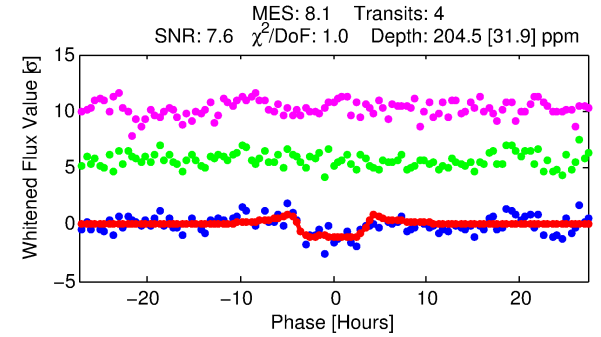
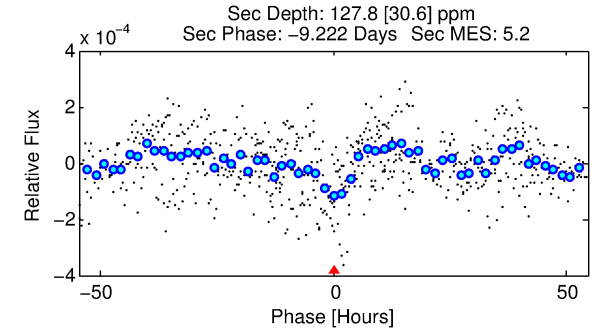
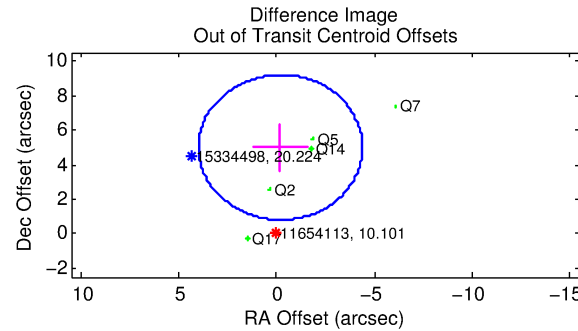
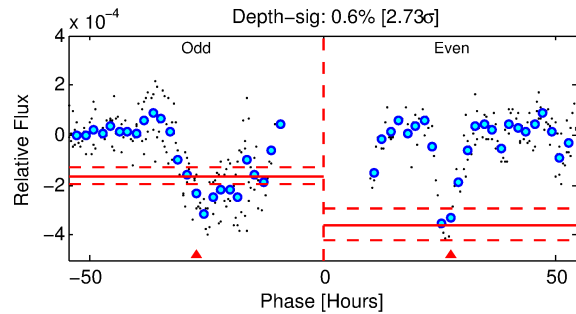
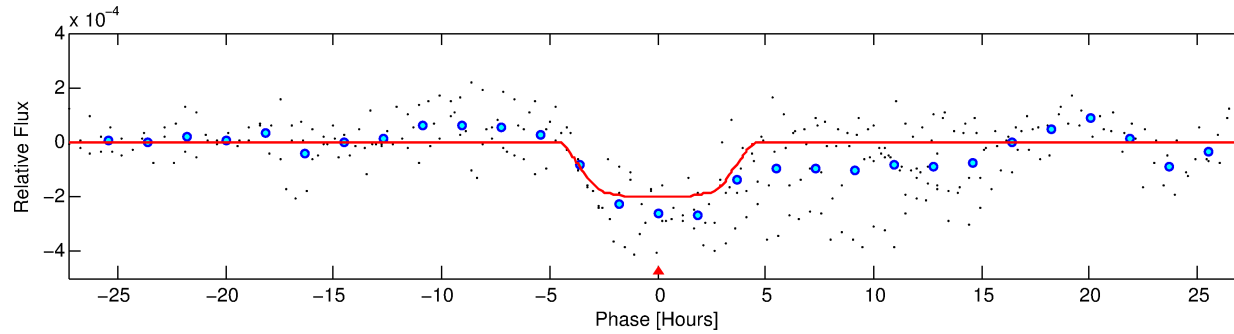
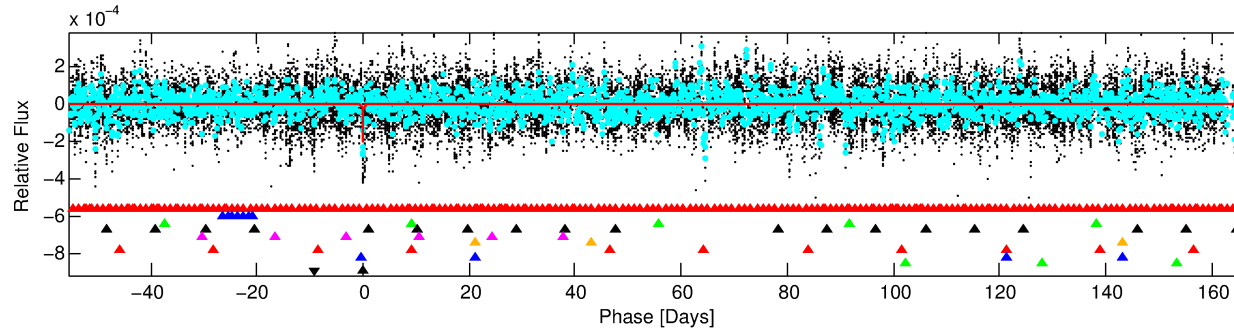
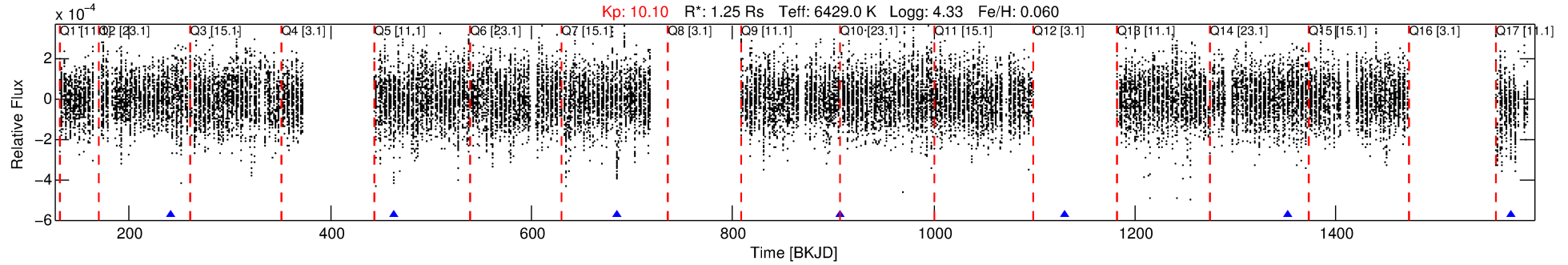
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011654113-10

No Significant Match Found

# DV One-Page Summary

KIC: 11654113 Candidate: 10 of 10 Period: 222.082 d



## DV Fit Results:

Period = 222.08218 [0.00372] d  
Epoch = 241.1711 [0.0154] BKJD  
Rp/R\* = 0.0168 [0.0015]  
a/R\* = 58.88 [10.80]  
b = 0.97 [0.01]  
Seff = 4.03 [1.75]  
Teq = 361 [39] K  
Rp = 2.29 [0.83] Re  
a = 0.7693 [0.2205] AU  
Ag = 7937.28 [4006.53] [1.98σ]  
Teffp = 5274 [443] K [11.05σ]

## DV Diagnostic Results:

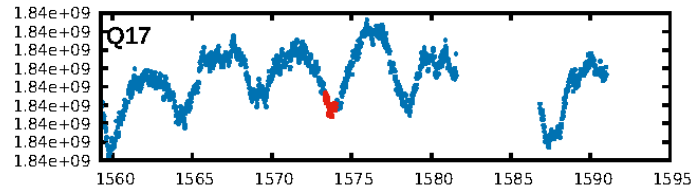
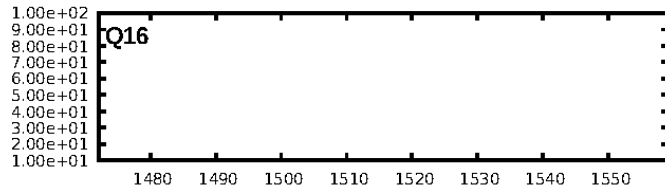
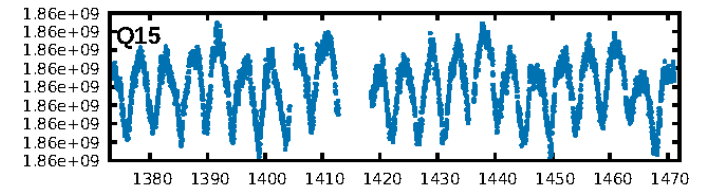
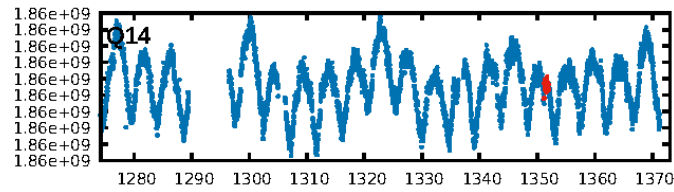
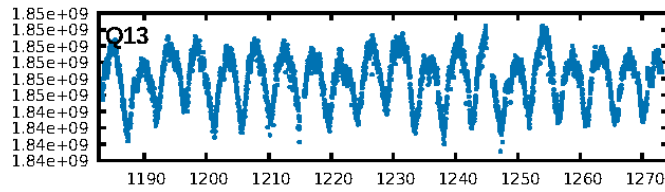
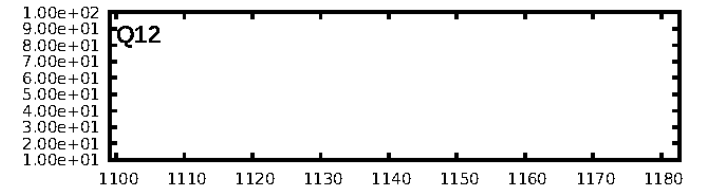
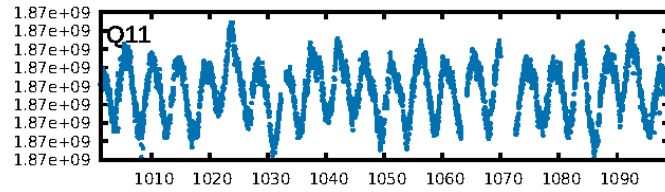
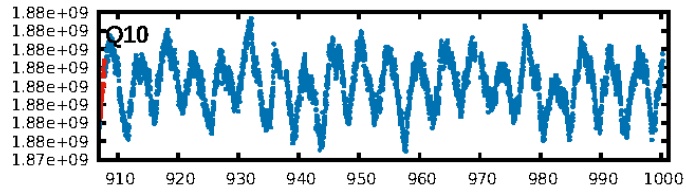
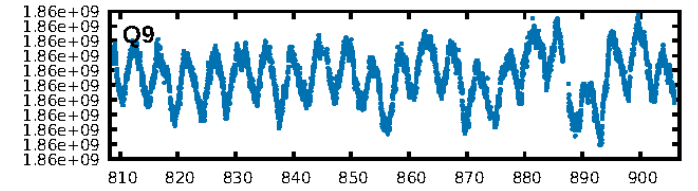
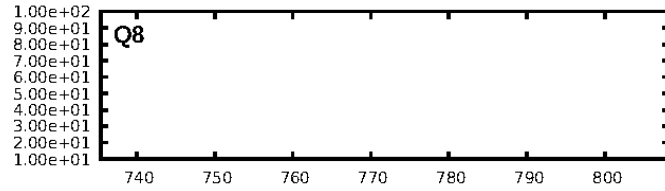
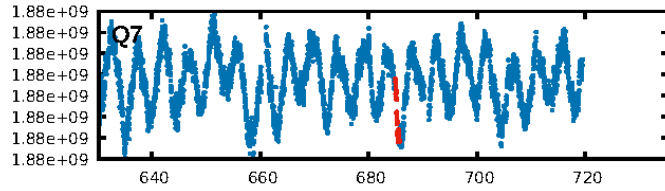
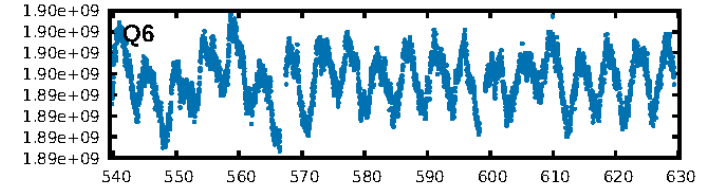
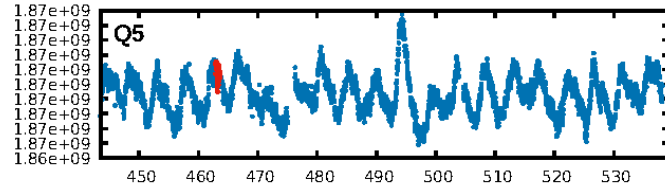
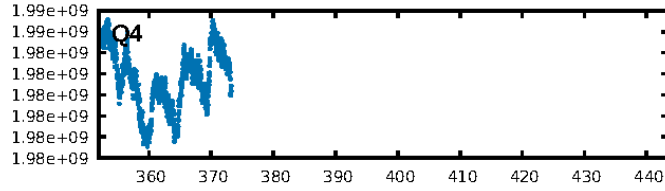
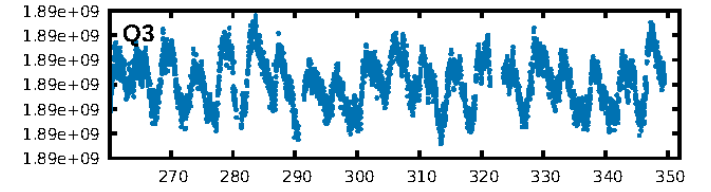
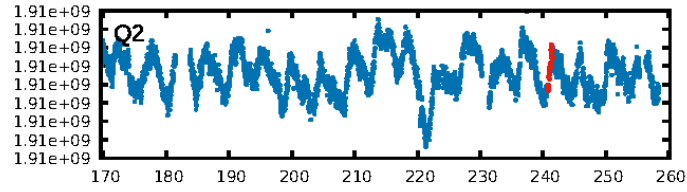
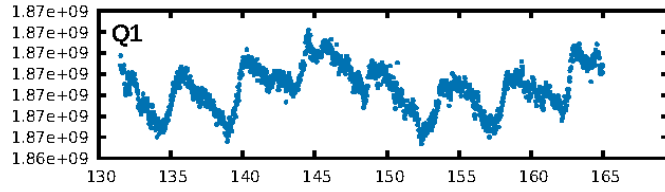
ShortPeriod-sig: 97.8% [2.29σ]  
LongPeriod-sig: 100.0% [31.57σ]  
ModelChiSquare2-sig: 15.6%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.468  
Centroid-sig: 1.0%  
Centroid-so: 2.068 arcsec [1.83σ]  
OotOffset-rm: 5.002 arcsec [3.58σ]  
KicOffset-rm: 5.154 arcsec [3.89σ]  
OotOffset-st: 2/1/0/2 [5]  
KicOffset-st: 2/1/0/2 [5]  
DiffImageQuality-fgm: 0.40 [2/5]  
DiffImageOverlap-fno: 0.60 [3/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:35:12 Z

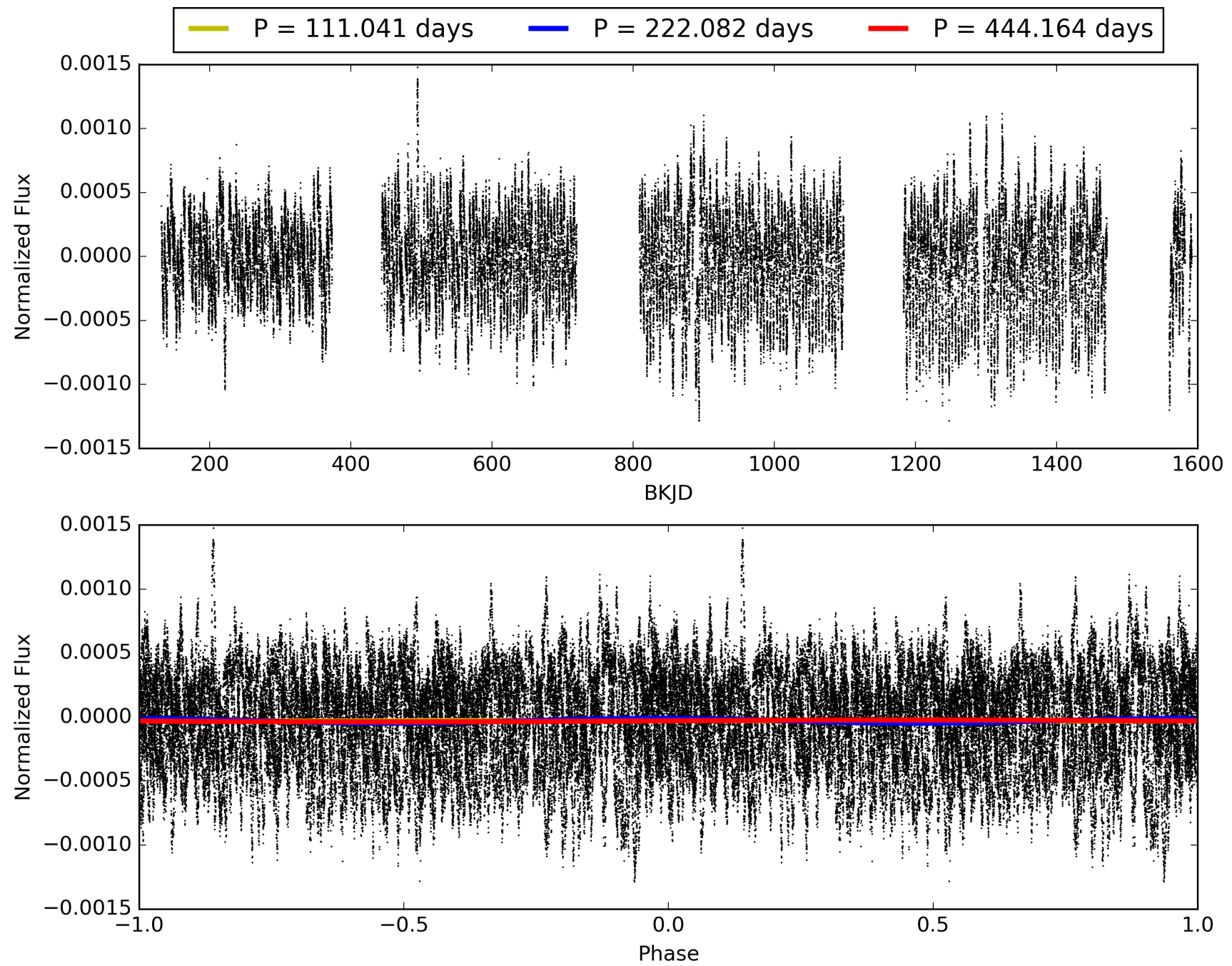
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011654113-10, PDC Light Curves

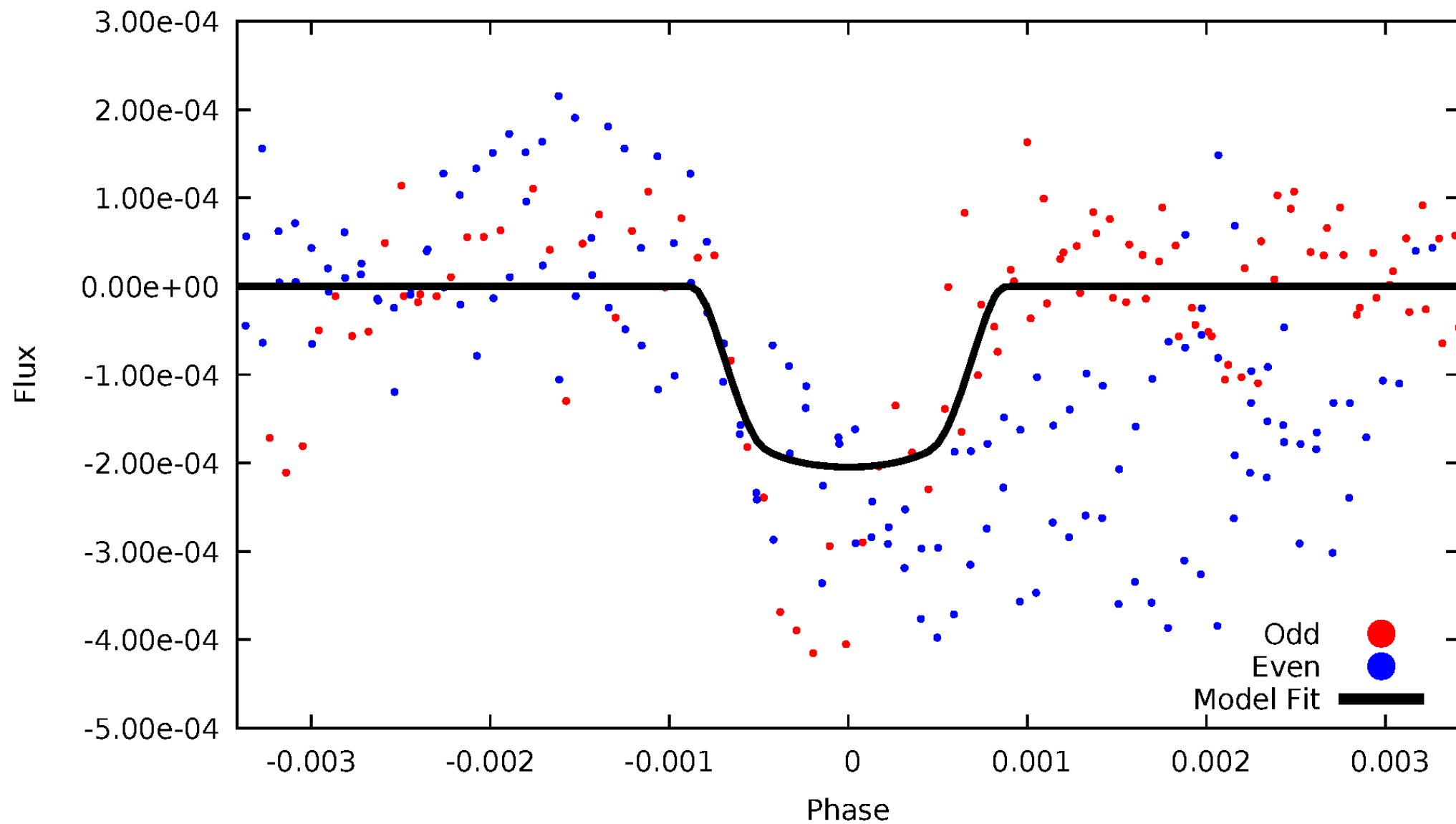


# TCE 011654113-10



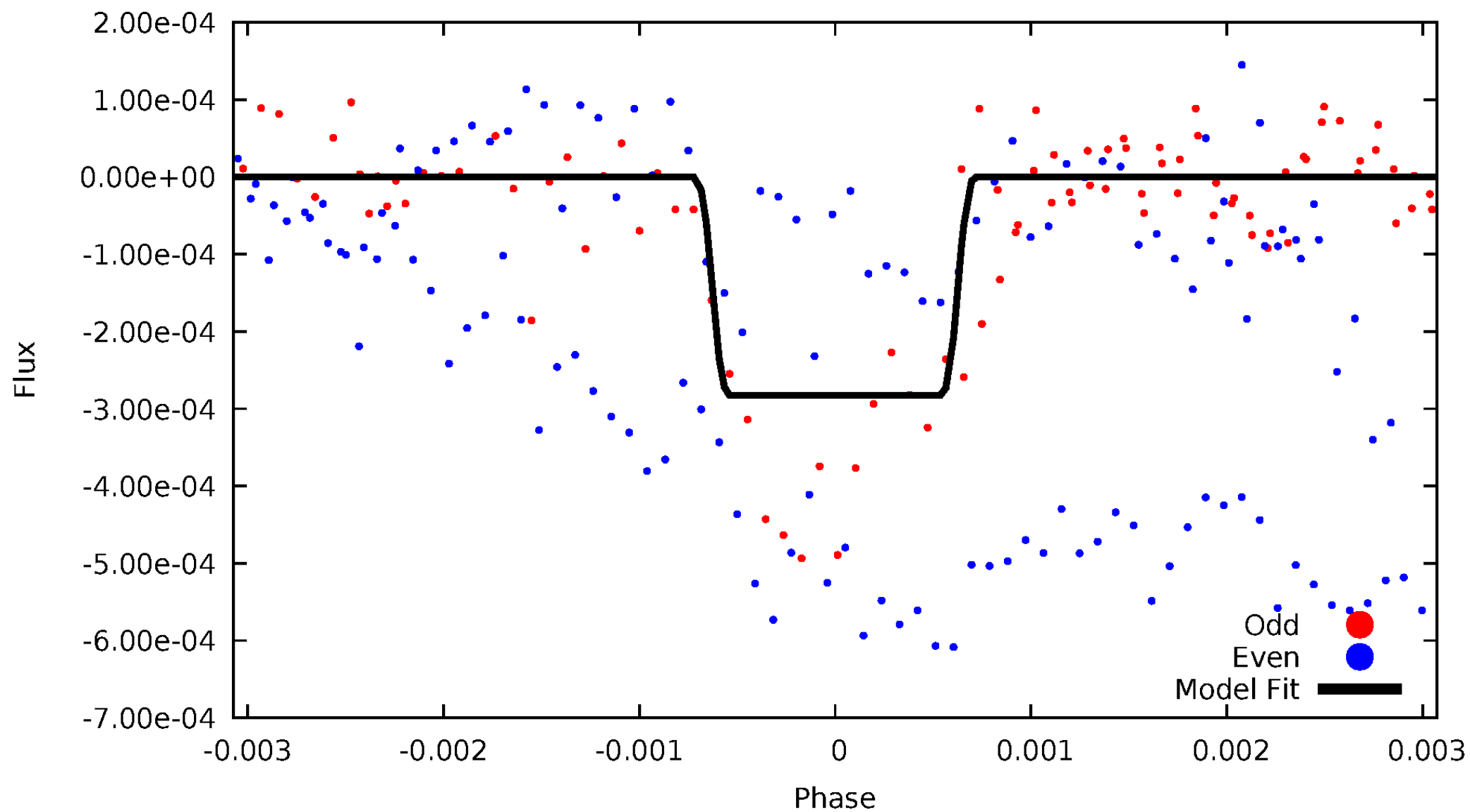
# DV Odd/Even

TCE 011654113-10



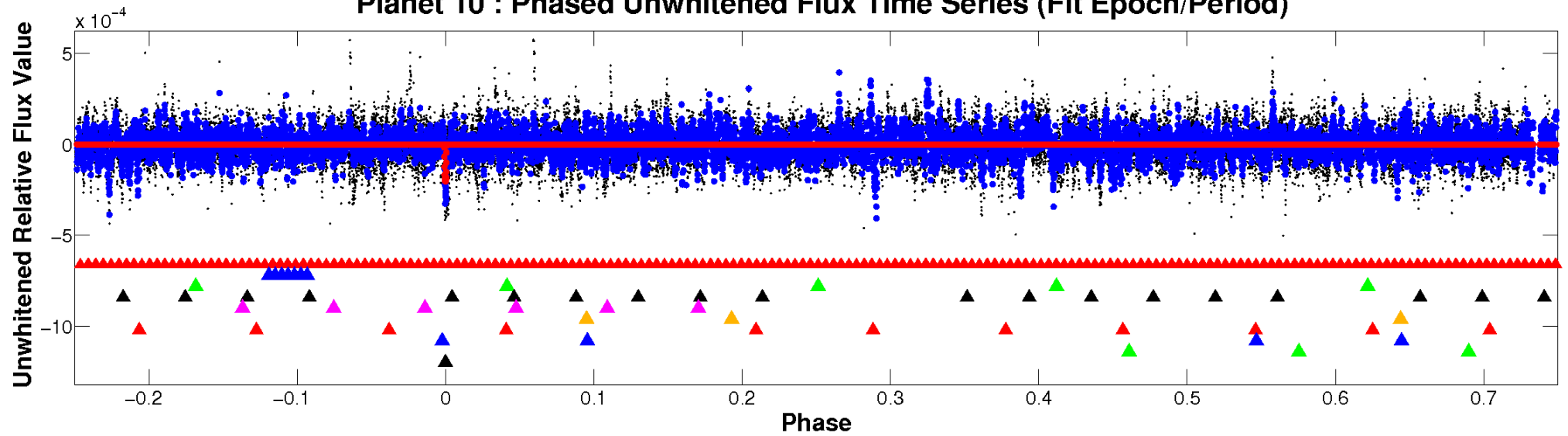
# ALT Odd/Even

TCE 011654113-10

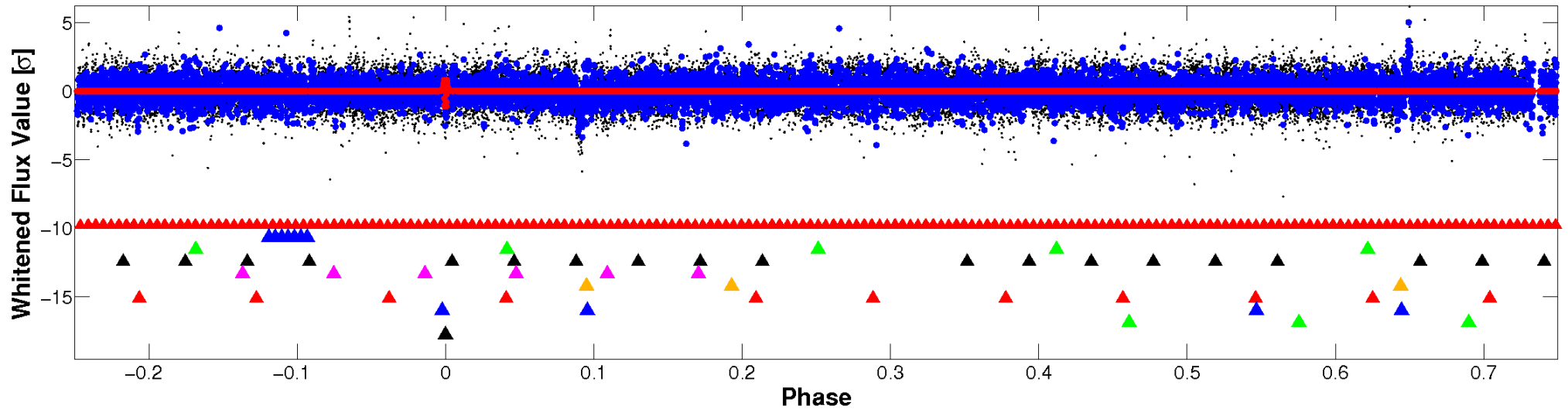


# Non-Whitened Vs. Whitened Light Curve

Planet 10 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

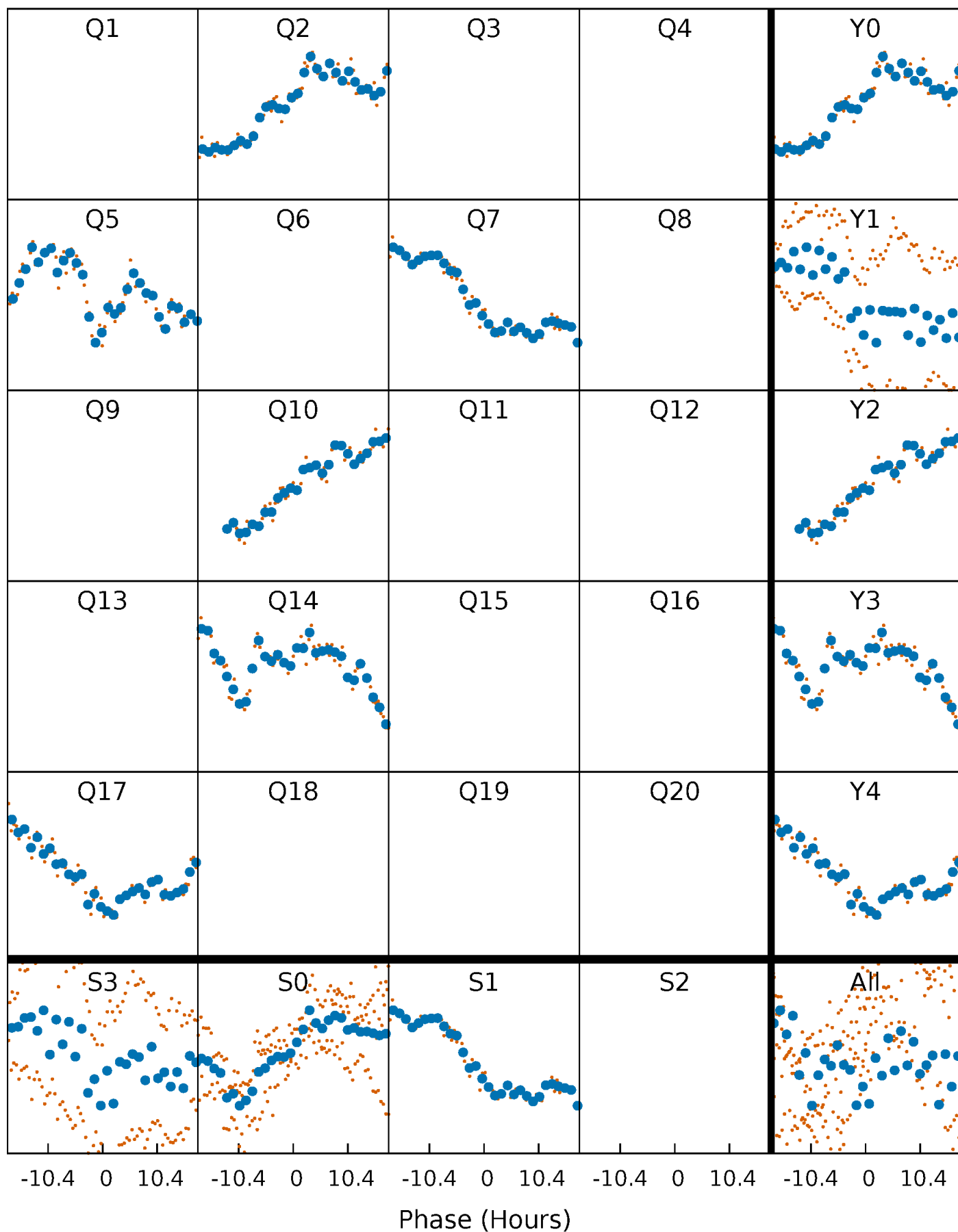


Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)



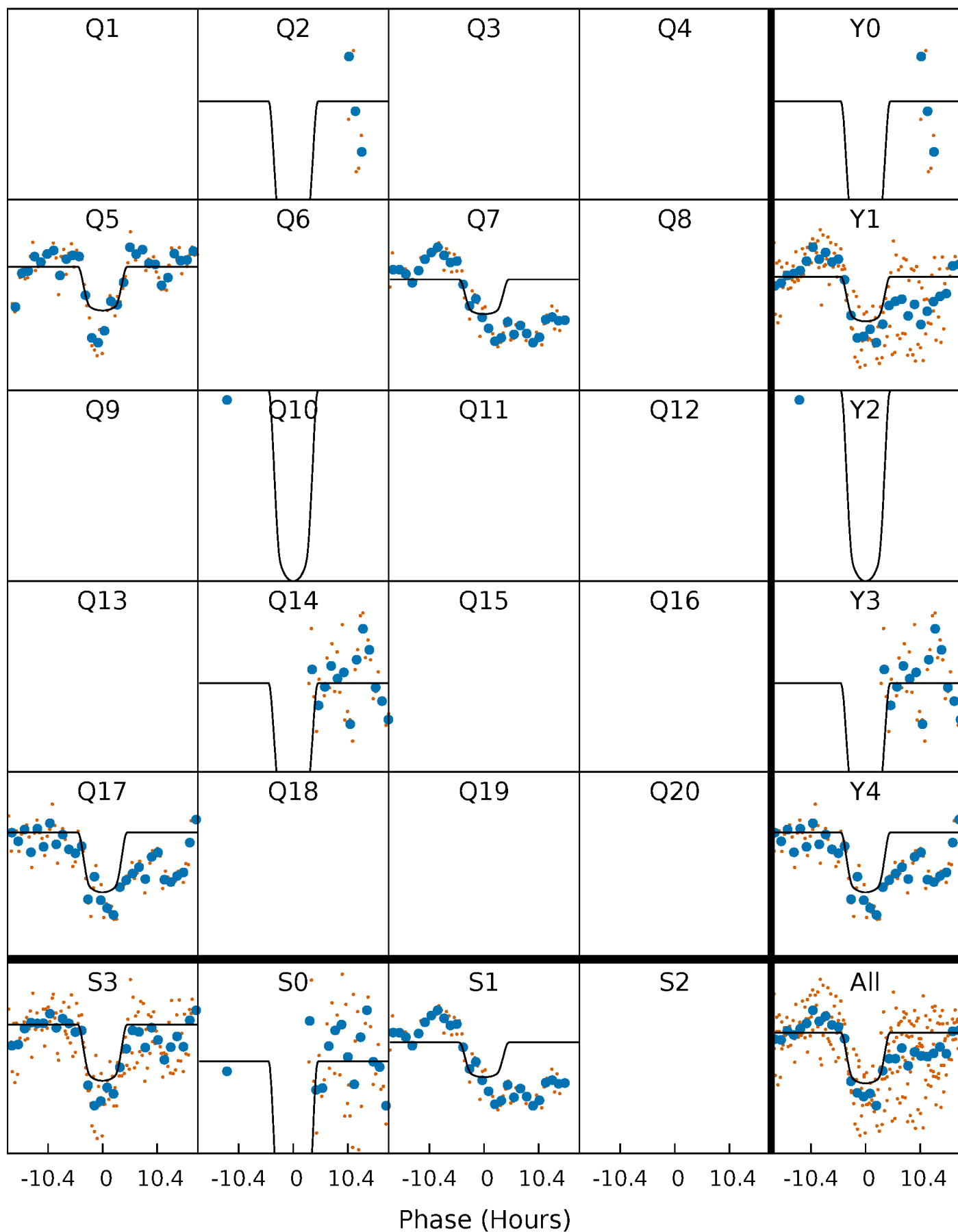
# PDC Quarter-Phased Transit Curves

TCE 011654113-10   P=222.082184 Days    $T_0=241.171086$  (BKJD)



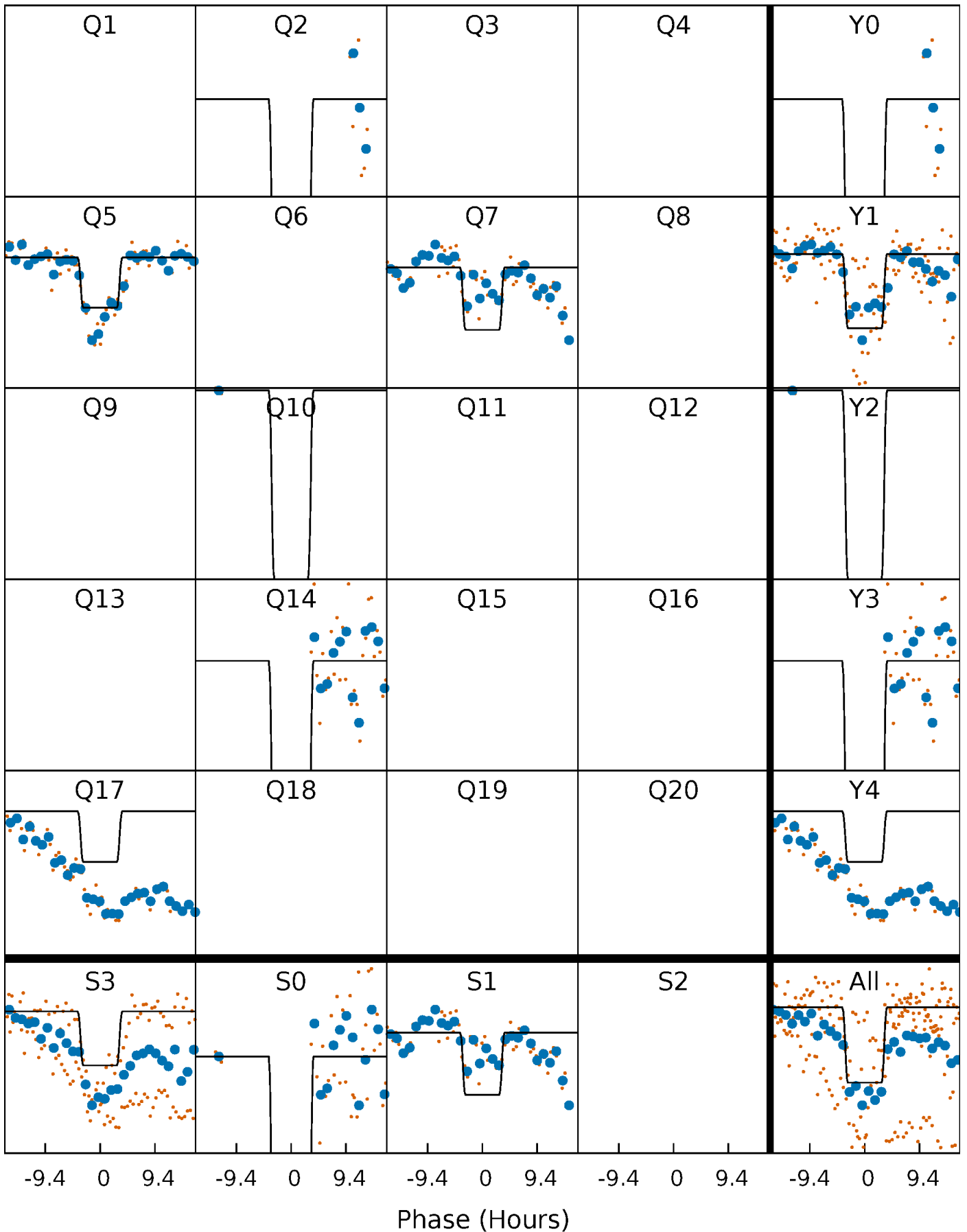
# DV Quarter-Phased Transit Curves

TCE 011654113-10 P=222.082184 Days  $T_0=241.171086$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011654113-10 P=222.078741 Days  $T_0=241.168873$  (BKJD)

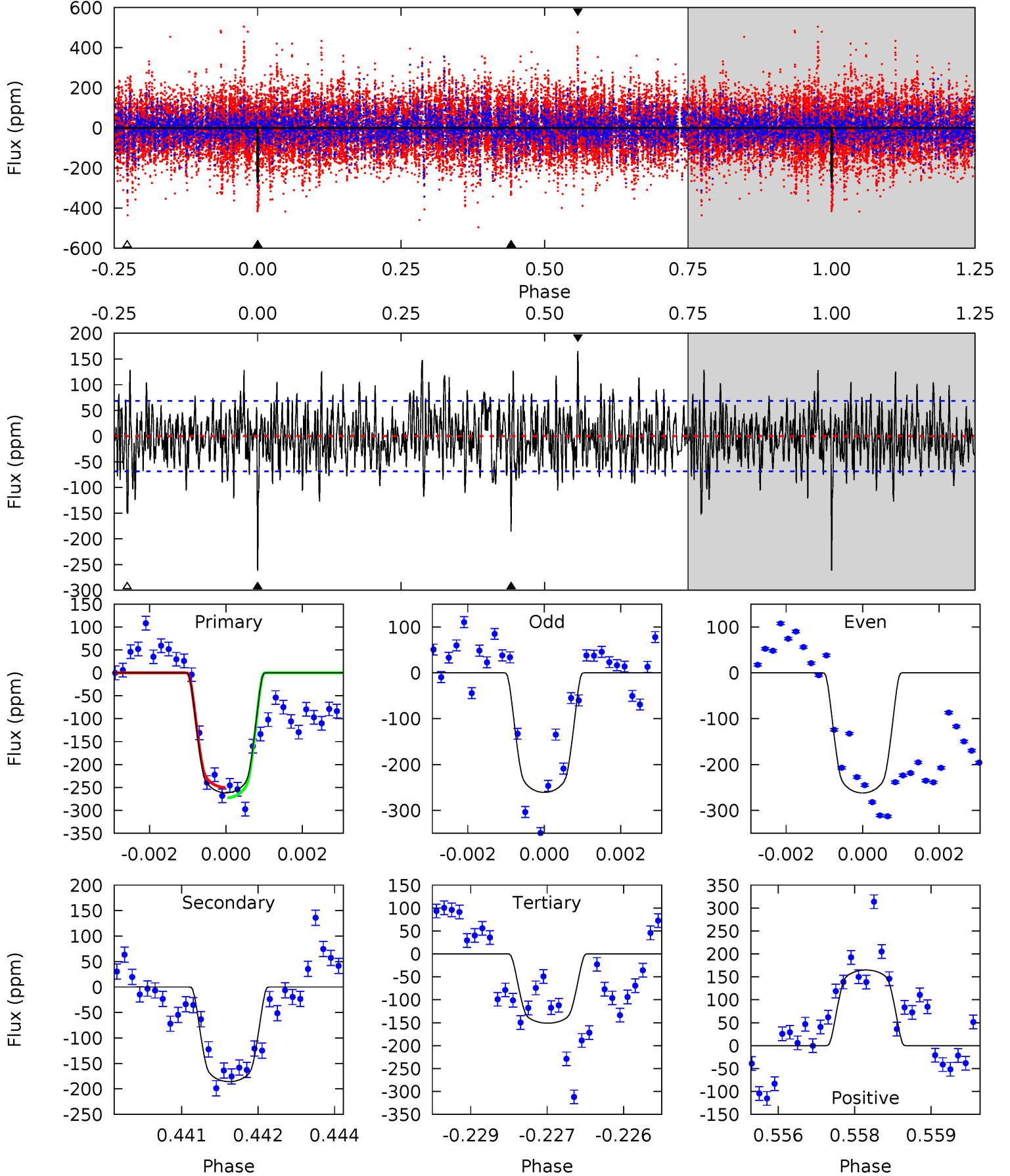




# DV Model-Shift Uniqueness Test

011654113-10, P = 222.082184 Days, E = 19.088902 Days

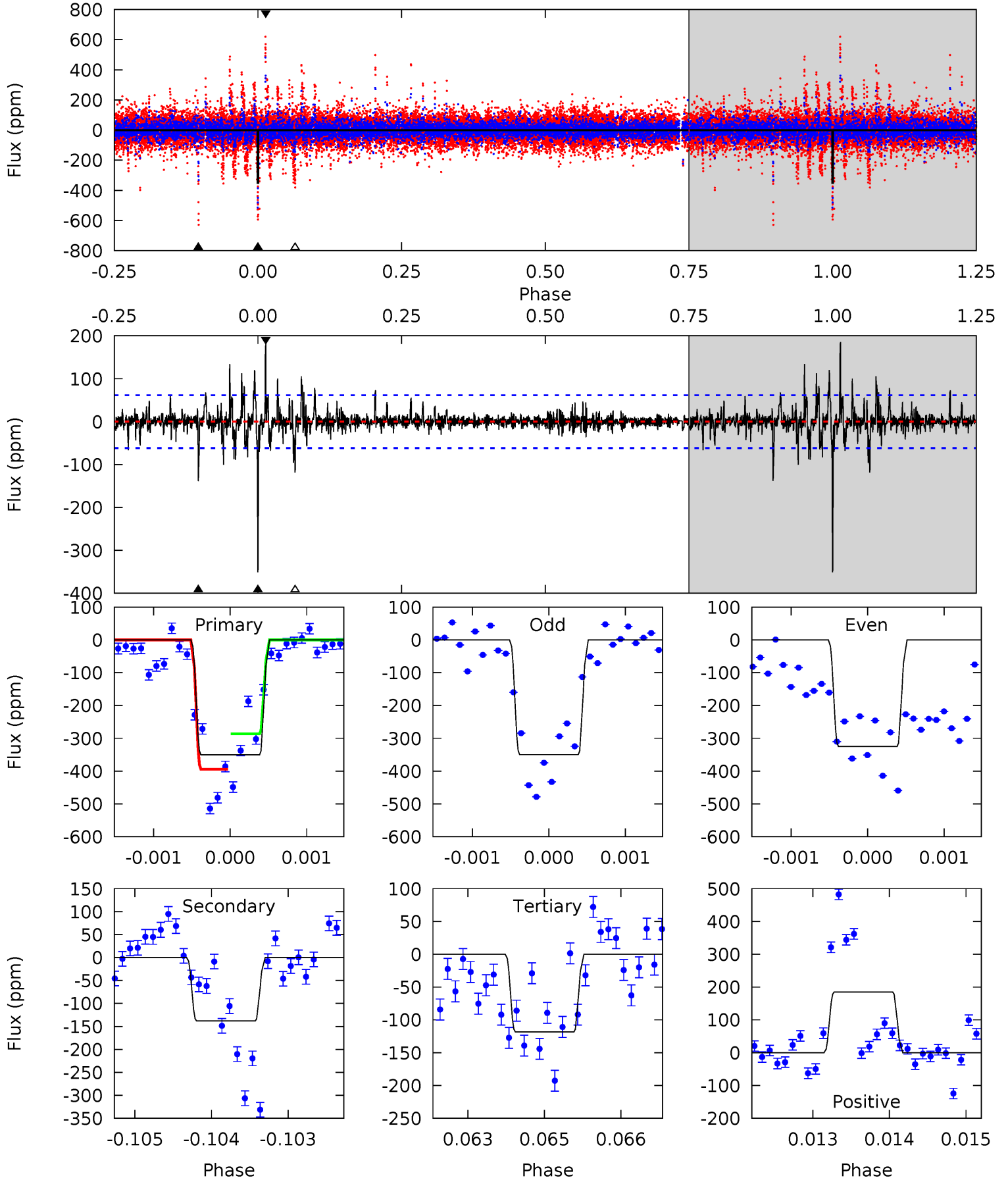
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.5	14.5	11.8	12.9	5.35	3.13	3.37	8.65	7.57	2.71	1.63	0.05	0.73	0.39	0.87



# Alt Model-Shift Uniqueness Test

011654113-10, P = 222.078741 Days, E = 19.090132 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	12.1	10.4	16.2	5.39	3.19	1.75	20.4	14.6	1.74	-4.07	1.07	0.94	0.34	0



### Stellar Parameters For KIC 011654113

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6429^{+179}_{-246}$	$4.335^{+0.072}_{-0.217}$	$0.060^{+0.250}_{-0.350}$	$1.249^{+0.437}_{-0.175}$	$1.231^{+0.180}_{-0.180}$	$0.890^{+0.352}_{-0.483}$
	+3%/-4%	+2%/-5%	+417%/-583%	+35%/-14%	+15%/-15%	+40%/-54%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011654113-10 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-186 \pm 13$	$2.40^{+0.45}_{-0.34}$	$515^{+39}_{-27}$	$5765^{+348}_{-303}$	$10403^{+3312}_{-2972}$
Alt.	$-138 \pm 11$	$2.35^{+0.45}_{-0.30}$	$515^{+37}_{-28}$	$5410^{+288}_{-286}$	$7762^{+2711}_{-2025}$

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

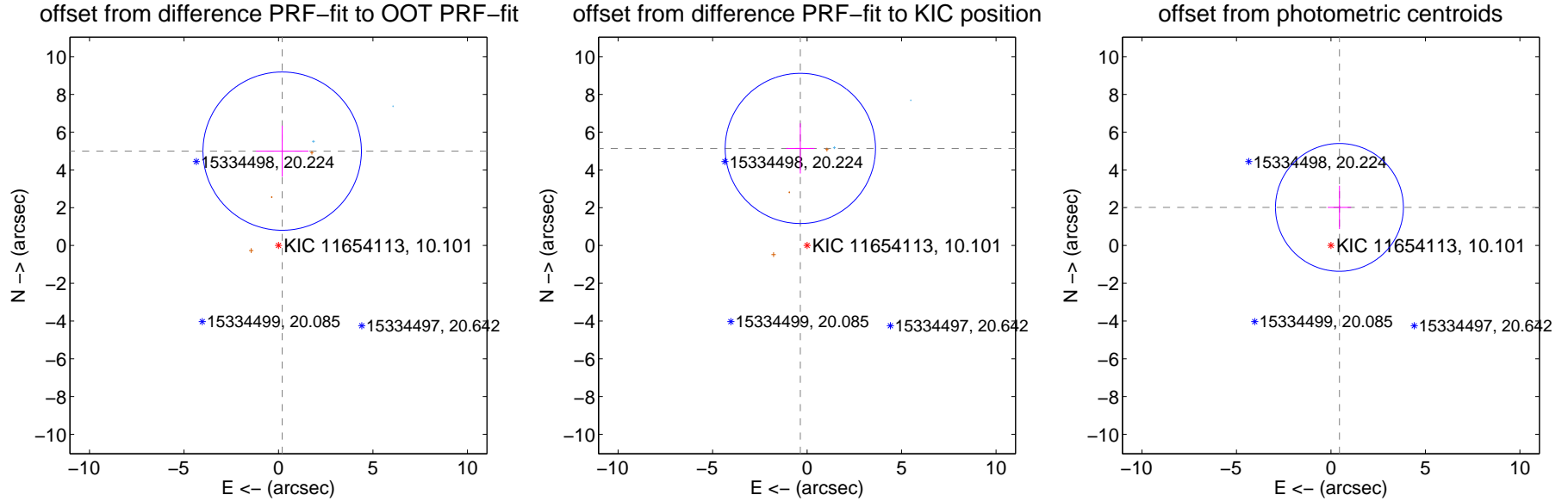
## DV Centroid Data

Supplemental centroid analysis for 011654113-10. **Kepler magnitude: 10.10.** Transit SNR 7.58

**There are 2 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>5.002 \pm 1.398</math></b>	<b>3.58</b>	$-0.196 \pm 1.389$	$4.998 \pm 1.347$
PRF-fit source offset from KIC position	<b><math>5.154 \pm 1.326</math></b>	<b>3.89</b>	$0.357 \pm 0.748$	$5.142 \pm 1.328$
photometric centroid source offset	$2.07 \pm 1.13$	1.83	$-0.45 \pm 0.62$	$2.02 \pm 1.15$



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.

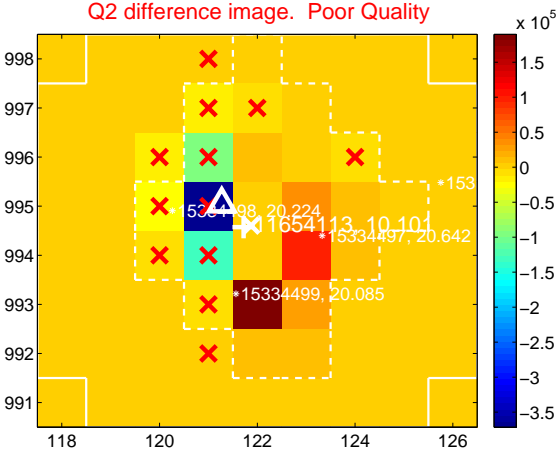
Q1 no difference image



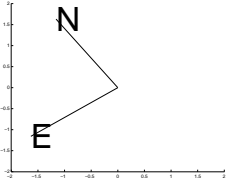
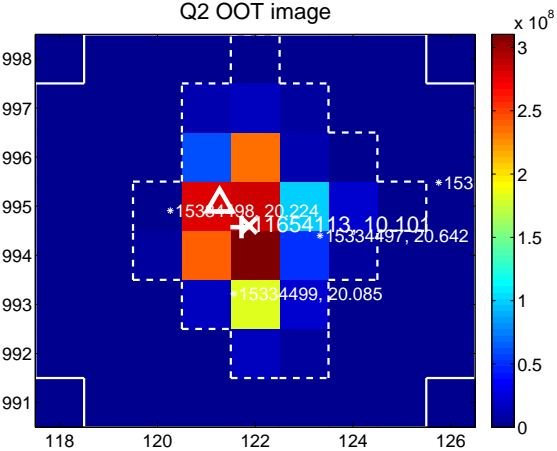
Q1 no OOT image



Q2 difference image. Poor Quality



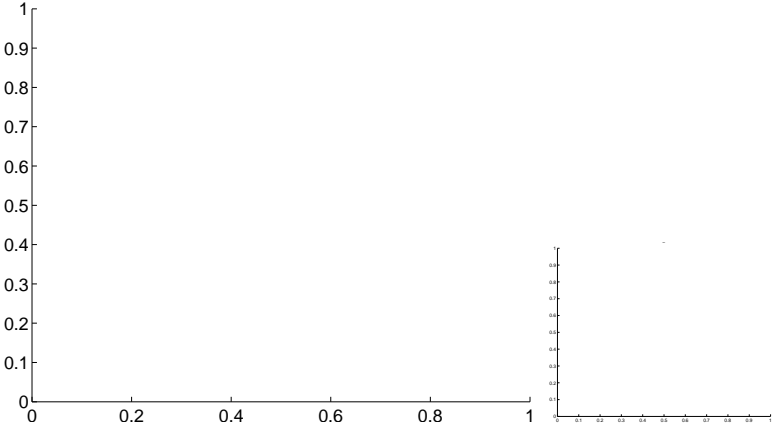
Q2 OOT image



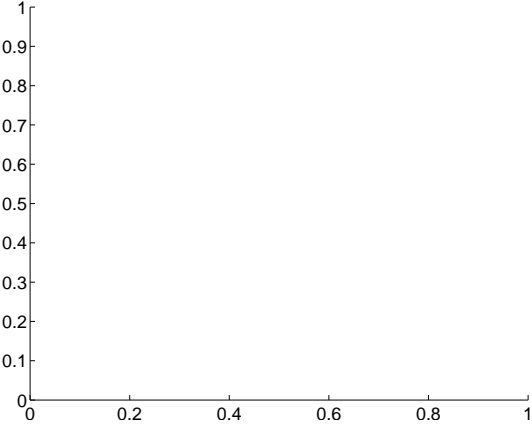
Q3 no difference image



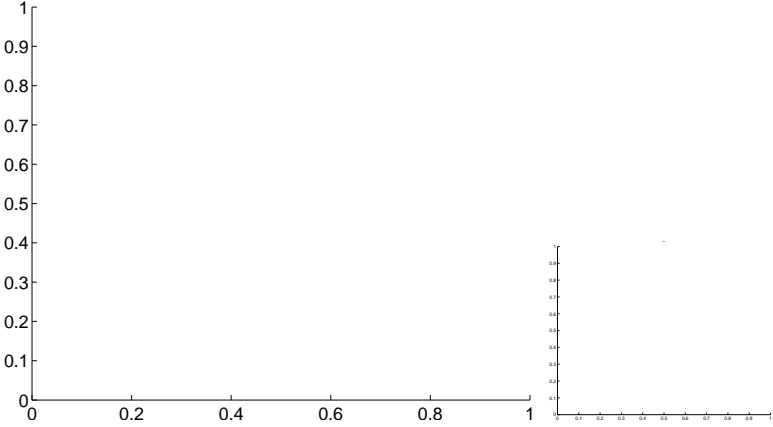
Q3 no OOT image



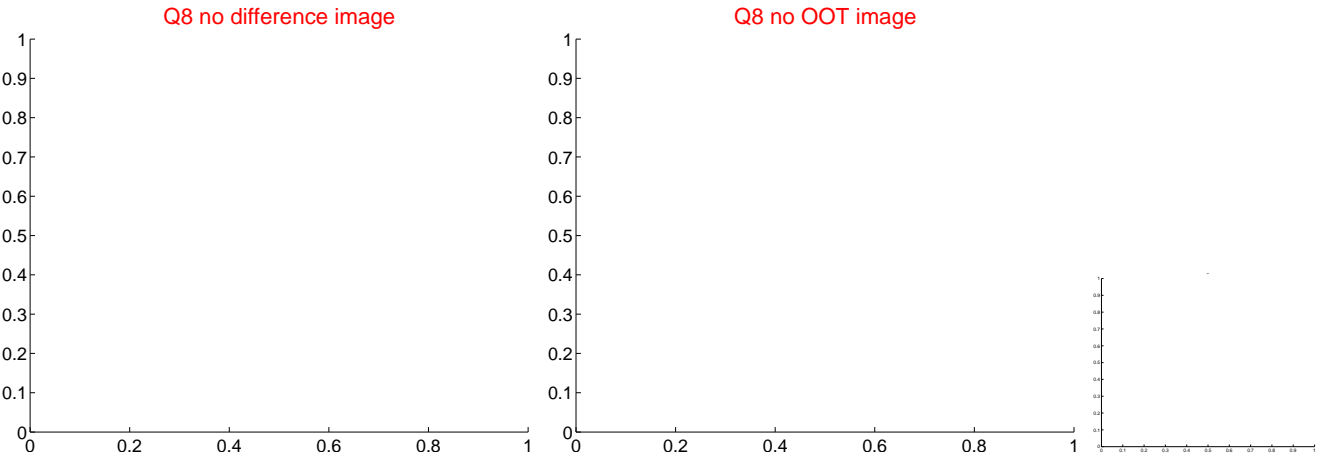
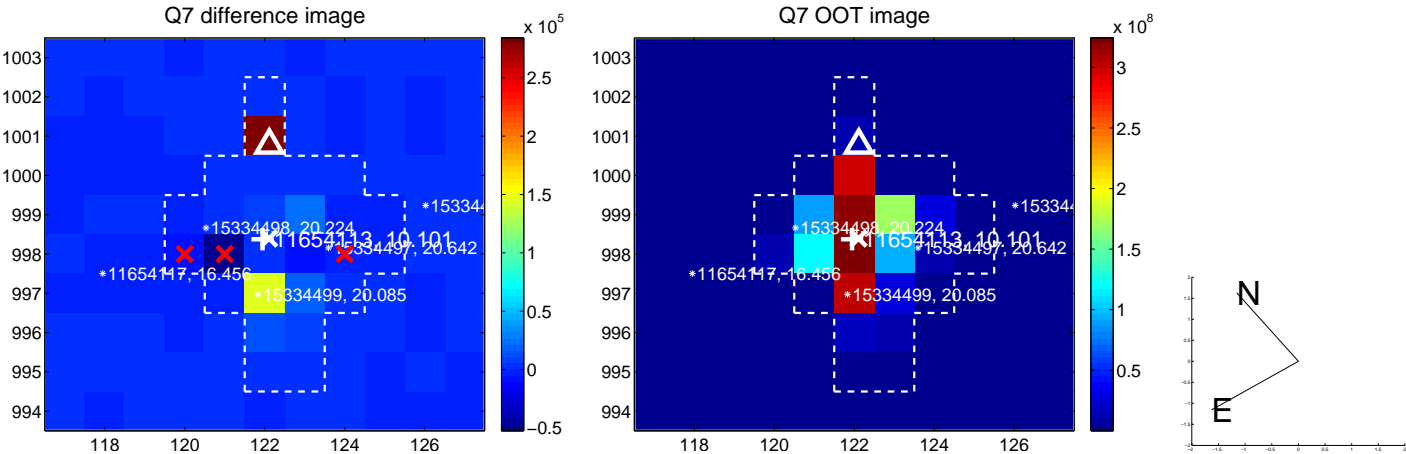
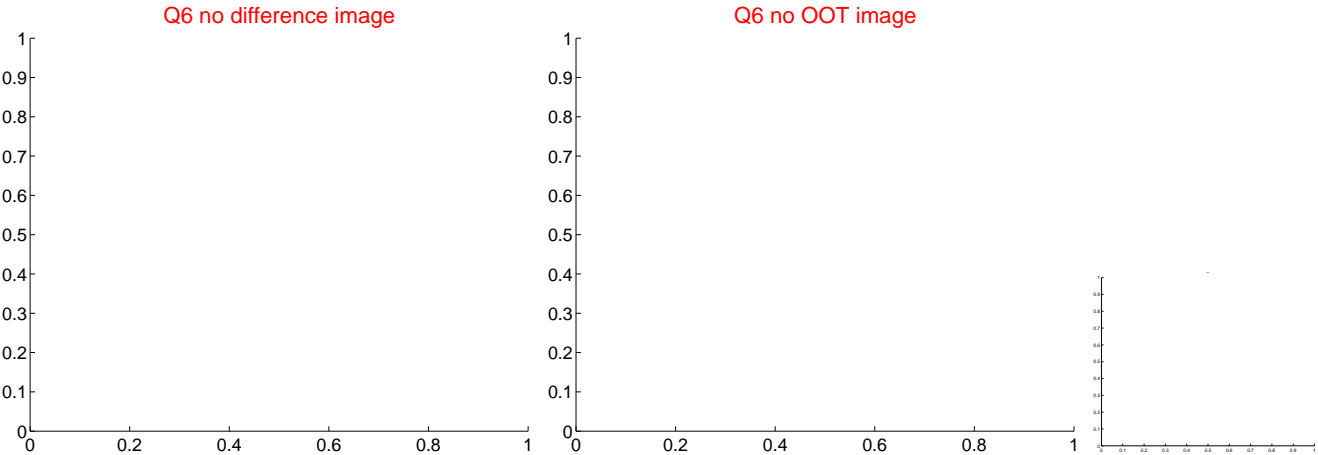
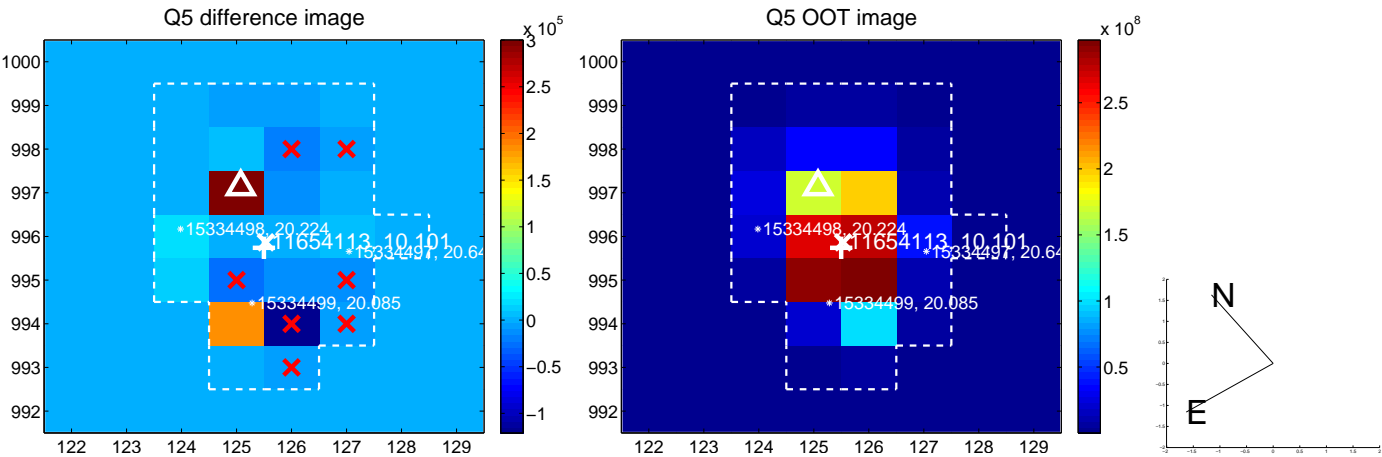
Q4 no difference image



Q4 no OOT image



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

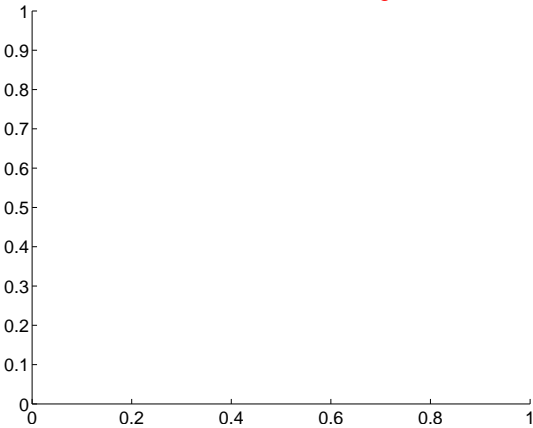


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

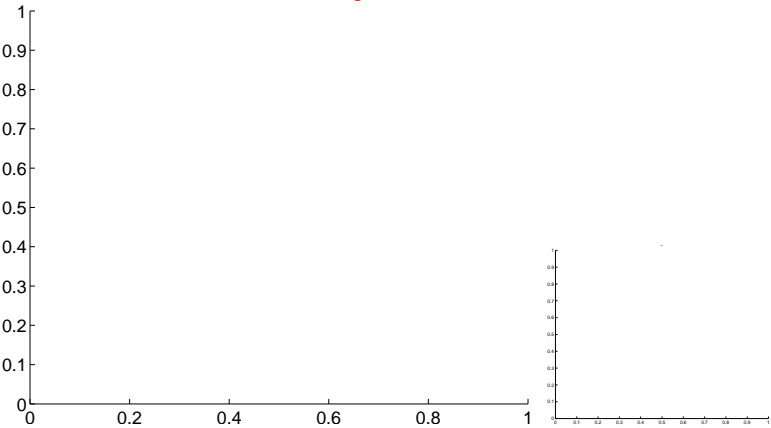


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

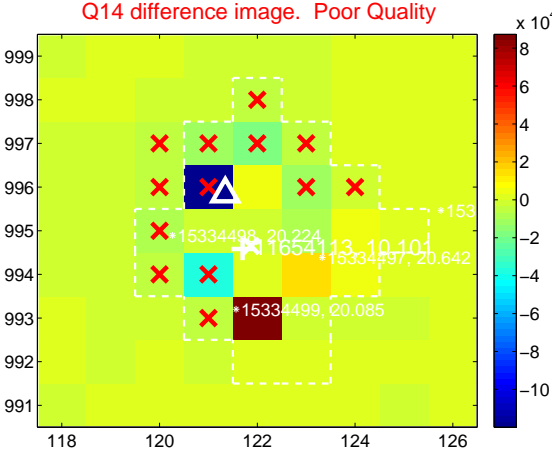
Q13 no difference image



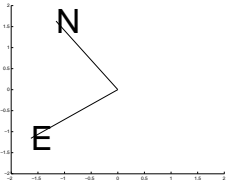
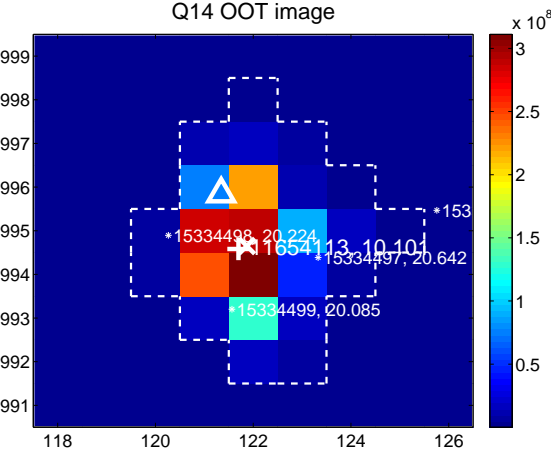
Q13 no OOT image



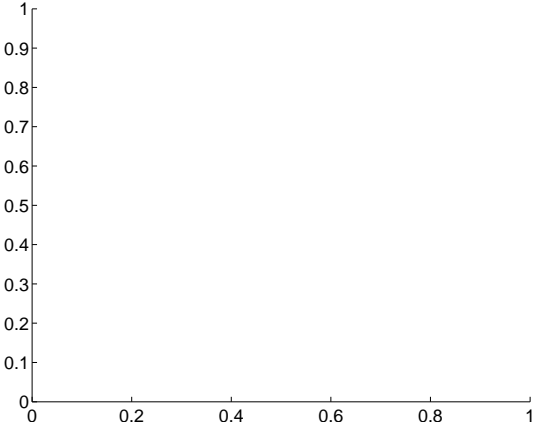
Q14 difference image. Poor Quality



Q14 OOT image



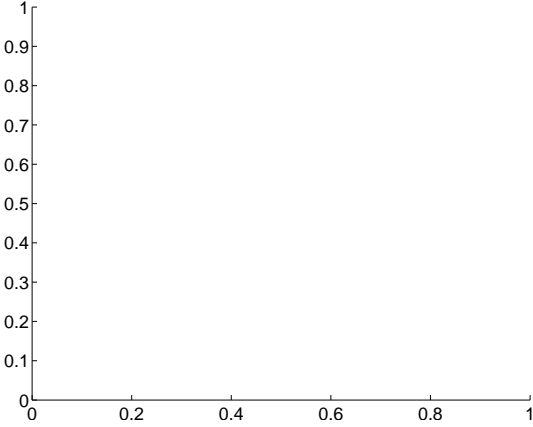
Q15 no difference image



Q15 no OOT image



Q16 no difference image

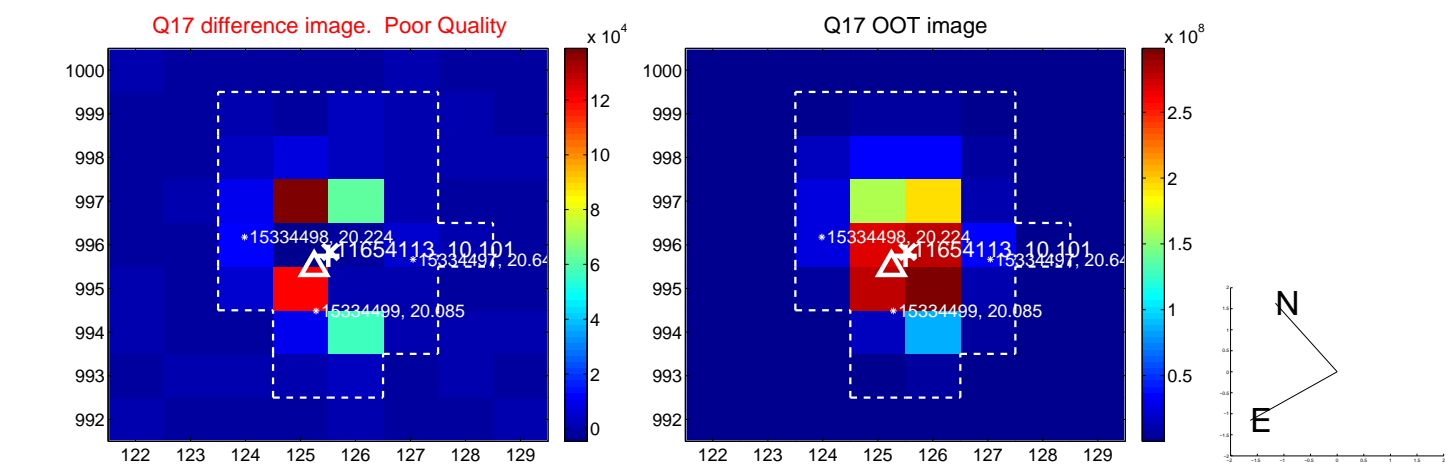


Q16 no OOT image

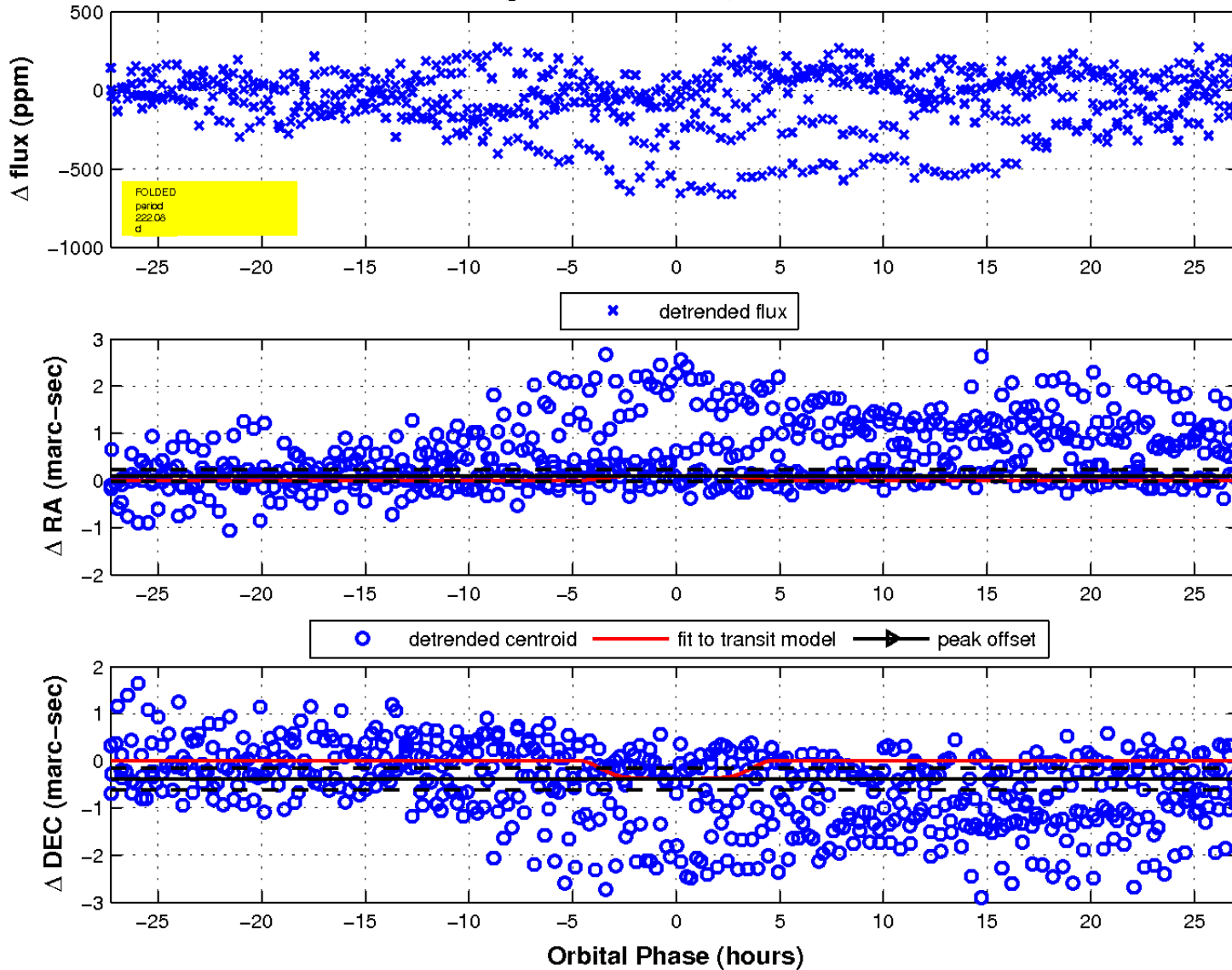




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

