

# KIC 010904343

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010904343-01	OBS	No	3.061235	132.737615	22.8	8.650	8.8	7.4	3.71	6714	2.00	10284.55
010904343-02	OBS	No	1.530349	132.310781	27.8	6.304	10.4	10.0	3.71	6714	2.71	25921.51
010904343-03	OBS	No	139.464948	217.524278	305.9	8.224	9.9	9.5	3.71	6714	8.43	63.21
010904343-04	OBS	No	60.793603	160.060354	212.8	4.472	8.5	9.2	3.71	6714	6.20	191.24
010904343-05	OBS	No	117.464997	228.800718	304.9	2.434	8.6	9.0	3.71	6714	7.37	79.46
010904343-06	OBS	No	34.916667	152.864357	120.7	2.929	8.1	6.3	3.71	6714	4.77	400.56
010904343-07	OBS	No	42.718363	155.839959	157.5	4.114	7.5	8.1	3.71	6714	5.36	306.12
010904343-08	OBS	No	106.321866	134.323578	151.5	6.479	7.6	6.4	3.71	6714	5.19	90.76
010904343-09	OBS	No	33.945926	146.949011	64.7	6.114	7.5	4.0	3.71	6714	3.37	415.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010904343-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
010904343-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010904343-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-09	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

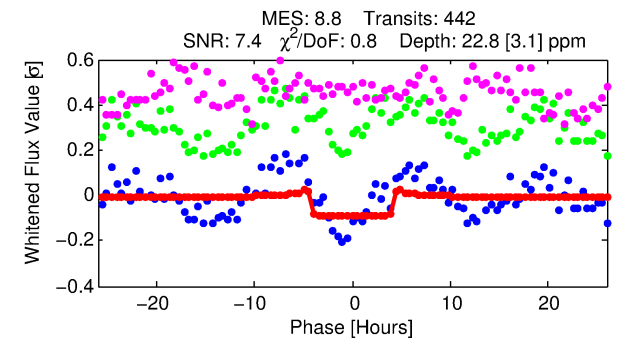
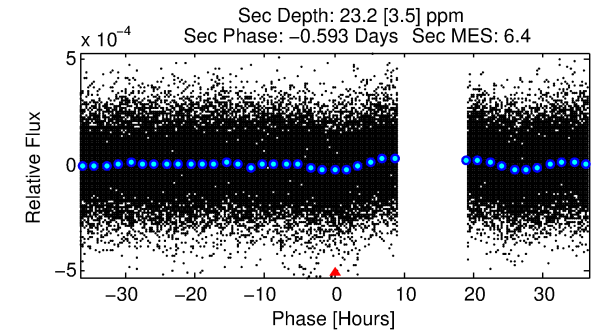
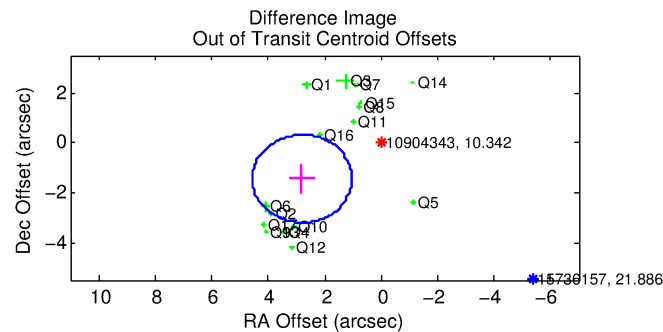
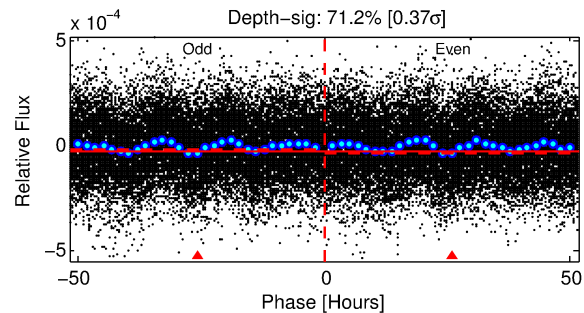
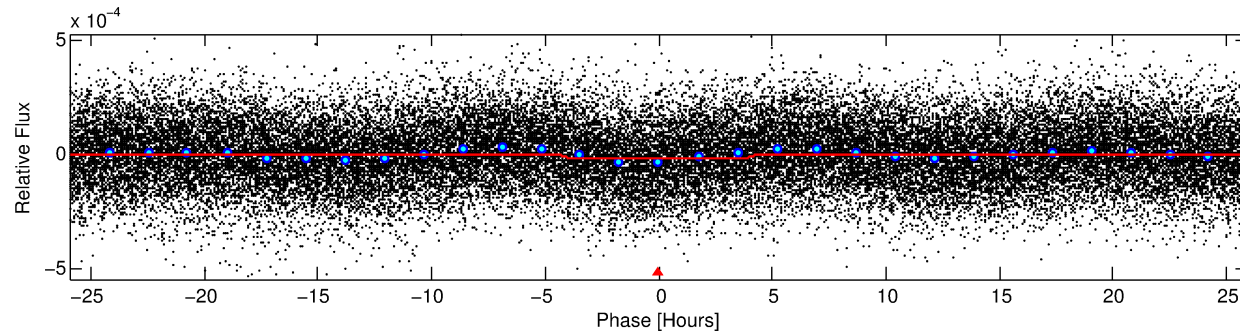
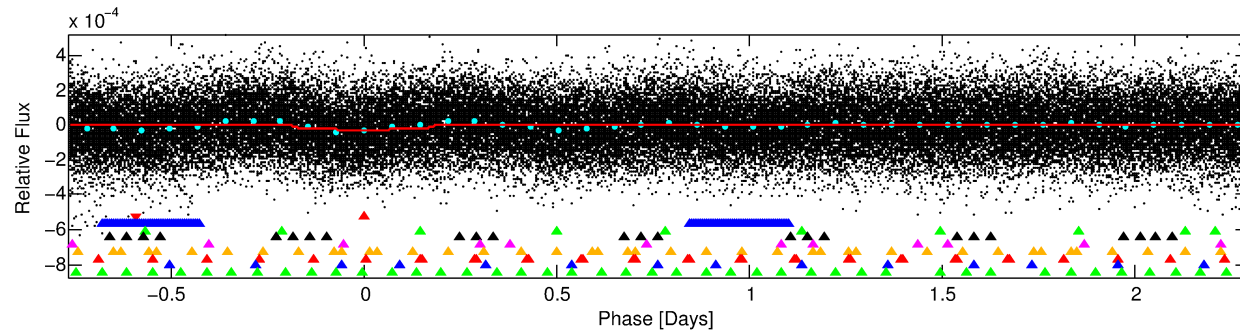
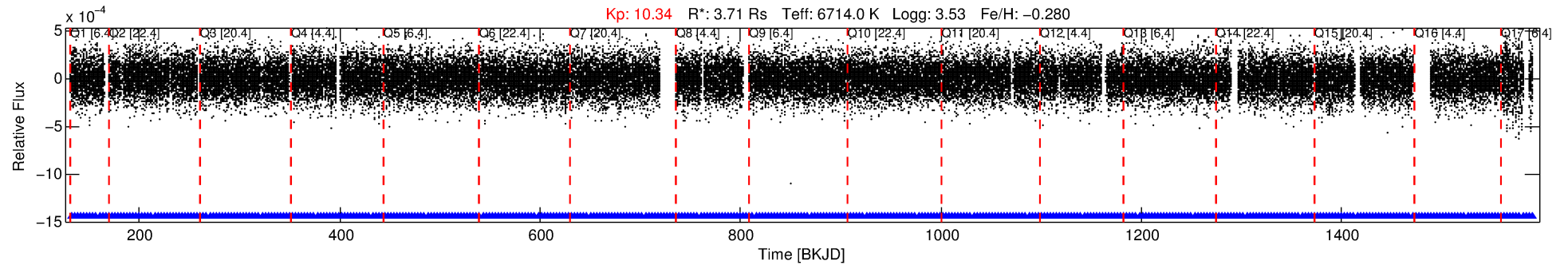
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010904343-01

No Significant Match Found

# DV One-Page Summary

KIC: 10904343 Candidate: 1 of 9 Period: 3.061 d



## DV Fit Results:

Period = 3.06123 [0.00003] d  
Epoch = 132.7376 [0.0059] BKJD  
 $R_p/R^* = 0.0049$  [0.0010]  
 $a/R^* = 1.71$  [1.30]  
 $b = 0.85$  [0.38]  
 $\text{Seff} = 10284.55$  [6141.58]  
 $T_{\text{eq}} = 2568$  [383] K  
 $R_p = 2.00$  [0.87]  $R_e$   
 $a = 0.0494$  [0.0182] AU  
 $\text{Ag} = 7.78$  [5.70] [1.19 $\sigma$ ]  
 $T_{\text{eff}} = 6630$  [750] K [4.82 $\sigma$ ]

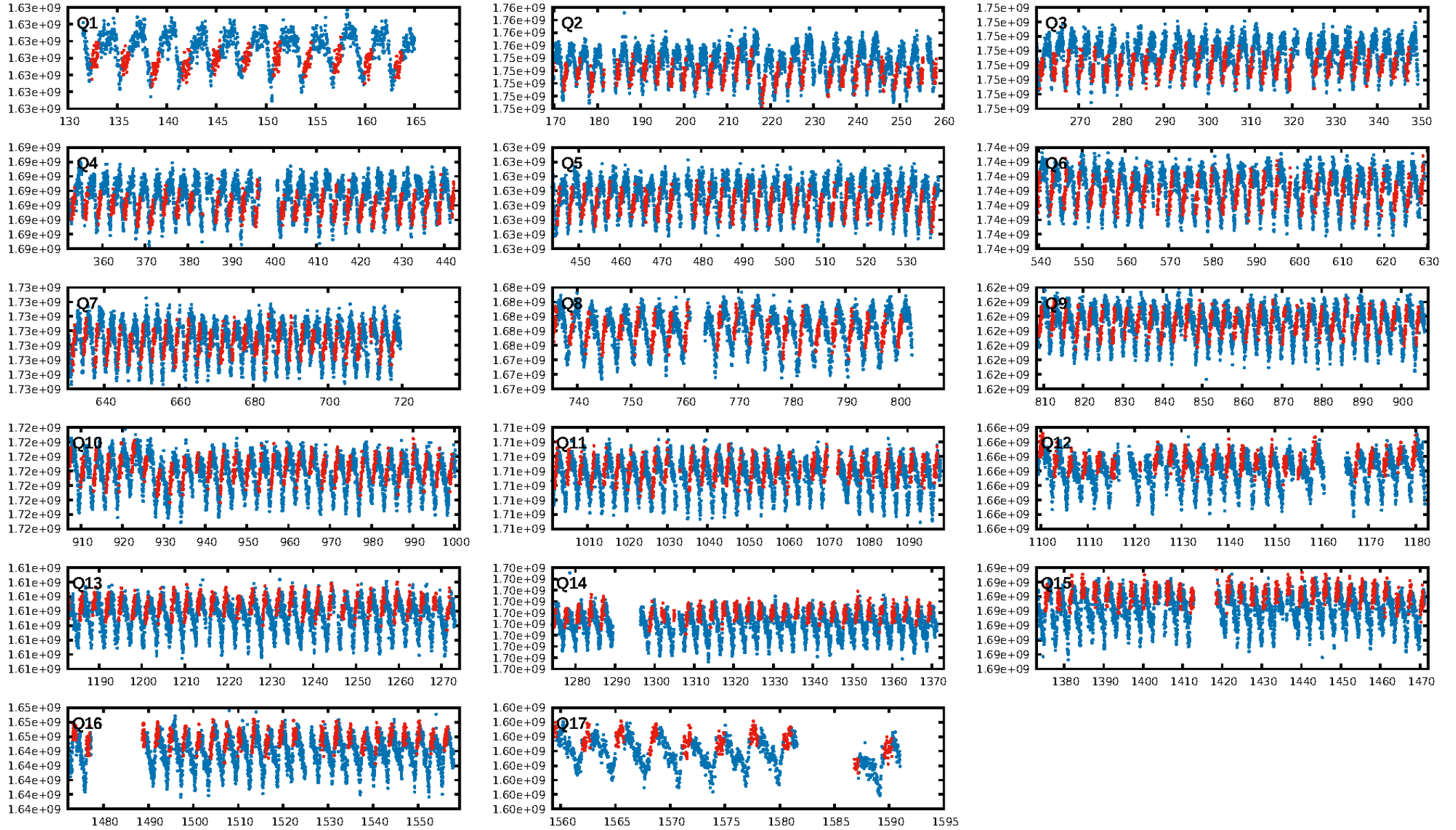
## DV Diagnostic Results:

ShortPeriod-sig: 99.9% [3.43 $\sigma$ ]  
LongPeriod-sig: 100.0% [69.97 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 3.09e-10**  
RollingBand-fgt: 1.00 [421/421]  
**GhostDiagnostic-chr: 0.9794**  
Centroid-sig: 3.8%  
Centroid-so: 0.700 arcsec [1.11 $\sigma$ ]  
**OotOffset-rm: 3.151 arcsec [5.37 $\sigma$ ]**  
**KicOffset-rm: 3.101 arcsec [5.94 $\sigma$ ]**  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.18 [3/17]  
DiffImageOverlap-fno: 0.00 [0/17]

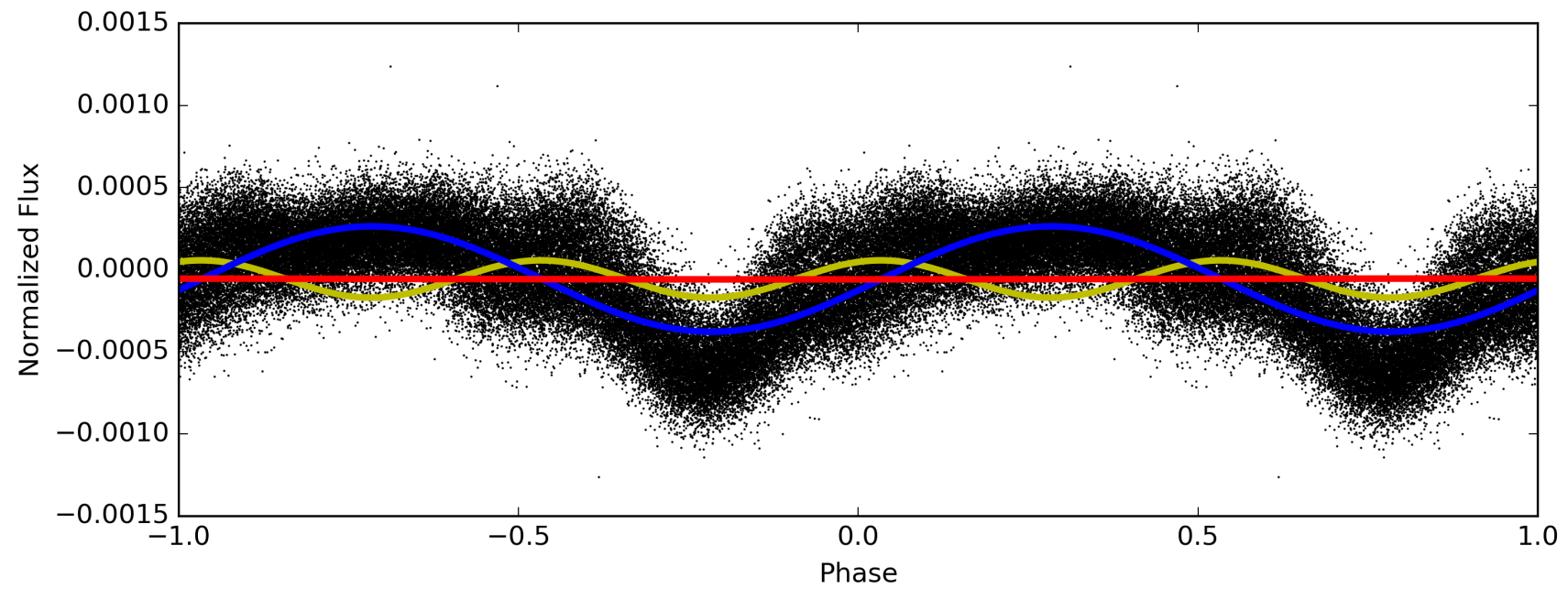
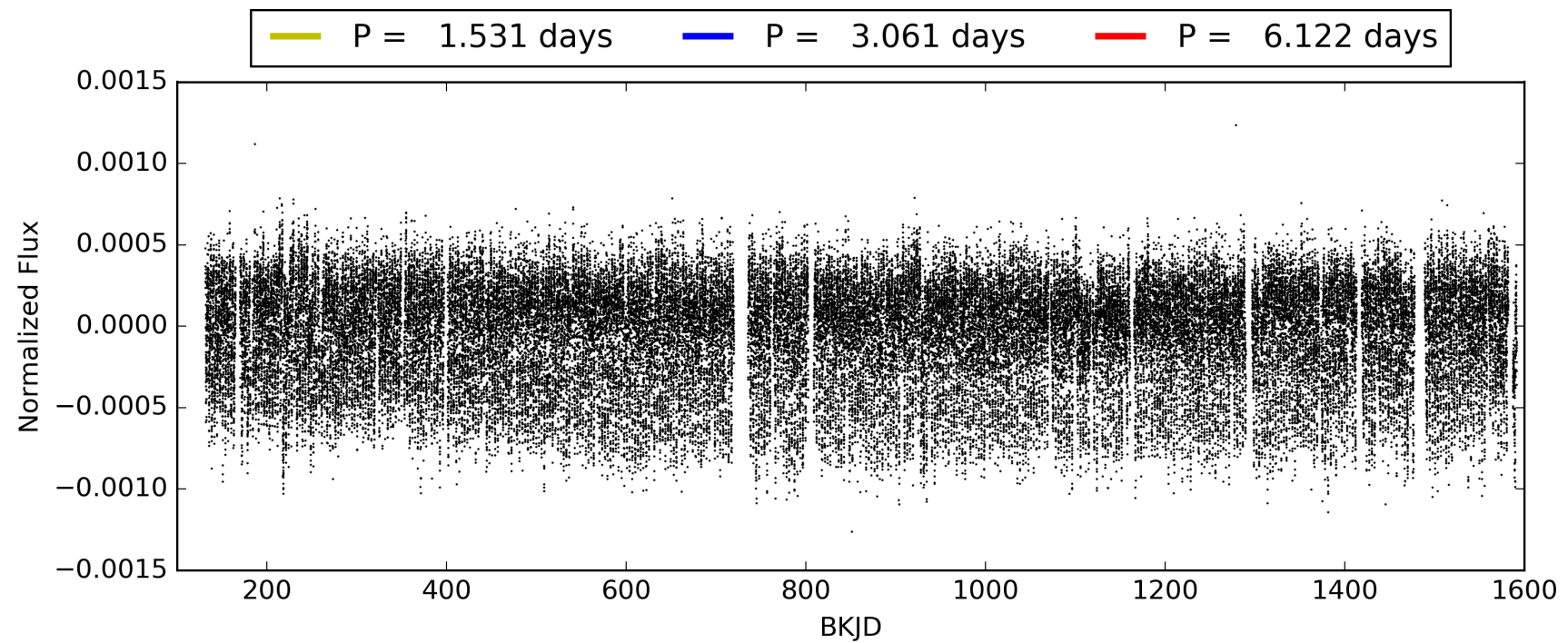
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:37:43 Z

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

# TCE 010904343-01, PDC Light Curves



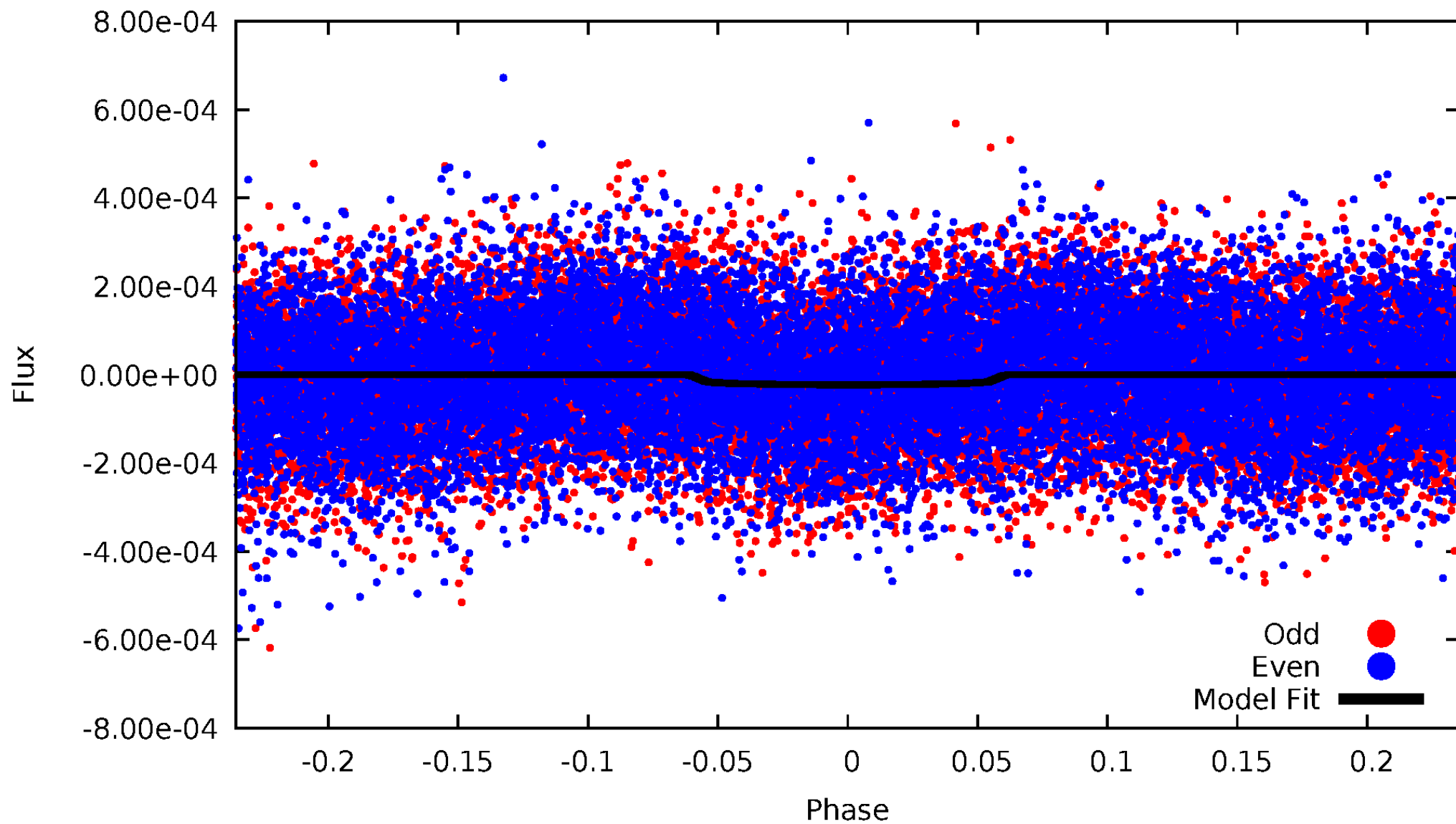
TCE 010904343-01





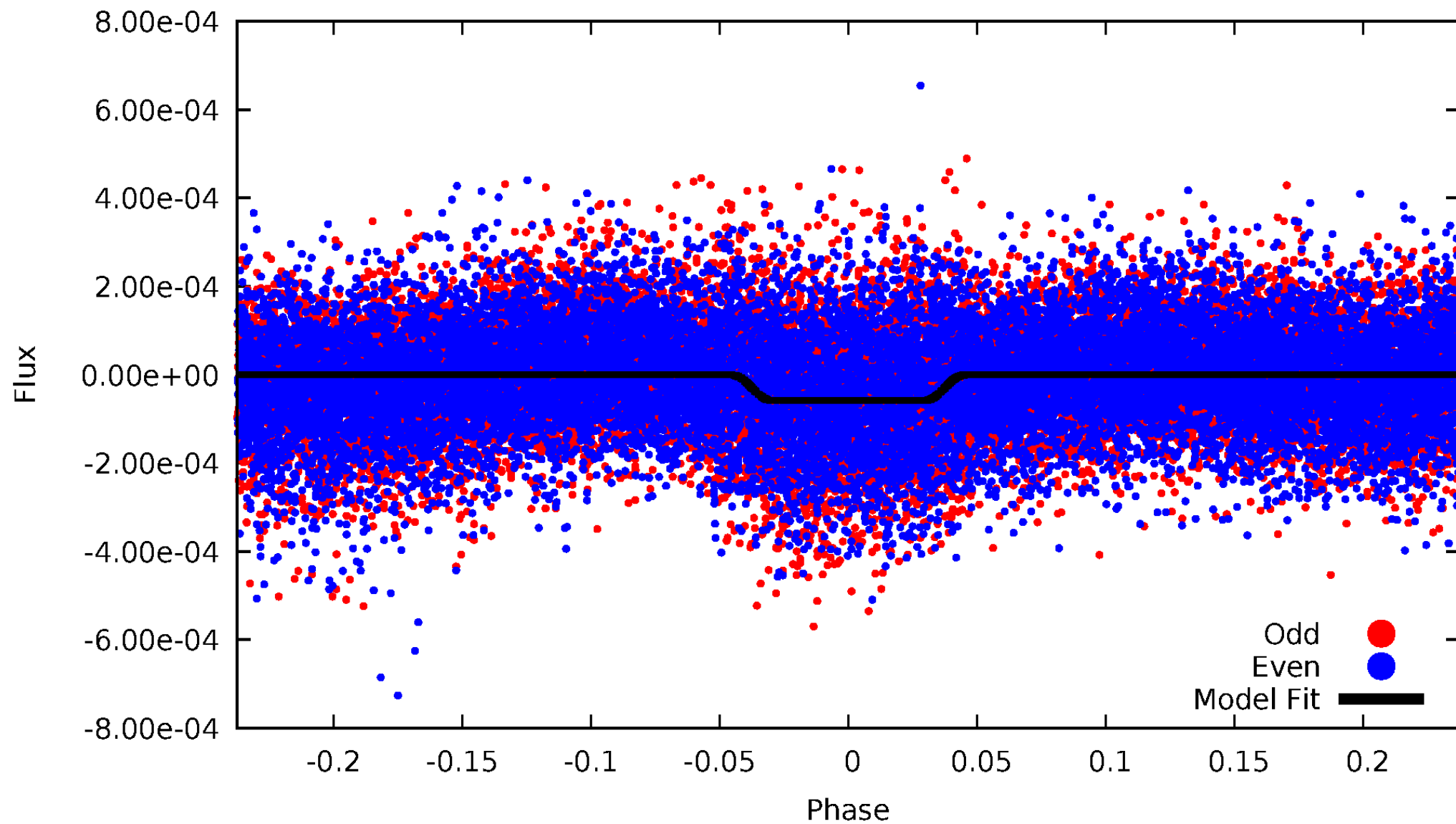
# DV Odd/Even

TCE 010904343-01



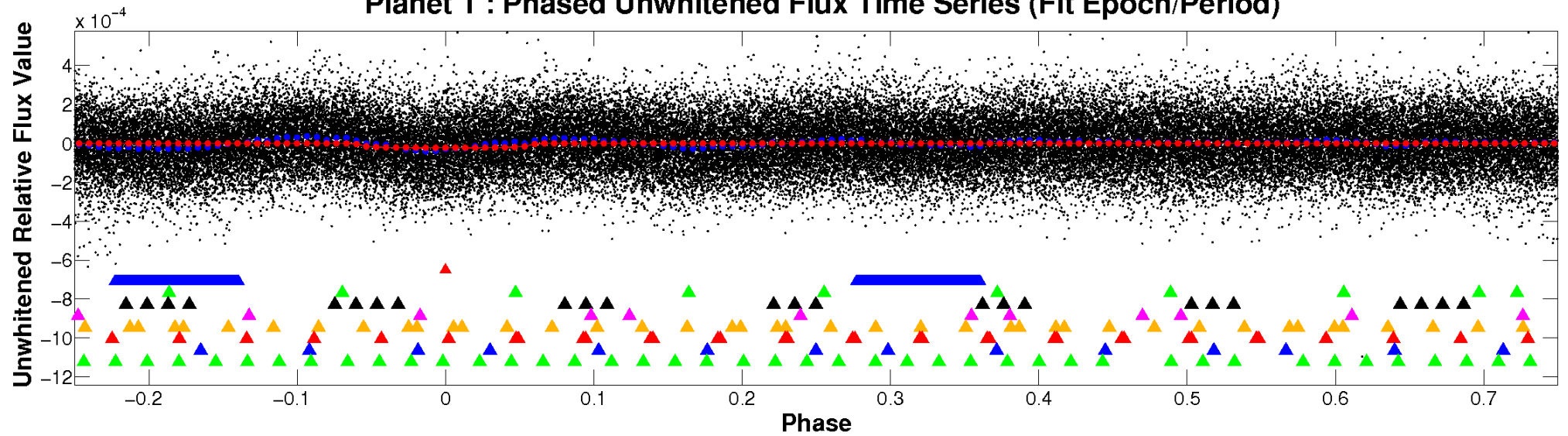
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TCE 010904343-01

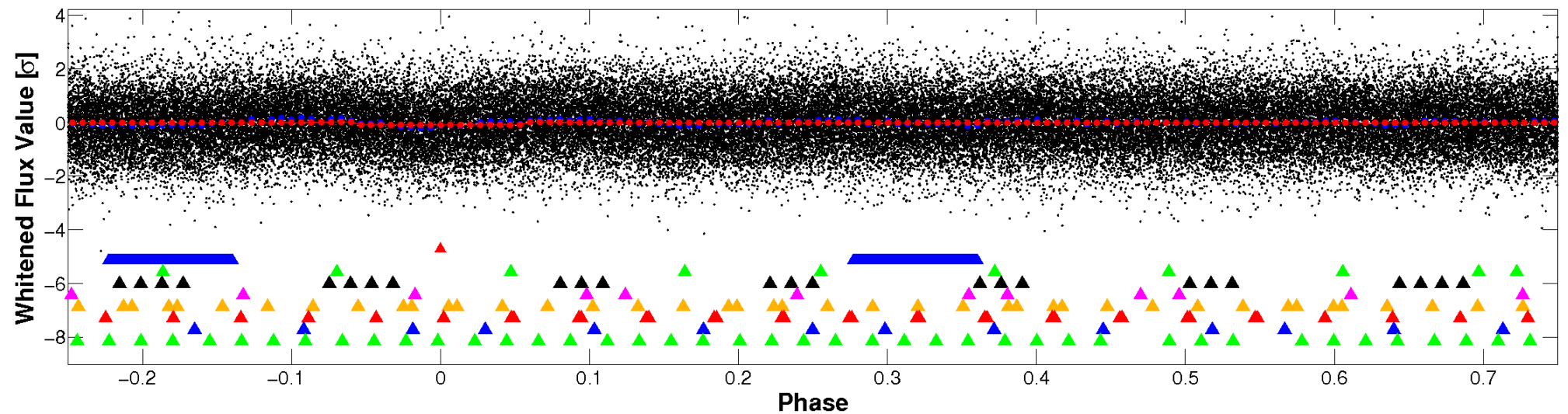


# Non-Whitened Vs. Whitened Light Curve

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

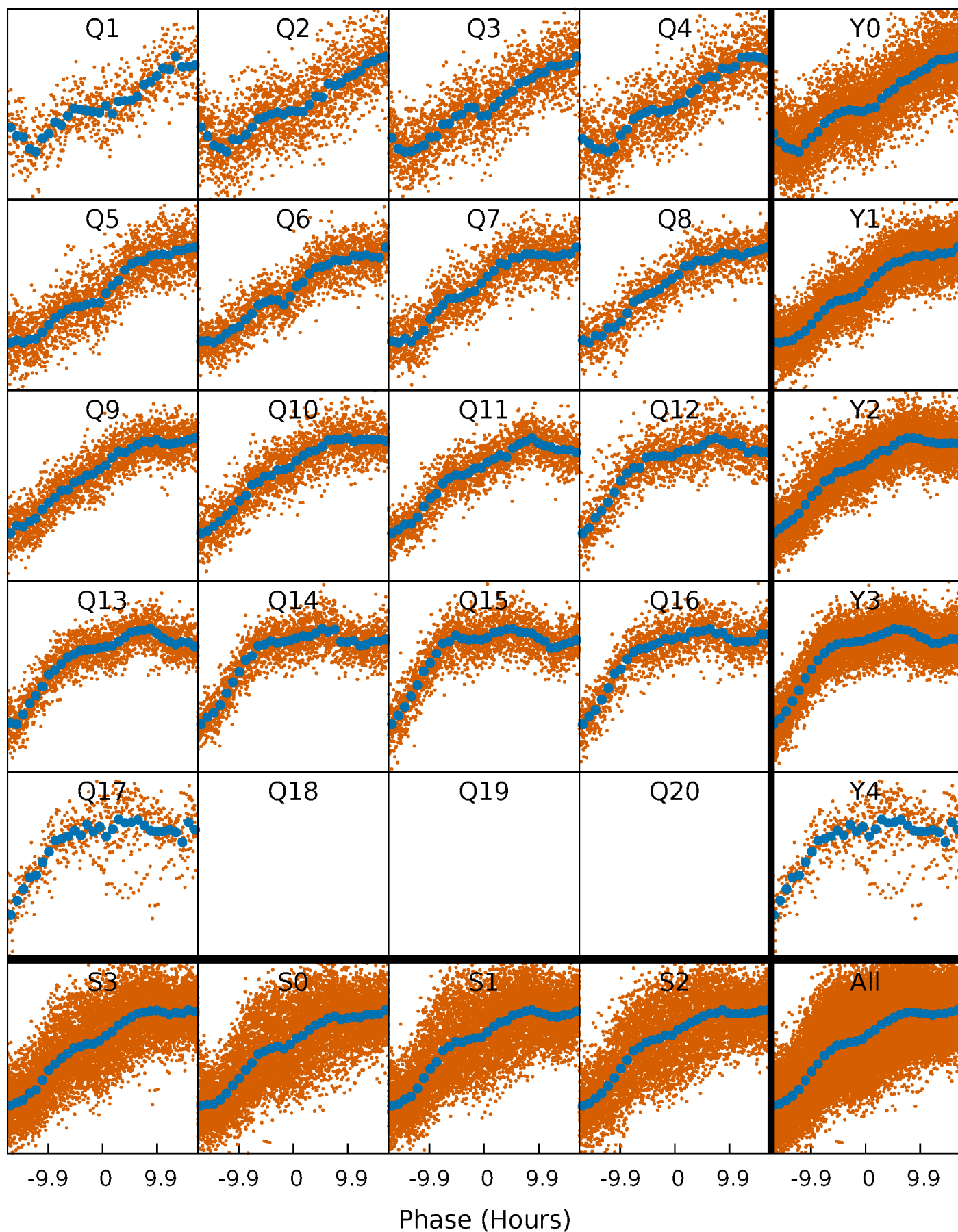


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

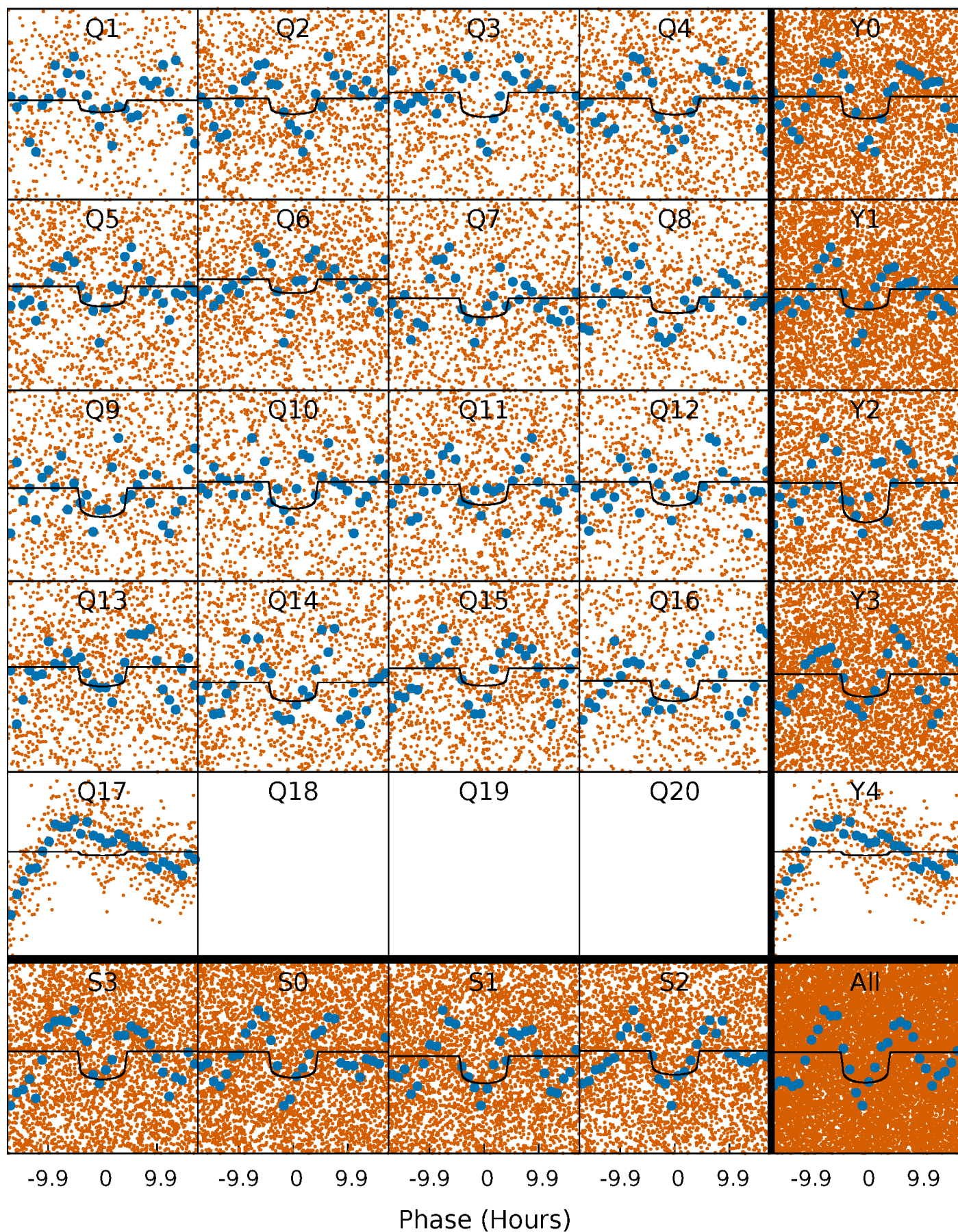
TCE 010904343-01   P= 3.061235 Days    $T_0=132.737615$  (BKJD)





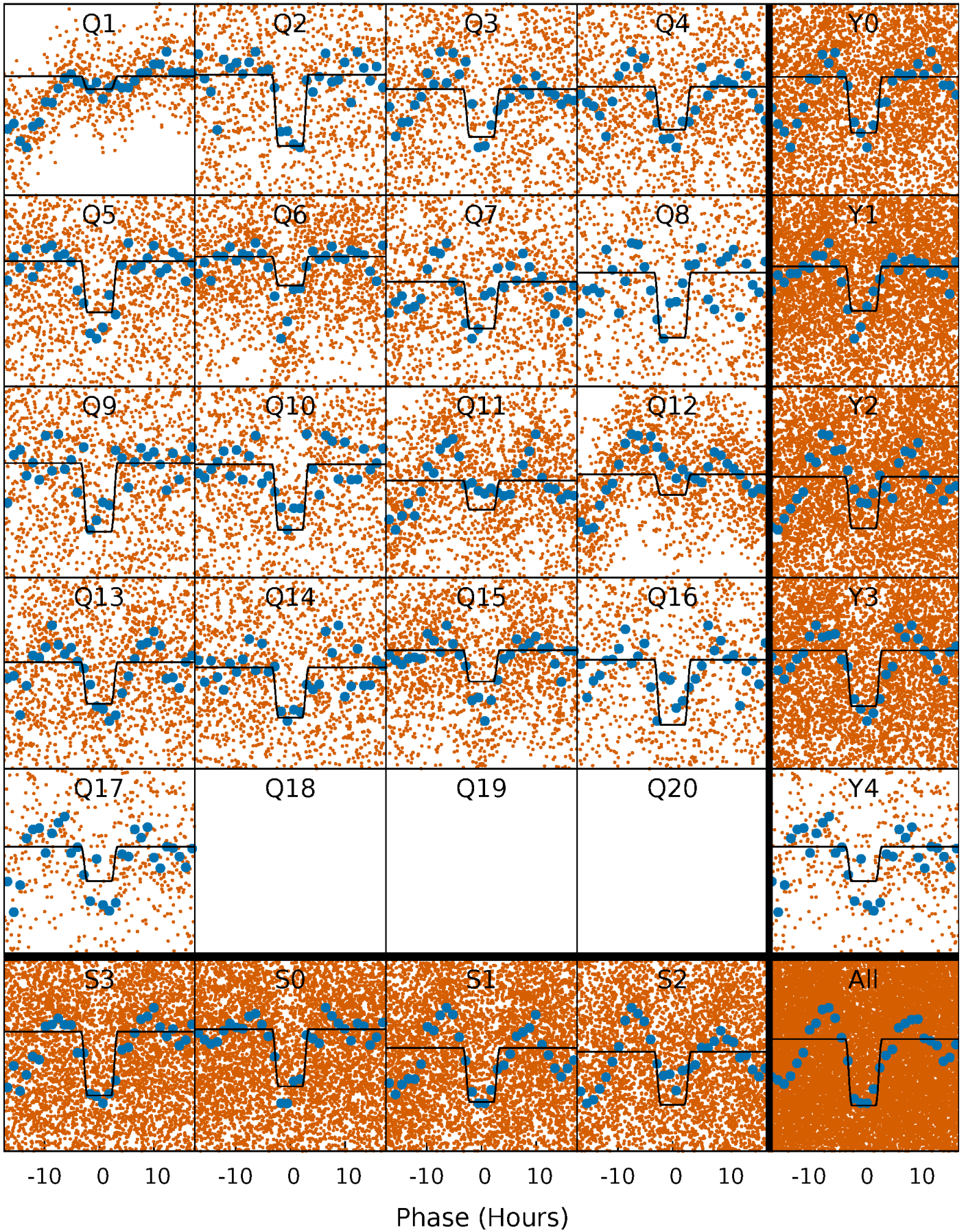
# DV Quarter-Phased Transit Curves

TCE 010904343-01 P= 3.061235 Days  $T_0=132.737615$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010904343-01 P= 3.061018 Days  $T_0=132.767656$  (BKJD)

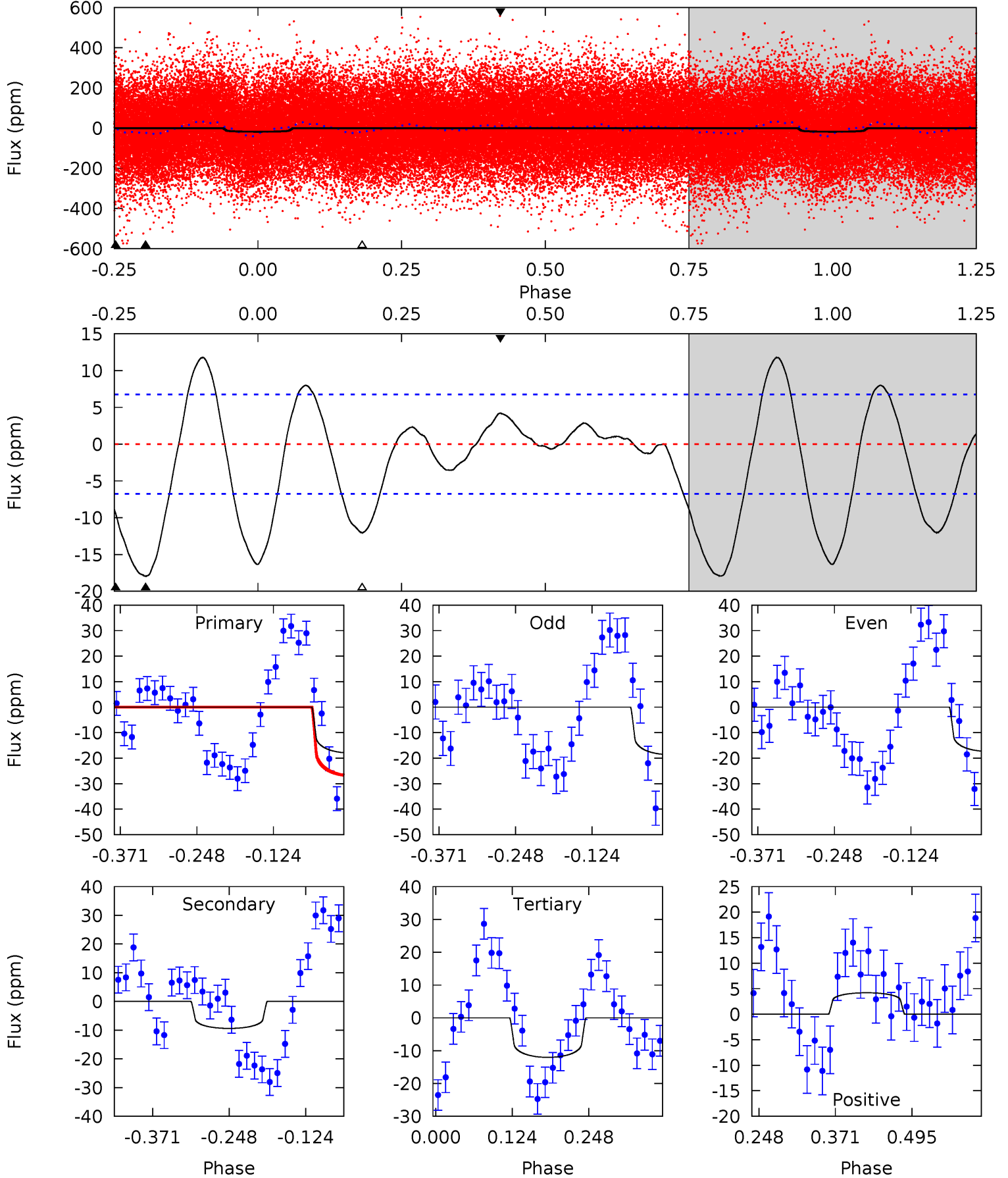




# DV Model-Shift Uniqueness Test

010904343-01, P = 3.061235 Days, E = 129.676380 Days

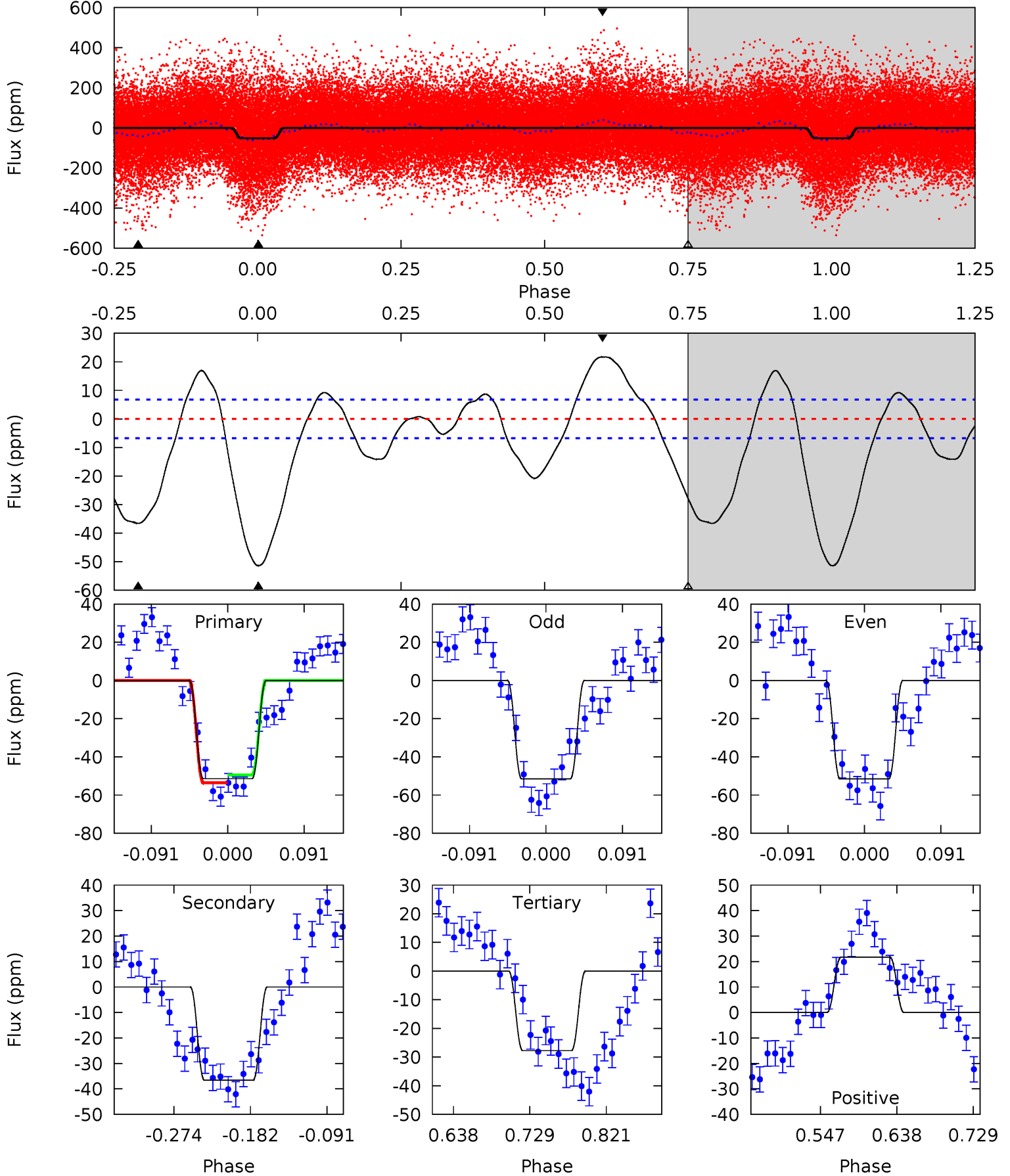
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.0	6.28	8.05	2.81	4.52	1.54	3.76	3.95	9.18	-1.77	3.47	0.42	0.82	0.40	5.87



# Alt Model-Shift Uniqueness Test

010904343-01, P = 3.061018 Days, E = 129.706638 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
34.9	24.8	18.8	14.7	4.58	1.69	7.93	16.1	20.2	5.99	10.1	0.01	1.05	0.30	1.36





### Stellar Parameters For KIC 010904343

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6714^{+168}_{-185}$	$3.533^{+0.344}_{-0.086}$	$-0.280^{+0.350}_{-0.250}$	$3.714^{+0.357}_{-1.427}$	$1.717^{+0.212}_{-0.345}$	$0.047^{+0.117}_{-0.013}$
	+3%/-3%	+10%/-2%	+125%/-89%	+10%/-38%	+12%/-20%	+247%/-27%
Source	PHO1	FLK73	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010904343-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-9 \pm 1$	$1.90^{+0.52}_{-0.50}$	$3527^{+186}_{-298}$	$5202^{+695}_{-506}$	$3.473^{+2.978}_{-1.360}$
Alt.	$-37 \pm 1$	$2.92^{+0.62}_{-0.62}$	$3523^{+178}_{-298}$	$5852^{+508}_{-358}$	$5.721^{+3.316}_{-1.660}$

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

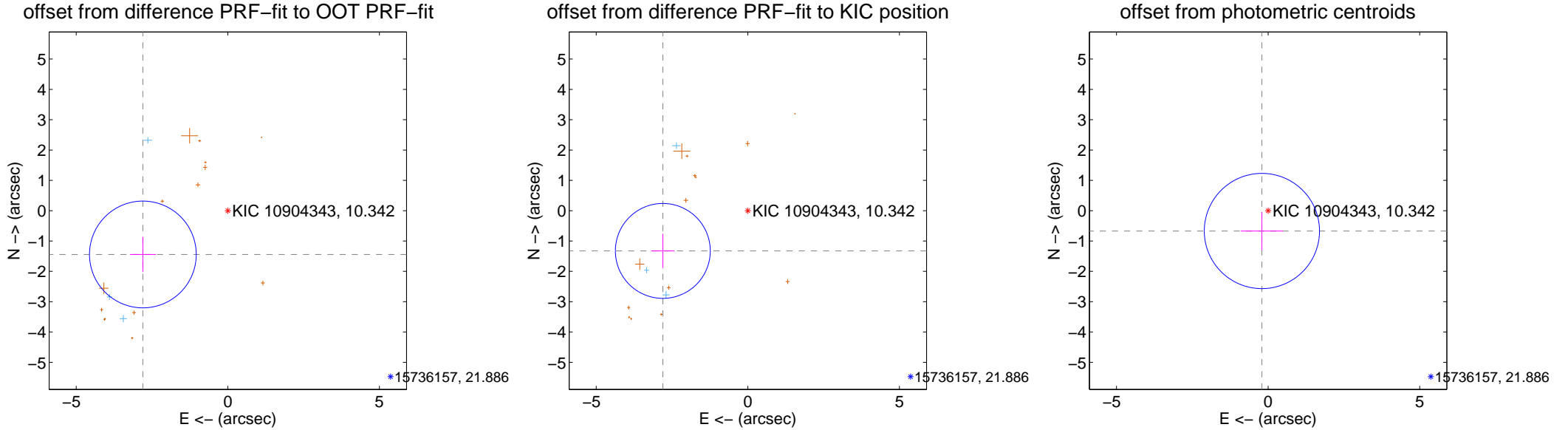
## DV Centroid Data

Supplemental centroid analysis for 010904343-01. **Kepler magnitude: 10.34.** Transit SNR 7.40

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

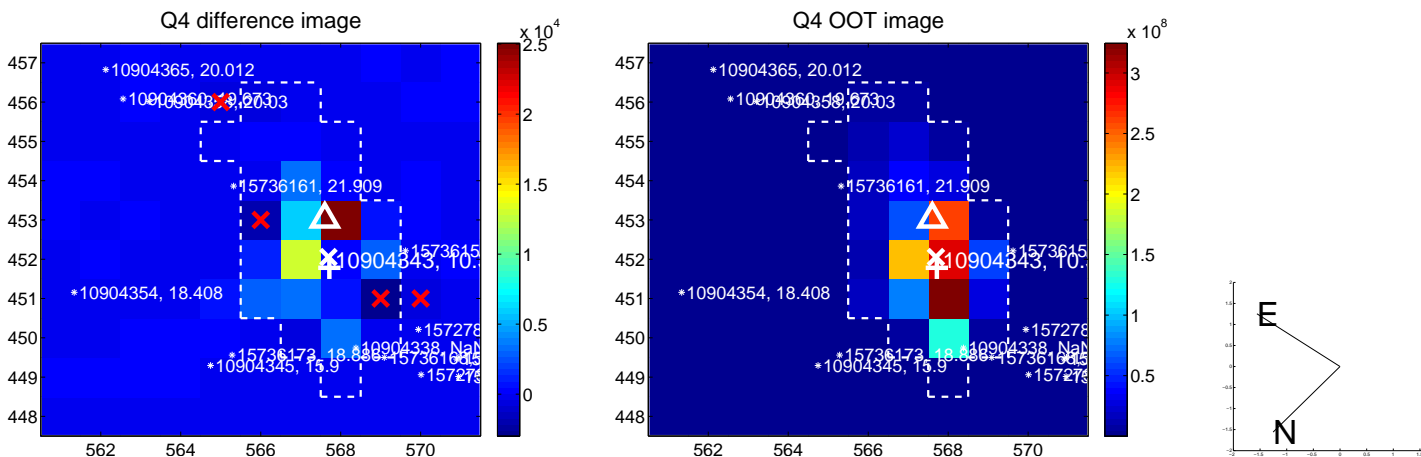
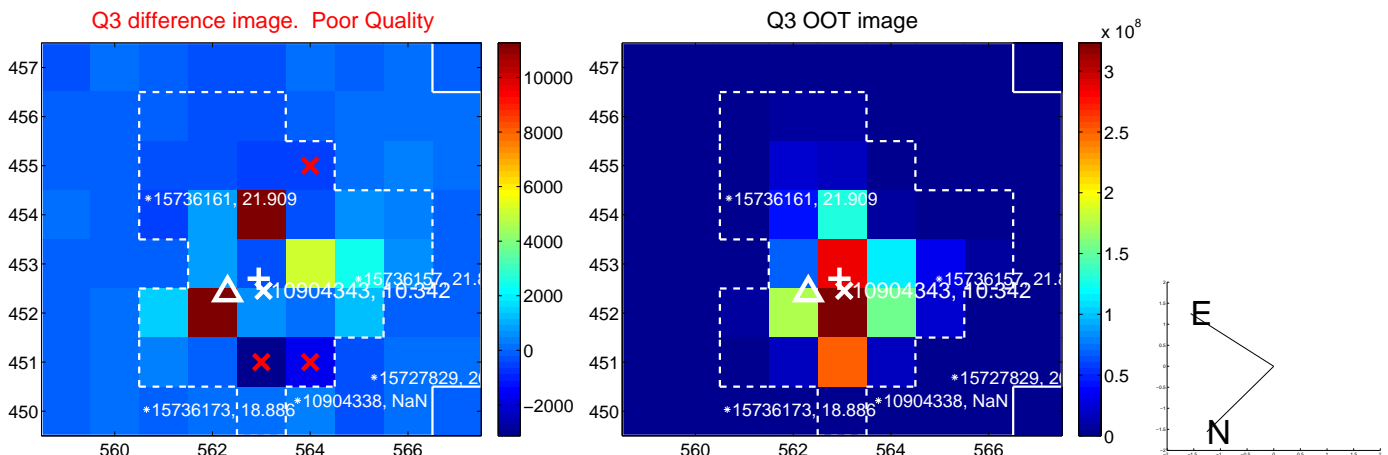
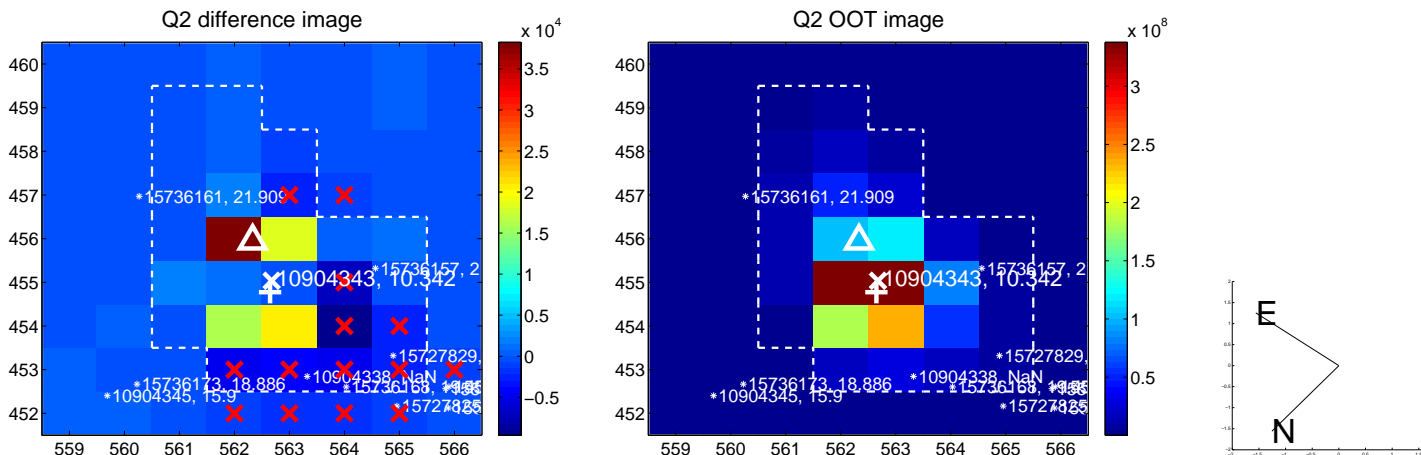
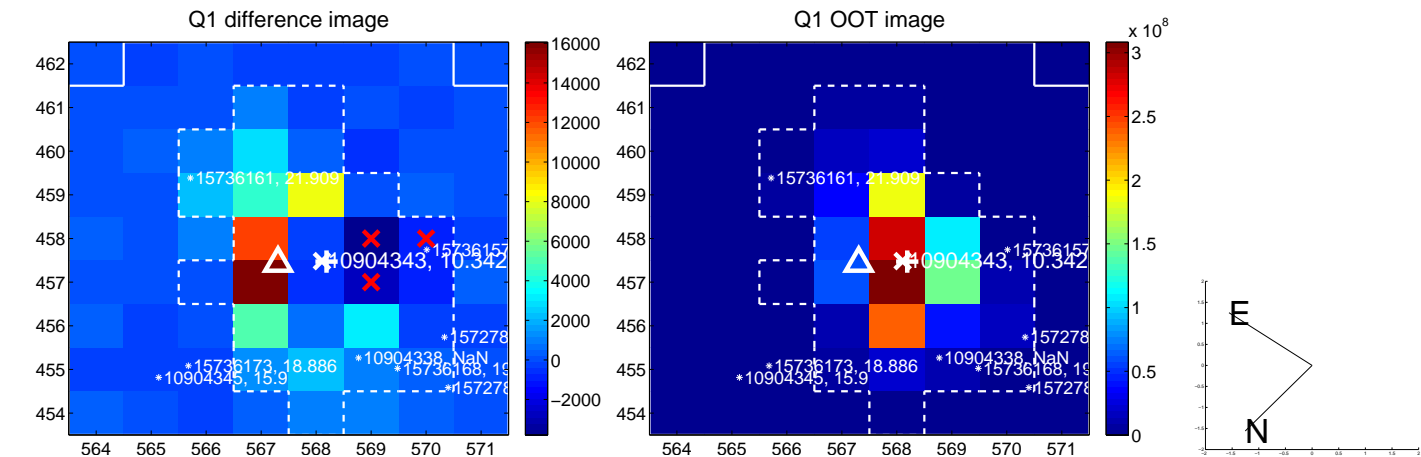
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>3.151 \pm 0.587</math></b>	<b>5.37</b>	$2.801 \pm 0.431$	$-1.443 \pm 0.580$
PRF-fit source offset from KIC position	<b><math>3.101 \pm 0.522</math></b>	<b>5.94</b>	$2.803 \pm 0.387$	$-1.326 \pm 0.563$
photometric centroid source offset	$0.70 \pm 0.63$	1.11	$0.20 \pm 0.70$	$-0.67 \pm 0.63$

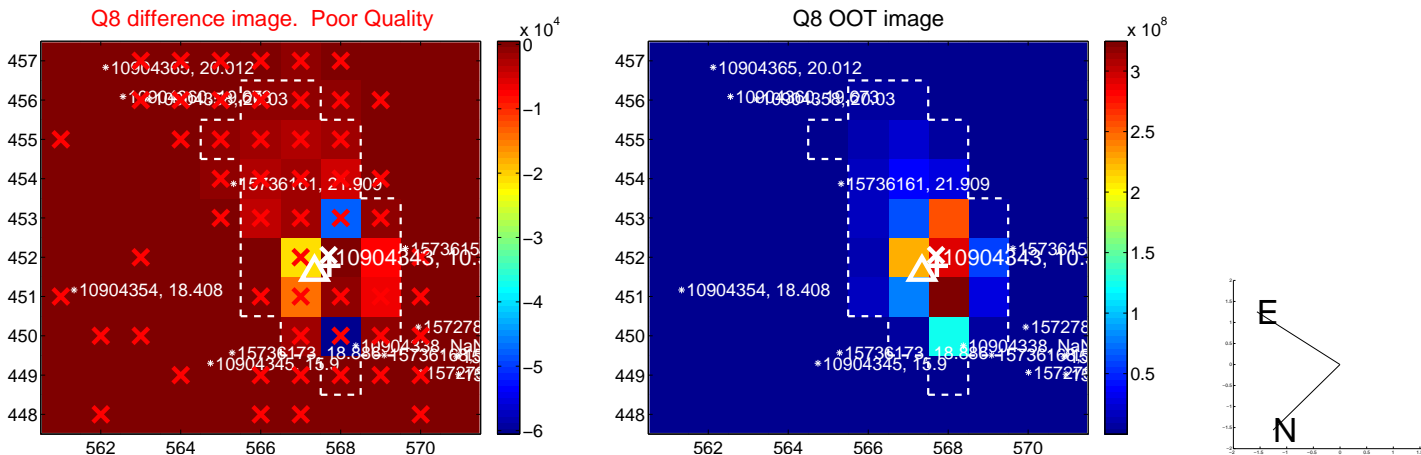
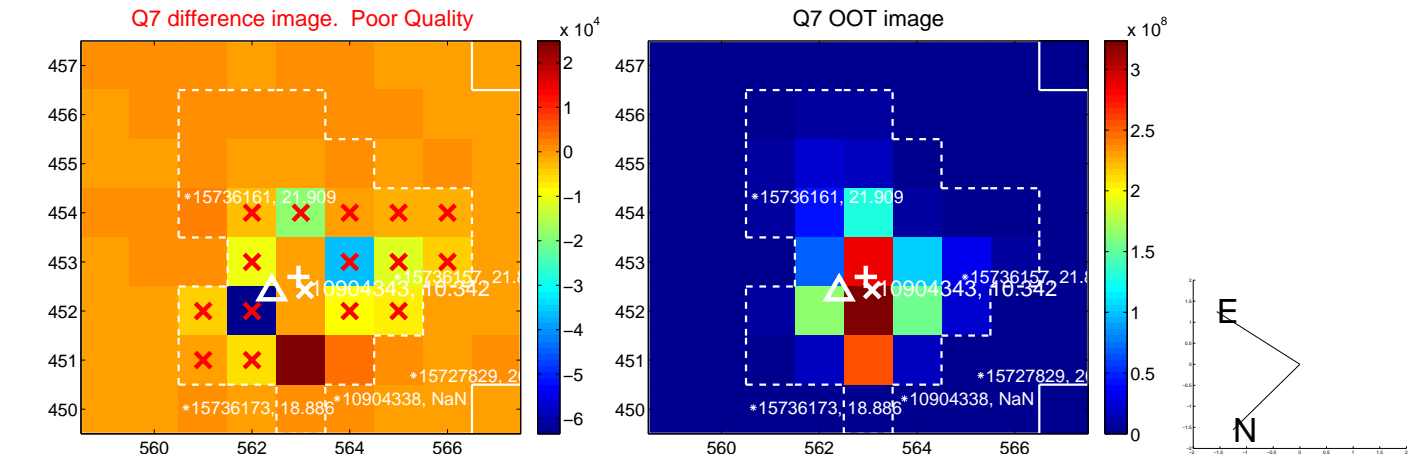
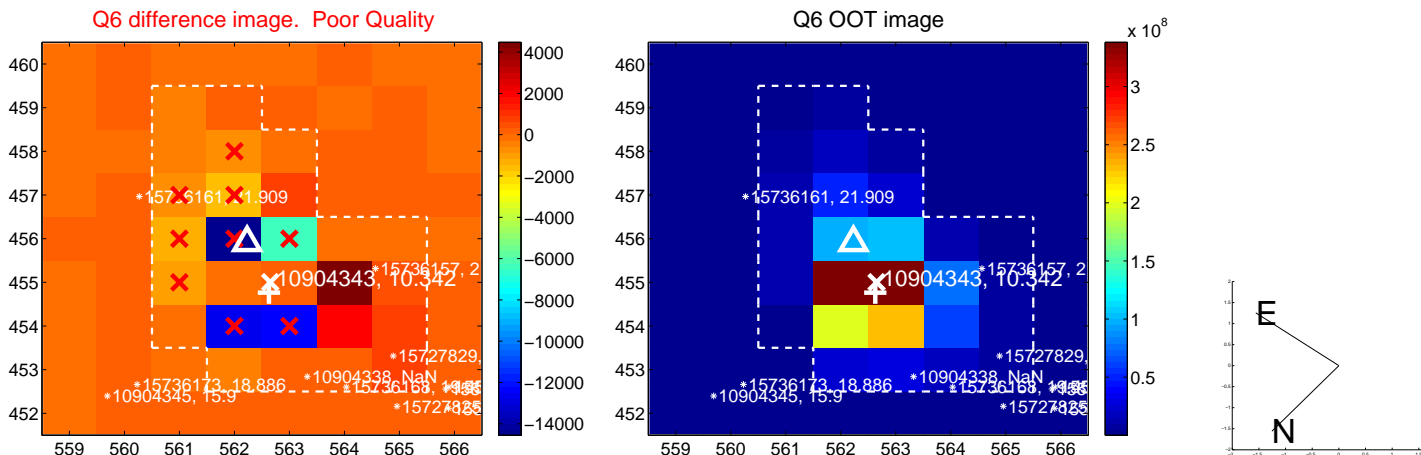
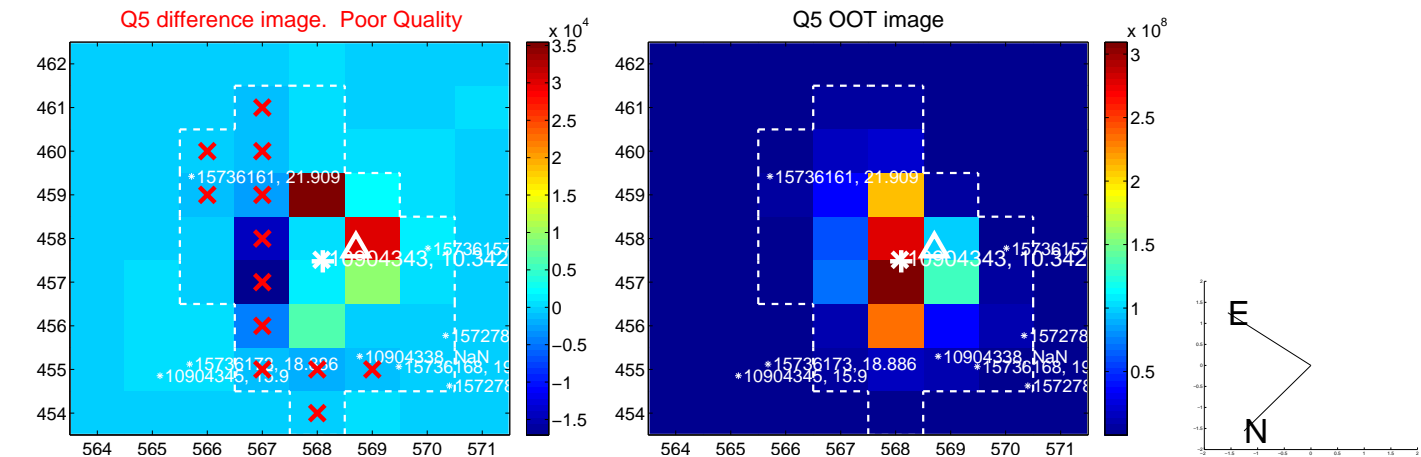


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



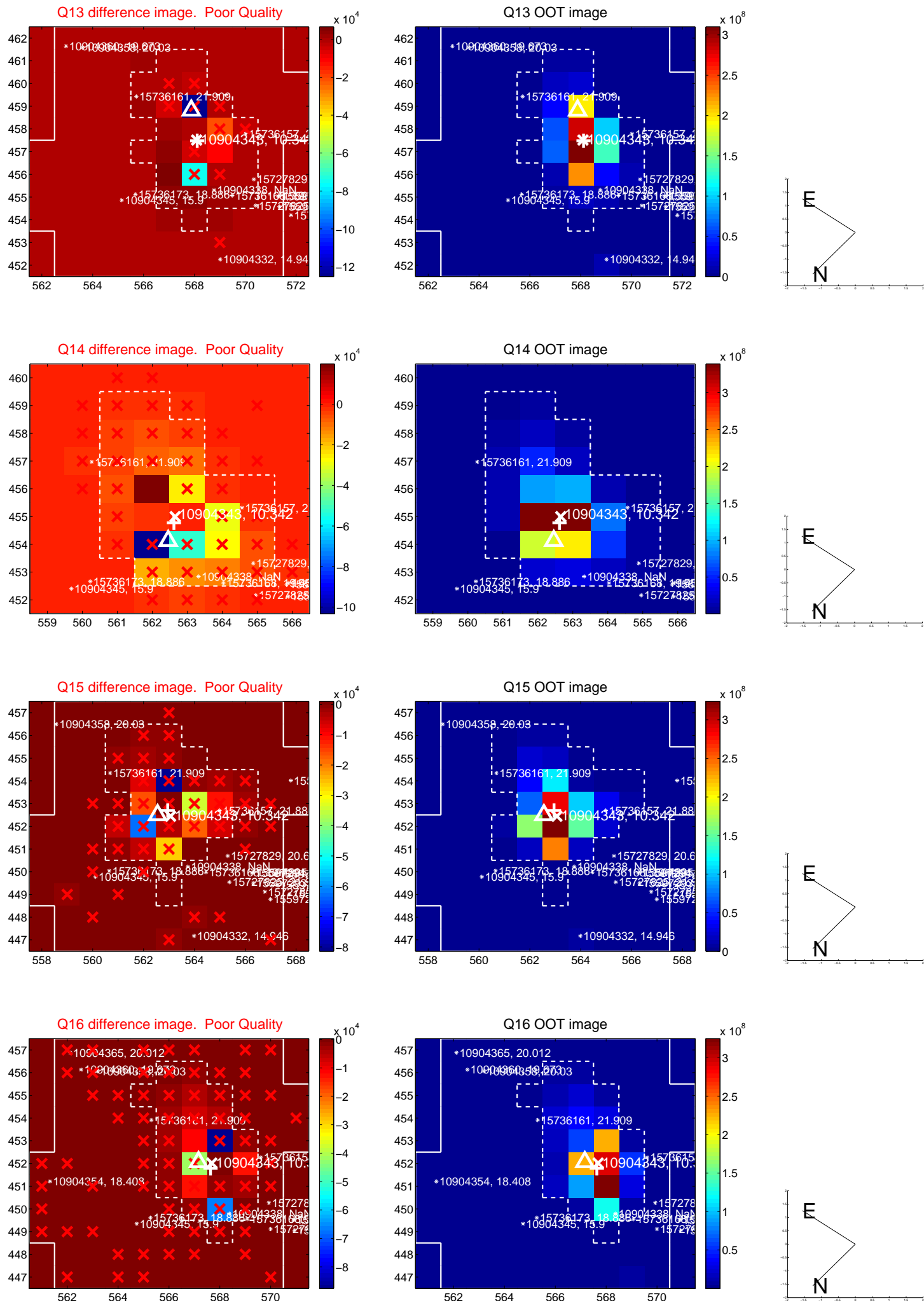
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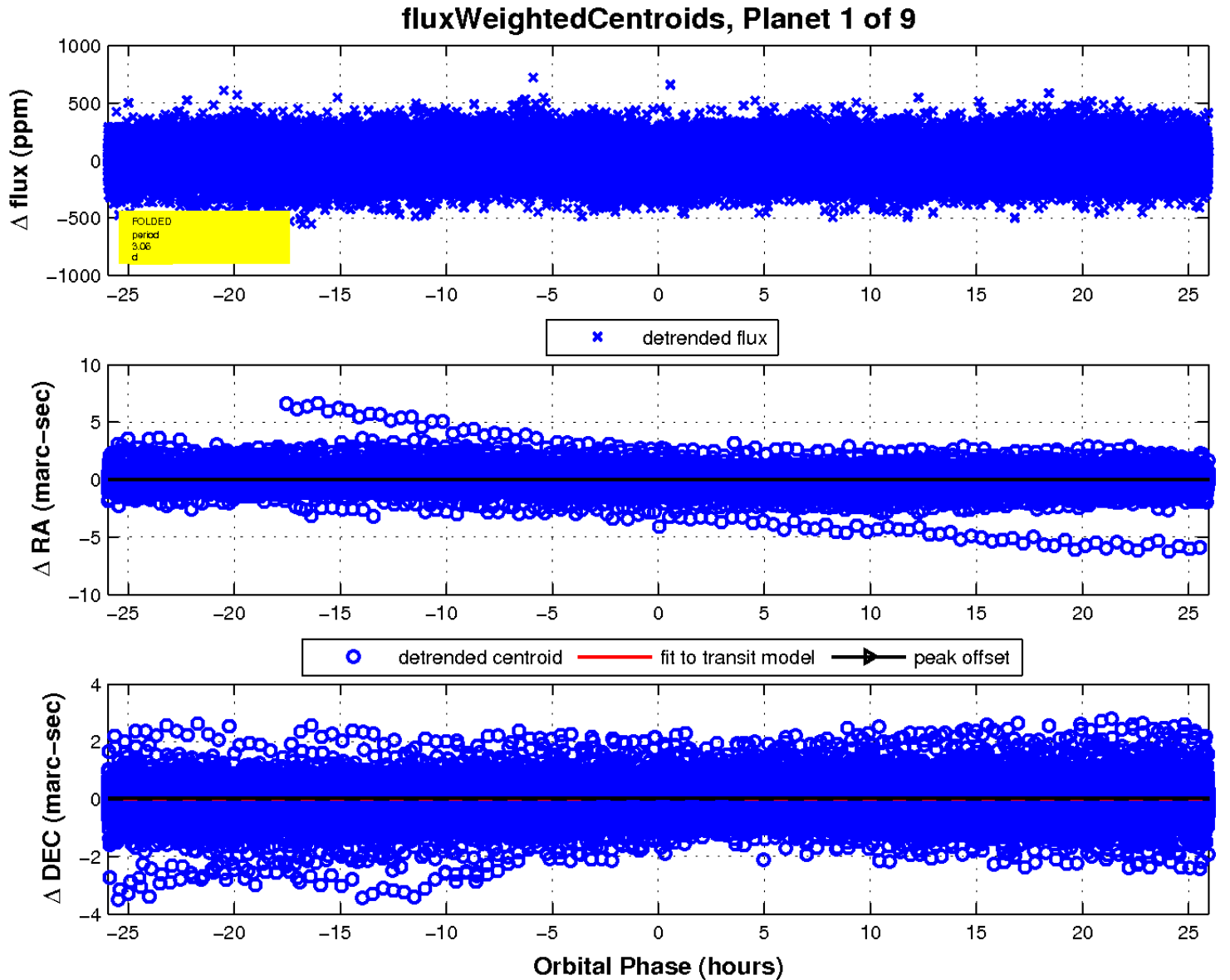
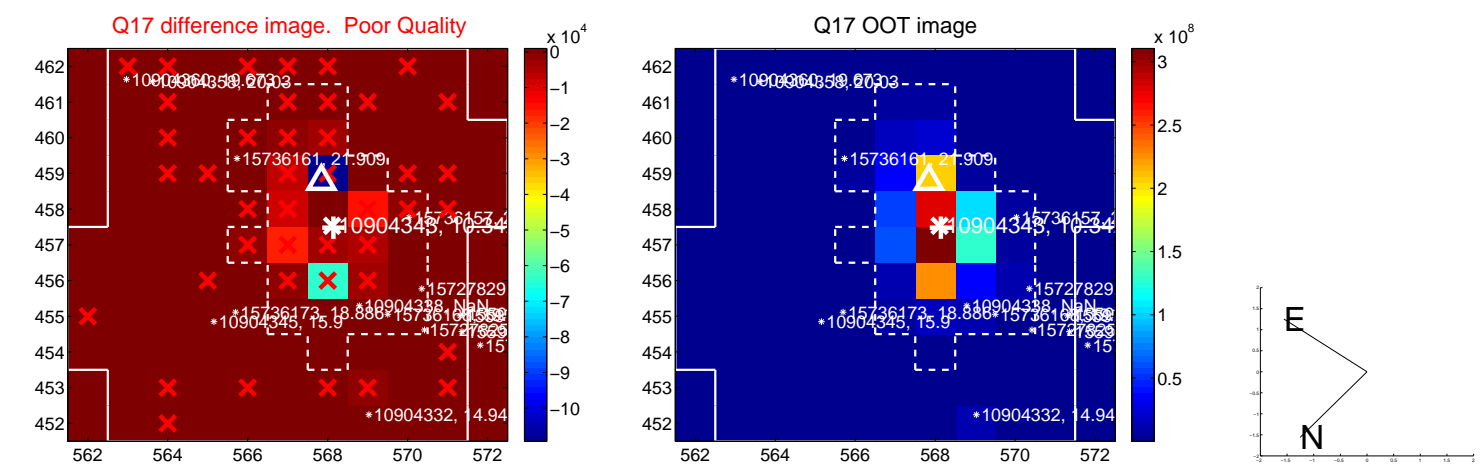




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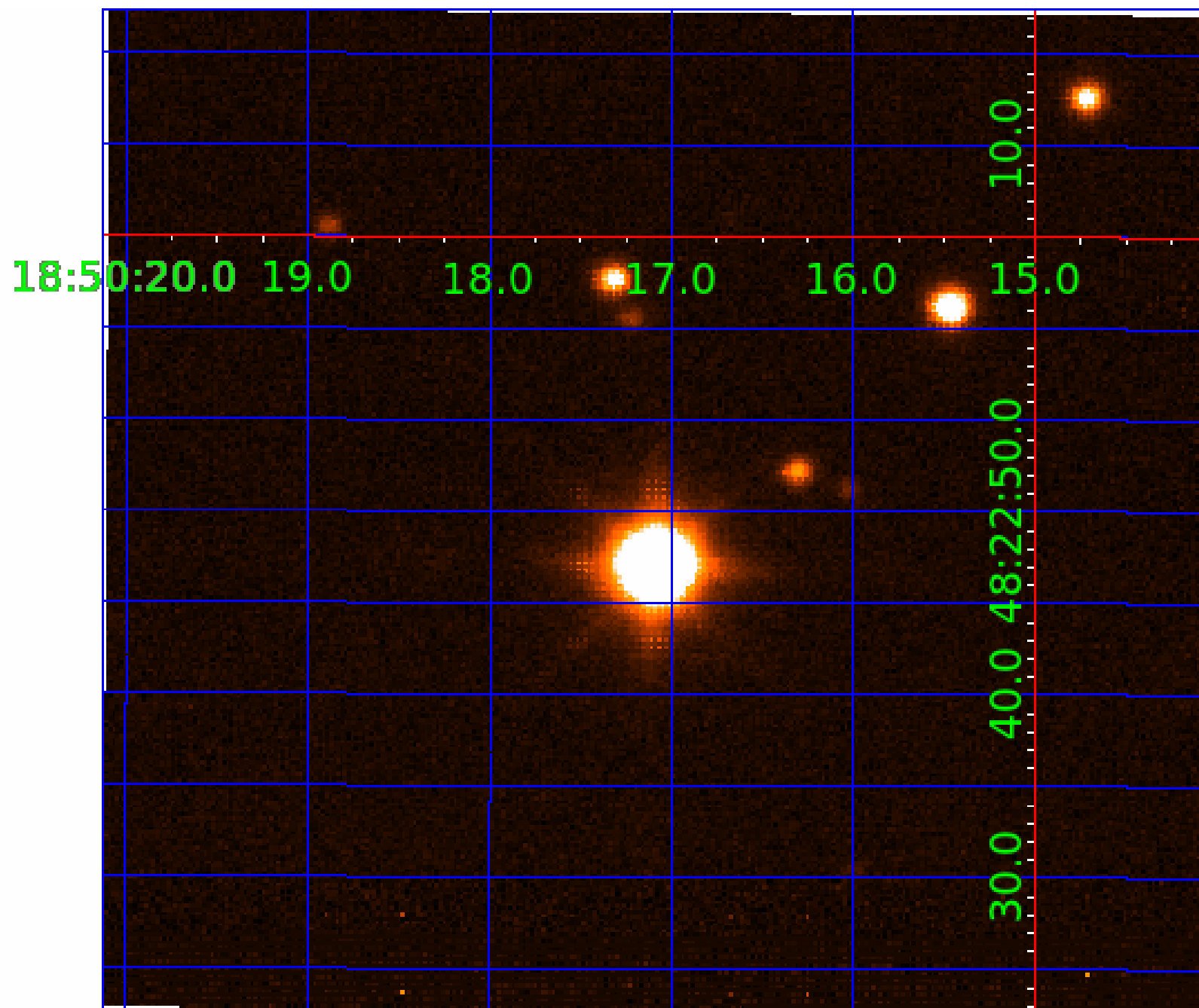


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# UKIRT Image

Declination





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010904343-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010904343-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
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**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

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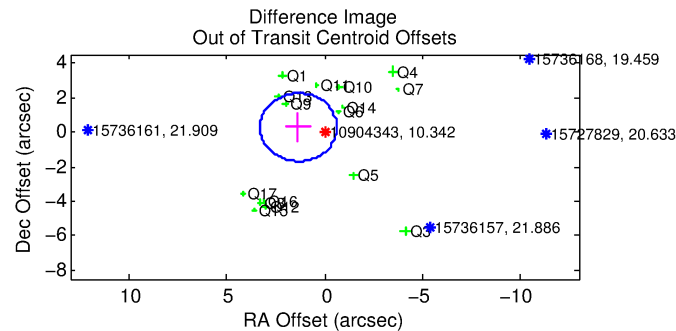
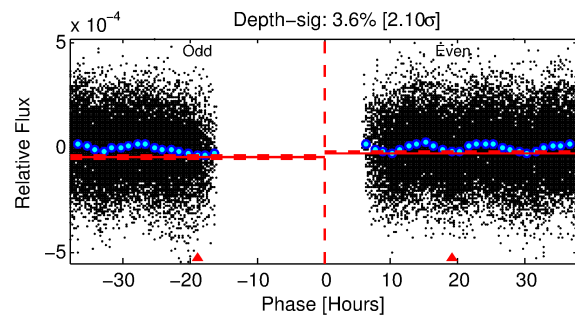
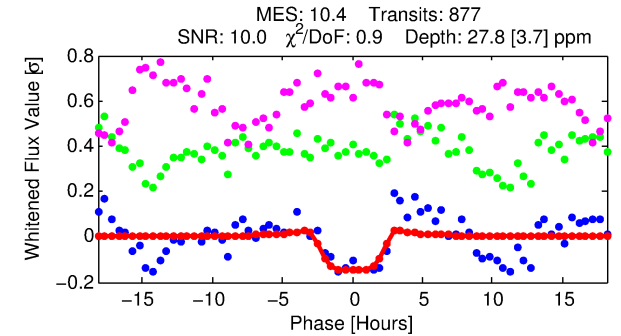
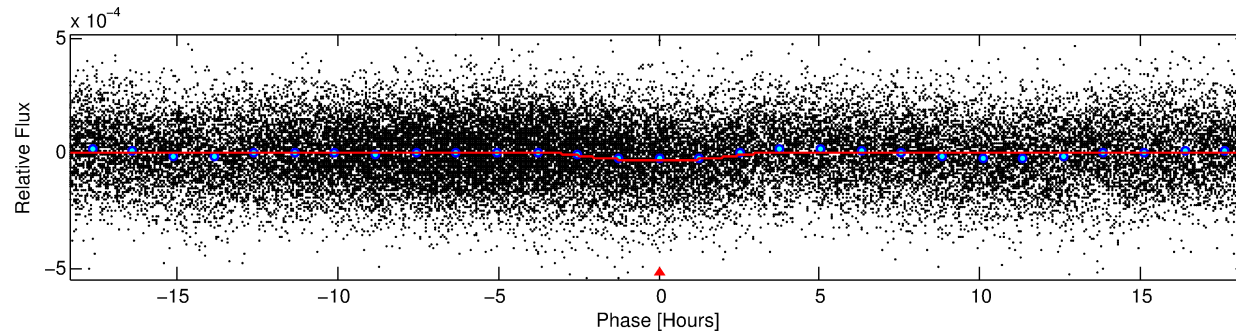
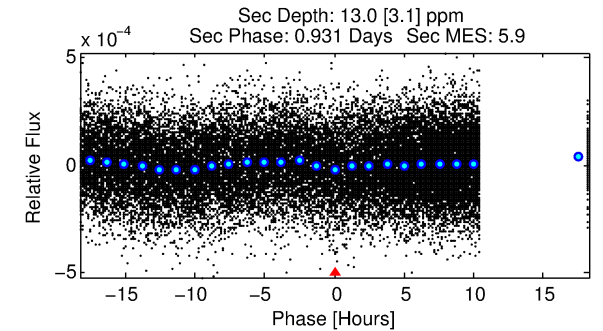
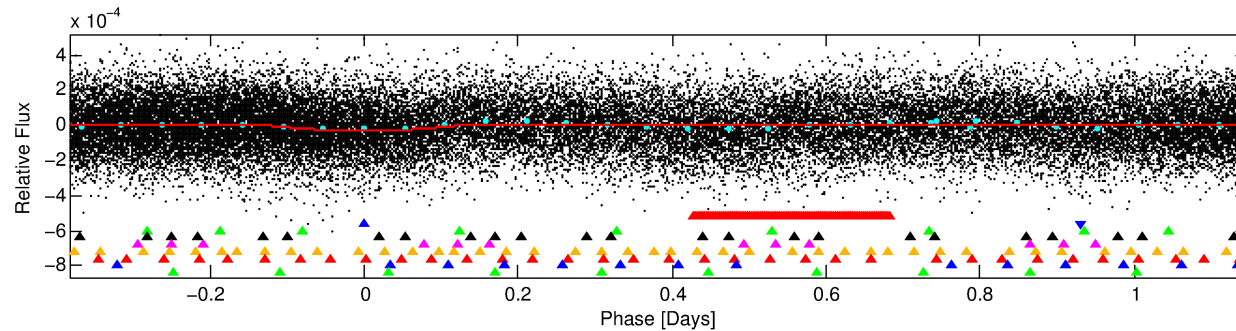
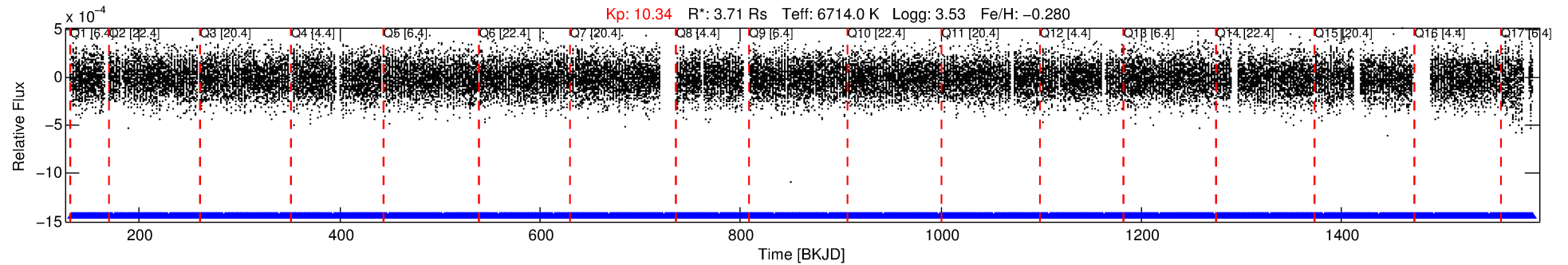
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010904343-02

No Significant Match Found

# DV One-Page Summary

KIC: 10904343 Candidate: 2 of 9 Period: 1.530 d



## DV Fit Results:

Period = 1.53035 [0.00002] d  
Epoch = 132.3108 [0.0085] BKJD  
 $R_p/R^* = 0.0067$  [0.0005]  
 $a/R^* = 1.05$  [0.02]  
 $b = 0.99$  [0.00]  
 $\text{Seff} = 25921.51$  [15479.43]  
 $T_{\text{eq}} = 3235$  [483] K  
 $R_p = 2.71$  [1.06]  $R_e$   
 $a = 0.0311$  [0.0114] AU  
 $A_g = 0.94$  [0.61] [-0.10σ]  
 $T_{\text{eff}} = 4925$  [375] K [2.76σ]

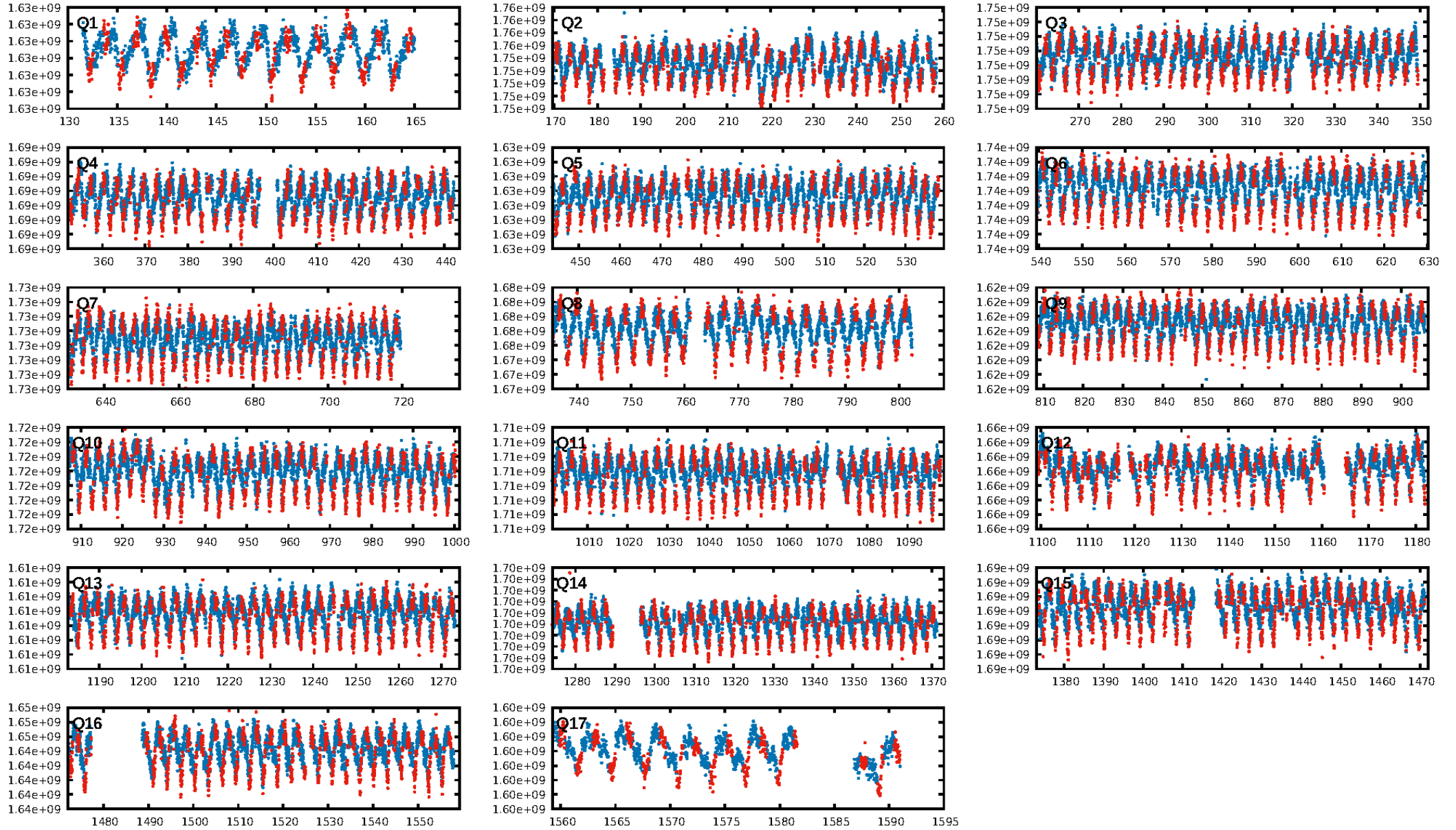
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.9% [3.43σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.39e-14  
RollingBand-fgt: 1.00 [838/838]  
GhostDiagnostic-chr: 0.7765  
Centroid-sig: 0.0%  
Centroid-so: 1.190 arcsec [2.74σ]  
OotOffset-rm: 1.372 arcsec [2.09σ]  
KicOffset-rm: 1.009 arcsec [1.40σ]  
OotOffset-st: 3/4/4/5 [16]  
KicOffset-st: 3/4/4/5 [16]  
DiffImageQuality-fgm: 0.00 [0/16]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:37:55 Z

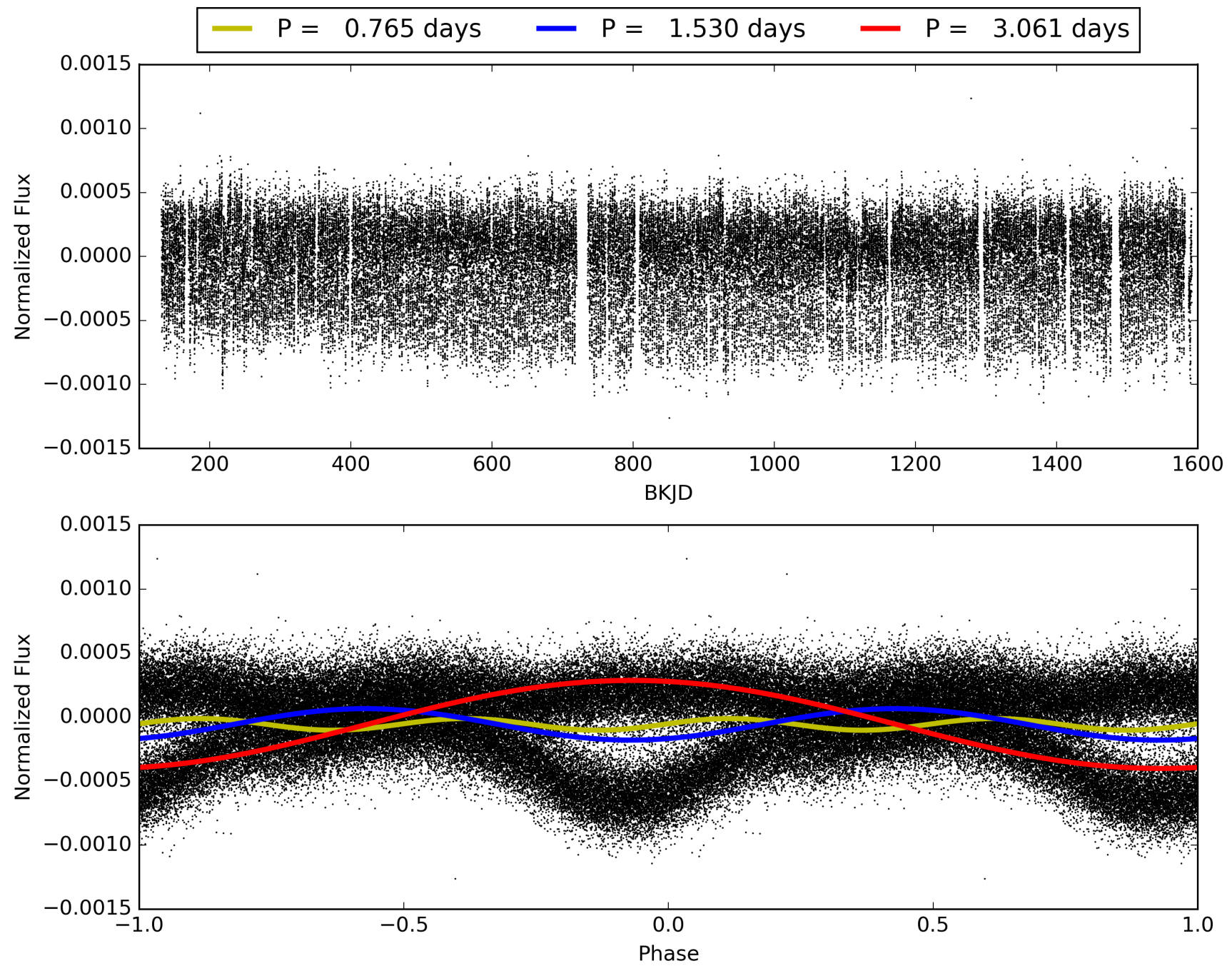
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010904343-02, PDC Light Curves





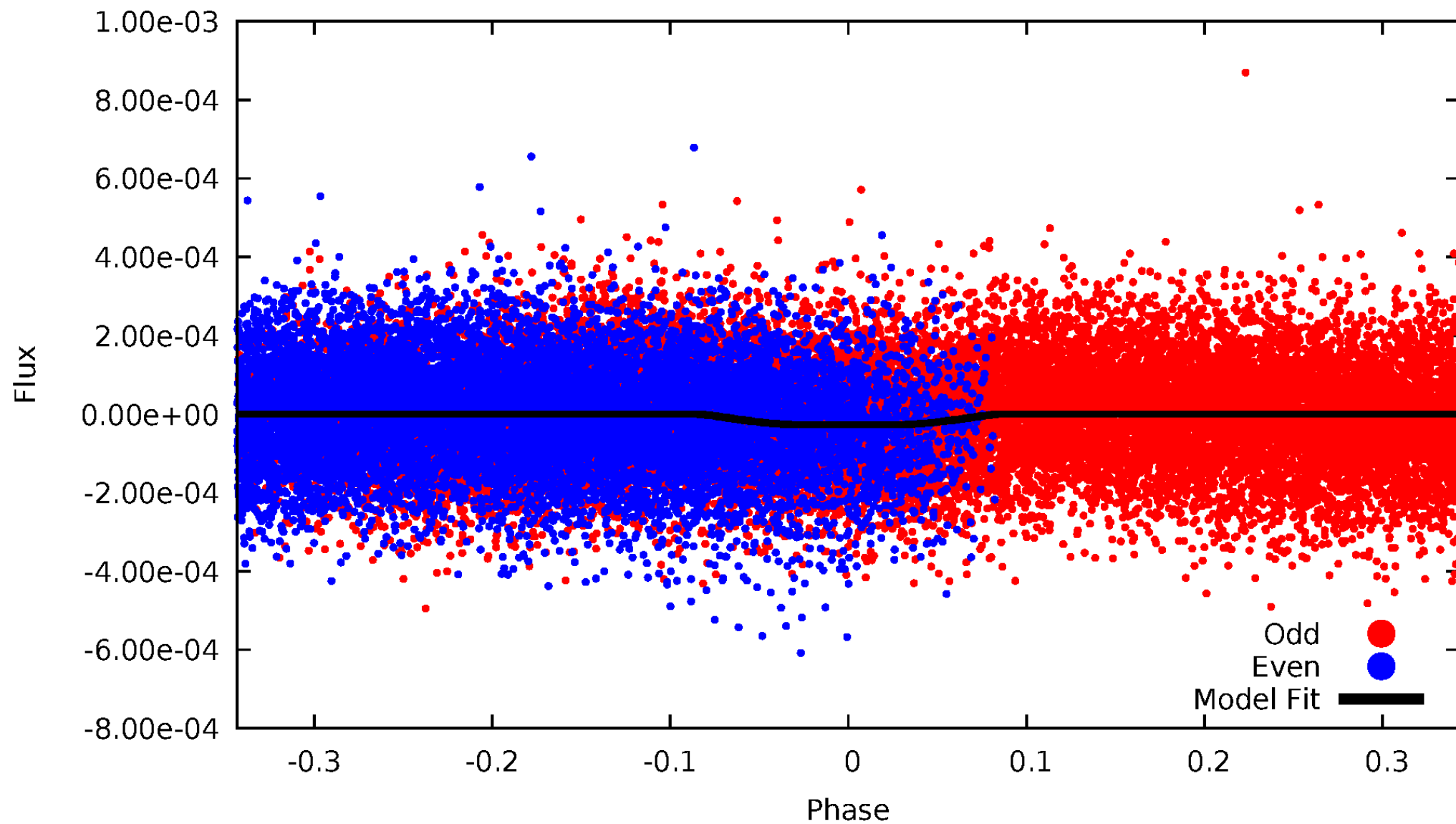
TCE 010904343-02





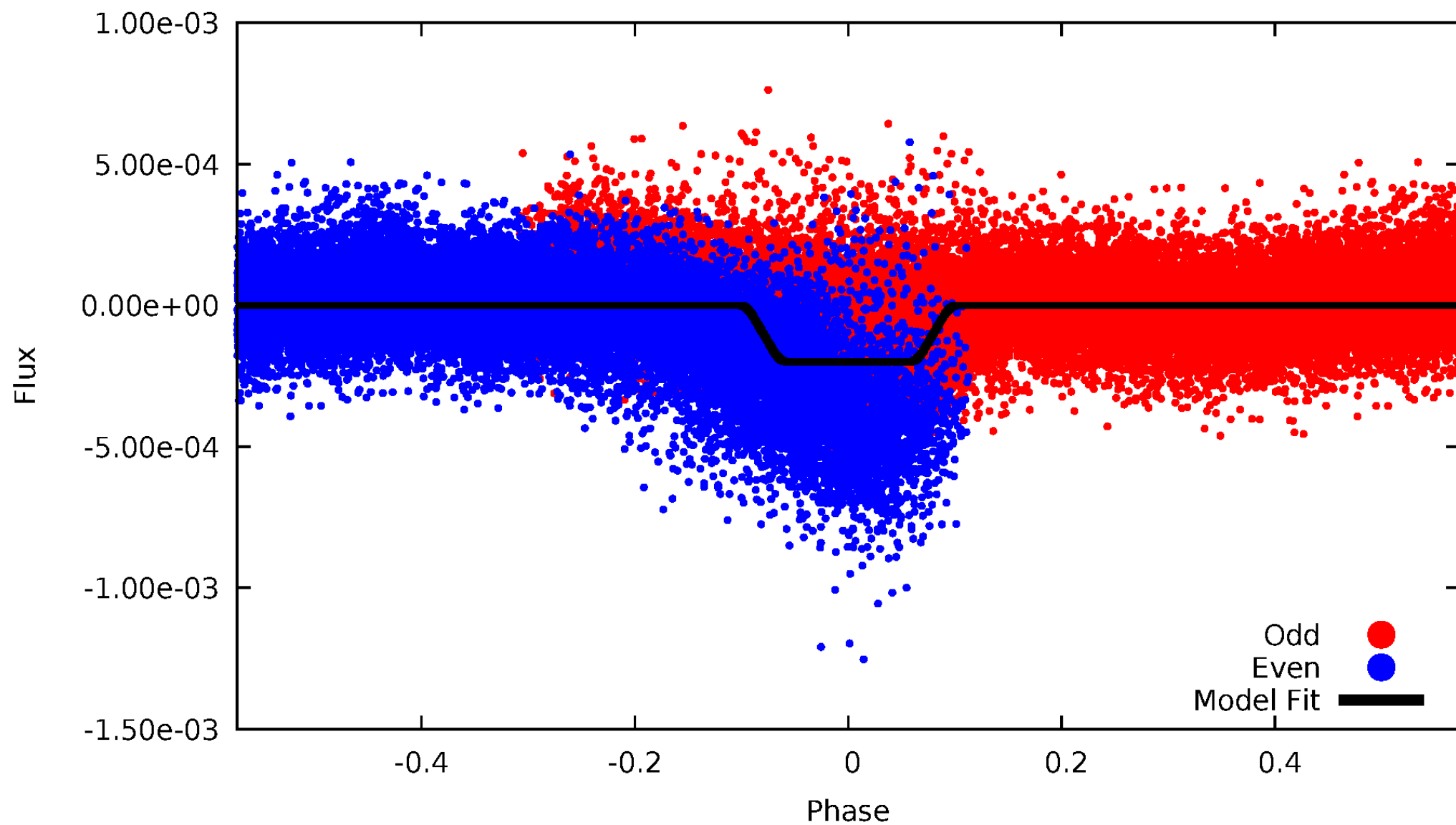
# DV Odd/Even

TCE 010904343-02



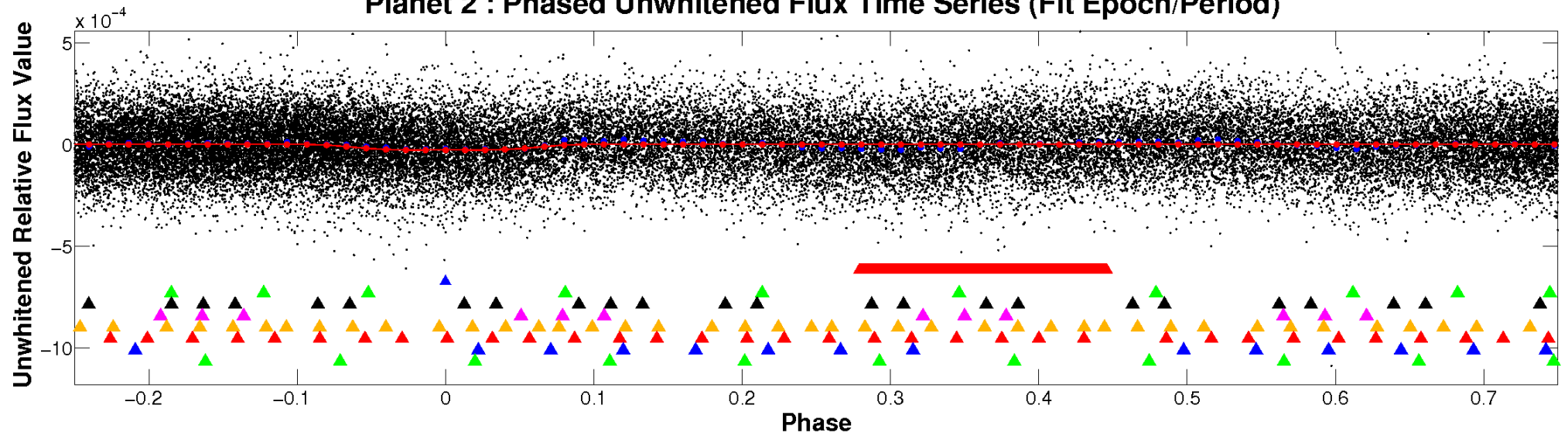
# ALT Odd/Even

TCE 010904343-02

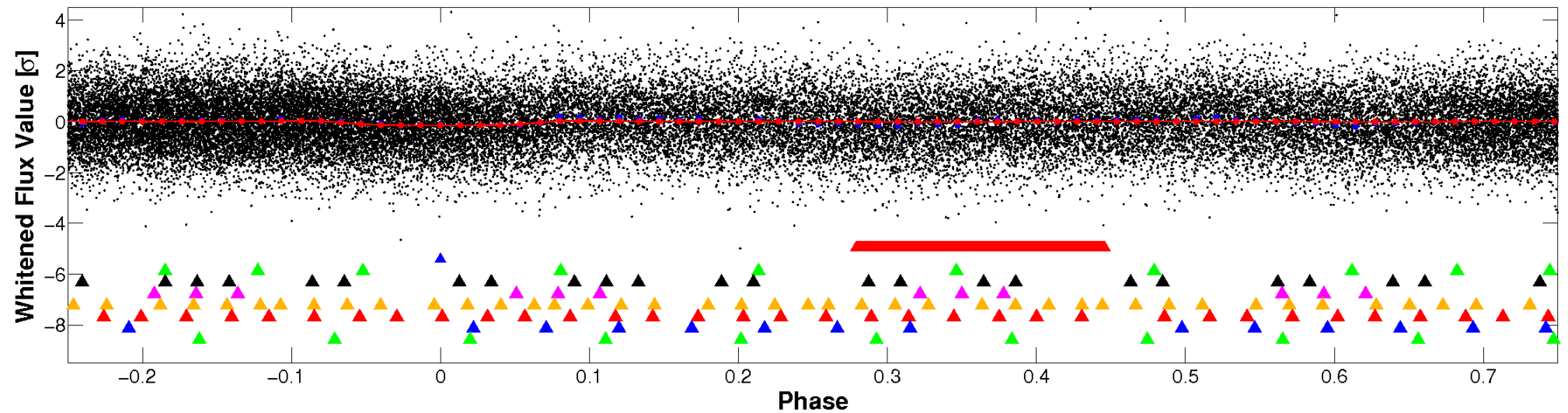


# Non-Whitened Vs. Whitened Light Curve

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

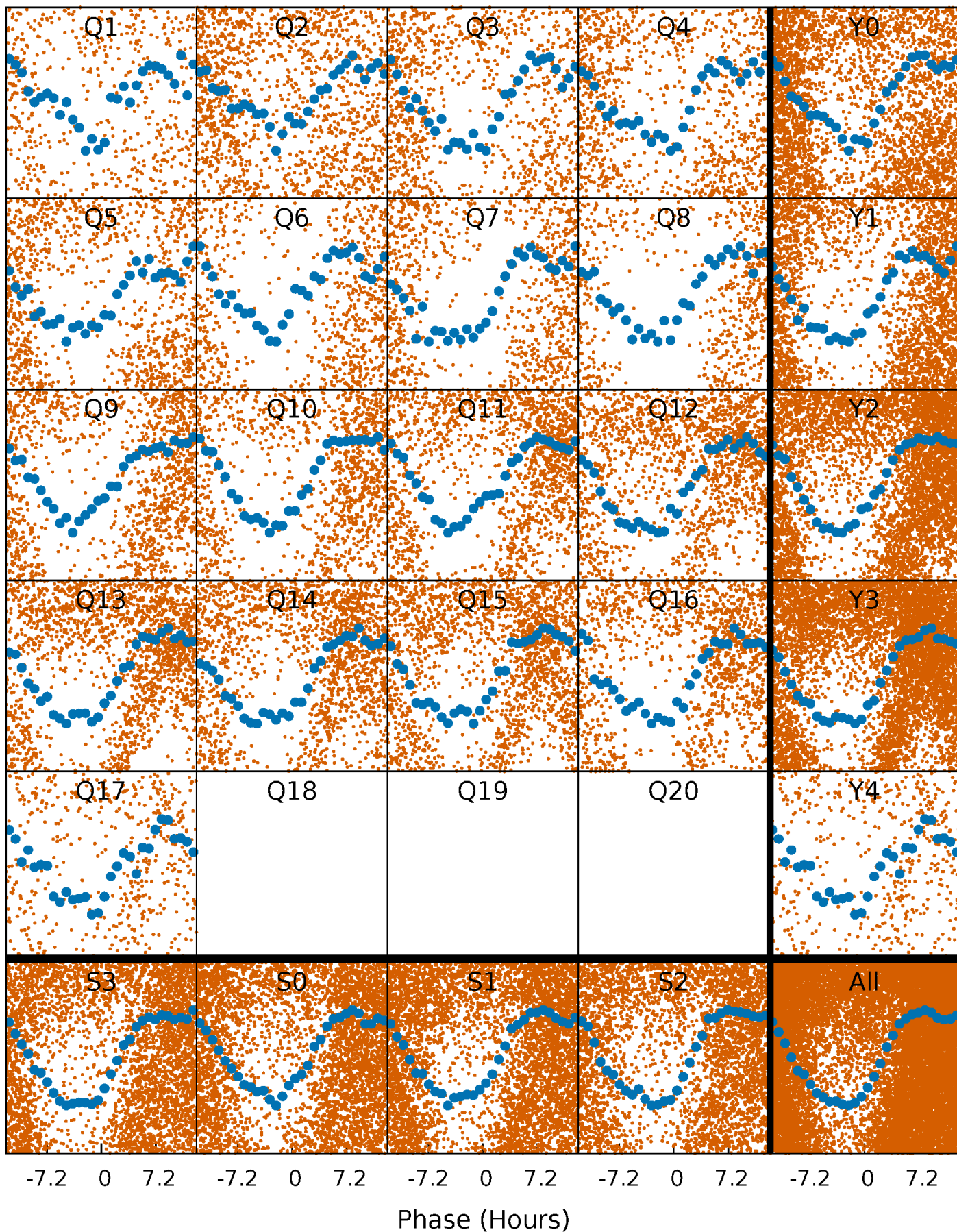


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

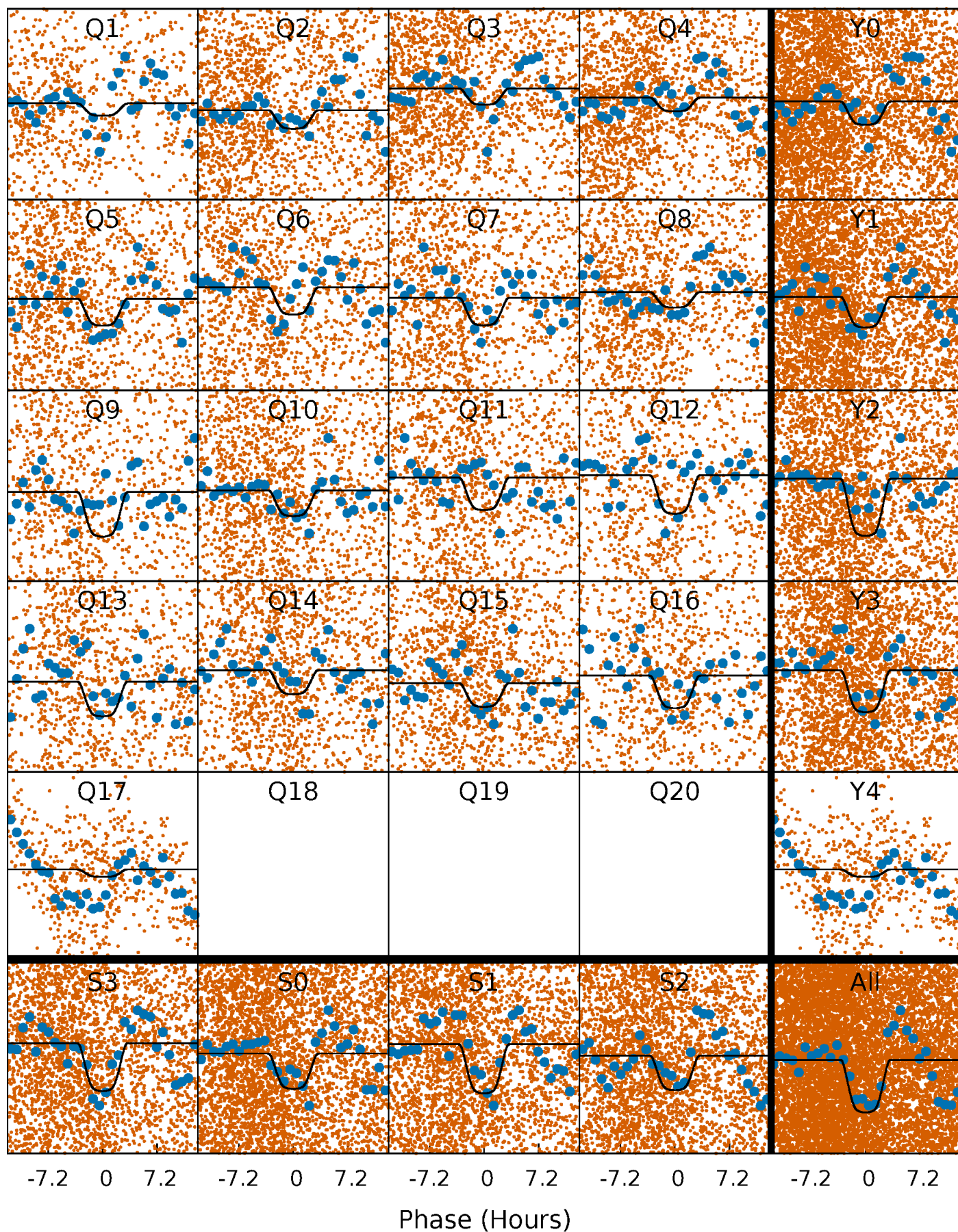
TCE 010904343-02 P= 1.530349 Days  $T_0=132.310781$  (BKJD)





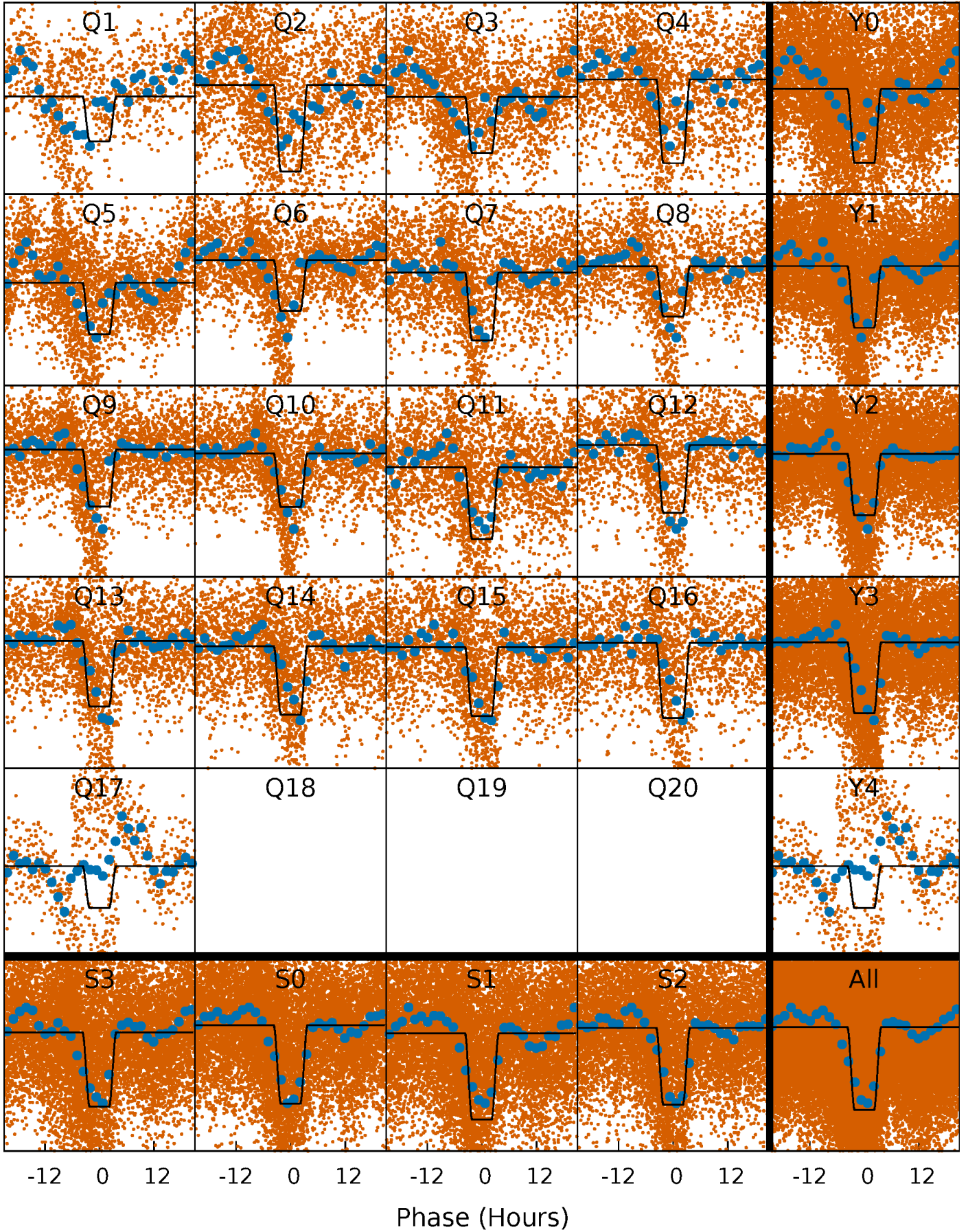
# DV Quarter-Phased Transit Curves

TCE 010904343-02 P= 1.530349 Days  $T_0=132.310781$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010904343-02   P= 1.530375 Days    $T_0=132.240609$  (BKJD)

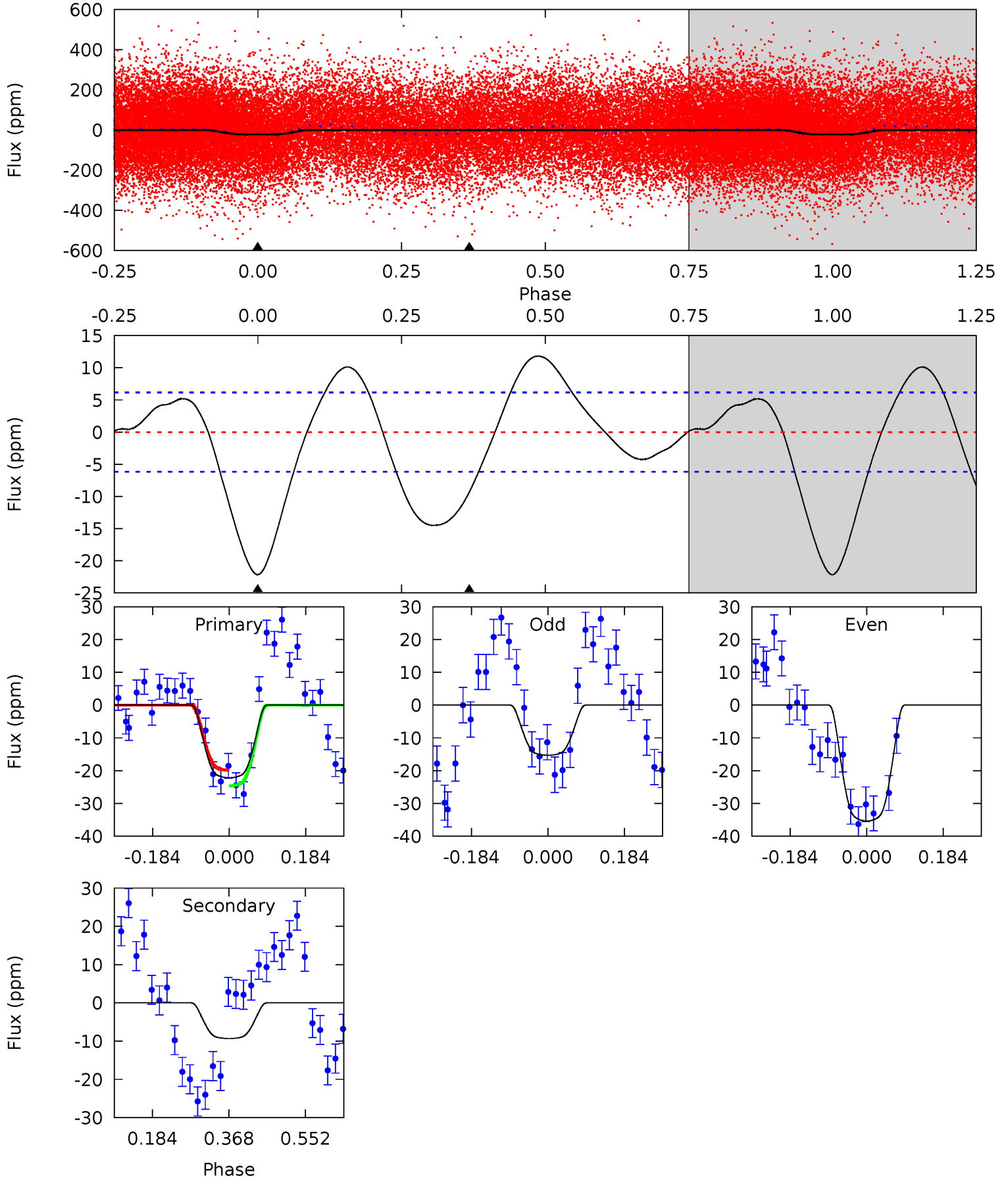




# DV Model-Shift Uniqueness Test

010904343-02, P = 1.530349 Days, E = 130.780432 Days

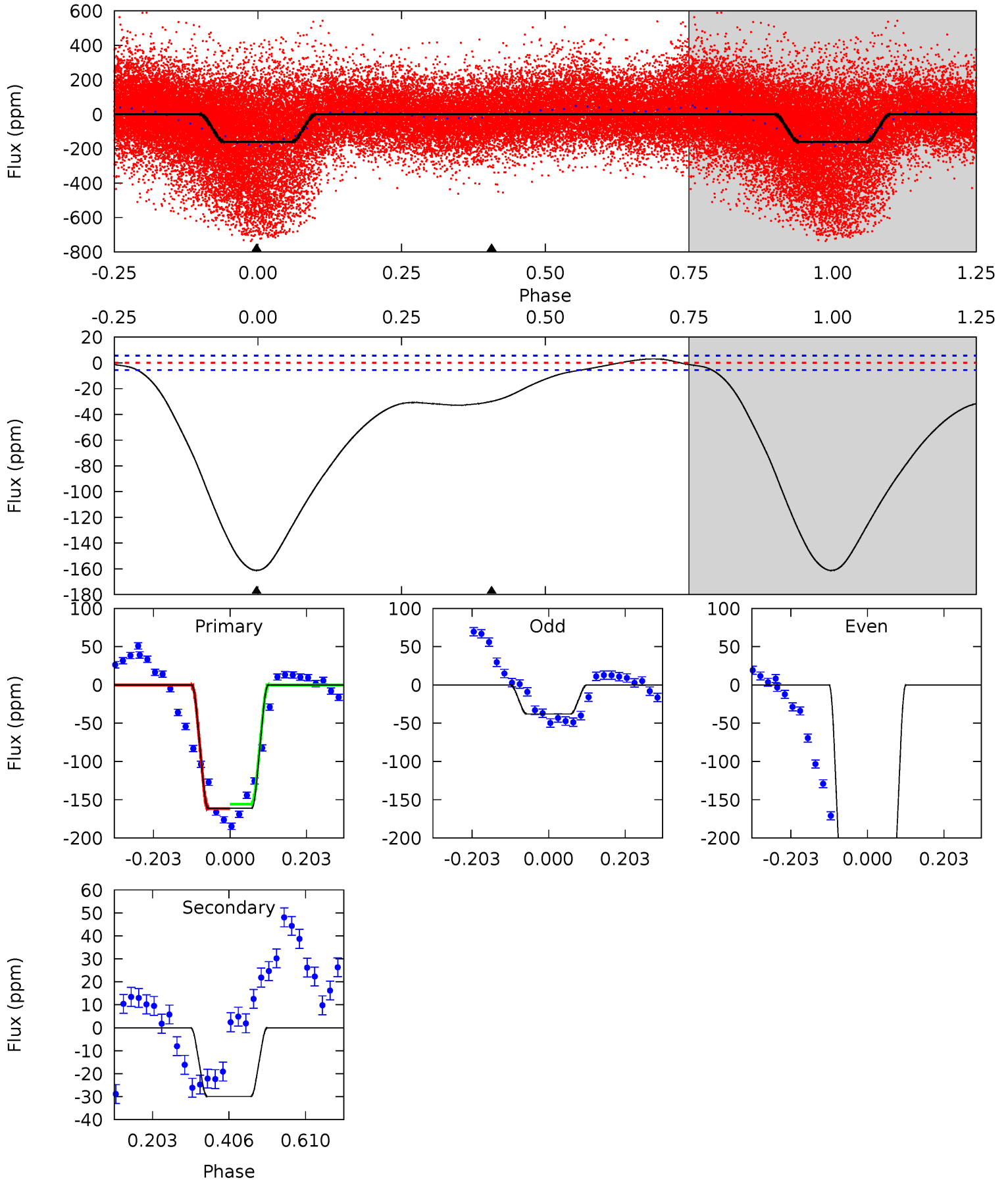
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	6.72	0	0	4.44	1.33	1.77	16.0	16.0	6.72	6.72	6.92	1.39	0.35	1.71



# Alt Model-Shift Uniqueness Test

010904343-02, P = 1.530375 Days, E = 130.710234 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
127.4	23.6	0	0	4.41	1.27	4.00	127.4	127.4	23.6	23.6	115.0	1.21	0.02	2.31





### Stellar Parameters For KIC 010904343

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6714^{+168}_{-185}$	$3.533^{+0.344}_{-0.086}$	$-0.280^{+0.350}_{-0.250}$	$3.714^{+0.357}_{-1.427}$	$1.717^{+0.212}_{-0.345}$	$0.047^{+0.117}_{-0.013}$
	+3%/-3%	+10%/-2%	+125%/-89%	+10%/-38%	+12%/-20%	+247%/-27%
Source	PHO1	FLK73	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010904343-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-9 \pm 1$	$2.62^{+0.37}_{-0.51}$	$4448^{+217}_{-398}$	$4239^{+297}_{-385}$	$0.740^{+0.353}_{-0.211}$
Alt.	$-30 \pm 1$	$5.68^{+0.49}_{-1.20}$	$4454^{+223}_{-402}$	$3756^{+261}_{-265}$	$0.507^{+0.240}_{-0.082}$

$T_{\text{max}}$  = 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

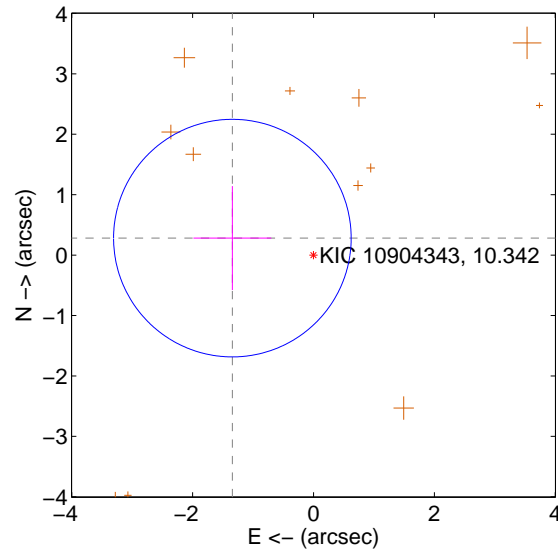
Supplemental centroid analysis for 010904343-02. **Kepler magnitude: 10.34.** Transit SNR 9.97

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

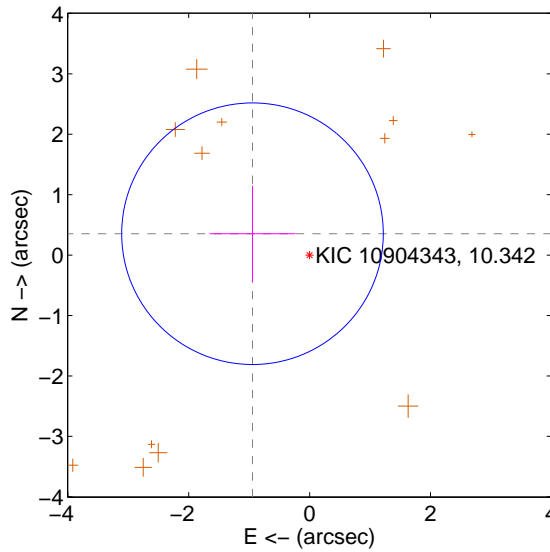
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.372 \pm 0.655$	2.09	$1.343 \pm 0.645$	$0.281 \pm 0.860$
PRF-fit source offset from KIC position	$1.009 \pm 0.722$	1.40	$0.945 \pm 0.710$	$0.354 \pm 0.796$
photometric centroid source offset	$1.19 \pm 0.43$	2.74	$0.84 \pm 0.46$	$-0.85 \pm 0.41$

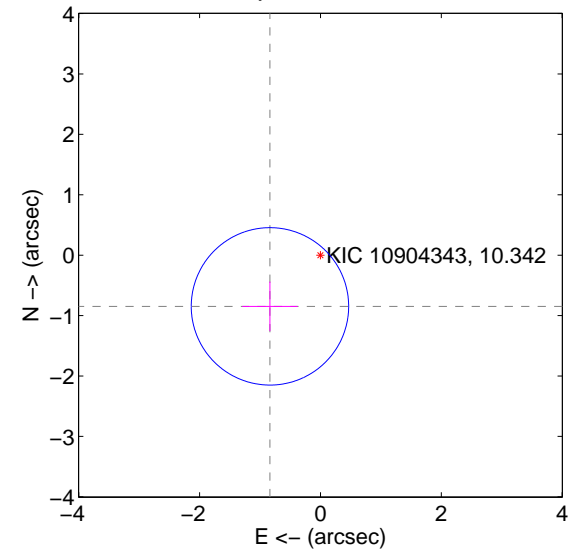
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

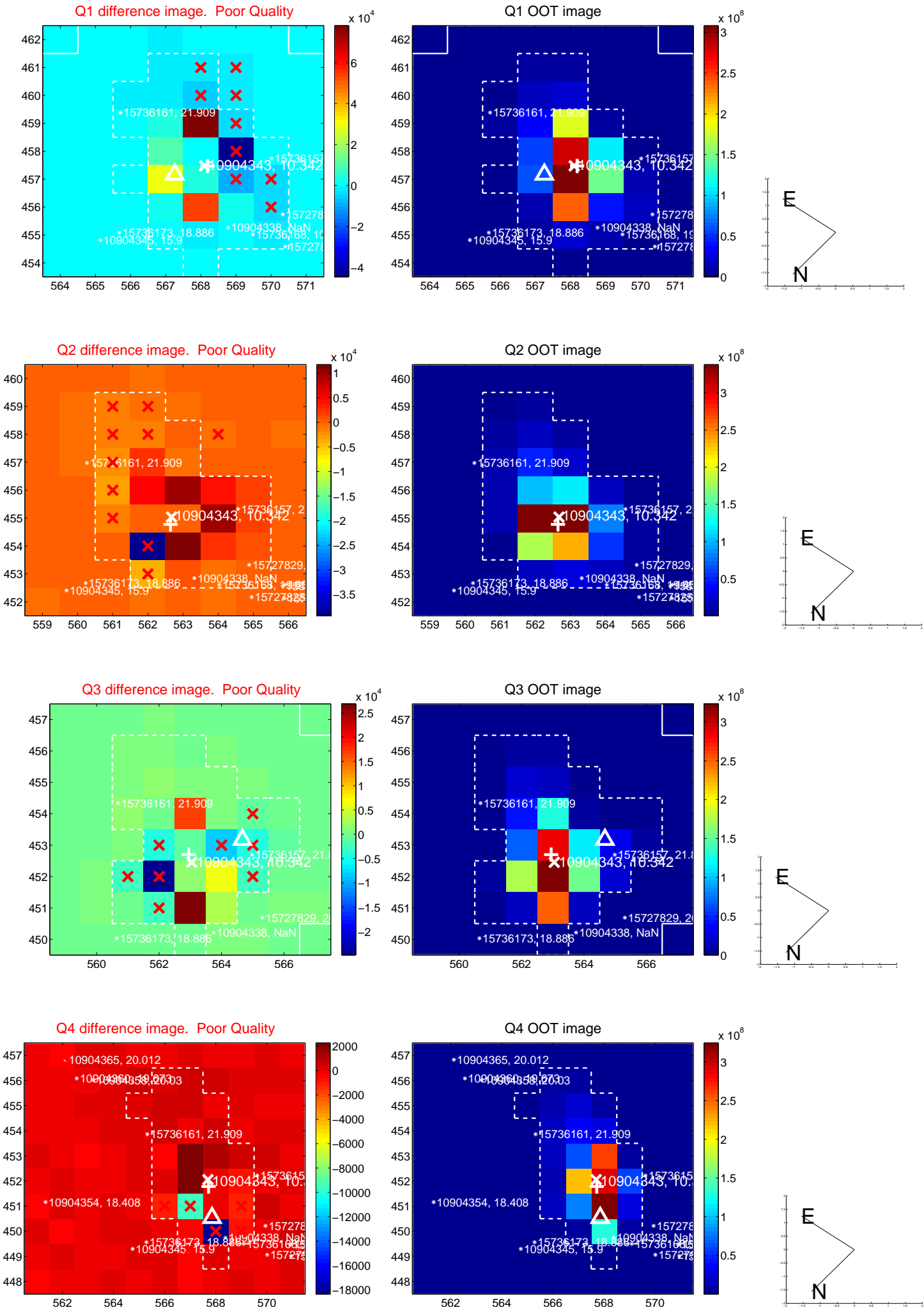


offset from photometric centroids

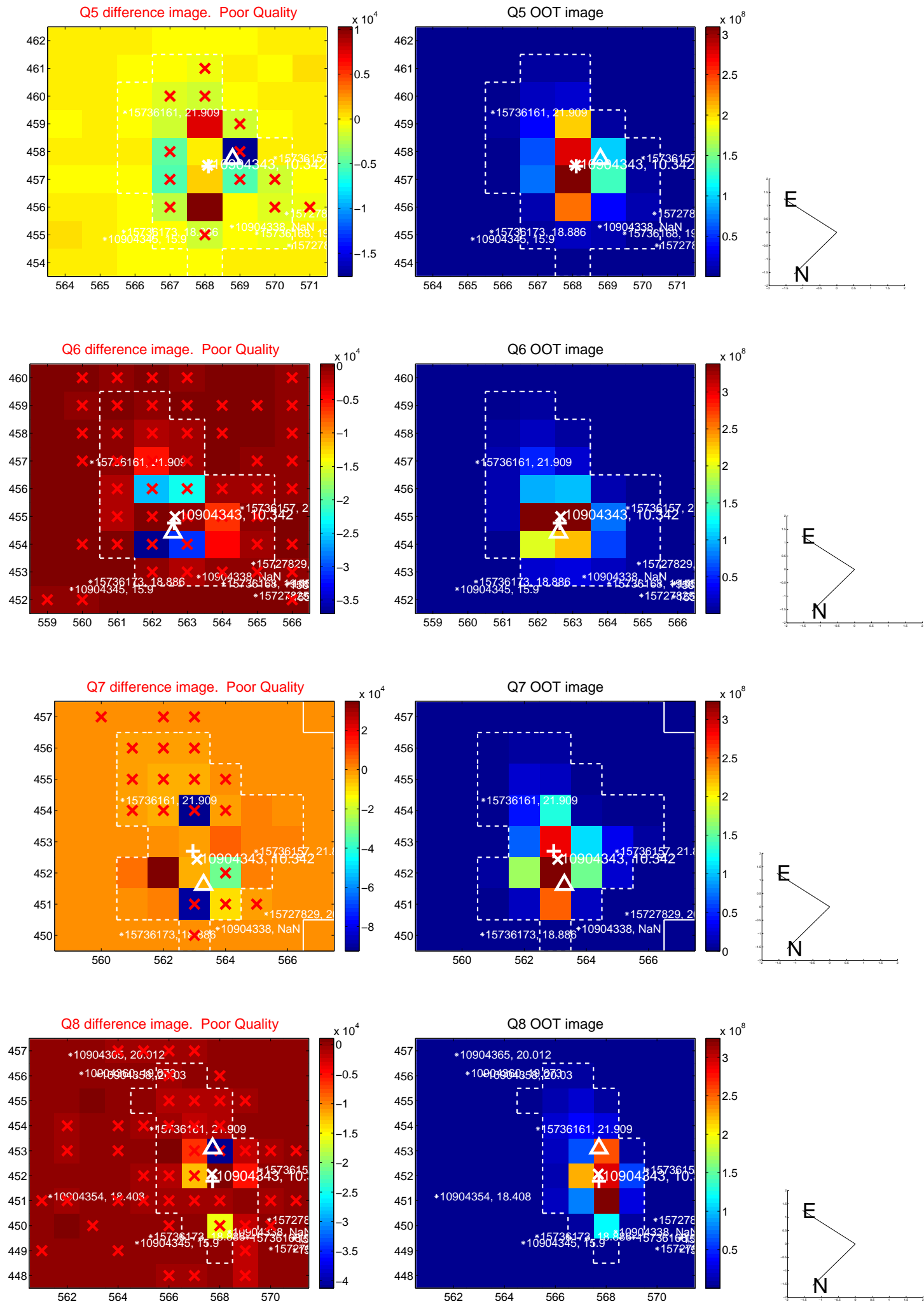


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

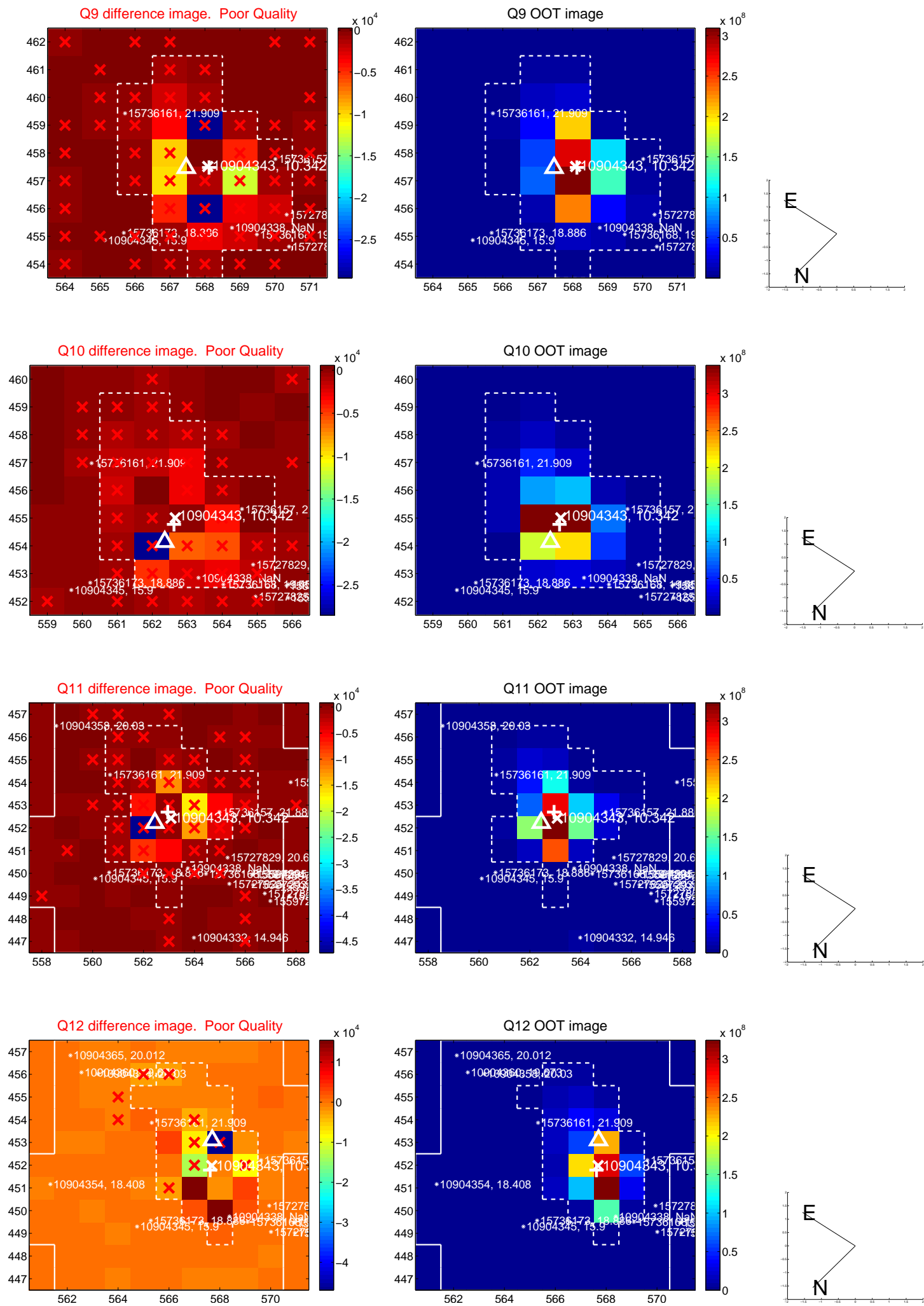
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

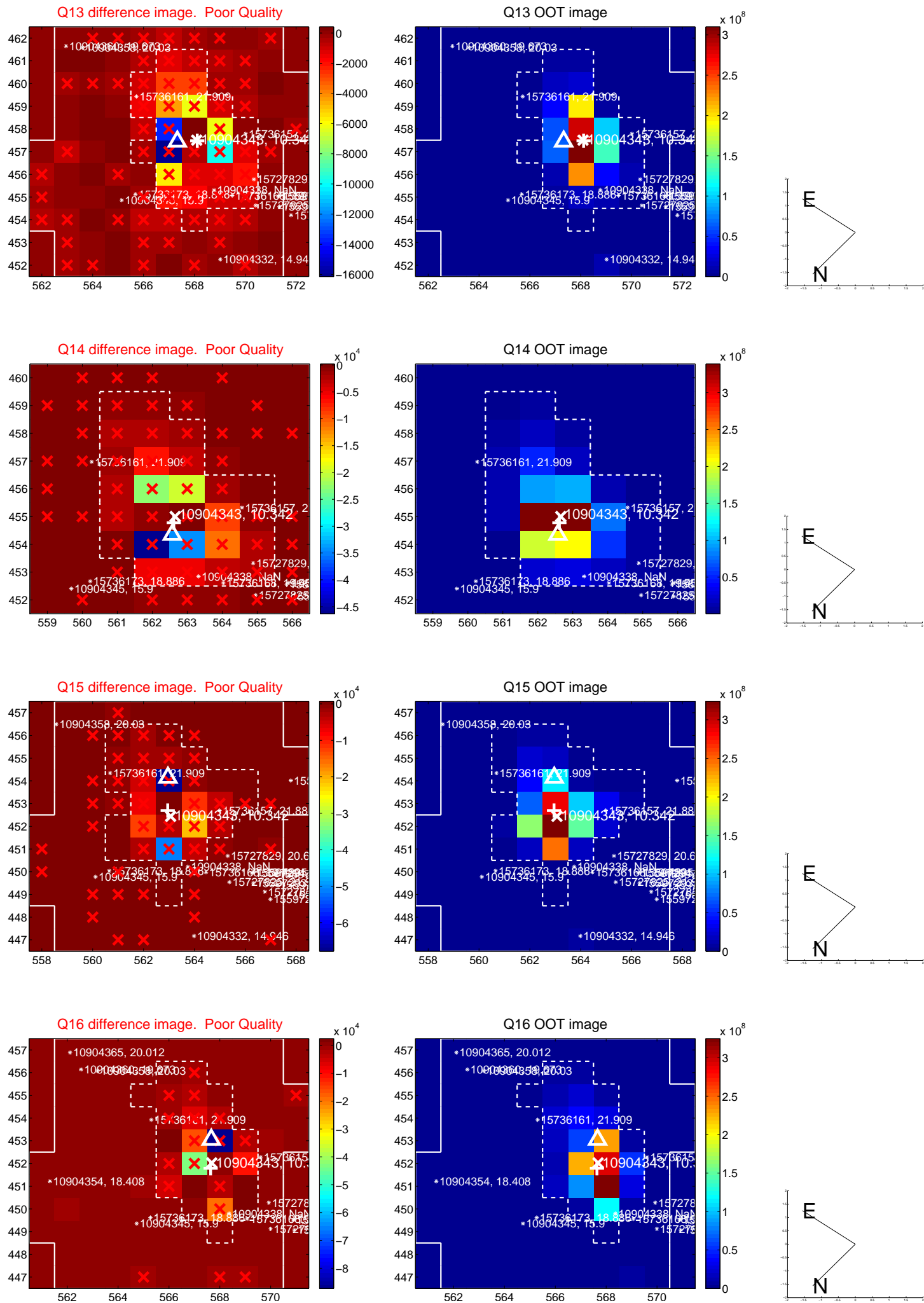


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

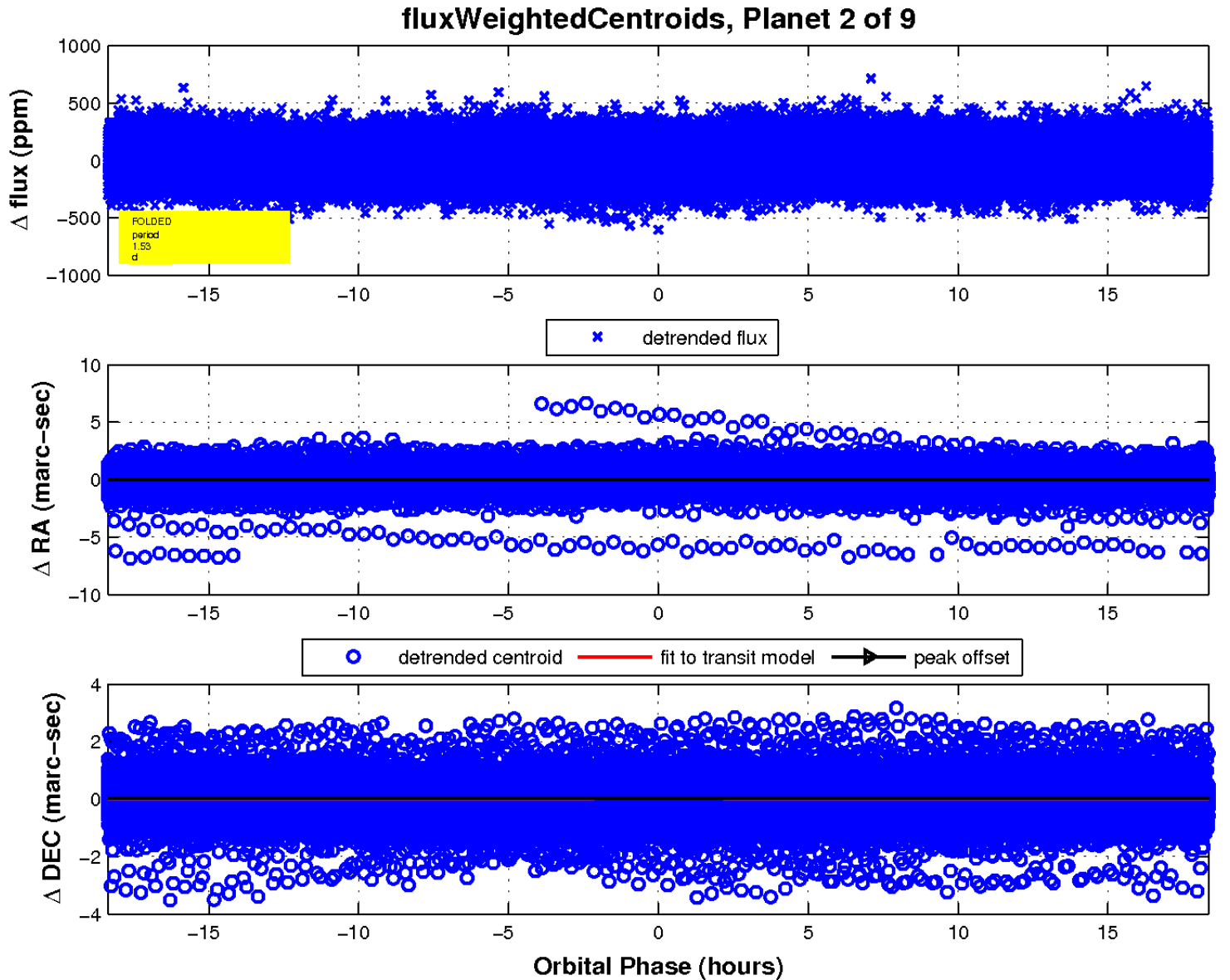
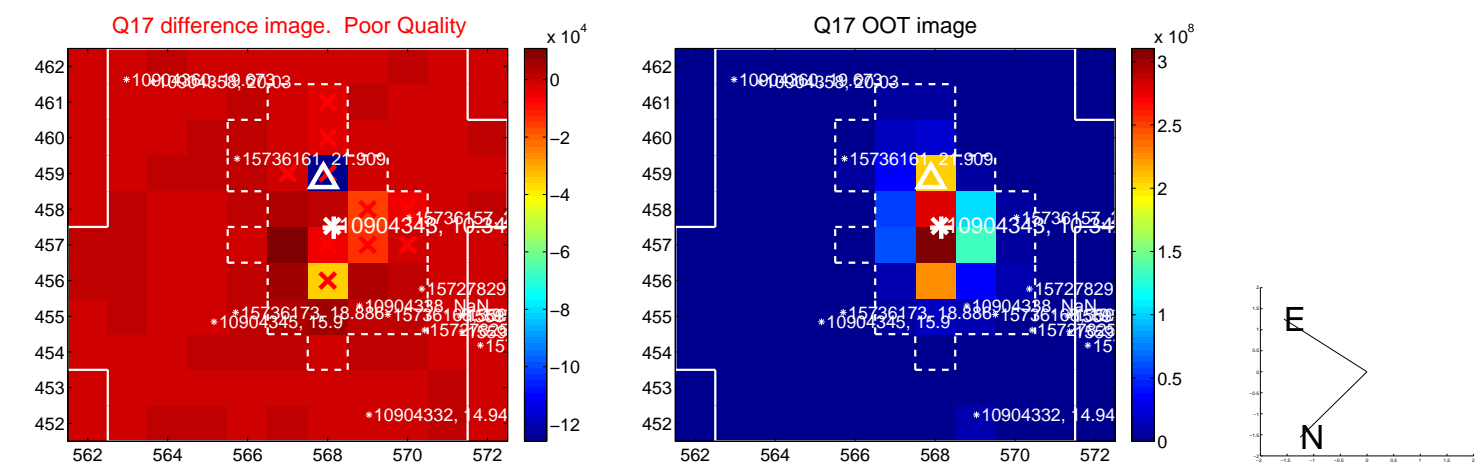




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

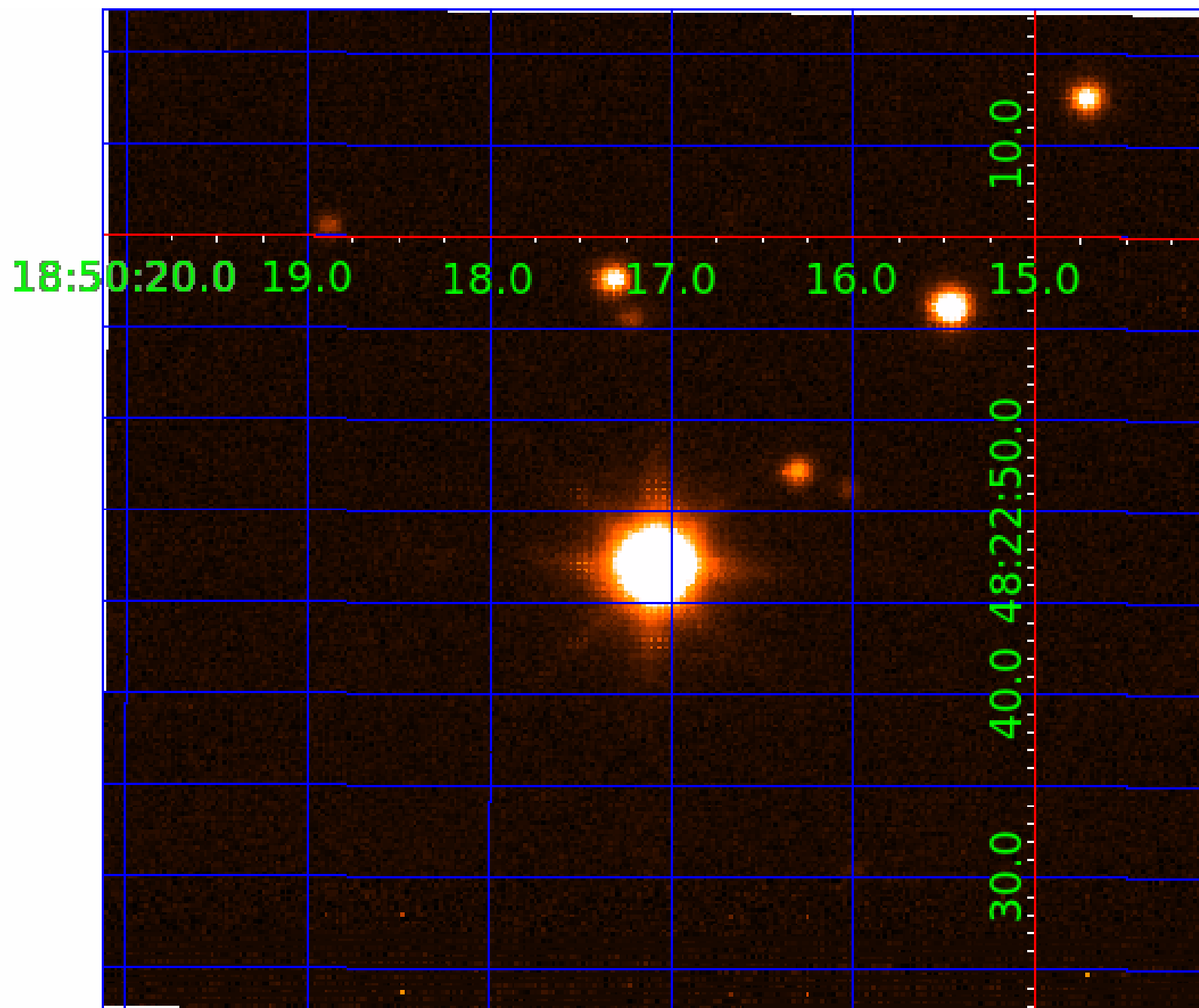


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010904343

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010904343-01	OBS	No	3.061235	132.737615	22.8	8.650	8.8	7.4	3.71	6714	2.00	10284.55
010904343-02	OBS	No	1.530349	132.310781	27.8	6.304	10.4	10.0	3.71	6714	2.71	25921.51
010904343-03	OBS	No	139.464948	217.524278	305.9	8.224	9.9	9.5	3.71	6714	8.43	63.21
010904343-04	OBS	No	60.793603	160.060354	212.8	4.472	8.5	9.2	3.71	6714	6.20	191.24
010904343-05	OBS	No	117.464997	228.800718	304.9	2.434	8.6	9.0	3.71	6714	7.37	79.46
010904343-06	OBS	No	34.916667	152.864357	120.7	2.929	8.1	6.3	3.71	6714	4.77	400.56
010904343-07	OBS	No	42.718363	155.839959	157.5	4.114	7.5	8.1	3.71	6714	5.36	306.12
010904343-08	OBS	No	106.321866	134.323578	151.5	6.479	7.6	6.4	3.71	6714	5.19	90.76
010904343-09	OBS	No	33.945926	146.949011	64.7	6.114	7.5	4.0	3.71	6714	3.37	415.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010904343-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
010904343-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010904343-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-09	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

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

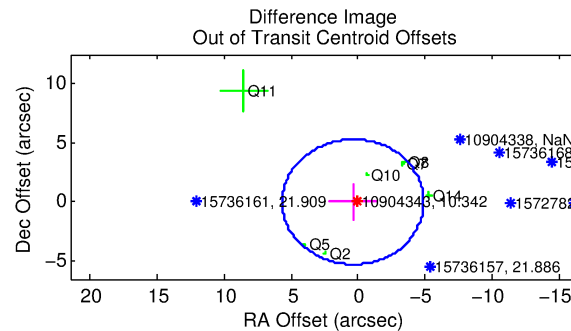
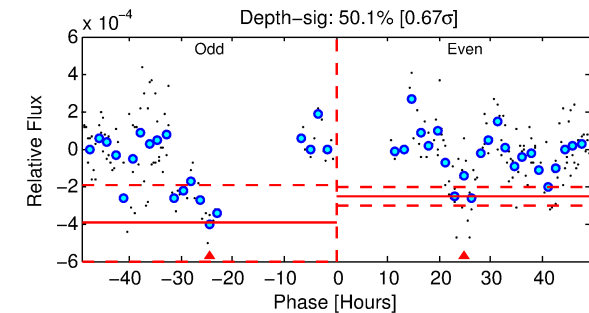
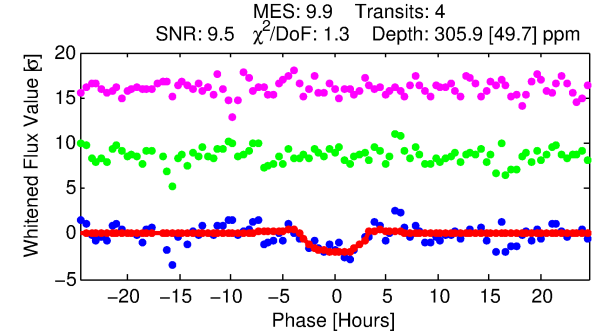
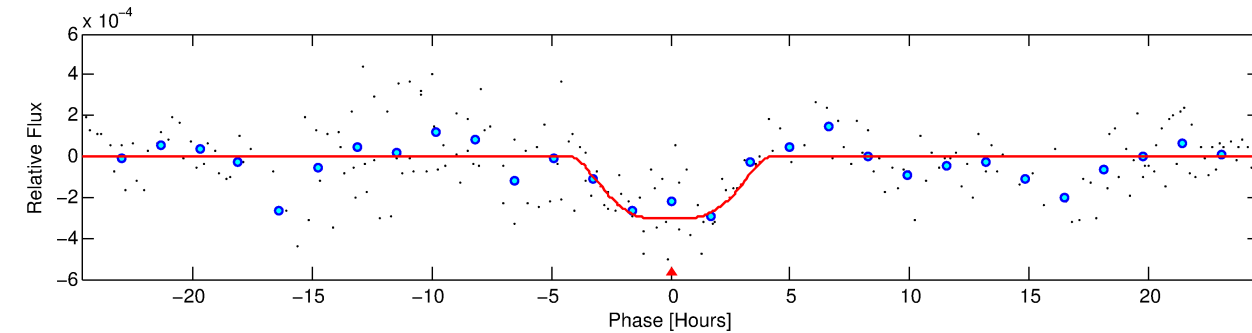
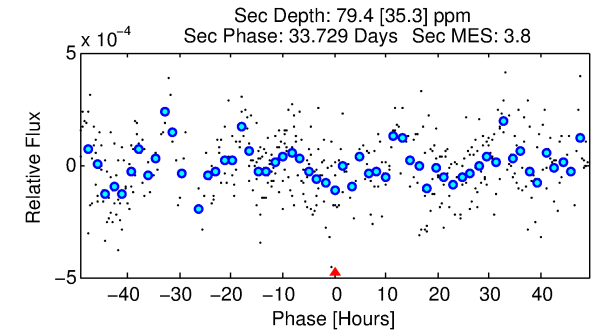
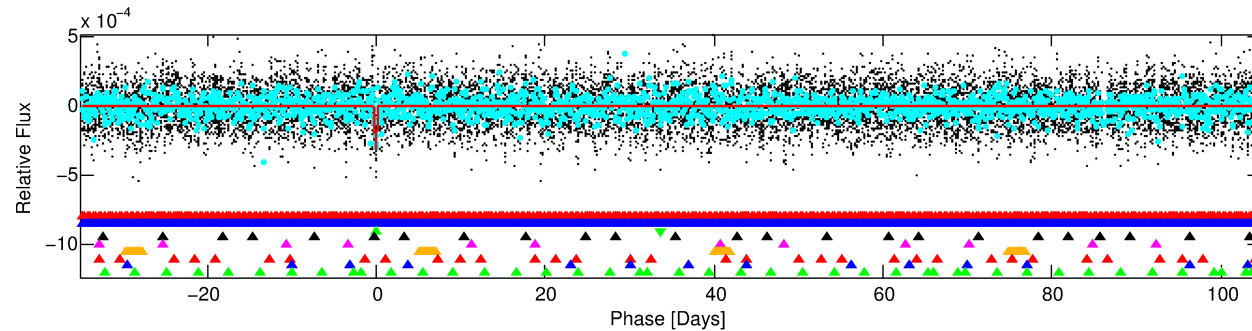
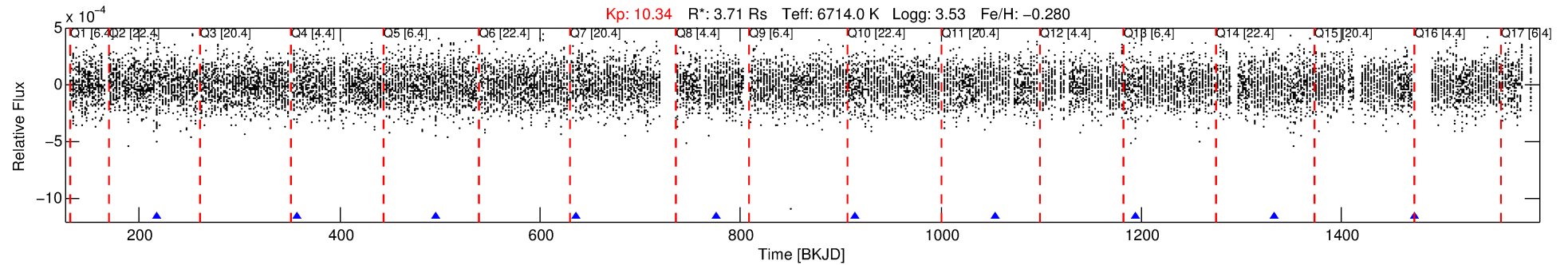
Ephemeris Match Information For 010904343-03

No Significant Match Found



# DV One-Page Summary

KIC: 10904343 Candidate: 3 of 9 Period: 139.465 d



## DV Fit Results:

Period = 139.46495 [0.00460] d  
Epoch = 217.5243 [0.0241] BKJD  
Rp/R\* = 0.0208 [0.0022]  
a/R\* = 39.22 [9.90]  
b = 0.97 [0.01]  
Self = 63.21 [37.74]  
Req = 719 [107] K  
Rp = 8.43 [3.36] Re  
a = 0.6303 [0.2319] AU  
Ag = 244.15 [187.21] [1.30σ]  
Teffp = 4394 [555] K [6.50σ]

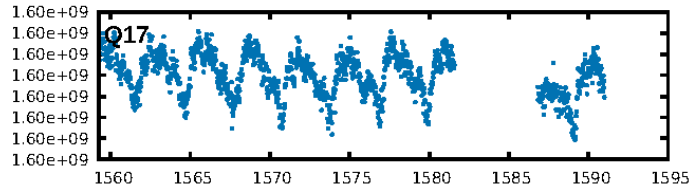
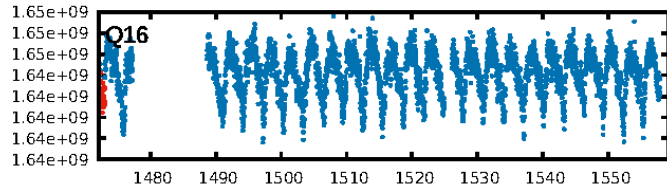
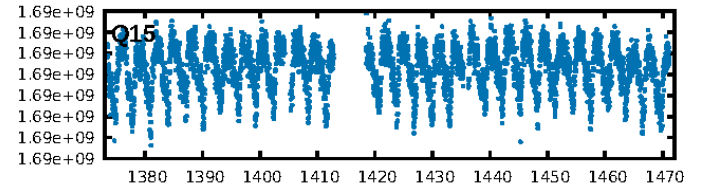
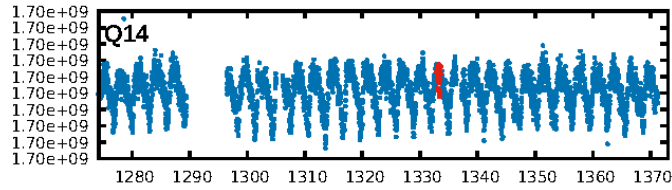
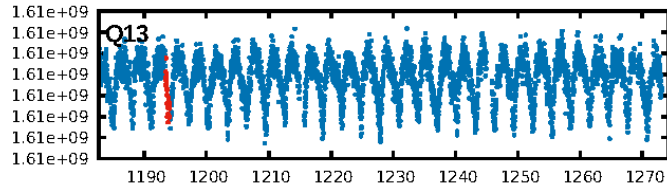
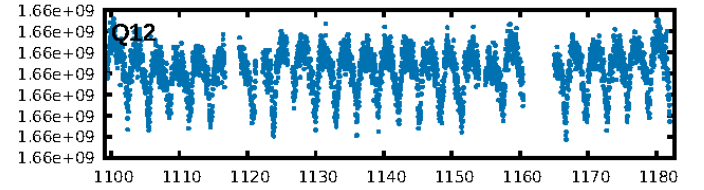
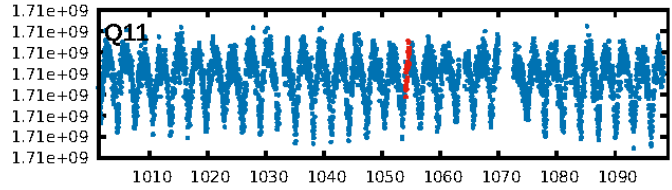
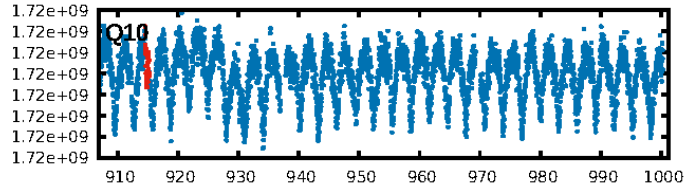
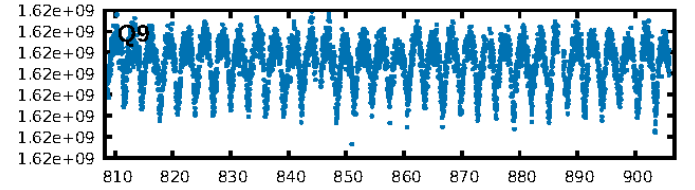
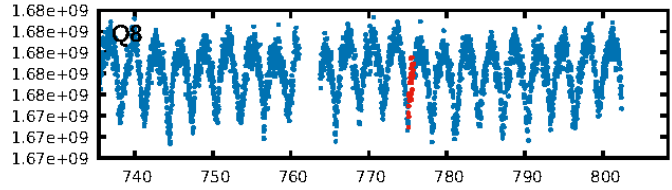
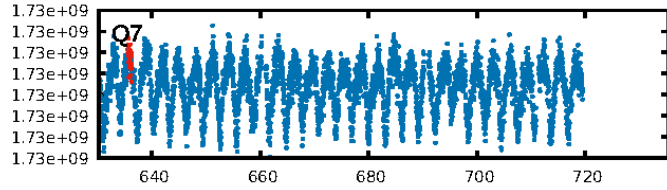
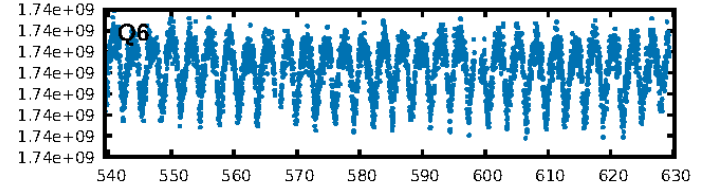
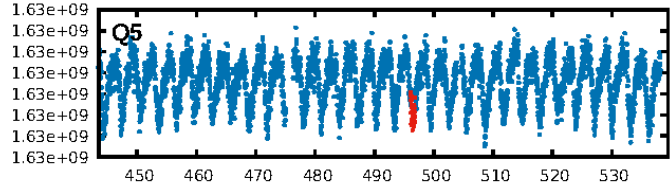
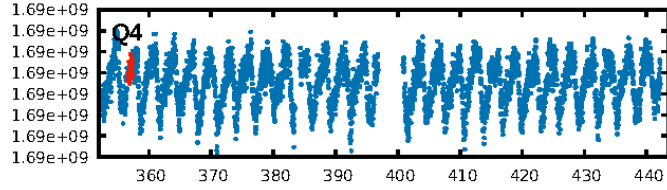
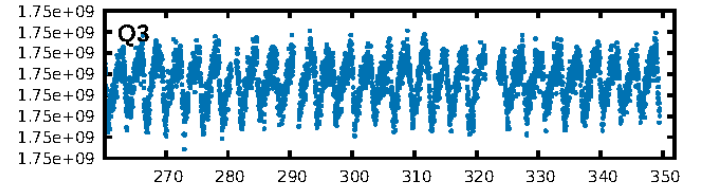
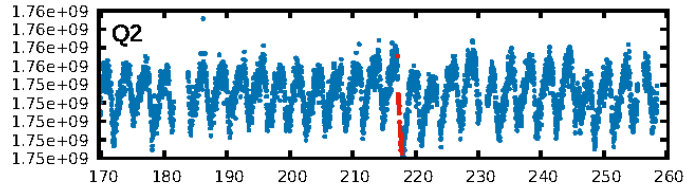
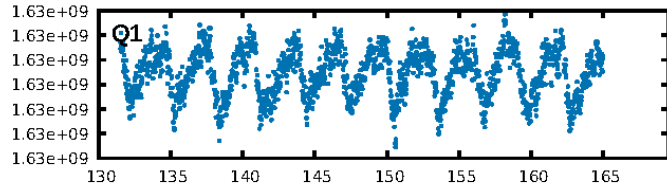
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [61.56σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 17.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.27e-11**  
RollingBand-fgt: 1.00 [4/4]  
**GhostDiagnostic-chr: 9.179**  
Centroid-sig: 50.5%  
Centroid-so: 0.430 arcsec [1.02σ]  
OotOffset-rm: 0.386 arcsec [0.22σ]  
KicOffset-rm: 0.533 arcsec [0.34σ]  
OotOffset-st: 3/2/1/1 [7]  
KicOffset-st: 3/2/1/1 [7]  
DiffImageQuality-fgm: 0.43 [3/7]  
DiffImageOverlap-fno: 0.00 [0/8]

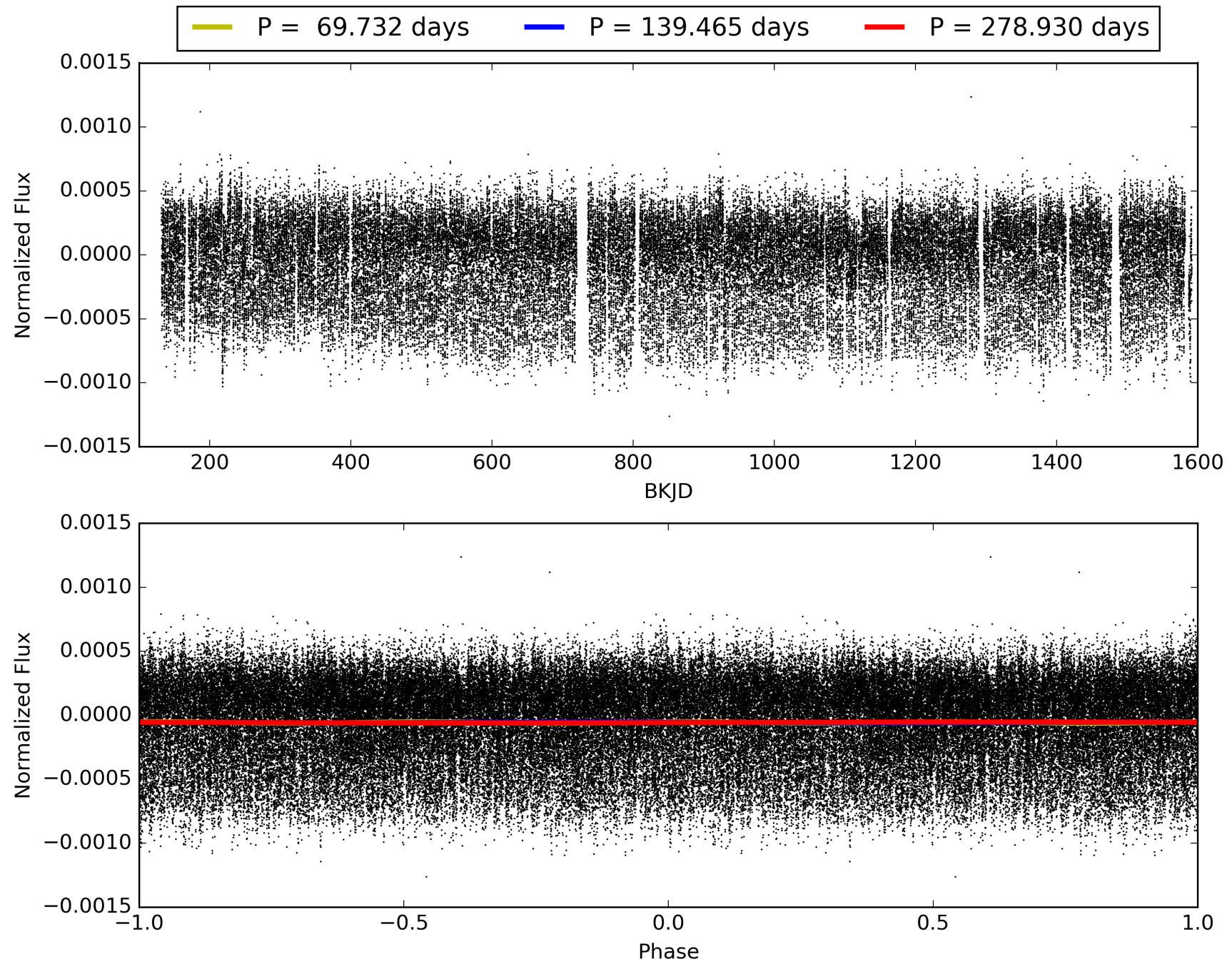
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:38:03 Z

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

## TCE 010904343-03, PDC Light Curves

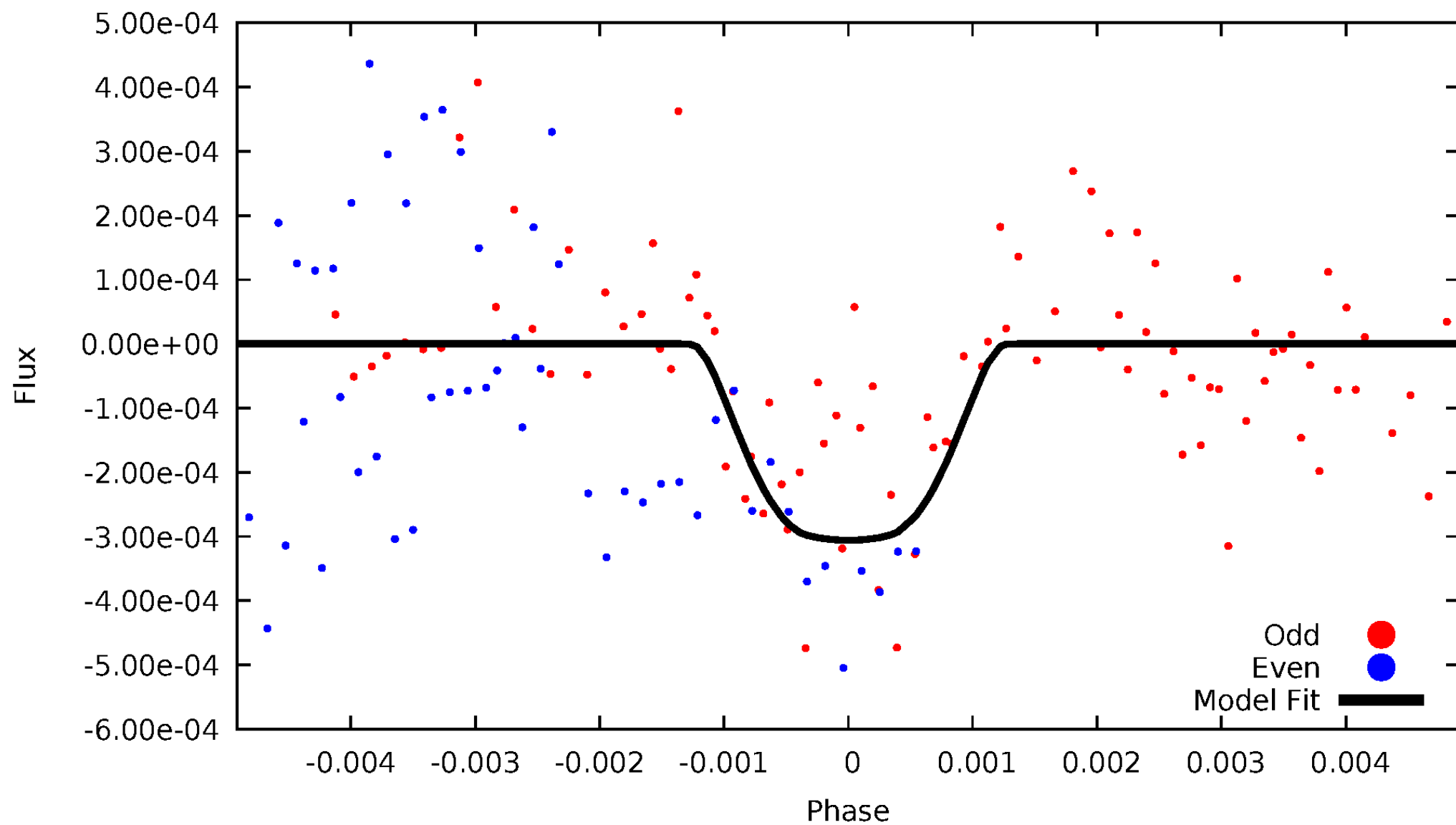


TCE 010904343-03



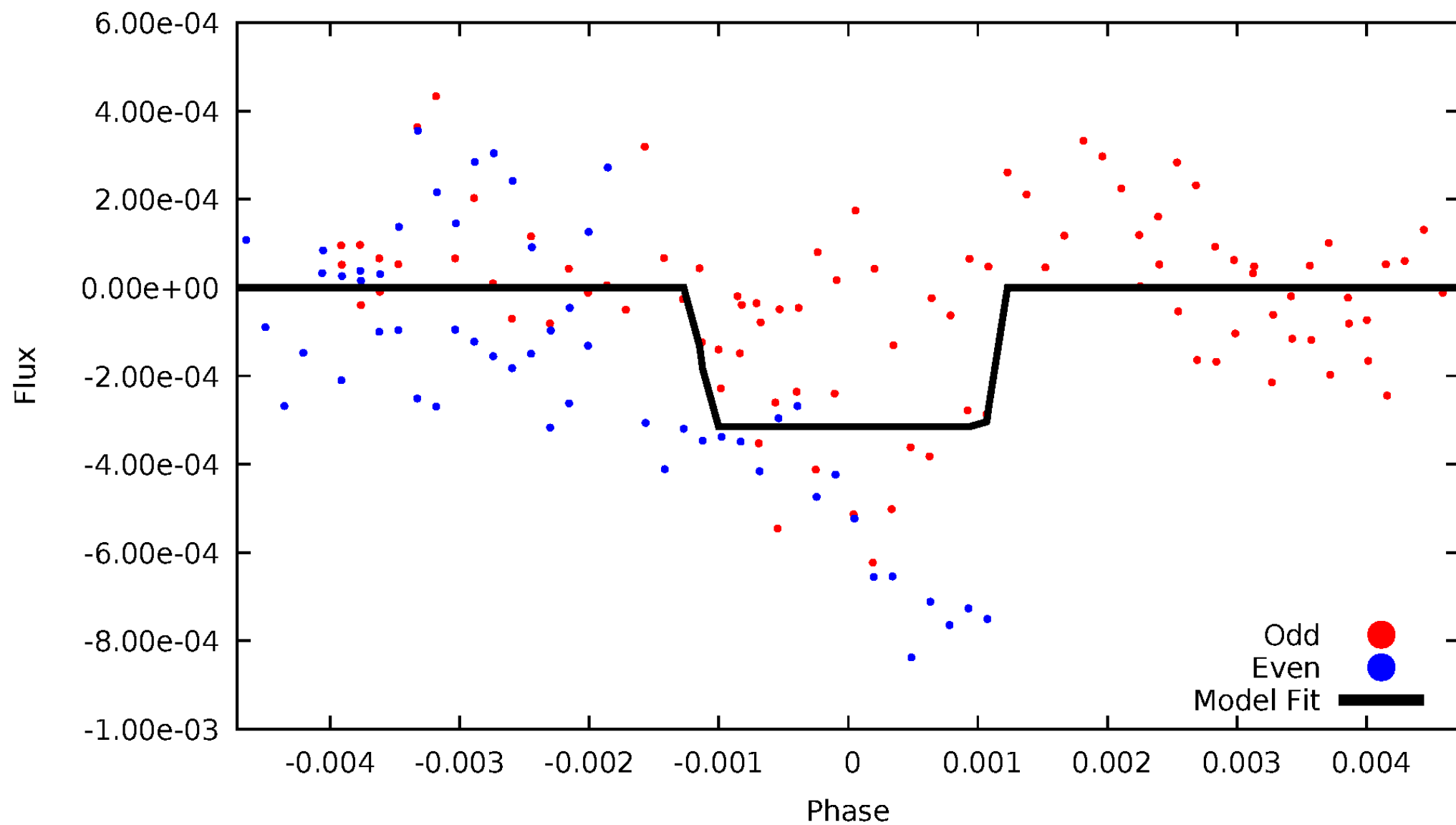
# DV Odd/Even

TCE 010904343-03



# ALT Odd/Even

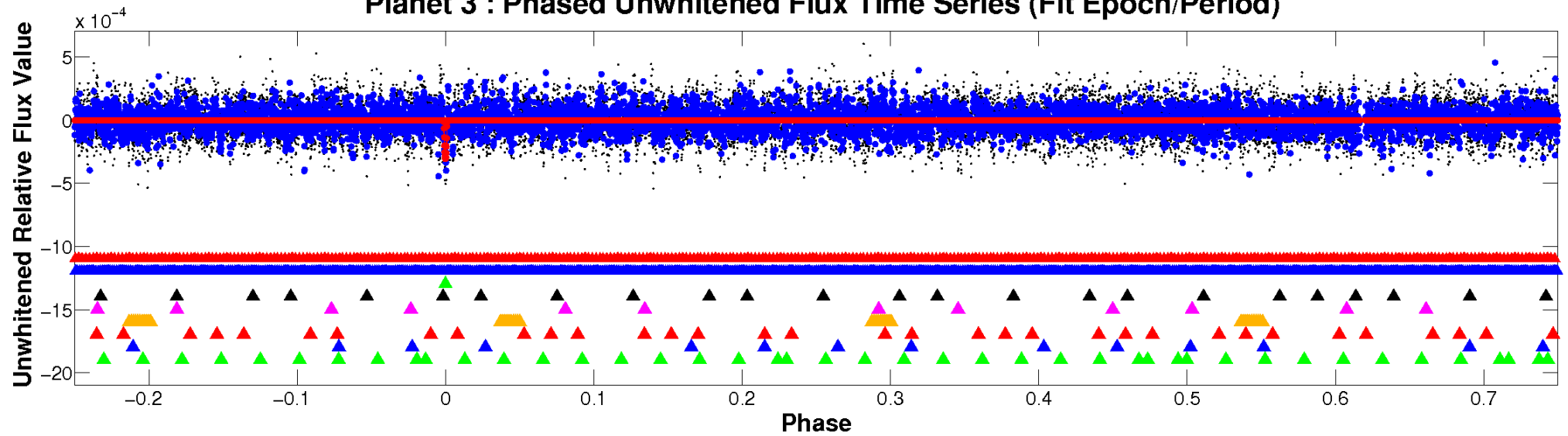
TCE 010904343-03



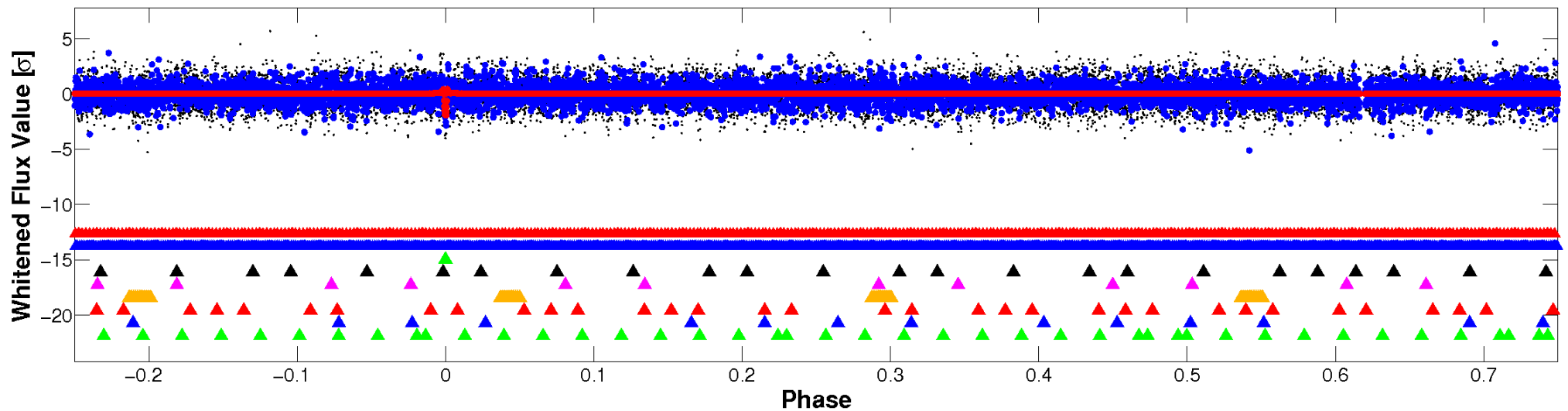


# Non-Whitened Vs. Whitened Light Curve

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

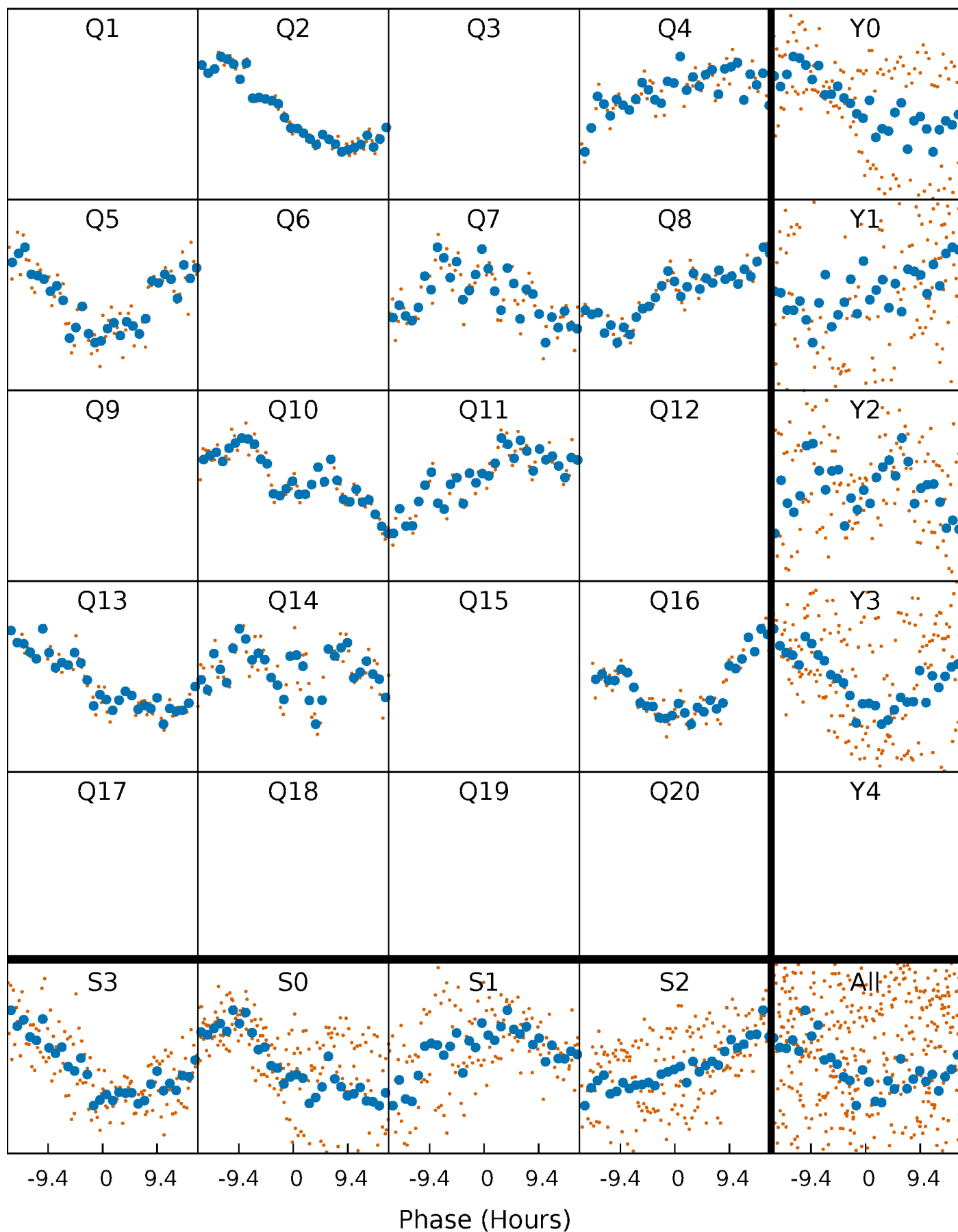


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



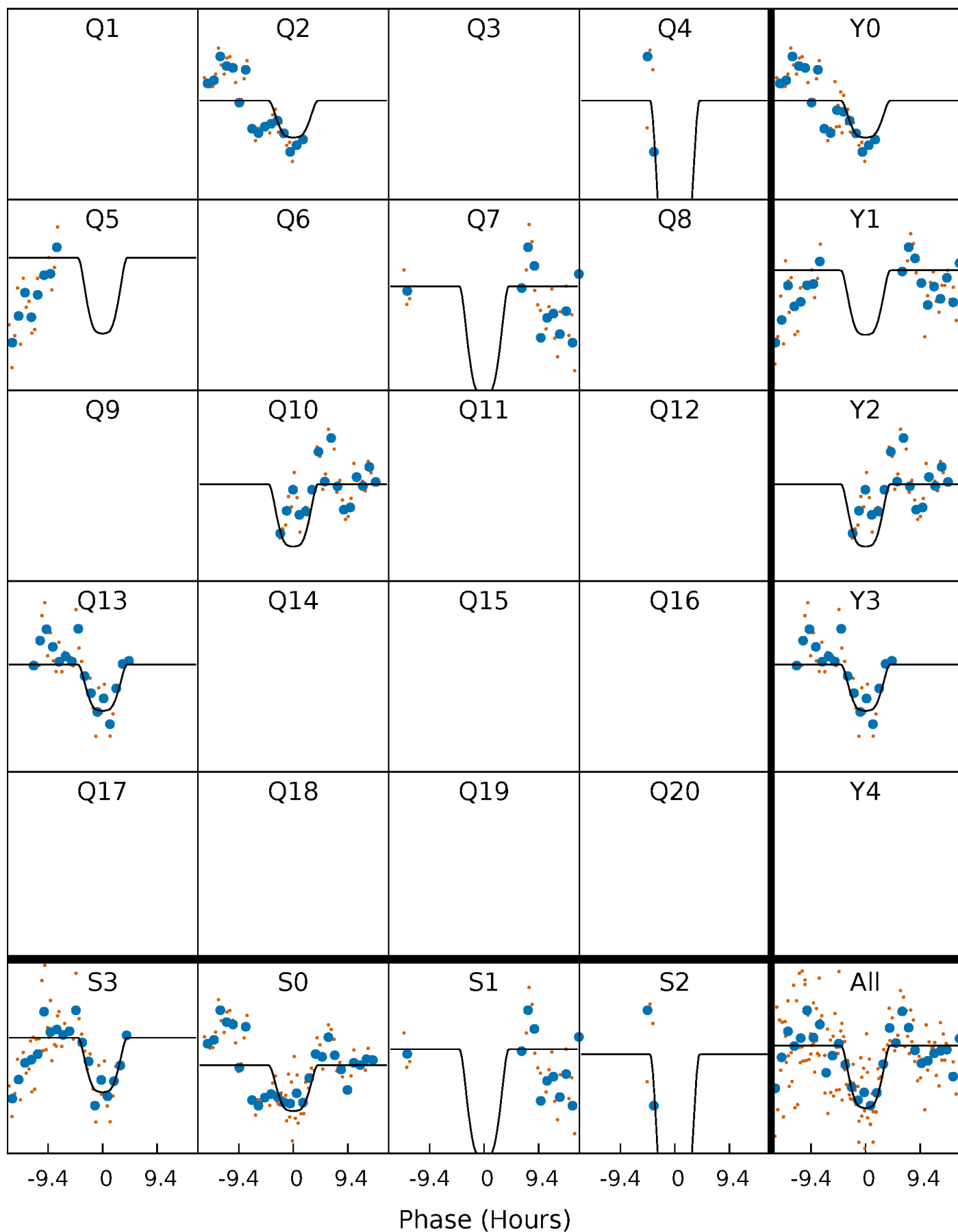
# PDC Quarter-Phased Transit Curves

TCE 010904343-03     $P=139.464948$  Days     $T_0=217.524278$  (BKJD)



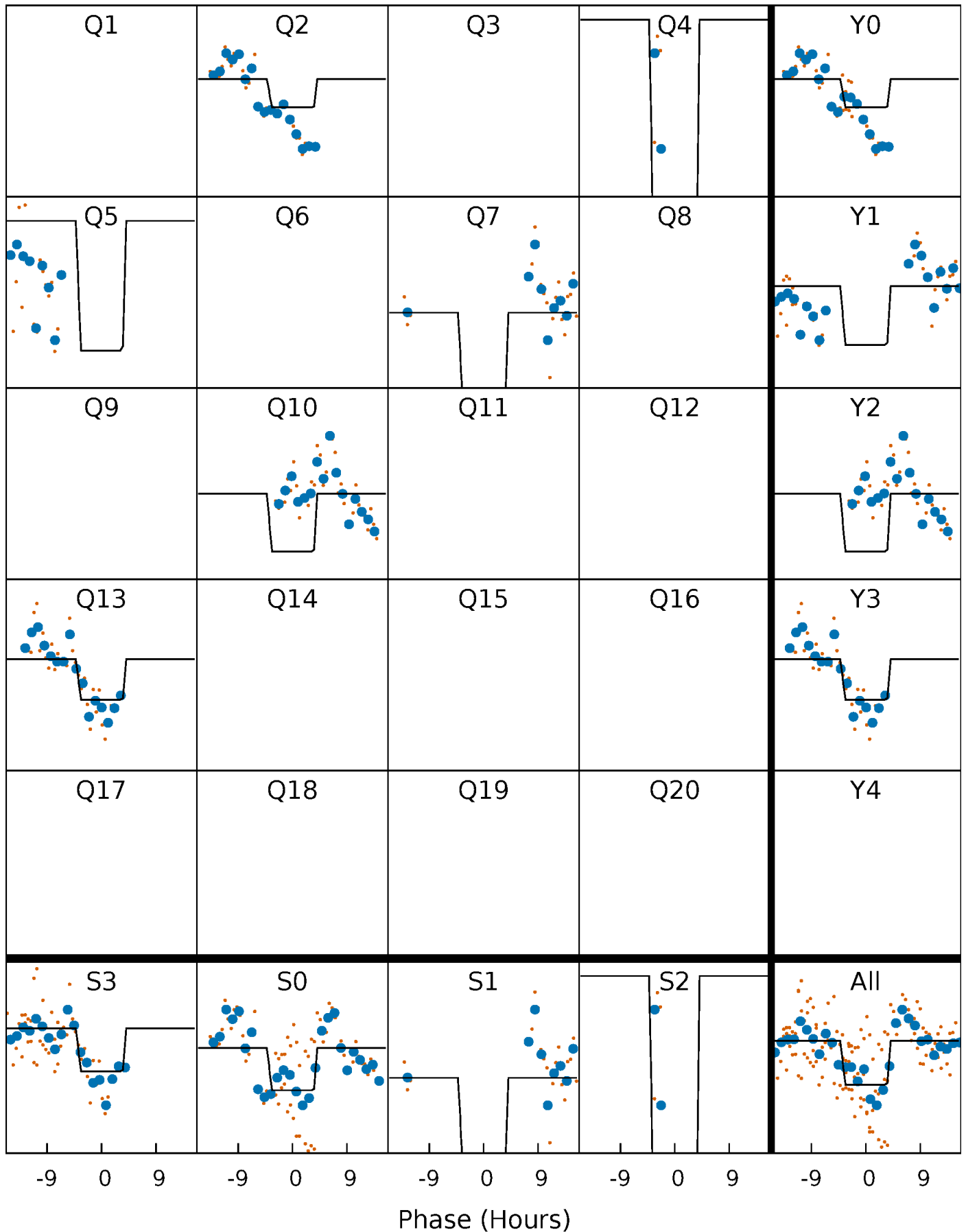
# DV Quarter-Phased Transit Curves

TCE 010904343-03 P=139.464948 Days  $T_0=217.524278$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

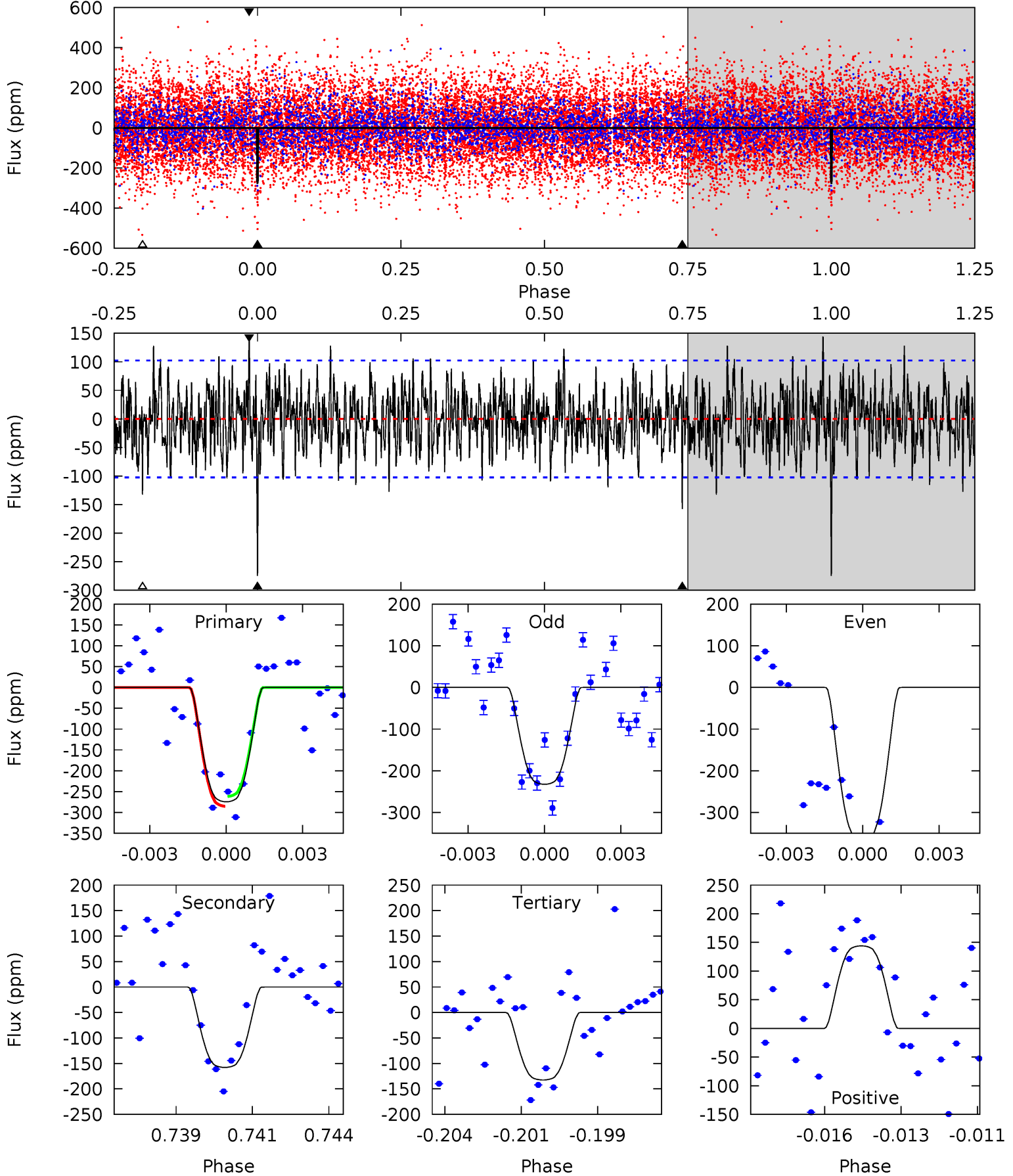
TCE 010904343-03 P=139.479481 Days  $T_0=217.450760$  (BKJD)



# DV Model-Shift Uniqueness Test

010904343-03, P = 139.464948 Days, E = 78.059330 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	8.14	6.83	7.43	5.28	3.01	2.18	7.33	6.73	1.31	0.71	3.02	1.03	0.34	0.60

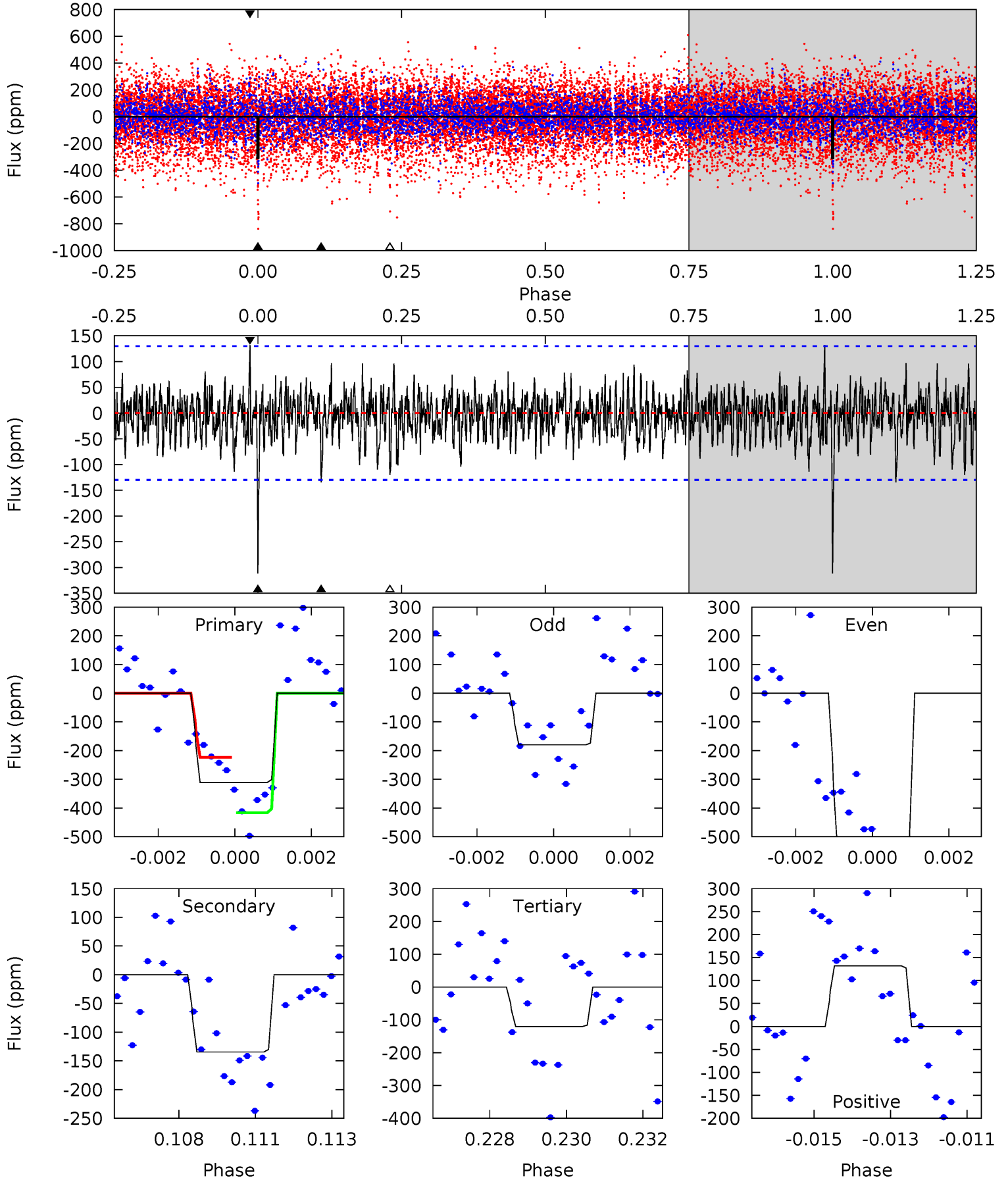




# Alt Model-Shift Uniqueness Test

010904343-03, P = 139.479481 Days, E = 77.971279 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
12.7	5.50	4.91	5.38	5.31	3.06	1.39	7.81	7.34	0.59	0.12	7.23	1.09	0.30	3.91



### Stellar Parameters For KIC 010904343

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6714^{+168}_{-185}$	$3.533^{+0.344}_{-0.086}$	$-0.280^{+0.350}_{-0.250}$	$3.714^{+0.357}_{-1.427}$	$1.717^{+0.212}_{-0.345}$	$0.047^{+0.117}_{-0.013}$
	+3%/-3%	+10%/-2%	+125%/-89%	+10%/-38%	+12%/-20%	+247%/-27%
Source	PHO1	FLK73	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010904343-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-158 \pm 19$	$8.13^{+1.29}_{-1.69}$	$988^{+51}_{-90}$	$5271^{+328}_{-303}$	$535^{+290}_{-150}$
Alt.	$-135 \pm 24$	$6.78^{+1.35}_{-1.46}$	$985^{+52}_{-84}$	$5439^{+442}_{-362}$	$626^{+390}_{-189}$

$T_{max}$  = 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

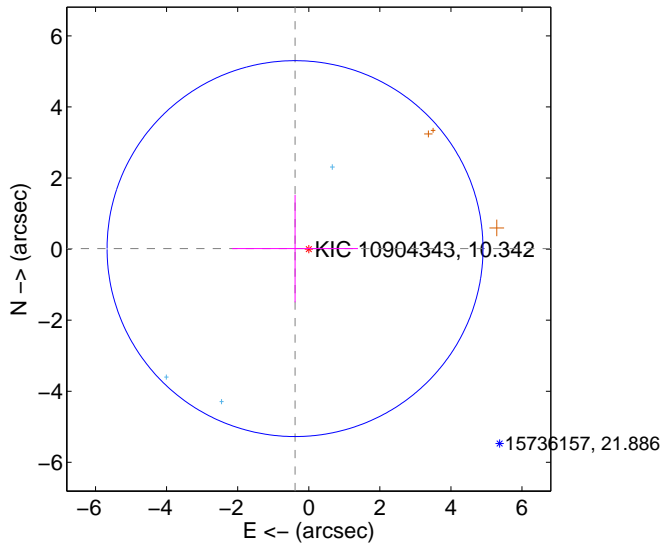
Supplemental centroid analysis for 010904343-03. **Kepler magnitude: 10.34.** Transit SNR 9.54

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

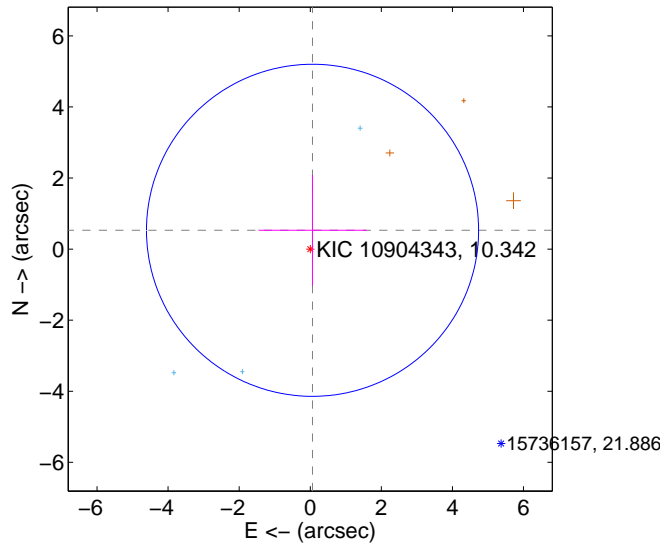
The direct PRF centroid is offset from the target star catalog position by about 0.88 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.386 \pm 1.763$	0.22	$0.386 \pm 1.770$	$0.013 \pm 1.510$
PRF-fit source offset from KIC position	$0.533 \pm 1.557$	0.34	$-0.064 \pm 1.522$	$0.529 \pm 1.558$
photometric centroid source offset	$0.43 \pm 0.42$	1.02	$-0.32 \pm 0.44$	$0.29 \pm 0.41$

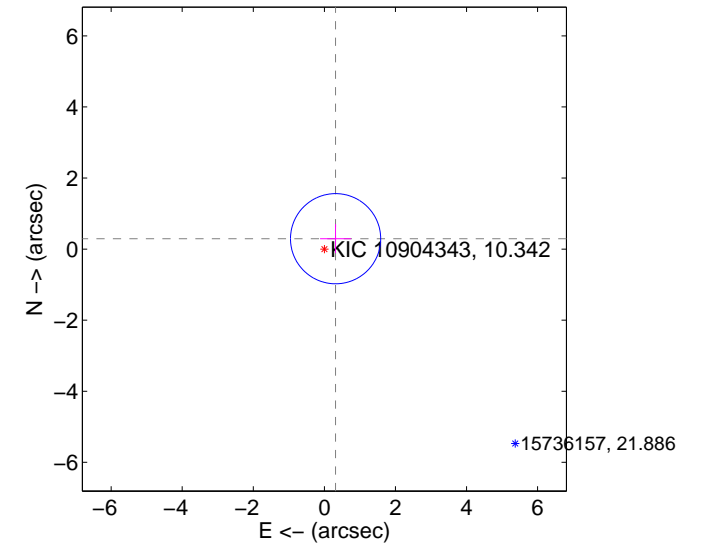
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



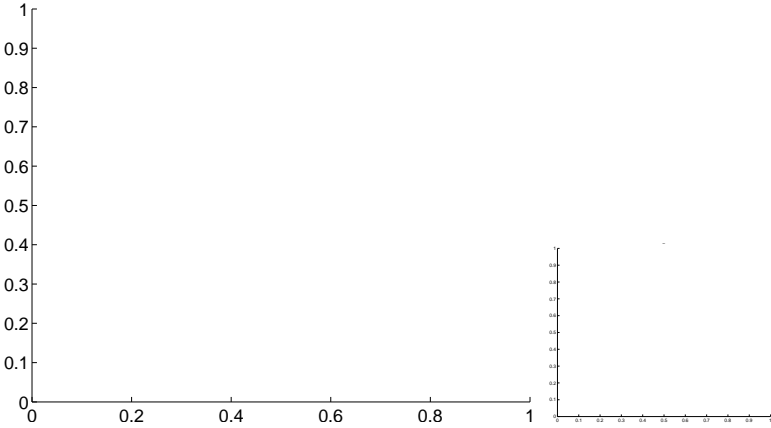
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

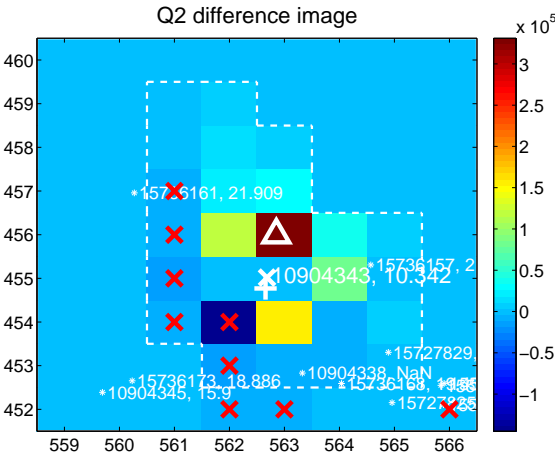
Q1 no difference image



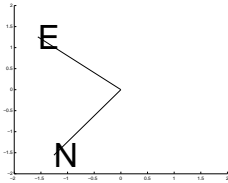
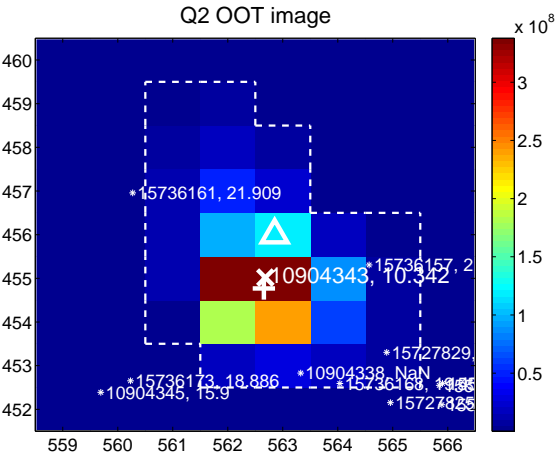
Q1 no OOT image



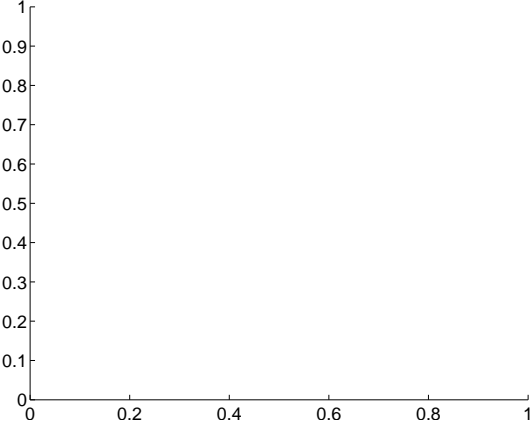
Q2 difference image



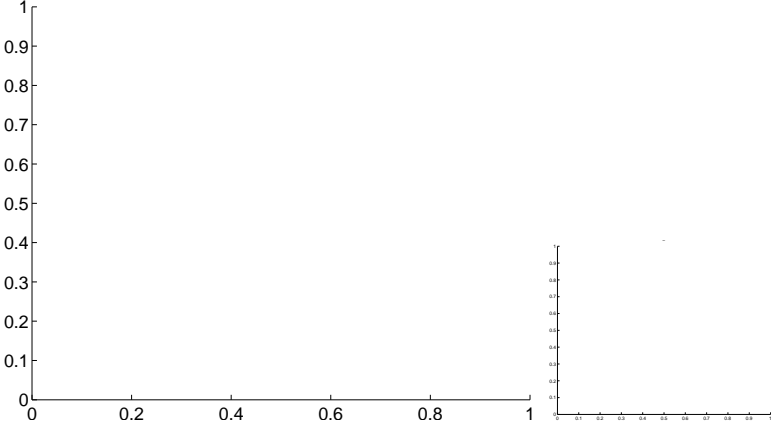
Q2 OOT image



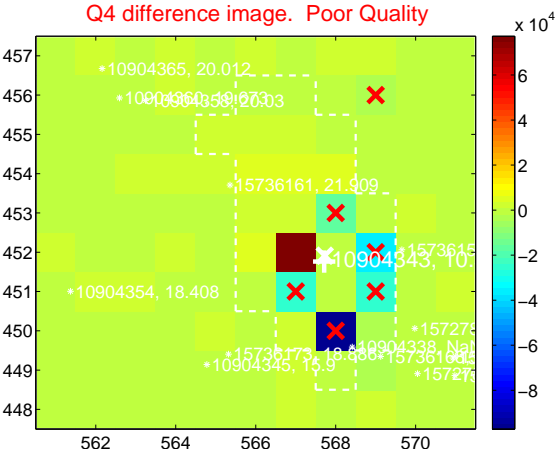
Q3 no difference image



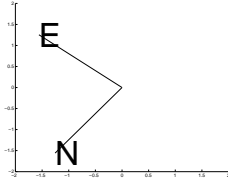
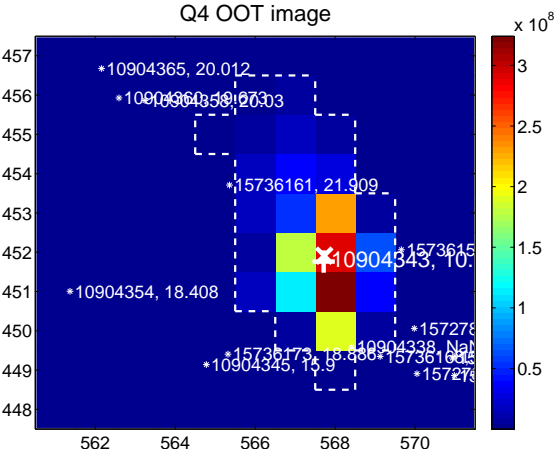
Q3 no OOT image



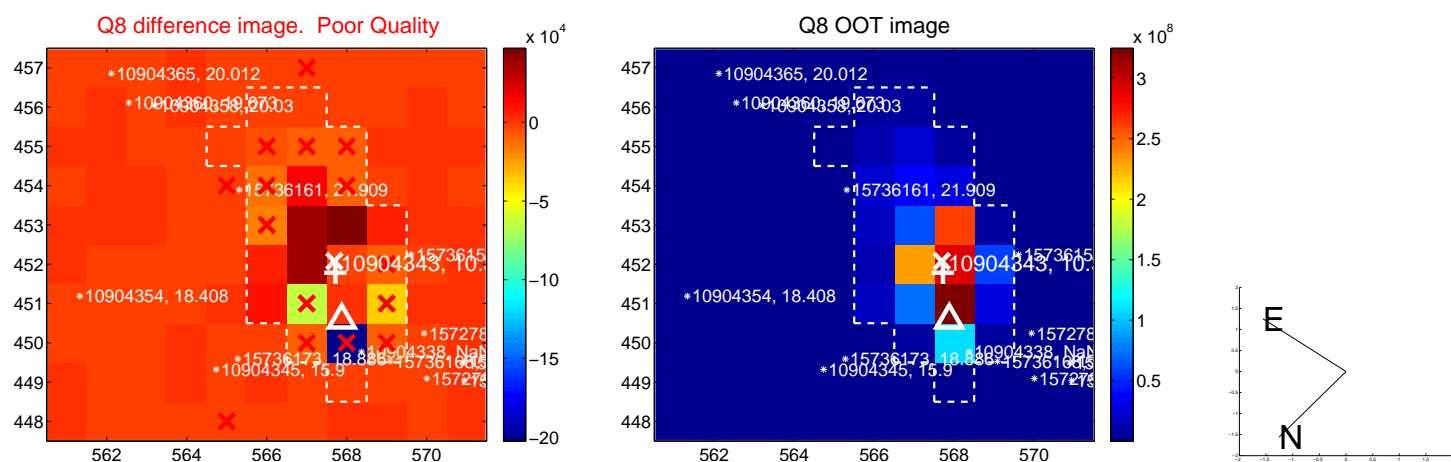
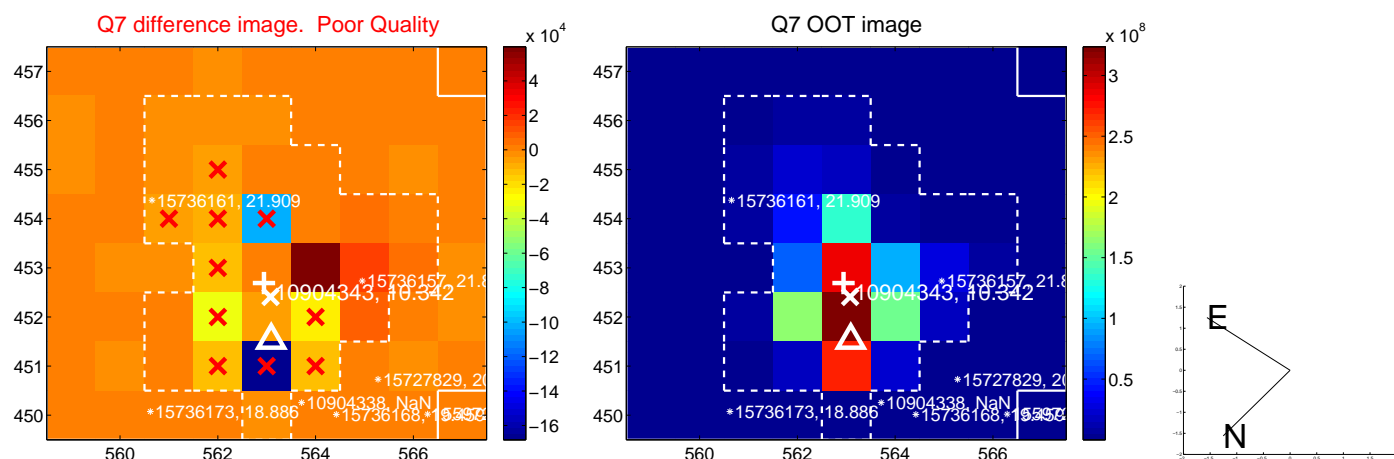
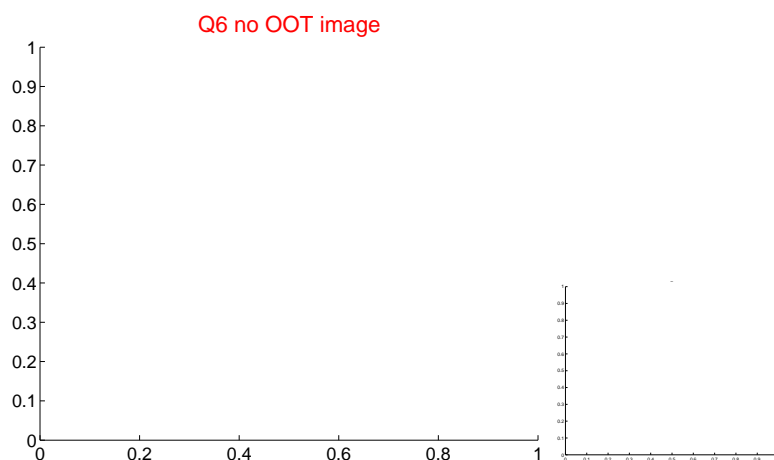
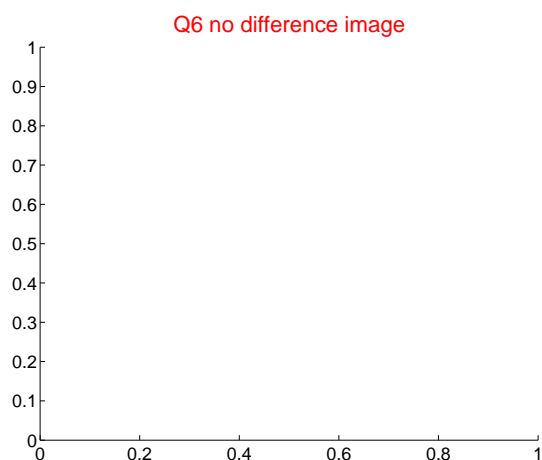
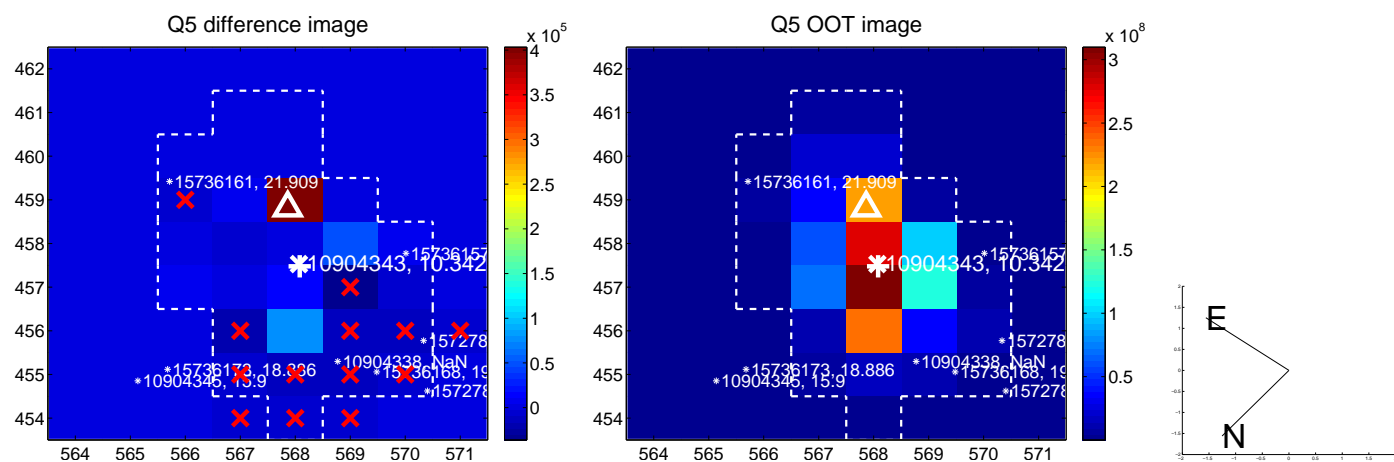
Q4 difference image. Poor Quality



Q4 OOT image



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





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

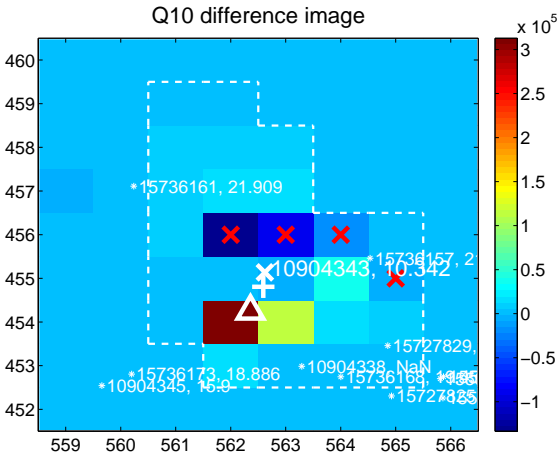
Q9 no difference image



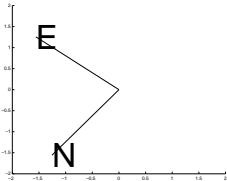
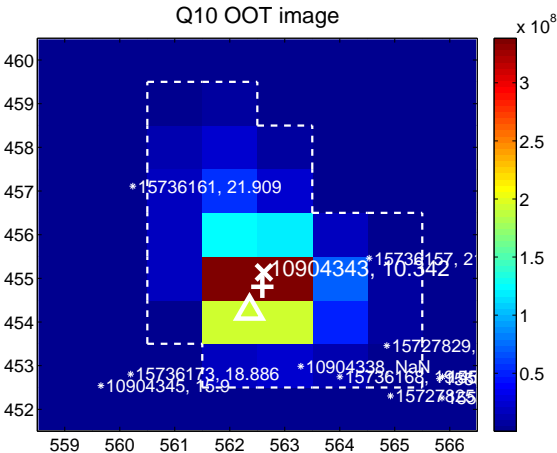
Q9 no OOT image



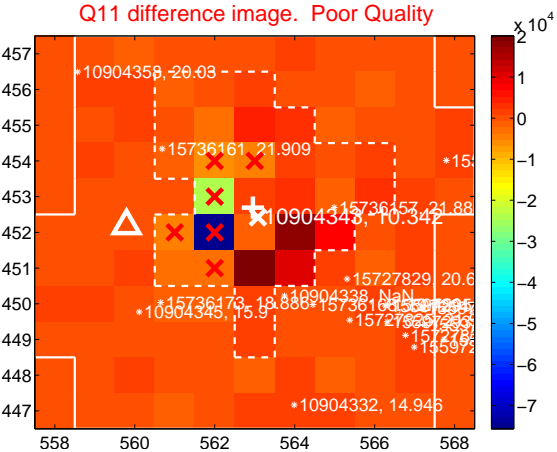
Q10 difference image



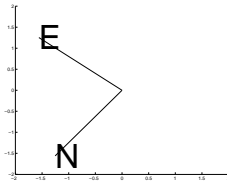
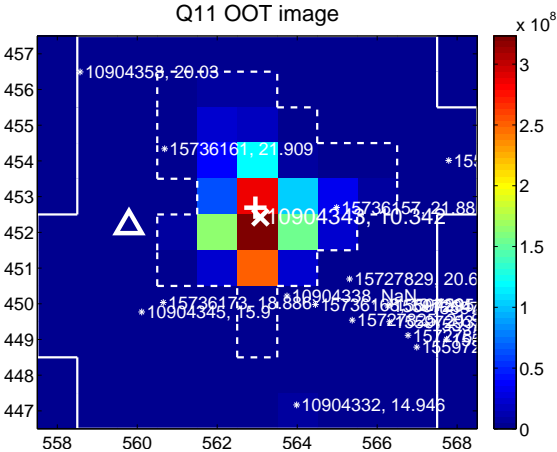
Q10 OOT image



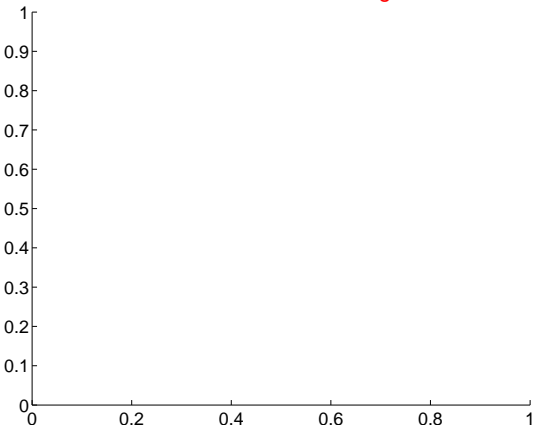
Q11 difference image. Poor Quality



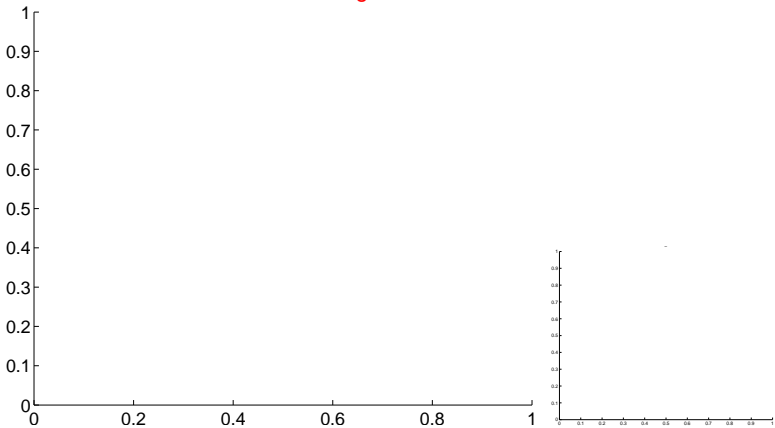
Q11 OOT image



Q12 no difference image



Q12 no OOT image



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

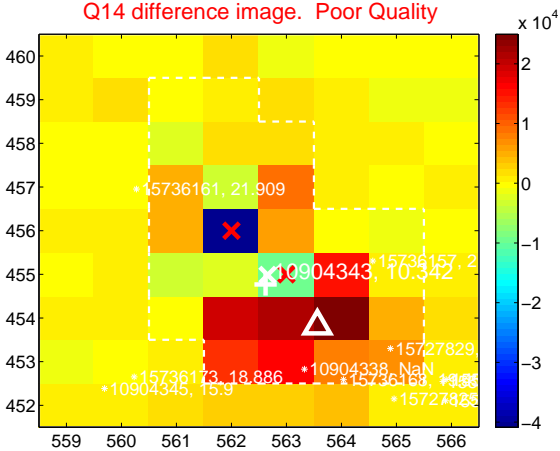
Q13 no difference image



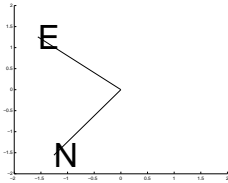
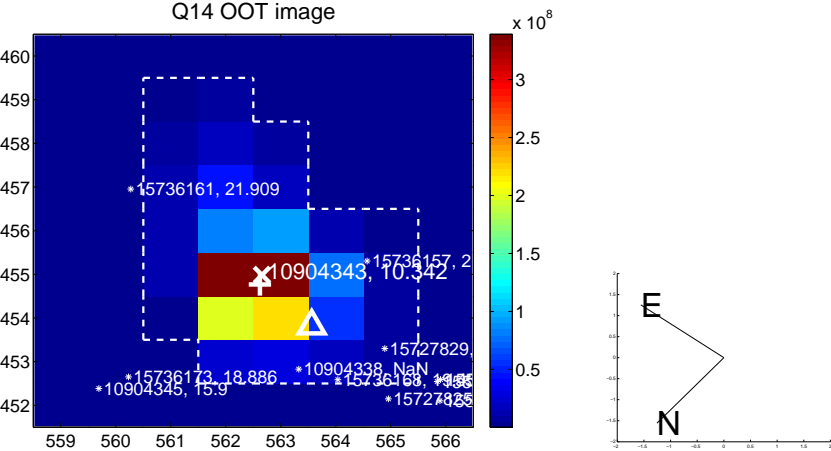
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



Q15 no difference image



Q15 no OOT image



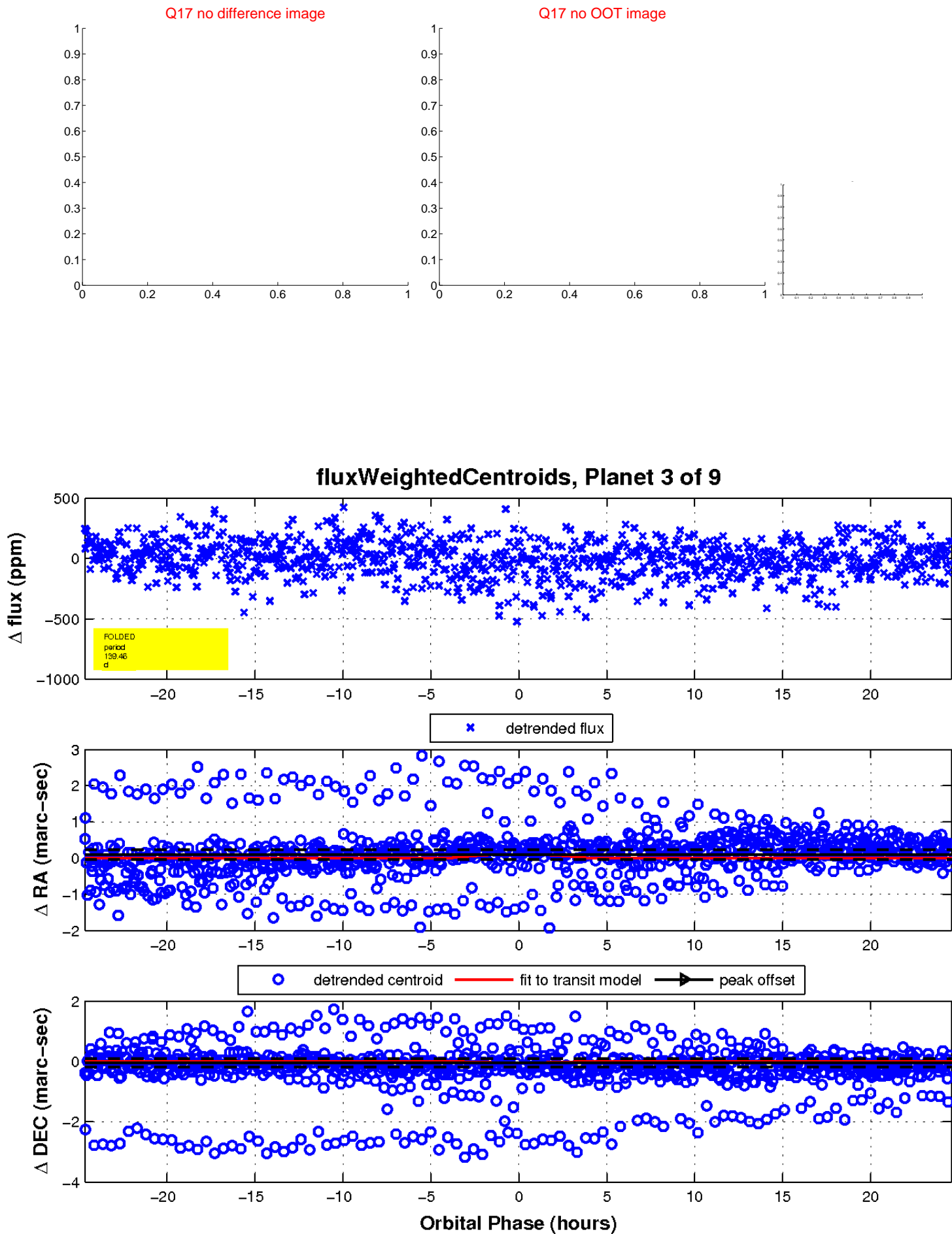
Q16 no difference image



Q16 no OOT image

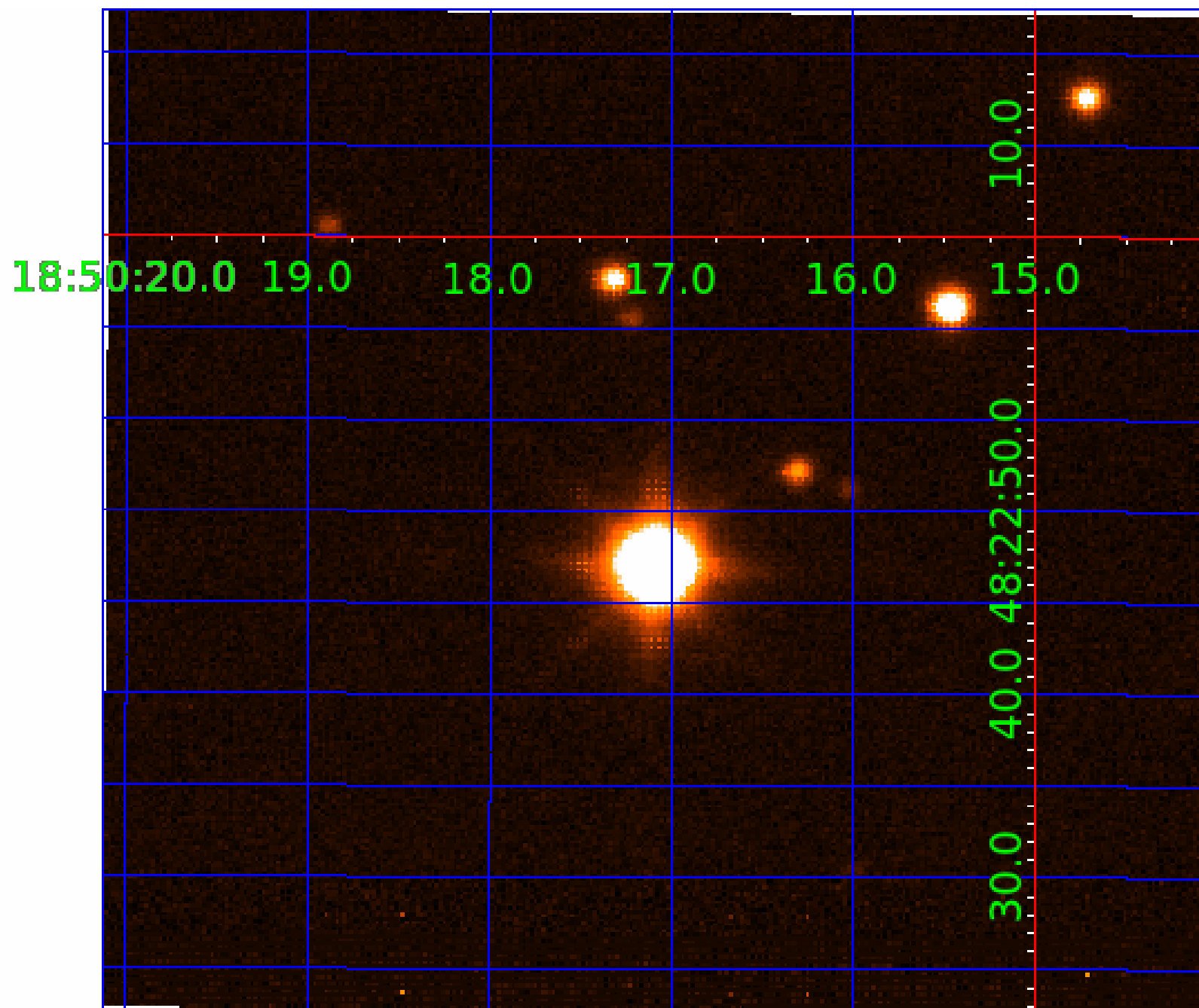


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010904343

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010904343-01	OBS	No	3.061235	132.737615	22.8	8.650	8.8	7.4	3.71	6714	2.00	10284.55
010904343-02	OBS	No	1.530349	132.310781	27.8	6.304	10.4	10.0	3.71	6714	2.71	25921.51
010904343-03	OBS	No	139.464948	217.524278	305.9	8.224	9.9	9.5	3.71	6714	8.43	63.21
010904343-04	OBS	No	60.793603	160.060354	212.8	4.472	8.5	9.2	3.71	6714	6.20	191.24
010904343-05	OBS	No	117.464997	228.800718	304.9	2.434	8.6	9.0	3.71	6714	7.37	79.46
010904343-06	OBS	No	34.916667	152.864357	120.7	2.929	8.1	6.3	3.71	6714	4.77	400.56
010904343-07	OBS	No	42.718363	155.839959	157.5	4.114	7.5	8.1	3.71	6714	5.36	306.12
010904343-08	OBS	No	106.321866	134.323578	151.5	6.479	7.6	6.4	3.71	6714	5.19	90.76
010904343-09	OBS	No	33.945926	146.949011	64.7	6.114	7.5	4.0	3.71	6714	3.37	415.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010904343-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
010904343-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010904343-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-09	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

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

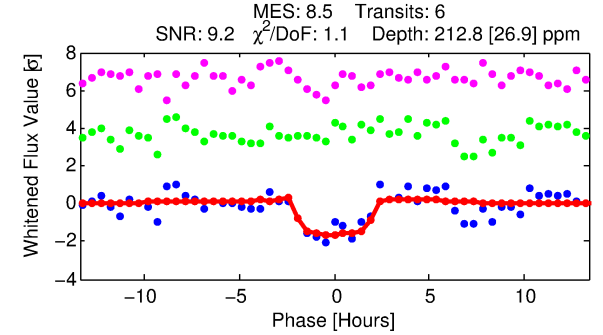
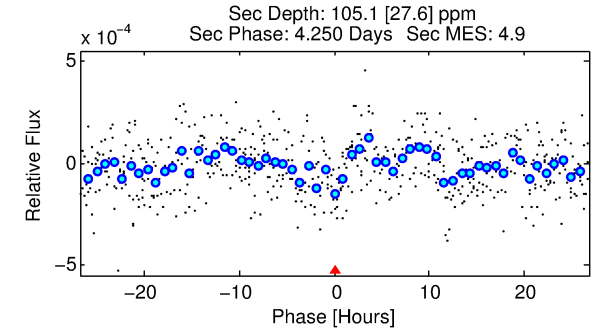
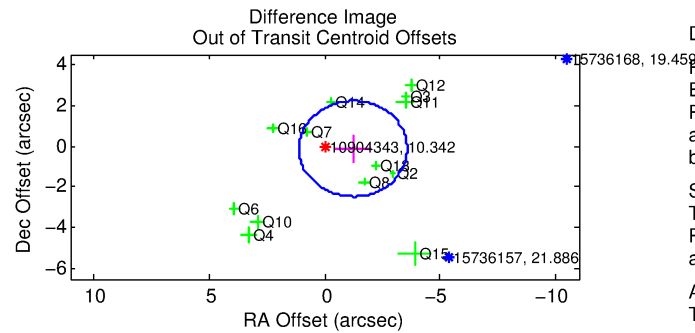
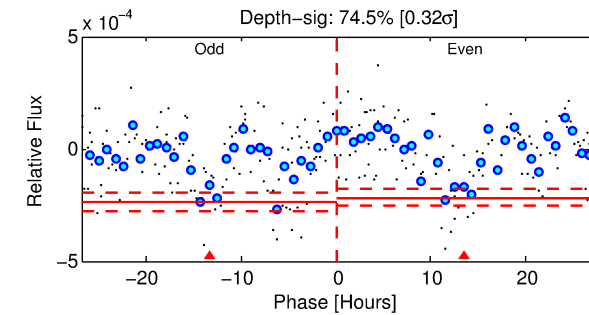
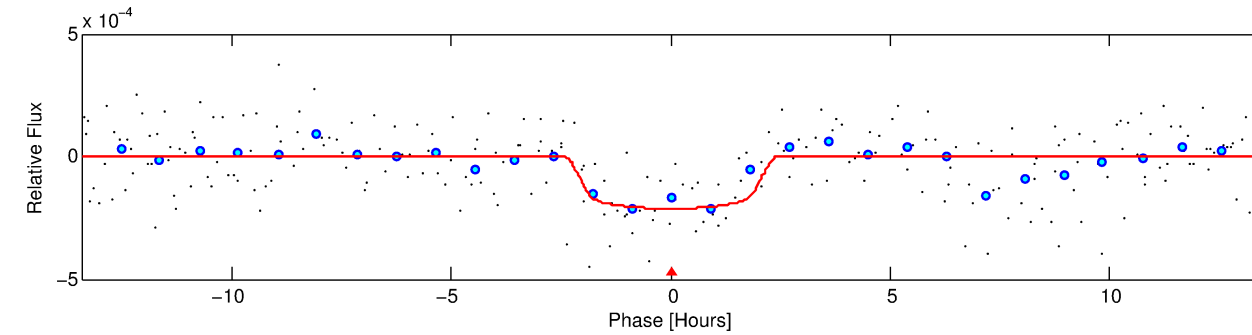
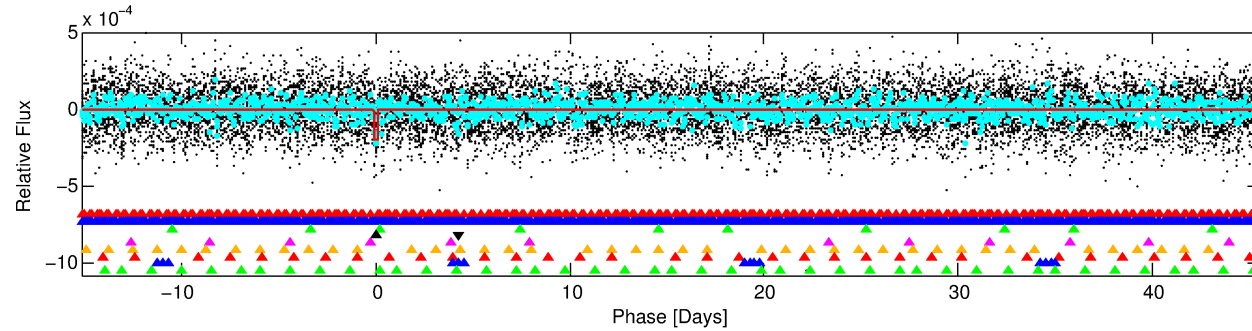
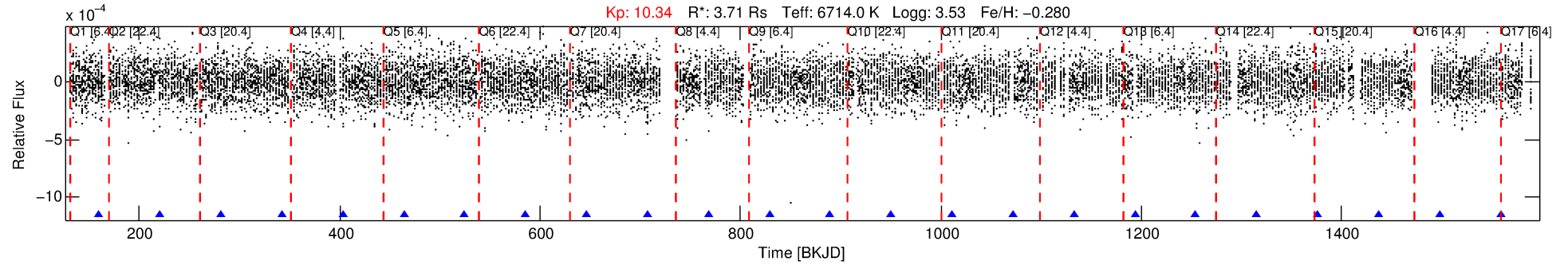
Ephemeris Match Information For 010904343-04

No Significant Match Found



# DV One-Page Summary

KIC: 10904343 Candidate: 4 of 9 Period: 60.794 d



## DV Fit Results:

Period = 60.79360 [0.00110] d  
Epoch = 160.0604 [0.0105] BKJD  
 $R_p/R^*$  = 0.0153 [0.0083]  
 $a/R^*$  = 53.26 [172.22]  
 $b$  = 0.88 [0.86]  
 $S_{\text{eff}}$  = 191.24 [114.20]  
 $T_{\text{eq}}$  = 948 [142] K  
 $R_p$  = 6.20 [4.13]  $R_e$   
 $a$  = 0.3624 [0.1333] AU  
 $A_g$  = 197.21 [249.06] [0.79 $\sigma$ ]  
 $T_{\text{eff}}$  = 5494 [1543] K [2.93 $\sigma$ ]

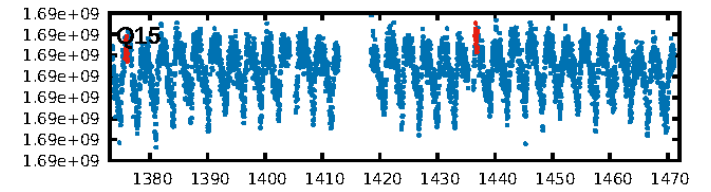
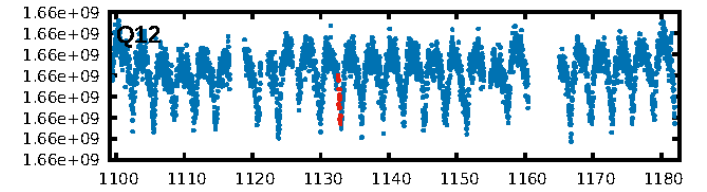
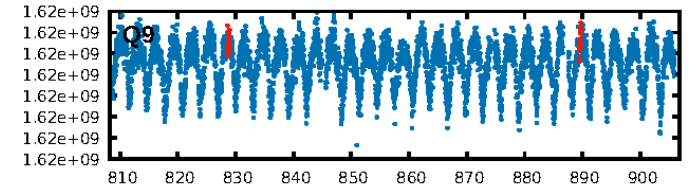
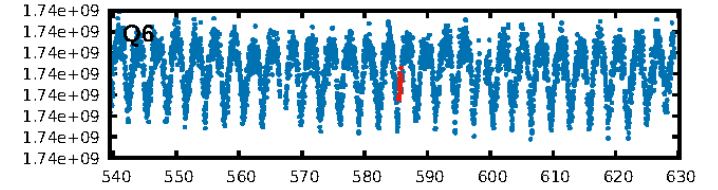
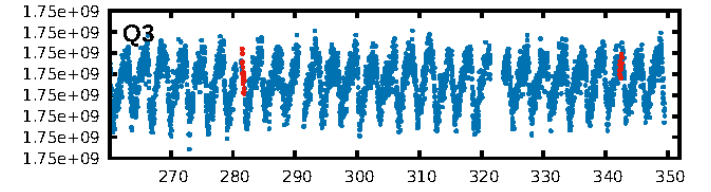
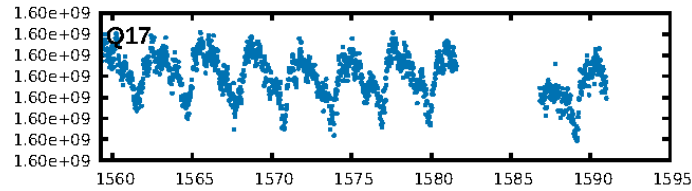
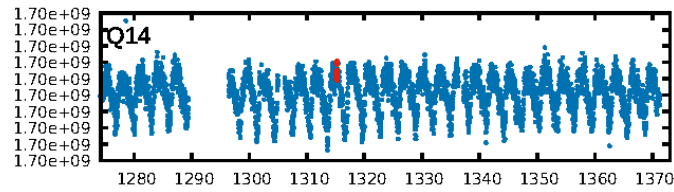
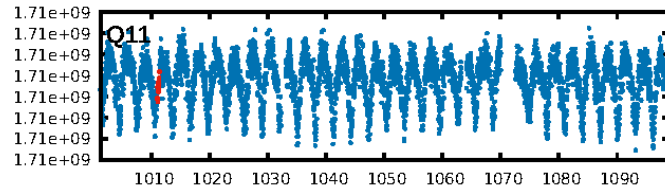
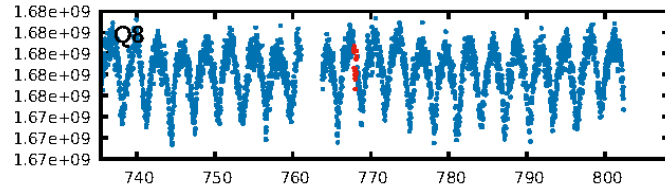
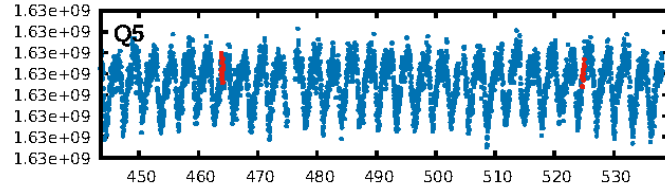
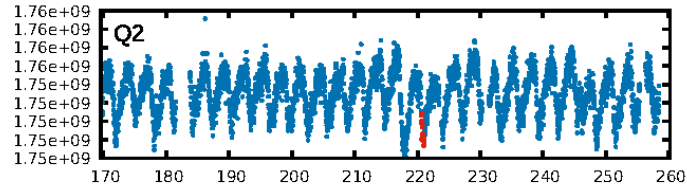
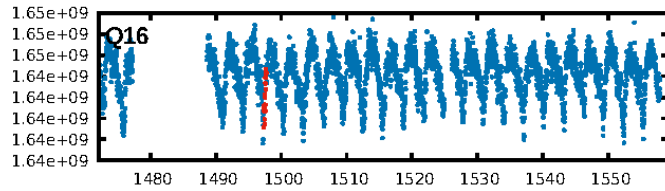
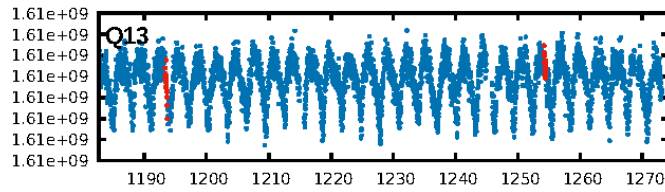
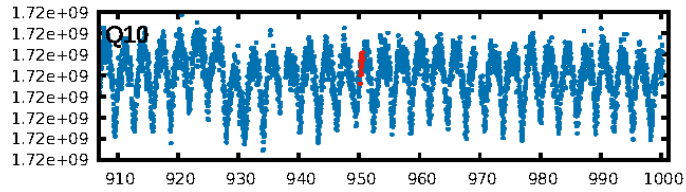
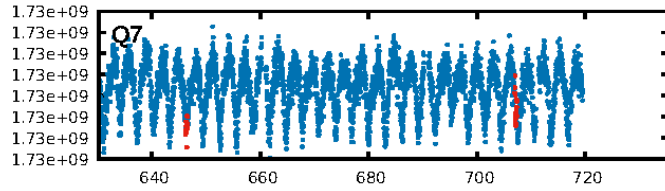
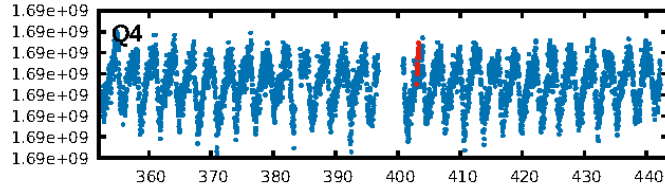
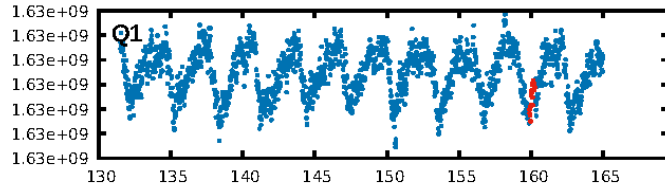
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [71.39 $\sigma$ ]  
LongPeriod-sig: 100.0% [138.80 $\sigma$ ]  
ModelChiSquare2-sig: 37.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 5.33e-09**  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 1.082  
Centroid-sig: 38.1%  
Centroid-so: 0.416 arcsec [1.15 $\sigma$ ]  
OotOffset-rm: 1.232 arcsec [1.58 $\sigma$ ]  
KicOffset-rm: 1.364 arcsec [1.72 $\sigma$ ]  
OotOffset-st: 4/4/4/1 [13]  
KicOffset-st: 4/4/4/1 [13]  
DiffImageQuality-fgm: 0.23 [3/13]  
DiffImageOverlap-fno: 0.06 [1/16]

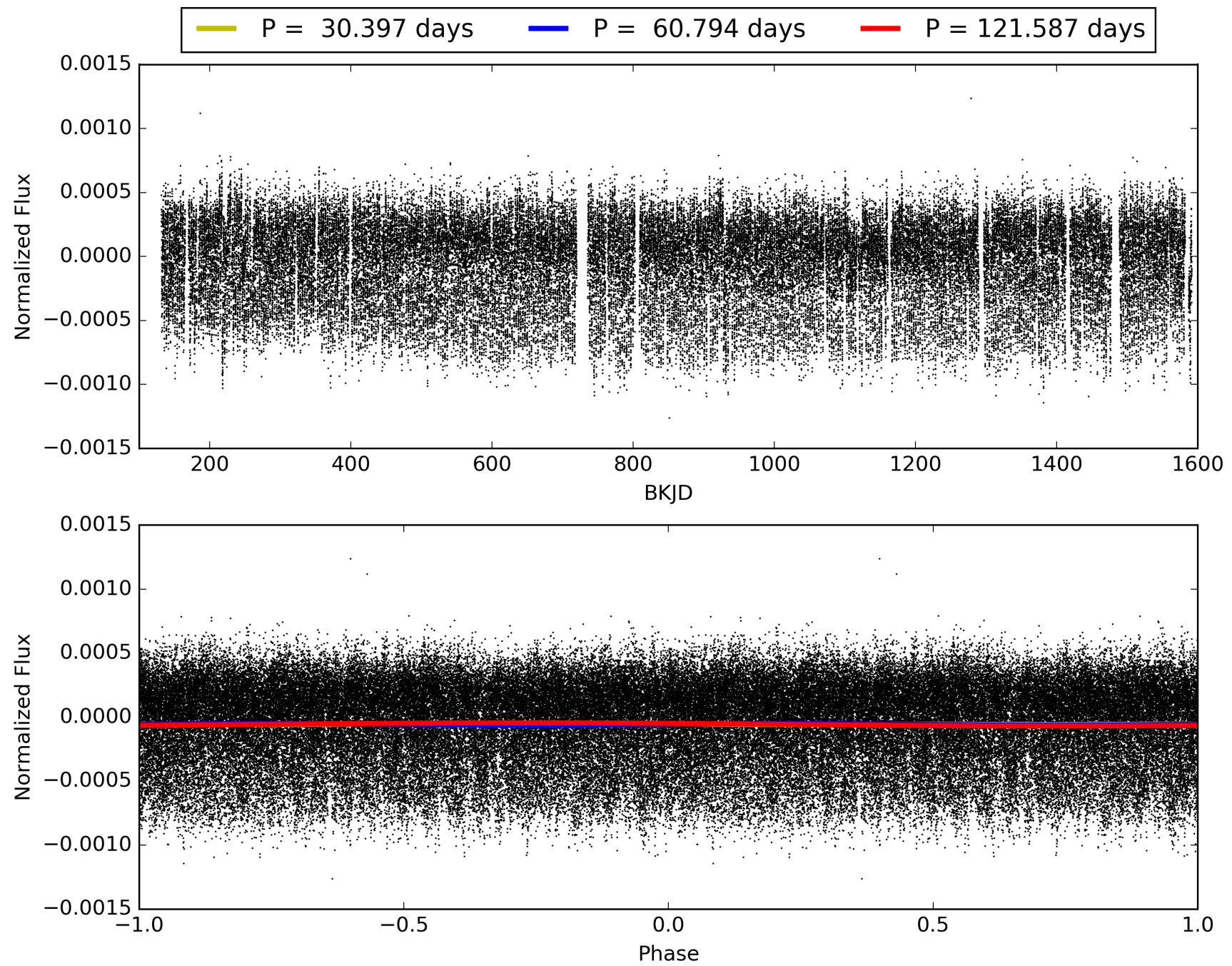
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:38:07 Z

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

# TCE 010904343-04, PDC Light Curves

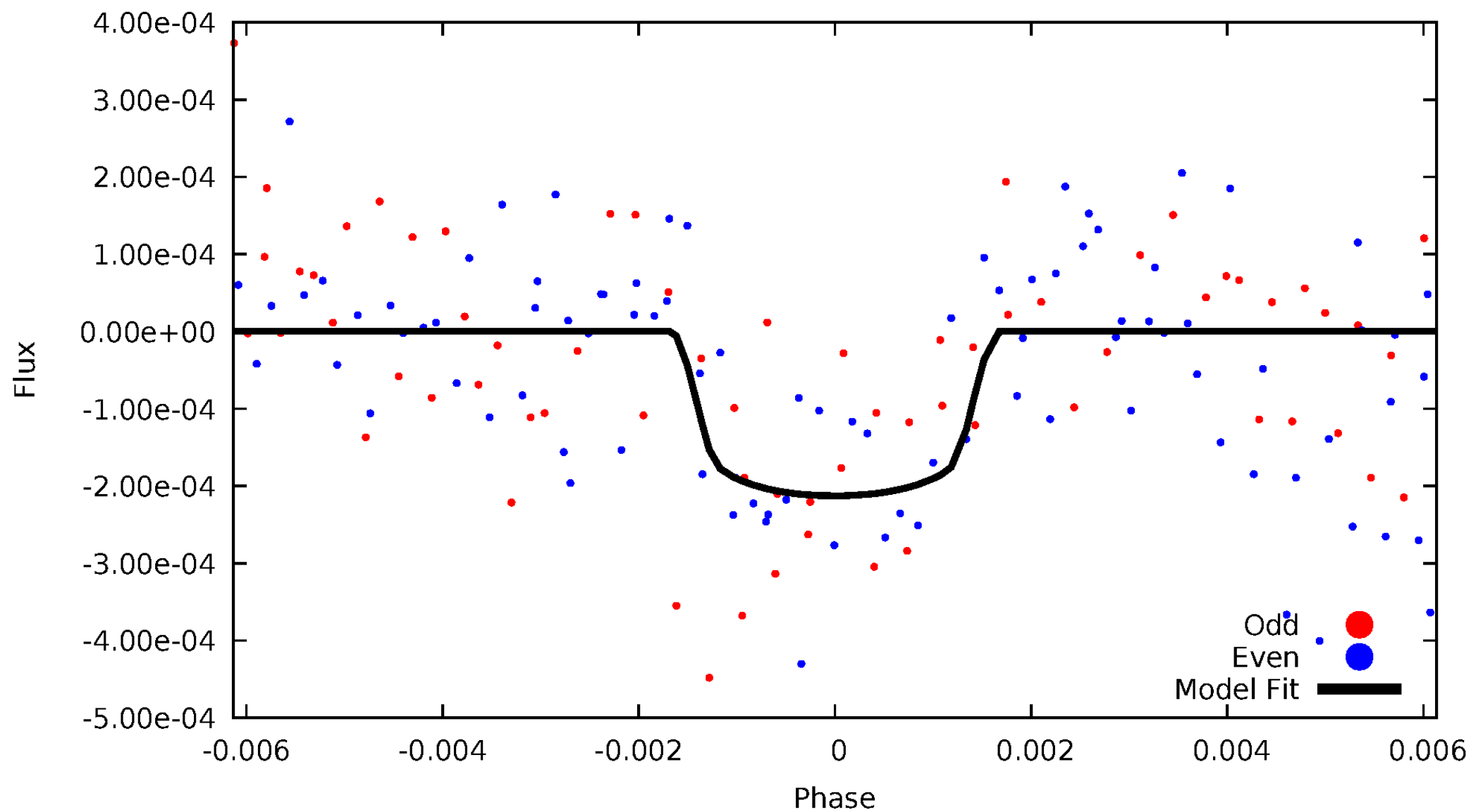


TCE 010904343-04



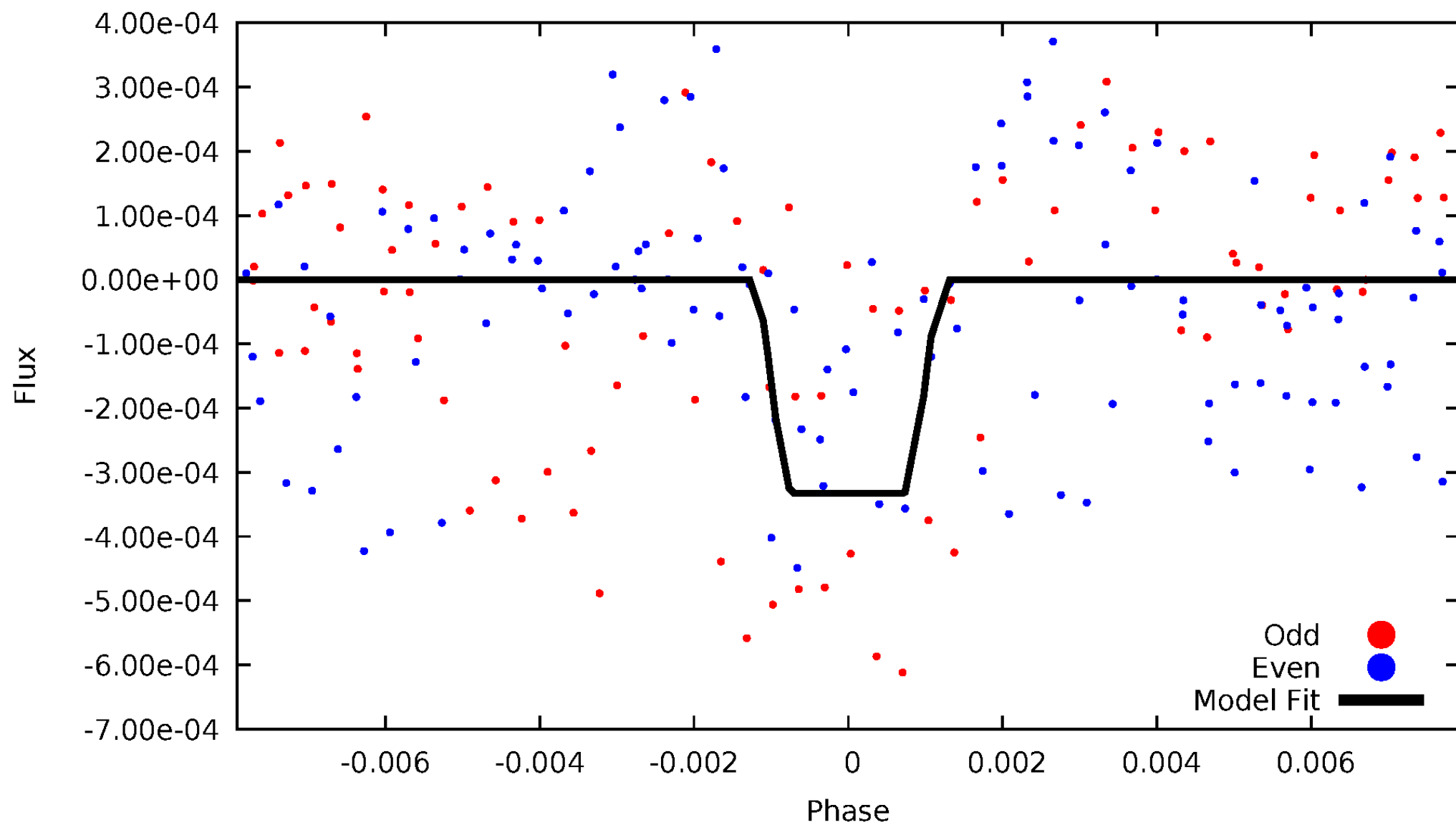
# DV Odd/Even

TCE 010904343-04



# ALT Odd/Even

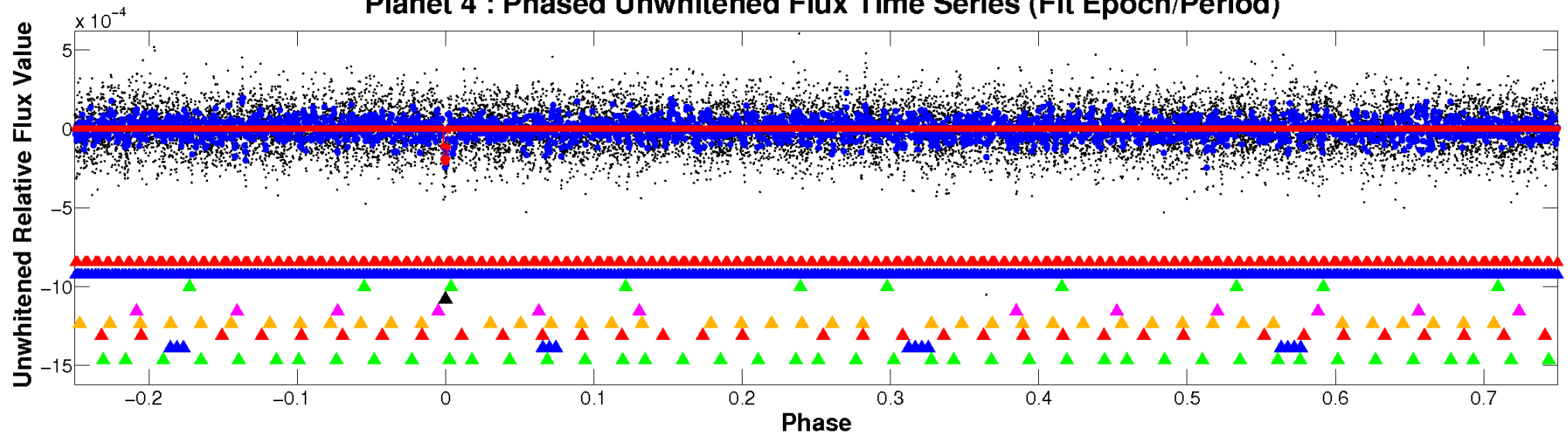
TCE 010904343-04



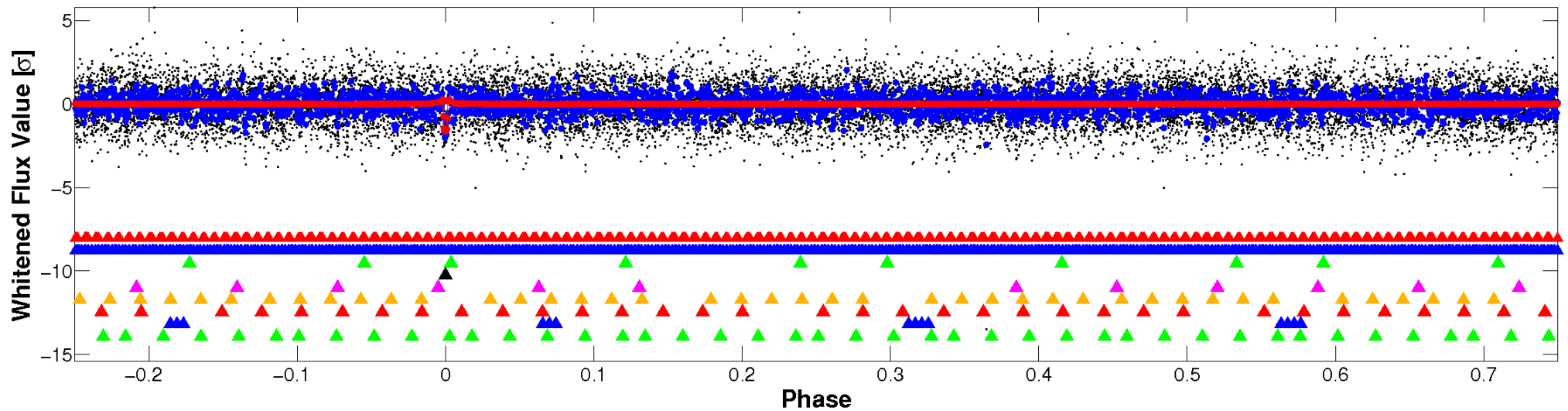


# Non-Whitened Vs. Whitened Light Curve

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

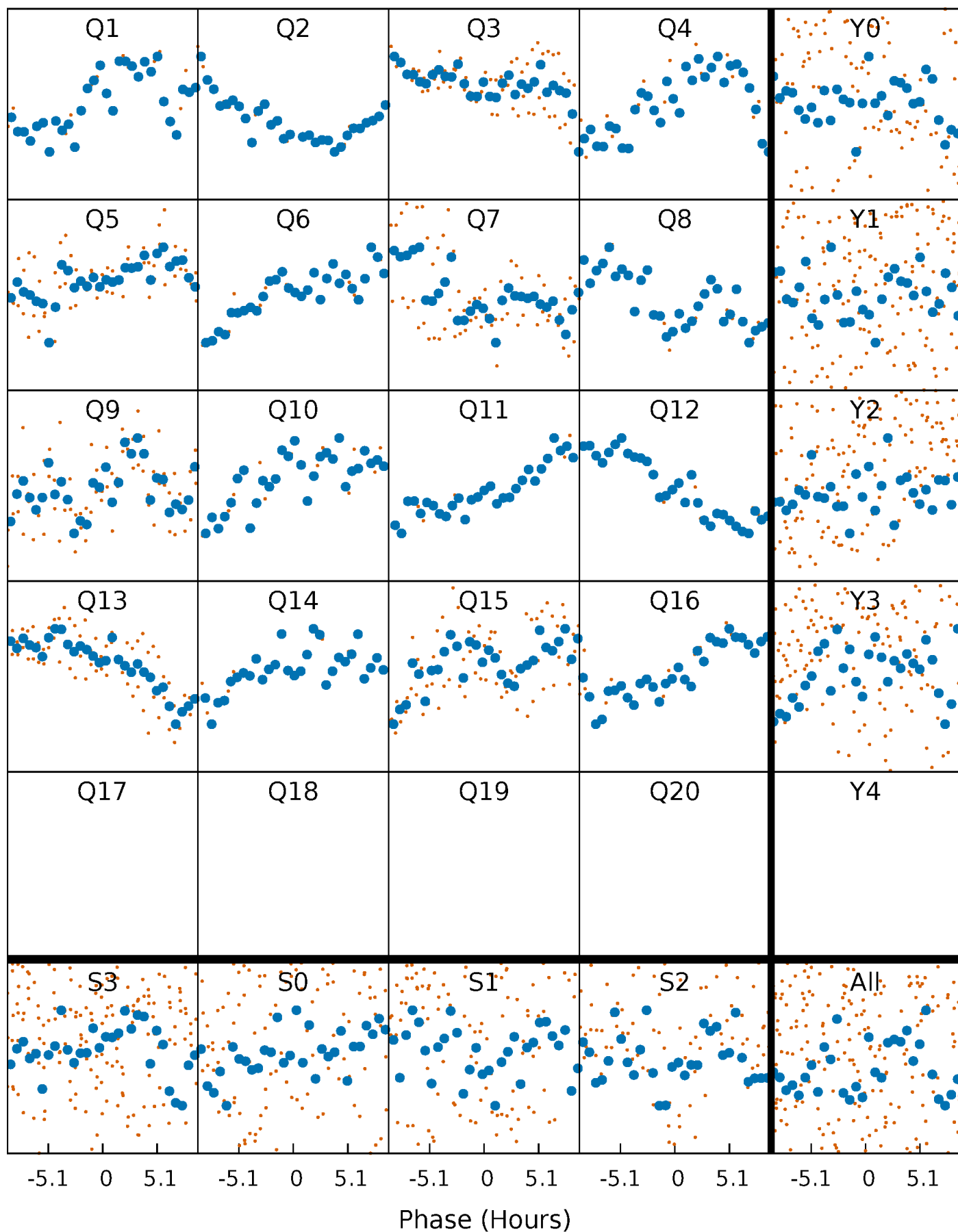


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



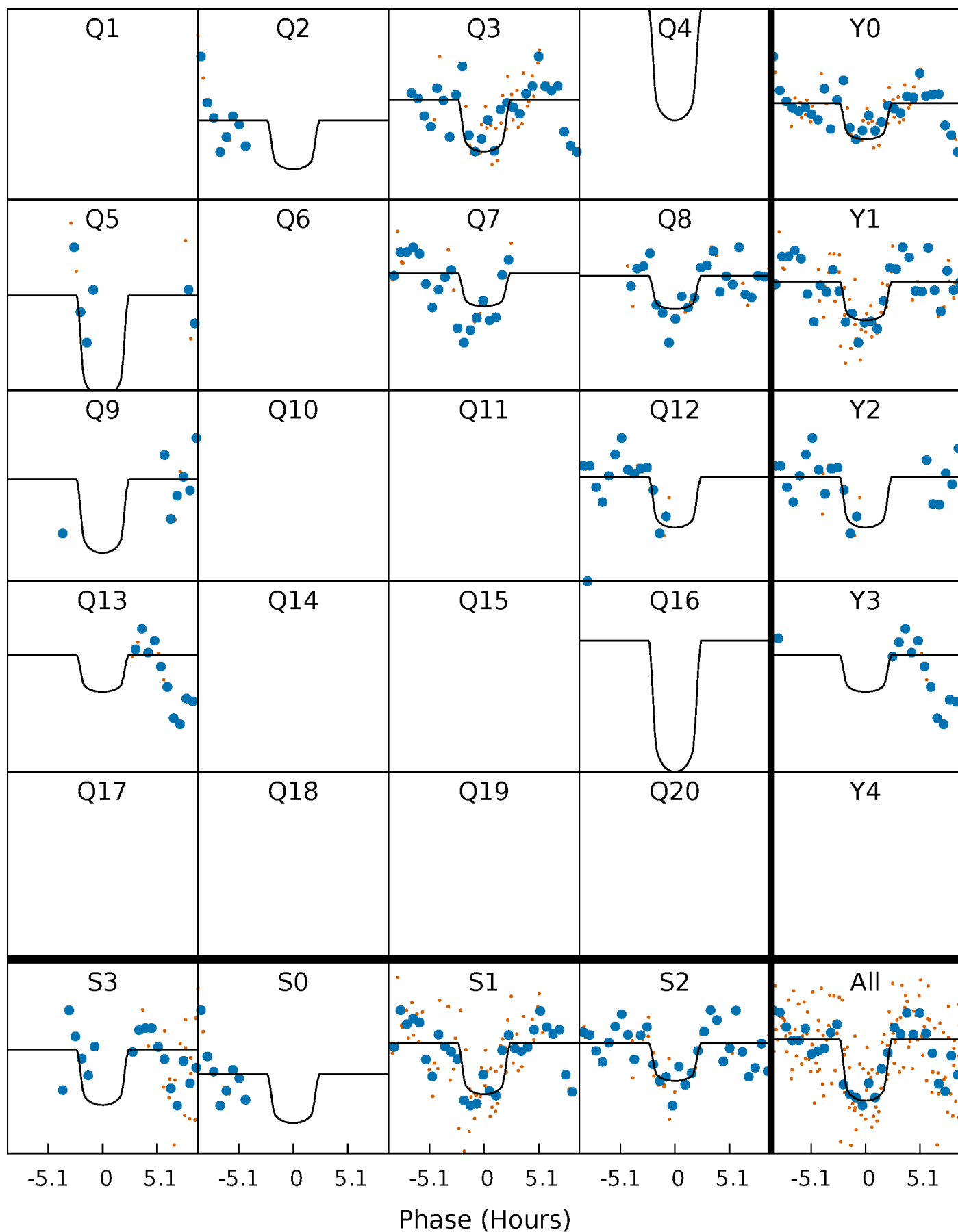
# PDC Quarter-Phased Transit Curves

TCE 010904343-04   P= 60.793603 Days    $T_0=160.060354$  (BKJD)



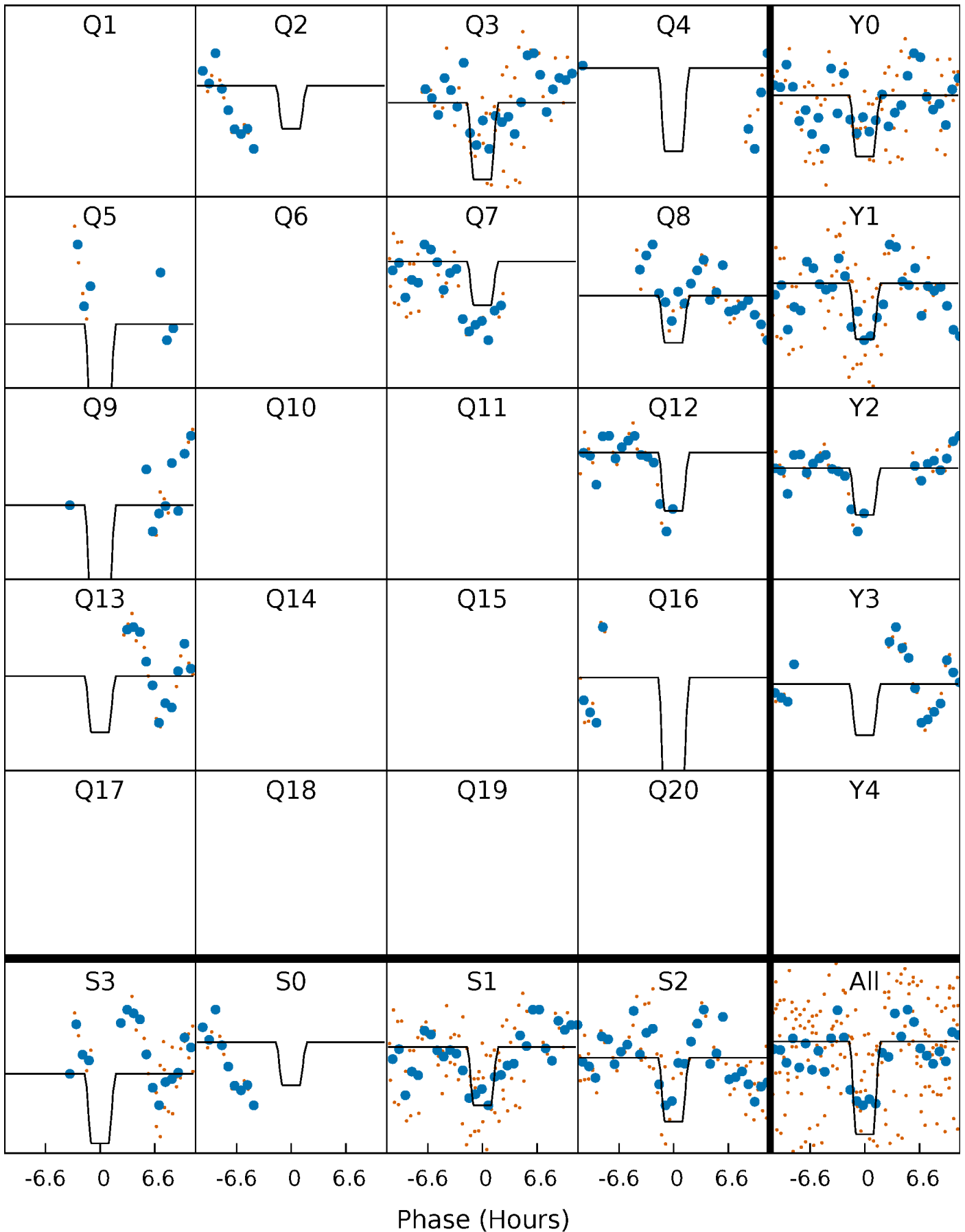
# DV Quarter-Phased Transit Curves

TCE 010904343-04 P= 60.793603 Days  $T_0=160.060354$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

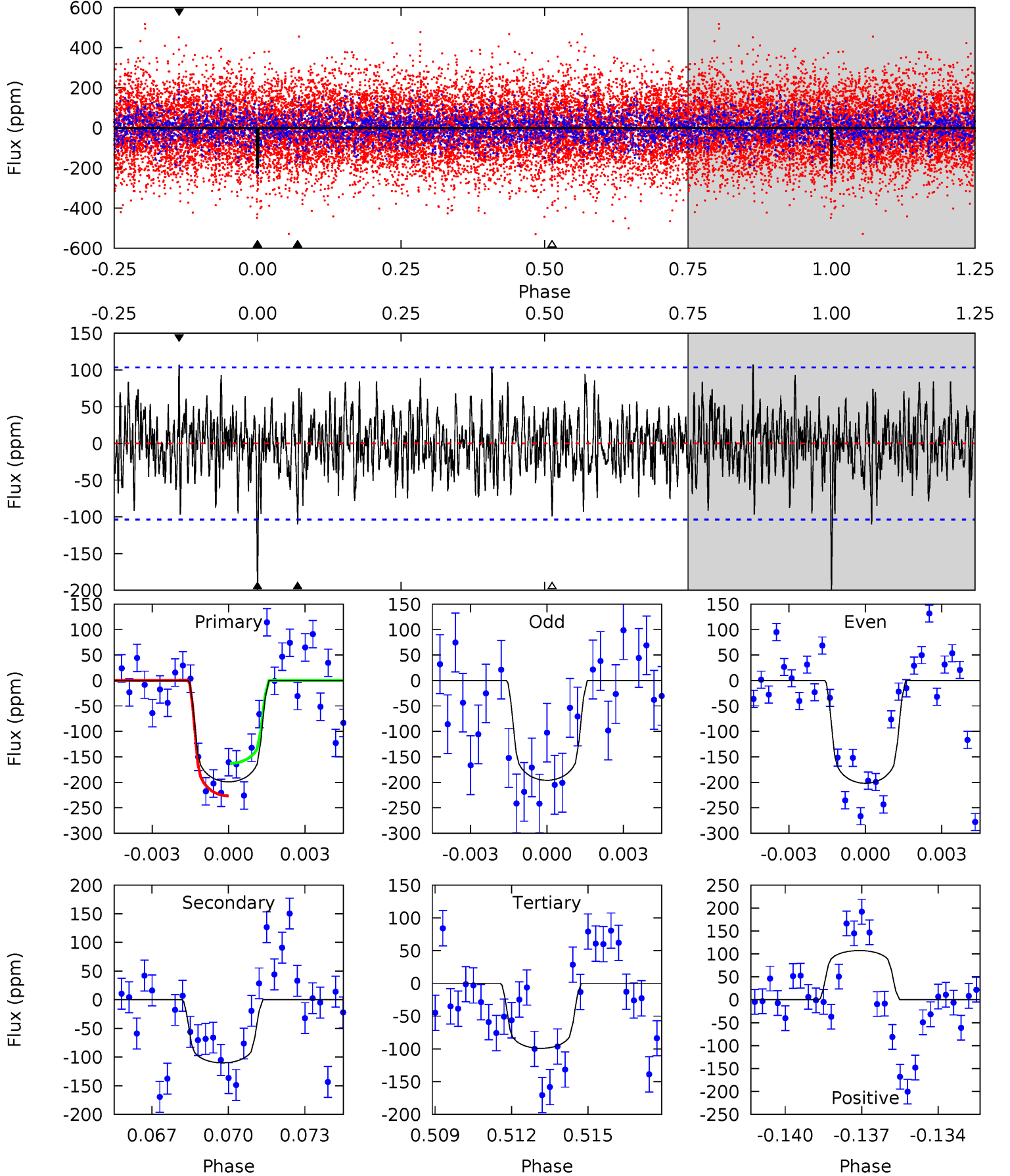
TCE 010904343-04     $P = 60.792936$  Days     $T_0 = 160.068487$  (BKJD)



# DV Model-Shift Uniqueness Test

010904343-04, P = 60.793603 Days, E = 99.266751 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	5.57	5.02	5.42	5.24	2.95	1.63	5.05	4.64	0.55	0.14	0.15	1.04	0.35	1.60

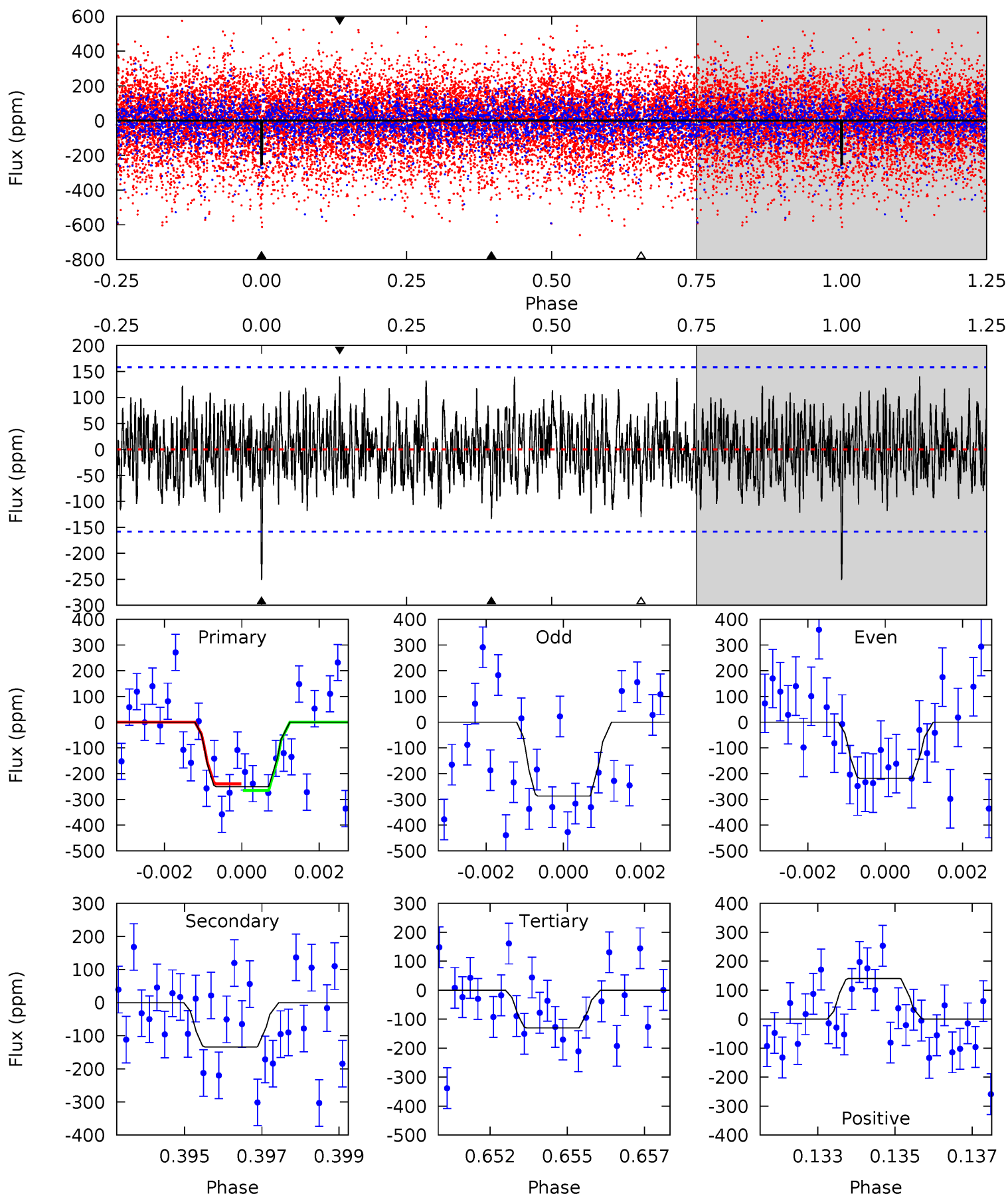




# Alt Model-Shift Uniqueness Test

010904343-04, P = 60.792936 Days, E = 99.275551 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.43	4.50	4.38	4.71	5.32	3.07	1.55	4.05	3.71	0.12	-0.21	1.16	1.23	0.36	0.43



### Stellar Parameters For KIC 010904343

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6714^{+168}_{-185}$	$3.533^{+0.344}_{-0.086}$	$-0.280^{+0.350}_{-0.250}$	$3.714^{+0.357}_{-1.427}$	$1.717^{+0.212}_{-0.345}$	$0.047^{+0.117}_{-0.013}$
	+3%/-3%	+10%/-2%	+125%/-89%	+10%/-38%	+12%/-20%	+247%/-27%
Source	PHO1	FLK73	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010904343-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-110 \pm 20$	$5.91^{+3.22}_{-3.11}$	$1296^{+66}_{-122}$	$5476^{+2525}_{-900}$	$232^{+783}_{-136}$
Alt.	$-134 \pm 30$	$7.25^{+3.06}_{-3.36}$	$1300^{+65}_{-117}$	$5293^{+1638}_{-790}$	$190^{+395}_{-103}$

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

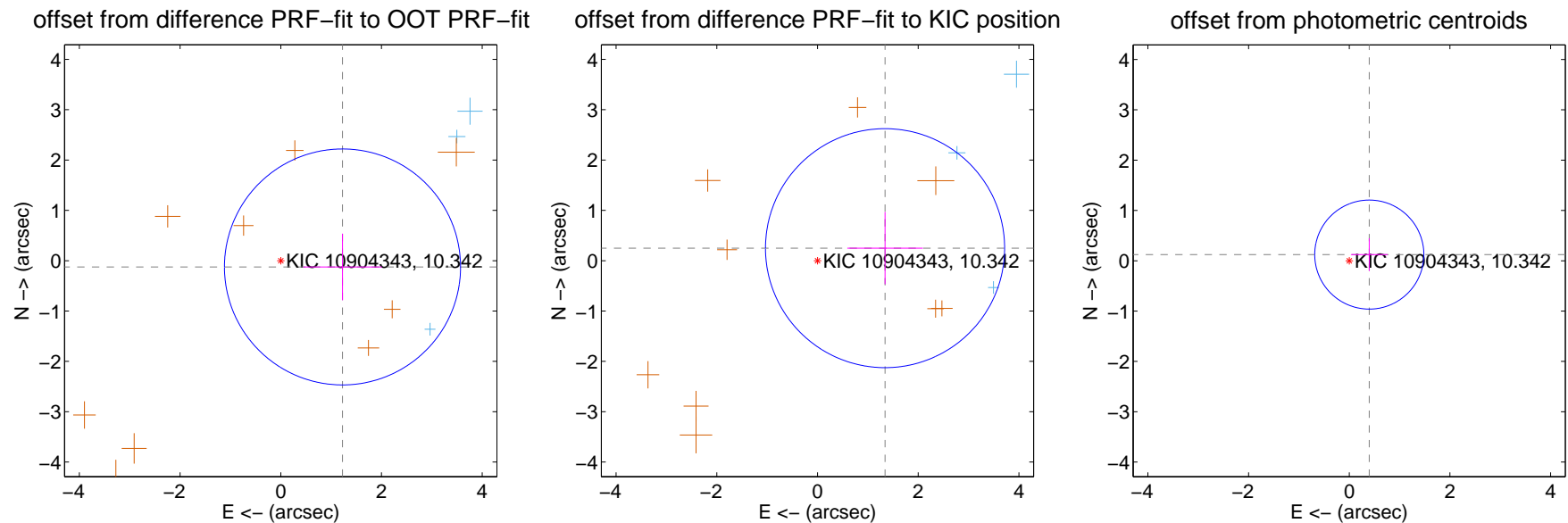
## DV Centroid Data

Supplemental centroid analysis for 010904343-04. **Kepler magnitude: 10.34.** Transit SNR 9.25

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

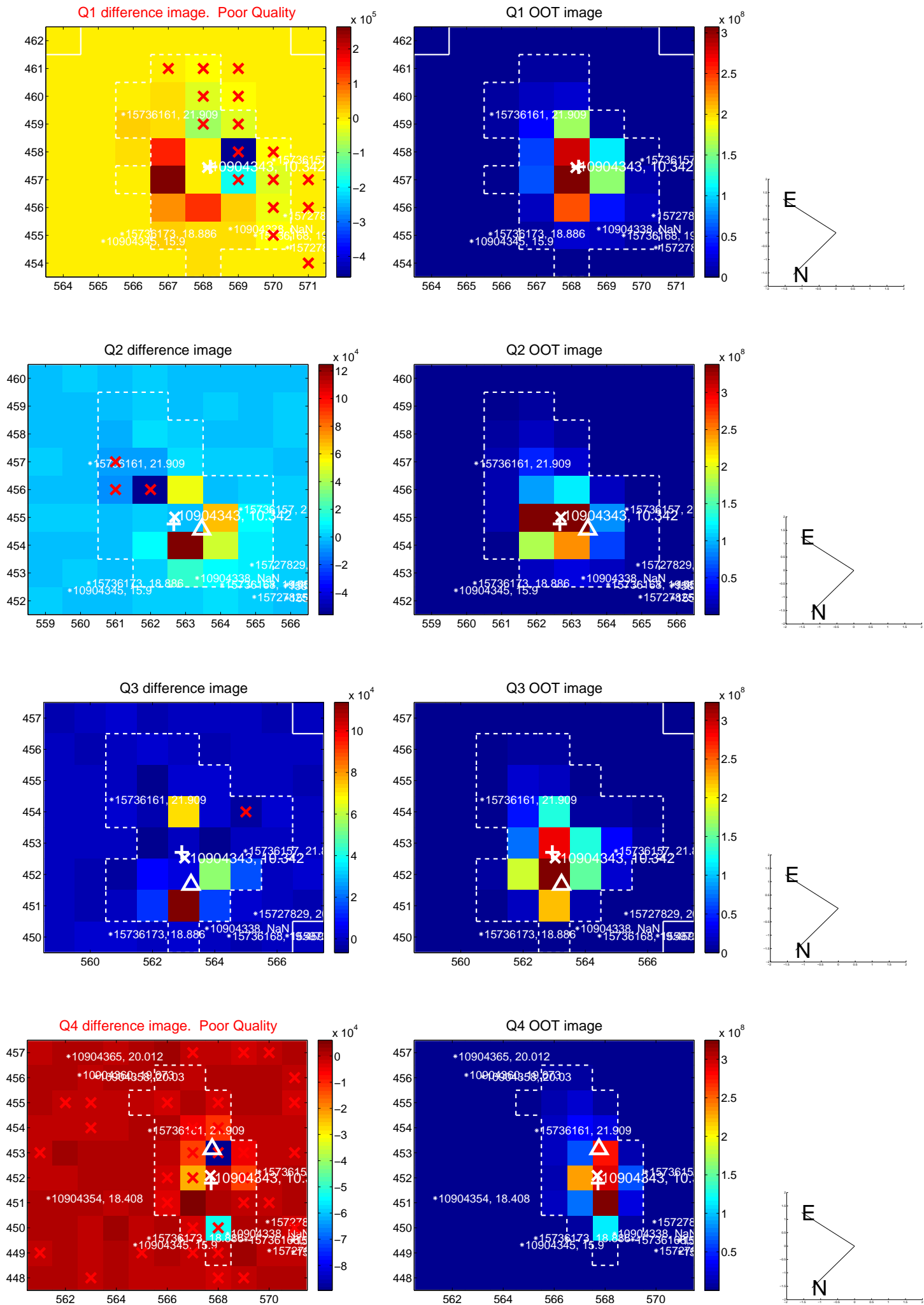
The direct PRF centroid is offset from the target star catalog position by about 0.72 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.232 \pm 0.781$	1.58	$-1.225 \pm 0.782$	$-0.124 \pm 0.661$
PRF-fit source offset from KIC position	$1.364 \pm 0.791$	1.72	$-1.341 \pm 0.750$	$0.249 \pm 0.718$
photometric centroid source offset	$0.42 \pm 0.36$	1.15	$-0.40 \pm 0.36$	$0.12 \pm 0.32$

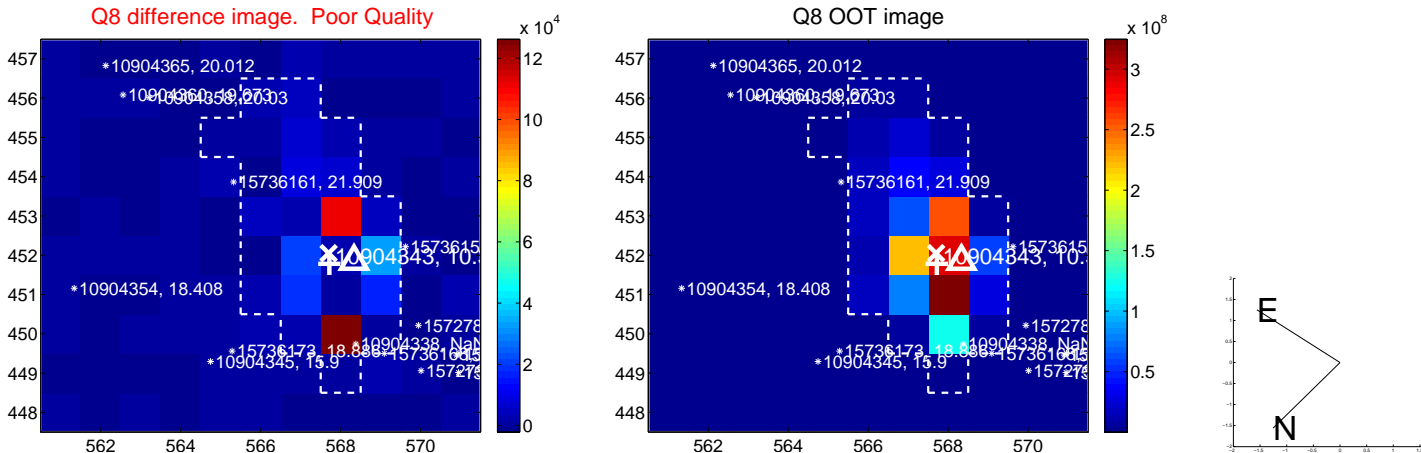
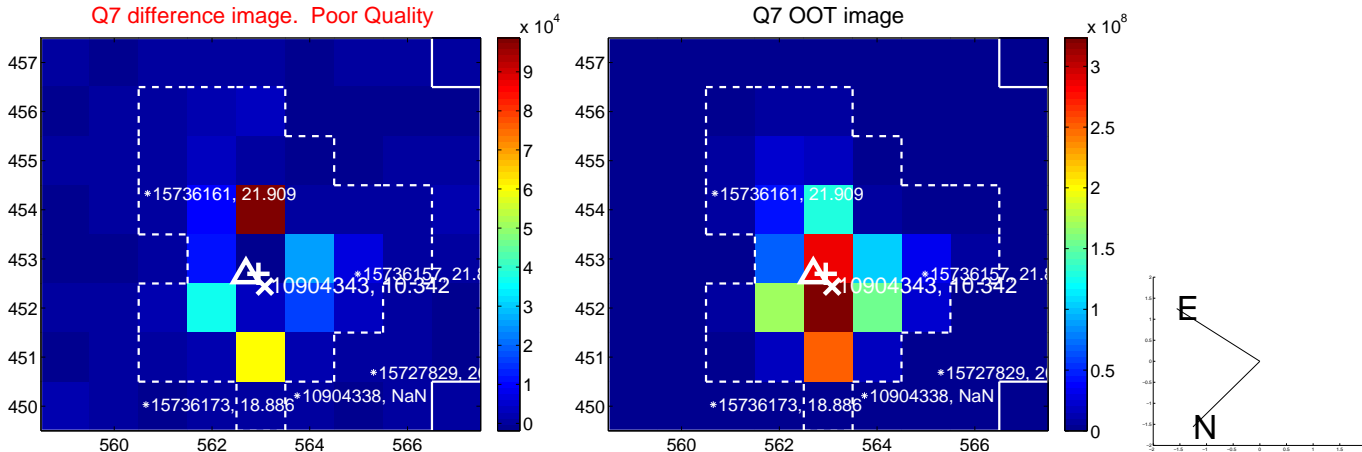
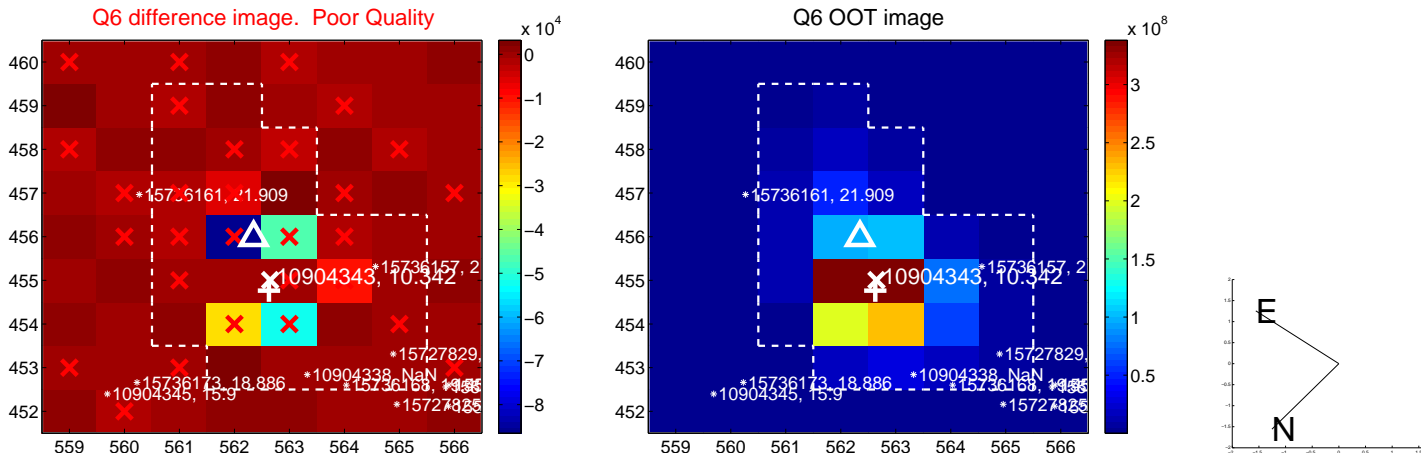
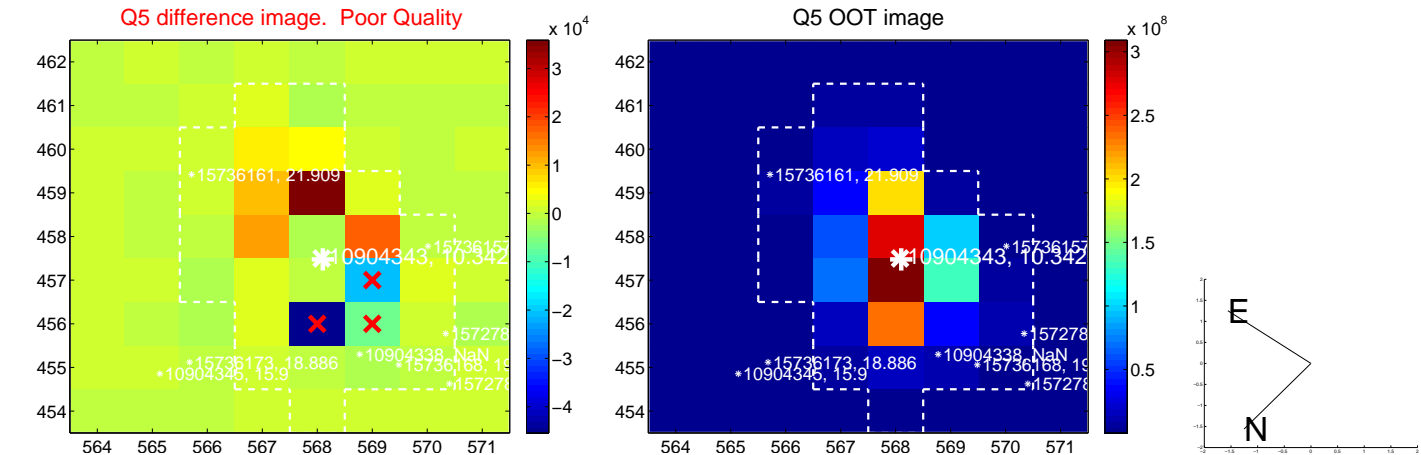


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

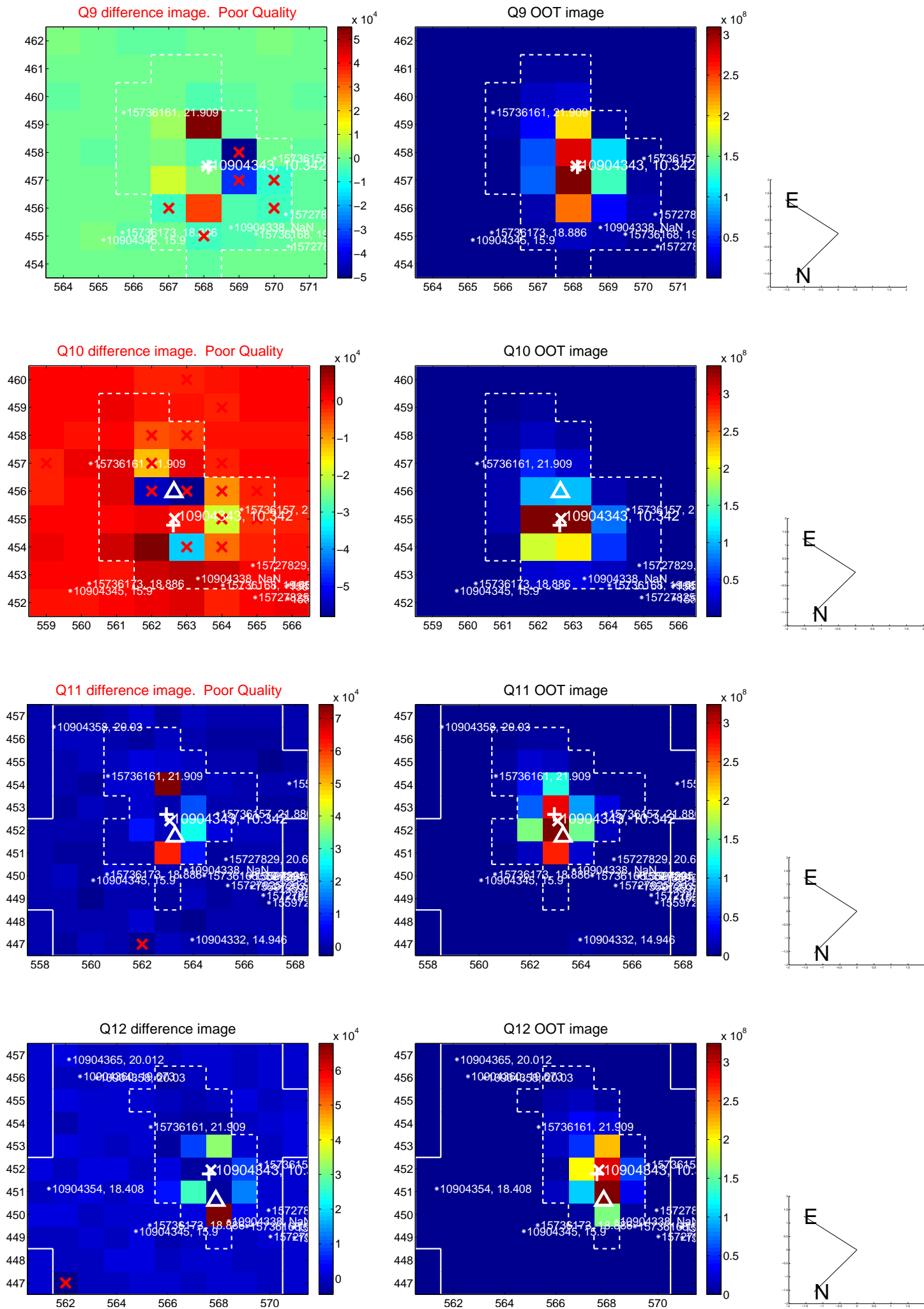


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

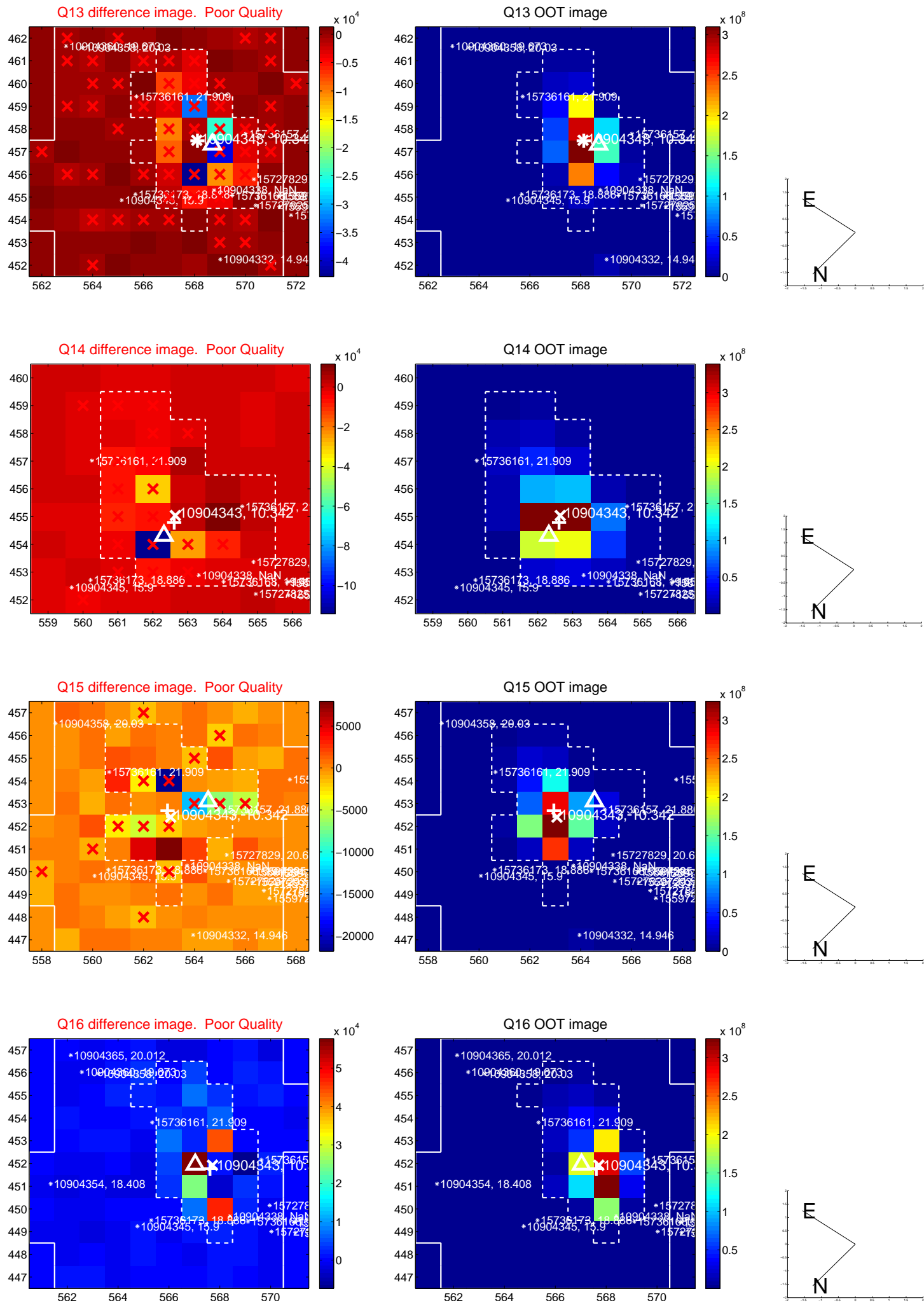




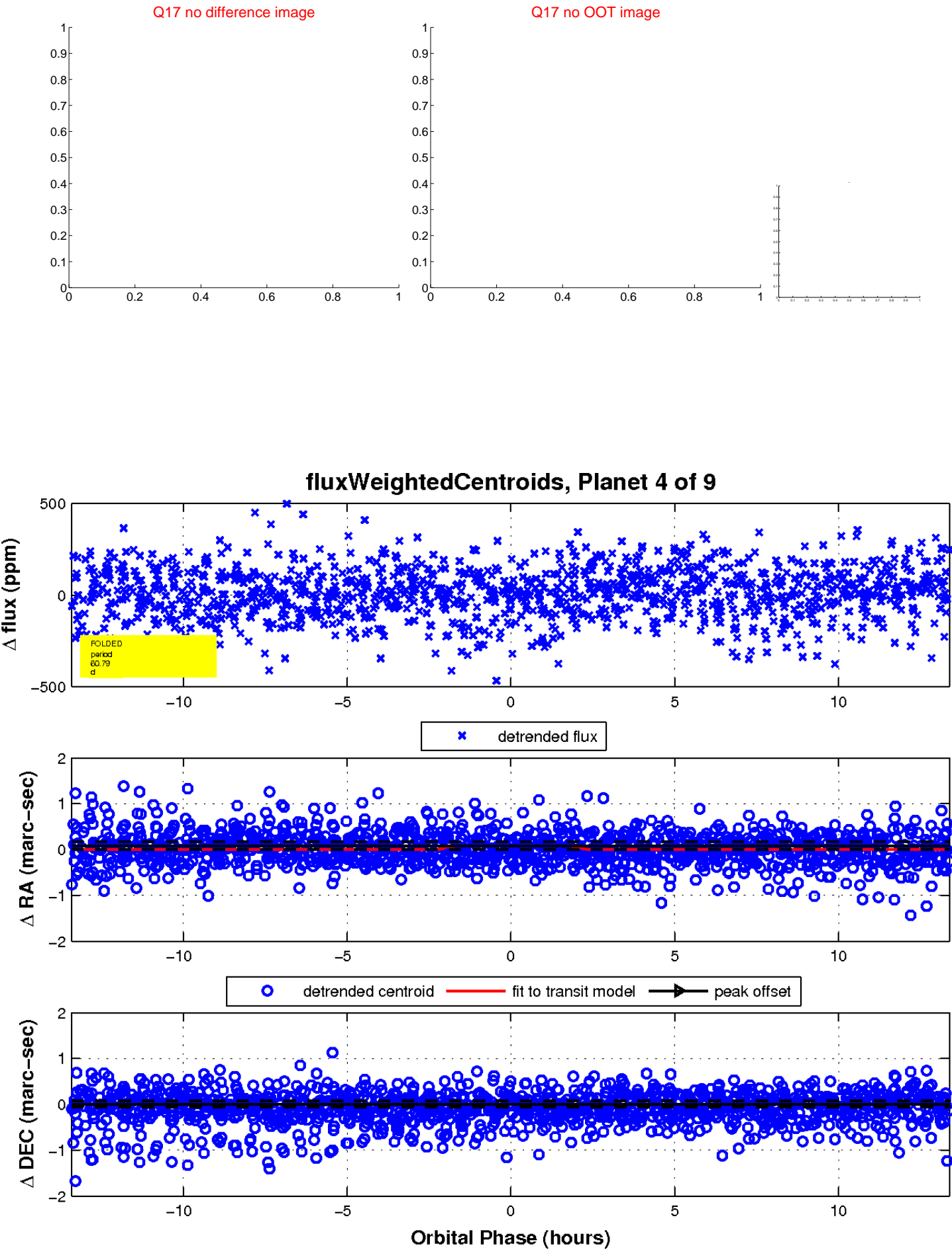
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



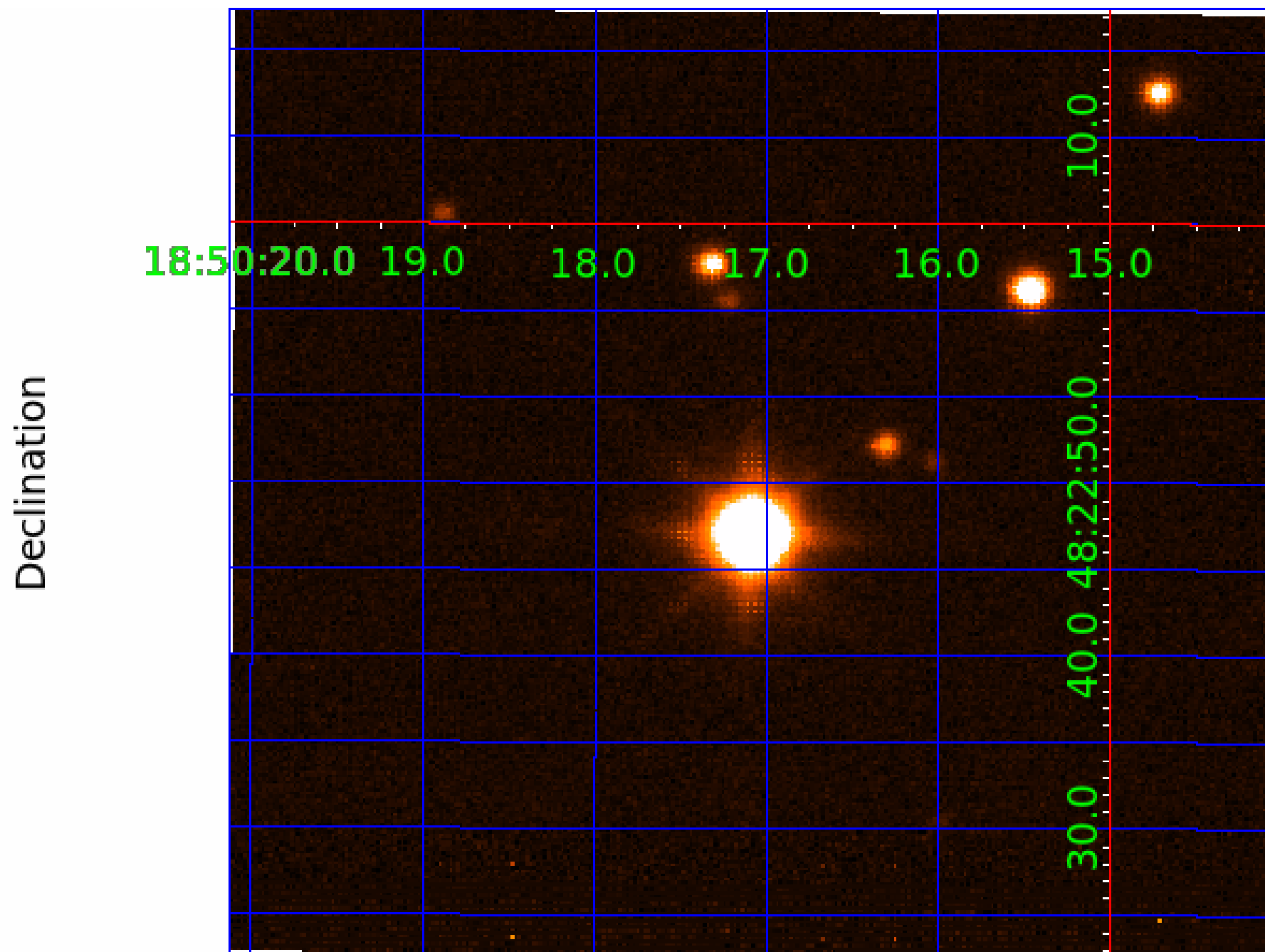
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 010904343

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010904343-01	OBS	No	3.061235	132.737615	22.8	8.650	8.8	7.4	3.71	6714	2.00	10284.55
010904343-02	OBS	No	1.530349	132.310781	27.8	6.304	10.4	10.0	3.71	6714	2.71	25921.51
010904343-03	OBS	No	139.464948	217.524278	305.9	8.224	9.9	9.5	3.71	6714	8.43	63.21
010904343-04	OBS	No	60.793603	160.060354	212.8	4.472	8.5	9.2	3.71	6714	6.20	191.24
010904343-05	OBS	No	117.464997	228.800718	304.9	2.434	8.6	9.0	3.71	6714	7.37	79.46
010904343-06	OBS	No	34.916667	152.864357	120.7	2.929	8.1	6.3	3.71	6714	4.77	400.56
010904343-07	OBS	No	42.718363	155.839959	157.5	4.114	7.5	8.1	3.71	6714	5.36	306.12
010904343-08	OBS	No	106.321866	134.323578	151.5	6.479	7.6	6.4	3.71	6714	5.19	90.76
010904343-09	OBS	No	33.945926	146.949011	64.7	6.114	7.5	4.0	3.71	6714	3.37	415.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010904343-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
010904343-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010904343-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-09	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

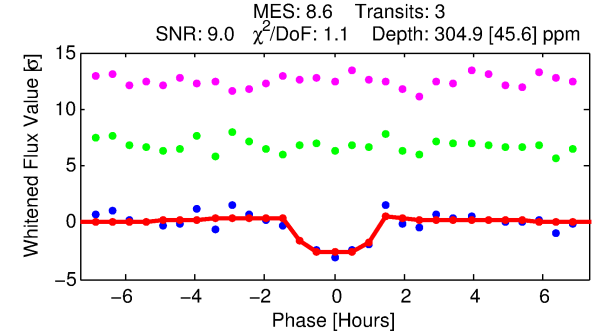
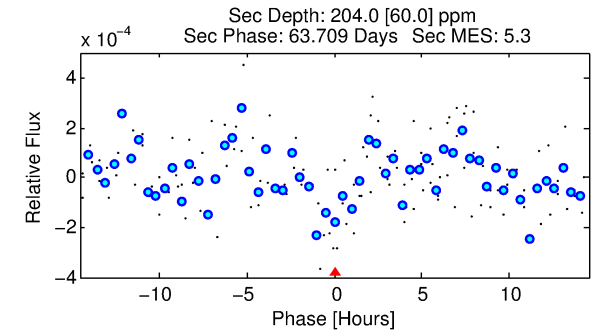
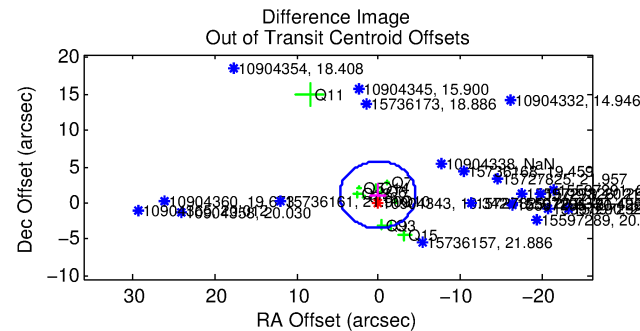
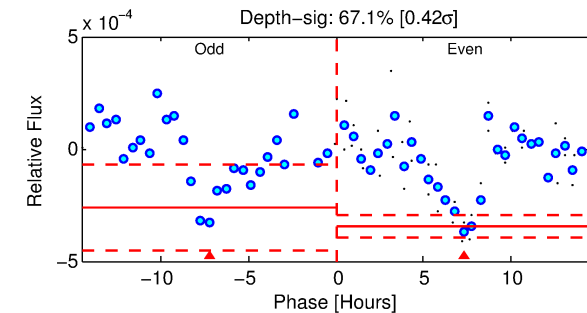
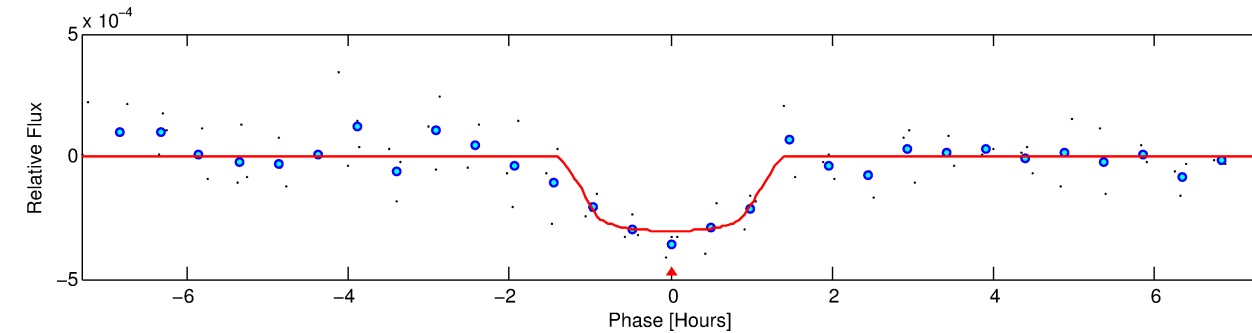
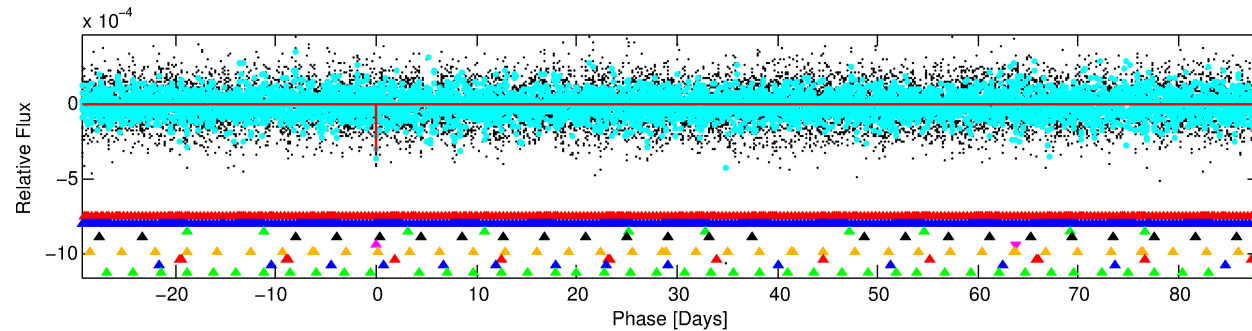
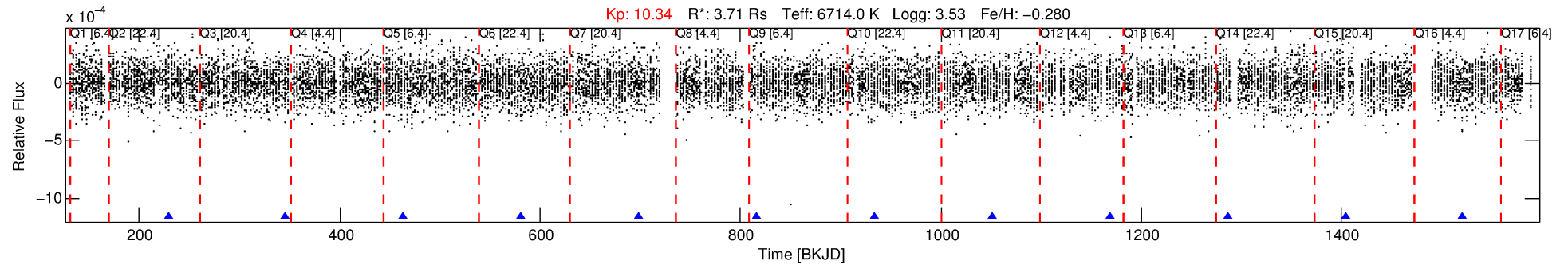
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010904343-05

No Significant Match Found

# DV One-Page Summary

KIC: 10904343 Candidate: 5 of 9 Period: 117.465 d



## DV Fit Results:

Period = 117.46500 [0.00119] d  
Epoch = 228.8007 [0.0097] BKJD  
 $R_p/R^*$  = 0.0182 [0.0156]  
 $a/R^*$  = 200.67 [1010.22]  
 $b$  = 0.86 [1.53]  
 $\text{Seff}$  = 79.46 [47.45]  
 $T_{\text{eq}}$  = 761 [114] K  
 $R_p$  = 7.37 [6.92]  $R_e$   
 $a$  = 0.5622 [0.2068] AU  
 $A_g$  = 653.76 [1199.63] [0.54 $\sigma$ ]  
 $T_{\text{eff}}$  = 5952 [2592] K [2.00 $\sigma$ ]

## DV Diagnostic Results:

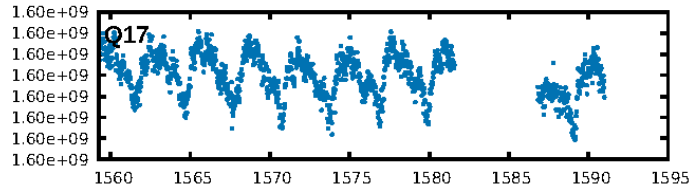
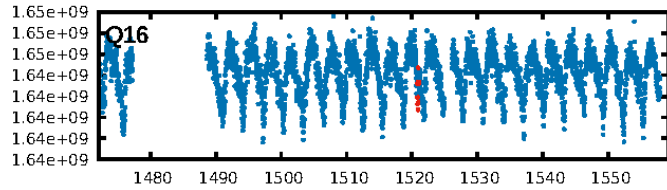
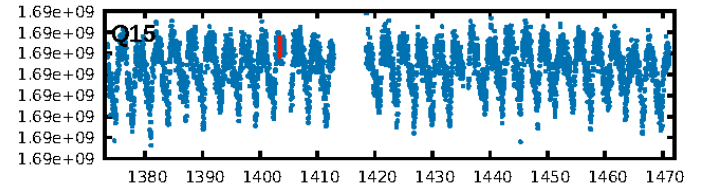
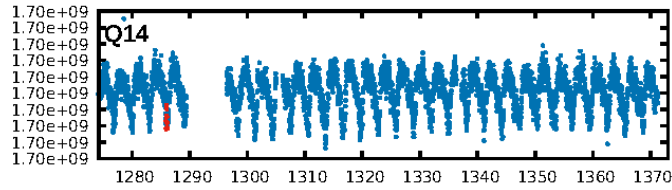
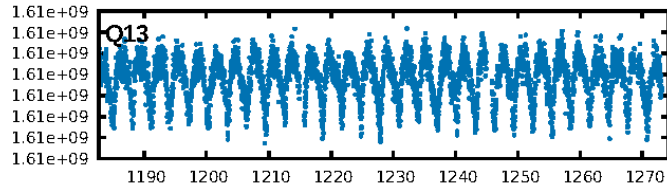
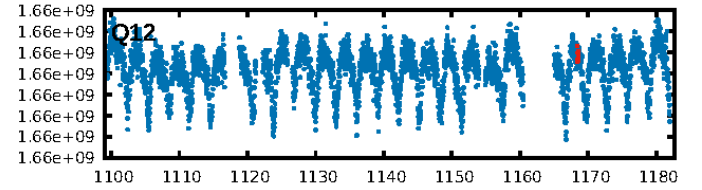
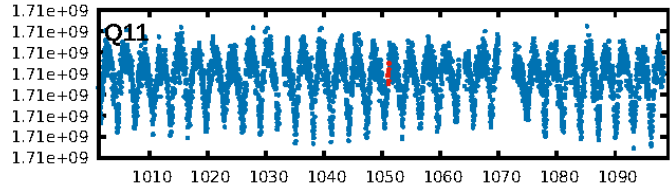
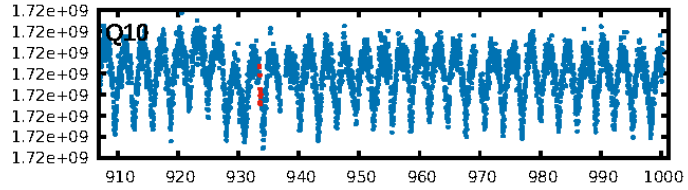
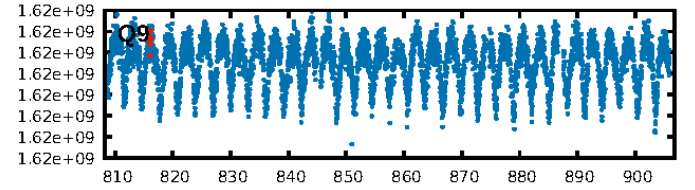
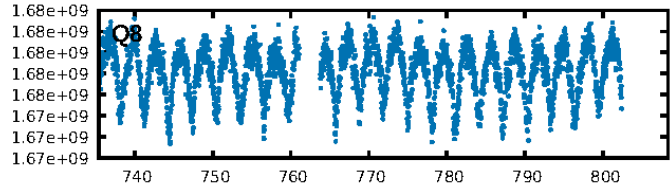
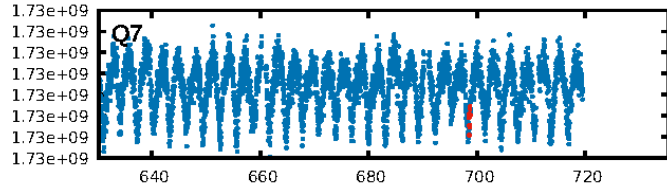
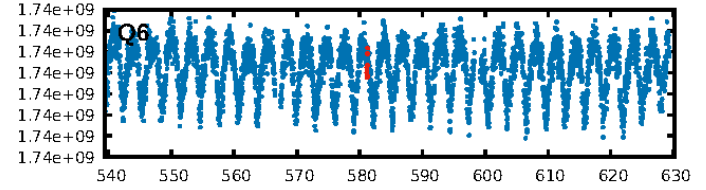
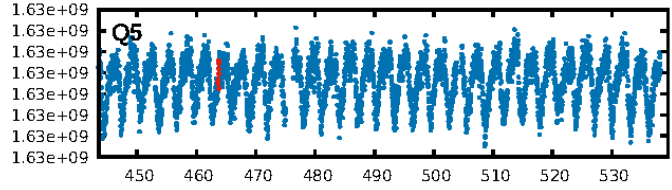
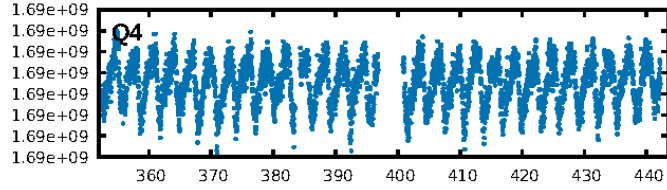
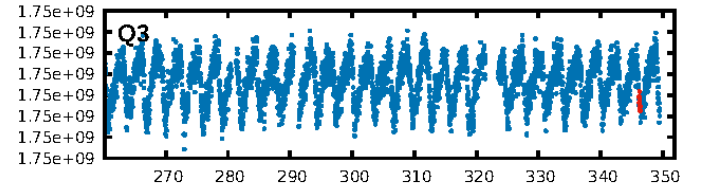
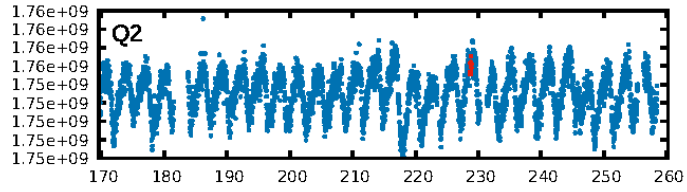
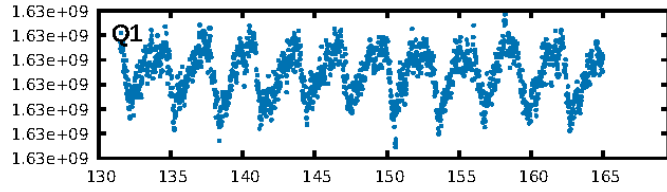
ShortPeriod-sig: 100.0% [38.64 $\sigma$ ]  
LongPeriod-sig: 100.0% [61.56 $\sigma$ ]  
ModelChiSquare2-sig: 10.5%  
ModelChiSquareGof-sig: 97.0%  
**Bootstrap-pfa: 4.28e-09**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.5572**  
Centroid-sig: 86.0%  
Centroid-so: 0.207 arcsec [0.53 $\sigma$ ]  
OotOffset-rm: 1.124 arcsec [0.73 $\sigma$ ]  
OotOffset-st: 3/4/2/2 [11]  
KicOffset-rm: 1.756 arcsec [1.18 $\sigma$ ]  
KicOffset-st: 3/4/2/2 [11]  
DiffImageQuality-fgm: 0.27 [3/11]  
DiffImageOverlap-fno: 0.25 [3/12]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:38:12 Z

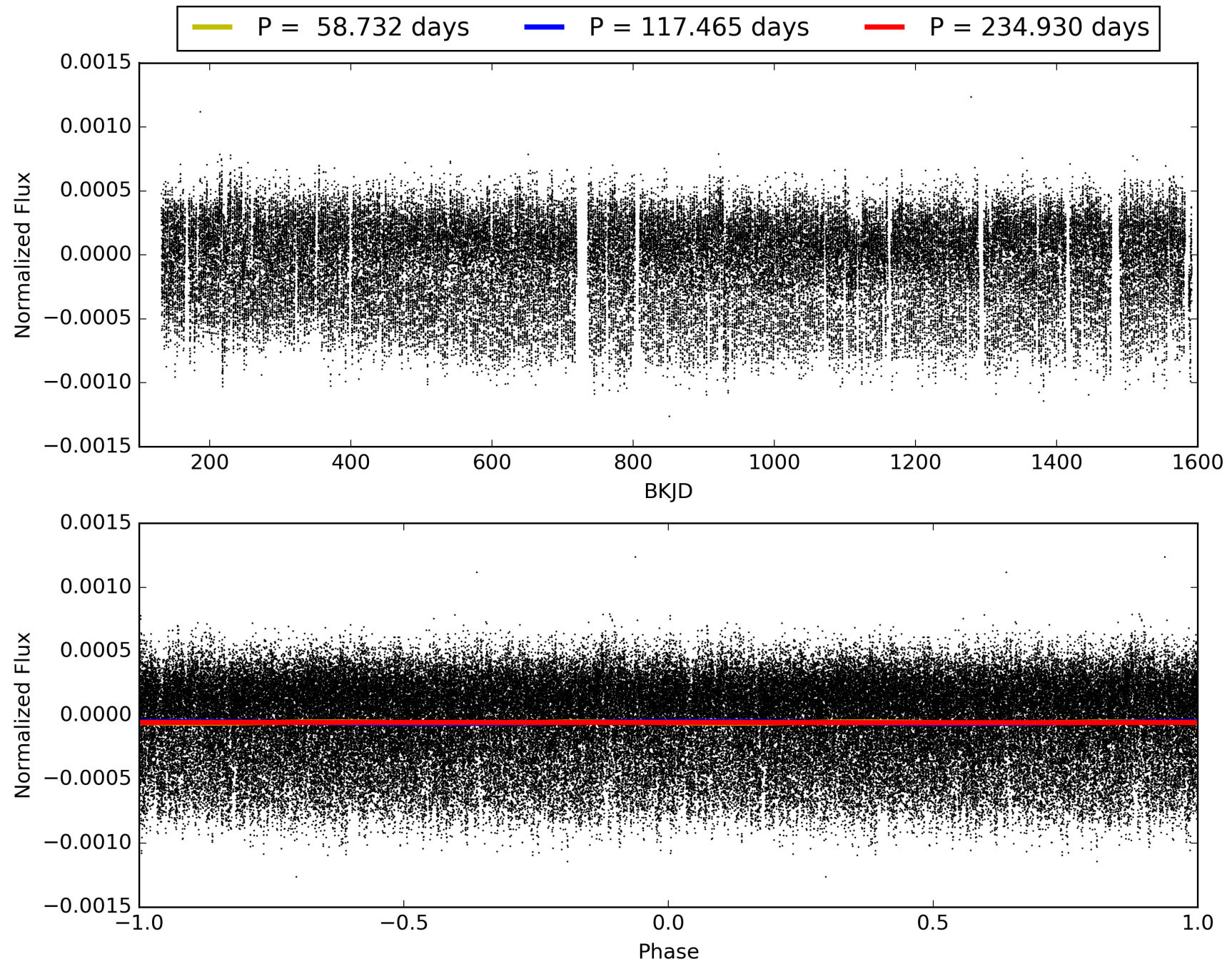
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



## TCE 010904343-05, PDC Light Curves

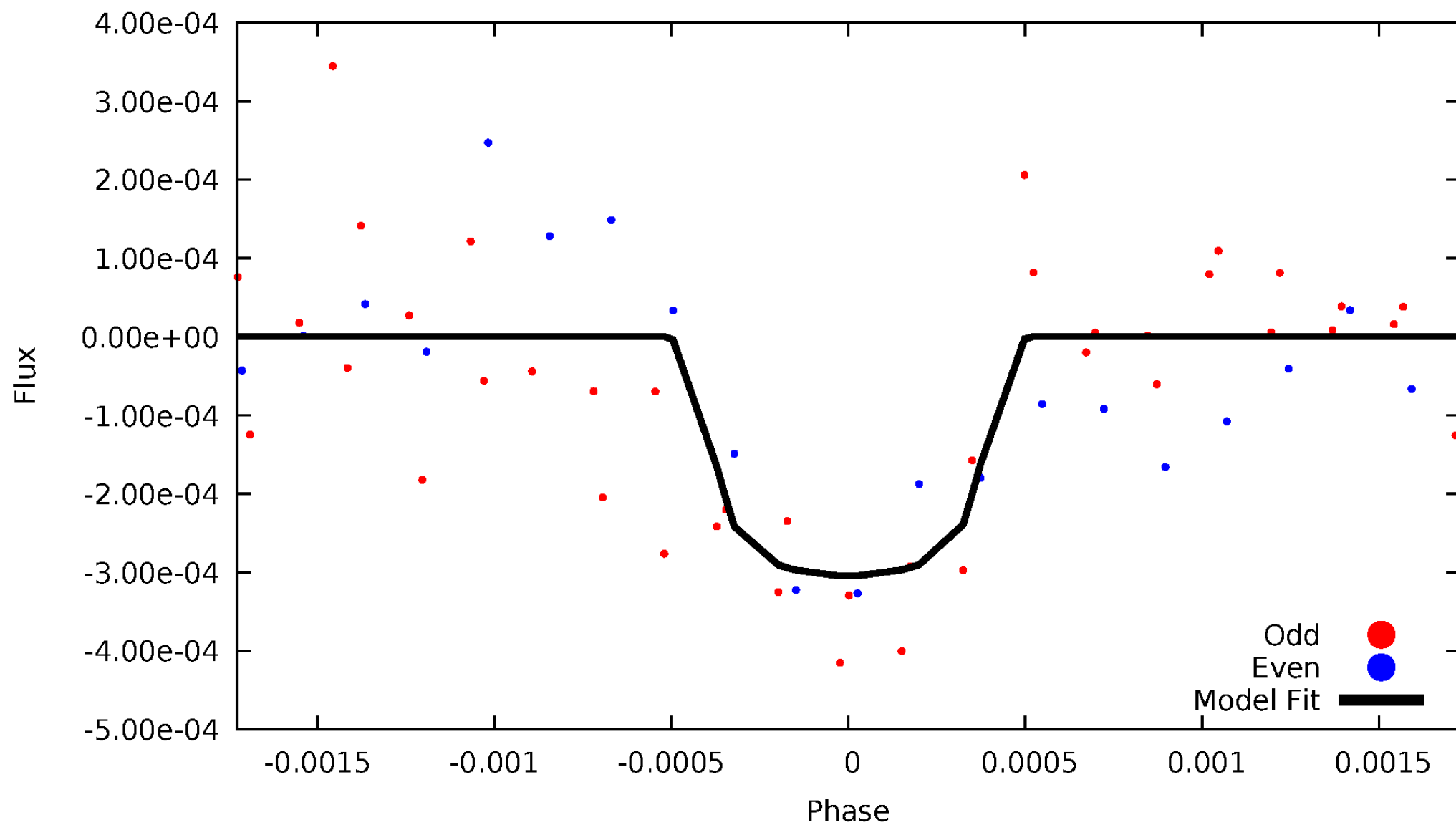


TCE 010904343-05



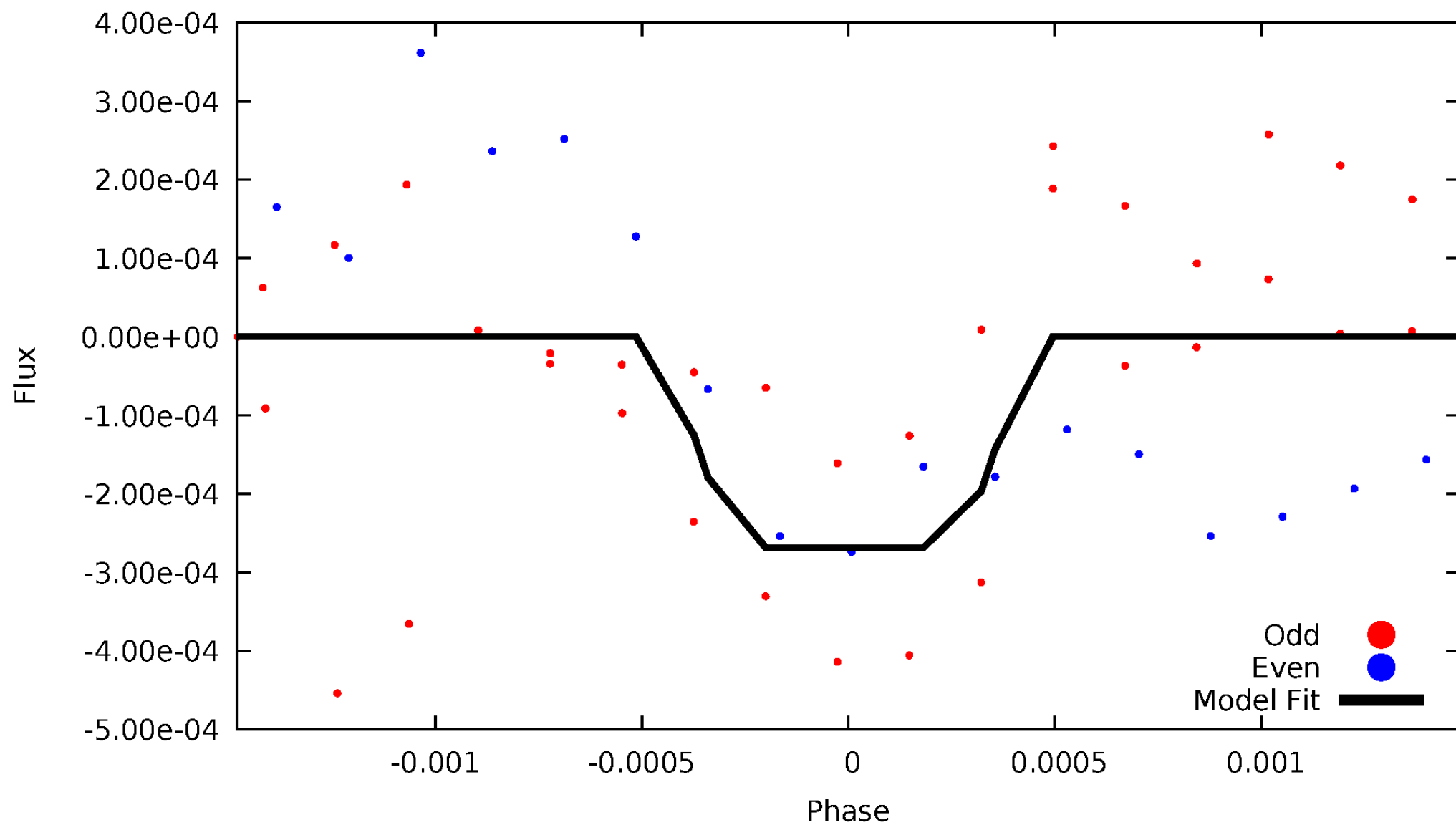
# DV Odd/Even

TCE 010904343-05



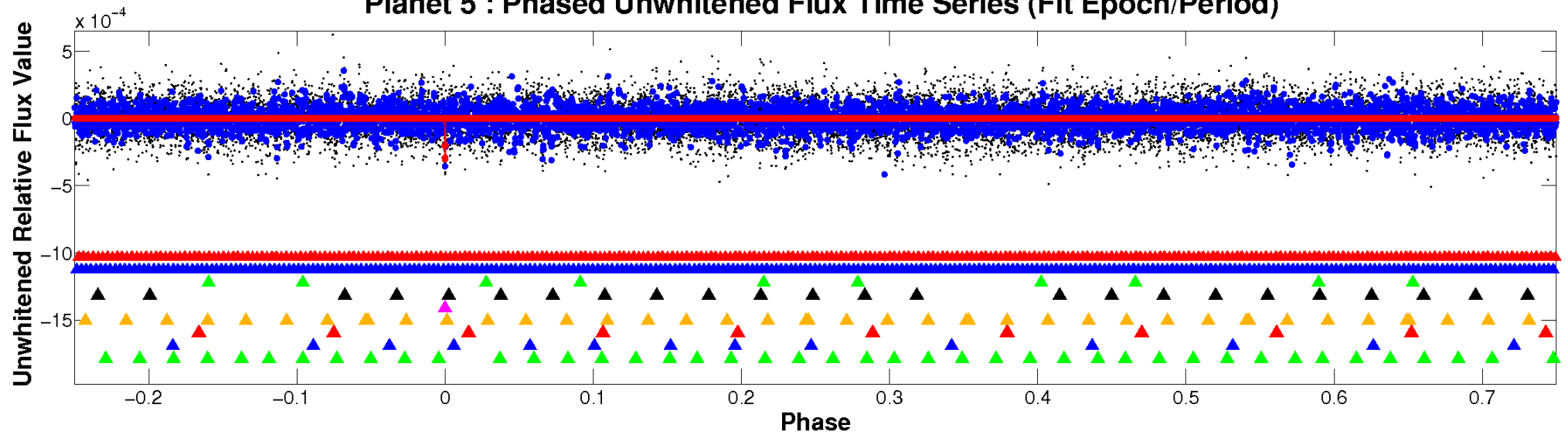
# ALT Odd/Even

TCE 010904343-05

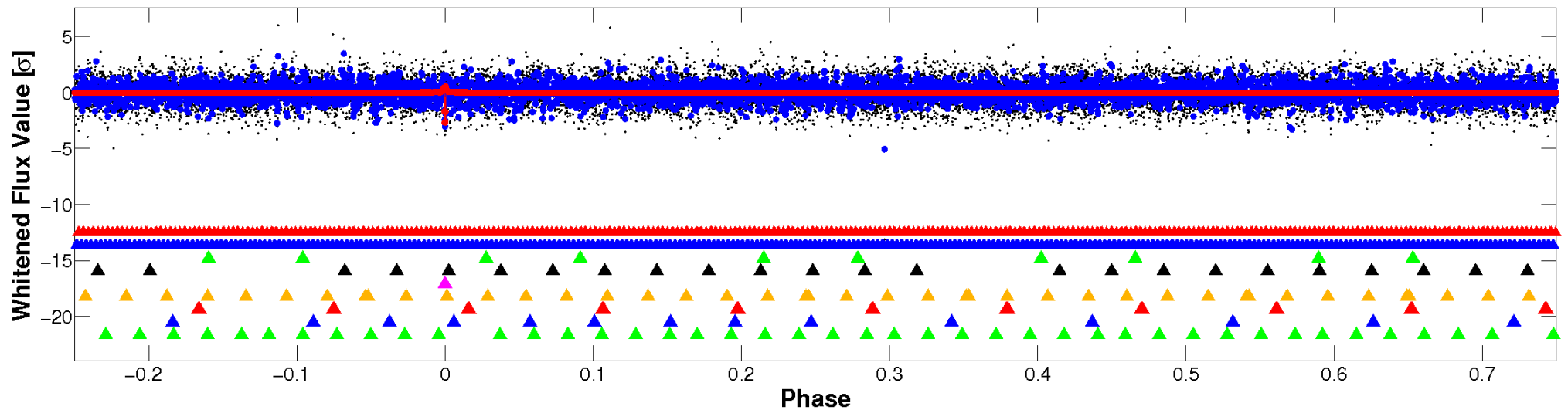


# Non-Whitened Vs. Whitened Light Curve

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

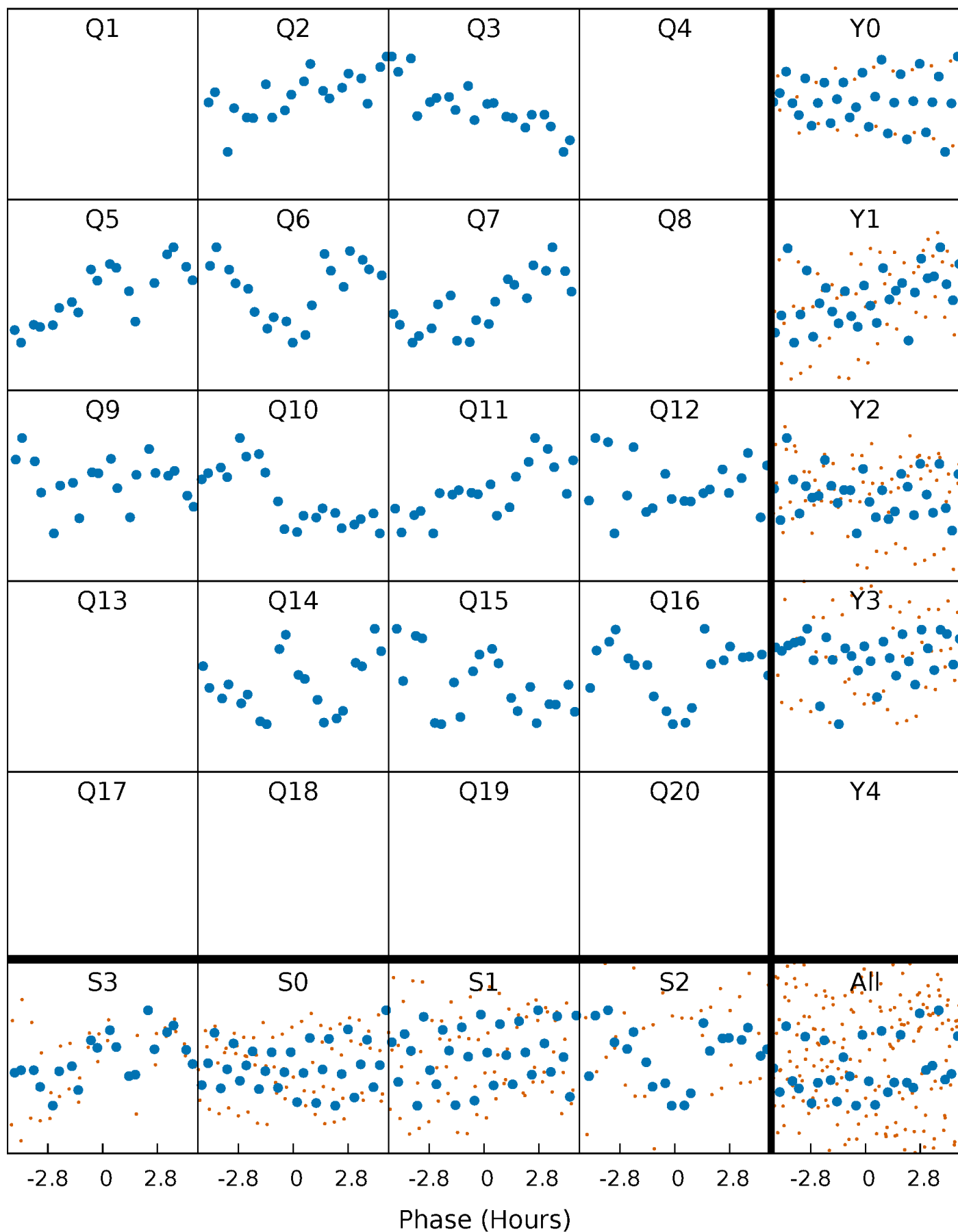


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

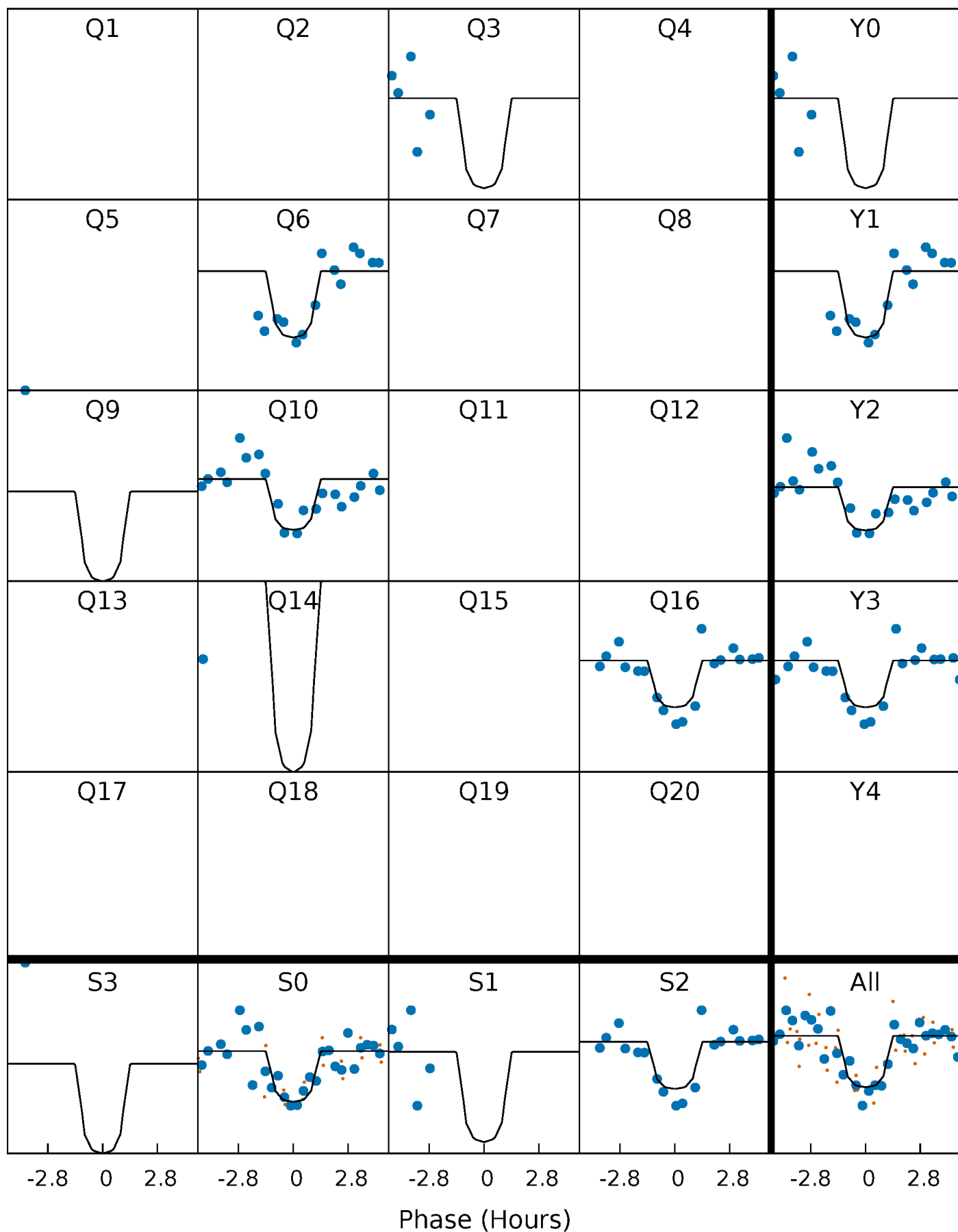
TCE 010904343-05     $P=117.464997$  Days     $T_0=228.800718$  (BKJD)





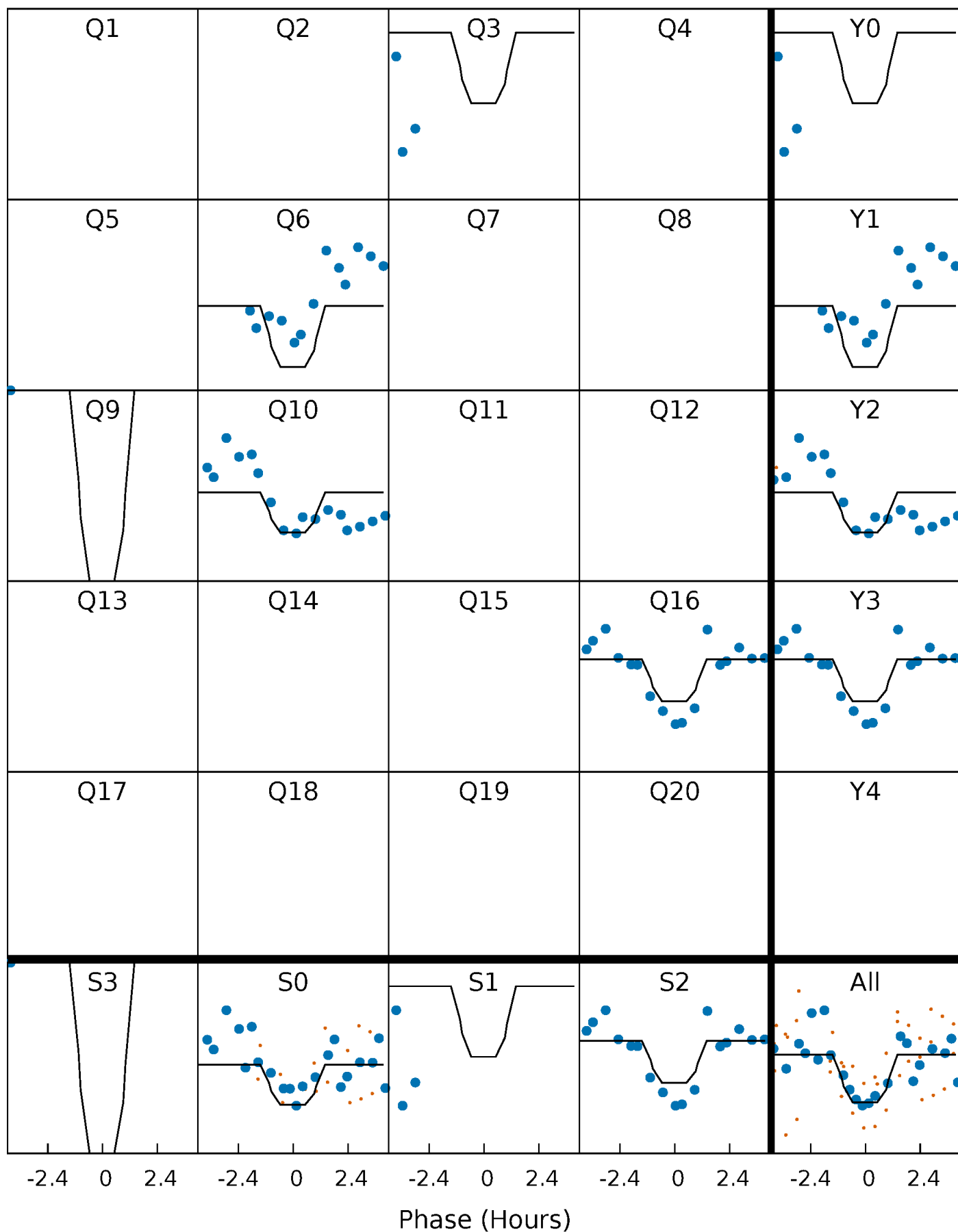
# DV Quarter-Phased Transit Curves

TCE 010904343-05     $P=117.464997$  Days     $T_0=228.800718$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

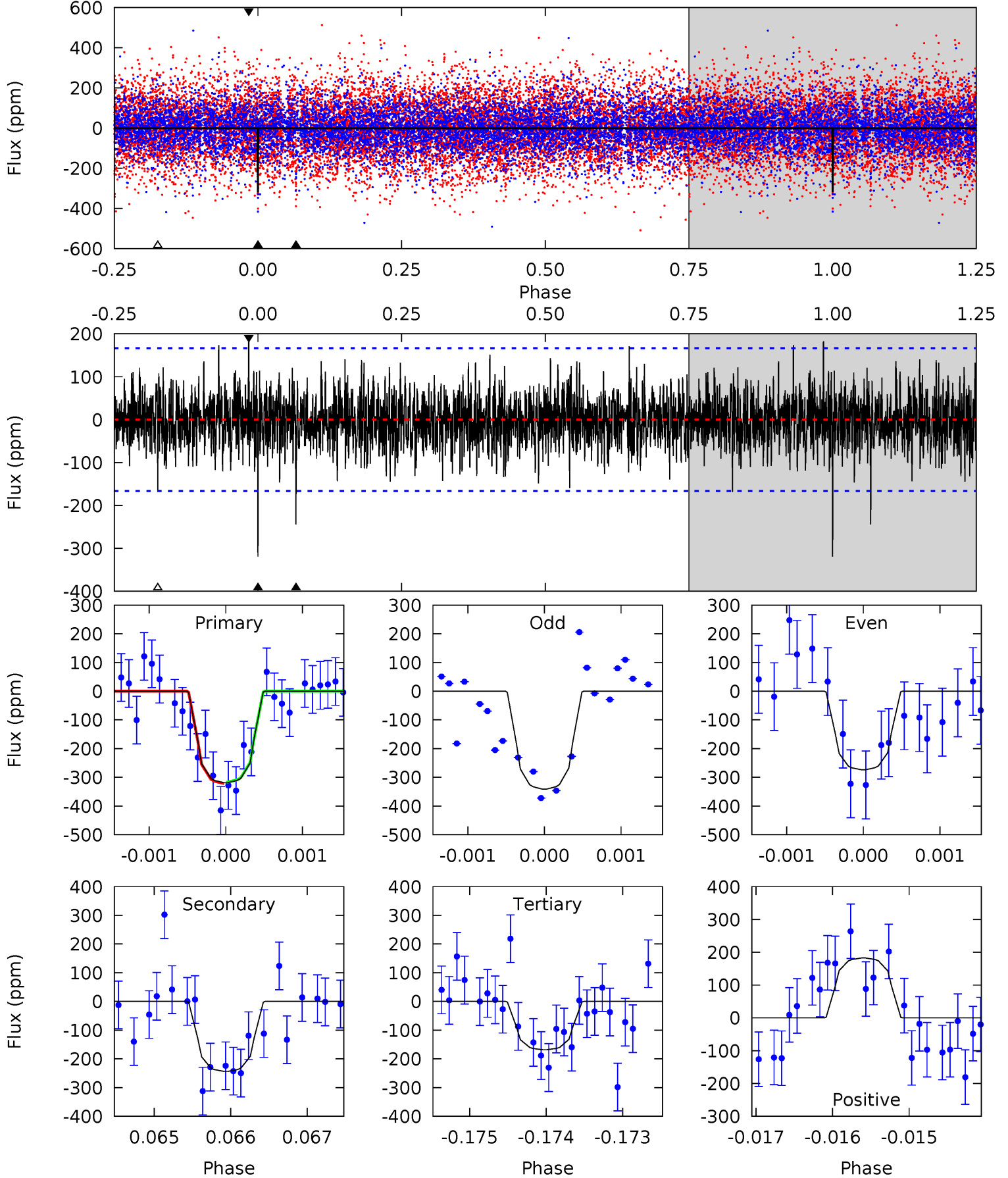
TCE 010904343-05 P=117.464630 Days  $T_0=228.805074$  (BKJD)



# DV Model-Shift Uniqueness Test

010904343-05, P = 117.464997 Days, E = 111.335721 Days

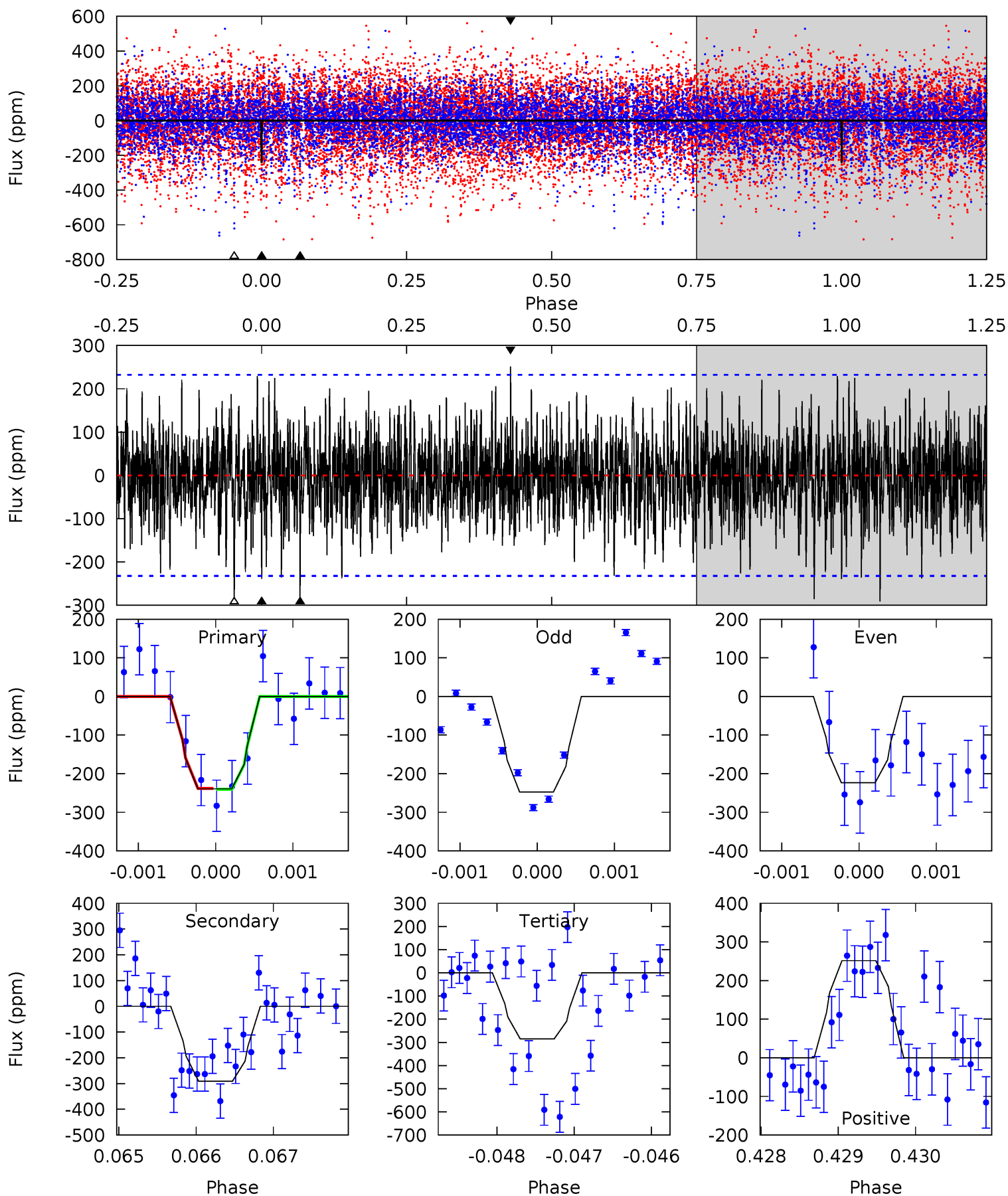
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	7.98	5.51	5.98	5.45	3.29	1.55	4.94	4.47	2.47	2.00	1.02	1.10	0.36	0.08



# Alt Model-Shift Uniqueness Test

010904343-05, P = 117.464630 Days, E = 111.340444 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.64	6.87	6.73	5.94	5.48	3.33	1.71	-1.09	-0.29	0.13	0.93	0.27	1.07	0.46	0.03



### Stellar Parameters For KIC 010904343

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6714^{+168}_{-185}$	$3.533^{+0.344}_{-0.086}$	$-0.280^{+0.350}_{-0.250}$	$3.714^{+0.357}_{-1.427}$	$1.717^{+0.212}_{-0.345}$	$0.047^{+0.117}_{-0.013}$
	+3%/-3%	+10%/-2%	+125%/-89%	+10%/-38%	+12%/-20%	+247%/-27%
Source	PHO1	FLK73	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010904343-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-244 \pm 31$	$7.82^{+5.98}_{-4.81}$	$1047^{+55}_{-89}$	$5799^{+4333}_{-1219}$	$677^{+3736}_{-451}$
Alt.	$-291 \pm 42$	$7.48^{+5.61}_{-4.37}$	$1052^{+51}_{-84}$	$6267^{+4540}_{-1436}$	$922^{+4600}_{-636}$

$T_{max}$  = 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

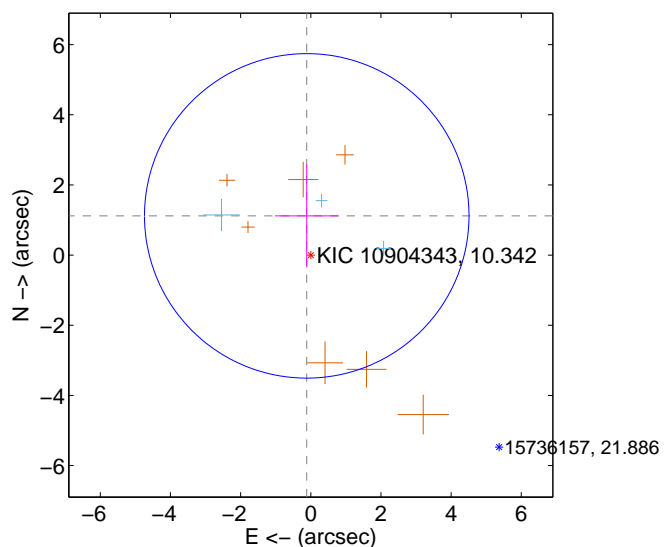
Supplemental centroid analysis for 010904343-05. **Kepler magnitude: 10.34.** Transit SNR 9.02

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

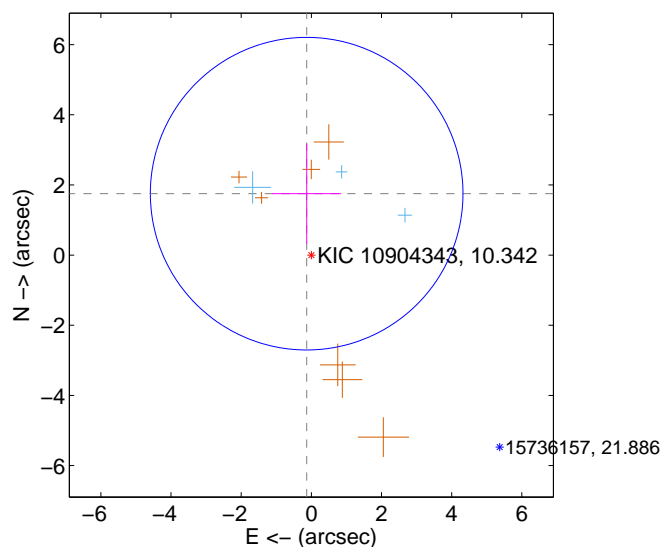
The direct PRF centroid is offset from the target star catalog position by about 0.91 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.124 \pm 1.542$	0.73	$0.115 \pm 0.904$	$1.118 \pm 1.467$
PRF-fit source offset from KIC position	$1.756 \pm 1.485$	1.18	$0.133 \pm 0.981$	$1.751 \pm 1.424$
photometric centroid source offset	$0.21 \pm 0.39$	0.53	$-0.17 \pm 0.42$	$0.12 \pm 0.35$

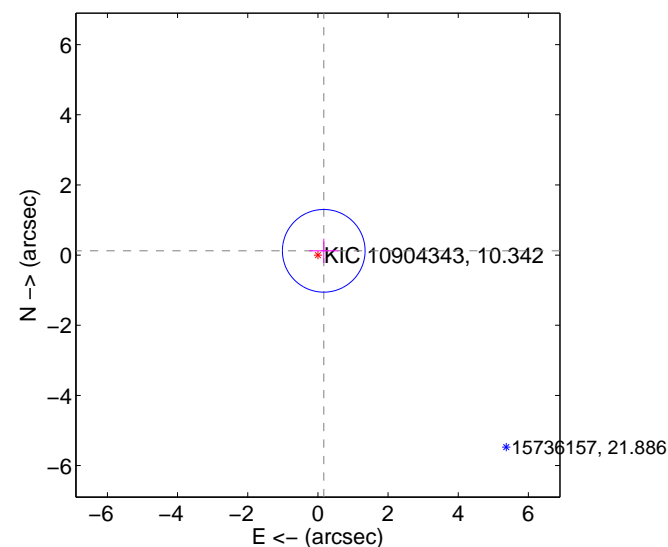
offset from difference PRF-fit to OOT PRF-fit



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.

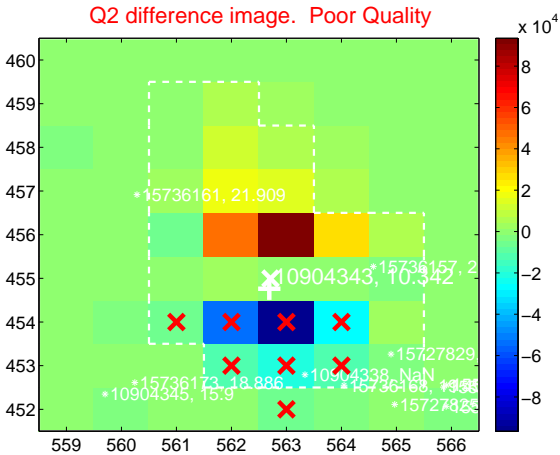
Q1 no difference image



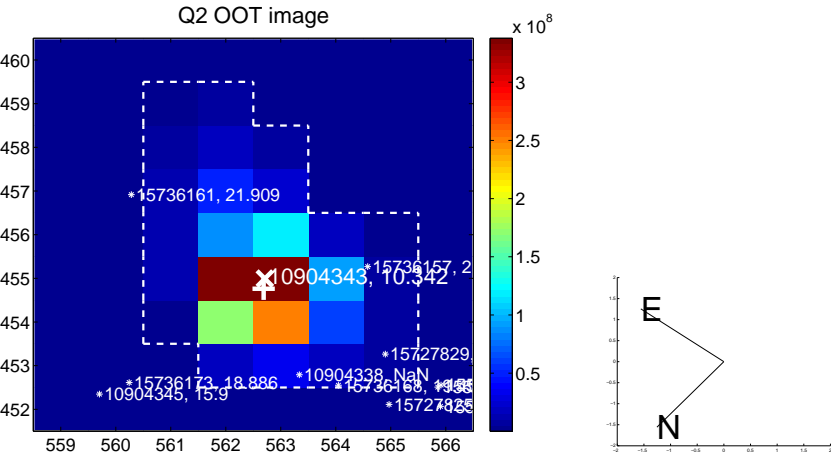
Q1 no OOT image



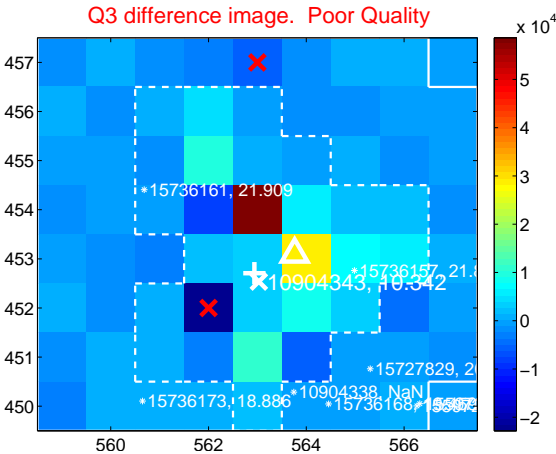
Q2 difference image. Poor Quality



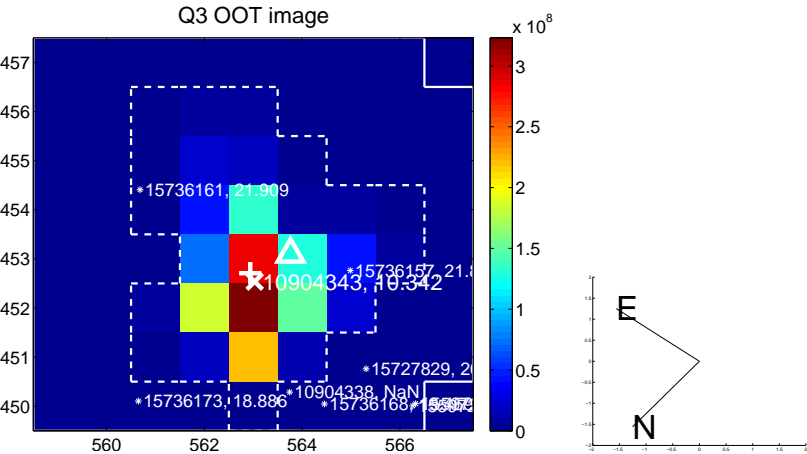
Q2 OOT image



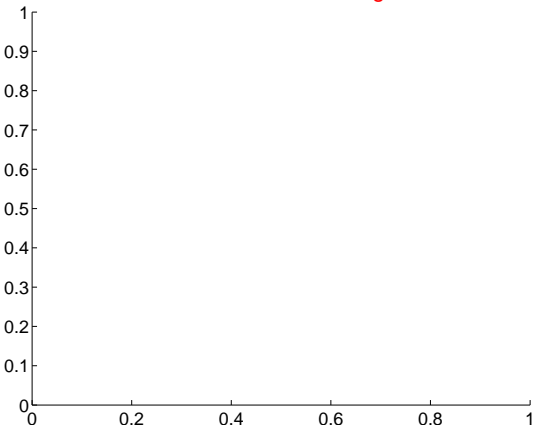
Q3 difference image. Poor Quality



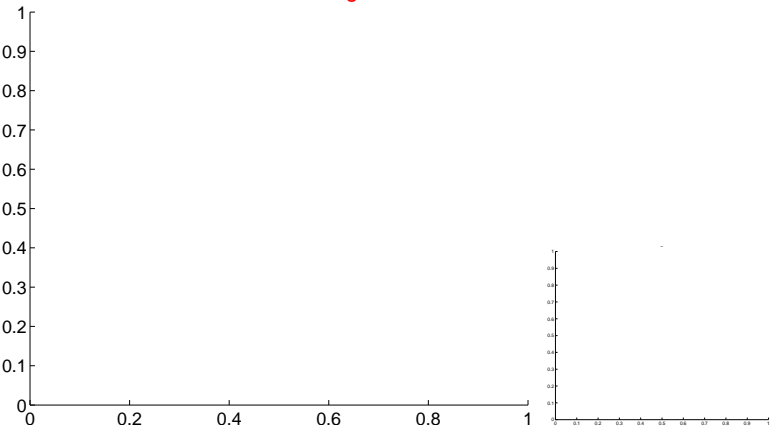
Q3 OOT image



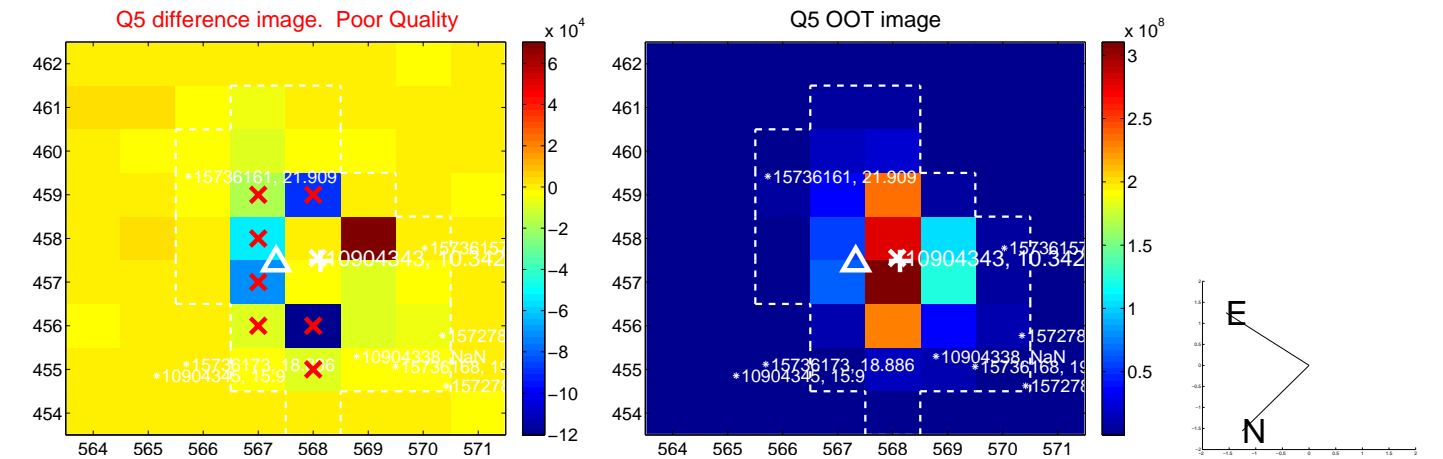
Q4 no difference image



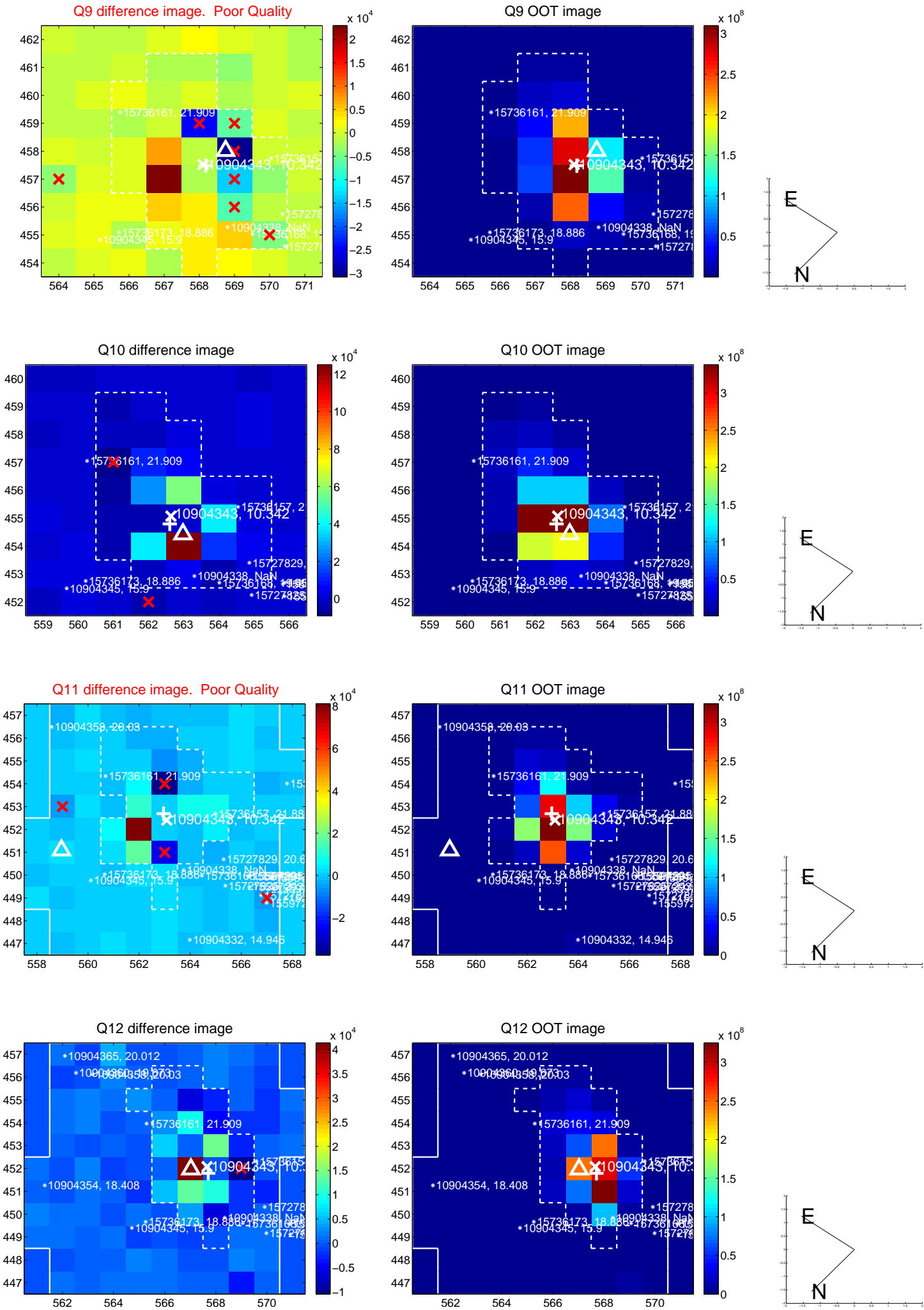
Q4 no OOT image



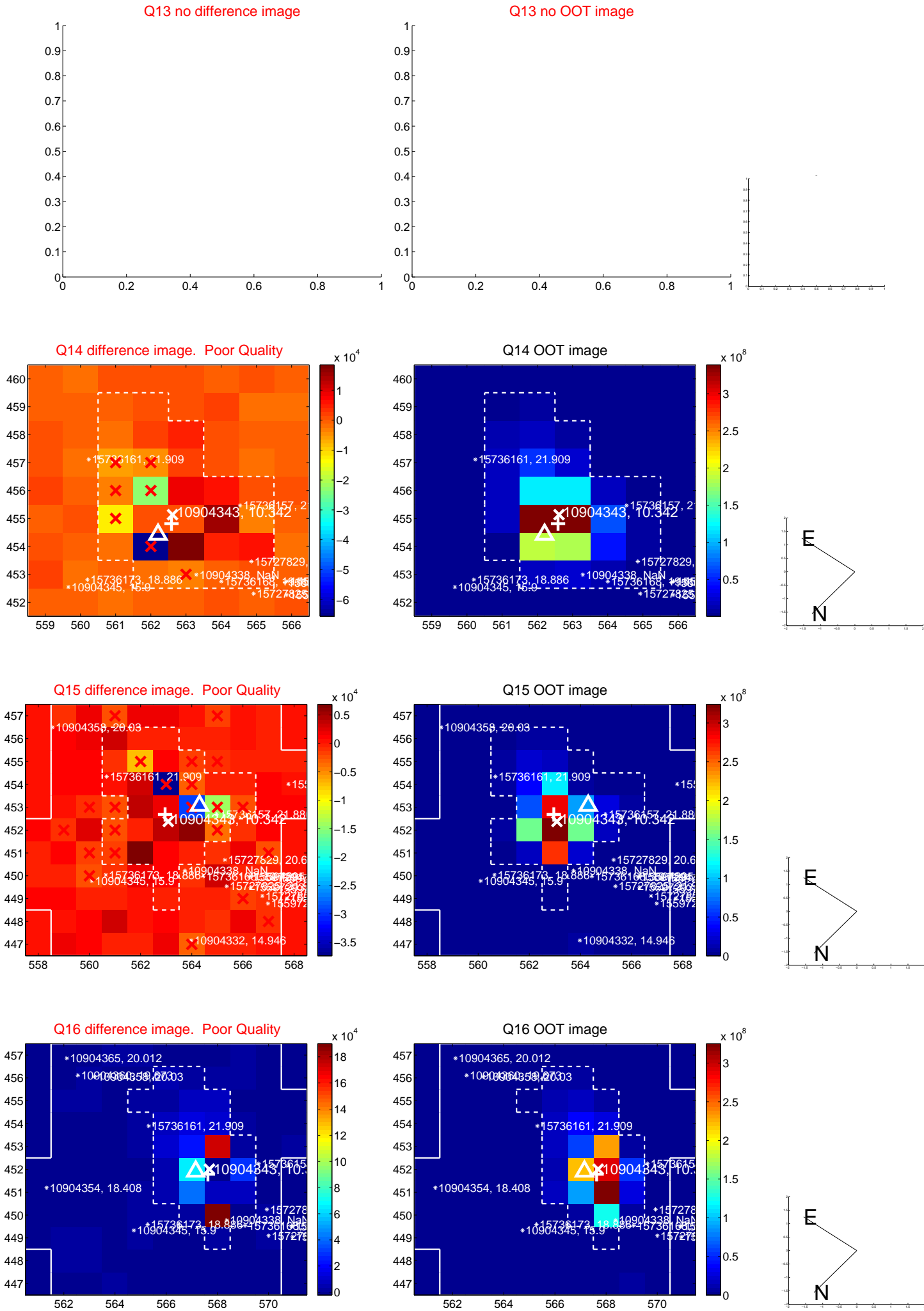
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



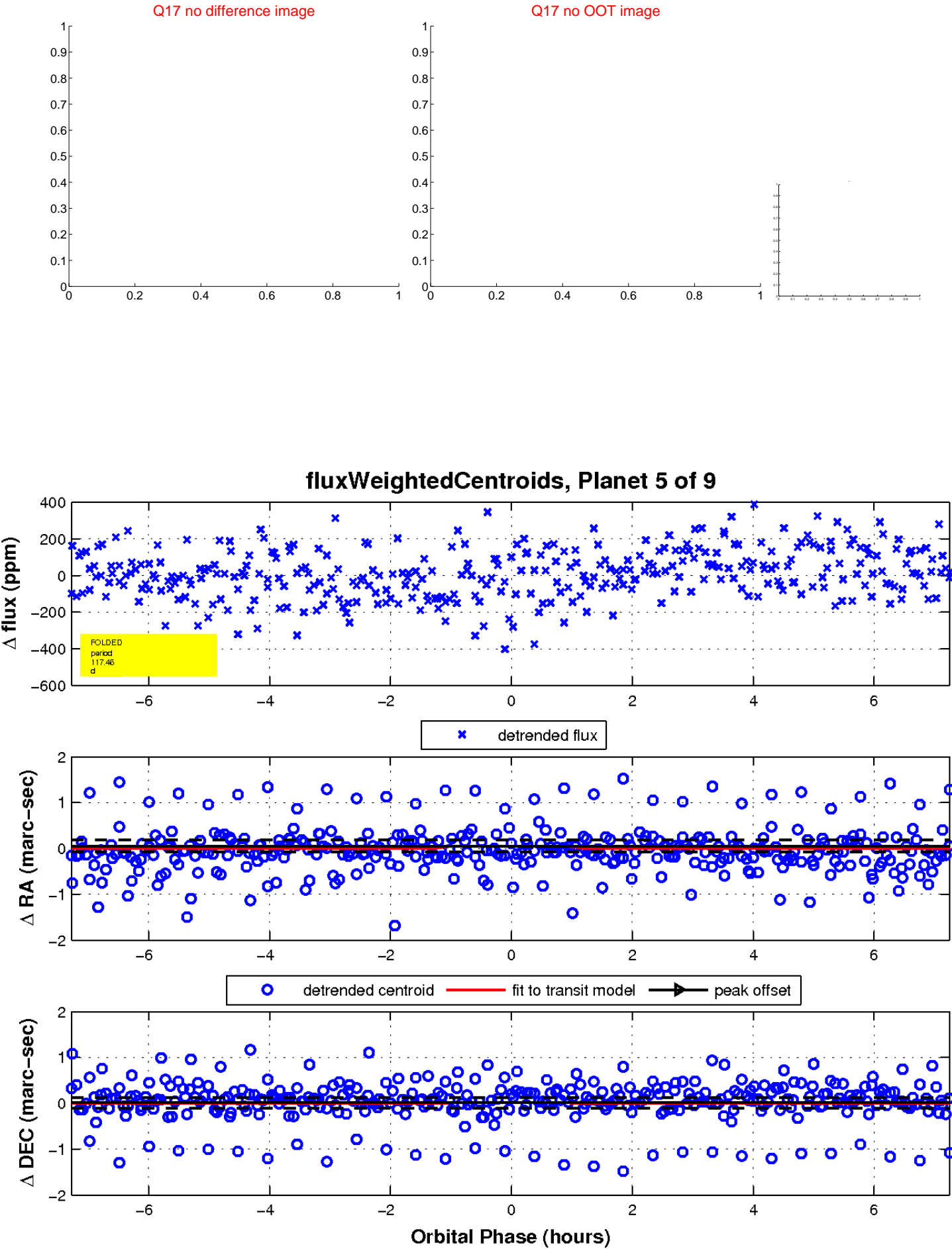
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

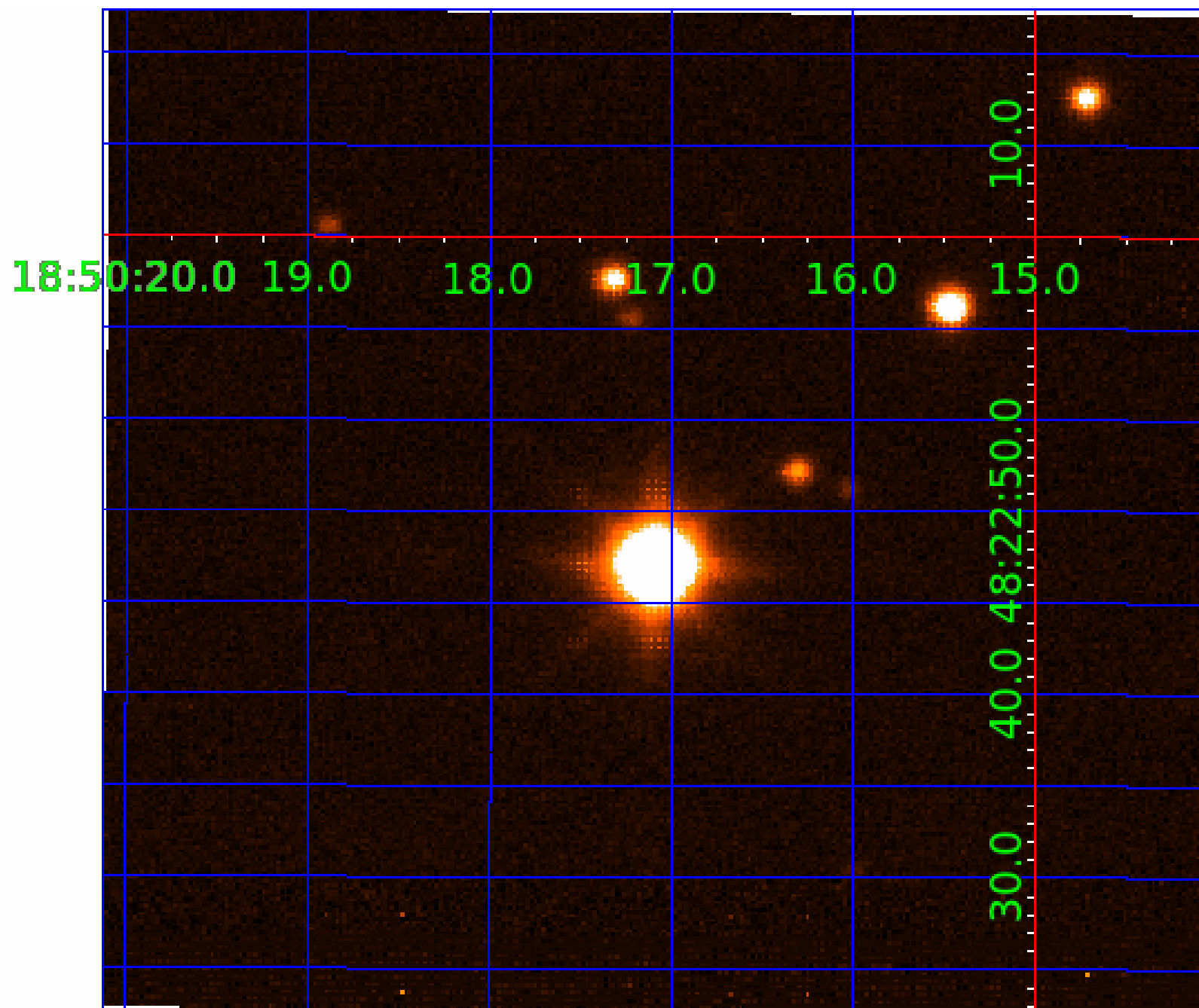


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010904343

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010904343-01	OBS	No	3.061235	132.737615	22.8	8.650	8.8	7.4	3.71	6714	2.00	10284.55
010904343-02	OBS	No	1.530349	132.310781	27.8	6.304	10.4	10.0	3.71	6714	2.71	25921.51
010904343-03	OBS	No	139.464948	217.524278	305.9	8.224	9.9	9.5	3.71	6714	8.43	63.21
010904343-04	OBS	No	60.793603	160.060354	212.8	4.472	8.5	9.2	3.71	6714	6.20	191.24
010904343-05	OBS	No	117.464997	228.800718	304.9	2.434	8.6	9.0	3.71	6714	7.37	79.46
010904343-06	OBS	No	34.916667	152.864357	120.7	2.929	8.1	6.3	3.71	6714	4.77	400.56
010904343-07	OBS	No	42.718363	155.839959	157.5	4.114	7.5	8.1	3.71	6714	5.36	306.12
010904343-08	OBS	No	106.321866	134.323578	151.5	6.479	7.6	6.4	3.71	6714	5.19	90.76
010904343-09	OBS	No	33.945926	146.949011	64.7	6.114	7.5	4.0	3.71	6714	3.37	415.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010904343-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
010904343-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010904343-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-09	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

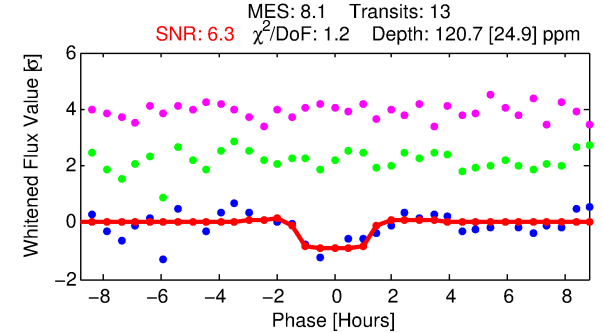
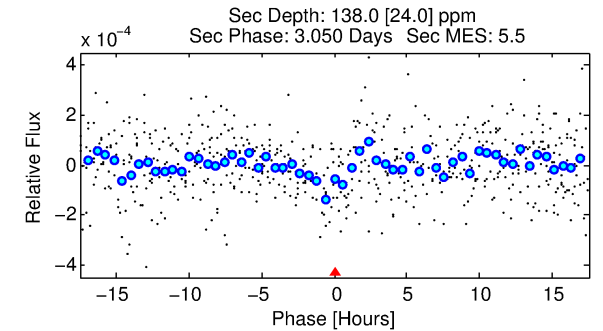
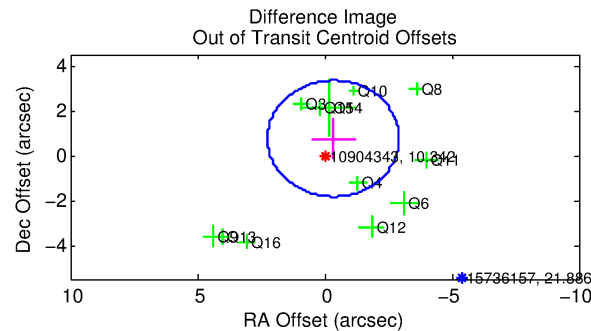
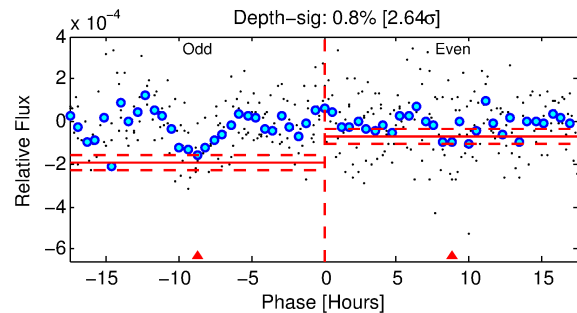
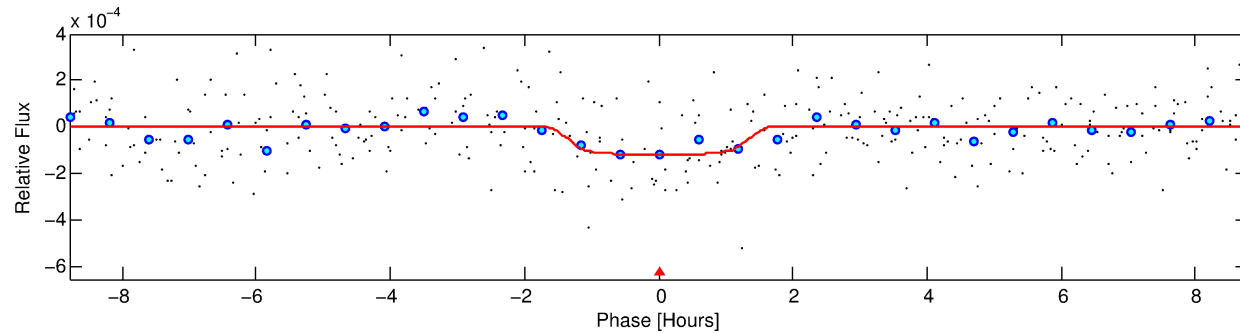
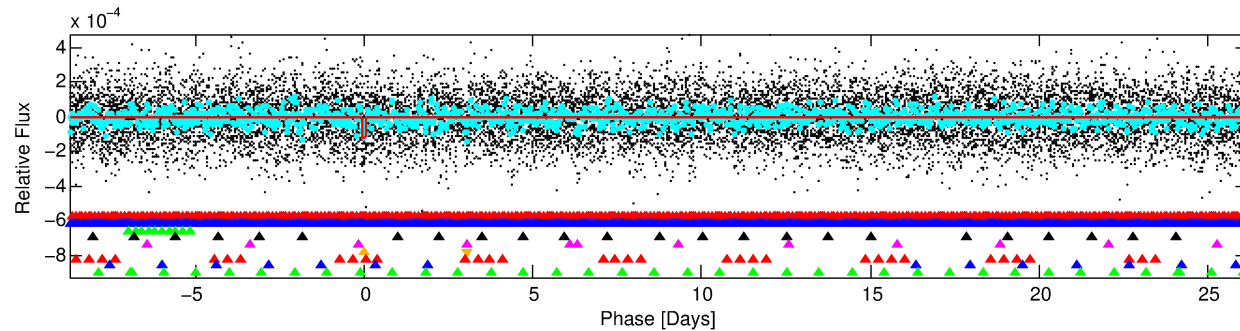
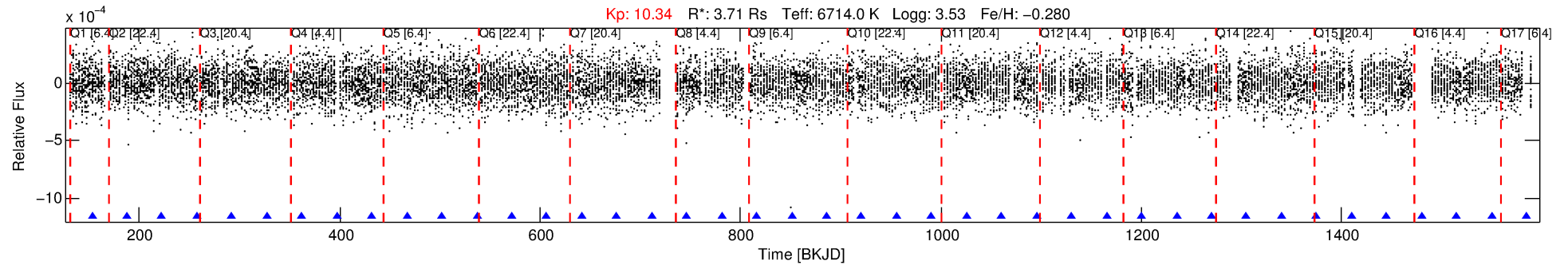
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010904343-06

No Significant Match Found

# DV One-Page Summary

KIC: 10904343 Candidate: 6 of 9 Period: 34.917 d



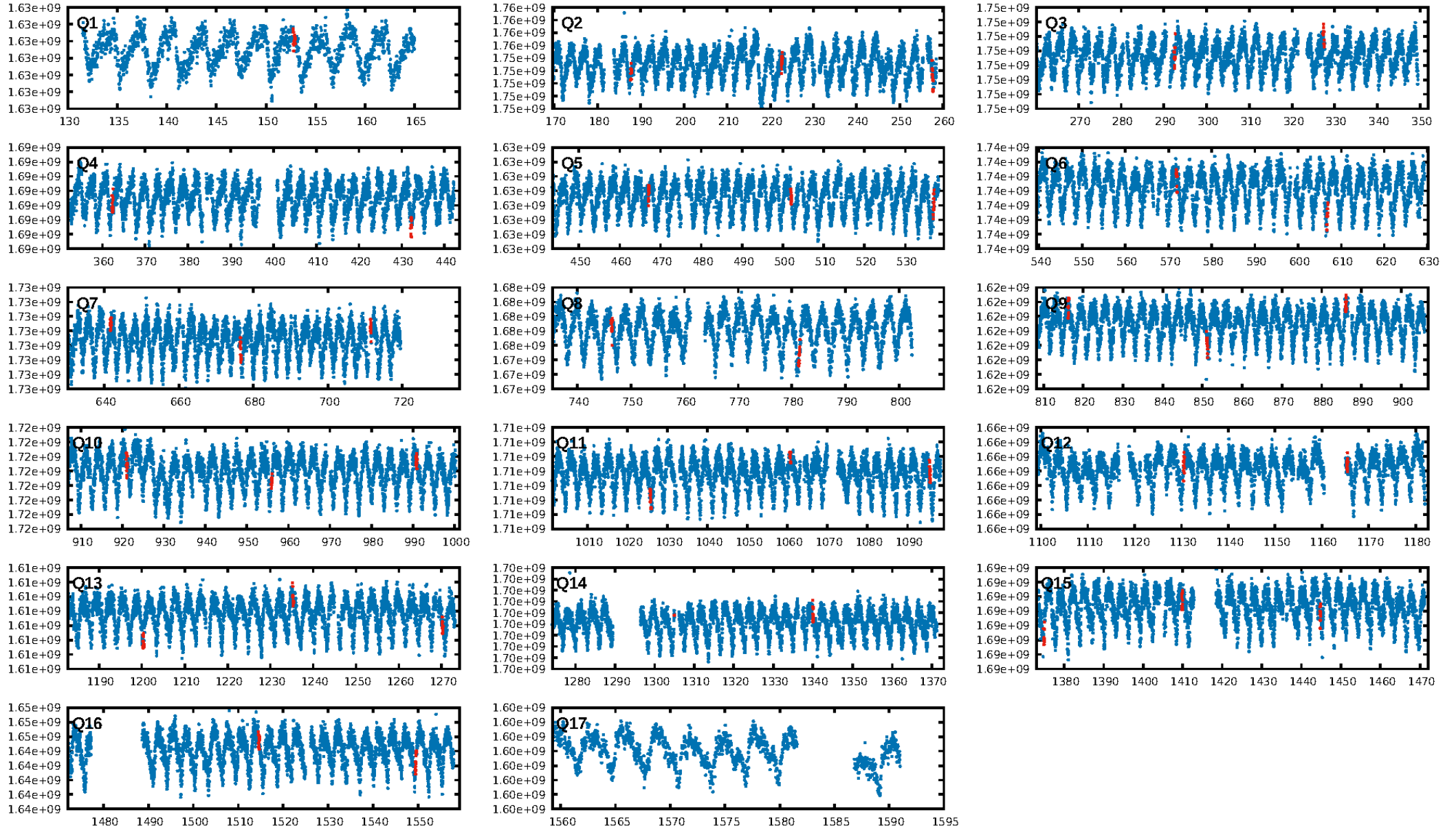
## DV Fit Results:

Period = 34.91667 [0.00048] d  
Epoch = 152.8644 [0.0099] BKJD  
Rp/R\* = 0.0118 [0.0104]  
a/R\* = 41.12 [216.89]  
b = 0.91 [1.06]  
Seff = 400.56 [239.20]  
Teq = 1141 [170] K  
Rp = 4.77 [4.61] Re  
a = 0.2504 [0.0921] AU  
Ag = 208.96 [391.44] [0.53 $\sigma$ ]  
Teffp = 6706 [2988] K [1.86 $\sigma$ ]

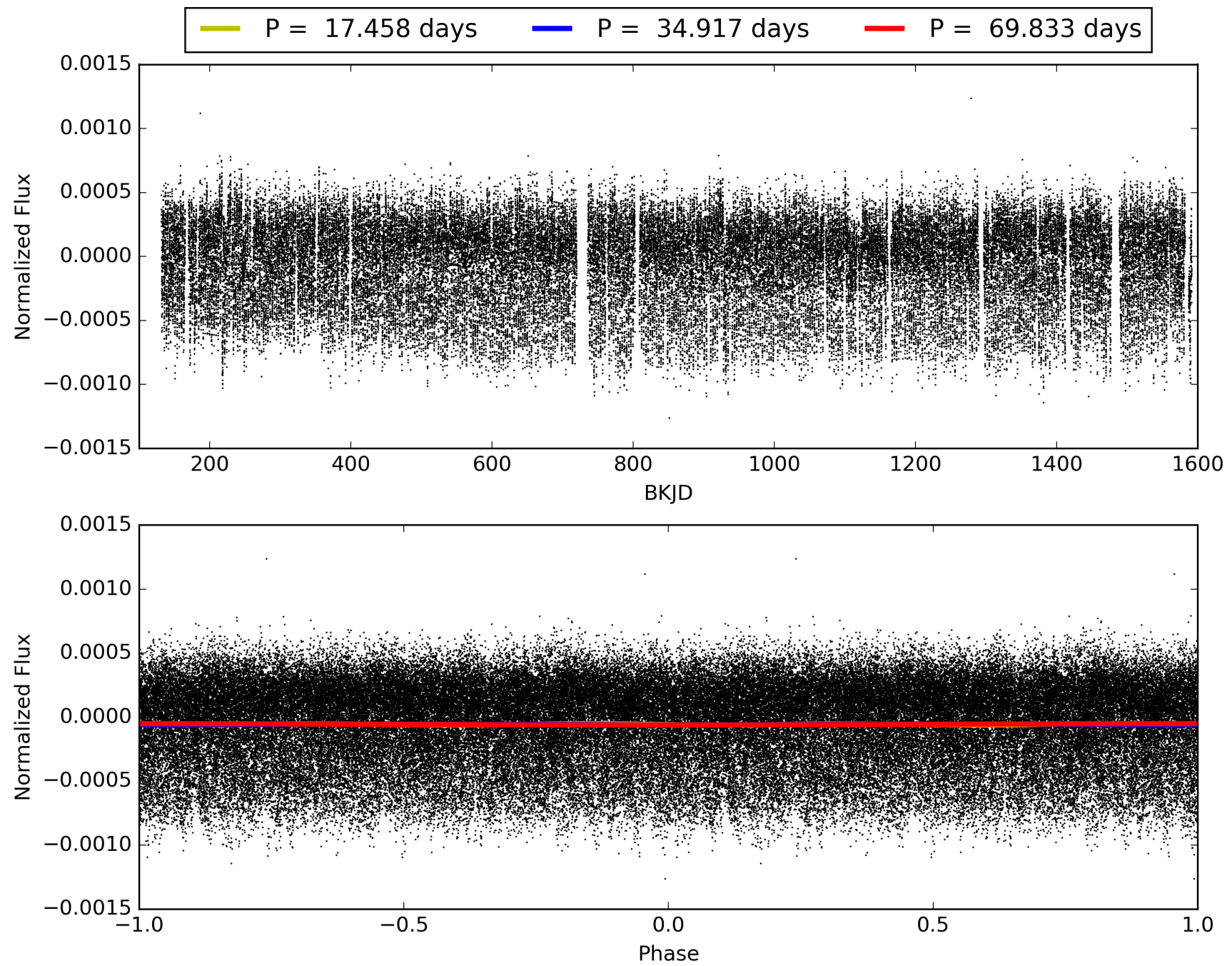
## DV Diagnostic Results:

ShortPeriod-sig: 99.9% [3.44 $\sigma$ ]  
LongPeriod-sig: 100.0% [37.07 $\sigma$ ]  
ModelChiSquare2-sig: 2.0%  
ModelChiSquareGof-sig: 98.1%  
**Bootstrap-pfa: 1.15e-08**  
RollingBand-fgt: 1.00 [12/12]  
GhostDiagnostic-chr: -2.032  
Centroid-sig: 69.1%  
Centroid-so: 0.362 arcsec [0.75 $\sigma$ ]  
OotOffset-rm: 0.822 arcsec [0.95 $\sigma$ ]  
OotOffset-st: 3/3/4/2 [12]  
KicOffset-rm: 0.854 arcsec [0.93 $\sigma$ ]  
KicOffset-st: 3/3/4/2 [12]  
DiffImageQuality-fgm: 0.25 [3/12]  
DiffImageOverlap-fno: 0.50 [8/16]

# TCE 010904343-06, PDC Light Curves

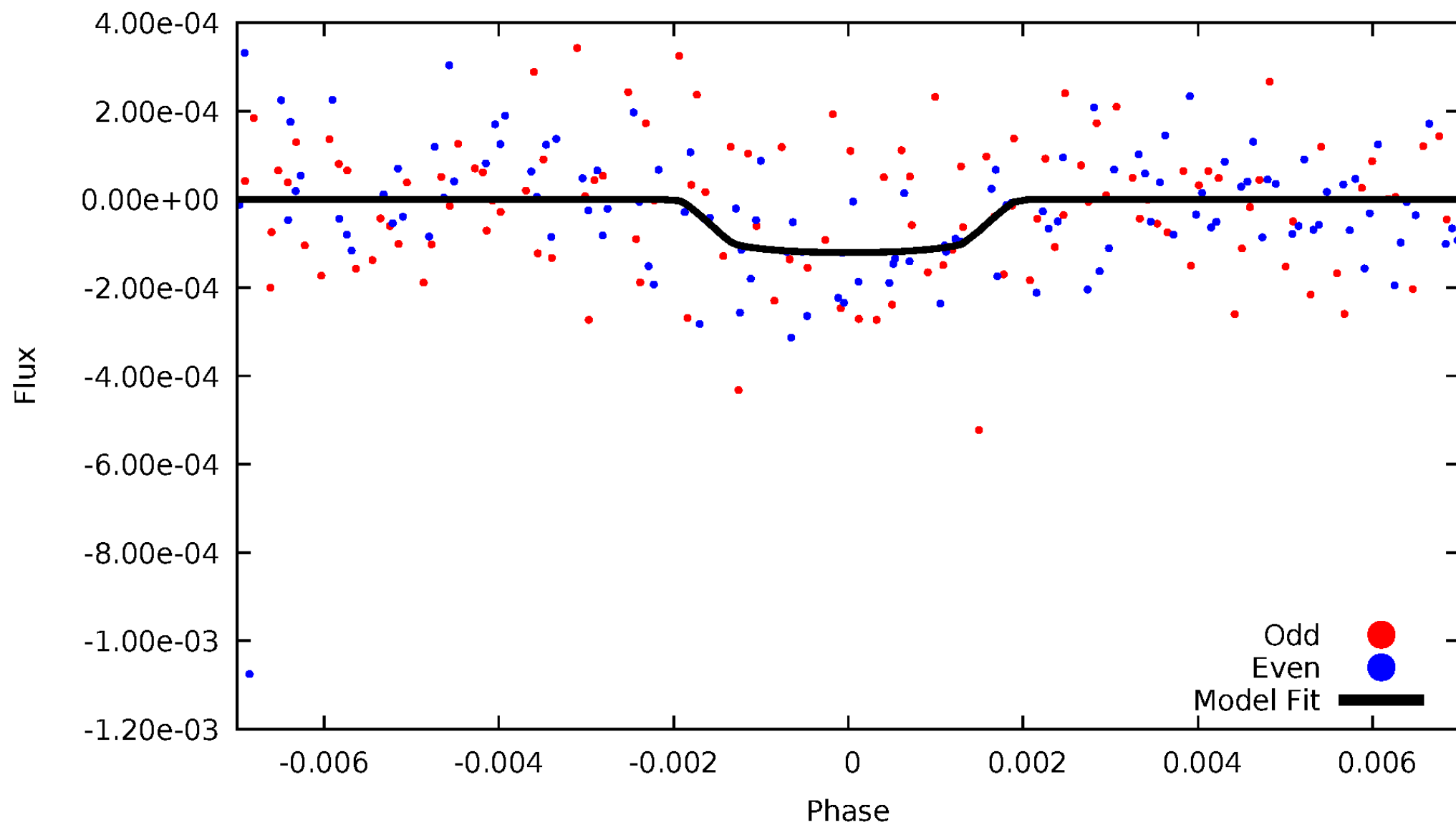


TCE 010904343-06



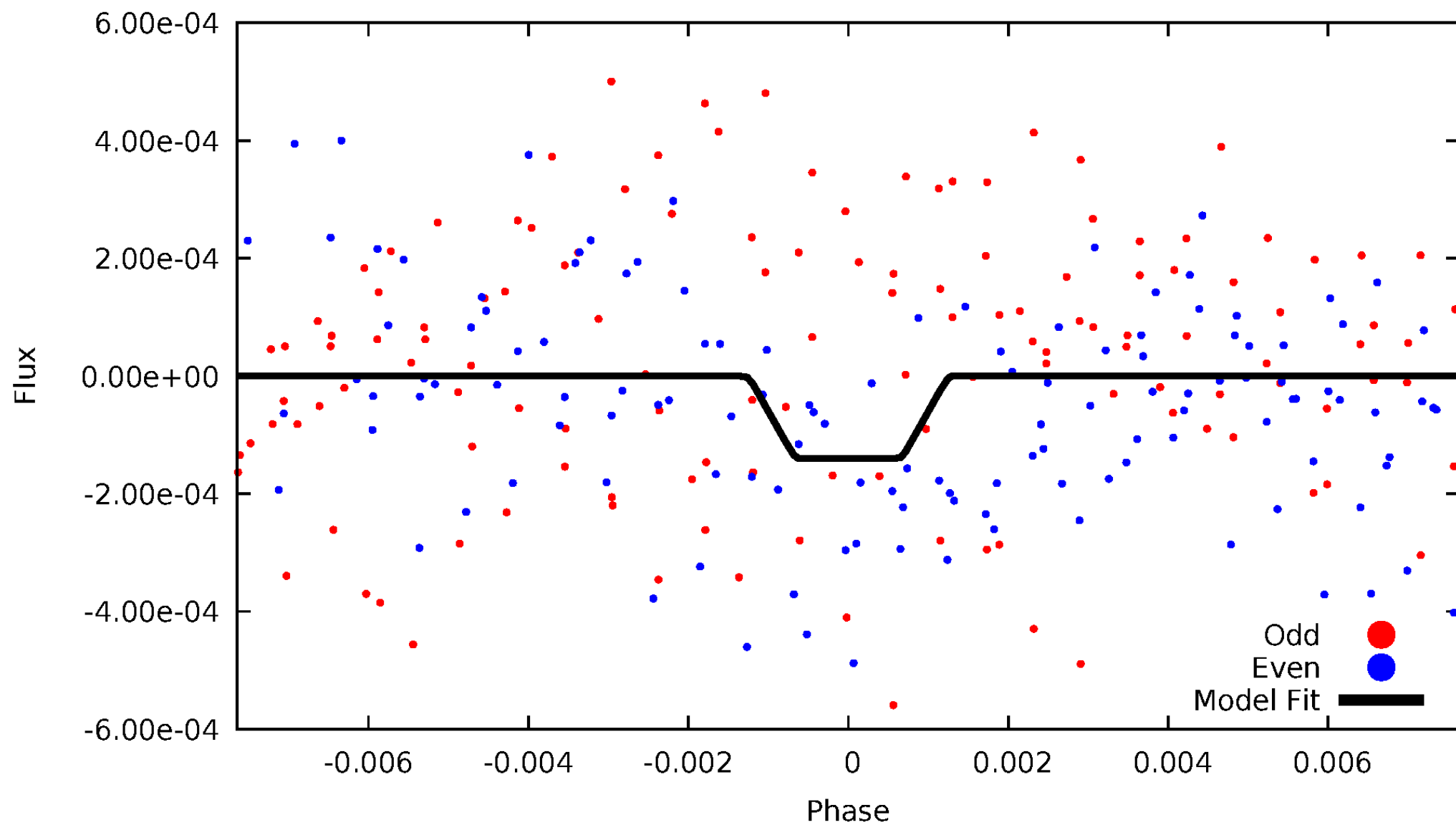
# DV Odd/Even

TCE 010904343-06



# ALT Odd/Even

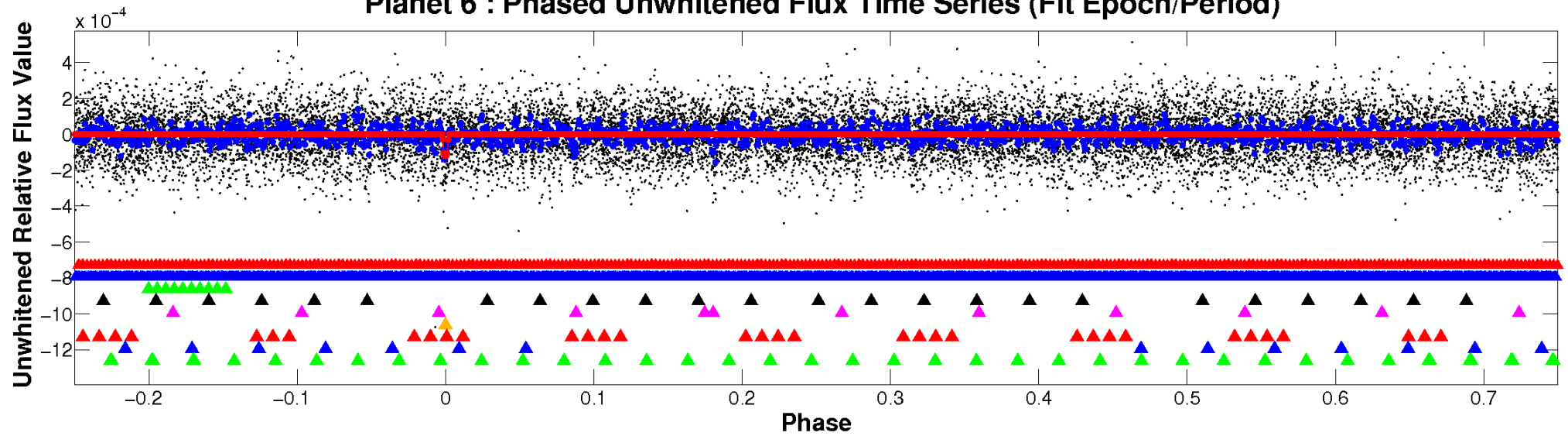
TCE 010904343-06



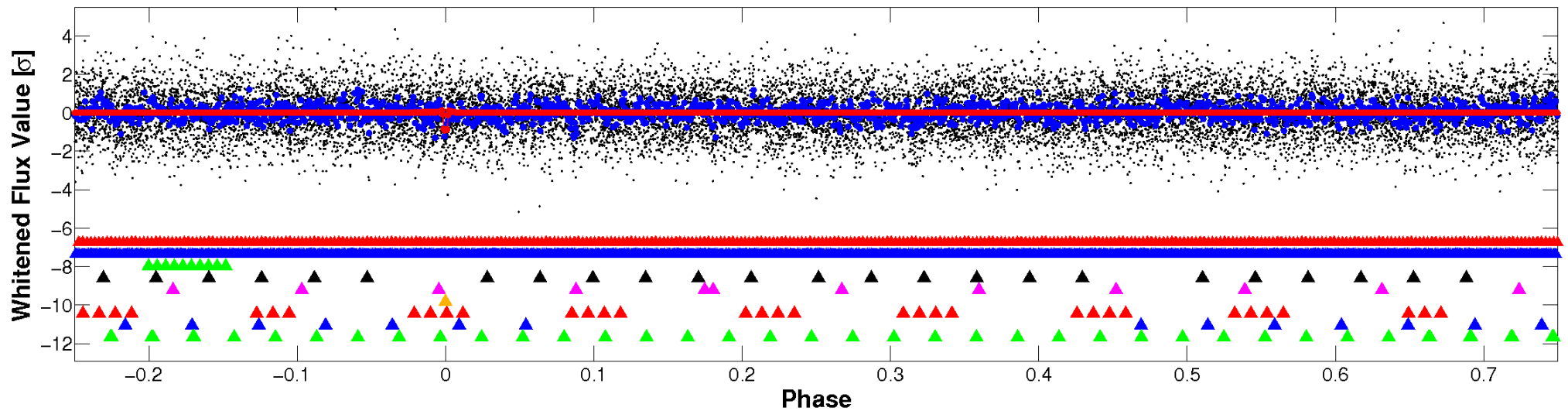


# Non-Whitened Vs. Whitened Light Curve

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

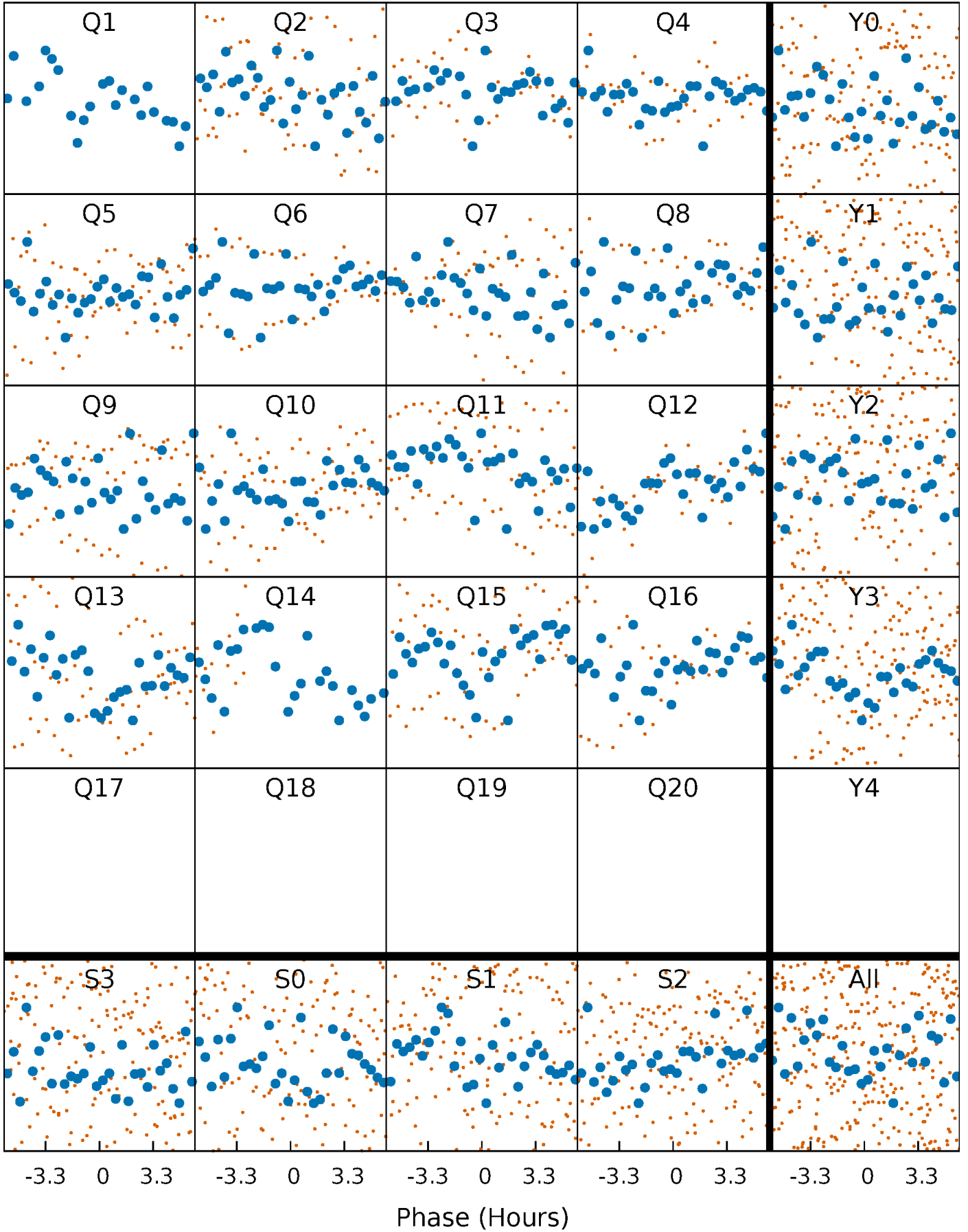


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



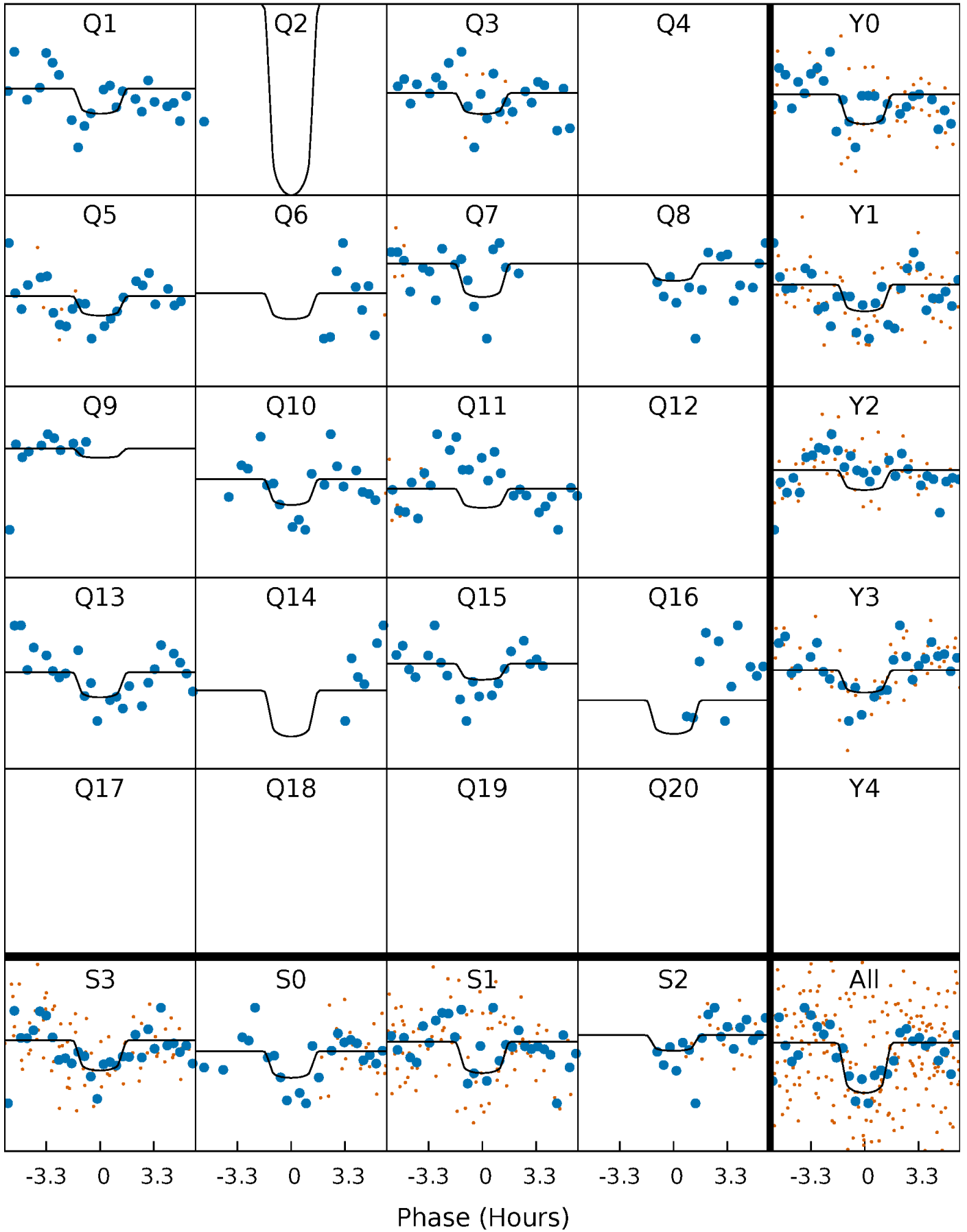
# PDC Quarter-Phased Transit Curves

TCE 010904343-06 P= 34.916667 Days  $T_0=152.864357$  (BKJD)



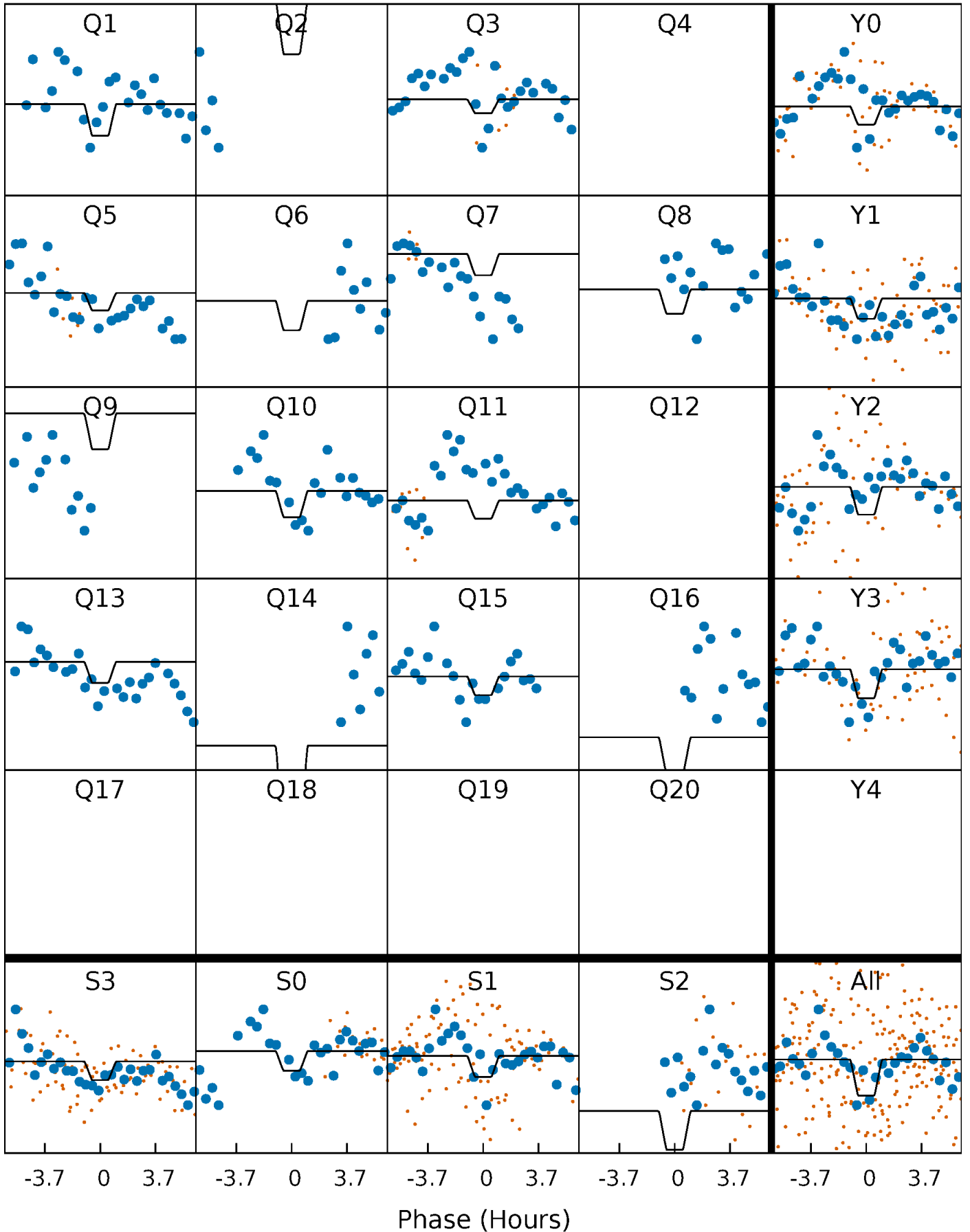
# DV Quarter-Phased Transit Curves

TCE 010904343-06 P= 34.916667 Days  $T_0=152.864357$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

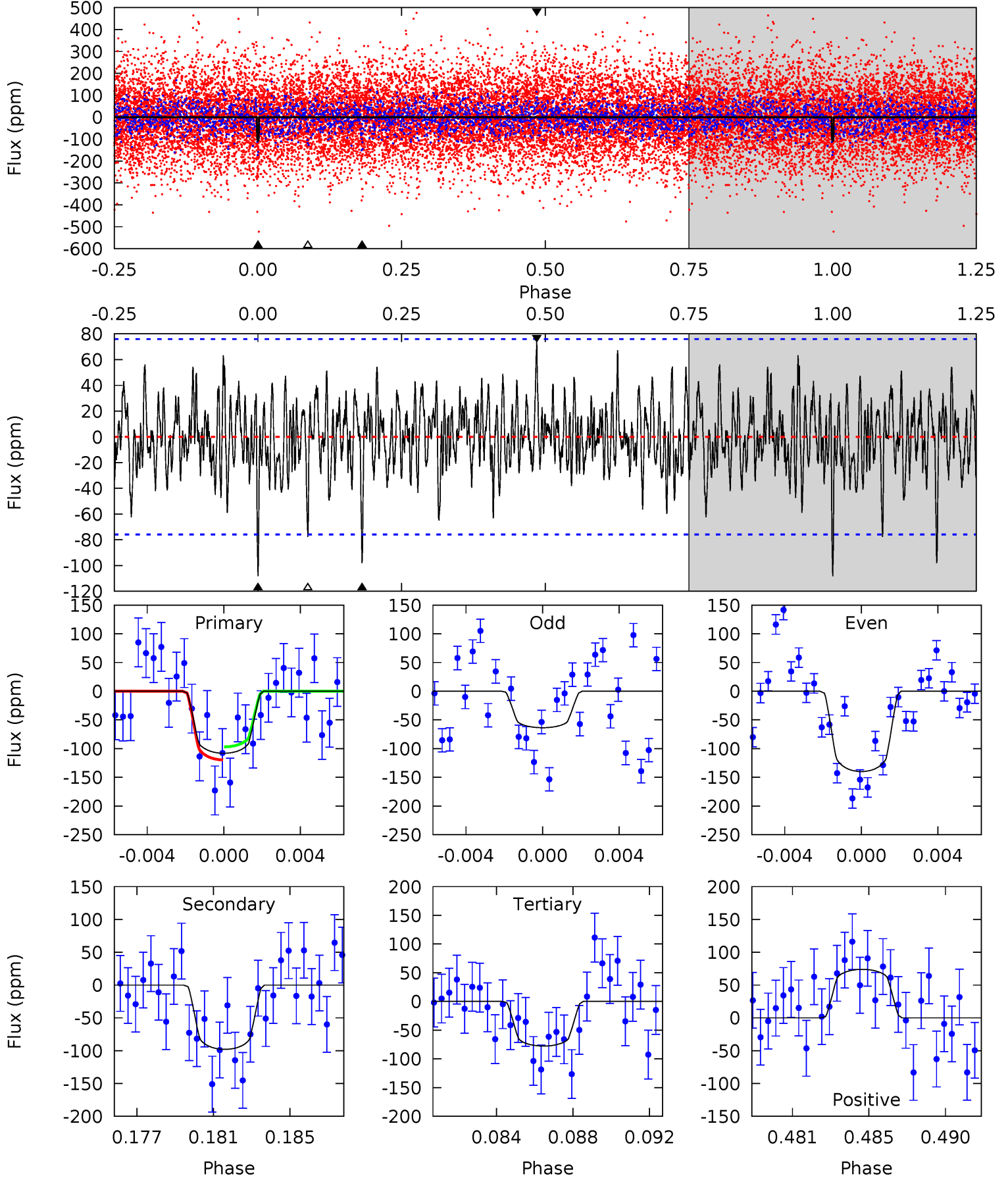
TCE 010904343-06     $P = 34.917548$  Days     $T_0 = 152.835645$  (BKJD)



# DV Model-Shift Uniqueness Test

010904343-06, P = 34.916667 Days, E = 117.947690 Days

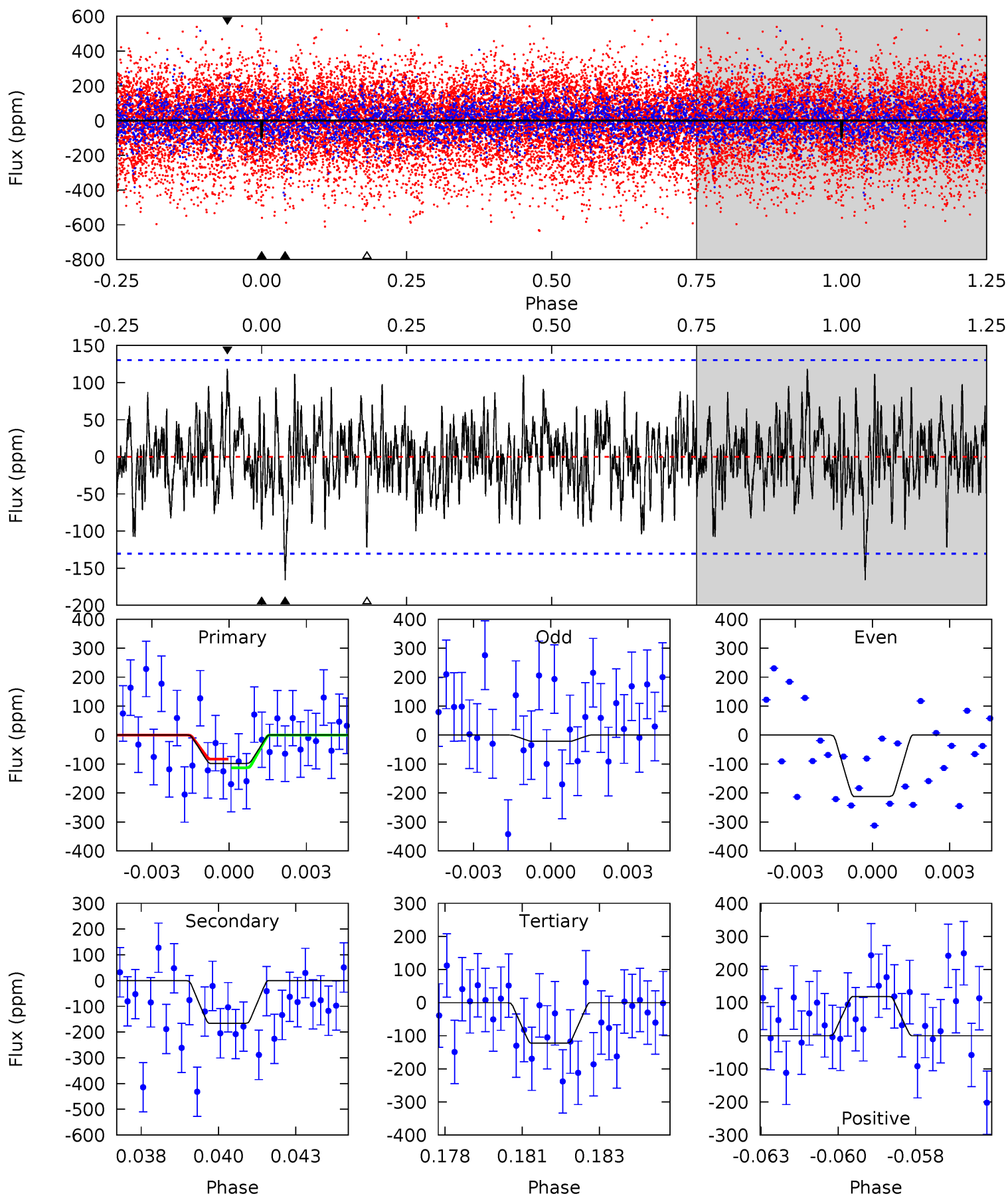
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.41	6.71	5.32	5.07	5.20	2.88	1.53	2.09	2.35	1.39	1.65	2.61	0.78	0.41	0.78



# Alt Model-Shift Uniqueness Test

010904343-06, P = 34.917548 Days, E = 117.918097 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.97	6.74	4.95	4.81	5.29	3.02	1.52	-0.97	-0.84	1.79	1.93	3.86	0.62	0.42	0.60





### Stellar Parameters For KIC 010904343

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6714^{+168}_{-185}$	$3.533^{+0.344}_{-0.086}$	$-0.280^{+0.350}_{-0.250}$	$3.714^{+0.357}_{-1.427}$	$1.717^{+0.212}_{-0.345}$	$0.047^{+0.117}_{-0.013}$
	+3%/-3%	+10%/-2%	+125%/-89%	+10%/-38%	+12%/-20%	+247%/-27%
Source	PHO1	FLK73	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010904343-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-98 \pm 15$	$5.08^{+3.85}_{-3.06}$	$1565^{+78}_{-129}$	$5781^{+3772}_{-1265}$	$132^{+722}_{-90}$
Alt.	$-166 \pm 25$	$5.09^{+4.06}_{-3.10}$	$1573^{+81}_{-142}$	$6612^{+5027}_{-1584}$	$226^{+1266}_{-157}$

$T_{max}$  = 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

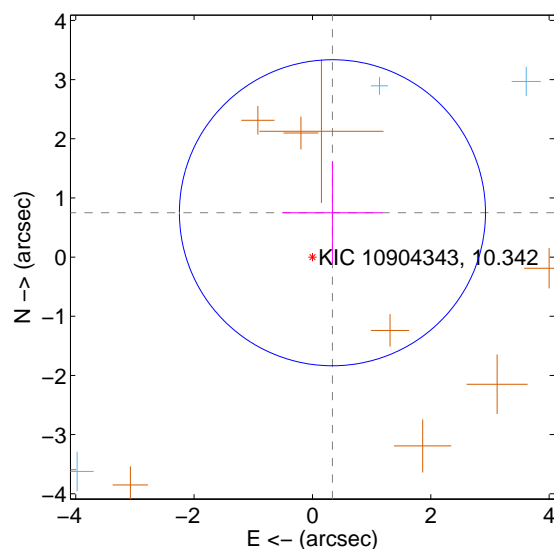
Supplemental centroid analysis for 010904343-06. **Kepler magnitude: 10.34.** Transit SNR 6.29

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

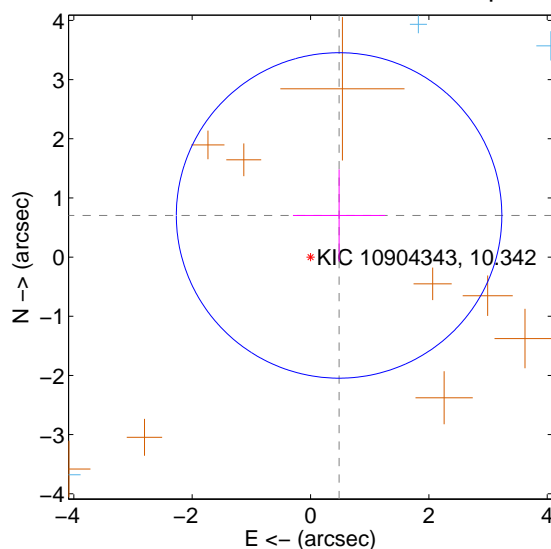
The direct PRF centroid is offset from the target star catalog position by about 0.85 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.822 \pm 0.862$	0.95	$-0.338 \pm 0.845$	$0.750 \pm 0.866$
PRF-fit source offset from KIC position	$0.854 \pm 0.917$	0.93	$-0.483 \pm 0.780$	$0.704 \pm 0.778$
photometric centroid source offset	$0.36 \pm 0.48$	0.75	$-0.05 \pm 0.56$	$0.36 \pm 0.48$

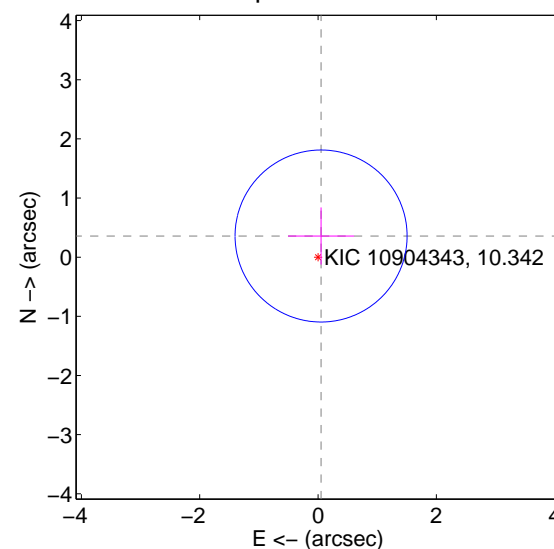
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

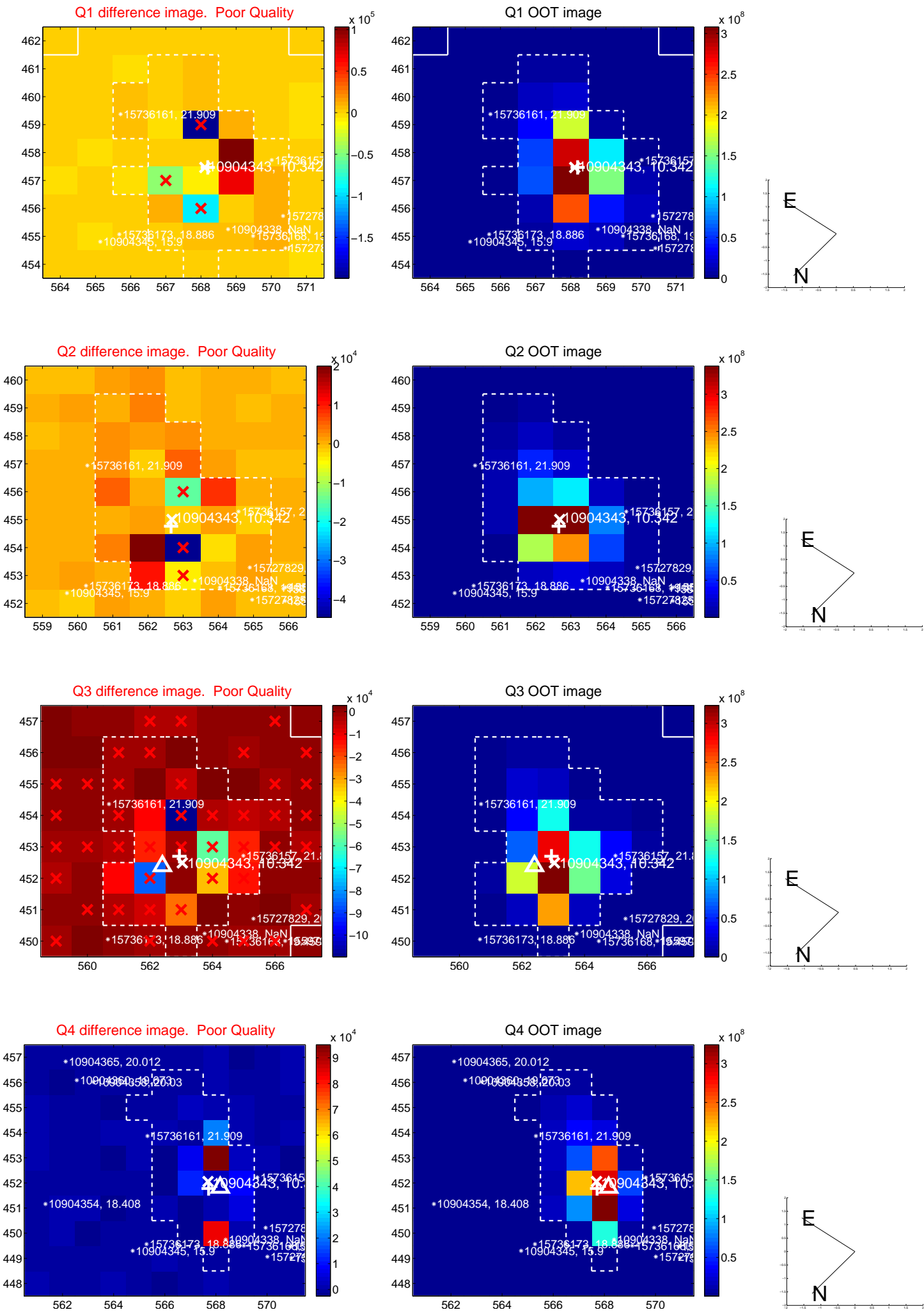


offset from photometric centroids

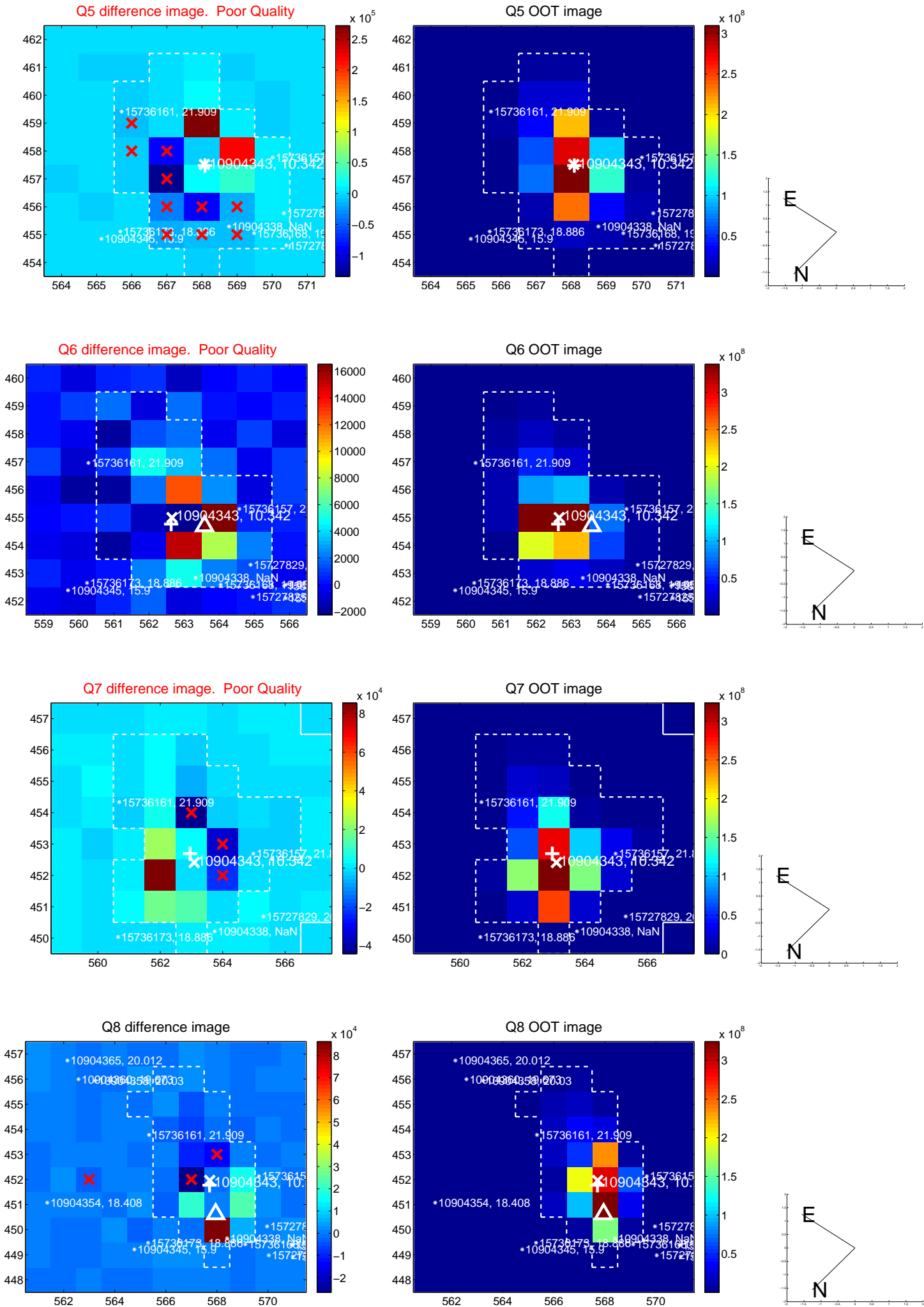


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

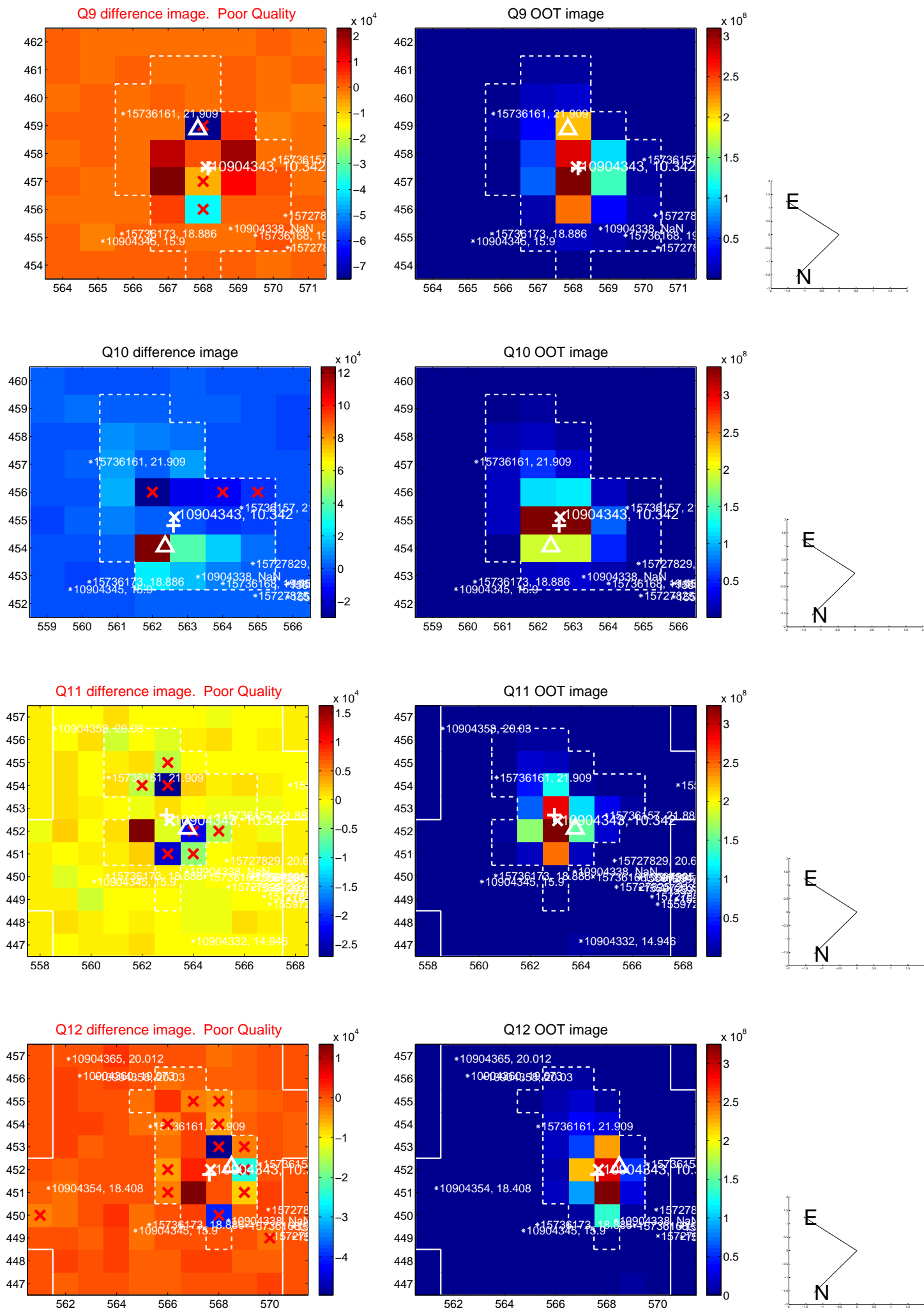
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



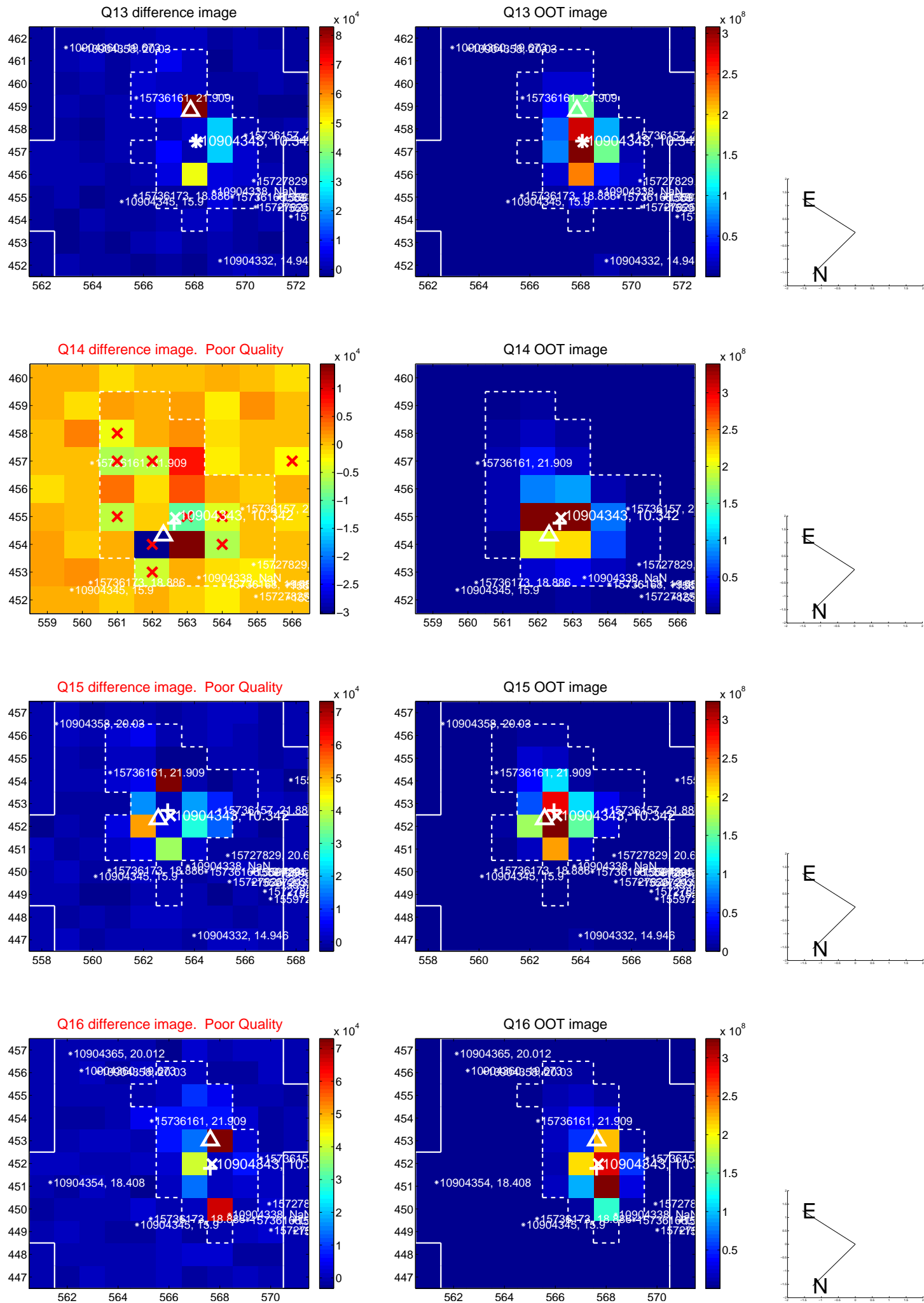
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

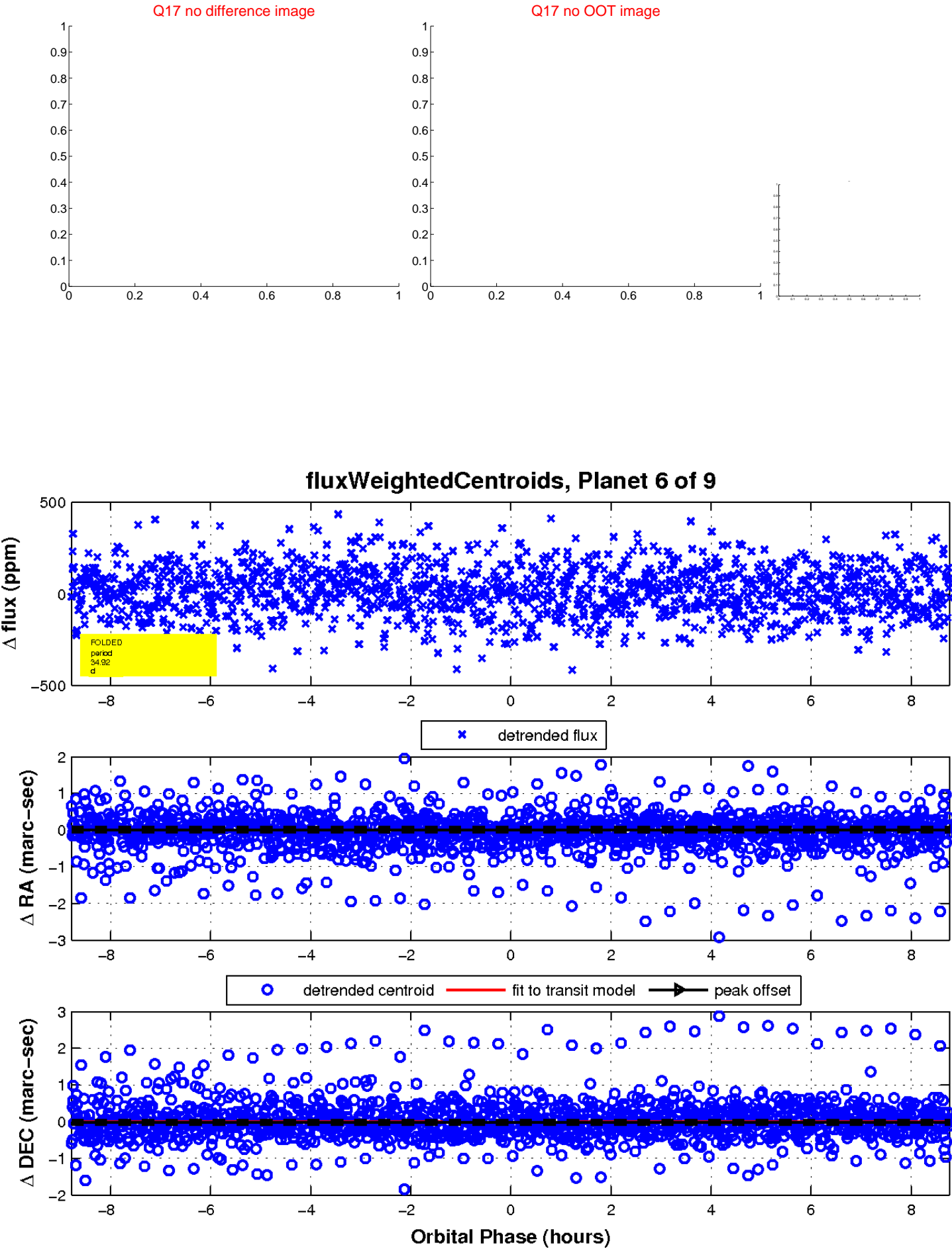


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



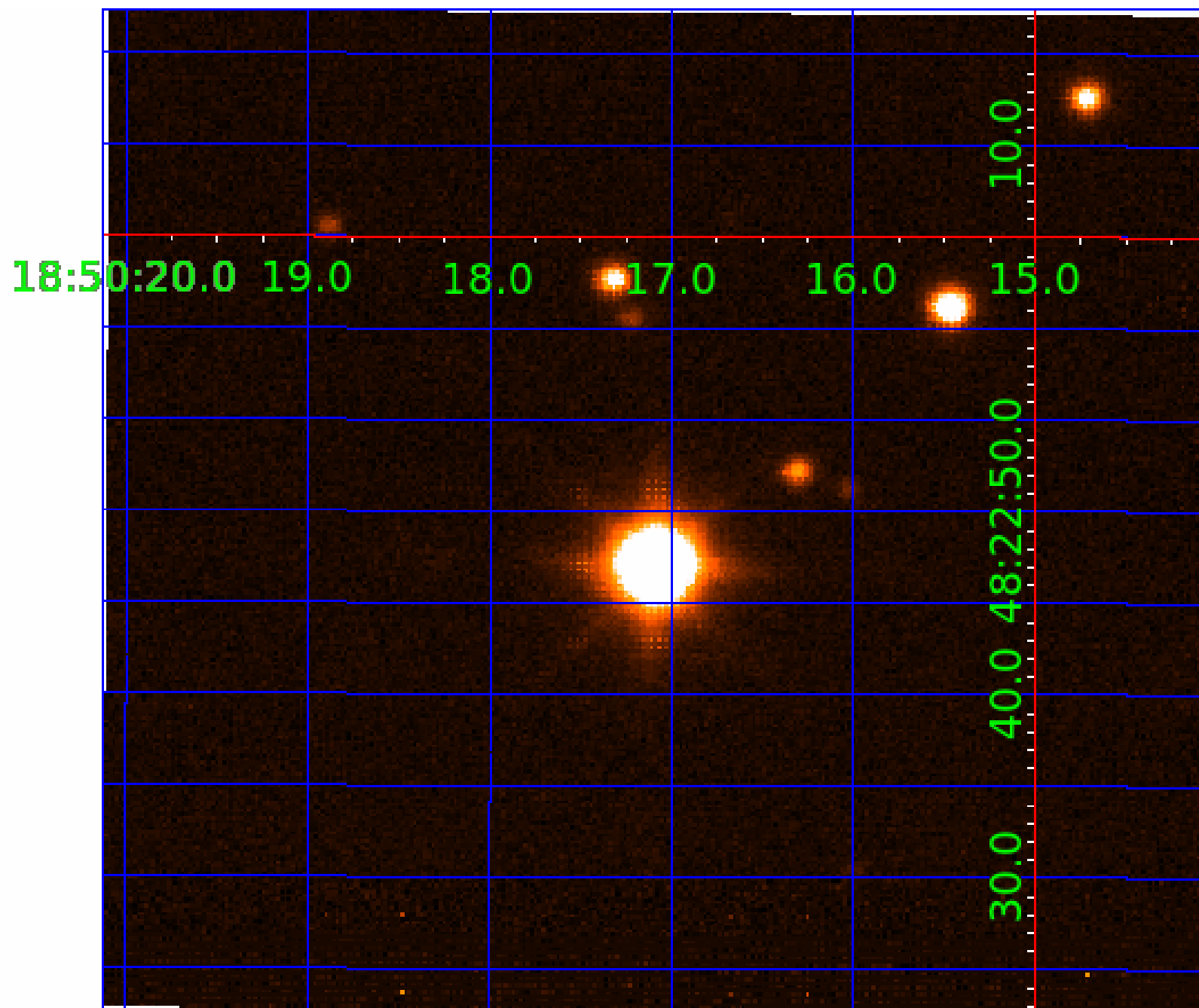


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010904343

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010904343-01	OBS	No	3.061235	132.737615	22.8	8.650	8.8	7.4	3.71	6714	2.00	10284.55
010904343-02	OBS	No	1.530349	132.310781	27.8	6.304	10.4	10.0	3.71	6714	2.71	25921.51
010904343-03	OBS	No	139.464948	217.524278	305.9	8.224	9.9	9.5	3.71	6714	8.43	63.21
010904343-04	OBS	No	60.793603	160.060354	212.8	4.472	8.5	9.2	3.71	6714	6.20	191.24
010904343-05	OBS	No	117.464997	228.800718	304.9	2.434	8.6	9.0	3.71	6714	7.37	79.46
010904343-06	OBS	No	34.916667	152.864357	120.7	2.929	8.1	6.3	3.71	6714	4.77	400.56
010904343-07	OBS	No	42.718363	155.839959	157.5	4.114	7.5	8.1	3.71	6714	5.36	306.12
010904343-08	OBS	No	106.321866	134.323578	151.5	6.479	7.6	6.4	3.71	6714	5.19	90.76
010904343-09	OBS	No	33.945926	146.949011	64.7	6.114	7.5	4.0	3.71	6714	3.37	415.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010904343-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
010904343-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010904343-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-09	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

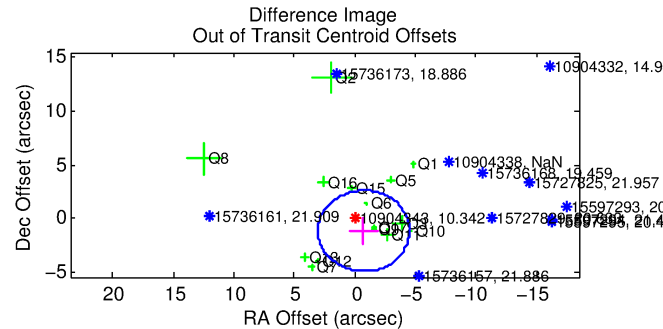
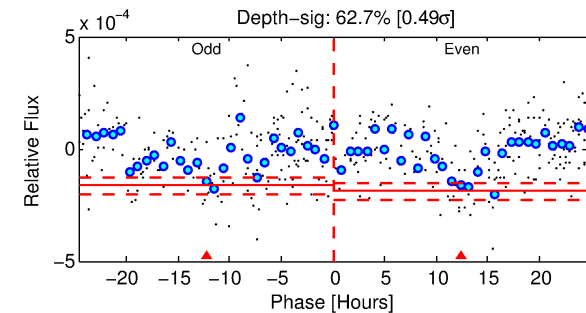
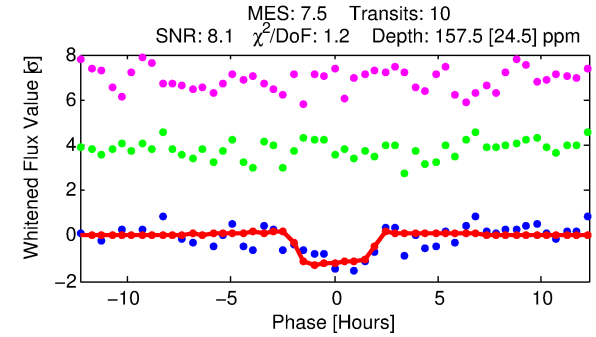
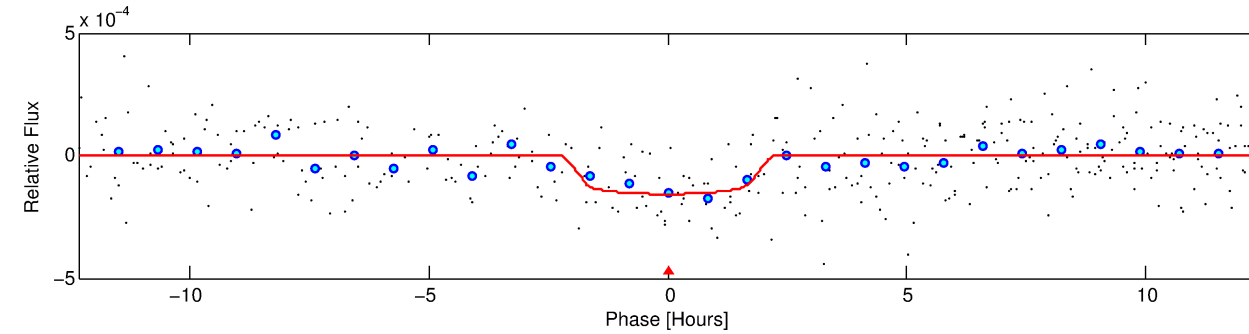
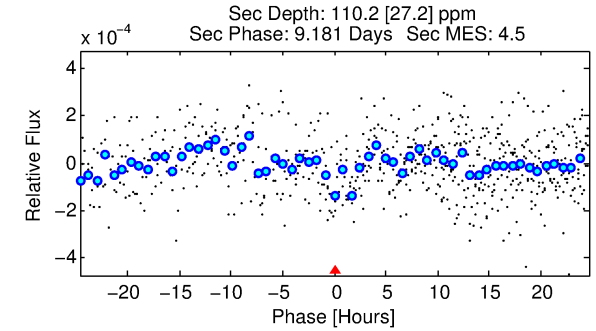
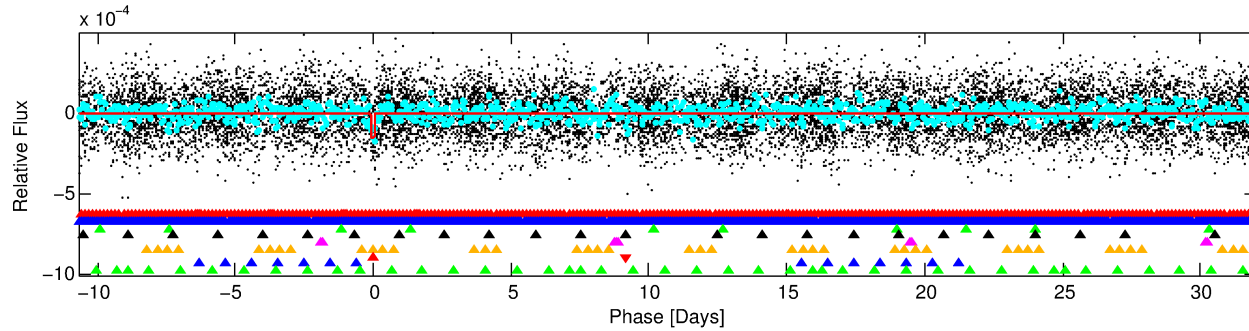
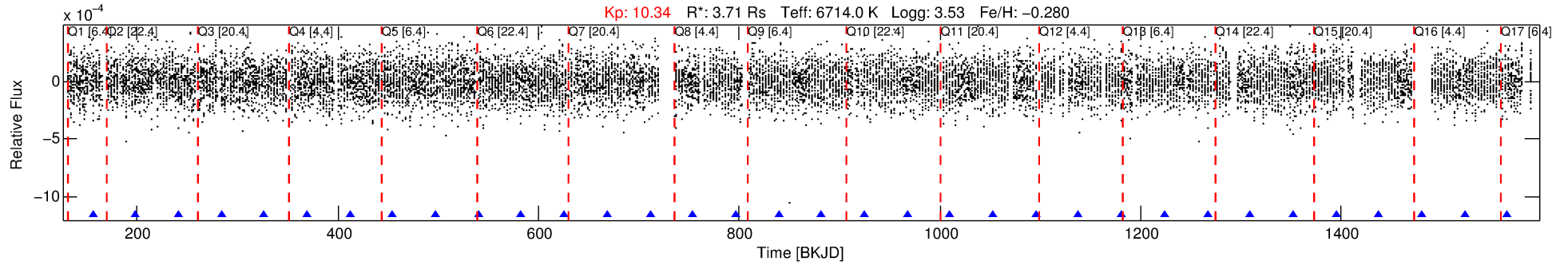
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010904343-07

No Significant Match Found

# DV One-Page Summary

KIC: 10904343 Candidate: 7 of 9 Period: 42.718 d



## DV Fit Results:

Period = 42.71836 [0.00061] d  
Epoch = 155.8400 [0.0108] BKJD  
Rp/R\* = 0.0132 [0.0055]  
a/R\* = 39.34 [95.31]  
b = 0.88 [0.61]  
Seff = 306.12 [182.81]  
Teff = 1067 [159] K  
Rp = 5.36 [3.05] Re  
a = 0.2864 [0.1054] AU  
Ag = 172.98 [182.05] [0.94σ]  
Teffp = 5981 [1317] K [3.71σ]

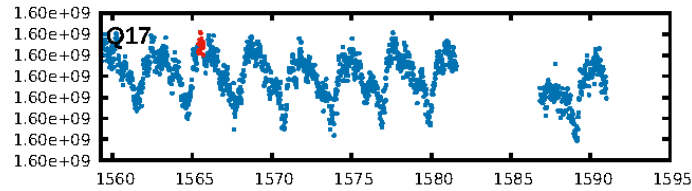
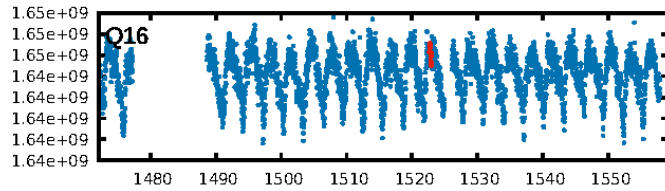
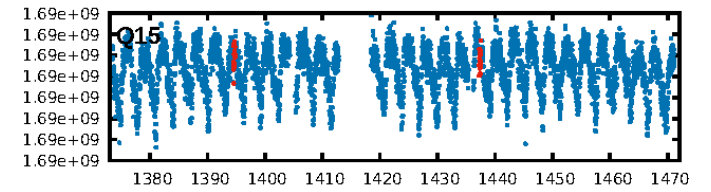
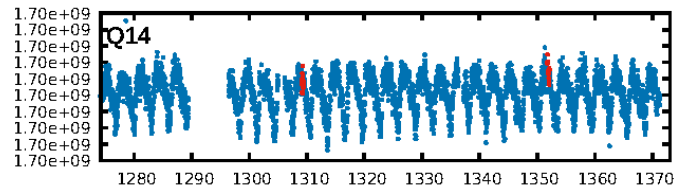
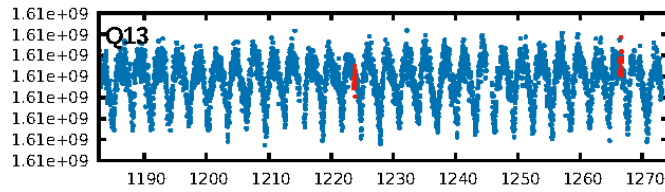
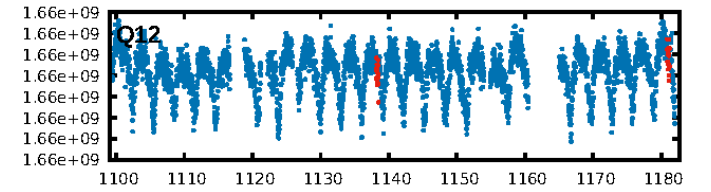
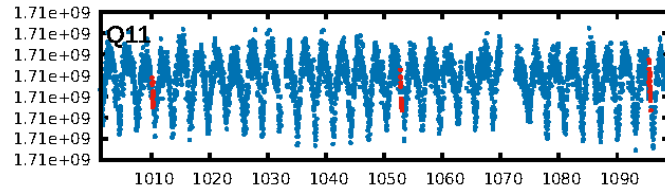
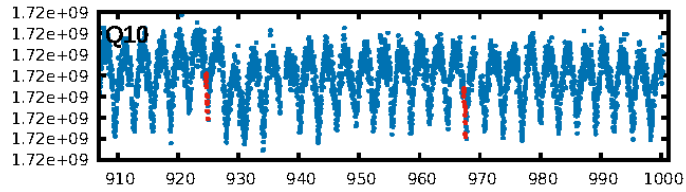
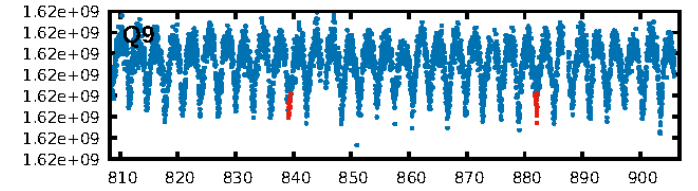
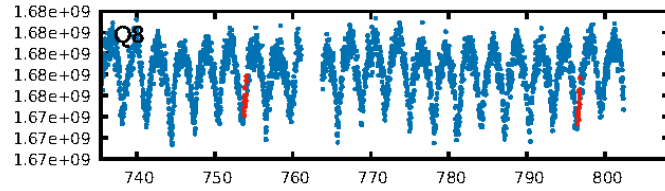
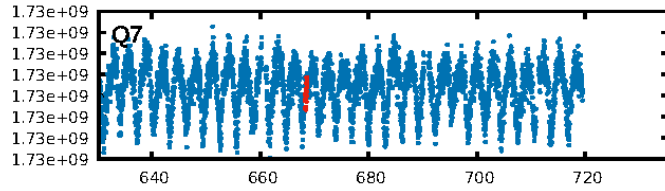
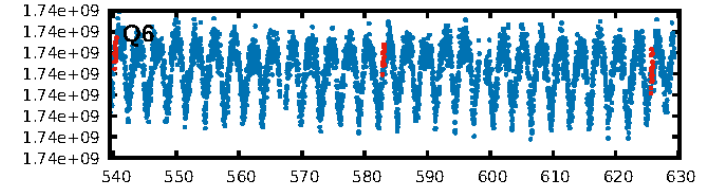
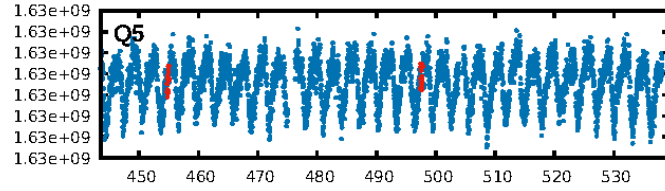
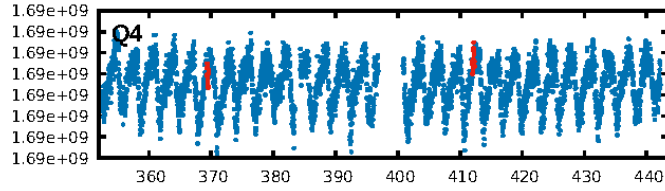
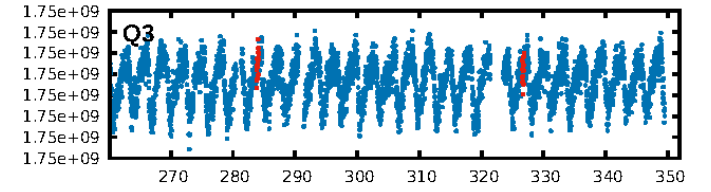
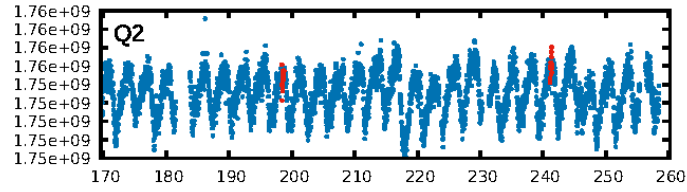
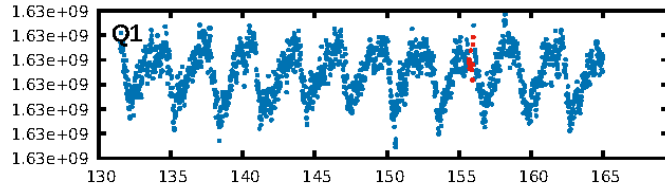
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [37.07σ]  
LongPeriod-sig: 100.0% [71.39σ]  
ModelChiSquare2-sig: 13.9%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.30e-07**  
RollingBand-fgt: 1.00 [9/9]  
**GhostDiagnostic-chr: 0.5341**  
Centroid-sig: 67.6%  
Centroid-so: 0.042 arcsec [0.10σ]  
OotOffset-rm: 1.396 arcsec [1.11σ]  
KicOffset-rm: 0.923 arcsec [0.86σ]  
OotOffset-st: 3/4/3/5 [15]  
KicOffset-st: 3/4/3/5 [15]  
DiffImageQuality-fgm: 0.27 [4/15]  
DiffImageOverlap-fno: 0.18 [3/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:38:21 Z

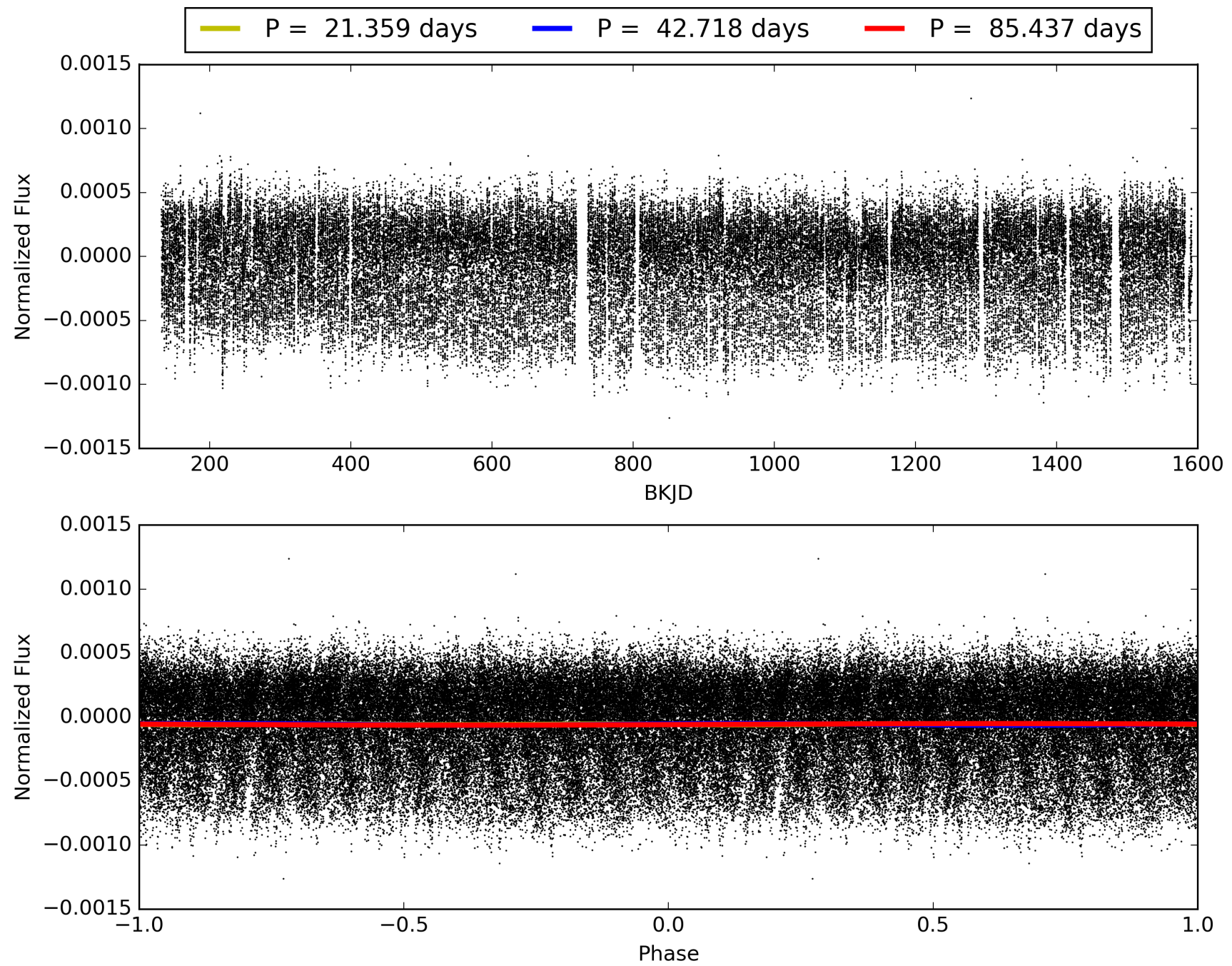
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010904343-07, PDC Light Curves





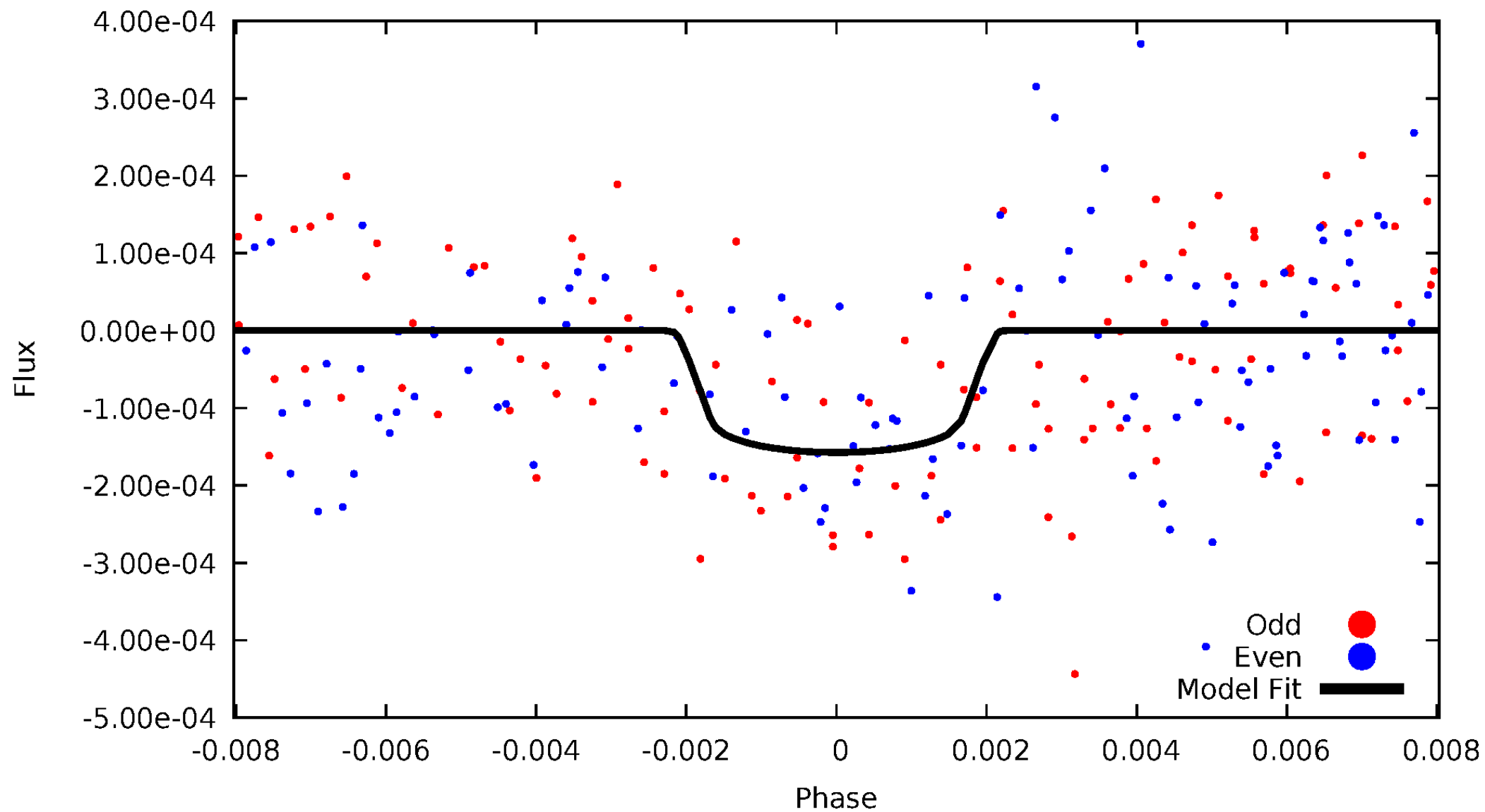
TCE 010904343-07





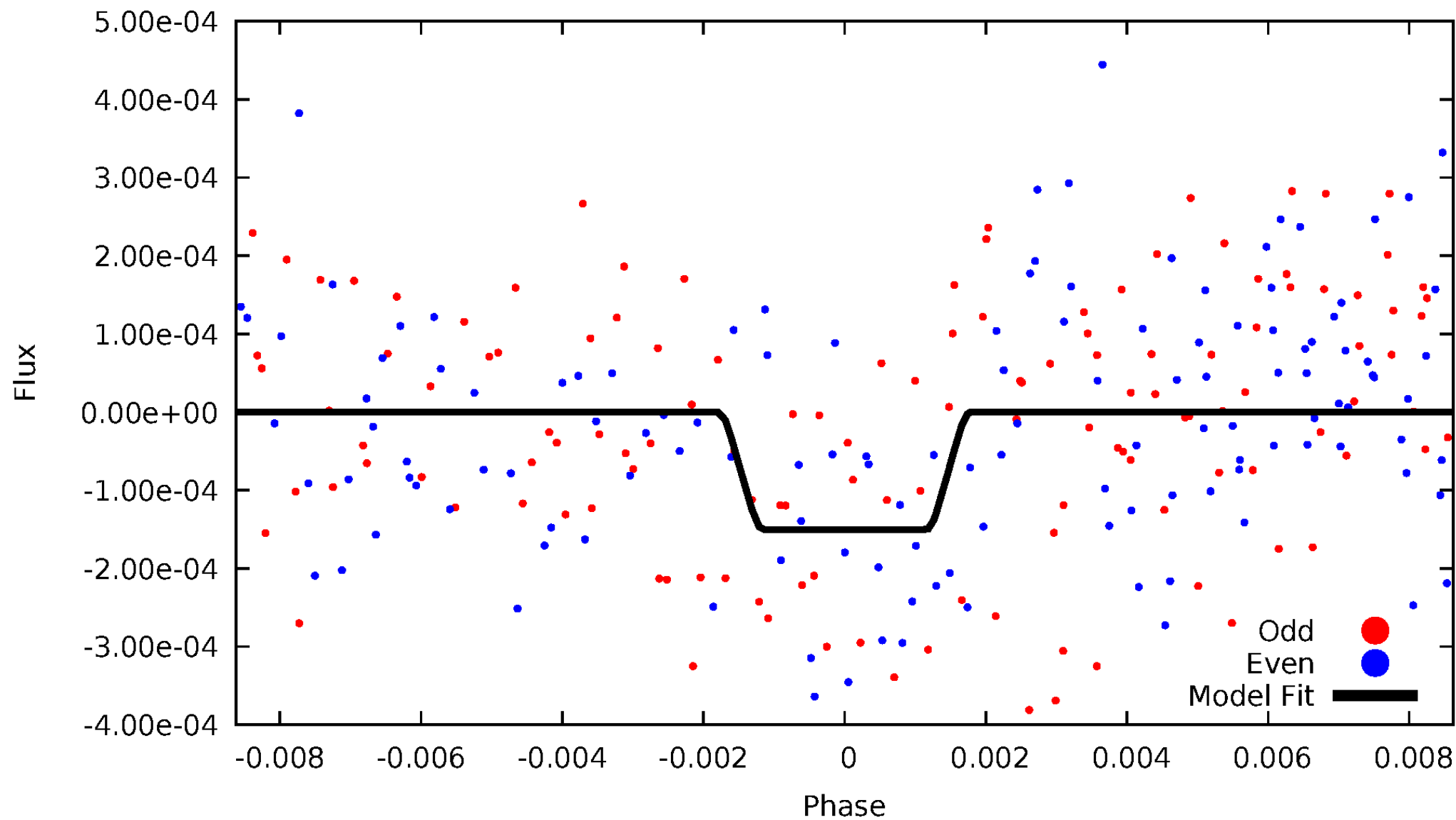
# DV Odd/Even

TCE 010904343-07



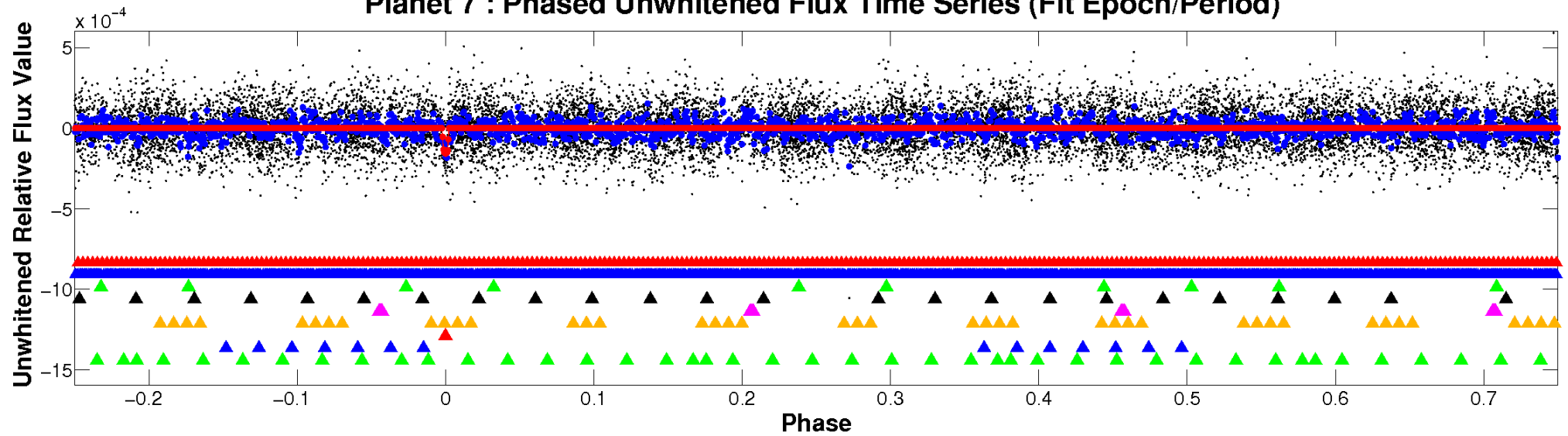
# ALT Odd/Even

TCE 010904343-07

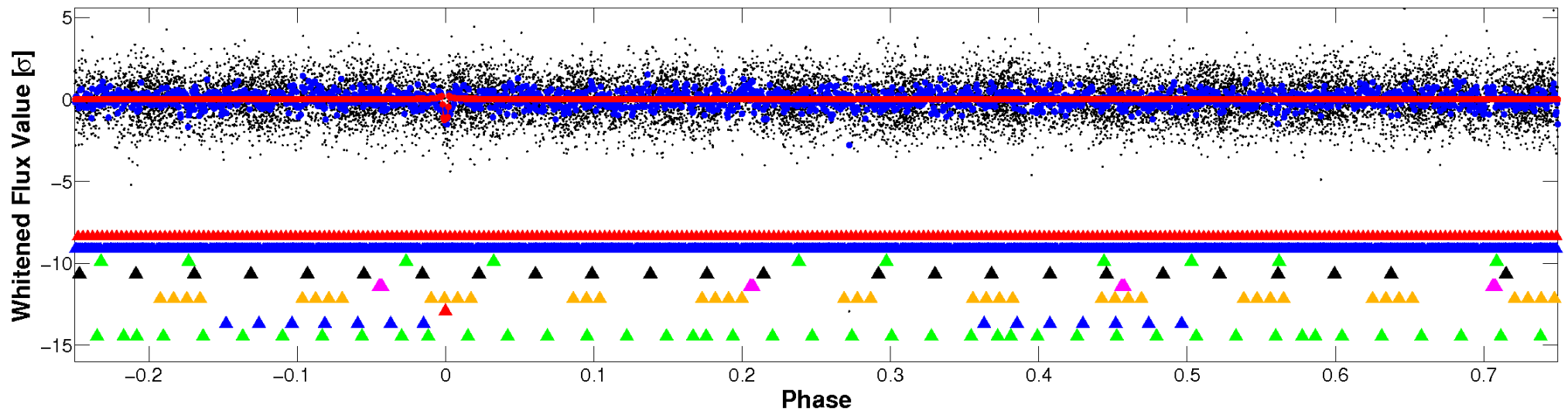


# Non-Whitened Vs. Whitened Light Curve

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

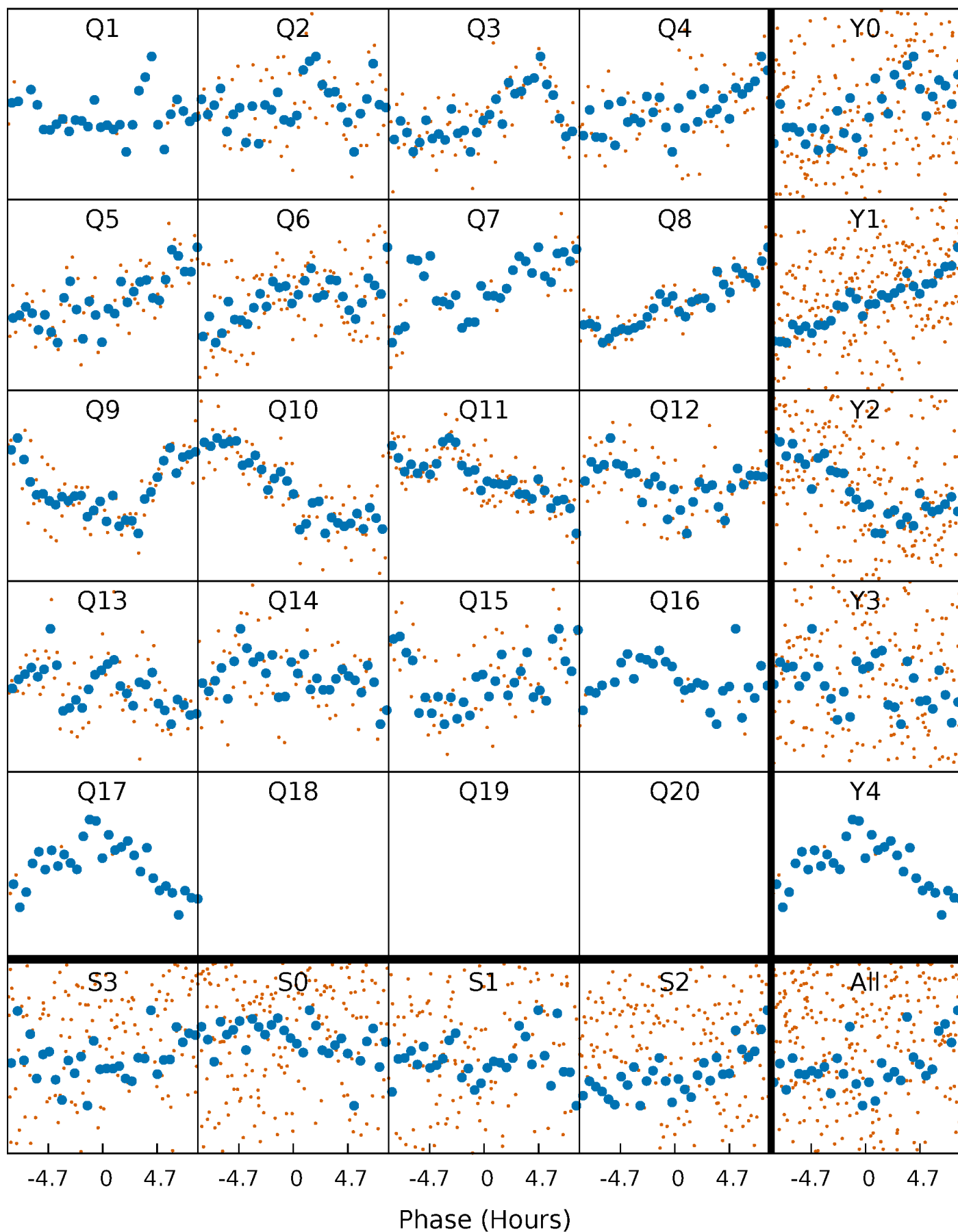


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



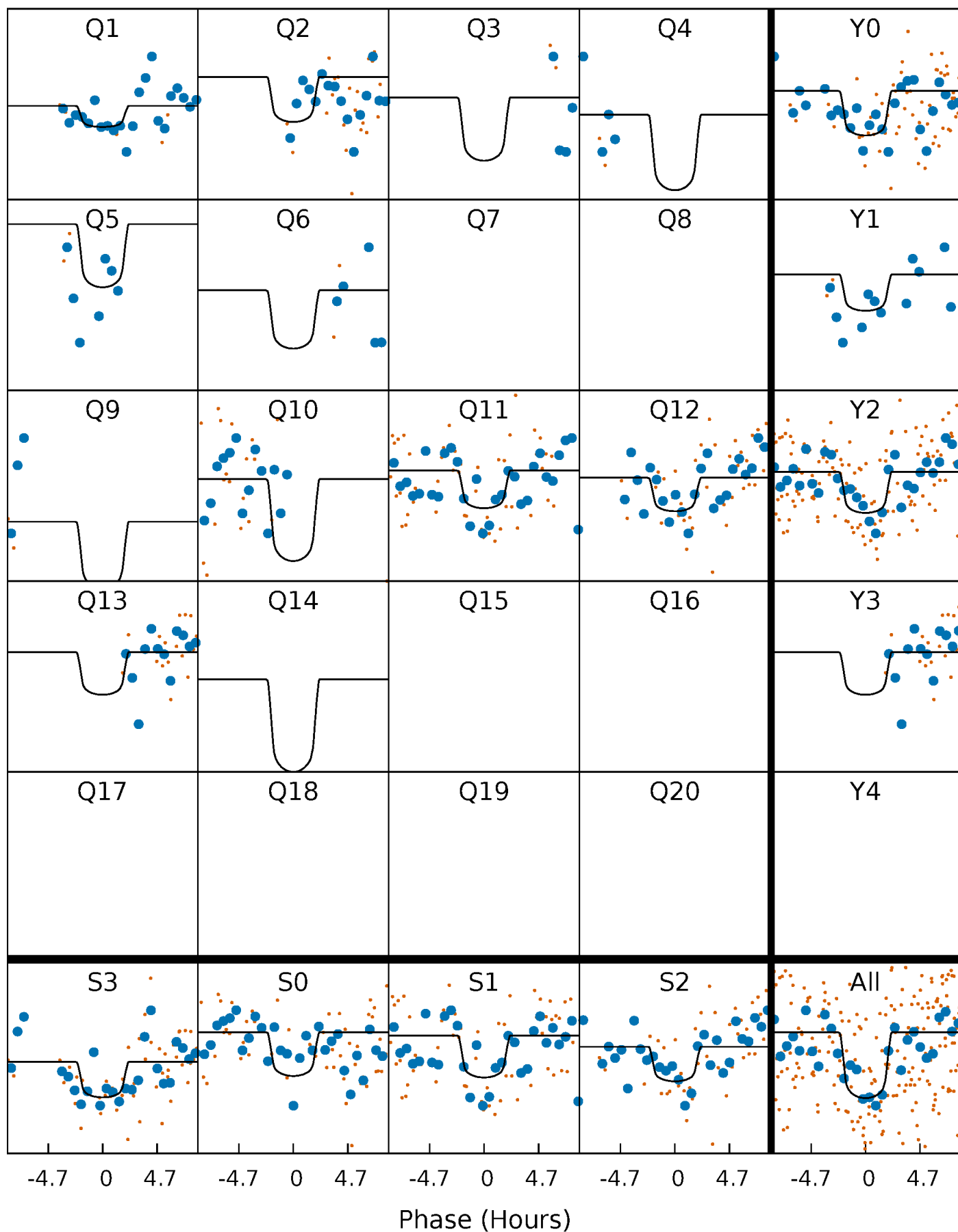
# PDC Quarter-Phased Transit Curves

TCE 010904343-07   P= 42.718363 Days    $T_0=155.839959$  (BKJD)



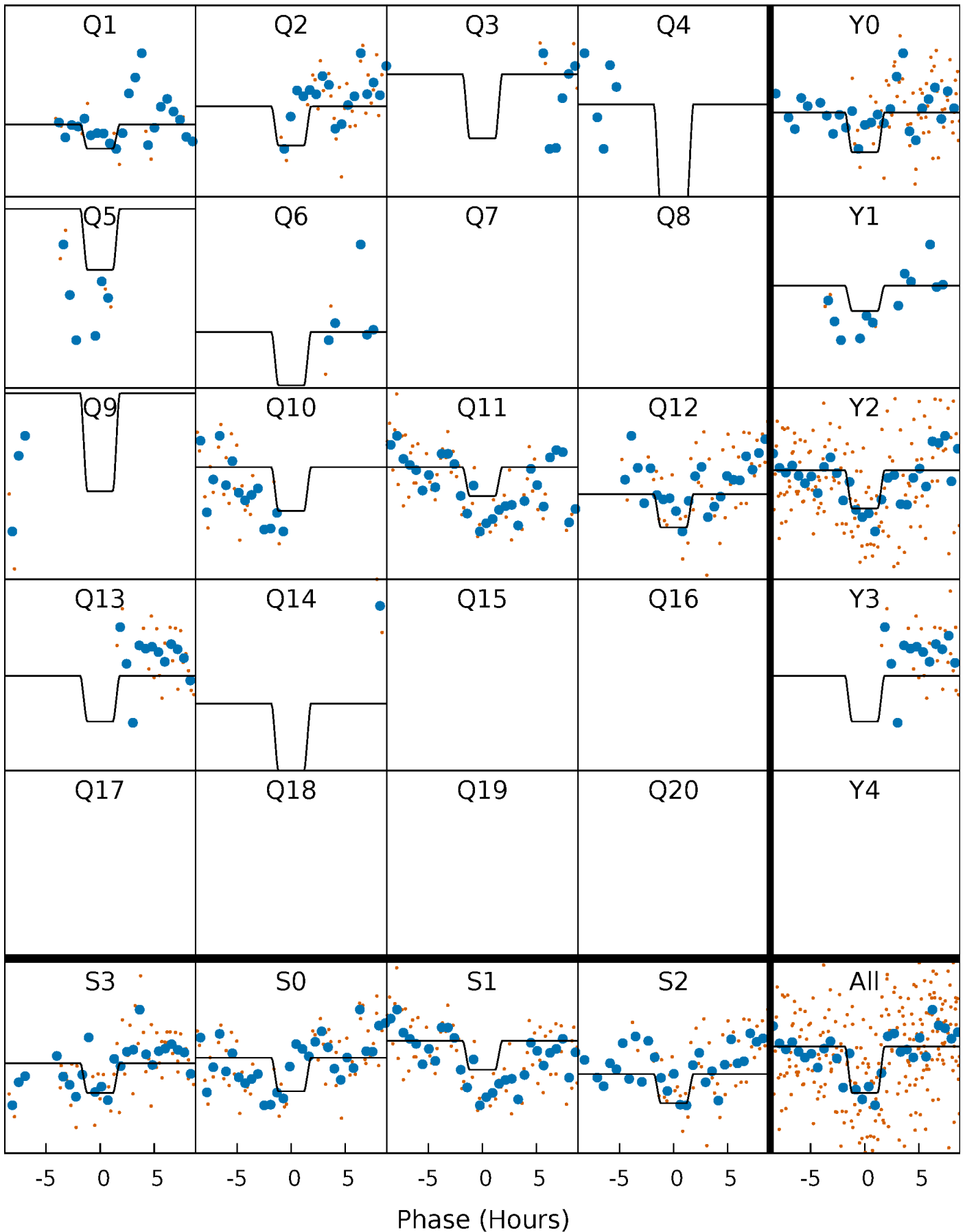
# DV Quarter-Phased Transit Curves

TCE 010904343-07 P= 42.718363 Days  $T_0=155.839959$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010904343-07     $P = 42.717971$  Days     $T_0 = 155.856957$  (BKJD)

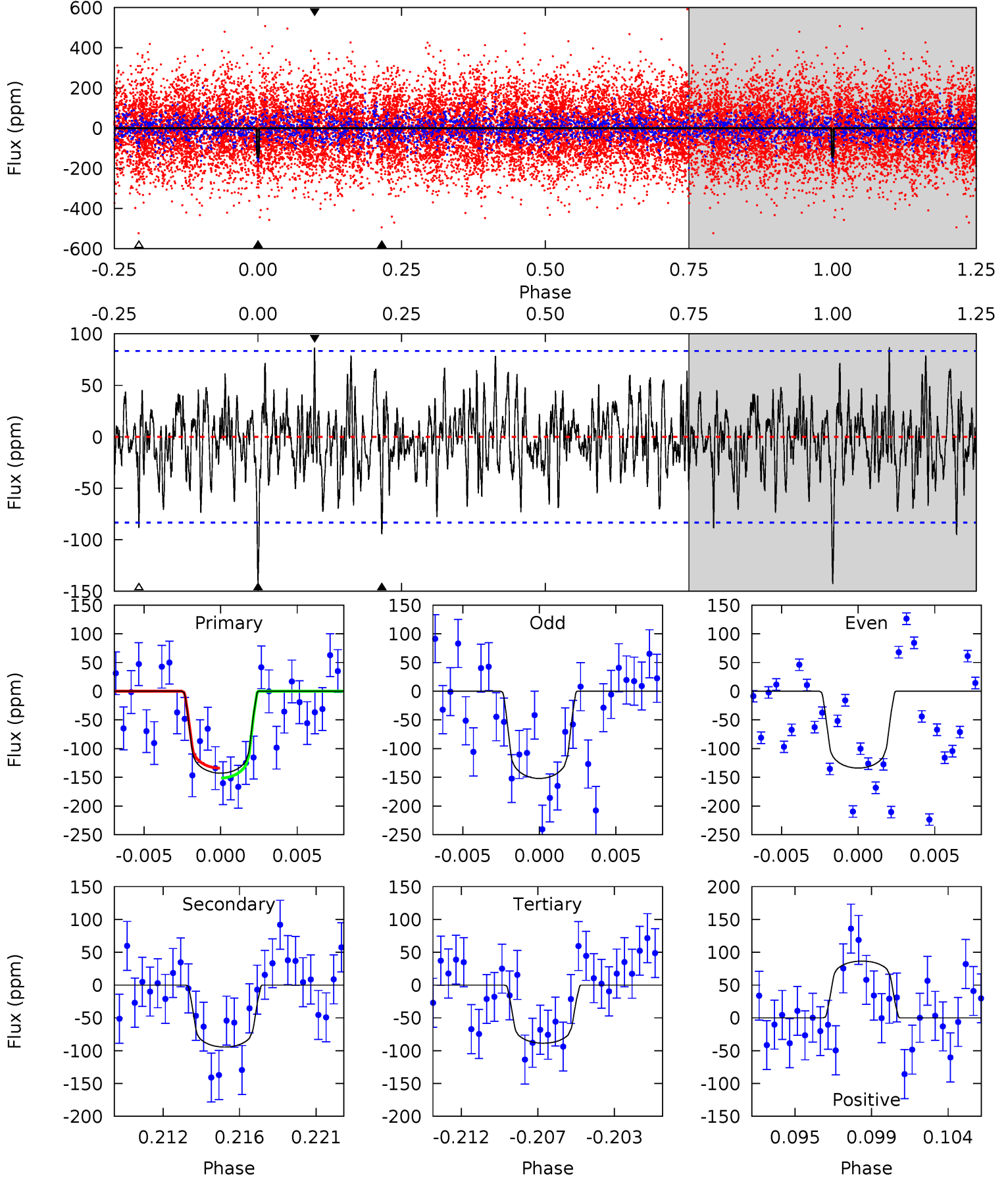




# DV Model-Shift Uniqueness Test

010904343-07, P = 42.718363 Days, E = 113.121596 Days

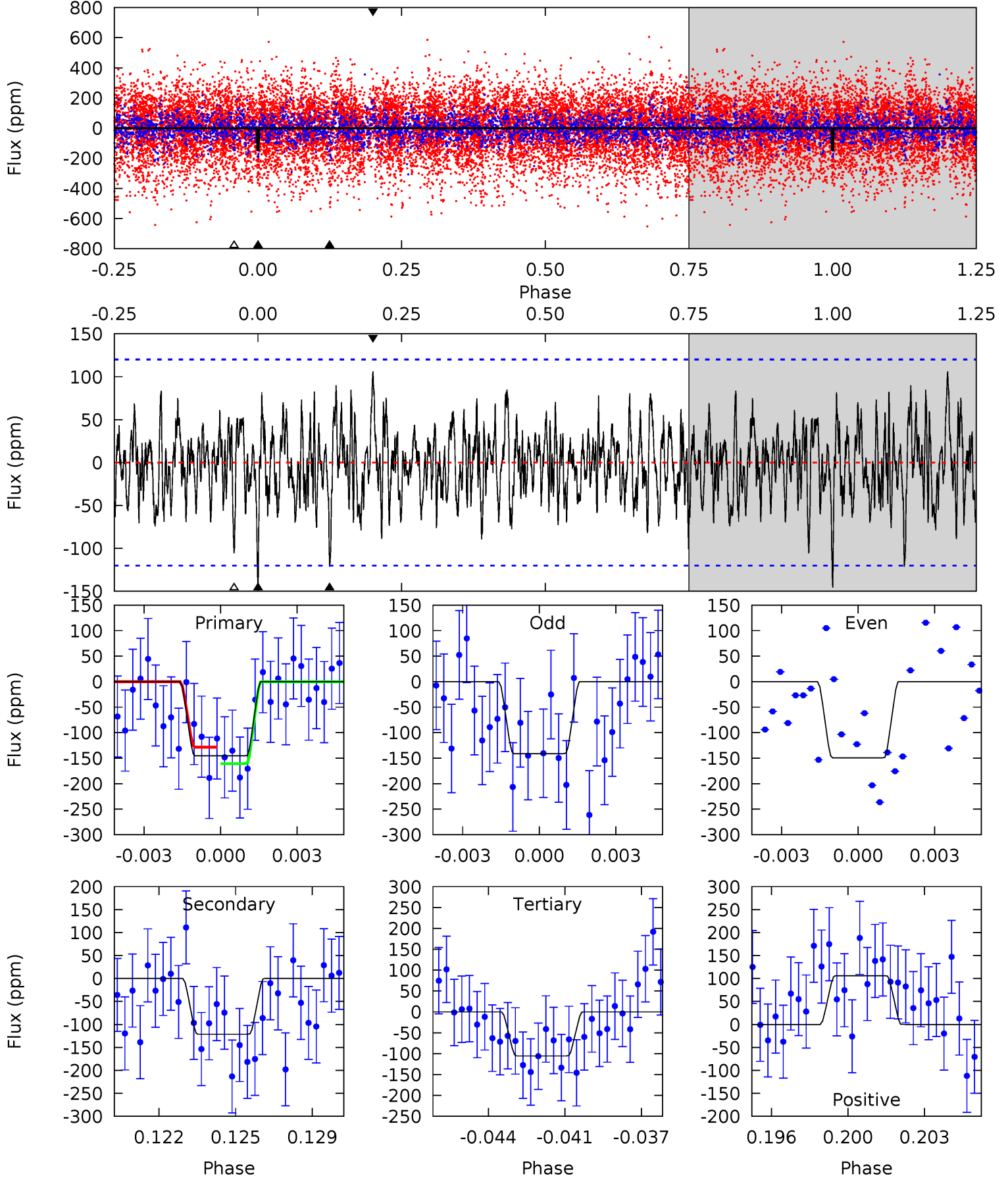
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.86	5.86	5.50	5.37	5.18	2.84	1.65	3.36	3.49	0.36	0.49	0.56	1.00	0.38	0.53



# Alt Model-Shift Uniqueness Test

010904343-07,  $P = 42.717971$  Days,  $E = 113.138986$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.34	5.28	4.60	4.62	5.23	2.93	1.49	1.74	1.72	0.68	0.66	0.19	0.99	0.42	0.70



### Stellar Parameters For KIC 010904343

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6714^{+168}_{-185}$	$3.533^{+0.344}_{-0.086}$	$-0.280^{+0.350}_{-0.250}$	$3.714^{+0.357}_{-1.427}$	$1.717^{+0.212}_{-0.345}$	$0.047^{+0.117}_{-0.013}$
	+3%/-3%	+10%/-2%	+125%/-89%	+10%/-38%	+12%/-20%	+247%/-27%
Source	PHO1	FLK73	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010904343-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-94 \pm 16$	$5.10^{+2.19}_{-2.30}$	$1464^{+79}_{-121}$	$5666^{+2024}_{-786}$	$161^{+380}_{-83}$
Alt.	$-121 \pm 23$	$4.67^{+2.35}_{-2.18}$	$1466^{+75}_{-122}$	$6349^{+2583}_{-1110}$	$255^{+596}_{-145}$

$T_{max}$  = Theoretical Maximum Planetary Temperature  
 $T_{obs}$  = Observed Planetary Temperature (Assuming A=0.3)  
 $A_{obs}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

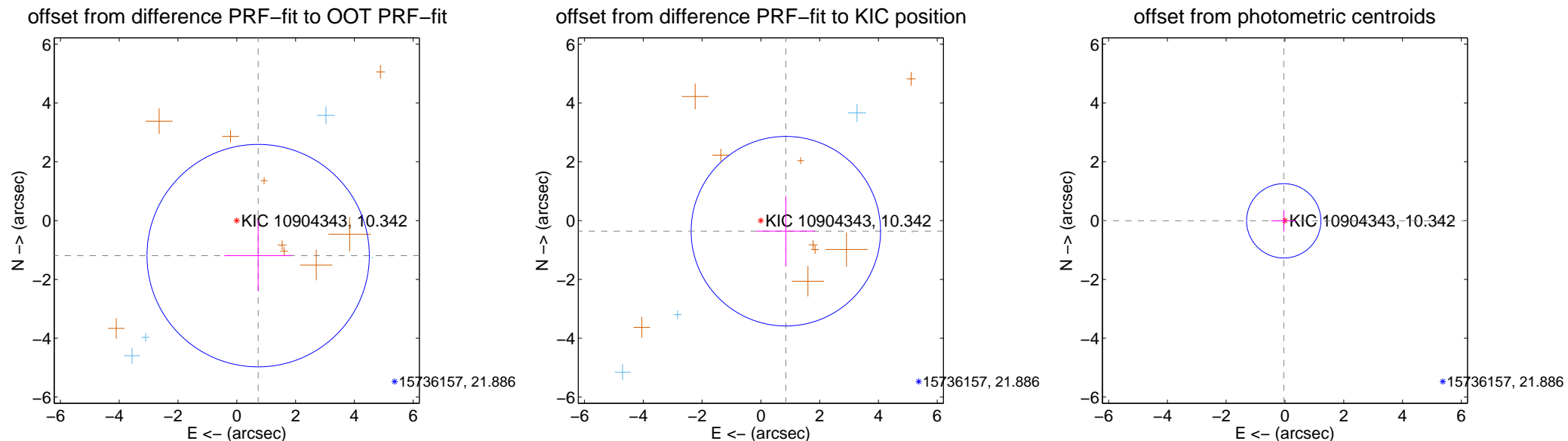
## DV Centroid Data

Supplemental centroid analysis for 010904343-07. **Kepler magnitude: 10.34**. Transit SNR 8.07

There are 4 quarters with good PRF difference image offsets

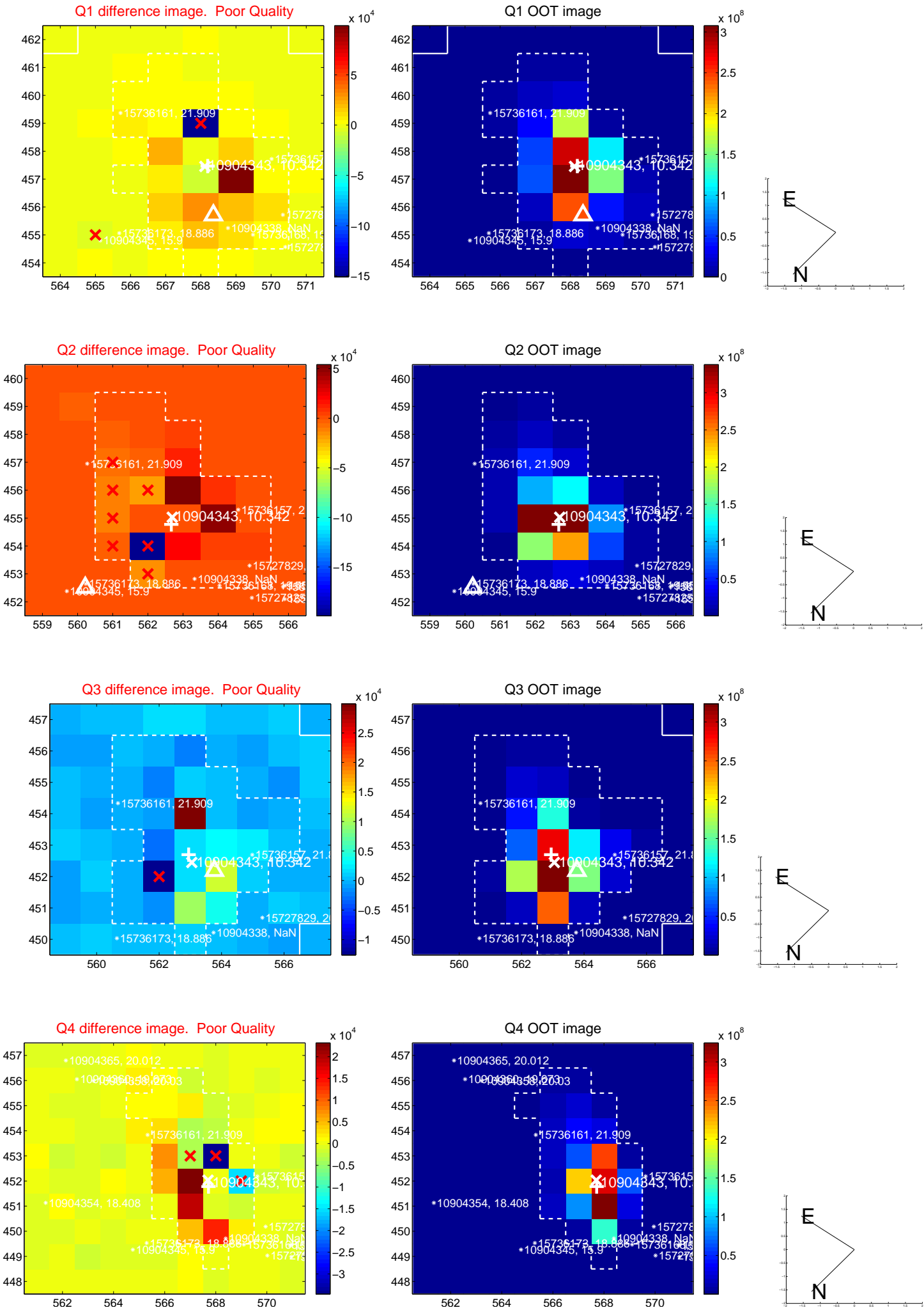
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.396 \pm 1.261$	1.11	$-0.727 \pm 1.152$	$-1.192 \pm 1.208$
PRF-fit source offset from KIC position	$0.923 \pm 1.074$	0.86	$-0.850 \pm 0.999$	$-0.361 \pm 1.197$
photometric centroid source offset	$0.04 \pm 0.42$	0.10	$0.04 \pm 0.42$	$-0.01 \pm 0.36$

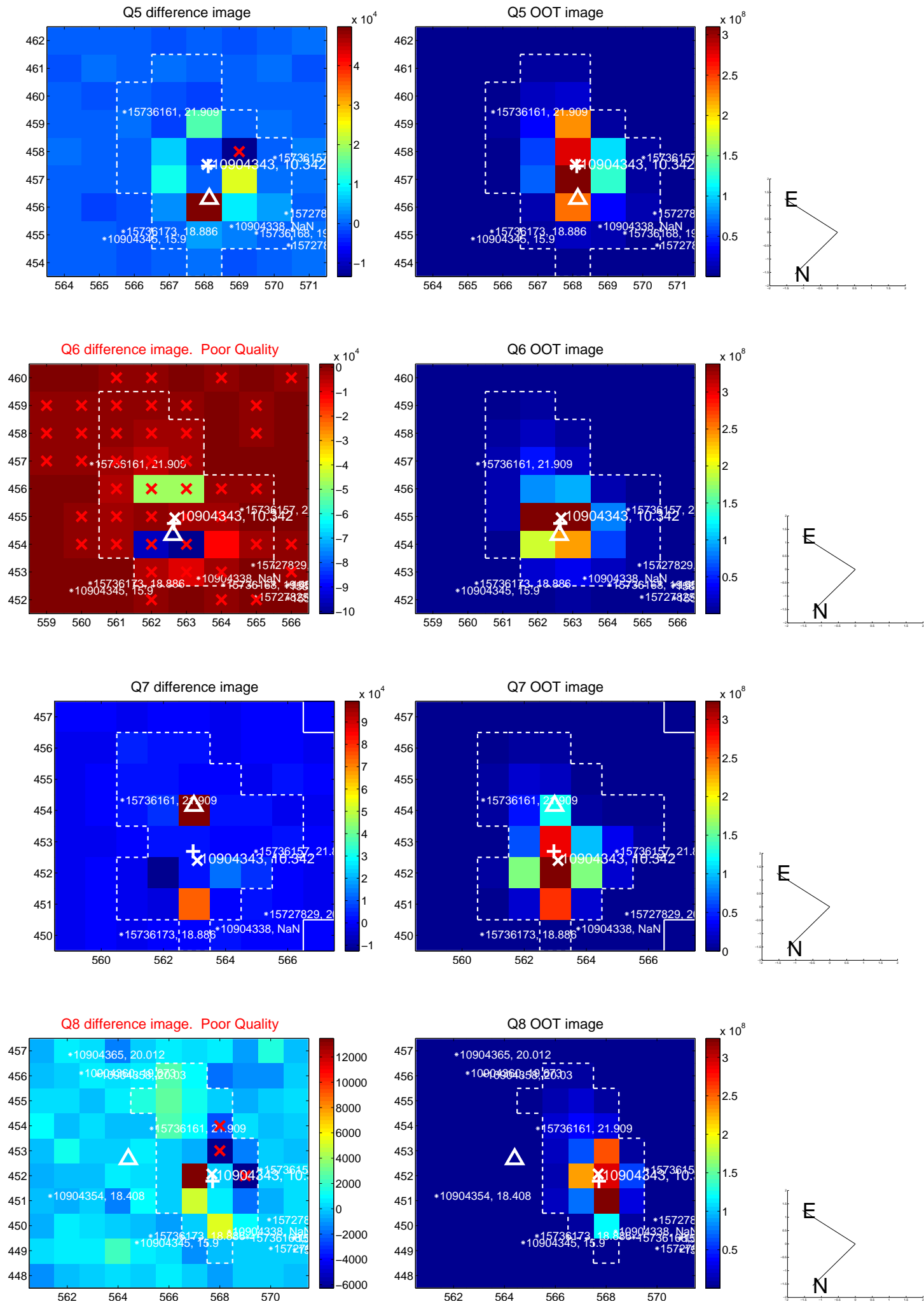


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

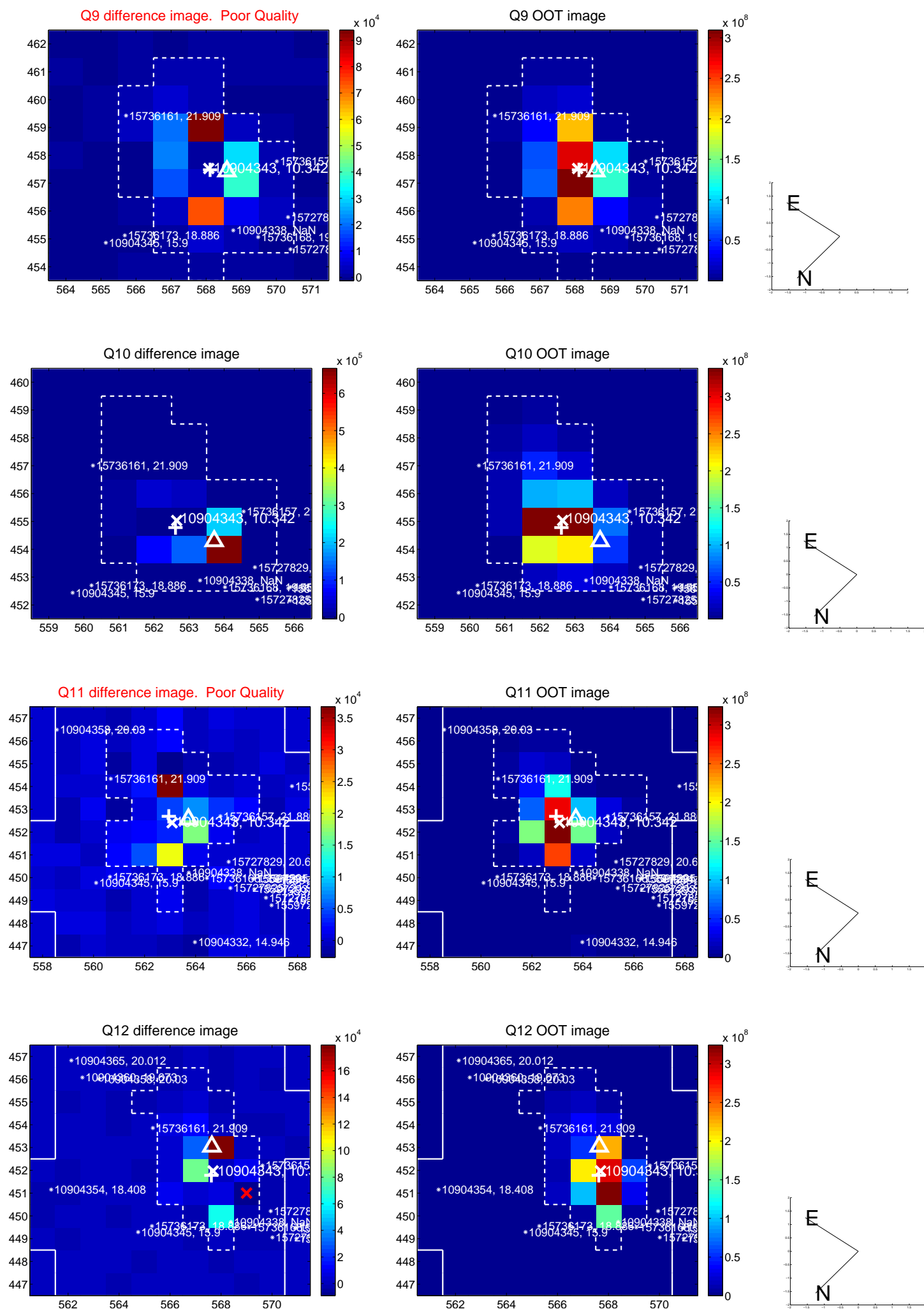
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



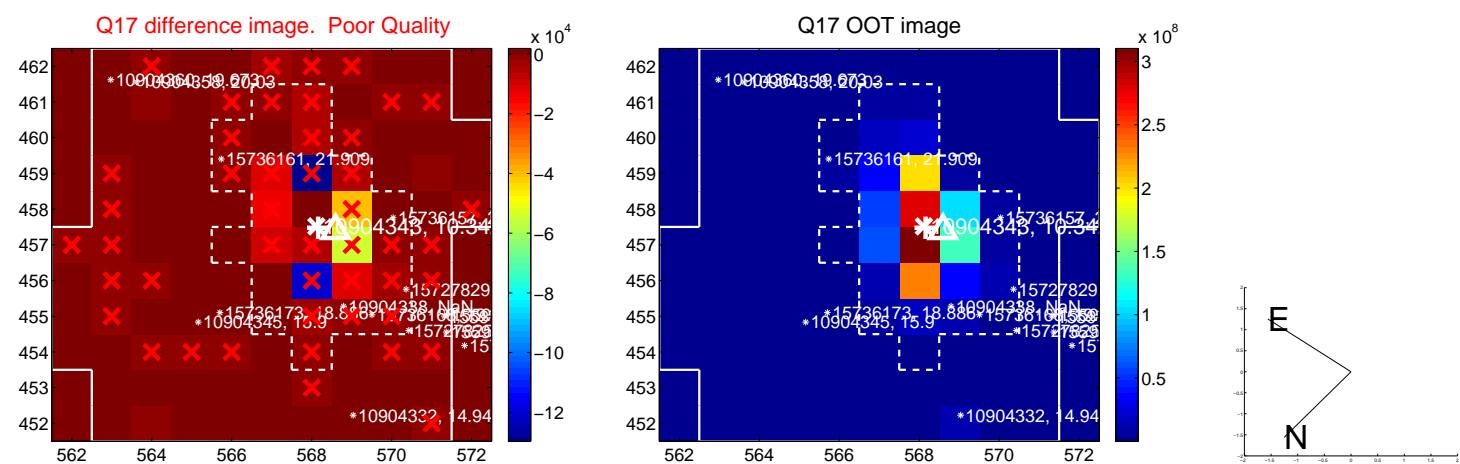
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



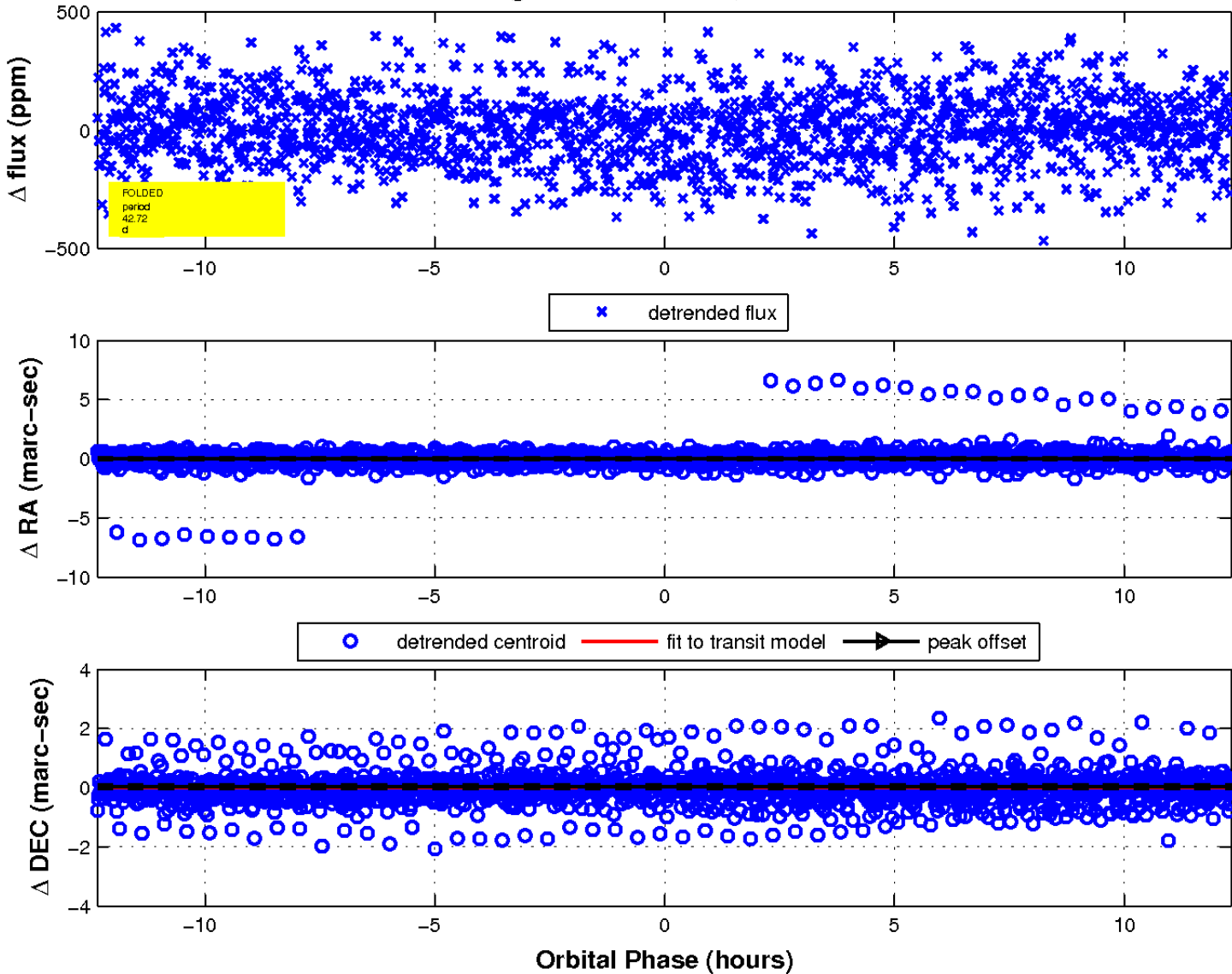




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

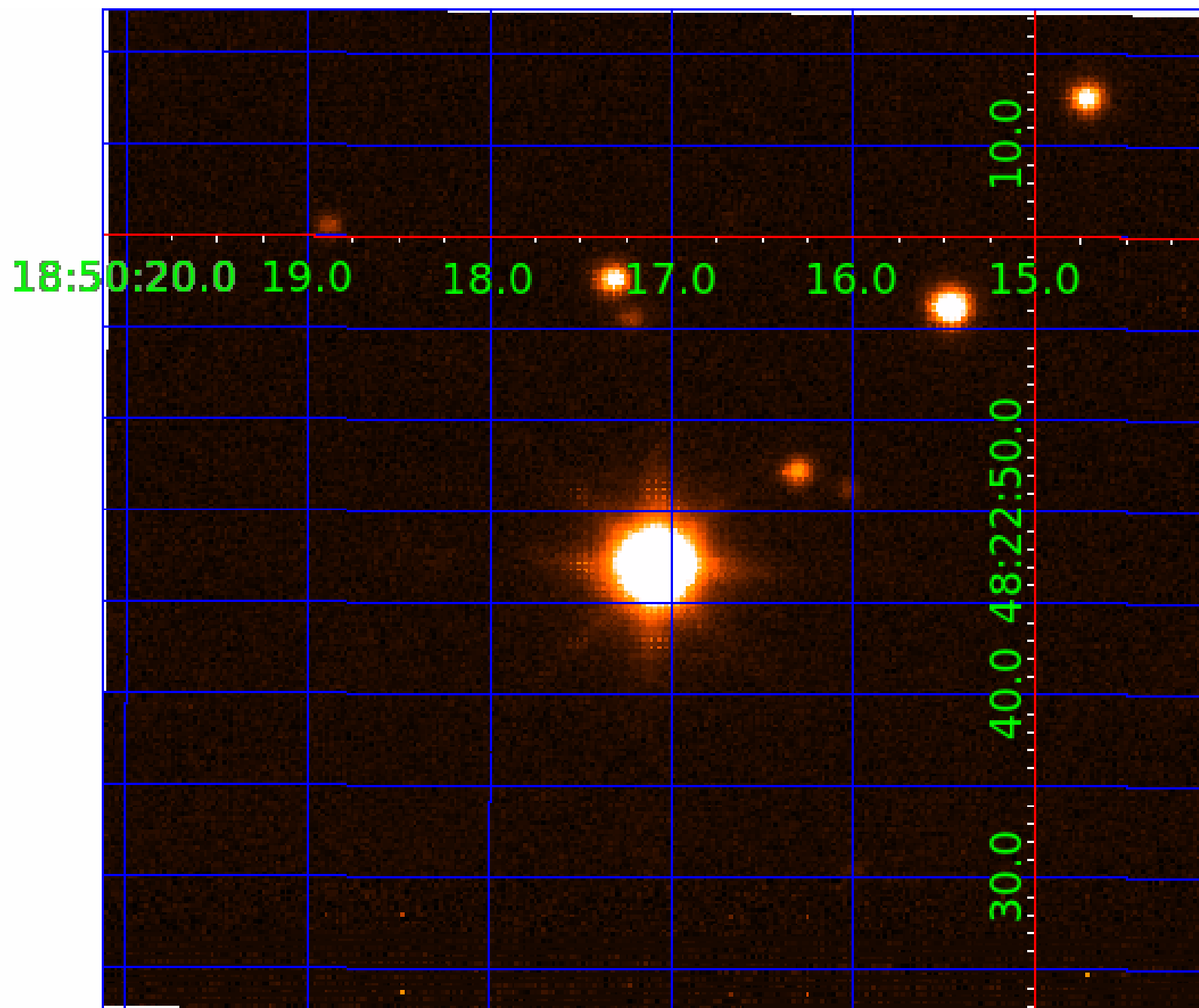


fluxWeightedCentroids, Planet 7 of 9



UKIRT Image

Declination



# KIC 010904343

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010904343-01	OBS	No	3.061235	132.737615	22.8	8.650	8.8	7.4	3.71	6714	2.00	10284.55
010904343-02	OBS	No	1.530349	132.310781	27.8	6.304	10.4	10.0	3.71	6714	2.71	25921.51
010904343-03	OBS	No	139.464948	217.524278	305.9	8.224	9.9	9.5	3.71	6714	8.43	63.21
010904343-04	OBS	No	60.793603	160.060354	212.8	4.472	8.5	9.2	3.71	6714	6.20	191.24
010904343-05	OBS	No	117.464997	228.800718	304.9	2.434	8.6	9.0	3.71	6714	7.37	79.46
010904343-06	OBS	No	34.916667	152.864357	120.7	2.929	8.1	6.3	3.71	6714	4.77	400.56
010904343-07	OBS	No	42.718363	155.839959	157.5	4.114	7.5	8.1	3.71	6714	5.36	306.12
010904343-08	OBS	No	106.321866	134.323578	151.5	6.479	7.6	6.4	3.71	6714	5.19	90.76
010904343-09	OBS	No	33.945926	146.949011	64.7	6.114	7.5	4.0	3.71	6714	3.37	415.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010904343-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
010904343-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010904343-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-09	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

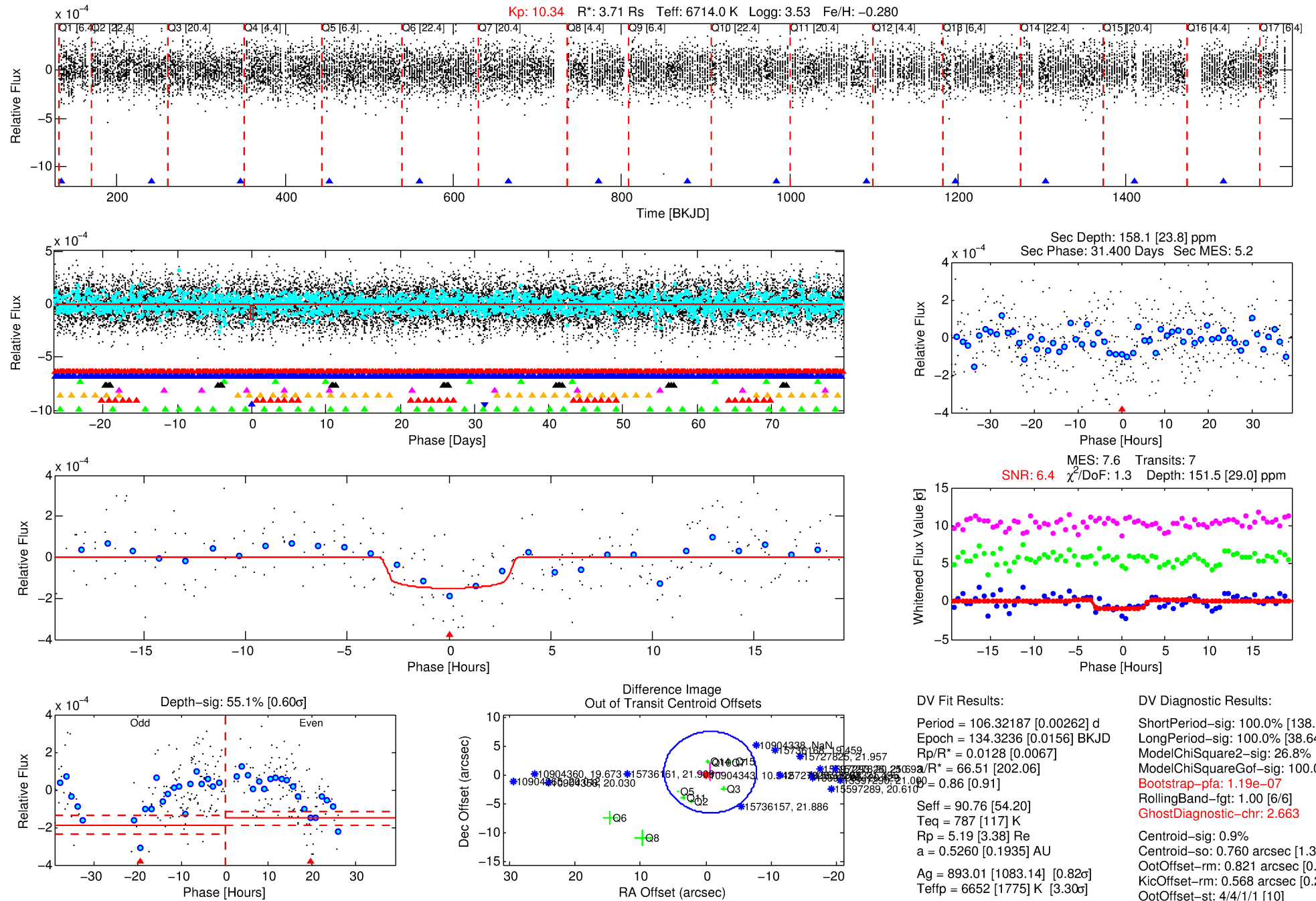
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010904343-08

No Significant Match Found

# DV One-Page Summary

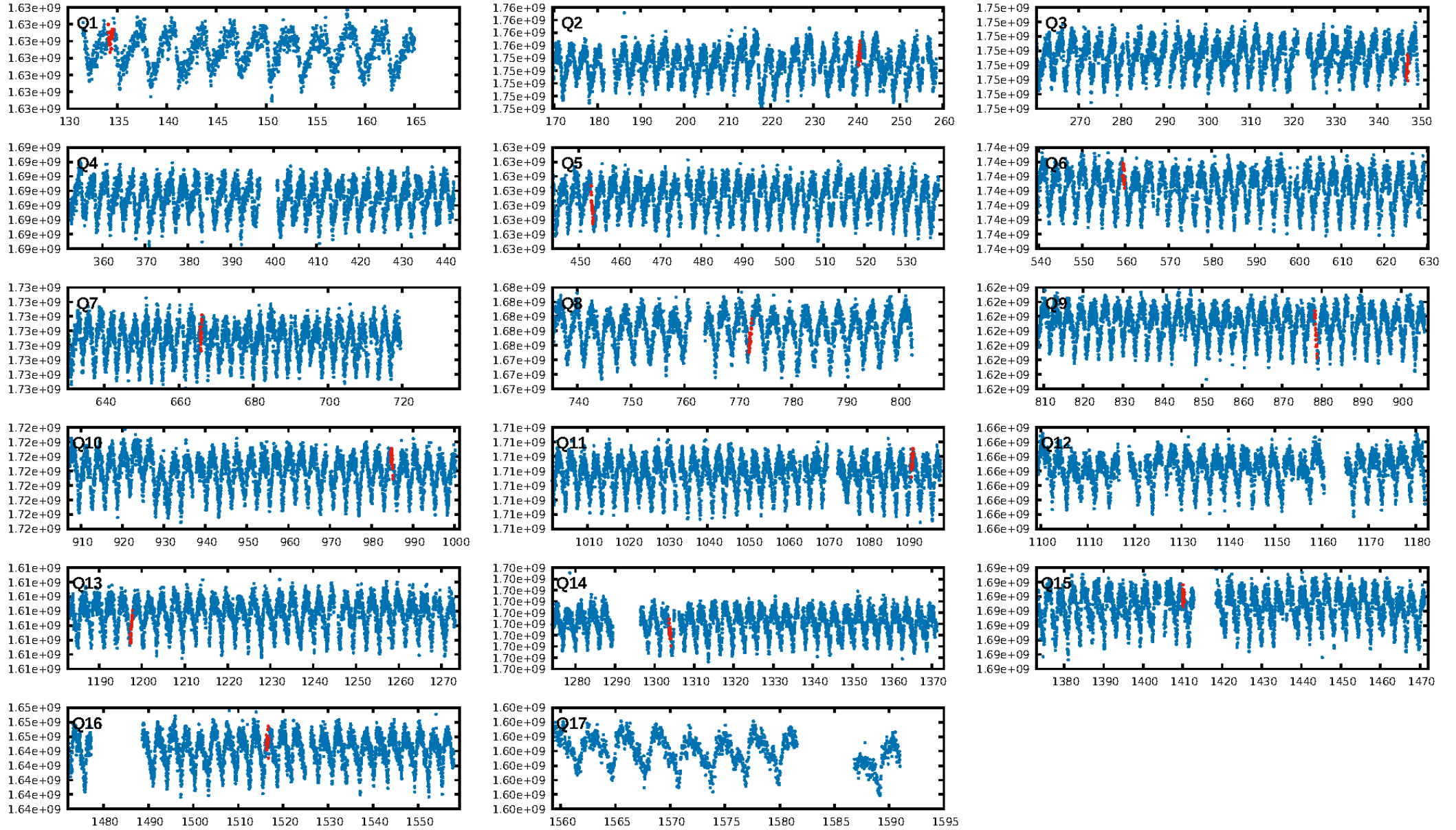
KIC: 10904343 Candidate: 8 of 9 Period: 106.322 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:38:25 Z

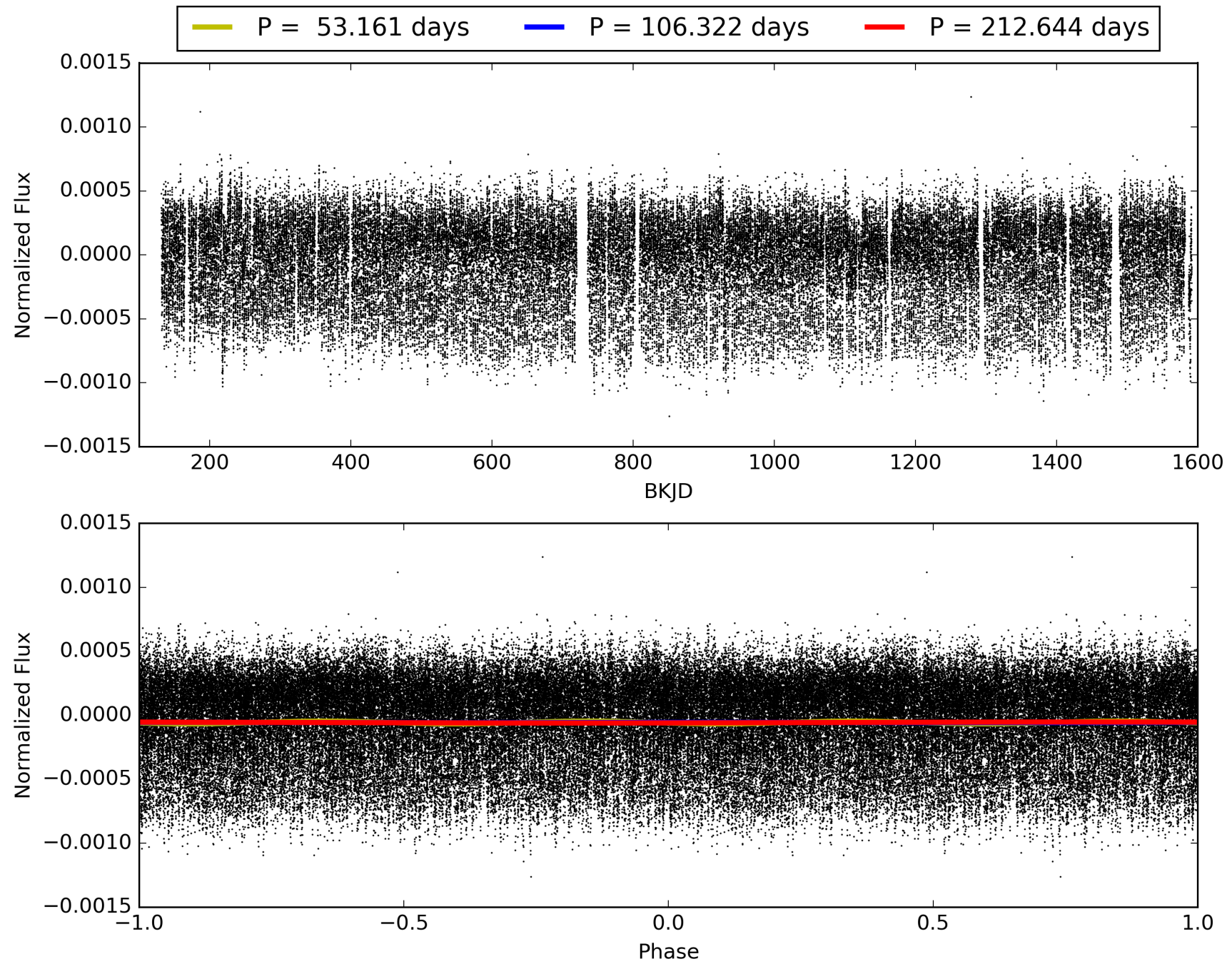
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010904343-08, PDC Light Curves





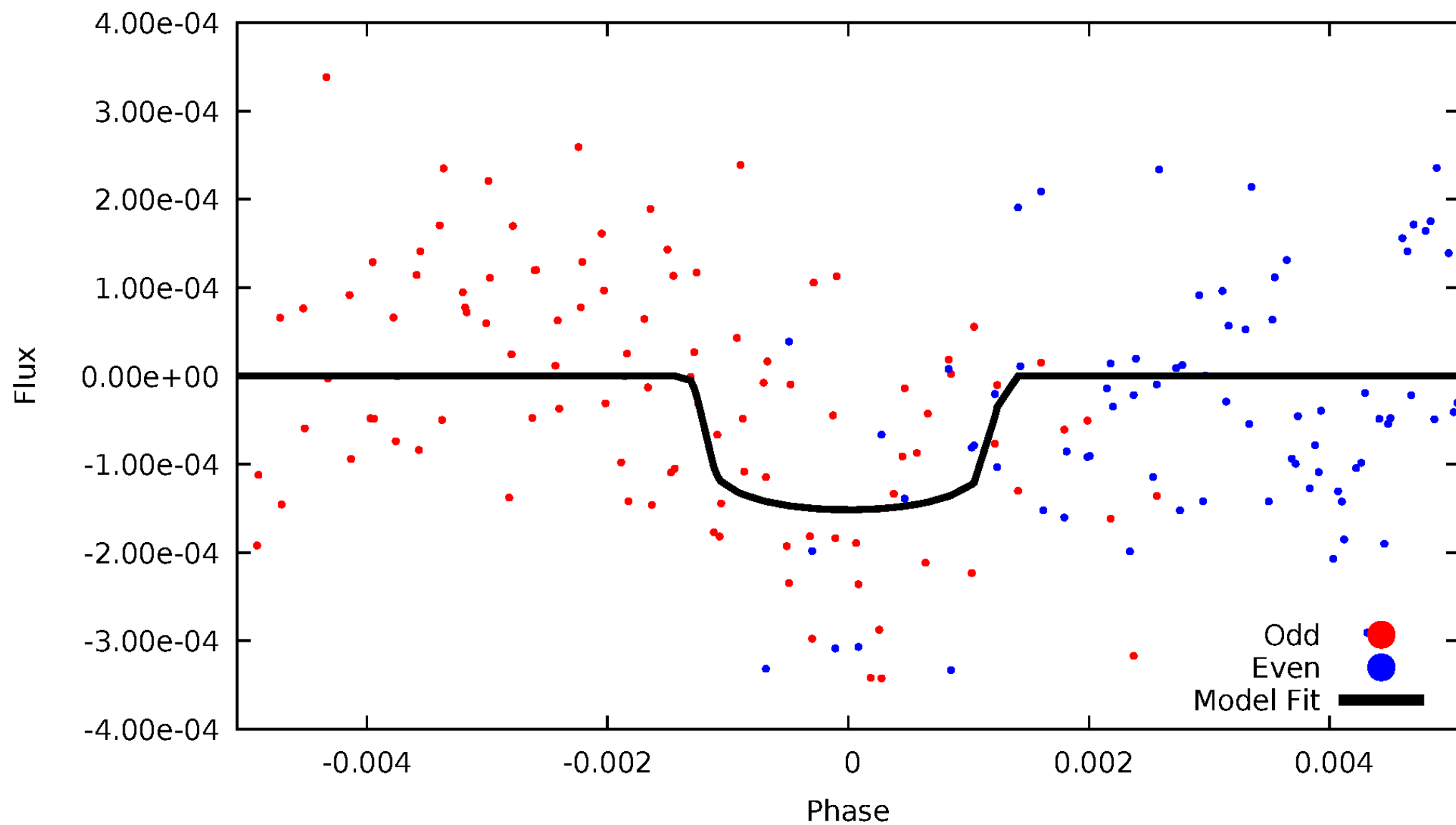
TCE 010904343-08





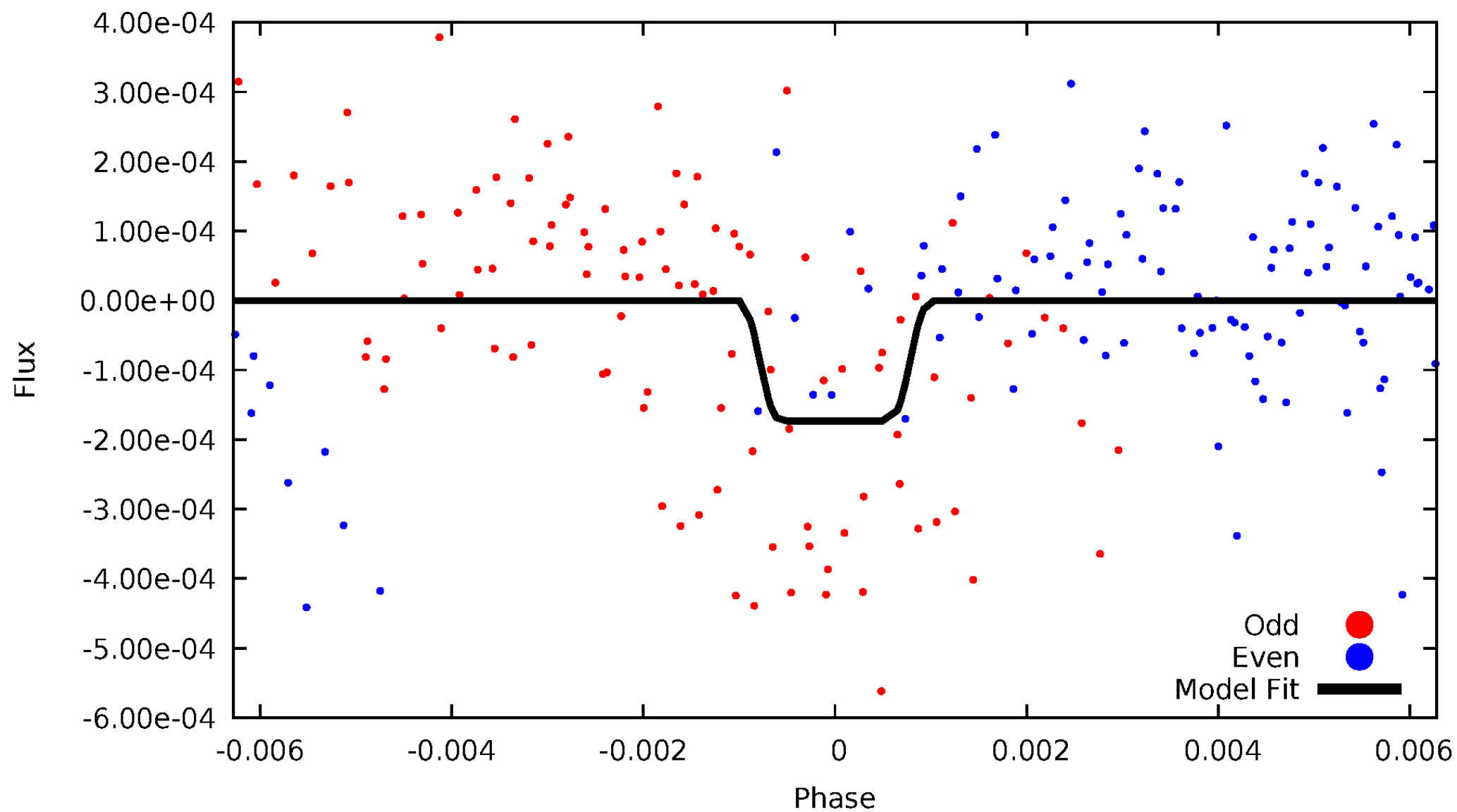
# DV Odd/Even

TCE 010904343-08



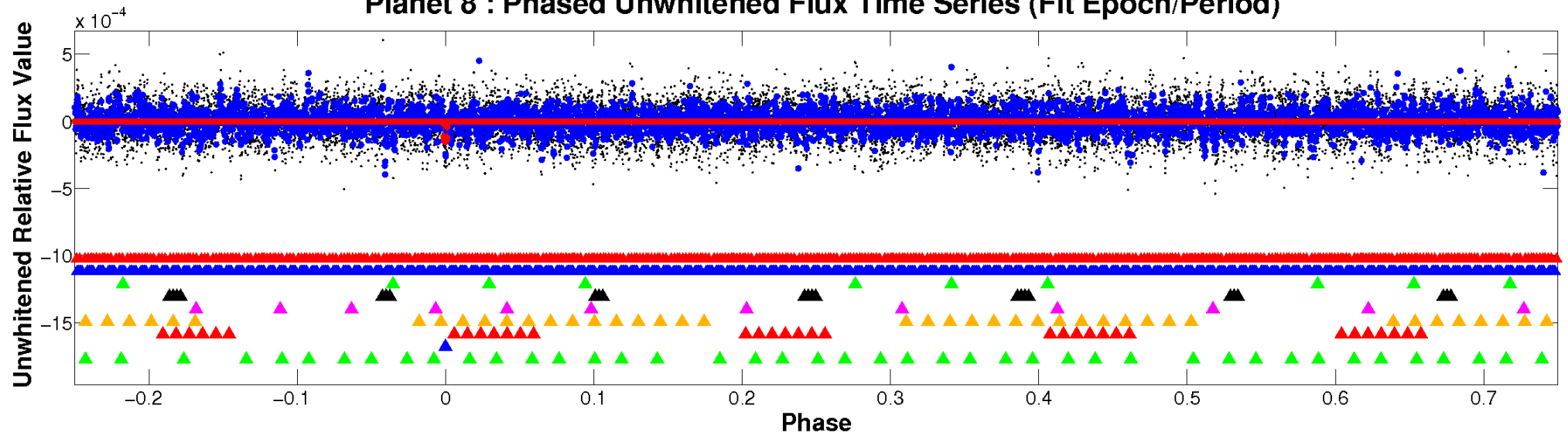
# ALT Odd/Even

TCE 010904343-08

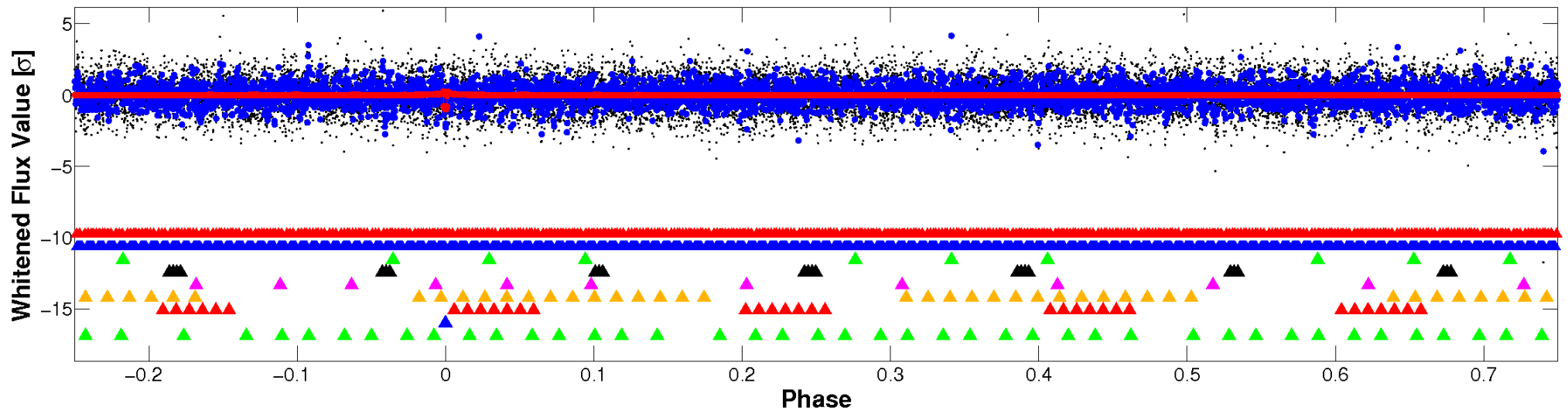


# Non-Whitened Vs. Whitened Light Curve

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

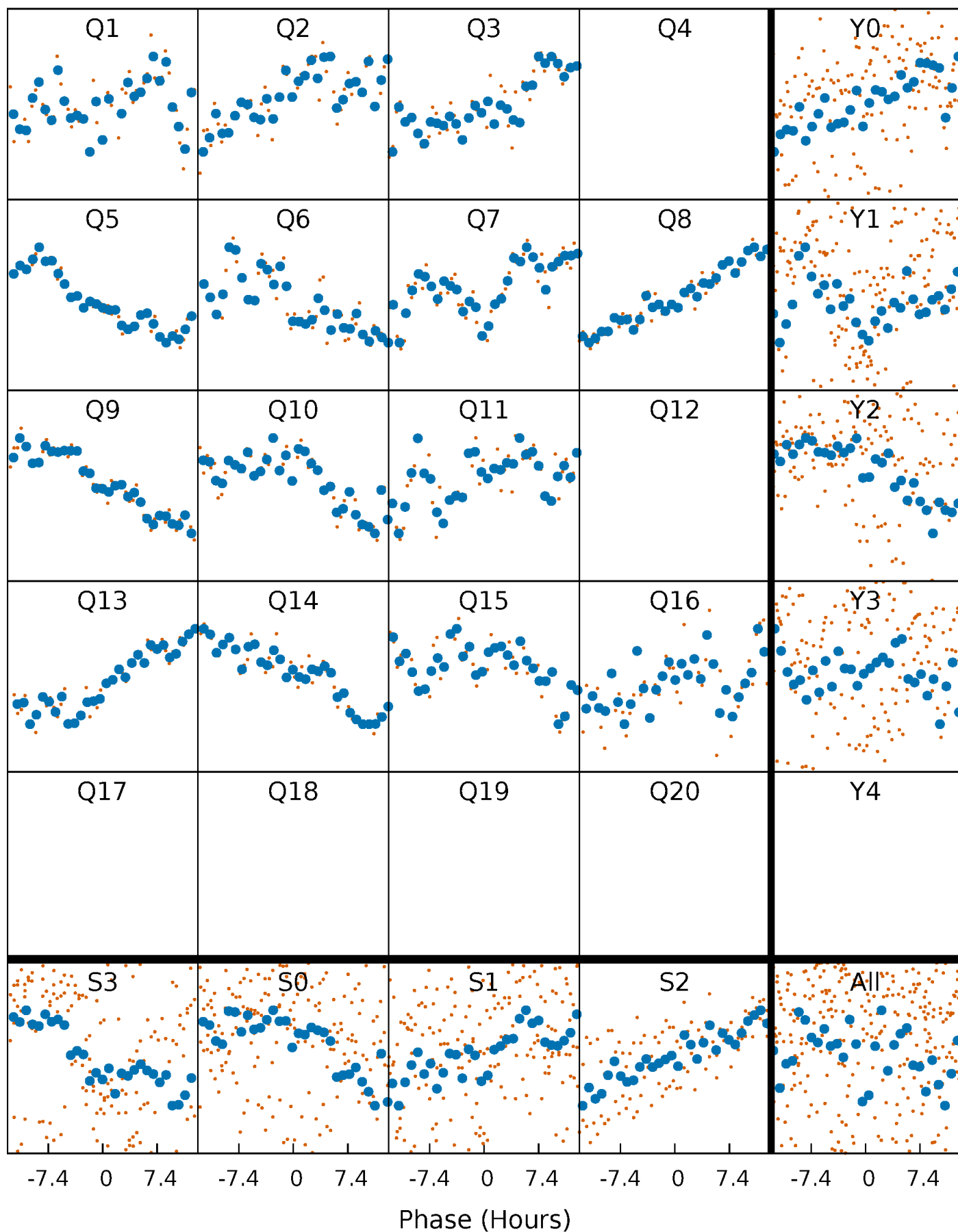


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



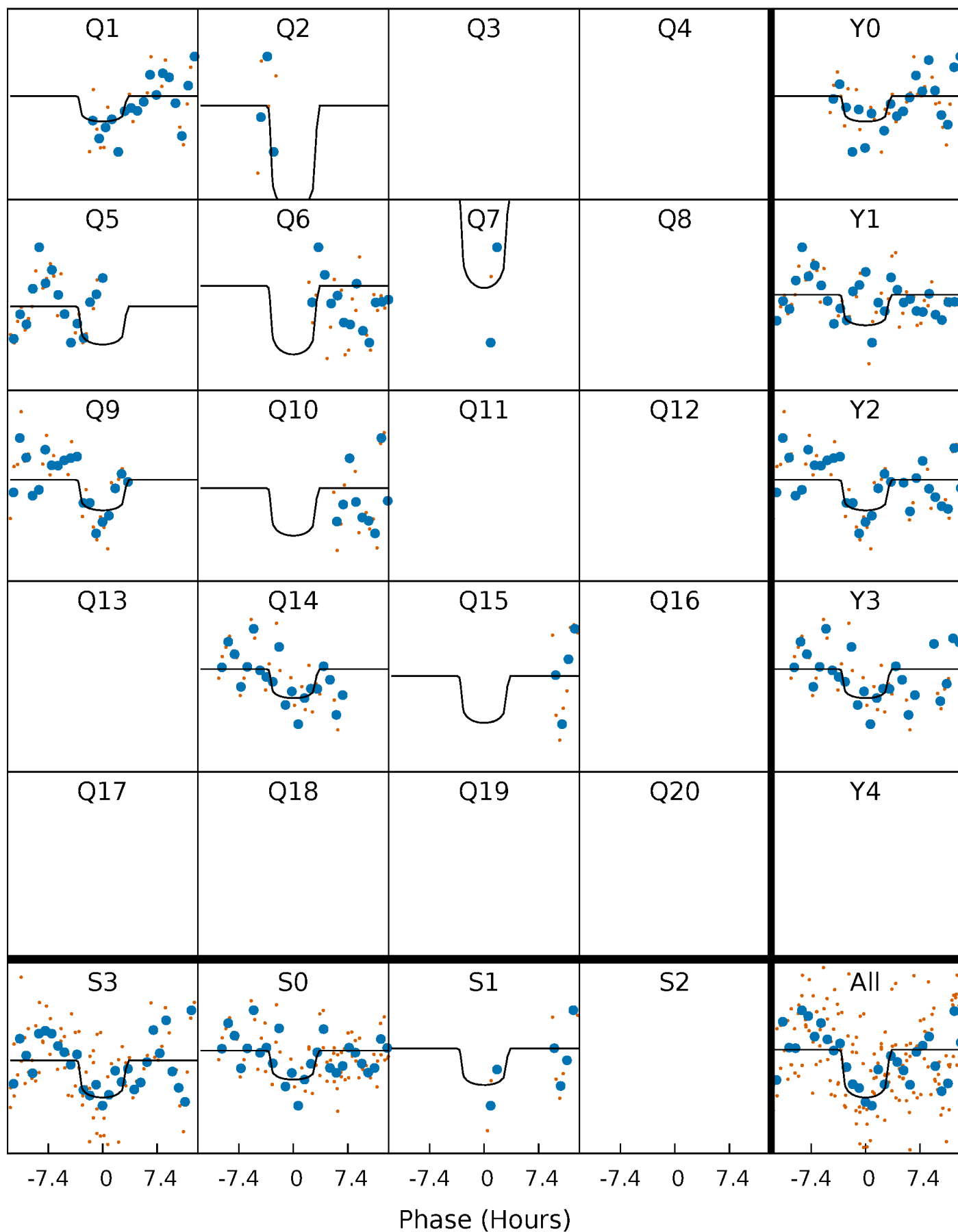
# PDC Quarter-Phased Transit Curves

TCE 010904343-08 P=106.321866 Days  $T_0=134.323578$  (BKJD)



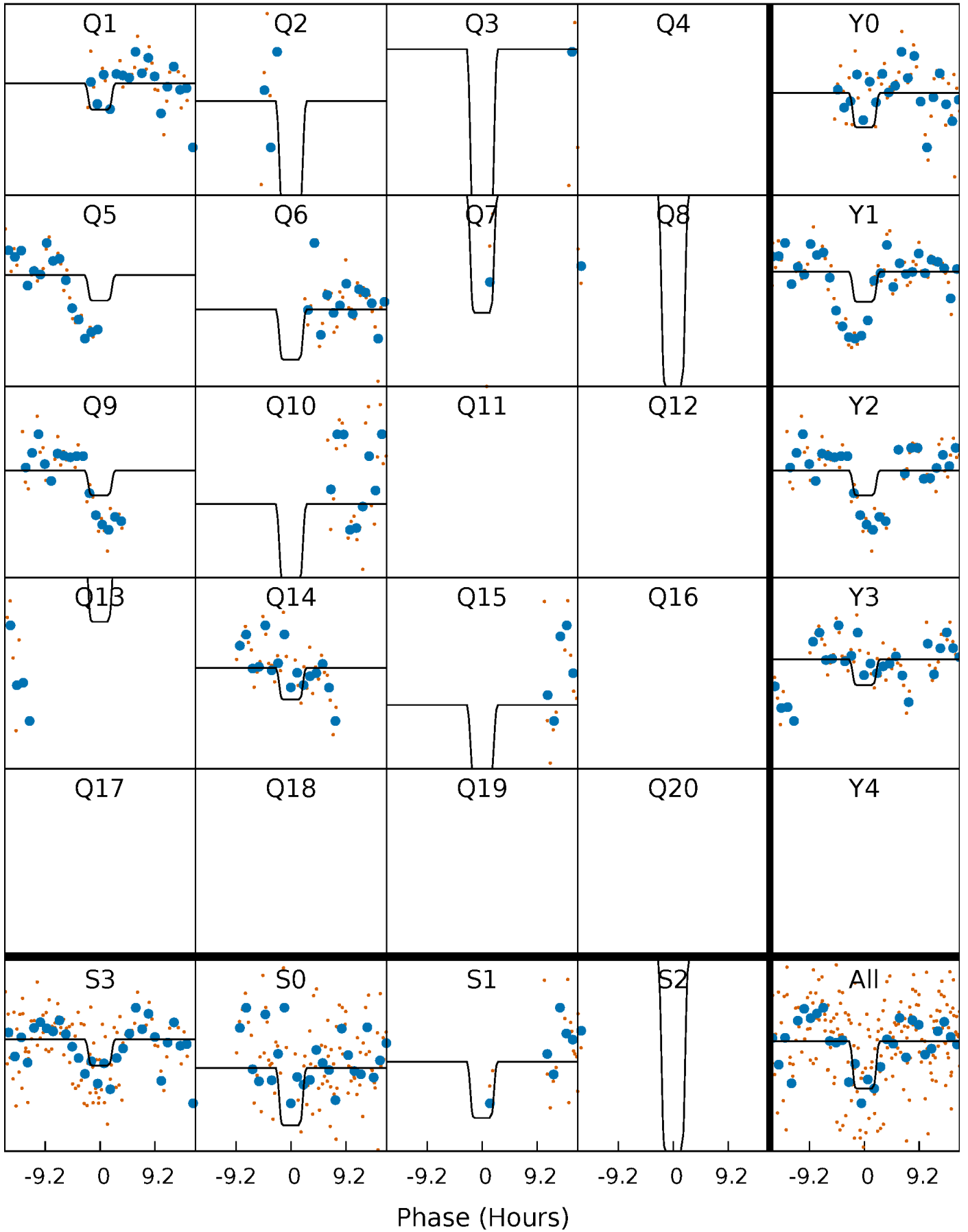
# DV Quarter-Phased Transit Curves

TCE 010904343-08     $P=106.321866$  Days     $T_0=134.323578$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

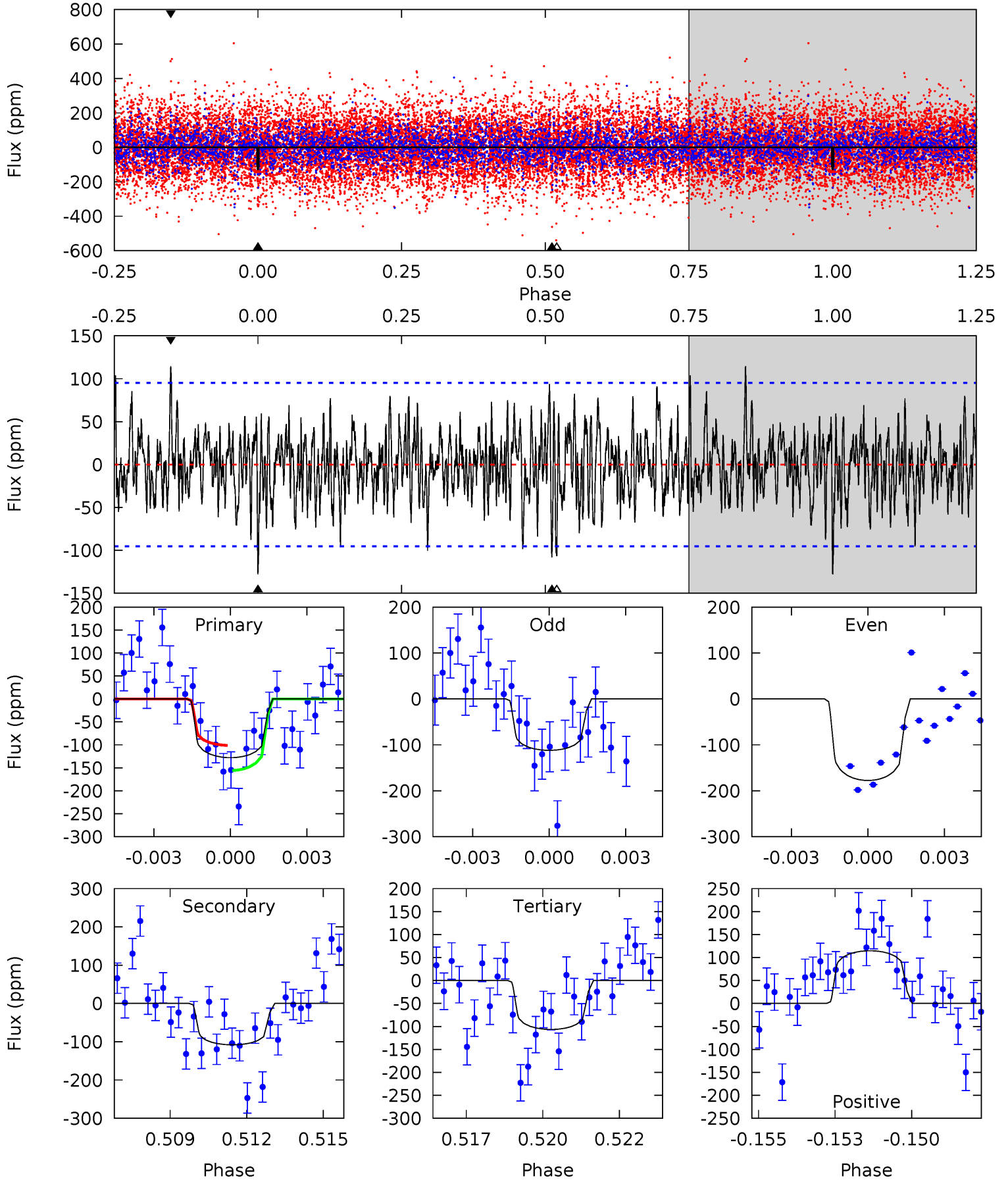
TCE 010904343-08 P=106.316908 Days  $T_0=134.336104$  (BKJD)



# DV Model-Shift Uniqueness Test

010904343-08,  $P = 106.321866$  Days,  $E = 28.001712$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.09	5.99	5.91	6.36	5.28	3.02	1.82	1.18	0.74	0.08	-0.37	1.54	0.96	0.47	1.51

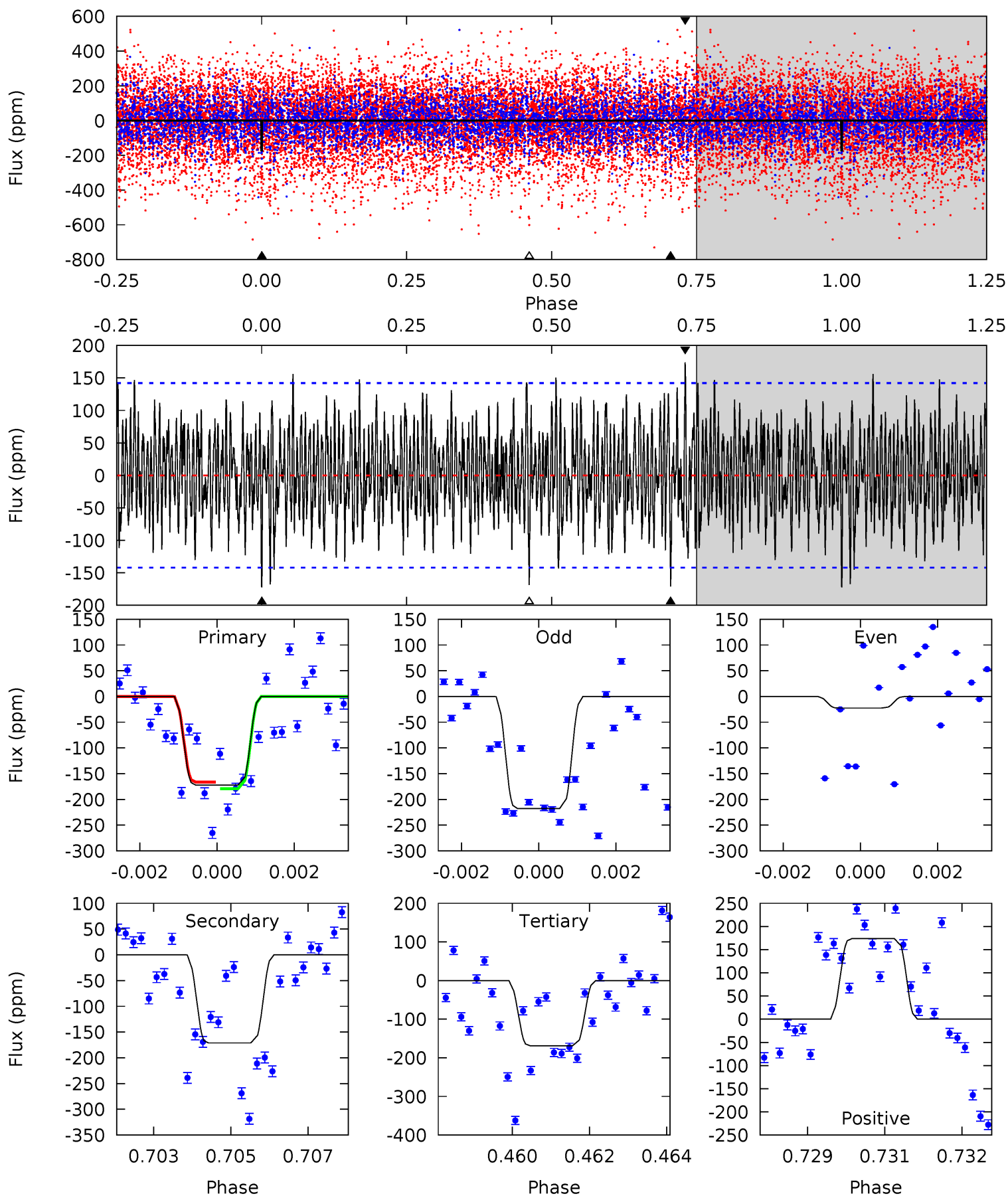




# Alt Model-Shift Uniqueness Test

010904343-08, P = 106.316908 Days, E = 28.019196 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.47	6.44	6.35	6.54	5.34	3.12	2.14	0.12	-0.07	0.09	-0.10	3.23	1.34	0.50	0.24



### Stellar Parameters For KIC 010904343

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6714^{+168}_{-185}$	$3.533^{+0.344}_{-0.086}$	$-0.280^{+0.350}_{-0.250}$	$3.714^{+0.357}_{-1.427}$	$1.717^{+0.212}_{-0.345}$	$0.047^{+0.117}_{-0.013}$
	+3%/-3%	+10%/-2%	+125%/-89%	+10%/-38%	+12%/-20%	+247%/-27%
Source	PHO1	FLK73	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010904343-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-108 \pm 18$	$4.97^{+2.80}_{-2.35}$	$1080^{+53}_{-100}$	$5896^{+2636}_{-981}$	$679^{+1738}_{-418}$
Alt.	$-171 \pm 27$	$5.08^{+2.62}_{-2.37}$	$1082^{+54}_{-98}$	$6615^{+3050}_{-1168}$	$1037^{+2681}_{-617}$

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

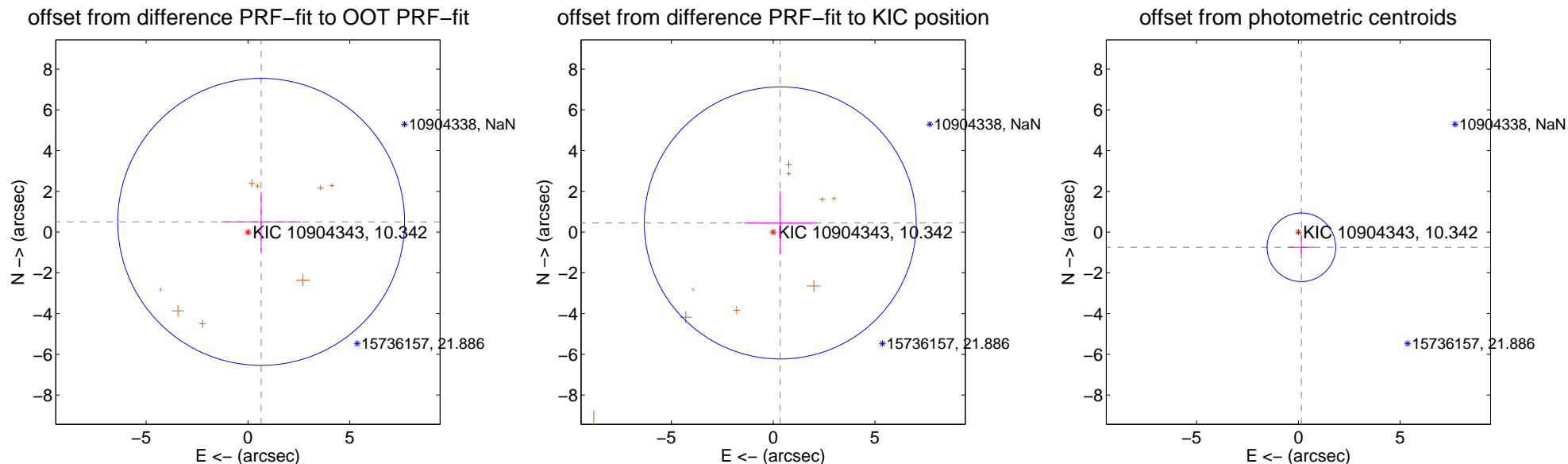
## DV Centroid Data

Supplemental centroid analysis for 010904343-08. **Kepler magnitude: 10.34.** Transit SNR 6.42

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

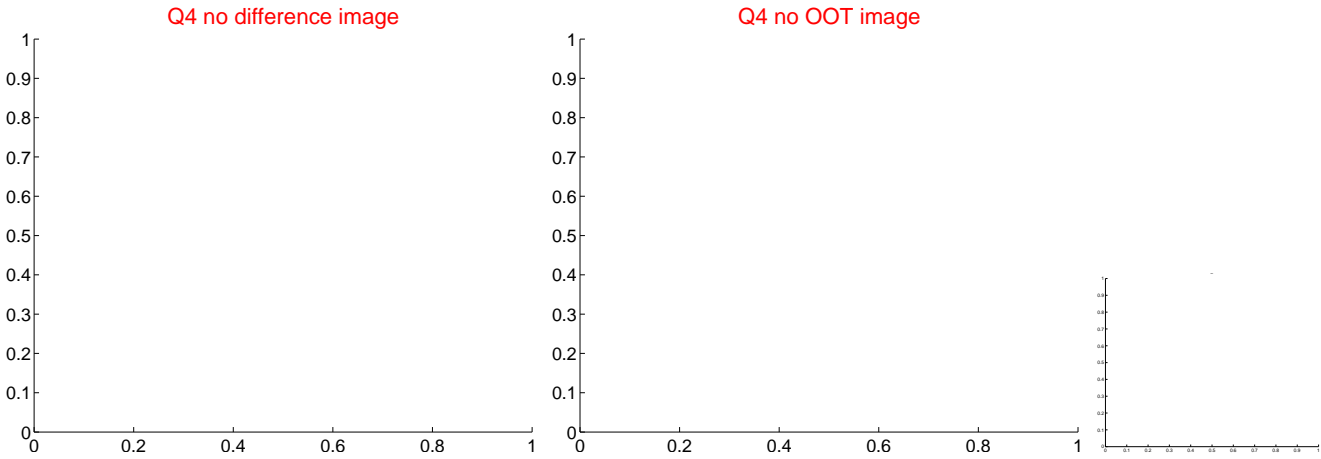
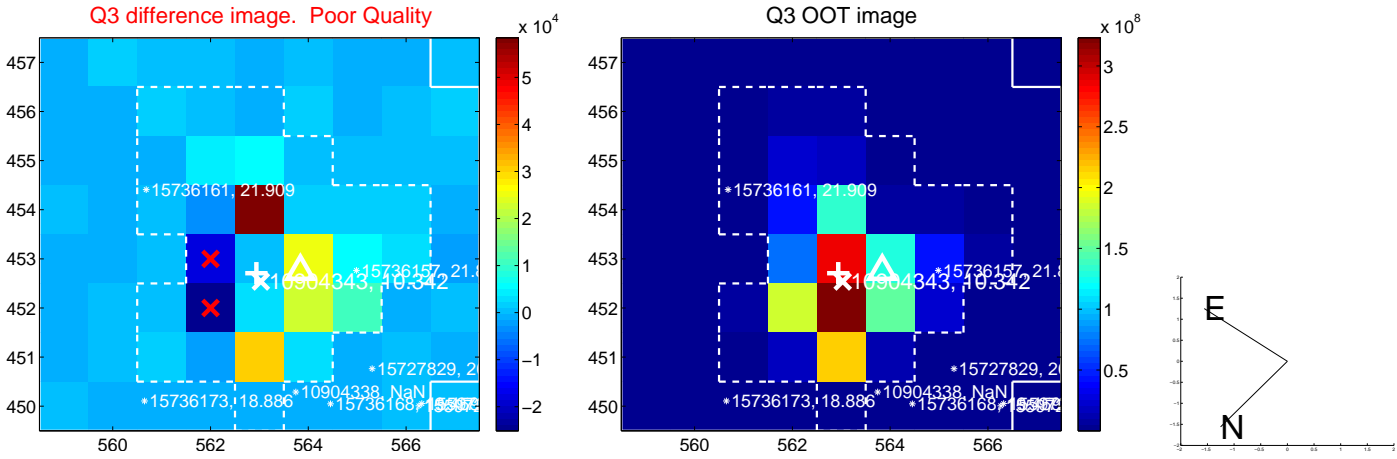
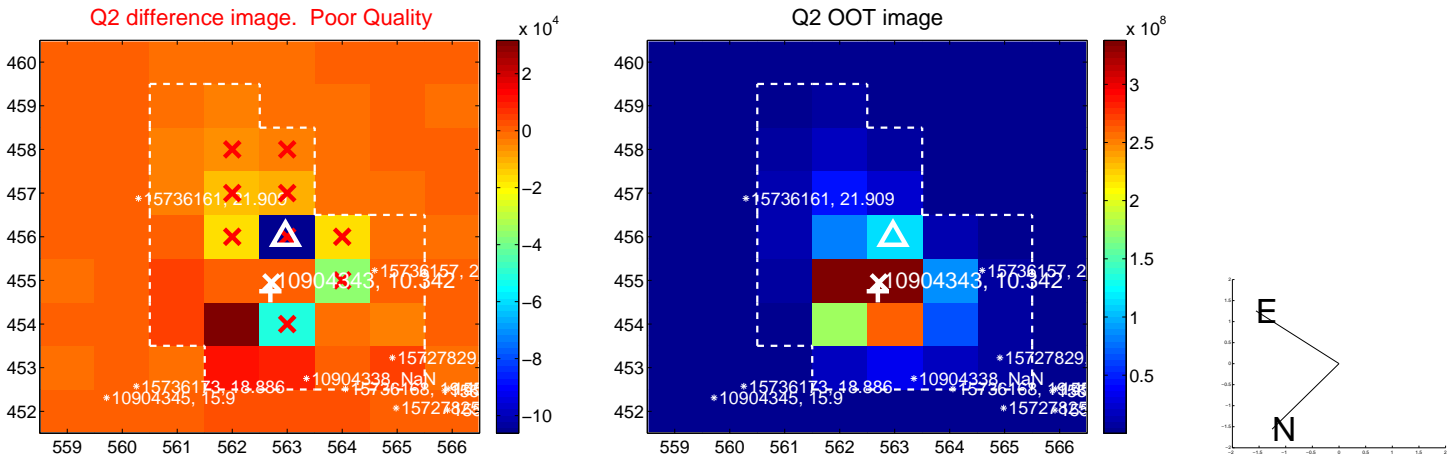
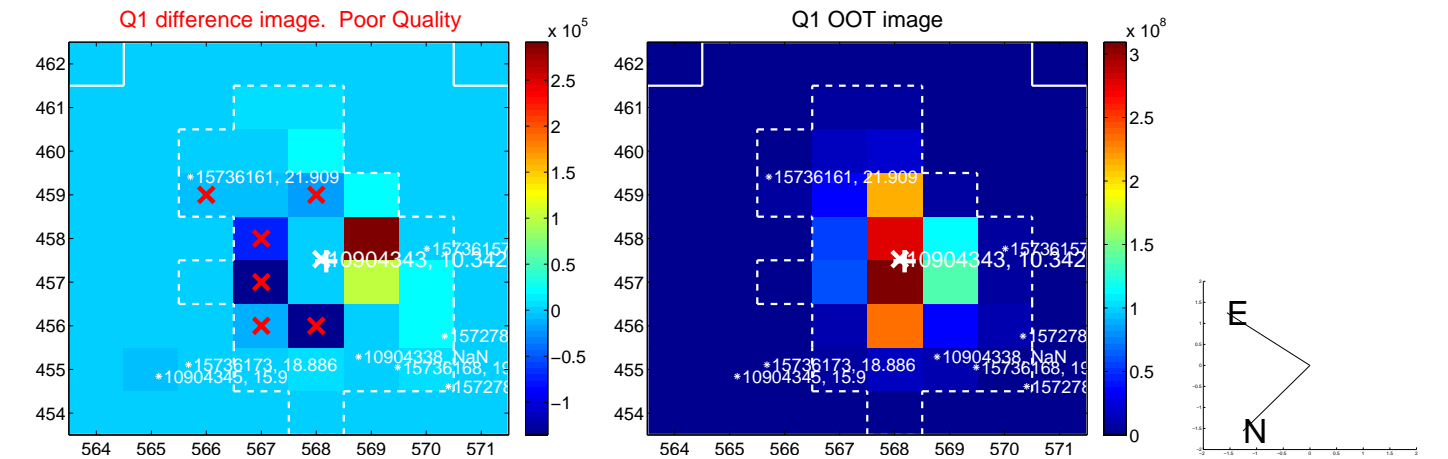
The direct PRF centroid is offset from the target star catalog position by about 1.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.821 \pm 2.348$	0.35	$-0.649 \pm 1.958$	$0.503 \pm 1.476$
PRF-fit source offset from KIC position	$0.568 \pm 2.226$	0.26	$-0.348 \pm 1.778$	$0.449 \pm 1.549$
photometric centroid source offset	$0.76 \pm 0.56$	1.35	$-0.15 \pm 0.63$	$-0.75 \pm 0.56$

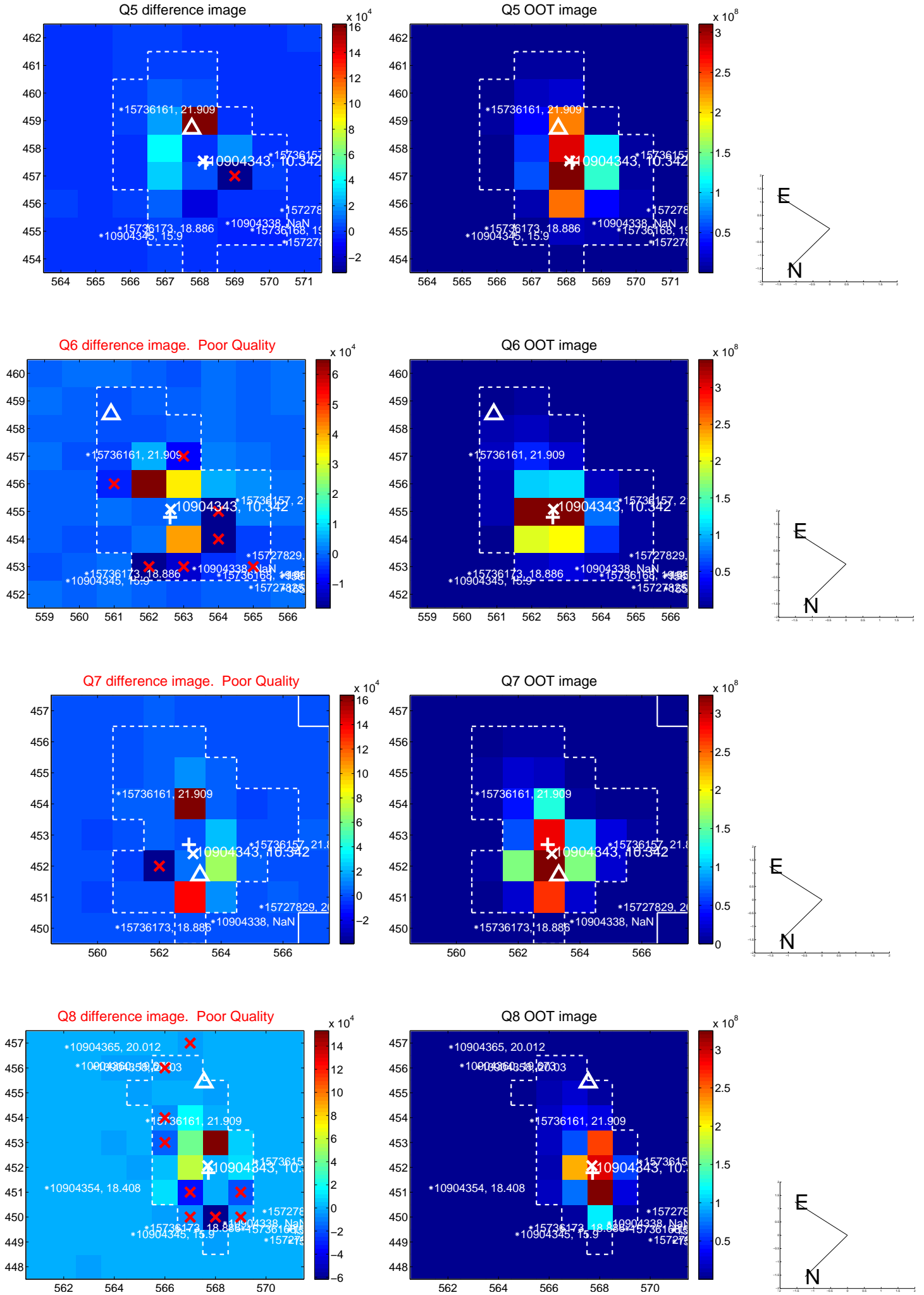


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

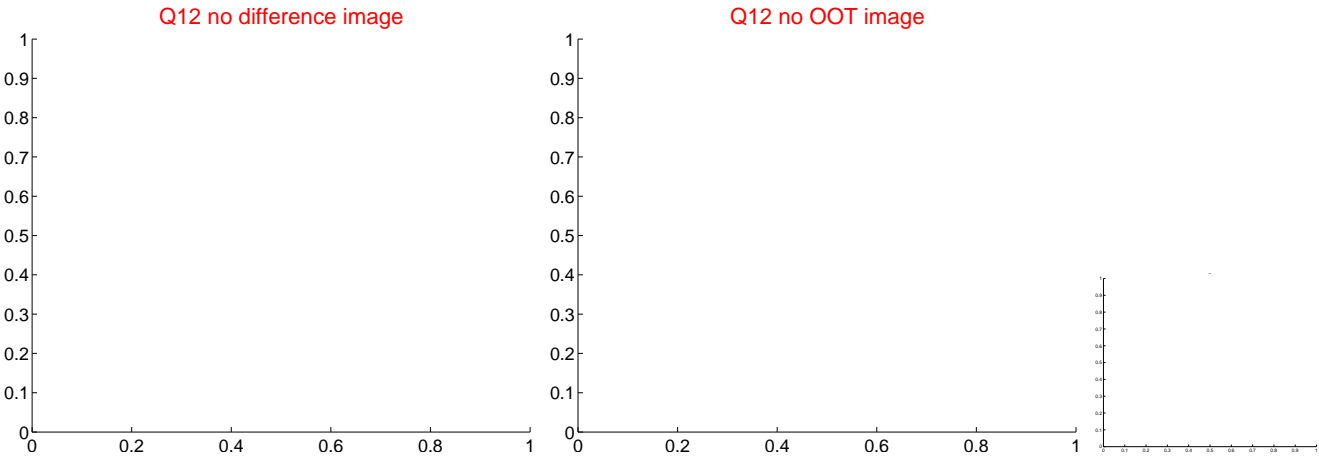
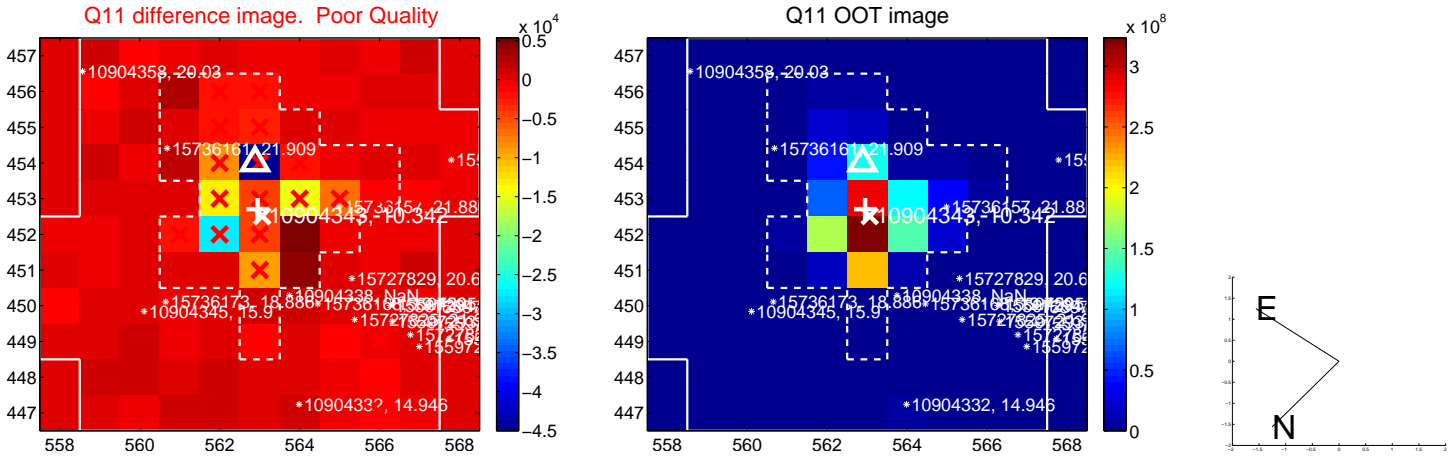
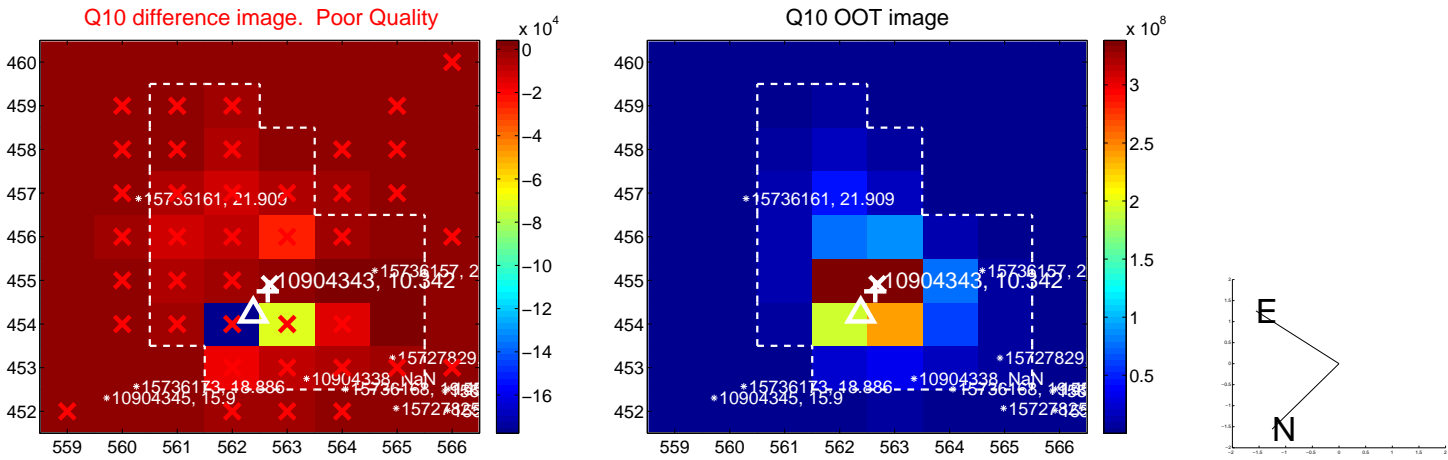
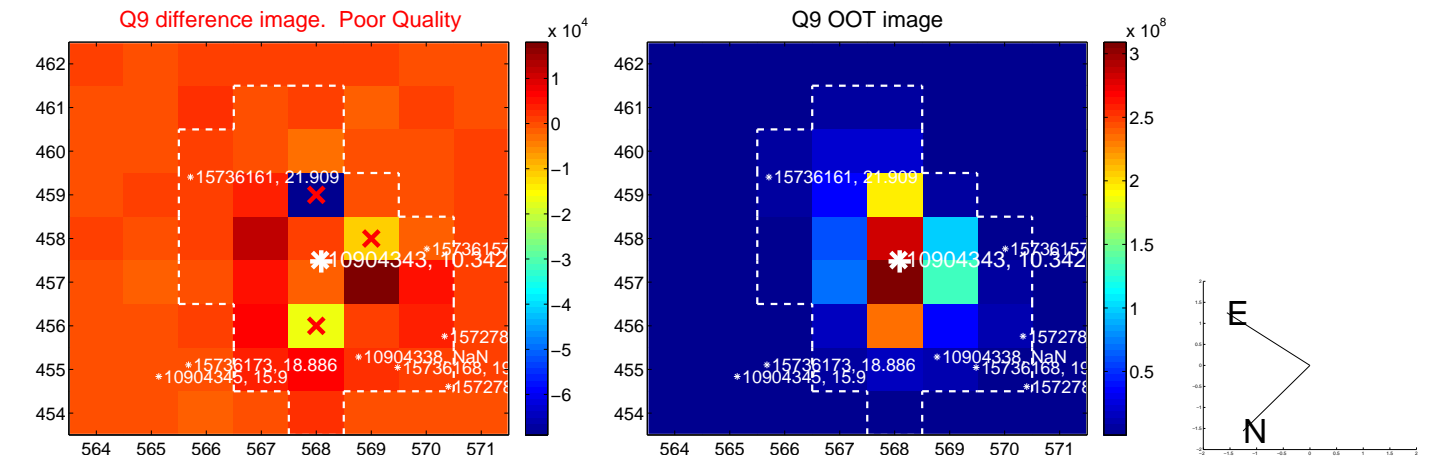
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

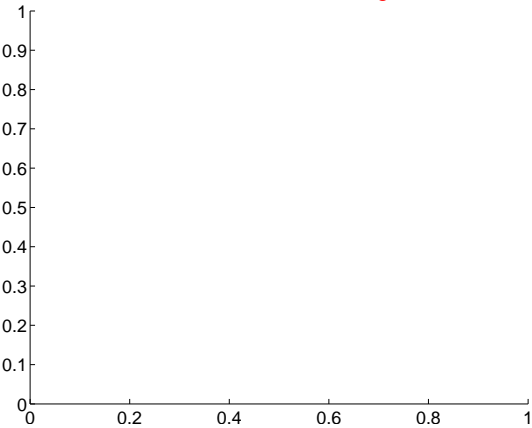


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

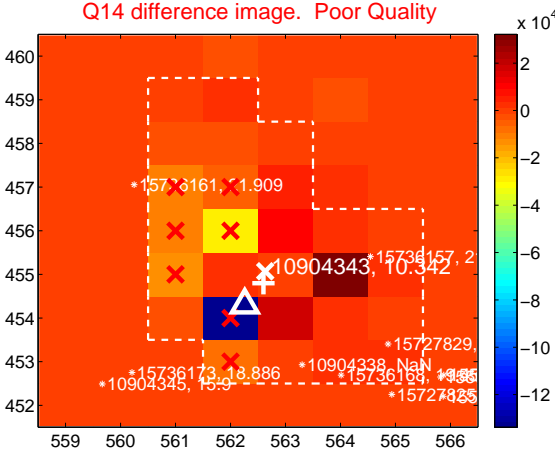
Q13 no difference image



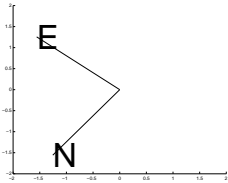
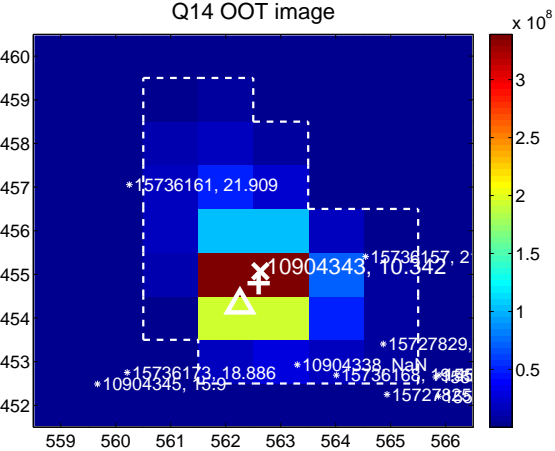
Q13 no OOT image



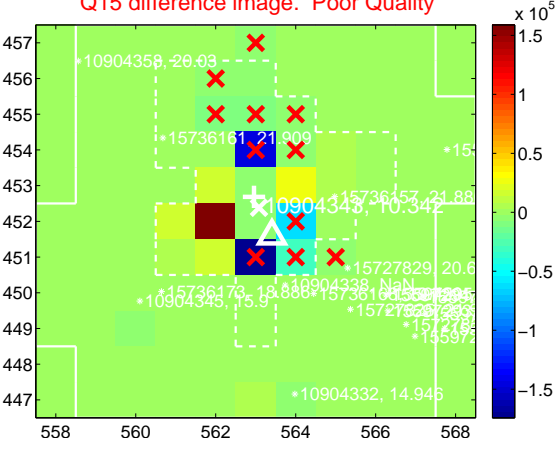
Q14 difference image. Poor Quality



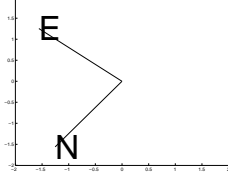
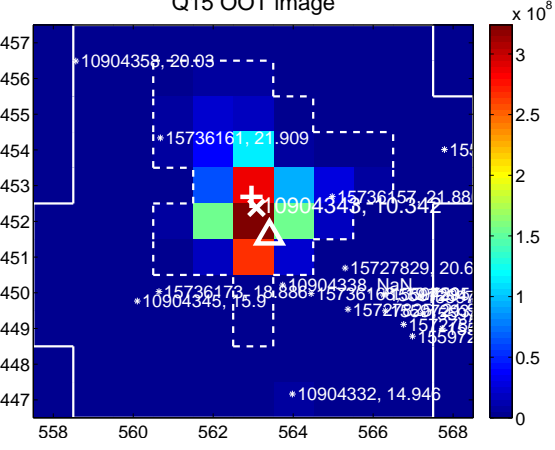
Q14 OOT image



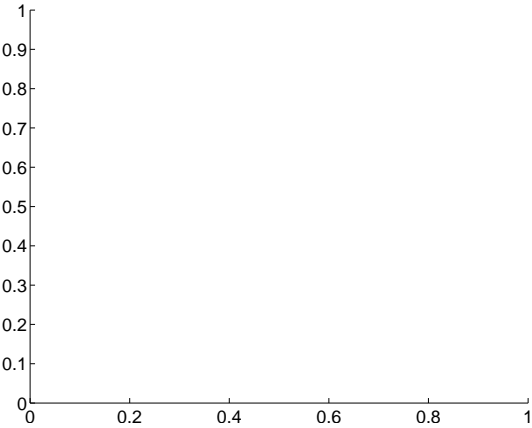
Q15 difference image. Poor Quality



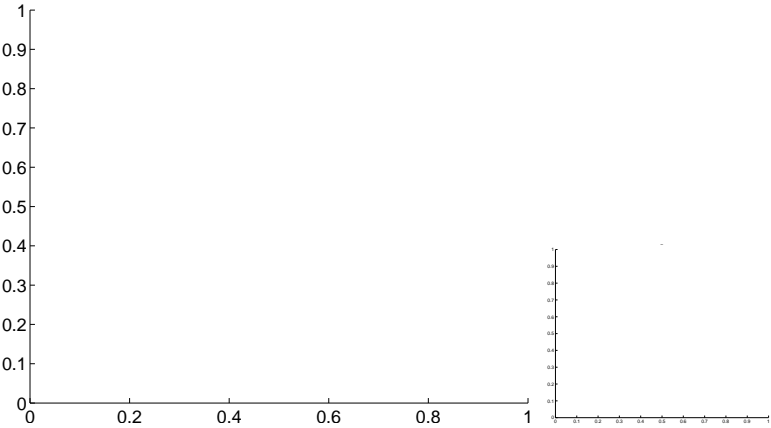
Q15 OOT image



Q16 no difference image

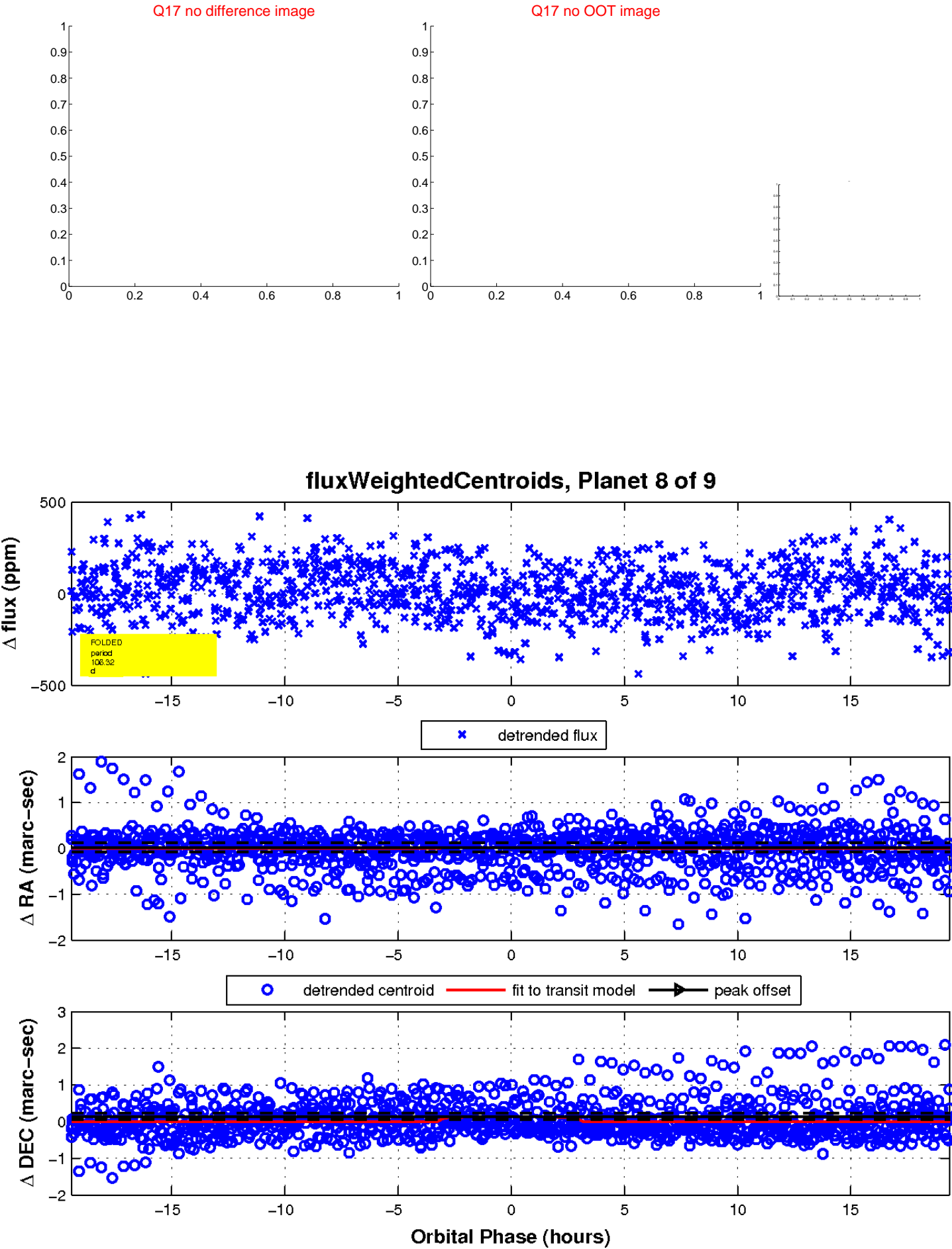


Q16 no OOT image



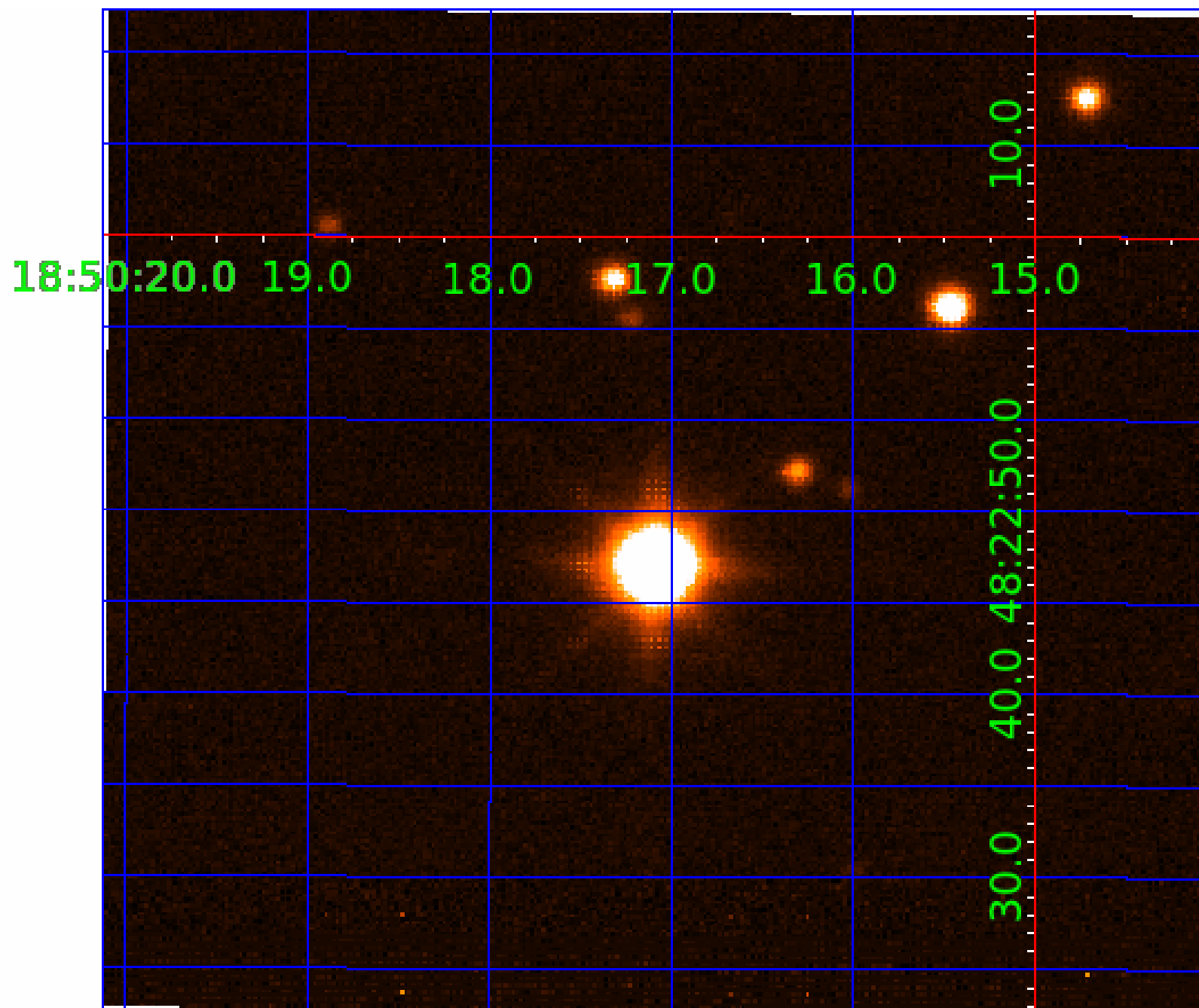


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010904343

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010904343-01	OBS	No	3.061235	132.737615	22.8	8.650	8.8	7.4	3.71	6714	2.00	10284.55
010904343-02	OBS	No	1.530349	132.310781	27.8	6.304	10.4	10.0	3.71	6714	2.71	25921.51
010904343-03	OBS	No	139.464948	217.524278	305.9	8.224	9.9	9.5	3.71	6714	8.43	63.21
010904343-04	OBS	No	60.793603	160.060354	212.8	4.472	8.5	9.2	3.71	6714	6.20	191.24
010904343-05	OBS	No	117.464997	228.800718	304.9	2.434	8.6	9.0	3.71	6714	7.37	79.46
010904343-06	OBS	No	34.916667	152.864357	120.7	2.929	8.1	6.3	3.71	6714	4.77	400.56
010904343-07	OBS	No	42.718363	155.839959	157.5	4.114	7.5	8.1	3.71	6714	5.36	306.12
010904343-08	OBS	No	106.321866	134.323578	151.5	6.479	7.6	6.4	3.71	6714	5.19	90.76
010904343-09	OBS	No	33.945926	146.949011	64.7	6.114	7.5	4.0	3.71	6714	3.37	415.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010904343-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
010904343-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010904343-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010904343-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010904343-09	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

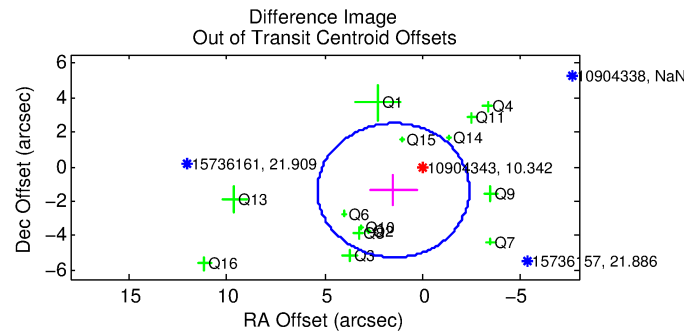
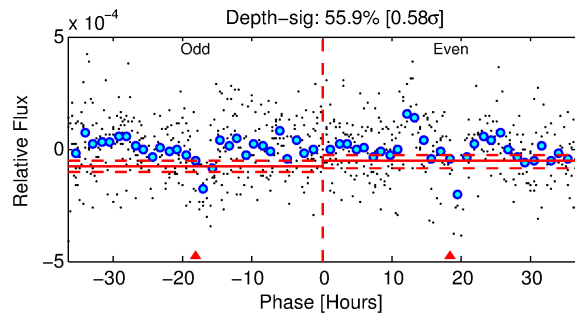
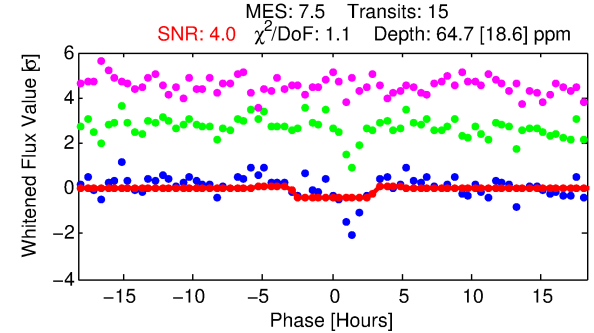
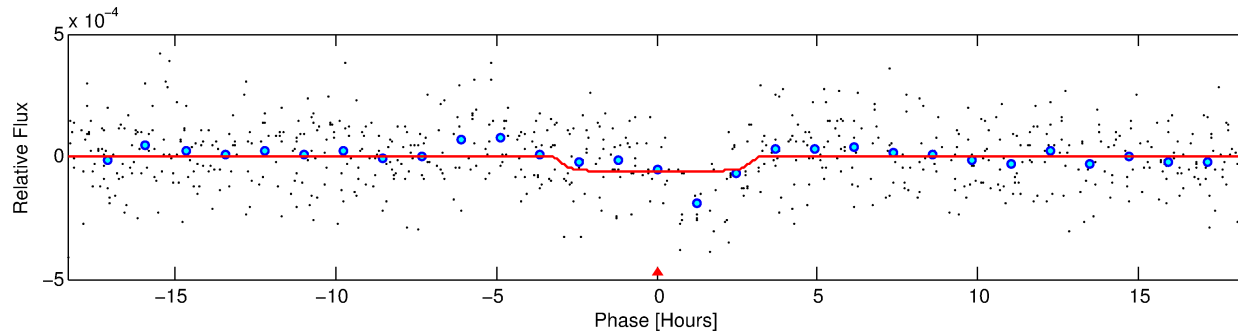
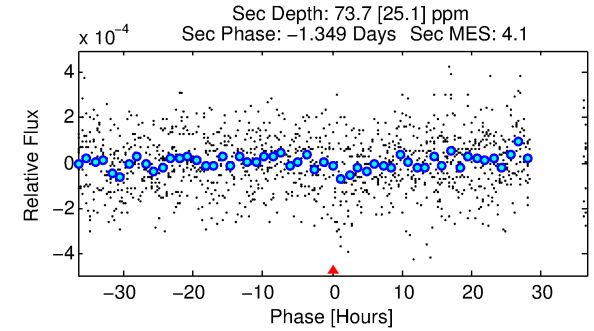
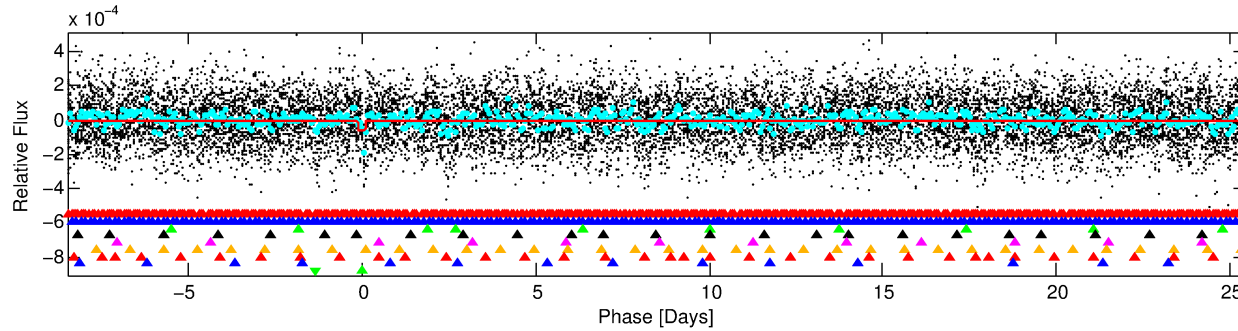
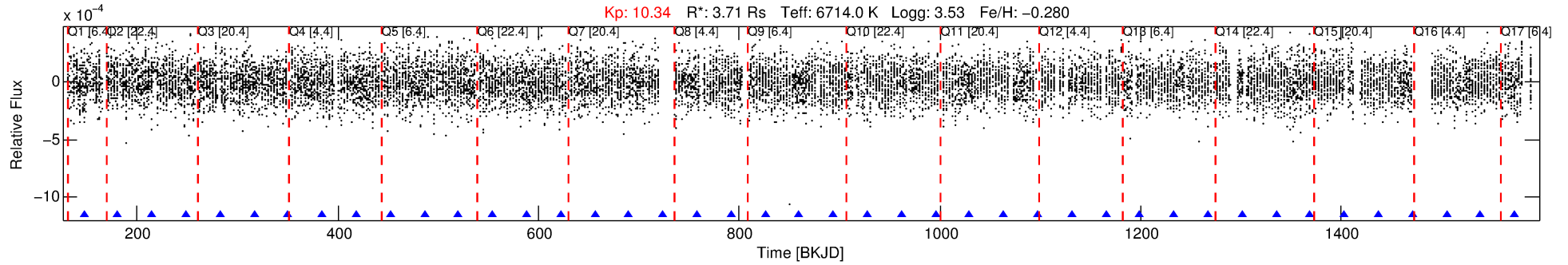
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010904343-09

No Significant Match Found

# DV One-Page Summary

KIC: 10904343 Candidate: 9 of 9 Period: 33.946 d



## DV Fit Results:

Period = 33.94593 [0.00097] d  
Epoch = 146.9490 [0.0227] BKJD  
 $R_p/R^*$  = 0.0083 [0.0049]  
 $a/R^*$  = 22.99 [76.37]  
 $b$  = 0.85 [1.09]  
 $S_{\text{eff}}$  = 415.91 [248.37]  
 $T_{\text{eq}}$  = 1152 [172] K  
 $R_p$  = 3.37 [2.37]  $R_e$   
 $a$  = 0.2457 [0.0904] AU  
 $A_g$  = 215.45 [293.18] [0.73σ]  
 $T_{\text{effp}}$  = 6821 [2102] K [2.69σ]

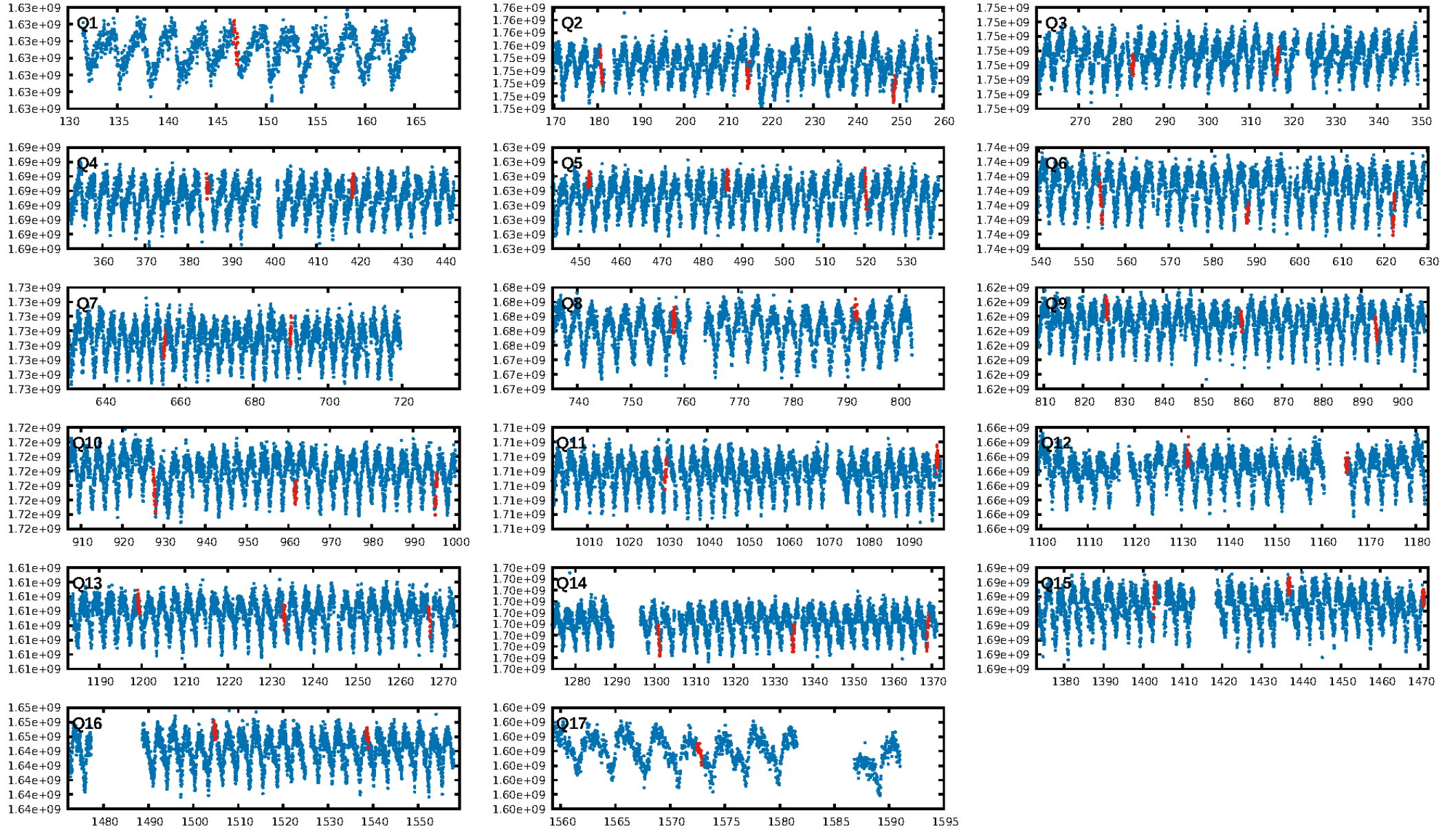
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [69.97σ]  
LongPeriod-sig: 99.9% [3.44σ]  
ModelChiSquare2-sig: 4.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.60e-07  
RollingBand-fgt: 1.00 [13/13]  
GhostDiagnostic-chr: 1.472  
Centroid-sig: 0.0%  
Centroid-so: 1.791 arcsec [2.34σ]  
OotOffset-rm: 2.021 arcsec [1.56σ]  
KicOffset-rm: 1.780 arcsec [1.32σ]  
OotOffset-st: 4/4/3/3 [14]  
KicOffset-st: 4/4/3/3 [14]  
DiffImageQuality-fgm: 0.29 [4/14]  
DiffImageOverlap-fno: 0.18 [3/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:38:29 Z

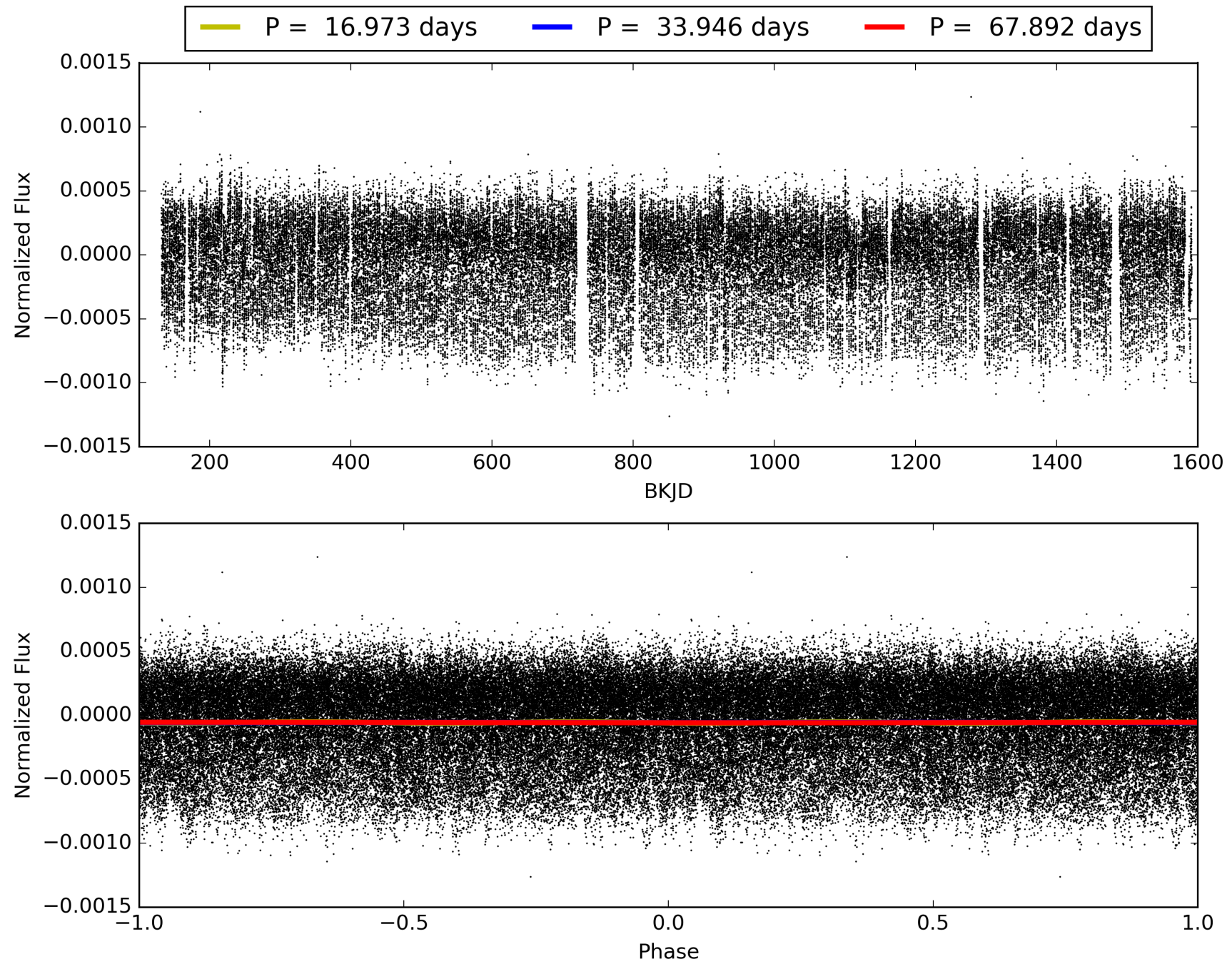
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010904343-09, PDC Light Curves



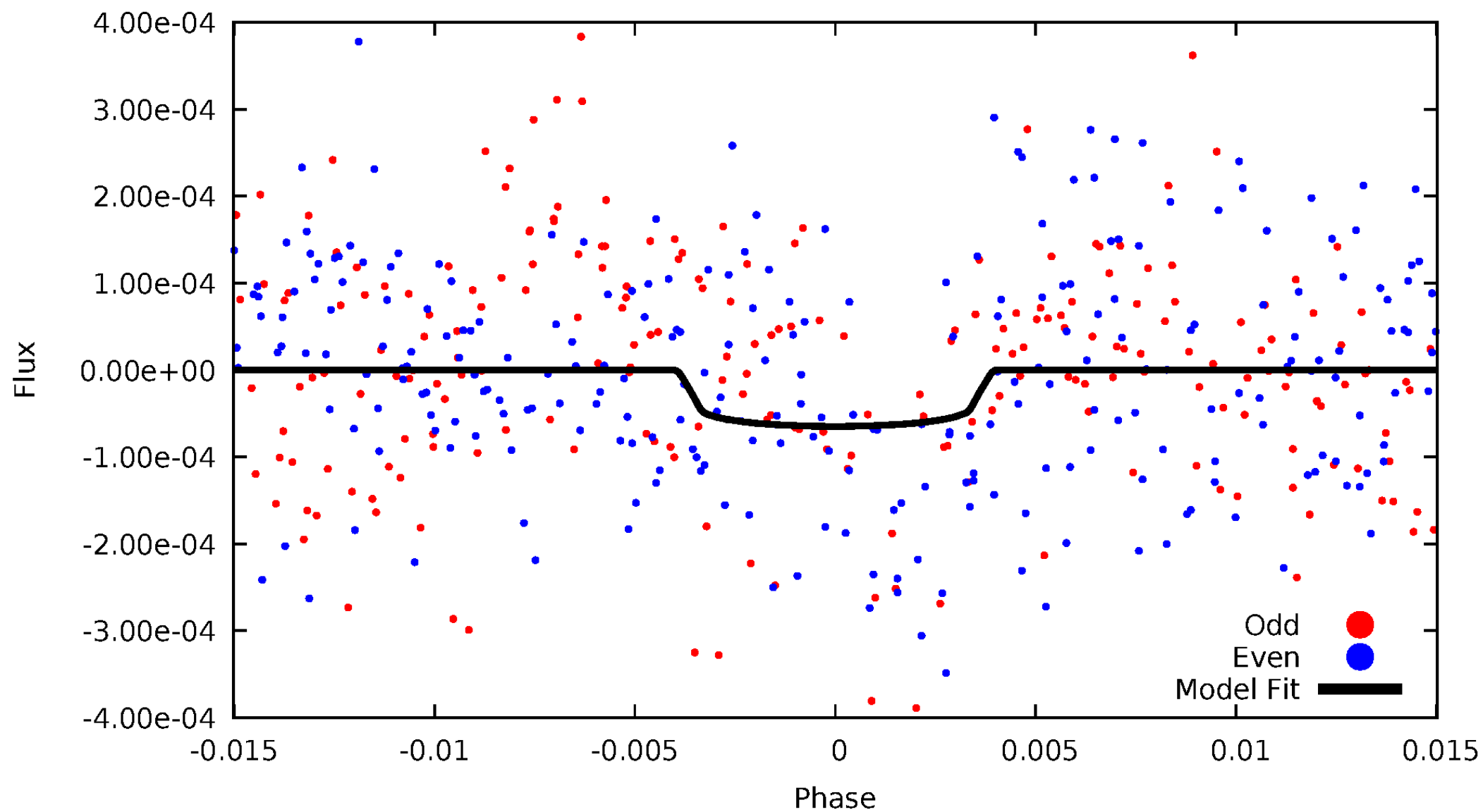


TCE 010904343-09



# DV Odd/Even

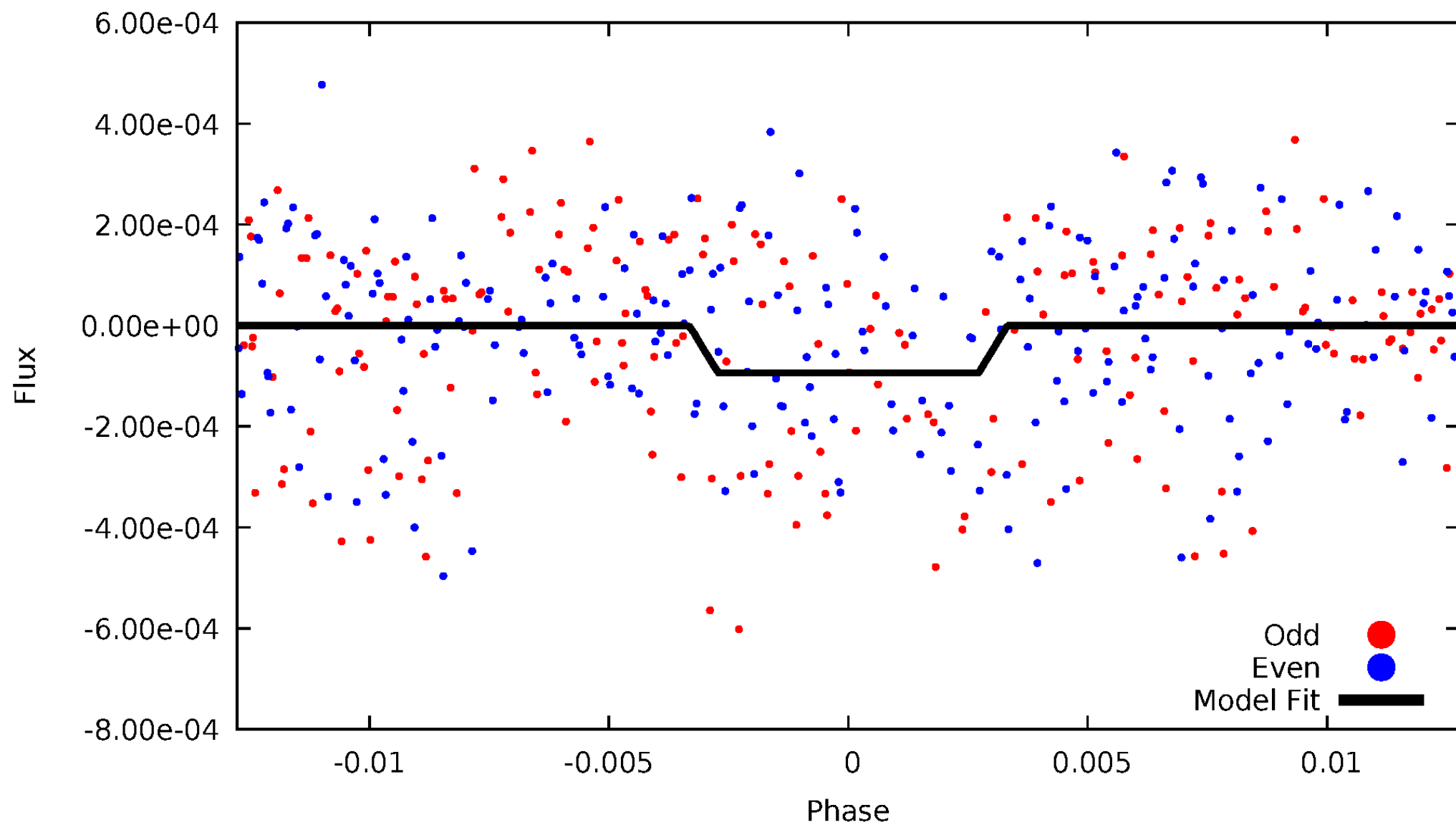
TCE 010904343-09



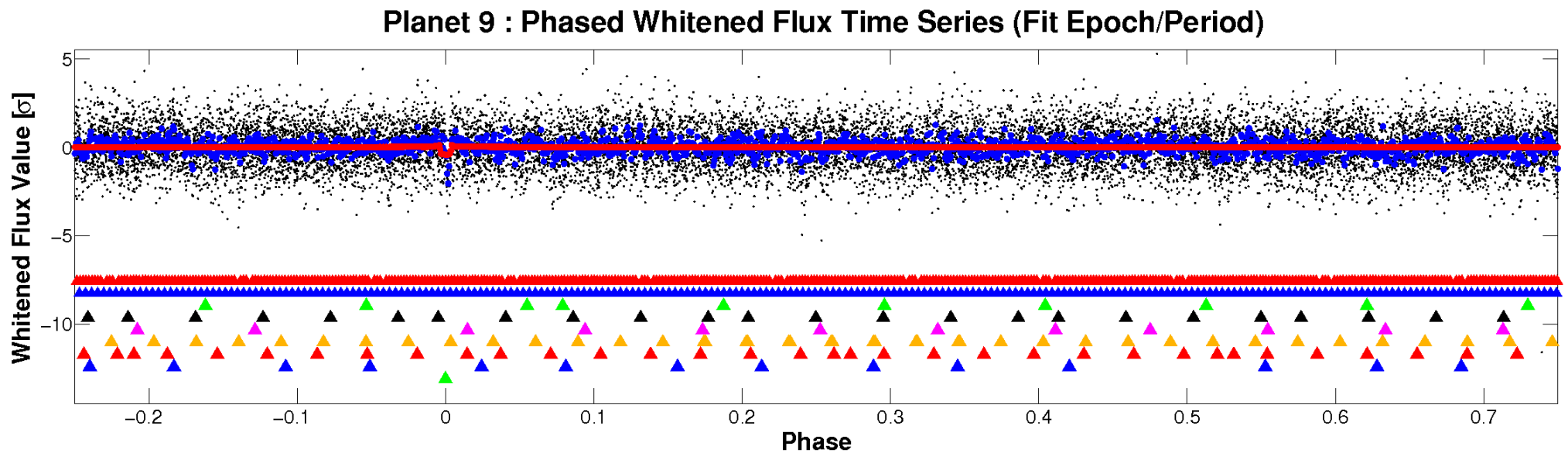
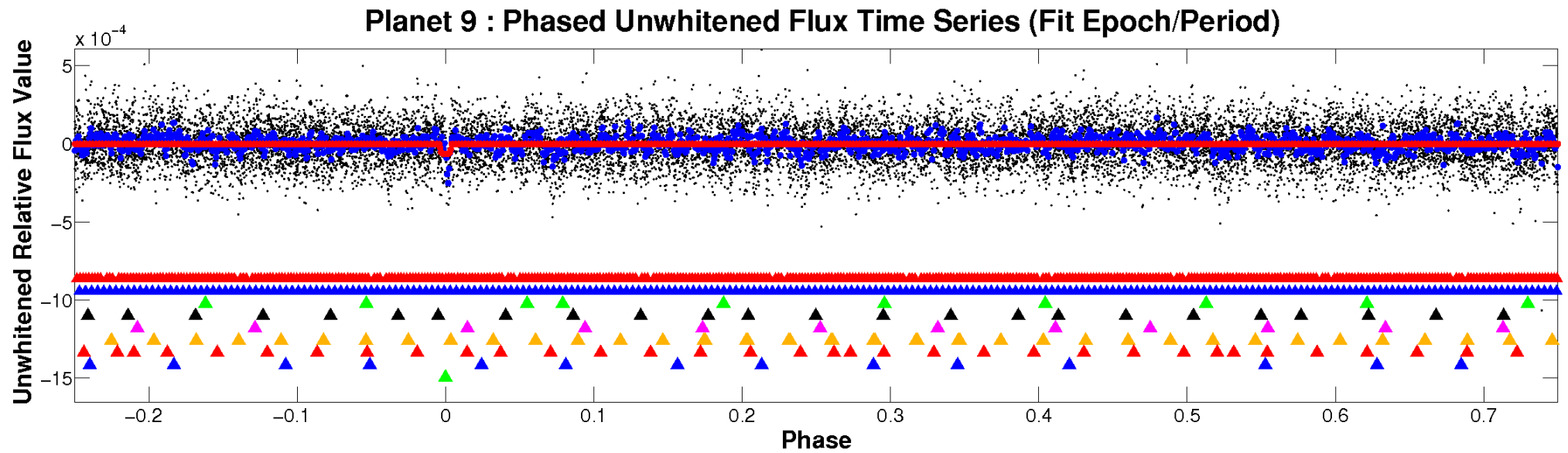


# ALT Odd/Even

TCE 010904343-09

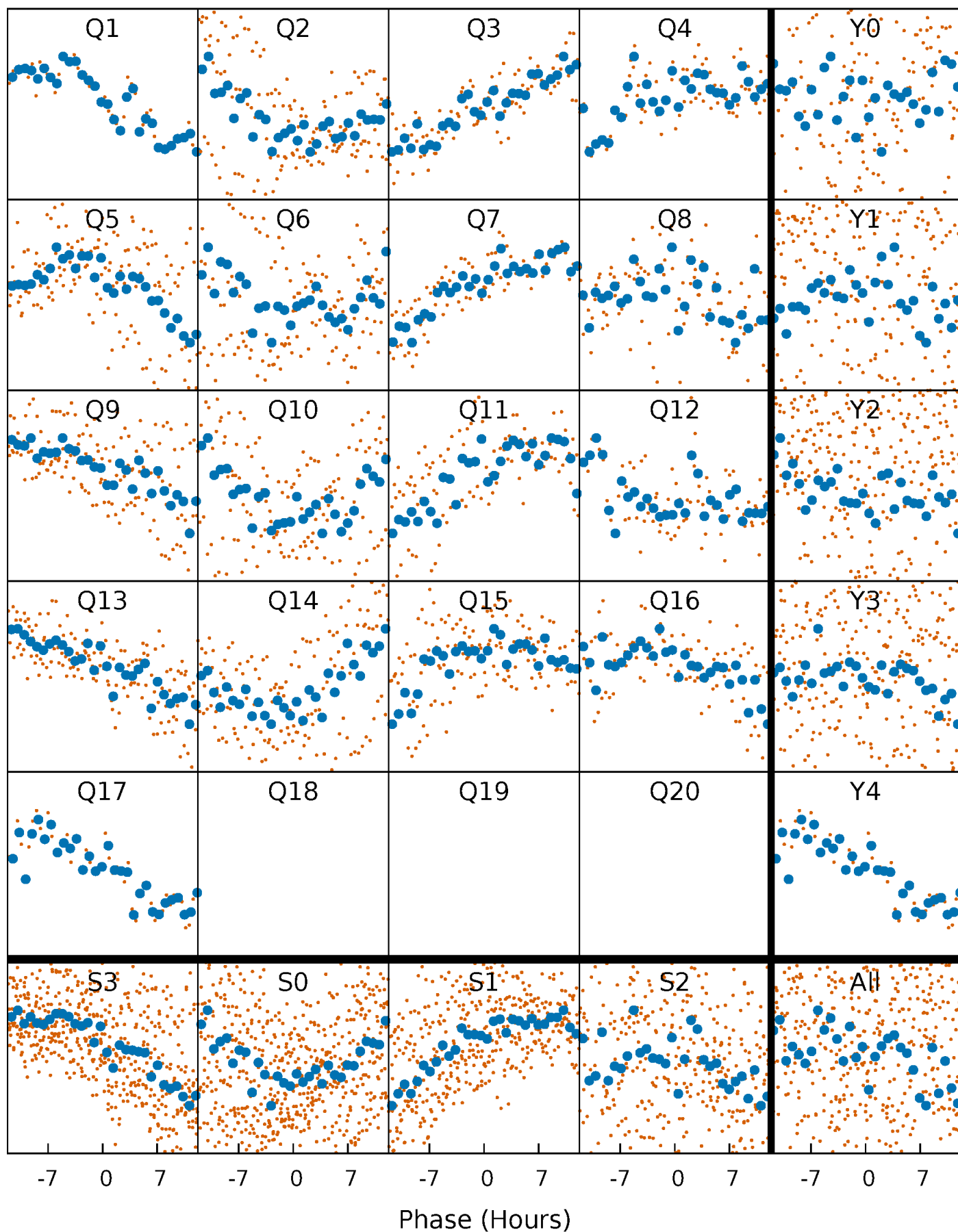


# Non-Whitened Vs. Whitened Light Curve



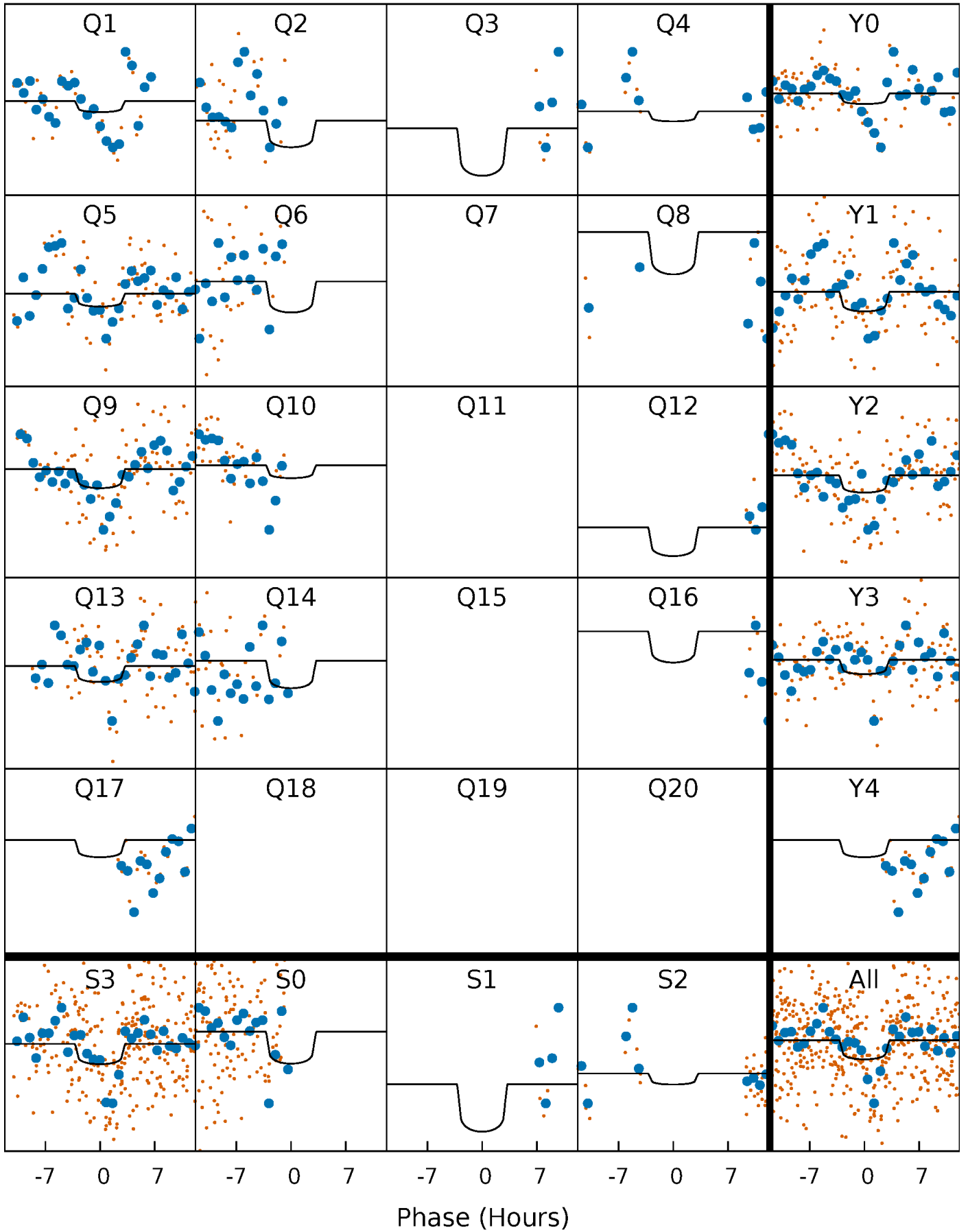
# PDC Quarter-Phased Transit Curves

TCE 010904343-09   P= 33.945926 Days    $T_0=146.949011$  (BKJD)



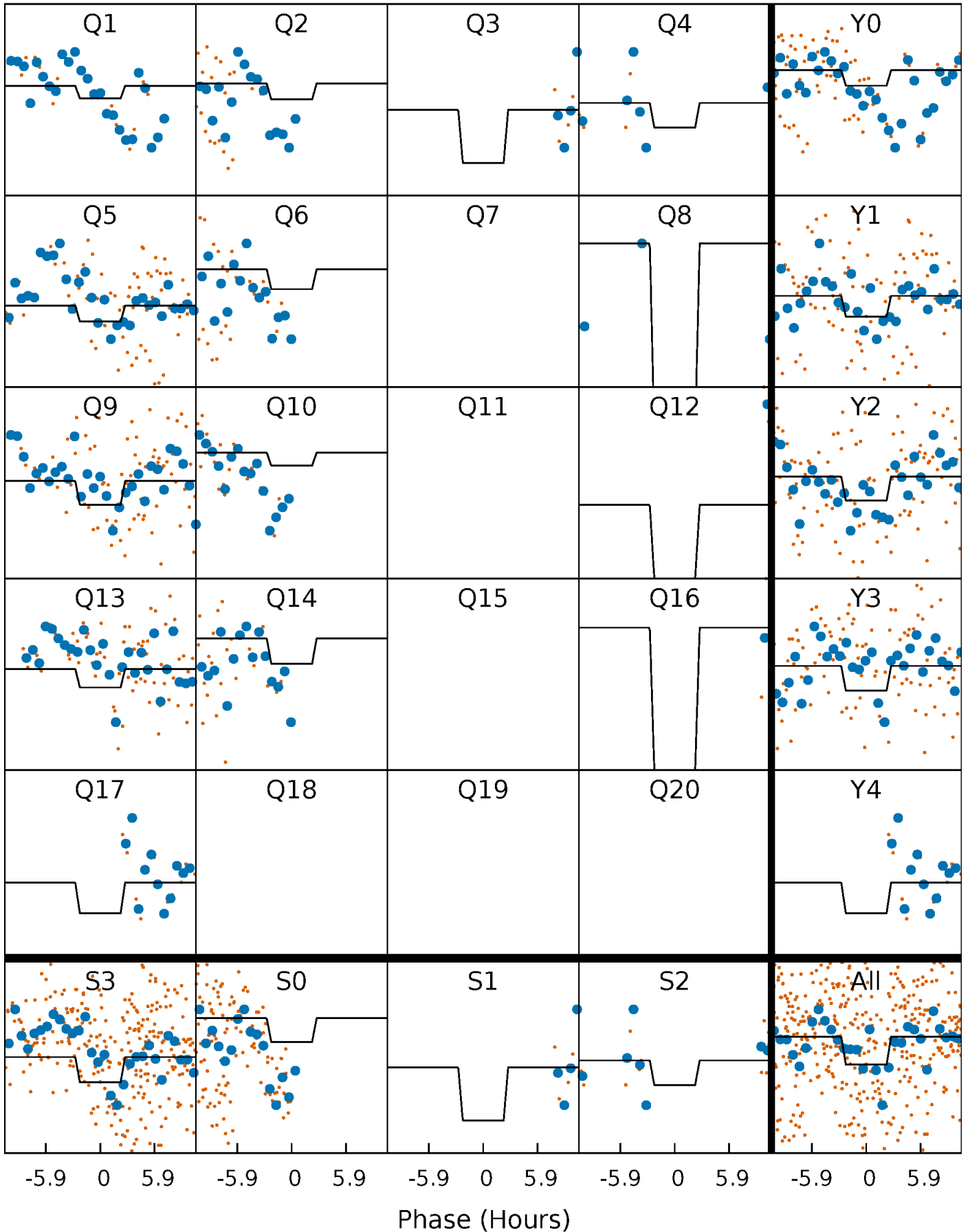
# DV Quarter-Phased Transit Curves

TCE 010904343-09   P= 33.945926 Days    $T_0=146.949011$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

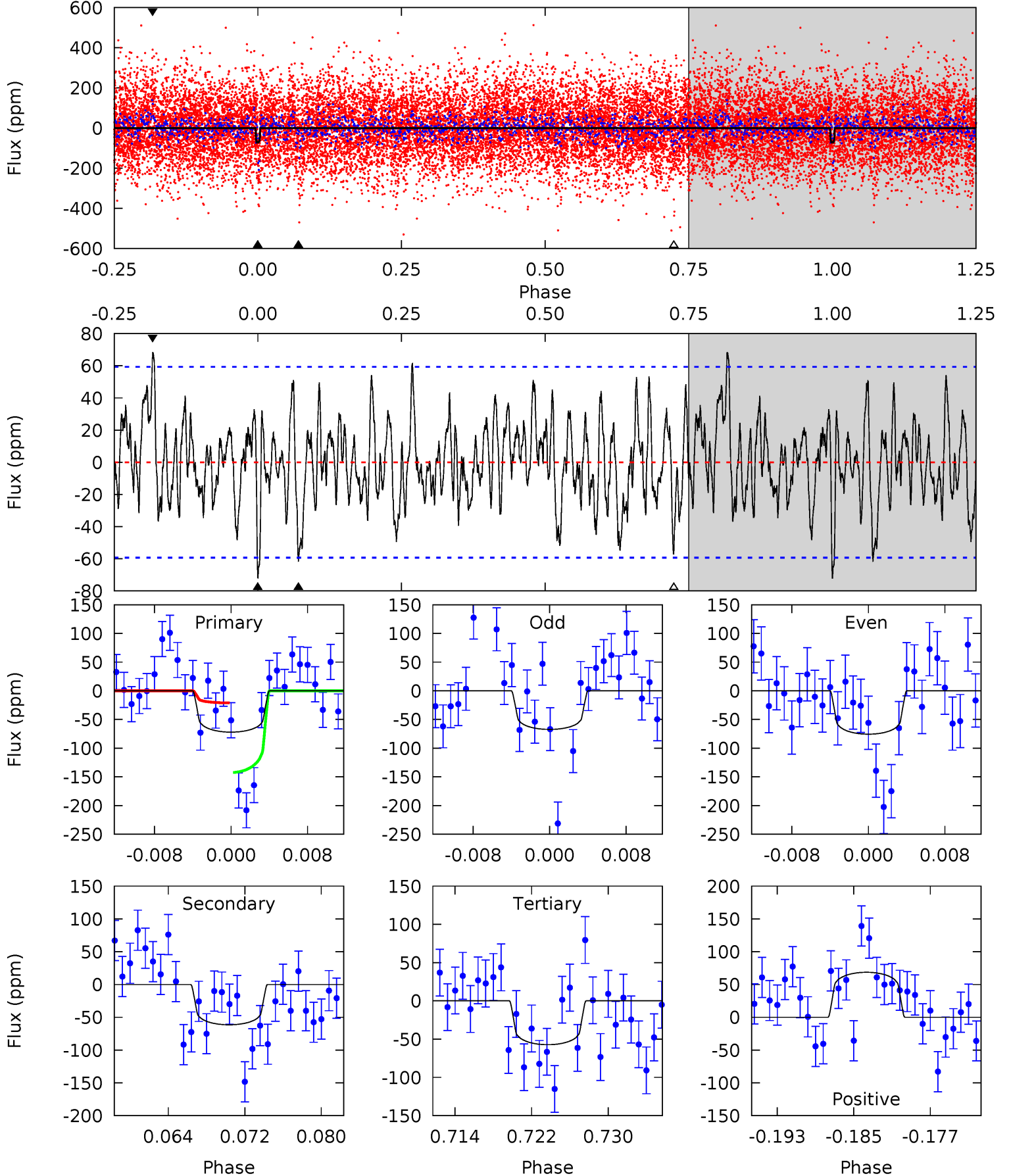
TCE 010904343-09     $P = 33.946774$  Days     $T_0 = 146.908547$  (BKJD)



# DV Model-Shift Uniqueness Test

010904343-09, P = 33.945926 Days, E = 113.003085 Days

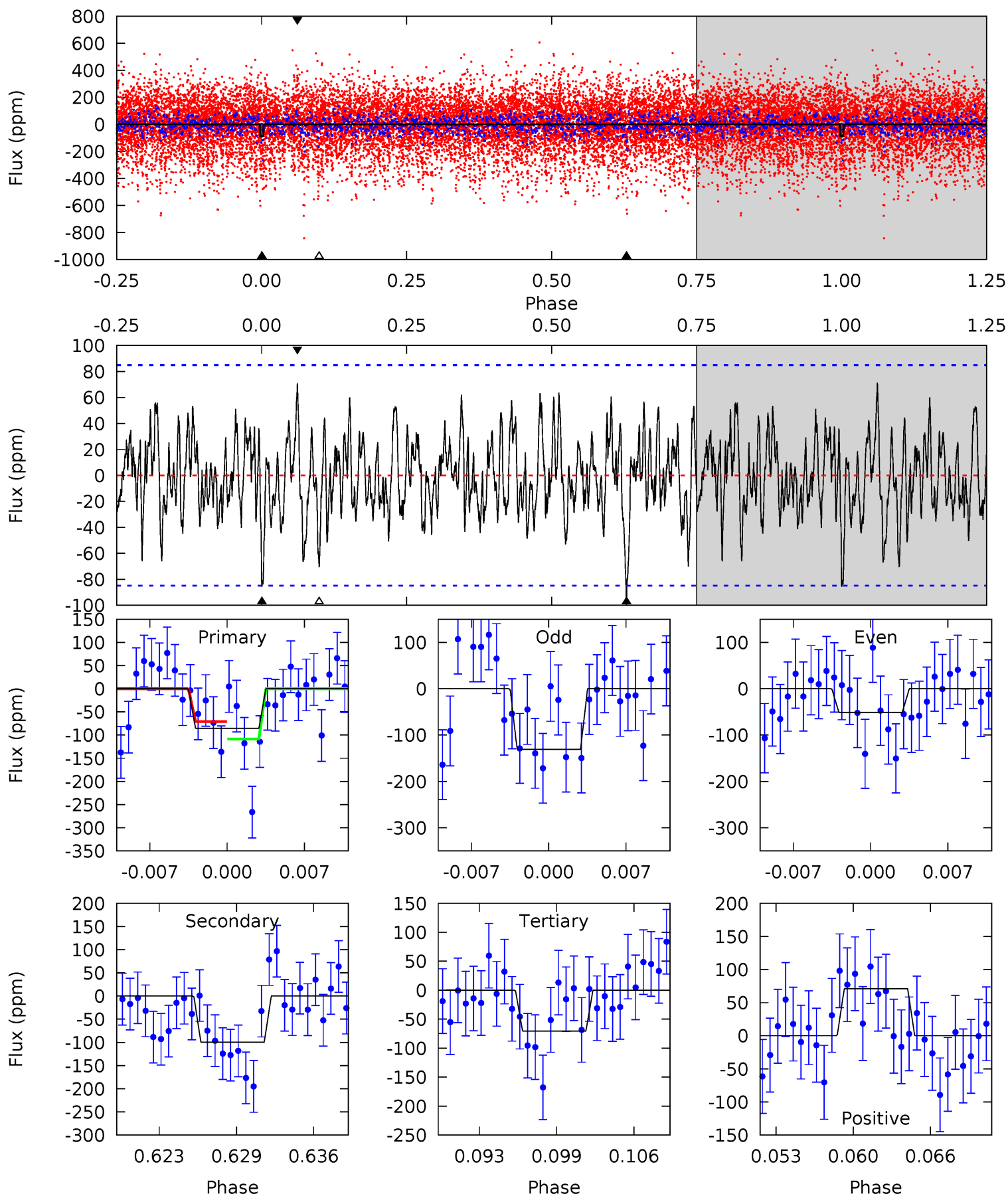
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.15	5.25	4.89	5.86	5.07	2.65	1.89	1.26	0.30	0.36	-0.61	0.35	1.42	0.49	5.12



# Alt Model-Shift Uniqueness Test

010904343-09, P = 33.946774 Days, E = 112.961773 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.15	5.99	4.24	4.28	5.10	2.72	1.53	0.91	0.87	1.75	1.71	2.38	0.86	0.42	1.11





### Stellar Parameters For KIC 010904343

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6714^{+168}_{-185}$	$3.533^{+0.344}_{-0.086}$	$-0.280^{+0.350}_{-0.250}$	$3.714^{+0.357}_{-1.427}$	$1.717^{+0.212}_{-0.345}$	$0.047^{+0.117}_{-0.013}$
	+3%/-3%	+10%/-2%	+125%/-89%	+10%/-38%	+12%/-20%	+247%/-27%
Source	PHO1	FLK73	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010904343-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-61 \pm 12$	$3.29^{+1.96}_{-1.87}$	$1585^{+81}_{-156}$	$6382^{+4029}_{-1256}$	$193^{+861}_{-122}$
Alt.	$-100 \pm 17$	$3.64^{+1.97}_{-1.82}$	$1575^{+85}_{-152}$	$6737^{+3665}_{-1214}$	$243^{+711}_{-143}$

$T_{max}$  = 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

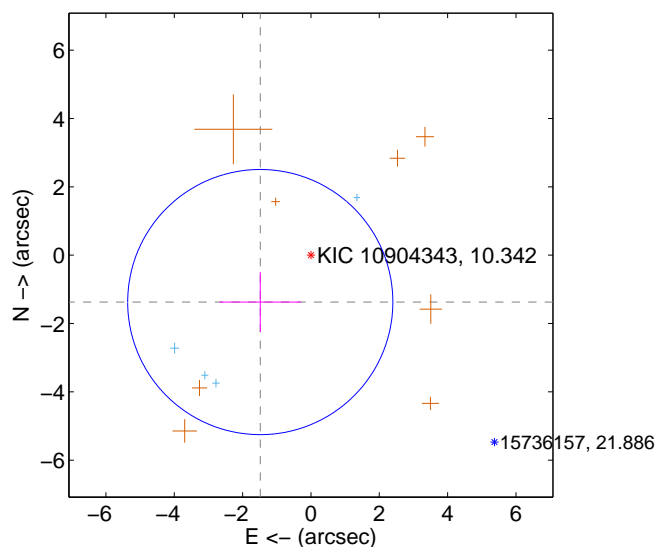
Supplemental centroid analysis for 010904343-09. **Kepler magnitude: 10.34**. Transit SNR 4.02

There are 4 quarters with good PRF difference image offsets

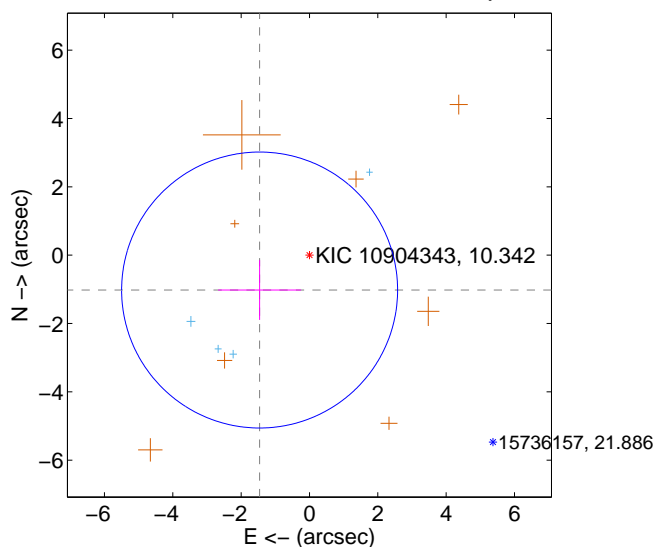
The direct PRF centroid is offset from the target star catalog position by about 0.92 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.021 \pm 1.293$	1.56	$1.483 \pm 1.192$	$-1.373 \pm 0.879$
PRF-fit source offset from KIC position	$1.780 \pm 1.346$	1.32	$1.459 \pm 1.212$	$-1.020 \pm 0.876$
photometric centroid source offset	$1.79 \pm 0.77$	2.34	$0.10 \pm 0.87$	$1.79 \pm 0.77$

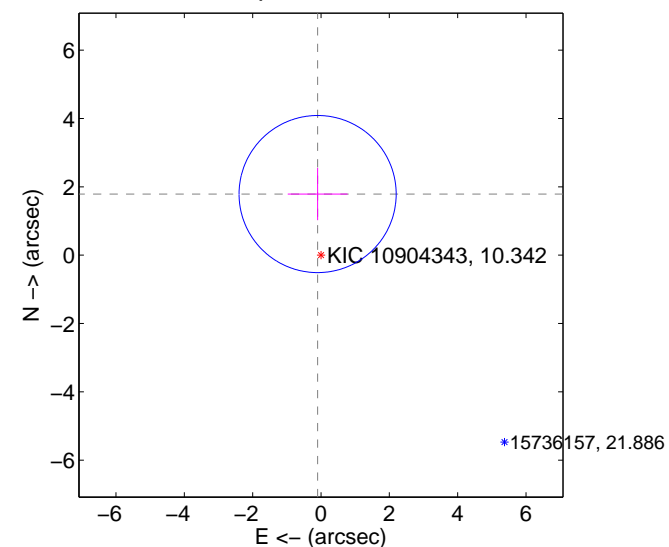
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



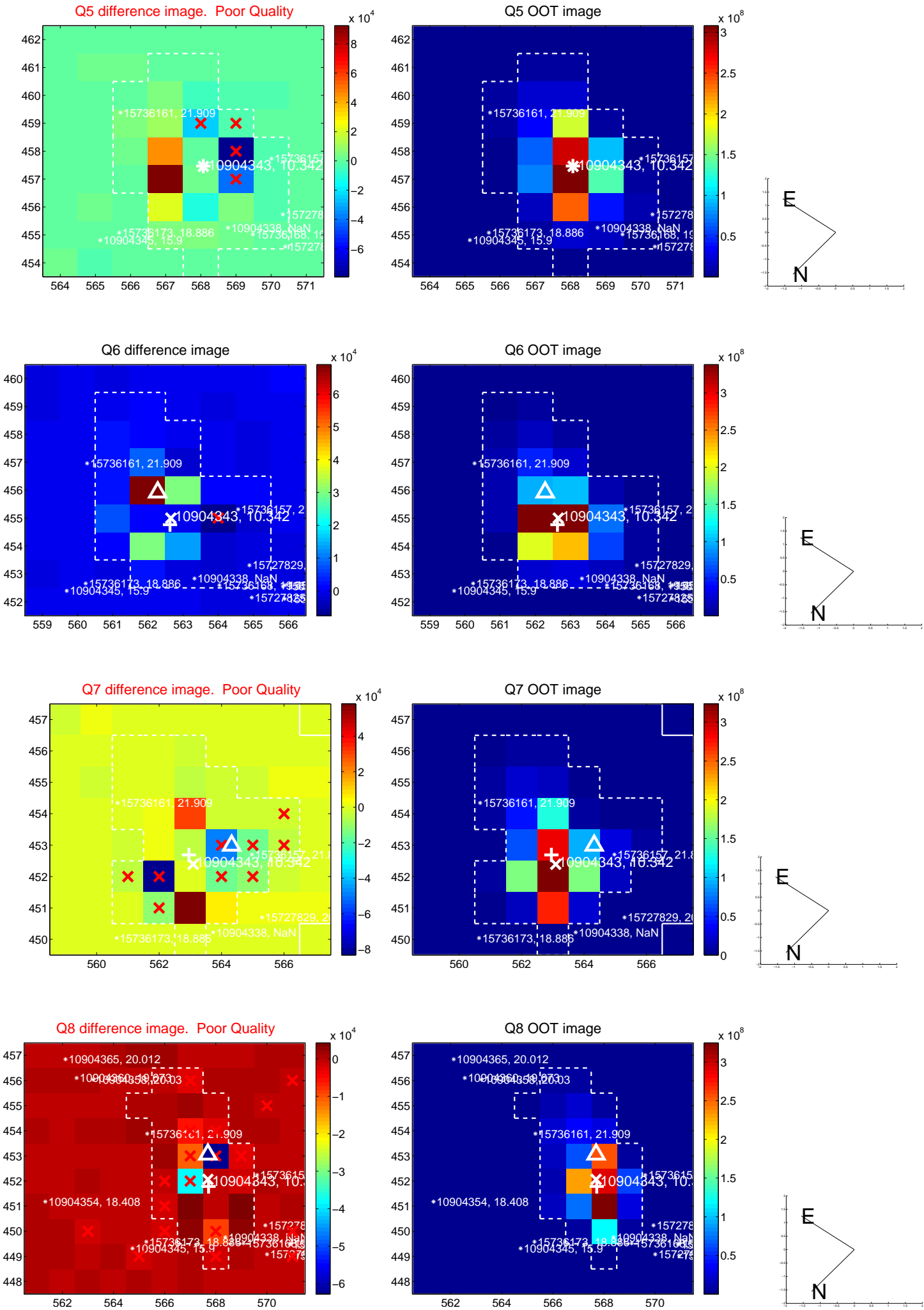
offset from photometric centroids



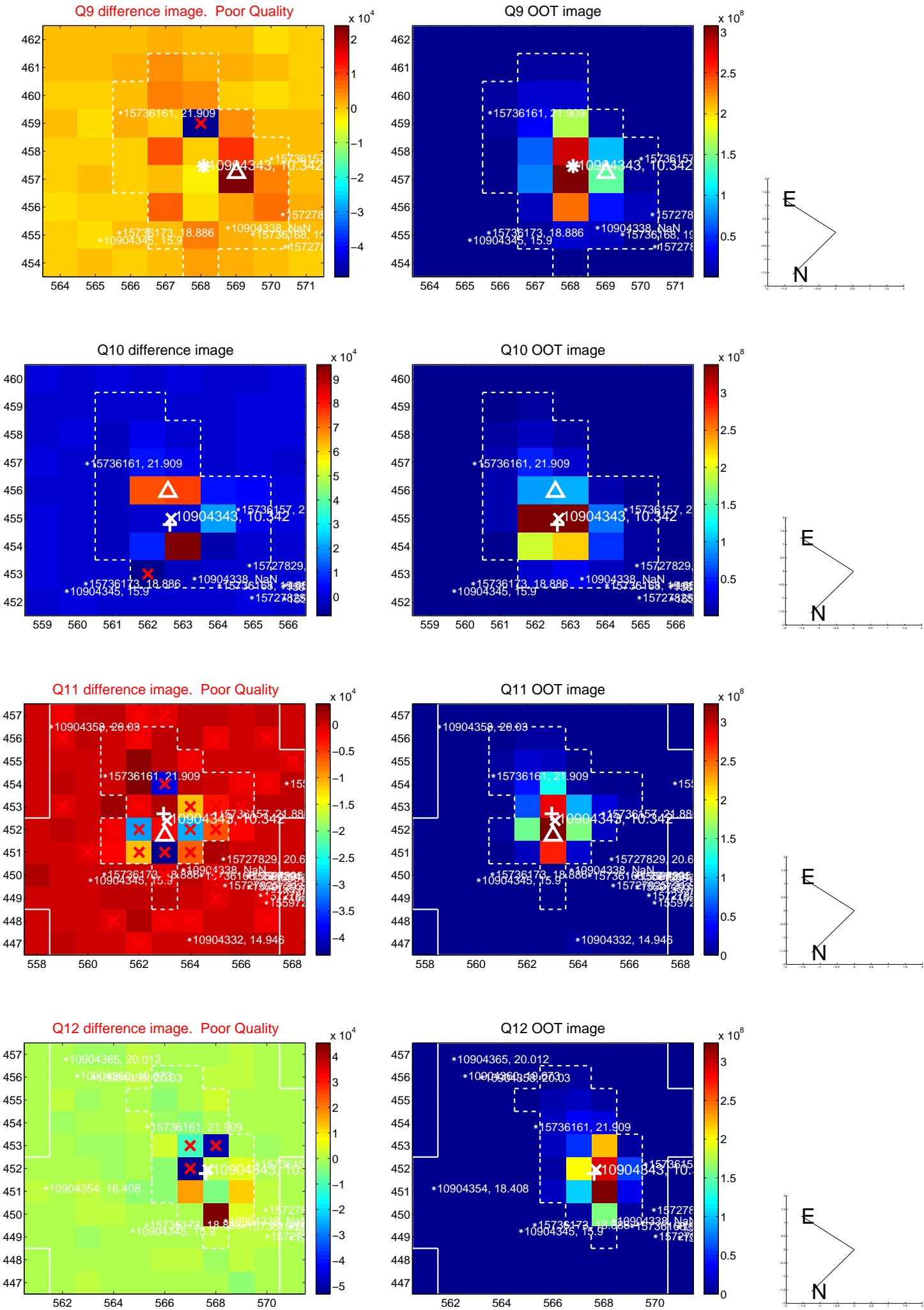
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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









UKIRT Image

Declination

