

# KIC 007538839

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007538839-01	OBS	No	1.134544	132.455678	38.6	4.970	9.4	10.9	4.83	6748	3.17	60194.66
007538839-02	OBS	No	69.916966	141.988100	286.1	3.284	7.5	8.1	4.83	6748	9.80	247.29
007538839-03	OBS	No	97.491990	137.632059	277.6	4.920	7.2	6.6	4.83	6748	8.75	158.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007538839-01	OBS	FP	0.00	1	0	0	0	LPP_DV
007538839-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT
007538839-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

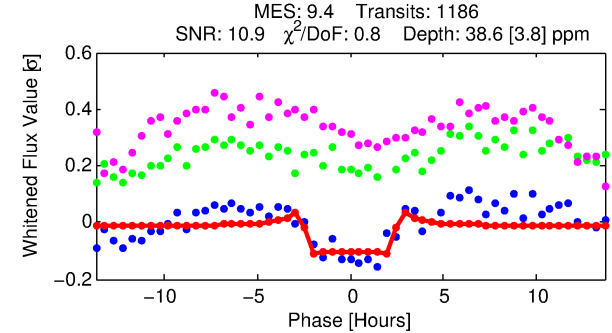
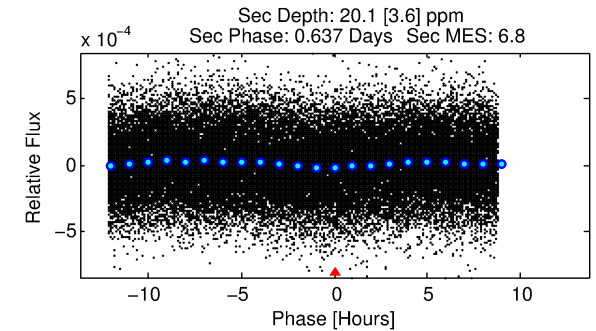
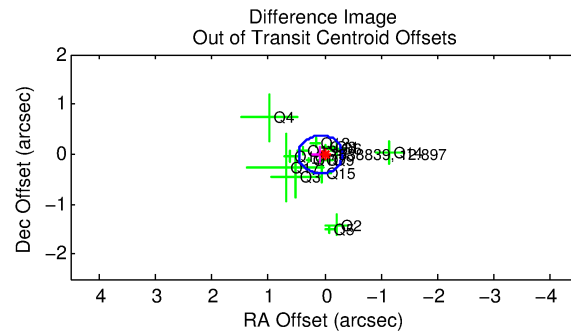
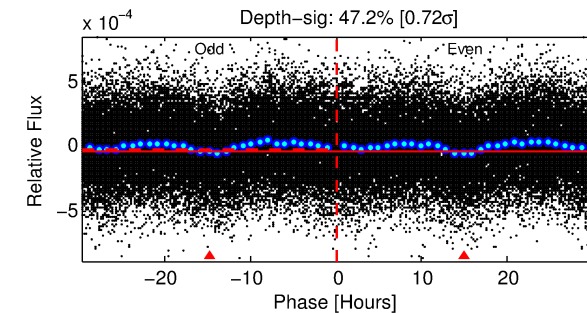
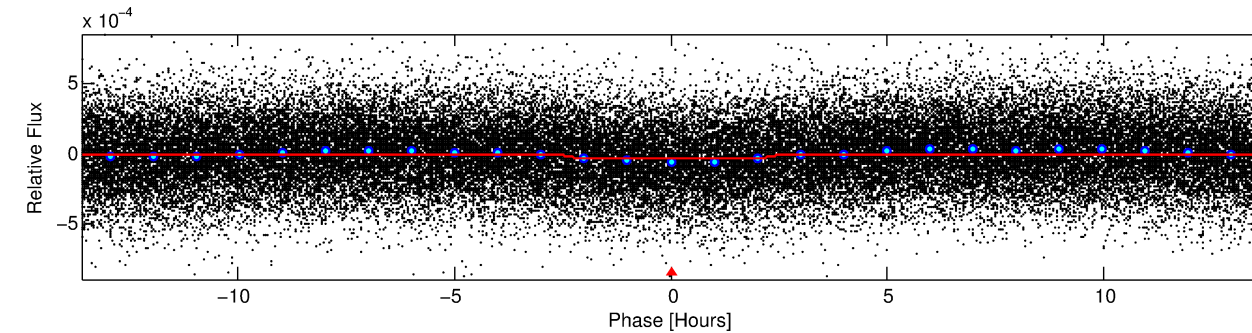
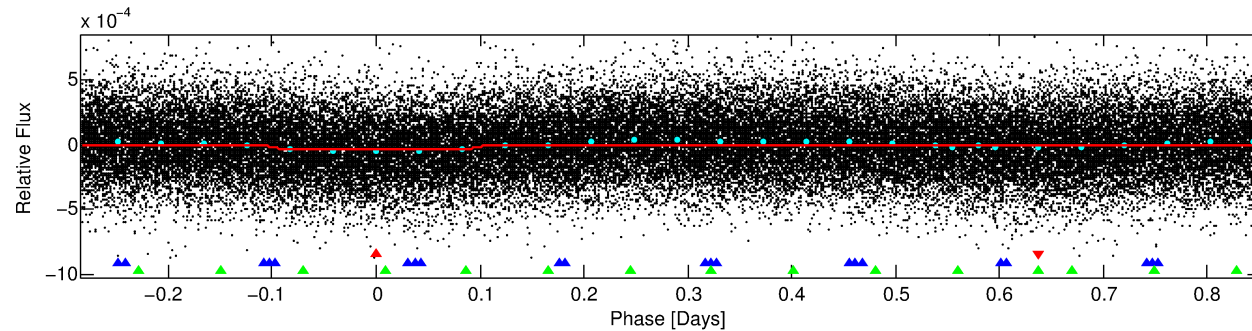
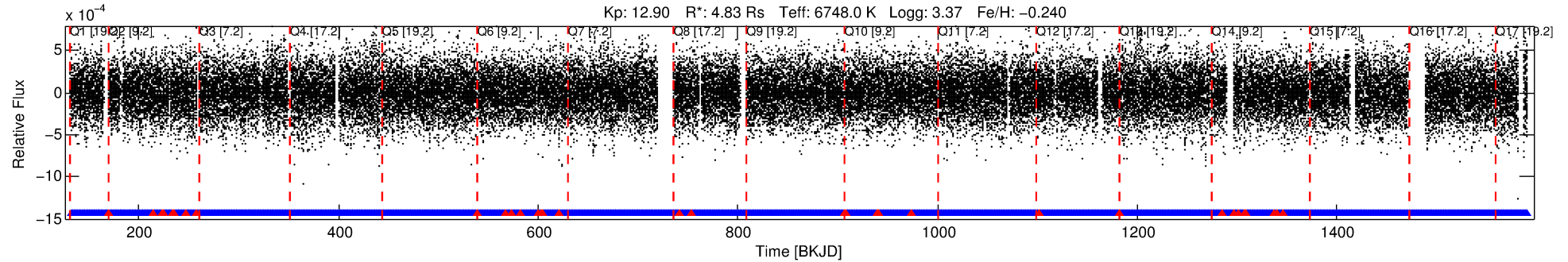
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007538839-01

No Significant Match Found

# DV One-Page Summary

KIC: 7538839 Candidate: 1 of 3 Period: 1.135 d



## DV Fit Results:

Period = 1.13454 [0.00001] d  
Epoch = 132.4557 [0.0028] BKJD  
Rp/R\* = 0.0060 [0.0017]  
a/R\* = 1.58 [1.54]  
b = 0.63 [1.57]  
Seff = 60194.66 [39314.54]  
Teff = 3994 [652] K  
Rp = 3.17 [1.62] Re  
a = 0.0268 [0.0108] AU  
Ag = 0.79 [0.70] [-0.30 $\sigma$ ]  
Teffp = 5825 [897] K [1.65 $\sigma$ ]

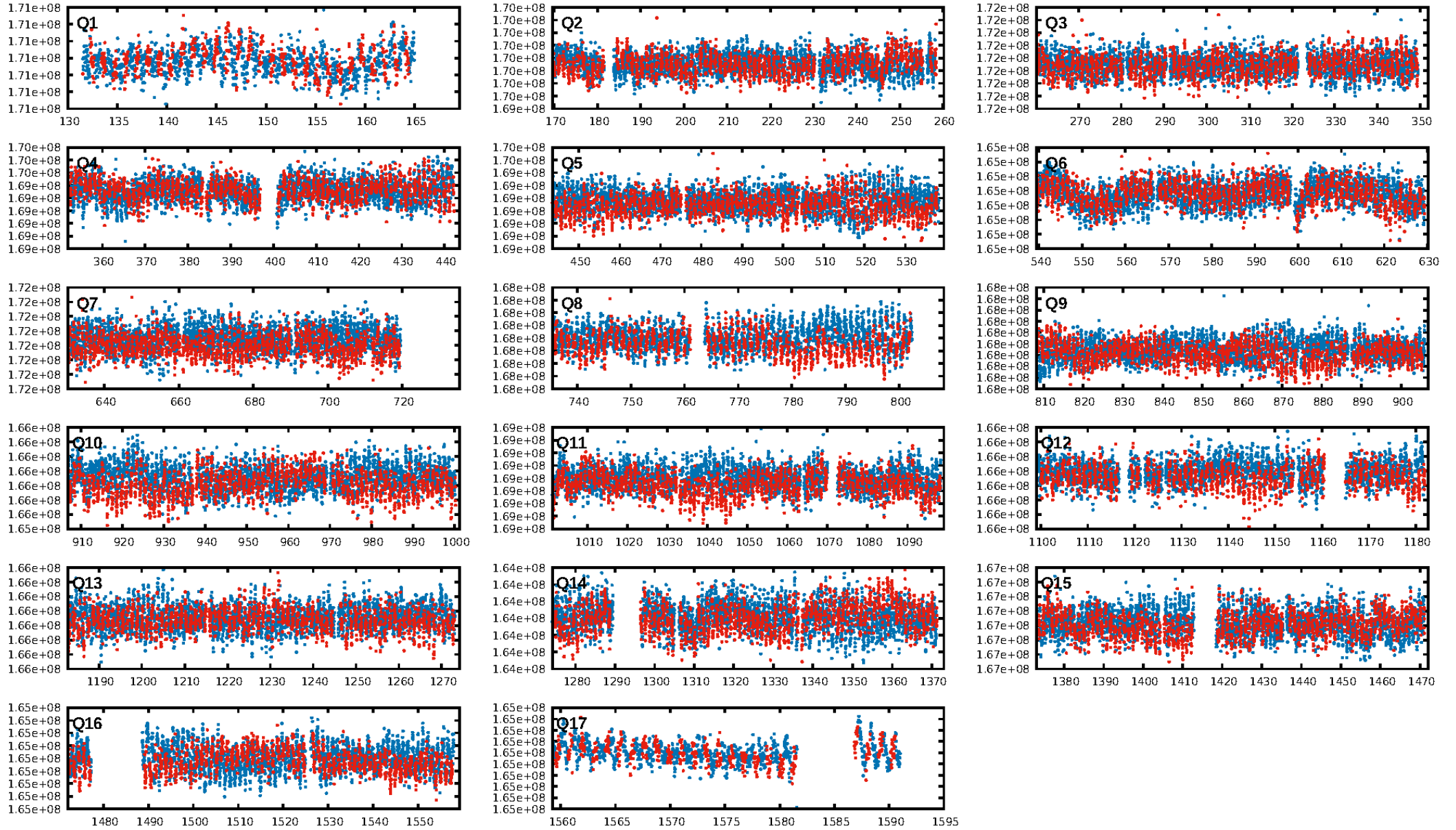
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [277.11 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGoF-sig: N/A  
Bootstrap-pfa: 5.80e-13  
RollingBand-fgt: 0.97 [1099/1133]  
GhostDiagnostic-chr: 2.009  
Centroid-sig: 28.5%  
Centroid-so: 0.126 arcsec [0.35 $\sigma$ ]  
OotOffset-rm: 0.078 arcsec [0.61 $\sigma$ ]  
KicOffset-rm: 0.094 arcsec [0.61 $\sigma$ ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:02:56 Z

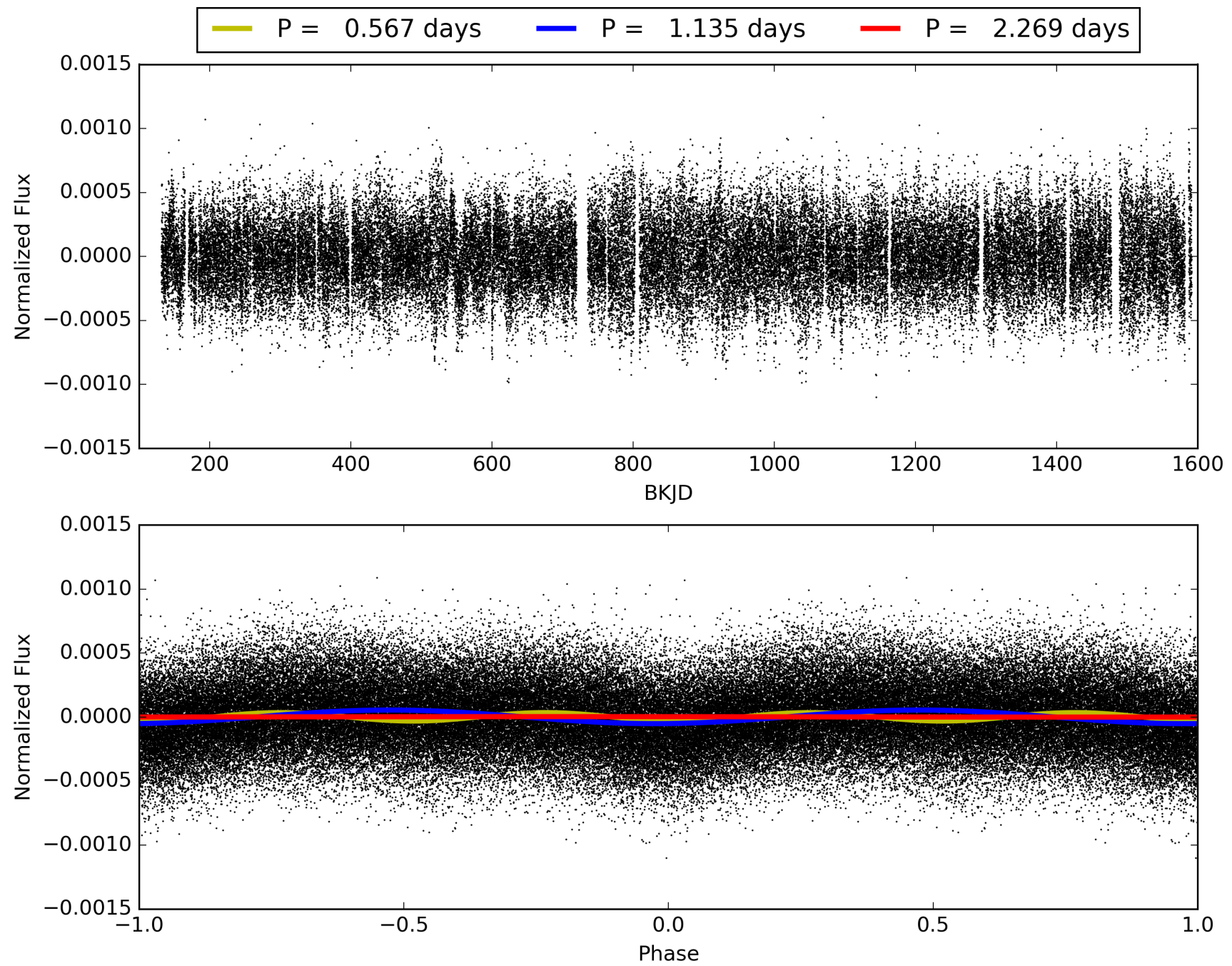
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007538839-01, PDC Light Curves





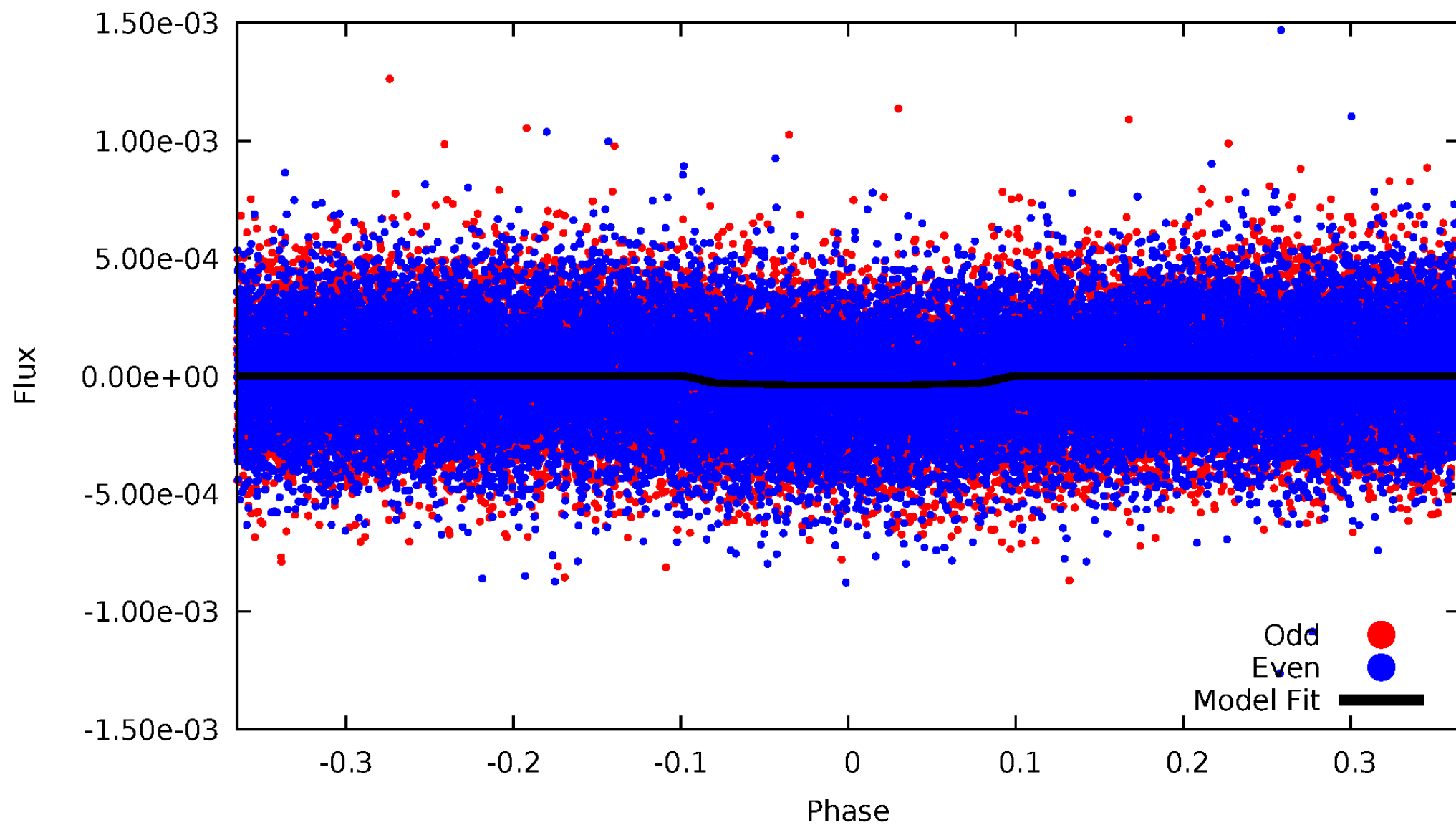
TCE 007538839-01





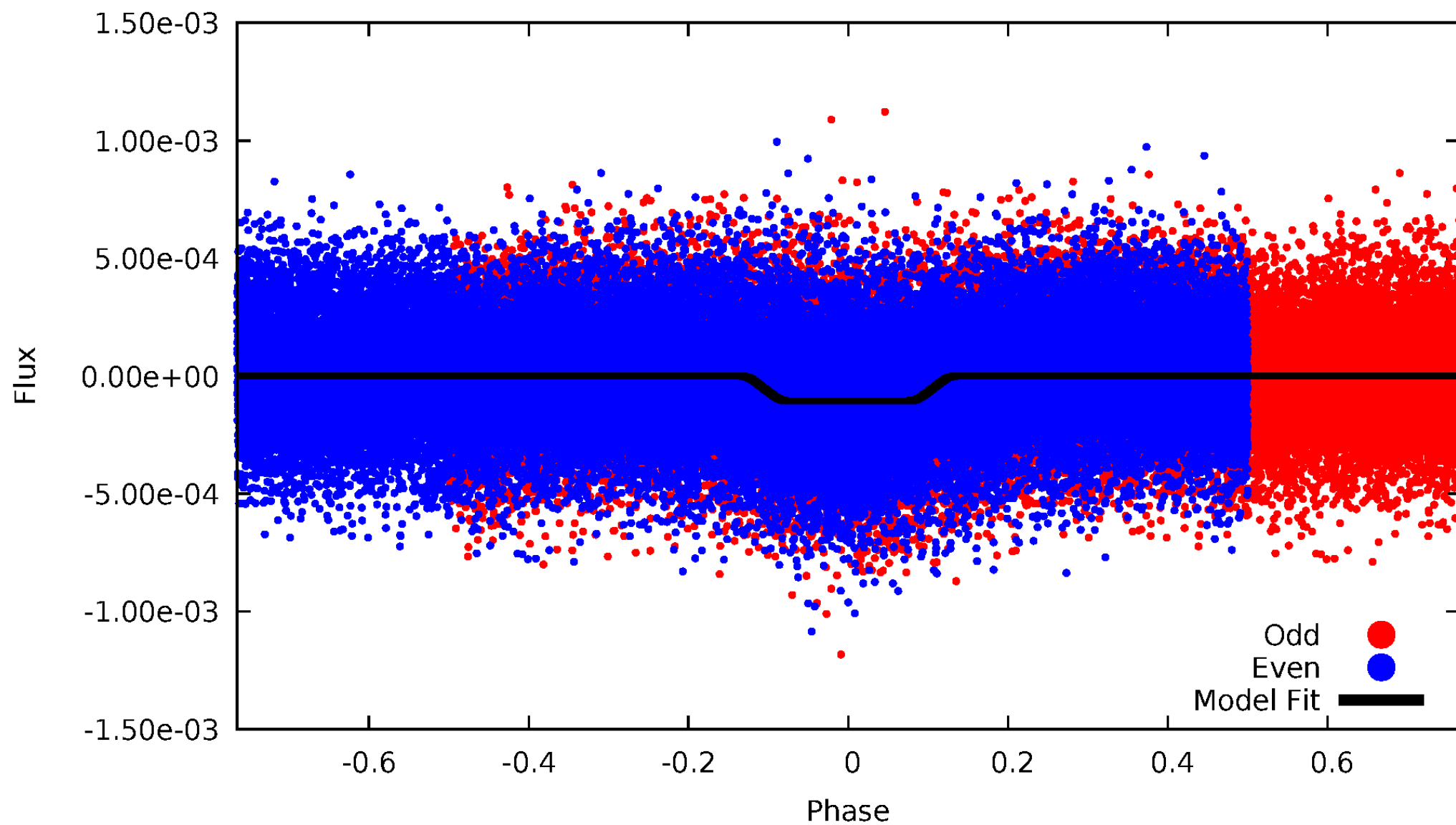
# DV Odd/Even

TCE 007538839-01

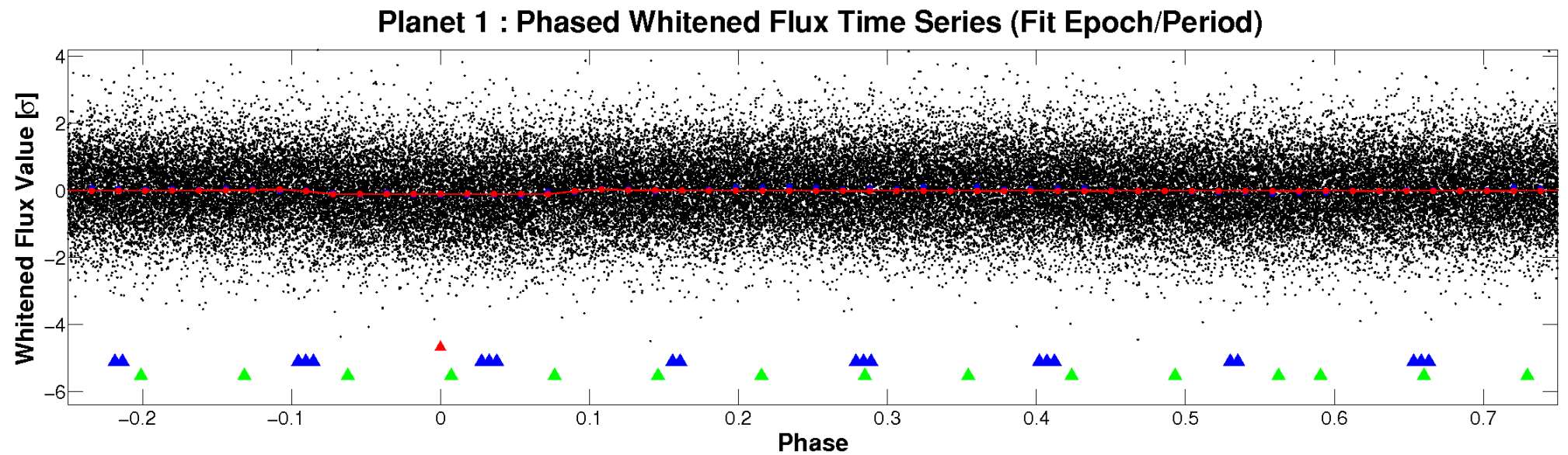
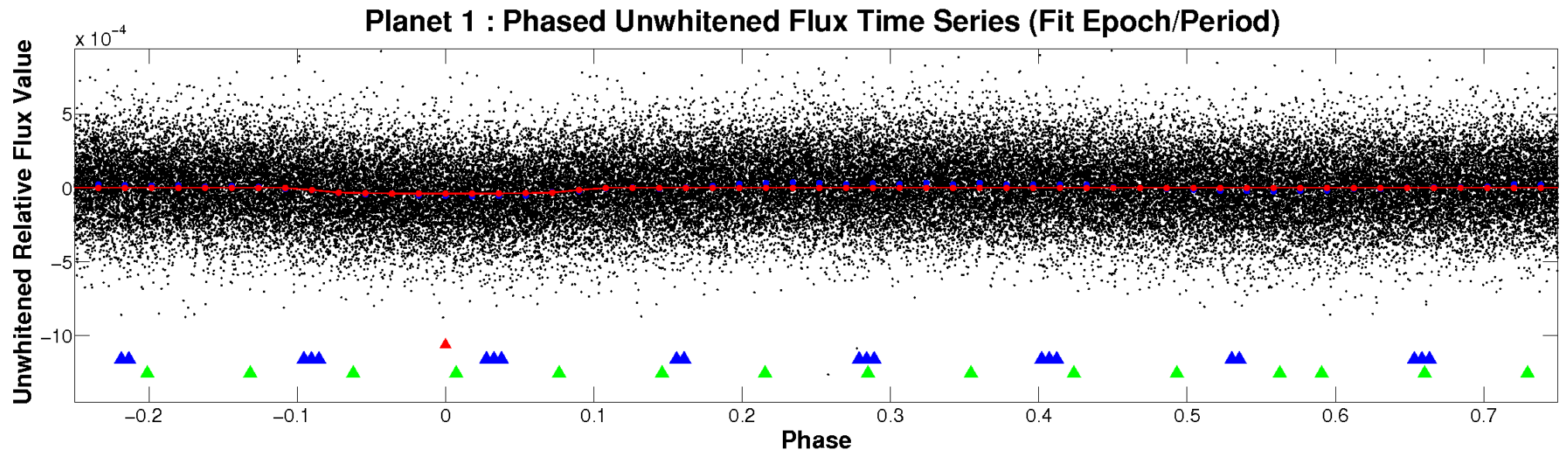


# ALT Odd/Even

TCE 007538839-01



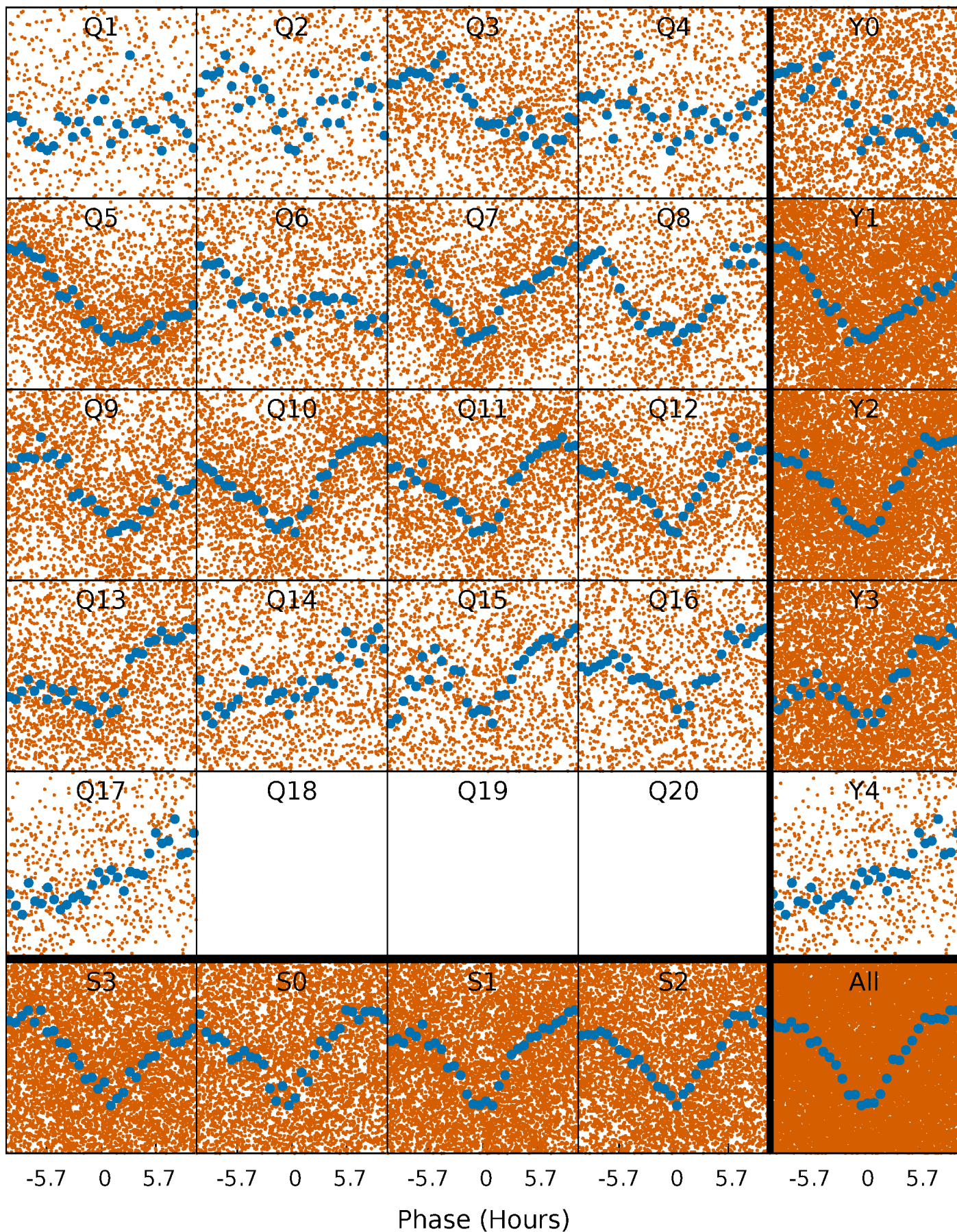
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

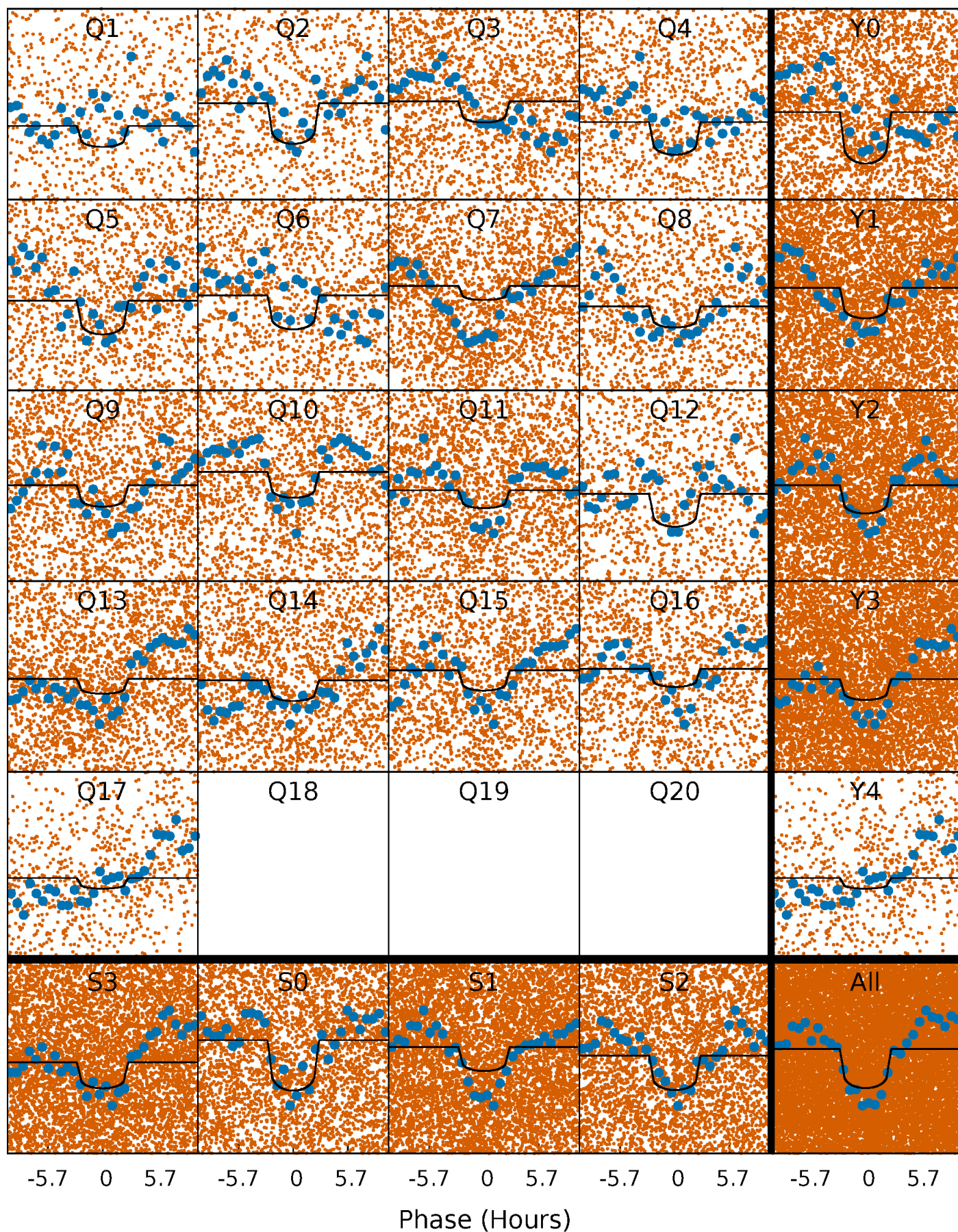
TCE 007538839-01 P= 1.134544 Days  $T_0=132.455678$  (BKJD)





# DV Quarter-Phased Transit Curves

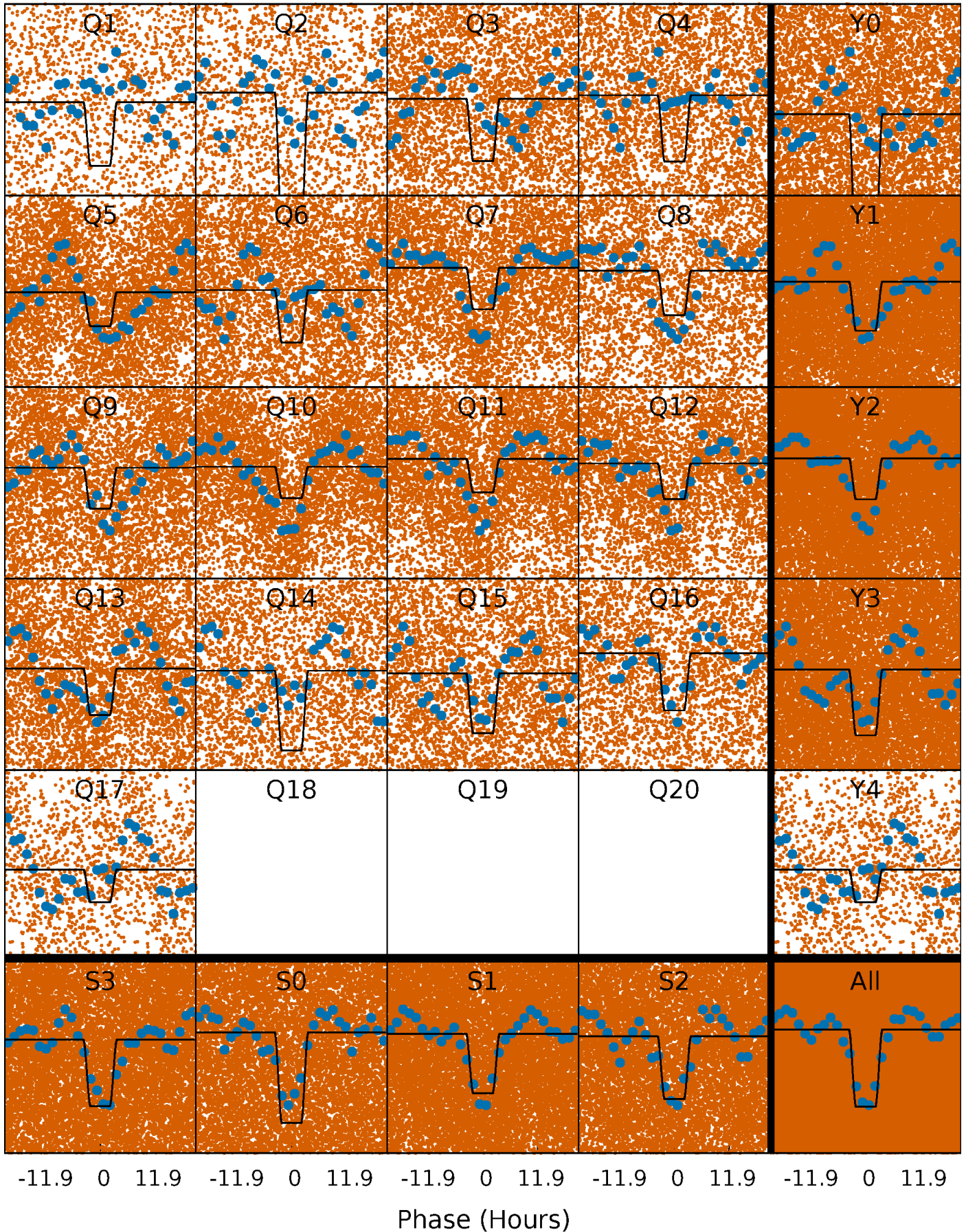
TCE 007538839-01 P= 1.134544 Days  $T_0=132.455678$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007538839-01 P= 1.134572 Days  $T_0=132.436100$  (BKJD)

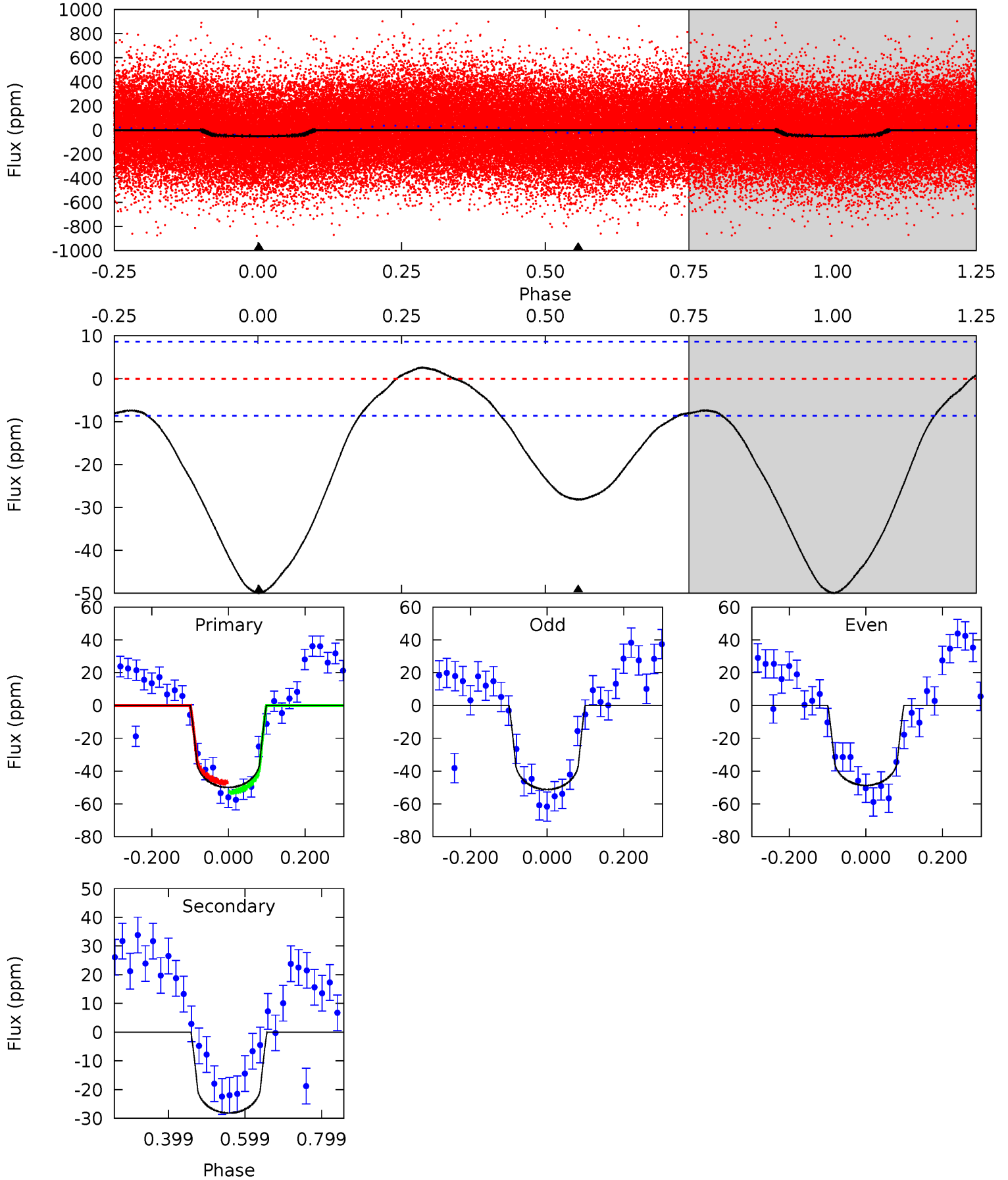




# DV Model-Shift Uniqueness Test

007538839-01, P = 1.134544 Days, E = 131.321134 Days

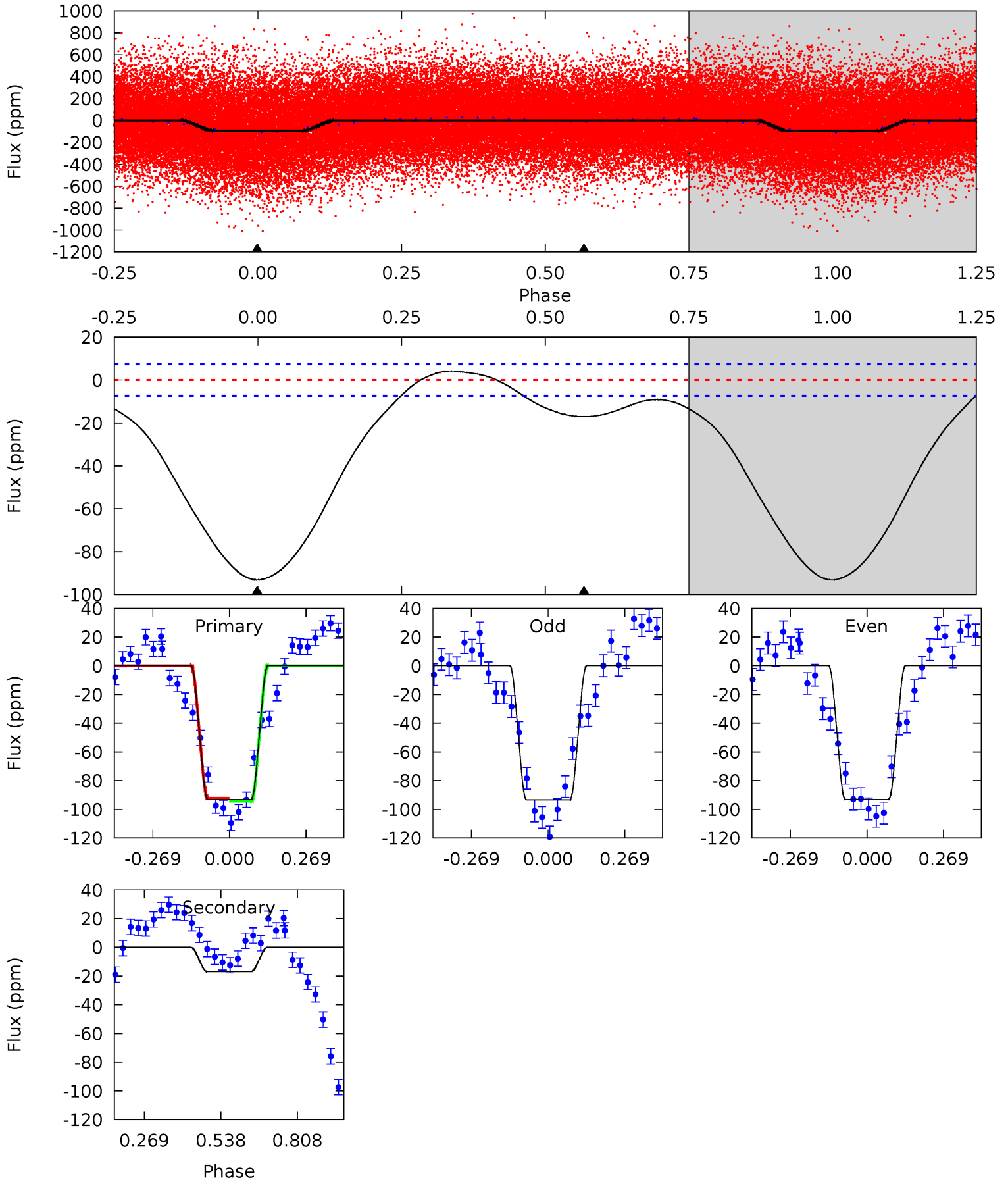
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.6	14.4	0	0	4.42	1.28	1.92	25.6	25.6	14.4	14.4	0.64	1.00	0.05	1.49



# Alt Model-Shift Uniqueness Test

007538839-01, P = 1.134572 Days, E = 131.301528 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
55.0	10.1	0	0	4.35	1.10	2.81	55.0	55.0	10.1	10.1	0.08	1.05	0.04	0.56



### Stellar Parameters For KIC 007538839

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6748^{+202}_{-223}$	$3.371^{+0.374}_{-0.066}$	$-0.240^{+0.350}_{-0.300}$	$4.826^{+0.360}_{-2.041}$	$1.998^{+0.133}_{-0.398}$	$0.025^{+0.080}_{-0.005}$
	+3%/-3%	+11%/-2%	+146%/-125%	+7%/-42%	+7%/-20%	+318%/-21%
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 007538839-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-28 \pm 2$	$2.90^{+0.98}_{-1.01}$	$5464^{+311}_{-569}$	$5965^{+1528}_{-971}$	$1.329^{+1.753}_{-0.590}$
Alt.	$-17 \pm 2$	$5.01^{+1.18}_{-1.15}$	$5472^{+302}_{-507}$	$-3195^{+6996}_{-819}$	$0.265^{+0.172}_{-0.091}$

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



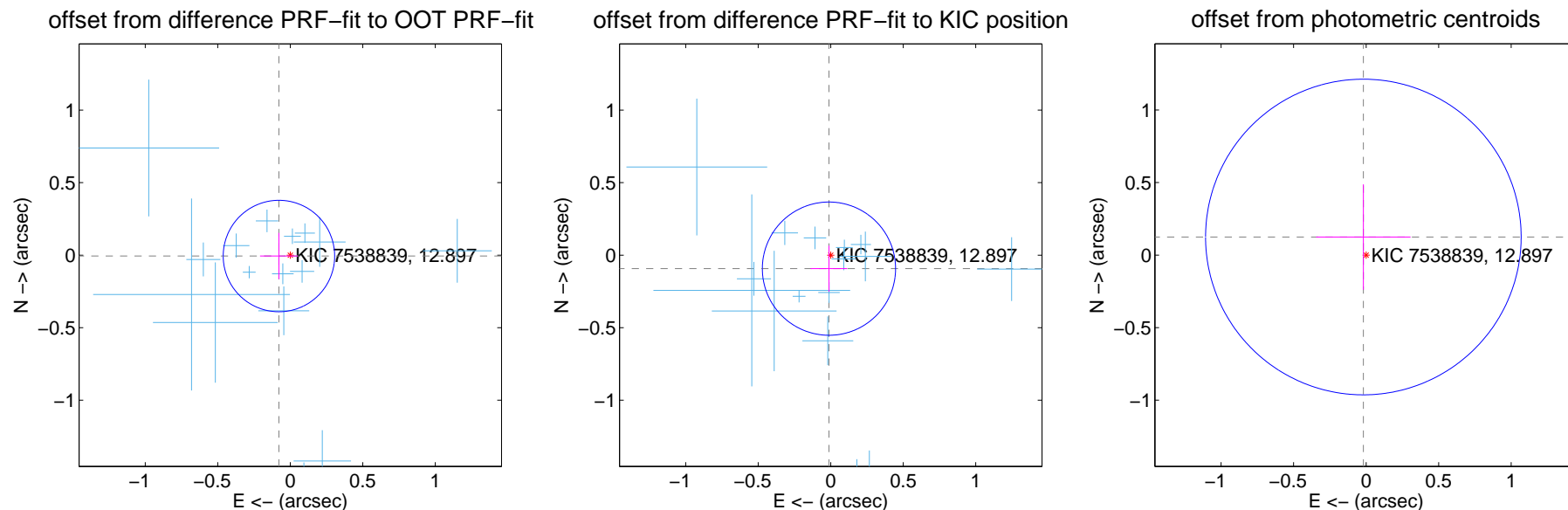
## DV Centroid Data

Supplemental centroid analysis for 007538839-01. Kepler magnitude: 12.90. Transit SNR 10.89

There are 16 quarters with good PRF difference image offsets

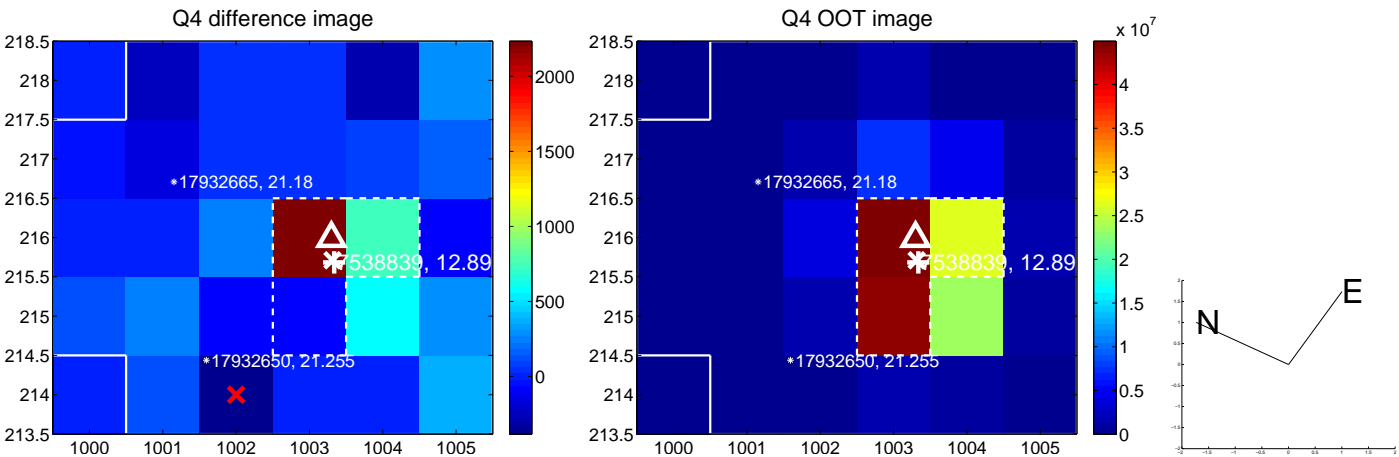
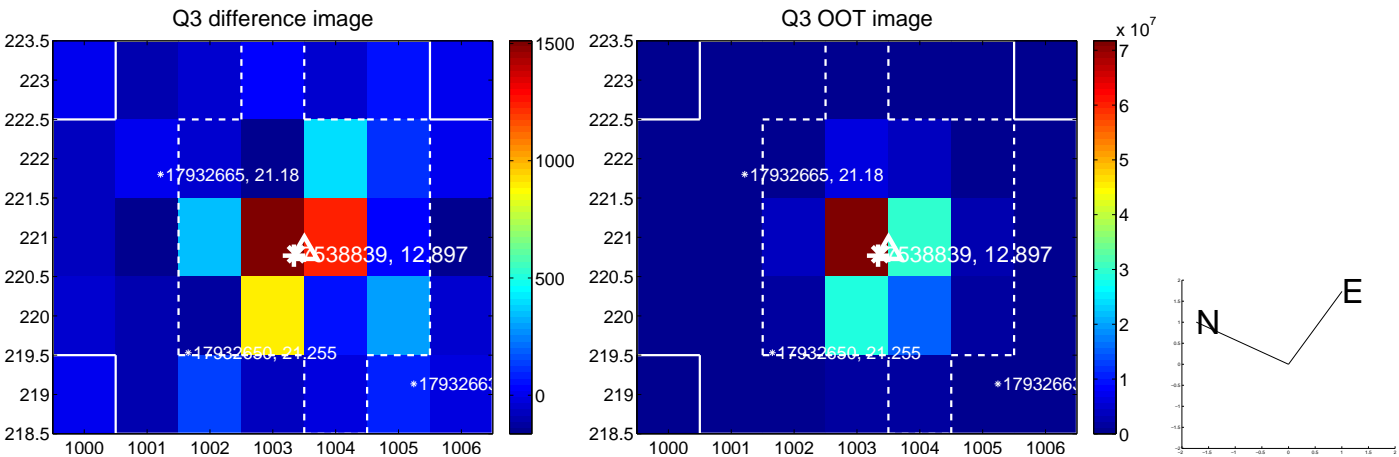
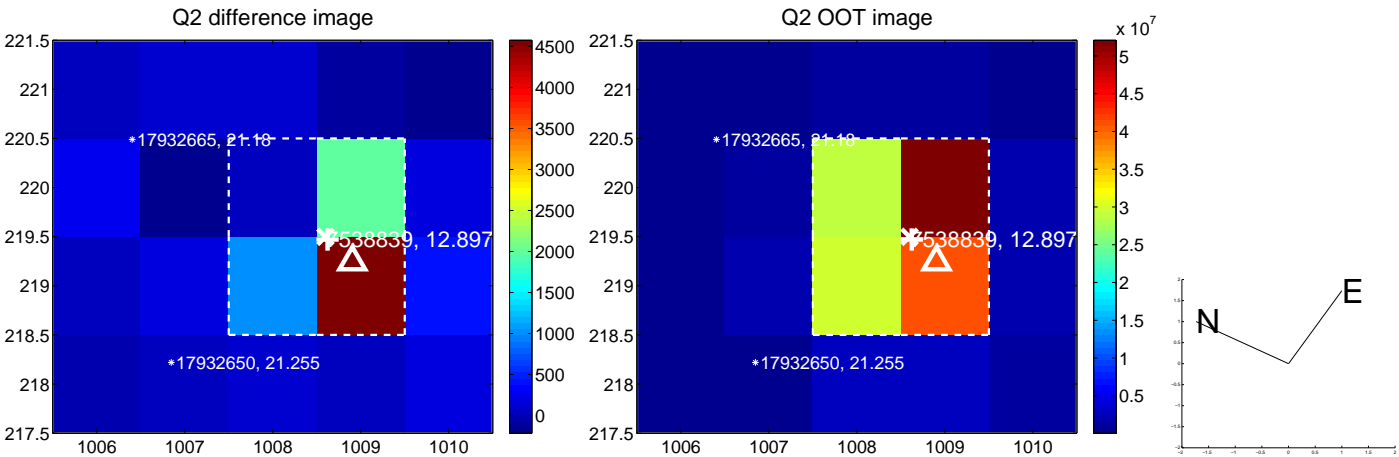
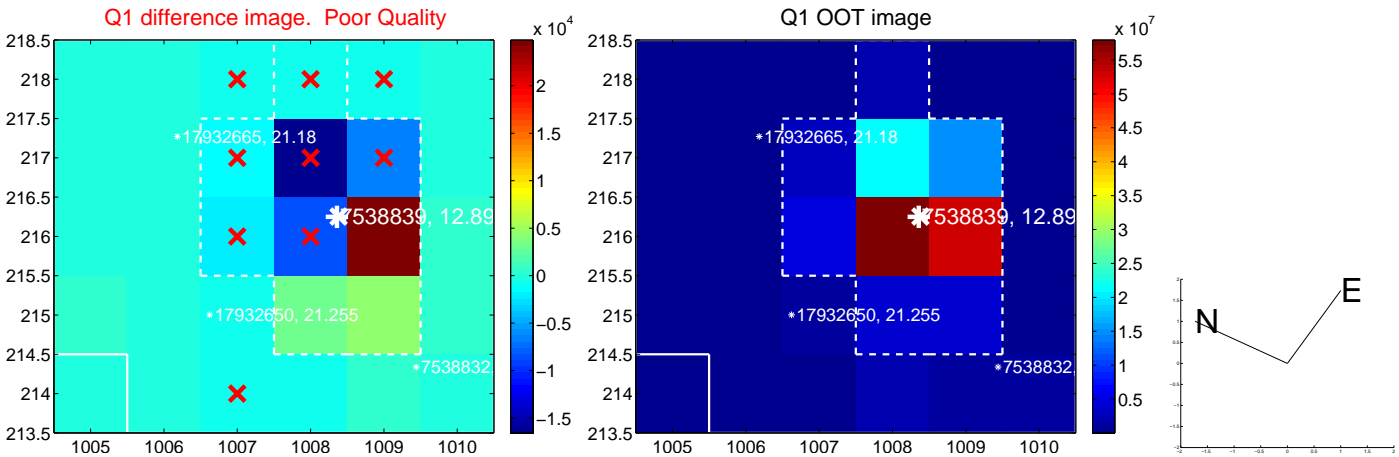
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.078 \pm 0.128$	0.61	$0.078 \pm 0.131$	$-0.006 \pm 0.159$
PRF-fit source offset from KIC position	$0.094 \pm 0.153$	0.61	$0.012 \pm 0.126$	$-0.093 \pm 0.158$
photometric centroid source offset	$0.13 \pm 0.36$	0.35	$0.02 \pm 0.33$	$0.12 \pm 0.36$

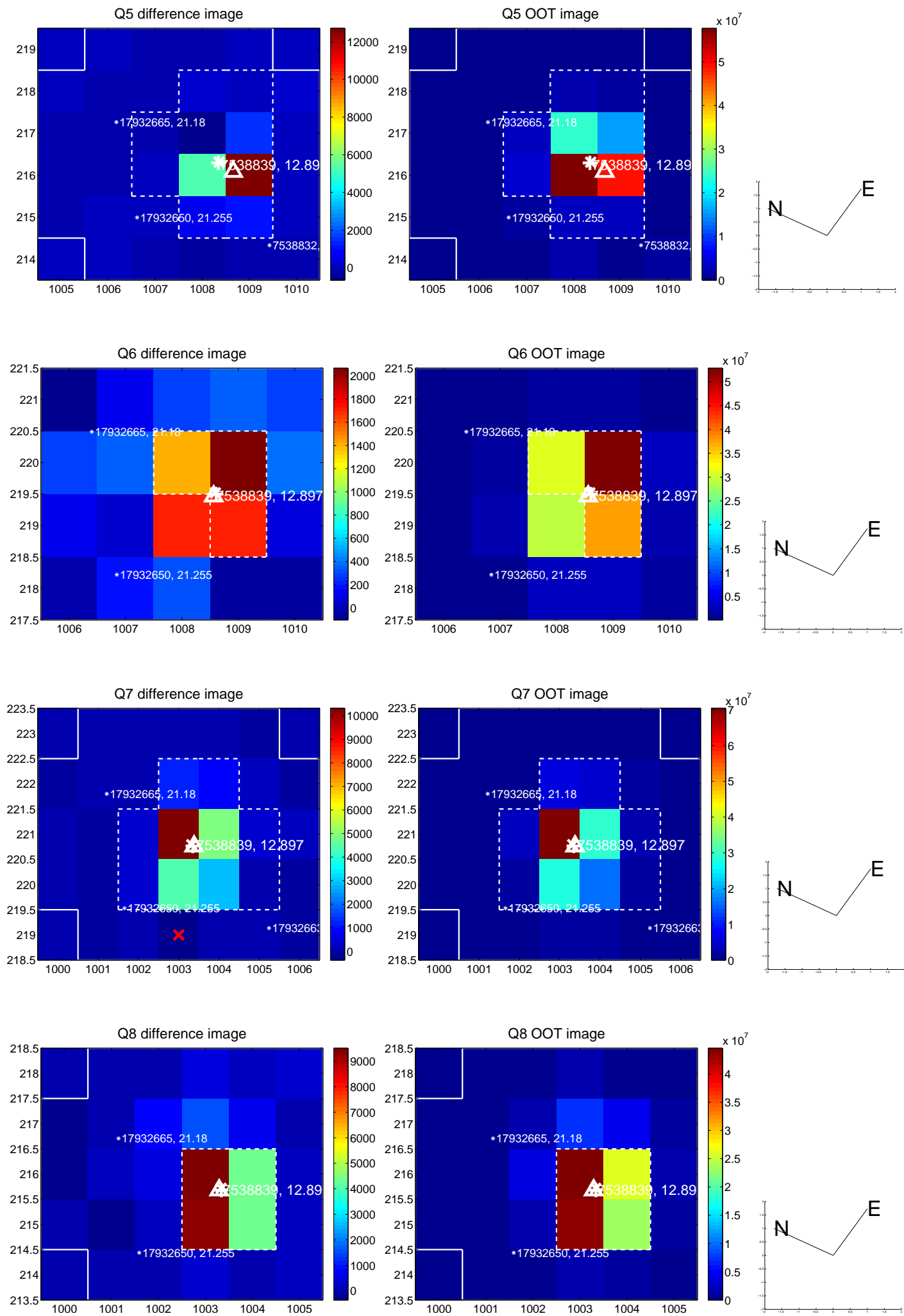


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

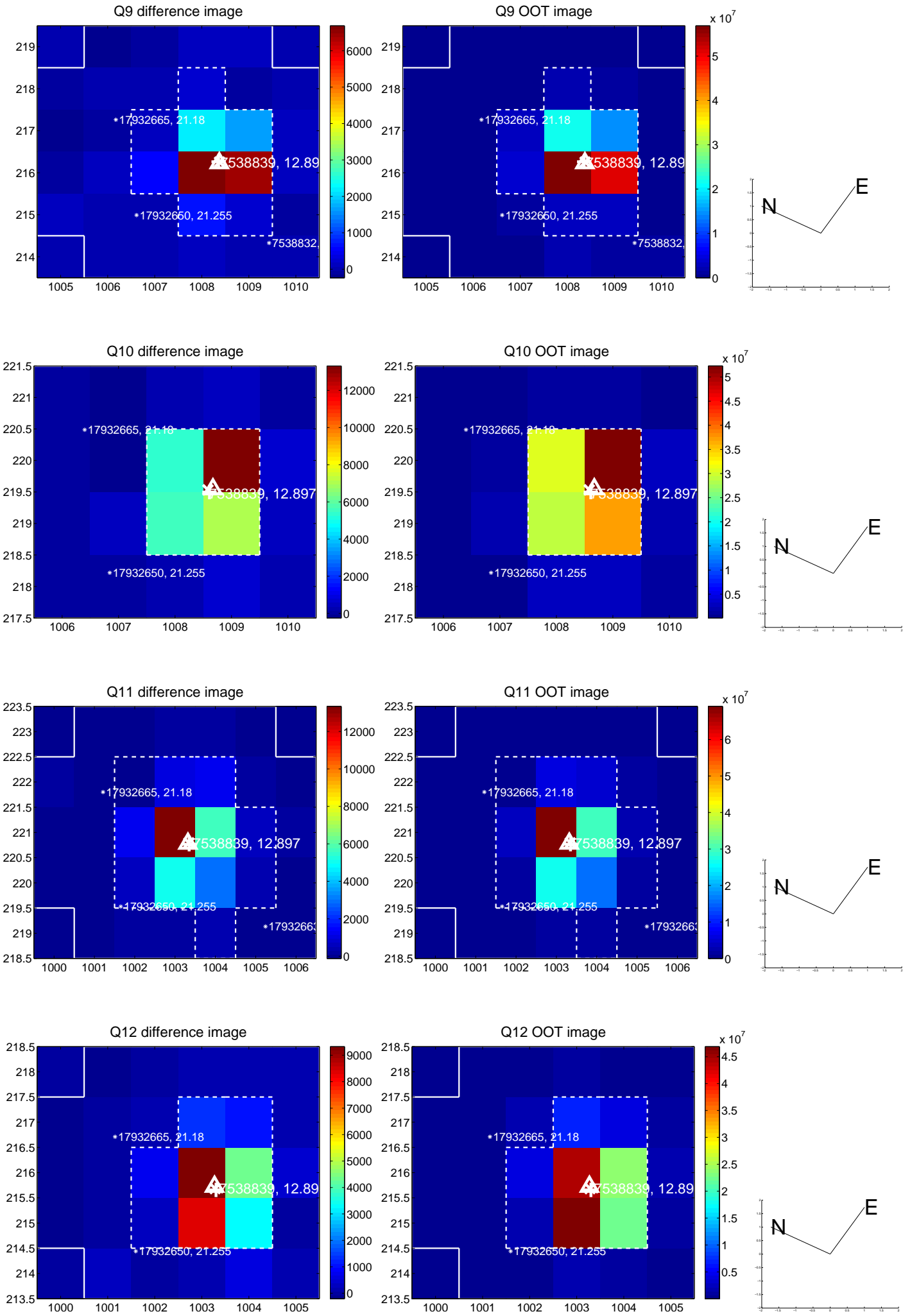


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

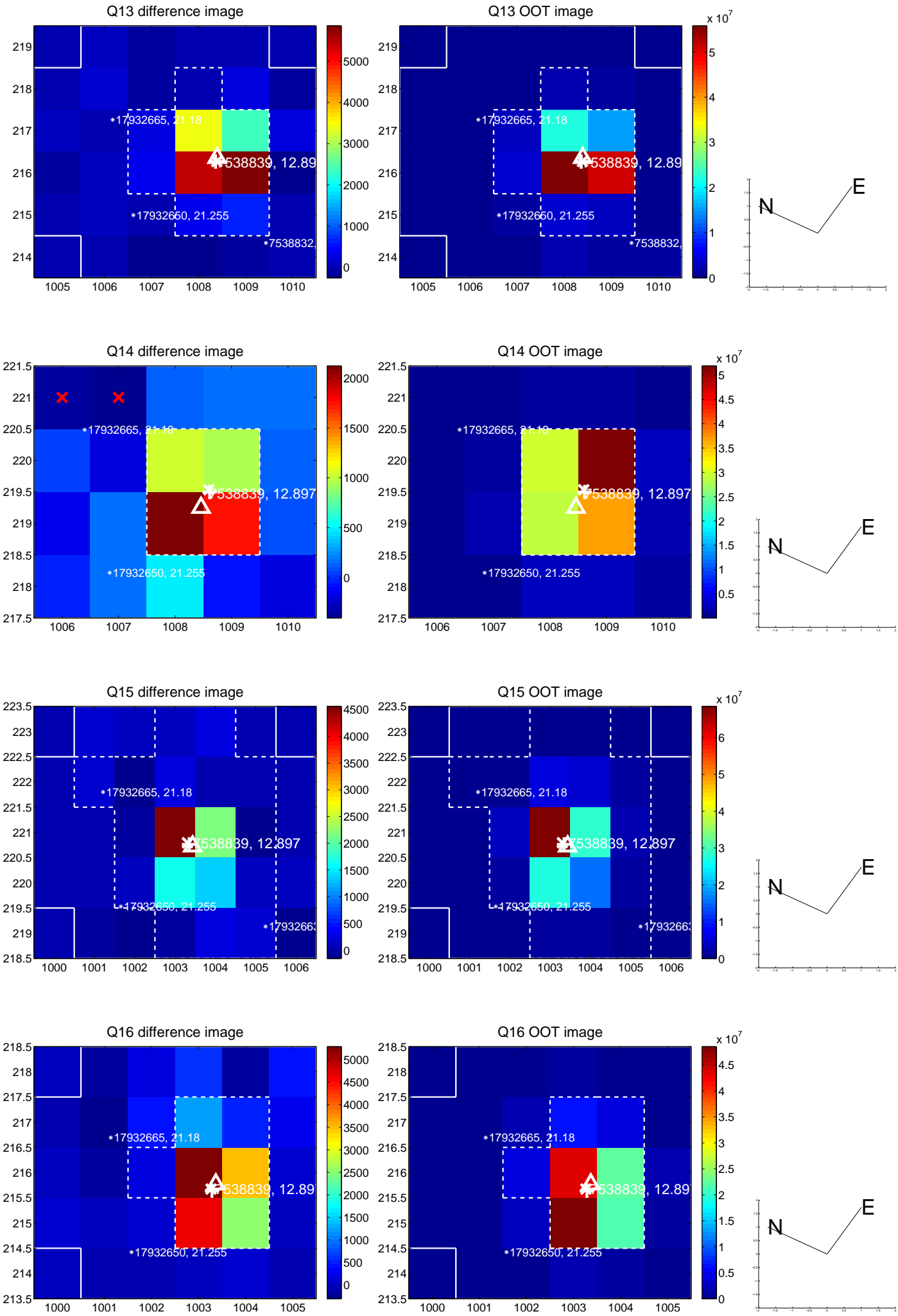




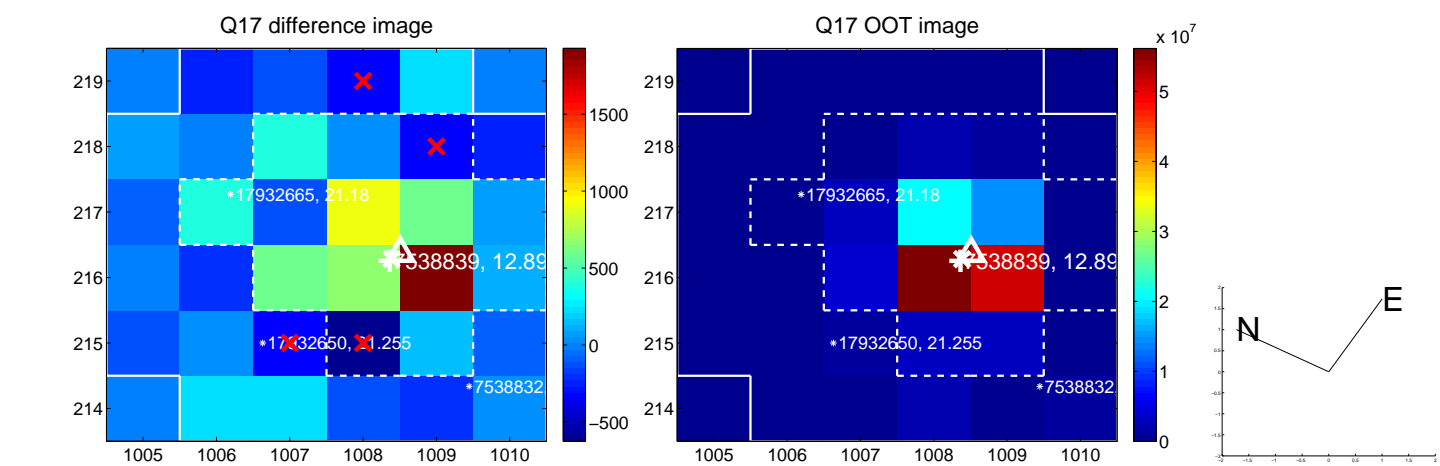
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



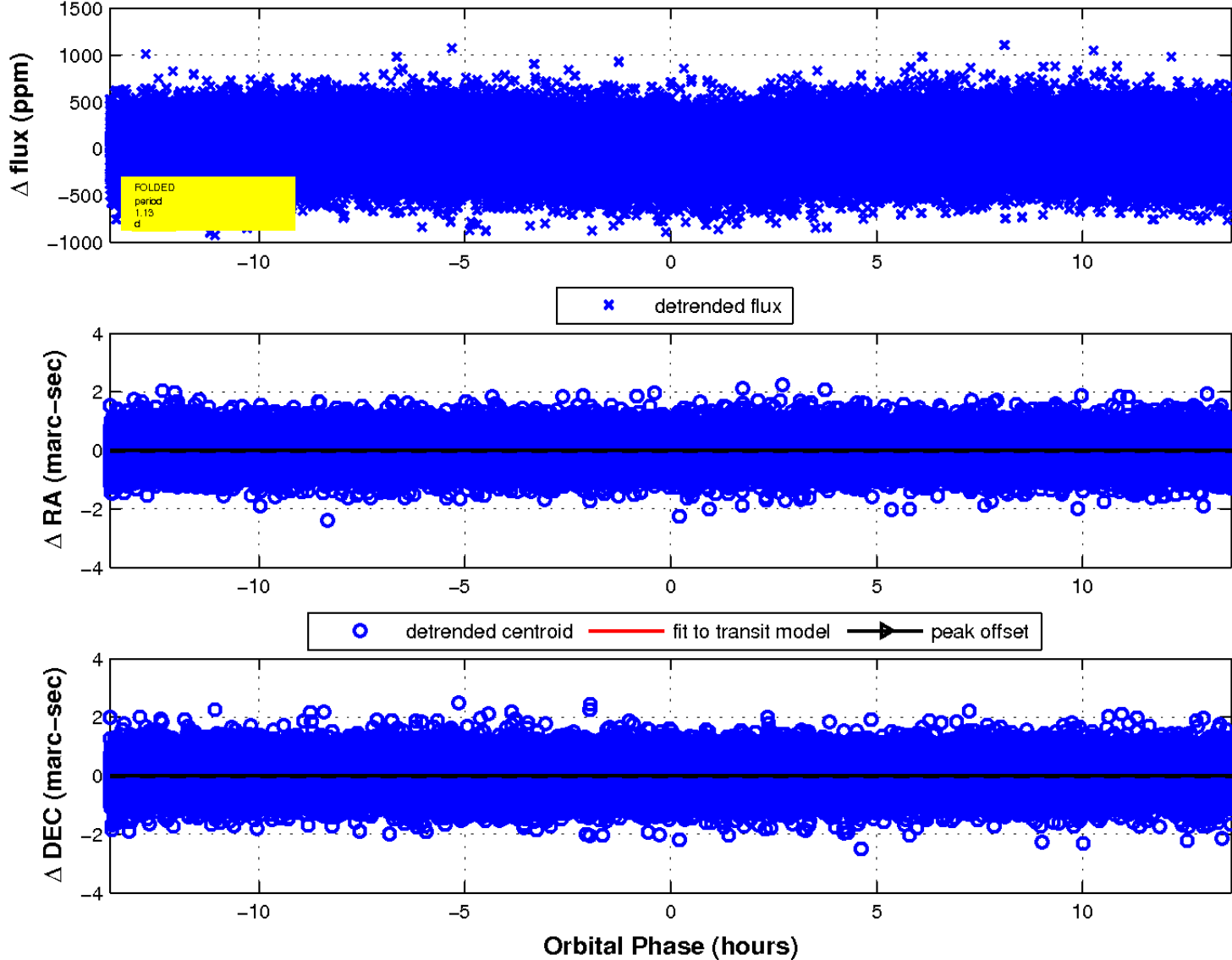
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

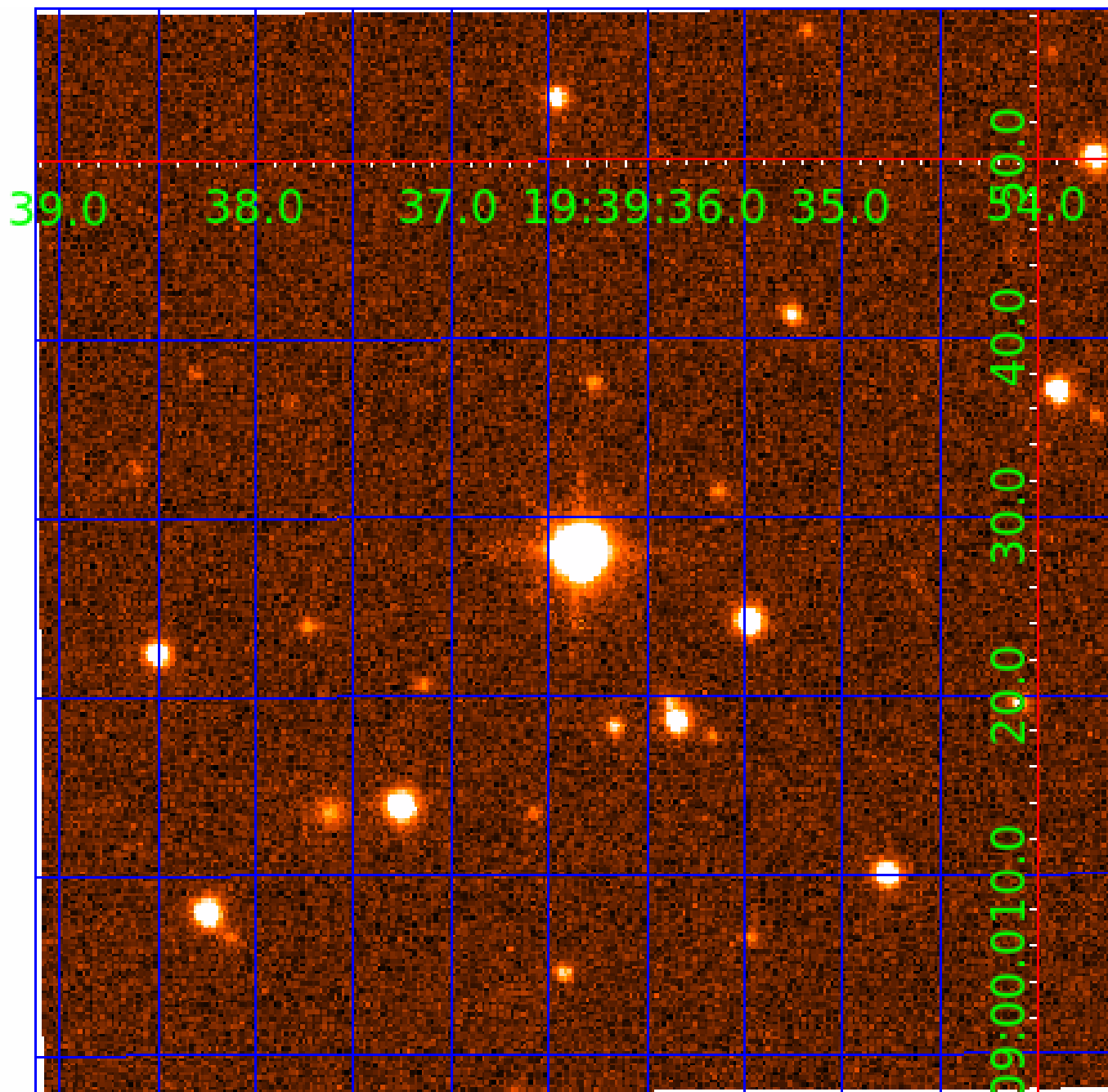


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination



# KIC 007538839

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007538839-01	OBS	No	1.134544	132.455678	38.6	4.970	9.4	10.9	4.83	6748	3.17	60194.66
007538839-02	OBS	No	69.916966	141.988100	286.1	3.284	7.5	8.1	4.83	6748	9.80	247.29
007538839-03	OBS	No	97.491990	137.632059	277.6	4.920	7.2	6.6	4.83	6748	8.75	158.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007538839-01	OBS	FP	0.00	1	0	0	0	LPP_DV
007538839-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT
007538839-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

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

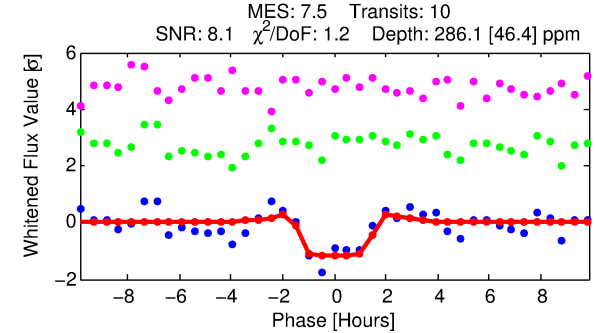
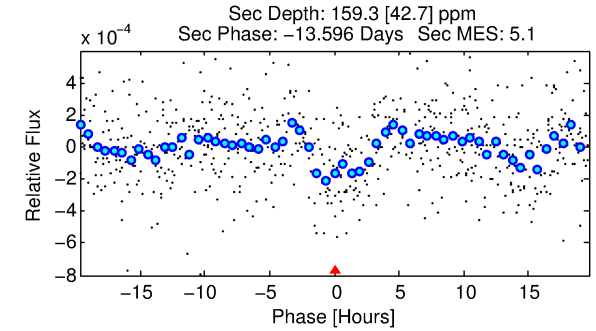
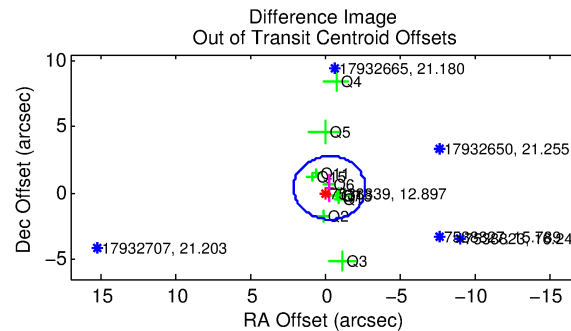
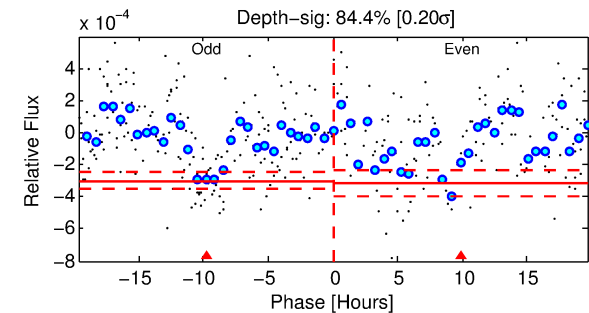
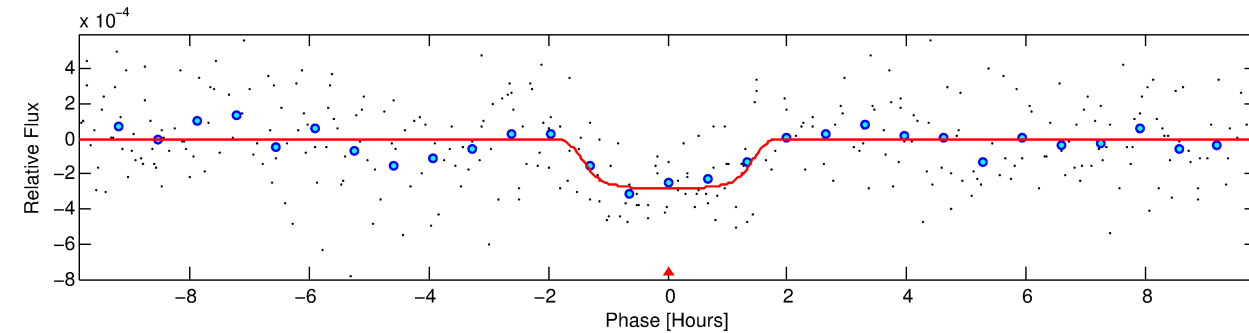
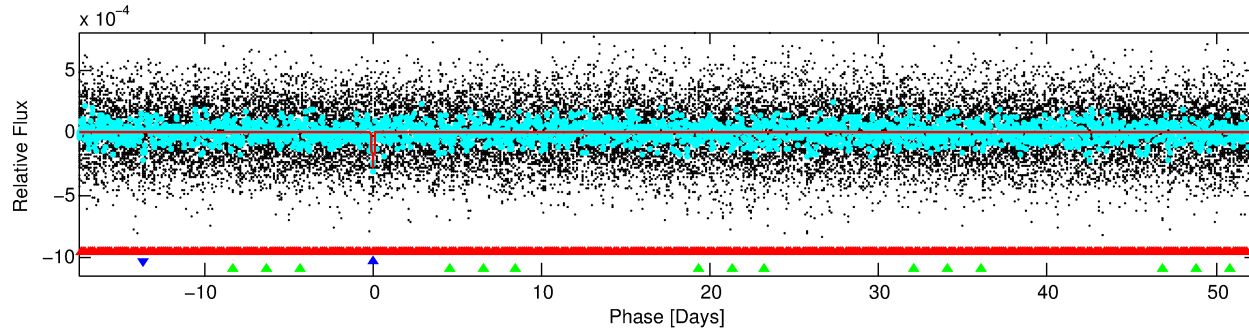
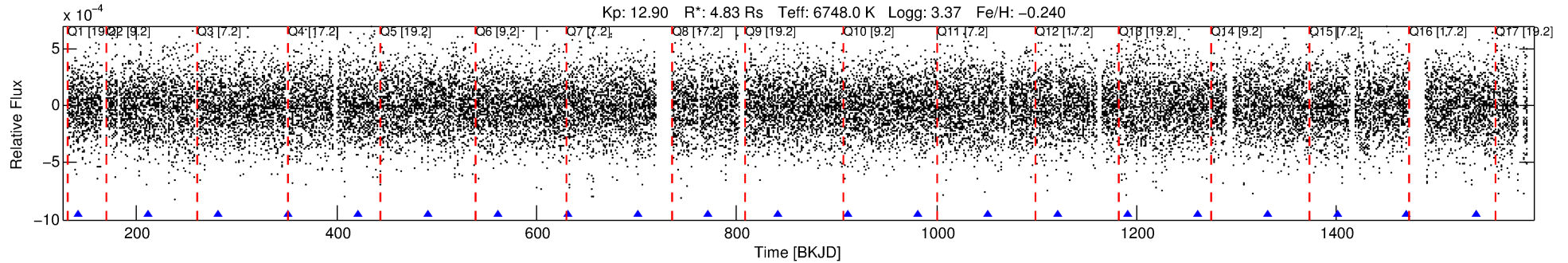
## Ephemeris Match Information For 007538839-02

No Significant Match Found



# DV One-Page Summary

KIC: 7538839 Candidate: 2 of 3 Period: 69.917 d



## DV Fit Results:

Period = 69.91697 [0.00079] d  
Epoch = 141.9881 [0.0084] BKJD  
Rp/R\* = 0.0186 [0.0043]  
a/R\* = 66.72 [81.63]  
b = 0.93 [0.17]  
Seff = 247.29 [161.51]  
Teq = 1011 [165] K  
Rp = 9.80 [4.72] Re  
a = 0.4183 [0.1683] AU  
Ag = 159.73 [133.20] [1.19 $\sigma$ ]  
Teffp = 5558 [766] K [5.80 $\sigma$ ]

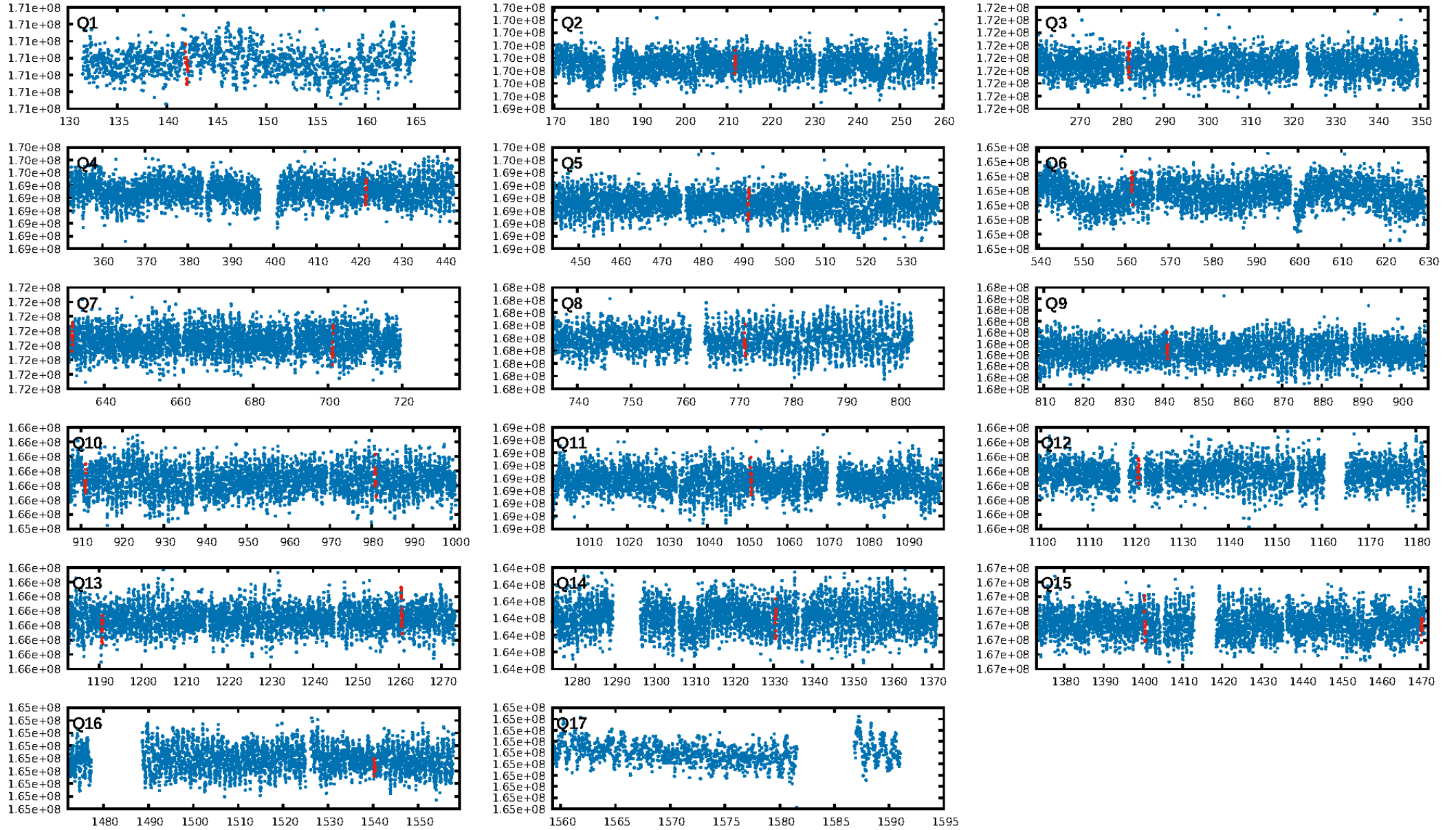
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [277.11 $\sigma$ ]  
LongPeriod-sig: 100.0% [111.87 $\sigma$ ]  
ModelChiSquare2-sig: 61.8%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 6.09e-09**  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: -10.5  
Centroid-sig: 12.3%  
Centroid-so: 0.638 arcsec [1.32 $\sigma$ ]  
OotOffset-rm: 0.509 arcsec [0.64 $\sigma$ ]  
KicOffset-rm: 0.475 arcsec [0.67 $\sigma$ ]  
OotOffset-st: 2/4/1/3 [10]  
KicOffset-st: 2/4/1/3 [10]  
DiffImageQuality-fgm: 0.60 [6/10]  
DiffImageOverlap-fno: 0.31 [5/16]

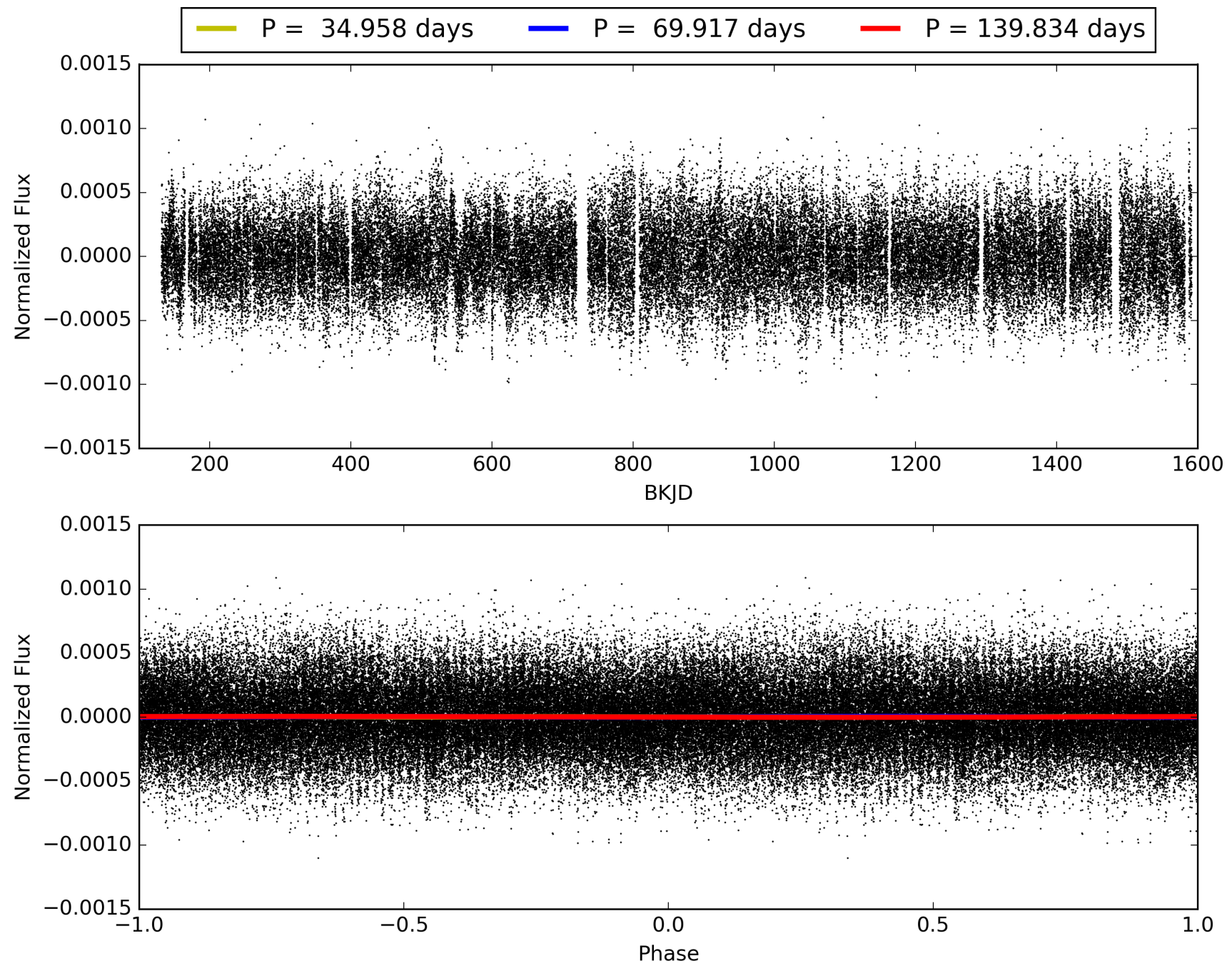
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:03:14 Z

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

# TCE 007538839-02, PDC Light Curves

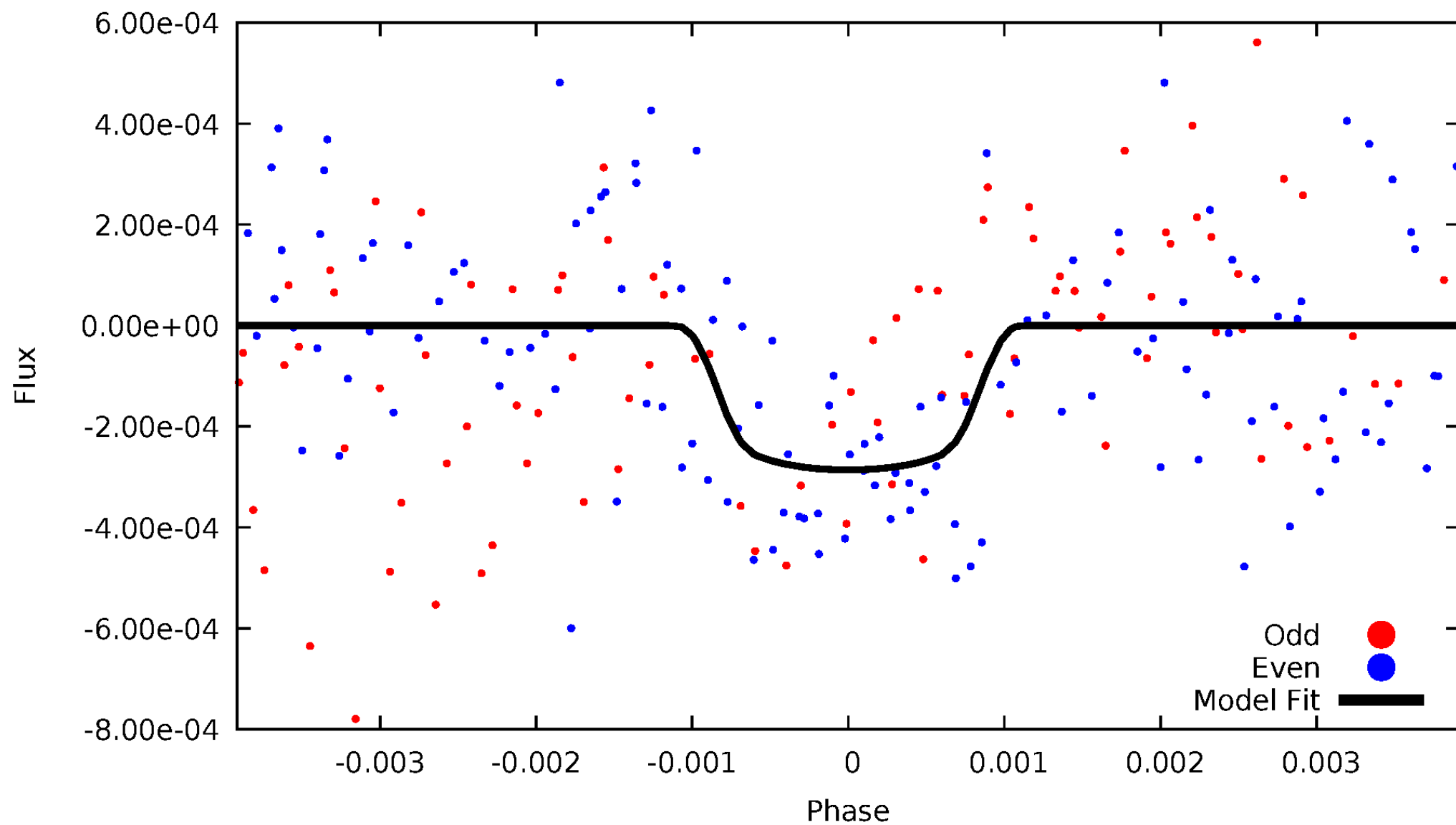


TCE 007538839-02



# DV Odd/Even

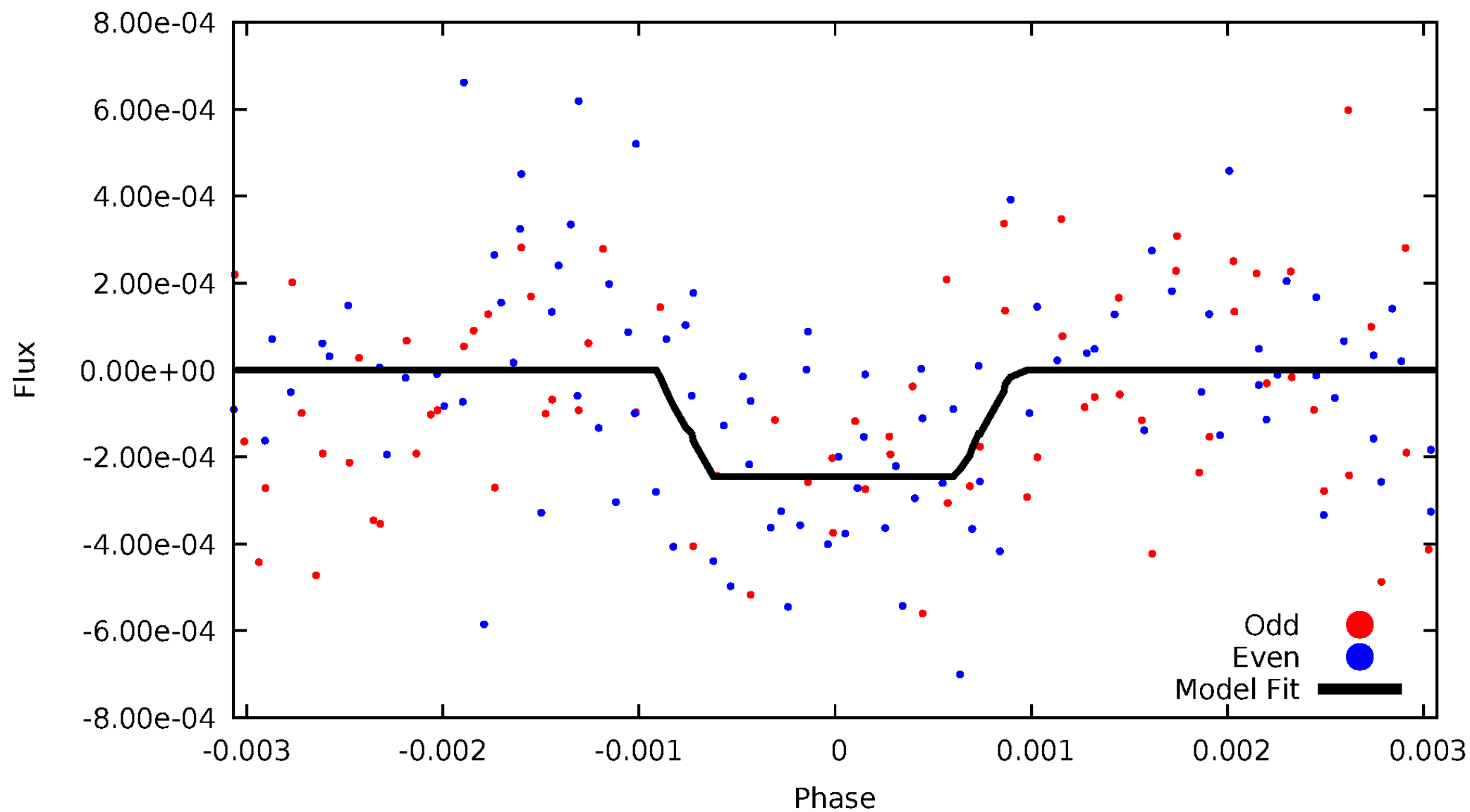
TCE 007538839-02





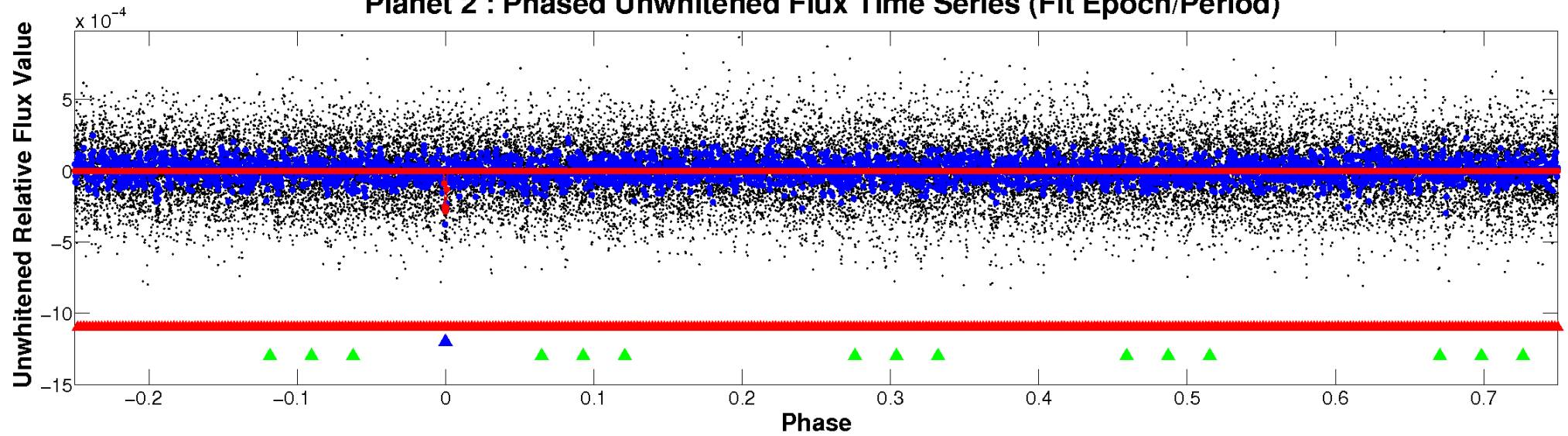
# ALT Odd/Even

TCE 007538839-02

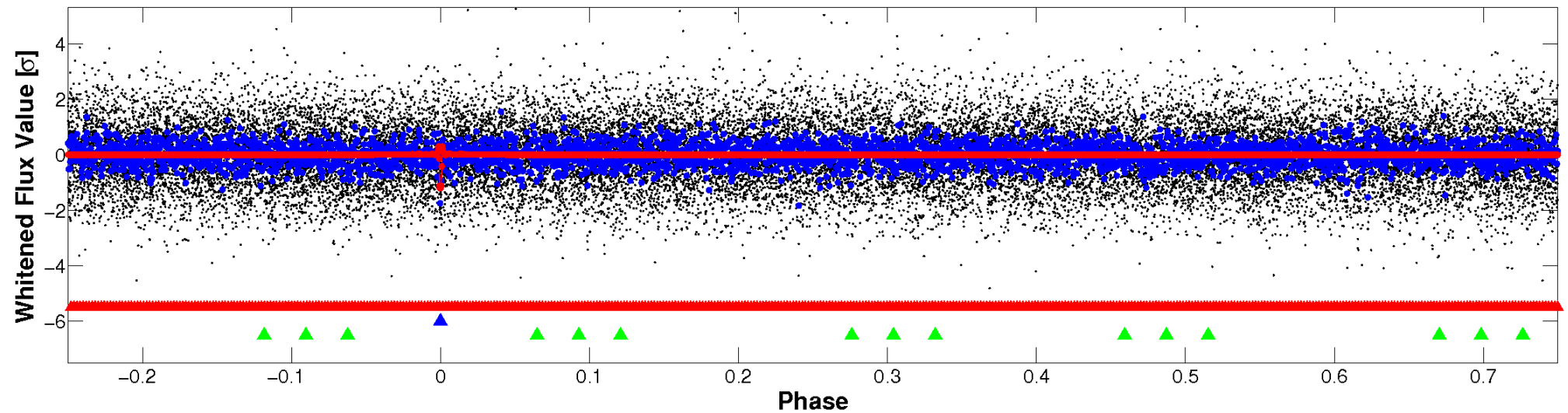


# Non-Whitened Vs. Whitened Light Curve

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

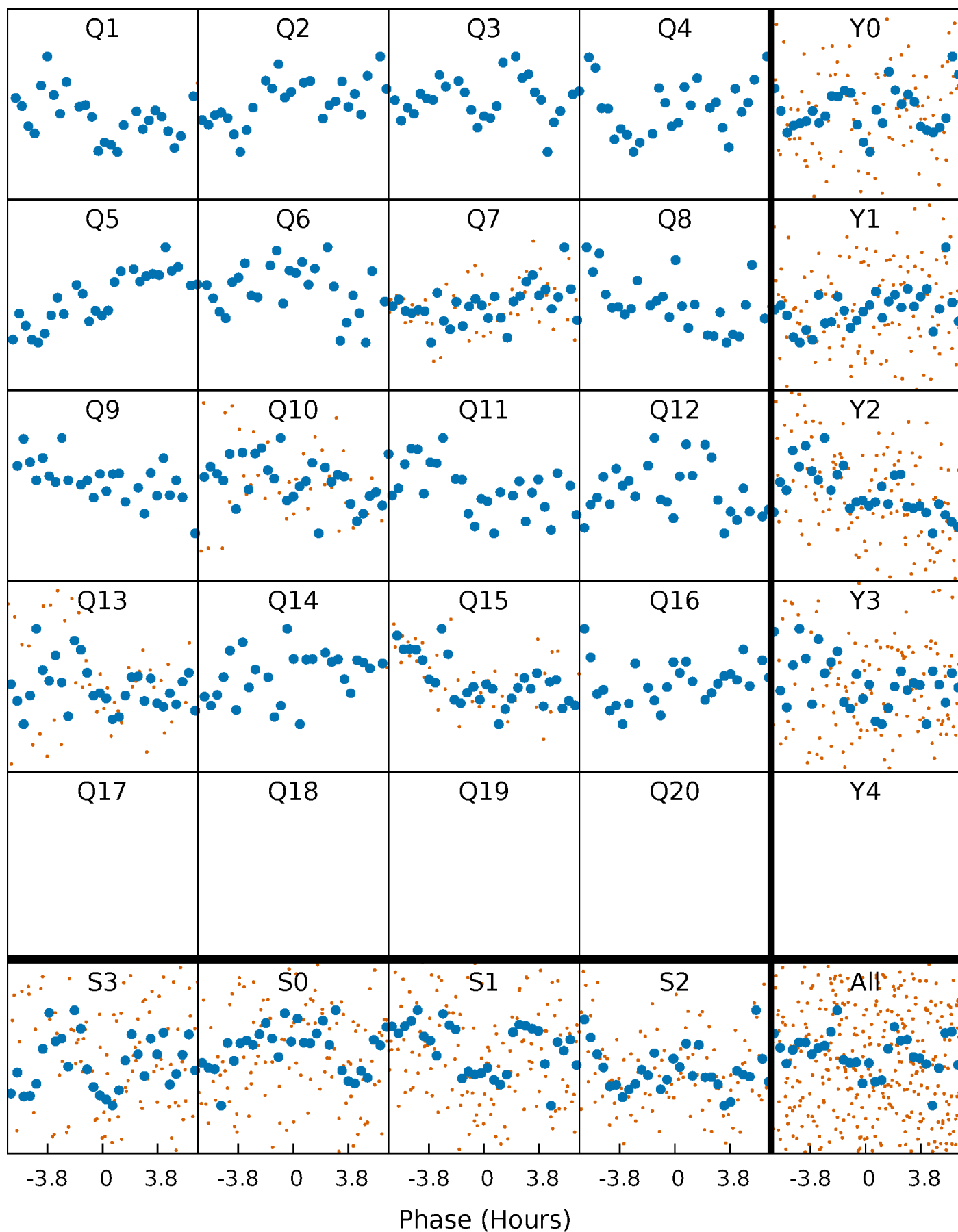


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



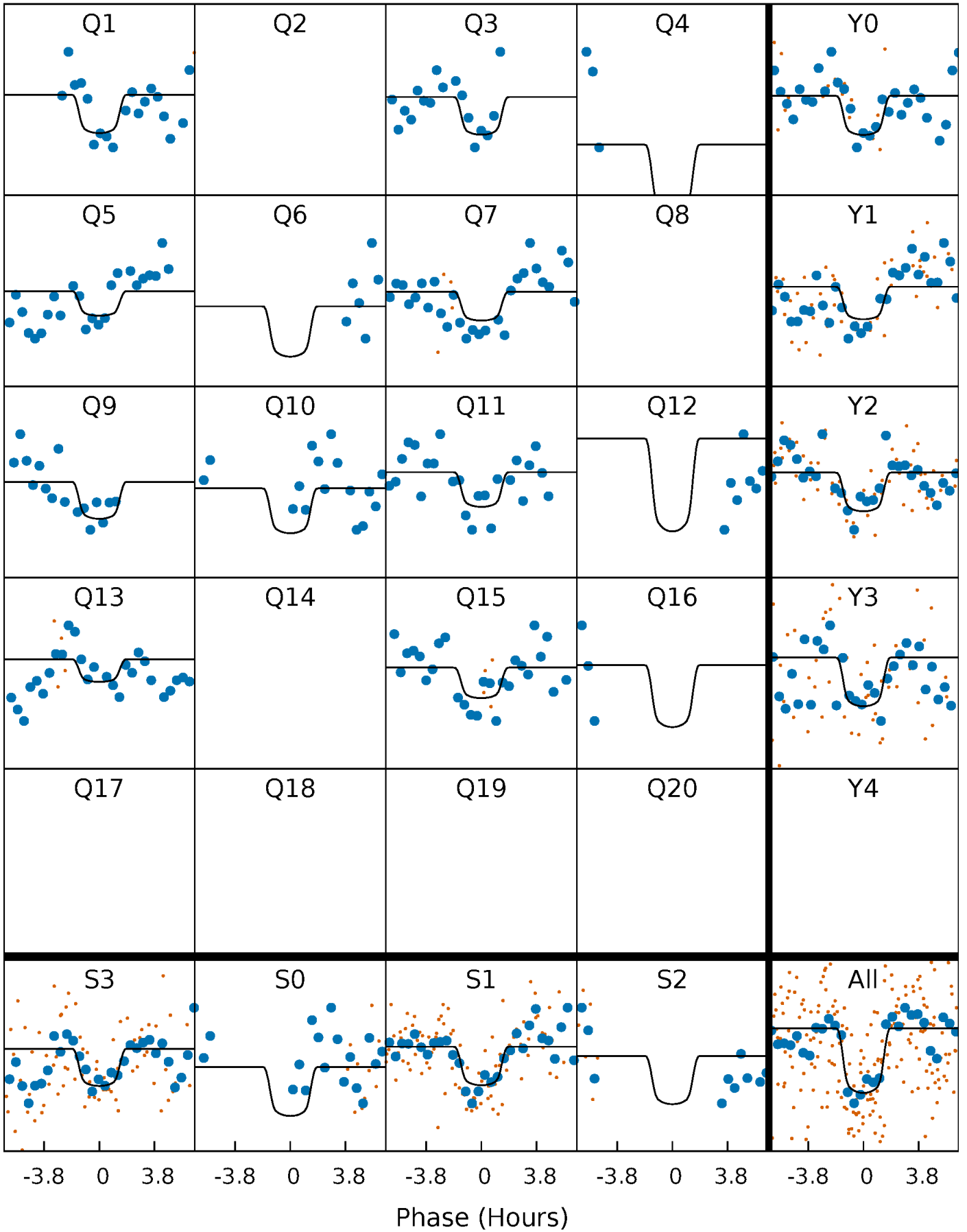
# PDC Quarter-Phased Transit Curves

TCE 007538839-02 P= 69.916966 Days  $T_0=141.988100$  (BKJD)



# DV Quarter-Phased Transit Curves

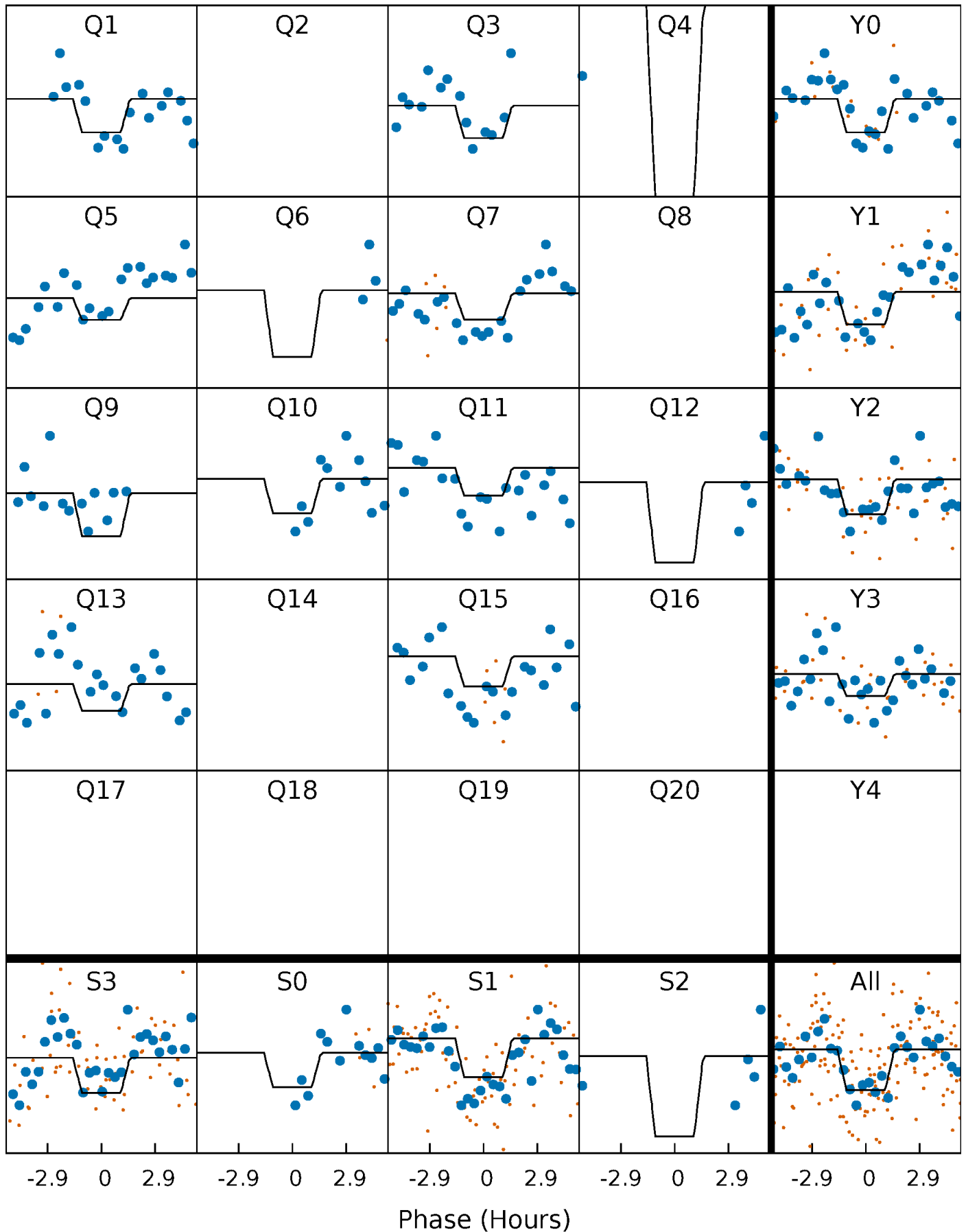
TCE 007538839-02   P= 69.916966 Days    $T_0=141.988100$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

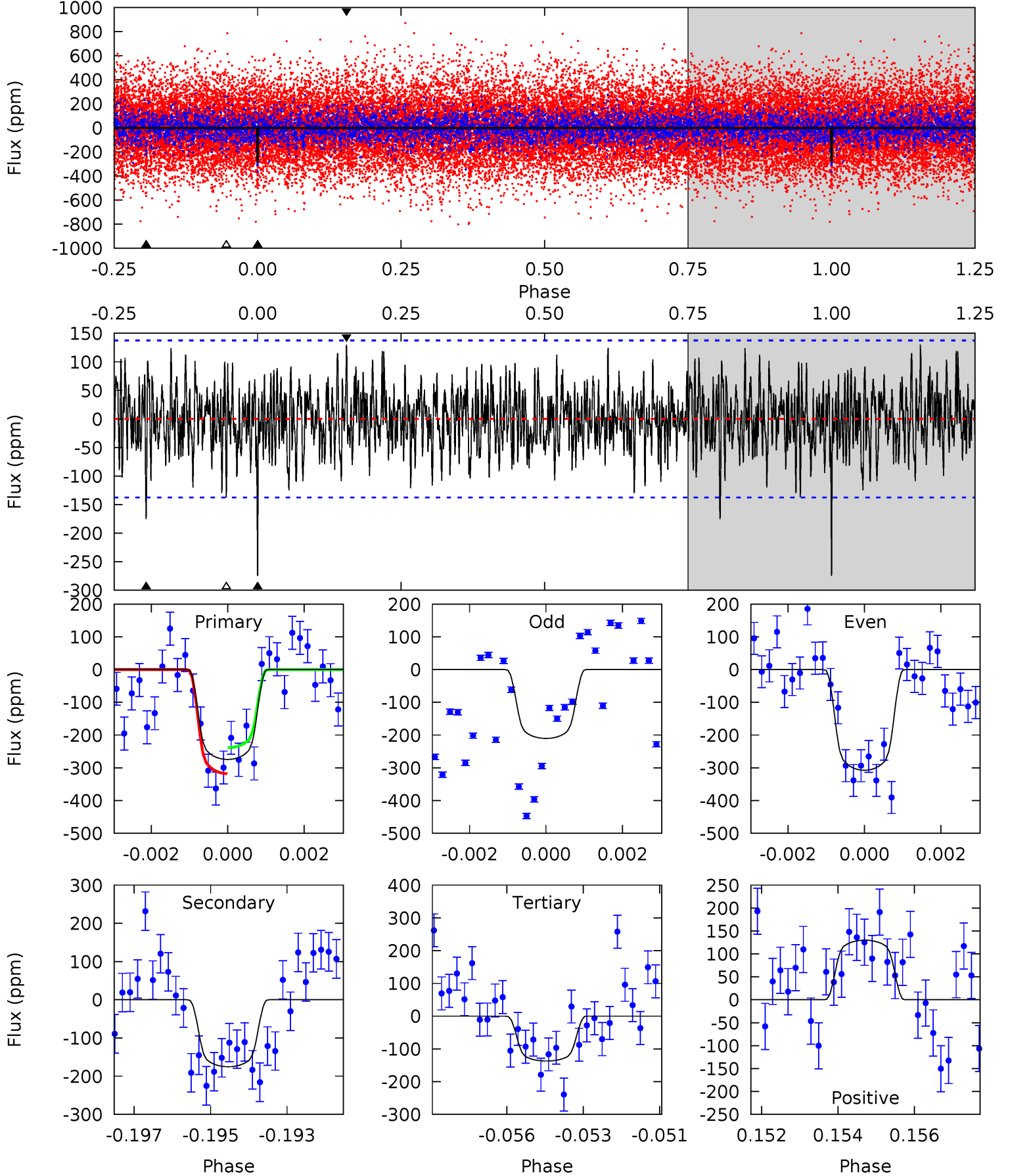
TCE 007538839-02   P= 69.917228 Days    $T_0=141.987025$  (BKJD)



# DV Model-Shift Uniqueness Test

007538839-02, P = 69.916966 Days, E = 72.071134 Days

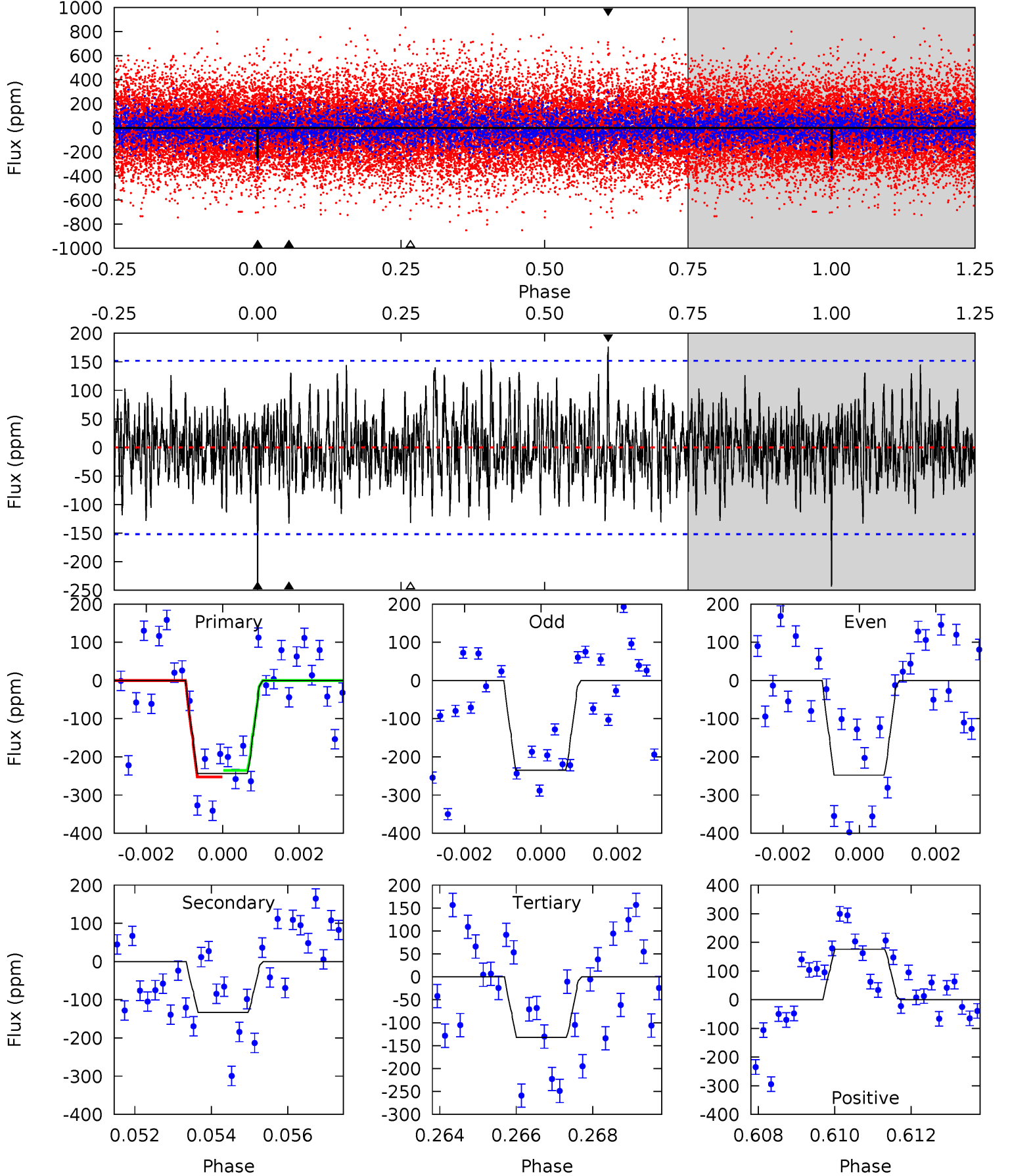
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	6.77	5.30	5.02	5.31	3.07	1.71	5.32	5.59	1.48	1.75	1.80	0.97	0.32	1.53



# Alt Model-Shift Uniqueness Test

007538839-02, P = 69.917228 Days, E = 72.069797 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
8.56	4.68	4.64	6.20	5.34	3.11	1.69	3.92	2.36	0.04	-1.52	0.22	1.13	0.42	0.30



### Stellar Parameters For KIC 007538839

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6748^{+202}_{-223}$	$3.371^{+0.374}_{-0.066}$	$-0.240^{+0.350}_{-0.300}$	$4.826^{+0.360}_{-2.041}$	$1.998^{+0.133}_{-0.398}$	$0.025^{+0.080}_{-0.005}$
	+3%/-3%	+11%/-2%	+146%/-125%	+7%/-42%	+7%/-20%	+318%/-21%
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 007538839-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-175 \pm 26$	$8.79^{+2.88}_{-2.50}$	$1385^{+71}_{-140}$	$5756^{+864}_{-641}$	$220^{+198}_{-101}$
Alt.	$-133 \pm 28$	$7.47^{+2.67}_{-2.31}$	$1380^{+77}_{-128}$	$5756^{+1106}_{-729}$	$218^{+220}_{-104}$

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



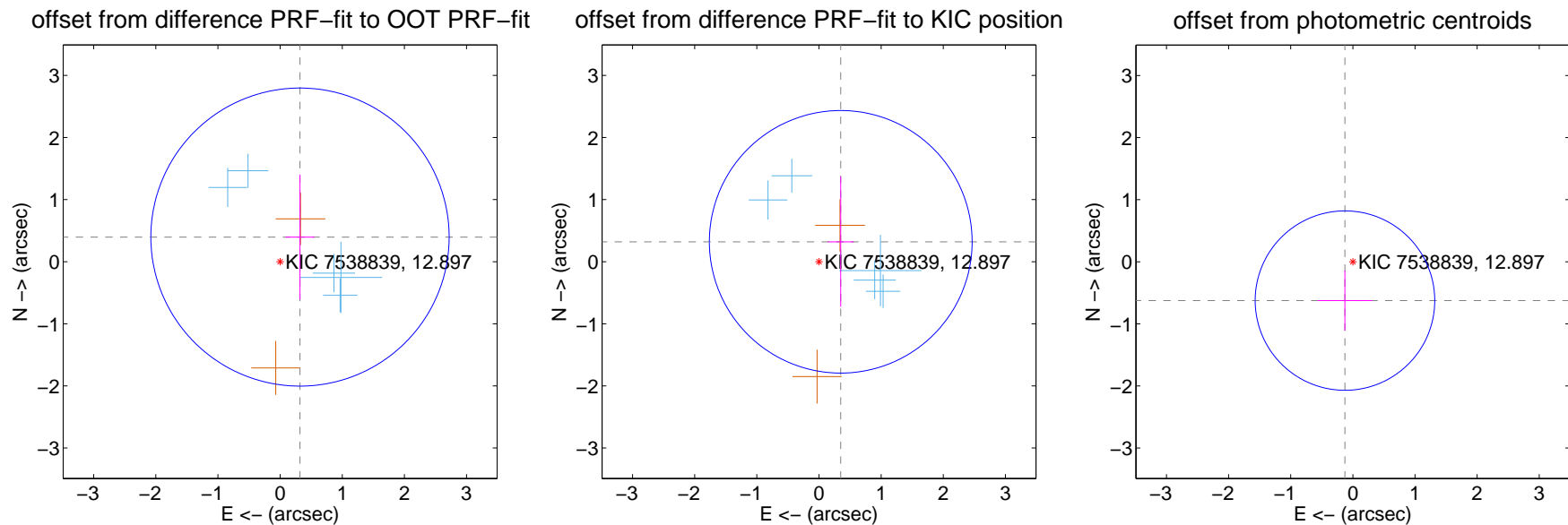
## DV Centroid Data

Supplemental centroid analysis for 007538839-02. Kepler magnitude: 12.90. Transit SNR 8.07

There are 6 quarters with good PRF difference image offsets

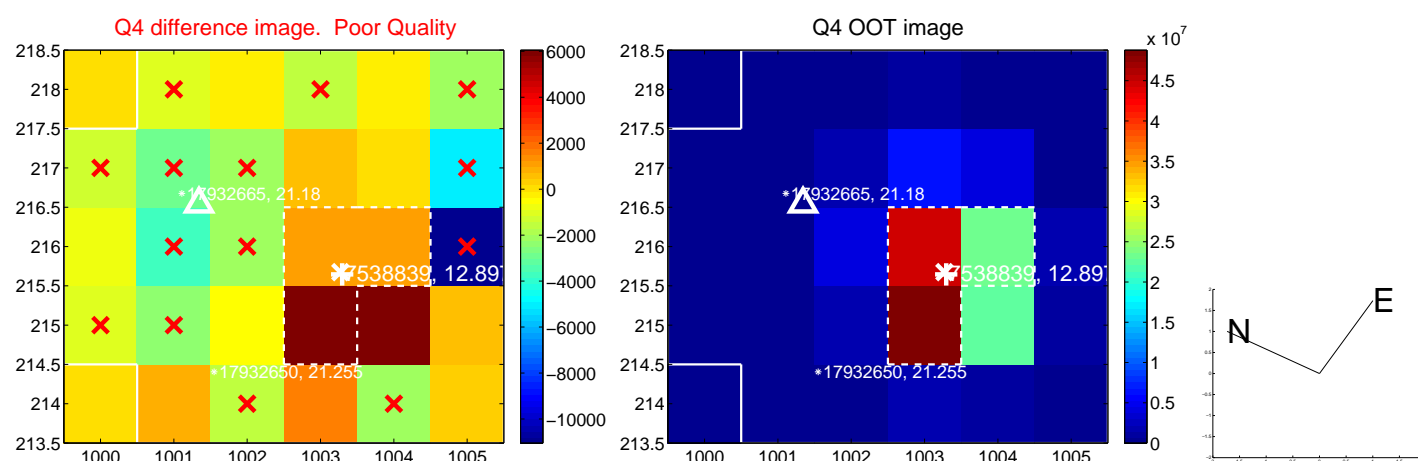
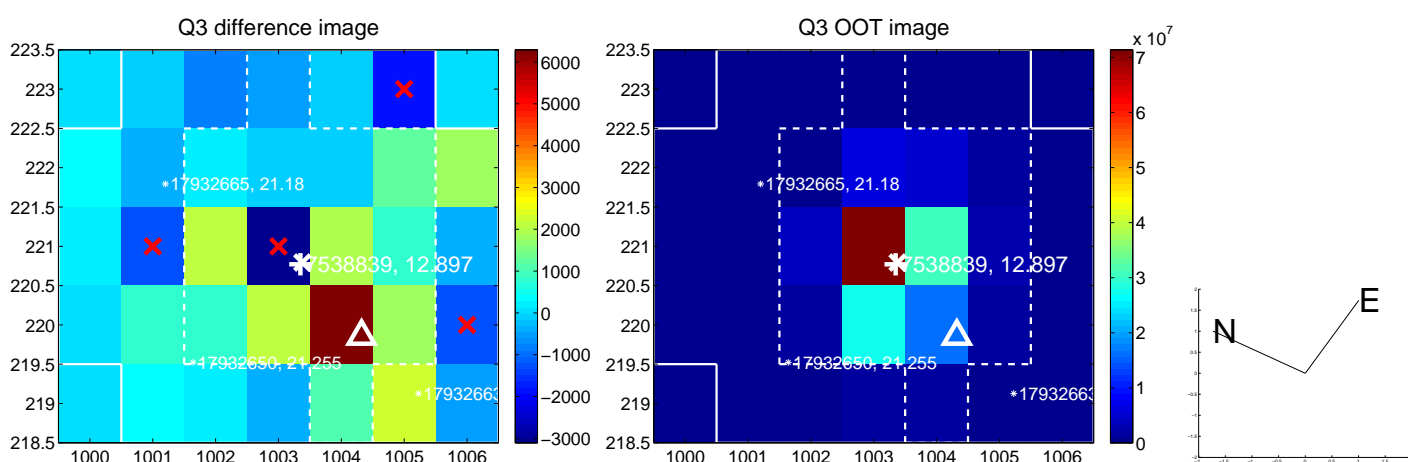
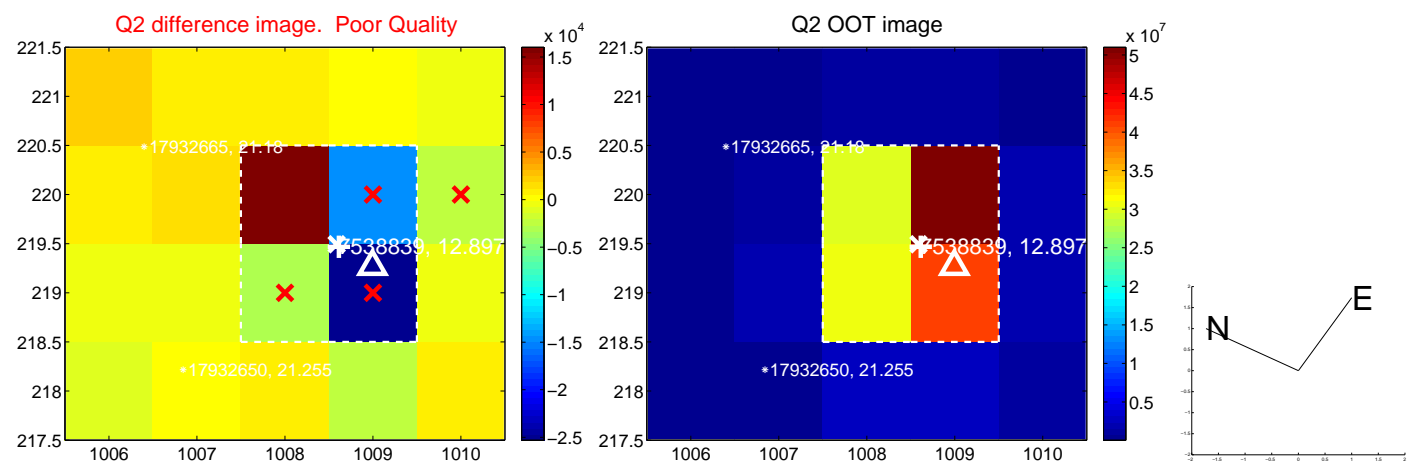
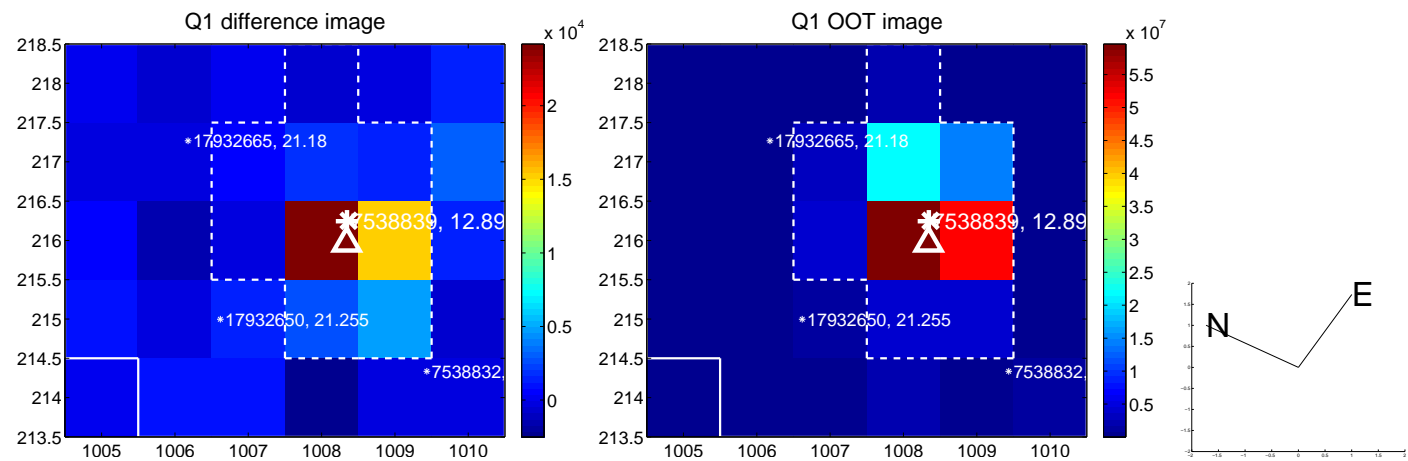
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.509 \pm 0.800$	0.64	$-0.320 \pm 0.233$	$0.397 \pm 1.007$
PRF-fit source offset from KIC position	$0.475 \pm 0.705$	0.67	$-0.350 \pm 0.209$	$0.320 \pm 1.046$
photometric centroid source offset	$0.64 \pm 0.48$	1.32	$0.13 \pm 0.44$	$-0.63 \pm 0.48$

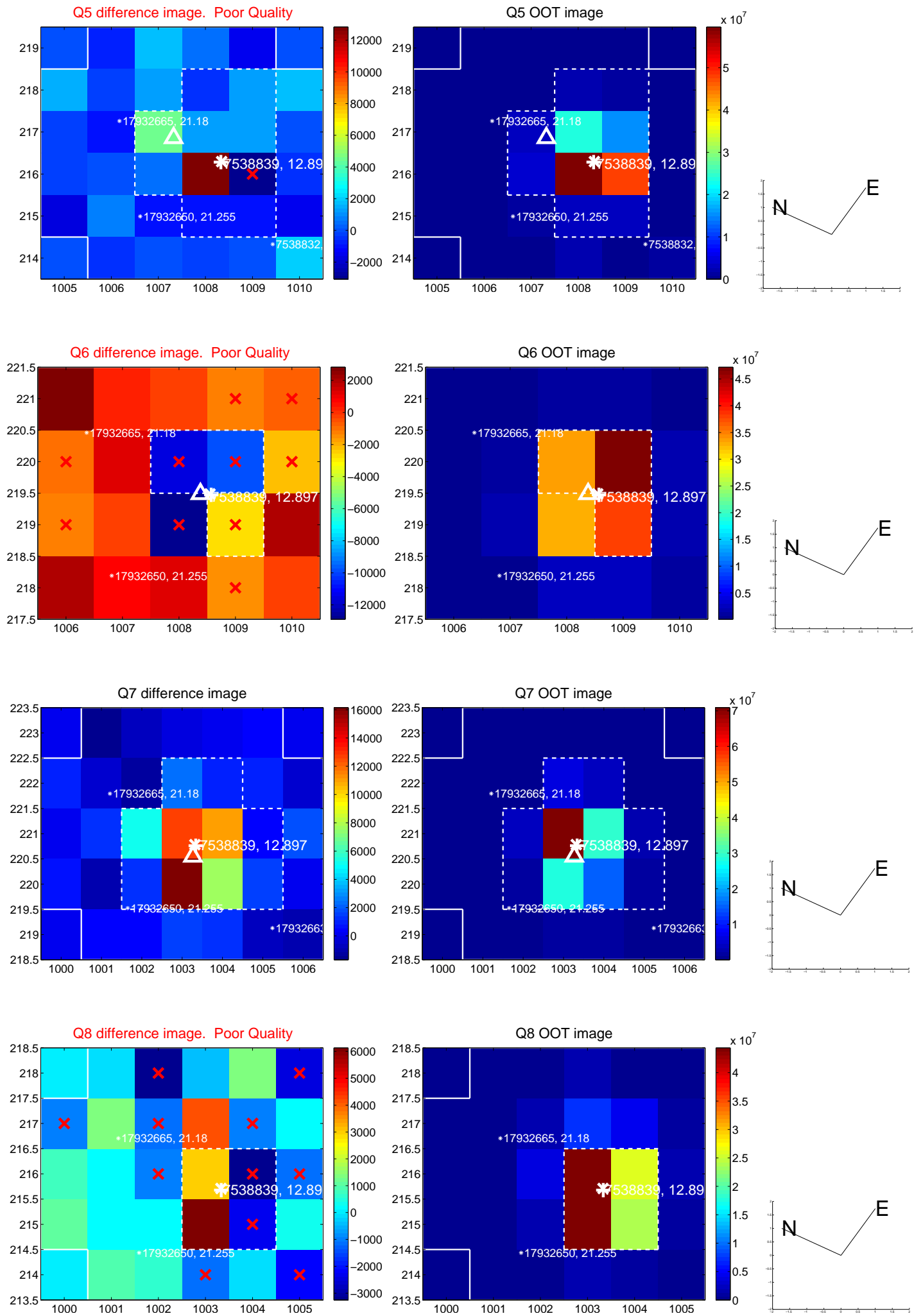


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

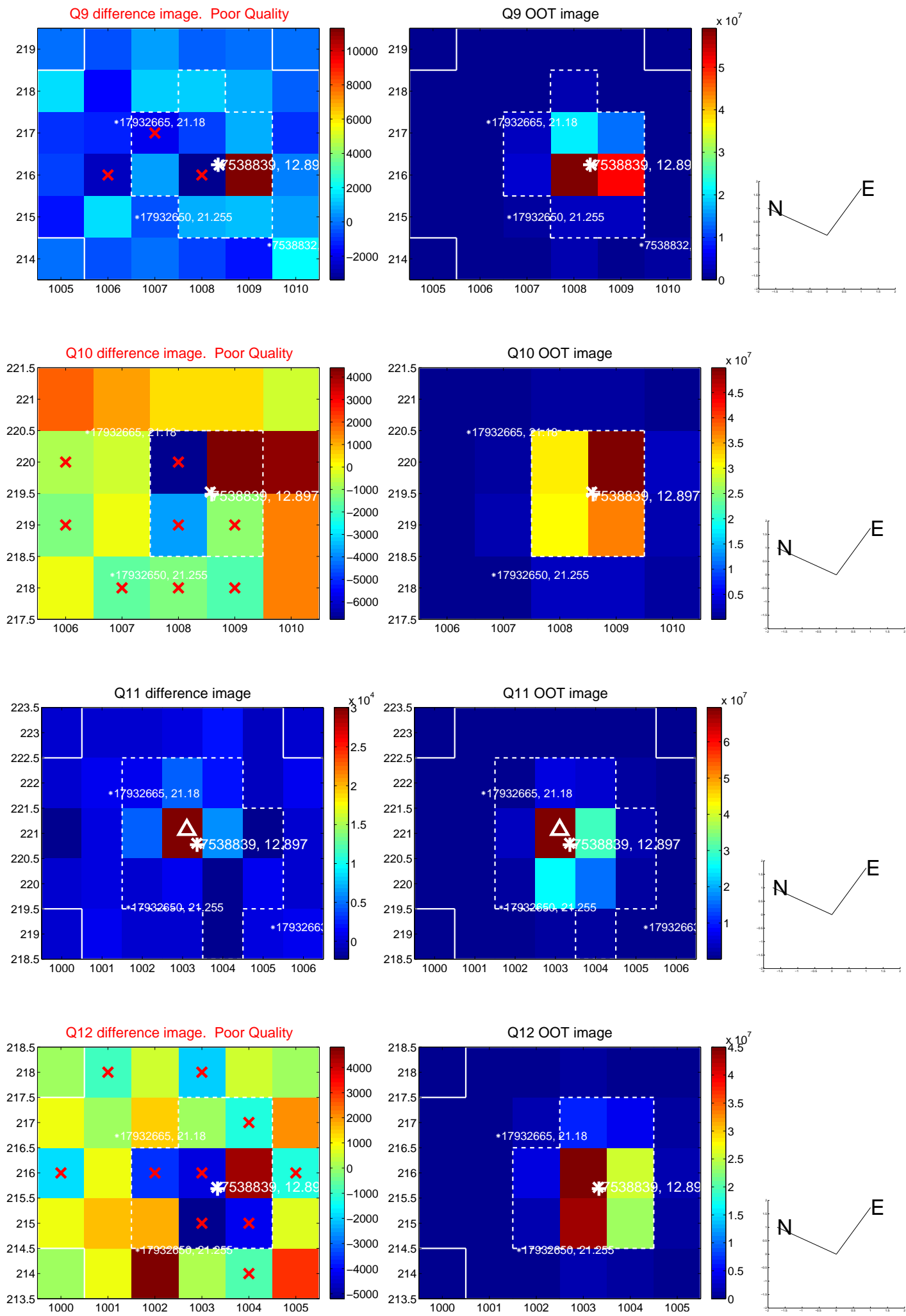
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



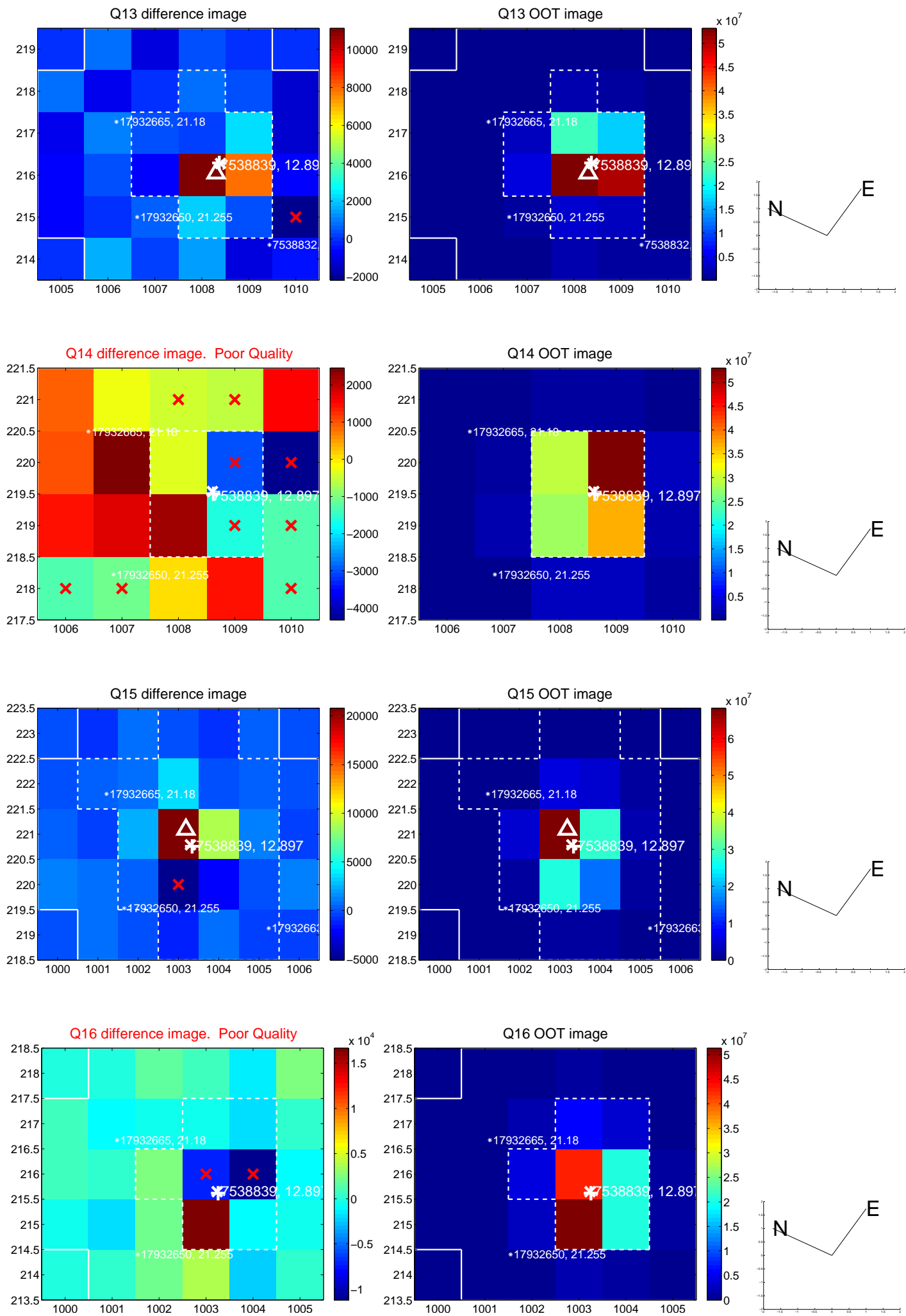
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

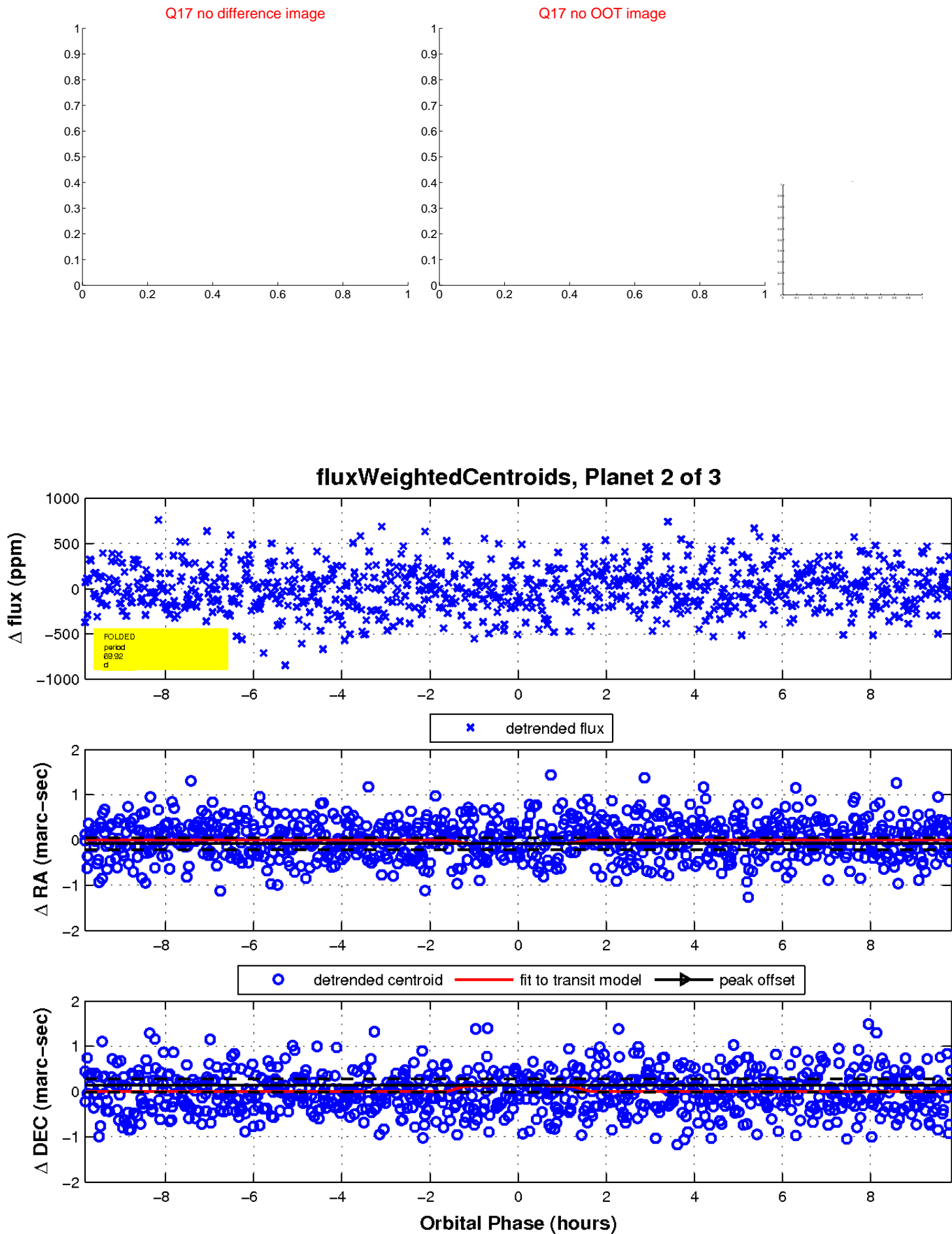


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



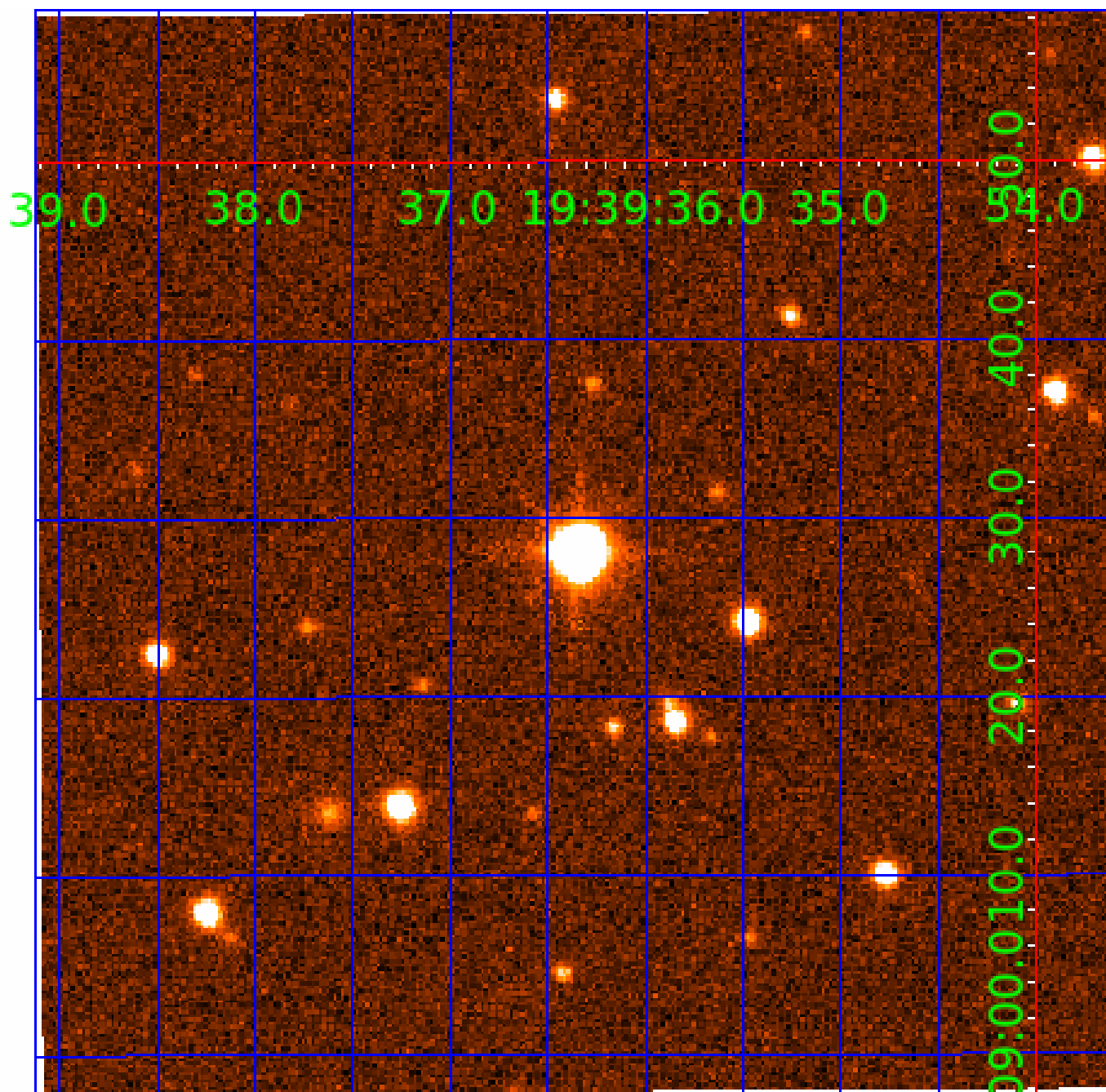


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007538839

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007538839-01	OBS	No	1.134544	132.455678	38.6	4.970	9.4	10.9	4.83	6748	3.17	60194.66
007538839-02	OBS	No	69.916966	141.988100	286.1	3.284	7.5	8.1	4.83	6748	9.80	247.29
007538839-03	OBS	No	97.491990	137.632059	277.6	4.920	7.2	6.6	4.83	6748	8.75	158.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007538839-01	OBS	FP	0.00	1	0	0	0	LPP_DV
007538839-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT
007538839-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

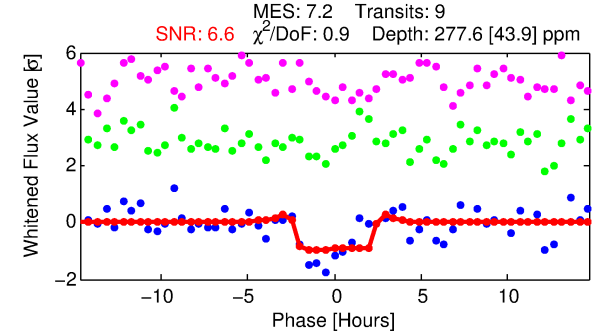
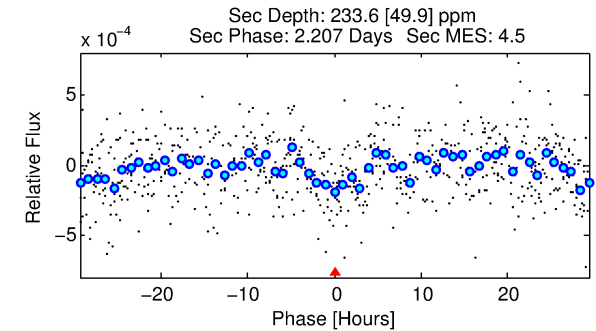
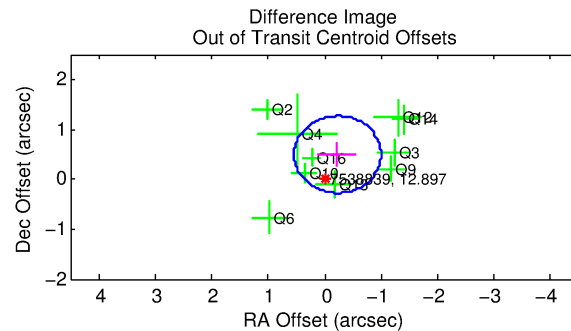
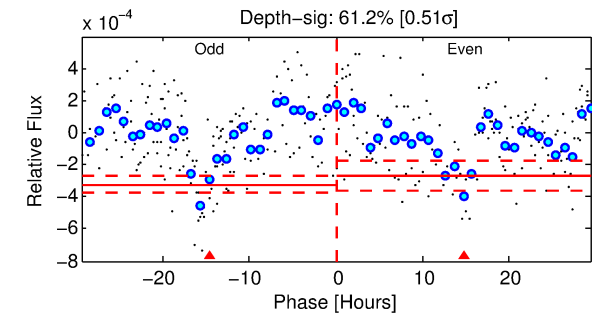
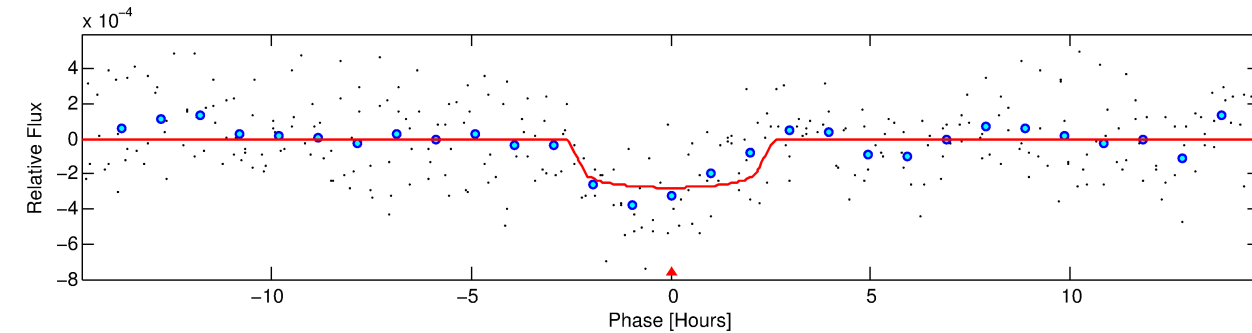
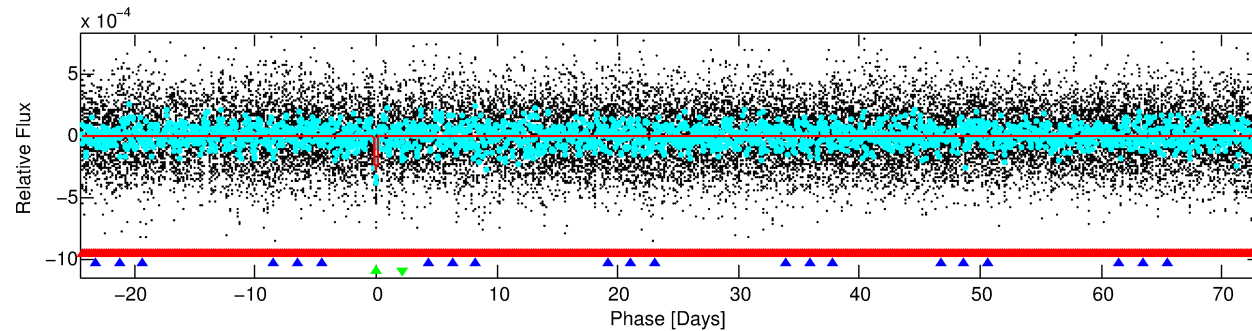
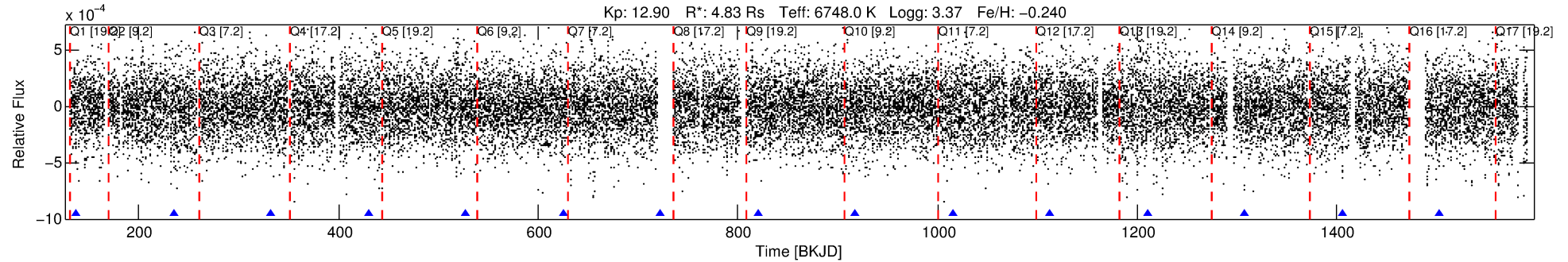
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007538839-03

No Significant Match Found

# DV One-Page Summary

KIC: 7538839 Candidate: 3 of 3 Period: 97.492 d



## DV Fit Results:

Period = 97.49199 [0.00112] d  
Epoch = 137.6321 [0.0073] BKJD  
Rp/R\* = 0.0166 [0.0122]  
a/R\* = 102.52 [435.04]  
b = 0.76 [2.40]  
Seff = 158.74 [103.68]  
Teq = 905 [148] K  
Rp = 8.75 [7.43] Re  
a = 0.5221 [0.2101] AU  
Ag = 457.75 [741.82] [0.62 $\sigma$ ]  
Teffp = 6473 [2419] K [2.30 $\sigma$ ]

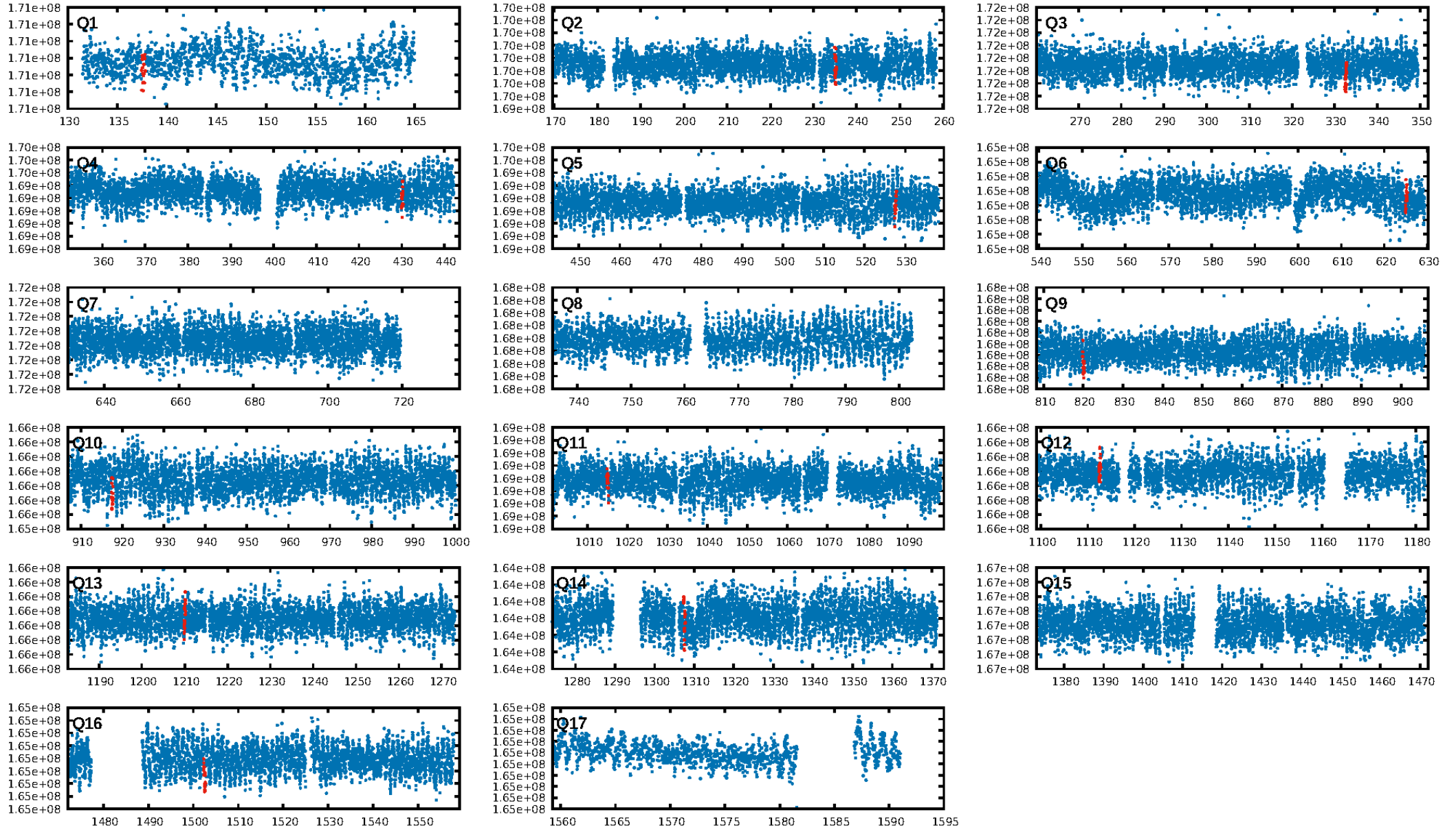
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [111.87 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 4.0%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.41e-08**  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: 1.11  
Centroid-sig: 23.5%  
Centroid-so: 0.399 arcsec [0.85 $\sigma$ ]  
OotOffset-rm: 0.543 arcsec [2.11 $\sigma$ ]  
KicOffset-rm: 0.509 arcsec [1.92 $\sigma$ ]  
OotOffset-st: 4/1/3/2 [10]  
KicOffset-st: 4/1/3/2 [10]  
DiffImageQuality-fgm: 0.70 [7/10]  
DiffImageOverlap-fno: 0.08 [1/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:03:21 Z

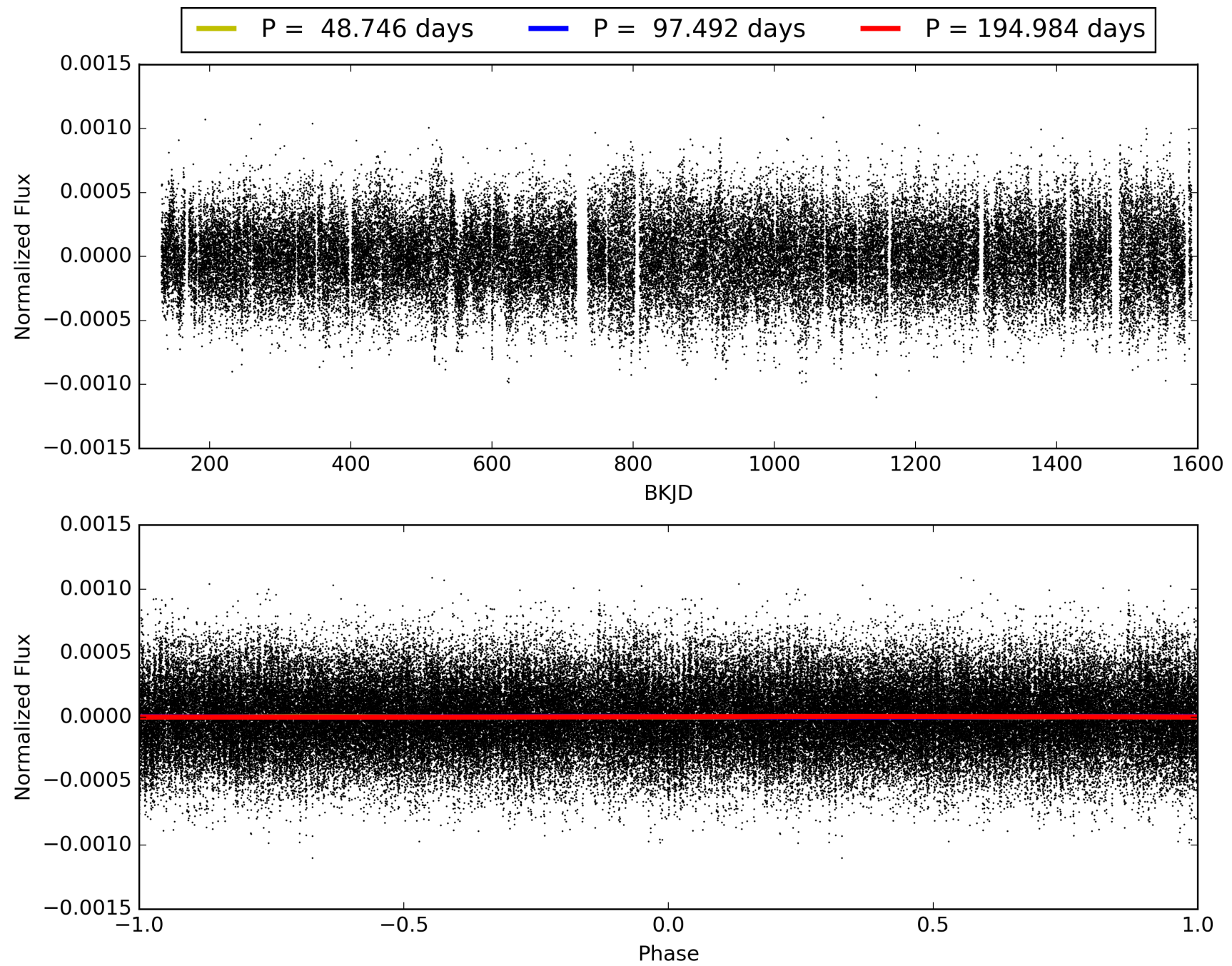
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007538839-03, PDC Light Curves



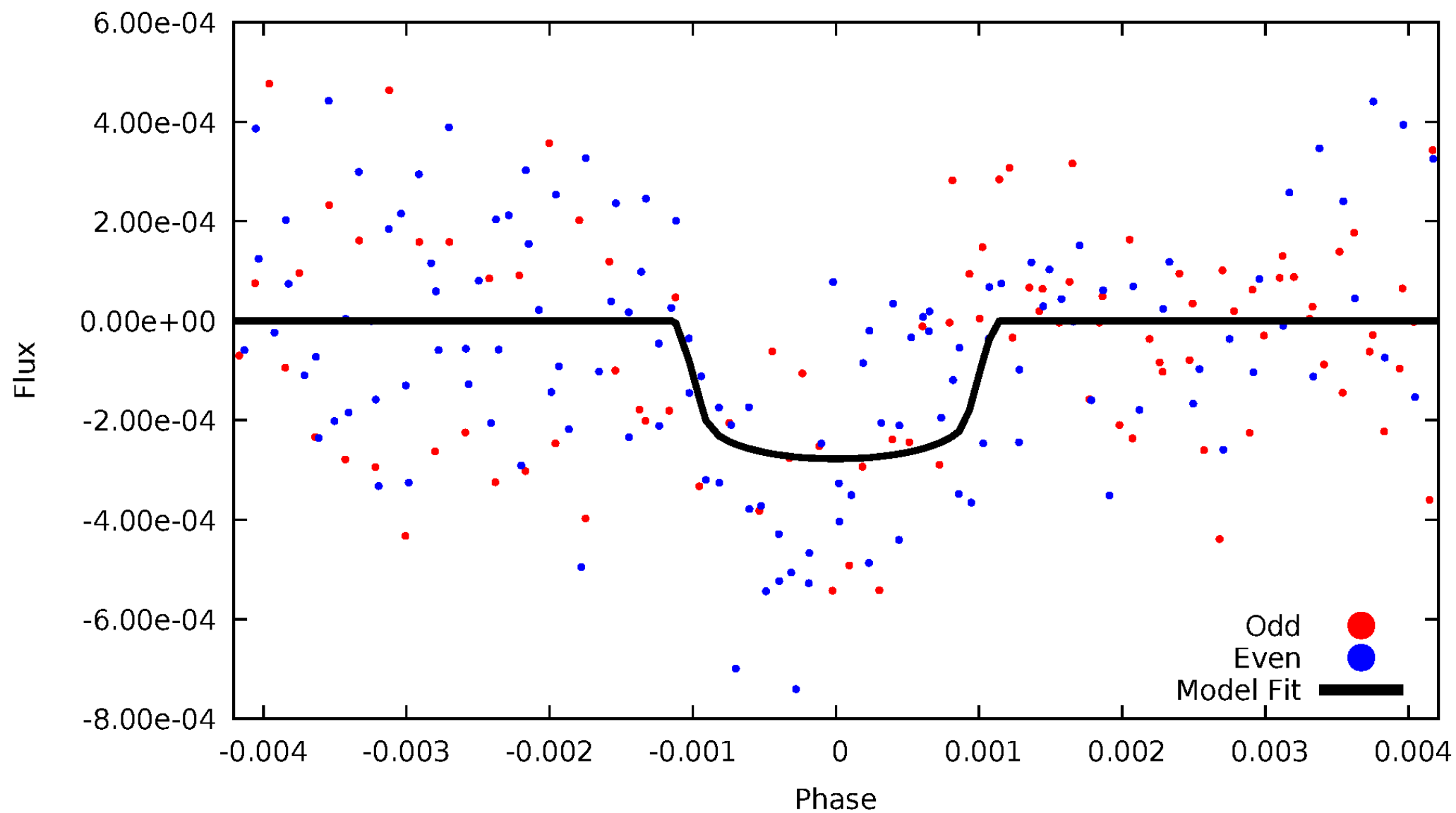


TCE 007538839-03



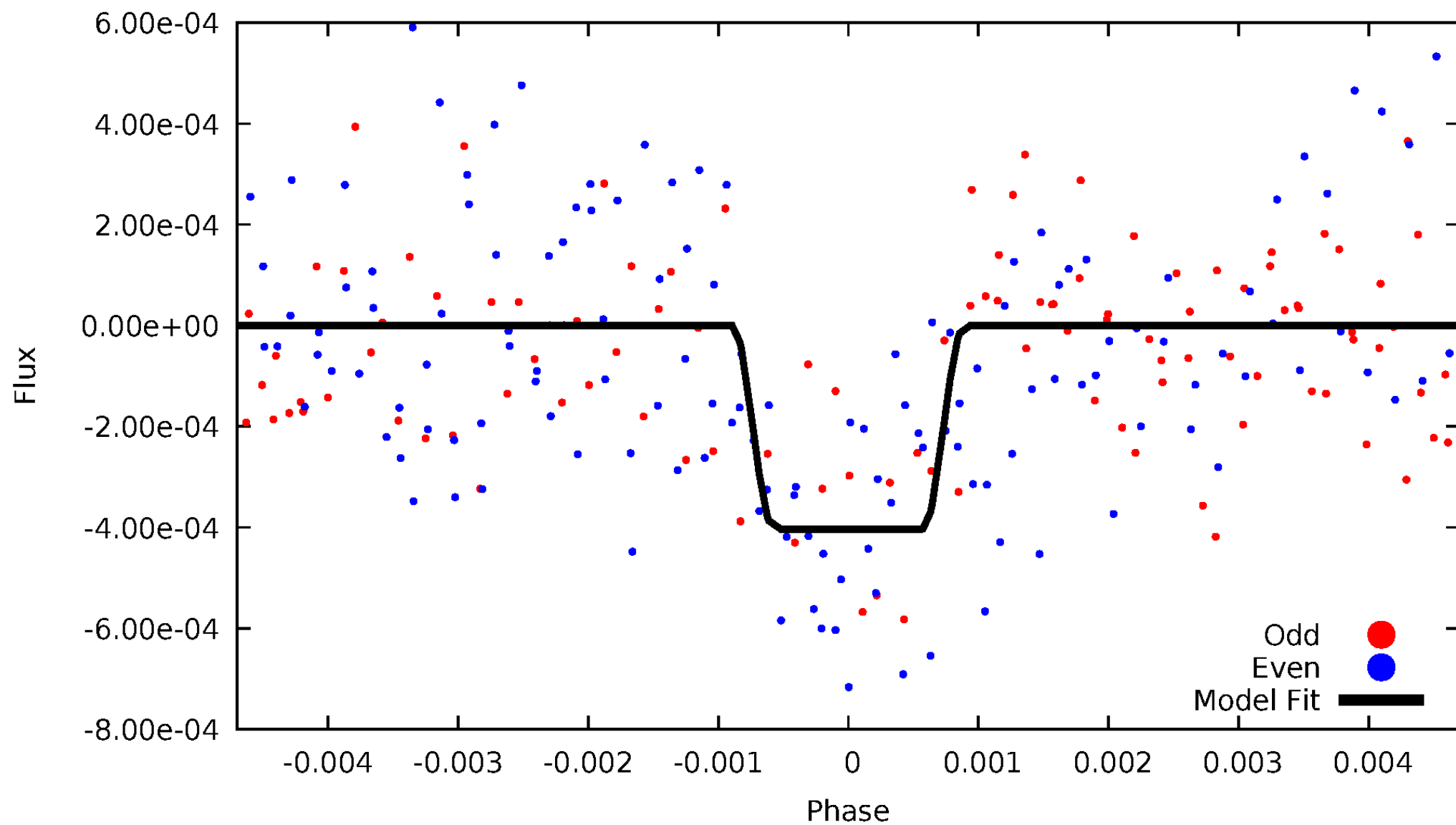
DV Odd/Even

TCE 007538839-03



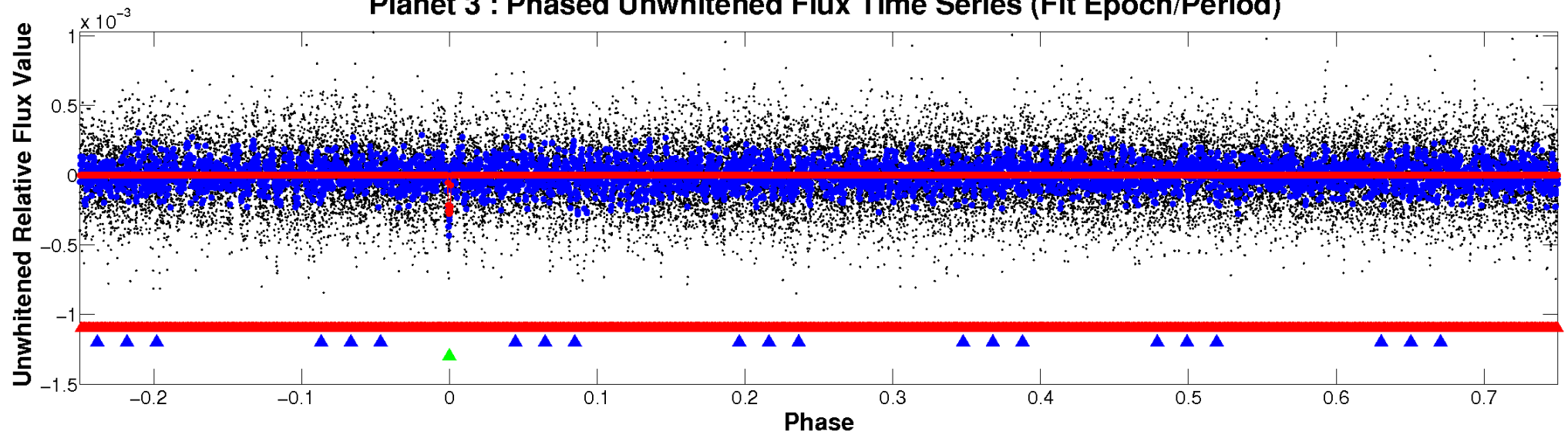
# ALT Odd/Even

TCE 007538839-03

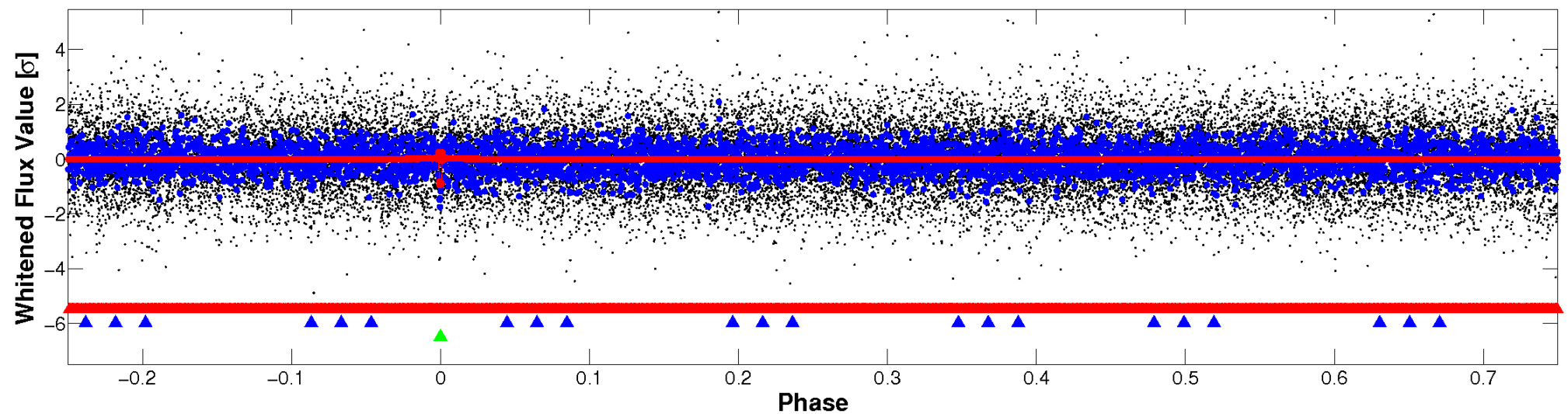


# Non-Whitened Vs. Whitened Light Curve

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

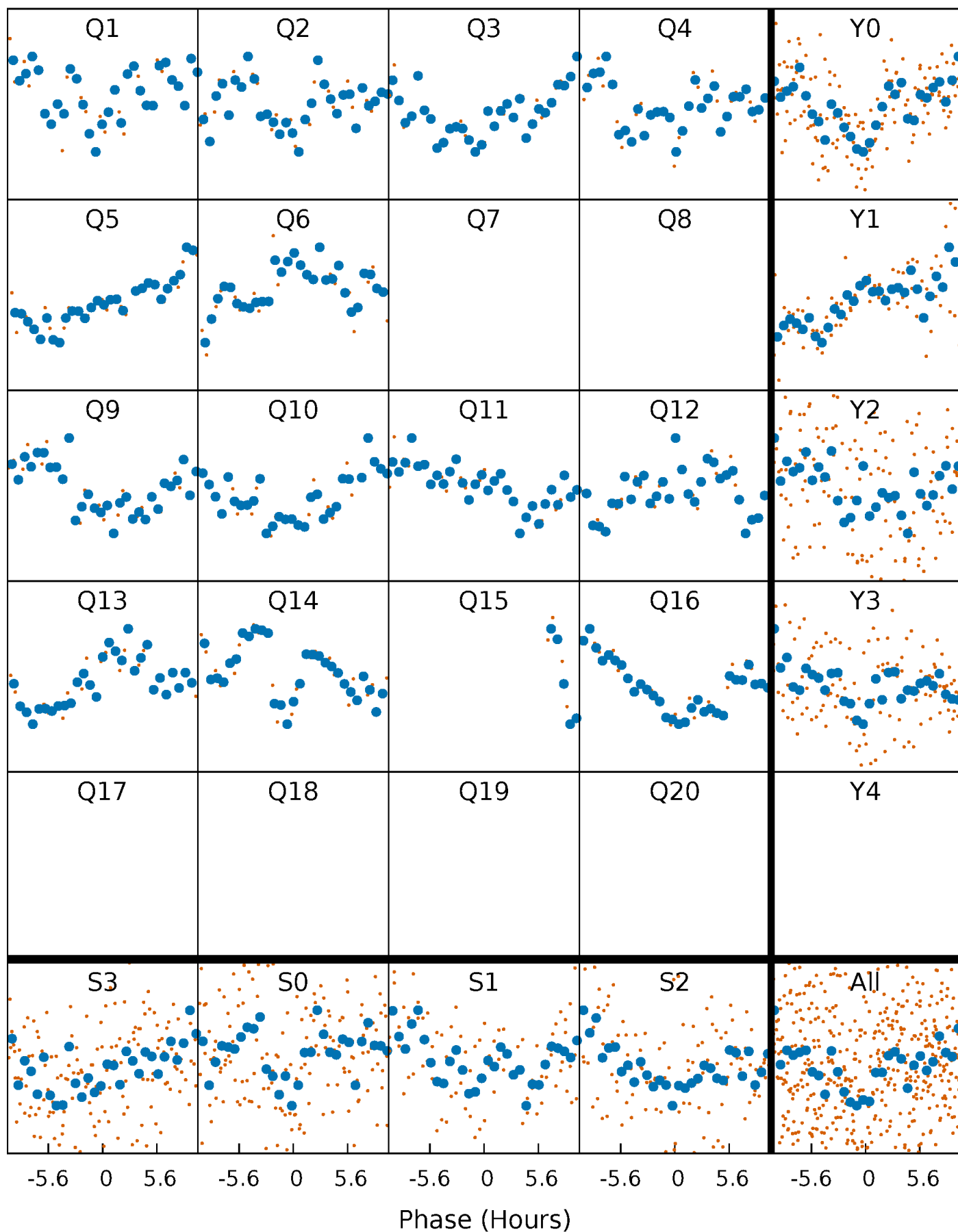


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

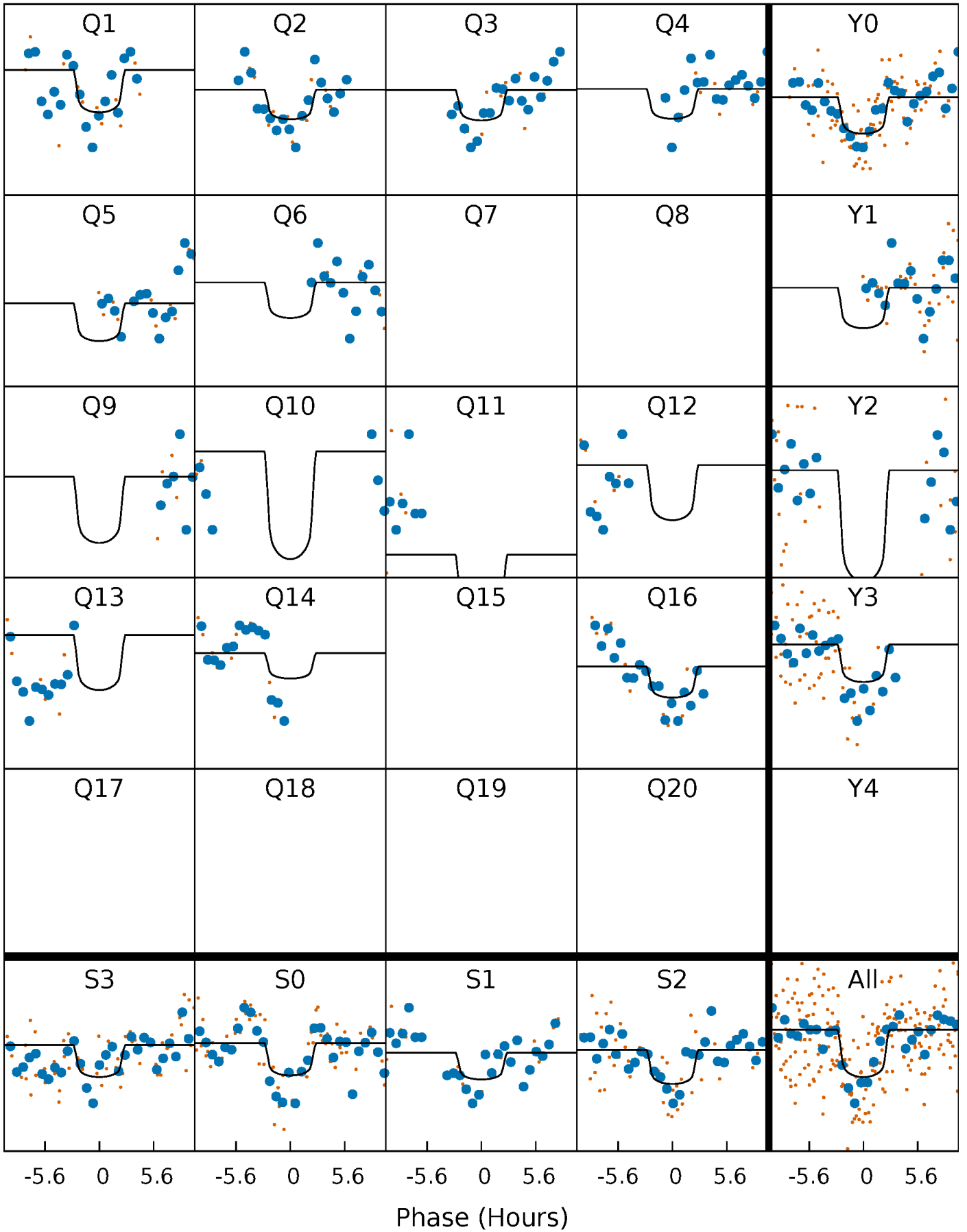
TCE 007538839-03   P= 97.491990 Days    $T_0=137.632058$  (BKJD)





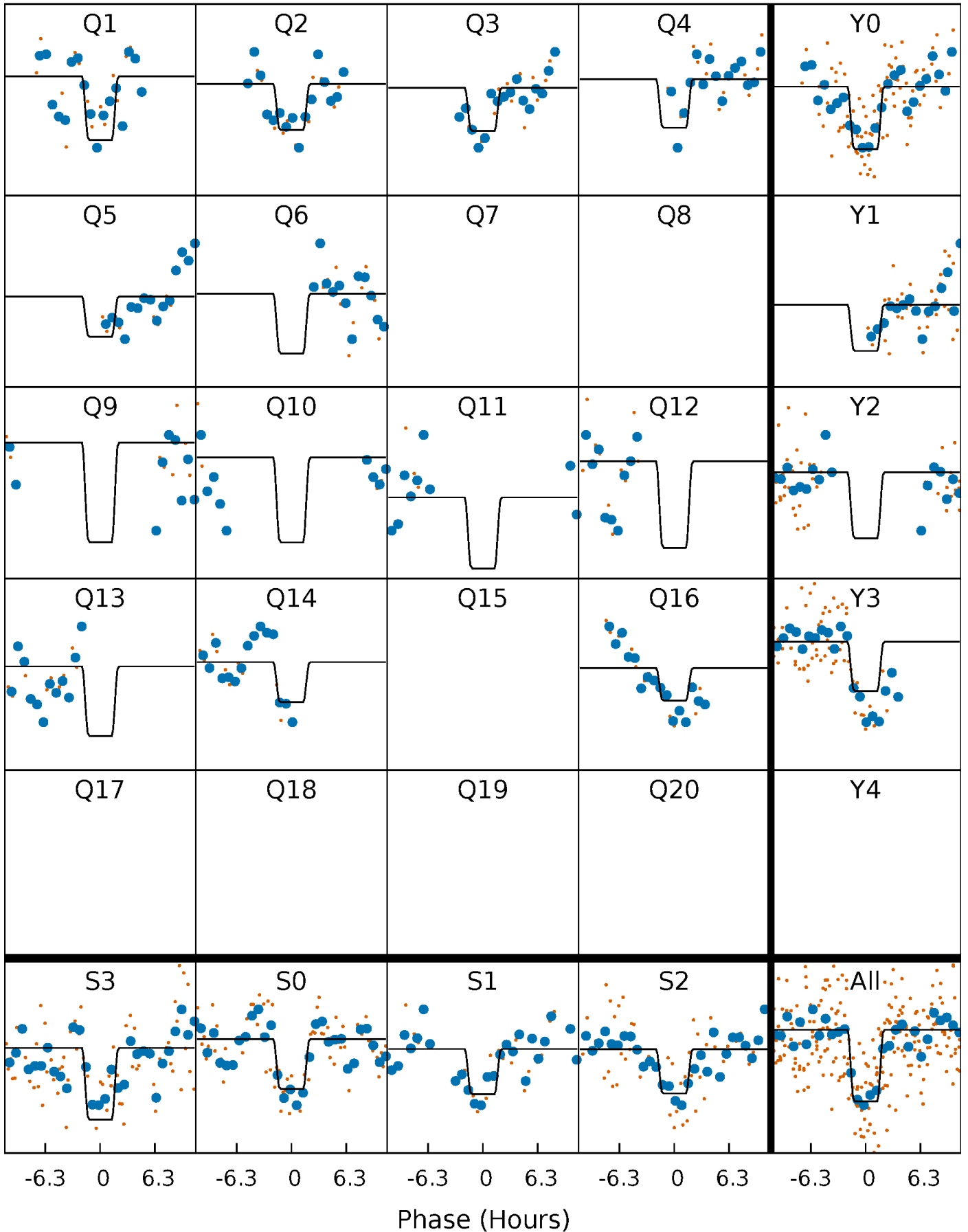
# DV Quarter-Phased Transit Curves

TCE 007538839-03   P= 97.491990 Days    $T_0=137.632058$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

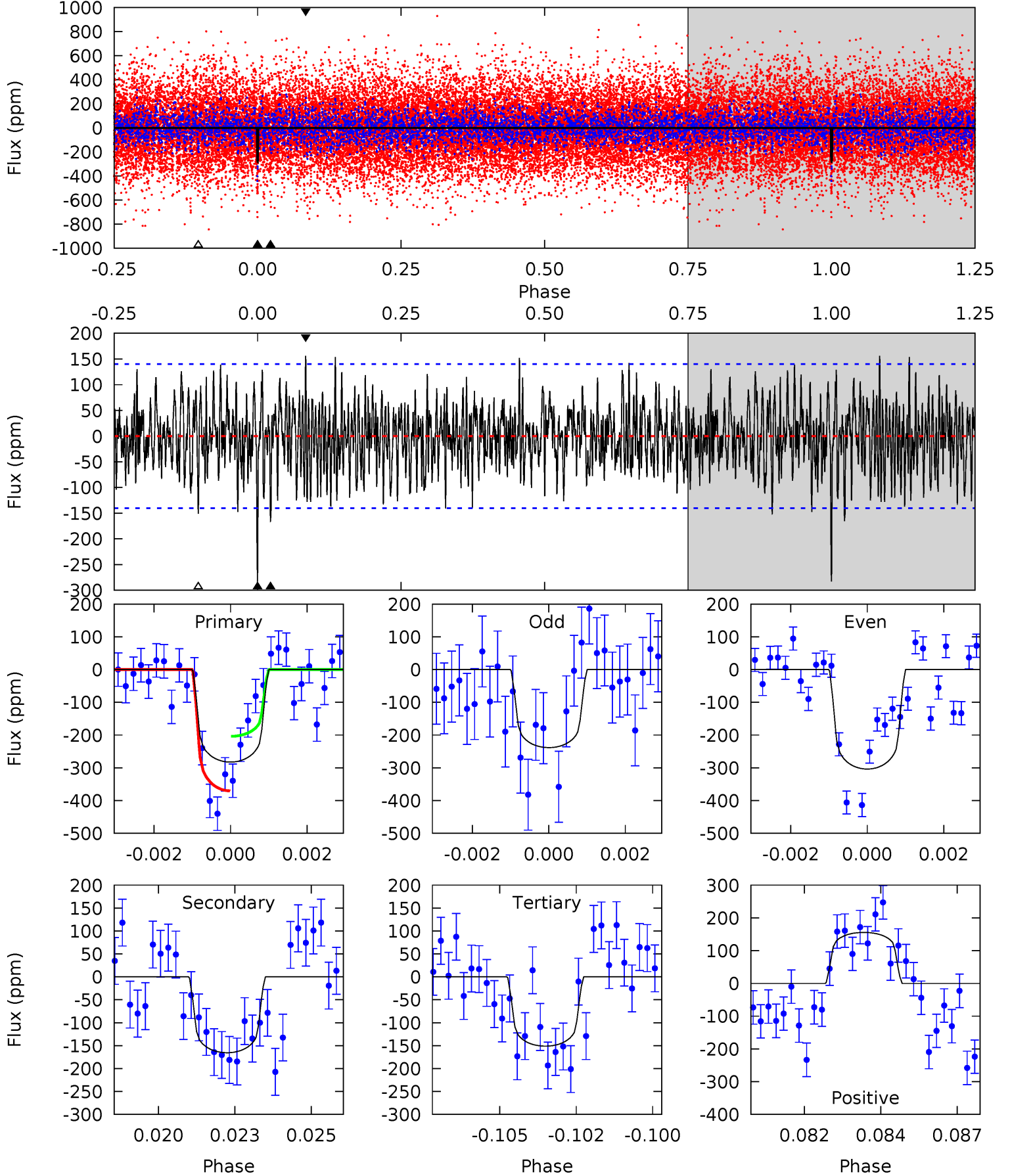
TCE 007538839-03     $P = 97.491489$  Days     $T_0 = 137.620377$  (BKJD)



# DV Model-Shift Uniqueness Test

007538839-03, P = 97.491990 Days, E = 40.140068 Days

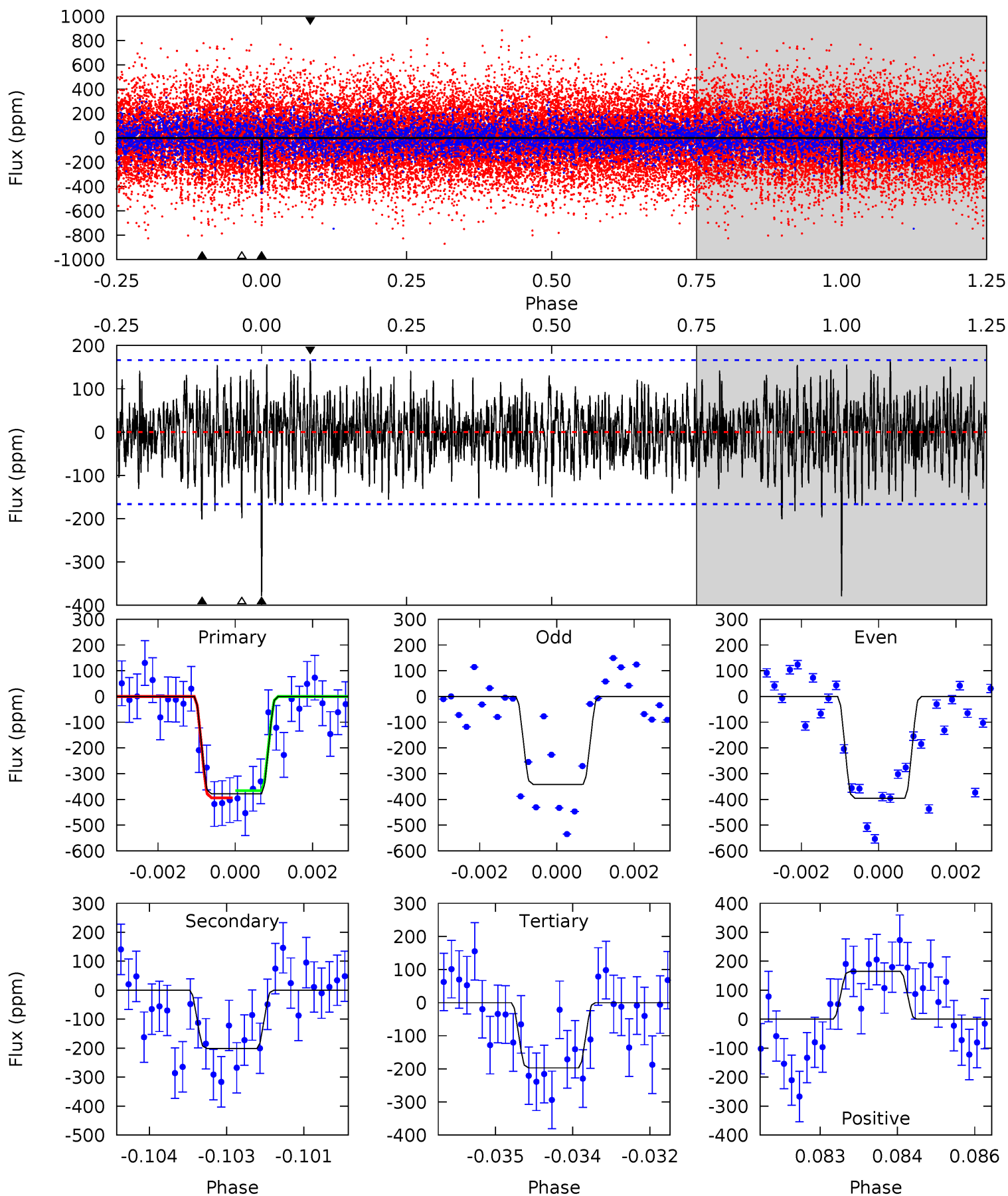
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	6.26	5.72	5.89	5.30	3.05	1.93	4.97	4.80	0.54	0.37	1.16	0.91	0.36	3.14



# Alt Model-Shift Uniqueness Test

007538839-03, P = 97.491489 Days, E = 40.128888 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
12.2	6.48	6.35	5.33	5.36	3.14	1.76	5.86	6.88	0.13	1.15	0.80	1.00	0.30	0.44



### Stellar Parameters For KIC 007538839

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6748^{+202}_{-223}$	$3.371^{+0.374}_{-0.066}$	$-0.240^{+0.350}_{-0.300}$	$4.826^{+0.360}_{-2.041}$	$1.998^{+0.133}_{-0.398}$	$0.025^{+0.080}_{-0.005}$
	+3%/-3%	+11%/-2%	+146%/-125%	+7%/-42%	+7%/-20%	+318%/-21%
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 007538839-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-166 \pm 26$	$8.77^{+5.81}_{-5.05}$	$1241^{+64}_{-113}$	$5714^{+3457}_{-1170}$	$323^{+1620}_{-211}$
Alt.	$-201 \pm 31$	$9.66^{+6.08}_{-5.67}$	$1236^{+70}_{-118}$	$5621^{+3523}_{-1012}$	$314^{+1576}_{-196}$

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



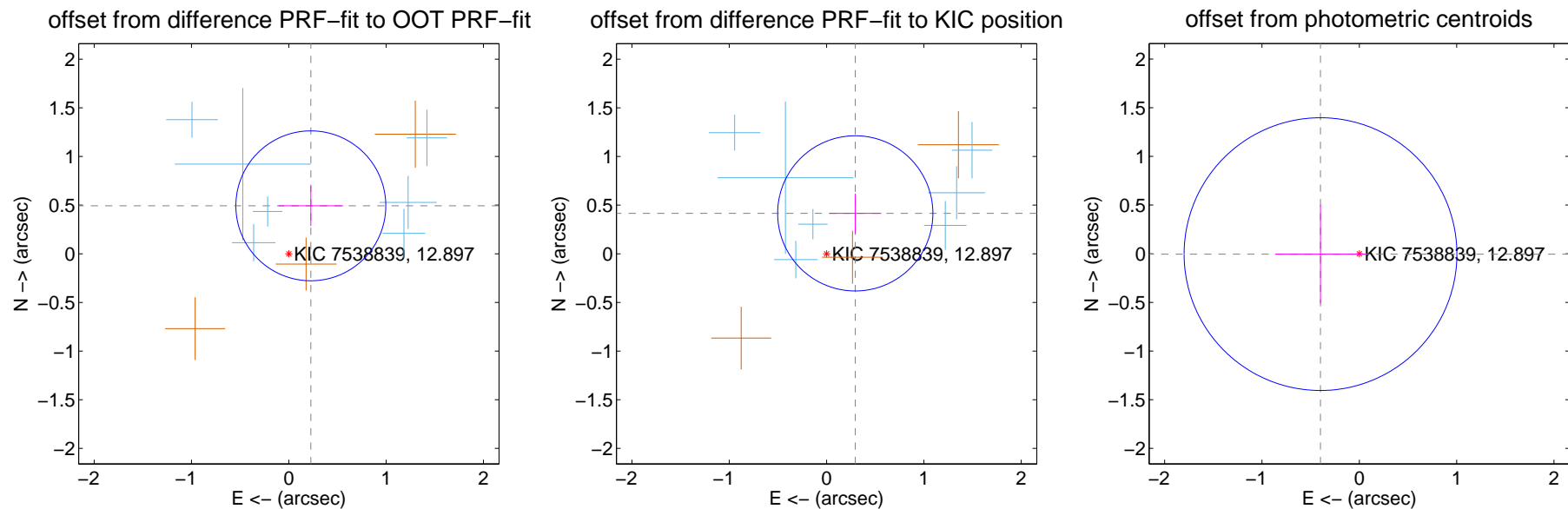
## DV Centroid Data

Supplemental centroid analysis for 007538839-03. Kepler magnitude: 12.90. Transit SNR 6.59

There are 7 quarters with good PRF difference image offsets

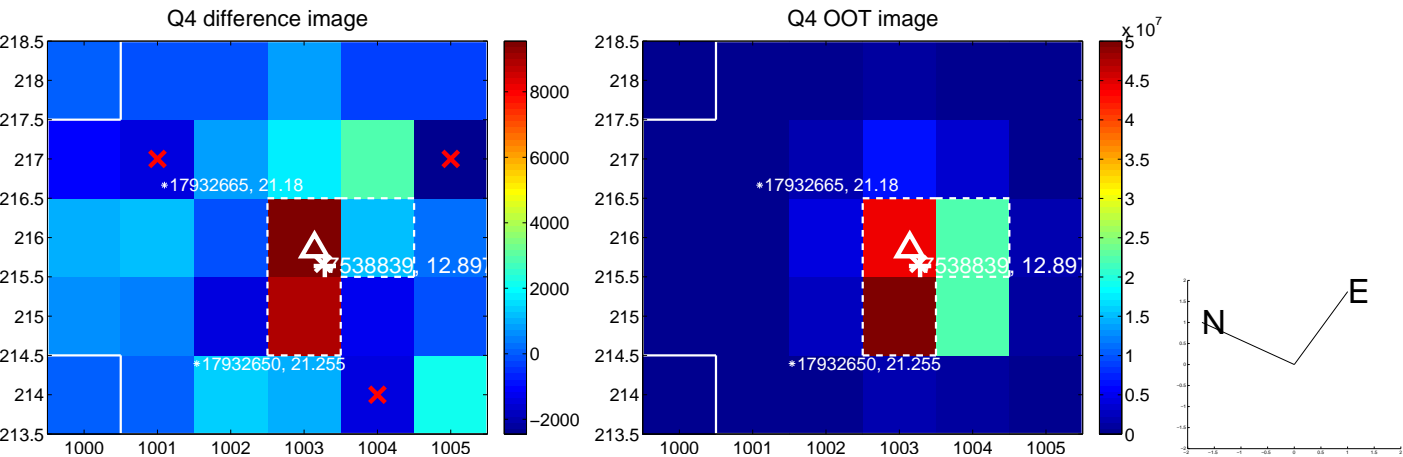
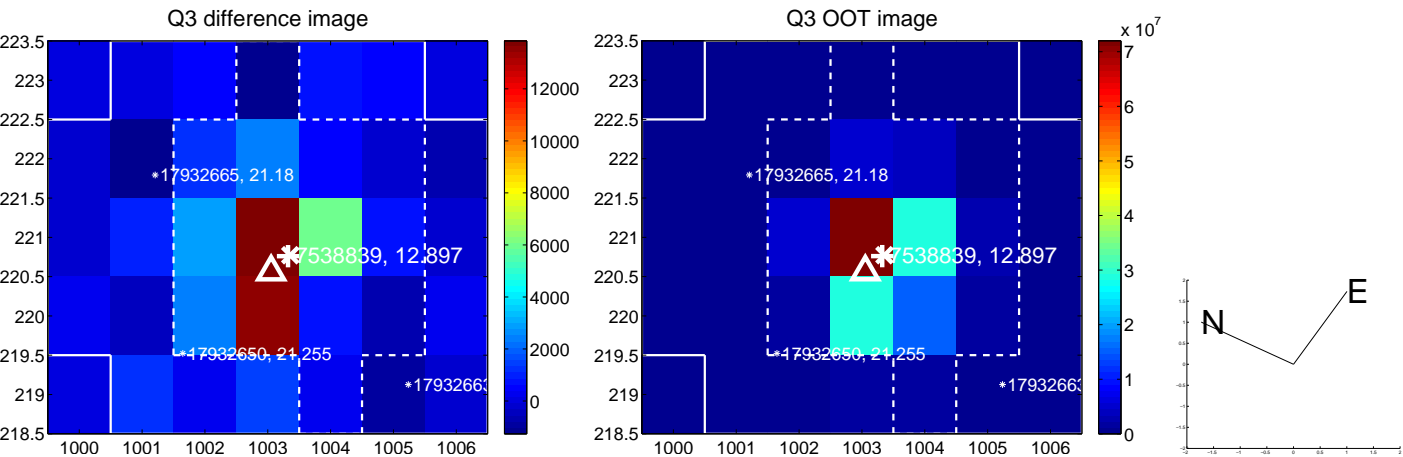
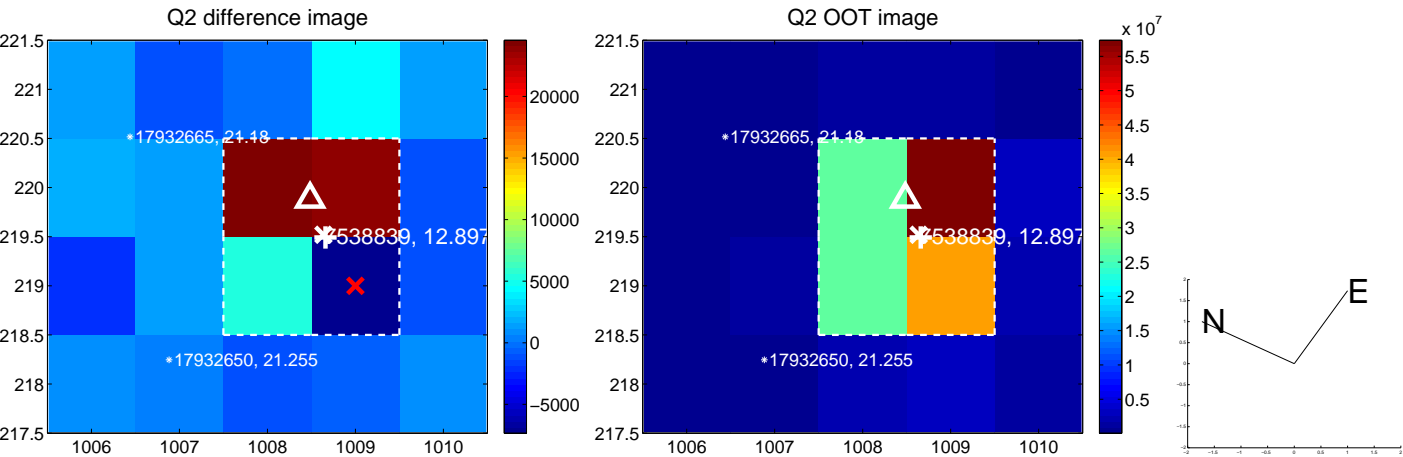
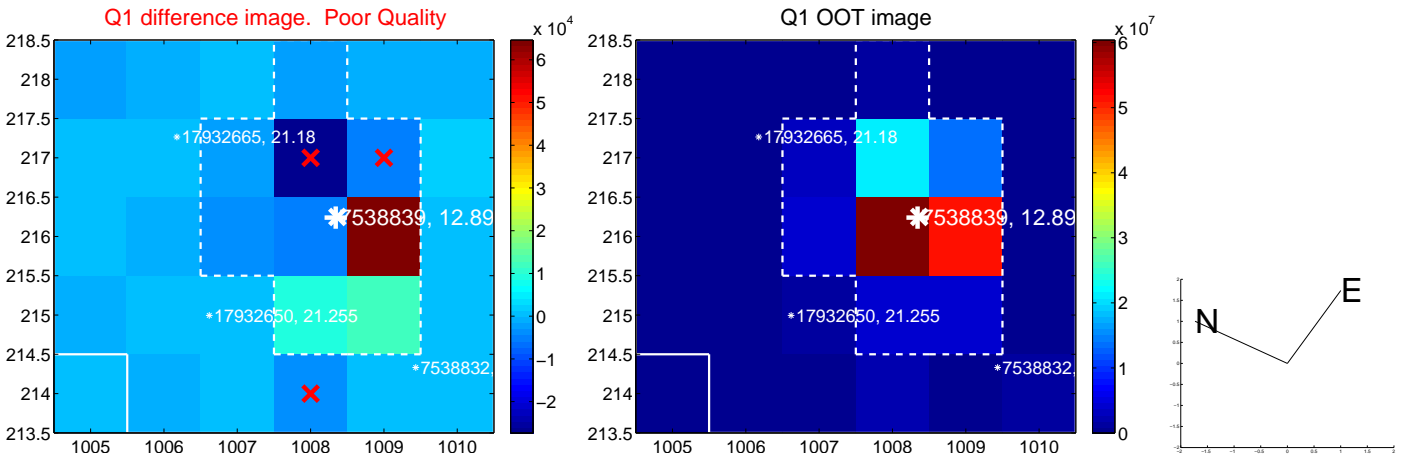
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.543 \pm 0.257$	2.11	$-0.226 \pm 0.332$	$0.493 \pm 0.207$
PRF-fit source offset from KIC position	$0.509 \pm 0.266$	1.92	$-0.295 \pm 0.268$	$0.416 \pm 0.203$
photometric centroid source offset	$0.40 \pm 0.47$	0.85	$0.40 \pm 0.47$	$-0.00 \pm 0.51$

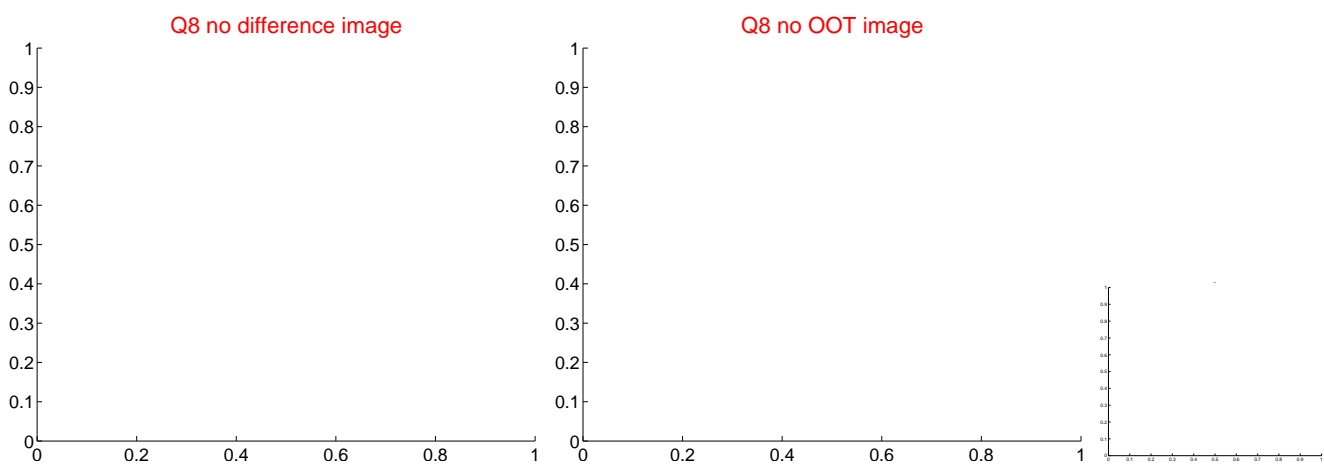
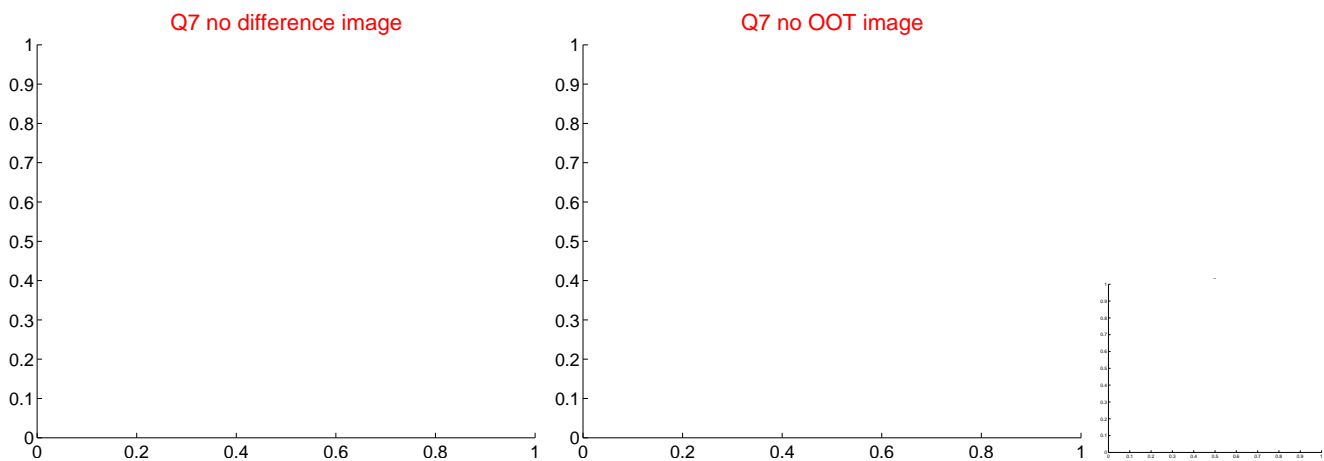
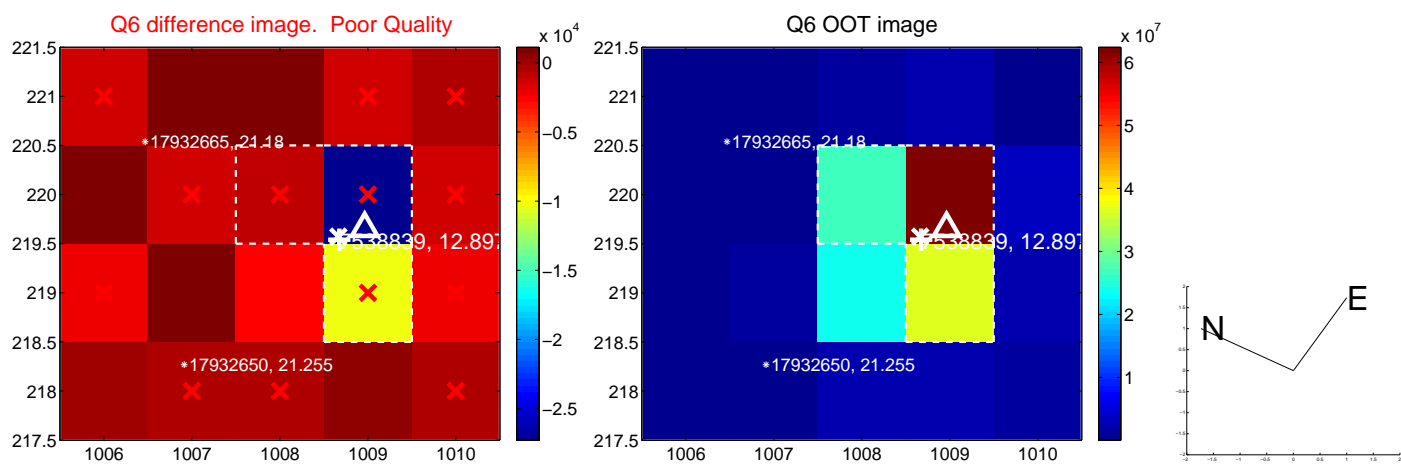
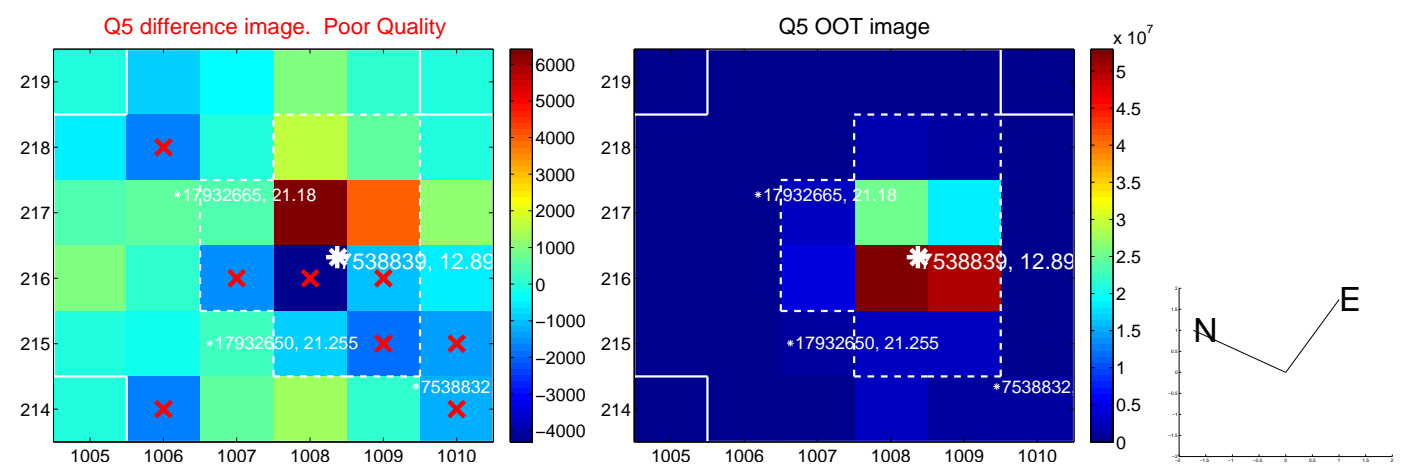


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

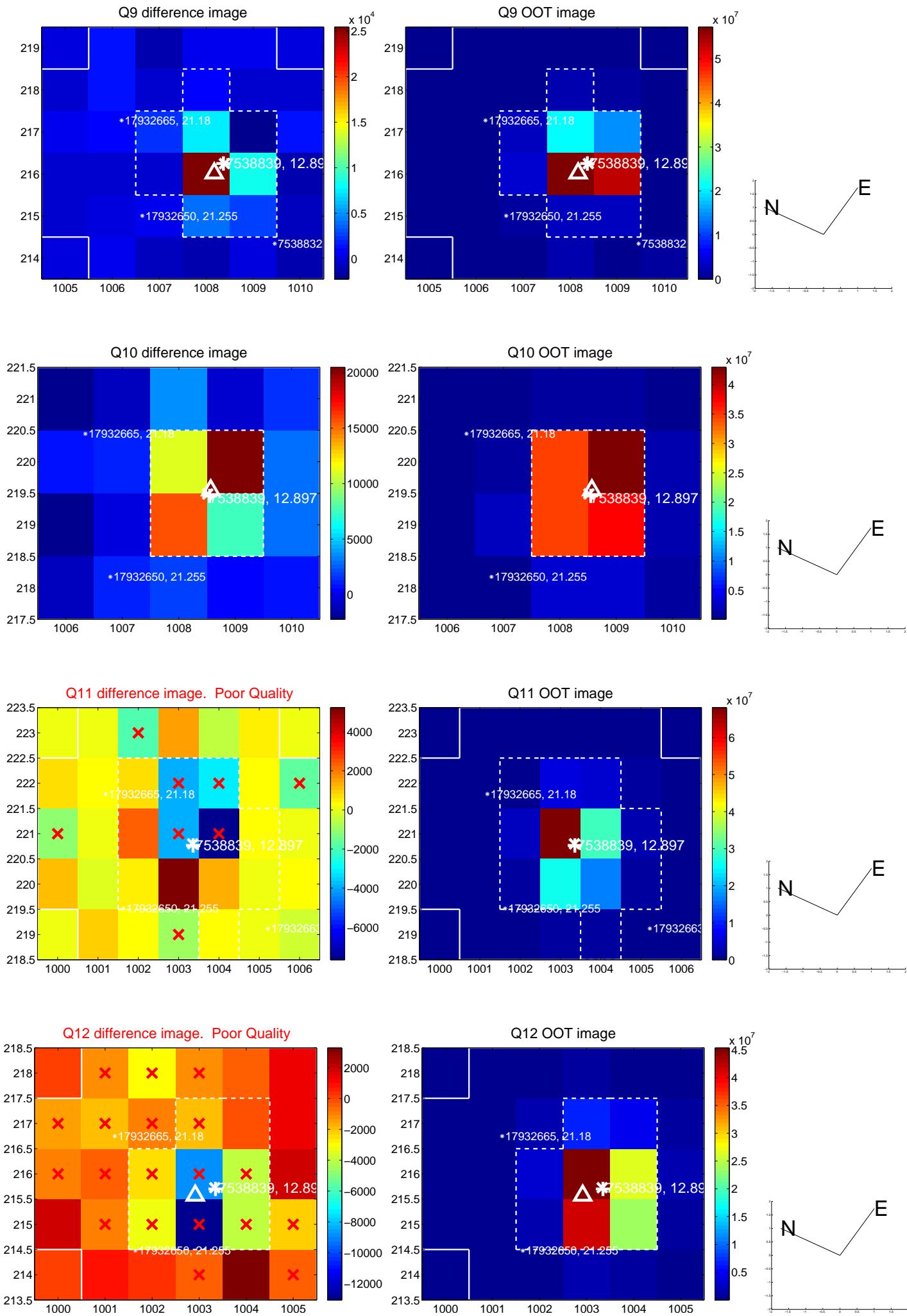
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



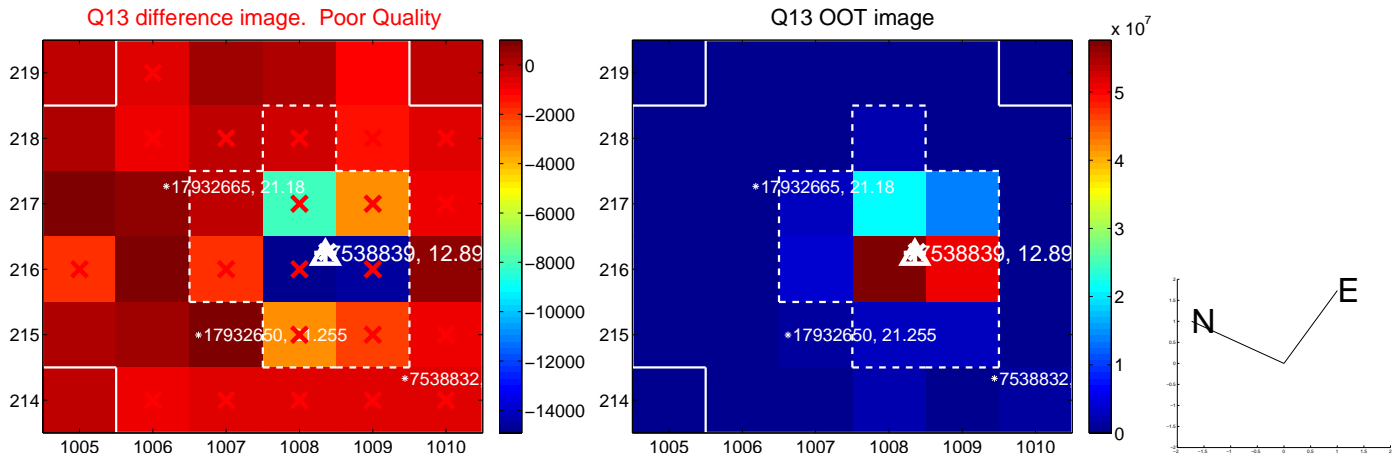
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



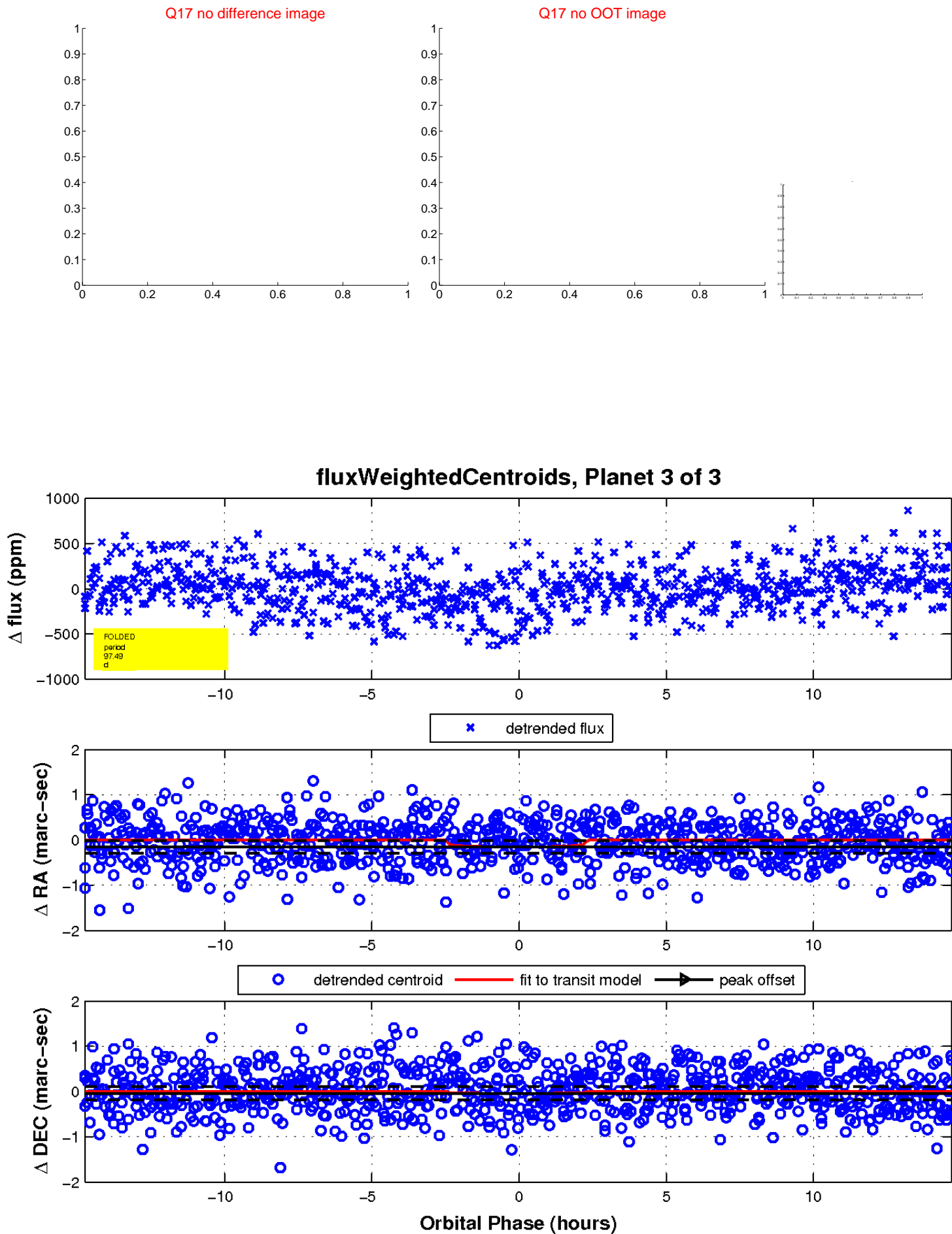
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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





UKIRT Image

Declination

