

# KIC 006868952

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006868952-01	OBS	No	4.671481	132.975833	45.5	14.290	8.0	8.7	1.58	6028	1.26	834.26
006868952-02	OBS	No	355.190361	189.720331	490.3	12.265	16.6	7.4	1.58	6028	3.52	2.59
006868952-03	OBS	No	4.671515	134.874401	43.8	14.839	7.2	9.0	1.58	6028	1.11	834.25
006868952-04	OBS	No	106.236149	236.236835	1.4	12.707	23.3	0.0	1.58	6028	0.20	12.95
006868952-05	OBS	No	134.486632	164.758051	370.0	26.357	15.1	8.3	1.58	6028	3.84	9.46
006868952-06	OBS	No	36.190386	138.068538	210.5	15.178	7.2	7.3	1.58	6028	2.47	54.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006868952-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006868952-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006868952-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
006868952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT

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

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

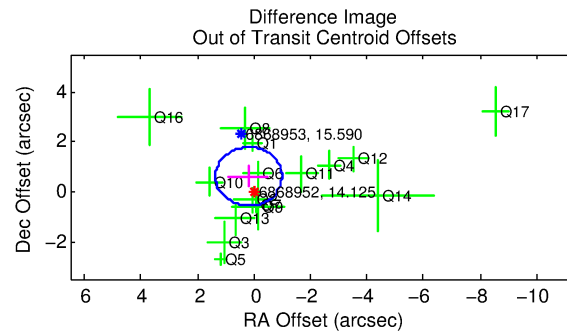
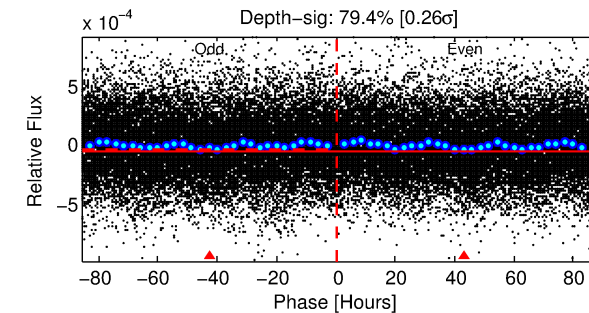
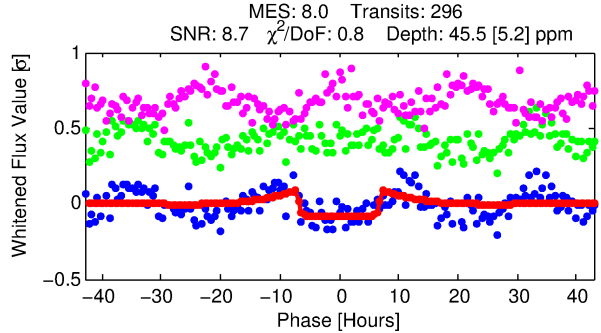
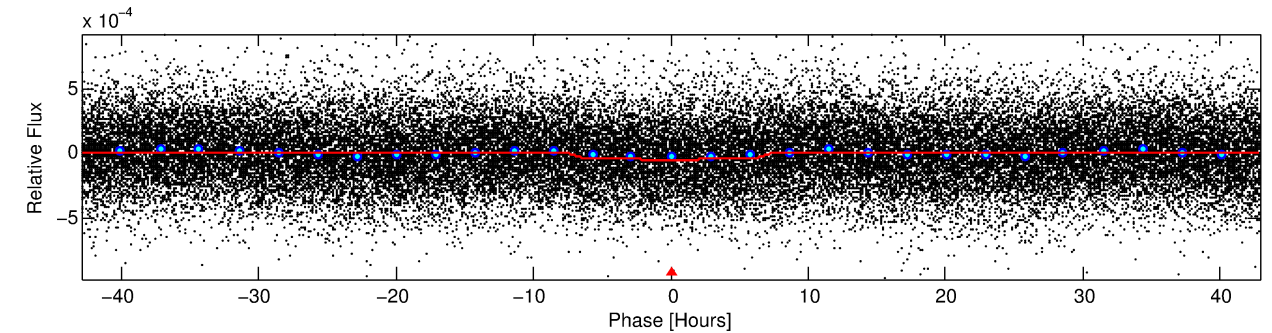
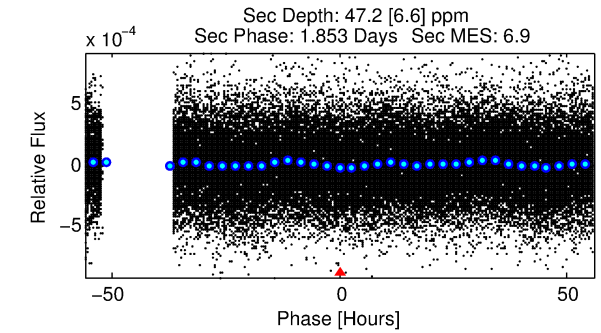
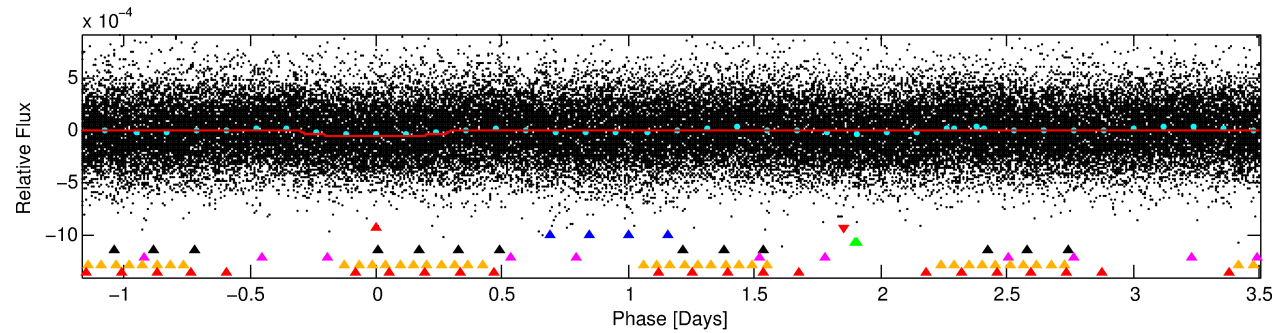
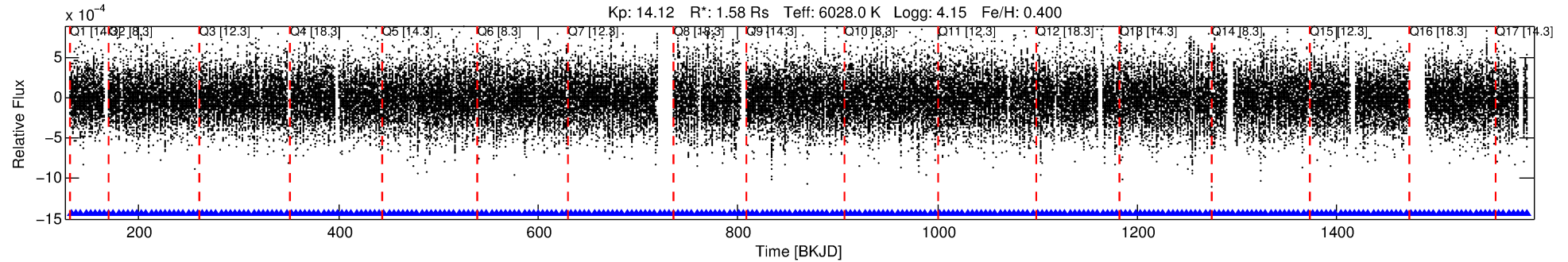
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Ephemeris Match Information For 006868952-01

No Significant Match Found

# DV One-Page Summary

KIC: 6868952 Candidate: 1 of 7 Period: 4.671 d



## DV Fit Results:

Period = 4.67148 [0.00007] d  
Epoch = 132.9758 [0.0106] BKJD  
Rp/R\* = 0.0073 [0.0011]  
a/R\* = 1.47 [0.55]  
b = 0.90 [0.15]  
Seff = 834.26 [240.86]  
Teq = 1370 [99] K  
Rp = 1.26 [0.33] Re  
a = 0.0596 [0.0112] AU  
Ag = 57.82 [25.52] [2.23σ]  
Teffp = 5843 [500] K [8.78σ]

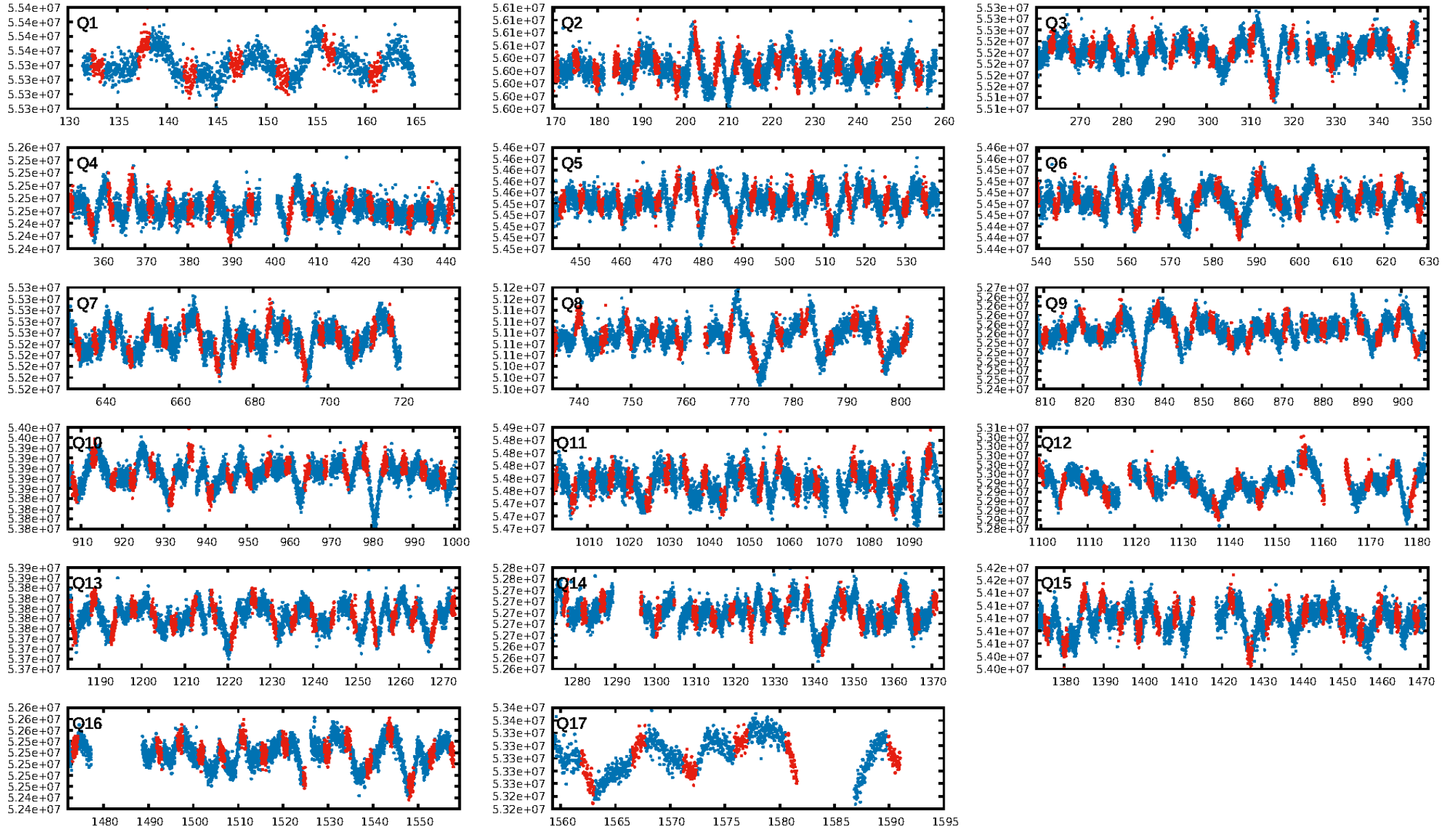
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.94e-13  
RollingBand-fgt: 1.00 [283/283]  
GhostDiagnostic-chr: 7.773  
Centroid-sig: 6.7%  
Centroid-so: 0.858 arcsec [1.18σ]  
OotOffset-rm: 0.638 arcsec [1.63σ]  
KicOffset-rm: 0.614 arcsec [1.76σ]  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.62 [10/16]  
DiffImageOverlap-fno: 1.00 [17/17]

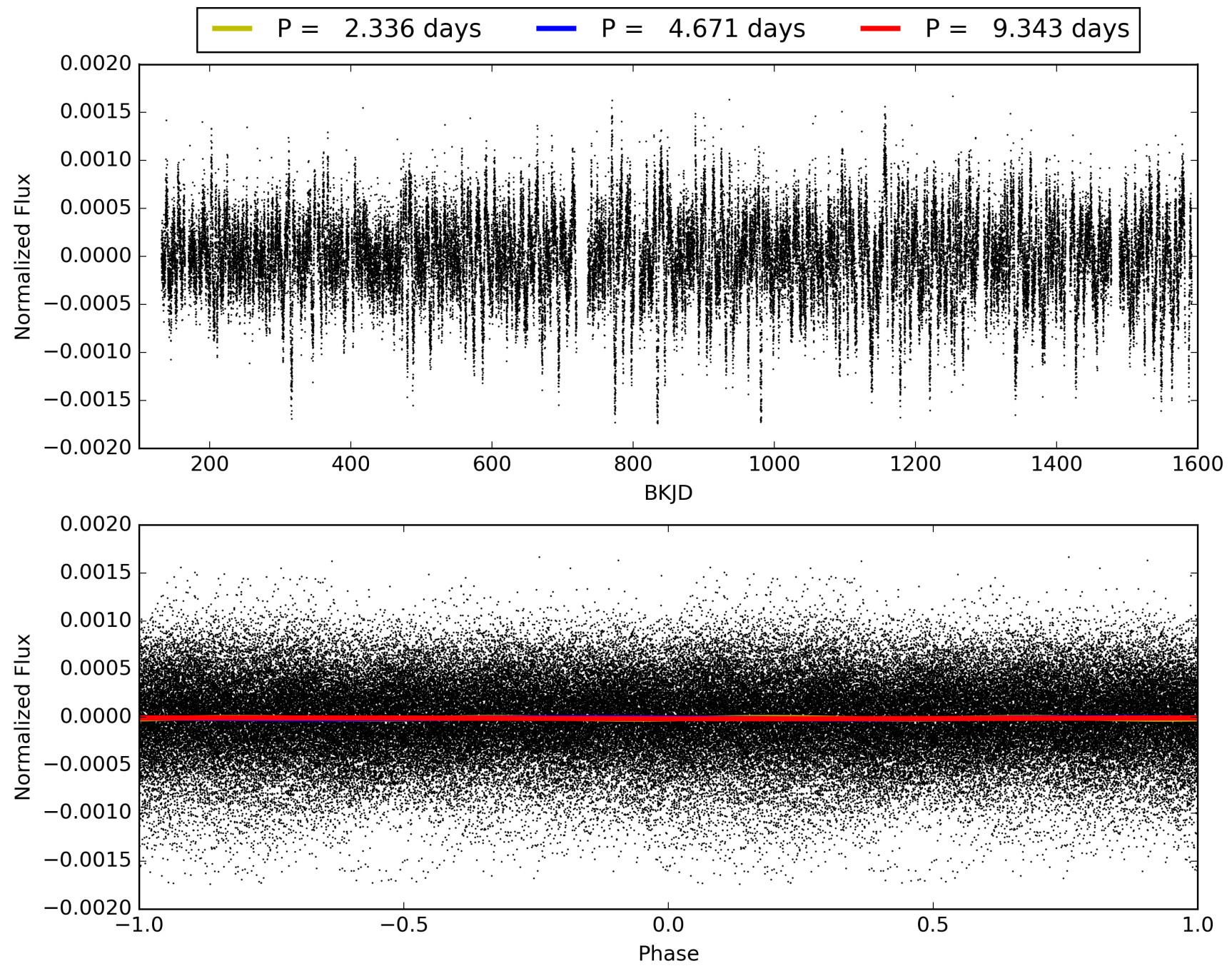
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:58:53 Z

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

# TCE 006868952-01, PDC Light Curves



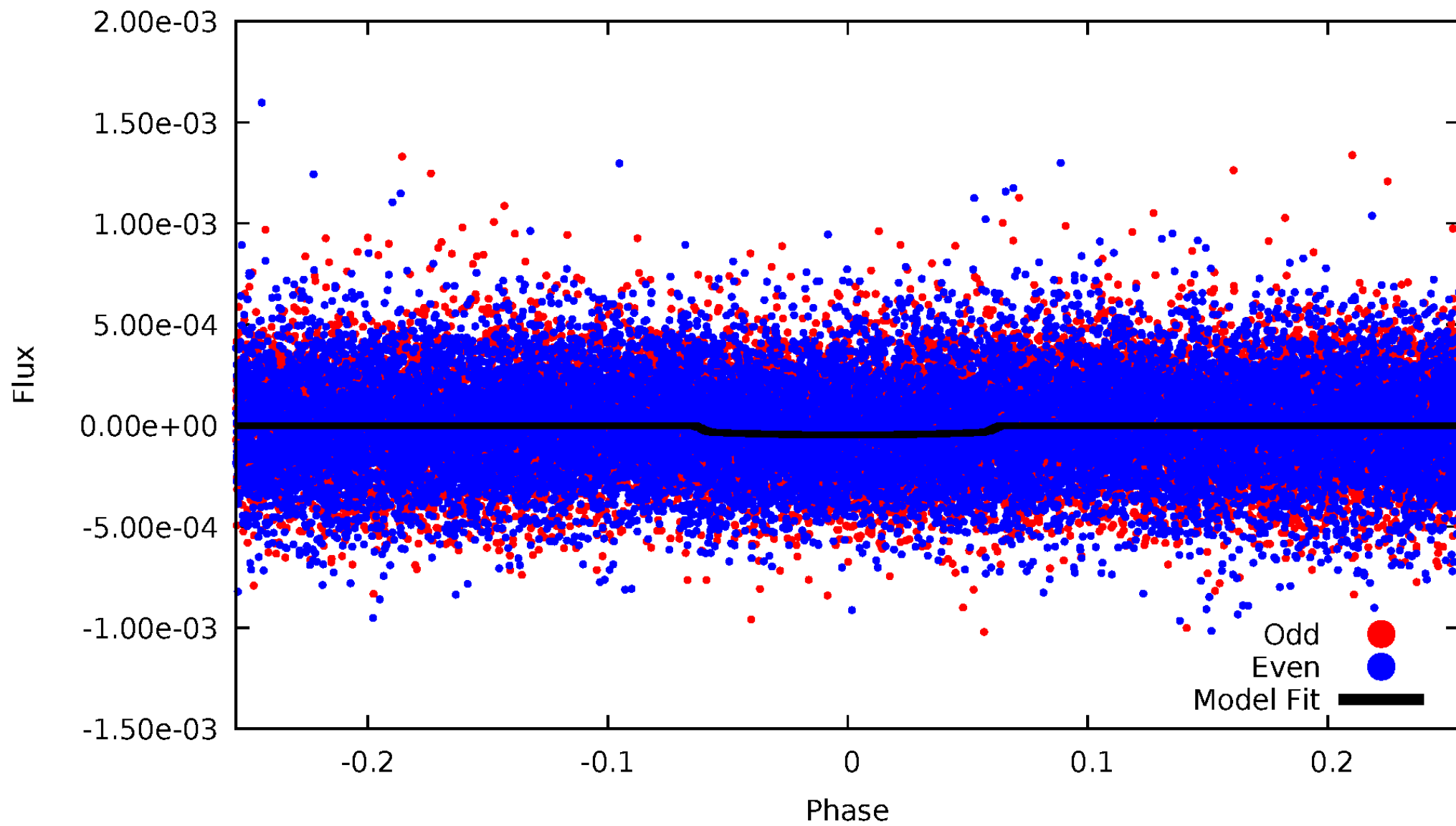
TCE 006868952-01





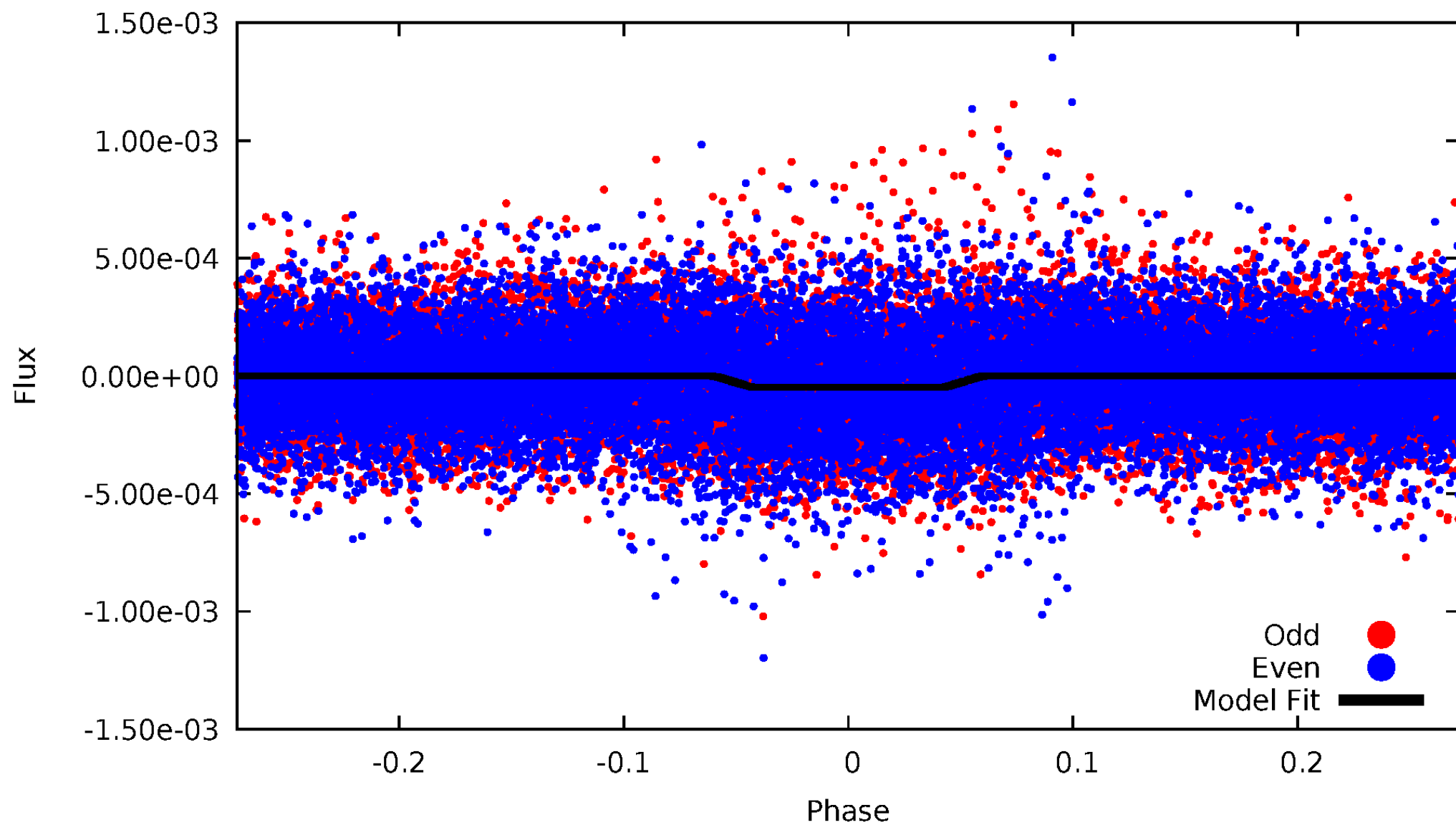
# DV Odd/Even

TCE 006868952-01



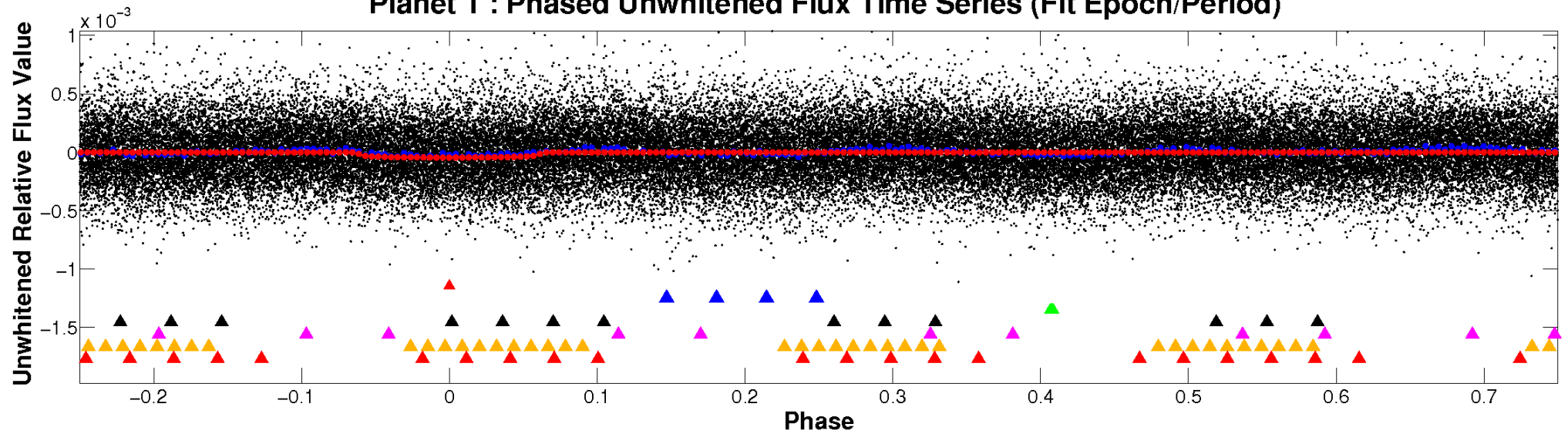
# ALT Odd/Even

TCE 006868952-01

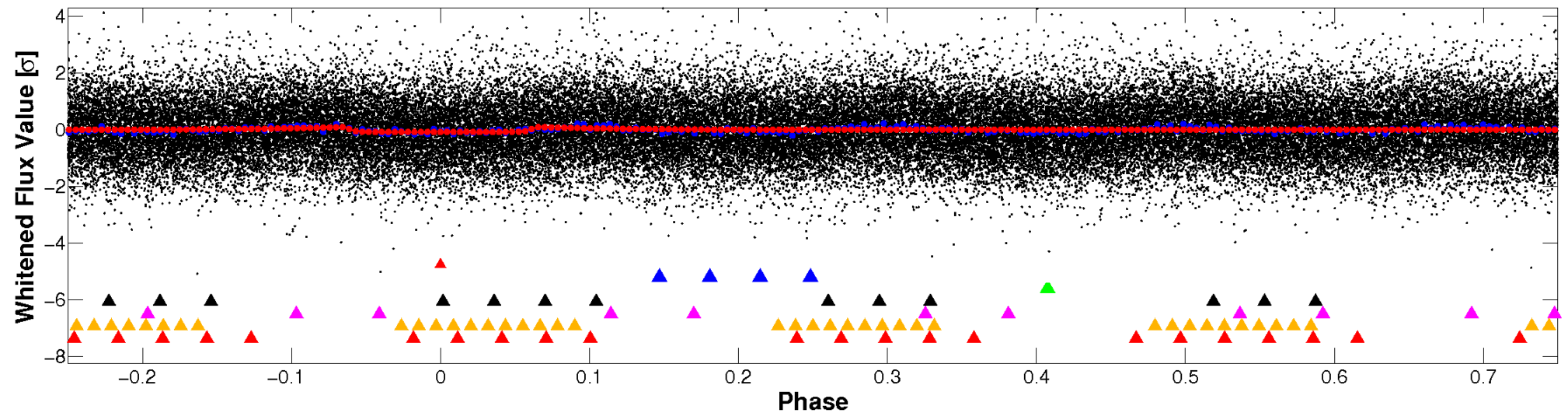


# Non-Whitened Vs. Whitened Light Curve

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

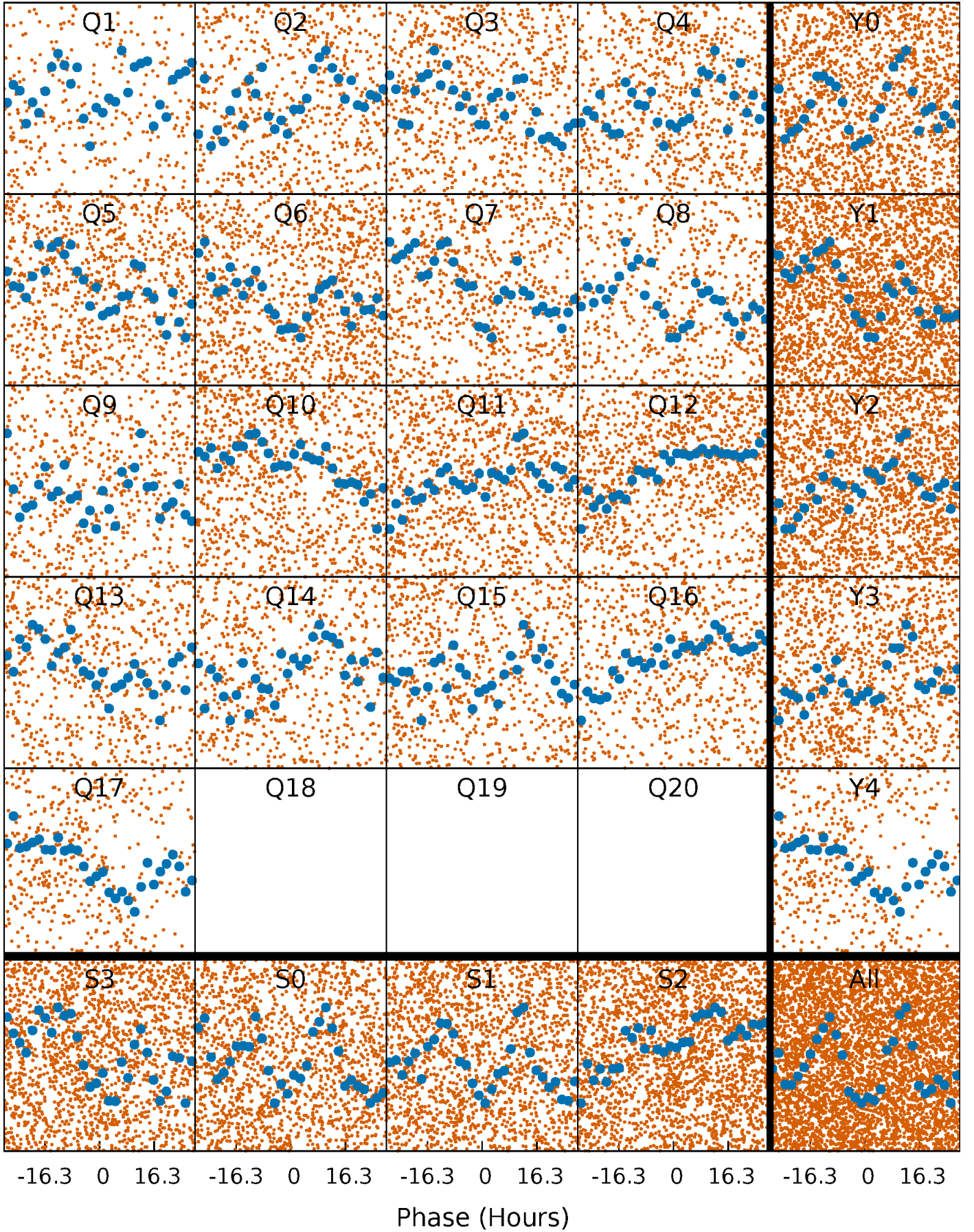


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

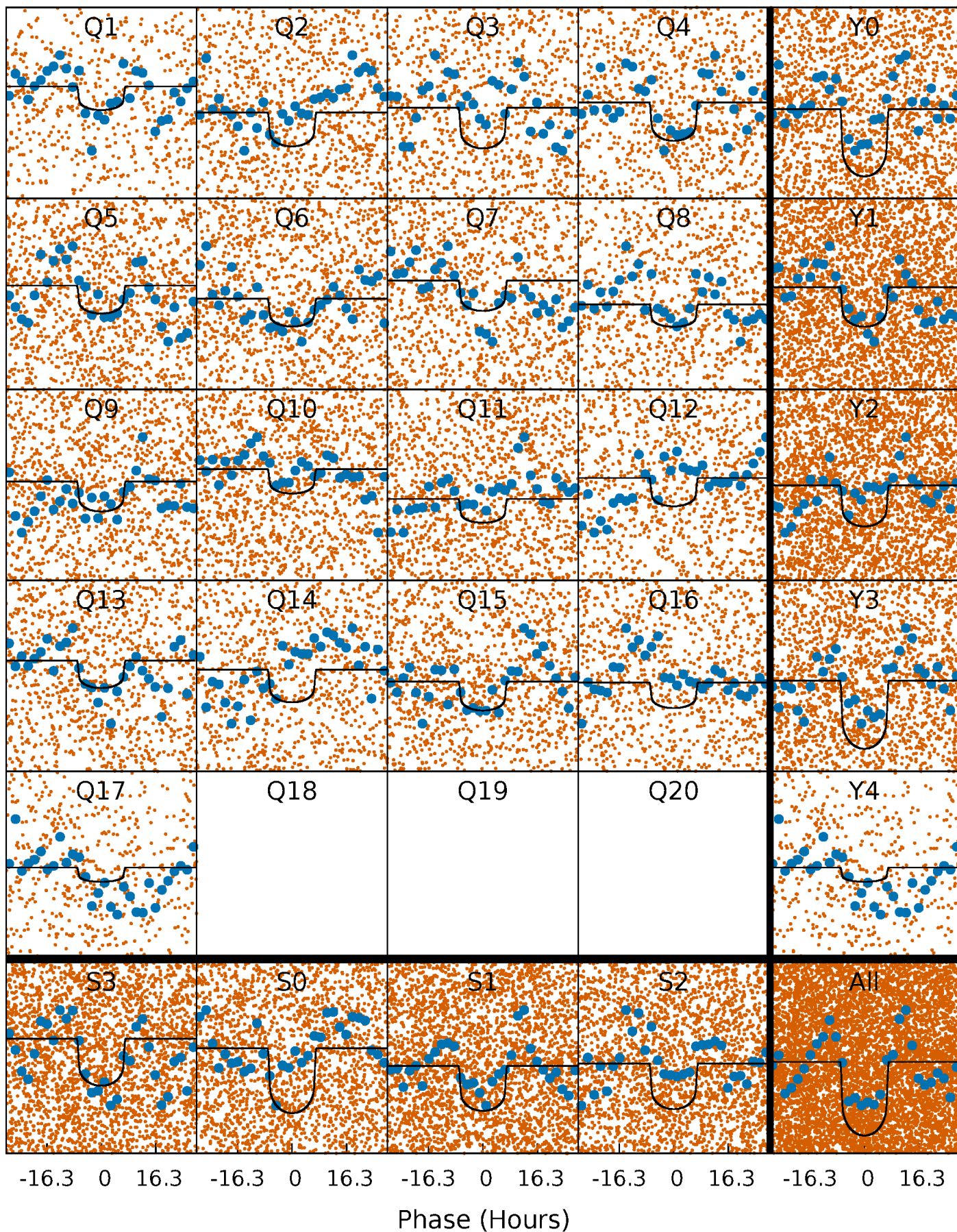
TCE 006868952-01 P= 4.671481 Days  $T_0=132.975833$  (BKJD)





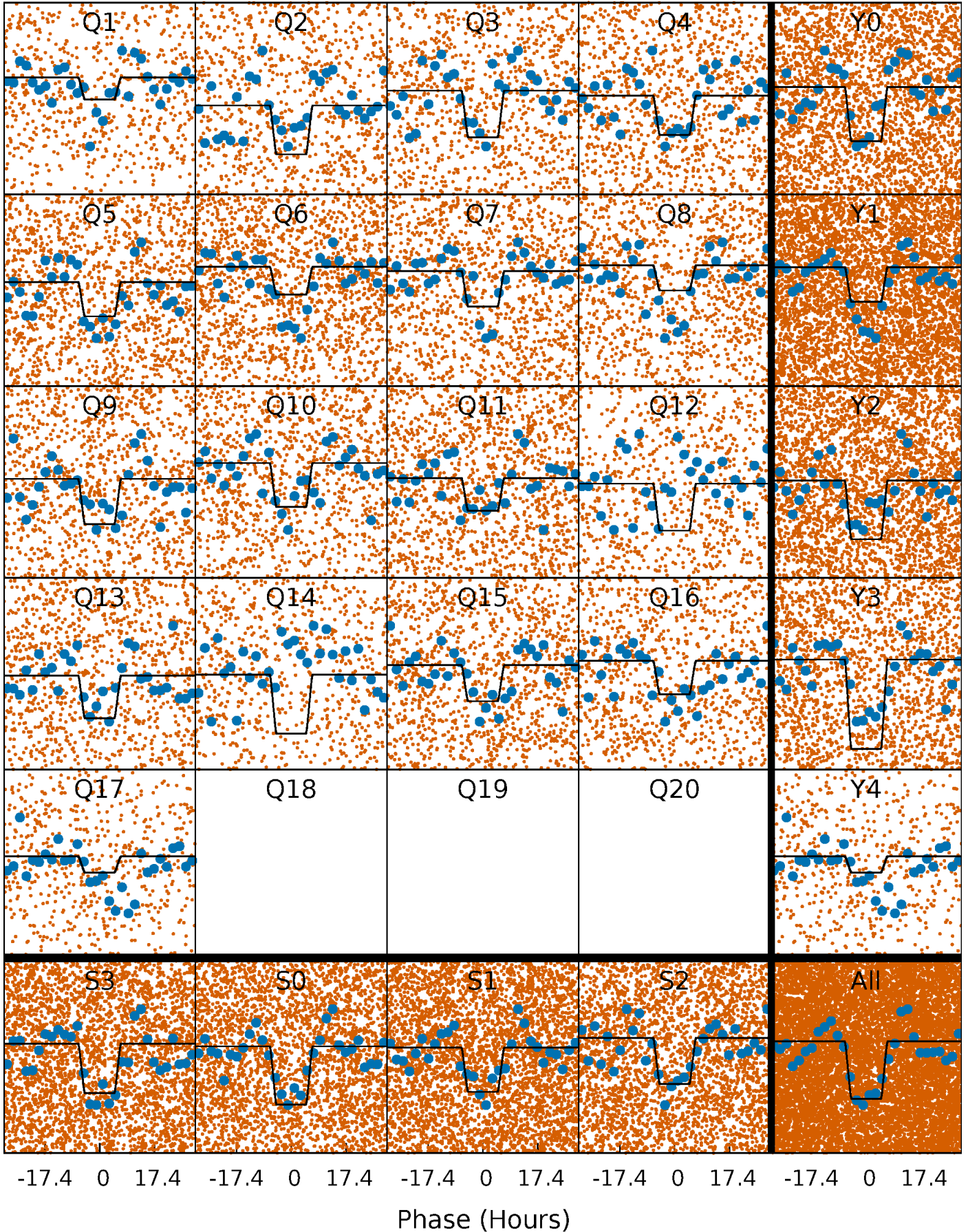
# DV Quarter-Phased Transit Curves

TCE 006868952-01 P= 4.671481 Days  $T_0=132.975833$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006868952-01 P= 4.671487 Days  $T_0=132.964630$  (BKJD)

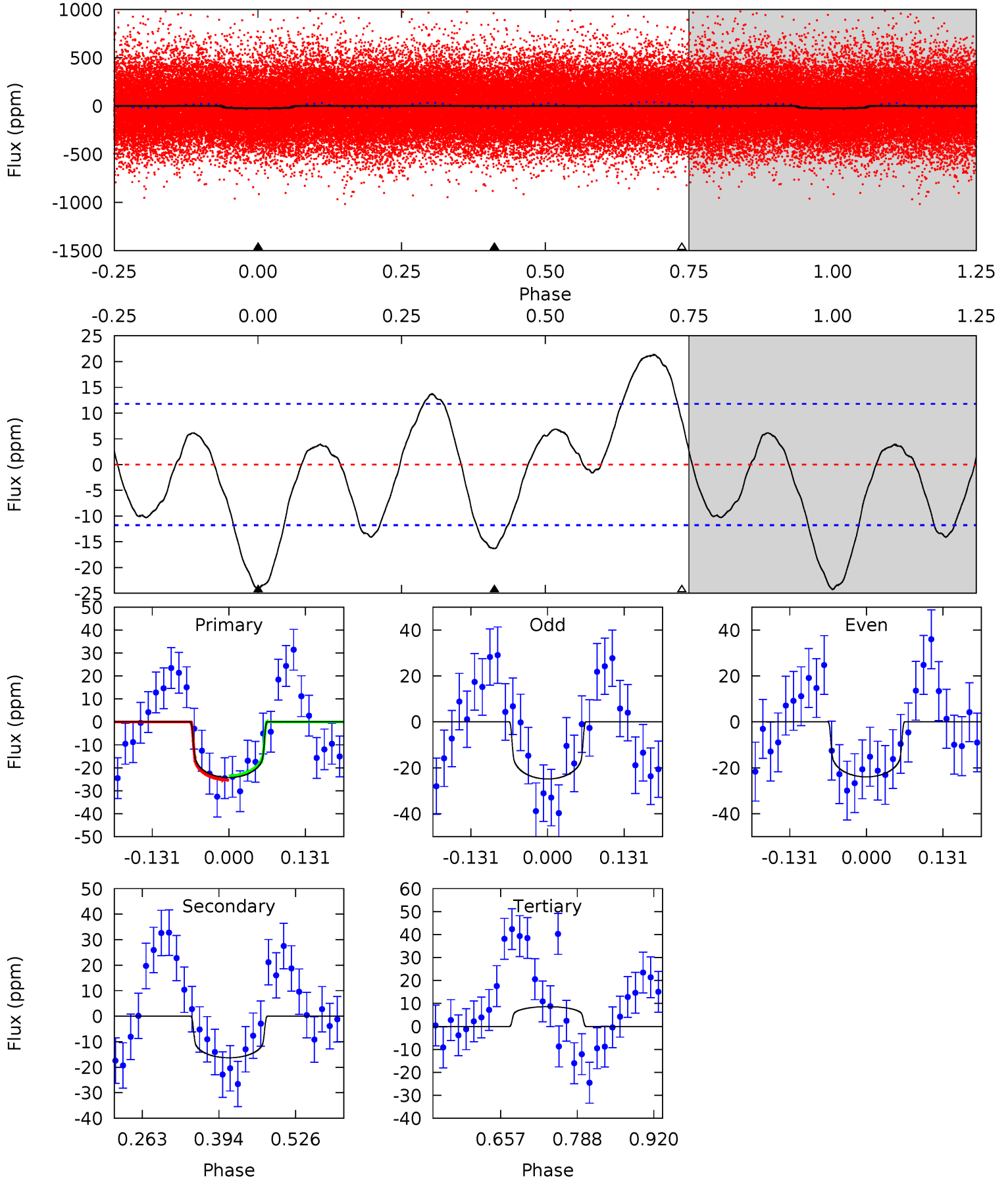




# DV Model-Shift Uniqueness Test

006868952-01, P = 4.671481 Days, E = 128.304352 Days

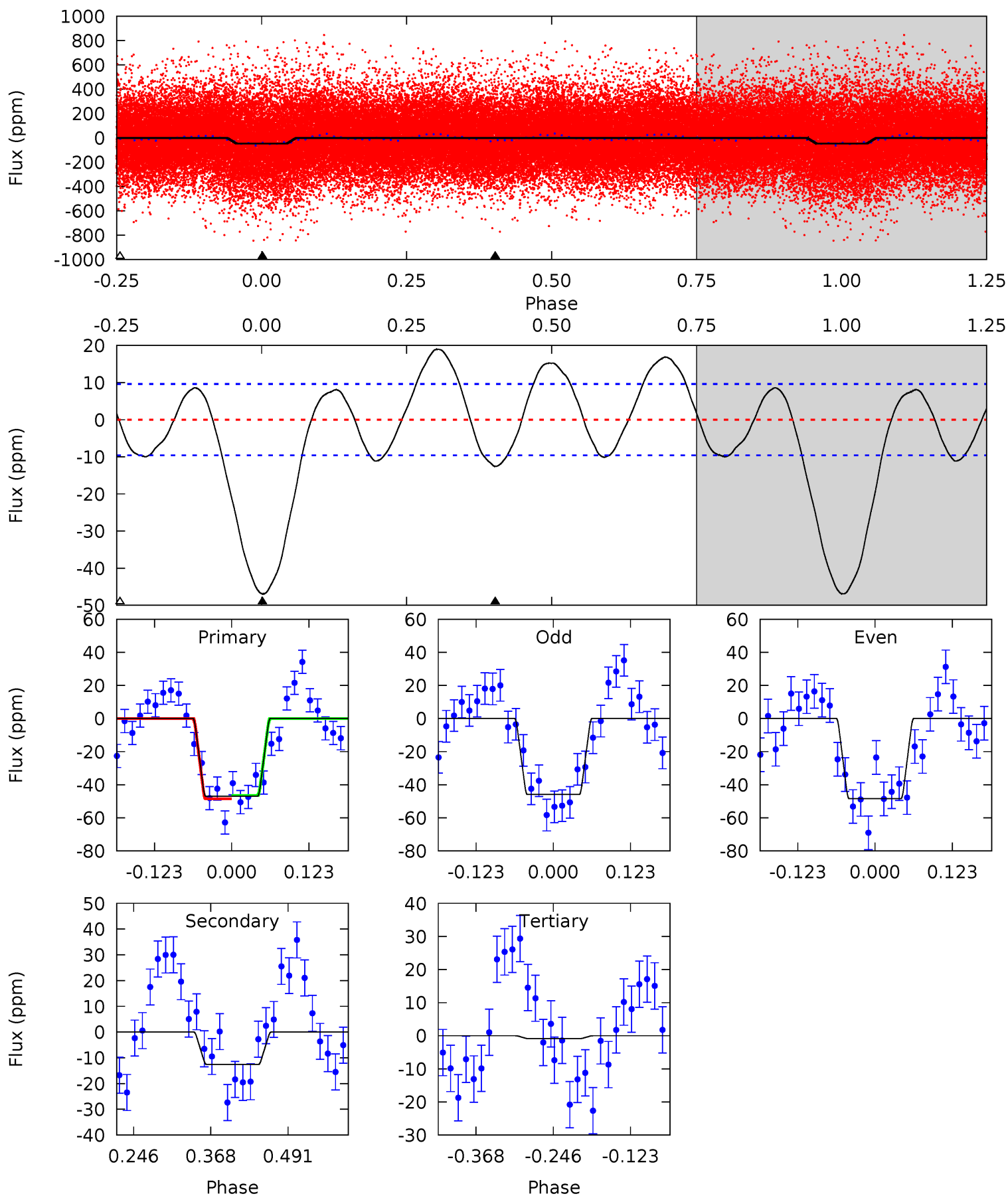
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.27	6.23	-3.29	0	4.51	1.51	3.94	12.6	9.27	9.52	6.23	0.17	0.74	0.47	0.35



# Alt Model-Shift Uniqueness Test

006868952-01, P = 4.671487 Days, E = 128.293143 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.1	5.93	0.41	0	4.52	1.54	3.98	21.7	22.1	5.52	5.93	0.58	1.44	0.29	0.45





### Stellar Parameters For KIC 006868952

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6028^{+81}_{-81}$	$4.151^{+0.160}_{-0.116}$	$0.400^{+0.100}_{-0.150}$	$1.583^{+0.275}_{-0.337}$	$1.296^{+0.101}_{-0.111}$	$0.460^{+0.387}_{-0.152}$
	+1%/-1%	+4%/-3%	+25%/-37%	+17%/-21%	+8%/-9%	+84%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 006868952-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-16 \pm 3$	$1.25^{+0.24}_{-0.24}$	$1912^{+93}_{-101}$	$4613^{+373}_{-299}$	$20^{+11}_{-7}$
Alt.	$-13 \pm 2$	$1.17^{+0.23}_{-0.22}$	$1914^{+87}_{-97}$	$4517^{+369}_{-303}$	$18^{+9}_{-6}$

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

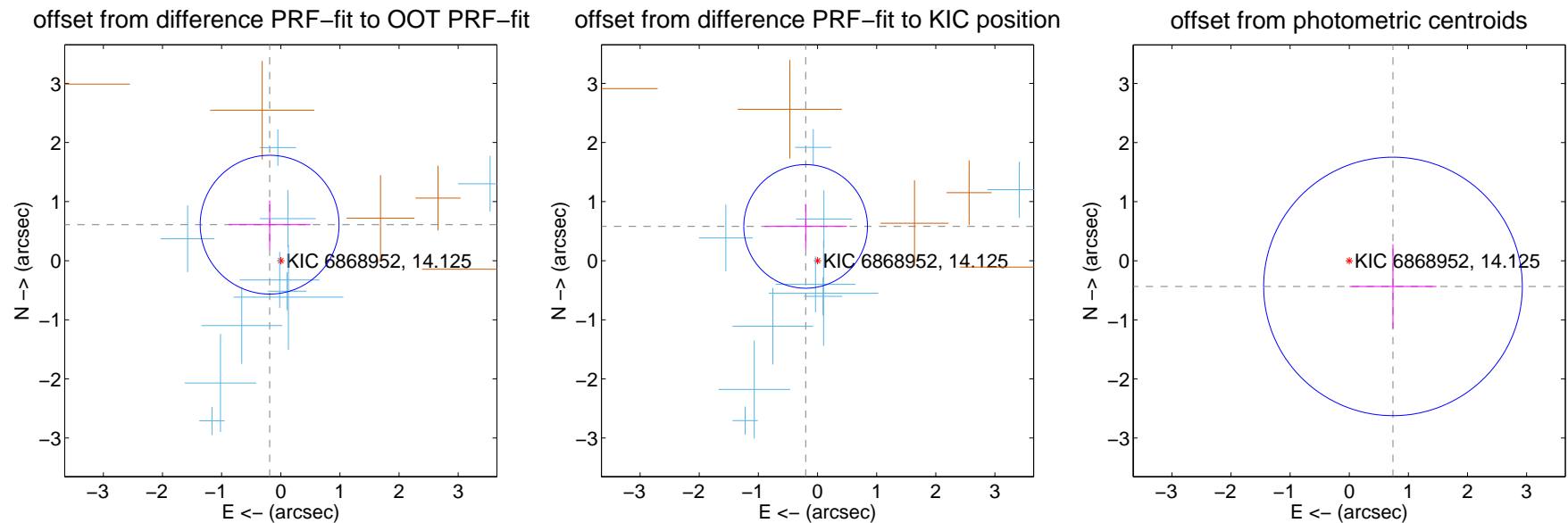
## DV Centroid Data

Supplemental centroid analysis for 006868952-01. Kepler magnitude: 14.12. Transit SNR 8.66

There are 10 quarters with good PRF difference image offsets

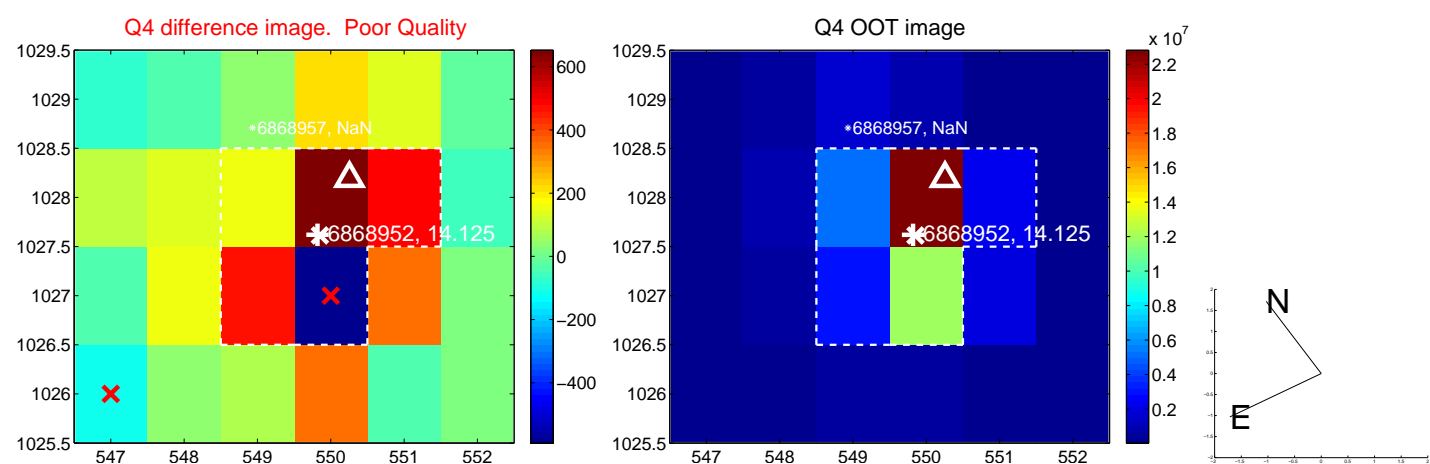
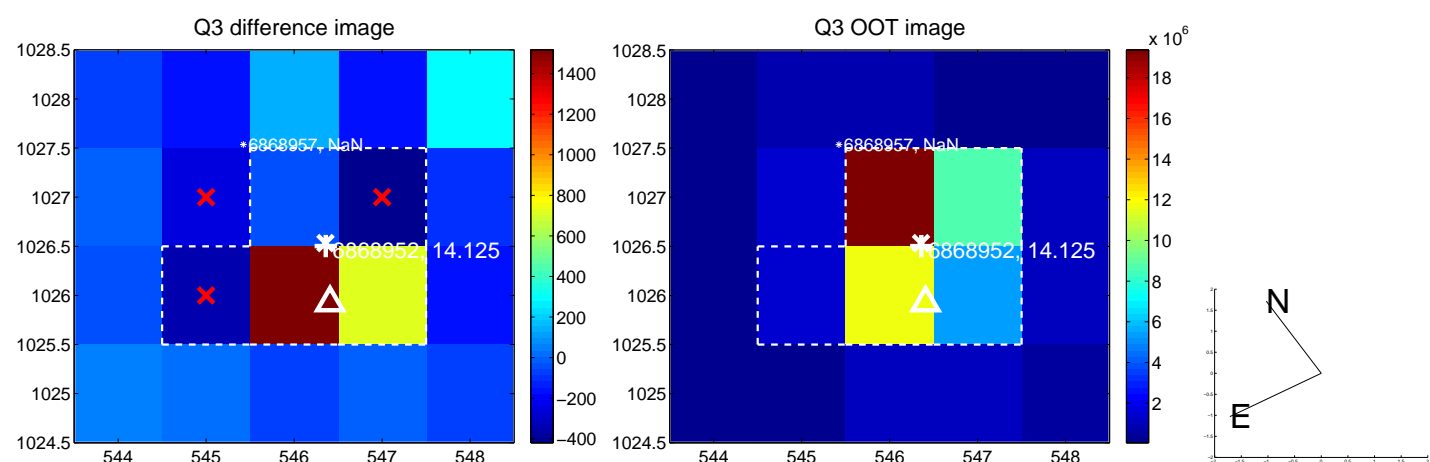
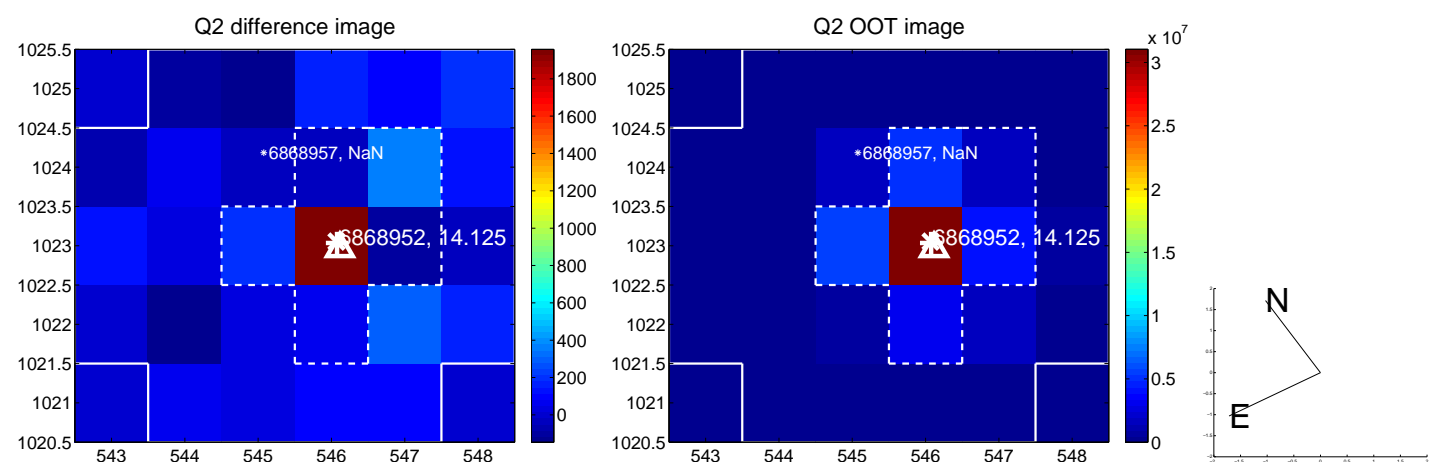
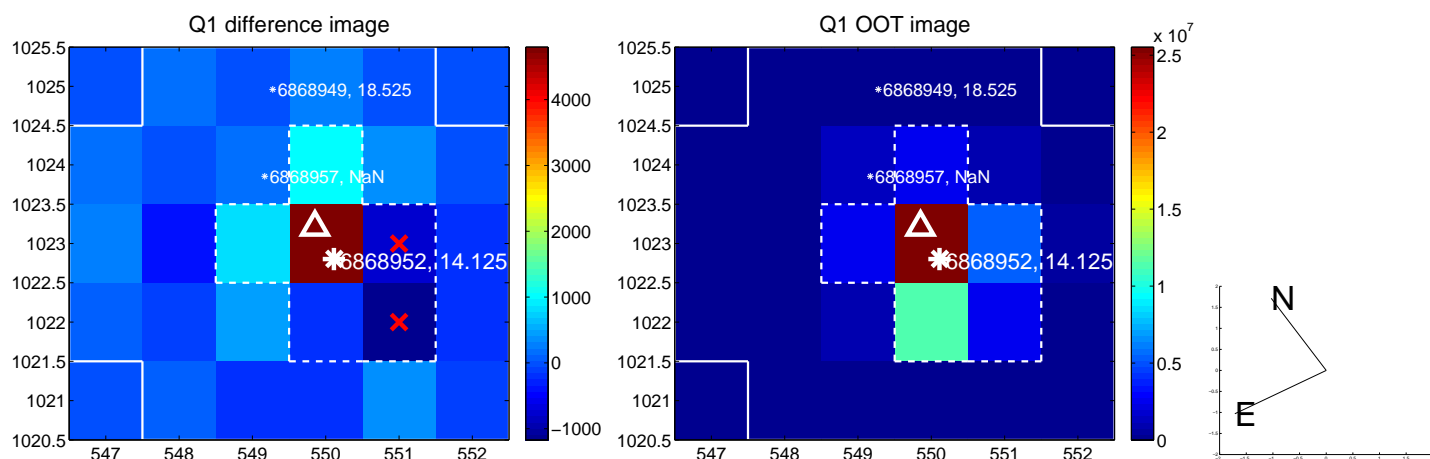
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.638 \pm 0.391$	1.63	$0.188 \pm 0.691$	$0.609 \pm 0.408$
PRF-fit source offset from KIC position	$0.614 \pm 0.349$	1.76	$0.201 \pm 0.696$	$0.580 \pm 0.377$
photometric centroid source offset	$0.86 \pm 0.73$	1.18	$-0.74 \pm 0.73$	$-0.43 \pm 0.71$

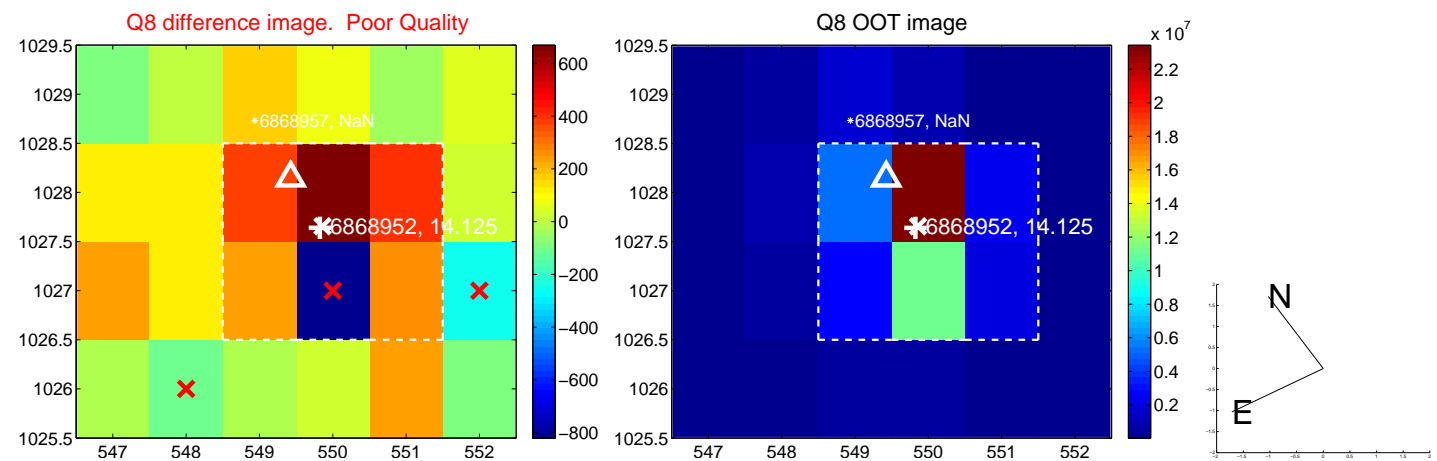
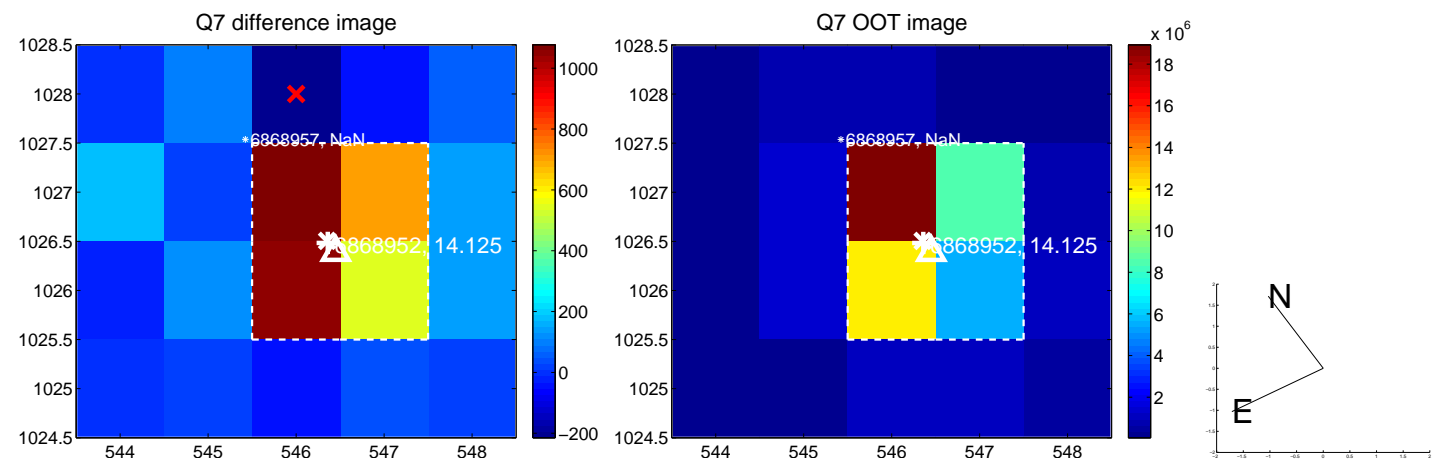
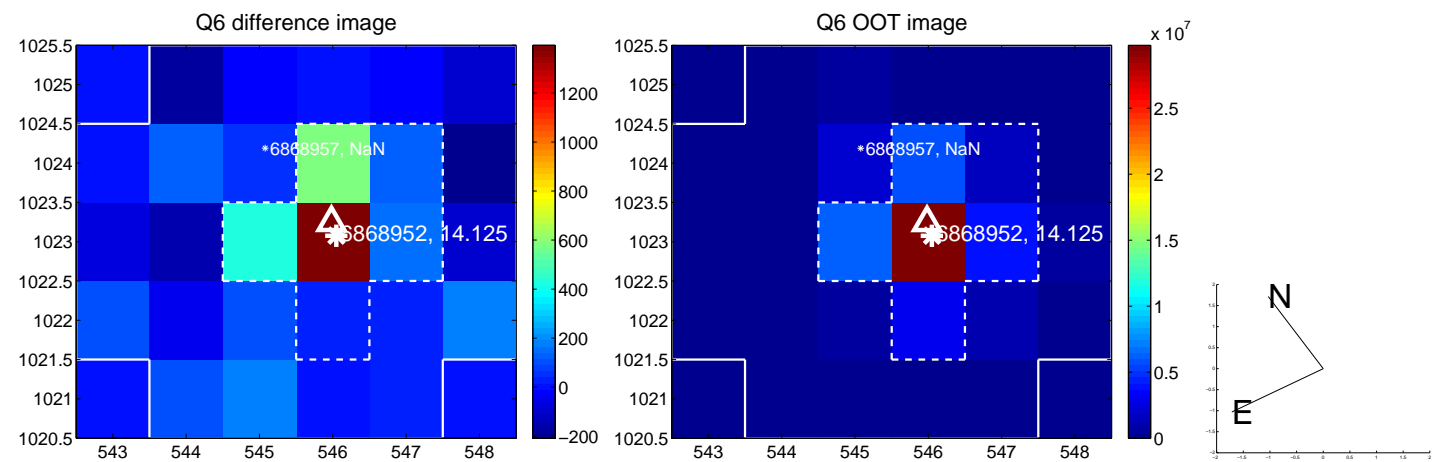
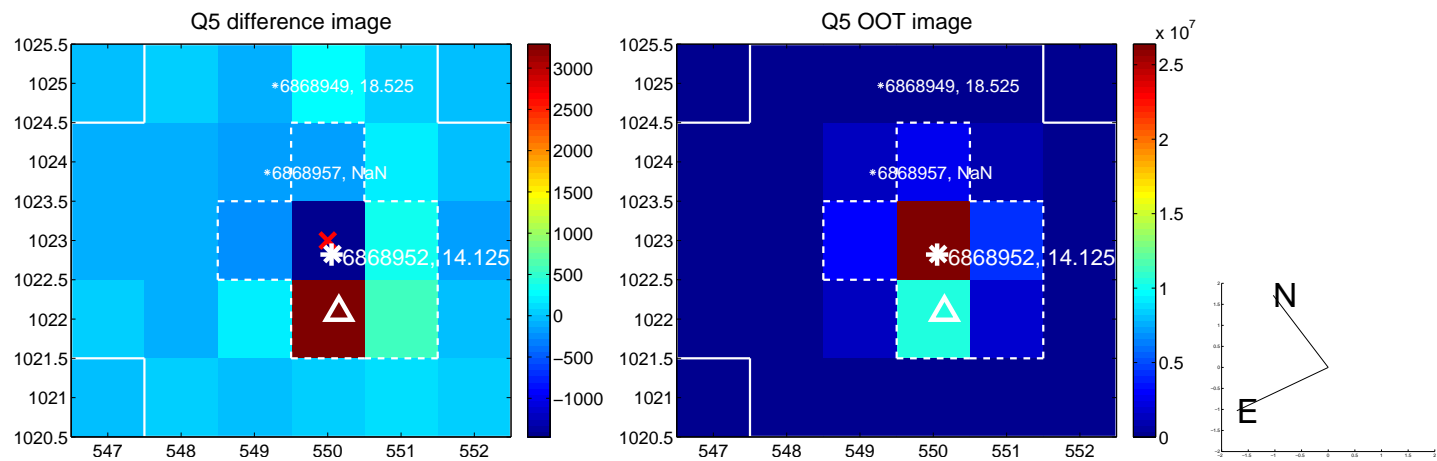


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

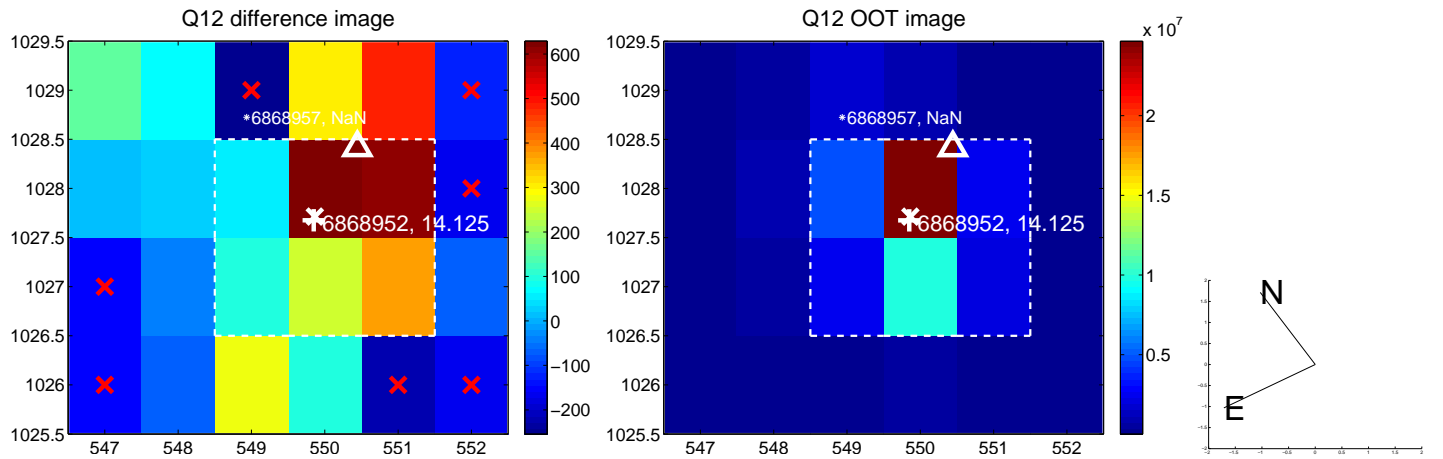
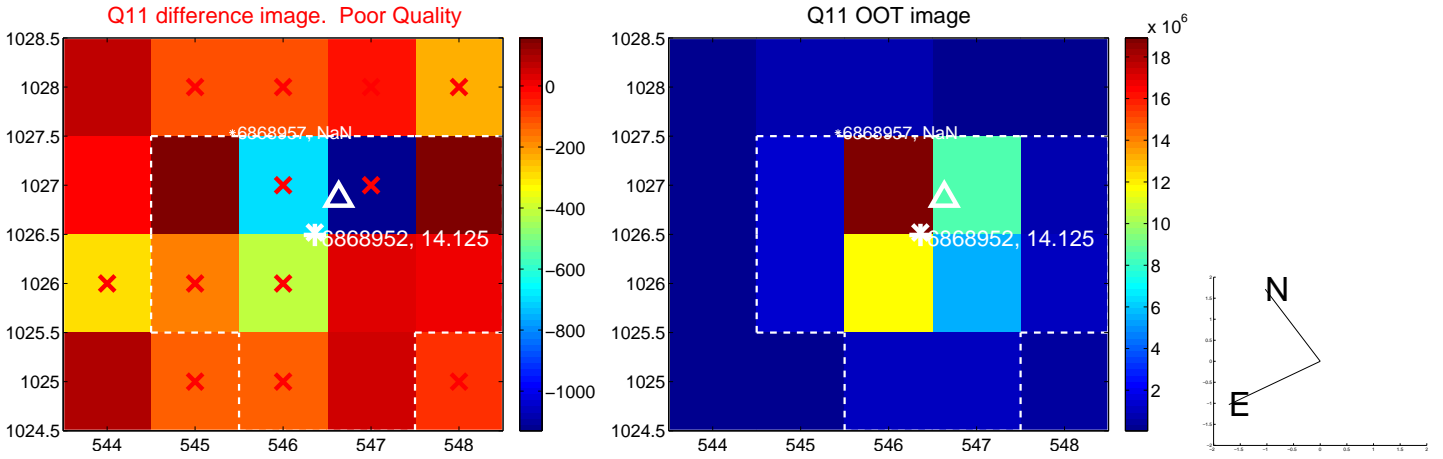
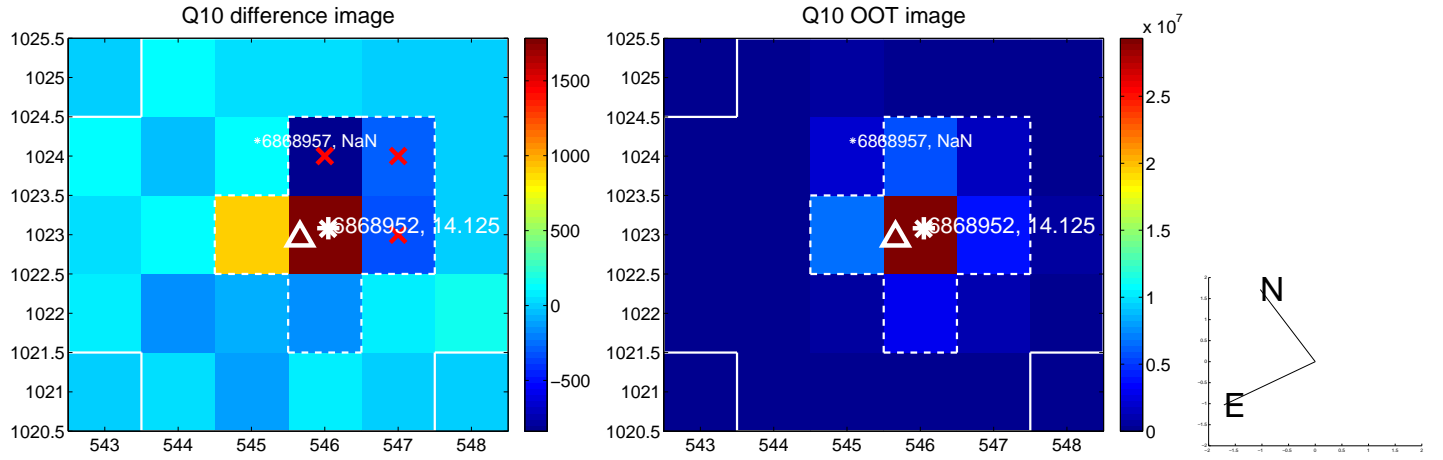
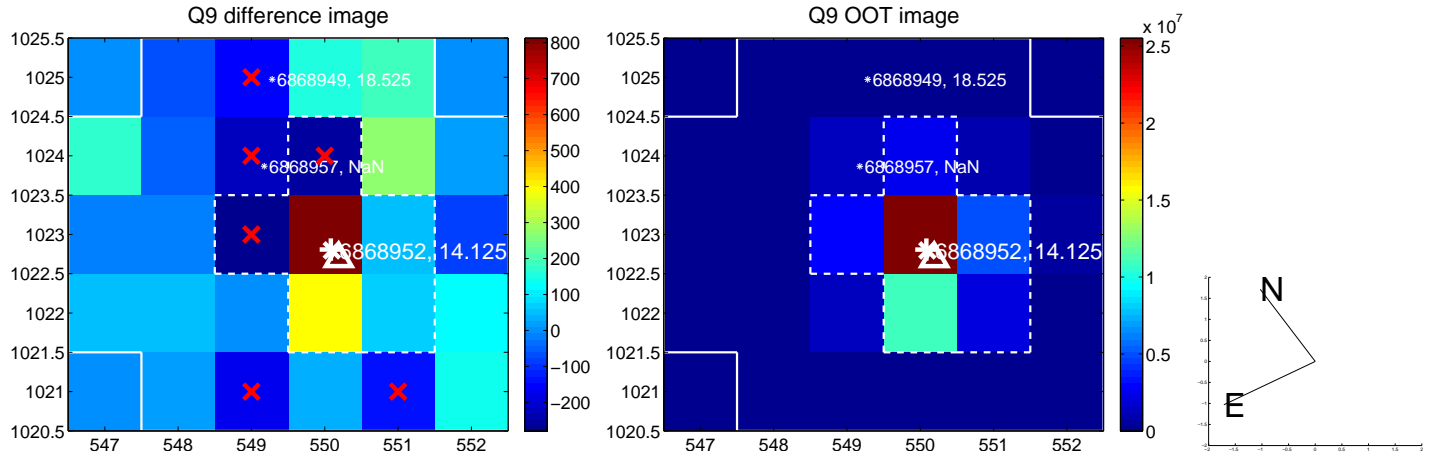


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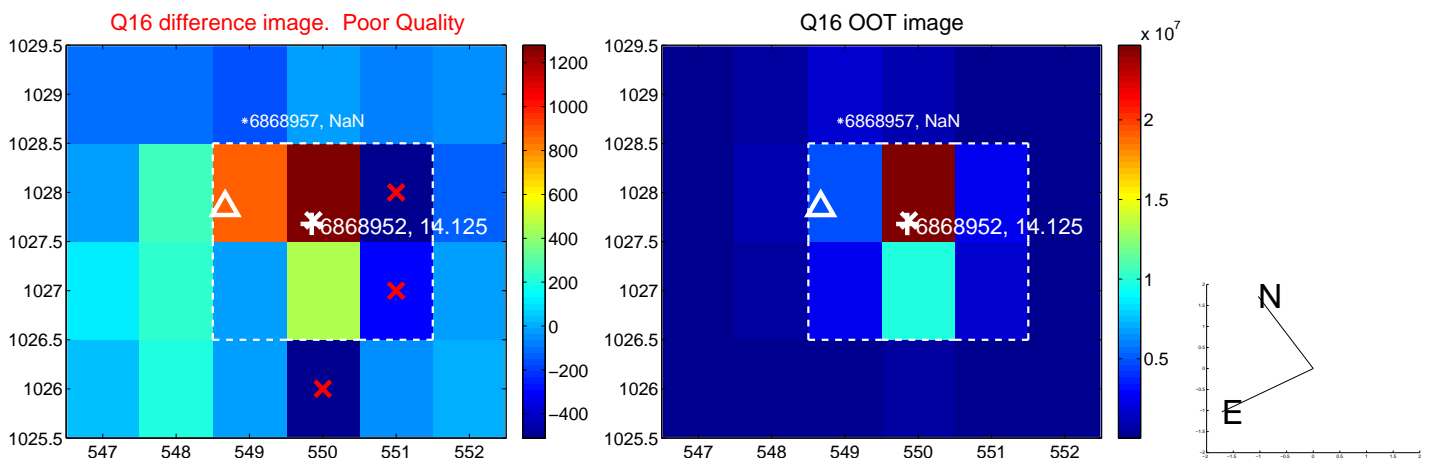
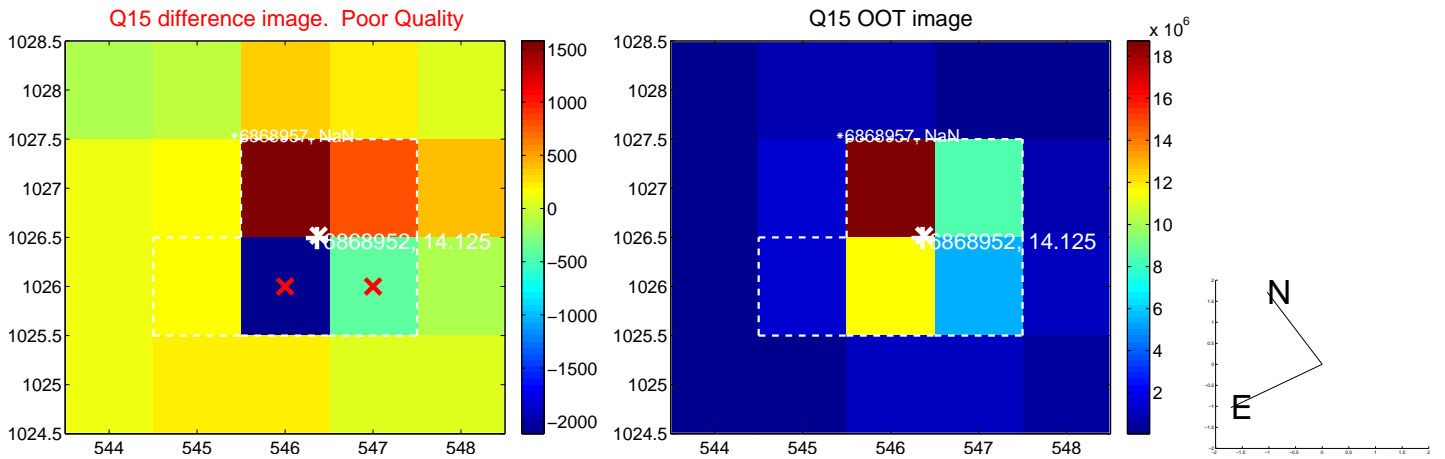
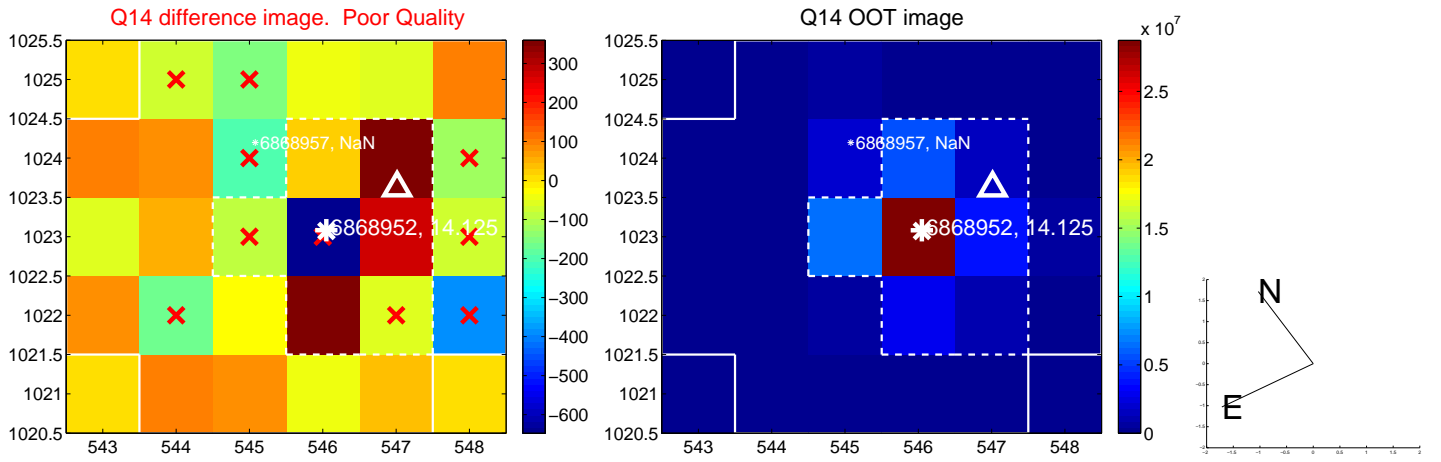
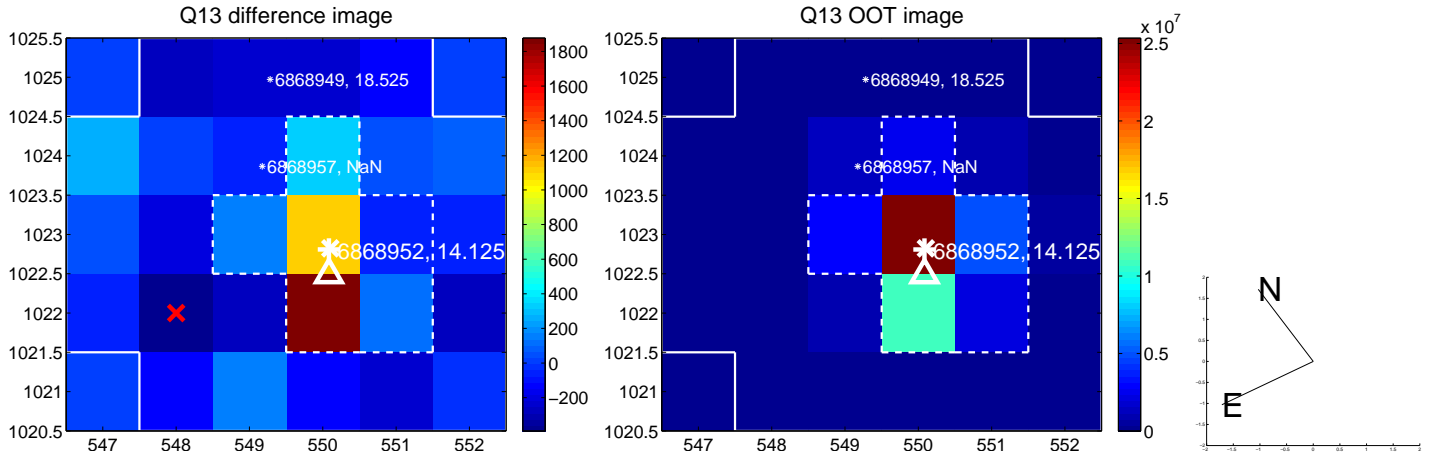




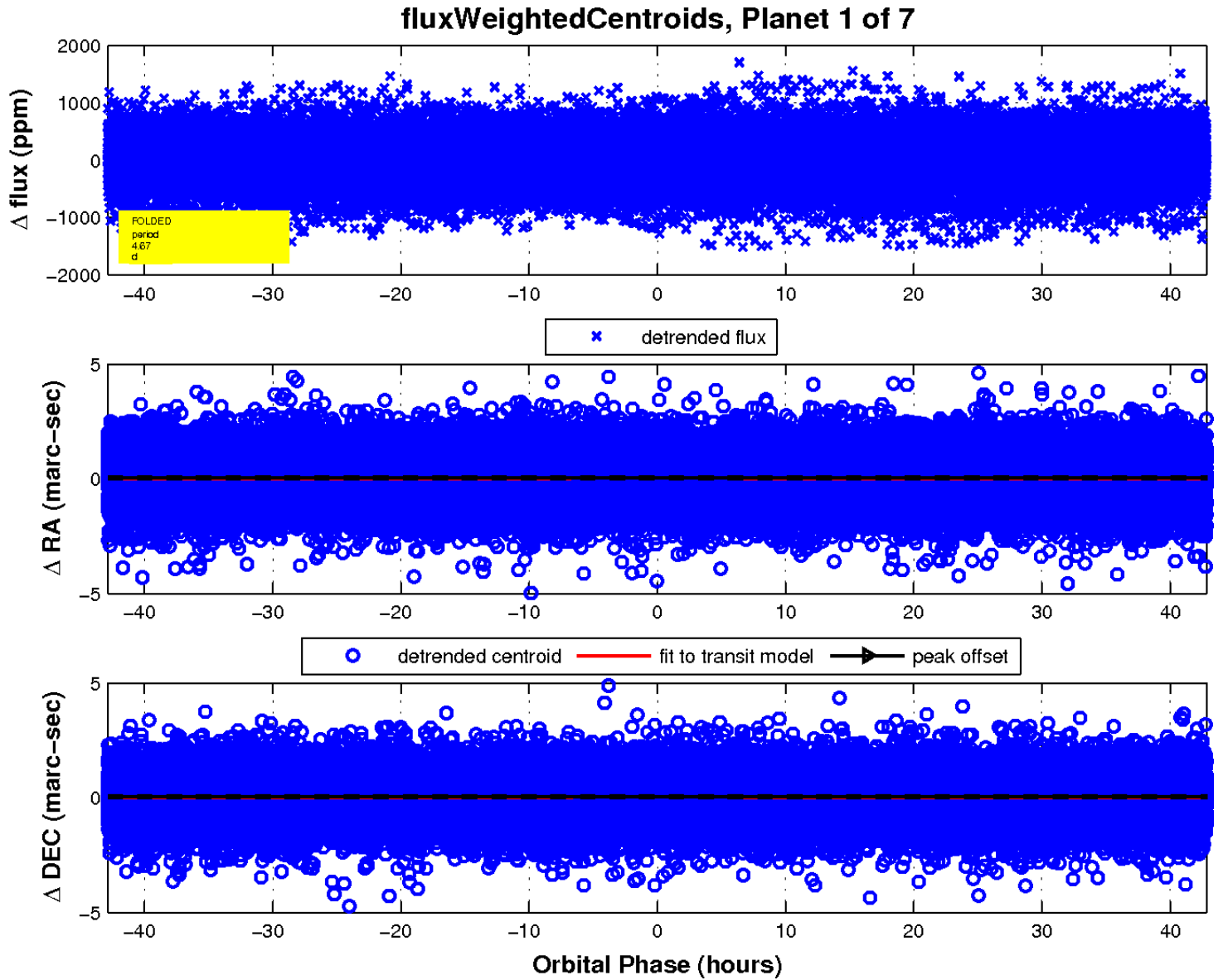
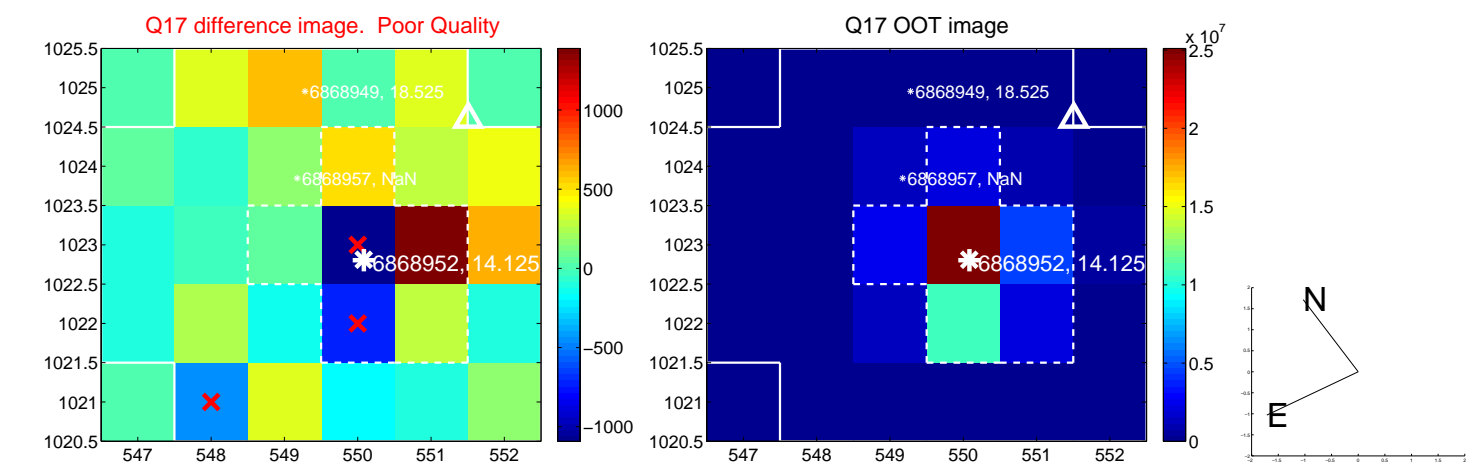
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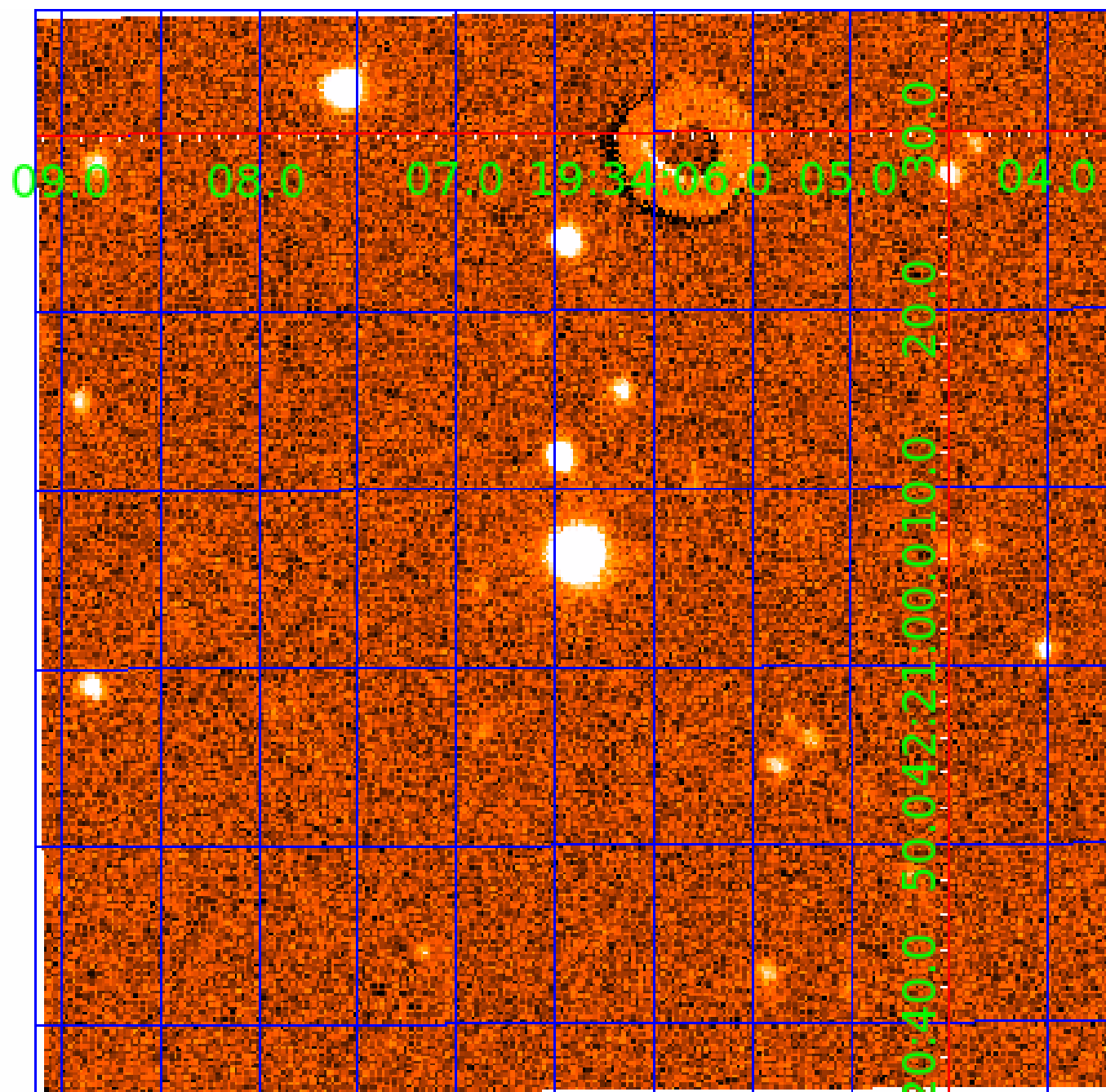


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# UKIRT Image

Declination





# KIC 006868952

## Q1-17 DR25 TCE Parameters

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006868952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
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N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

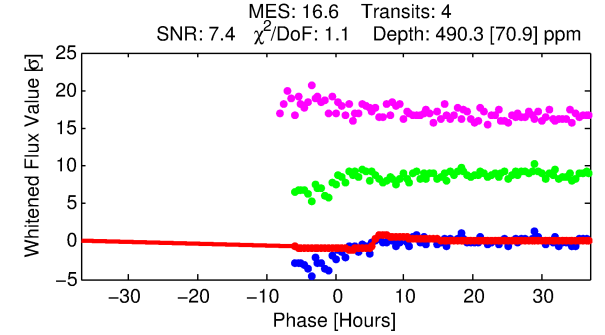
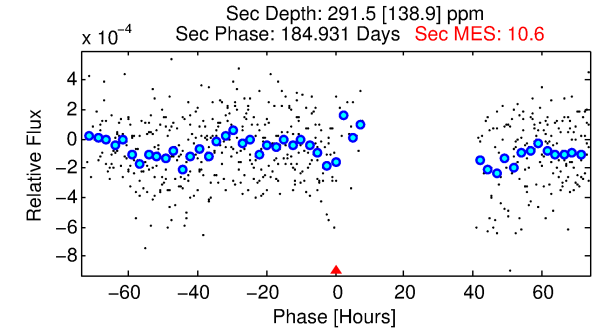
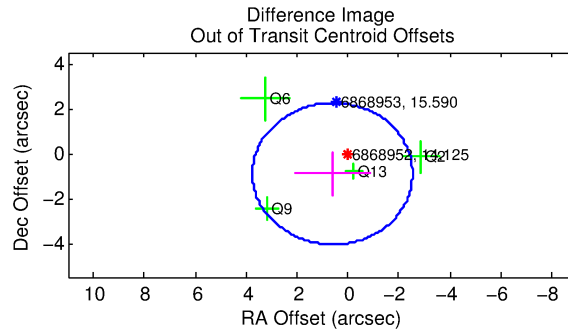
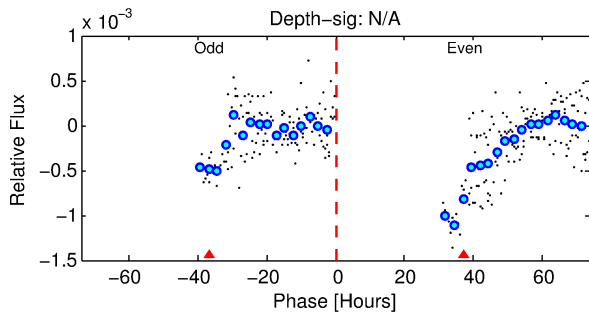
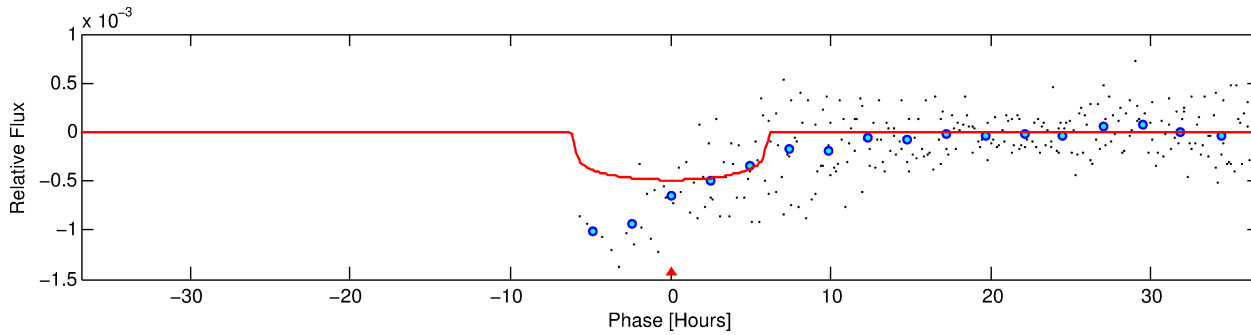
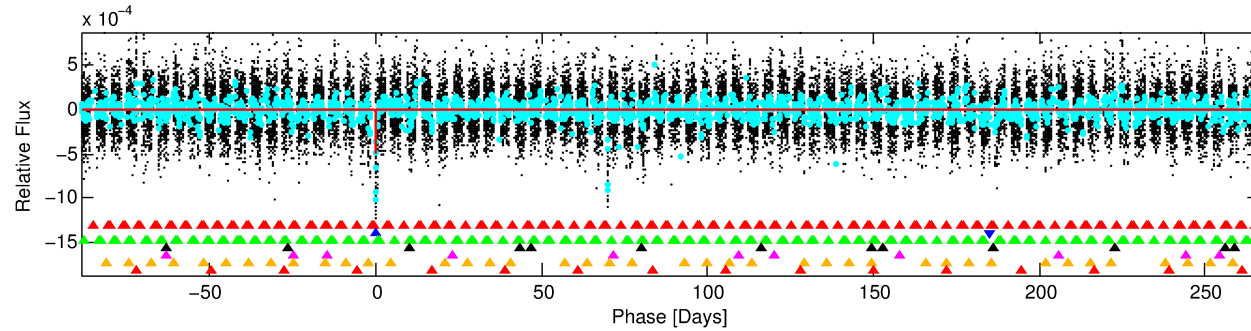
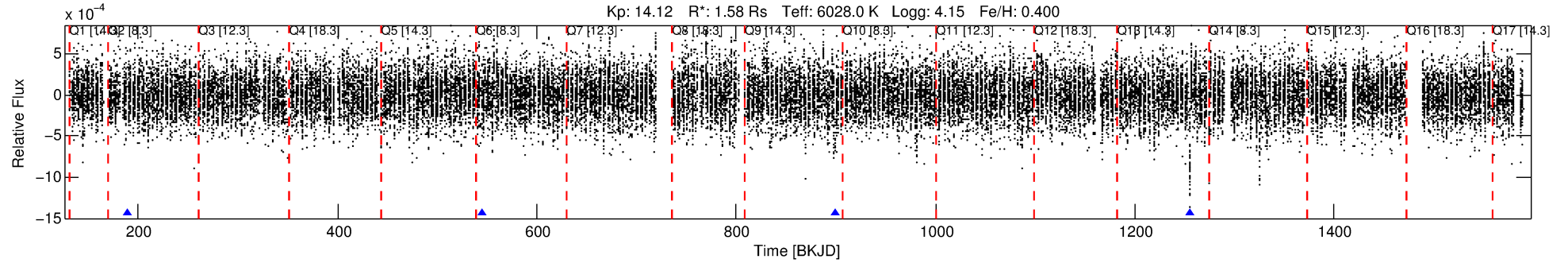
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## Ephemeris Match Information For 006868952-02

No Significant Match Found

# DV One-Page Summary

KIC: 6868952 Candidate: 2 of 7 Period: 355.190 d



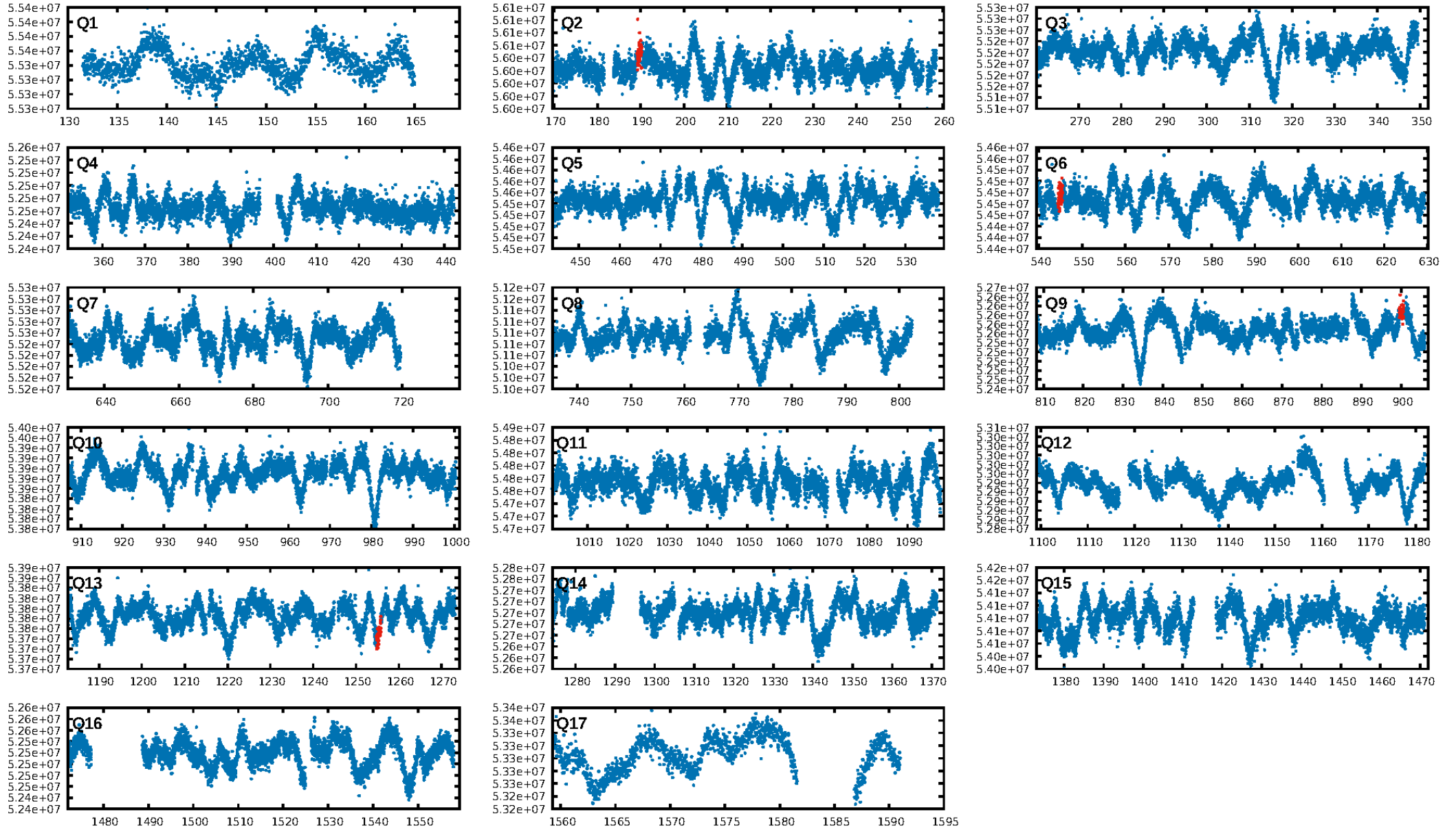
## DV Fit Results:

Period = 355.19036 [0.00723] d  
Epoch = 189.7203 [0.0201] BKJD  
Rp/R\* = 0.0204 [0.0227]  
a/R\* = 212.20 [1056.75]  
b = 0.35 [12.57]  
Seff = 2.59 [0.75]  
Teff = 323 [23] K  
Rp = 3.52 [3.99] Re  
a = 1.0699 [0.2008] AU  
Ag = 14799.26 [33956.96] [0.44 $\sigma$ ]  
Teffp = 5516 [3141] K [1.65 $\sigma$ ]

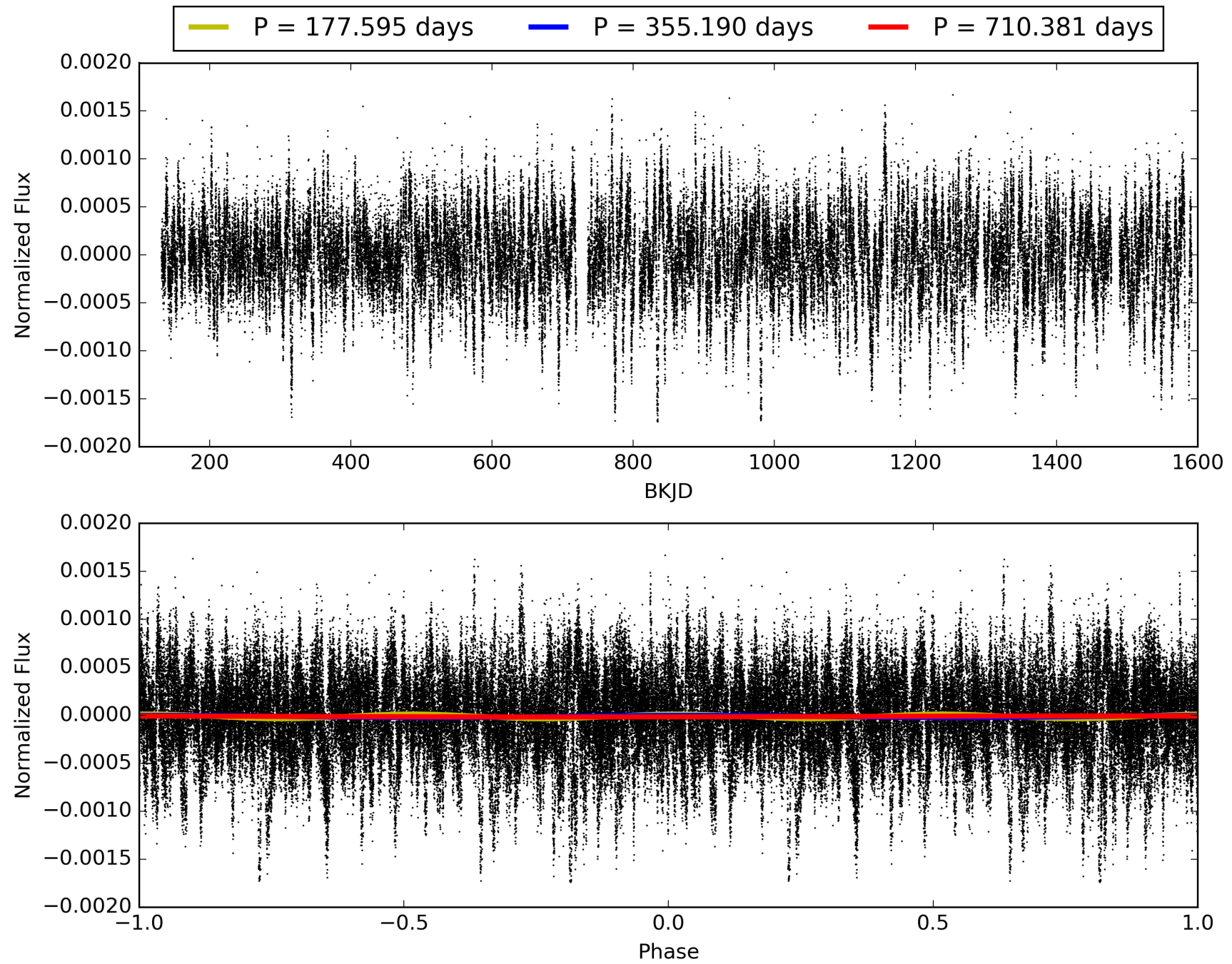
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [182.21 $\sigma$ ]  
LongPeriod-sig: N/A  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.41e-25  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.2275  
Centroid-sig: 17.5%  
Centroid-so: 0.898 arcsec [1.39 $\sigma$ ]  
OotOffset-rm: 1.086 arcsec [1.03 $\sigma$ ]  
KicOffset-rm: 1.123 arcsec [1.12 $\sigma$ ]  
OotOffset-st: 2/0/0/2 [4]  
KicOffset-st: 2/0/0/2 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.00 [0/4]

# TCE 006868952-02, PDC Light Curves



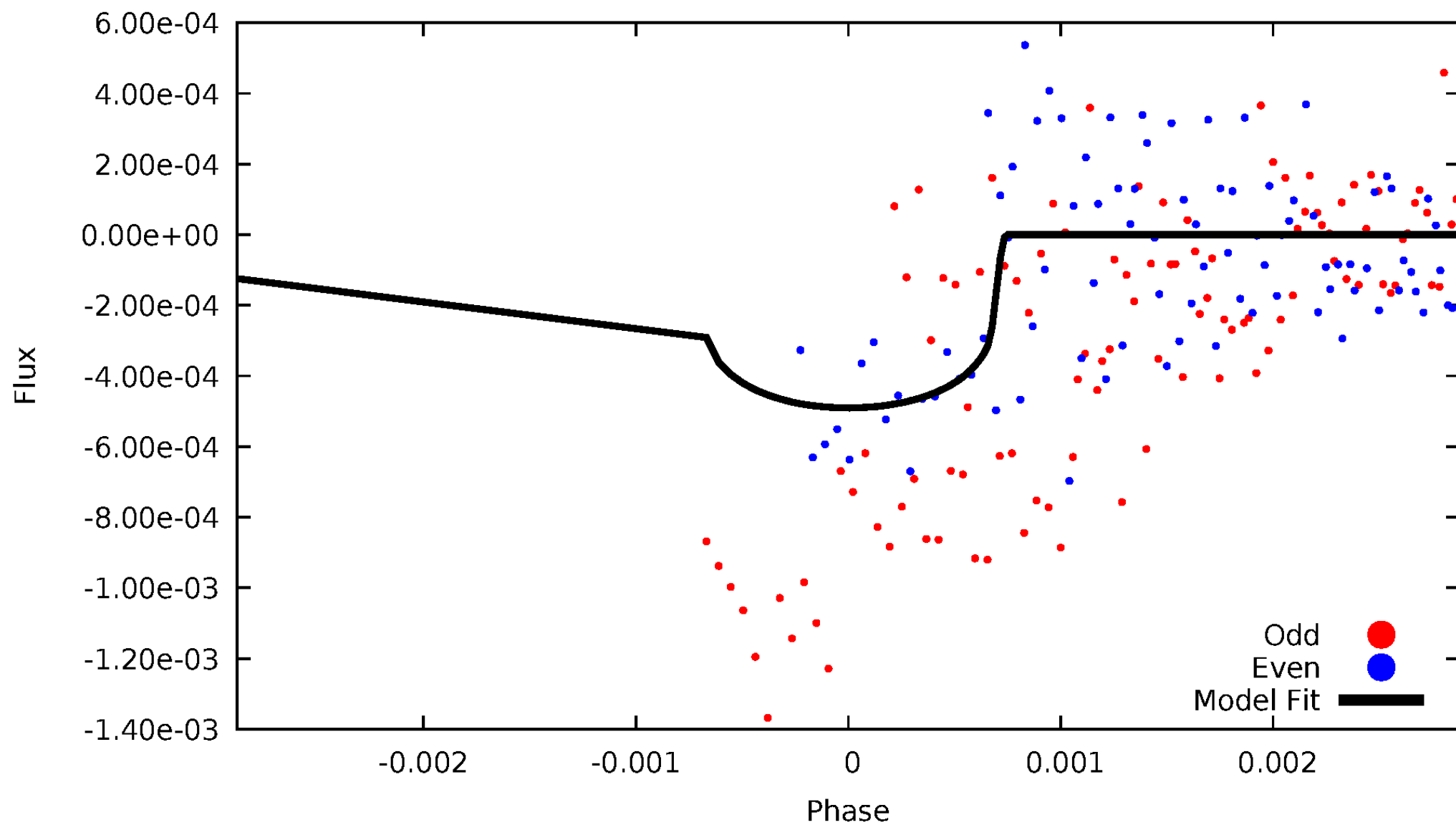
TCE 006868952-02





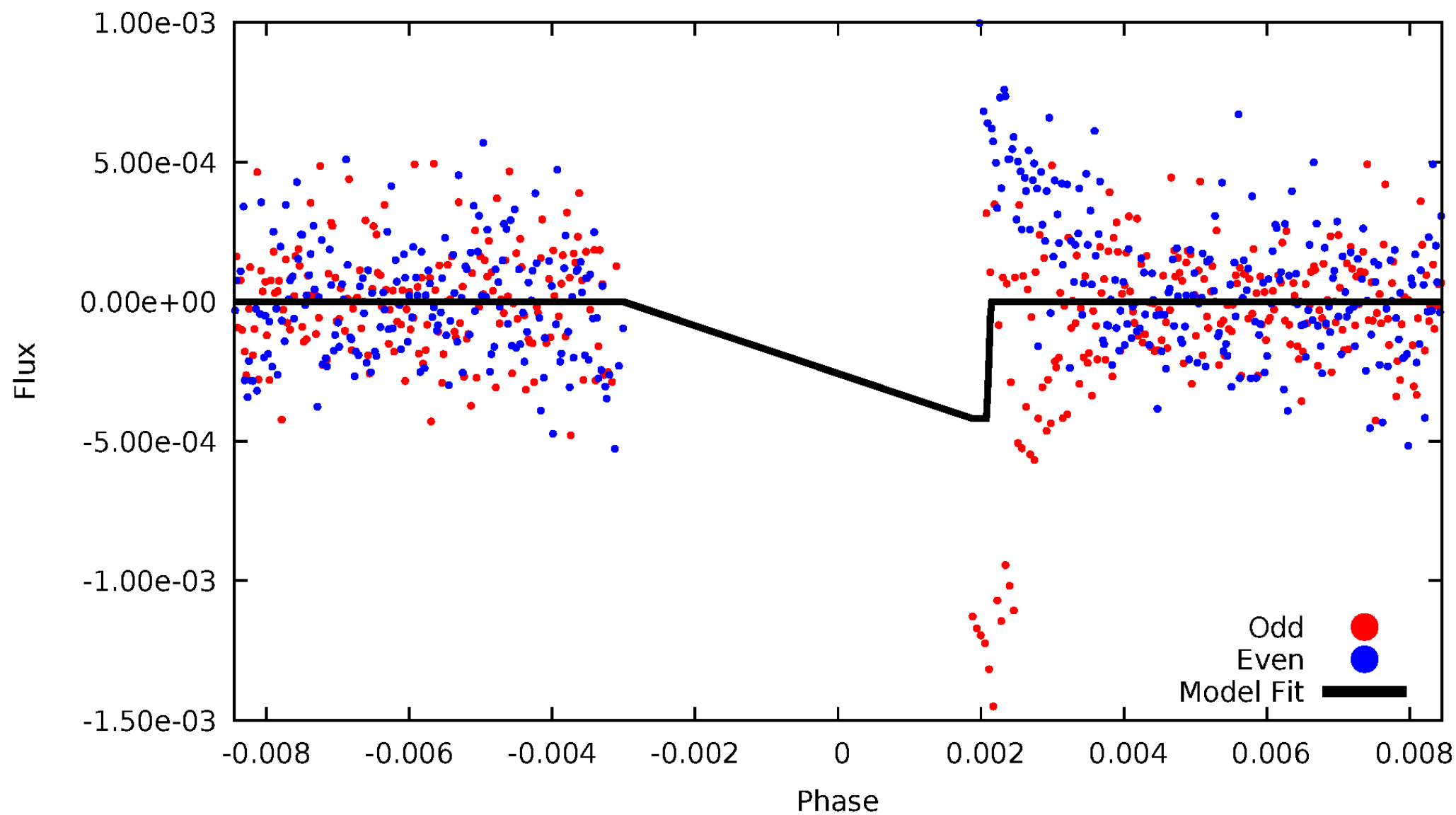
# DV Odd/Even

TCE 006868952-02



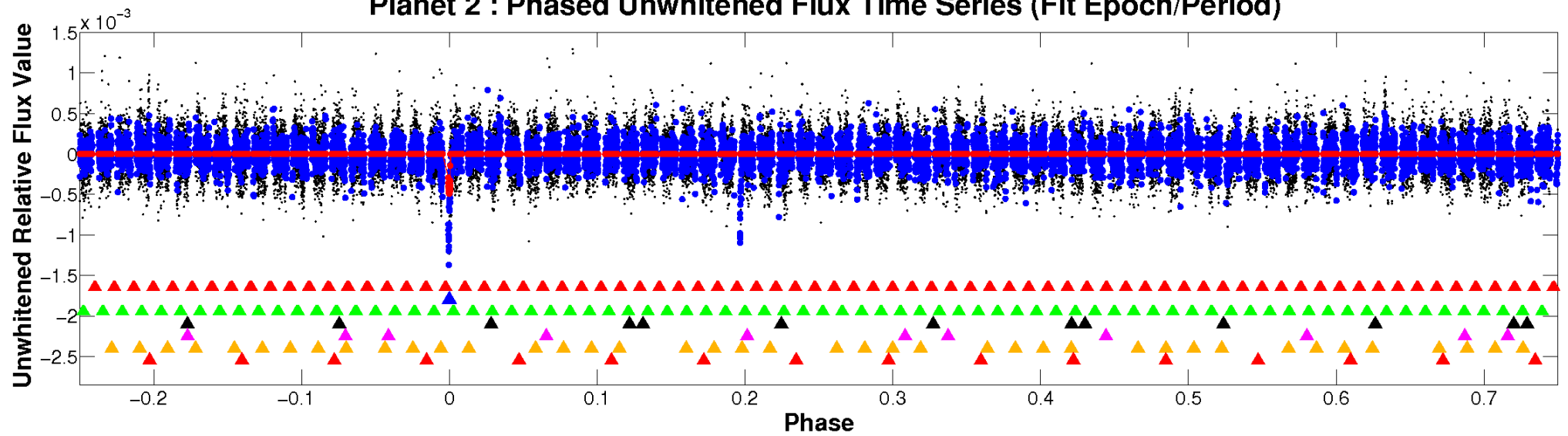
# ALT Odd/Even

TCE 006868952-02

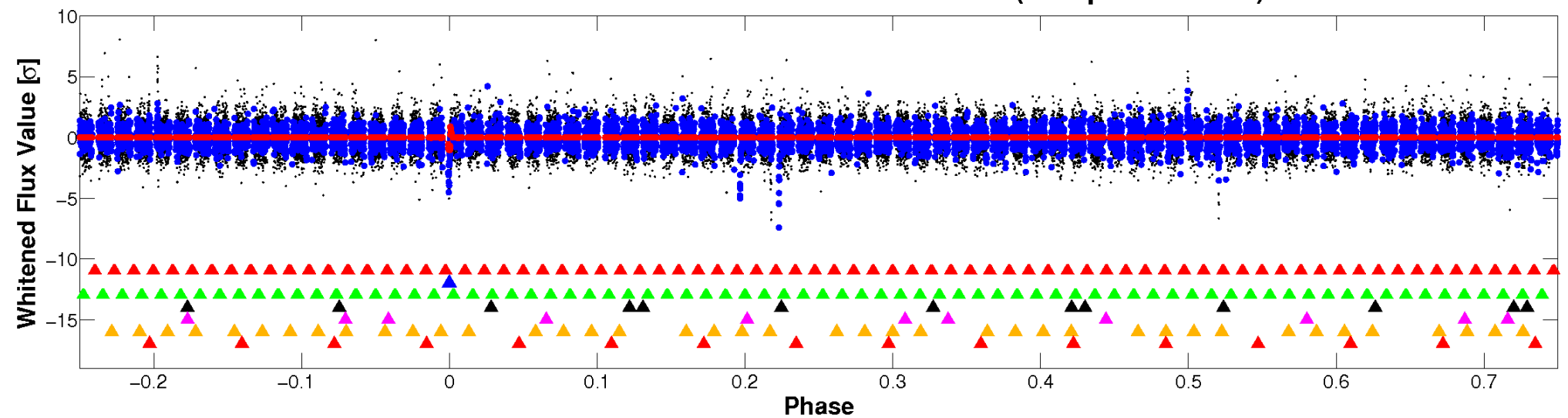


# Non-Whitened Vs. Whitened Light Curve

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

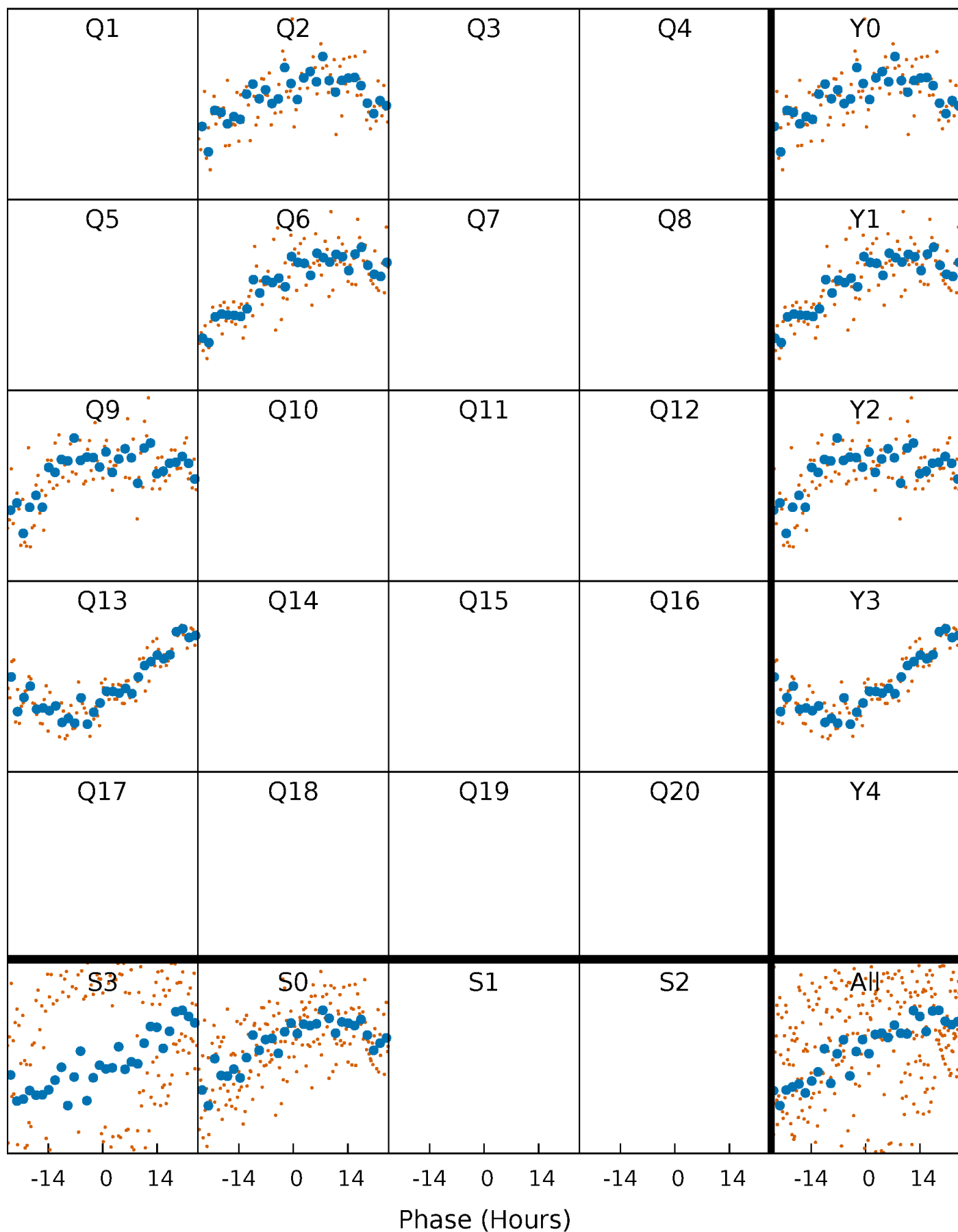


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

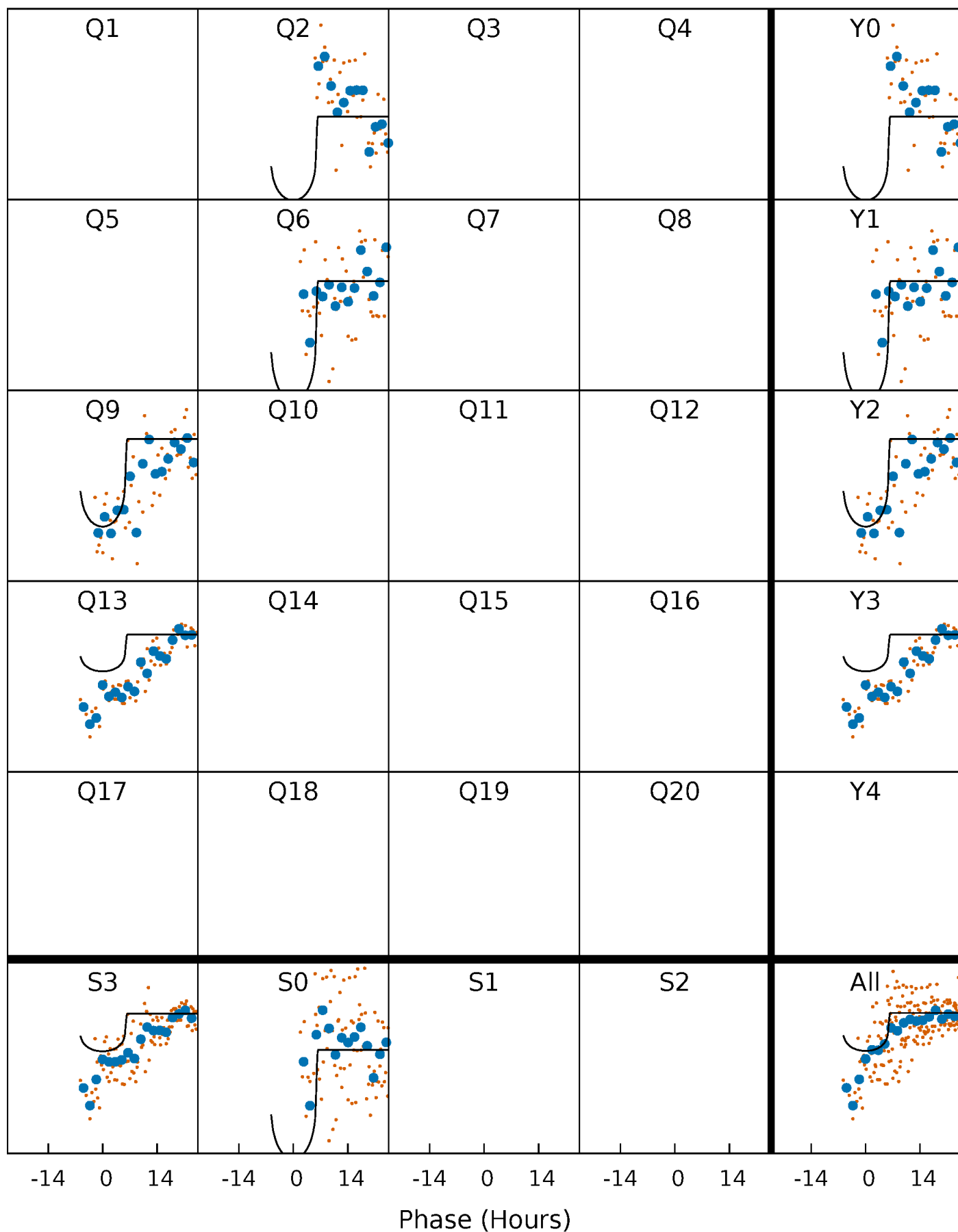
TCE 006868952-02     $P=355.190361$  Days     $T_0=189.720331$  (BKJD)





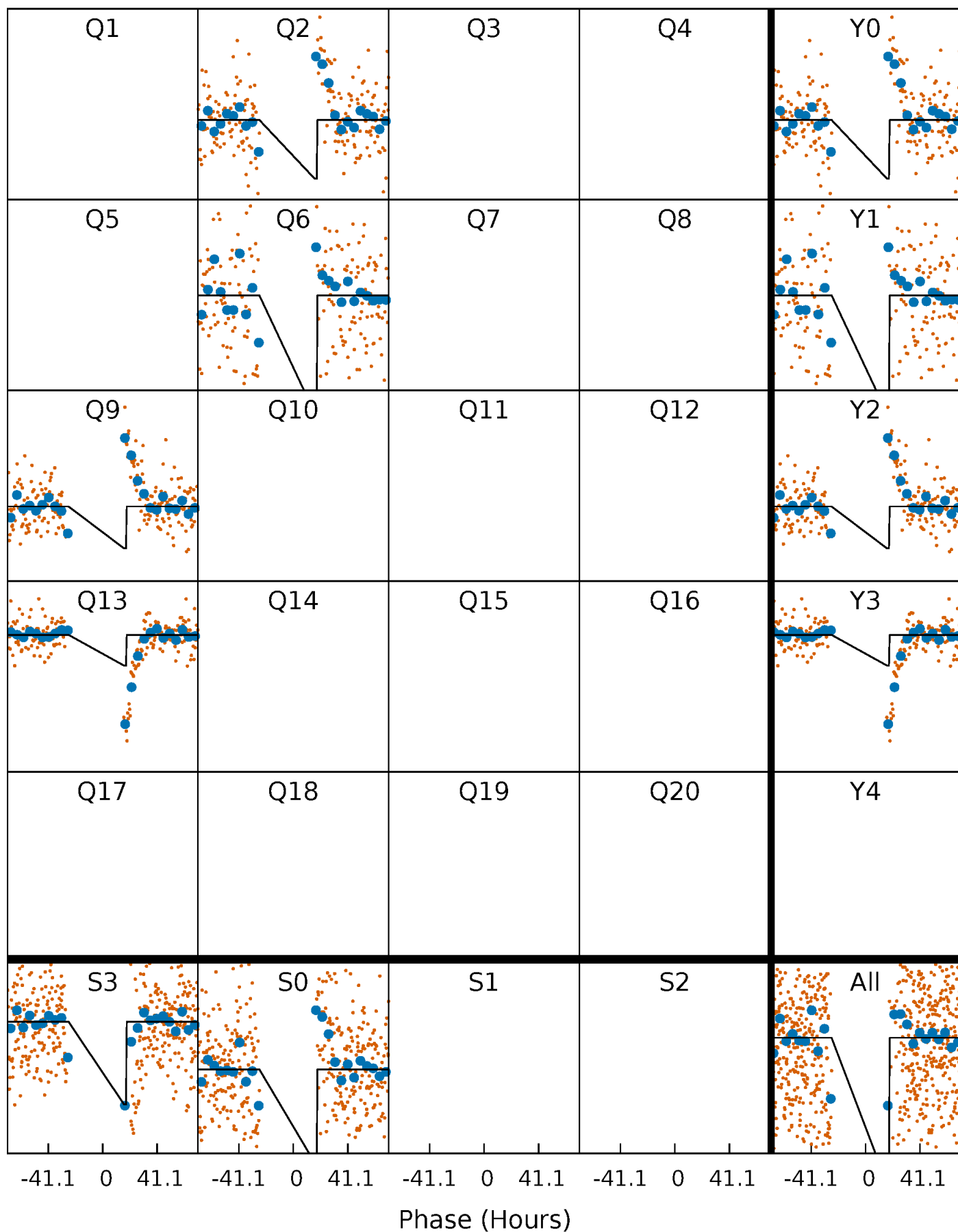
# DV Quarter-Phased Transit Curves

TCE 006868952-02 P=355.190361 Days  $T_0=189.720331$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

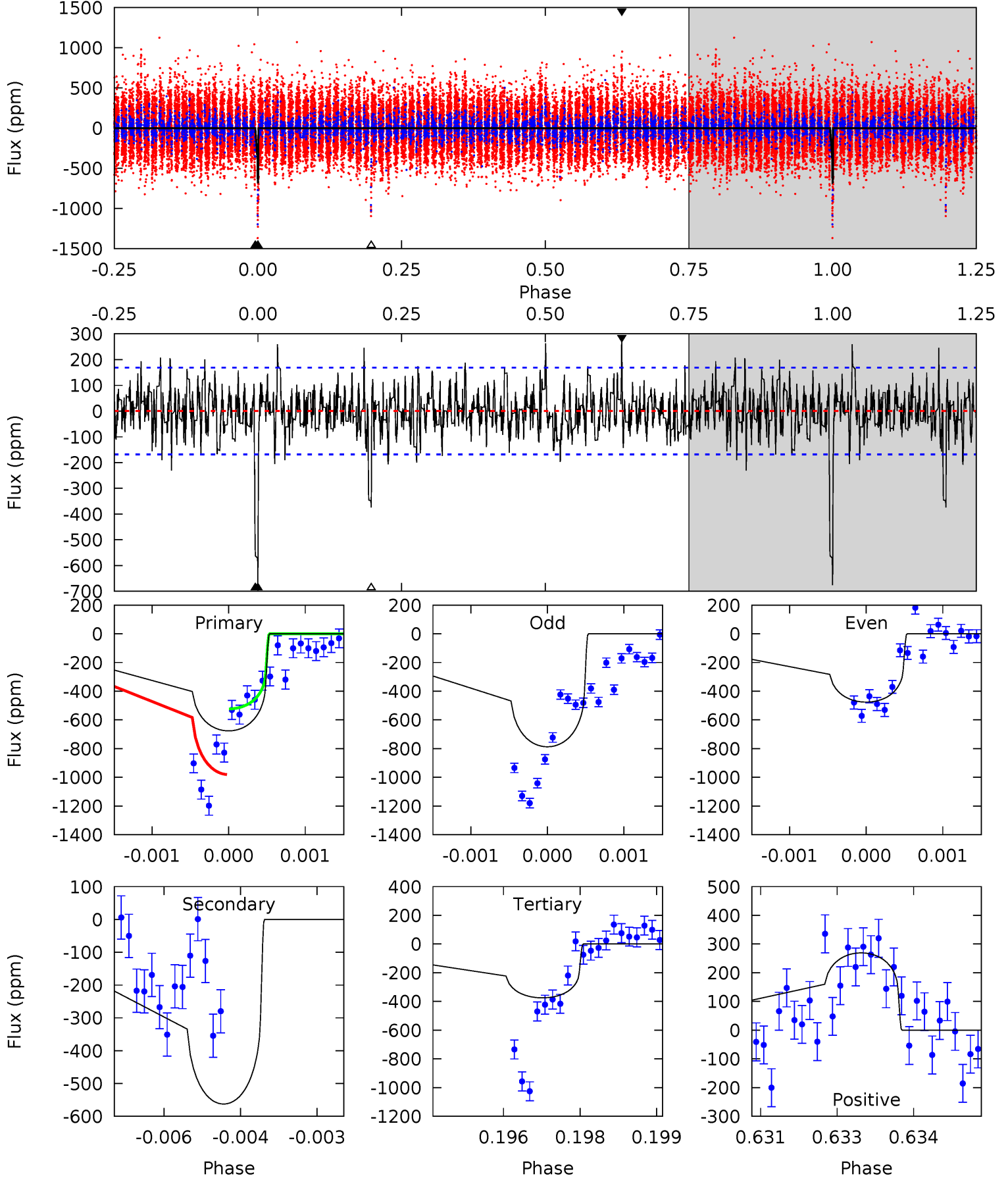
TCE 006868952-02 P=355.067161 Days  $T_0=189.183884$  (BKJD)



# DV Model-Shift Uniqueness Test

006868952-02, P = 355.190361 Days, E = 189.720331 Days

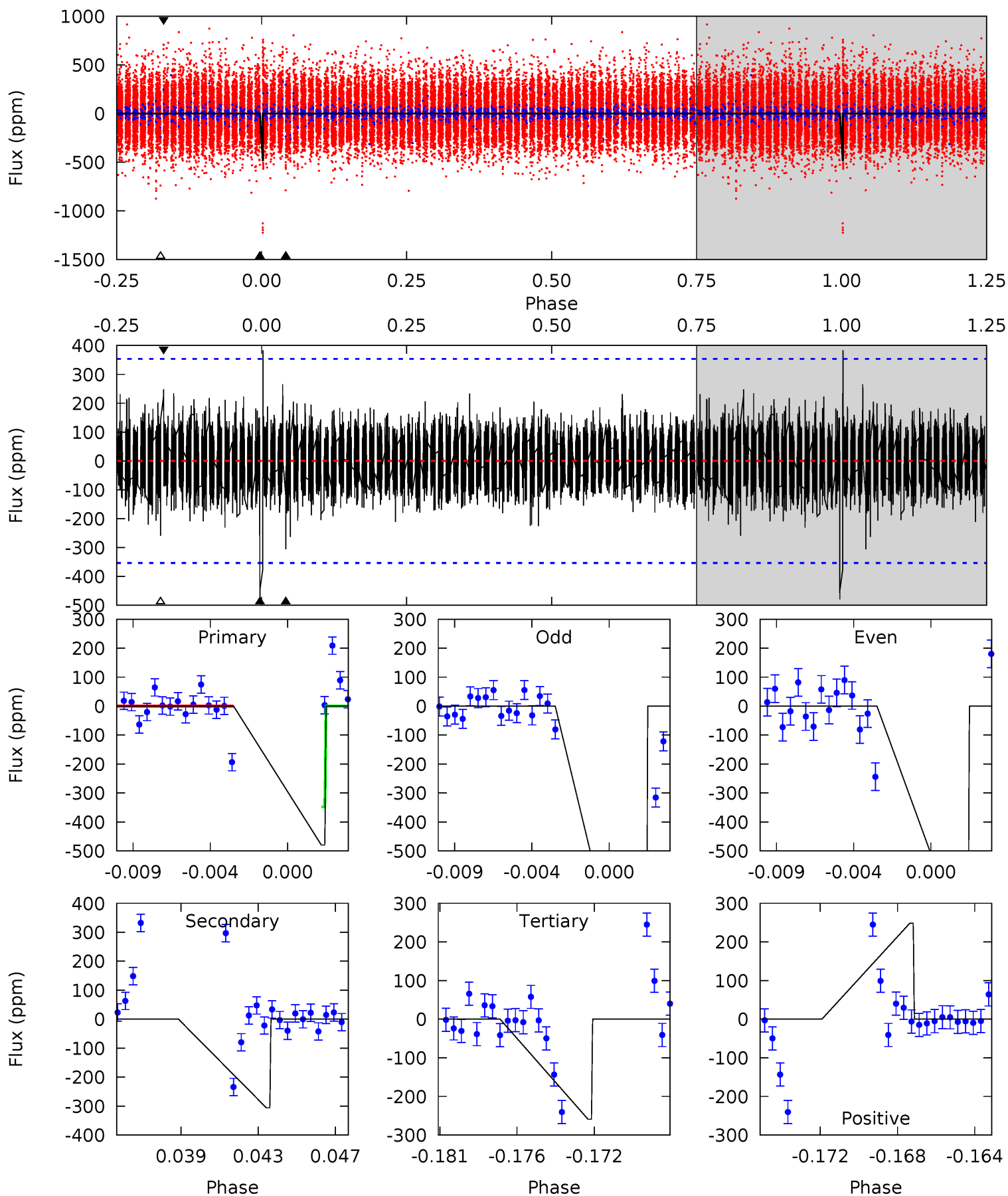
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.7	18.0	12.0	8.62	5.39	3.19	2.15	9.66	13.0	6.02	9.40	4.81	0.86	0.28	6.64



# Alt Model-Shift Uniqueness Test

006868952-02, P = 355.067161 Days, E = 189.183884 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
7.04	4.49	3.80	3.64	5.19	2.85	0.88	3.24	3.40	0.69	0.85	3.43	-0.11	0.44	0





### Stellar Parameters For KIC 006868952

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6028^{+81}_{-81}$	$4.151^{+0.160}_{-0.116}$	$0.400^{+0.100}_{-0.150}$	$1.583^{+0.275}_{-0.337}$	$1.296^{+0.101}_{-0.111}$	$0.460^{+0.387}_{-0.152}$
	+1%/-1%	+4%/-3%	+25%/-37%	+17%/-21%	+8%/-9%	+84%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 006868952-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-563 \pm 31$	$4.36^{+3.37}_{-2.70}$	$451^{+23}_{-25}$	$5880^{+4553}_{-1349}$	$19434^{+109456}_{-13650}$
Alt.	$-306 \pm 68$	$4.52^{+3.49}_{-2.91}$	$451^{+22}_{-26}$	$5015^{+3599}_{-1019}$	$9693^{+67532}_{-6767}$

$T_{max}$  = 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

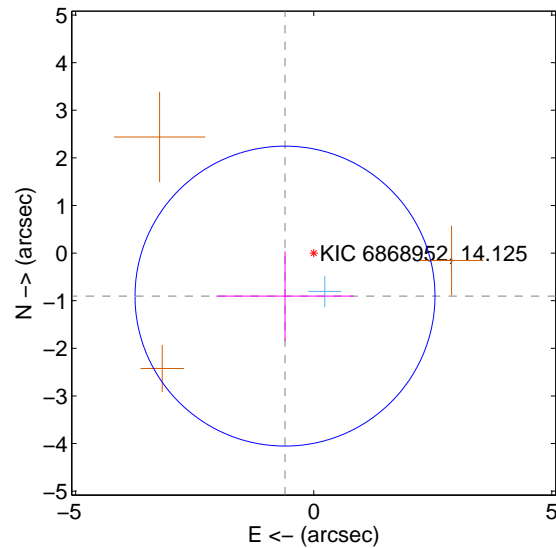
Supplemental centroid analysis for 006868952-02. Kepler magnitude: 14.12. Transit SNR 7.40

There are 1 quarters with good PRF difference image offsets

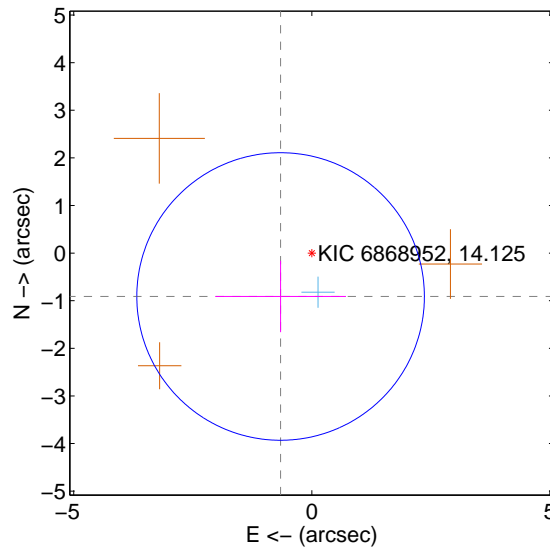
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.086 \pm 1.050$	1.03	$0.603 \pm 1.442$	$-0.903 \pm 0.943$
PRF-fit source offset from KIC position	$1.123 \pm 1.007$	1.12	$0.655 \pm 1.373$	$-0.912 \pm 0.751$
photometric centroid source offset	$0.90 \pm 0.65$	1.39	$0.22 \pm 0.62$	$0.87 \pm 0.65$

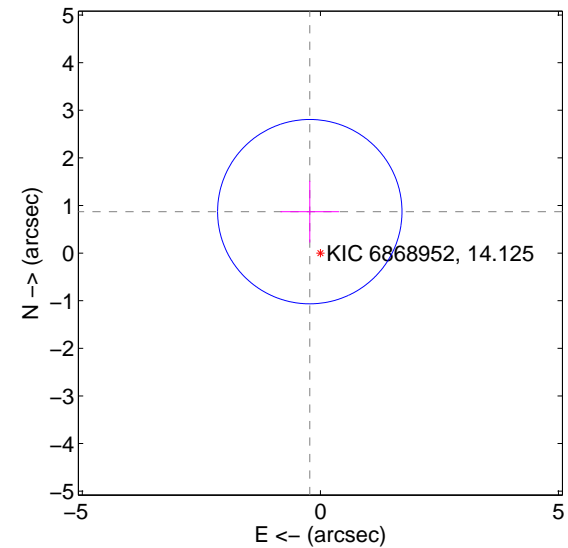
offset from difference PRF-fit to OOT PRF-fit



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.

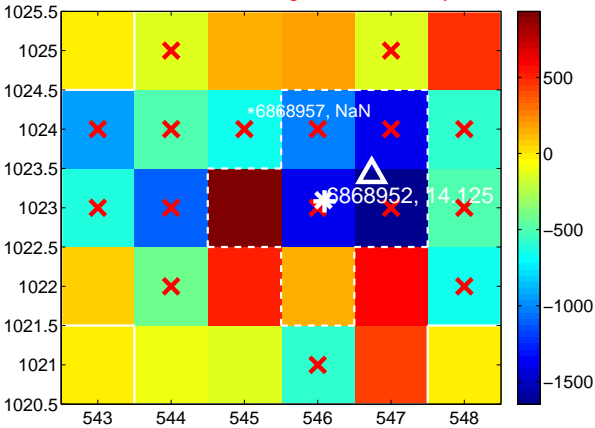
Q1 no difference image



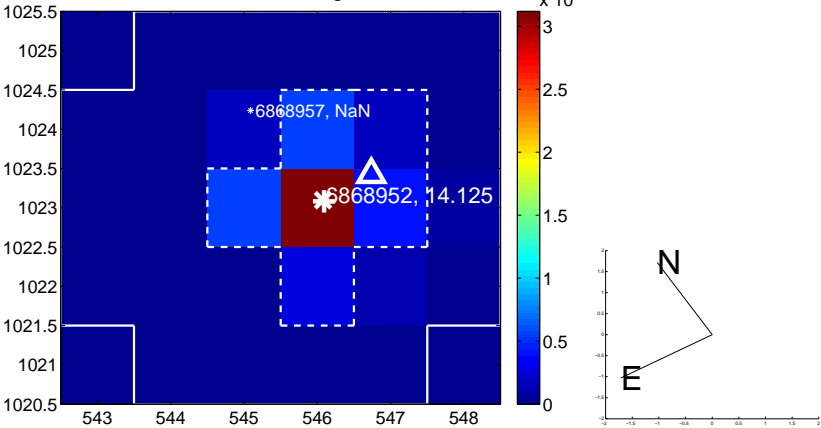
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



Q3 no difference image



Q3 no OOT image



Q4 no difference image



Q4 no OOT image



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

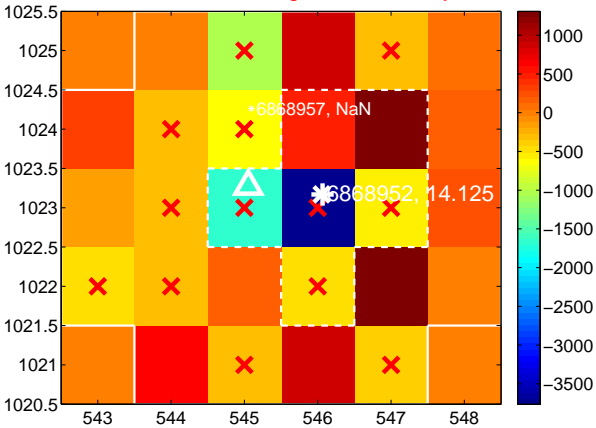
Q5 no difference image



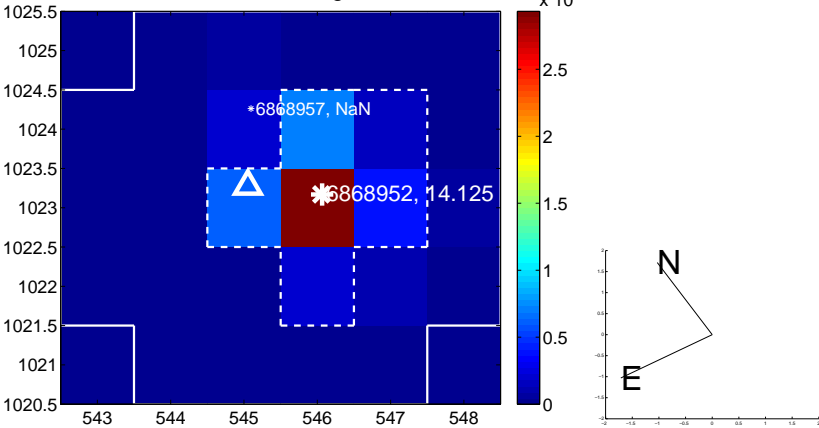
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



Q7 no difference image



Q7 no OOT image



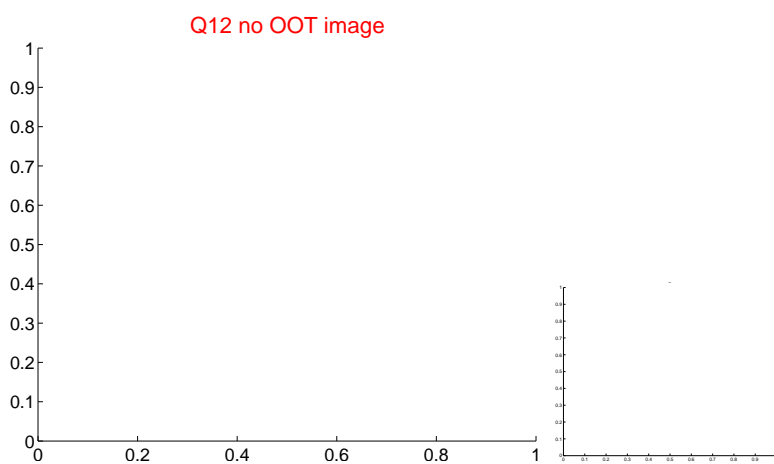
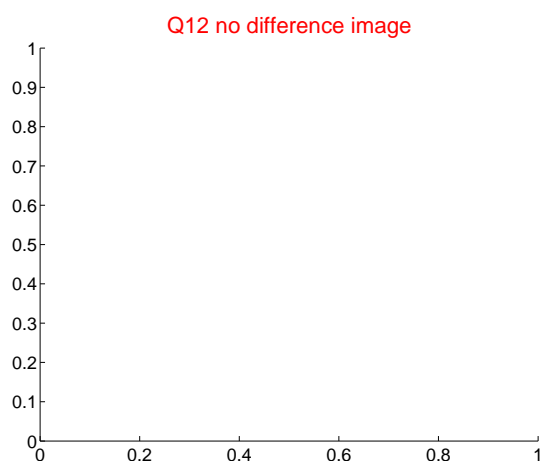
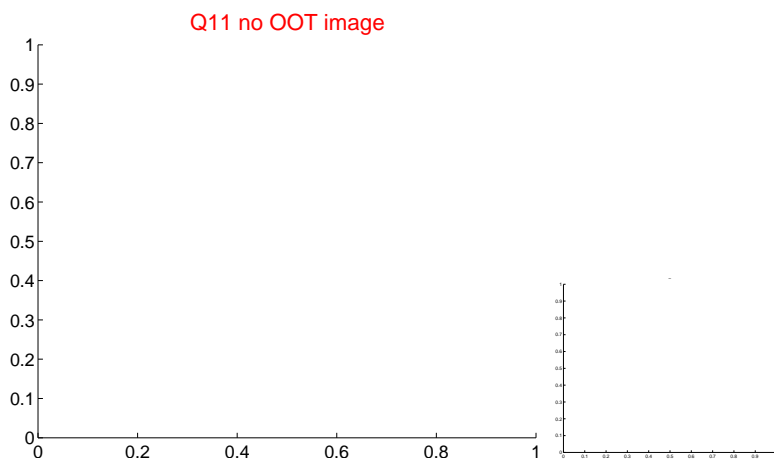
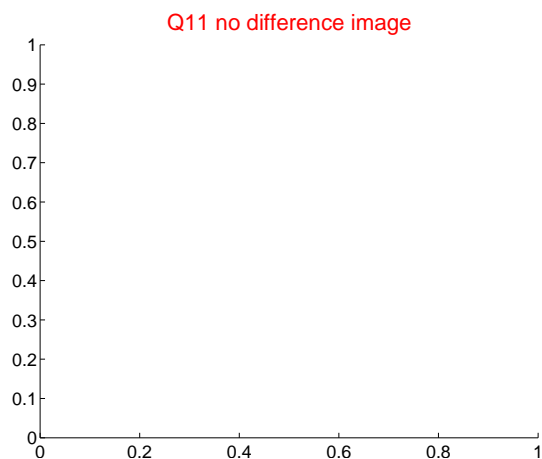
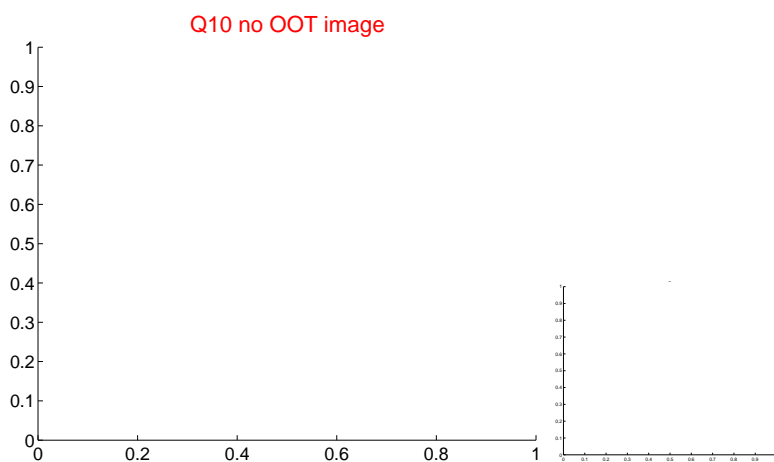
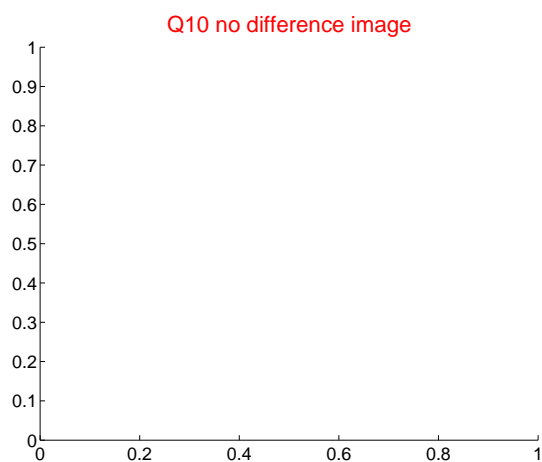
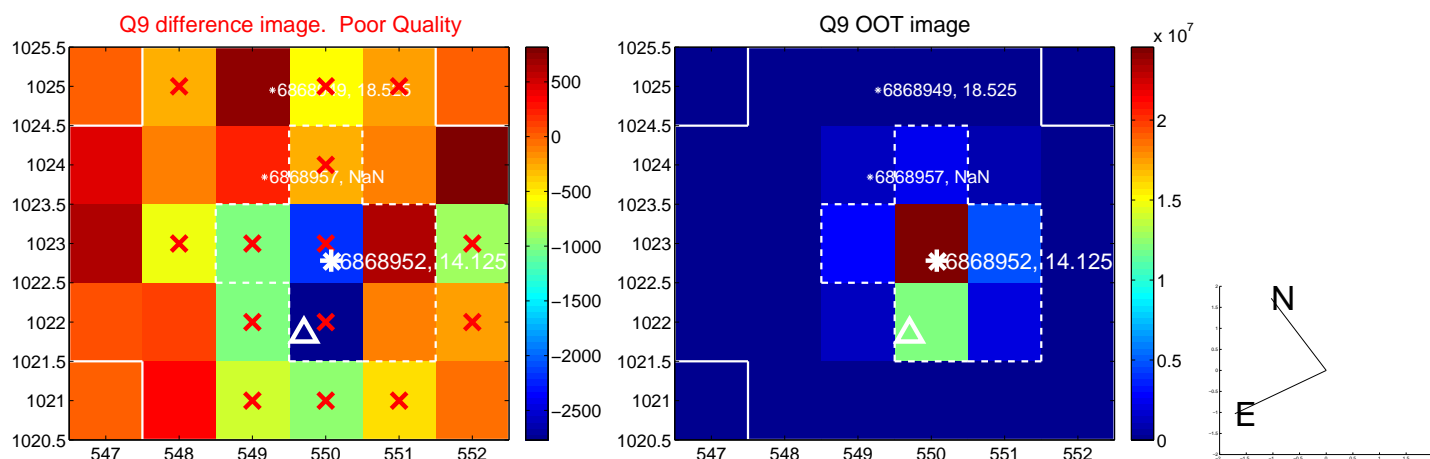
Q8 no difference image



Q8 no OOT image

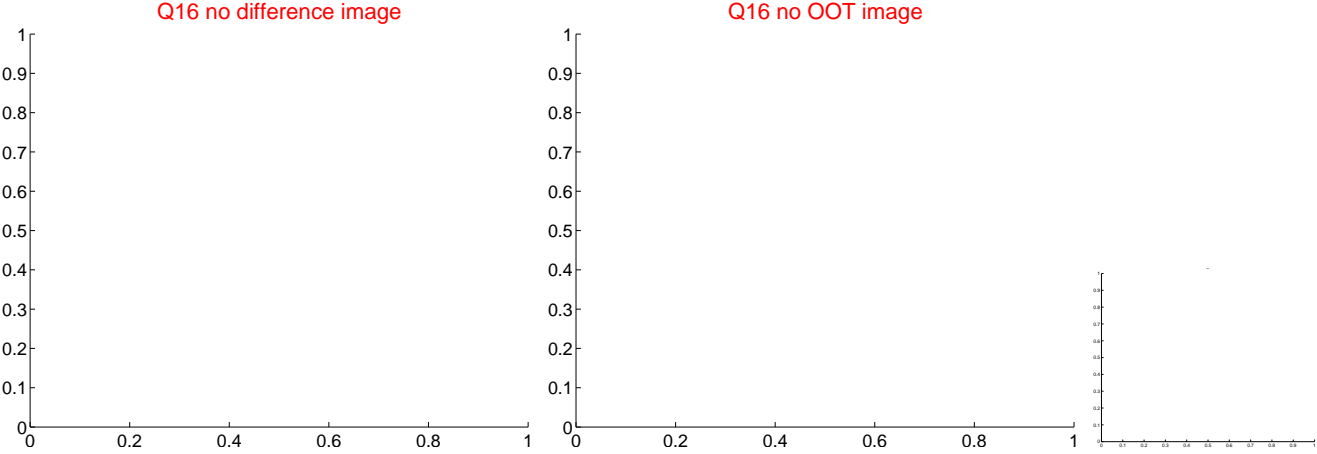
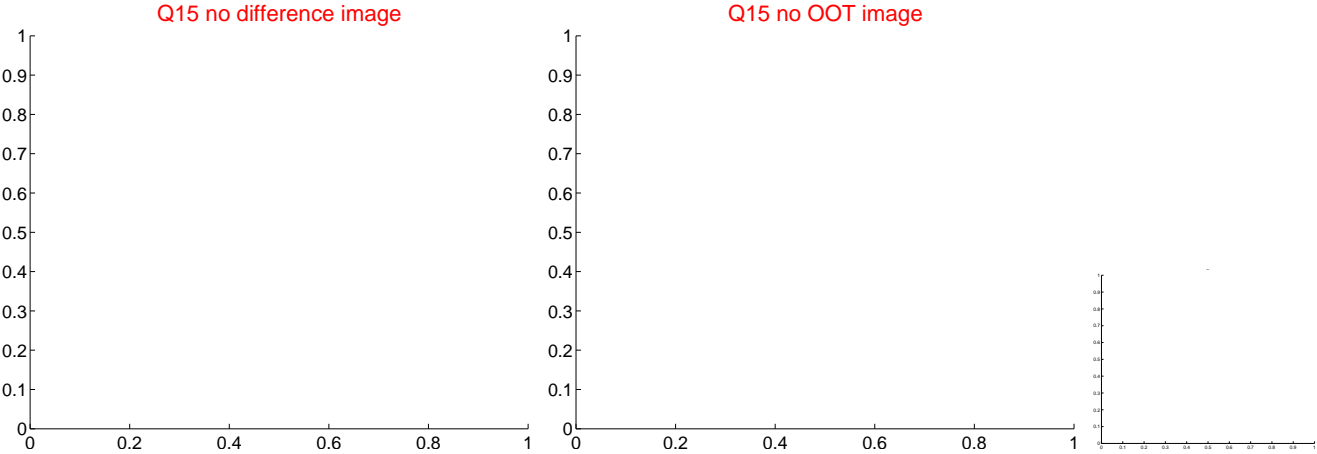
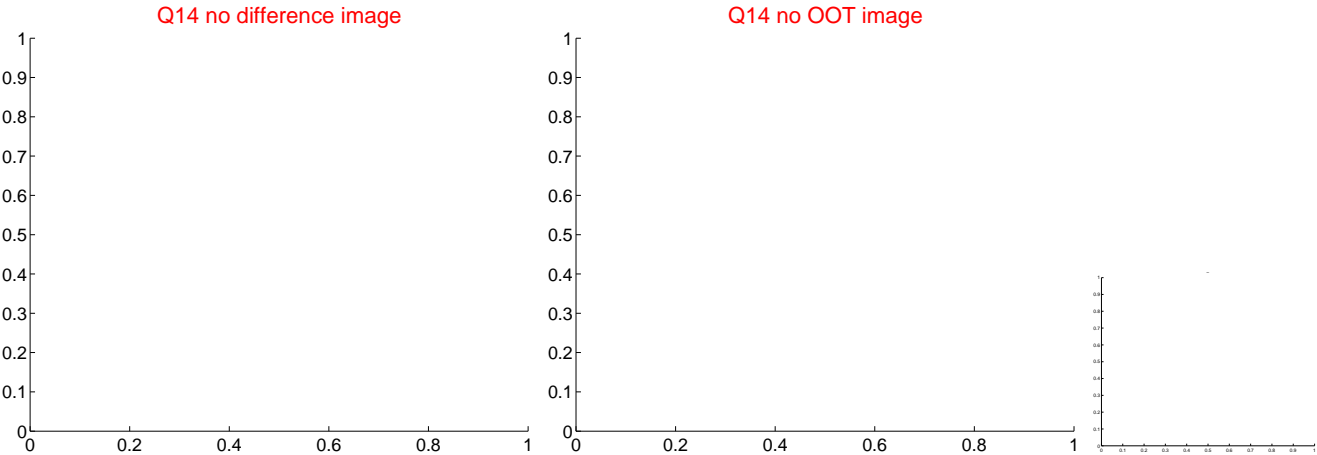
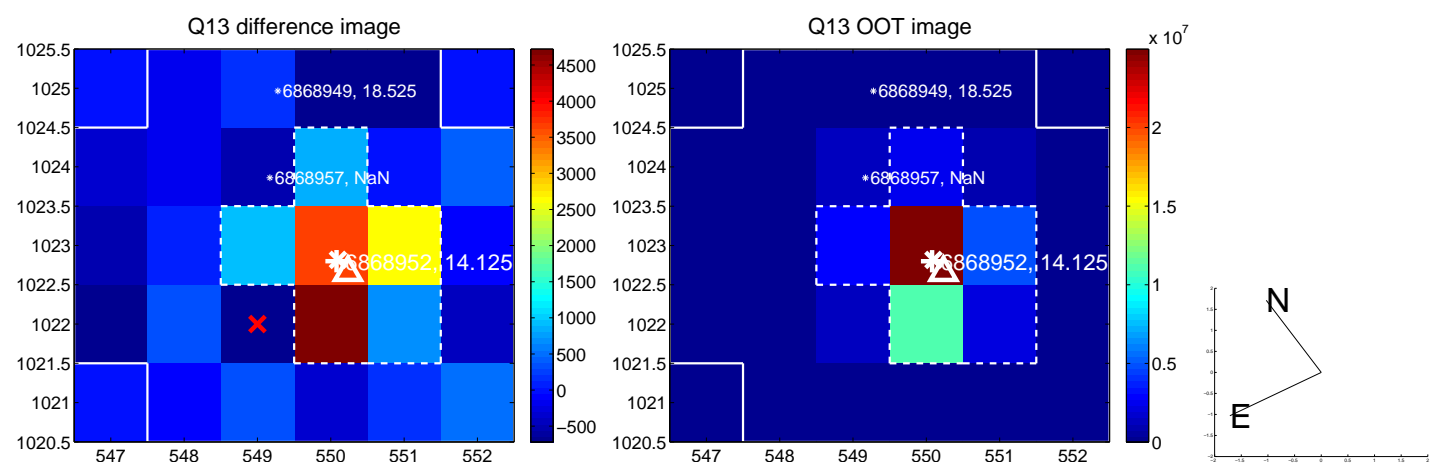


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

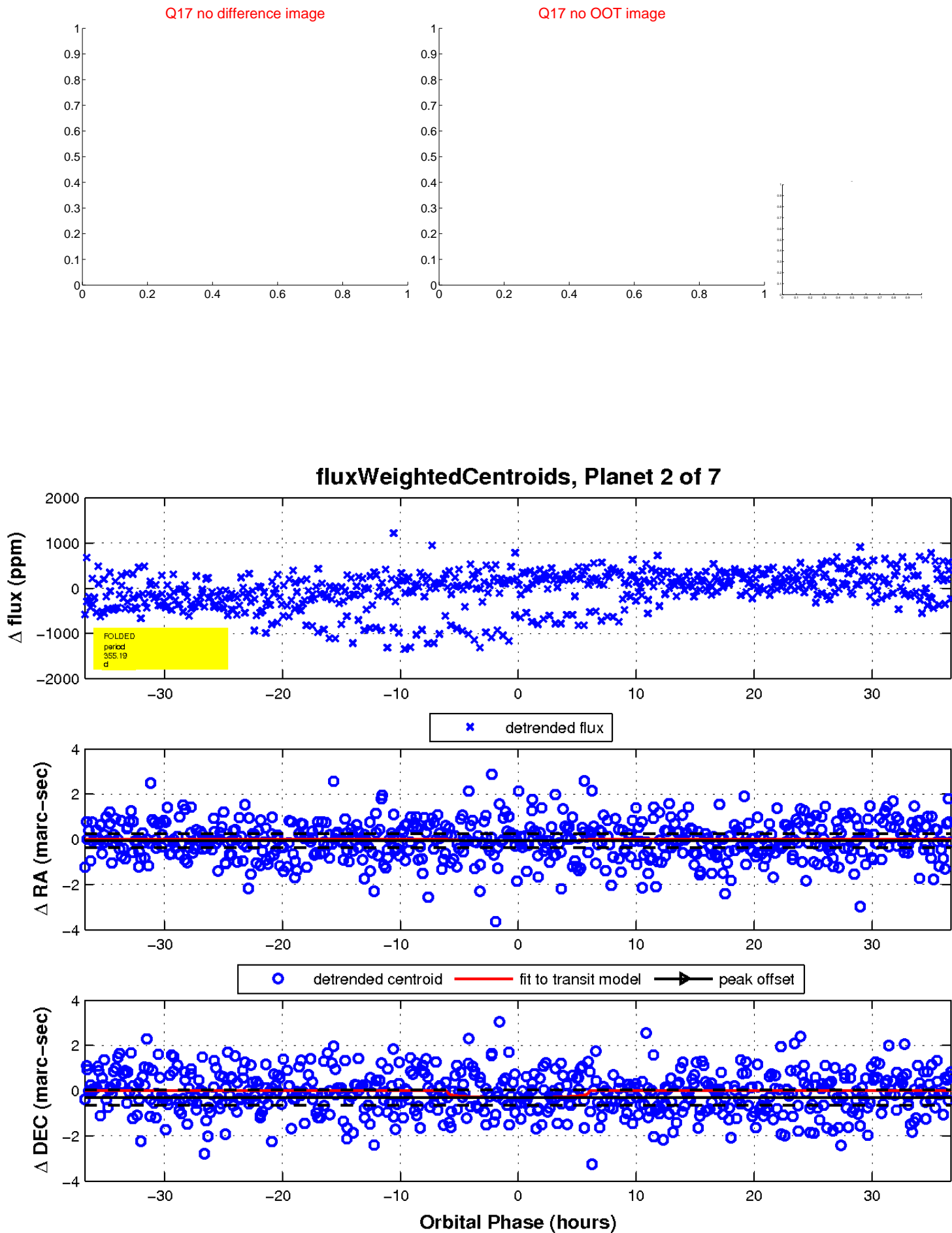




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

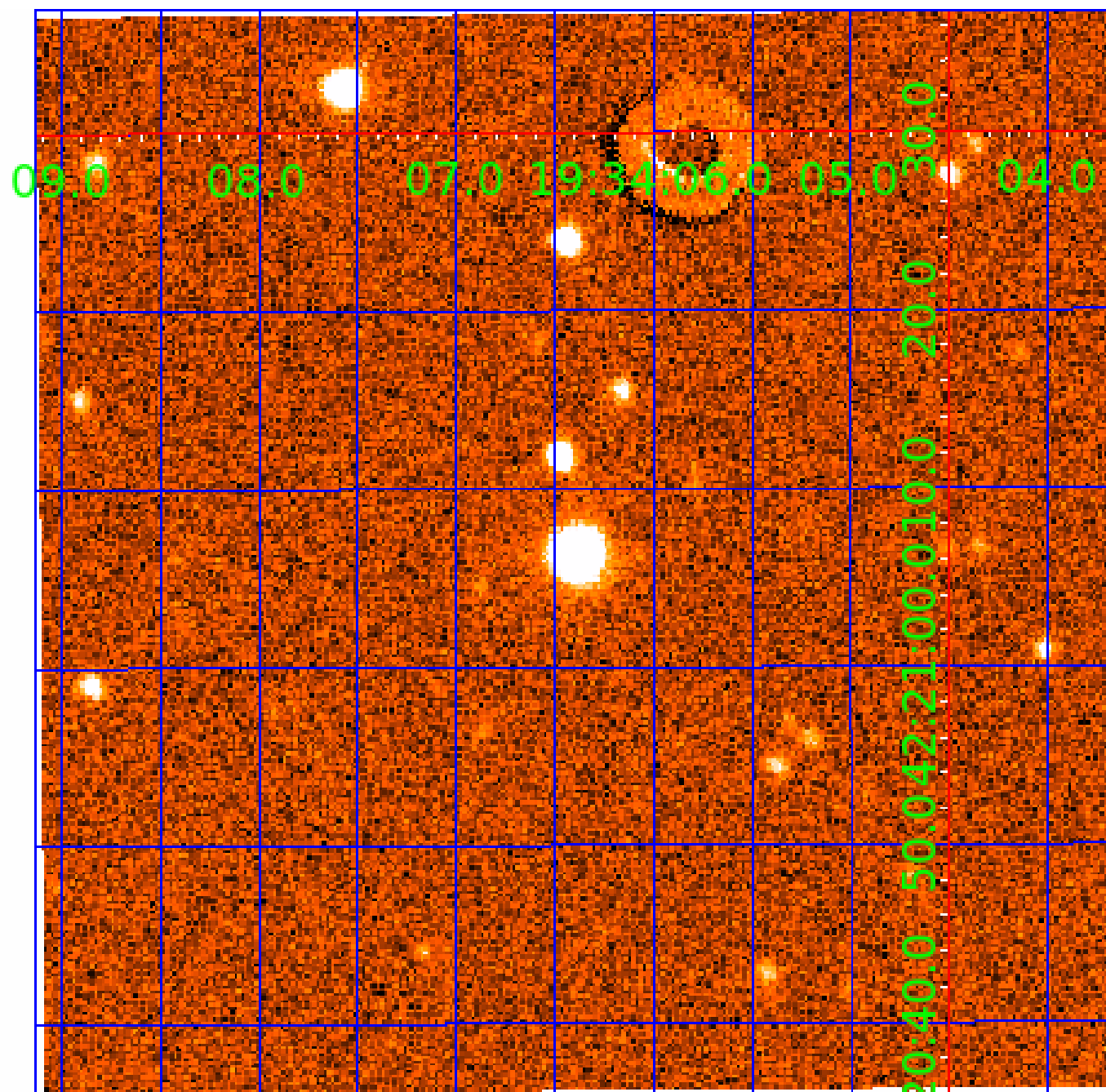


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006868952

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006868952-01	OBS	No	4.671481	132.975833	45.5	14.290	8.0	8.7	1.58	6028	1.26	834.26
006868952-02	OBS	No	355.190361	189.720331	490.3	12.265	16.6	7.4	1.58	6028	3.52	2.59
006868952-03	OBS	No	4.671515	134.874401	43.8	14.839	7.2	9.0	1.58	6028	1.11	834.25
006868952-04	OBS	No	106.236149	236.236835	1.4	12.707	23.3	0.0	1.58	6028	0.20	12.95
006868952-05	OBS	No	134.486632	164.758051	370.0	26.357	15.1	8.3	1.58	6028	3.84	9.46
006868952-06	OBS	No	36.190386	138.068538	210.5	15.178	7.2	7.3	1.58	6028	2.47	54.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006868952-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006868952-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006868952-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
006868952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT

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

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

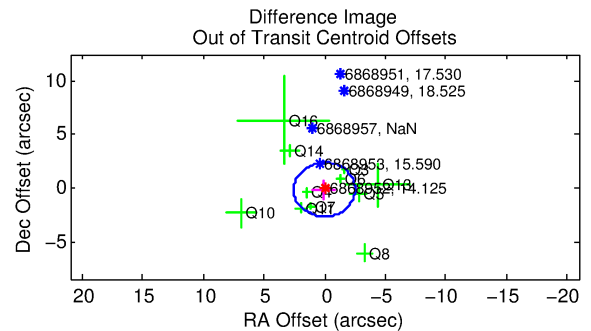
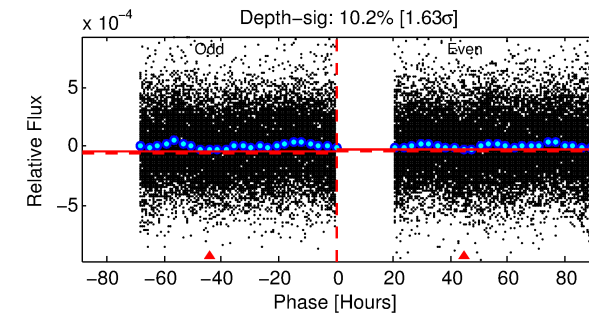
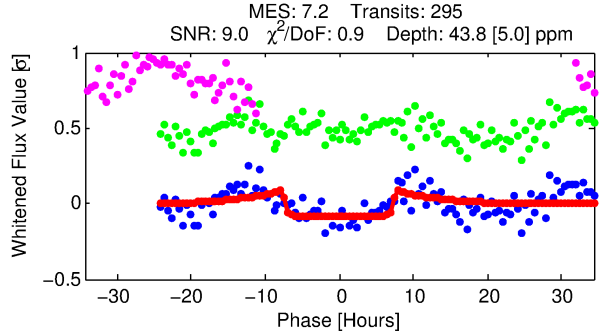
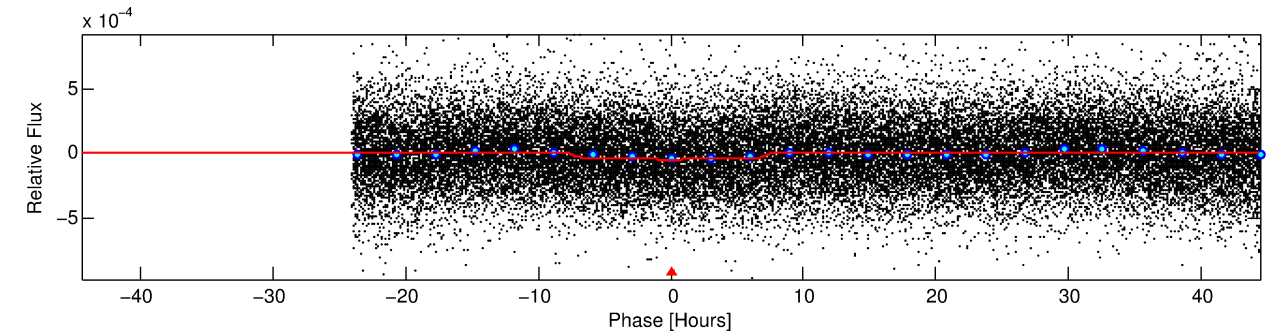
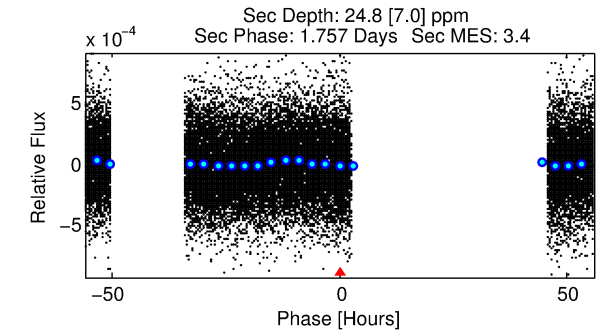
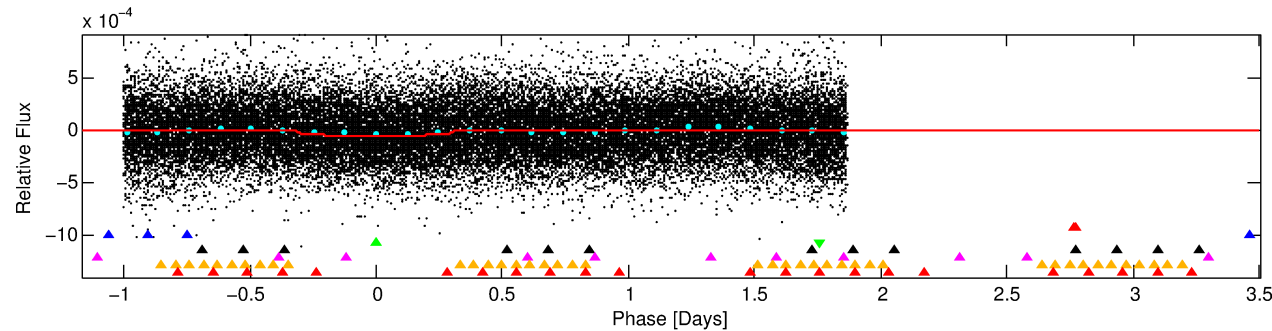
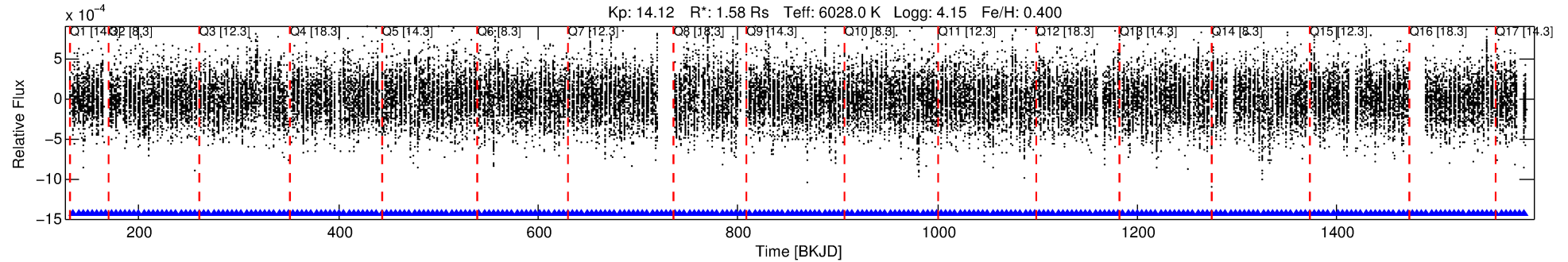
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006868952-03

No Significant Match Found

# DV One-Page Summary

KIC: 6868952 Candidate: 3 of 7 Period: 4.672 d



## DV Fit Results:

Period = 4.67152 [0.00007] d  
Epoch = 134.8744 [0.0099] BKJD  
Rp/R\* = 0.0064 [0.0023]  
a/R\* = 1.95 [2.32]  
b = 0.68 [1.27]  
Seff = 834.25 [240.86]  
Teq = 1370 [99] K  
Rp = 1.11 [0.46] Re  
a = 0.0596 [0.0112] AU  
Ag = 39.09 [32.04] [1.19σ]  
Teffp = 5298 [1021] K [3.83σ]

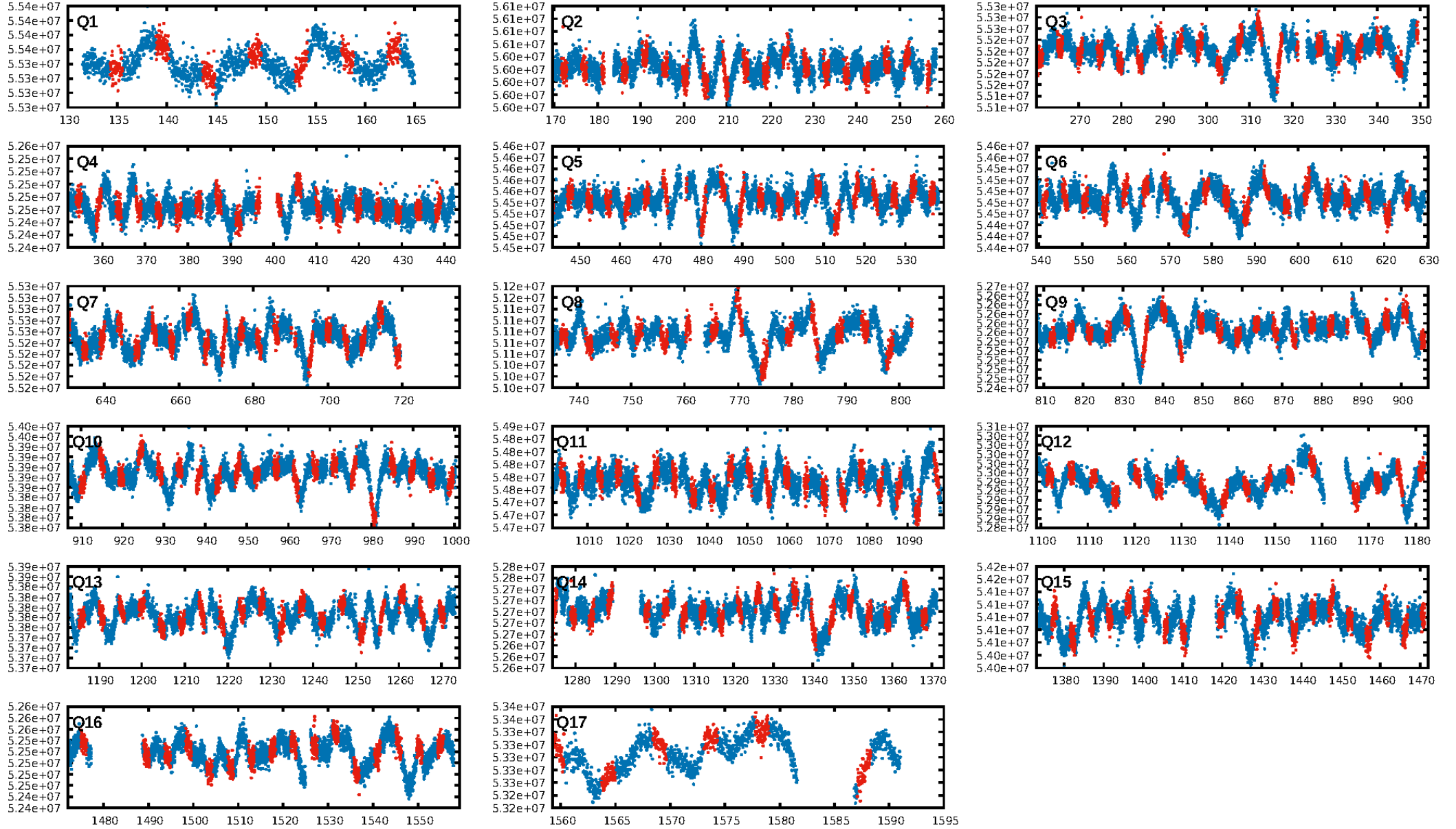
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 100.0% [35.64σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.97e-11  
RollingBand-fgt: 1.00 [282/282]  
GhostDiagnostic-chr: 1.397  
Centroid-sig: 28.4%  
Centroid-so: 0.847 arcsec [1.14σ]  
OotOffset-rm: 0.147 arcsec [0.17σ]  
KicOffset-rm: 0.186 arcsec [0.21σ]  
OotOffset-st: 3/3/3/2 [11]  
KicOffset-st: 3/3/3/2 [11]  
DiffImageQuality-fgm: 0.27 [3/11]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:59:11 Z

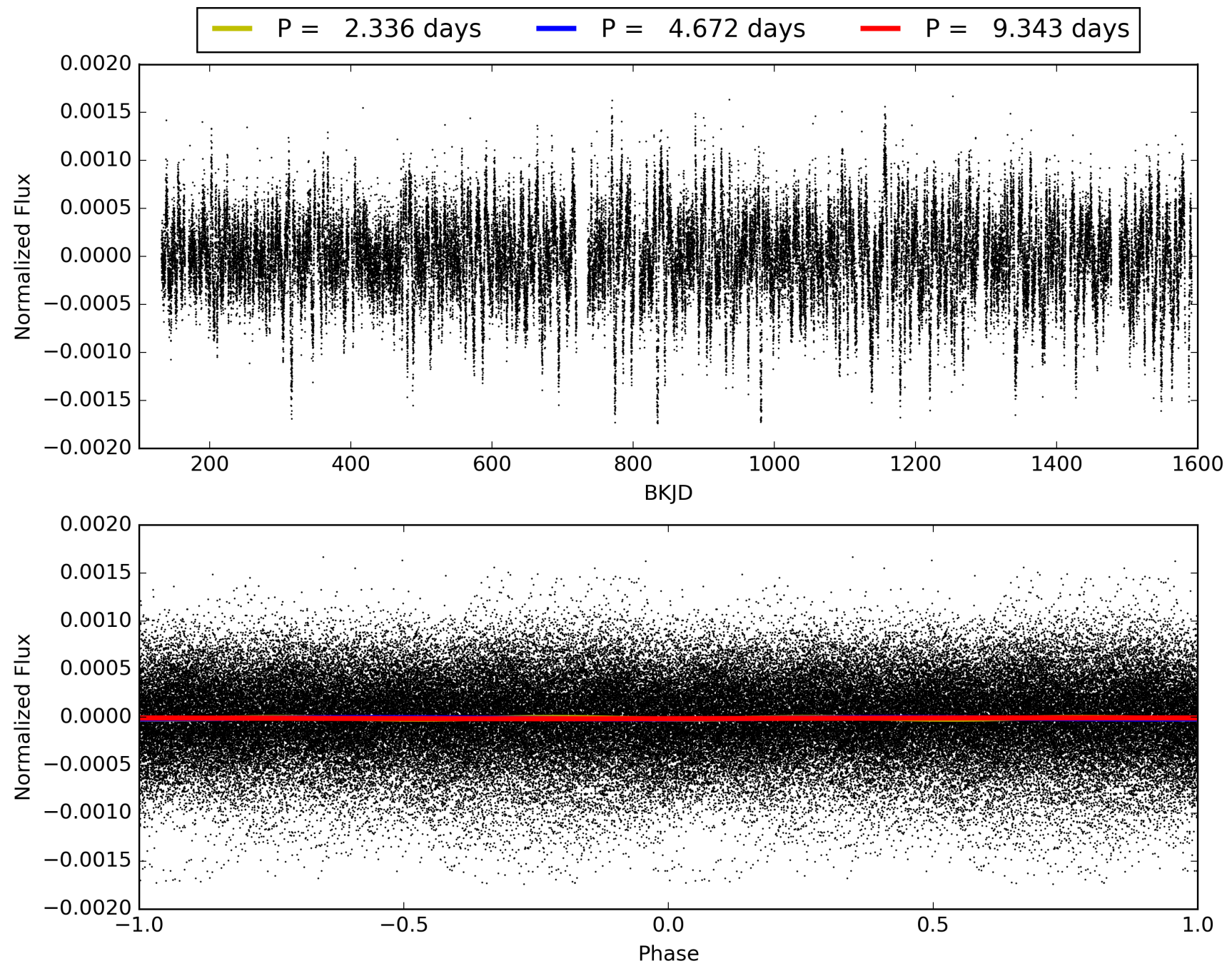
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006868952-03, PDC Light Curves



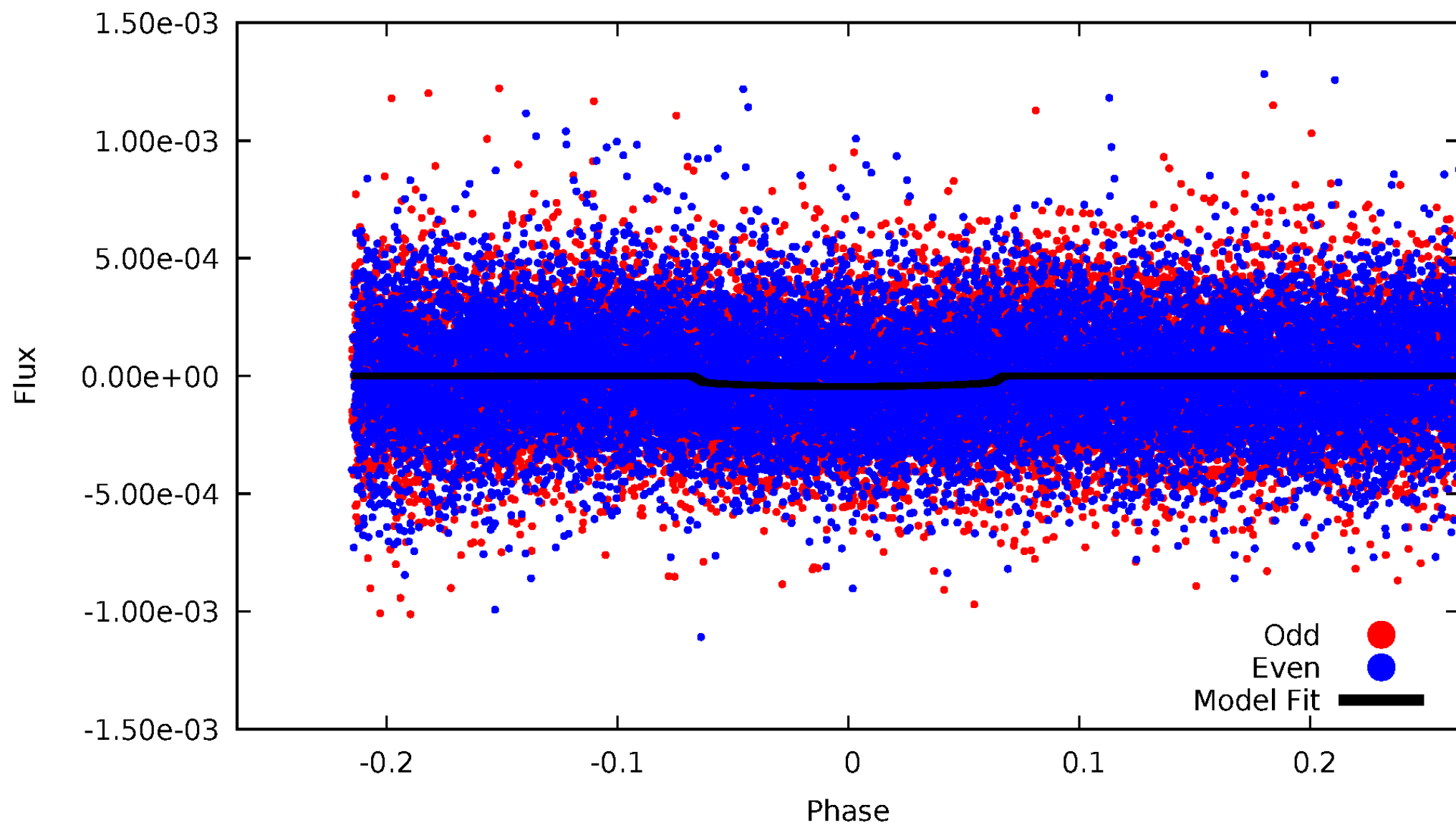


TCE 006868952-03



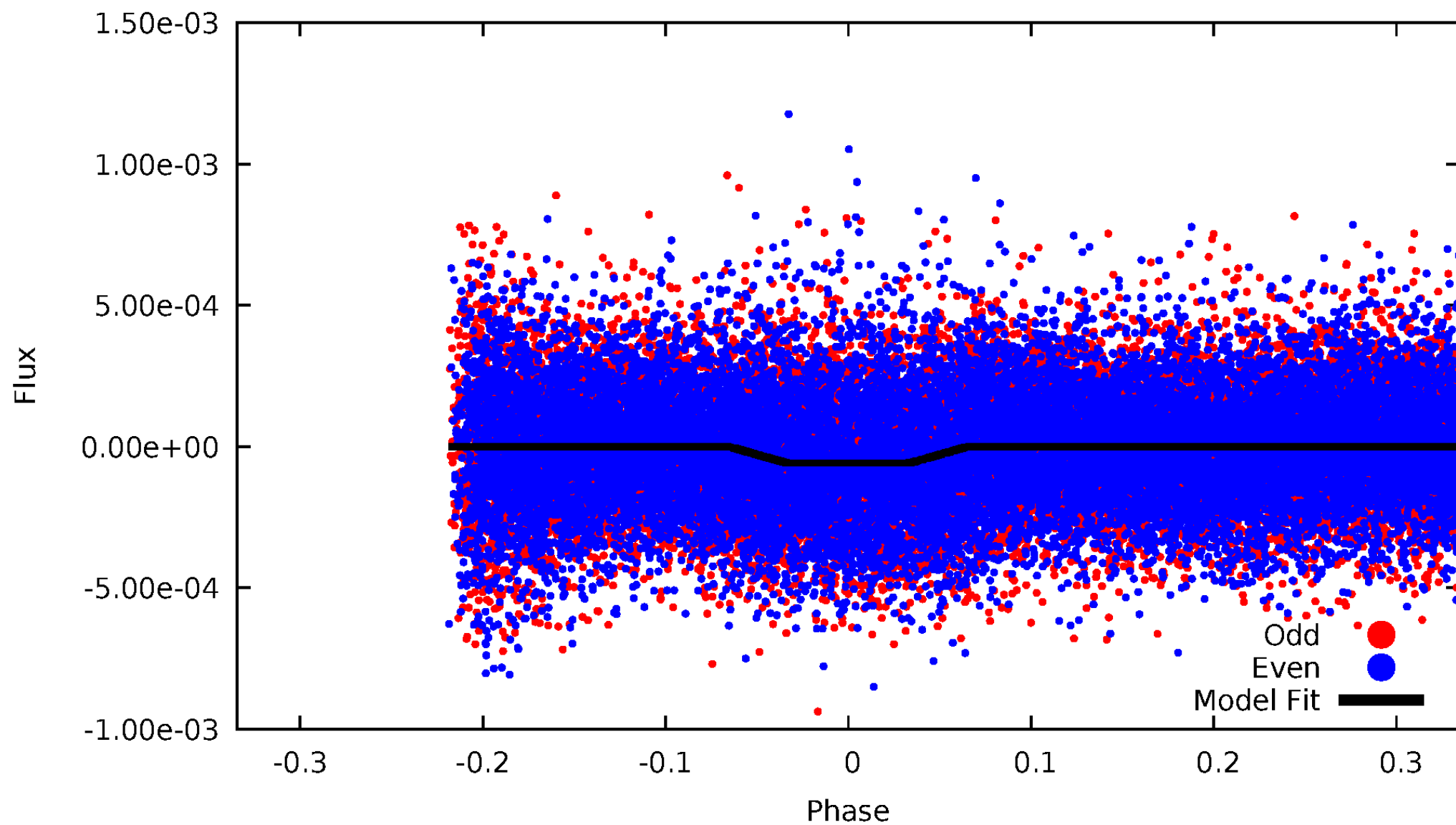
# DV Odd/Even

TCE 006868952-03



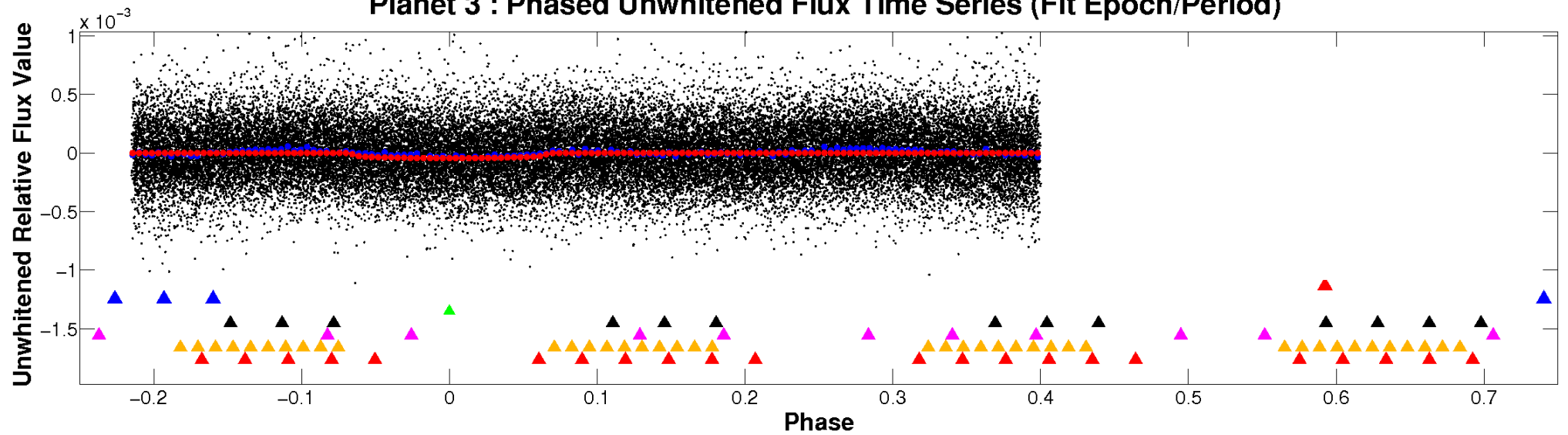
# ALT Odd/Even

TCE 006868952-03

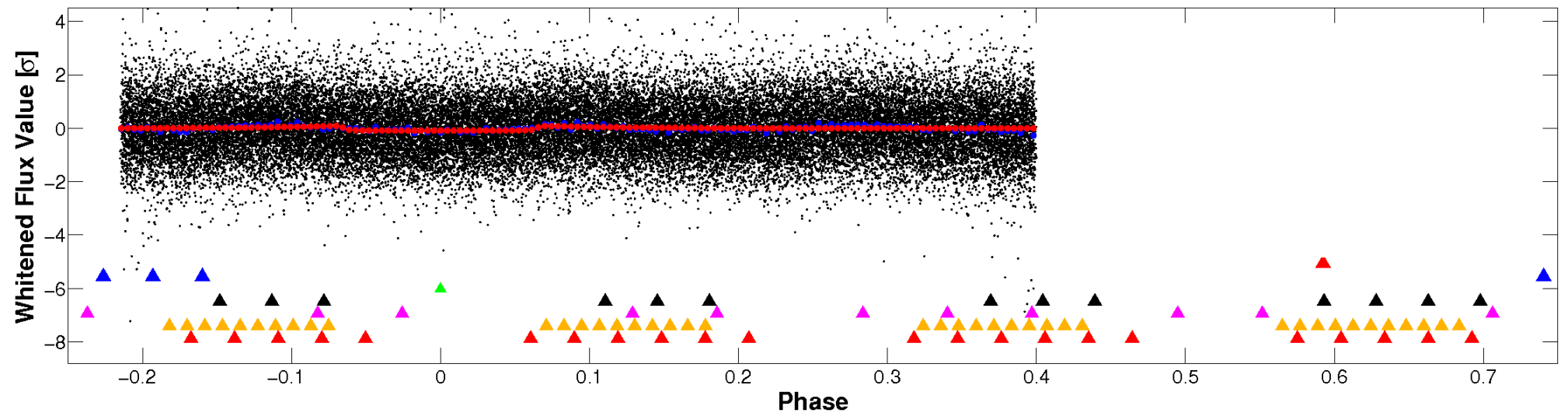


# Non-Whitened Vs. Whitened Light Curve

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



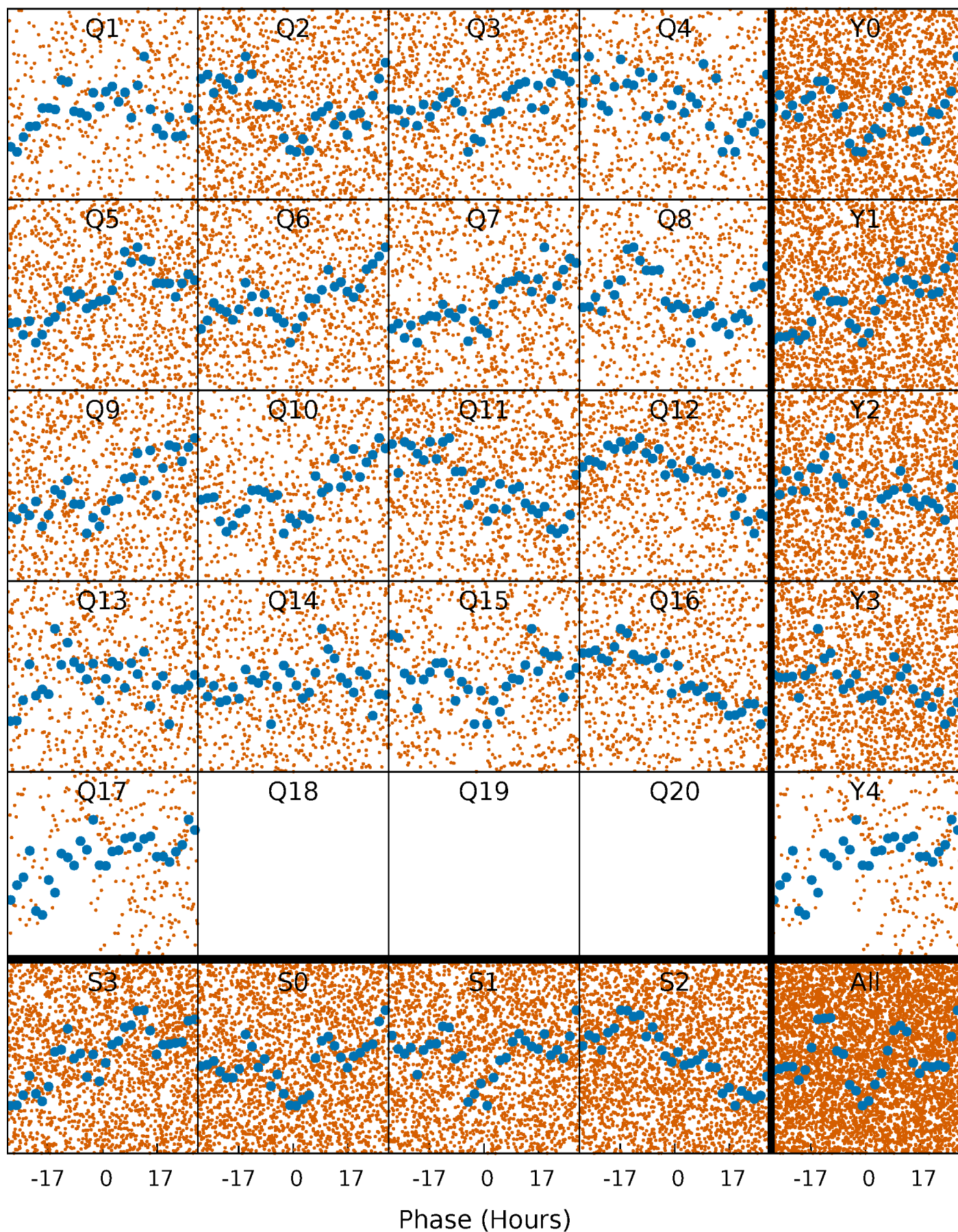
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





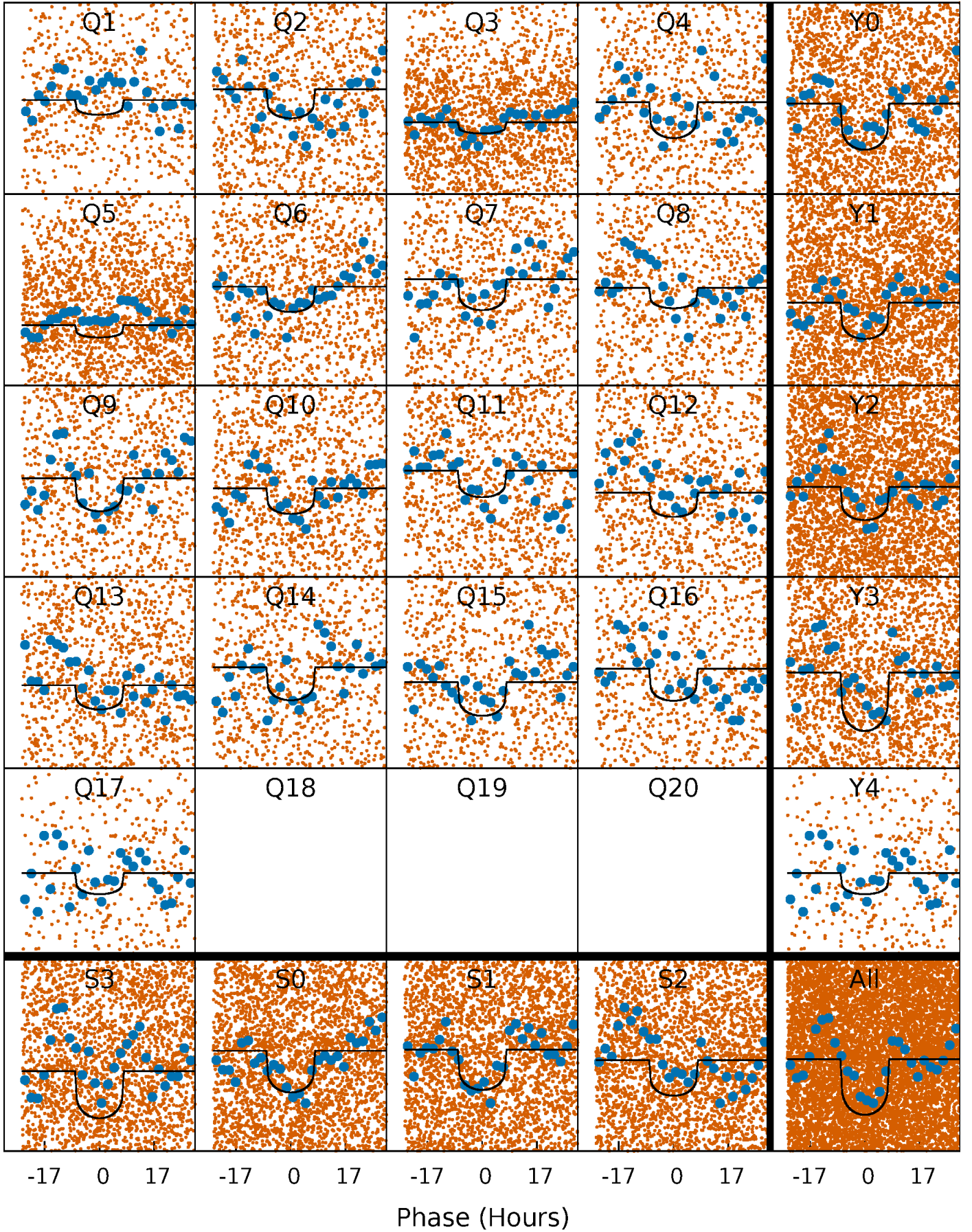
# PDC Quarter-Phased Transit Curves

TCE 006868952-03 P= 4.671515 Days  $T_0=134.874401$  (BKJD)



# DV Quarter-Phased Transit Curves

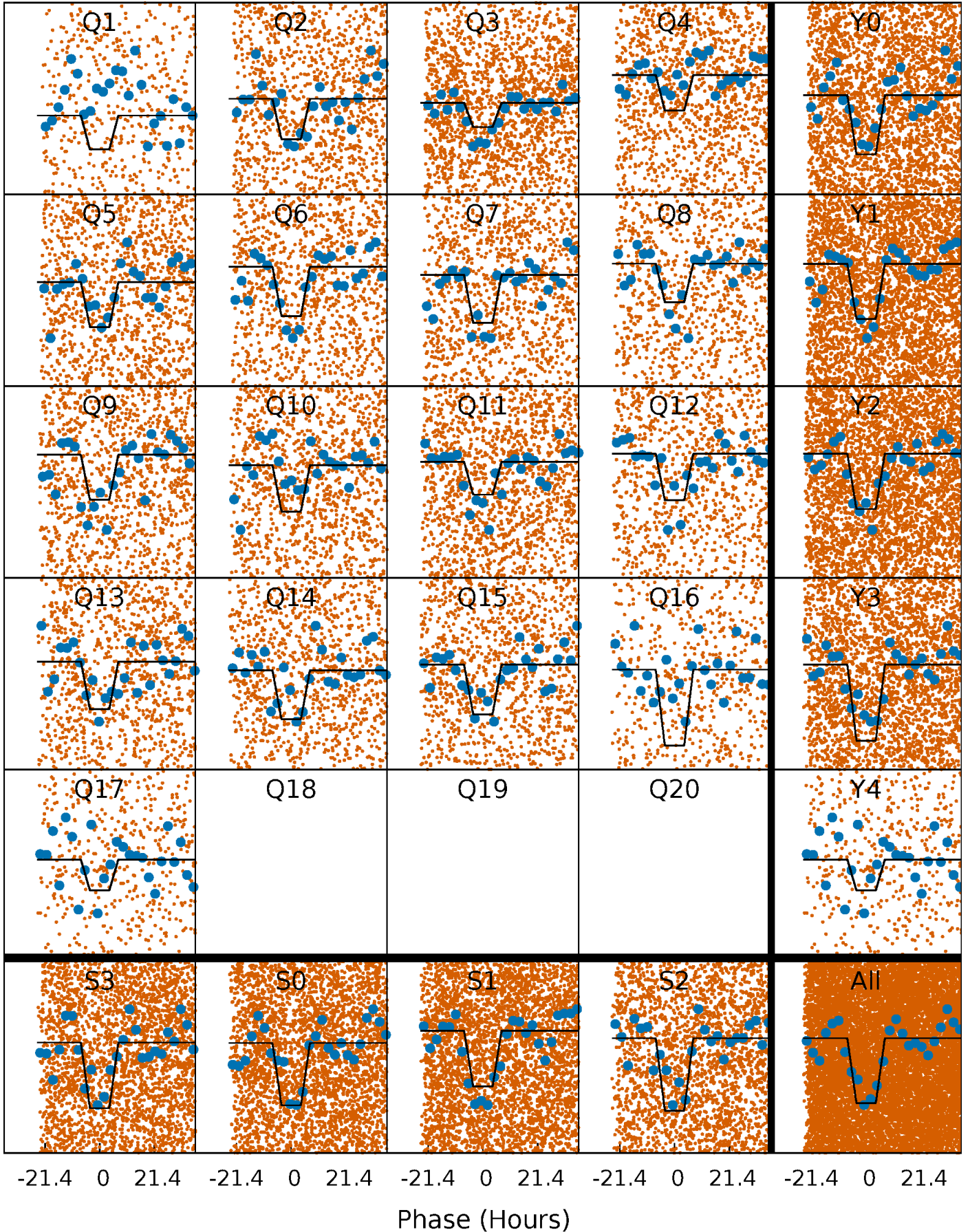
TCE 006868952-03   P= 4.671515 Days    $T_0=134.874401$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

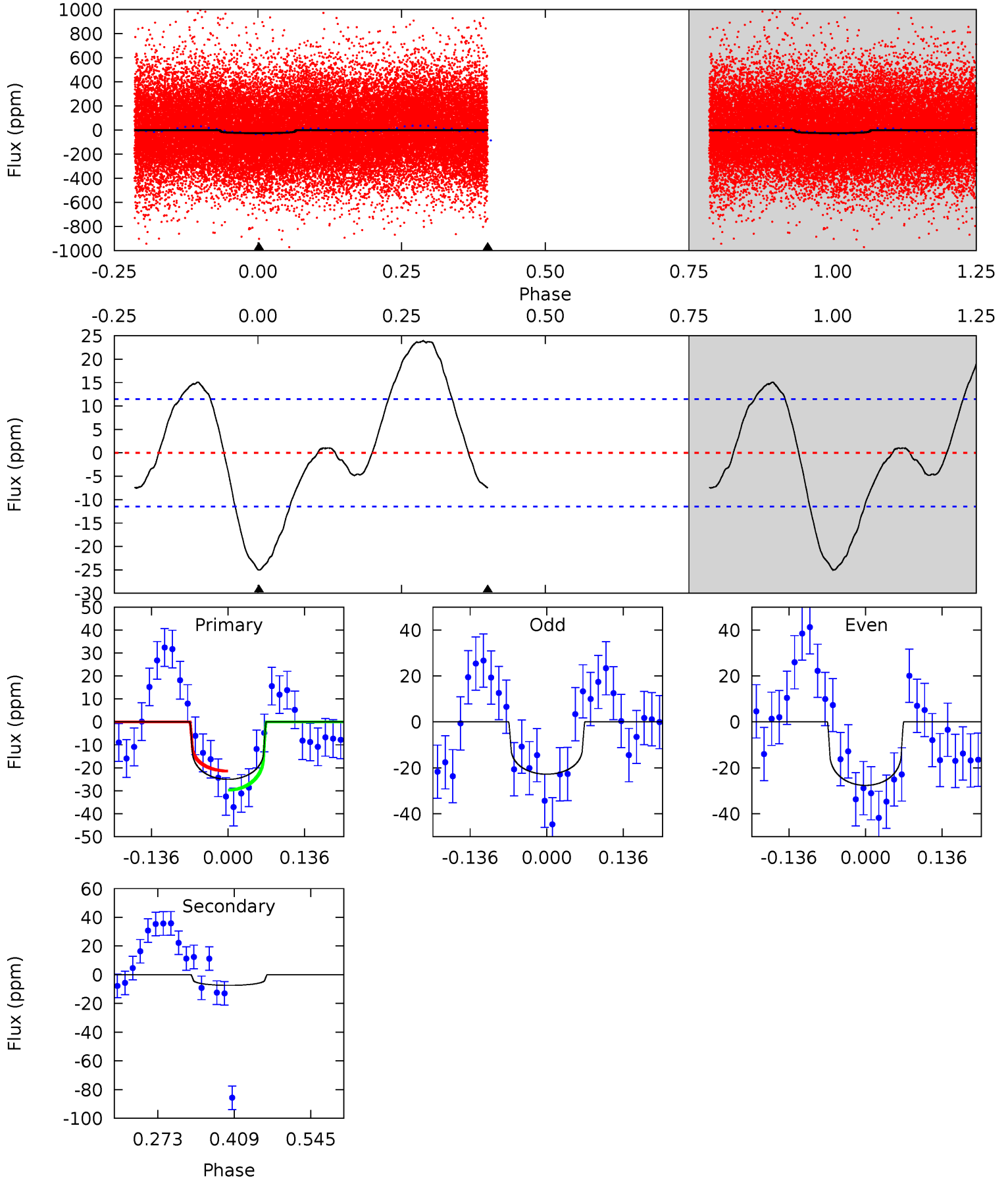
TCE 006868952-03   P= 4.671771 Days    $T_0=134.812200$  (BKJD)



# DV Model-Shift Uniqueness Test

006868952-03, P = 4.671515 Days, E = 130.202886 Days

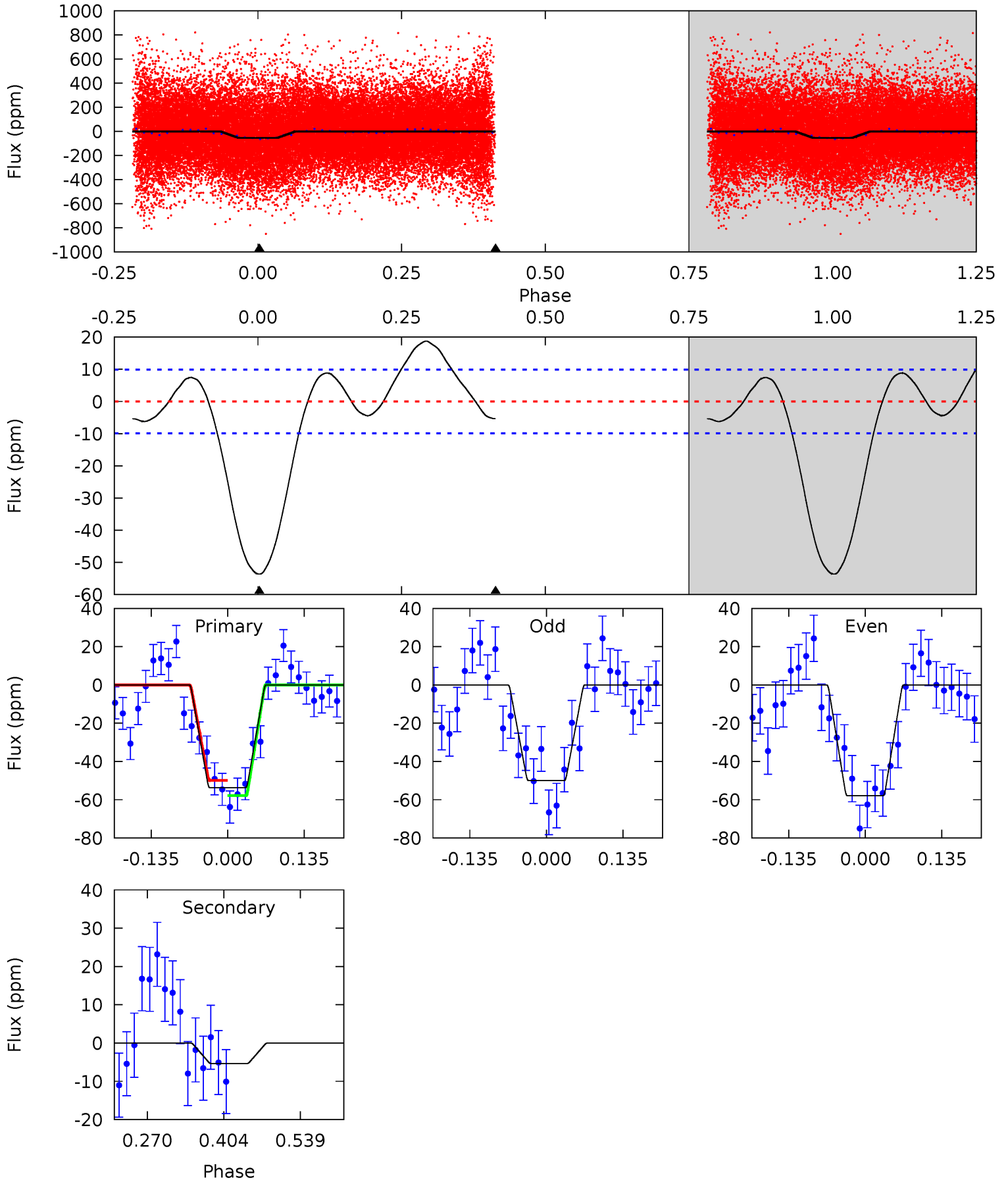
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.81	2.90	0	0	4.50	1.49	3.29	9.81	9.81	2.90	2.90	0.95	1.22	0.49	1.63



# Alt Model-Shift Uniqueness Test

006868952-03, P = 4.671771 Days, E = 130.140429 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.4	2.44	0	0	4.50	1.50	2.89	24.4	24.4	2.44	2.44	1.80	0.88	0.26	1.81



### Stellar Parameters For KIC 006868952

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6028^{+81}_{-81}$	$4.151^{+0.160}_{-0.116}$	$0.400^{+0.100}_{-0.150}$	$1.583^{+0.275}_{-0.337}$	$1.296^{+0.101}_{-0.111}$	$0.460^{+0.387}_{-0.152}$
	+1%/-1%	+4%/-3%	+25%/-37%	+17%/-21%	+8%/-9%	+84%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 006868952-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-7 \pm 3$	$1.10^{+0.46}_{-0.40}$	$1912^{+89}_{-110}$	$4127^{+849}_{-508}$	$11^{+18}_{-6}$
Alt.	$-5 \pm 2$	$1.30^{+0.41}_{-0.41}$	$1915^{+91}_{-102}$	$3684^{+612}_{-416}$	$5.994^{+8.230}_{-3.113}$

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

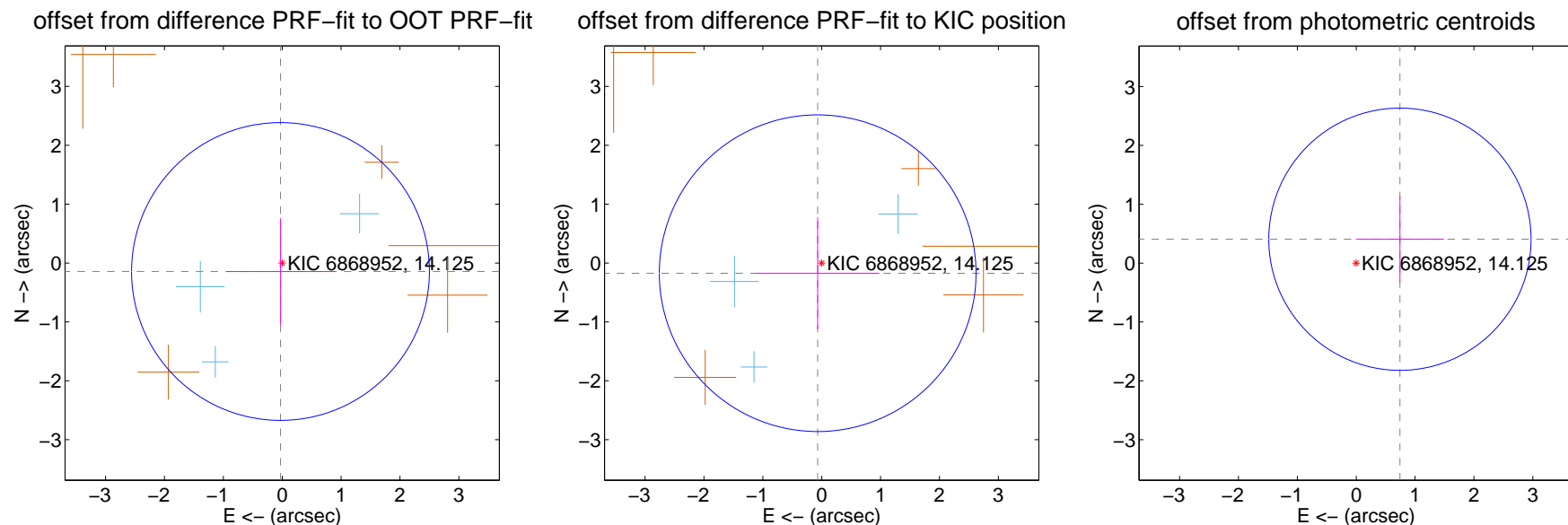
## DV Centroid Data

Supplemental centroid analysis for 006868952-03. Kepler magnitude: 14.12. Transit SNR 9.03

There are 3 quarters with good PRF difference image offsets

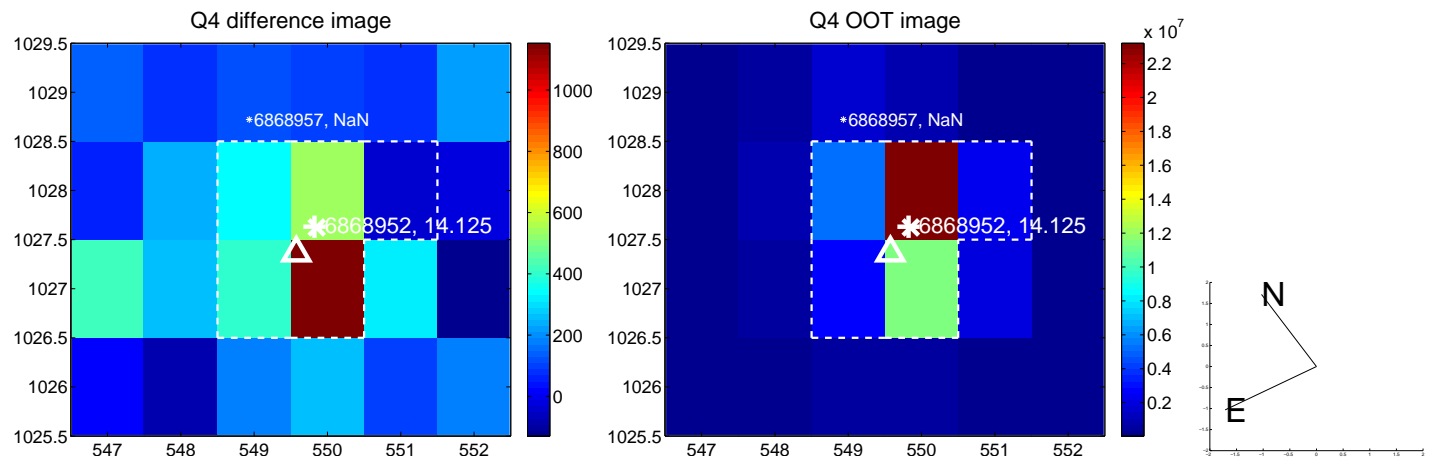
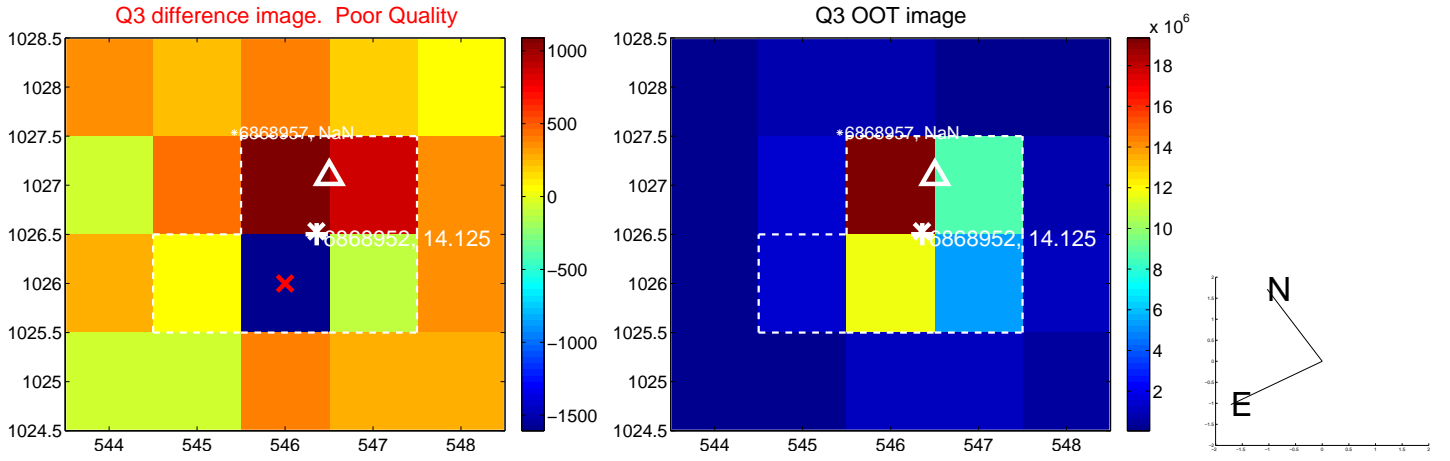
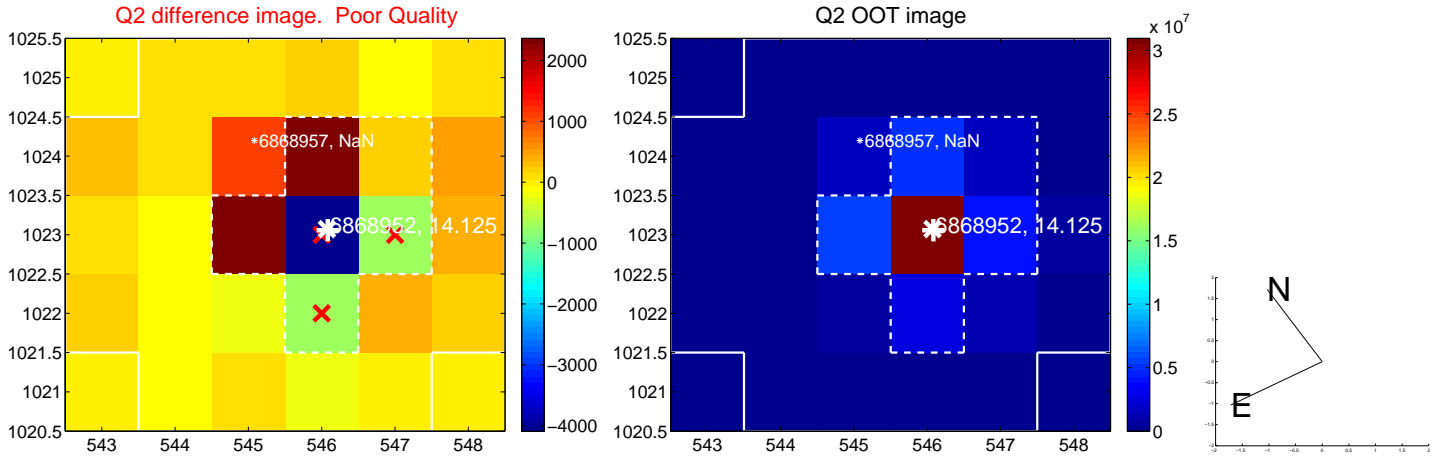
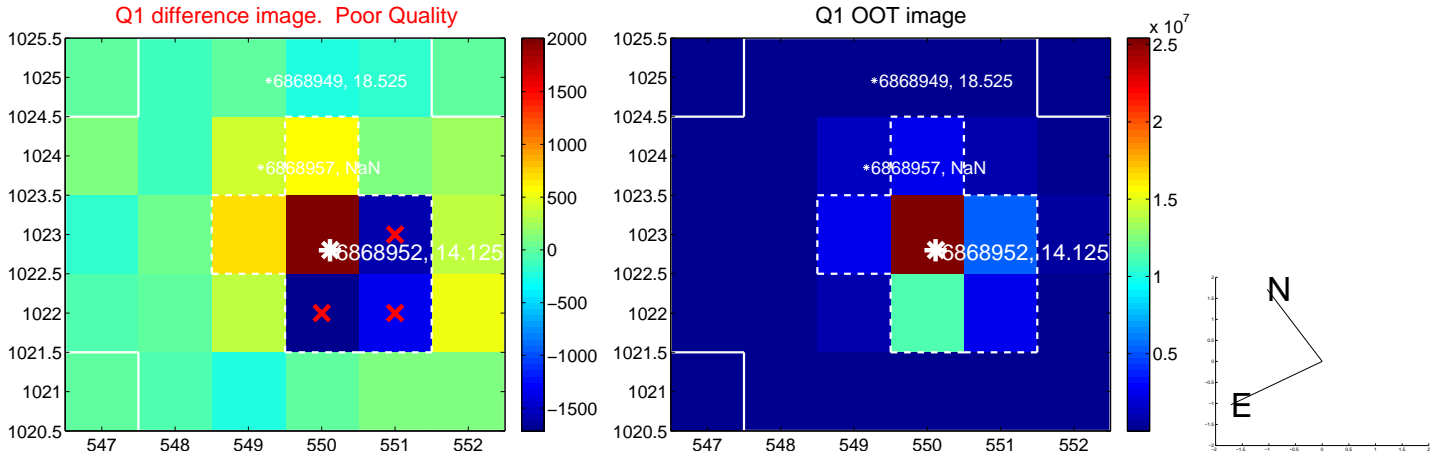
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.147 \pm 0.843$	0.17	$0.030 \pm 0.923$	$-0.144 \pm 0.904$
PRF-fit source offset from KIC position	$0.186 \pm 0.897$	0.21	$0.069 \pm 1.048$	$-0.173 \pm 0.951$
photometric centroid source offset	$0.85 \pm 0.74$	1.14	$-0.74 \pm 0.75$	$0.41 \pm 0.73$



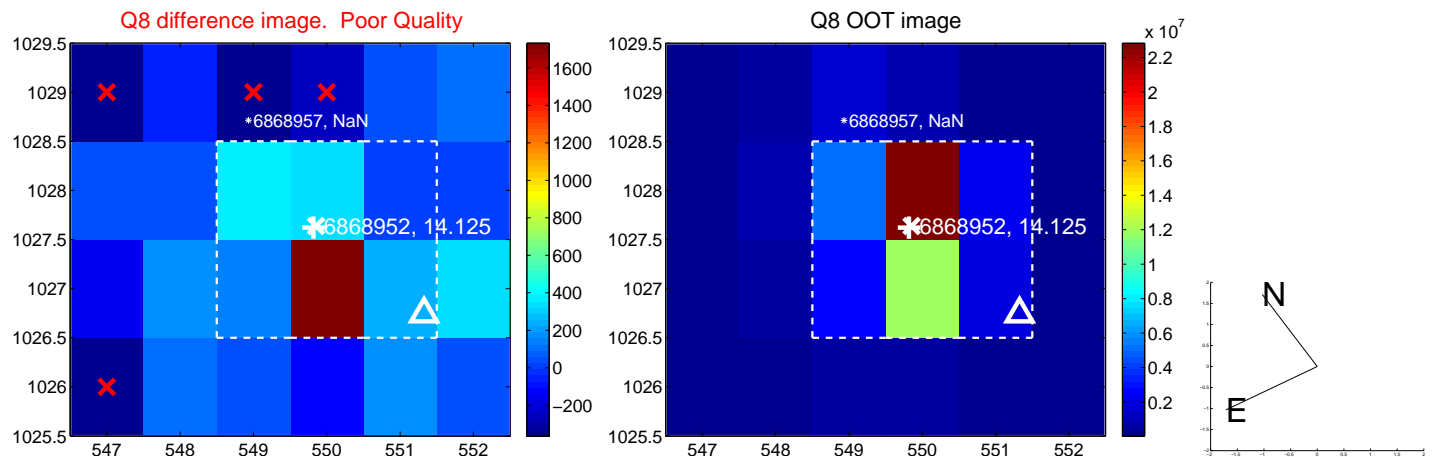
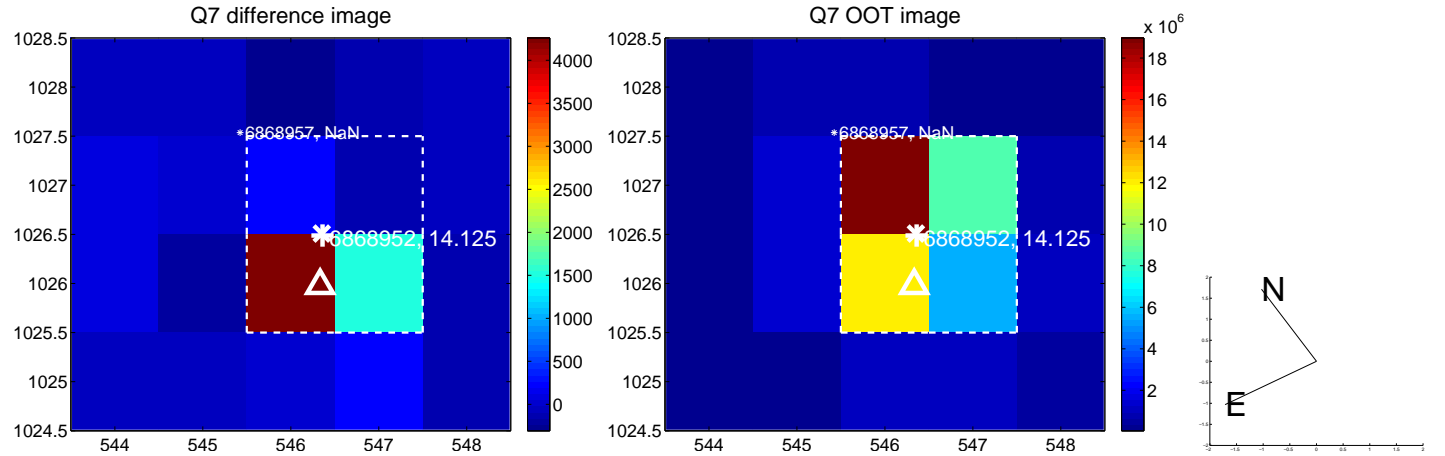
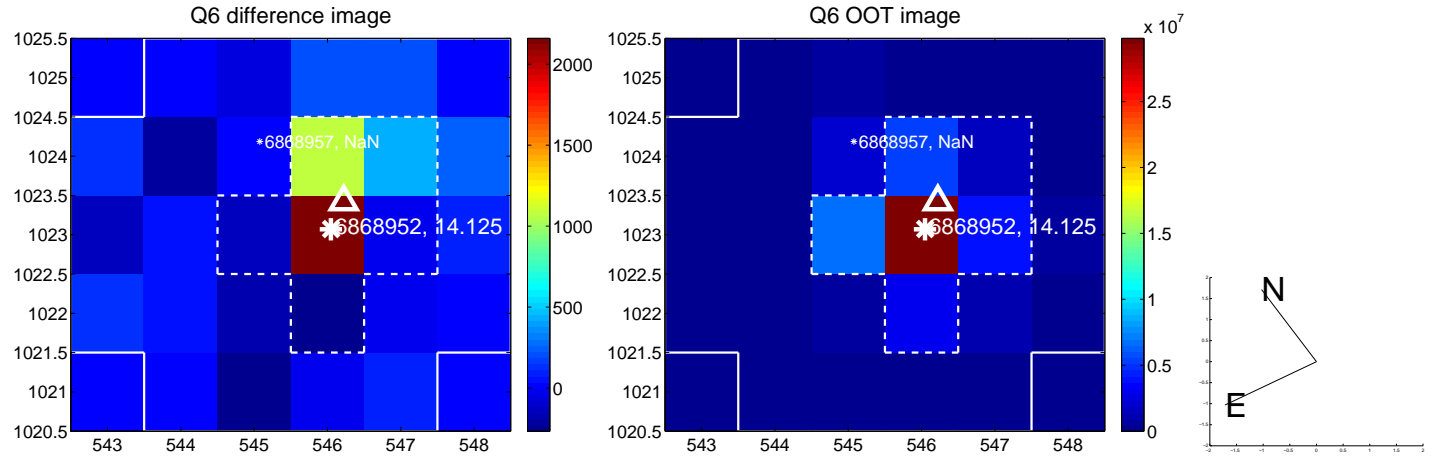
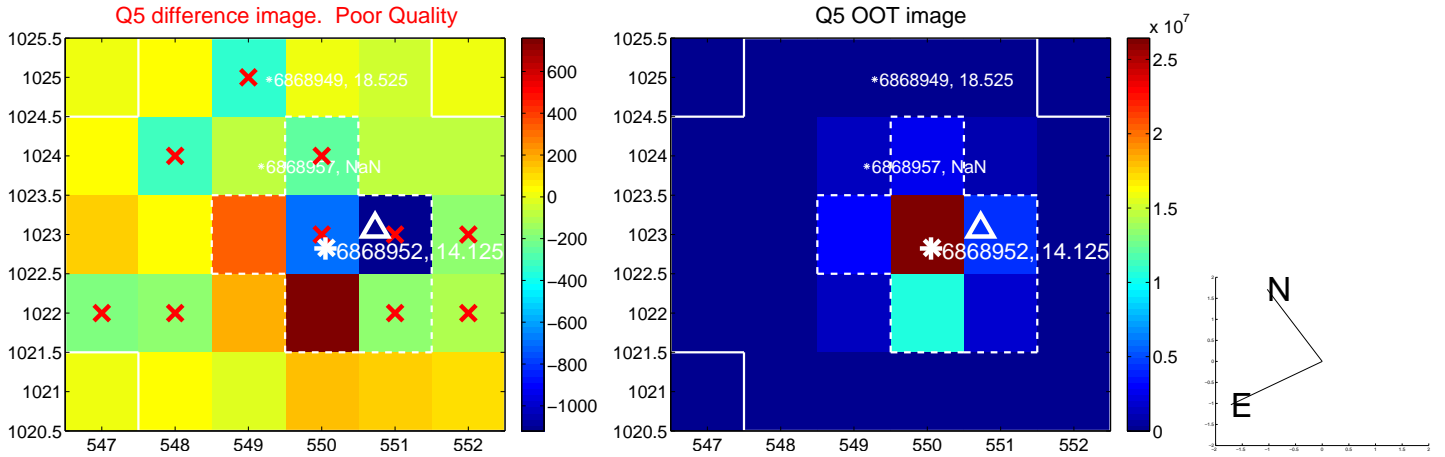
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

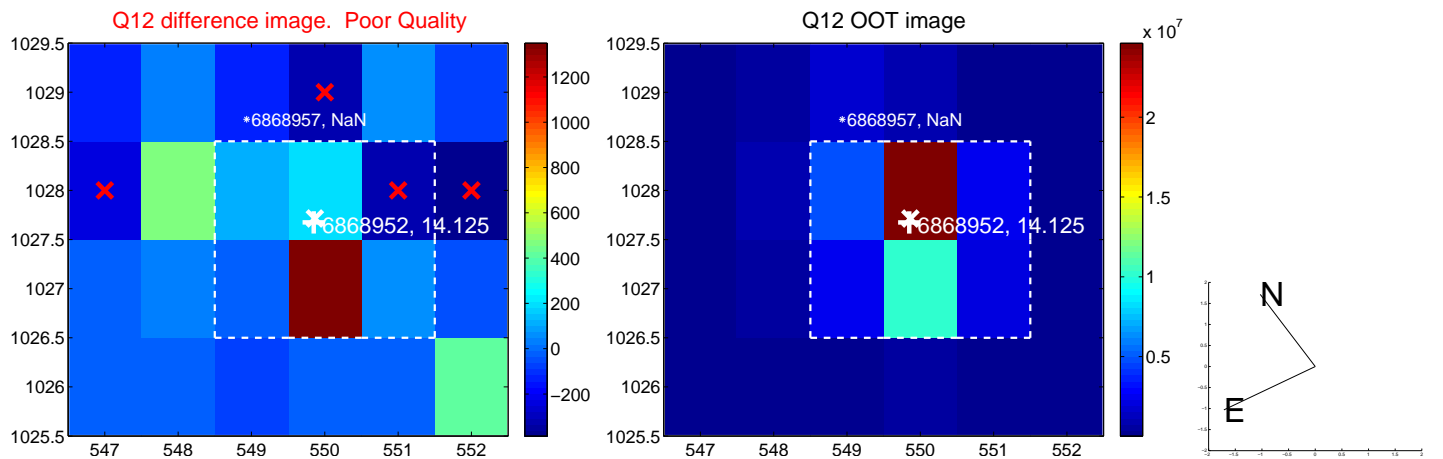
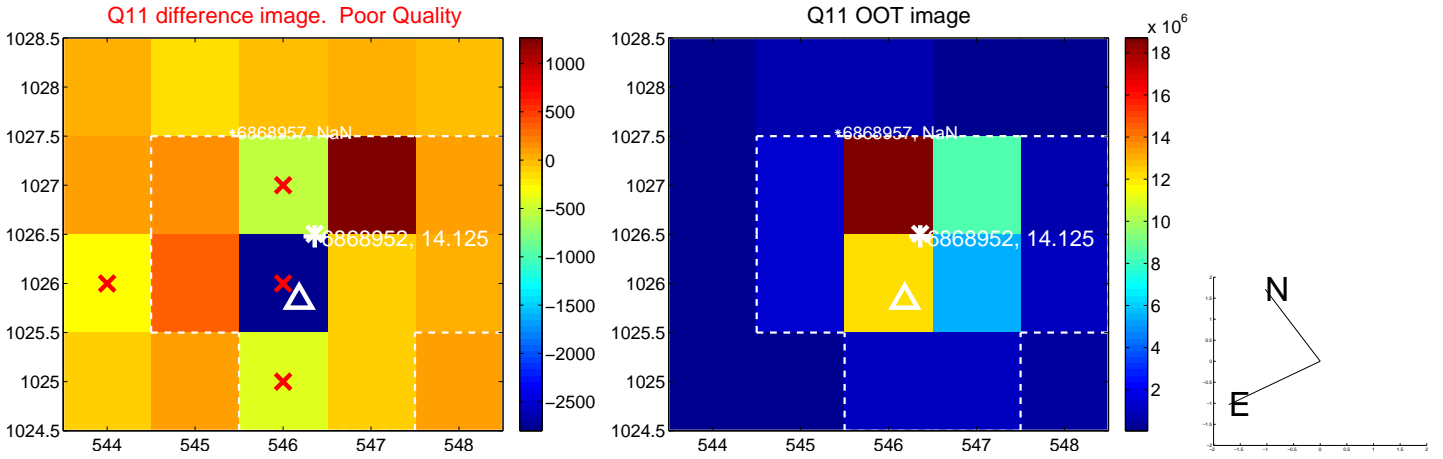
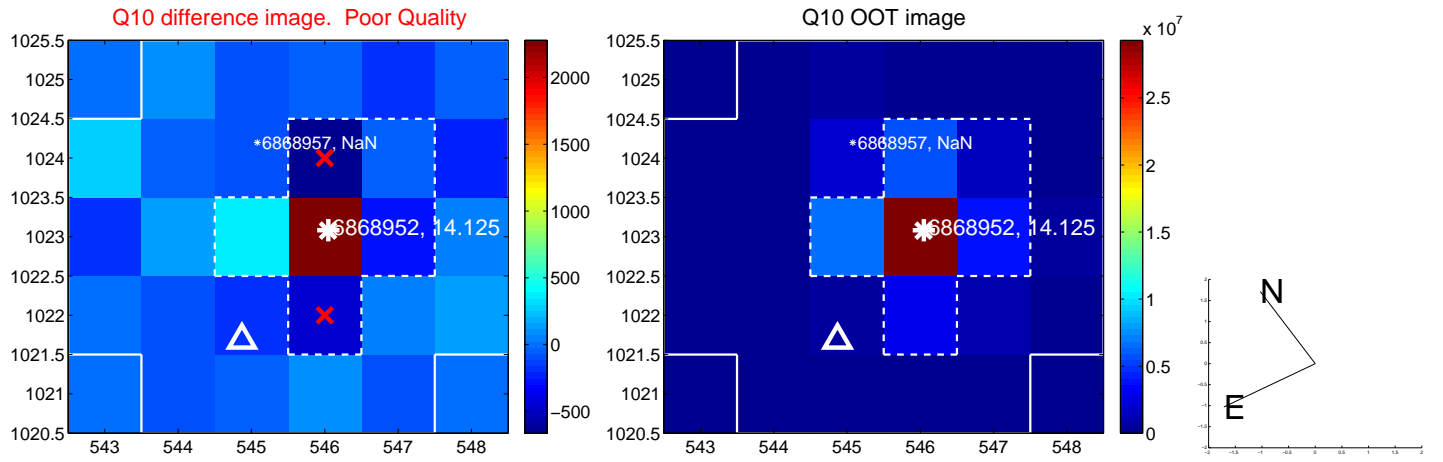
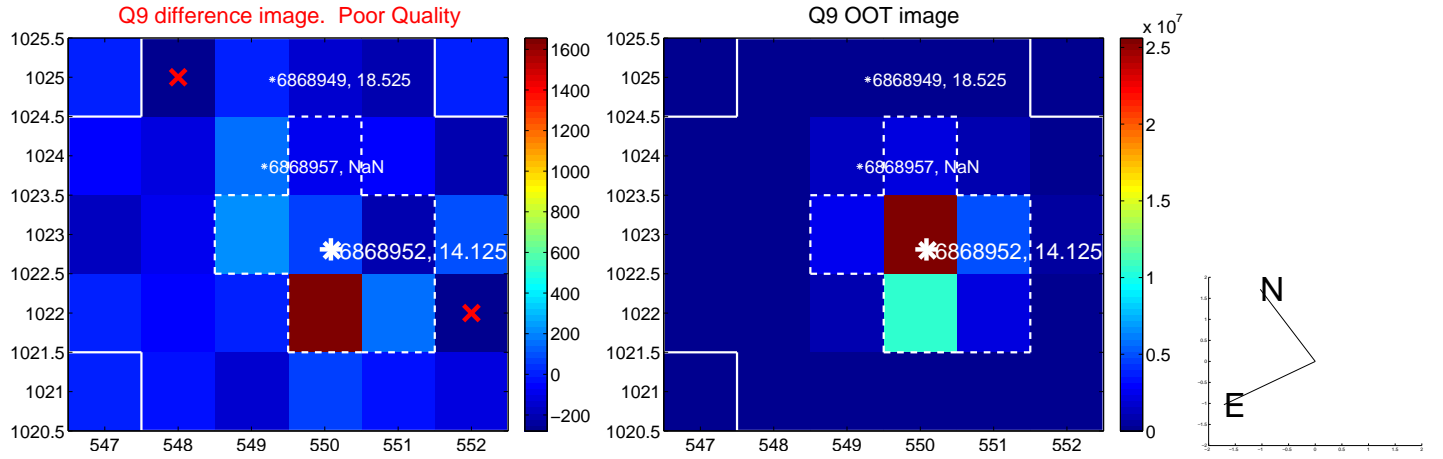




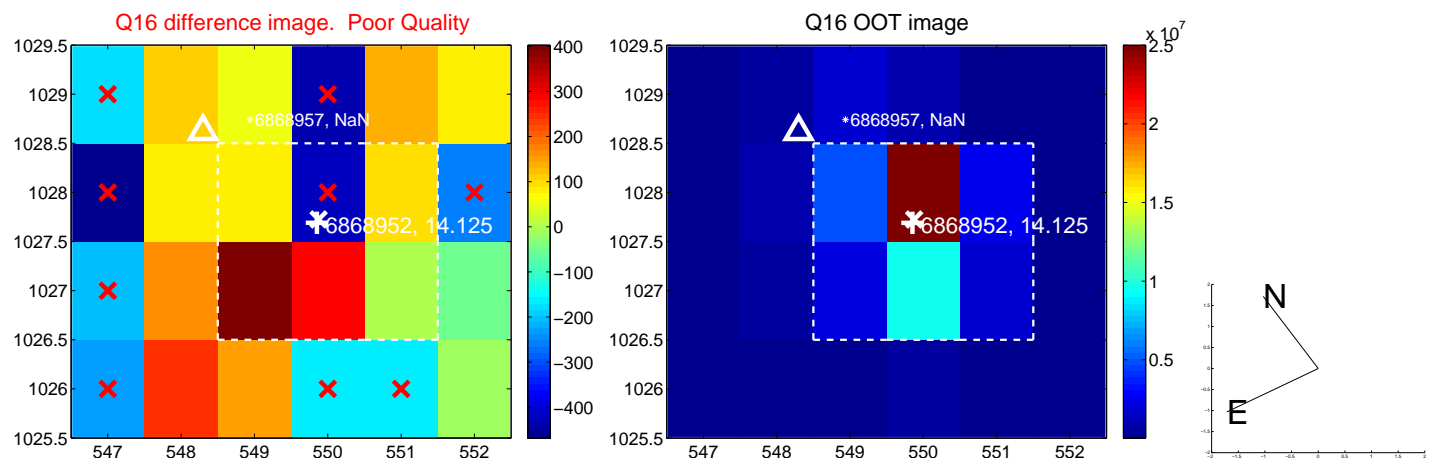
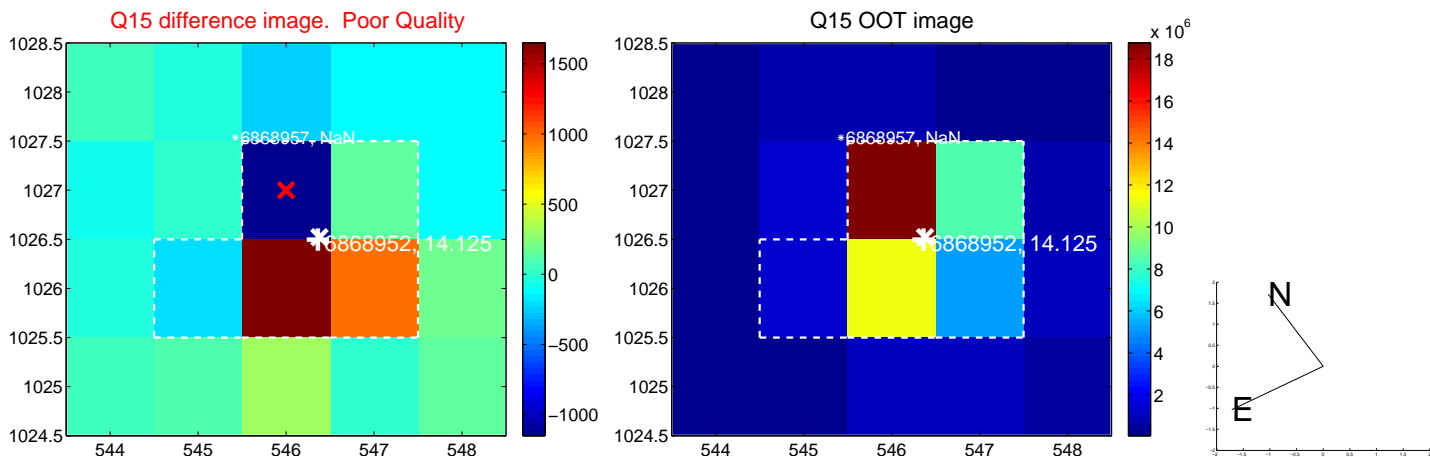
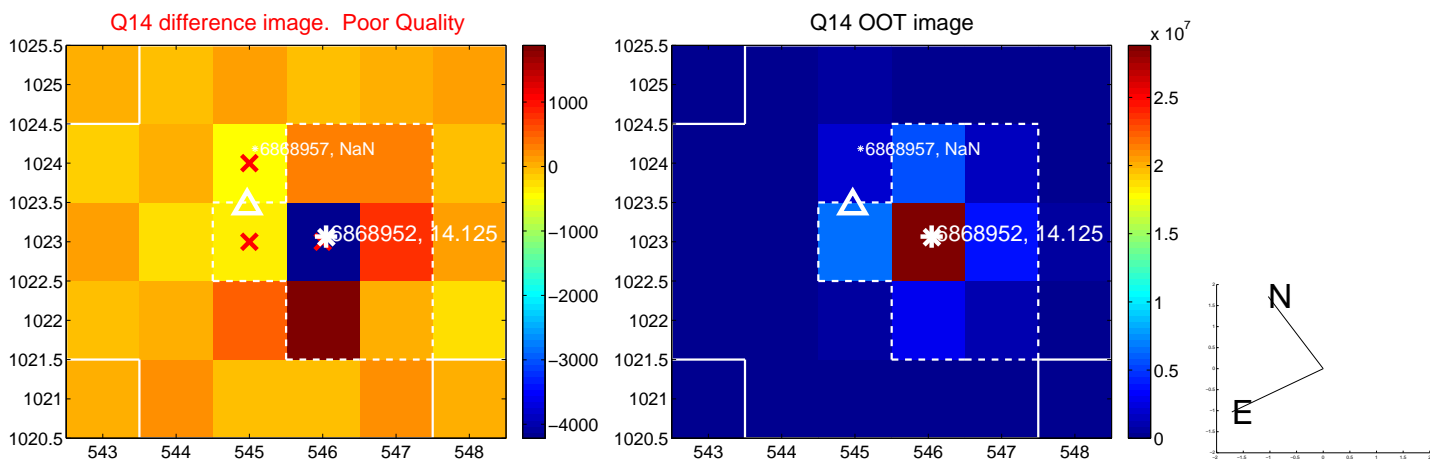
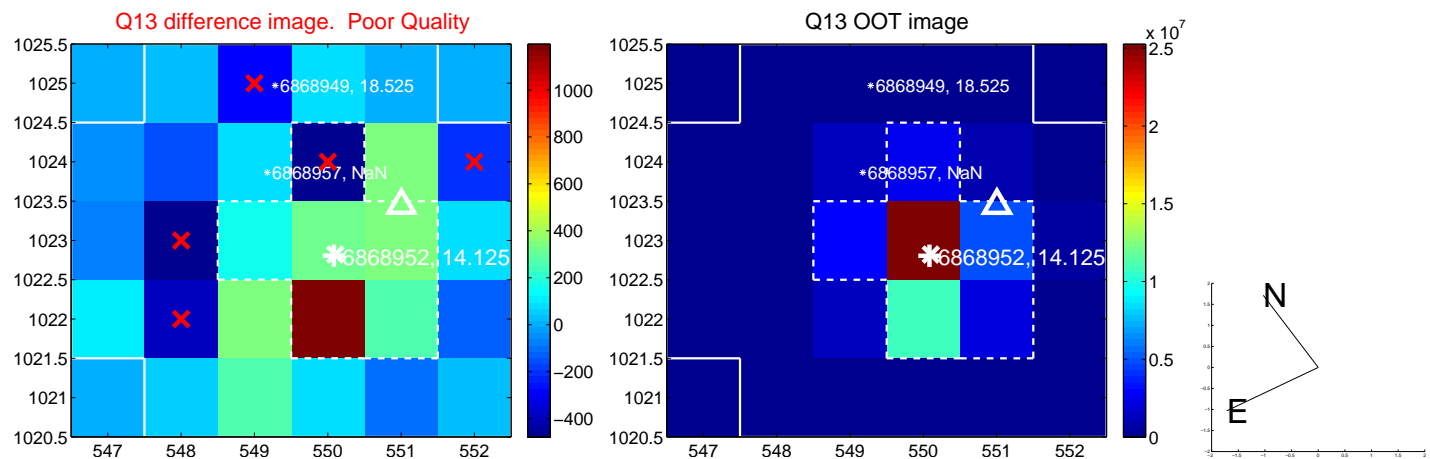
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



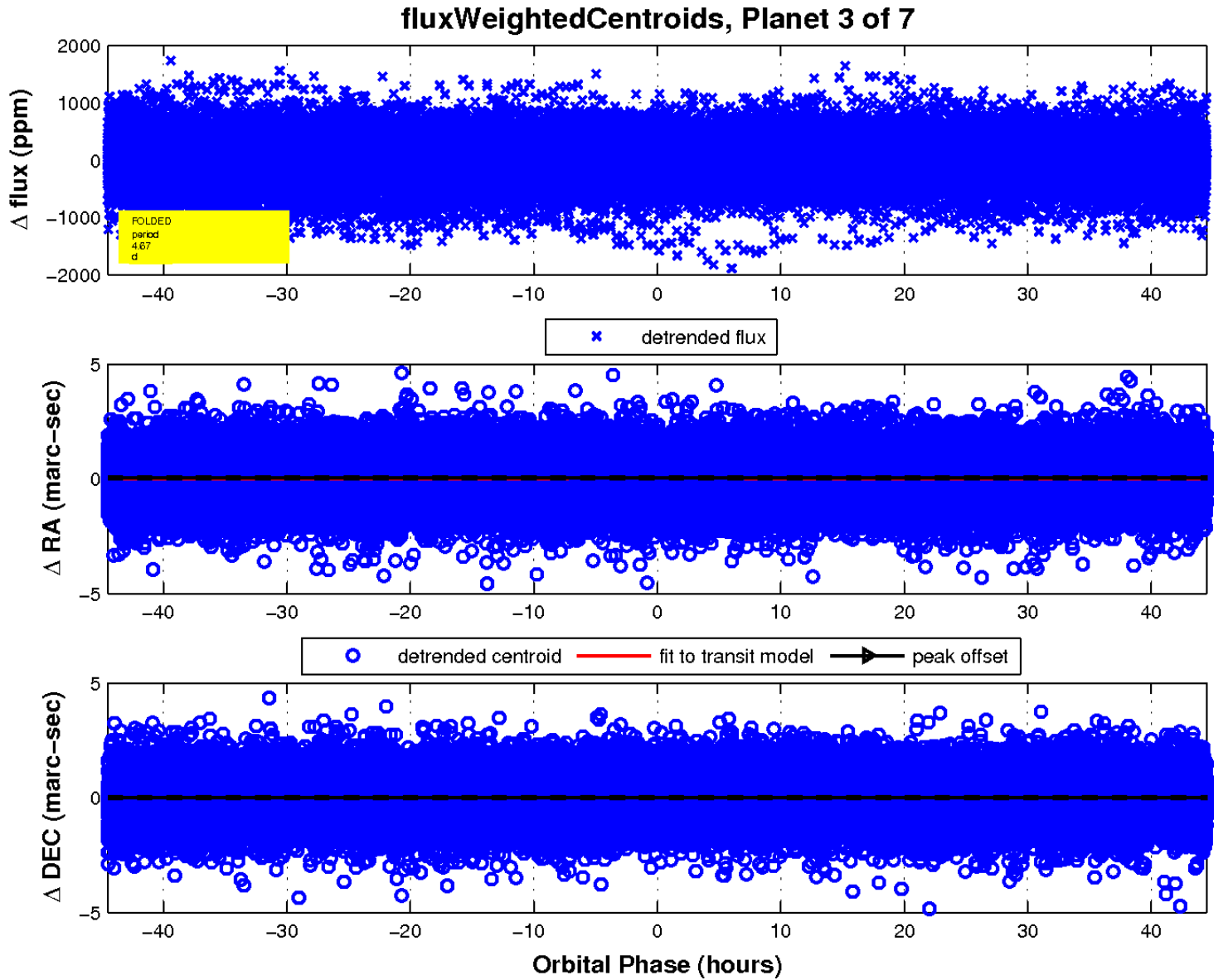
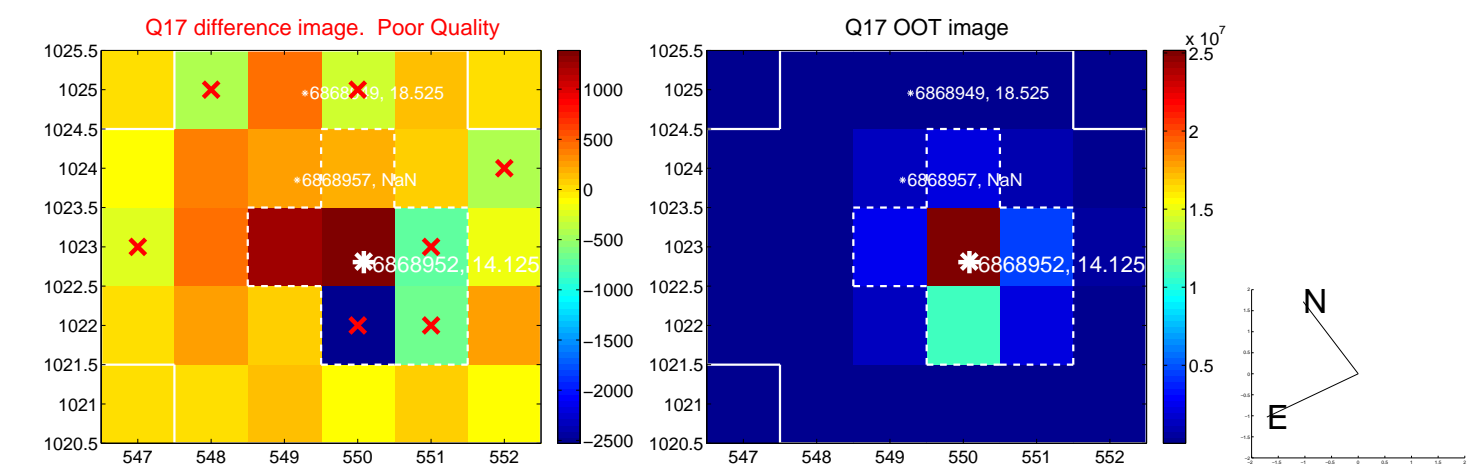
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

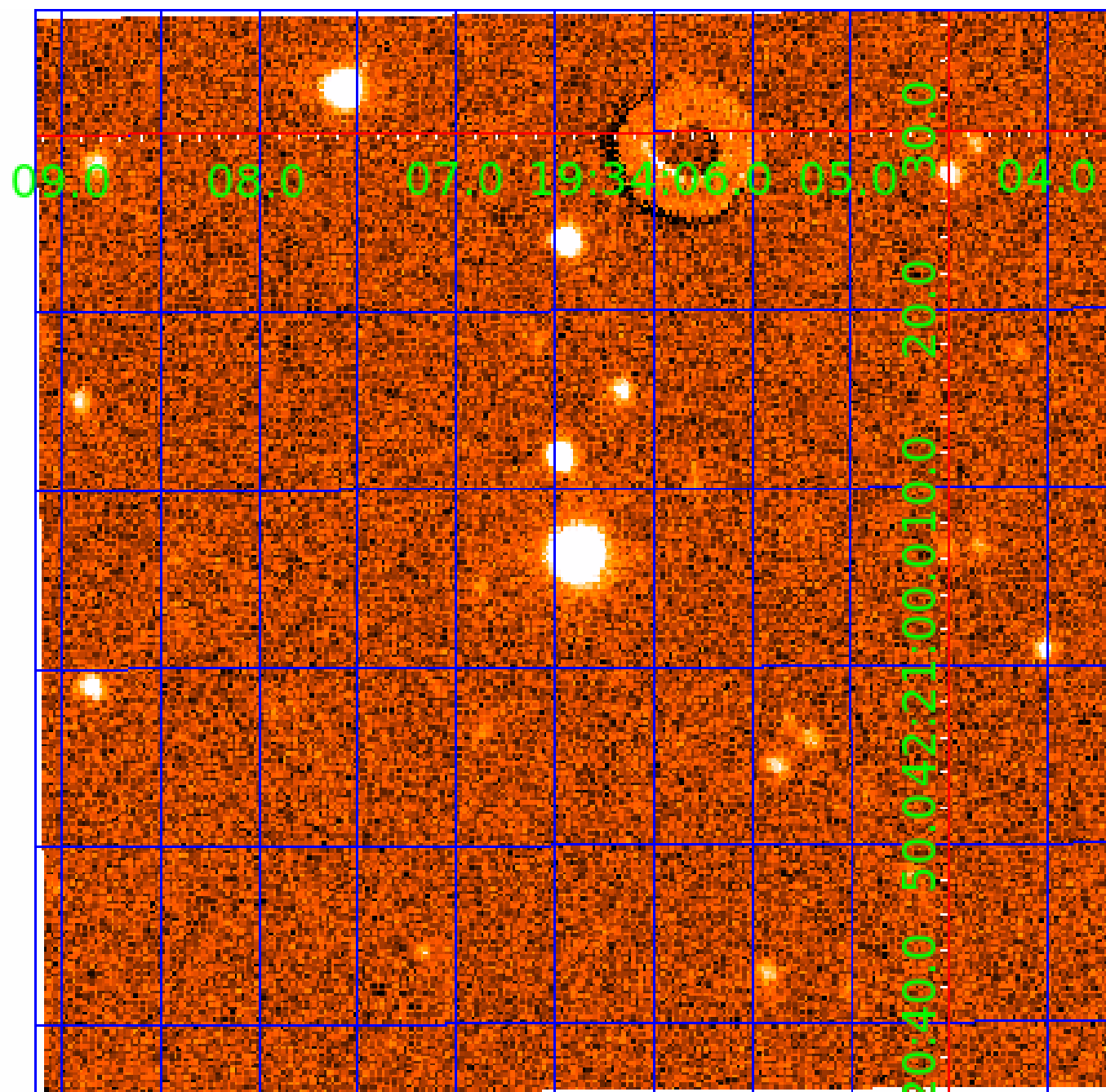


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006868952

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006868952-01	OBS	No	4.671481	132.975833	45.5	14.290	8.0	8.7	1.58	6028	1.26	834.26
006868952-02	OBS	No	355.190361	189.720331	490.3	12.265	16.6	7.4	1.58	6028	3.52	2.59
006868952-03	OBS	No	4.671515	134.874401	43.8	14.839	7.2	9.0	1.58	6028	1.11	834.25
006868952-04	OBS	No	106.236149	236.236835	1.4	12.707	23.3	0.0	1.58	6028	0.20	12.95
006868952-05	OBS	No	134.486632	164.758051	370.0	26.357	15.1	8.3	1.58	6028	3.84	9.46
006868952-06	OBS	No	36.190386	138.068538	210.5	15.178	7.2	7.3	1.58	6028	2.47	54.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006868952-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006868952-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006868952-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
006868952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_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.

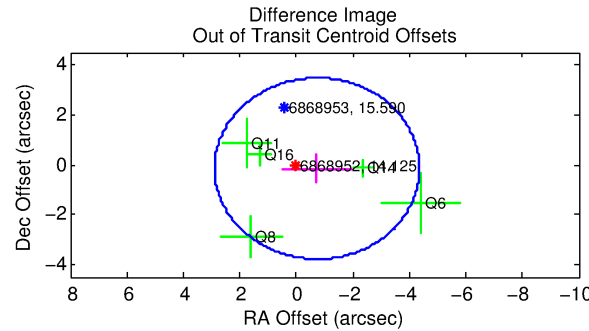
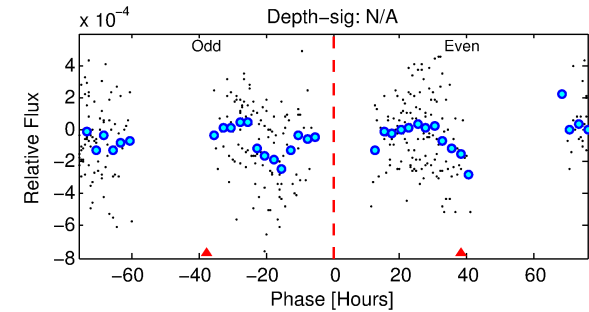
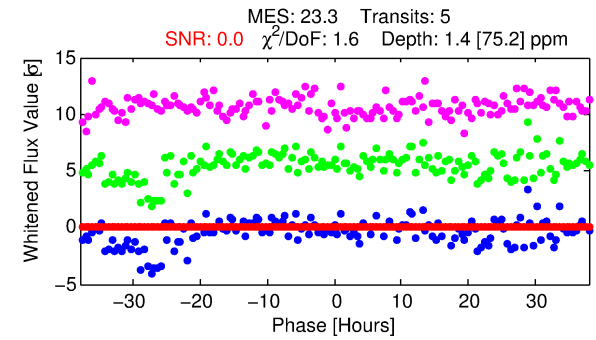
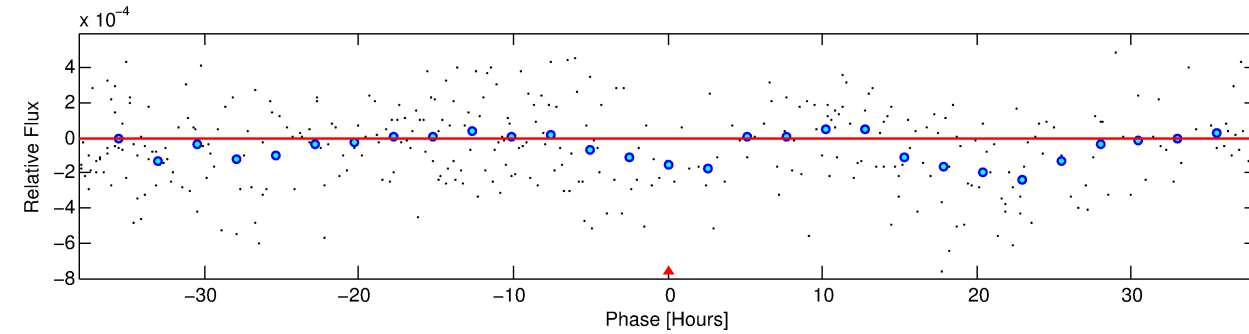
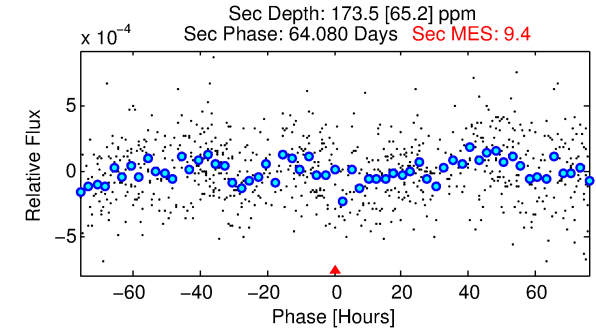
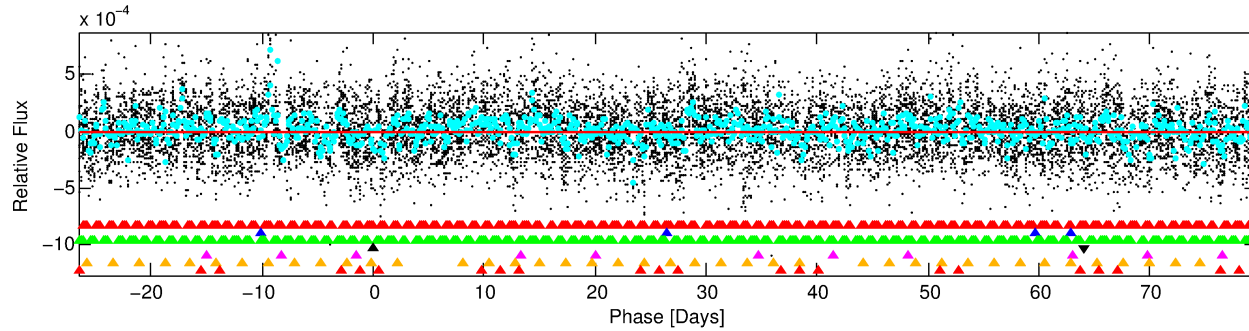
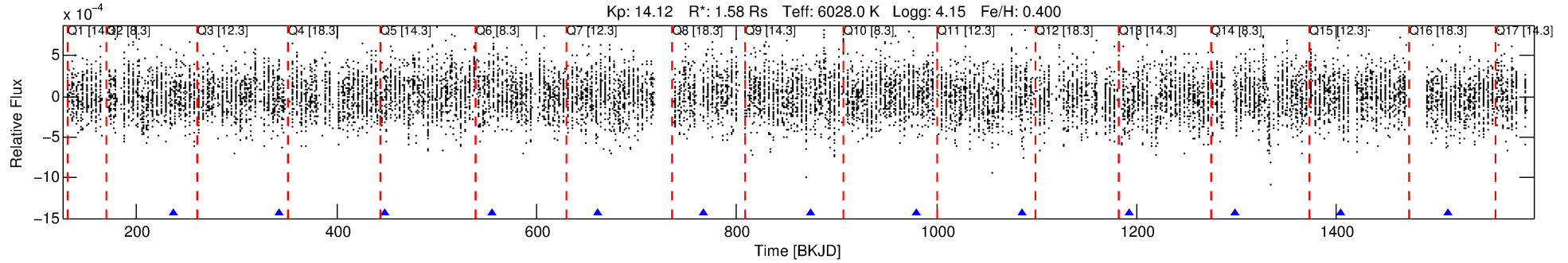
Ephemeris Match Information For 006868952-04

No Significant Match Found



# DV One-Page Summary

KIC: 6868952 Candidate: 4 of 7 Period: 106.236 d



## DV Fit Results:

Period = 106.23615 [1.66899] d  
Epoch = 236.2368 [6.4412] BKJD  
Rp/R\* = 0.0012 [0.0490]  
a/R\* = 46.80 [6004.87]  
b = 0.68 [109.37]  
Seff = 12.95 [3.75]  
Teq = 484 [35] K  
Rp = 0.20 [8.47] Re  
a = 0.4785 [0.0899] AU  
Ag = 537426.01 [45141789.63] [0.01σ]  
Teffp = 20249 [425150] K [0.05σ]

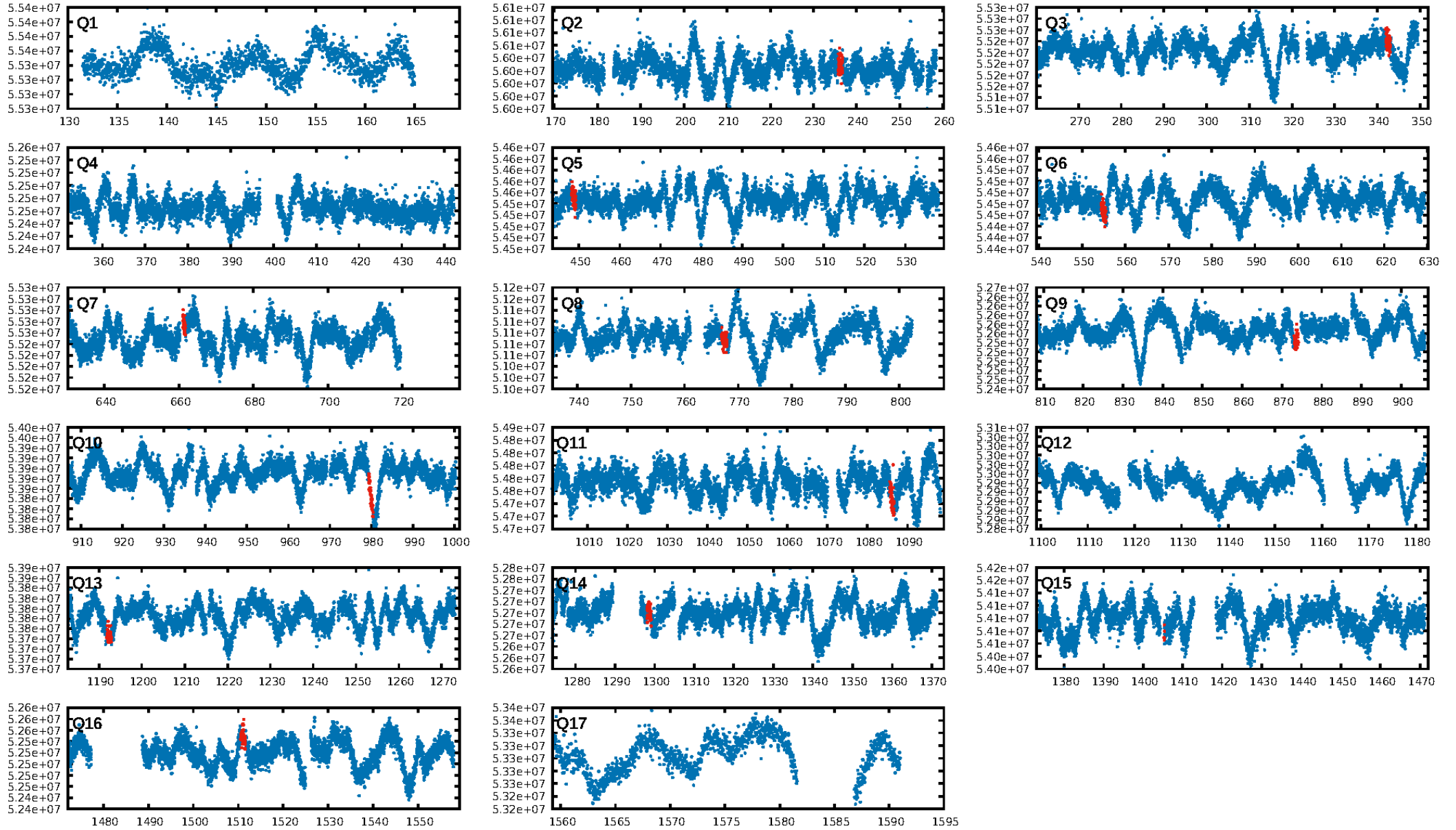
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [41.30σ]  
LongPeriod-sig: 100.0% [23.17σ]  
ModelChiSquare2-sig: 8.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 8.20e-51  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.745 arcsec [0.62σ]  
KicOffset-rm: 0.676 arcsec [0.52σ]  
OotOffset-st: 2/1/2/0 [5]  
KicOffset-st: 2/1/2/0 [5]  
DiffImageQuality-fgm: 0.20 [1/5]  
DiffImageOverlap-fno: 0.00 [0/9]

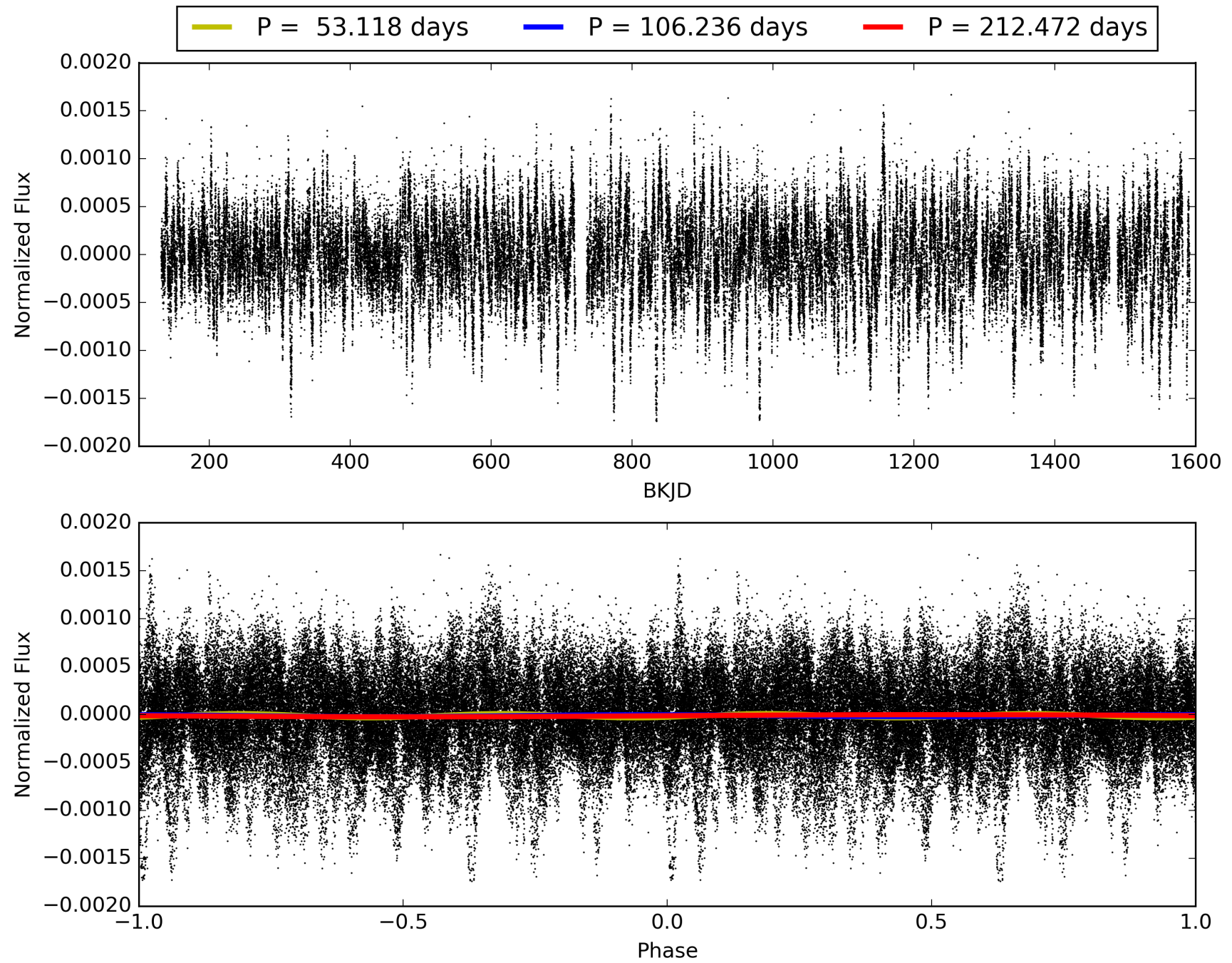
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:59:19 Z

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

# TCE 006868952-04, PDC Light Curves

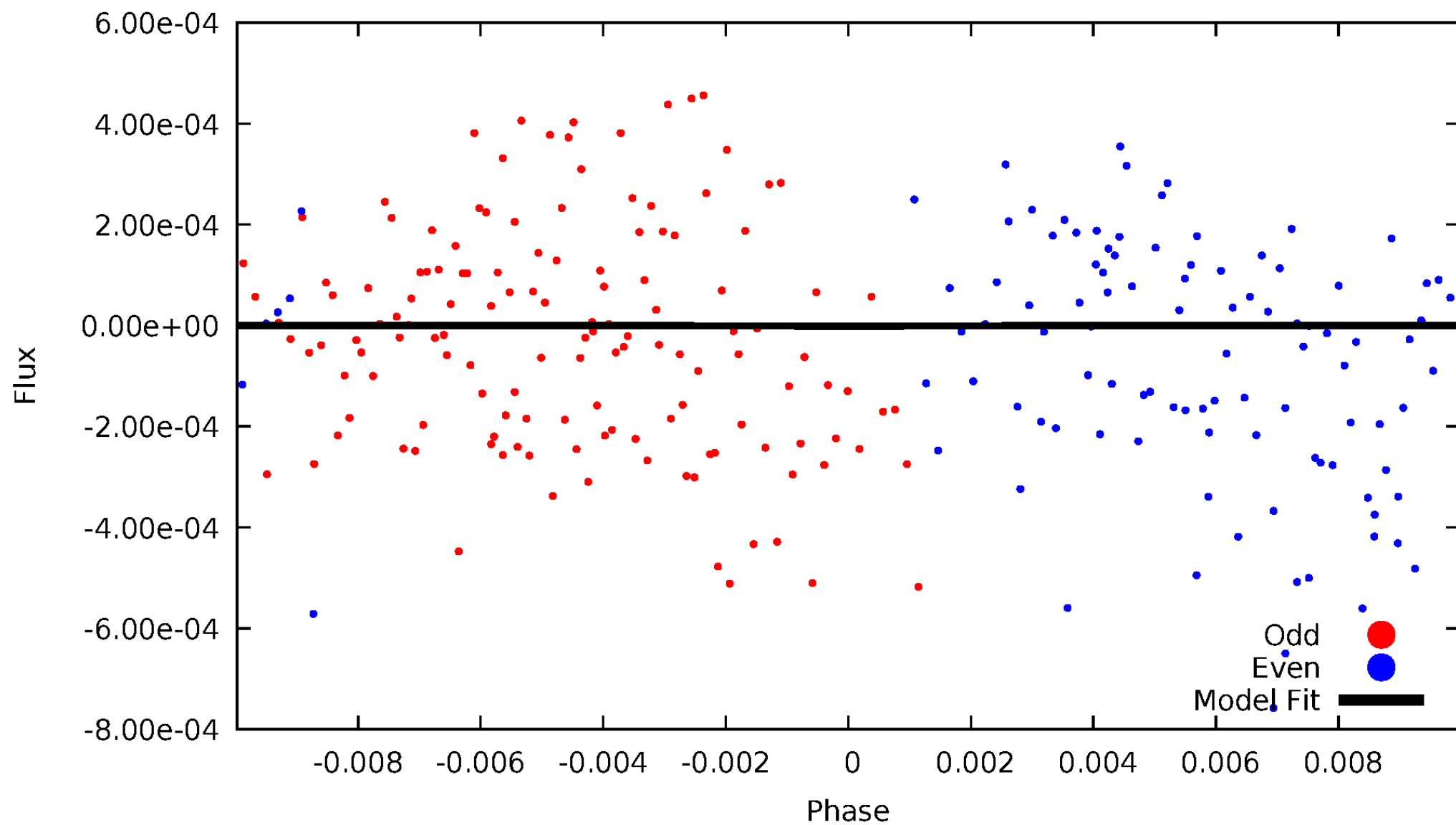


TCE 006868952-04



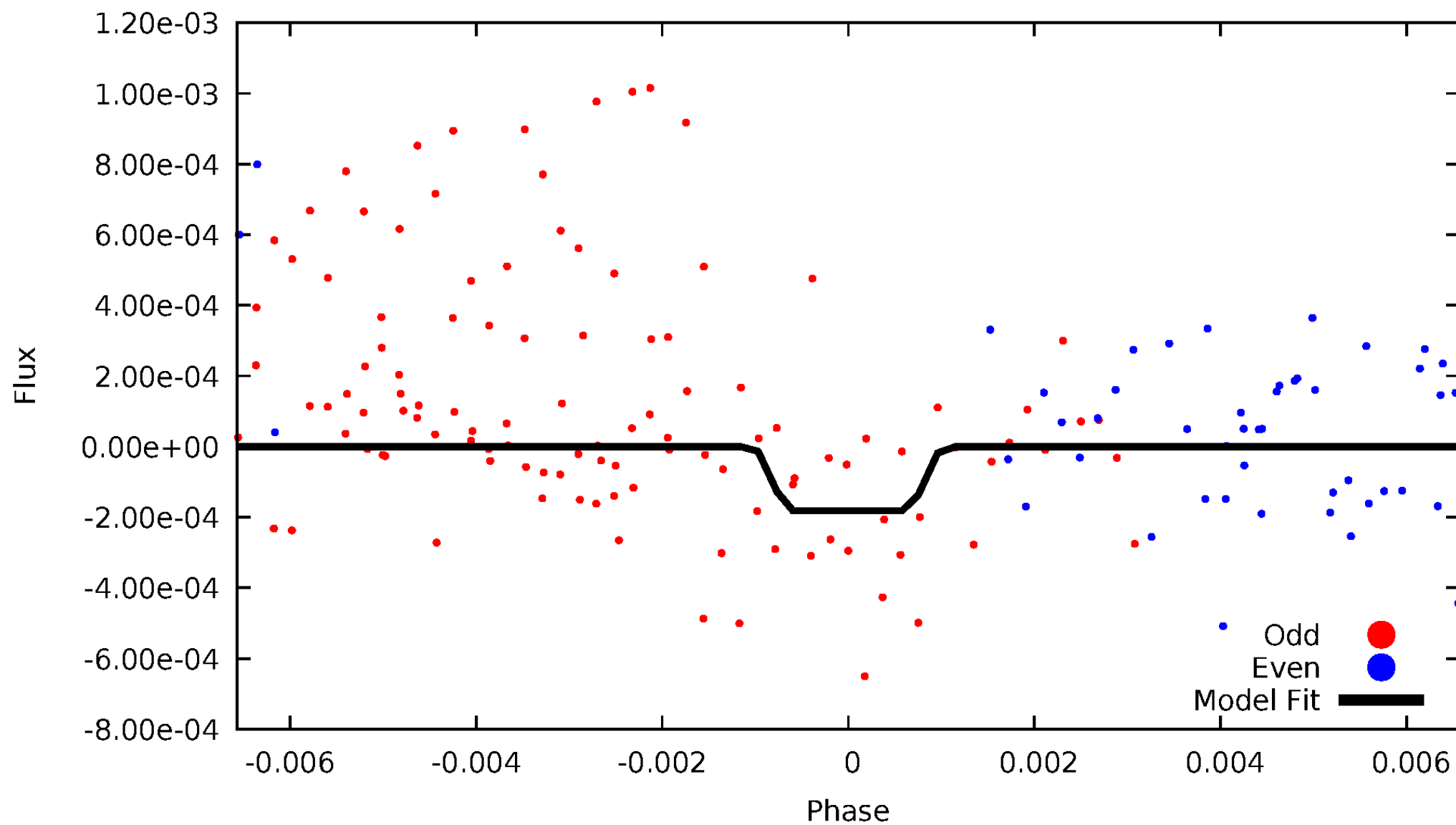
# DV Odd/Even

TCE 006868952-04



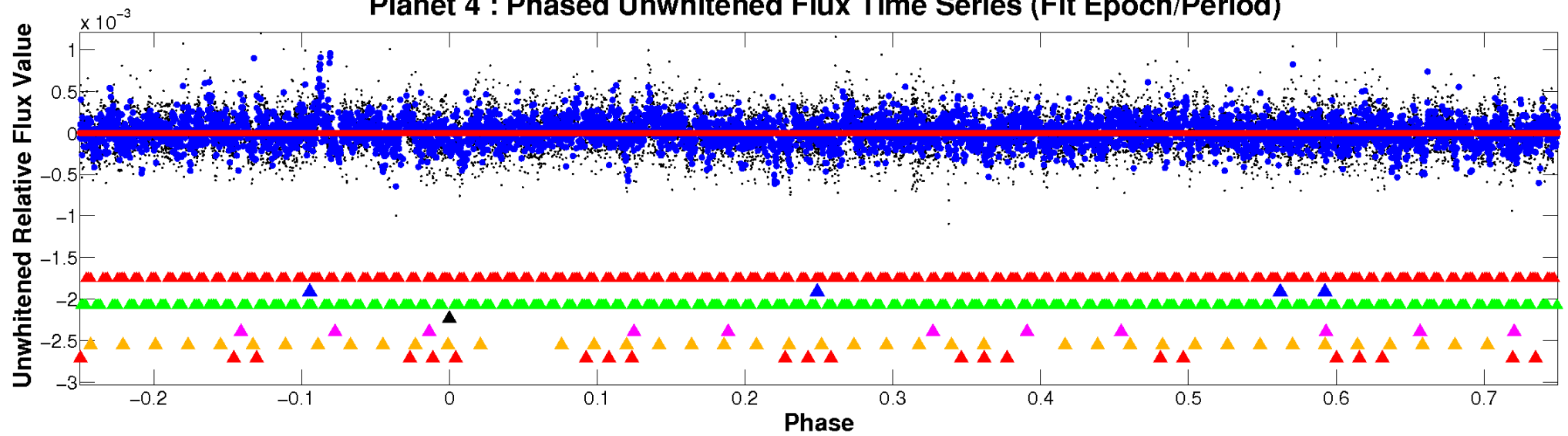
# ALT Odd/Even

TCE 006868952-04

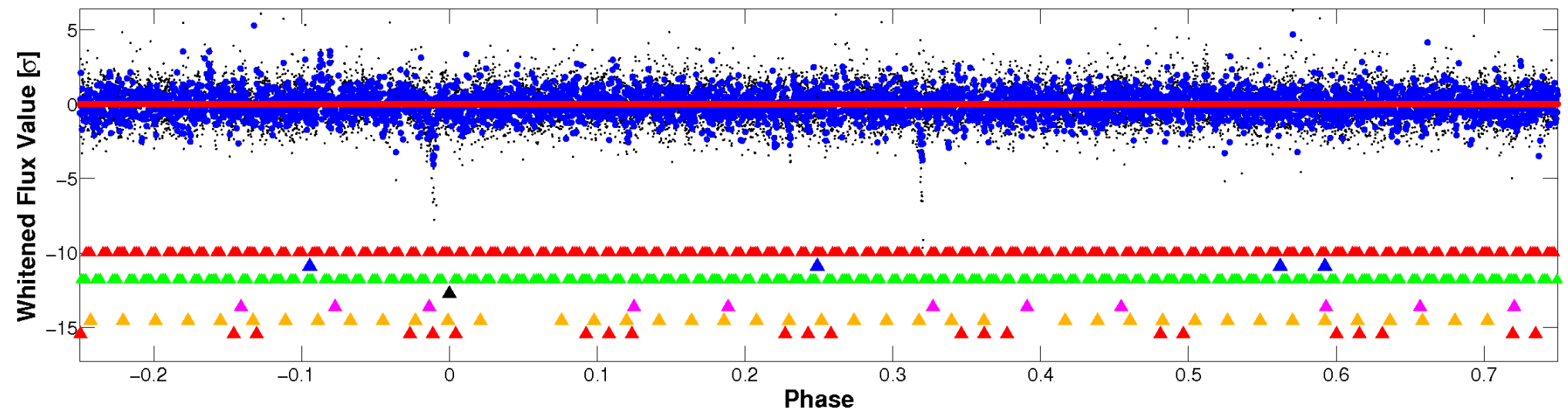


# Non-Whitened Vs. Whitened Light Curve

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



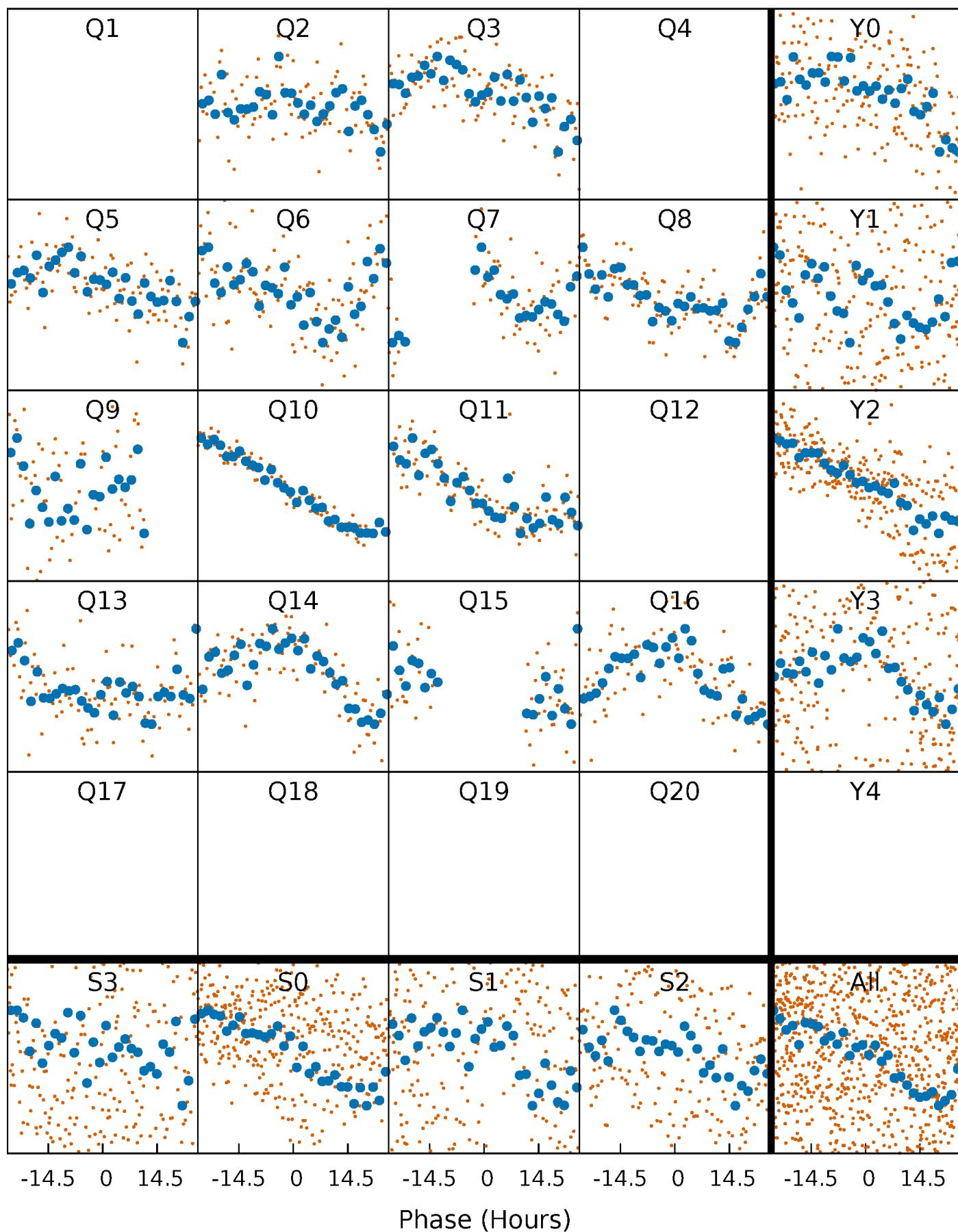
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

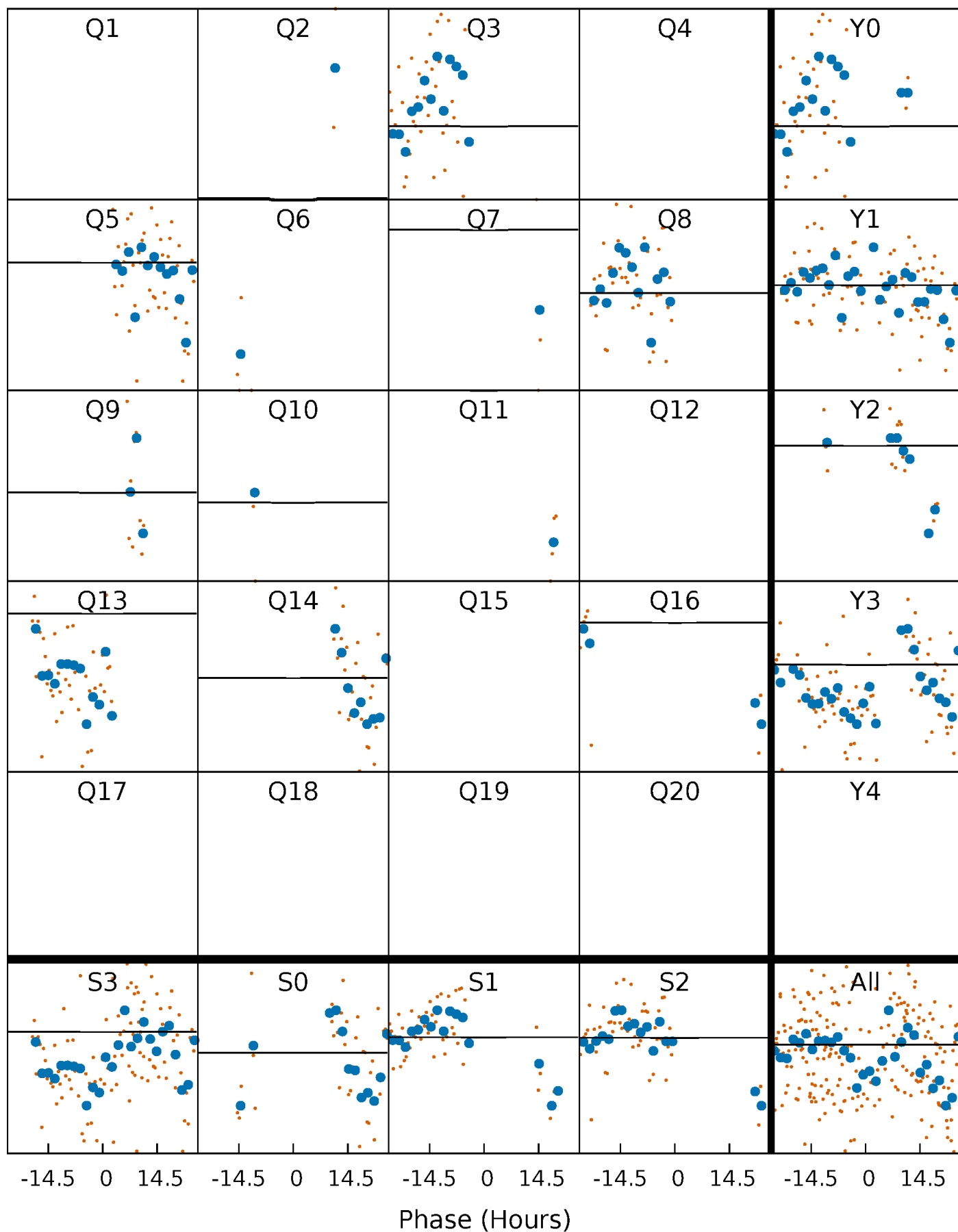
TCE 006868952-04 P=106.236149 Days  $T_0=236.236835$  (BKJD)





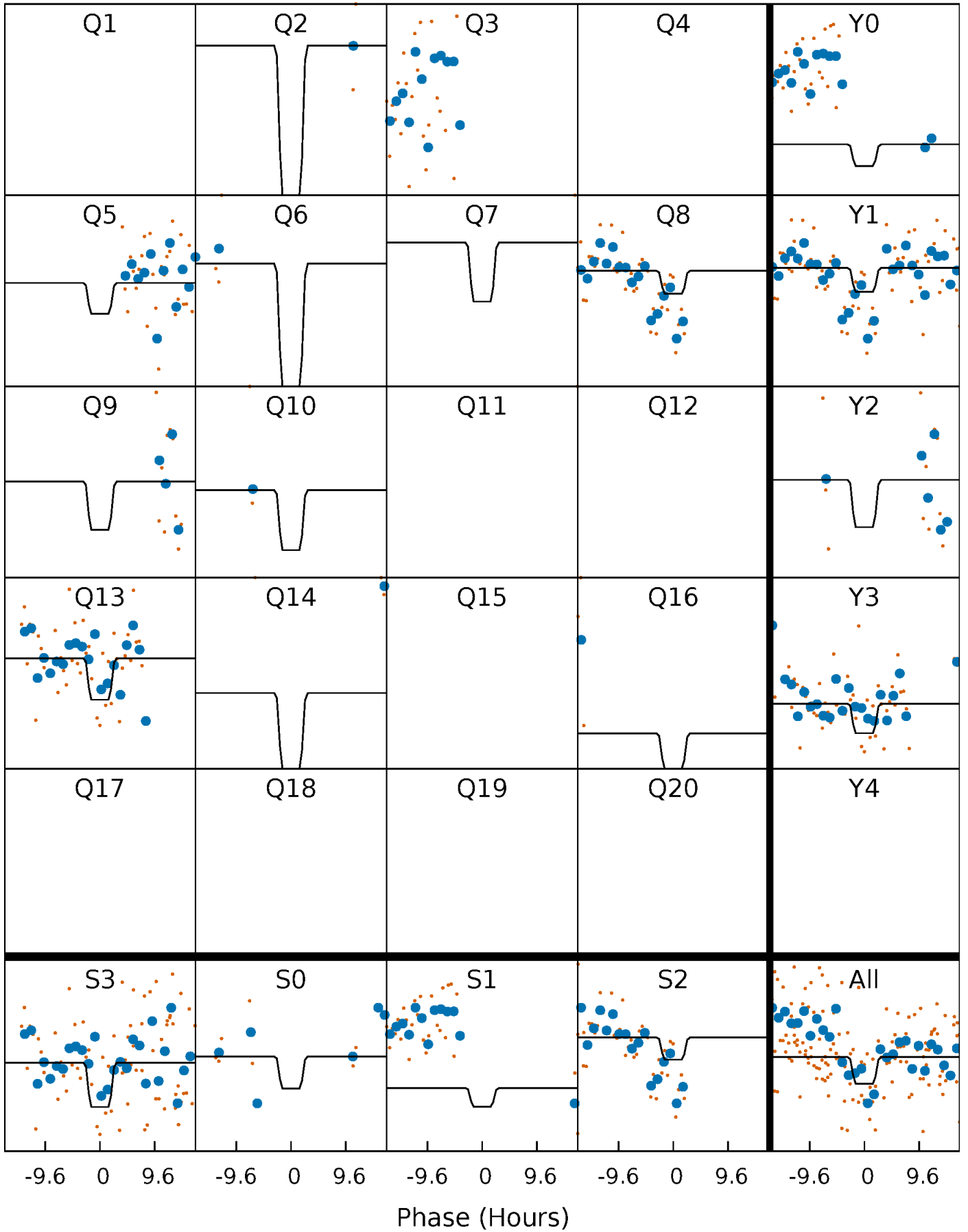
# DV Quarter-Phased Transit Curves

TCE 006868952-04     $P=106.236149$  Days     $T_0=236.236835$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

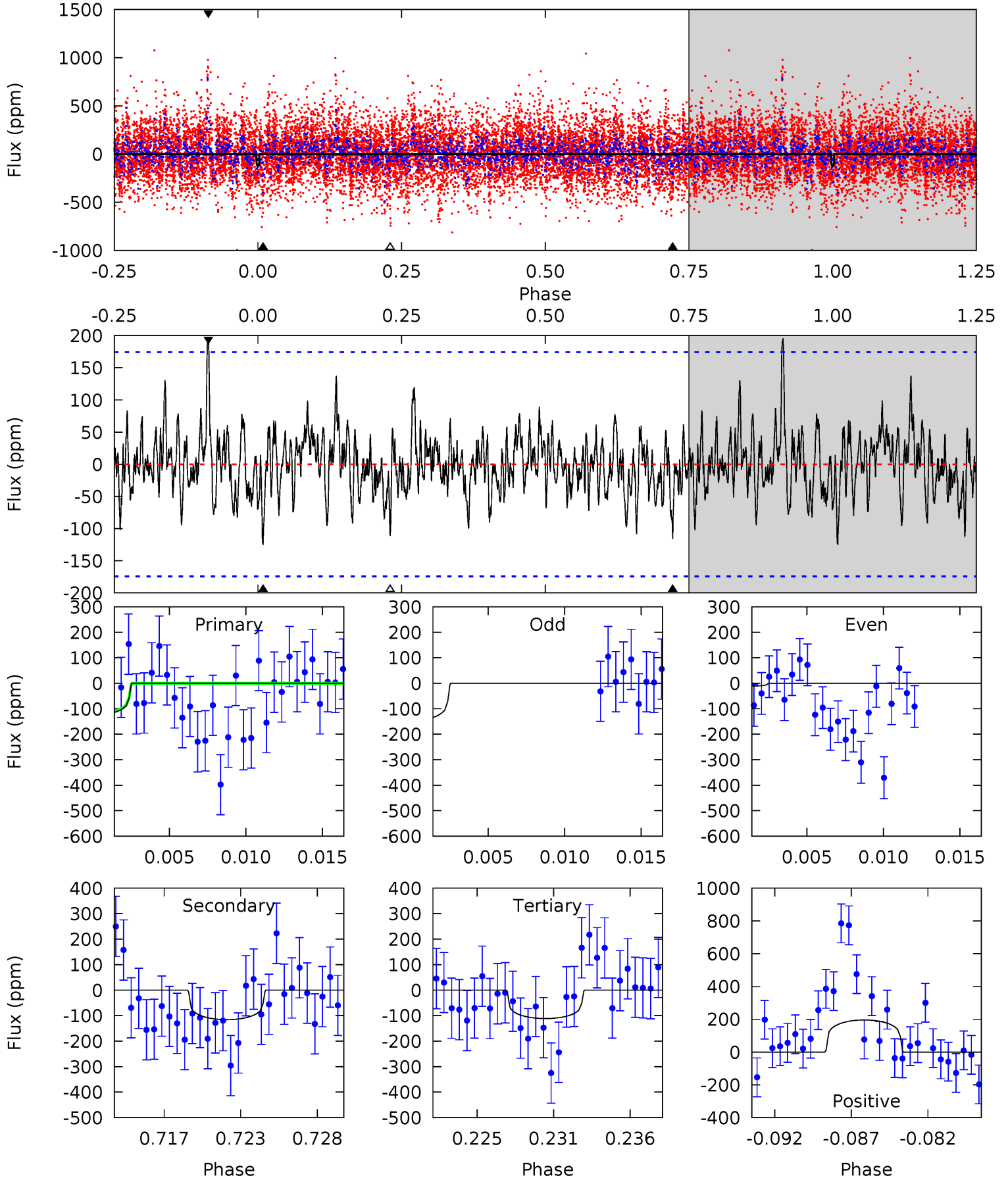
TCE 006868952-04 P=106.213645 Days  $T_0=236.234087$  (BKJD)



# DV Model-Shift Uniqueness Test

006868952-04, P = 106.236149 Days, E = 130.000686 Days

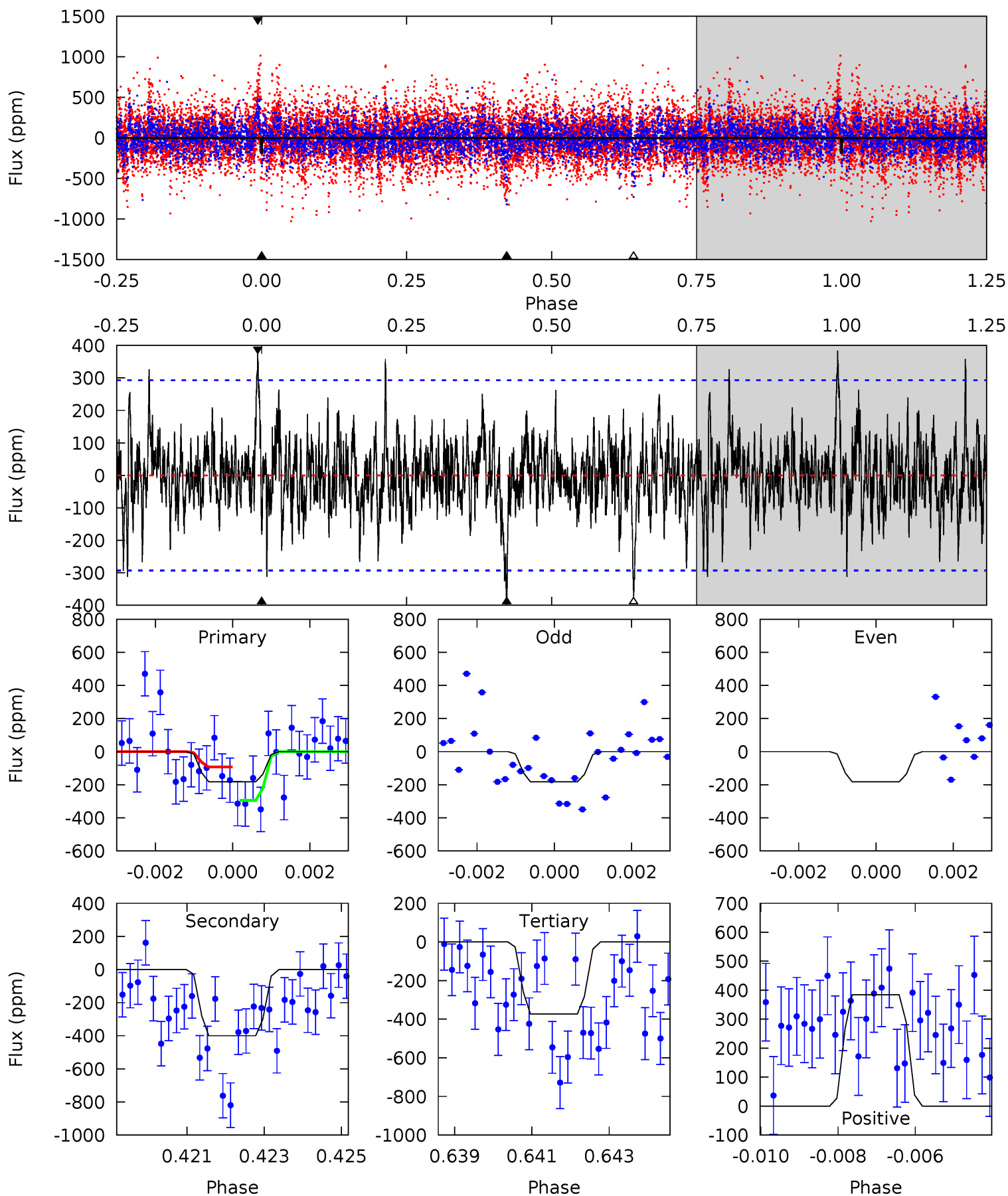
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.70	3.42	3.29	5.79	5.15	2.80	1.14	0.41	-2.08	0.13	-2.36	1.60	29.8	0.61	0.11



# Alt Model-Shift Uniqueness Test

006868952-04, P = 106.213645 Days, E = 130.020442 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
3.32	7.28	6.79	7.00	5.33	3.10	1.65	-3.47	-3.67	0.49	0.28	0	1.00	0.49	1.83



### Stellar Parameters For KIC 006868952

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6028^{+81}_{-81}$	$4.151^{+0.160}_{-0.116}$	$0.400^{+0.100}_{-0.150}$	$1.583^{+0.275}_{-0.337}$	$1.296^{+0.101}_{-0.111}$	$0.460^{+0.387}_{-0.152}$
	+1%/-1%	+4%/-3%	+25%/-37%	+17%/-21%	+8%/-9%	+84%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 006868952-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-116 \pm 34$	$5.71^{+6.71}_{-3.96}$	$673^{+34}_{-36}$	$3757^{+2339}_{-784}$	$420^{+4380}_{-335}$
Alt.	$-400 \pm 55$	$6.44^{+6.75}_{-4.41}$	$675^{+34}_{-36}$	$4578^{+3318}_{-1028}$	$1217^{+10831}_{-927}$

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

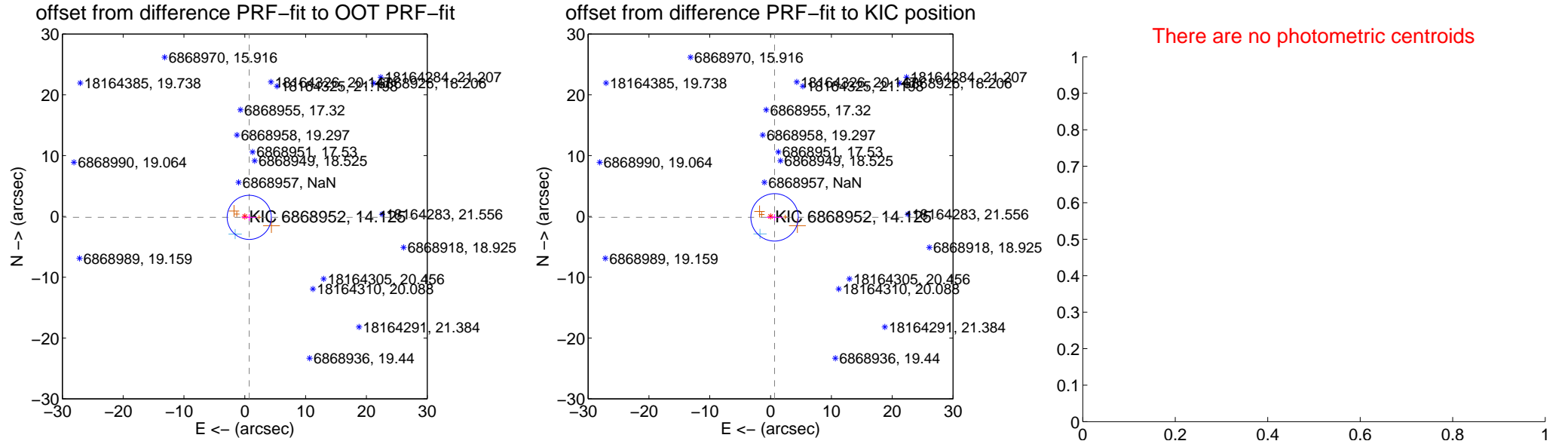
## DV Centroid Data

Supplemental centroid analysis for 006868952-04. Kepler magnitude: 14.12. Transit SNR 0.03

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.745 \pm 1.210$	0.62	$-0.729 \pm 1.231$	$-0.155 \pm 0.549$
PRF-fit source offset from KIC position	$0.676 \pm 1.299$	0.52	$-0.657 \pm 1.329$	$-0.155 \pm 0.524$
photometric centroid source offset	—	—	—	—



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.

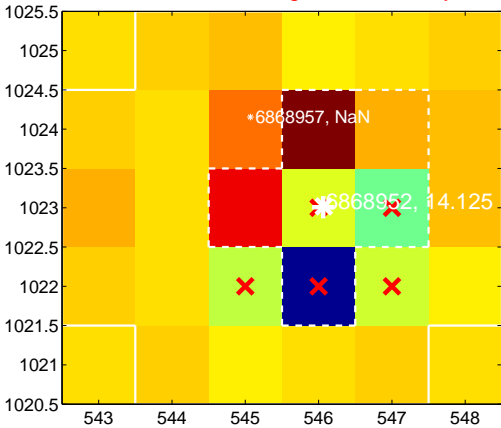
Q1 no difference image



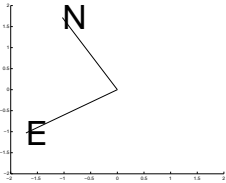
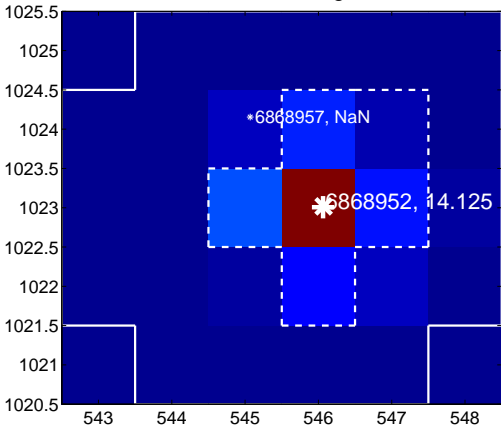
Q1 no OOT image



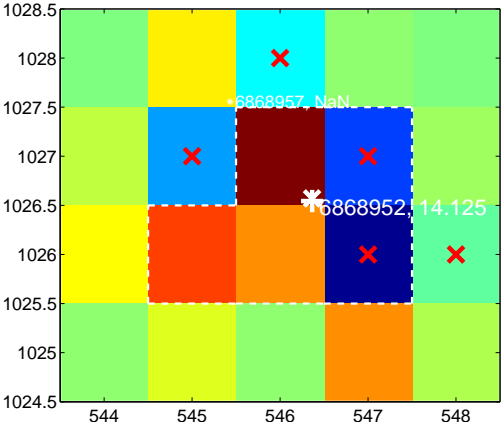
Q2 difference image. Poor Quality



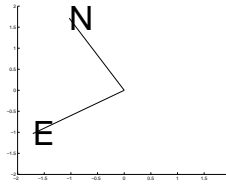
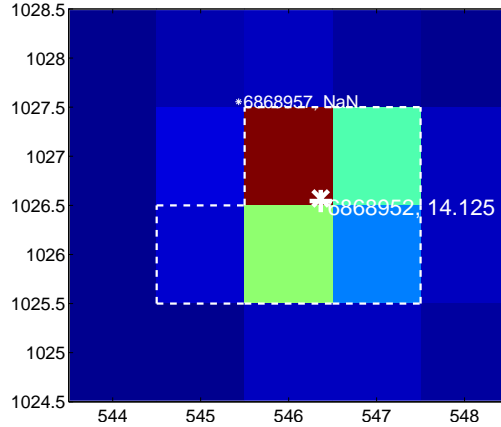
Q2 OOT image



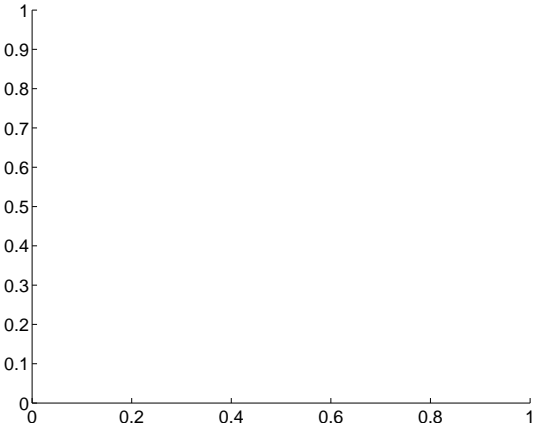
Q3 difference image. Poor Quality



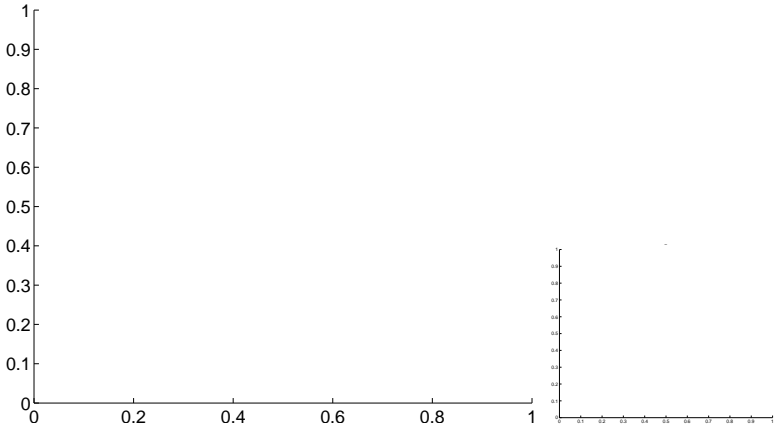
Q3 OOT image



Q4 no difference image

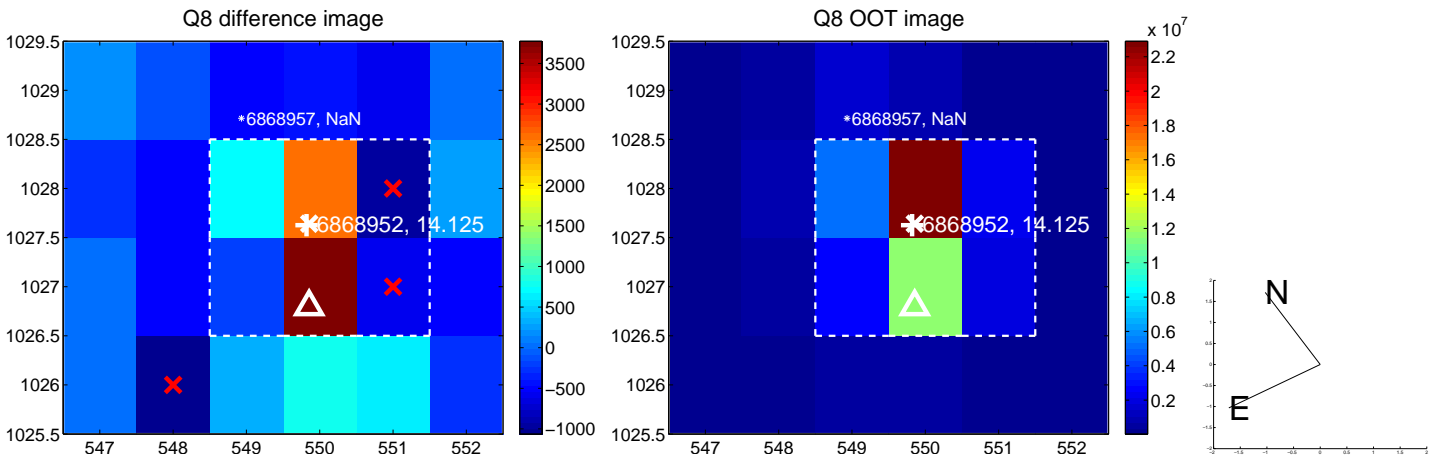
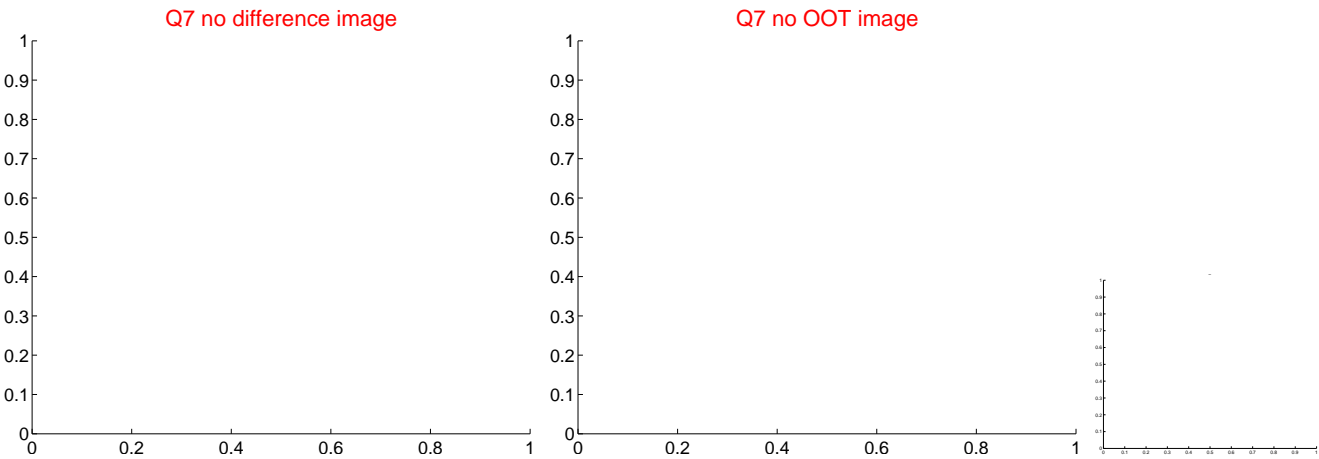
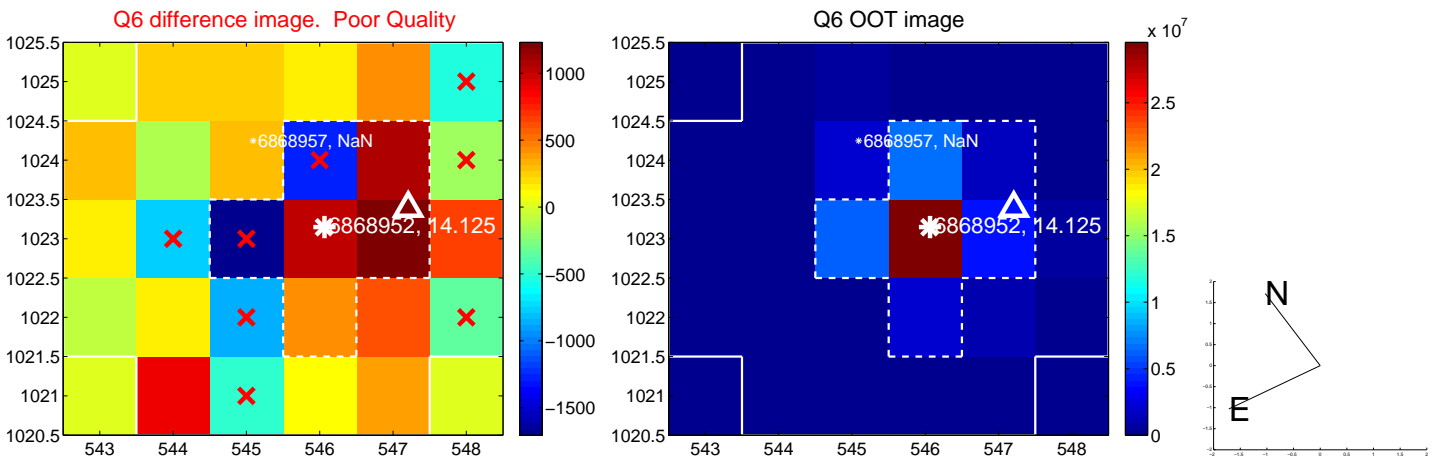
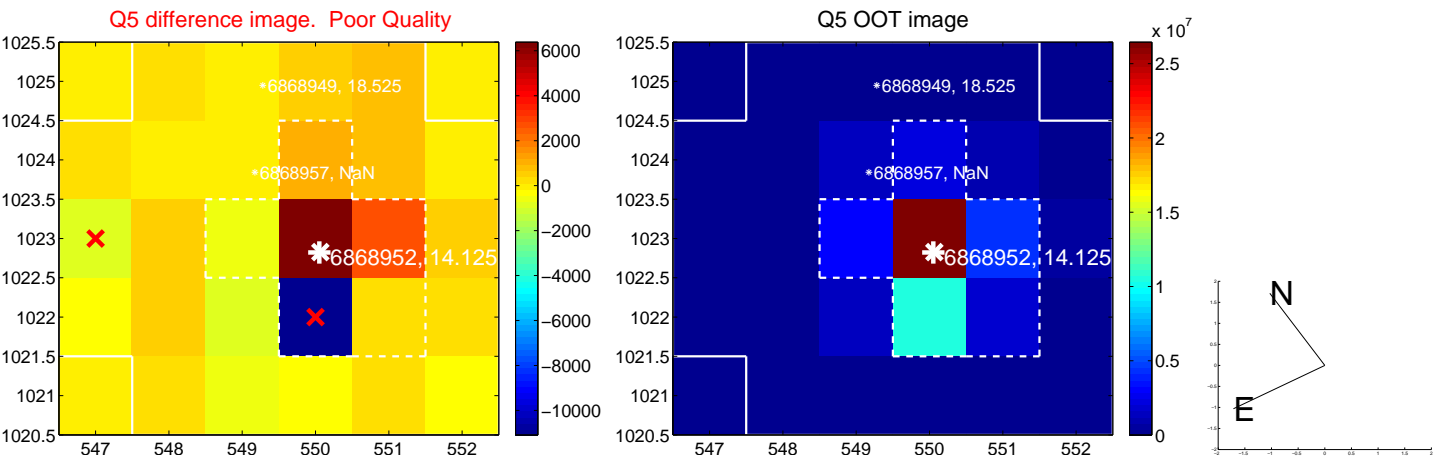


Q4 no OOT image





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



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

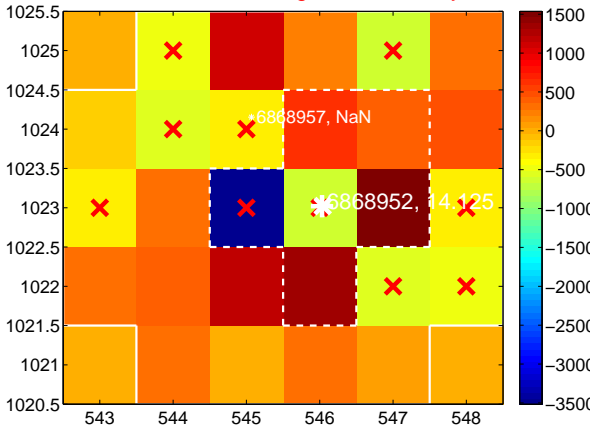
Q9 no difference image



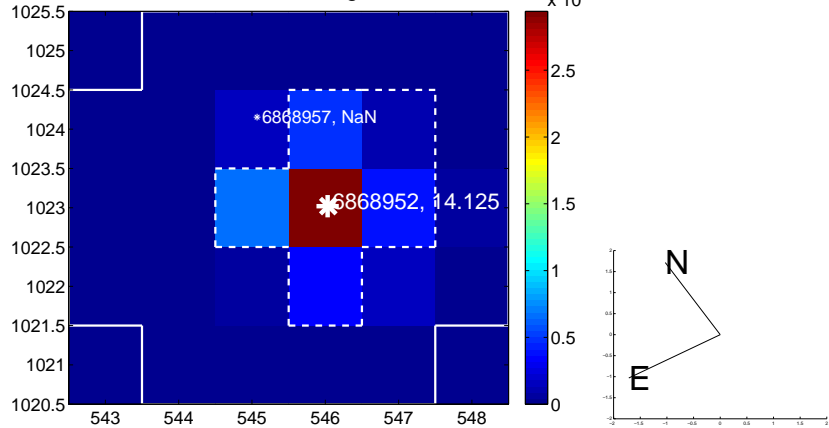
Q9 no OOT image



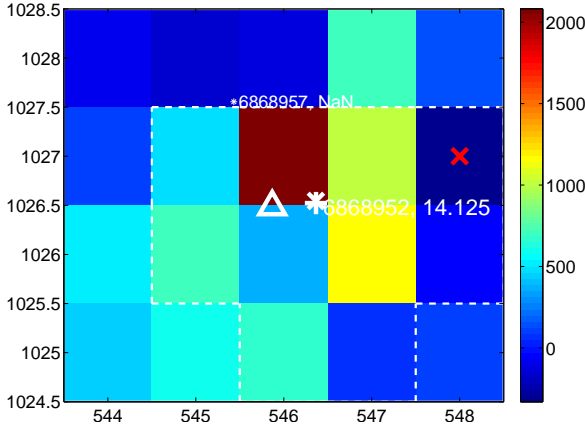
Q10 difference image. Poor Quality



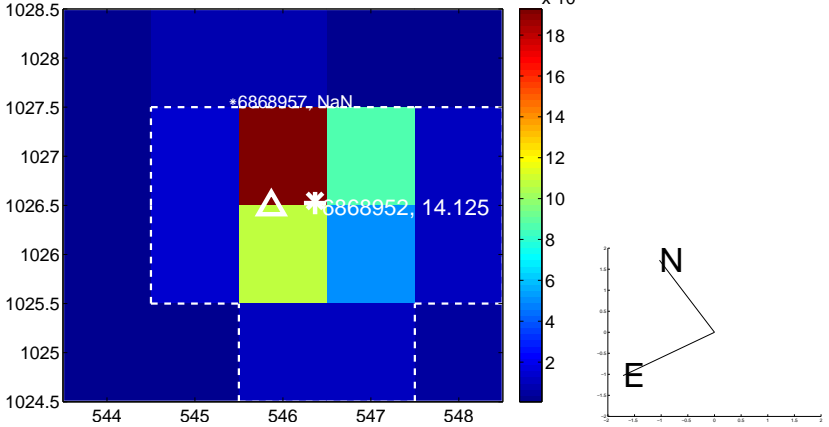
Q10 OOT image



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.

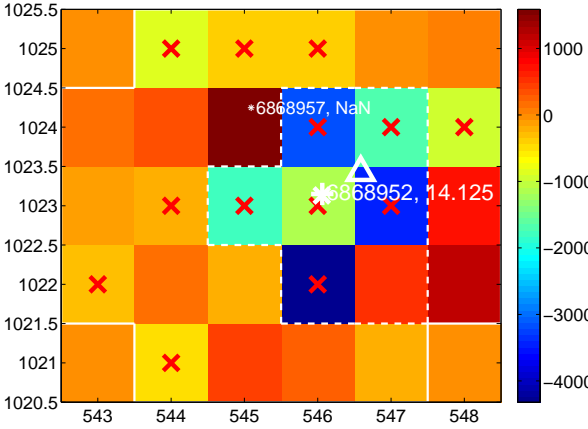
Q13 no difference image



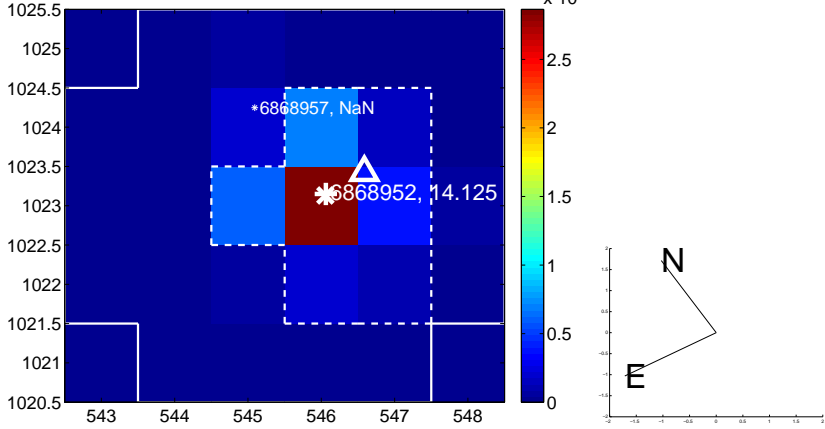
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



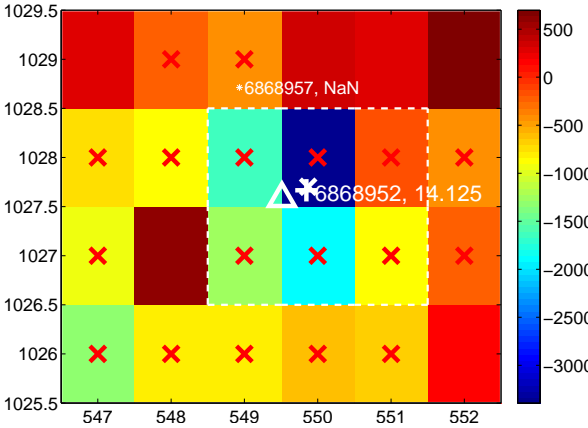
Q15 no difference image



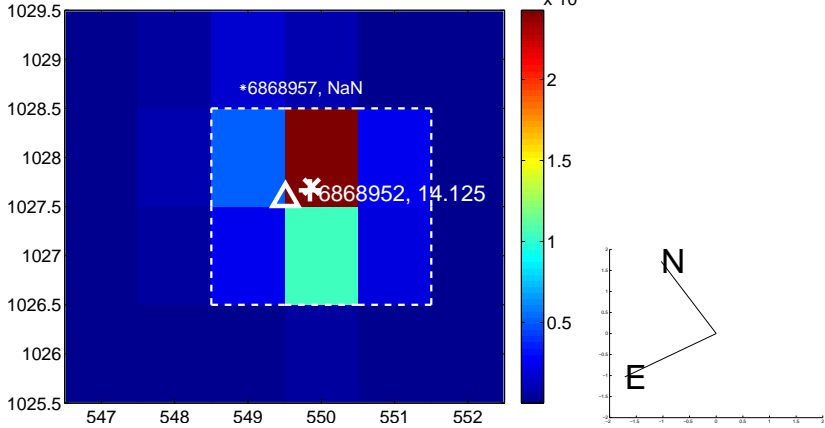
Q15 no OOT image



Q16 difference image. Poor Quality



Q16 OOT image



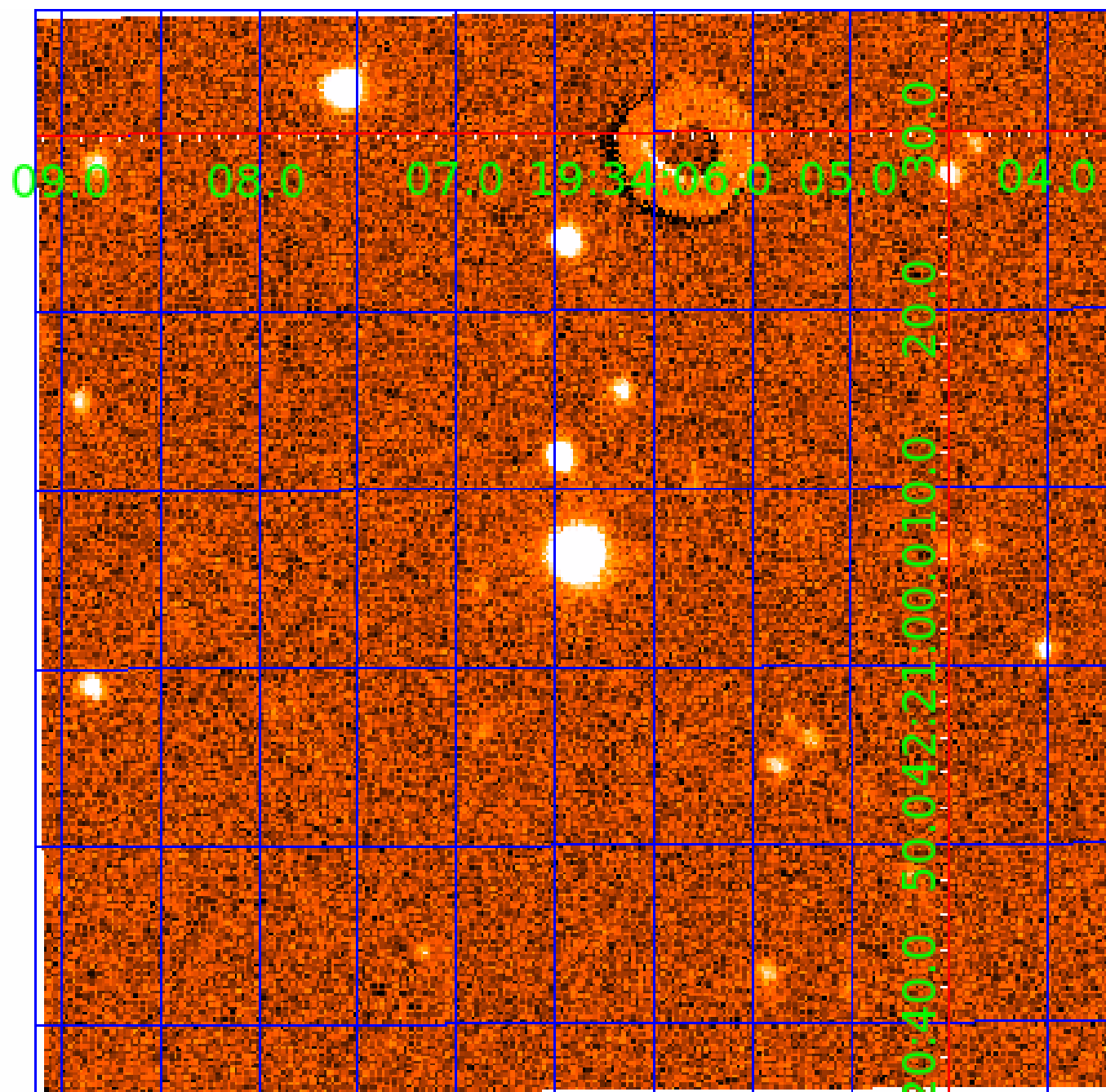
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



# KIC 006868952

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006868952-01	OBS	No	4.671481	132.975833	45.5	14.290	8.0	8.7	1.58	6028	1.26	834.26
006868952-02	OBS	No	355.190361	189.720331	490.3	12.265	16.6	7.4	1.58	6028	3.52	2.59
006868952-03	OBS	No	4.671515	134.874401	43.8	14.839	7.2	9.0	1.58	6028	1.11	834.25
006868952-04	OBS	No	106.236149	236.236835	1.4	12.707	23.3	0.0	1.58	6028	0.20	12.95
006868952-05	OBS	No	134.486632	164.758051	370.0	26.357	15.1	8.3	1.58	6028	3.84	9.46
006868952-06	OBS	No	36.190386	138.068538	210.5	15.178	7.2	7.3	1.58	6028	2.47	54.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006868952-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006868952-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006868952-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
006868952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_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.

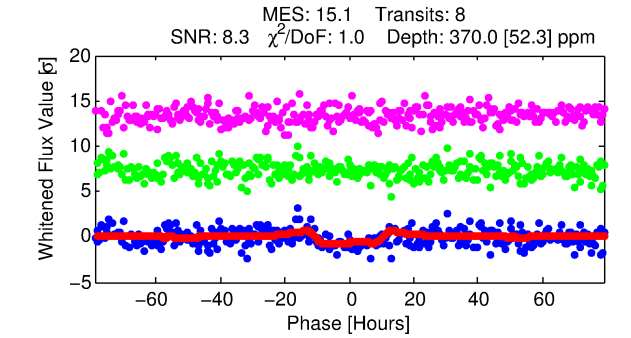
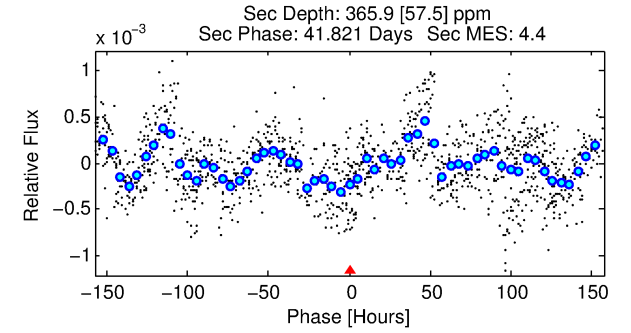
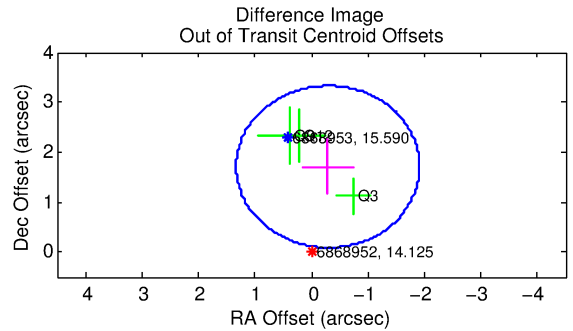
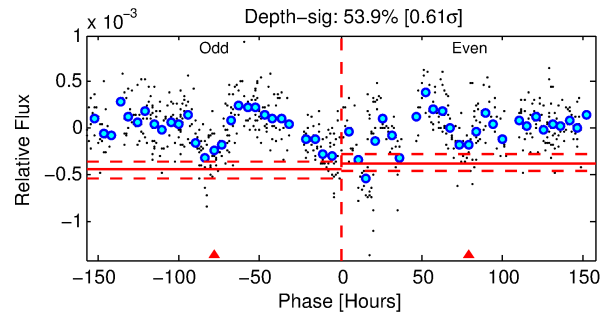
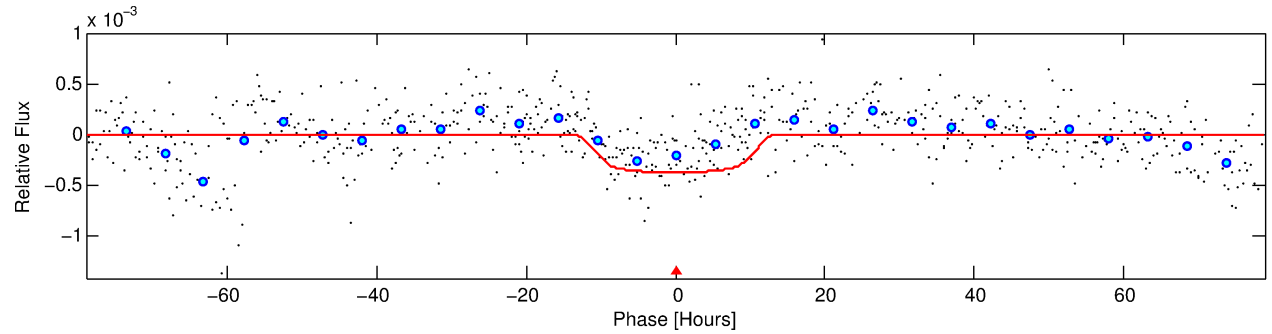
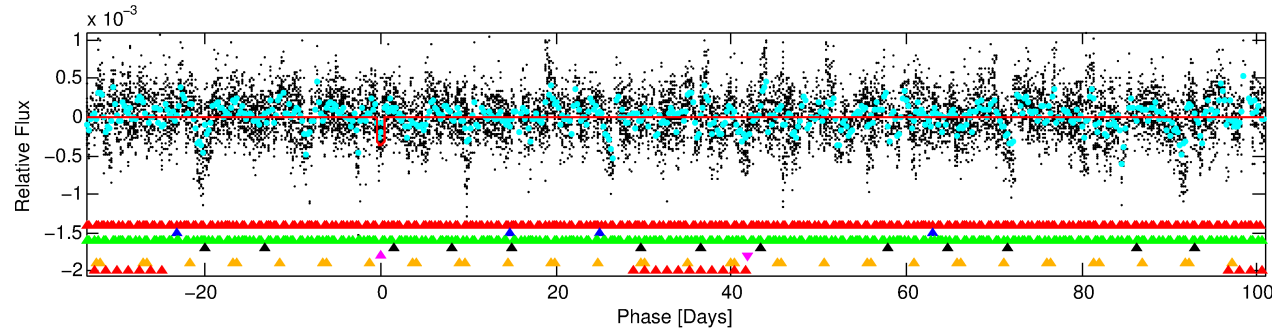
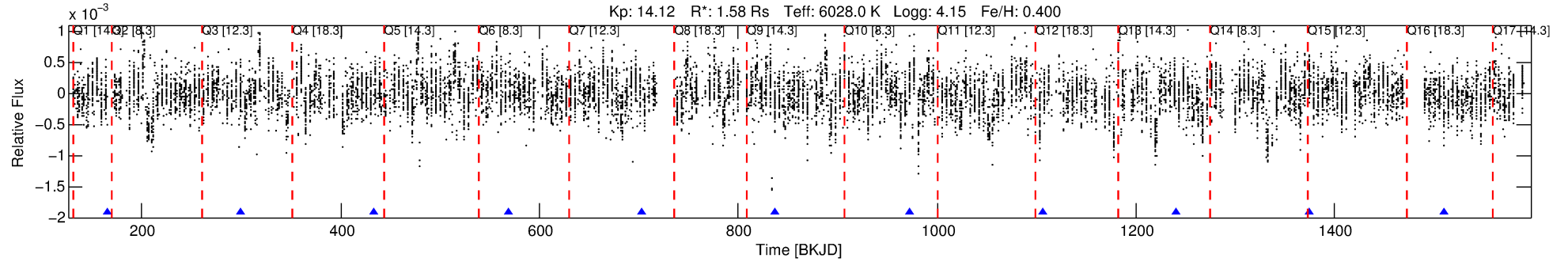
Ephemeris Match Information For 006868952-05

No Significant Match Found



# DV One-Page Summary

KIC: 6868952 Candidate: 5 of 7 Period: 134.487 d



## DV Fit Results:

Period = 134.48663 [0.00588] d  
Epoch = 164.7581 [0.0336] BKJD  
Rp/R\* = 0.0222 [0.0020]  
a/R\* = 15.01 [3.17]  
b = 0.95 [0.02]  
Seff = 9.46 [2.73]  
Teq = 447 [32] K  
Rp = 3.84 [0.89] Re  
a = 0.5599 [0.1051] AU  
Ag = 4284.91 [1585.08] [2.70 $\sigma$ ]  
Teff = 5593 [340] K [15.05 $\sigma$ ]

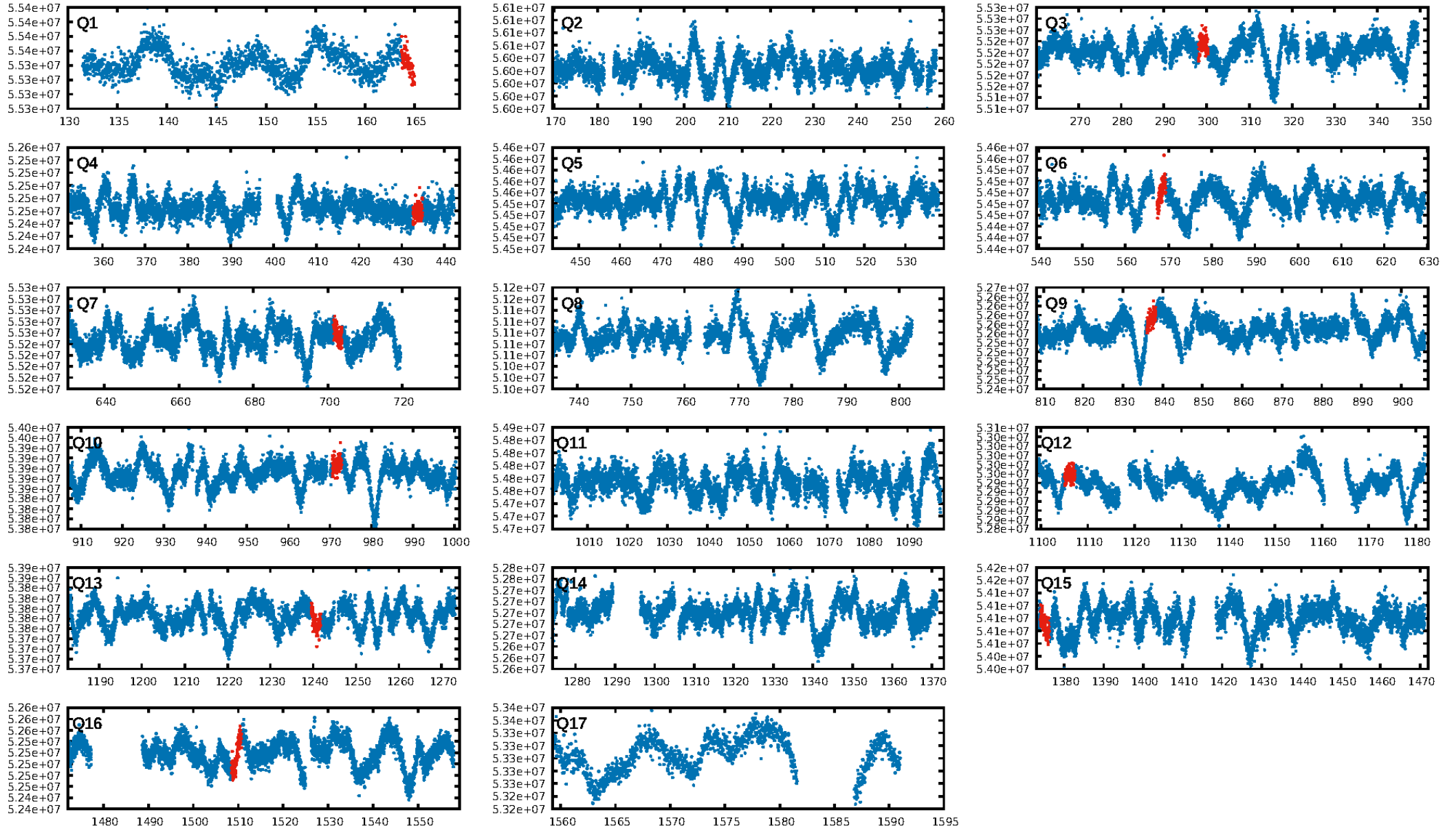
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [23.17 $\sigma$ ]  
LongPeriod-sig: 100.0% [182.21 $\sigma$ ]  
ModelChiSquare2-sig: 16.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.60e-23  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: 3.013  
Centroid-sig: 6.6%  
Centroid-so: 0.807 arcsec [2.16 $\sigma$ ]  
OotOffset-rm: 1.734 arcsec [3.21 $\sigma$ ]  
KicOffset-rm: 1.643 arcsec [3.00 $\sigma$ ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 0.00 [0/5]

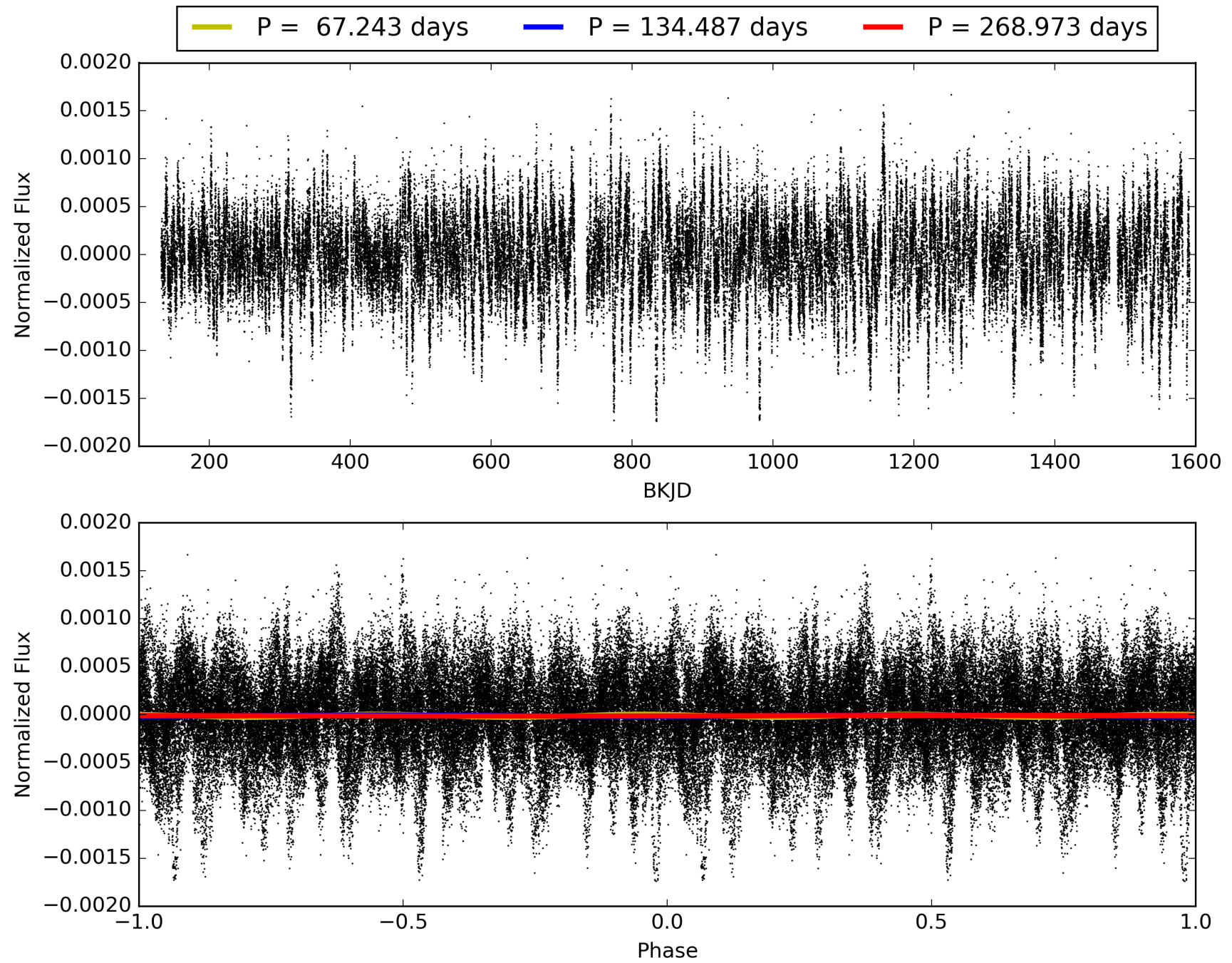
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:59:23 Z

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

# TCE 006868952-05, PDC Light Curves

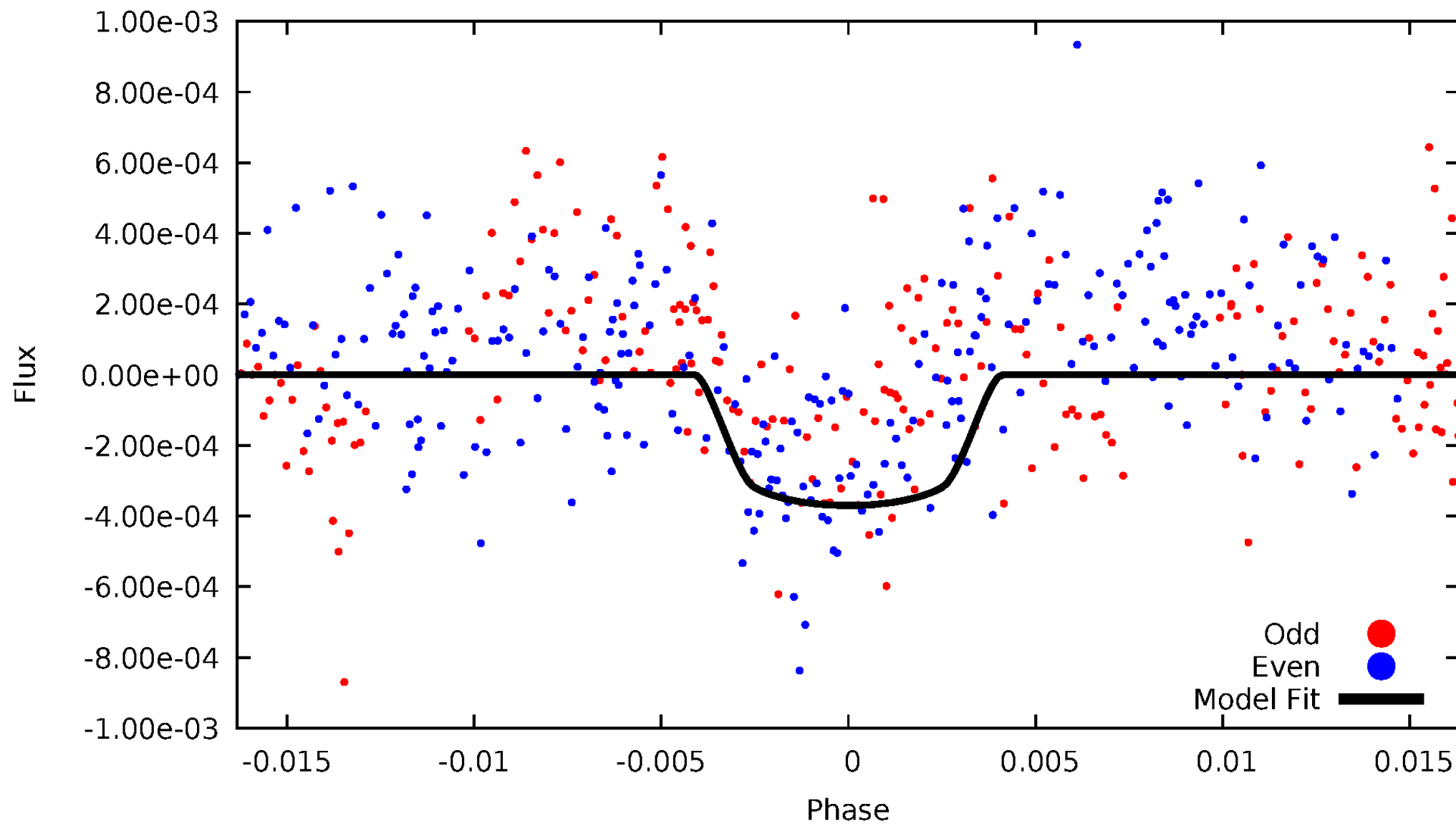


TCE 006868952-05



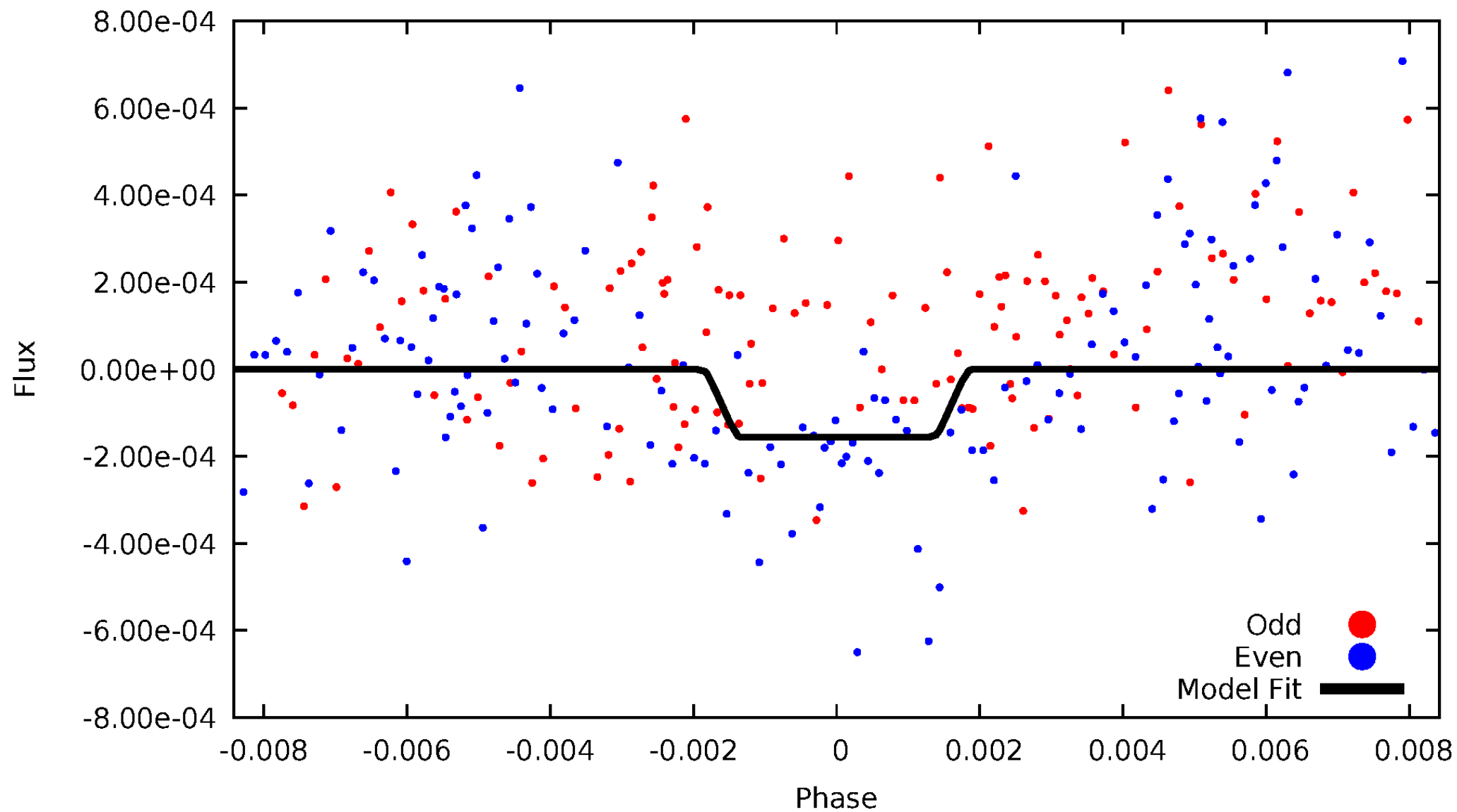
# DV Odd/Even

TCE 006868952-05



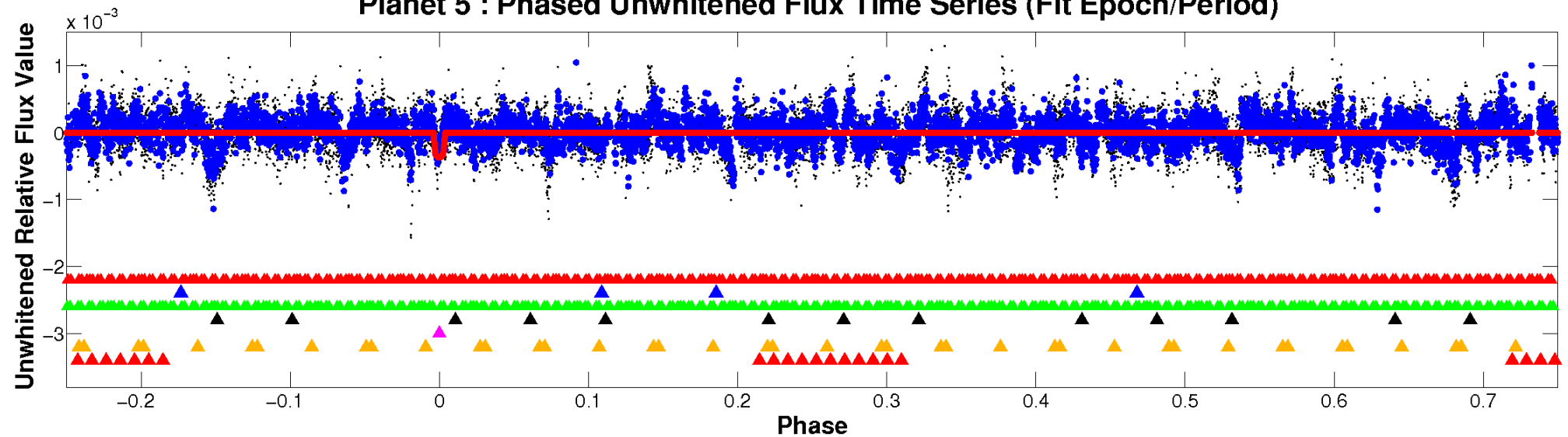
# ALT Odd/Even

TCE 006868952-05

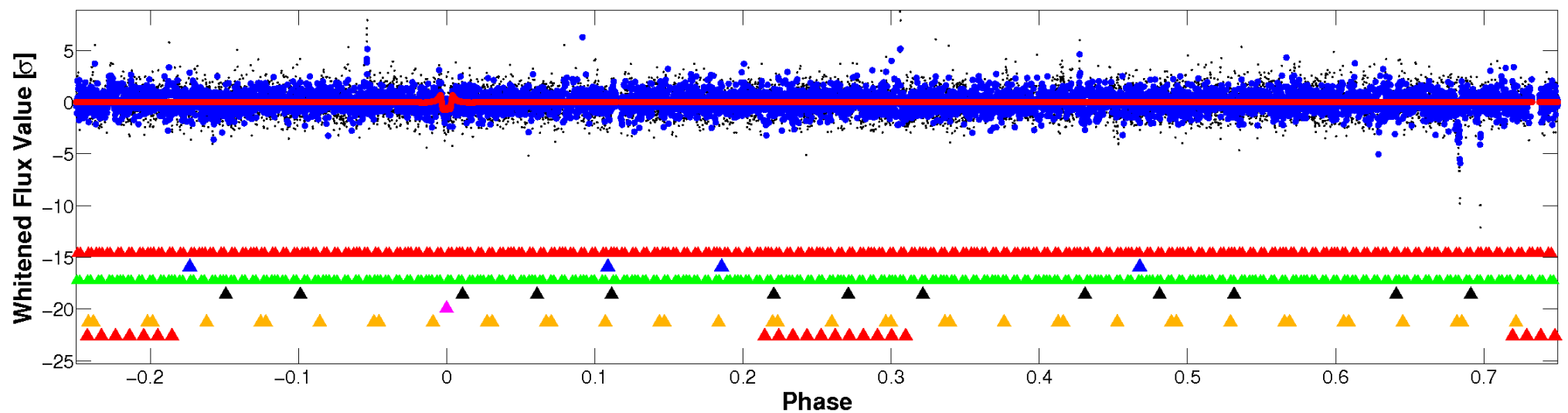


# Non-Whitened Vs. Whitened Light Curve

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



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





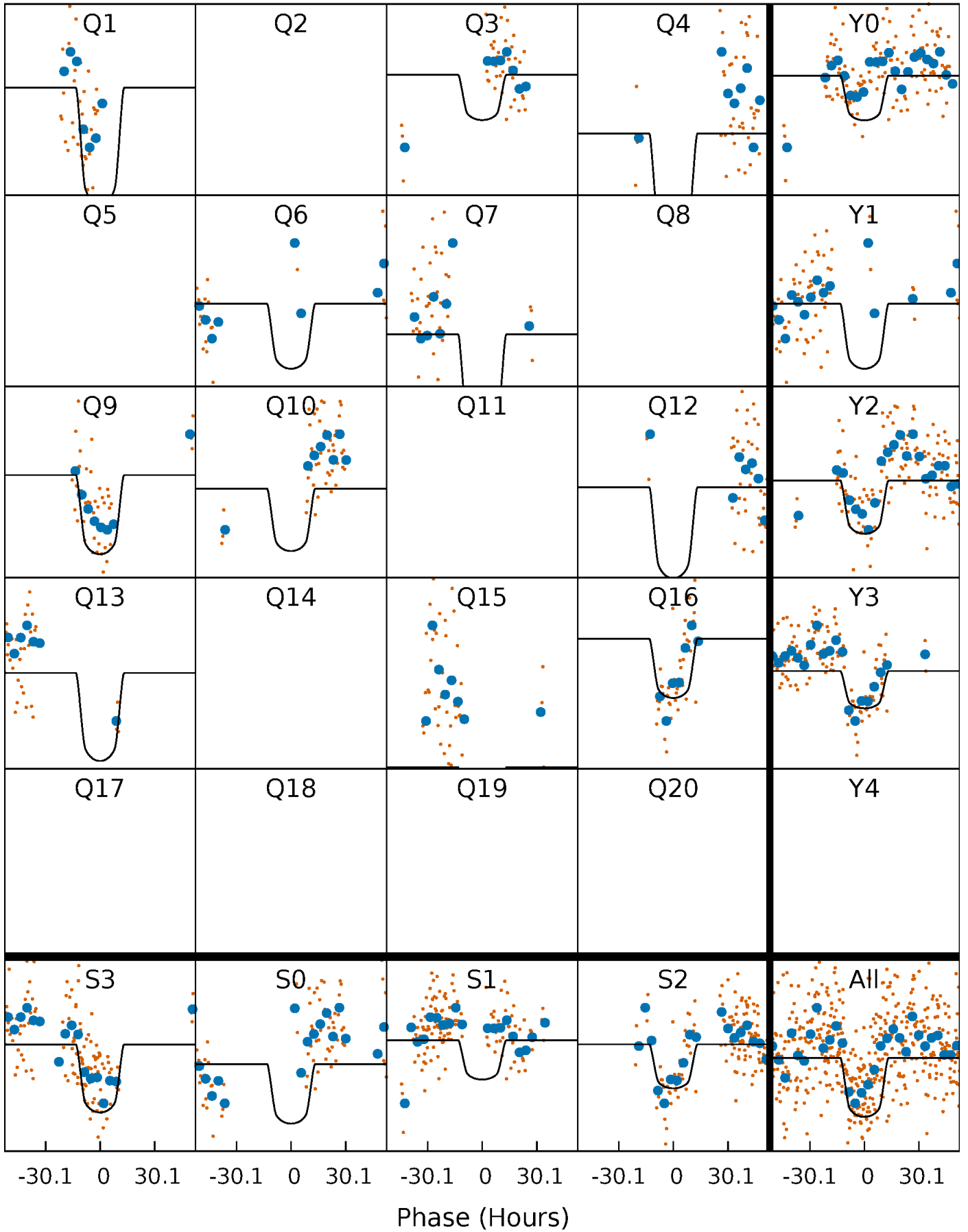
# PDC Quarter-Phased Transit Curves

TCE 006868952-05 P=134.486632 Days  $T_0=164.758051$  (BKJD)



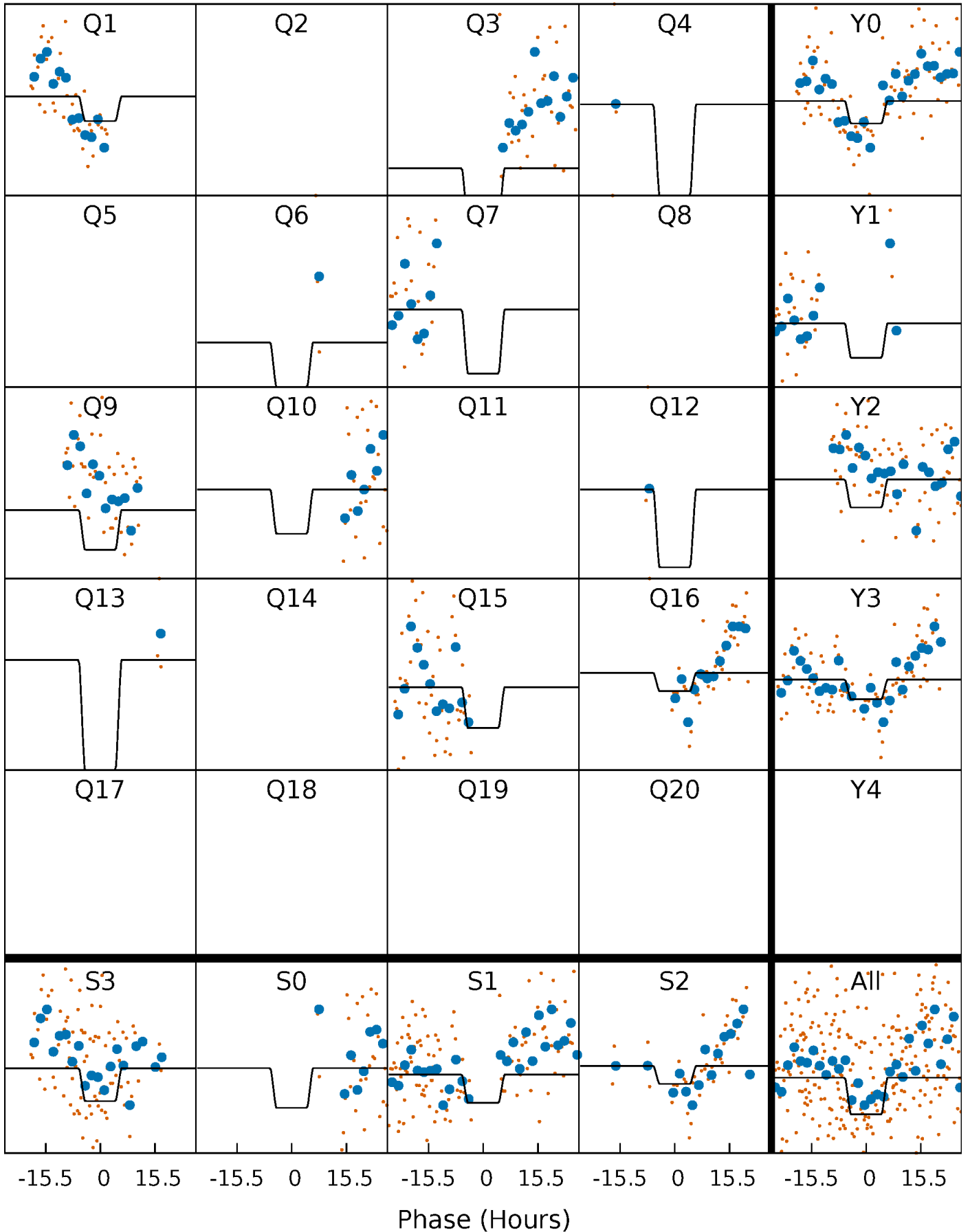
# DV Quarter-Phased Transit Curves

TCE 006868952-05     $P=134.486632$  Days     $T_0=164.758051$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

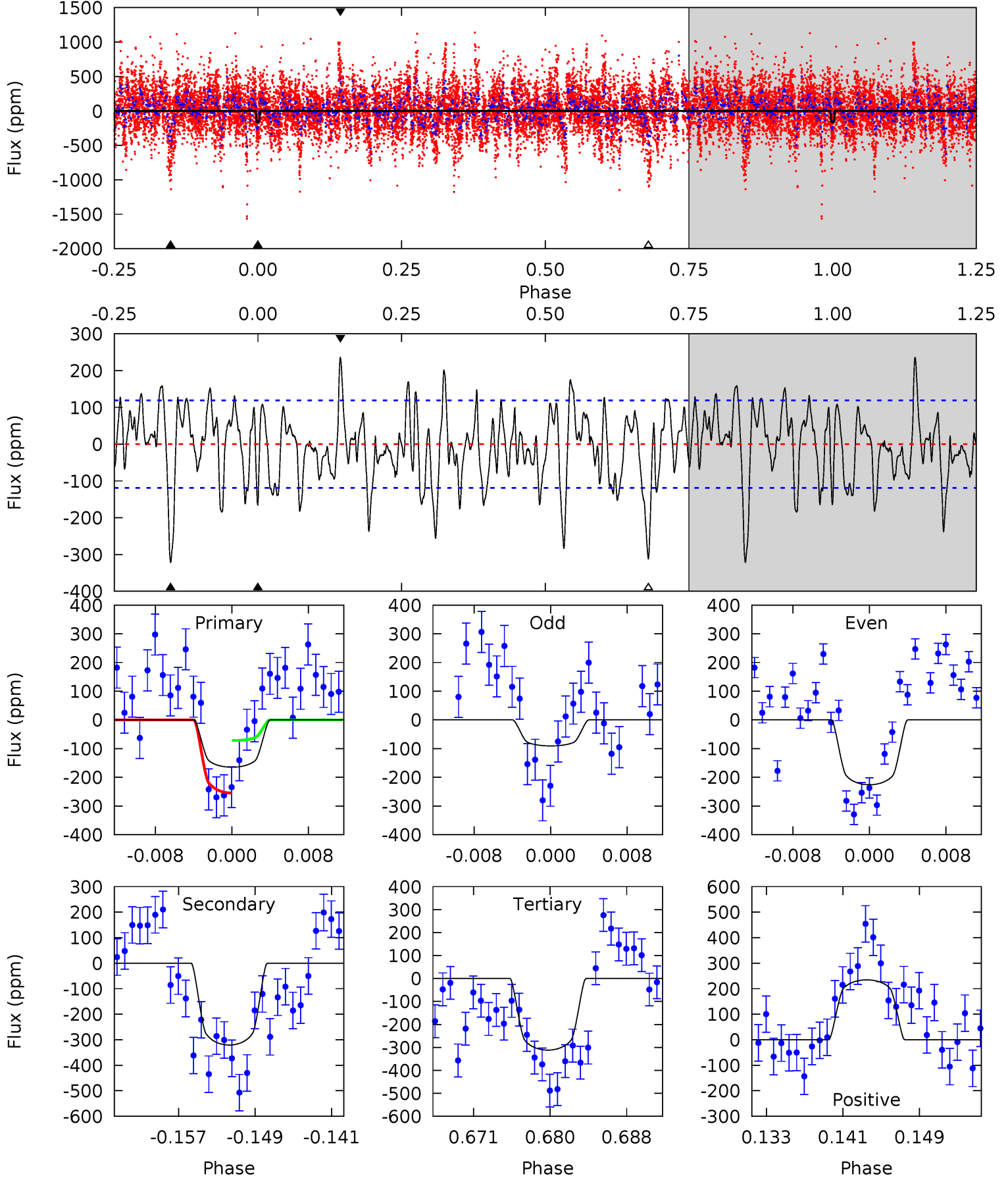
TCE 006868952-05     $P=134.459636$  Days     $T_0=164.679389$  (BKJD)



# DV Model-Shift Uniqueness Test

006868952-05, P = 134.486632 Days, E = 30.271419 Days

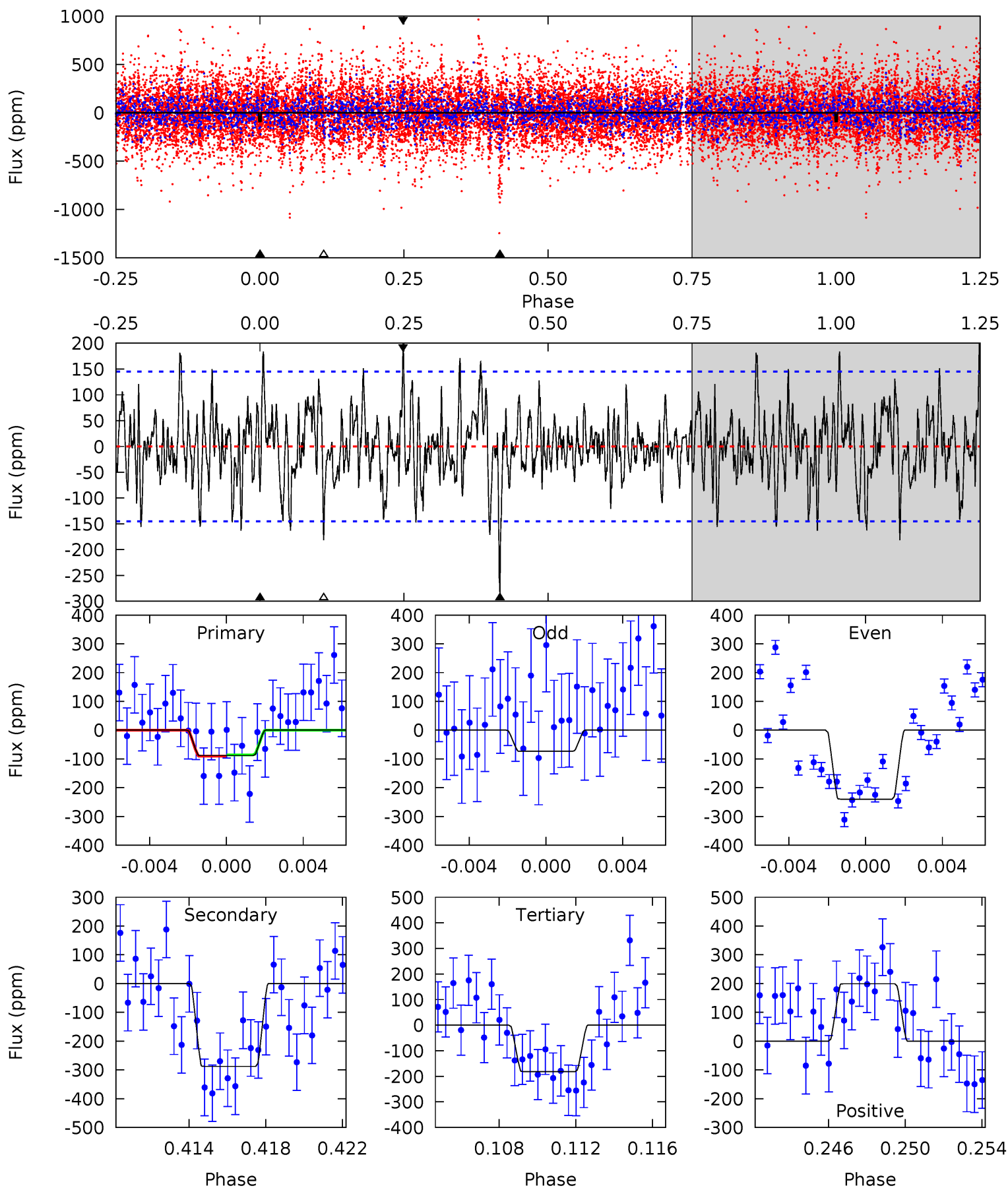
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.02	13.6	13.3	9.98	5.06	2.64	3.81	-6.25	-2.96	0.38	3.67	2.92	-1.09	0.42	3.91



# Alt Model-Shift Uniqueness Test

006868952-05, P = 134.459636 Days, E = 30.219753 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
3.17	10.3	6.51	7.15	5.21	2.90	2.09	-3.35	-3.99	3.82	3.18	2.94	0.27	0.41	0.08



### Stellar Parameters For KIC 006868952

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6028^{+81}_{-81}$	$4.151^{+0.160}_{-0.116}$	$0.400^{+0.100}_{-0.150}$	$1.583^{+0.275}_{-0.337}$	$1.296^{+0.101}_{-0.111}$	$0.460^{+0.387}_{-0.152}$
	+1%/-1%	+4%/-3%	+25%/-37%	+17%/-21%	+8%/-9%	+84%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 006868952-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-321 \pm 24$	$3.81^{+0.51}_{-0.50}$	$625^{+29}_{-33}$	$5442^{+259}_{-225}$	$3765^{+1303}_{-823}$
Alt.	$-288 \pm 28$	$2.13^{+0.41}_{-0.39}$	$625^{+31}_{-34}$	$7091^{+812}_{-567}$	$10831^{+5741}_{-3371}$

$T_{\text{max}}$  = 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

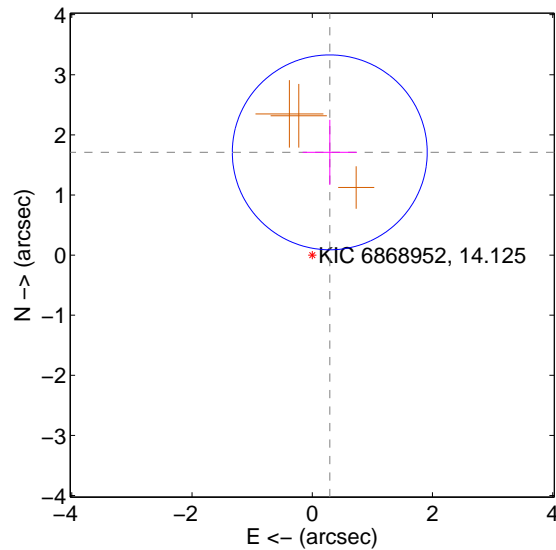
Supplemental centroid analysis for 006868952-05. Kepler magnitude: 14.12. Transit SNR 8.29

There are 0 quarters with good PRF difference image offsets

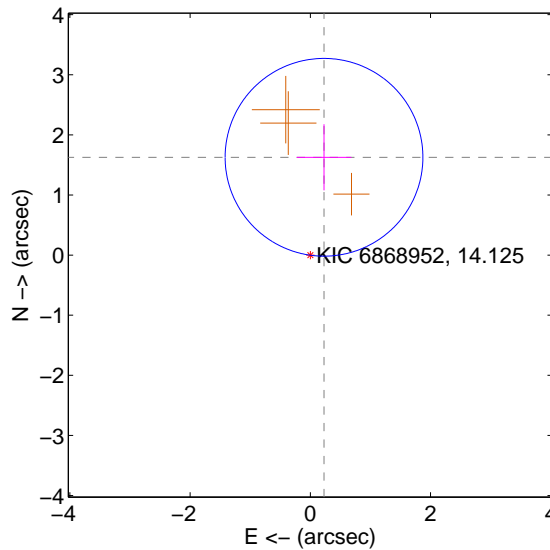
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.734 \pm 0.540$	3.21	$-0.292 \pm 0.451$	$1.709 \pm 0.543$
PRF-fit source offset from KIC position	$1.643 \pm 0.548$	3.00	$-0.228 \pm 0.455$	$1.627 \pm 0.550$
photometric centroid source offset	$0.81 \pm 0.37$	2.16	$0.73 \pm 0.38$	$0.33 \pm 0.36$

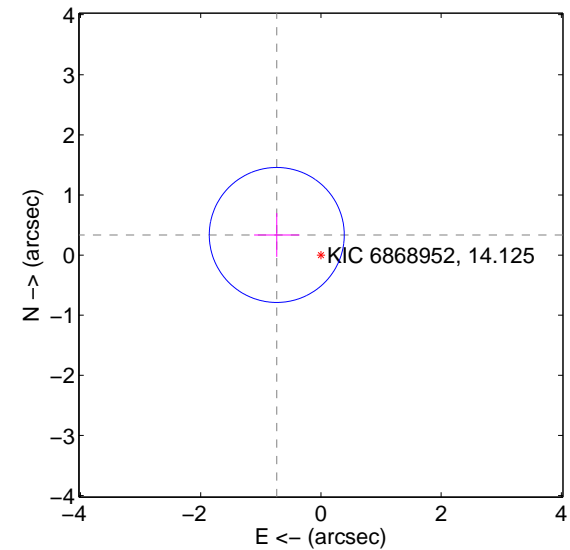
offset from difference PRF-fit to OOT PRF-fit



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



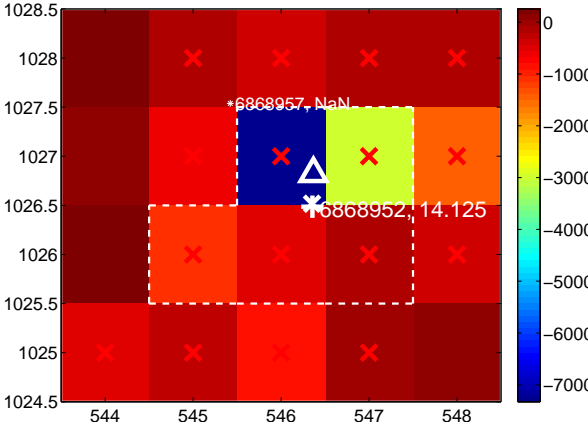
Q2 no difference image



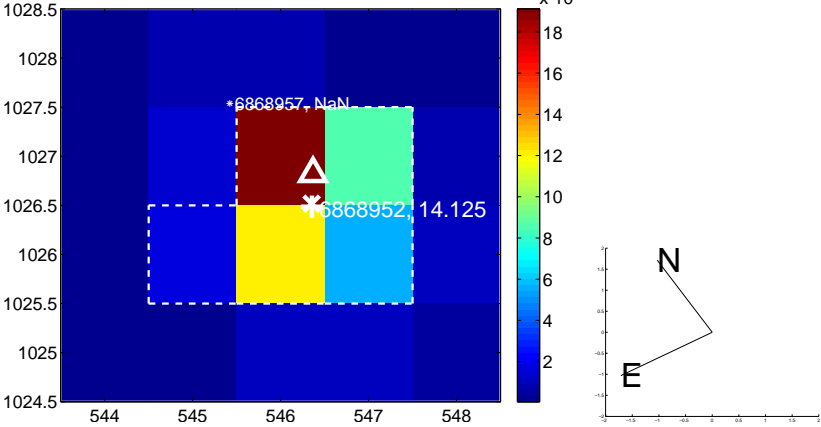
Q2 no OOT image



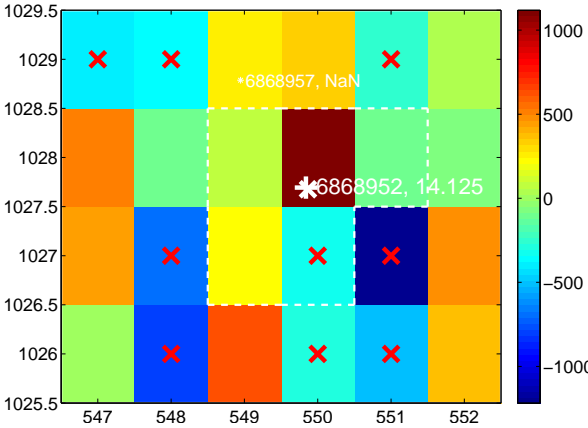
Q3 difference image. Poor Quality



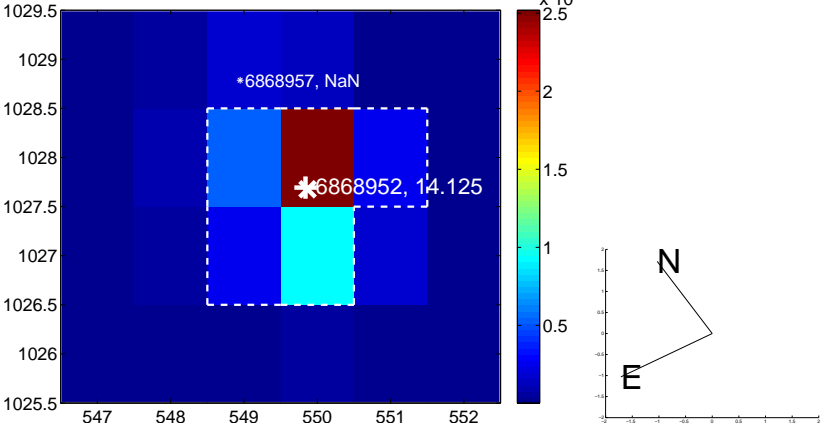
Q3 OOT image



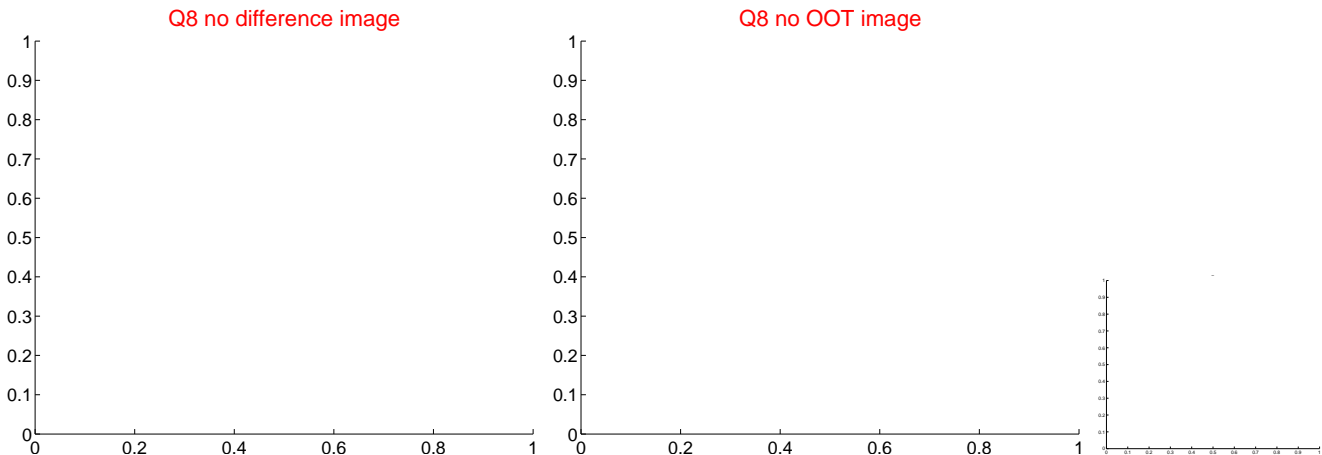
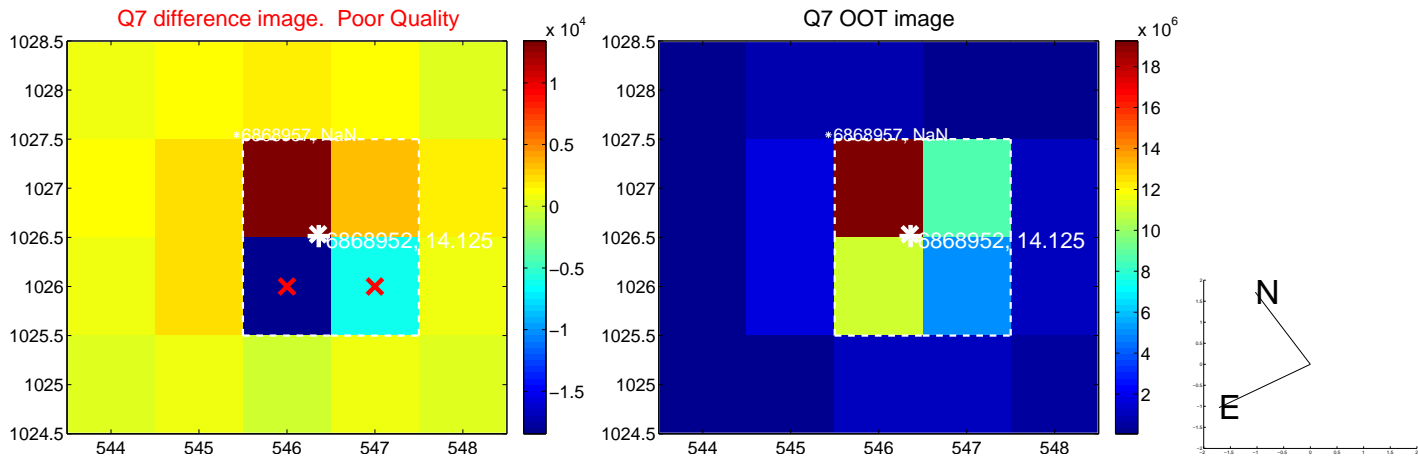
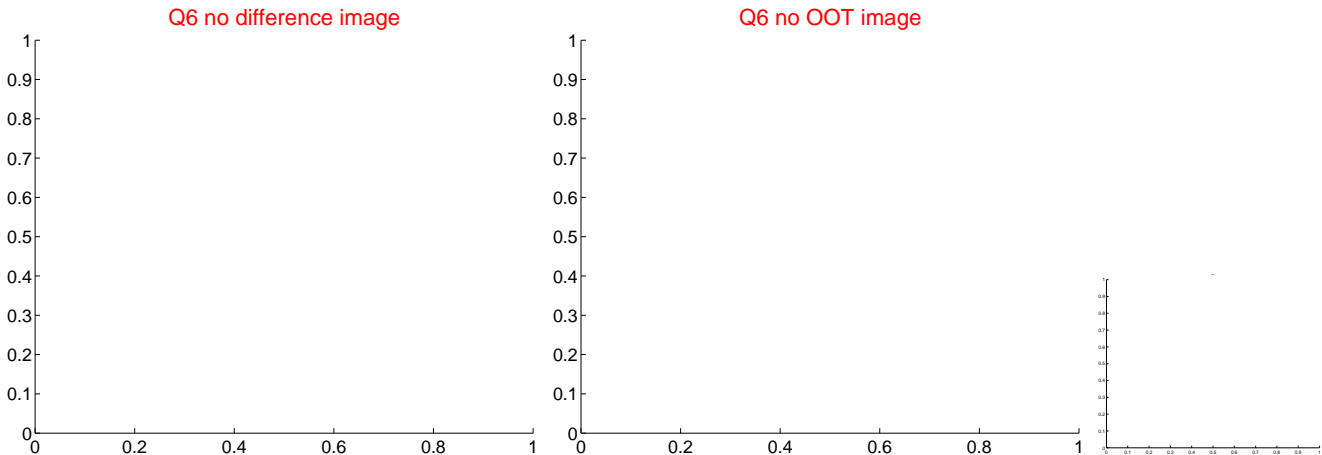
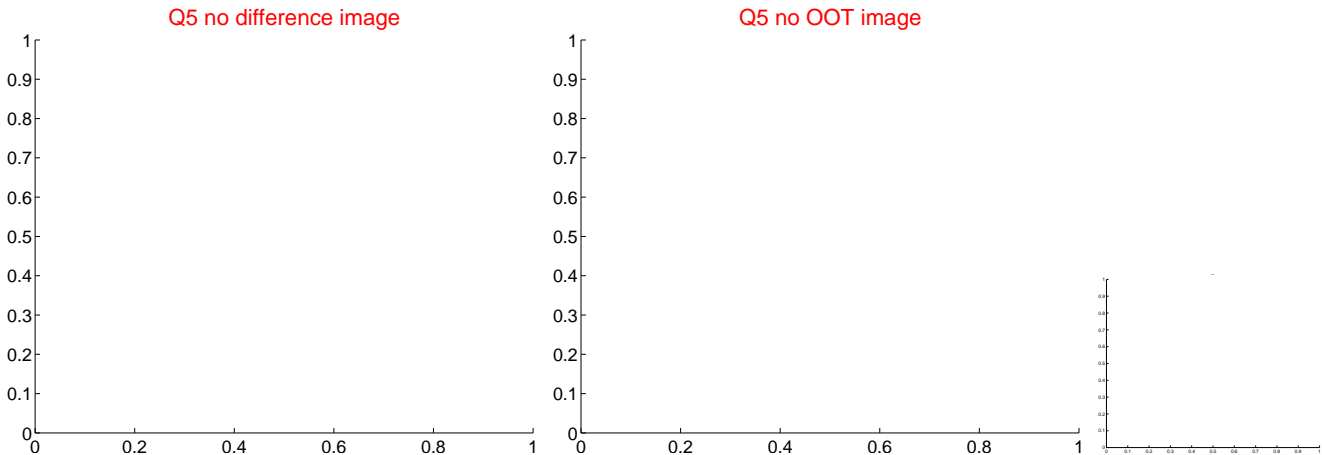
Q4 difference image. Poor Quality



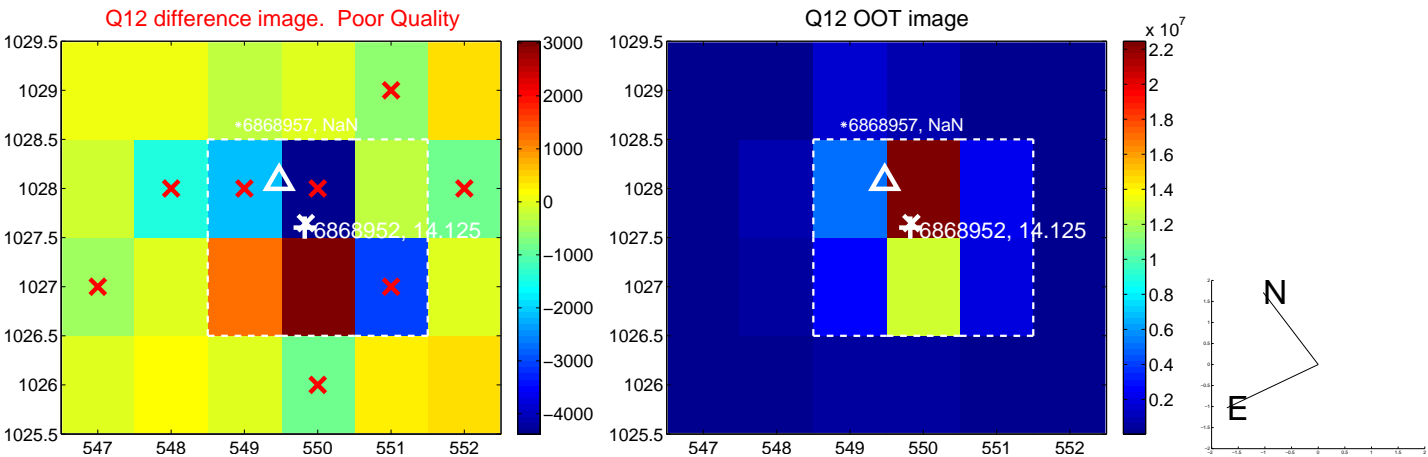
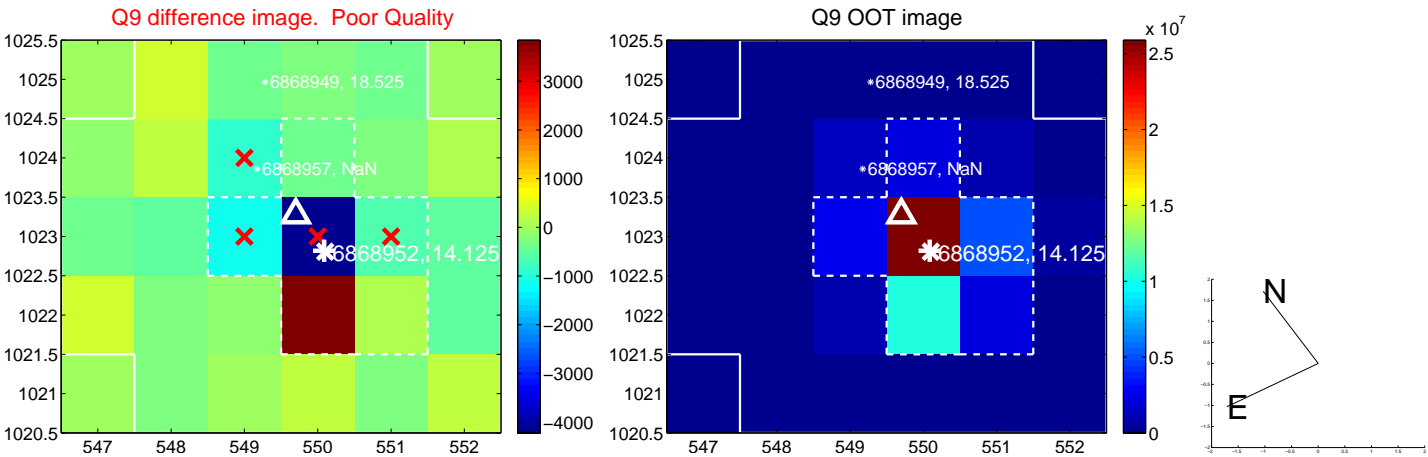
Q4 OOT image



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



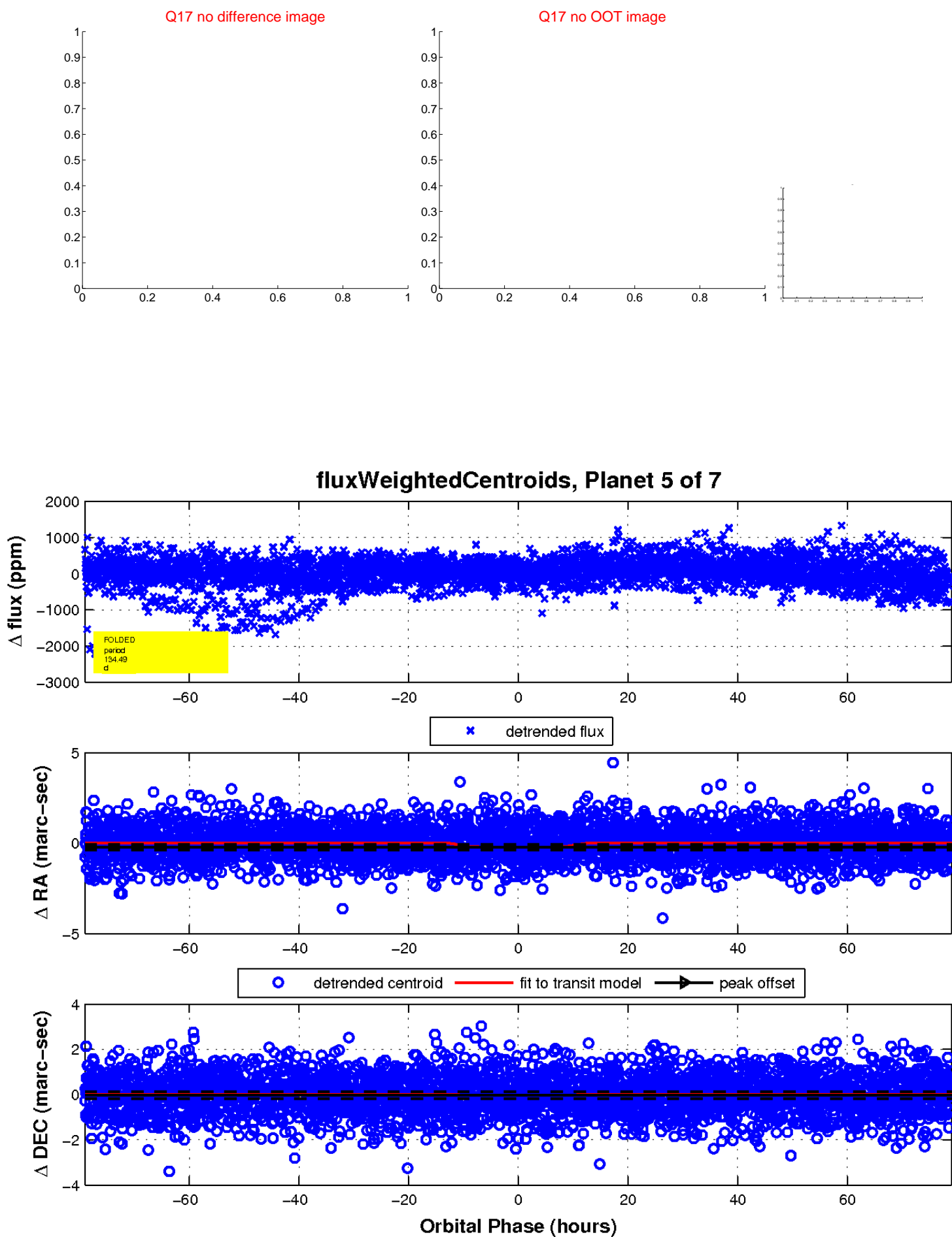
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

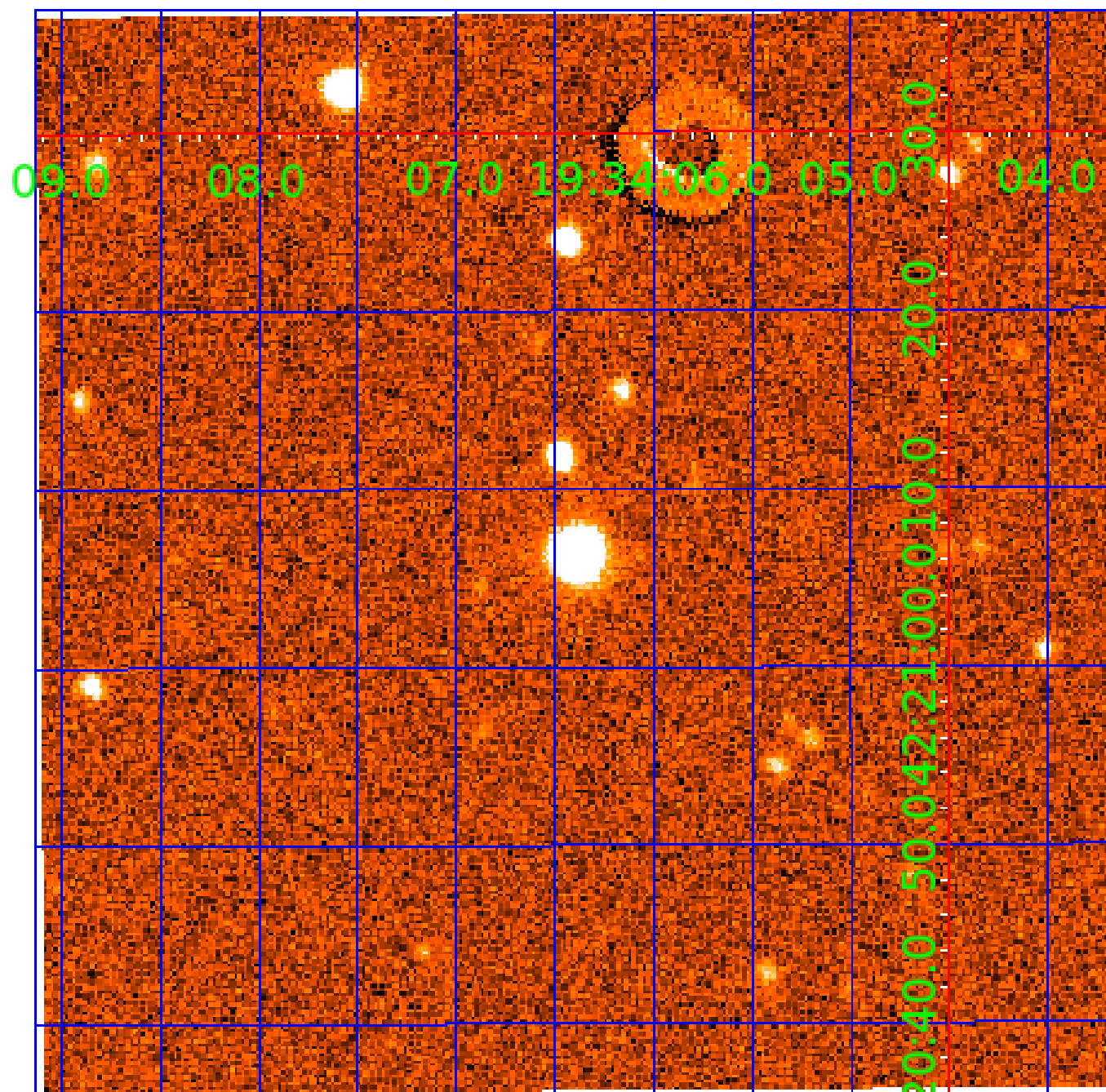


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006868952

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006868952-01	OBS	No	4.671481	132.975833	45.5	14.290	8.0	8.7	1.58	6028	1.26	834.26
006868952-02	OBS	No	355.190361	189.720331	490.3	12.265	16.6	7.4	1.58	6028	3.52	2.59
006868952-03	OBS	No	4.671515	134.874401	43.8	14.839	7.2	9.0	1.58	6028	1.11	834.25
006868952-04	OBS	No	106.236149	236.236835	1.4	12.707	23.3	0.0	1.58	6028	0.20	12.95
006868952-05	OBS	No	134.486632	164.758051	370.0	26.357	15.1	8.3	1.58	6028	3.84	9.46
006868952-06	OBS	No	36.190386	138.068538	210.5	15.178	7.2	7.3	1.58	6028	2.47	54.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006868952-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006868952-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006868952-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
006868952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006868952-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_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.

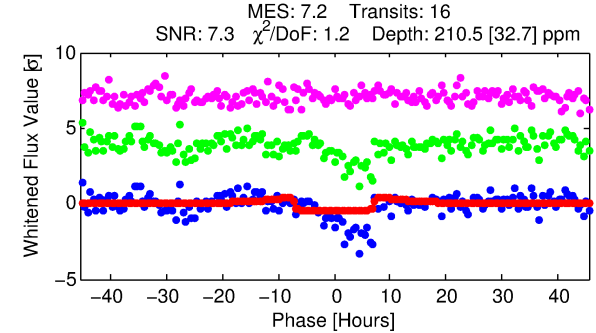
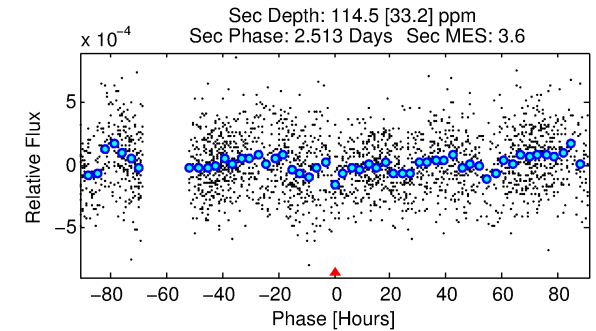
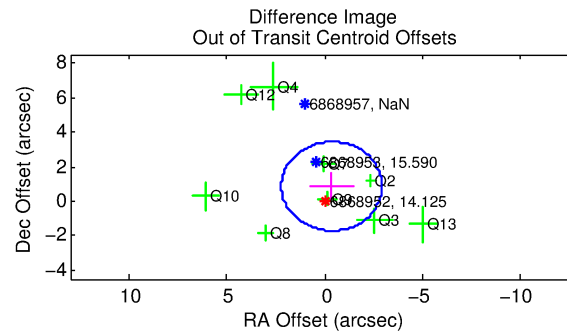
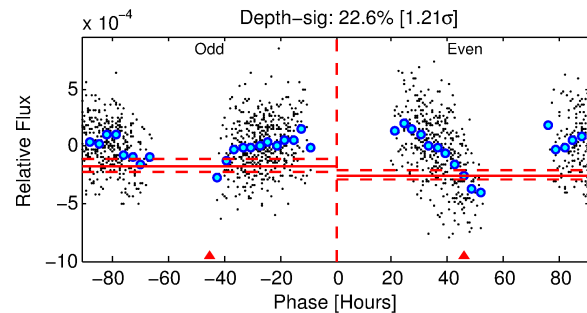
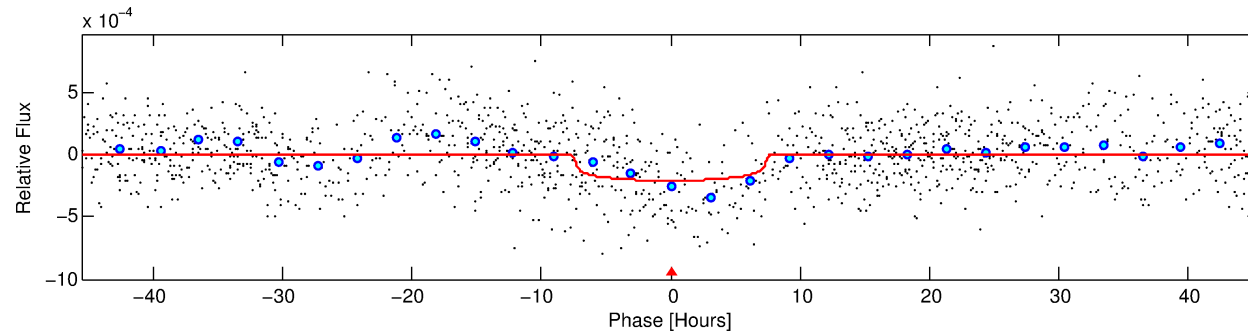
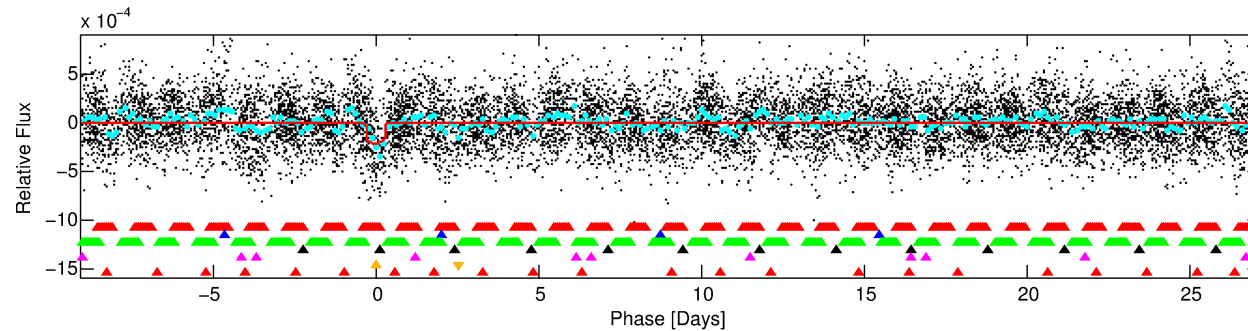
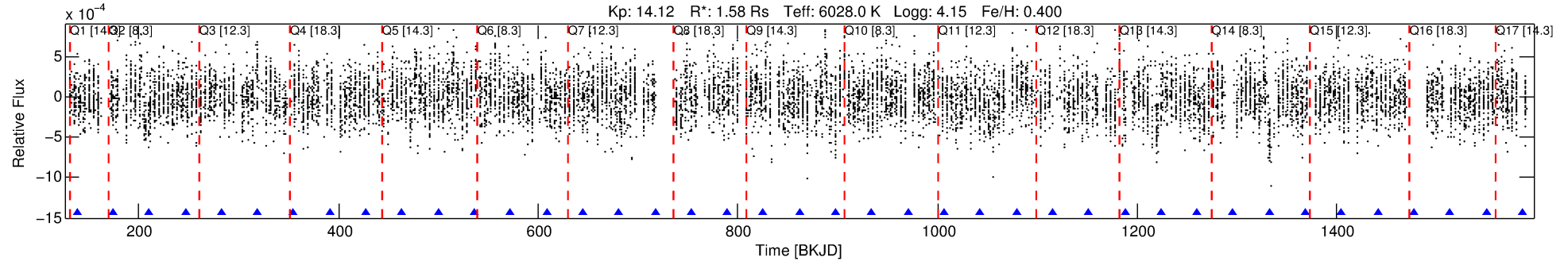
Ephemeris Match Information For 006868952-06

No Significant Match Found



# DV One-Page Summary

KIC: 6868952 Candidate: 6 of 7 Period: 36.190 d



## DV Fit Results:

Period = 36.19039 [0.00104] d  
Epoch = 138.0685 [0.0173] BKJD  
Rp/R\* = 0.0143 [0.0051]  
a/R\* = 12.89 [20.18]  
b = 0.73 [1.02]  
Seff = 54.42 [15.71]  
Teq = 693 [50] K  
Rp = 2.47 [1.03] Re  
a = 0.2334 [0.0438] AU  
Ag = 560.53 [461.02] [1.21 $\sigma$ ]  
Teffp = 5210 [1008] K [4.48 $\sigma$ ]

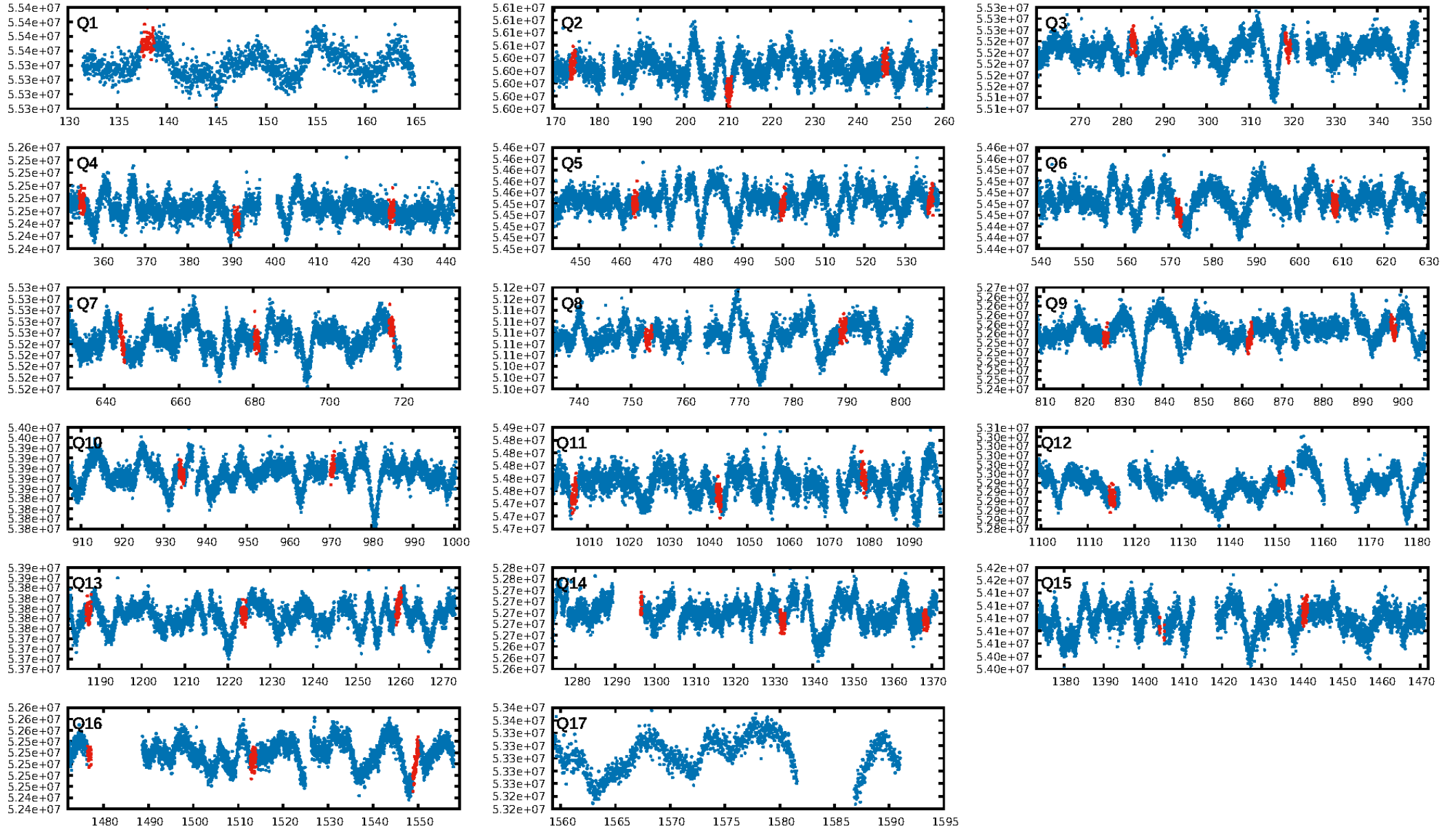
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [35.64 $\sigma$ ]  
LongPeriod-sig: 100.0% [29.81 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 9.81e-09  
RollingBand-fgt: 1.00 [16/16]  
GhostDiagnostic-chr: -6.935  
Centroid-sig: 82.8%  
Centroid-so: 0.173 arcsec [0.41 $\sigma$ ]  
OotOffset-rm: 0.934 arcsec [1.09 $\sigma$ ]  
OotOffset-st: 2/2/3/2 [9]  
KicOffset-rm: 0.898 arcsec [1.06 $\sigma$ ]  
KicOffset-st: 2/2/3/2 [9]  
DiffImageQuality-fgm: 0.44 [4/9]  
DiffImageOverlap-fno: 0.00 [0/16]

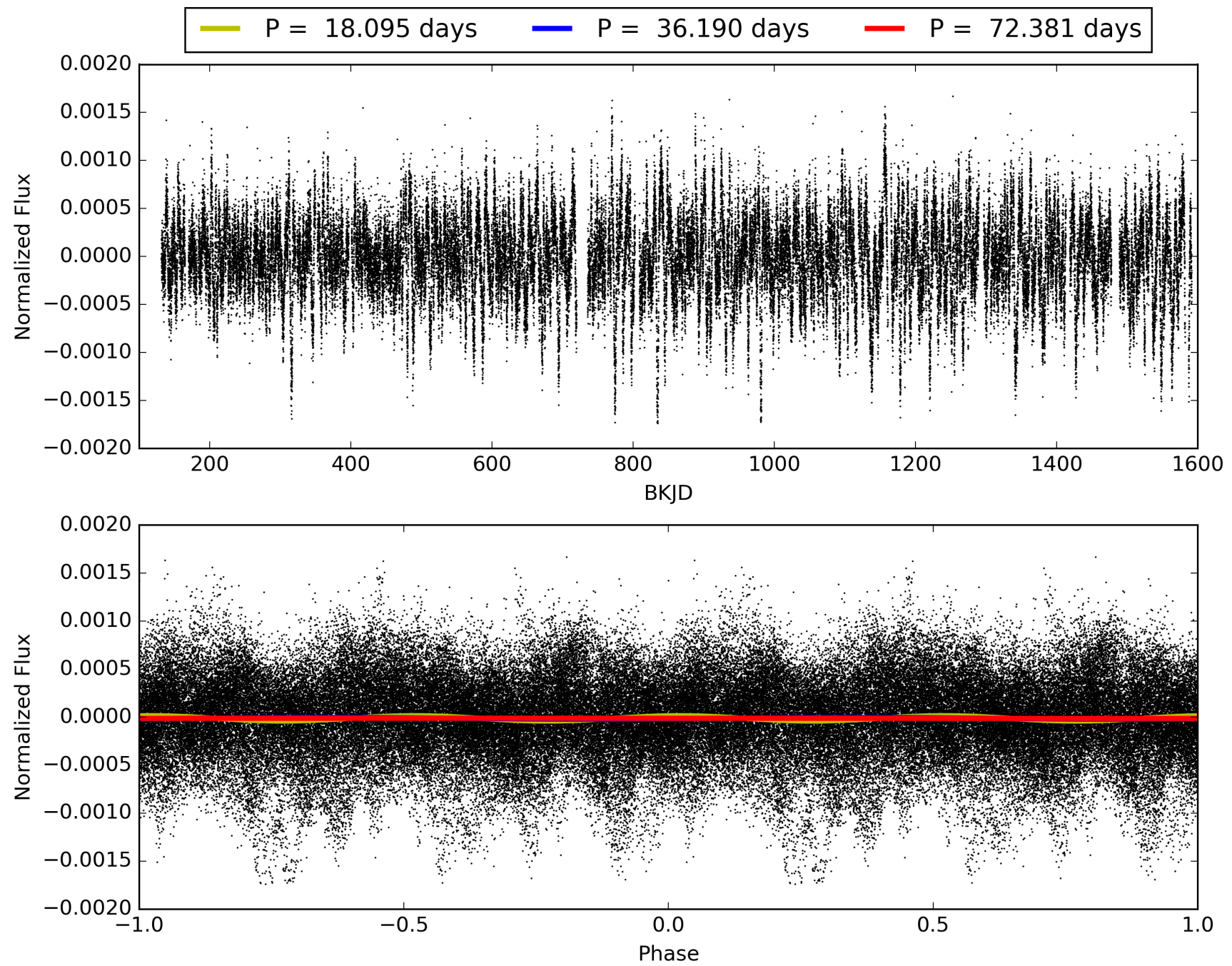
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:59:27 Z

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

# TCE 006868952-06, PDC Light Curves

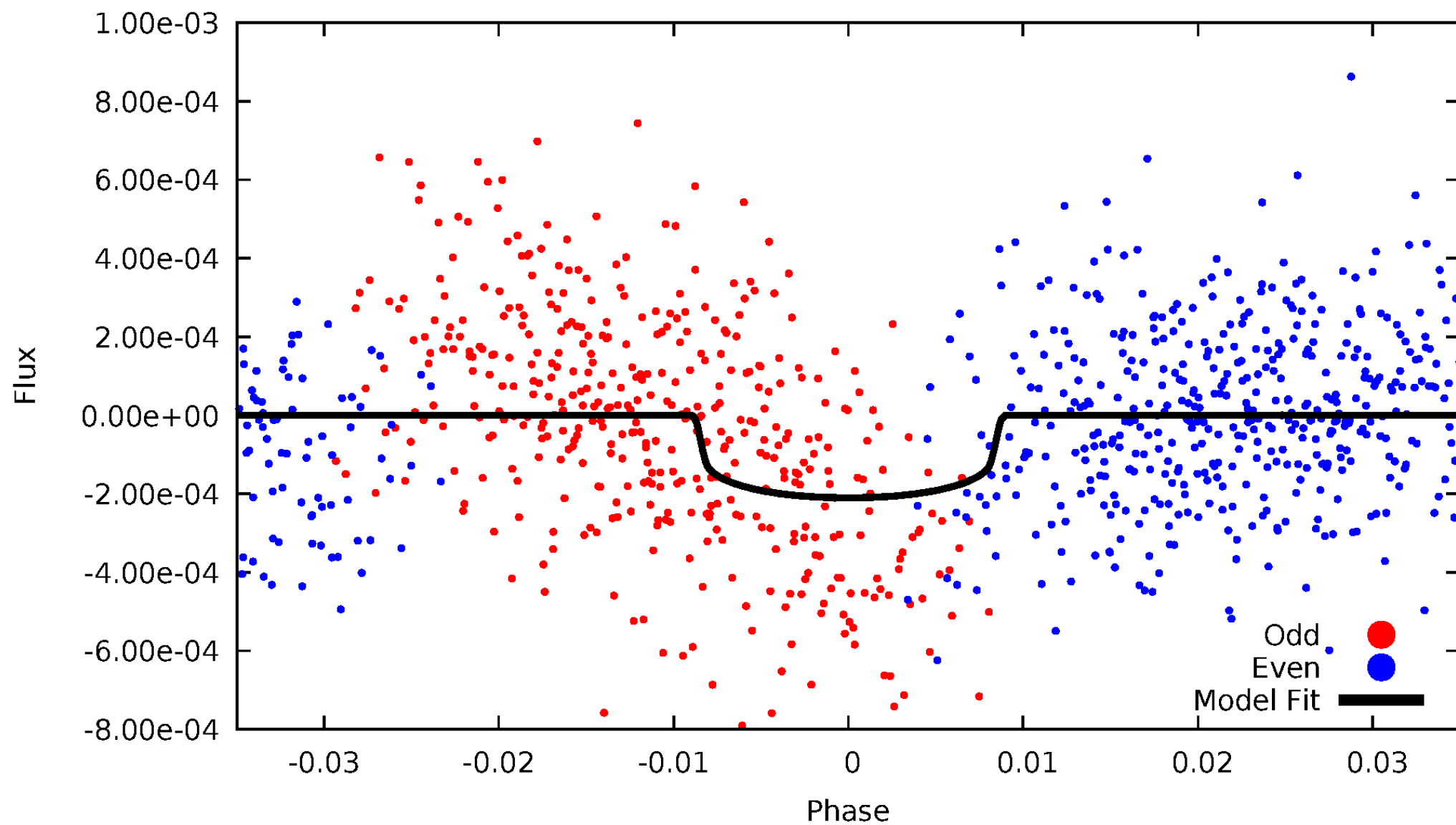


TCE 006868952-06



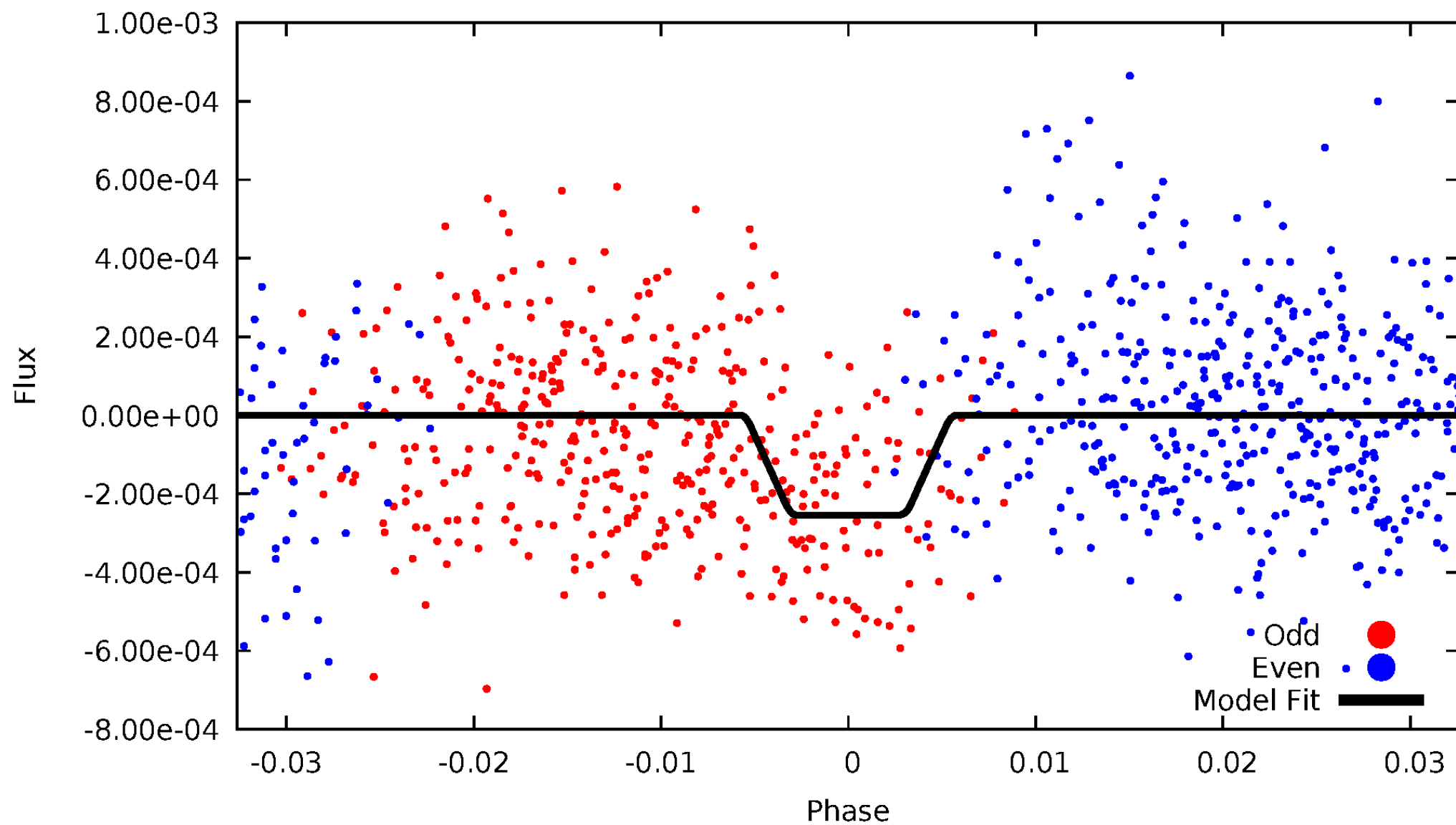
# DV Odd/Even

TCE 006868952-06



# ALT Odd/Even

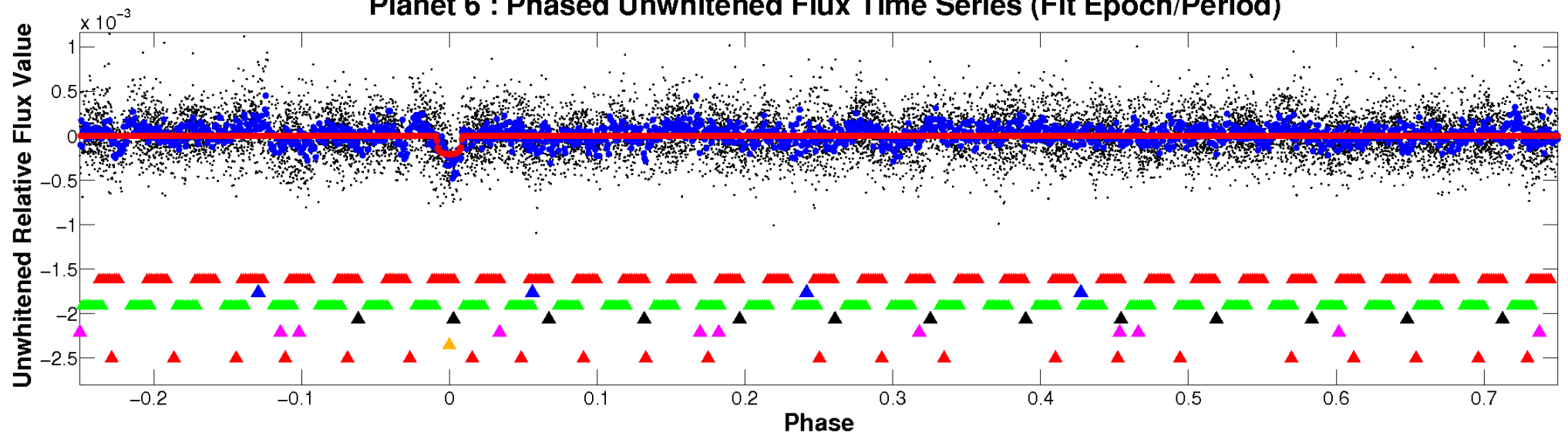
TCE 006868952-06



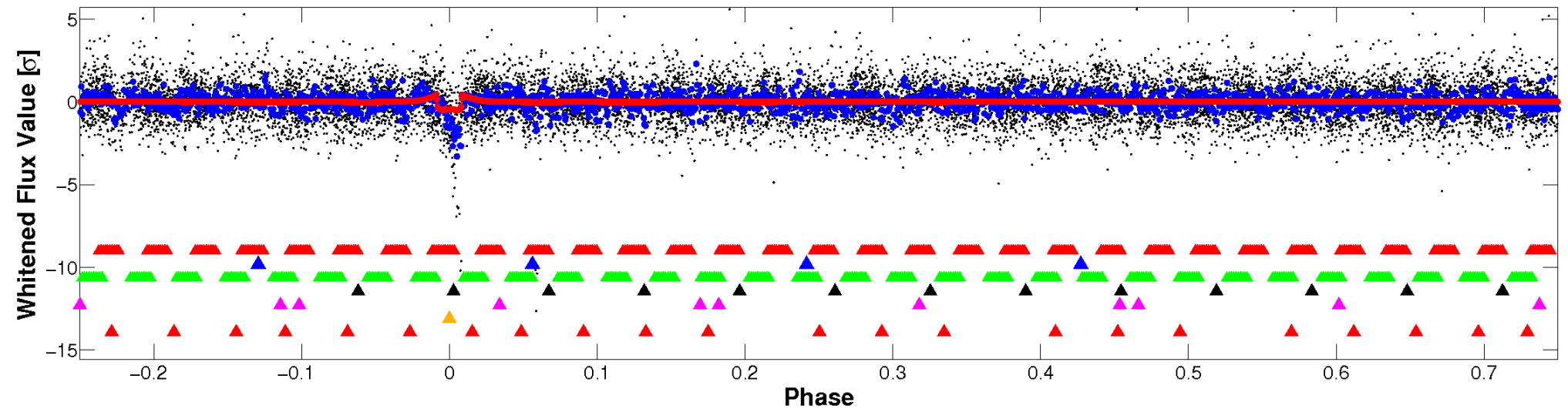


# Non-Whitened Vs. Whitened Light Curve

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

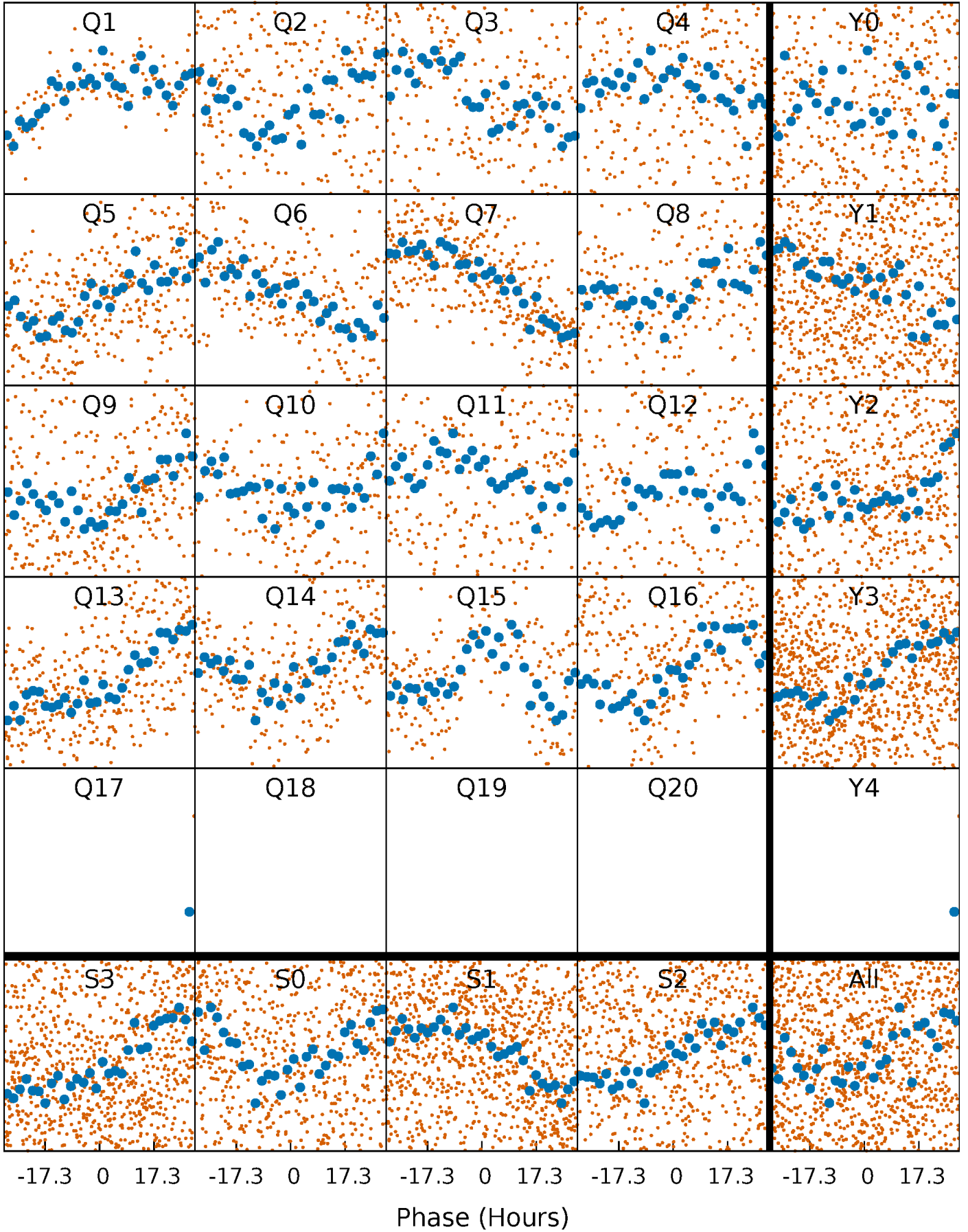


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

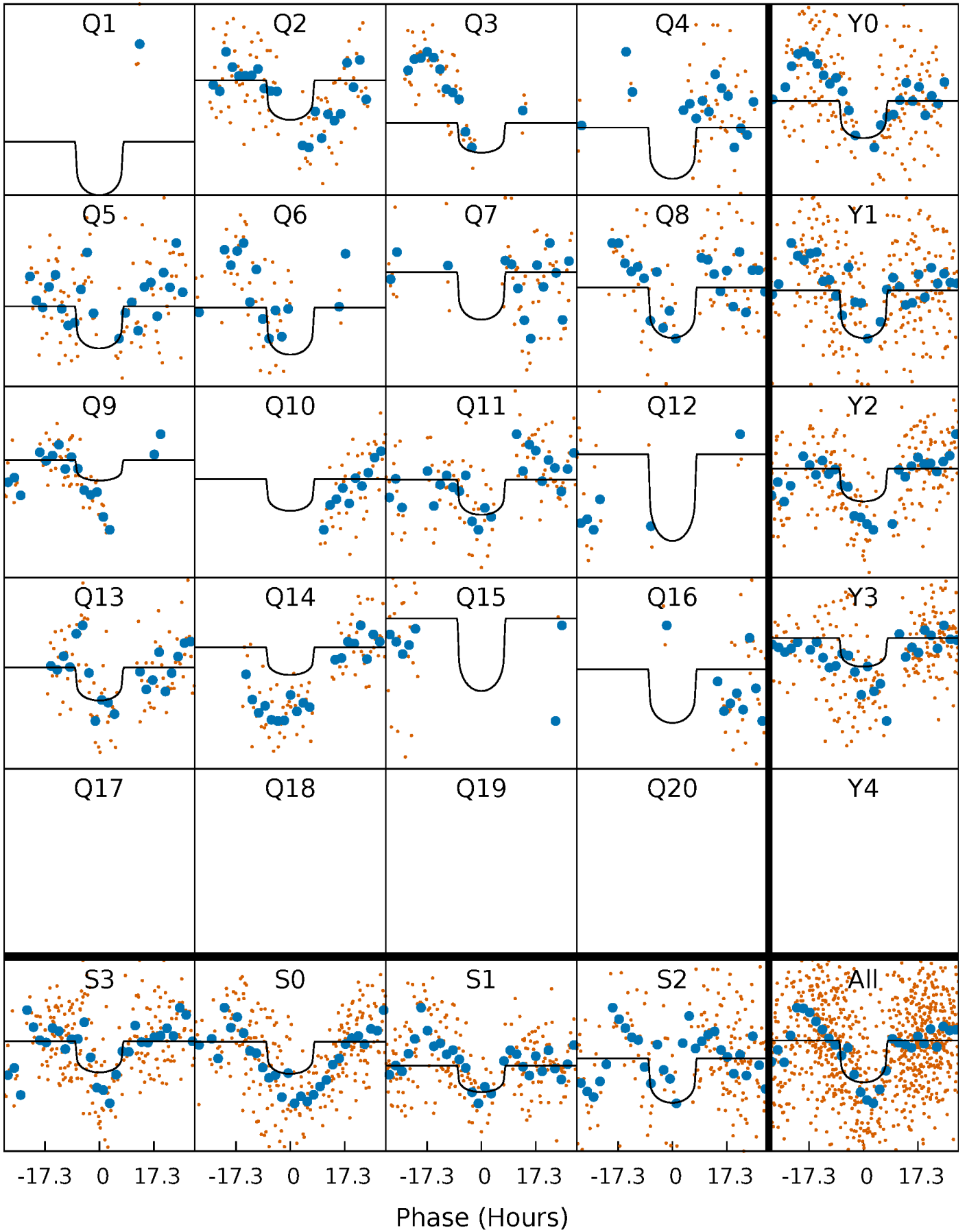
TCE 006868952-06 P= 36.190386 Days  $T_0=138.068538$  (BKJD)





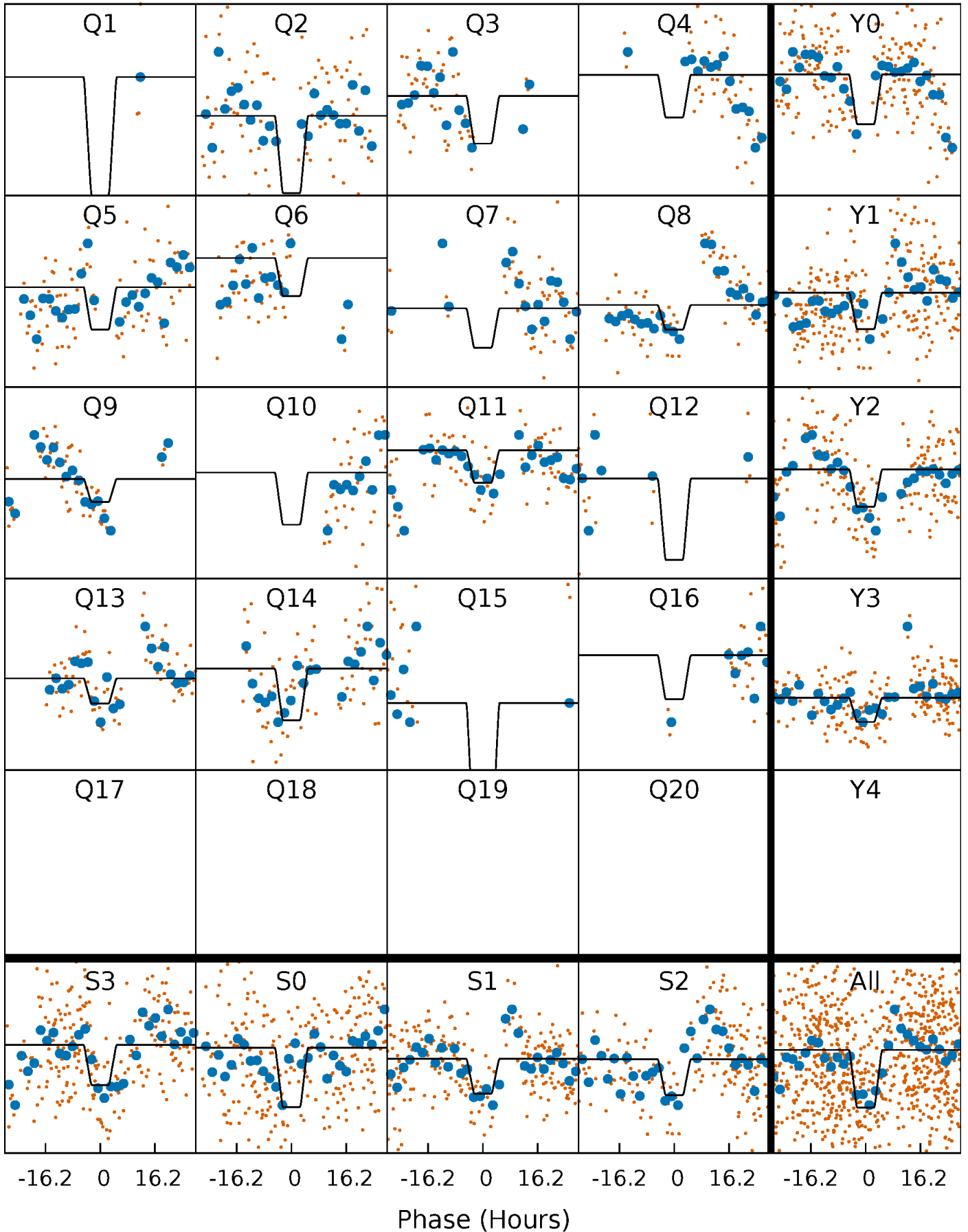
# DV Quarter-Phased Transit Curves

TCE 006868952-06 P= 36.190386 Days  $T_0=138.068538$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

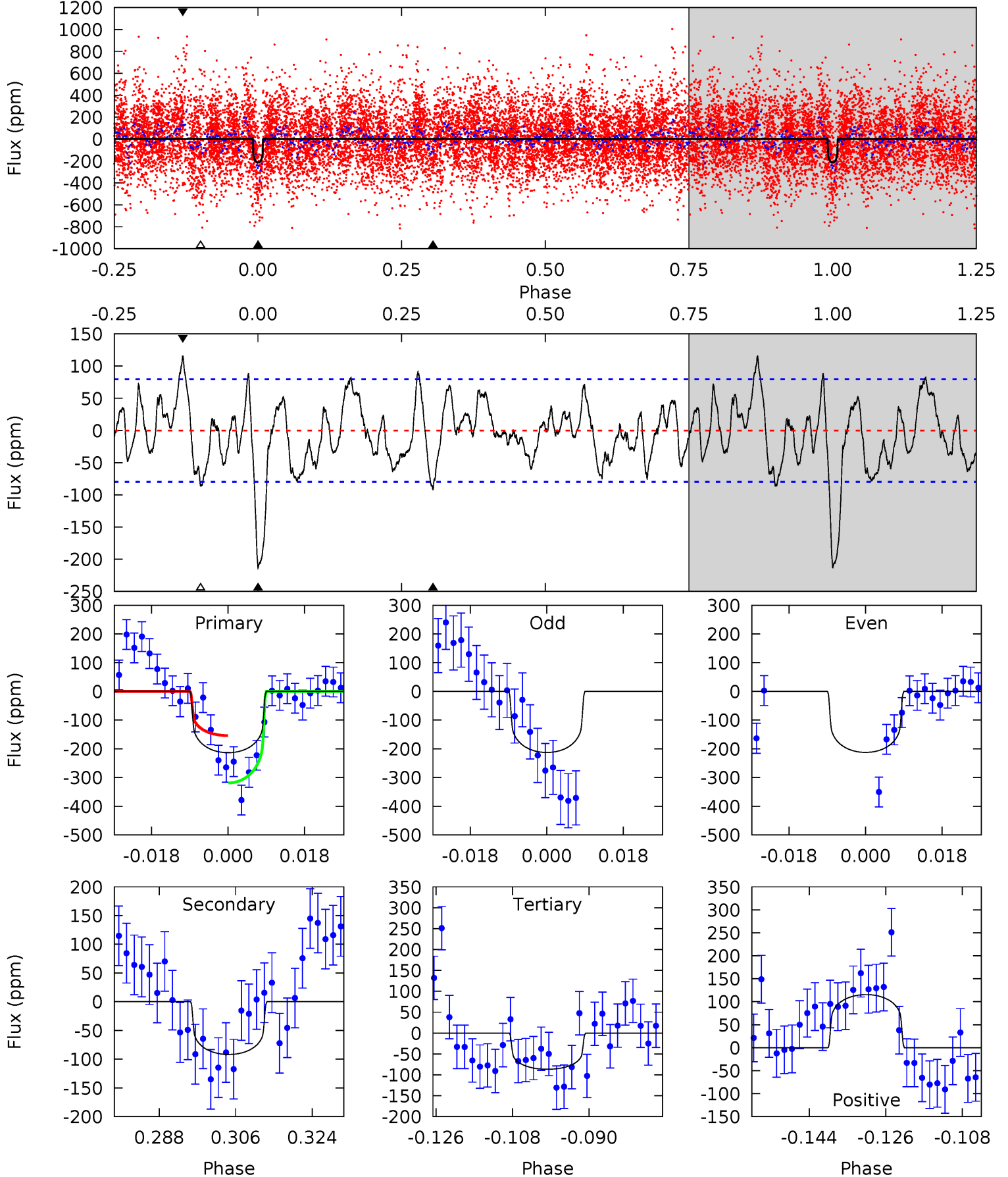
TCE 006868952-06 P= 36.188346 Days  $T_0=138.105972$  (BKJD)



# DV Model-Shift Uniqueness Test

006868952-06, P = 36.190386 Days, E = 101.878152 Days

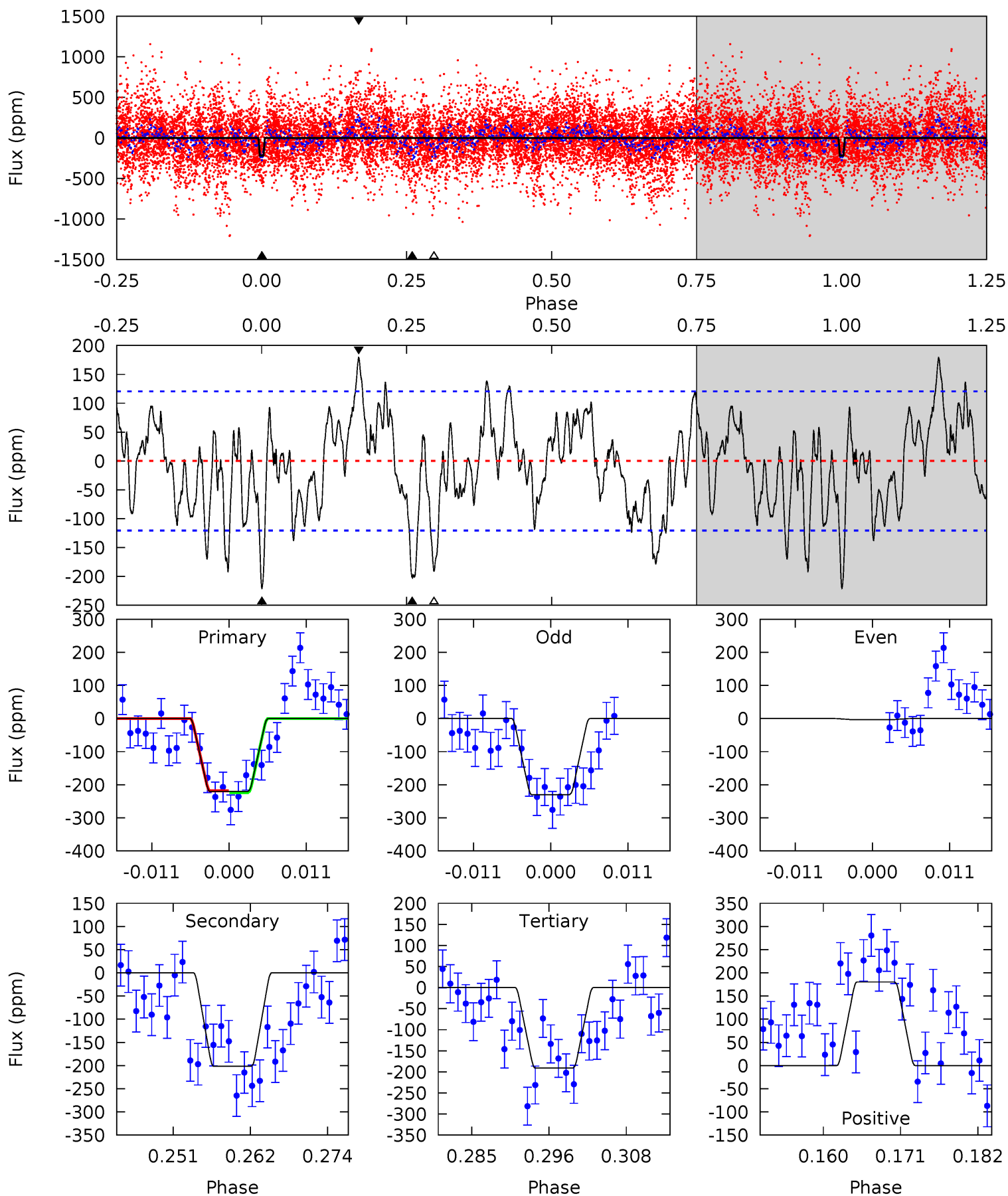
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.1	5.65	5.34	7.10	4.91	2.37	2.34	7.80	6.04	0.31	-1.45	0.01	1.05	0.35	4.85



# Alt Model-Shift Uniqueness Test

006868952-06, P = 36.188346 Days, E = 101.917626 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
9.14	8.36	7.92	7.47	5.00	2.53	2.78	1.22	1.67	0.44	0.89	2.51	0.85	0.45	0.11



### Stellar Parameters For KIC 006868952

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6028^{+81}_{-81}$	$4.151^{+0.160}_{-0.116}$	$0.400^{+0.100}_{-0.150}$	$1.583^{+0.275}_{-0.337}$	$1.296^{+0.101}_{-0.111}$	$0.460^{+0.387}_{-0.152}$
	+1%/-1%	+4%/-3%	+25%/-37%	+17%/-21%	+8%/-9%	+84%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 006868952-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-92 \pm 16$	$2.43^{+0.95}_{-0.84}$	$967^{+49}_{-52}$	$4996^{+1075}_{-603}$	$470^{+635}_{-242}$
Alt.	$-202 \pm 24$	$2.74^{+0.96}_{-0.92}$	$966^{+50}_{-49}$	$5657^{+1277}_{-672}$	$809^{+1035}_{-372}$

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

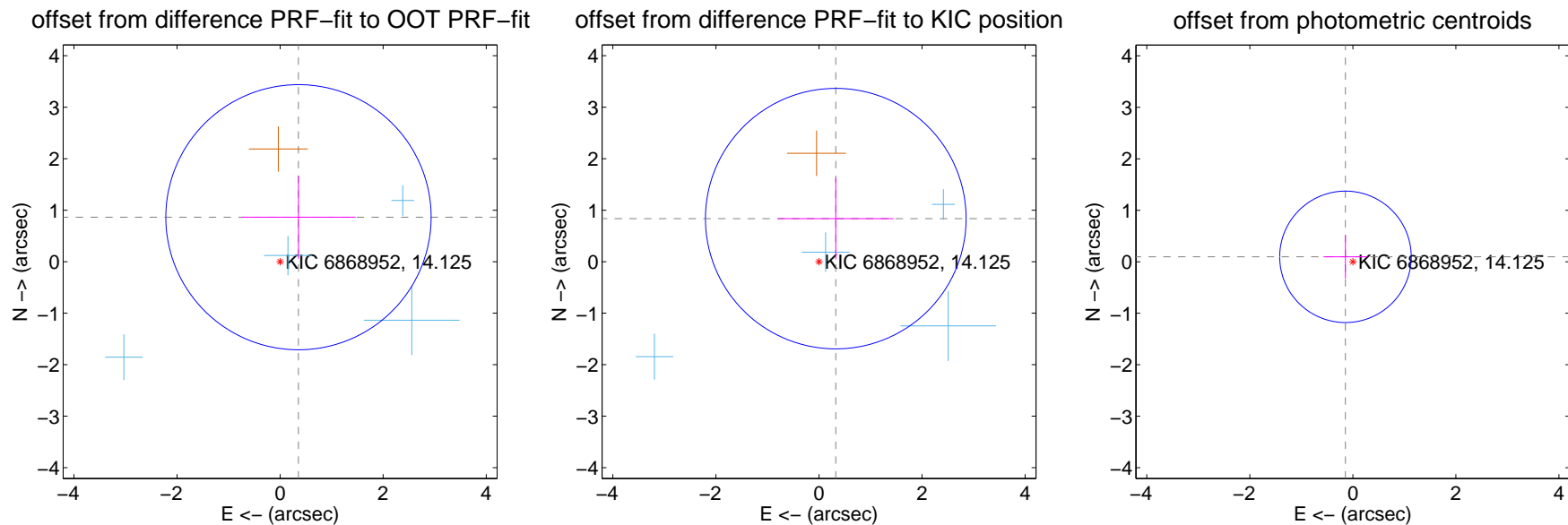
## DV Centroid Data

Supplemental centroid analysis for 006868952-06. Kepler magnitude: 14.12. Transit SNR 7.32

There are 4 quarters with good PRF difference image offsets

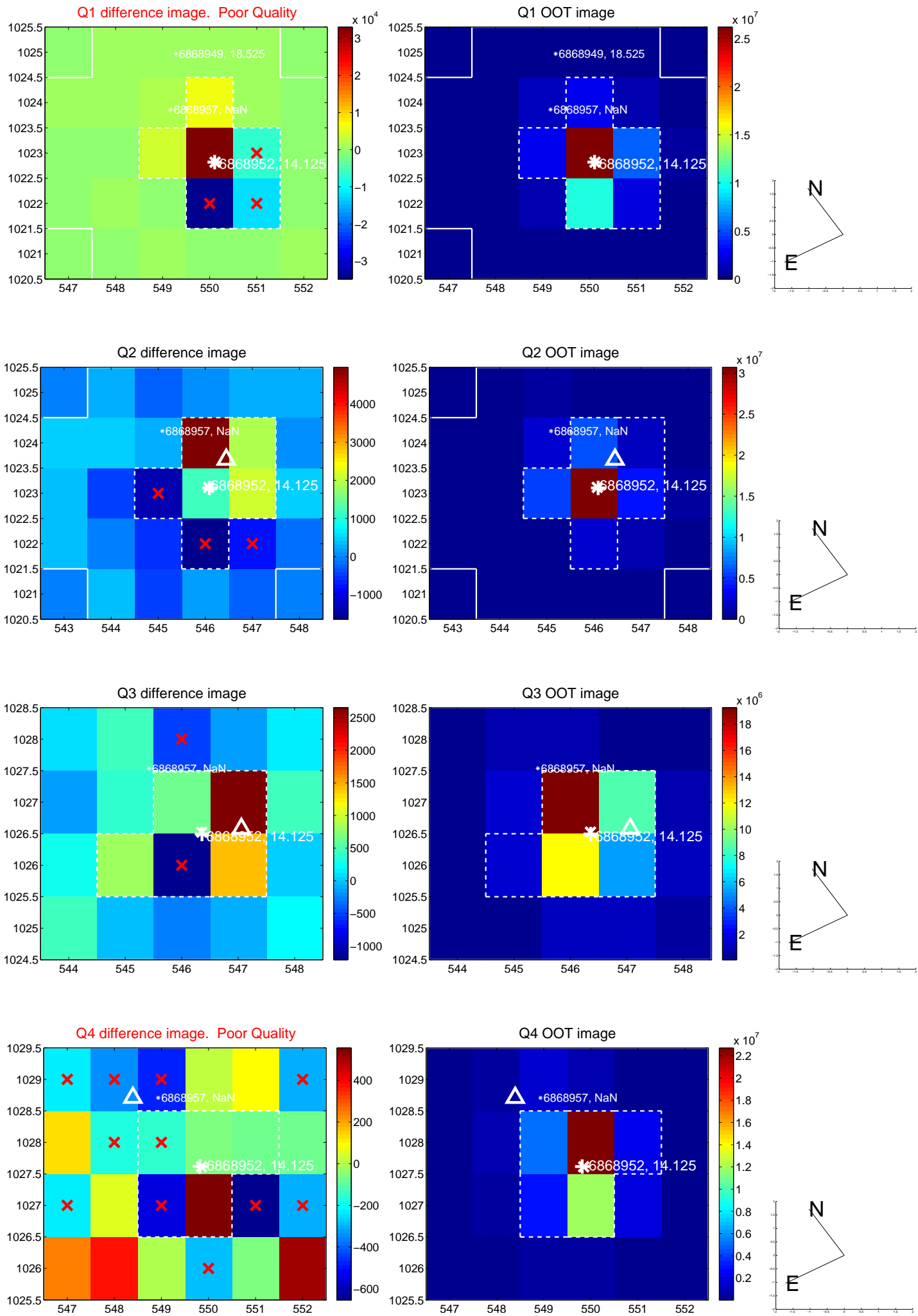
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.934 \pm 0.858$	1.09	$-0.357 \pm 1.111$	$0.864 \pm 0.807$
PRF-fit source offset from KIC position	$0.898 \pm 0.843$	1.06	$-0.326 \pm 1.124$	$0.836 \pm 0.792$
photometric centroid source offset	$0.17 \pm 0.43$	0.41	$0.14 \pm 0.43$	$0.10 \pm 0.42$



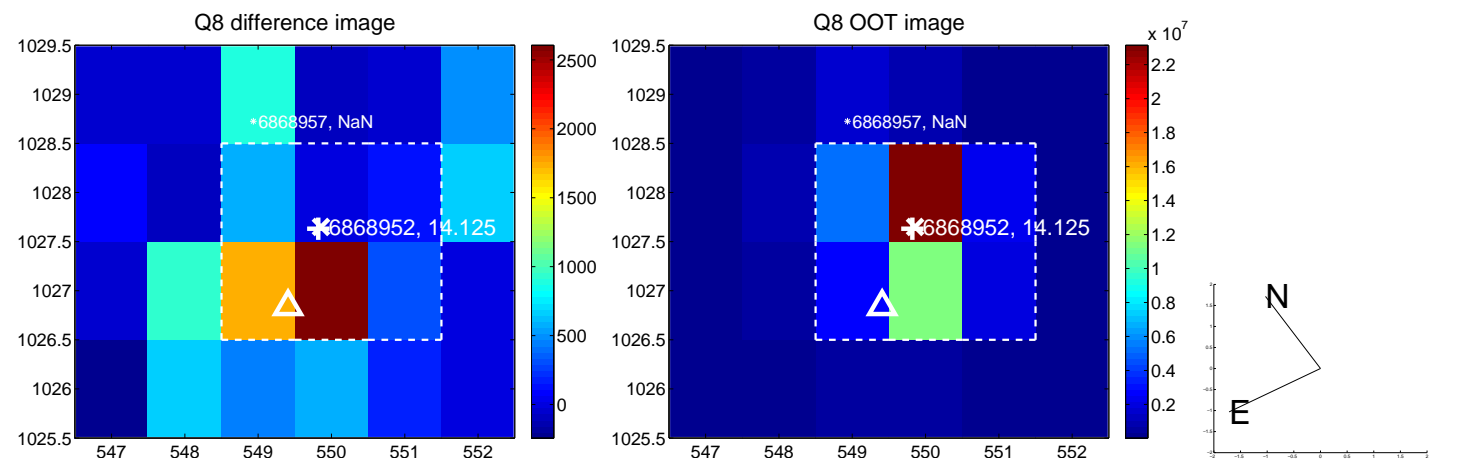
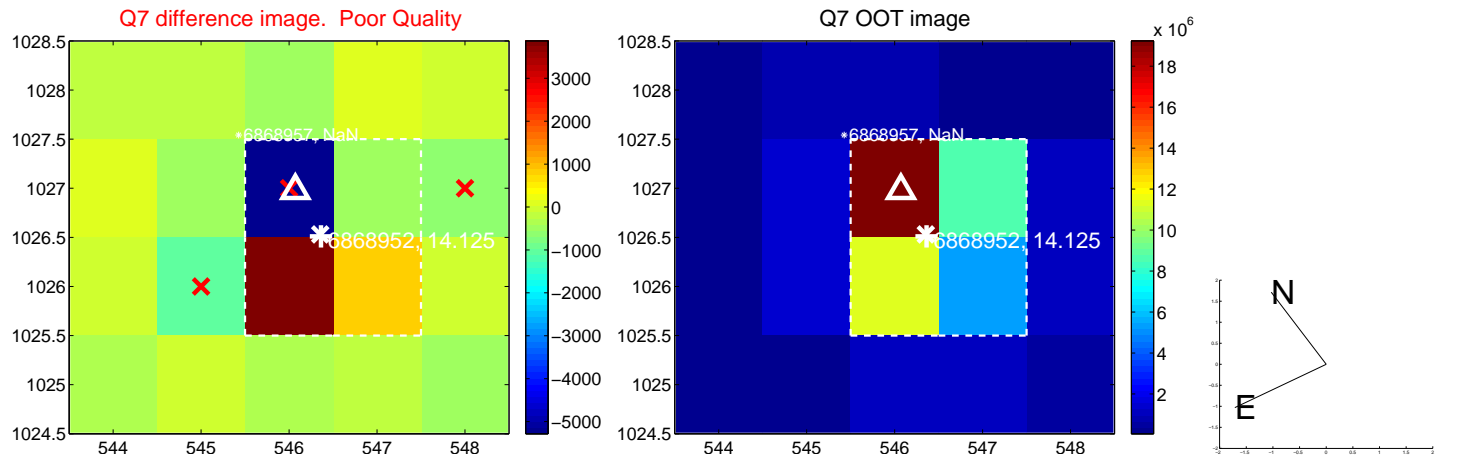
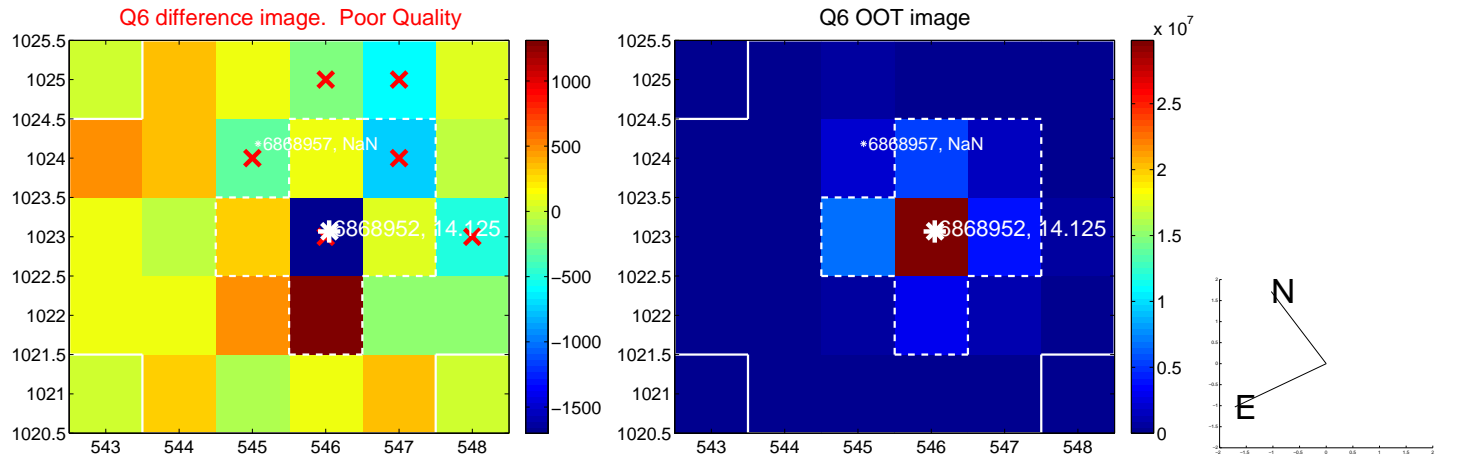
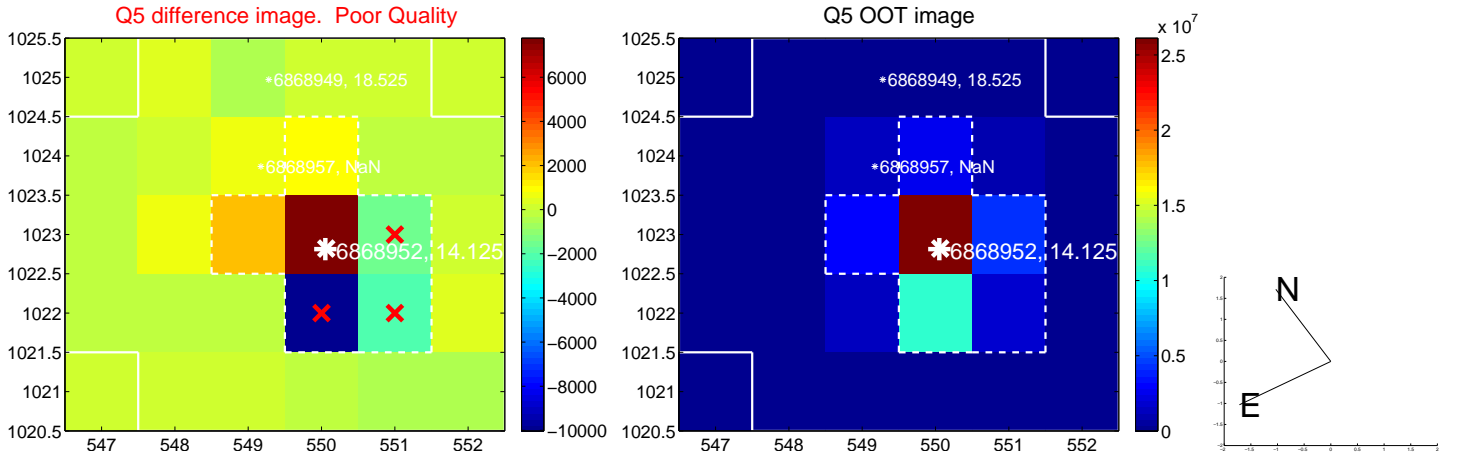
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

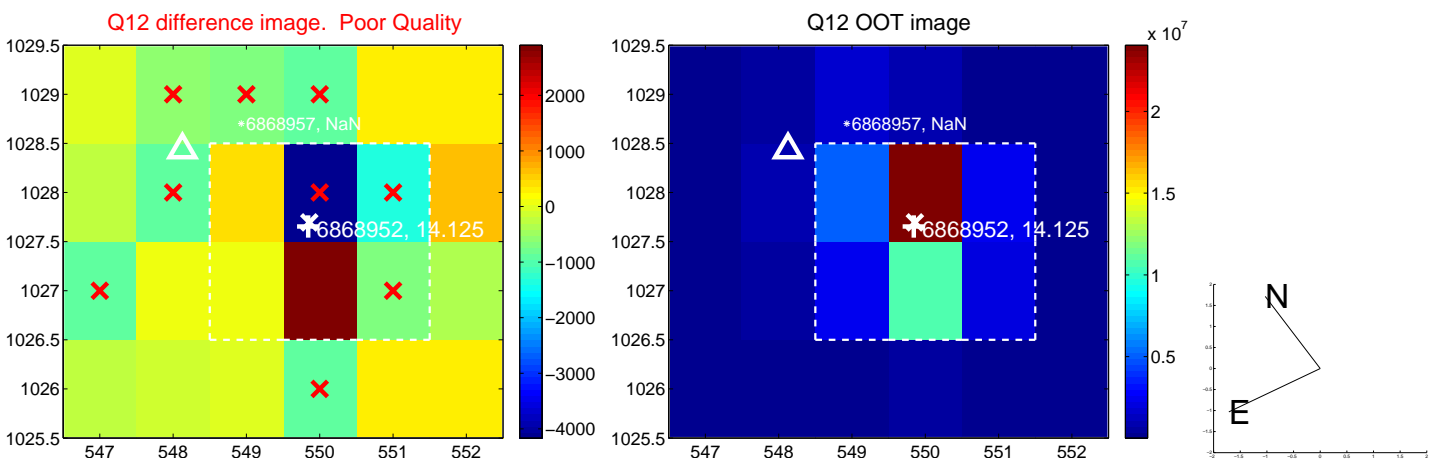
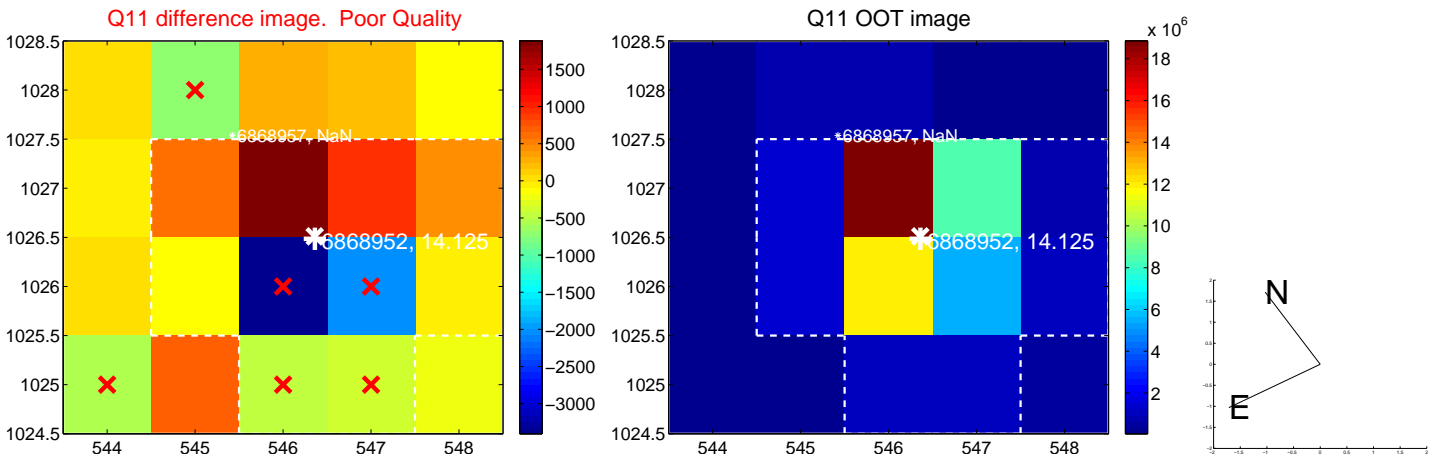
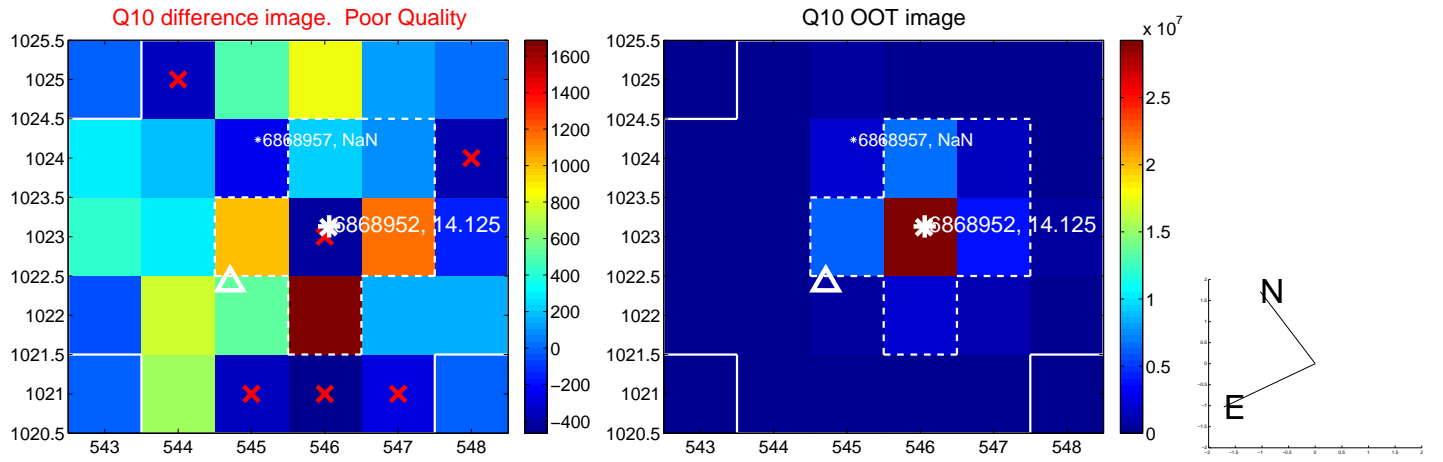
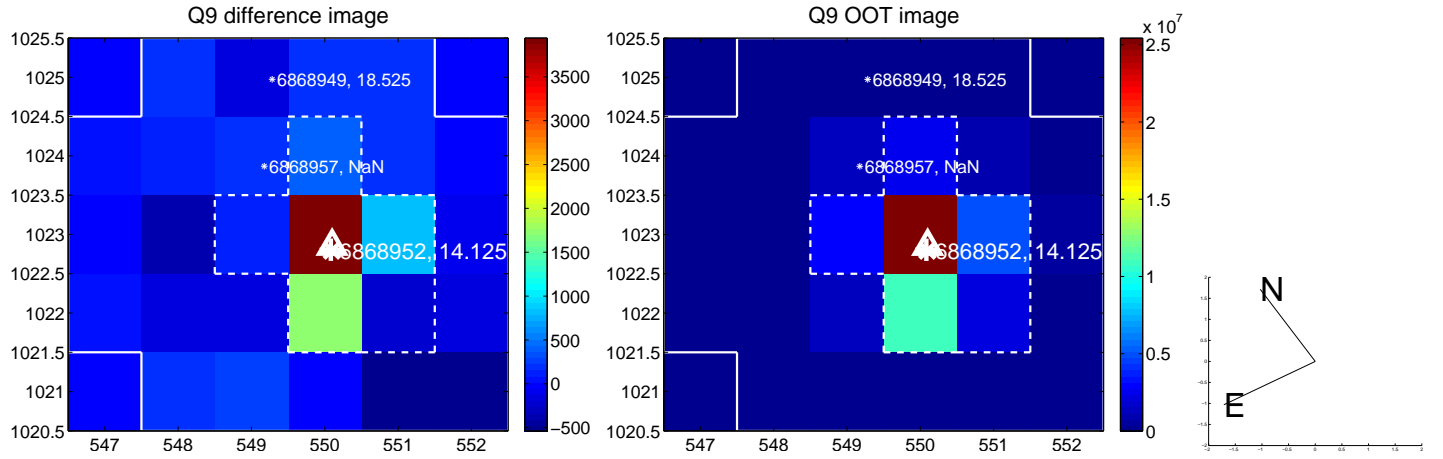




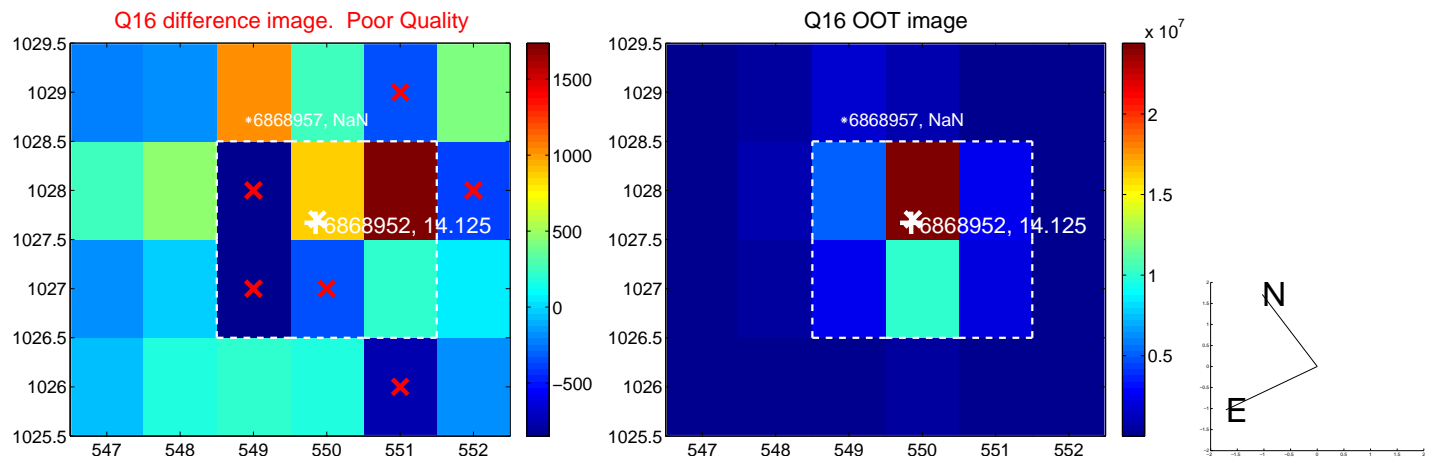
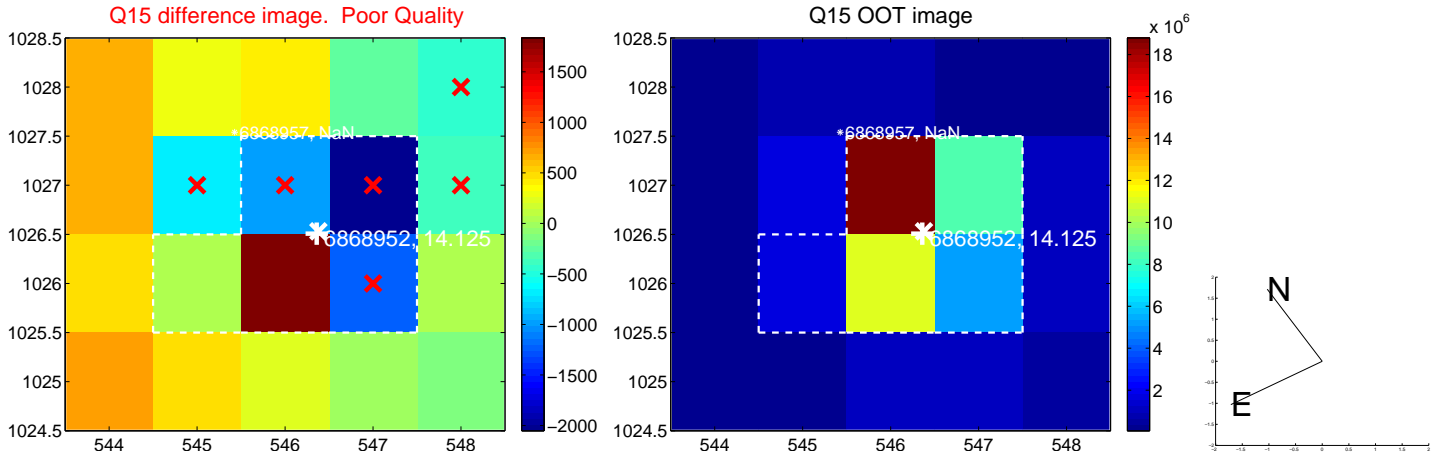
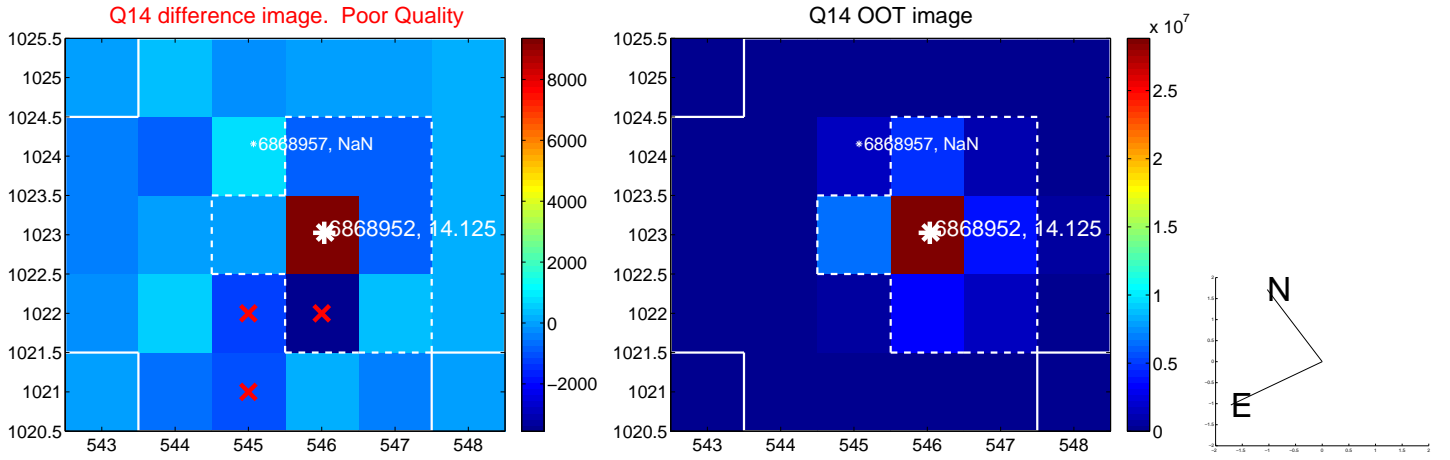
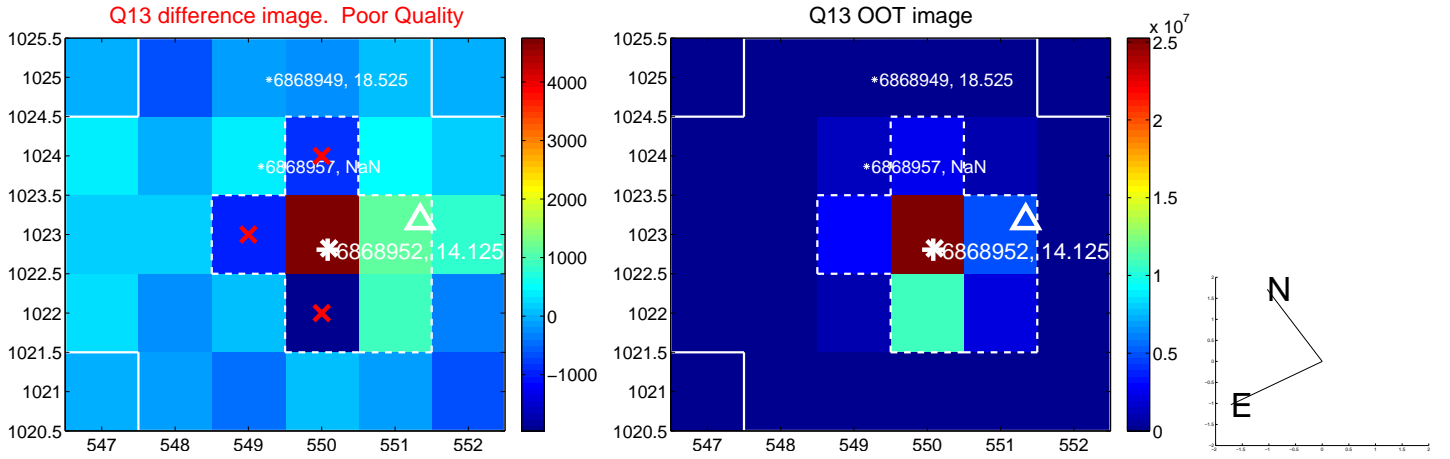
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



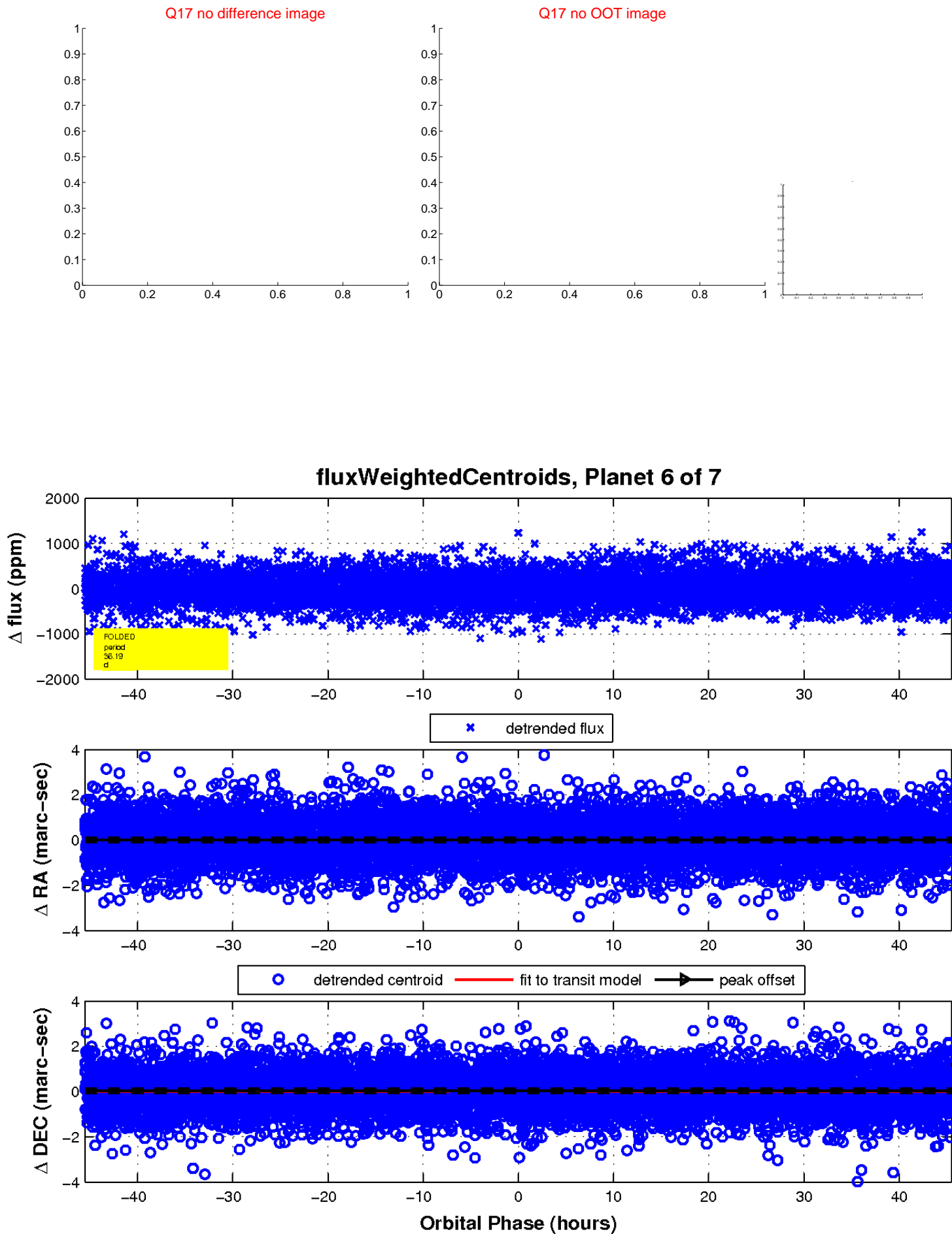
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

