

# KIC 008959769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008959769-01	OBS	No	3.254571	134.602531	14.7	7.573	9.7	7.1	1.48	6400	0.72	1748.47
008959769-02	OBS	No	600.822251	346.881533	179.1	17.018	9.9	7.7	1.48	6400	2.13	1.66
008959769-03	OBS	No	3.253880	133.073666	6.6	21.262	9.1	3.7	1.48	6400	0.41	1748.97

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008959769-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—CENT_SATURATED
008959769-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_SATURATED
008959769-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

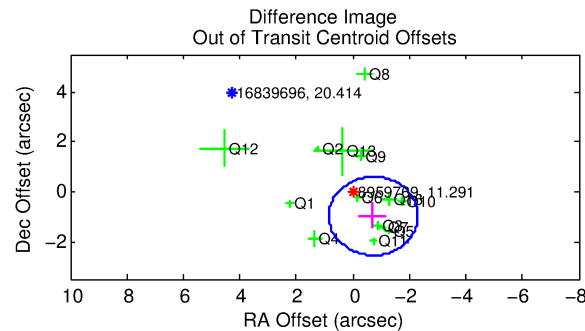
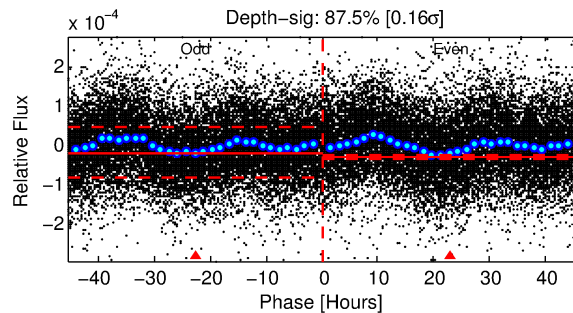
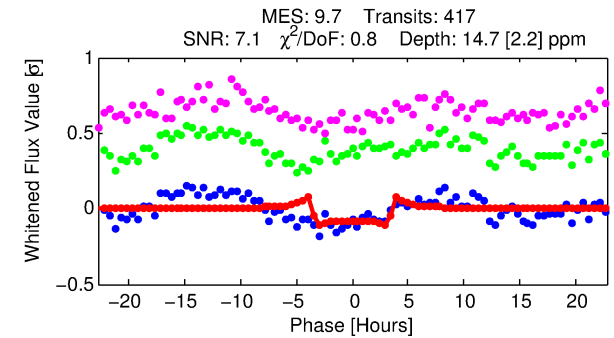
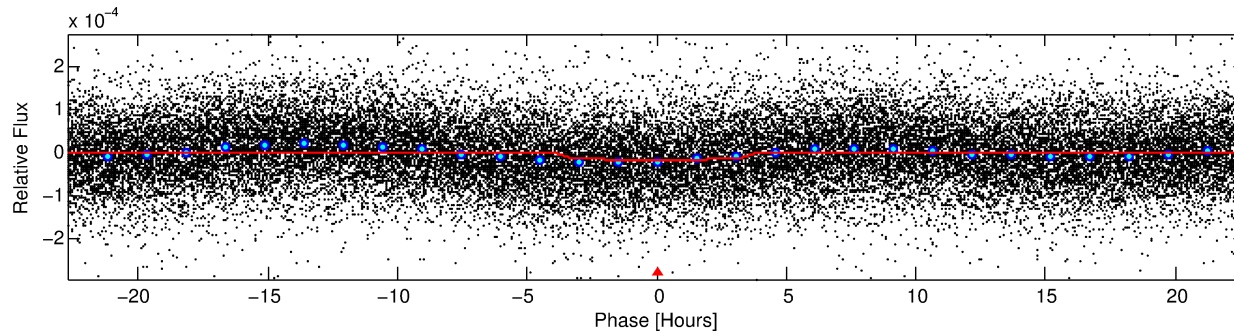
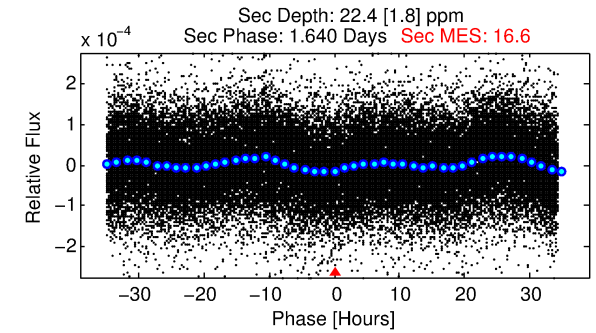
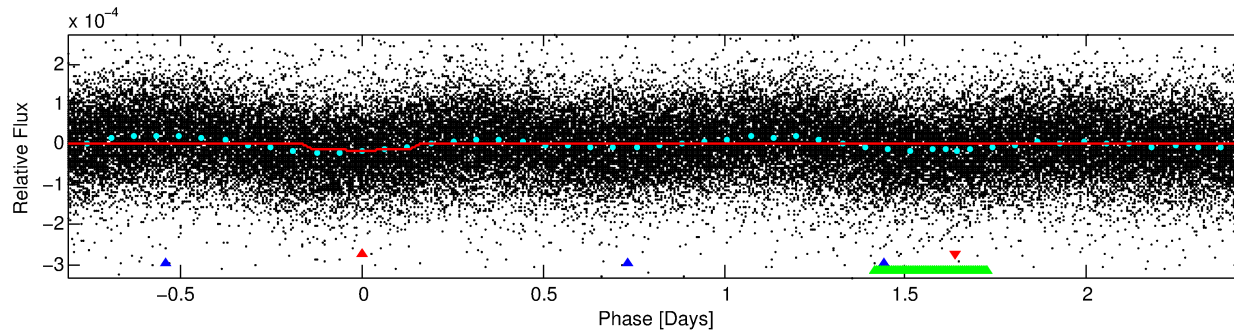
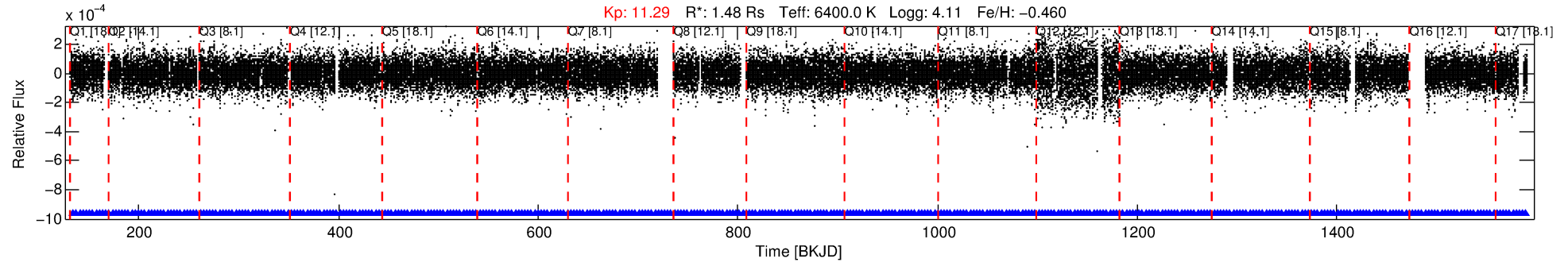
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008959769-01

No Significant Match Found

# DV One-Page Summary

KIC: 8959769 Candidate: 1 of 3 Period: 3.255 d



## DV Fit Results:

Period = 3.25457 [0.00003] d  
Epoch = 134.6025 [0.0052] BKJD  
 $R_p/R^* = 0.0045$  [0.0005]  
 $a/R^* = 1.34$  [0.31]  
 $b = 0.96$  [0.04]  
 $\text{Seff} = 1748.47$  [907.78]  
 $T_{\text{eq}} = 1649$  [214] K  
 $R_p = 0.72$  [0.24]  $R_e$   
 $a = 0.0434$  [0.0134] AU  
 $A_g = 44.82$  [24.76] [1.77σ]  
 **$T_{\text{eff}} = 6596$  [472] K [9.54σ]**

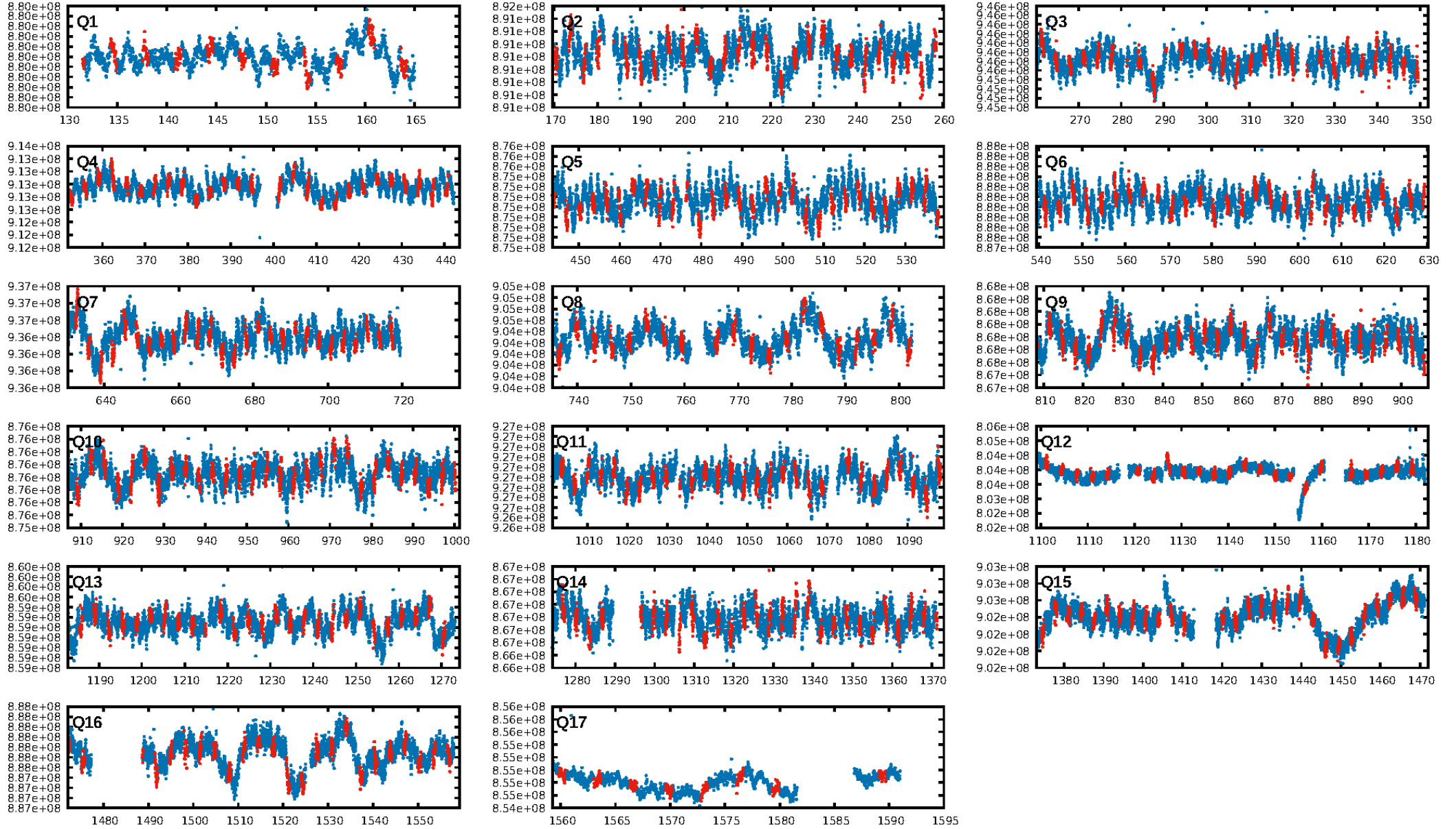
## DV Diagnostic Results:

**ShortPeriod-sig: 0.1% [0.00σ]**  
LongPeriod-sig: 100.0% [769.93σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGo-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [398/398]  
GhostDiagnostic-chr: -0.518  
Centroid-sig: 35.9%  
Centroid-so: 0.615 arcsec [0.81σ]  
OotOffset-rm: 1.214 arcsec [2.32σ]  
OotOffset-st: 3/3/4/4 [14]  
KicOffset-rm: 1.207 arcsec [2.38σ]  
KicOffset-st: 3/3/4/4 [14]  
DiffImageQuality-fgm: 0.86 [12/14]  
DiffImageOverlap-fno: 1.00 [17/17]

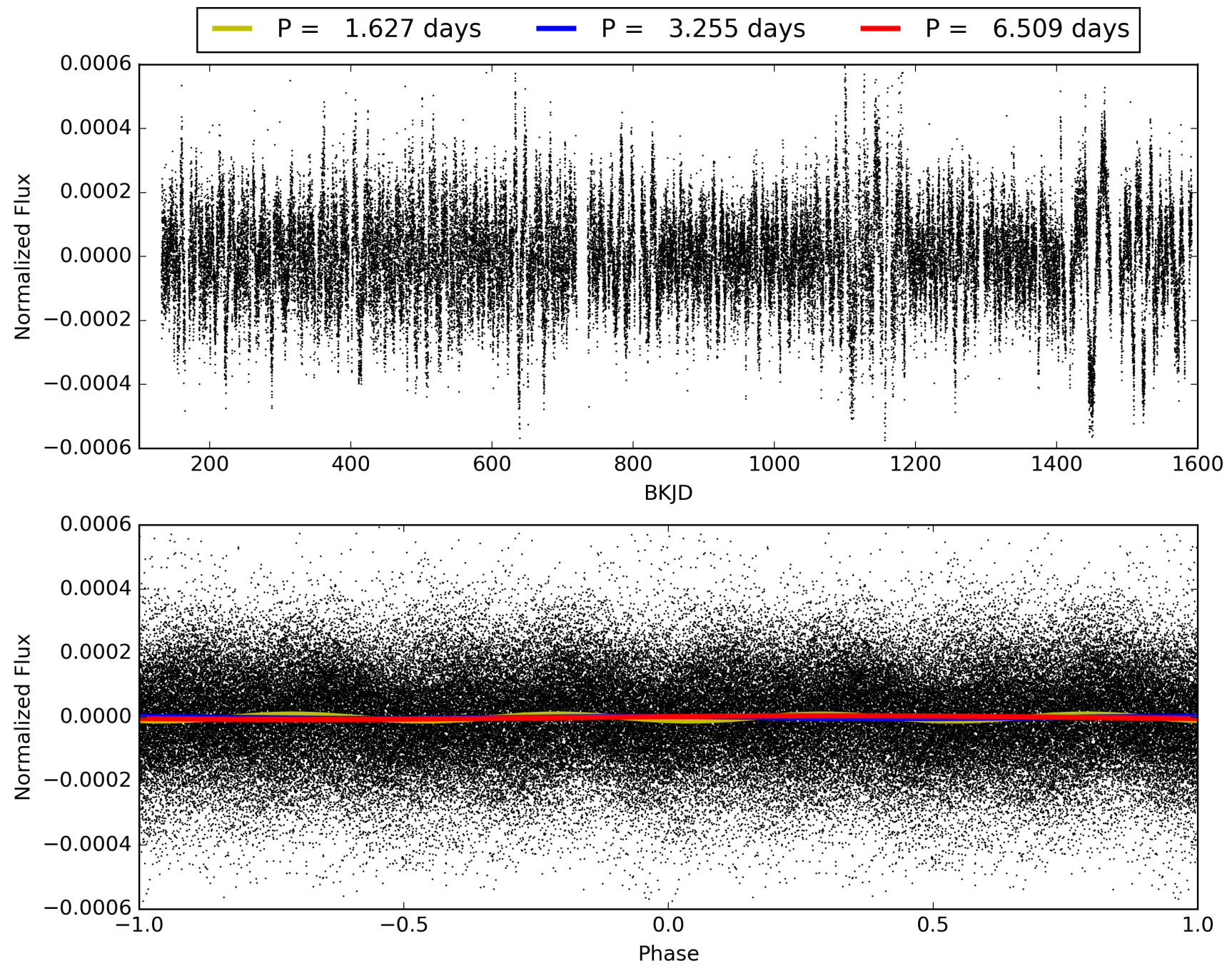
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008959769-01, PDC Light Curves

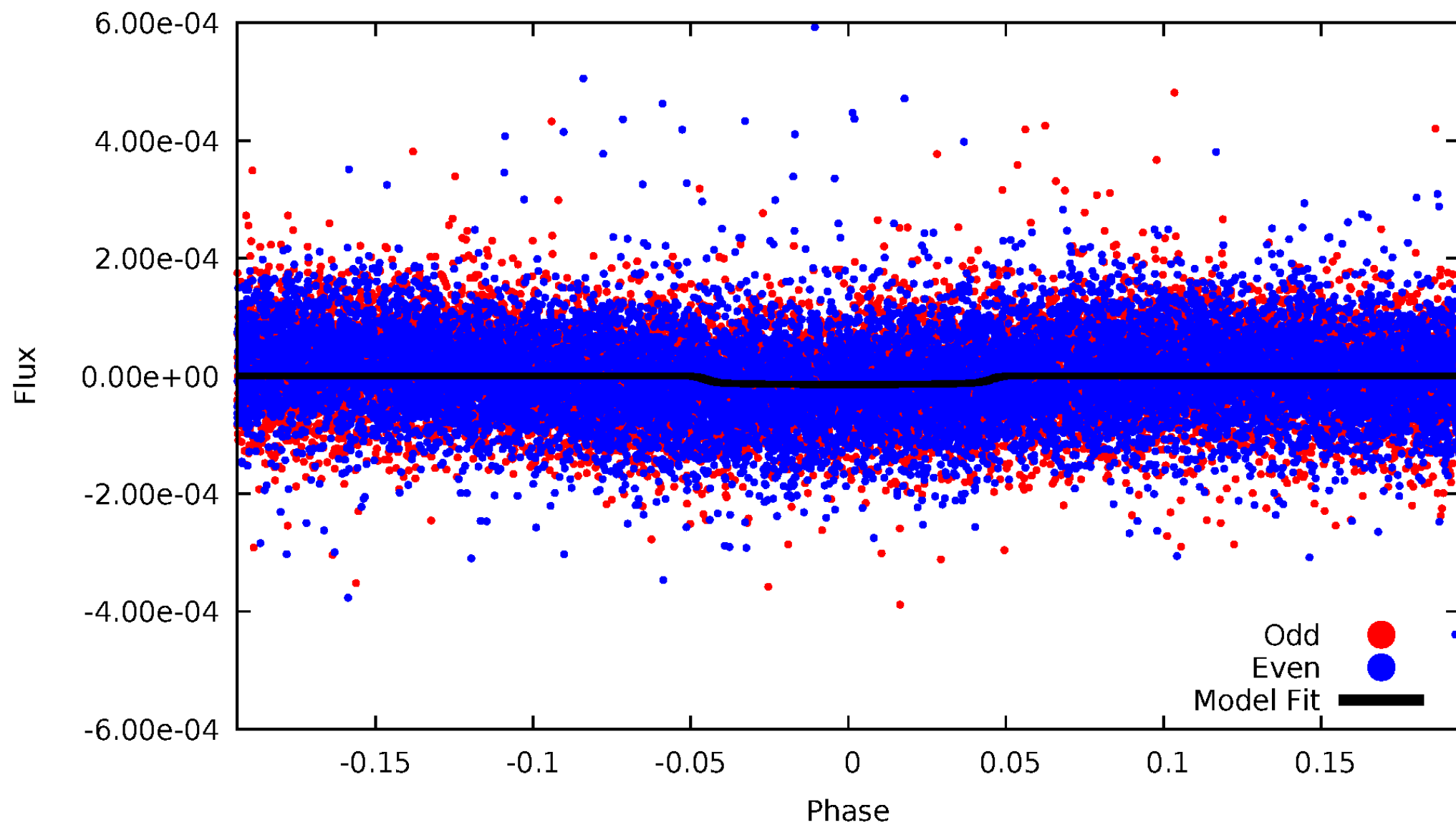


TCE 008959769-01



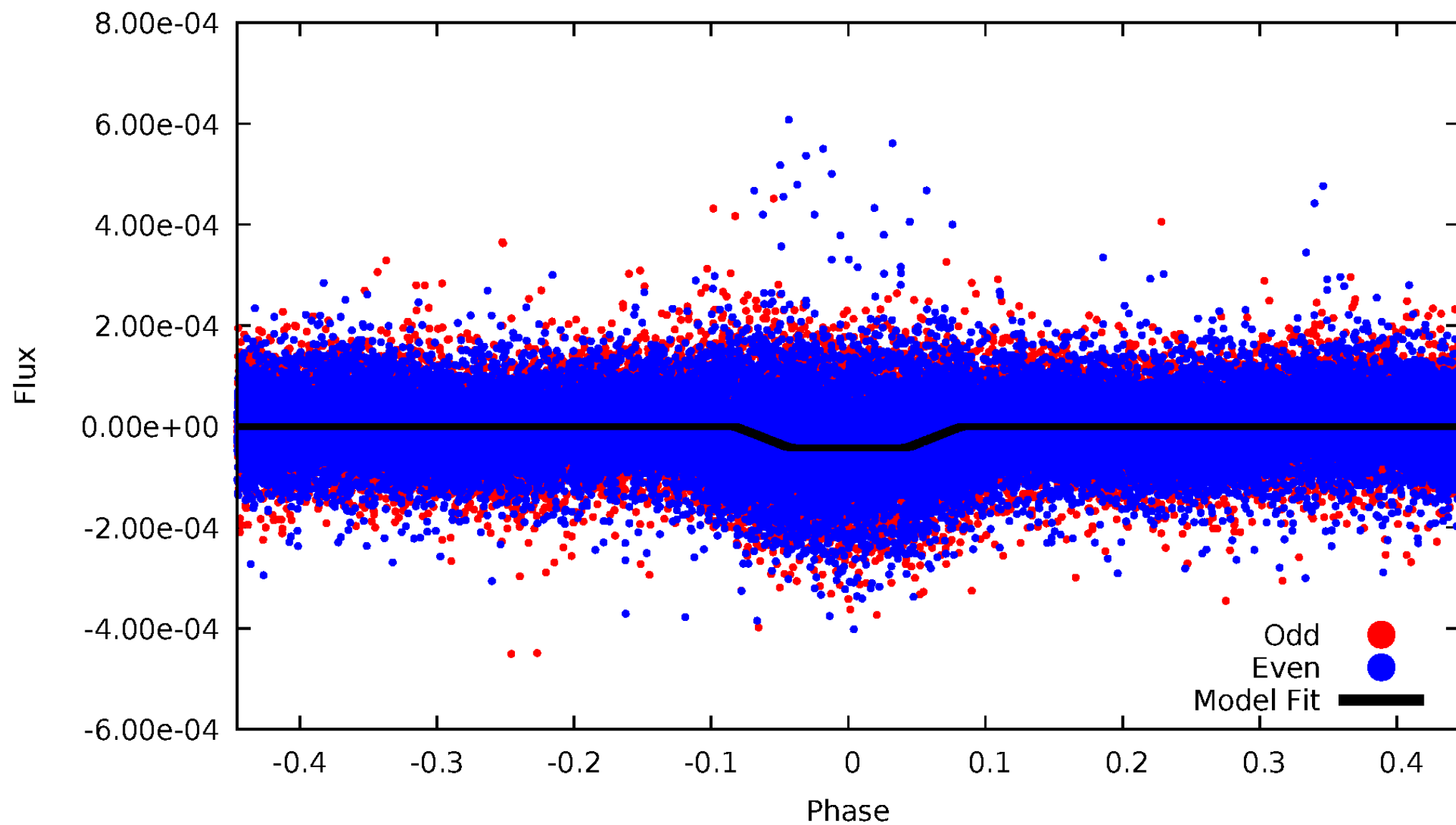
# DV Odd/Even

TCE 008959769-01



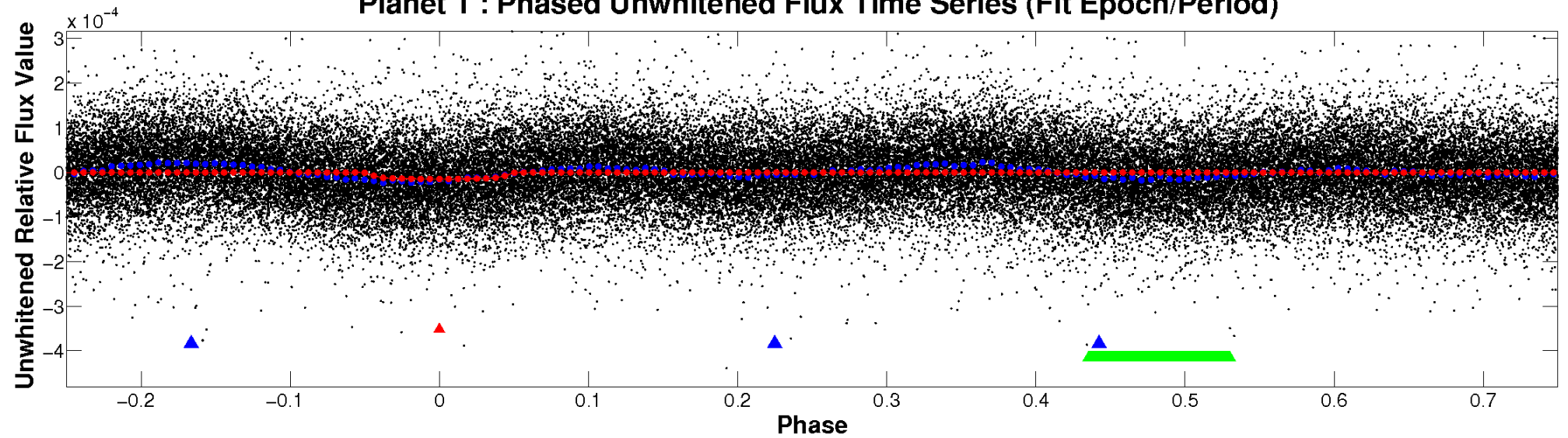
# ALT Odd/Even

TCE 008959769-01

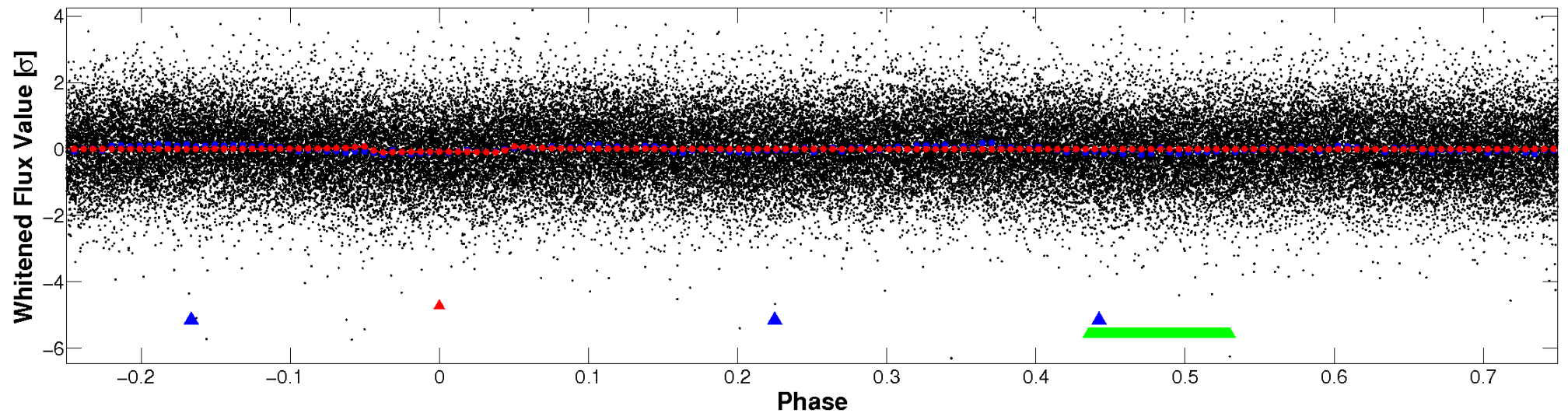


# Non-Whitened Vs. Whitened Light Curve

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

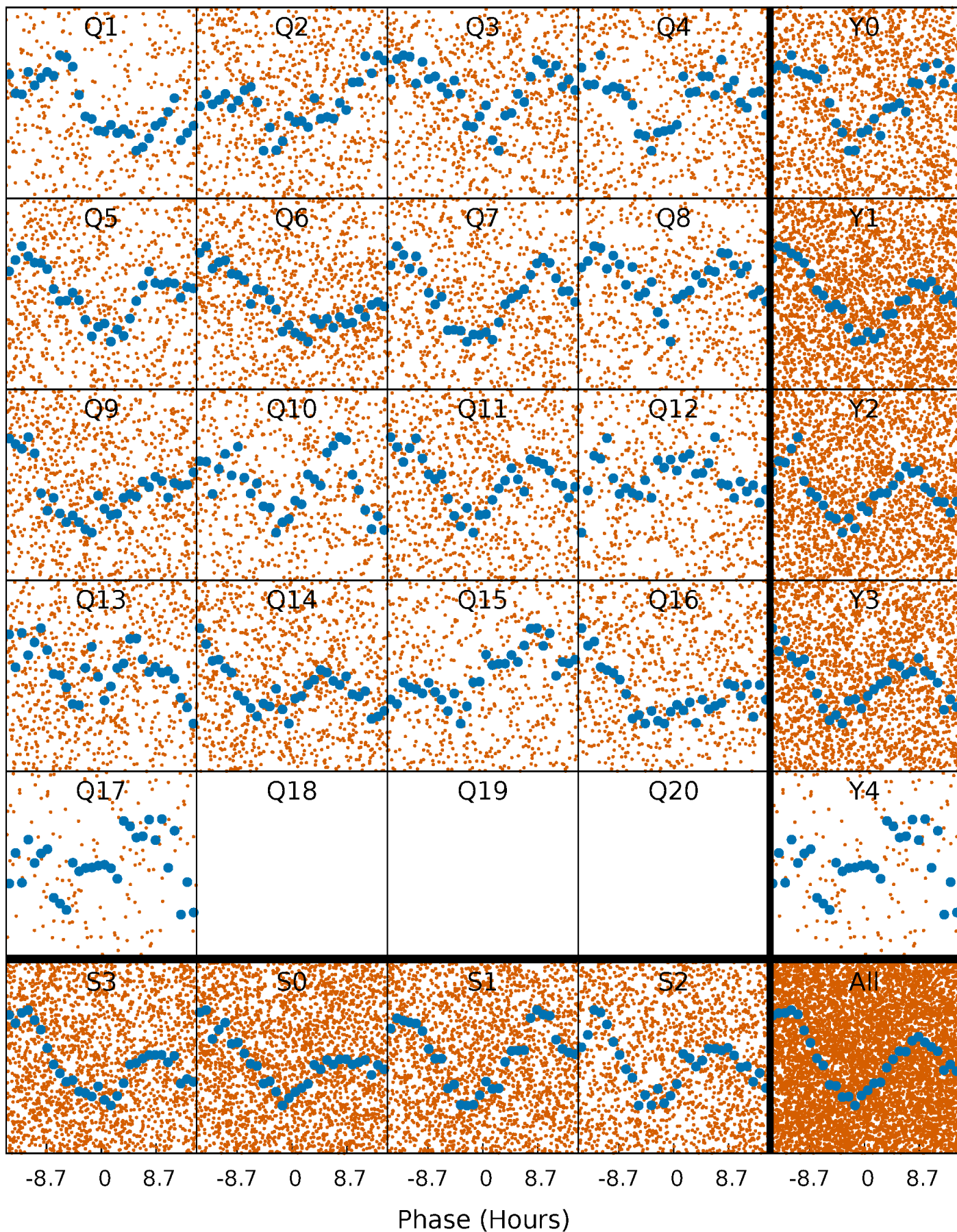


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



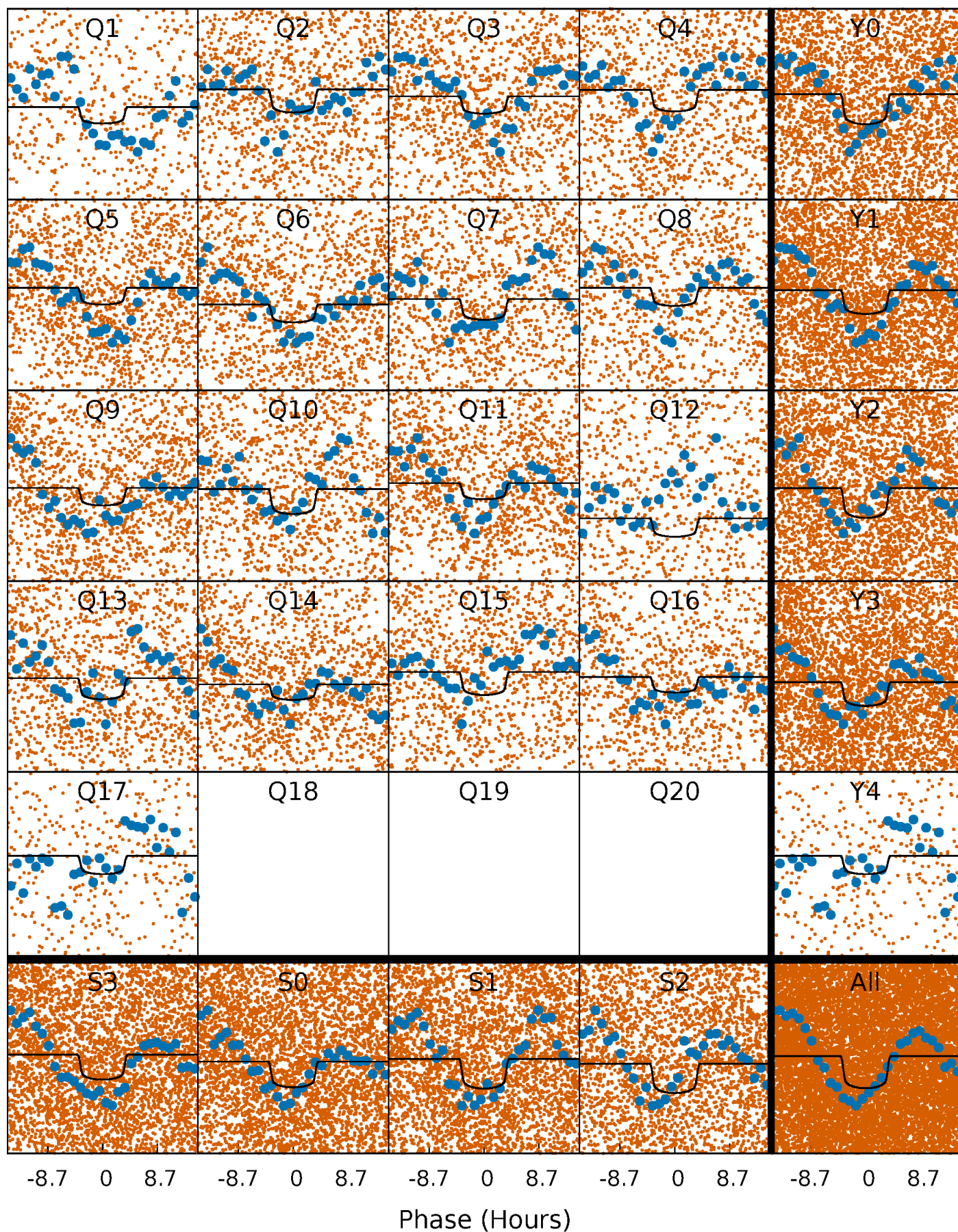
# PDC Quarter-Phased Transit Curves

TCE 008959769-01   P= 3.254571 Days    $T_0=134.602531$  (BKJD)



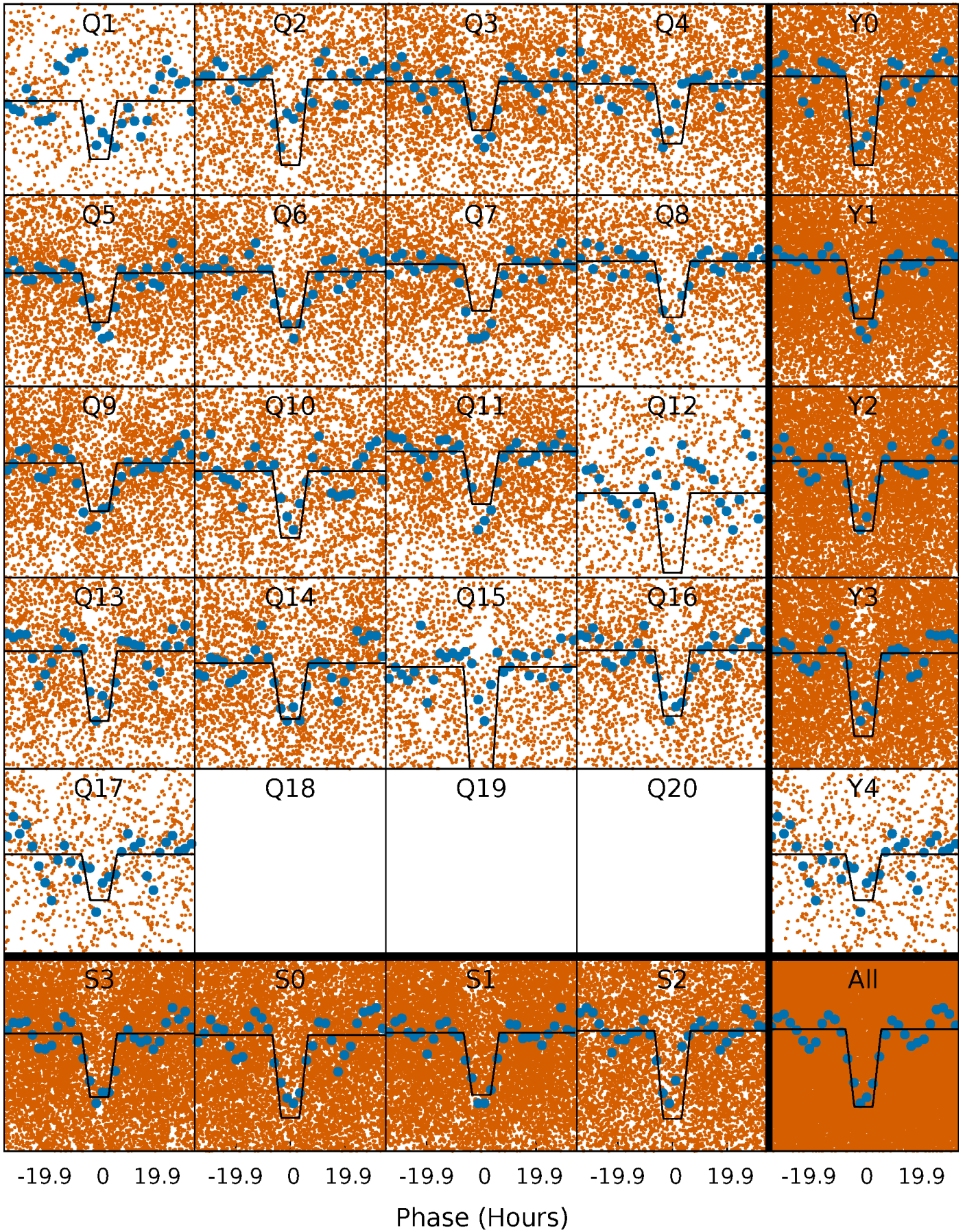
# DV Quarter-Phased Transit Curves

TCE 008959769-01 P= 3.254571 Days  $T_0=134.602531$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

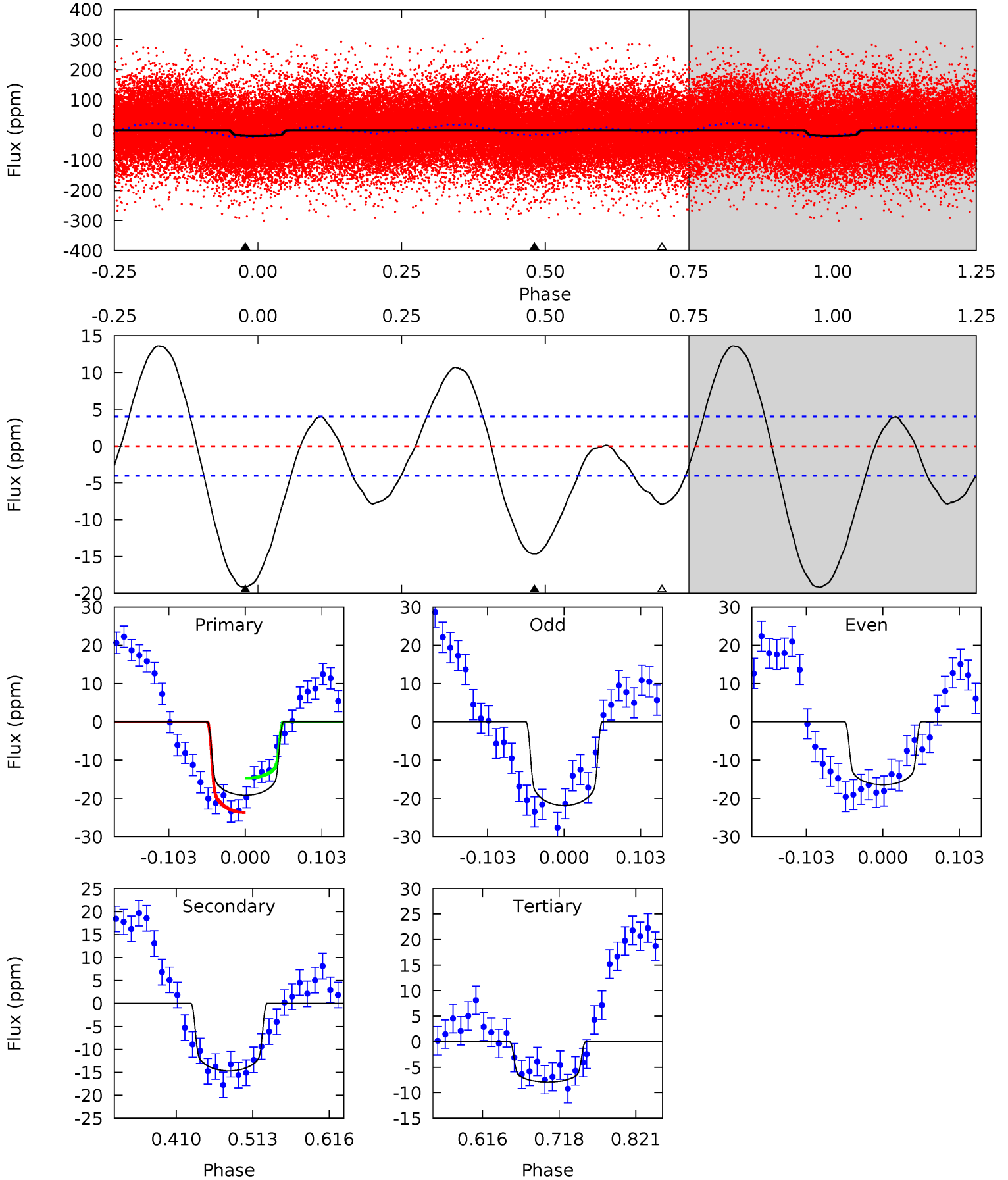
TCE 008959769-01   P= 3.253983 Days    $T_0=134.649759$  (BKJD)



# DV Model-Shift Uniqueness Test

008959769-01, P = 3.254571 Days, E = 131.347960 Days

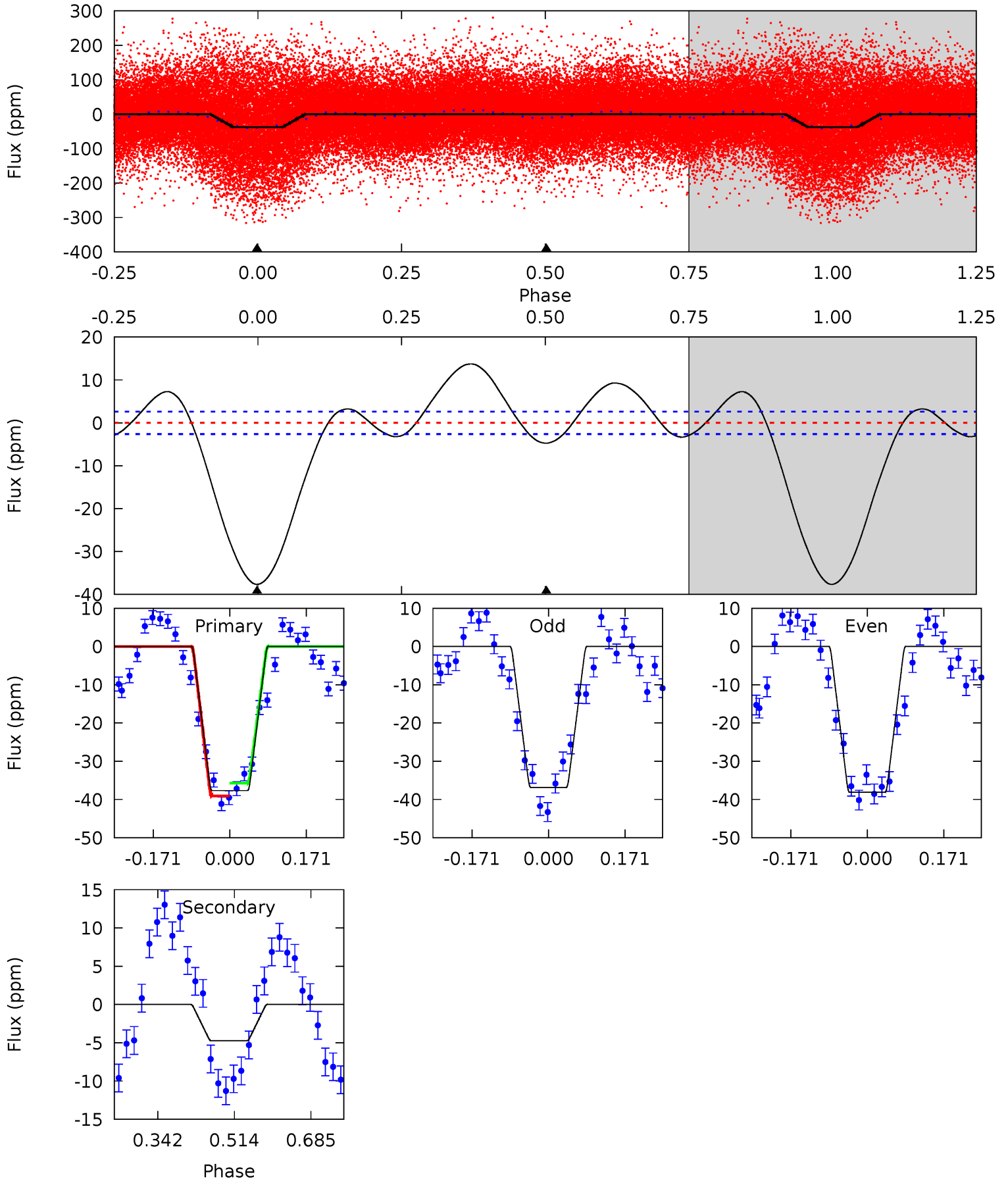
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.7	16.6	8.93	0	4.56	1.63	7.57	12.7	21.7	7.64	16.6	3.05	0.99	0.42	5.11



# Alt Model-Shift Uniqueness Test

008959769-01, P = 3.253983 Days, E = 131.395776 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
64.0	8.05	0	0	4.45	1.37	5.80	64.0	64.0	8.05	8.05	1.10	1.09	0.27	2.82



### Stellar Parameters For KIC 008959769

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6400^{+199}_{-244}$	$4.110^{+0.293}_{-0.158}$	$-0.460^{+0.300}_{-0.300}$	$1.481^{+0.381}_{-0.466}$	$1.031^{+0.152}_{-0.137}$	$0.447^{+0.867}_{-0.197}$
	+3%/-4%	+7%/-4%	+65%/-65%	+26%/-31%	+15%/-13%	+194%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 008959769-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-15 \pm 1$	$0.70^{+0.12}_{-0.15}$	$2268^{+180}_{-204}$	$5924^{+434}_{-377}$	$31^{+17}_{-9}$
Alt.	$-5 \pm 1$	$1.02^{+0.18}_{-0.19}$	$2271^{+187}_{-185}$	$3974^{+188}_{-171}$	$4.749^{+2.417}_{-1.422}$

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

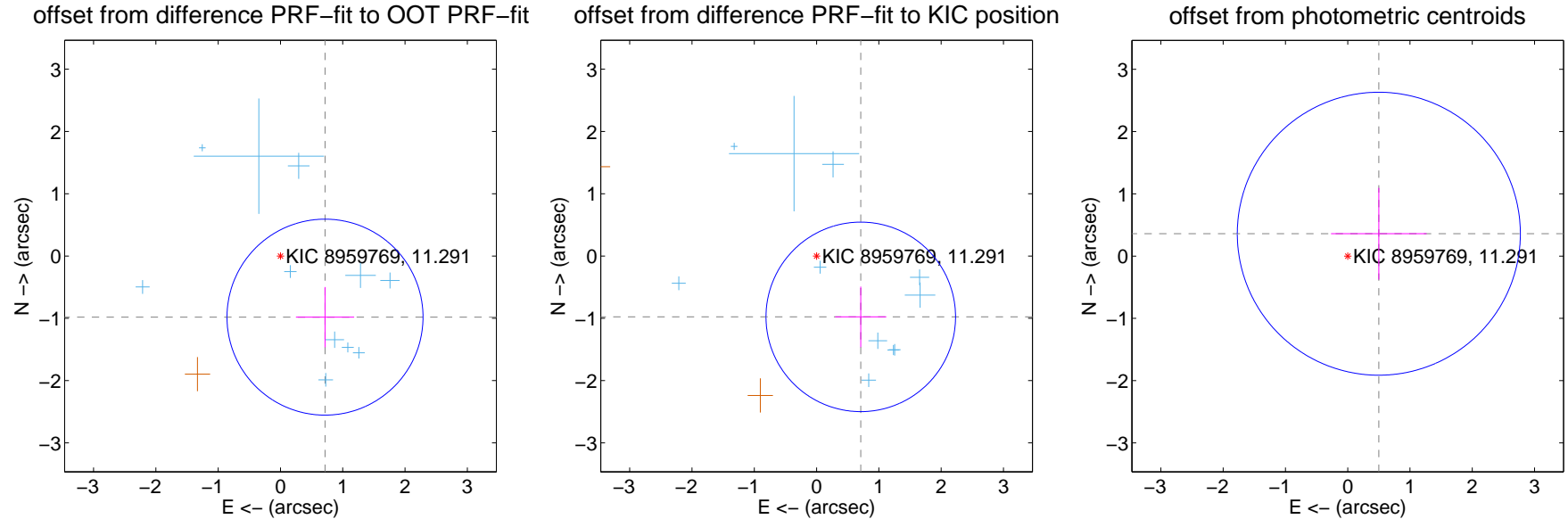
## DV Centroid Data

Supplemental centroid analysis for 008959769-01. **Kepler magnitude: 11.29.** Transit SNR 7.15

There are 12 quarters with good PRF difference image offsets

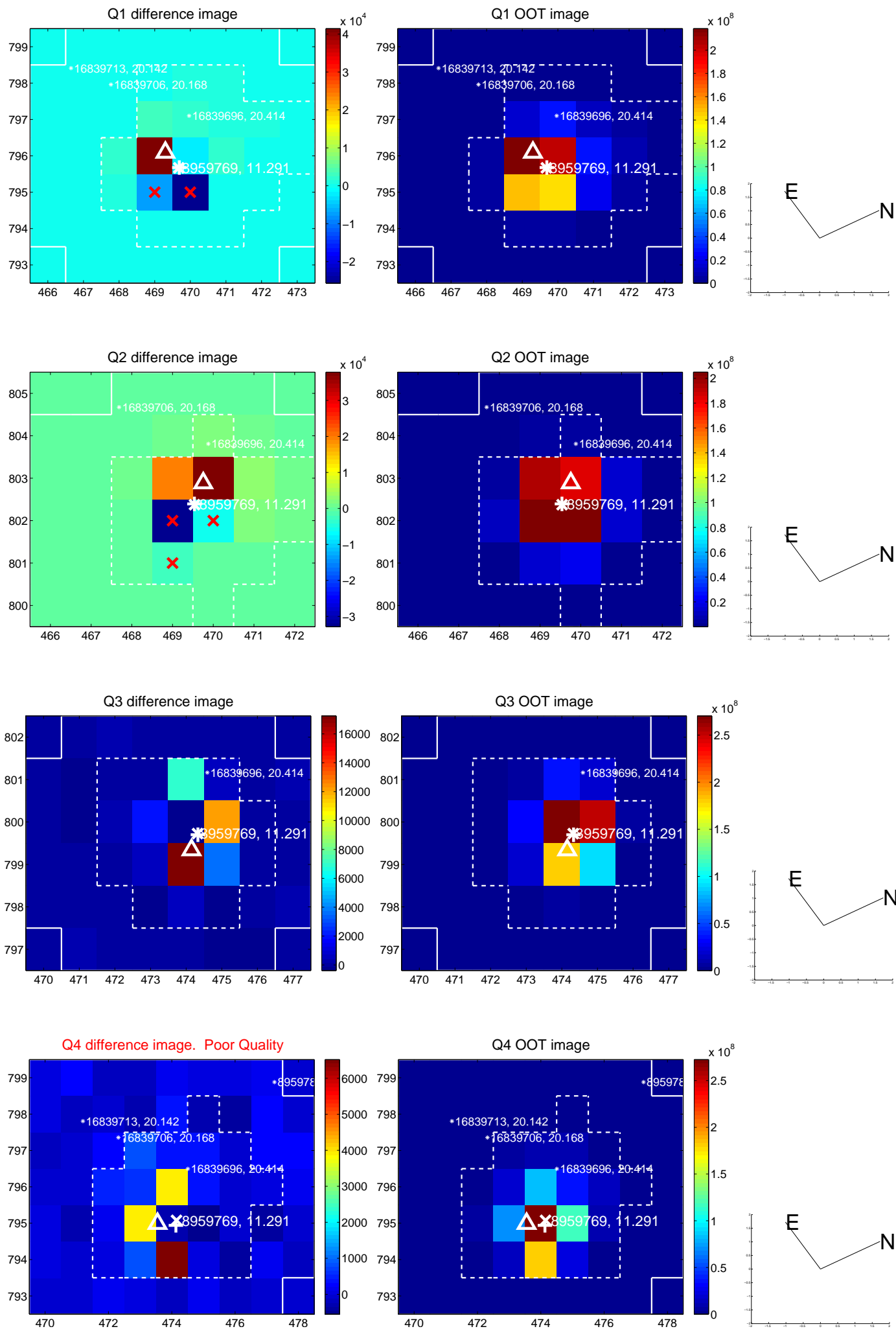
The direct PRF centroid is offset from the target star catalog position by about 0.49 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.214 \pm 0.524$	2.32	$-0.715 \pm 0.467$	$-0.981 \pm 0.484$
PRF-fit source offset from KIC position	$1.207 \pm 0.507$	2.38	$-0.709 \pm 0.410$	$-0.977 \pm 0.486$
photometric centroid source offset	$0.61 \pm 0.76$	0.81	$-0.50 \pm 0.77$	$0.36 \pm 0.74$

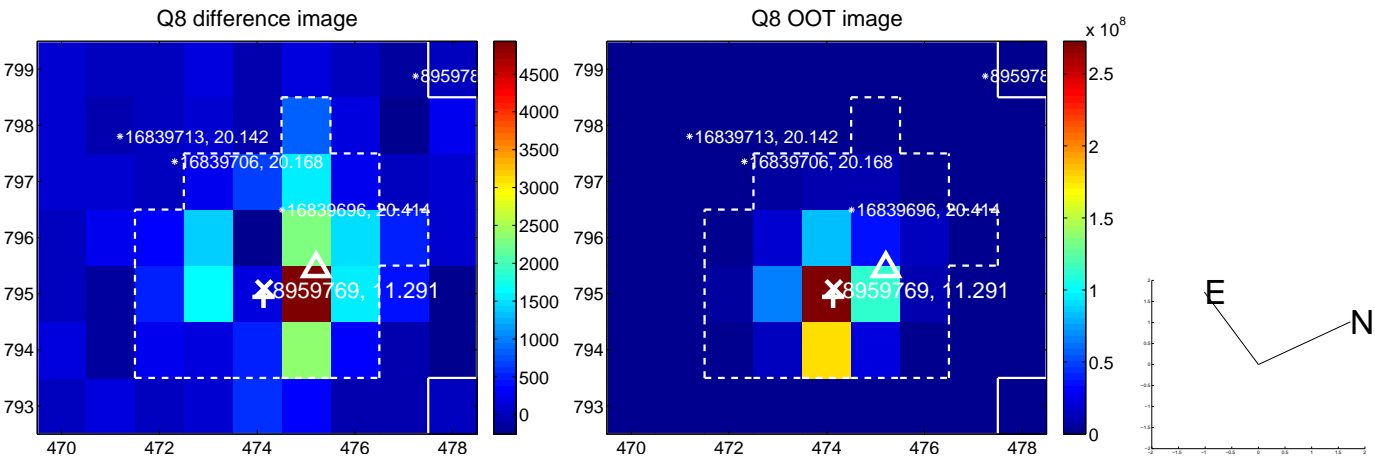
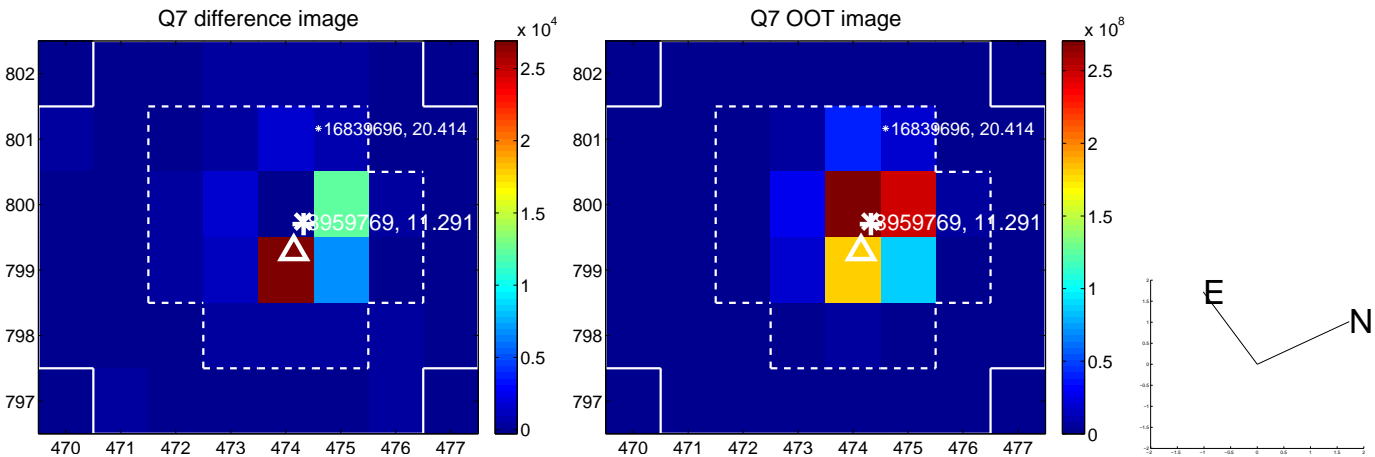
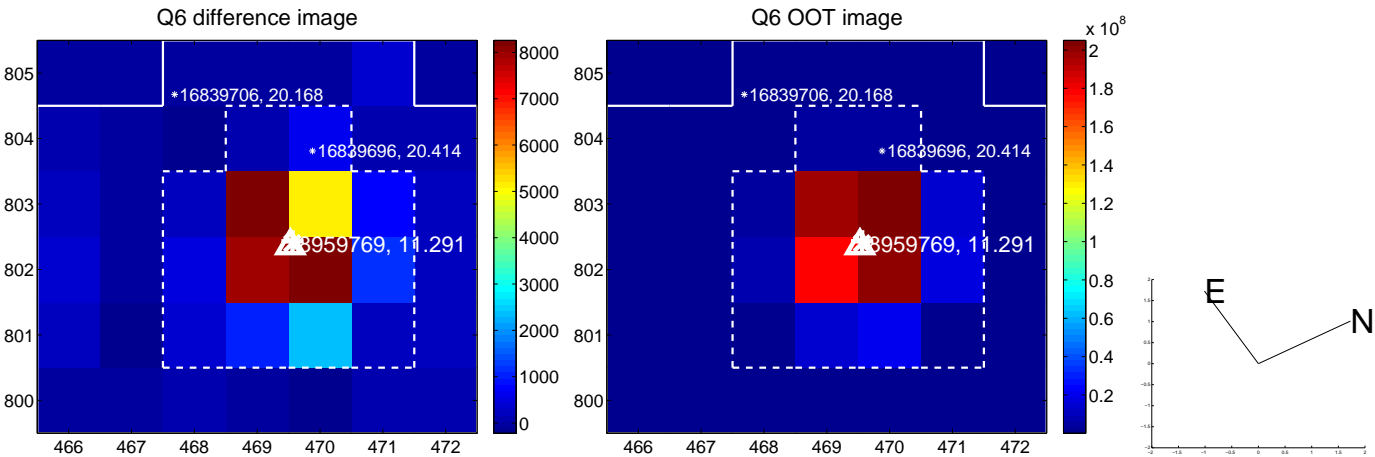
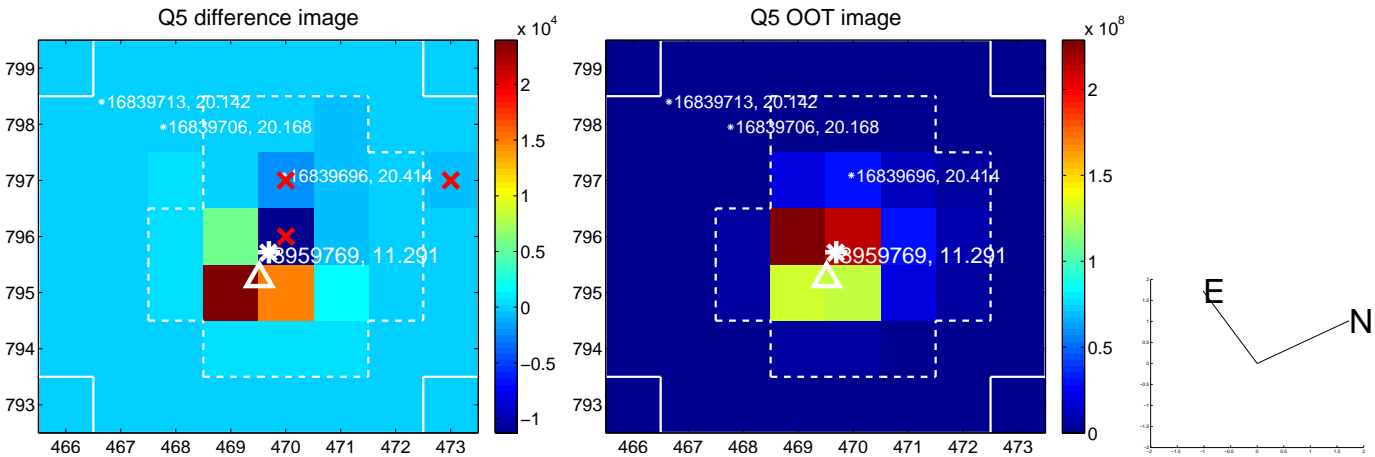


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

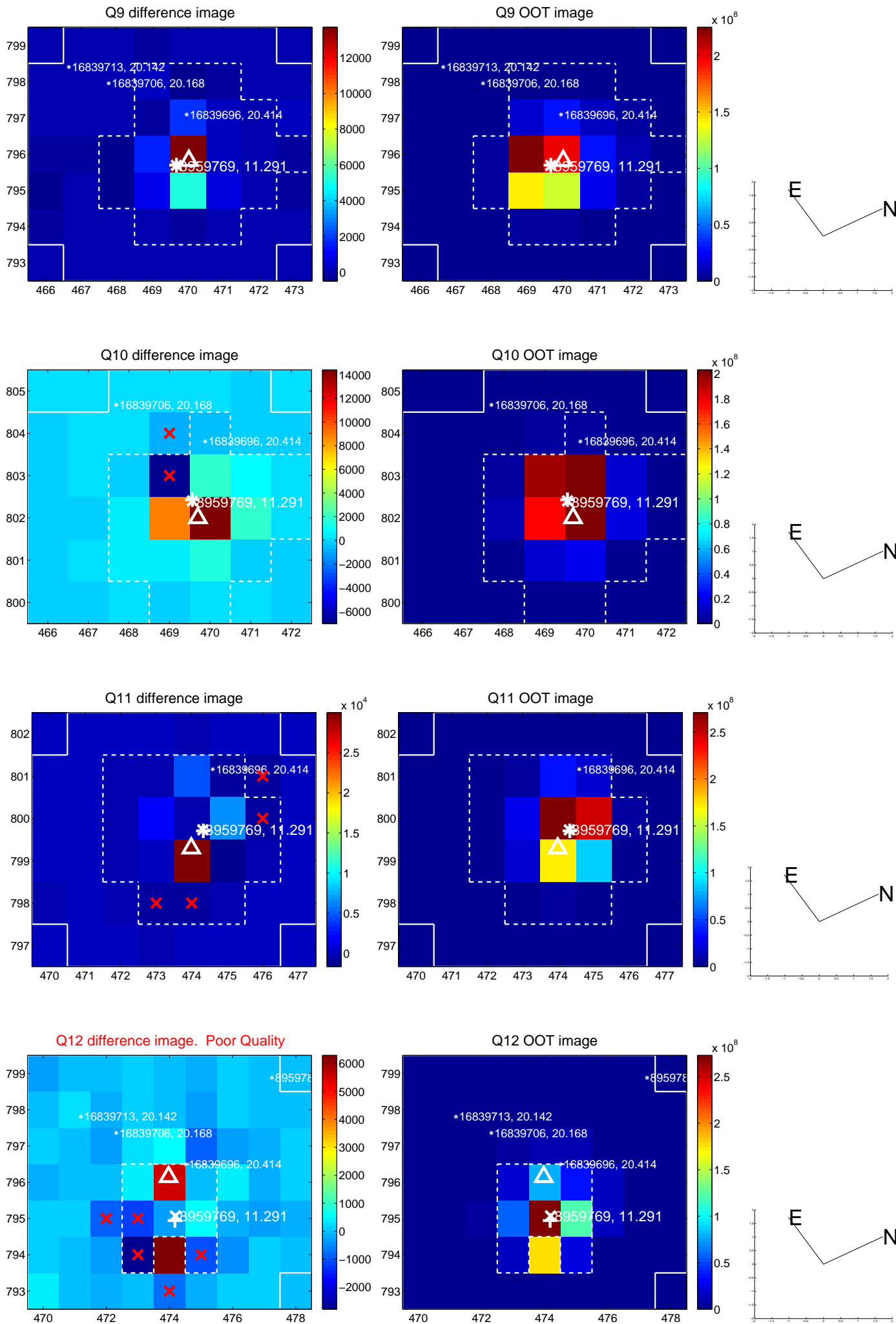
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



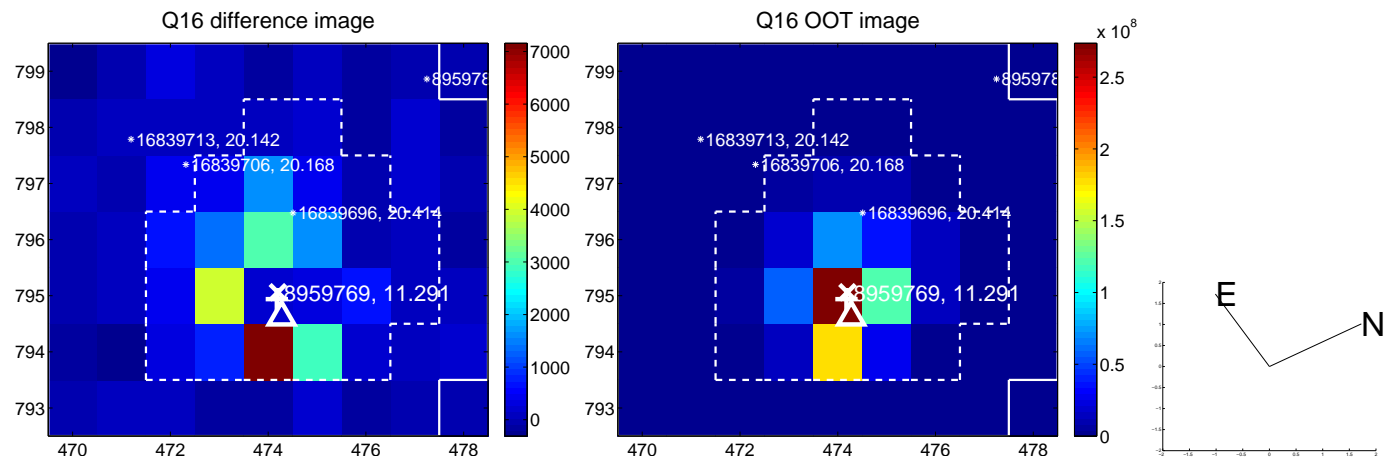
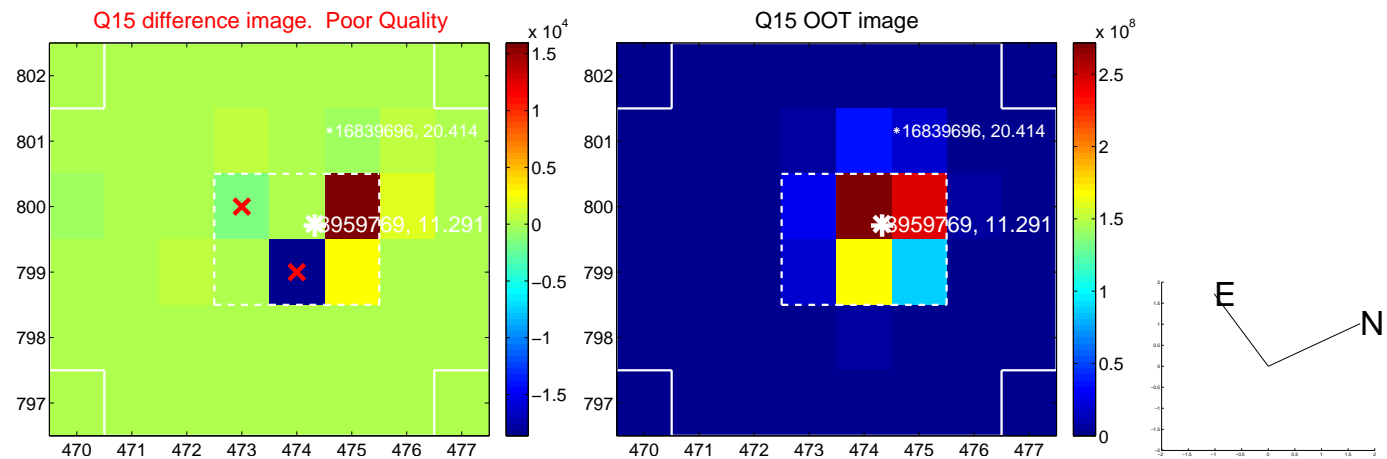
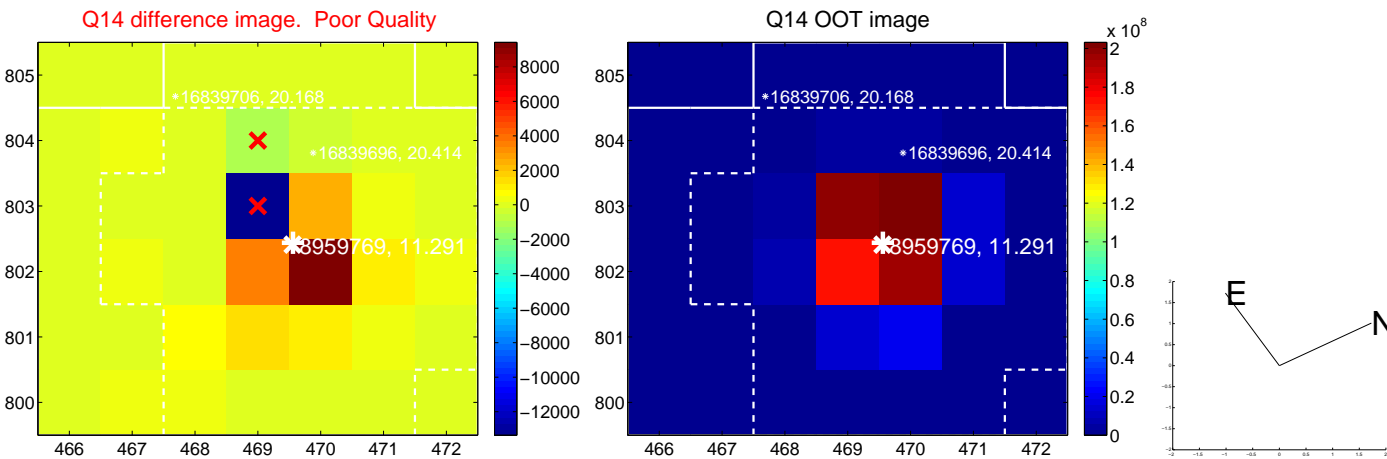
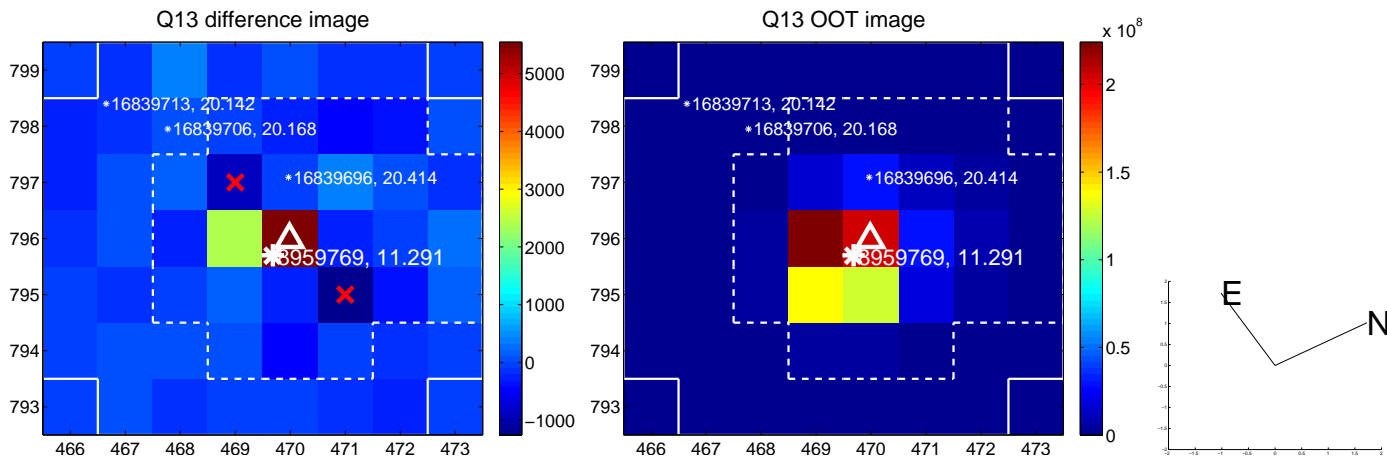
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



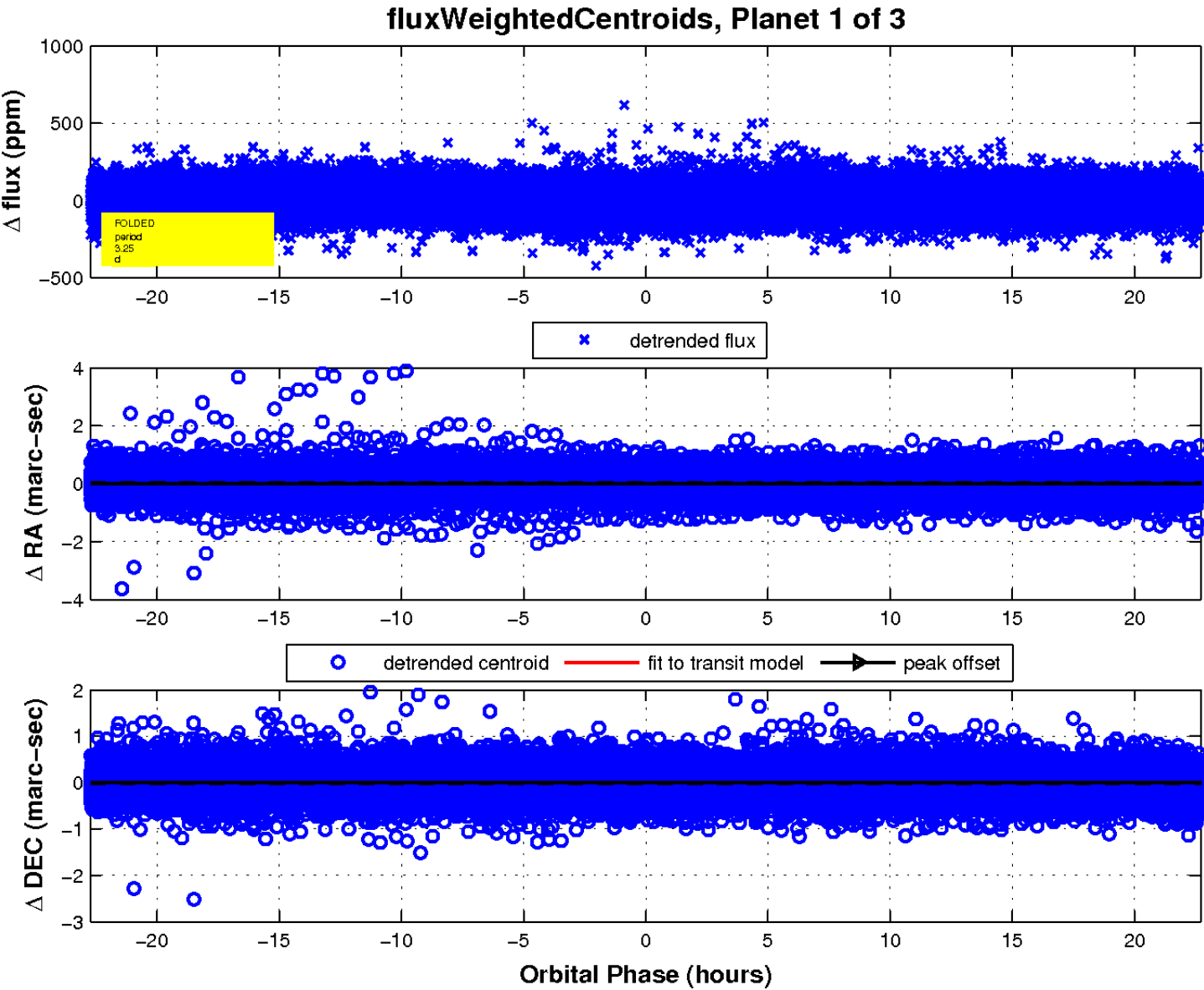
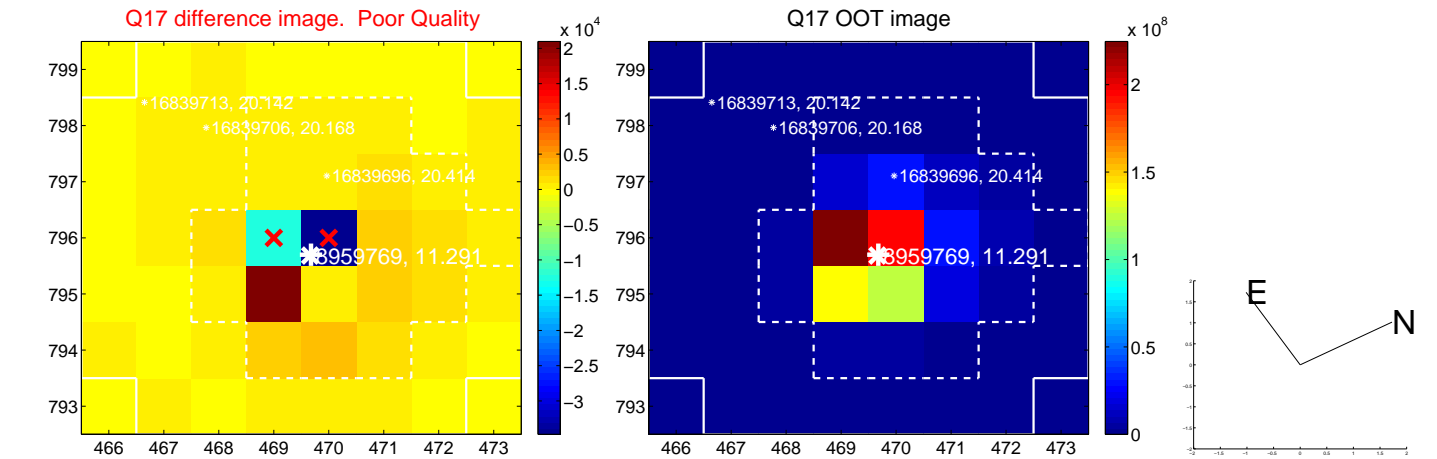
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white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

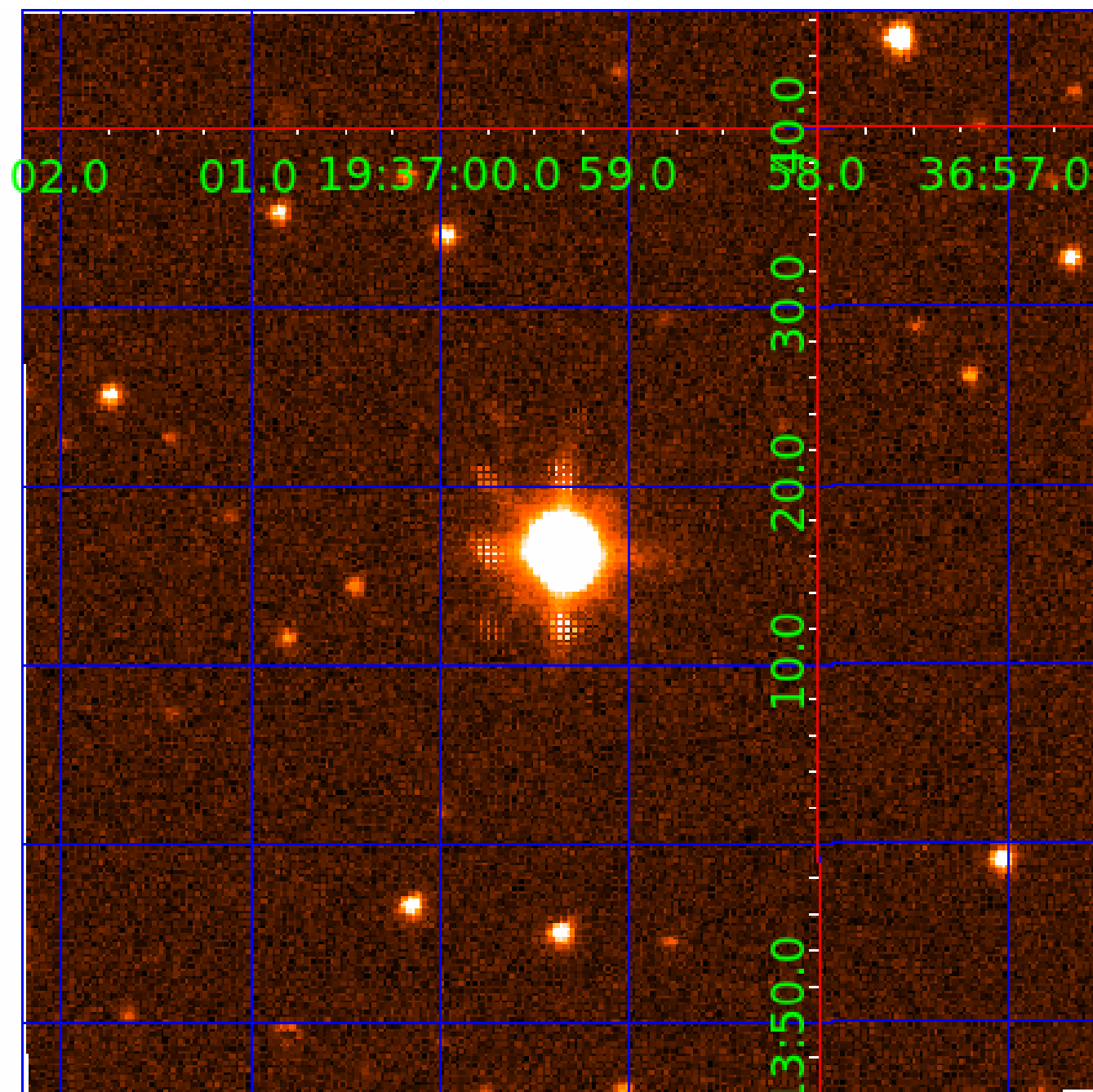


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008959769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008959769-01	OBS	No	3.254571	134.602531	14.7	7.573	9.7	7.1	1.48	6400	0.72	1748.47
008959769-02	OBS	No	600.822251	346.881533	179.1	17.018	9.9	7.7	1.48	6400	2.13	1.66
008959769-03	OBS	No	3.253880	133.073666	6.6	21.262	9.1	3.7	1.48	6400	0.41	1748.97

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008959769-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—CENT_SATURATED
008959769-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_SATURATED
008959769-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

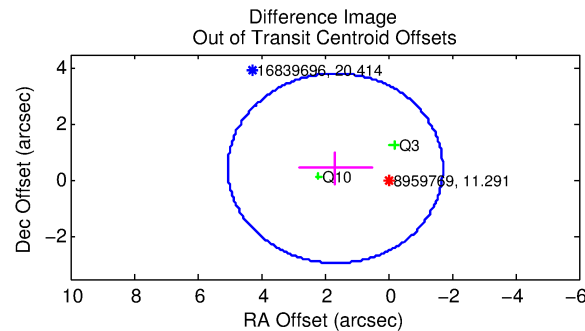
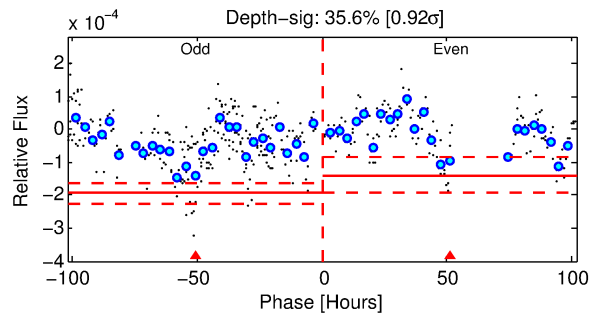
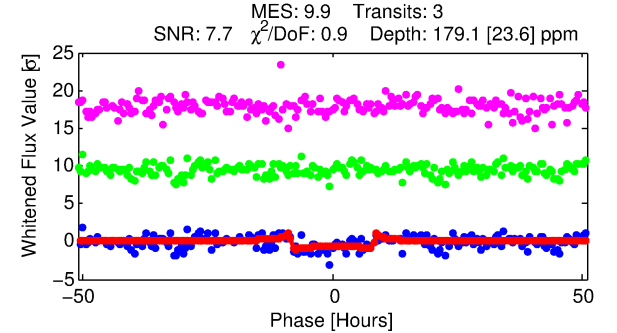
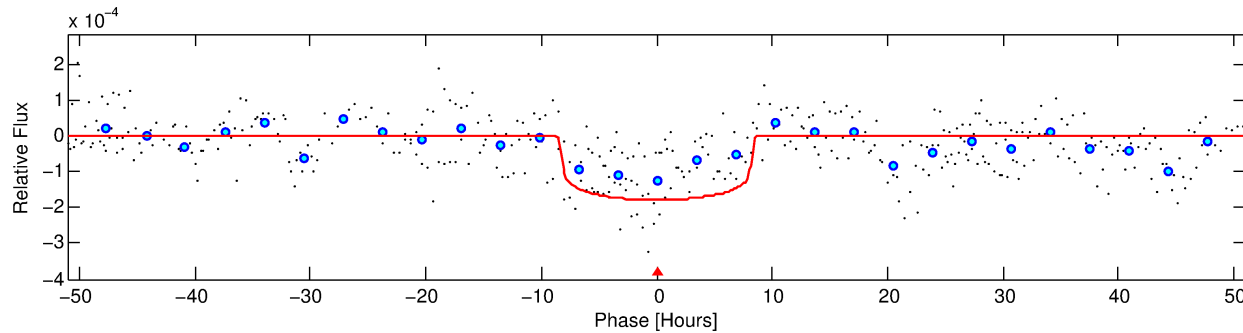
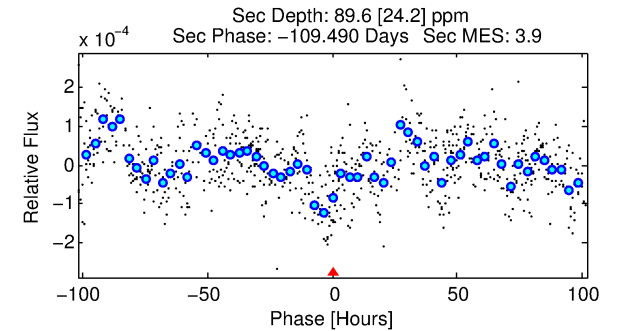
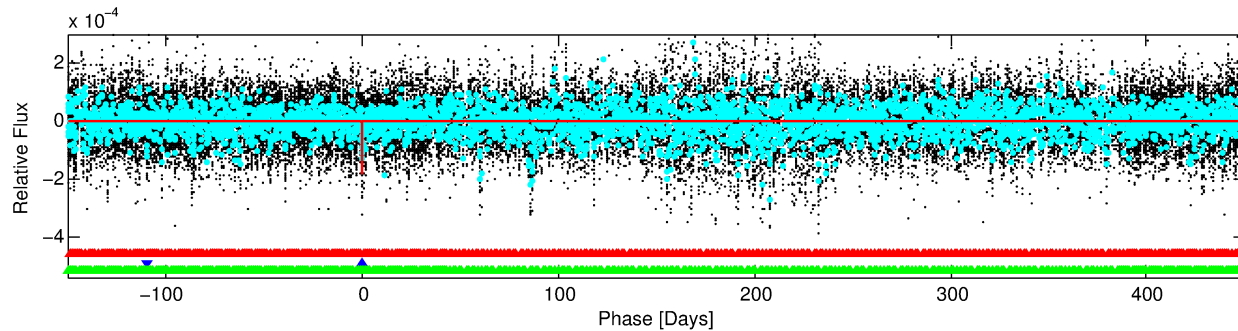
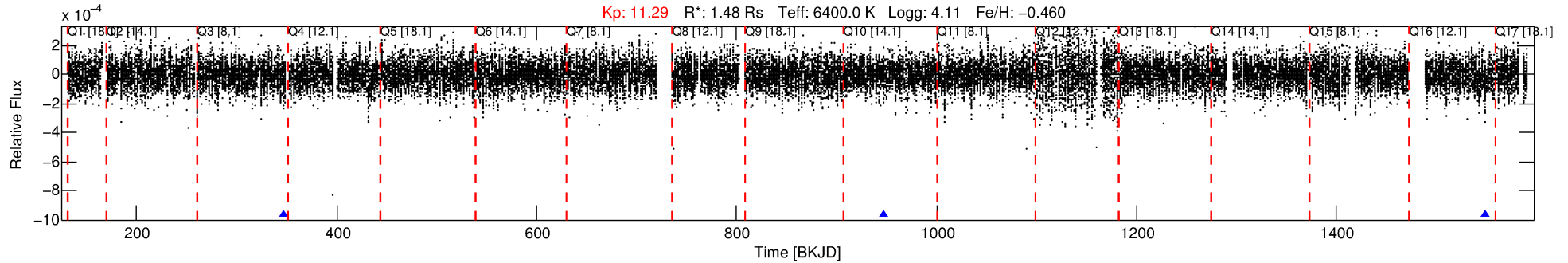
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008959769-02

No Significant Match Found

# DV One-Page Summary

KIC: 8959769 Candidate: 2 of 3 Period: 600.822 d



## DV Fit Results:

Period = 600.82225 [0.00733] d  
Epoch = 346.8815 [0.0112] BKJD  
Rp/R\* = 0.0132 [0.0022]  
a/R\* = 192.70 [155.05]  
b = 0.72 [0.54]  
Seff = 1.66 [0.86]  
Teq = 290 [38] K  
Rp = 2.13 [0.76] Re  
a = 1.4079 [0.4330] AU  
Ag = 21516.69 [14150.25] [1.52σ]  
Teffp = 5423 [620] K [8.26σ]

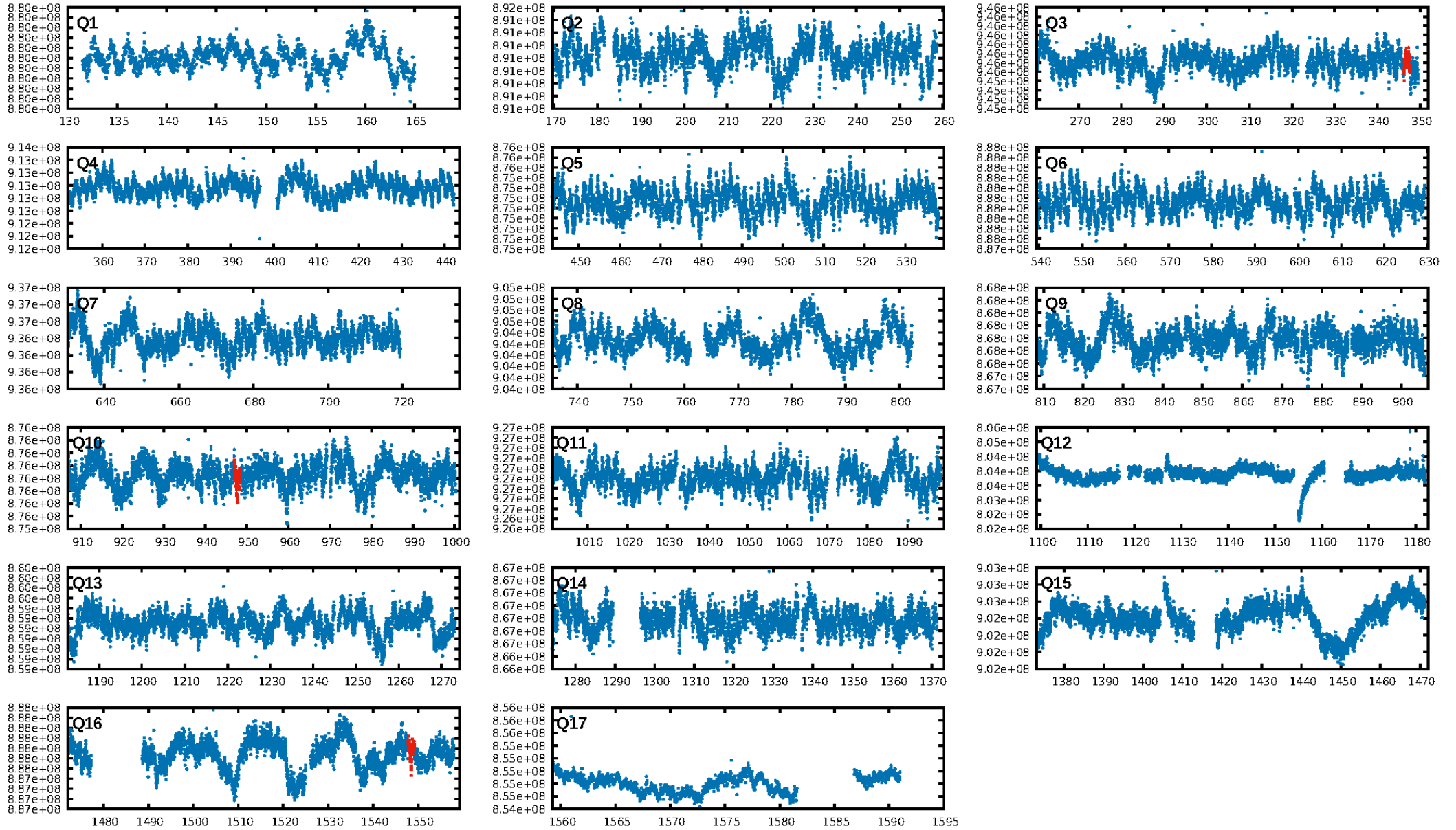
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [769.93σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 4.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.9598  
Centroid-sig: 3.0%  
Centroid-so: 1.099 arcsec [1.61σ]  
OotOffset-rm: 1.719 arcsec [1.53σ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-rm: 1.807 arcsec [1.52σ]  
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DiffImageOverlap-fno: 0.00 [0/2]

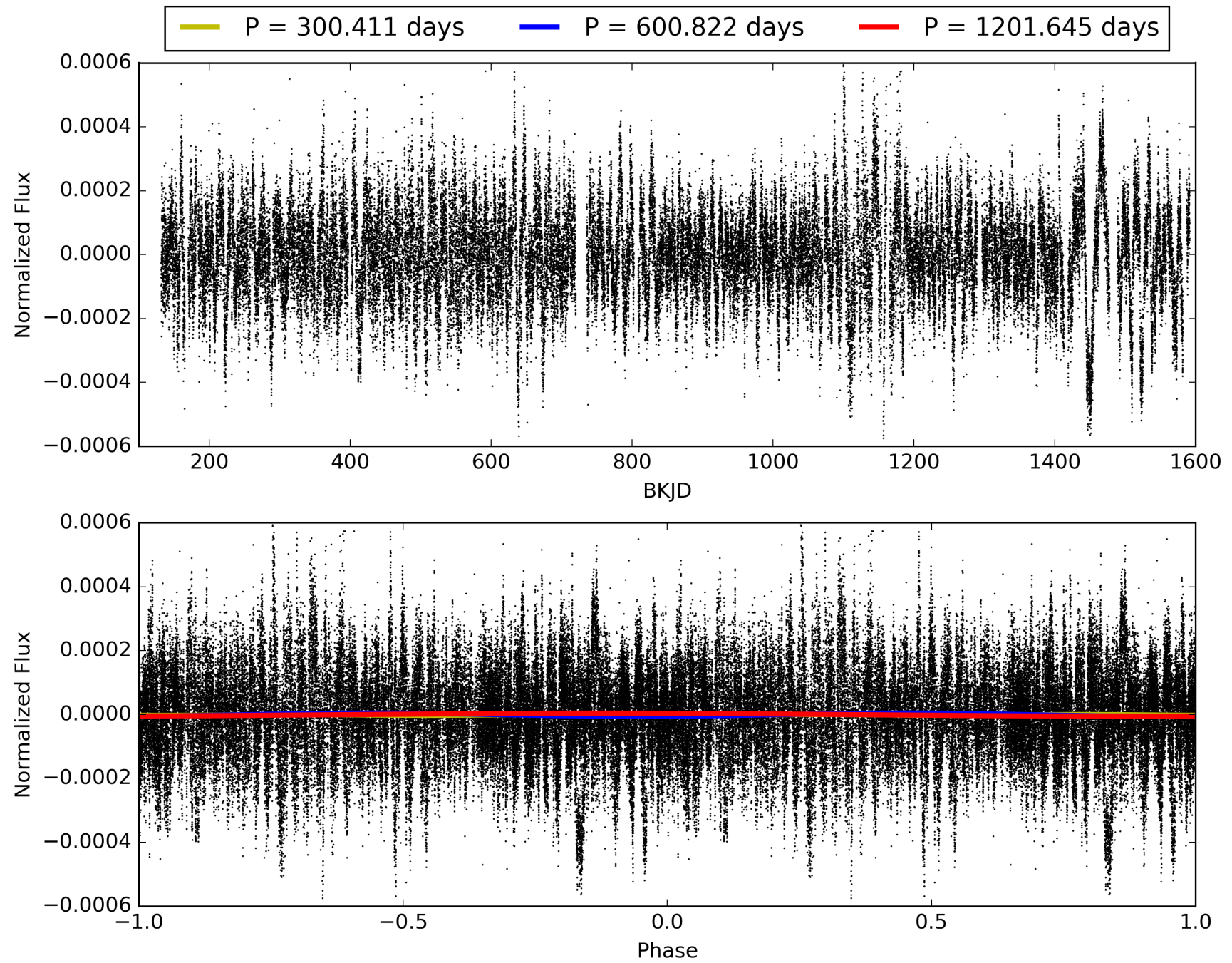
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:00:48 Z

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

# TCE 008959769-02, PDC Light Curves

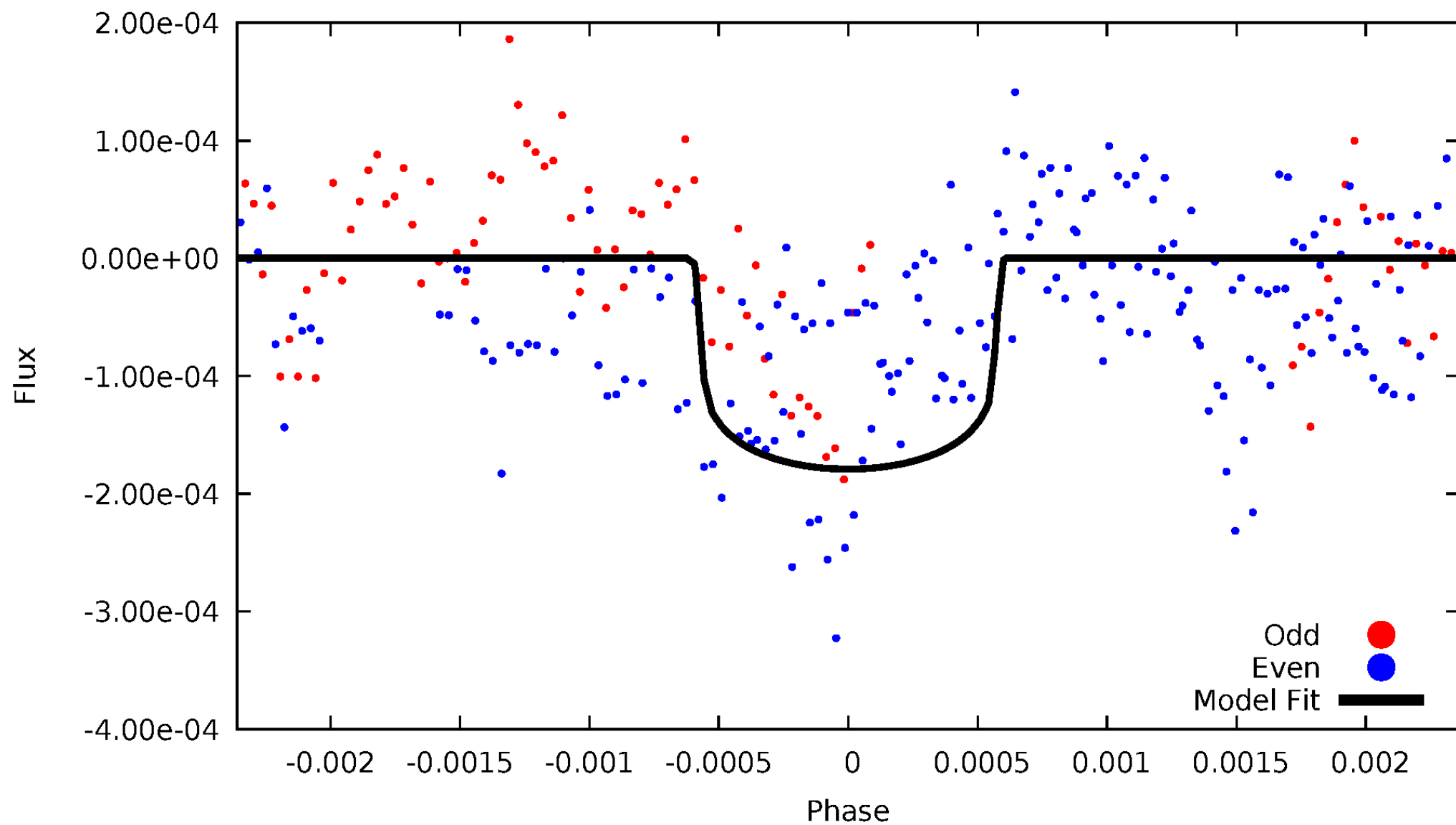


TCE 008959769-02



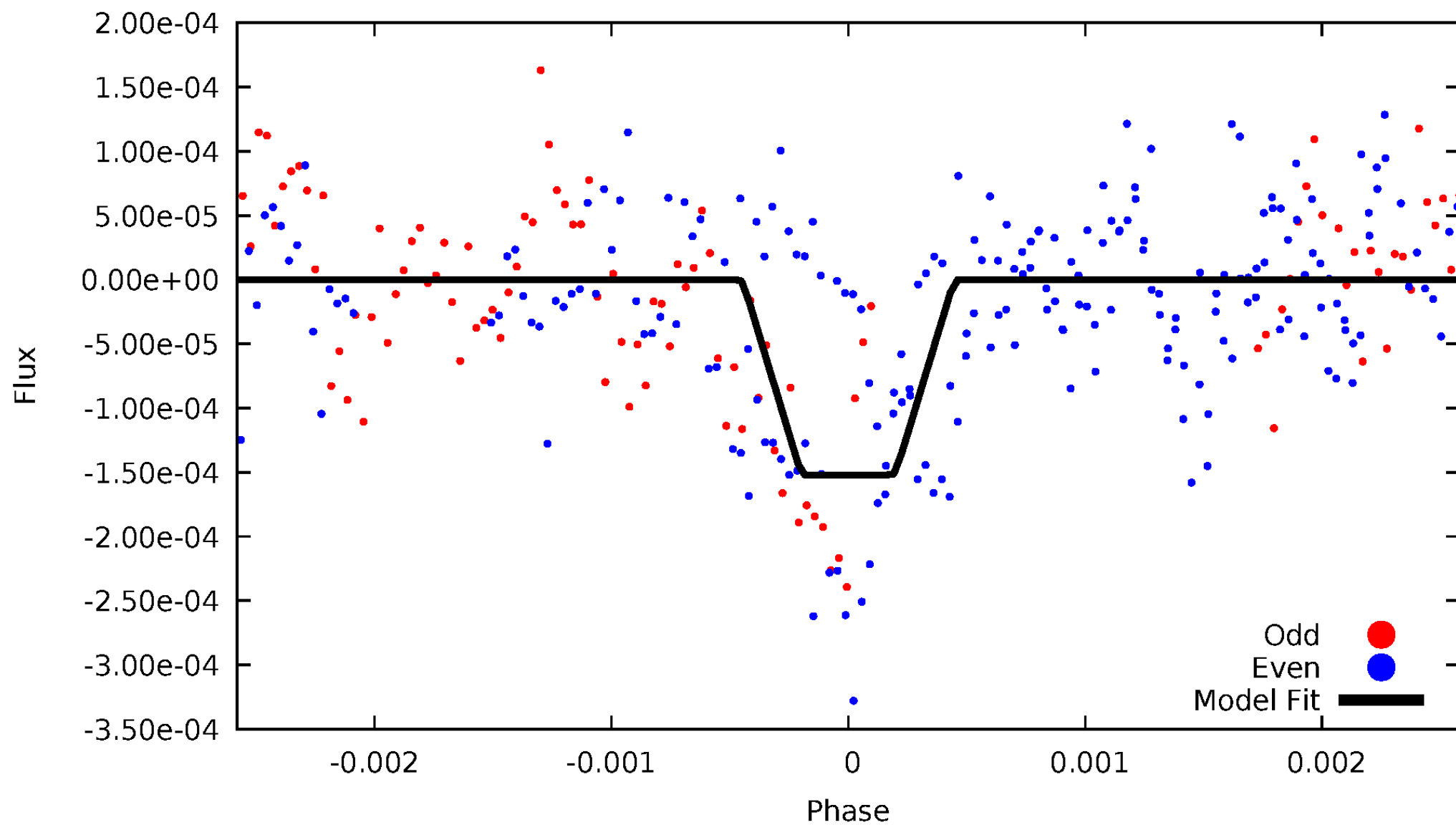
# DV Odd/Even

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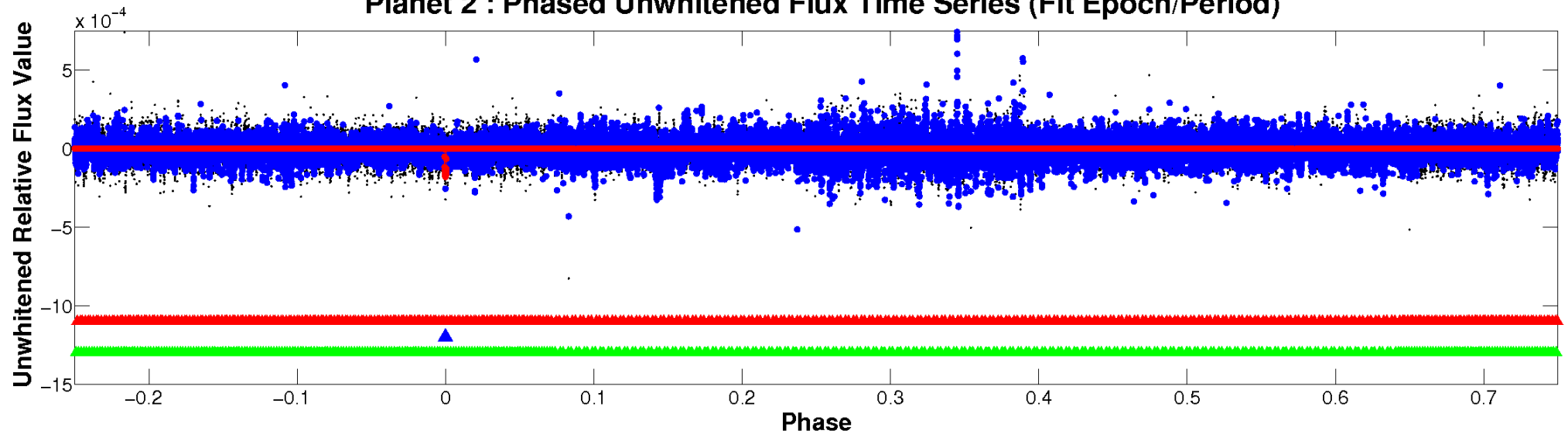
# ALT Odd/Even

TCE 008959769-02

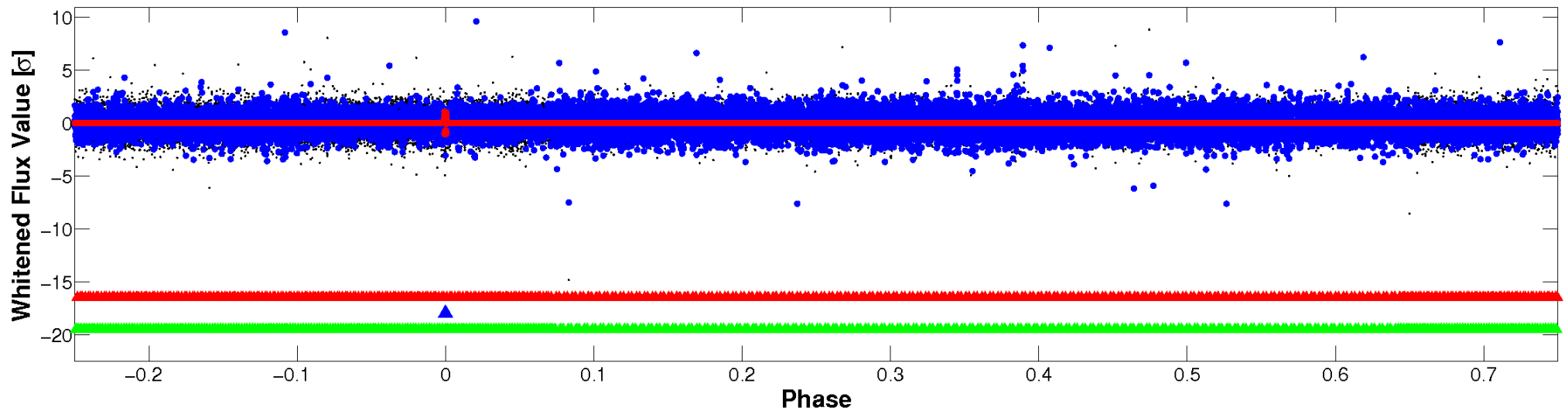


# Non-Whitened Vs. Whitened Light Curve

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

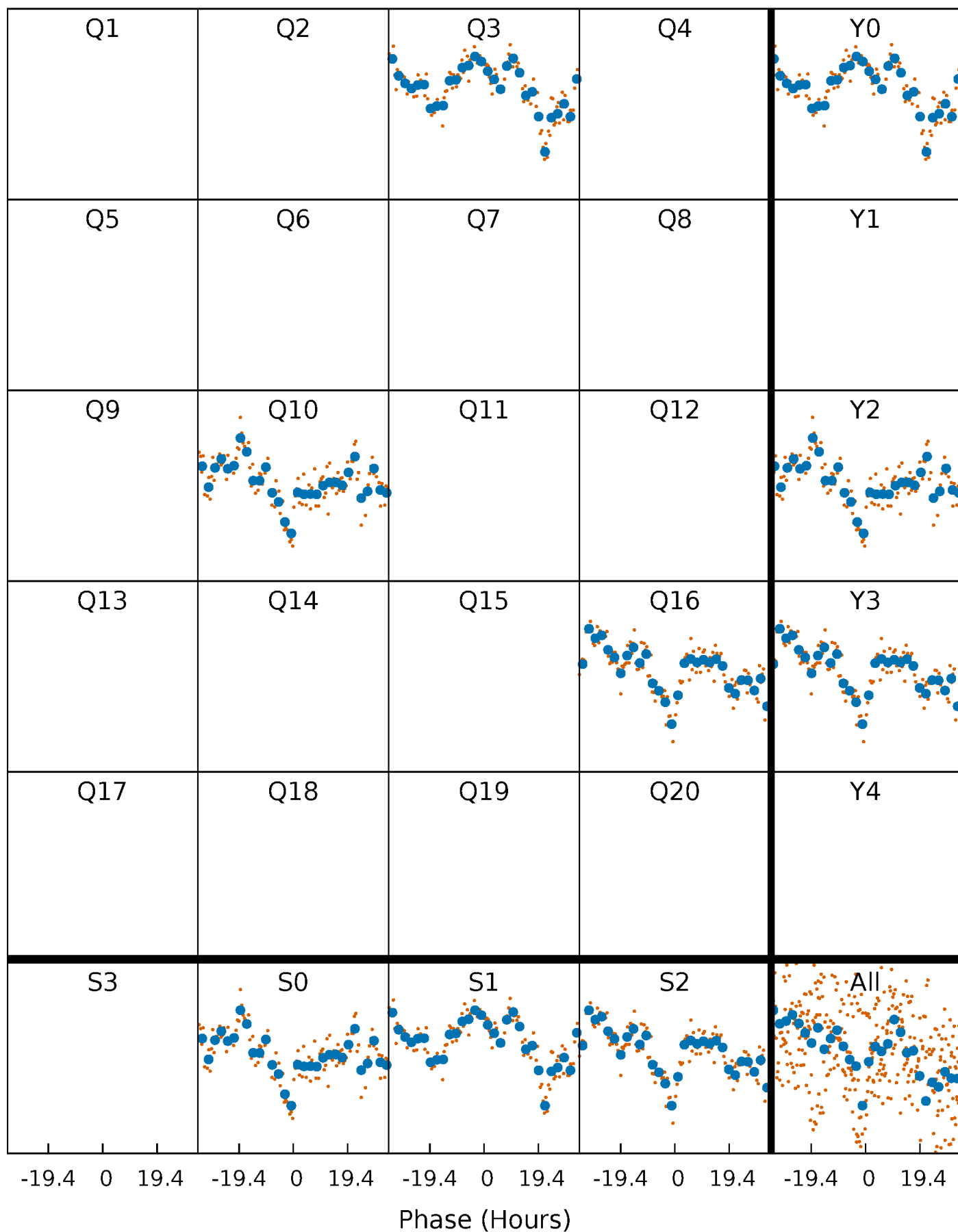


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



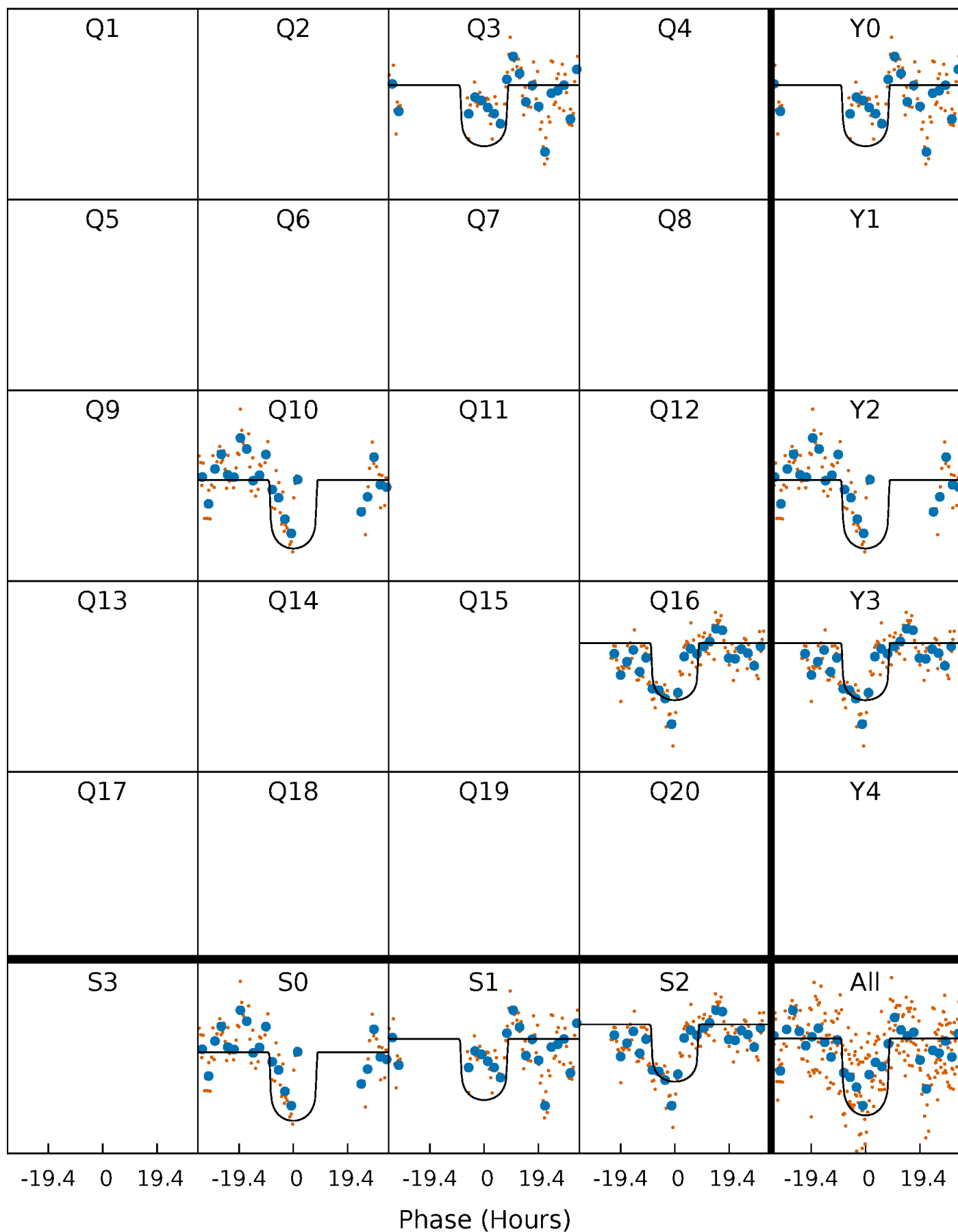
# PDC Quarter-Phased Transit Curves

TCE 008959769-02     $P=600.822251$  Days     $T_0=346.881533$  (BKJD)



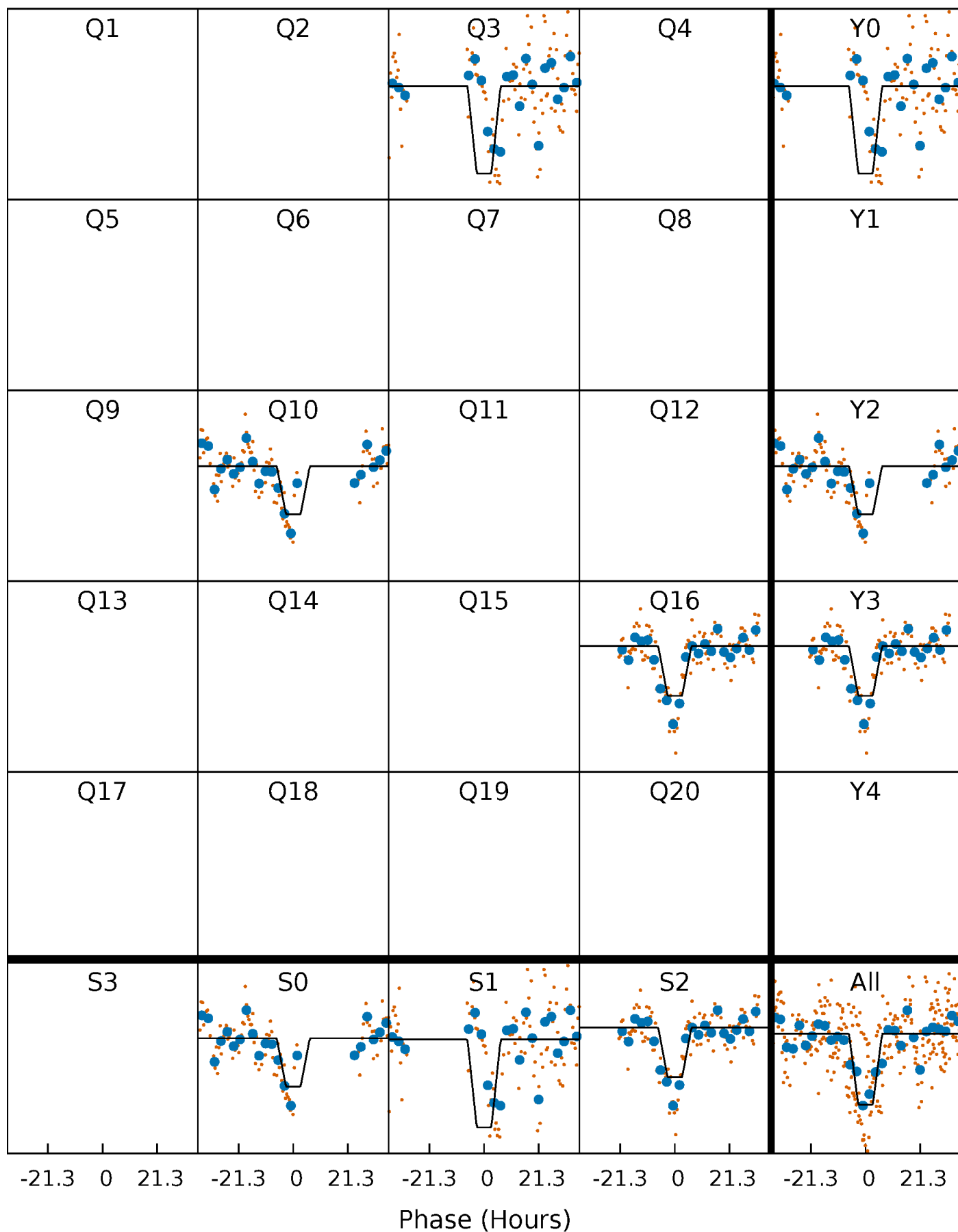
# DV Quarter-Phased Transit Curves

TCE 008959769-02     $P=600.822251$  Days     $T_0=346.881533$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

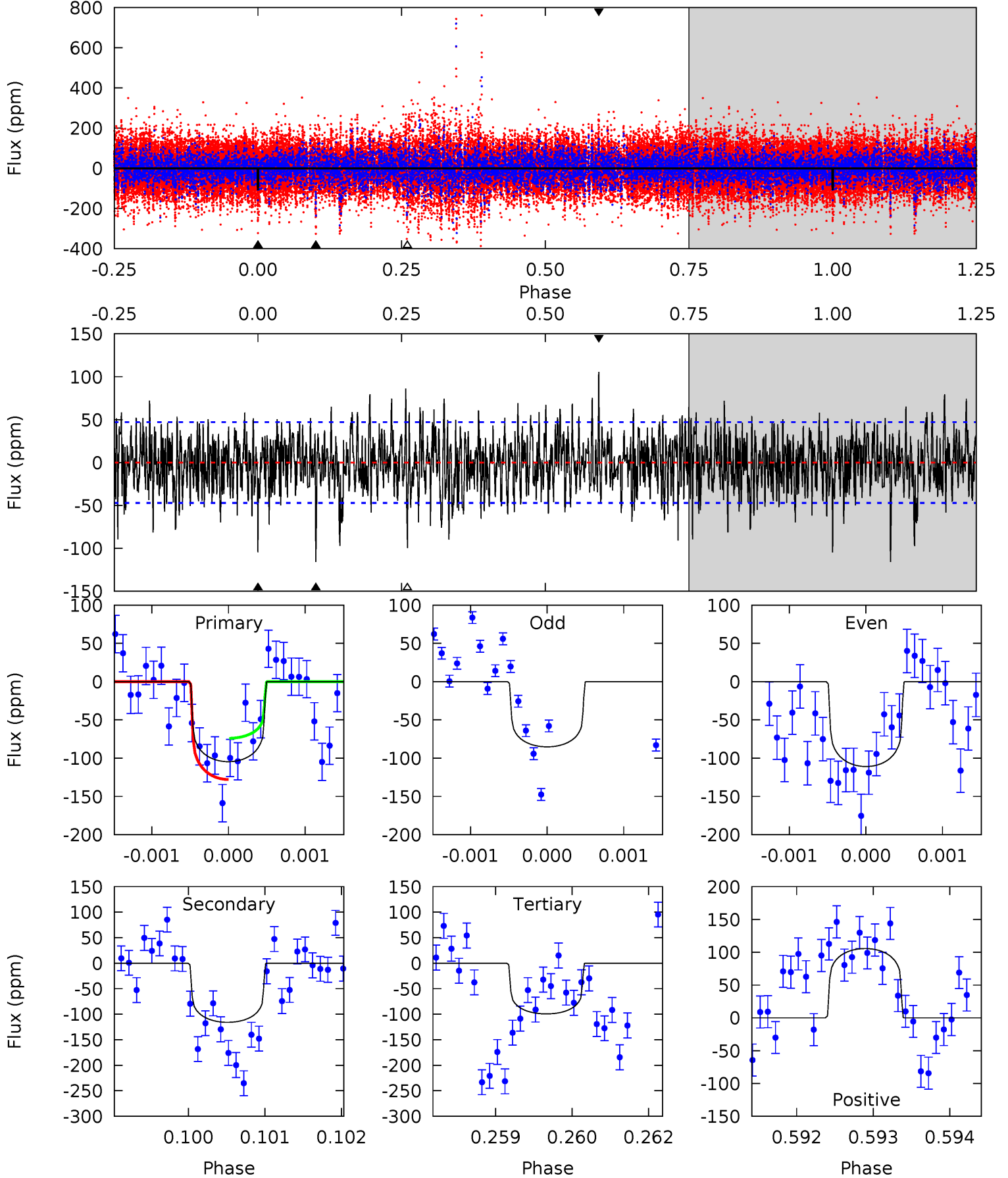
TCE 008959769-02     $P=600.787531$  Days     $T_0=346.909381$  (BKJD)



# DV Model-Shift Uniqueness Test

008959769-02, P = 600.822251 Days, E = 346.881533 Days

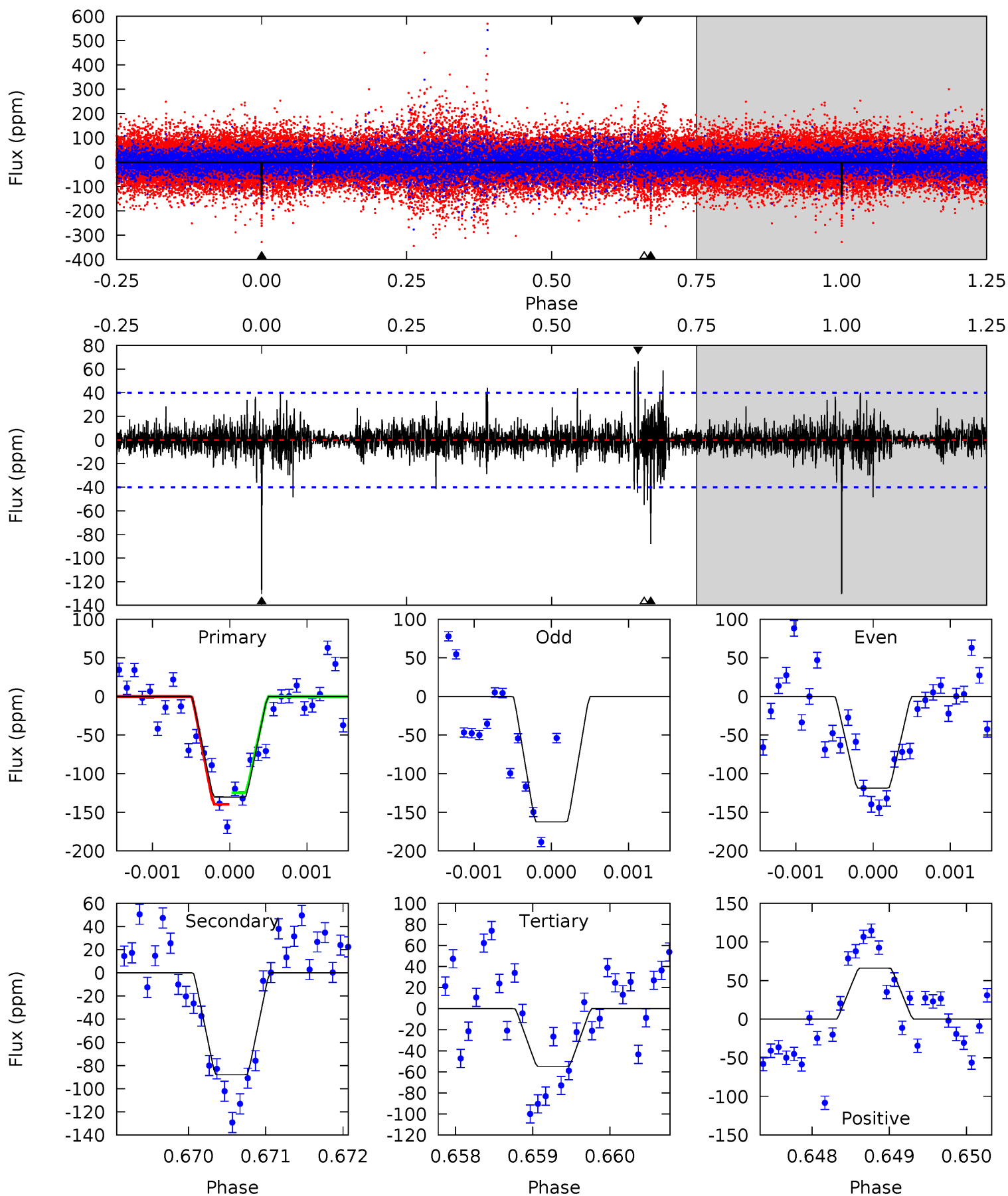
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.0	13.3	11.4	12.2	5.42	3.24	3.12	0.59	-0.12	1.89	1.18	1.23	1.19	0.48	3.04



# Alt Model-Shift Uniqueness Test

008959769-02, P = 600.787531 Days, E = 346.909381 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.8	12.0	7.49	9.03	5.47	3.31	1.29	10.3	8.78	4.52	2.98	2.43	0.81	0.34	0.97



### Stellar Parameters For KIC 008959769

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6400^{+199}_{-244}$	$4.110^{+0.293}_{-0.158}$	$-0.460^{+0.300}_{-0.300}$	$1.481^{+0.381}_{-0.466}$	$1.031^{+0.152}_{-0.137}$	$0.447^{+0.867}_{-0.197}$
	+3%/-4%	+7%/-4%	+65%/-65%	+26%/-31%	+15%/-13%	+194%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 008959769-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-116 \pm 9$	$2.08^{+0.52}_{-0.45}$	$401^{+31}_{-34}$	$5776^{+578}_{-440}$	$29579^{+17644}_{-10320}$
Alt.	$-88 \pm 7$	$1.95^{+0.49}_{-0.45}$	$400^{+30}_{-33}$	$5589^{+573}_{-454}$	$25877^{+17324}_{-9456}$

$T_{max}$  = 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

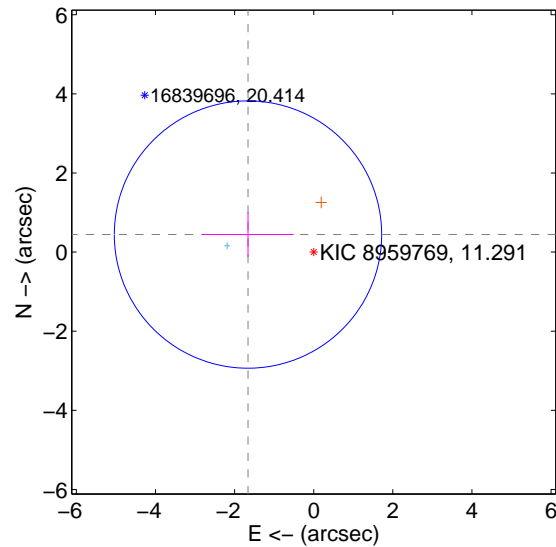
Supplemental centroid analysis for 008959769-02. **Kepler magnitude: 11.29.** Transit SNR 7.65

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

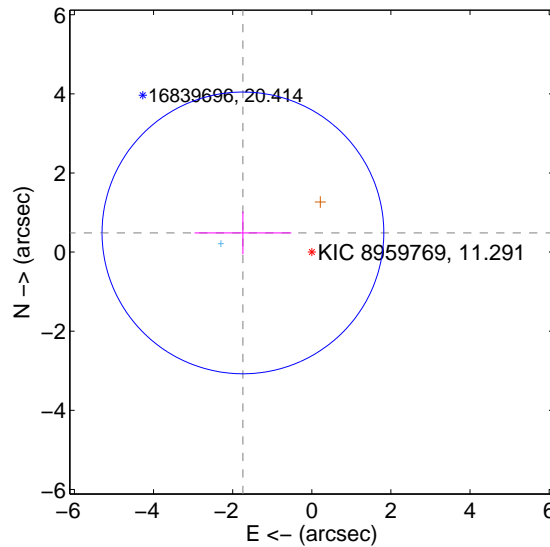
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.719 \pm 1.126$	1.53	$1.661 \pm 1.156$	$0.443 \pm 0.564$
PRF-fit source offset from KIC position	$1.807 \pm 1.187$	1.52	$1.741 \pm 1.223$	$0.485 \pm 0.542$
photometric centroid source offset	$1.10 \pm 0.68$	1.61	$-0.79 \pm 0.72$	$-0.76 \pm 0.65$

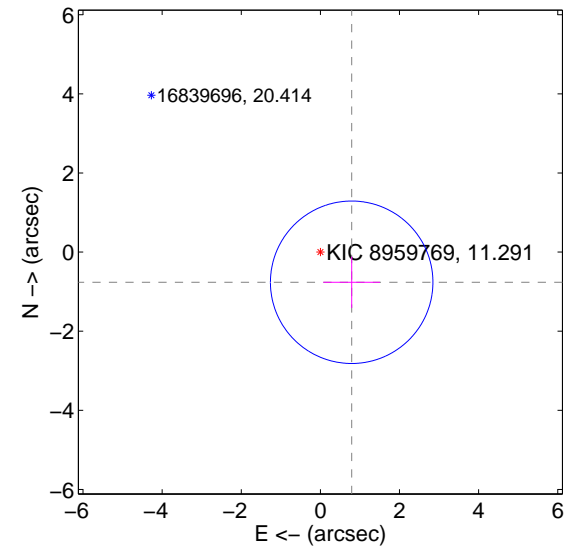
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

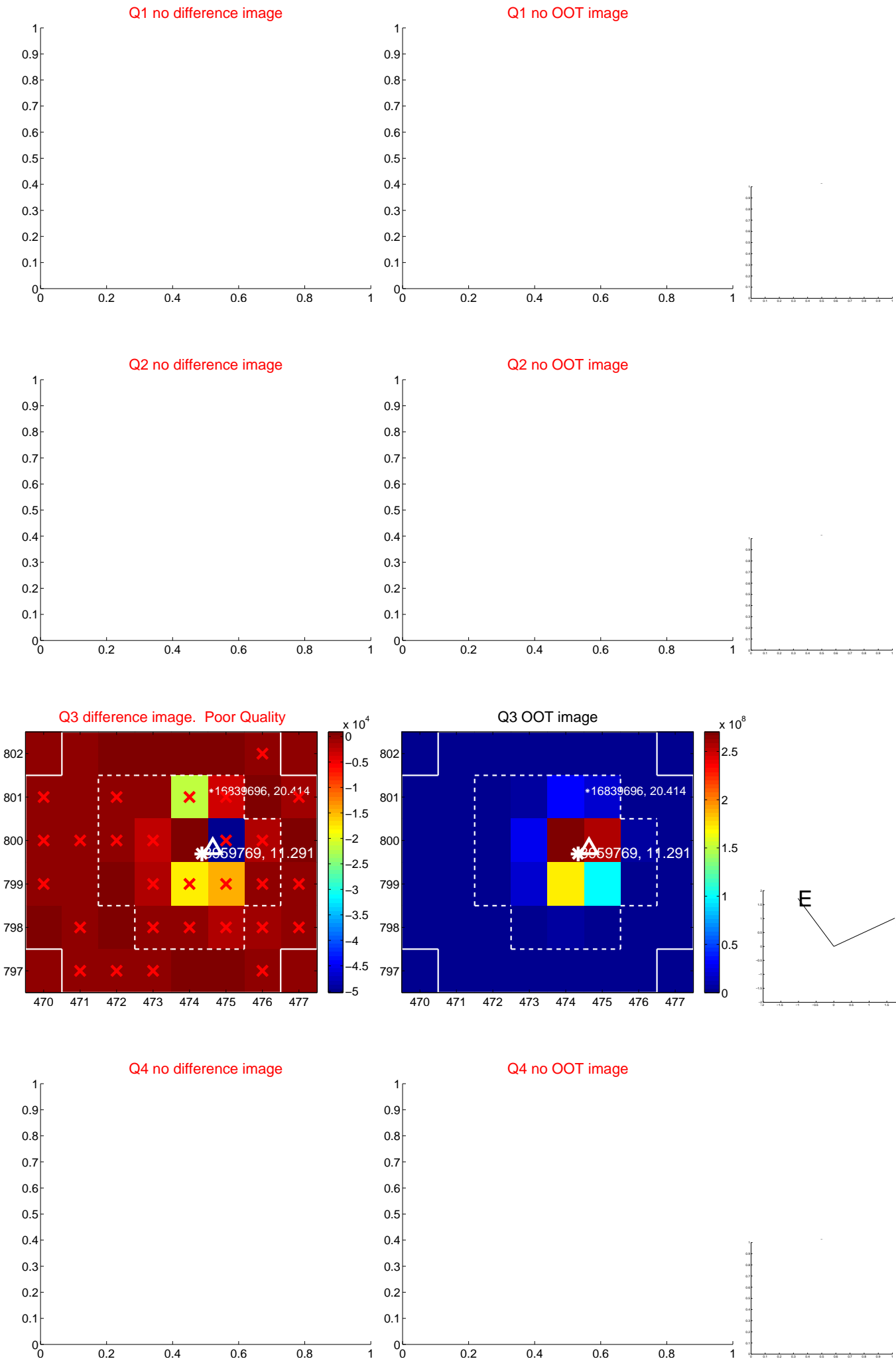


offset from photometric centroids

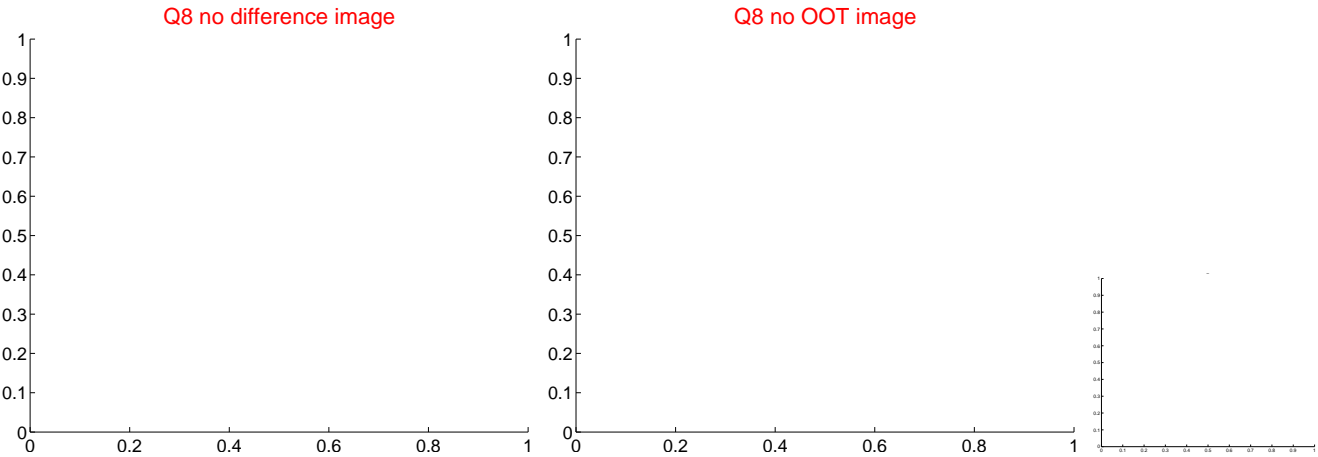
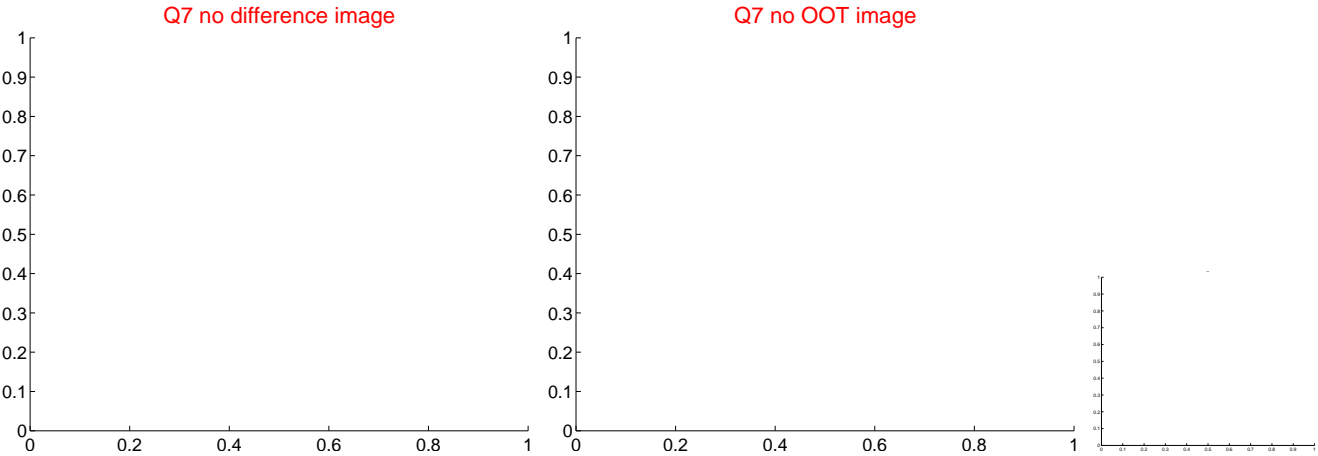
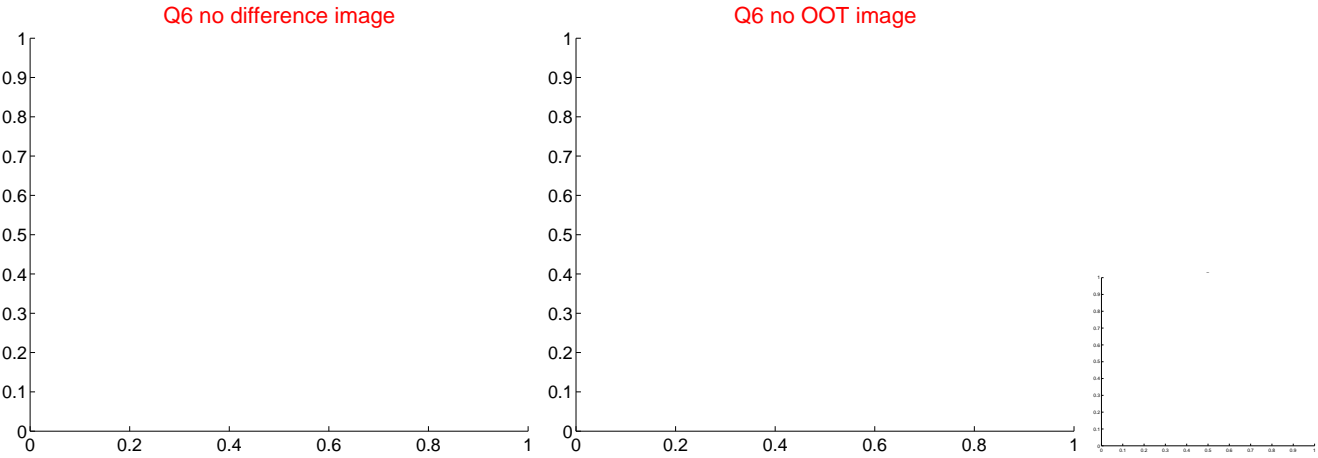
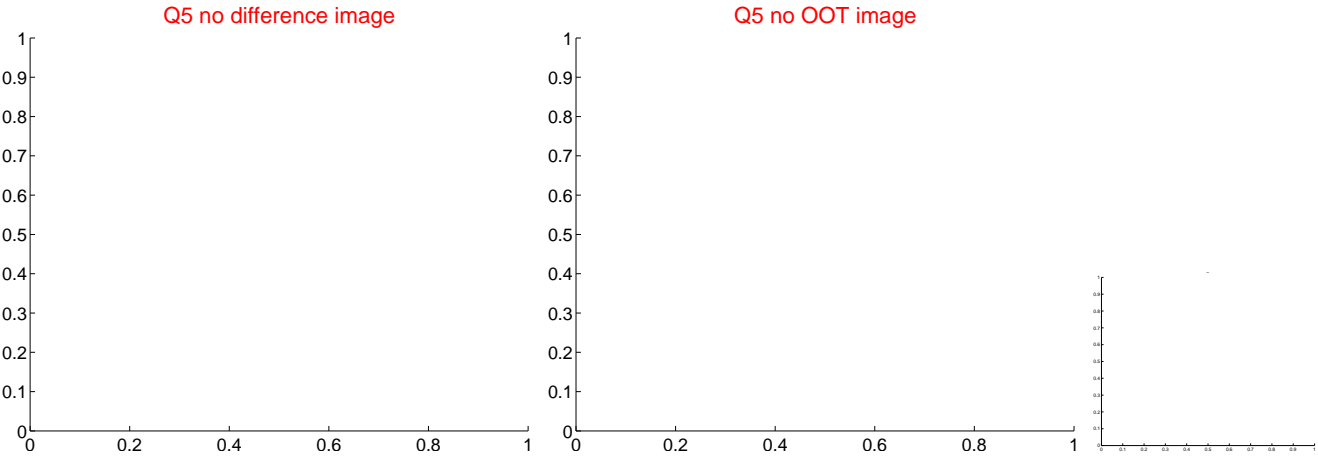


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

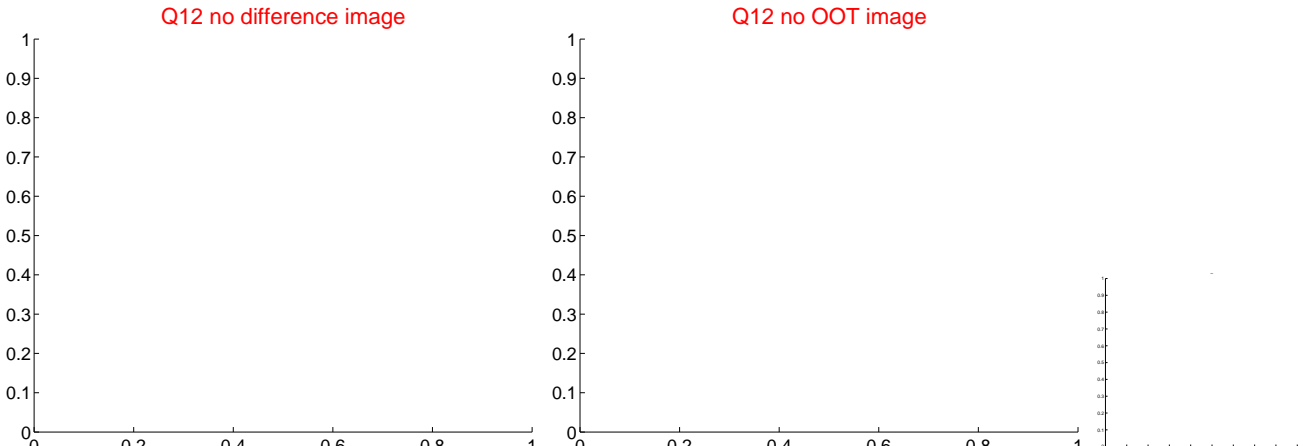
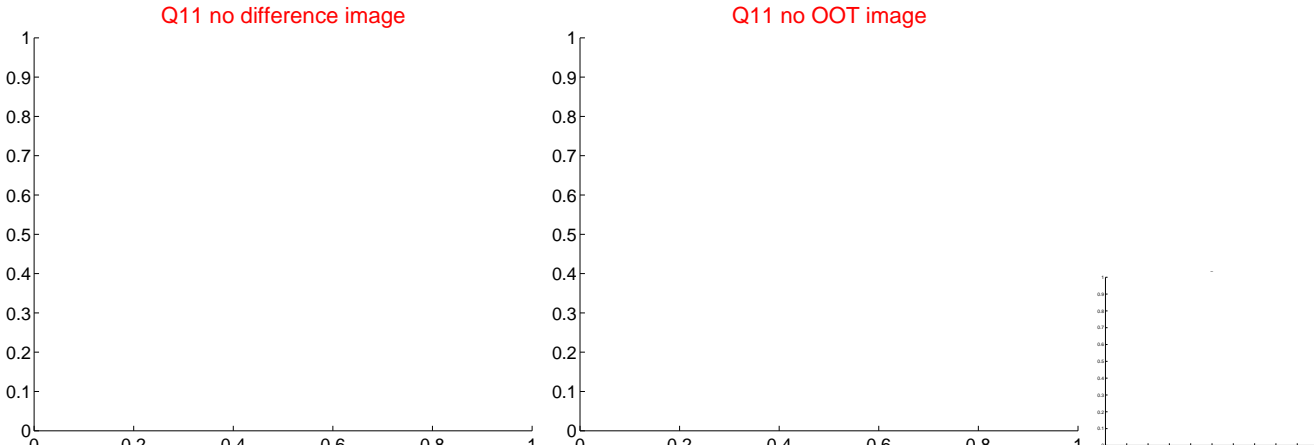
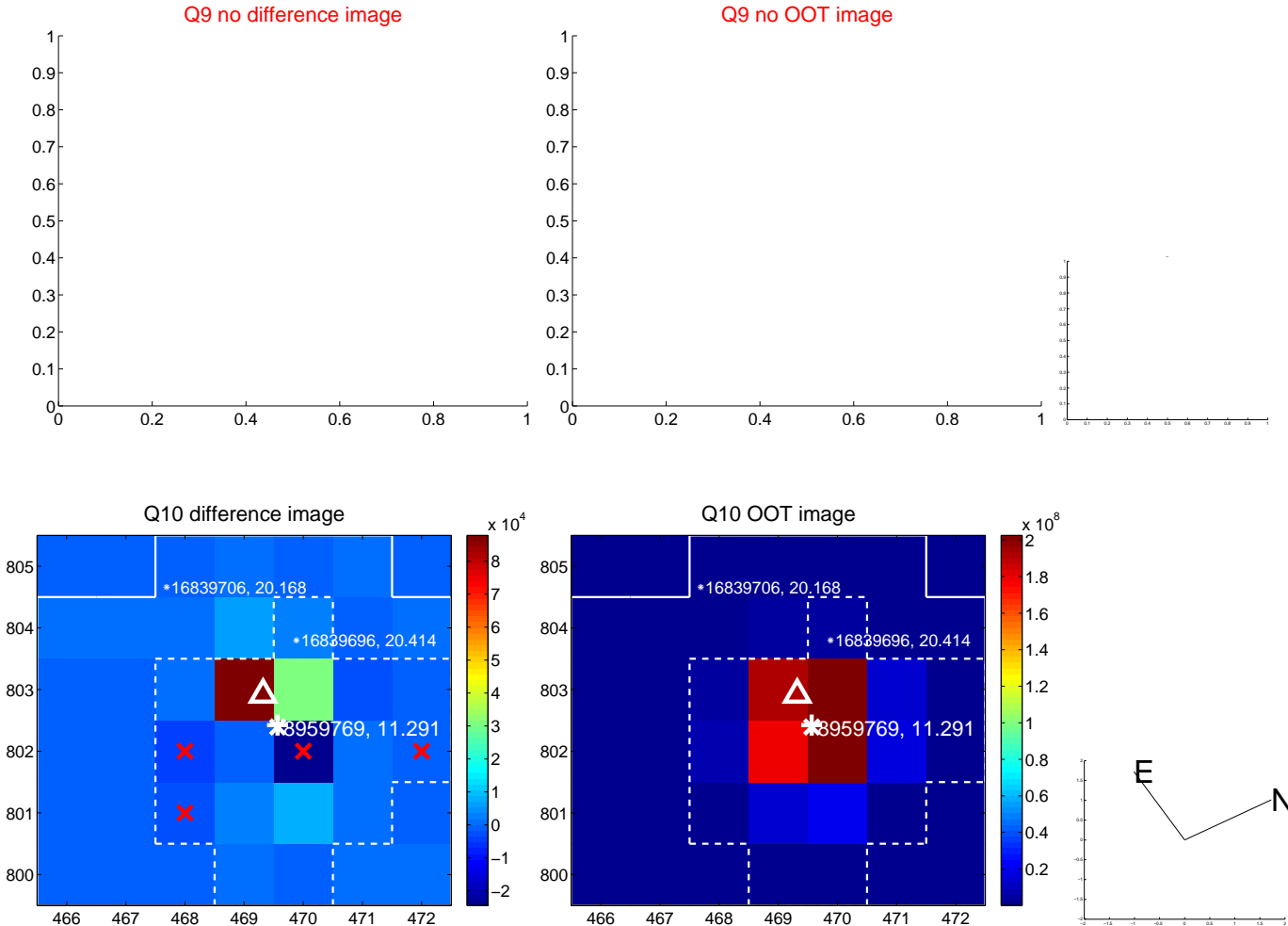
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



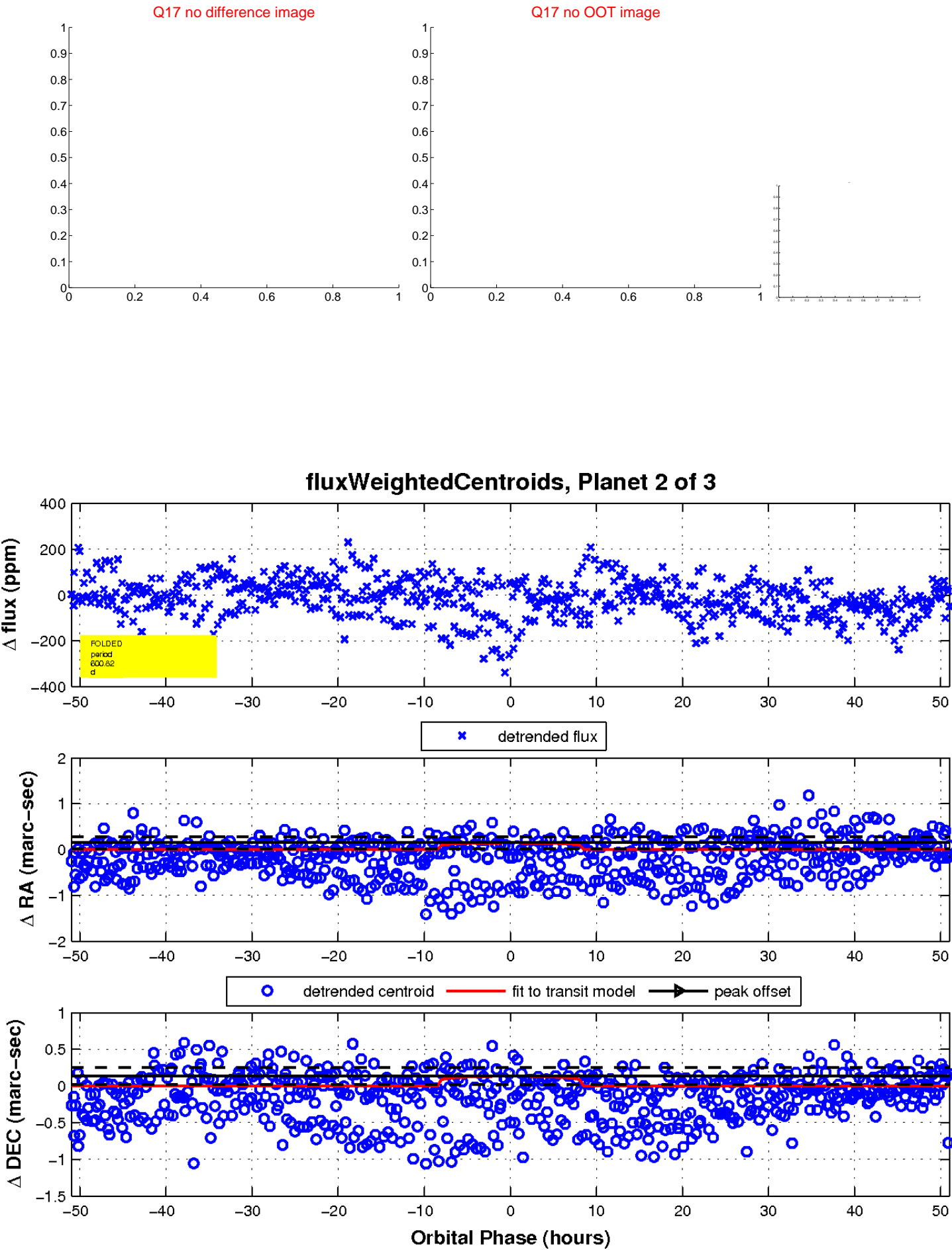
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

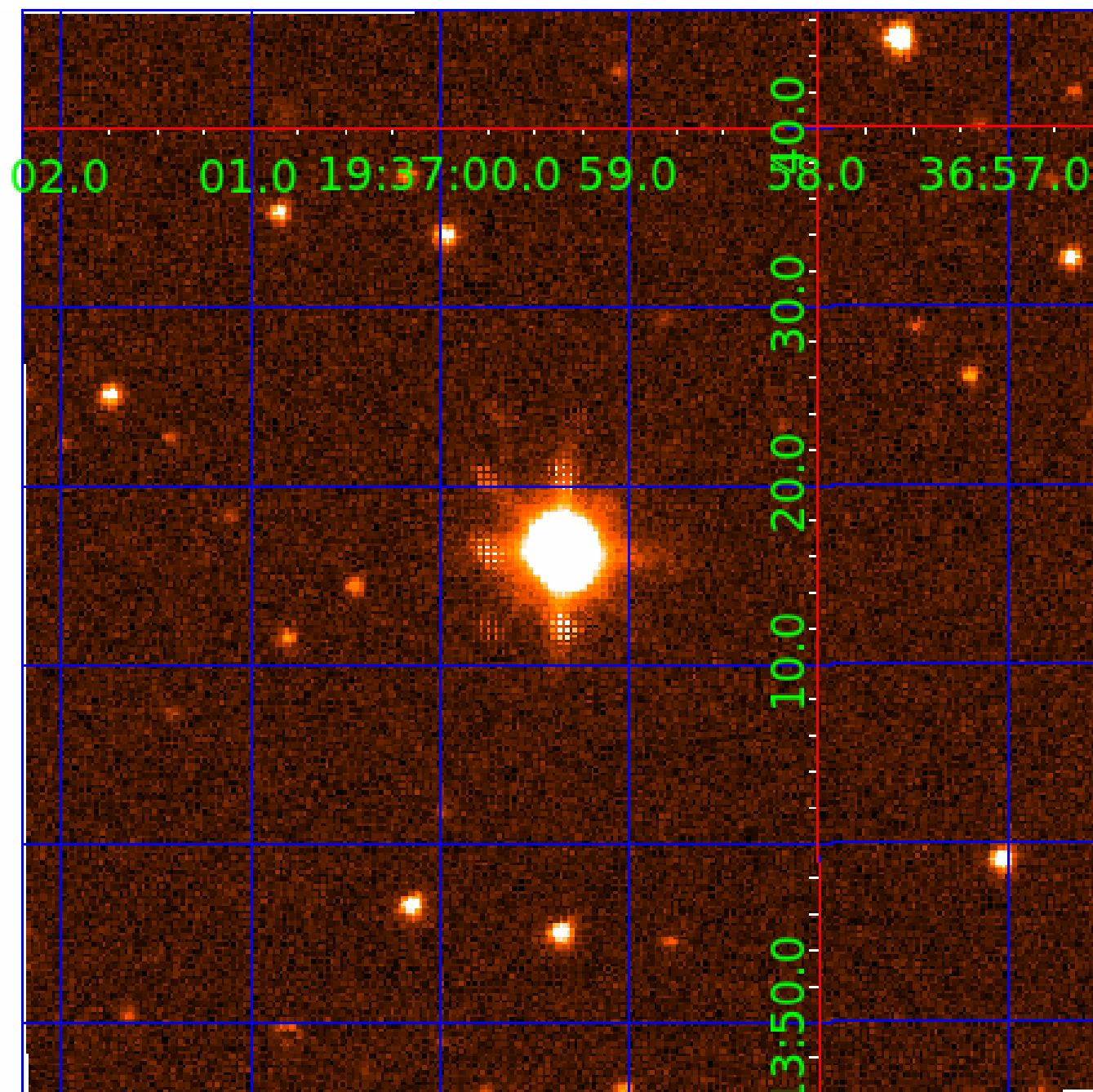


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008959769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008959769-01	OBS	No	3.254571	134.602531	14.7	7.573	9.7	7.1	1.48	6400	0.72	1748.47
008959769-02	OBS	No	600.822251	346.881533	179.1	17.018	9.9	7.7	1.48	6400	2.13	1.66
008959769-03	OBS	No	3.253880	133.073666	6.6	21.262	9.1	3.7	1.48	6400	0.41	1748.97

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008959769-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—CENT_SATURATED
008959769-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_SATURATED
008959769-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

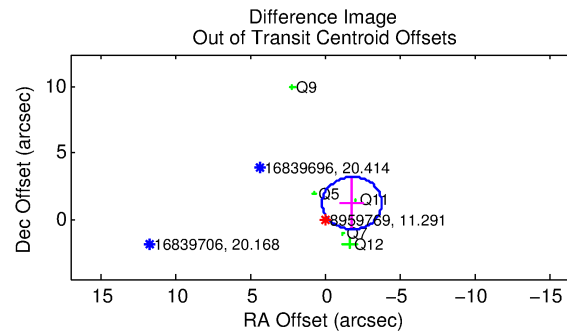
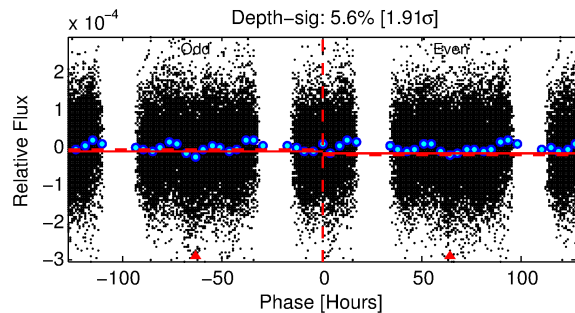
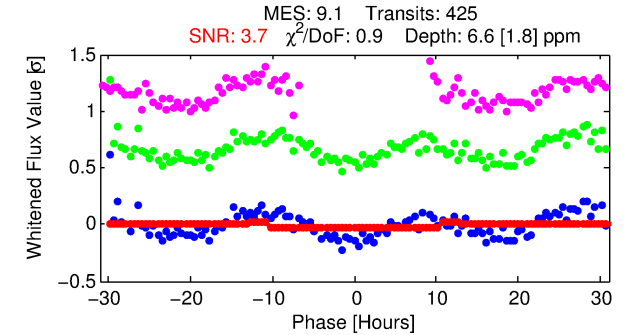
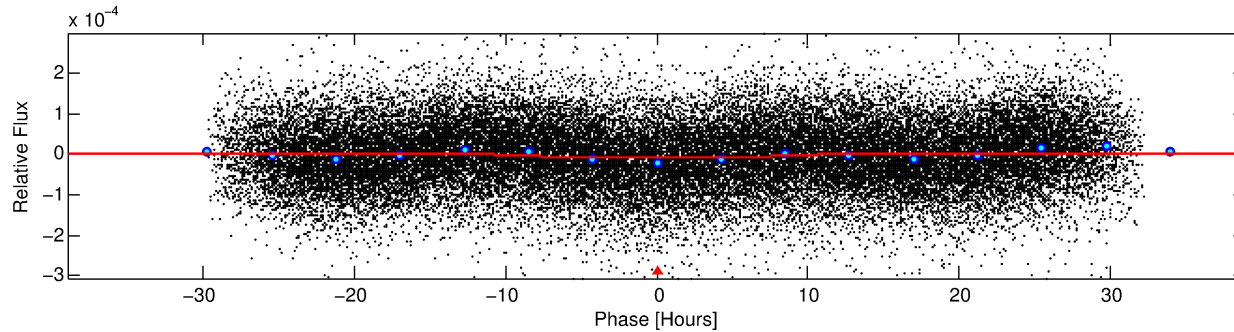
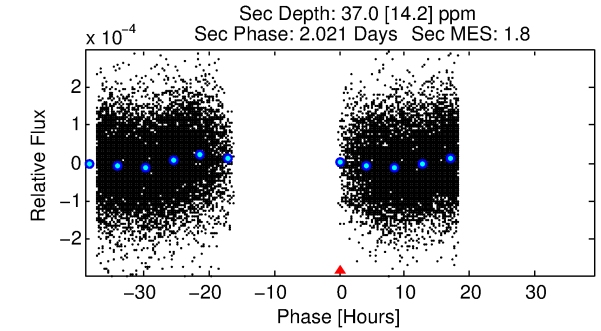
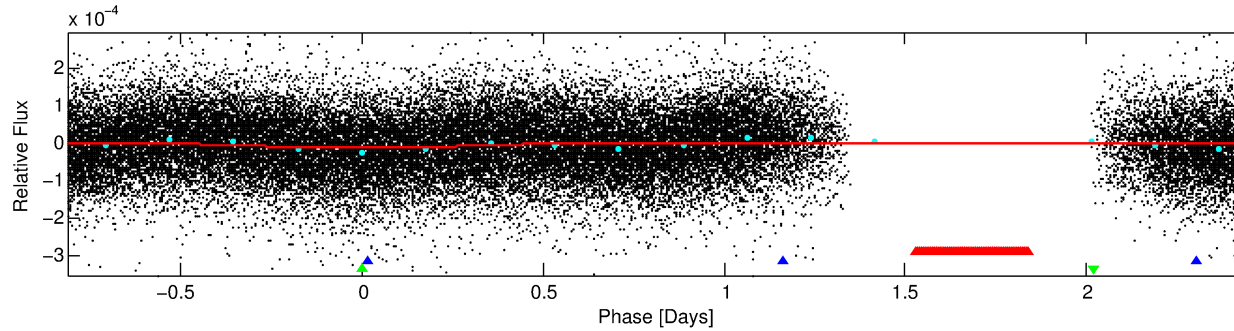
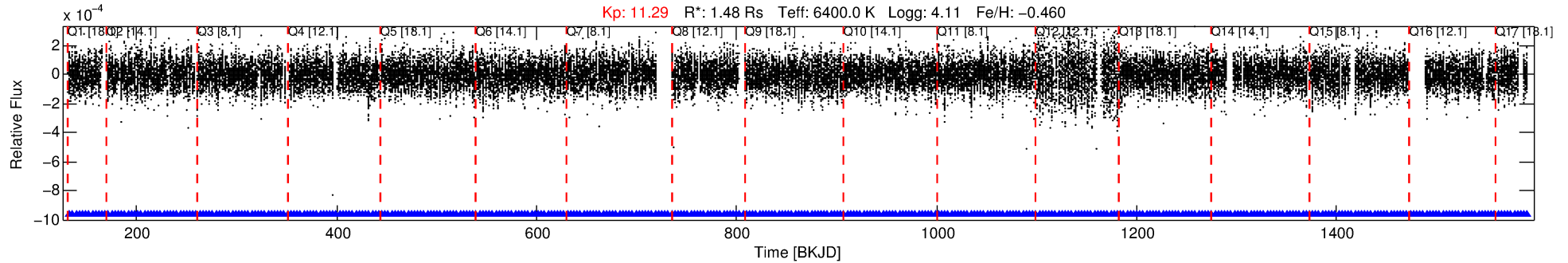
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008959769-03

No Significant Match Found

# DV One-Page Summary

KIC: 8959769 Candidate: 3 of 3 Period: 3.254 d



## DV Fit Results:

Period = 3.25388 [0.00008] d  
Epoch = 133.0737 [0.0136] BKJD  
Rp/R\* = 0.0025 [0.0010]  
a/R\* = 1.18 [0.72]  
b = 0.70 [1.57]  
Seff = 1748.97 [908.04]  
Teq = 1649 [214] K  
Rp = 0.41 [0.21] Re  
a = 0.0434 [0.0134] AU  
Ag = 232.74 [240.27] [0.96σ]  
Teffp = 9958 [2285] K [3.62σ]

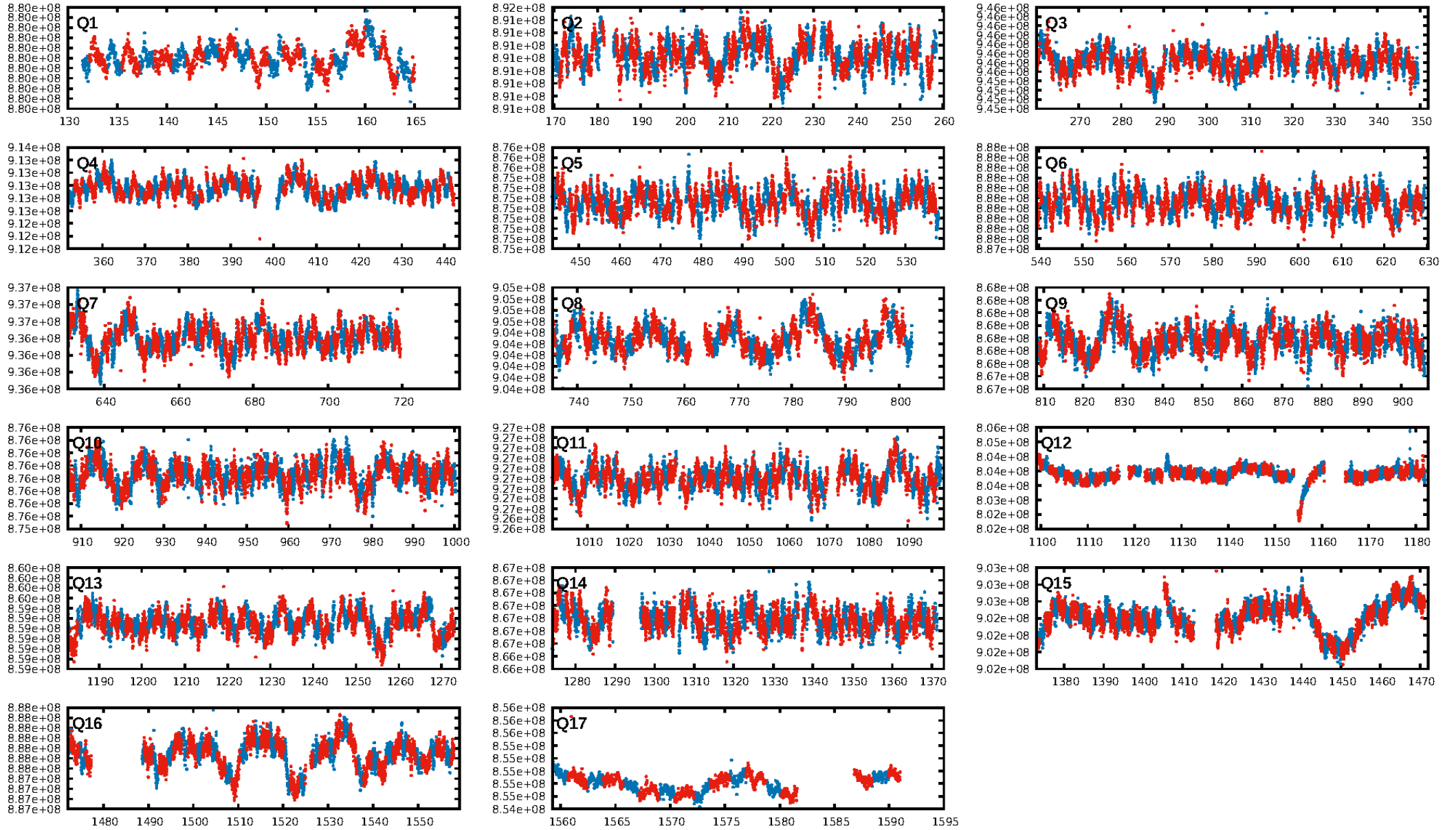
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [406/406]  
GhostDiagnostic-chr: 5.233  
Centroid-sig: 3.8%  
Centroid-so: 1.623 arcsec [1.32σ]  
OotOffset-rm: 2.198 arcsec [3.32σ]  
KicOffset-rm: 2.288 arcsec [3.34σ]  
OotOffset-st: 0.2/1/2 [5]  
KicOffset-st: 0.2/1/2 [5]  
DiffImageQuality-fgm: 0.20 [1/5]  
DiffImageOverlap-fno: 0.18 [3/17]

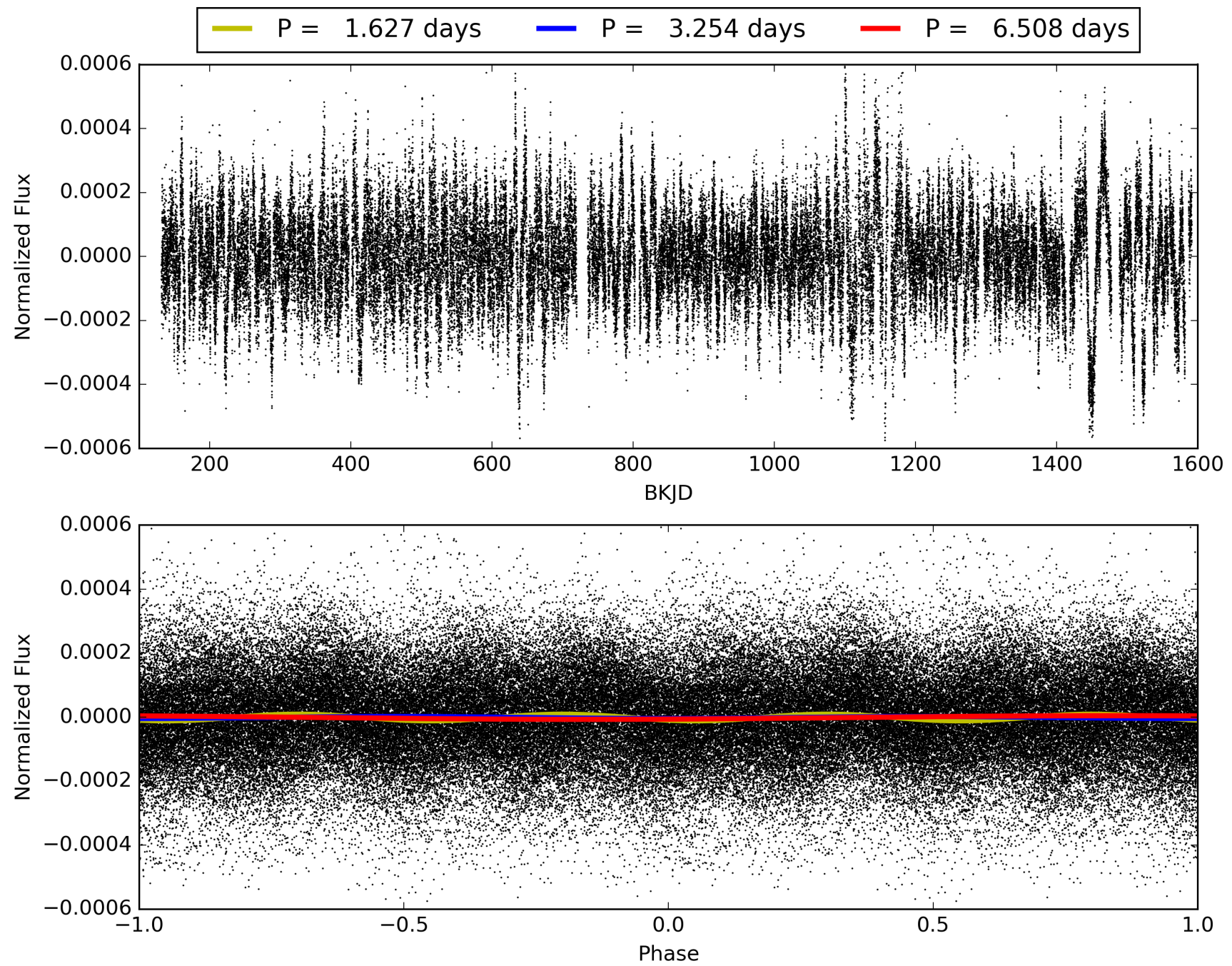
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:00:57 Z

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

# TCE 008959769-03, PDC Light Curves

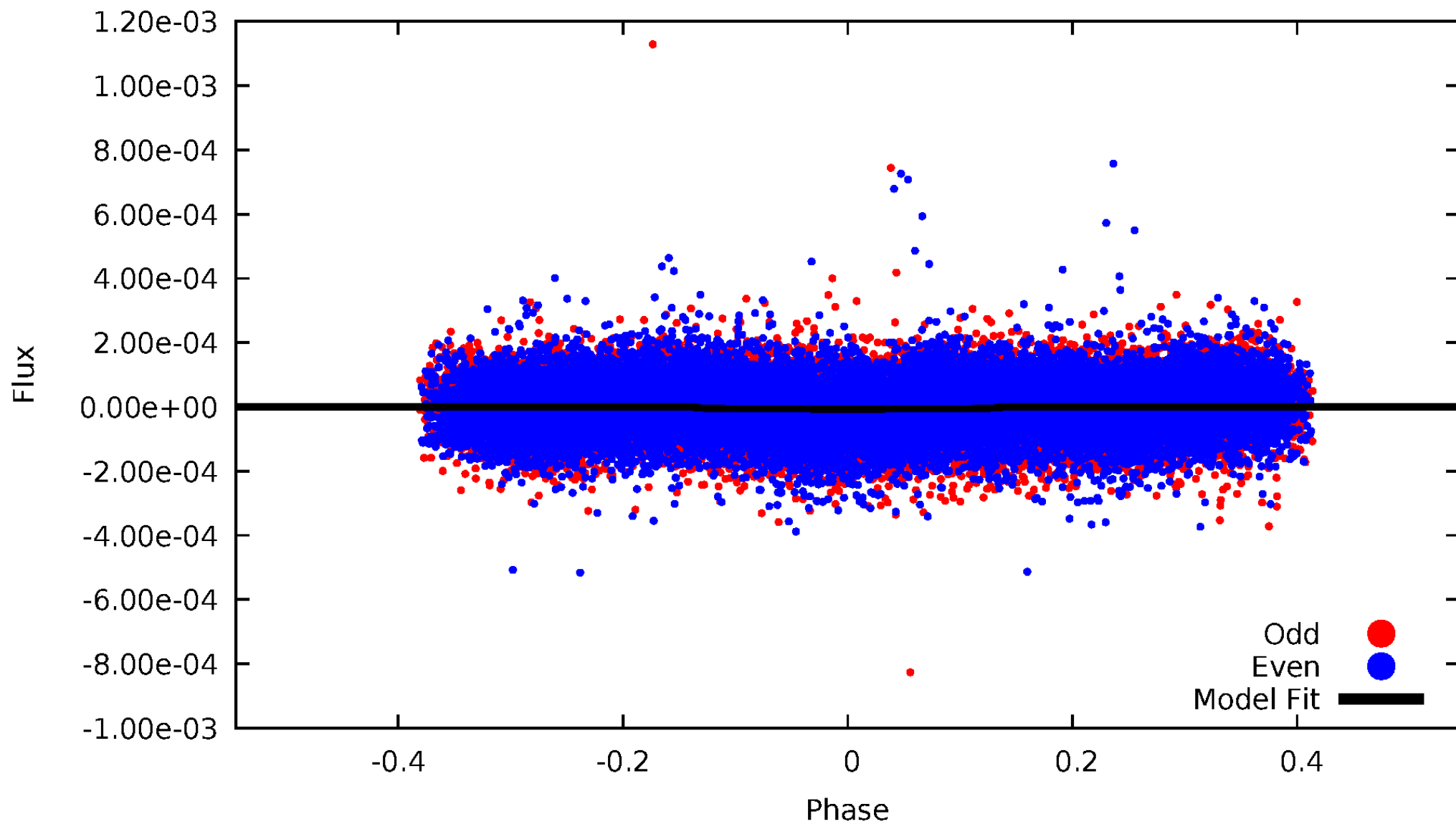


TCE 008959769-03



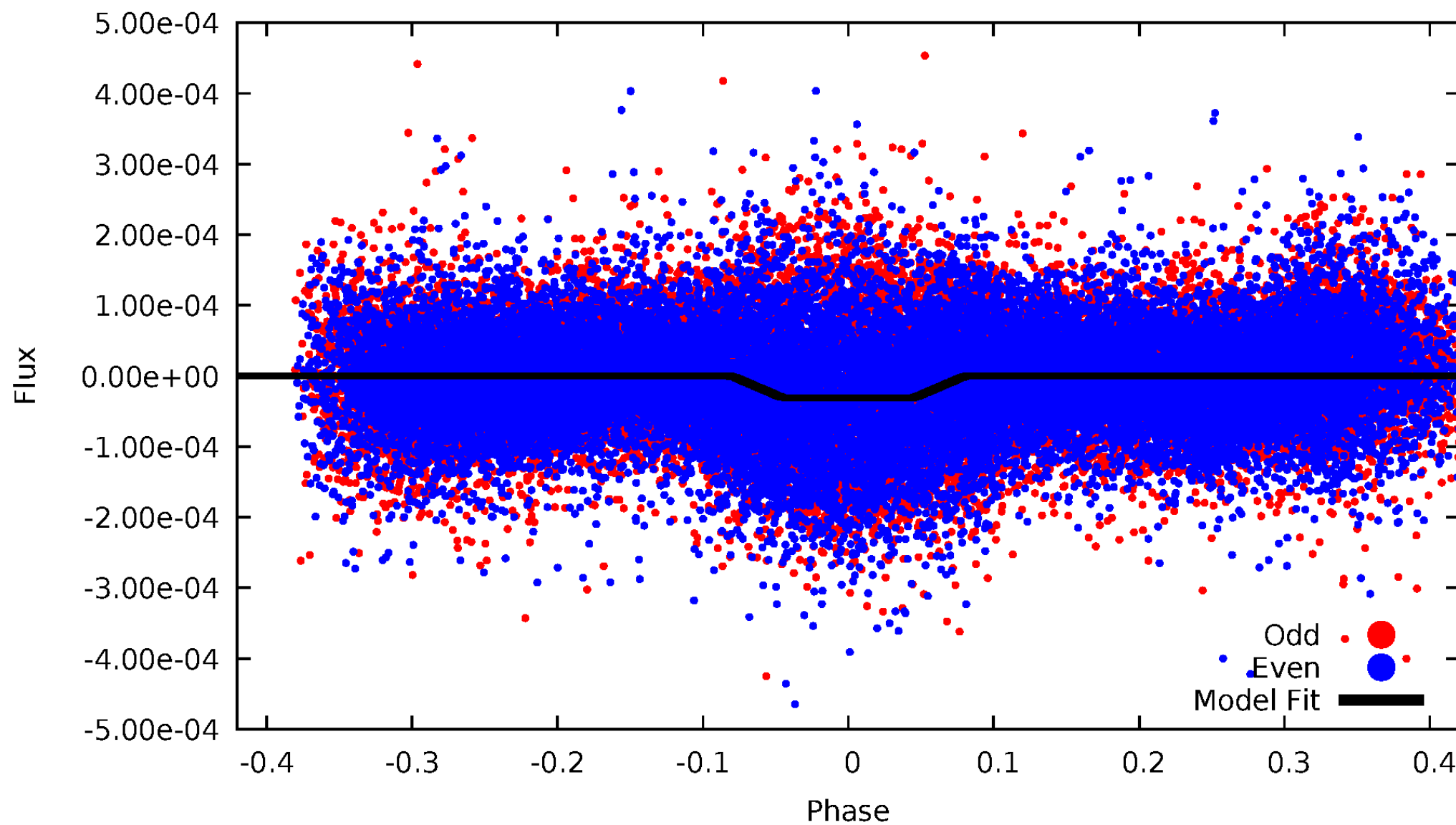
# DV Odd/Even

TCE 008959769-03



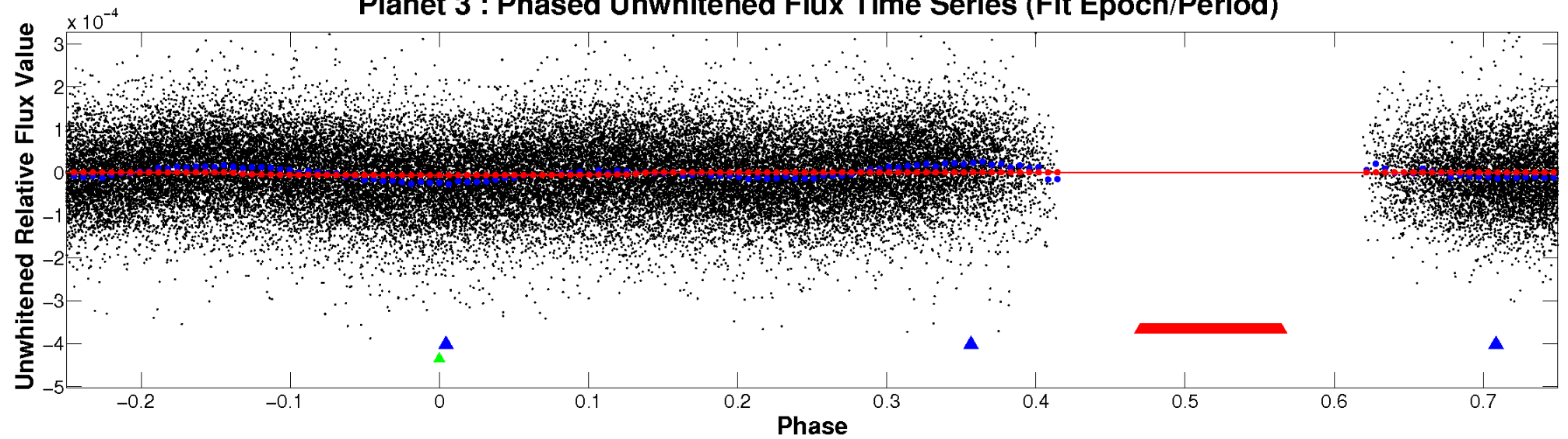
# ALT Odd/Even

TCE 008959769-03

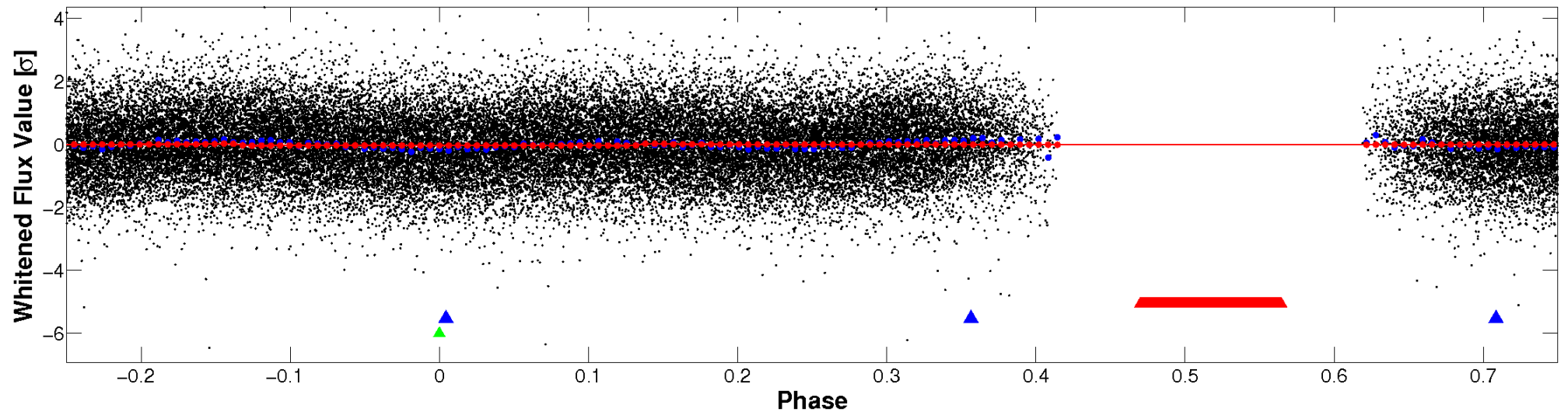


# Non-Whitened Vs. Whitened Light Curve

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

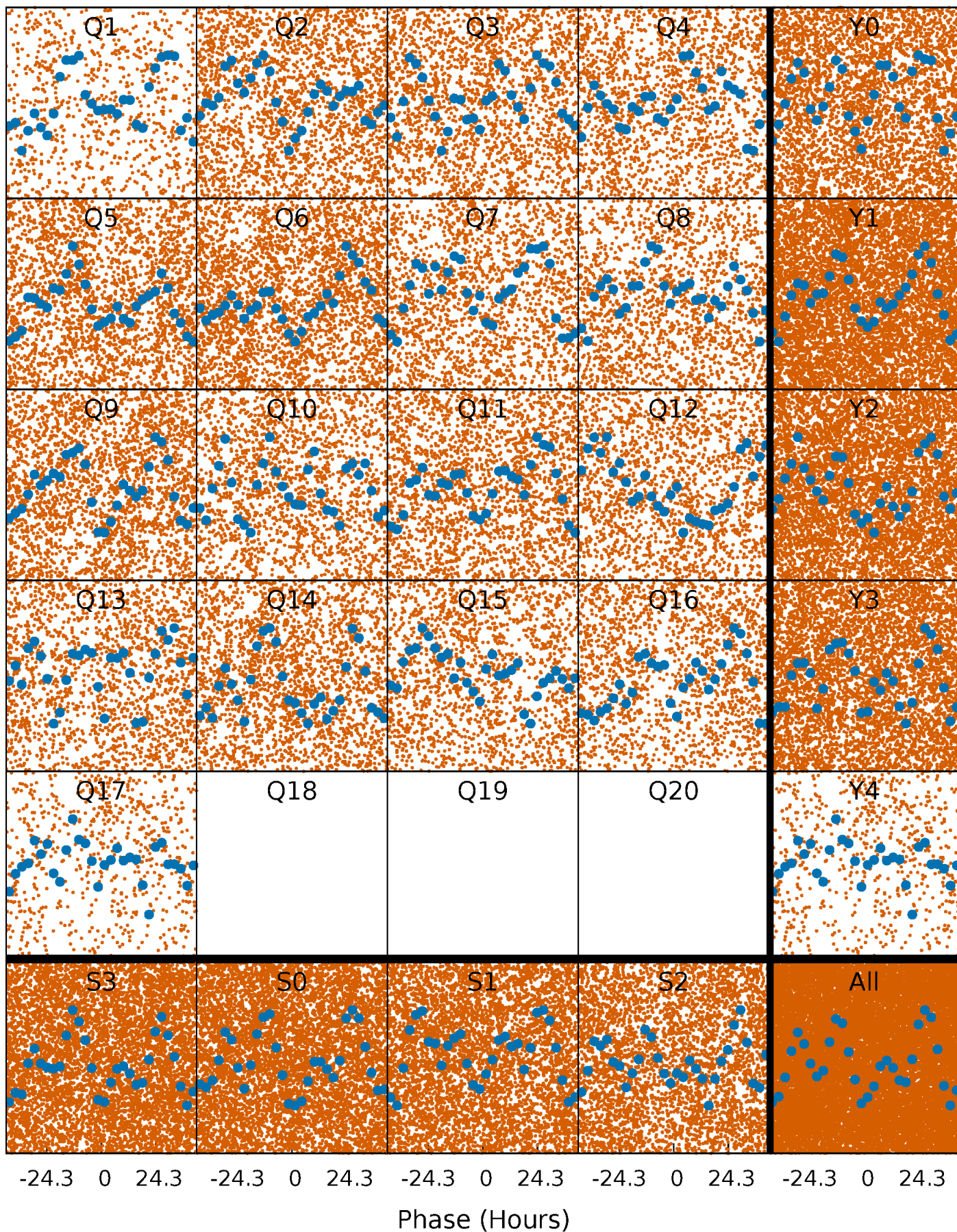


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



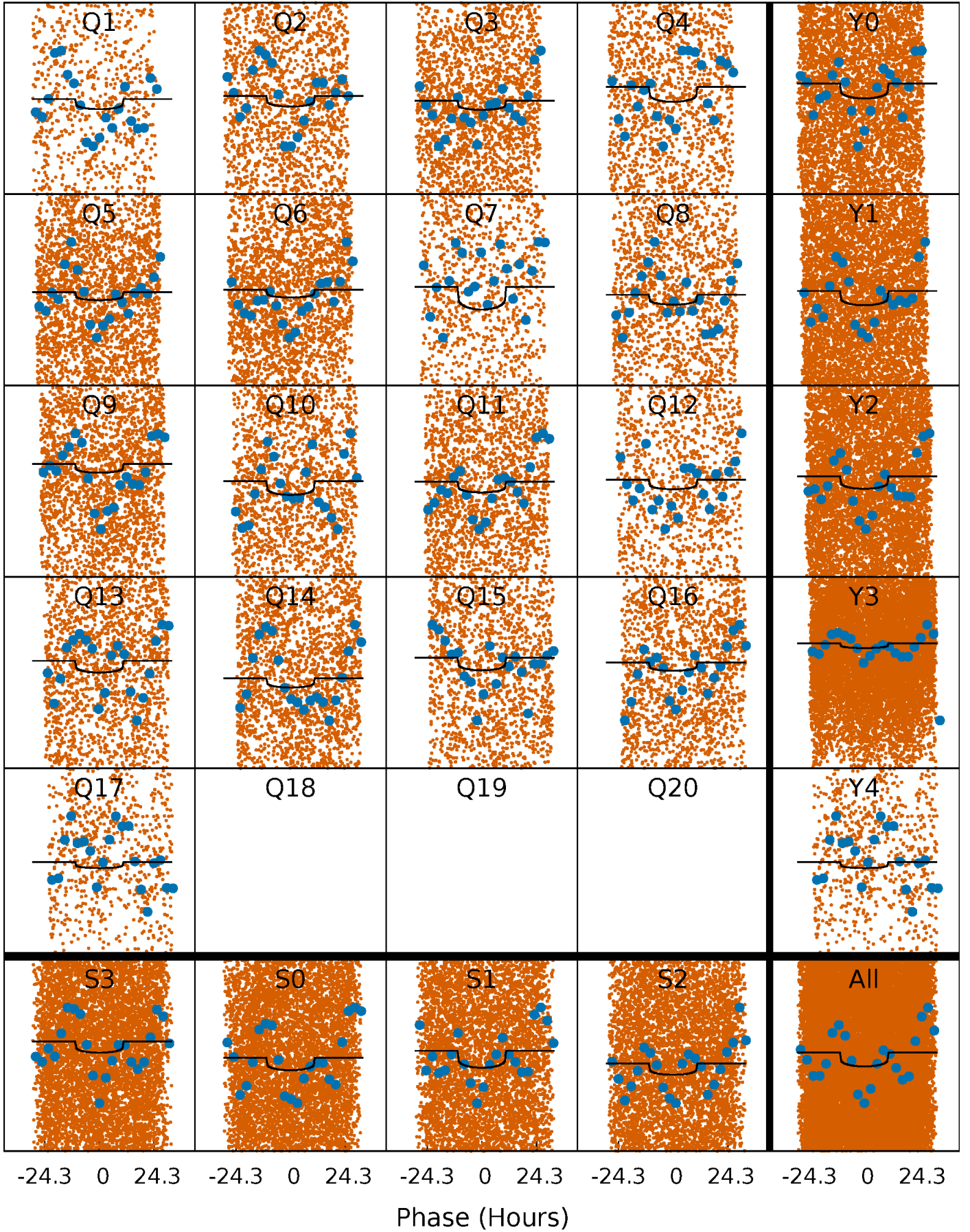
# PDC Quarter-Phased Transit Curves

TCE 008959769-03 P= 3.253880 Days  $T_0=133.073666$  (BKJD)



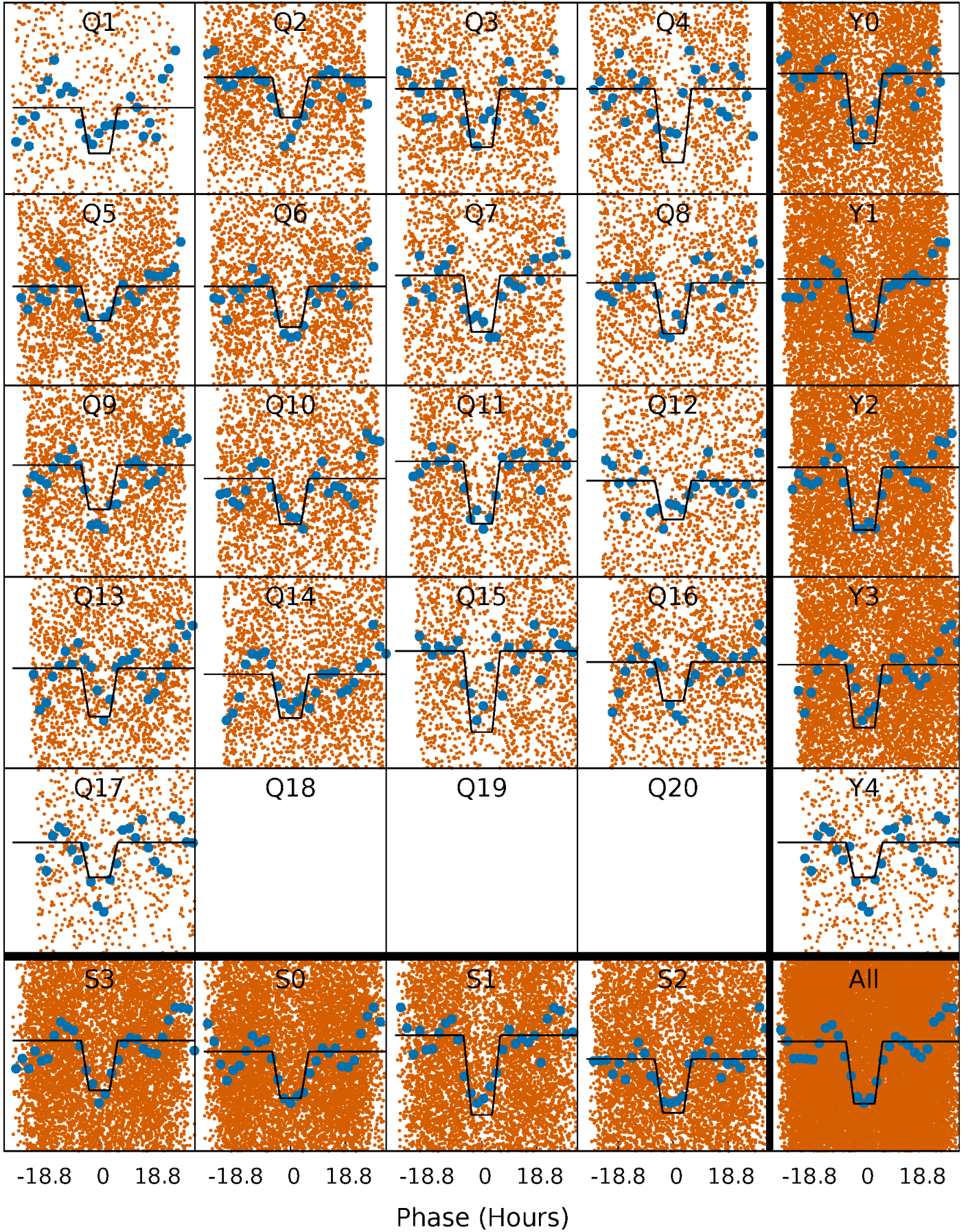
# DV Quarter-Phased Transit Curves

TCE 008959769-03     $P = 3.253880$  Days     $T_0 = 133.073666$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

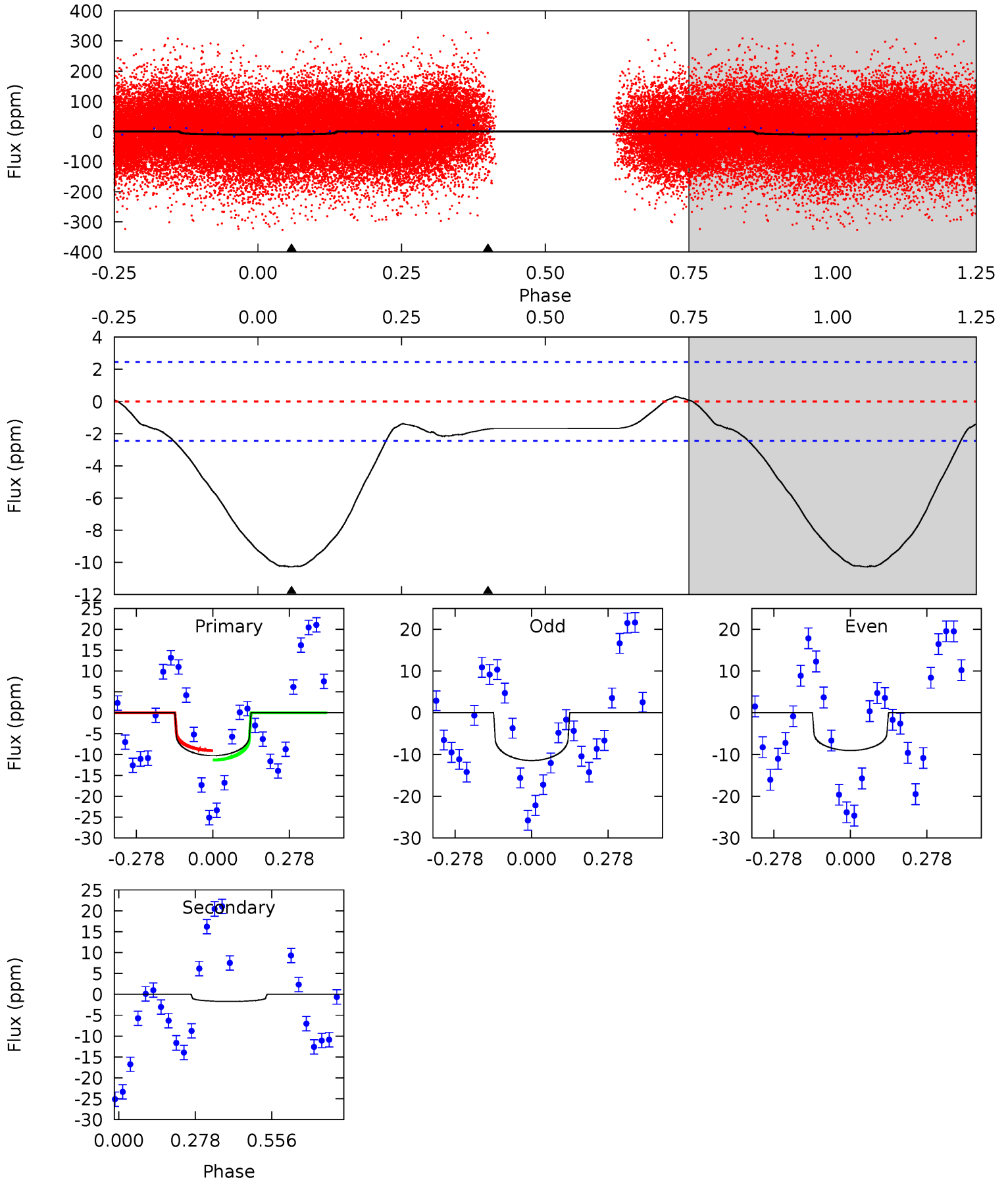
TCE 008959769-03     $P = 3.253788$  Days     $T_0 = 133.072583$  (BKJD)



# DV Model-Shift Uniqueness Test

008959769-03, P = 3.253880 Days, E = 129.819786 Days

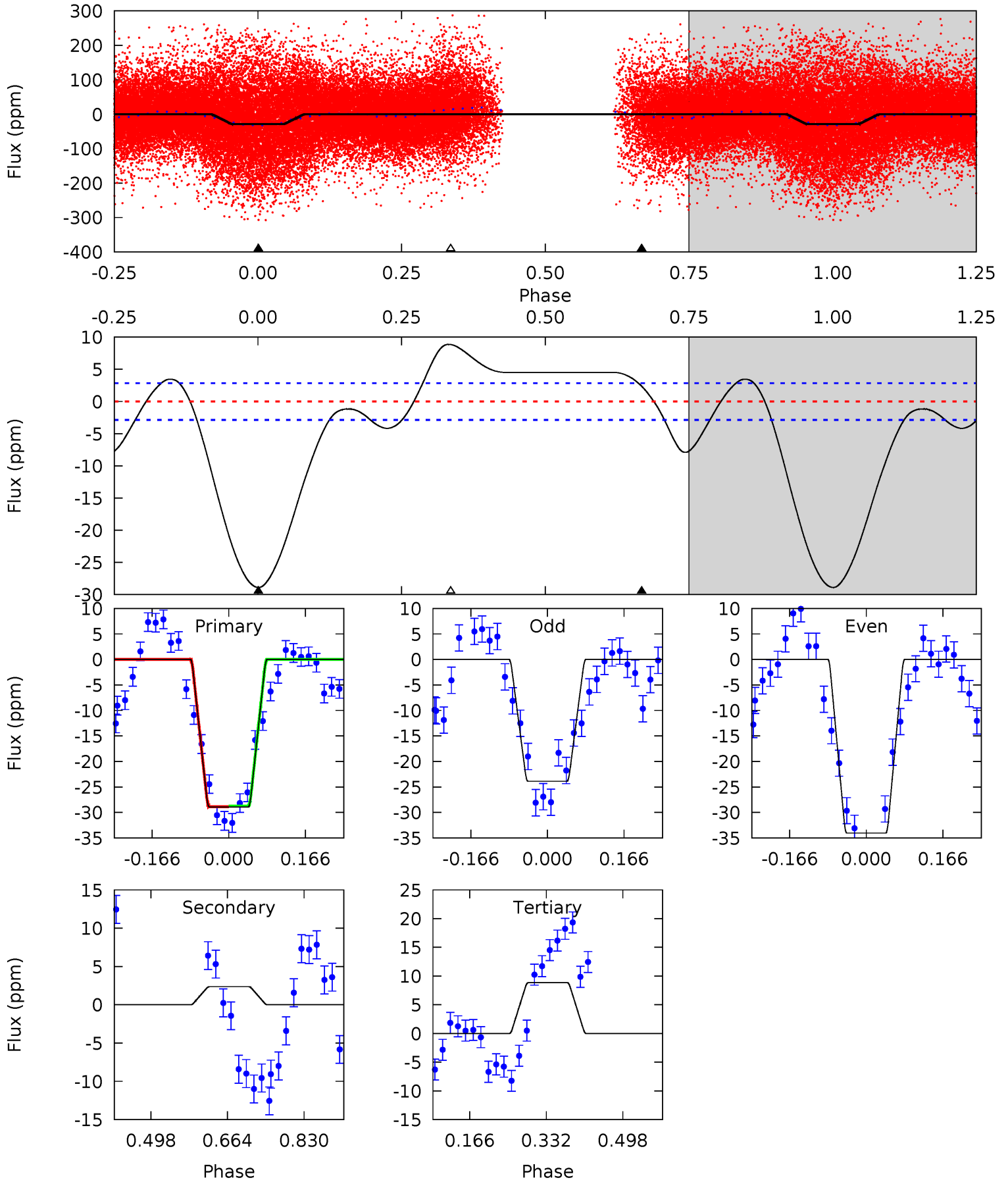
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.2	3.03	0	0	4.35	1.08	0.58	18.2	18.2	3.03	3.03	2.14	1.20	0.03	1.88



# Alt Model-Shift Uniqueness Test

008959769-03, P = 3.253788 Days, E = 129.818795 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
45.0	-3.69	-13.8	0	4.46	1.38	7.59	58.8	45.0	10.1	-3.69	7.93	0.89	0.23	0.15



### Stellar Parameters For KIC 008959769

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6400^{+199}_{-244}$	$4.110^{+0.293}_{-0.158}$	$-0.460^{+0.300}_{-0.300}$	$1.481^{+0.381}_{-0.466}$	$1.031^{+0.152}_{-0.137}$	$0.447^{+0.867}_{-0.197}$
	+3%/-4%	+7%/-4%	+65%/-65%	+26%/-31%	+15%/-13%	+194%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 008959769-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-2\pm 1$	$0.38^{+0.18}_{-0.16}$	$2271^{+173}_{-200}$	$4657^{+1277}_{-656}$	$11^{+24}_{-6}$
Alt.	$2\pm 1$	$0.86^{+0.23}_{-0.21}$	$2268^{+167}_{-210}$	$-3821^{+285}_{-336}$	$-3.340^{+1.485}_{-2.644}$

$T_{max}$  = 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

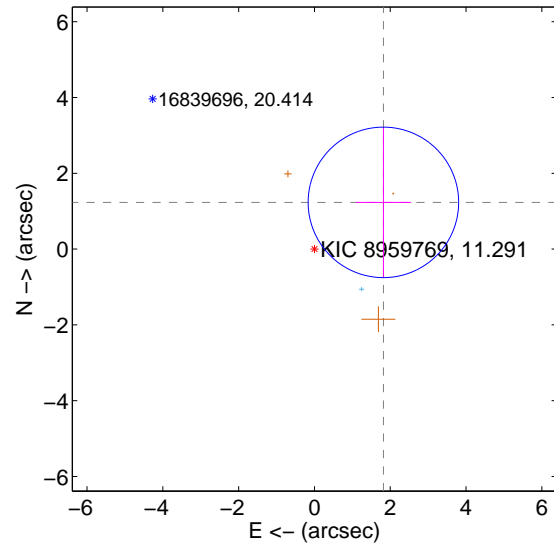
Supplemental centroid analysis for 008959769-03. **Kepler magnitude: 11.29.** Transit SNR 3.71

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

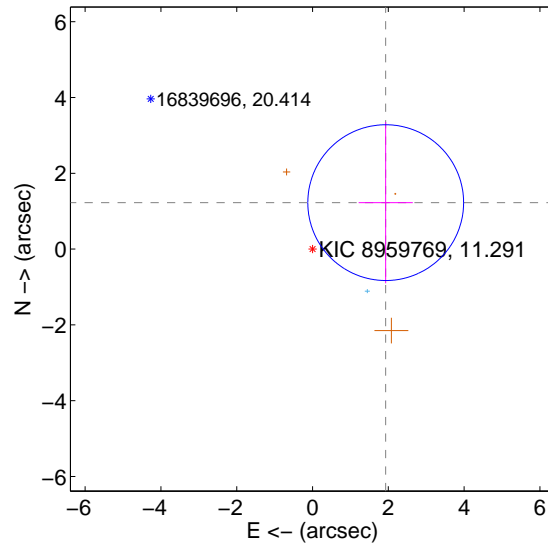
The direct PRF centroid is offset from the target star catalog position by about 0.49 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>2.198 <math>\pm</math> 0.662</b>	<b>3.32</b>	-1.820 $\pm$ 0.726	1.233 $\pm$ 1.981
PRF-fit source offset from KIC position	<b>2.288 <math>\pm</math> 0.685</b>	<b>3.34</b>	-1.931 $\pm$ 0.716	1.226 $\pm$ 2.129
photometric centroid source offset	1.62 $\pm$ 1.23	1.32	-0.59 $\pm$ 1.18	1.51 $\pm$ 1.24

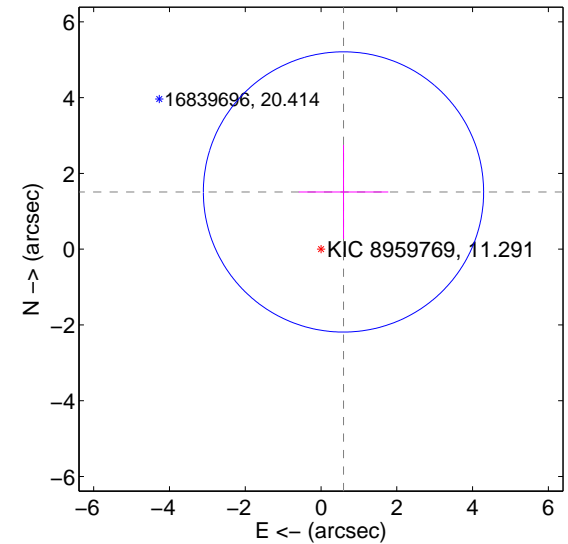
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

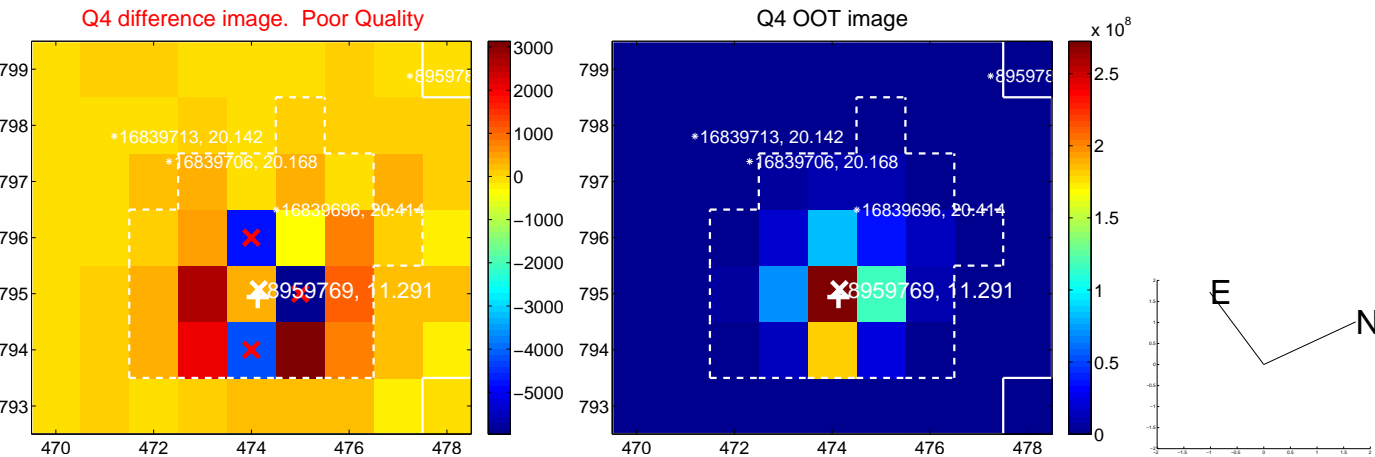
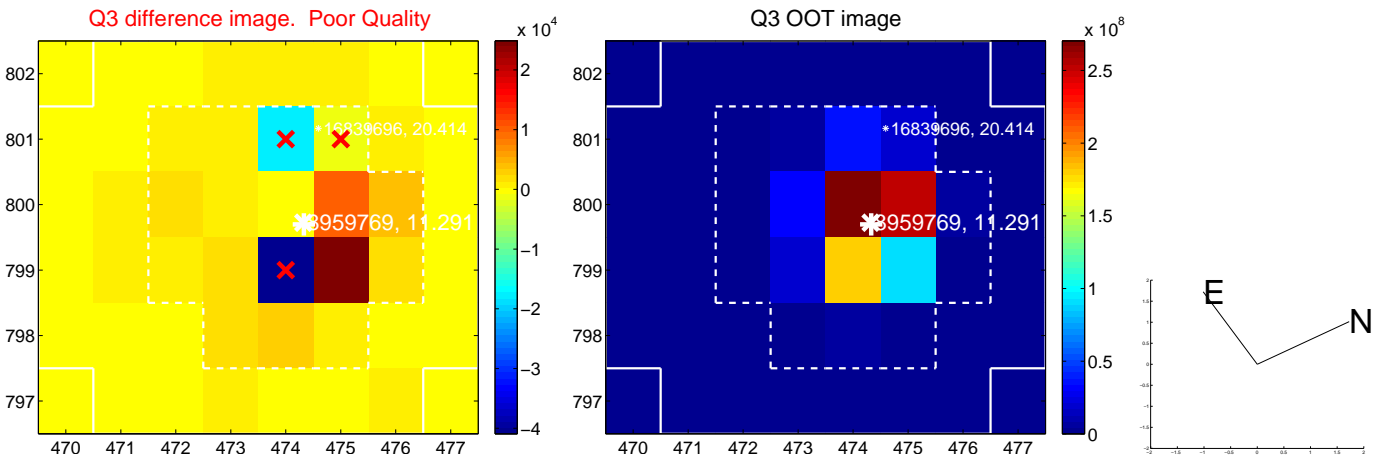
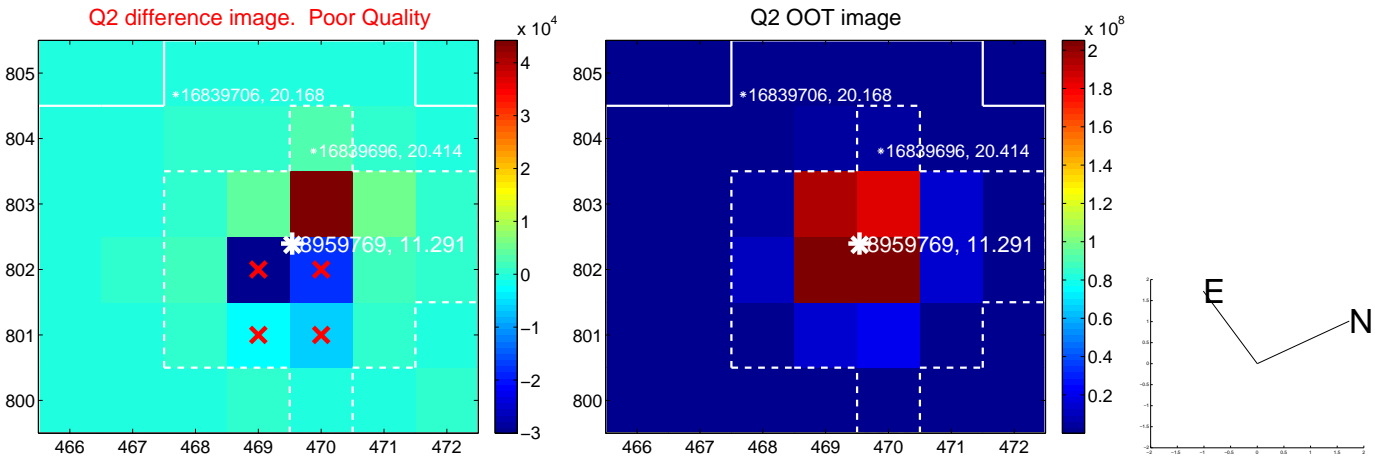
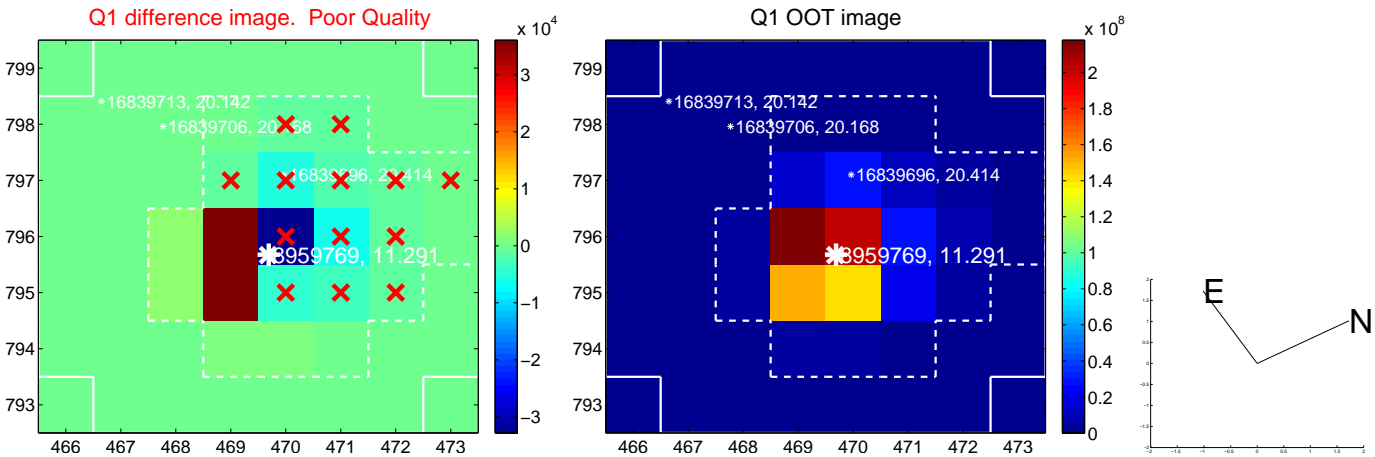


offset from photometric centroids

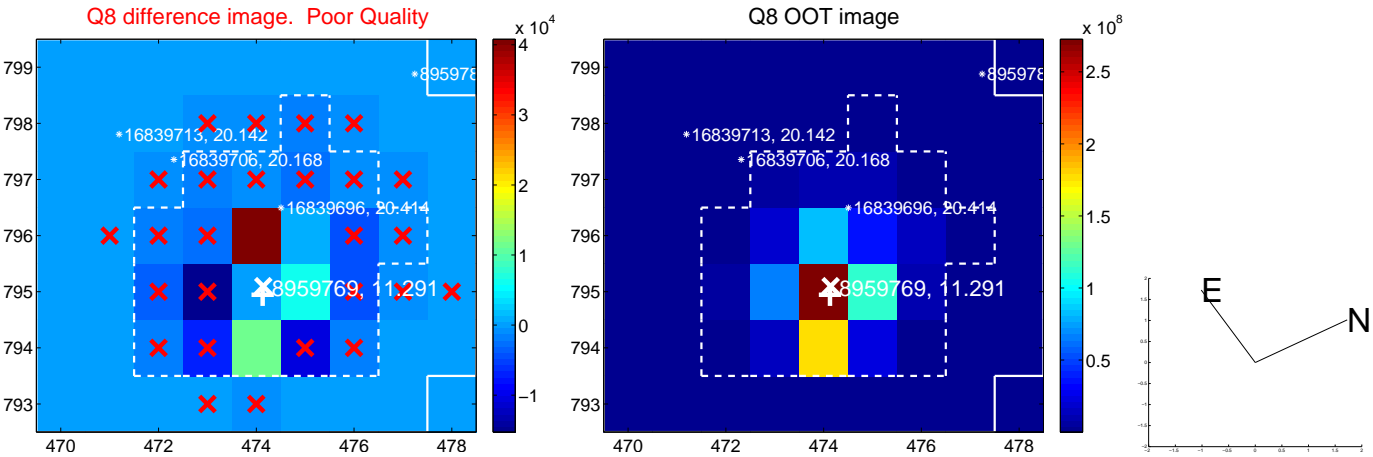
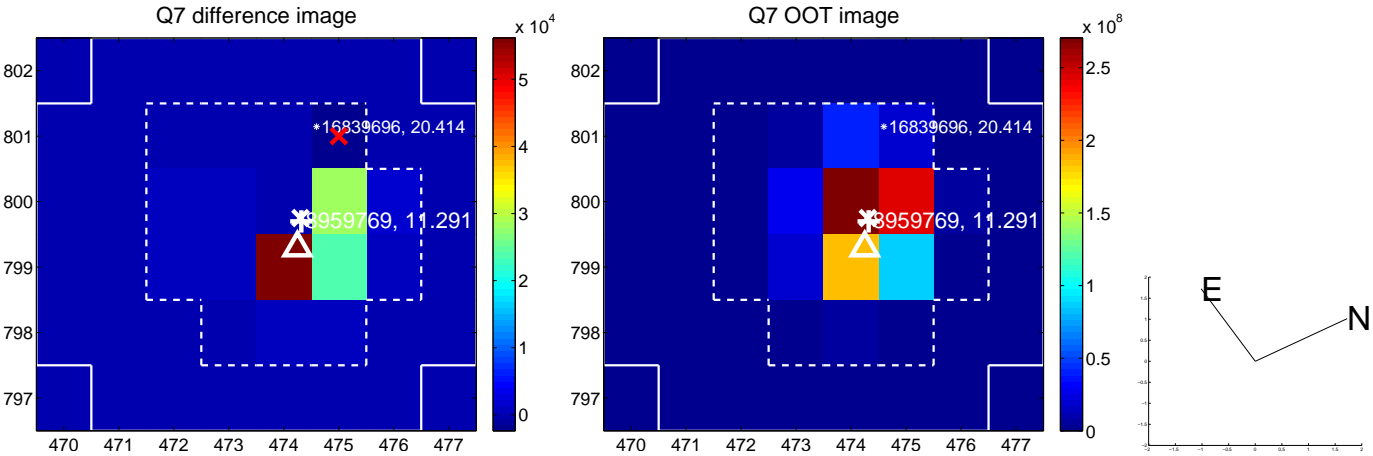
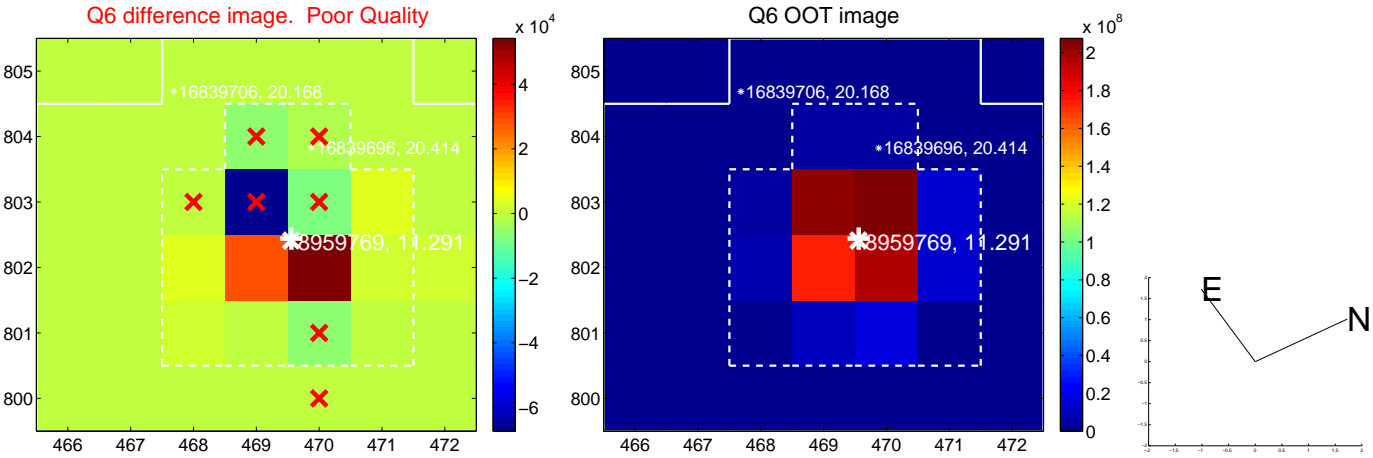
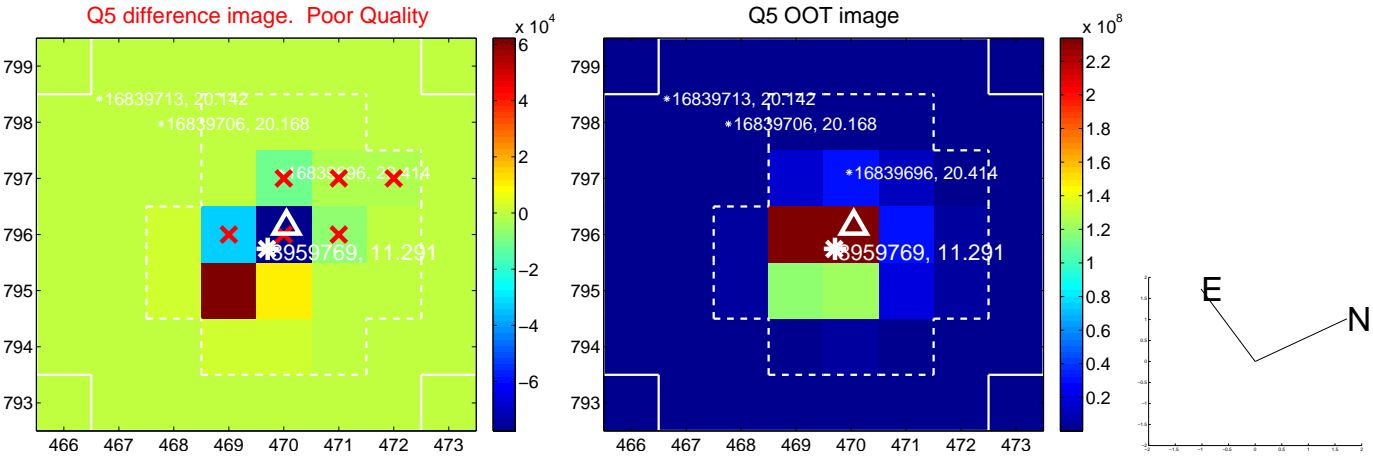


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

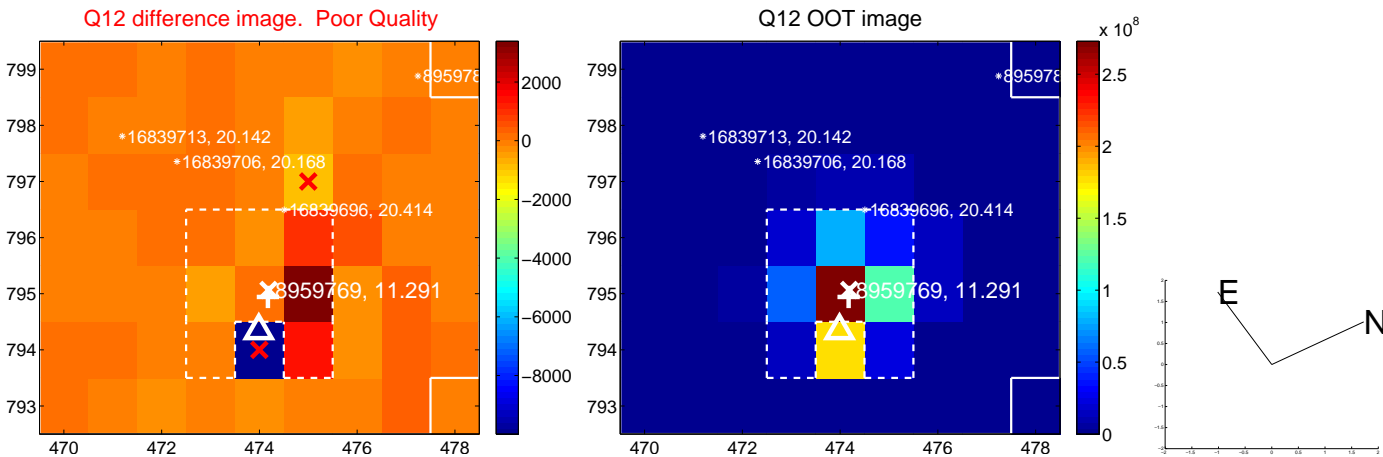
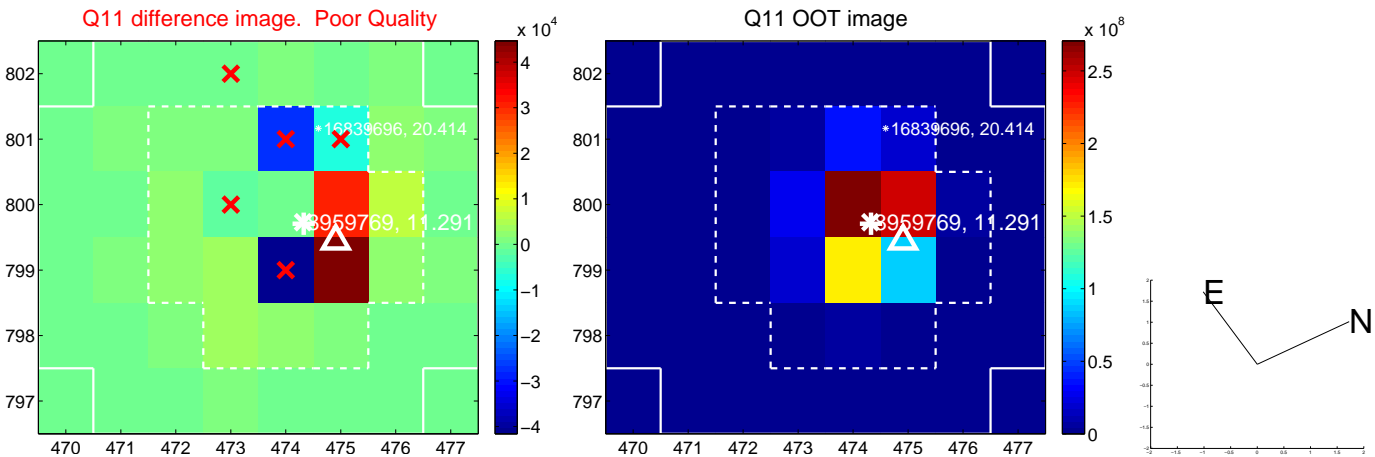
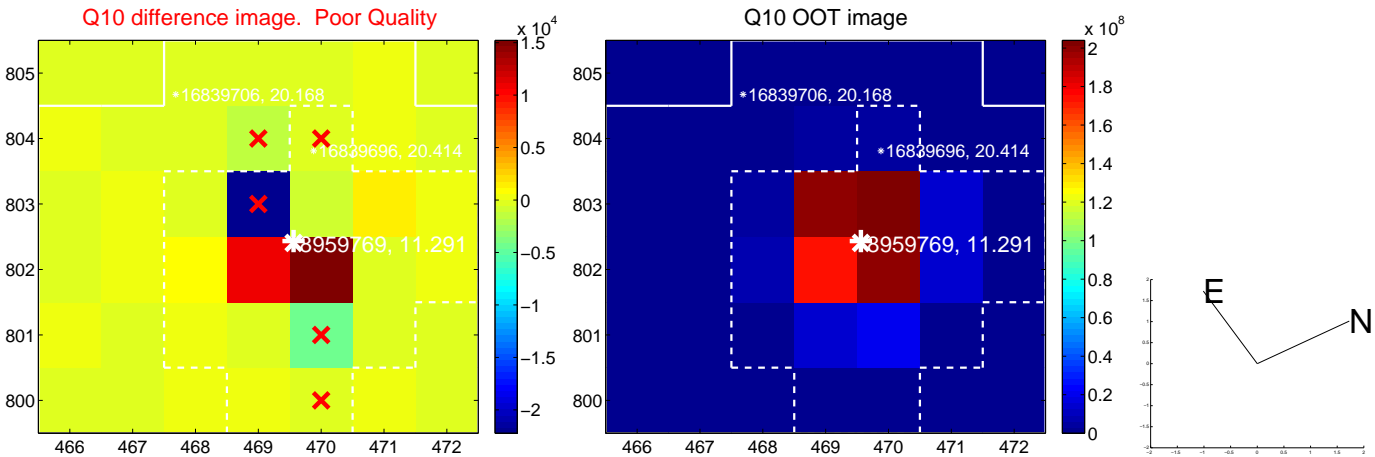
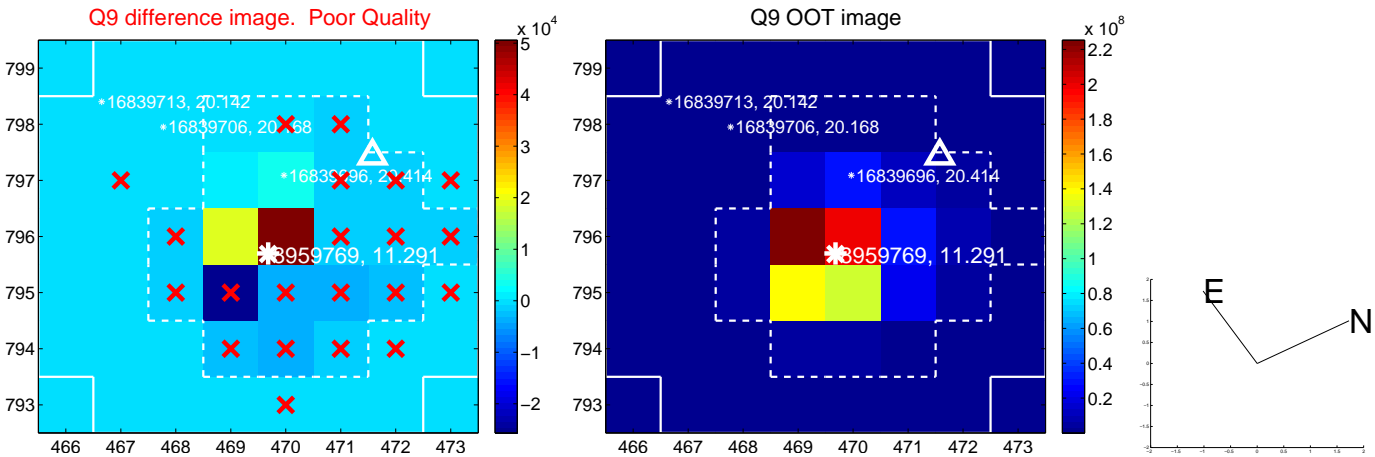
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



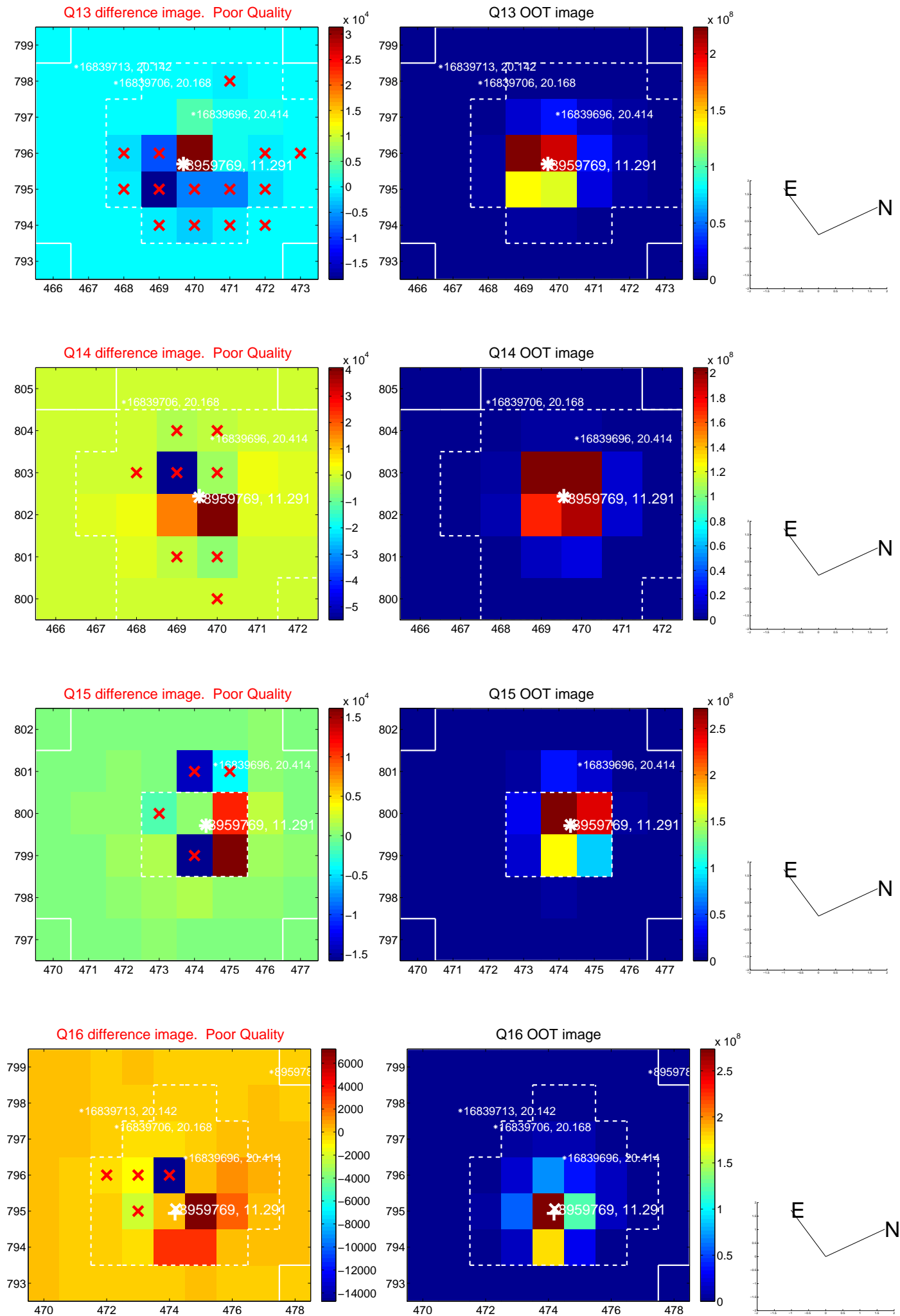
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



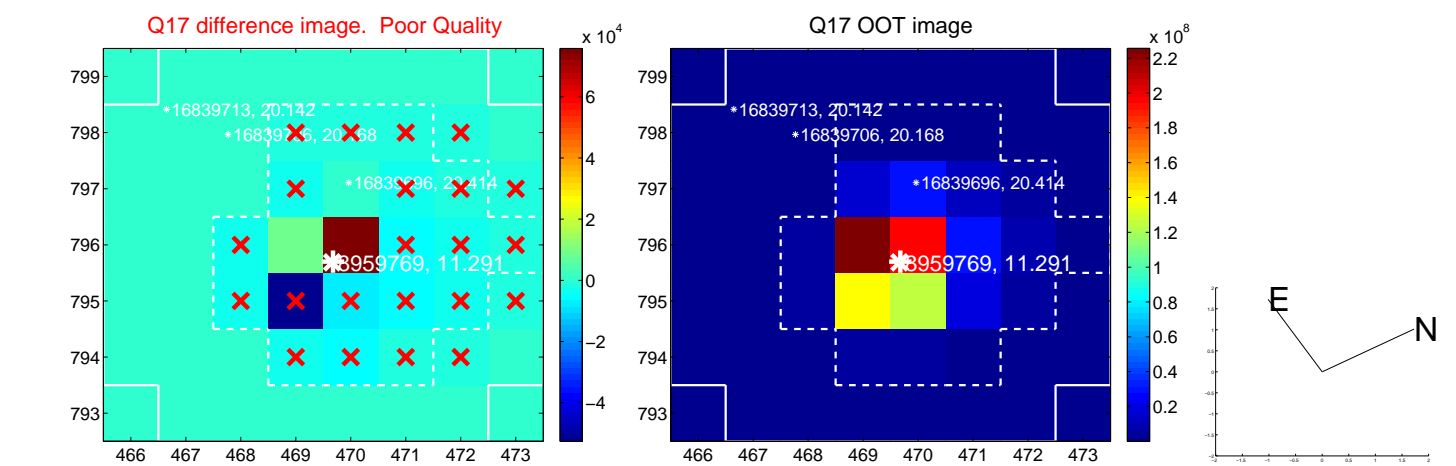
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



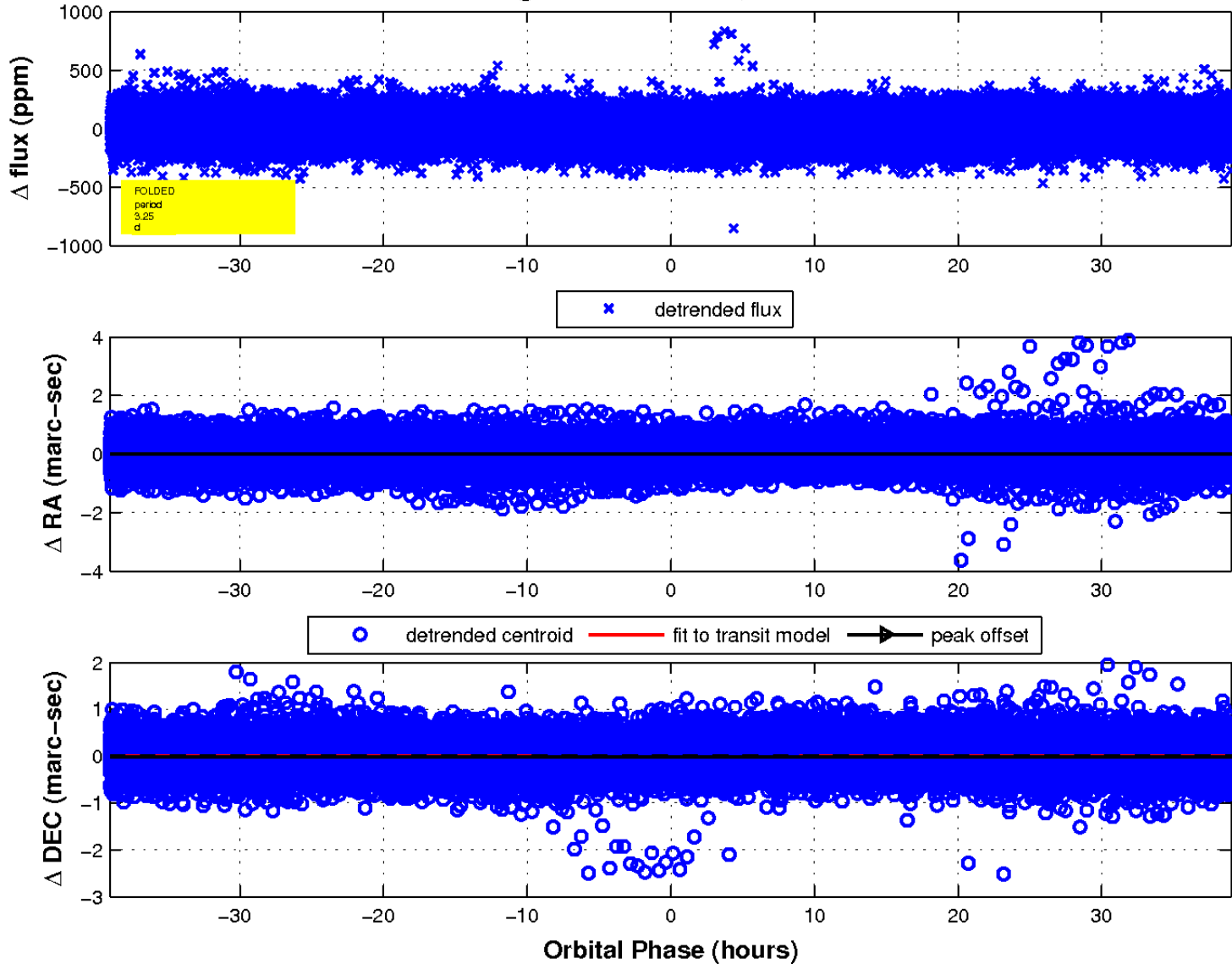
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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UKIRT Image

Declination

