

# KIC 004936089

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004936089-01	OBS	No	0.756804	131.910393	10.4	4.891	9.0	4.4	4.50	11502	1.53	523149.13
004936089-02	OBS	No	3.785899	133.766423	70.7	1.690	20.6	2.5	4.50	11502	4.33	61147.36
004936089-03	OBS	No	142.196715	149.682871	1437.0	2.559	15.2	9.5	4.50	11502	18.25	486.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004936089-01	OBS	FP	0.00	1	0	0	0	LPP_DV
004936089-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004936089-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS

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

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

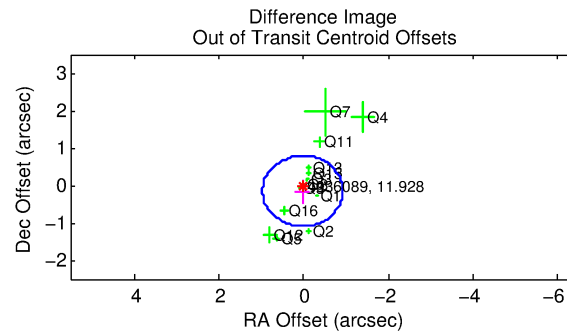
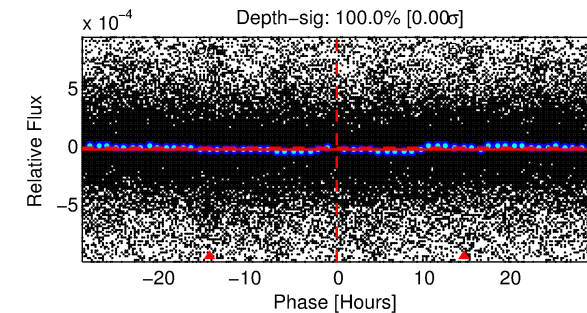
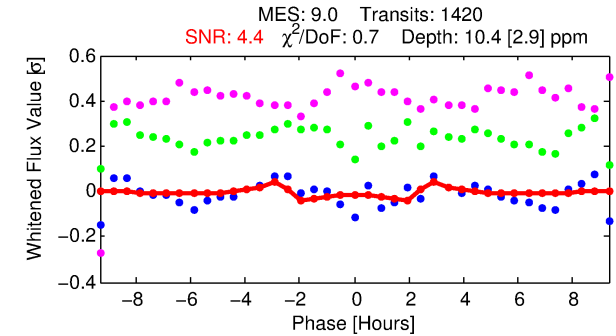
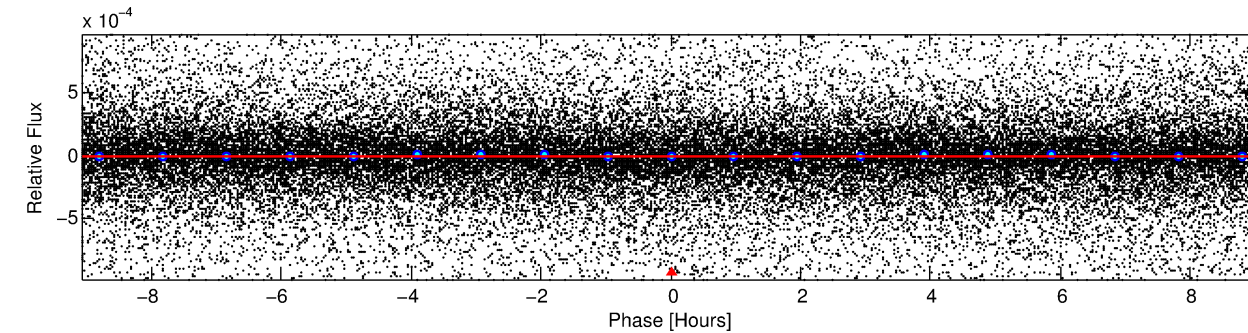
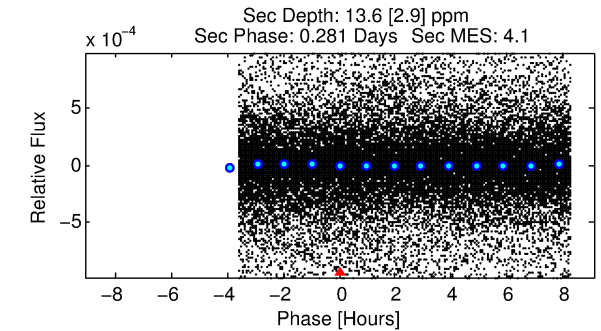
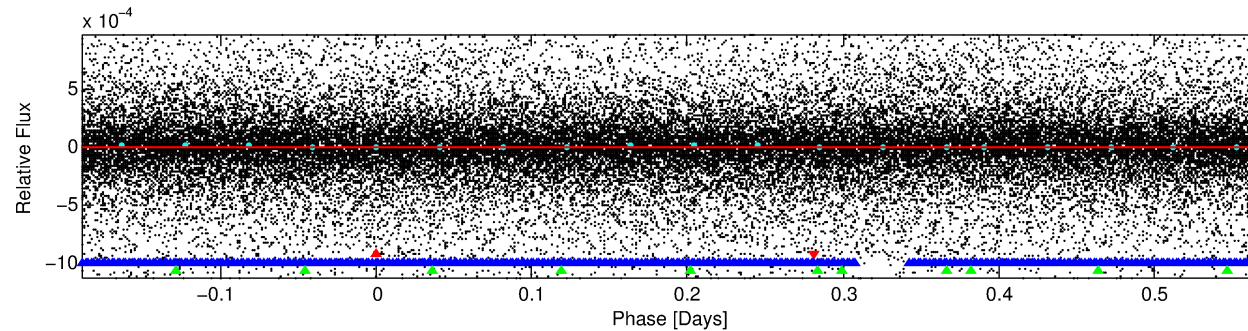
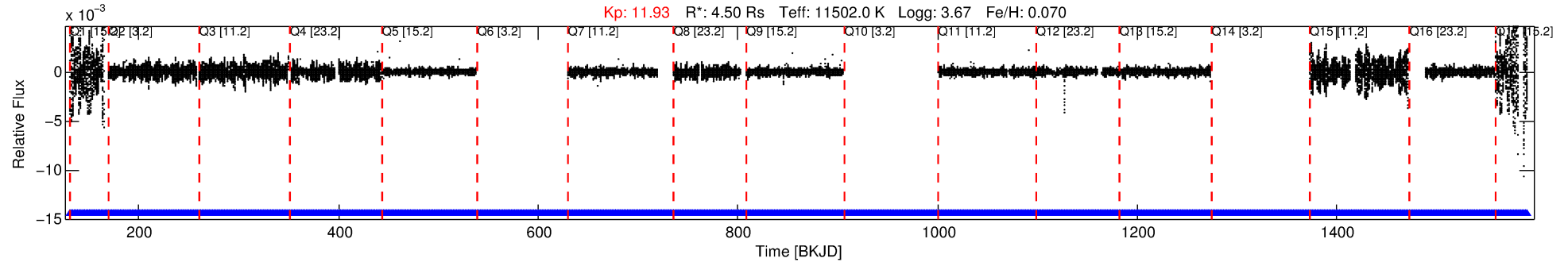
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004936089-01

No Significant Match Found

# DV One-Page Summary

KIC: 4936089 Candidate: 1 of 3 Period: 0.757 d



## DV Fit Results:

Period = 0.75680 [0.00002] d  
Epoch = 131.9104 [0.0036] BKJD  
 $R_p/R^*$  = 0.0031 [0.0007]  
 $a/R^*$  = 1.26 [0.73]  
 $b$  = 0.53 [2.18]  
 $\text{Seff}$  = 523149.13 [556803.13]  
 $T_{\text{eq}}$  = 6858 [1825] K  
 $R_p$  = 1.53 [0.90]  $R_e$   
 $a$  = 0.0246 [0.0131] AU  
 $A_g$  = 1.94 [1.94] [0.48σ]  
 $T_{\text{eff}}$  = 12508 [2520] K [1.82σ]

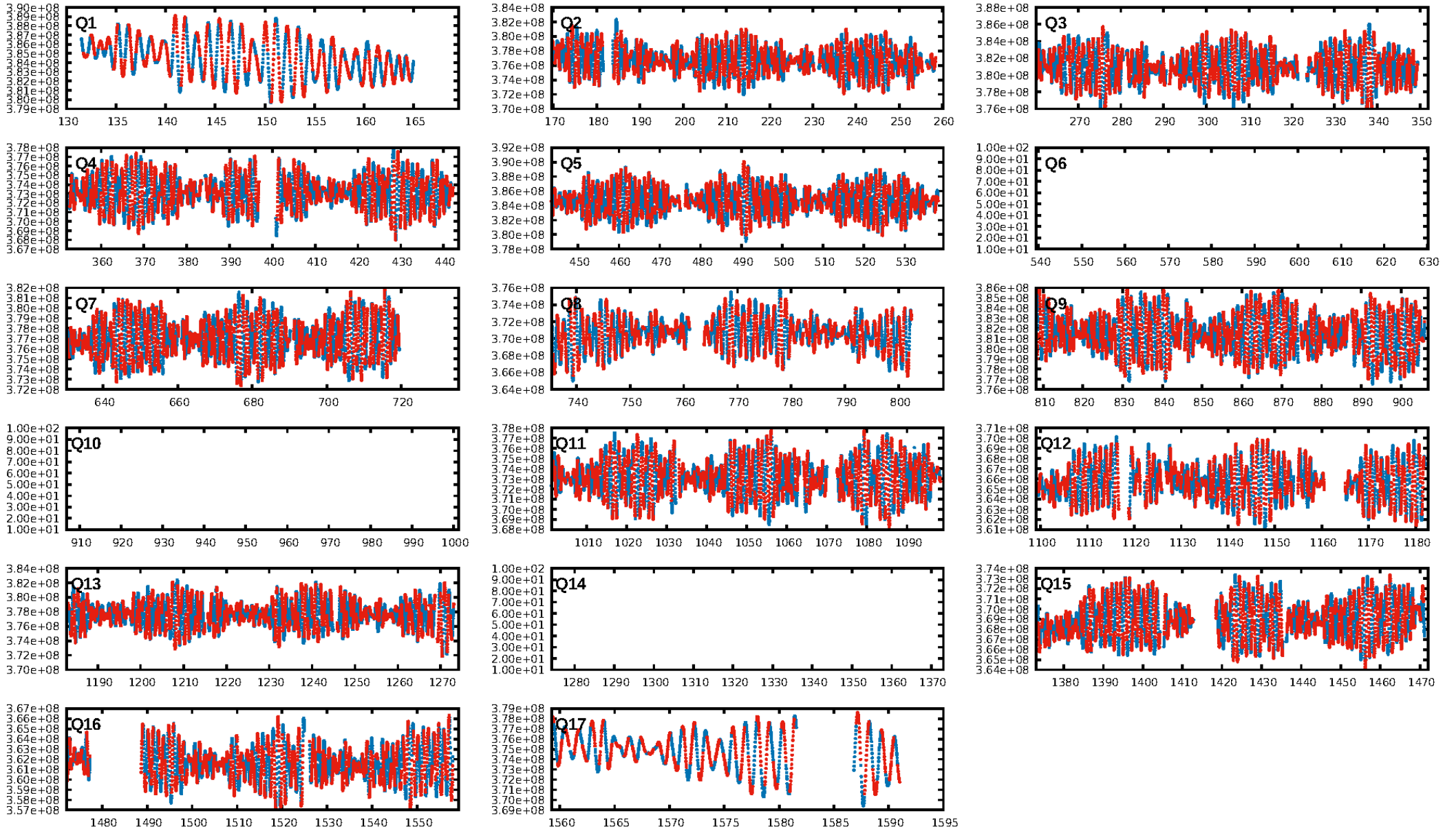
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [14.05σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.37e-19  
RollingBand-fgt: 1.00 [1340/1340]  
**GhostDiagnostic-chr: 0.473**  
Centroid-sig: 28.3%  
Centroid-so: 0.403 arcsec [0.32σ]  
OotOffset-rm: 0.153 arcsec [0.49σ]  
KicOffset-rm: 0.201 arcsec [0.84σ]  
OotOffset-st: 1/4/4/4 [13]  
KicOffset-st: 1/4/4/4 [13]  
DiffImageQuality-fgm: 0.54 [7/13]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:11:43 Z

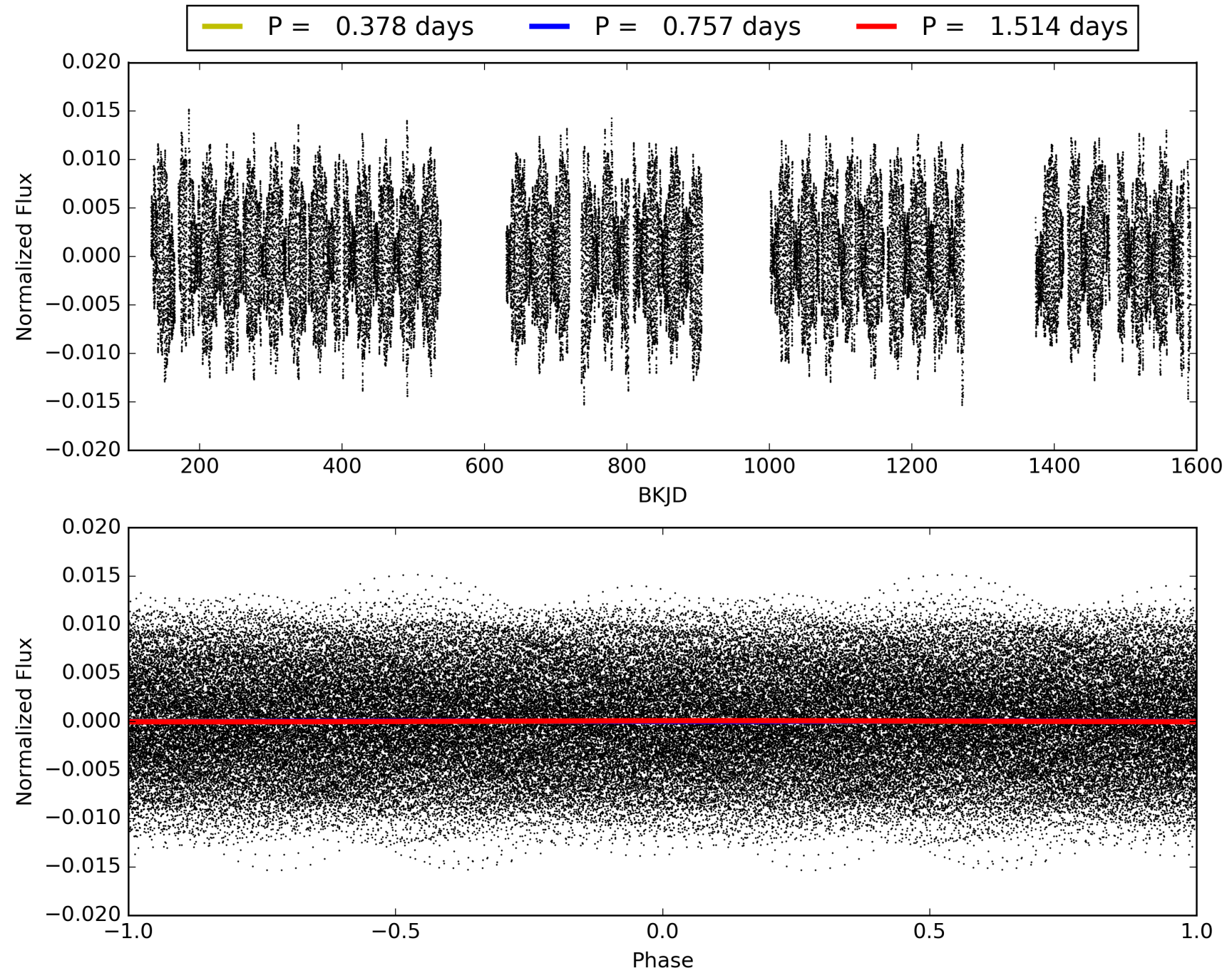
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 004936089-01, PDC Light Curves



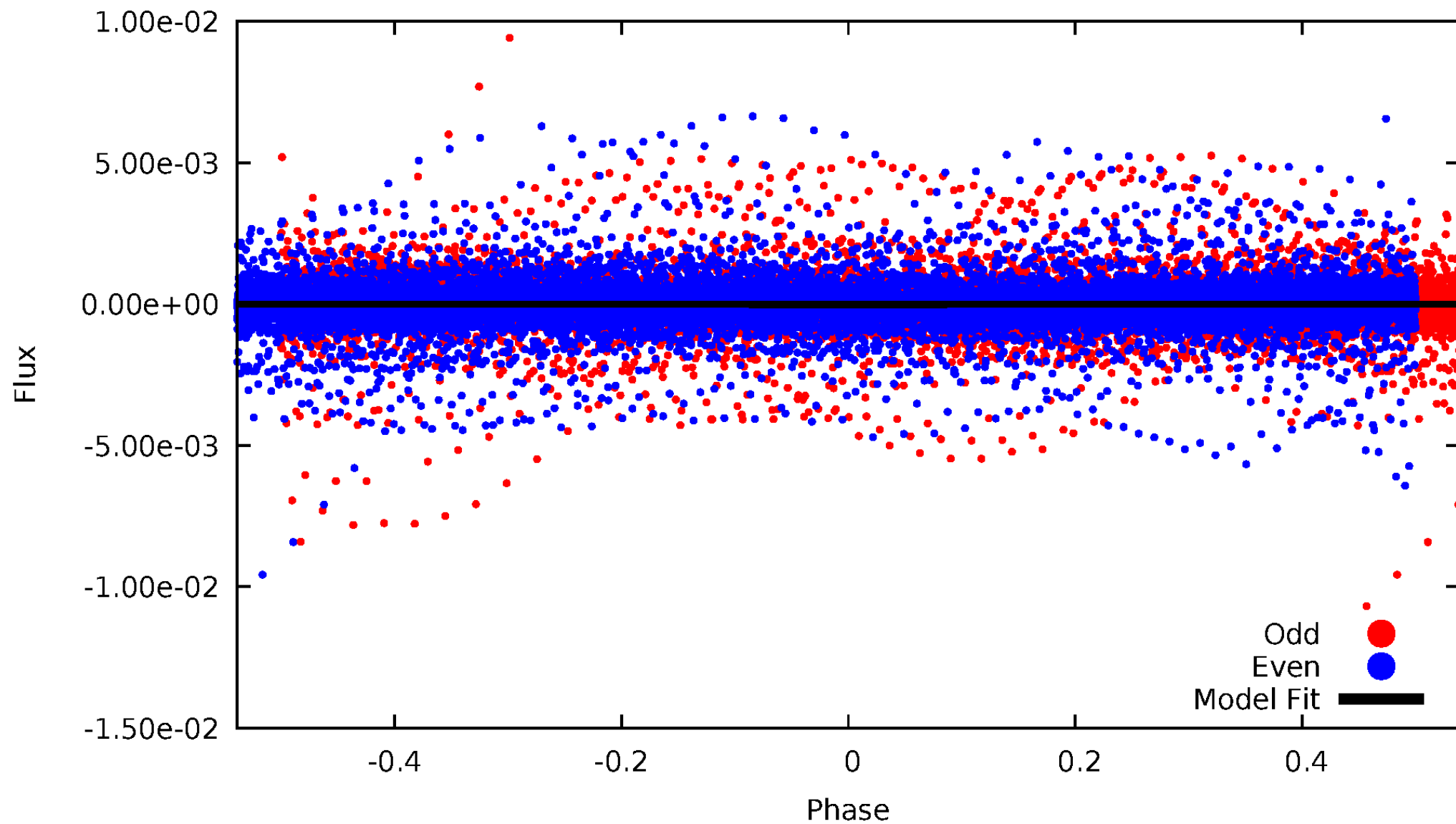


TCE 004936089-01



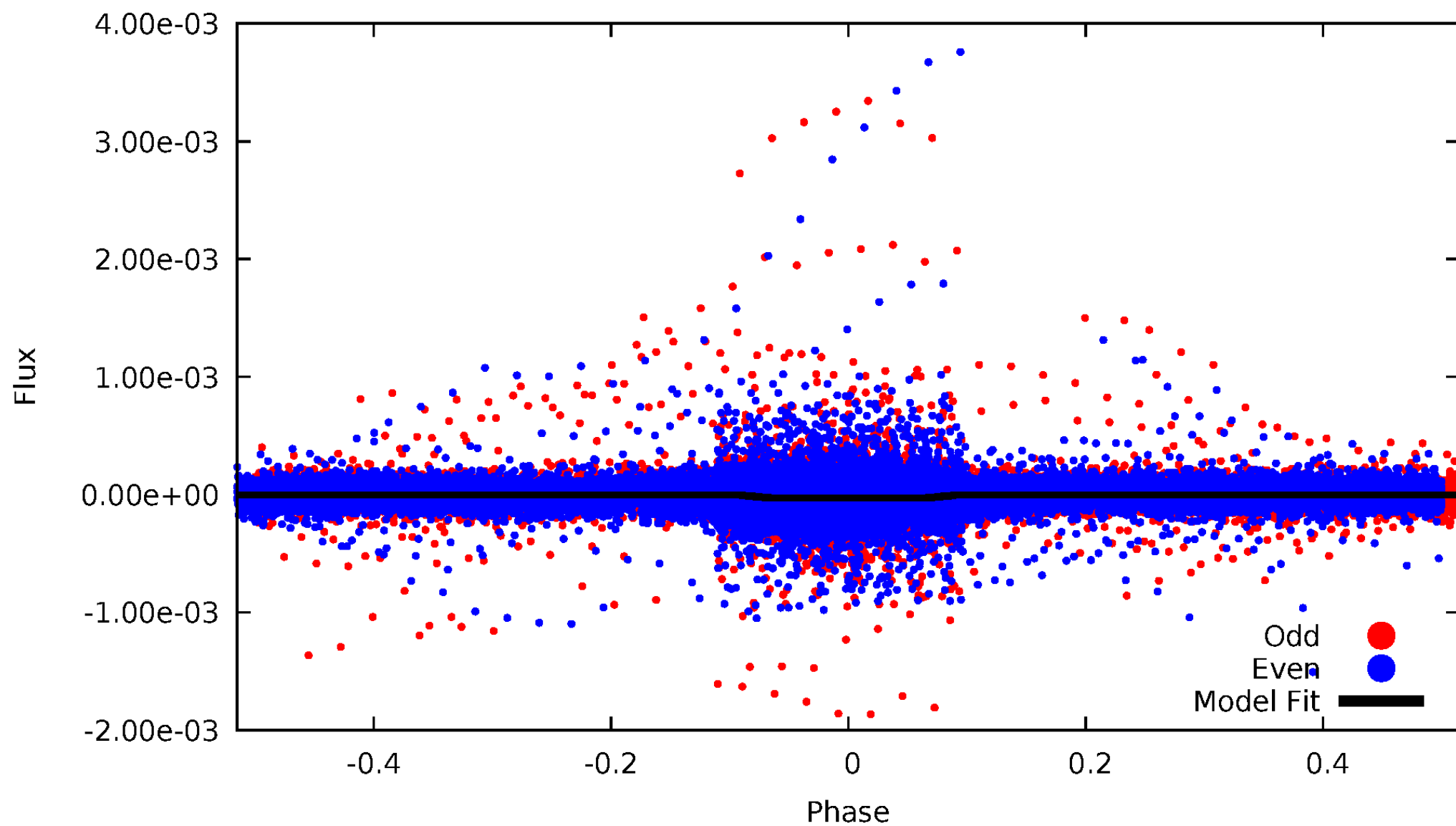
# DV Odd/Even

TCE 004936089-01



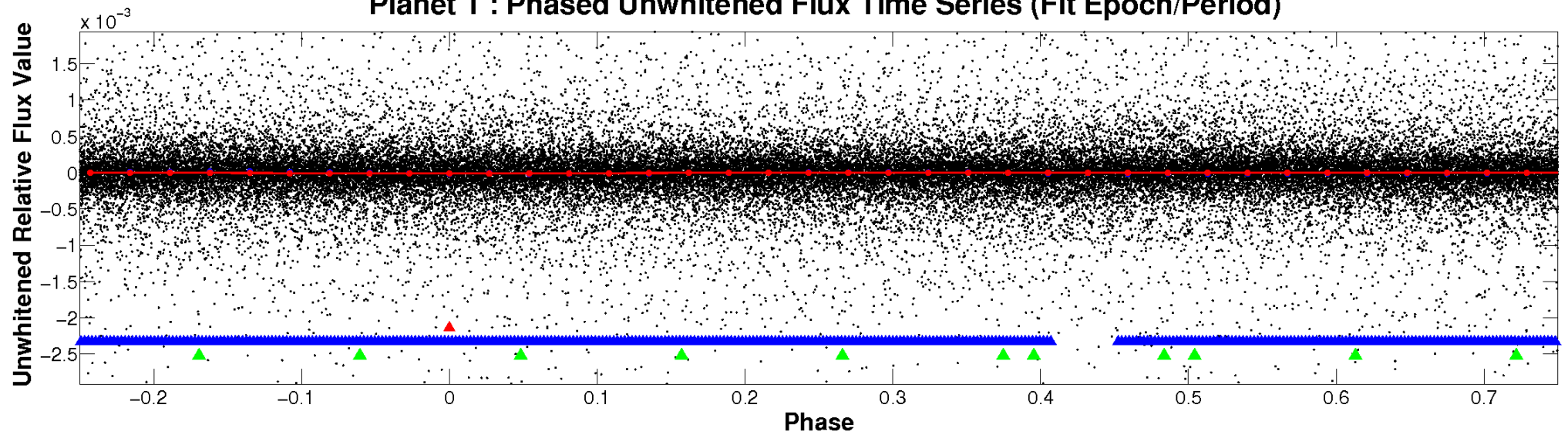
# ALT Odd/Even

TCE 004936089-01

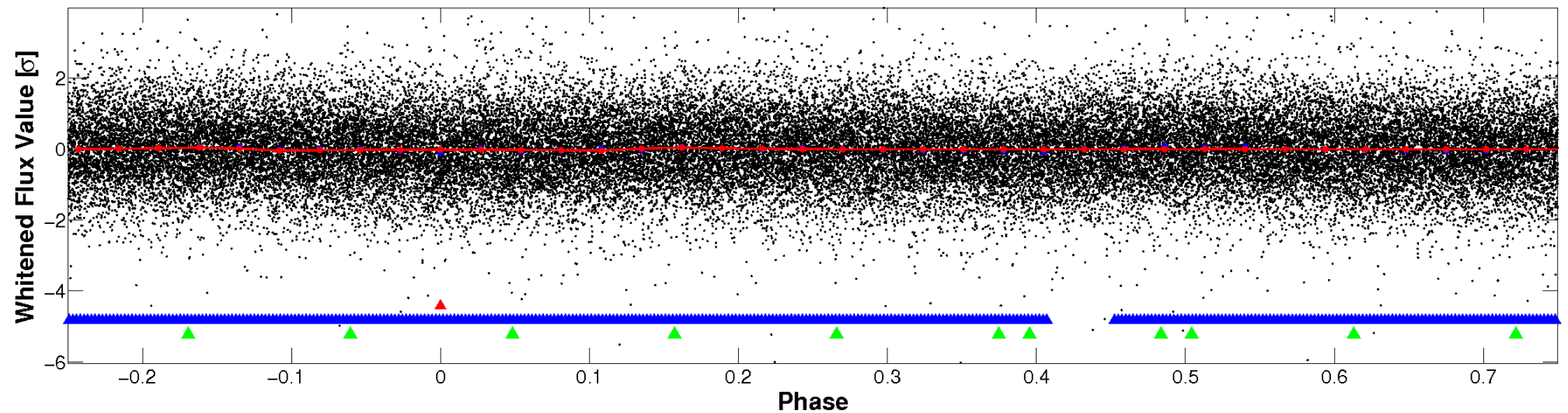


# Non-Whitened Vs. Whitened Light Curve

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



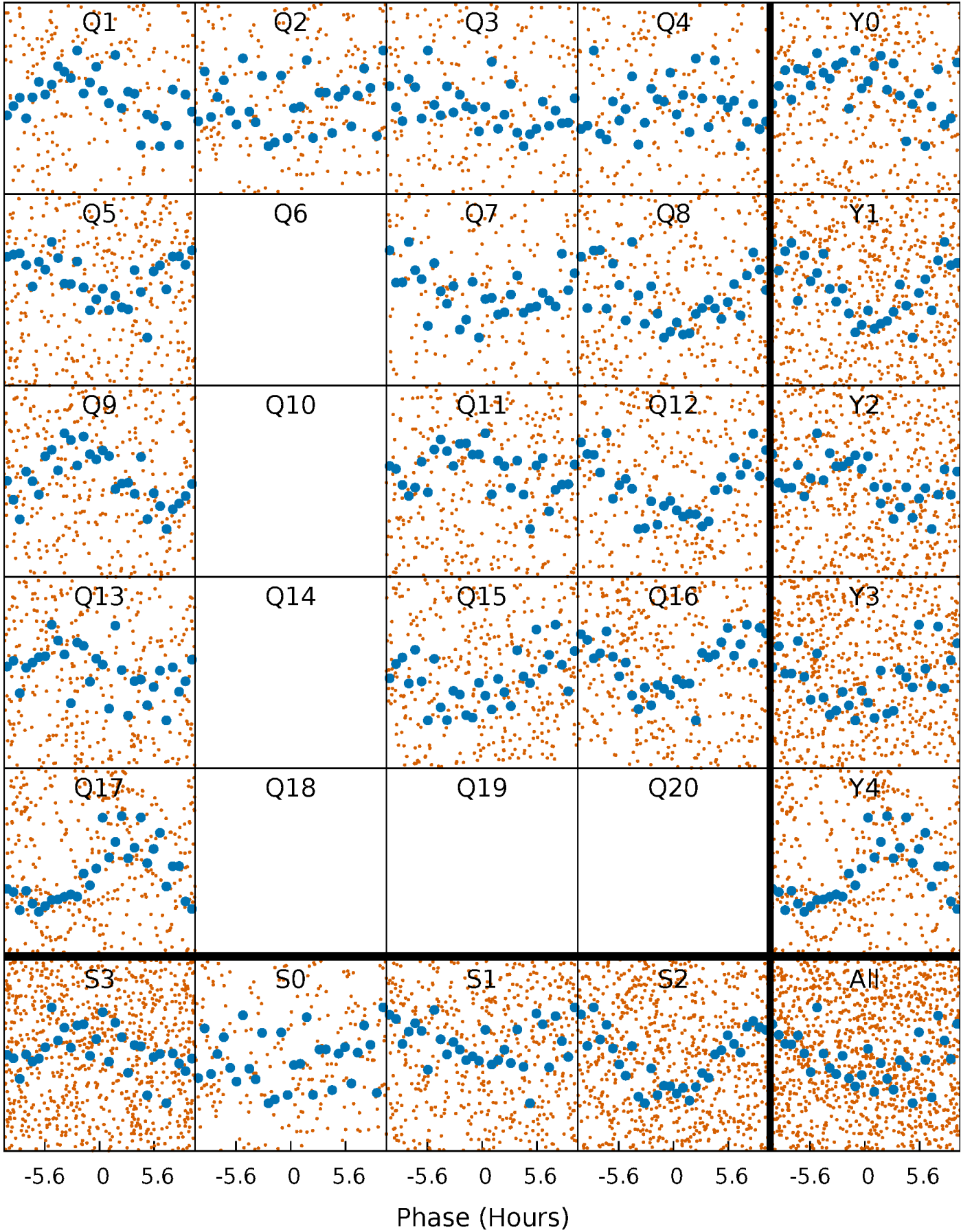
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

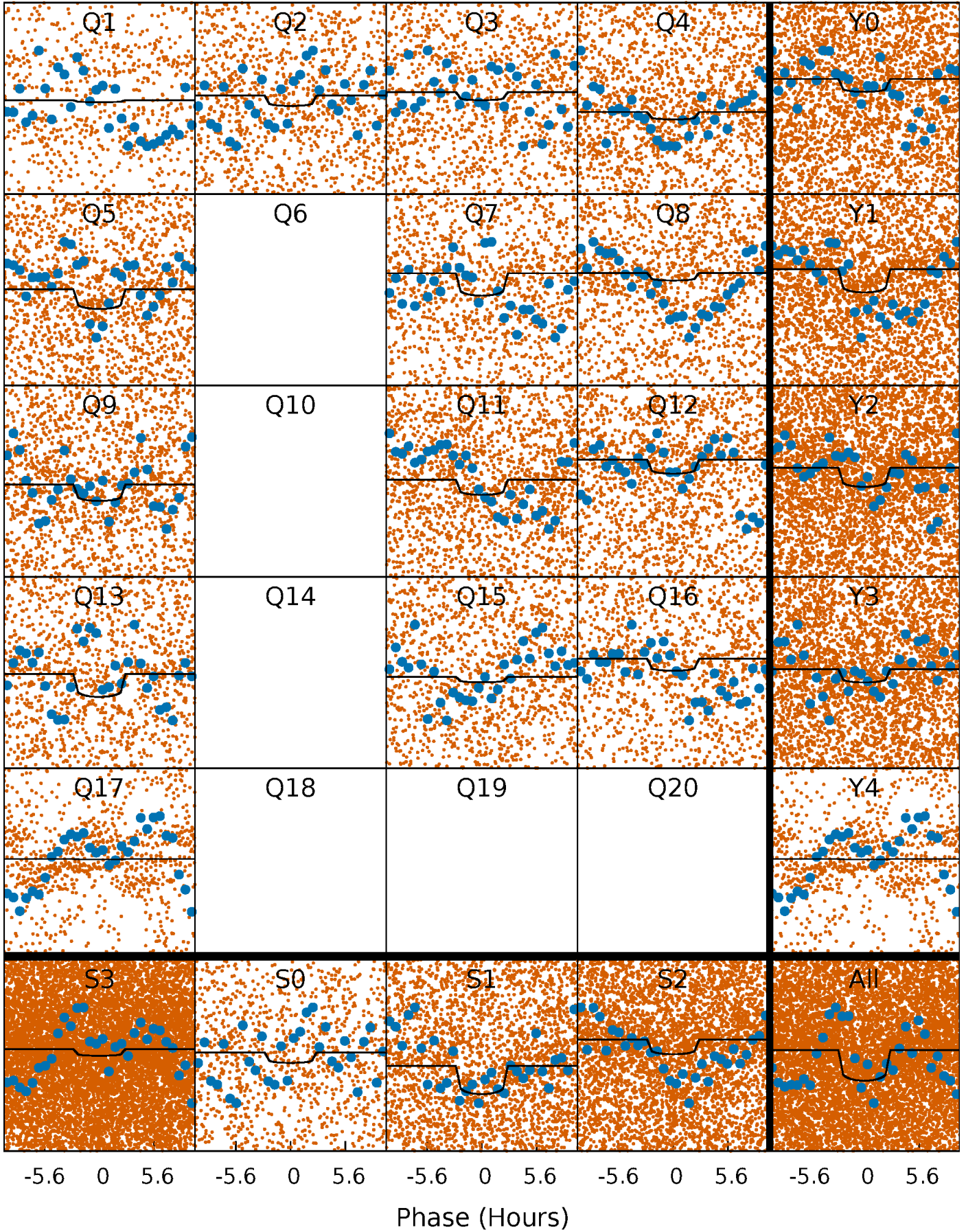
TCE 004936089-01   P= 0.756804 Days    $T_0=131.910393$  (BKJD)





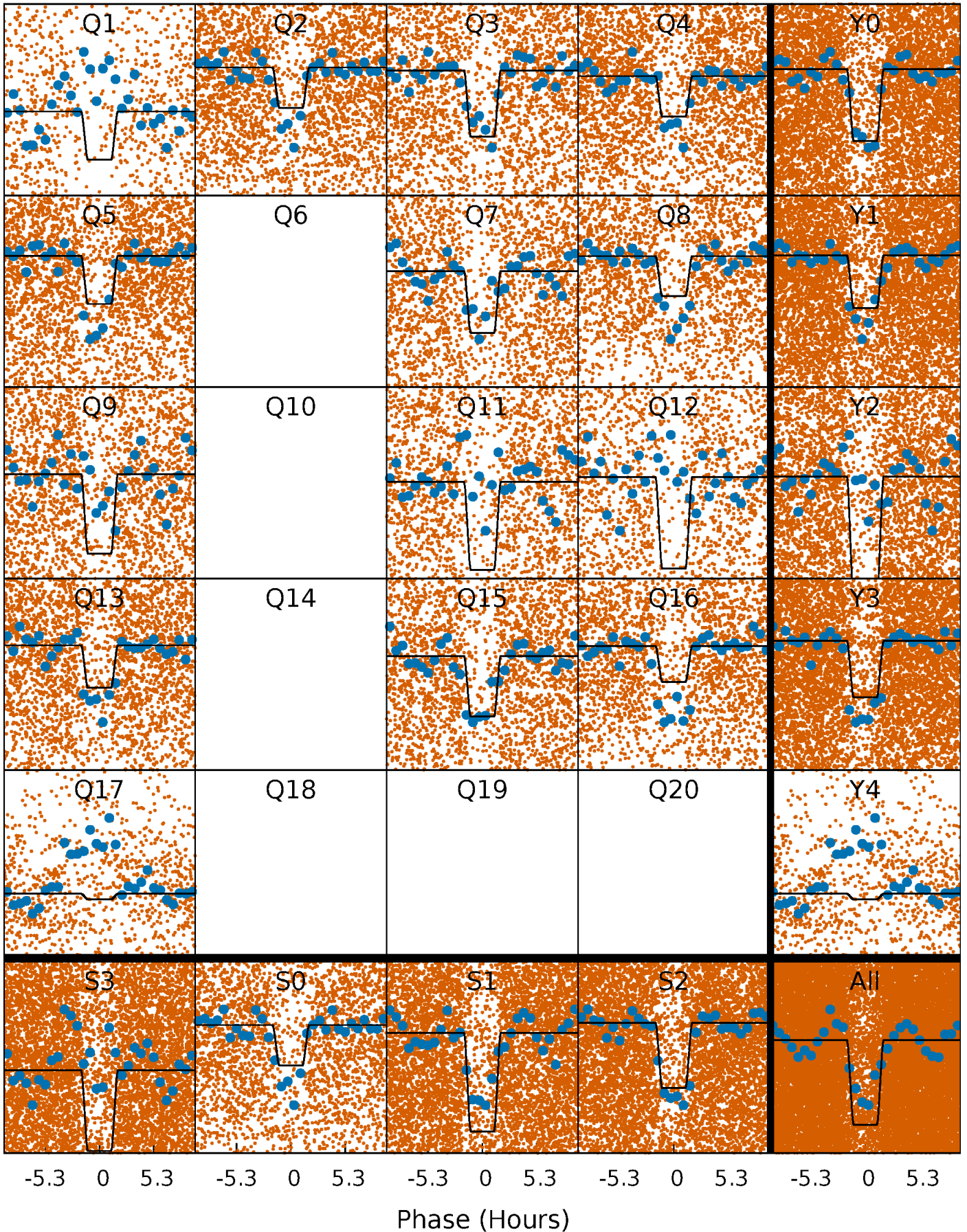
# DV Quarter-Phased Transit Curves

TCE 004936089-01 P= 0.756804 Days  $T_0=131.910393$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004936089-01 P= 0.756866 Days  $T_0=131.865260$  (BKJD)

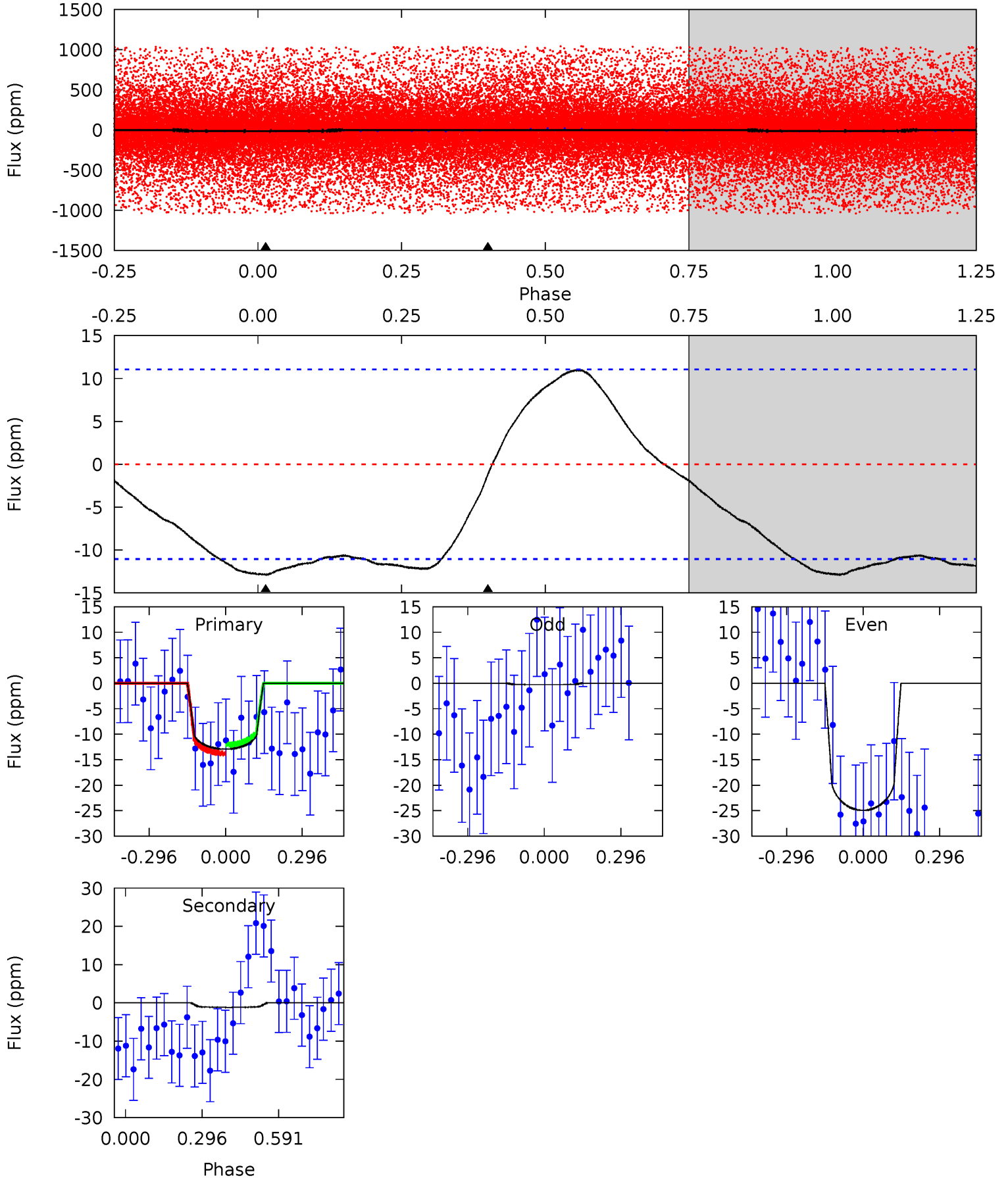




# DV Model-Shift Uniqueness Test

004936089-01, P = 0.756804 Days, E = 131.153589 Days

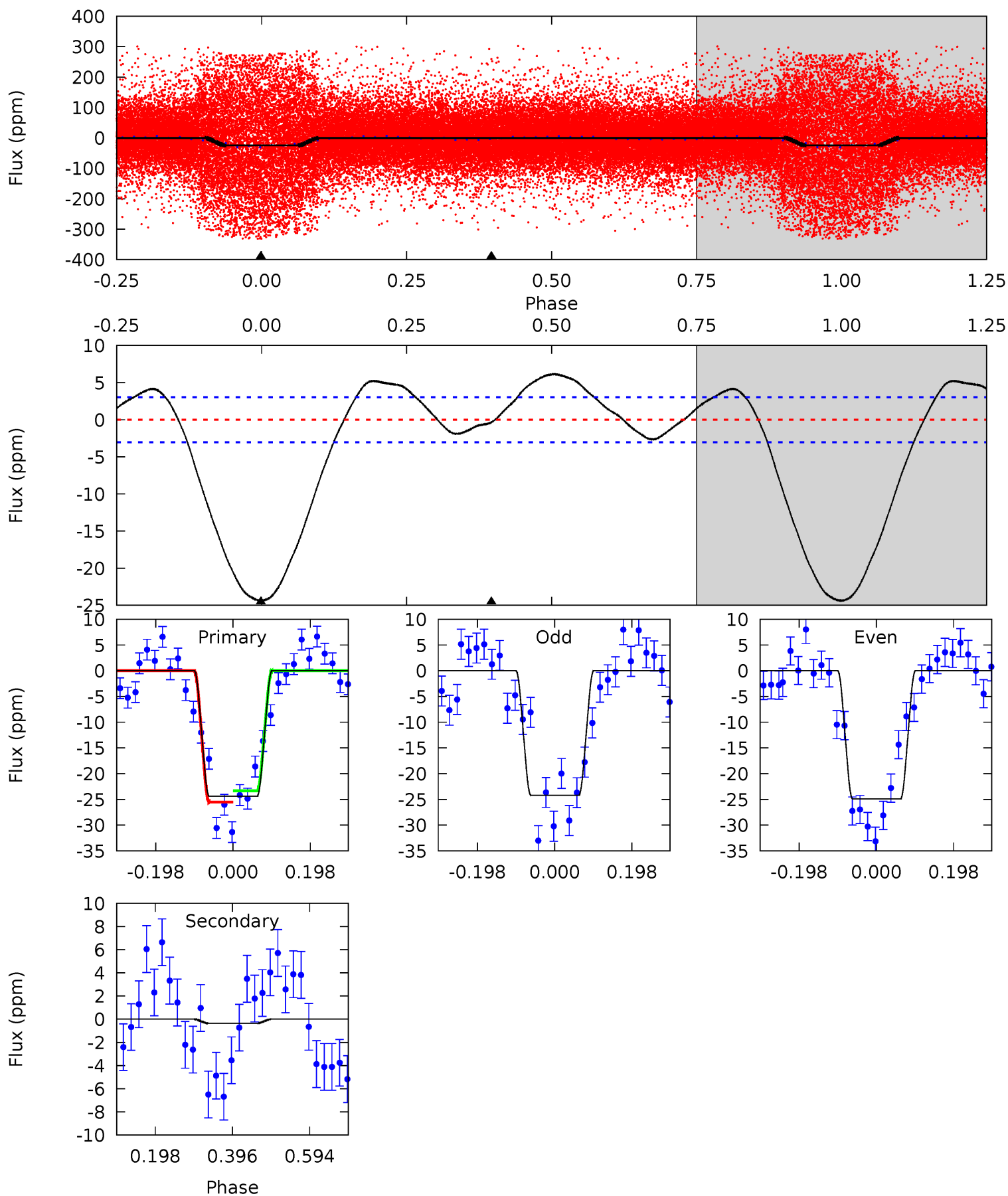
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.06	0.46	0	0	4.33	1.05	0.60	5.06	5.06	0.46	0.46	4.84	0.38	0.46	0.32



# Alt Model-Shift Uniqueness Test

004936089-01, P = 0.756866 Days, E = 131.108394 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
35.4	0.52	0	0	4.42	1.29	2.89	35.4	35.4	0.52	0.52	0.51	0.78	0.20	1.55





### Stellar Parameters For KIC 004936089

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$11502^{+449}_{-1798}$	$3.673^{+0.510}_{-0.090}$	$0.070^{+0.250}_{-0.600}$	$4.497^{+0.606}_{-2.422}$	$3.472^{+0.069}_{-1.265}$	$0.054^{+0.332}_{-0.016}$
	+4%/-16%	+14%/-2%	+357%/-857%	+13%/-54%	+2%/-36%	+618%/-30%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004936089-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1 \pm 3$	$1.29^{+0.48}_{-0.43}$	$8773^{+1189}_{-1590}$	$-4938^{+11974}_{-2654}$	$0.199^{+0.660}_{-0.456}$
Alt.	$-0 \pm 1$	$2.35^{+0.54}_{-0.64}$	$8846^{+1147}_{-1666}$	$-6322^{+1074}_{-797}$	$0.020^{+0.051}_{-0.037}$

$T_{max}$  = 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

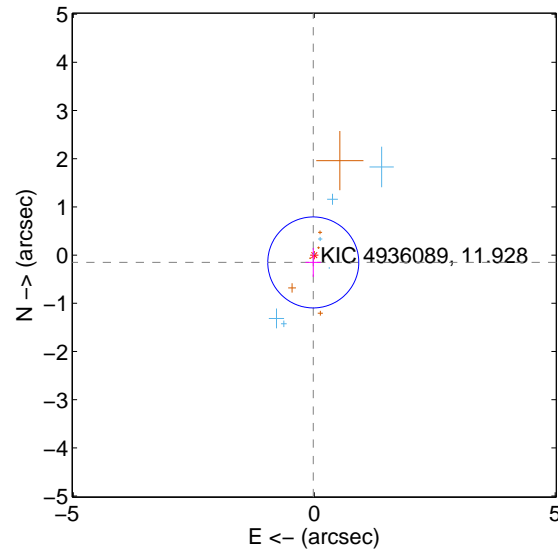
Supplemental centroid analysis for 004936089-01. **Kepler magnitude: 11.93.** Transit SNR 4.43

There are 7 quarters with good PRF difference image offsets

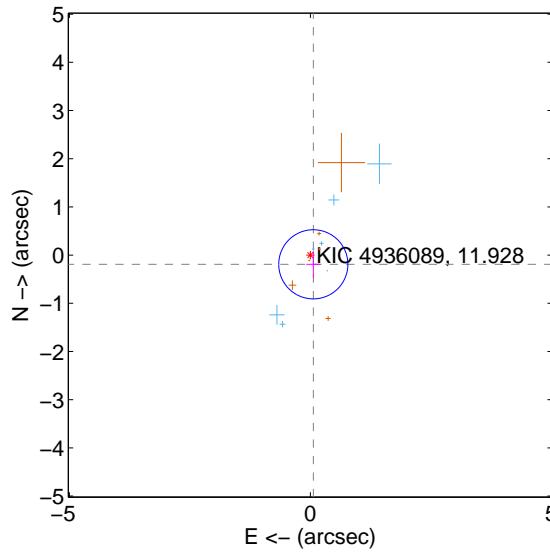
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.153 \pm 0.315$	0.49	$0.020 \pm 0.162$	$-0.152 \pm 0.301$
PRF-fit source offset from KIC position	$0.201 \pm 0.239$	0.84	$-0.062 \pm 0.146$	$-0.191 \pm 0.279$
photometric centroid source offset	$0.40 \pm 1.26$	0.32	$0.08 \pm 1.15$	$0.39 \pm 1.27$

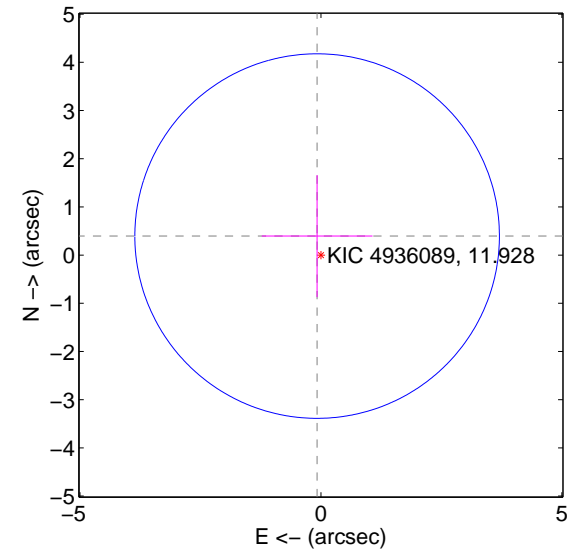
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

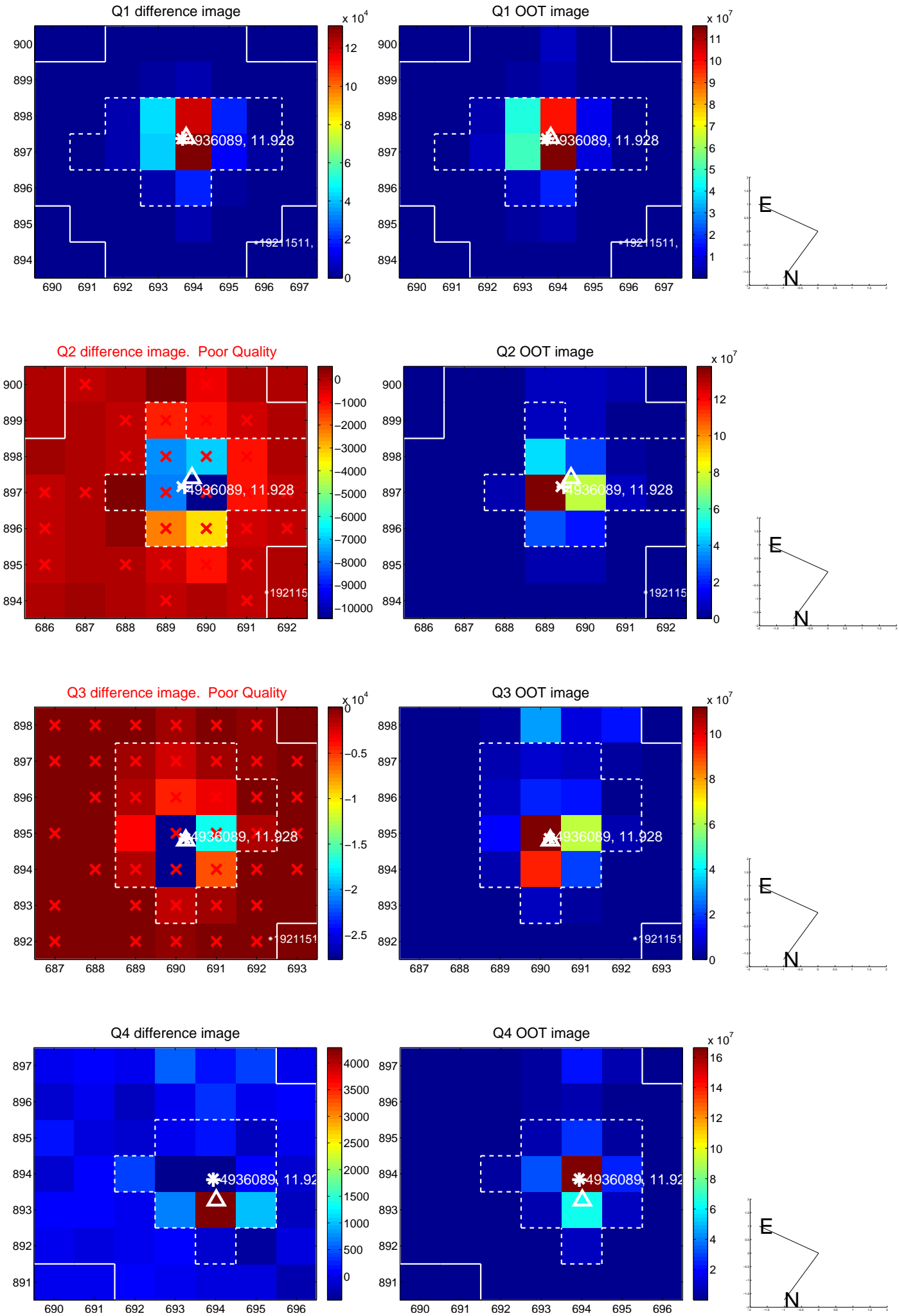


offset from photometric centroids

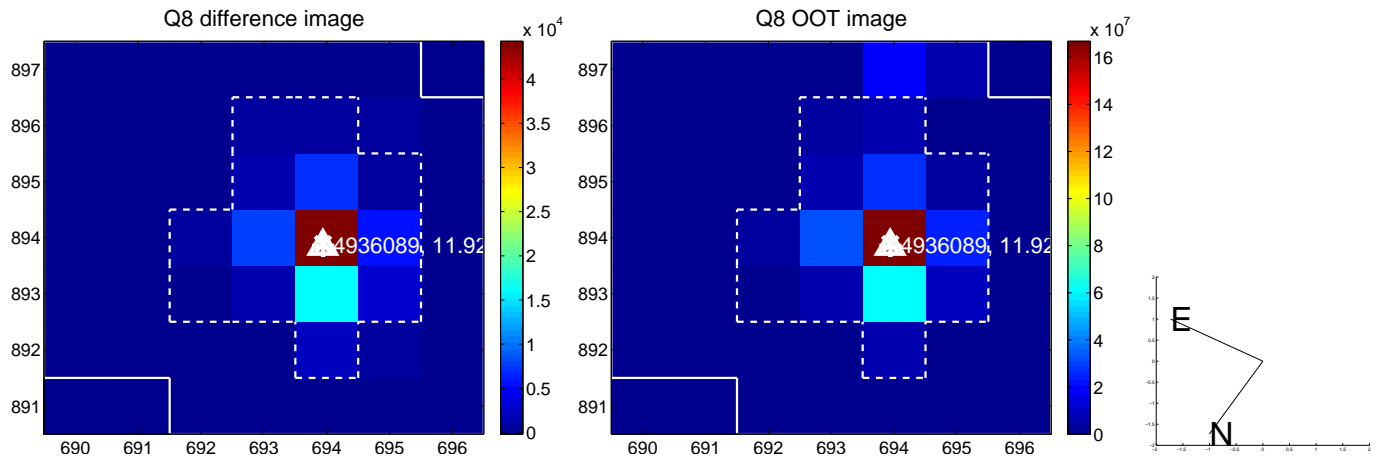
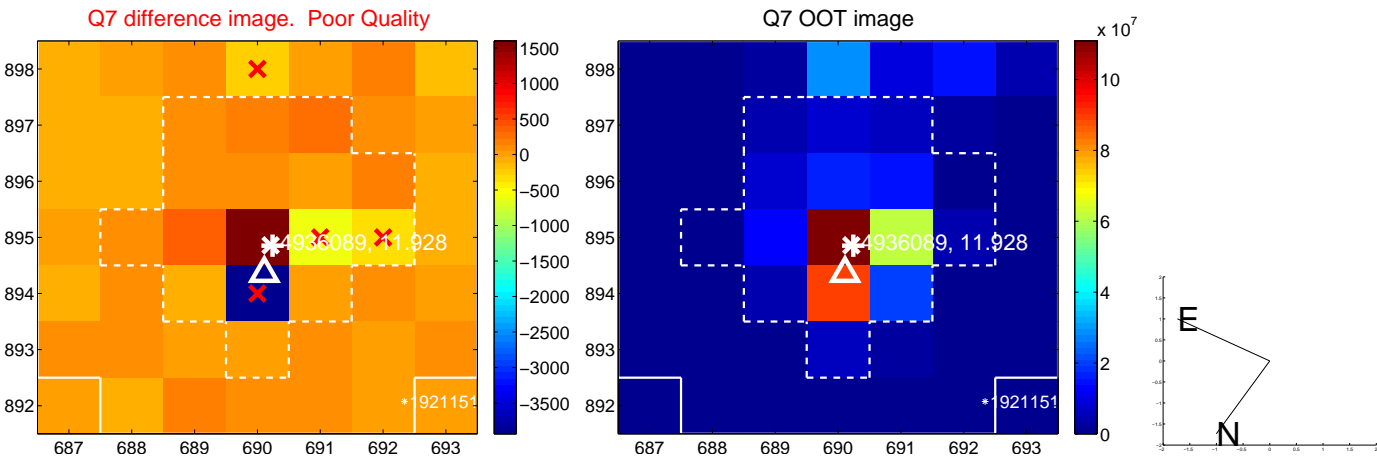
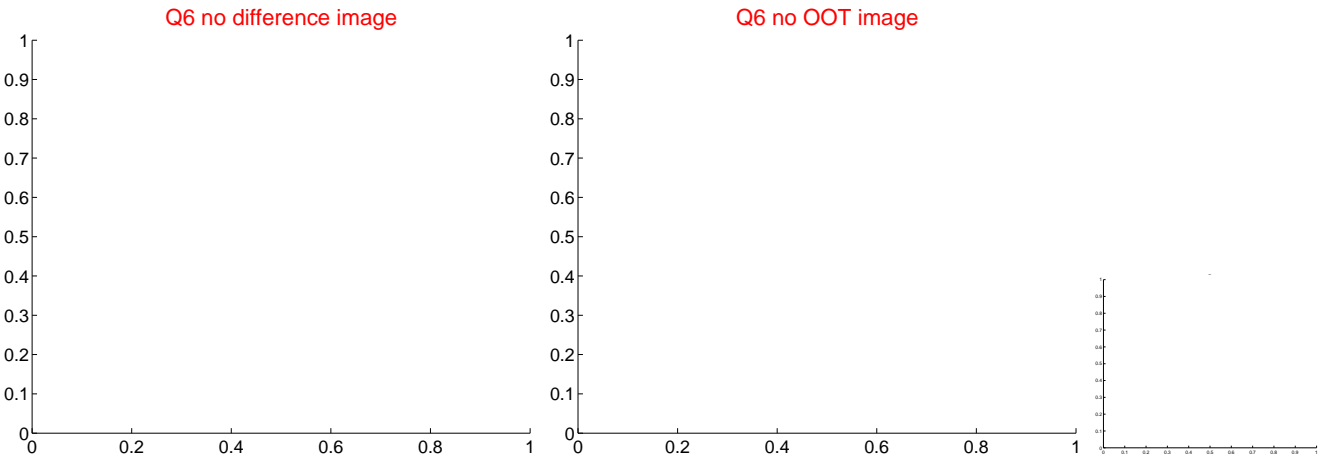
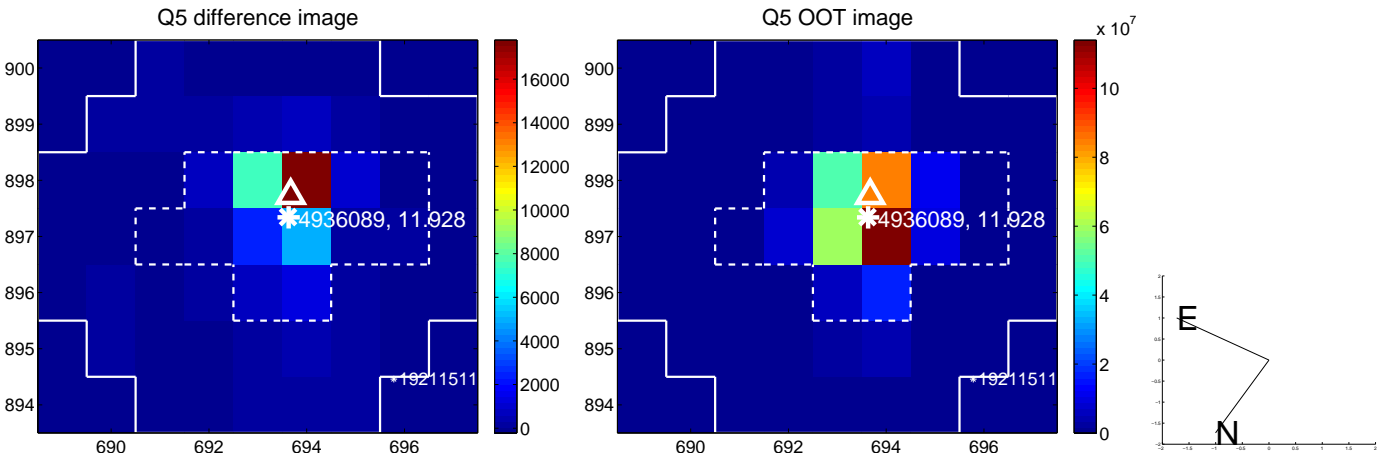


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

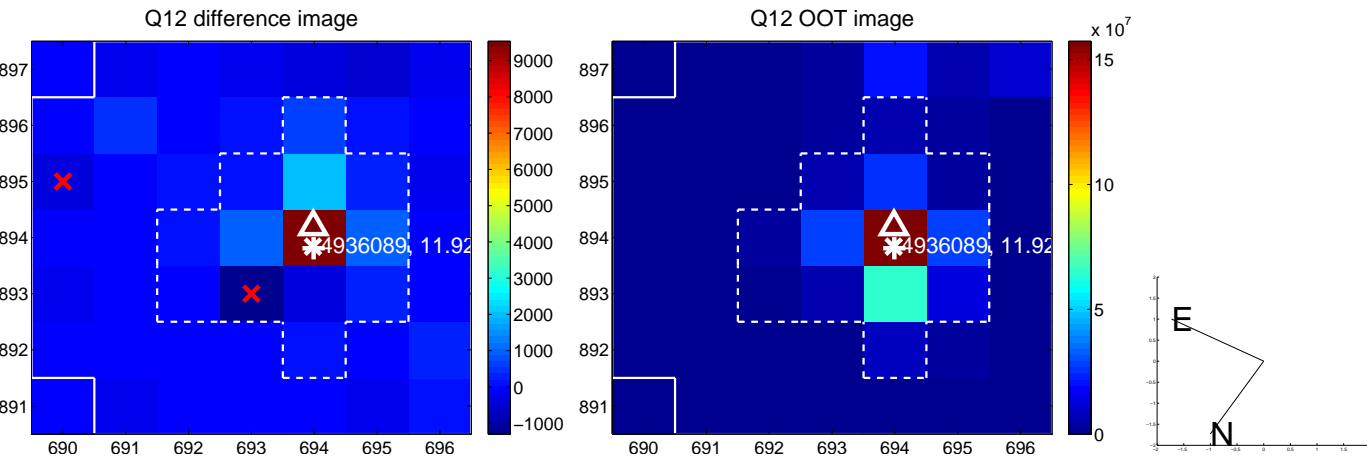
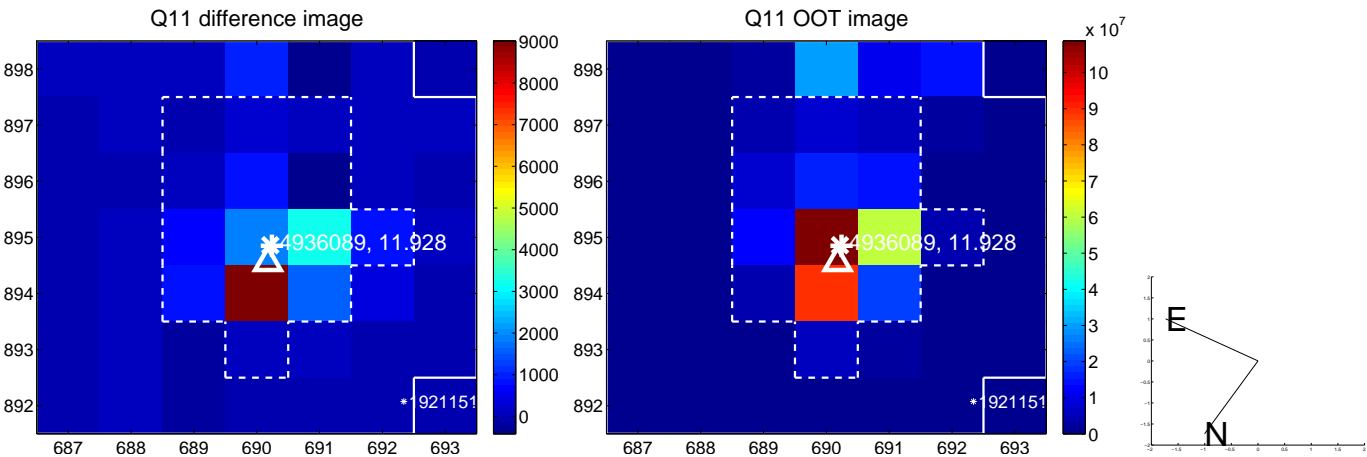
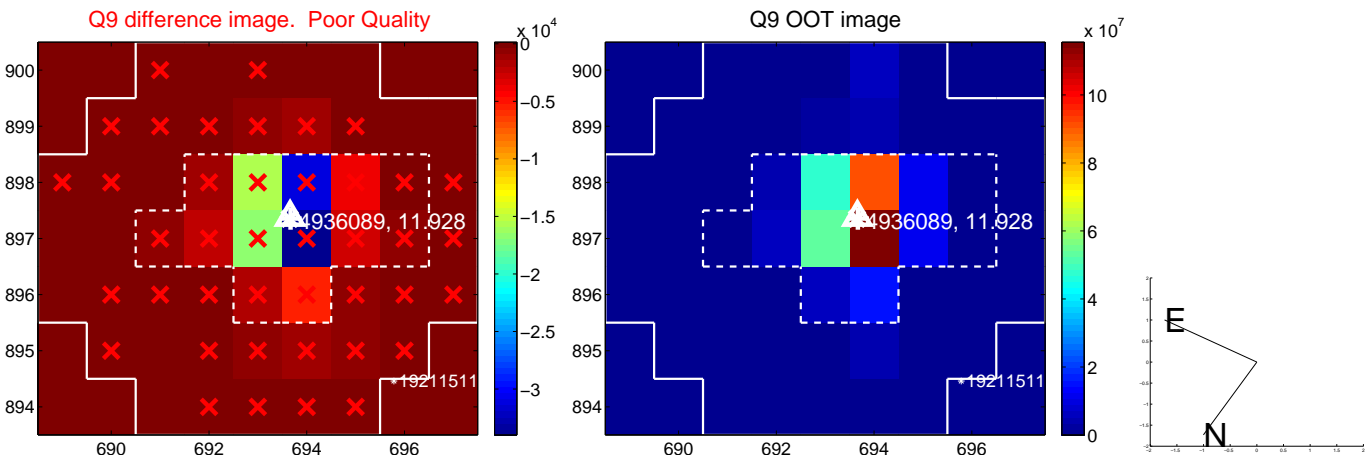


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

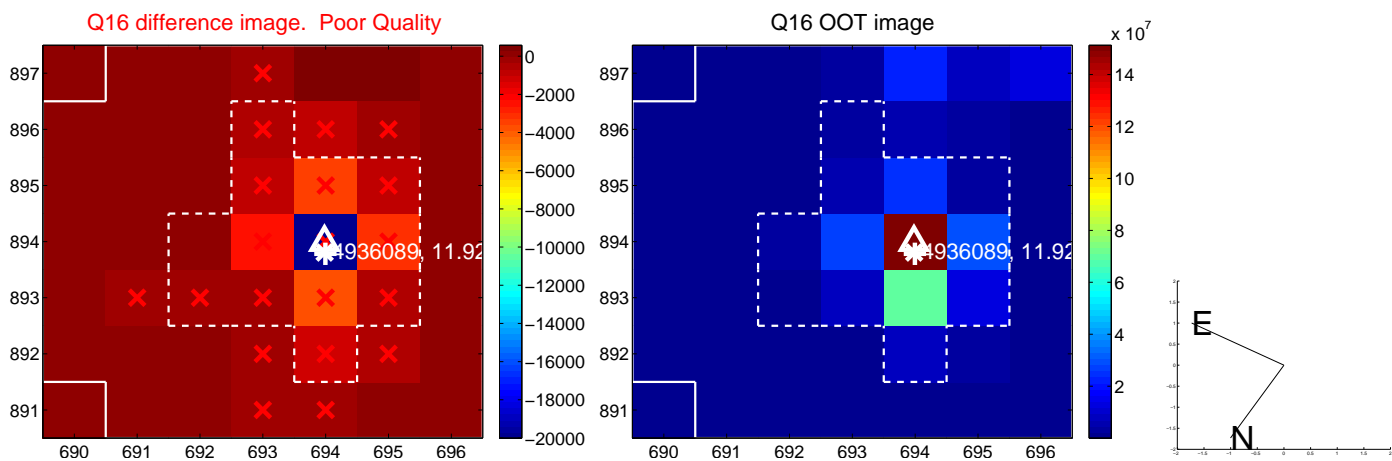
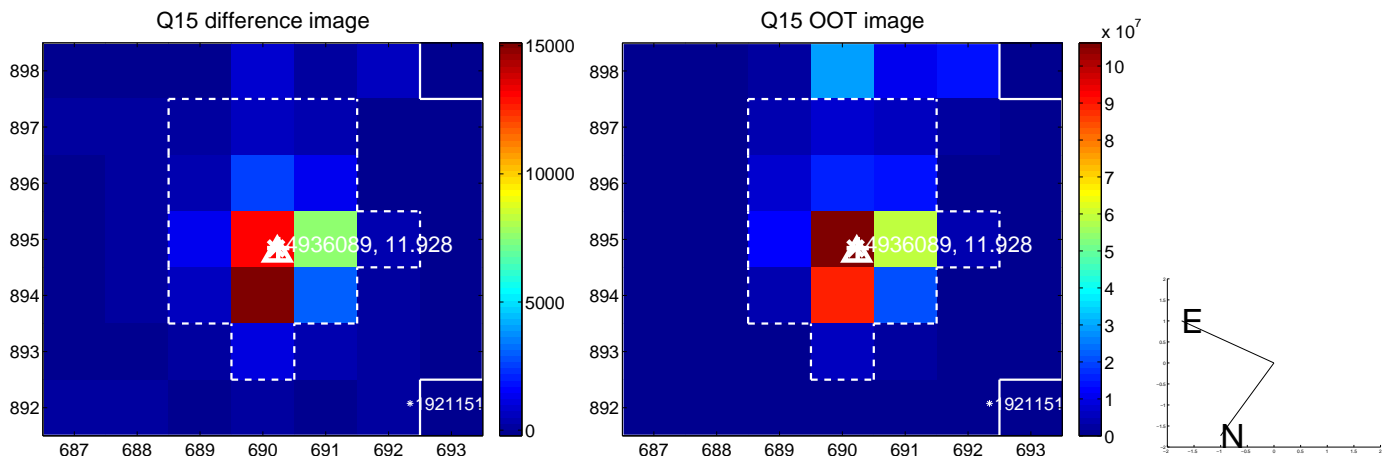
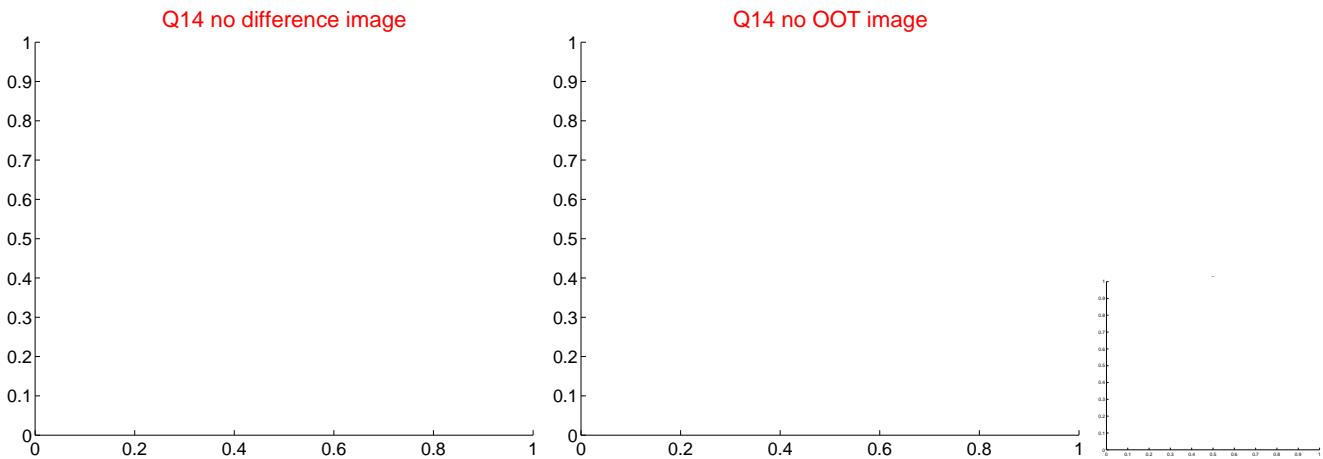
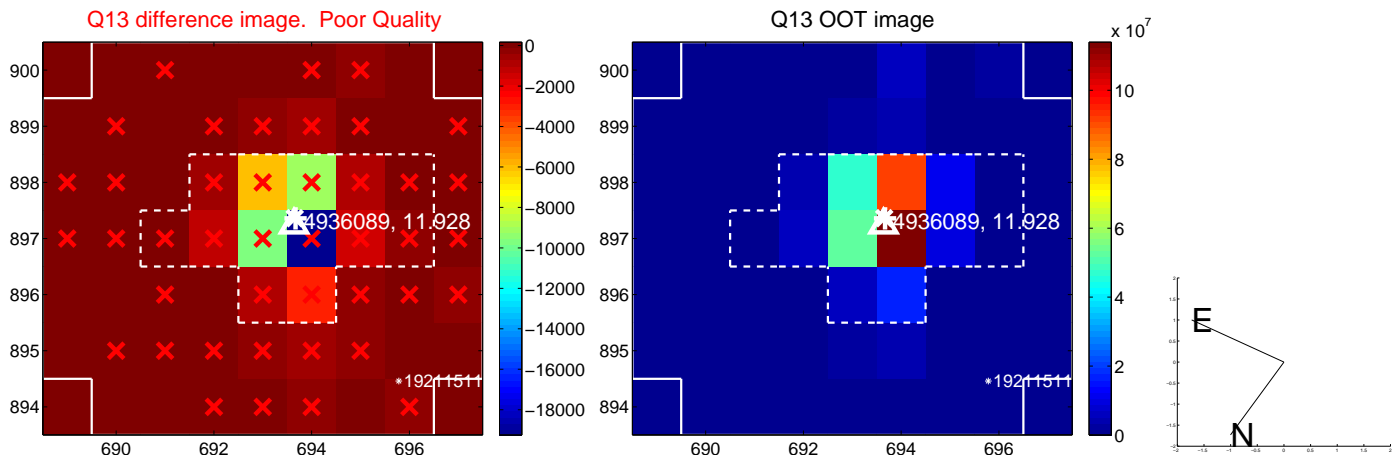




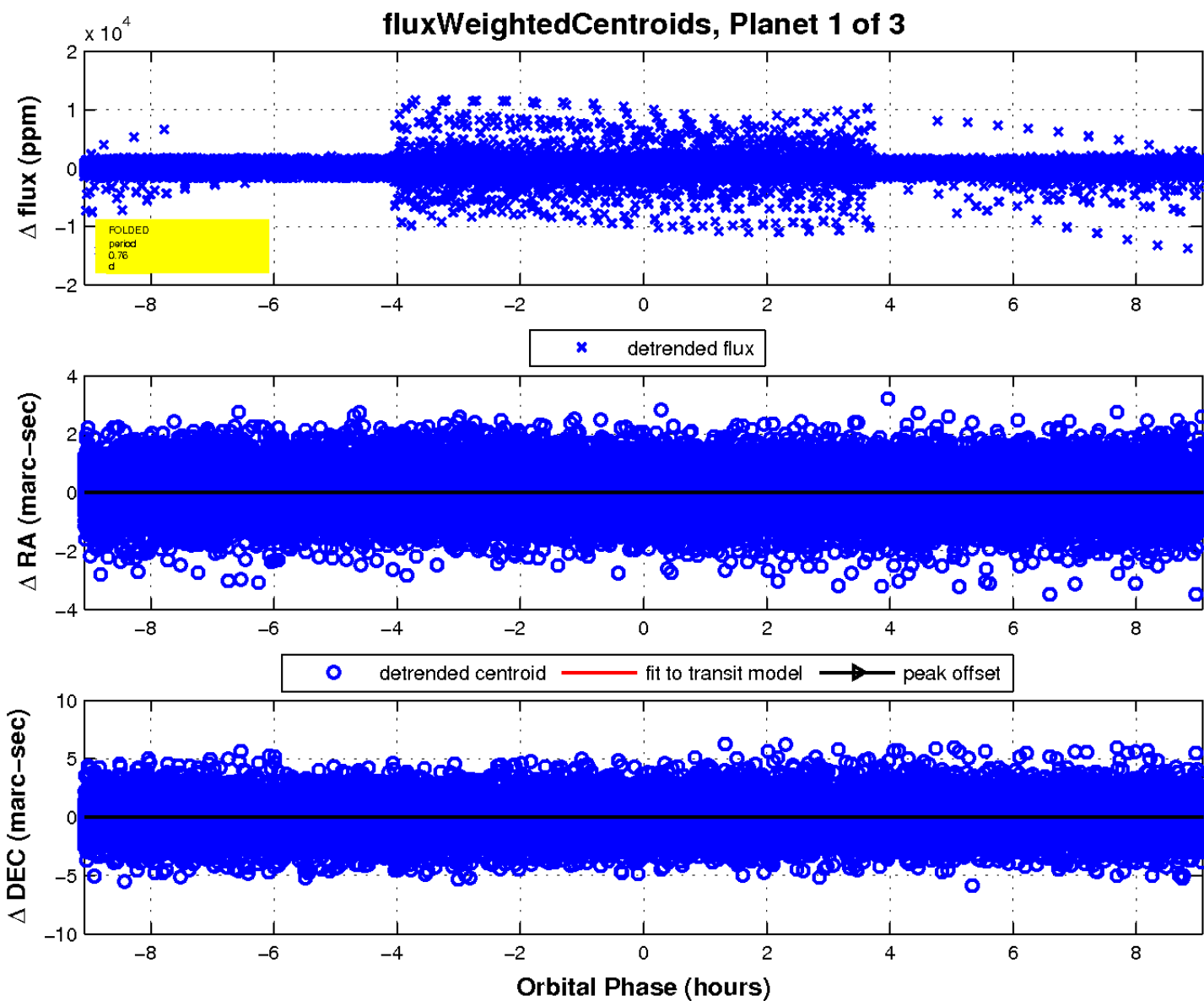
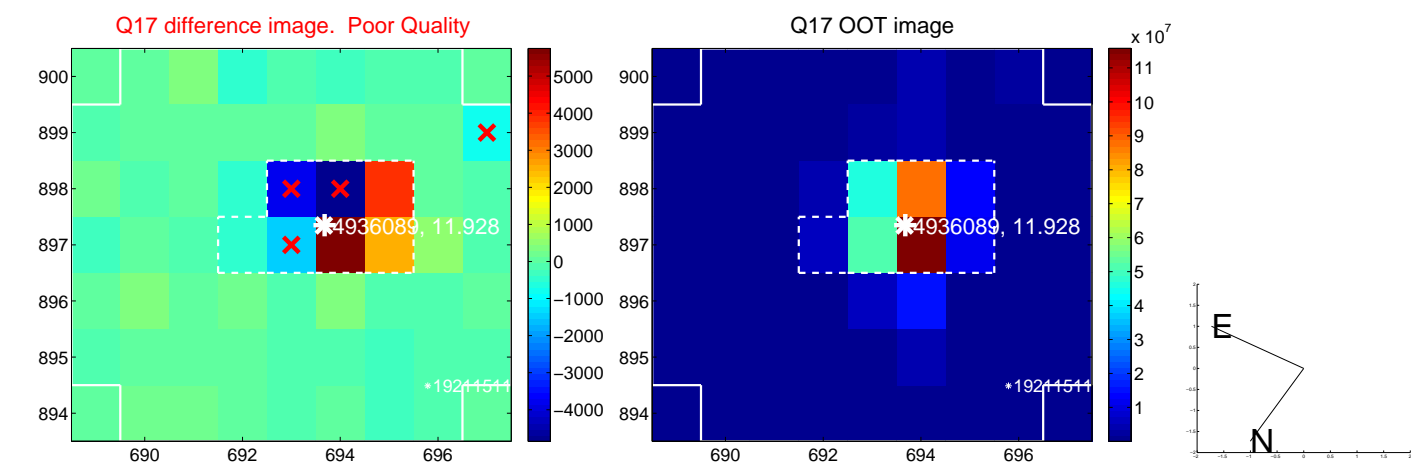
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

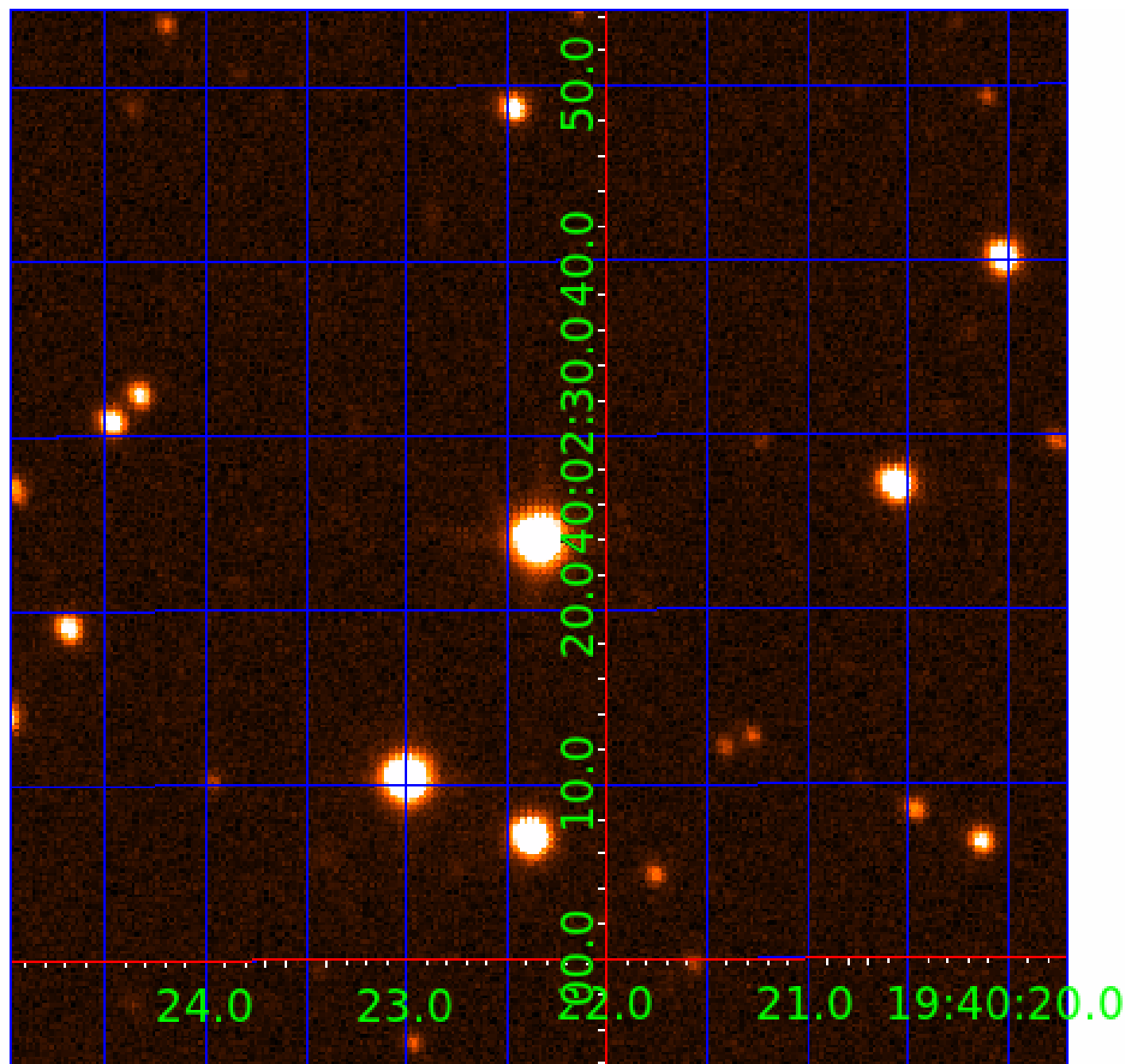


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 004936089

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004936089-01	OBS	No	0.756804	131.910393	10.4	4.891	9.0	4.4	4.50	11502	1.53	523149.13
004936089-02	OBS	No	3.785899	133.766423	70.7	1.690	20.6	2.5	4.50	11502	4.33	61147.36
004936089-03	OBS	No	142.196715	149.682871	1437.0	2.559	15.2	9.5	4.50	11502	18.25	486.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004936089-01	OBS	FP	0.00	1	0	0	0	LPP_DV
004936089-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004936089-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS

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

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

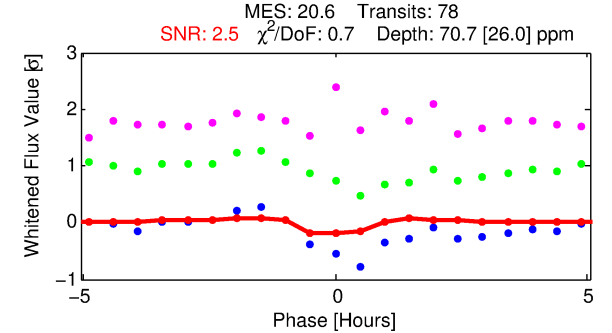
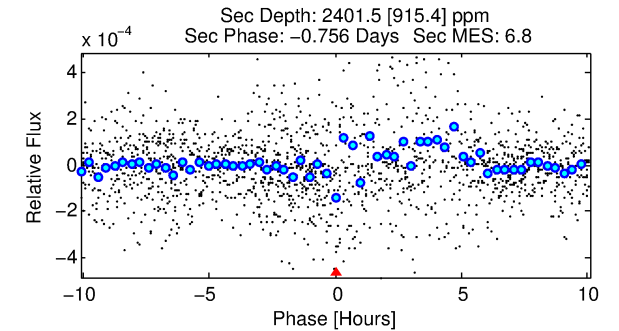
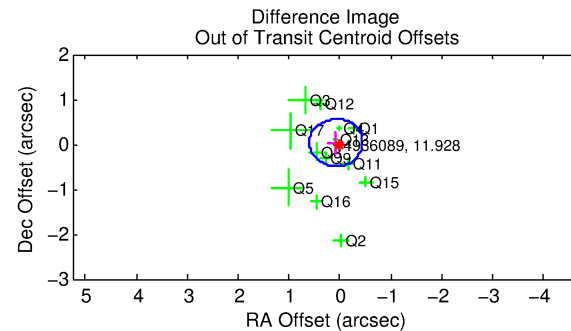
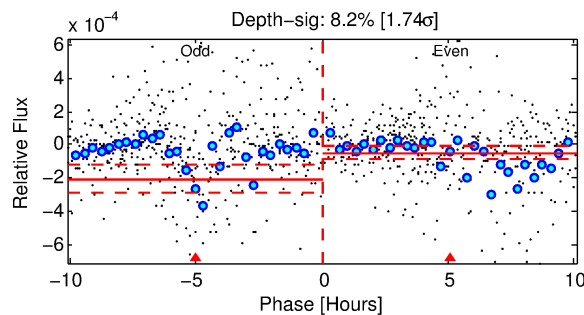
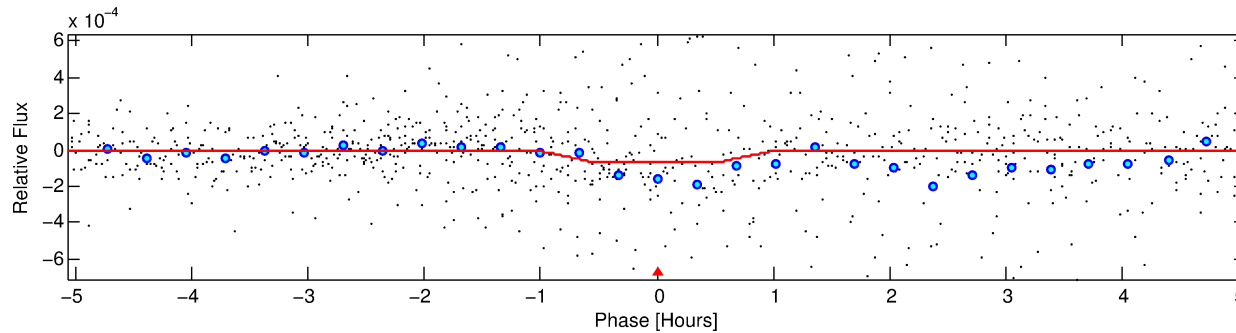
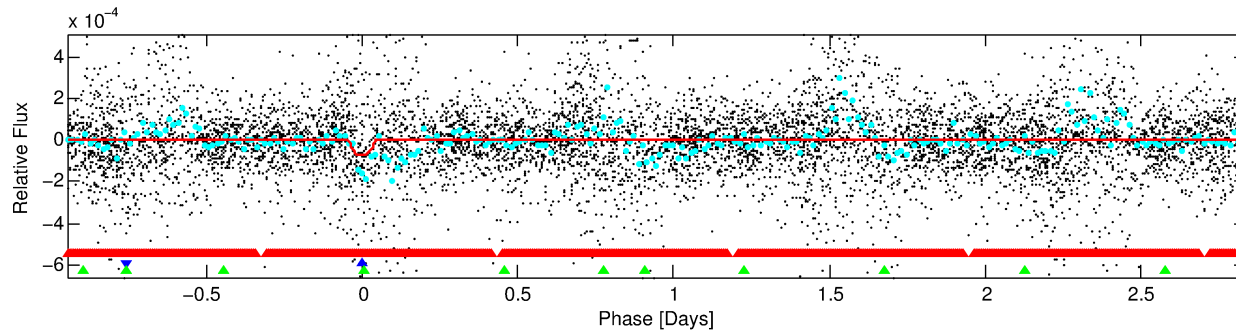
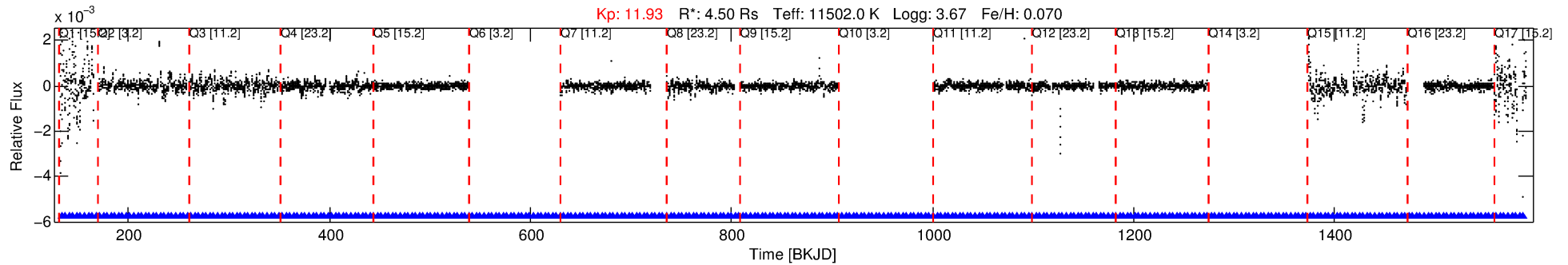
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004936089-02

No Significant Match Found

# DV One-Page Summary

KIC: 4936089 Candidate: 2 of 3 Period: 3.786 d



## DV Fit Results:

Period = 3.78590 [0.00005] d  
Epoch = 133.7664 [0.0078] BKJD  
 $R_p/R^* = 0.0088$  [0.0068]  
 $a/R^* = 7.66$  [49.12]  
 $b = 0.91$  [1.32]  
 $\text{Seff} = 61147.36$  [65080.95]  
 $T_{\text{eq}} = 4010$  [1067] K  
 $R_p = 4.33$  [4.06]  $R_{\text{e}}$   
 $a = 0.0720$  [0.0383] AU  
 $A_g = 365.43$  [657.77] [0.55 $\sigma$ ]  
 $T_{\text{eff}} = 27106$  [11518] K [2.00 $\sigma$ ]

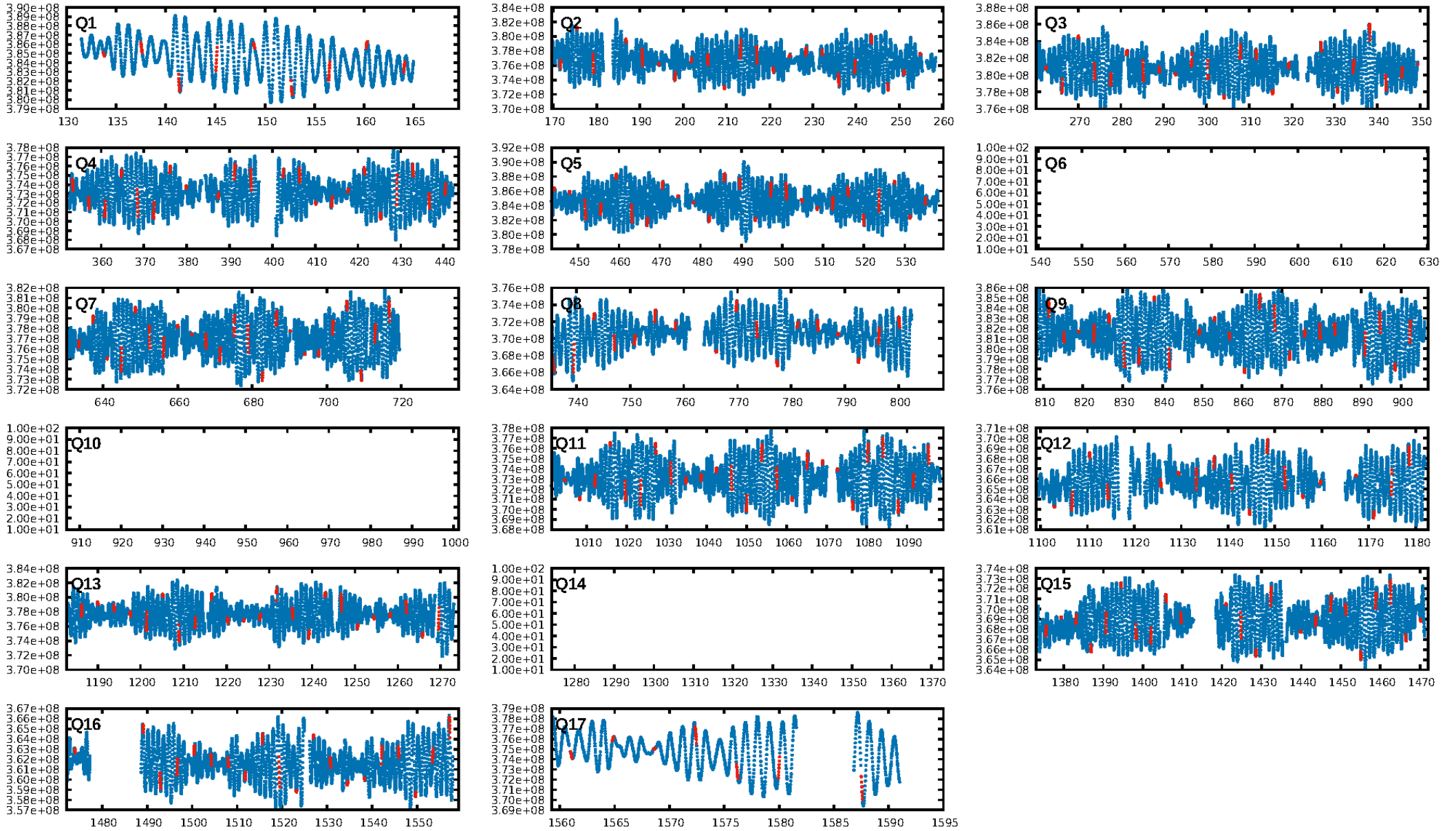
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [14.05 $\sigma$ ]  
LongPeriod-sig: 100.0% [1083.25 $\sigma$ ]  
ModelChiSquare2-sig: 5.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.41e-63  
RollingBand-fgt: 1.00 [62/62]  
GhostDiagnostic-chr: 14.63  
Centroid-sig: 27.5%  
Centroid-so: 0.359 arcsec [0.62 $\sigma$ ]  
OotOffset-rm: 0.084 arcsec [0.48 $\sigma$ ]  
KicOffset-rm: 0.029 arcsec [0.11 $\sigma$ ]  
OotOffset-st: 1/3/4/5 [13]  
KicOffset-st: 1/3/4/5 [13]  
DiffImageQuality-fgm: 0.85 [11/13]  
DiffImageOverlap-fno: 0.21 [3/14]

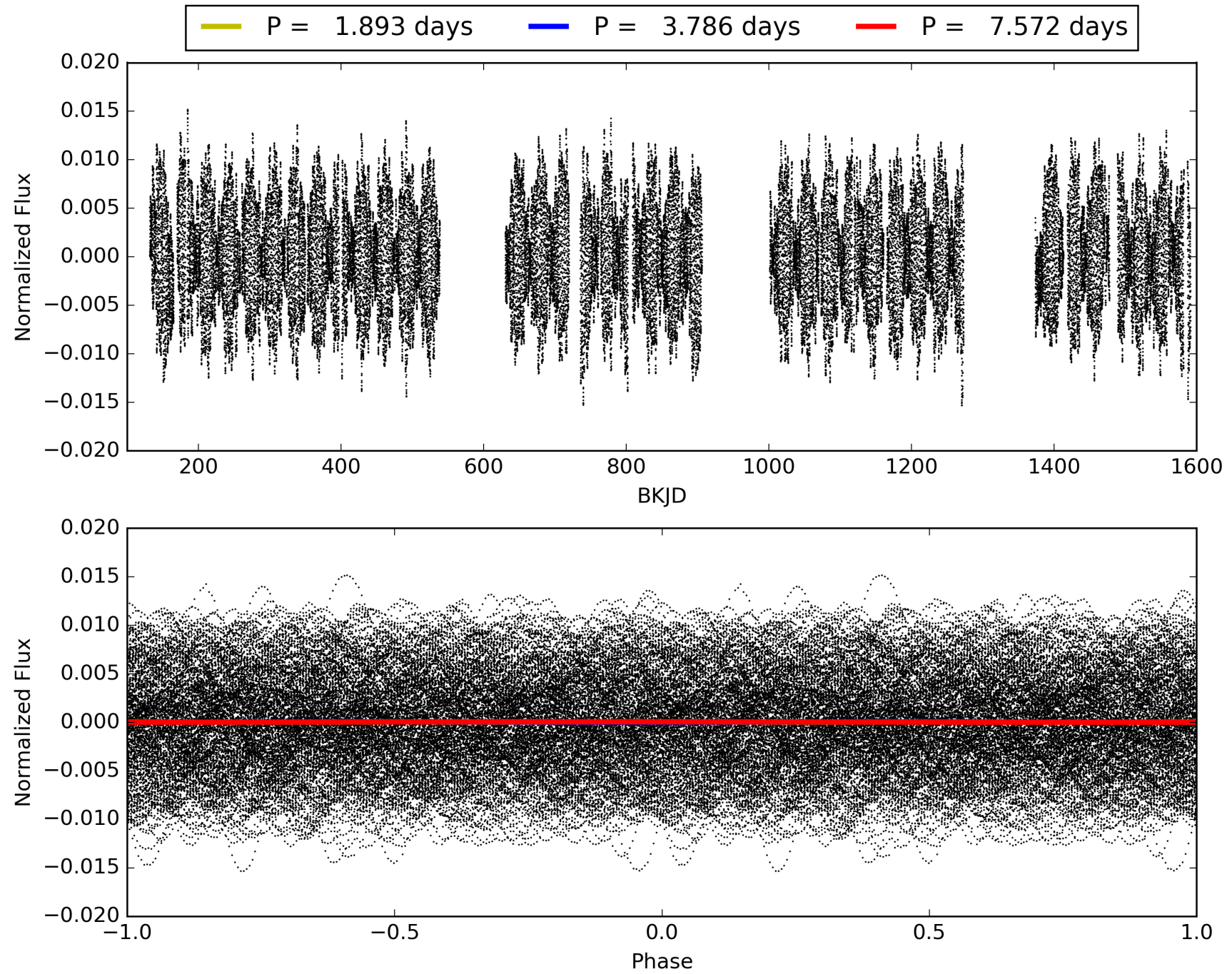
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:11:52 Z

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

# TCE 004936089-02, PDC Light Curves

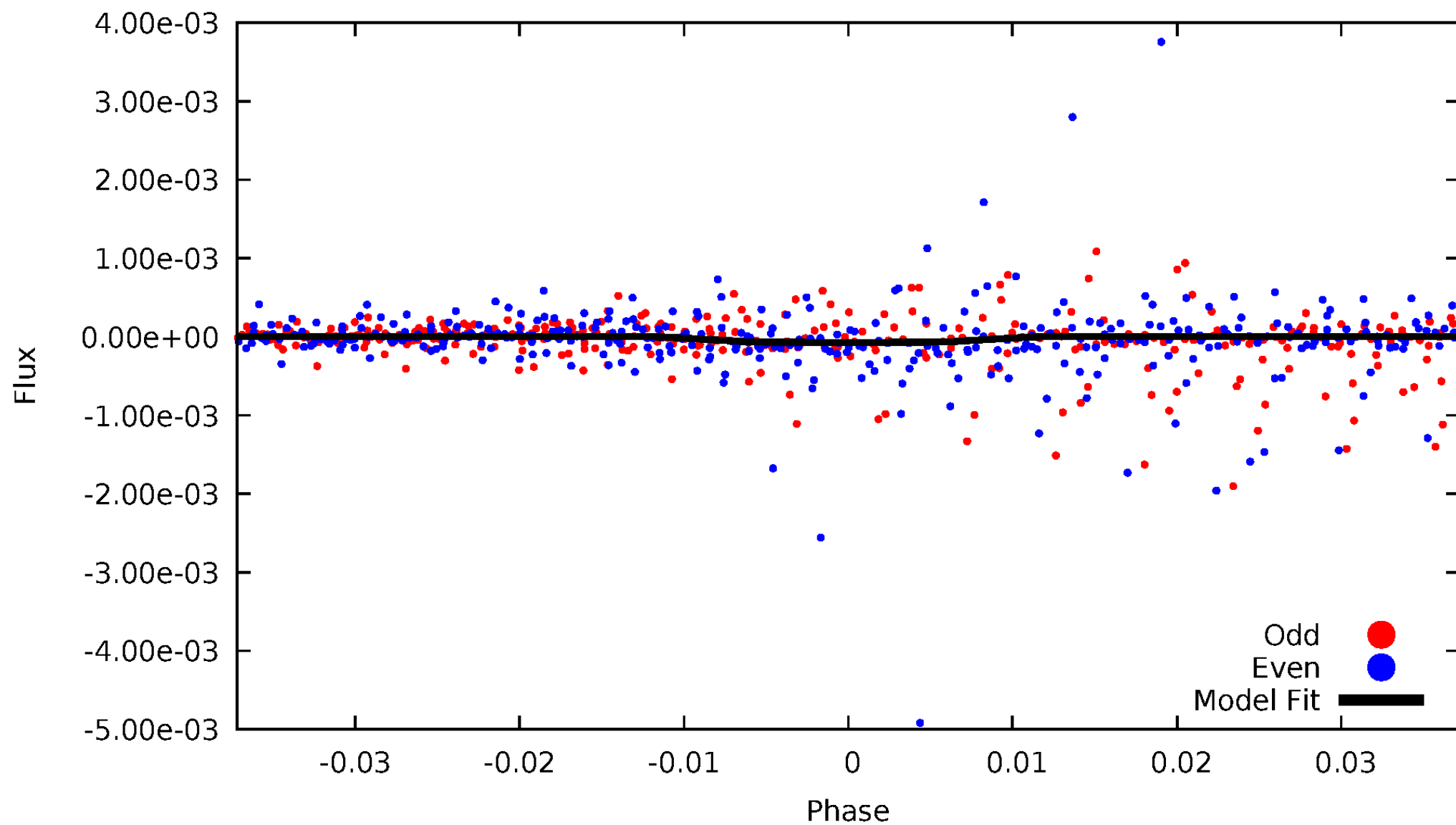


TCE 004936089-02



# DV Odd/Even

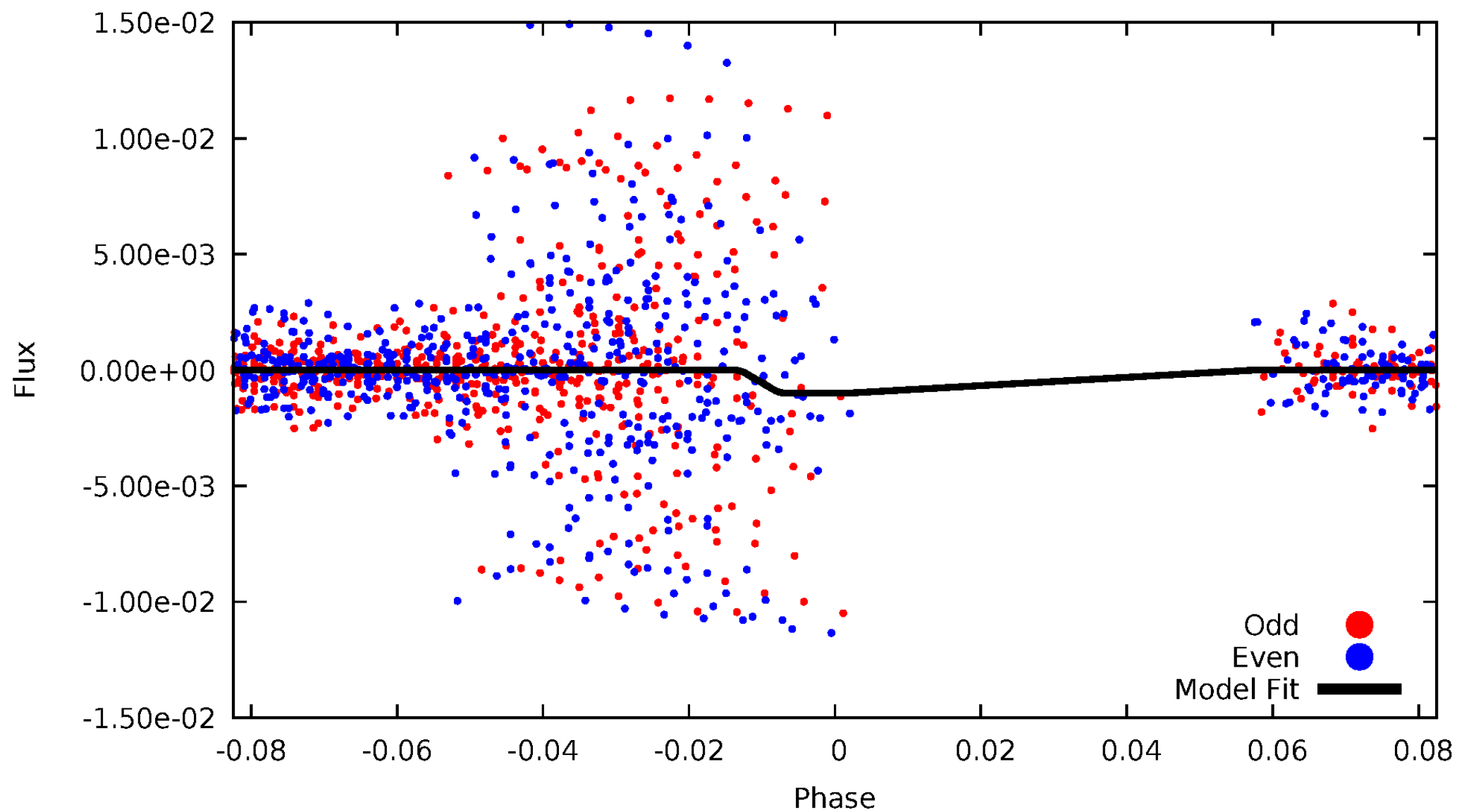
TCE 004936089-02





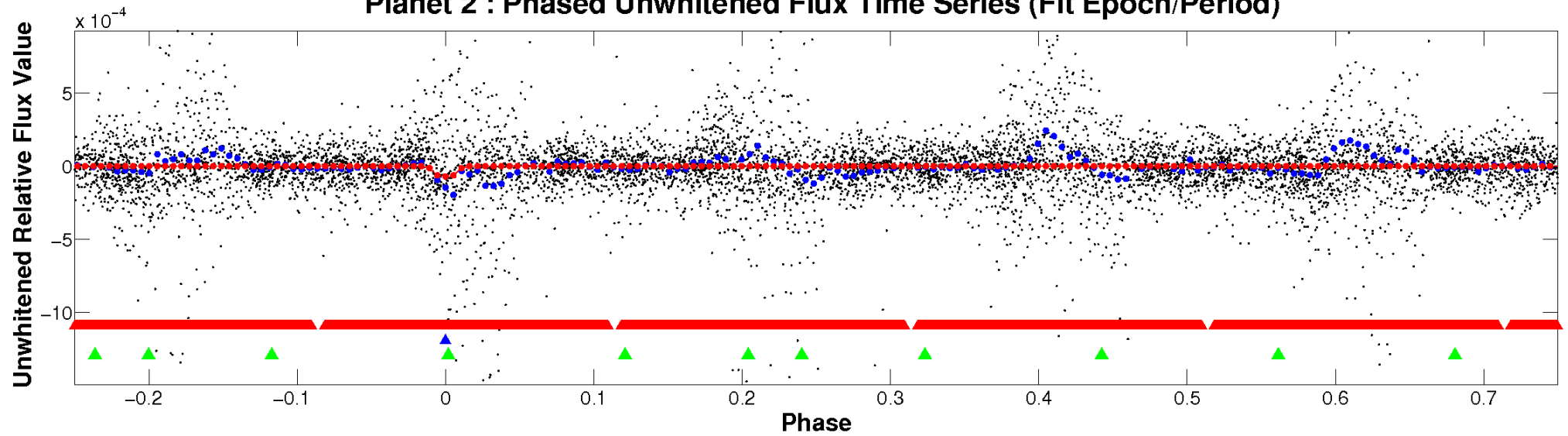
# ALT Odd/Even

TCE 004936089-02

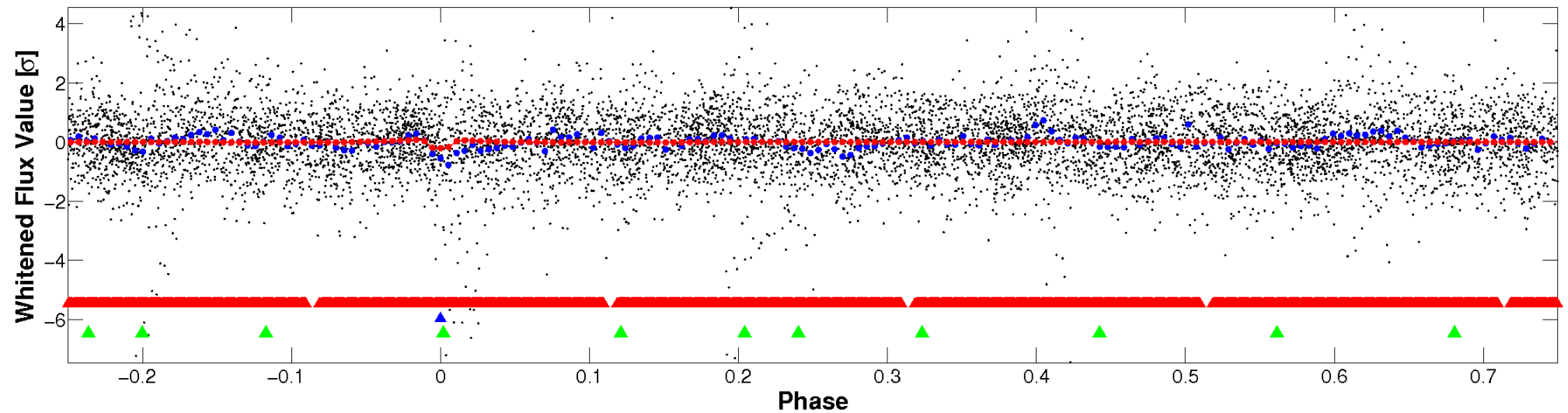


# Non-Whitened Vs. Whitened Light Curve

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

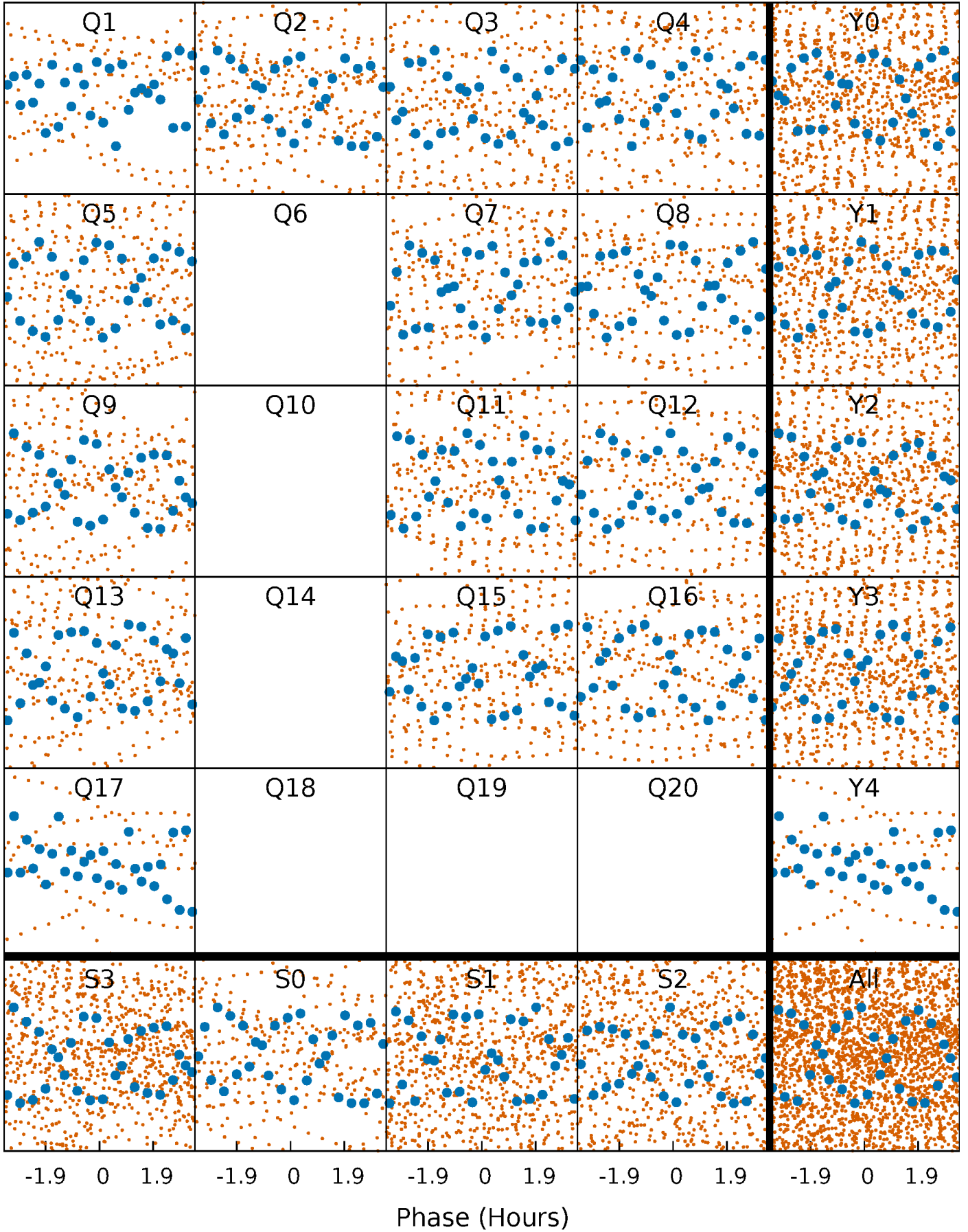


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



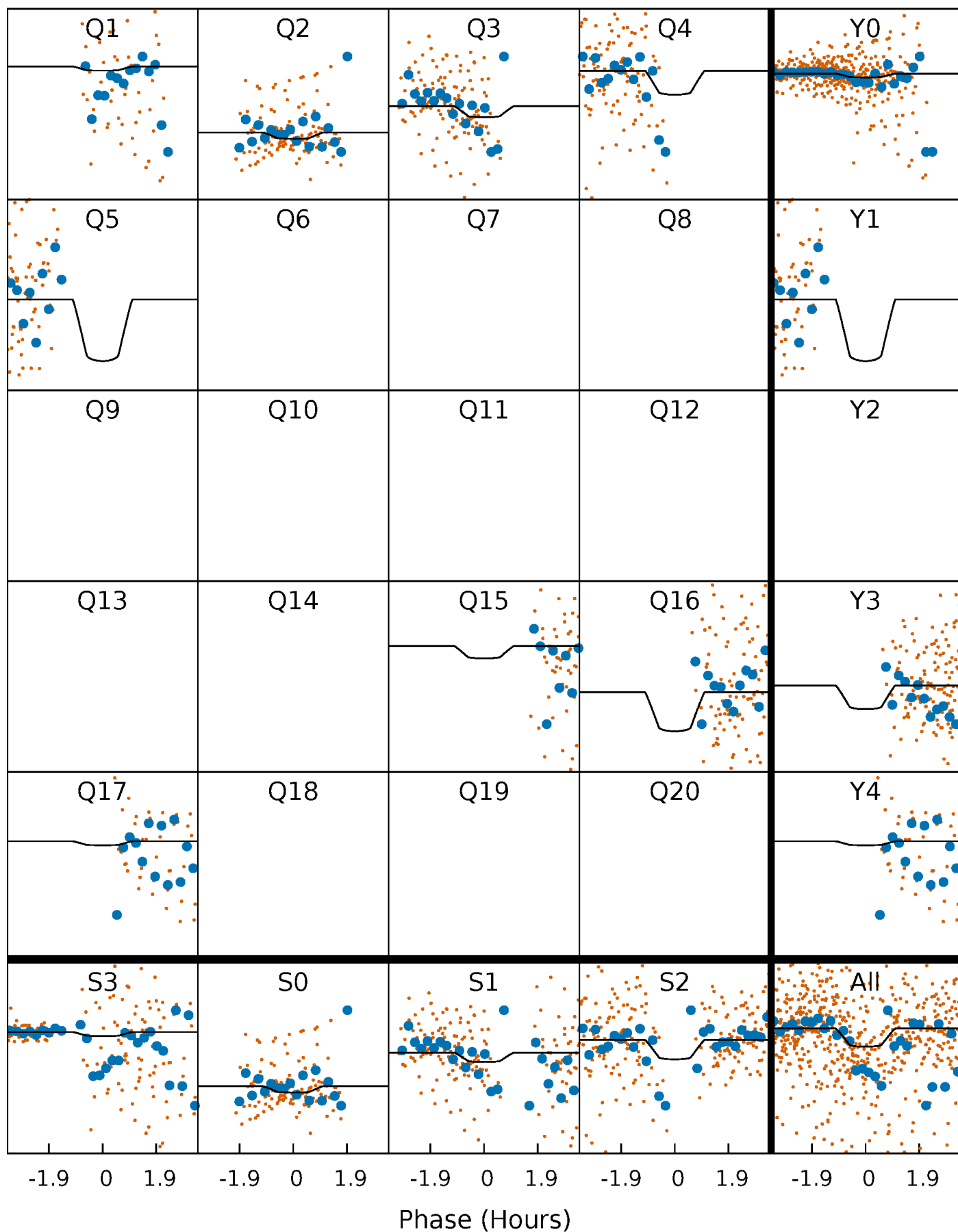
# PDC Quarter-Phased Transit Curves

TCE 004936089-02 P= 3.785899 Days  $T_0=133.766423$  (BKJD)



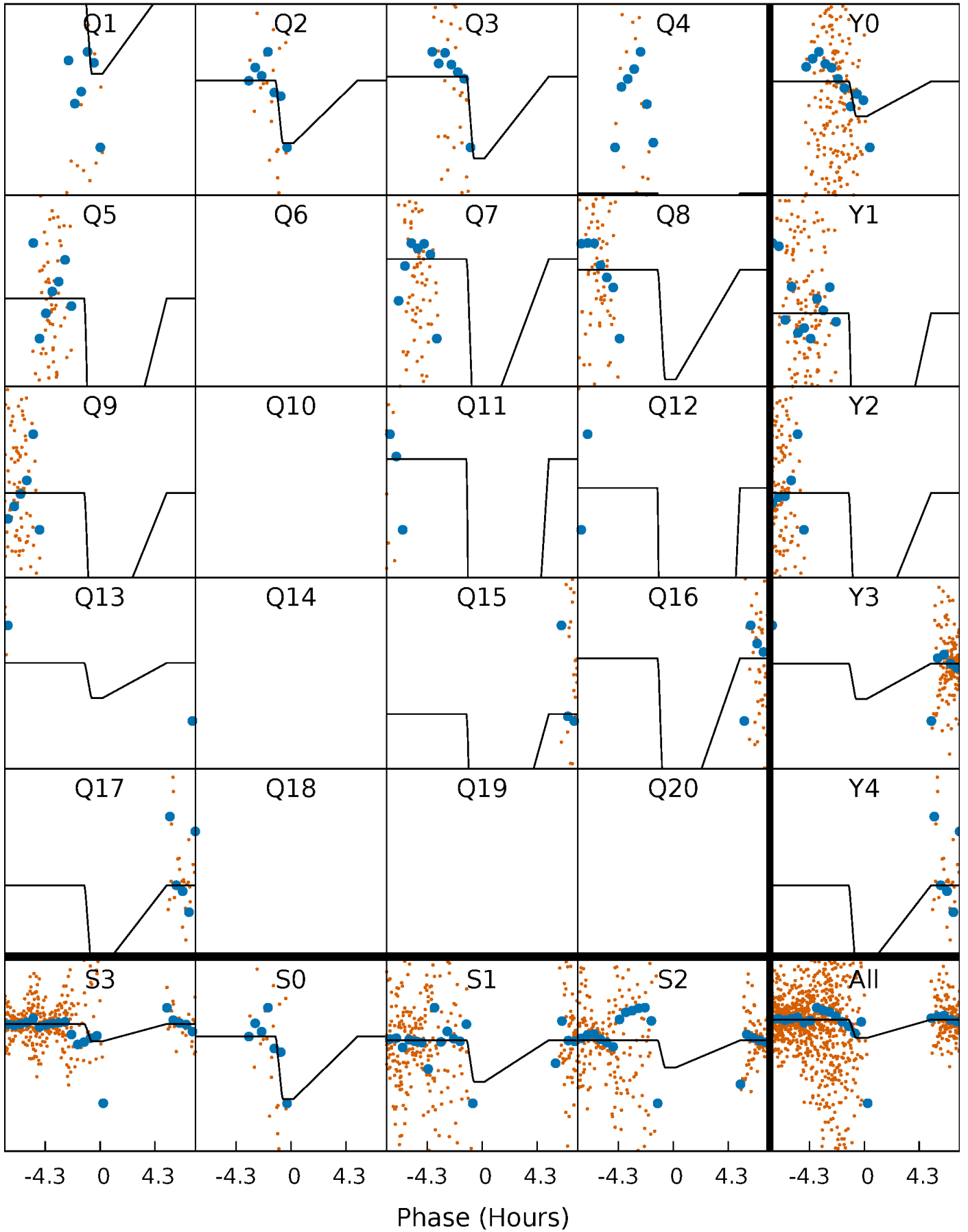
# DV Quarter-Phased Transit Curves

TCE 004936089-02     $P = 3.785899$  Days     $T_0 = 133.766423$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004936089-02     $P = 3.785142$  Days     $T_0 = 133.854556$  (BKJD)

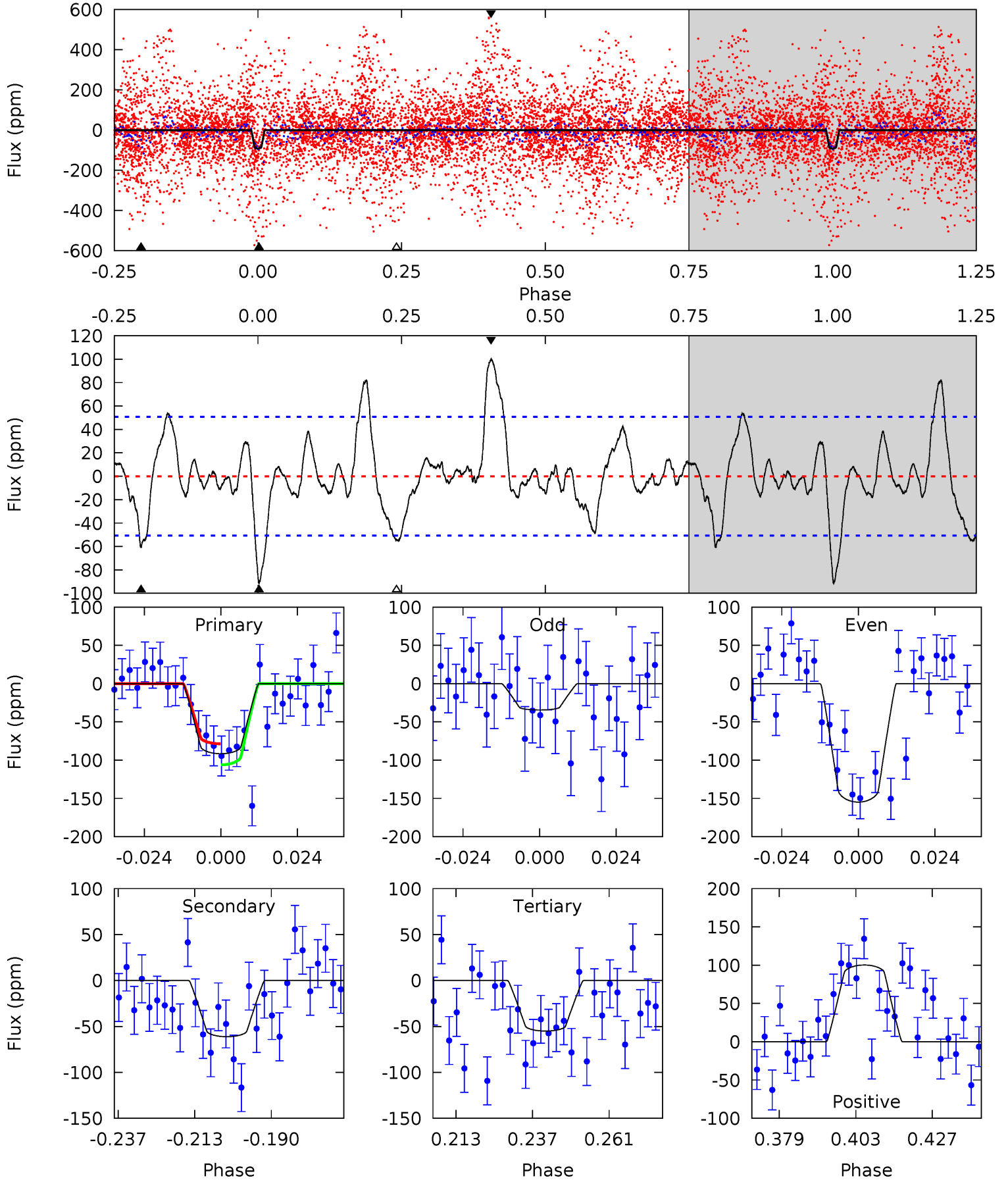




# DV Model-Shift Uniqueness Test

004936089-02, P = 3.785899 Days, E = 129.980524 Days

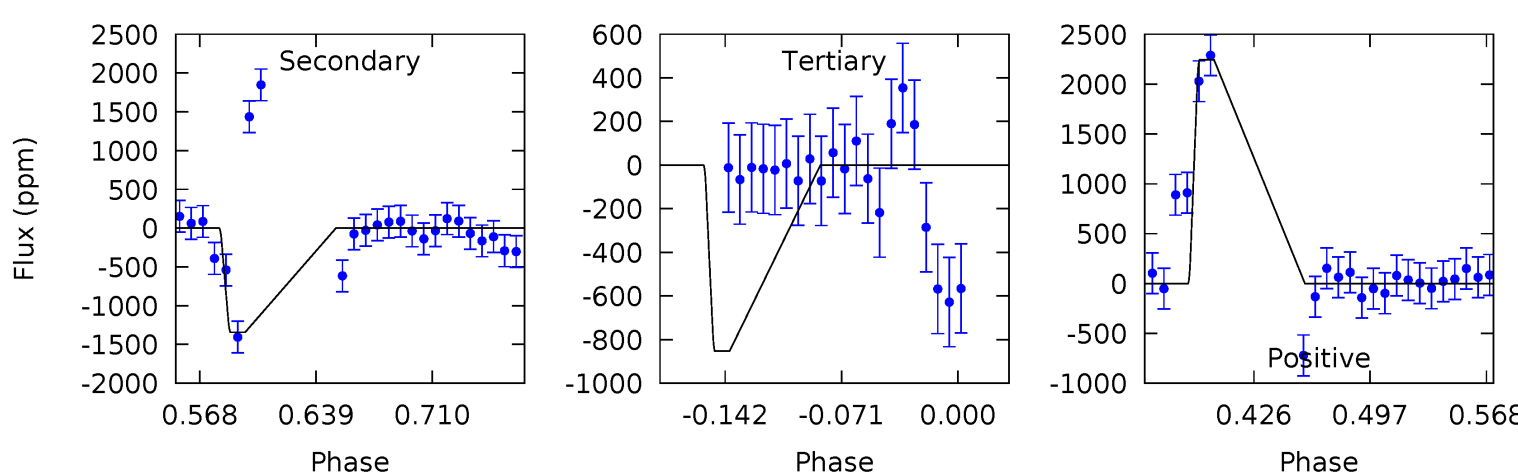
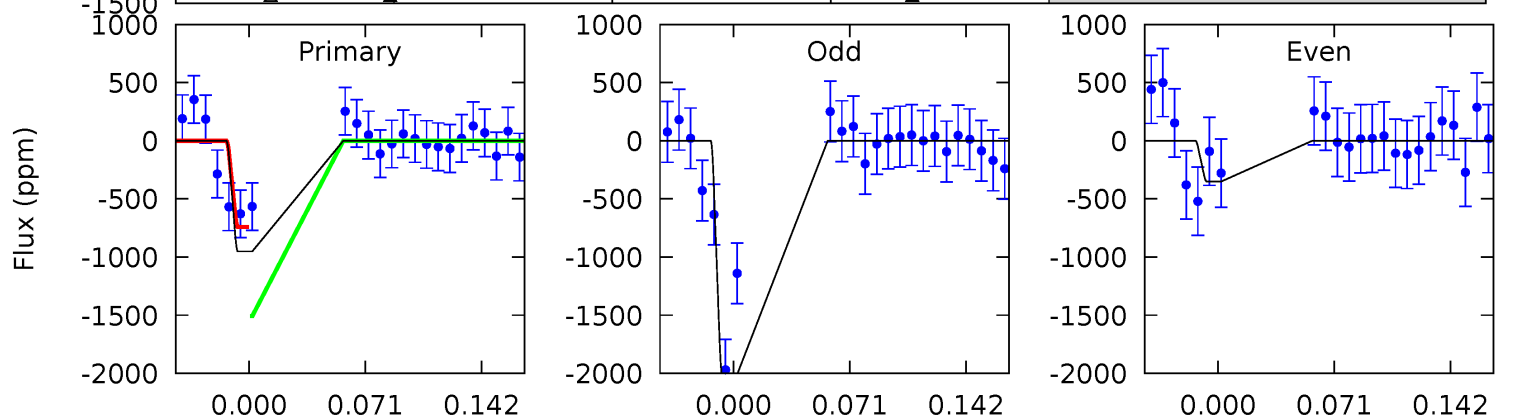
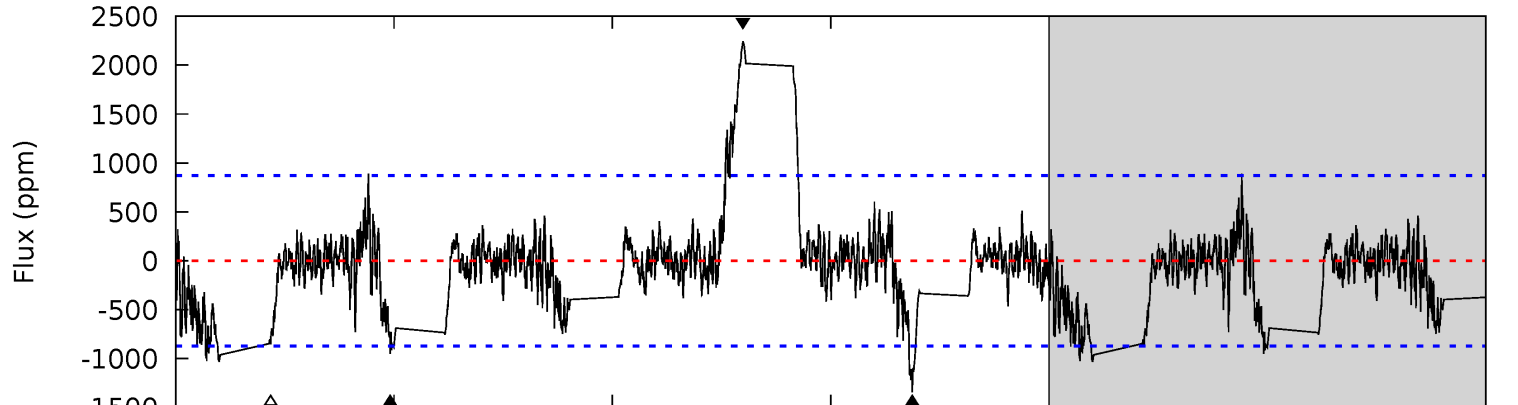
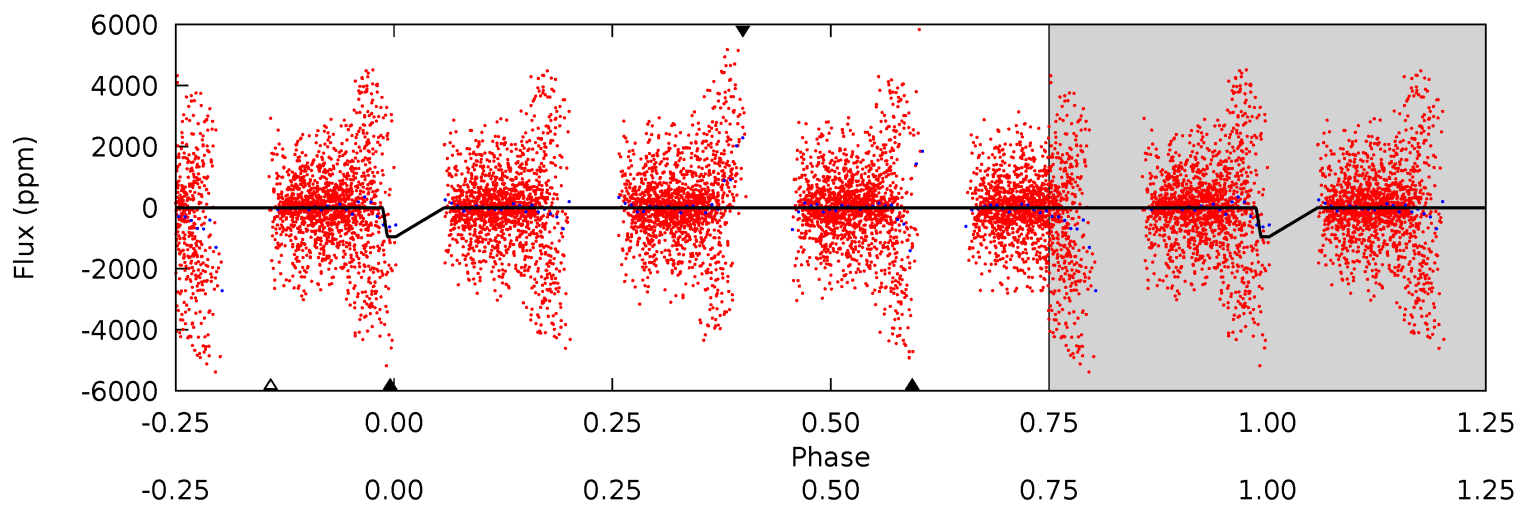
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.78	5.86	5.27	9.59	4.86	2.26	2.52	3.50	-0.82	0.59	-3.73	5.74	1.73	0.52	1.29



# Alt Model-Shift Uniqueness Test

004936089-02, P = 3.785142 Days, E = 130.069414 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.06	7.14	4.54	11.9	4.64	1.81	1.56	0.52	-6.87	2.60	-4.79	4.23	0.78	0.63	1.00



### Stellar Parameters For KIC 004936089

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$11502^{+449}_{-1798}$	$3.673^{+0.510}_{-0.090}$	$0.070^{+0.250}_{-0.600}$	$4.497^{+0.606}_{-2.422}$	$3.472^{+0.069}_{-1.265}$	$0.054^{+0.332}_{-0.016}$
	+4%/-16%	+14%/-2%	+357%/-857%	+13%/-54%	+2%/-36%	+618%/-30%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004936089-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-61 \pm 10$	$4.29^{+3.12}_{-2.47}$	$5185^{+667}_{-902}$	$8833^{+9296}_{-2368}$	$8.865^{+41.396}_{-5.903}$
Alt.	$-1343 \pm 188$	$13.42^{+4.49}_{-4.14}$	$5162^{+643}_{-883}$	$12489^{+3431}_{-2463}$	$20^{+20}_{-9}$

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

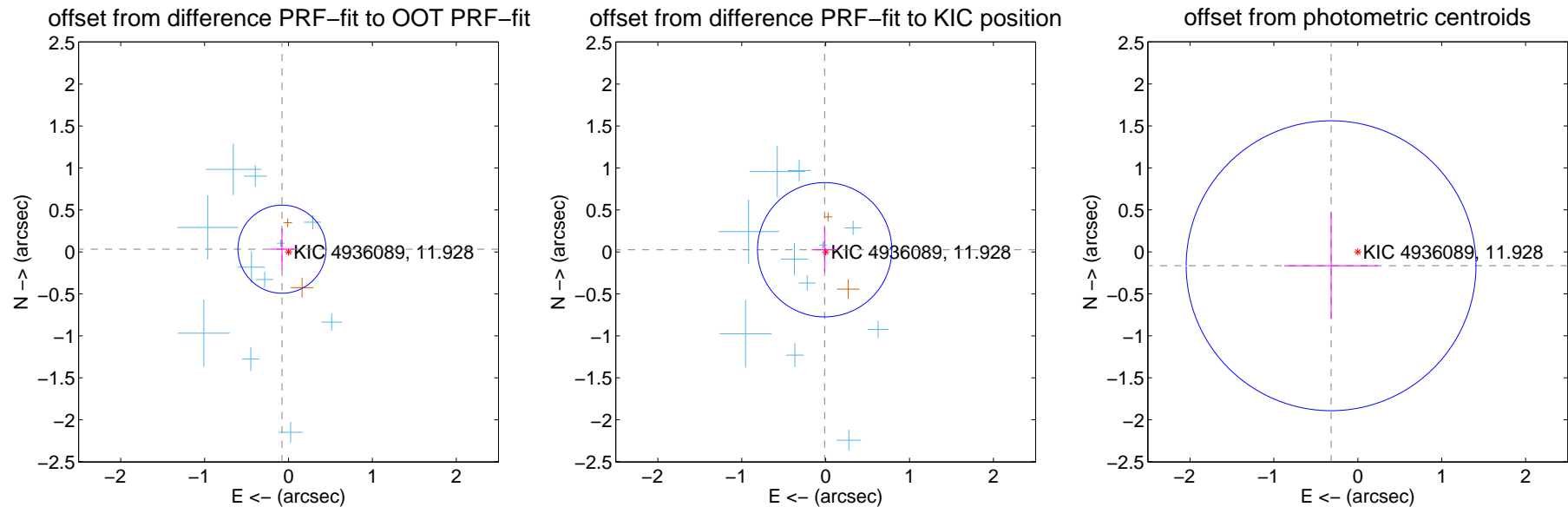
## DV Centroid Data

Supplemental centroid analysis for 004936089-02. **Kepler magnitude: 11.93.** Transit SNR 2.53

There are 11 quarters with good PRF difference image offsets

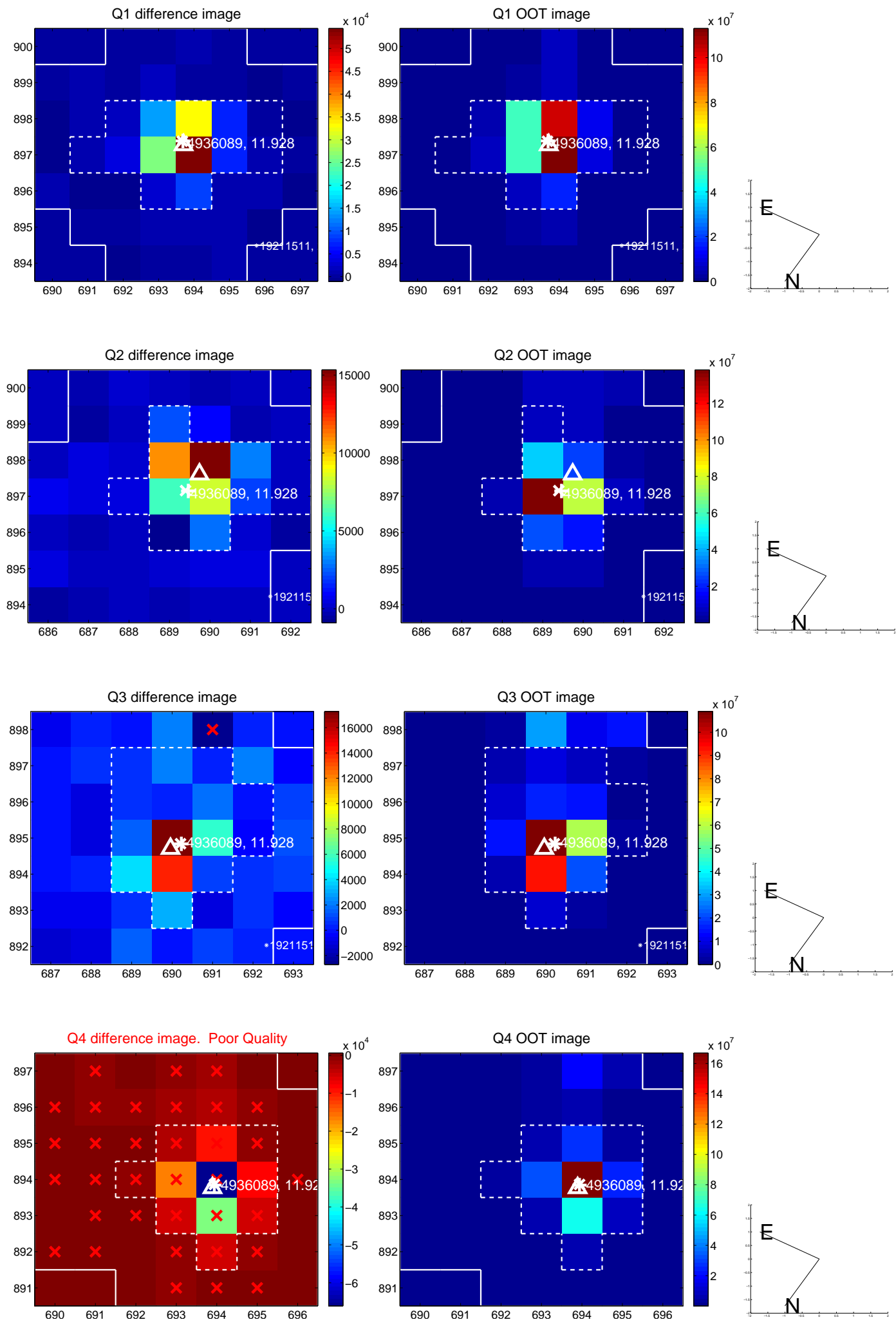
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.084 \pm 0.175$	0.48	$0.077 \pm 0.145$	$0.033 \pm 0.244$
PRF-fit source offset from KIC position	$0.029 \pm 0.267$	0.11	$0.012 \pm 0.154$	$0.026 \pm 0.265$
photometric centroid source offset	$0.36 \pm 0.58$	0.62	$0.32 \pm 0.56$	$-0.17 \pm 0.63$



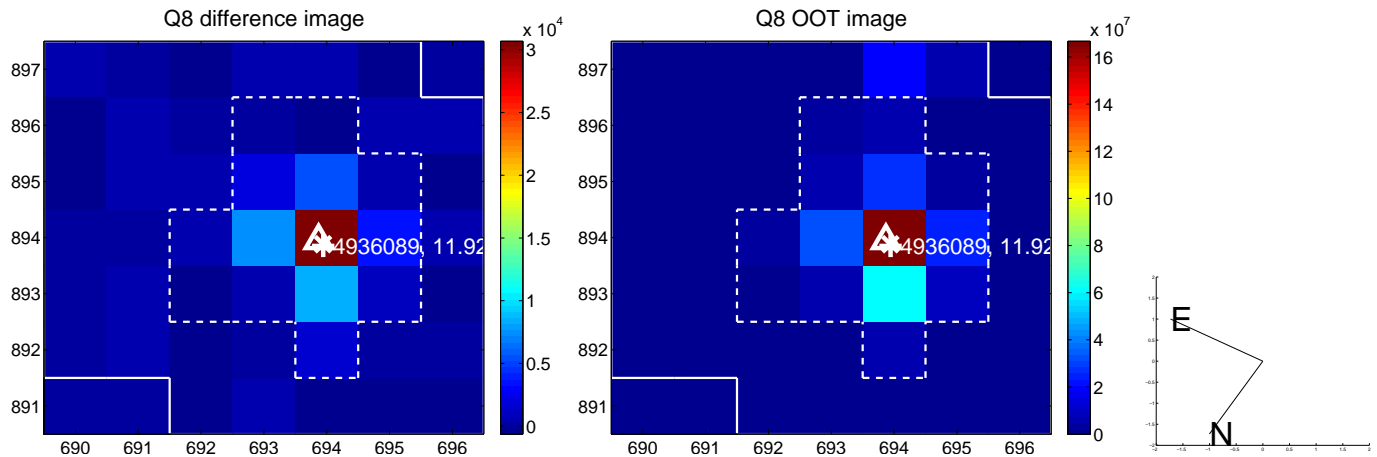
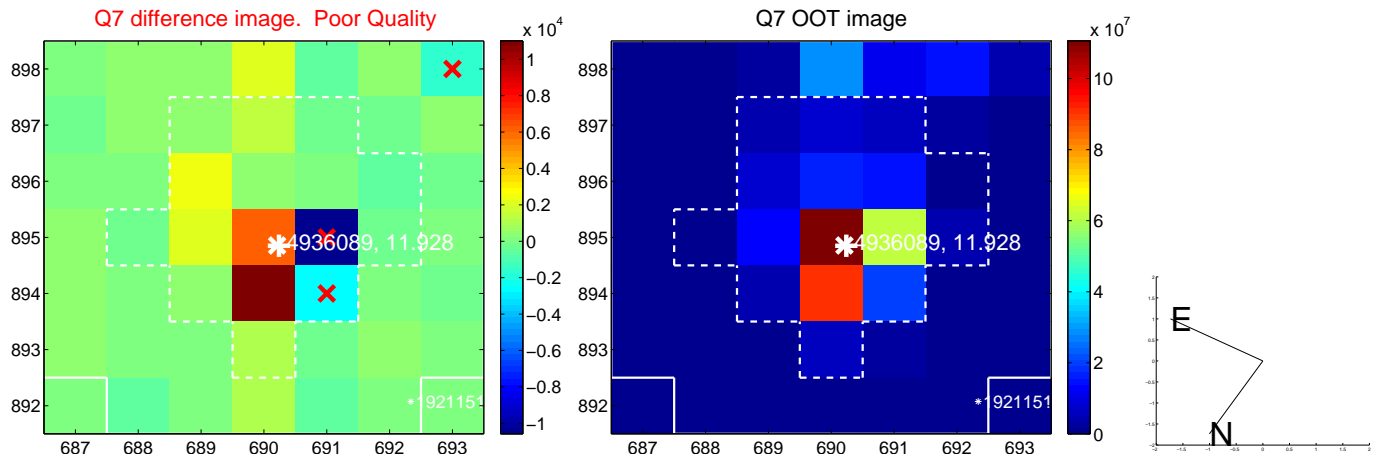
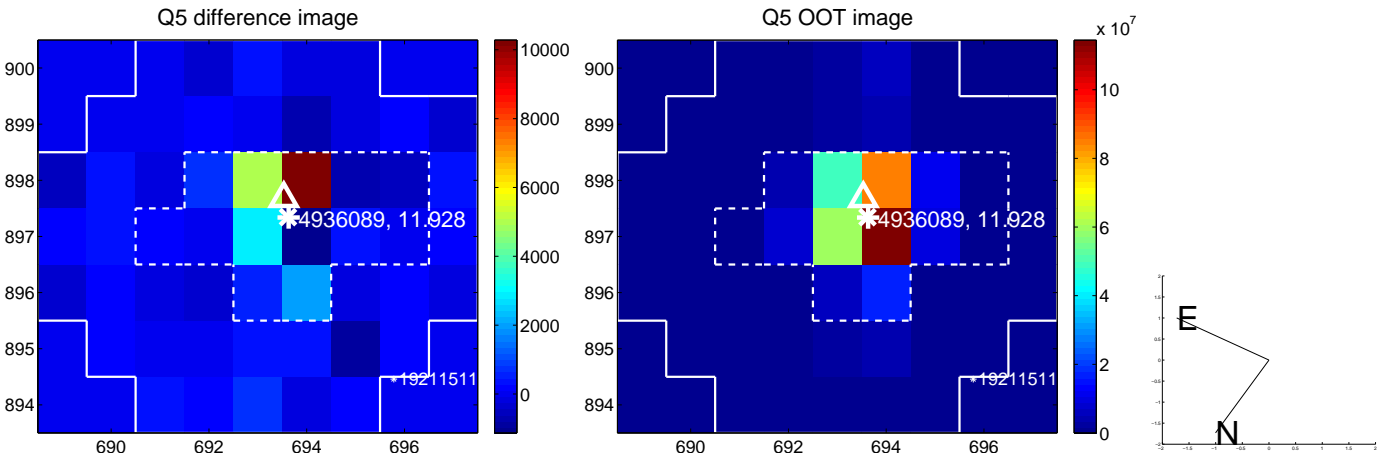
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

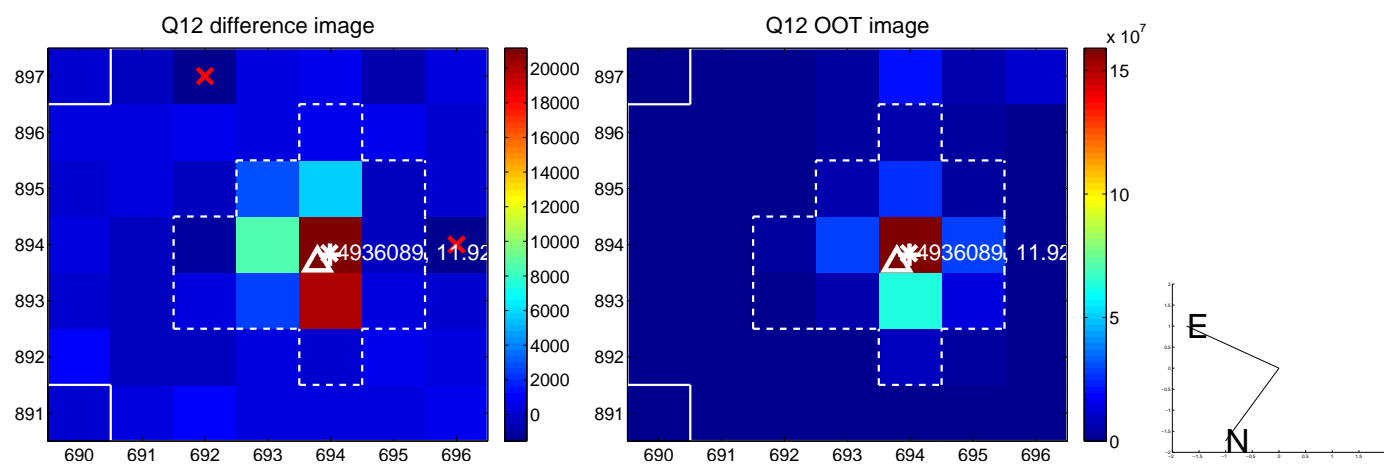
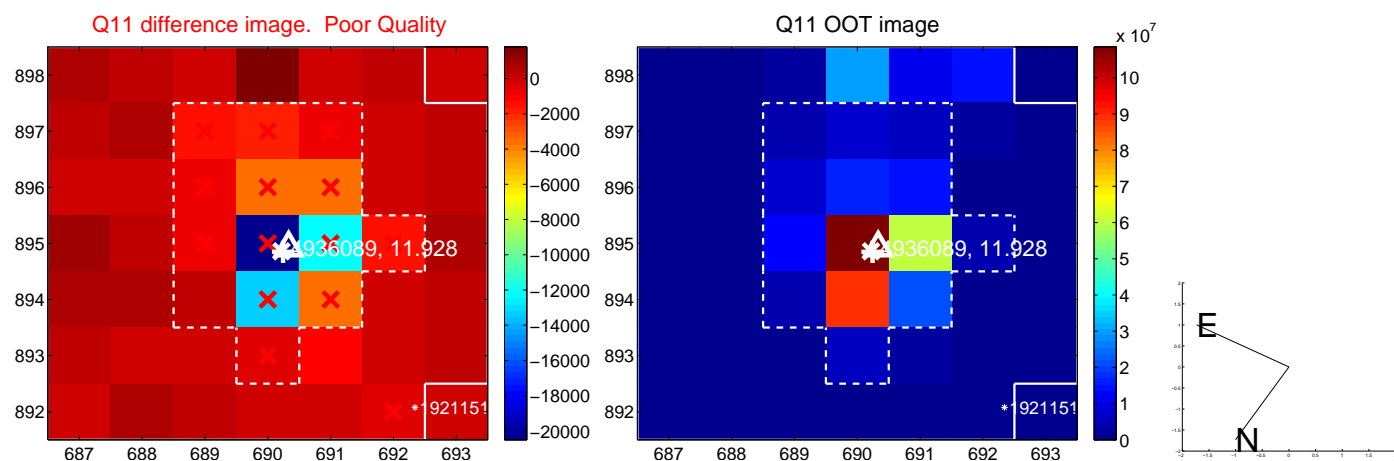
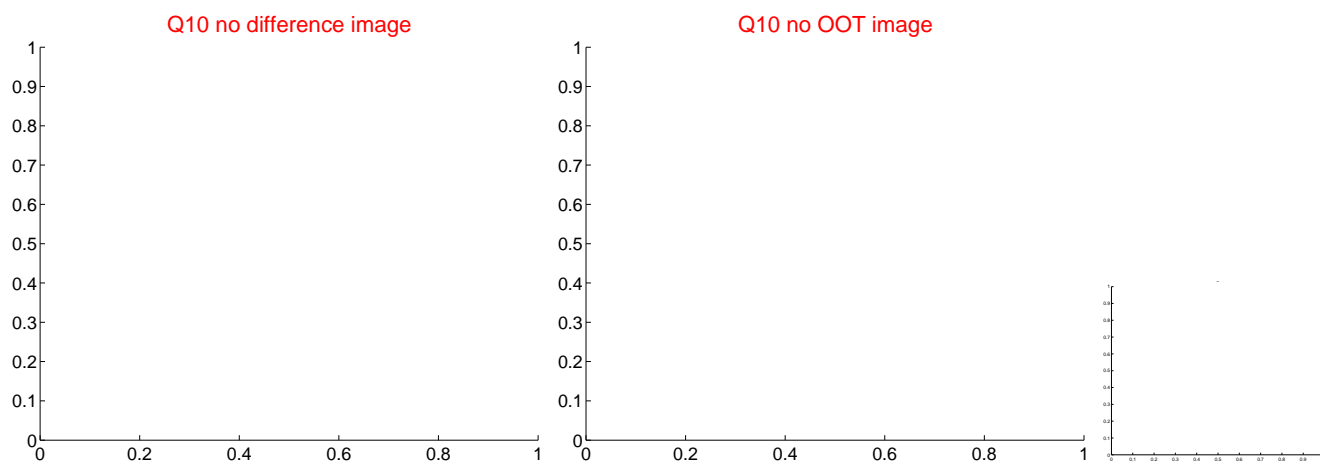
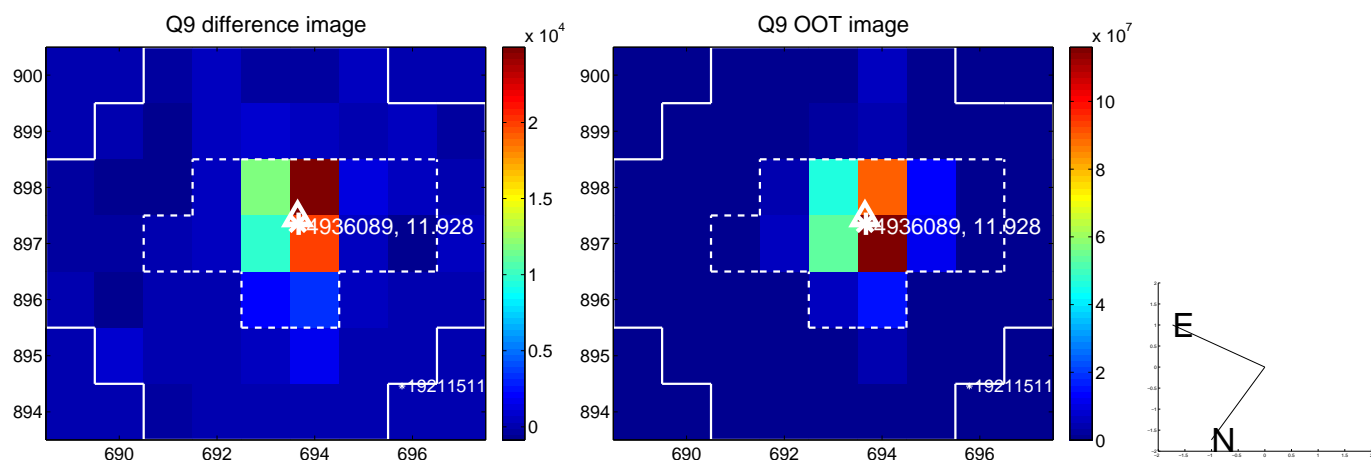




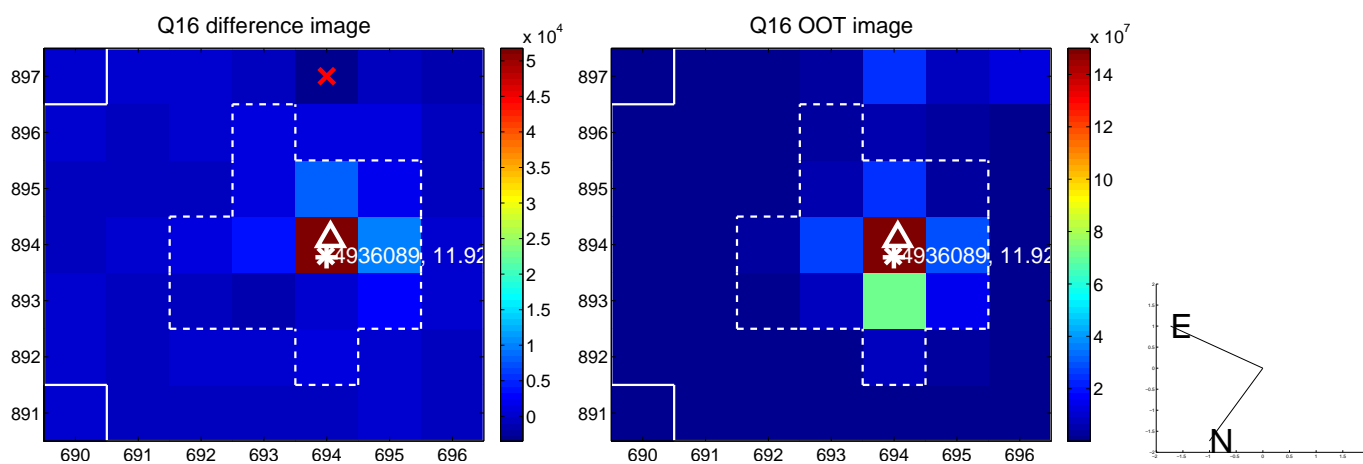
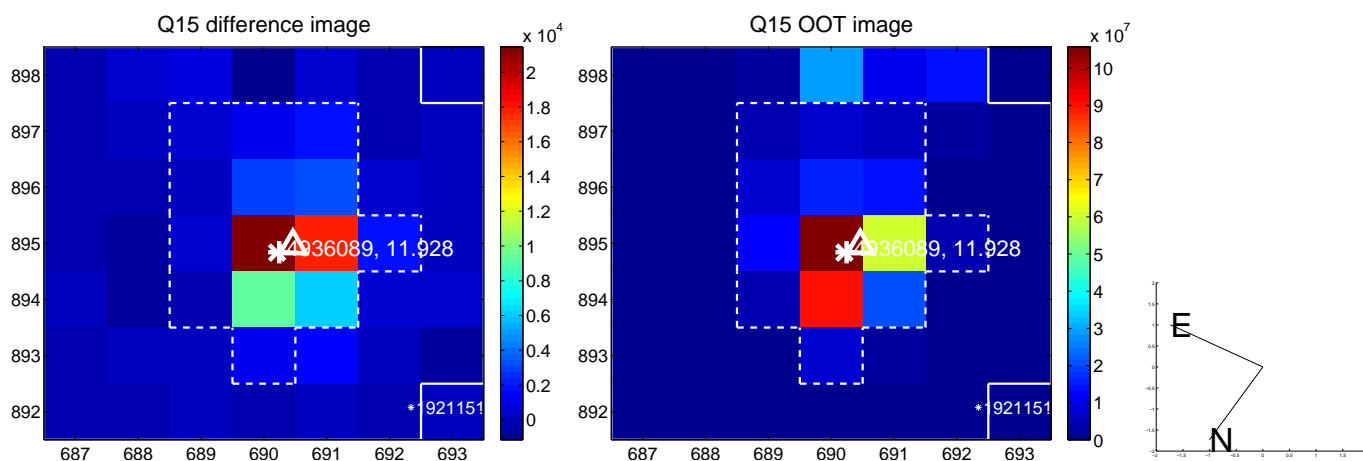
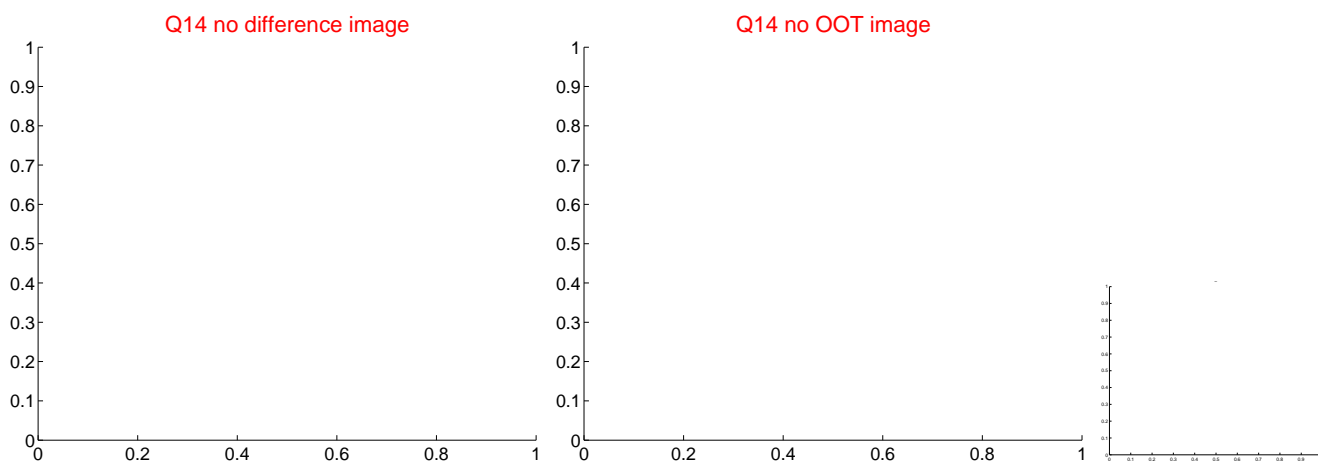
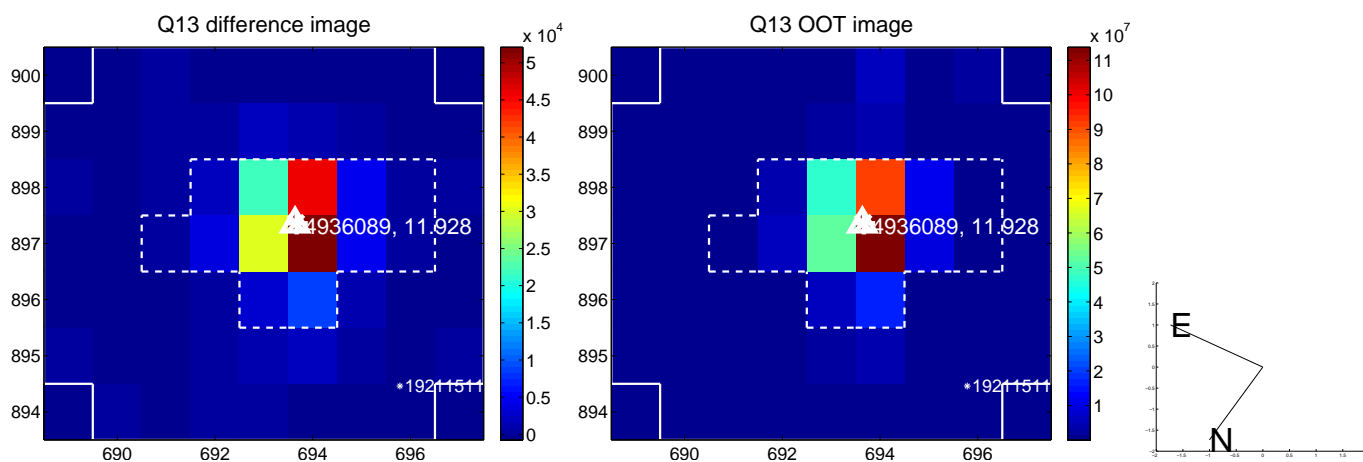
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



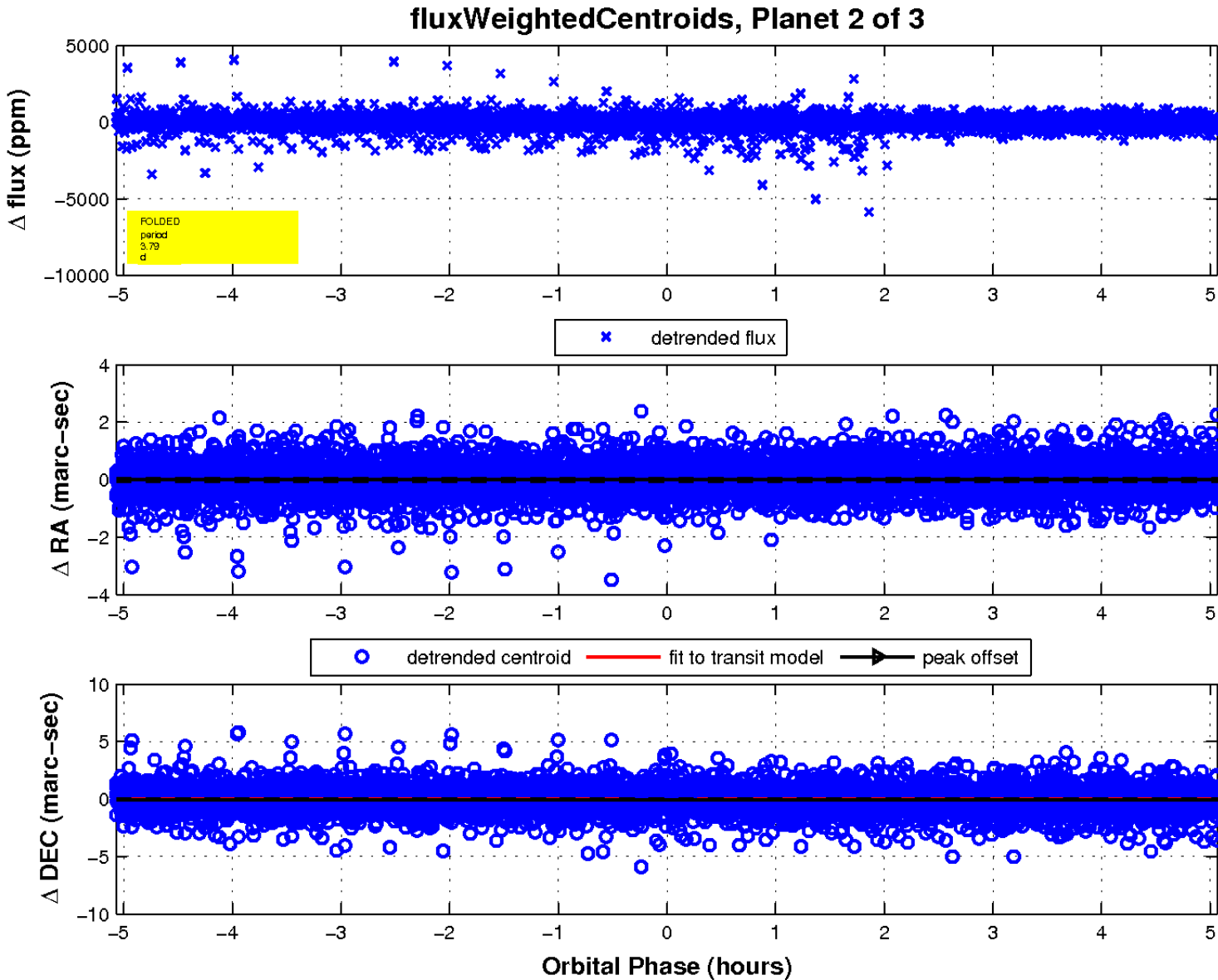
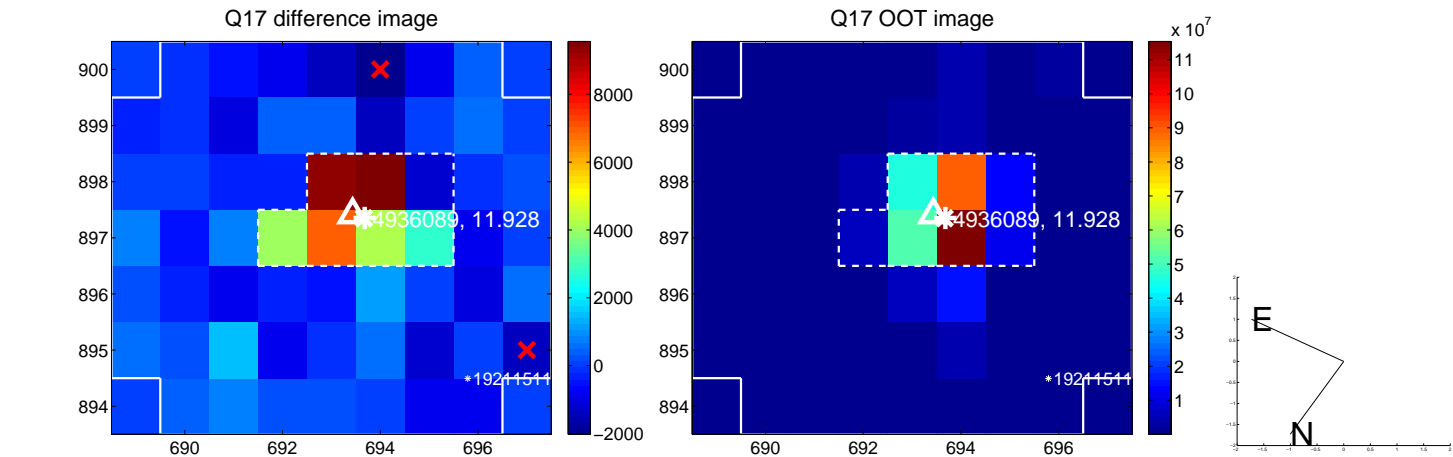
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

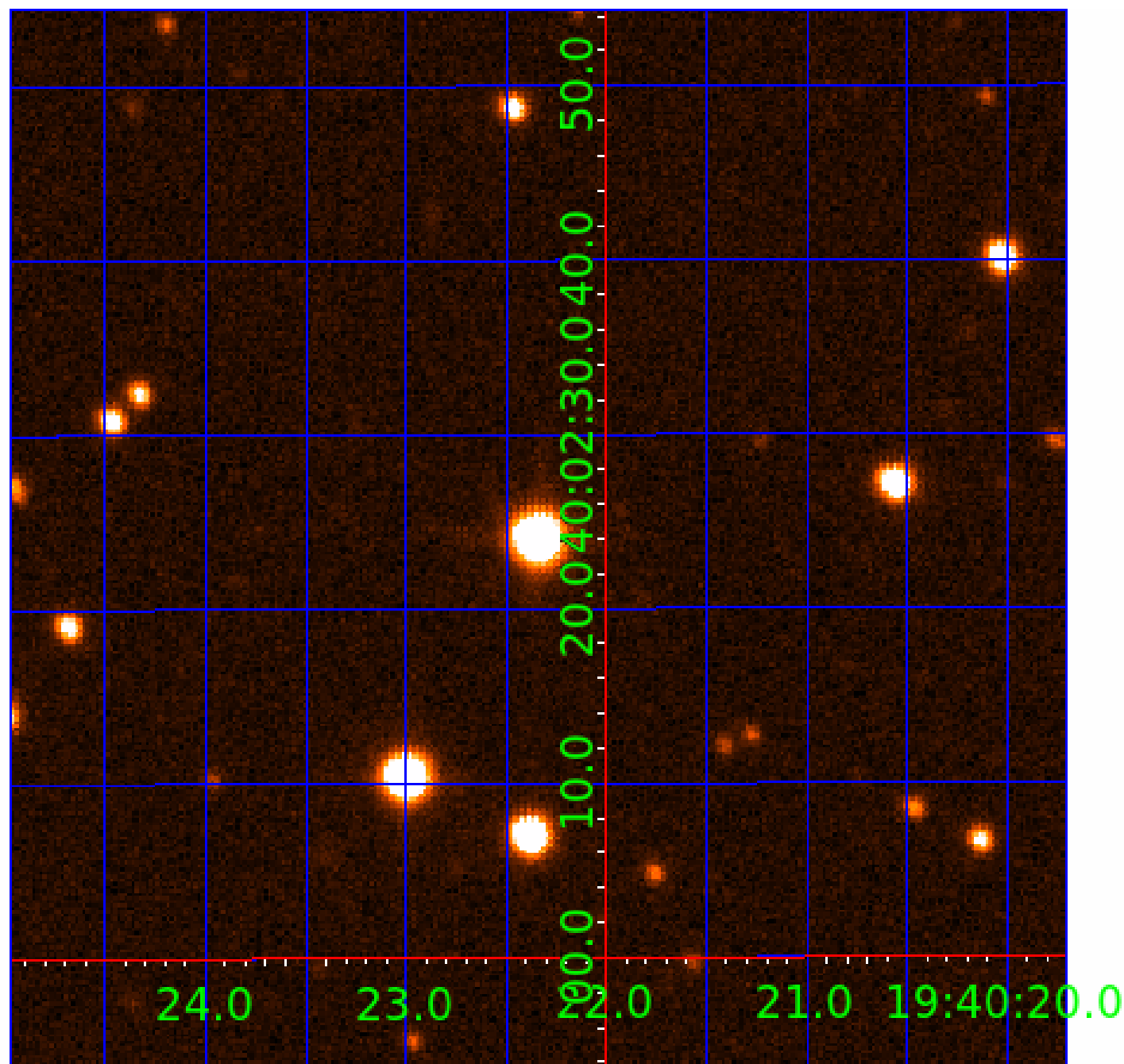


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 004936089

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004936089-01	OBS	No	0.756804	131.910393	10.4	4.891	9.0	4.4	4.50	11502	1.53	523149.13
004936089-02	OBS	No	3.785899	133.766423	70.7	1.690	20.6	2.5	4.50	11502	4.33	61147.36
004936089-03	OBS	No	142.196715	149.682871	1437.0	2.559	15.2	9.5	4.50	11502	18.25	486.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004936089-01	OBS	FP	0.00	1	0	0	0	LPP_DV
004936089-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004936089-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS

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

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

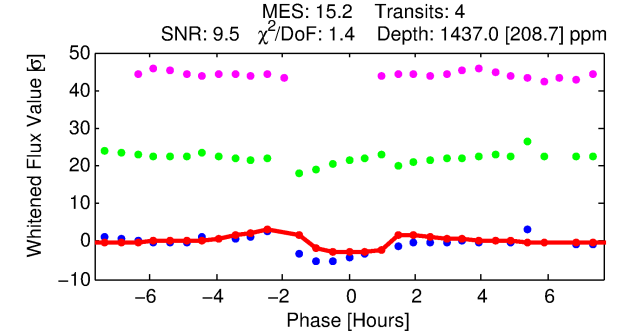
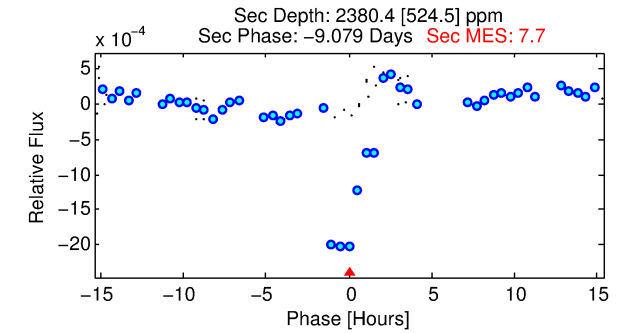
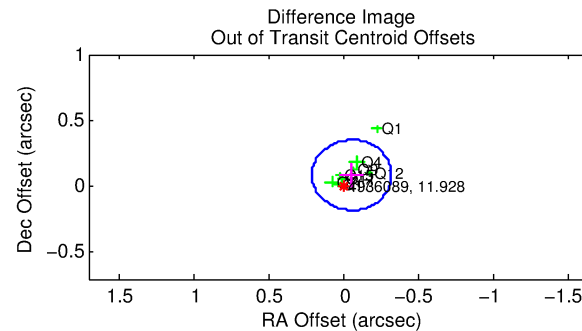
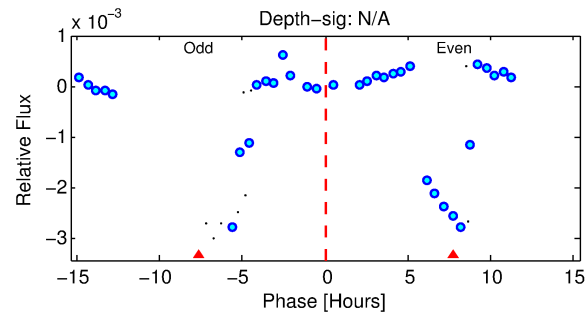
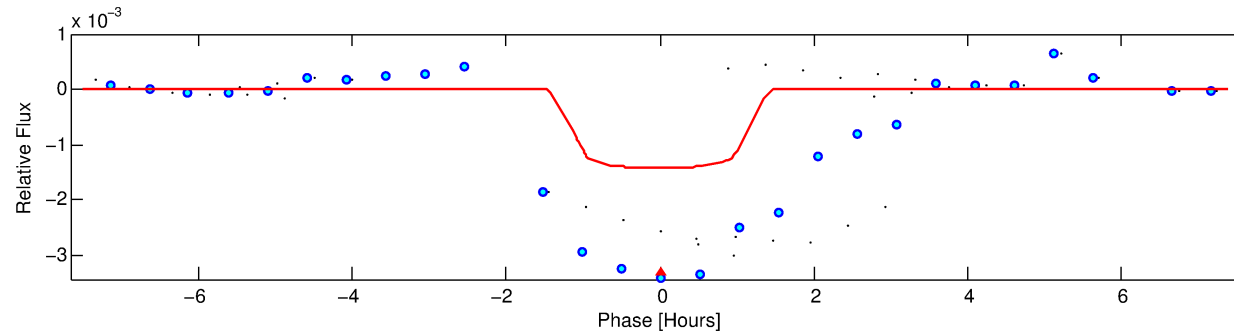
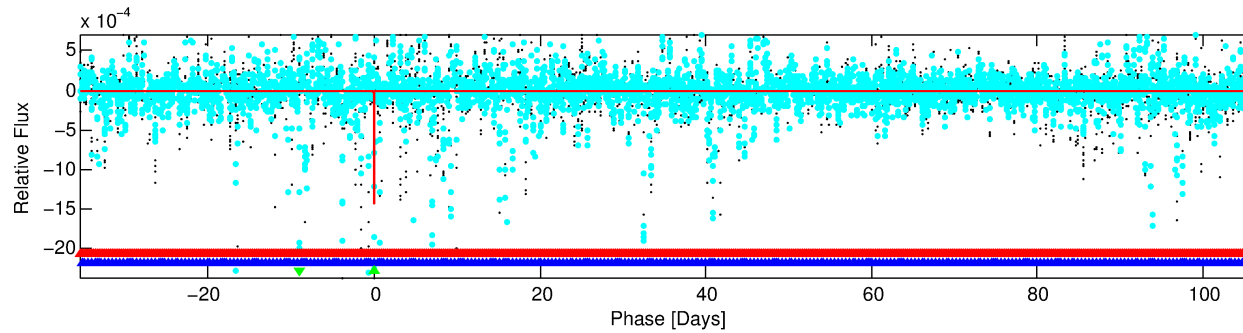
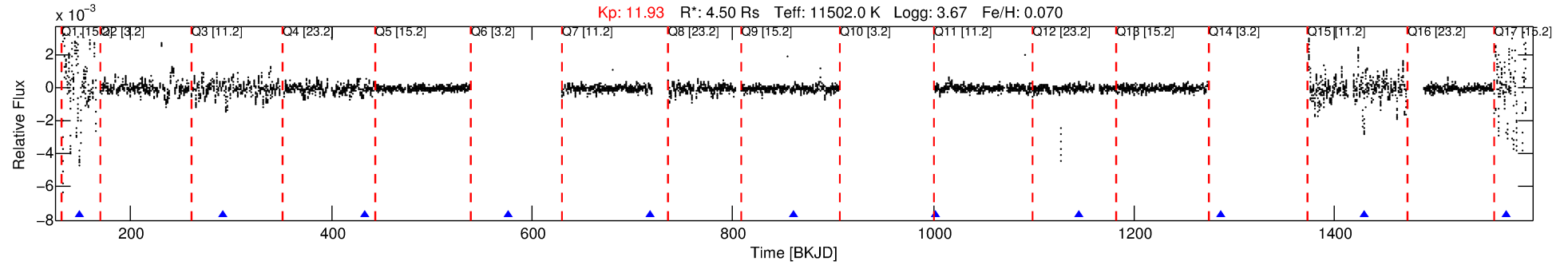
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004936089-03

No Significant Match Found

# DV One-Page Summary

KIC: 4936089 Candidate: 3 of 3 Period: 142.197 d



## DV Fit Results:

Period = 142.19672 [0.00074] d  
Epoch = 149.6829 [0.0046] BKJD  
Rp/R\* = 0.0372 [0.0192]  
a/R\* = 339.26 [1366.64]  
b = 0.66 [3.42]  
Seff = 486.13 [517.40]  
Teq = 1197 [319] K  
Rp = 18.25 [13.61] Re  
a = 0.8077 [0.4290] AU  
Ag = 2565.34 [3494.01] [0.73σ]  
Teffp = 13175 [4040] K [2.9σ]

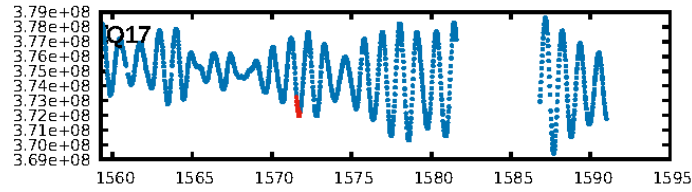
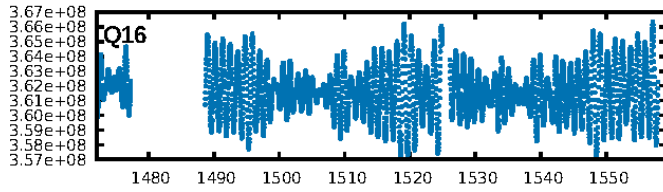
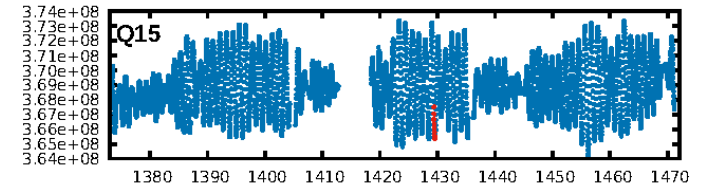
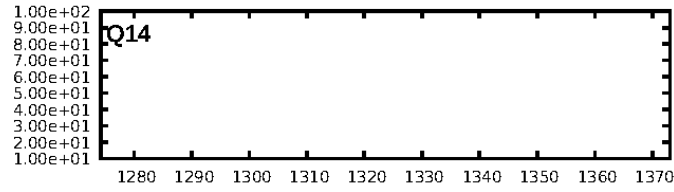
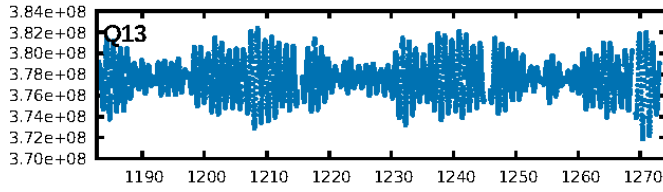
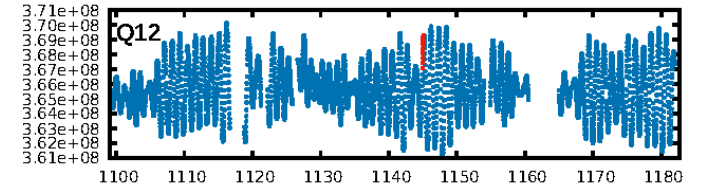
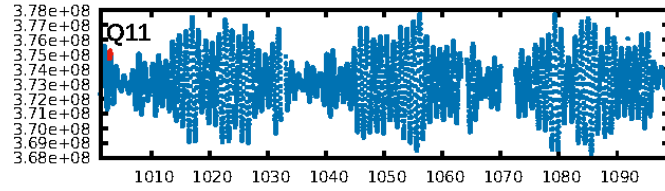
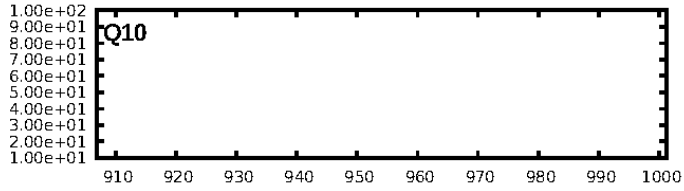
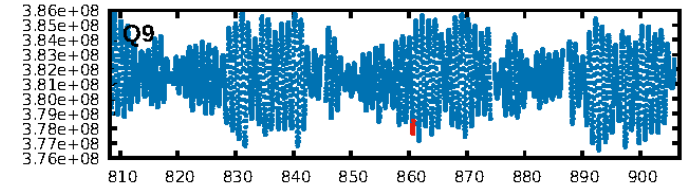
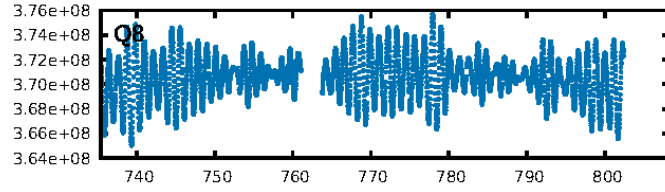
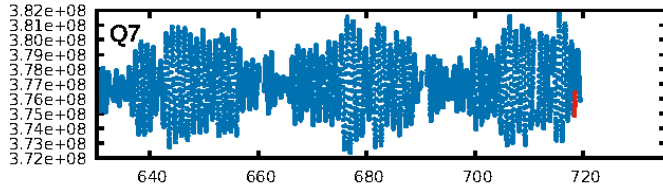
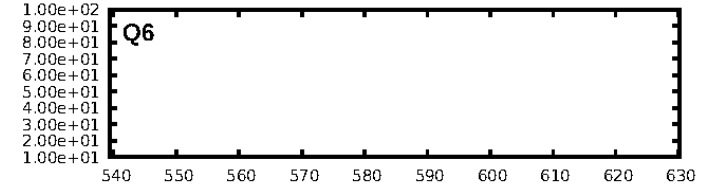
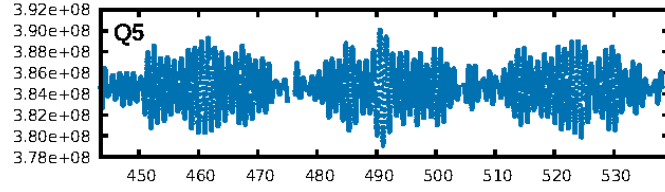
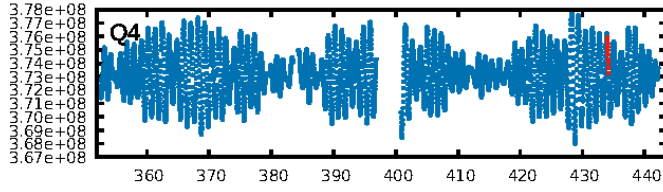
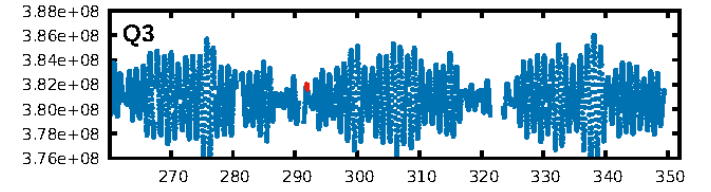
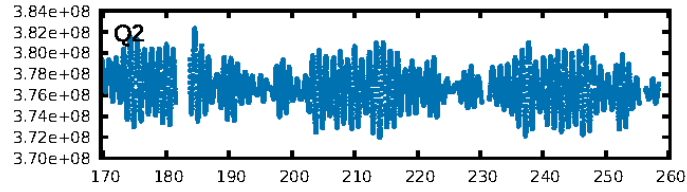
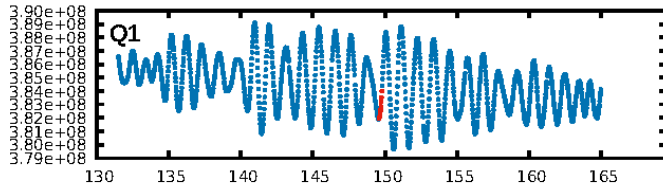
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1083.25σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 99.5%  
Bootstrap-pfa: 5.65e-25  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 1  
Centroid-sig: 1.4%  
Centroid-so: 0.974 arcsec [7.00σ]  
OotOffset-rm: 0.104 arcsec [1.17σ]  
KicOffset-rm: 0.139 arcsec [1.73σ]  
OotOffset-st: 0/3/2/3 [8]  
KicOffset-st: 0/3/2/3 [8]  
DiffImageQuality-fgm: 0.62 [5/8]  
DiffImageOverlap-fno: 0.00 [0/8]

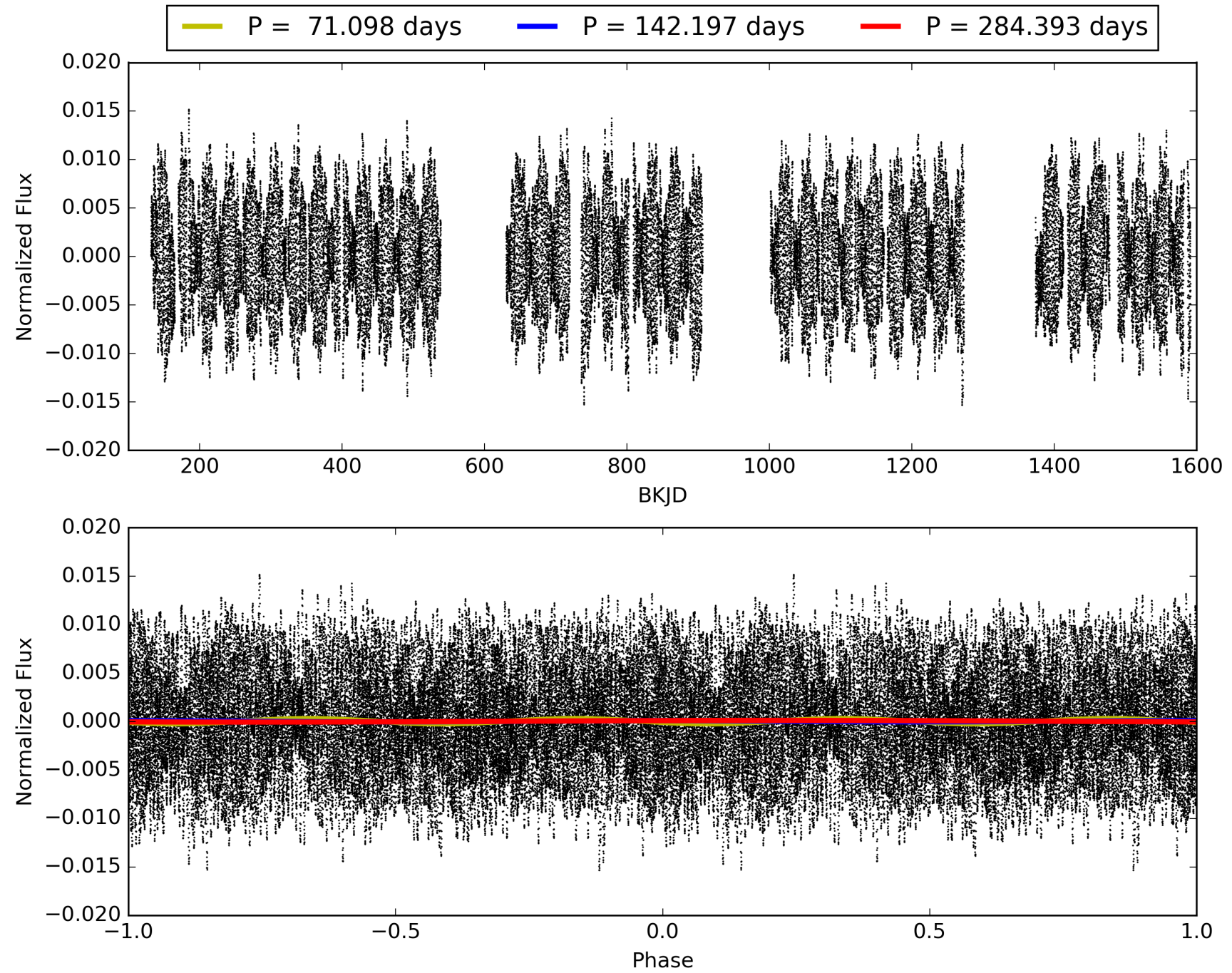
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:11:56 Z

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

# TCE 004936089-03, PDC Light Curves

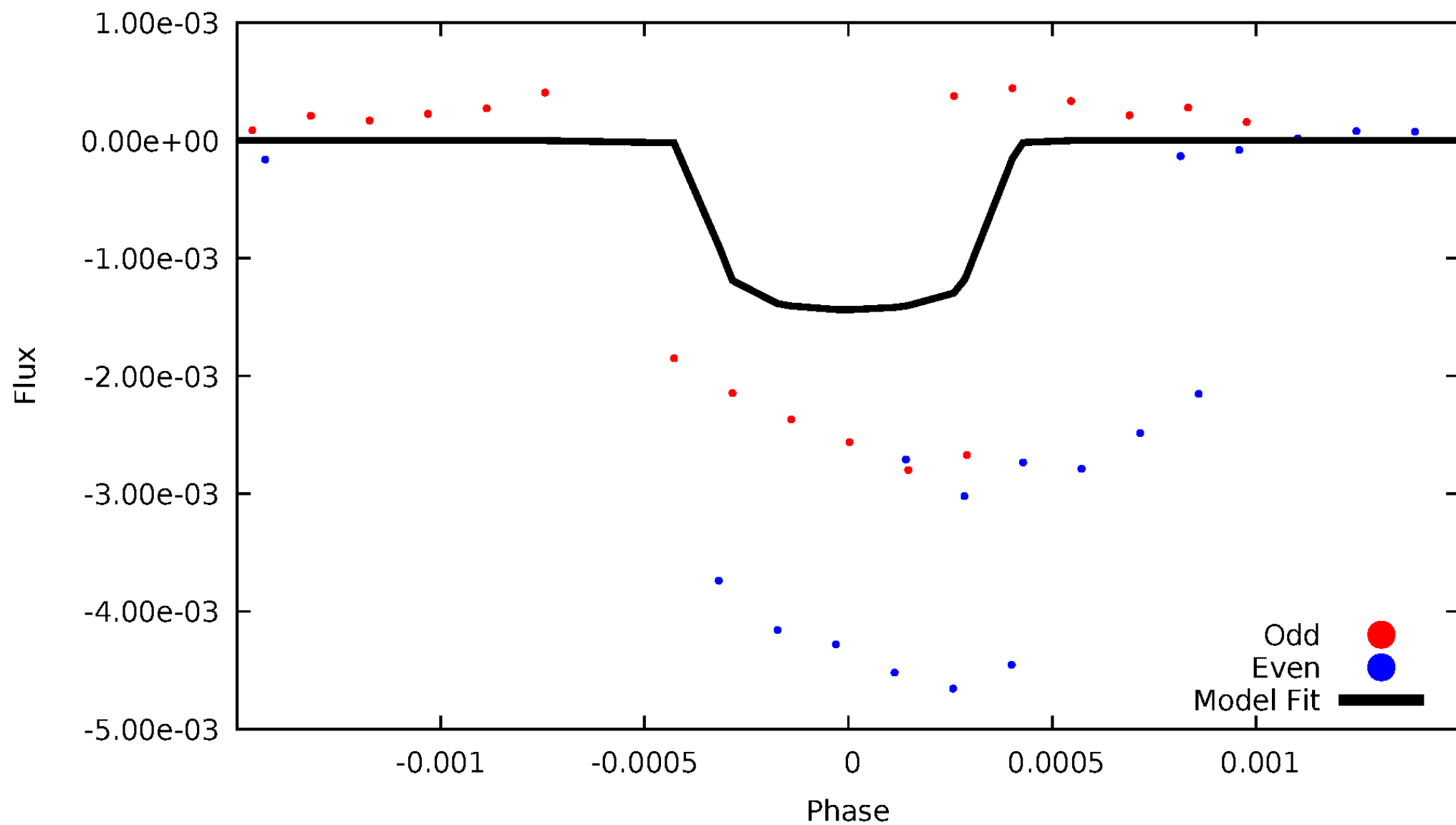


# TCE 004936089-03



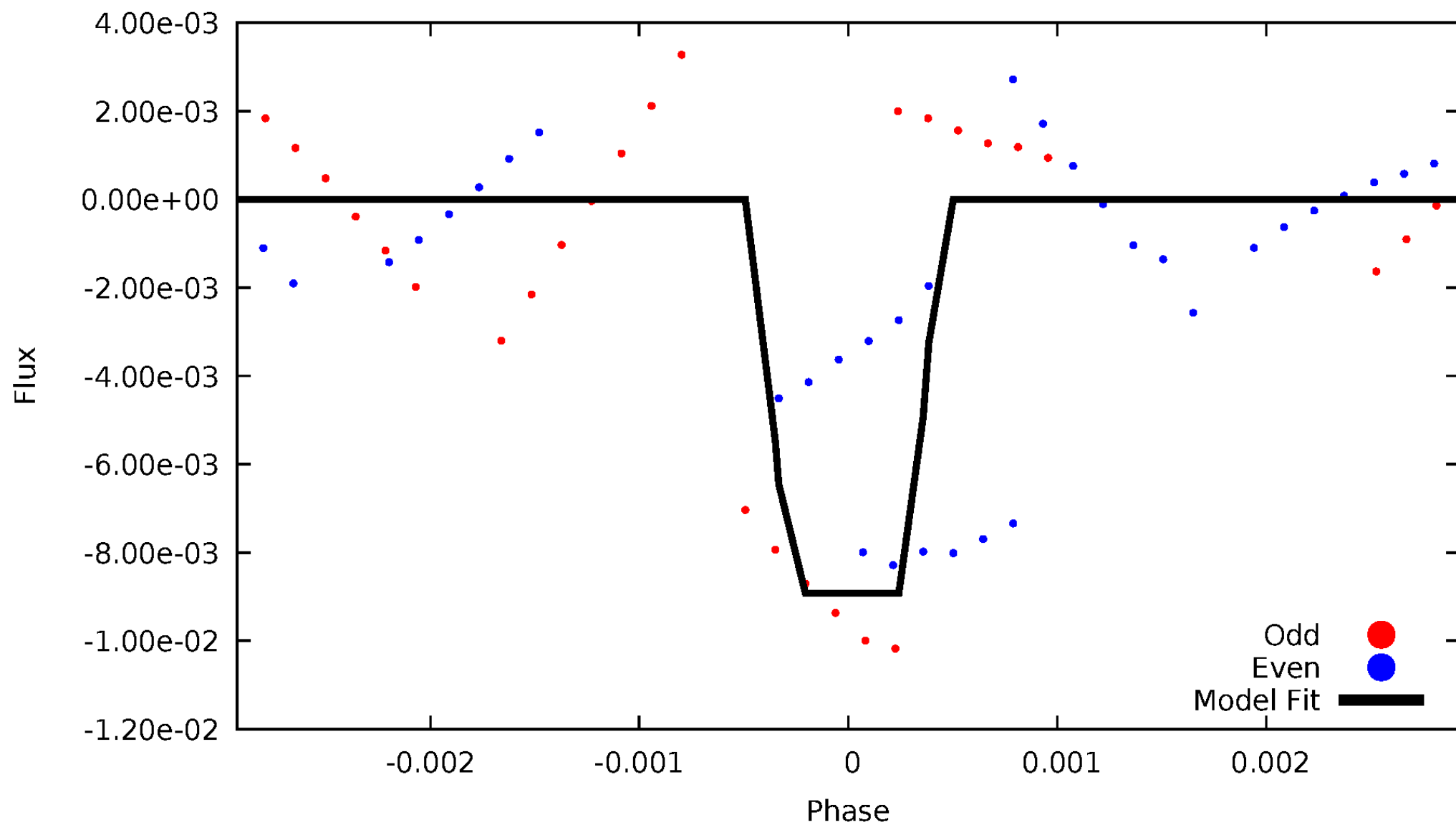
# DV Odd/Even

TCE 004936089-03



# ALT Odd/Even

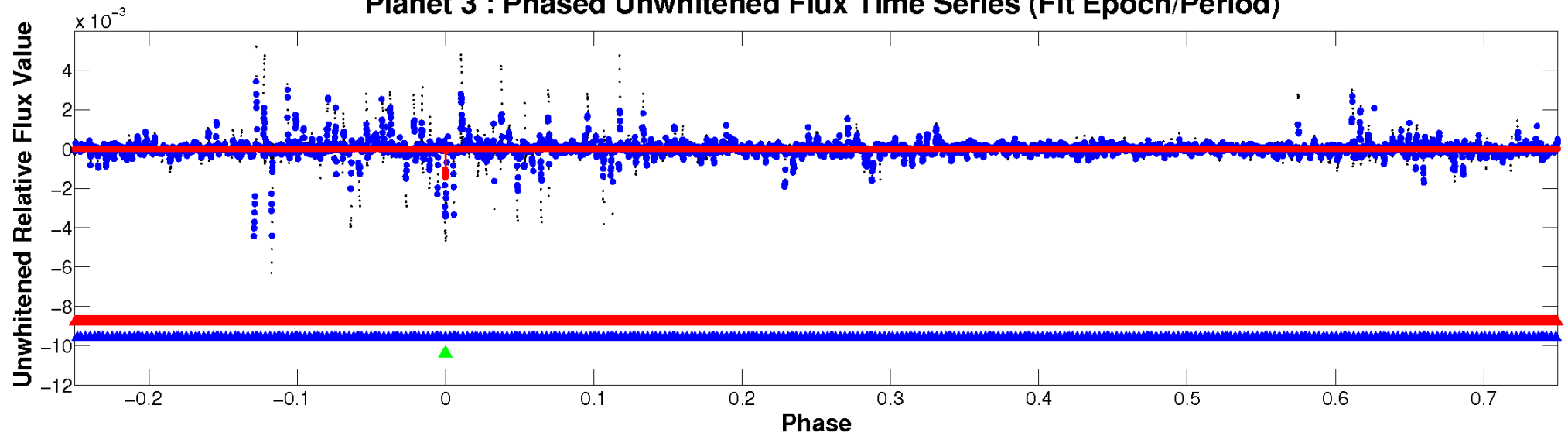
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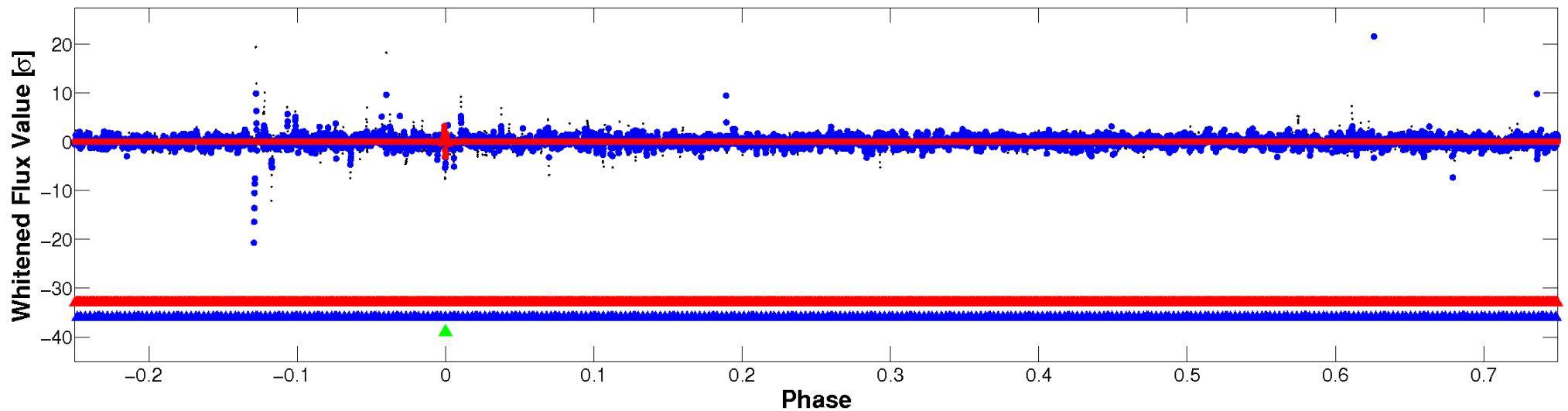


# Non-Whitened Vs. Whitened Light Curve

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

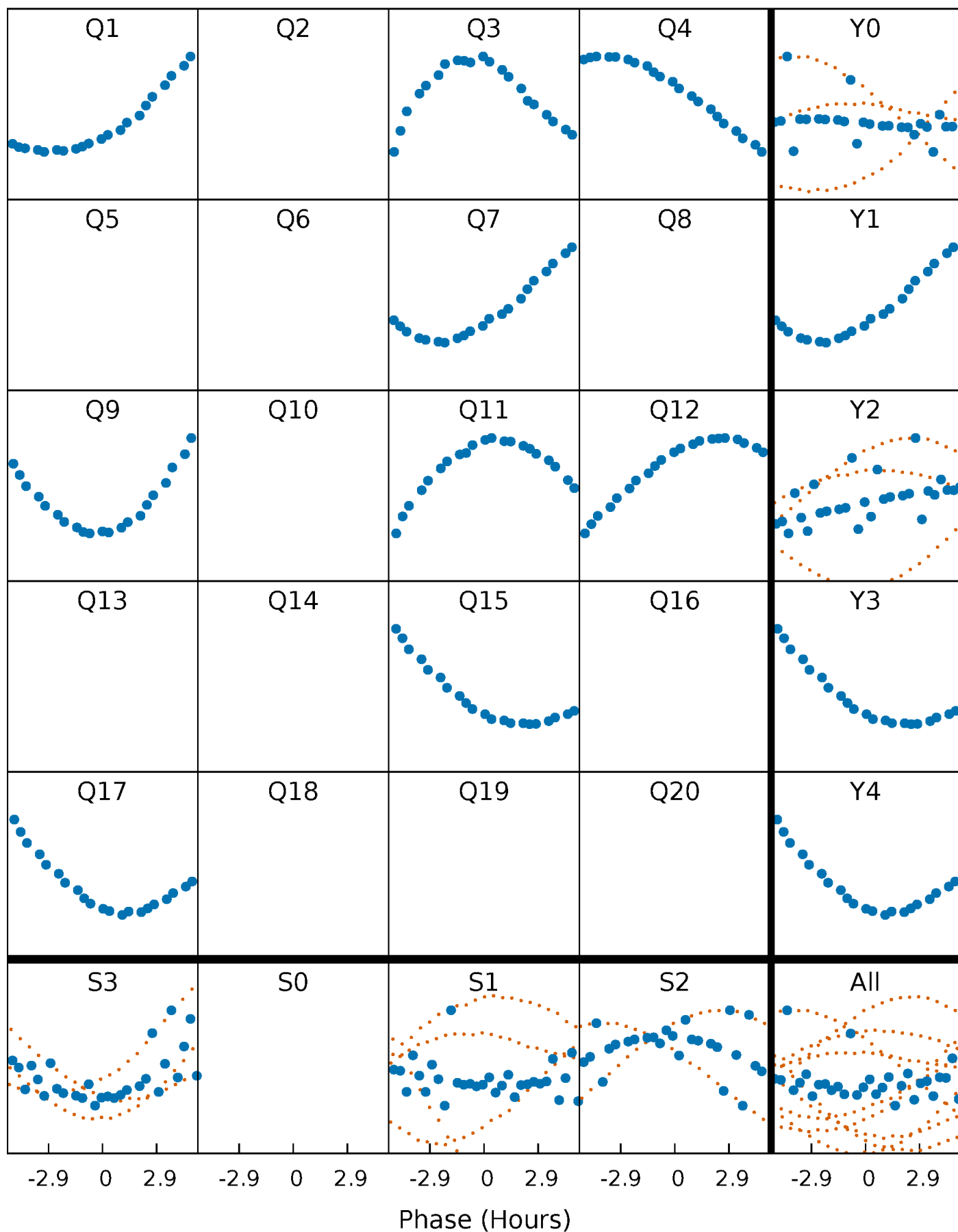


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



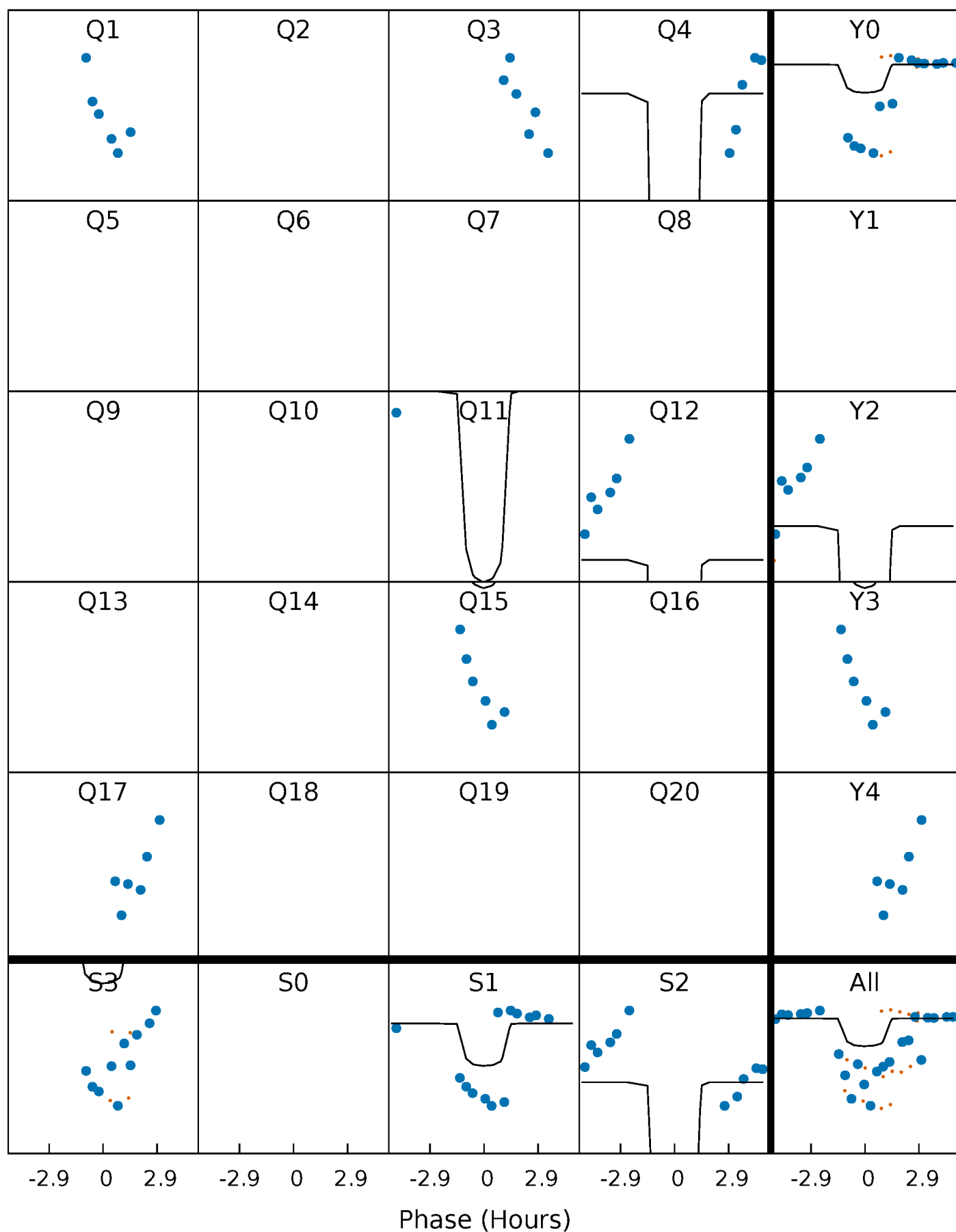
# PDC Quarter-Phased Transit Curves

TCE 004936089-03 P=142.196715 Days  $T_0=149.682871$  (BKJD)



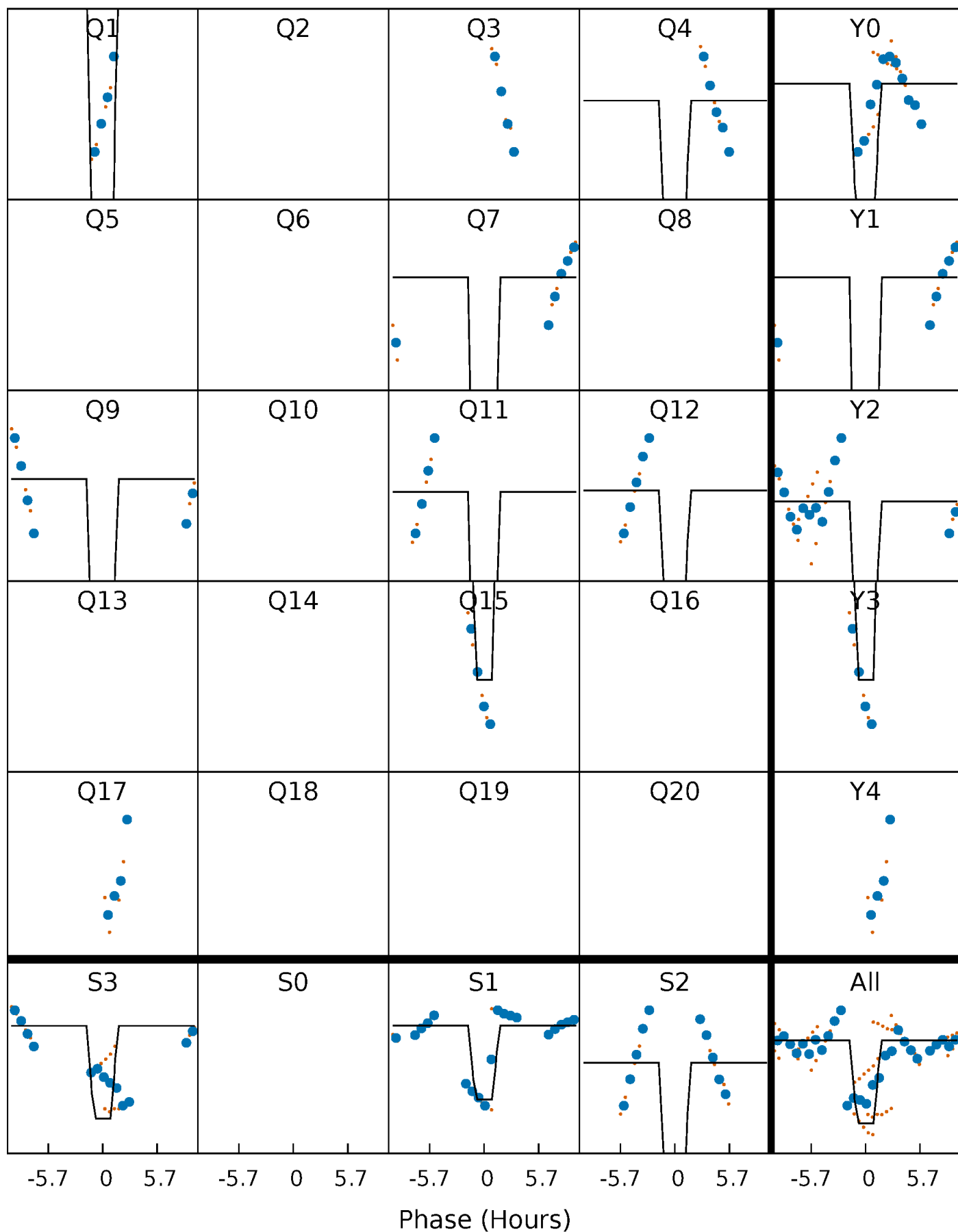
## DV Quarter-Phased Transit Curves

TCE 004936089-03    P=142.196715 Days     $T_0=149.682871$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

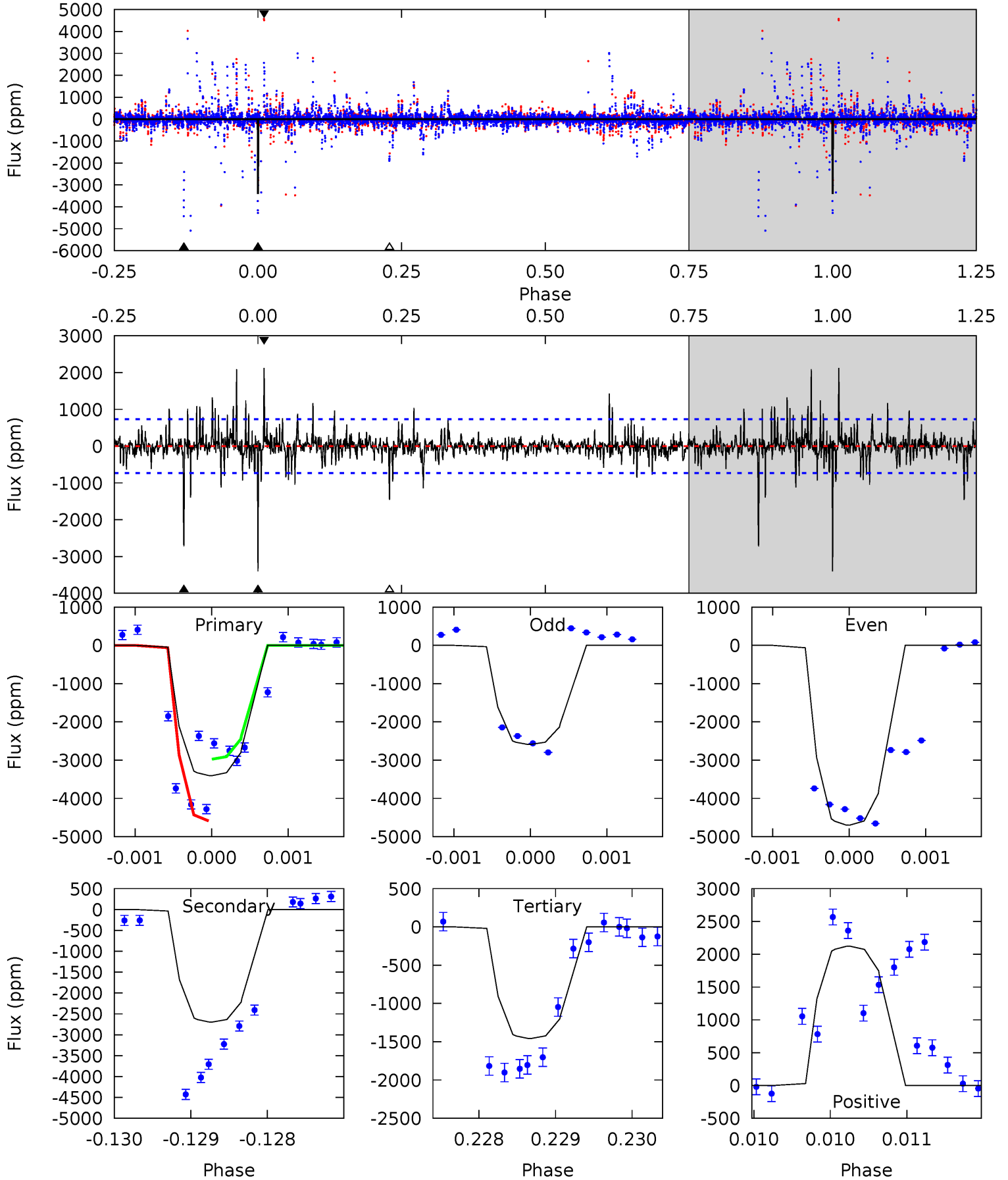
TCE 004936089-03     $P=142.197492$  Days     $T_0=149.685141$  (BKJD)



# DV Model-Shift Uniqueness Test

004936089-03, P = 142.196715 Days, E = 7.486156 Days

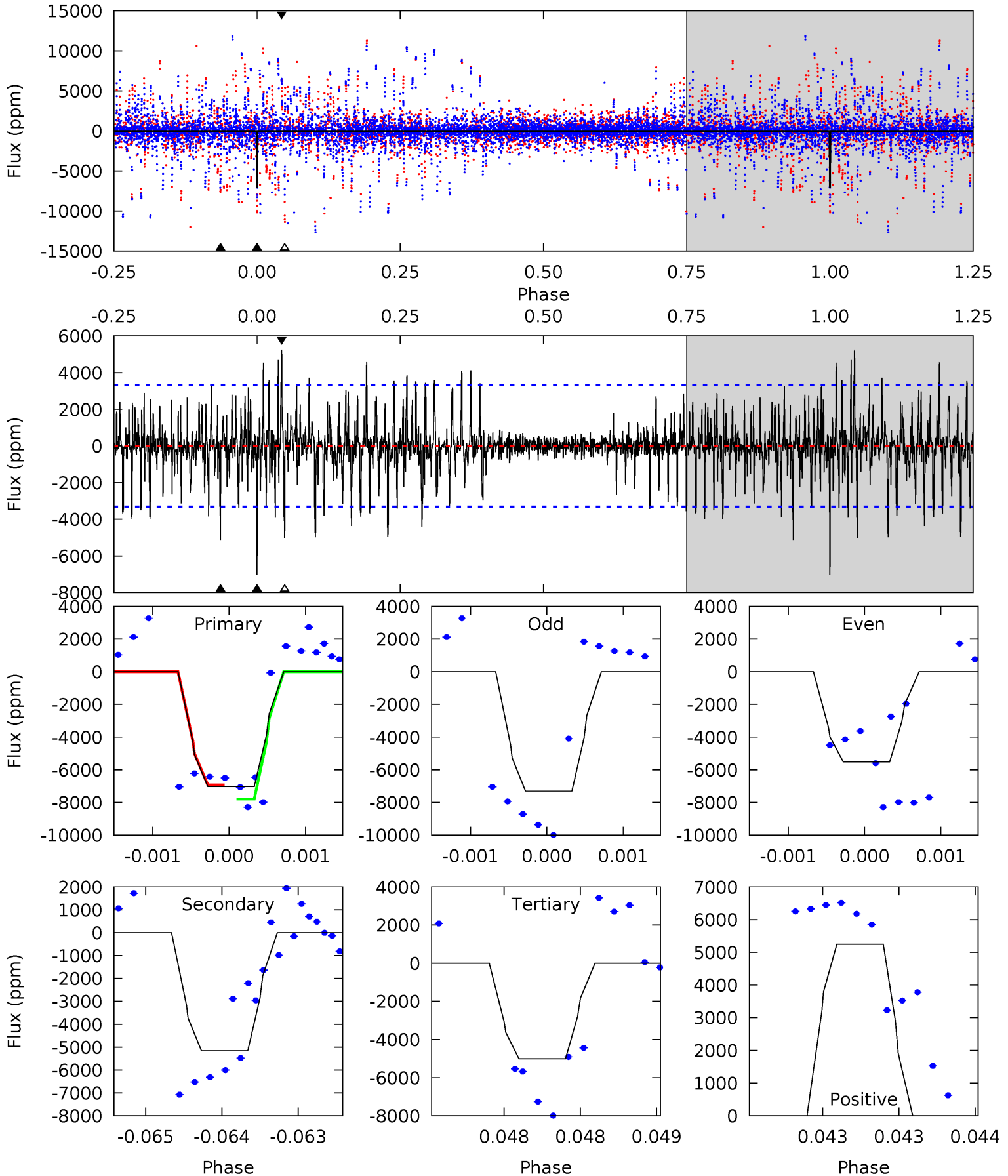
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.6	20.2	10.9	15.9	5.50	3.37	1.92	14.6	9.63	9.30	4.30	7.18	0.87	0.38	5.07



# Alt Model-Shift Uniqueness Test

004936089-03, P = 142.197492 Days, E = 7.487649 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
11.7	8.58	8.34	8.72	5.51	3.38	1.80	3.34	2.96	0.23	-0.15	1.33	0.79	0.43	0.70





### Stellar Parameters For KIC 004936089

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$11502^{+449}_{-1798}$	$3.673^{+0.510}_{-0.090}$	$0.070^{+0.250}_{-0.600}$	$4.497^{+0.606}_{-2.422}$	$3.472^{+0.069}_{-1.265}$	$0.054^{+0.332}_{-0.016}$
	+4%/-16%	+14%/-2%	+357%/-857%	+13%/-54%	+2%/-36%	+618%/-30%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004936089-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2696 \pm 133$	$15.93^{+8.93}_{-8.54}$	$1528^{+212}_{-272}$	$14406^{+15722}_{-4473}$	$3685^{+12306}_{-2202}$
Alt.	$-5158 \pm 601$	$40.24^{+12.39}_{-11.88}$	$1546^{+191}_{-279}$	$9175^{+1818}_{-1462}$	$1083^{+1095}_{-435}$

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

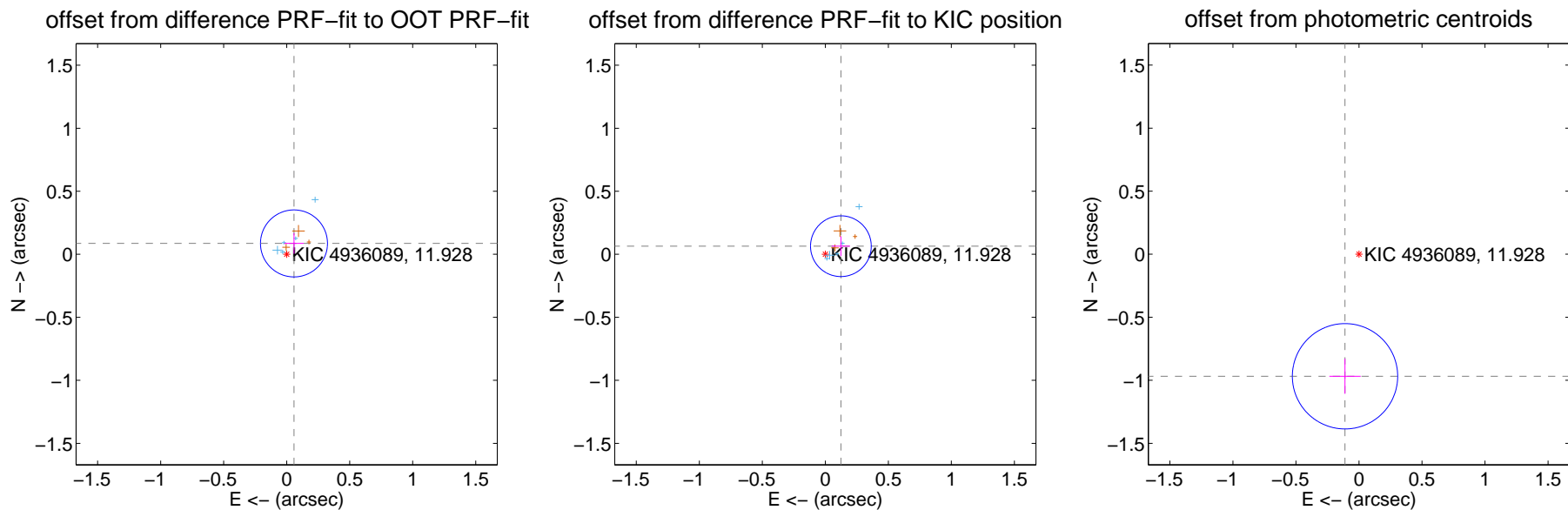
## DV Centroid Data

Supplemental centroid analysis for 004936089-03. **Kepler magnitude: 11.93.** Transit SNR 9.51

There are 5 quarters with good PRF difference image offsets

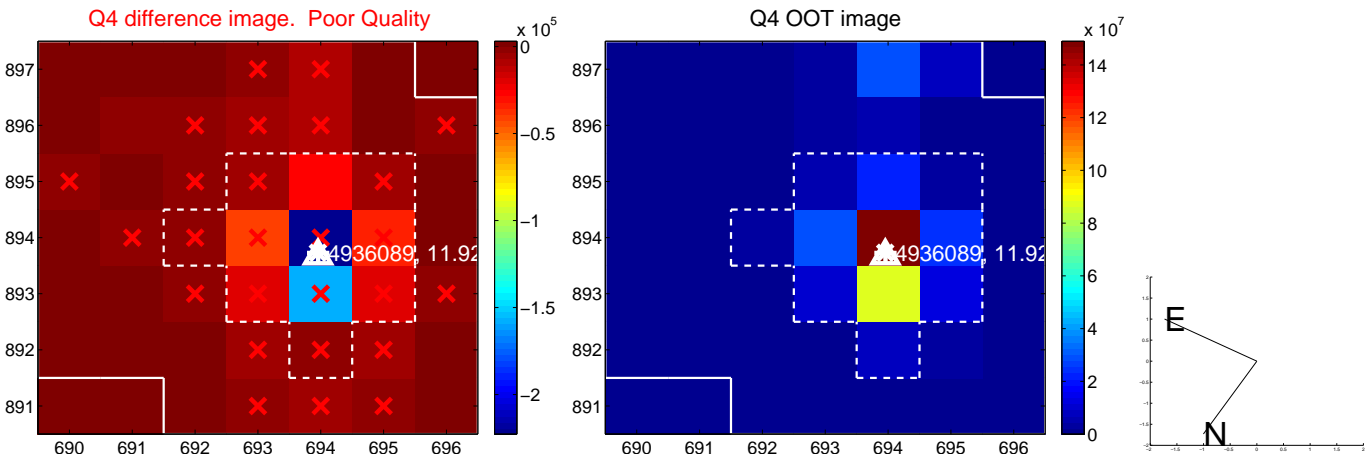
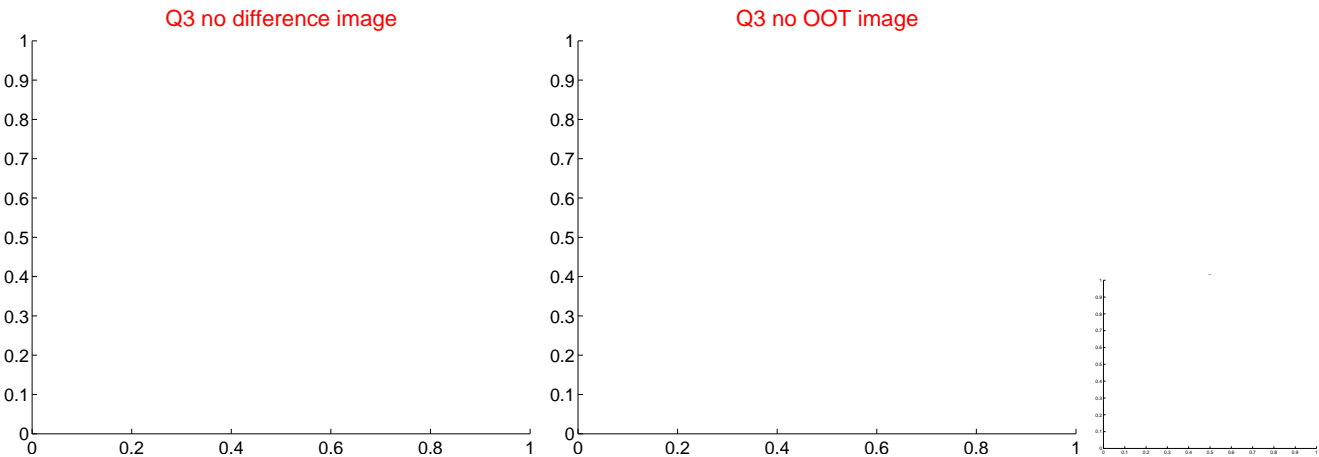
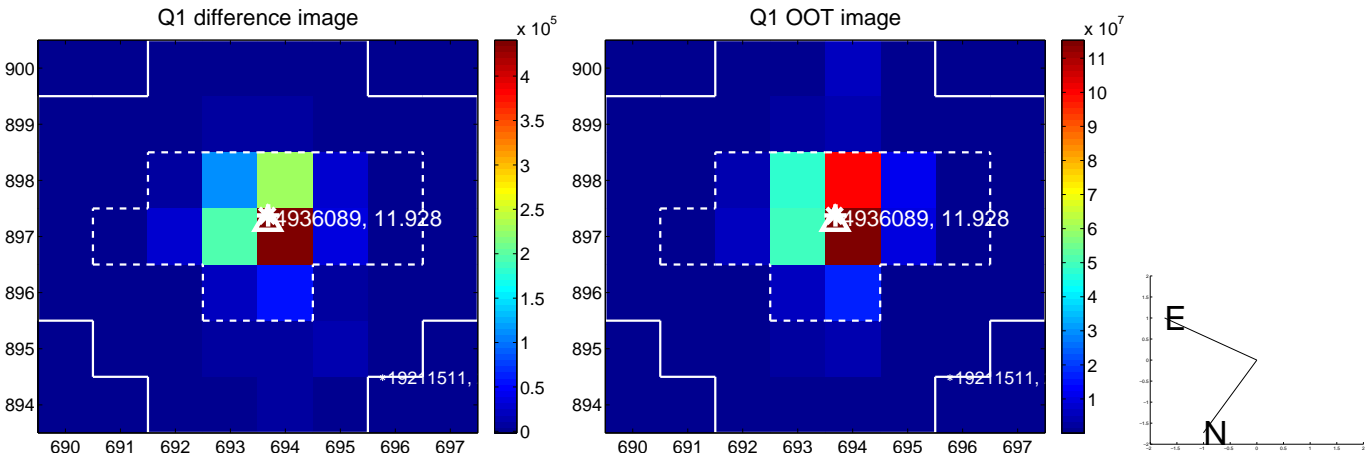
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.104 \pm 0.089$	1.17	$-0.058 \pm 0.077$	$0.086 \pm 0.082$
PRF-fit source offset from KIC position	$0.139 \pm 0.080$	1.73	$-0.123 \pm 0.073$	$0.064 \pm 0.079$
photometric centroid source offset	<b><math>0.97 \pm 0.14</math></b>	<b>7.00</b>	$0.11 \pm 0.12$	$-0.97 \pm 0.14$



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

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



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

Q5 no difference image



Q5 no OOT image



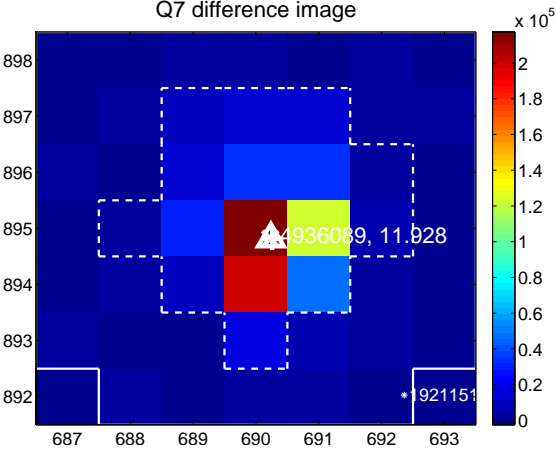
Q6 no difference image



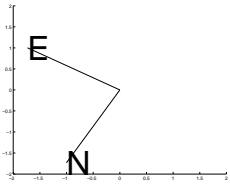
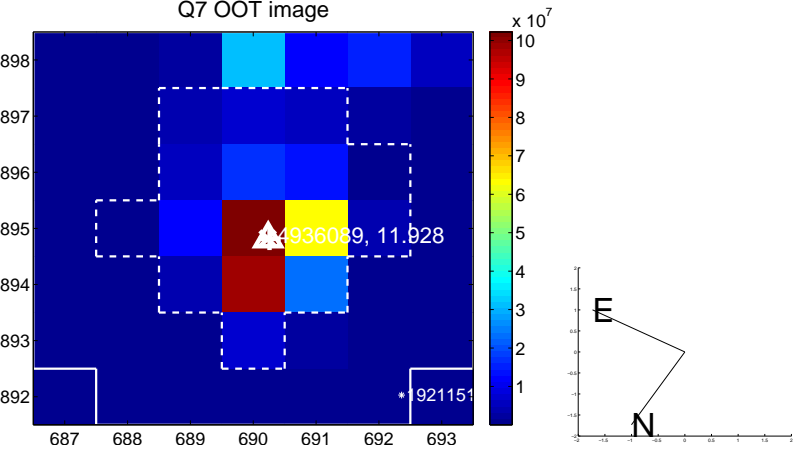
Q6 no OOT image



Q7 difference image



Q7 OOT image



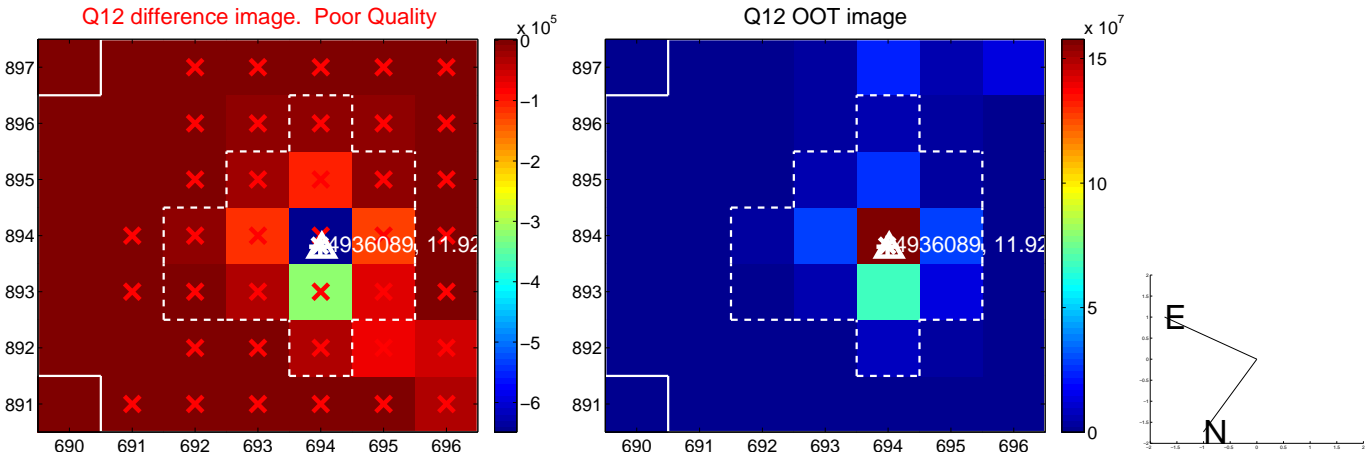
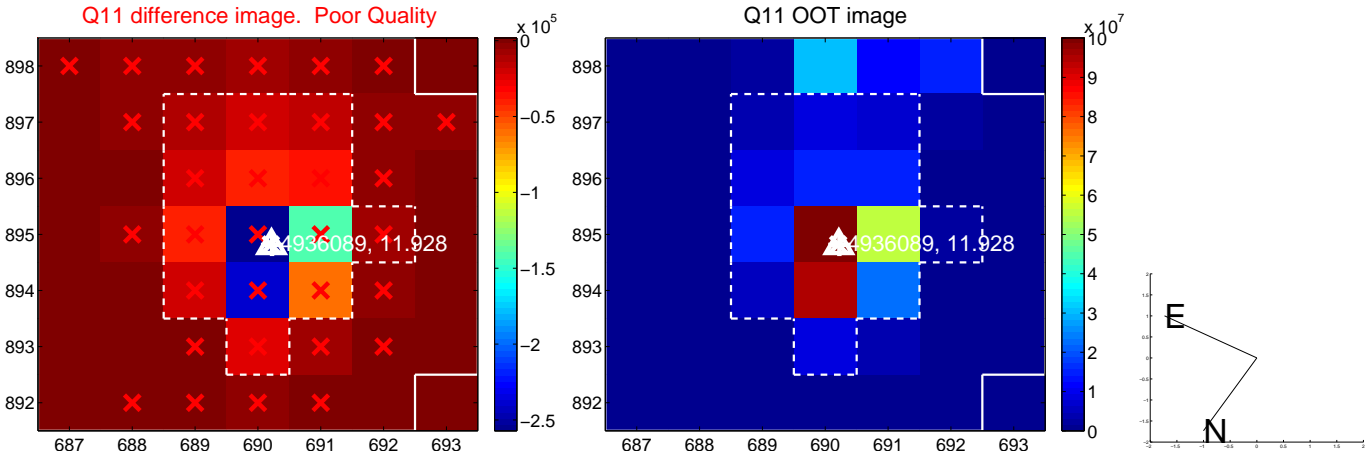
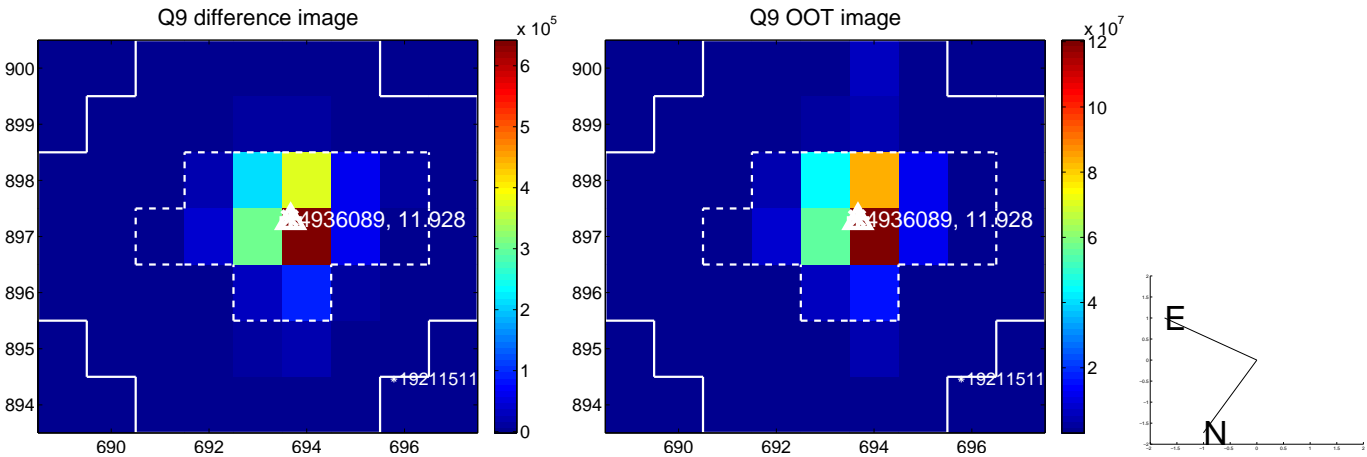
Q8 no difference image



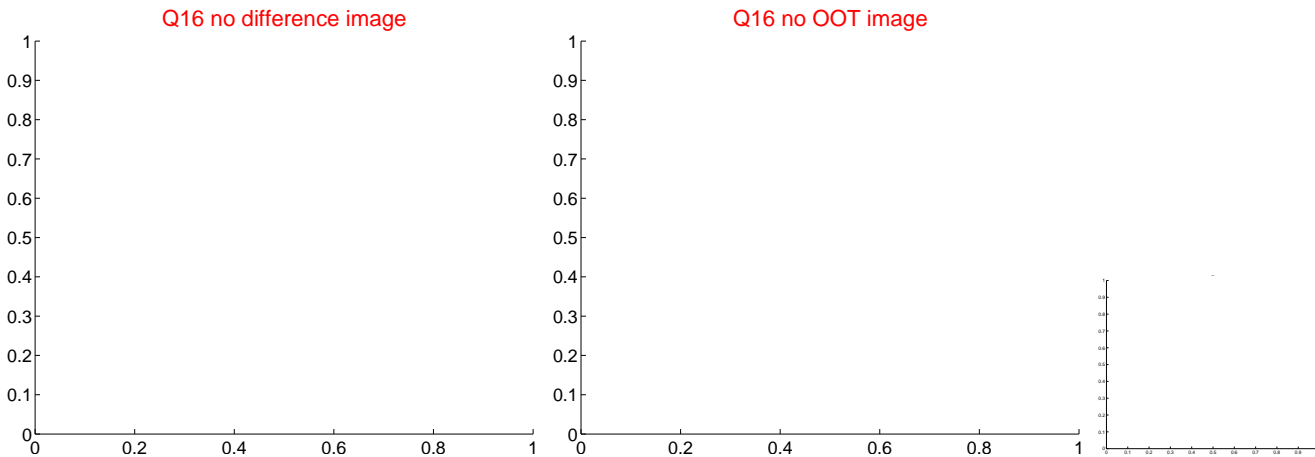
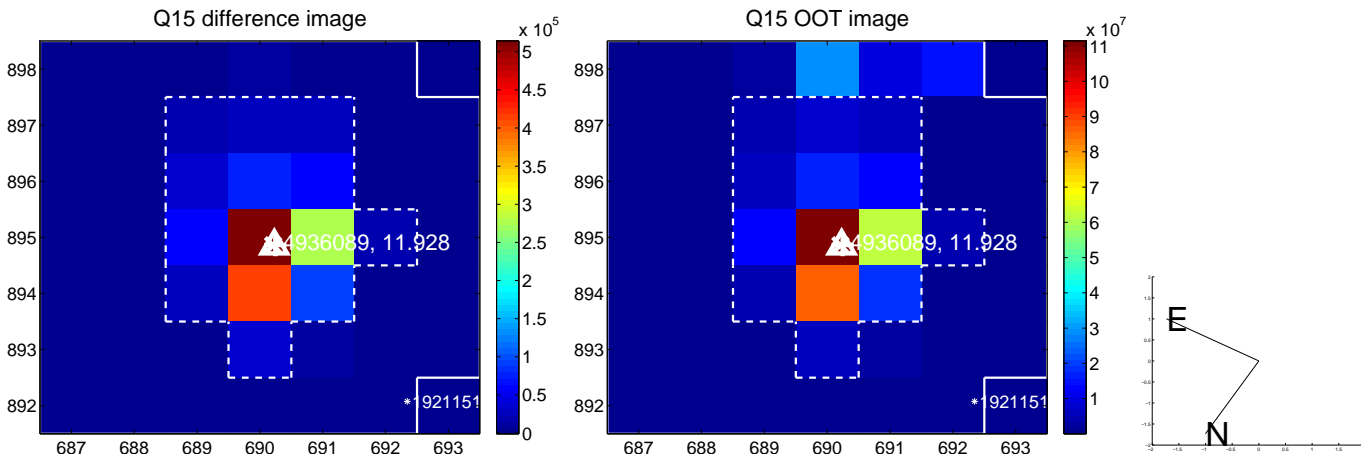
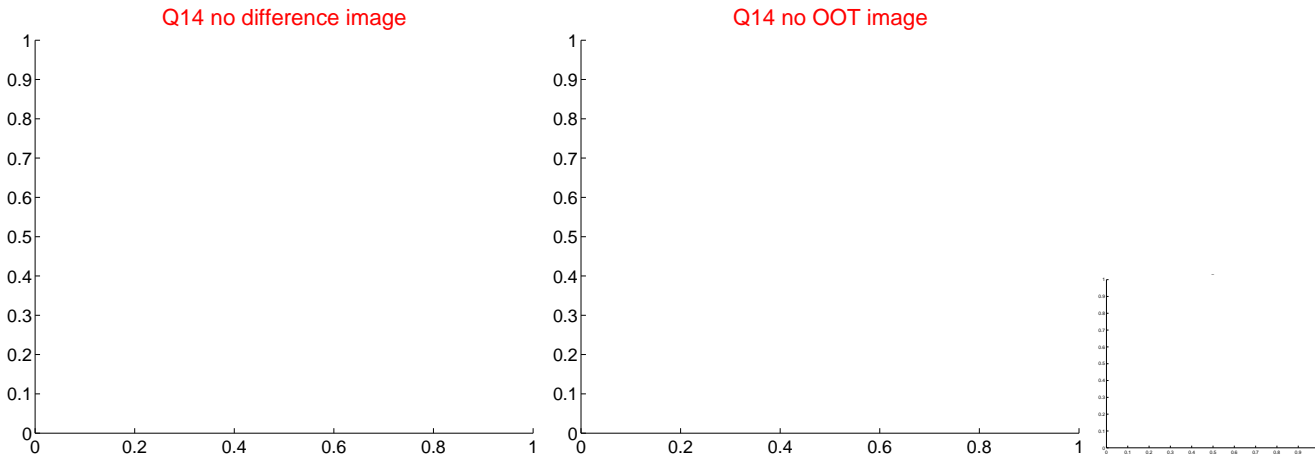
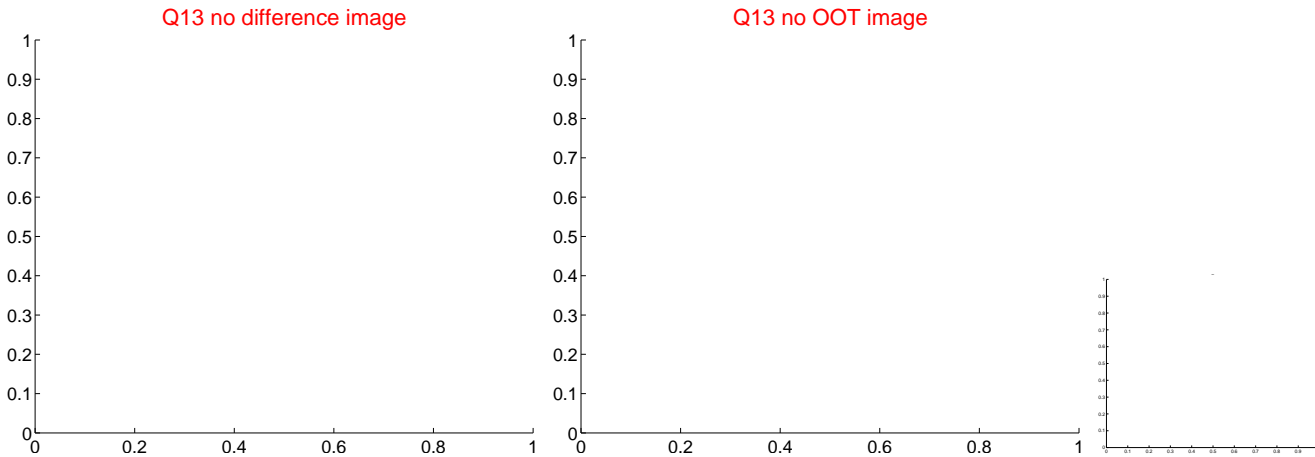
Q8 no OOT image



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

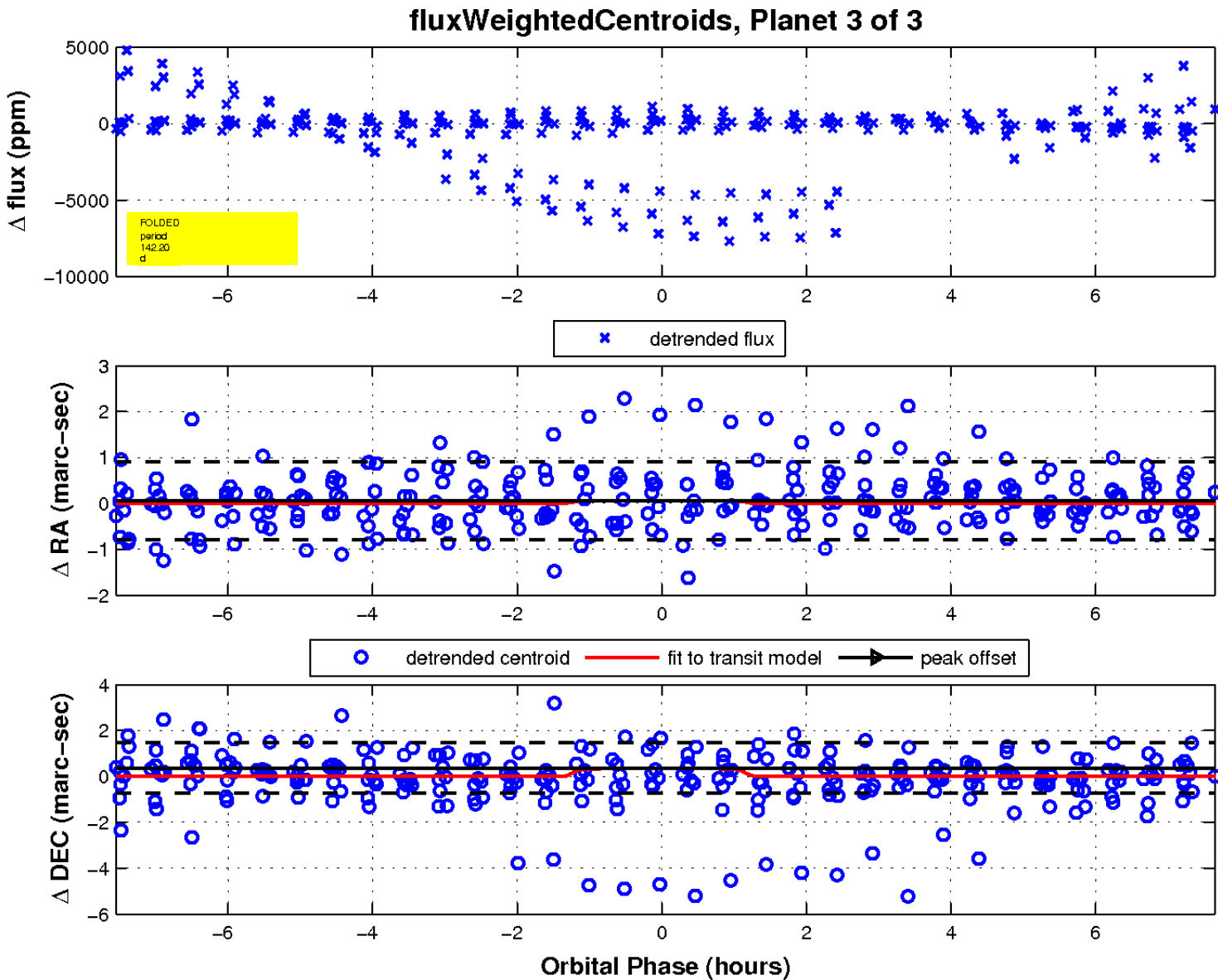
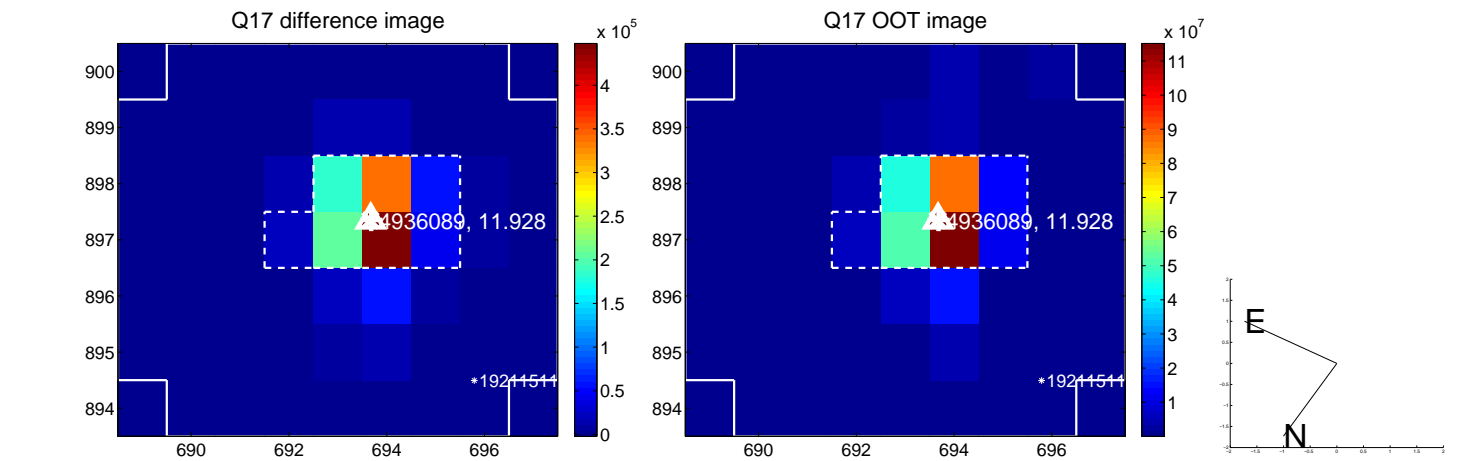


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value





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



UKIRT Image

Declination

