

# KIC 005088308

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005088308-01	OBS	No	1.523081	132.134297	35.7	3.368	10.5	11.5	12.61	6513	8.82	0.00
005088308-02	OBS	No	0.868281	132.381449	26.0	4.357	11.3	10.7	12.61	6513	6.50	0.00
005088308-03	OBS	No	0.868358	132.090618	67.7	6.098	13.5	20.2	12.61	6513	10.73	0.00
005088308-04	OBS	No	1.188842	132.543448	184.9	0.694	9.0	6.0	12.61	6513	20.47	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005088308-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005088308-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005088308-03	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED—EPHEM_MATCH
005088308-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

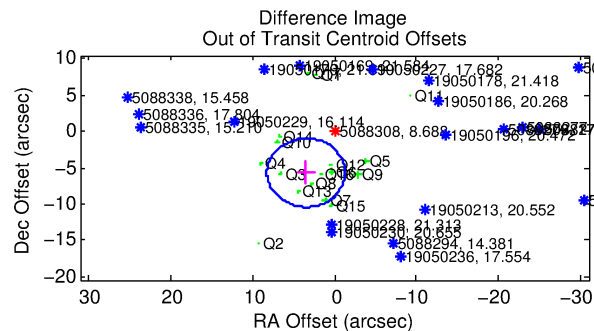
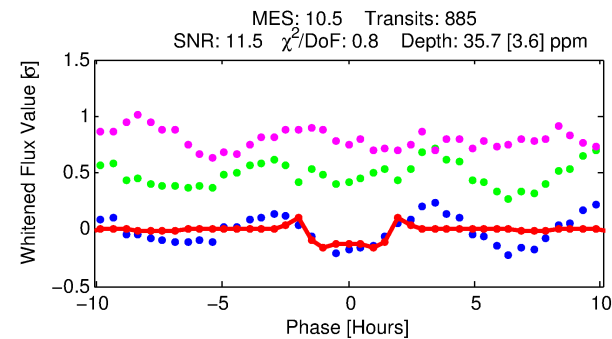
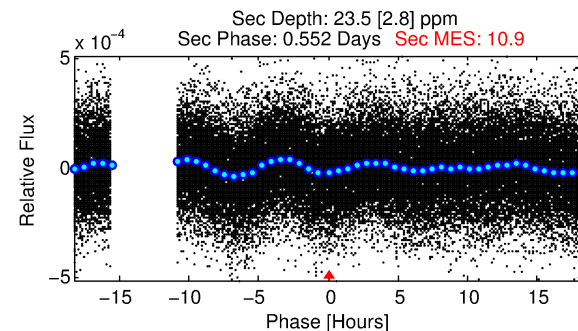
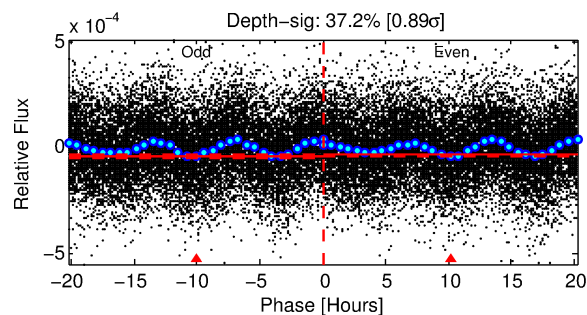
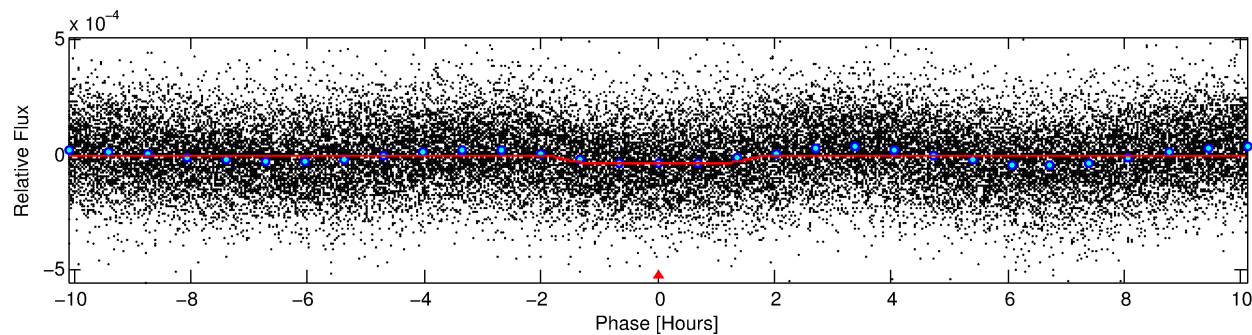
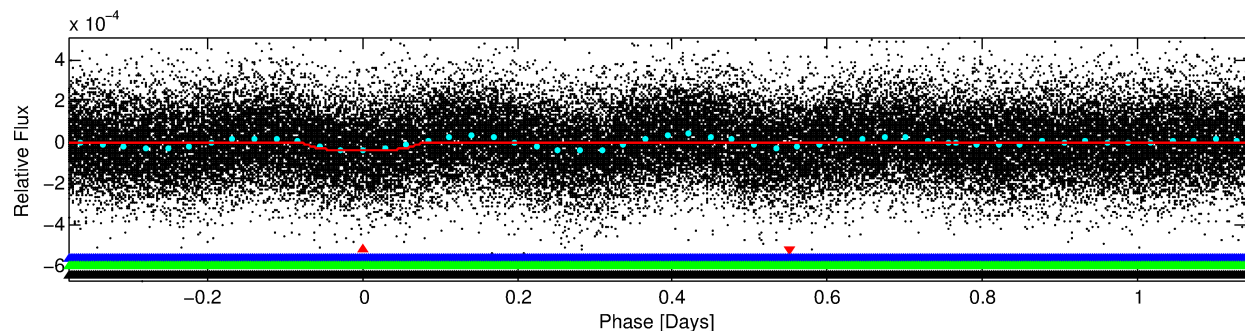
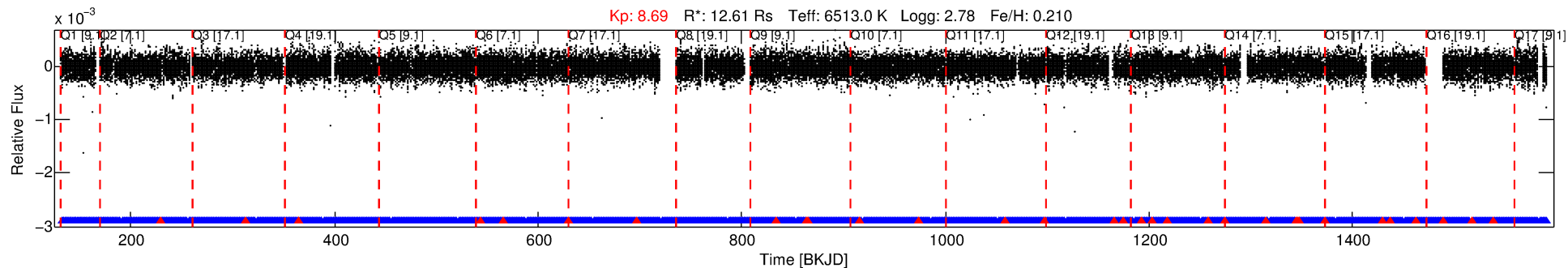
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005088308-01

No Significant Match Found

# DV One-Page Summary

KIC: 5088308 Candidate: 1 of 4 Period: 1.523 d



## DV Fit Results:

Period = 1.52308 [0.00001] d  
Epoch = 132.1343 [0.0015] BKJD  
Rp/R\* = 0.0064 [0.0010]  
a/R\* = 1.80 [1.08]  
b = 0.90 [0.18]  
Seff = N/A  
Teq = N/A  
Rp = 8.82 [2.61] Re  
a = N/A  
Ag = N/A  
Teff = N/A

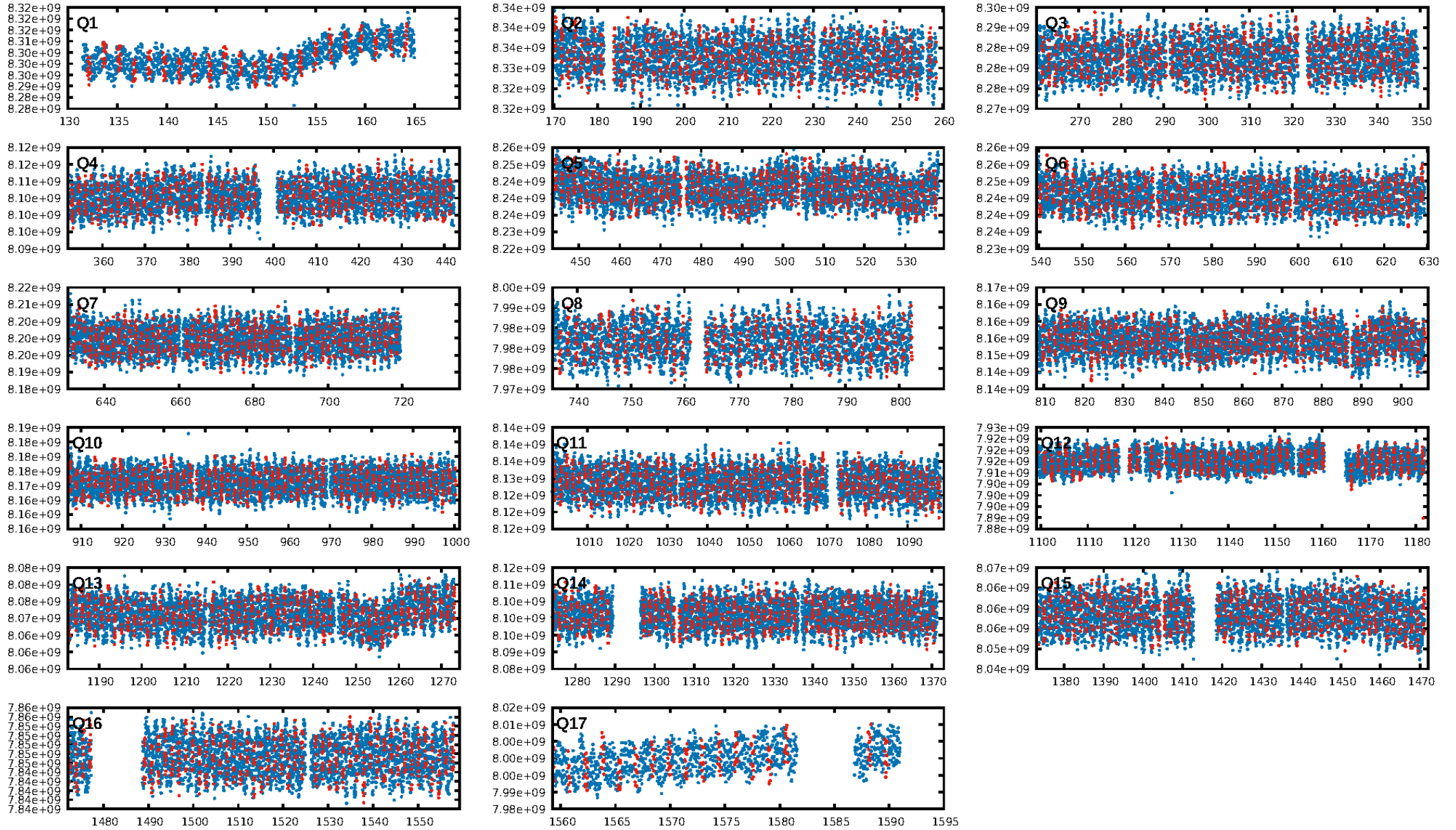
## DV Diagnostic Results:

ShortPeriod-sig: 98.0% [2.33 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.23e-13  
RollingBand-fgt: 0.96 [814/846]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.1%  
Centroid-so: 2.478 arcsec [3.53 $\sigma$ ]  
OotOffset-rm: 6.691 arcsec [4.23 $\sigma$ ]  
KicOffset-rm: 7.740 arcsec [4.54 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.00 [0/17]  
DiffImageOverlap-fno: 0.00 [0/17]

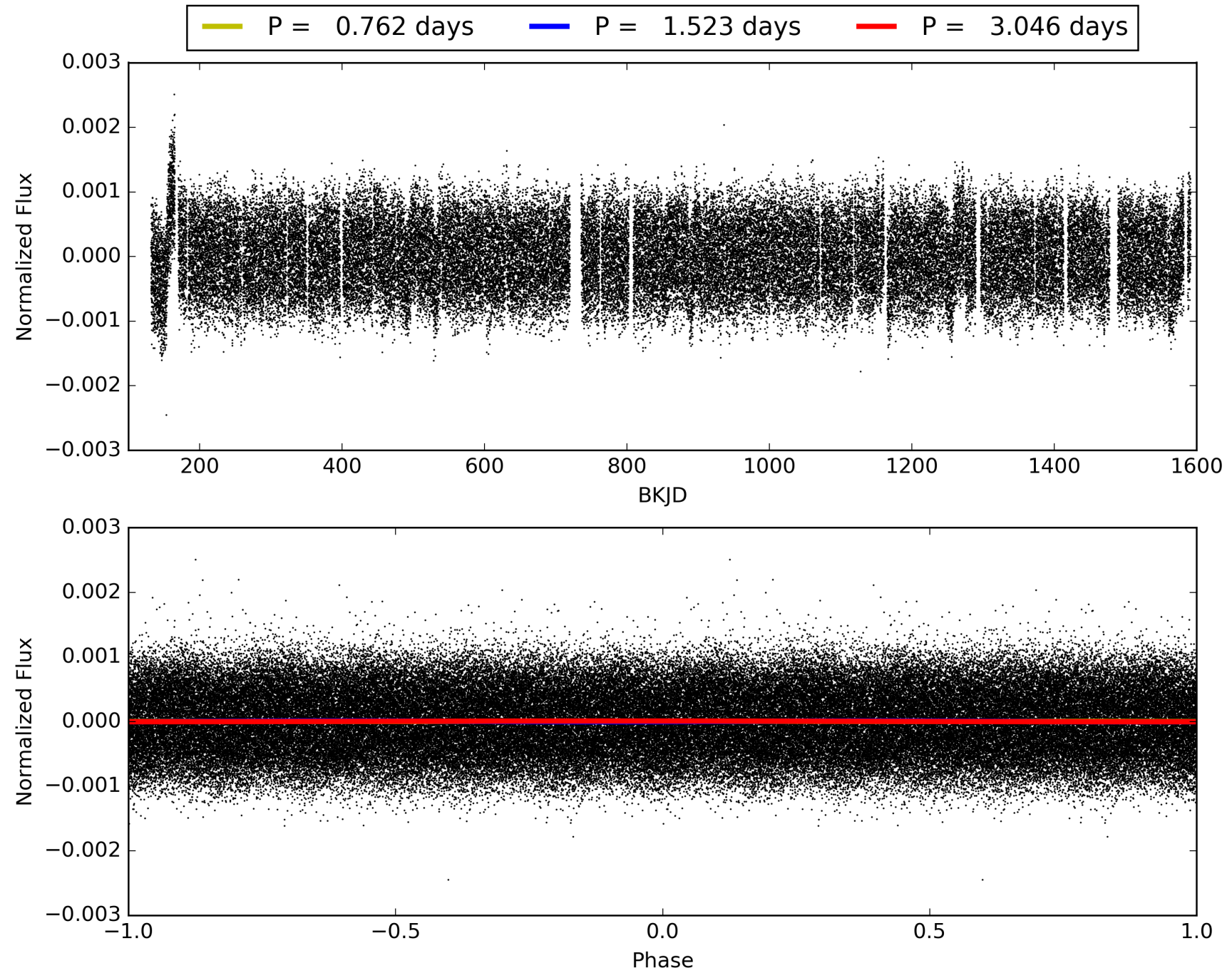
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:28:16 Z

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

# TCE 005088308-01, PDC Light Curves



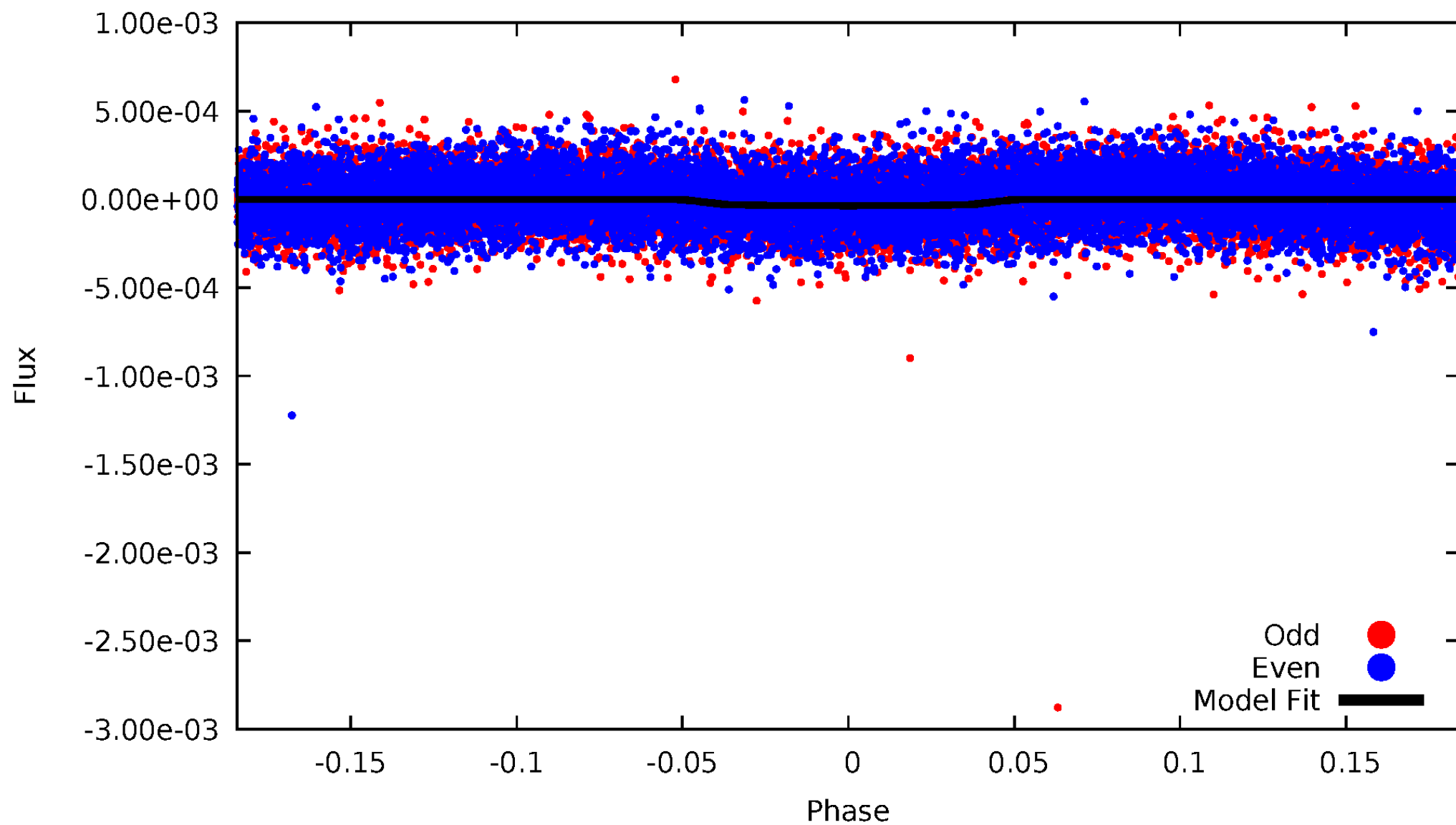
TCE 005088308-01





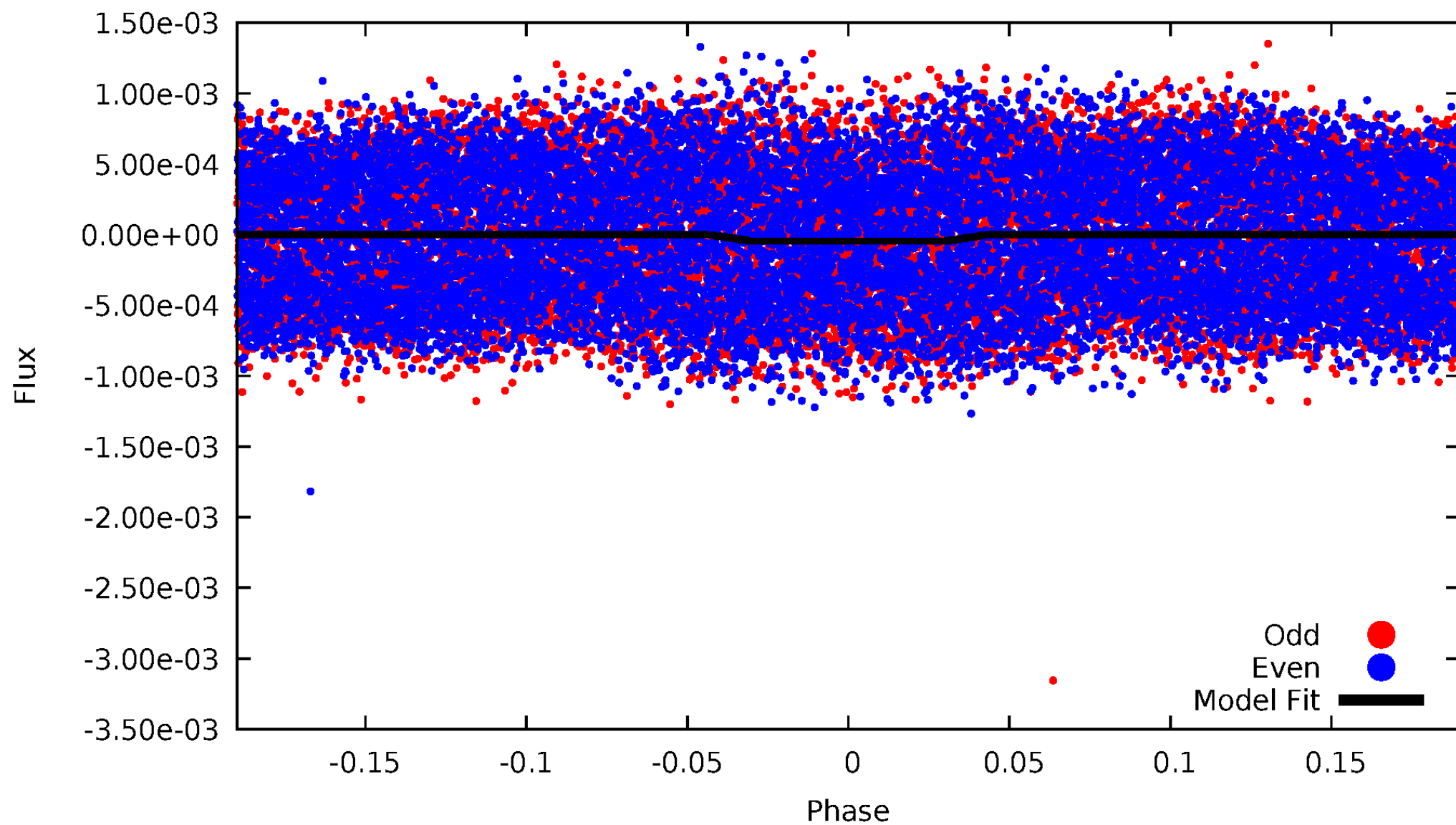
DV Odd/Even

TCE 005088308-01



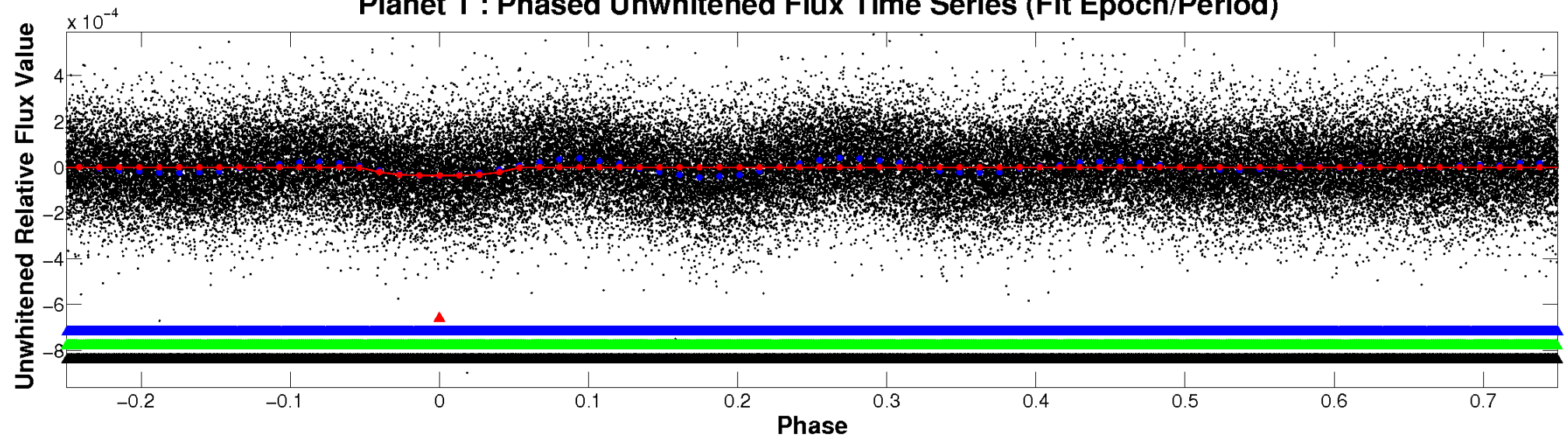
# ALT Odd/Even

TCE 005088308-01

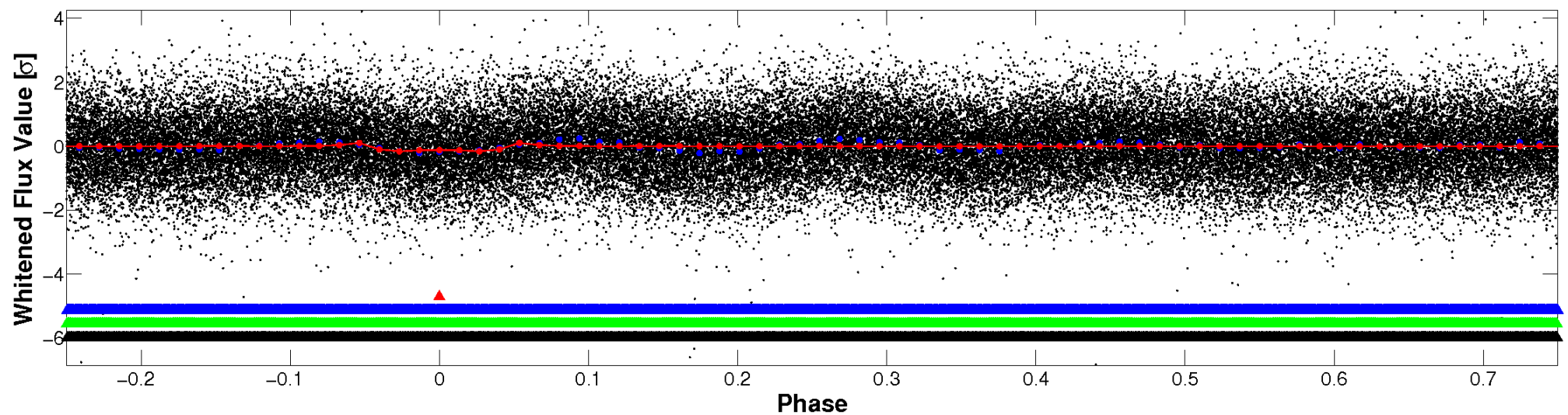


# Non-Whitened Vs. Whitened Light Curve

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

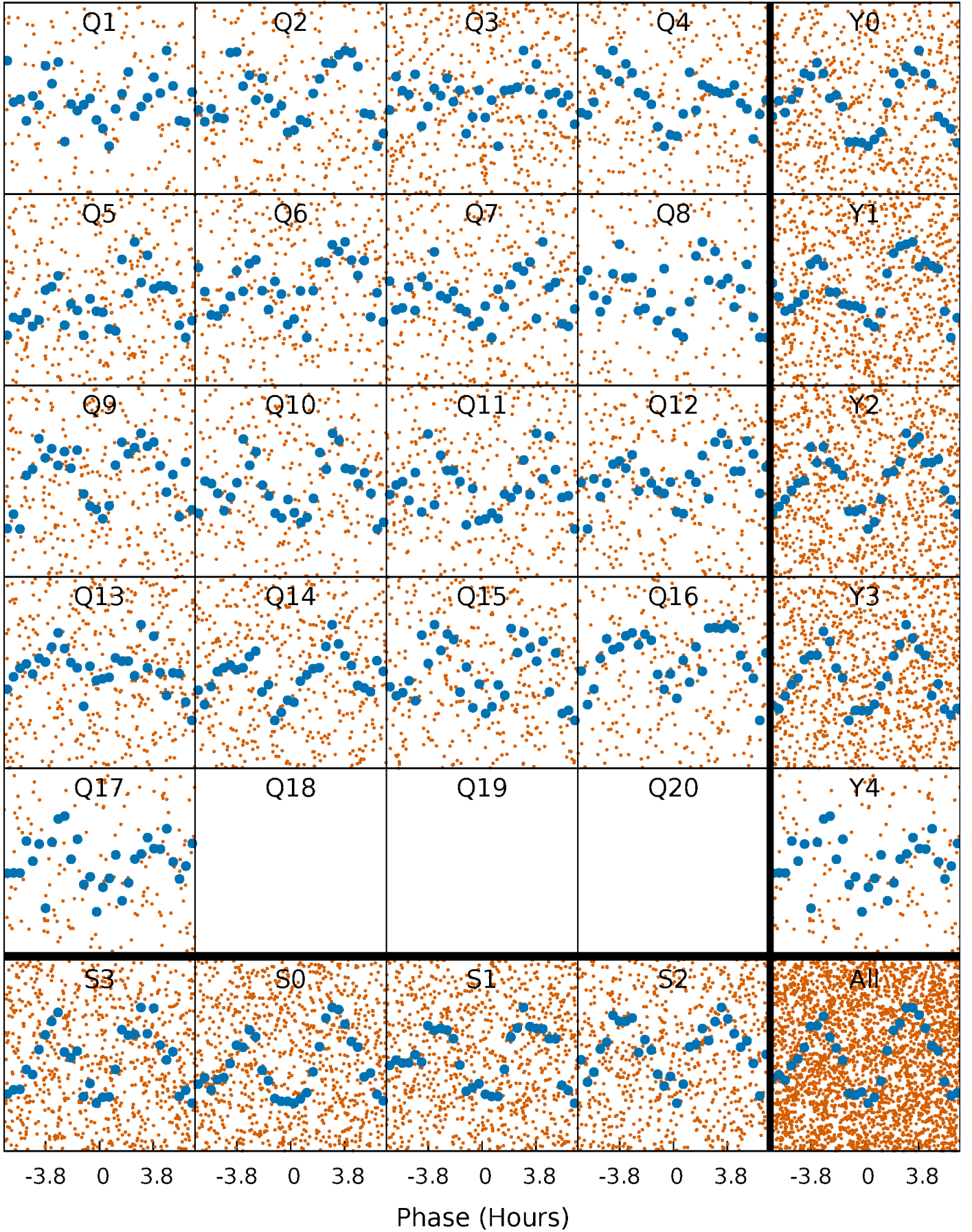


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

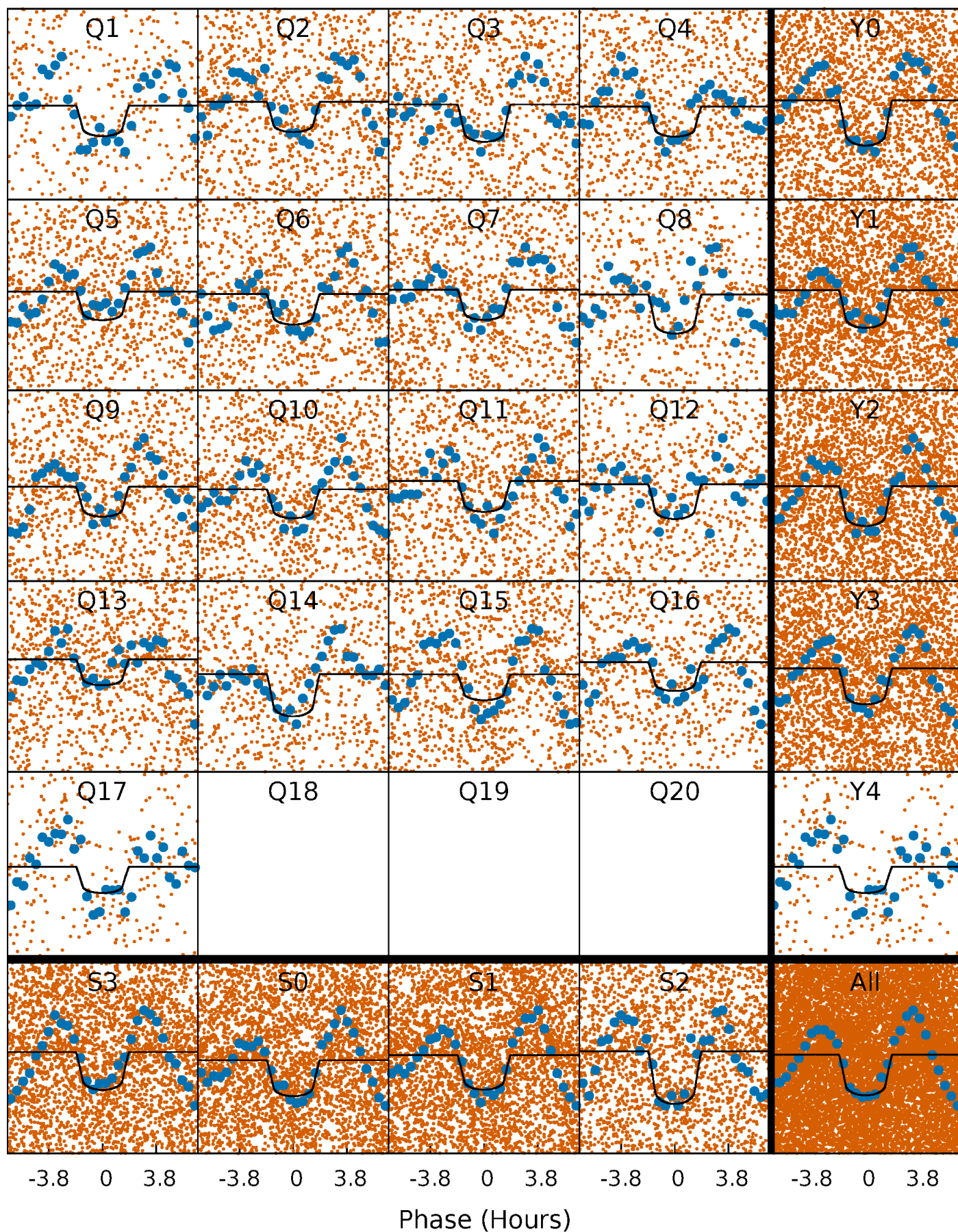
TCE 005088308-01   P= 1.523081 Days    $T_0=132.134297$  (BKJD)





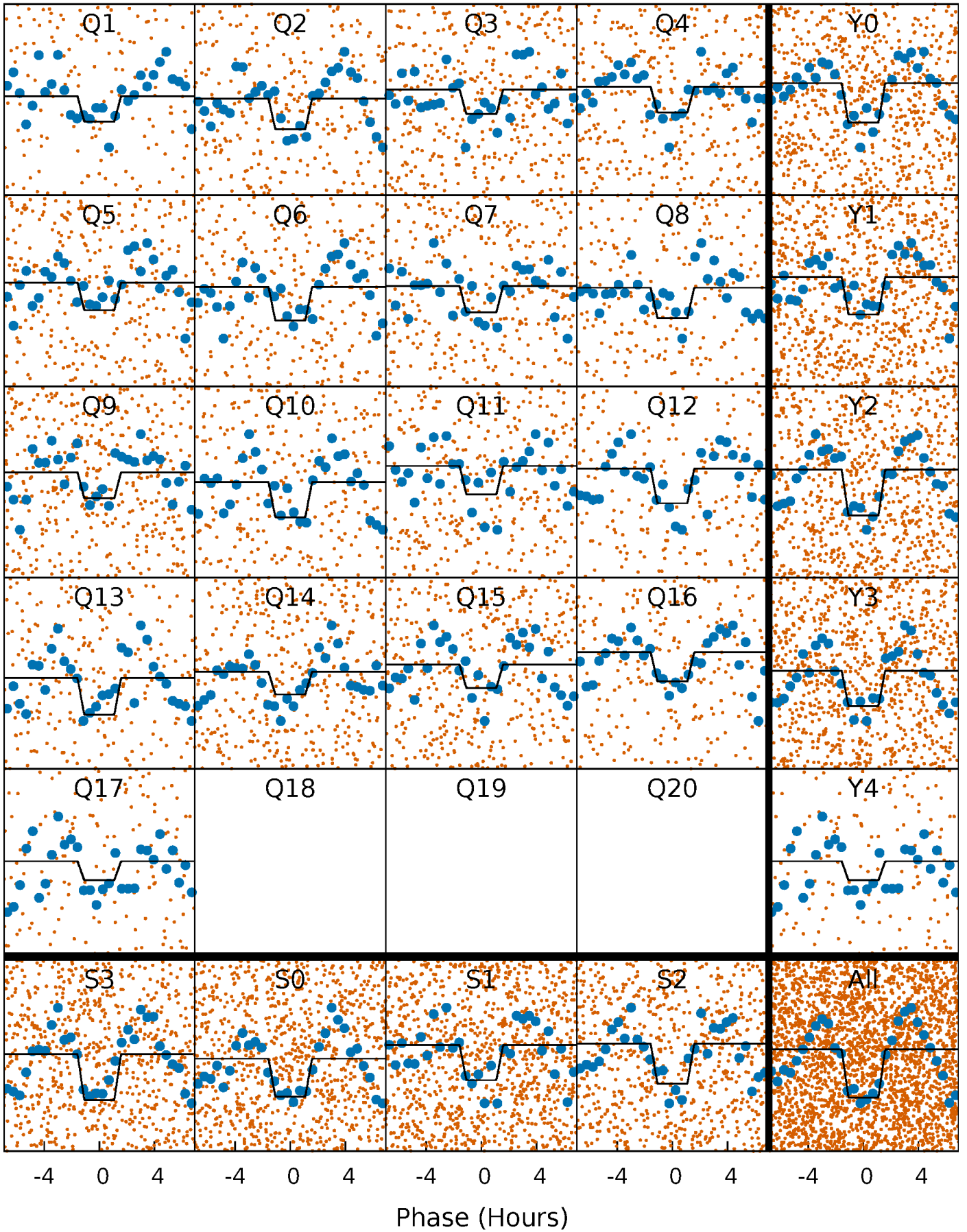
# DV Quarter-Phased Transit Curves

TCE 005088308-01 P= 1.523081 Days  $T_0=132.134297$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

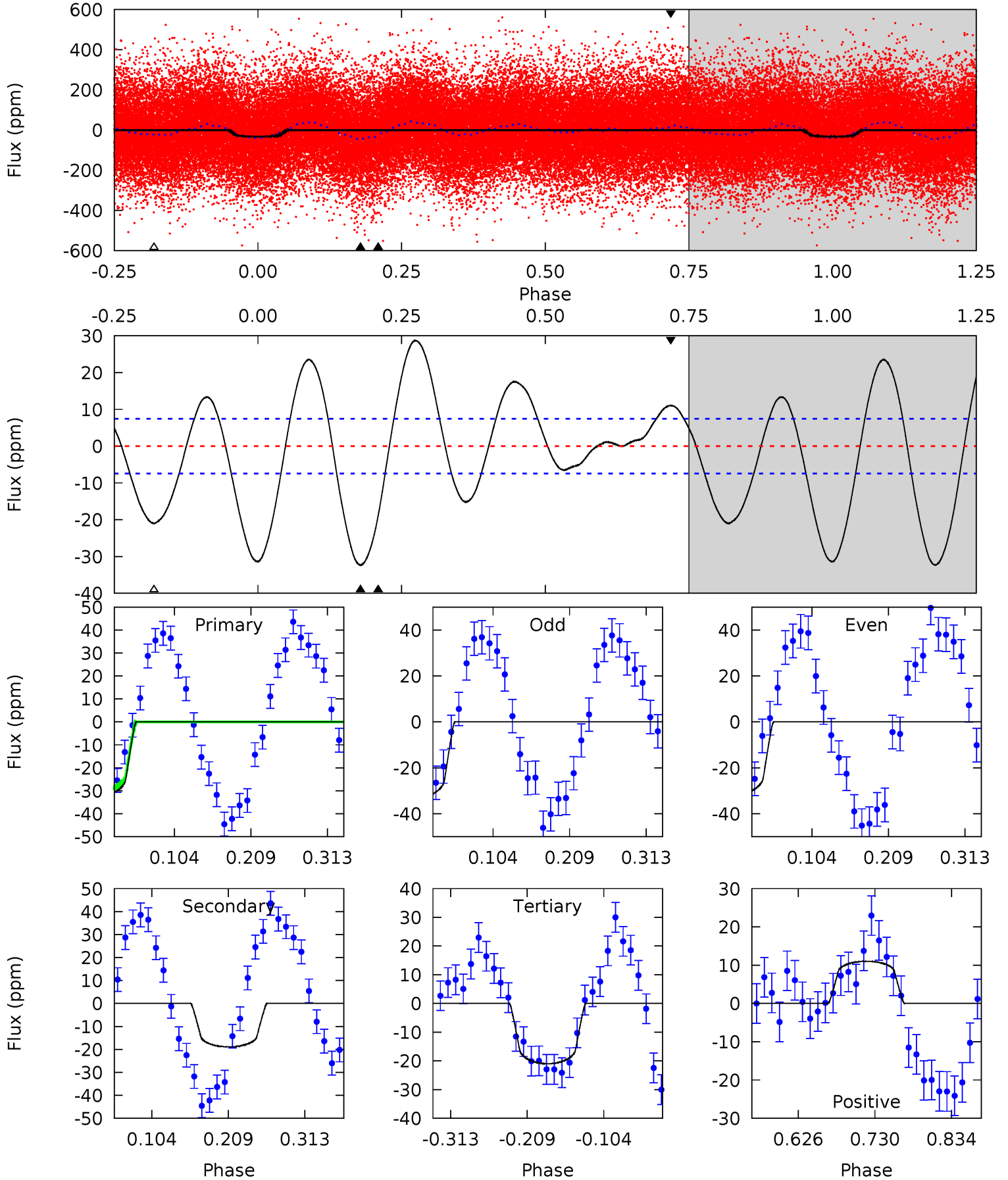
TCE 005088308-01 P= 1.523092 Days  $T_0=132.126320$  (BKJD)



# DV Model-Shift Uniqueness Test

005088308-01, P = 1.523081 Days, E = 130.611216 Days

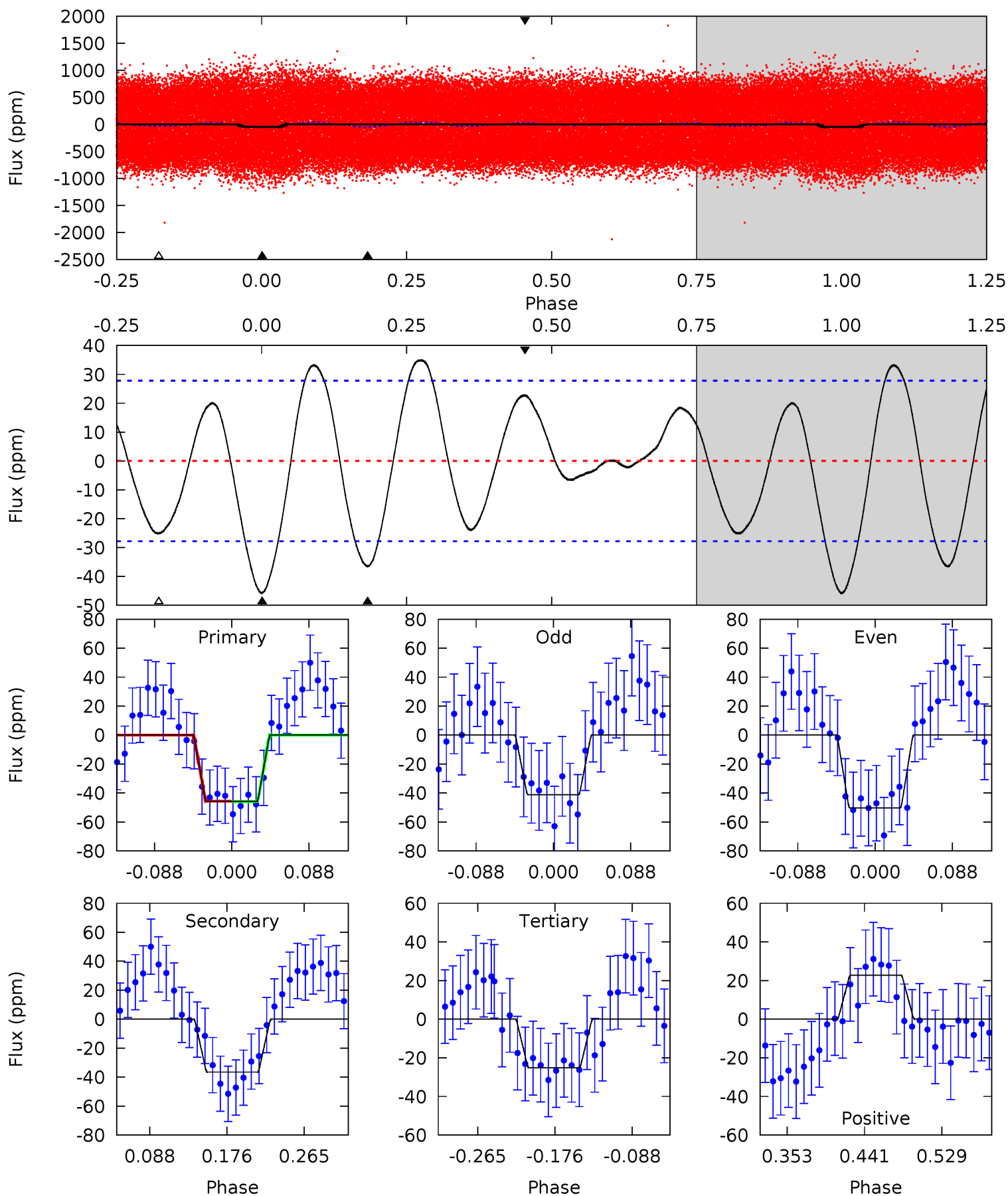
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.8	11.6	12.8	6.74	4.56	1.62	7.40	6.93	13.0	-1.28	4.82	0.42	0.87	0.47	1.08



# Alt Model-Shift Uniqueness Test

005088308-01, P = 1.523092 Days, E = 130.603228 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
7.56	6.03	4.15	3.76	4.59	1.70	2.46	3.42	3.81	1.88	2.27	0.75	0.90	0.43	0.02





### Stellar Parameters For KIC 005088308

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6513^{+411}_{-823}$	$2.782^{+0.175}_{-0.094}$	$0.210^{+0.150}_{-0.150}$	$12.613^{+1.350}_{-3.149}$	$3.511^{+0.033}_{-0.593}$	$0.002^{+0.002}_{-0.001}$
	+6%/-13%	+6%/-3%	+71%/-71%	+11%/-25%	+1%/-17%	+98%/-25%
Source	SPE4	SPE4	SPE4	DSEP		

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

### Secondary Eclipse Parameters for KIC 005088308-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-19 \pm 2$	$8.48^{+1.55}_{-1.58}$	$7024^{+619}_{-885}$	$-4261^{+7857}_{-770}$	$0.217^{+0.120}_{-0.064}$
Alt.	$-36 \pm 6$	$9.24^{+1.57}_{-1.60}$	$7085^{+604}_{-827}$	$4000^{+1301}_{-8104}$	$0.355^{+0.173}_{-0.111}$

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

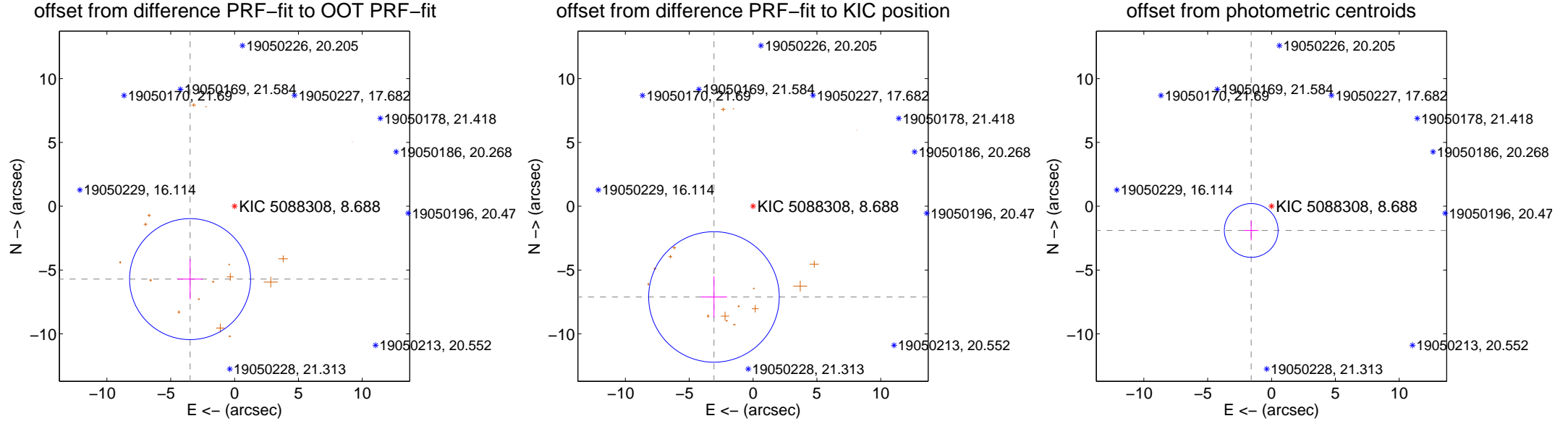
## DV Centroid Data

Supplemental centroid analysis for 005088308-01. **Kepler magnitude: 8.69.** Transit SNR 11.49

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

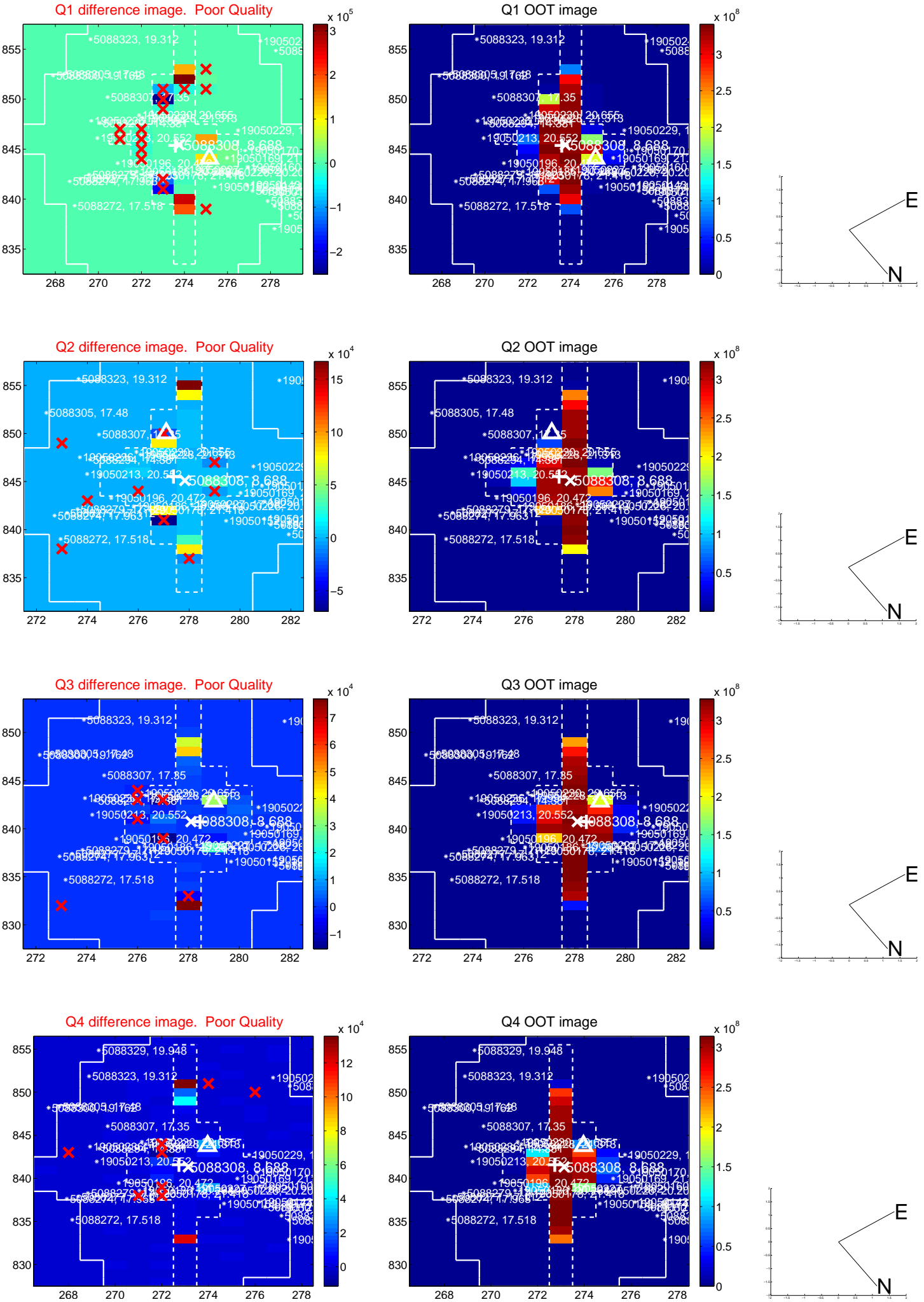
The direct PRF centroid is offset from the target star catalog position by about 0.93 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>6.691 \pm 1.580</math></b>	<b>4.23</b>	$3.485 \pm 1.007$	$-5.712 \pm 1.571$
PRF-fit source offset from KIC position	<b><math>7.740 \pm 1.704</math></b>	<b>4.54</b>	$3.061 \pm 1.024$	$-7.109 \pm 1.623$
photometric centroid source offset	<b><math>2.48 \pm 0.70</math></b>	<b>3.53</b>	$1.59 \pm 0.57$	$-1.90 \pm 0.78$

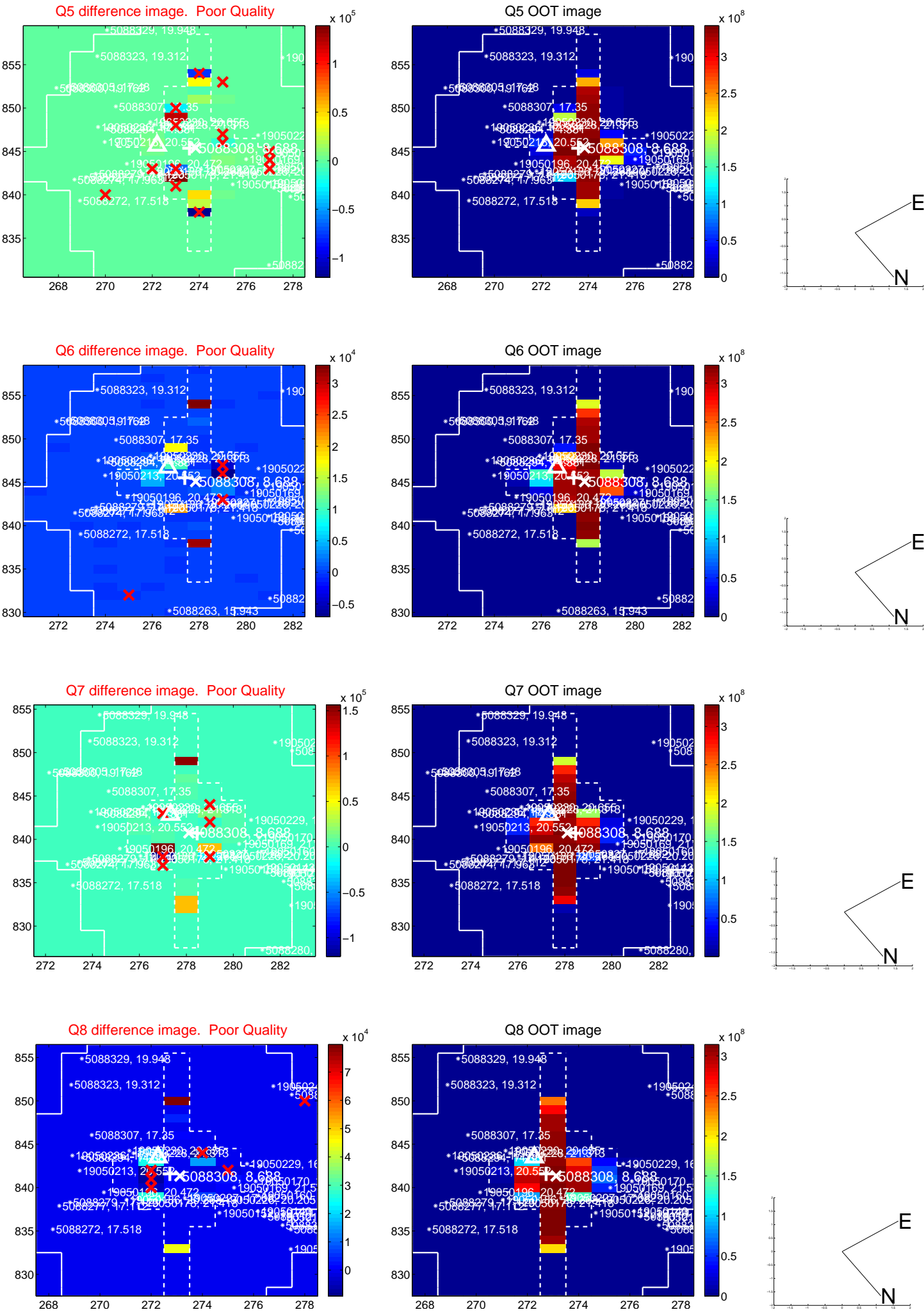


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

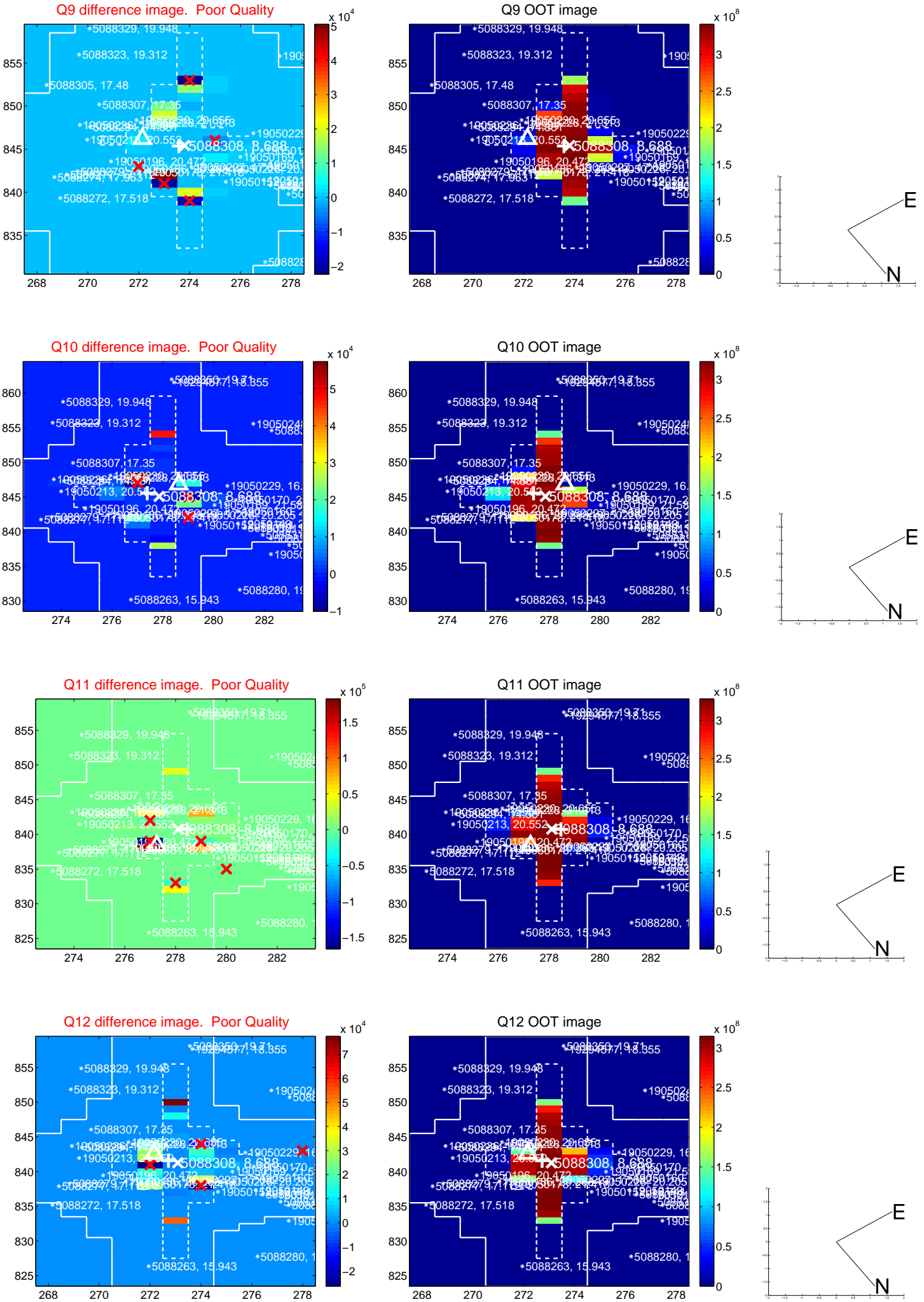


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

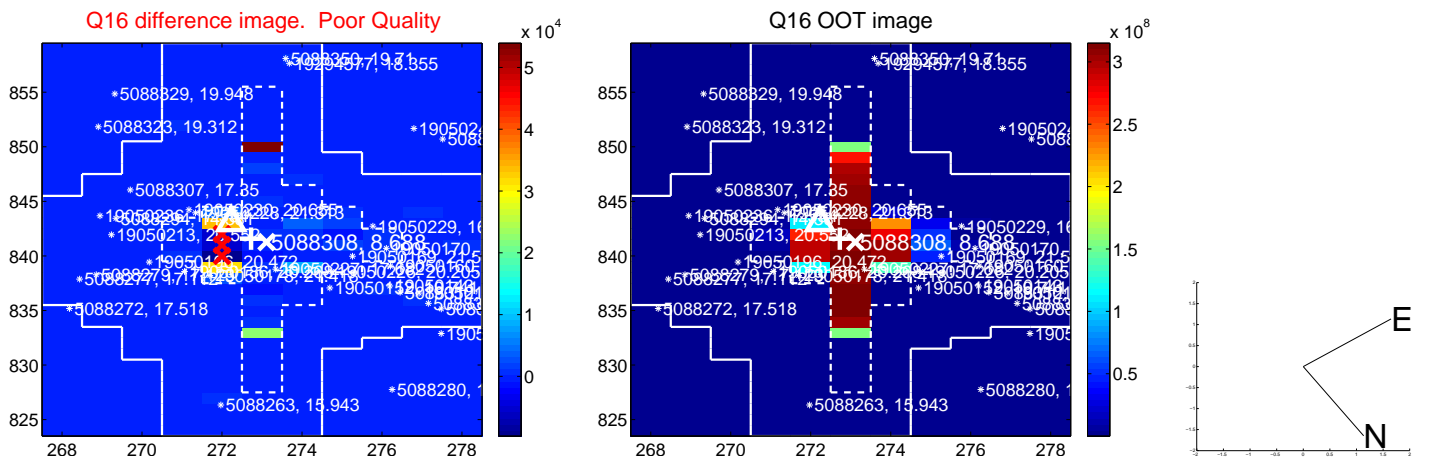
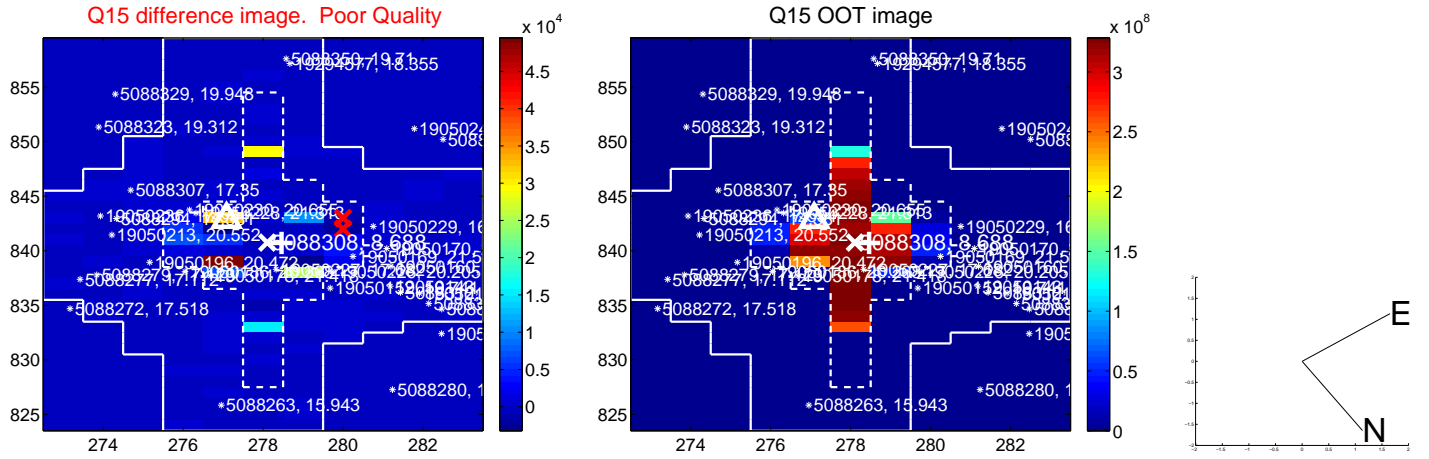
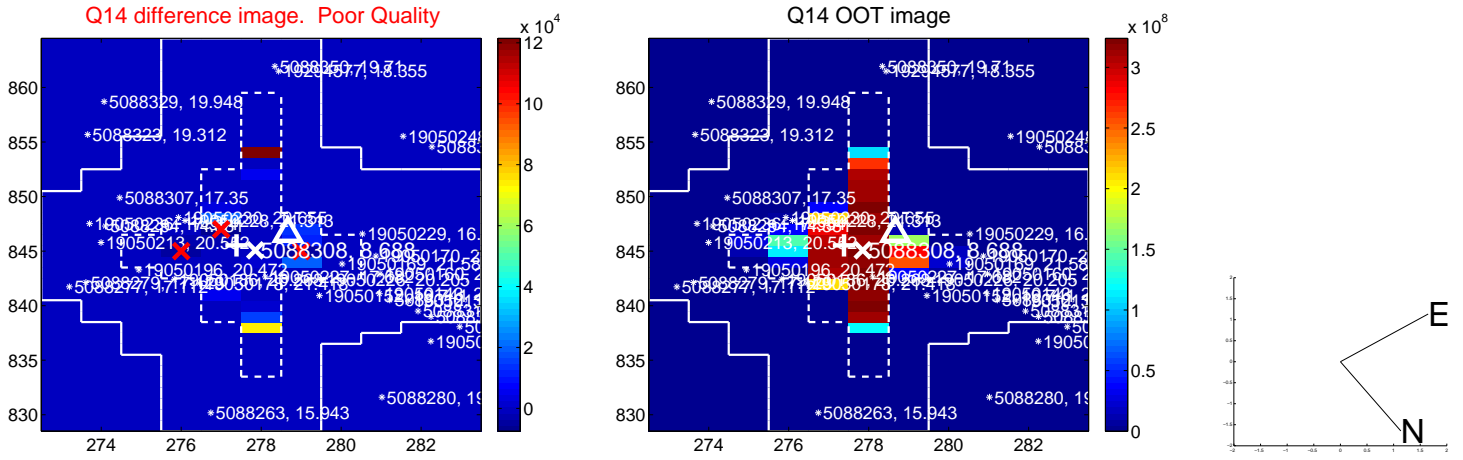
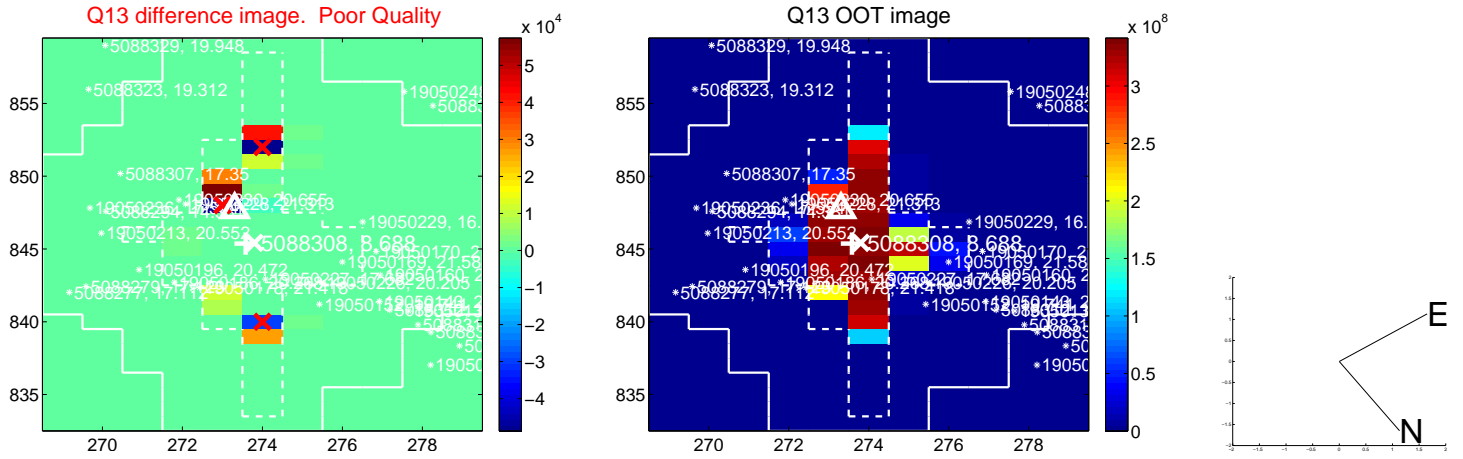




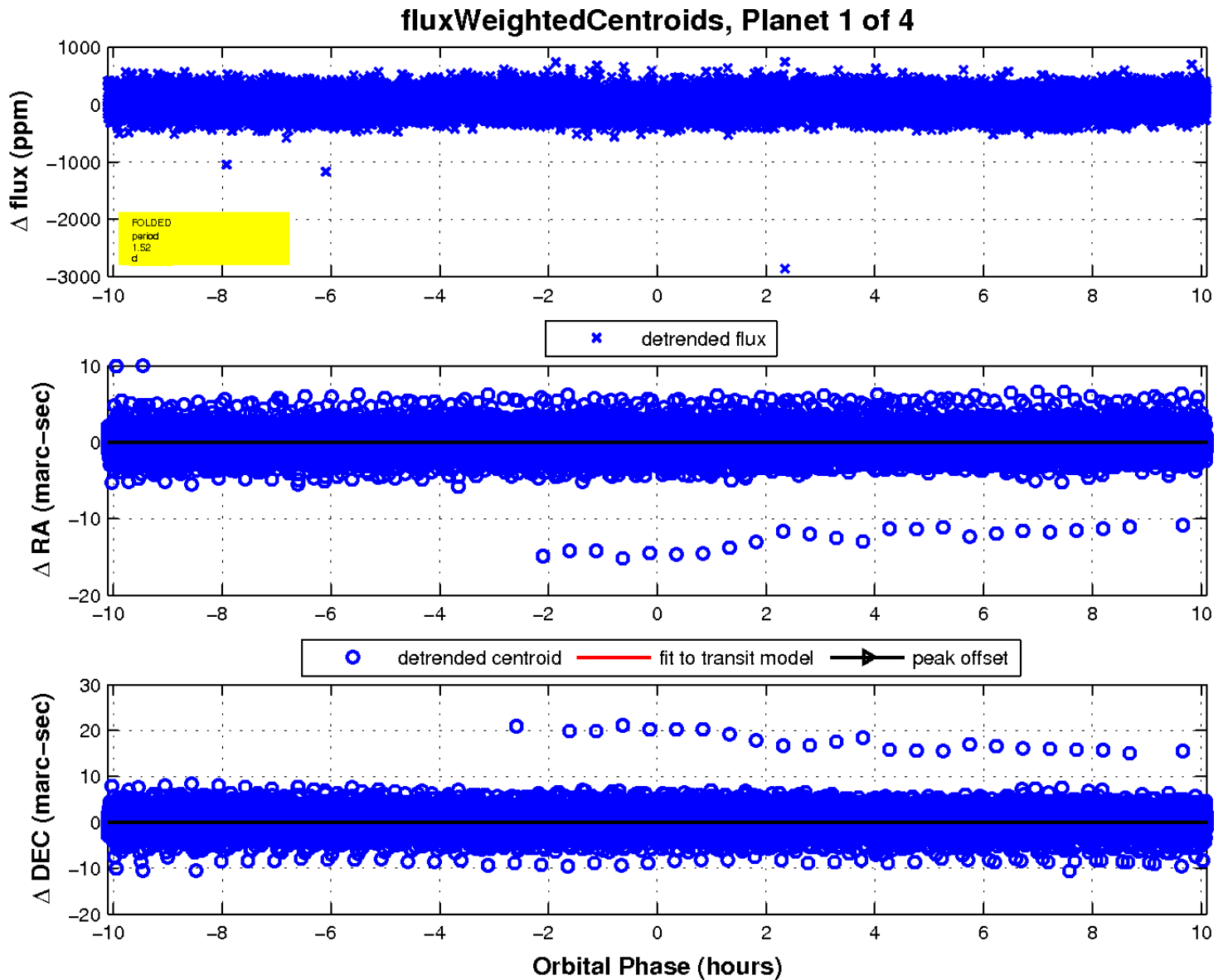
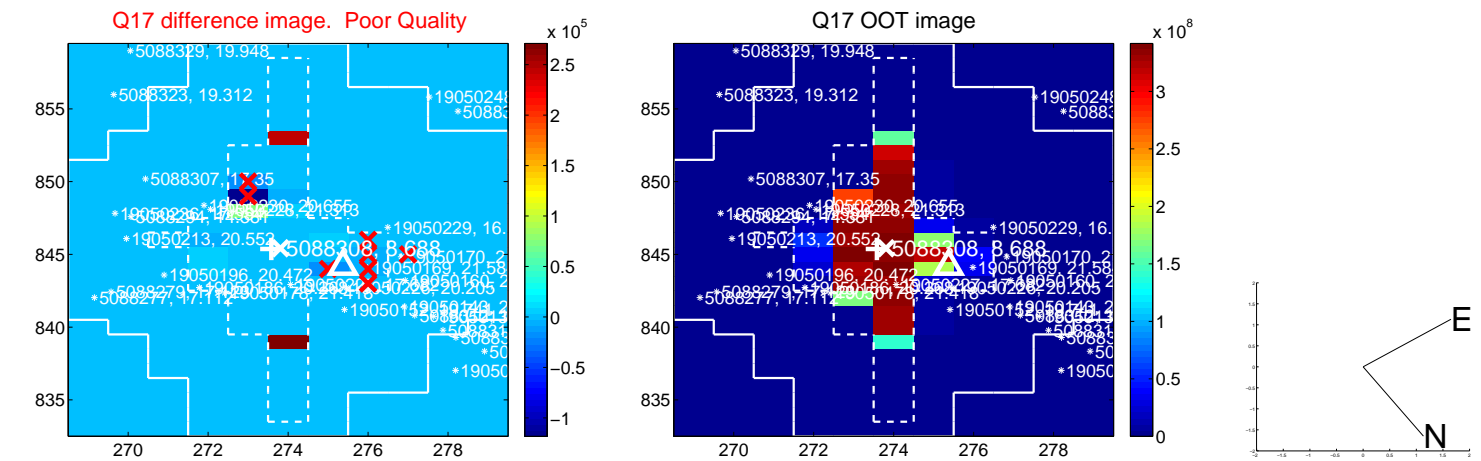
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

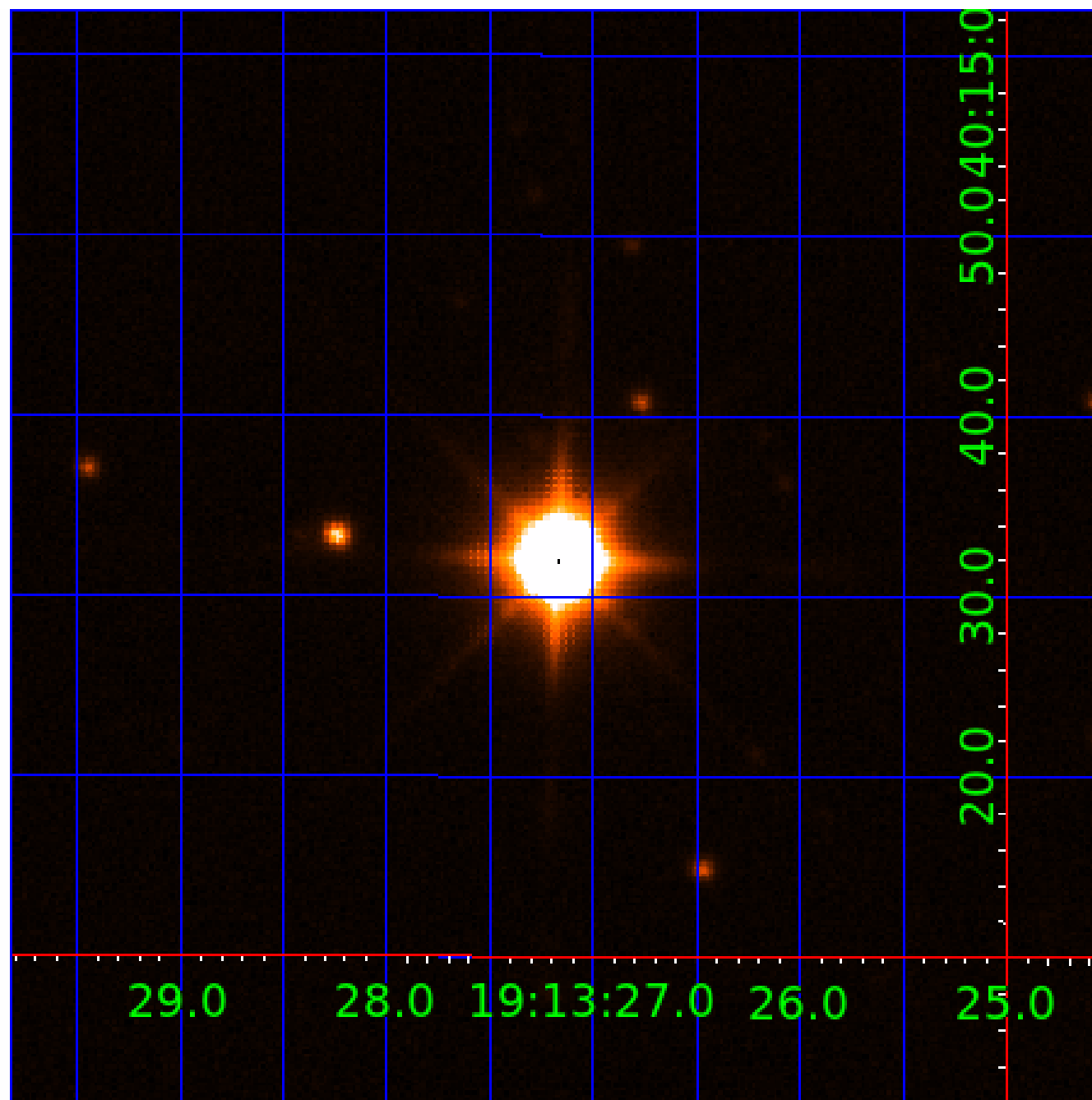


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005088308

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005088308-01	OBS	No	1.523081	132.134297	35.7	3.368	10.5	11.5	12.61	6513	8.82	0.00
005088308-02	OBS	No	0.868281	132.381449	26.0	4.357	11.3	10.7	12.61	6513	6.50	0.00
005088308-03	OBS	No	0.868358	132.090618	67.7	6.098	13.5	20.2	12.61	6513	10.73	0.00
005088308-04	OBS	No	1.188842	132.543448	184.9	0.694	9.0	6.0	12.61	6513	20.47	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005088308-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005088308-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005088308-03	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED—EPHEM_MATCH
005088308-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

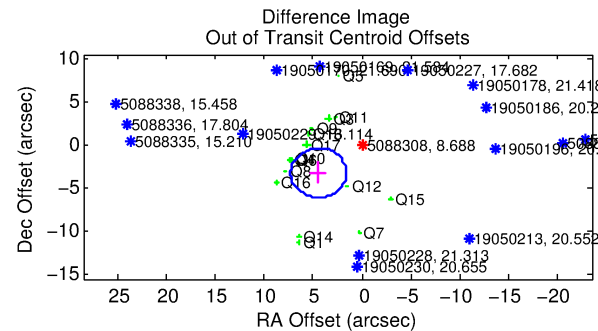
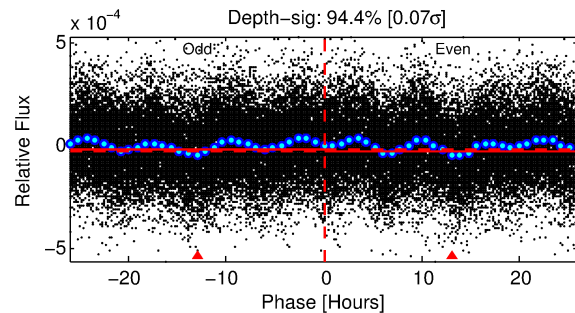
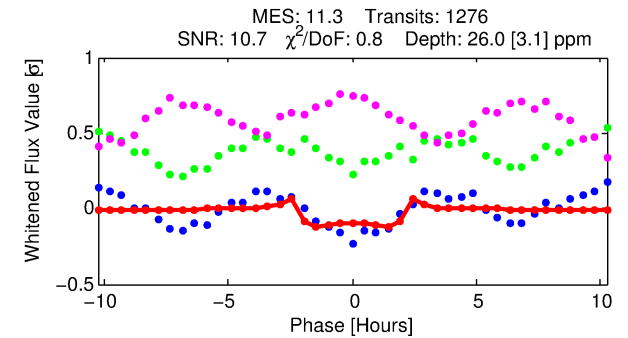
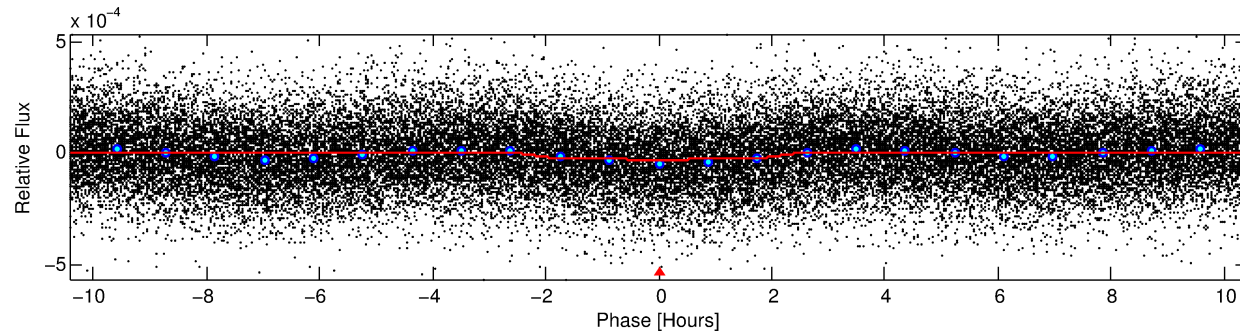
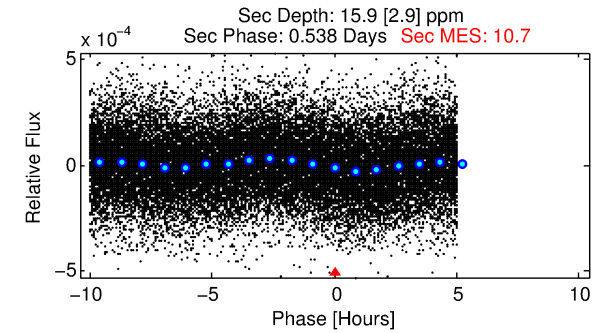
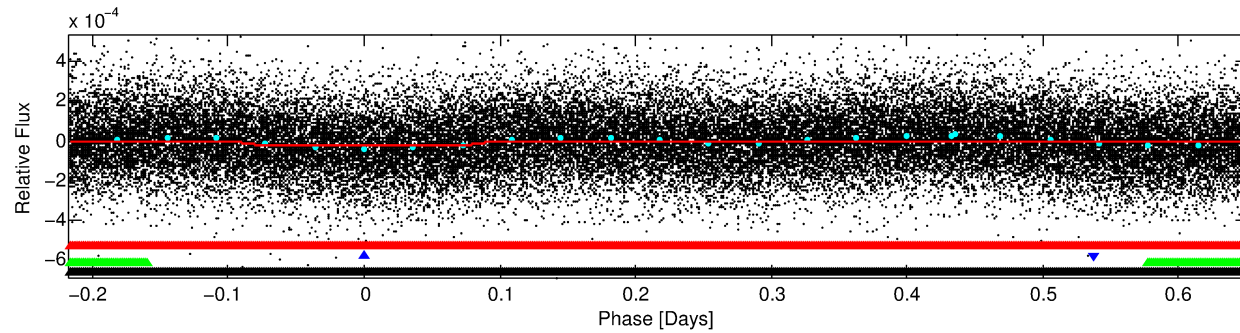
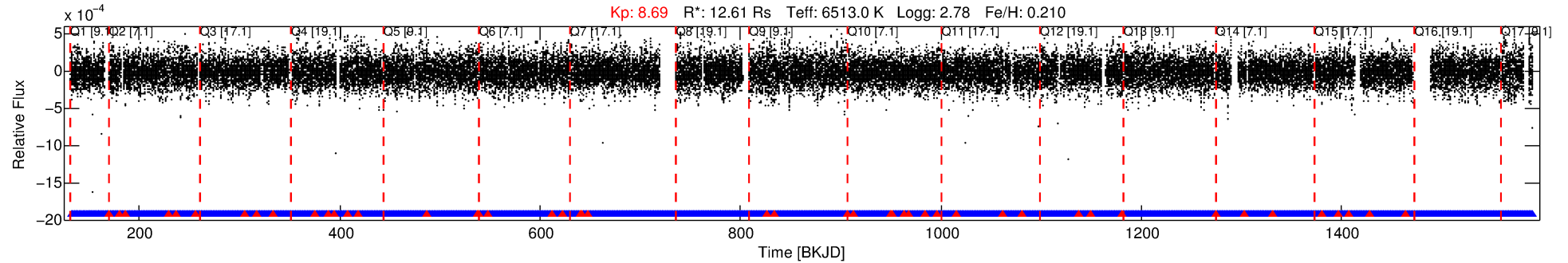
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005088308-02

No Significant Match Found

# DV One-Page Summary

KIC: 5088308 Candidate: 2 of 4 Period: 0.868 d



## DV Fit Results:

Period = 0.86828 [0.00001] d  
Epoch = 132.3814 [0.0021] BKJD  
Rp/R\* = 0.0047 [0.0016]  
a/R\* = 1.62 [1.77]  
b = 0.24 [7.07]  
Seff = N/A  
Teq = N/A  
Rp = 6.50 [2.72] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

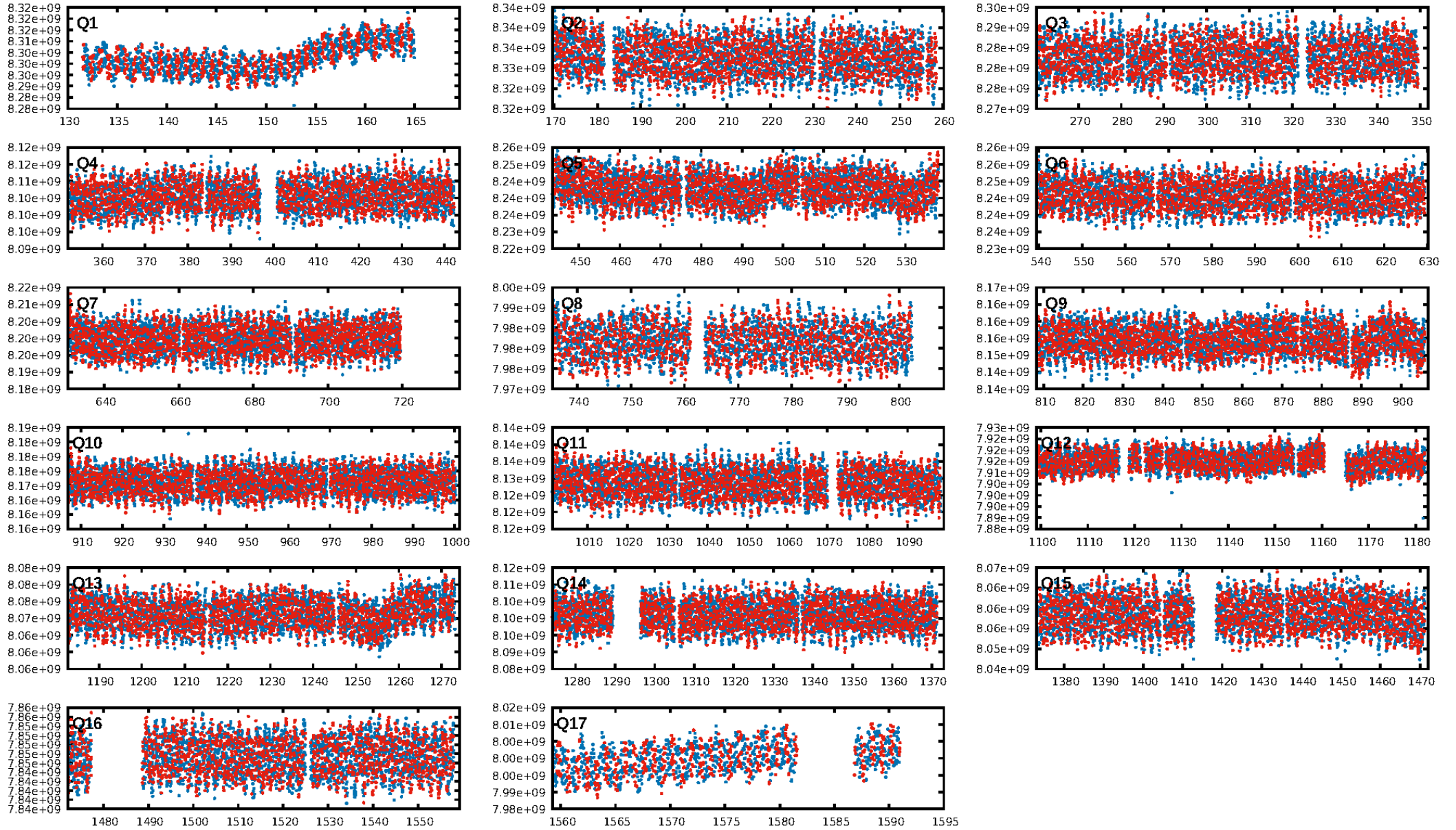
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.09e-37  
RollingBand-fgt: 0.96 [1170/1218]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.0%  
Centroid-so: 2.934 arcsec [3.66σ]  
OotOffset-rm: 5.499 arcsec [5.79σ]  
KicOffset-rm: 6.559 arcsec [5.55σ]  
OotOffset-st: 3/4/4/5 [16]  
KicOffset-st: 3/4/4/5 [16]  
DiffImageQuality-fgm: 0.00 [0/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:28:28 Z

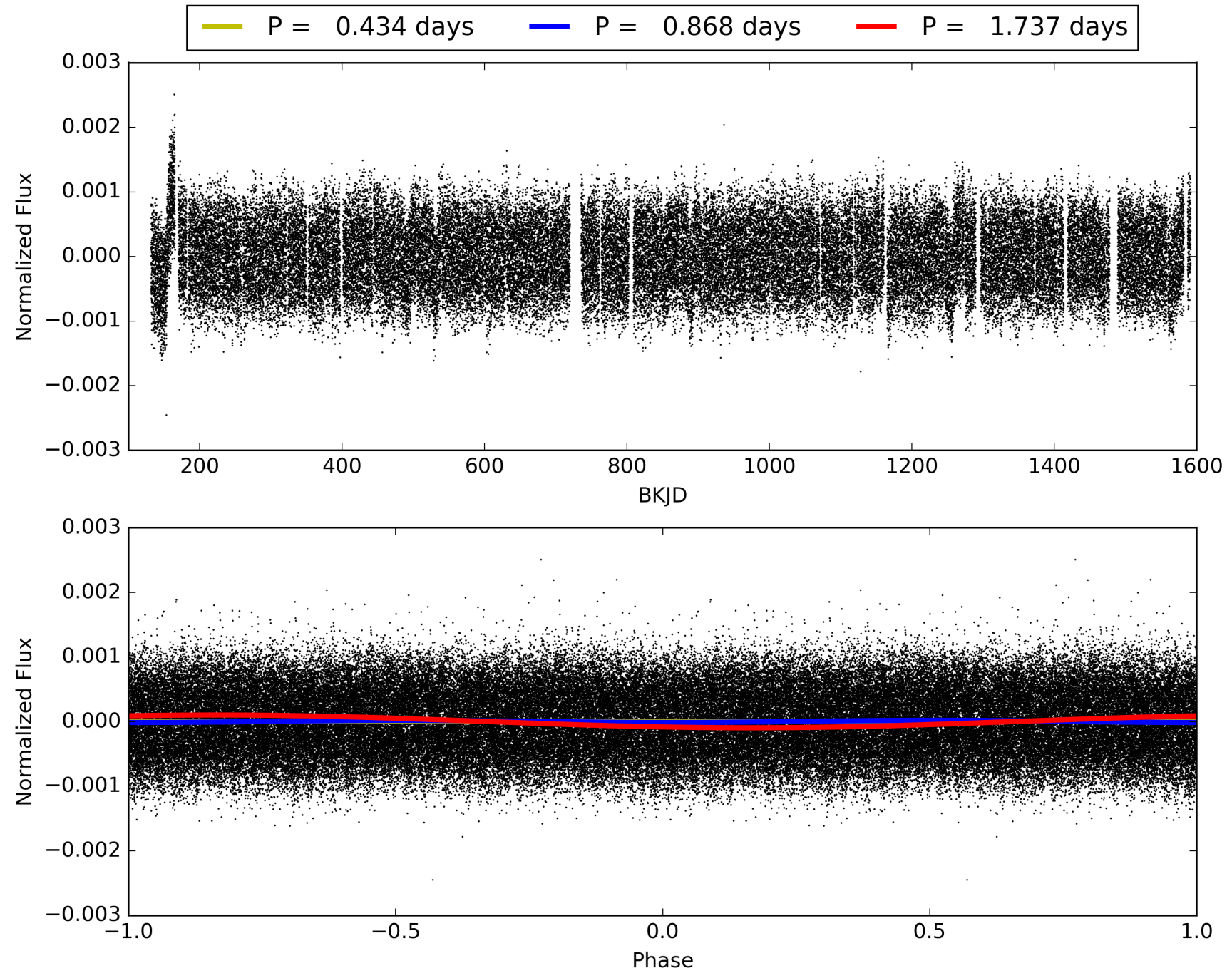
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005088308-02, PDC Light Curves



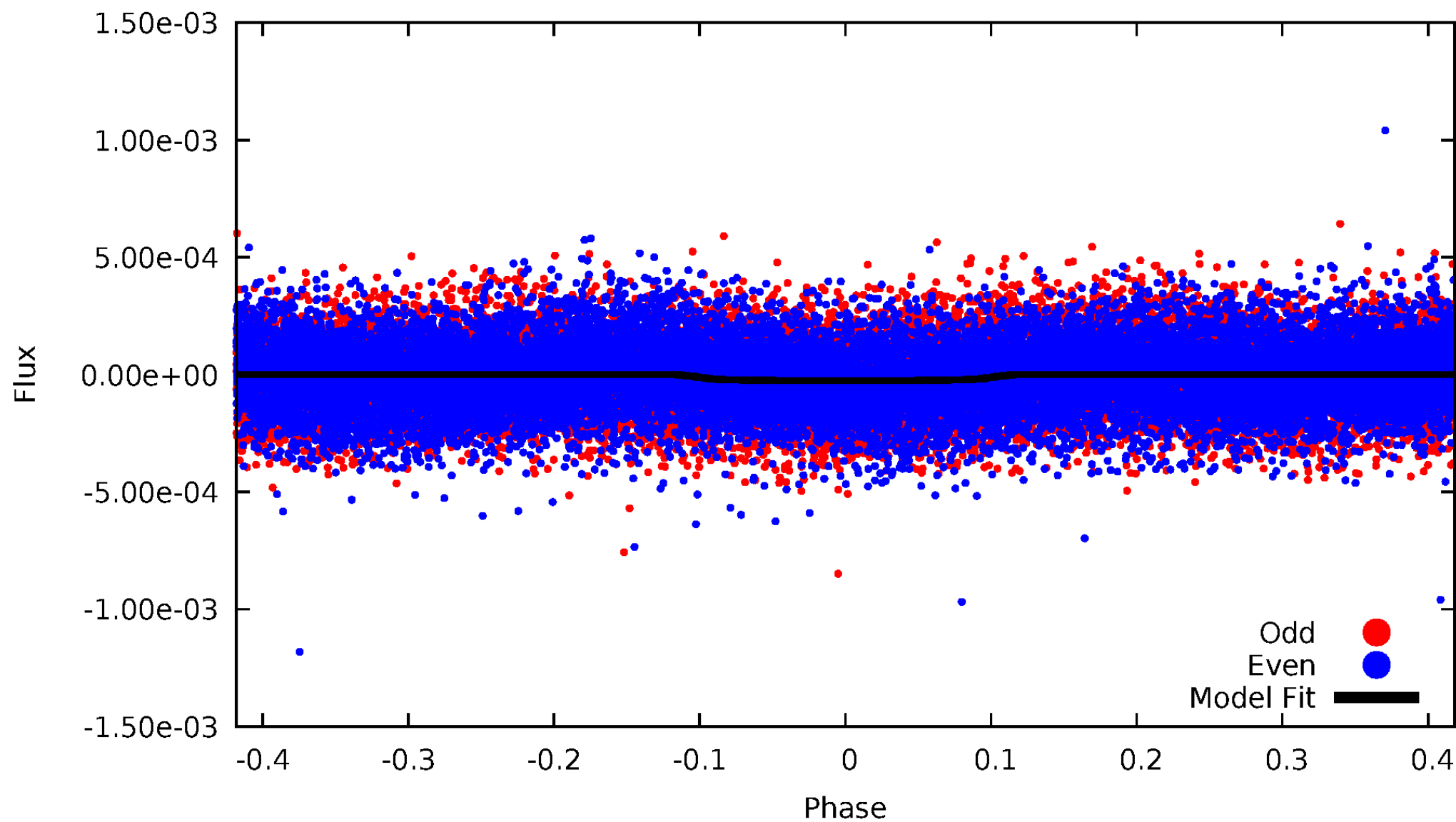


# TCE 005088308-02



# DV Odd/Even

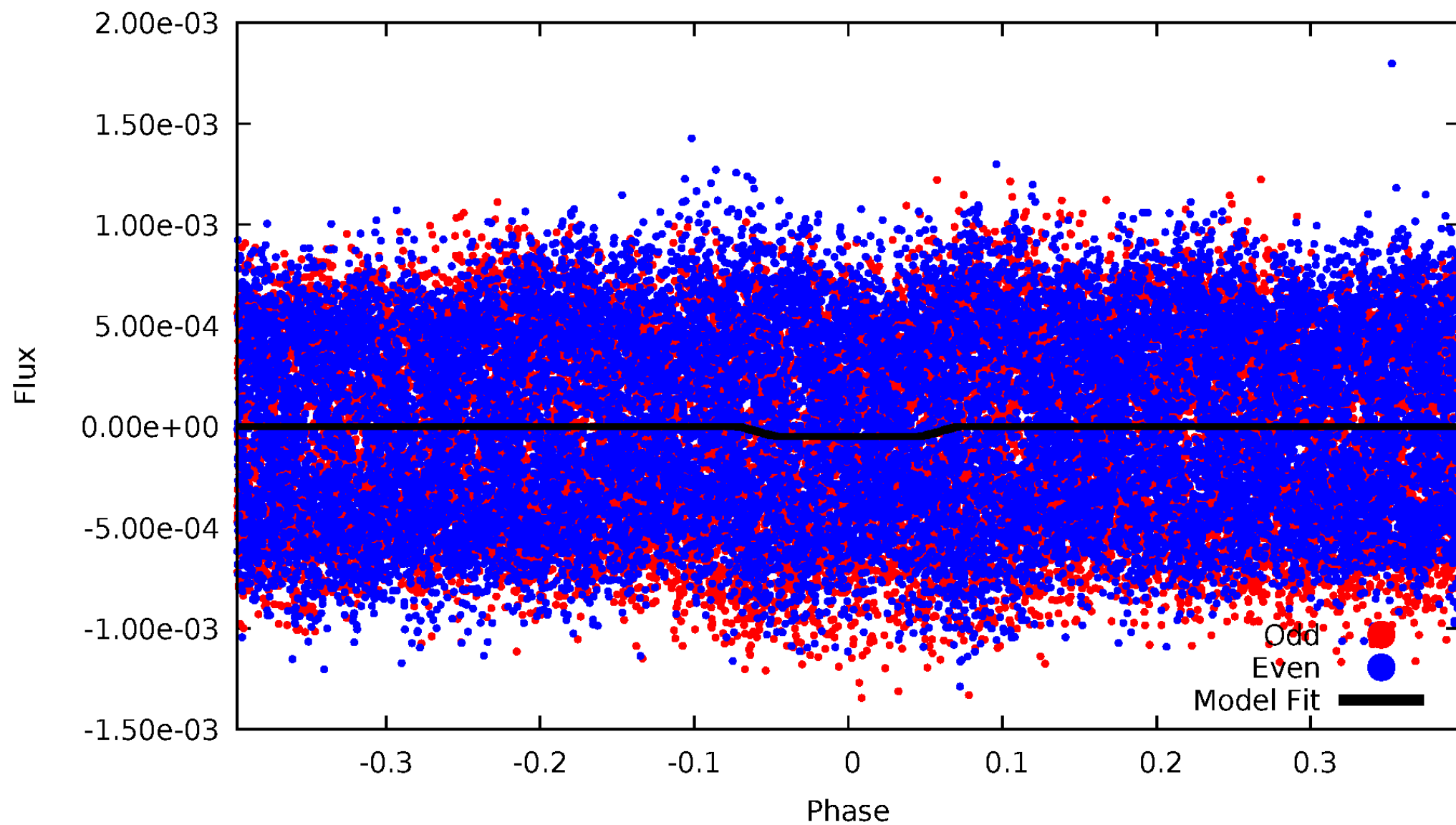
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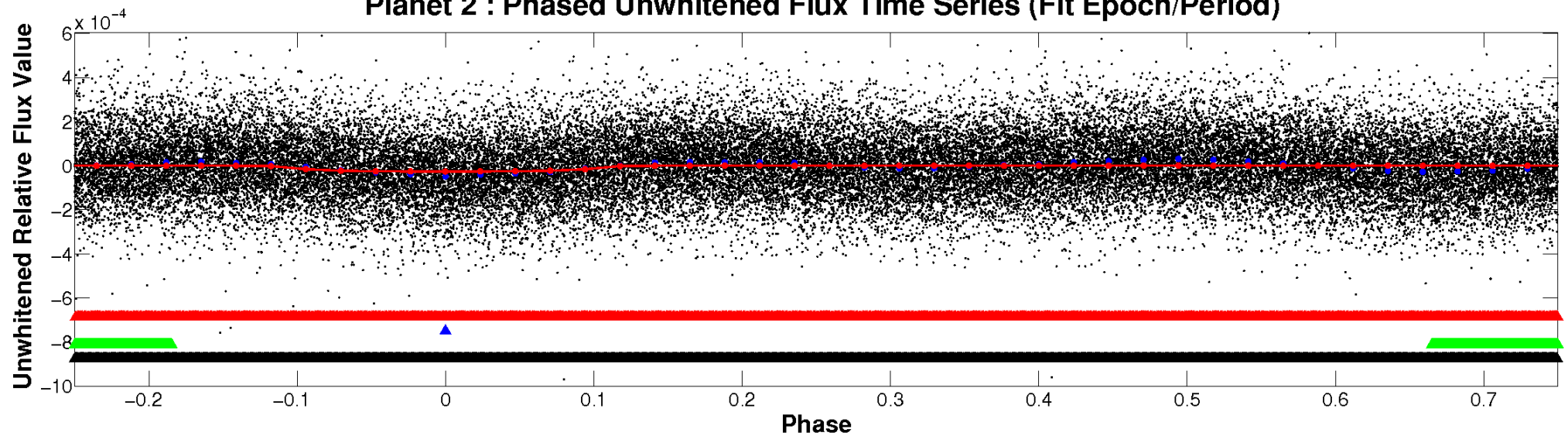
# ALT Odd/Even

TCE 005088308-02

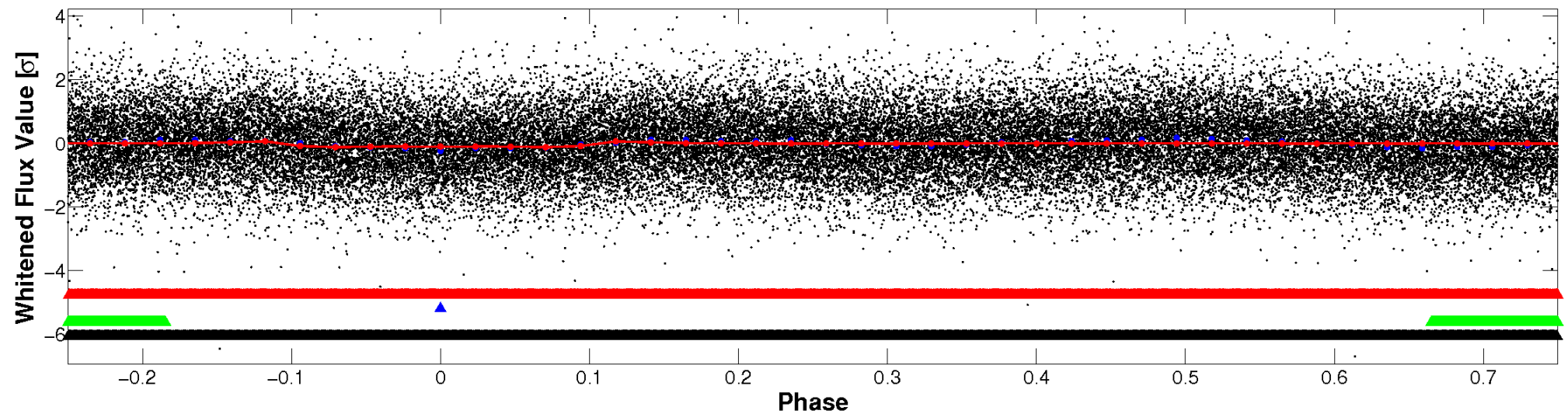


# Non-Whitened Vs. Whitened Light Curve

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

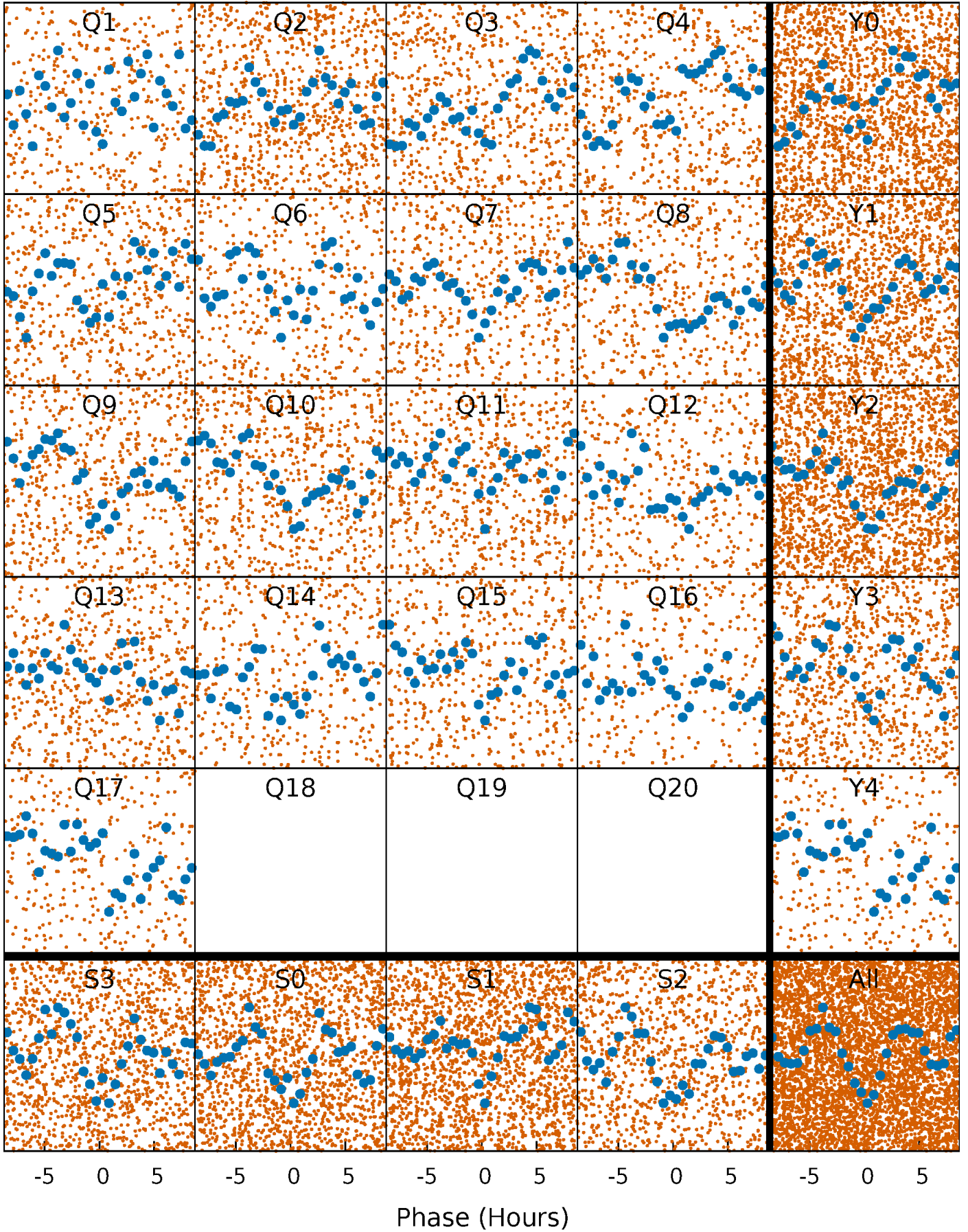


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

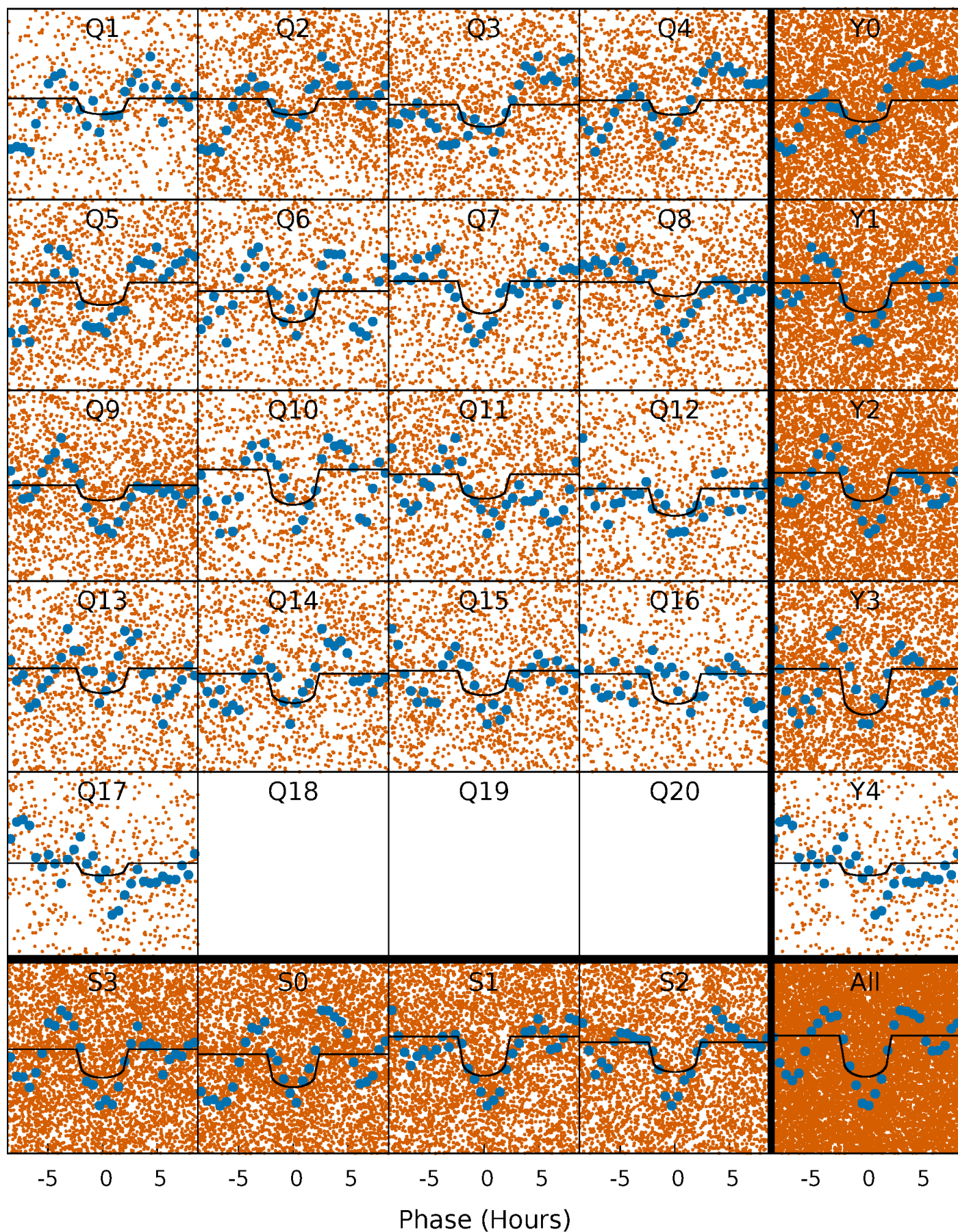
TCE 005088308-02   P= 0.868281 Days    $T_0=132.381449$  (BKJD)





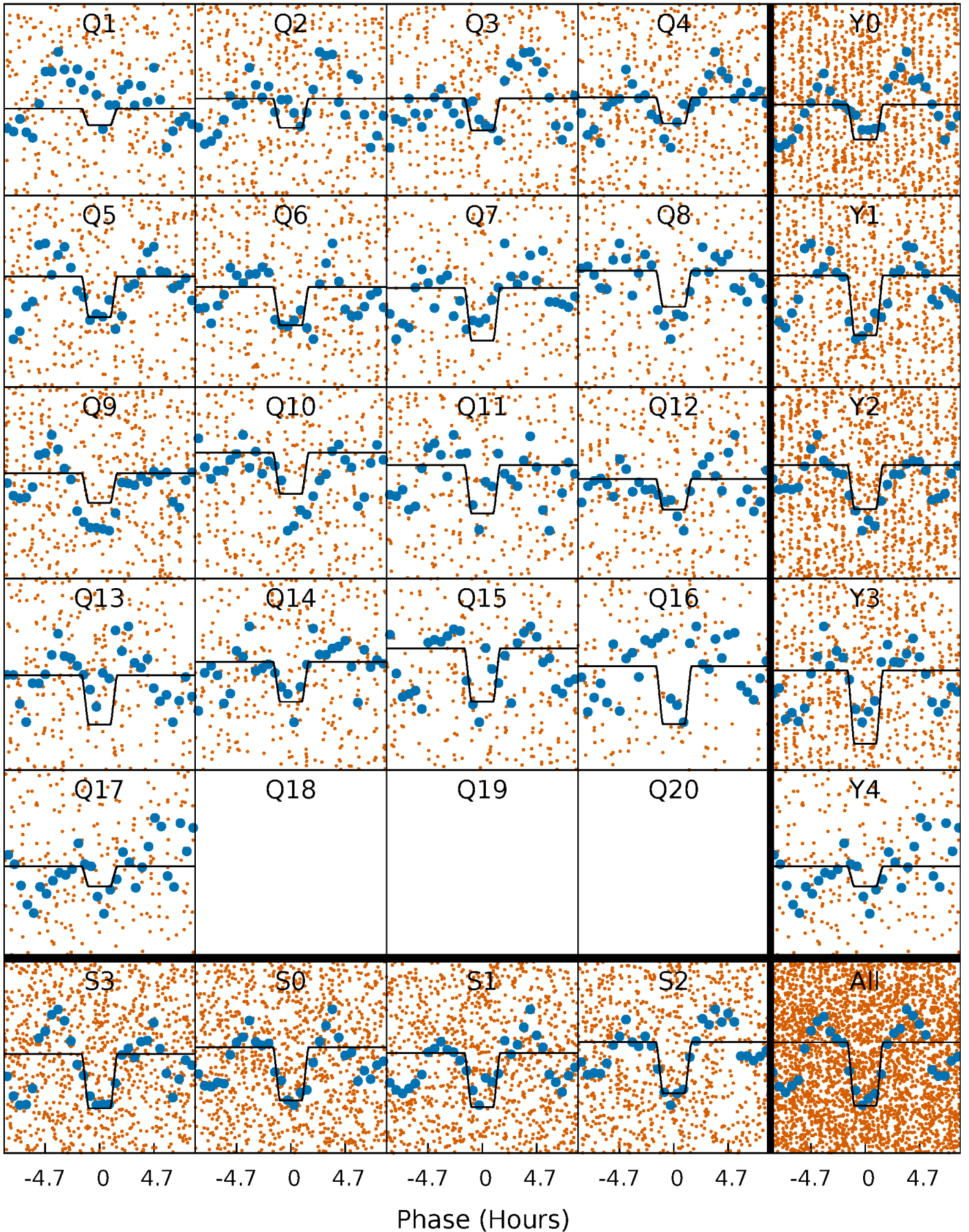
# DV Quarter-Phased Transit Curves

TCE 005088308-02   P= 0.868281 Days    $T_0=132.381449$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005088308-02   P= 0.868312 Days    $T_0=132.368044$  (BKJD)

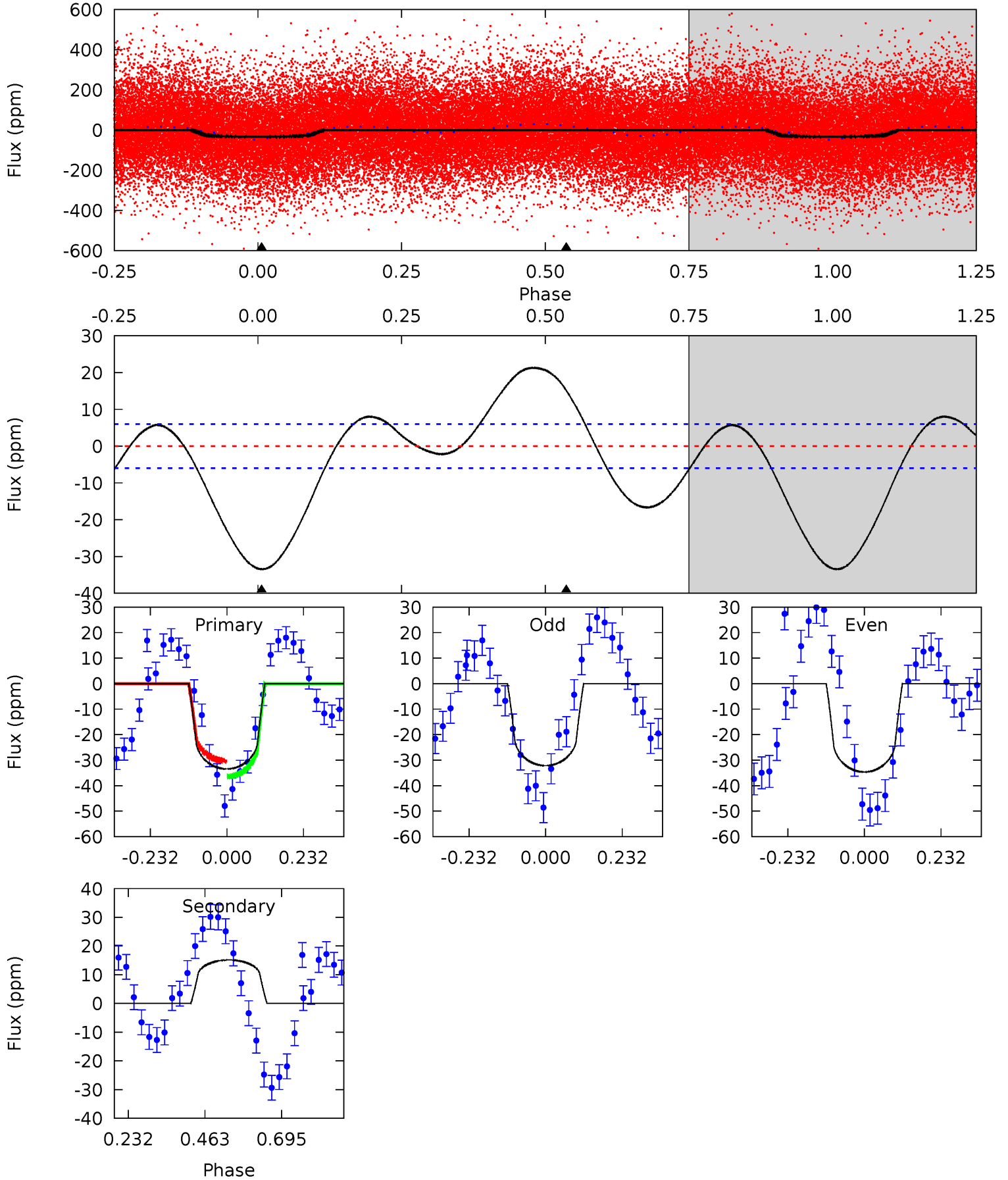




# DV Model-Shift Uniqueness Test

005088308-02, P = 0.868281 Days, E = 130.644887 Days

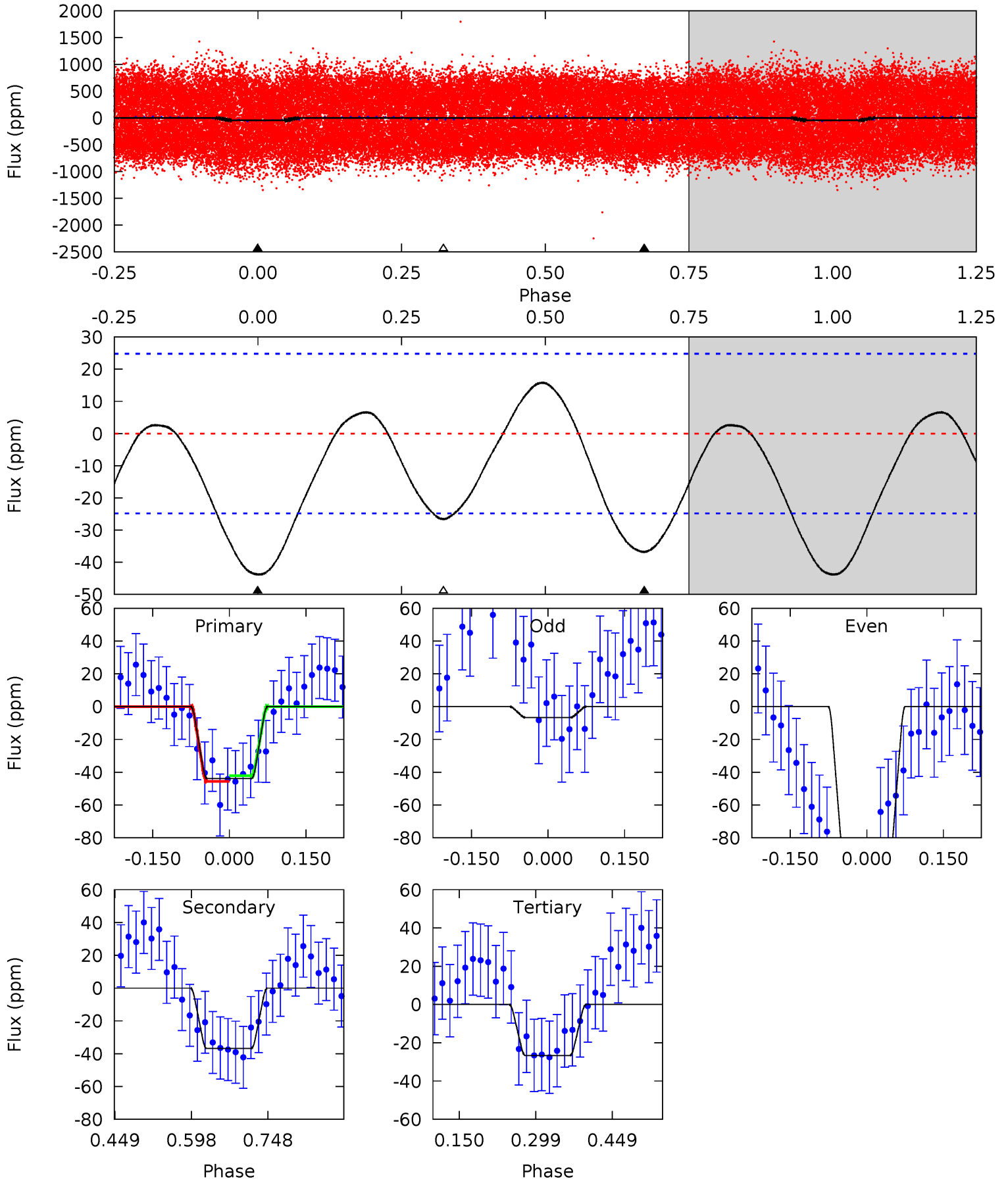
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.5	-11.1	0	0	4.39	1.20	1.67	24.5	24.5	-11.1	-11.1	0.91	1.10	0.39	2.25



# Alt Model-Shift Uniqueness Test

005088308-02, P = 0.868312 Days, E = 131.499732 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
7.92	6.65	4.81	0	4.48	1.44	2.45	3.11	7.92	1.84	6.65	7.77	1.28	0.27	0.31



### Stellar Parameters For KIC 005088308

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6513^{+411}_{-823}$	$2.782^{+0.175}_{-0.094}$	$0.210^{+0.150}_{-0.150}$	$12.613^{+1.350}_{-3.149}$	$3.511^{+0.033}_{-0.593}$	$0.002^{+0.002}_{-0.001}$
	+6%/-13%	+6%/-3%	+71%/-71%	+11%/-25%	+1%/-17%	+98%/-25%
Source	SPE4	SPE4	SPE4	DSEP		

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

### Secondary Eclipse Parameters for KIC 005088308-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$15 \pm 1$	$6.37^{+2.38}_{-2.19}$	$8489^{+708}_{-1079}$	$-7959^{+1227}_{-1237}$	$-0.147^{+0.069}_{-0.193}$
Alt.	$-37 \pm 6$	$9.36^{+2.44}_{-2.31}$	$8490^{+838}_{-1076}$	$-5504^{+2122}_{-1033}$	$0.163^{+0.125}_{-0.059}$

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

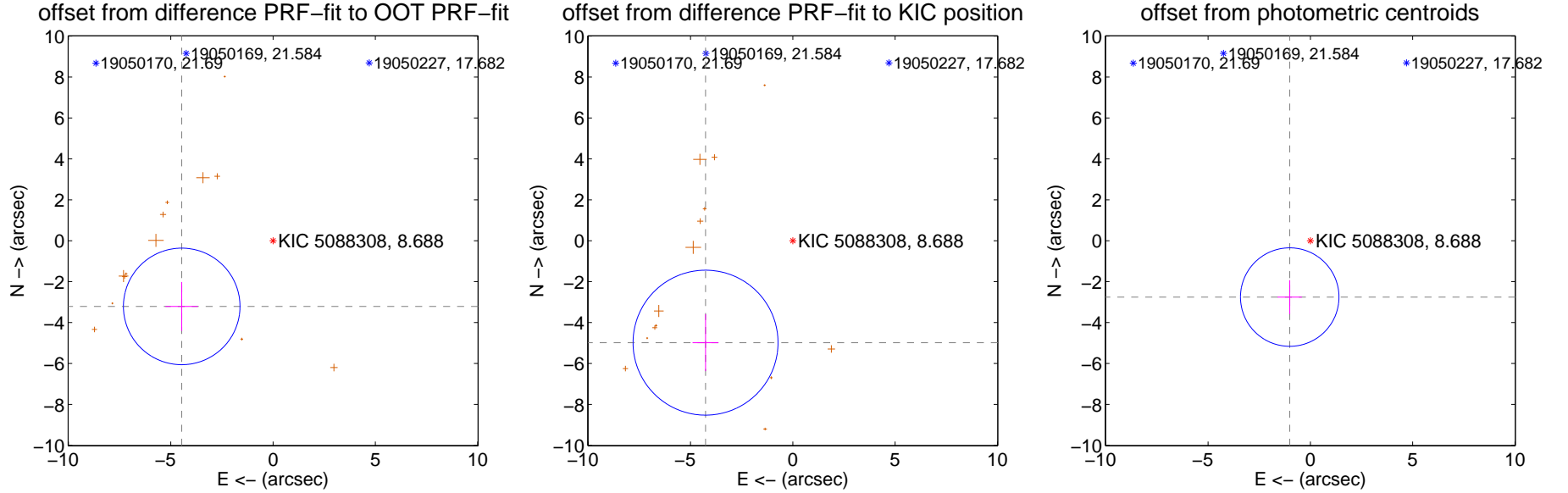
## DV Centroid Data

Supplemental centroid analysis for 005088308-02. **Kepler magnitude: 8.69.** Transit SNR 10.67

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

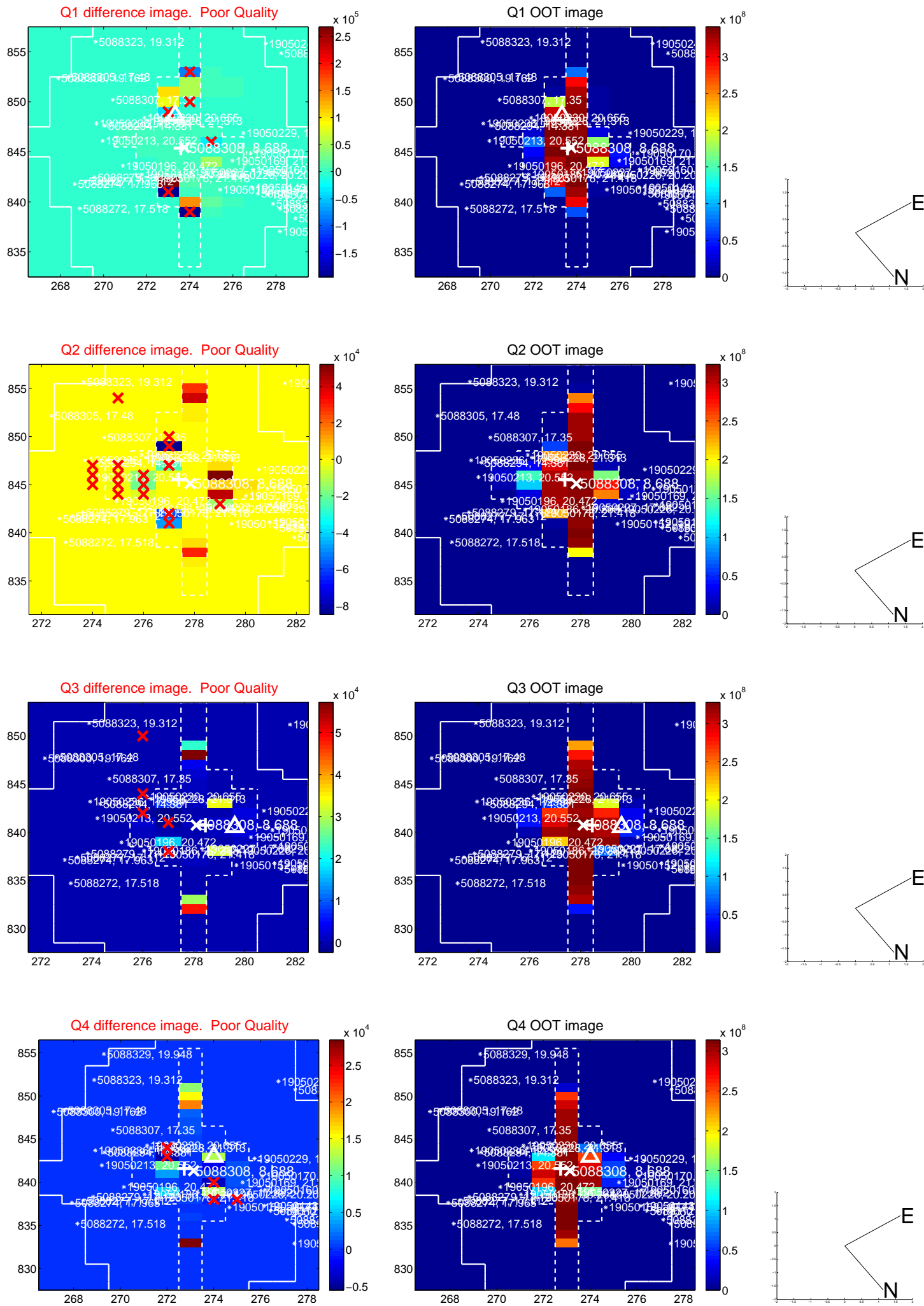
The direct PRF centroid is offset from the target star catalog position by about 0.93 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>5.499 \pm 0.949</math></b>	<b>5.79</b>	$4.465 \pm 0.795$	$-3.211 \pm 1.195$
PRF-fit source offset from KIC position	<b><math>6.559 \pm 1.181</math></b>	<b>5.55</b>	$4.265 \pm 0.633$	$-4.983 \pm 1.393$
photometric centroid source offset	<b><math>2.93 \pm 0.80</math></b>	<b>3.66</b>	$1.01 \pm 0.59$	$-2.75 \pm 0.83$



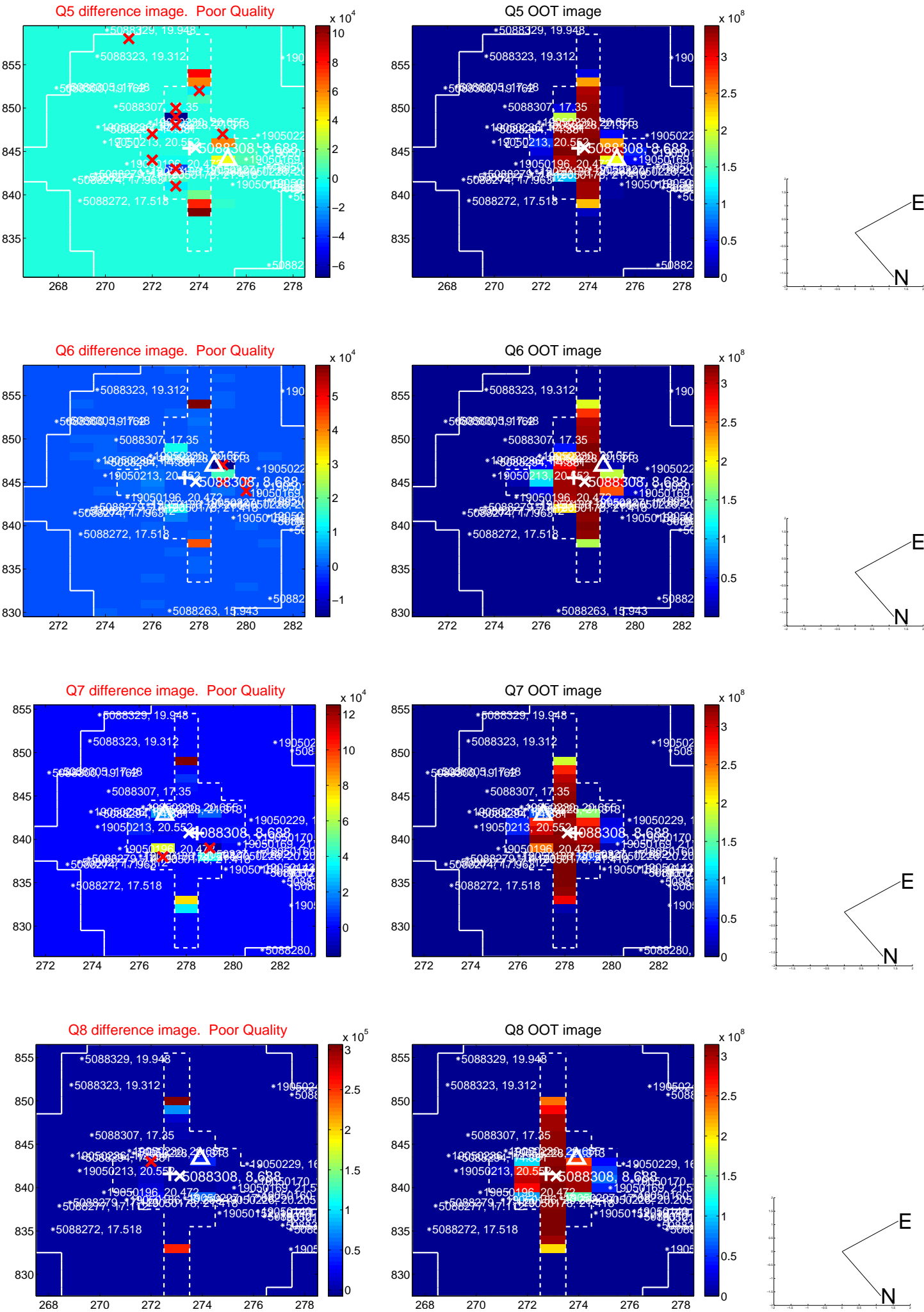
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

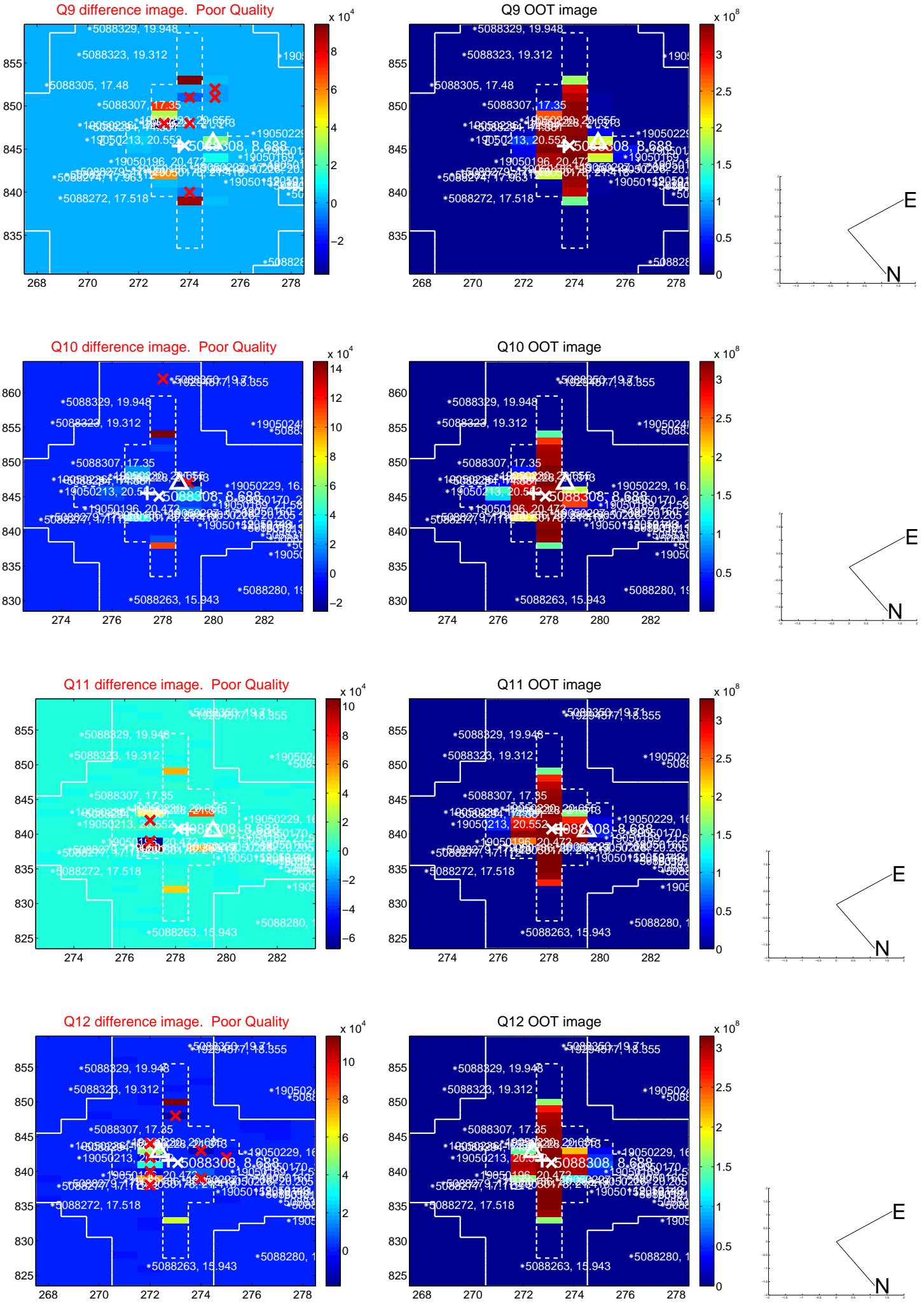




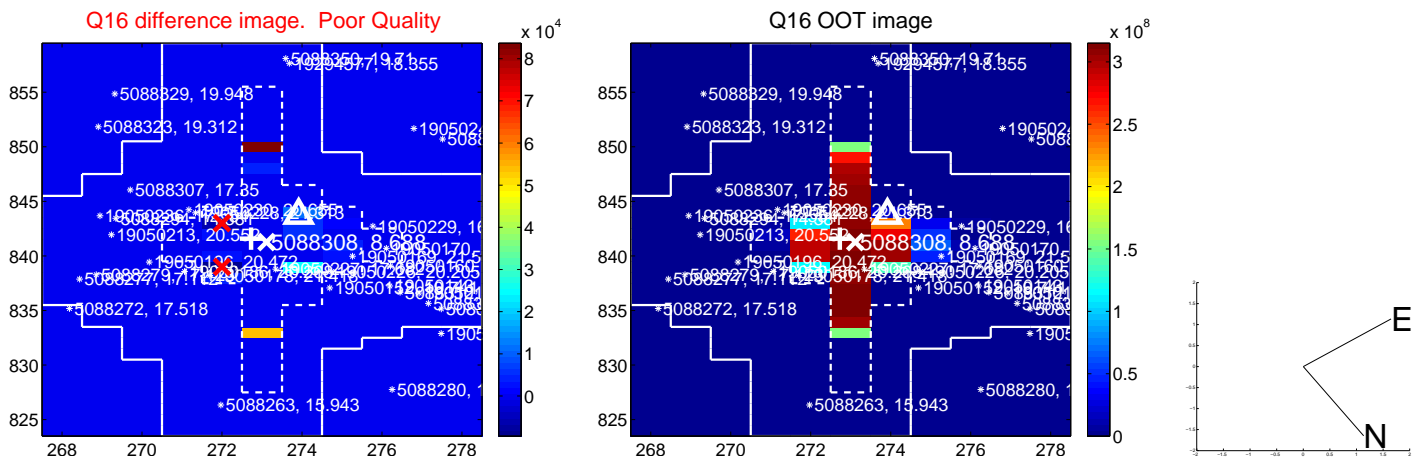
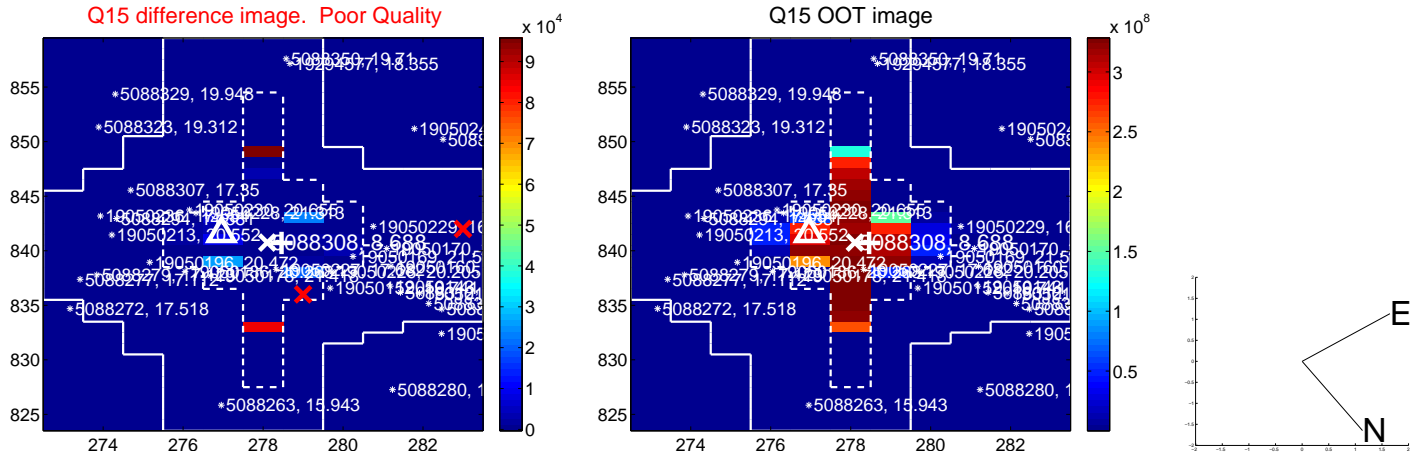
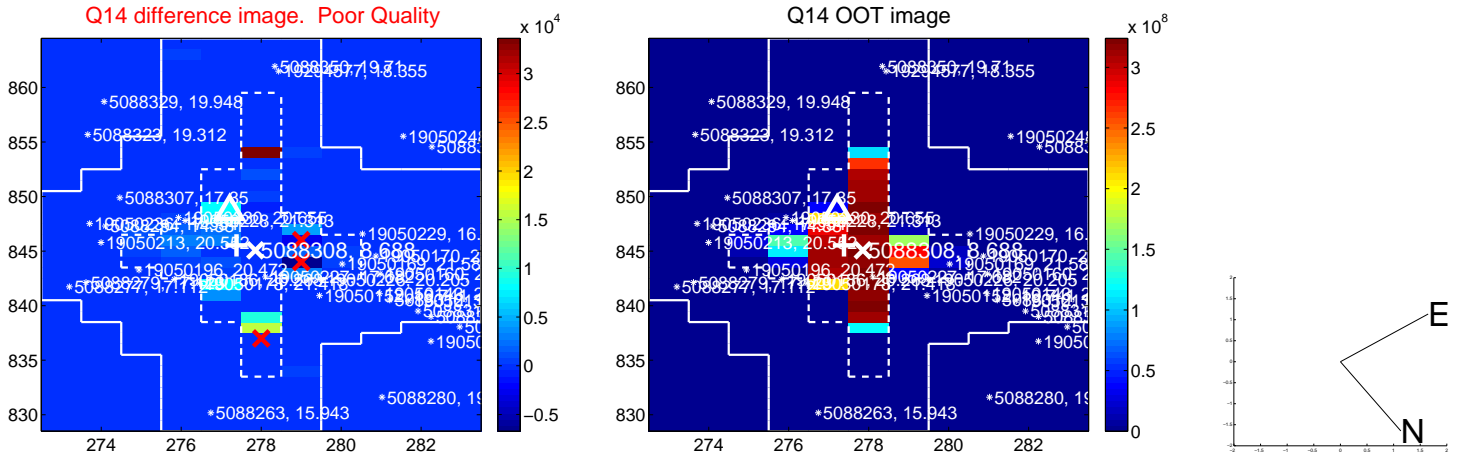
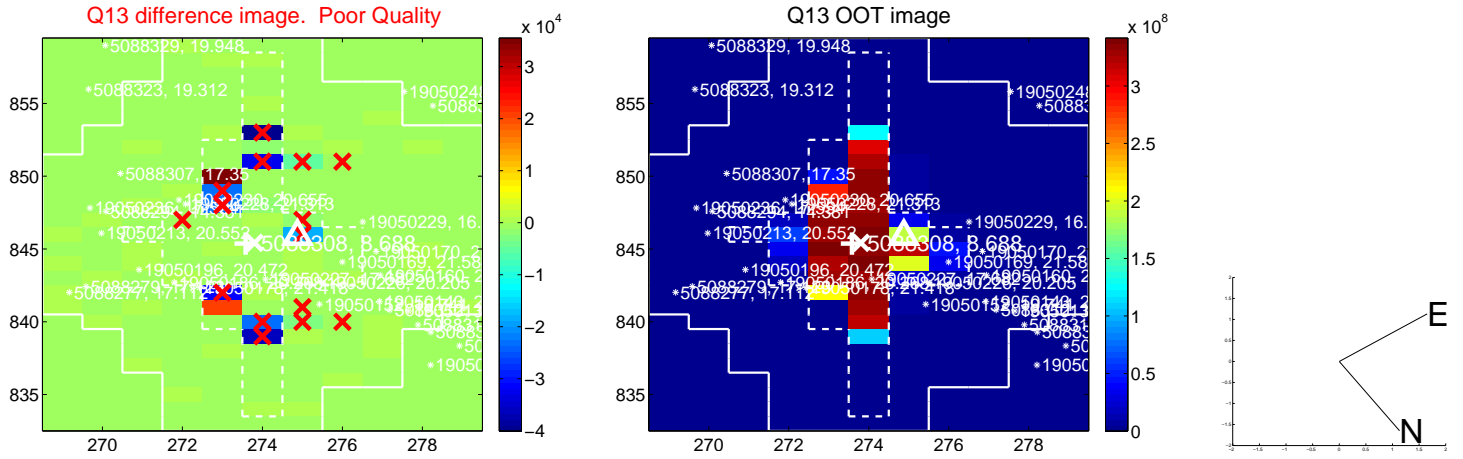
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



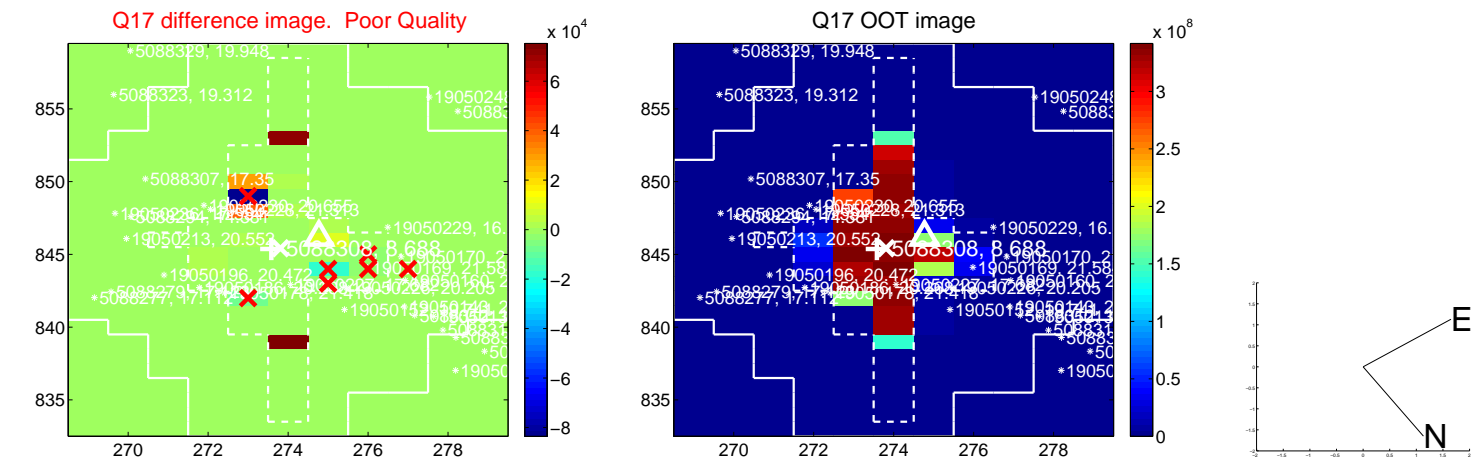
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



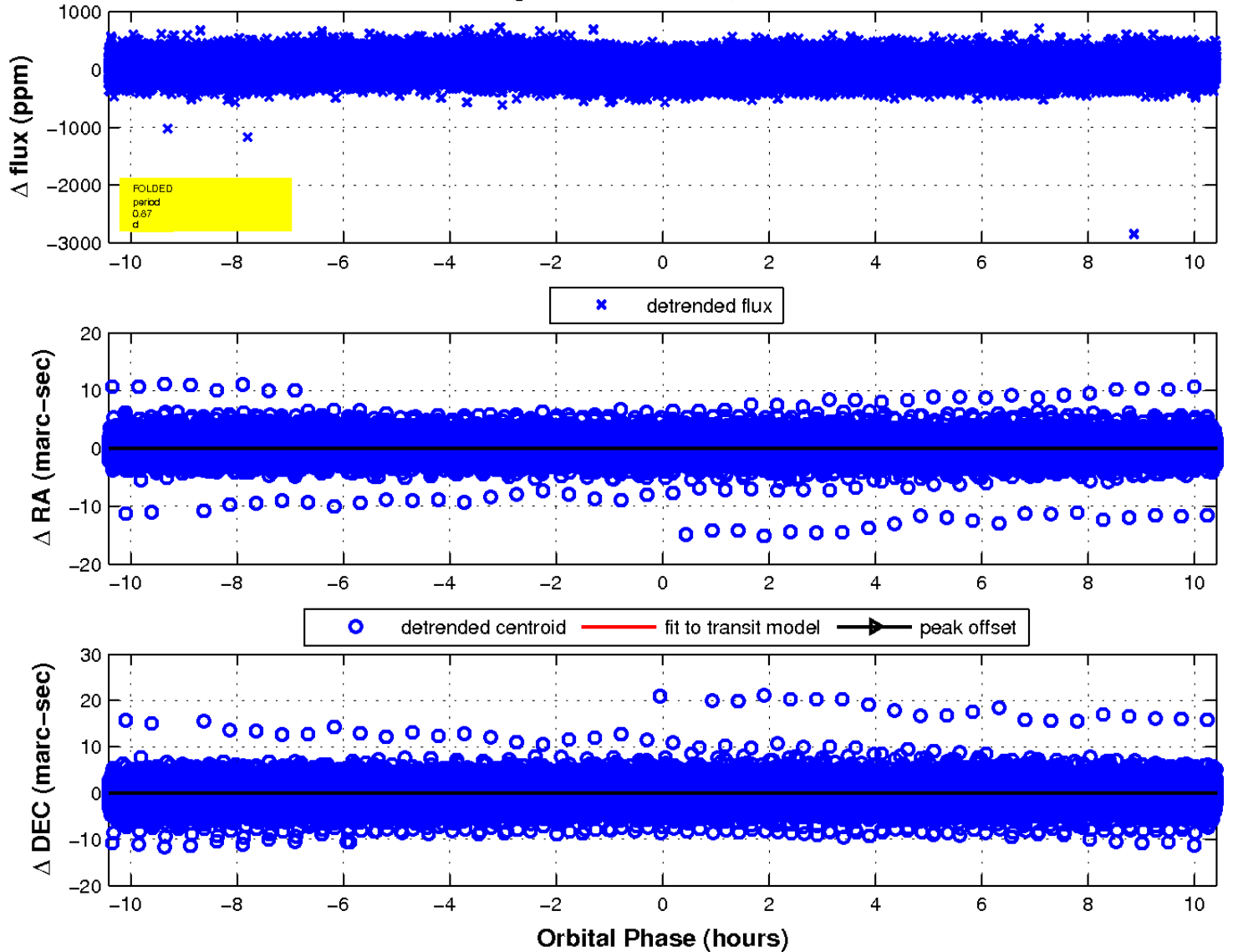
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

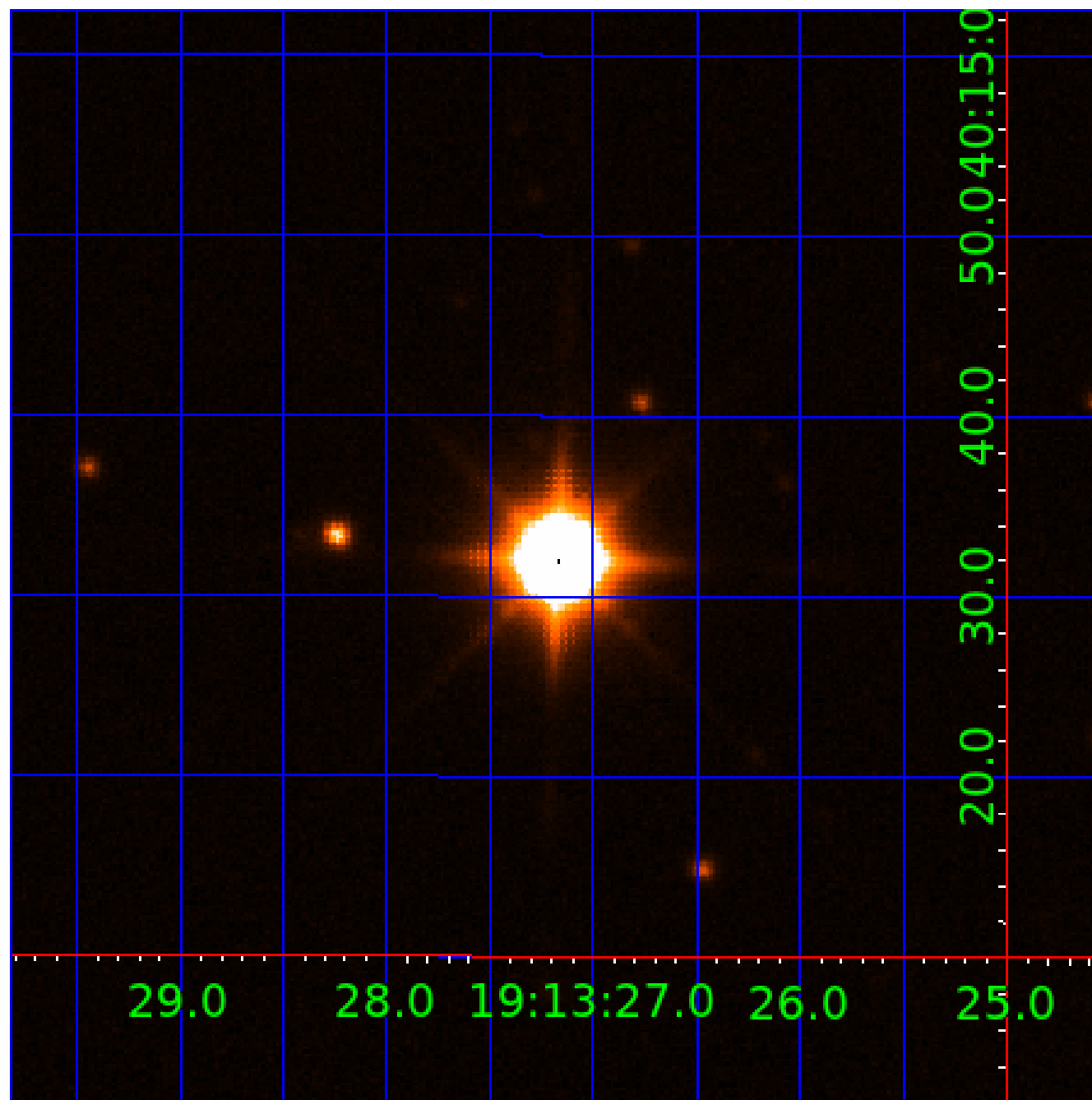


**fluxWeightedCentroids, Planet 2 of 4**



UKIRT Image

Declination





# KIC 005088308

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005088308-01	OBS	No	1.523081	132.134297	35.7	3.368	10.5	11.5	12.61	6513	8.82	0.00
005088308-02	OBS	No	0.868281	132.381449	26.0	4.357	11.3	10.7	12.61	6513	6.50	0.00
005088308-03	OBS	No	0.868358	132.090618	67.7	6.098	13.5	20.2	12.61	6513	10.73	0.00
005088308-04	OBS	No	1.188842	132.543448	184.9	0.694	9.0	6.0	12.61	6513	20.47	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005088308-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005088308-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005088308-03	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED—EPHEM_MATCH
005088308-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—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.

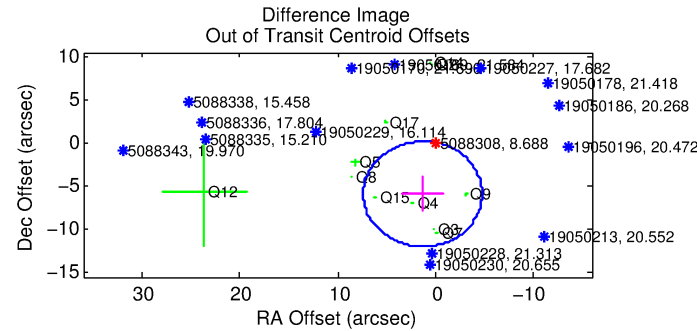
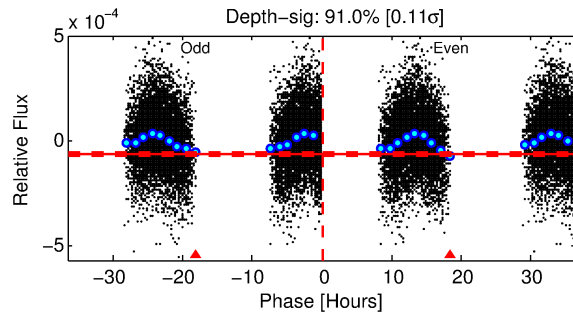
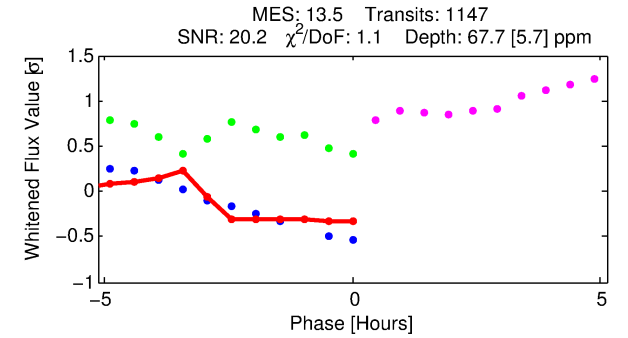
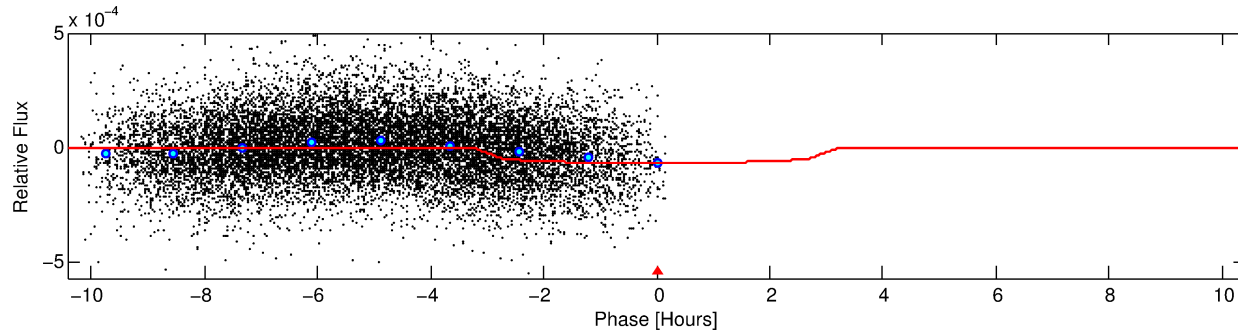
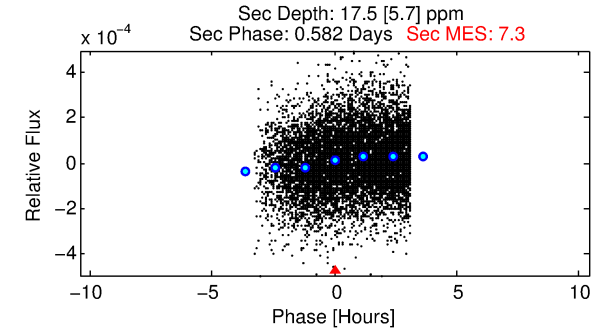
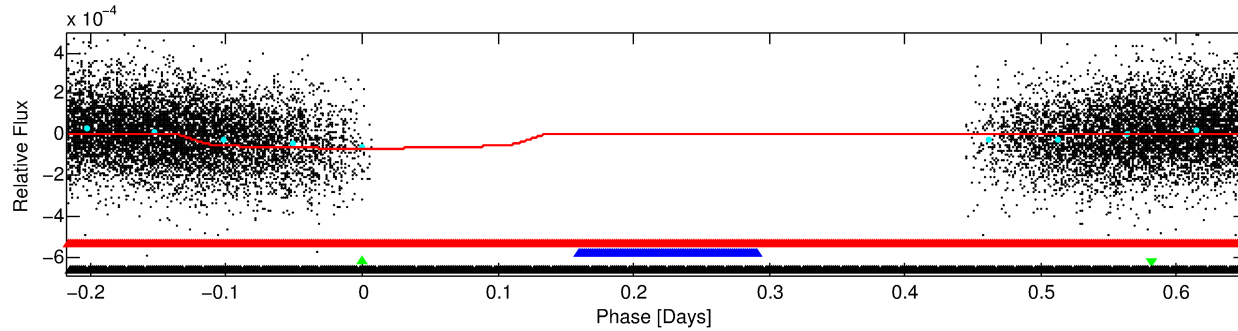
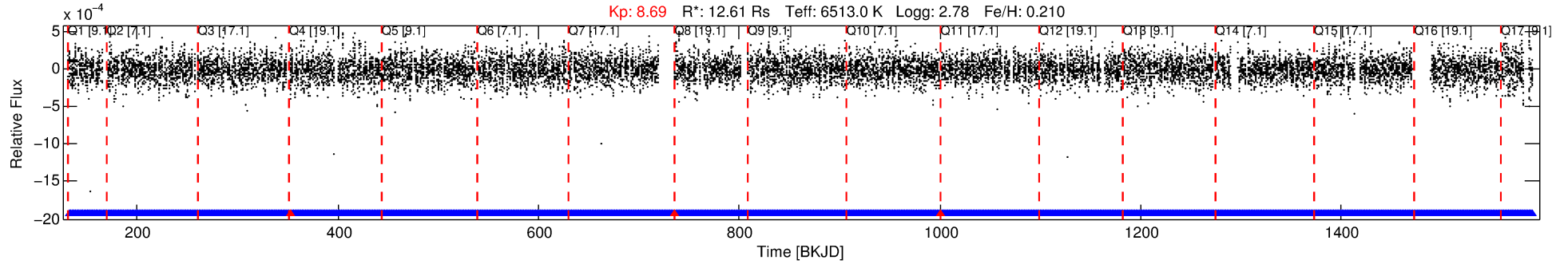
## Ephemeris Match Information For 005088308-03

TCE (1)	KIC	Parent (2)	Parent KIC	P <sub>1</sub> :P <sub>2</sub>	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	m <sub>2</sub>	m <sub>1</sub>	D <sub>2</sub> /D <sub>1</sub>	Mechanism	Flag	$\sigma_P$	$\sigma_T$
005088308-03	5088308	2708.01	5175986	1:1	535.1	76	-111	15.90	8.69	7.91	Direct-PRF	1	3.17	1.79

**Notes:** P<sub>1</sub>:P<sub>2</sub> is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column. m<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 5088308 Candidate: 3 of 4 Period: 0.868 d



## DV Fit Results:

Period = 0.86836 [0.00001] d  
Epoch = 132.0906 [0.0049] BKJD  
Rp/R\* = 0.0078 [0.0024]  
a/R\* = 1.21 [0.62]  
b = 0.51 [2.42]  
Seff = N/A  
Teq = N/A  
Rp = 10.73 [4.23] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

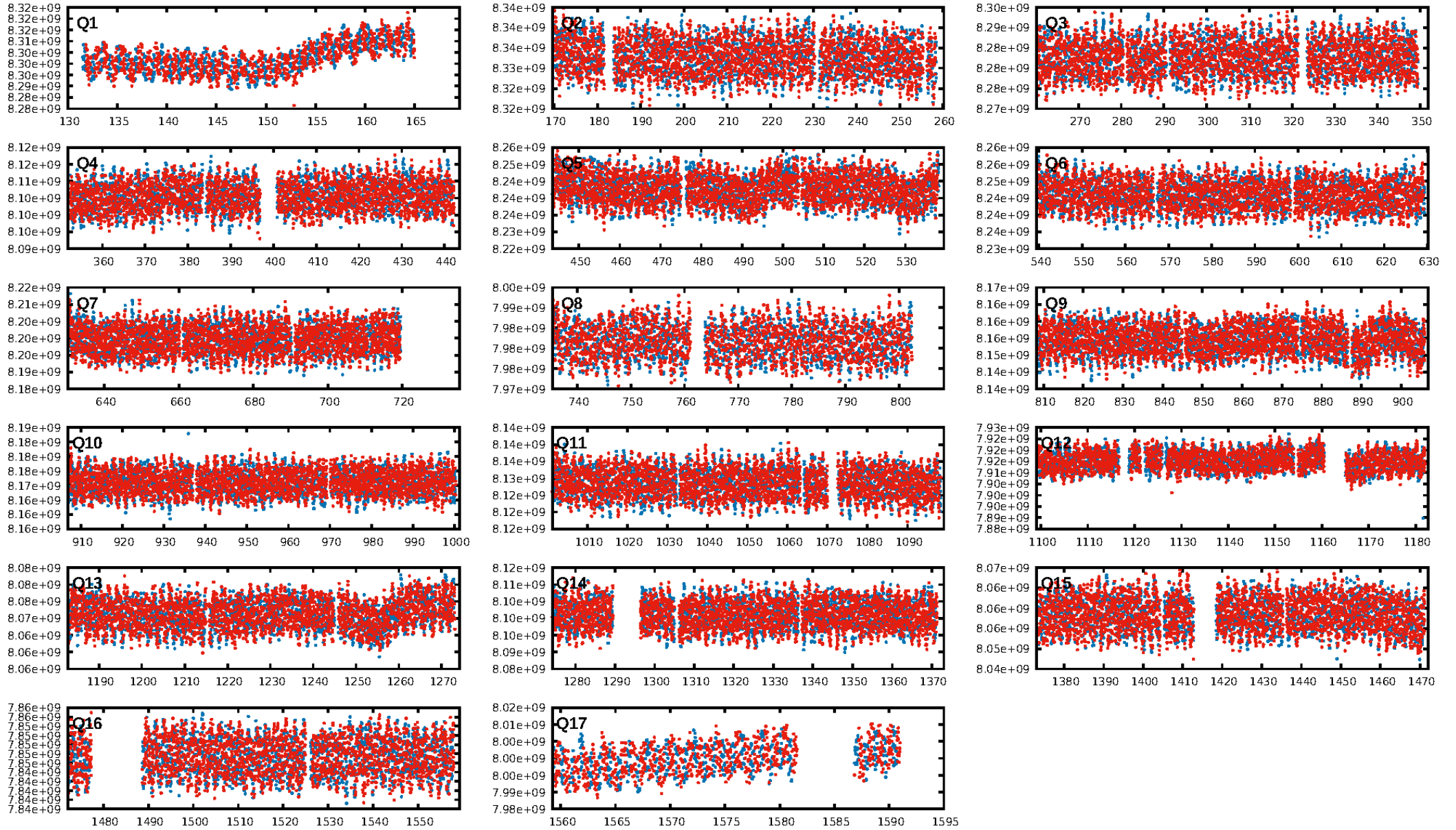
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 79.0% [1.25σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.64e-77  
RollingBand-fgt: 1.00 [1099/1102]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 91.7%  
Centroid-so: 0.953 arcsec [3.07σ]  
OotOffset-rm: 6.049 arcsec [2.98σ]  
KicOffset-rm: 6.135 arcsec [3.42σ]  
OotOffset-st: 2/3/3/3 [11]  
KicOffset-st: 2/3/3/3 [11]  
DiffImageQuality-fgm: 0.00 [0/11]  
DiffImageOverlap-fno: 0.00 [0/17]

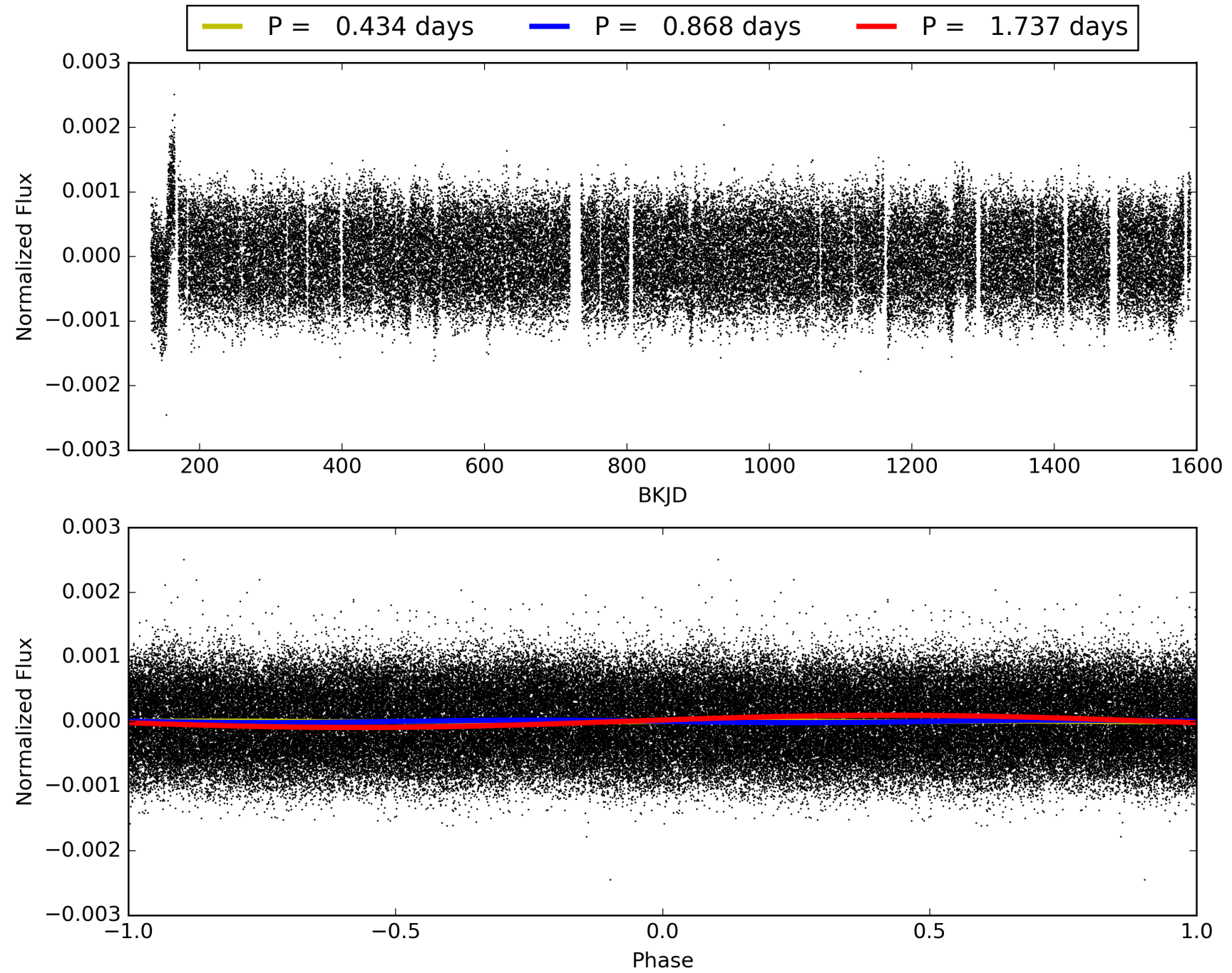
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:28:41 Z

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

# TCE 005088308-03, PDC Light Curves

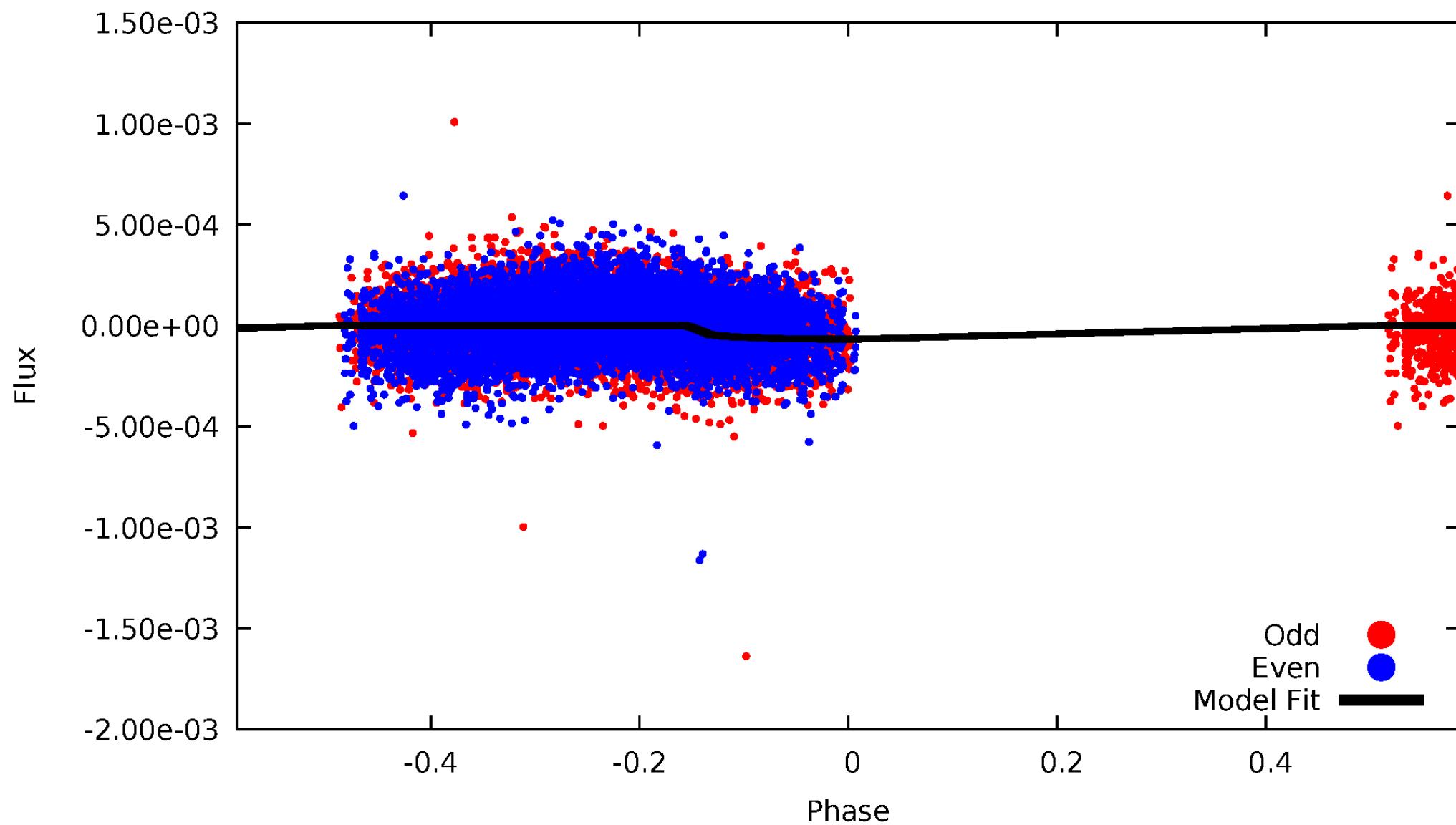


TCE 005088308-03



# DV Odd/Even

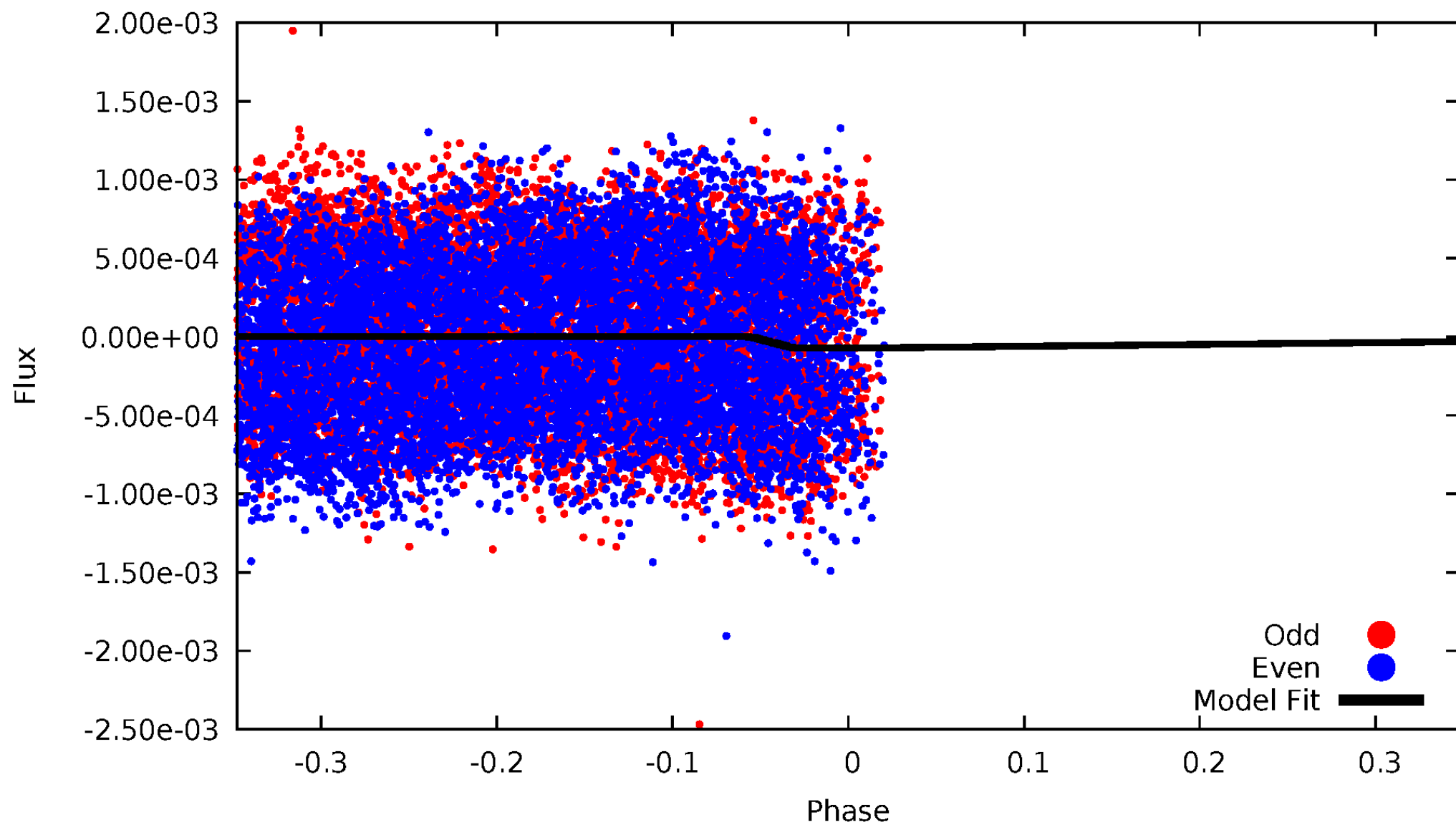
TCE 005088308-03





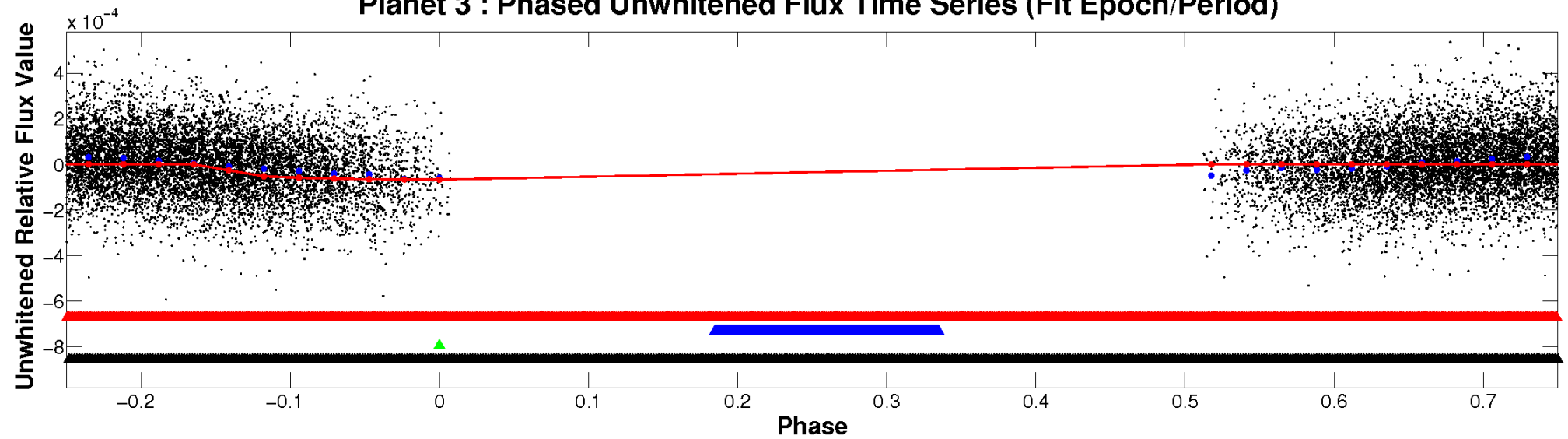
# ALT Odd/Even

TCE 005088308-03

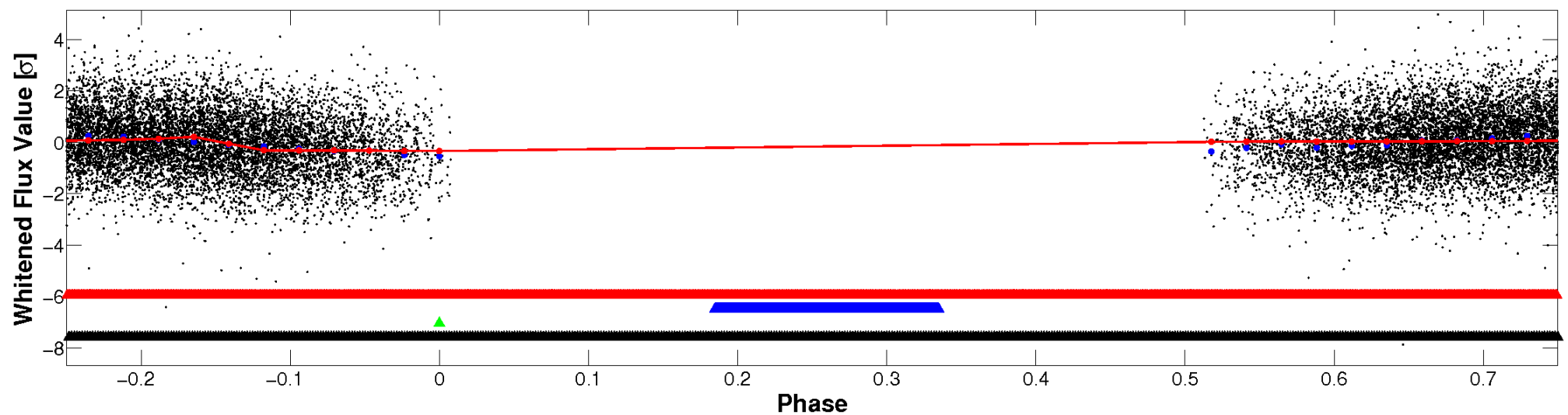


# Non-Whitened Vs. Whitened Light Curve

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

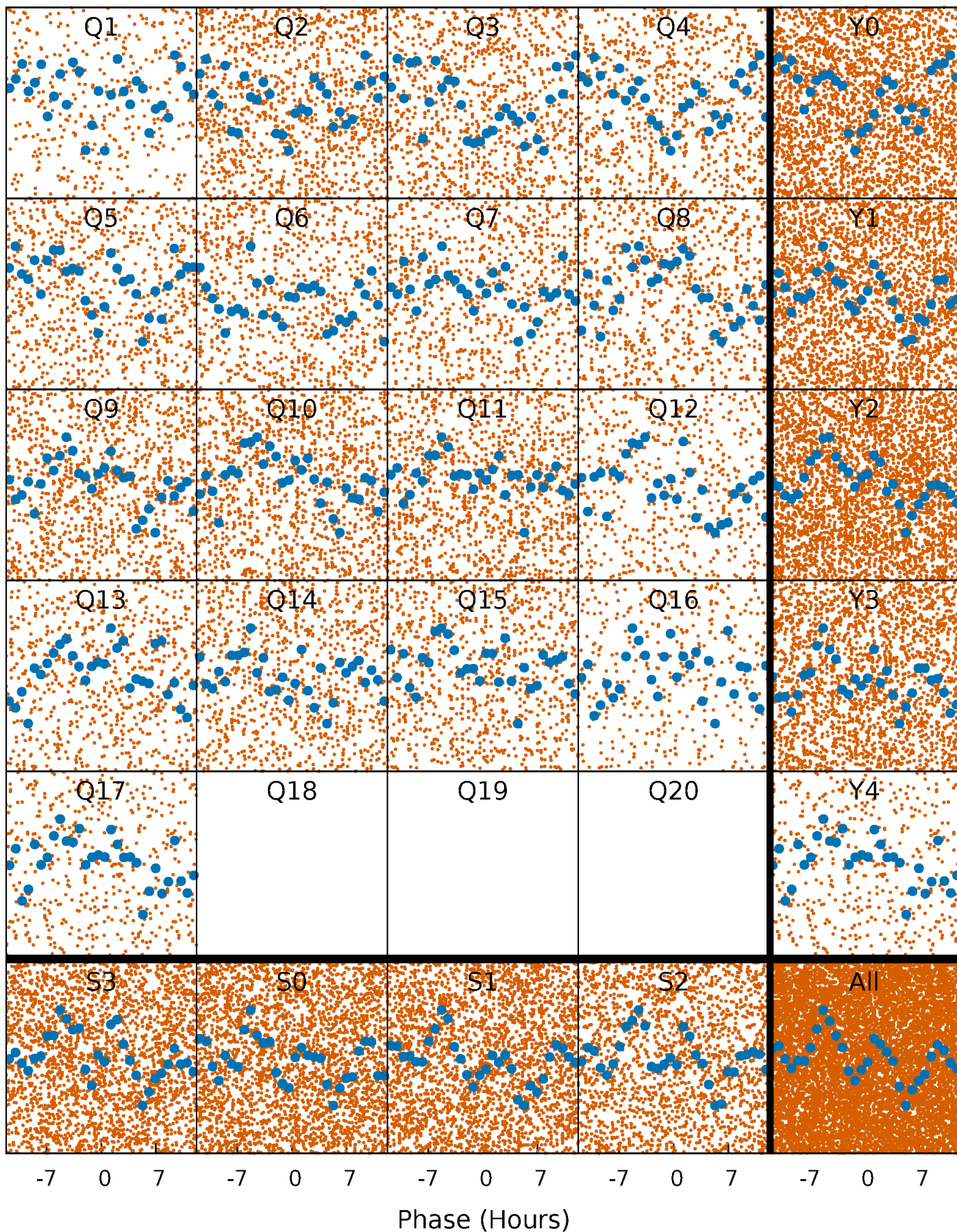


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



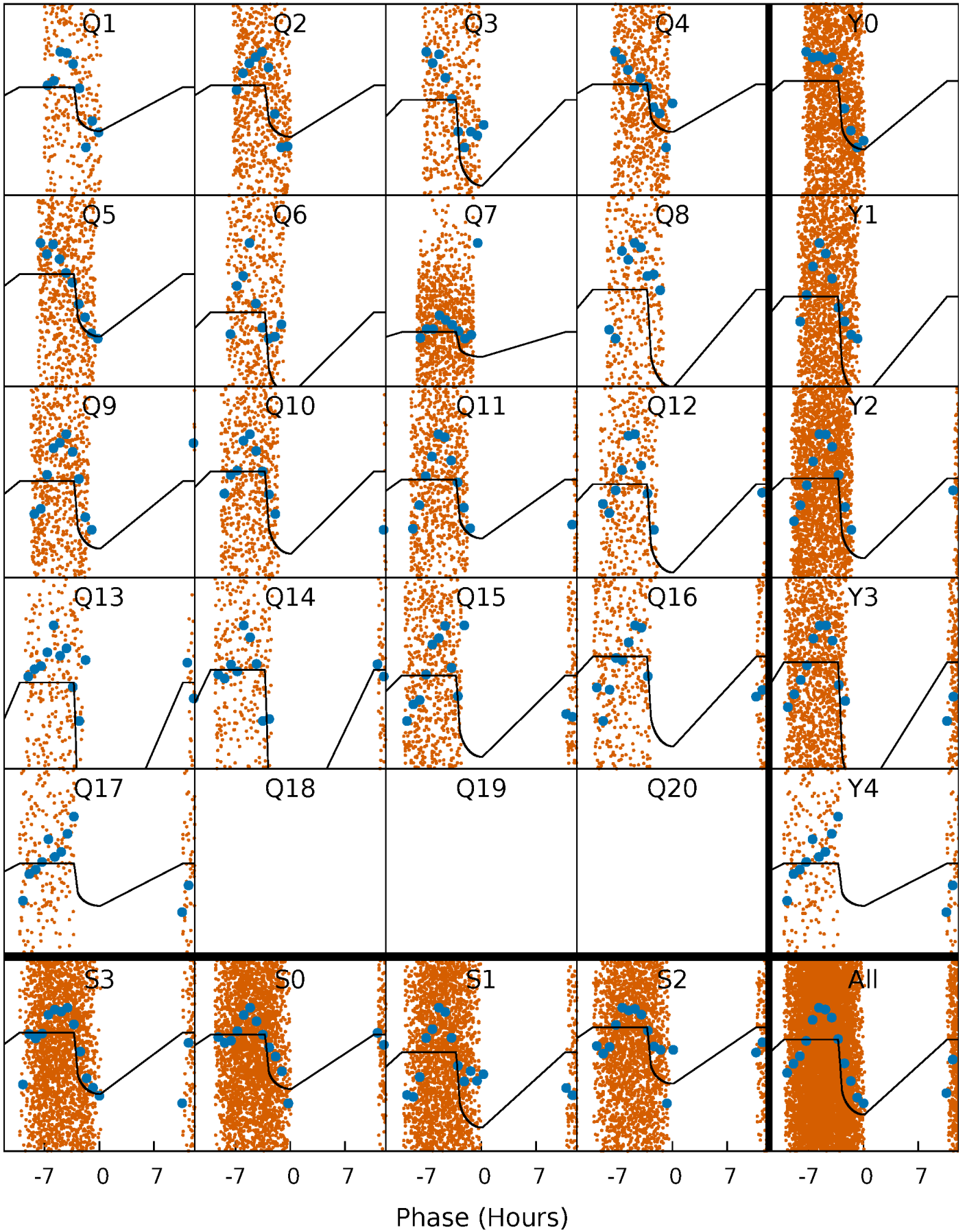
# PDC Quarter-Phased Transit Curves

TCE 005088308-03   P= 0.868358 Days    $T_0=132.090618$  (BKJD)



# DV Quarter-Phased Transit Curves

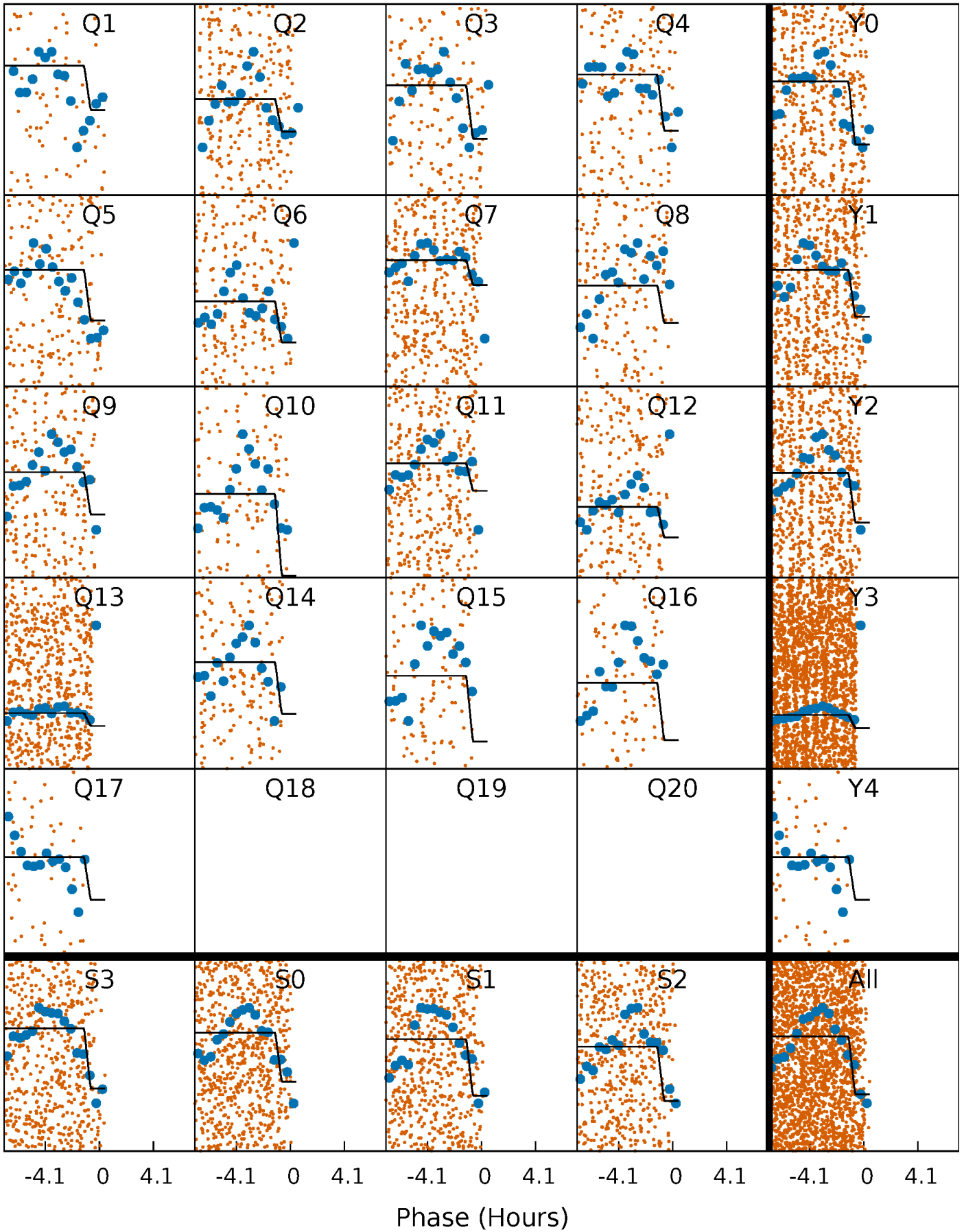
TCE 005088308-03 P= 0.868358 Days  $T_0=132.090618$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 005088308-03   P= 0.868312 Days    $T_0=132.080344$  (BKJD)

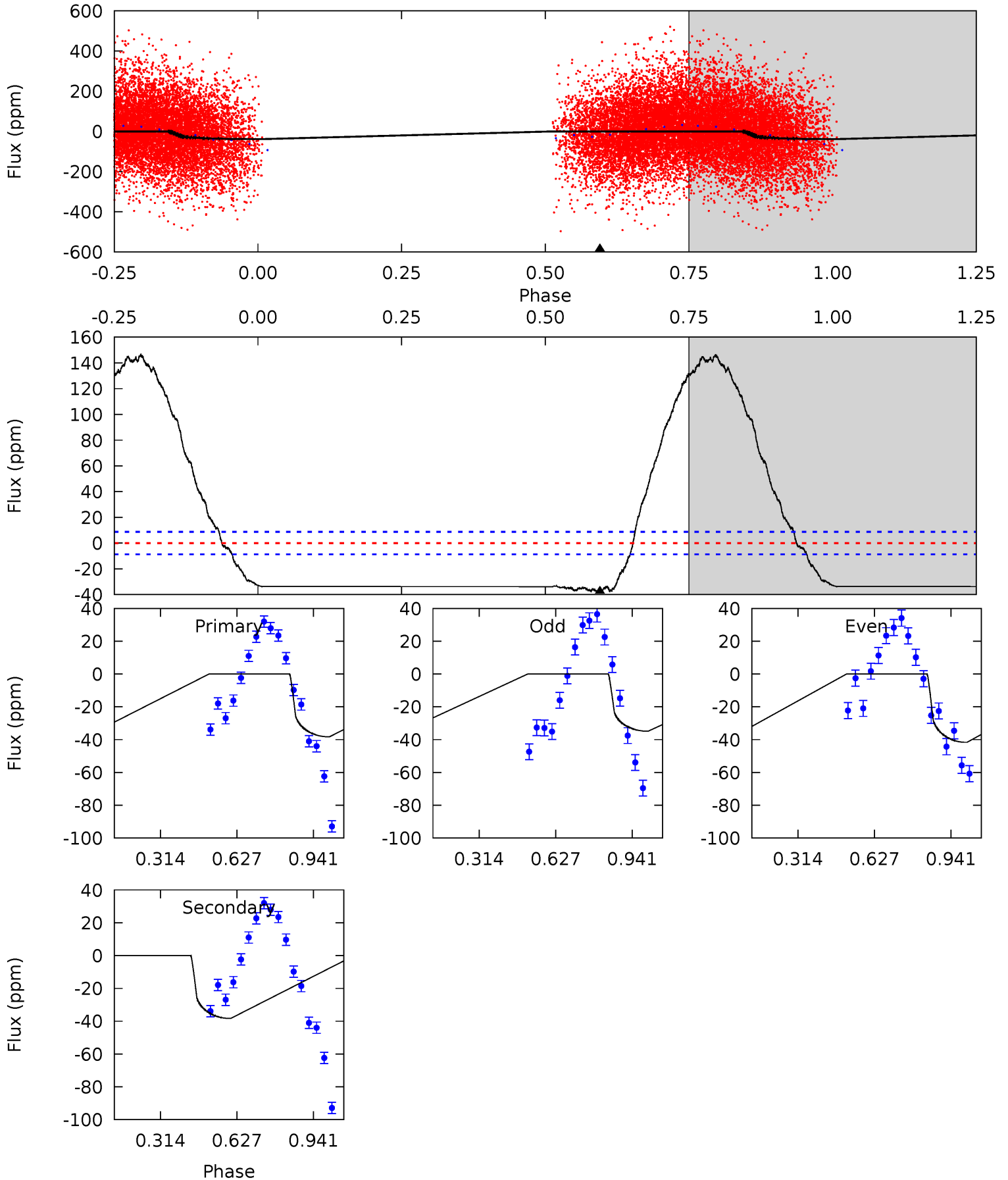




# DV Model-Shift Uniqueness Test

005088308-03, P = 0.868358 Days, E = 131.222260 Days

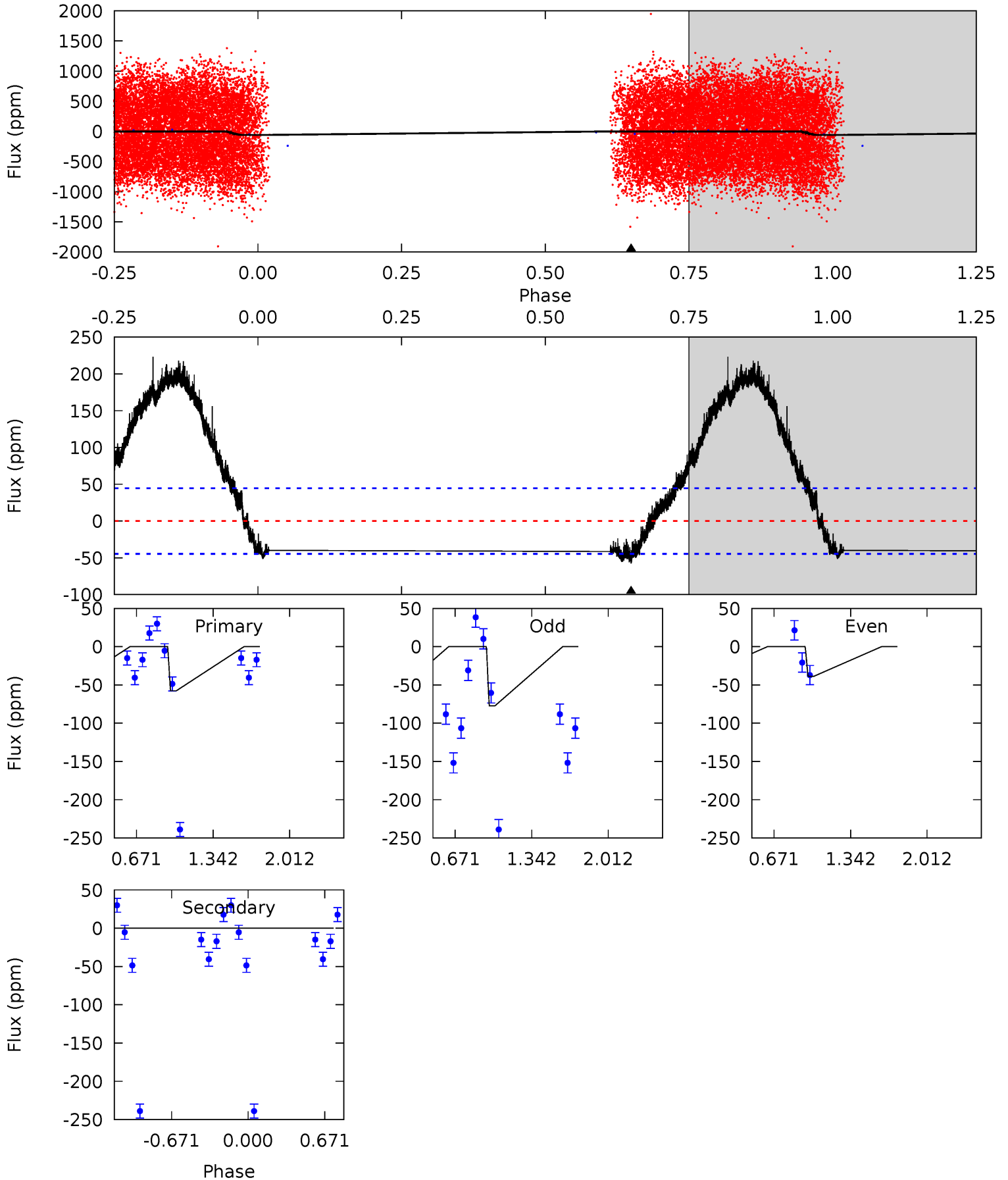
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.0	19.0	0	0	4.32	1.01	9.00	19.0	19.0	19.0	19.0	1.69	0.95	0.79	3.33



# Alt Model-Shift Uniqueness Test

005088308-03, P = 0.868312 Days, E = 131.212032 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
5.35	0	0	0	4.15	0.43	2.74	5.35	5.35	0	0	1.80	1.17	0.79	0.65



### Stellar Parameters For KIC 005088308

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6513^{+411}_{-823}$	$2.782^{+0.175}_{-0.094}$	$0.210^{+0.150}_{-0.150}$	$12.613^{+1.350}_{-3.149}$	$3.511^{+0.033}_{-0.593}$	$0.002^{+0.002}_{-0.001}$
	+6%/-13%	+6%/-3%	+71%/-71%	+11%/-25%	+1%/-17%	+98%/-25%
Source	SPE4	SPE4	SPE4	DSEP		

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

### Secondary Eclipse Parameters for KIC 005088308-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-38 \pm 2$	$10.36^{+3.53}_{-3.05}$	$8486^{+771}_{-1051}$	$-5656^{+2147}_{-1045}$	$0.139^{+0.142}_{-0.060}$
Alt.	$0 \pm 11$	$11.10^{+3.74}_{-3.34}$	$8541^{+747}_{-1031}$	$-6968^{+1012}_{-798}$	$-0.001^{+0.037}_{-0.037}$

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

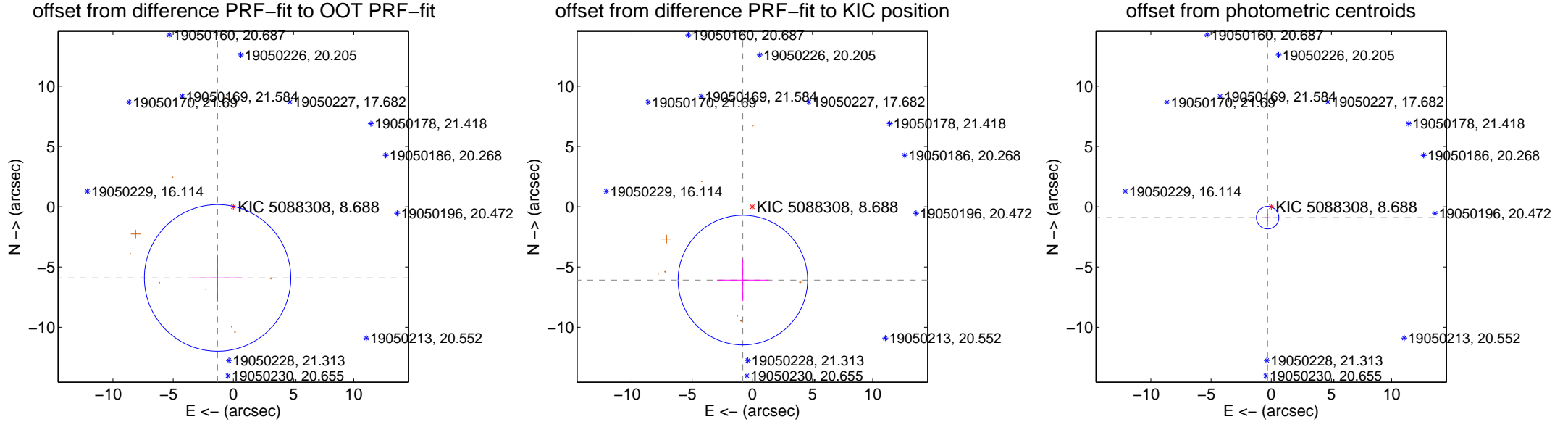
## DV Centroid Data

Supplemental centroid analysis for 005088308-03. **Kepler magnitude: 8.69.** Transit SNR 20.25

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

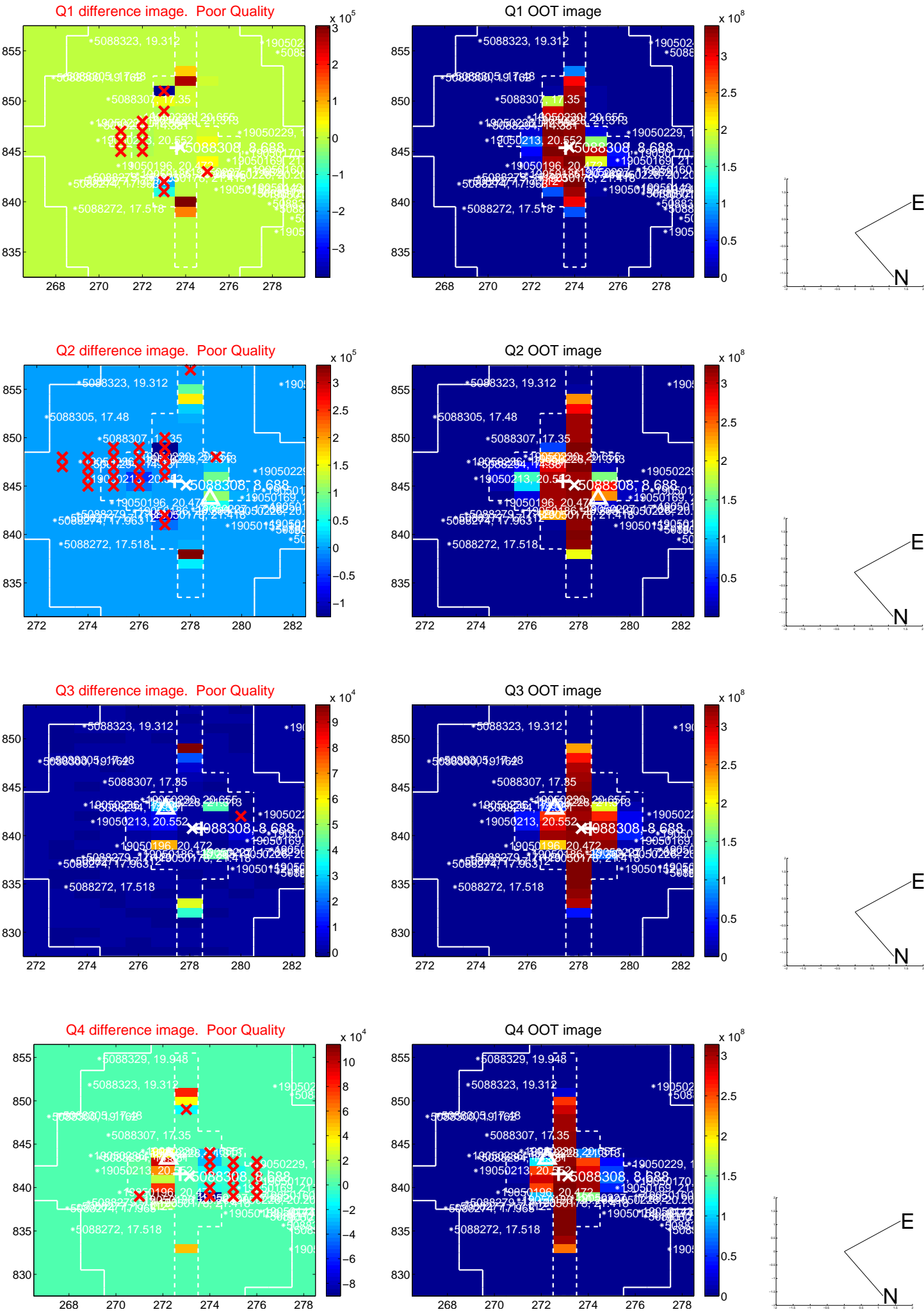
The direct PRF centroid is offset from the target star catalog position by about 0.93 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.049 \pm 2.027$	2.98	$1.309 \pm 2.100$	$-5.906 \pm 1.955$
PRF-fit source offset from KIC position	$6.135 \pm 1.792$	3.42	$0.785 \pm 2.145$	$-6.084 \pm 1.732$
photometric centroid source offset	$0.95 \pm 0.31$	3.07	$0.30 \pm 0.23$	$-0.90 \pm 0.32$



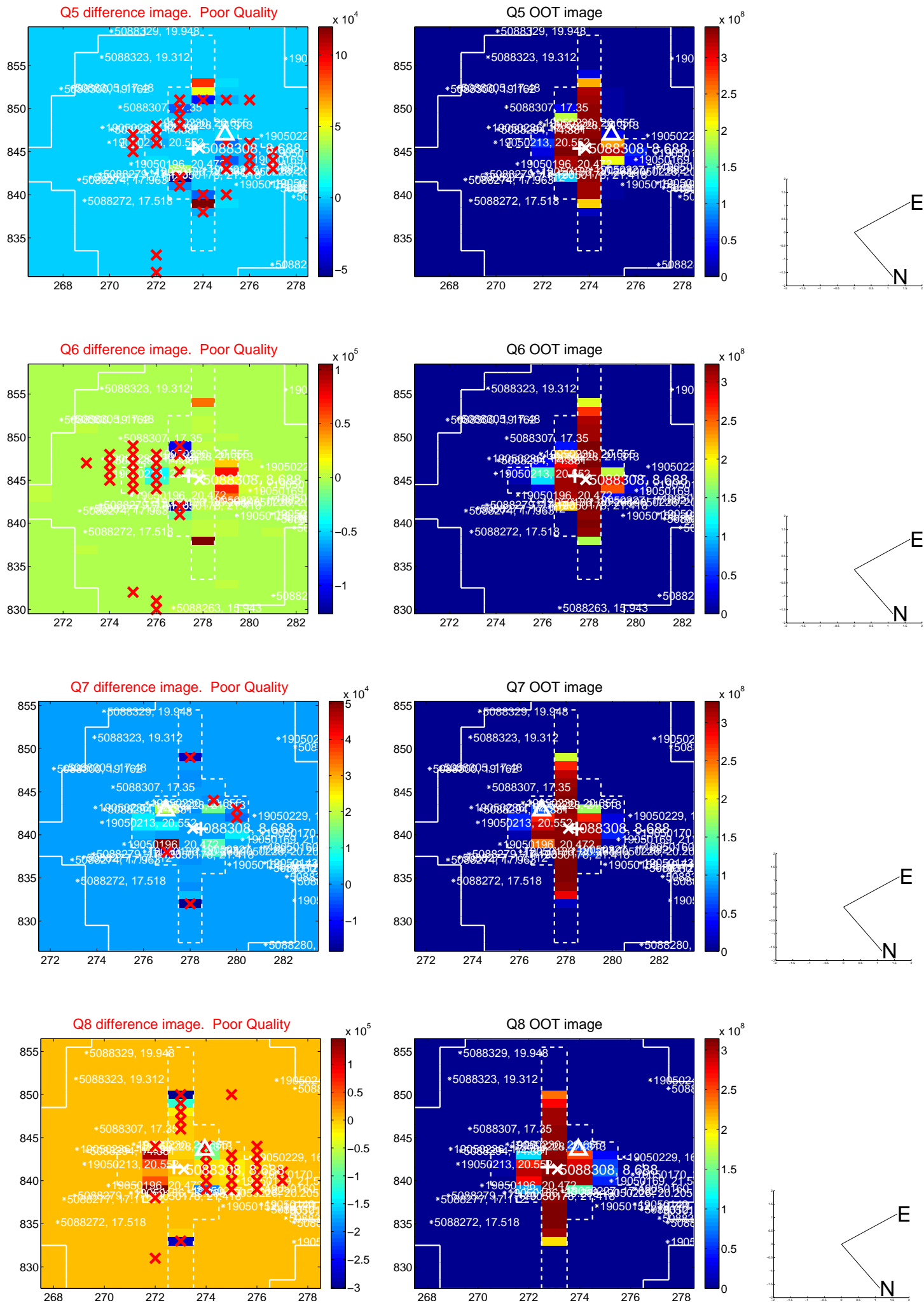
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

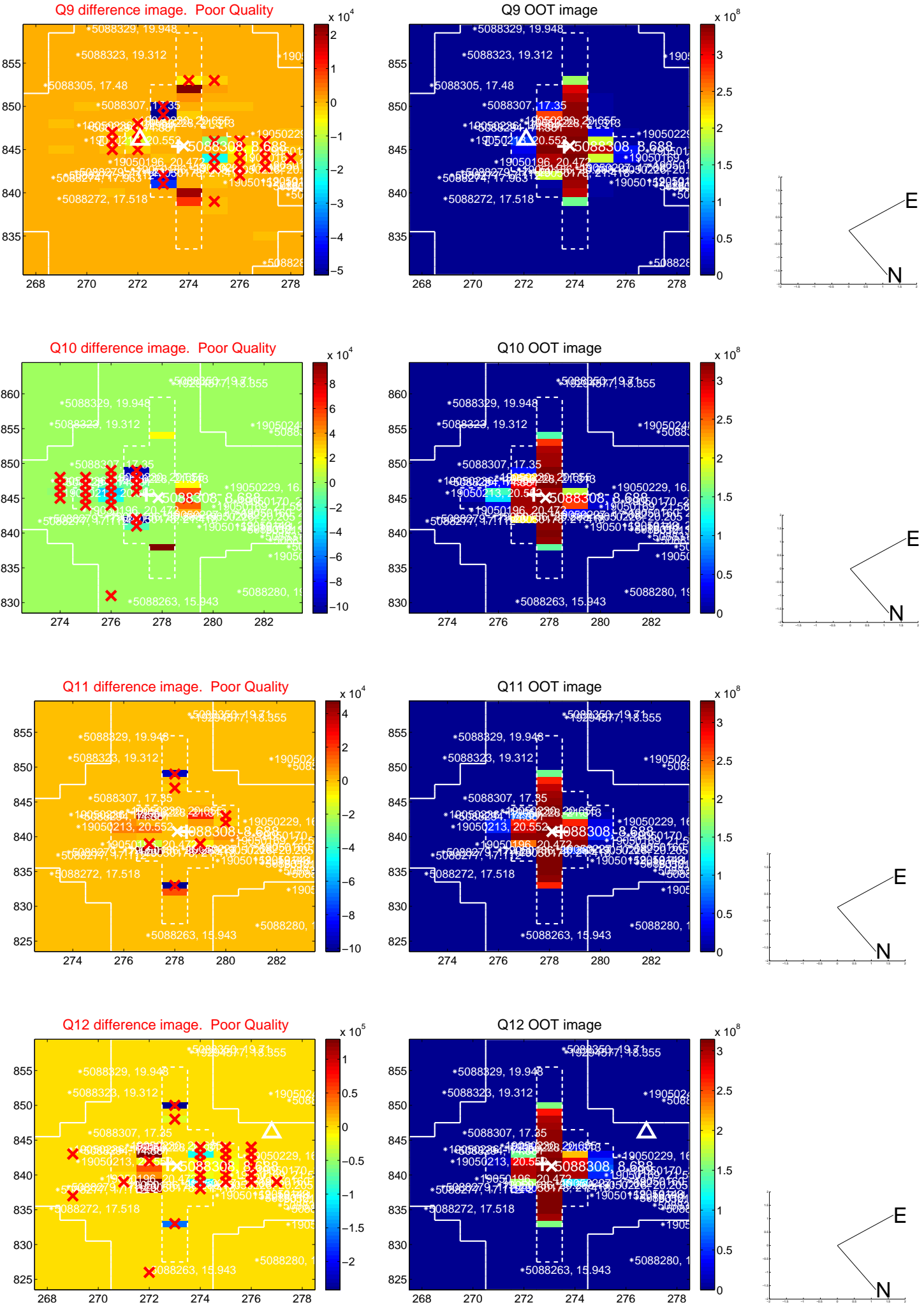




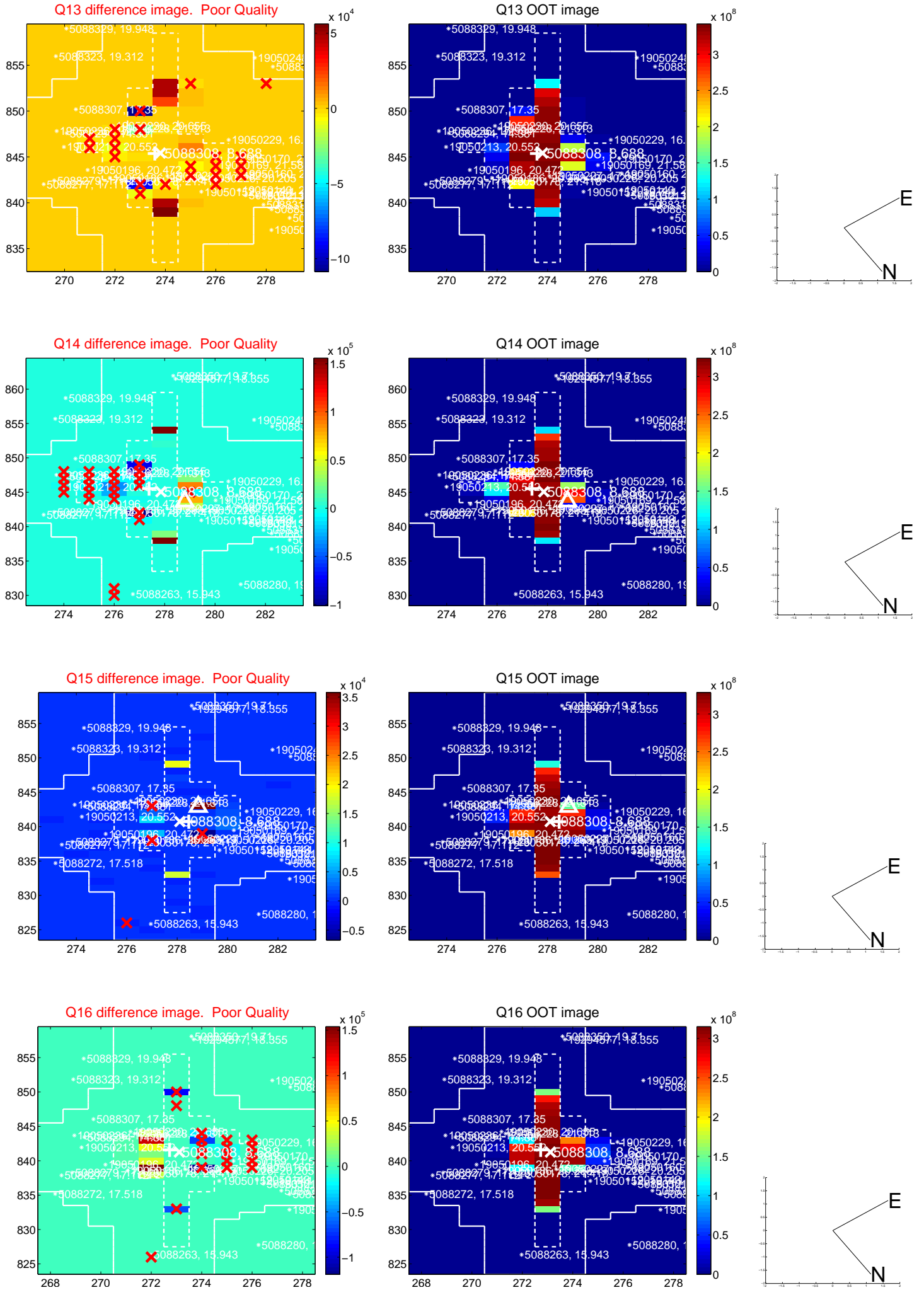
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



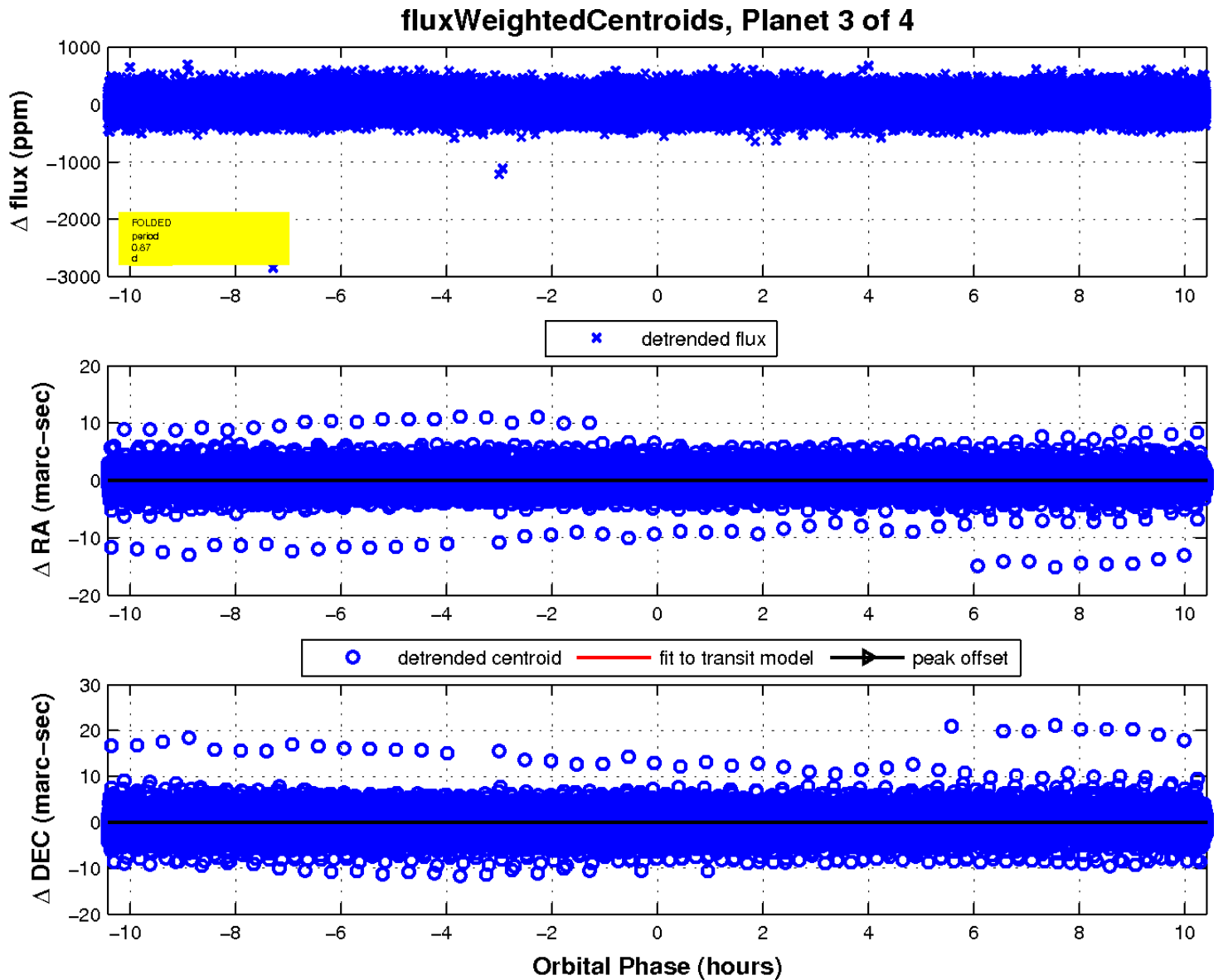
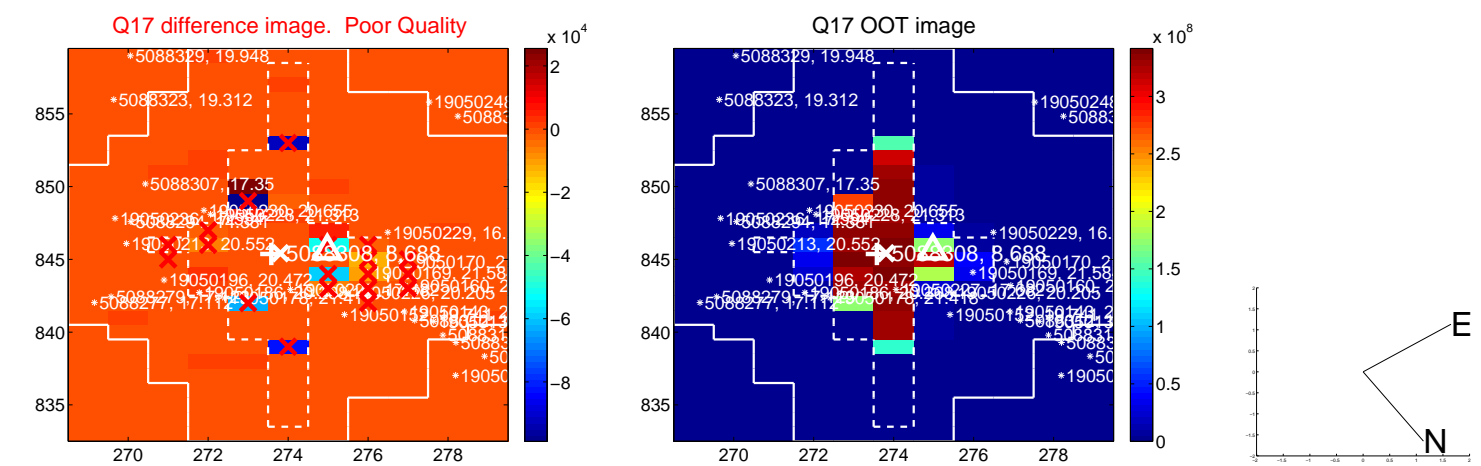
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



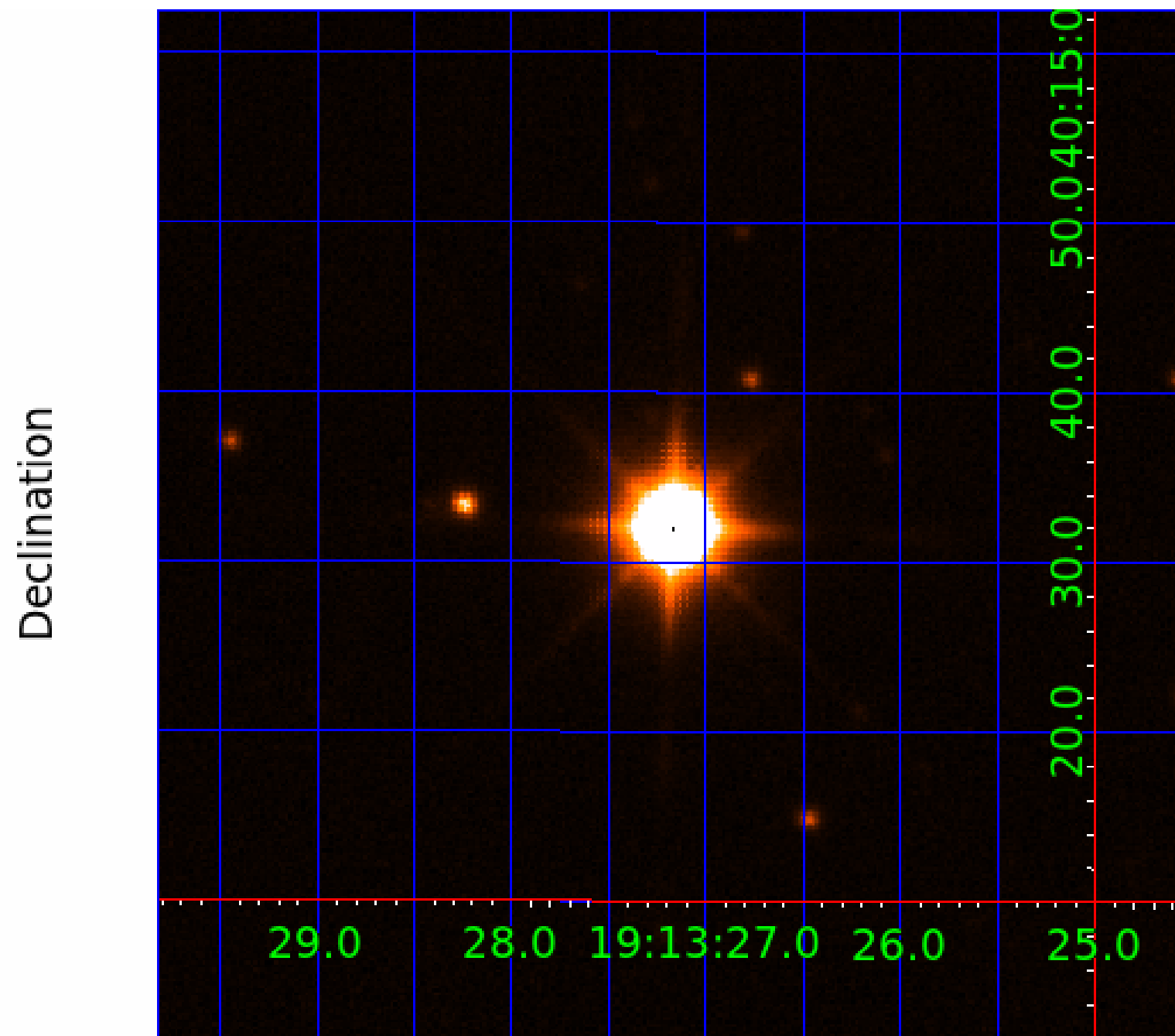
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 005088308

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005088308-01	OBS	No	1.523081	132.134297	35.7	3.368	10.5	11.5	12.61	6513	8.82	0.00
005088308-02	OBS	No	0.868281	132.381449	26.0	4.357	11.3	10.7	12.61	6513	6.50	0.00
005088308-03	OBS	No	0.868358	132.090618	67.7	6.098	13.5	20.2	12.61	6513	10.73	0.00
005088308-04	OBS	No	1.188842	132.543448	184.9	0.694	9.0	6.0	12.61	6513	20.47	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005088308-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005088308-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005088308-03	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED—EPHEM_MATCH
005088308-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED

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

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

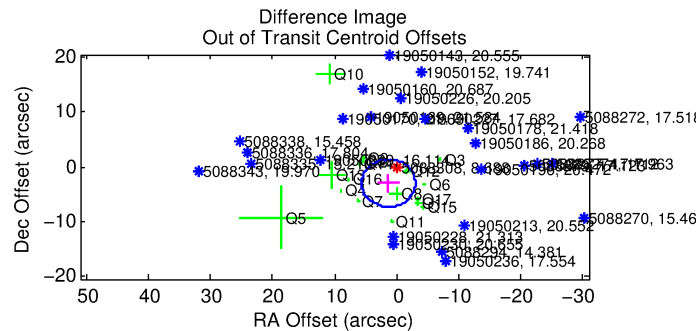
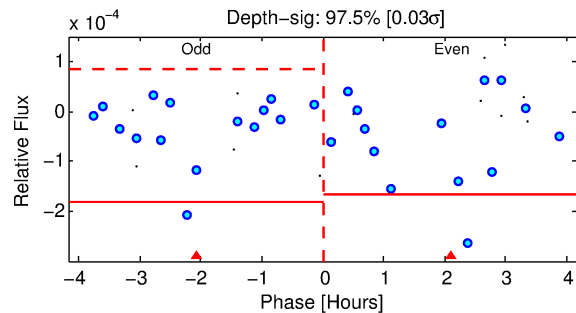
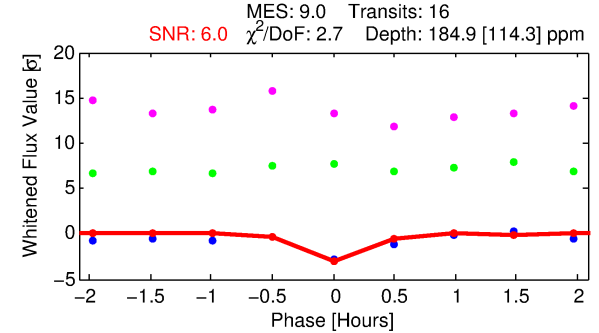
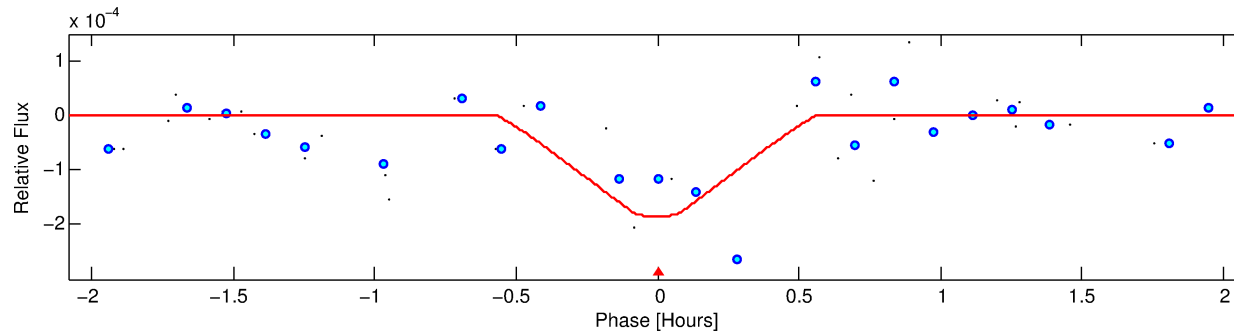
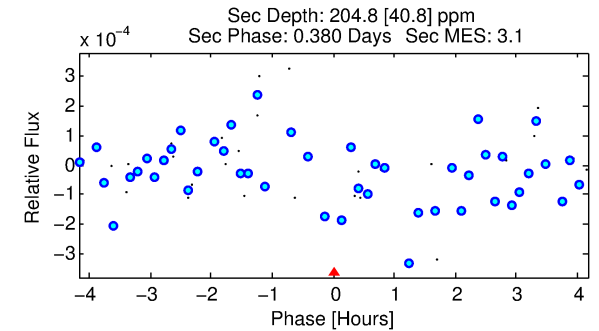
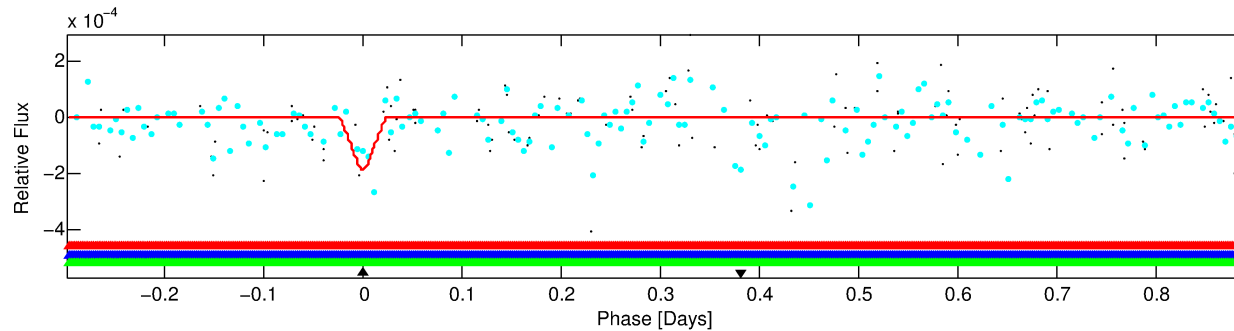
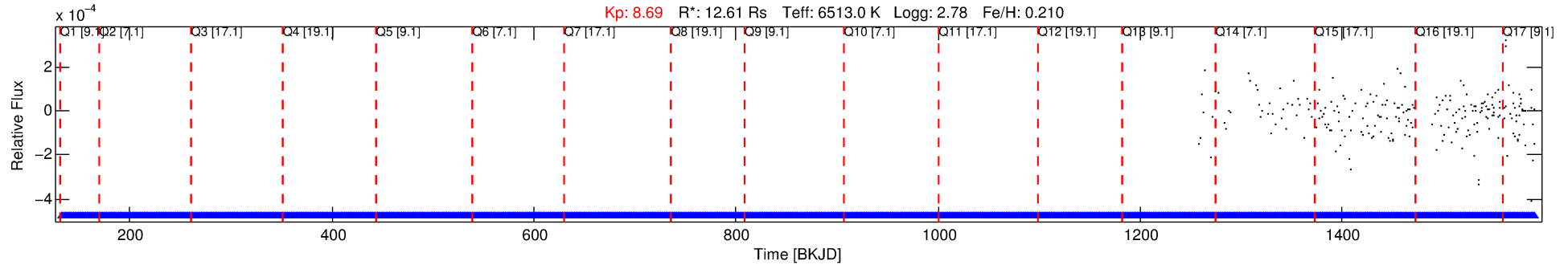
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005088308-04

No Significant Match Found

# DV One-Page Summary

KIC: 5088308 Candidate: 4 of 4 Period: 1.189 d



## DV Fit Results:

Period = 1.18884 [0.00003] d  
Epoch = 132.5434 [0.0049] BKJD  
Rp/R\* = 0.0149 [0.0180]  
a/R\* = 6.11 [38.08]  
b = 0.90 [1.34]  
Seff = N/A  
Teq = N/A  
Rp = 20.47 [25.34] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

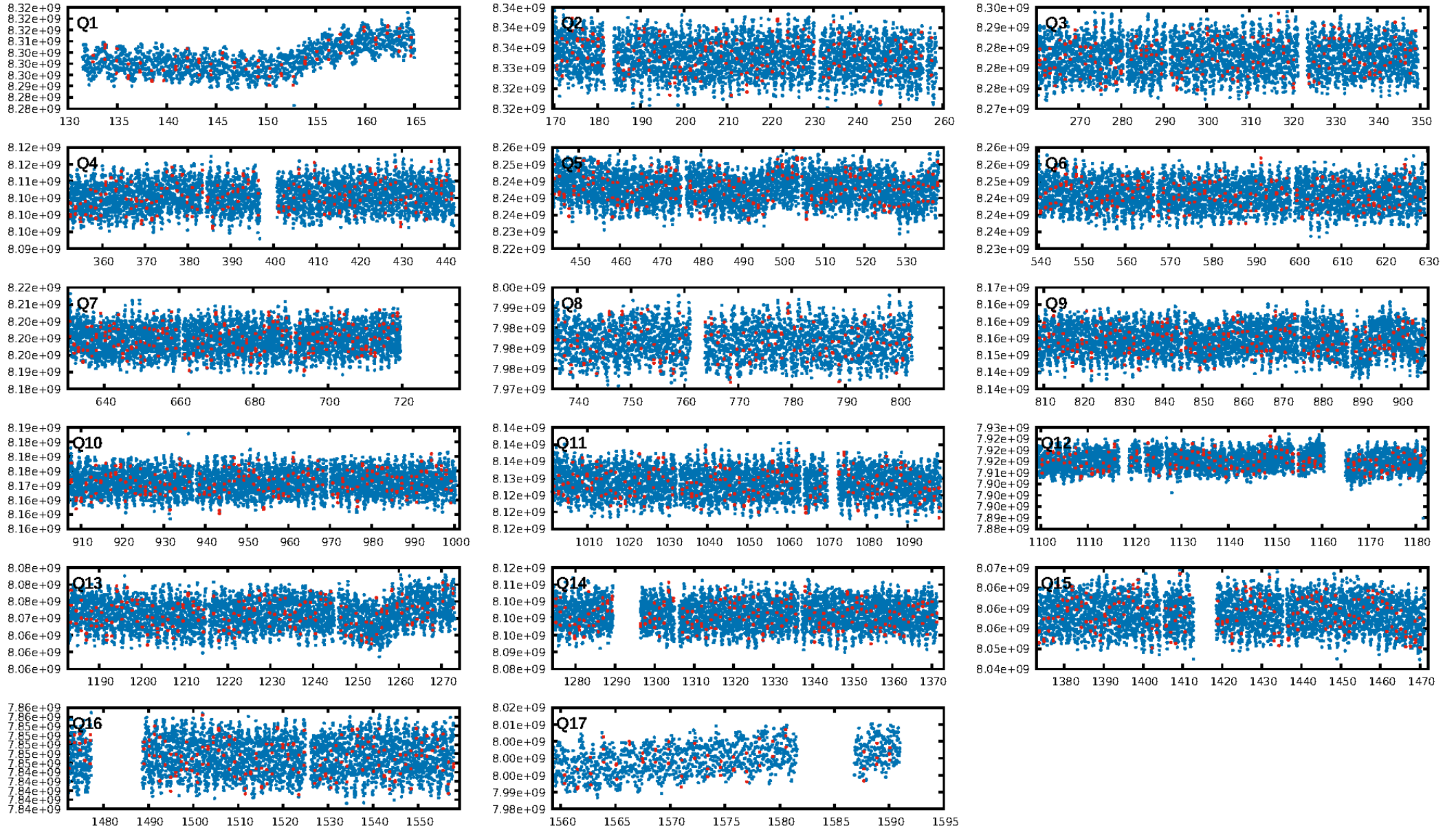
## DV Diagnostic Results:

ShortPeriod-sig: 79.0% [1.25σ]  
LongPeriod-sig: 98.0% [2.33σ]  
ModelChiSquare2-sig: 6.7%  
ModelChiSquareGof-sig: 93.3%  
Bootstrap-pfa: 2.99e-01  
RollingBand-fgt: 1.00 [14/14]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.0%  
Centroid-so: 0.497 arcsec [2.40σ]  
OotOffset-rm: 3.301 arcsec [2.29σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 4.946 arcsec [3.82σ]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.00 [0/17]  
DiffImageOverlap-fno: 0.06 [1/17]

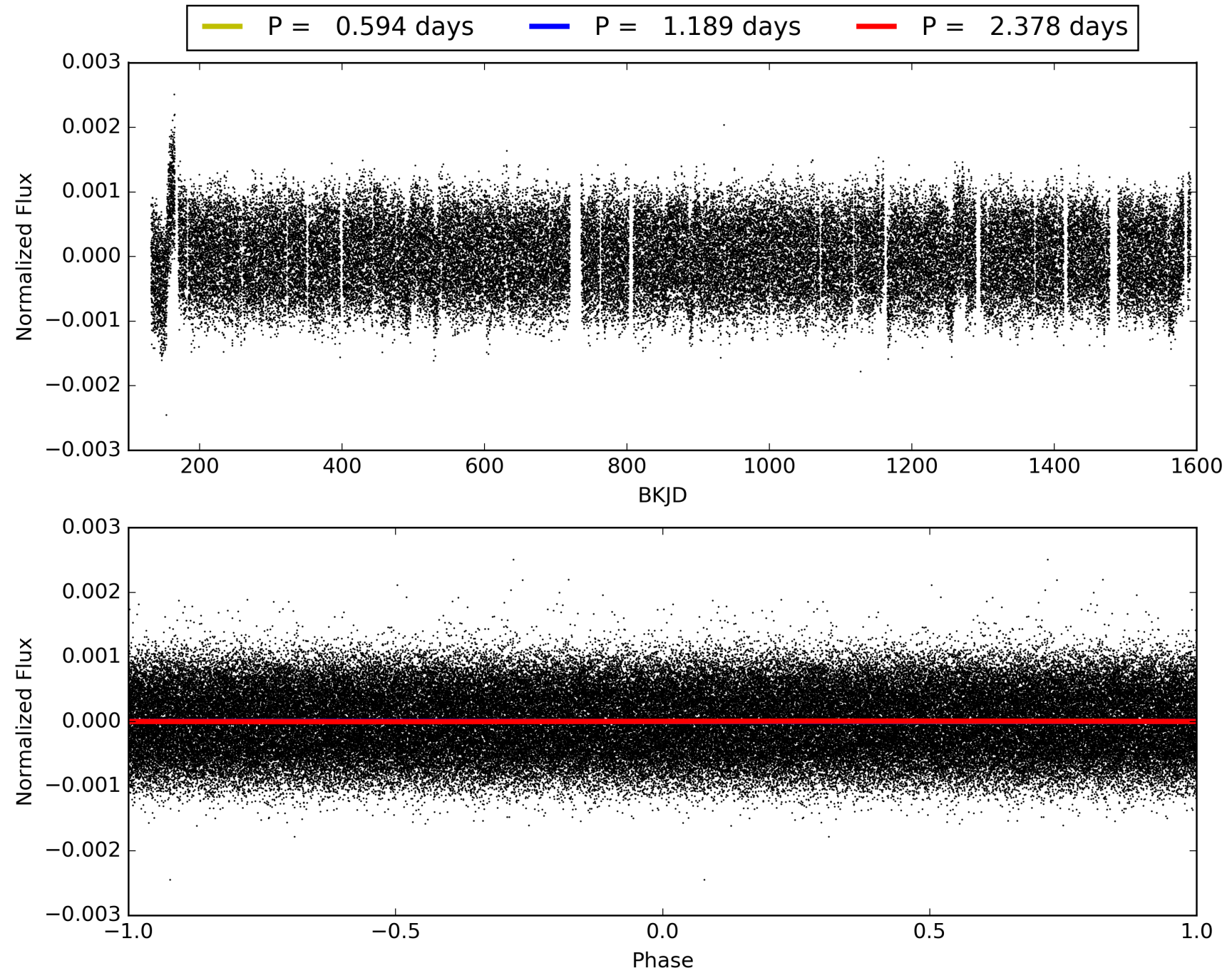
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:28:47 Z

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

# TCE 005088308-04, PDC Light Curves

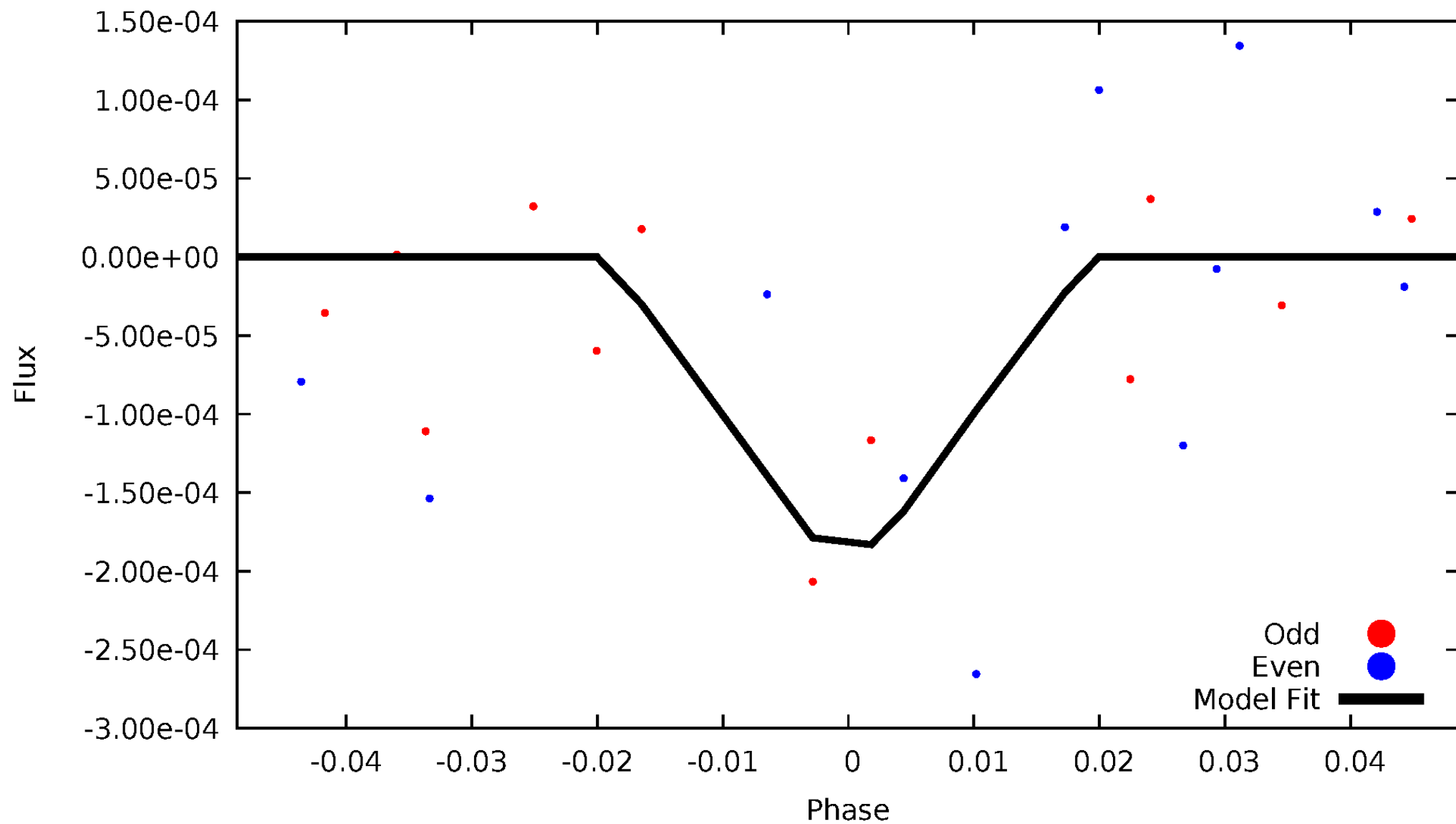


# TCE 005088308-04



# DV Odd/Even

TCE 005088308-04





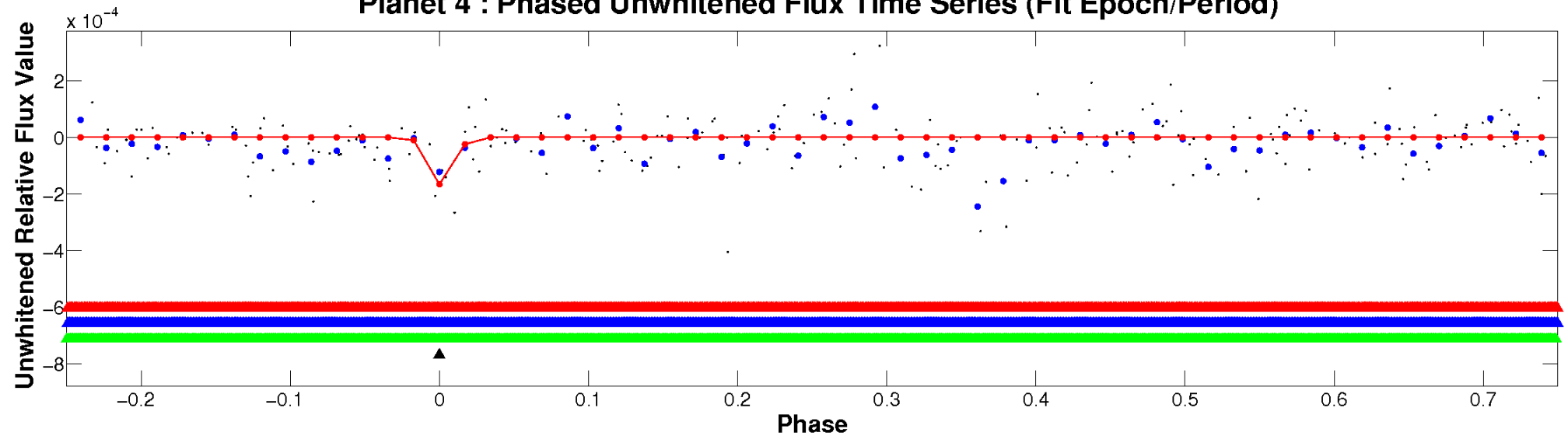


ALT Odd/Even

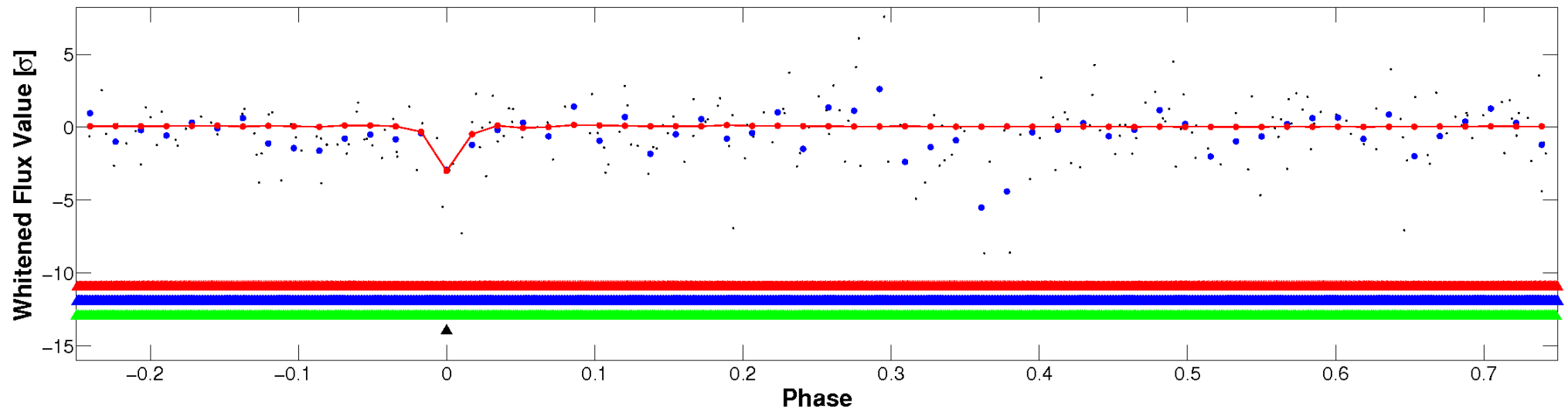
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

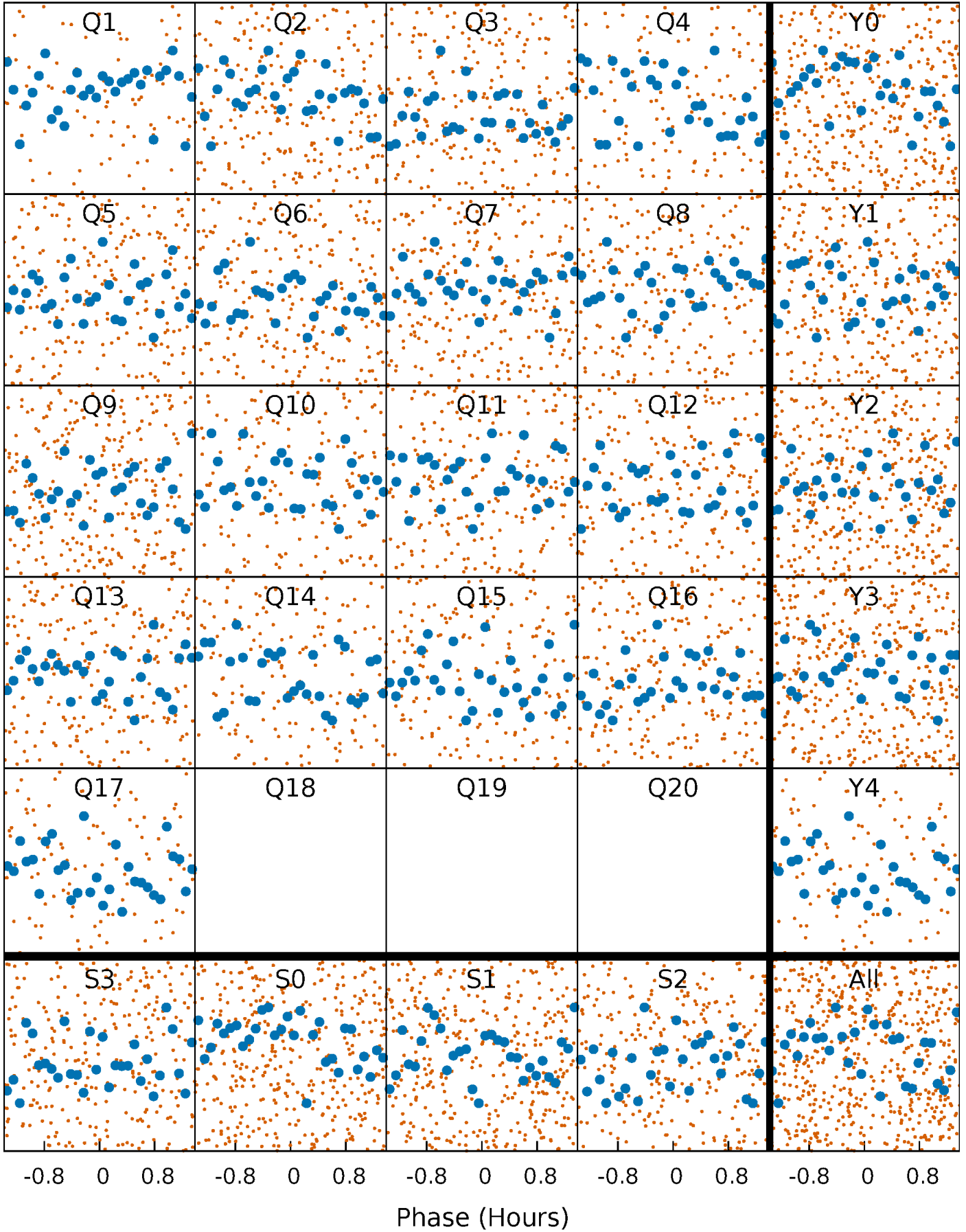


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



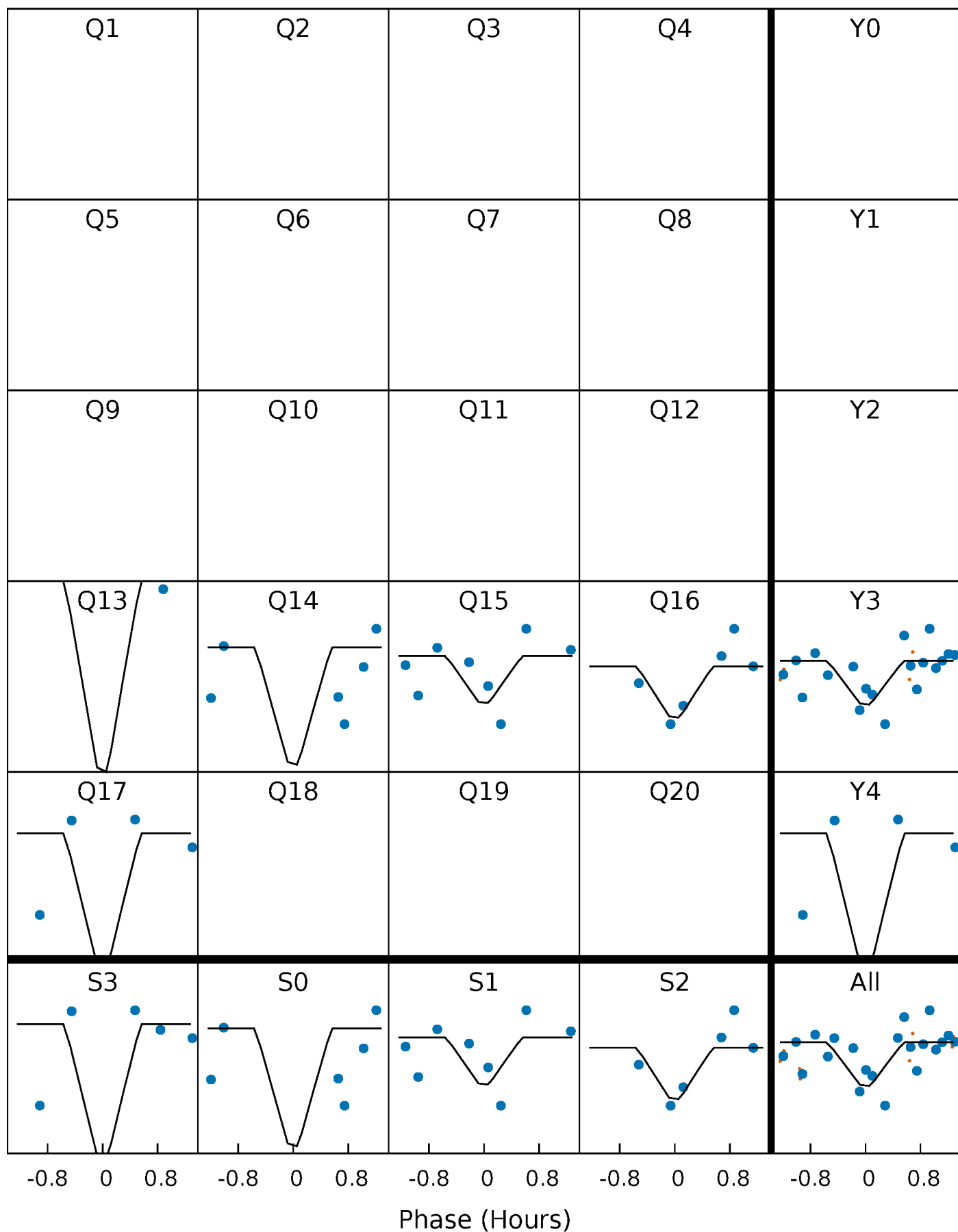
# PDC Quarter-Phased Transit Curves

TCE 005088308-04   P= 1.188842 Days    $T_0=132.543448$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005088308-04     $P = 1.188842$  Days     $T_0 = 132.543448$  (BKJD)



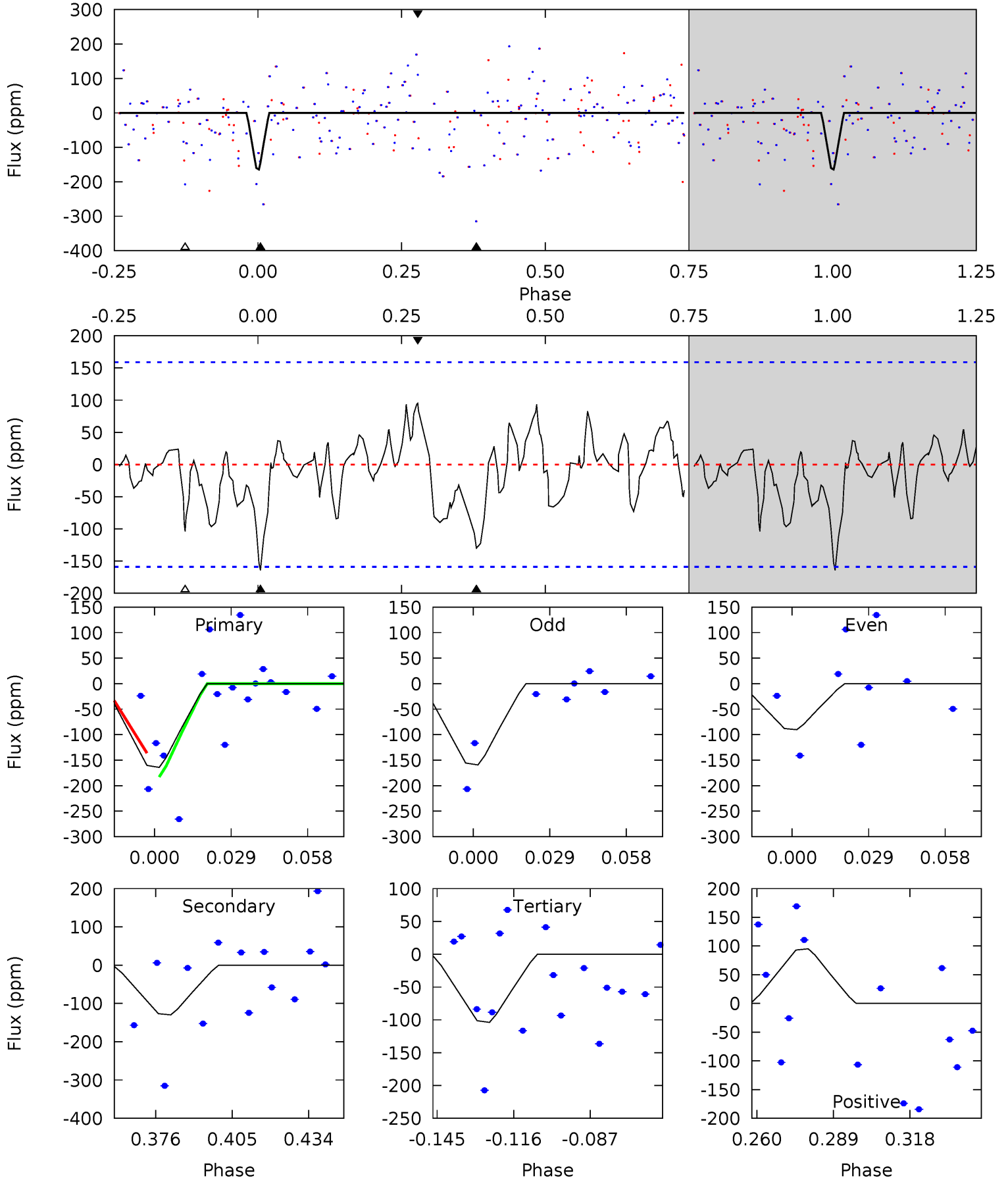


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005088308-04, P = 1.188842 Days, E = 132.543448 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
4.98	3.94	3.15	2.89	4.82	2.18	1.35	1.83	2.09	0.79	1.05	0.91	0	0.37	0.58



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005088308

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6513^{+411}_{-823}$	$2.782^{+0.175}_{-0.094}$	$0.210^{+0.150}_{-0.150}$	$12.613^{+1.350}_{-3.149}$	$3.511^{+0.033}_{-0.593}$	$0.002^{+0.002}_{-0.001}$
	+6%/-13%	+6%/-3%	+71%/-71%	+11%/-25%	+1%/-17%	+98%/-25%
Source	SPE4	SPE4	SPE4	DSEP		

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

### Secondary Eclipse Parameters for KIC 005088308-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-130 \pm 33$	$26.83^{+22.12}_{-16.73}$	$7652^{+720}_{-910}$	$-5282^{+12115}_{-1062}$	$0.102^{+0.680}_{-0.072}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

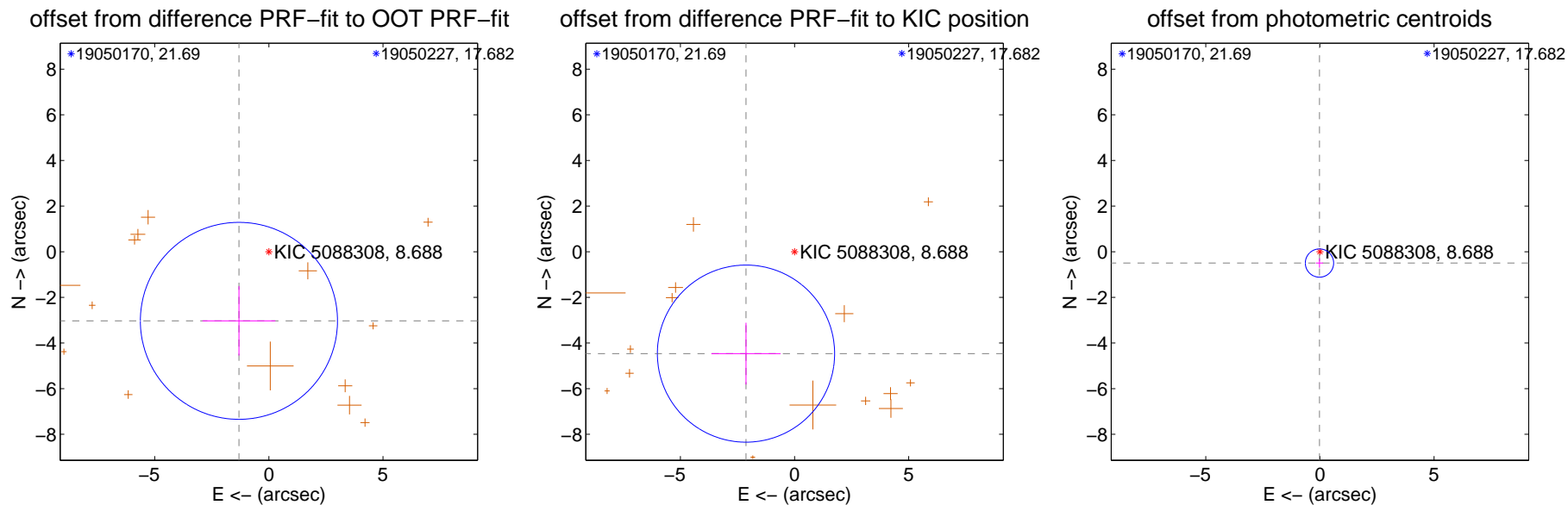
## DV Centroid Data

Supplemental centroid analysis for 005088308-04. **Kepler magnitude: 8.69.** Transit SNR 5.97

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

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

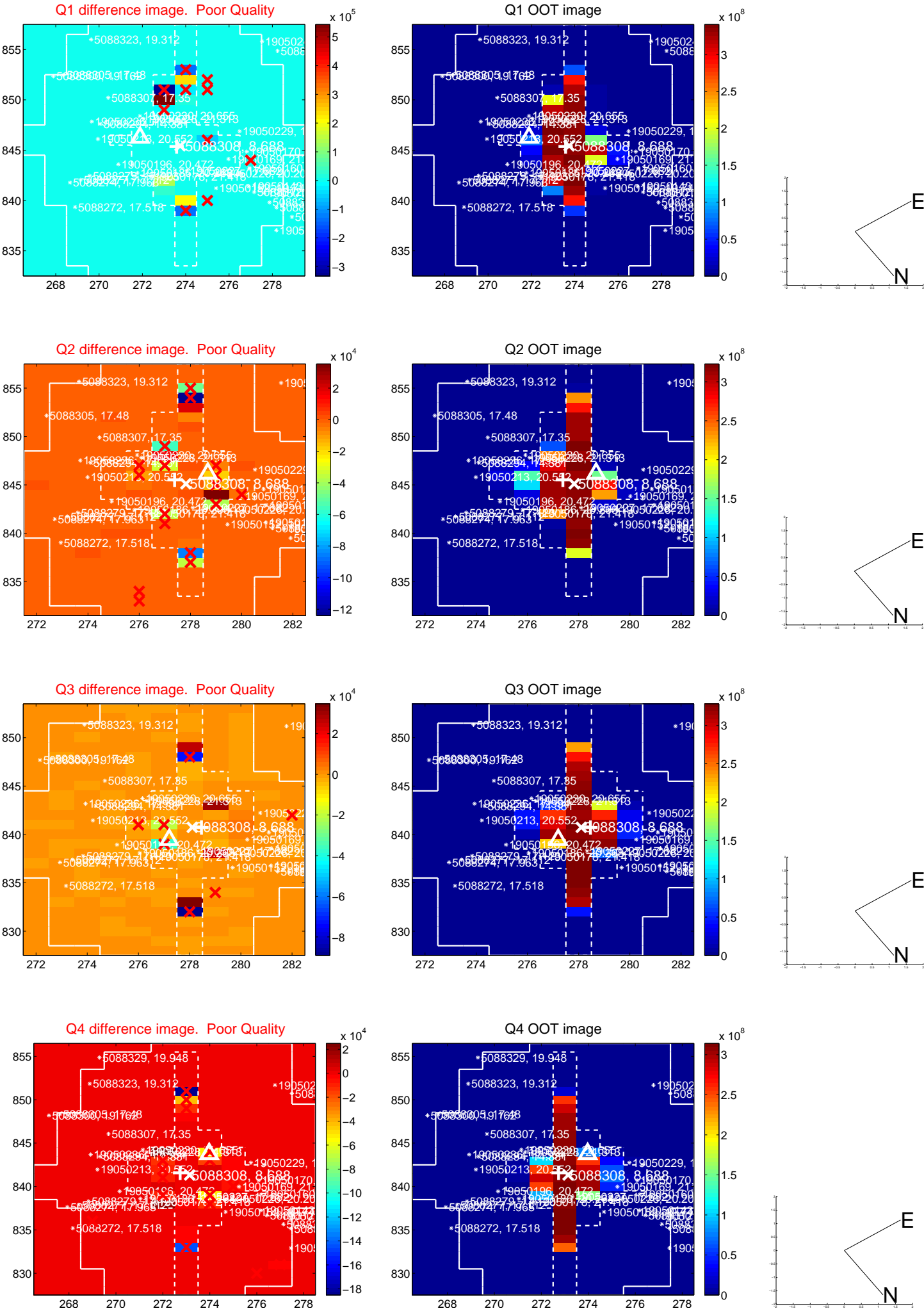
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.301 \pm 1.439$	2.29	$1.310 \pm 1.595$	$-3.030 \pm 1.519$
PRF-fit source offset from KIC position	<b><math>4.946 \pm 1.294</math></b>	<b>3.82</b>	$2.127 \pm 1.518$	$-4.466 \pm 1.353$
photometric centroid source offset	$0.50 \pm 0.21$	2.40	$0.02 \pm 0.15$	$-0.50 \pm 0.21$



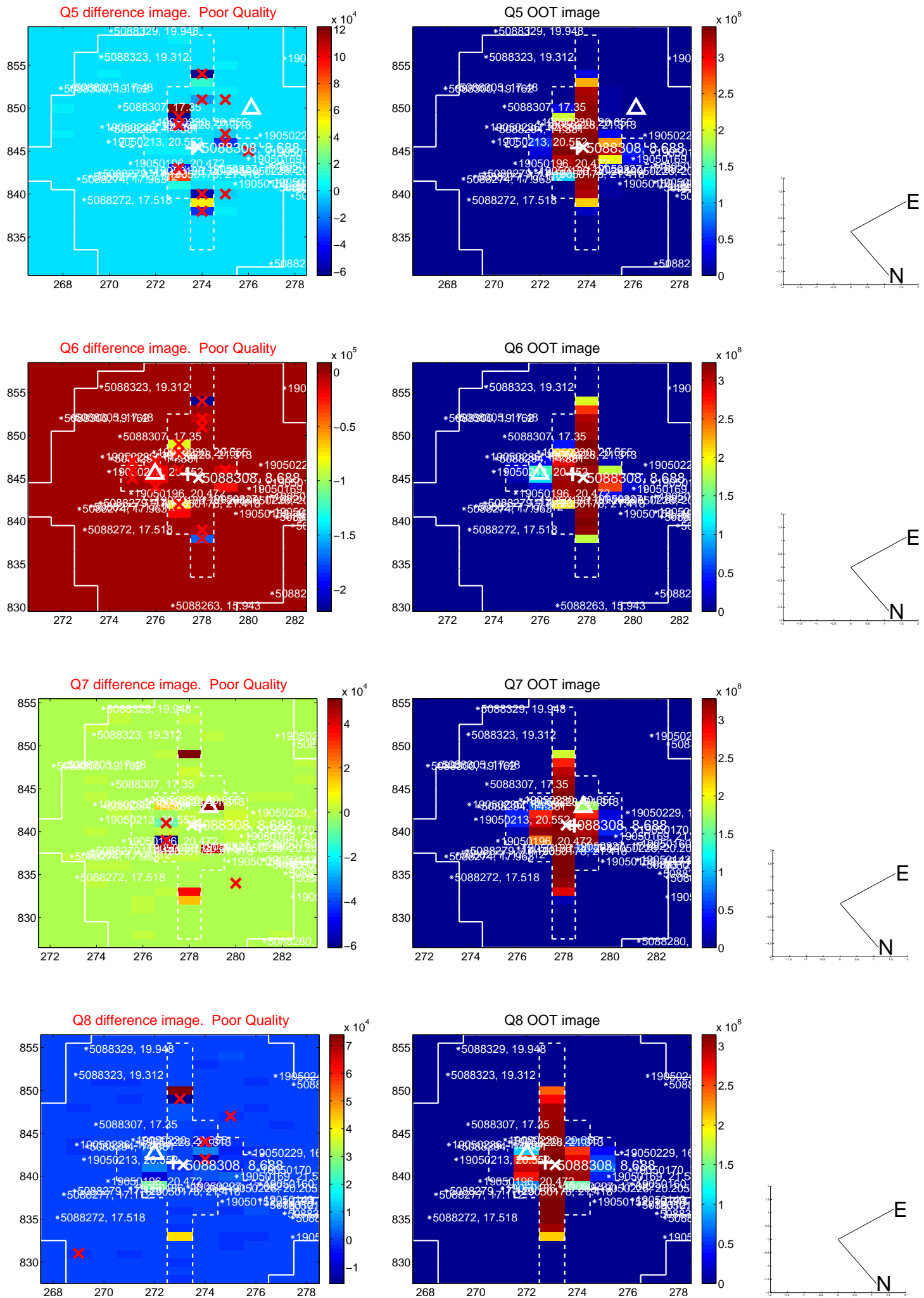
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



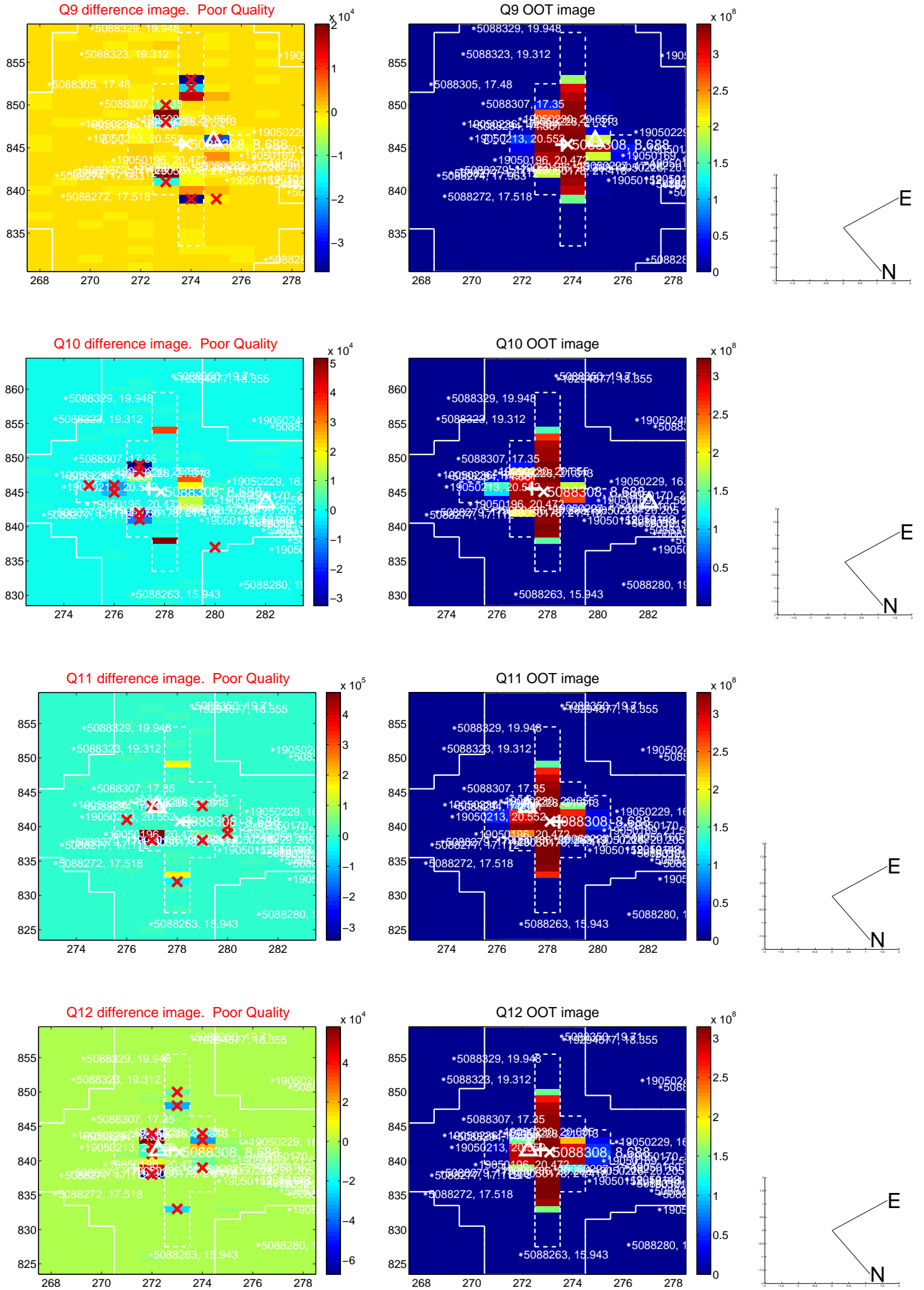
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



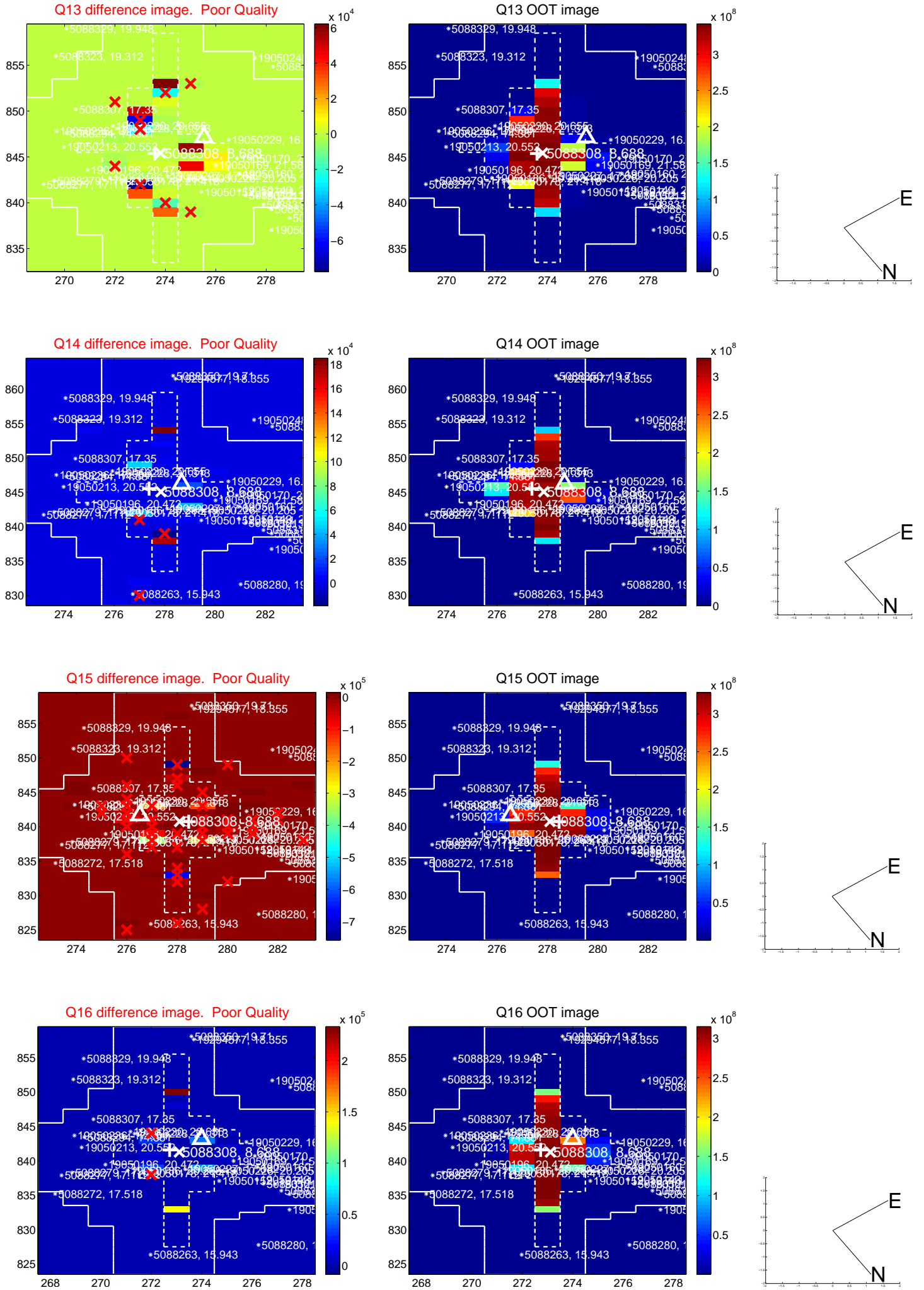
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



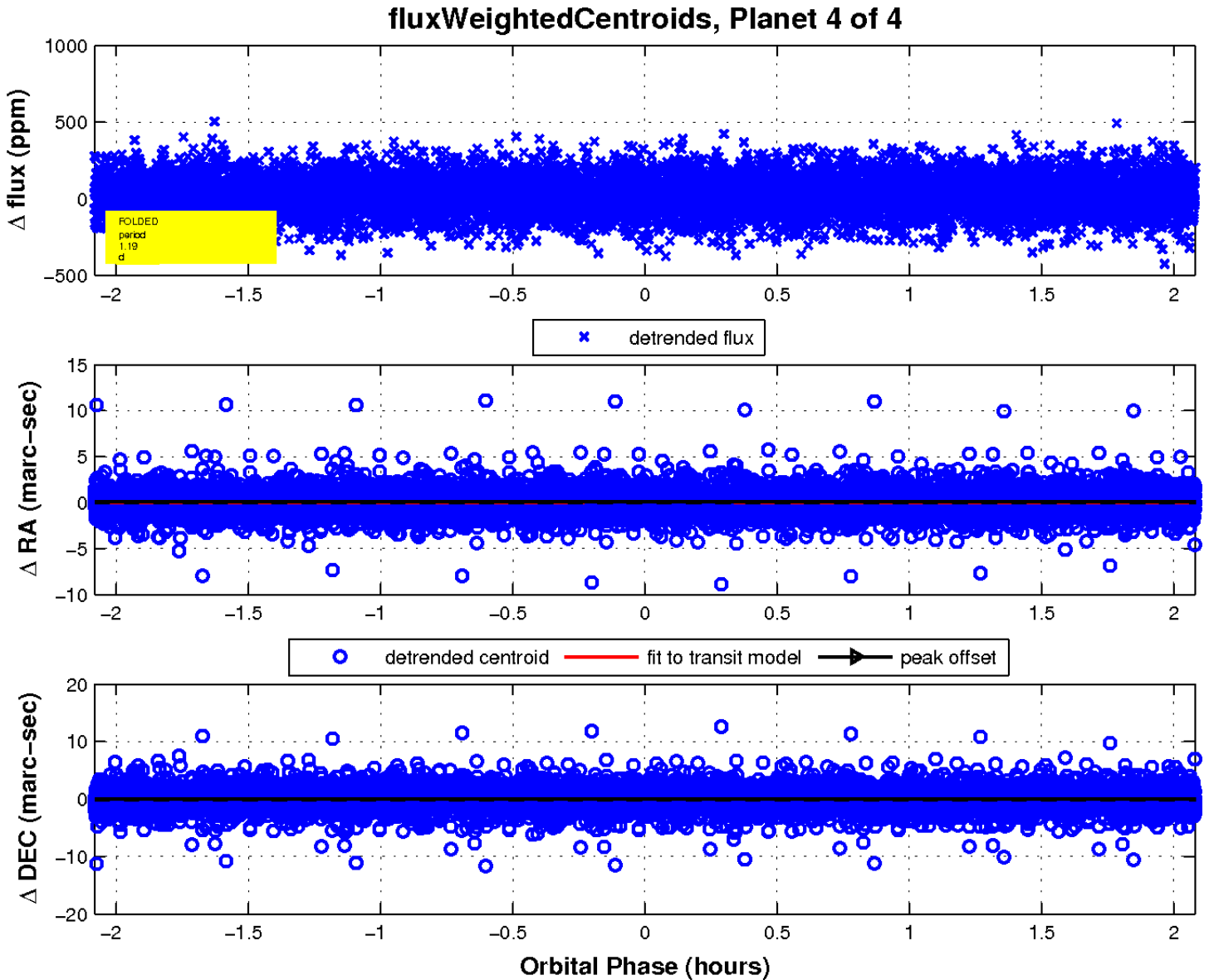
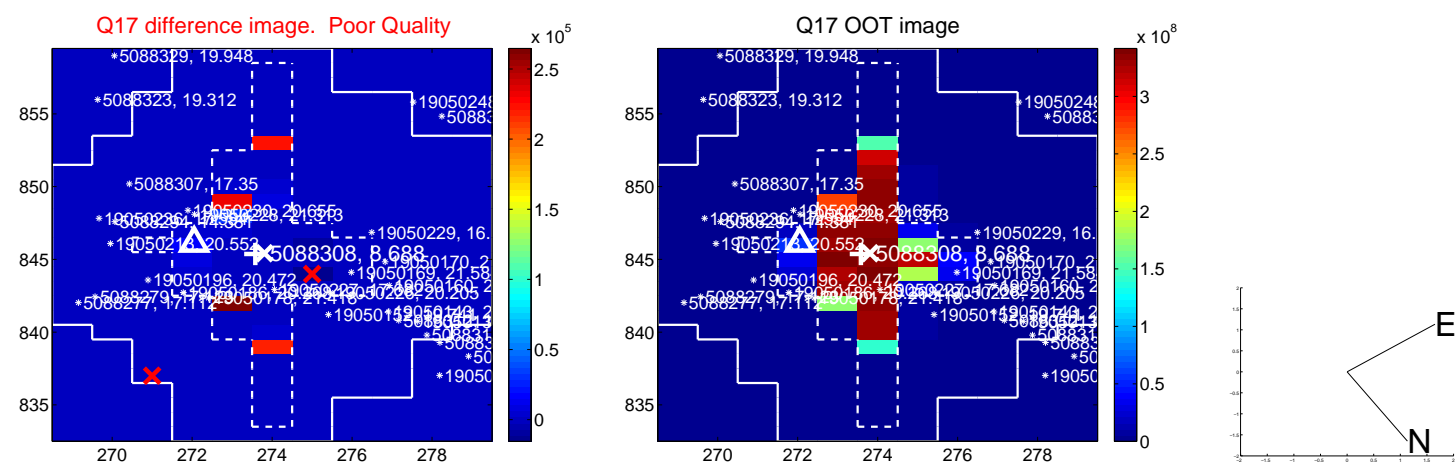
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

