

# KIC 011445913

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011445913-01	OBS	No	1.485309	131.681187	164.7	8.521	14.0	14.9	4.24	7242	7.53	42974.42
011445913-02	OBS	No	1.485296	132.140277	1060.2	14.364	18.3	22.2	4.24	7242	23.81	42974.90

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011445913-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011445913-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

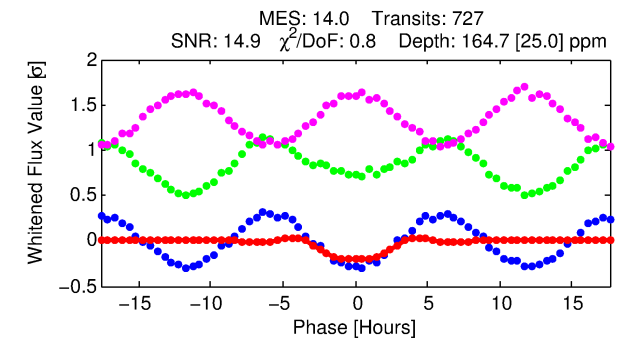
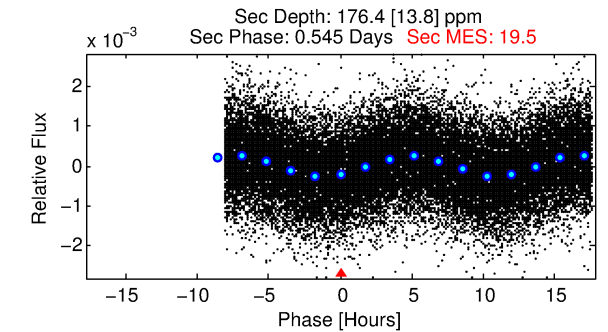
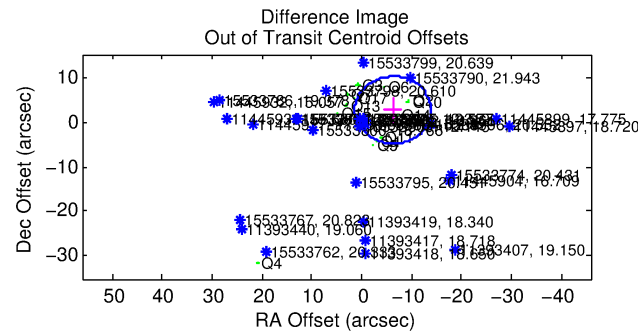
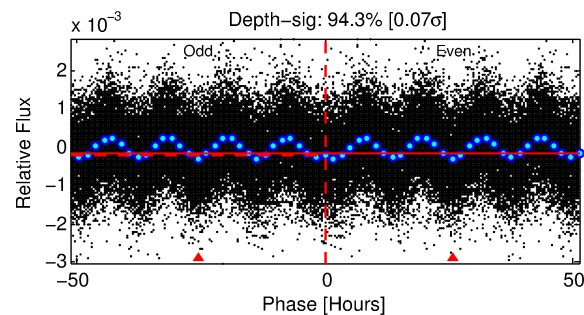
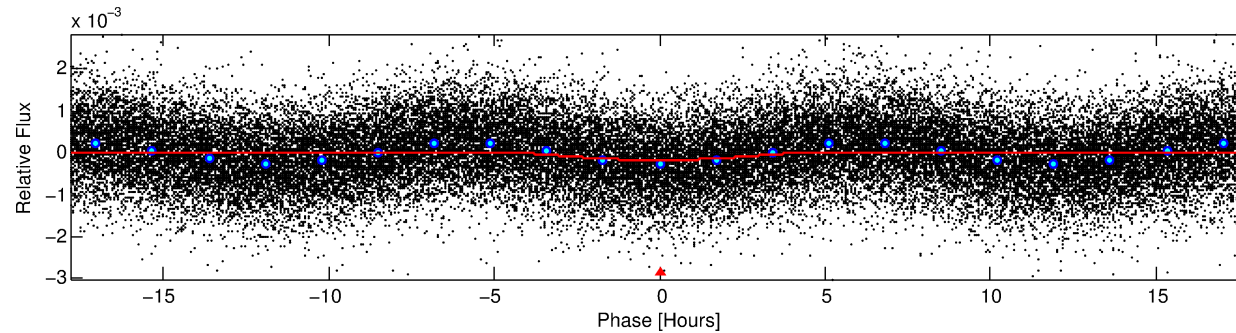
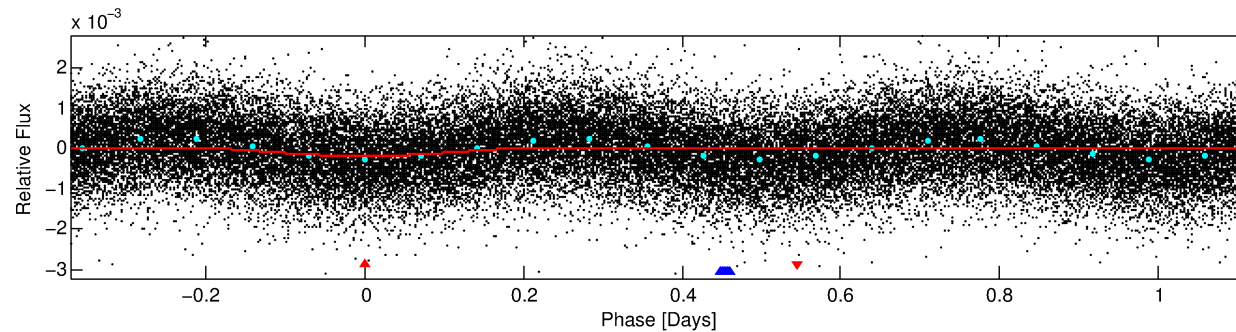
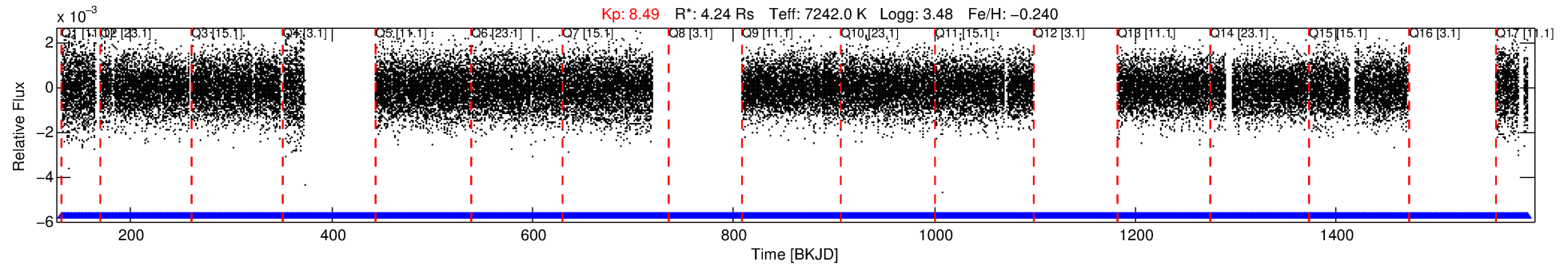
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011445913-01

No Significant Match Found

# DV One-Page Summary

KIC: 11445913 Candidate: 1 of 2 Period: 1.485 d



## DV Fit Results:

Period = 1.48531 [0.00002] d  
Epoch = 131.6812 [0.0081] BKJD  
 $R_p/R^* = 0.0163$  [0.0020]  
 $a/R^* = 1.05$  [0.01]  
 $b = 0.99$  [0.01]  
 $\text{Seff} = 42974.42$  [20984.54]  
 $T_{\text{eq}} = 3671$  [448] K  
 $R_p = 7.53$  [2.59]  $R_{\text{e}}$   
 $a = 0.0321$  [0.0097] AU  
 $A_g = 1.76$  [0.96] [0.79 $\sigma$ ]  
 **$T_{\text{eff}} = 6540$  [444] K [4.55 $\sigma$ ]**

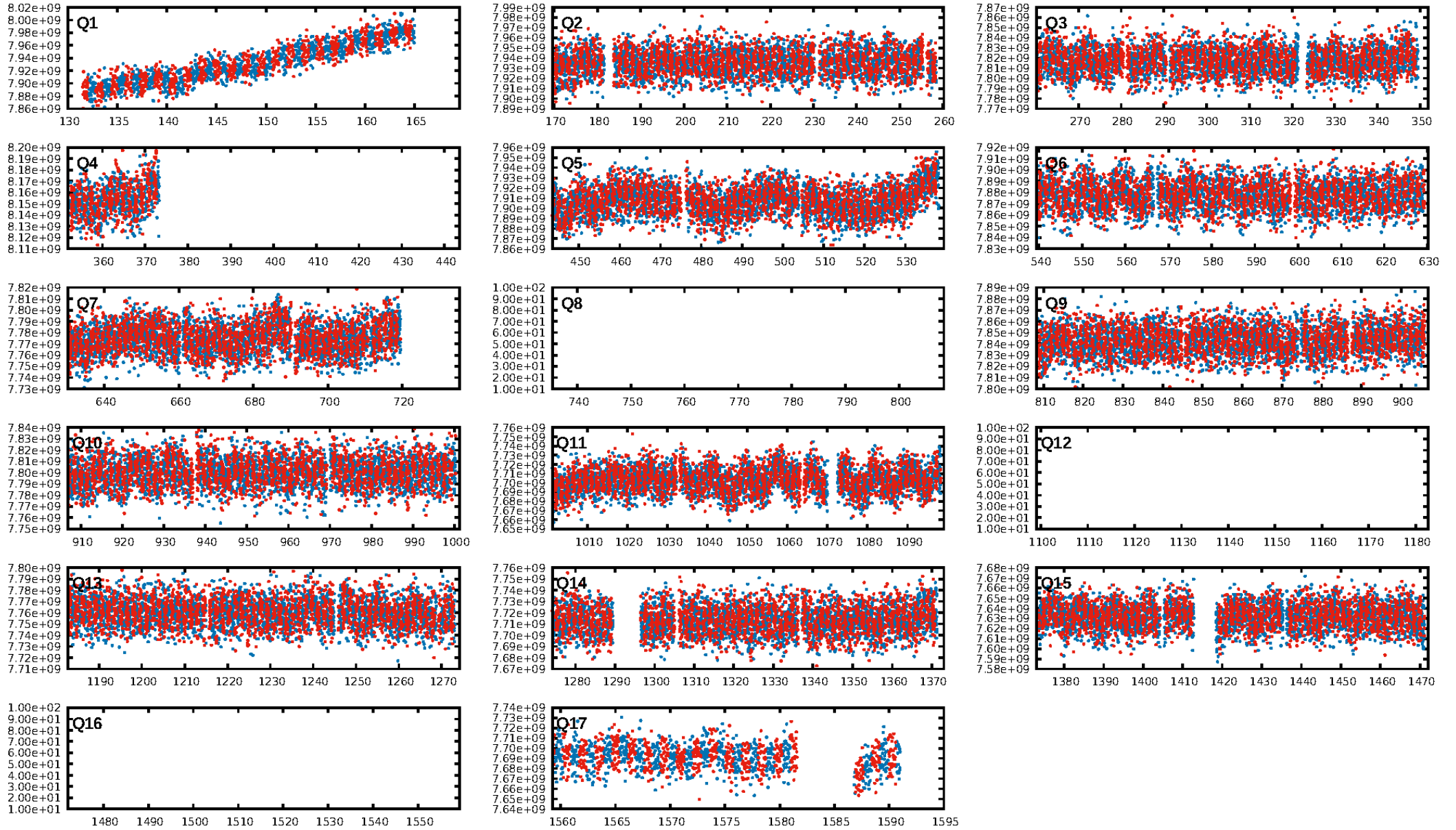
## DV Diagnostic Results:

**ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]**  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [671/671]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.8%  
**Centroid-so: 1.858 arcsec [6.22 $\sigma$ ]**  
OotOffset-rm: 6.901 arcsec [2.71 $\sigma$ ]  
OotOffset-st: 4/4/1/5 [14]  
KicOffset-rm: 5.898 arcsec [2.08 $\sigma$ ]  
KicOffset-st: 4/4/1/5 [14]  
DiffImageQuality-fgm: 0.07 [1/14]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:00:50 Z

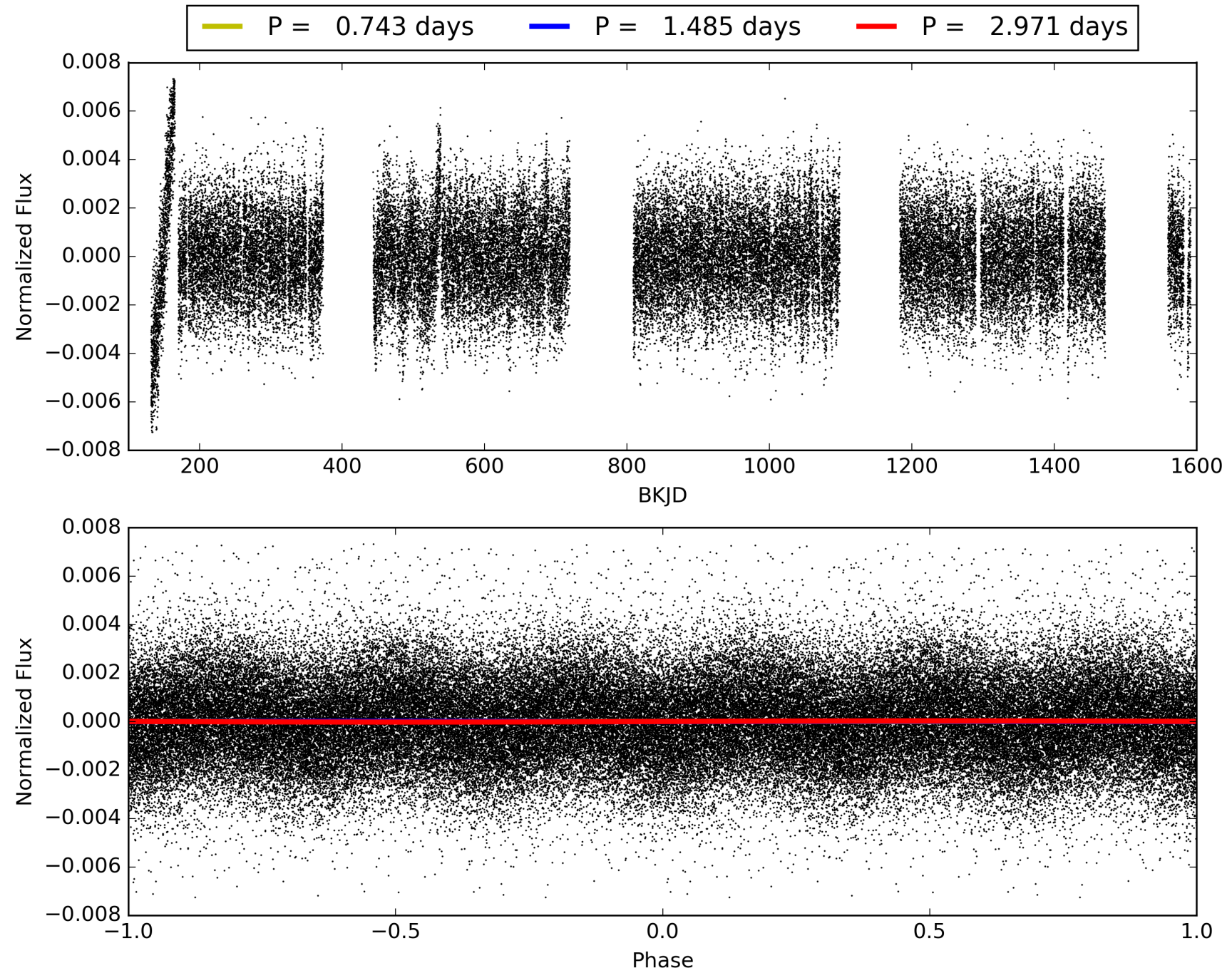
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011445913-01, PDC Light Curves



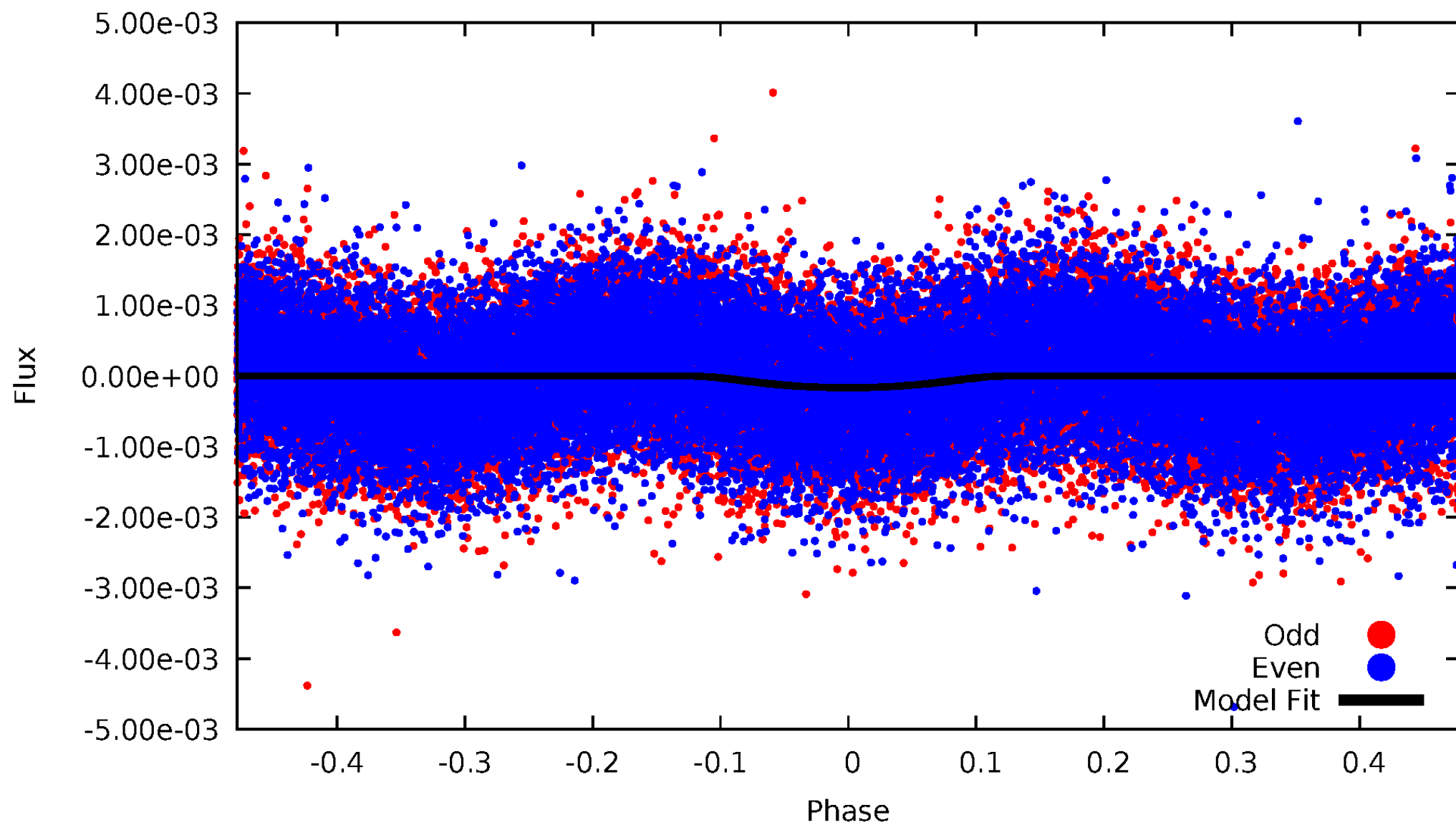


TCE 011445913-01



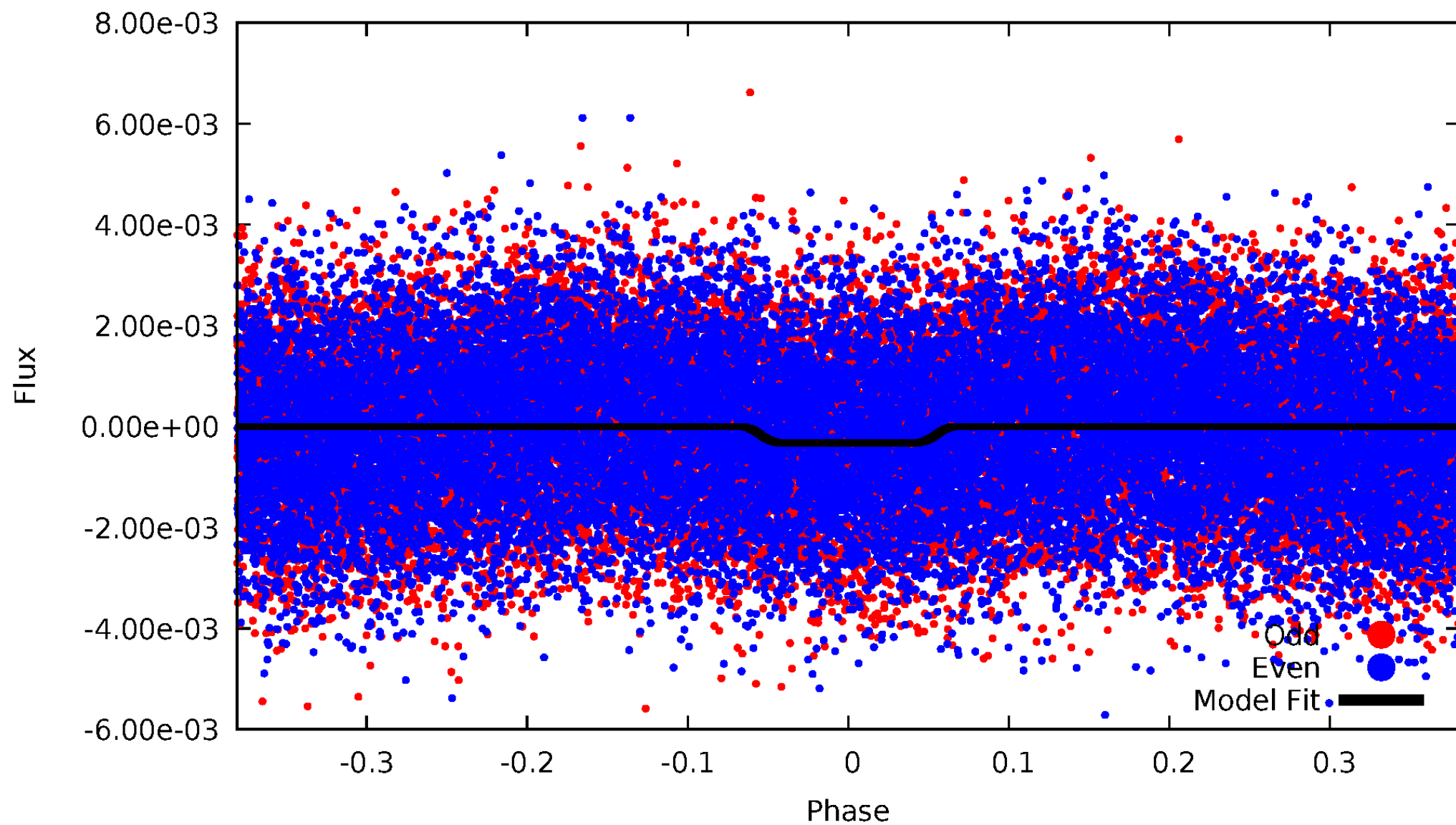
# DV Odd/Even

TCE 011445913-01

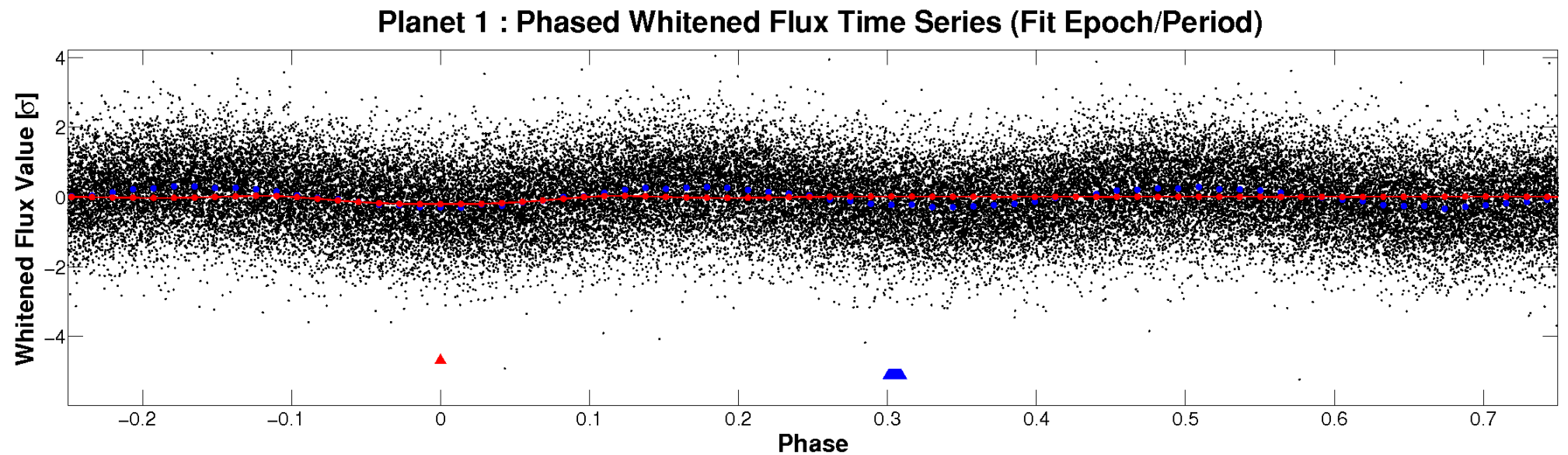
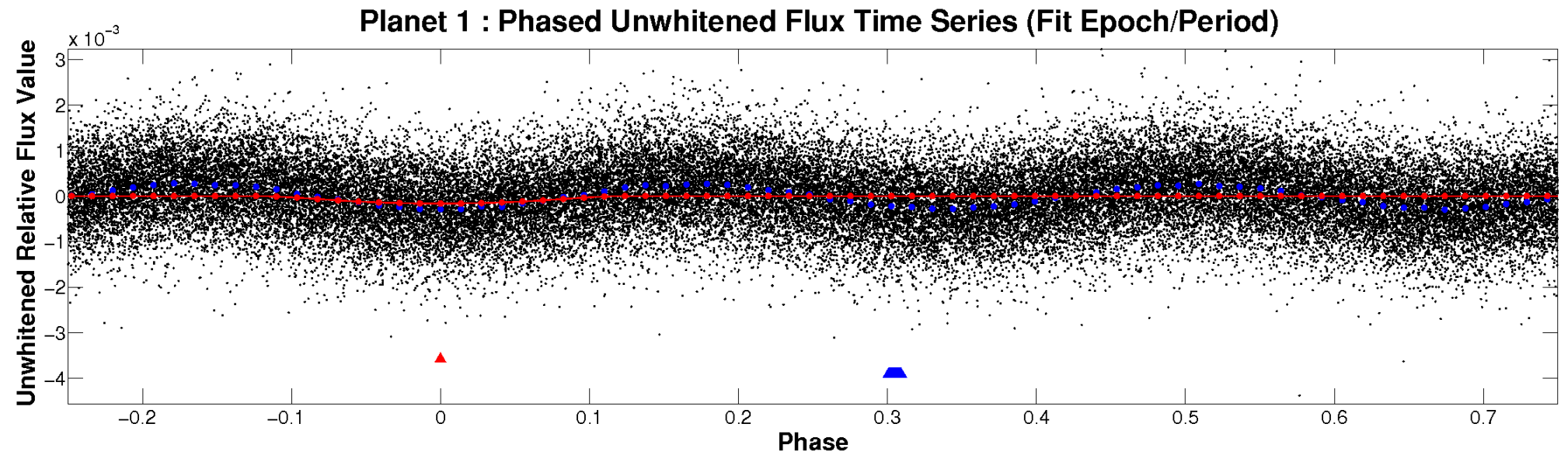


# ALT Odd/Even

TCE 011445913-01



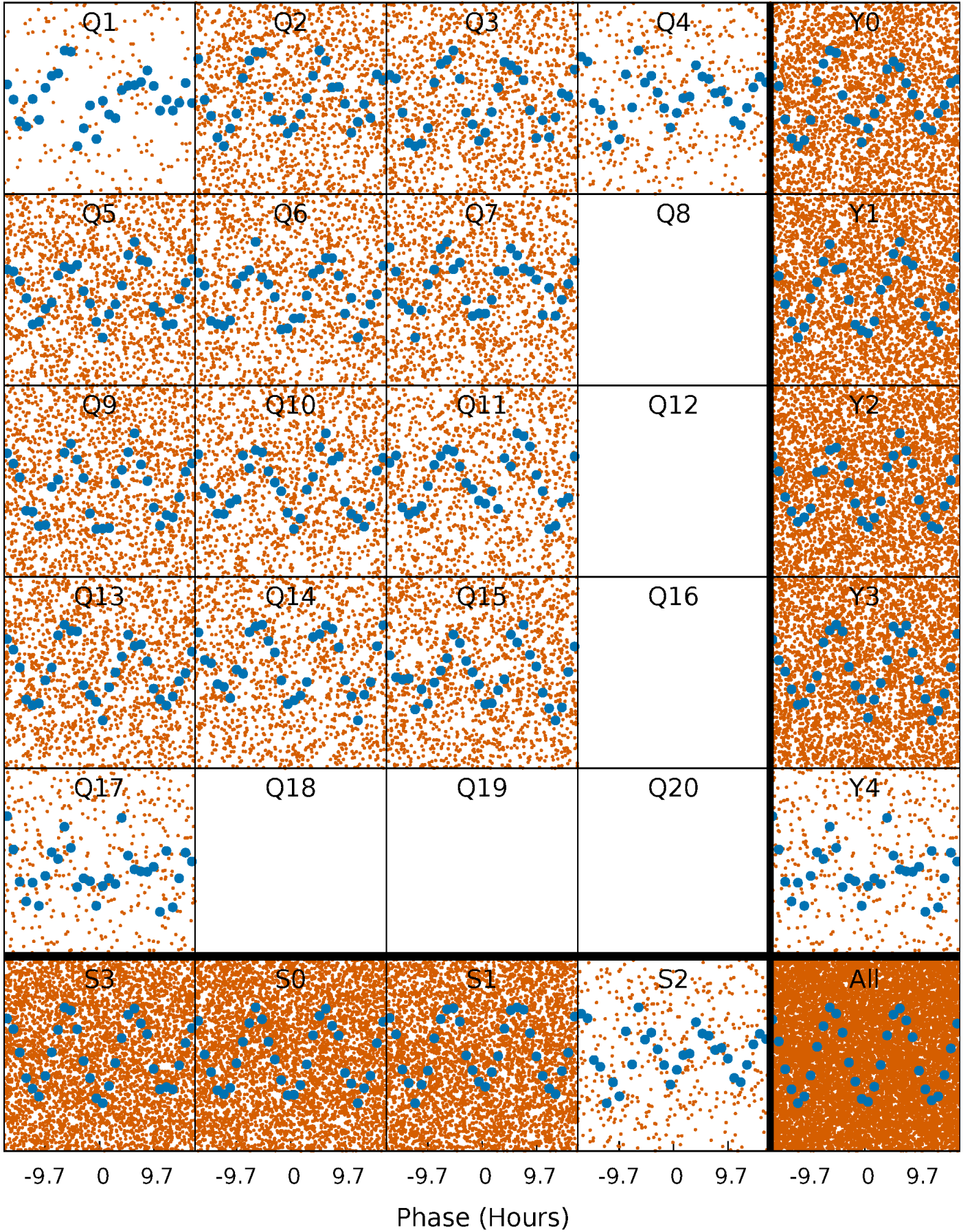
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

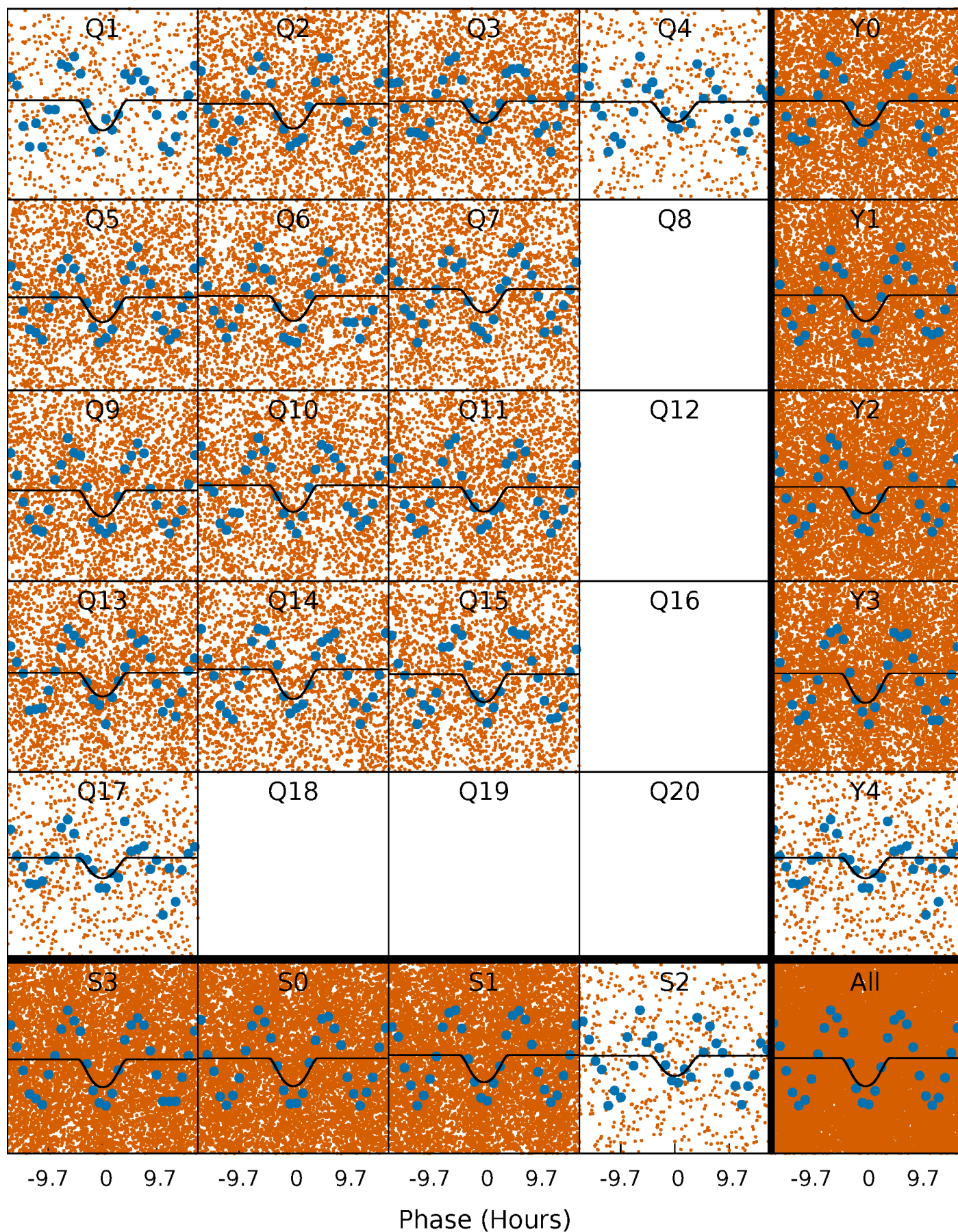
TCE 011445913-01 P= 1.485309 Days  $T_0=131.681187$  (BKJD)





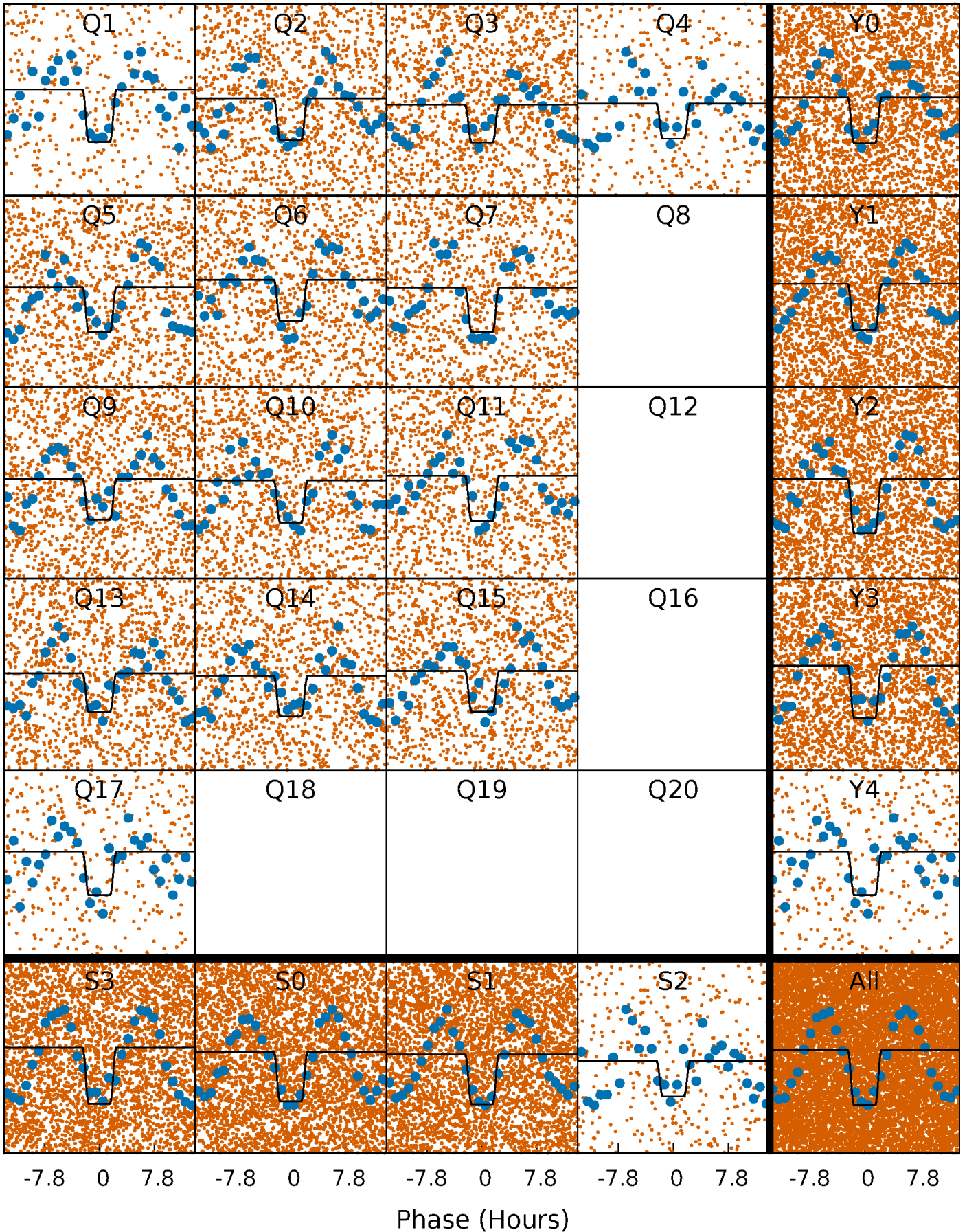
# DV Quarter-Phased Transit Curves

TCE 011445913-01 P= 1.485309 Days  $T_0=131.681187$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011445913-01 P= 1.485310 Days  $T_0=131.683753$  (BKJD)

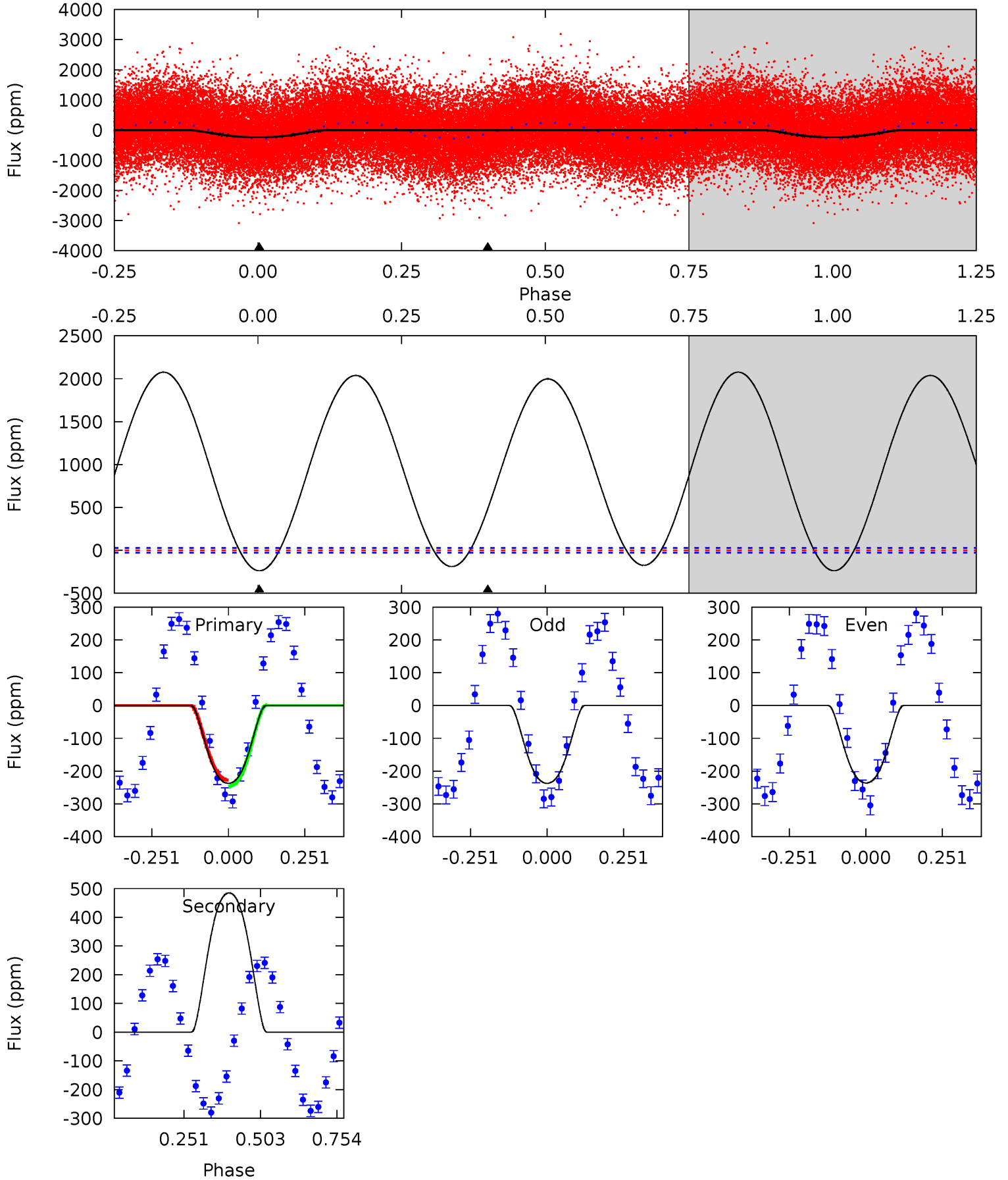




# DV Model-Shift Uniqueness Test

011445913-01, P = 1.485309 Days, E = 130.195878 Days

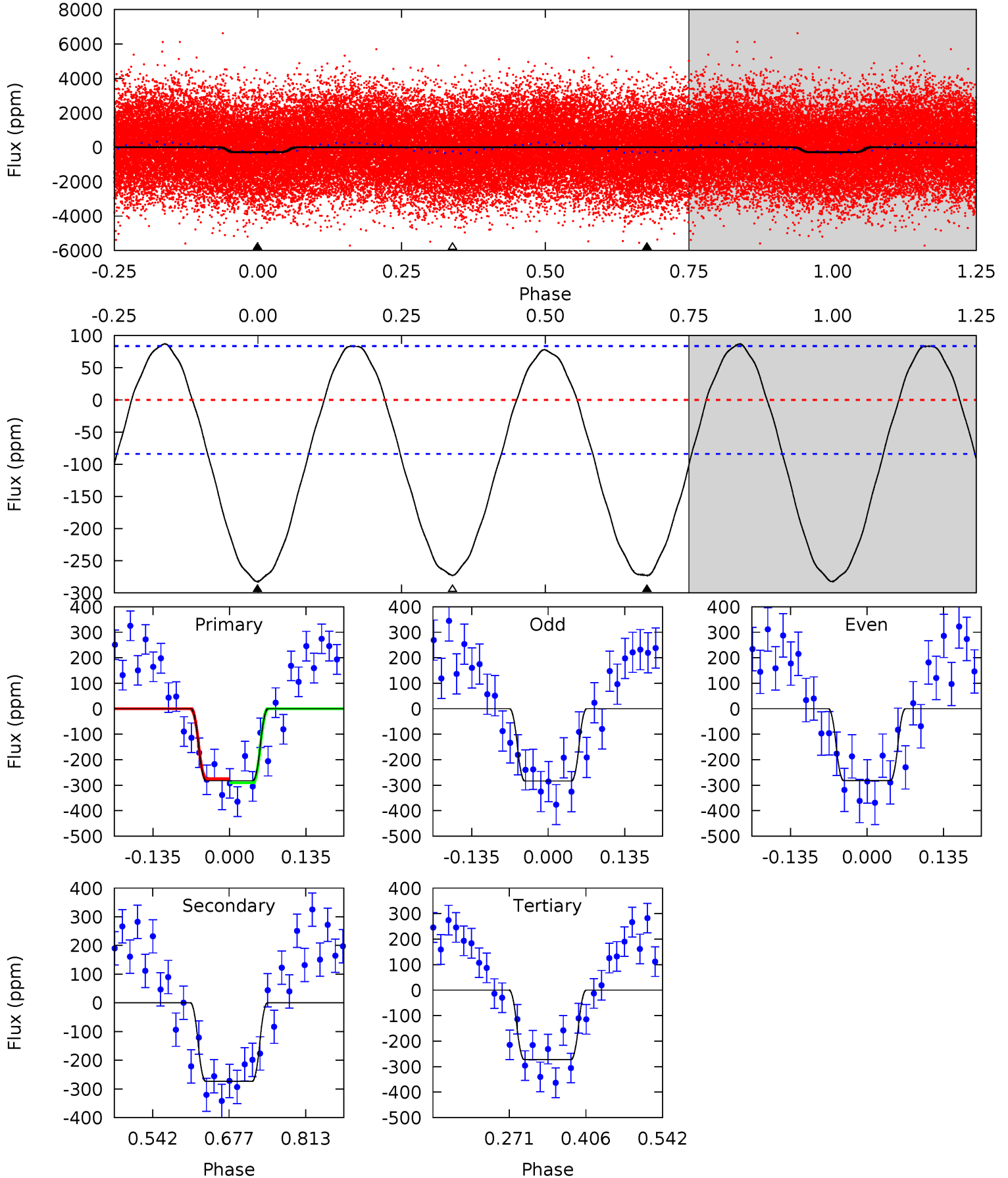
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.1	-75.9	0	0	4.37	1.15	52.1	37.1	37.1	-75.9	-75.9	0.08	0.85	0.90	1.52



# Alt Model-Shift Uniqueness Test

011445913-01, P = 1.485310 Days, E = 130.198443 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
15.2	14.7	14.7	0	4.50	1.49	6.98	0.52	15.2	0.01	14.7	0.05	0.99	0.24	0.41





### Stellar Parameters For KIC 011445913

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7242^{+129}_{-158}$	$3.484^{+0.280}_{-0.049}$	$-0.240^{+0.150}_{-0.150}$	$4.236^{+0.160}_{-1.364}$	$1.996^{+0.049}_{-0.293}$	$0.037^{+0.070}_{-0.004}$
	+2%/-2%	+8%/-1%	+62%/-62%	+4%/-32%	+2%/-15%	+190%/-11%
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 011445913-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$485 \pm 6$	$7.18^{+1.16}_{-1.22}$	$5079^{+160}_{-374}$	$-8850^{+676}_{-838}$	$-5.275^{+1.342}_{-2.117}$
Alt.	$-273 \pm 19$	$7.92^{+1.24}_{-1.39}$	$5071^{+162}_{-372}$	$6654^{+544}_{-451}$	$2.438^{+1.097}_{-0.592}$

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

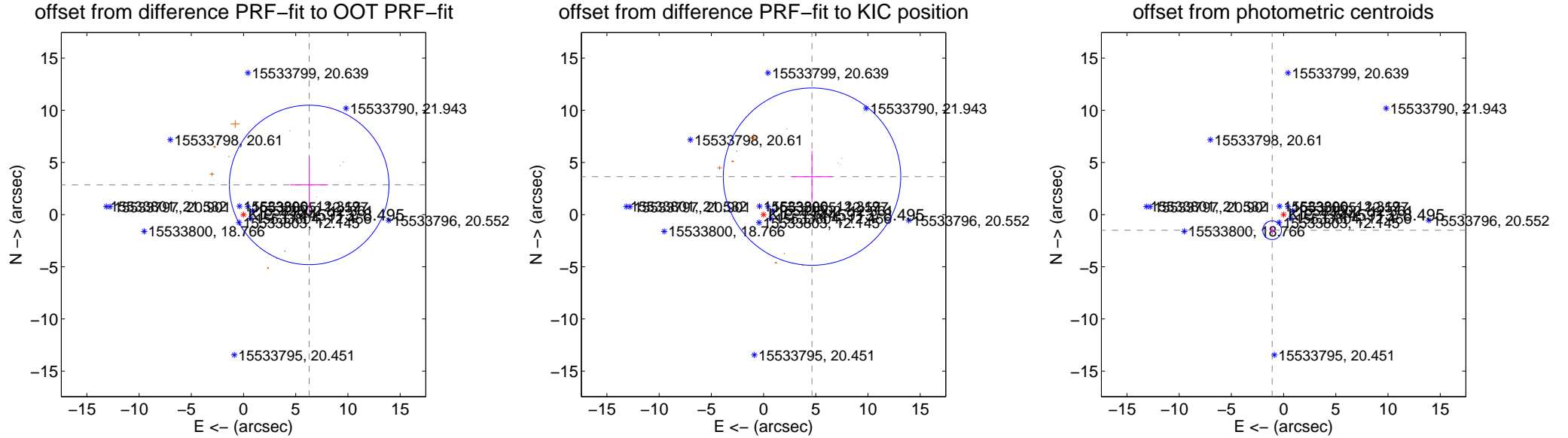
## DV Centroid Data

Supplemental centroid analysis for 011445913-01. **Kepler magnitude: 8.49.** Transit SNR 14.91

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

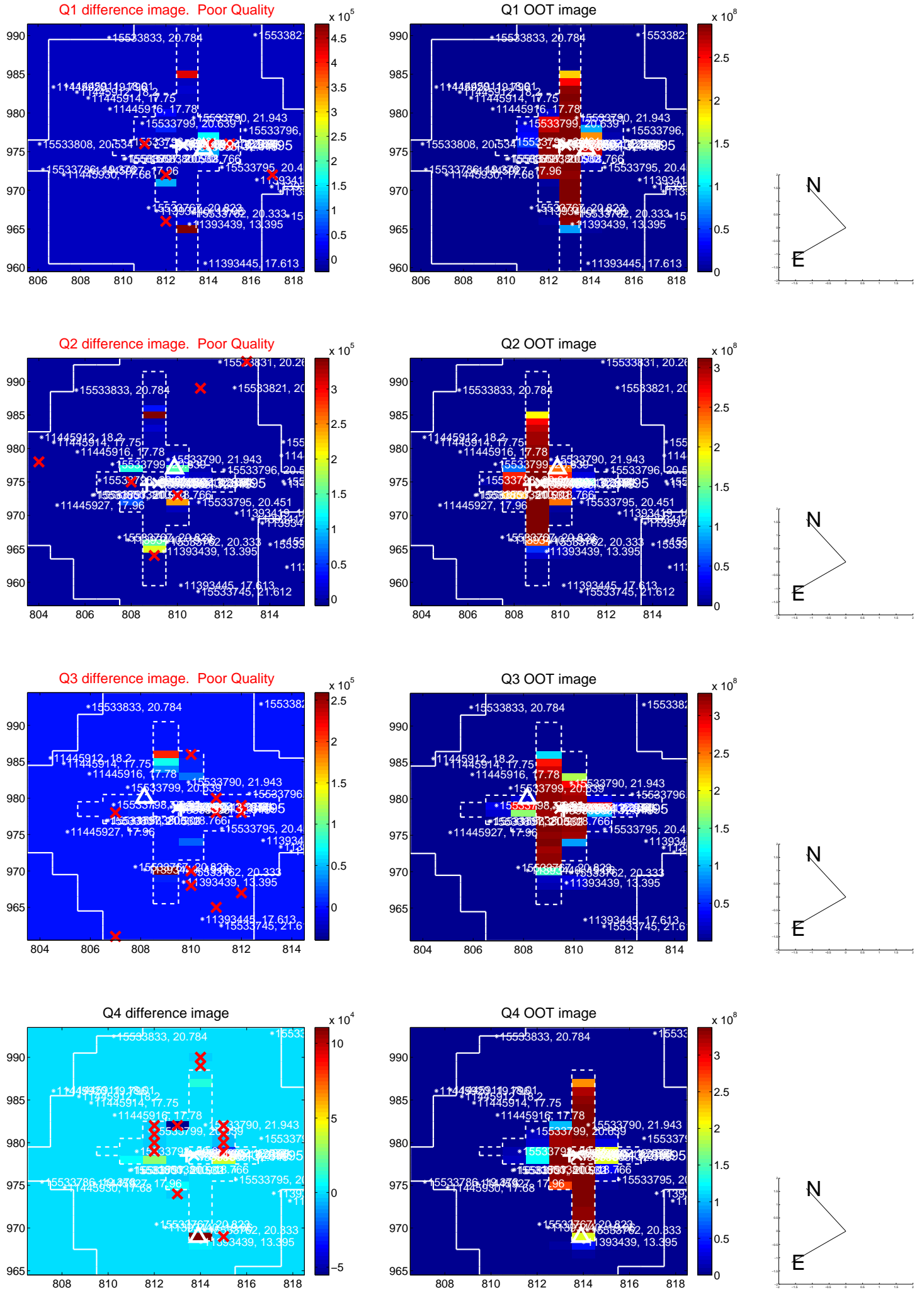
The direct PRF centroid is offset from the target star catalog position by about 1.27 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.901 \pm 2.547$	2.71	$-6.288 \pm 1.831$	$2.844 \pm 2.650$
PRF-fit source offset from KIC position	$5.898 \pm 2.832$	2.08	$-4.641 \pm 1.935$	$3.640 \pm 2.457$
photometric centroid source offset	$1.86 \pm 0.30$	<b>6.22</b>	$1.10 \pm 0.25$	$-1.50 \pm 0.32$

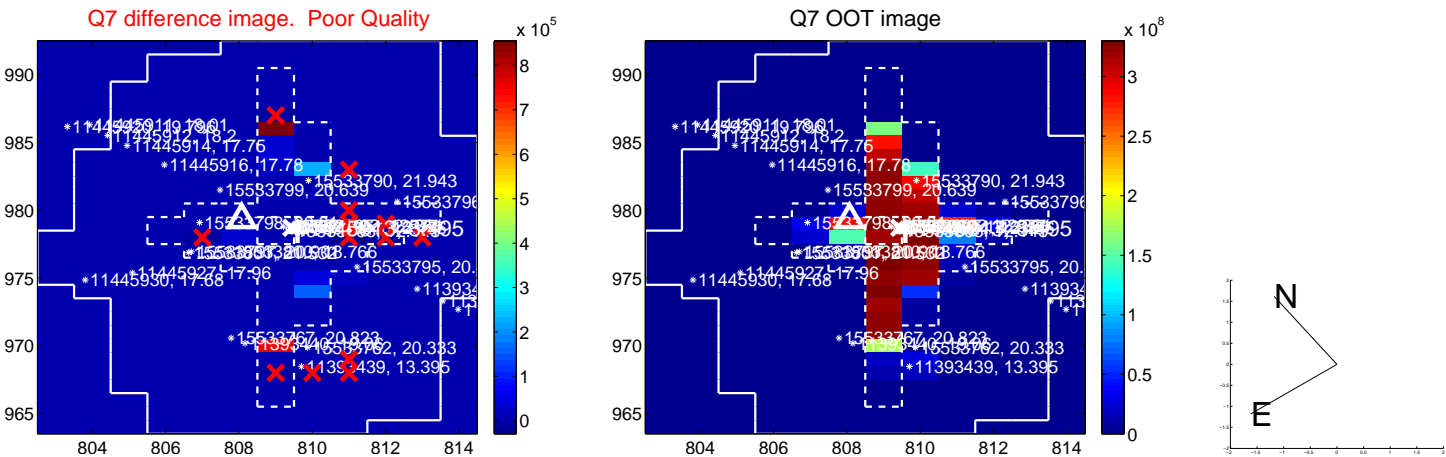
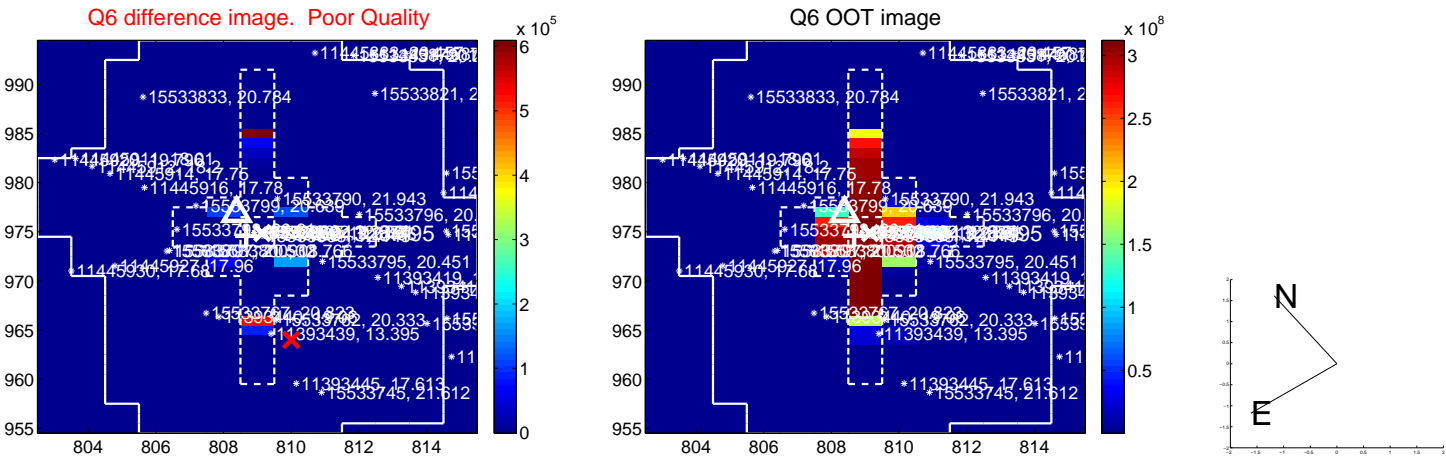
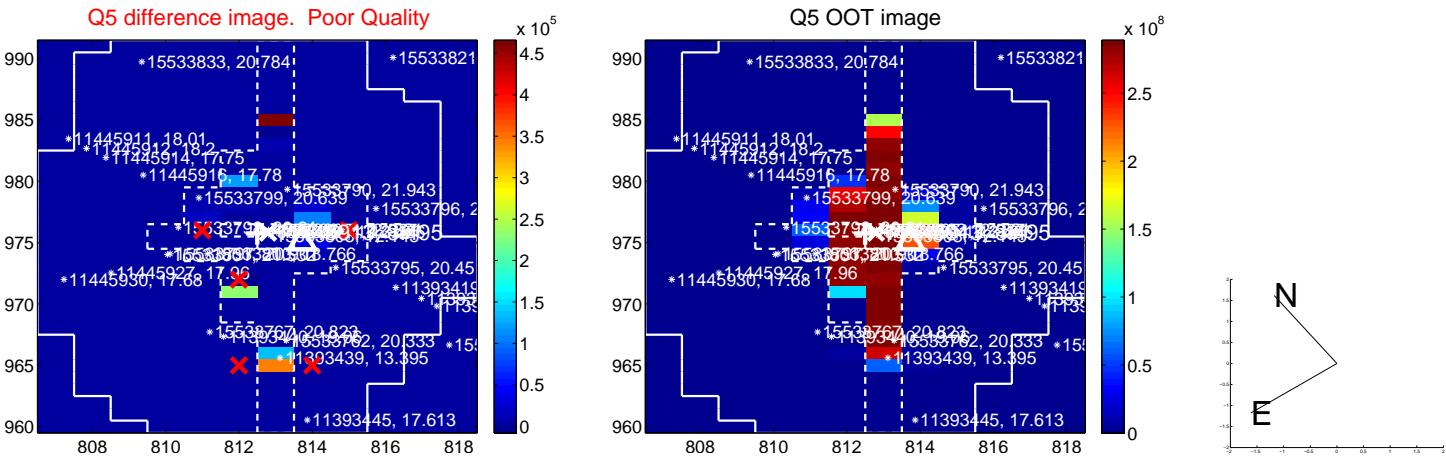


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

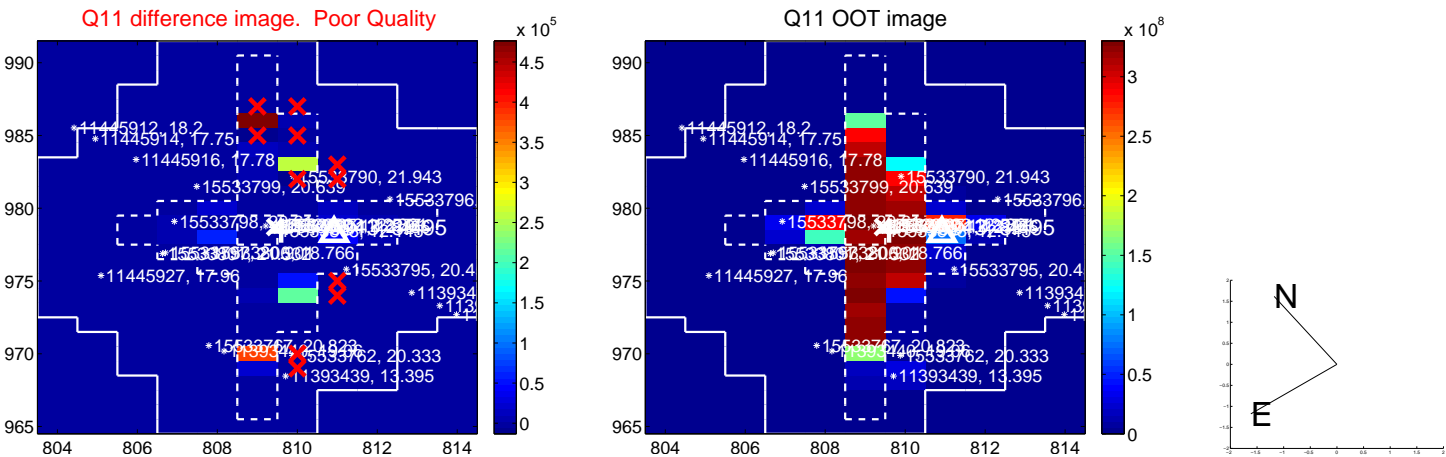
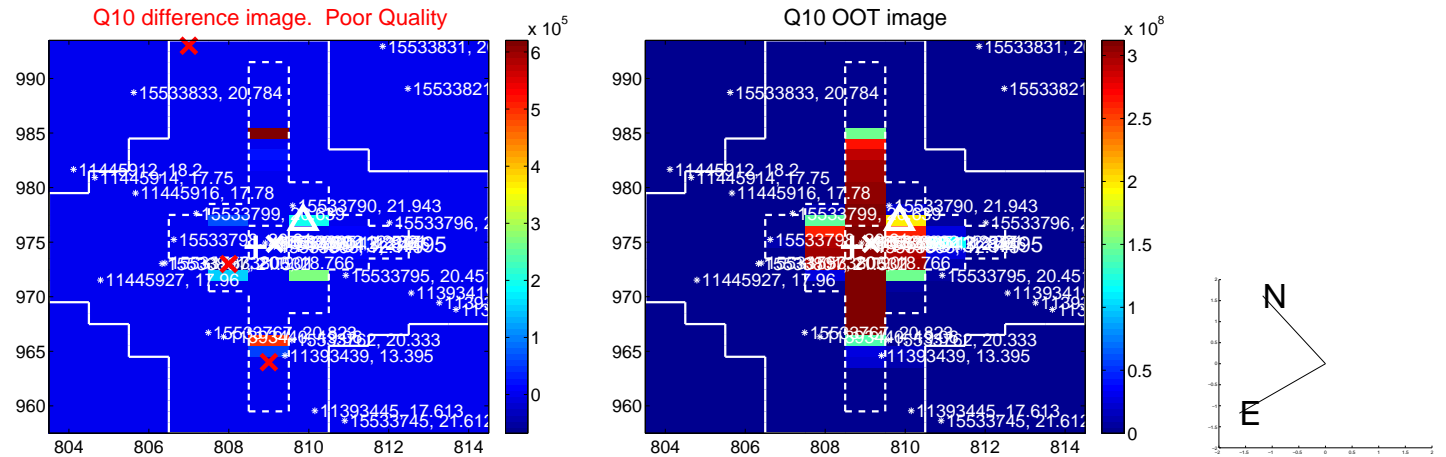
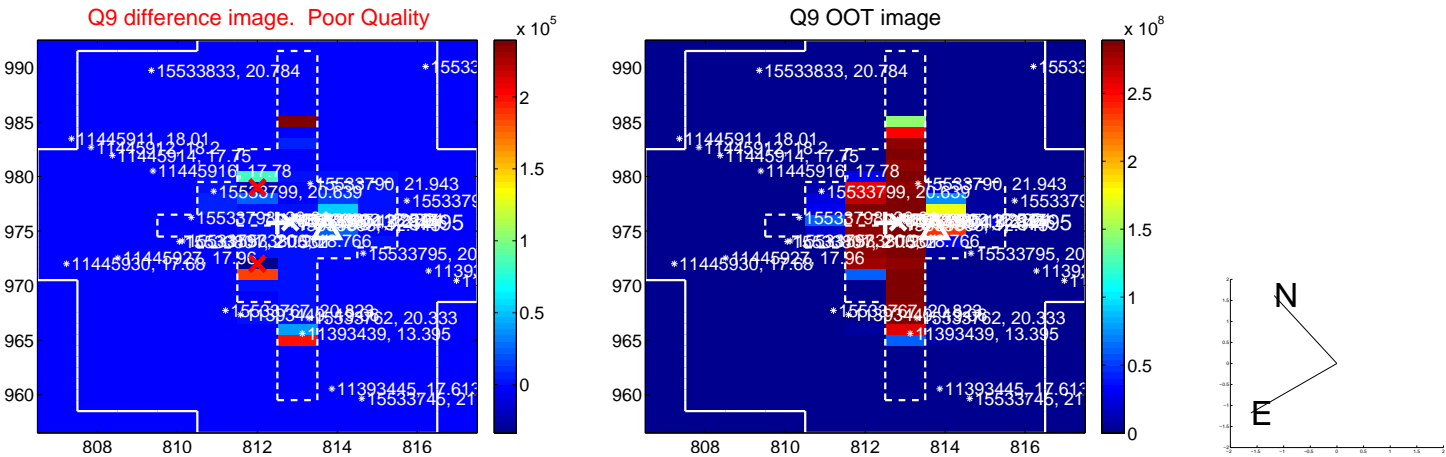


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

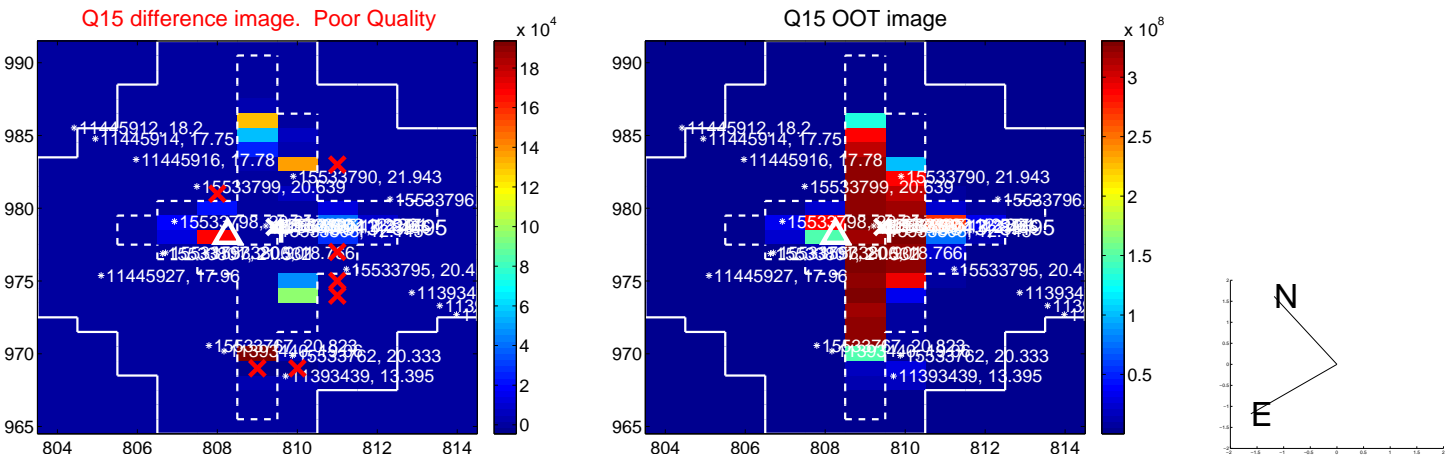
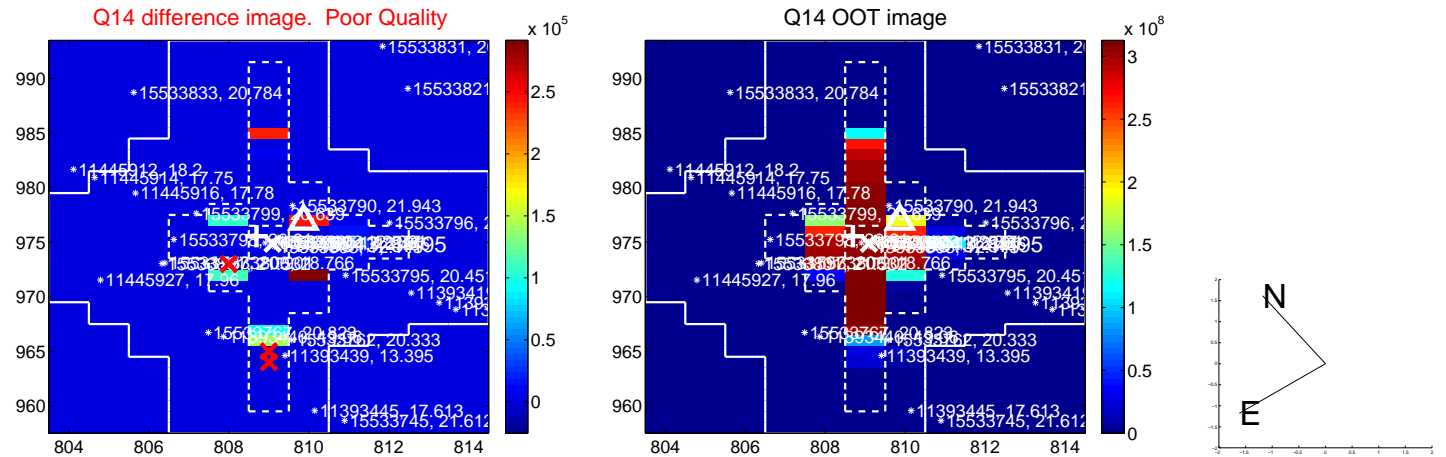
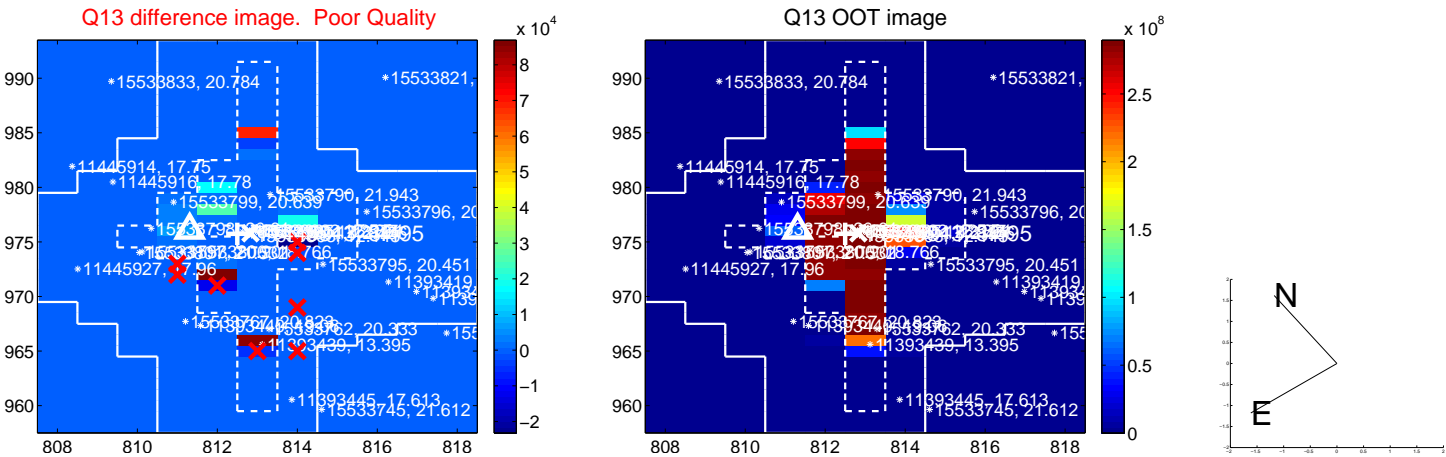




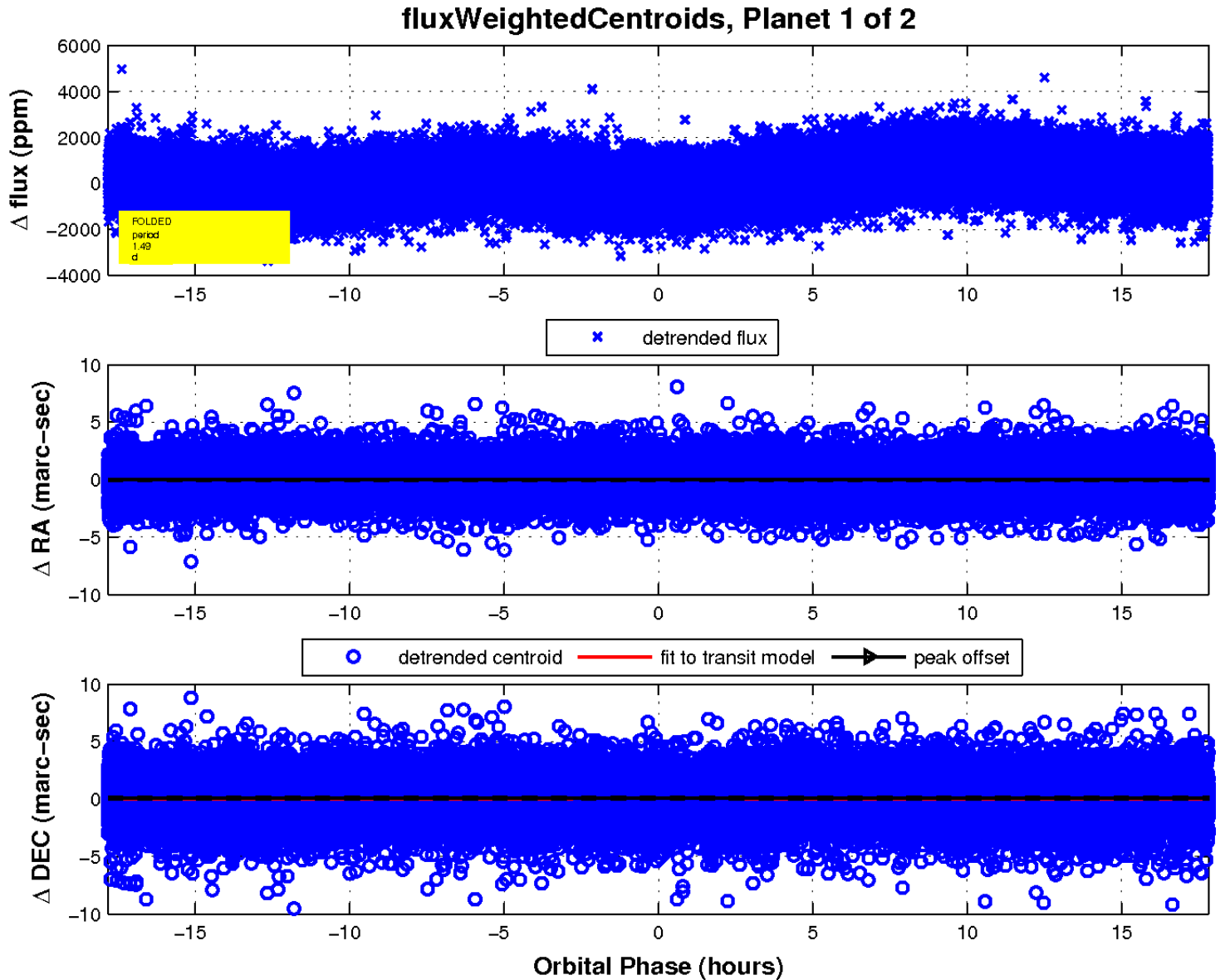
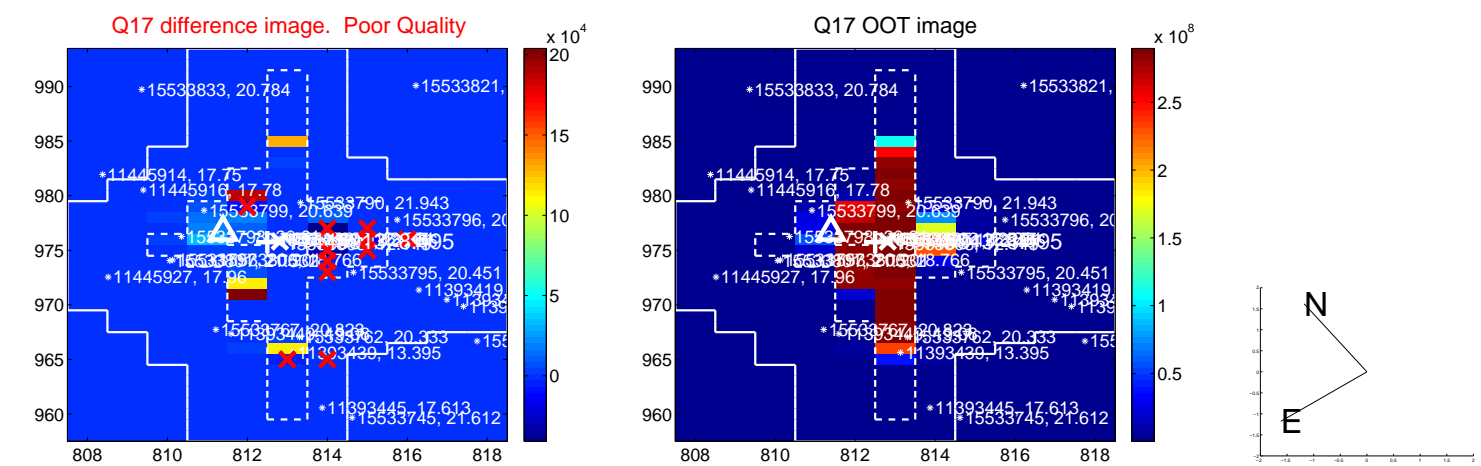
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

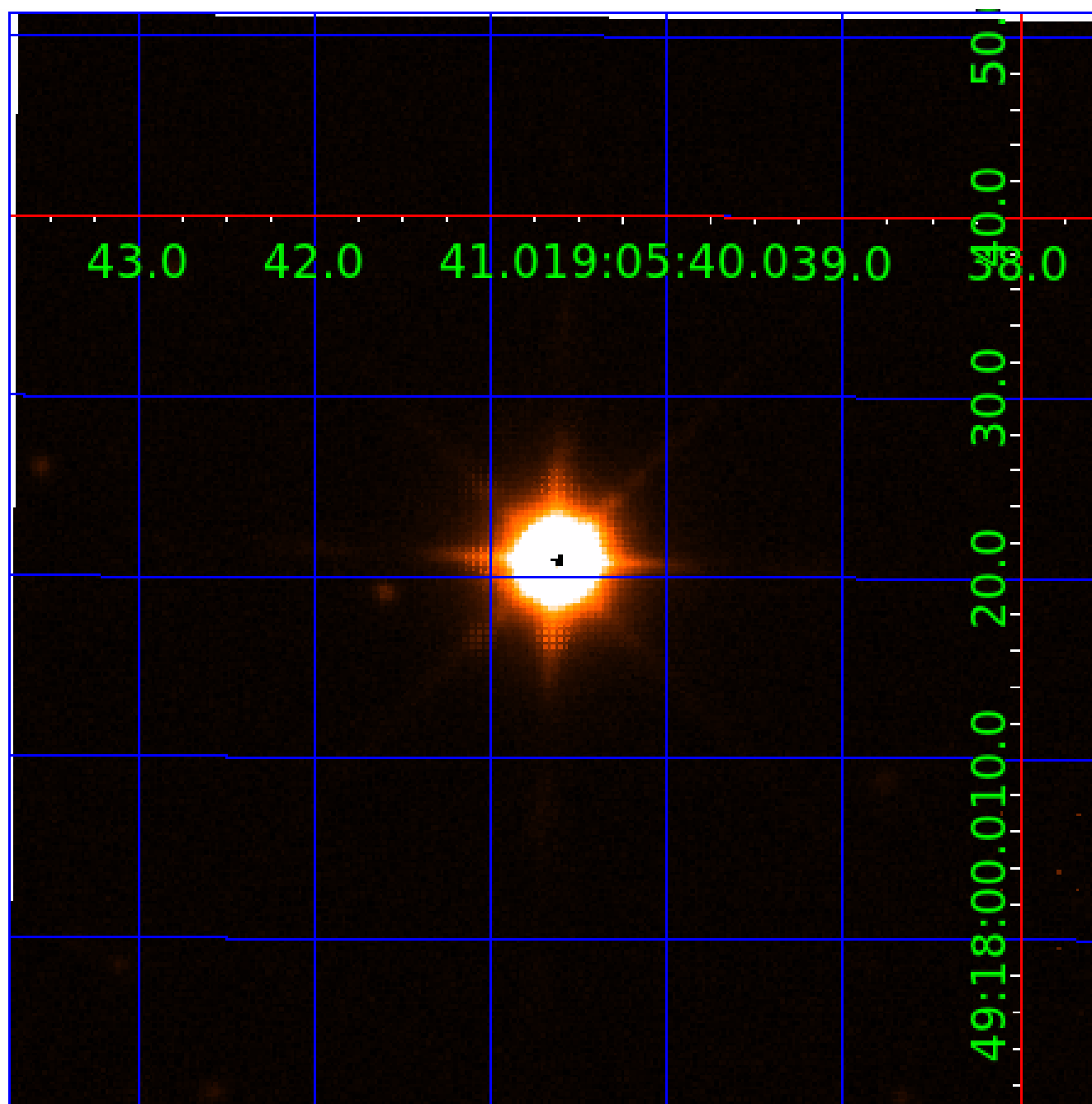


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 011445913

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011445913-01	OBS	No	1.485309	131.681187	164.7	8.521	14.0	14.9	4.24	7242	7.53	42974.42
011445913-02	OBS	No	1.485296	132.140277	1060.2	14.364	18.3	22.2	4.24	7242	23.81	42974.90

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011445913-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011445913-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

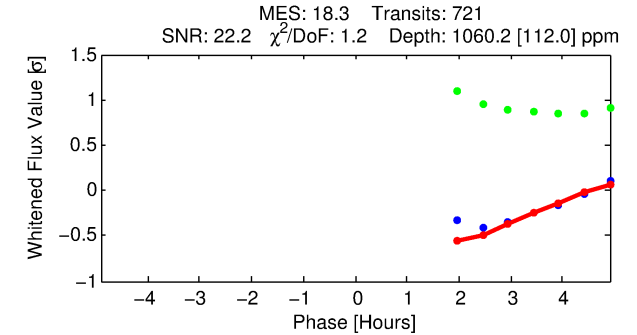
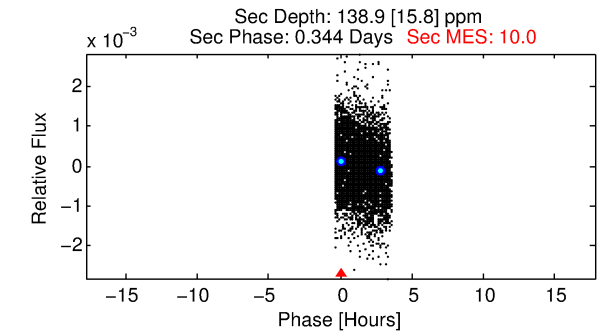
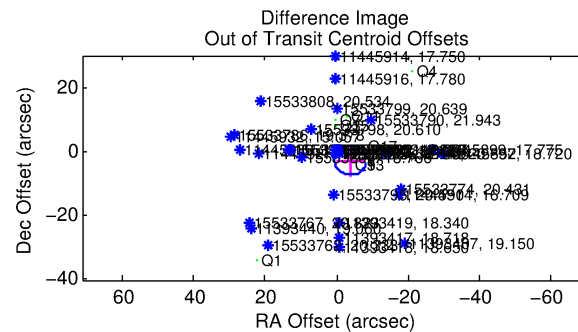
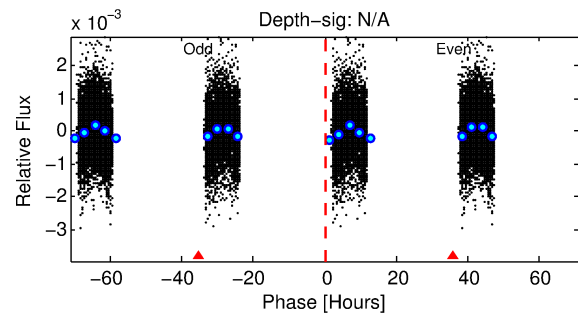
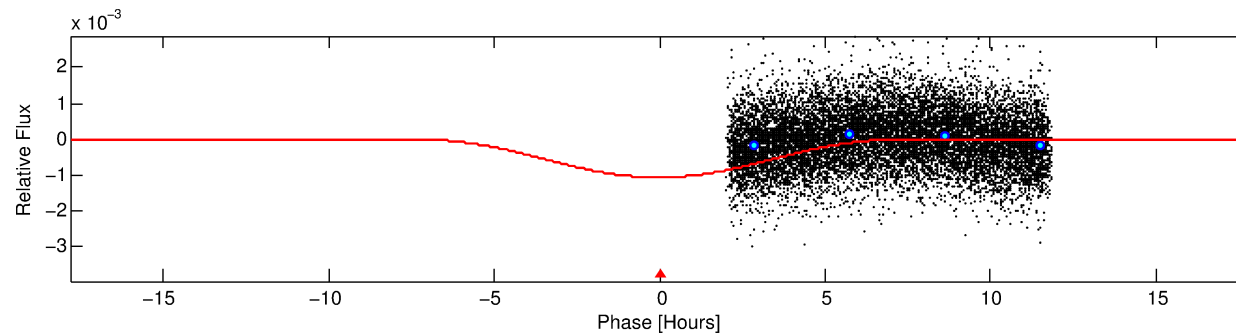
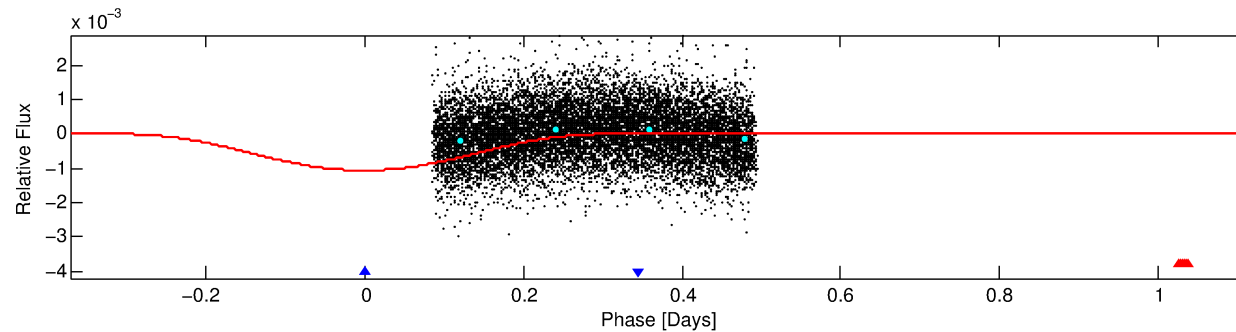
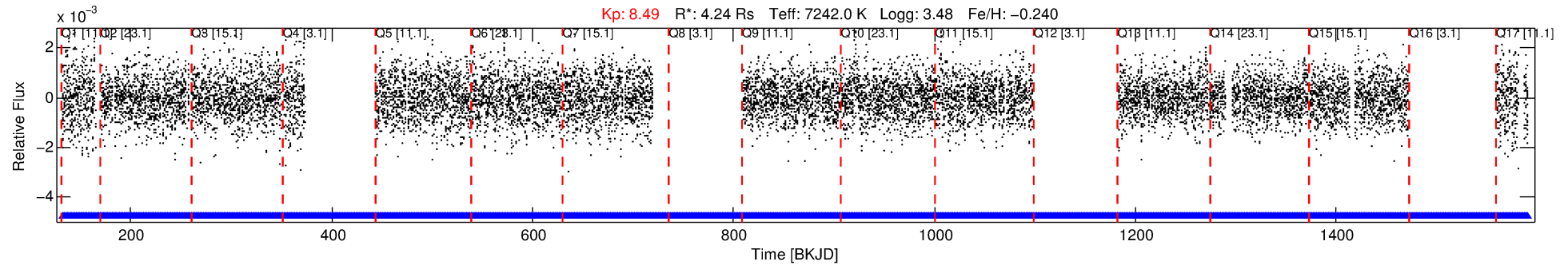
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011445913-02

No Significant Match Found

# DV One-Page Summary

KIC: 11445913 Candidate: 2 of 2 Period: 1.485 d



## DV Fit Results:

Period = 1.48530 [0.00001] d  
Epoch = 132.1403 [0.0163] BKJD  
 $R_p/R^* = 0.0515$  [0.0391]  
 $a/R^* = 1.06$  [0.04]  
 $b = 0.99$  [0.06]  
 $\text{Seff} = 42974.90$  [20984.77]  
 $T_{\text{eq}} = 3671$  [448] K  
 **$R_p = 23.81$  [19.65] Re**  
 $a = 0.0321$  [0.0097] AU  
 $\text{Ag} = 0.14$  [0.22]  $[-3.89\sigma]$   
 $T_{\text{effp}} = 3464$  [1322] K  $[-0.15\sigma]$

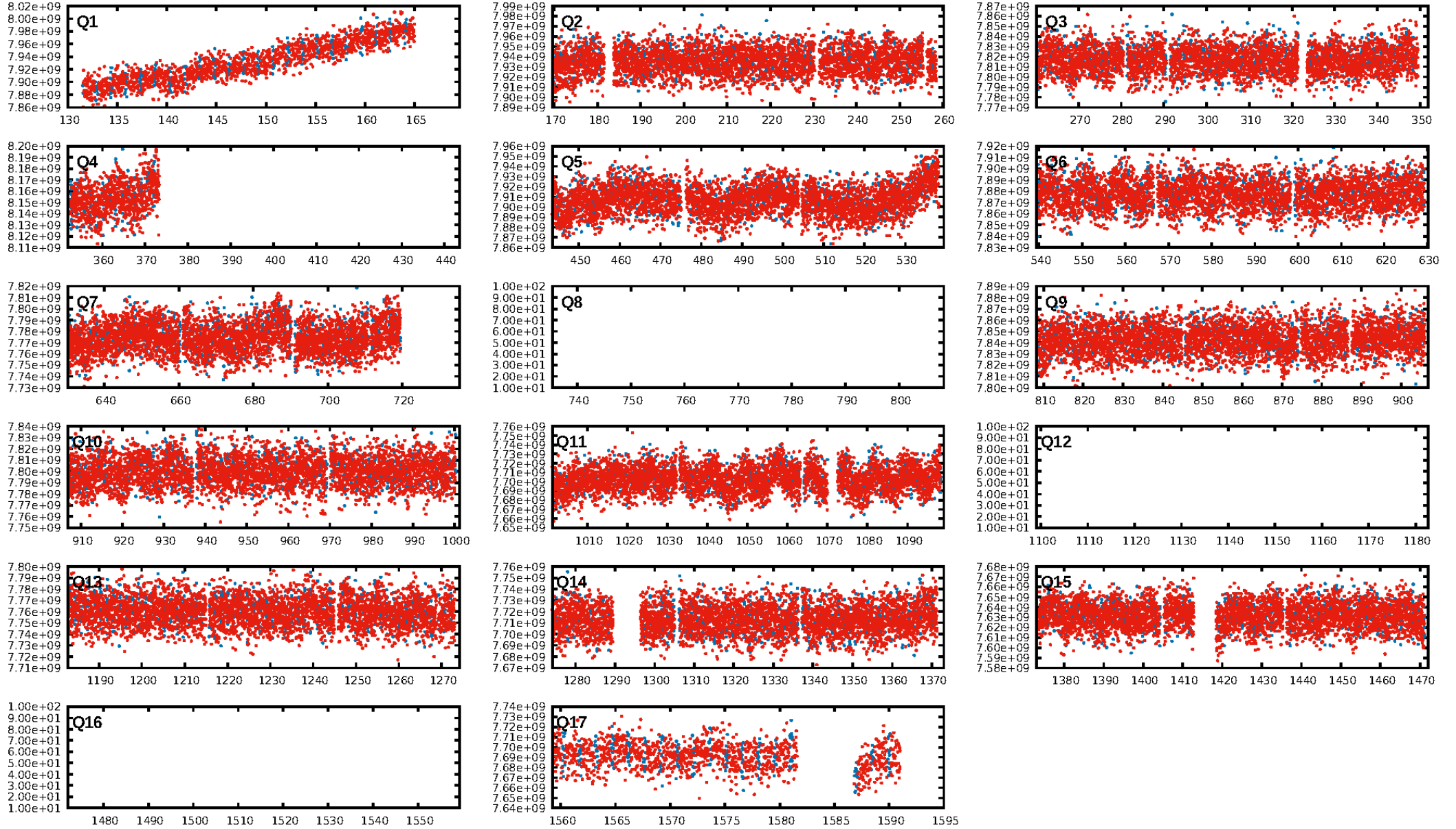
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [666/666]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 10.9%  
**Centroid-so: 1.382 arcsec [31.21σ]**  
**OotOffset-rm: 4.738 arcsec [3.15σ]**  
KicOffset-rm: 3.581 arcsec [2.75σ]  
OotOffset-st: 0/4/1/5 [10]  
KicOffset-st: 0/4/1/5 [10]  
DiffImageQuality-fgm: 0.10 [1/10]  
DiffImageOverlap-fno: 0.00 [0/14]

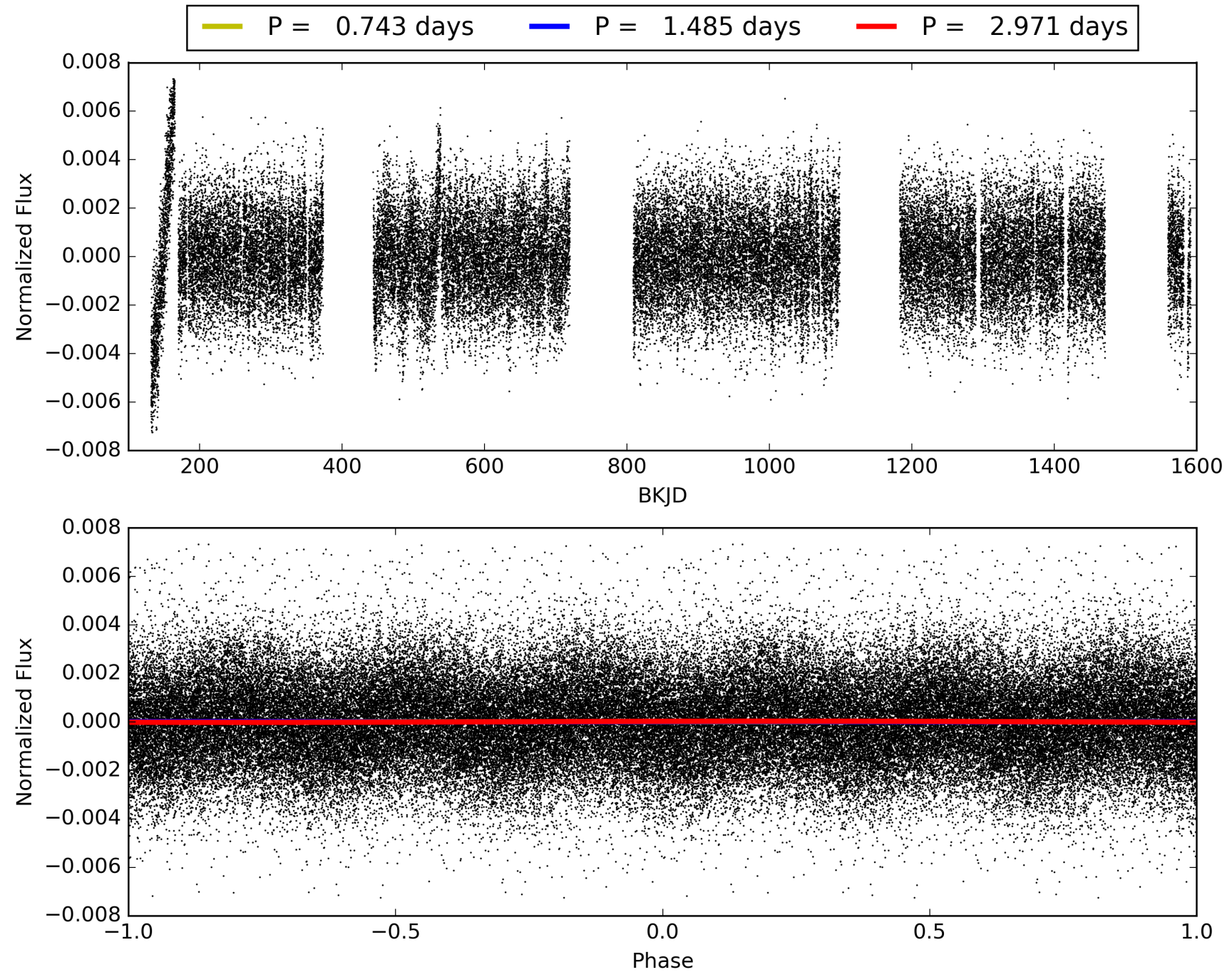
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:01:05 Z

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

# TCE 011445913-02, PDC Light Curves



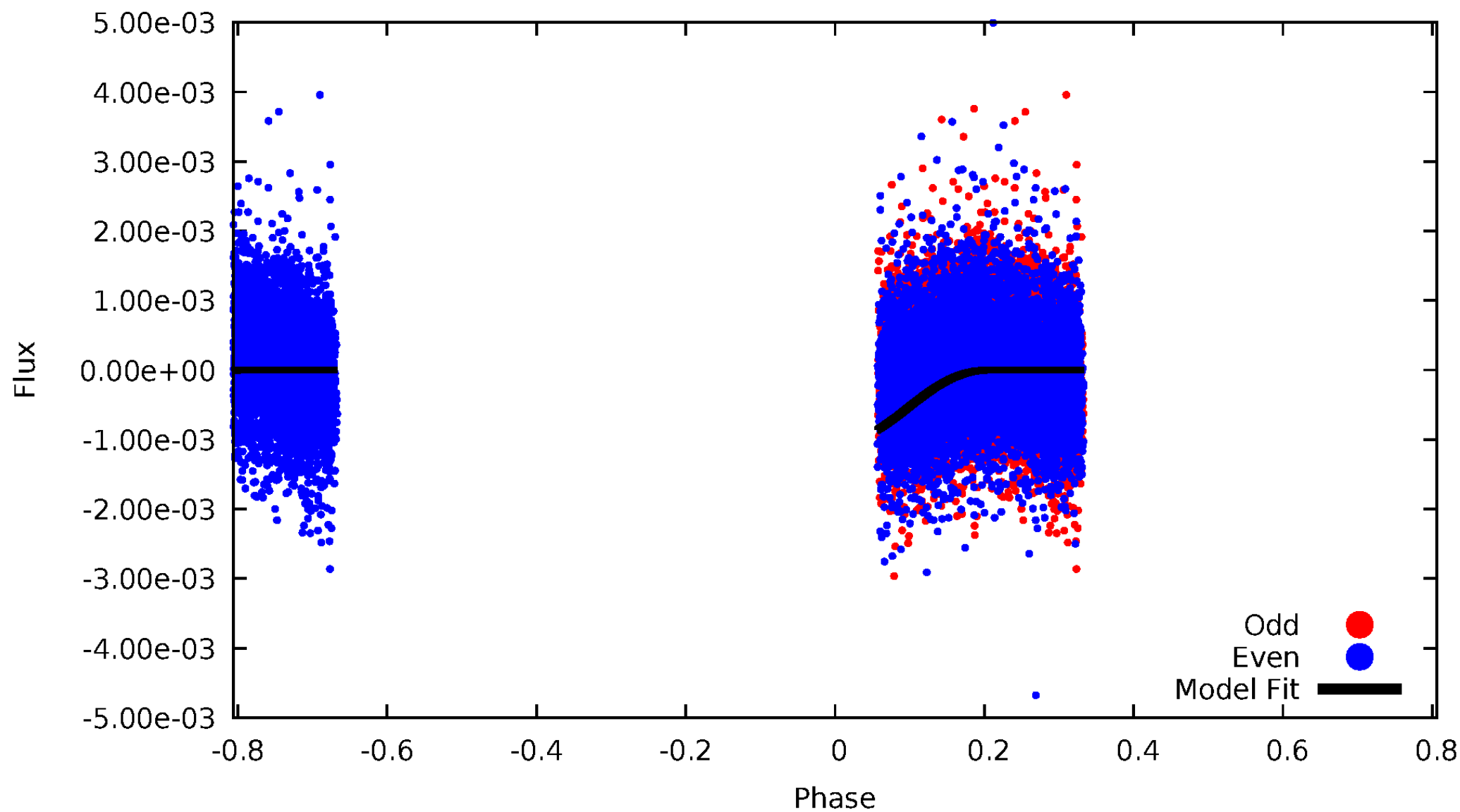
# TCE 011445913-02





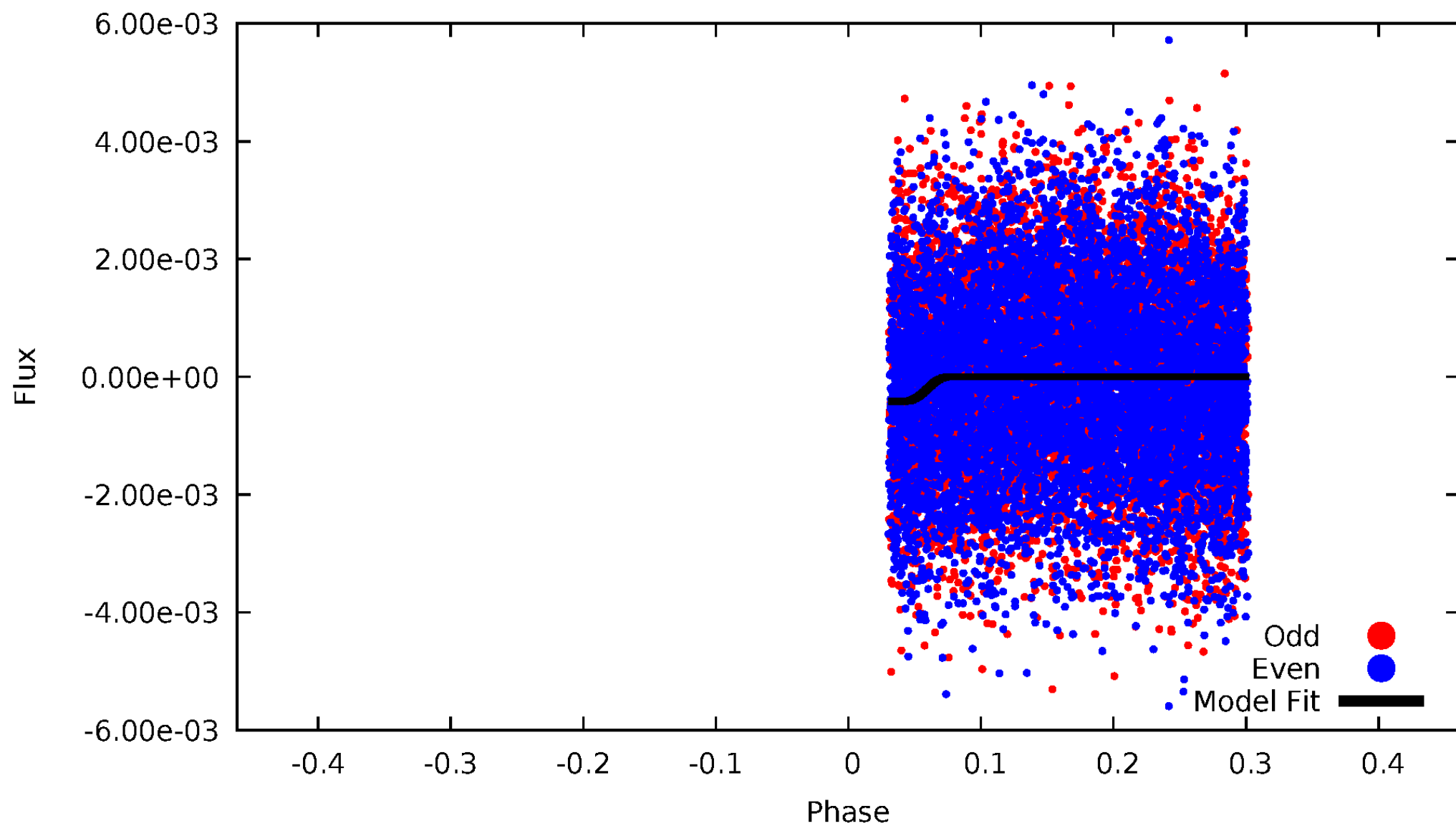
# DV Odd/Even

TCE 011445913-02



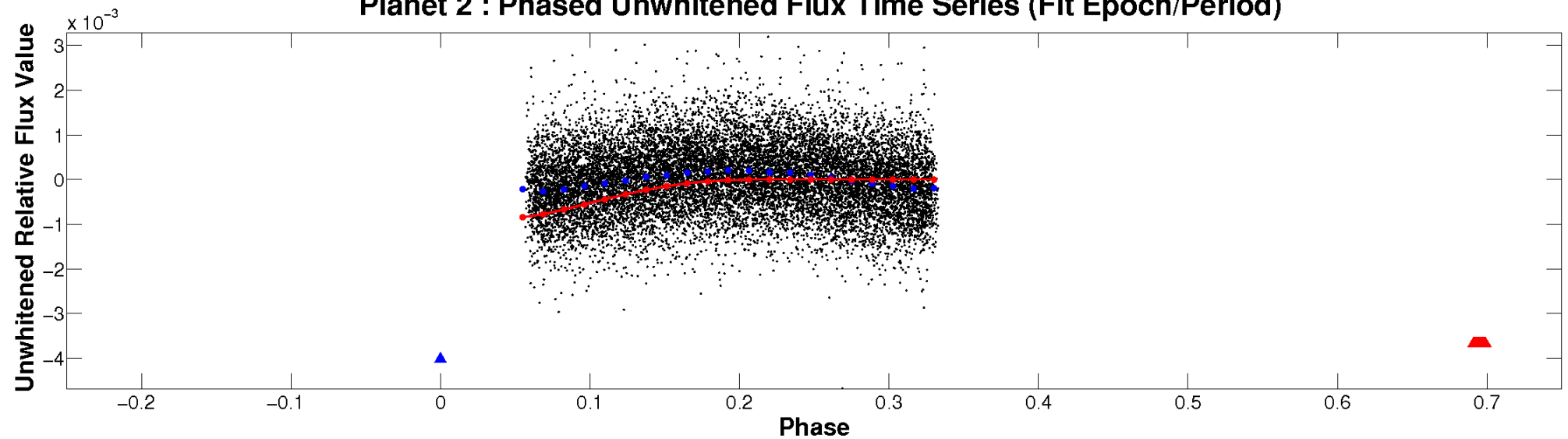
# ALT Odd/Even

TCE 011445913-02

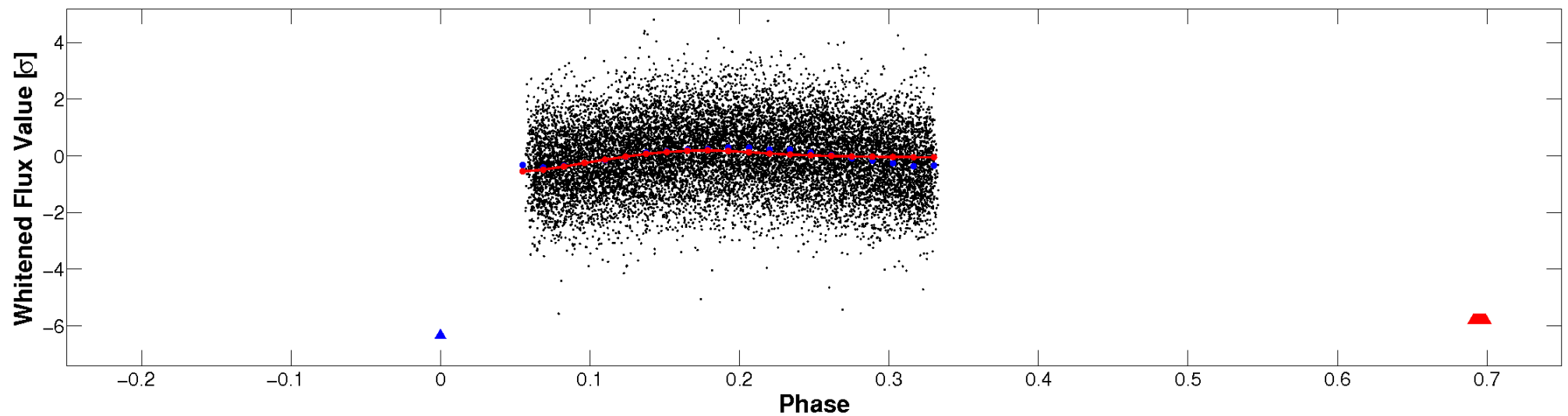


# Non-Whitened Vs. Whitened Light Curve

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

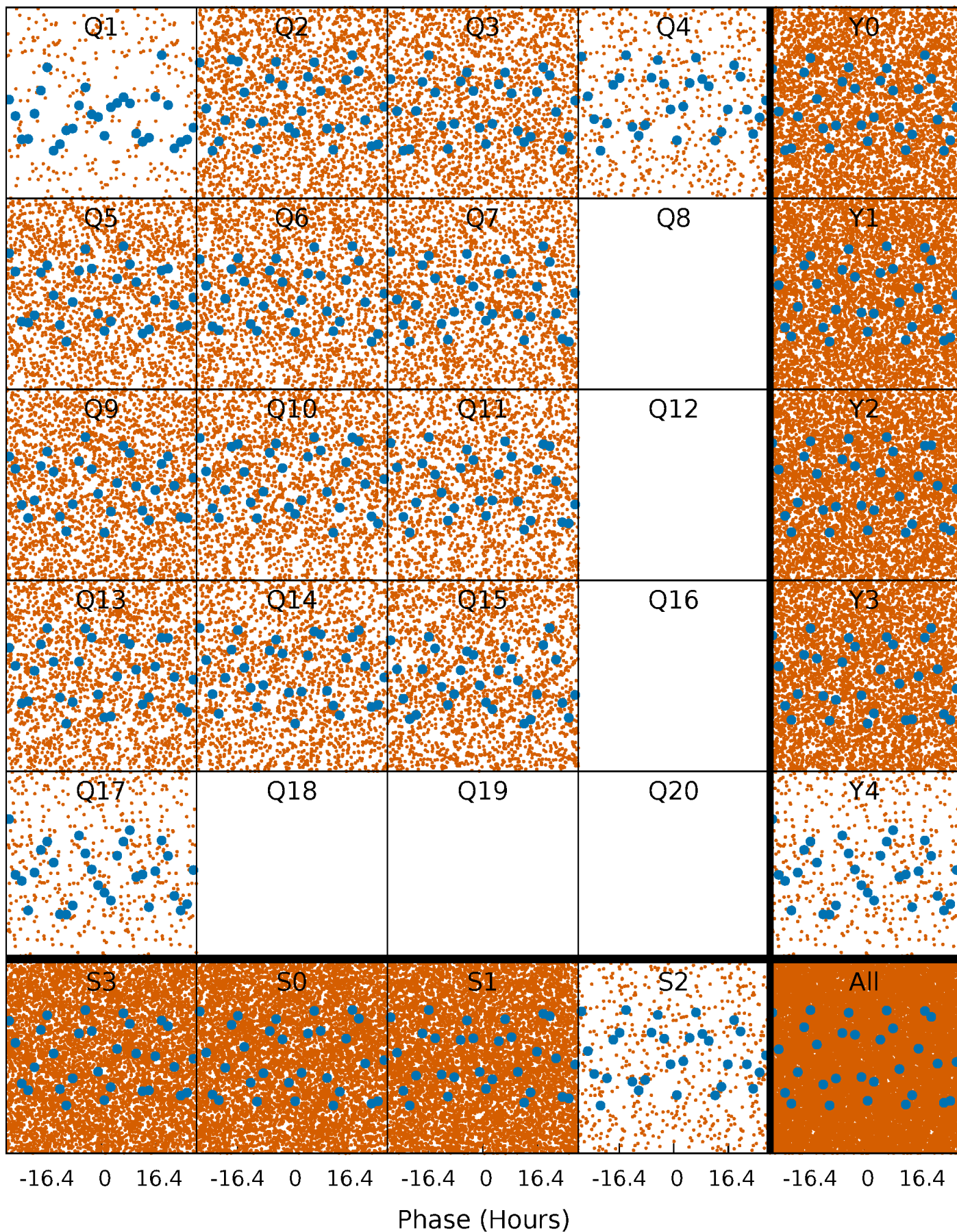


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



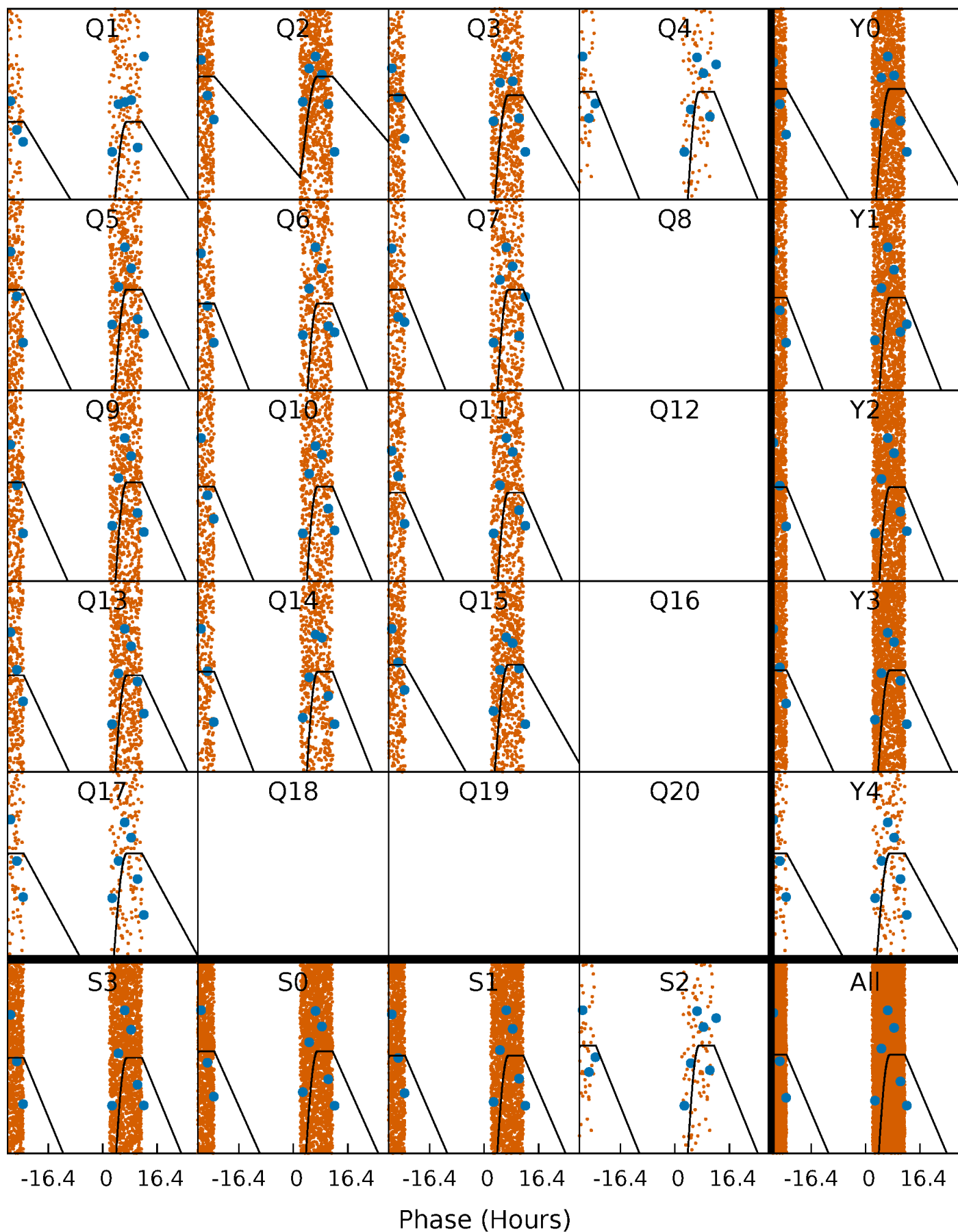
# PDC Quarter-Phased Transit Curves

TCE 011445913-02 P= 1.485296 Days  $T_0=132.140277$  (BKJD)



# DV Quarter-Phased Transit Curves

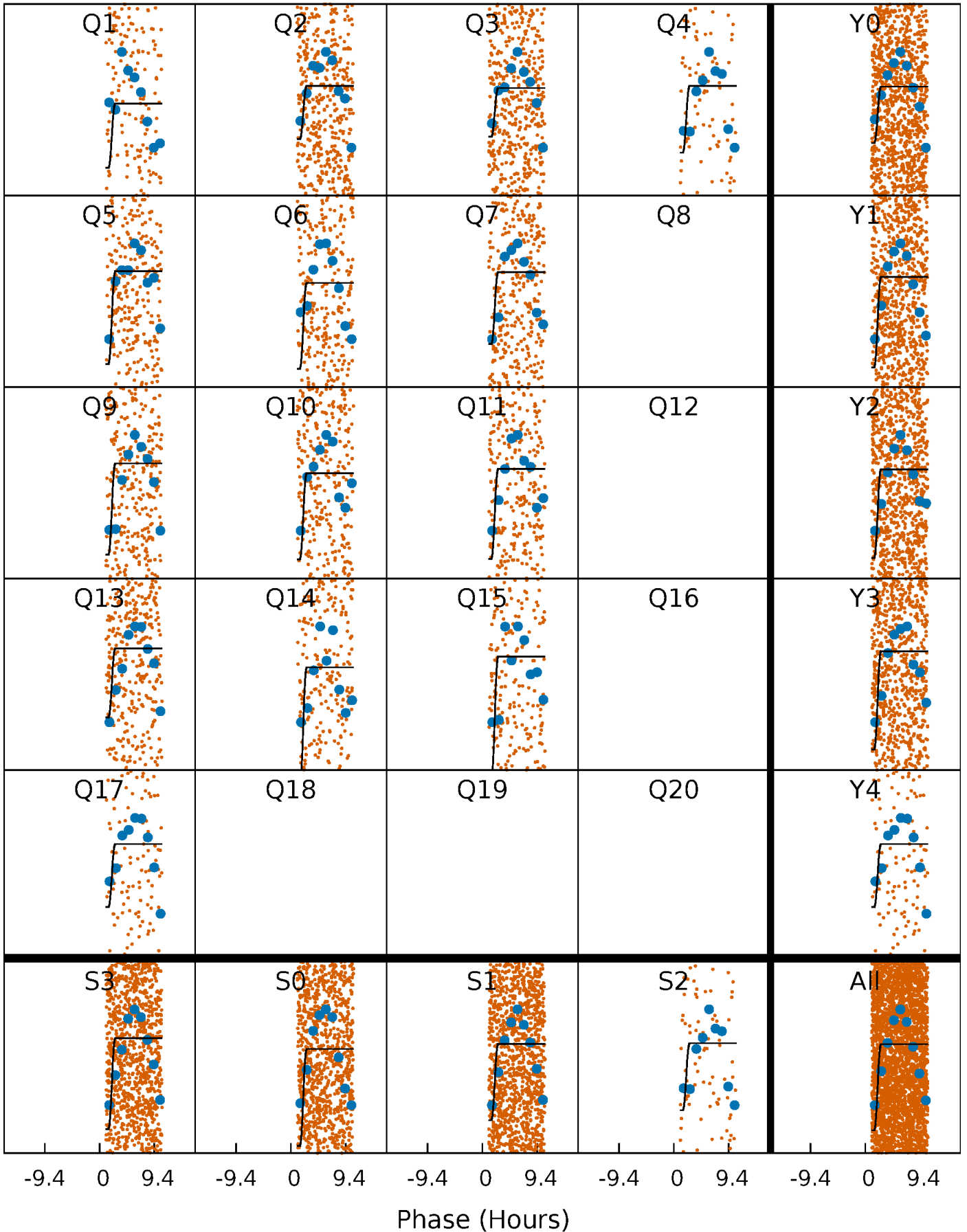
TCE 011445913-02   P= 1.485296 Days    $T_0=132.140277$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

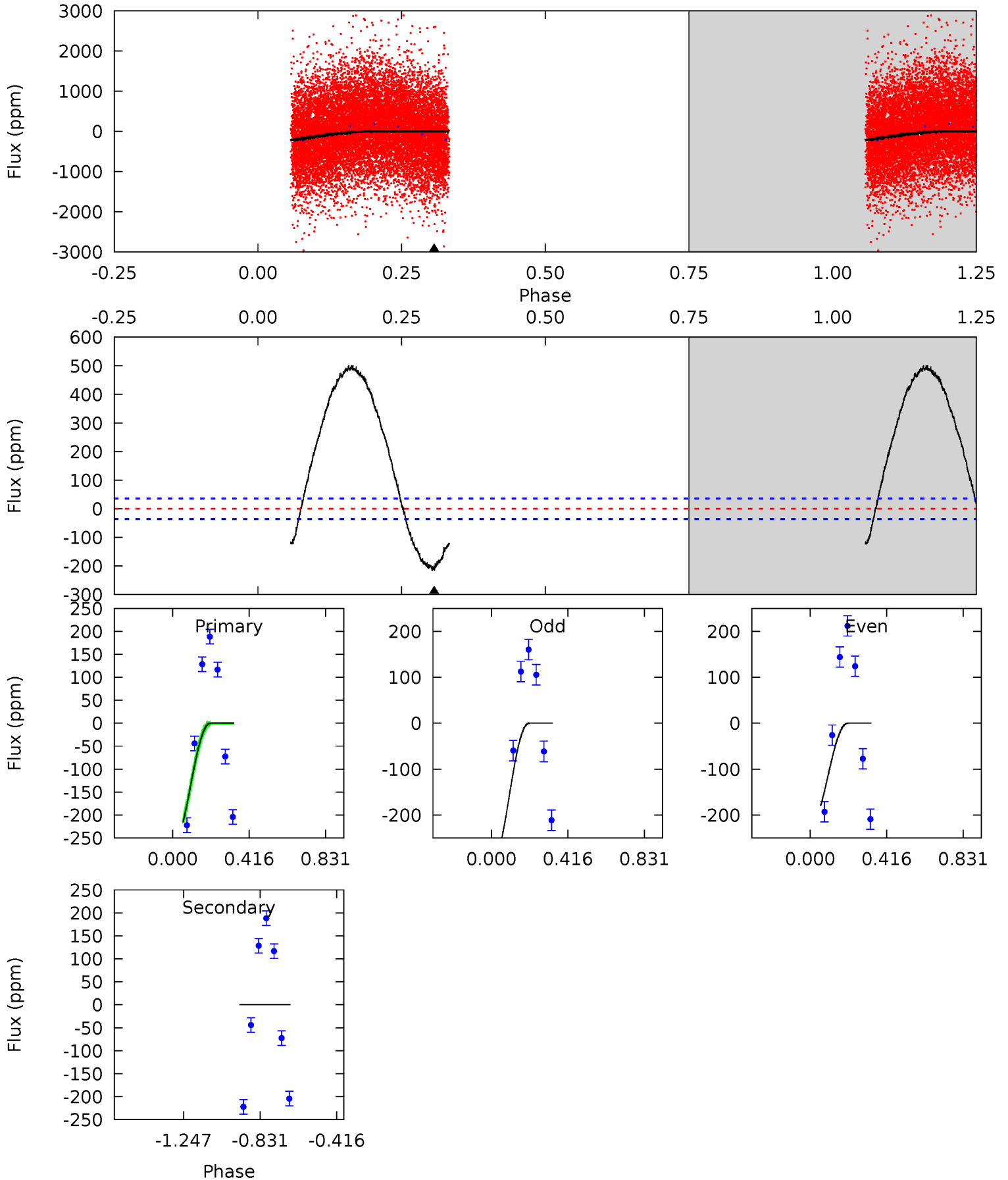
TCE 011445913-02   P= 1.485304 Days    $T_0=132.179296$  (BKJD)



# DV Model-Shift Uniqueness Test

011445913-02, P = 1.485296 Days, E = 132.140277 Days

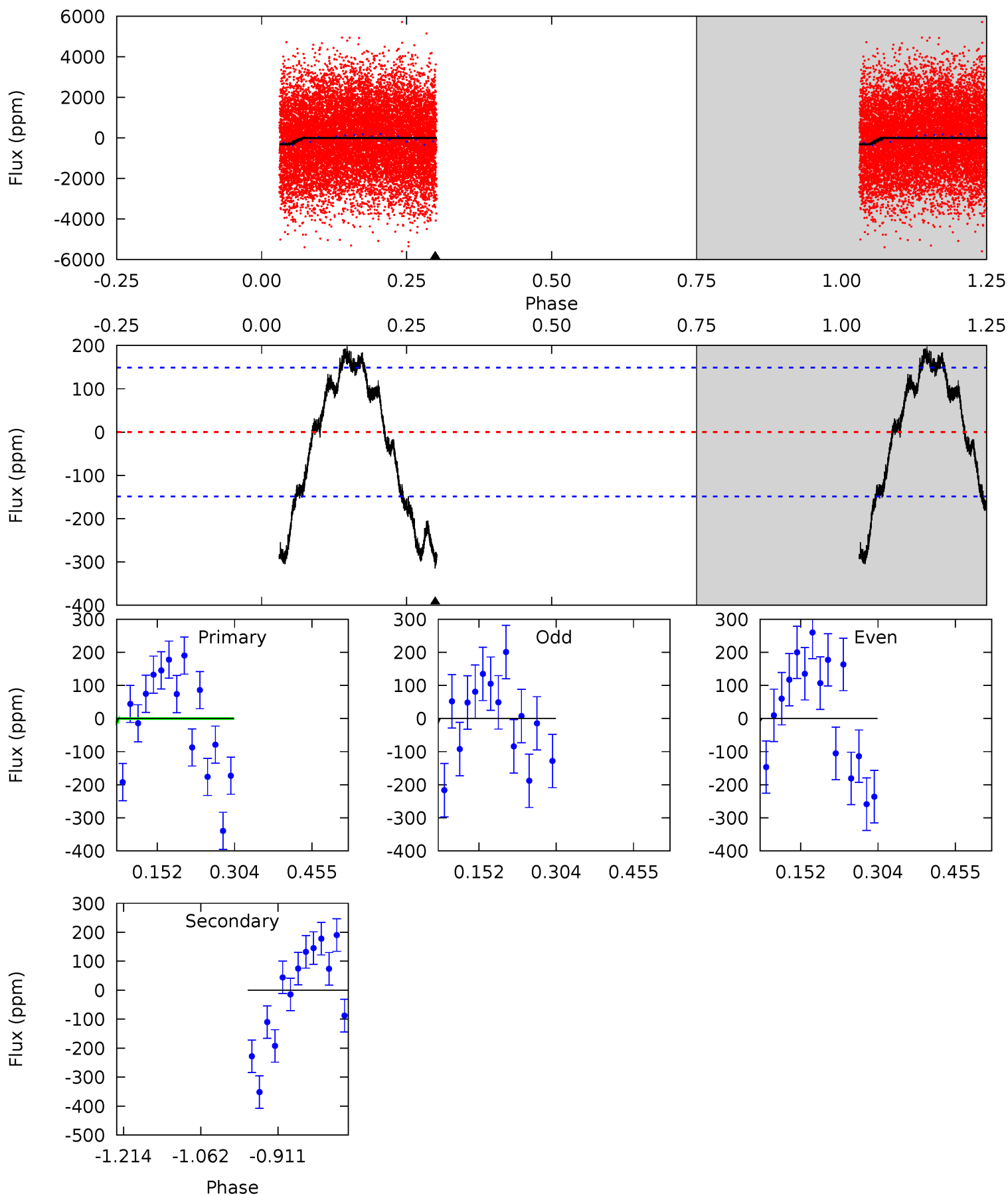
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.6	0	0	0	4.26	0.81	8.53	25.6	25.6	0	0	4.19	1.06	0.70	0



# Alt Model-Shift Uniqueness Test

011445913-02, P = 1.485304 Days, E = 132.179296 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.47	0	0	0	4.48	1.43	4.44	9.47	9.47	0	0	1.41	1.12	0.39	0



### Stellar Parameters For KIC 011445913

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7242^{+129}_{-158}$	$3.484^{+0.280}_{-0.049}$	$-0.240^{+0.150}_{-0.150}$	$4.236^{+0.160}_{-1.364}$	$1.996^{+0.049}_{-0.293}$	$0.037^{+0.070}_{-0.004}$
	+2%/-2%	+8%/-1%	+62%/-62%	+4%/-32%	+2%/-15%	+190%/-11%
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 011445913-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$0 \pm 8$	$23.90^{+16.40}_{-13.67}$	$5072^{+172}_{-398}$	$-4325^{+284}_{-135}$	$0.000^{+0.014}_{-0.011}$
Alt.	$0 \pm 33$	$15.48^{+14.65}_{-10.10}$	$5049^{+188}_{-350}$	$-4327^{+569}_{-307}$	$-0.000^{+0.121}_{-0.125}$

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

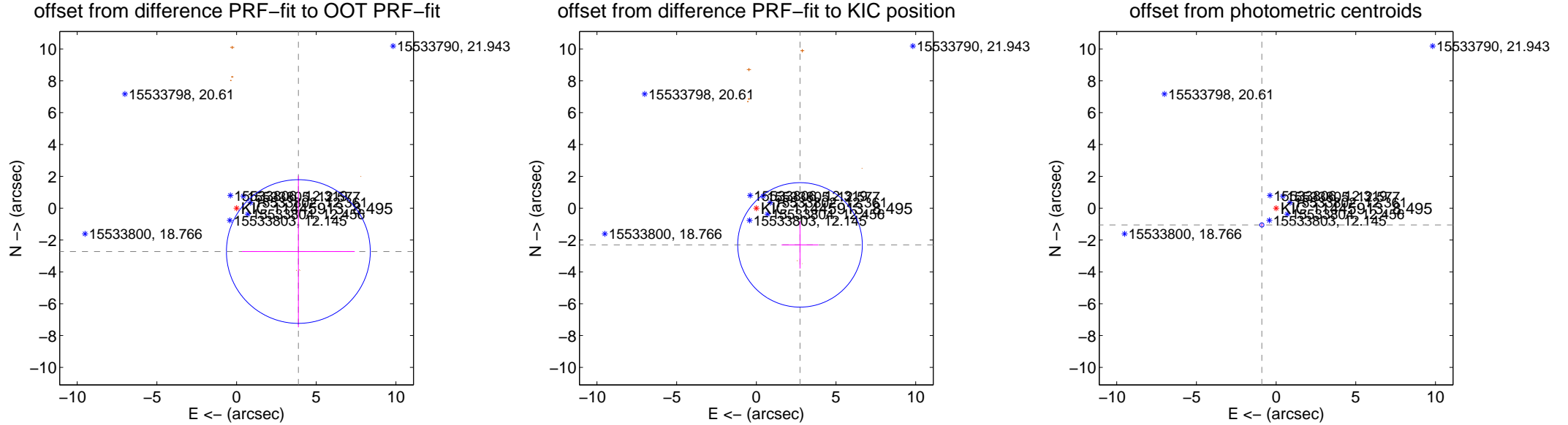
## DV Centroid Data

Supplemental centroid analysis for 011445913-02. **Kepler magnitude: 8.49.** Transit SNR 22.18

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

The direct PRF centroid is offset from the target star catalog position by about 1.28 arcsec

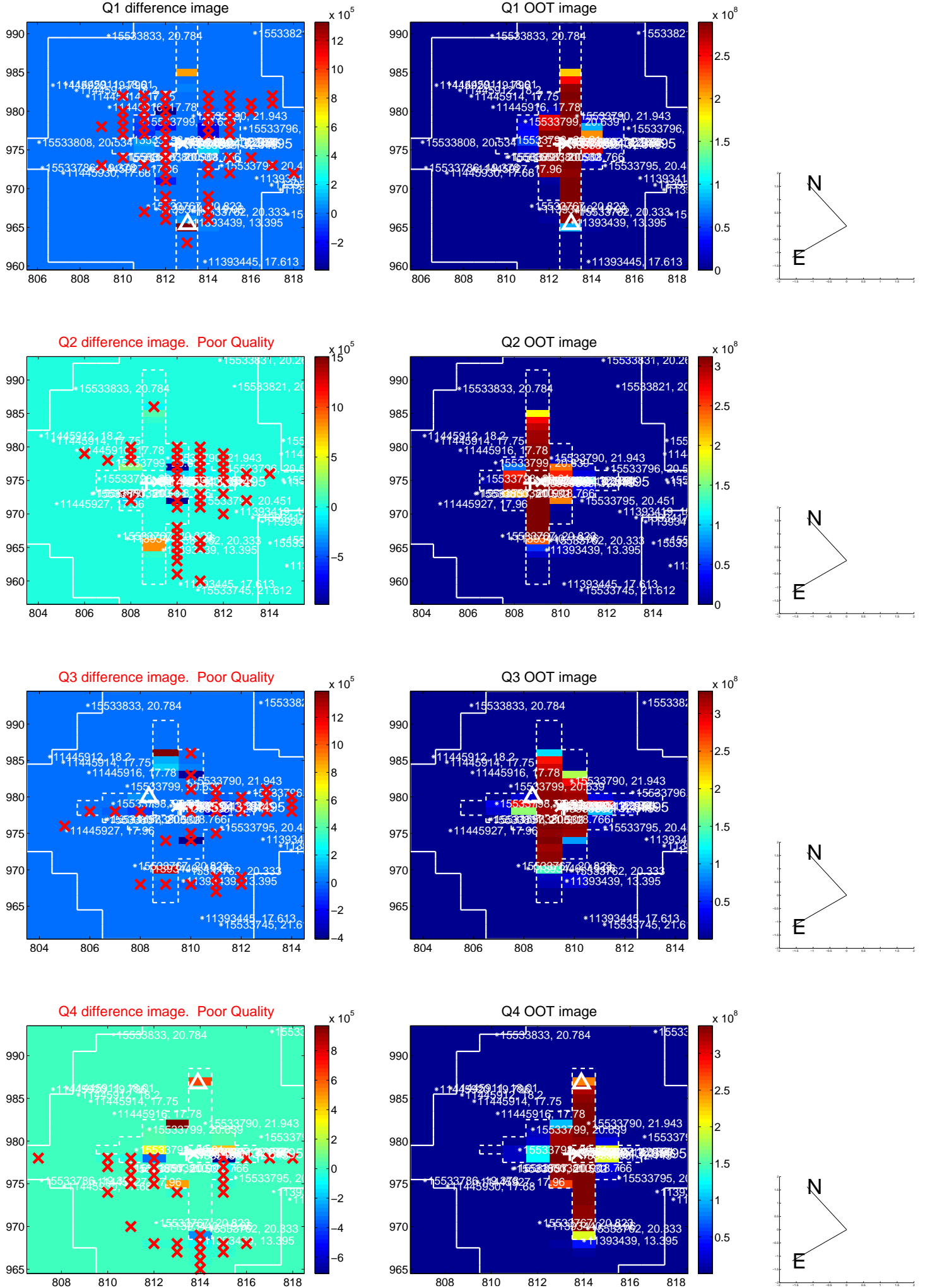
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.738 \pm 1.504</math></b>	<b>3.15</b>	$-3.878 \pm 3.541$	$-2.722 \pm 4.759$
PRF-fit source offset from KIC position	$3.581 \pm 1.303$	2.75	$-2.741 \pm 1.156$	$-2.305 \pm 1.486$
photometric centroid source offset	<b><math>1.38 \pm 0.04</math></b>	<b>31.21</b>	$0.90 \pm 0.04$	$-1.05 \pm 0.05$



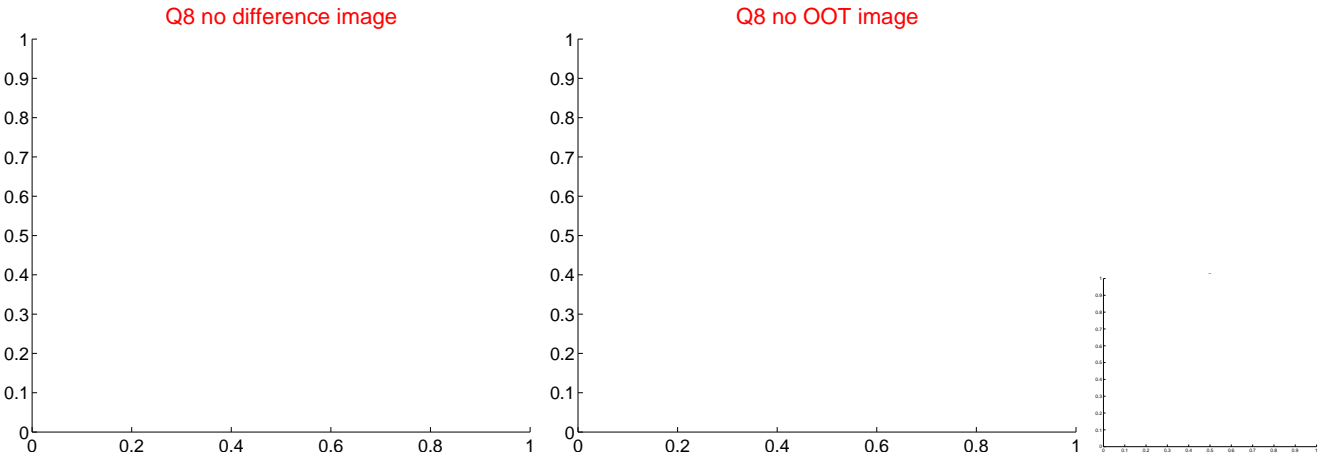
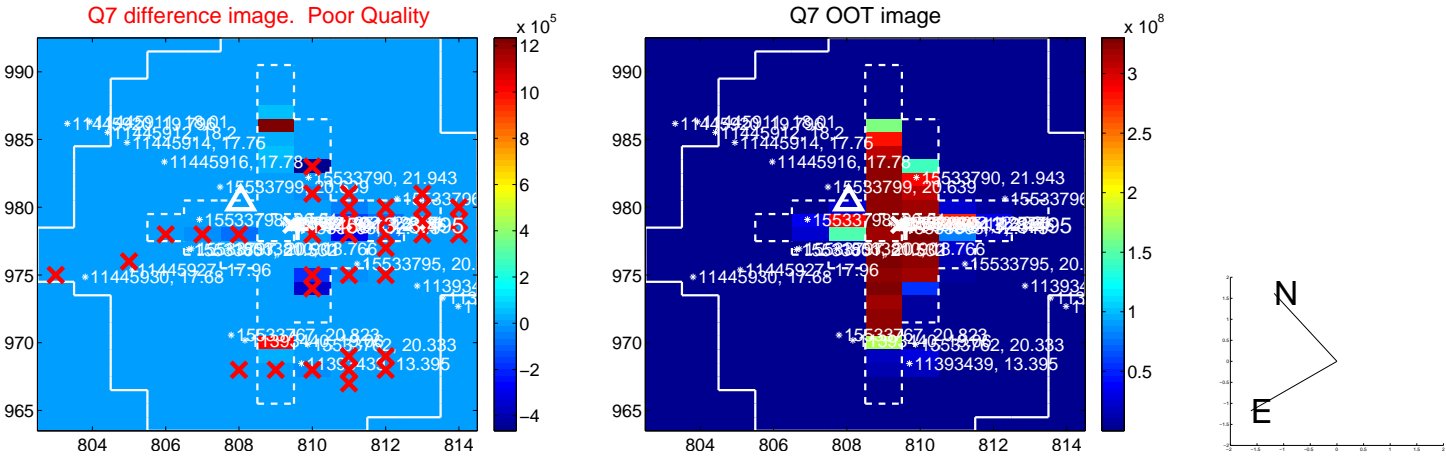
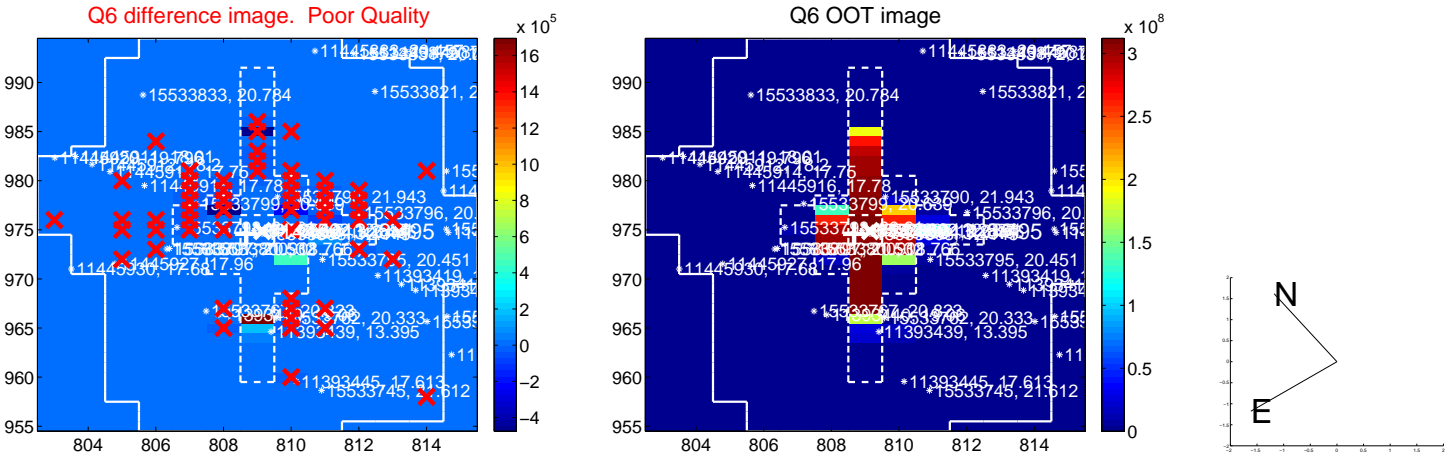
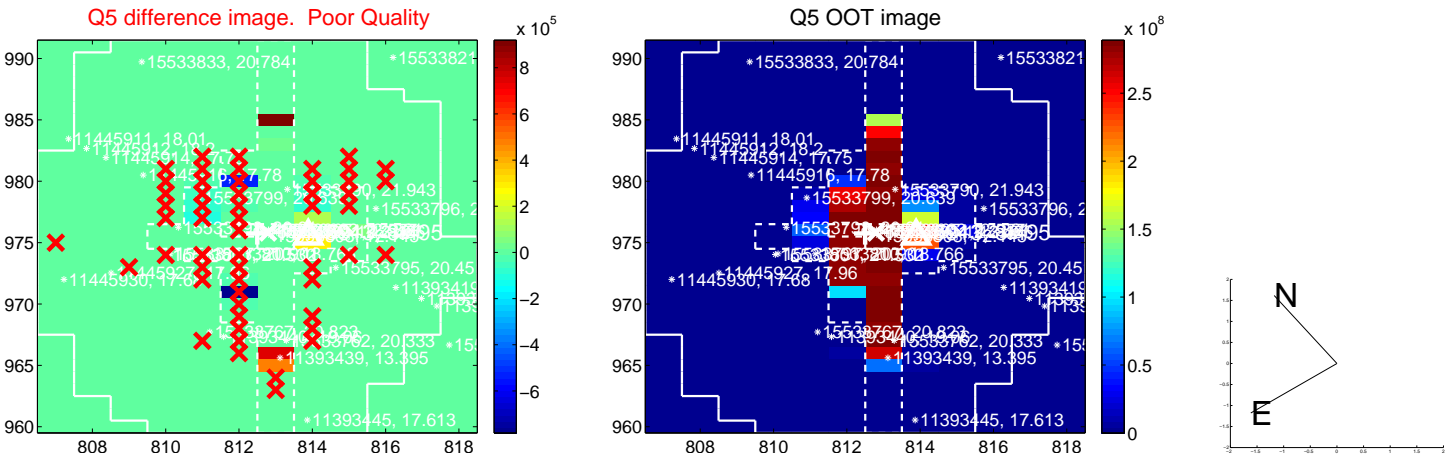
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



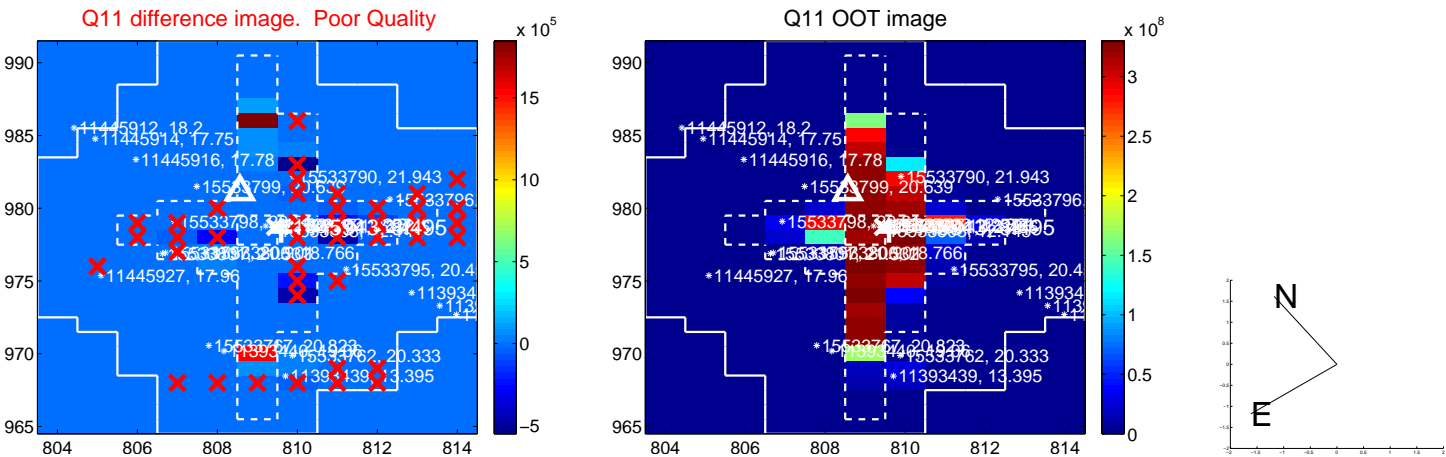
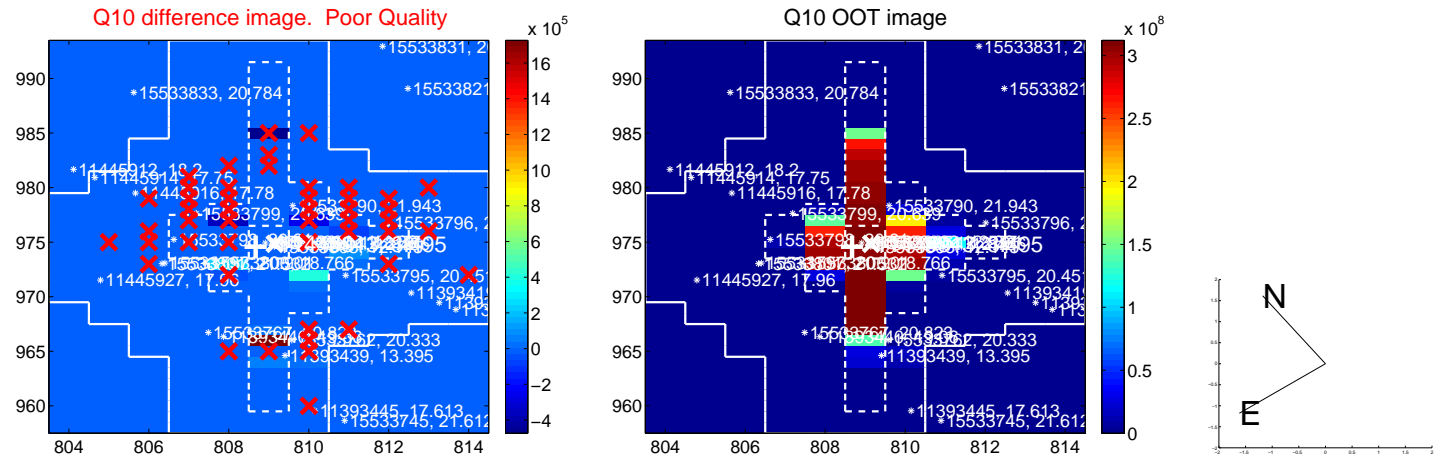
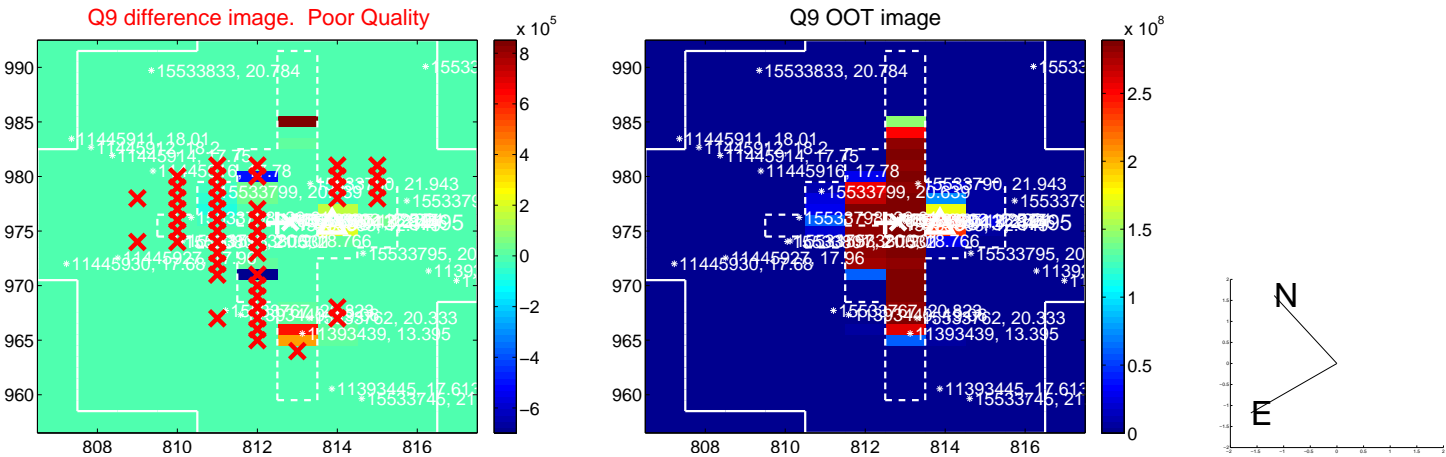
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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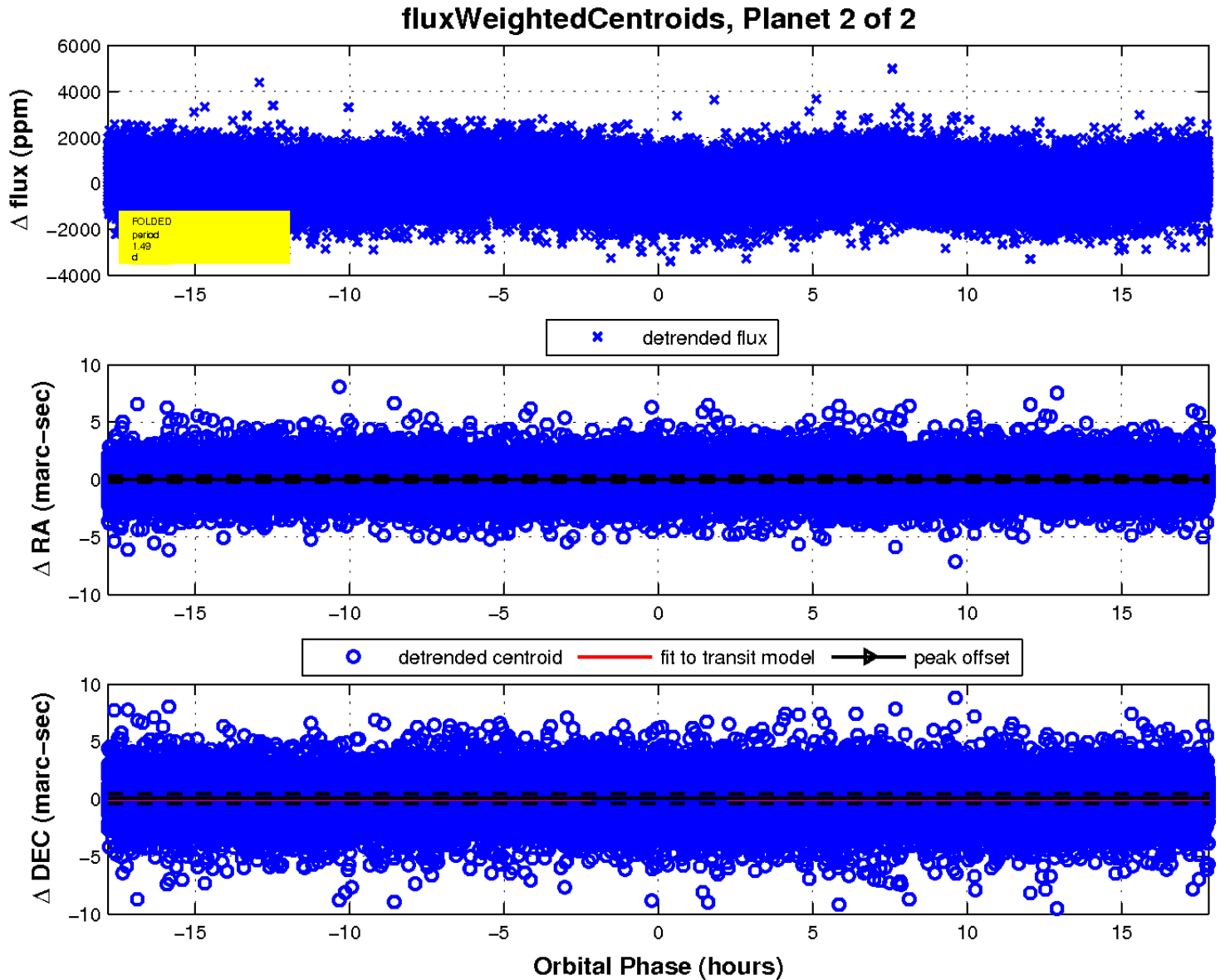
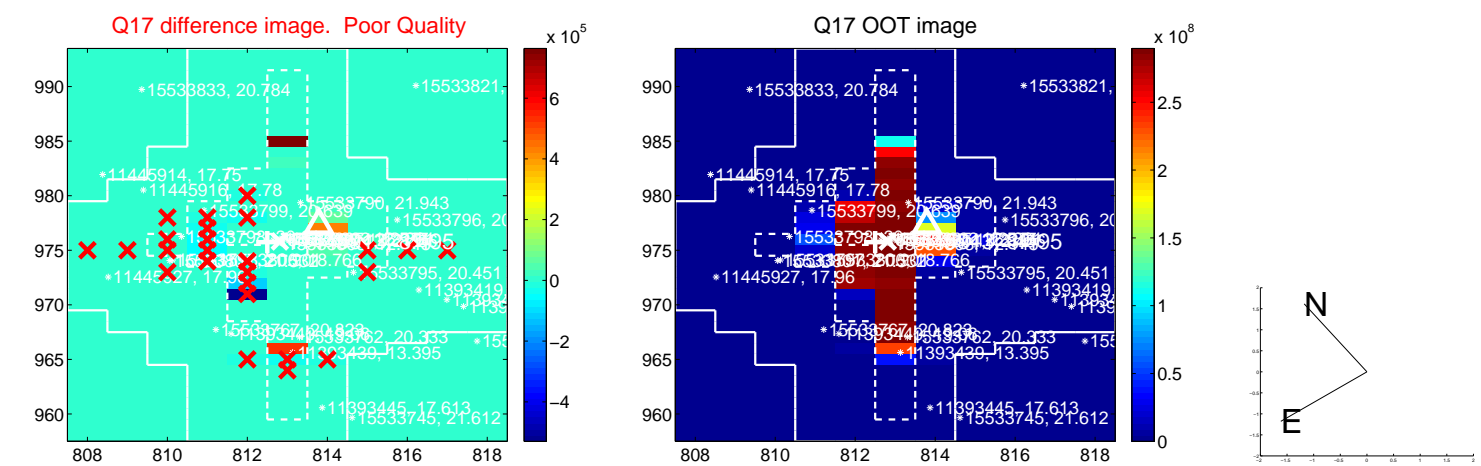


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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





UKIRT Image

