

# KIC 010990092

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010990092-01	OBS	No	1.175635	132.154314	8.3	5.326	9.6	8.8	3.24	8130	0.98	53354.03
010990092-02	OBS	No	100.378482	201.656387	54.2	12.985	9.3	5.4	3.24	8130	2.65	141.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010990092-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
010990092-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_MEAS

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

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

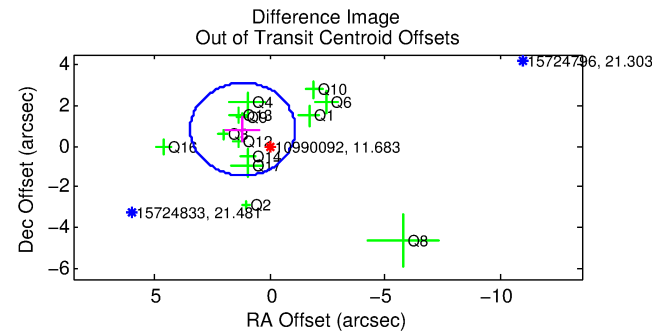
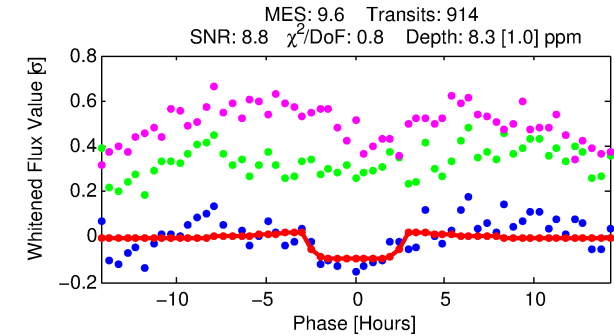
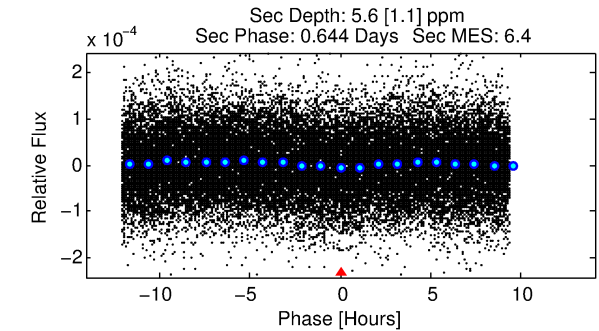
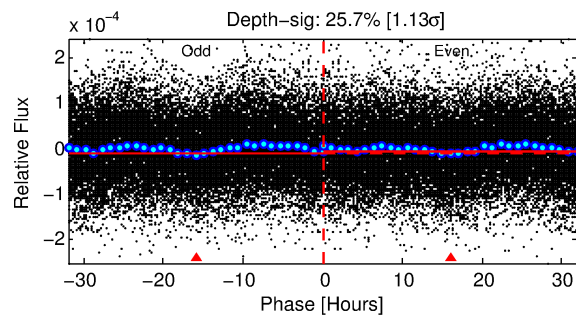
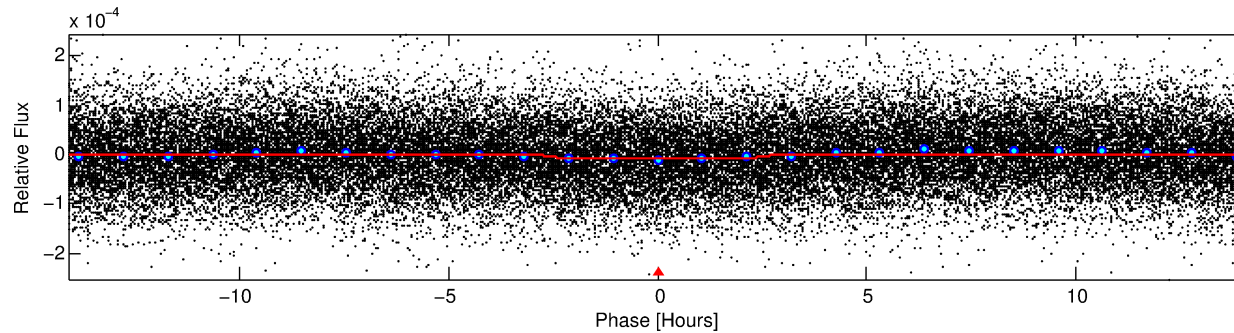
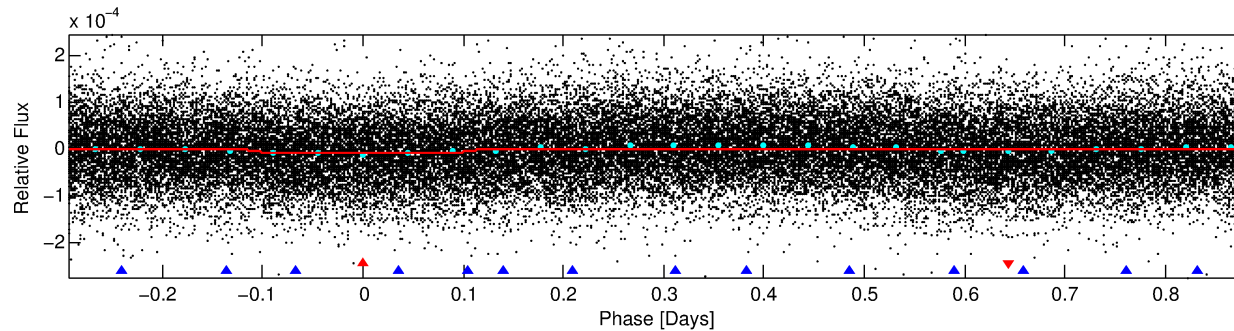
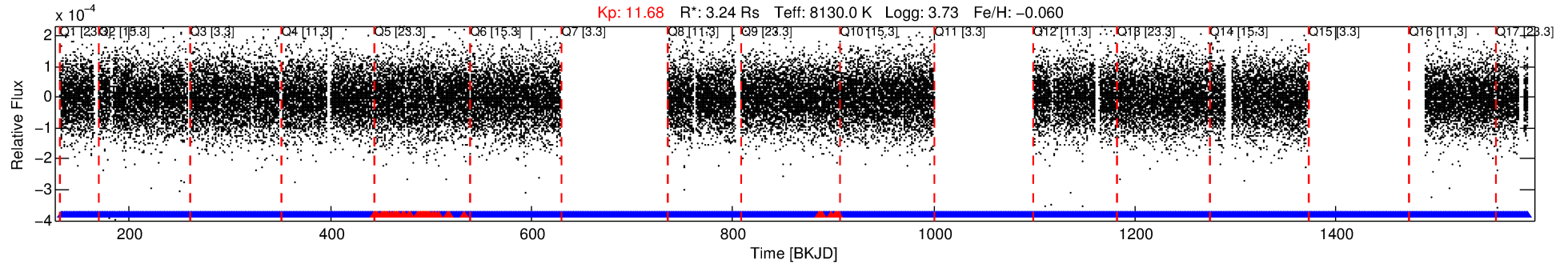
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010990092-01

No Significant Match Found

# DV One-Page Summary

KIC: 10990092 Candidate: 1 of 2 Period: 1.176 d



## DV Fit Results:

Period = 1.17563 [0.00002] d  
Epoch = 132.1543 [0.0053] BKJD  
Rp/R\* = 0.0028 [0.0005]  
a/R\* = 1.57 [0.85]  
b = 0.59 [1.02]  
Seff = 53354.03 [40748.05]  
Teq = 3875 [740] K  
Rp = 0.98 [0.49] Re  
a = 0.0277 [0.0128] AU  
Ag = 2.48 [2.09] [0.71σ]  
Teffp = 7521 [793] K [3.36σ]

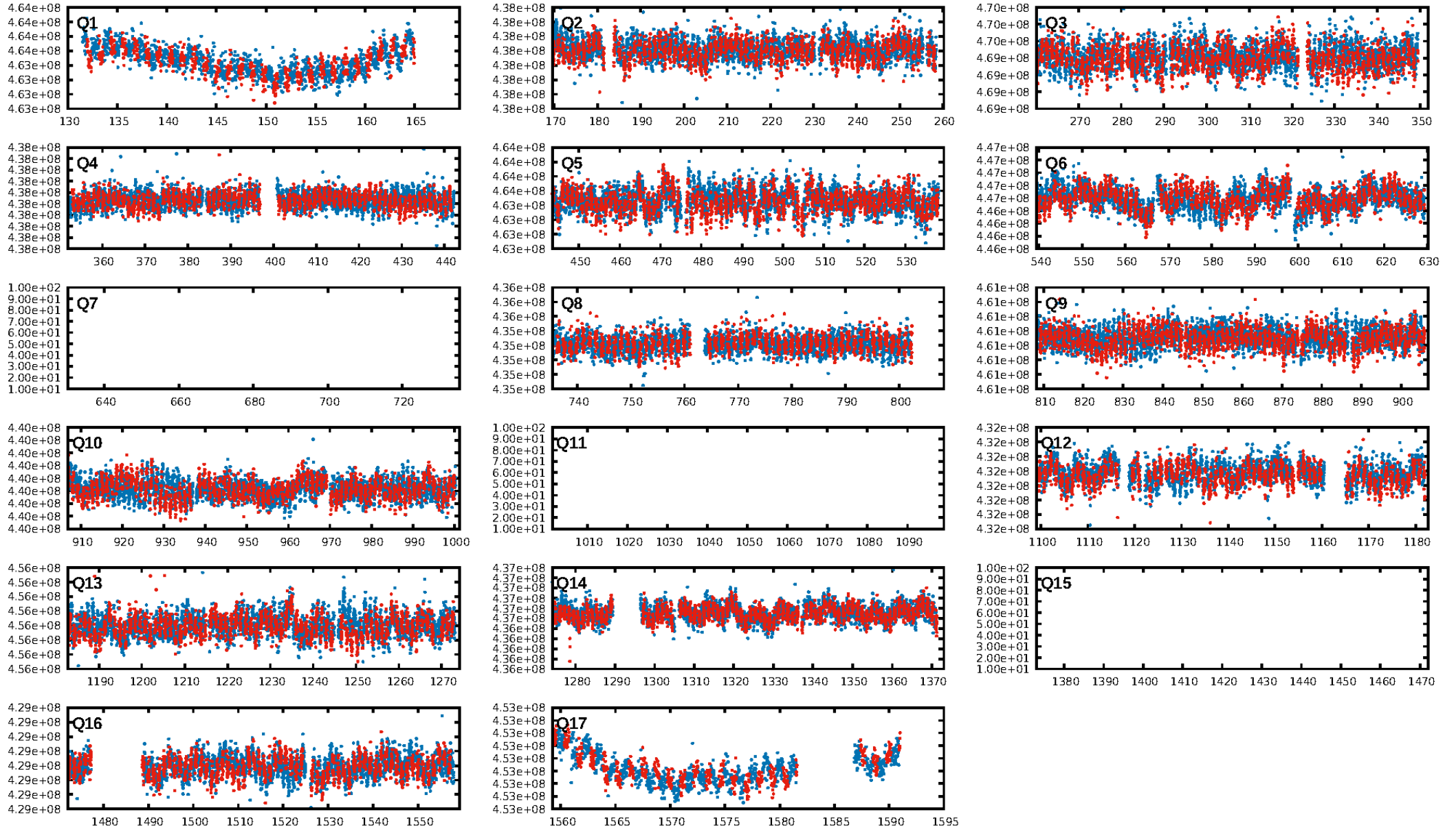
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [169.64σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.68e-16  
RollingBand-fgt: 0.95 [815/862]  
GhostDiagnostic-chr: 5.68  
Centroid-sig: N/A  
Centroid-so: 0.328 arcsec [0.28σ]  
OotOffset-rm: 1.434 arcsec [1.90σ]  
KicOffset-rm: 1.352 arcsec [1.78σ]  
OotOffset-st: 4/1/4/4 [13]  
KicOffset-st: 4/1/4/4 [13]  
DiffImageQuality-fgm: 0.62 [8/13]  
DiffImageOverlap-fno: 1.00 [14/14]

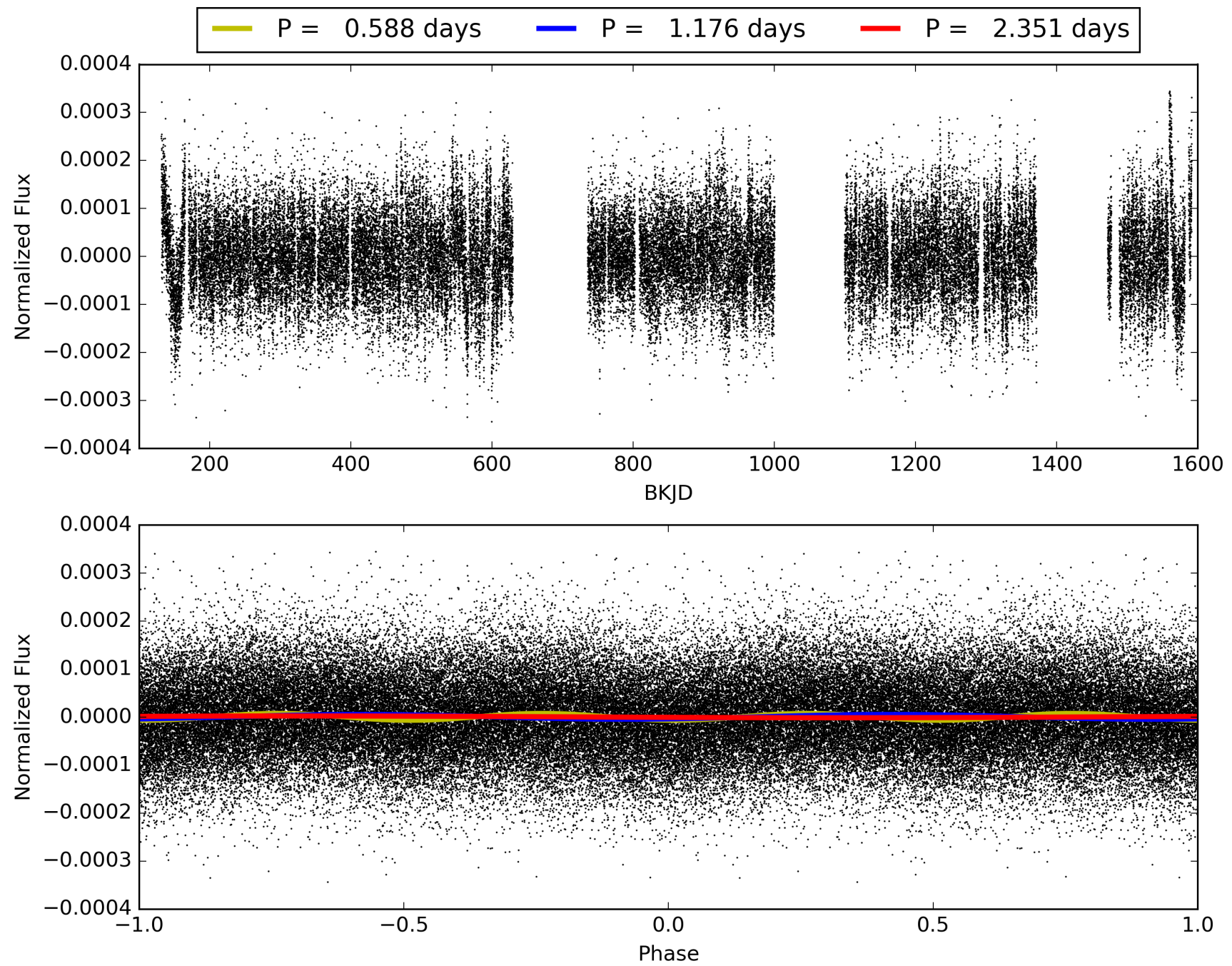
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 10:35:19 Z

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

# TCE 010990092-01, PDC Light Curves



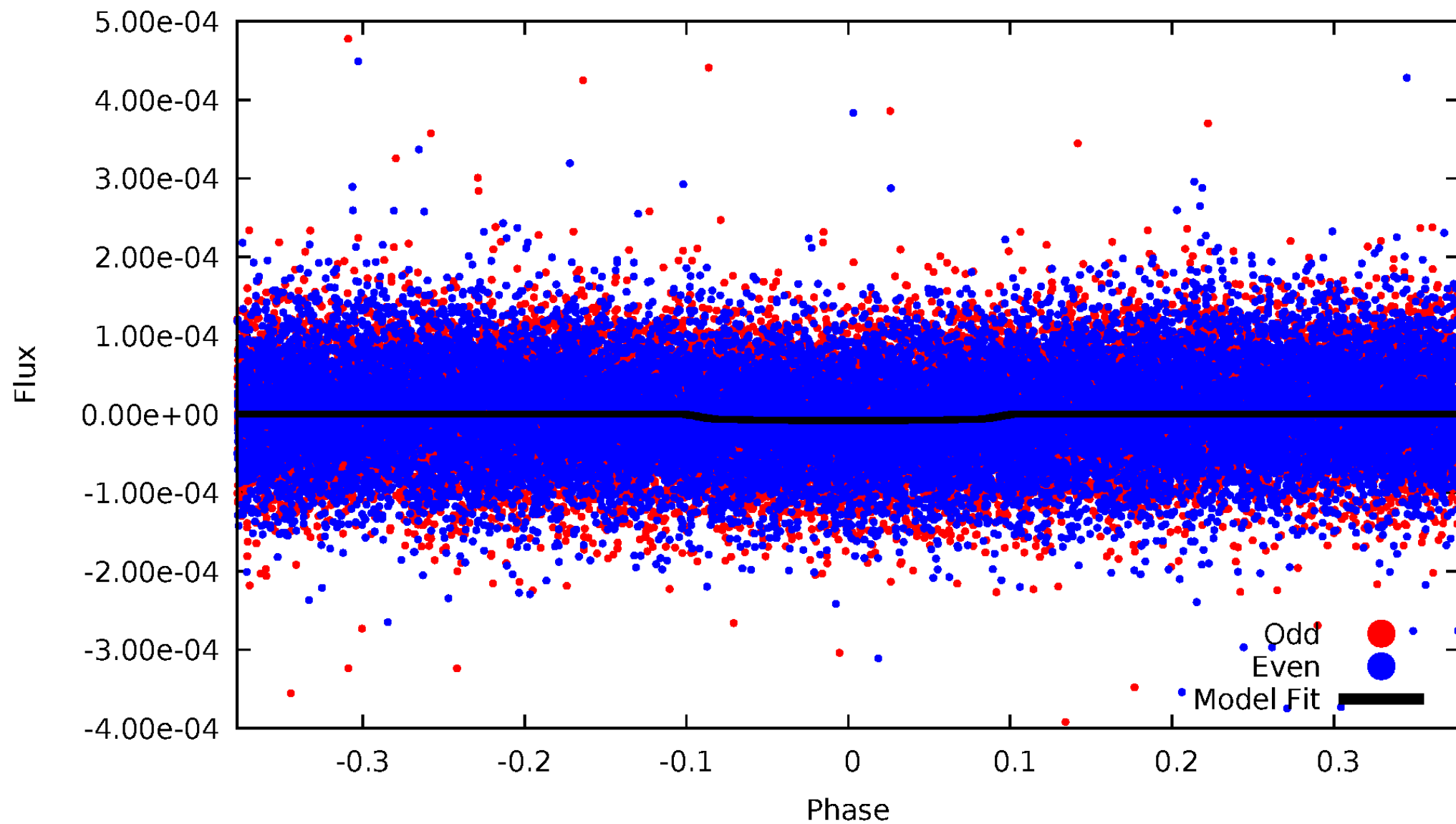
TCE 010990092-01





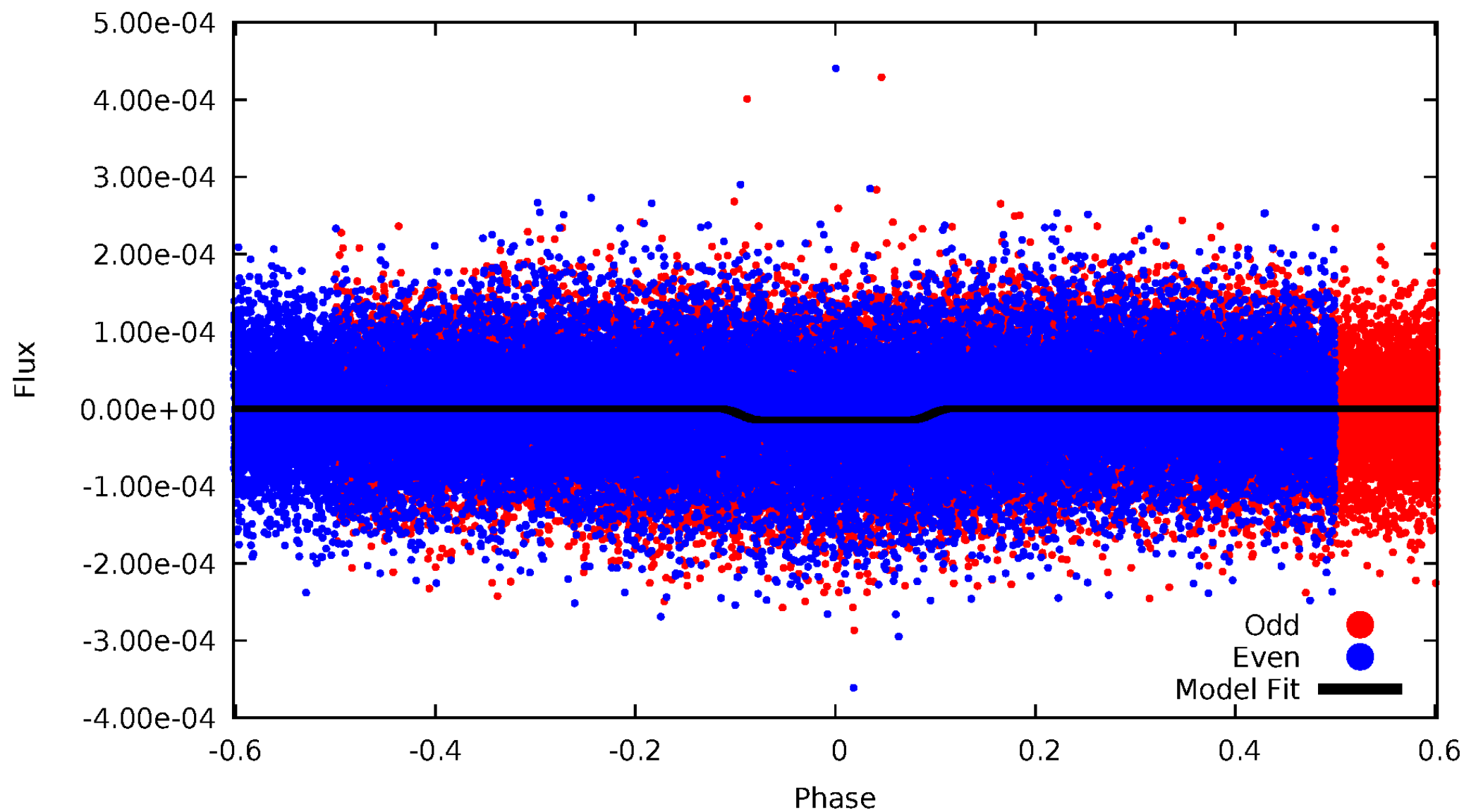
# DV Odd/Even

TCE 010990092-01



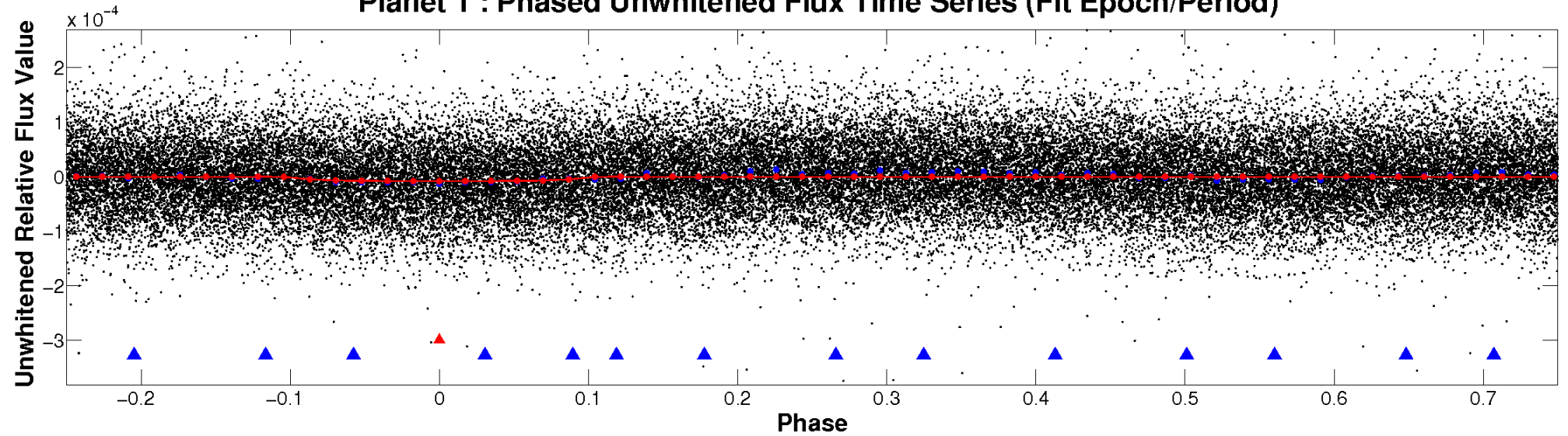
# ALT Odd/Even

TCE 010990092-01

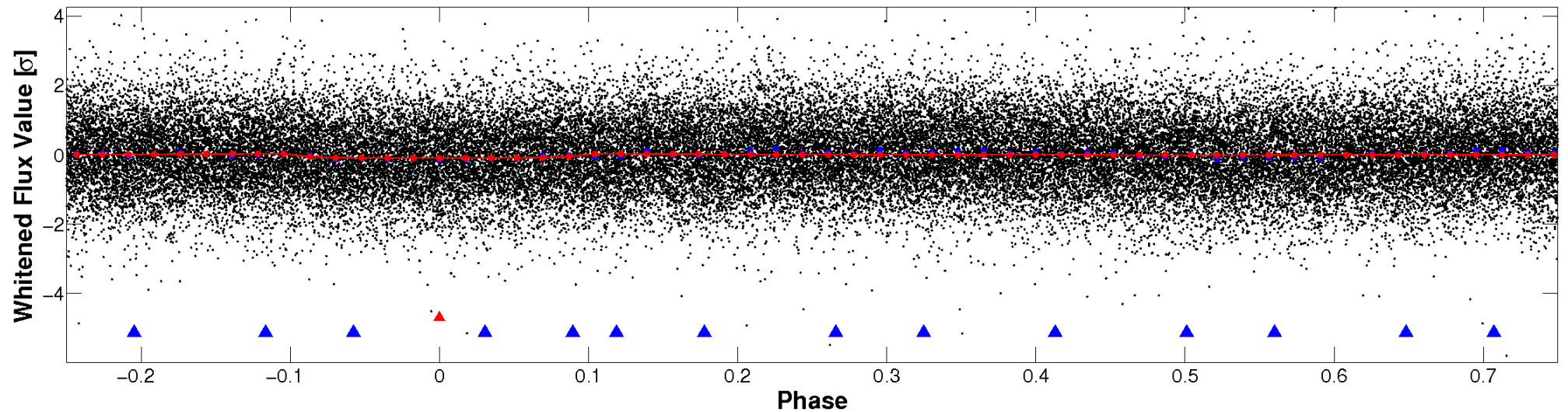


# Non-Whitened Vs. Whitened Light Curve

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

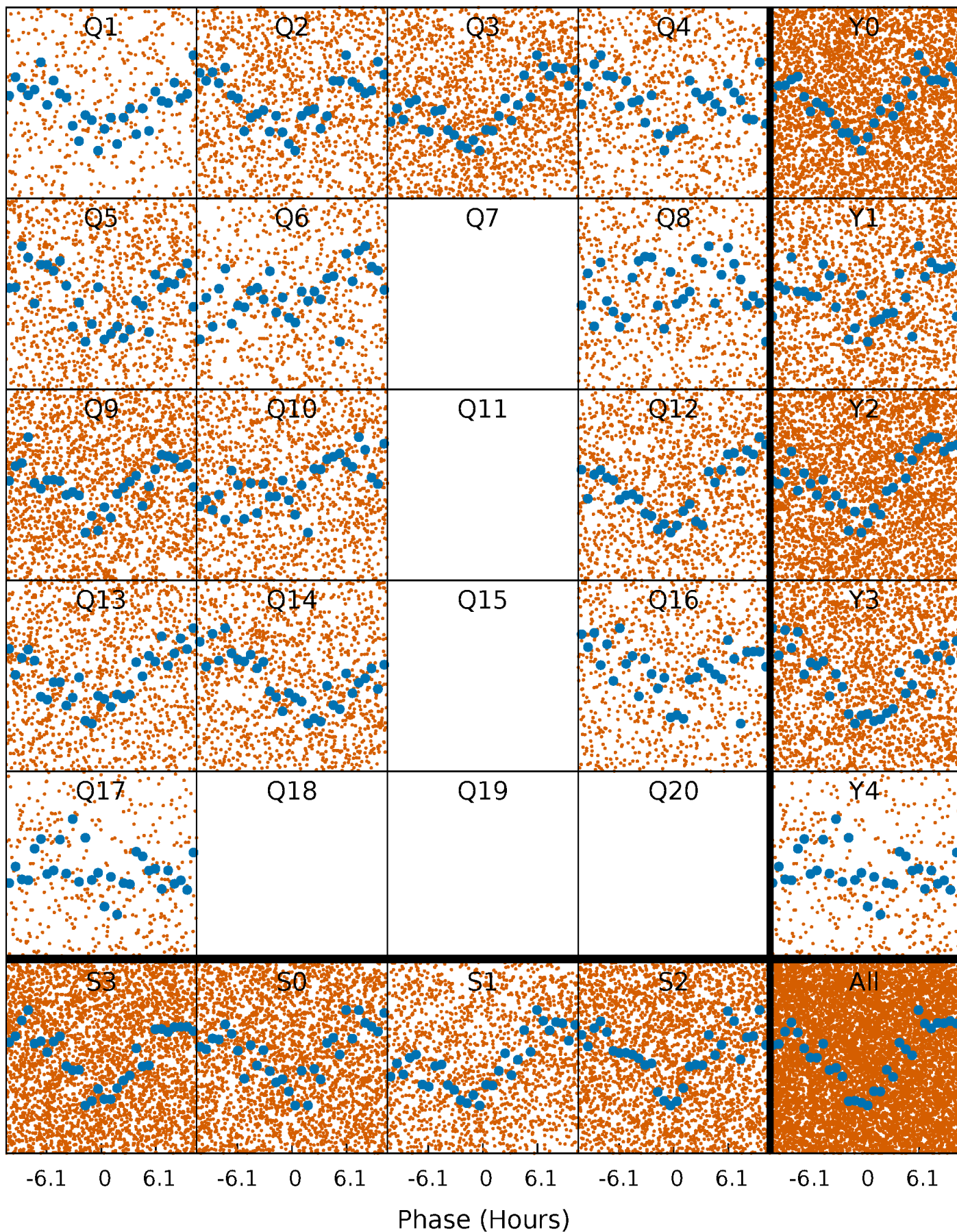


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

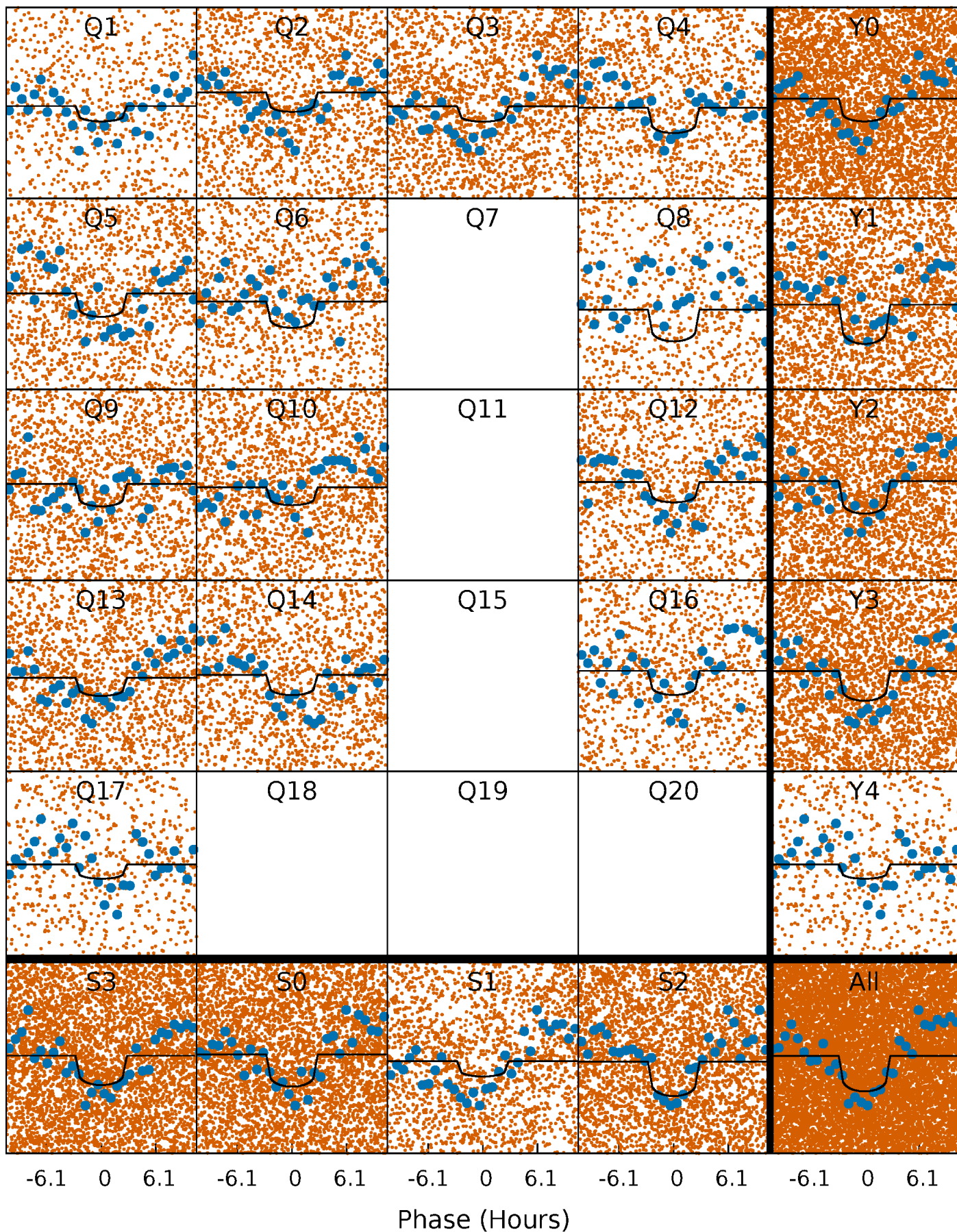
TCE 010990092-01   P= 1.175635 Days    $T_0=132.154314$  (BKJD)





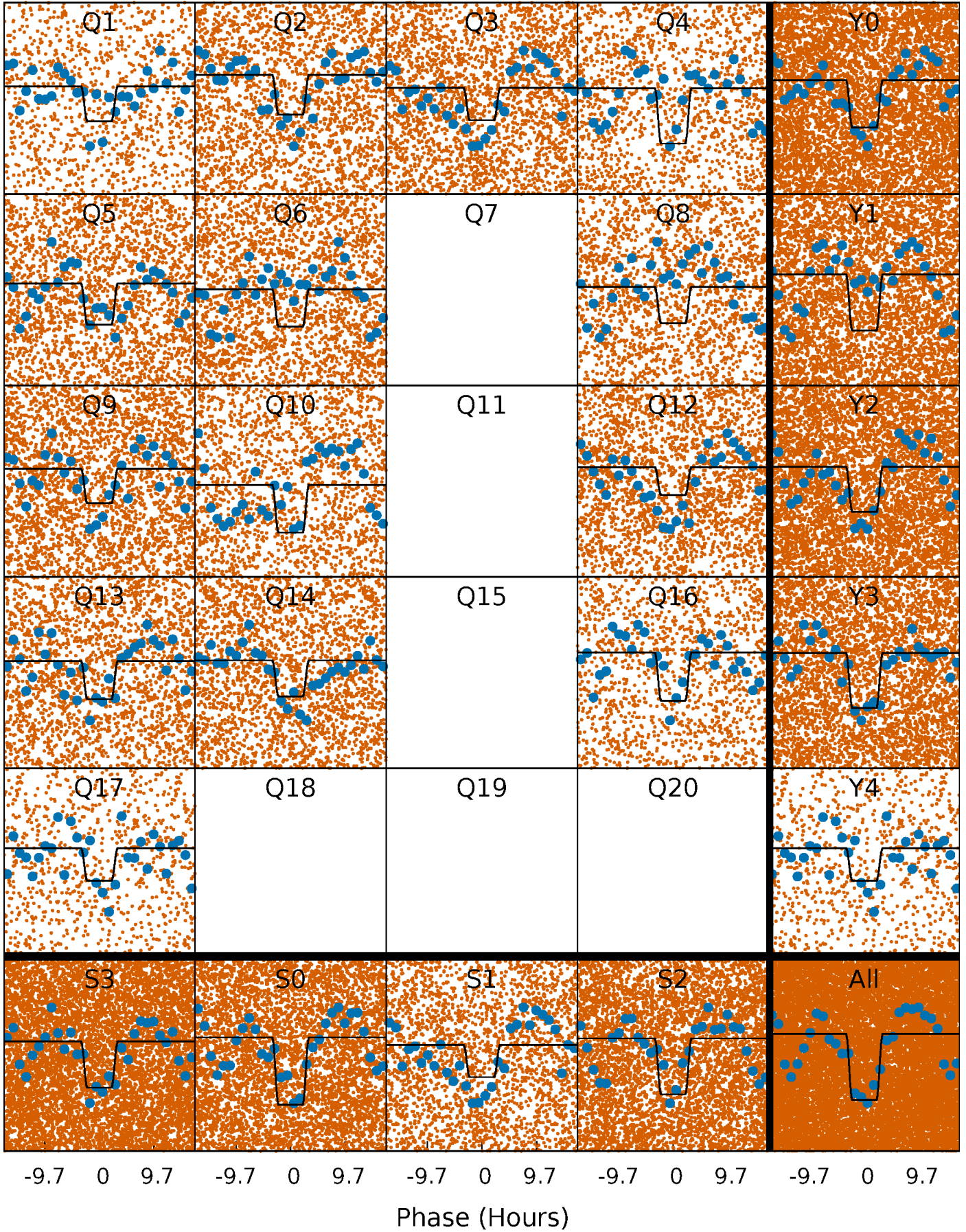
# DV Quarter-Phased Transit Curves

TCE 010990092-01 P= 1.175635 Days  $T_0=132.154314$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010990092-01 P= 1.175673 Days  $T_0=132.121895$  (BKJD)

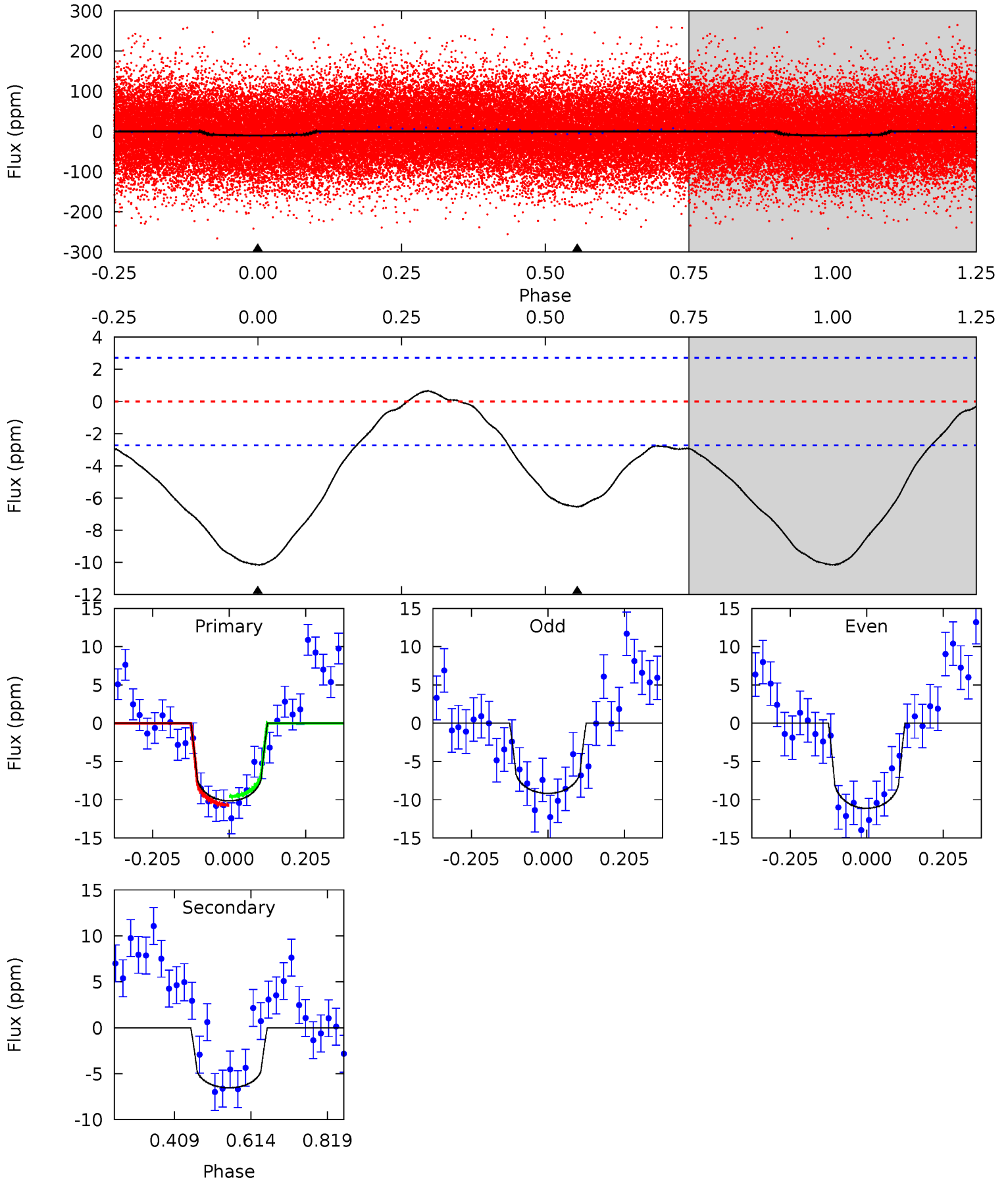




# DV Model-Shift Uniqueness Test

010990092-01, P = 1.175635 Days, E = 130.978679 Days

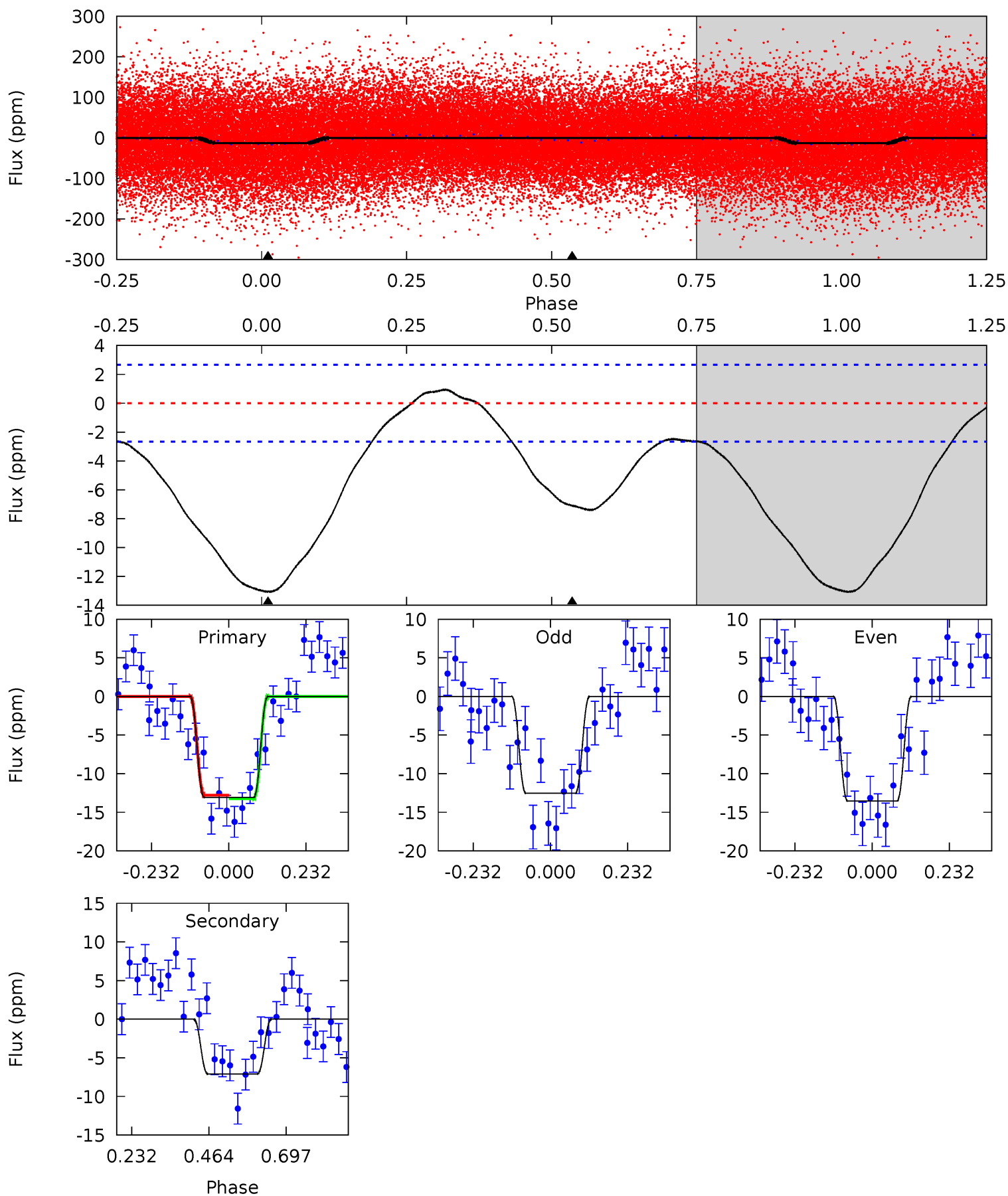
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.4	10.6	0	0	4.41	1.27	2.38	16.4	16.4	10.6	10.6	1.58	1.15	0.06	0.92



# Alt Model-Shift Uniqueness Test

010990092-01, P = 1.175673 Days, E = 130.946222 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.5	11.7	0	0	4.38	1.19	2.52	21.5	21.5	11.7	11.7	0.82	0.92	0.07	0.37





### Stellar Parameters For KIC 010990092

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$8130^{+225}_{-338}$	$3.731^{+0.440}_{-0.110}$	$-0.060^{+0.200}_{-0.400}$	$3.239^{+0.825}_{-1.532}$	$2.061^{+0.334}_{-0.501}$	$0.085^{+0.325}_{-0.035}$
	+3%/-4%	+12%/-3%	+333%/-667%	+25%/-47%	+16%/-24%	+380%/-41%
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 010990092-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-7 \pm 1$	$0.88^{+0.26}_{-0.22}$	$5204^{+392}_{-637}$	$7474^{+1130}_{-764}$	$3.503^{+2.751}_{-1.367}$
Alt.	$-7 \pm 1$	$1.26^{+0.28}_{-0.32}$	$5218^{+403}_{-609}$	$6300^{+585}_{-475}$	$1.952^{+1.457}_{-0.662}$

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

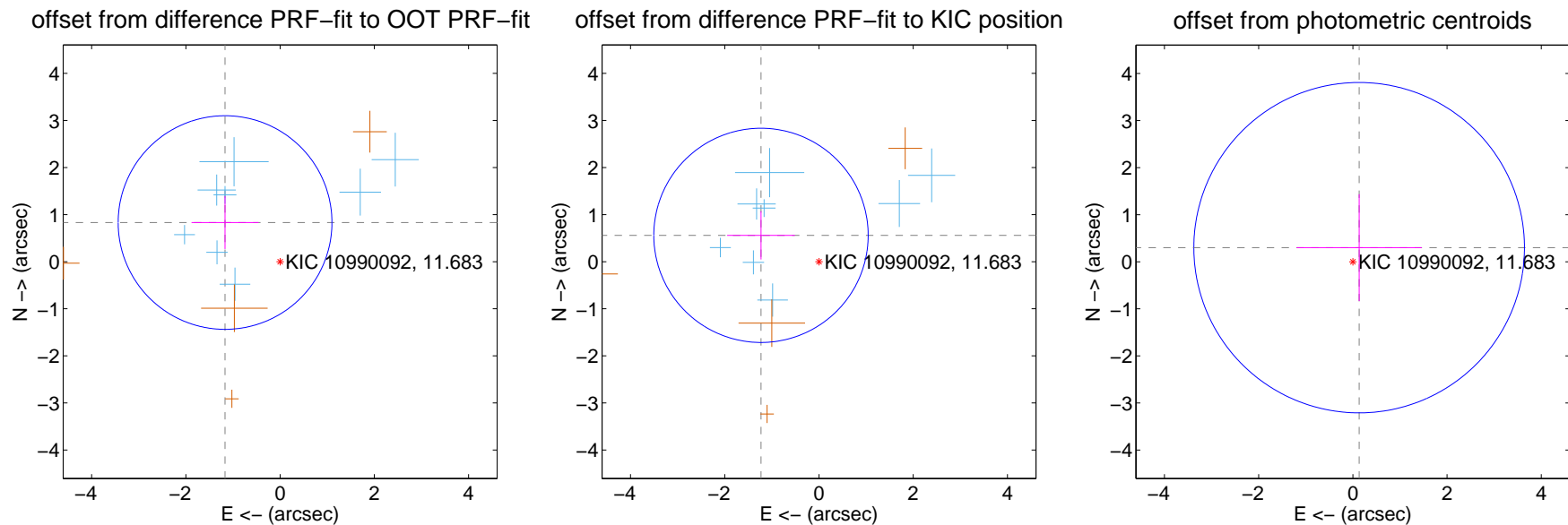
## DV Centroid Data

Supplemental centroid analysis for 010990092-01. **Kepler magnitude: 11.68.** Transit SNR 8.78

There are 8 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

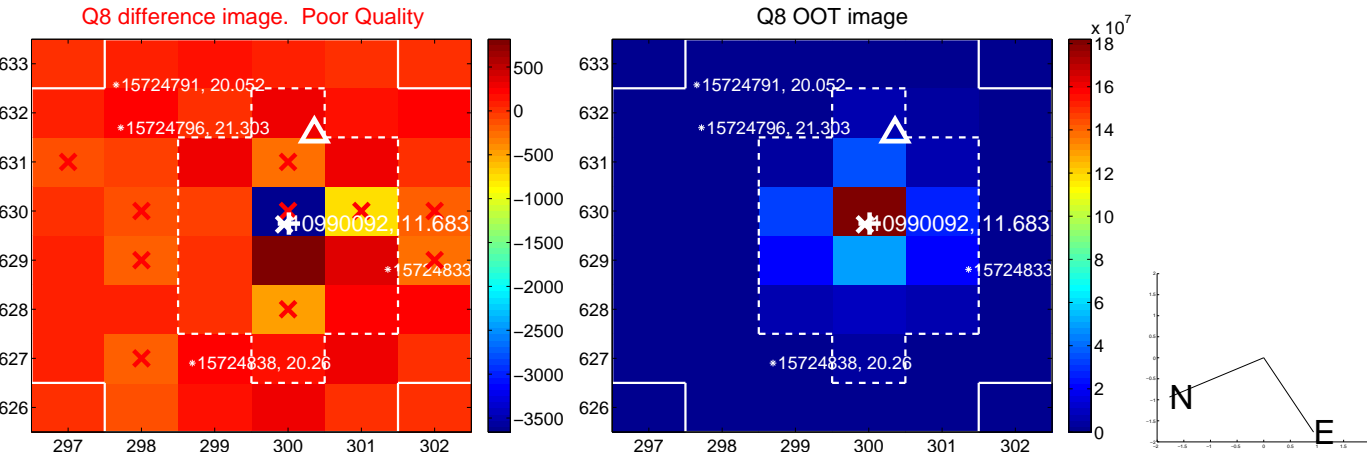
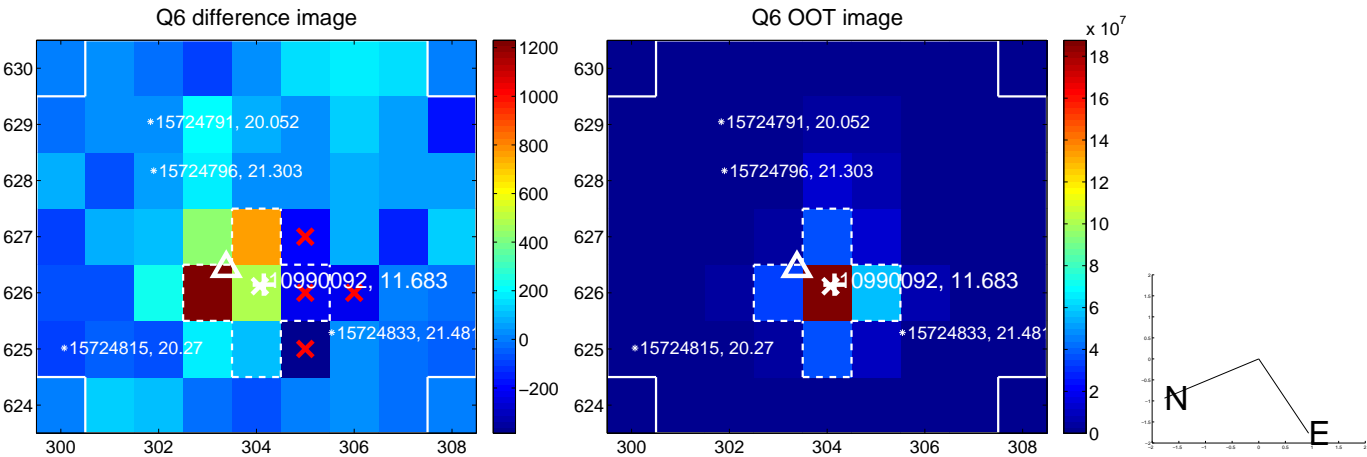
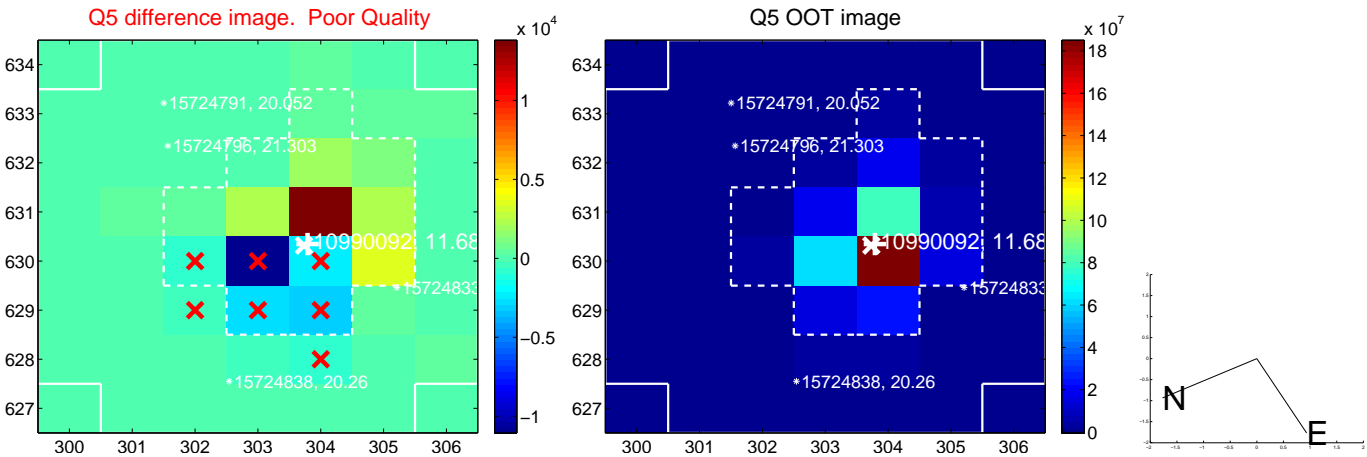
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.434 \pm 0.756$	1.90	$1.168 \pm 0.712$	$0.832 \pm 0.561$
PRF-fit source offset from KIC position	$1.352 \pm 0.758$	1.78	$1.231 \pm 0.718$	$0.559 \pm 0.513$
photometric centroid source offset	$0.33 \pm 1.17$	0.28	$-0.13 \pm 1.33$	$0.30 \pm 1.14$



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.

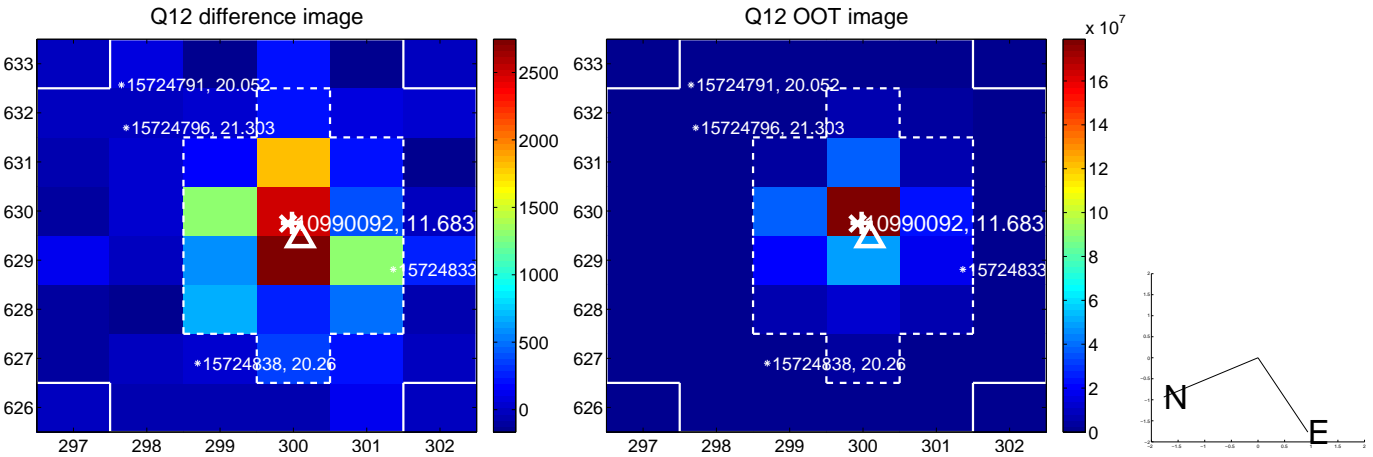
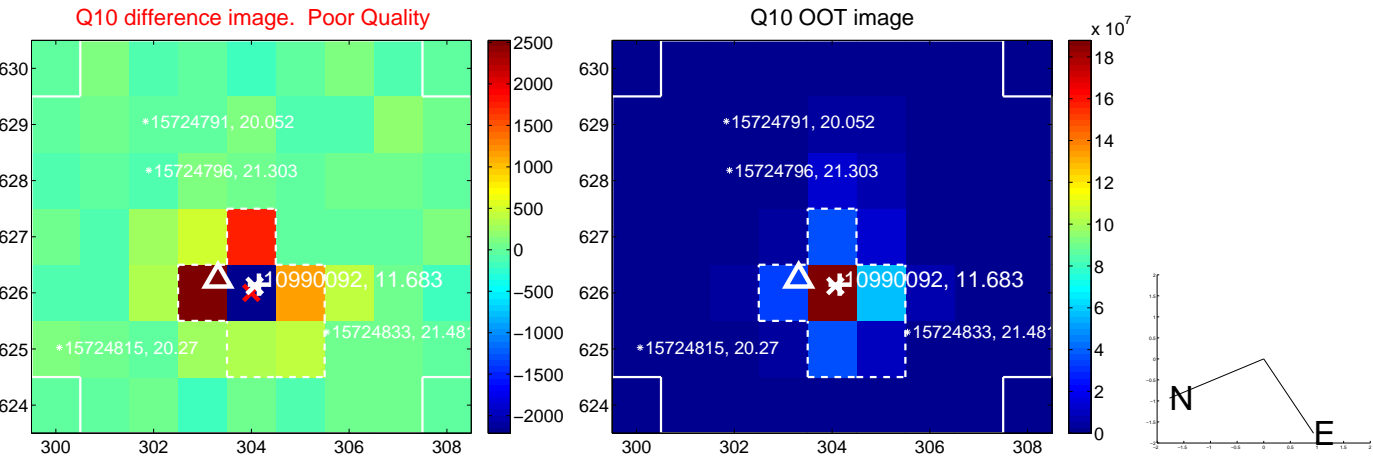
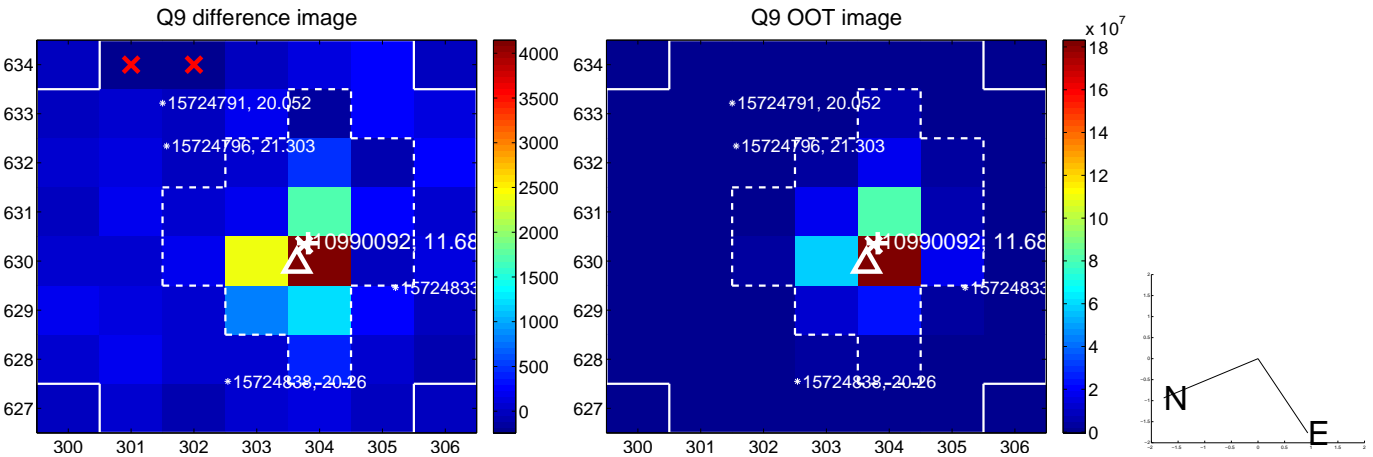


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

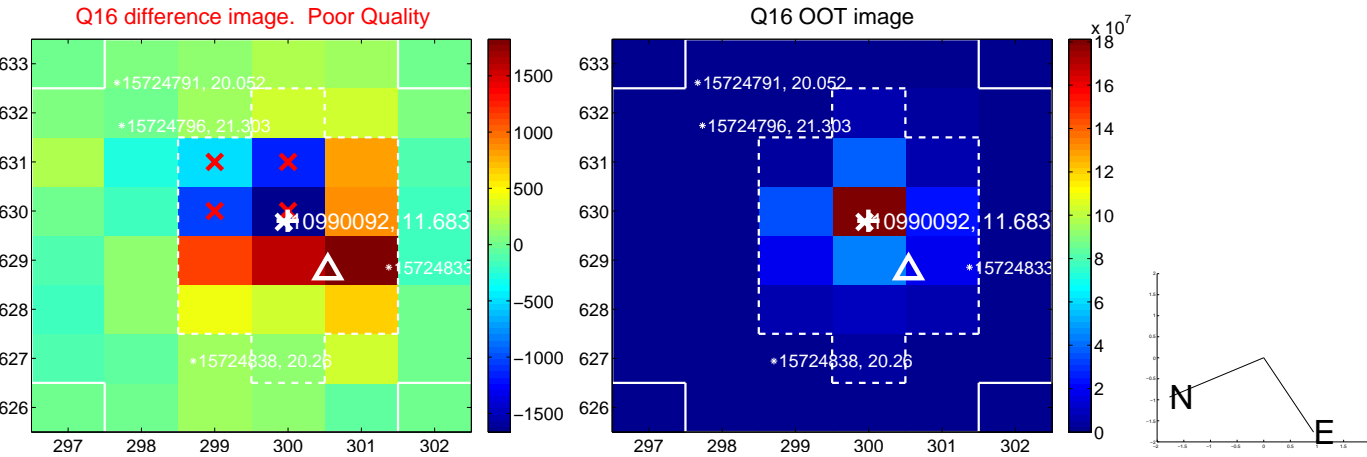
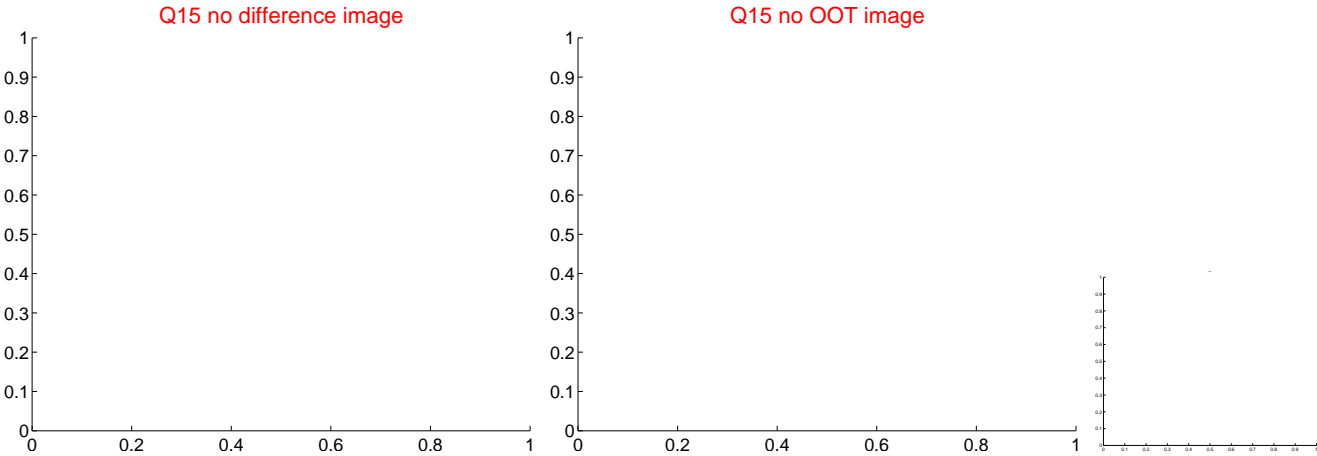
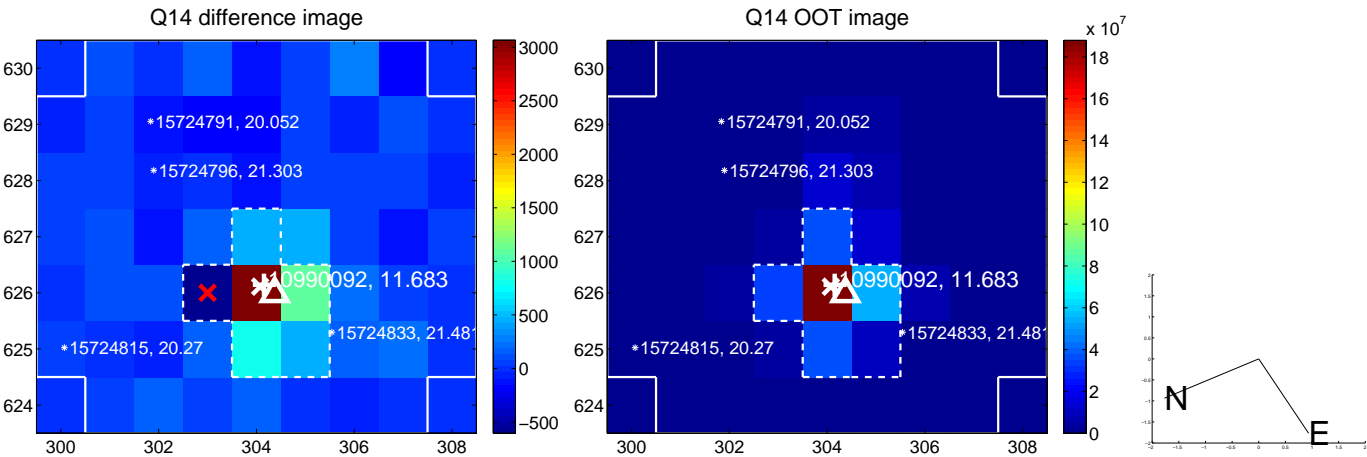
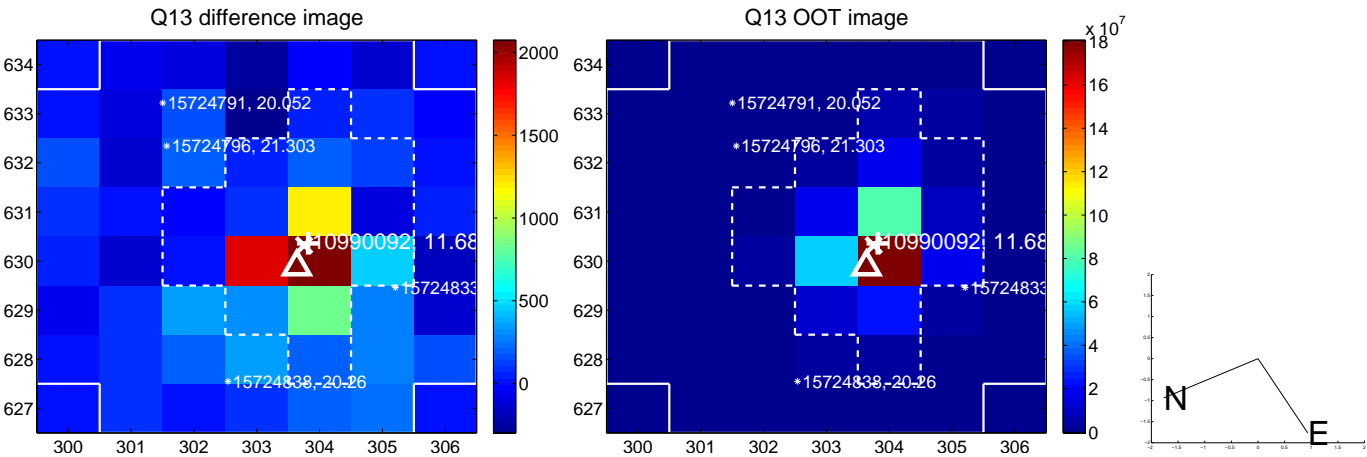




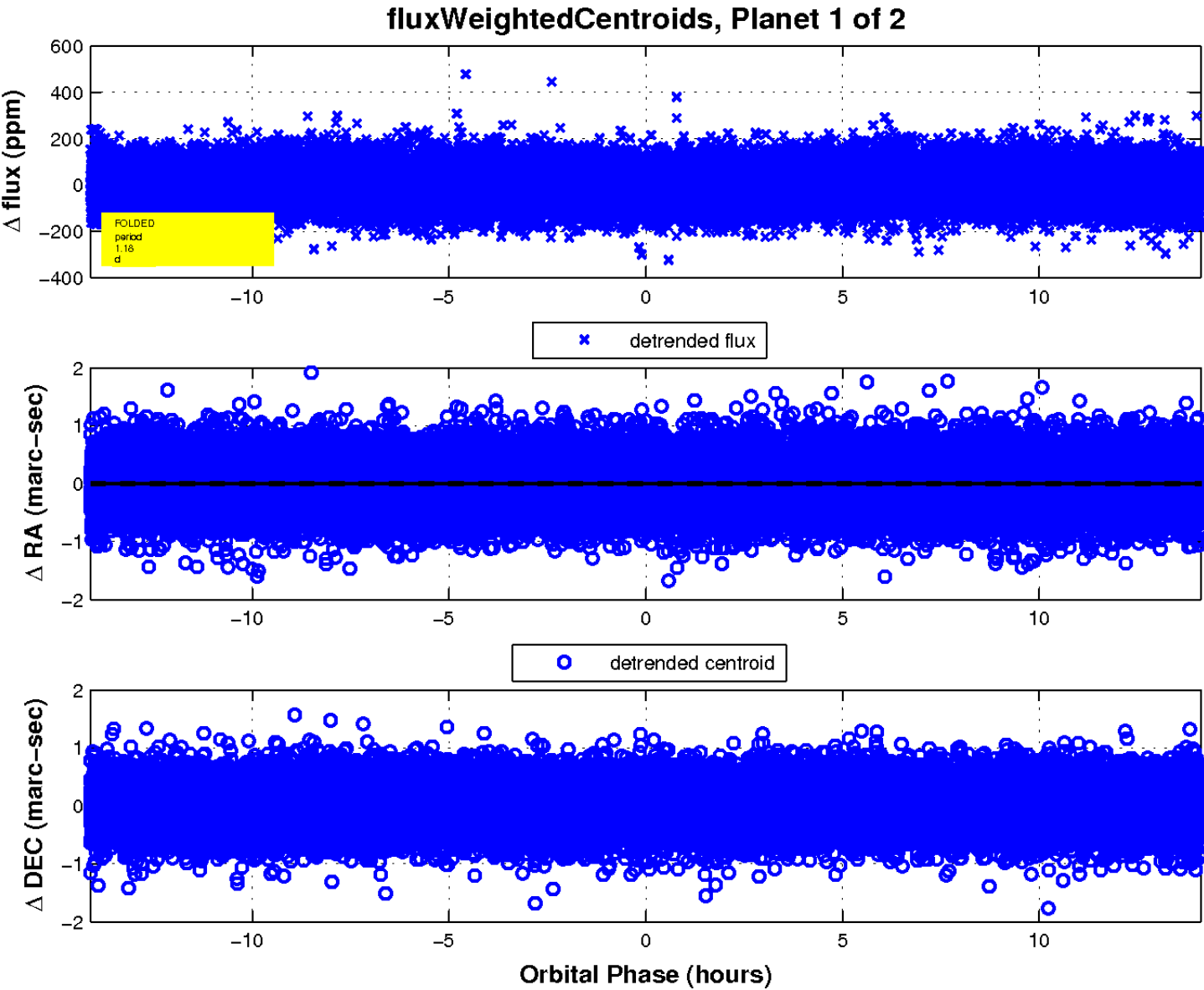
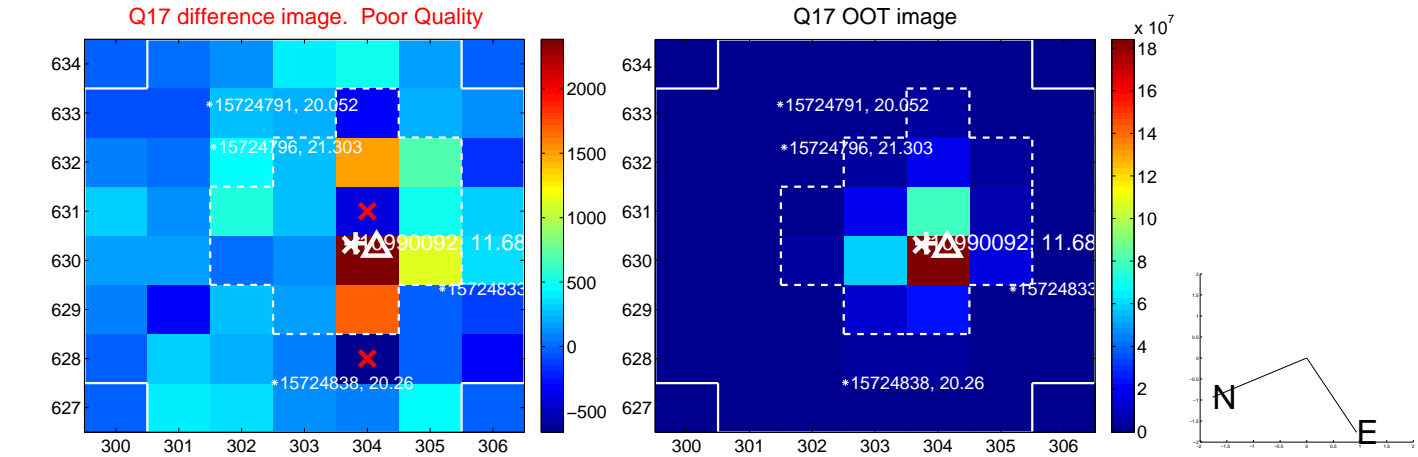
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

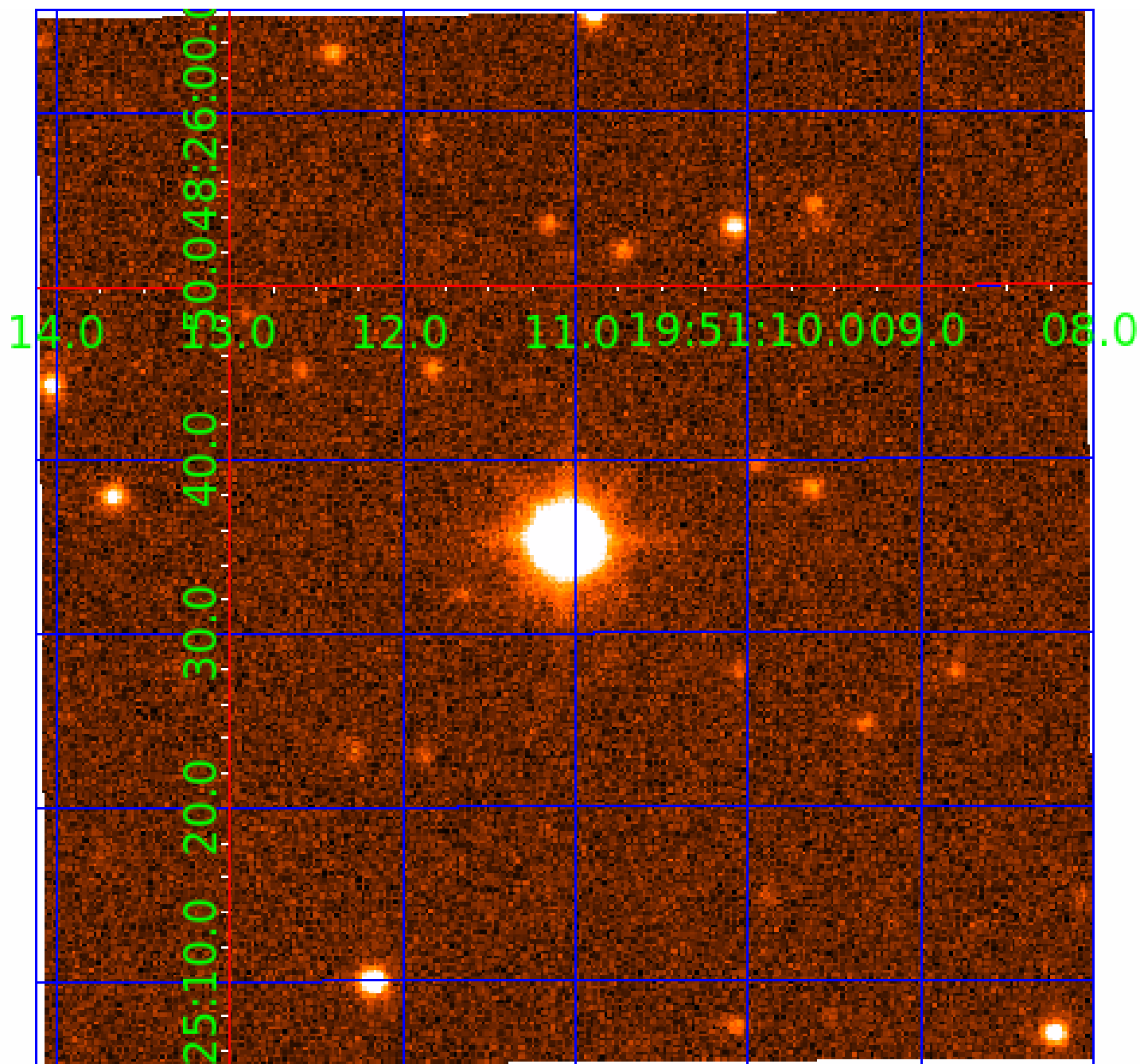


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010990092

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010990092-01	OBS	No	1.175635	132.154314	8.3	5.326	9.6	8.8	3.24	8130	0.98	53354.03
010990092-02	OBS	No	100.378482	201.656387	54.2	12.985	9.3	5.4	3.24	8130	2.65	141.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010990092-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
010990092-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_MEAS

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

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

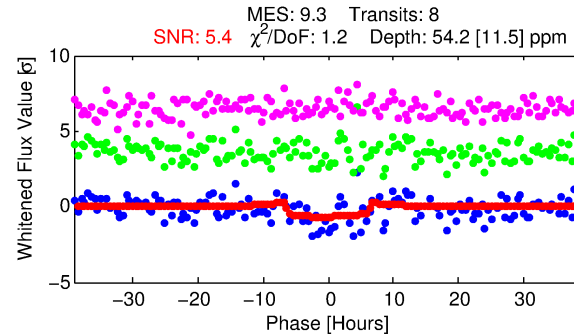
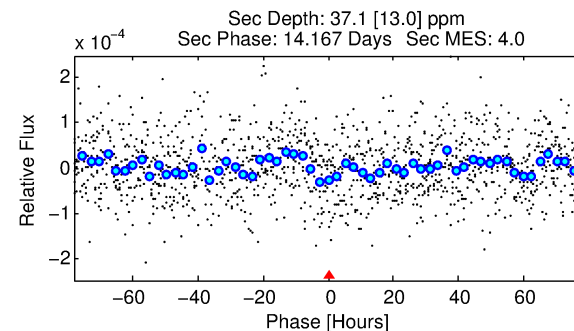
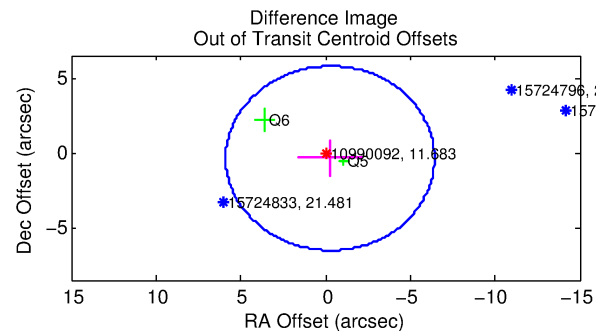
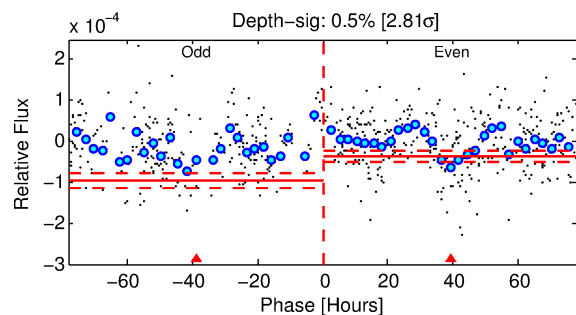
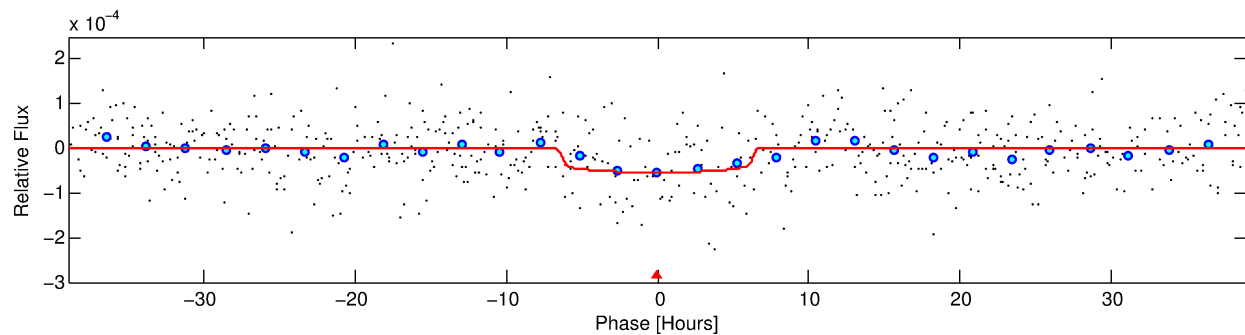
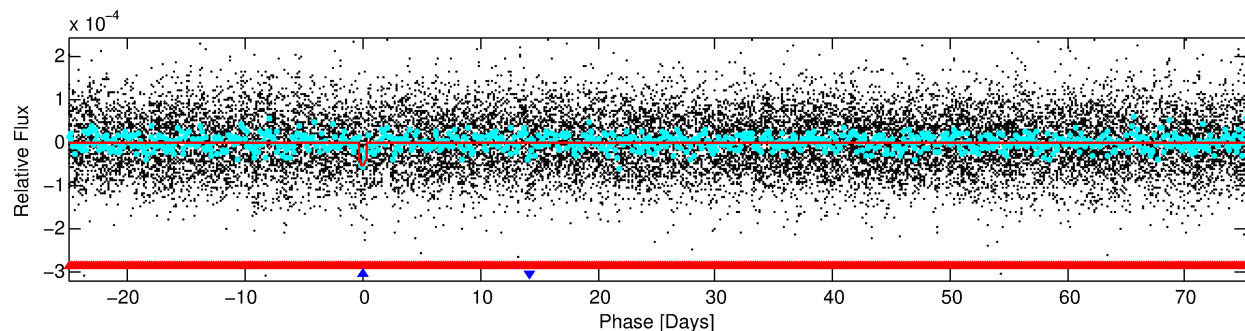
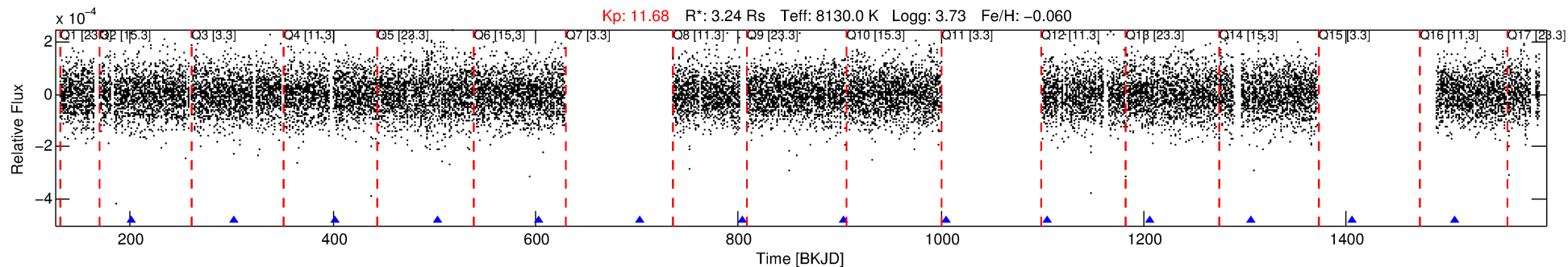
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010990092-02

No Significant Match Found

# DV One-Page Summary

KIC: 10990092 Candidate: 2 of 2 Period: 100.378 d



## DV Fit Results:

Period = 100.37848 [0.00337] d  
Epoch = 201.6564 [0.0247] BKJD  
Rp/R\* = 0.0075 [0.0028]  
a/R\* = 34.48 [73.68]  
b = 0.82 [0.85]  
Seff = 141.91 [108.38]  
Teq = 880 [168] K  
Rp = 2.65 [1.60] Re  
a = 0.5379 [0.2485] AU  
Ag = 839.67 [931.79] [0.90 $\sigma$ ]  
Teffp = 7325 [1536] K [4.17 $\sigma$ ]

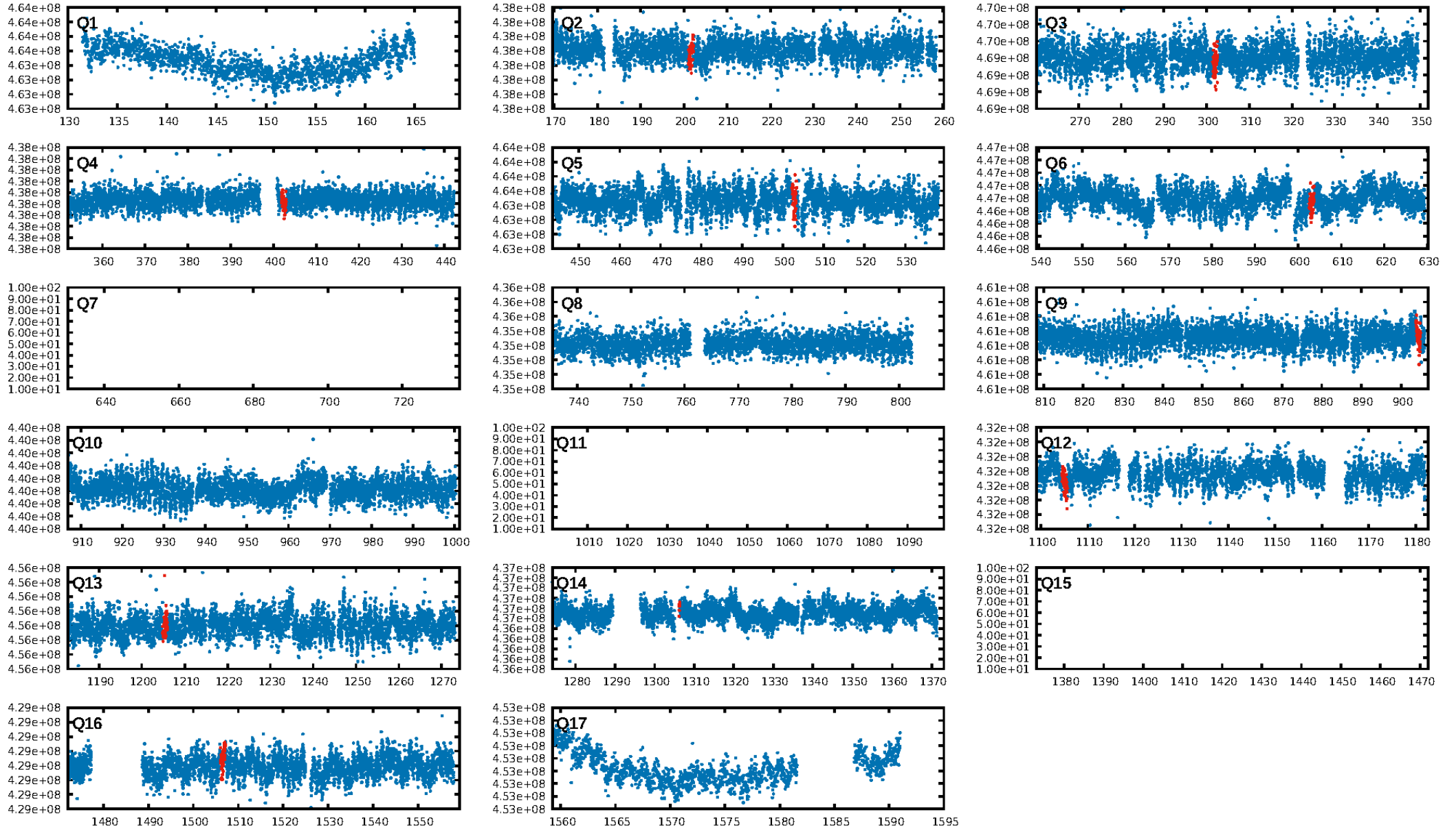
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [169.64 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.22e-14  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: 21  
Centroid-sig: N/A  
Centroid-so: 0.193 arcsec [0.12 $\sigma$ ]  
OotOffset-rm: 0.463 arcsec [0.23 $\sigma$ ]  
KicOffset-rm: 0.685 arcsec [0.39 $\sigma$ ]  
OotOffset-st: 1/0/0/1 [2]  
KicOffset-st: 1/0/0/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.00 [0/6]

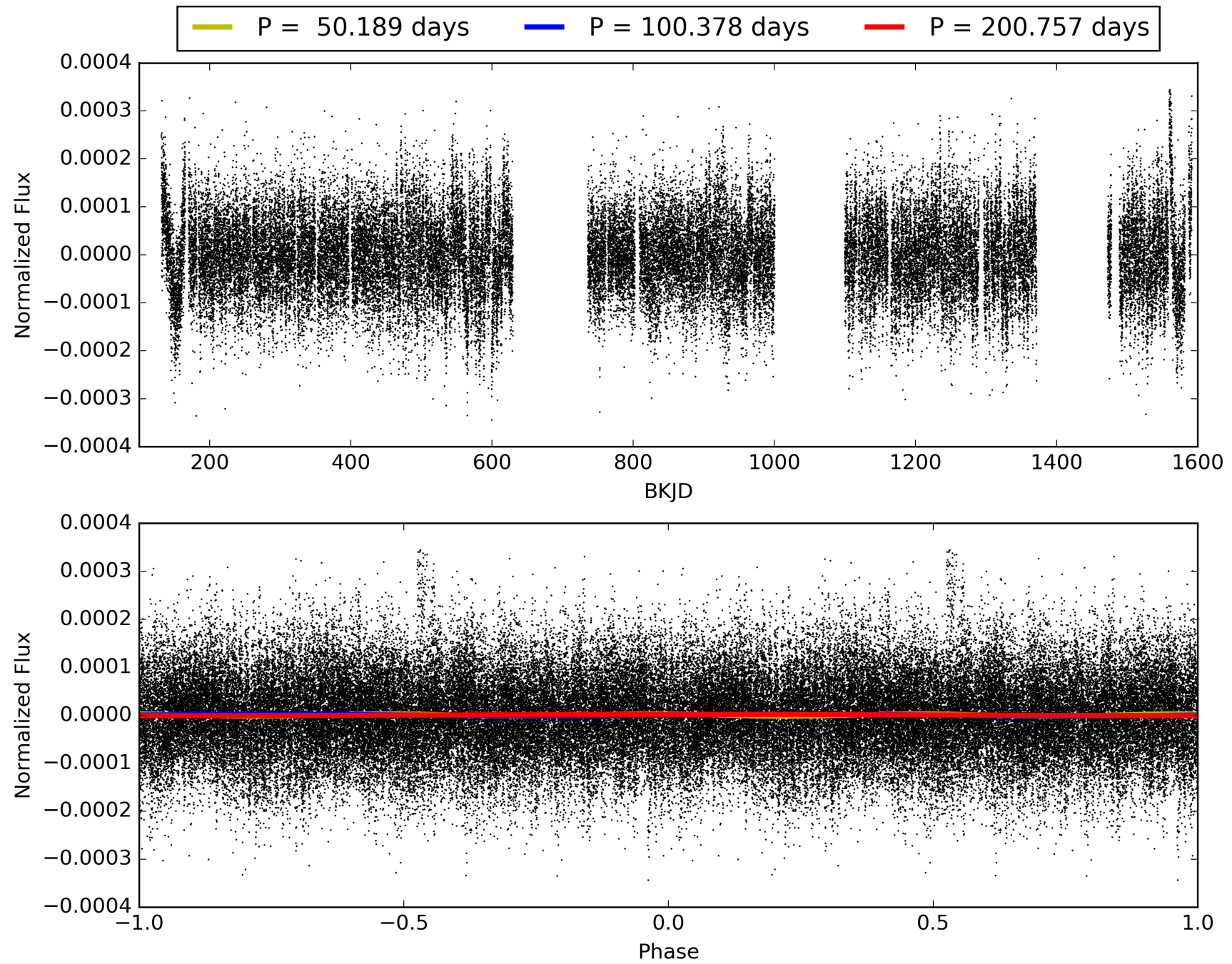
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 10:35:29 Z

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

# TCE 010990092-02, PDC Light Curves



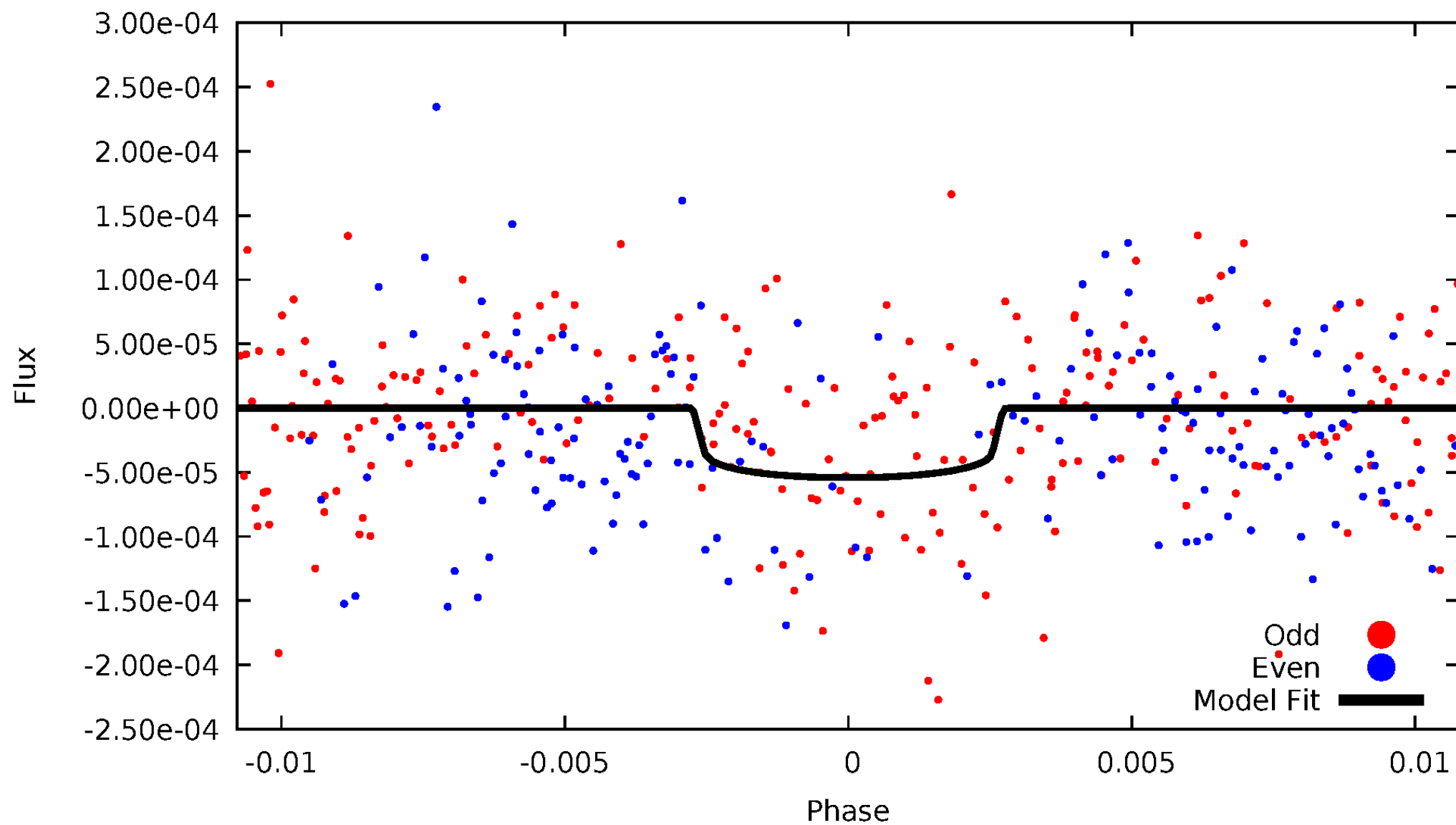
TCE 010990092-02





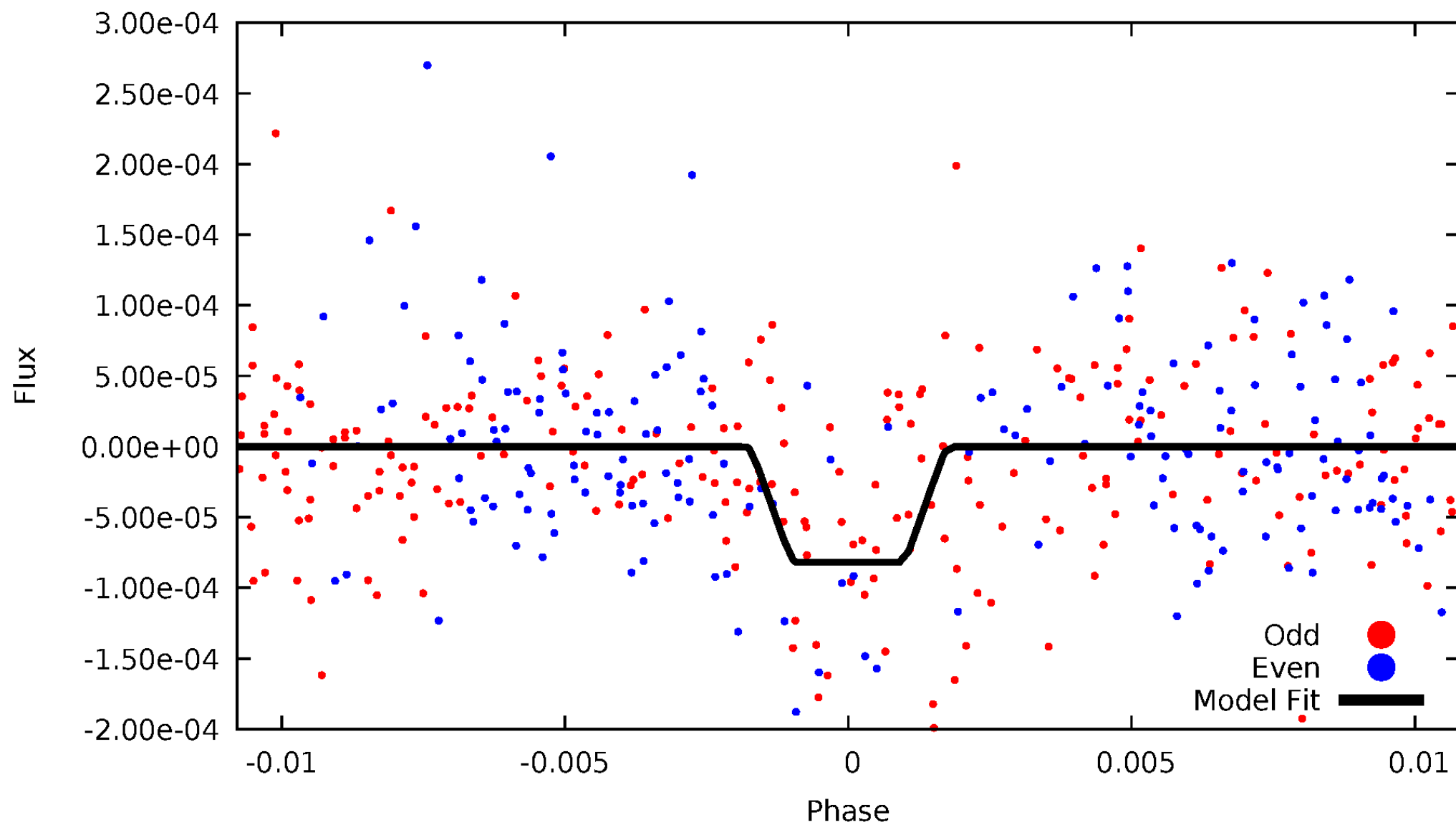
# DV Odd/Even

TCE 010990092-02



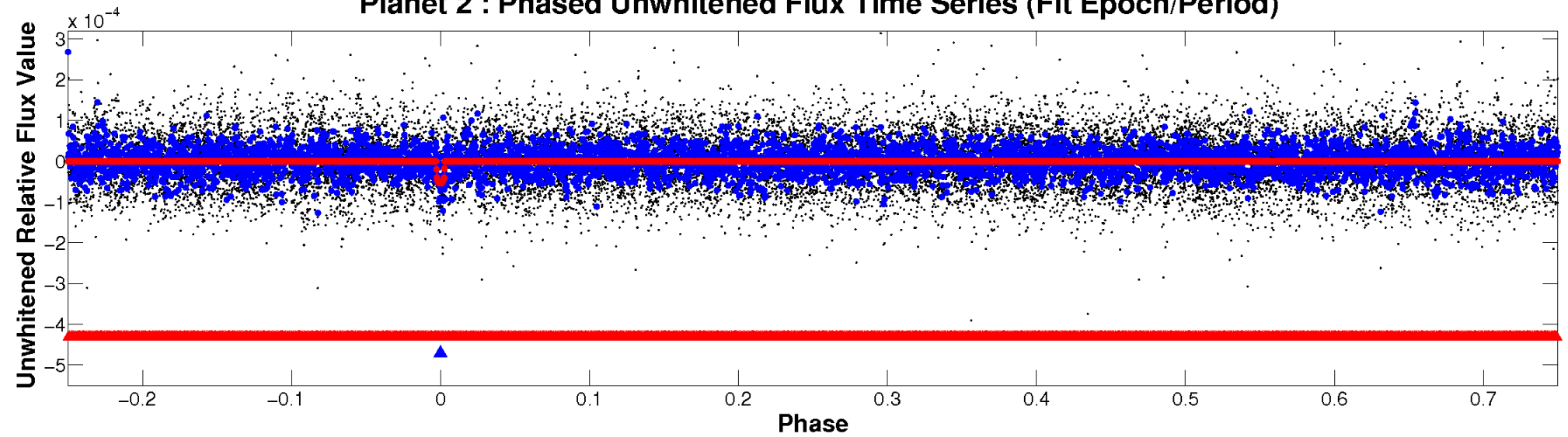
# ALT Odd/Even

TCE 010990092-02

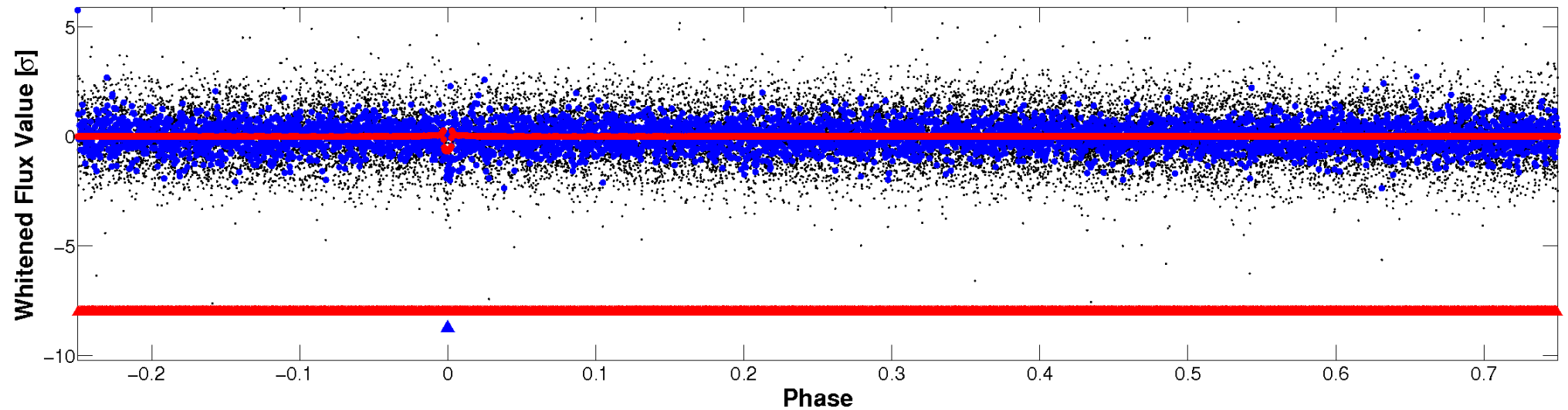


# Non-Whitened Vs. Whitened Light Curve

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



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



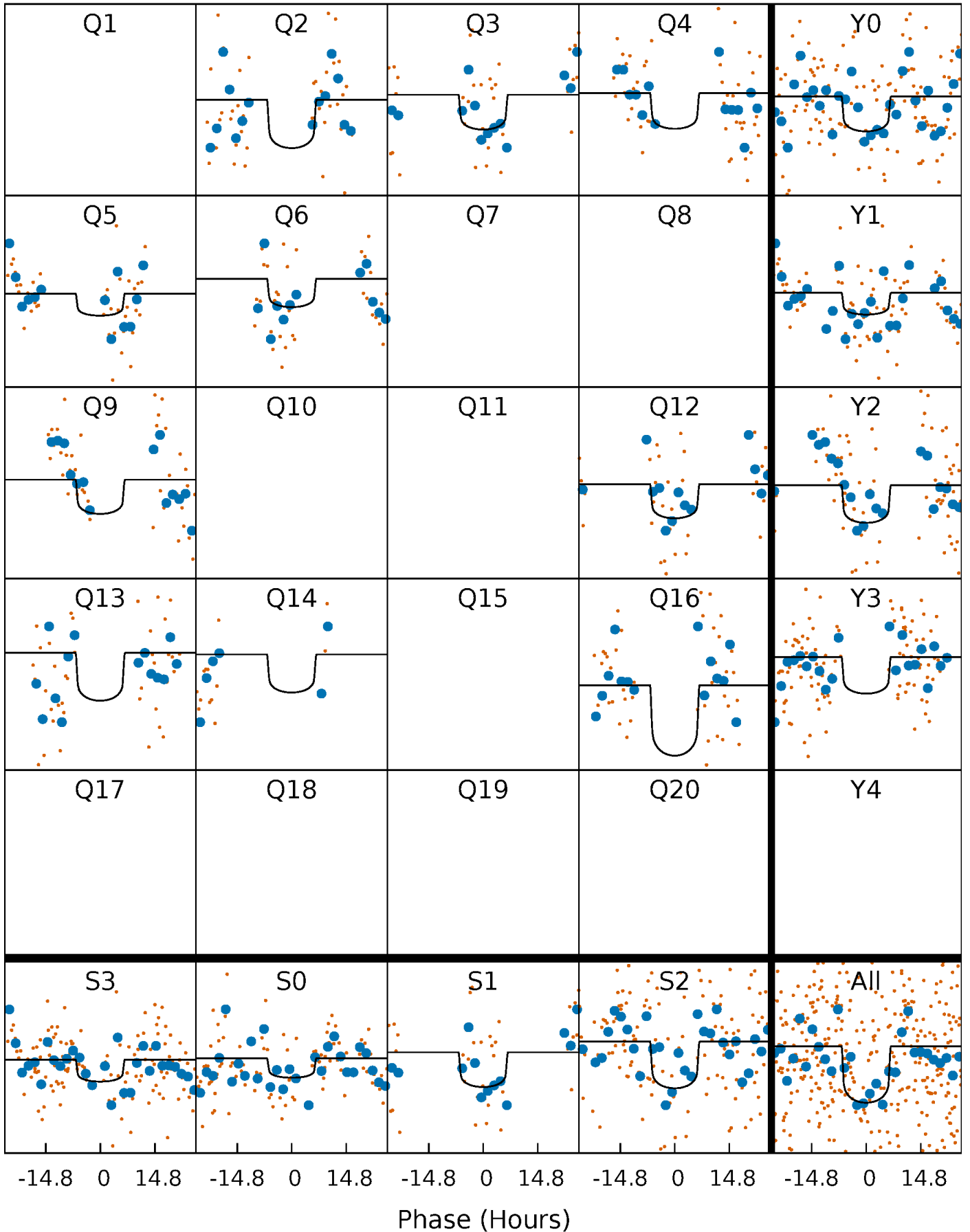
# PDC Quarter-Phased Transit Curves

TCE 010990092-02     $P=100.378482$  Days     $T_0=201.656387$  (BKJD)



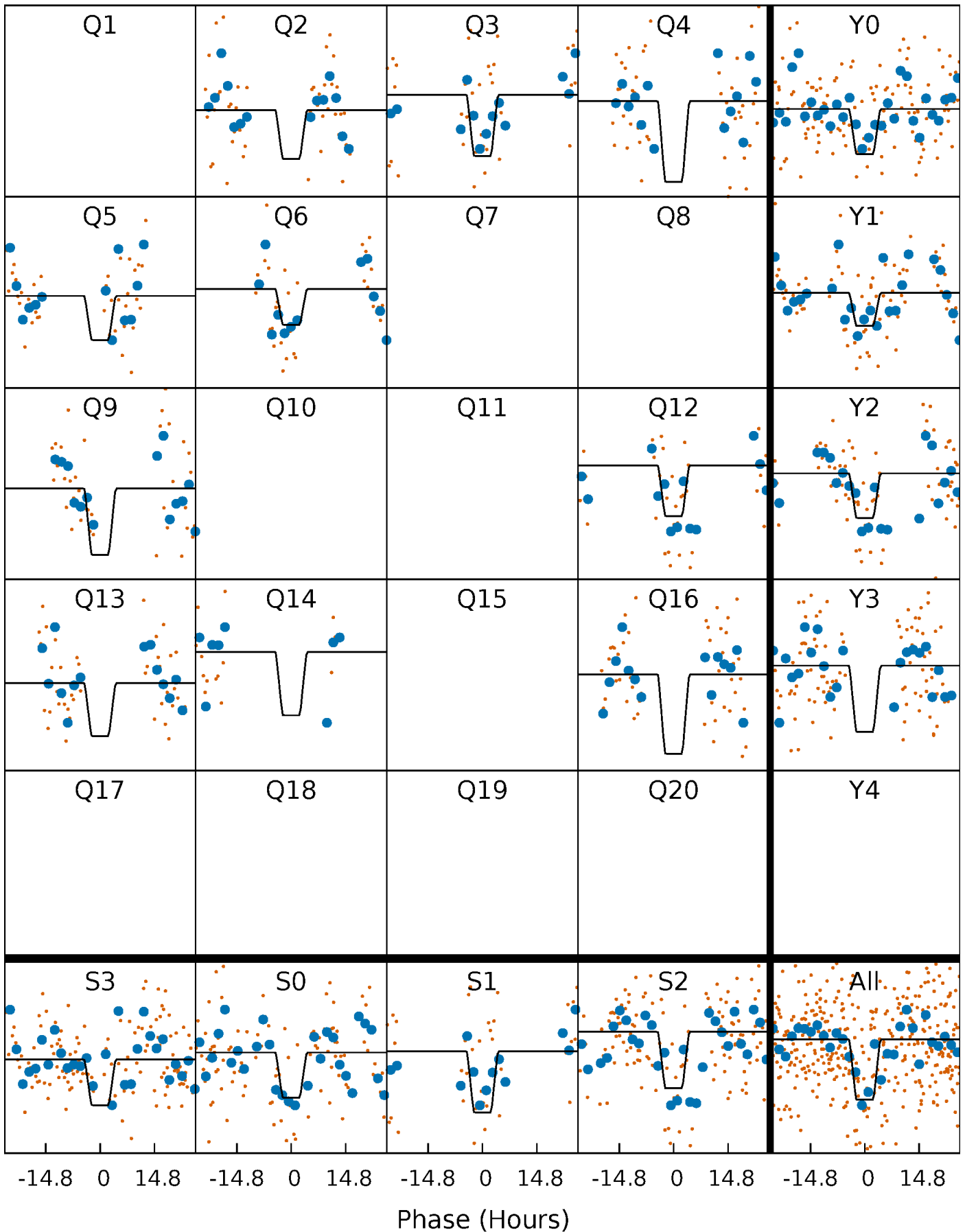
# DV Quarter-Phased Transit Curves

TCE 010990092-02     $P=100.378482$  Days     $T_0=201.656387$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010990092-02     $P=100.370078$  Days     $T_0=201.672779$  (BKJD)

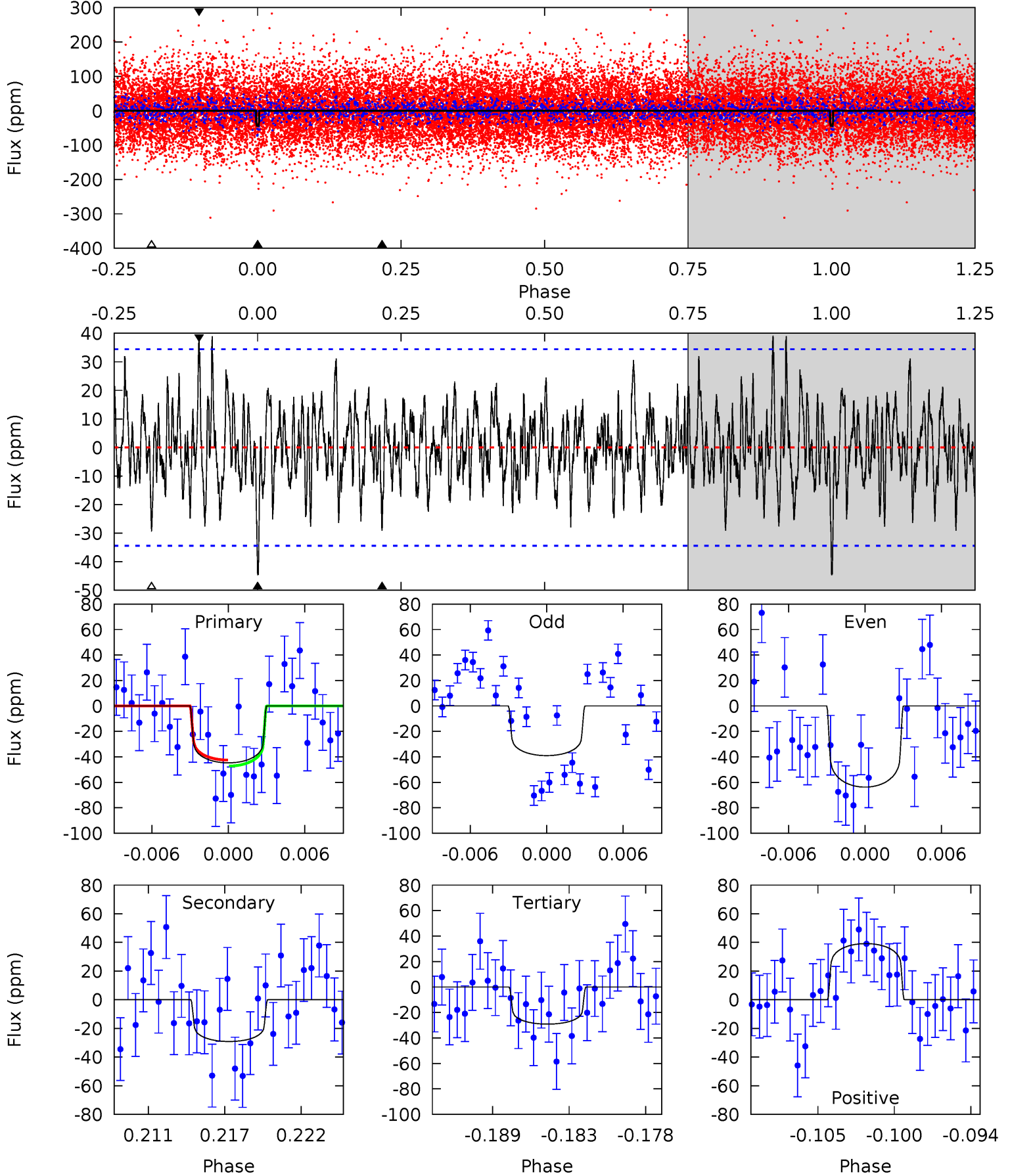




# DV Model-Shift Uniqueness Test

010990092-02, P = 100.378482 Days, E = 101.277905 Days

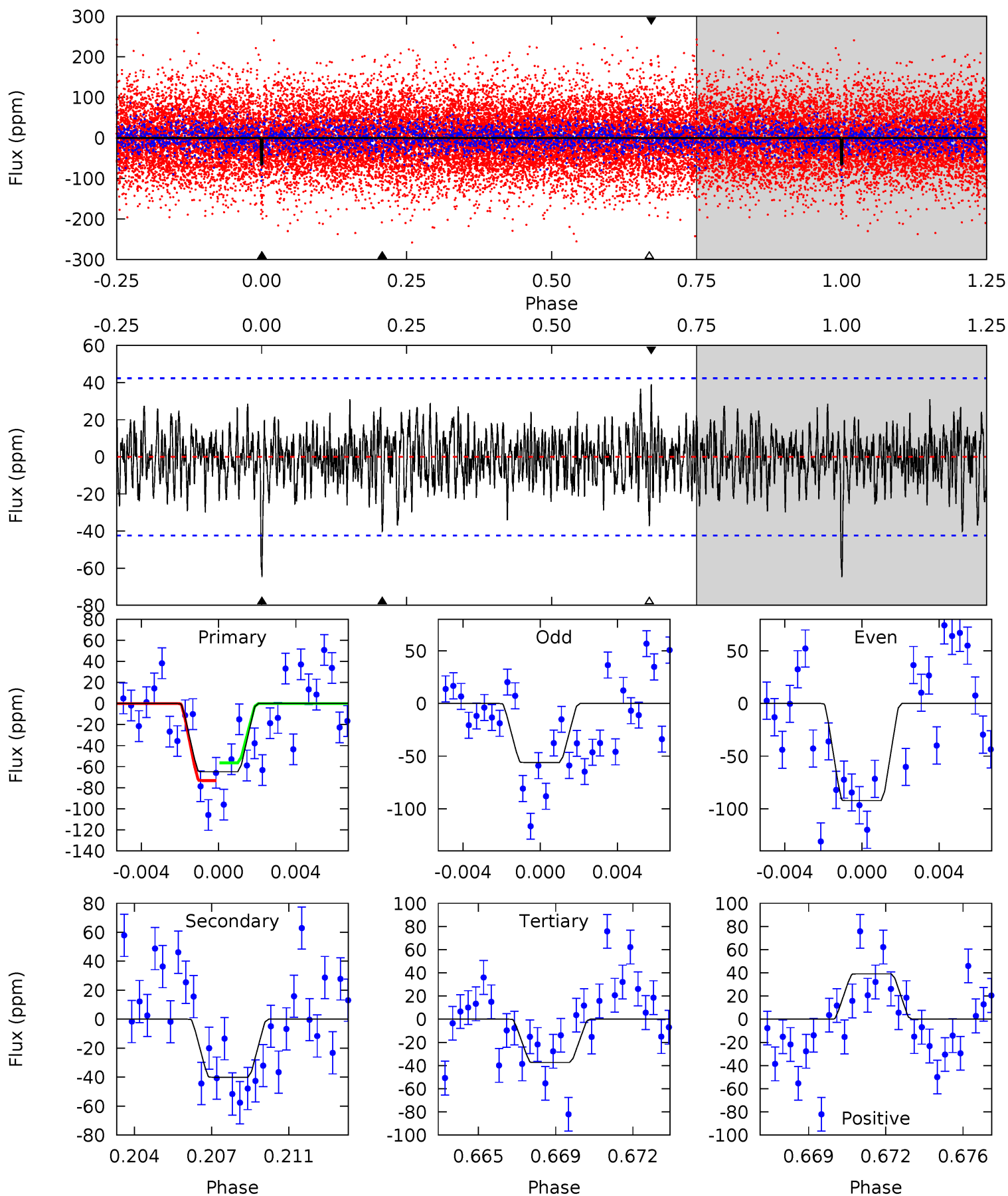
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.67	4.35	4.35	5.85	5.14	2.77	1.63	2.32	0.82	0.00	-1.50	1.62	1.00	0.47	0.35



# Alt Model-Shift Uniqueness Test

010990092-02, P = 100.370078 Days, E = 101.302701 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
7.98	4.94	4.60	4.82	5.22	2.91	1.40	3.38	3.16	0.34	0.12	1.84	1.14	0.38	1.04



### Stellar Parameters For KIC 010990092

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$8130^{+225}_{-338}$	$3.731^{+0.440}_{-0.110}$	$-0.060^{+0.200}_{-0.400}$	$3.239^{+0.825}_{-1.532}$	$2.061^{+0.334}_{-0.501}$	$0.085^{+0.325}_{-0.035}$
	+3%/-4%	+12%/-3%	+333%/-667%	+25%/-47%	+16%/-24%	+380%/-41%
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 010990092-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-29 \pm 7$	$2.41^{+1.09}_{-1.03}$	$1187^{+88}_{-133}$	$6671^{+2232}_{-1030}$	$797^{+1484}_{-421}$
Alt.	$-40 \pm 8$	$2.89^{+1.12}_{-1.08}$	$1180^{+108}_{-147}$	$6533^{+1798}_{-819}$	$758^{+1176}_{-367}$

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

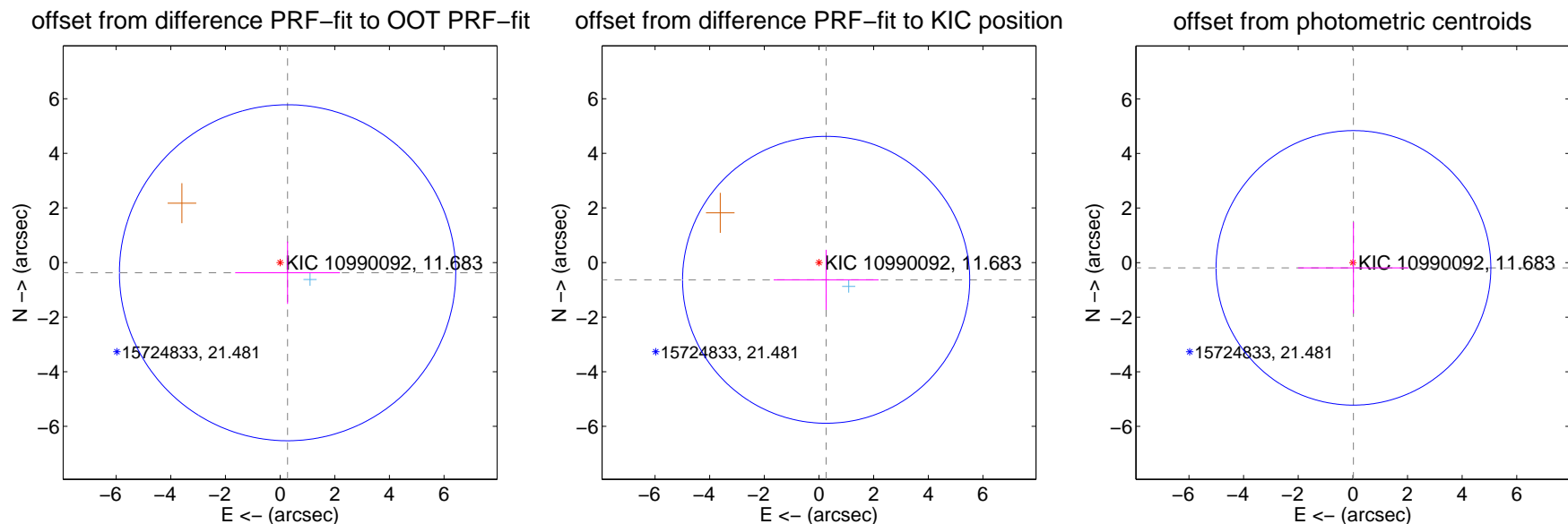
## DV Centroid Data

Supplemental centroid analysis for 010990092-02. **Kepler magnitude: 11.68.** Transit SNR 5.40

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

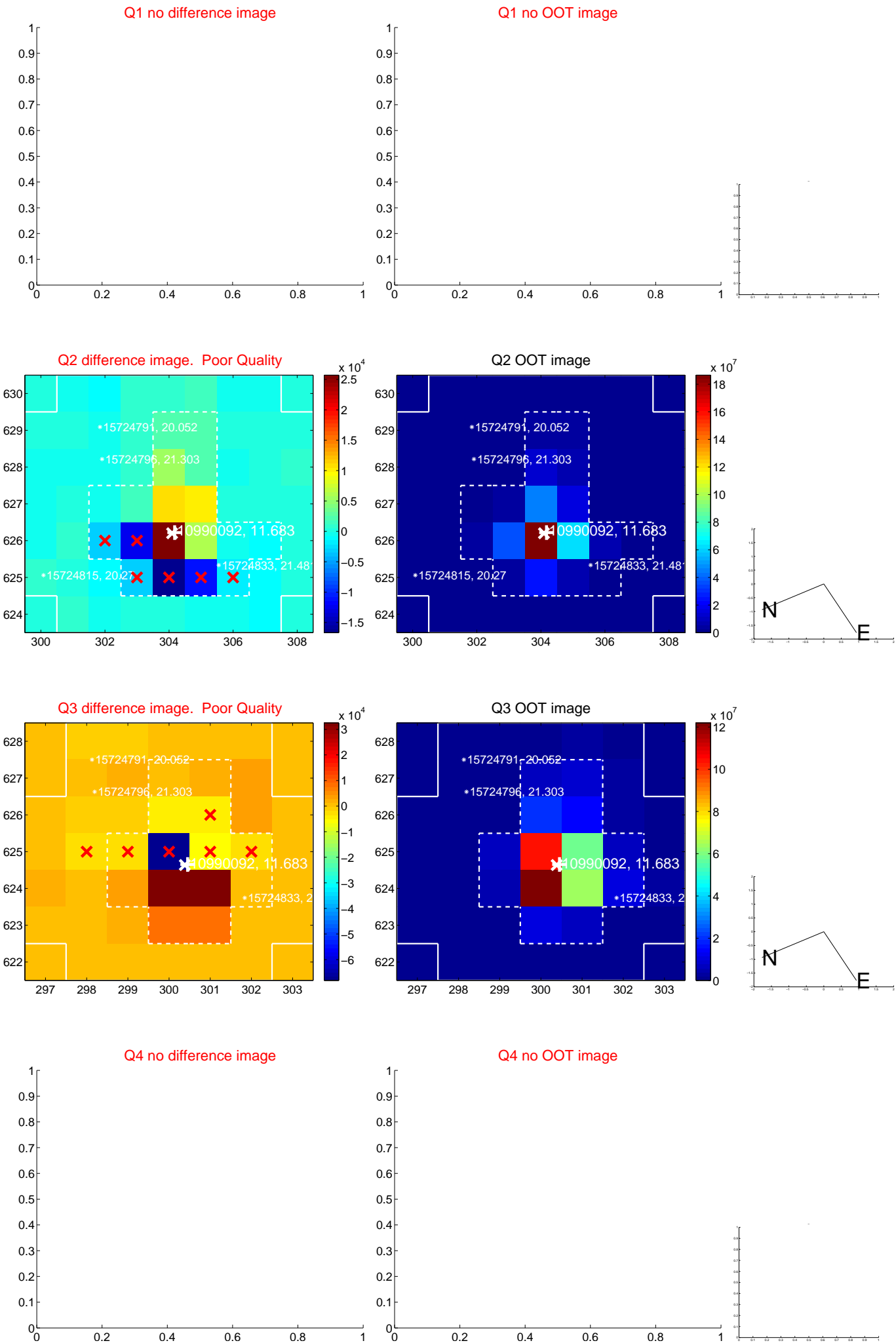
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.463 \pm 2.051$	0.23	$-0.273 \pm 1.915$	$-0.374 \pm 1.144$
PRF-fit source offset from KIC position	$0.685 \pm 1.751$	0.39	$-0.262 \pm 1.920$	$-0.633 \pm 1.101$
photometric centroid source offset	$0.19 \pm 1.68$	0.12	$-0.02 \pm 2.02$	$-0.19 \pm 1.67$

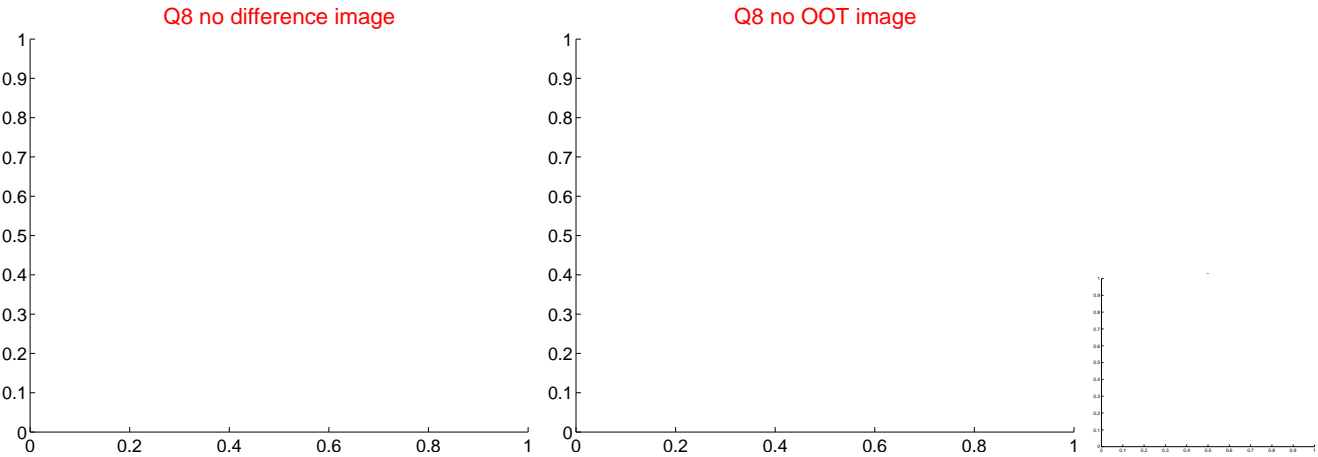
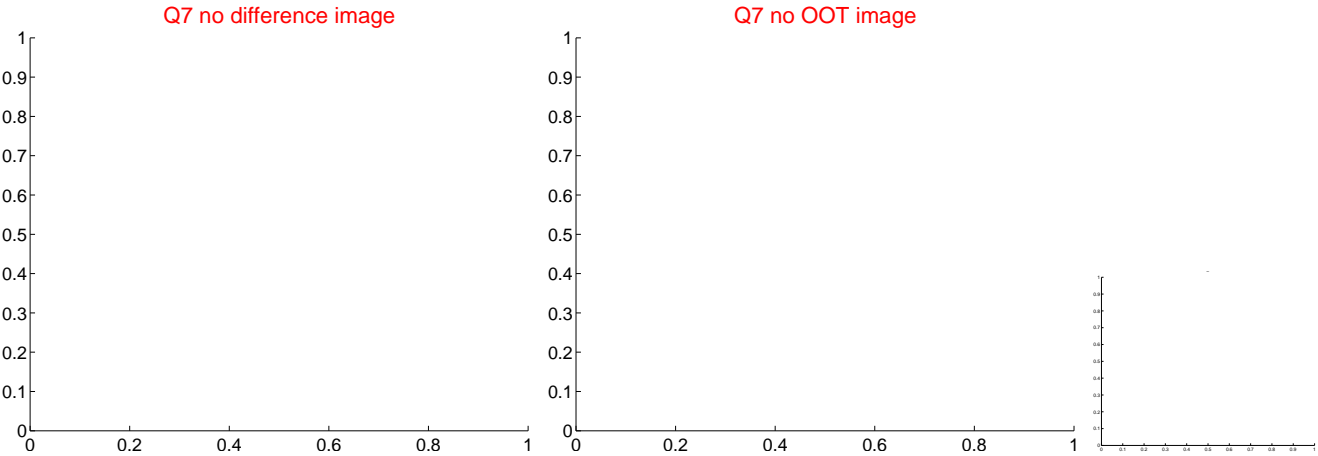
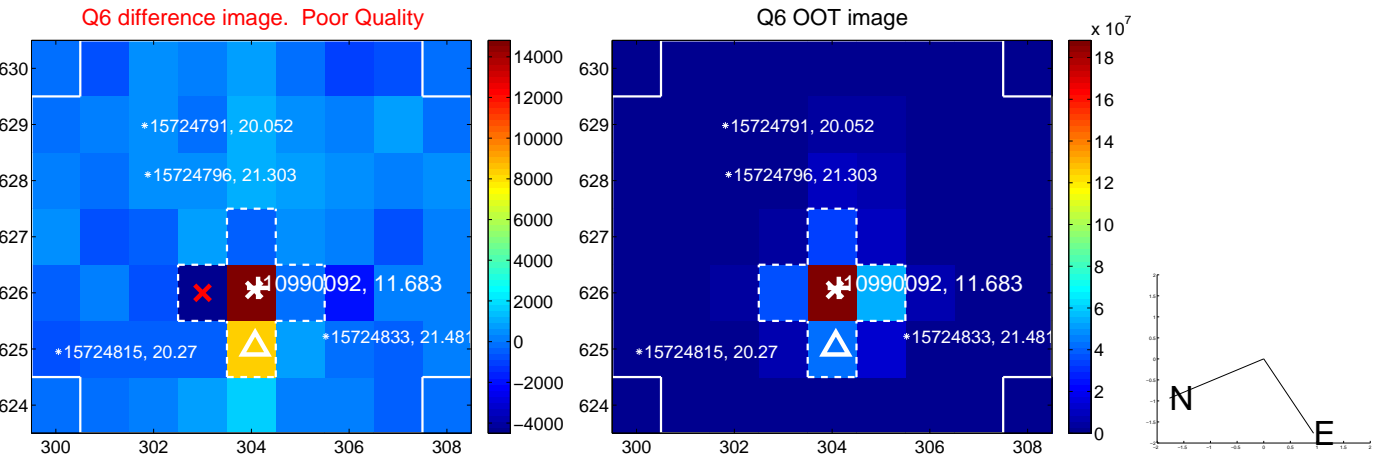
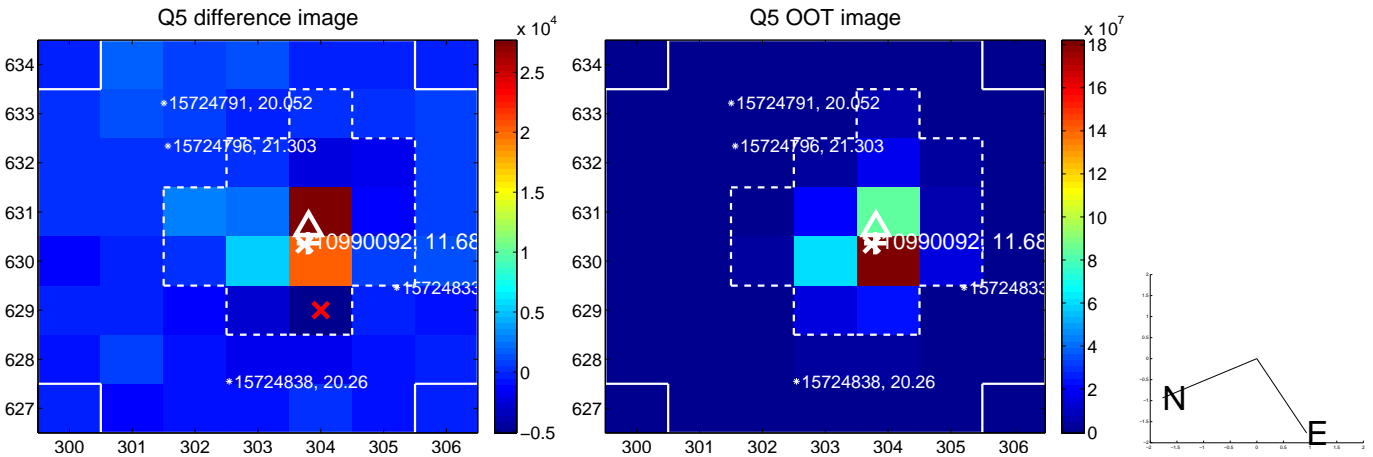


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

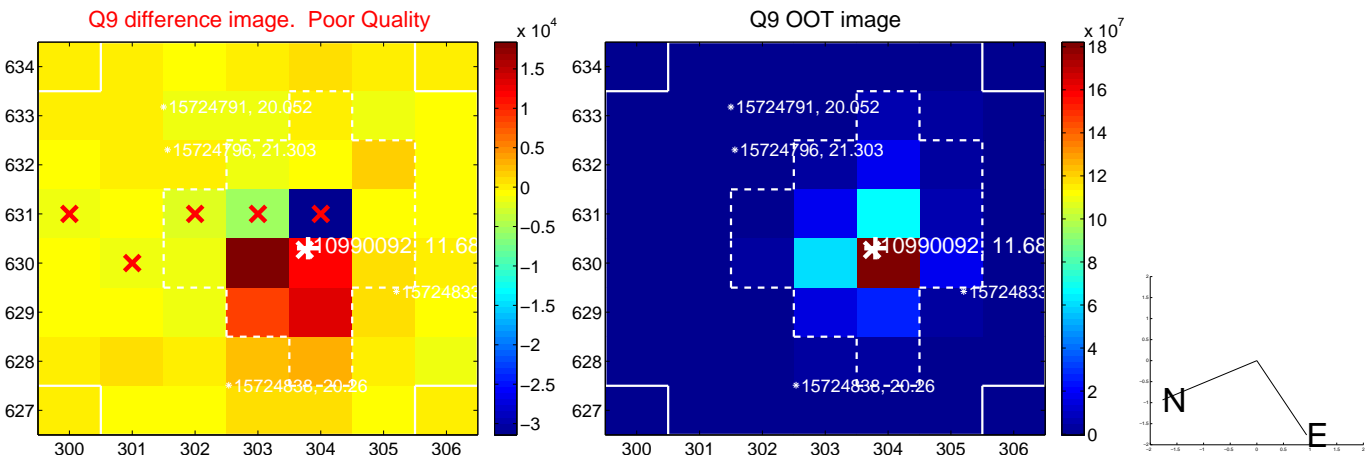


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

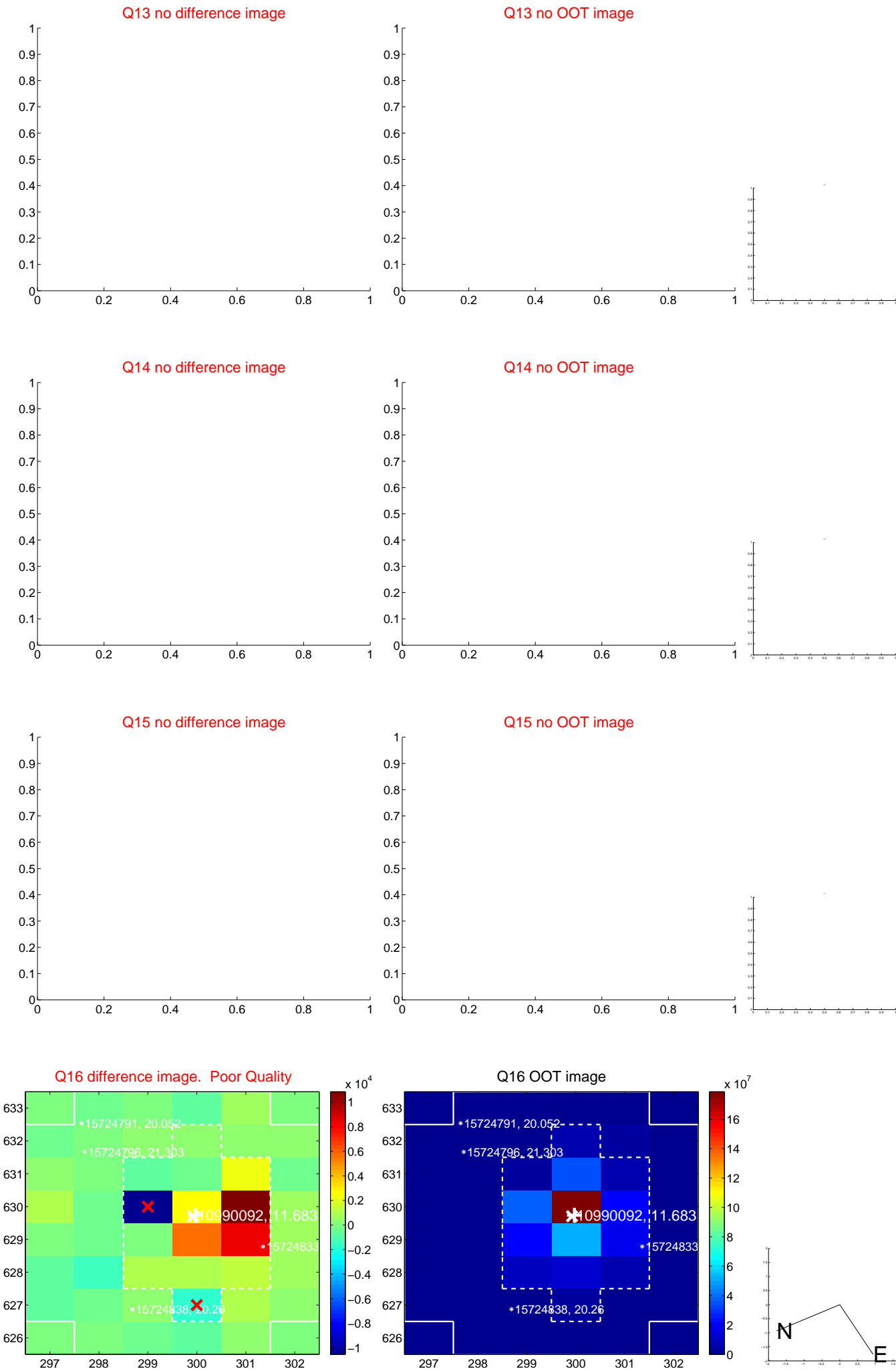




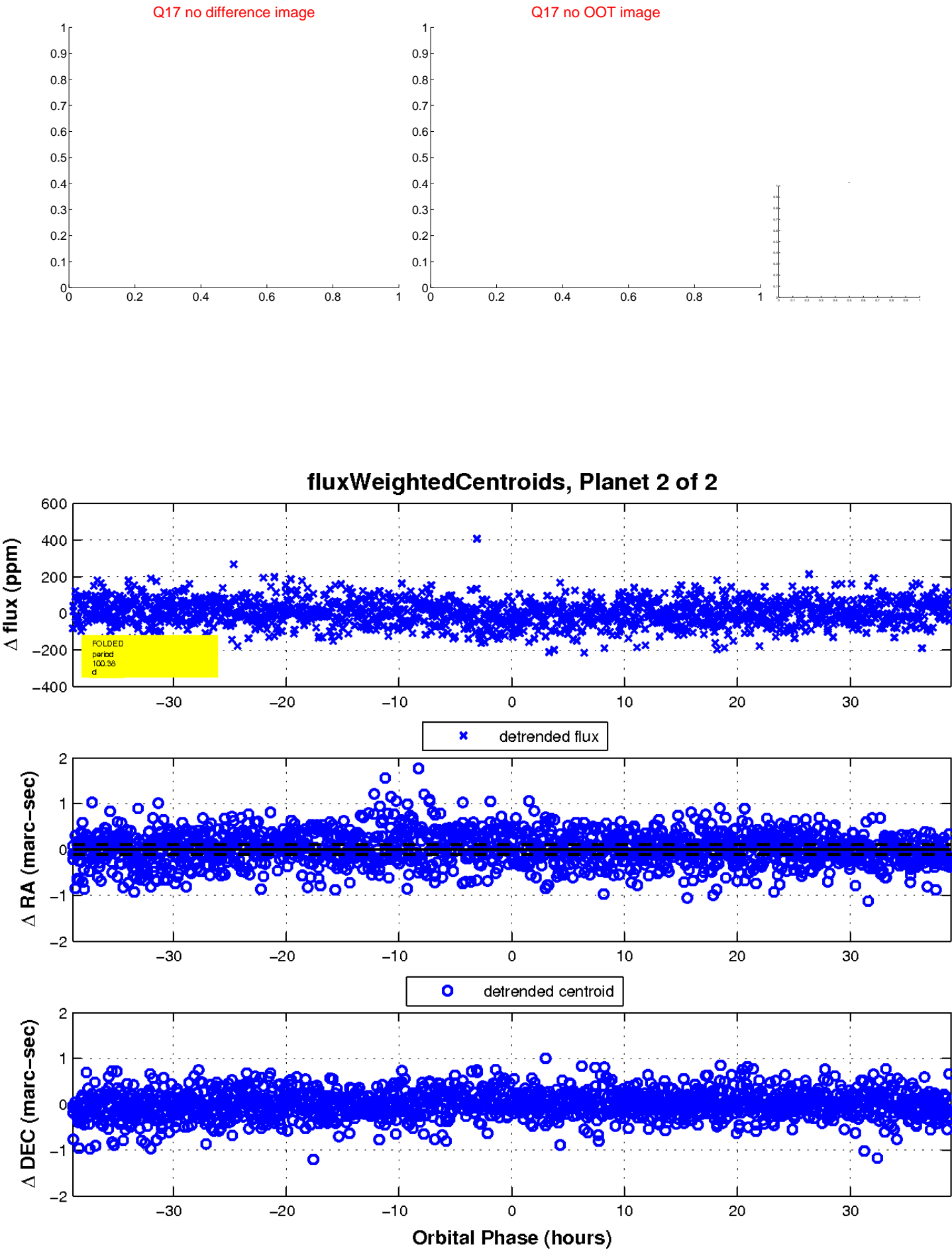
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

