

# KIC 010091829

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010091829-01	OBS	No	2.685897	132.966276	9.3	17.710	13.4	10.7	2.48	7751	0.77	8802.86
010091829-02	OBS	No	51.150813	150.403921	75.0	13.637	23.3	11.1	2.48	7751	2.61	173.09
010091829-04	OBS	No	103.251385	212.511369	77.6	11.125	15.0	10.7	2.48	7751	2.46	67.85
010091829-05	OBS	No	39.721348	158.143016	55.9	7.274	14.0	8.1	2.48	7751	2.12	242.50
010091829-06	OBS	No	97.893326	213.505551	72.2	12.046	12.5	8.2	2.48	7751	2.22	72.85
010091829-07	OBS	No	185.242008	174.661147	75.4	15.466	13.6	8.8	2.48	7751	2.54	31.12
010091829-08	OBS	No	144.806501	226.139993	476.4	66.191	10.9	9.9	2.48	7751	6.89	43.22
010091829-09	OBS	No	123.726523	248.998906	51.2	12.172	9.0	7.0	2.48	7751	2.05	53.31
010091829-10	OBS	No	15.454682	141.232200	49.5	3.861	7.4	8.1	2.48	7751	2.01	853.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010091829-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
010091829-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
010091829-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED
010091829-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010091829-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

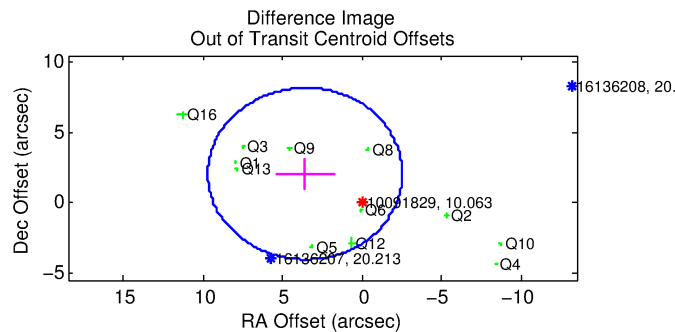
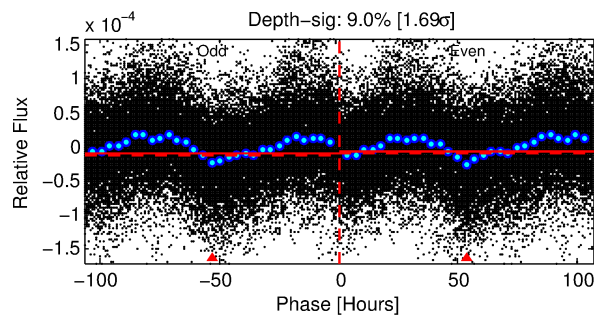
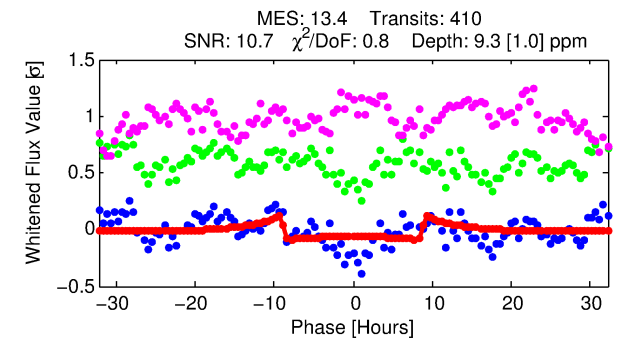
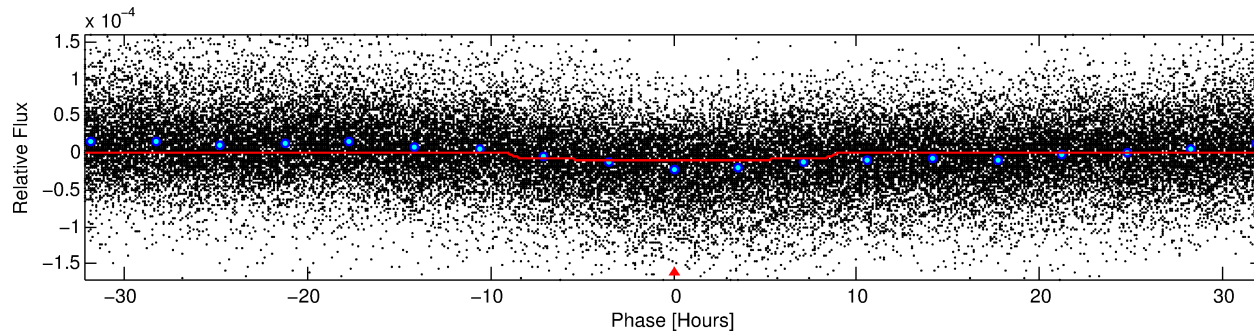
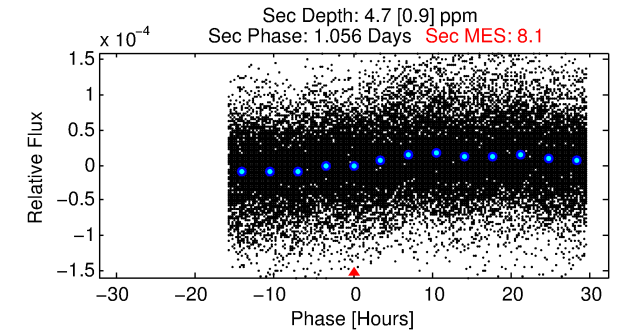
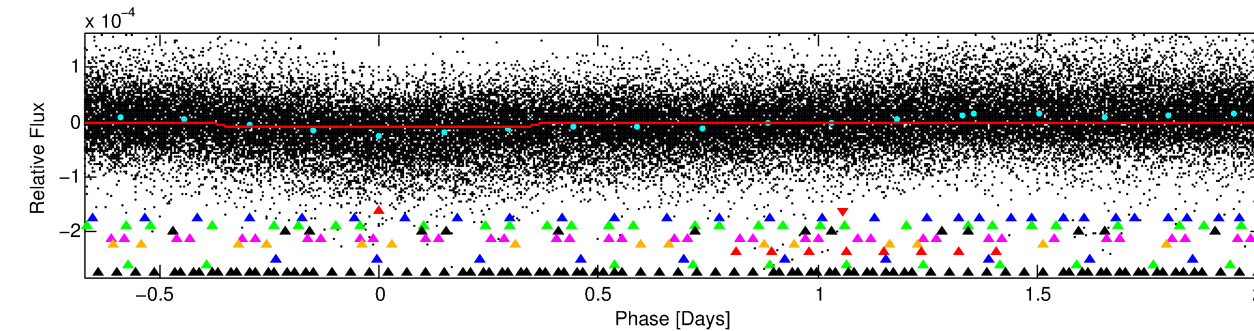
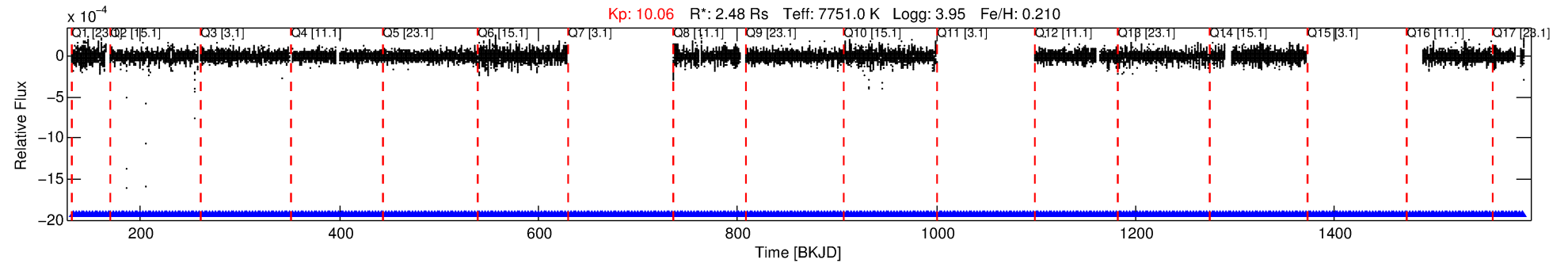
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010091829-01

No Significant Match Found

# DV One-Page Summary

KIC: 10091829 Candidate: 1 of 10 Period: 2.686 d



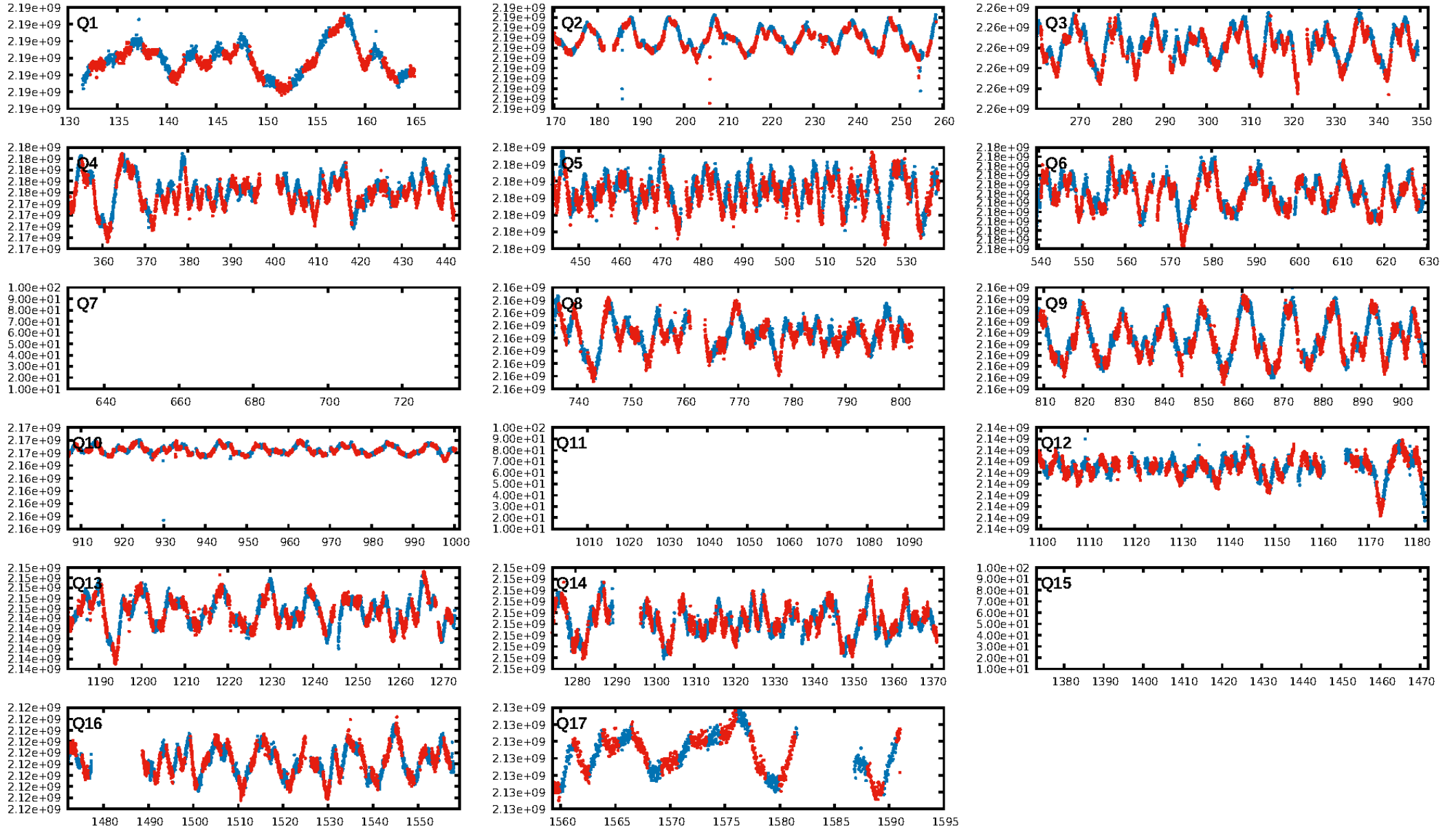
## DV Fit Results:

Period = 2.68590 [0.00002] d  
Epoch = 132.9663 [0.0043] BKJD  
Rp/R\* = 0.0028 [0.0011]  
a/R\* = 1.32 [1.35]  
b = 0.07 [35.58]  
Seff = 8802.86 [2185.10]  
Teq = 2470 [153] K  
Rp = 0.77 [0.34] Re  
a = 0.0476 [0.0077] AU  
Ag = 9.88 [8.47] [1.05σ]  
**Teffp = 6771 [1392] K [3.07σ]**

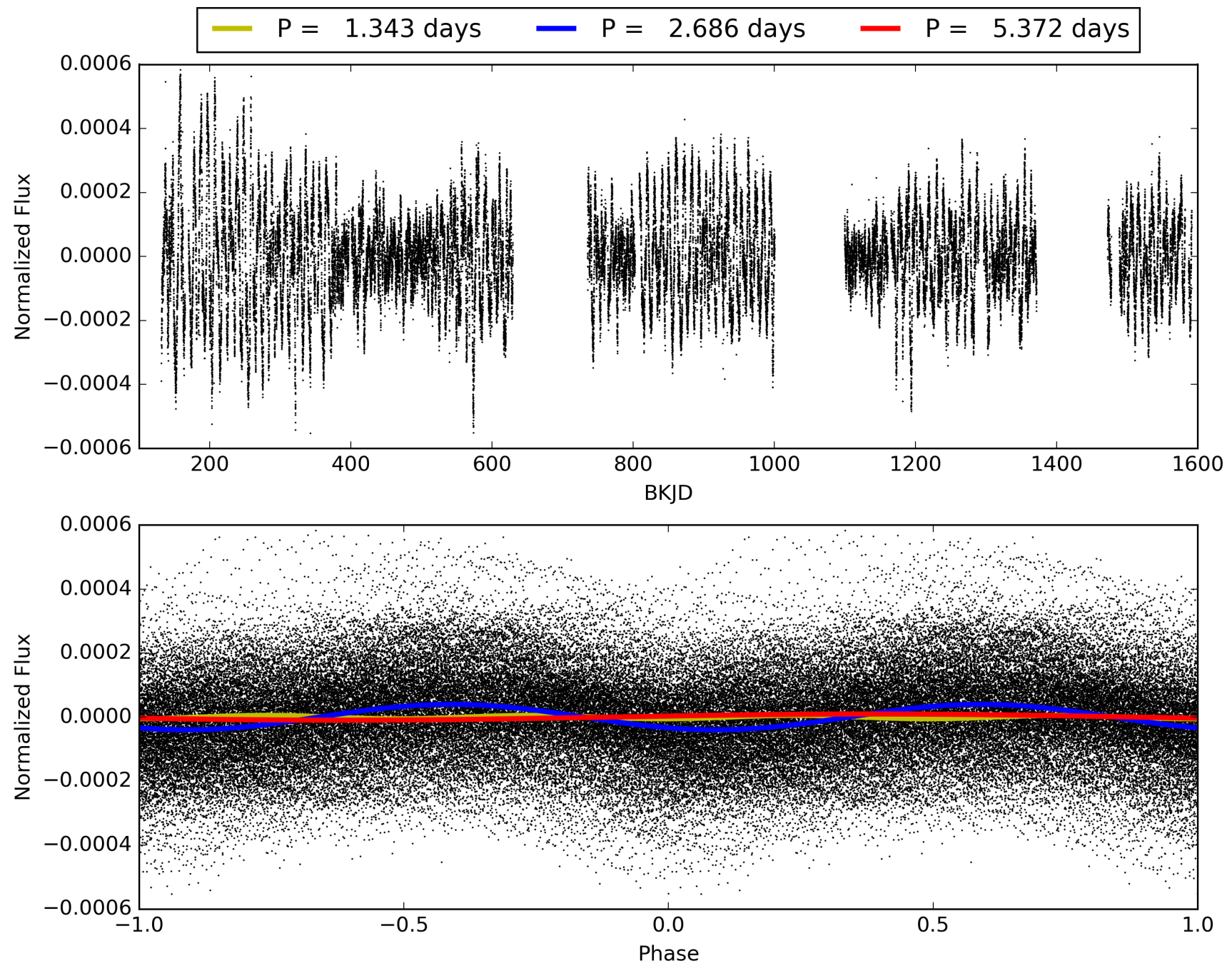
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [16.91σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.25e-25  
RollingBand-fgt: 1.00 [387/387]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 97.5%  
Centroid-so: 0.840 arcsec [0.58σ]  
OotOffset-rm: 4.142 arcsec [2.03σ]  
KicOffset-rm: 2.511 arcsec [1.36σ]  
OotOffset-st: 3/1/4/4 [12]  
KicOffset-st: 3/1/4/4 [12]  
DiffImageQuality-fgm: 0.08 [1/12]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 010091829-01, PDC Light Curves



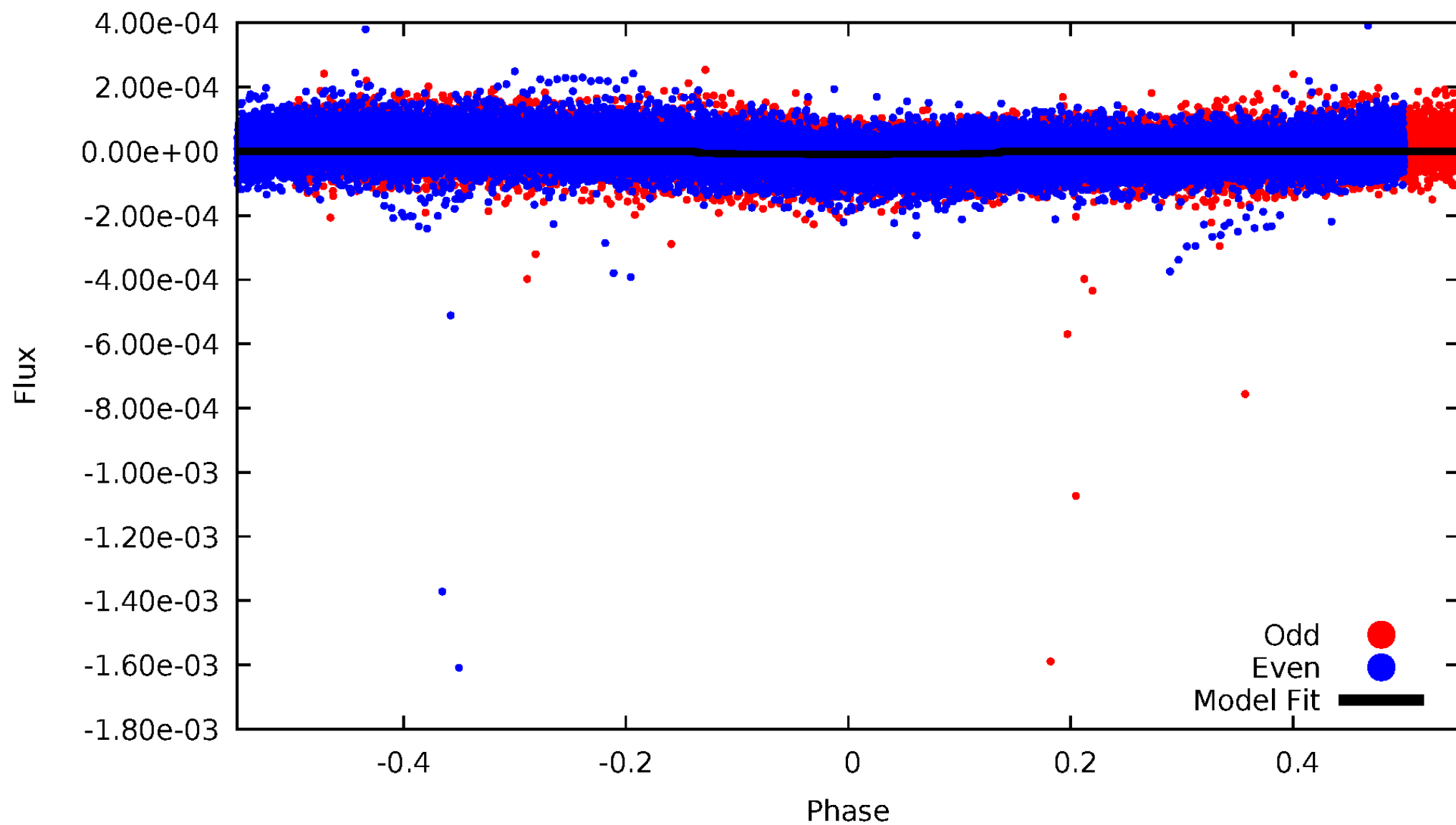
TCE 010091829-01





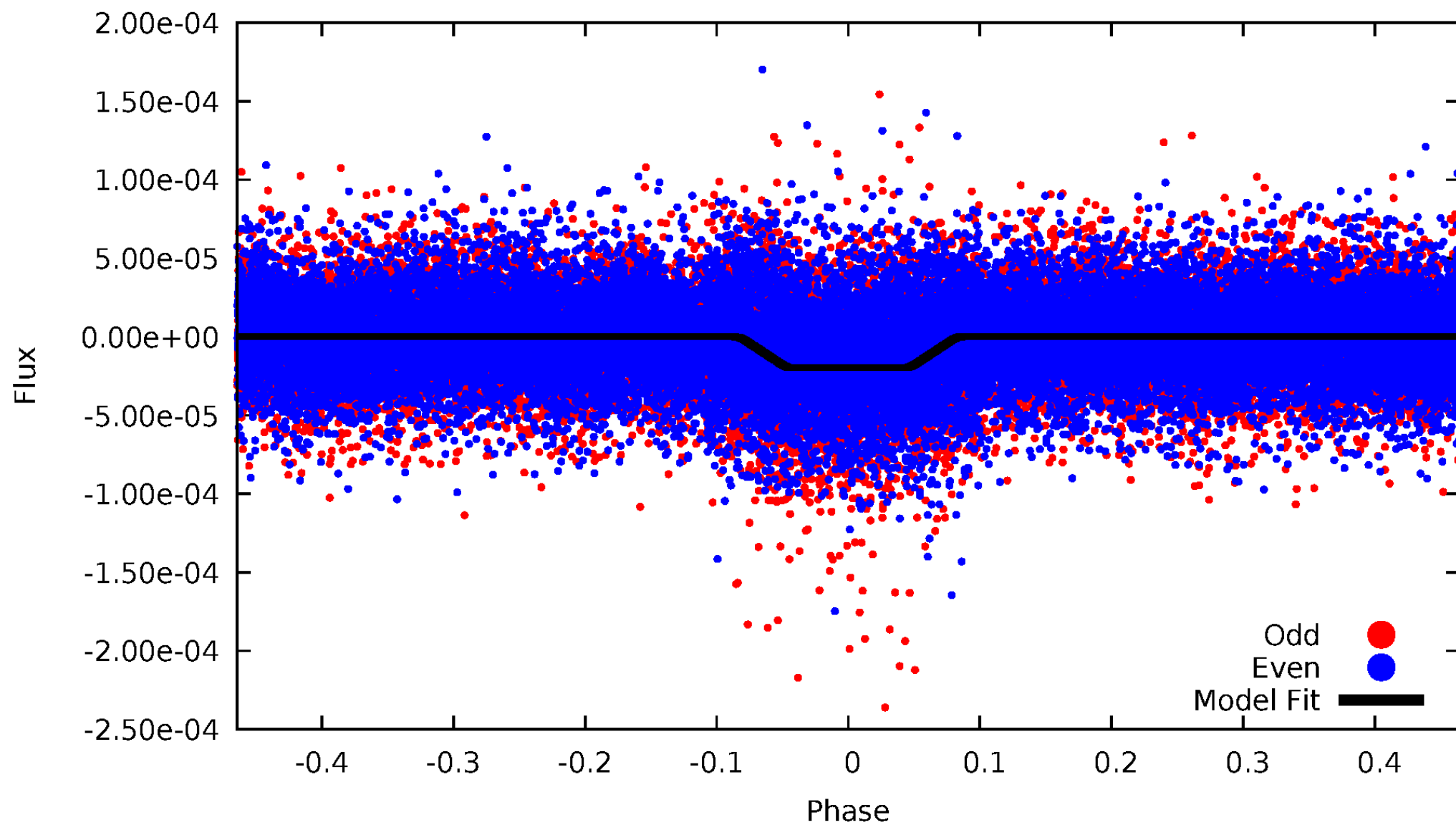
DV Odd/Even

TCE 010091829-01

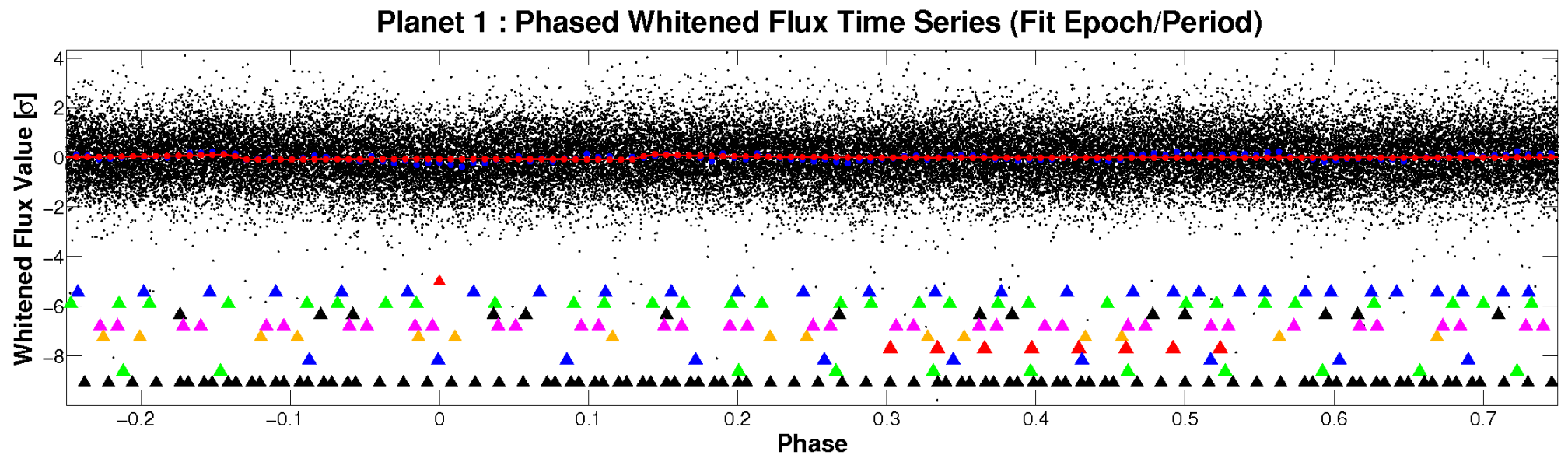
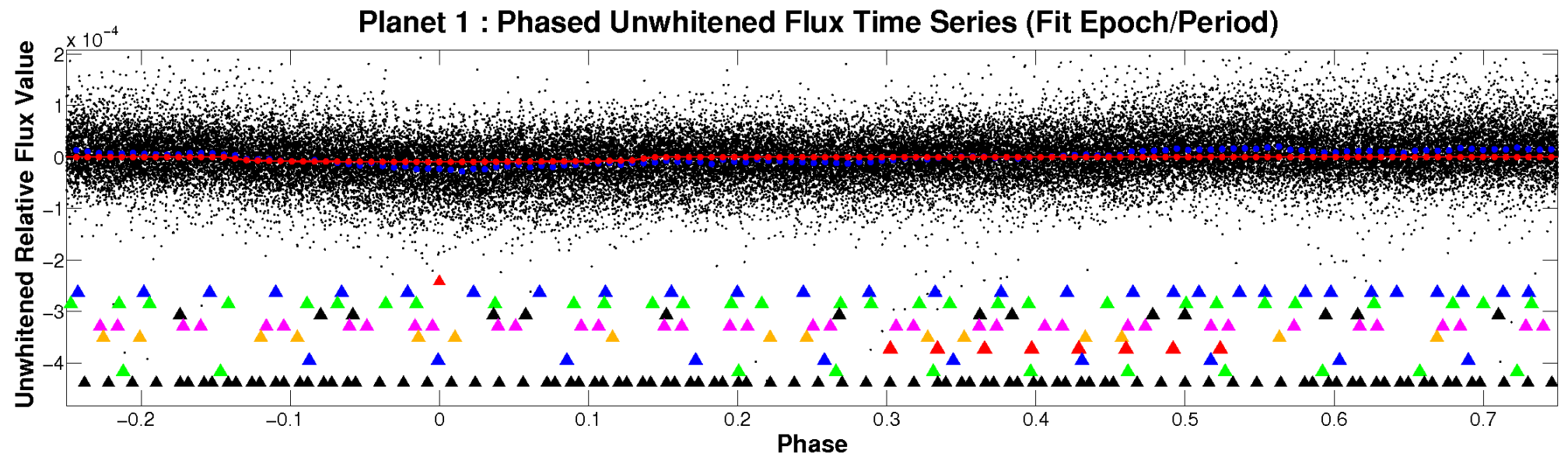


# ALT Odd/Even

TCE 010091829-01

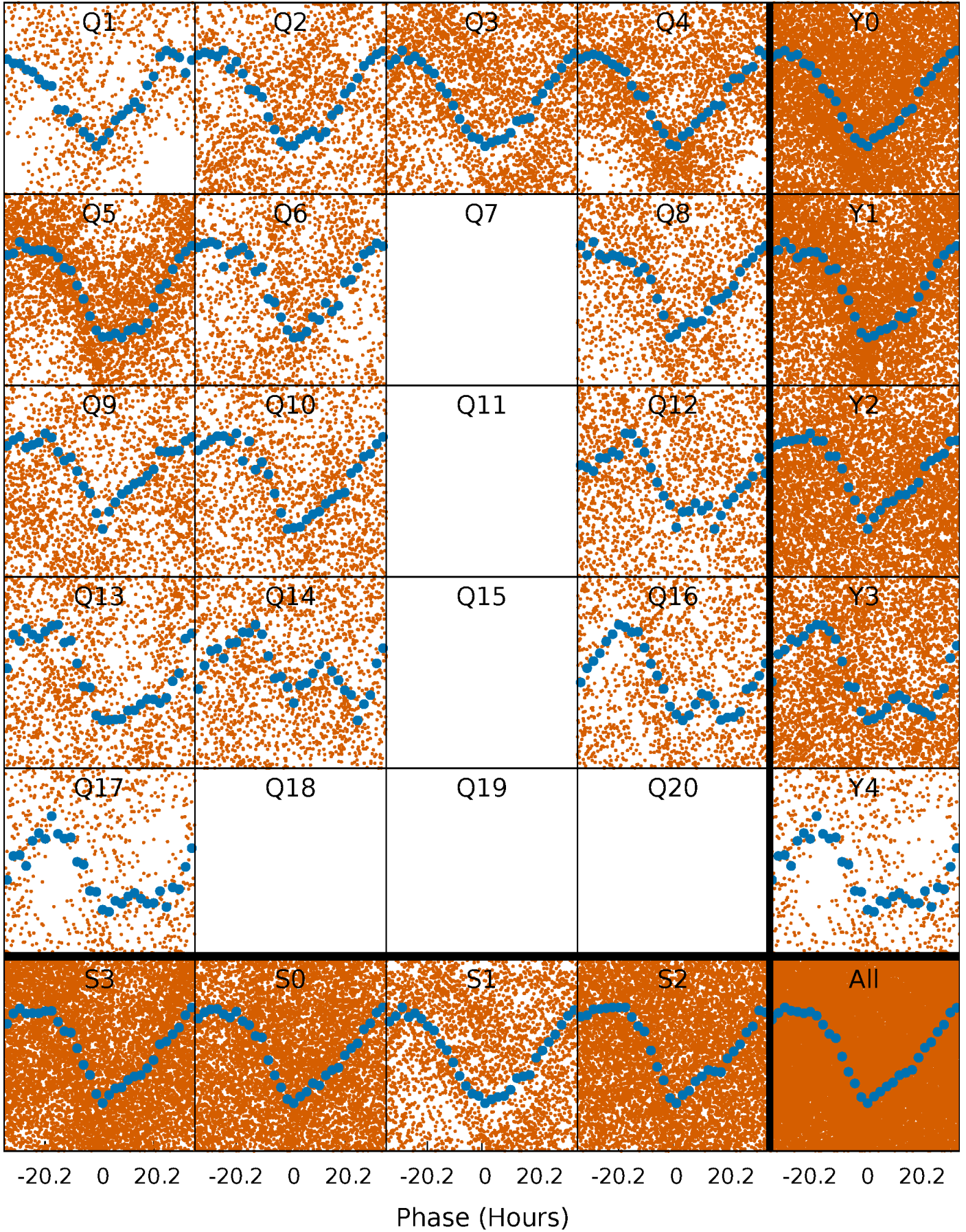


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

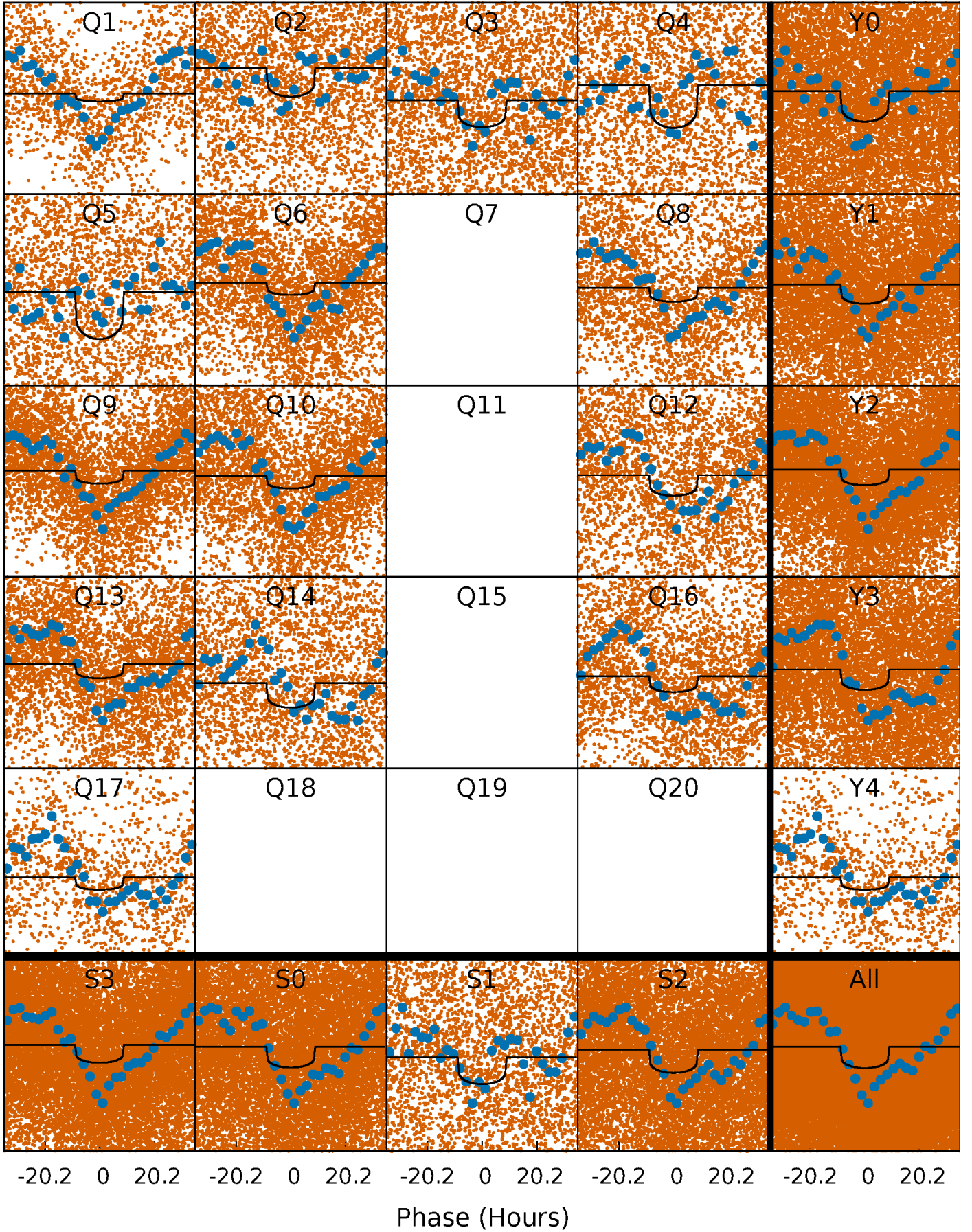
TCE 010091829-01 P= 2.685897 Days  $T_0=132.966276$  (BKJD)





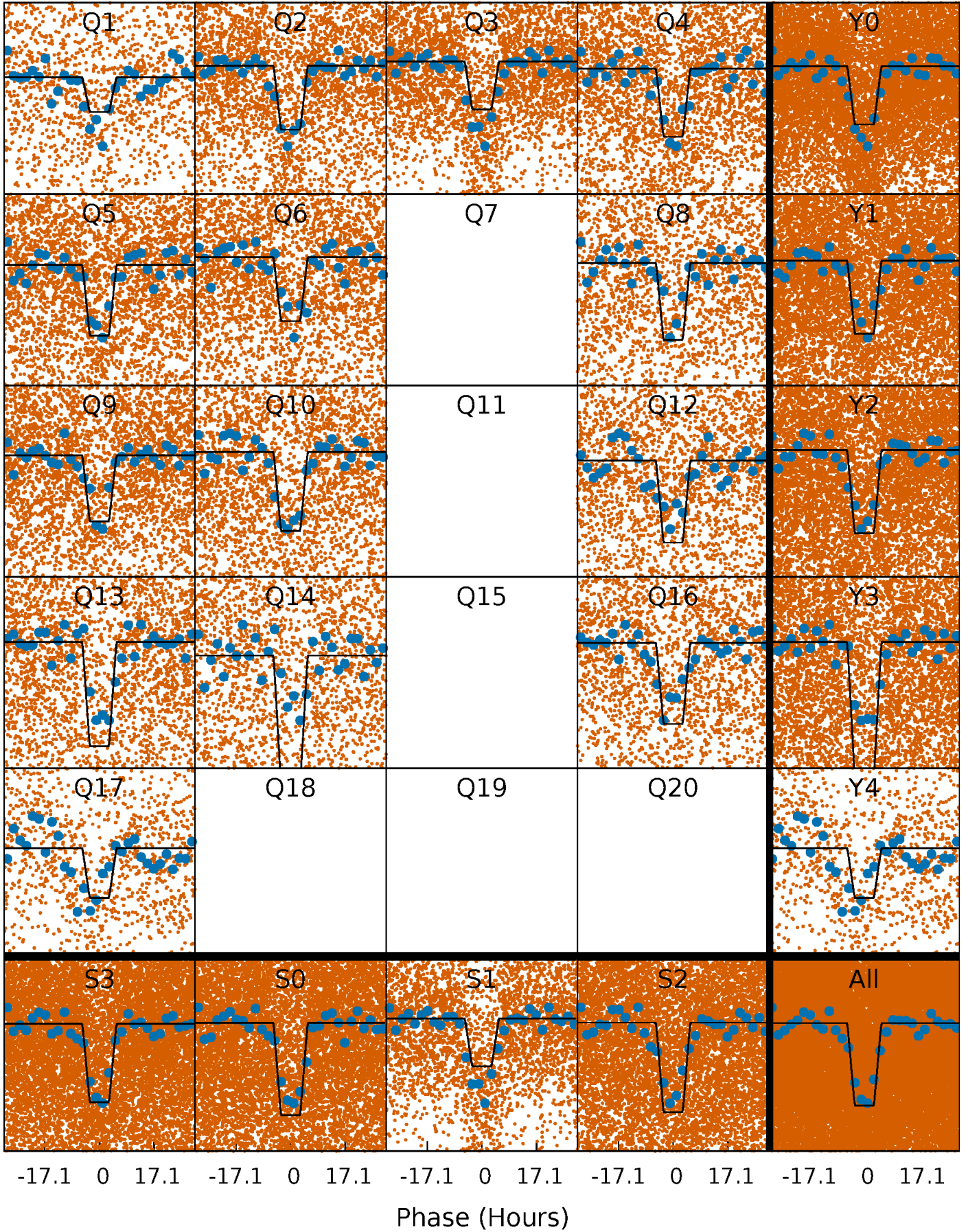
# DV Quarter-Phased Transit Curves

TCE 010091829-01   P= 2.685897 Days    $T_0=132.966276$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010091829-01 P= 2.686168 Days  $T_0=132.928625$  (BKJD)

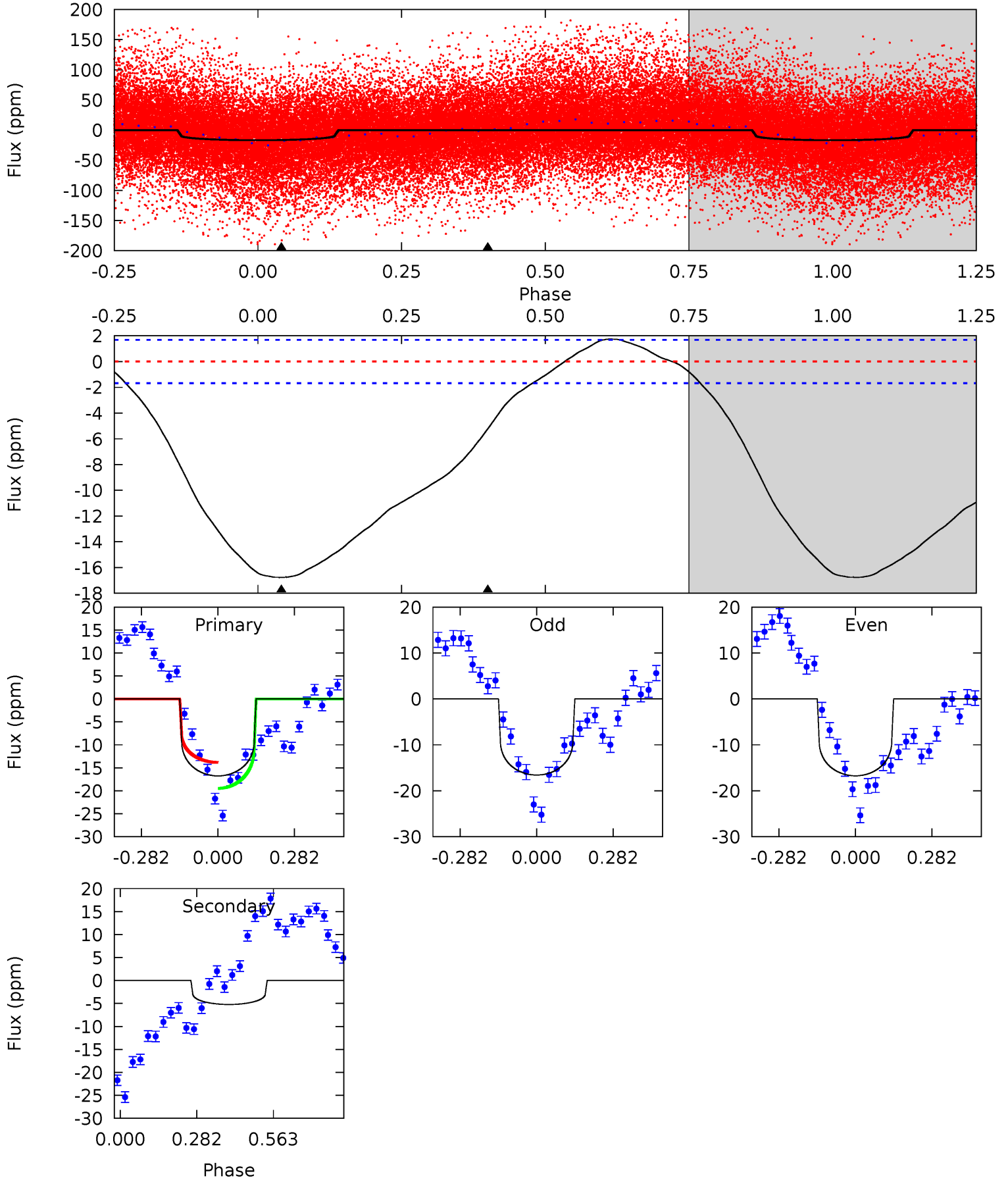




# DV Model-Shift Uniqueness Test

010091829-01, P = 2.685897 Days, E = 130.280379 Days

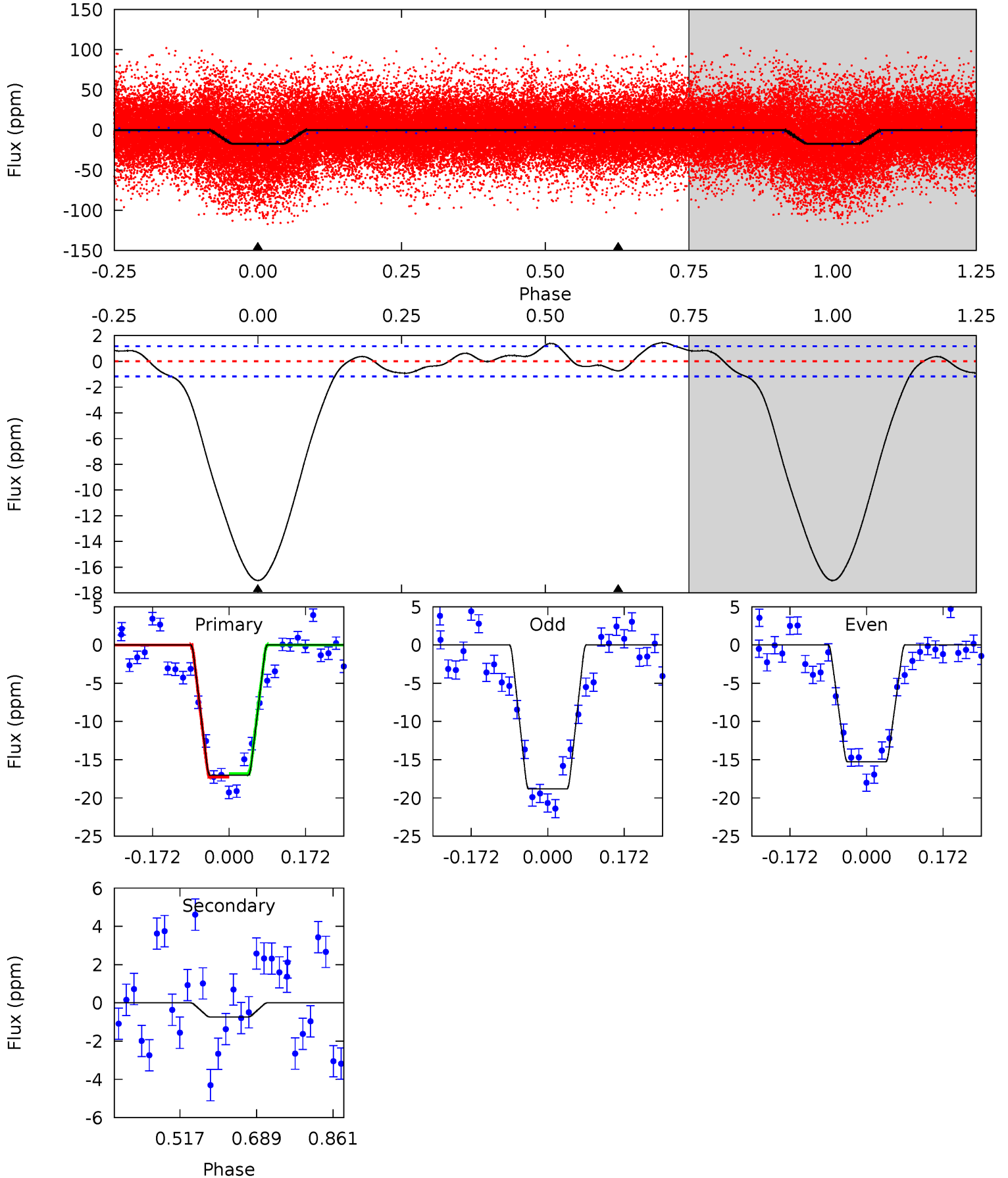
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.3	13.5	0	0	4.34	1.08	1.96	43.3	43.3	13.5	13.5	0.21	1.32	0.09	7.68



# Alt Model-Shift Uniqueness Test

010091829-01, P = 2.686168 Days, E = 130.242457 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
64.6	2.80	0	0	4.45	1.37	1.81	64.6	64.6	2.80	2.80	6.73	1.05	0.08	0.83





### Stellar Parameters For KIC 010091829

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7751^{+85}_{-77}$	$3.947^{+0.138}_{-0.092}$	$0.210^{+0.200}_{-0.200}$	$2.481^{+0.371}_{-0.453}$	$1.986^{+0.166}_{-0.185}$	$0.183^{+0.123}_{-0.053}$
	+1%/-1%	+3%/-2%	+95%/-95%	+15%/-18%	+8%/-9%	+67%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 010091829-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-5 \pm 0$	$0.76^{+0.29}_{-0.30}$	$3444^{+129}_{-161}$	$6862^{+2310}_{-1153}$	$12^{+18}_{-6}$
Alt.	$-1 \pm 0$	$1.17^{+0.30}_{-0.31}$	$3448^{+135}_{-171}$	$3384^{+588}_{-865}$	$0.659^{+0.598}_{-0.319}$

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

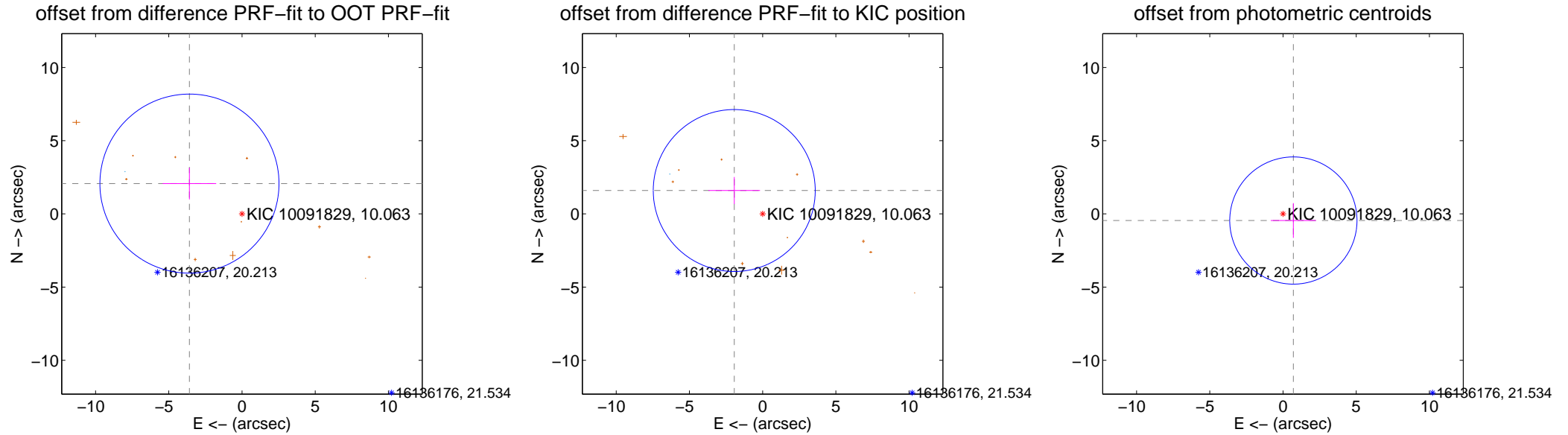
## DV Centroid Data

Supplemental centroid analysis for 010091829-01. **Kepler magnitude: 10.06.** Transit SNR 10.69

There are 1 quarters with good PRF difference image offsets

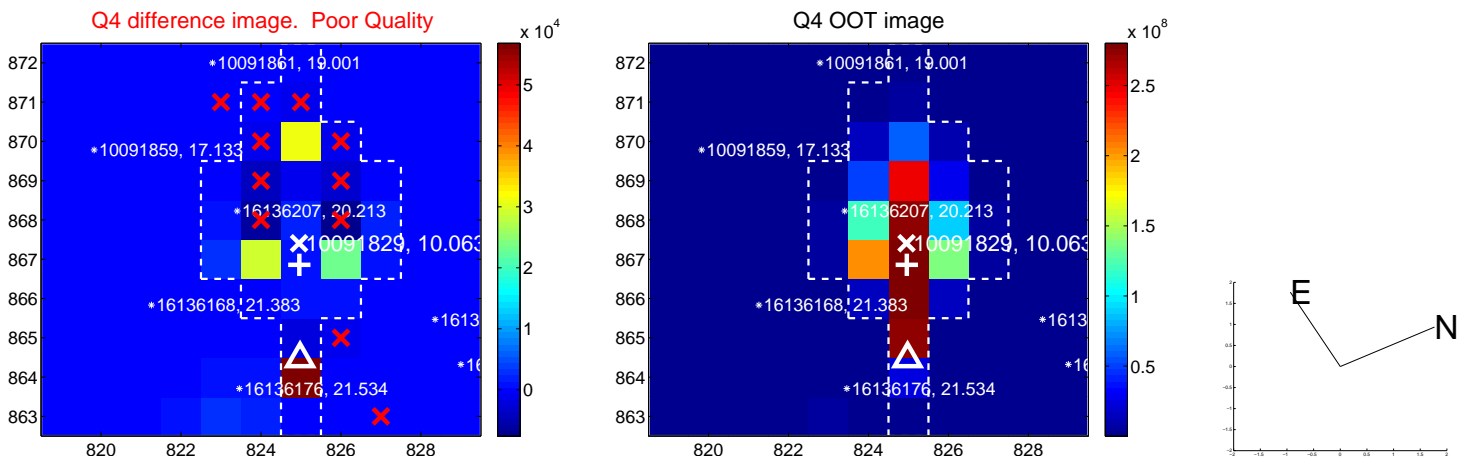
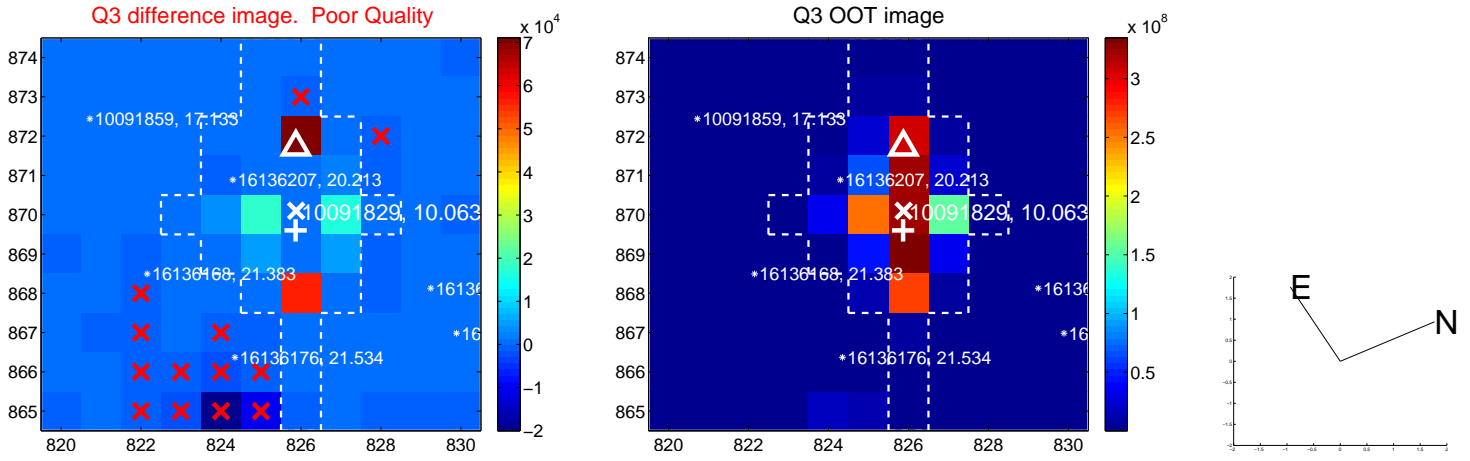
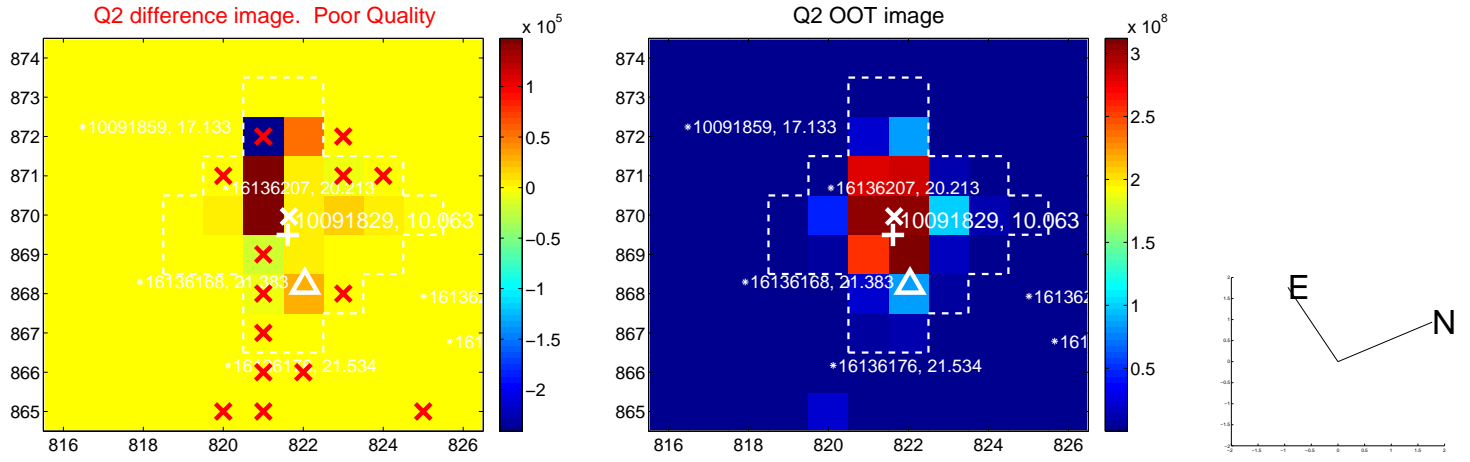
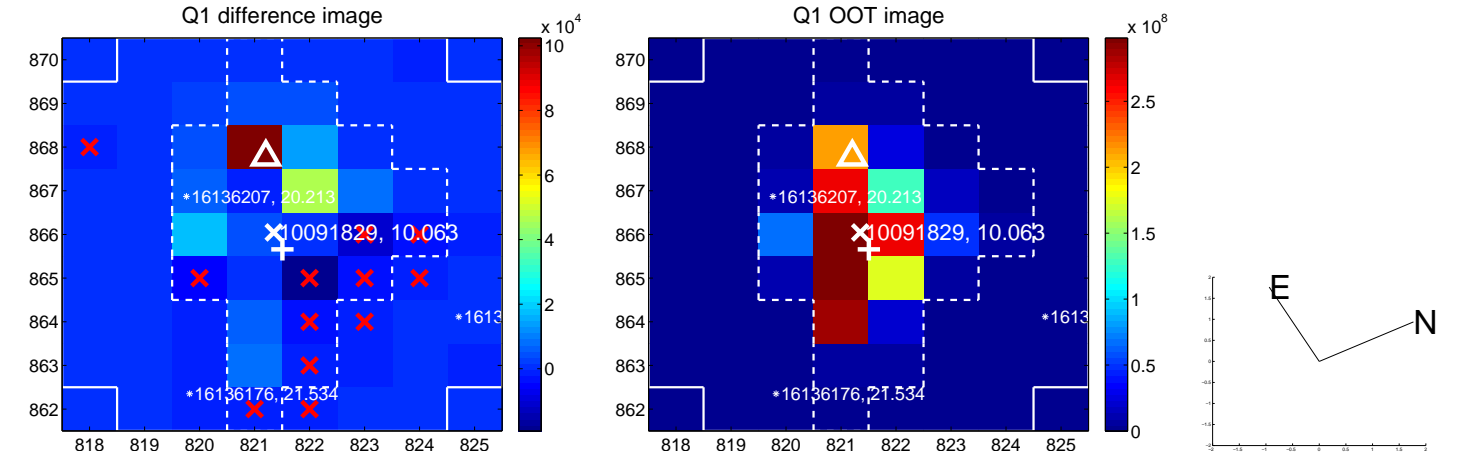
The OOT PRF centroid is offset from the target star catalog position by about 2.03 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.142 \pm 2.038$	2.03	$3.589 \pm 1.829$	$2.068 \pm 1.079$
PRF-fit source offset from KIC position	$2.511 \pm 1.843$	1.36	$1.938 \pm 1.762$	$1.596 \pm 0.925$
photometric centroid source offset	$0.84 \pm 1.45$	0.58	$-0.71 \pm 1.54$	$-0.45 \pm 1.19$

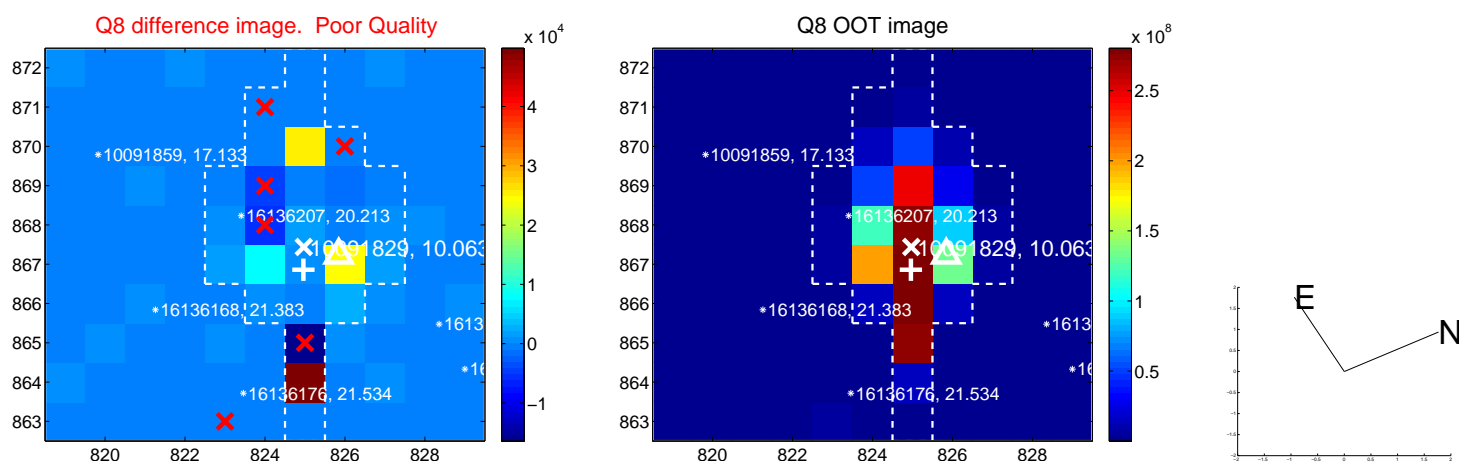
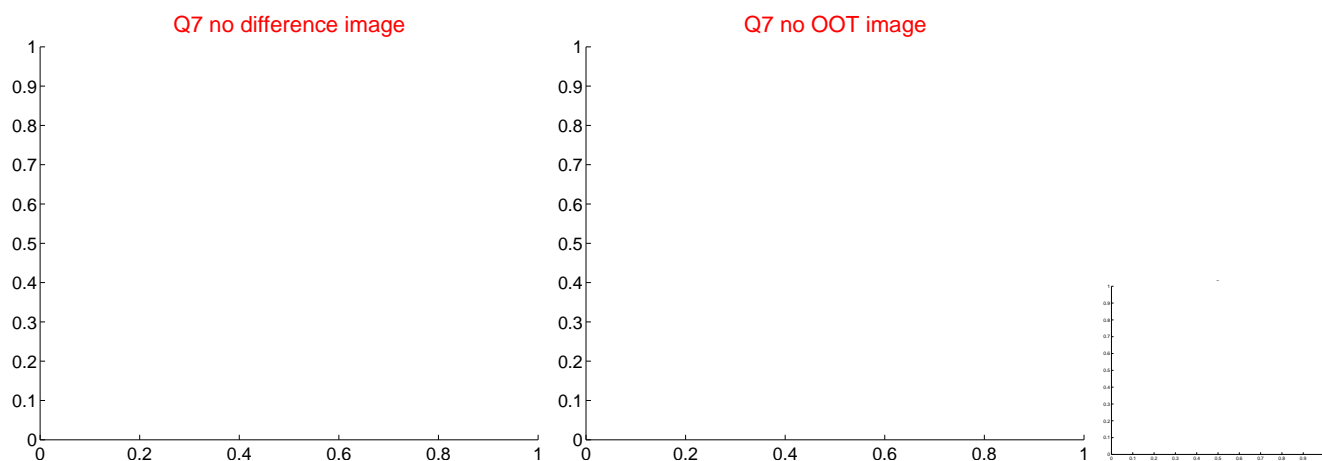
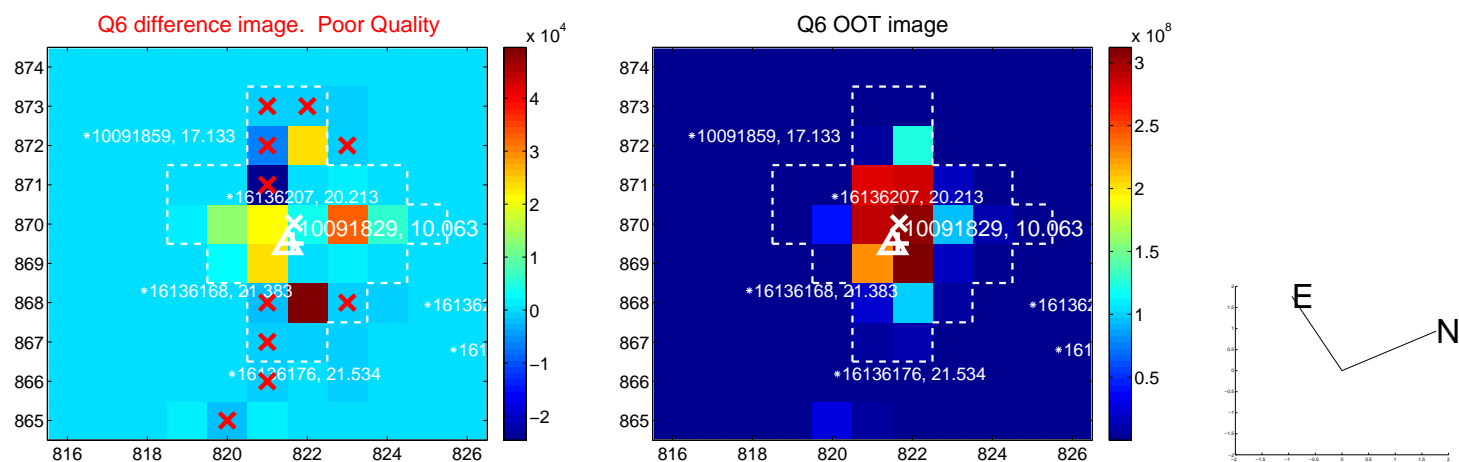
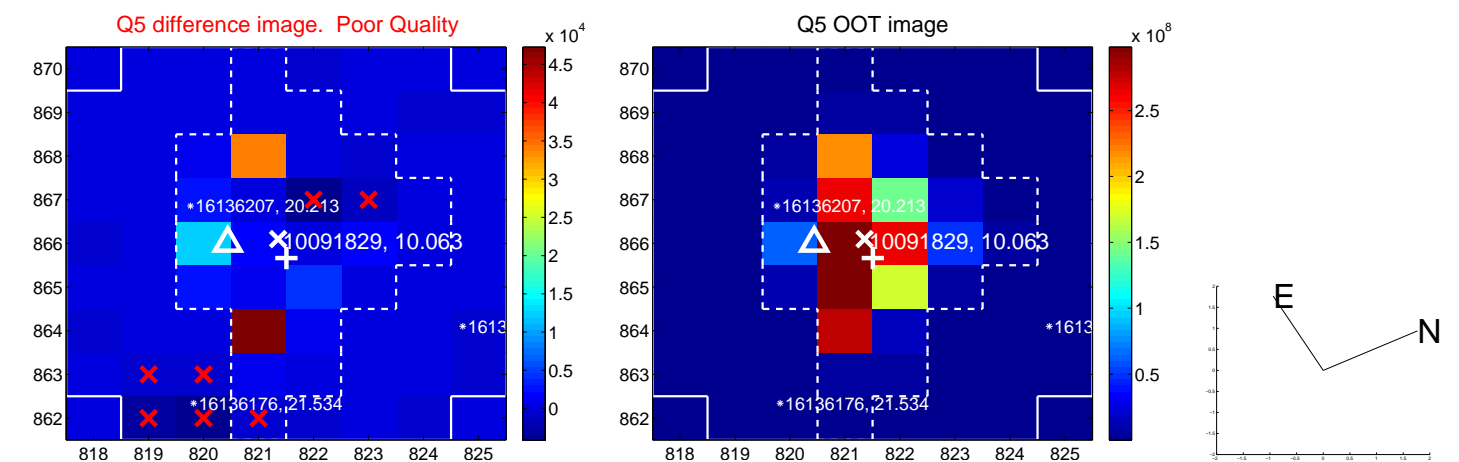


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

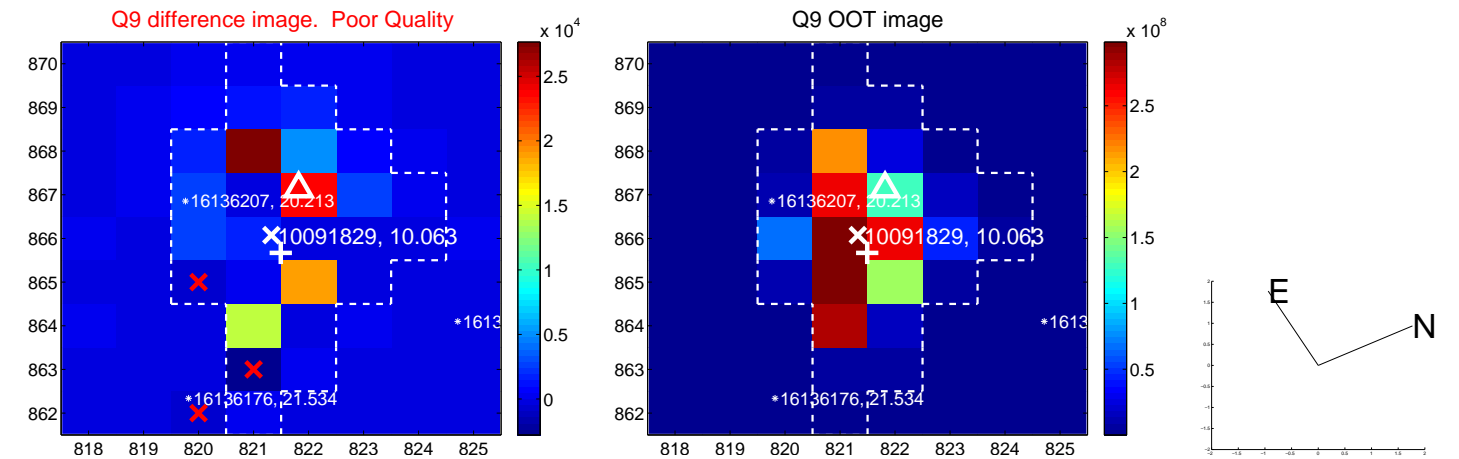


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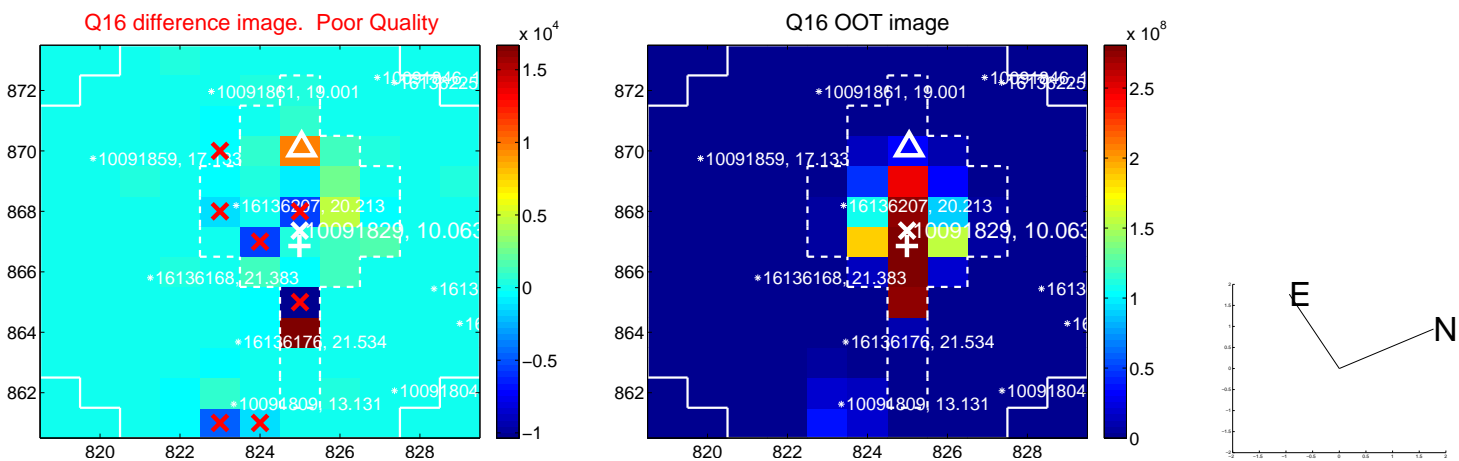
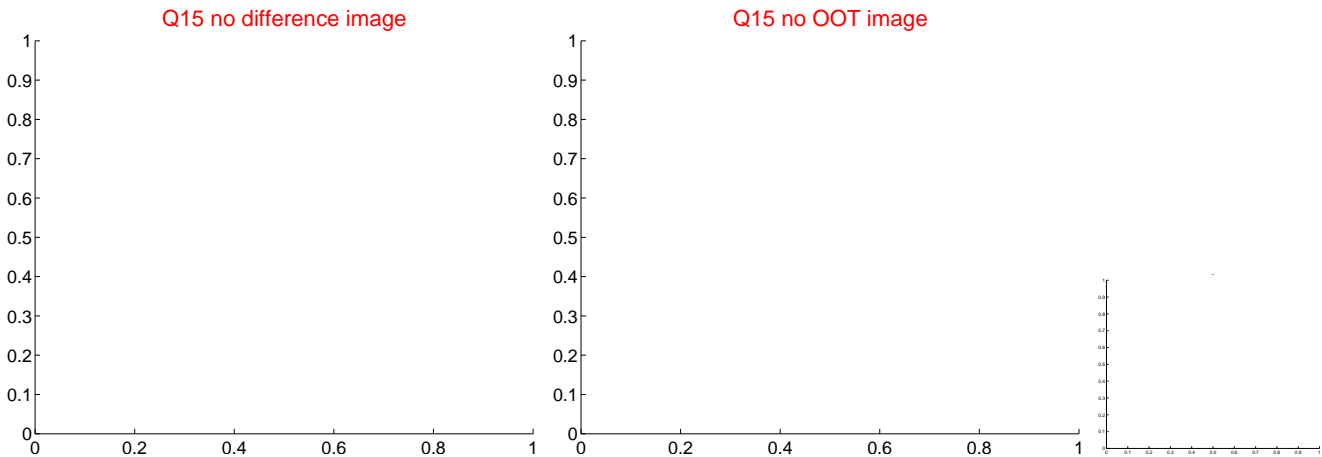
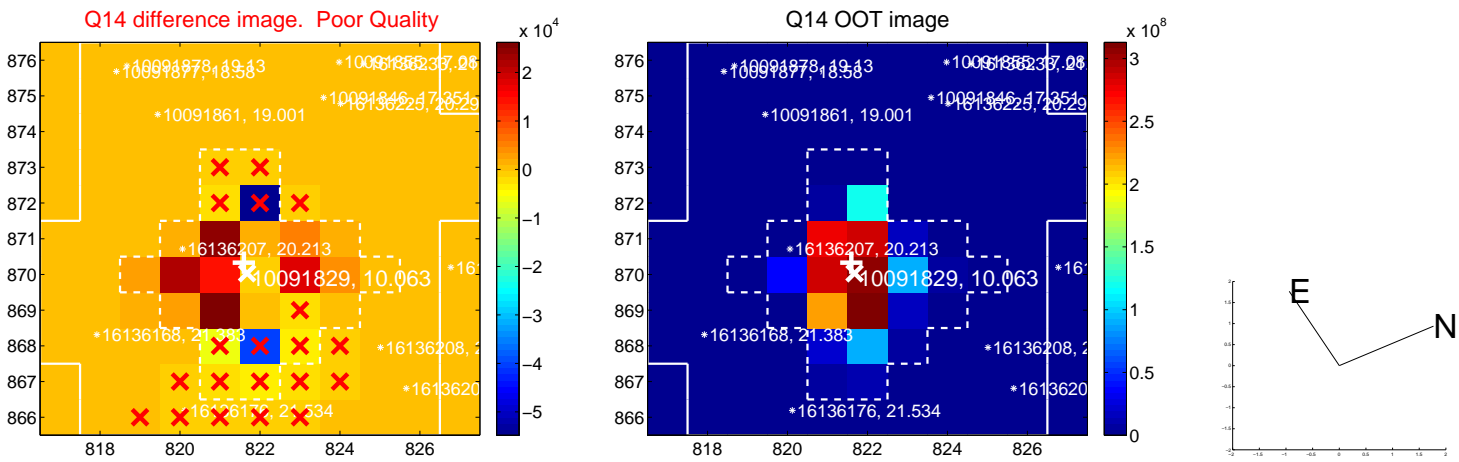
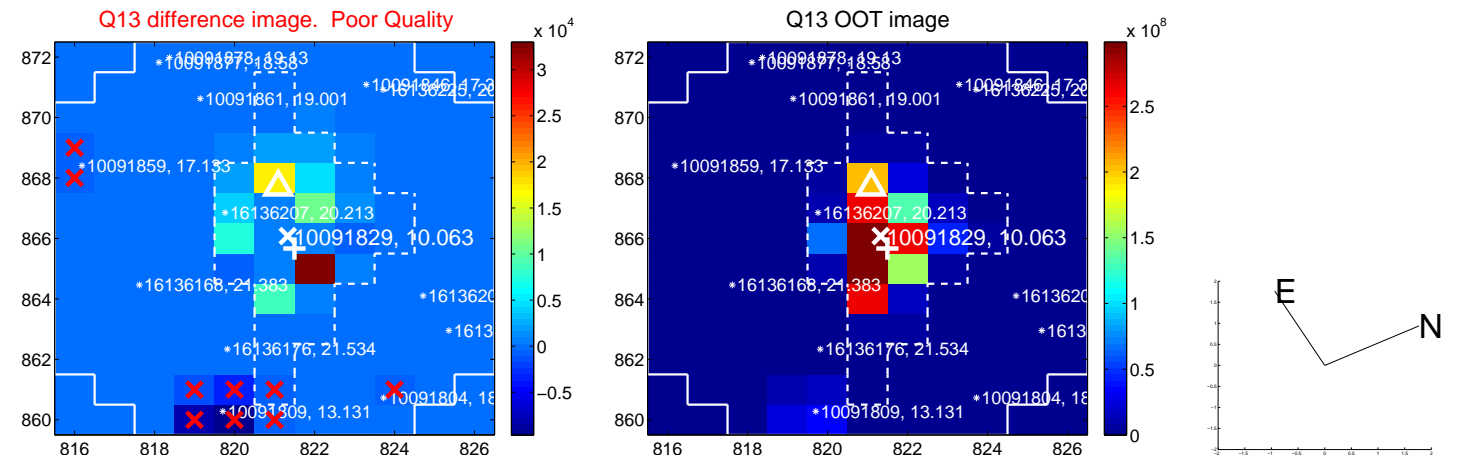




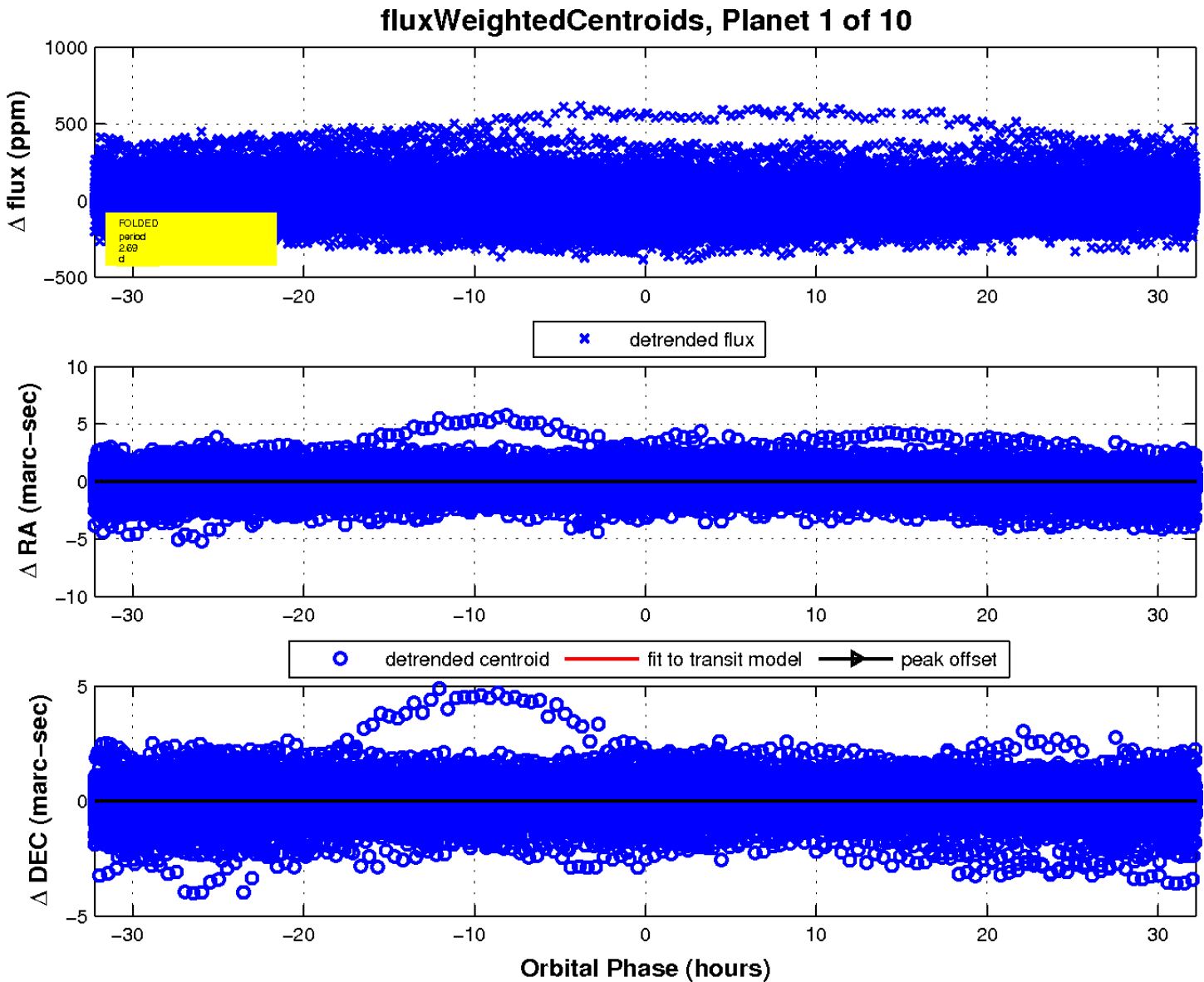
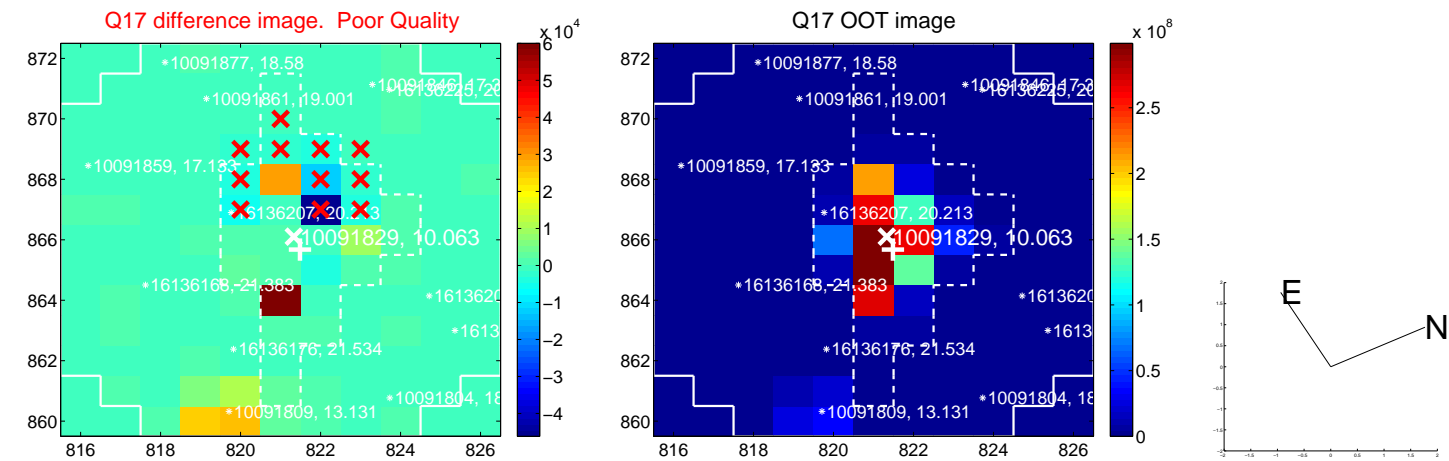
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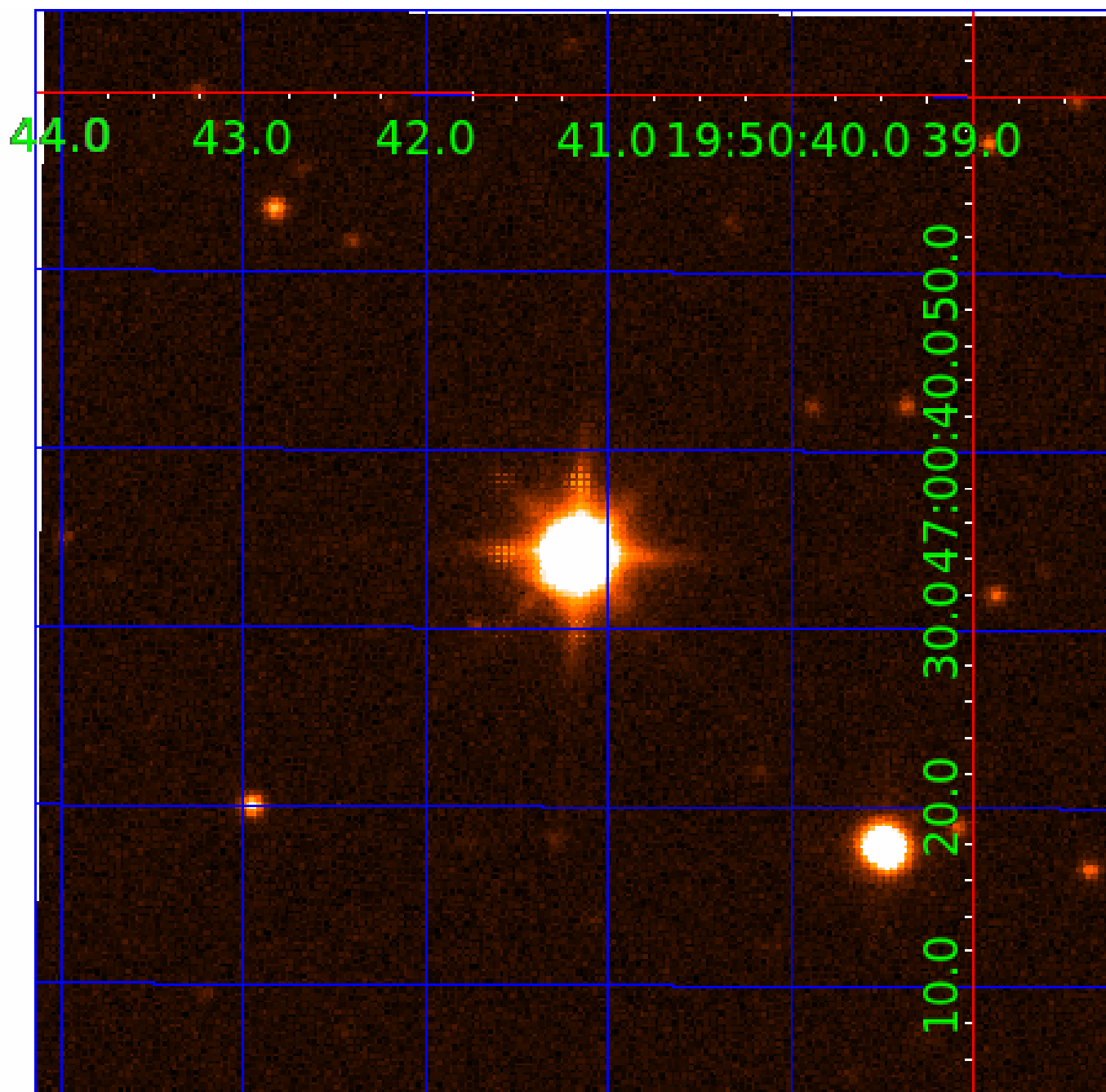


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UKIRT Image

Declination





# KIC 010091829

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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010091829-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
010091829-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED
010091829-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010091829-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

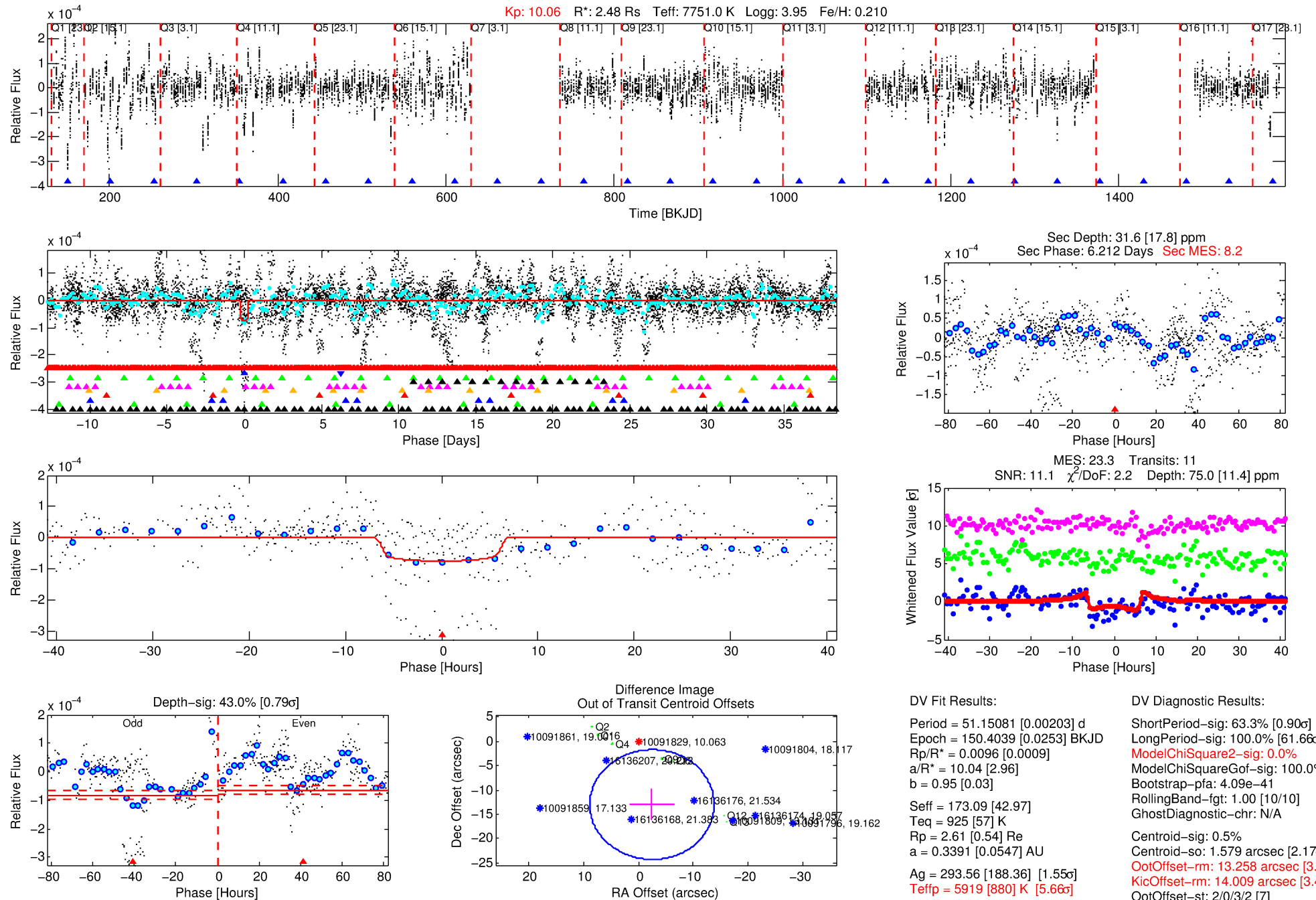
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010091829-02

No Significant Match Found

# DV One-Page Summary

KIC: 10091829 Candidate: 2 of 10 Period: 51.151 d



## DV Fit Results:

Period = 51.15081 [0.00203] d  
Epoch = 150.4039 [0.0253] BKJD  
Rp/R\* = 0.0096 [0.0009]  
a/R\* = 10.04 [2.96]  
b = 0.95 [0.03]  
Seff = 173.09 [42.97]  
Teq = 925 [57] K  
Rp = 2.61 [0.54] Re  
a = 0.3391 [0.0547] AU  
Ag = 293.56 [188.36] [1.55σ]  
Teff = 5919 [880] K [5.66σ]

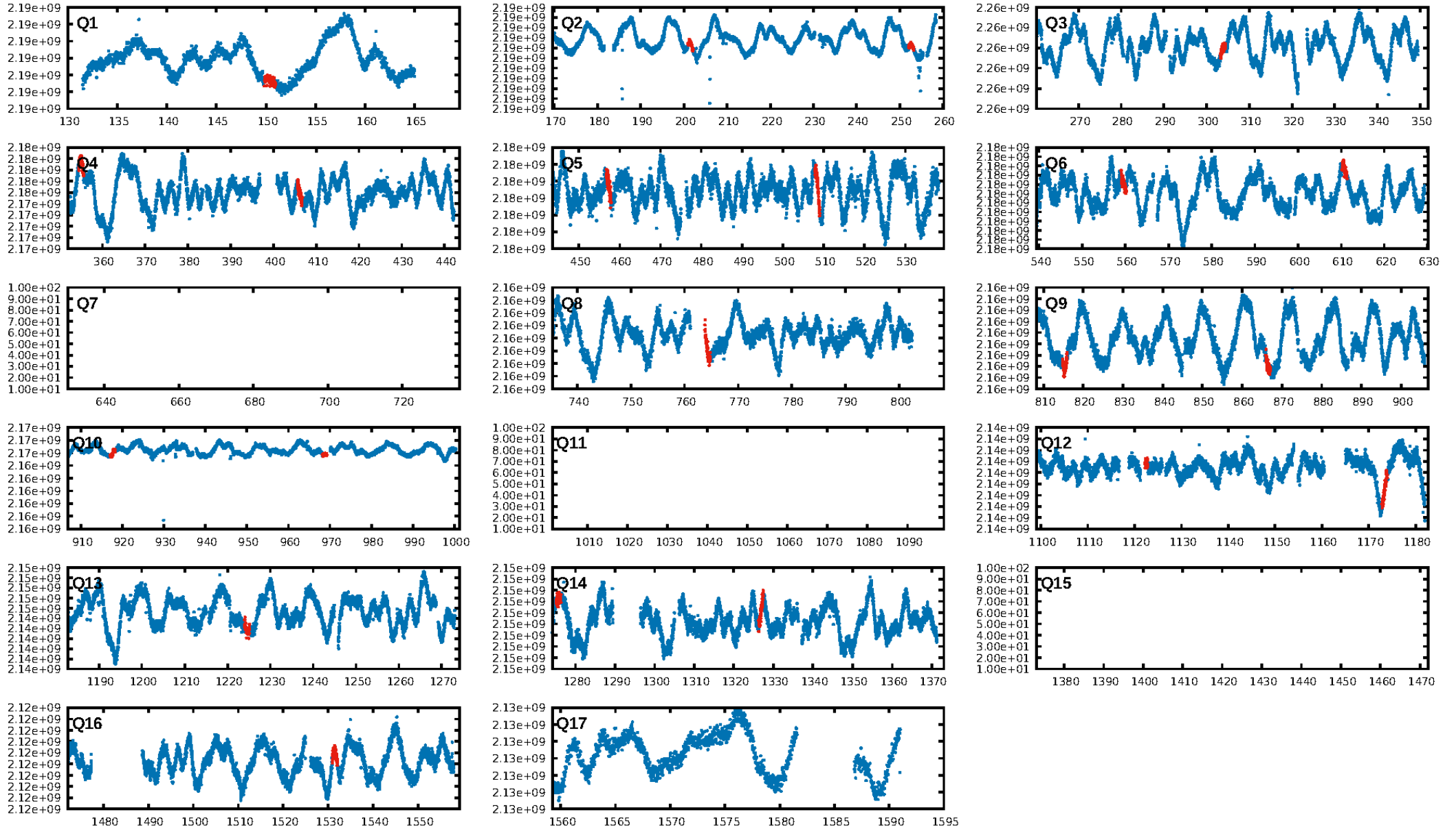
## DV Diagnostic Results:

ShortPeriod-sig: 63.3% [0.90σ]  
LongPeriod-sig: 100.0% [61.66σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.09e-41  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.5%  
Centroid-so: 1.579 arcsec [2.17σ]  
OotOffset-rm: 13.258 arcsec [3.51σ]  
KicOffset-rm: 14.009 arcsec [3.44σ]  
OotOffset-st: 2/0/3/2 [7]  
KicOffset-st: 2/0/3/2 [7]  
DiffImageQuality-fgm: 0.00 [0/7]  
DiffImageOverlap-fno: 0.00 [0/12]

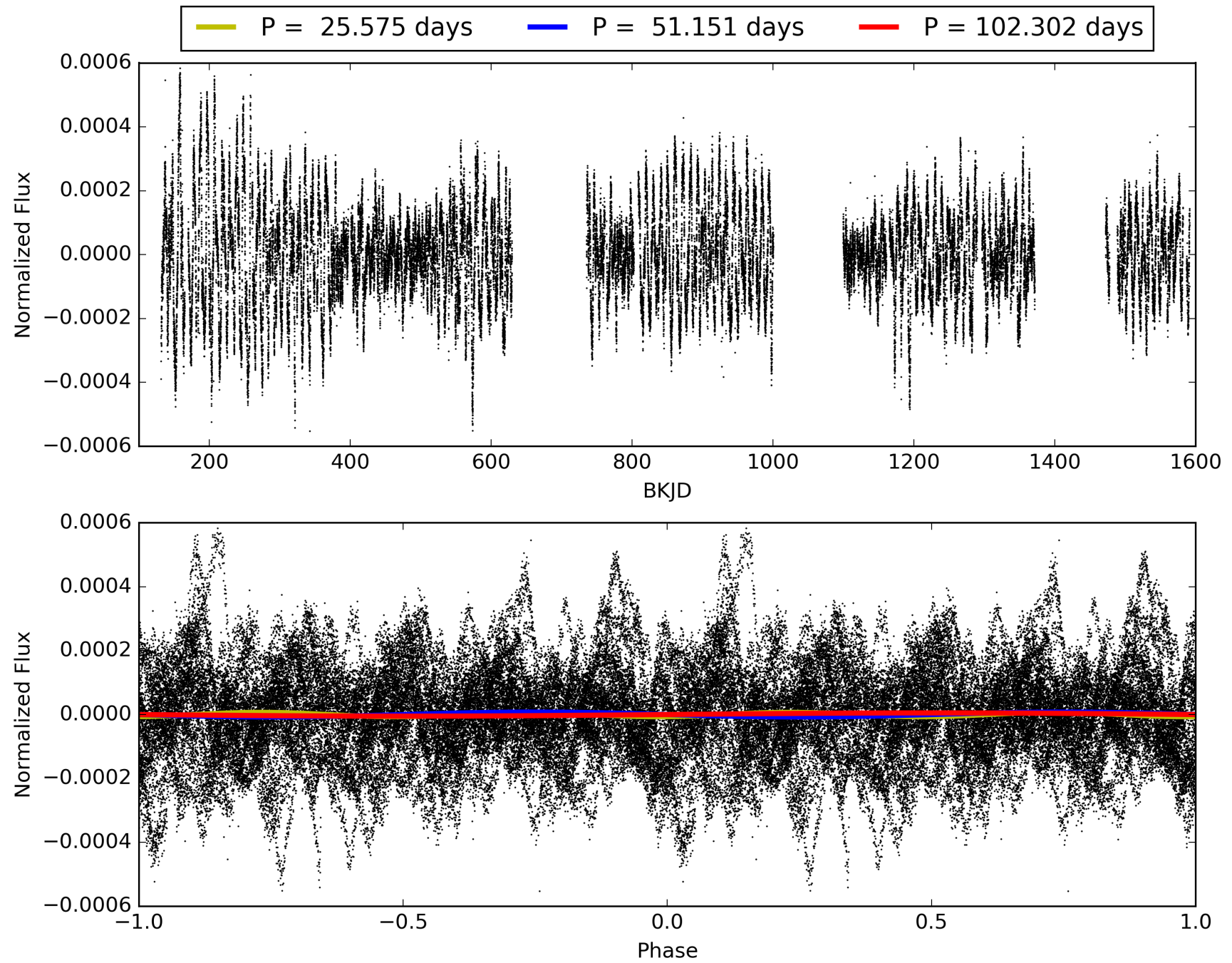
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:10:47 Z

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

# TCE 010091829-02, PDC Light Curves

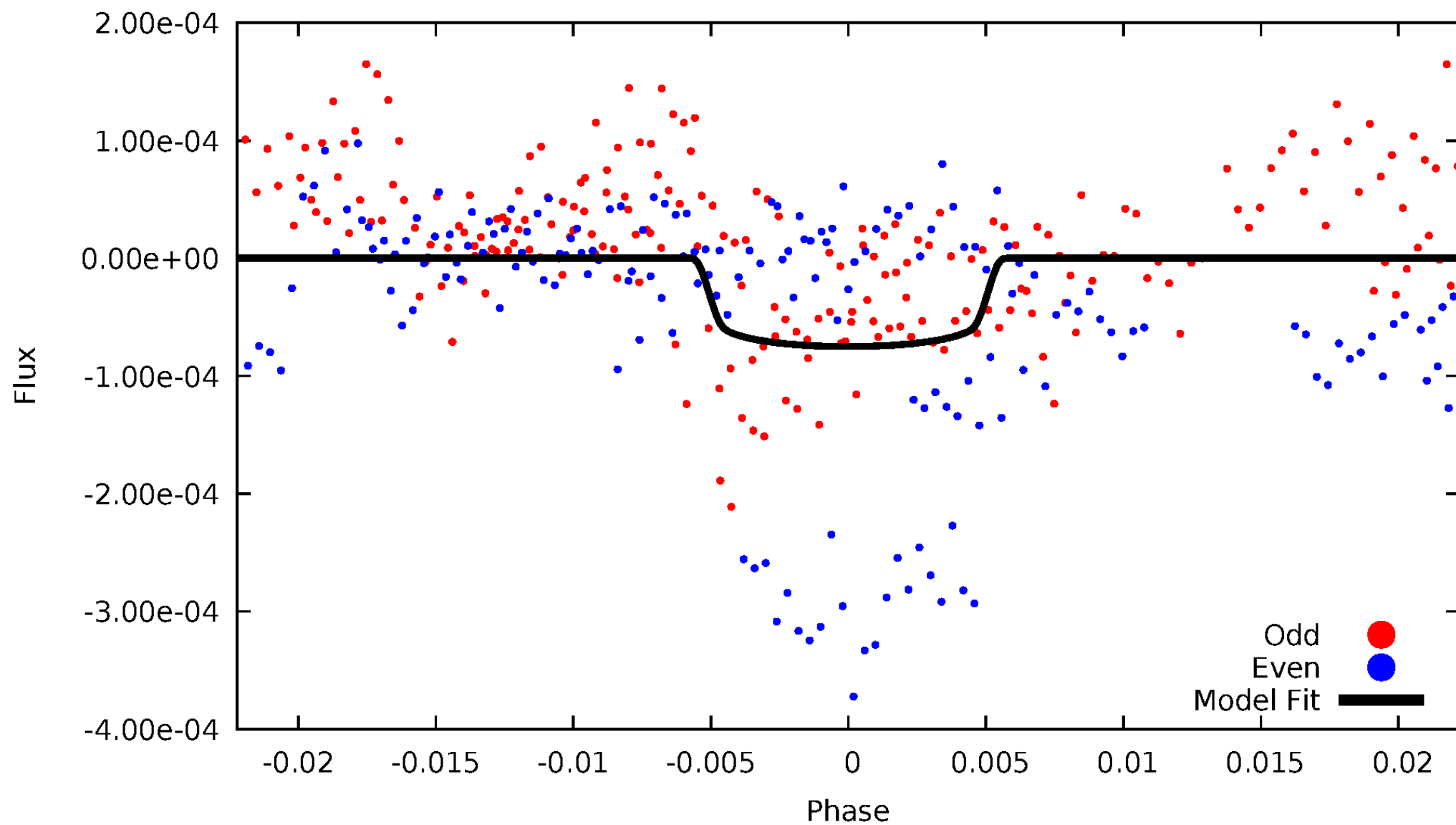


TCE 010091829-02



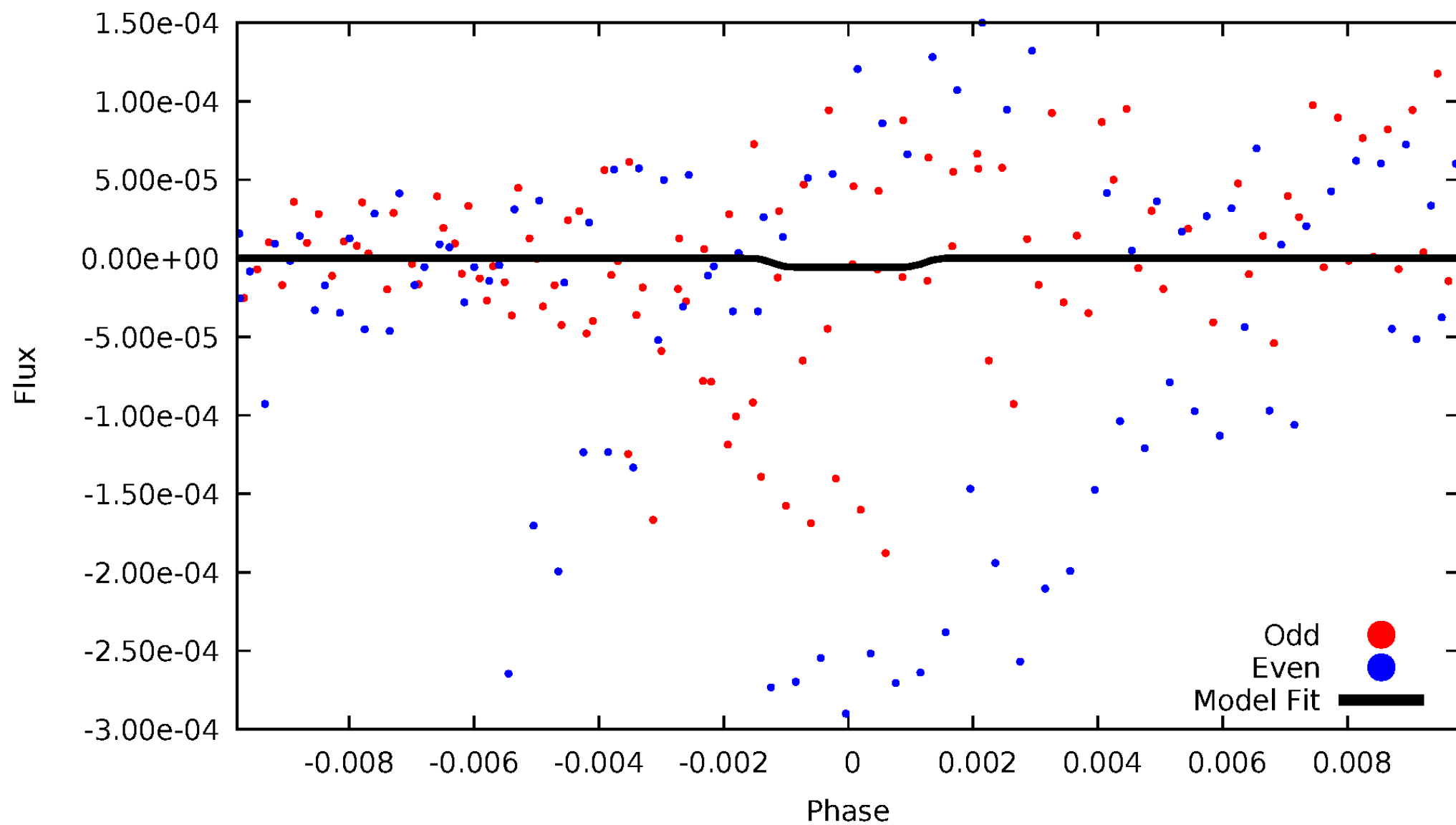
# DV Odd/Even

TCE 010091829-02



# ALT Odd/Even

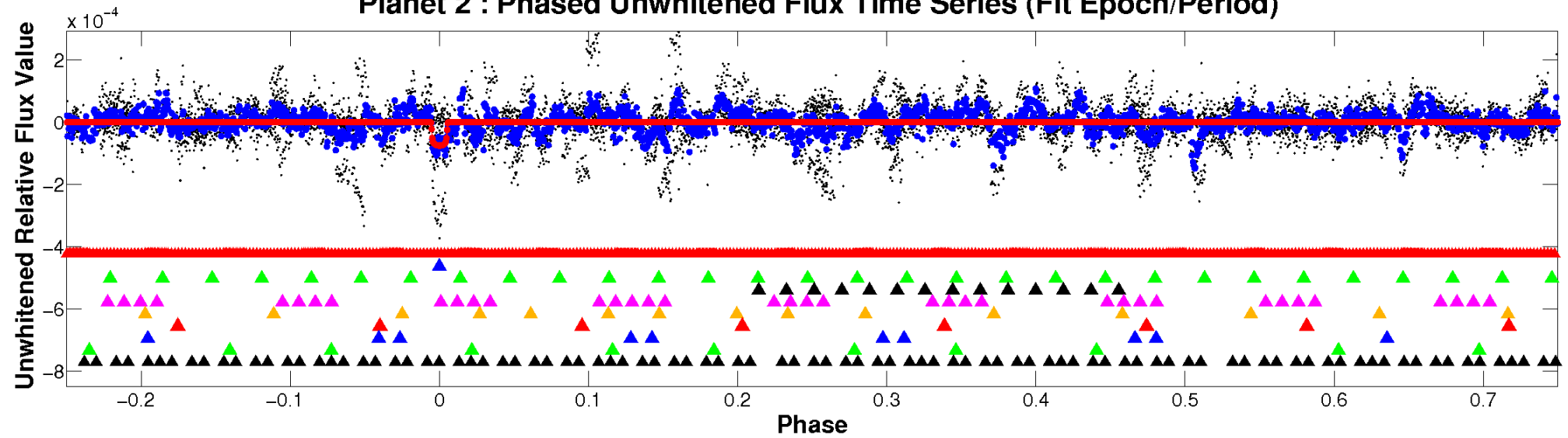
TCE 010091829-02



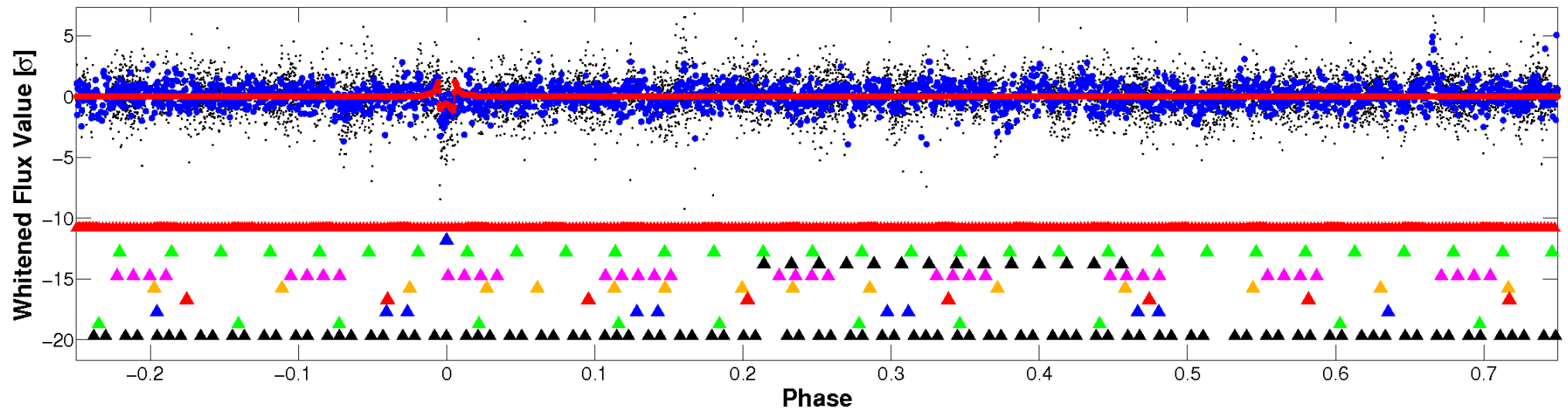


# Non-Whitened Vs. Whitened Light Curve

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

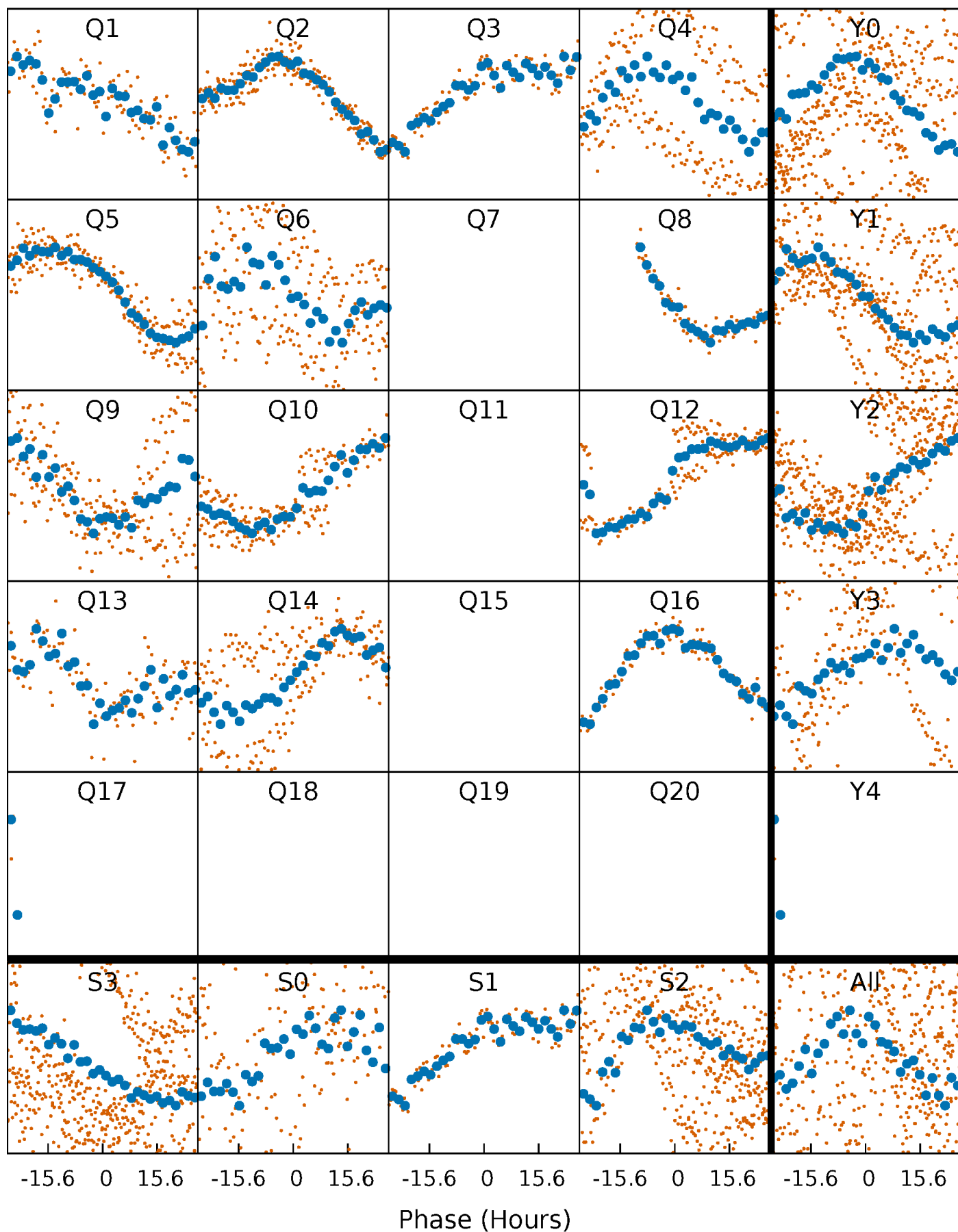


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



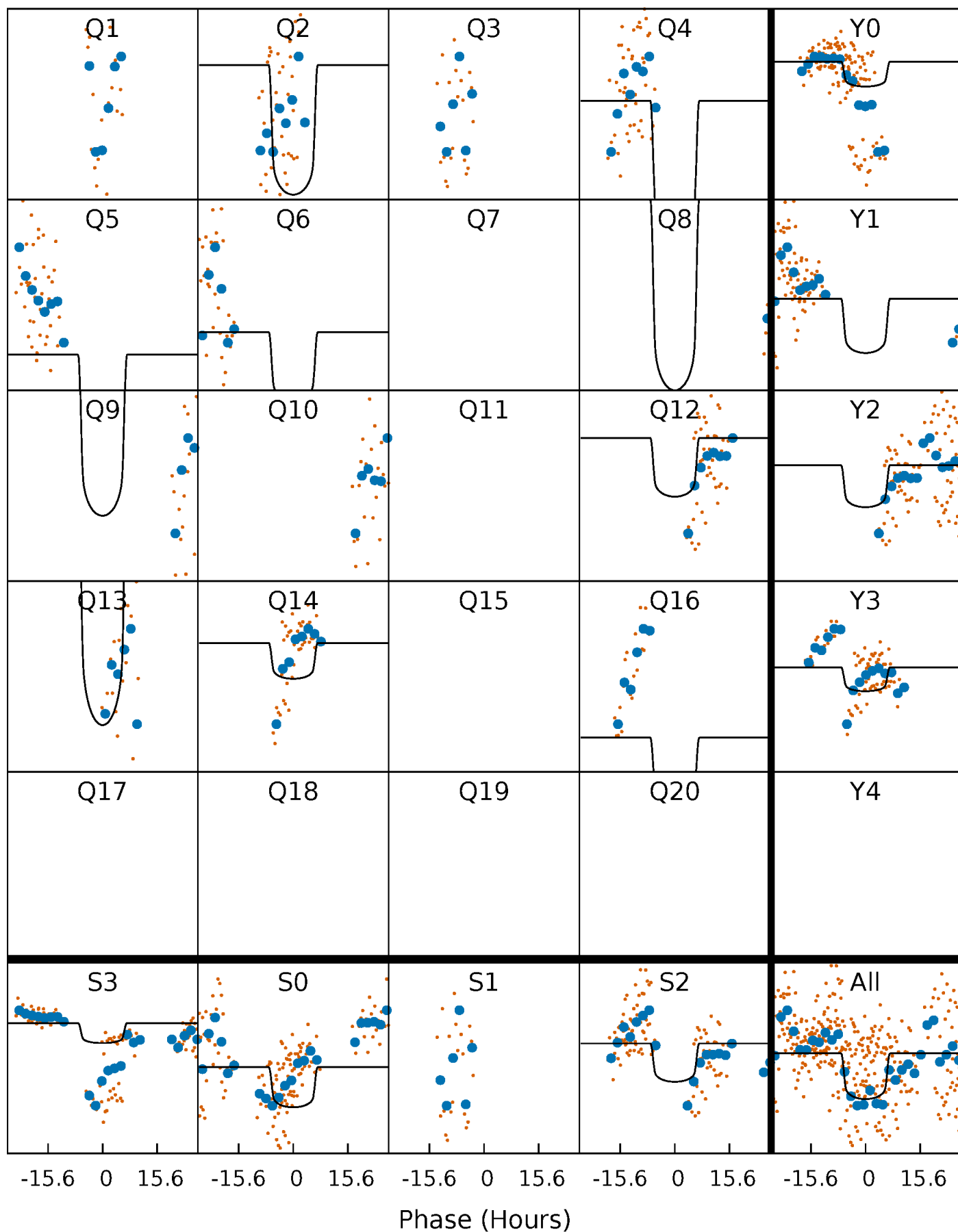
# PDC Quarter-Phased Transit Curves

TCE 010091829-02   P= 51.150813 Days    $T_0=150.403921$  (BKJD)



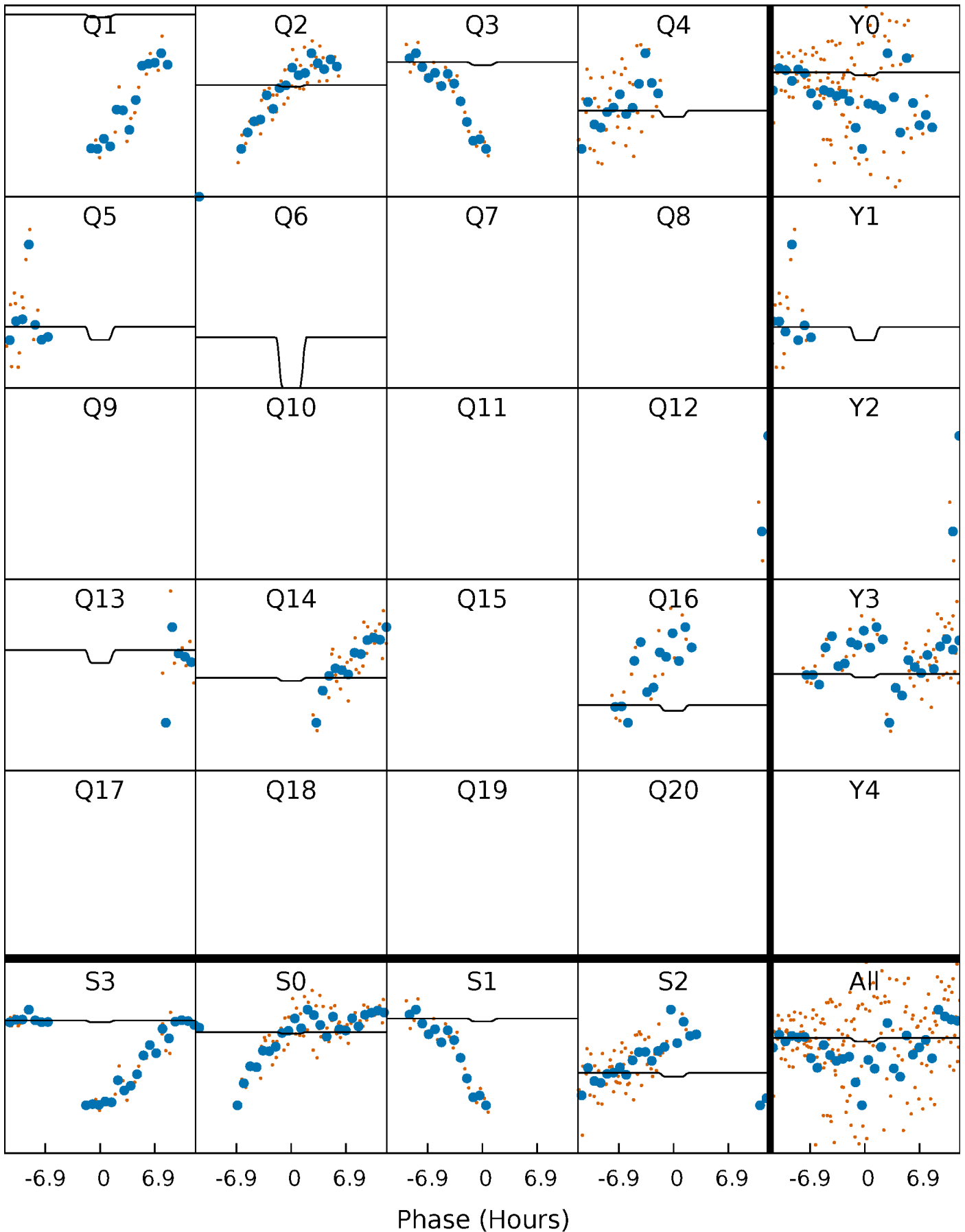
# DV Quarter-Phased Transit Curves

TCE 010091829-02 P= 51.150813 Days  $T_0=150.403921$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

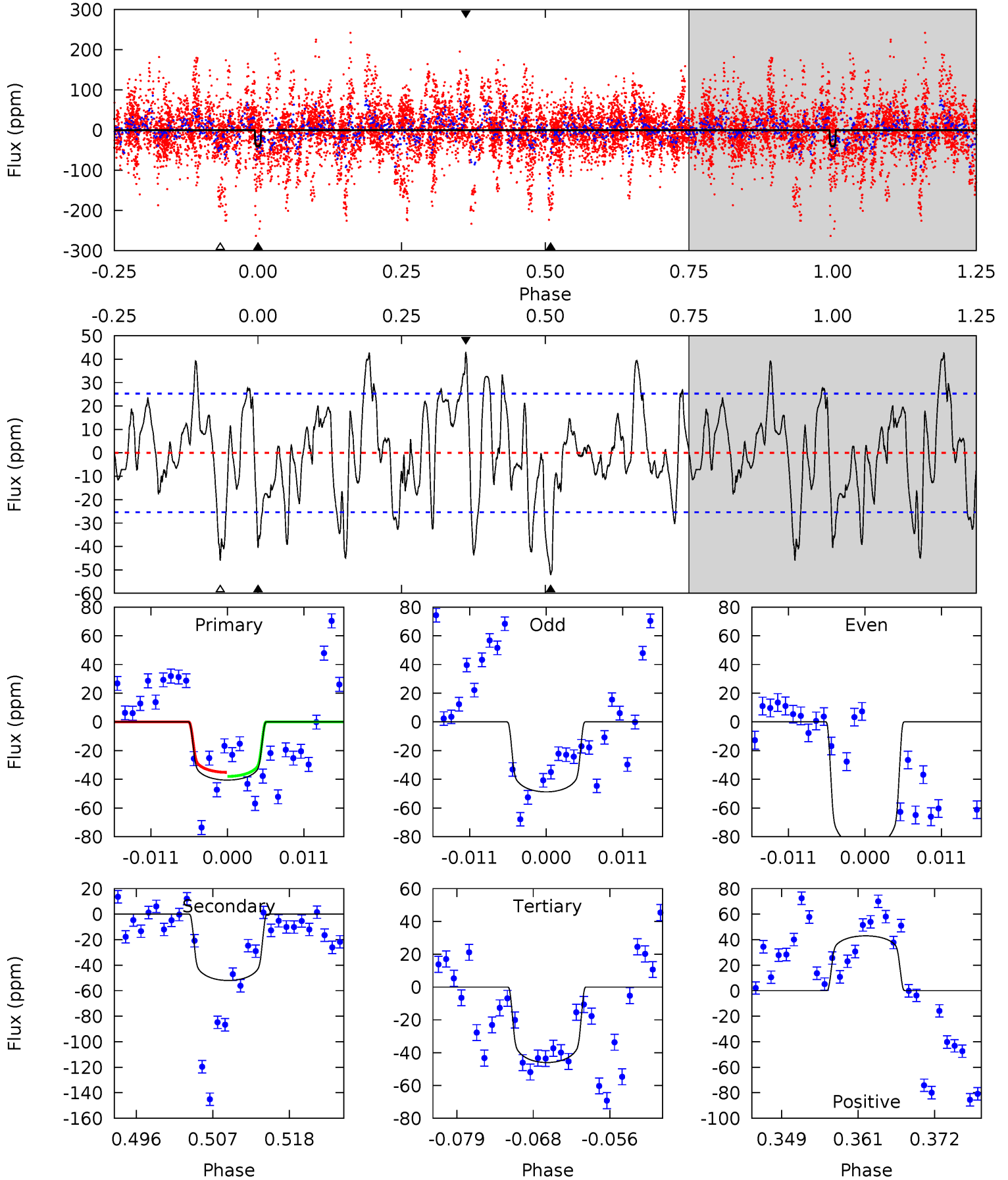
TCE 010091829-02 P= 51.141156 Days  $T_0=150.272704$  (BKJD)



# DV Model-Shift Uniqueness Test

010091829-02, P = 51.150813 Days, E = 99.253108 Days

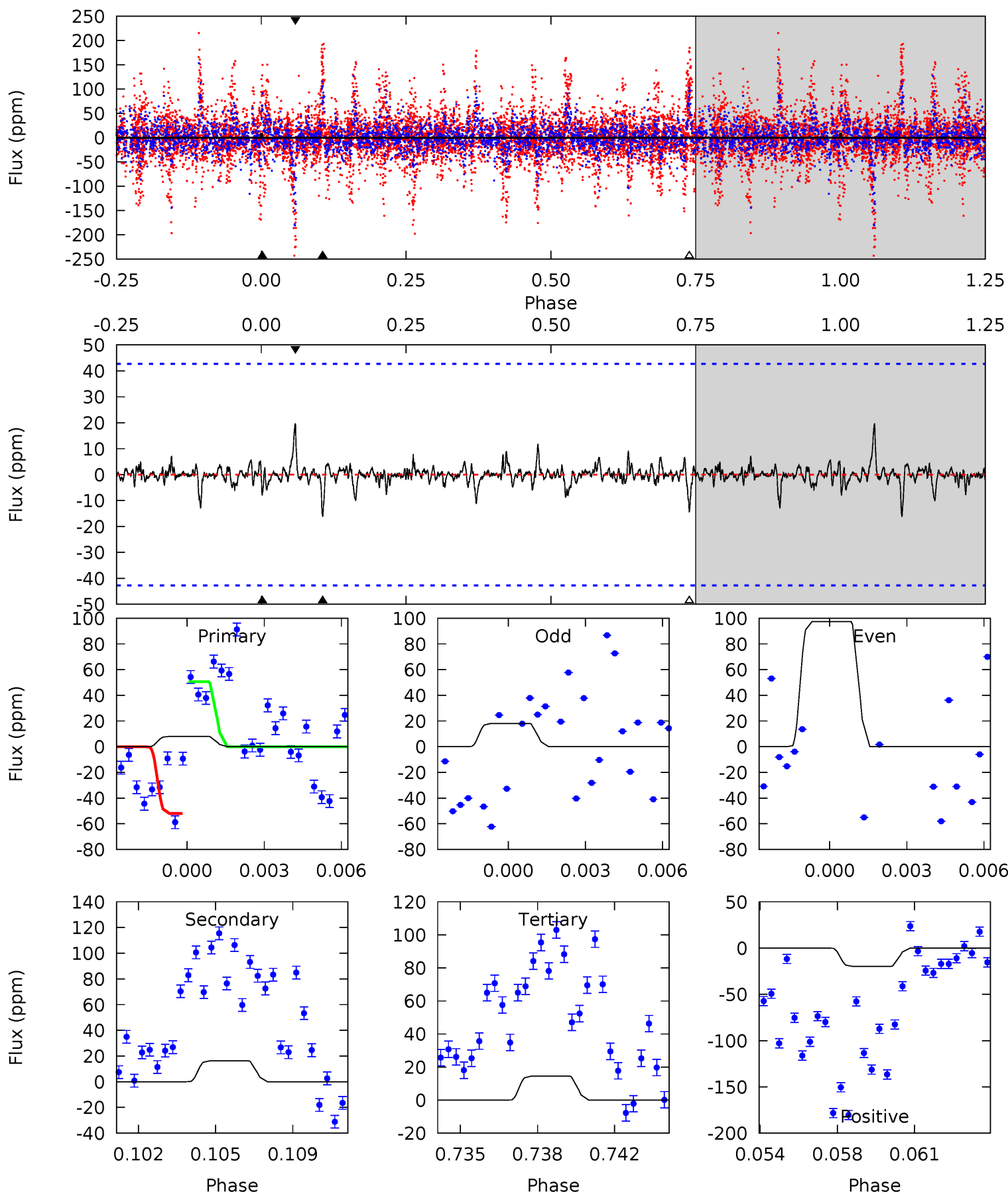
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.01	10.3	9.09	8.49	5.00	2.53	3.54	-1.08	-0.48	1.18	1.78	3.88	2.12	0.45	0.28



# Alt Model-Shift Uniqueness Test

010091829-02, P = 51.141156 Days, E = 99.131548 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
0.98	1.99	1.78	2.42	5.24	2.95	0.38	-0.80	-1.44	0.21	-0.43	5.07	2.67	0.55	0





### Stellar Parameters For KIC 010091829

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7751^{+85}_{-77}$	$3.947^{+0.138}_{-0.092}$	$0.210^{+0.200}_{-0.200}$	$2.481^{+0.371}_{-0.453}$	$1.986^{+0.166}_{-0.185}$	$0.183^{+0.123}_{-0.053}$
	+1%/-1%	+3%/-2%	+95%/-95%	+15%/-18%	+8%/-9%	+67%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 010091829-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-52 \pm 5$	$2.58^{+0.35}_{-0.35}$	$1288^{+52}_{-59}$	$6590^{+442}_{-346}$	$498^{+168}_{-118}$
Alt.	$-16 \pm 8$	$0.62^{+0.27}_{-0.23}$	$1288^{+54}_{-54}$	$11146^{+6157}_{-3247}$	$2576^{+4421}_{-1655}$

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

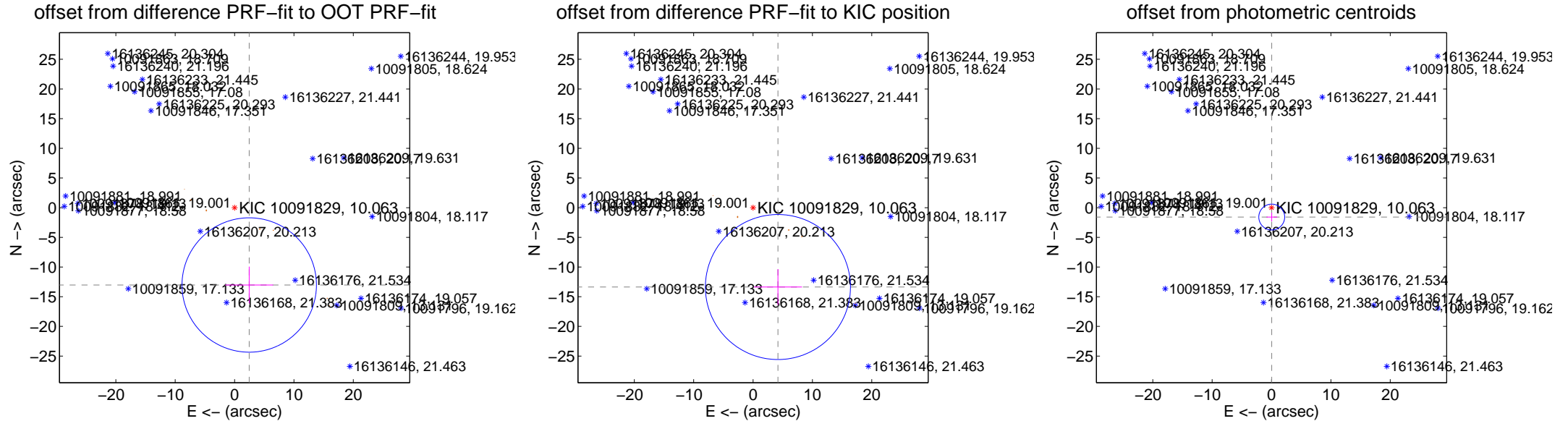
## DV Centroid Data

Supplemental centroid analysis for 010091829-02. **Kepler magnitude: 10.06.** Transit SNR 11.11

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

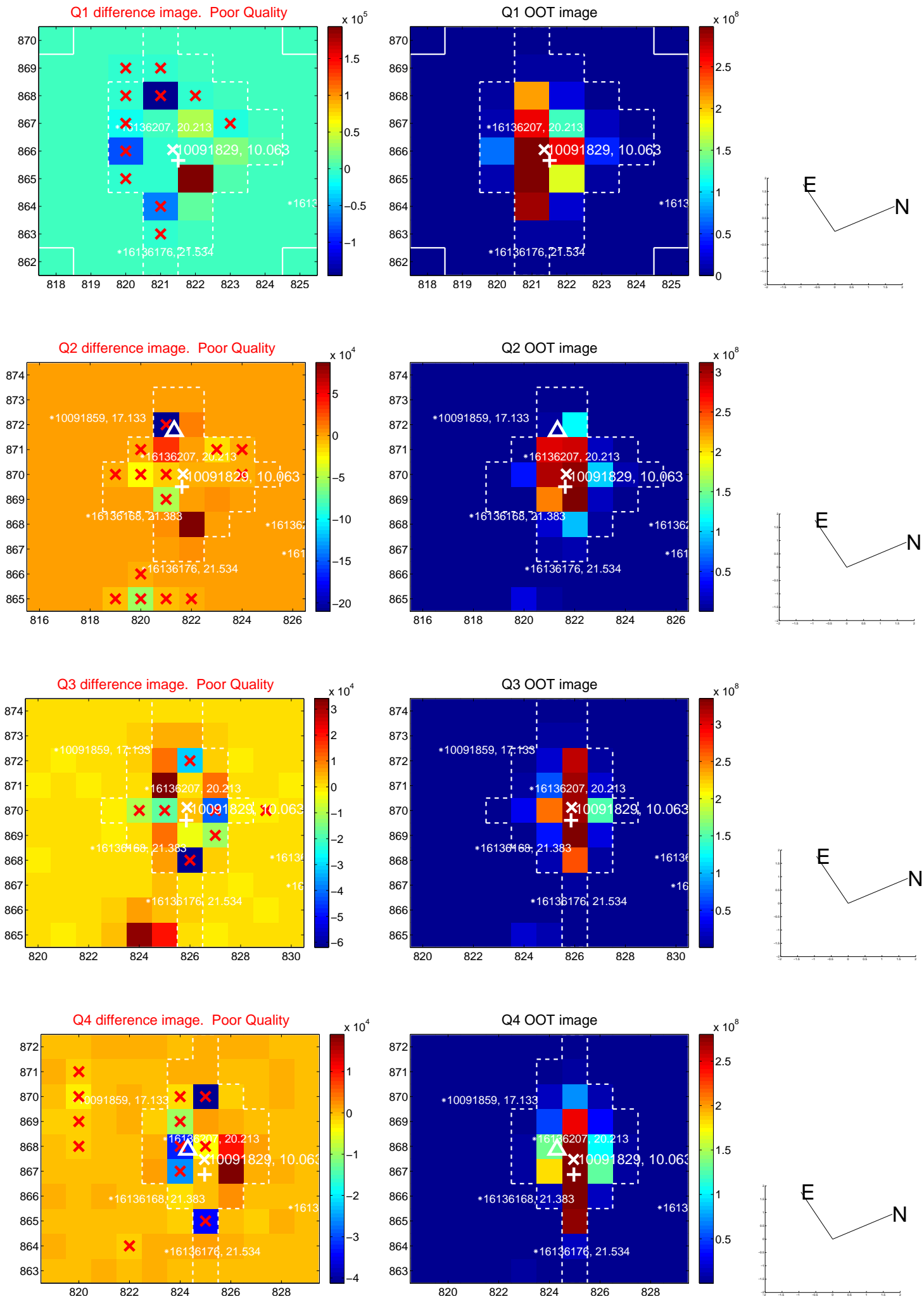
The direct PRF centroid is offset from the target star catalog position by about 1.95 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>13.258 \pm 3.773</math></b>	<b>3.51</b>	$-2.466 \pm 4.031$	$-13.026 \pm 3.097$
PRF-fit source offset from KIC position	<b><math>14.009 \pm 4.072</math></b>	<b>3.44</b>	$-4.189 \pm 4.056$	$-13.368 \pm 3.019$
photometric centroid source offset	$1.58 \pm 0.73$	2.17	$-0.04 \pm 0.90$	$-1.58 \pm 0.73$

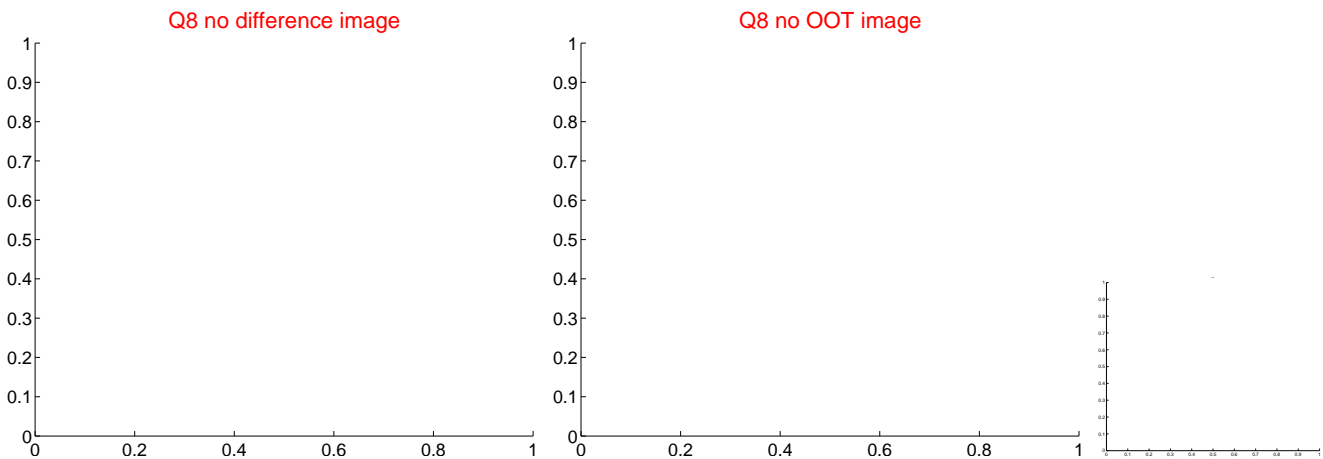
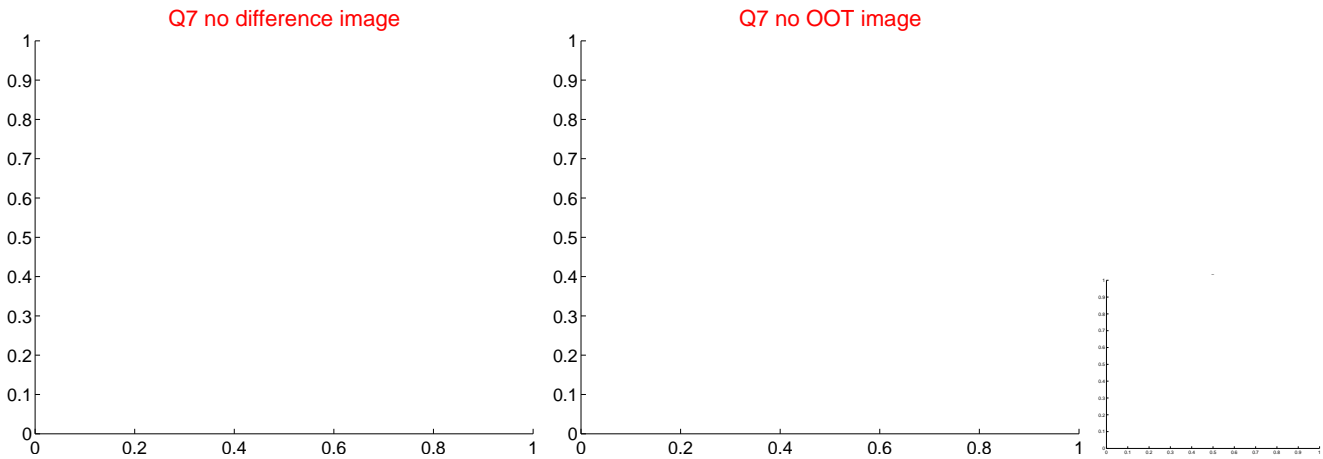
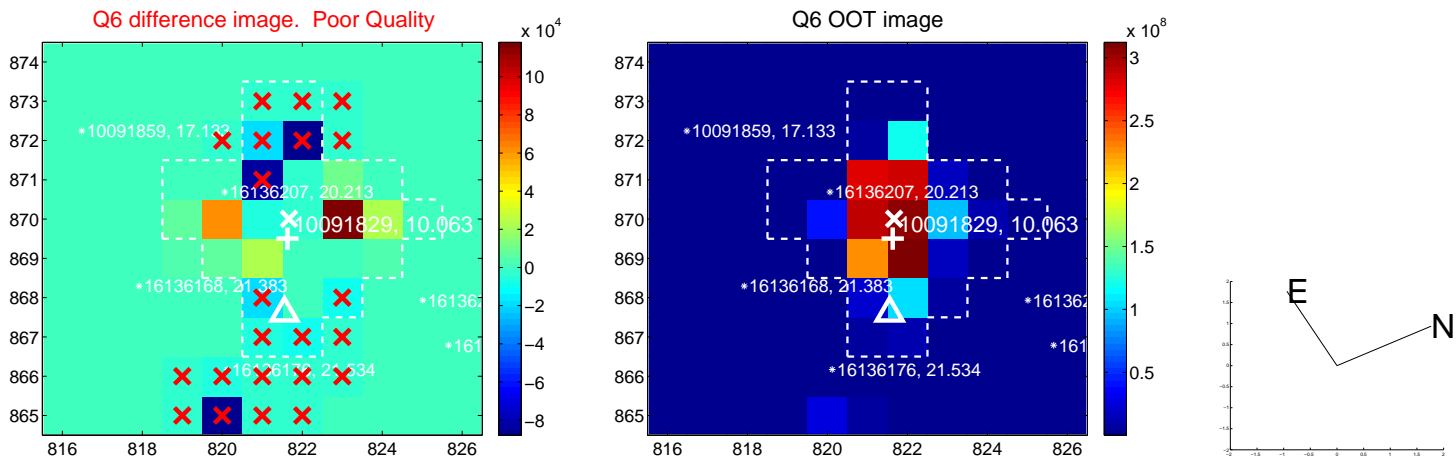
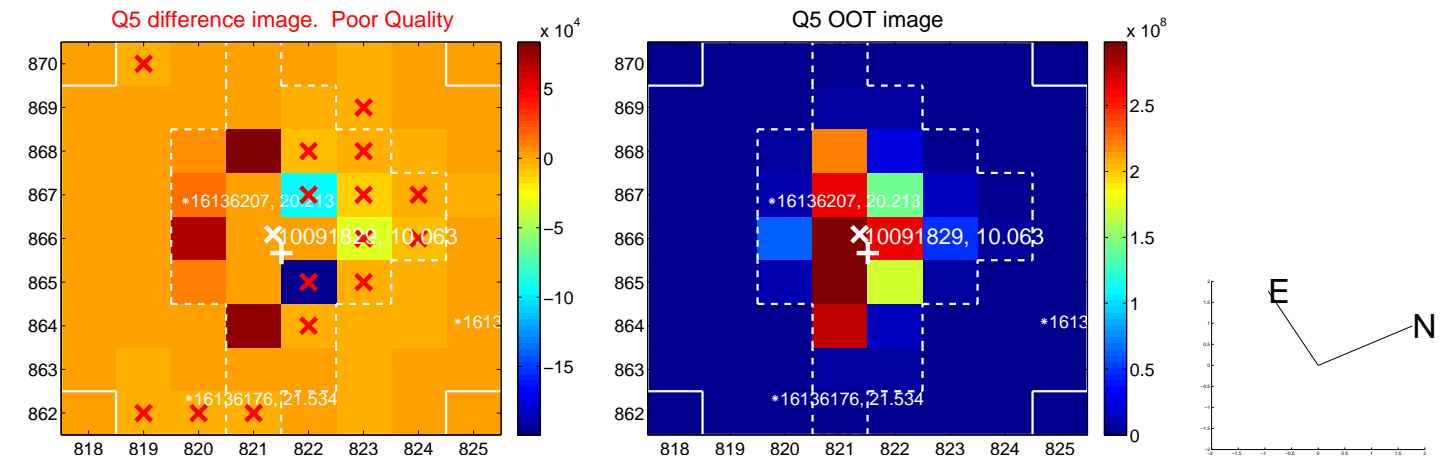


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

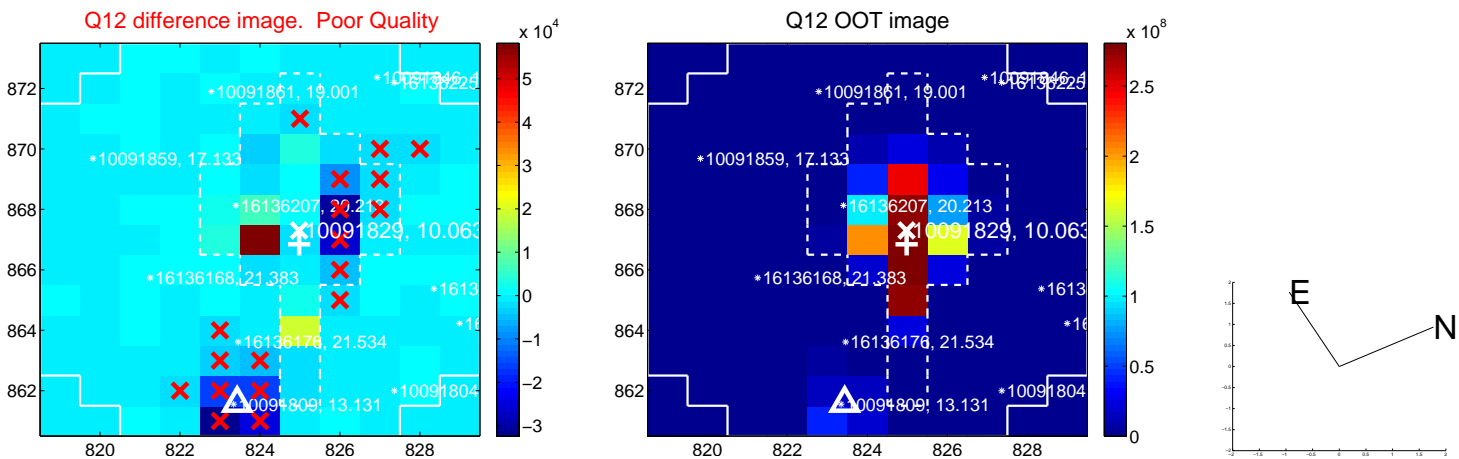
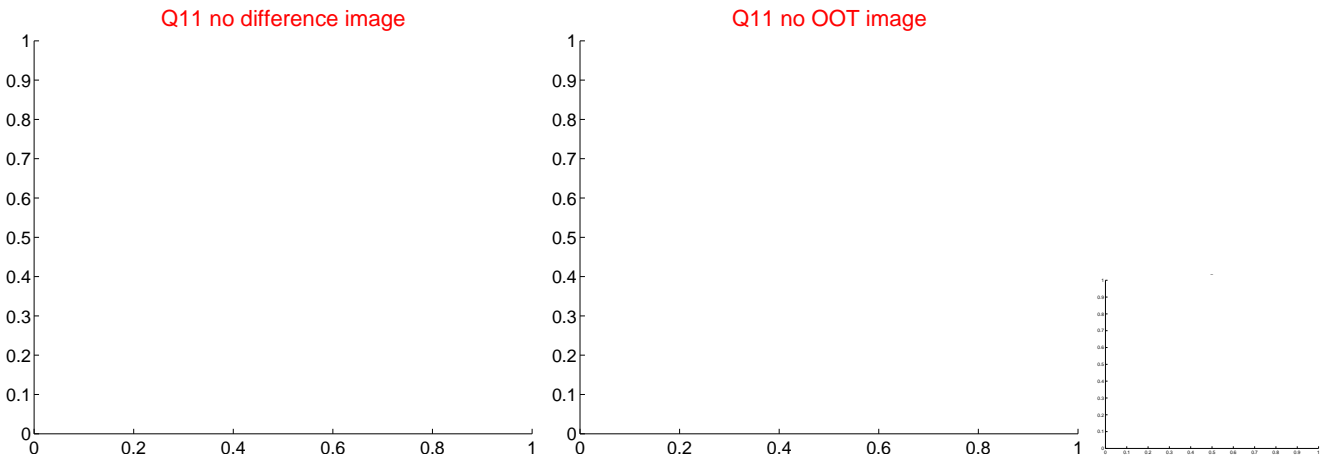
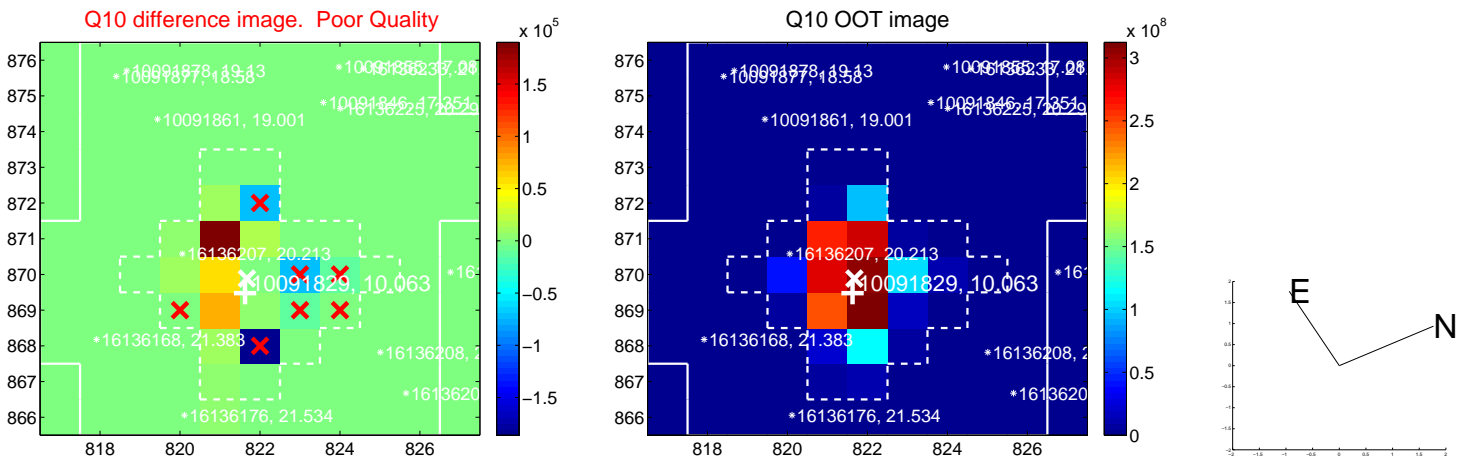
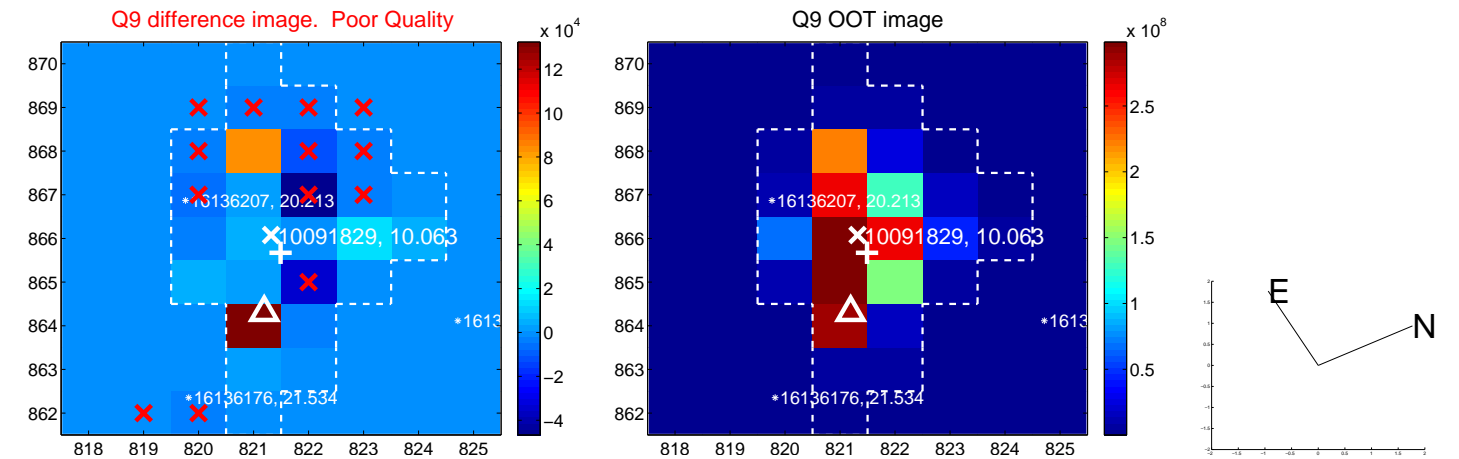
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

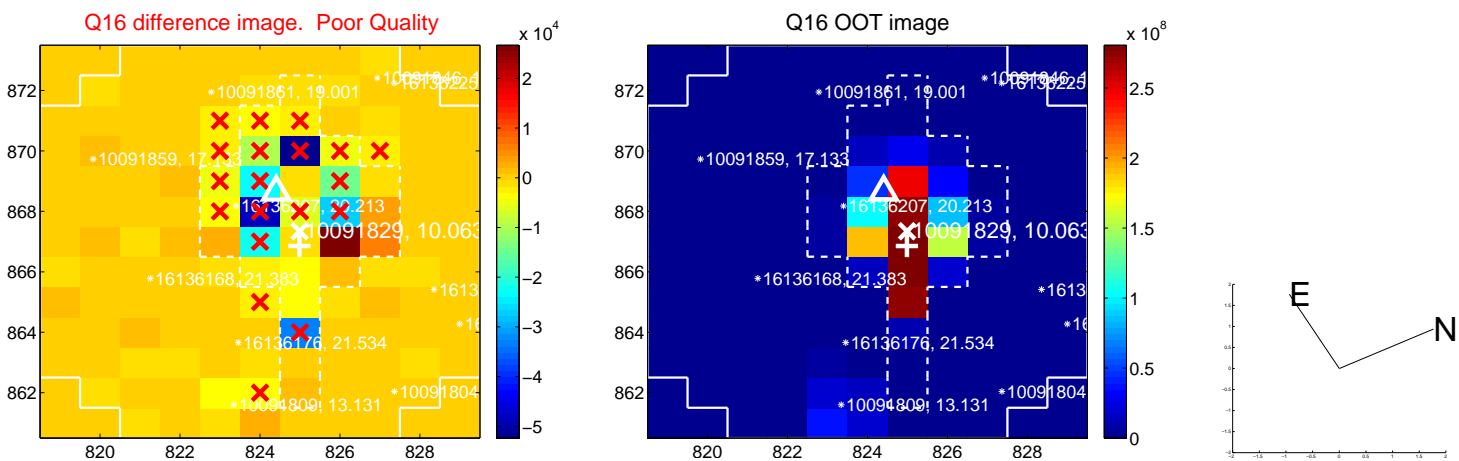
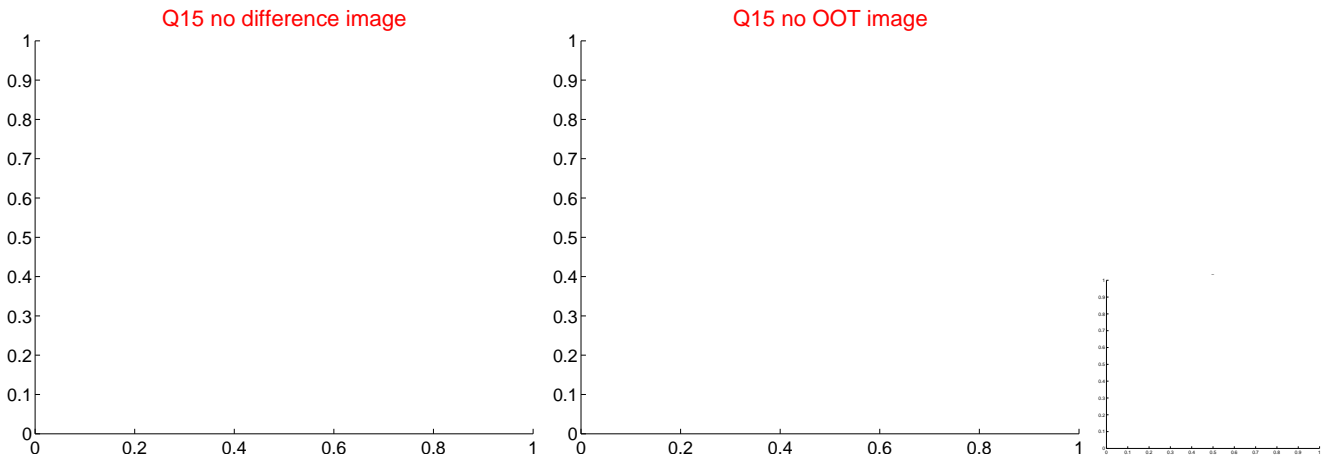
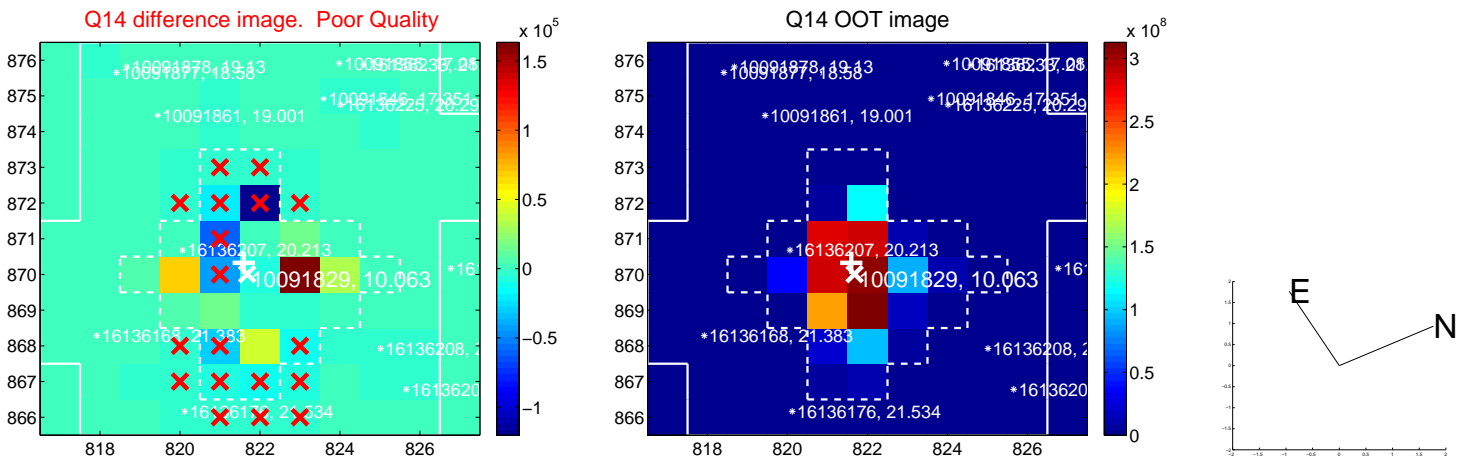
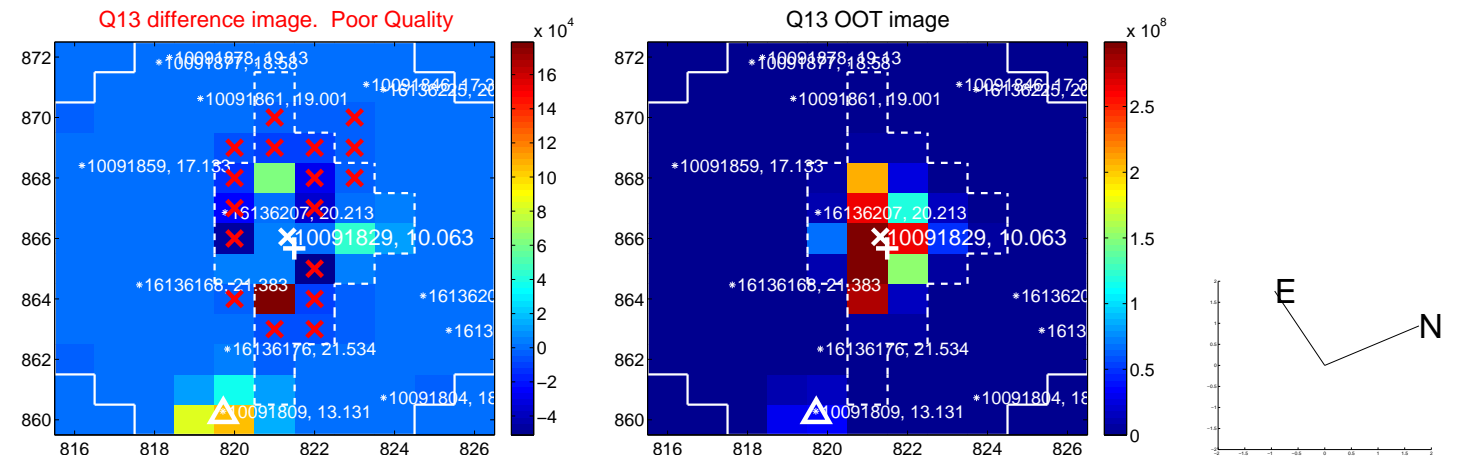


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

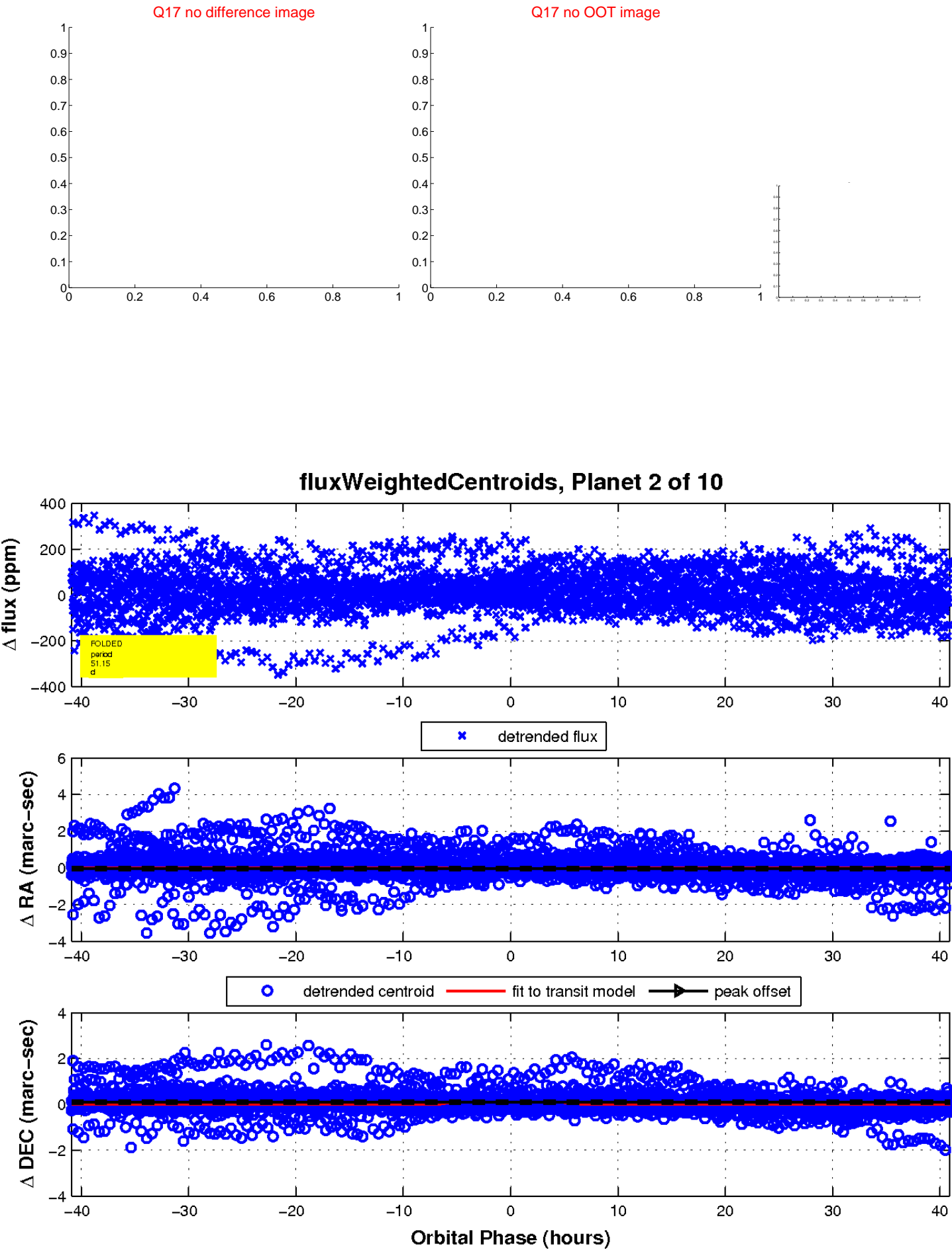




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

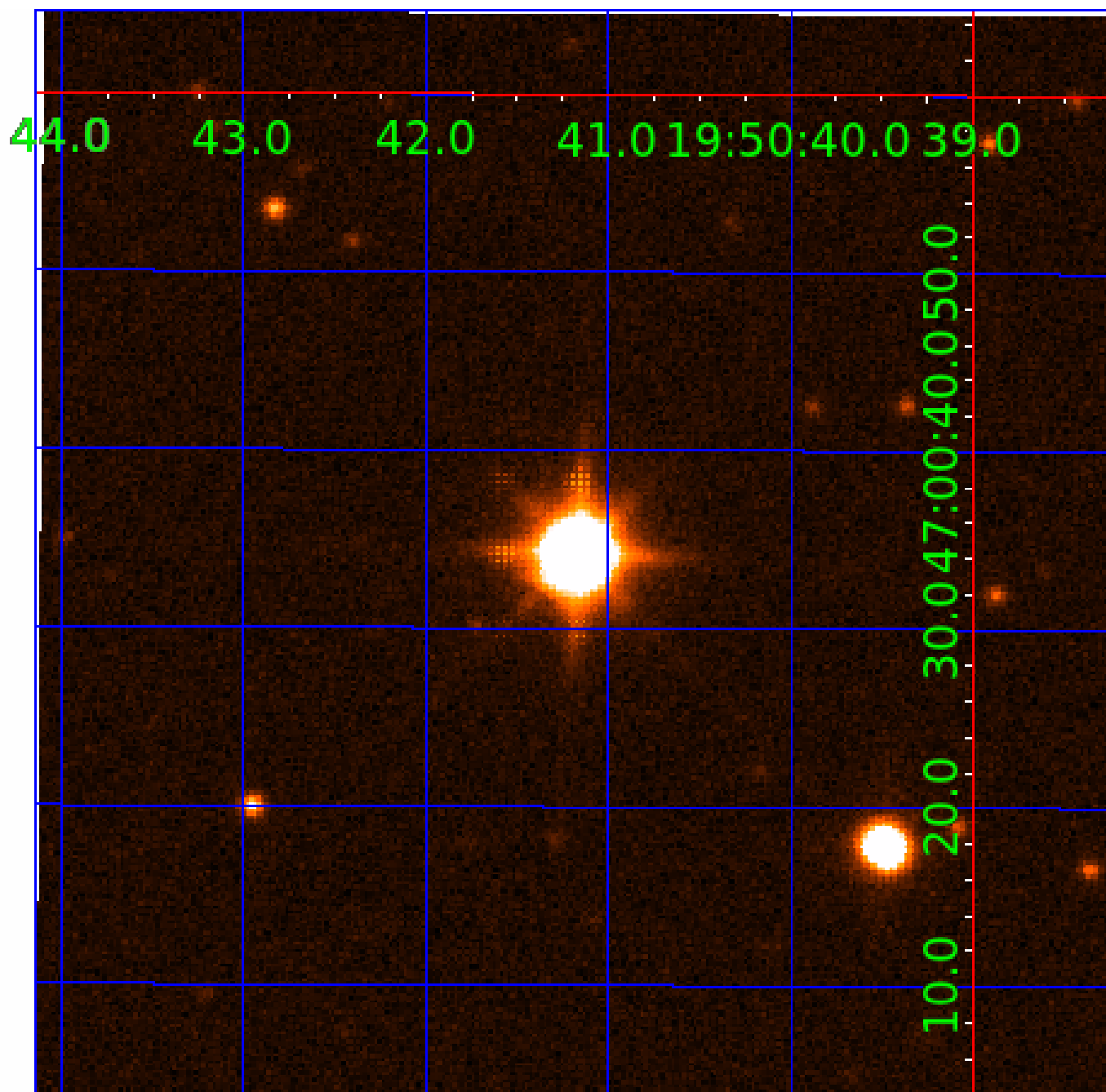


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010091829

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010091829-01	OBS	No	2.685897	132.966276	9.3	17.710	13.4	10.7	2.48	7751	0.77	8802.86
010091829-02	OBS	No	51.150813	150.403921	75.0	13.637	23.3	11.1	2.48	7751	2.61	173.09
010091829-04	OBS	No	103.251385	212.511369	77.6	11.125	15.0	10.7	2.48	7751	2.46	67.85
010091829-05	OBS	No	39.721348	158.143016	55.9	7.274	14.0	8.1	2.48	7751	2.12	242.50
010091829-06	OBS	No	97.893326	213.505551	72.2	12.046	12.5	8.2	2.48	7751	2.22	72.85
010091829-07	OBS	No	185.242008	174.661147	75.4	15.466	13.6	8.8	2.48	7751	2.54	31.12
010091829-08	OBS	No	144.806501	226.139993	476.4	66.191	10.9	9.9	2.48	7751	6.89	43.22
010091829-09	OBS	No	123.726523	248.998906	51.2	12.172	9.0	7.0	2.48	7751	2.05	53.31
010091829-10	OBS	No	15.454682	141.232200	49.5	3.861	7.4	8.1	2.48	7751	2.01	853.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010091829-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
010091829-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
010091829-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED
010091829-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010091829-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

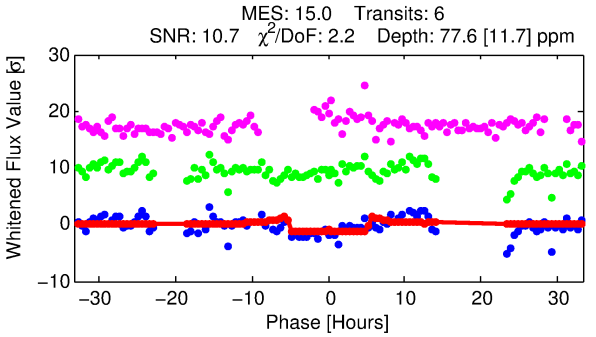
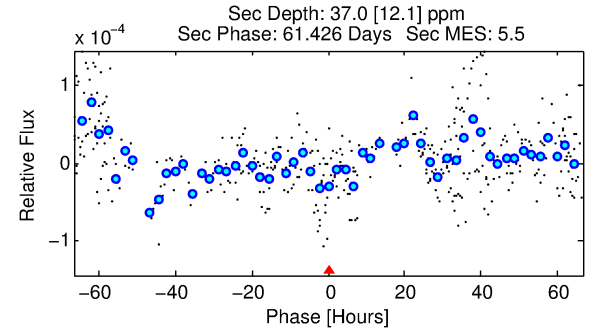
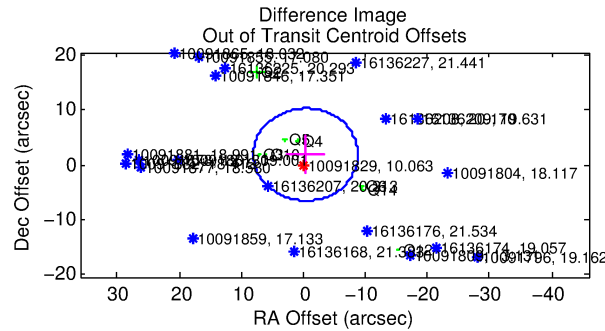
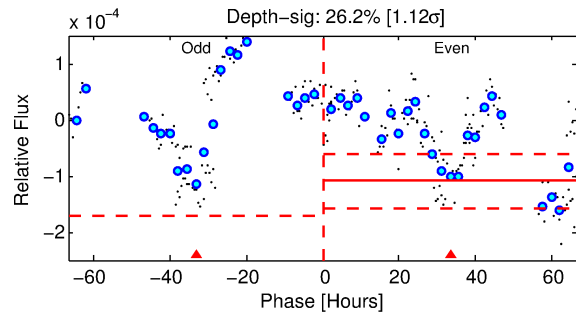
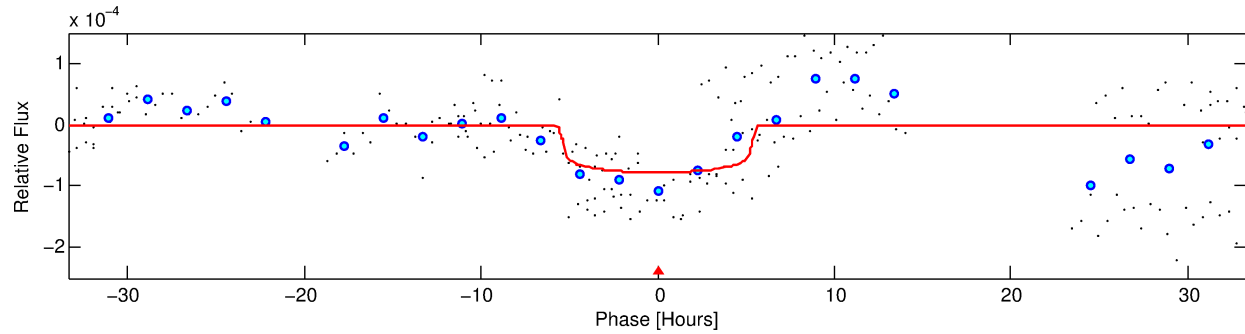
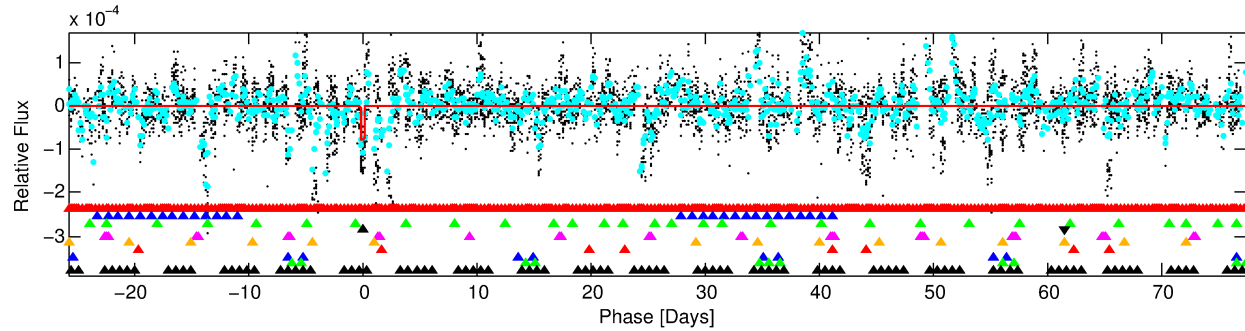
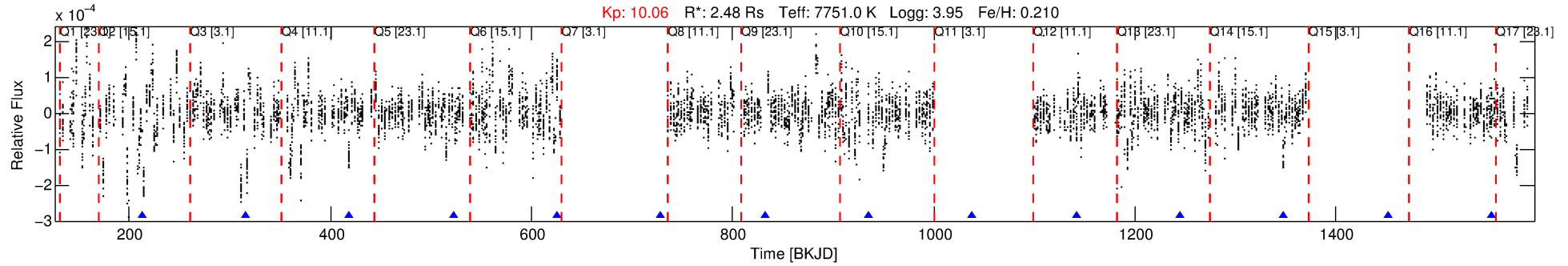
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010091829-04

No Significant Match Found

# DV One-Page Summary

KIC: 10091829 Candidate: 4 of 10 Period: 103.251 d



## DV Fit Results:

Period = 103.25138 [0.00127] d  
Epoch = 212.5114 [0.0094] BKJD  
Rp/R\* = 0.0091 [0.0017]  
a/R\* = 38.37 [40.32]  
b = 0.85 [0.34]  
Seff = 67.85 [16.84]  
Teq = 732 [45] K  
Rp = 2.46 [0.65] Re  
a = 0.5416 [0.0874] AU  
Ag = 984.09 [550.50] [1.79 $\sigma$ ]  
Teffp = 6337 [800] K [6.99 $\sigma$ ]

## DV Diagnostic Results:

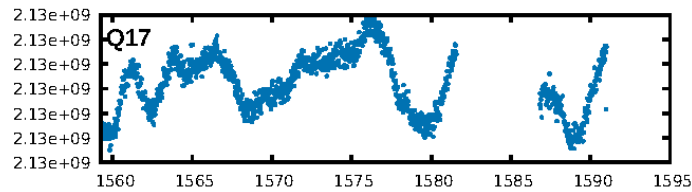
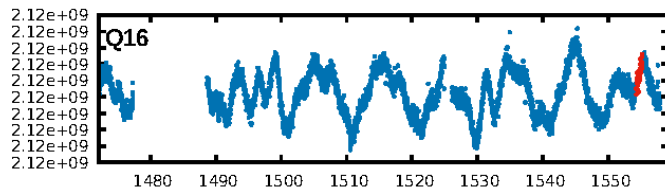
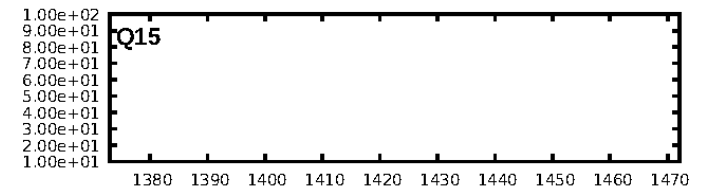
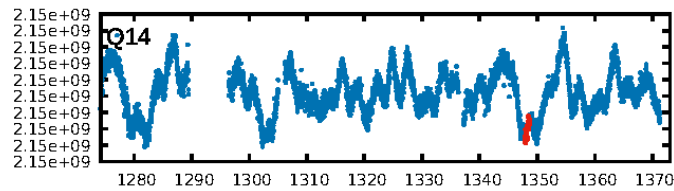
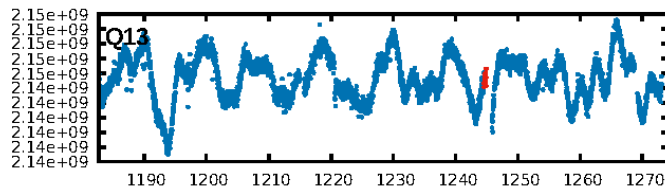
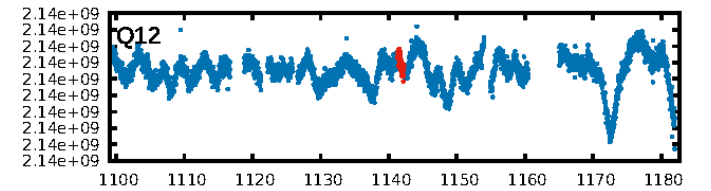
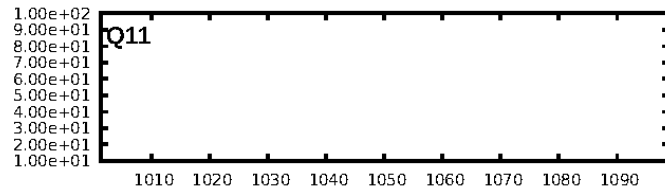
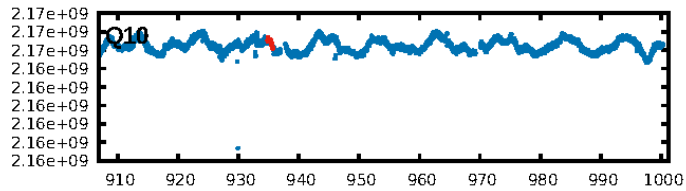
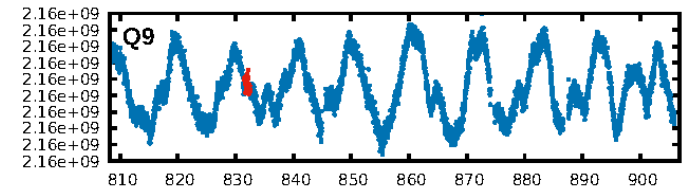
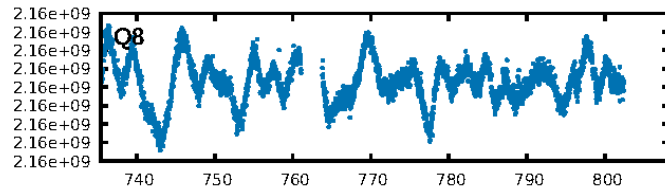
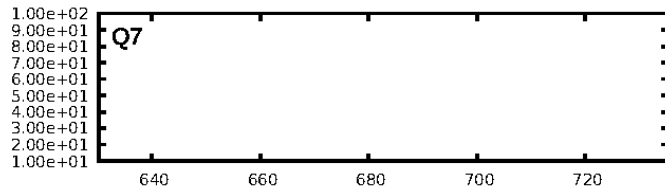
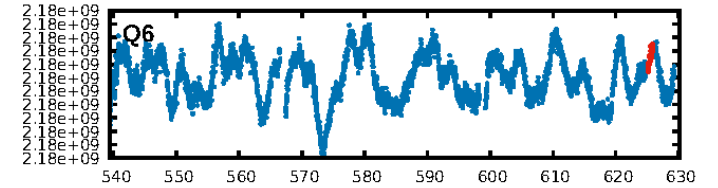
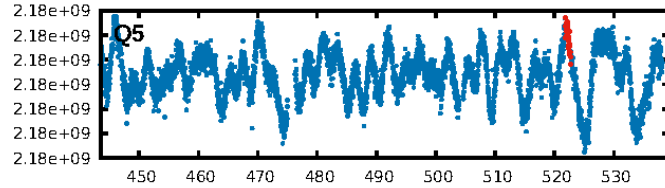
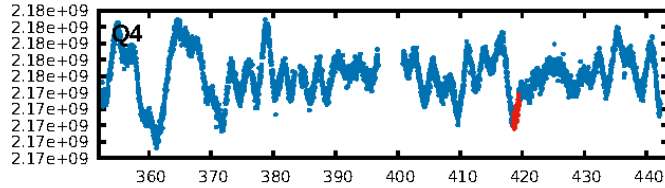
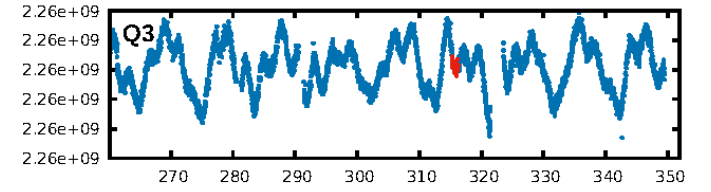
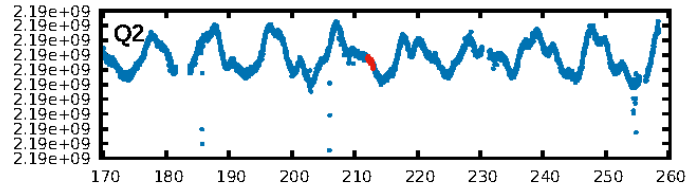
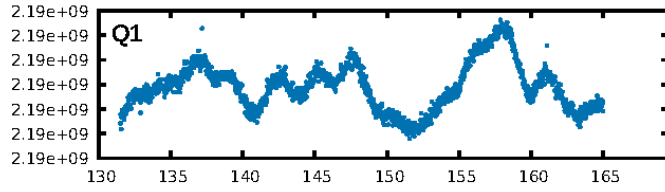
ShortPeriod-sig: 100.0% [7.84 $\sigma$ ]  
LongPeriod-sig: 100.0% [29.80 $\sigma$ ]  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 95.7%  
Bootstrap-pfa: 1.80e-18  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.0%  
Centroid-so: 1.882 arcsec [1.76 $\sigma$ ]  
OotOffset-rm: 1.882 arcsec [0.67 $\sigma$ ]  
KicOffset-rm: 2.535 arcsec [1.54 $\sigma$ ]  
OotOffset-st: 4/1/2/1 [8]  
KicOffset-st: 4/1/2/1 [8]  
DiffImageQuality-fgm: 0.12 [1/8]  
DiffImageOverlap-fno: 0.10 [1/10]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:10:56 Z

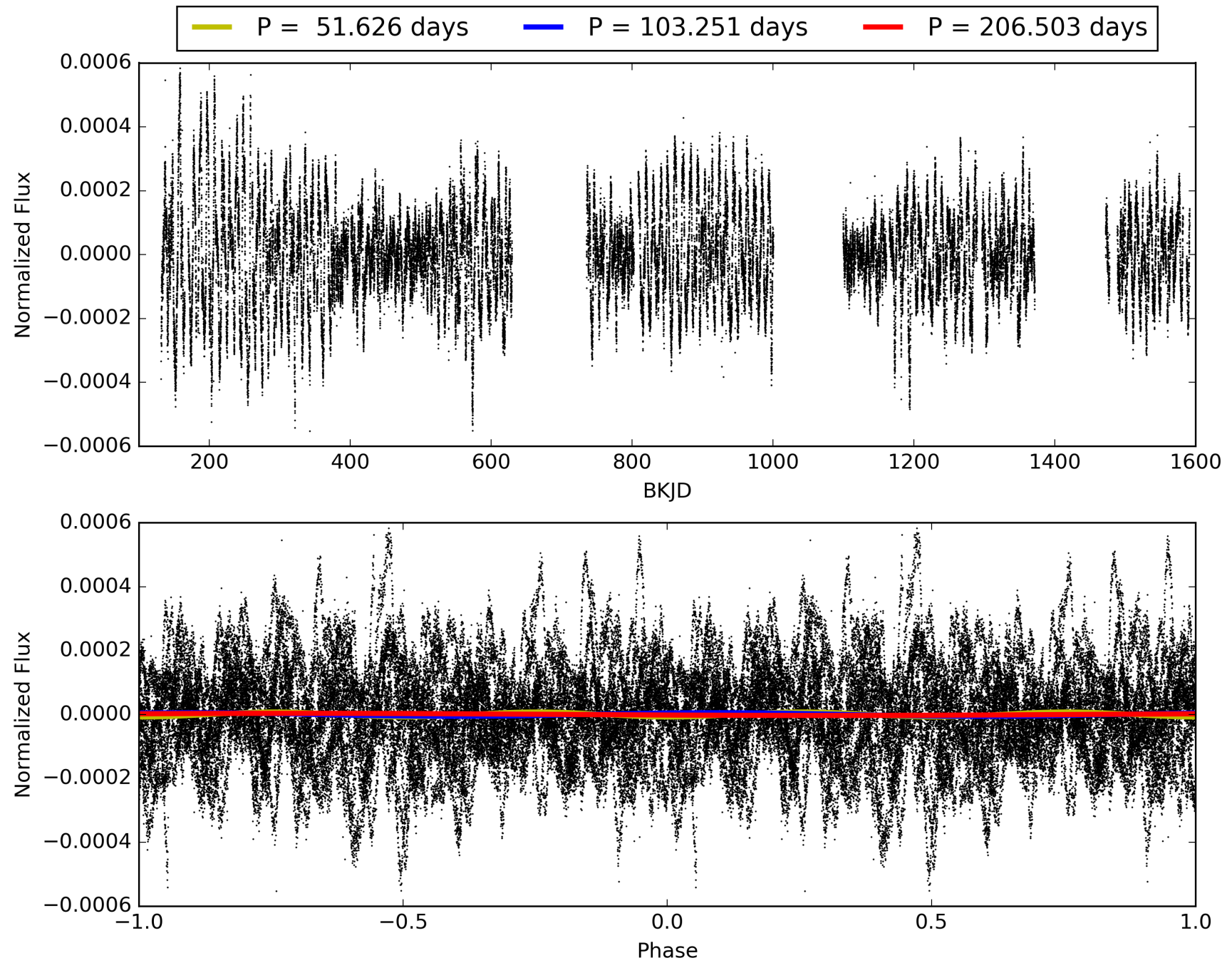
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 010091829-04, PDC Light Curves

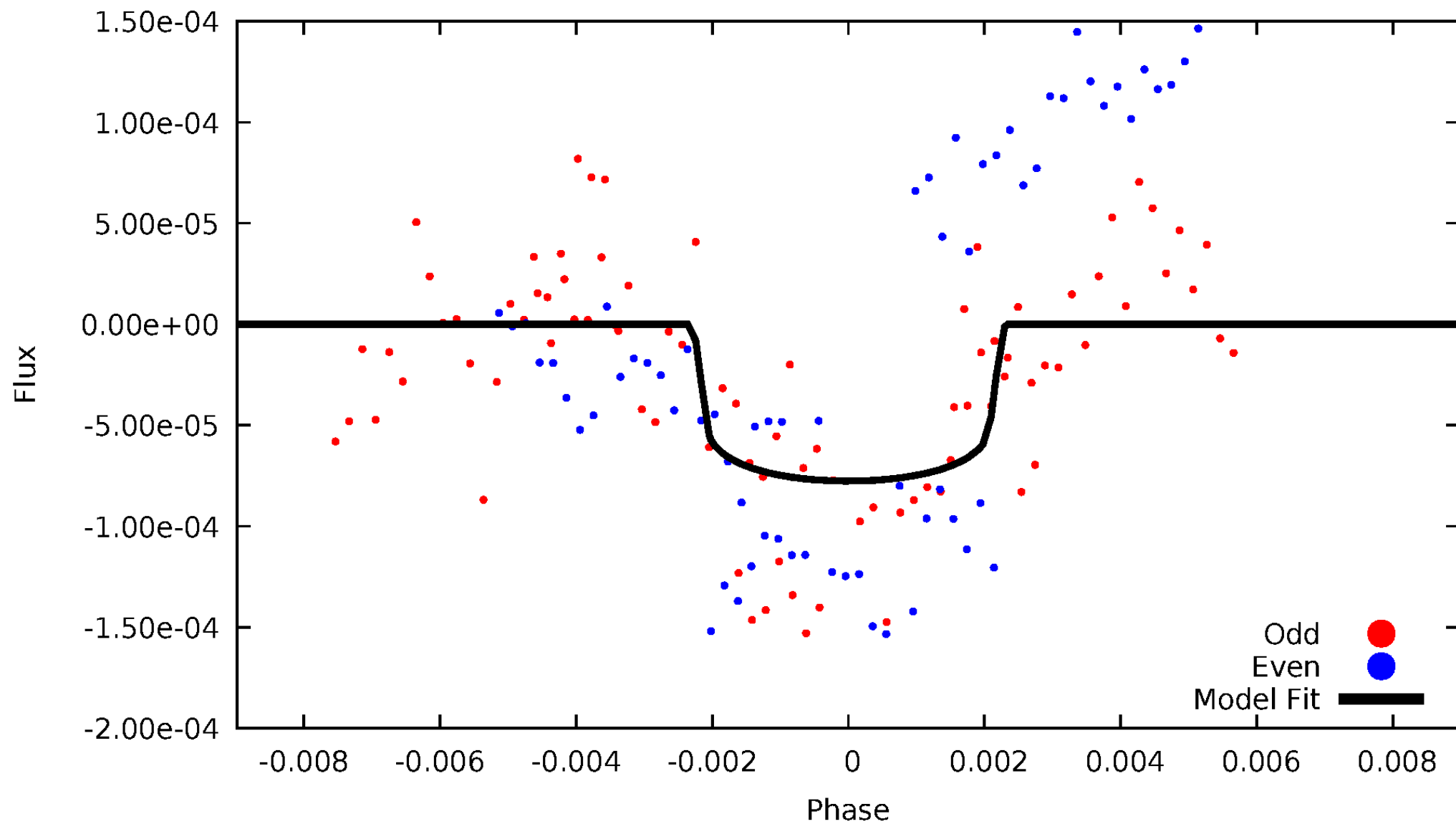


TCE 010091829-04



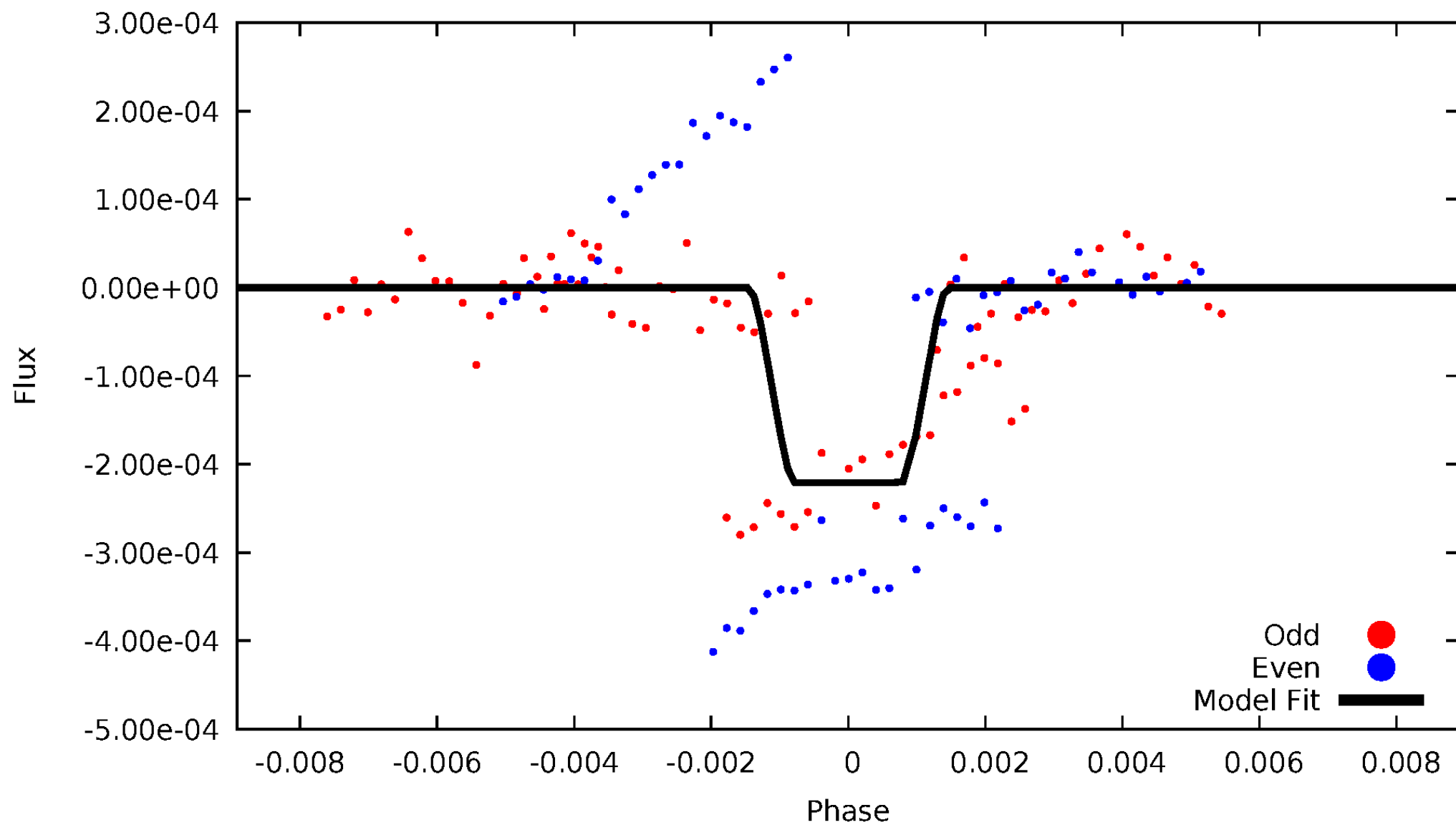
# DV Odd/Even

TCE 010091829-04



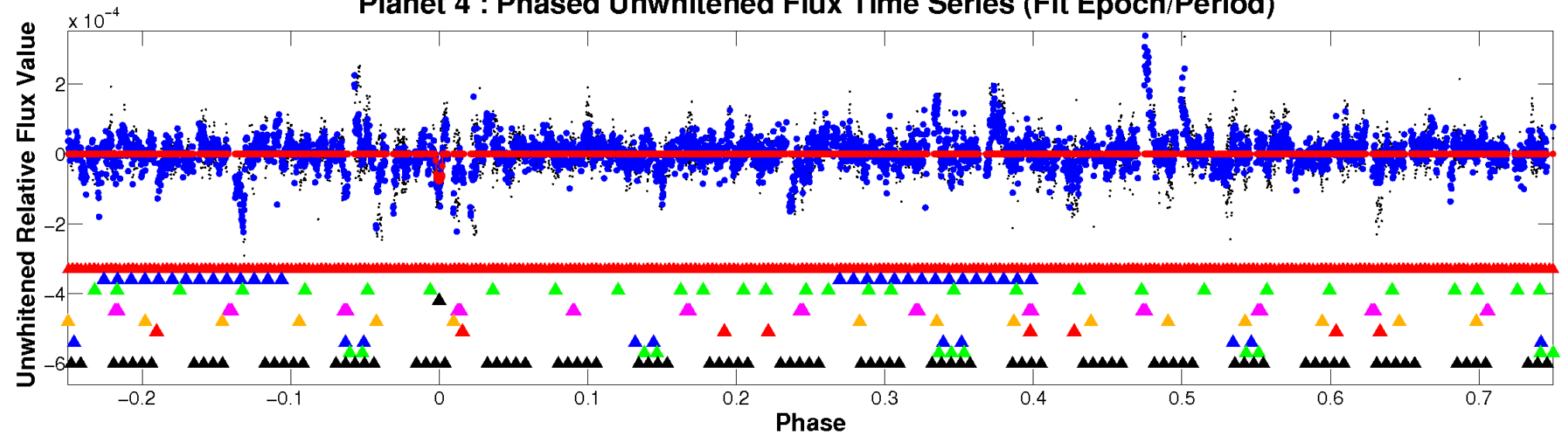
# ALT Odd/Even

TCE 010091829-04

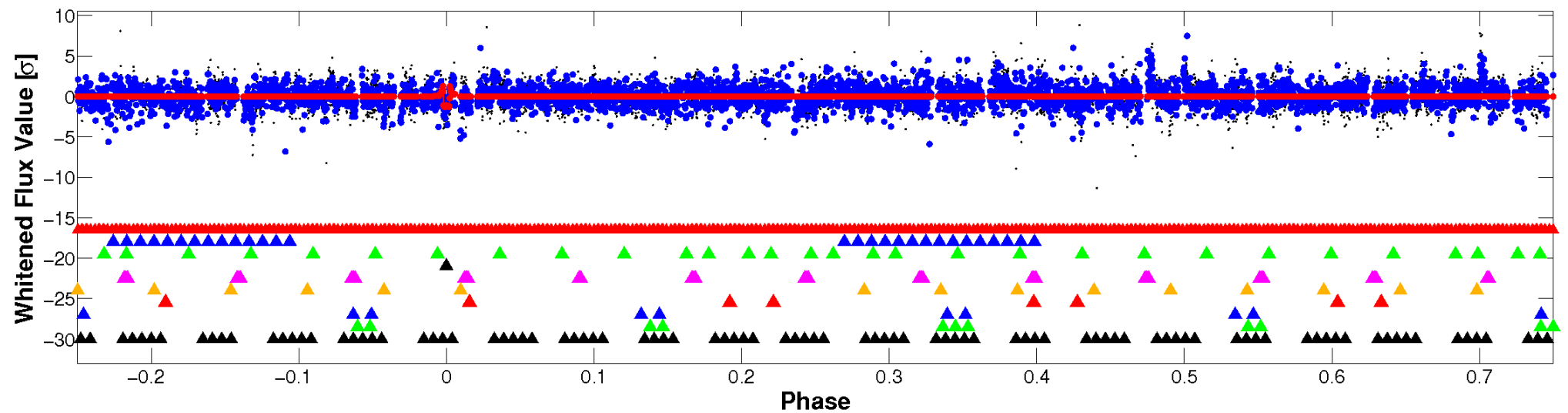


# Non-Whitened Vs. Whitened Light Curve

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

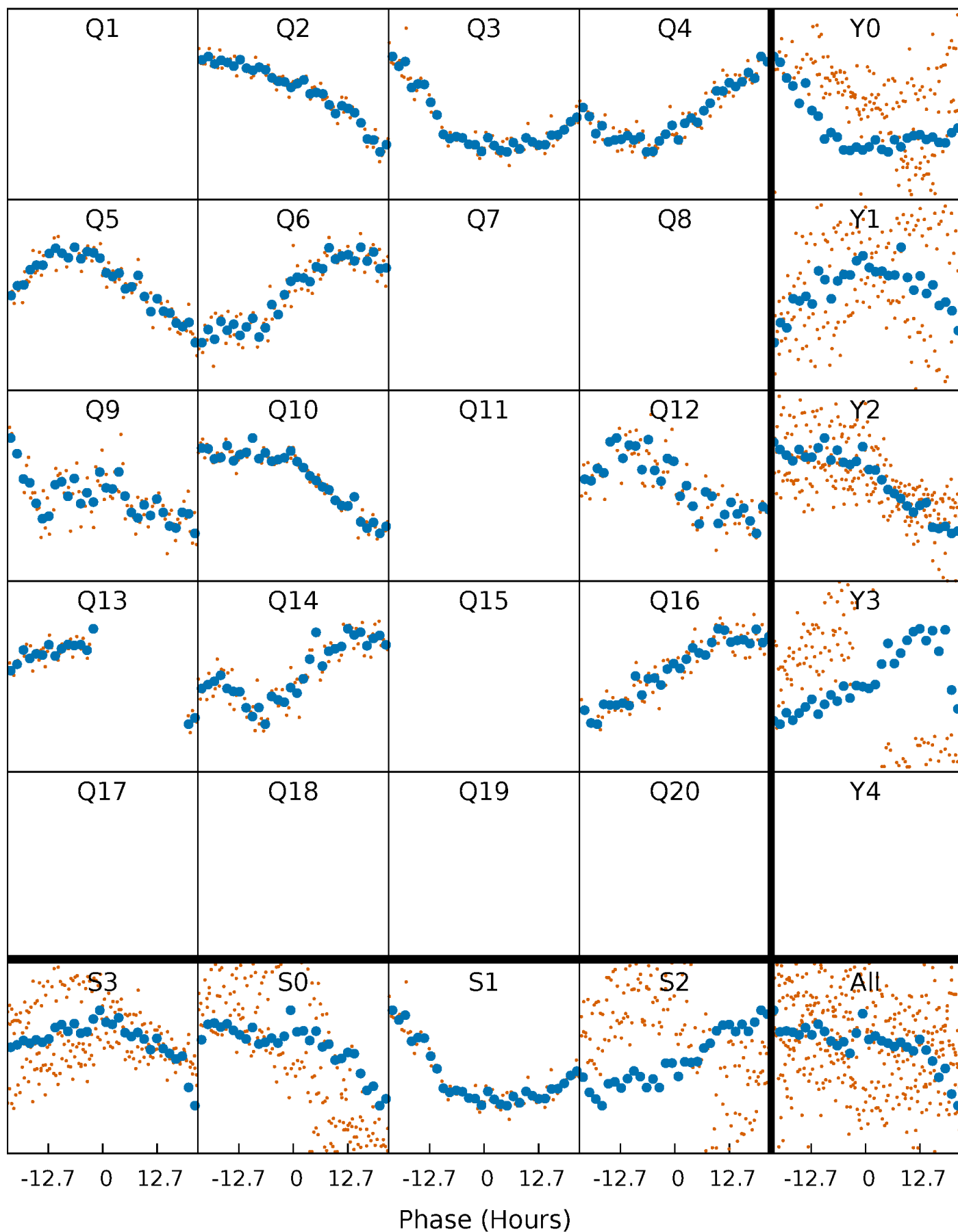


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

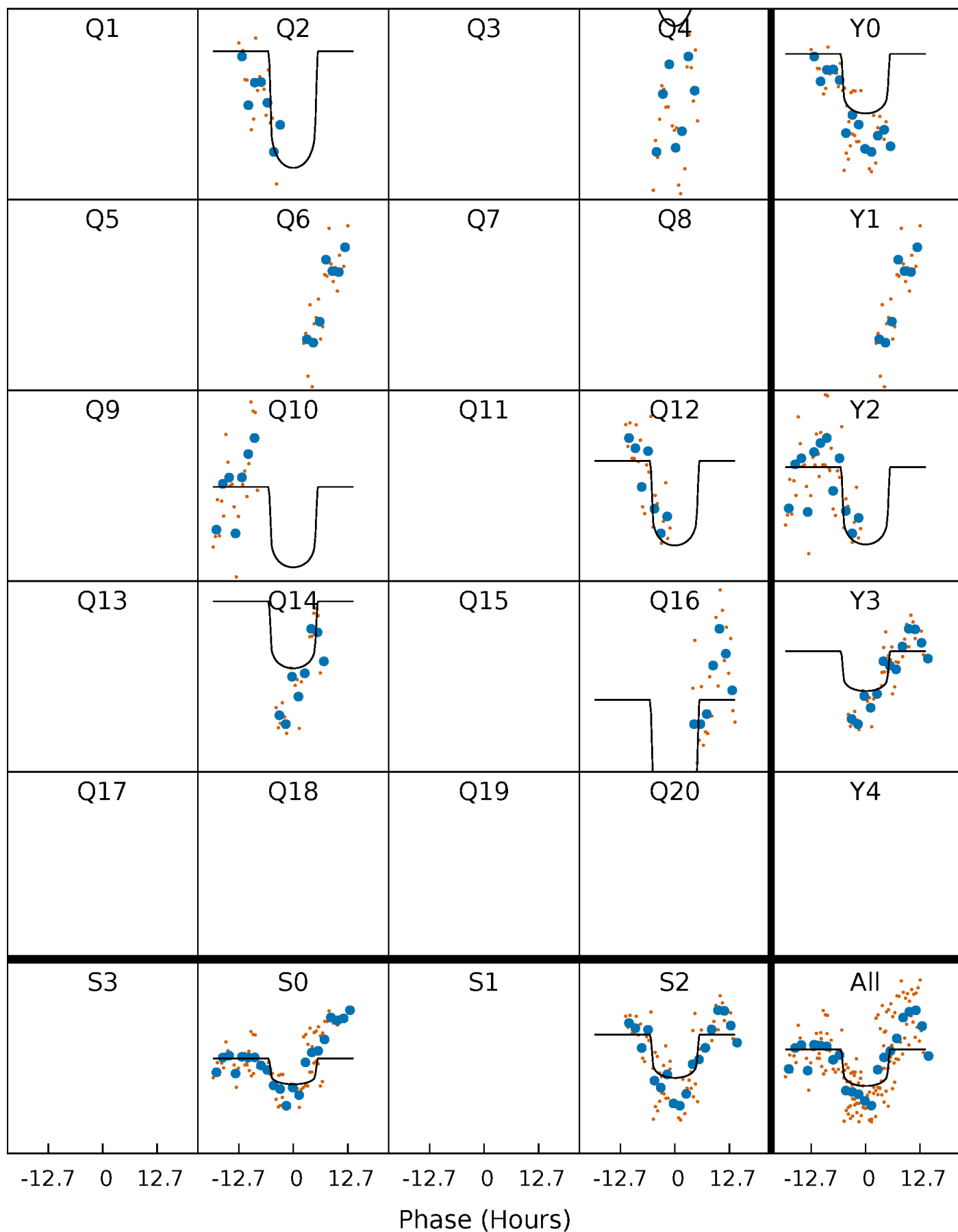
TCE 010091829-04 P=103.251385 Days  $T_0=212.511369$  (BKJD)





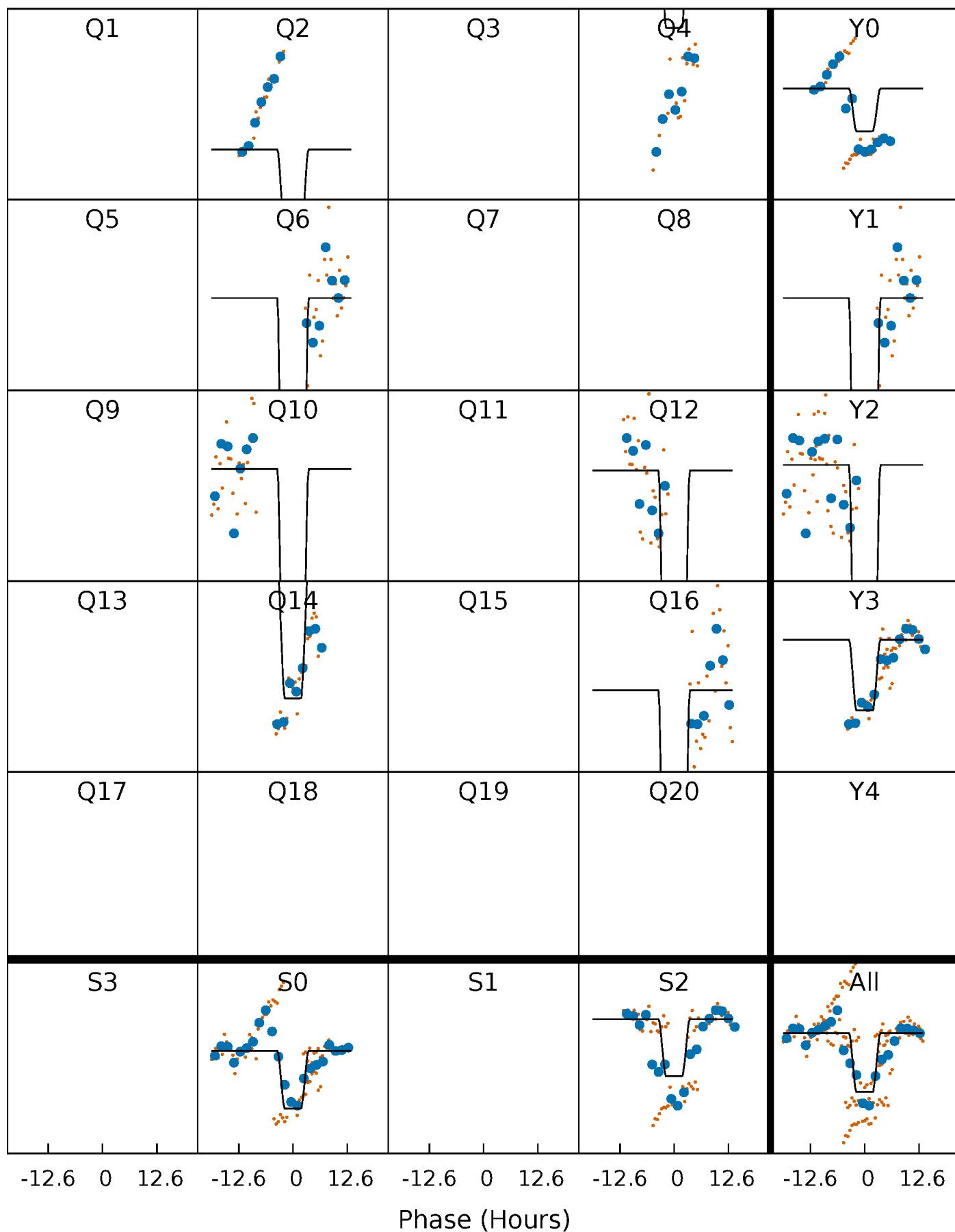
# DV Quarter-Phased Transit Curves

TCE 010091829-04 P=103.251385 Days  $T_0=212.511369$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

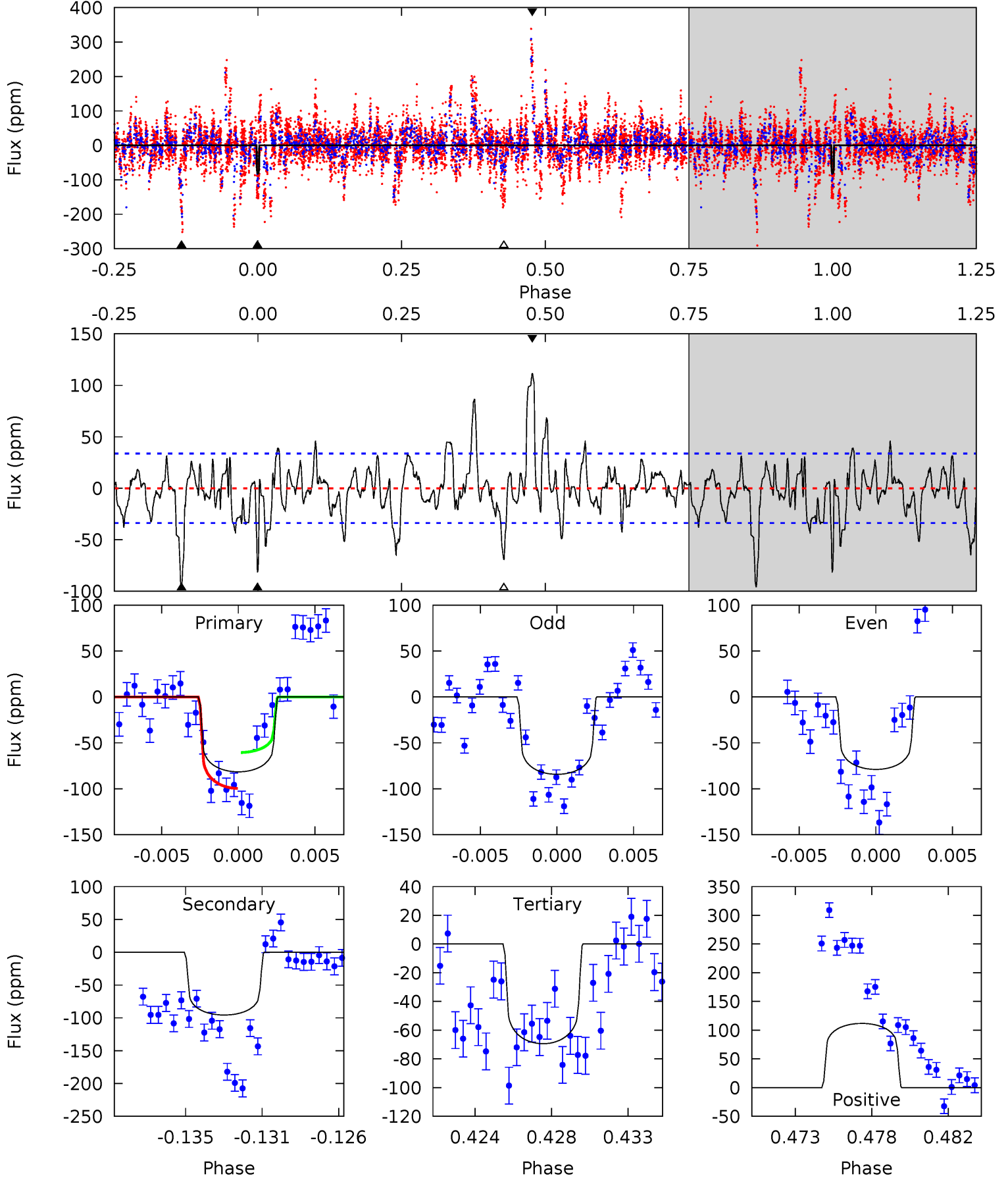
TCE 010091829-04 P=103.253777 Days  $T_0=212.501988$  (BKJD)



# DV Model-Shift Uniqueness Test

010091829-04, P = 103.251385 Days, E = 109.259984 Days

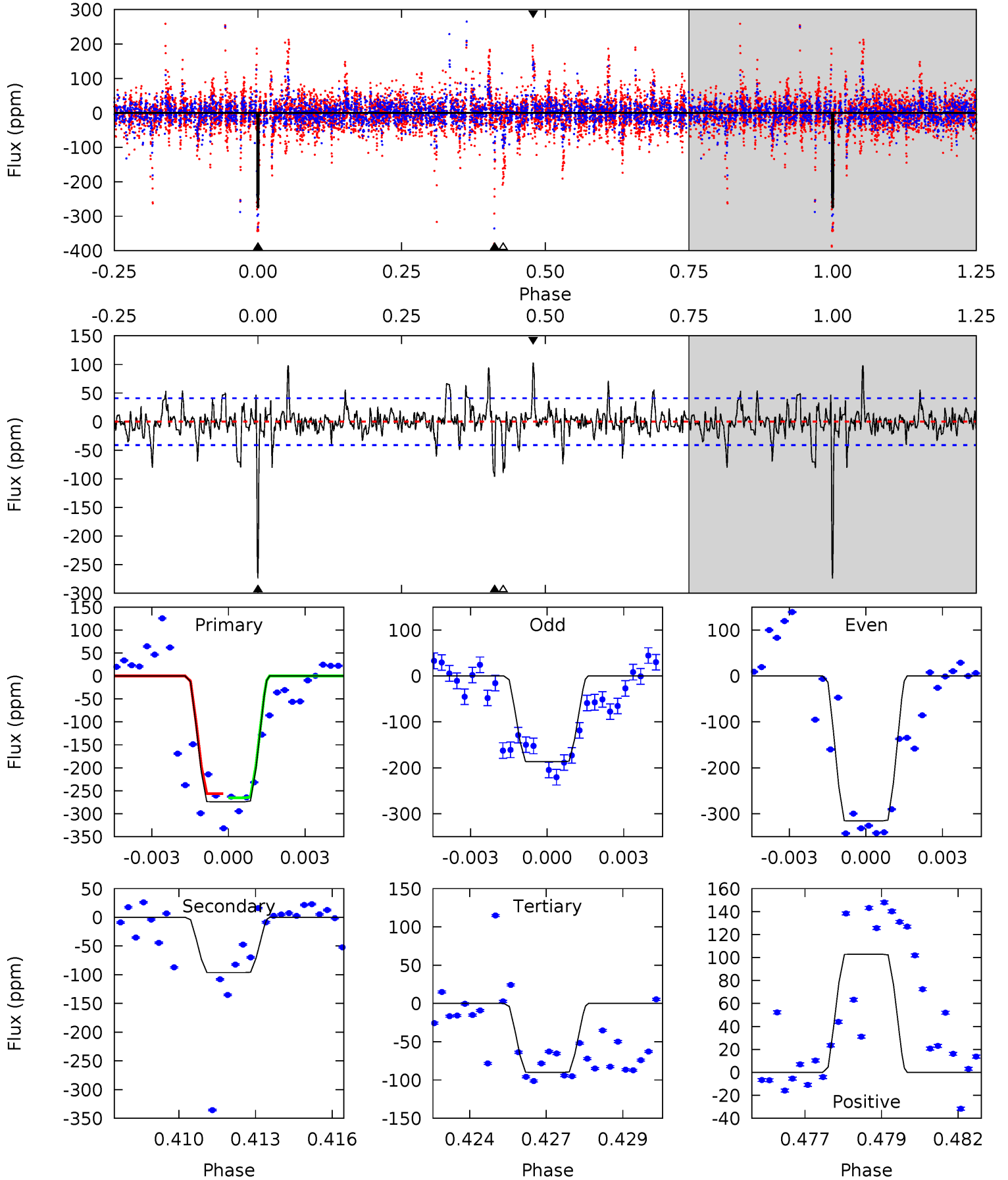
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	14.7	10.7	17.2	5.18	2.84	3.57	1.86	-4.64	4.03	-2.47	0.41	0.79	0.54	3.03



# Alt Model-Shift Uniqueness Test

010091829-04, P = 103.253777 Days, E = 109.248211 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.2	12.4	11.6	13.2	5.27	2.99	2.86	23.7	22.0	0.81	-0.85	8.58	3.09	0.27	0.57



### Stellar Parameters For KIC 010091829

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7751^{+85}_{-77}$	$3.947^{+0.138}_{-0.092}$	$0.210^{+0.200}_{-0.200}$	$2.481^{+0.371}_{-0.453}$	$1.986^{+0.166}_{-0.185}$	$0.183^{+0.123}_{-0.053}$
	+1%/-1%	+3%/-2%	+95%/-95%	+15%/-18%	+8%/-9%	+67%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 010091829-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-96 \pm 7$	$2.43^{+0.56}_{-0.50}$	$1020^{+40}_{-48}$	$8108^{+1256}_{-849}$	$2599^{+1568}_{-845}$
Alt.	$-96 \pm 8$	$3.97^{+0.60}_{-0.57}$	$1020^{+41}_{-49}$	$6177^{+422}_{-346}$	$996^{+331}_{-259}$

$T_{\text{max}}$  = 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

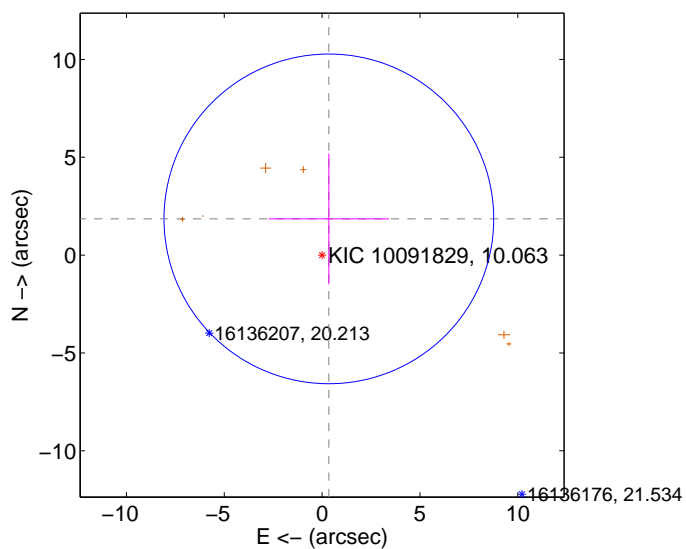
Supplemental centroid analysis for 010091829-04. **Kepler magnitude: 10.06.** Transit SNR 10.69

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

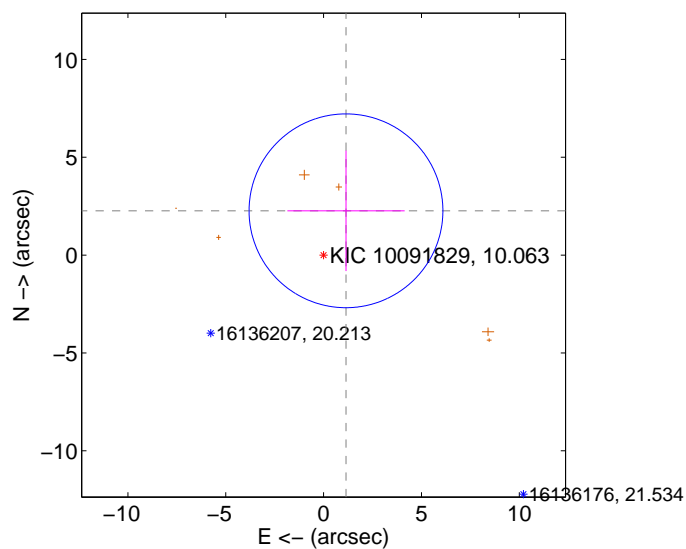
The direct PRF centroid is offset from the target star catalog position by about 1.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.882 \pm 2.808$	0.67	$-0.343 \pm 3.080$	$1.850 \pm 3.343$
PRF-fit source offset from KIC position	$2.535 \pm 1.651$	1.54	$-1.142 \pm 2.996$	$2.264 \pm 3.078$
photometric centroid source offset	$1.88 \pm 1.07$	1.76	$0.47 \pm 1.27$	$1.82 \pm 1.06$

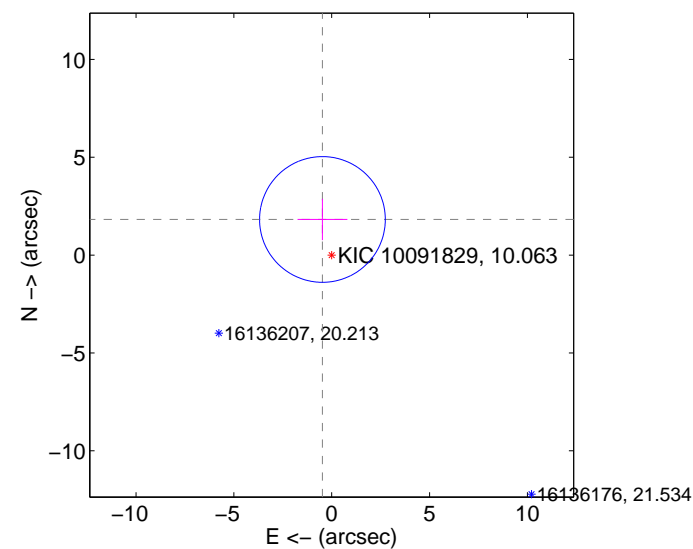
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



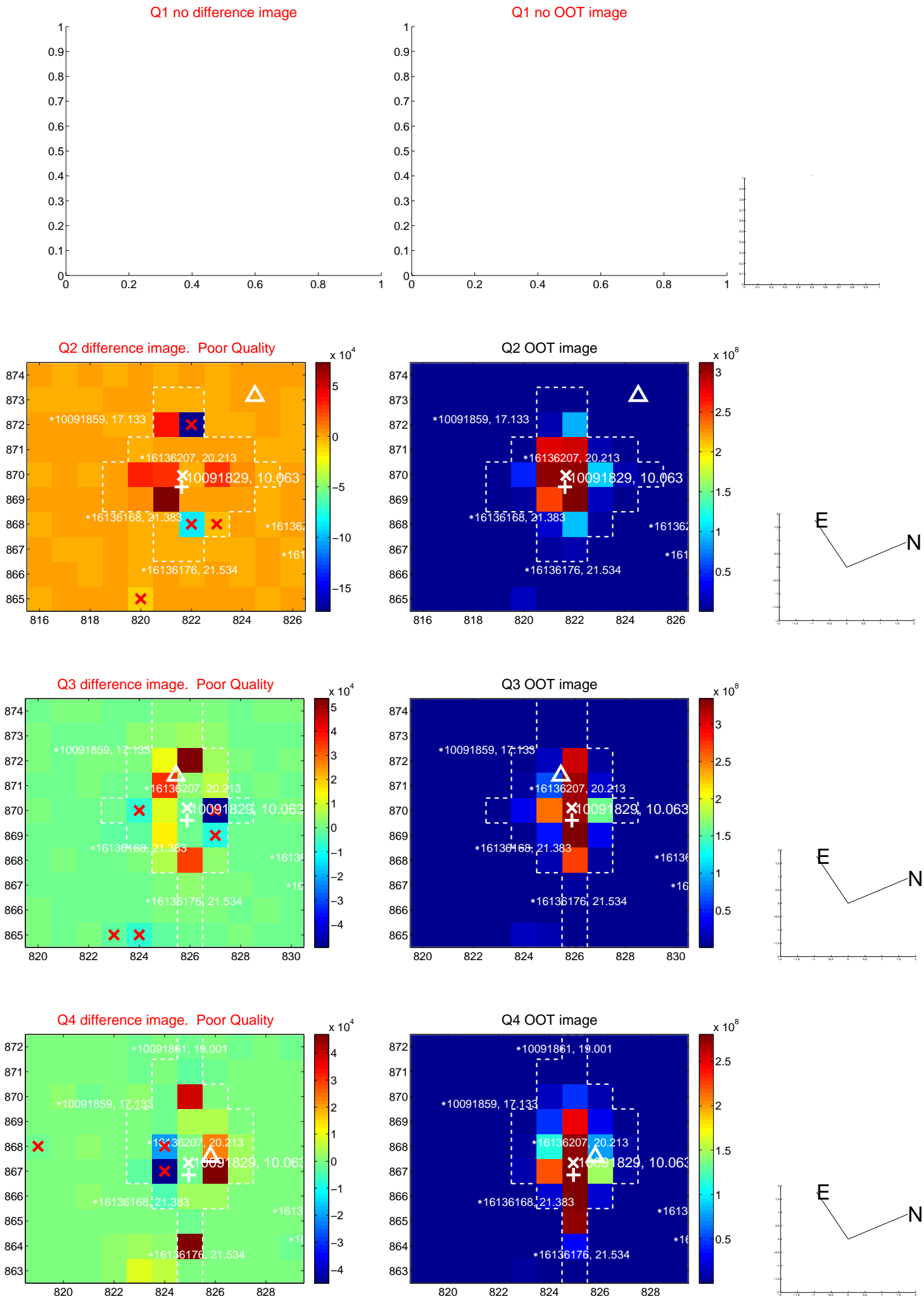
offset from photometric centroids



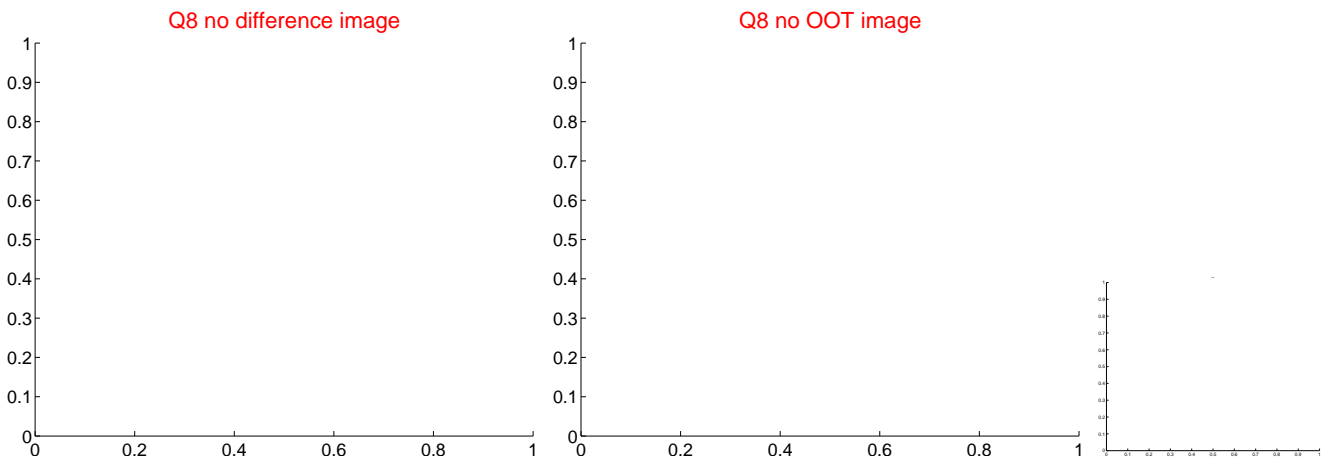
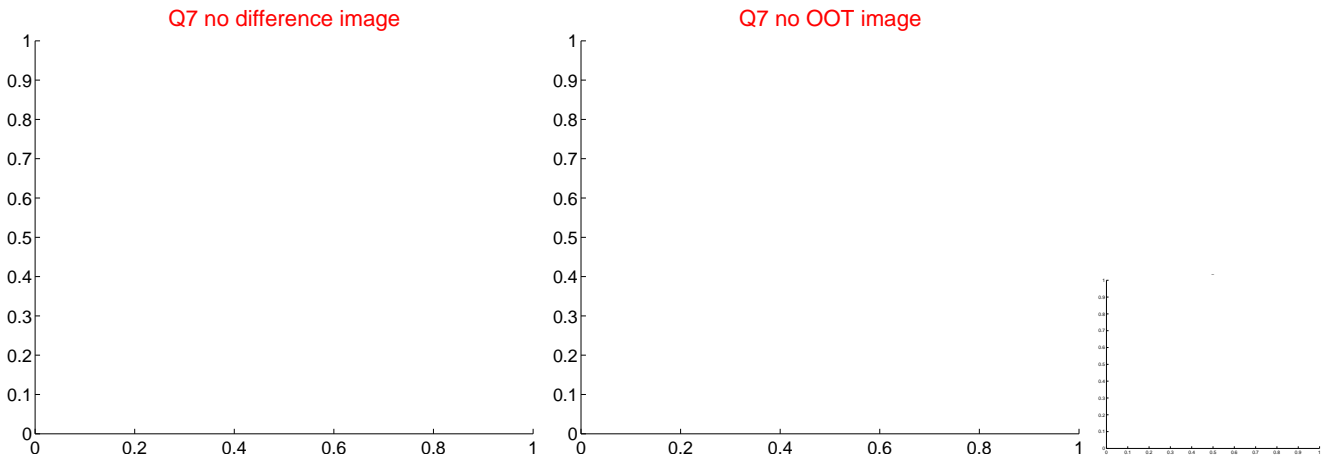
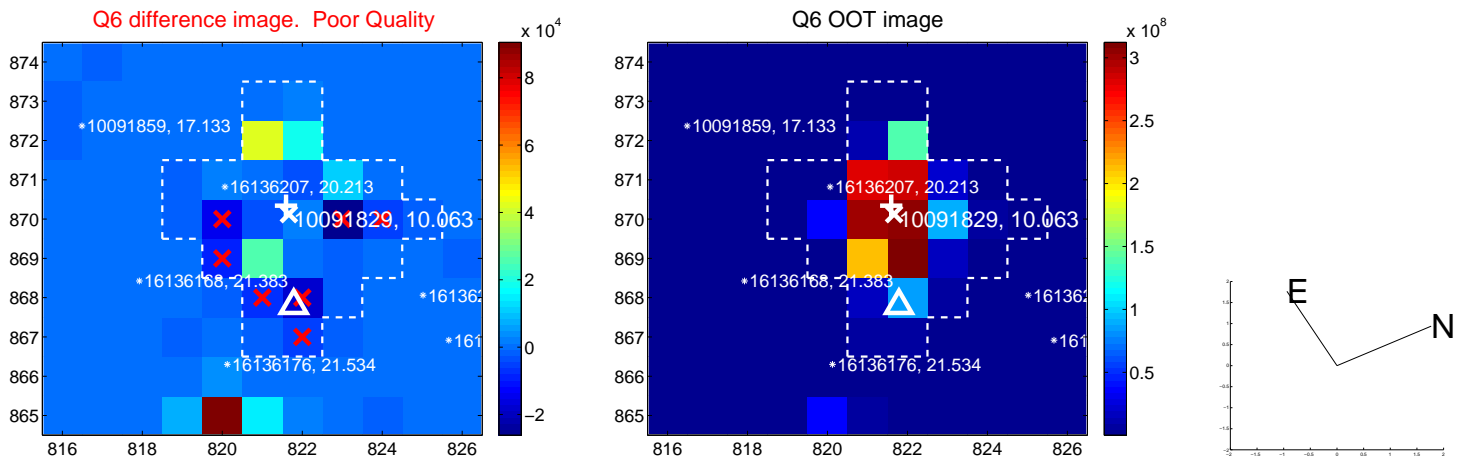
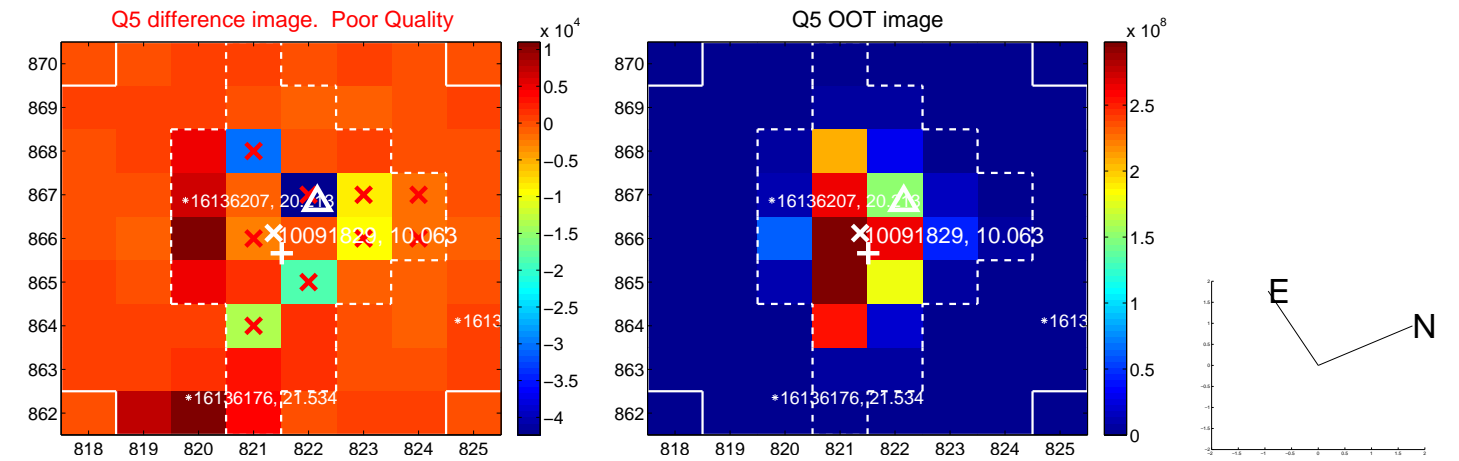
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



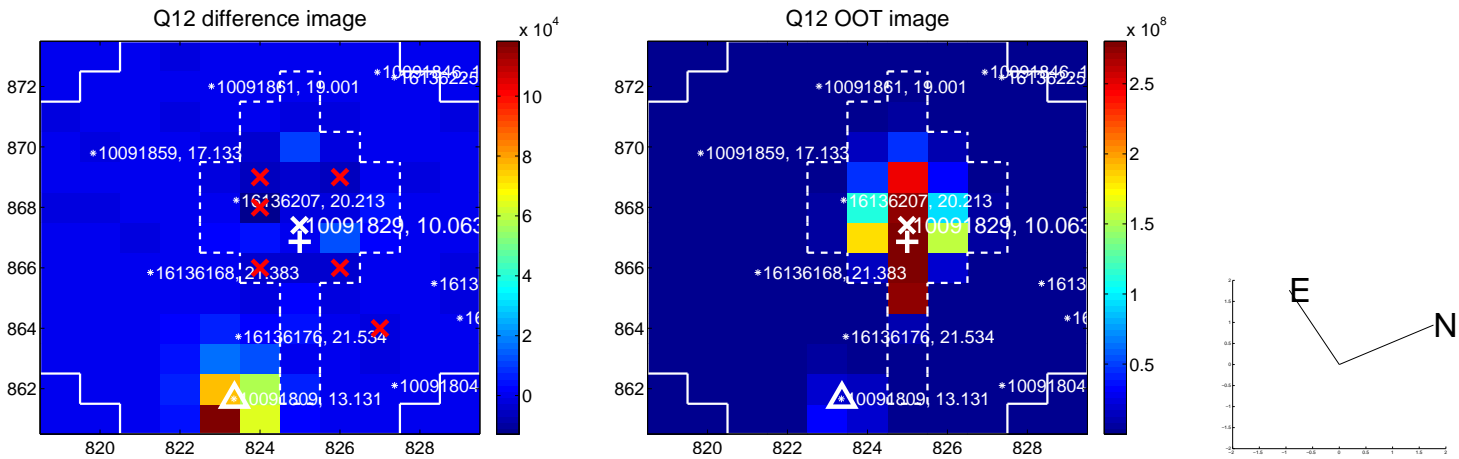
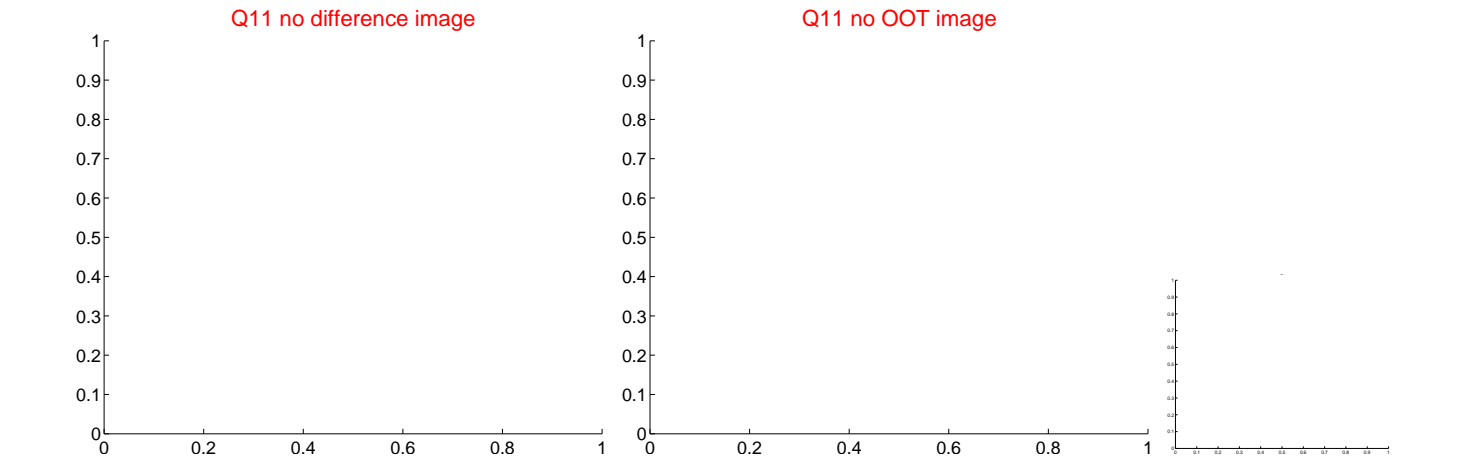
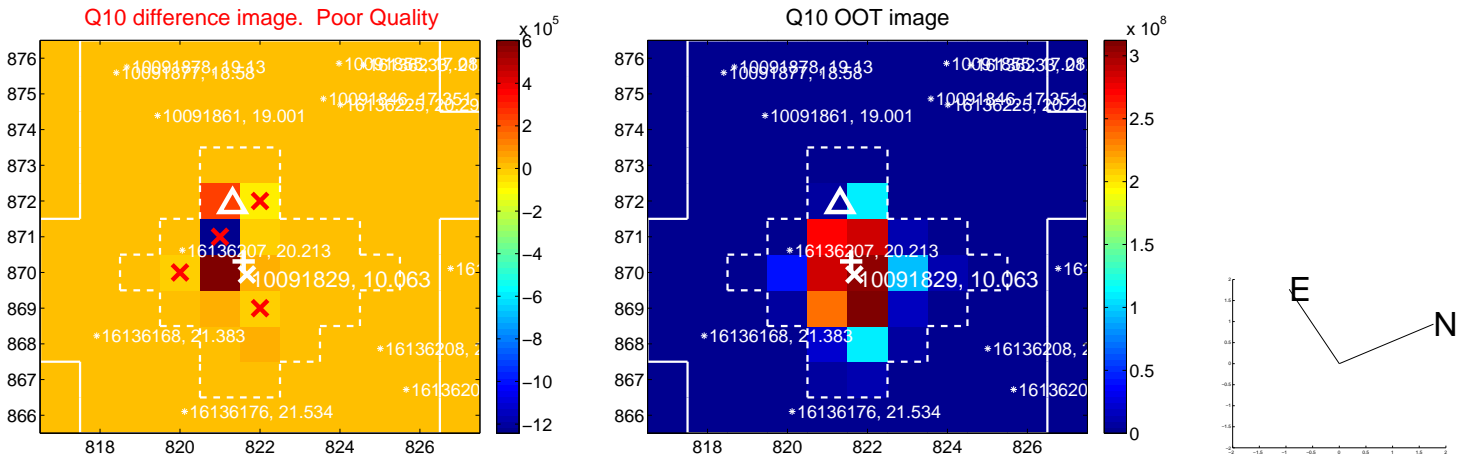
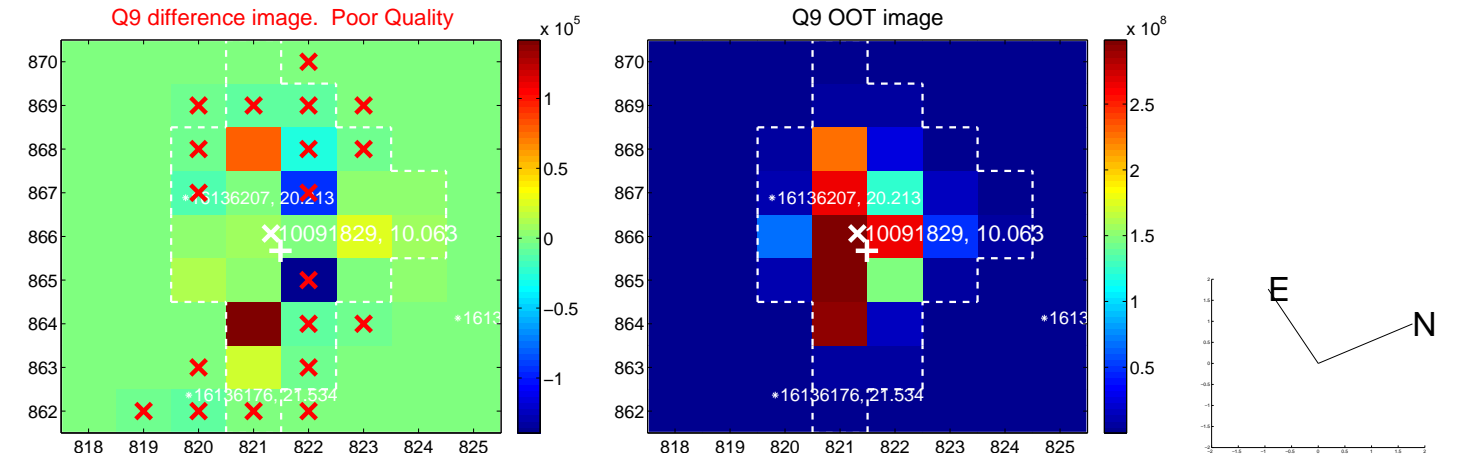
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



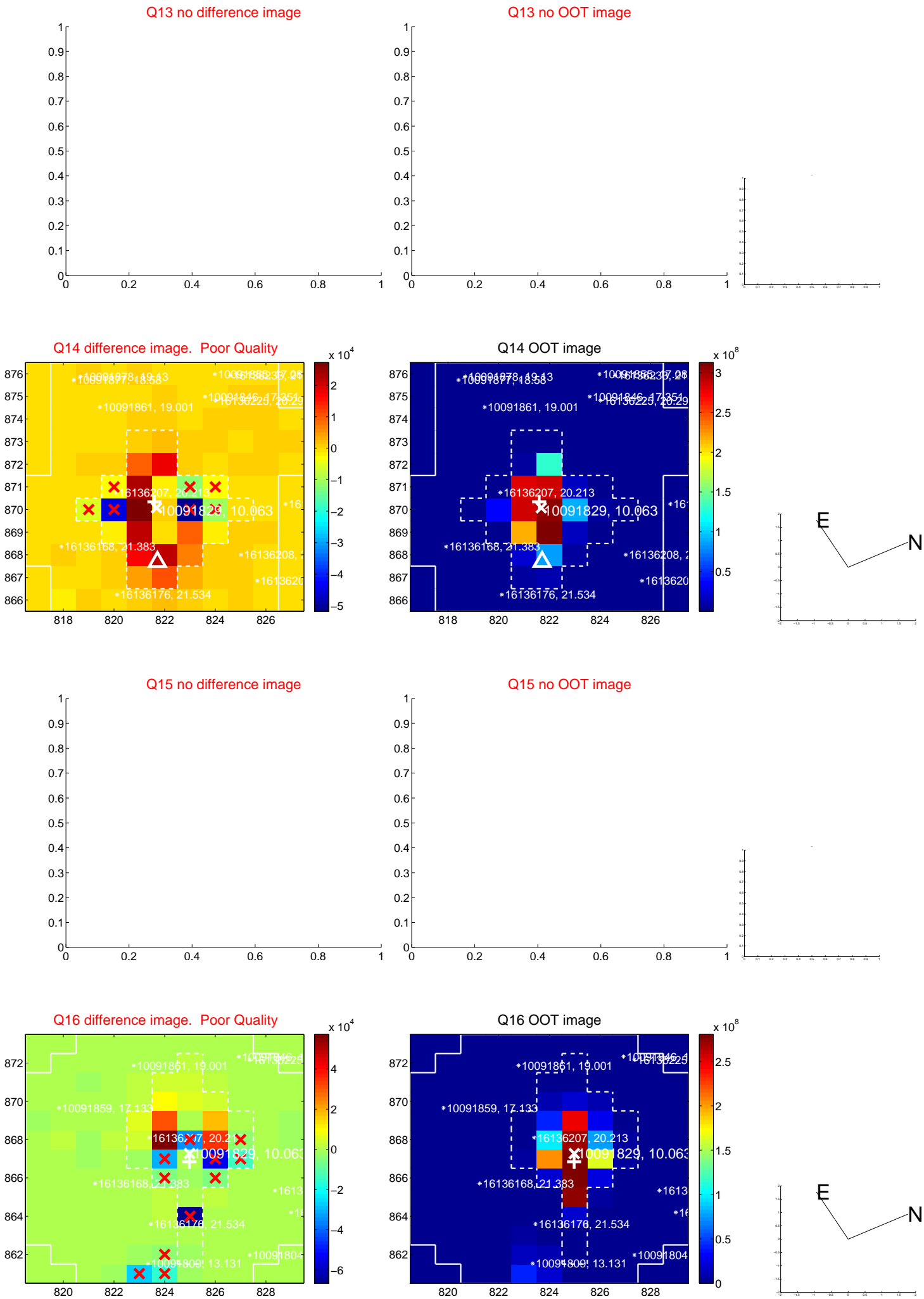
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



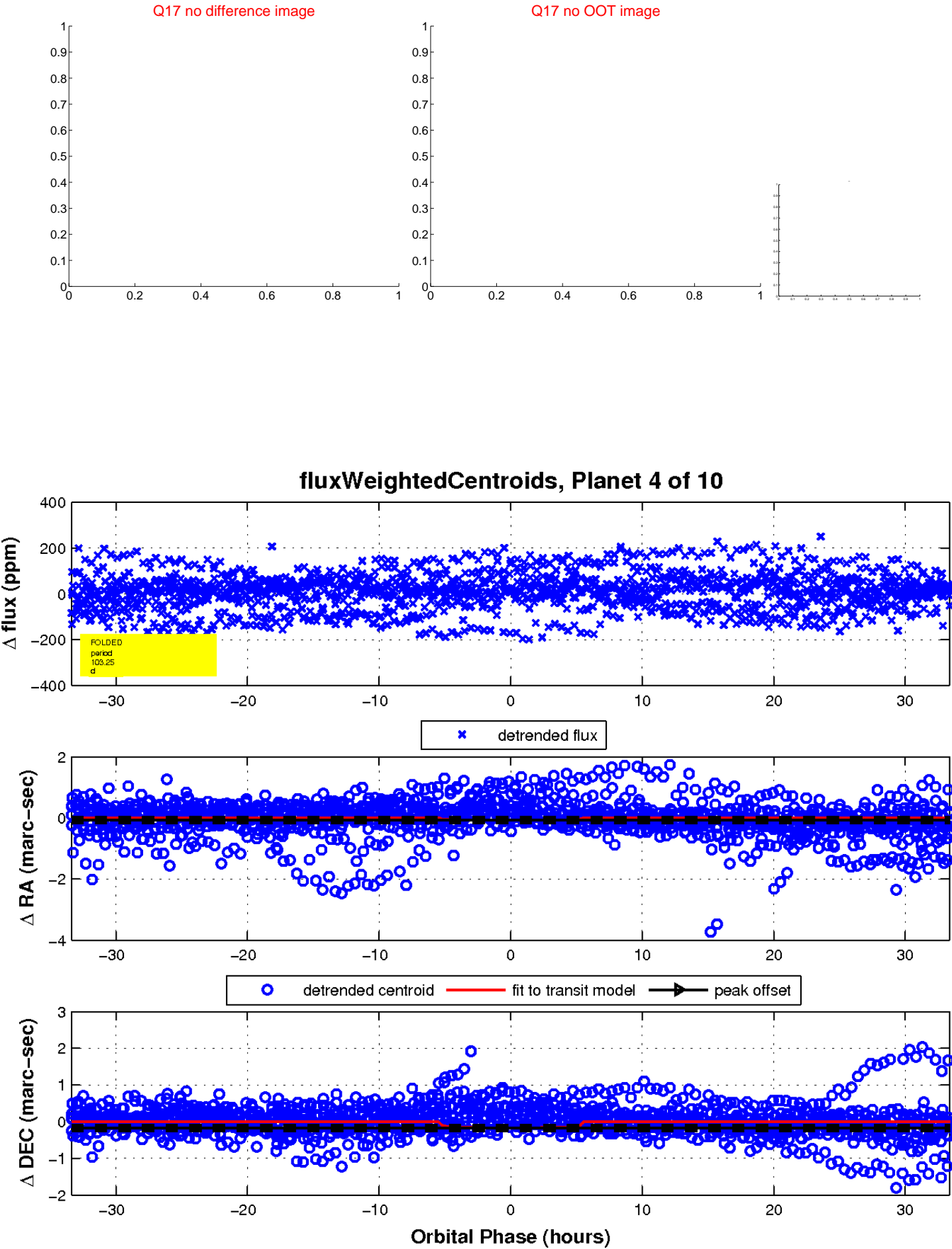
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

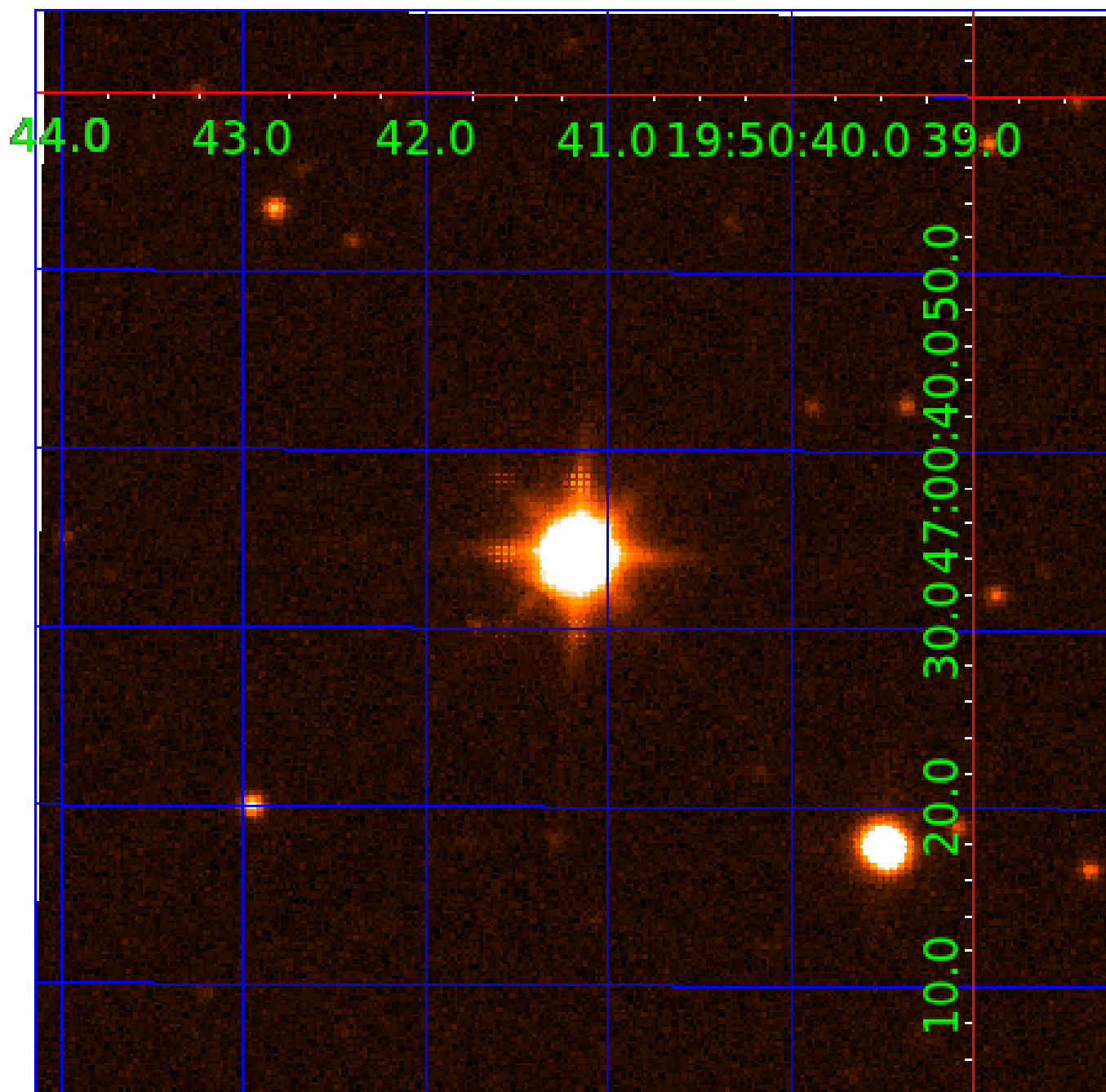


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010091829

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010091829-01	OBS	No	2.685897	132.966276	9.3	17.710	13.4	10.7	2.48	7751	0.77	8802.86
010091829-02	OBS	No	51.150813	150.403921	75.0	13.637	23.3	11.1	2.48	7751	2.61	173.09
010091829-04	OBS	No	103.251385	212.511369	77.6	11.125	15.0	10.7	2.48	7751	2.46	67.85
010091829-05	OBS	No	39.721348	158.143016	55.9	7.274	14.0	8.1	2.48	7751	2.12	242.50
010091829-06	OBS	No	97.893326	213.505551	72.2	12.046	12.5	8.2	2.48	7751	2.22	72.85
010091829-07	OBS	No	185.242008	174.661147	75.4	15.466	13.6	8.8	2.48	7751	2.54	31.12
010091829-08	OBS	No	144.806501	226.139993	476.4	66.191	10.9	9.9	2.48	7751	6.89	43.22
010091829-09	OBS	No	123.726523	248.998906	51.2	12.172	9.0	7.0	2.48	7751	2.05	53.31
010091829-10	OBS	No	15.454682	141.232200	49.5	3.861	7.4	8.1	2.48	7751	2.01	853.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010091829-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
010091829-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
010091829-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED
010091829-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010091829-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

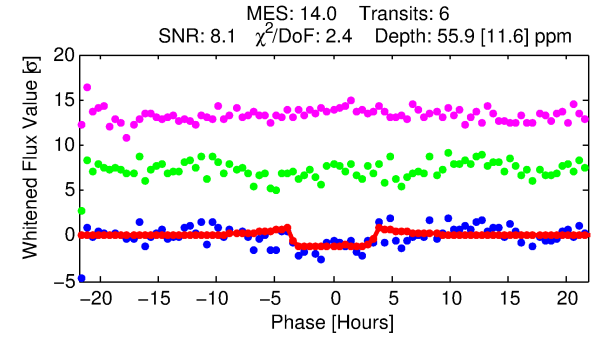
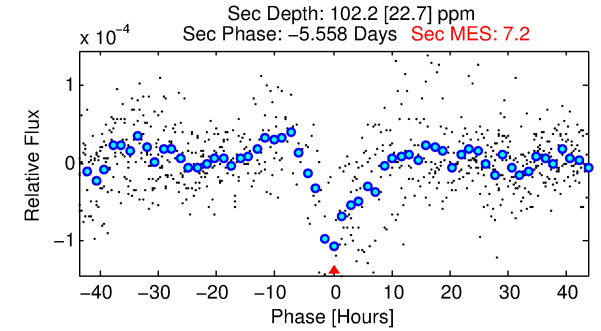
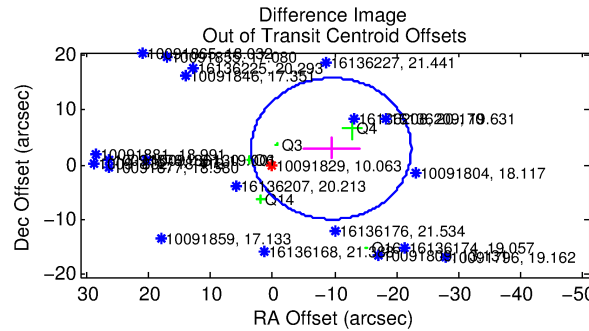
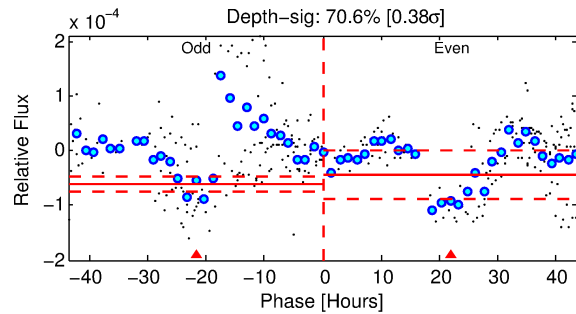
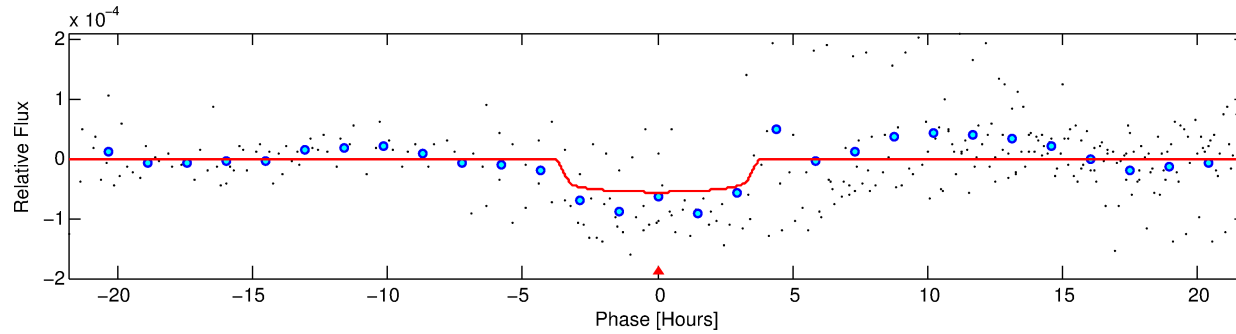
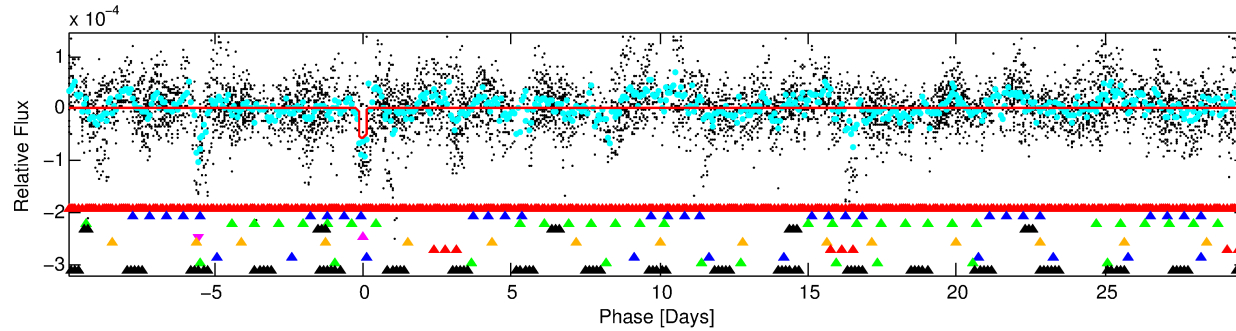
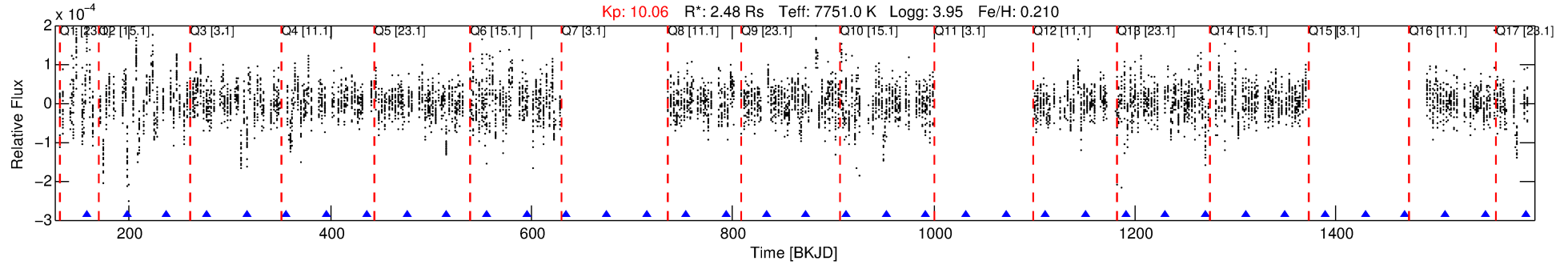
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010091829-05

No Significant Match Found

# DV One-Page Summary

KIC: 10091829 Candidate: 5 of 10 Period: 39.721 d



## DV Fit Results:

Period = 39.72135 [0.00083] d  
Epoch = 158.1430 [0.0124] BKJD  
Rp/R\* = 0.0078 [0.0032]  
a/R\* = 20.56 [49.64]  
b = 0.88 [0.62]  
Seff = 242.50 [60.19]  
Teq = 1006 [62] K  
Rp = 2.12 [0.94] Re  
a = 0.2865 [0.0462] AU  
Ag = 1026.52 [894.49] [1.15σ]  
Teffp = 8806 [1844] K [4.23σ]

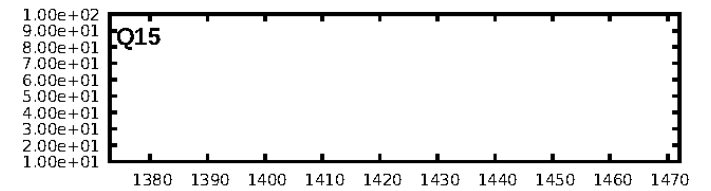
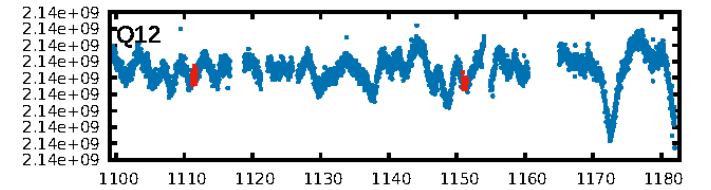
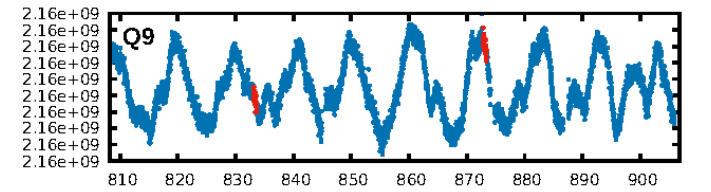
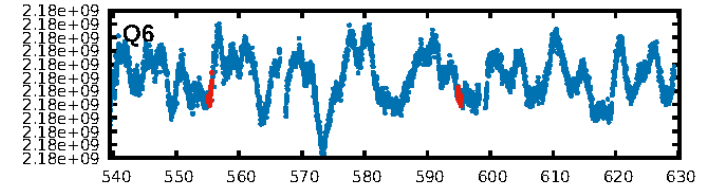
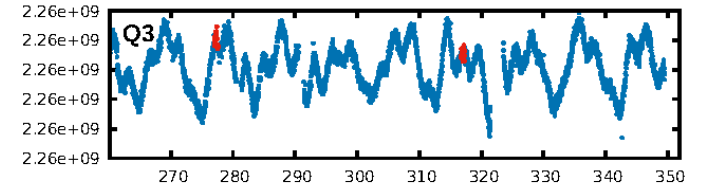
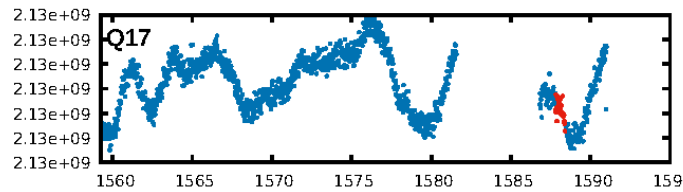
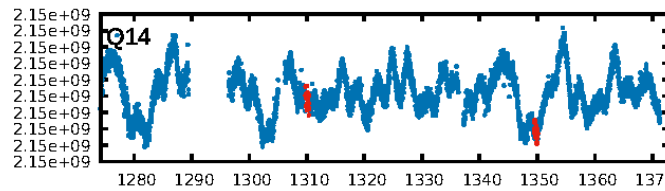
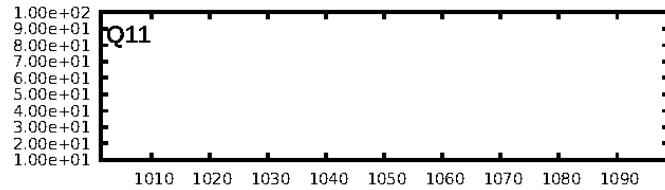
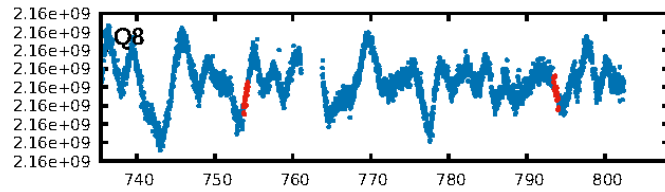
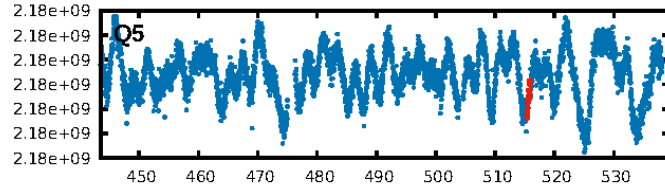
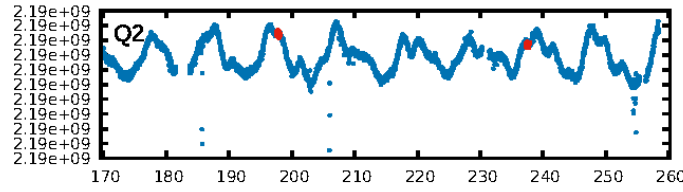
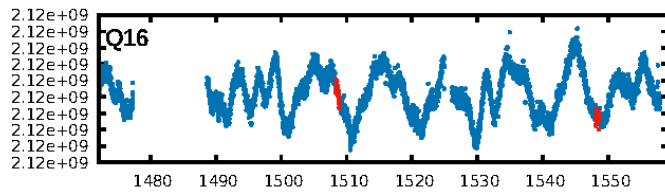
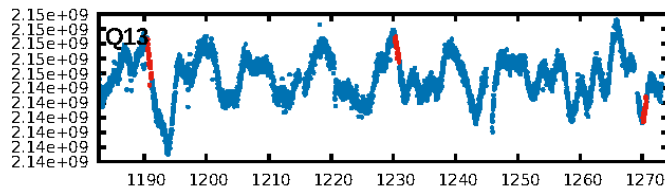
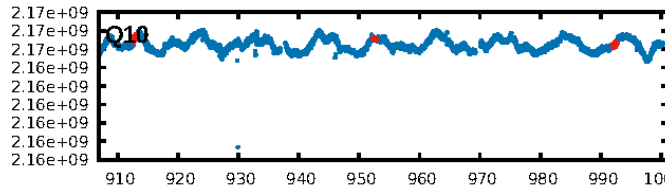
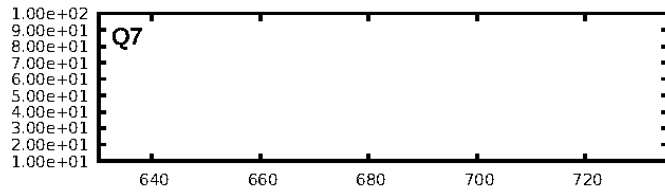
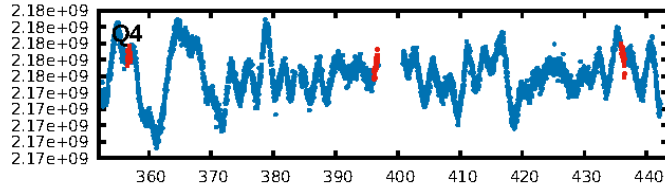
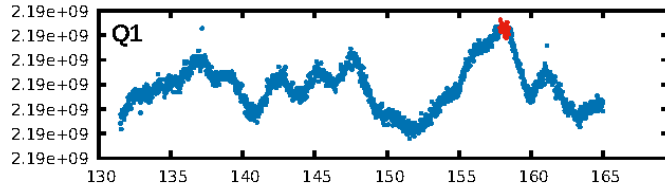
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [70.72σ]  
LongPeriod-sig: 100.0% [5.33σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 91.7%  
Bootstrap-pfa: 1.31e-19  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 21.4%  
Centroid-so: 0.556 arcsec [0.51σ]  
OotOffset-rm: 9.943 arcsec [2.32σ]  
OotOffset-st: 2/1/2/0 [5]  
KicOffset-rm: 2.471 arcsec [0.79σ]  
KicOffset-st: 2/1/2/0 [5]  
DiffImageQuality-fgm: 0.00 [0/5]  
DiffImageOverlap-fno: 0.38 [5/13]

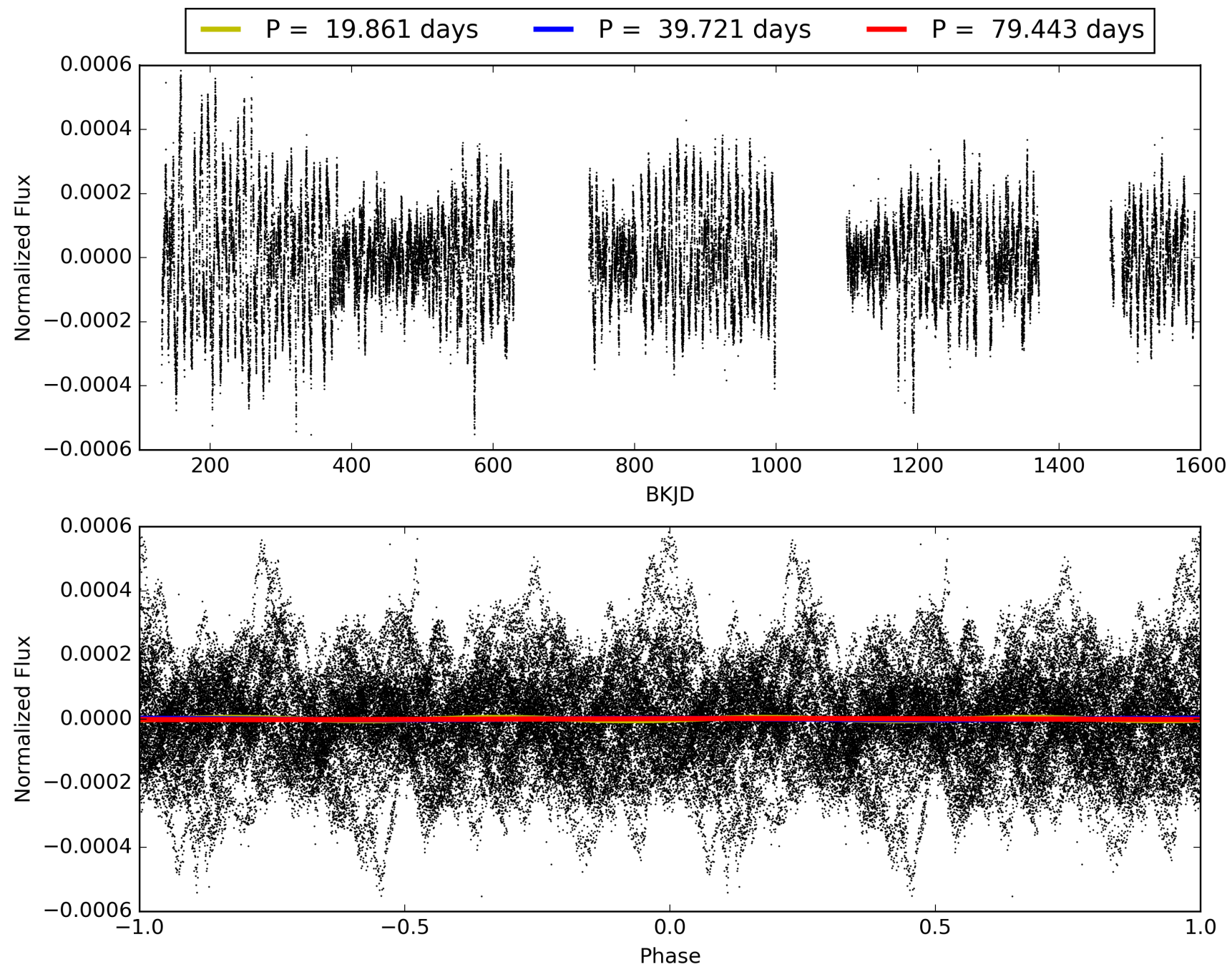
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:11:00 Z

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

# TCE 010091829-05, PDC Light Curves

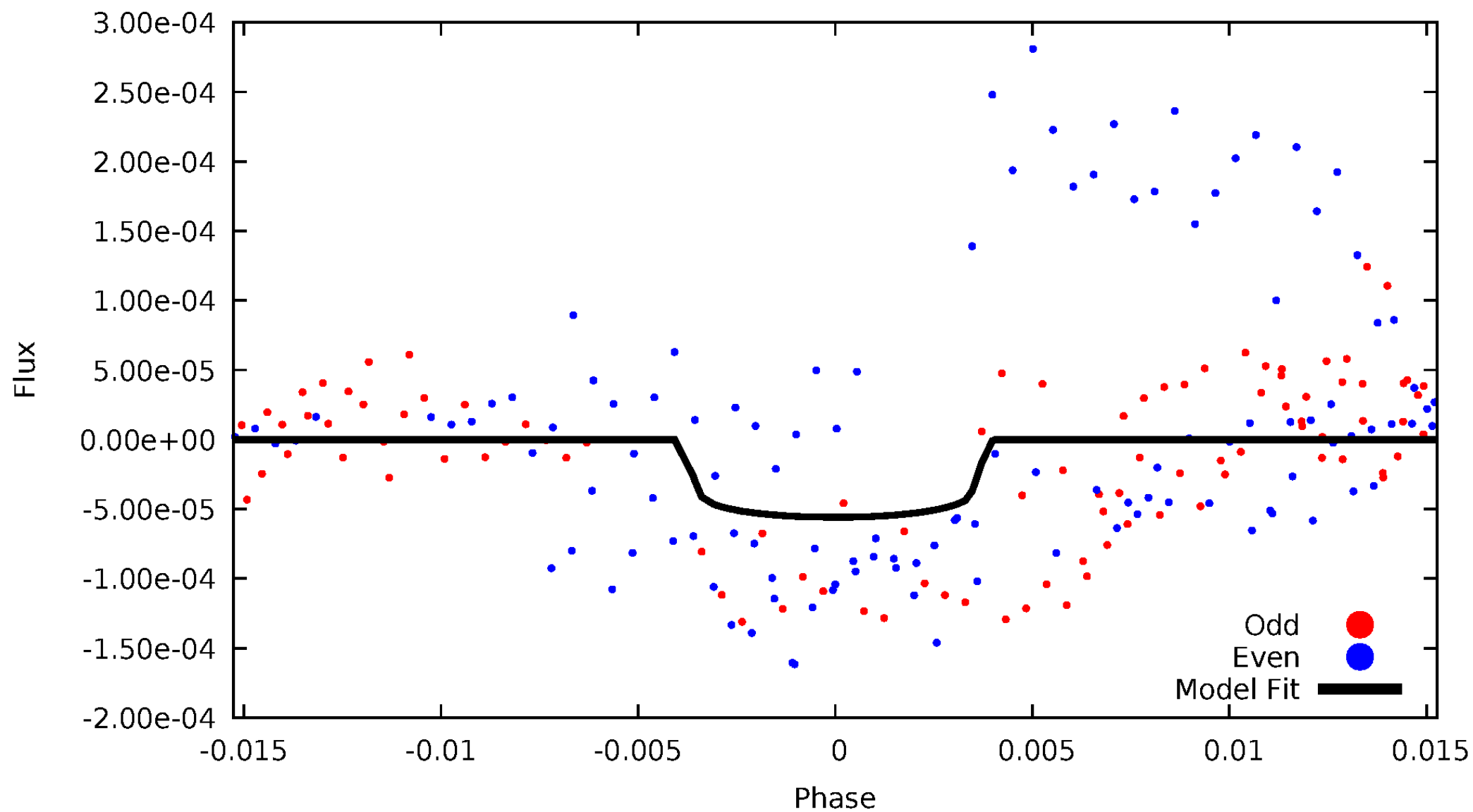


TCE 010091829-05



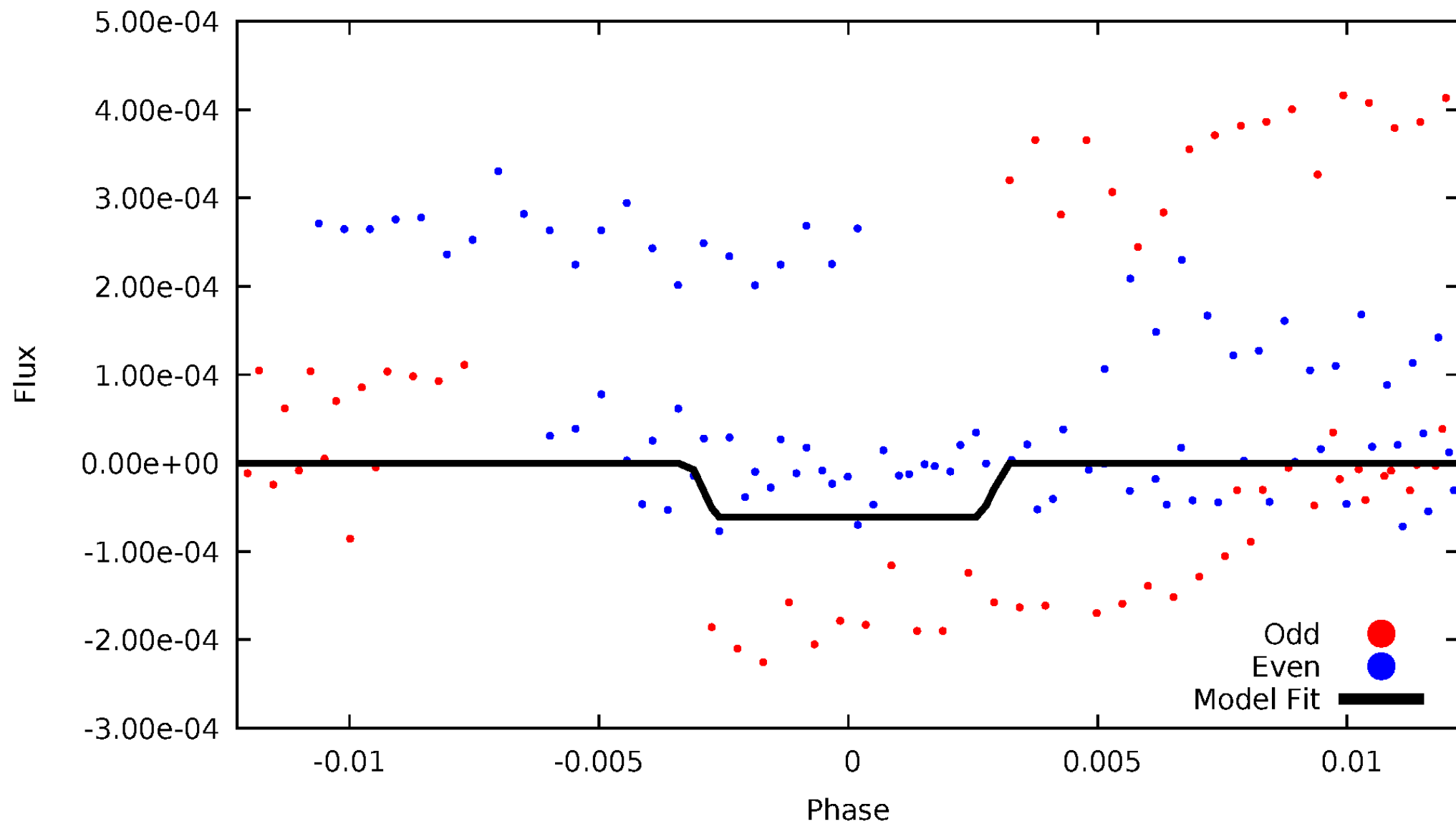
# DV Odd/Even

TCE 010091829-05



# ALT Odd/Even

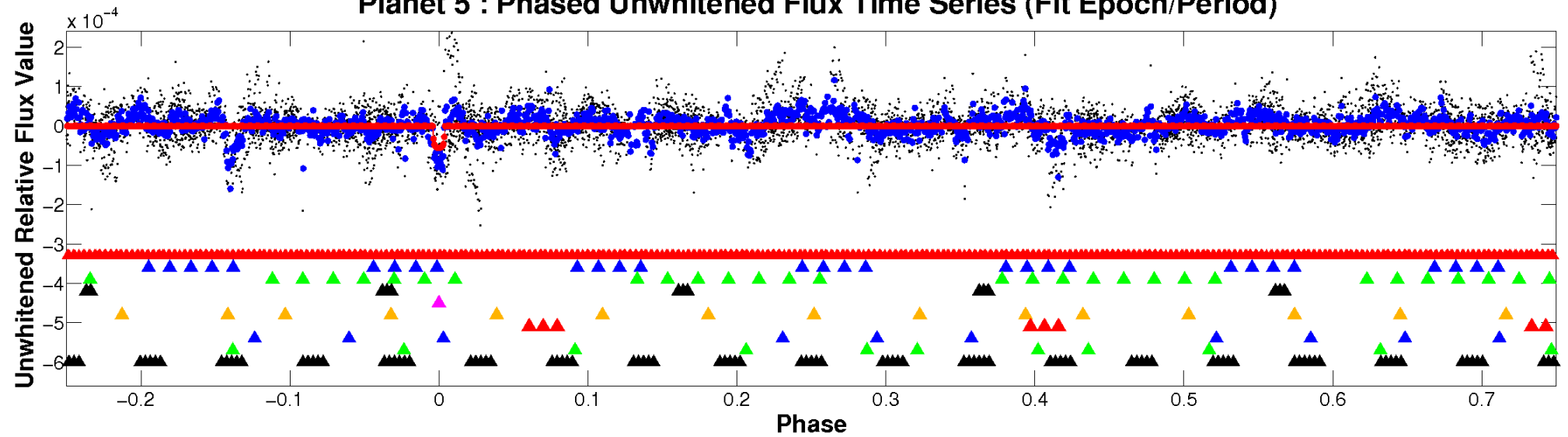
TCE 010091829-05



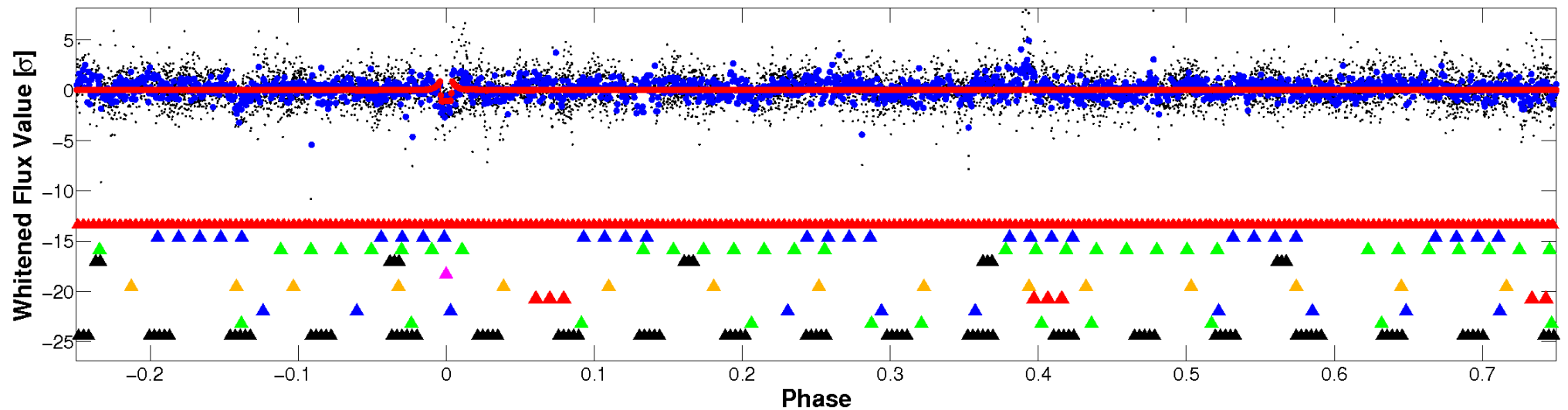


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

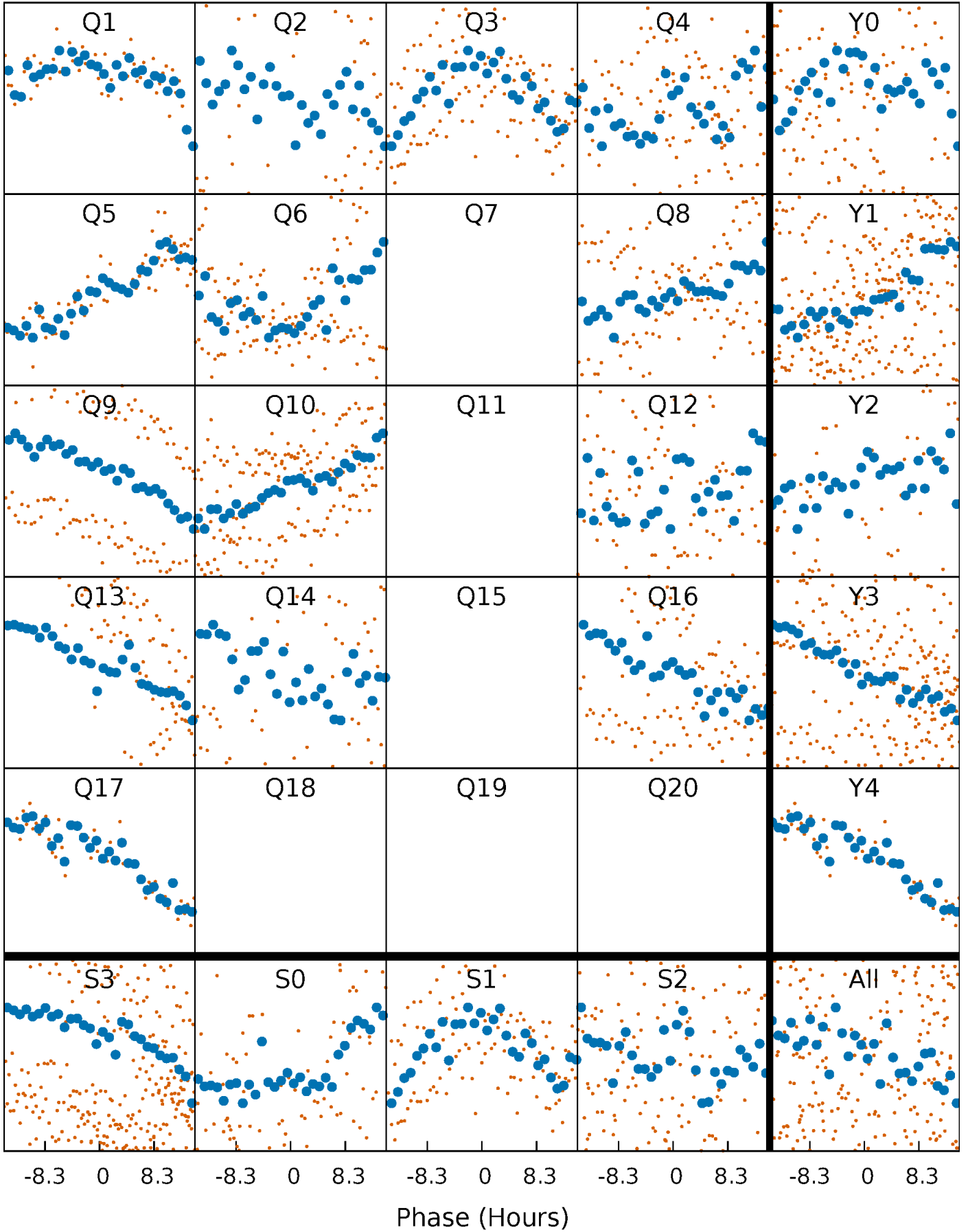


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



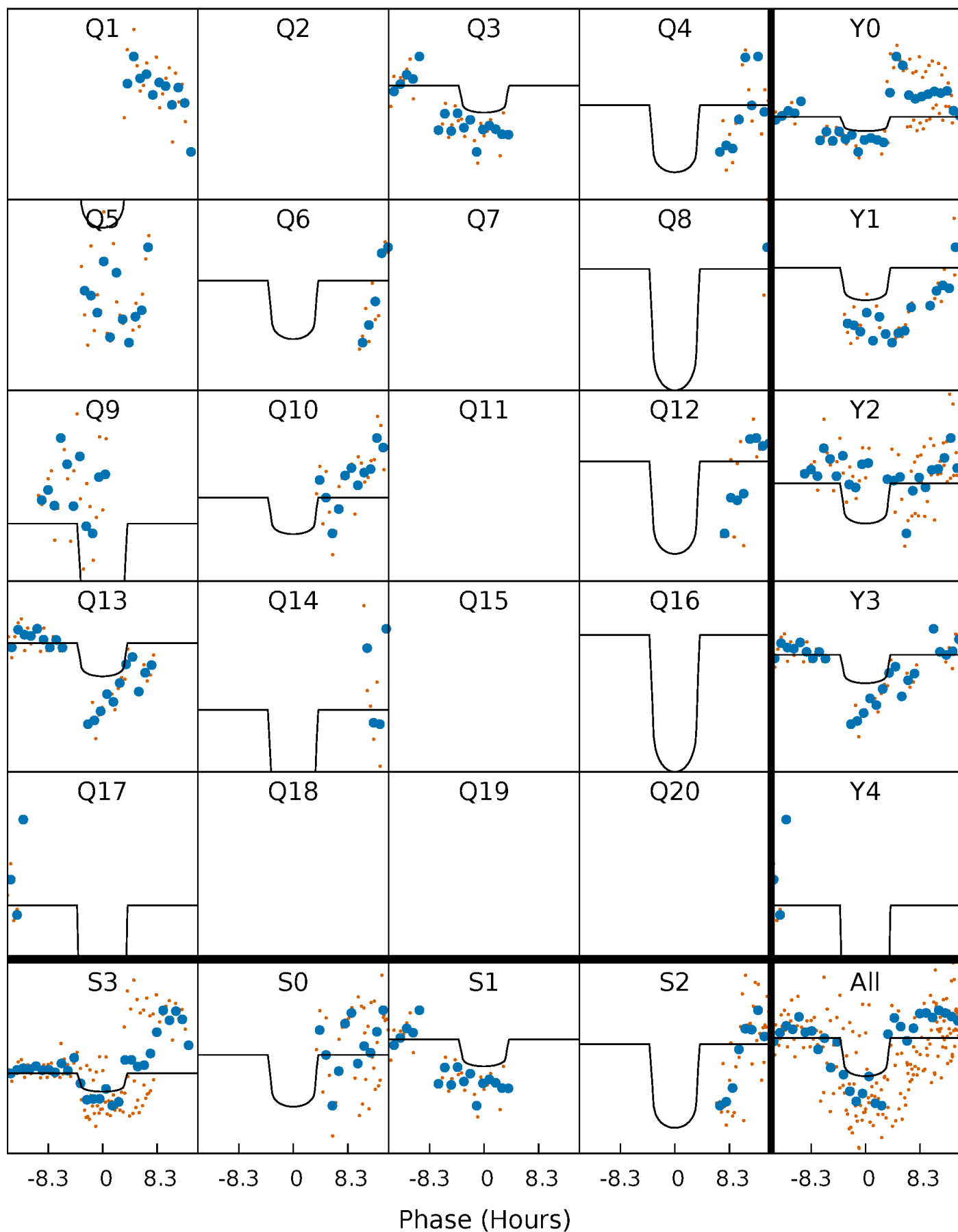
# PDC Quarter-Phased Transit Curves

TCE 010091829-05   P= 39.721348 Days    $T_0=158.143016$  (BKJD)



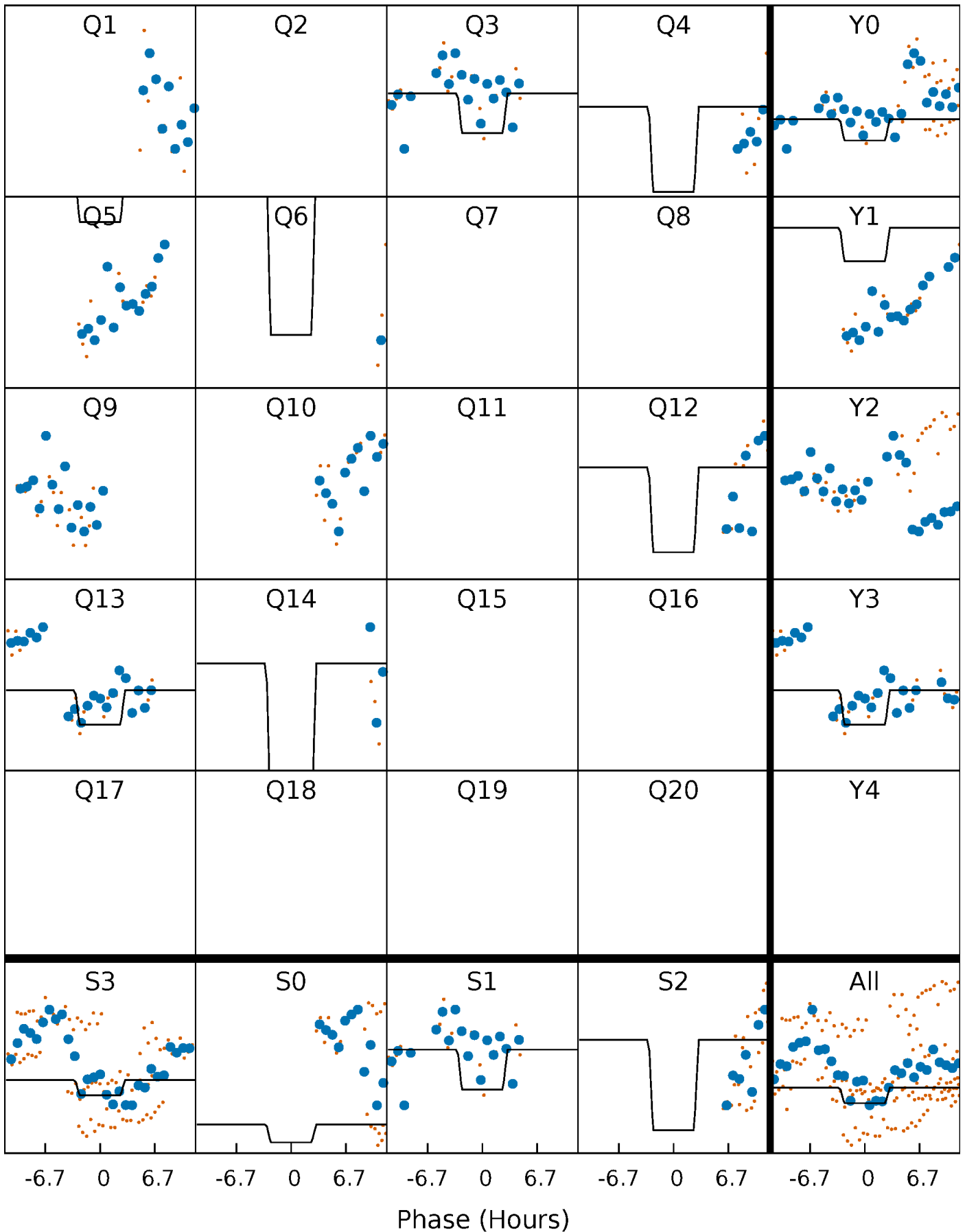
# DV Quarter-Phased Transit Curves

TCE 010091829-05   P= 39.721348 Days    $T_0=158.143016$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

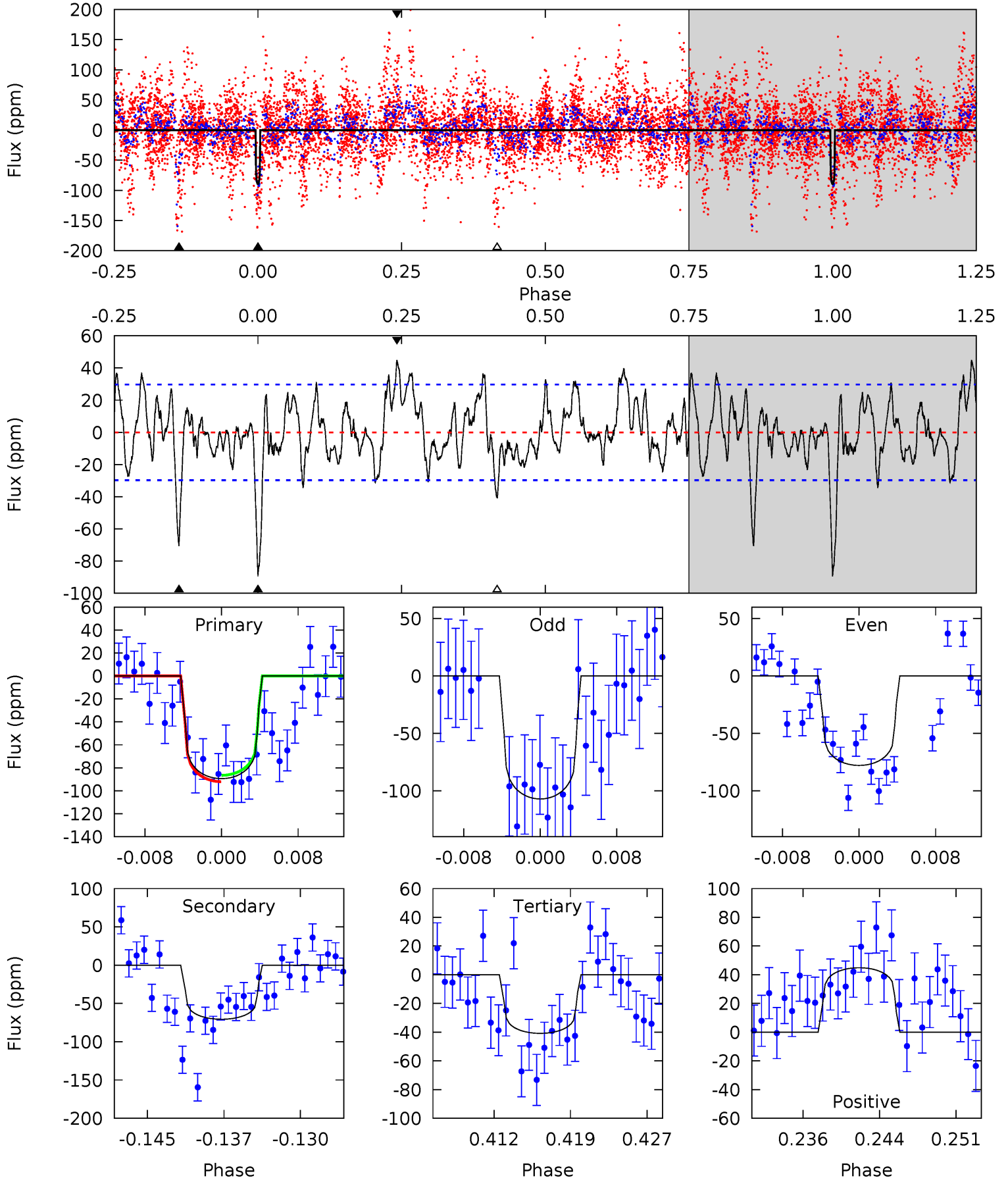
TCE 010091829-05     $P = 39.725846$  Days     $T_0 = 158.076646$  (BKJD)



# DV Model-Shift Uniqueness Test

010091829-05, P = 39.721348 Days, E = 118.421668 Days

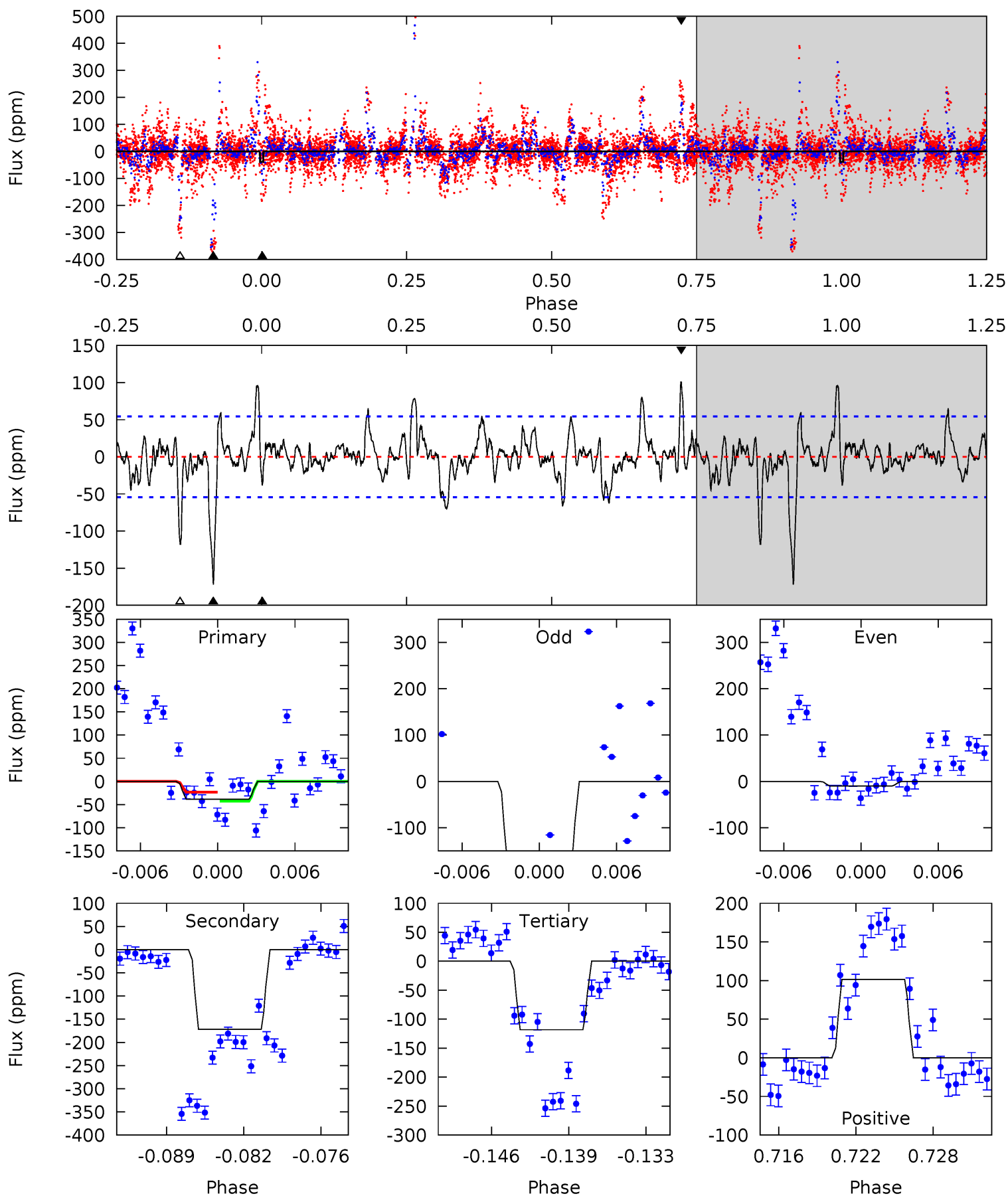
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.3	12.1	6.97	7.66	5.08	2.67	2.63	8.29	7.60	5.08	4.39	2.37	0.18	0.33	0.47



# Alt Model-Shift Uniqueness Test

010091829-05, P = 39.725846 Days, E = 118.350800 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
3.64	16.2	11.1	9.55	5.11	2.73	2.02	-7.49	-5.92	5.06	6.63	7.96	-1.12	0.37	0.90



### Stellar Parameters For KIC 010091829

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7751^{+85}_{-77}$	$3.947^{+0.138}_{-0.092}$	$0.210^{+0.200}_{-0.200}$	$2.481^{+0.371}_{-0.453}$	$1.986^{+0.166}_{-0.185}$	$0.183^{+0.123}_{-0.053}$
	+1%/-1%	+3%/-2%	+95%/-95%	+15%/-18%	+8%/-9%	+67%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 010091829-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-71 \pm 6$	$2.03^{+0.89}_{-0.83}$	$1400^{+60}_{-66}$	$8229^{+3686}_{-1519}$	$760^{+1457}_{-393}$
Alt.	$-172 \pm 11$	$2.11^{+0.87}_{-0.84}$	$1403^{+58}_{-65}$	$10999^{+5763}_{-2374}$	$1795^{+3078}_{-926}$

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



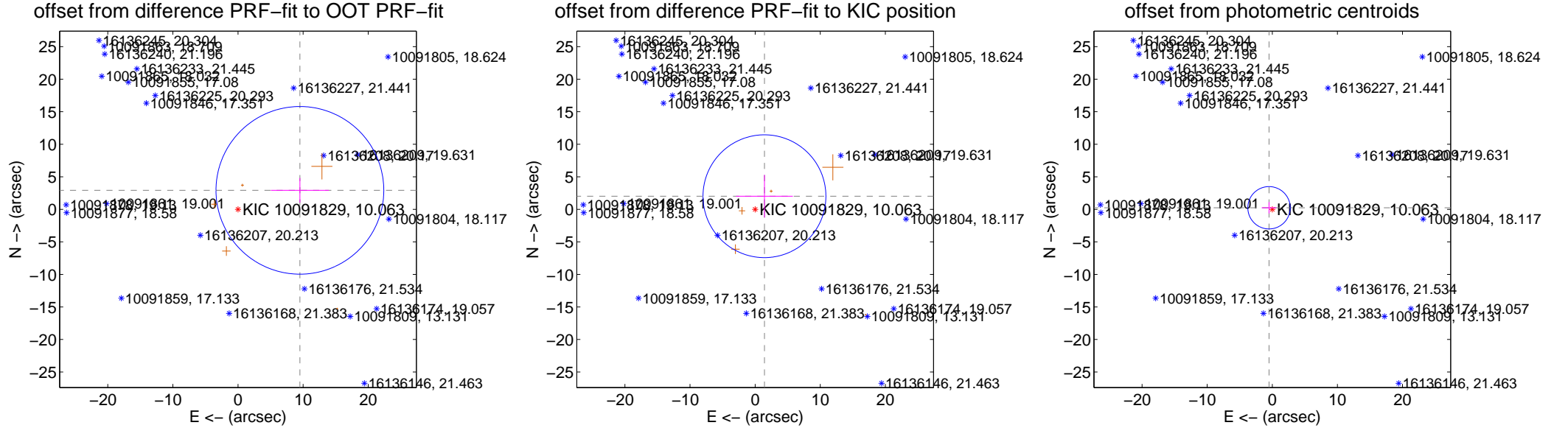
## DV Centroid Data

Supplemental centroid analysis for 010091829-05. **Kepler magnitude: 10.06.** Transit SNR 8.13

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

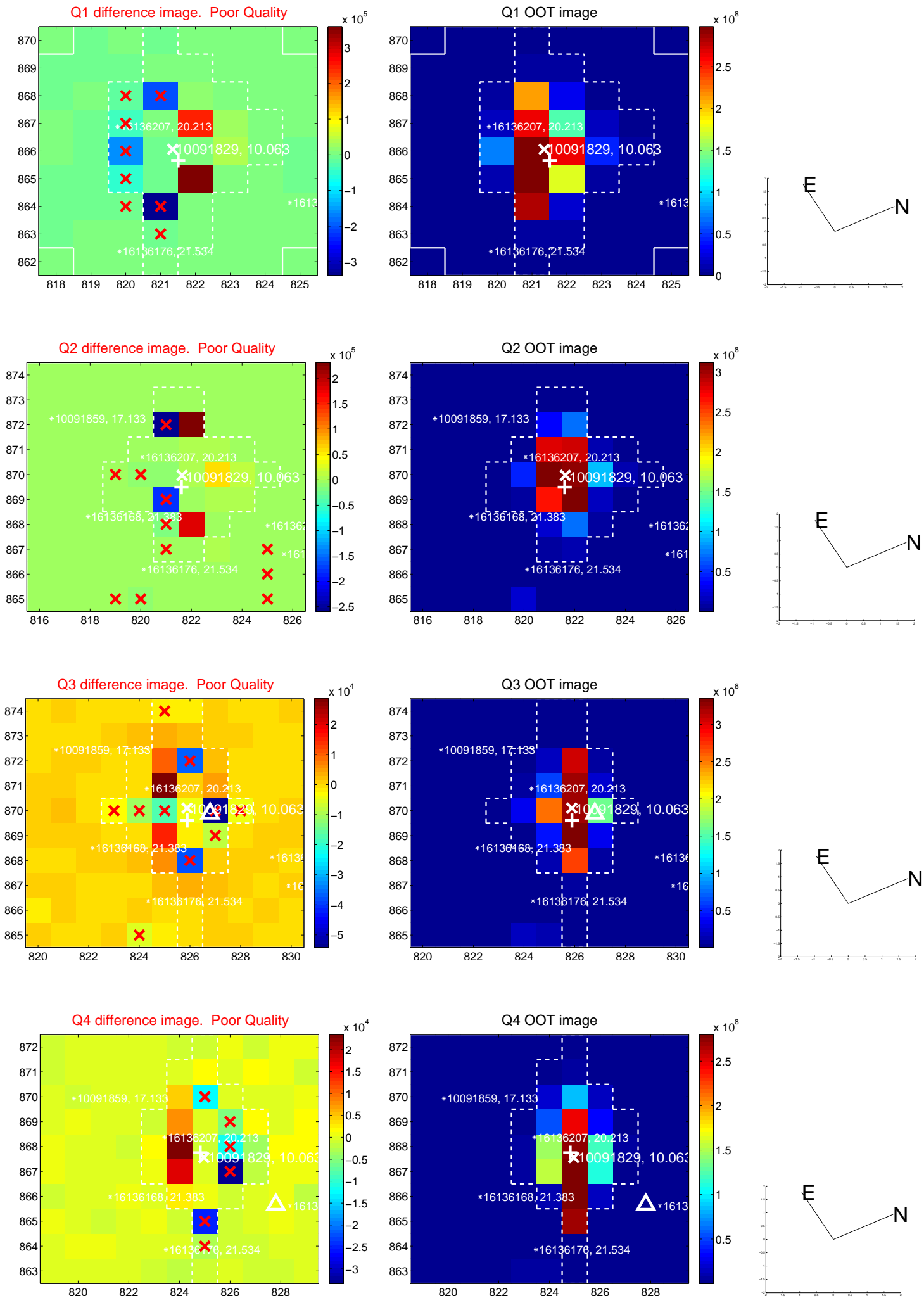
The direct PRF centroid is offset from the target star catalog position by about 2.00 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$9.943 \pm 4.294$	2.32	$-9.505 \pm 4.454$	$2.919 \pm 1.892$
PRF-fit source offset from KIC position	$2.471 \pm 3.145$	0.79	$-1.429 \pm 4.358$	$2.016 \pm 3.286$
photometric centroid source offset	$0.56 \pm 1.08$	0.51	$0.50 \pm 1.13$	$0.24 \pm 0.88$

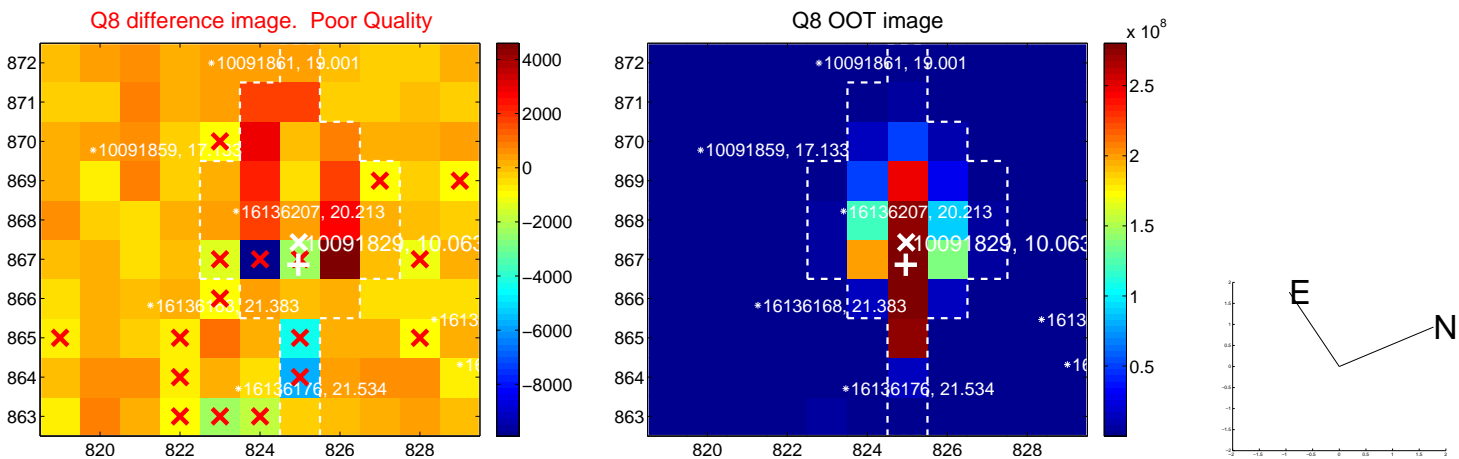
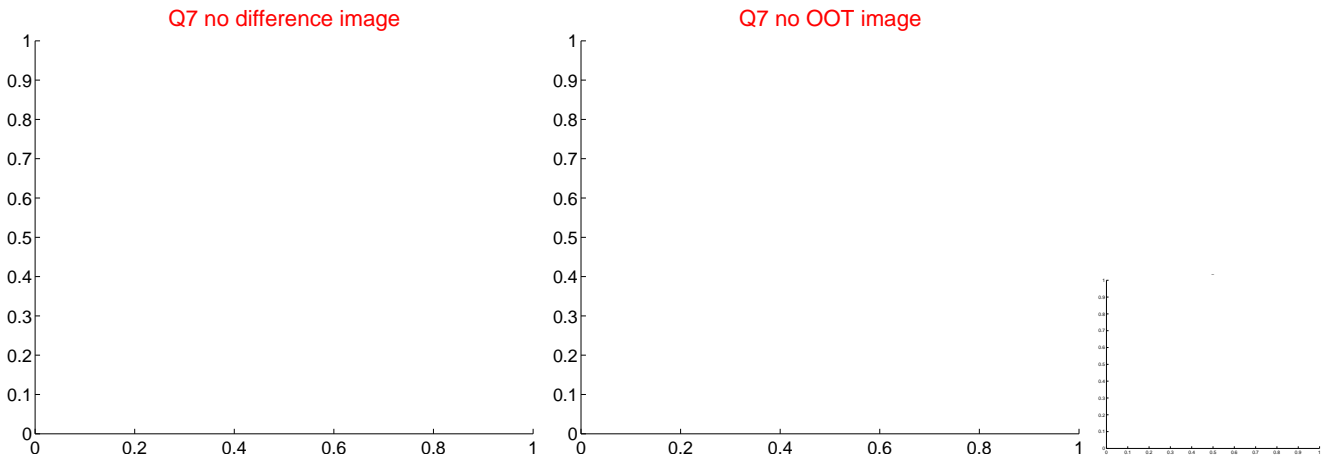
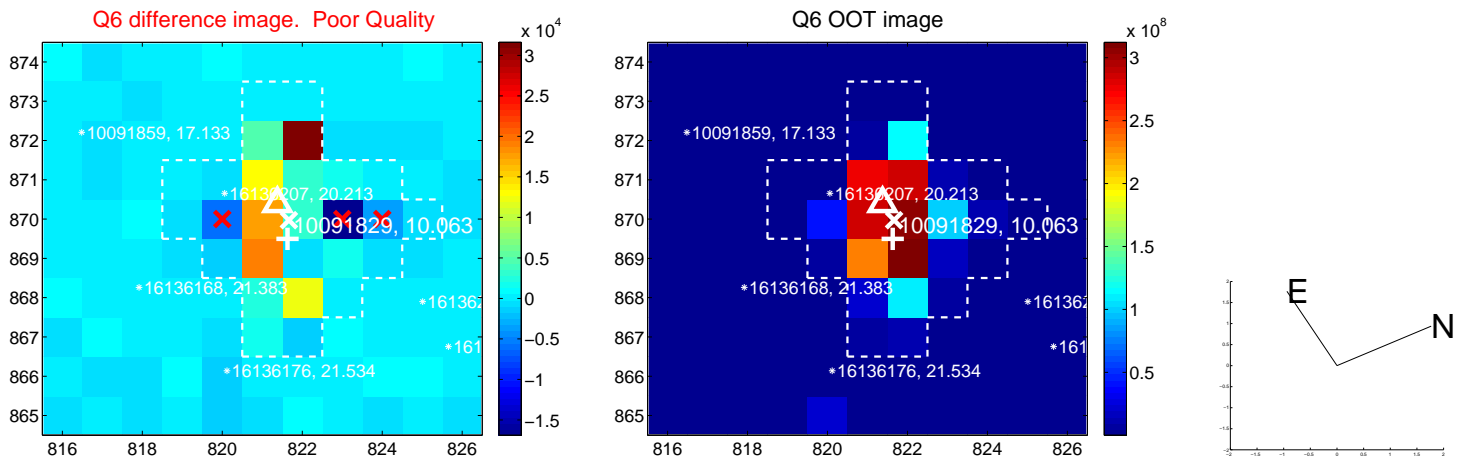
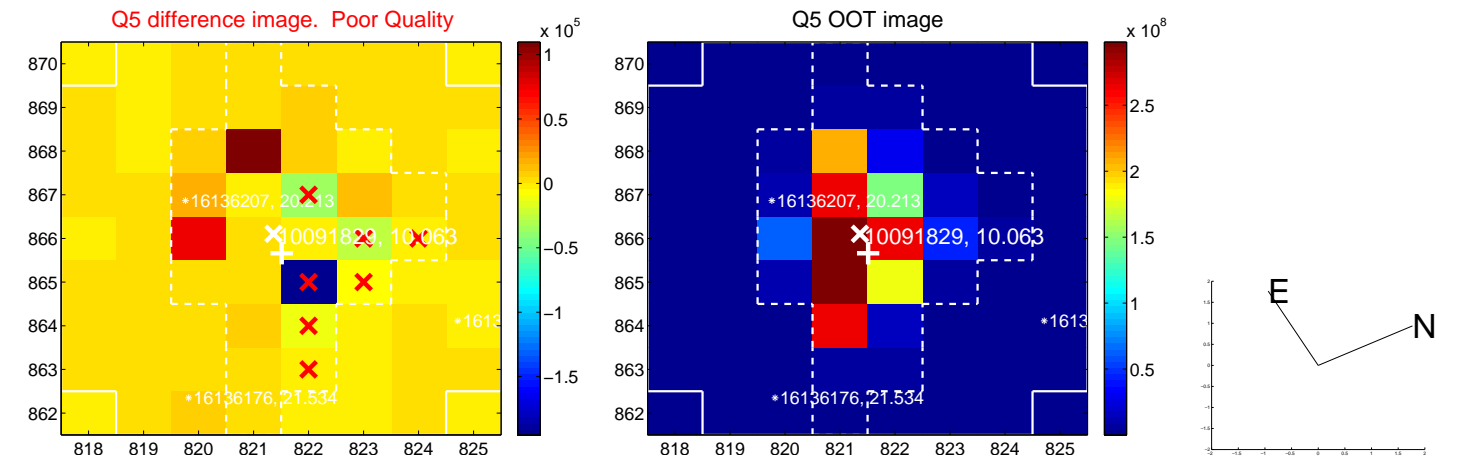


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

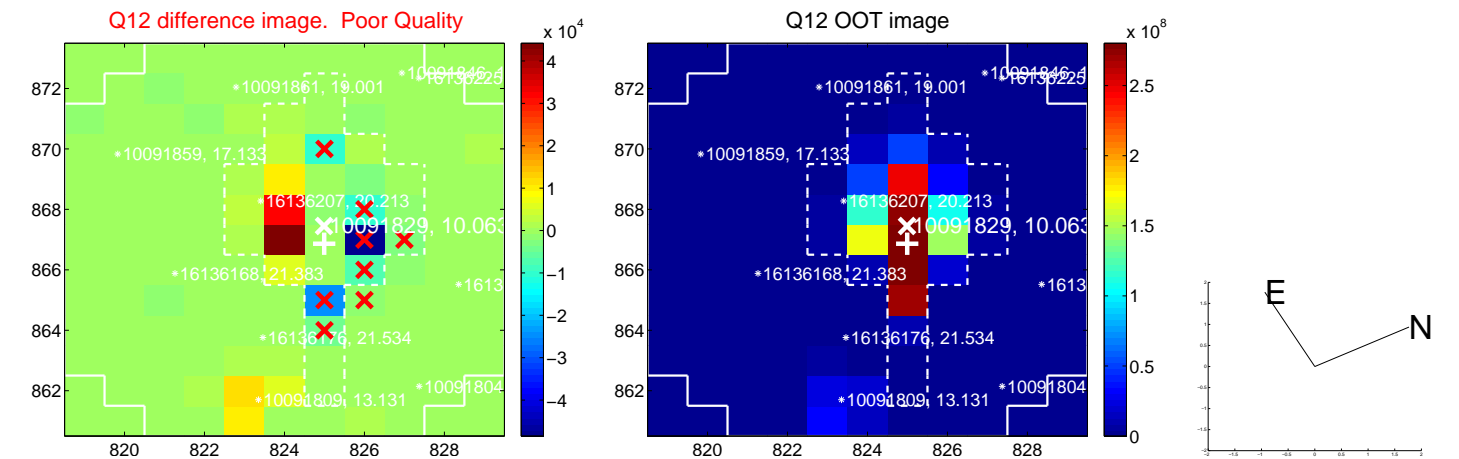
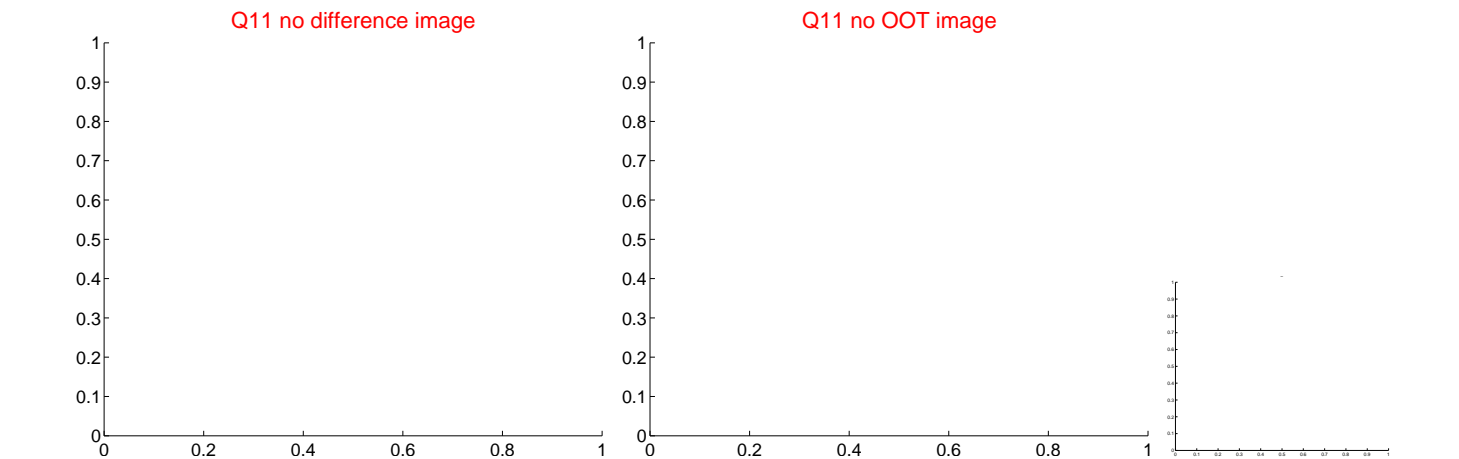
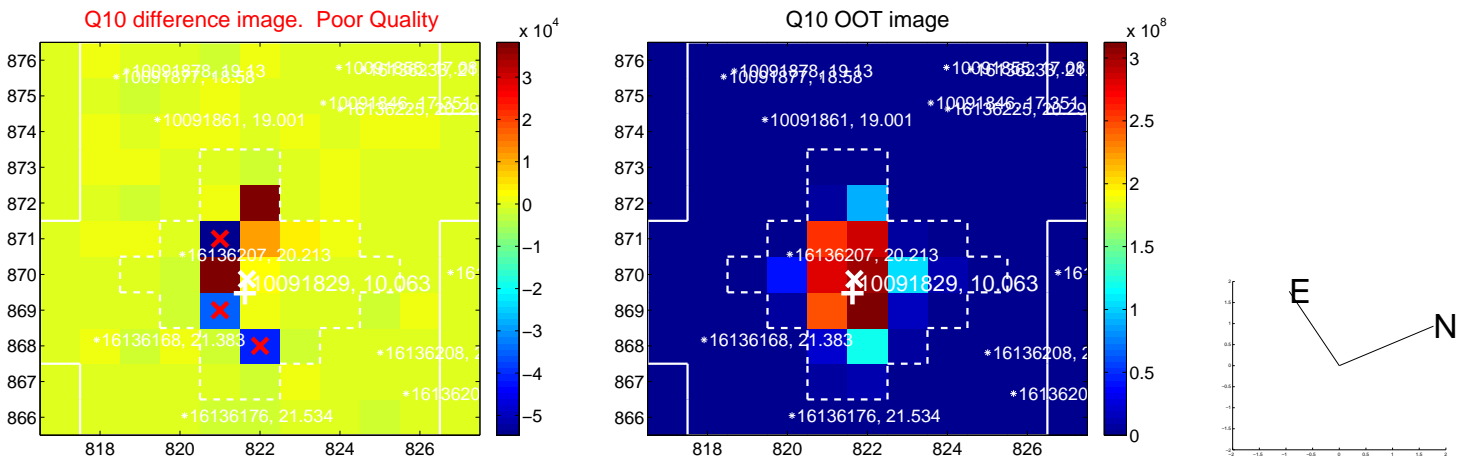
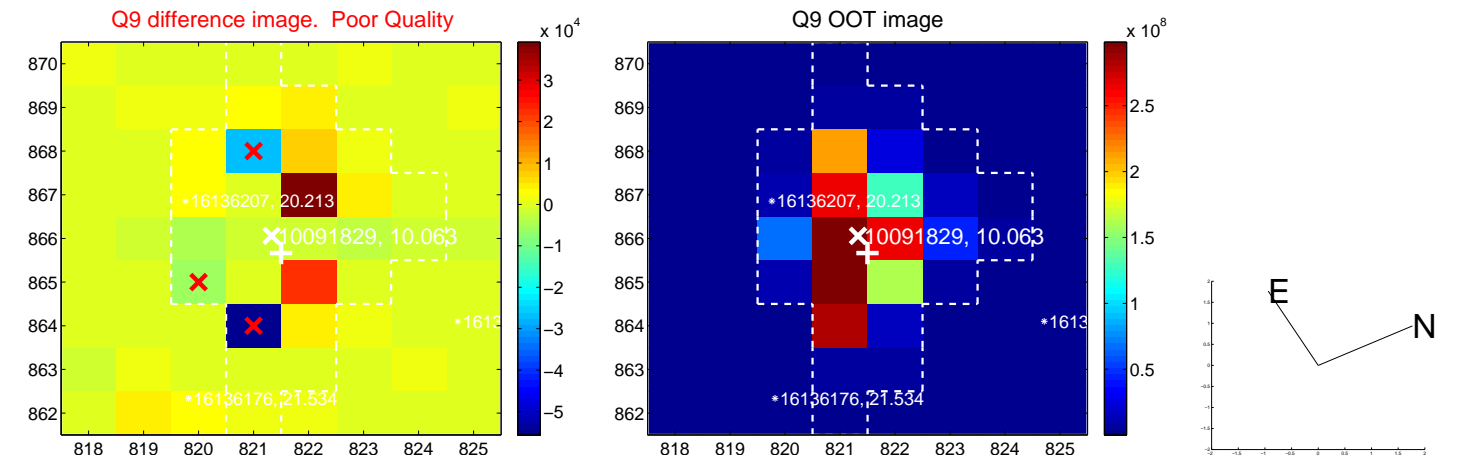
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



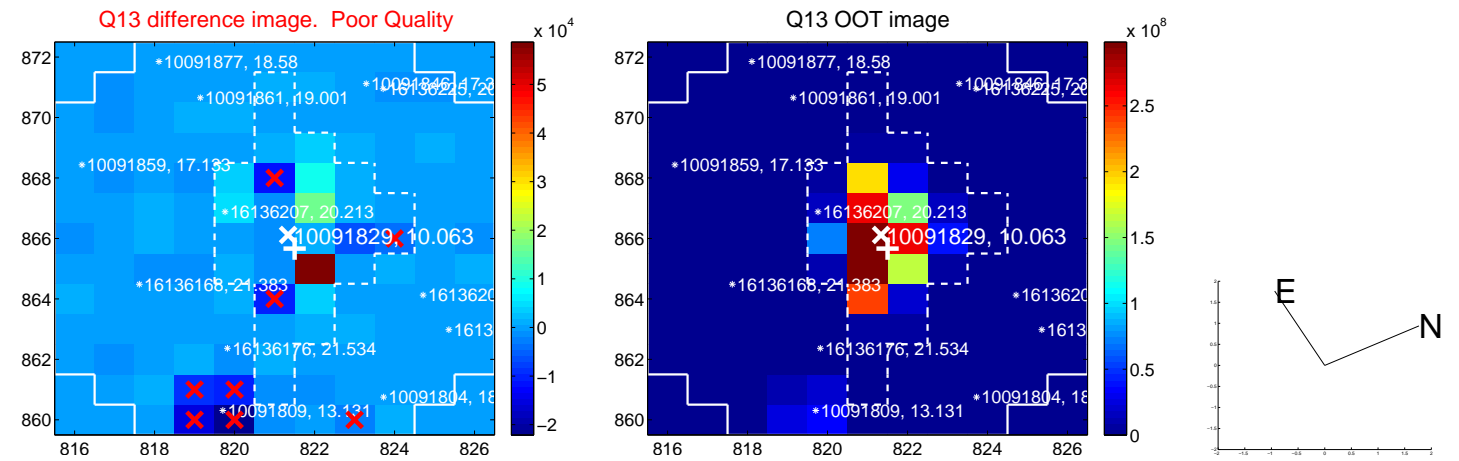
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



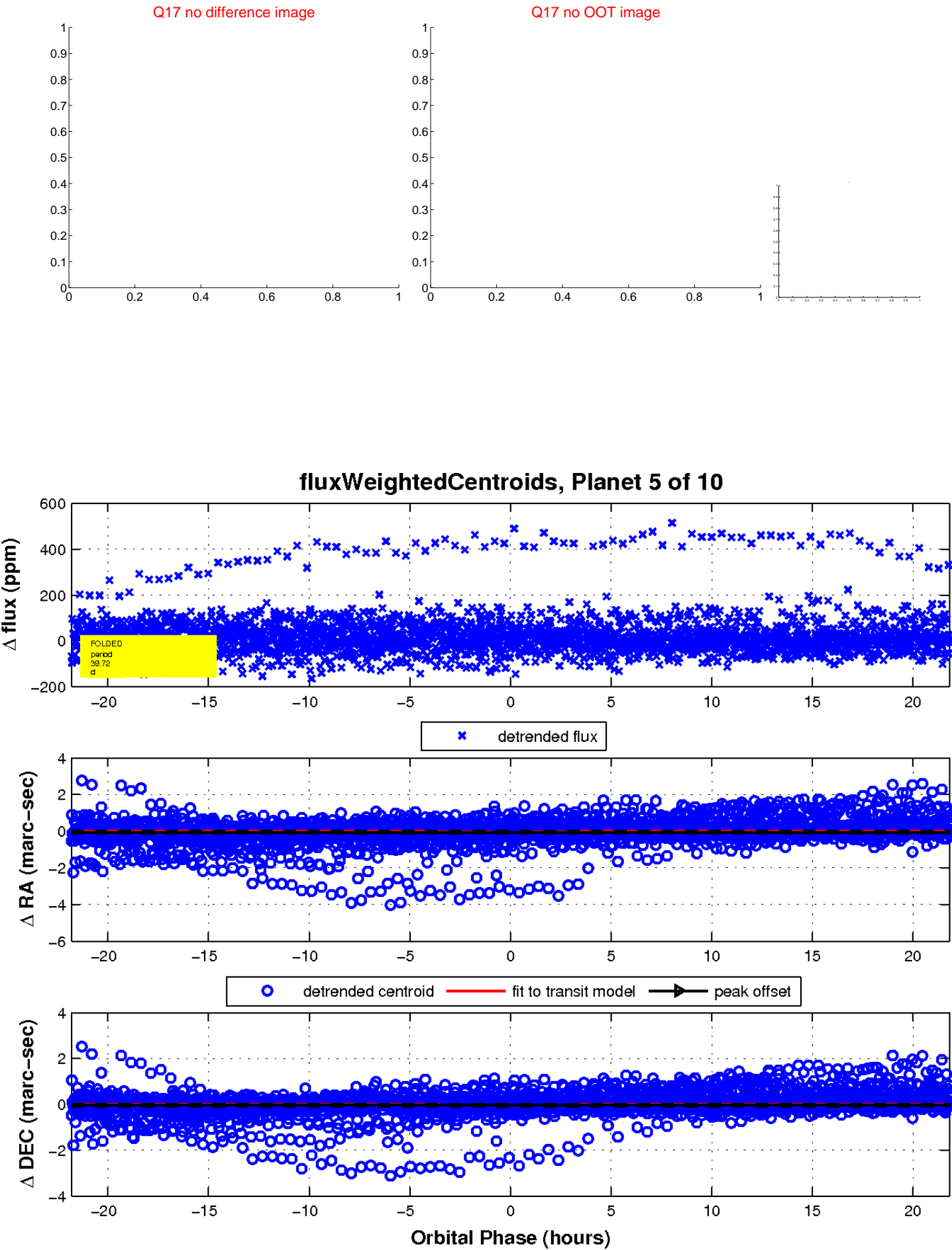
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

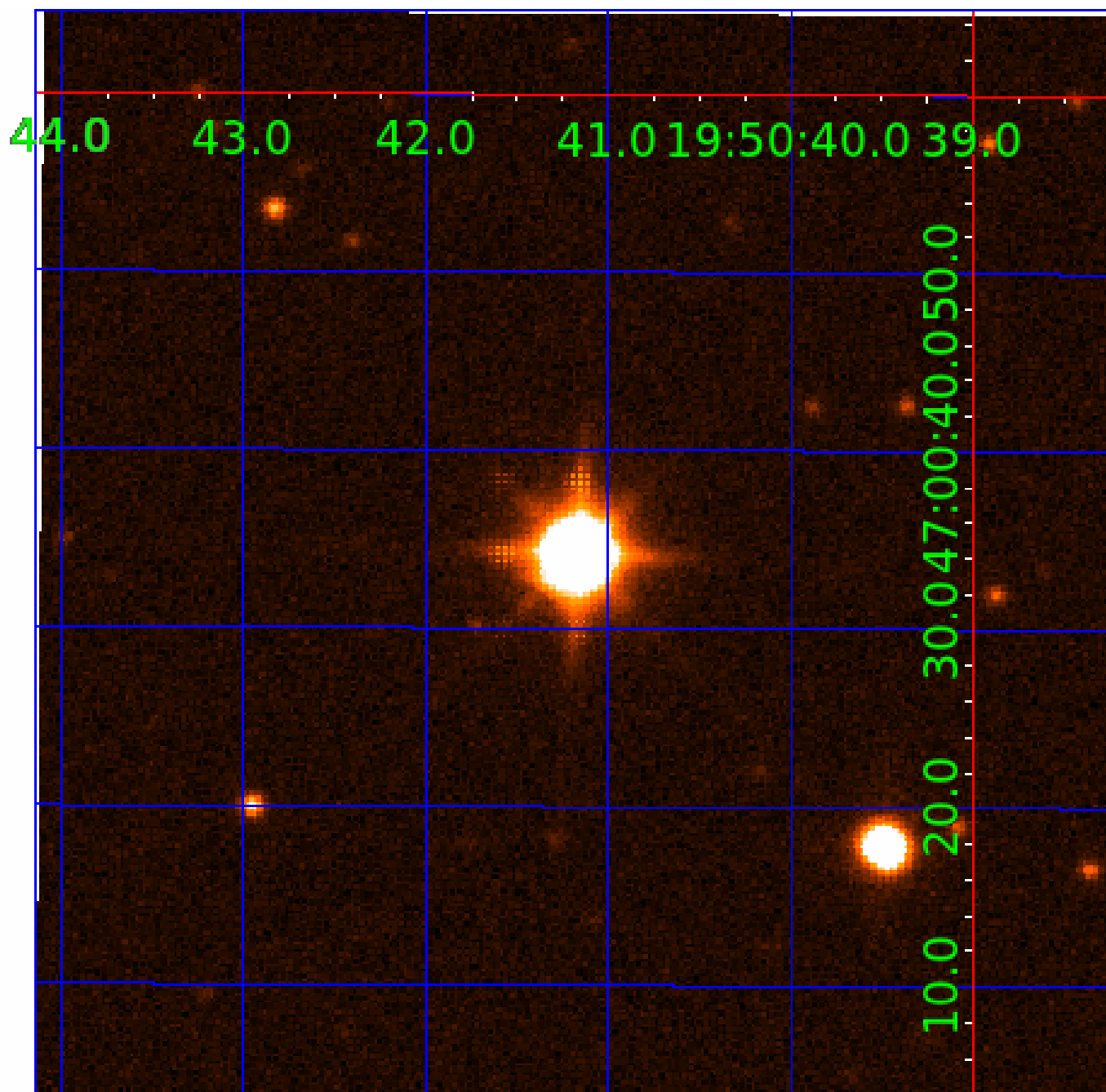


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010091829

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010091829-01	OBS	No	2.685897	132.966276	9.3	17.710	13.4	10.7	2.48	7751	0.77	8802.86
010091829-02	OBS	No	51.150813	150.403921	75.0	13.637	23.3	11.1	2.48	7751	2.61	173.09
010091829-04	OBS	No	103.251385	212.511369	77.6	11.125	15.0	10.7	2.48	7751	2.46	67.85
010091829-05	OBS	No	39.721348	158.143016	55.9	7.274	14.0	8.1	2.48	7751	2.12	242.50
010091829-06	OBS	No	97.893326	213.505551	72.2	12.046	12.5	8.2	2.48	7751	2.22	72.85
010091829-07	OBS	No	185.242008	174.661147	75.4	15.466	13.6	8.8	2.48	7751	2.54	31.12
010091829-08	OBS	No	144.806501	226.139993	476.4	66.191	10.9	9.9	2.48	7751	6.89	43.22
010091829-09	OBS	No	123.726523	248.998906	51.2	12.172	9.0	7.0	2.48	7751	2.05	53.31
010091829-10	OBS	No	15.454682	141.232200	49.5	3.861	7.4	8.1	2.48	7751	2.01	853.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010091829-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
010091829-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
010091829-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED
010091829-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010091829-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

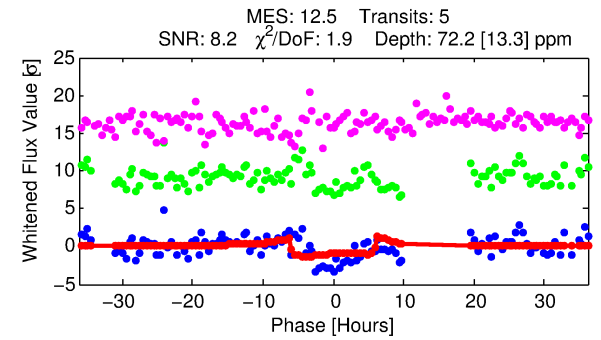
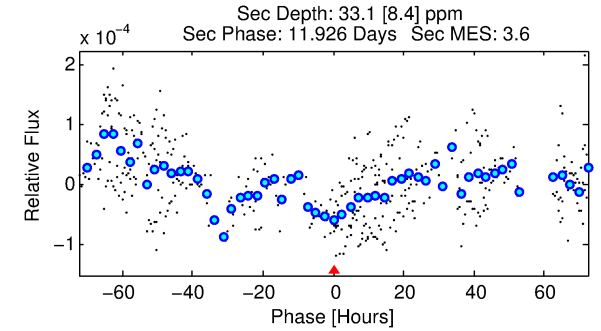
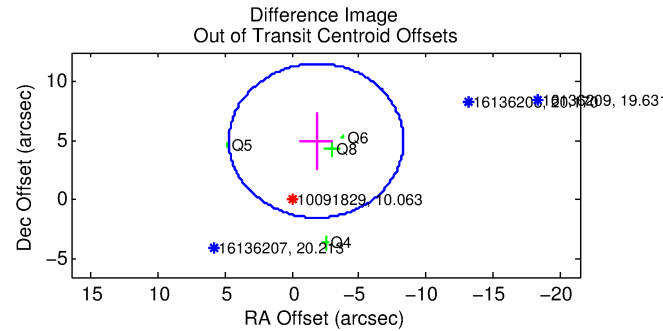
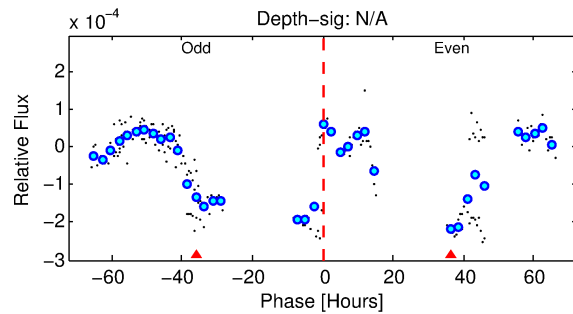
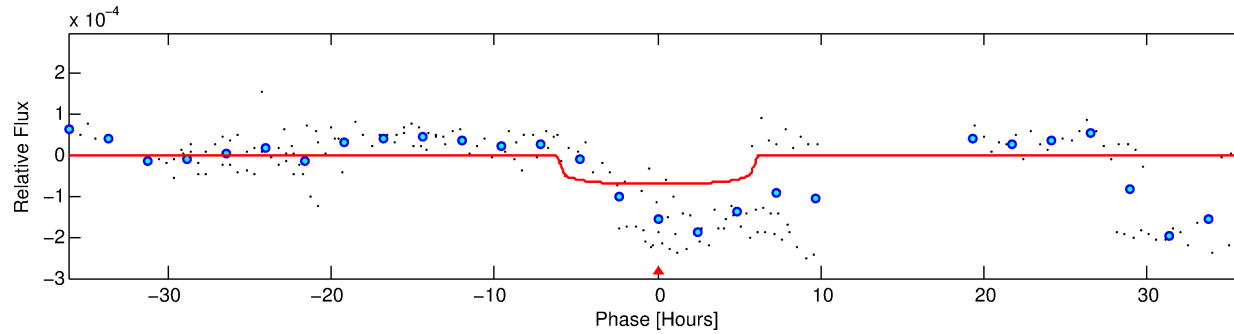
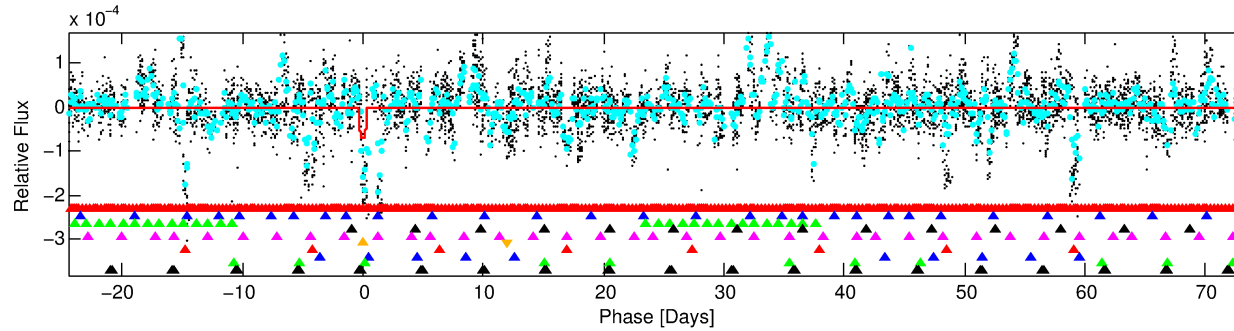
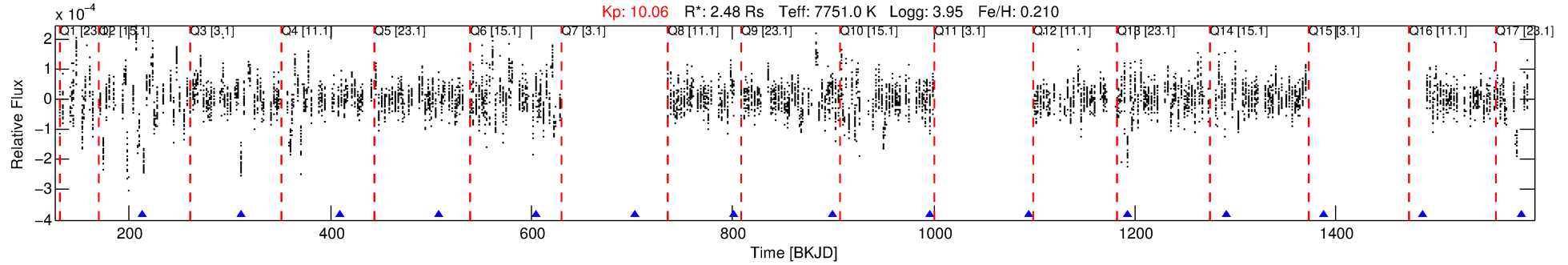
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010091829-06

No Significant Match Found

# DV One-Page Summary

KIC: 10091829 Candidate: 6 of 10 Period: 97.893 d



## DV Fit Results:

Period = 97.89333 [0.00253] d  
Epoch = 213.5056 [0.0157] BKJD  
Rp/R\* = 0.0082 [0.0025]  
a/R\* = 49.91 [85.58]  
b = 0.61 [1.78]  
Seff = 72.85 [18.08]  
Teq = 745 [46] K  
Rp = 2.22 [0.80] Re  
a = 0.5227 [0.0843] AU  
Ag = 1010.99 [722.20] [1.40σ]  
Teffp = 6495 [1092] K [5.26σ]

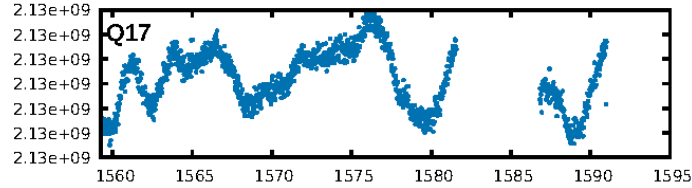
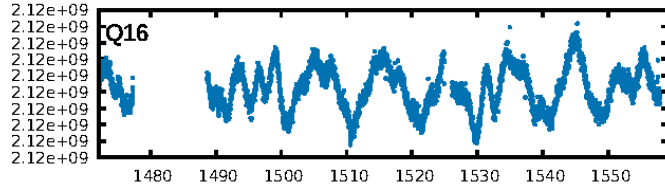
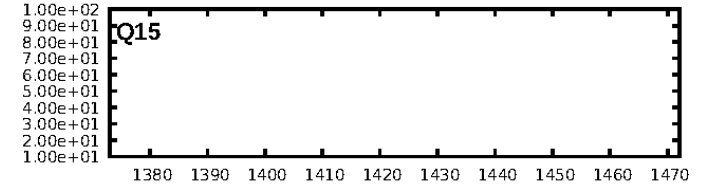
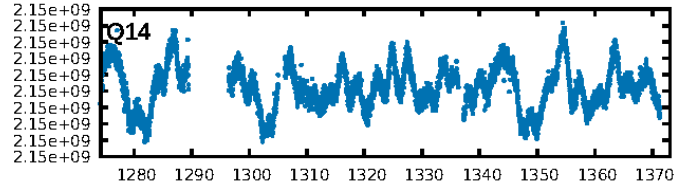
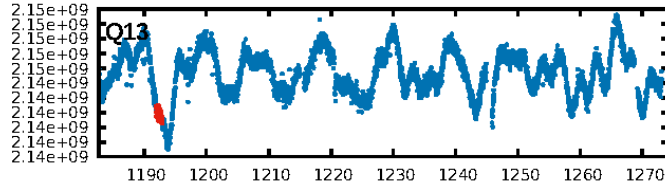
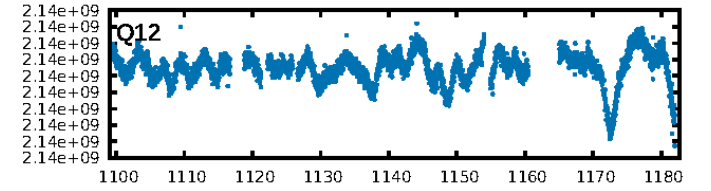
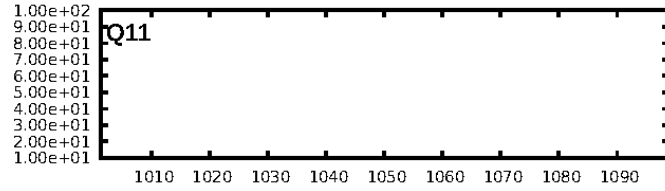
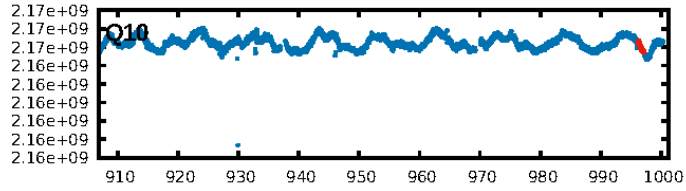
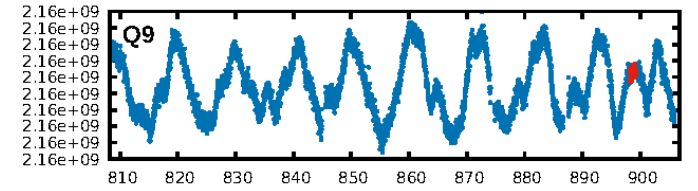
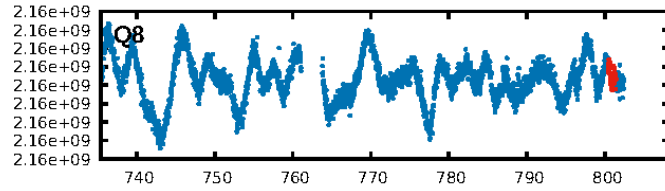
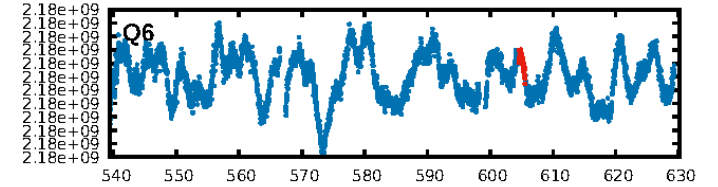
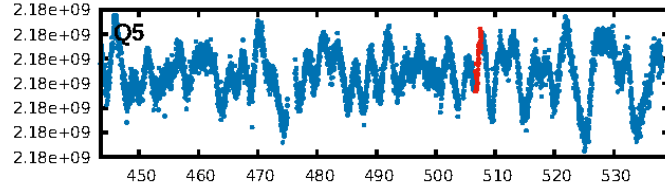
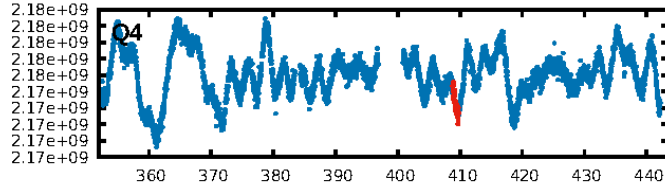
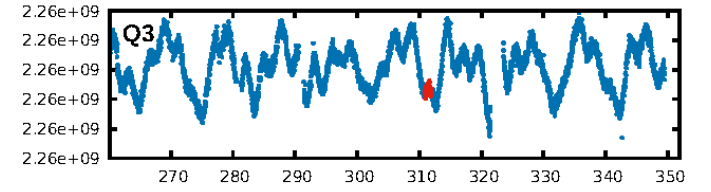
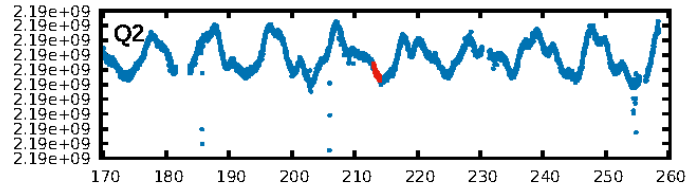
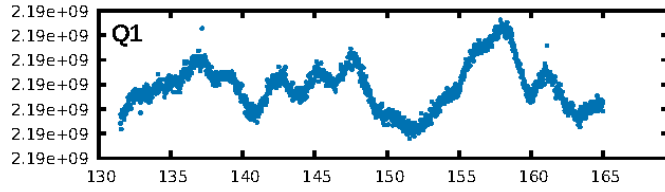
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [61.66σ]  
LongPeriod-sig: 100.0% [7.84σ]  
ModelChiSquare2-sig: 0.9%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: 2.02e-14  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 20.7%  
Centroid-so: 1.764 arcsec [1.42σ]  
OotOffset-rm: 5.338 arcsec [2.46σ]  
KicOffset-rm: 5.329 arcsec [2.69σ]  
OotOffset-st: 1/0/2/1 [4]  
KicOffset-st: 1/0/2/1 [4]  
DiffImageQuality-fgm: 0.00 [0/4]  
DiffImageOverlap-fno: 0.00 [0/8]

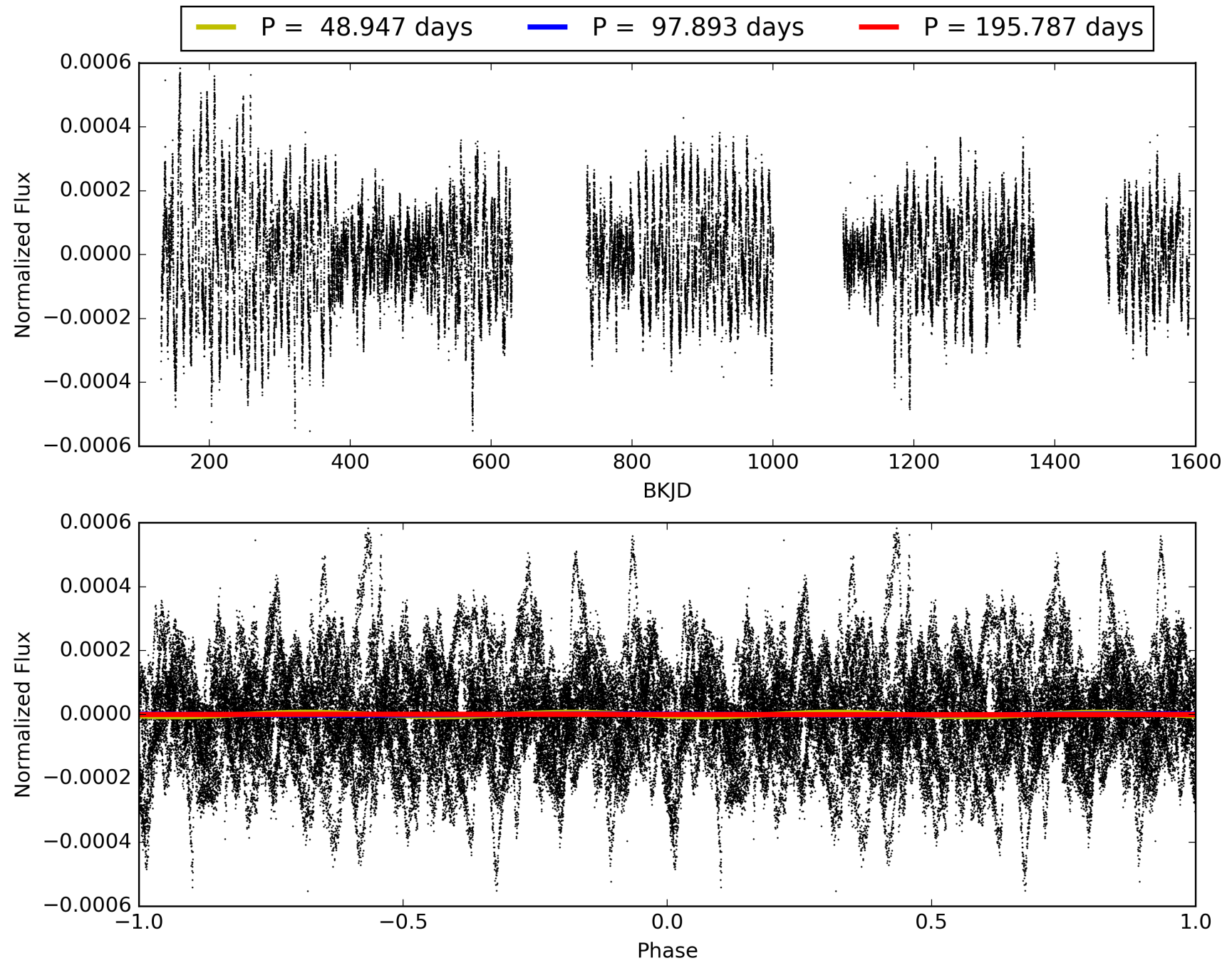
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:11:03 Z

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

# TCE 010091829-06, PDC Light Curves

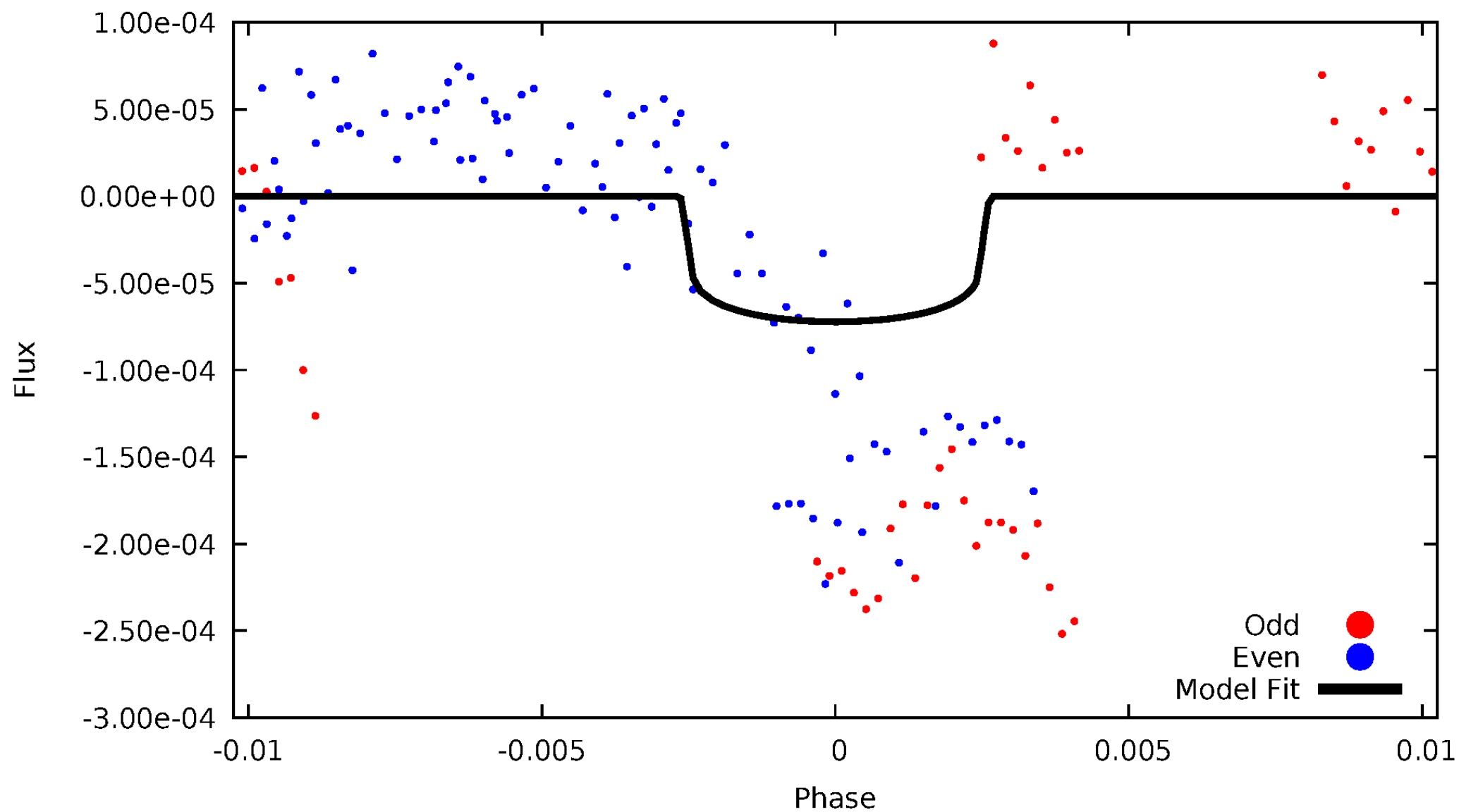


# TCE 010091829-06



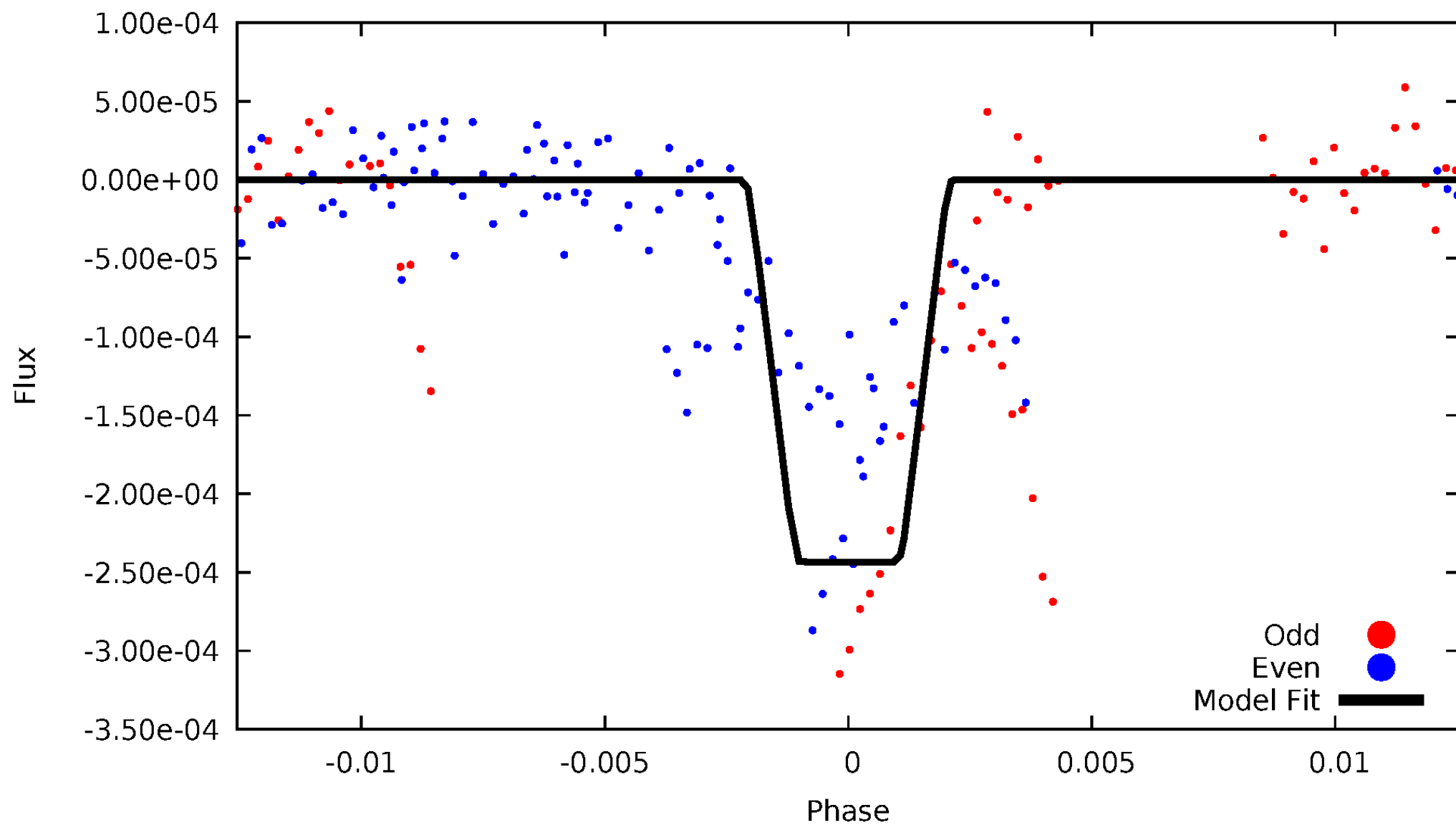
# DV Odd/Even

TCE 010091829-06



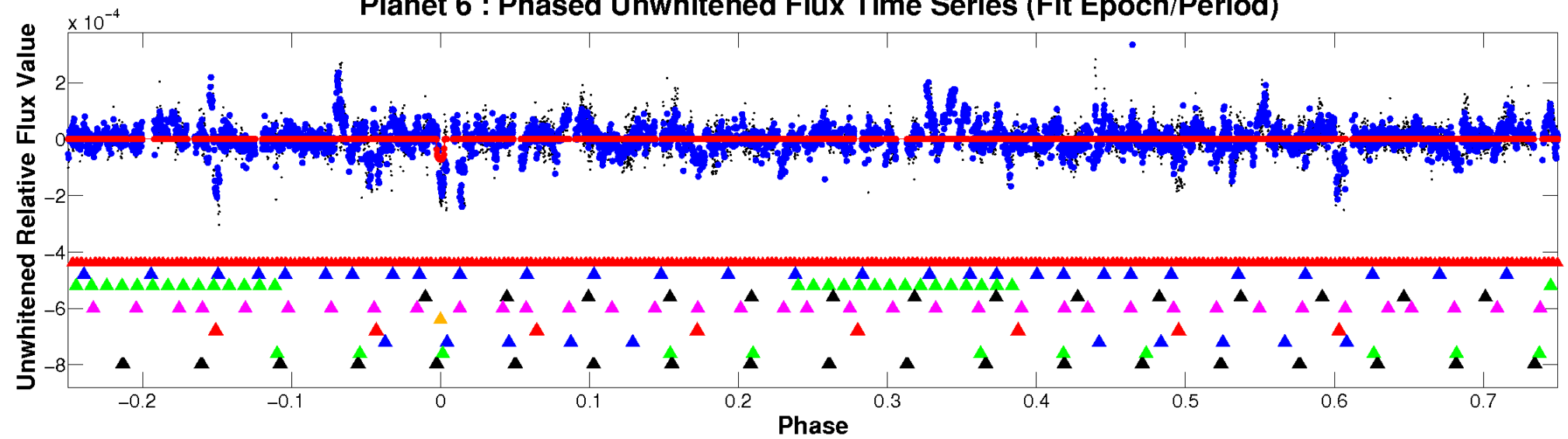
# ALT Odd/Even

TCE 010091829-06

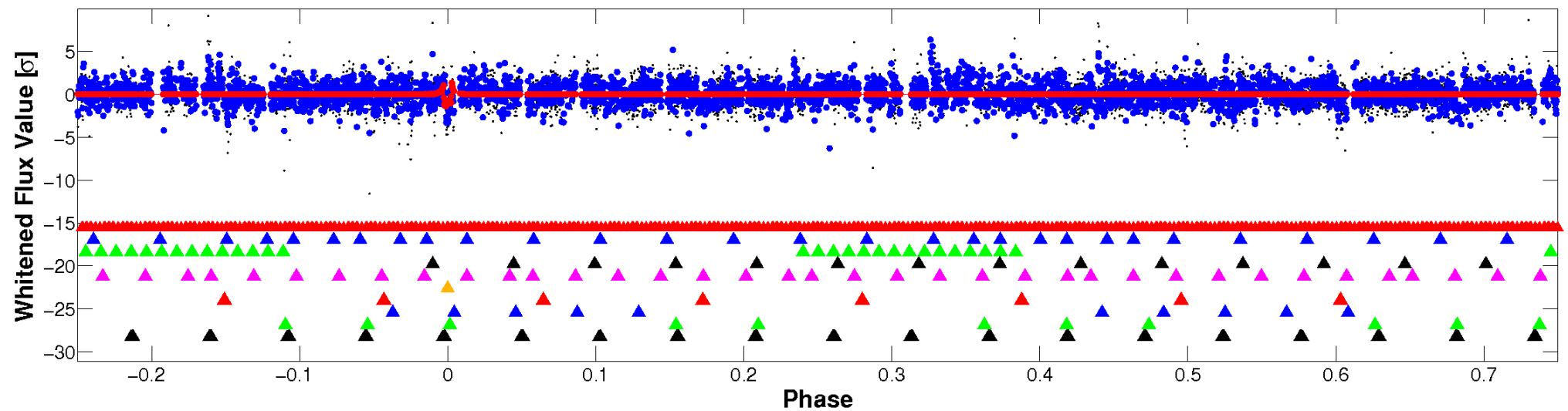


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



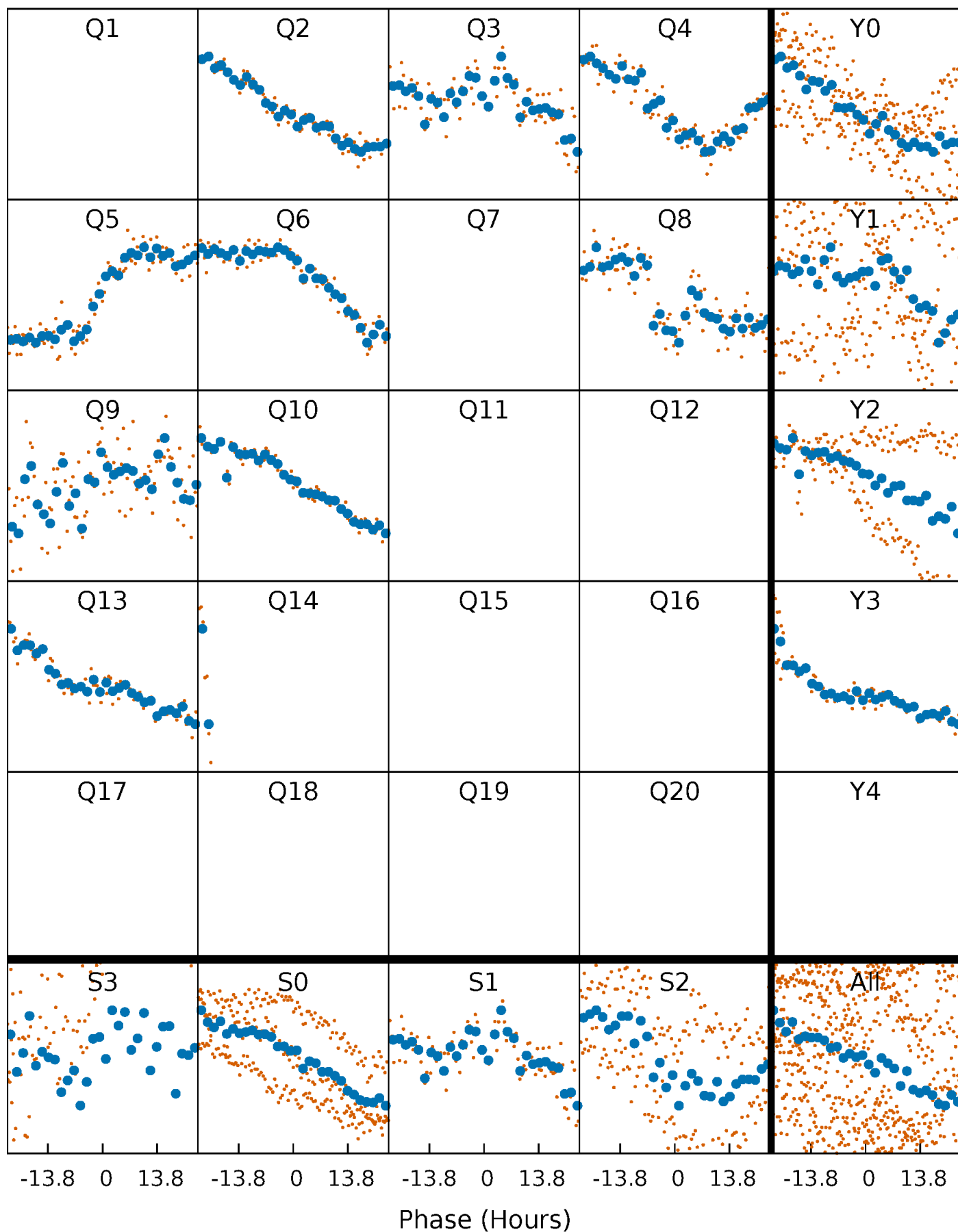
## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)





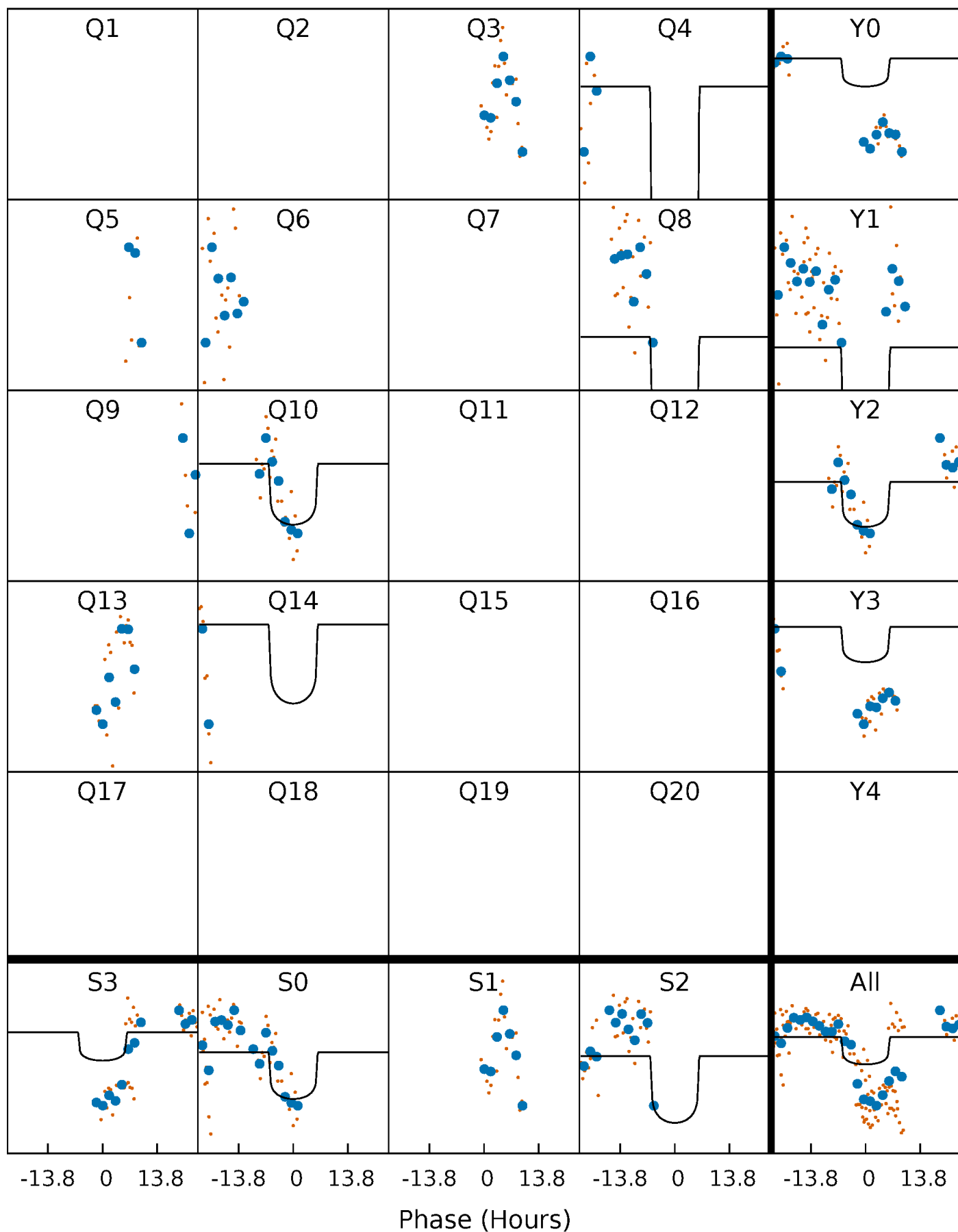
# PDC Quarter-Phased Transit Curves

TCE 010091829-06 P= 97.893326 Days  $T_0=213.505551$  (BKJD)



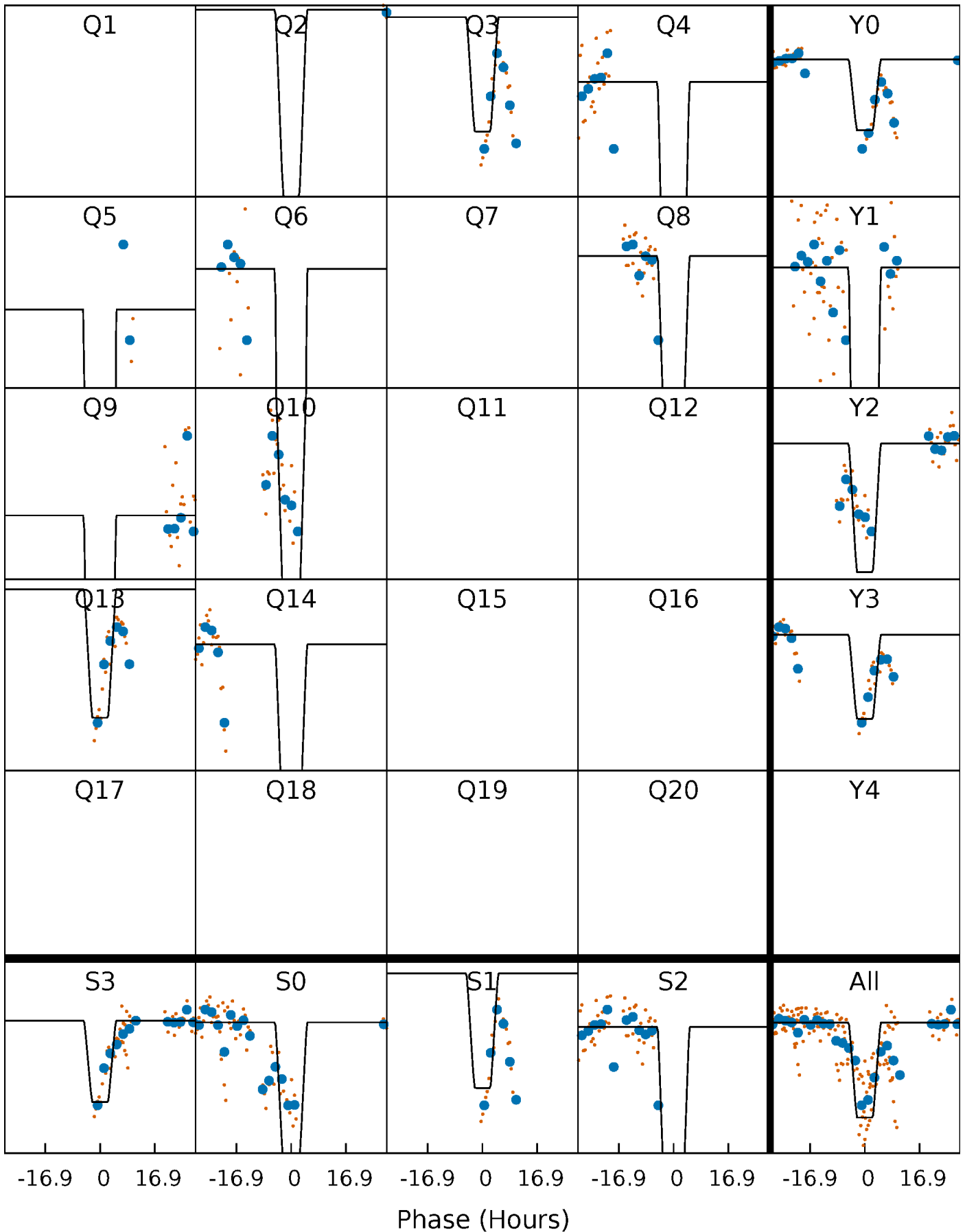
# DV Quarter-Phased Transit Curves

TCE 010091829-06 P= 97.893326 Days  $T_0=213.505551$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

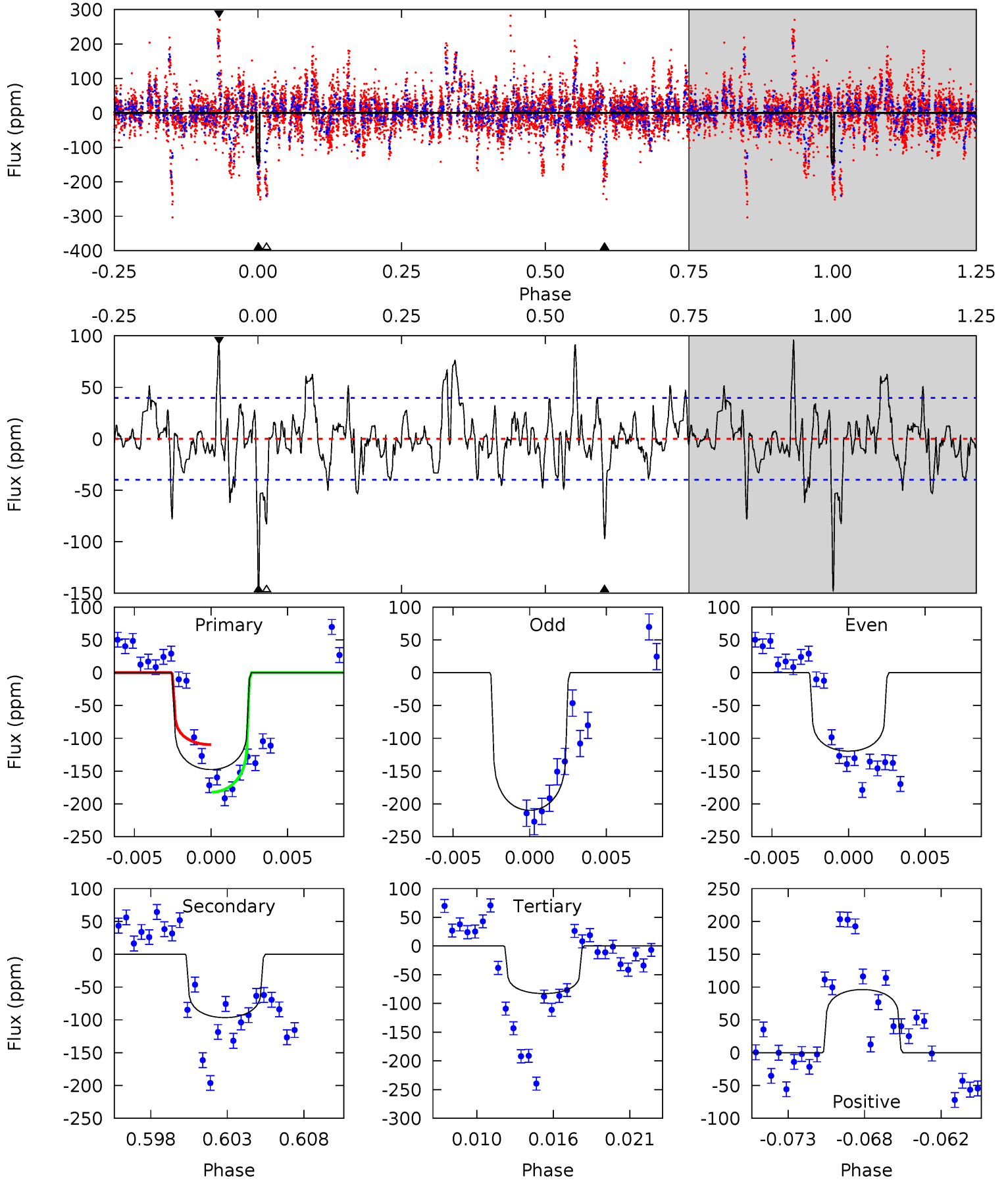
TCE 010091829-06 P= 97.891804 Days  $T_0=213.494586$  (BKJD)



# DV Model-Shift Uniqueness Test

010091829-06, P = 97.893326 Days, E = 115.612225 Days

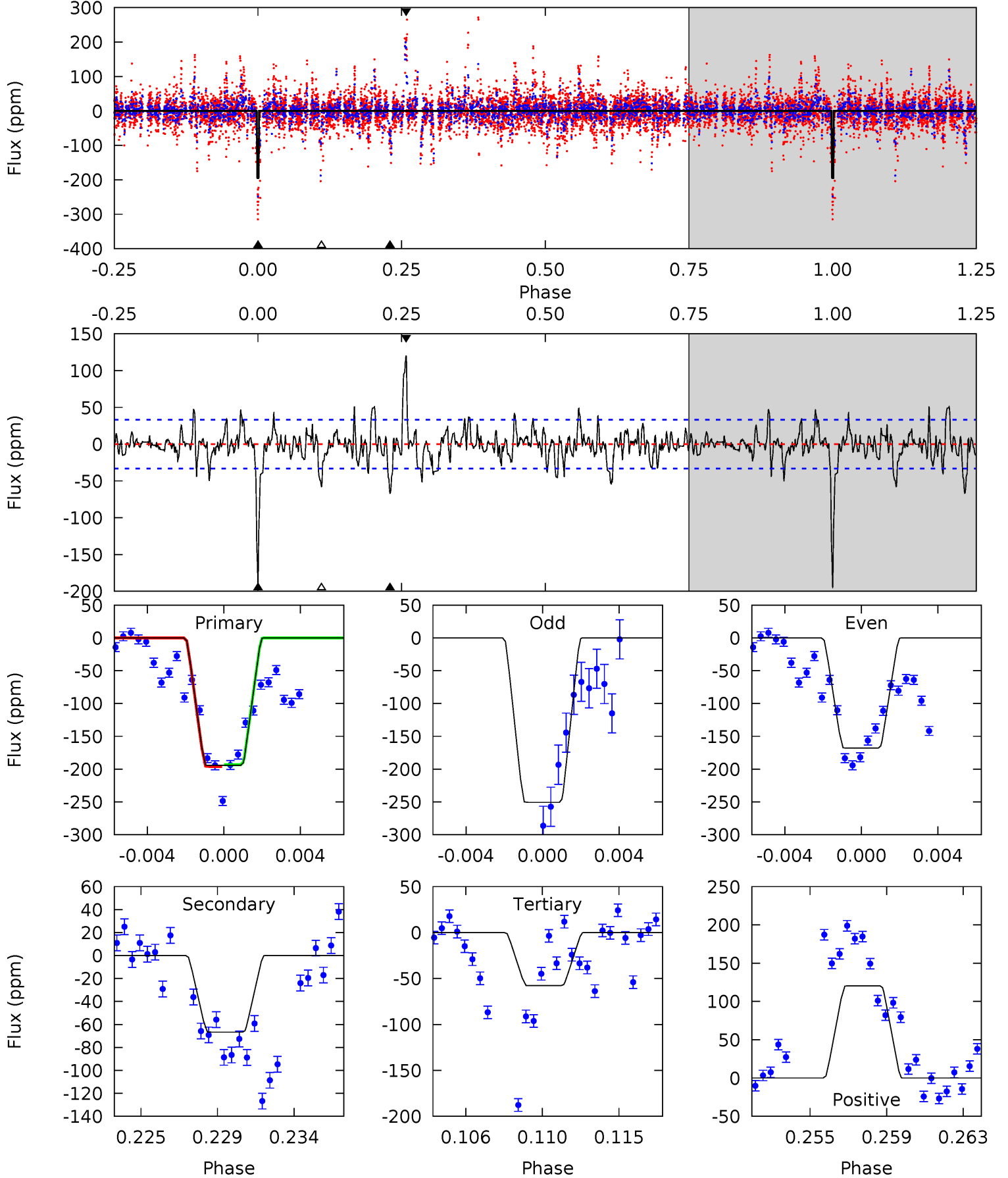
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.1	12.5	10.7	12.5	5.15	2.79	3.08	8.41	6.67	1.79	0.05	5.75	1.01	0.39	4.61



# Alt Model-Shift Uniqueness Test

010091829-06, P = 97.891804 Days, E = 115.602782 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
30.4	10.4	9.02	18.8	5.19	2.86	2.58	21.3	11.6	1.39	-8.38	5.49	1.00	0.38	0.21



### Stellar Parameters For KIC 010091829

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7751^{+85}_{-77}$	$3.947^{+0.138}_{-0.092}$	$0.210^{+0.200}_{-0.200}$	$2.481^{+0.371}_{-0.453}$	$1.986^{+0.166}_{-0.185}$	$0.183^{+0.123}_{-0.053}$
	+1%/-1%	+3%/-2%	+95%/-95%	+15%/-18%	+8%/-9%	+67%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 010091829-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-97 \pm 8$	$2.20^{+0.75}_{-0.76}$	$1039^{+43}_{-48}$	$8699^{+2975}_{-1388}$	$3049^{+3932}_{-1410}$
Alt.	$-67 \pm 6$	$4.11^{+0.85}_{-0.77}$	$1040^{+39}_{-51}$	$5552^{+499}_{-411}$	$583^{+296}_{-183}$

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

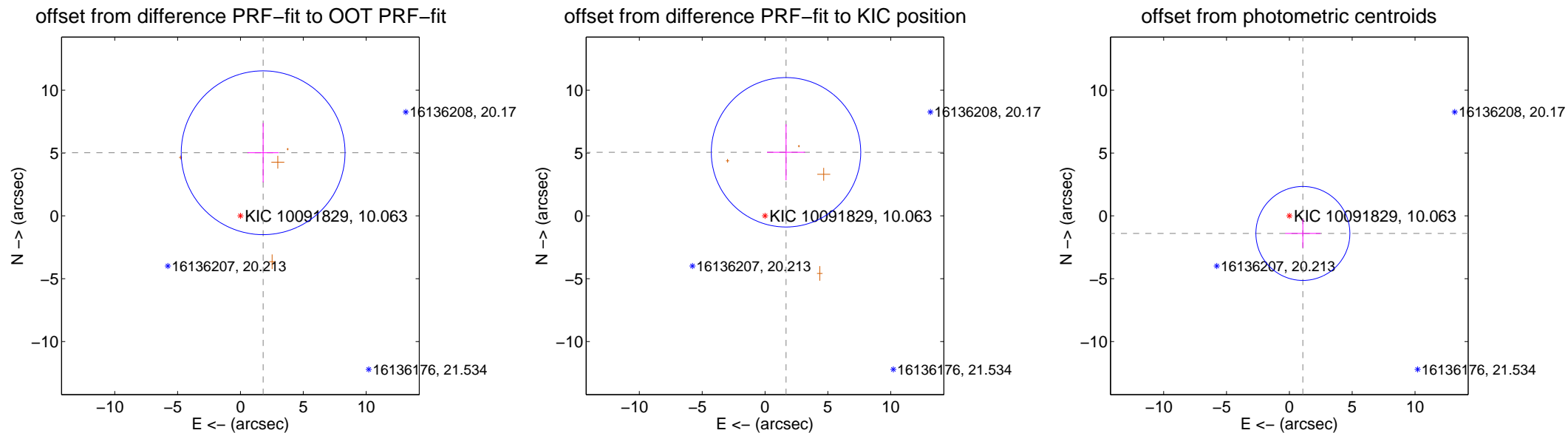
## DV Centroid Data

Supplemental centroid analysis for 010091829-06. **Kepler magnitude: 10.06.** Transit SNR 8.22

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

The direct PRF centroid is offset from the target star catalog position by about 1.95 arcsec

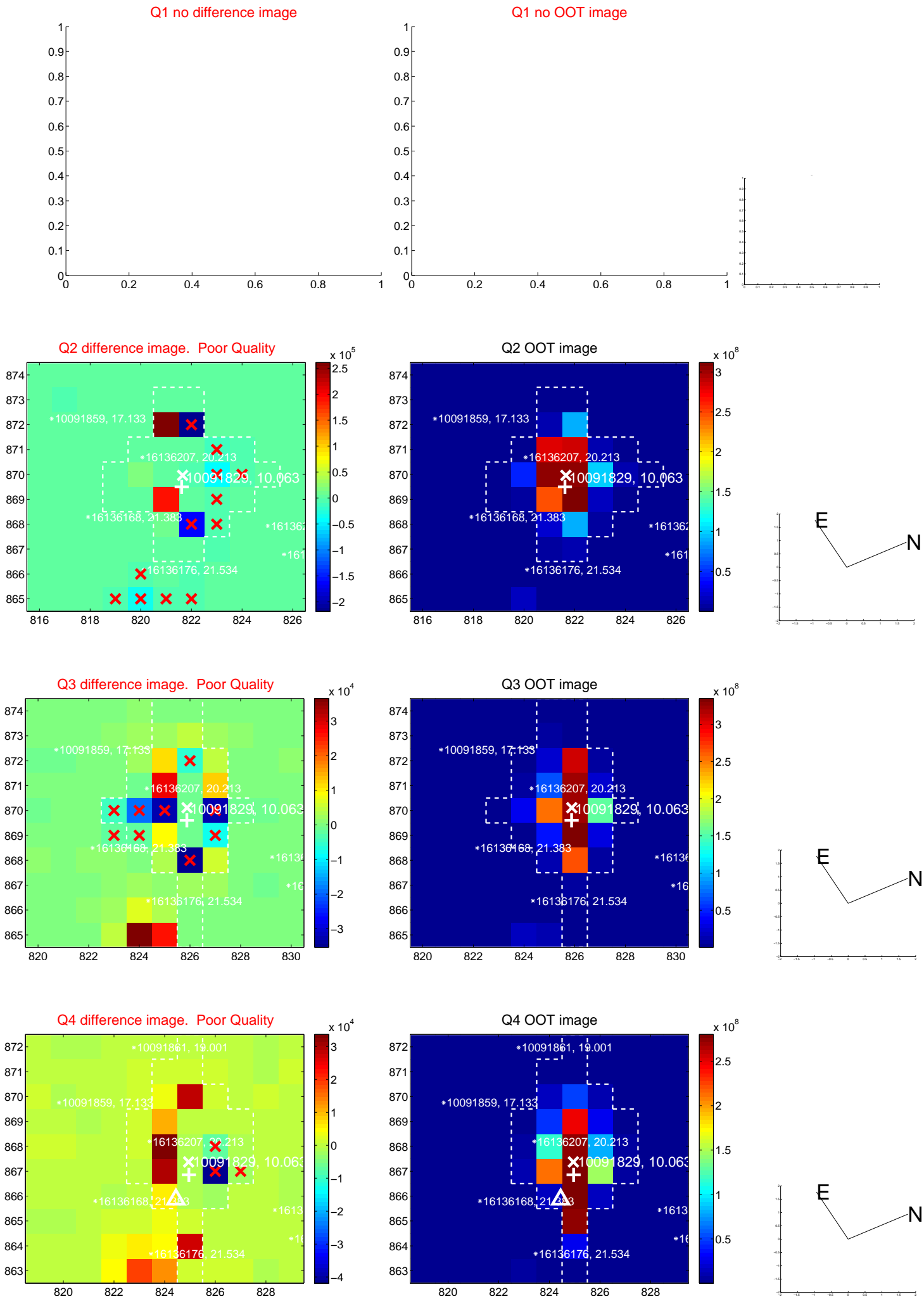
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.338 \pm 2.172$	2.46	$-1.805 \pm 1.244$	$5.023 \pm 2.356$
PRF-fit source offset from KIC position	$5.329 \pm 1.981$	2.69	$-1.671 \pm 1.513$	$5.060 \pm 2.230$
photometric centroid source offset	$1.76 \pm 1.25$	1.42	$-1.08 \pm 1.40$	$-1.40 \pm 1.14$



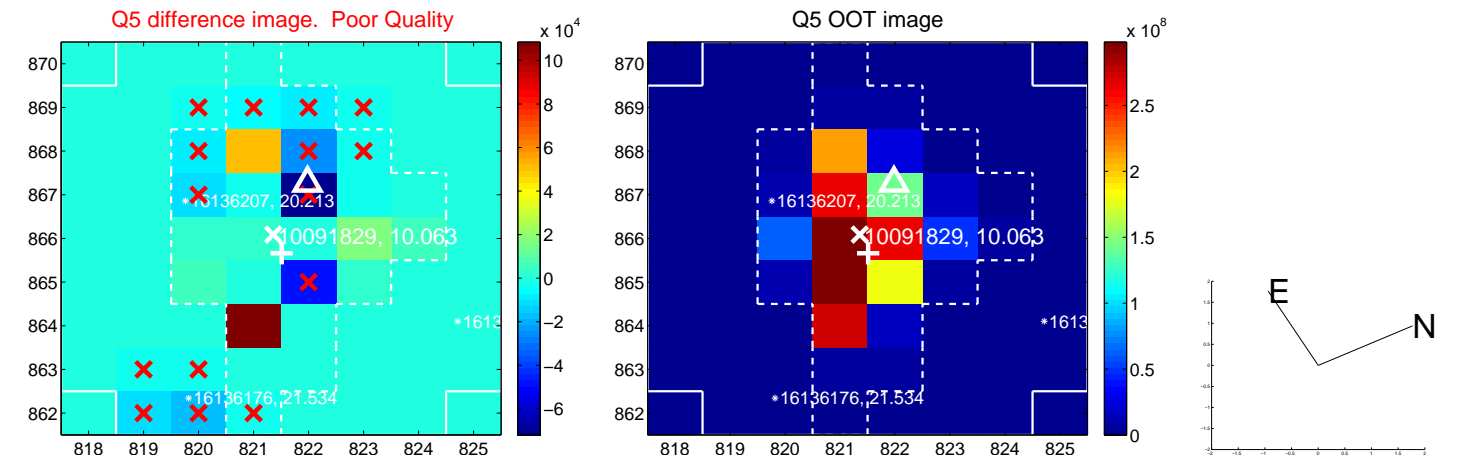
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



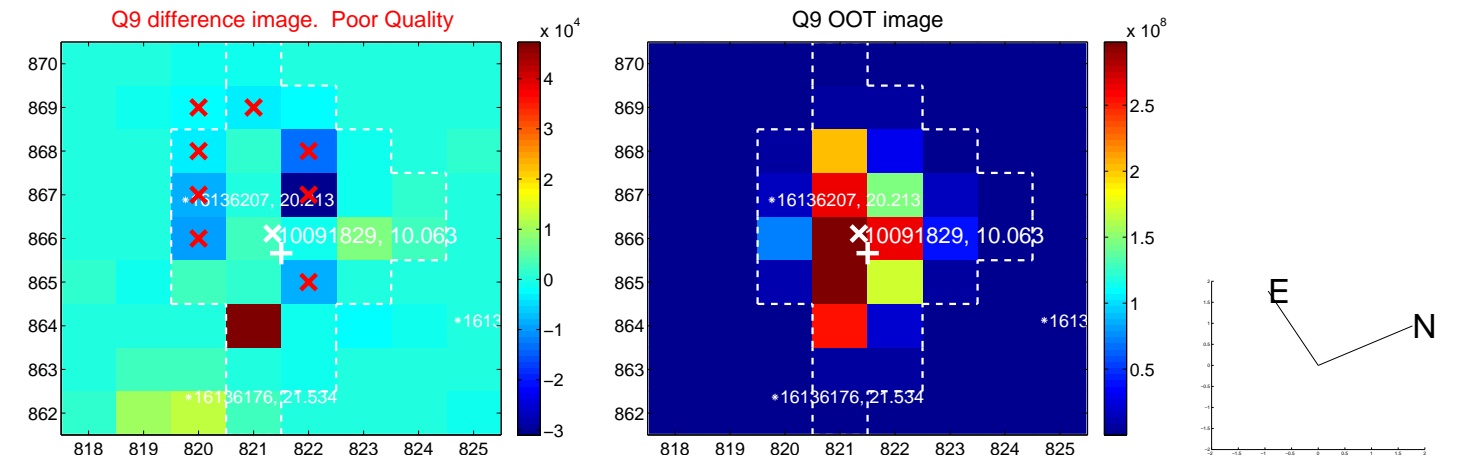
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



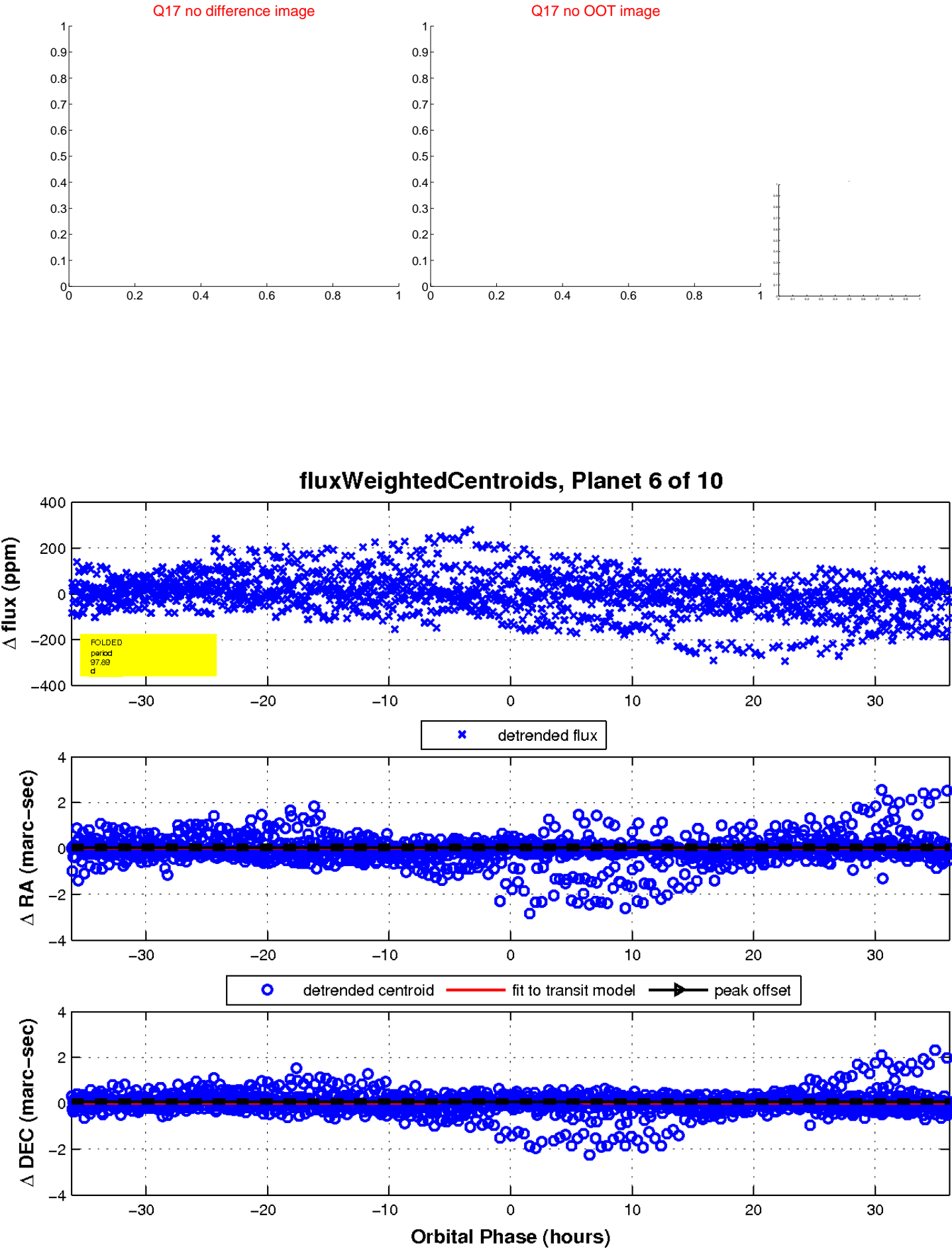
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

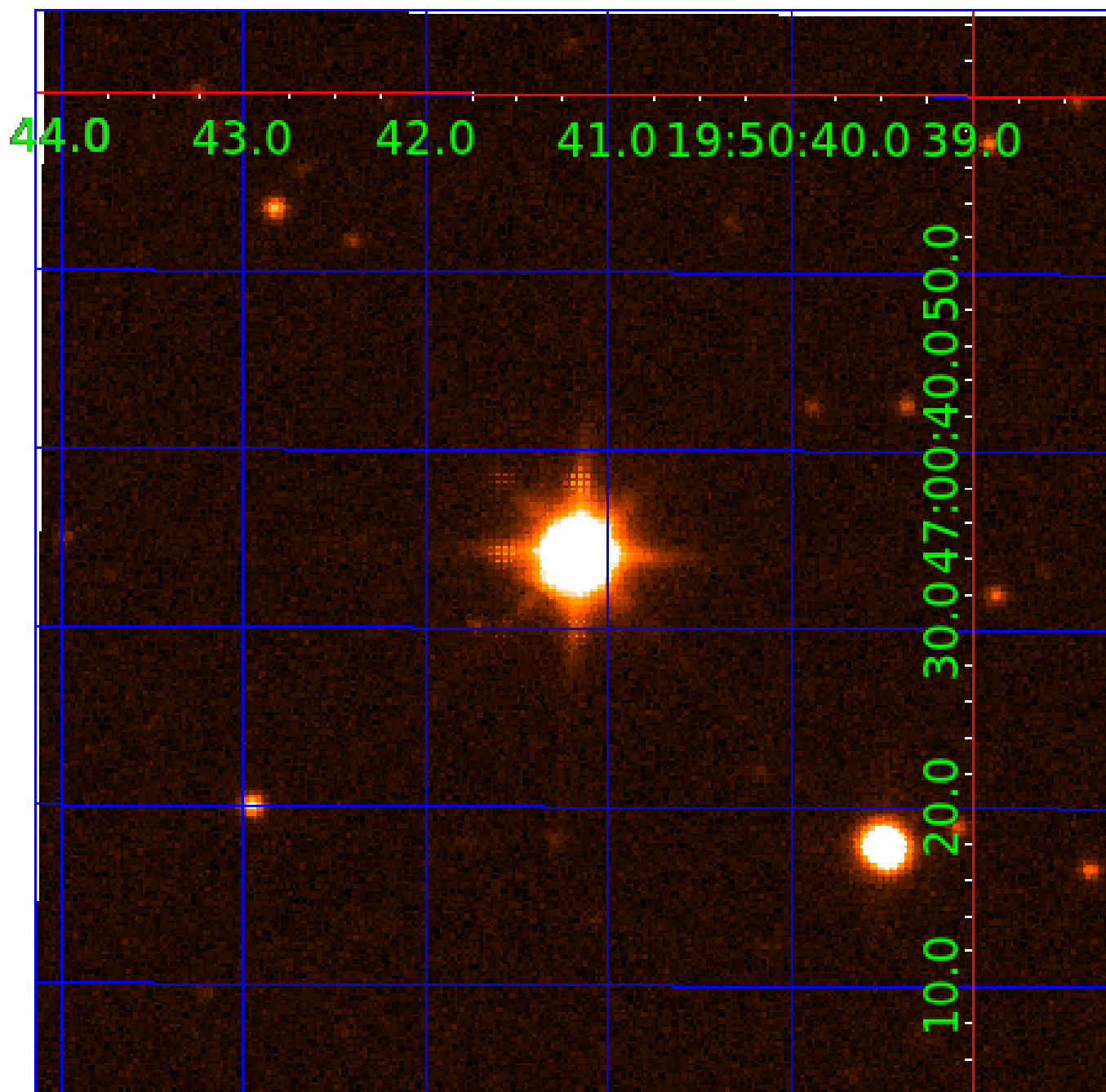


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010091829

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010091829-01	OBS	No	2.685897	132.966276	9.3	17.710	13.4	10.7	2.48	7751	0.77	8802.86
010091829-02	OBS	No	51.150813	150.403921	75.0	13.637	23.3	11.1	2.48	7751	2.61	173.09
010091829-04	OBS	No	103.251385	212.511369	77.6	11.125	15.0	10.7	2.48	7751	2.46	67.85
010091829-05	OBS	No	39.721348	158.143016	55.9	7.274	14.0	8.1	2.48	7751	2.12	242.50
010091829-06	OBS	No	97.893326	213.505551	72.2	12.046	12.5	8.2	2.48	7751	2.22	72.85
010091829-07	OBS	No	185.242008	174.661147	75.4	15.466	13.6	8.8	2.48	7751	2.54	31.12
010091829-08	OBS	No	144.806501	226.139993	476.4	66.191	10.9	9.9	2.48	7751	6.89	43.22
010091829-09	OBS	No	123.726523	248.998906	51.2	12.172	9.0	7.0	2.48	7751	2.05	53.31
010091829-10	OBS	No	15.454682	141.232200	49.5	3.861	7.4	8.1	2.48	7751	2.01	853.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010091829-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
010091829-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
010091829-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED
010091829-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010091829-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—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.

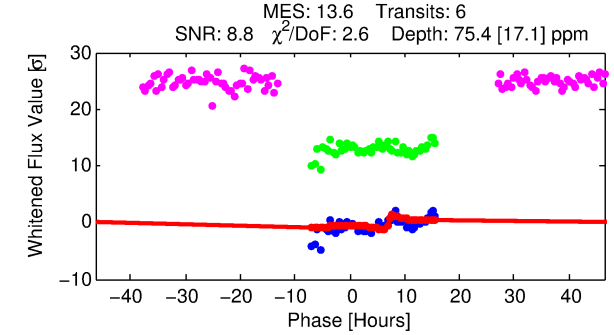
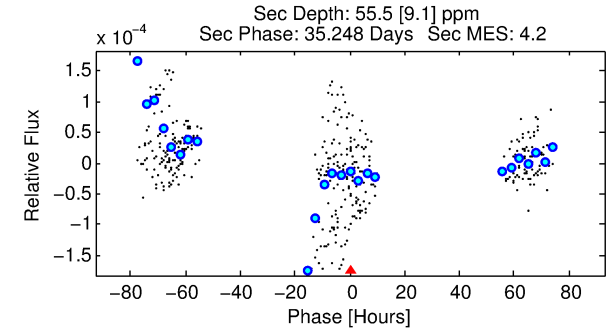
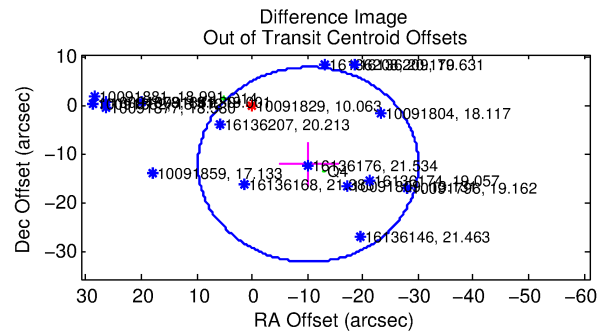
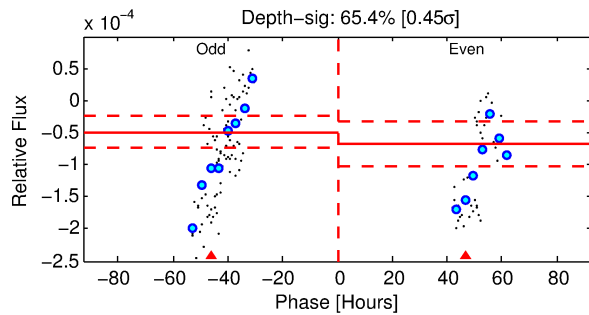
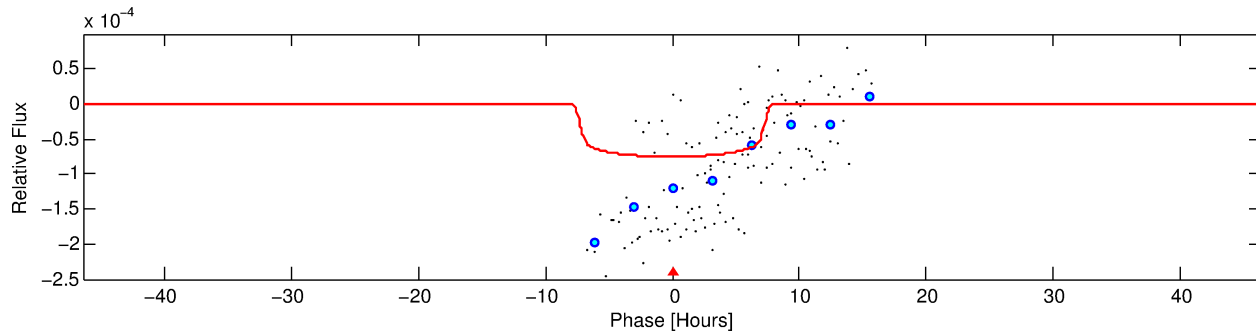
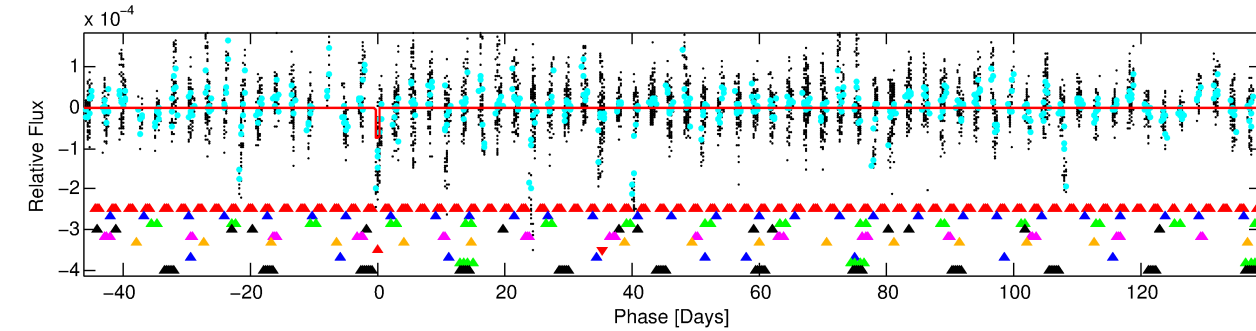
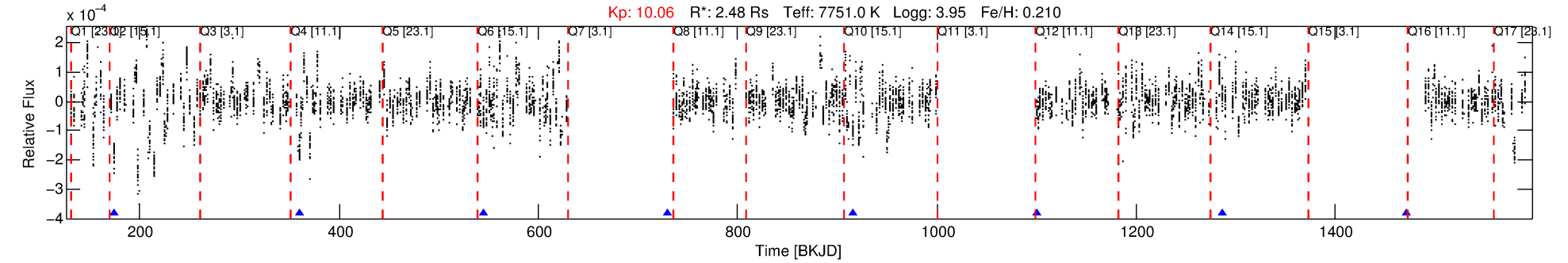
Ephemeris Match Information For 010091829-07

No Significant Match Found



# DV One-Page Summary

KIC: 10091829 Candidate: 7 of 10 Period: 185.242 d



## DV Fit Results:

Period = 185.24201 [0.00758] d  
Epoch = 174.6611 [0.0586] BKJD  
Rp/R\* = 0.0094 [0.0015]  
a/R\* = 38.21 [26.61]  
b = 0.92 [0.10]  
Seff = 31.12 [7.73]  
Teq = 602 [37] K  
Rp = 2.54 [0.62] Re  
a = 0.7997 [0.1290] AU  
Ag = 3036.11 [1344.46] [2.26 $\sigma$ ]  
Teffp = 6912 [643] K [9.80 $\sigma$ ]

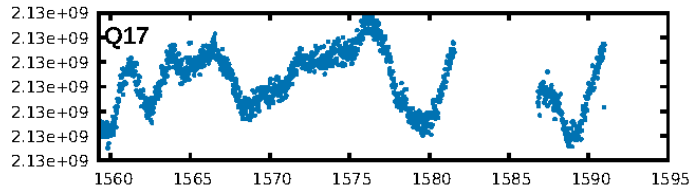
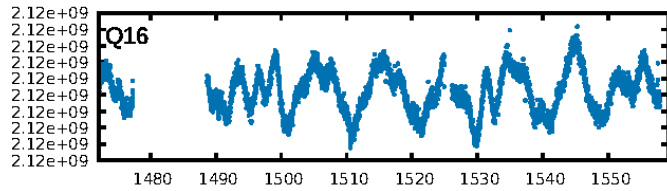
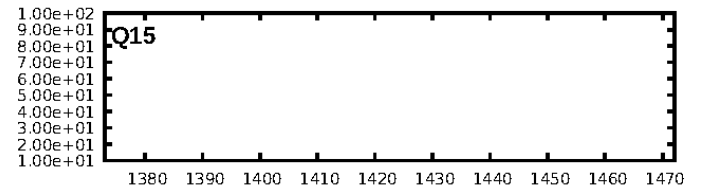
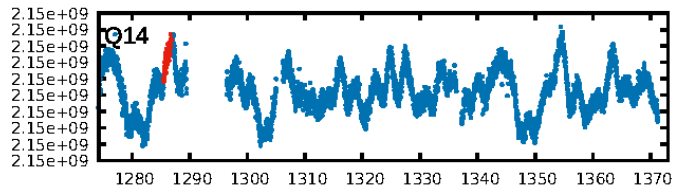
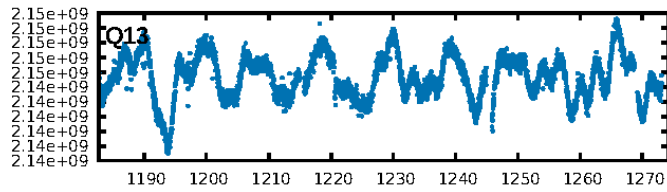
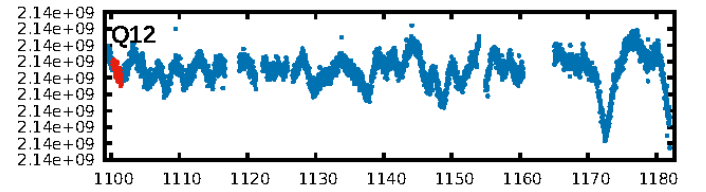
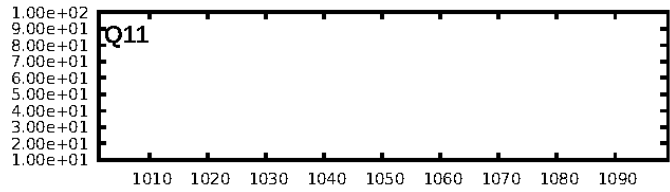
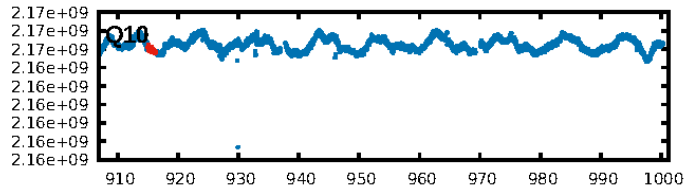
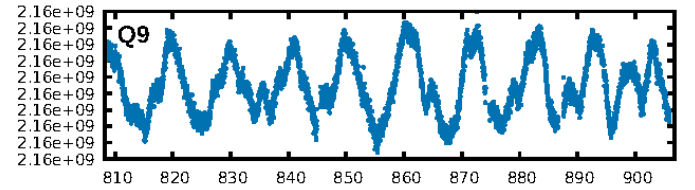
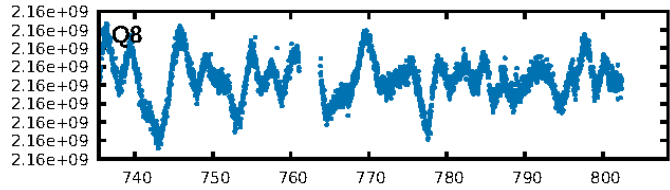
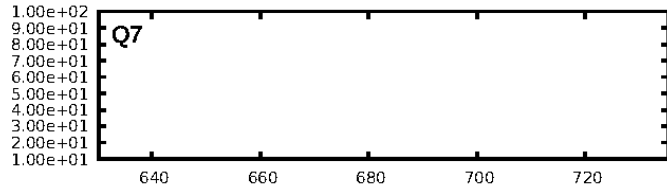
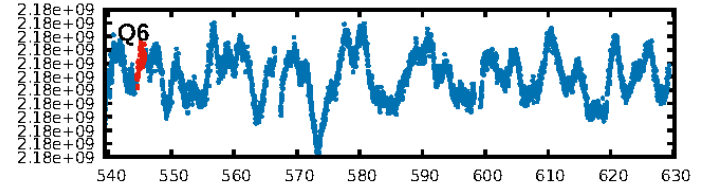
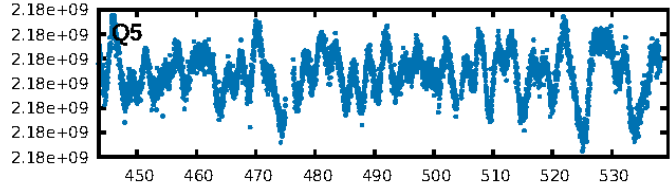
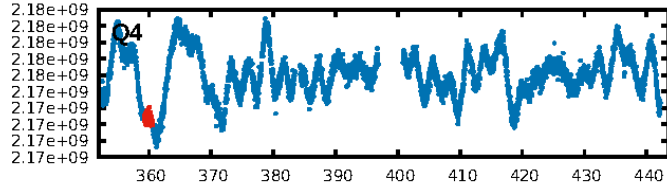
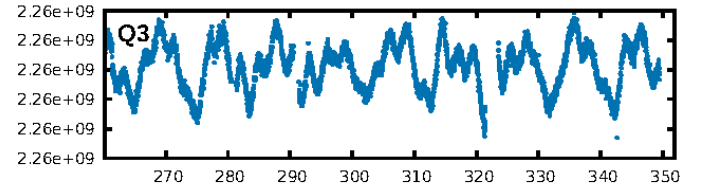
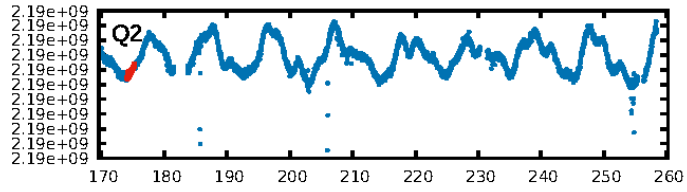
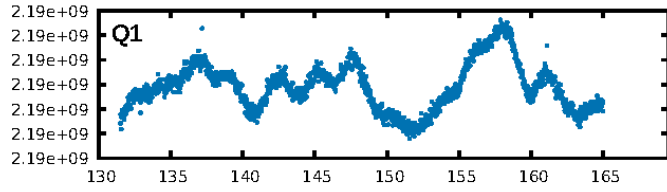
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [14.28 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 98.4%  
Bootstrap-pfa: 9.75e-16  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 62.3%  
Centroid-so: 1.682 arcsec [0.80 $\sigma$ ]  
OotOffset-rm: 15.758 arcsec [2.37 $\sigma$ ]  
KicOffset-rm: 15.528 arcsec [1.83 $\sigma$ ]  
OotOffset-st: 1/0/1/0 [2]  
KicOffset-st: 1/0/1/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/5]

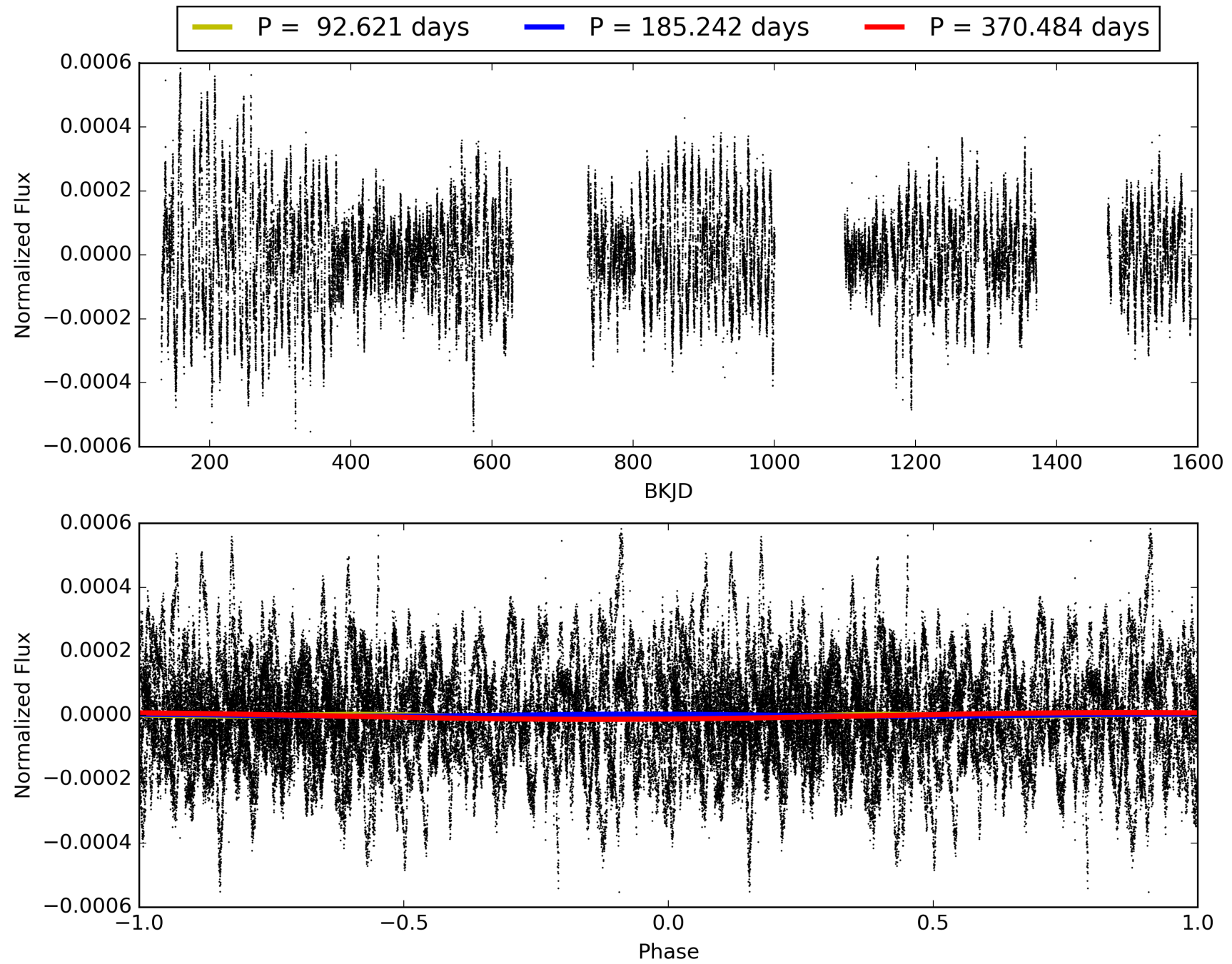
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:11:06 Z

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

## TCE 010091829-07, PDC Light Curves

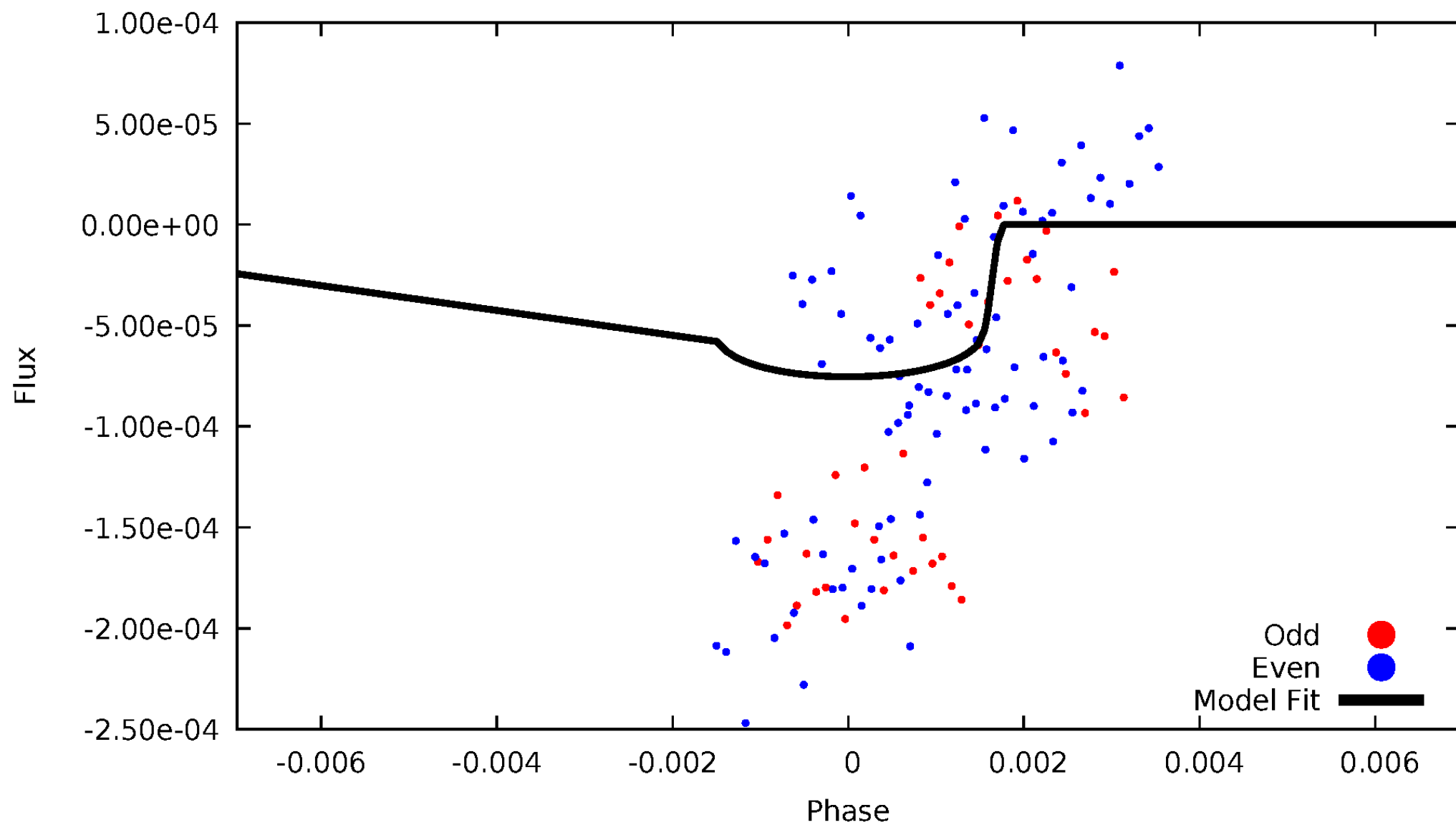


TCE 010091829-07



# DV Odd/Even

TCE 010091829-07



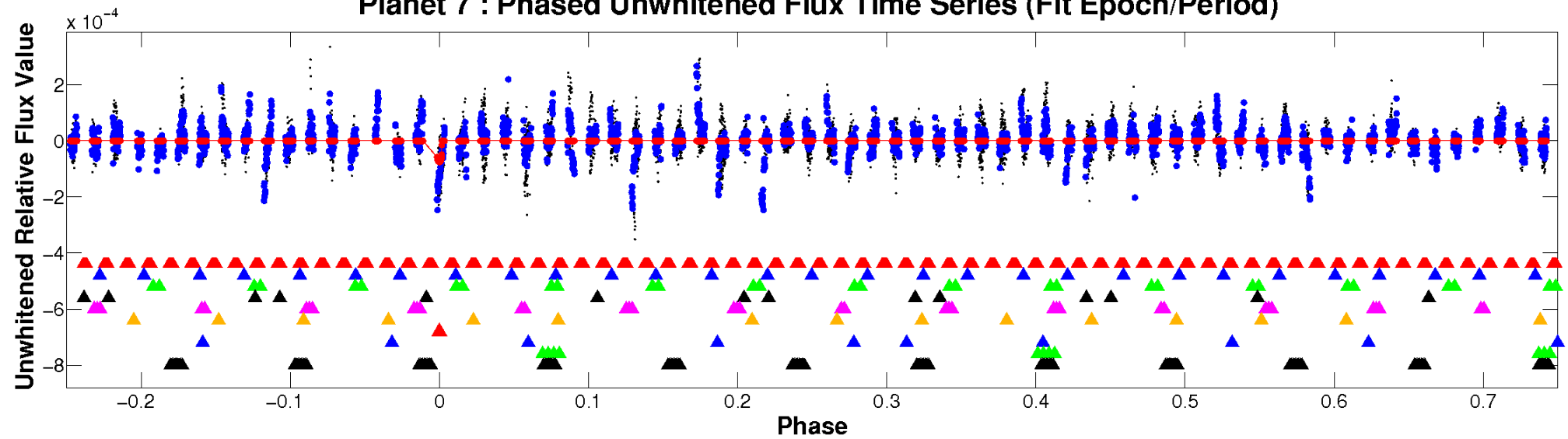


ALT Odd/Even

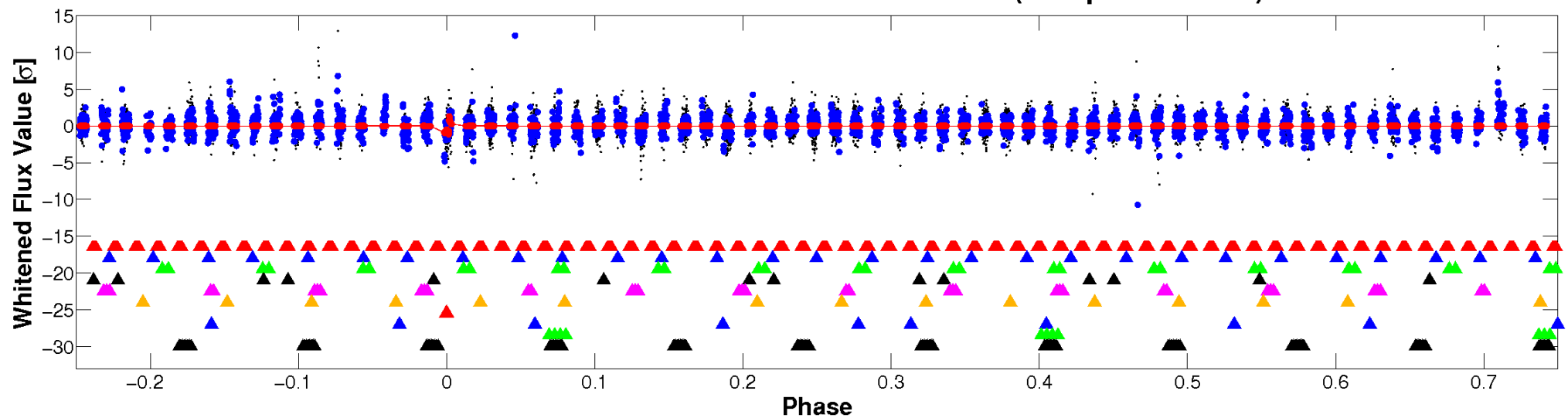
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

## Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



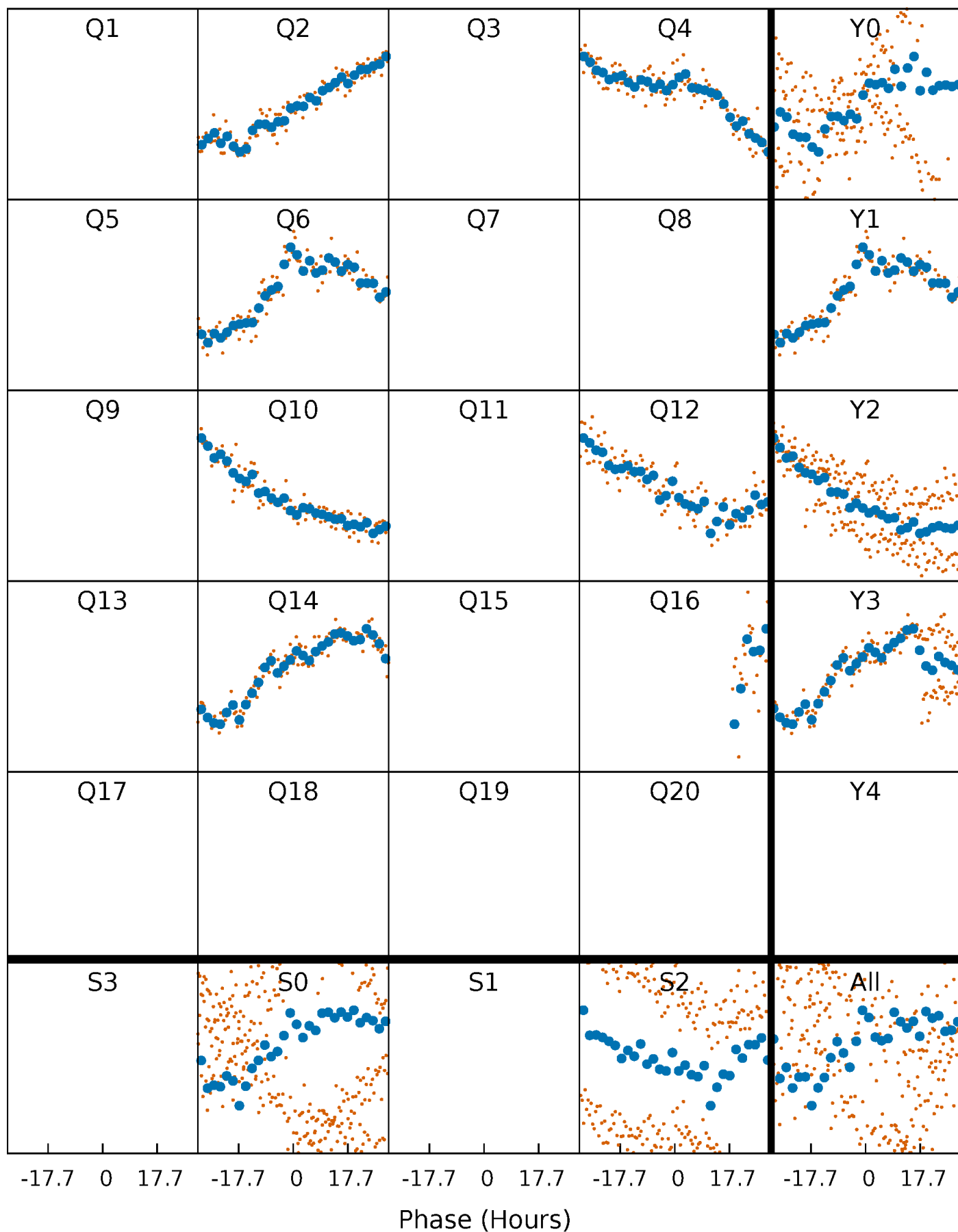
## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)





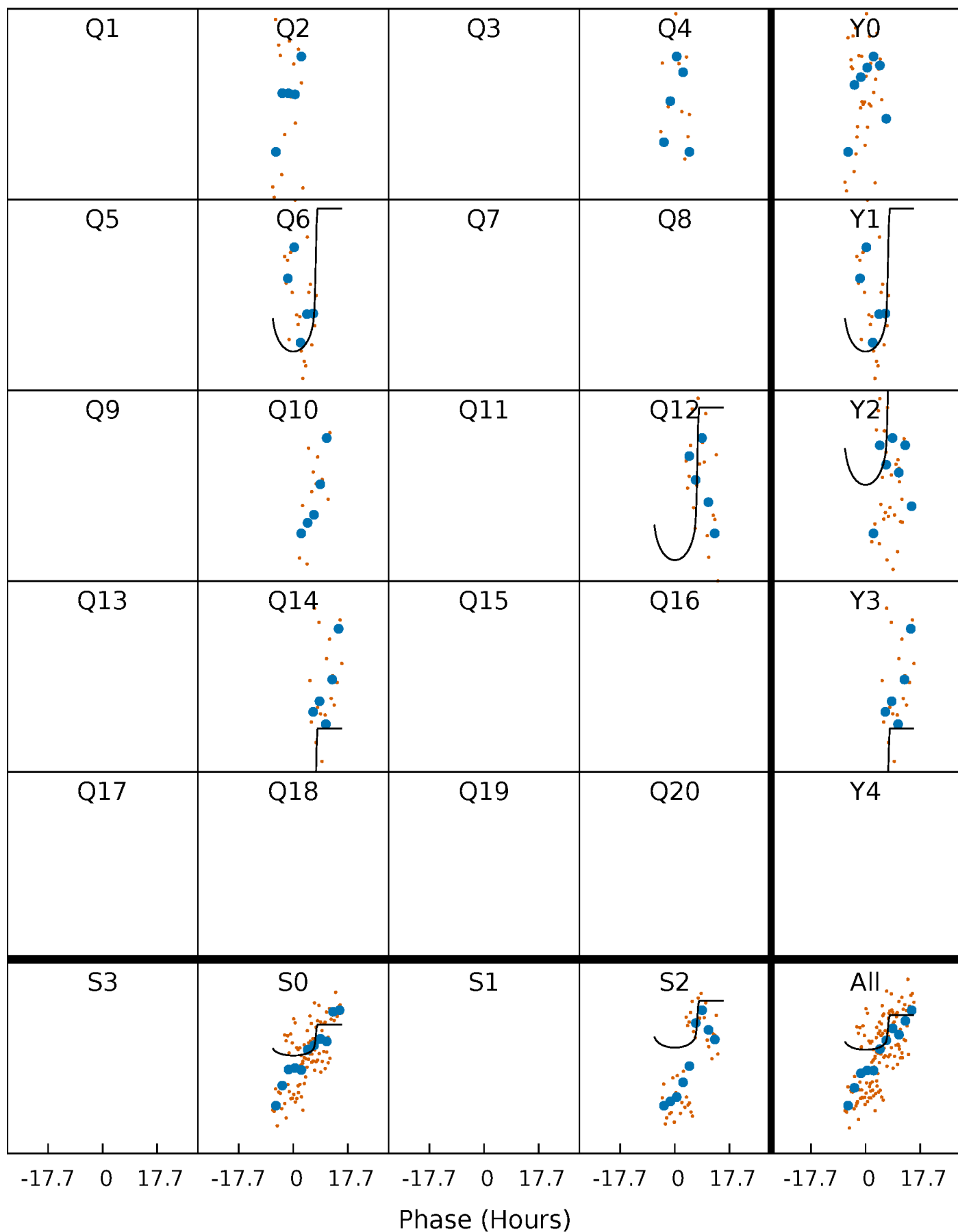
# PDC Quarter-Phased Transit Curves

TCE 010091829-07     $P=185.242008$  Days     $T_0=174.661147$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 010091829-07 P=185.242008 Days  $T_0=174.661147$  (BKJD)

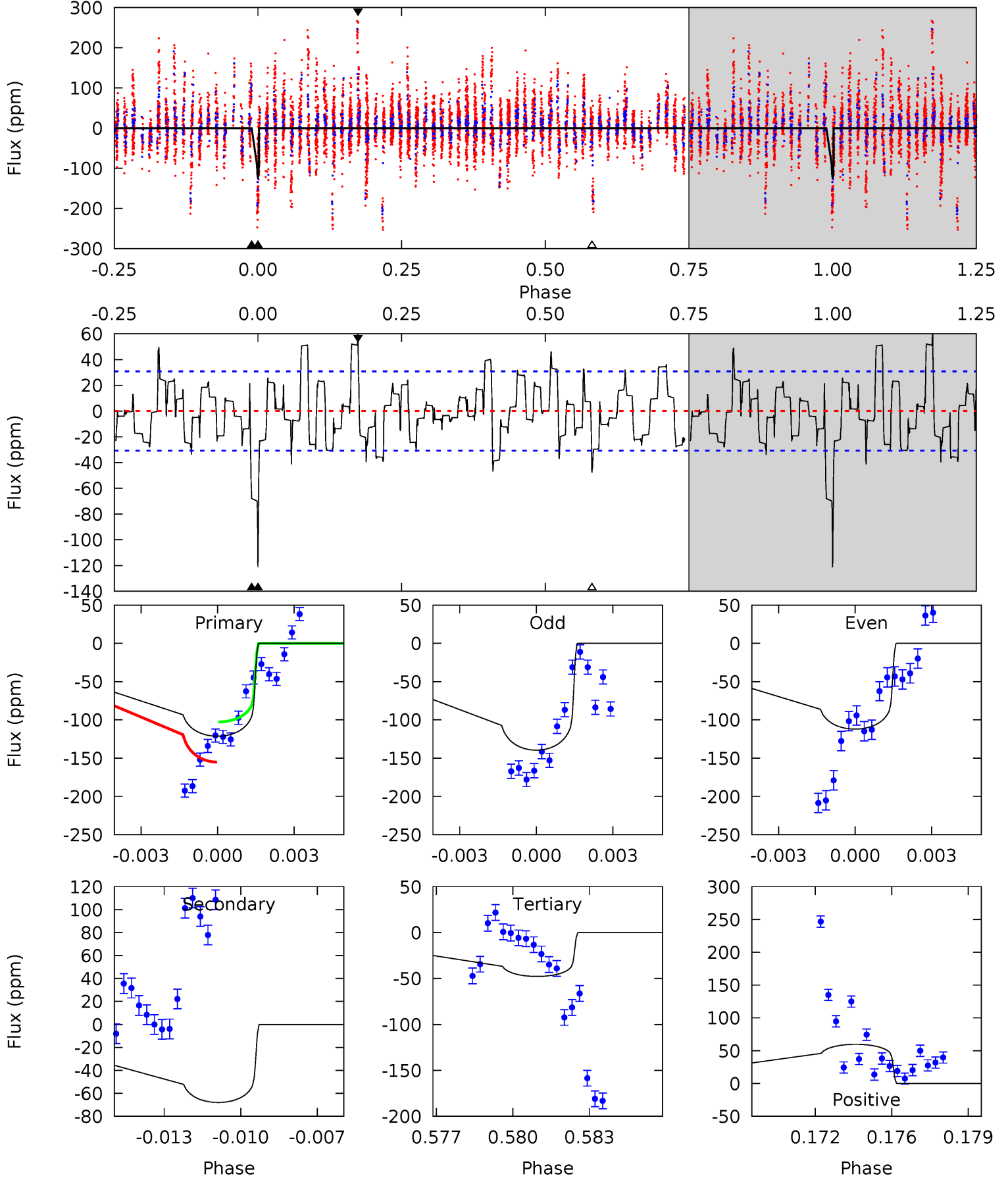


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

010091829-07, P = 185.242008 Days, E = 174.661147 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
20.6	11.5	8.12	10.1	5.23	2.94	3.19	12.5	10.5	3.43	1.41	2.33	1.14	0.33	4.20



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 010091829

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7751^{+85}_{-77}$	$3.947^{+0.138}_{-0.092}$	$0.210^{+0.200}_{-0.200}$	$2.481^{+0.371}_{-0.453}$	$1.986^{+0.166}_{-0.185}$	$0.183^{+0.123}_{-0.053}$
	+1%/-1%	+3%/-2%	+95%/-95%	+15%/-18%	+8%/-9%	+67%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 010091829-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-68 \pm 6$	$2.48^{+0.56}_{-0.44}$	$839^{+31}_{-37}$	$7203^{+860}_{-627}$	$3883^{+1925}_{-1287}$
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  $A_{obs} \gg 1.0$

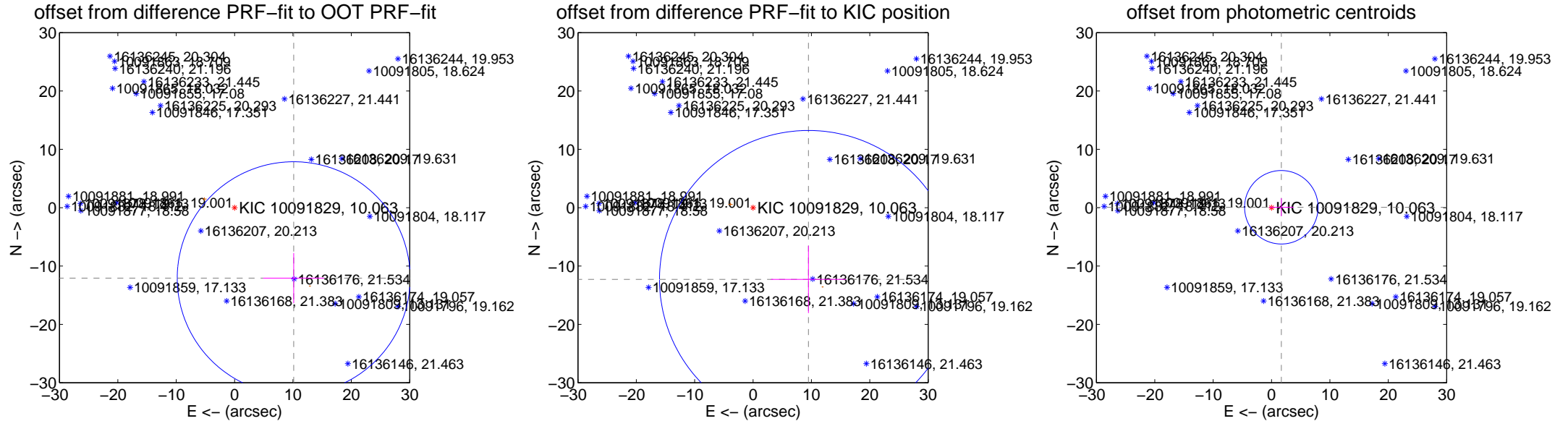
## DV Centroid Data

Supplemental centroid analysis for 010091829-07. **Kepler magnitude: 10.06.** Transit SNR 8.76

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

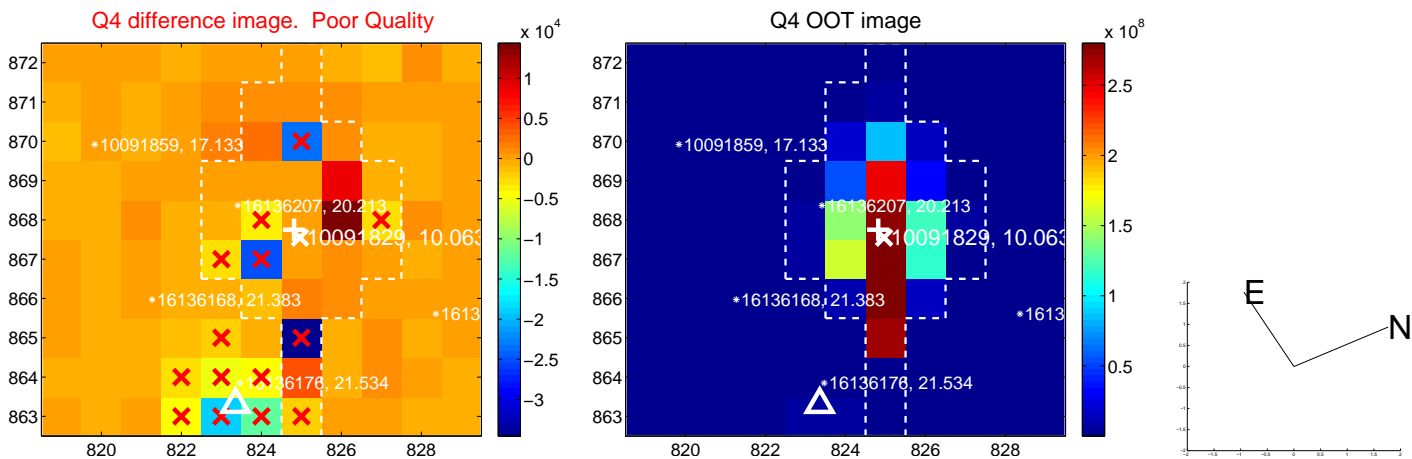
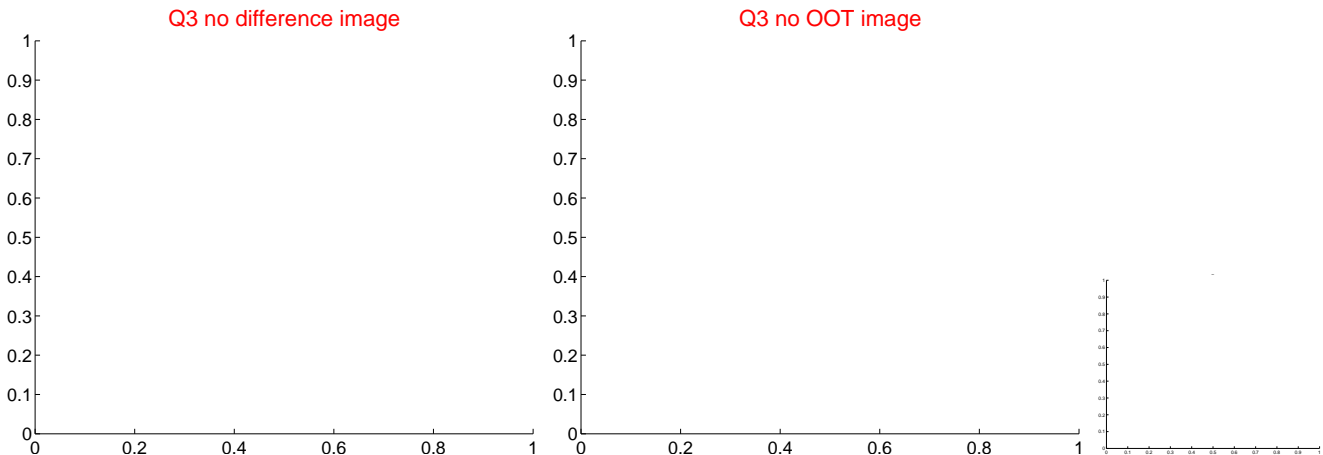
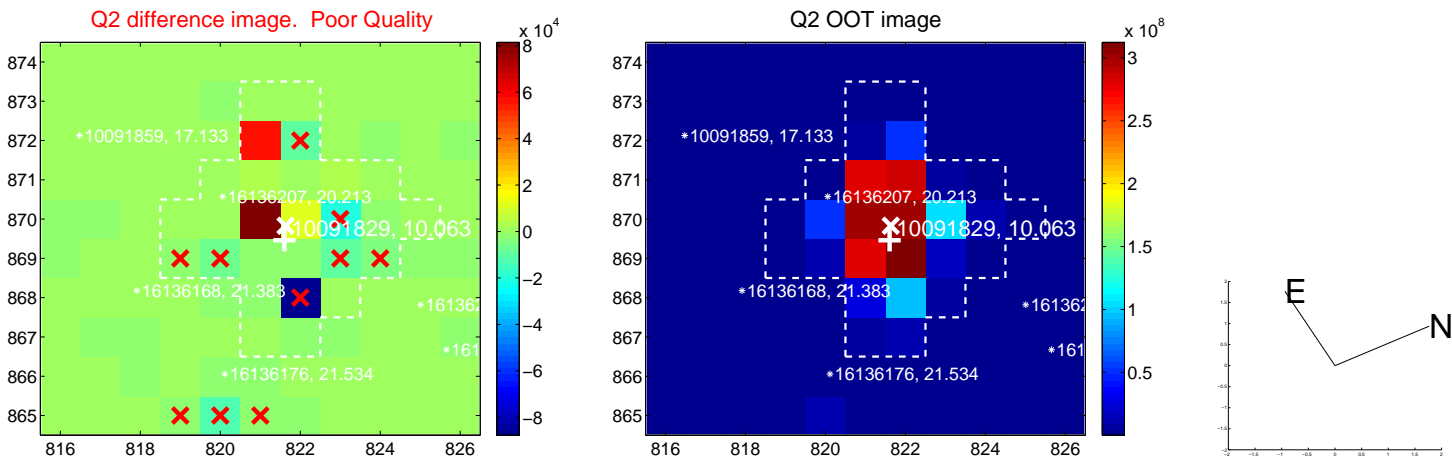
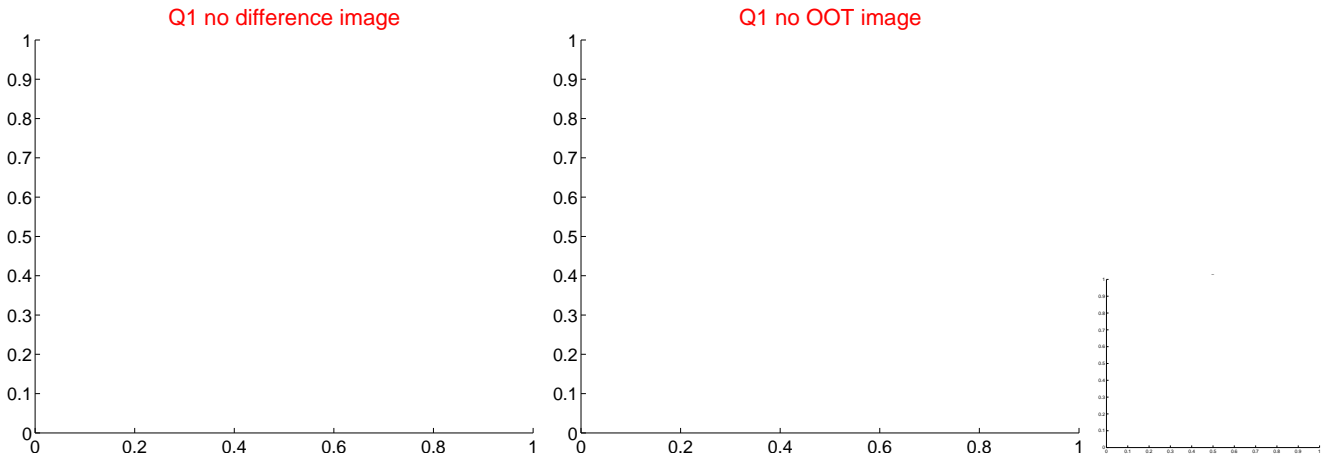
The direct PRF centroid is offset from the target star catalog position by about 1.59 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$15.758 \pm 6.649$	2.37	$-10.125 \pm 5.214$	$-12.075 \pm 4.306$
PRF-fit source offset from KIC position	$15.528 \pm 8.506$	1.83	$-9.494 \pm 6.440$	$-12.288 \pm 5.774$
photometric centroid source offset	$1.68 \pm 2.10$	0.80	$-1.68 \pm 2.10$	$0.07 \pm 1.54$



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

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





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

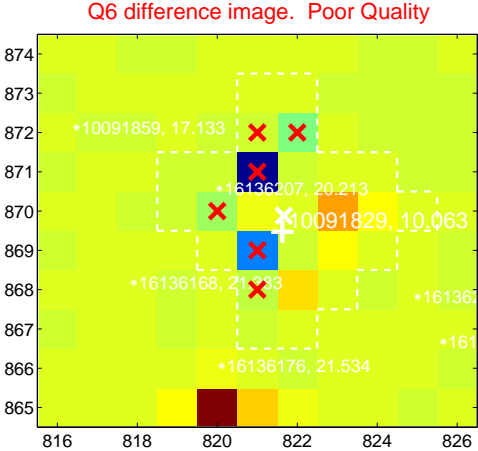
Q5 no difference image



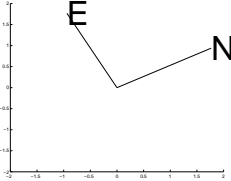
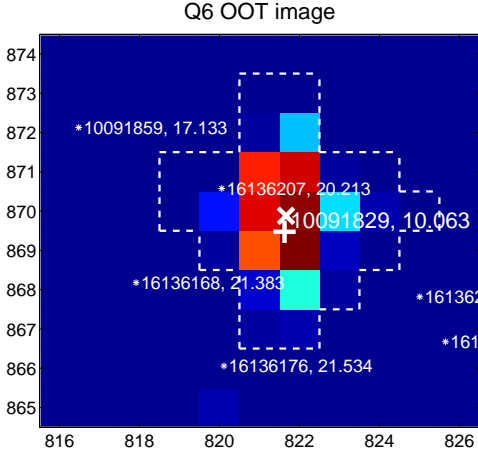
Q5 no OOT image



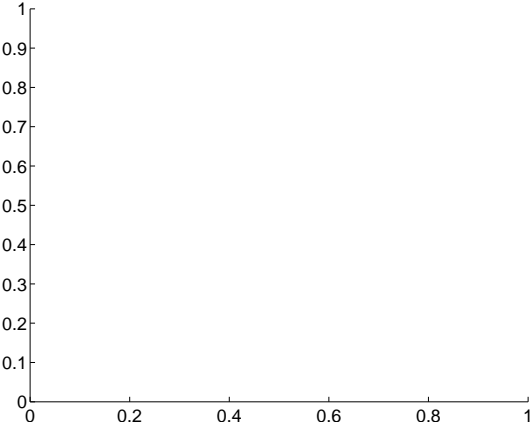
Q6 difference image. Poor Quality



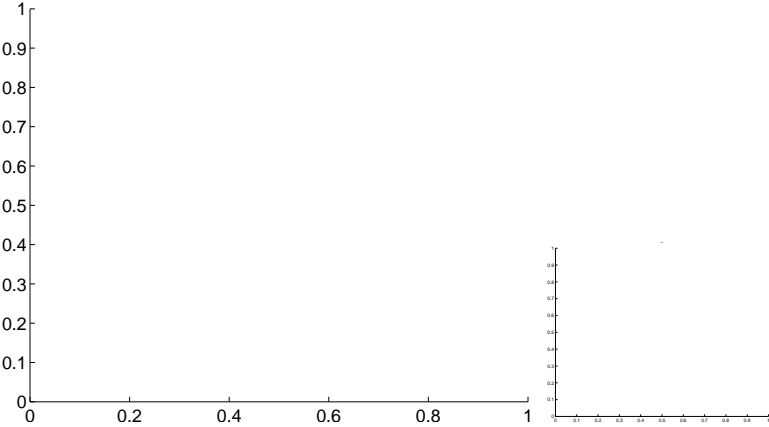
Q6 OOT image



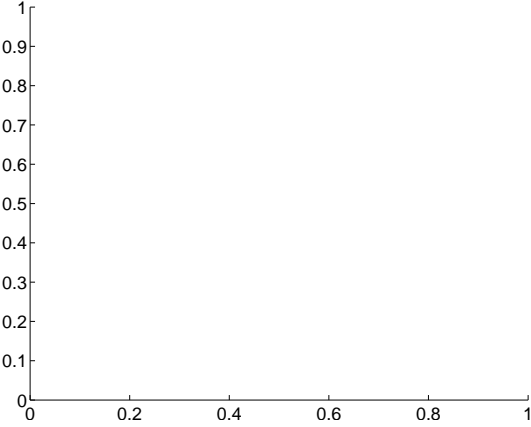
Q7 no difference image



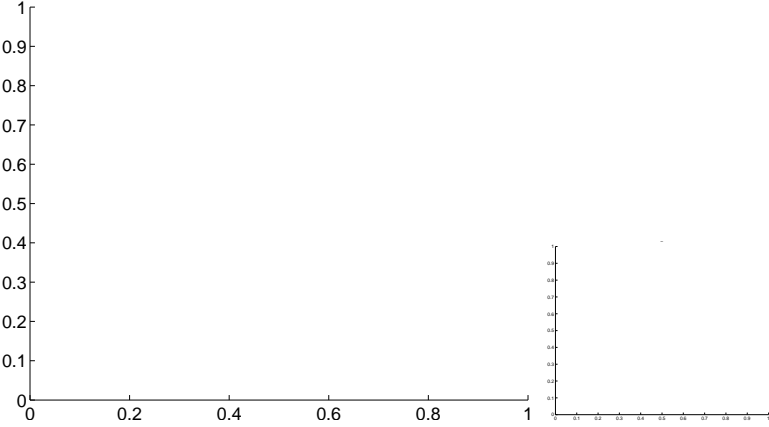
Q7 no OOT image



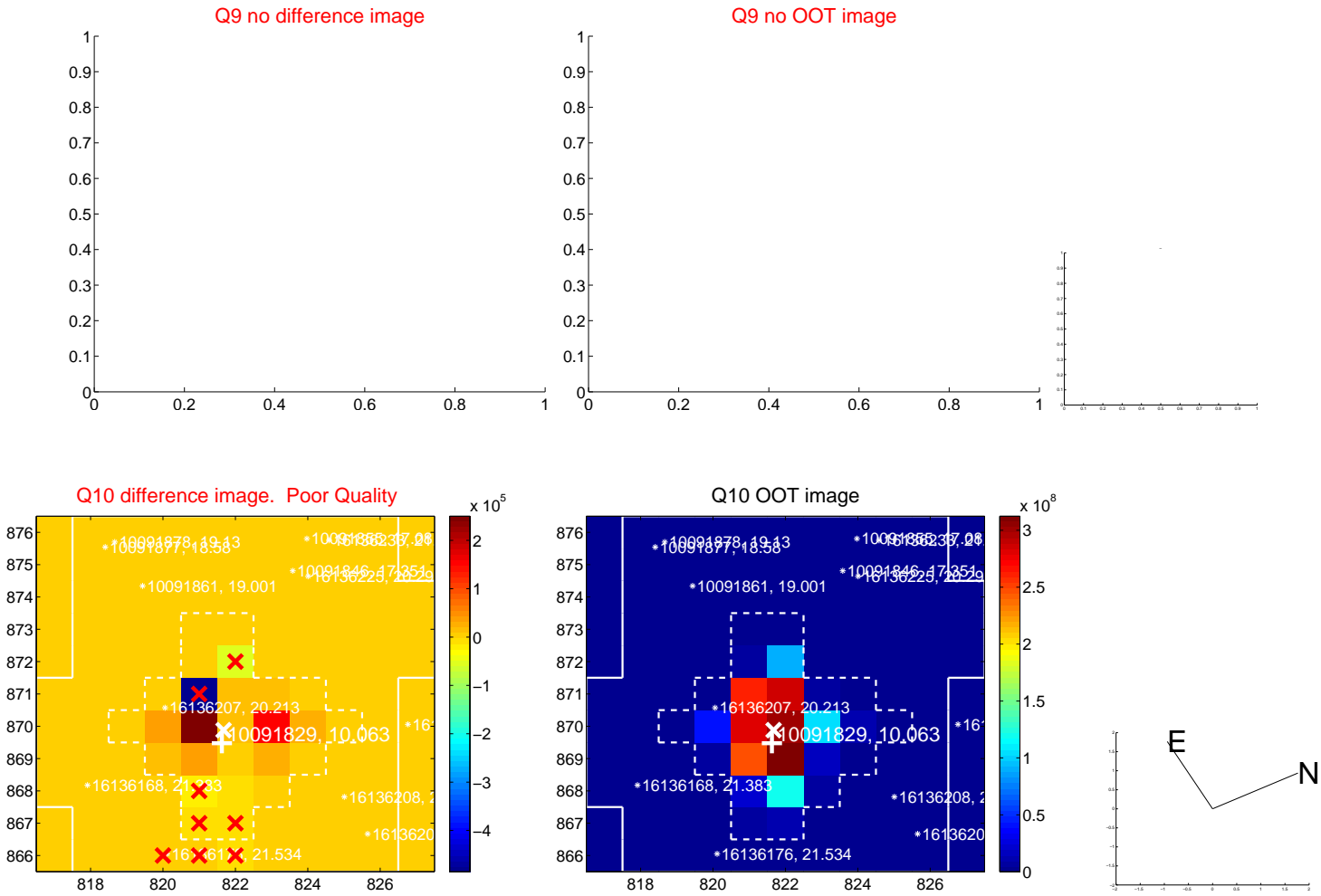
Q8 no difference image



Q8 no OOT image



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



Q10 difference image. Poor Quality



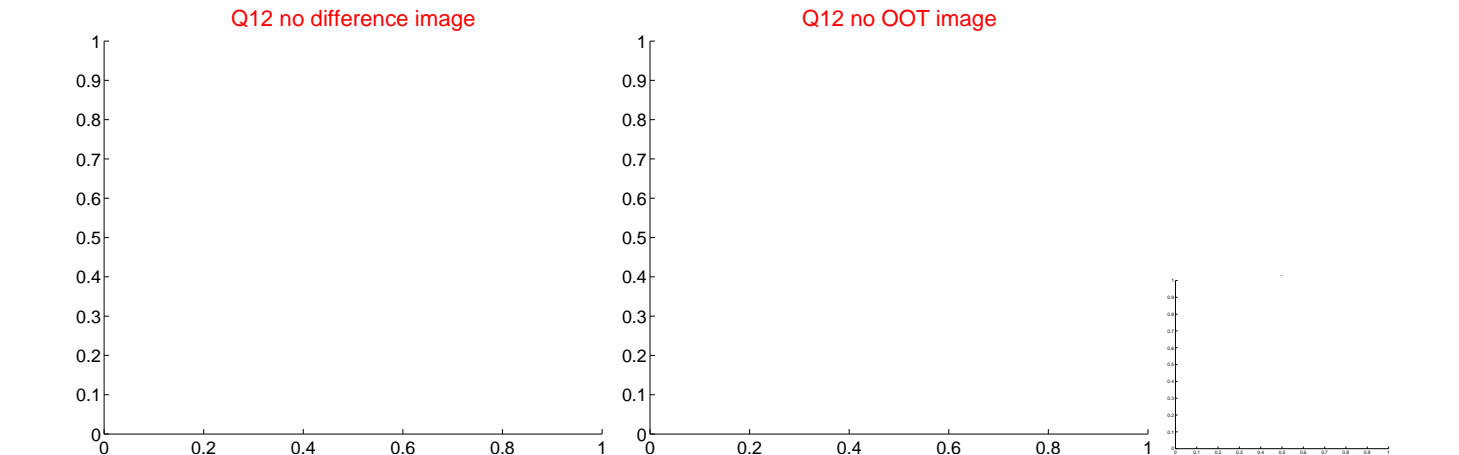
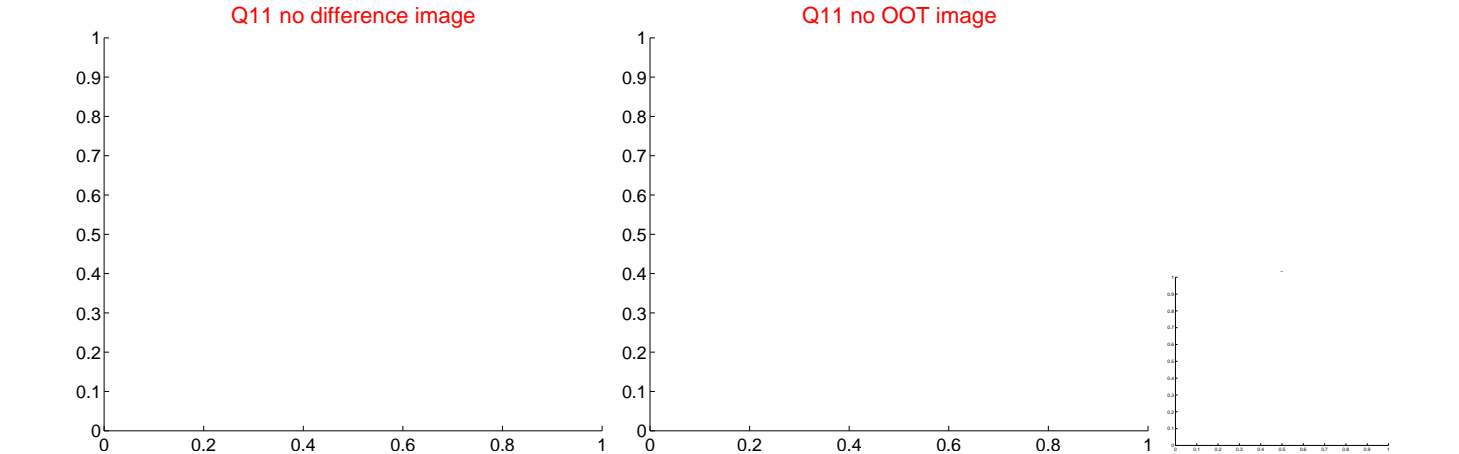
Q10 OOT image



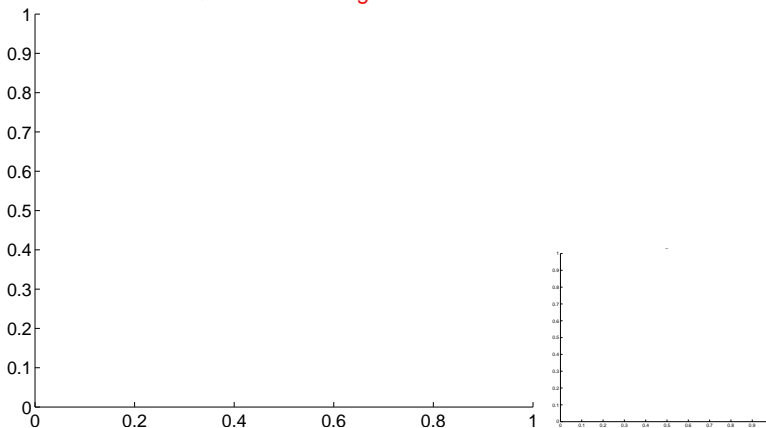
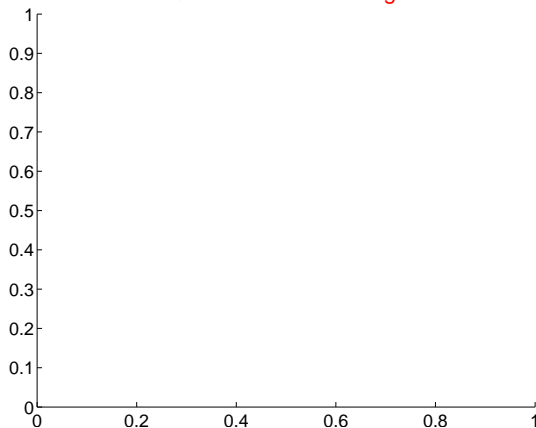
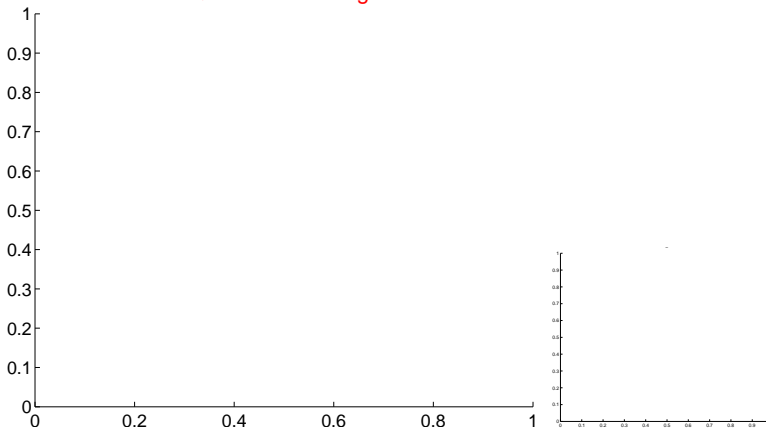
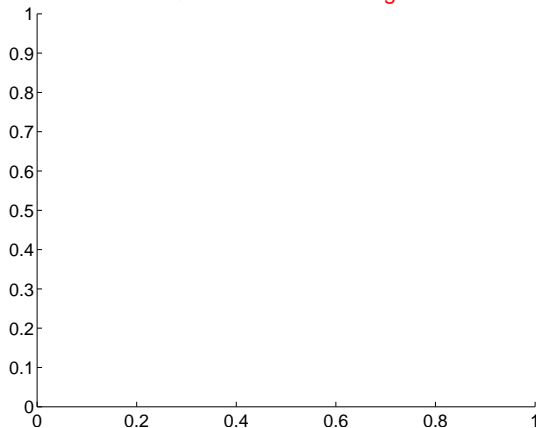
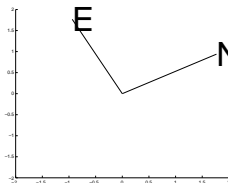
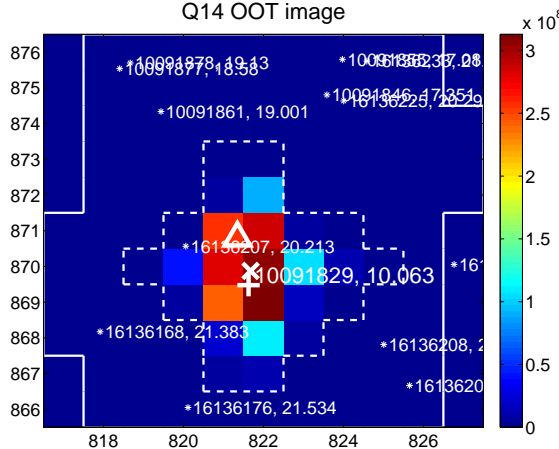
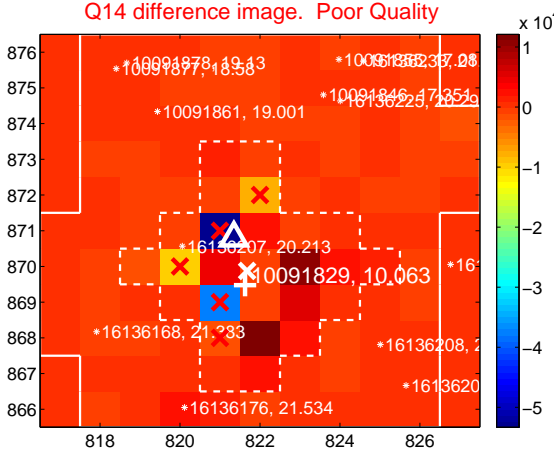
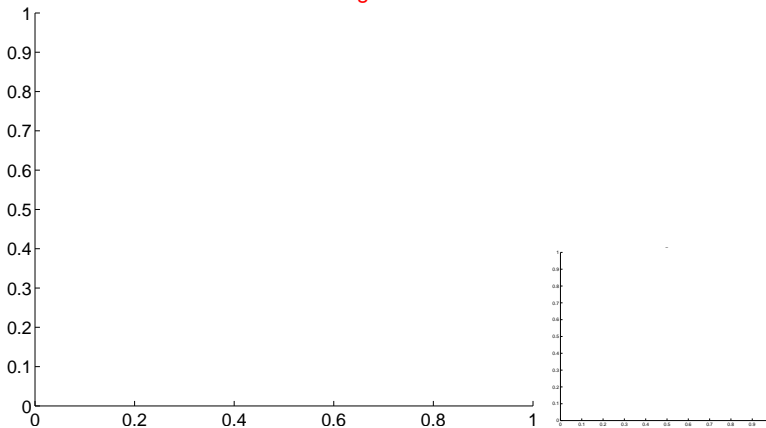
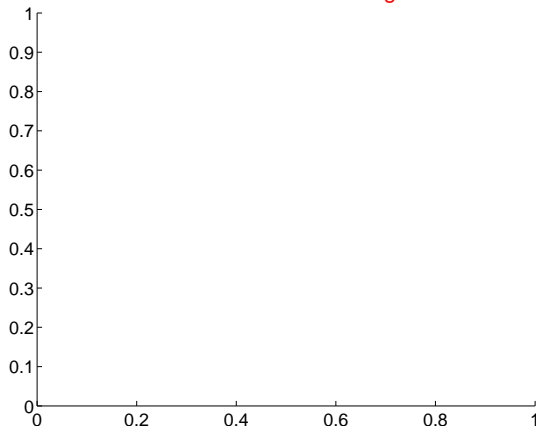
E

N

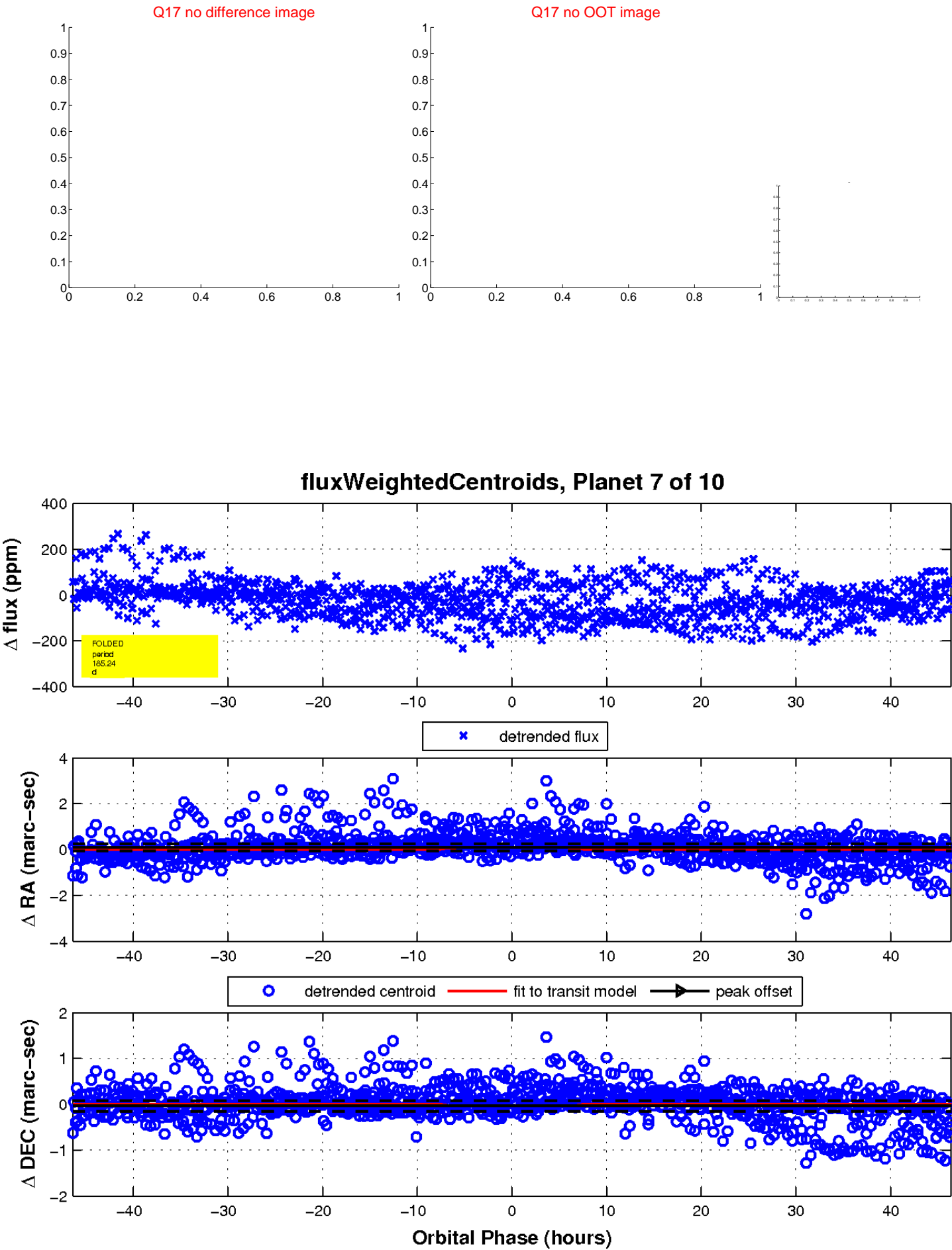




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

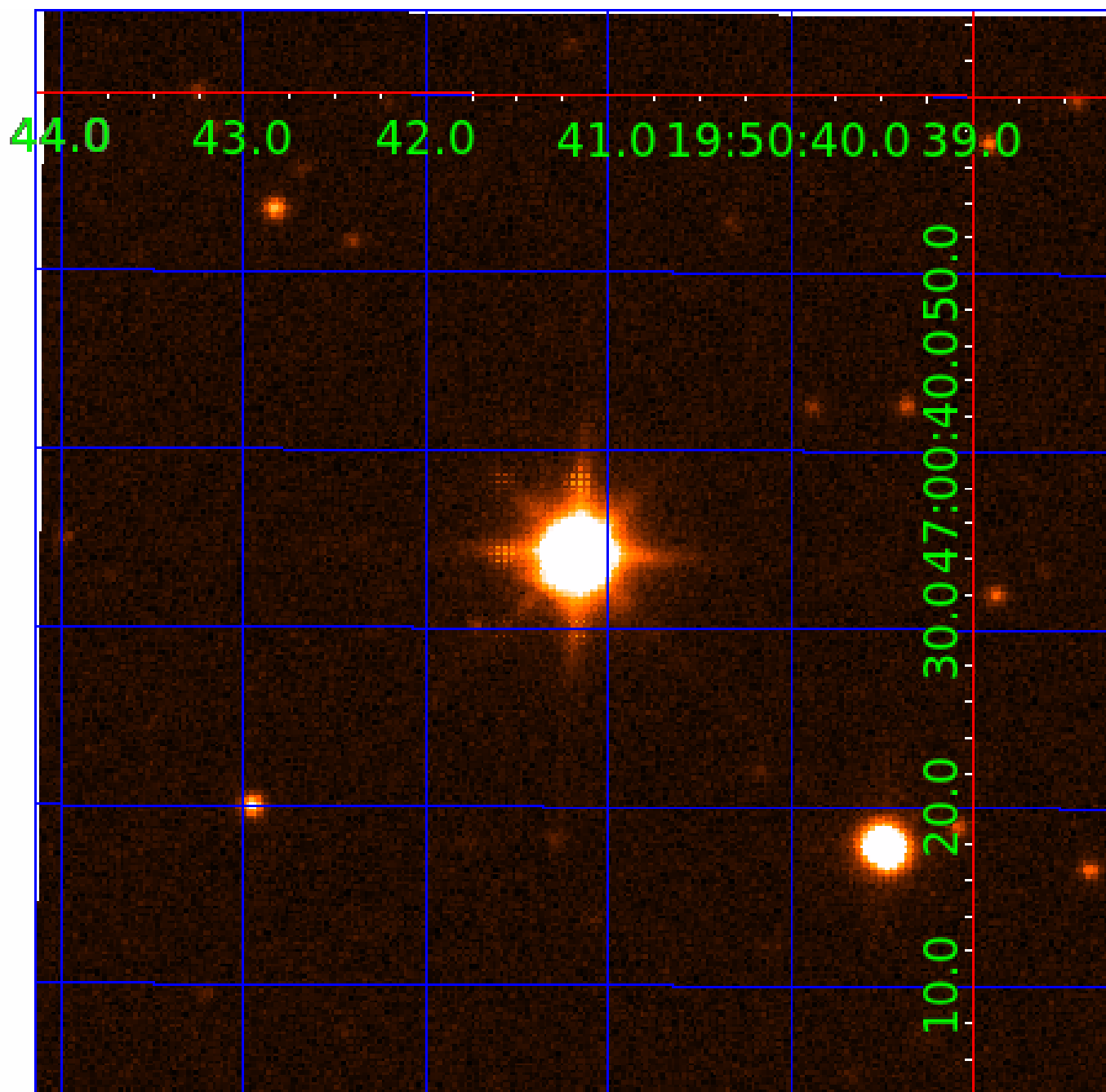


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010091829

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010091829-01	OBS	No	2.685897	132.966276	9.3	17.710	13.4	10.7	2.48	7751	0.77	8802.86
010091829-02	OBS	No	51.150813	150.403921	75.0	13.637	23.3	11.1	2.48	7751	2.61	173.09
010091829-04	OBS	No	103.251385	212.511369	77.6	11.125	15.0	10.7	2.48	7751	2.46	67.85
010091829-05	OBS	No	39.721348	158.143016	55.9	7.274	14.0	8.1	2.48	7751	2.12	242.50
010091829-06	OBS	No	97.893326	213.505551	72.2	12.046	12.5	8.2	2.48	7751	2.22	72.85
010091829-07	OBS	No	185.242008	174.661147	75.4	15.466	13.6	8.8	2.48	7751	2.54	31.12
010091829-08	OBS	No	144.806501	226.139993	476.4	66.191	10.9	9.9	2.48	7751	6.89	43.22
010091829-09	OBS	No	123.726523	248.998906	51.2	12.172	9.0	7.0	2.48	7751	2.05	53.31
010091829-10	OBS	No	15.454682	141.232200	49.5	3.861	7.4	8.1	2.48	7751	2.01	853.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010091829-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
010091829-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
010091829-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED
010091829-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010091829-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

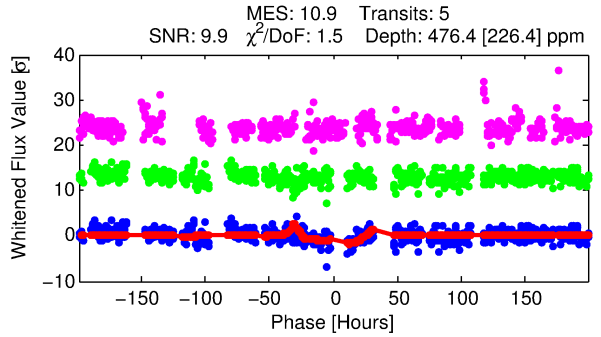
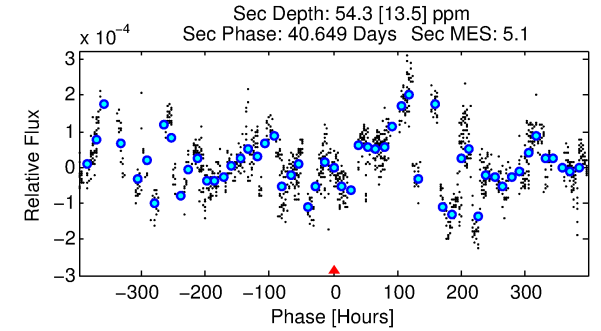
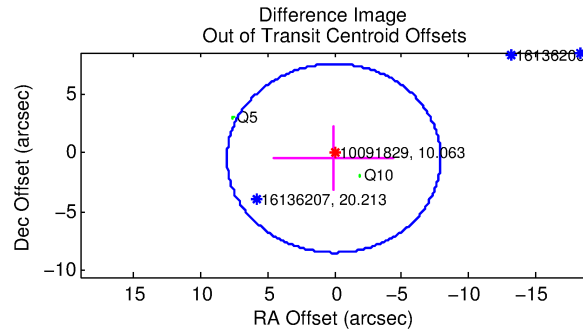
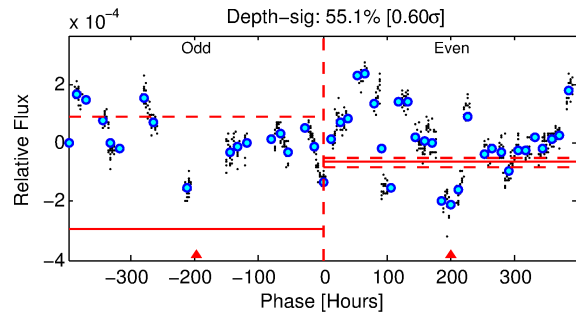
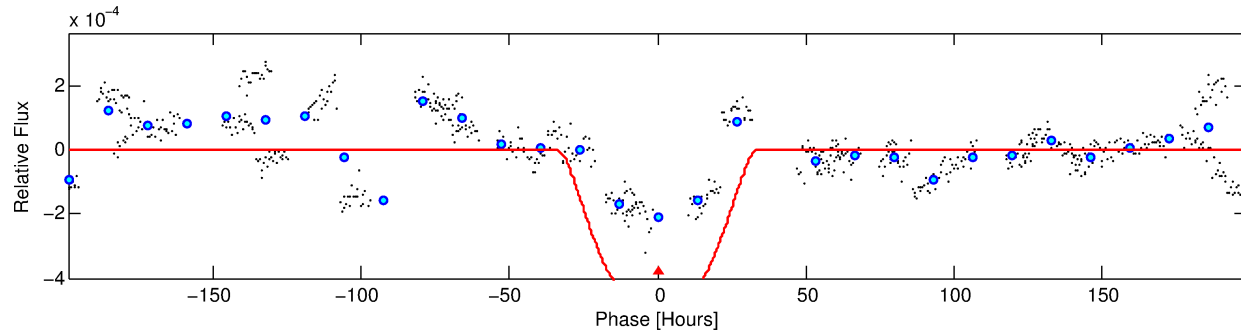
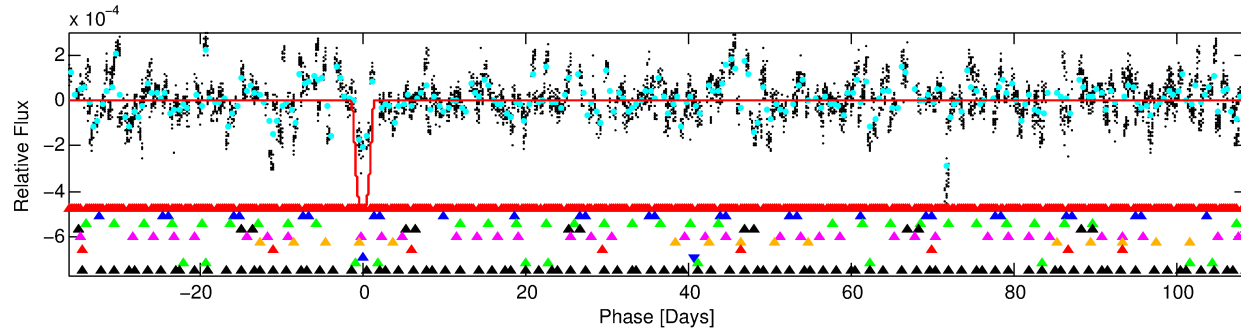
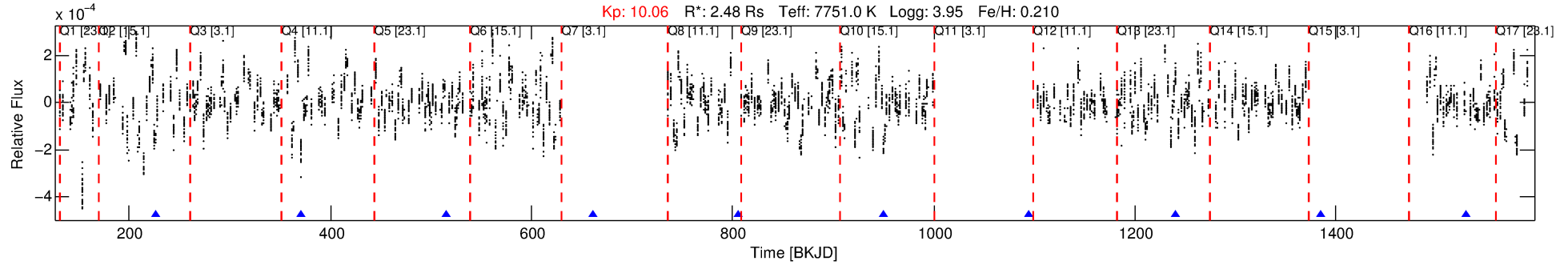
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010091829-08

No Significant Match Found

# DV One-Page Summary

KIC: 10091829 Candidate: 8 of 10 Period: 144.807 d



## DV Fit Results:

Period = 144.80650 [0.09116] d  
Epoch = 226.1400 [0.3165] BKJD  
Rp/R\* = 0.0254 [0.0060]  
a/R\* = 5.62 [1.39]  
b = 0.97 [0.01]  
Seff = 43.22 [10.73]  
Teq = 654 [41] K  
Rp = 6.89 [2.05] Re  
a = 0.6786 [0.1095] AU  
Ag = 289.73 [169.72] [1.70 $\sigma$ ]  
Teff = 4171 [557] K [6.30 $\sigma$ ]

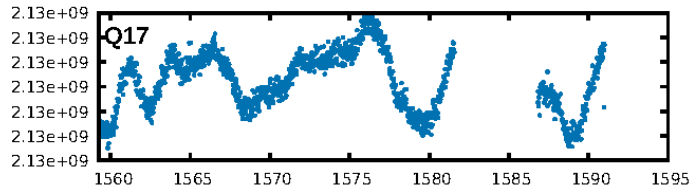
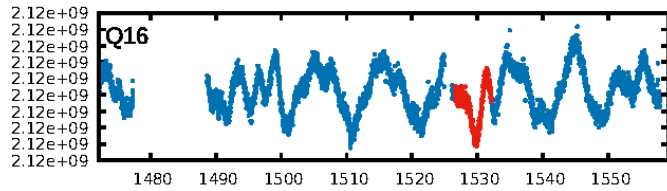
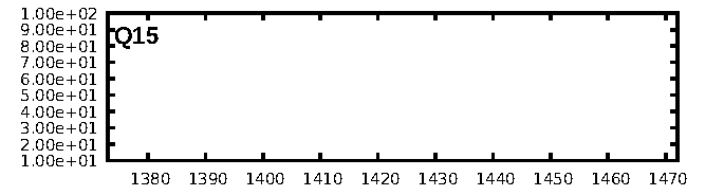
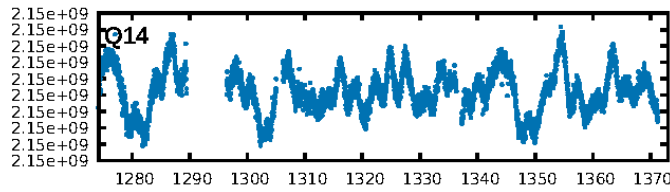
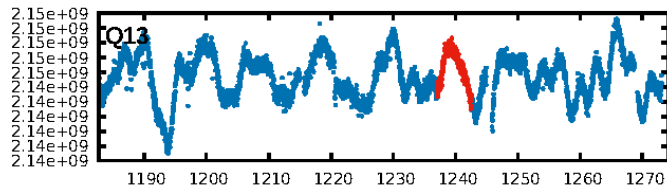
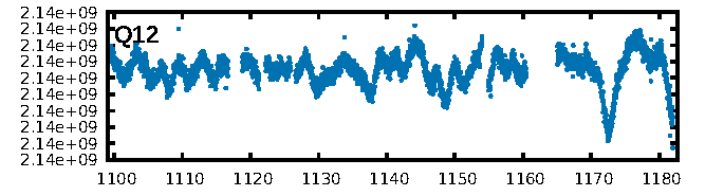
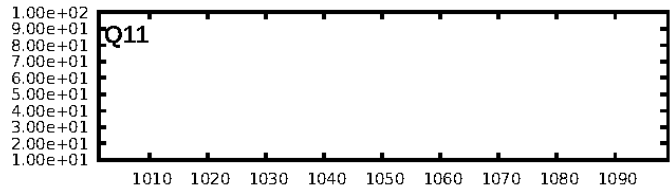
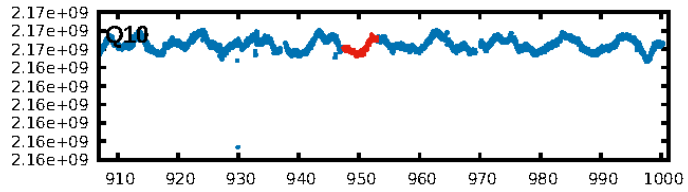
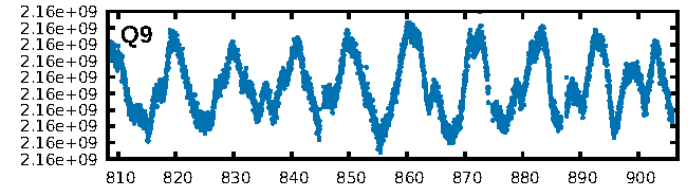
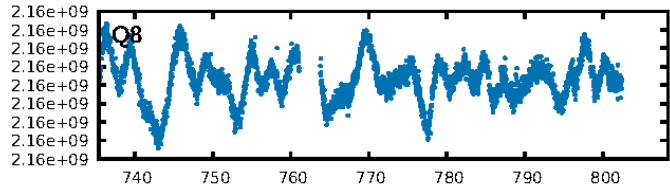
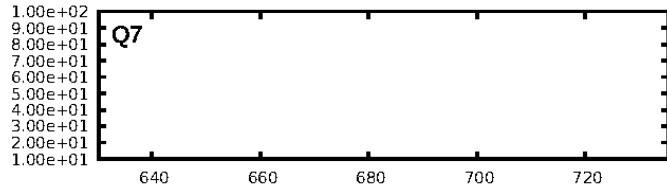
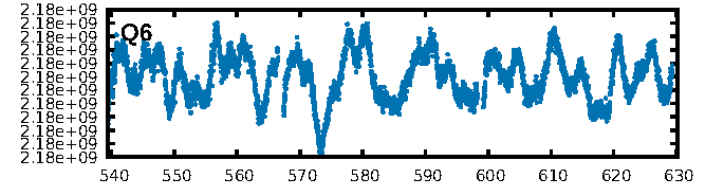
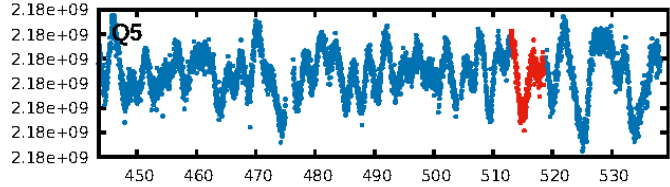
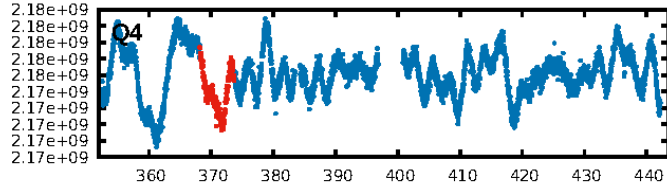
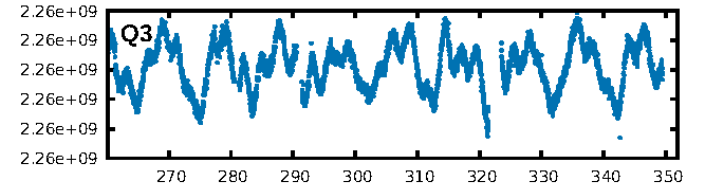
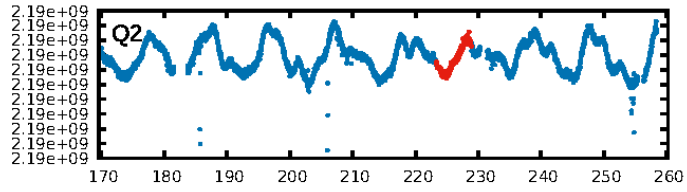
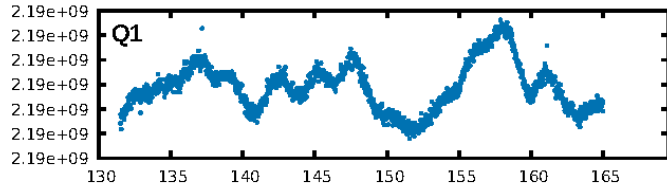
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.52 $\sigma$ ]  
LongPeriod-sig: 100.0% [14.28 $\sigma$ ]  
ModelChiSquare2-sig: 13.8%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.21e-10**  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 81.7%  
Centroid-so: 0.508 arcsec [2.06 $\sigma$ ]  
OotOffset-rm: 0.467 arcsec [0.18 $\sigma$ ]  
KicOffset-rm: 0.795 arcsec [0.28 $\sigma$ ]  
OotOffset-st: 1/0/0/1 [2]  
KicOffset-st: 1/0/0/1 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:11:12 Z

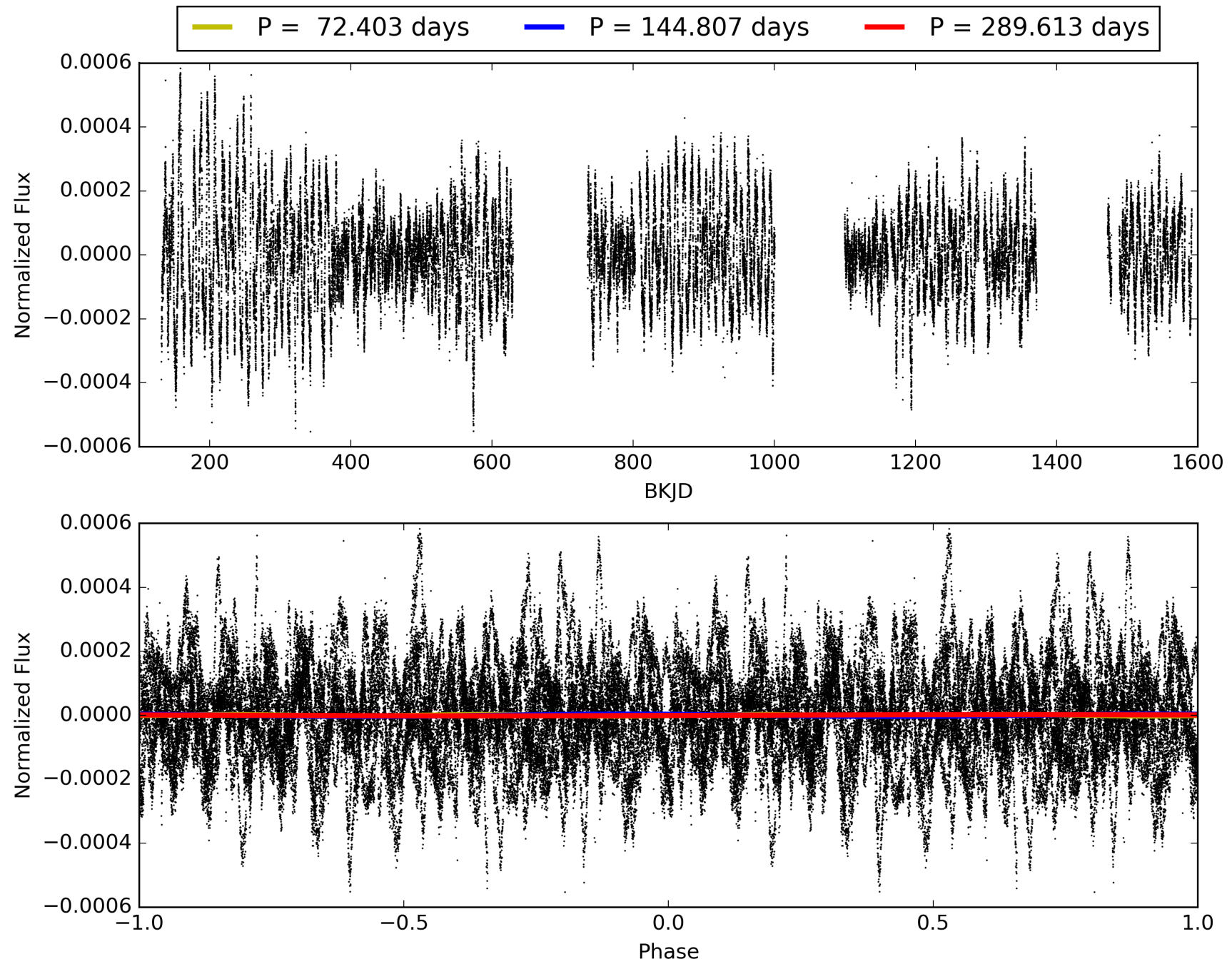
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

## TCE 010091829-08, PDC Light Curves



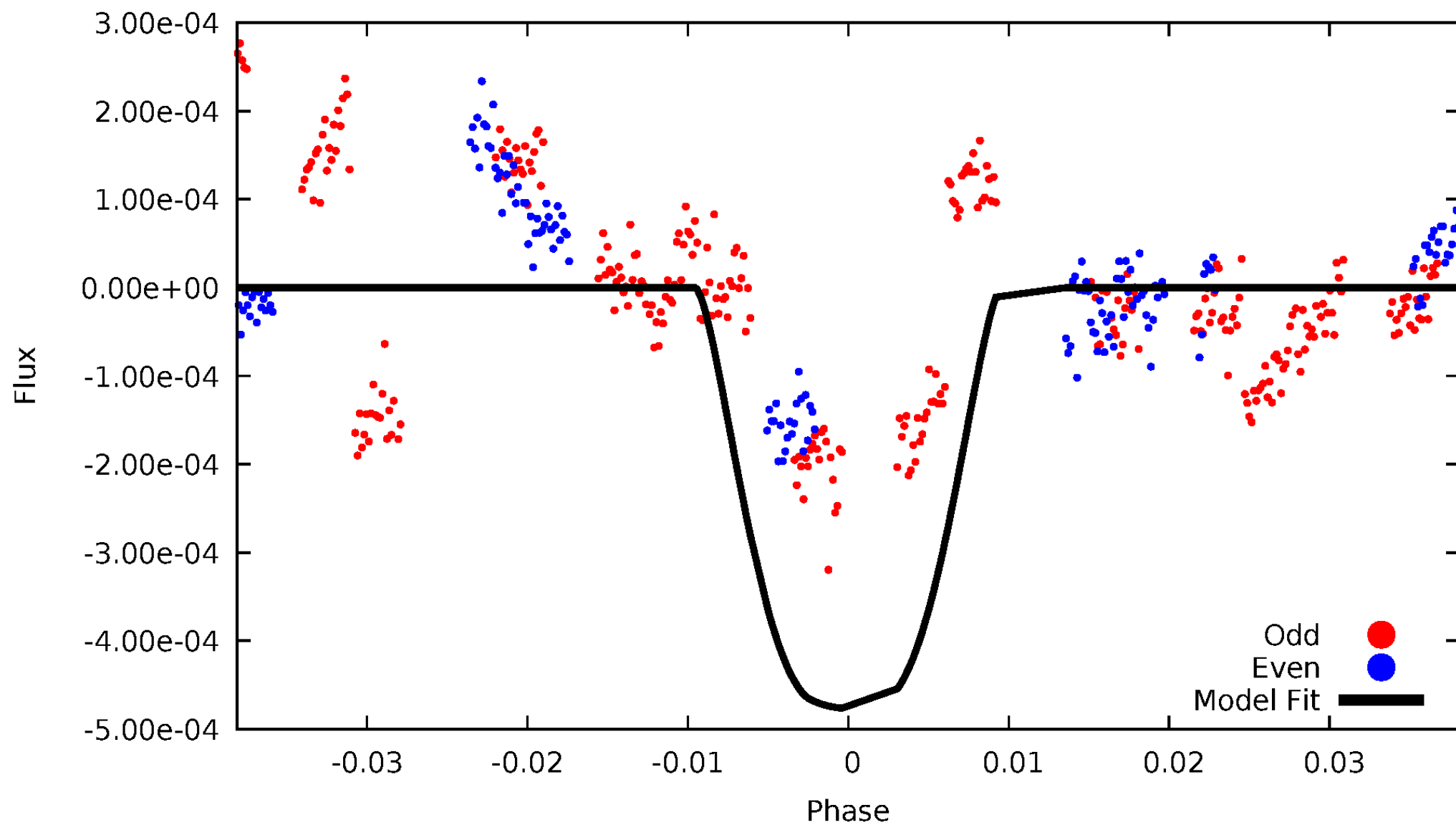


TCE 010091829-08



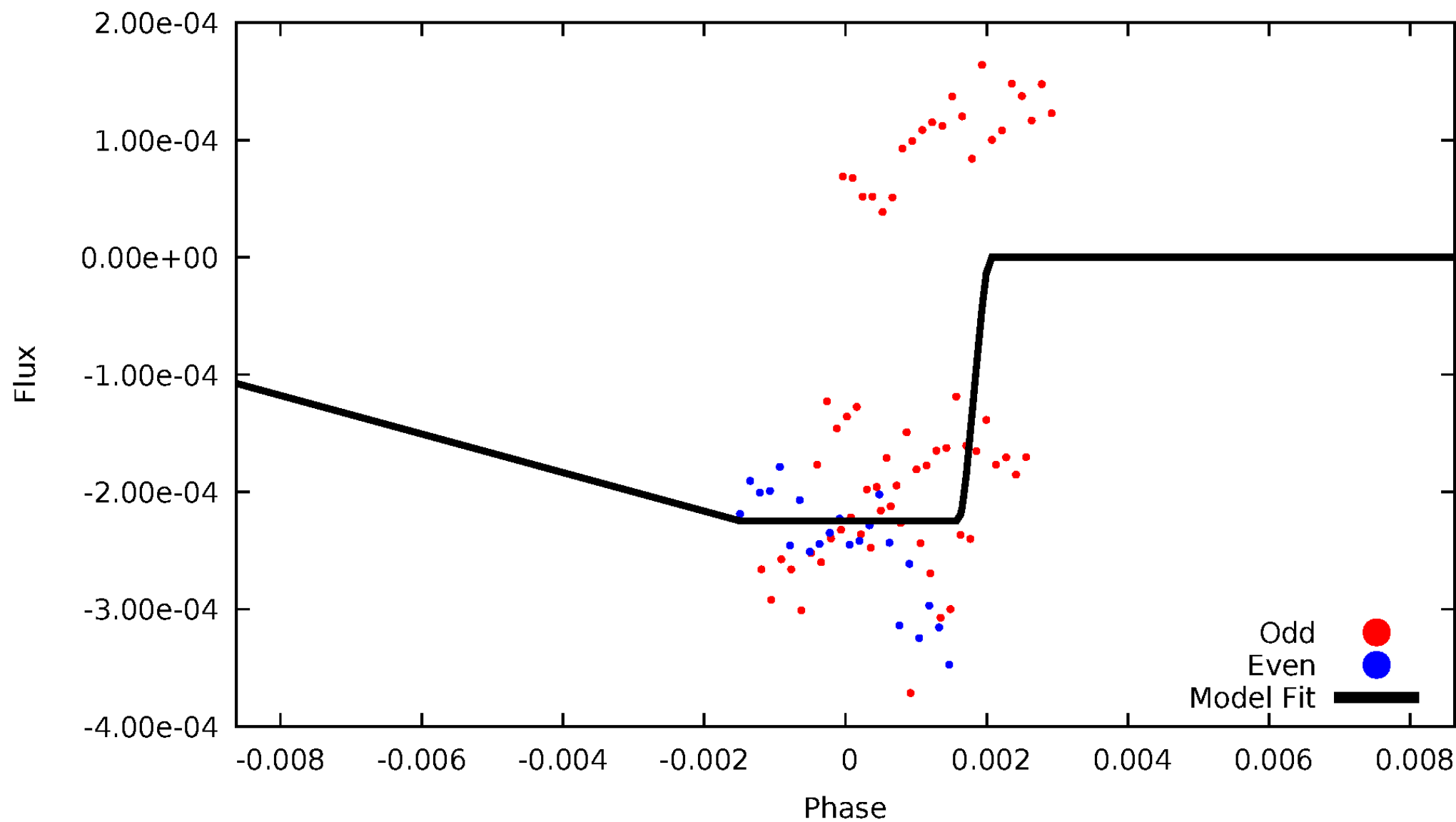
# DV Odd/Even

TCE 010091829-08



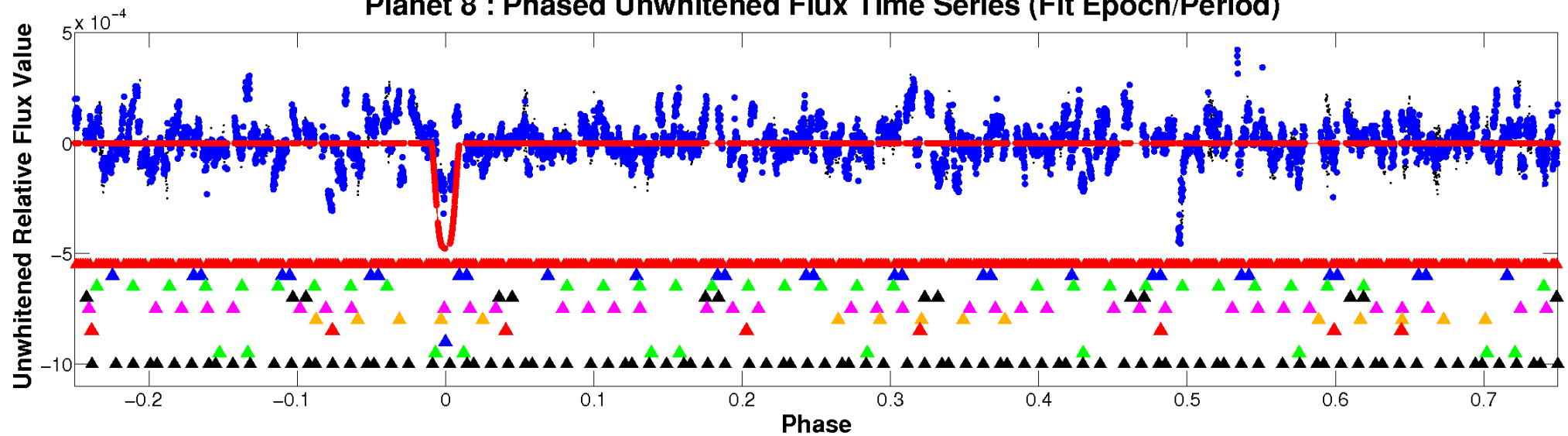
# ALT Odd/Even

TCE 010091829-08

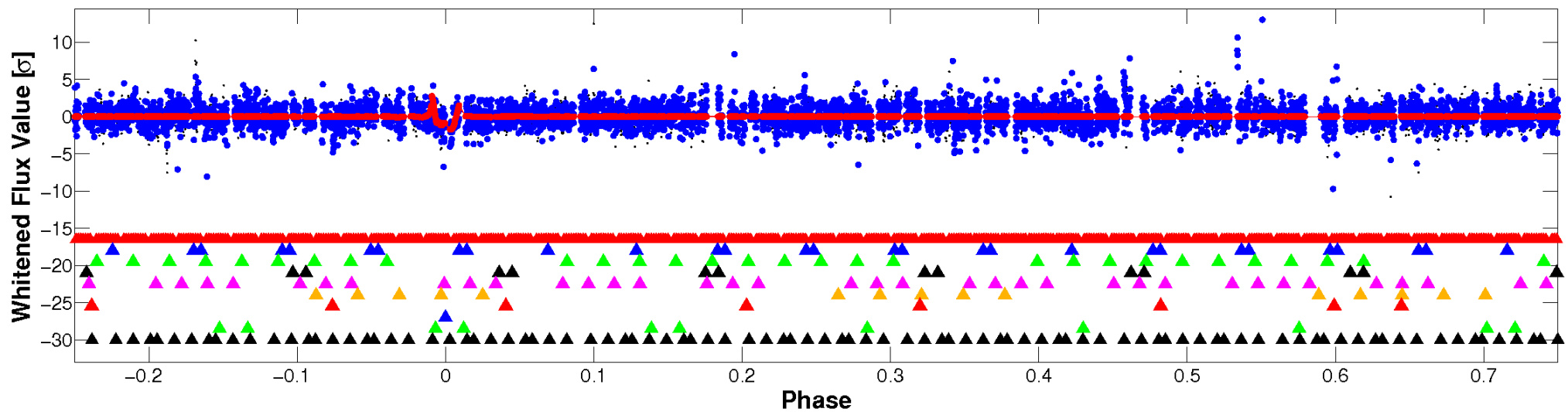


# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

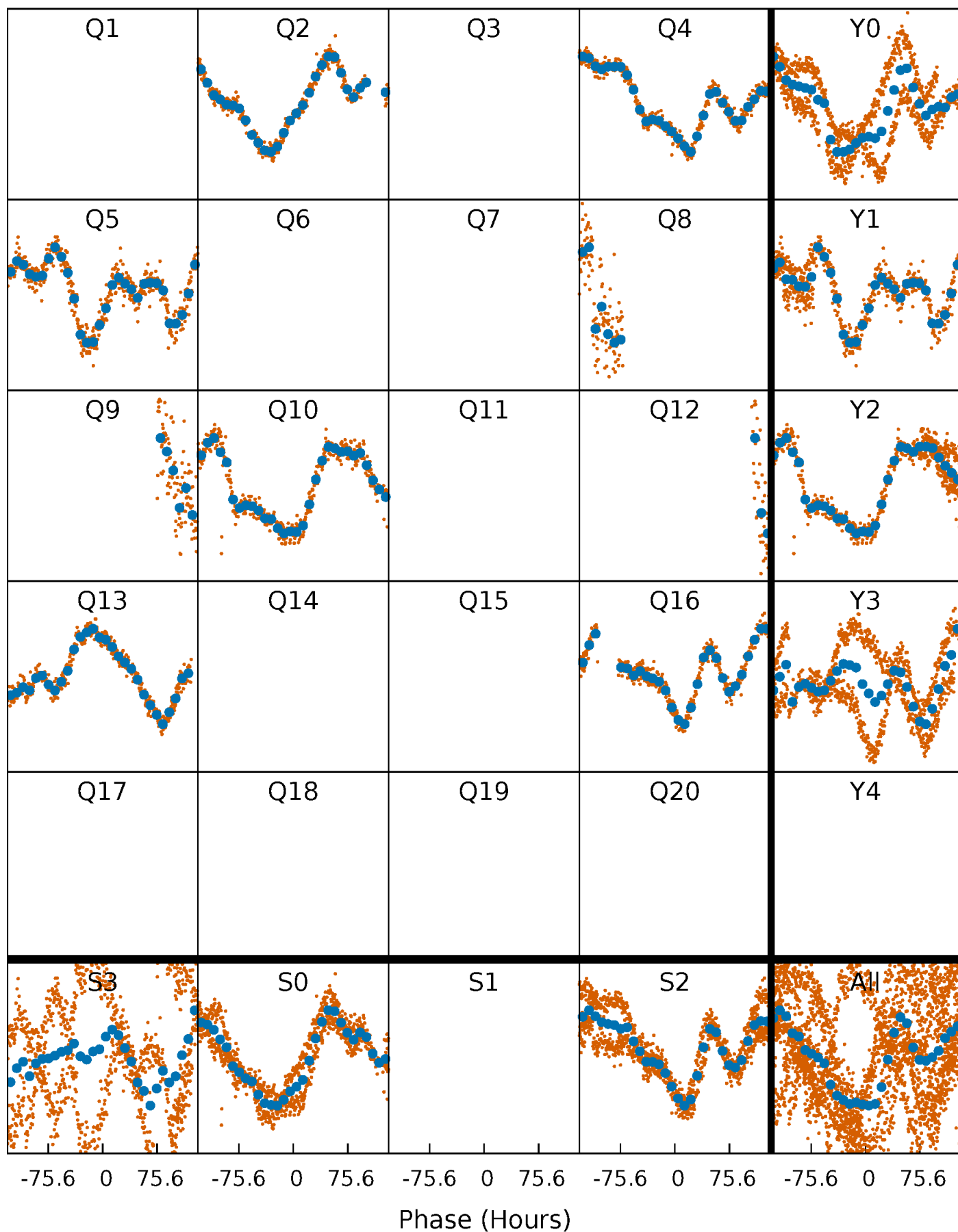


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



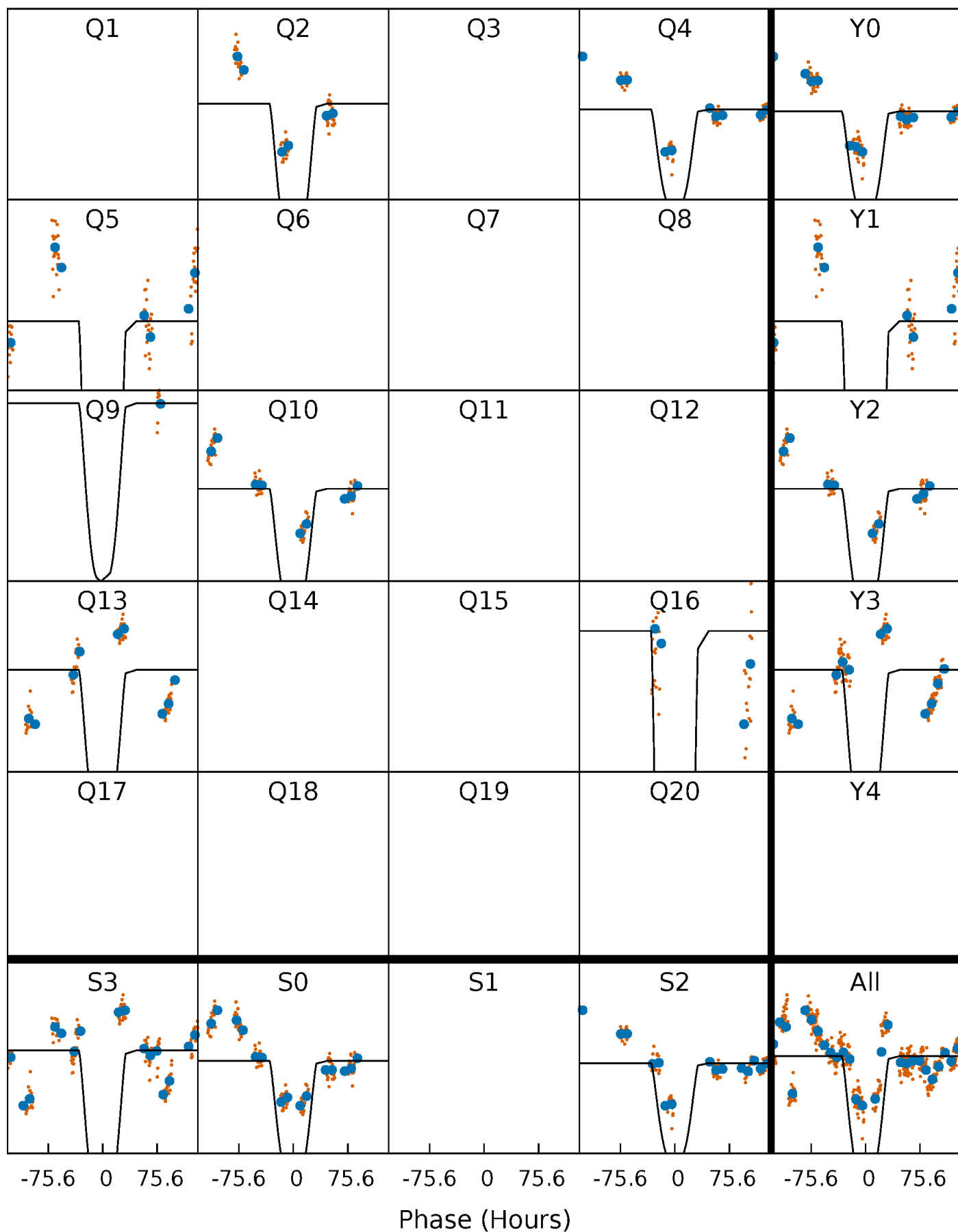
# PDC Quarter-Phased Transit Curves

TCE 010091829-08 P=144.806501 Days  $T_0=226.139993$  (BKJD)



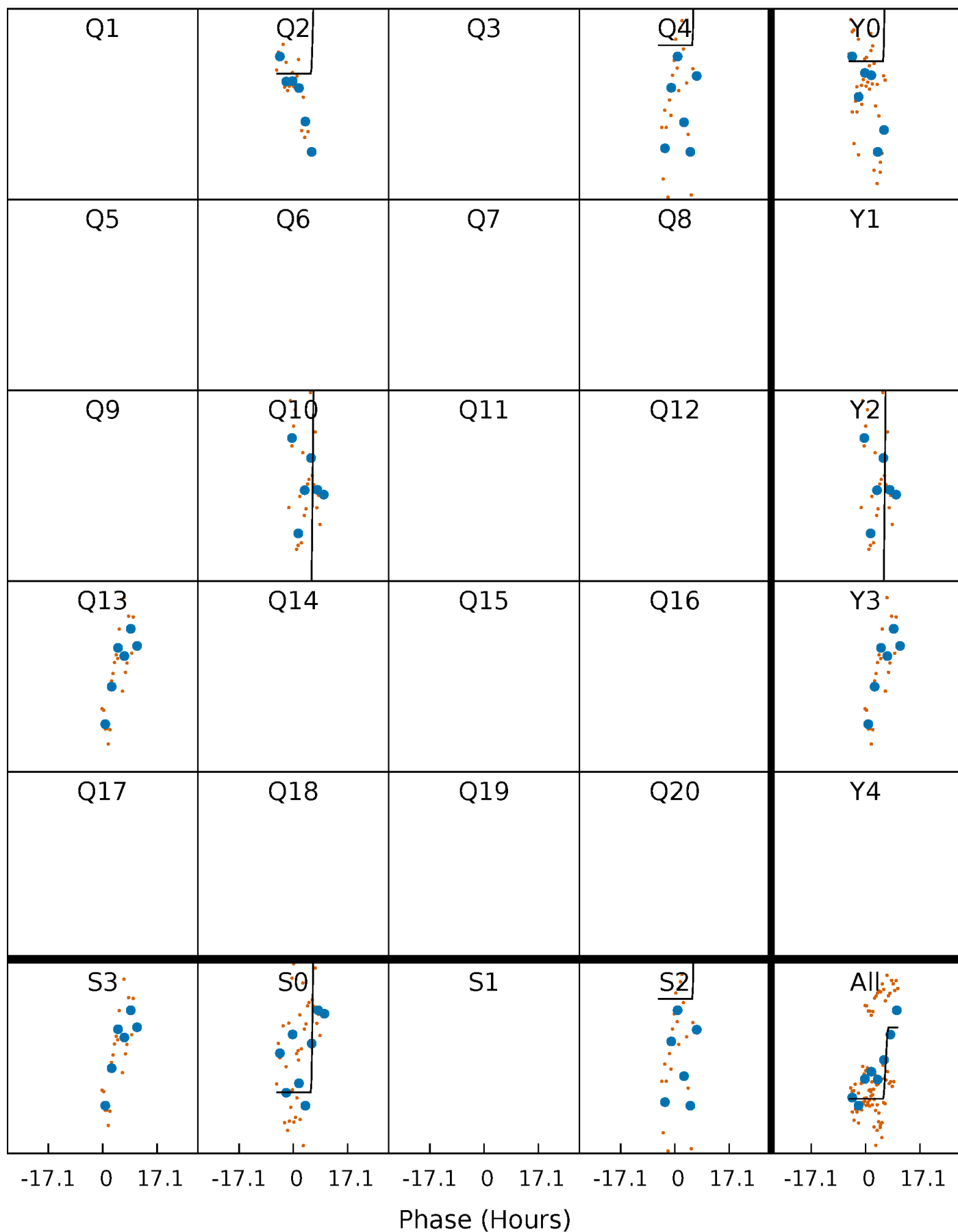
# DV Quarter-Phased Transit Curves

TCE 010091829-08 P=144.806501 Days  $T_0=226.139993$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

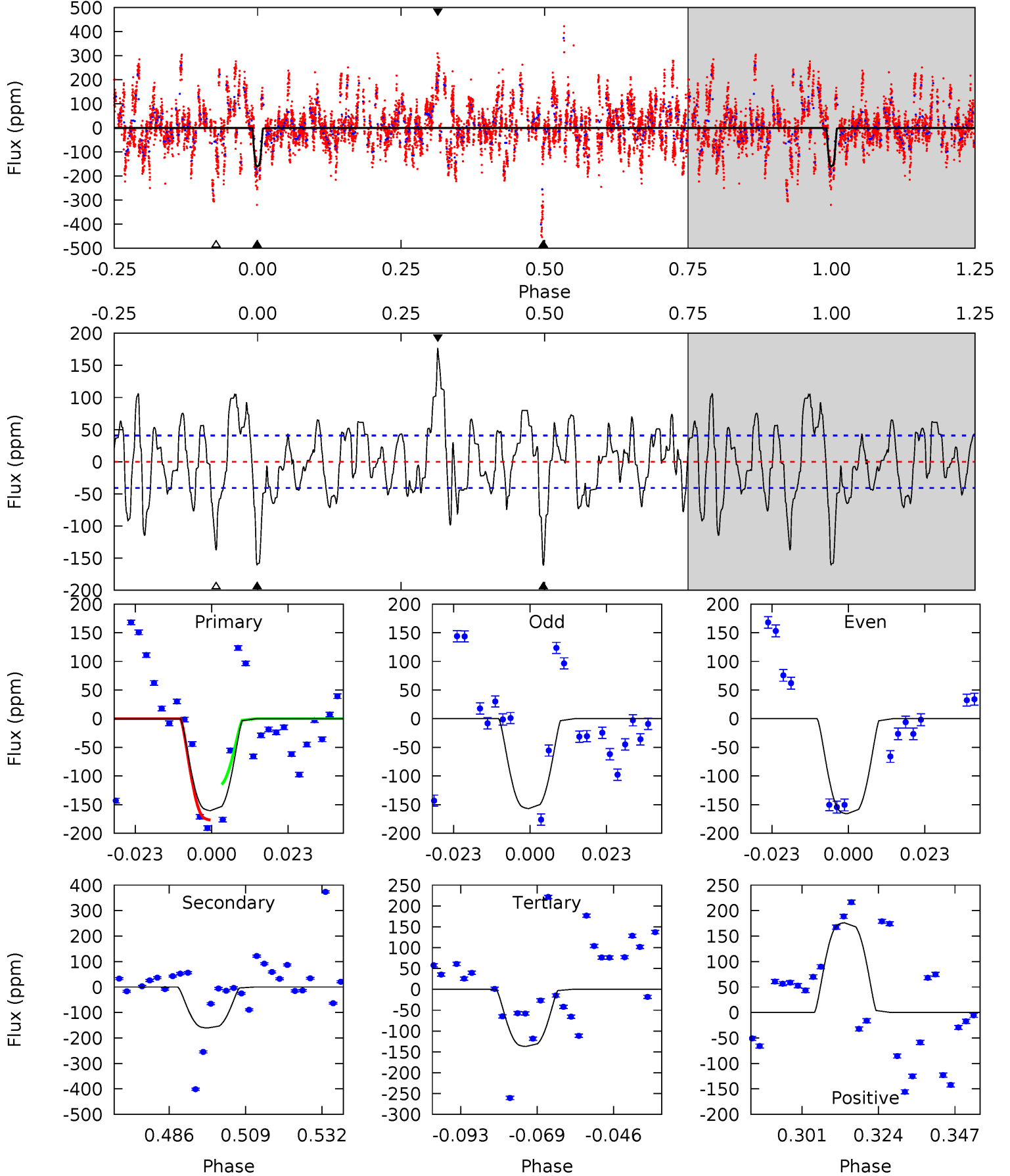
TCE 010091829-08 P=145.010164 Days  $T_0=225.622774$  (BKJD)



# DV Model-Shift Uniqueness Test

010091829-08, P = 144.806501 Days, E = 81.333492 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
19.2	19.2	16.4	21.0	4.86	2.27	5.81	2.80	-1.86	2.84	-1.83	0.44	0.31	0.52	3.64

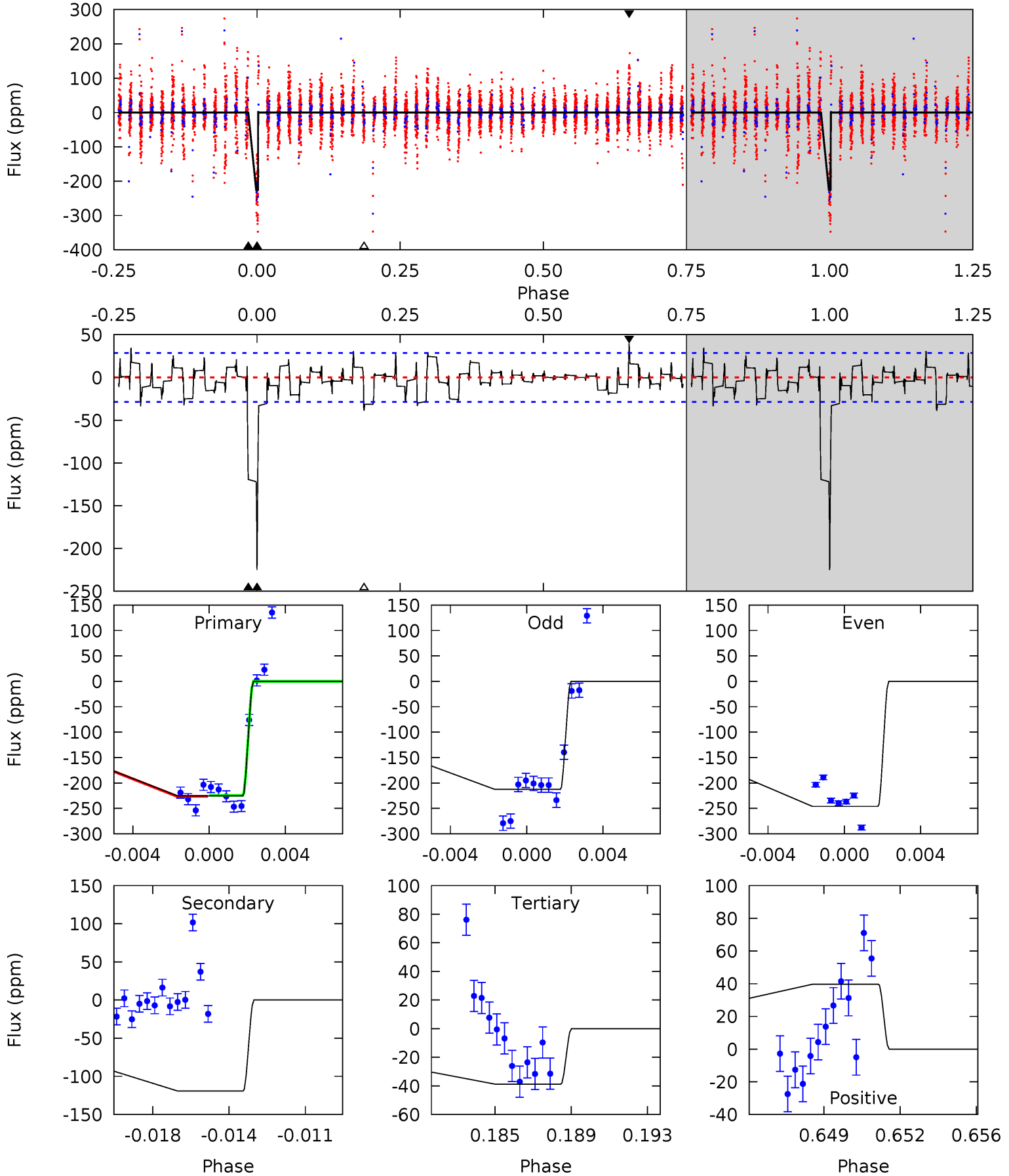




# Alt Model-Shift Uniqueness Test

010091829-08,  $P = 145.010164$  Days,  $E = 80.612610$  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
41.1	21.8	7.09	7.26	5.22	2.91	2.24	34.0	33.9	14.7	14.5	2.91	0.71	0.15	0



### Stellar Parameters For KIC 010091829

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7751^{+85}_{-77}$	$3.947^{+0.138}_{-0.092}$	$0.210^{+0.200}_{-0.200}$	$2.481^{+0.371}_{-0.453}$	$1.986^{+0.166}_{-0.185}$	$0.183^{+0.123}_{-0.053}$
	+1%/-1%	+3%/-2%	+95%/-95%	+15%/-18%	+8%/-9%	+67%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 010091829-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-161 \pm 8$	$6.72^{+1.76}_{-1.77}$	$911^{+36}_{-40}$	$5443^{+761}_{-528}$	$915^{+754}_{-355}$
Alt.	$-119 \pm 5$	$3.96^{+1.80}_{-1.56}$	$911^{+36}_{-43}$	$6522^{+2067}_{-1025}$	$1957^{+3232}_{-1039}$

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

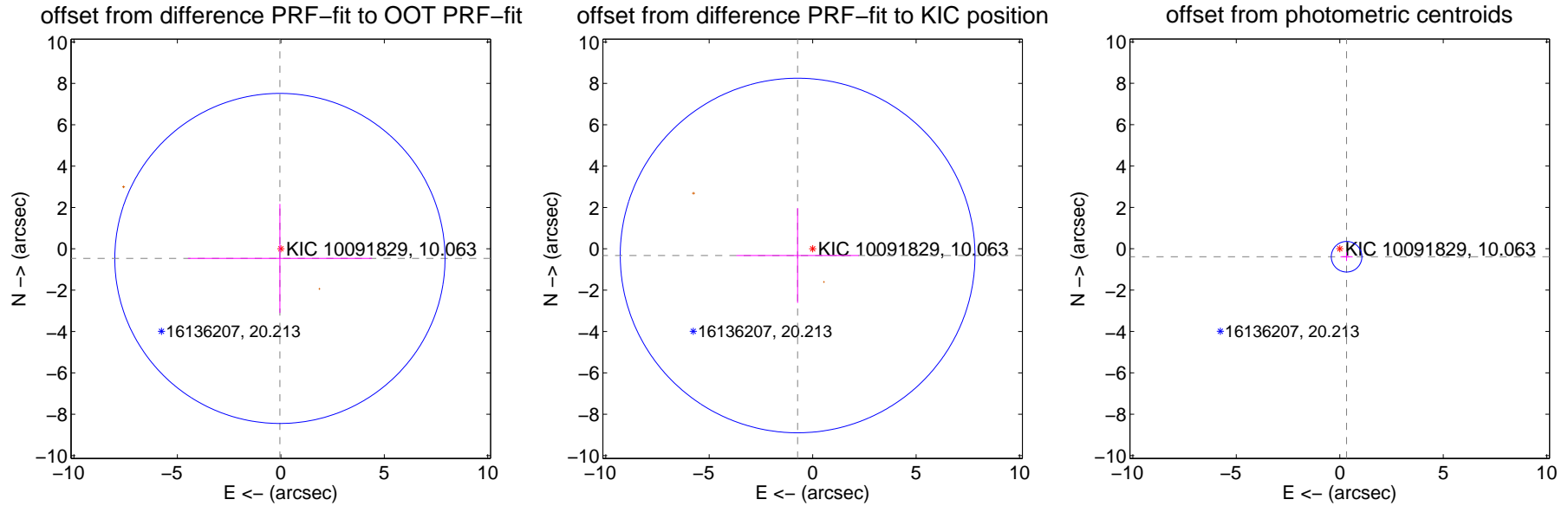
## DV Centroid Data

Supplemental centroid analysis for 010091829-08. **Kepler magnitude: 10.06.** Transit SNR 9.88

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

The direct PRF centroid is offset from the target star catalog position by about 1.36 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.467 \pm 2.660$	0.18	$0.045 \pm 4.441$	$-0.465 \pm 2.638$
PRF-fit source offset from KIC position	$0.795 \pm 2.858$	0.28	$0.727 \pm 2.957$	$-0.323 \pm 2.295$
photometric centroid source offset	$0.51 \pm 0.25$	2.06	$-0.33 \pm 0.29$	$-0.39 \pm 0.21$

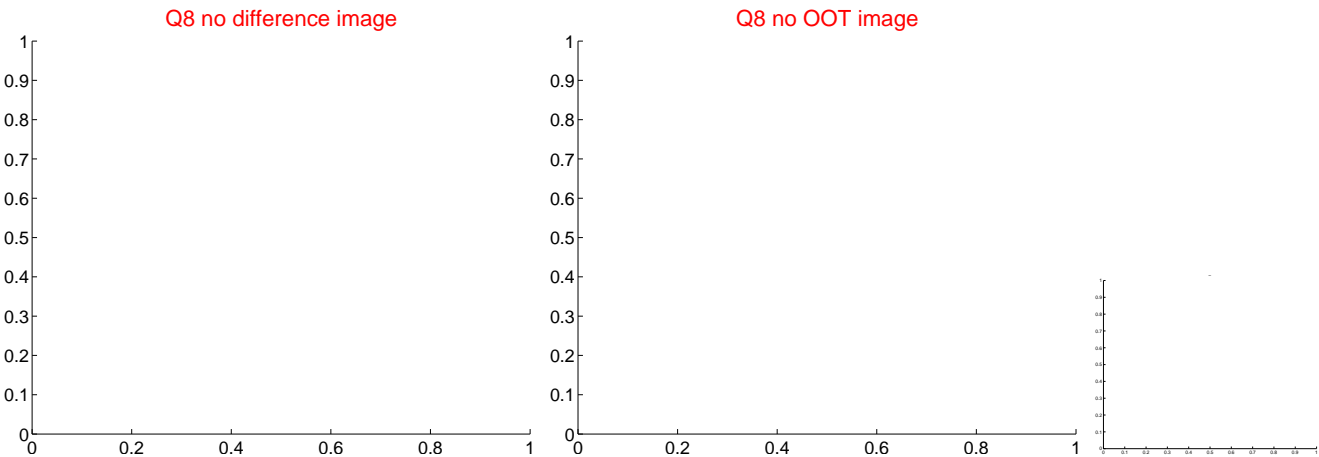
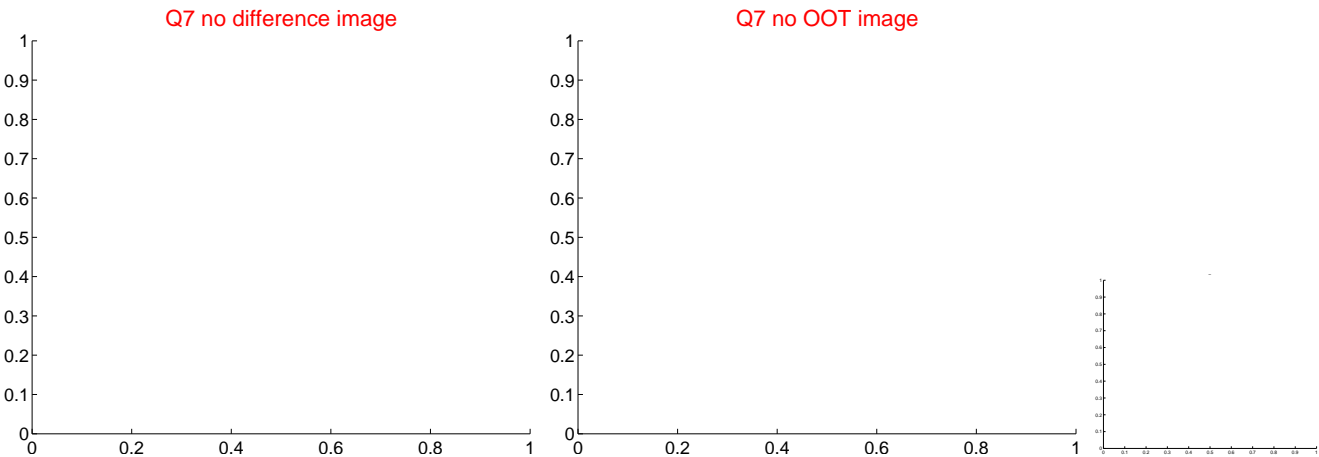
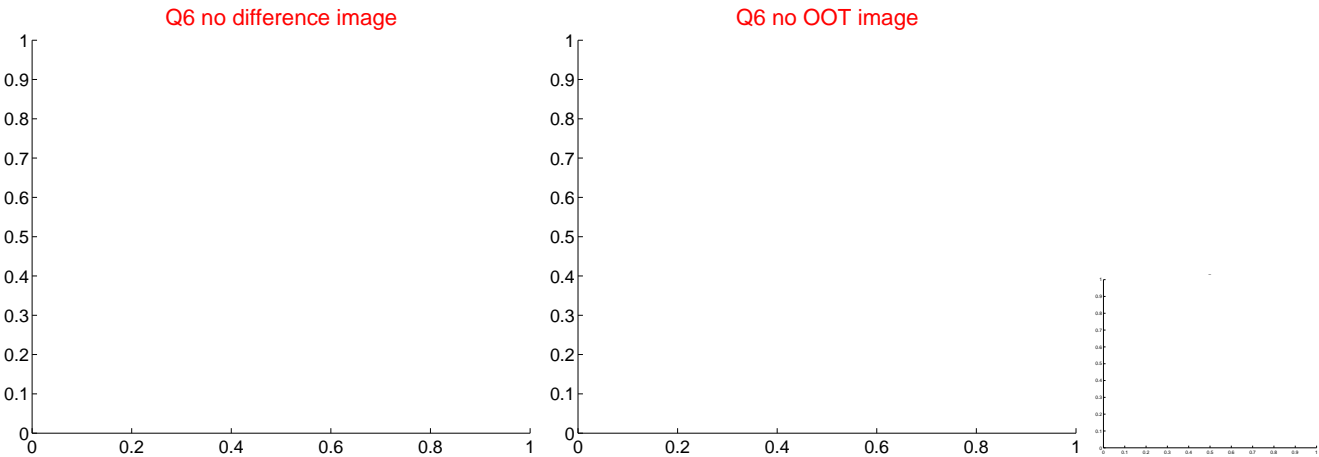
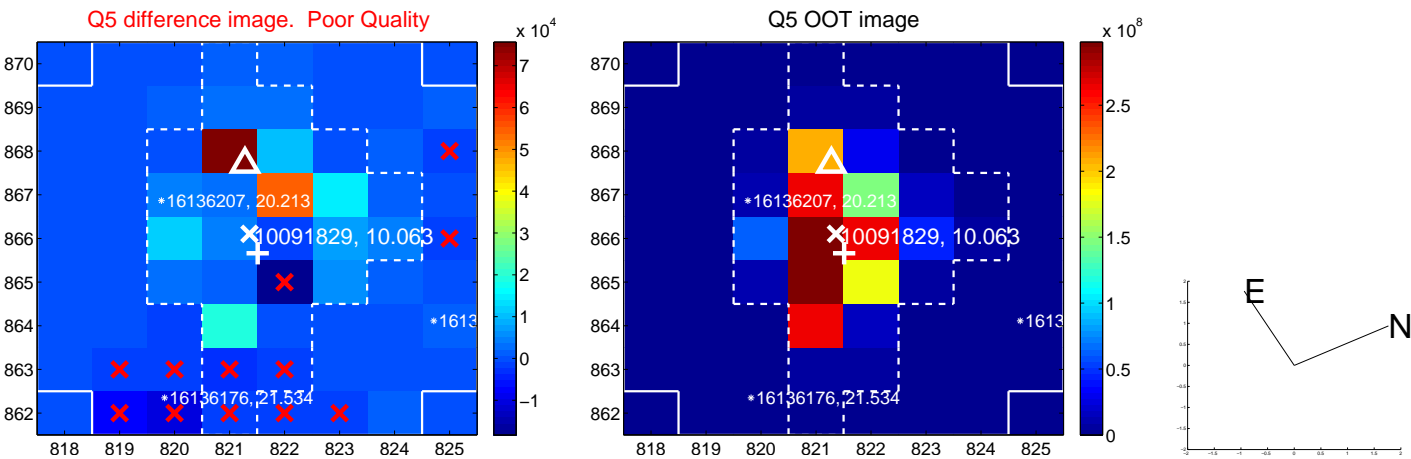


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

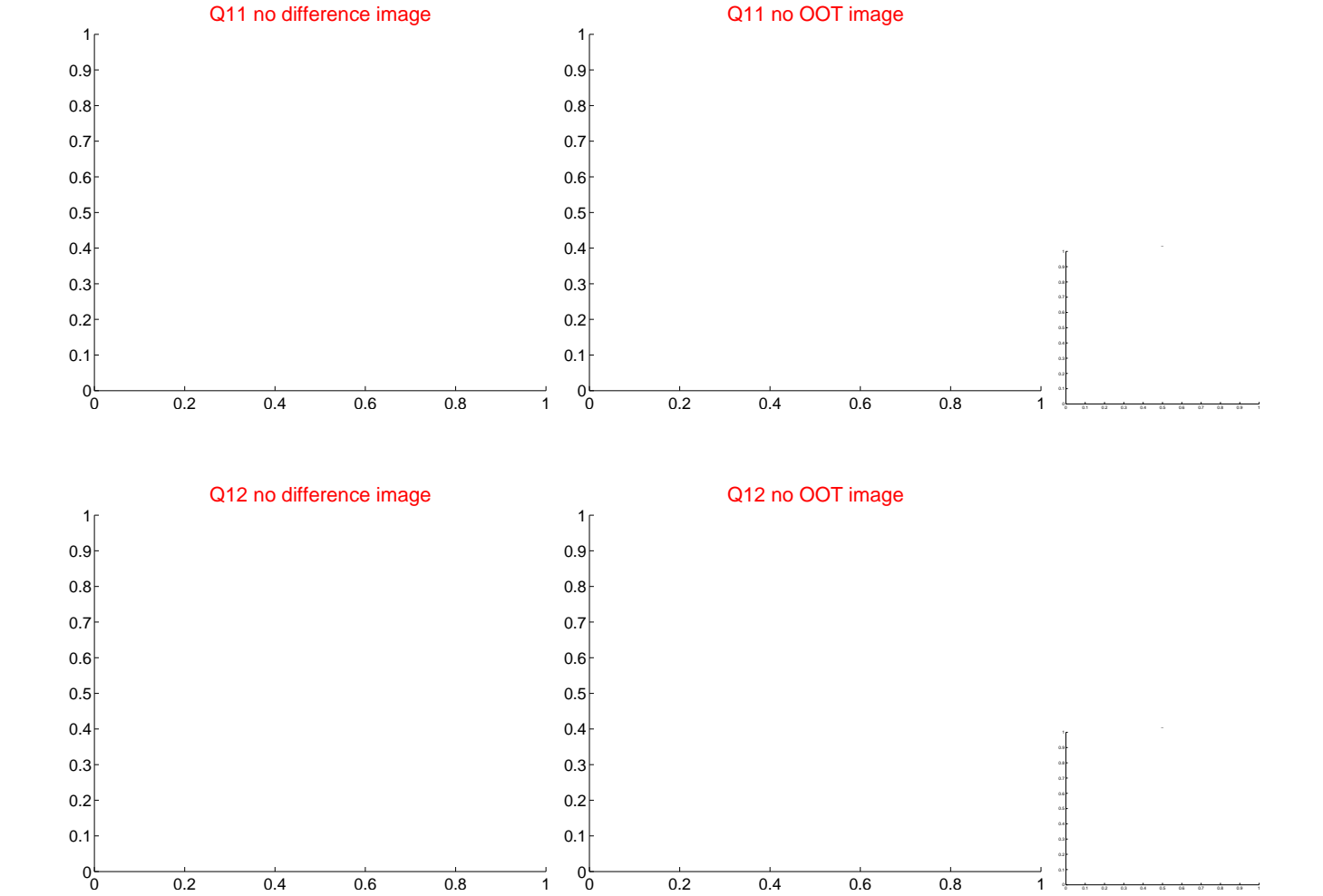
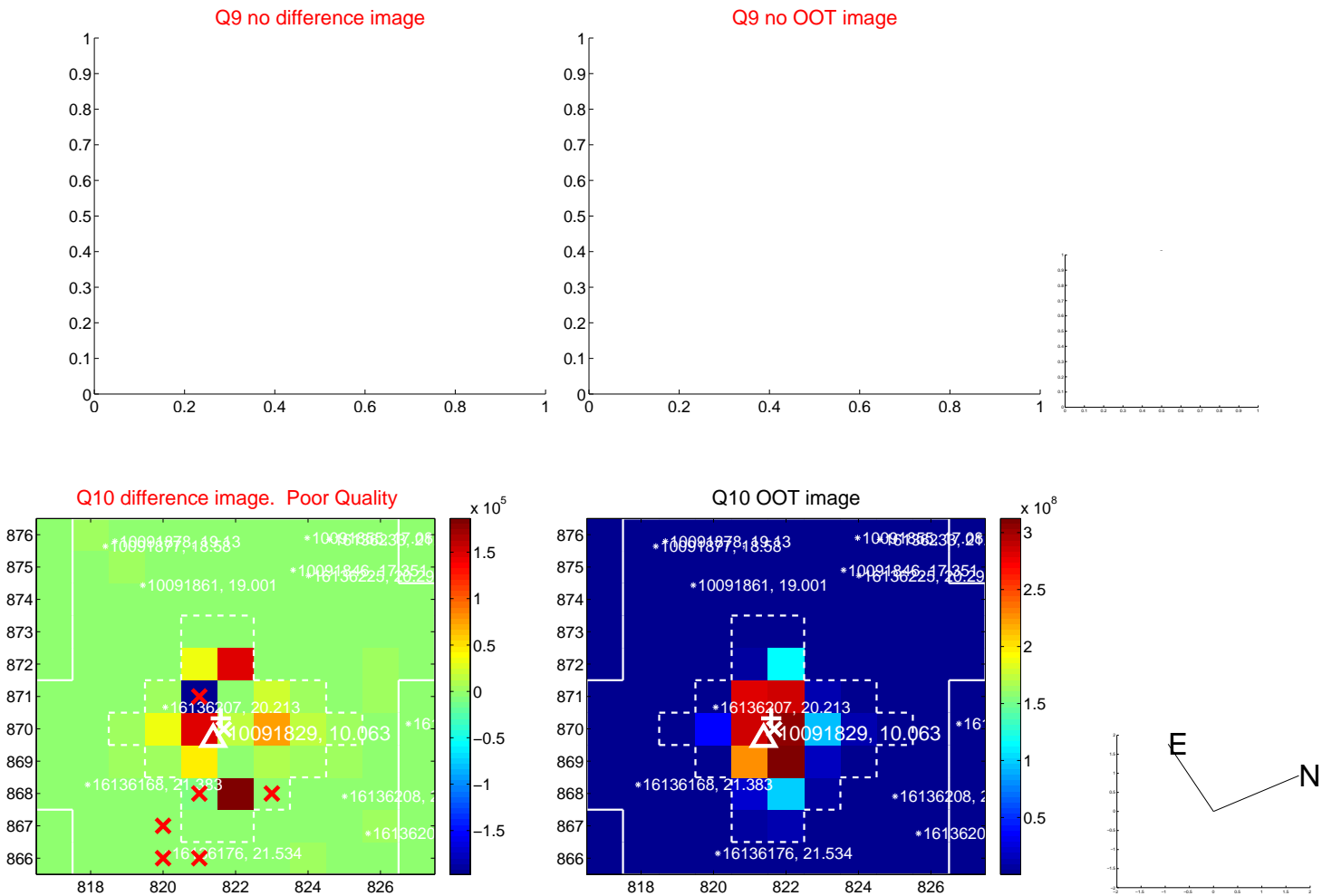
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



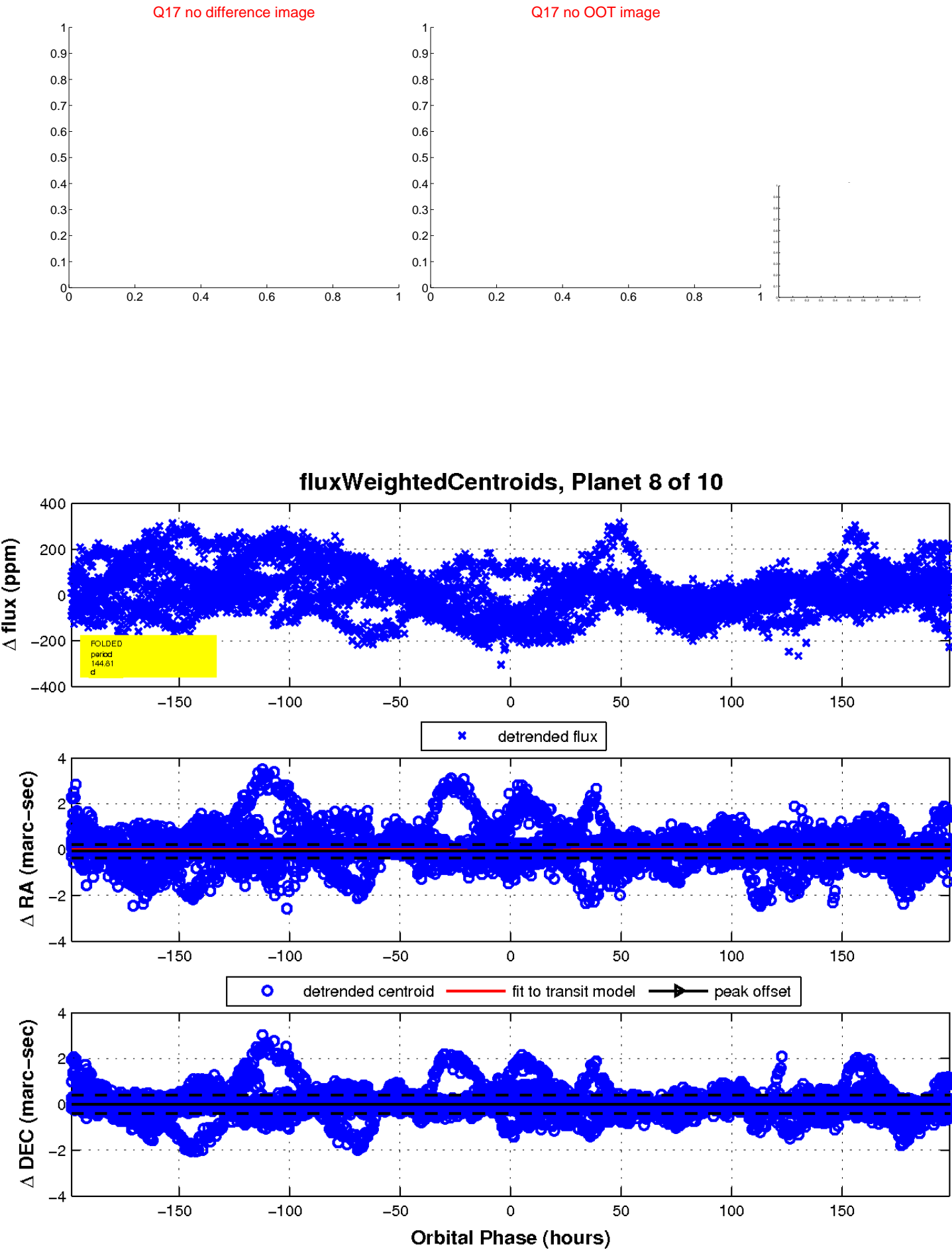
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



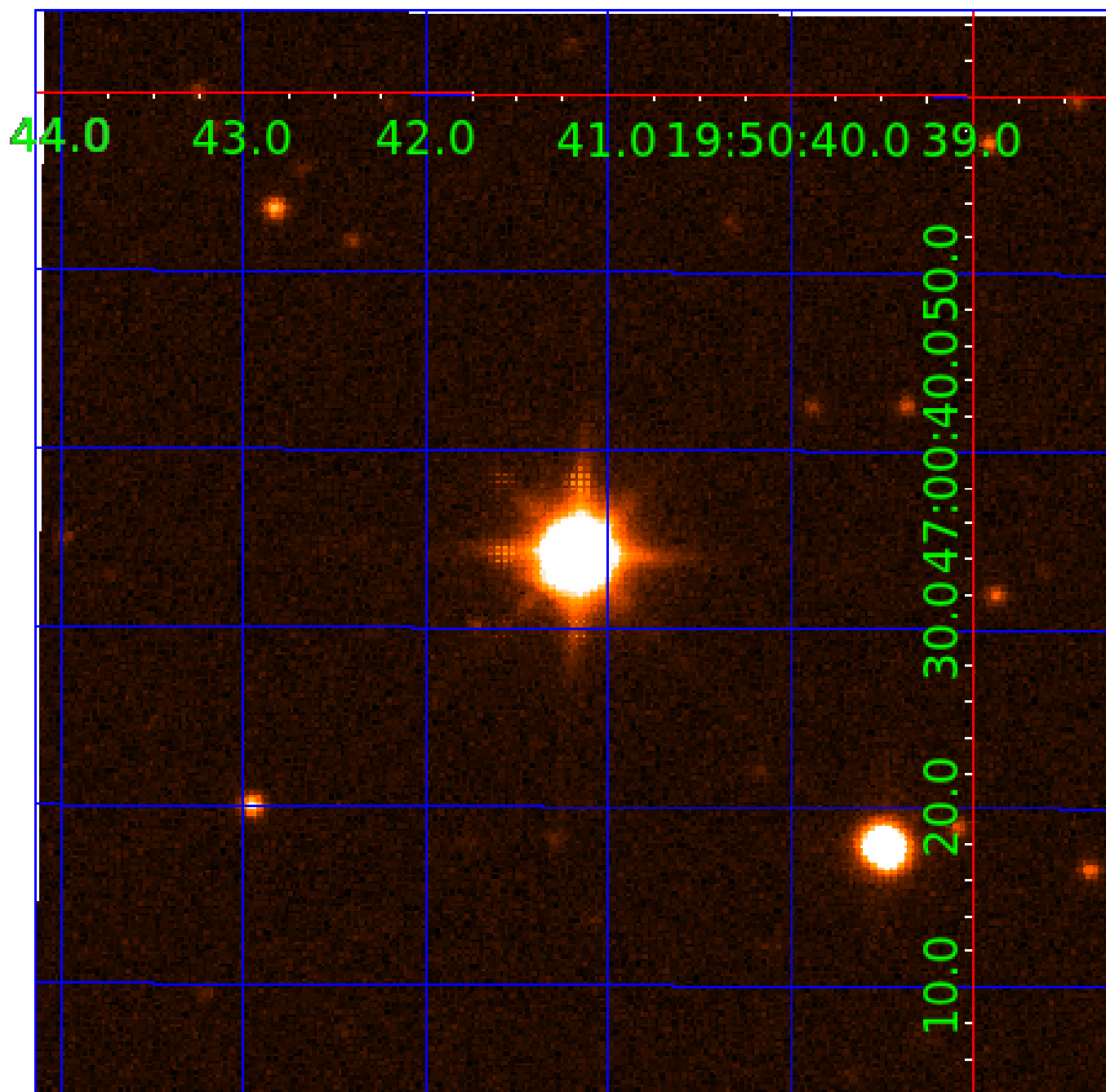
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 010091829

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010091829-01	OBS	No	2.685897	132.966276	9.3	17.710	13.4	10.7	2.48	7751	0.77	8802.86
010091829-02	OBS	No	51.150813	150.403921	75.0	13.637	23.3	11.1	2.48	7751	2.61	173.09
010091829-04	OBS	No	103.251385	212.511369	77.6	11.125	15.0	10.7	2.48	7751	2.46	67.85
010091829-05	OBS	No	39.721348	158.143016	55.9	7.274	14.0	8.1	2.48	7751	2.12	242.50
010091829-06	OBS	No	97.893326	213.505551	72.2	12.046	12.5	8.2	2.48	7751	2.22	72.85
010091829-07	OBS	No	185.242008	174.661147	75.4	15.466	13.6	8.8	2.48	7751	2.54	31.12
010091829-08	OBS	No	144.806501	226.139993	476.4	66.191	10.9	9.9	2.48	7751	6.89	43.22
010091829-09	OBS	No	123.726523	248.998906	51.2	12.172	9.0	7.0	2.48	7751	2.05	53.31
010091829-10	OBS	No	15.454682	141.232200	49.5	3.861	7.4	8.1	2.48	7751	2.01	853.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010091829-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
010091829-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
010091829-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED
010091829-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010091829-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

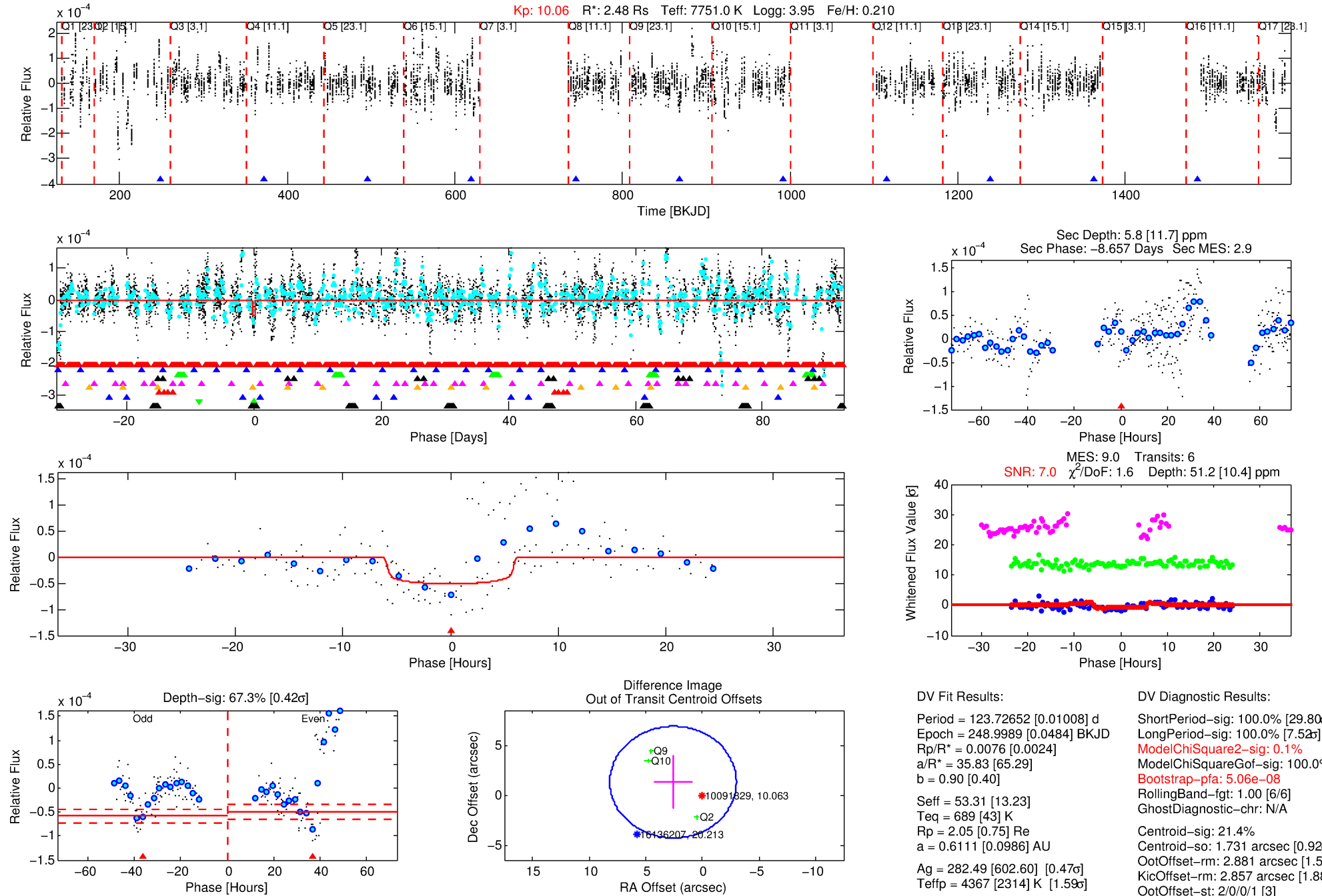
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010091829-09

No Significant Match Found

# DV One-Page Summary

KIC: 10091829 Candidate: 9 of 10 Period: 123.727 d



## DV Fit Results:

Period =  $123.72652 [0.01008] \text{ d}$   
 Epoch =  $248.9989 [0.0484] \text{ BKJD}$   
 $R_p/R^* = 0.0076 [0.0024]$   
 $a/R^* = 35.83 [65.29]$   
 $b = 0.90 [0.40]$   
 $\text{Seff} = 53.31 [13.23]$   
 $T_{\text{eq}} = 689 [43] \text{ K}$   
 $R_p = 2.05 [0.75] R_e$   
 $a = 0.6111 [0.0986] \text{ AU}$   
 $A_g = 282.49 [602.60] [0.47\sigma]$   
 $T_{\text{eff}} = 4367 [2314] \text{ K} [1.59\sigma]$

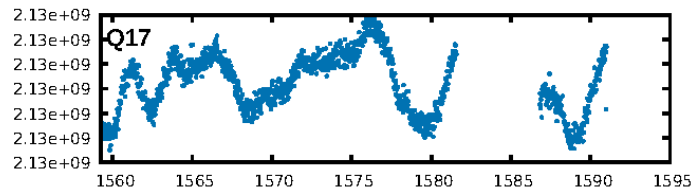
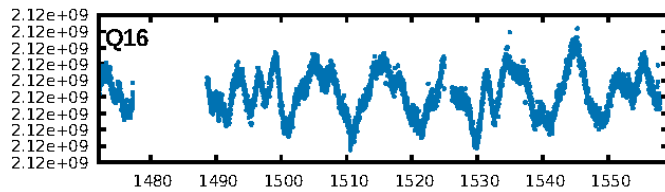
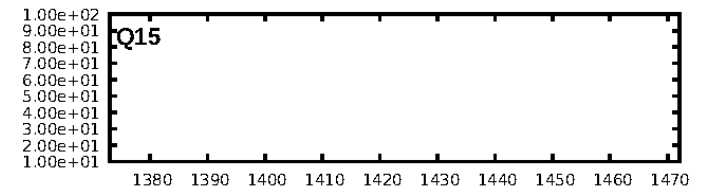
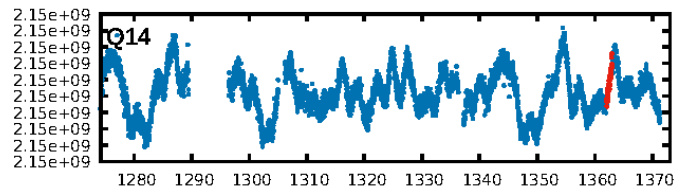
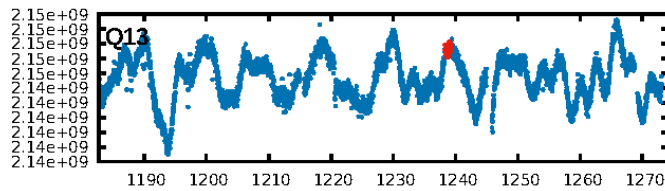
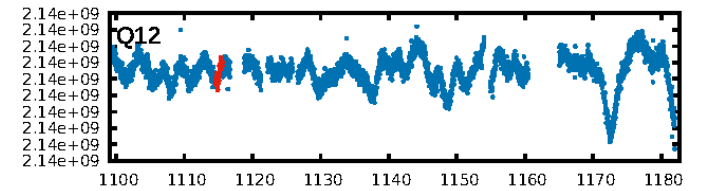
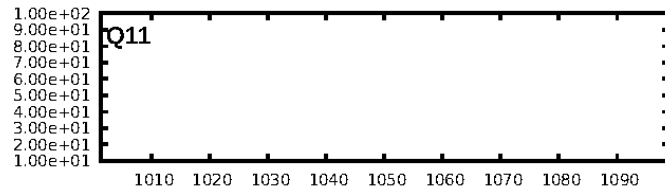
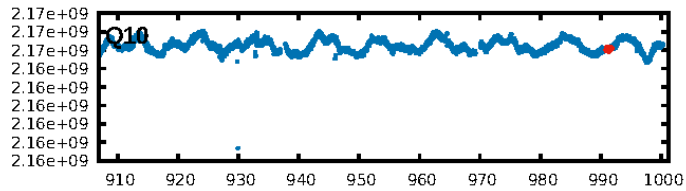
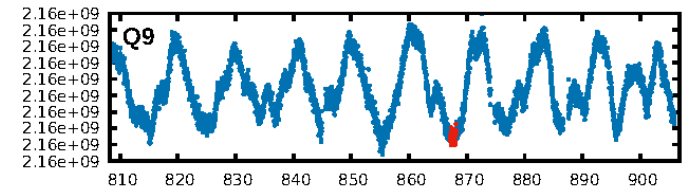
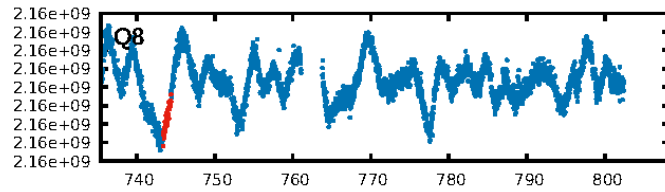
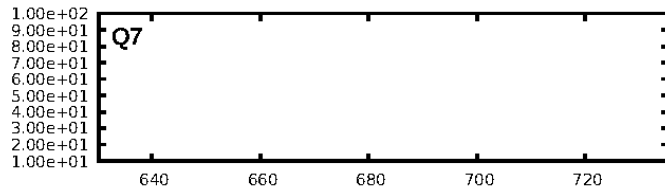
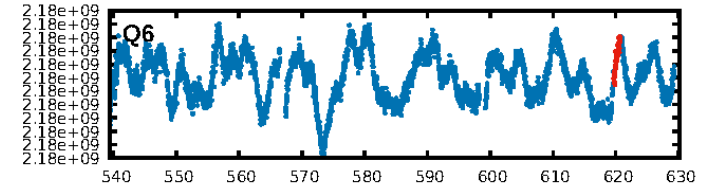
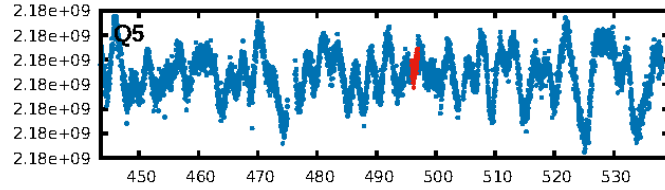
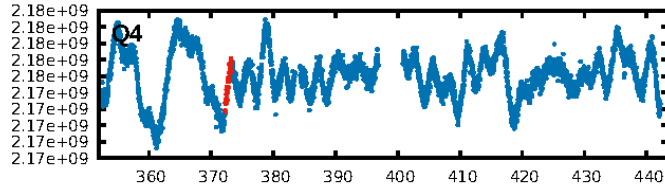
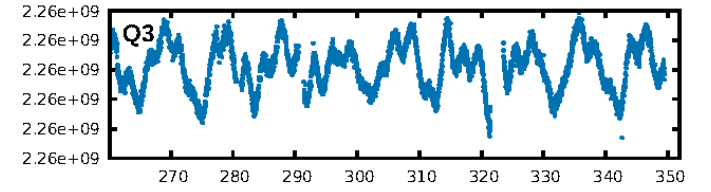
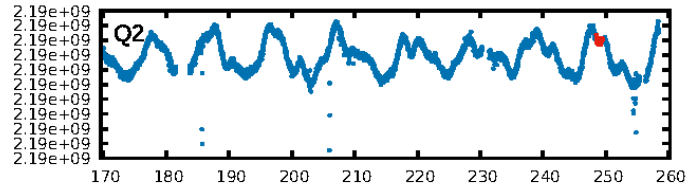
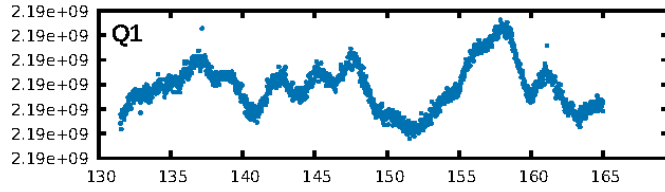
## DV Diagnostic Results:

ShortPeriod-sig:  $100.0\% [29.80\sigma]$   
 LongPeriod-sig:  $100.0\% [7.52\sigma]$   
 ModelChiSquare2-sig:  $0.1\%$   
 ModelChiSquareGof-sig:  $100.0\%$   
 Bootstrap-pfa:  $5.06e-08$   
 RollingBand-fgt:  $1.00 [6/6]$   
 GhostDiagnostic-chr:  $N/A$   
 Centroid-sig:  $21.4\%$   
 Centroid-so:  $1.731 \text{ arcsec} [0.92\sigma]$   
 OotOffset-rm:  $2.881 \text{ arcsec} [1.55\sigma]$   
 KicOffset-rm:  $2.857 \text{ arcsec} [1.88\sigma]$   
 OotOffset-st:  $2/0/0/1 [3]$   
 KicOffset-st:  $2/0/0/1 [3]$   
 DiffImageQuality-fgm:  $0.67 [2/3]$   
 DiffImageOverlap-fno:  $0.00 [0/9]$

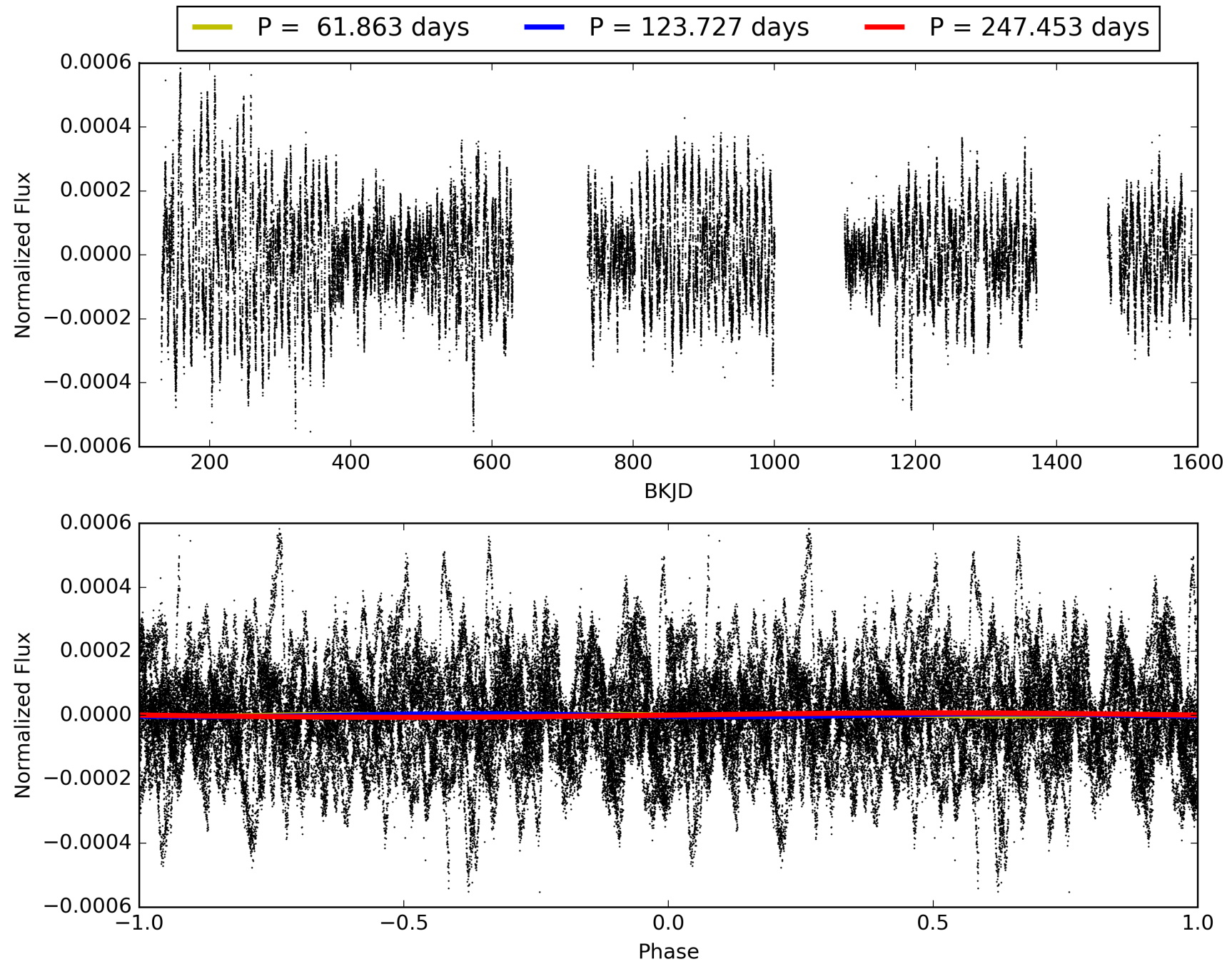
Software Revision: `svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958` -- Date Generated: 01-Feb-2016 12:11:15 Z

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

# TCE 010091829-09, PDC Light Curves

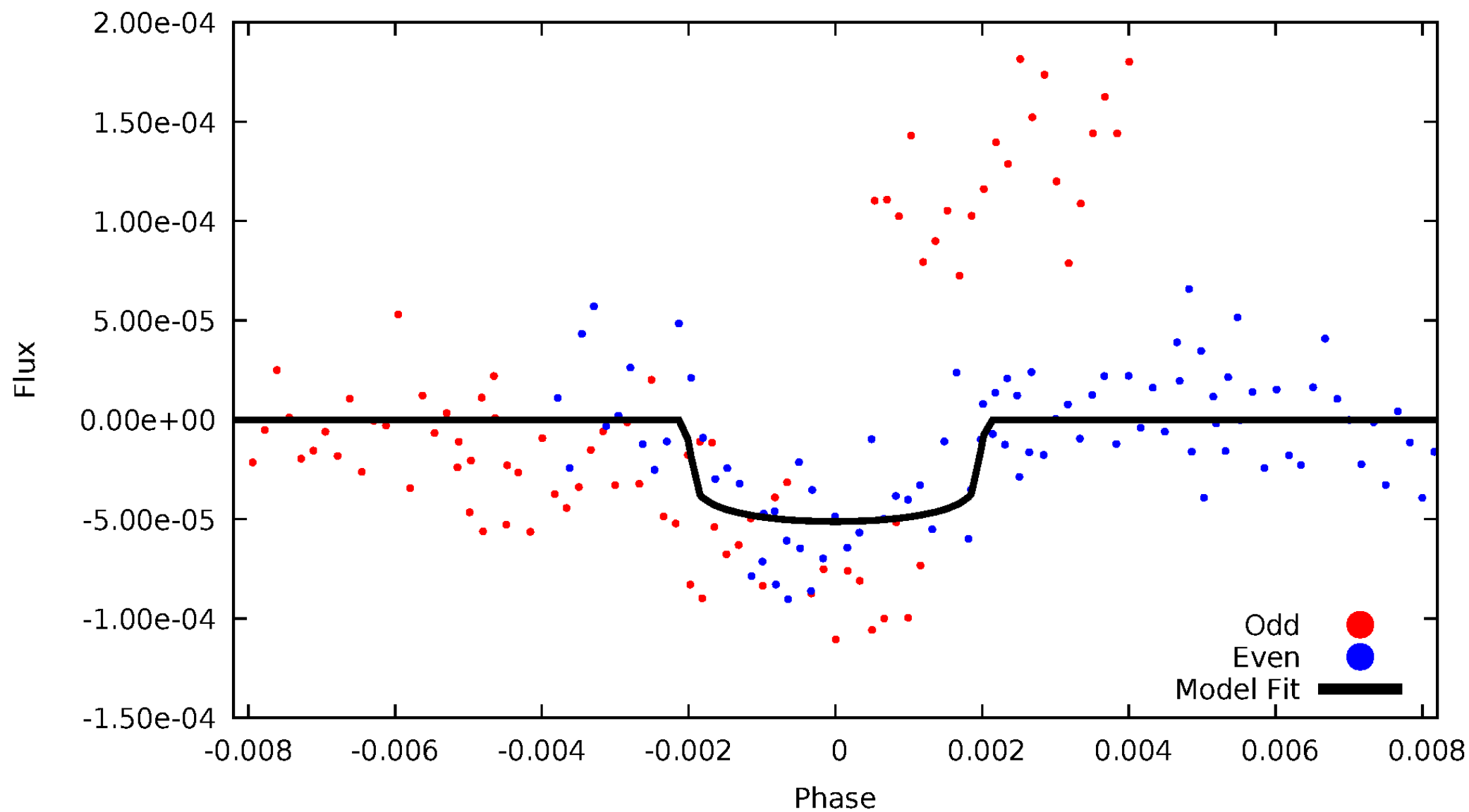


TCE 010091829-09



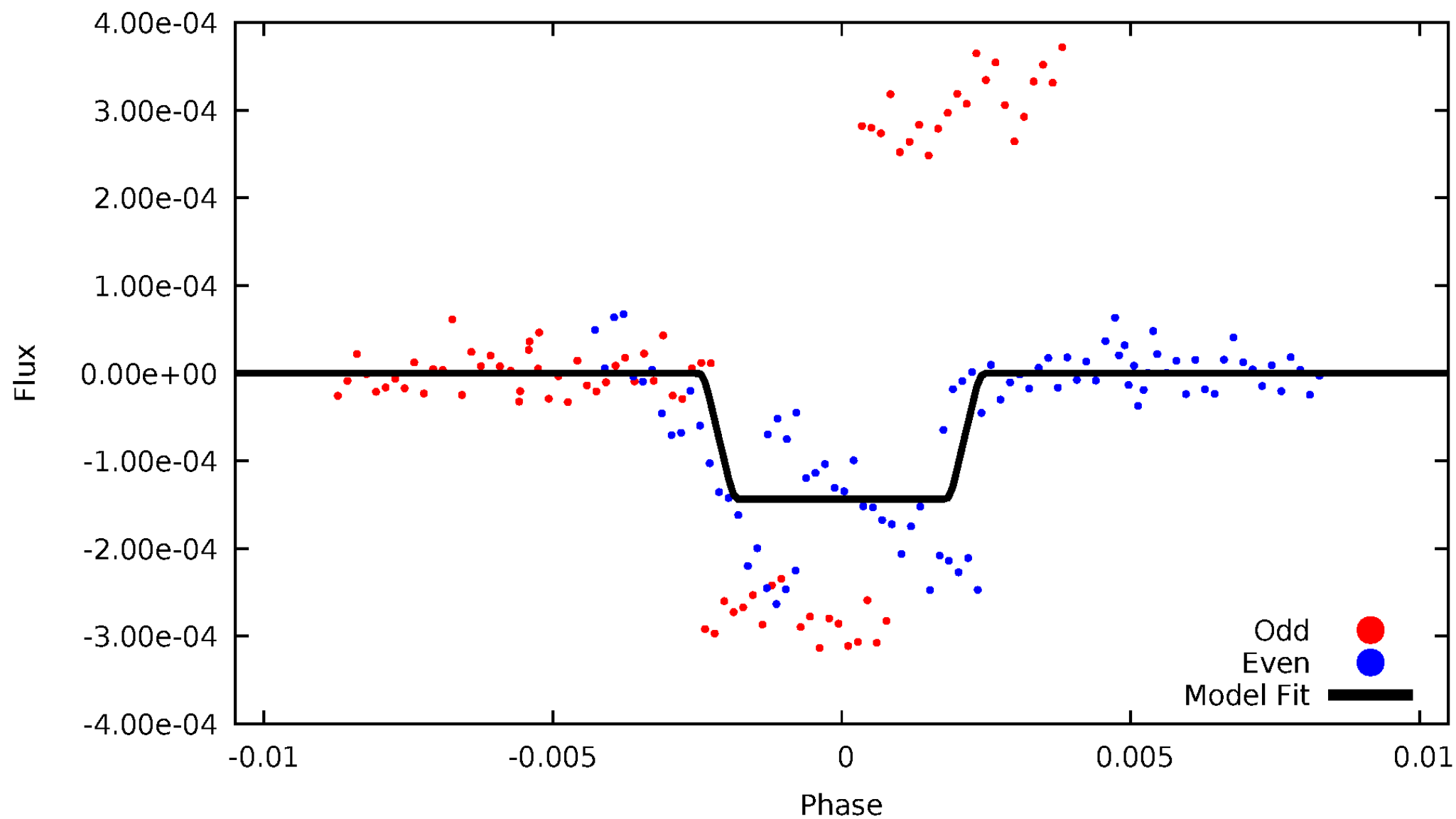
# DV Odd/Even

TCE 010091829-09



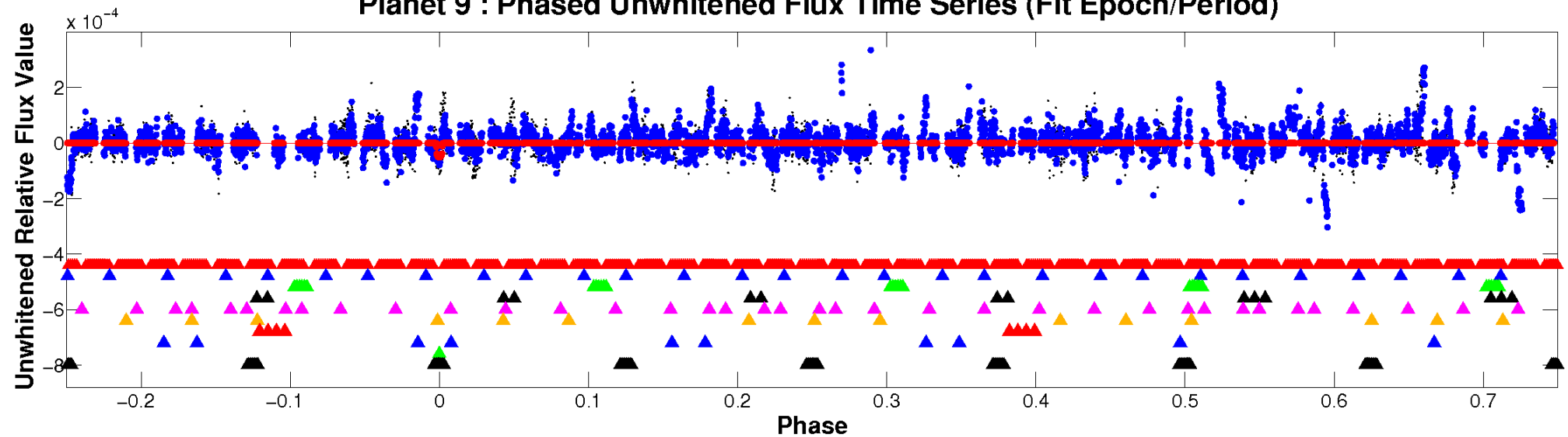
# ALT Odd/Even

TCE 010091829-09

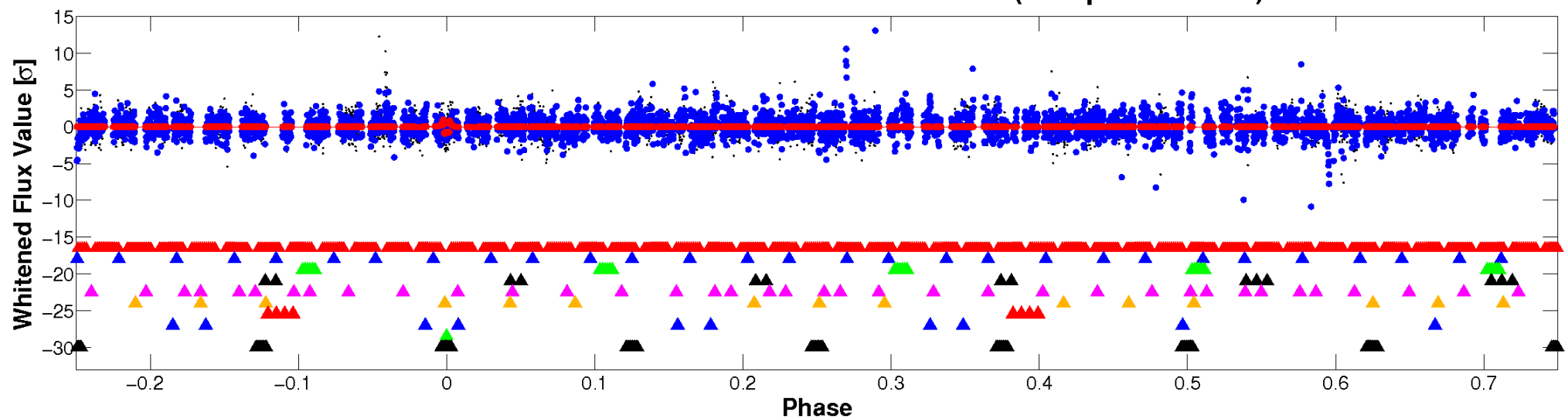


# Non-Whitened Vs. Whitened Light Curve

Planet 9 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



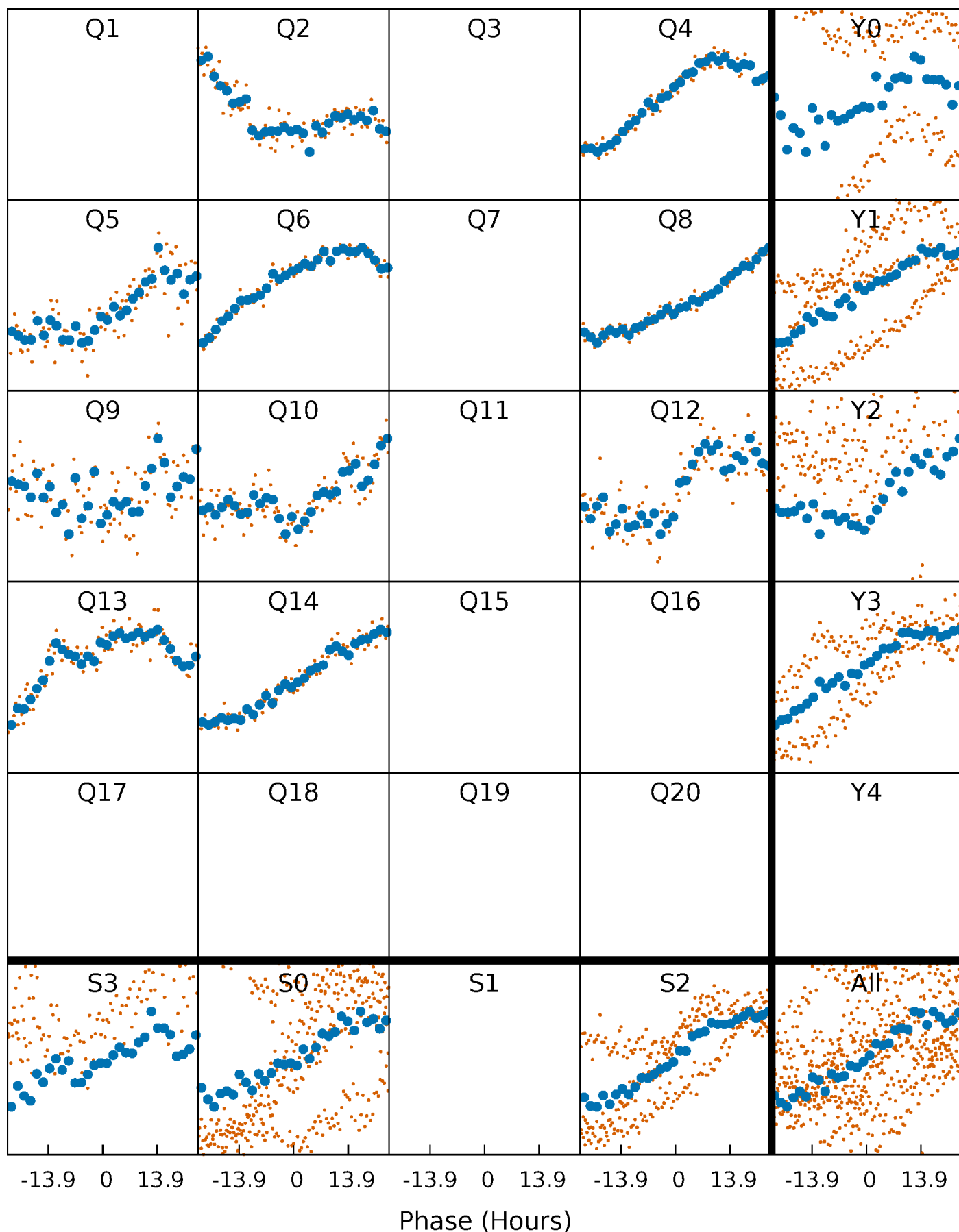
Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)





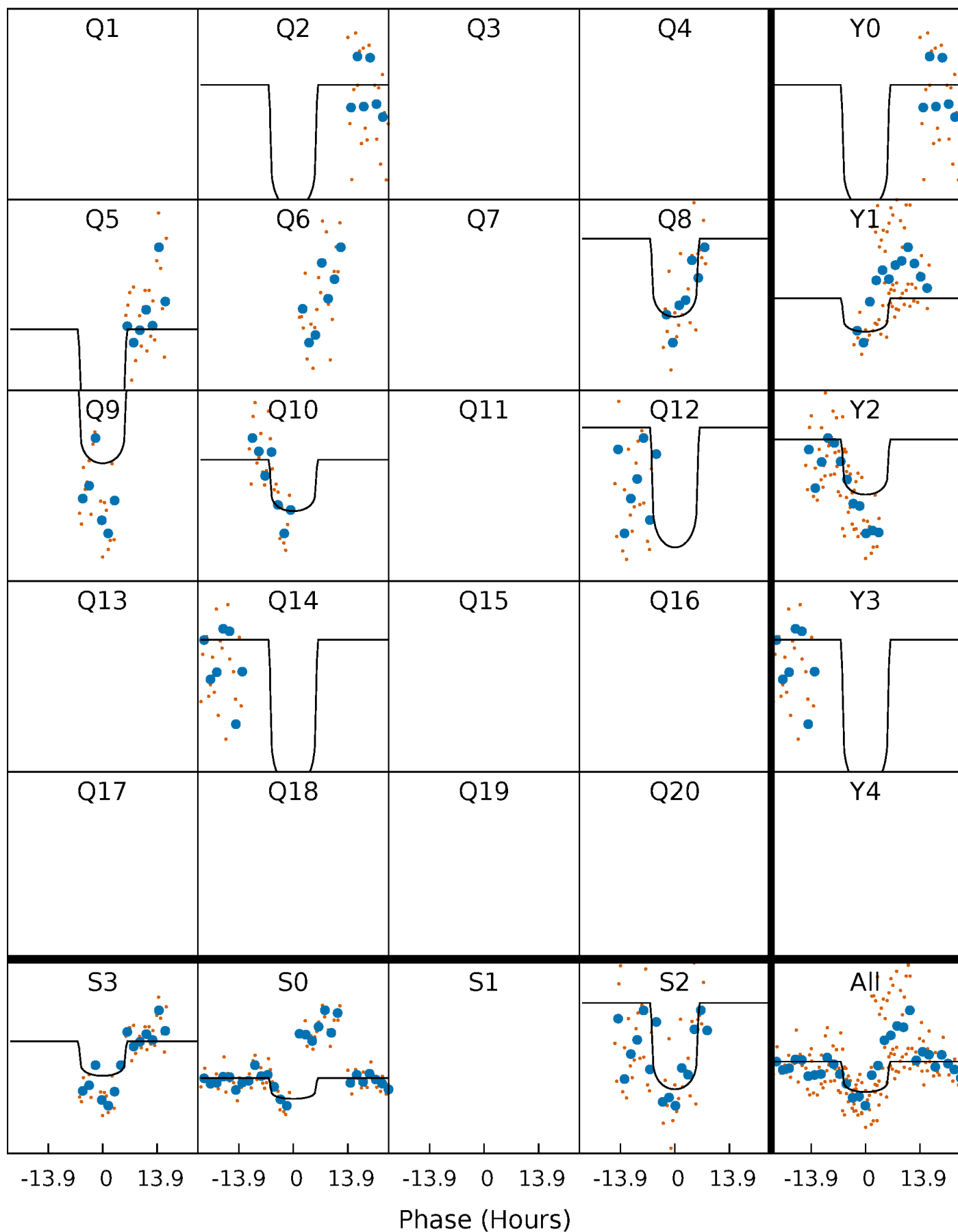
# PDC Quarter-Phased Transit Curves

TCE 010091829-09     $P=123.726523$  Days     $T_0=248.998906$  (BKJD)



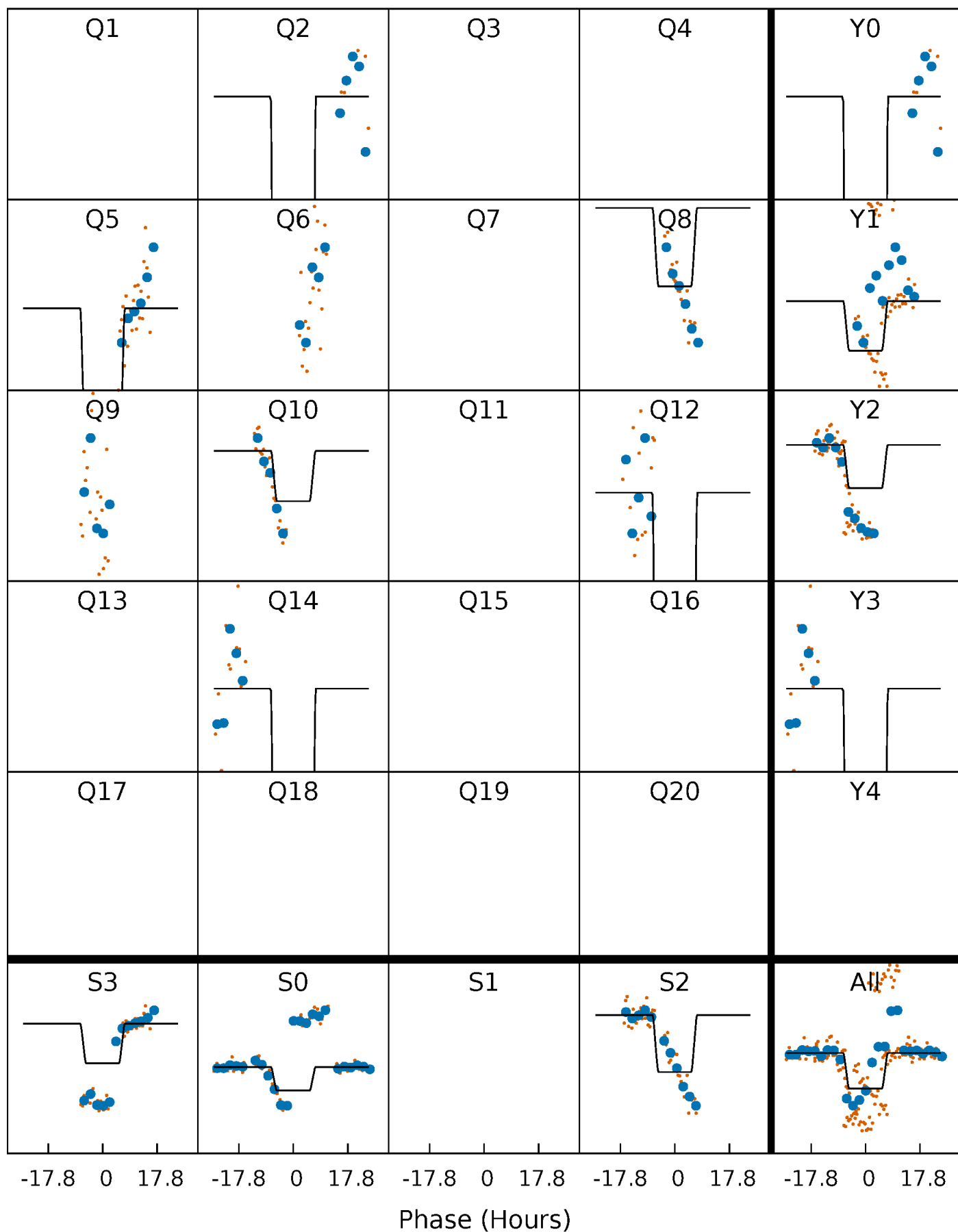
# DV Quarter-Phased Transit Curves

TCE 010091829-09     $P=123.726523$  Days     $T_0=248.998906$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

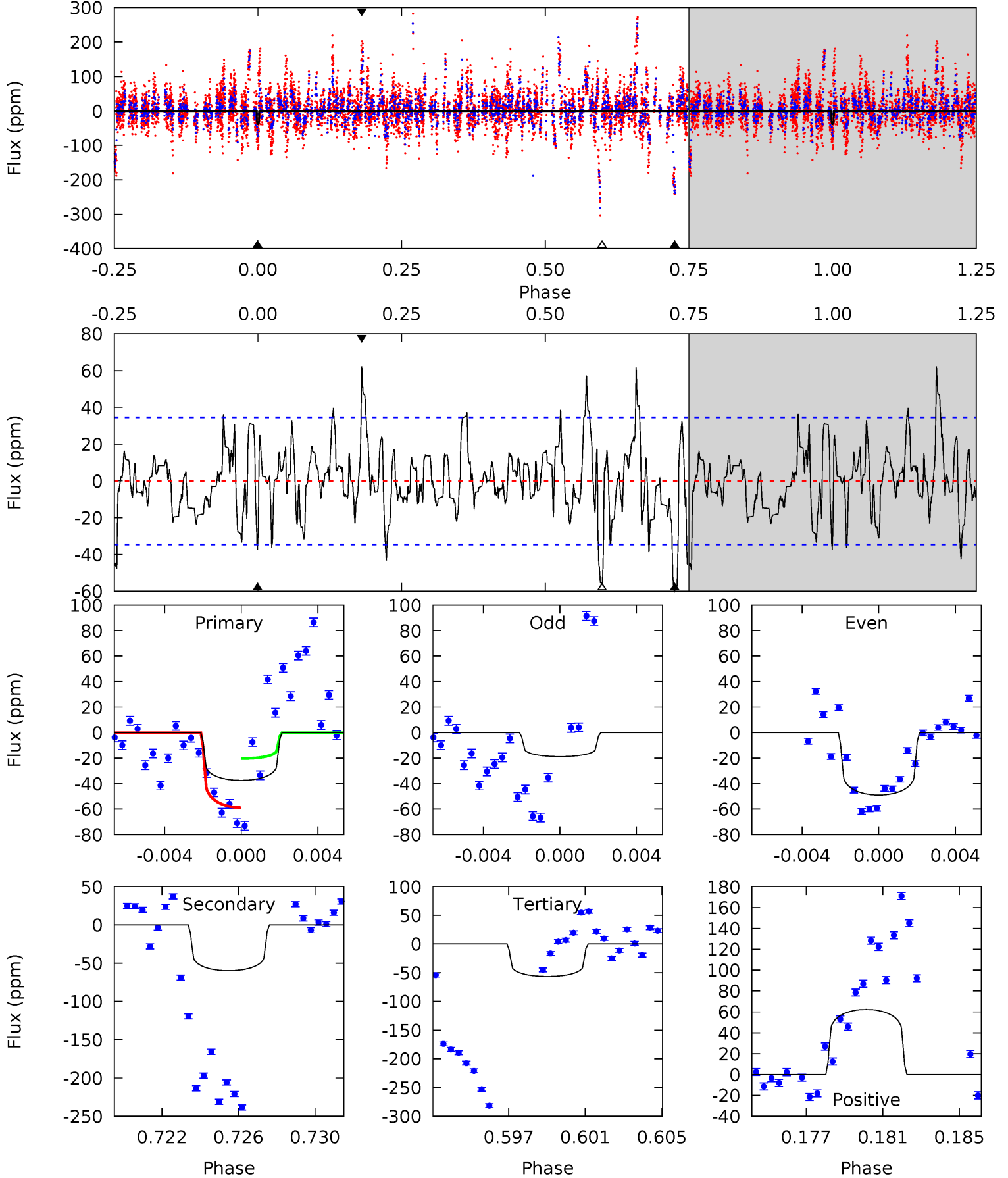
TCE 010091829-09 P=123.738828 Days  $T_0=248.985173$  (BKJD)



# DV Model-Shift Uniqueness Test

010091829-09, P = 123.726523 Days, E = 125.272383 Days

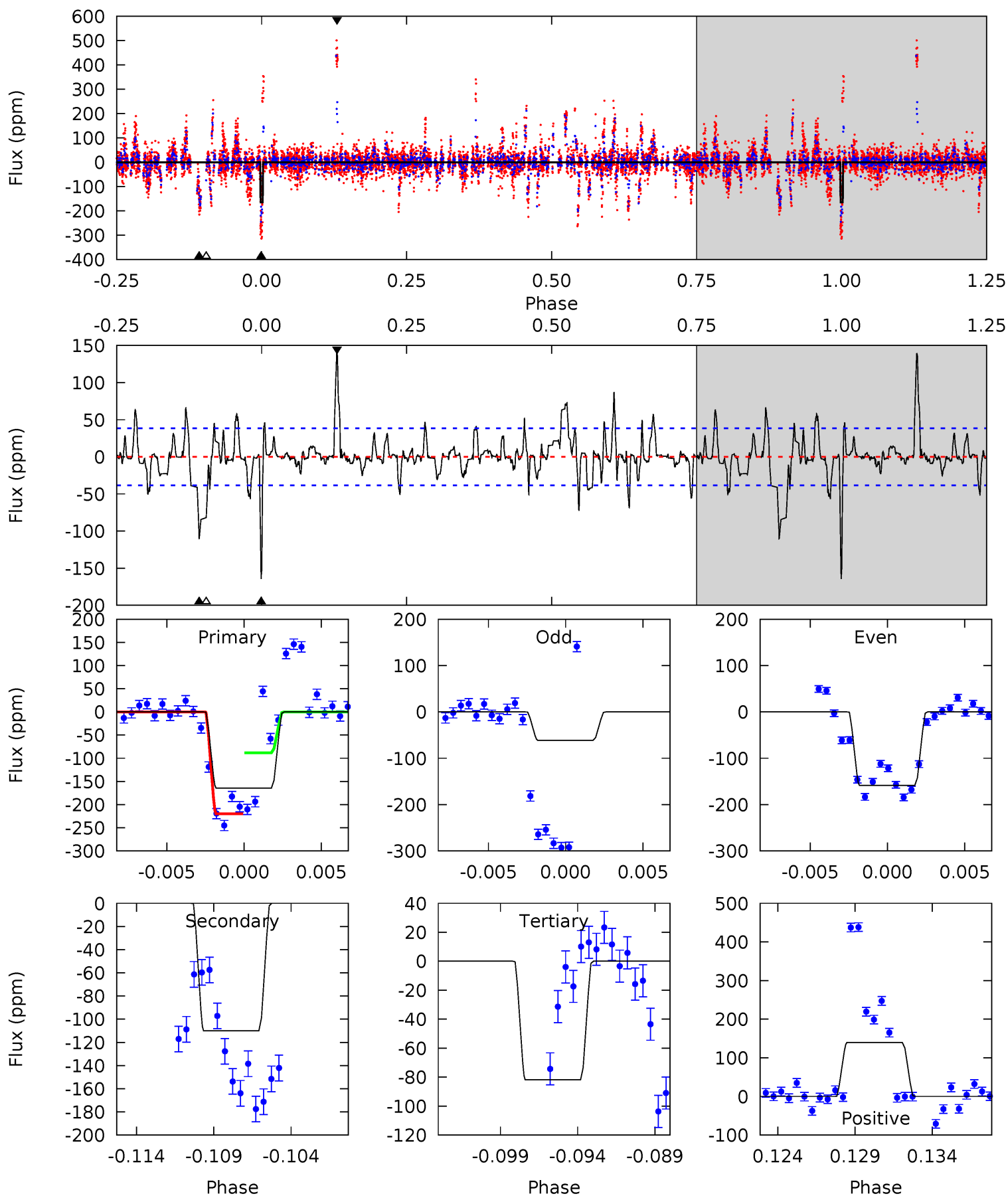
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.63	9.00	8.50	9.37	5.20	2.88	2.57	-2.87	-3.75	0.50	-0.38	2.30	0.46	0.51	2.84



# Alt Model-Shift Uniqueness Test

010091829-09, P = 123.738828 Days, E = 125.246345 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
22.0	14.7	11.0	18.7	5.16	2.81	3.27	11.1	3.33	3.76	-3.96	6.81	0.62	0.46	8.79



### Stellar Parameters For KIC 010091829

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7751^{+85}_{-77}$	$3.947^{+0.138}_{-0.092}$	$0.210^{+0.200}_{-0.200}$	$2.481^{+0.371}_{-0.453}$	$1.986^{+0.166}_{-0.185}$	$0.183^{+0.123}_{-0.053}$
	+1%/-1%	+3%/-2%	+95%/-95%	+15%/-18%	+8%/-9%	+67%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 010091829-09 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-60 \pm 7$	$2.05^{+0.67}_{-0.66}$	$957^{+39}_{-45}$	$7759^{+2077}_{-1049}$	$2981^{+3346}_{-1322}$
Alt.	$-110 \pm 7$	$3.20^{+0.76}_{-0.71}$	$960^{+38}_{-43}$	$7171^{+1035}_{-711}$	$2223^{+1390}_{-792}$

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

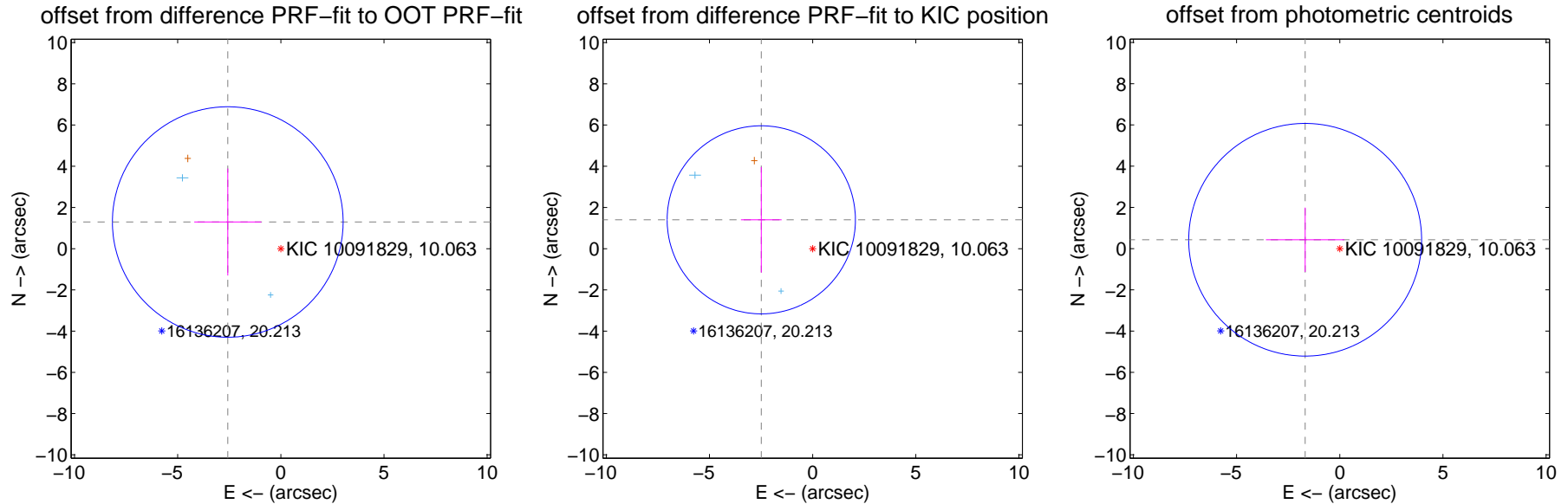
## DV Centroid Data

Supplemental centroid analysis for 010091829-09. **Kepler magnitude: 10.06.** Transit SNR 7.04

**There are 2 quarters with good PRF difference image offsets**

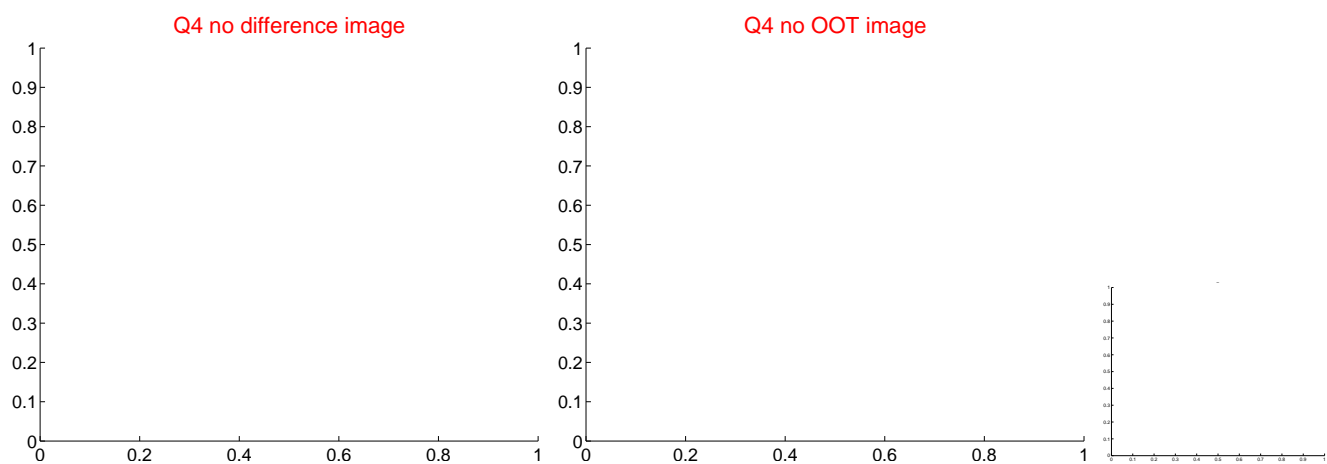
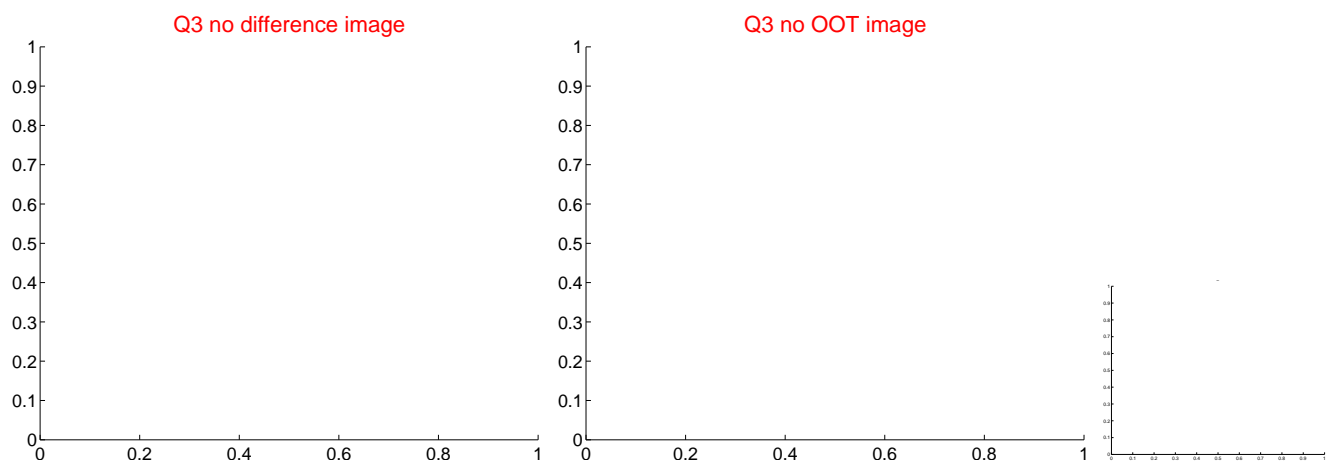
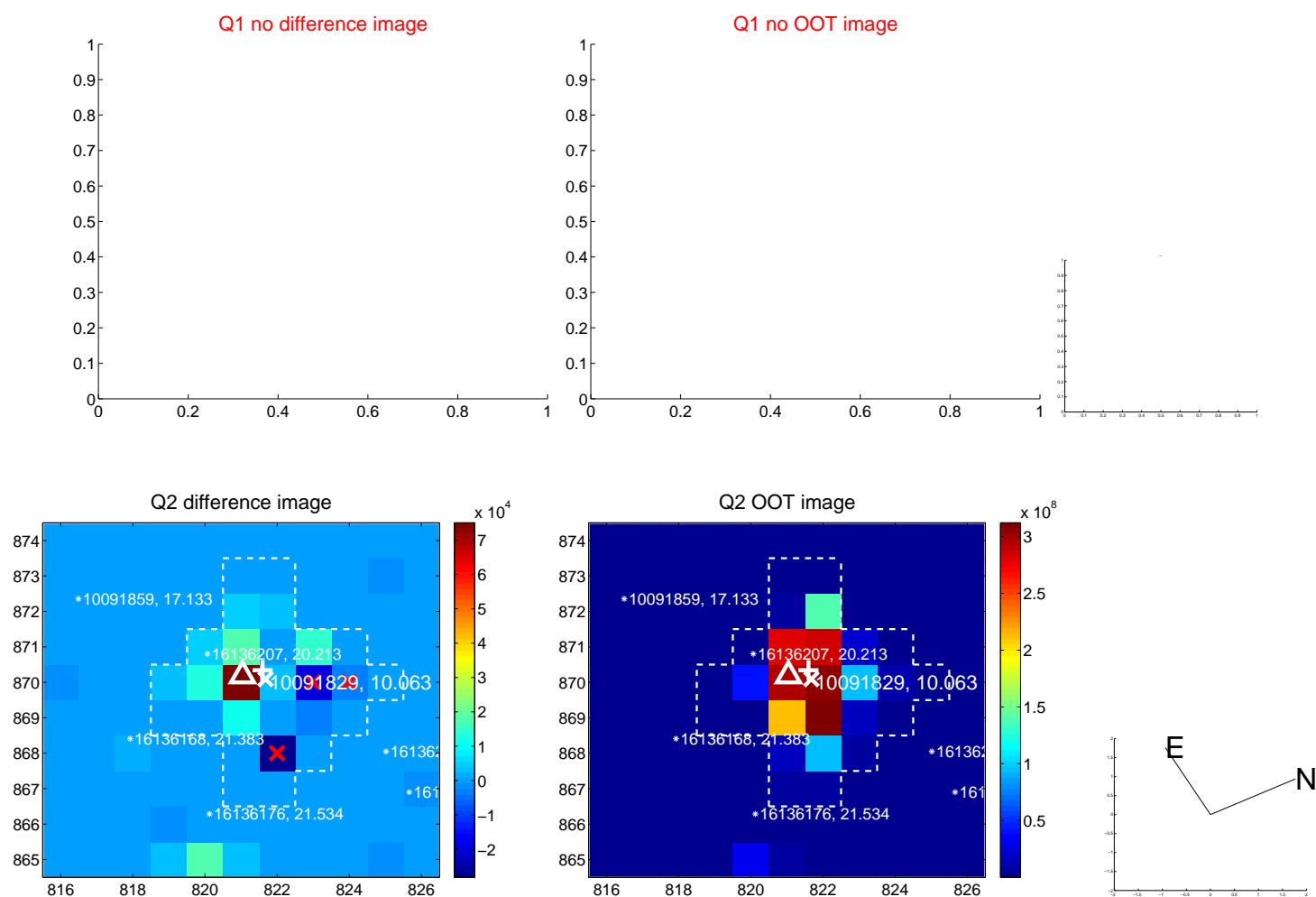
The direct PRF centroid is offset from the target star catalog position by about 0.94 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.881 \pm 1.864$	1.55	$2.573 \pm 1.627$	$1.295 \pm 2.595$
PRF-fit source offset from KIC position	$2.857 \pm 1.521$	1.88	$2.490 \pm 0.987$	$1.401 \pm 2.559$
photometric centroid source offset	$1.73 \pm 1.88$	0.92	$1.68 \pm 1.90$	$0.43 \pm 1.56$



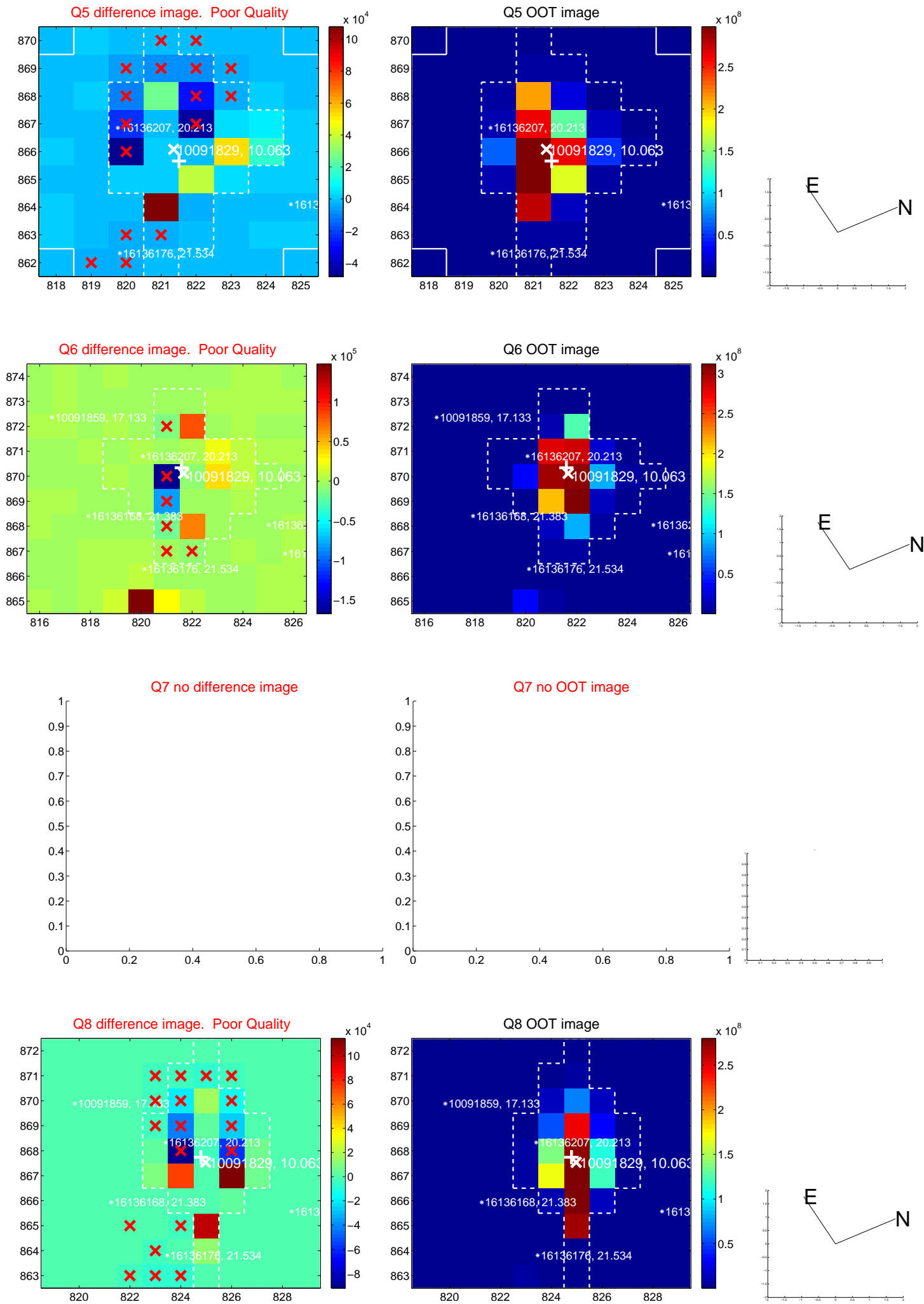
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

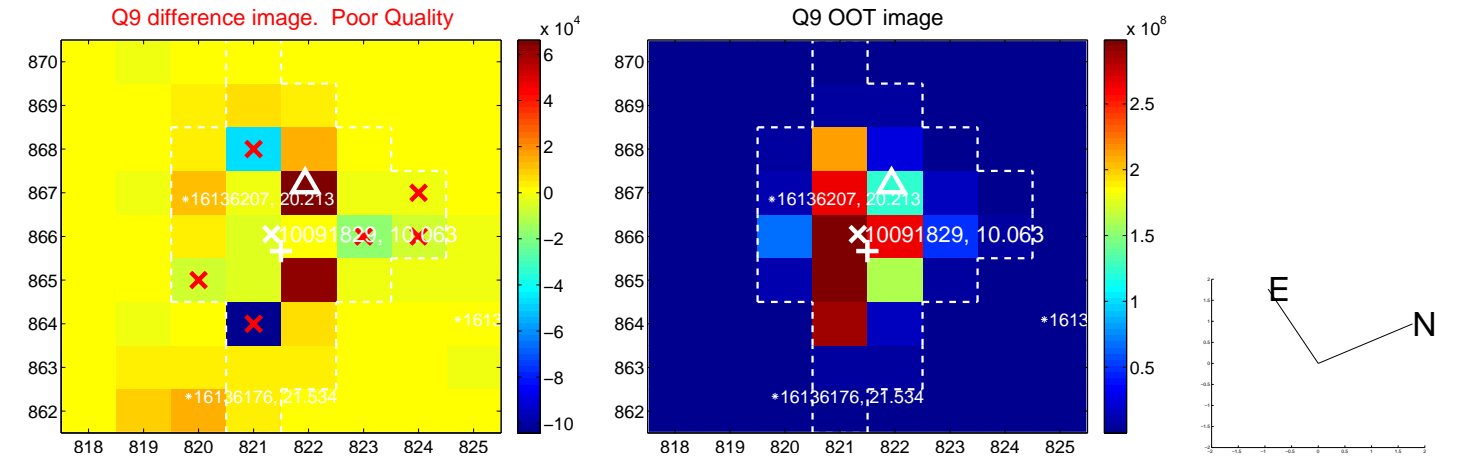




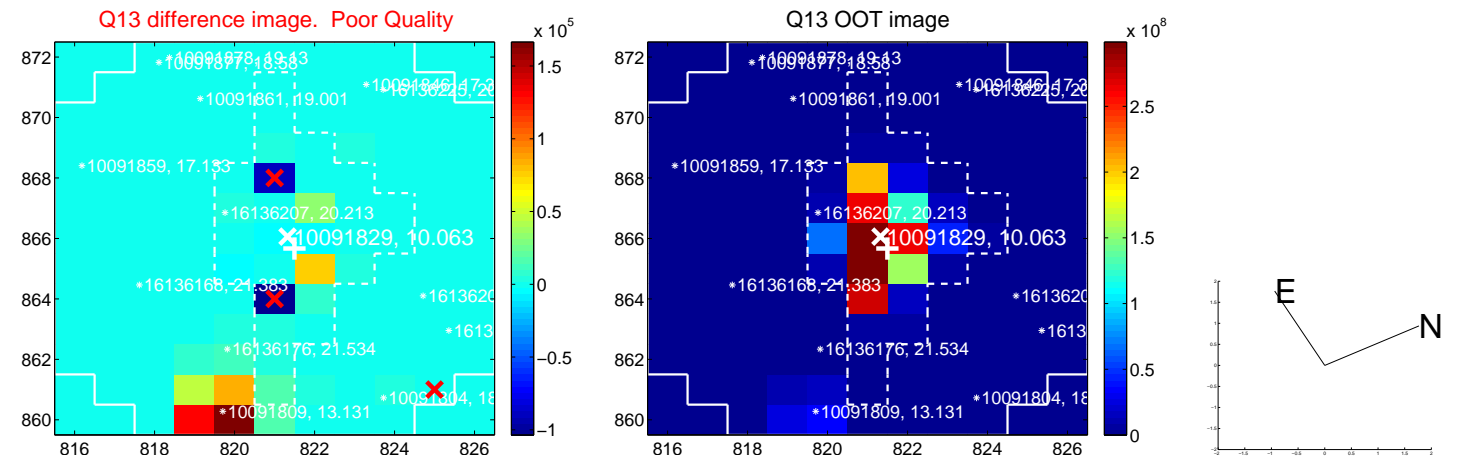
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



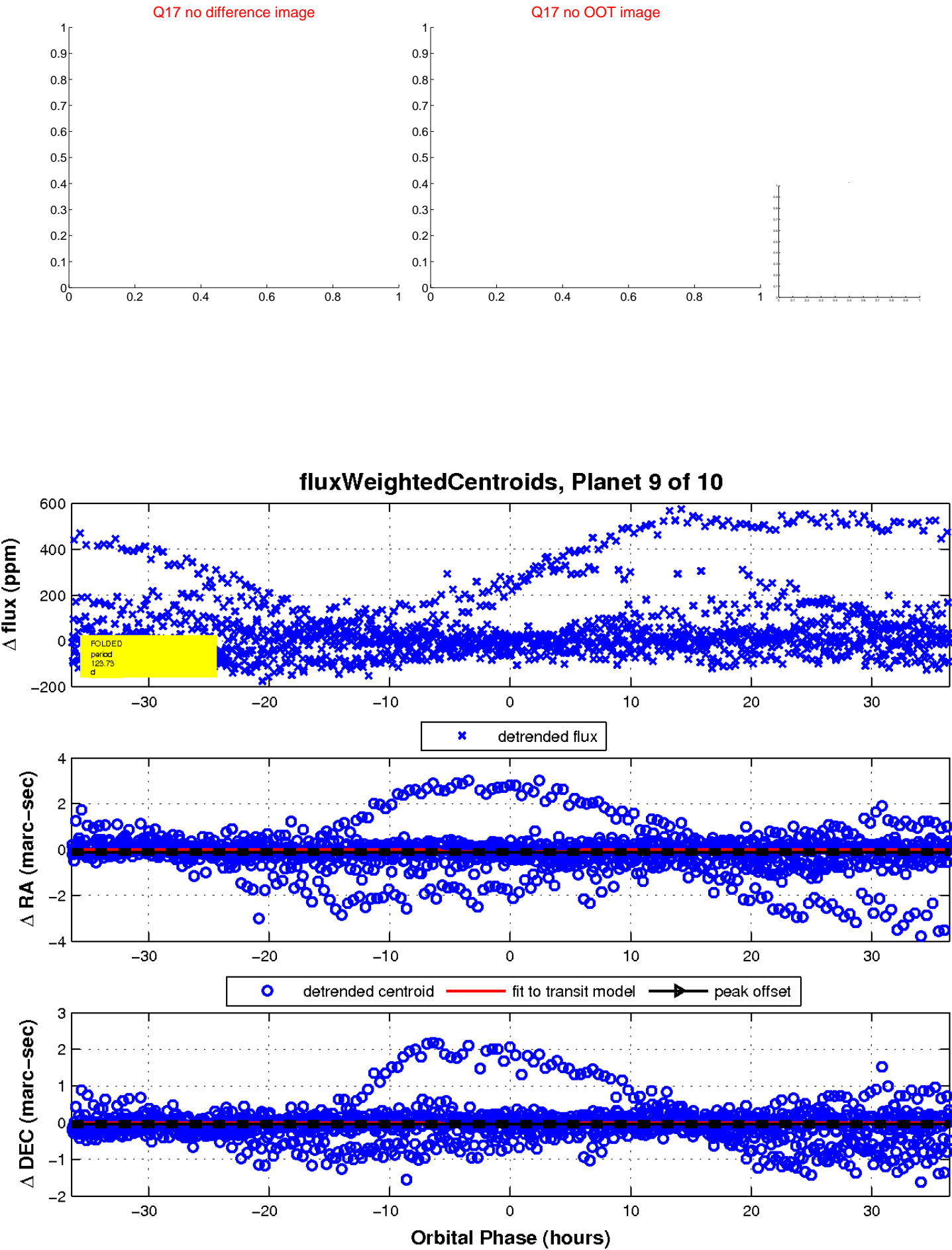
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

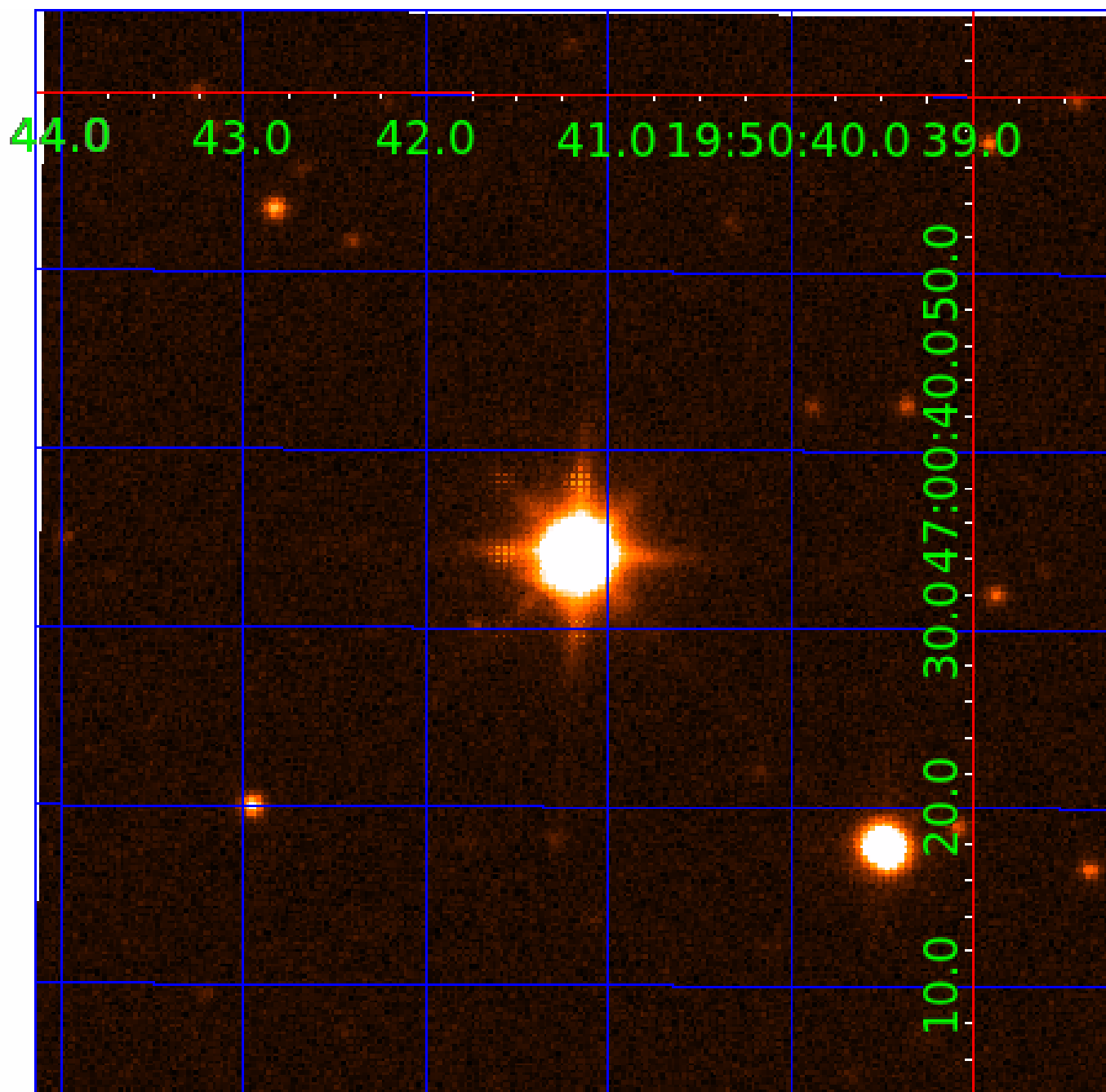


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010091829

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010091829-01	OBS	No	2.685897	132.966276	9.3	17.710	13.4	10.7	2.48	7751	0.77	8802.86
010091829-02	OBS	No	51.150813	150.403921	75.0	13.637	23.3	11.1	2.48	7751	2.61	173.09
010091829-04	OBS	No	103.251385	212.511369	77.6	11.125	15.0	10.7	2.48	7751	2.46	67.85
010091829-05	OBS	No	39.721348	158.143016	55.9	7.274	14.0	8.1	2.48	7751	2.12	242.50
010091829-06	OBS	No	97.893326	213.505551	72.2	12.046	12.5	8.2	2.48	7751	2.22	72.85
010091829-07	OBS	No	185.242008	174.661147	75.4	15.466	13.6	8.8	2.48	7751	2.54	31.12
010091829-08	OBS	No	144.806501	226.139993	476.4	66.191	10.9	9.9	2.48	7751	6.89	43.22
010091829-09	OBS	No	123.726523	248.998906	51.2	12.172	9.0	7.0	2.48	7751	2.05	53.31
010091829-10	OBS	No	15.454682	141.232200	49.5	3.861	7.4	8.1	2.48	7751	2.01	853.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010091829-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
010091829-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010091829-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
010091829-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED
010091829-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED
010091829-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010091829-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

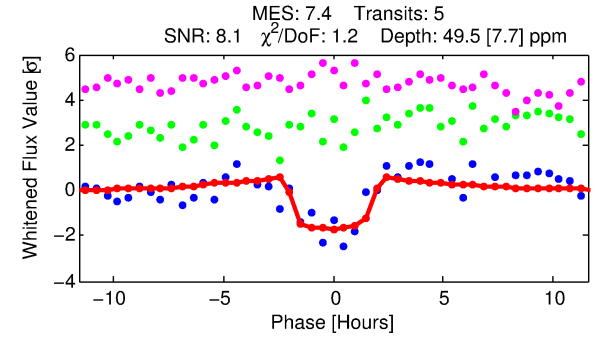
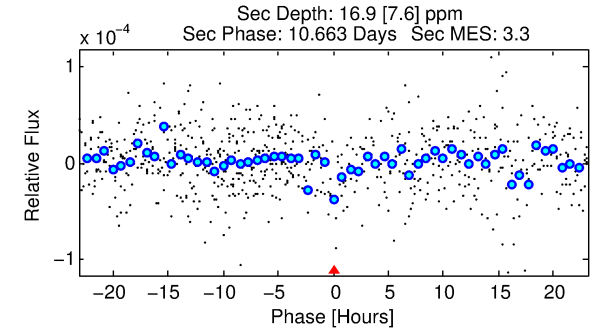
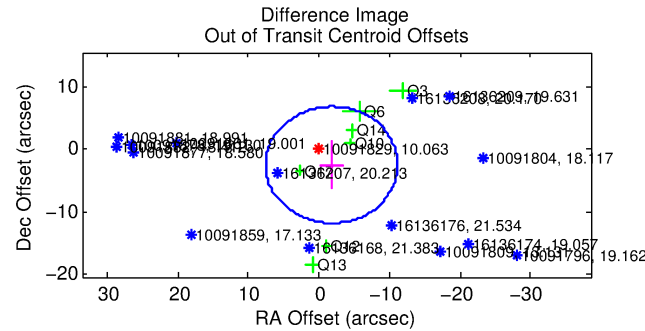
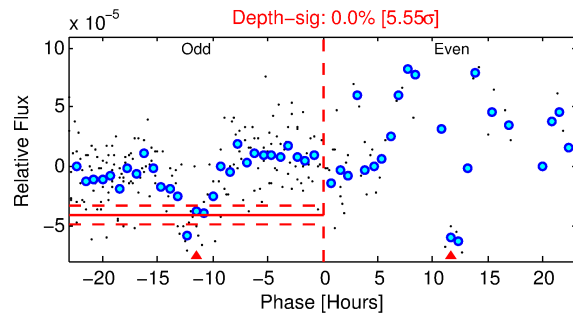
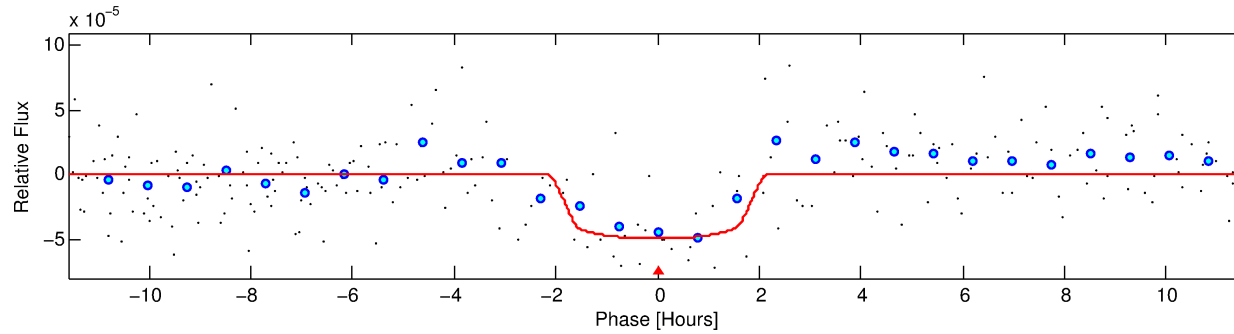
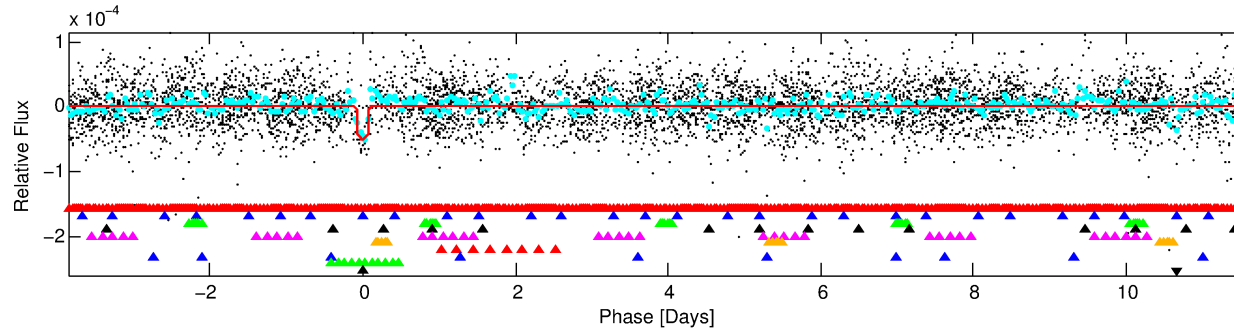
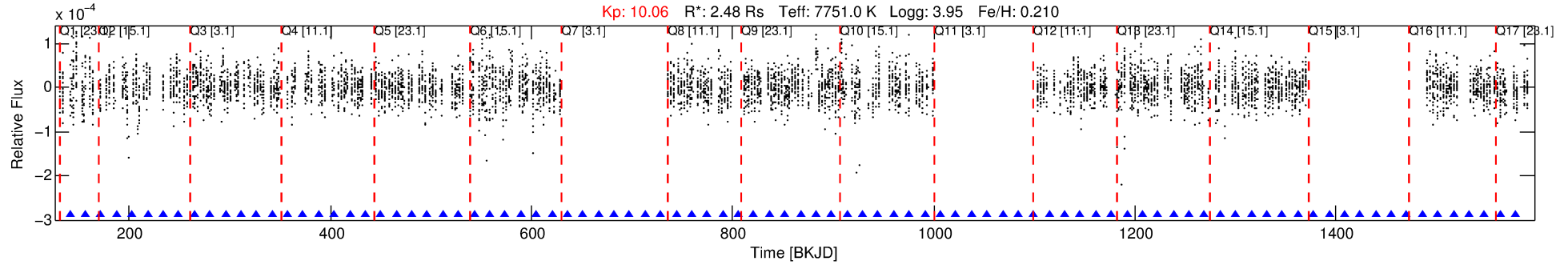
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010091829-10

No Significant Match Found

# DV One-Page Summary

KIC: 10091829 Candidate: 10 of 10 Period: 15.455 d



## DV Fit Results:

Period = 15.45468 [0.00016] d  
Epoch = 141.2322 [0.0105] BKJD  
Rp/R\* = 0.0074 [0.0034]  
a/R\* = 14.50 [40.80]  
b = 0.89 [0.67]  
Seff = 853.75 [211.92]  
Teq = 1378 [86] K  
Rp = 2.01 [1.00] Re  
a = 0.1527 [0.0246] AU  
Ag = 53.74 [56.61] [0.93 $\sigma$ ]  
Teffp = 5770 [1479] K [2.96 $\sigma$ ]

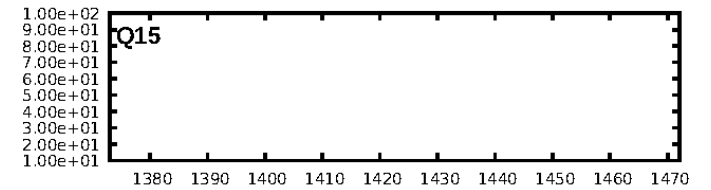
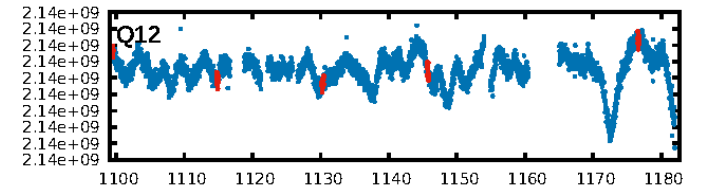
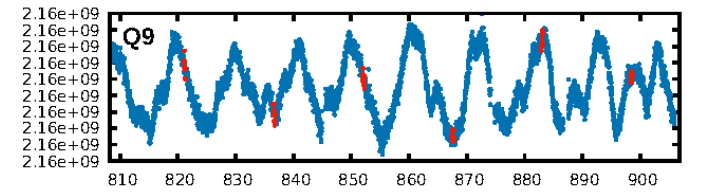
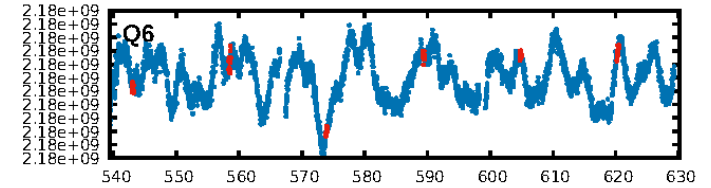
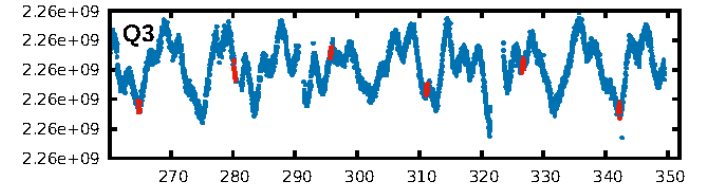
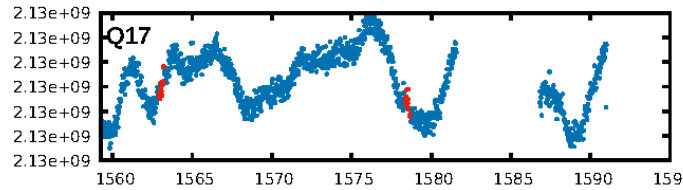
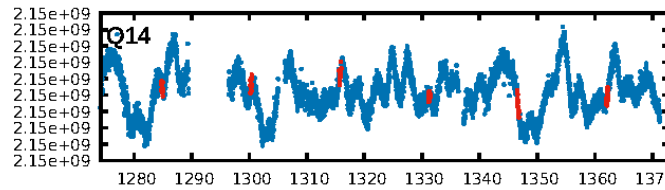
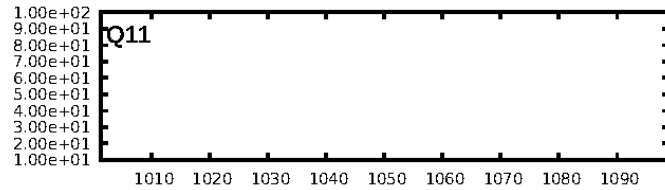
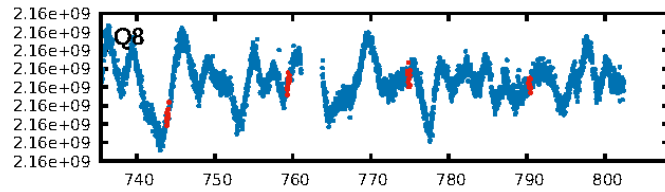
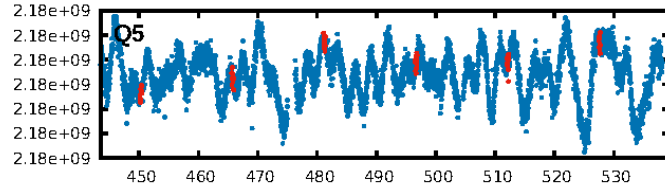
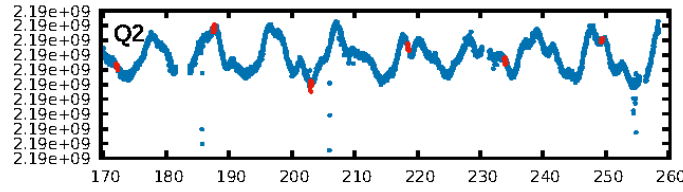
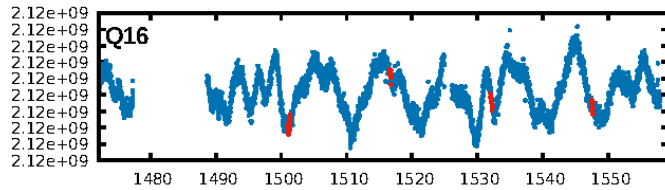
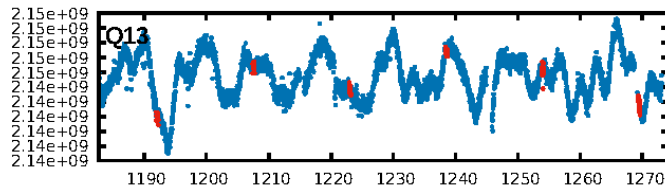
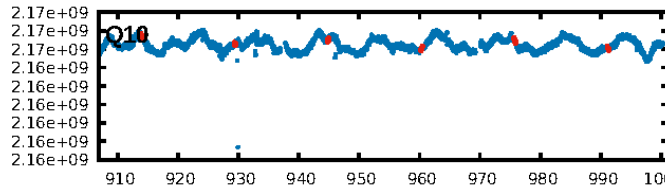
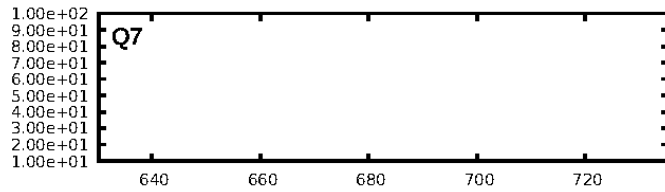
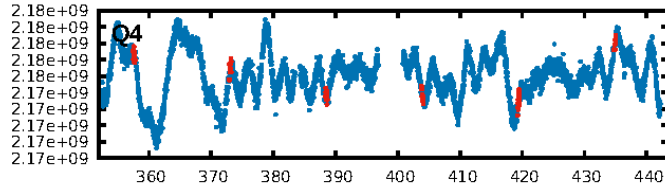
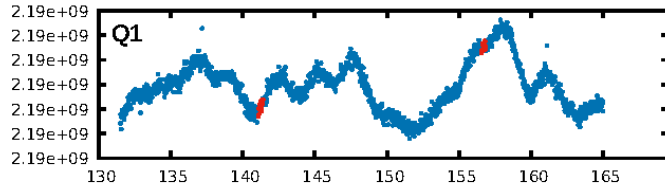
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [16.91 $\sigma$ ]  
LongPeriod-sig: 100.0% [70.72 $\sigma$ ]  
ModelChiSquare2-sig: 30.3%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: 1.34e-09  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 96.5%  
Centroid-so: 0.716 arcsec [0.94 $\sigma$ ]  
OotOffset-rm: 3.113 arcsec [1.00 $\sigma$ ]  
OotOffset-st: 3/1/1/2 [7]  
KicOffset-rm: 3.793 arcsec [1.35 $\sigma$ ]  
KicOffset-st: 3/1/1/2 [7]  
DiffImageQuality-fgm: 0.00 [0/7]  
DiffImageOverlap-fno: 0.71 [10/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:11:18 Z

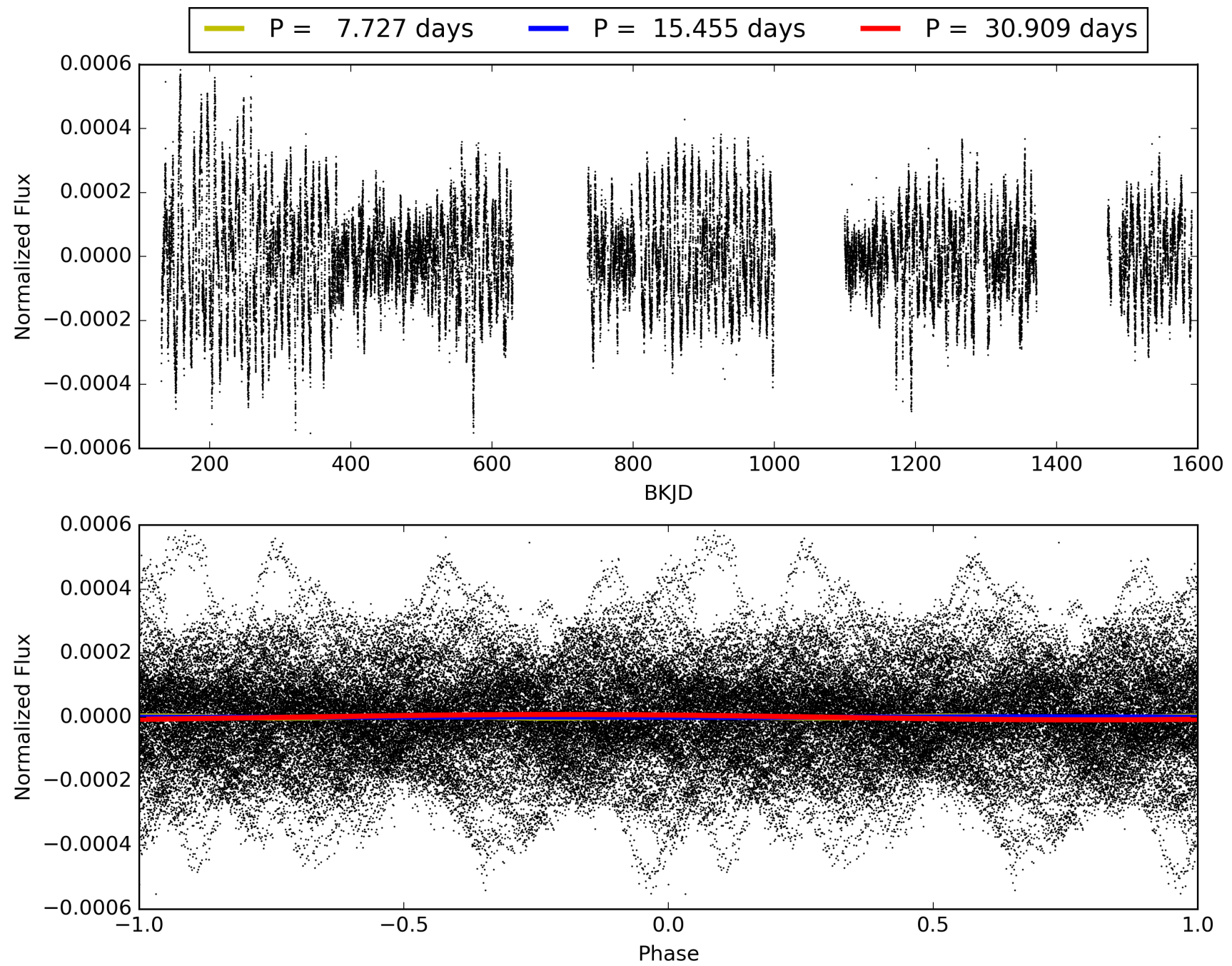
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010091829-10, PDC Light Curves



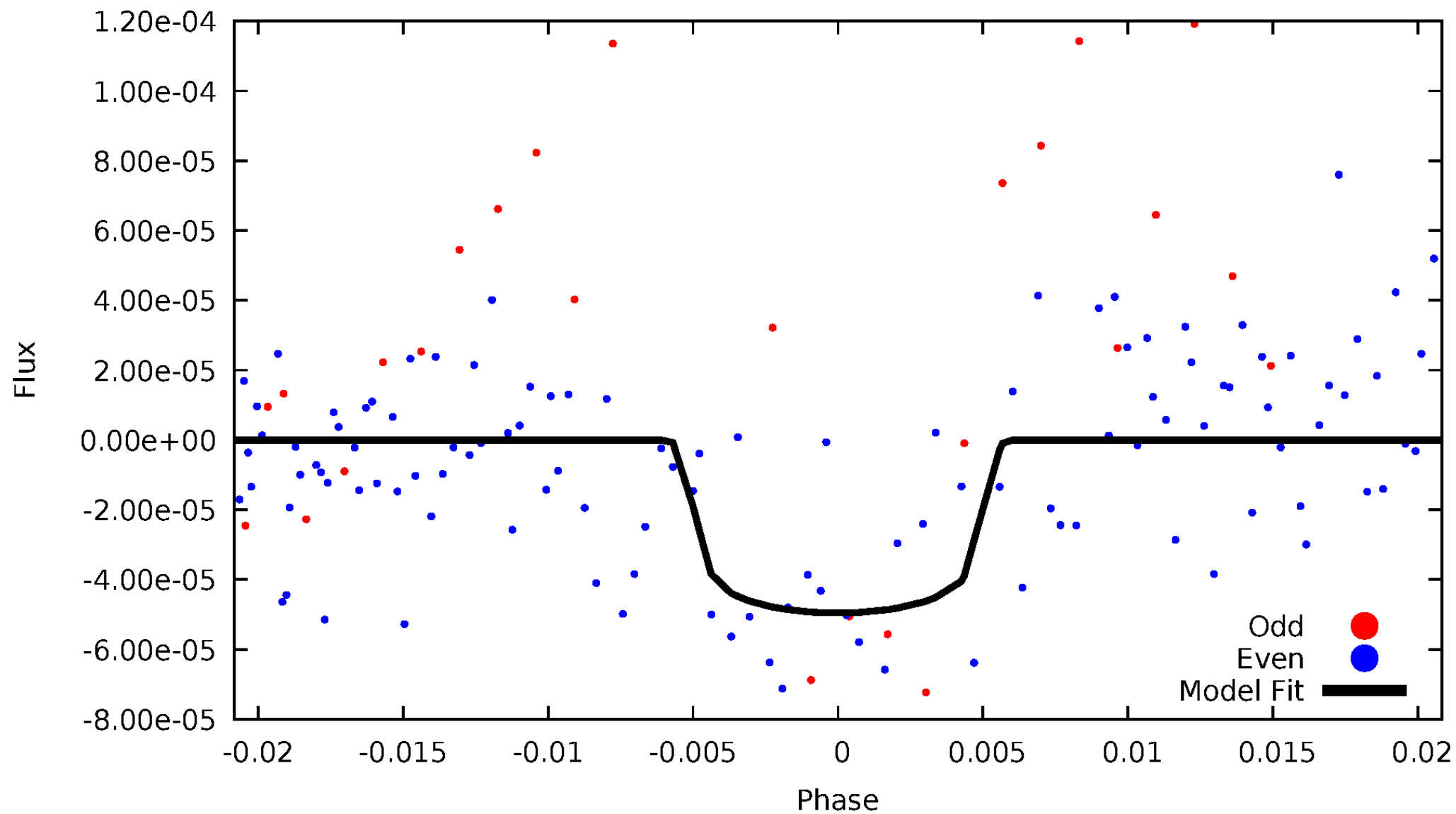


TCE 010091829-10



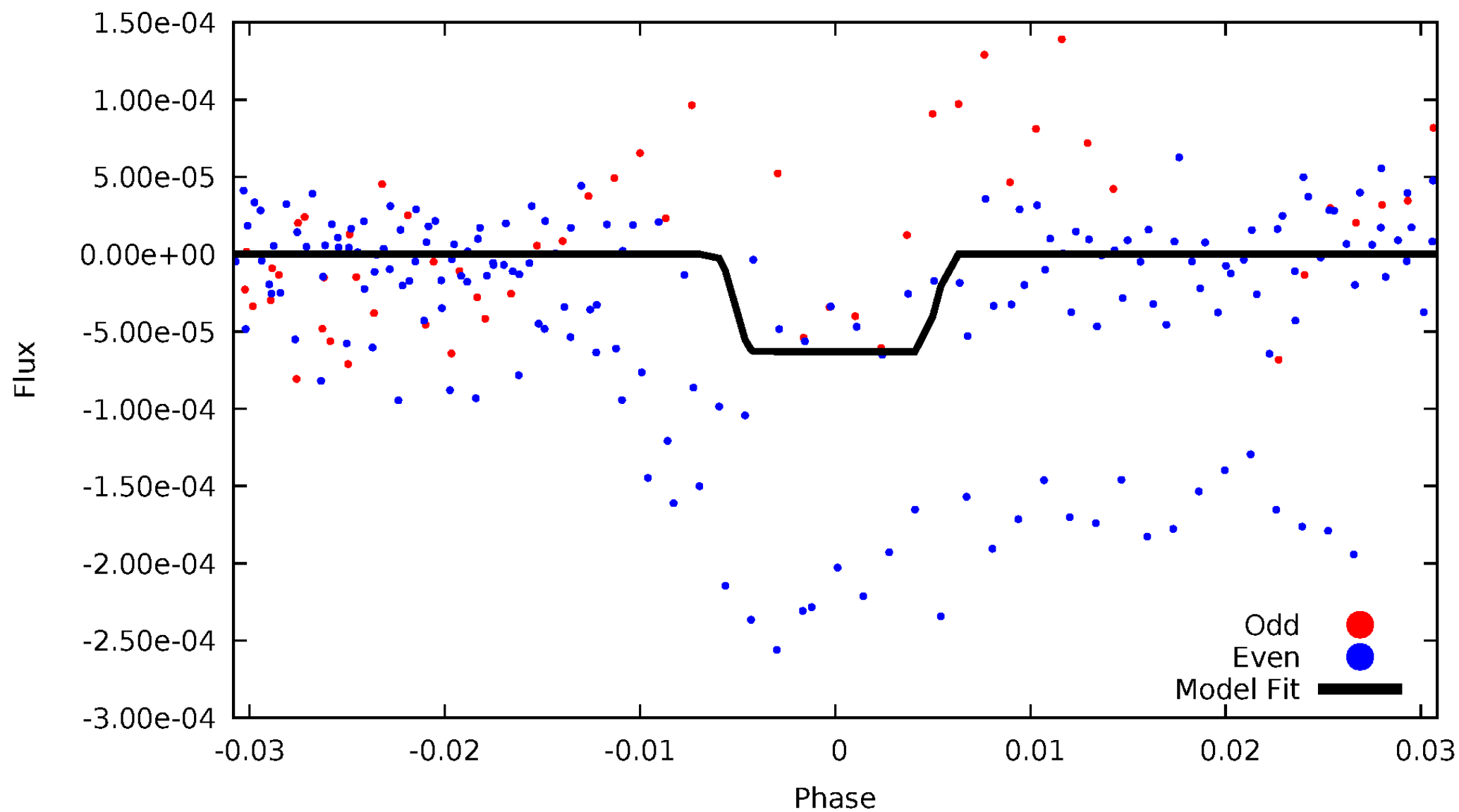
# DV Odd/Even

TCE 010091829-10



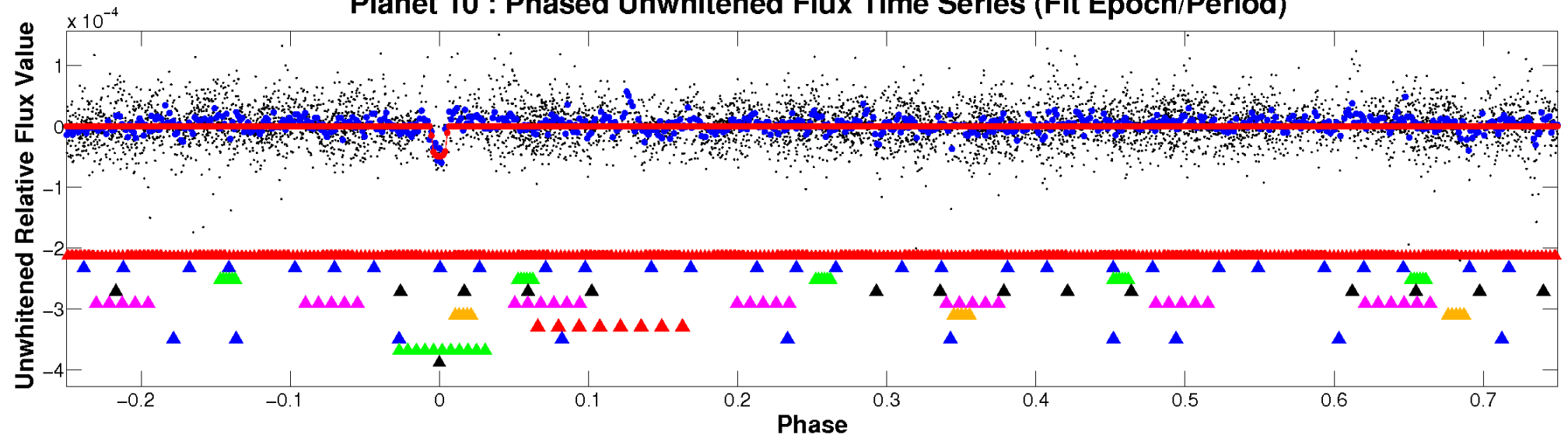
# ALT Odd/Even

TCE 010091829-10

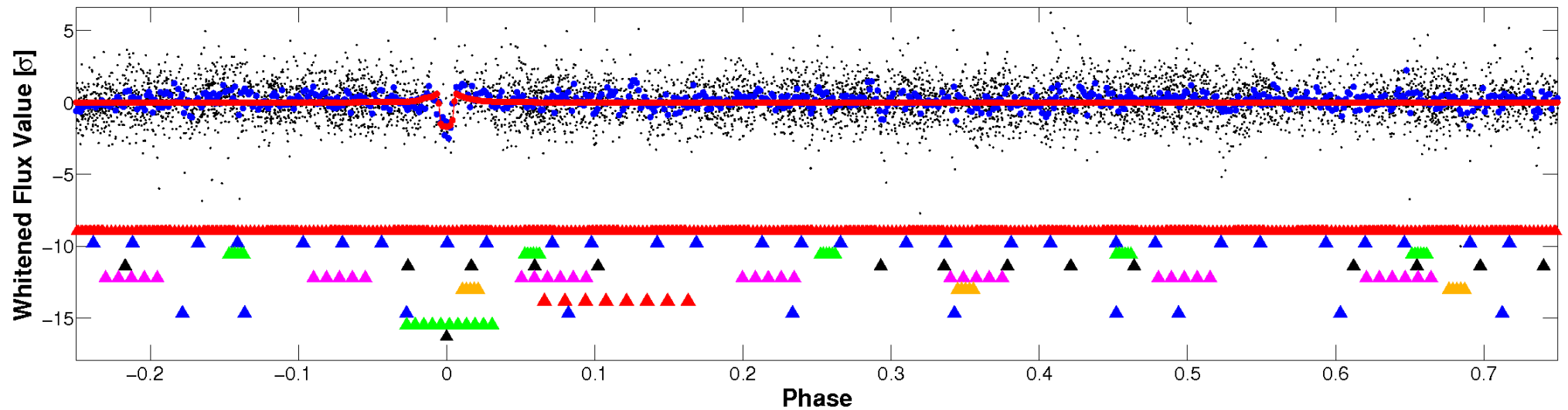


# Non-Whitened Vs. Whitened Light Curve

Planet 10 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

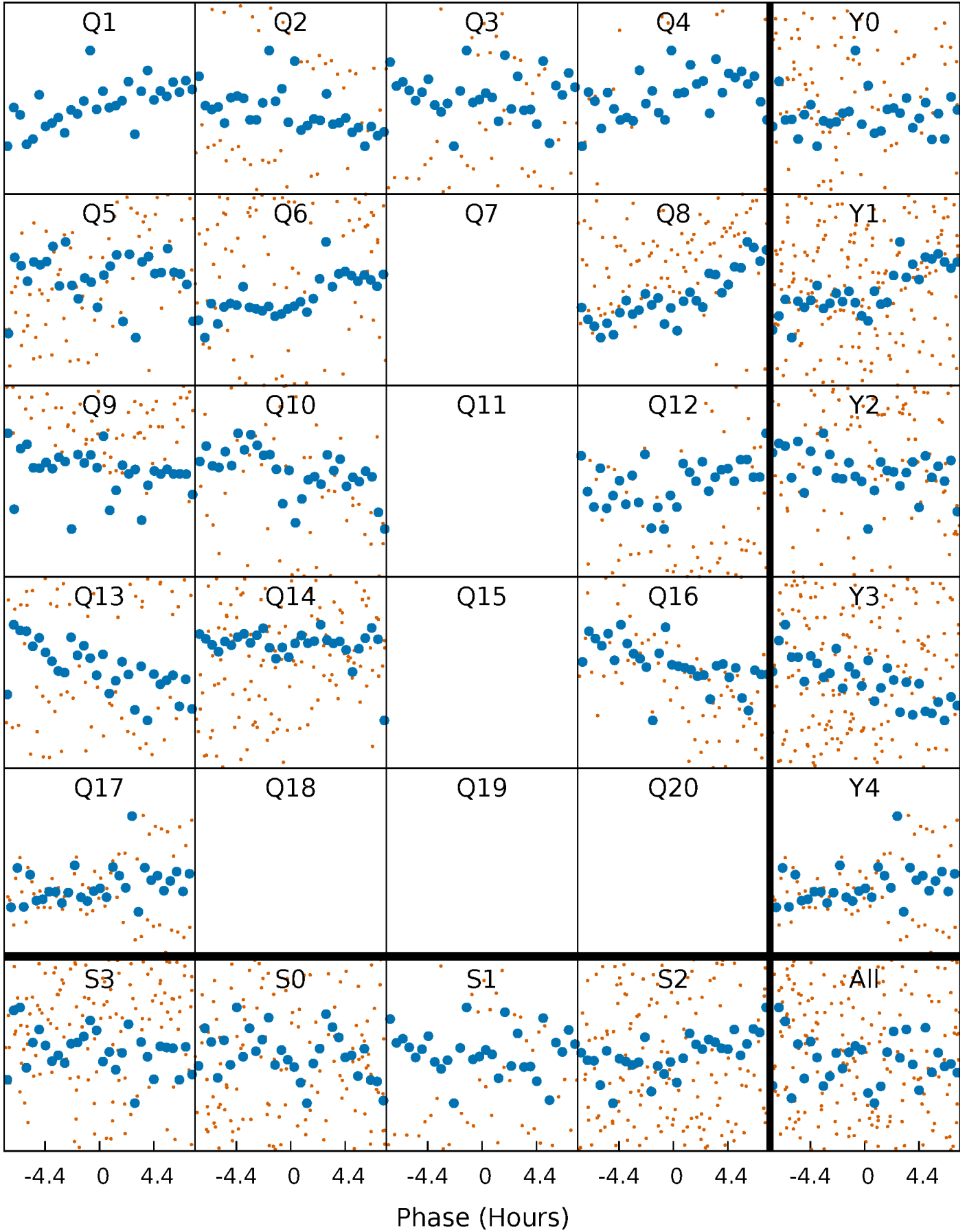


Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)



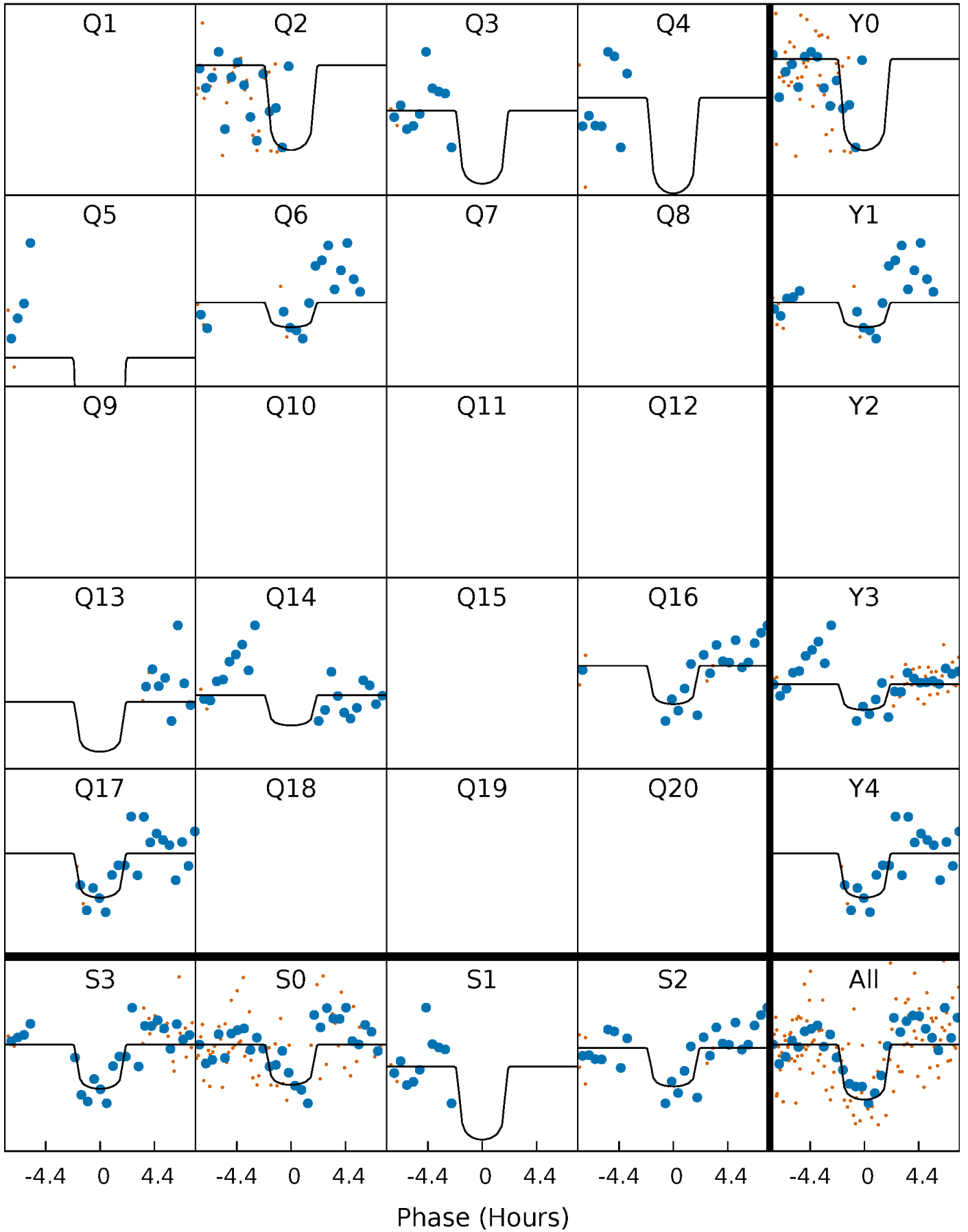
# PDC Quarter-Phased Transit Curves

TCE 010091829-10   P= 15.454682 Days    $T_0=141.232200$  (BKJD)



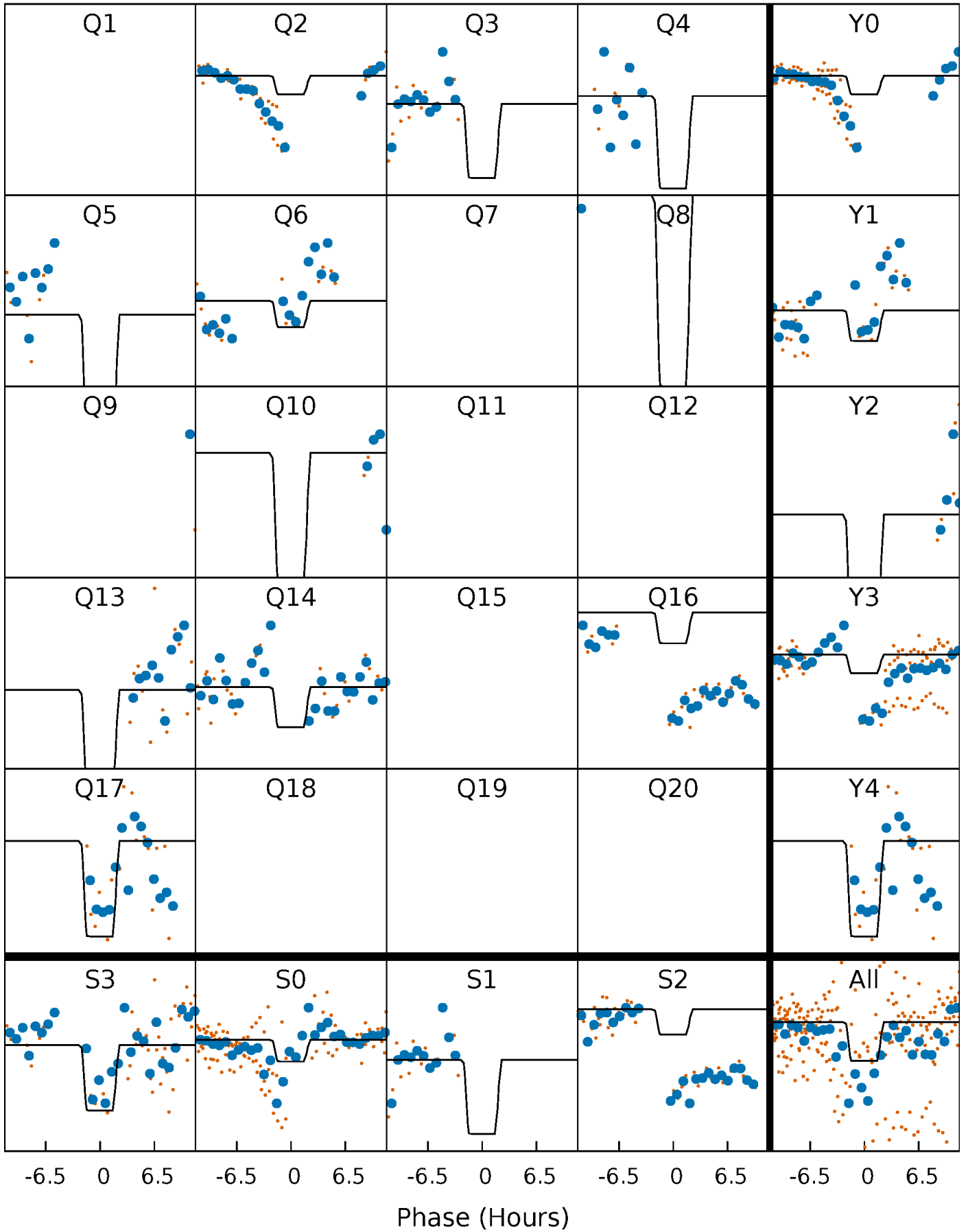
# DV Quarter-Phased Transit Curves

TCE 010091829-10 P= 15.454682 Days  $T_0=141.232200$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

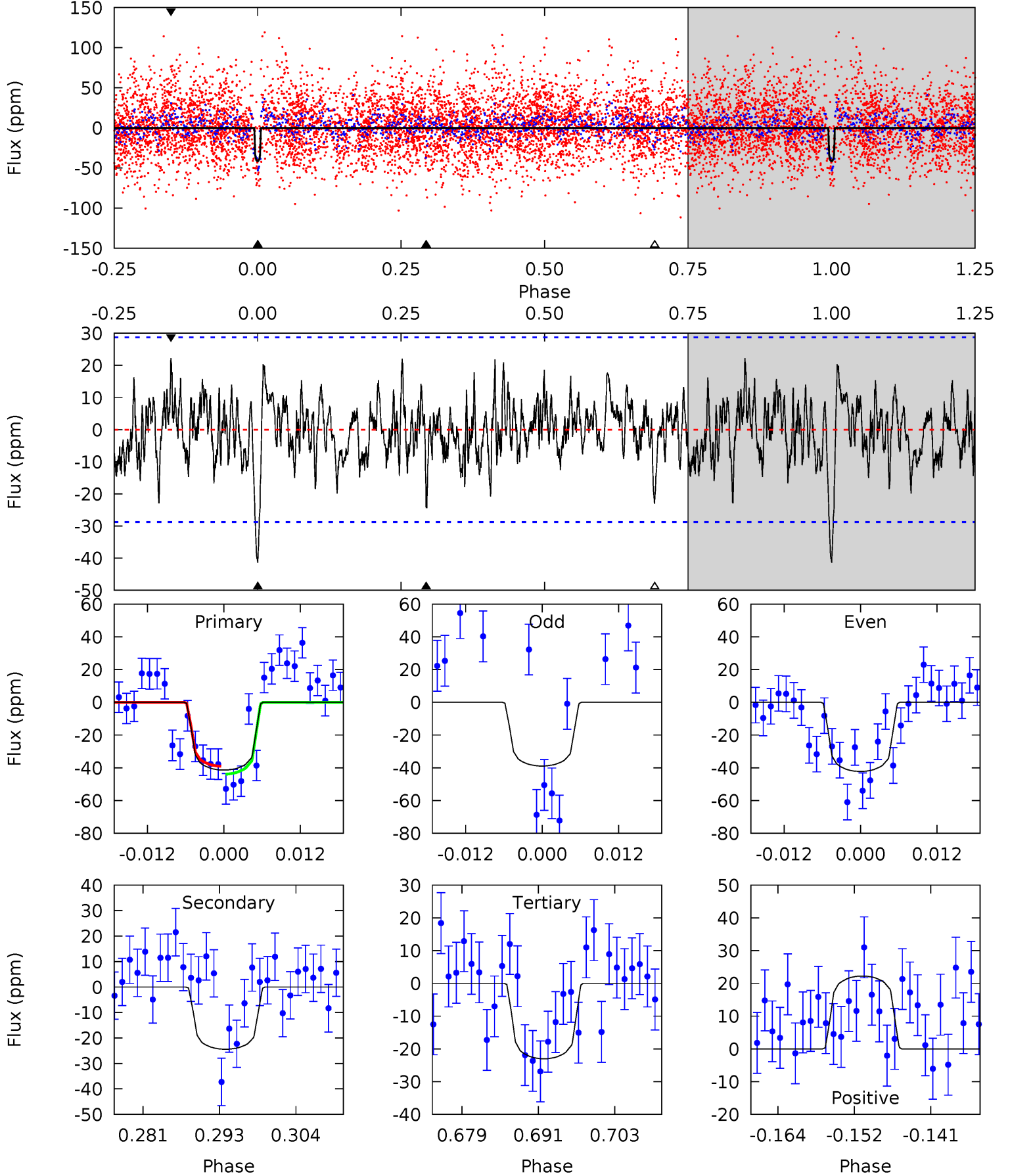
TCE 010091829-10   P= 15.454327 Days    $T_0=141.252395$  (BKJD)



# DV Model-Shift Uniqueness Test

010091829-10,  $P = 15.454682$  Days,  $E = 125.777518$  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
7.19	4.24	4.00	3.86	5.00	2.52	1.28	3.19	3.33	0.24	0.38	0.25	0.89	0.35	0.42

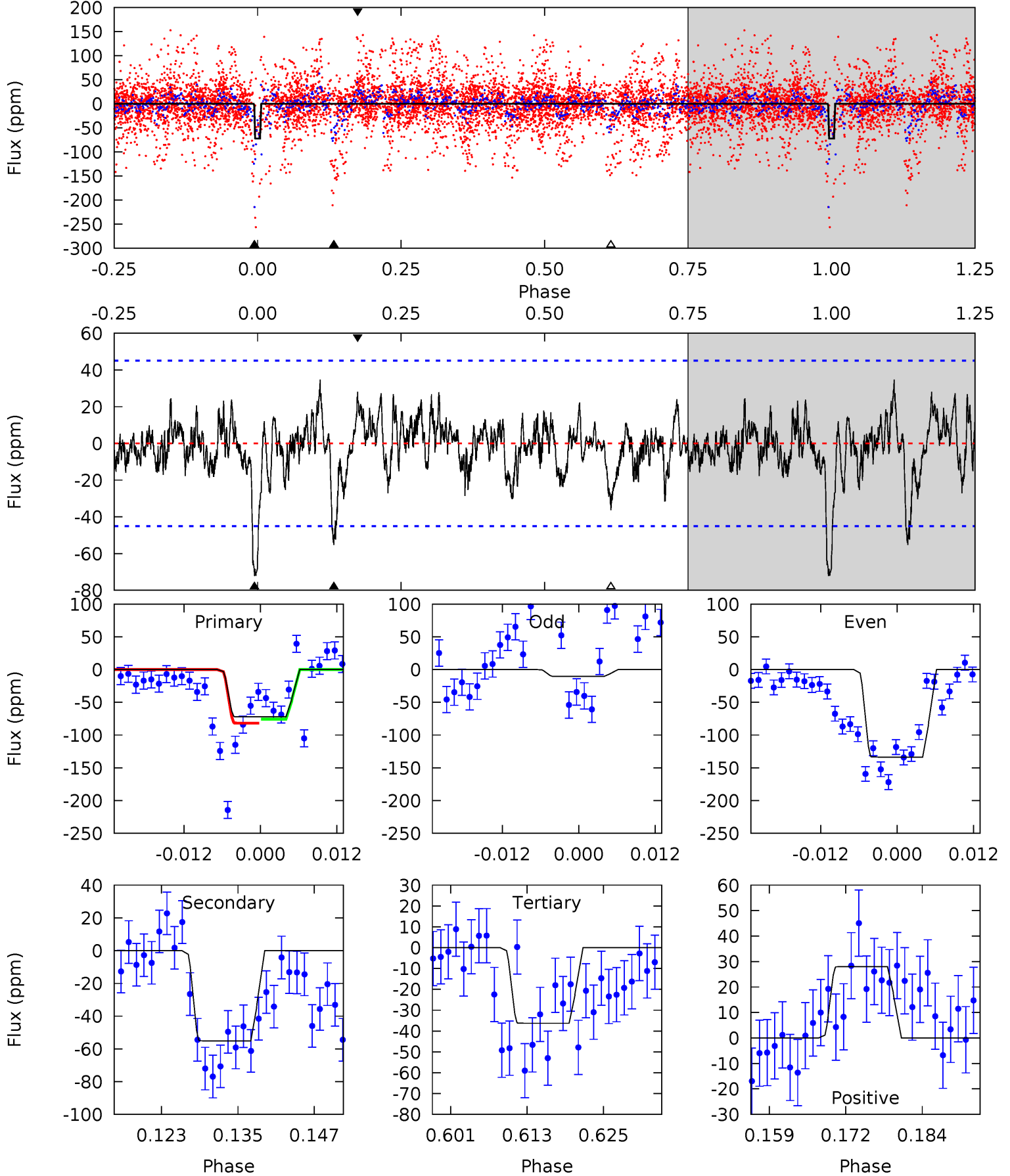




# Alt Model-Shift Uniqueness Test

010091829-10,  $P = 15.454327$  Days,  $E = 125.798068$  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	6.11	4.02	3.10	4.99	2.50	1.19	3.97	4.88	2.09	3.01	5.85	1.03	0.33	0.36



### Stellar Parameters For KIC 010091829

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7751^{+85}_{-77}$	$3.947^{+0.138}_{-0.092}$	$0.210^{+0.200}_{-0.200}$	$2.481^{+0.371}_{-0.453}$	$1.986^{+0.166}_{-0.185}$	$0.183^{+0.123}_{-0.053}$
	+1%/-1%	+3%/-2%	+95%/-95%	+15%/-18%	+8%/-9%	+67%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 010091829-10 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-24 \pm 6$	$2.01^{+0.91}_{-0.91}$	$1926^{+74}_{-91}$	$6214^{+2434}_{-1093}$	$80^{+185}_{-45}$
Alt.	$-55 \pm 9$	$2.15^{+0.93}_{-0.92}$	$1925^{+75}_{-85}$	$7429^{+3386}_{-1317}$	$155^{+323}_{-82}$

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

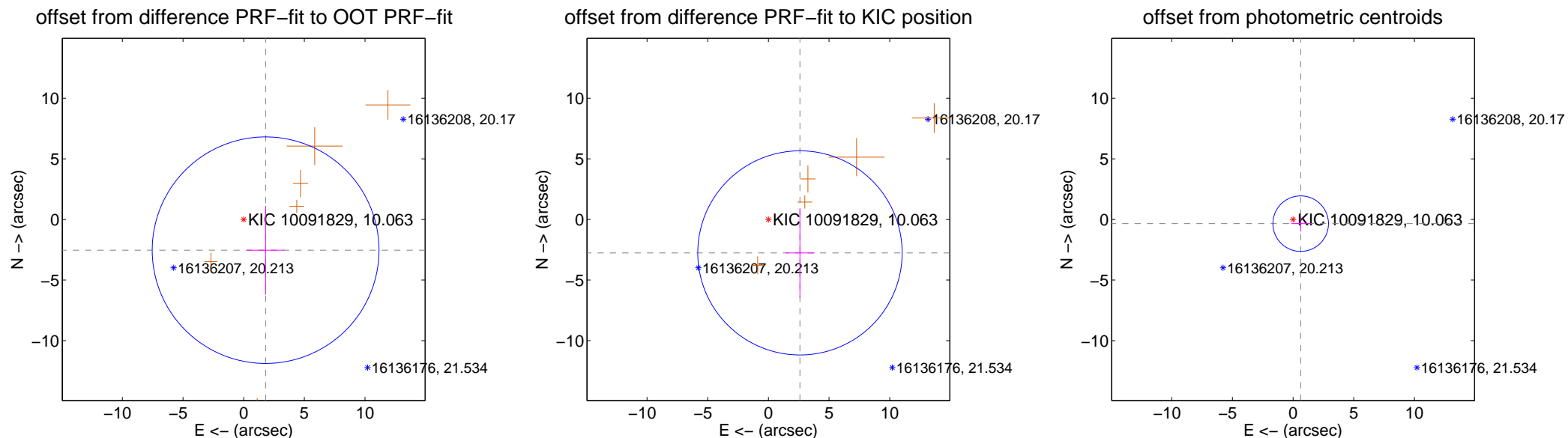
## DV Centroid Data

Supplemental centroid analysis for 010091829-10. **Kepler magnitude: 10.06.** Transit SNR 8.13

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

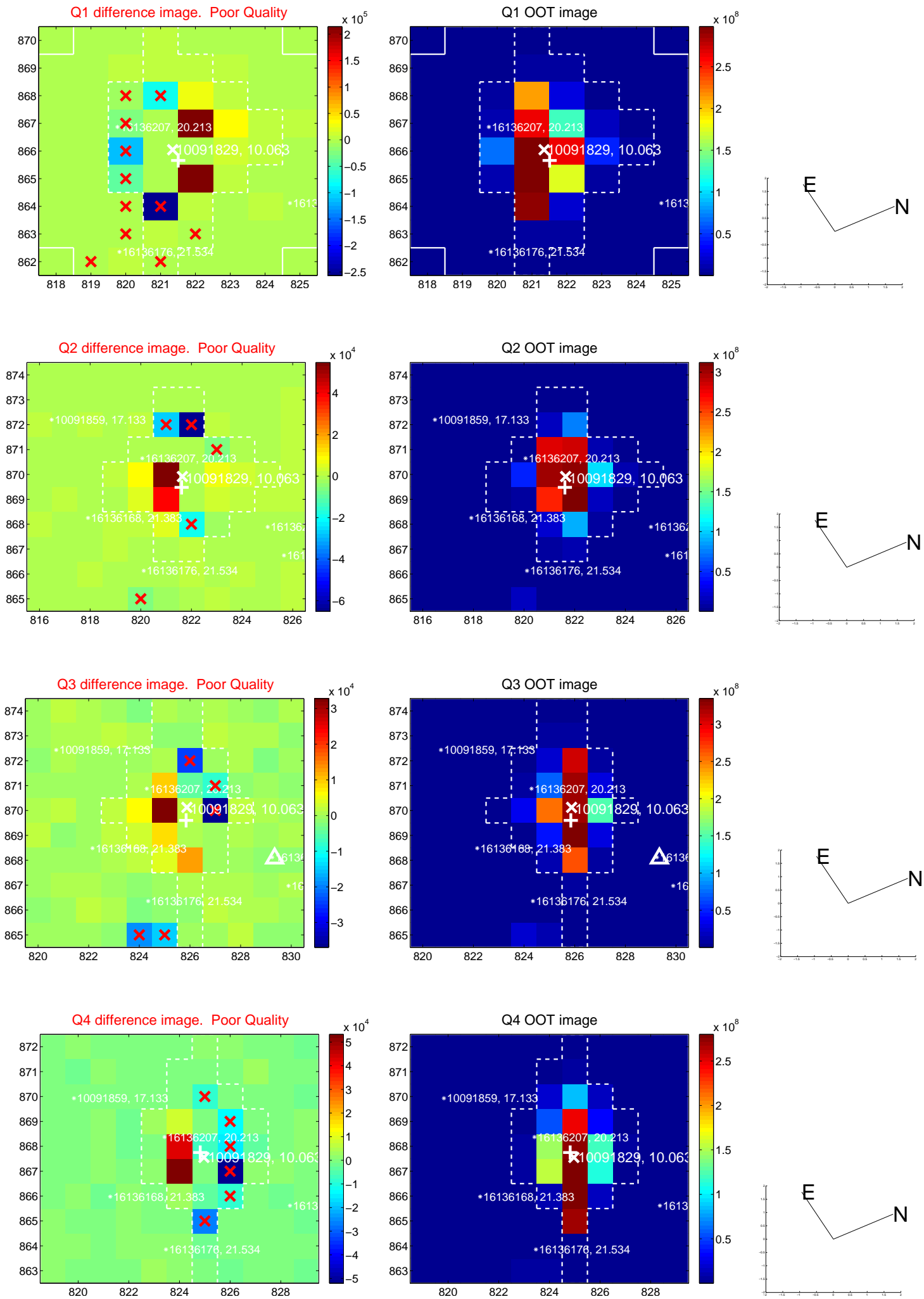
The direct PRF centroid is offset from the target star catalog position by about 1.84 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.113 \pm 3.114$	1.00	$-1.807 \pm 1.532$	$-2.535 \pm 3.666$
PRF-fit source offset from KIC position	$3.793 \pm 2.807$	1.35	$-2.602 \pm 1.190$	$-2.759 \pm 3.691$
photometric centroid source offset	$0.72 \pm 0.76$	0.94	$-0.63 \pm 0.80$	$-0.35 \pm 0.65$

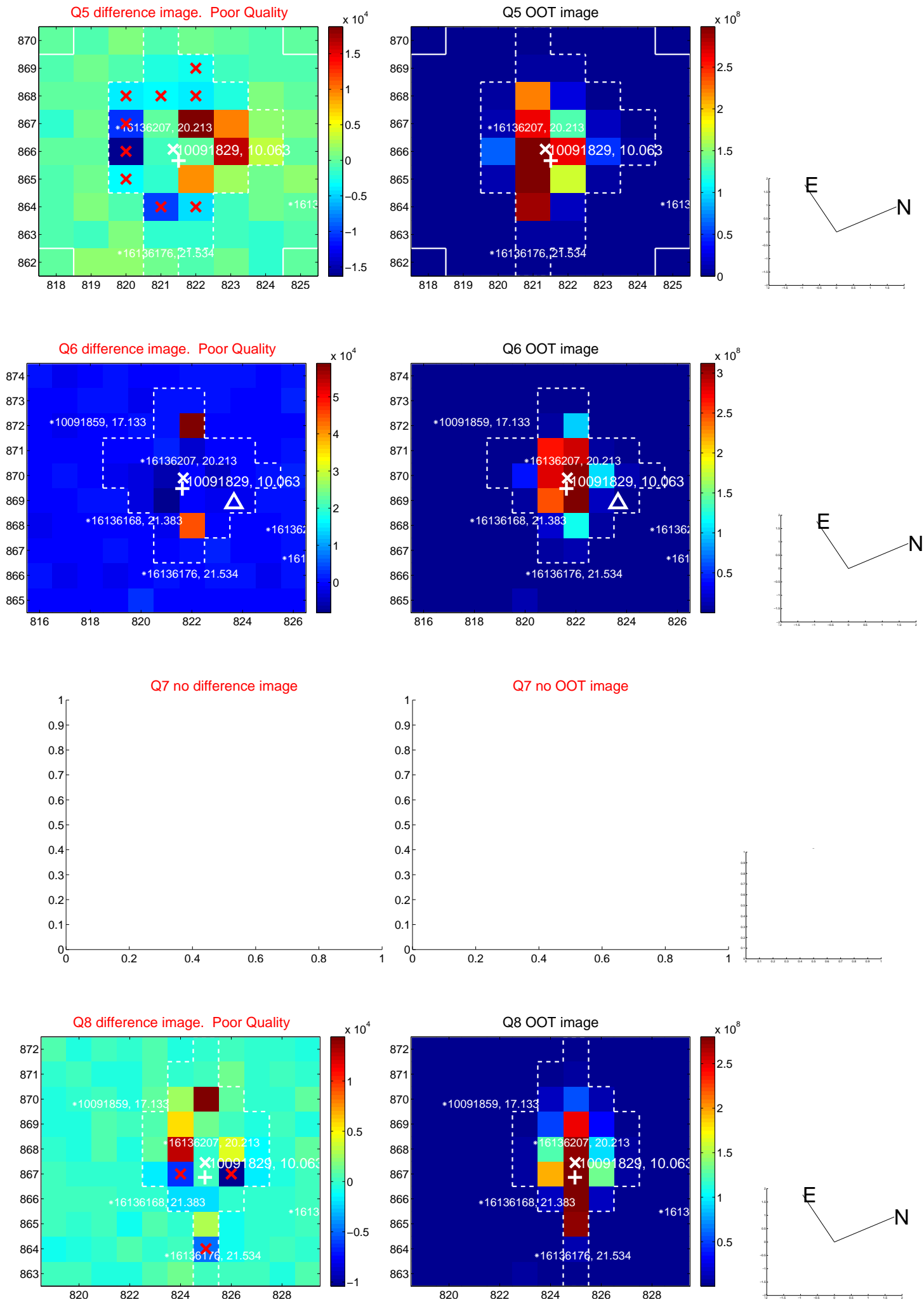


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

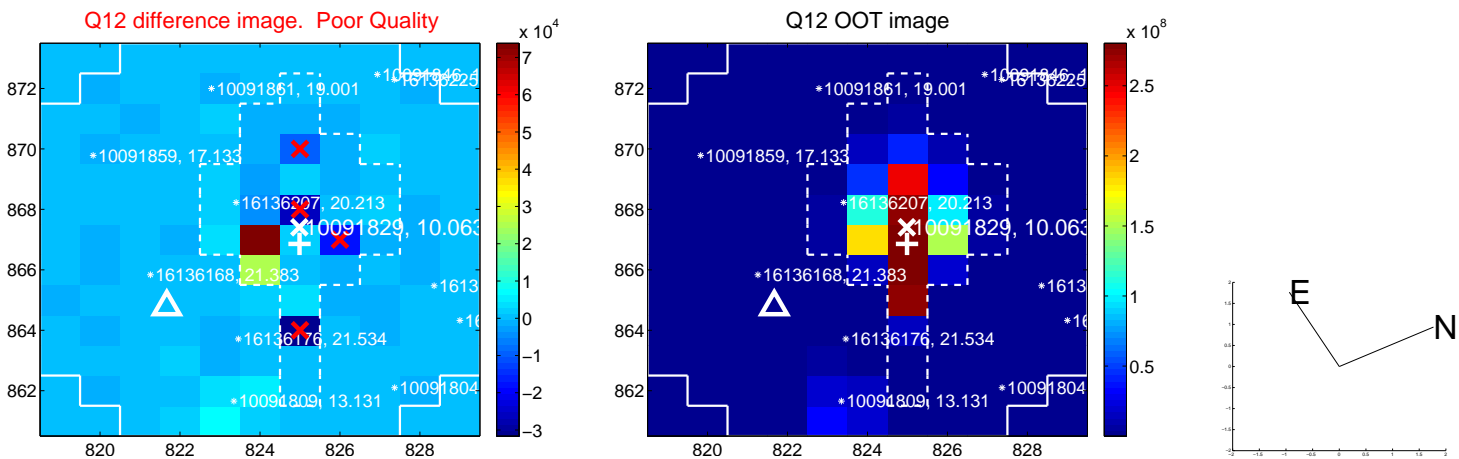
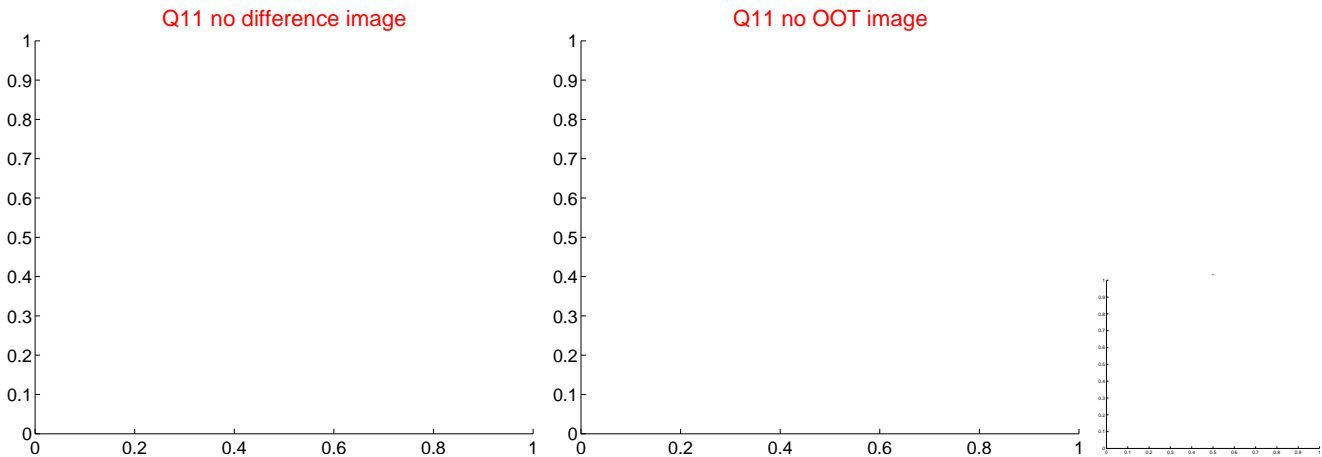
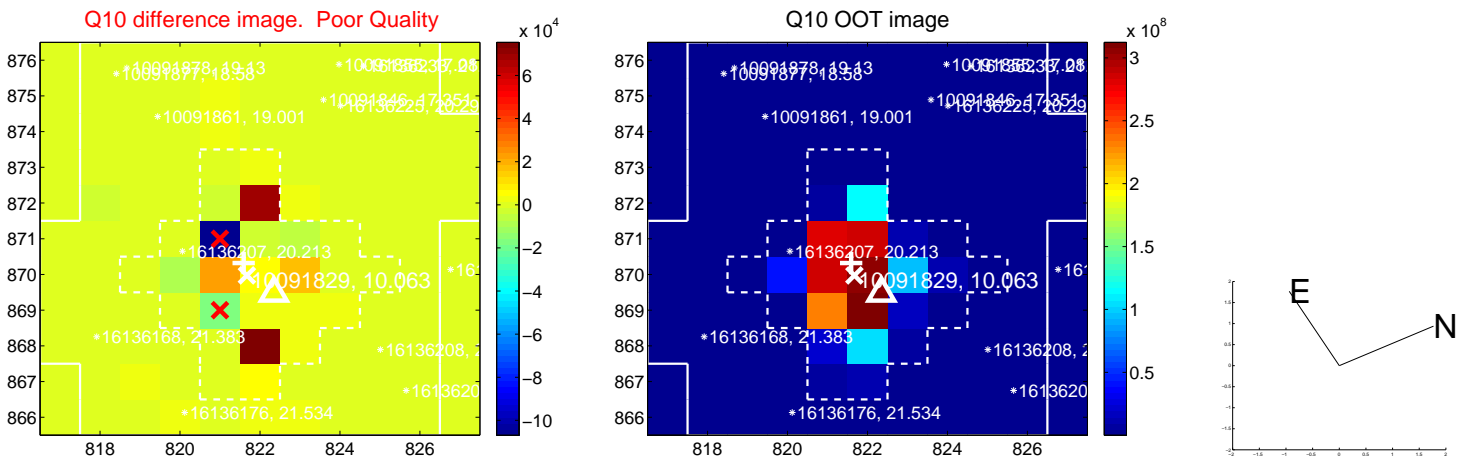
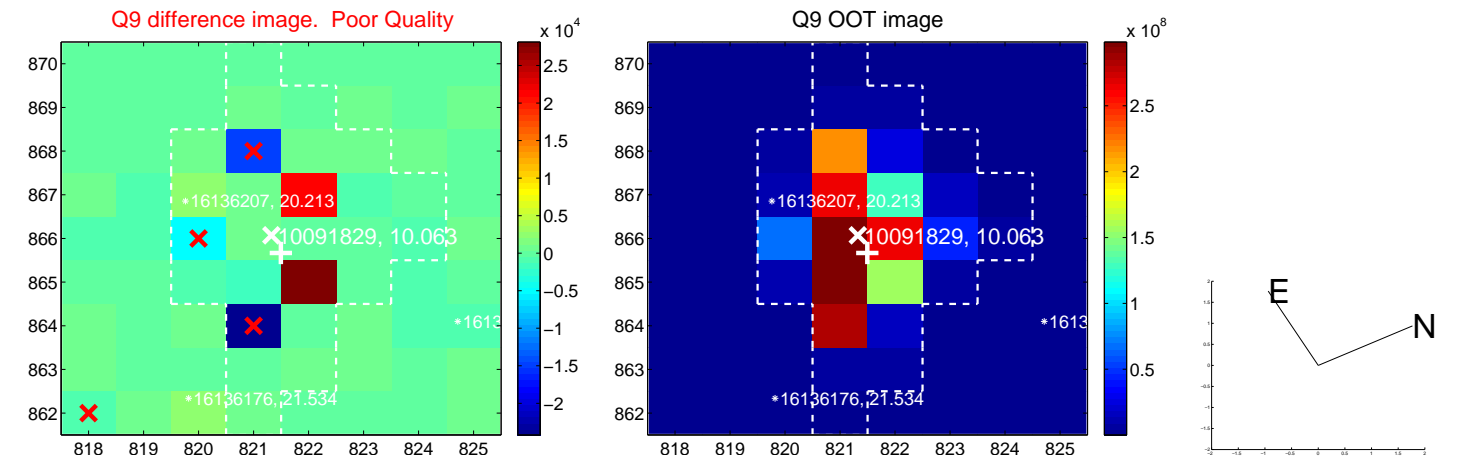
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



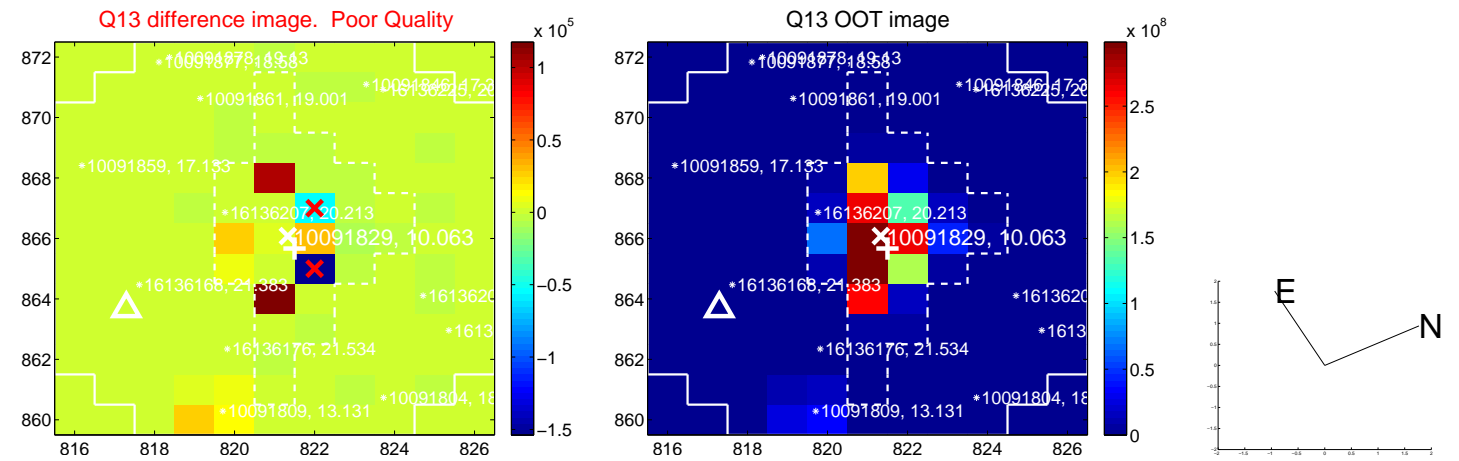
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



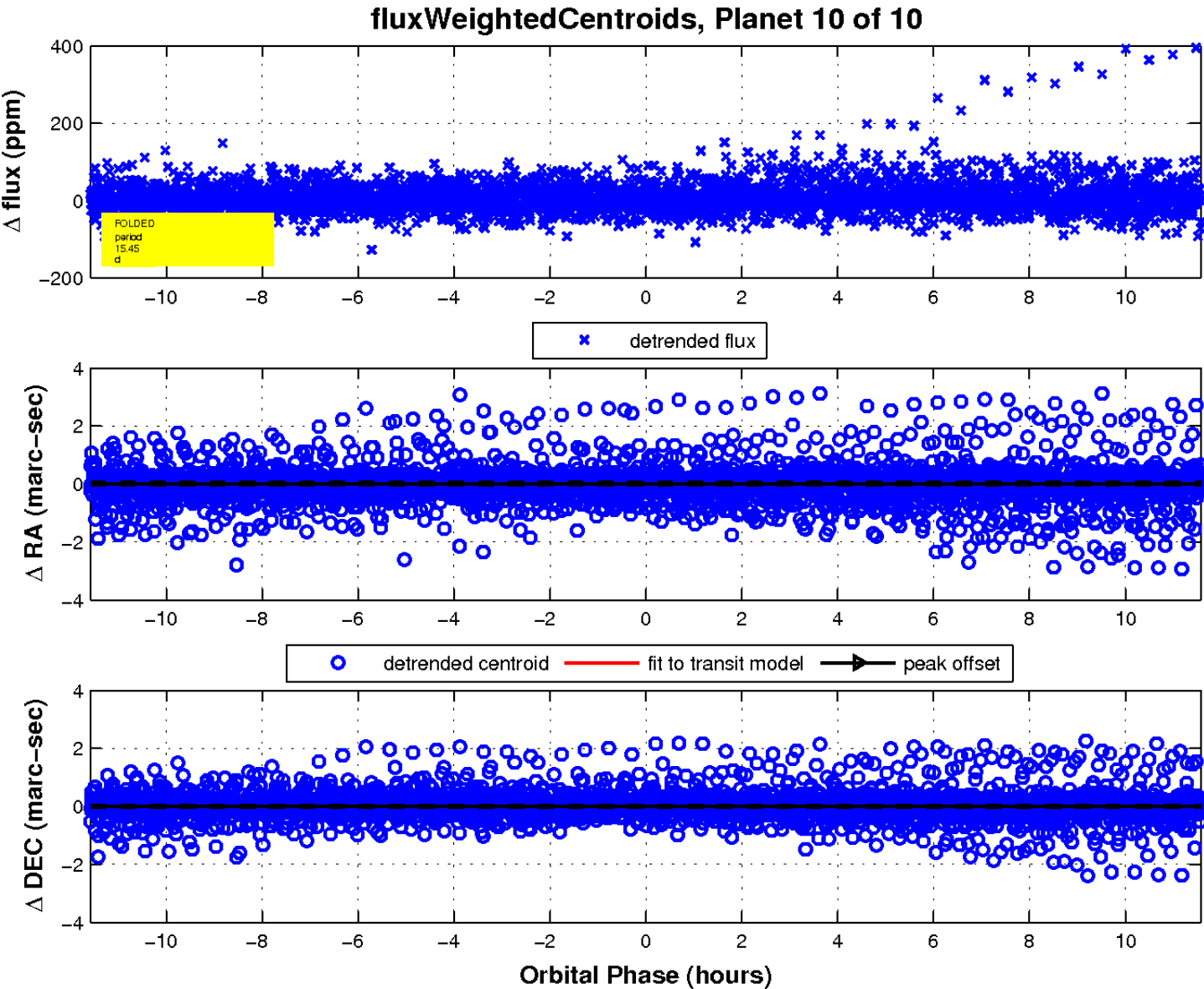
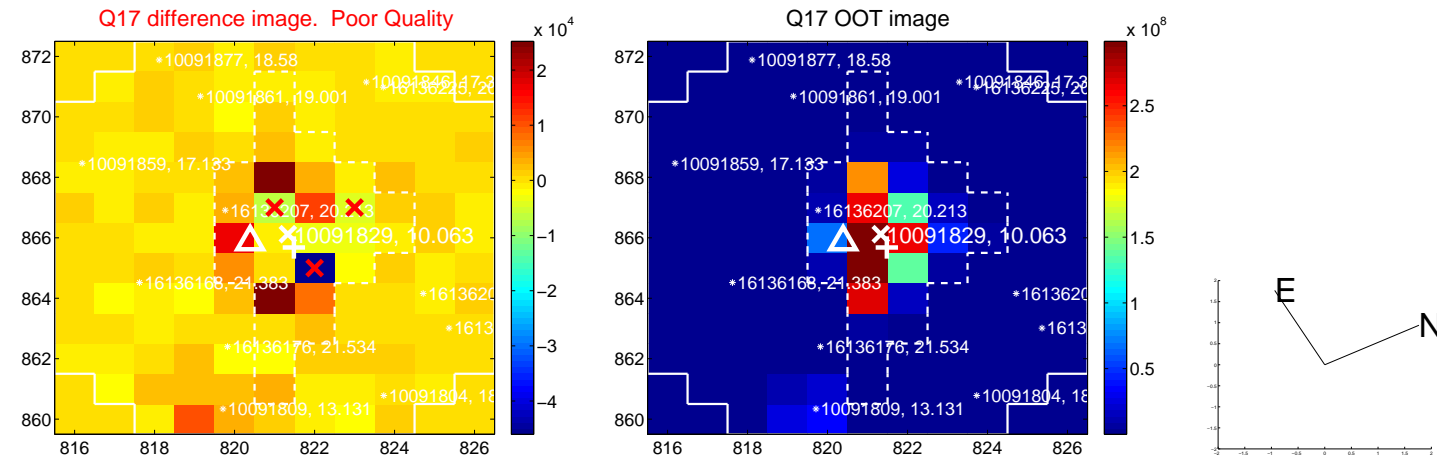
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

