

# KIC 010220150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010220150-01	OBS	No	0.678481	131.610834	142.0	0.516	10.6	14.6	1.90	5524	2.54	14843.69
010220150-02	OBS	No	0.678490	132.082895	132.0	0.822	9.9	16.7	1.90	5524	2.62	14843.44
010220150-03	OBS	No	0.678483	131.808746	154.3	0.576	11.0	16.9	1.90	5524	2.43	14843.63

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010220150-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010220150-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD—CENT_SATURATED
010220150-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

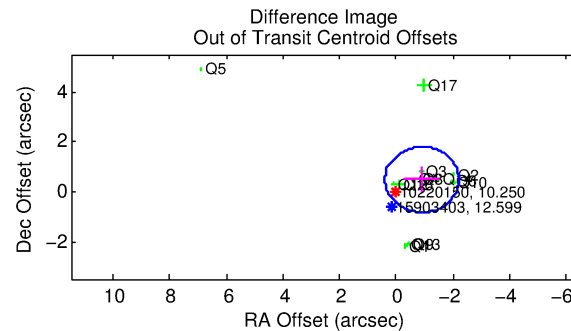
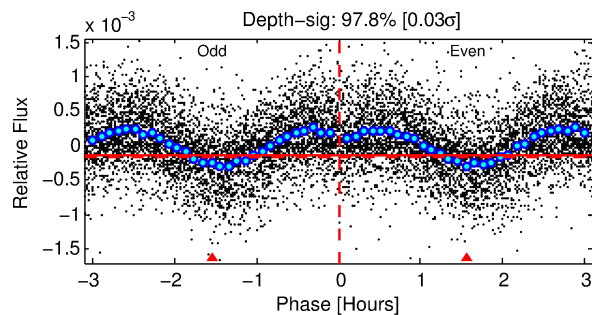
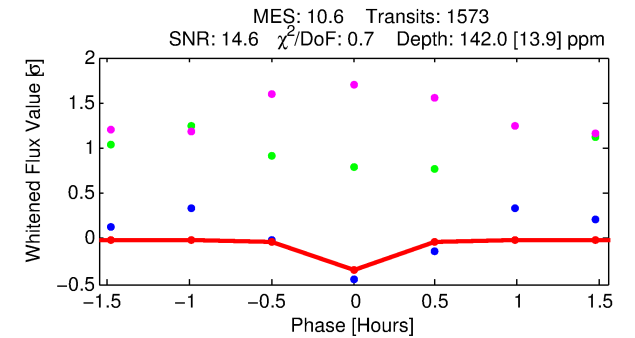
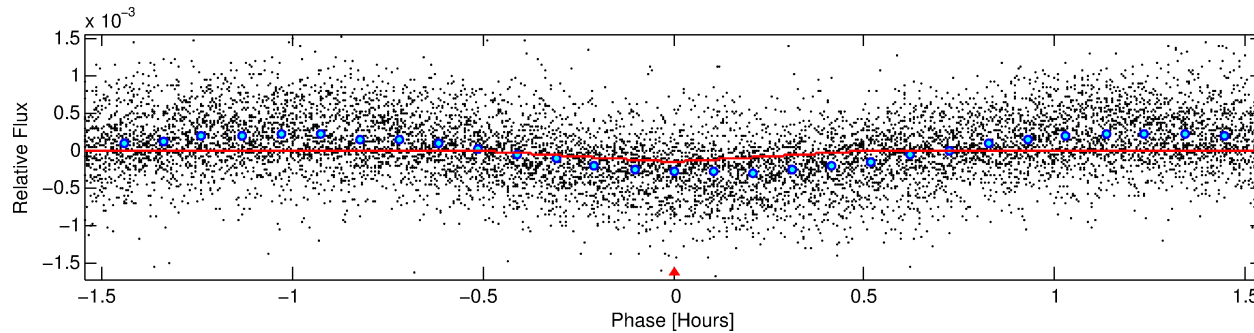
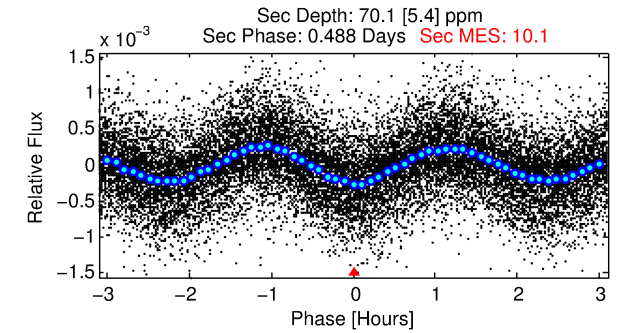
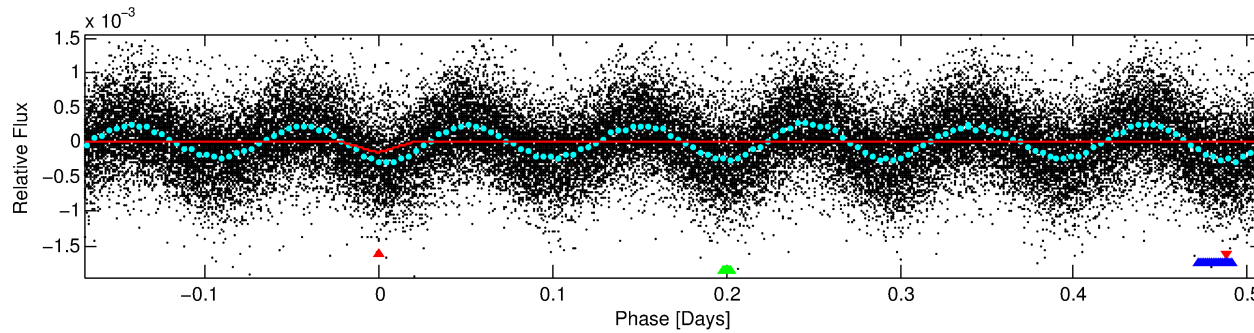
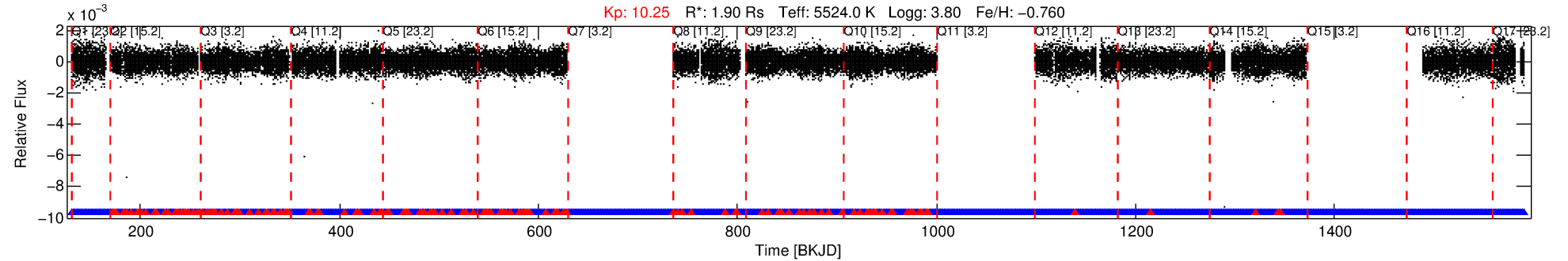
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010220150-01

No Significant Match Found

# DV One-Page Summary

KIC: 10220150 Candidate: 1 of 3 Period: 0.678 d



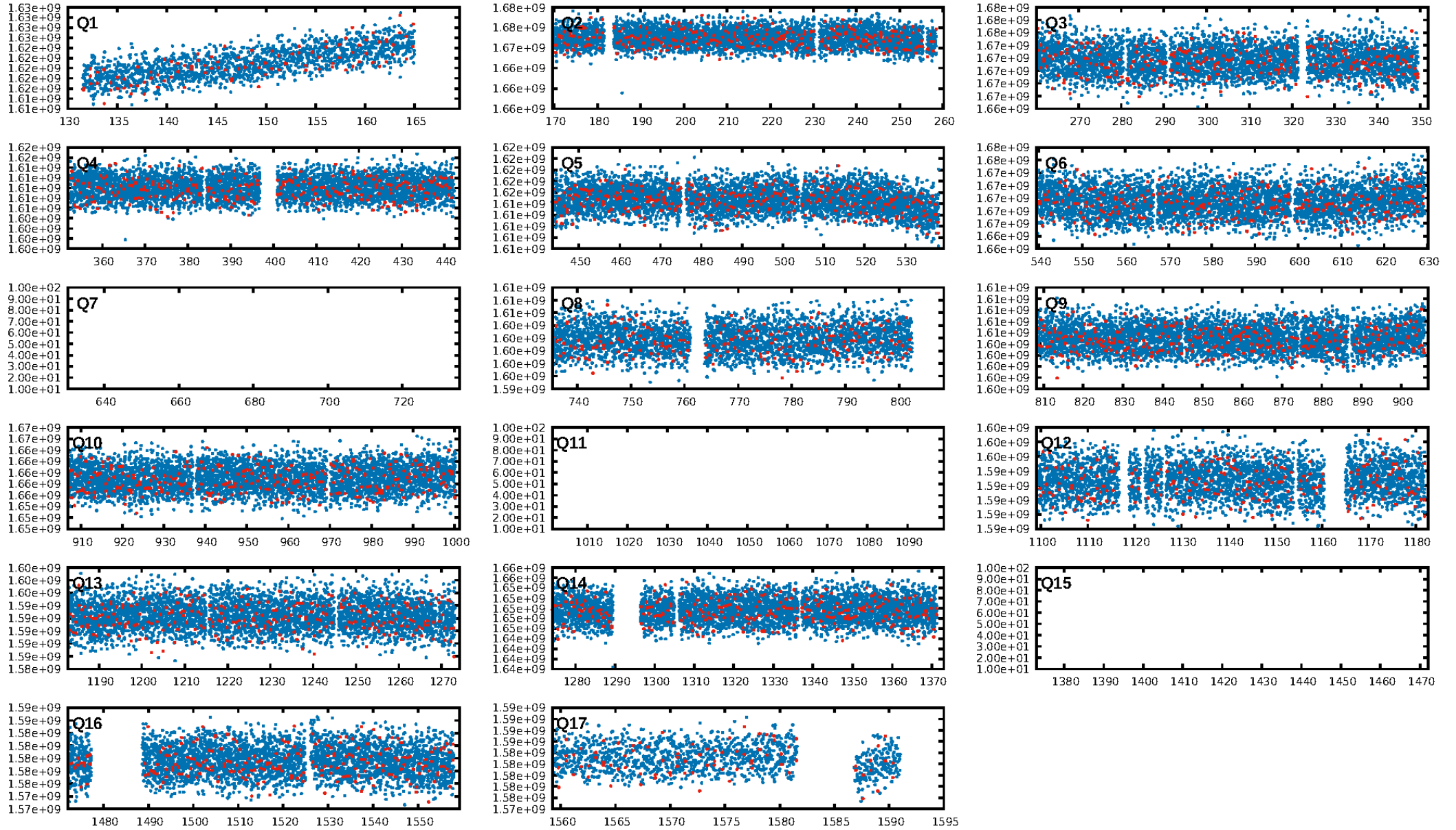
## DV Fit Results:

Period = 0.67848 [0.00001] d  
Epoch = 131.6108 [0.0007] BKJD  
Rp/R\* = 0.0122 [0.0037]  
a/R\* = 7.36 [10.20]  
b = 0.70 [1.02]  
Seff = 14843.69 [18837.69]  
Teq = 2815 [893] K  
Rp = 2.54 [1.75] Re  
a = 0.0142 [0.0103] AU  
Ag = 1.21 [1.70] [0.13σ]  
Teffp = 4568 [707] K [1.54σ]

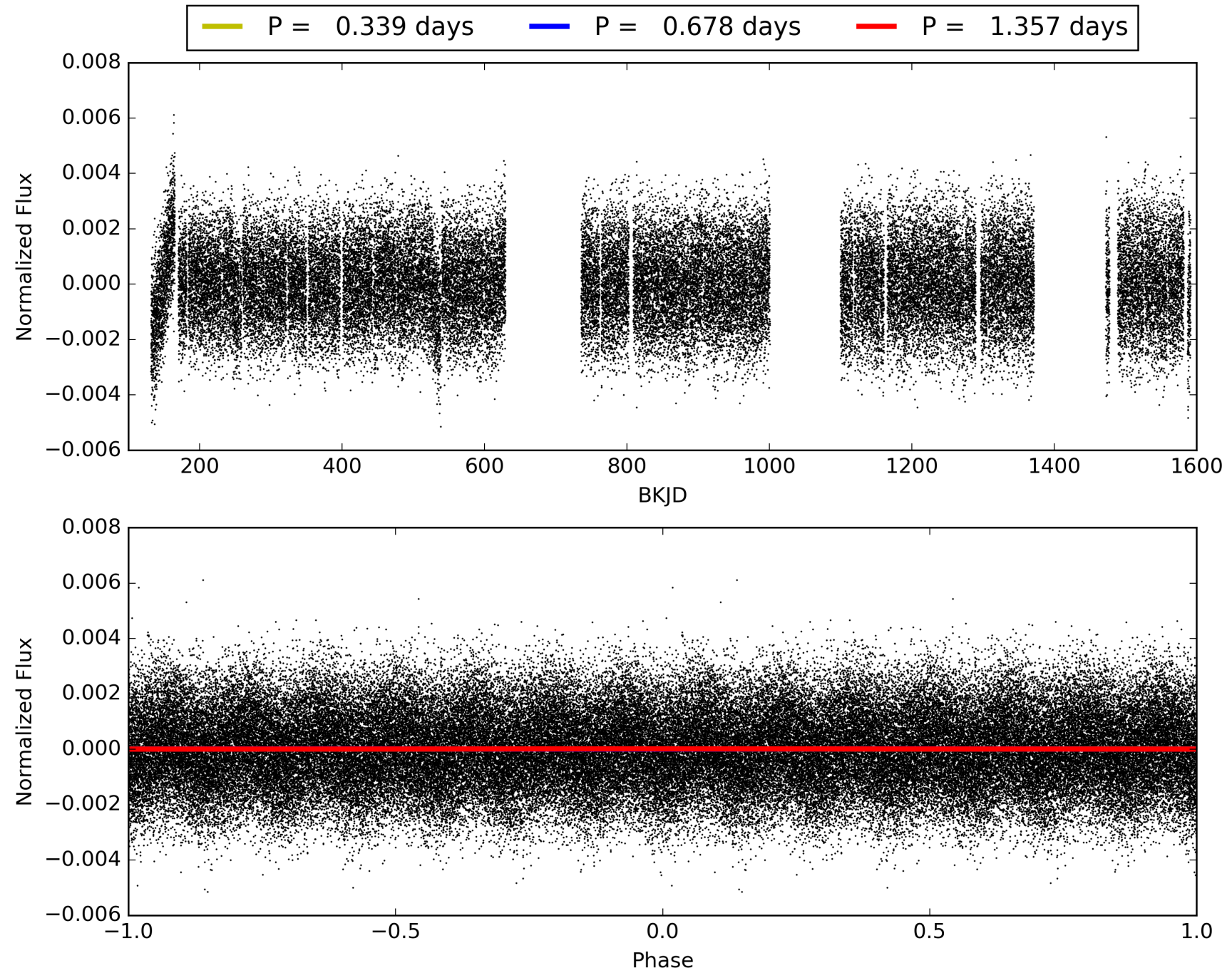
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.36e-47  
RollingBand-fgt: 0.89 [1326/1483]  
GhostDiagnostic-chr: 1.988  
Centroid-sig: 69.0%  
Centroid-so: 0.185 arcsec [1.54σ]  
OotOffset-rm: 1.030 arcsec [2.36σ]  
KicOffset-rm: 1.624 arcsec [3.17σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.00 [0/14]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 010220150-01, PDC Light Curves



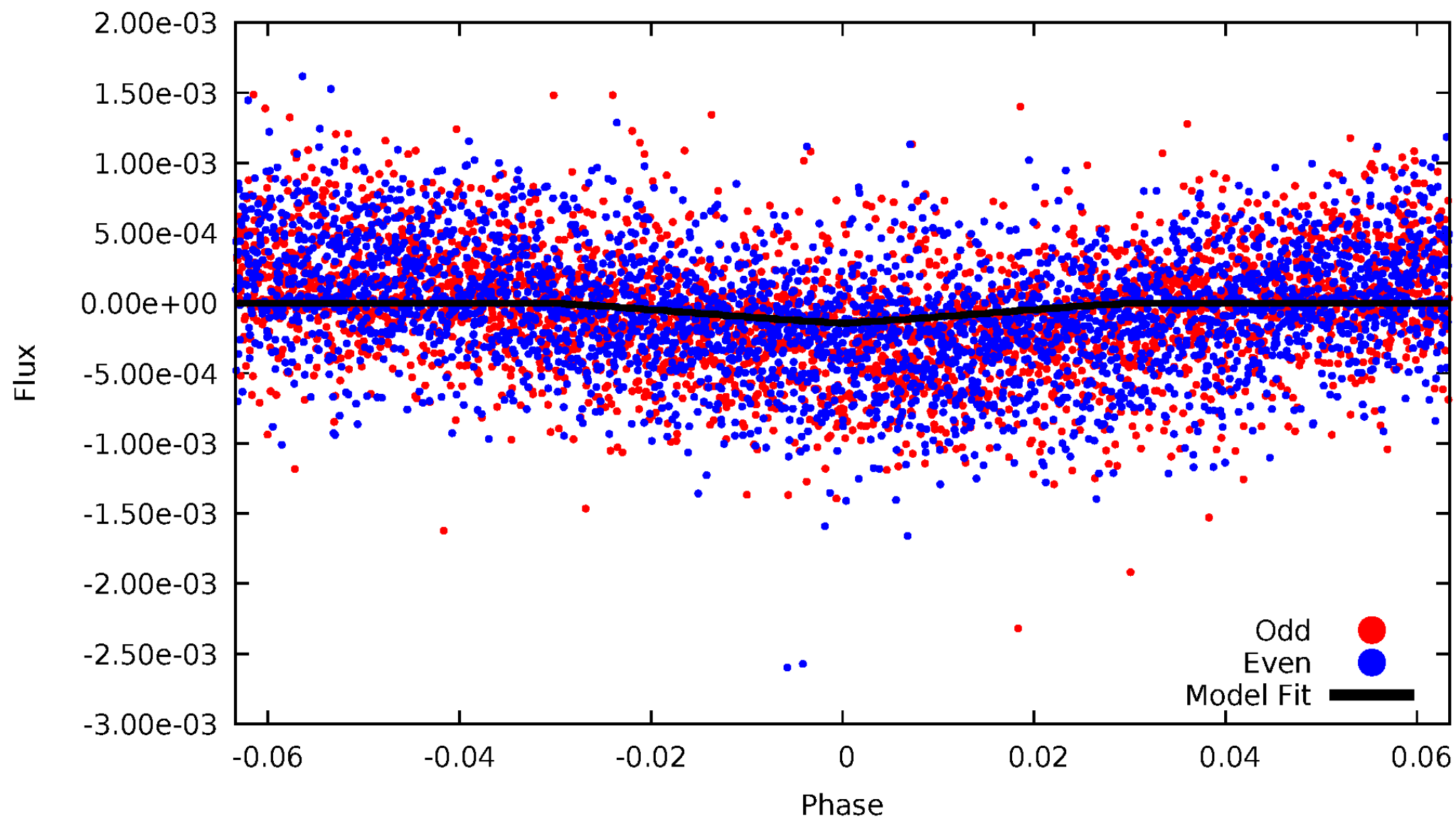
TCE 010220150-01





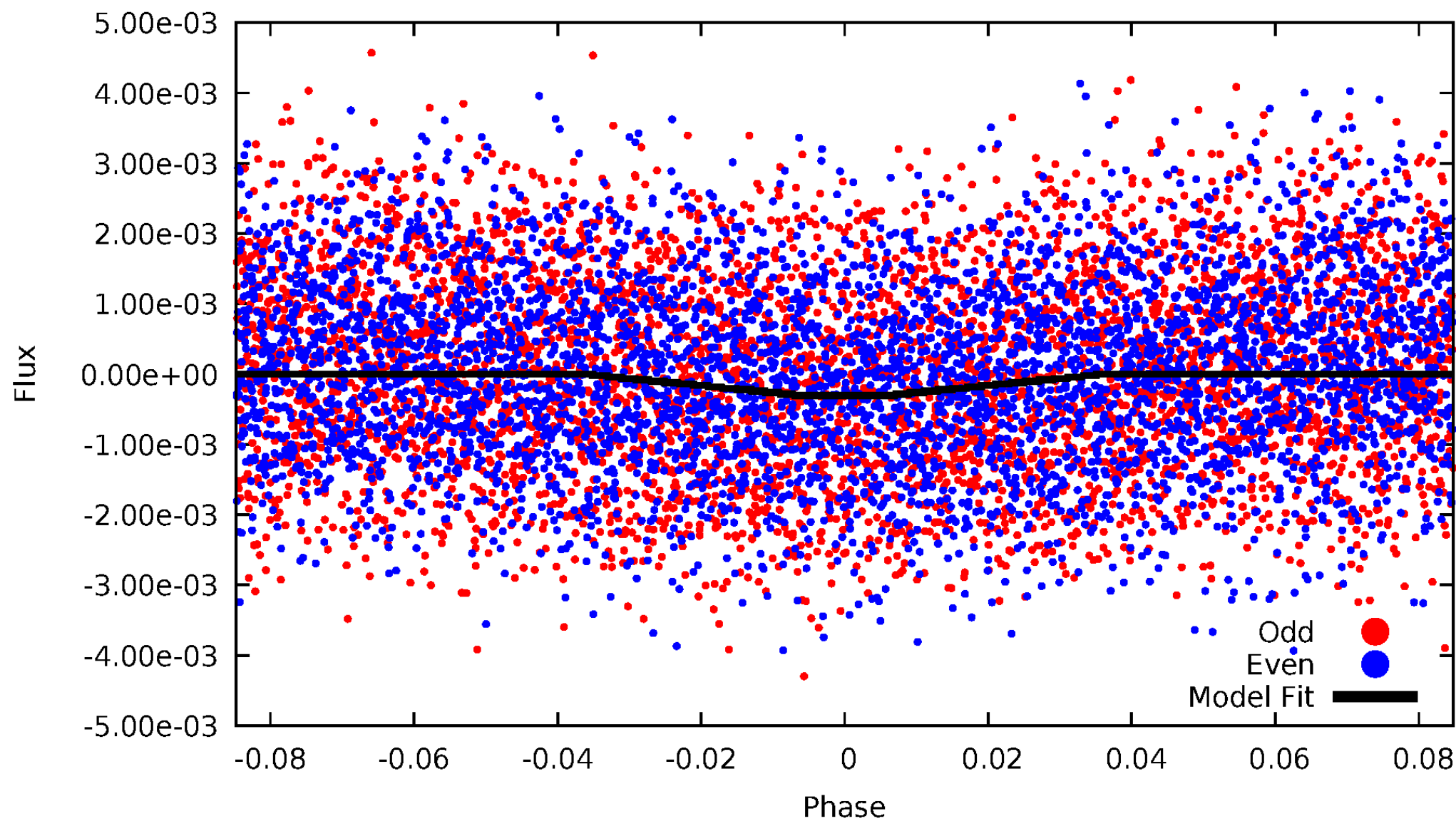
# DV Odd/Even

TCE 010220150-01



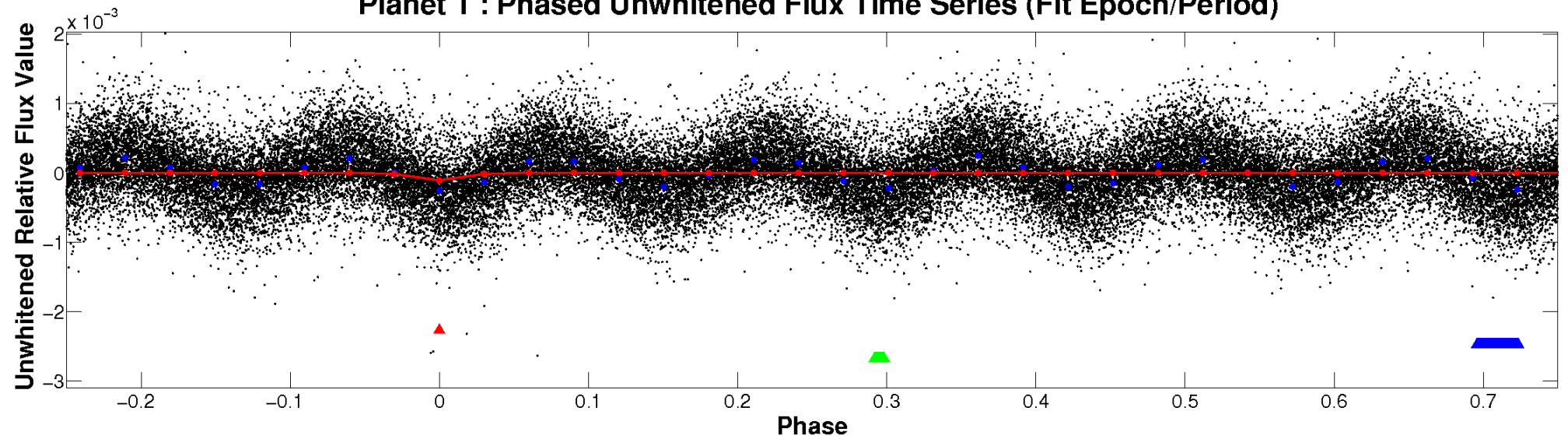
# ALT Odd/Even

TCE 010220150-01

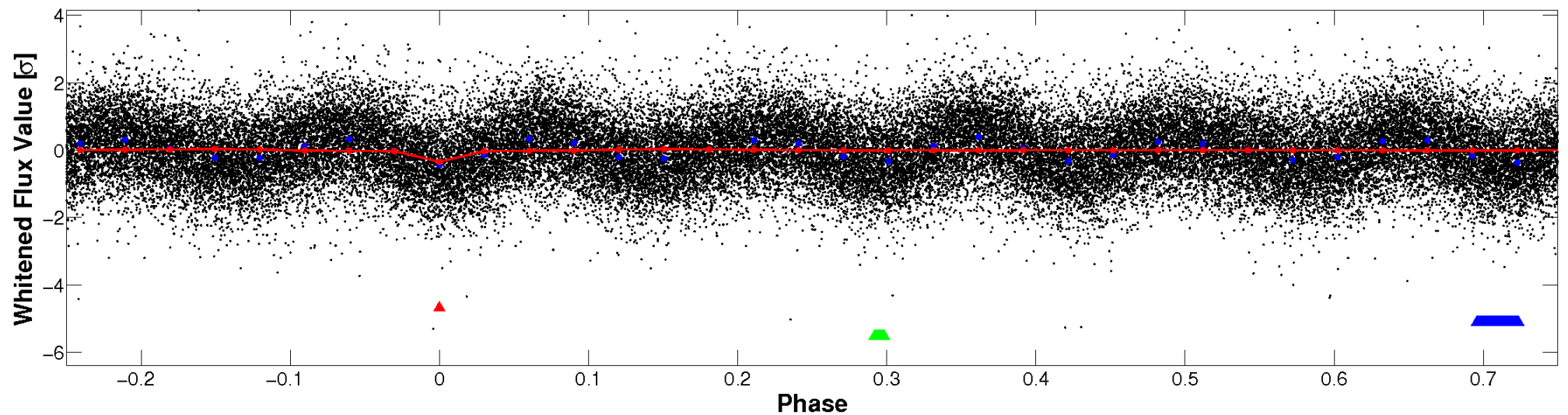


# Non-Whitened Vs. Whitened Light Curve

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

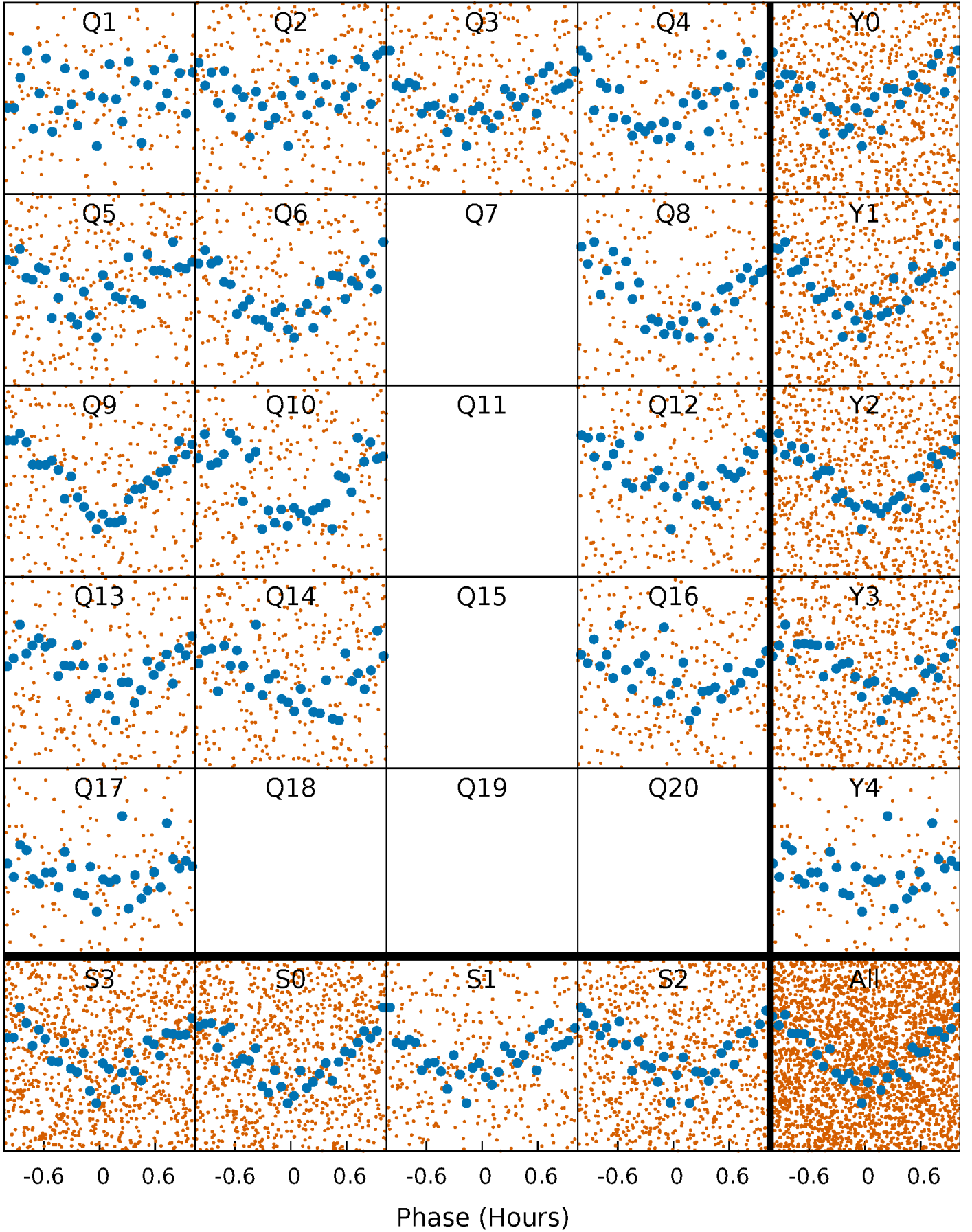


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

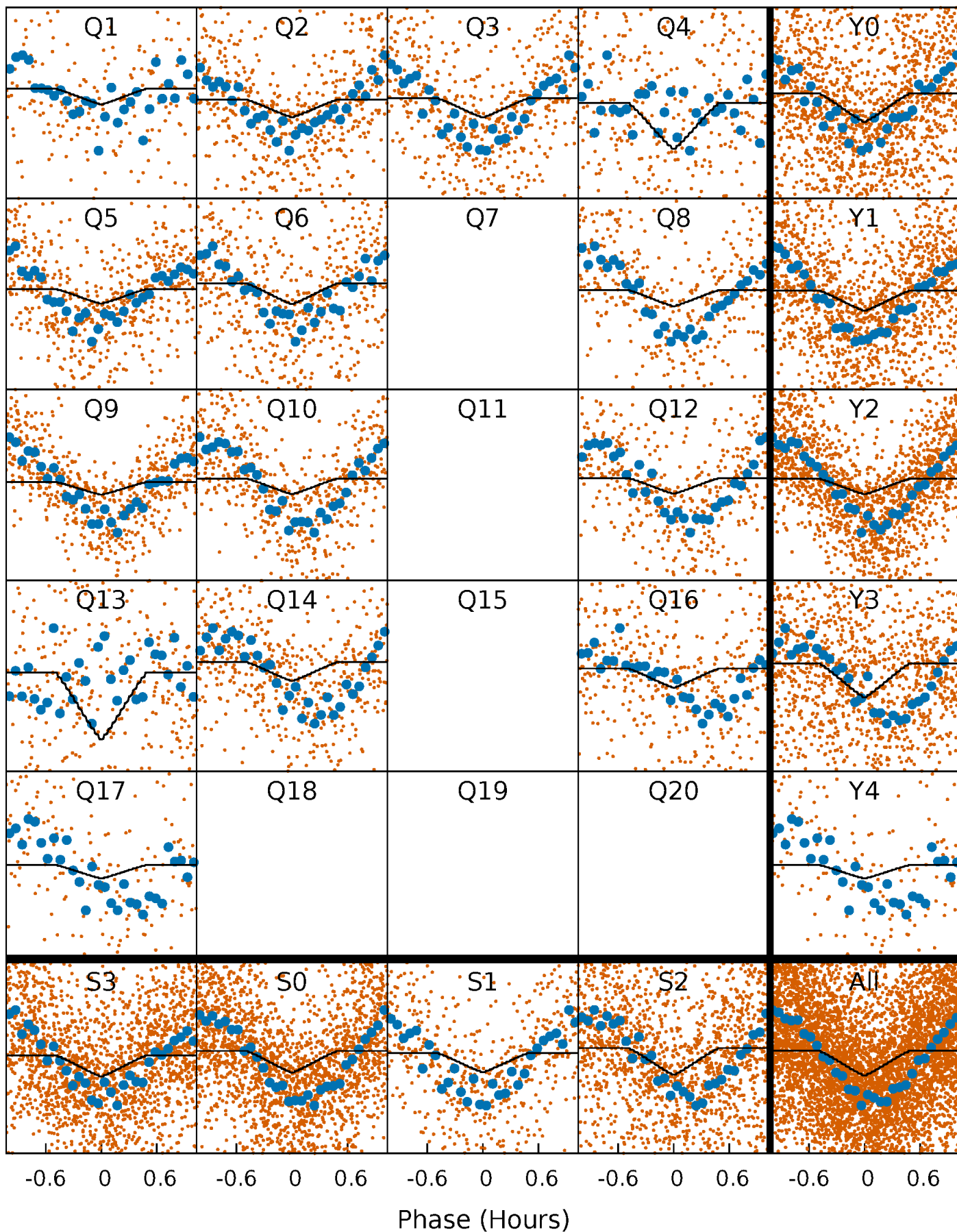
TCE 010220150-01   P= 0.678481 Days    $T_0=131.610834$  (BKJD)





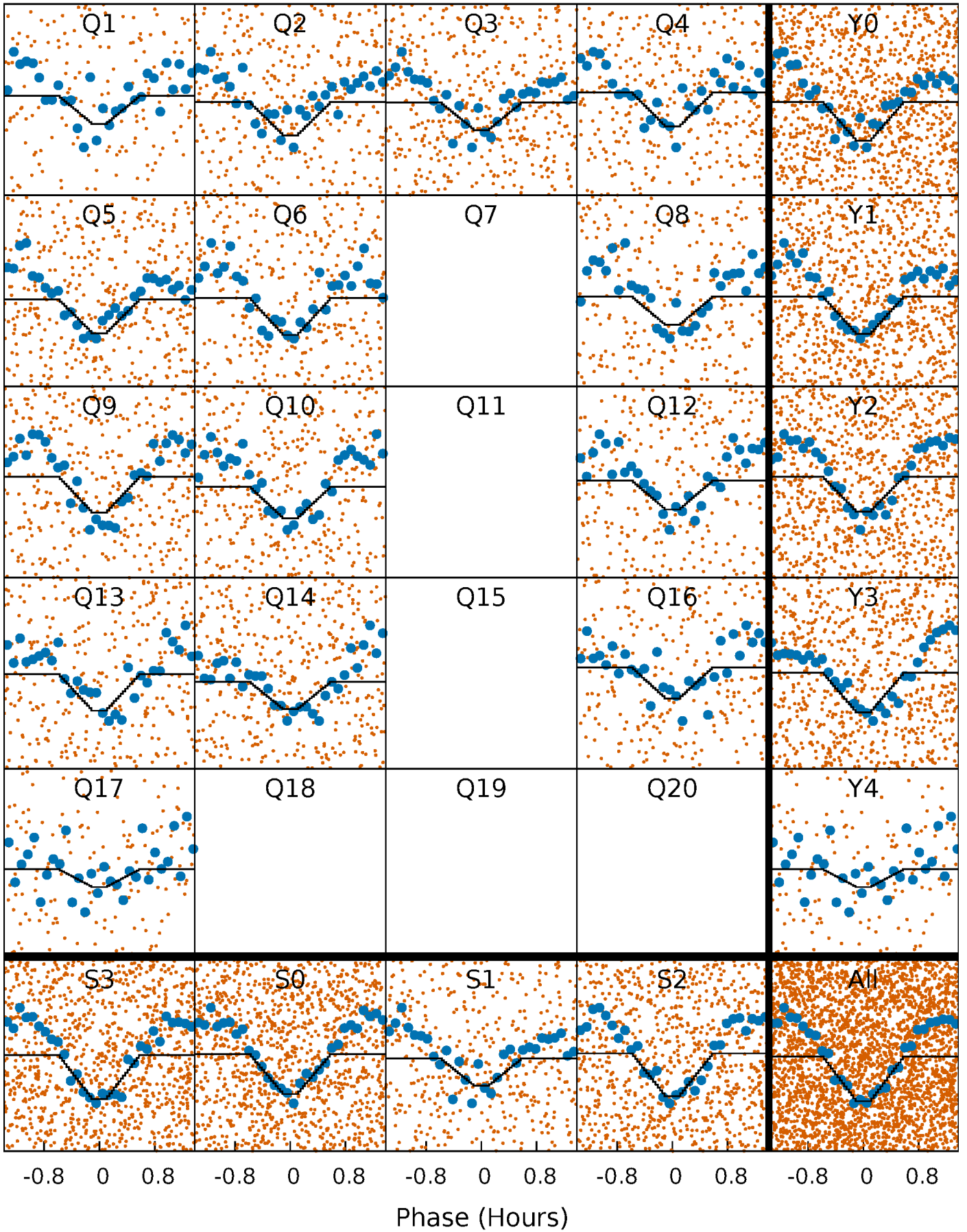
# DV Quarter-Phased Transit Curves

TCE 010220150-01 P= 0.678481 Days  $T_0=131.610834$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

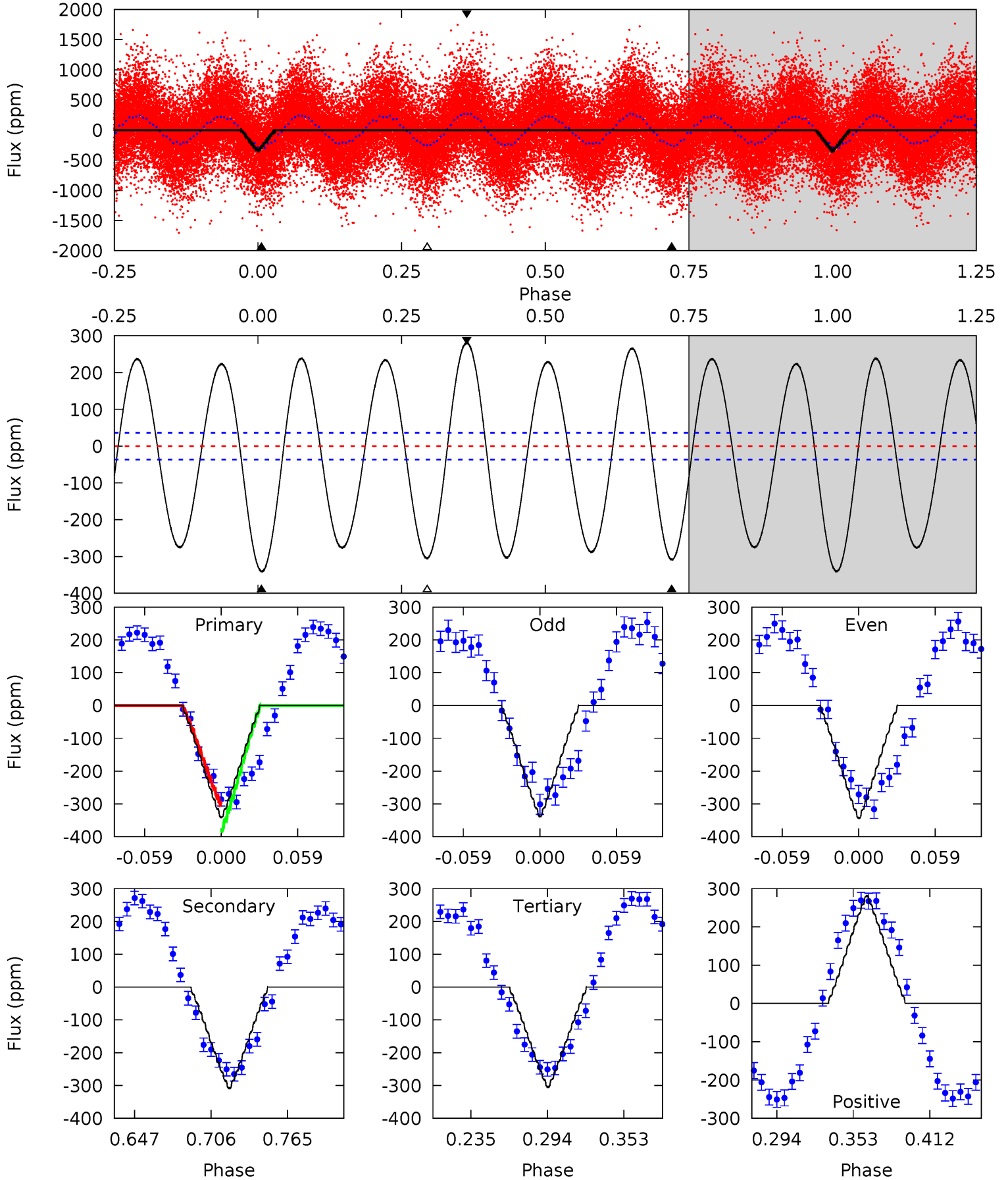
TCE 010220150-01 P= 0.678485 Days  $T_0=131.607377$  (BKJD)



# DV Model-Shift Uniqueness Test

010220150-01, P = 0.678481 Days, E = 130.932353 Days

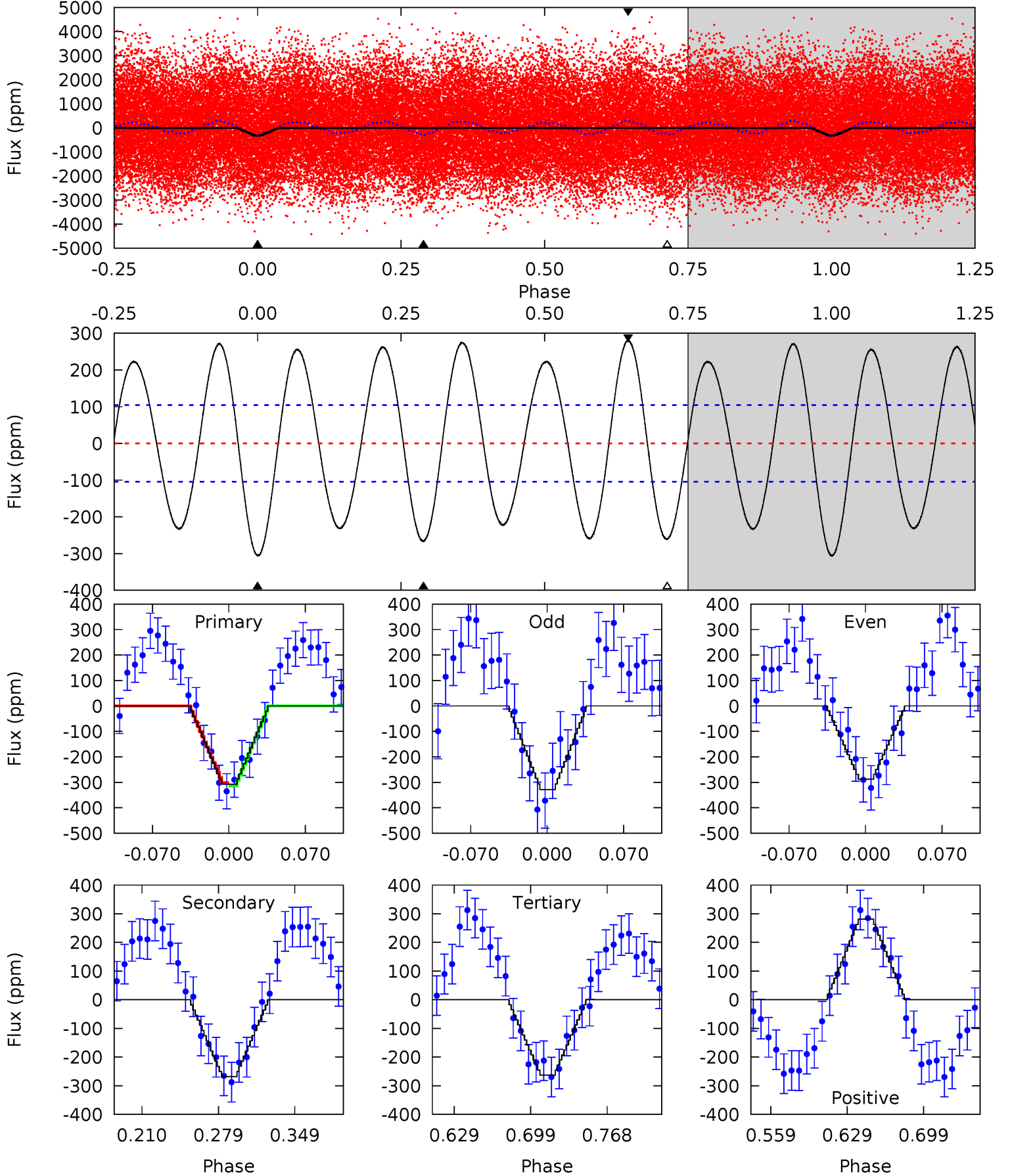
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.6	39.4	39.0	35.9	4.67	1.89	24.6	4.61	7.71	0.46	3.56	0.32	1.09	0.45	5.13



# Alt Model-Shift Uniqueness Test

010220150-01, P = 0.678485 Days, E = 130.928892 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
13.7	11.9	11.7	12.5	4.64	1.81	7.69	1.99	1.16	0.24	-0.59	0.89	0.92	0.48	0.26





### Stellar Parameters For KIC 010220150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5524^{+181}_{-148}$	$3.803^{+0.777}_{-0.333}$	$-0.760^{+0.350}_{-0.250}$	$1.899^{+1.177}_{-1.177}$	$0.835^{+0.183}_{-0.122}$	$0.172^{+2.825}_{-0.126}$
	+3%/-3%	+20%/-9%	+46%/-33%	+62%/-62%	+22%/-15%	+1643%/-73%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010220150-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-309 \pm 8$	$2.35^{+1.23}_{-0.98}$	$3869^{+605}_{-670}$	$6558^{+1594}_{-919}$	$6.454^{+11.890}_{-3.706}$
Alt.	$-268 \pm 23$	$3.49^{+1.58}_{-1.32}$	$3893^{+657}_{-707}$	$5186^{+724}_{-514}$	$2.517^{+4.008}_{-1.336}$

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

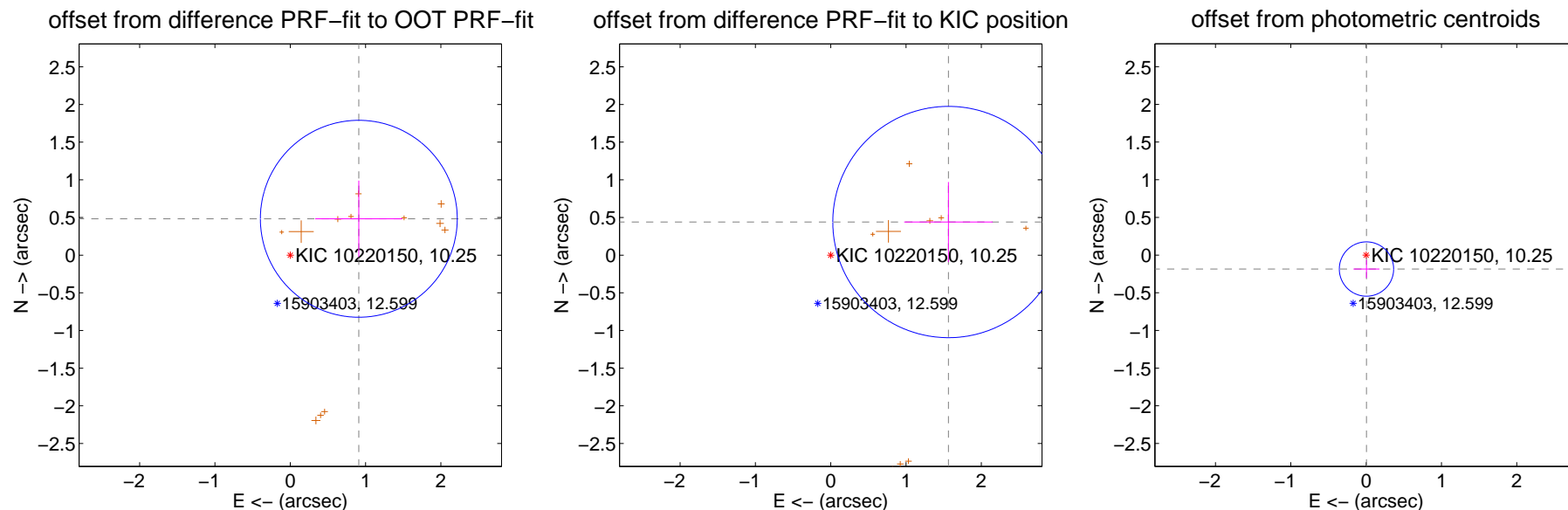
## DV Centroid Data

Supplemental centroid analysis for 010220150-01. **Kepler magnitude: 10.25.** Transit SNR 14.57

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

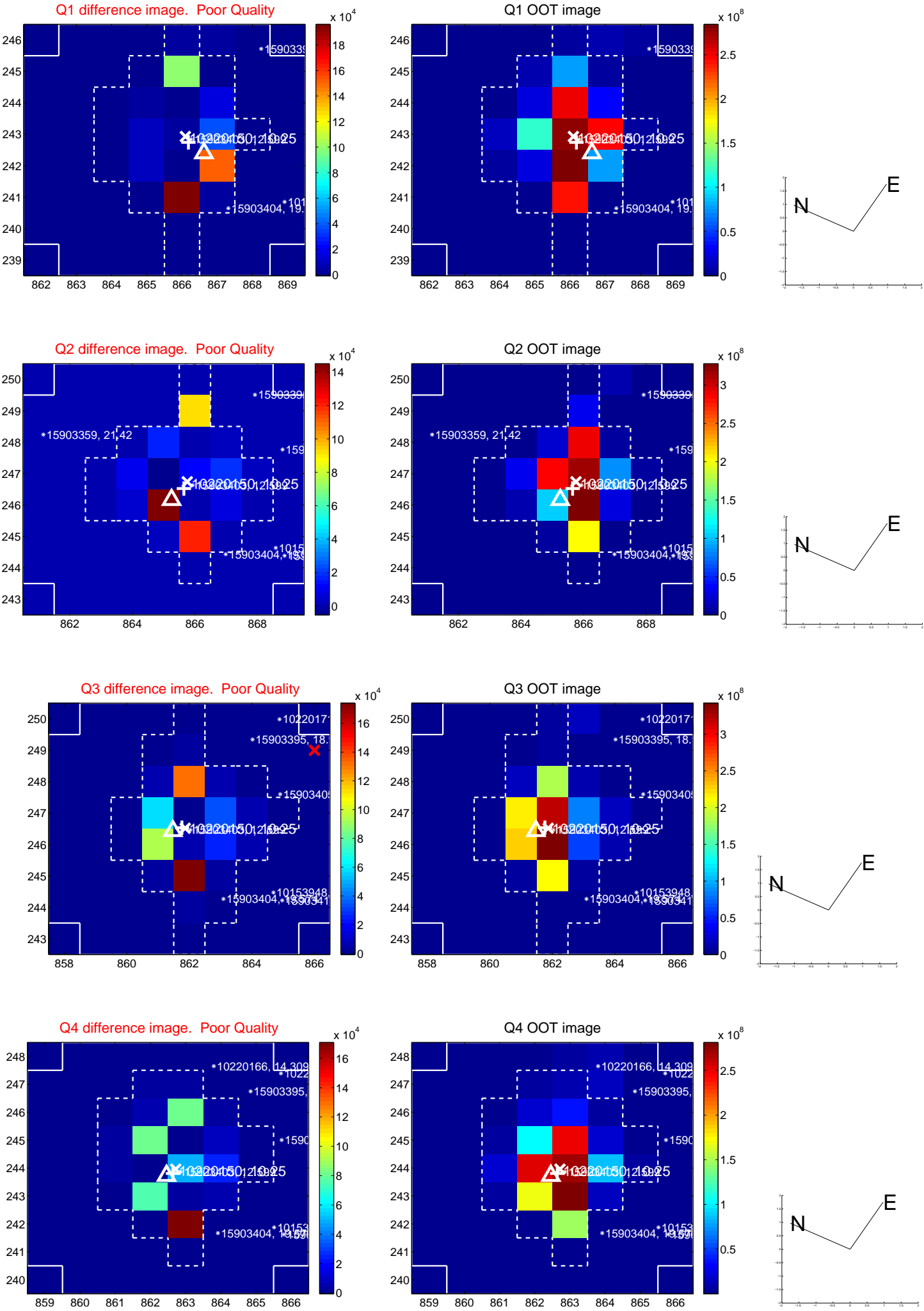
The direct PRF centroid is offset from the target star catalog position by about 0.88 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.030 \pm 0.436$	2.36	$-0.910 \pm 0.578$	$0.483 \pm 0.507$
PRF-fit source offset from KIC position	<b><math>1.624 \pm 0.512</math></b>	<b>3.17</b>	$-1.563 \pm 0.589$	$0.440 \pm 0.531$
photometric centroid source offset	$0.19 \pm 0.12$	1.54	$-0.00 \pm 0.17$	$-0.19 \pm 0.12$

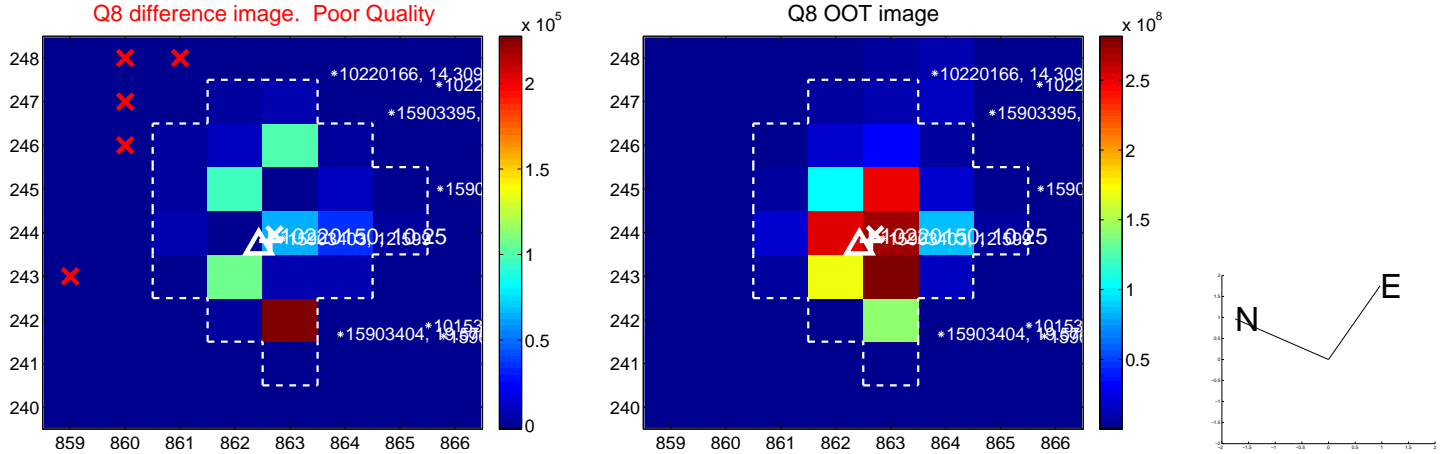
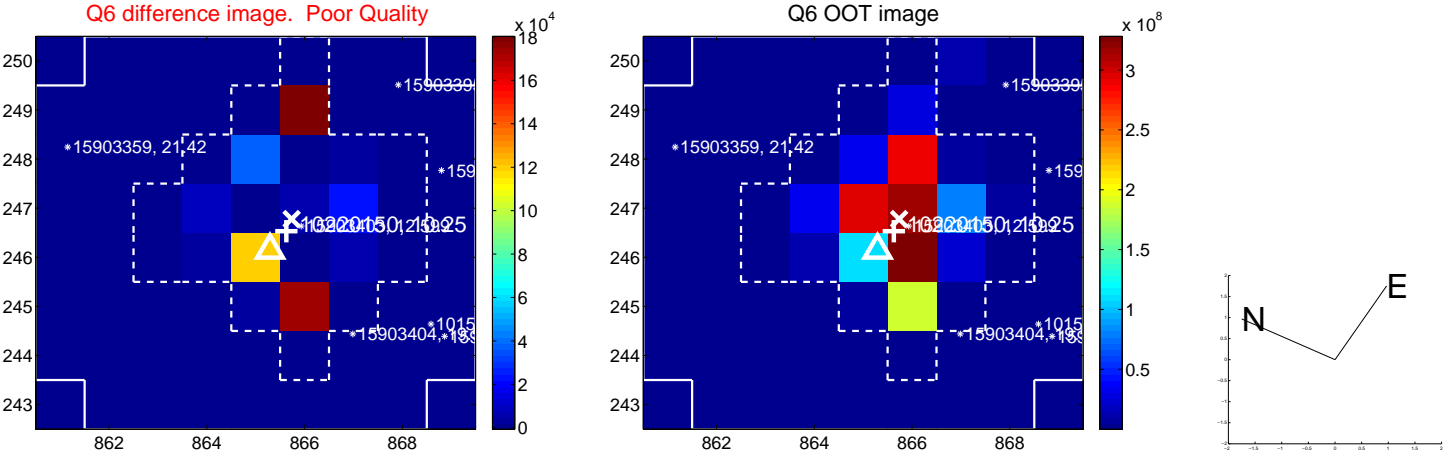
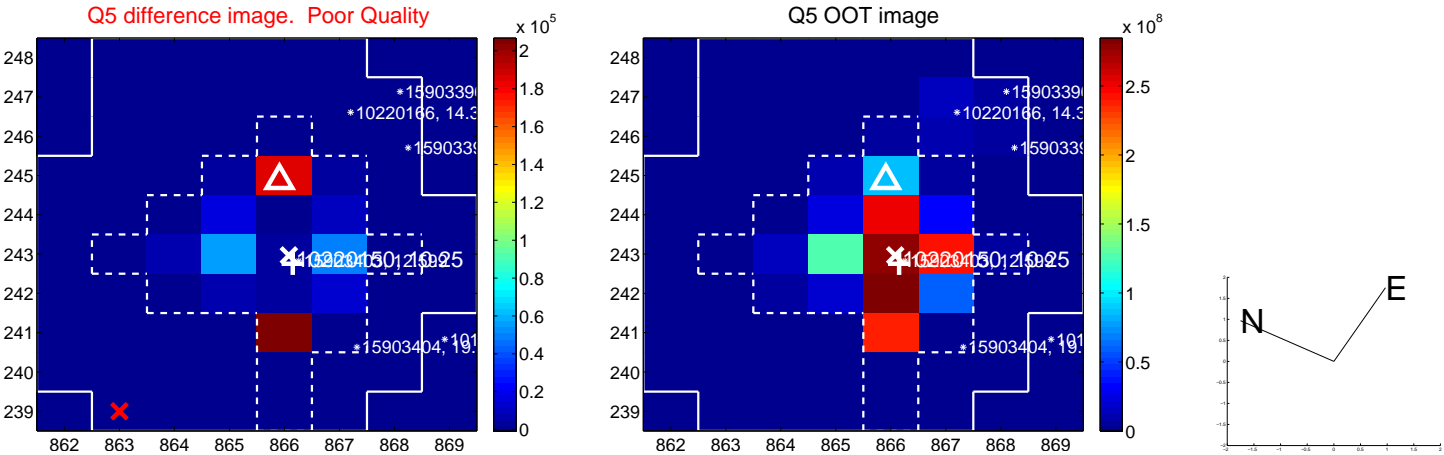


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

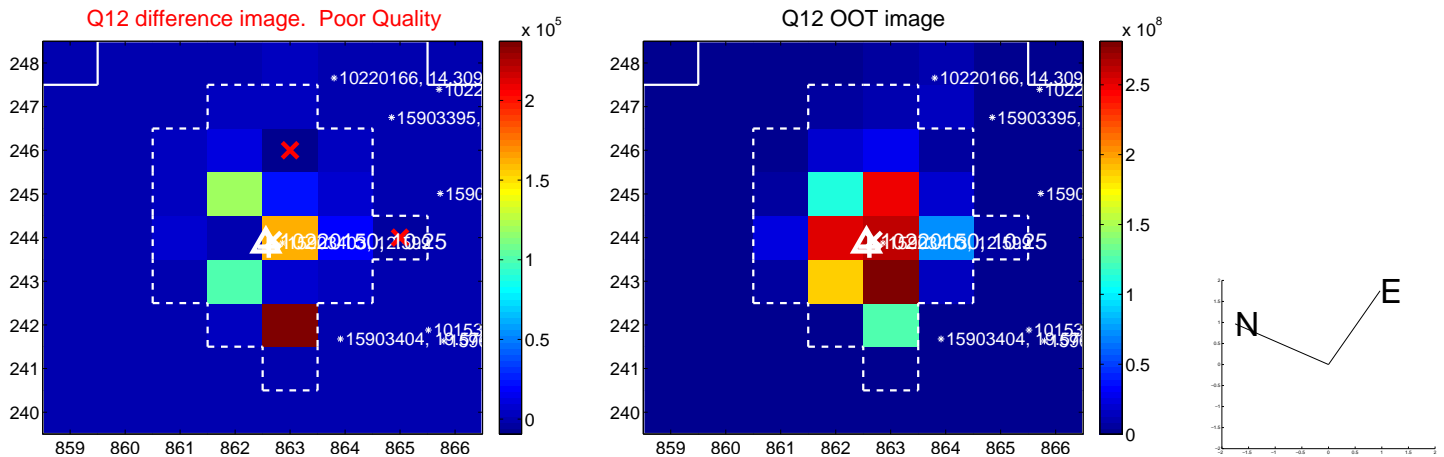
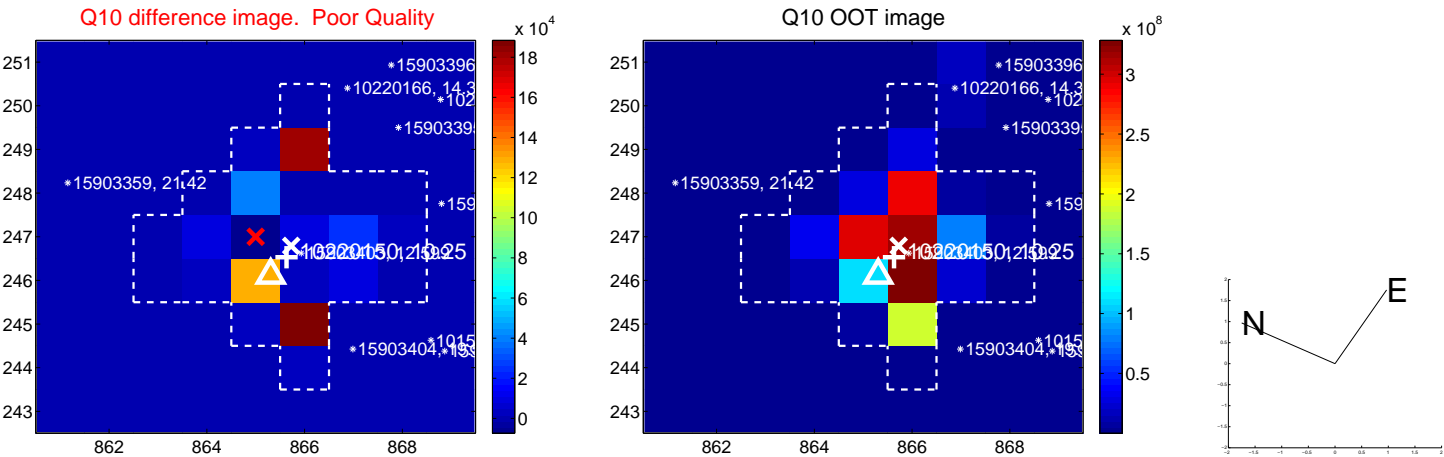
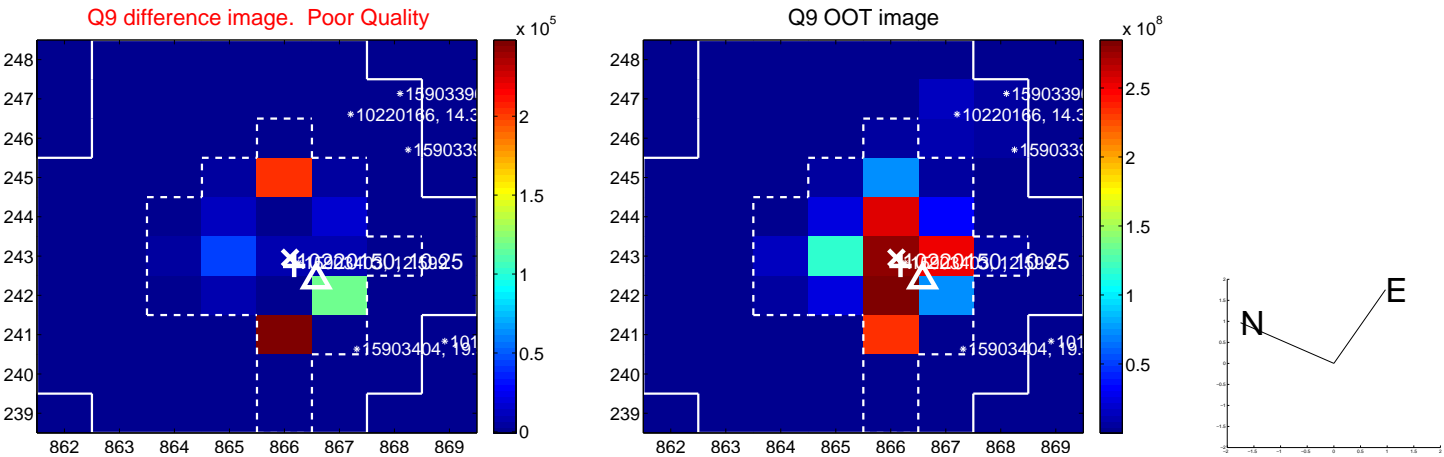


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

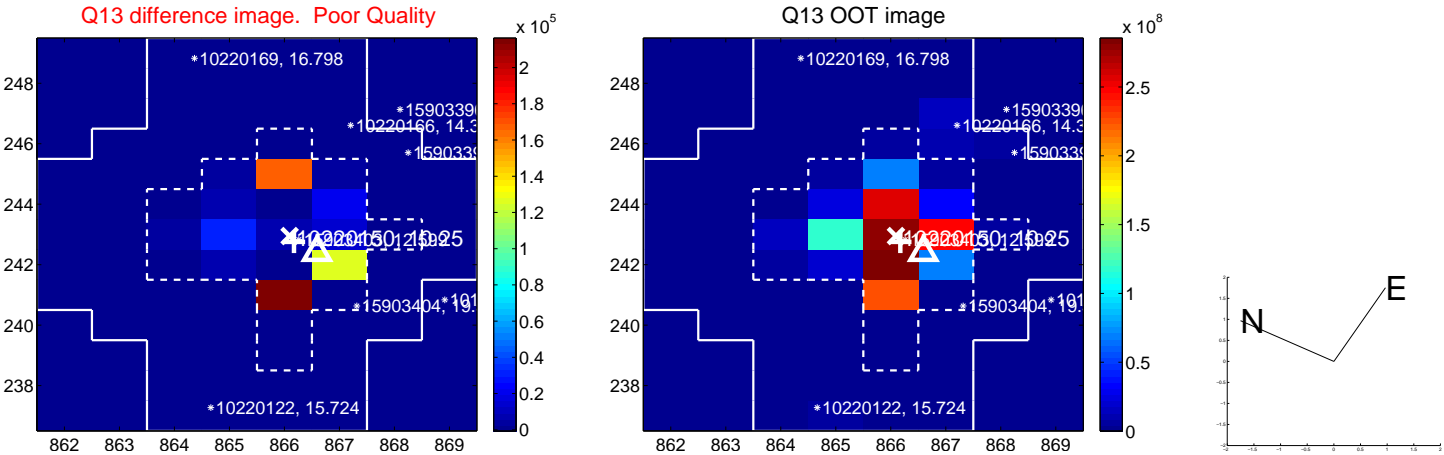




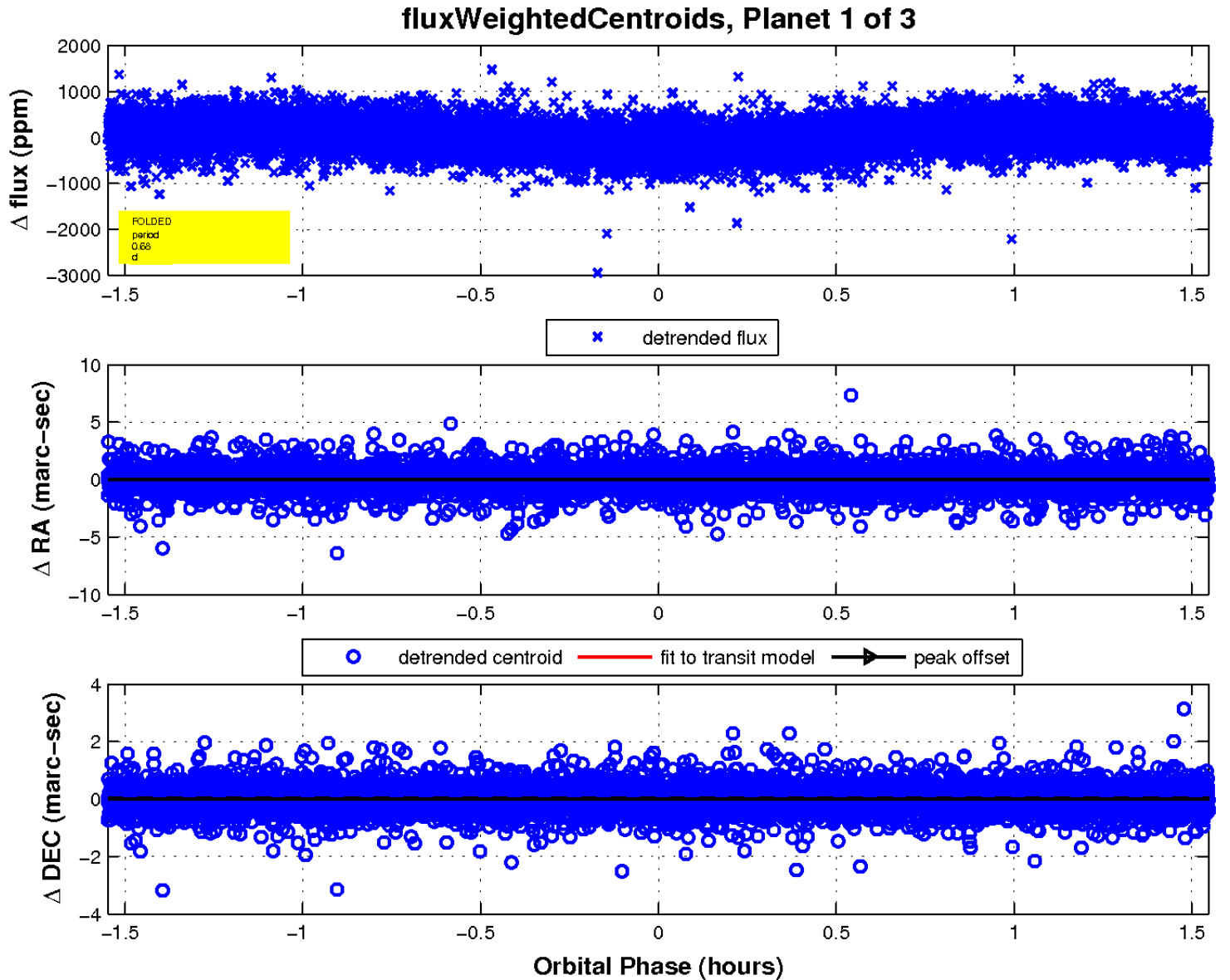
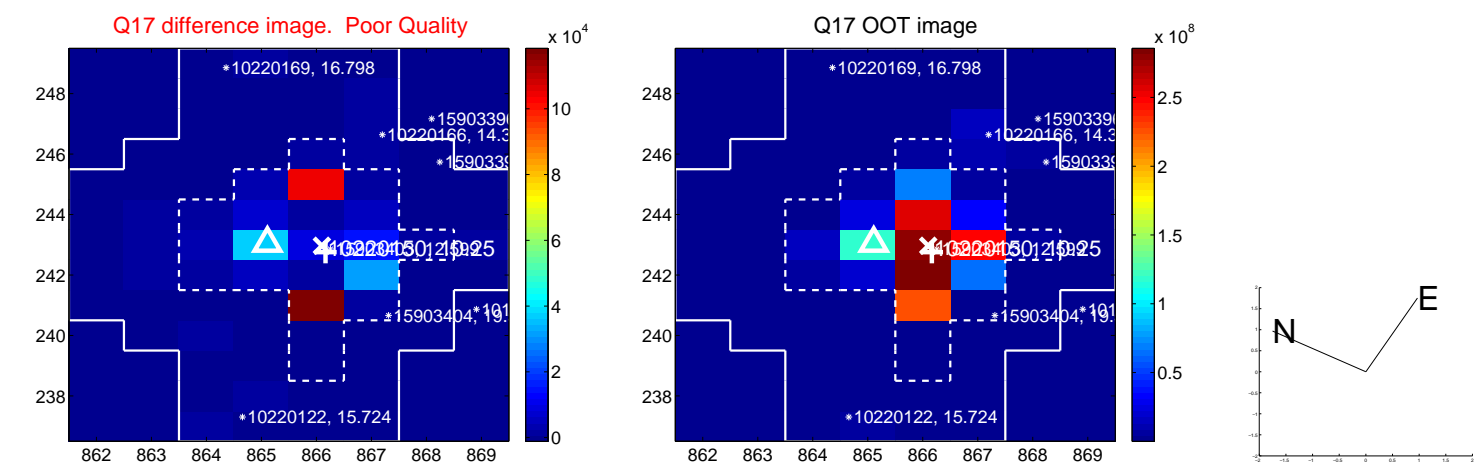
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

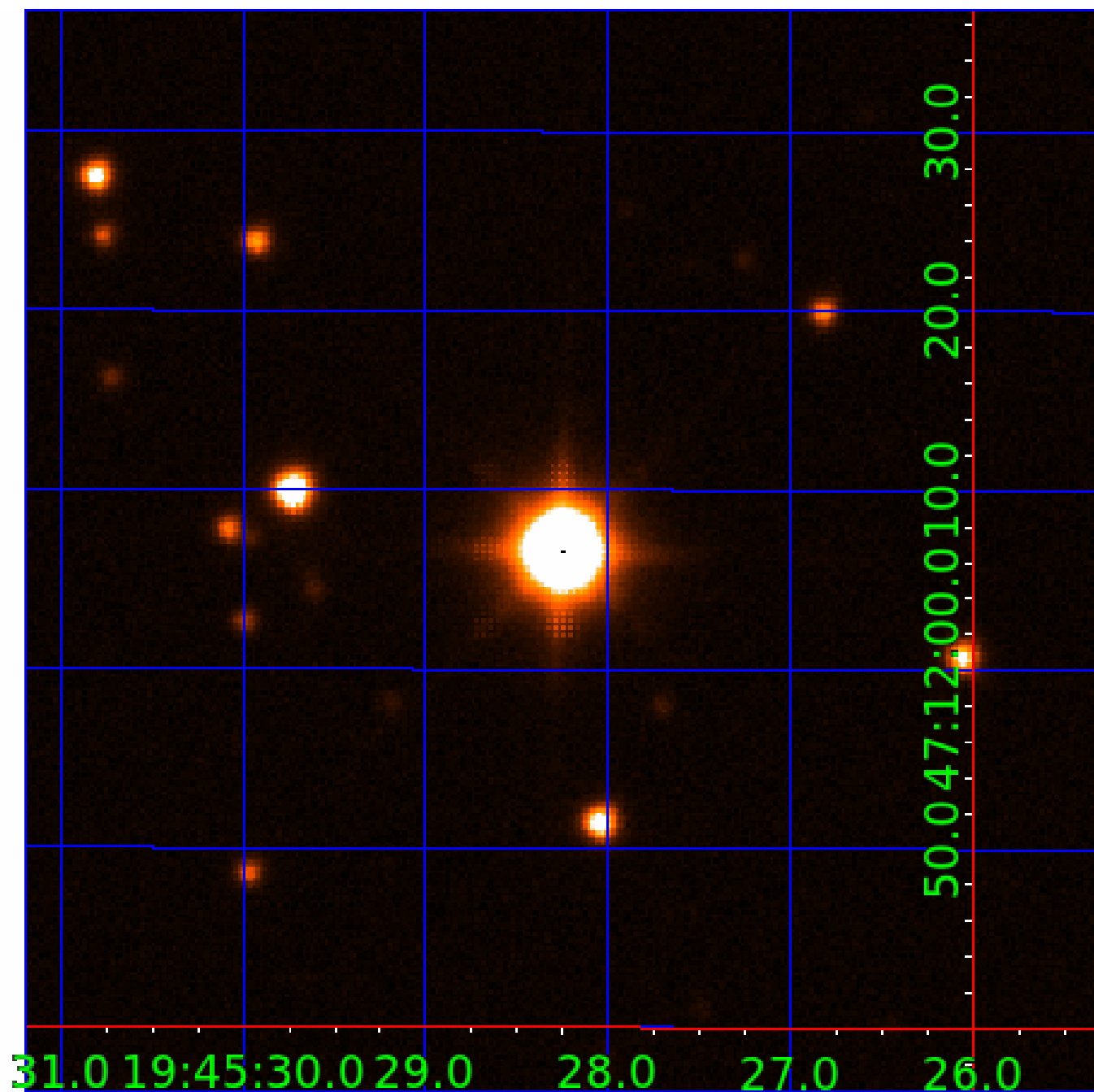


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010220150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010220150-01	OBS	No	0.678481	131.610834	142.0	0.516	10.6	14.6	1.90	5524	2.54	14843.69
010220150-02	OBS	No	0.678490	132.082895	132.0	0.822	9.9	16.7	1.90	5524	2.62	14843.44
010220150-03	OBS	No	0.678483	131.808746	154.3	0.576	11.0	16.9	1.90	5524	2.43	14843.63

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010220150-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010220150-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD—CENT_SATURATED
010220150-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

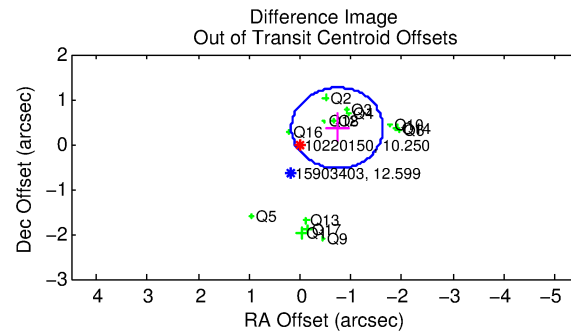
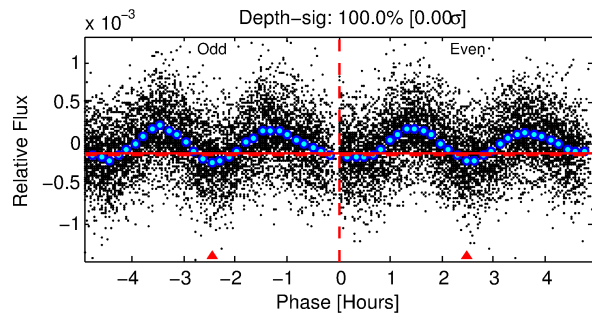
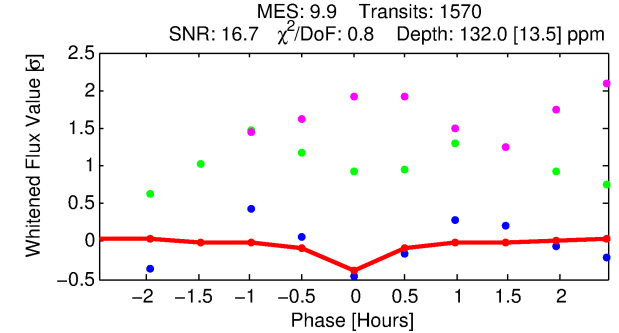
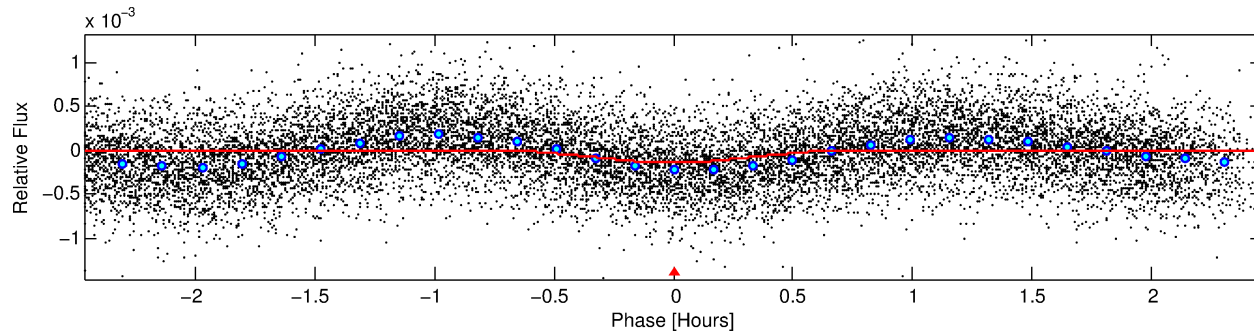
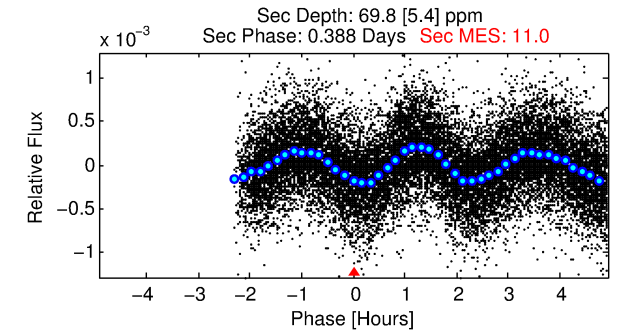
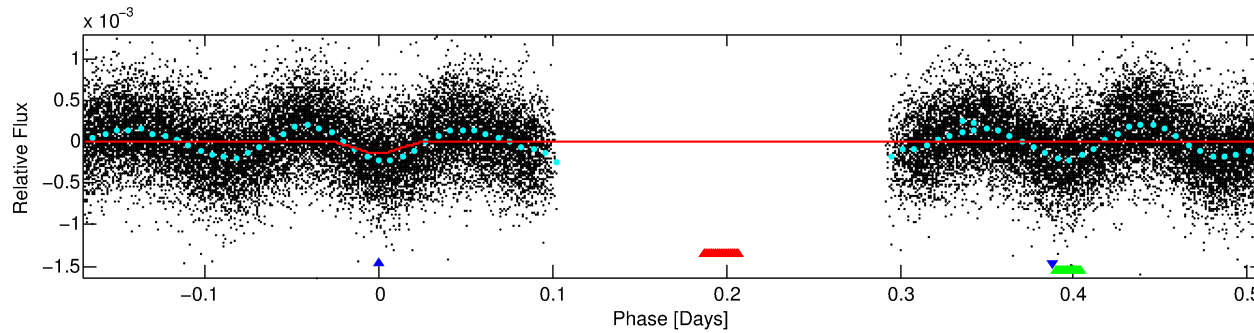
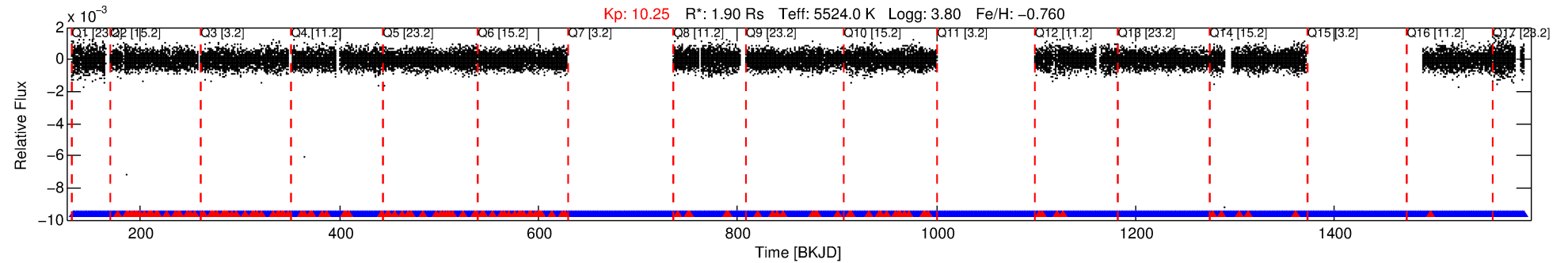
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010220150-02

No Significant Match Found

# DV One-Page Summary

KIC: 10220150 Candidate: 2 of 3 Period: 0.678 d



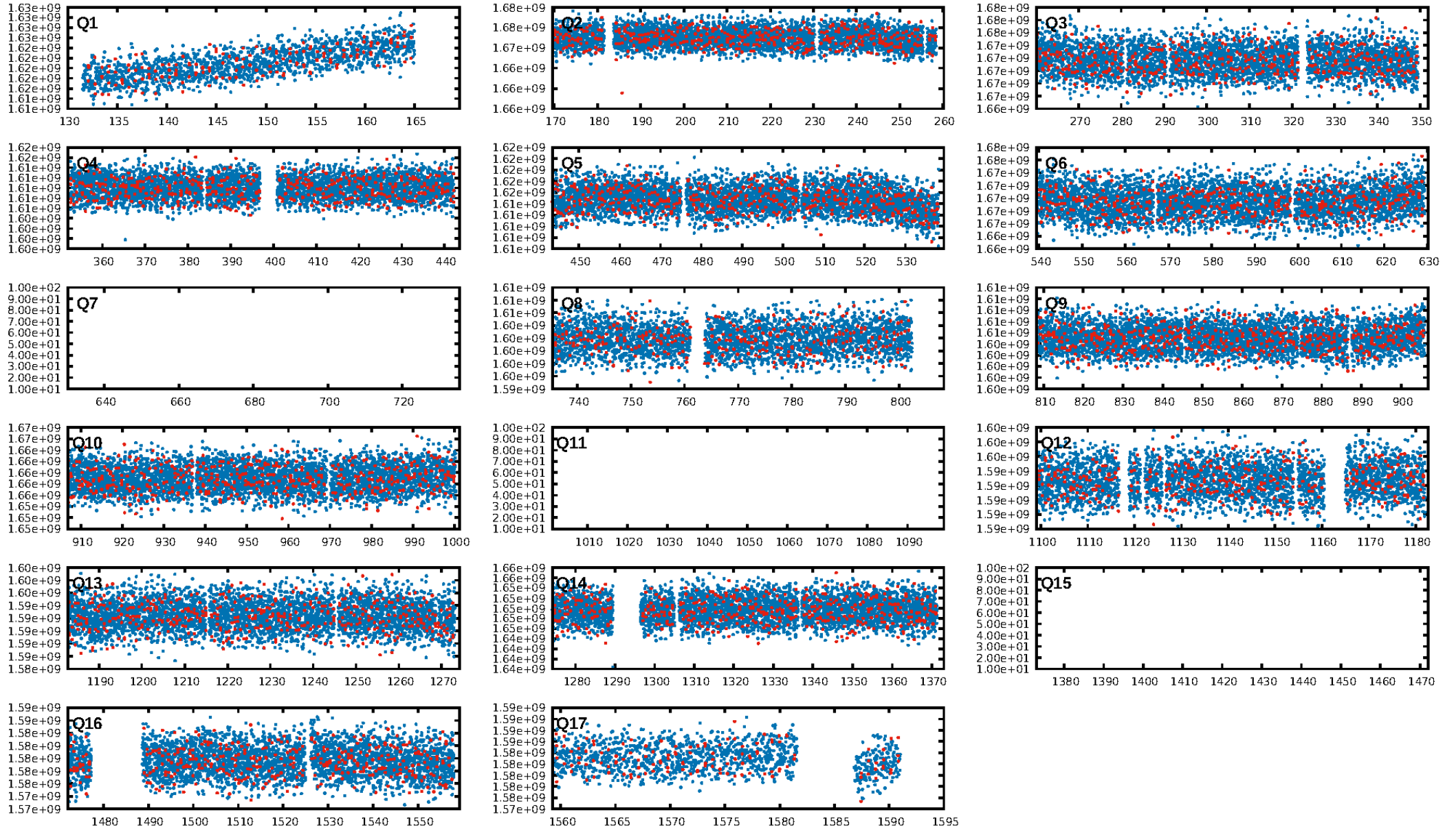
## DV Fit Results:

Period = 0.67849 [0.00001] d  
Epoch = 132.0829 [0.0009] BKJD  
Rp/R\* = 0.0126 [0.0035]  
a/R\* = 3.07 [3.78]  
b = 0.90 [0.30]  
Seff = 14843.44 [18837.36]  
Teq = 2815 [893] K  
Rp = 2.62 [1.78] Re  
a = 0.0142 [0.0103] AU  
Ag = 1.14 [1.57] [0.09σ]  
Teffp = 4493 [654] K [1.52σ]

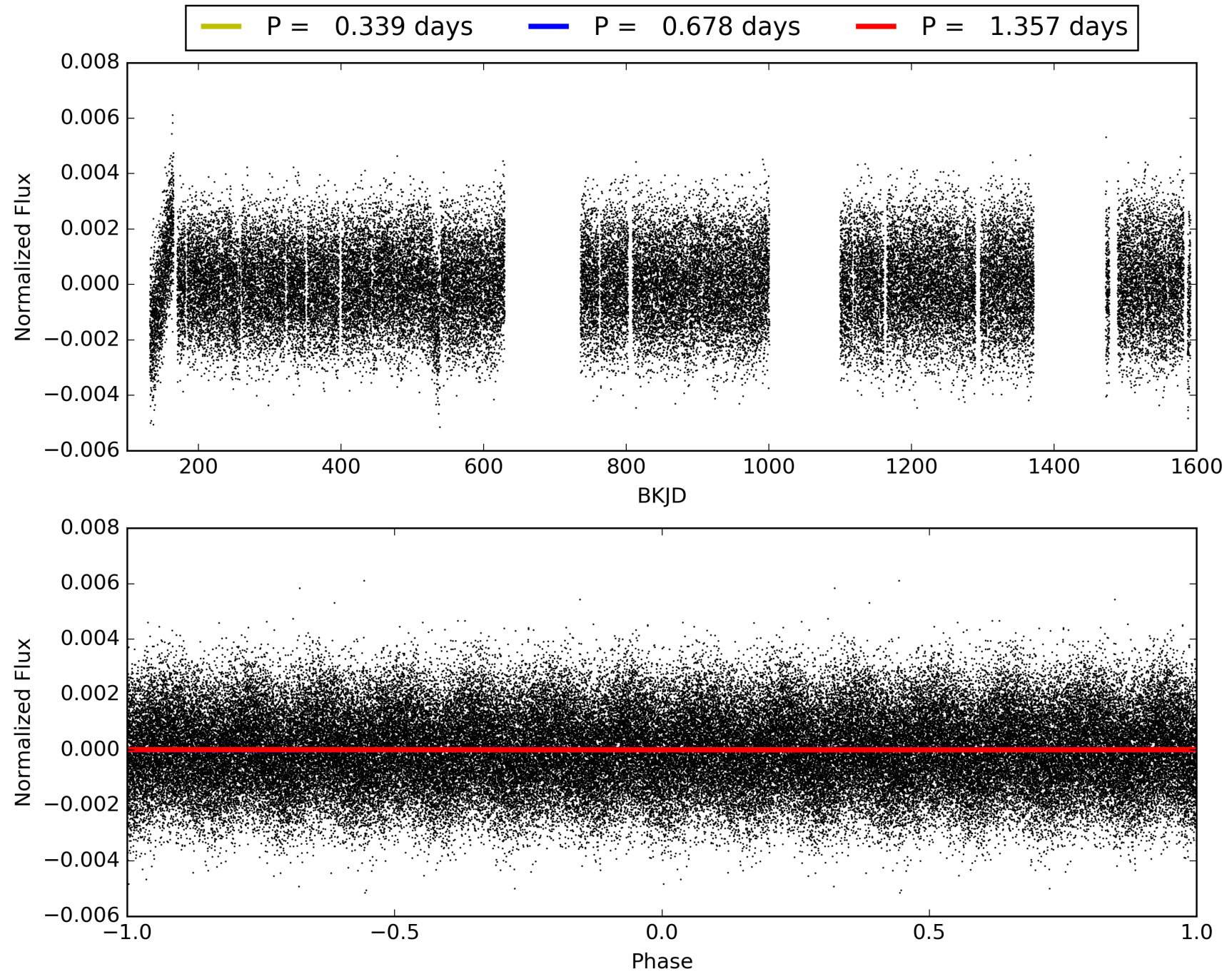
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.73e-42  
RollingBand-fgt: 0.91 [1343/1482]  
GhostDiagnostic-chr: 2.469  
Centroid-sig: 94.2%  
Centroid-so: 0.127 arcsec [1.17σ]  
OotOffset-rm: 0.816 arcsec [2.72σ]  
KicOffset-rm: 1.304 arcsec [4.00σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.00 [0/14]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 010220150-02, PDC Light Curves

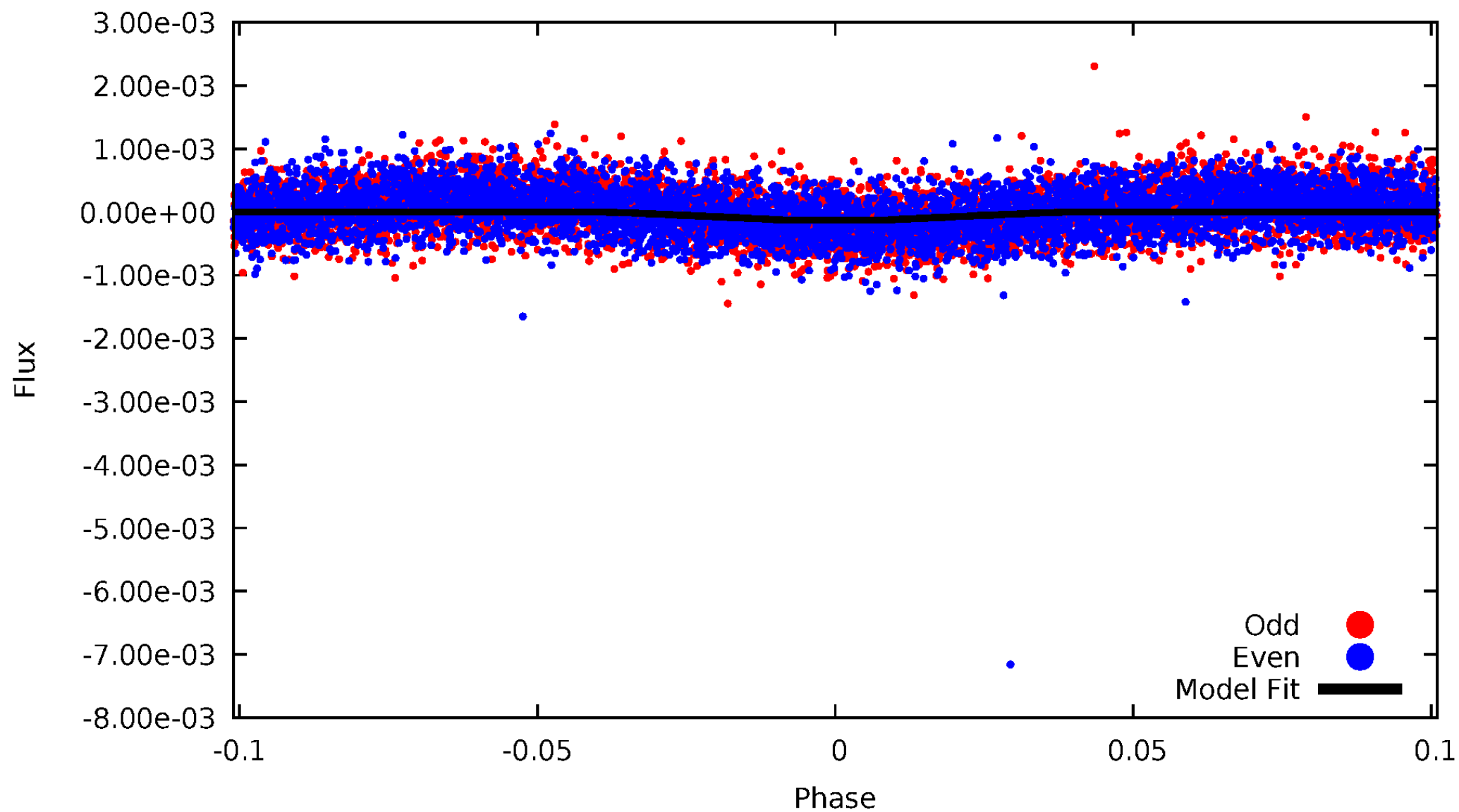


TCE 010220150-02



# DV Odd/Even

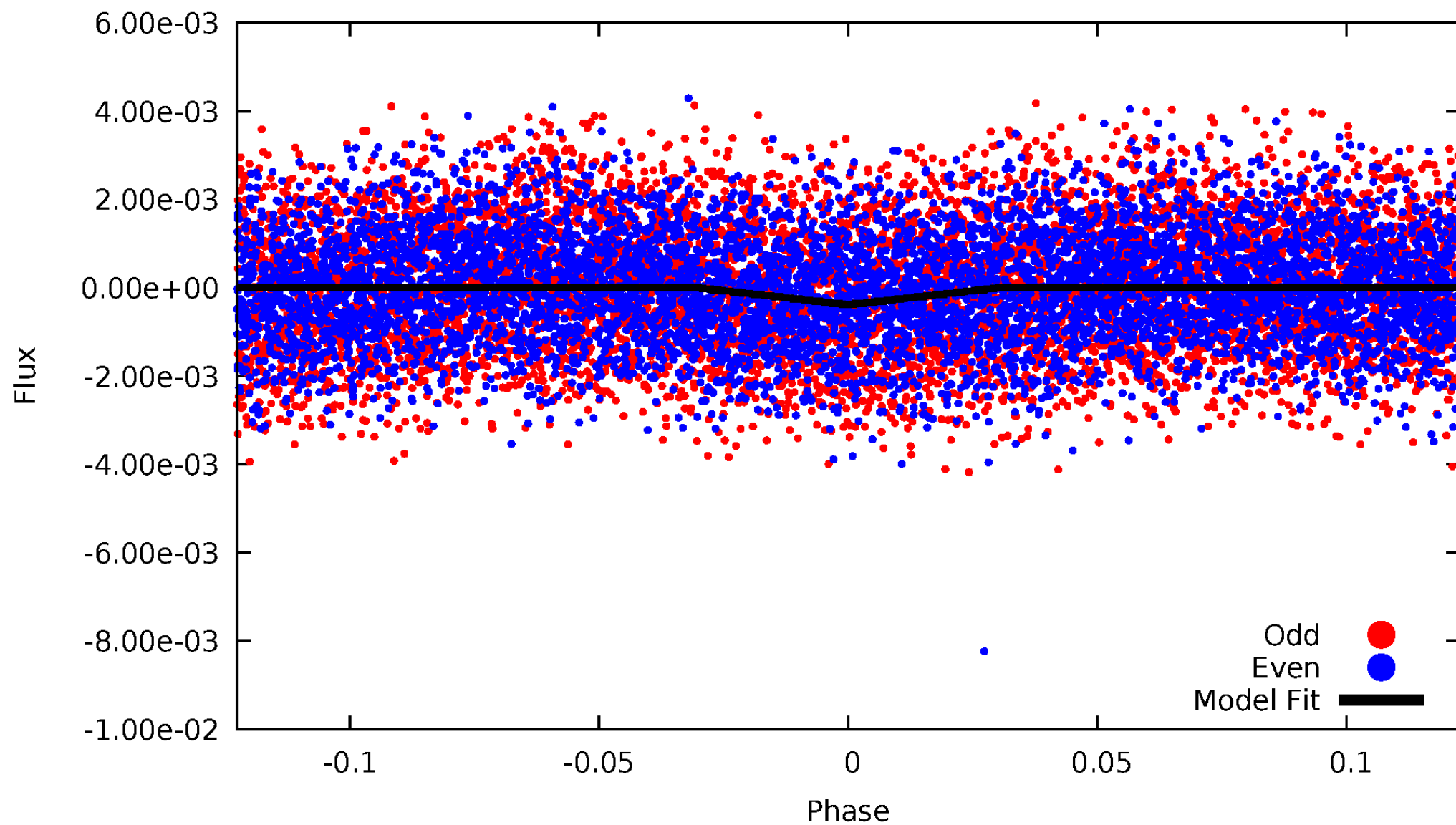
TCE 010220150-02





# ALT Odd/Even

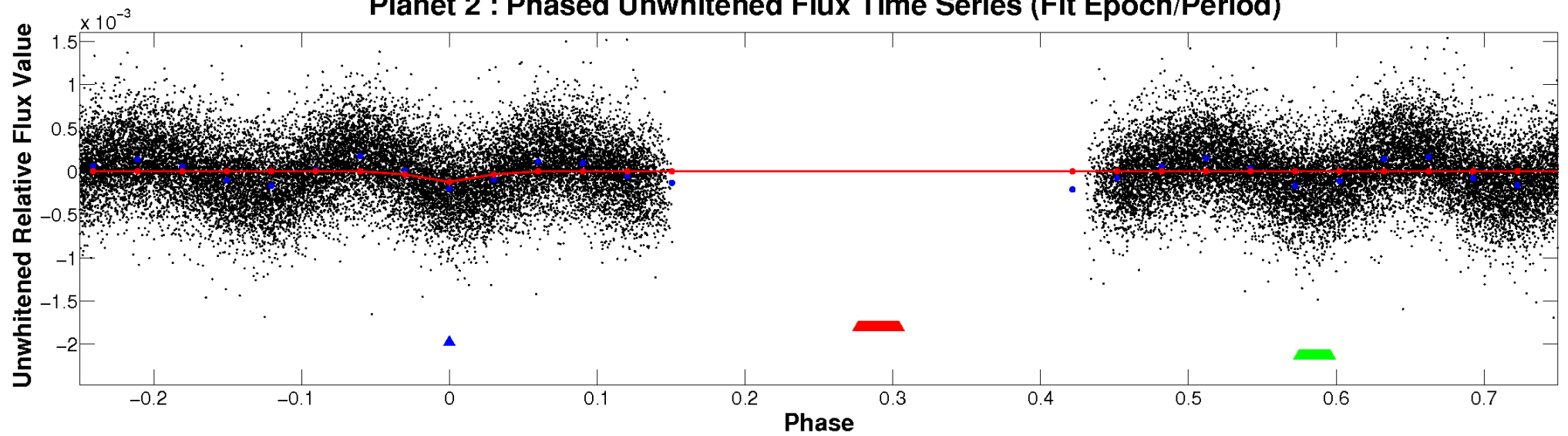
TCE 010220150-02



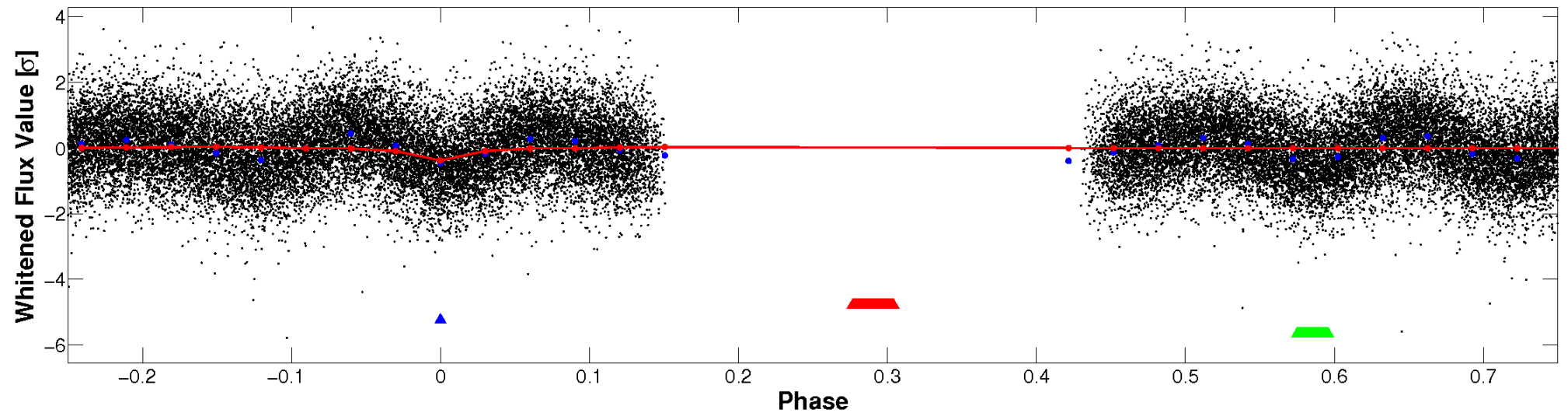


# Non-Whitened Vs. Whitened Light Curve

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

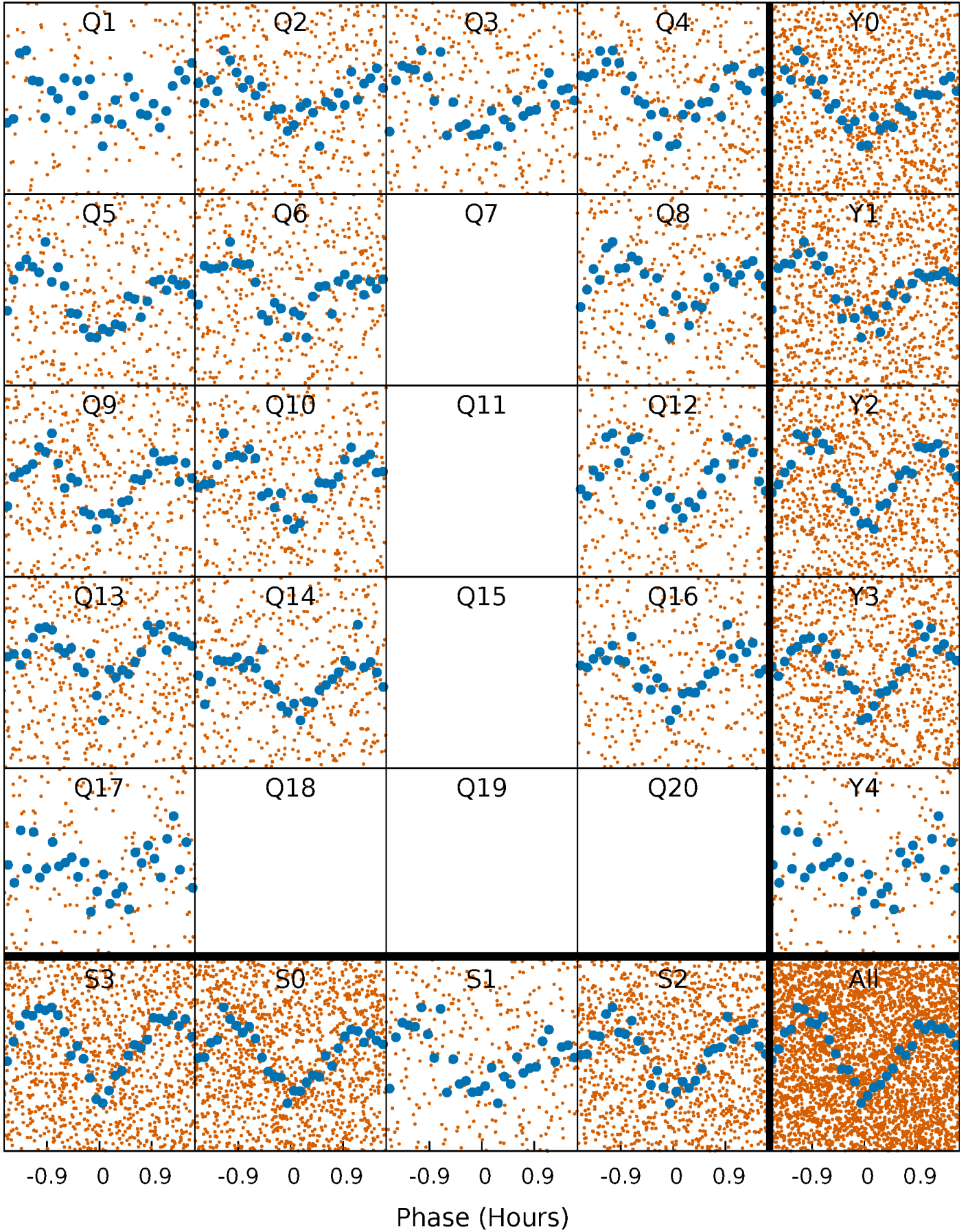


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



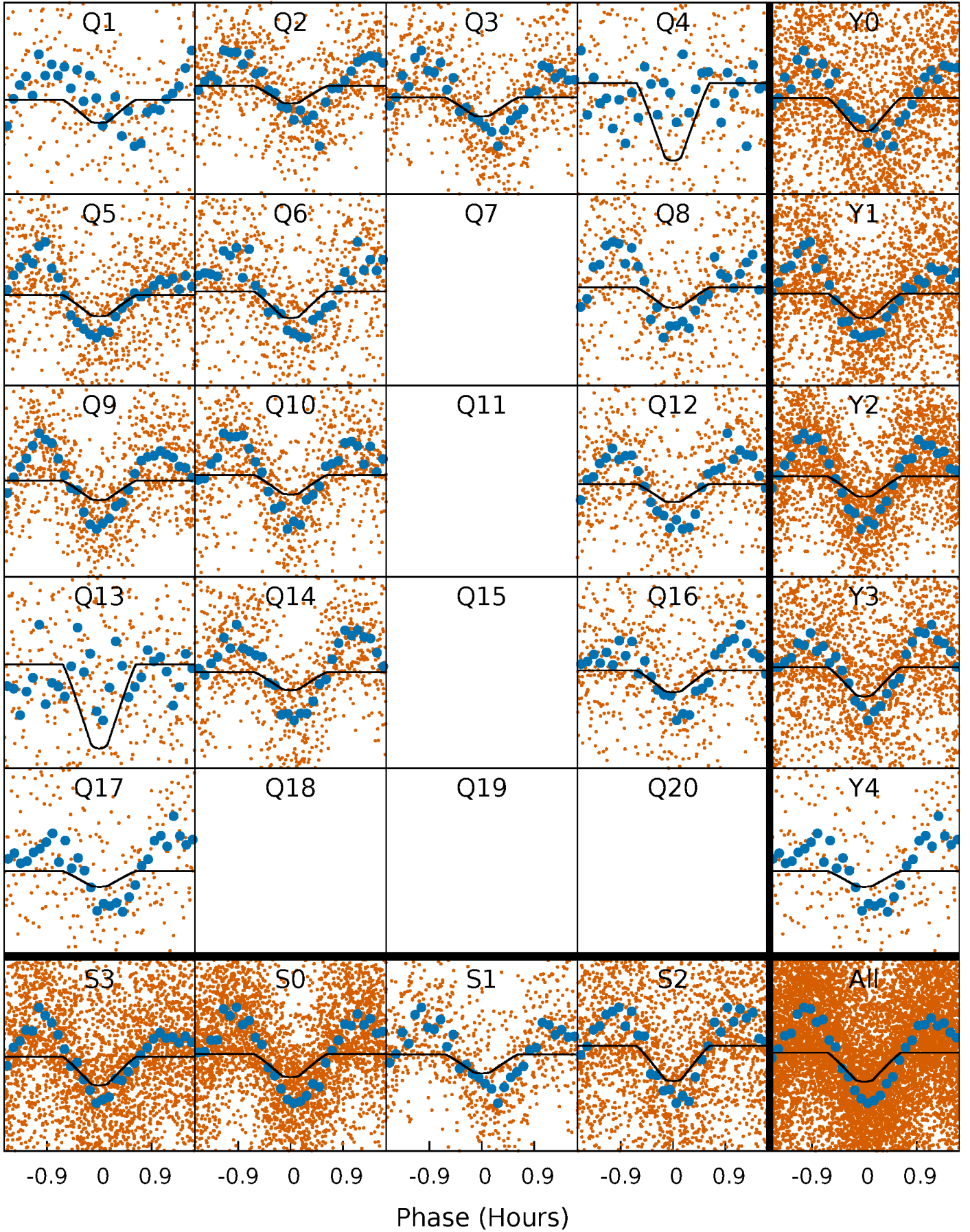
# PDC Quarter-Phased Transit Curves

TCE 010220150-02   P= 0.678490 Days    $T_0=132.082895$  (BKJD)



# DV Quarter-Phased Transit Curves

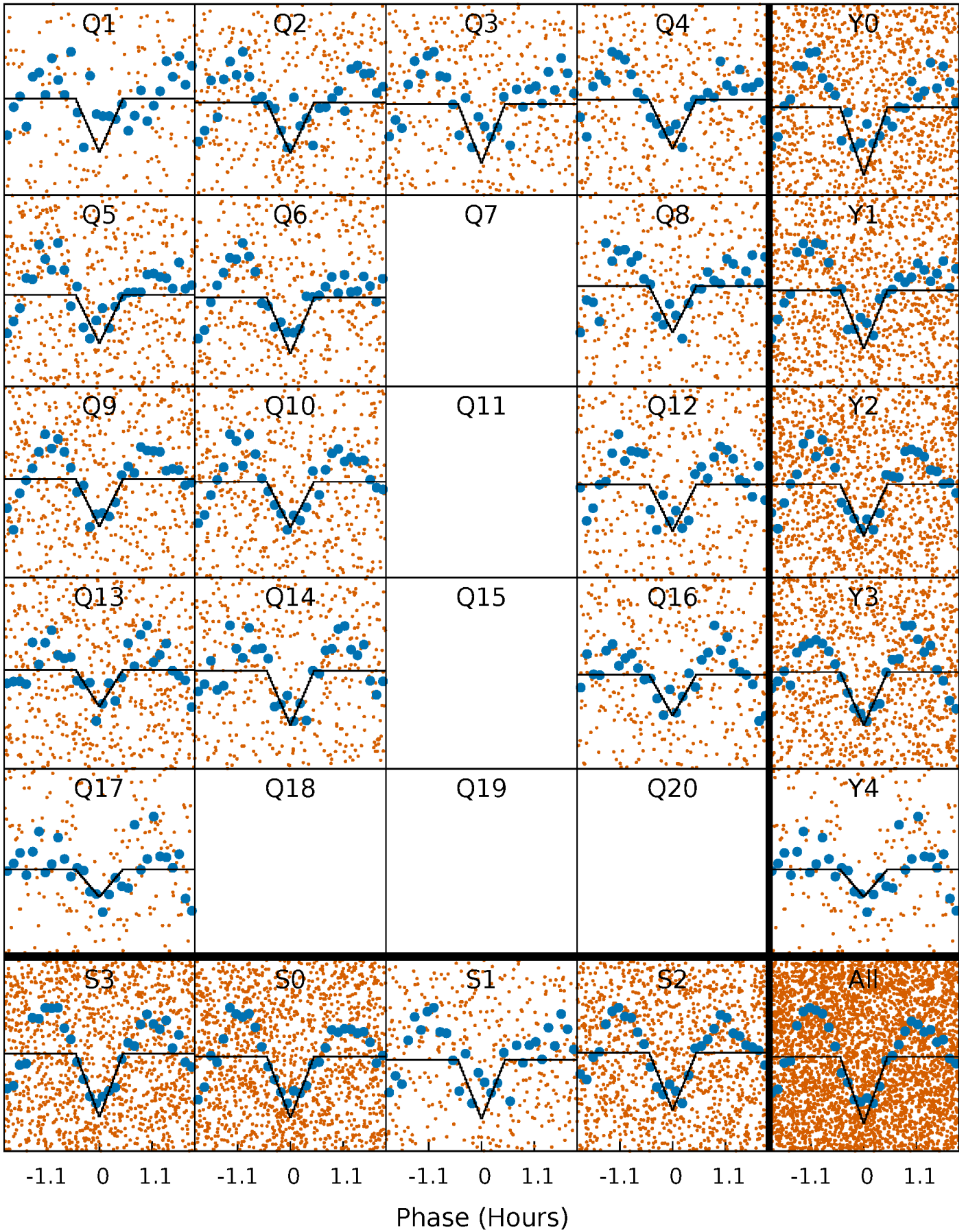
TCE 010220150-02     $P = 0.678490$  Days     $T_0 = 132.082895$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

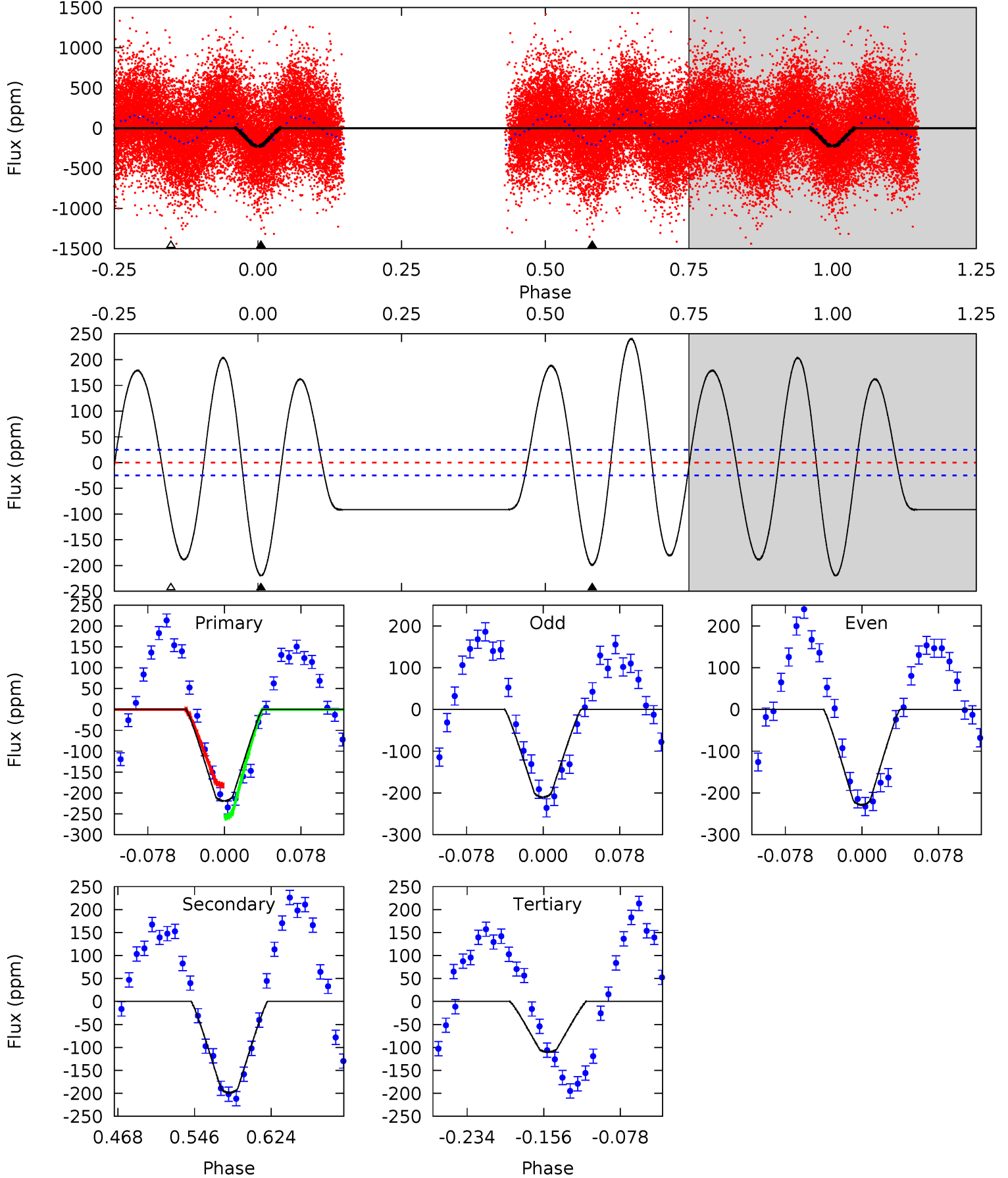
TCE 010220150-02   P= 0.678491 Days    $T_0=132.084206$  (BKJD)



# DV Model-Shift Uniqueness Test

010220150-02, P = 0.678490 Days, E = 131.404405 Days

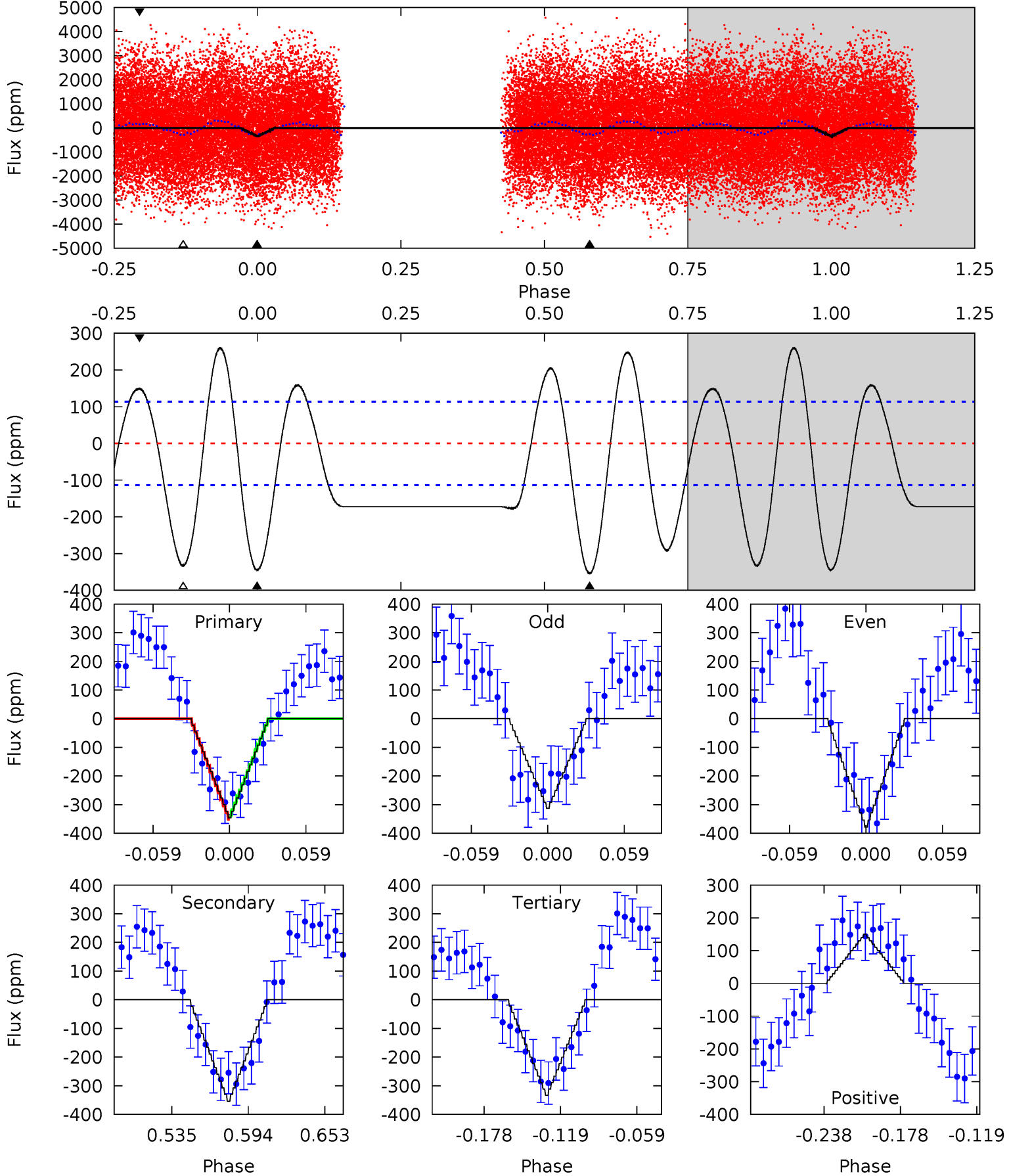
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.8	37.0	20.4	0	4.62	1.76	21.9	20.4	40.8	16.5	37.0	1.72	0.96	0.52	7.27



# Alt Model-Shift Uniqueness Test

010220150-02, P = 0.678491 Days, E = 131.405715 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
14.2	14.6	13.7	6.15	4.67	1.89	7.08	0.51	8.04	0.87	8.40	1.37	1.07	0.42	0.23





### Stellar Parameters For KIC 010220150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5524^{+181}_{-148}$	$3.803^{+0.777}_{-0.333}$	$-0.760^{+0.350}_{-0.250}$	$1.899^{+1.177}_{-1.177}$	$0.835^{+0.183}_{-0.122}$	$0.172^{+2.825}_{-0.126}$
	+3%/-3%	+20%/-9%	+46%/-33%	+62%/-62%	+22%/-15%	+1643%/-73%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010220150-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-199 \pm 5$	$2.43^{+1.21}_{-1.00}$	$3886^{+572}_{-705}$	$5742^{+1109}_{-739}$	$3.799^{+6.928}_{-2.111}$
Alt.	$-355 \pm 24$	$3.88^{+1.57}_{-1.44}$	$3876^{+639}_{-728}$	$5299^{+565}_{-515}$	$2.647^{+4.157}_{-1.333}$

$T_{max}$  = 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

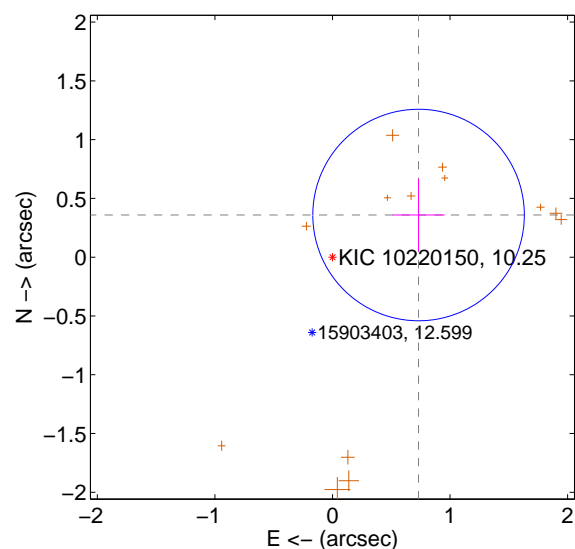
Supplemental centroid analysis for 010220150-02. **Kepler magnitude: 10.25.** Transit SNR 16.66

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

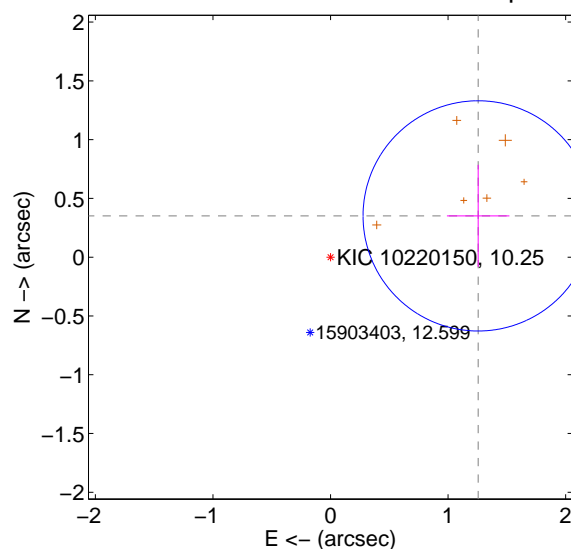
The direct PRF centroid is offset from the target star catalog position by about 0.87 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.816 \pm 0.300$	2.72	$-0.733 \pm 0.223$	$0.359 \pm 0.309$
PRF-fit source offset from KIC position	<b><math>1.304 \pm 0.326</math></b>	<b>4.00</b>	$-1.256 \pm 0.266$	$0.351 \pm 0.434$
photometric centroid source offset	$0.13 \pm 0.11$	1.17	$-0.03 \pm 0.15$	$-0.12 \pm 0.10$

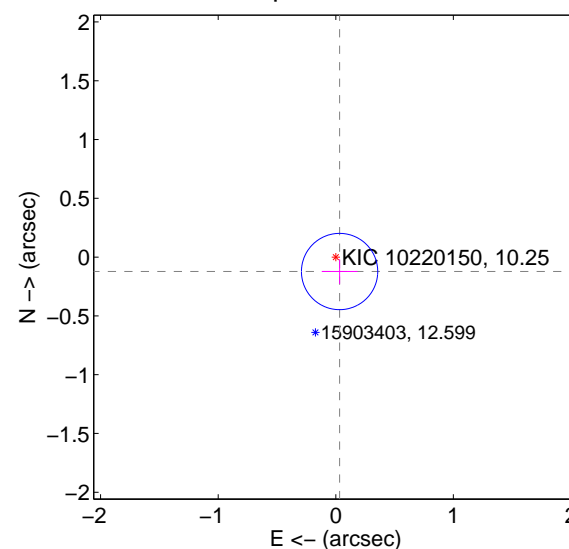
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

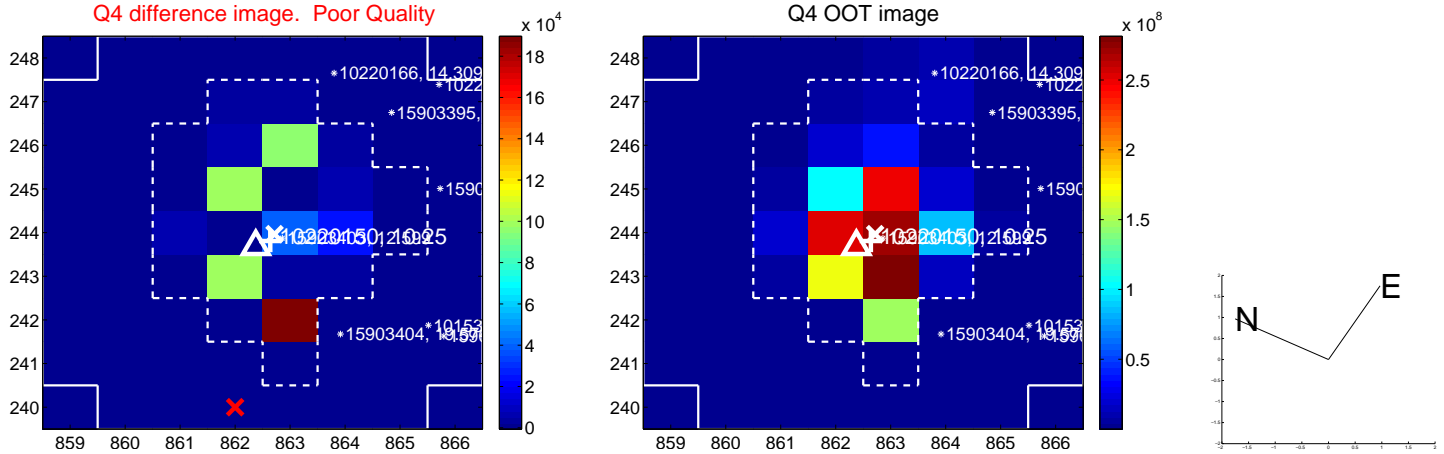
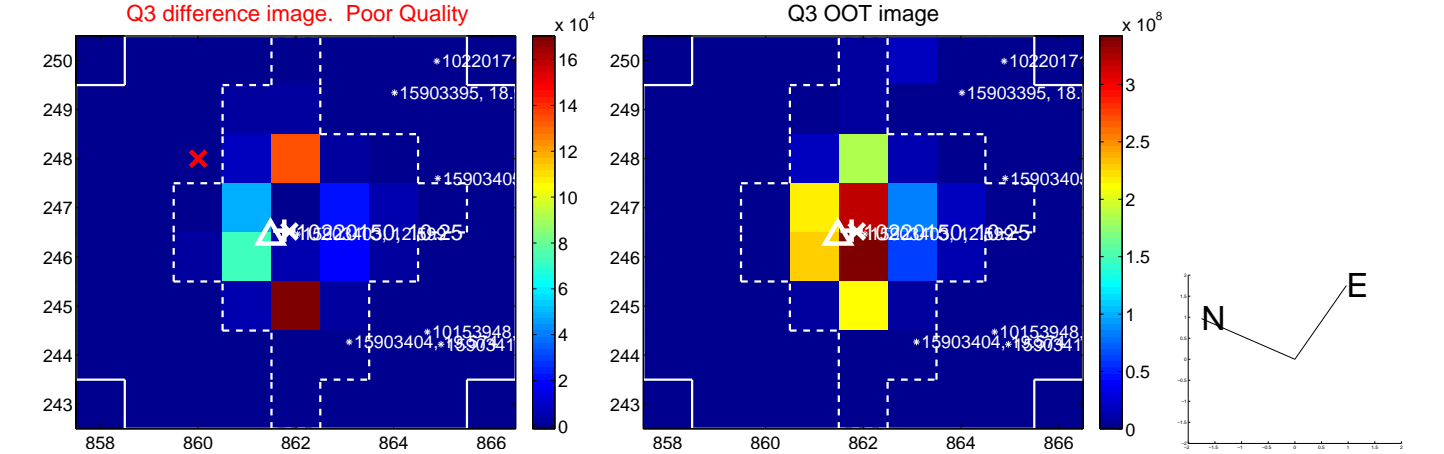
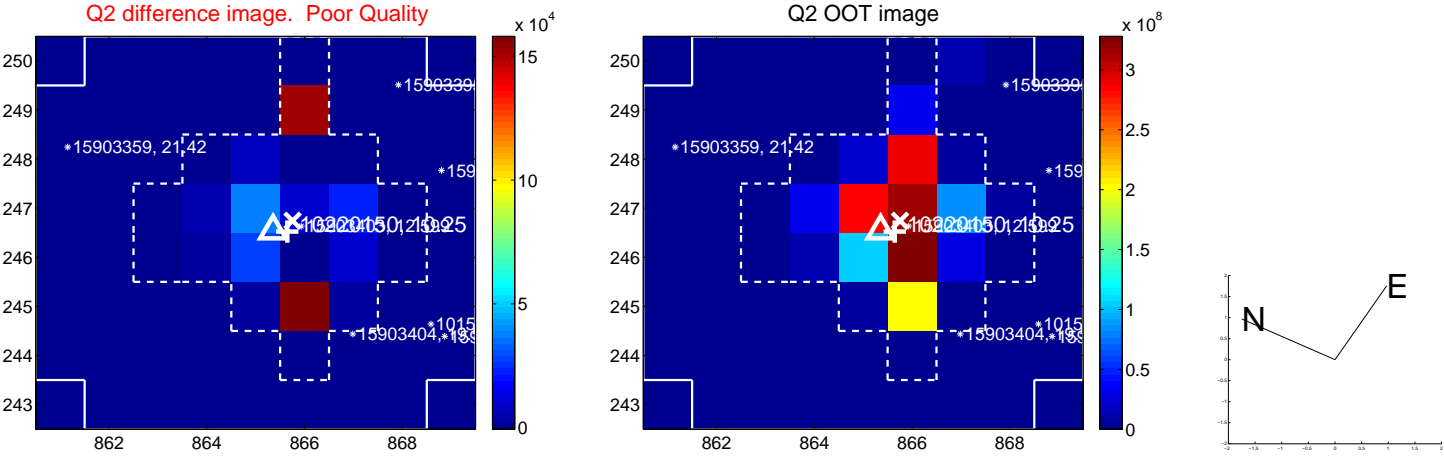
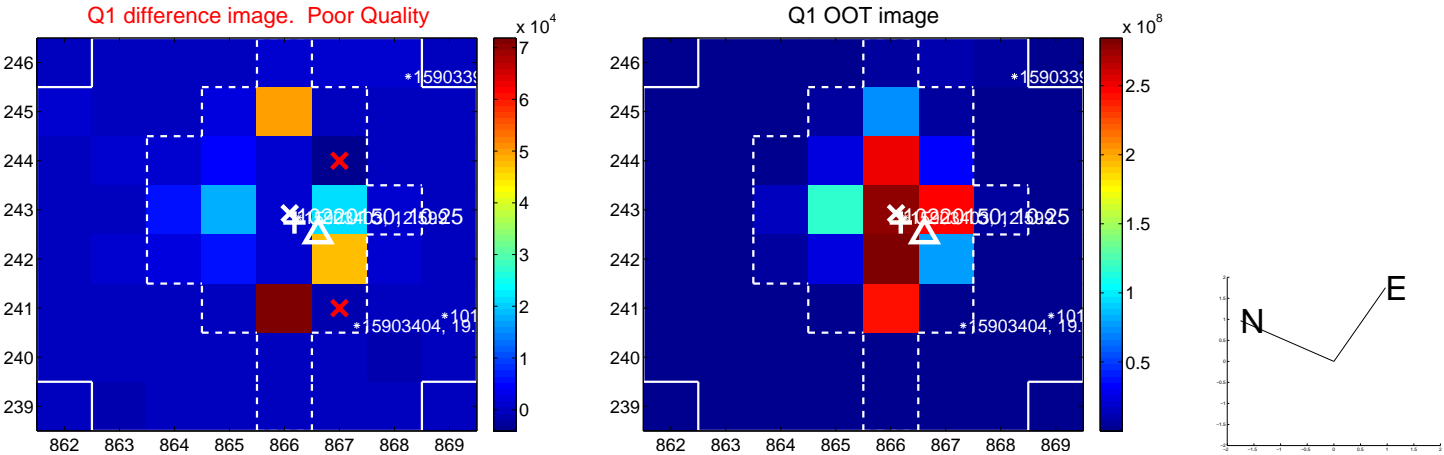


offset from photometric centroids

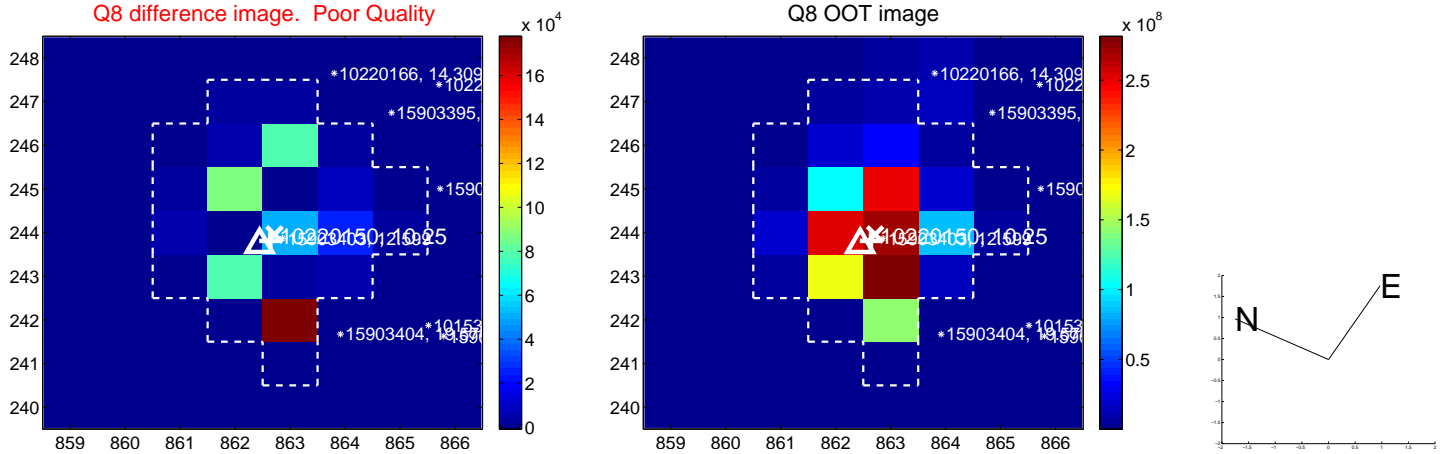
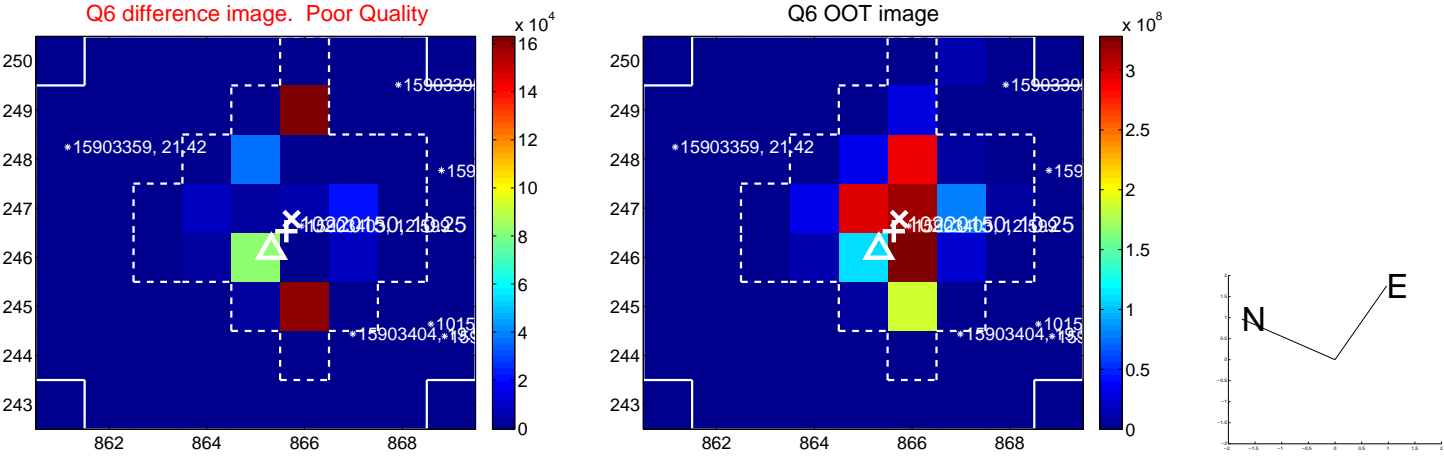
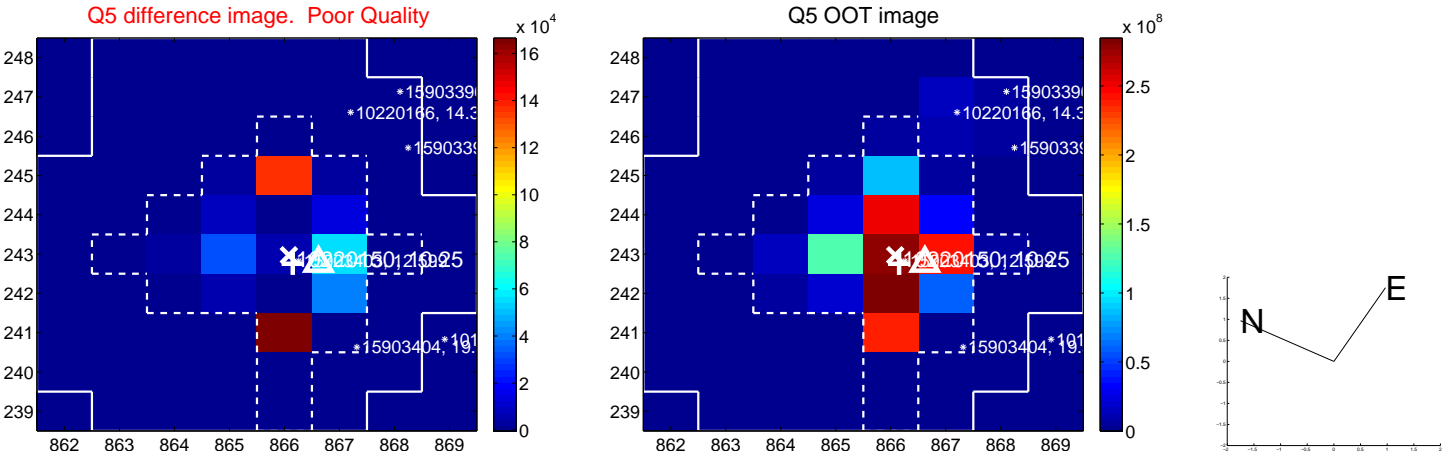


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

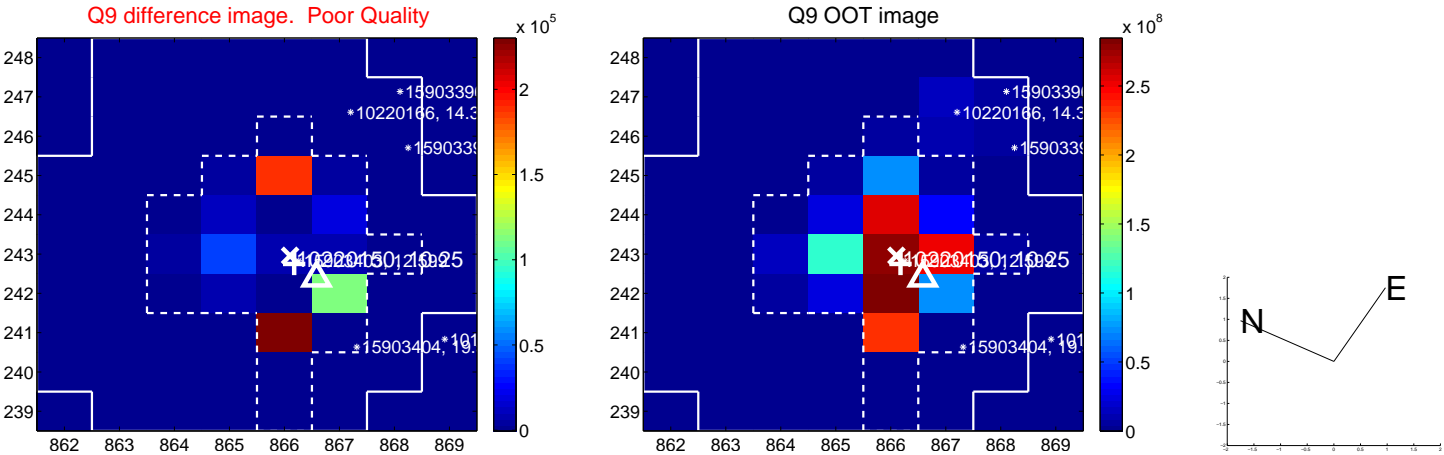
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



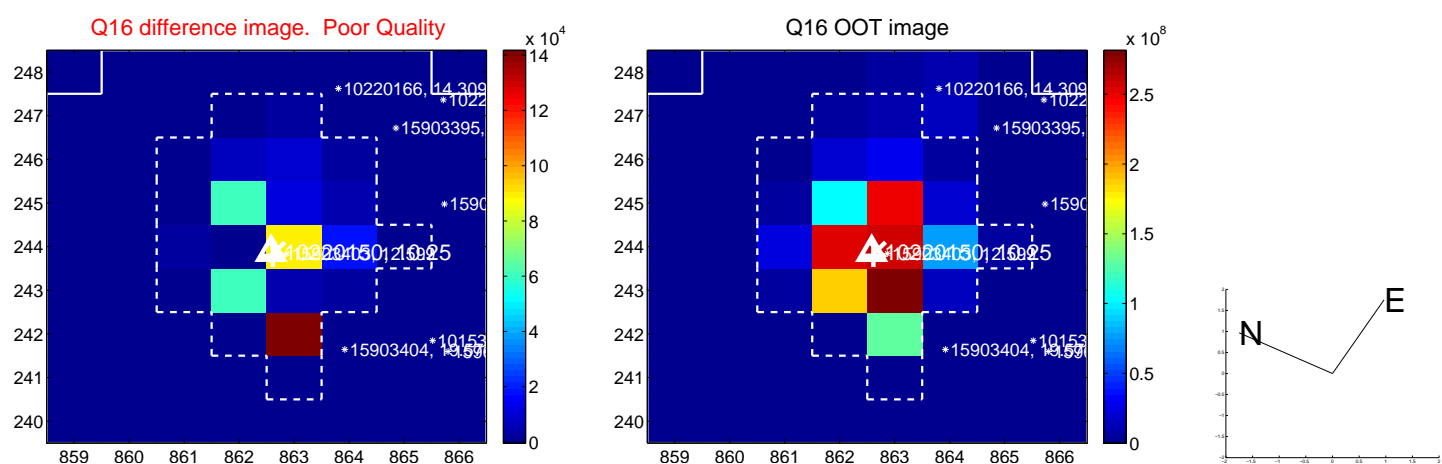
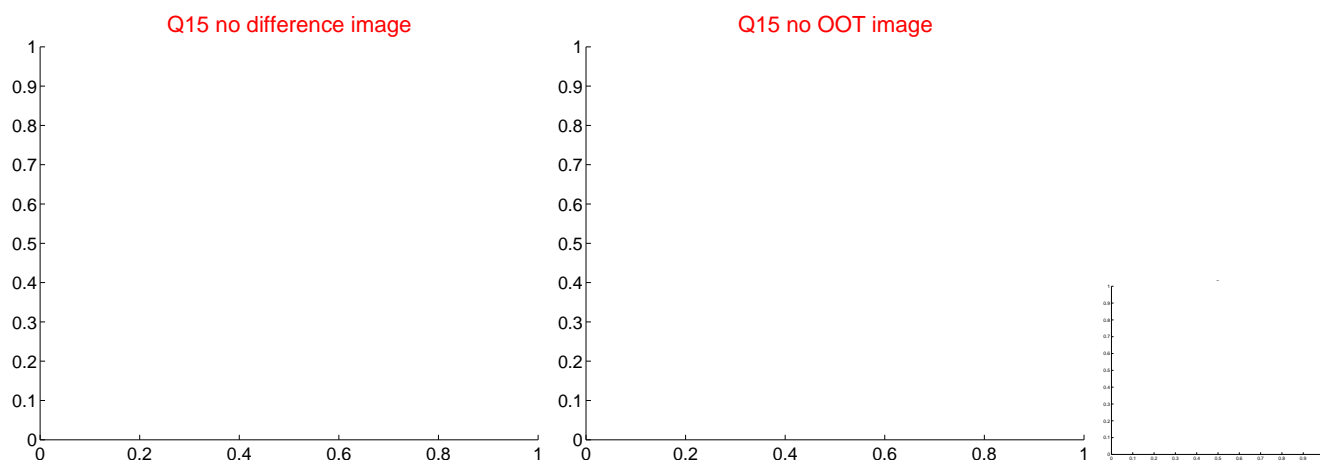
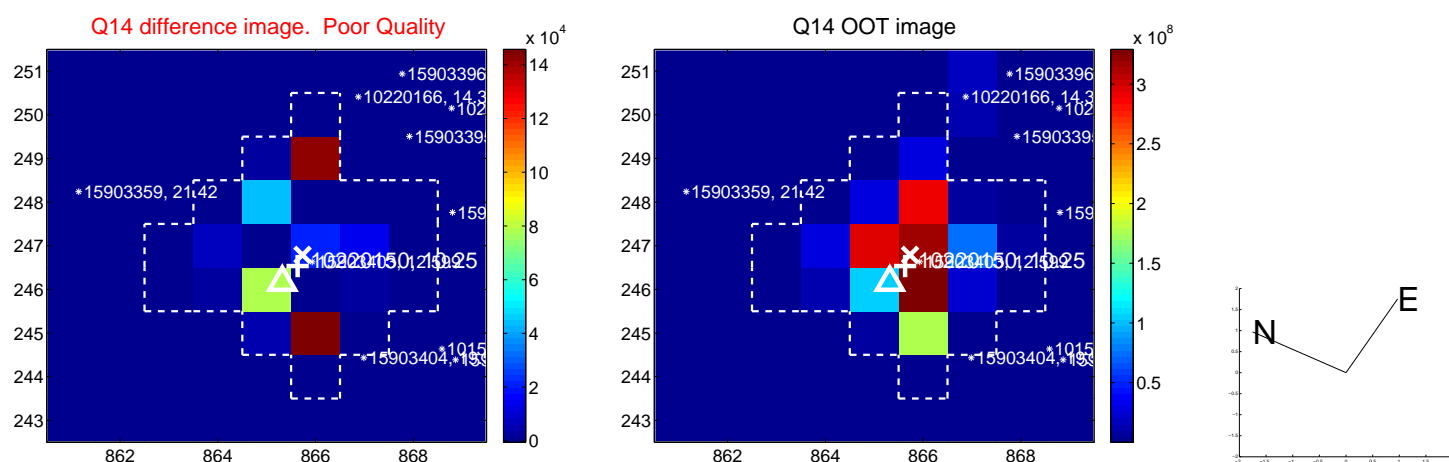
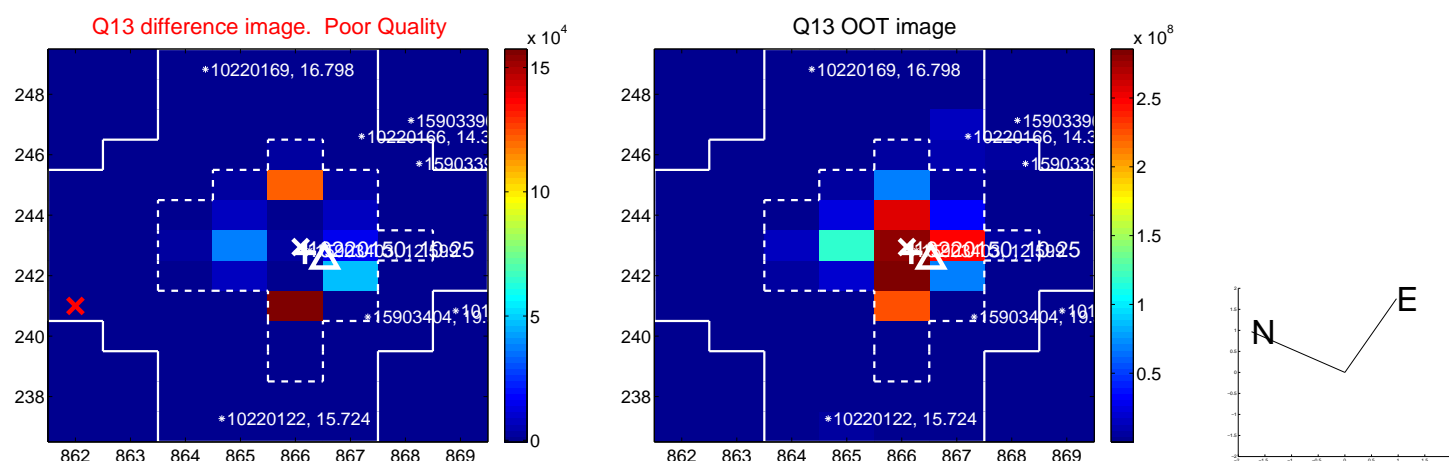
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

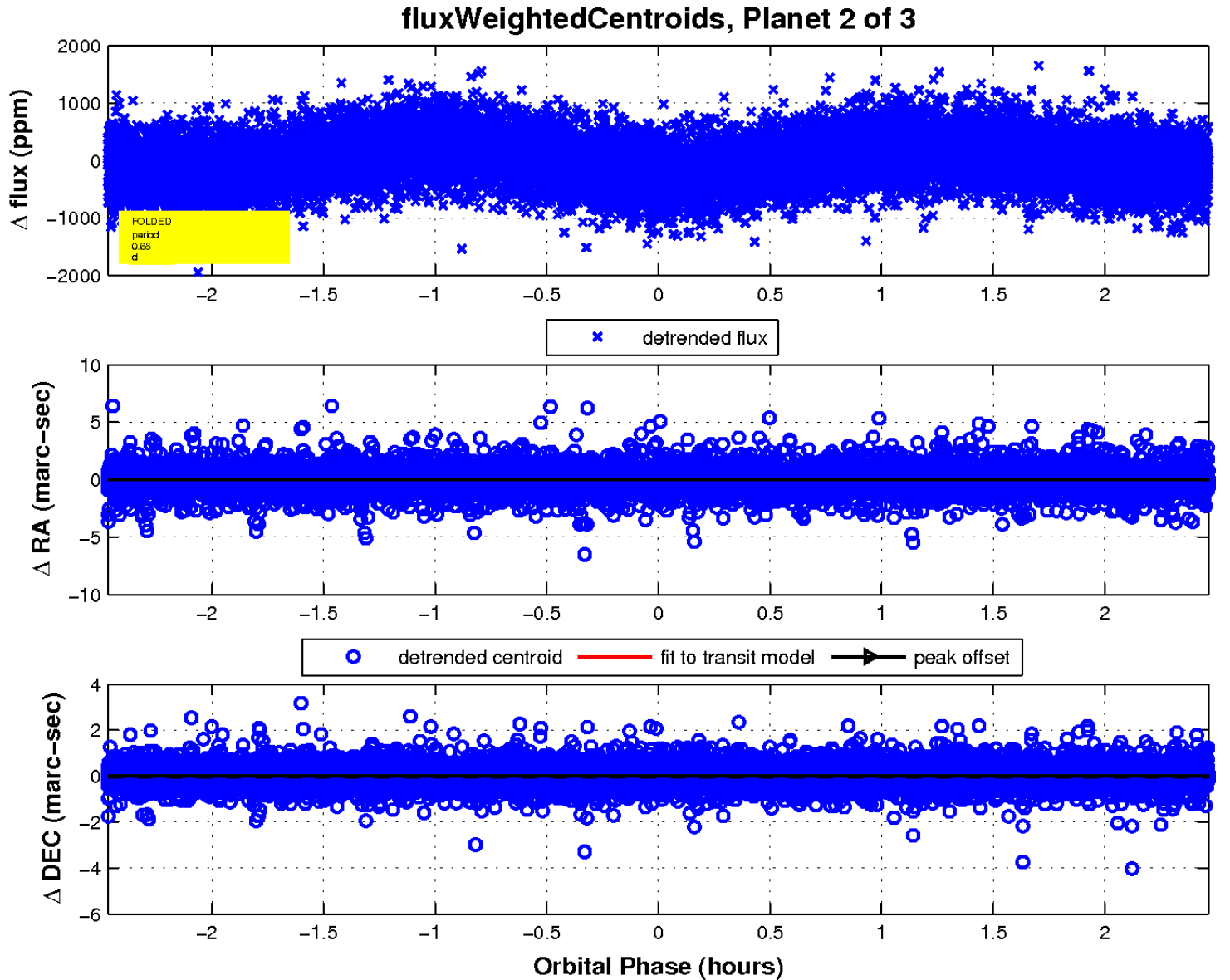
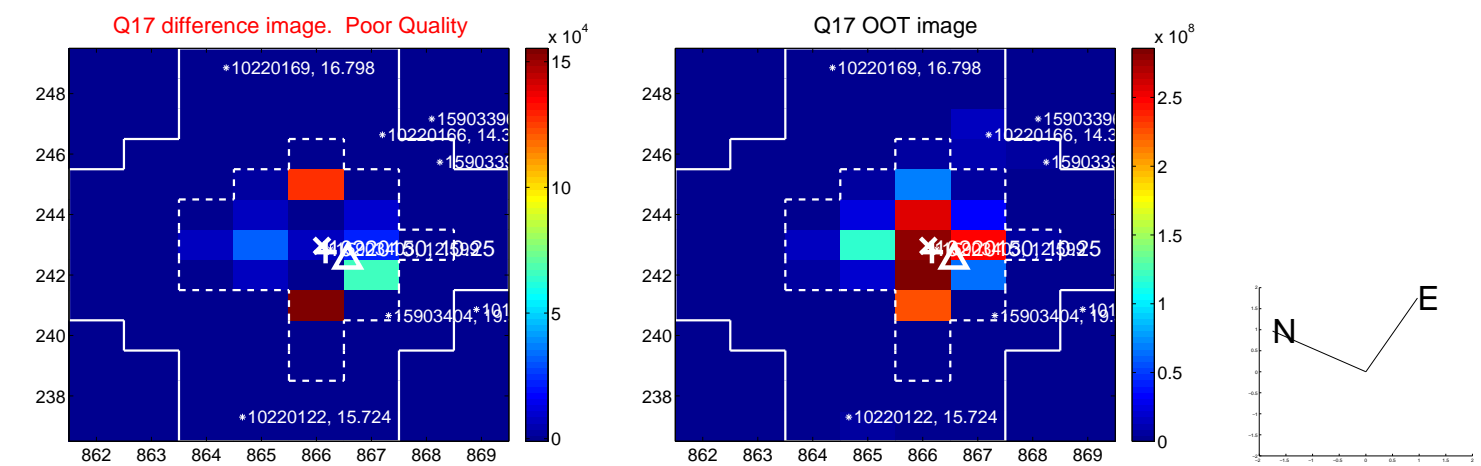


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



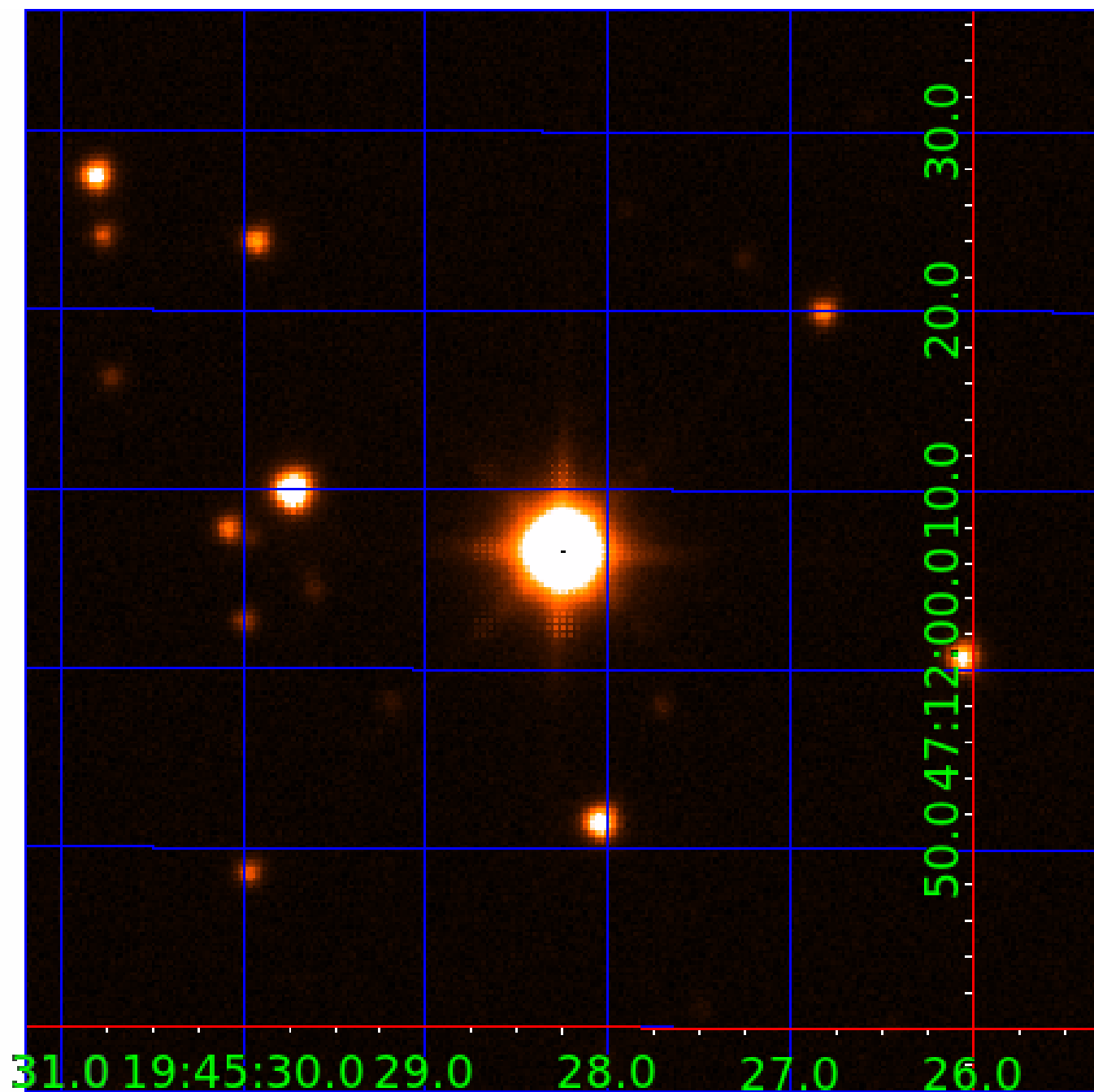


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010220150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010220150-01	OBS	No	0.678481	131.610834	142.0	0.516	10.6	14.6	1.90	5524	2.54	14843.69
010220150-02	OBS	No	0.678490	132.082895	132.0	0.822	9.9	16.7	1.90	5524	2.62	14843.44
010220150-03	OBS	No	0.678483	131.808746	154.3	0.576	11.0	16.9	1.90	5524	2.43	14843.63

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010220150-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010220150-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD—CENT_SATURATED
010220150-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

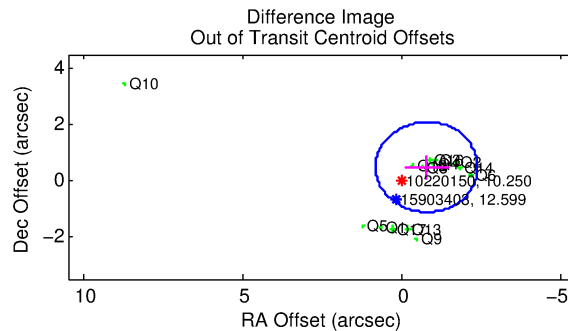
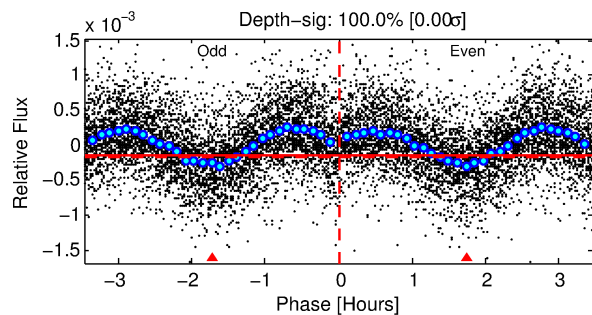
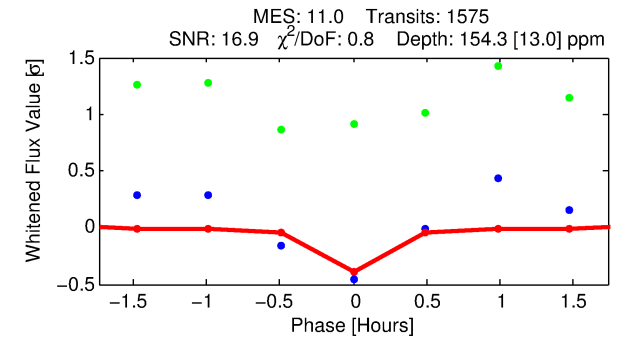
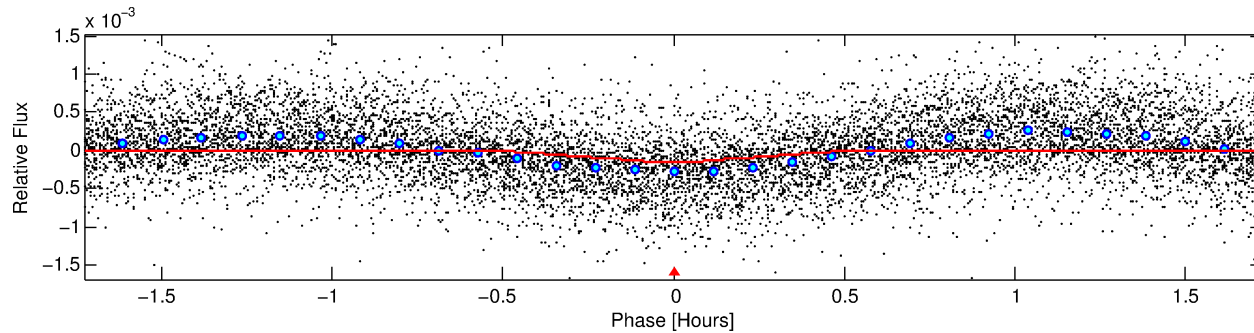
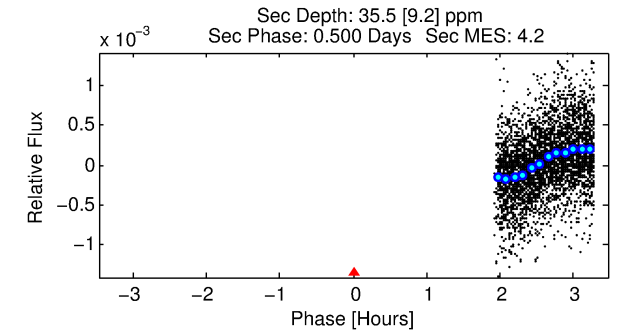
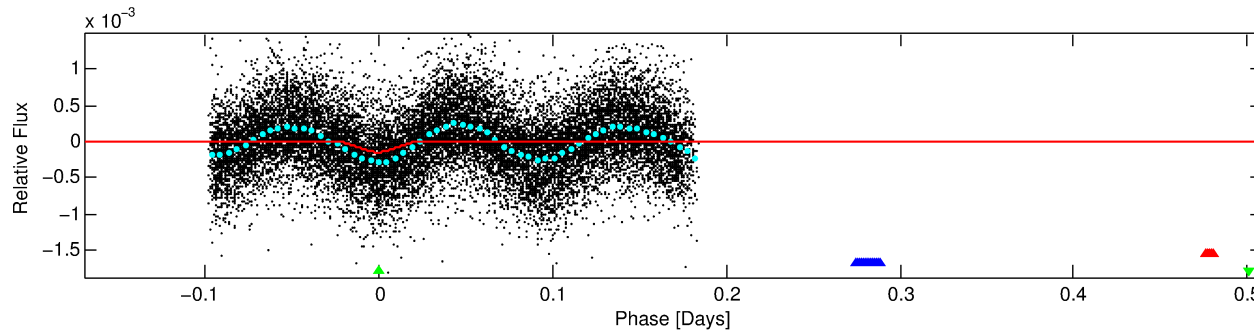
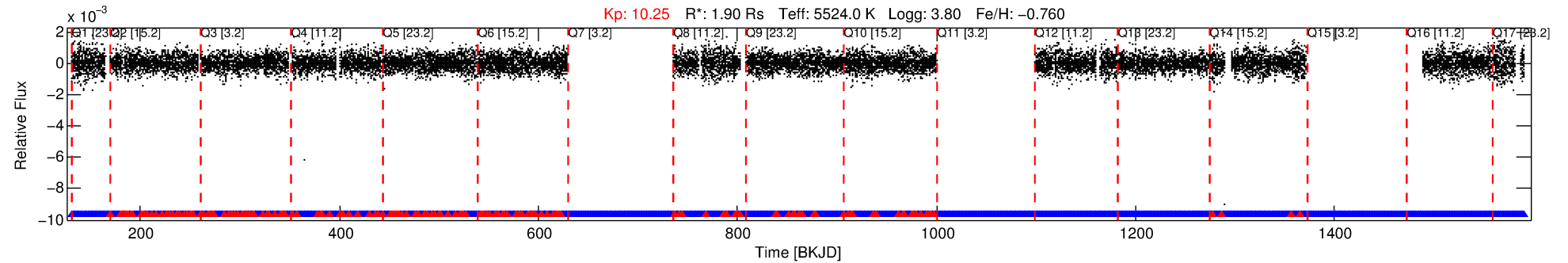
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010220150-03

No Significant Match Found

# DV One-Page Summary

KIC: 10220150 Candidate: 3 of 3 Period: 0.678 d



## DV Fit Results:

Period = 0.67848 [0.00001] d  
Epoch = 131.8087 [0.0007] BKJD  
Rp/R\* = 0.0117 [0.0114]  
a/R\* = 9.07 [40.20]  
b = 0.10 [44.51]  
Seff = 14843.63 [18837.61]  
Teq = 2815 [893] K  
Rp = 2.43 [2.80] Re  
a = 0.0142 [0.0103] AU  
Ag = 0.67 [1.57] [-0.21σ]  
Teffp = 3941 [1936] K [0.53σ]

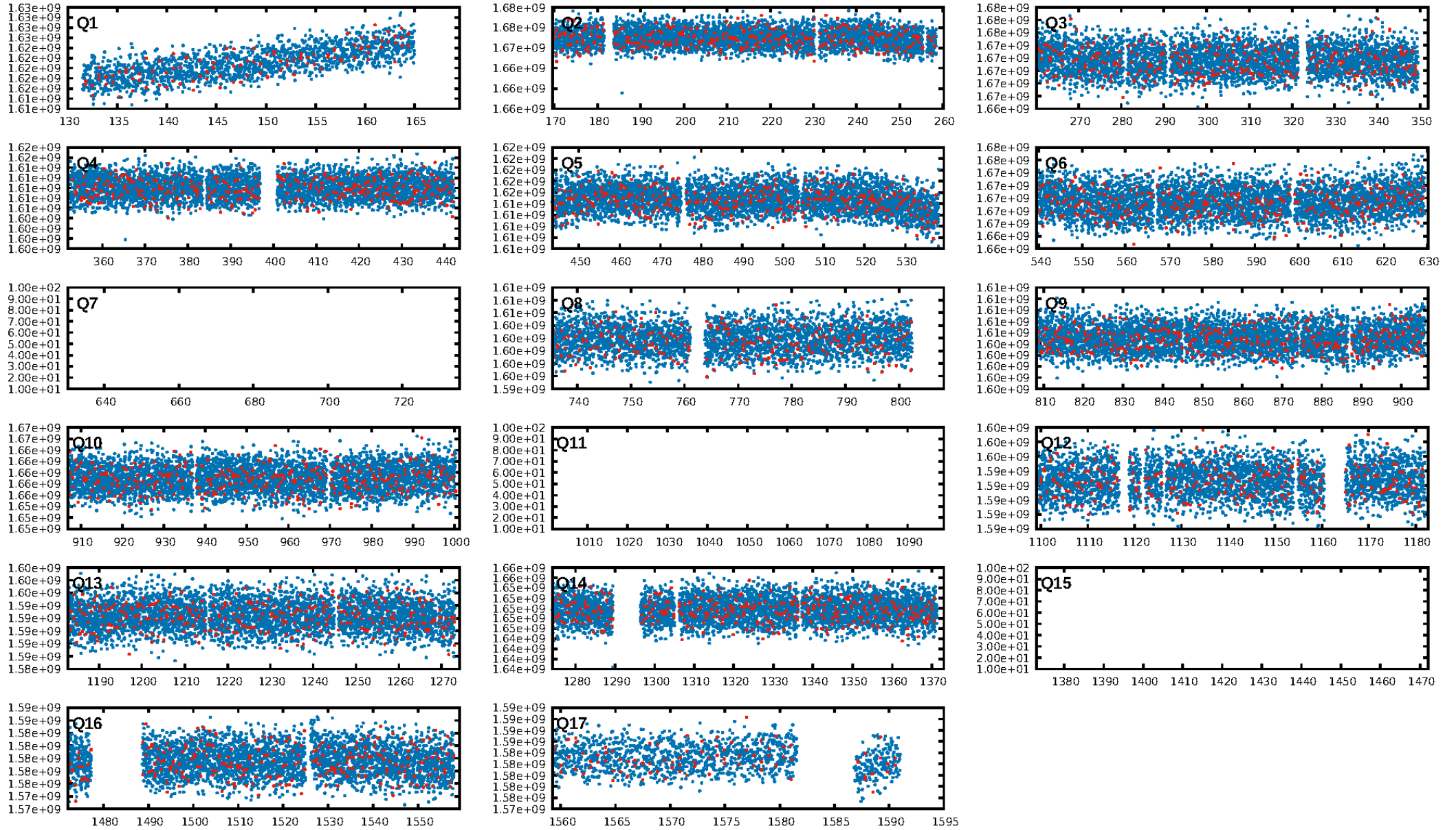
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.86e-49  
RollingBand-fgt: 0.89 [1329/1487]  
GhostDiagnostic-chr: -3.171  
Centroid-sig: 1.8%  
Centroid-so: 0.262 arcsec [1.78σ]  
OotOffset-rm: 0.914 arcsec [1.71σ]  
KicOffset-rm: 1.421 arcsec [2.09σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.00 [0/14]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:55:25 Z

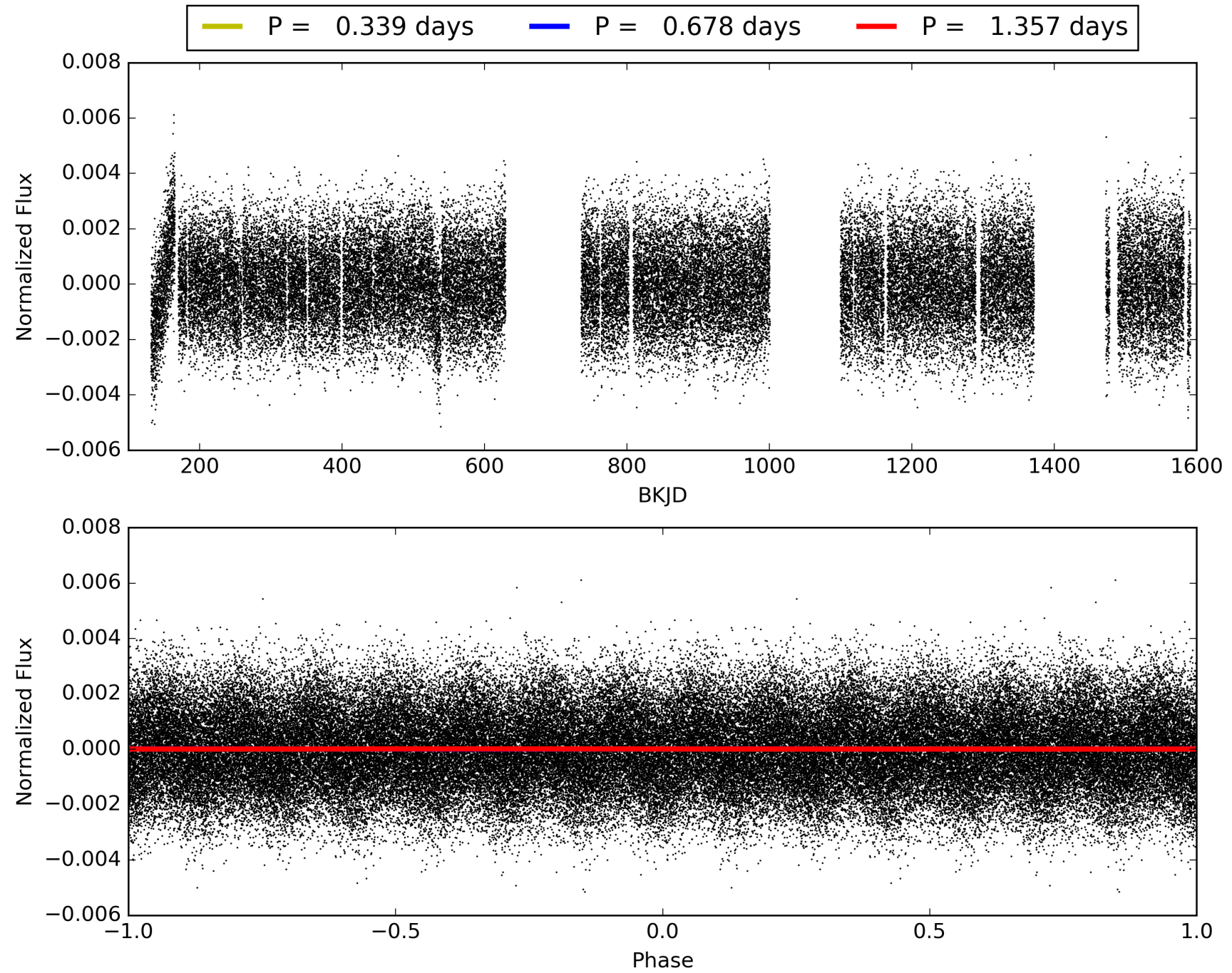
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010220150-03, PDC Light Curves





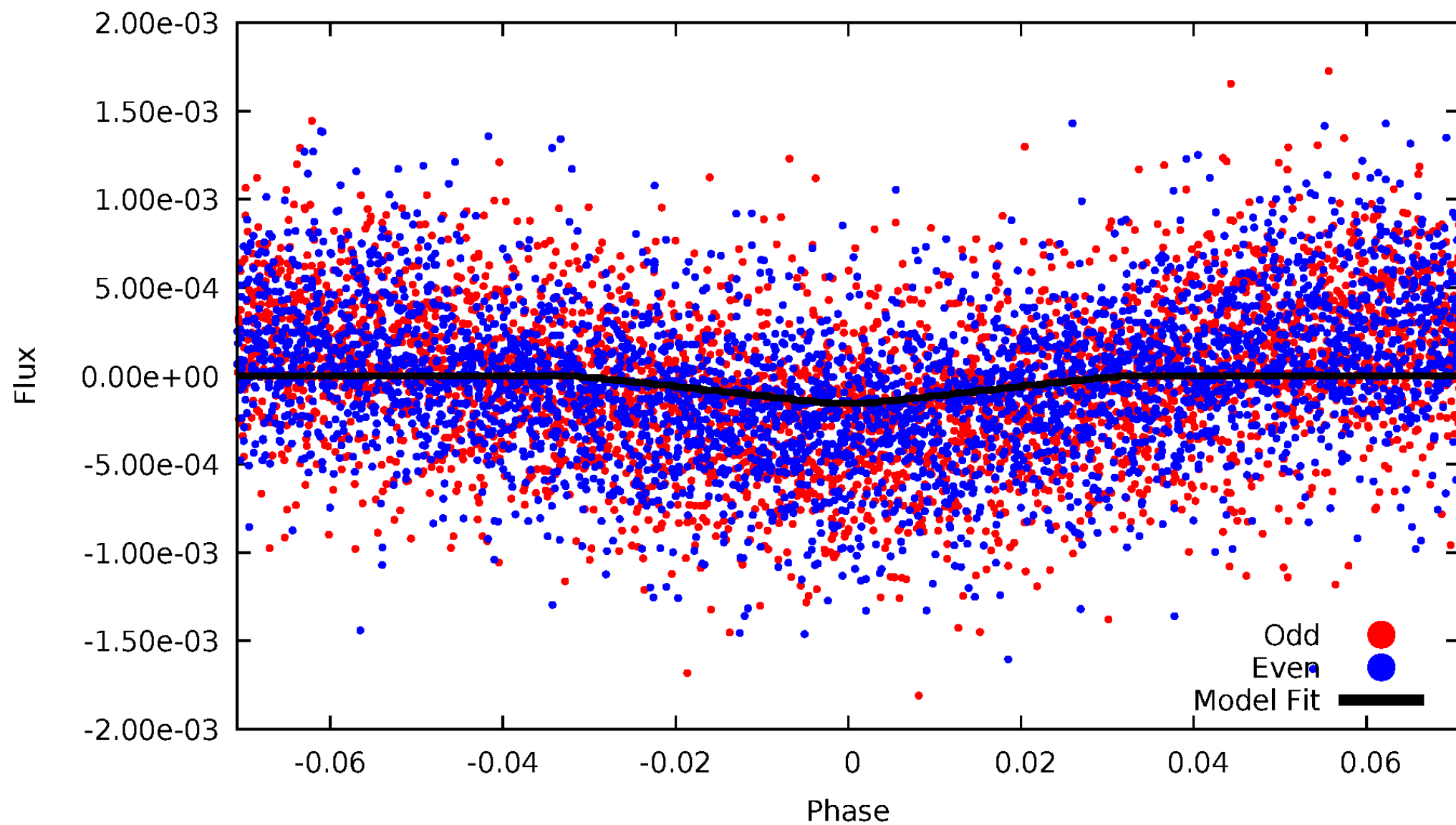
TCE 010220150-03





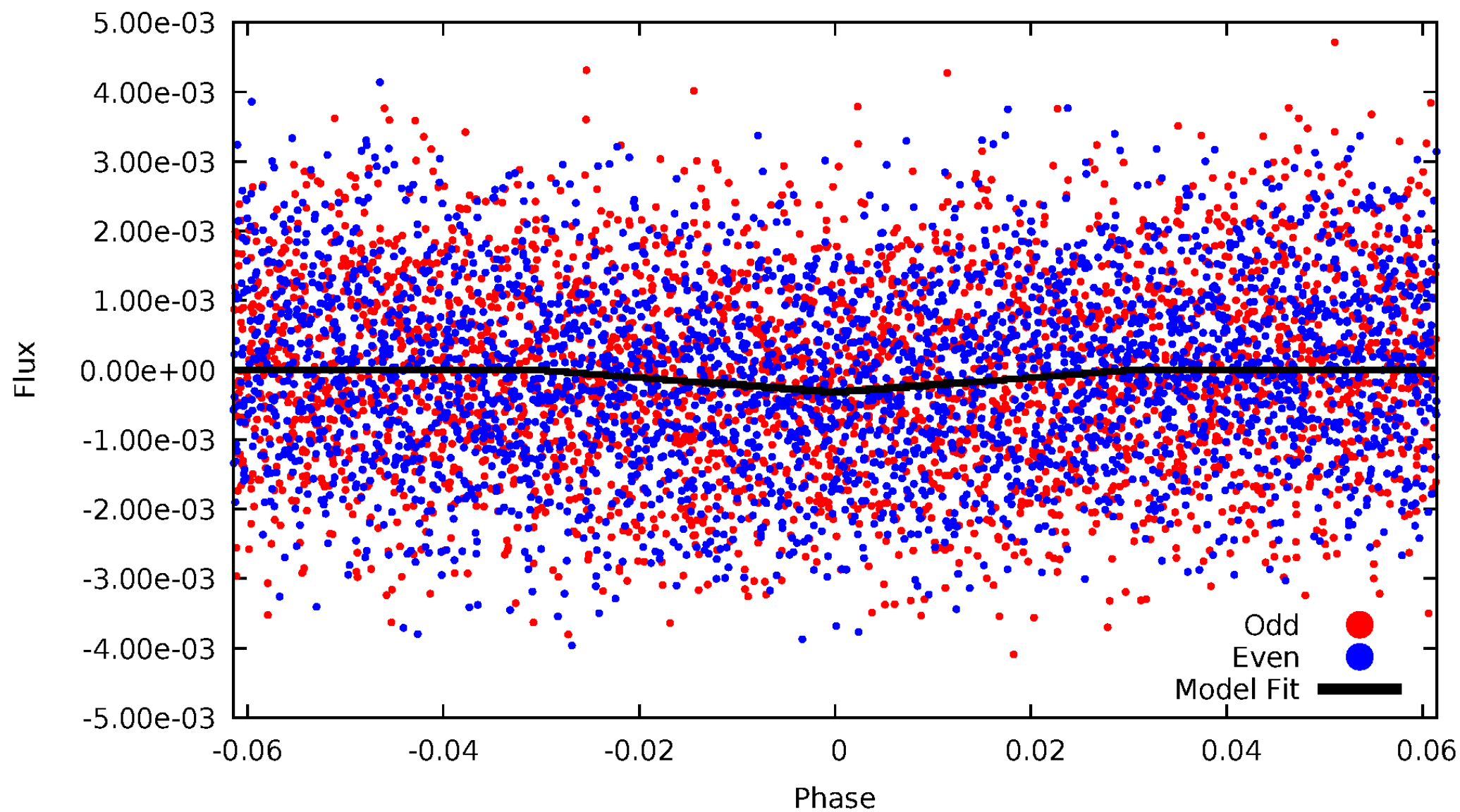
DV Odd/Even

TCE 010220150-03

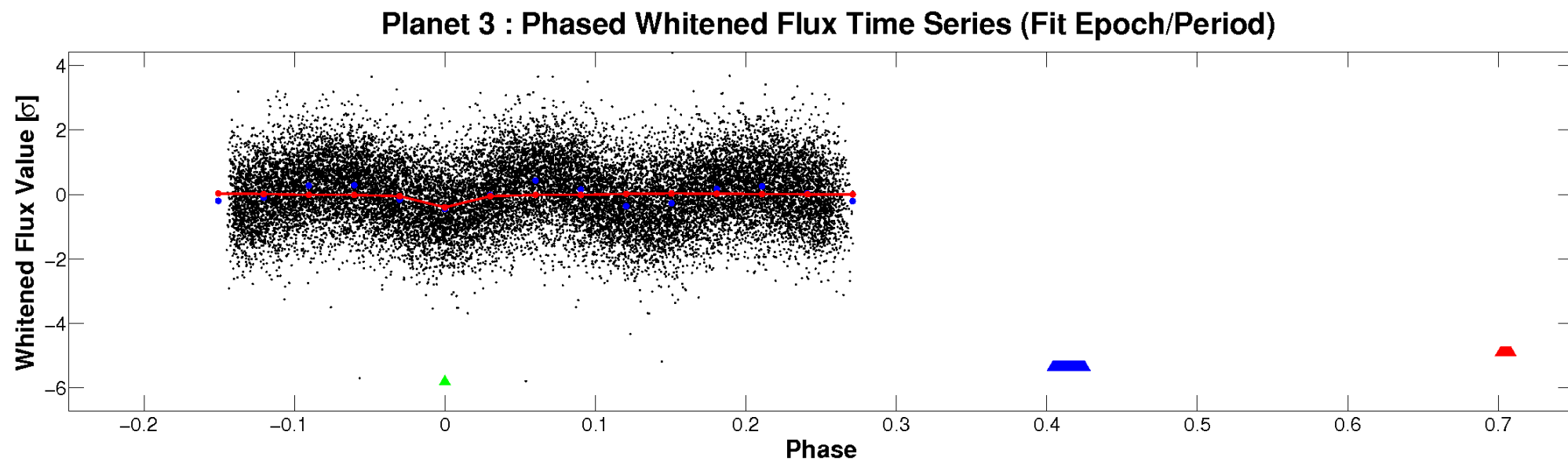
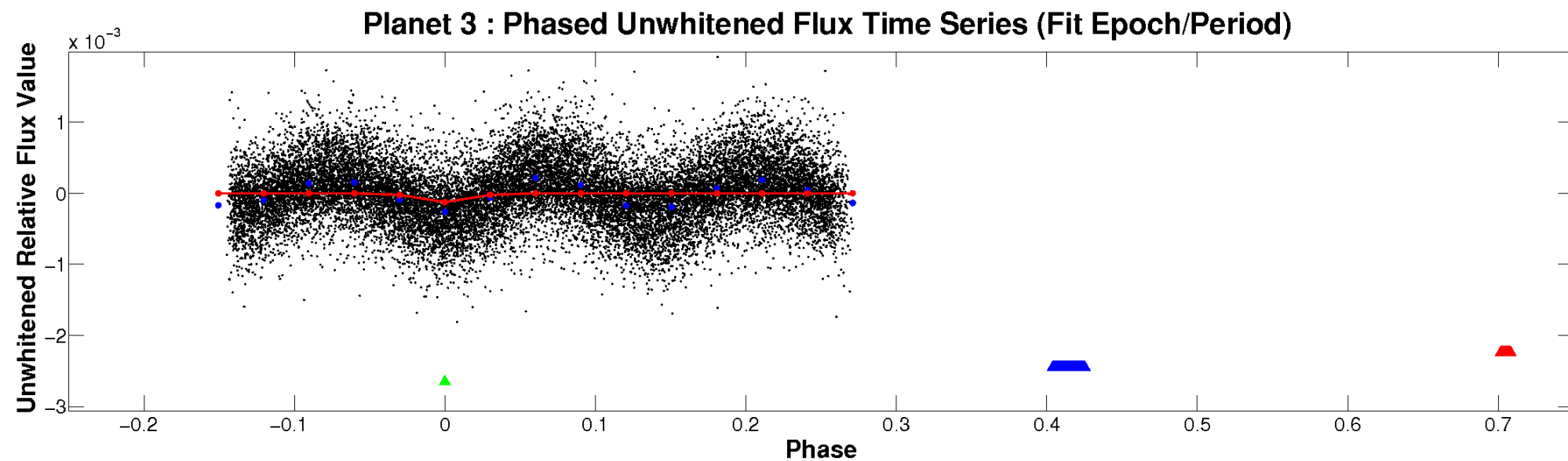


# ALT Odd/Even

TCE 010220150-03

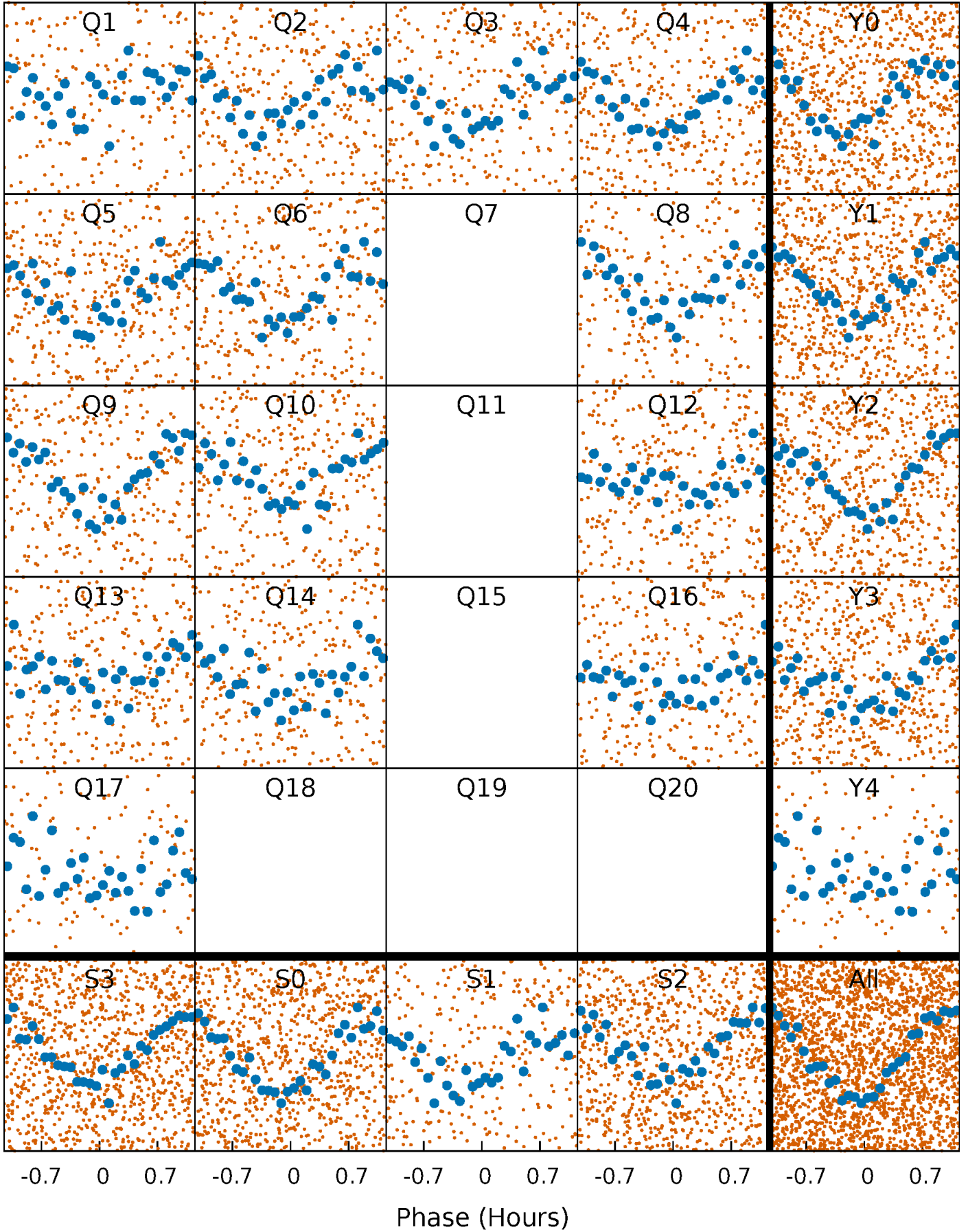


# Non-Whitened Vs. Whitened Light Curve



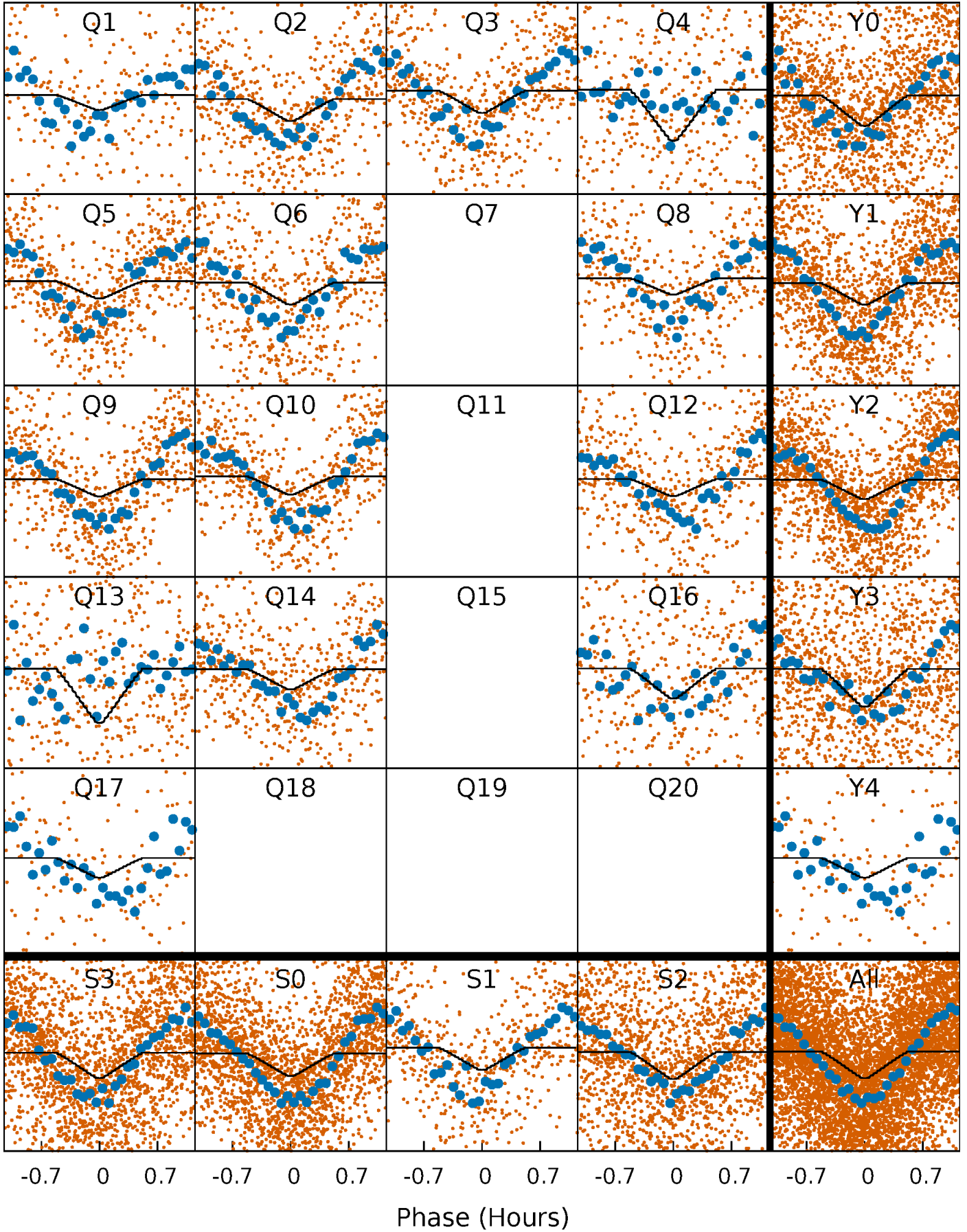
# PDC Quarter-Phased Transit Curves

TCE 010220150-03 P= 0.678483 Days  $T_0=131.808746$  (BKJD)



# DV Quarter-Phased Transit Curves

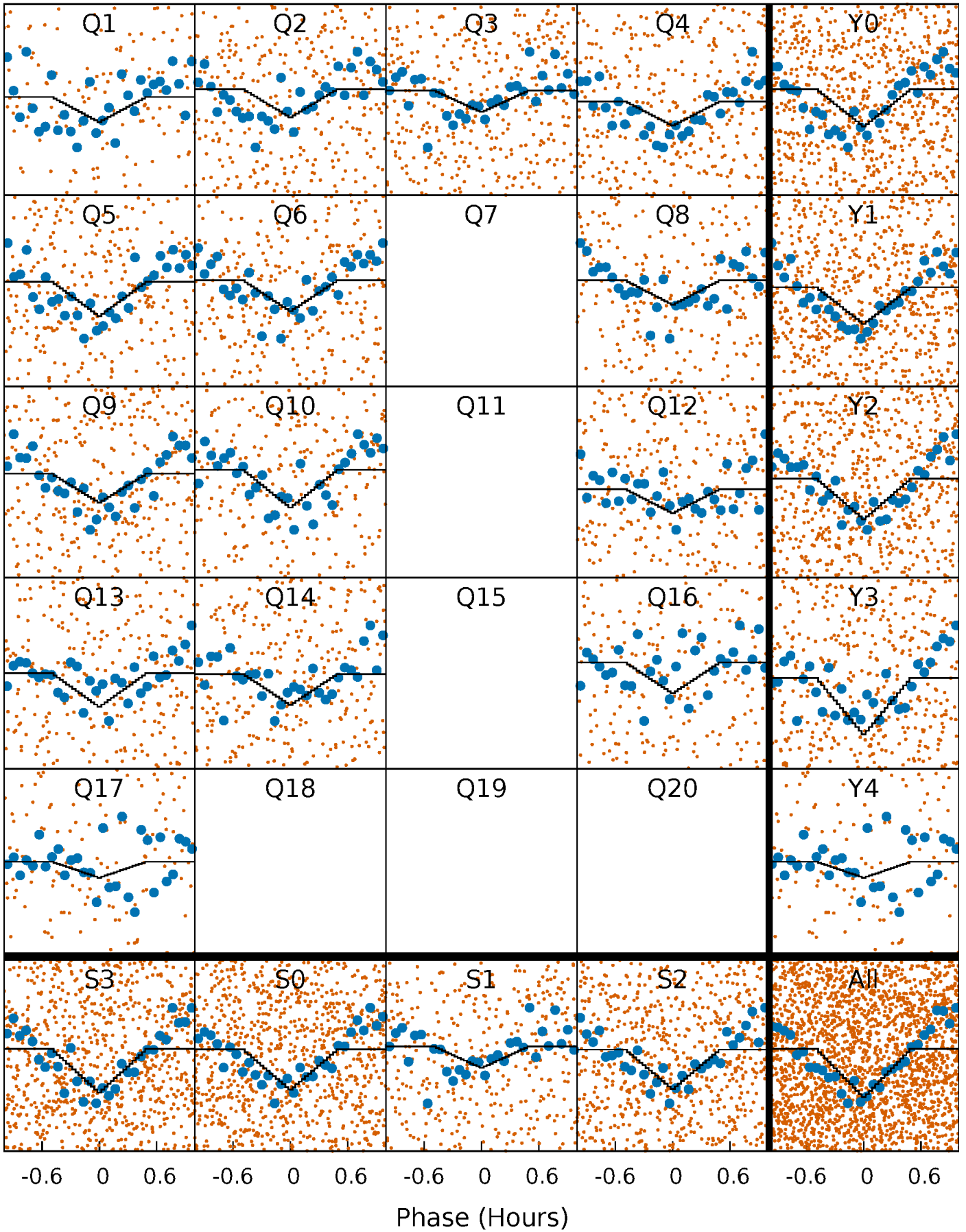
TCE 010220150-03 P= 0.678483 Days  $T_0=131.808746$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 010220150-03 P= 0.678485 Days  $T_0=131.806363$  (BKJD)

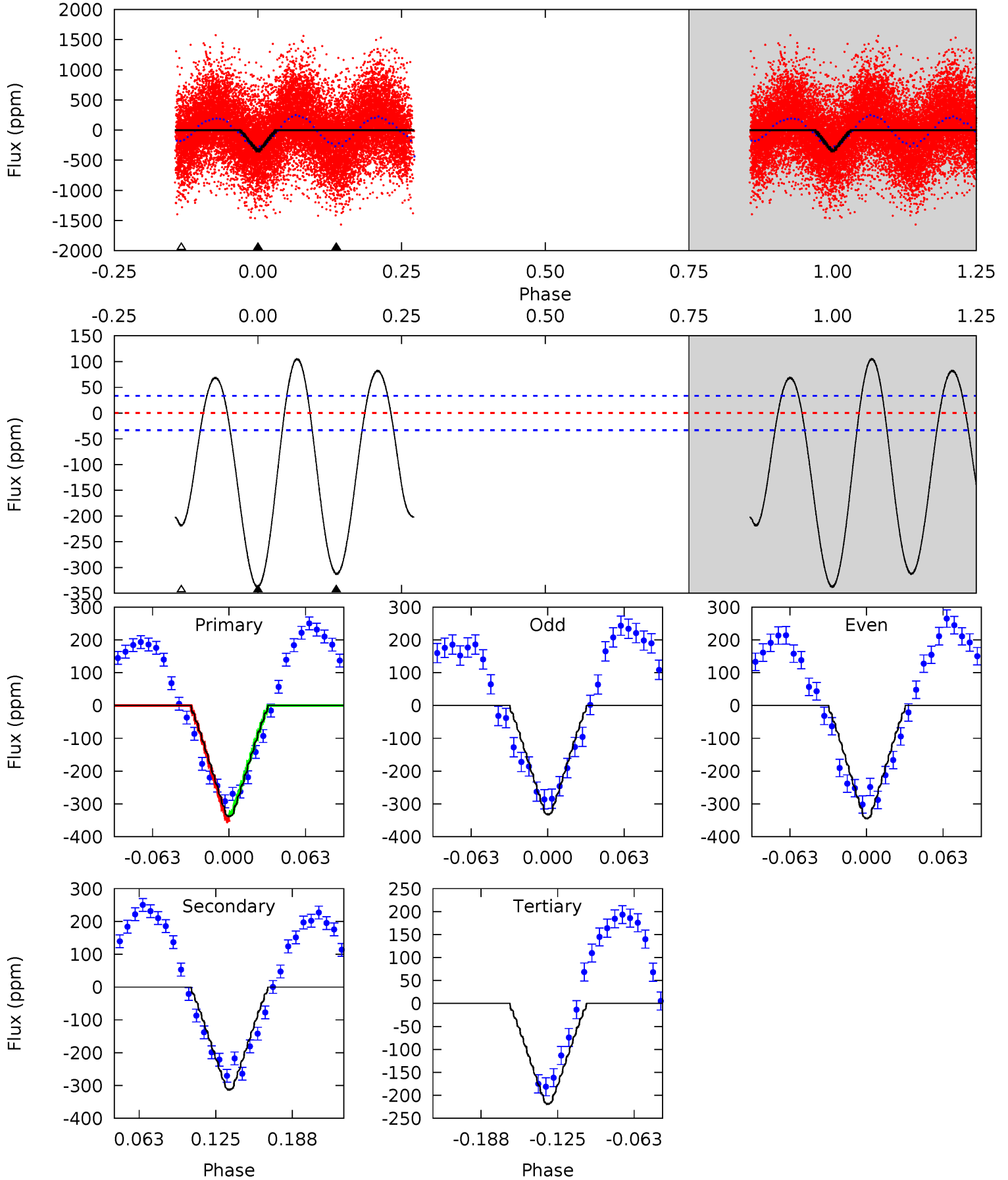




# DV Model-Shift Uniqueness Test

010220150-03, P = 0.678483 Days, E = 131.130263 Days

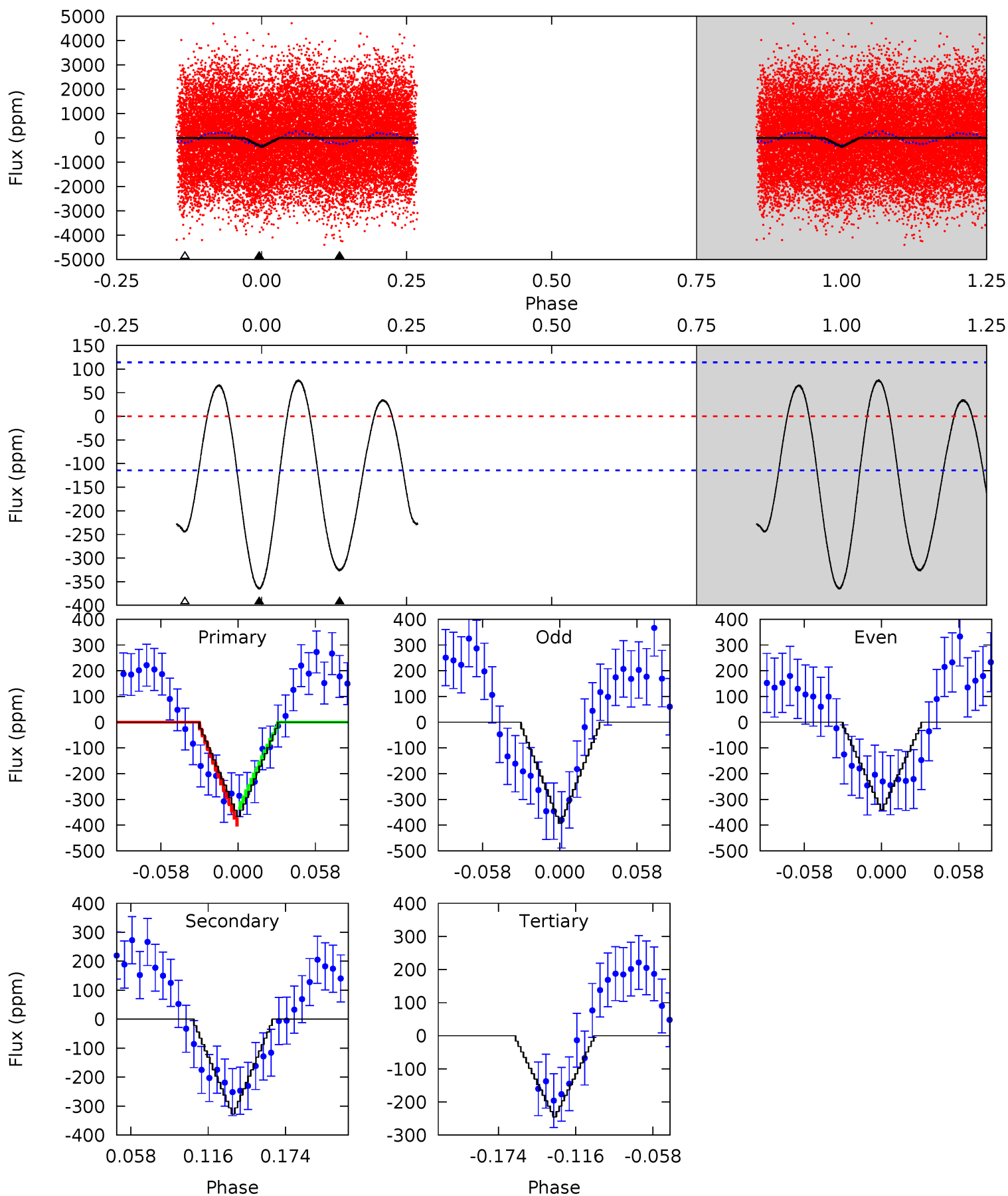
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
47.2	43.7	30.5	0	4.66	1.86	15.3	16.7	47.2	13.1	43.7	0.86	1.03	0.24	1.46



# Alt Model-Shift Uniqueness Test

010220150-03, P = 0.678485 Days, E = 131.127878 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
15.0	13.4	10.0	0	4.68	1.90	4.40	4.94	15.0	3.36	13.4	1.07	1.03	0.18	1.35



### Stellar Parameters For KIC 010220150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5524^{+181}_{-148}$	$3.803^{+0.777}_{-0.333}$	$-0.760^{+0.350}_{-0.250}$	$1.899^{+1.177}_{-1.177}$	$0.835^{+0.183}_{-0.122}$	$0.172^{+2.825}_{-0.126}$
	+3%/-3%	+20%/-9%	+46%/-33%	+62%/-62%	+22%/-15%	+1643%/-73%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010220150-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-313 \pm 7$	$2.69^{+2.61}_{-1.76}$	$3907^{+608}_{-738}$	$5989^{+5943}_{-1458}$	$4.941^{+37.535}_{-3.682}$
Alt.	$-328 \pm 24$	$3.56^{+2.80}_{-2.22}$	$3880^{+637}_{-692}$	$5313^{+3513}_{-1113}$	$2.862^{+17.687}_{-1.937}$

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

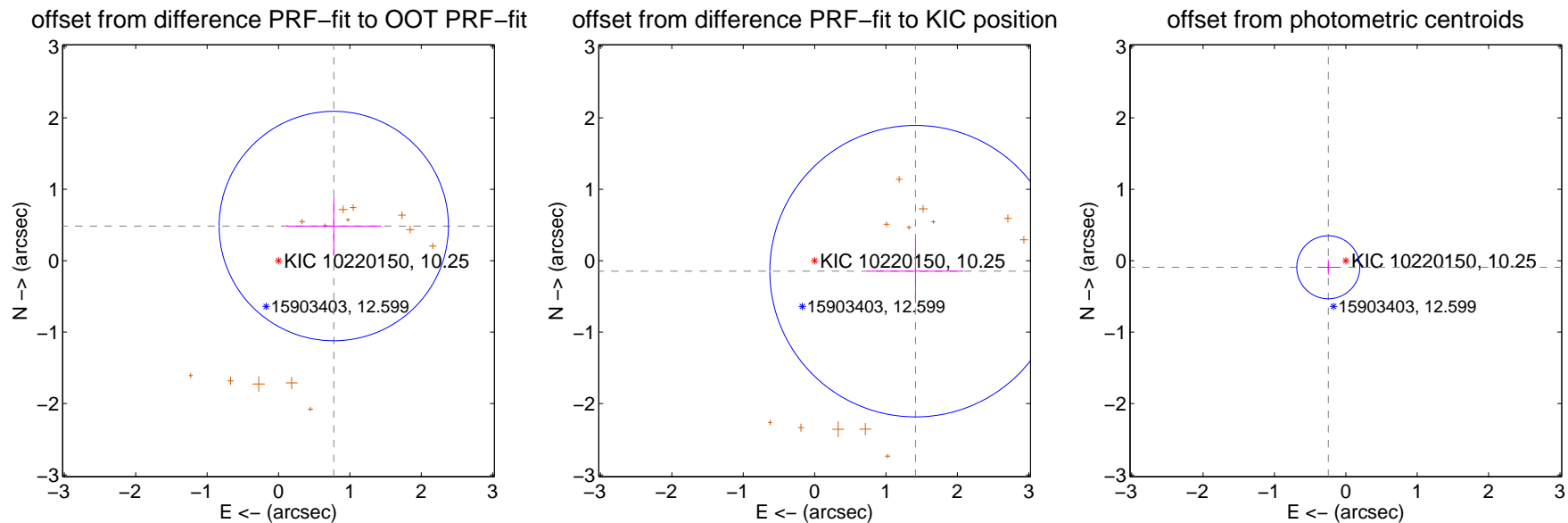
## DV Centroid Data

Supplemental centroid analysis for 010220150-03. **Kepler magnitude: 10.25.** Transit SNR 16.90

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

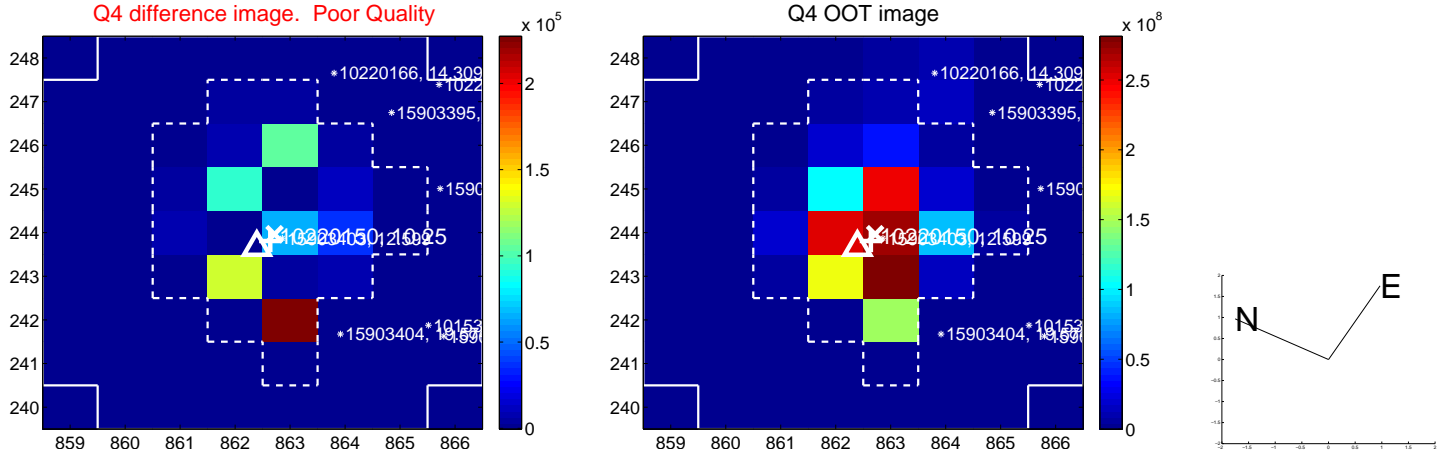
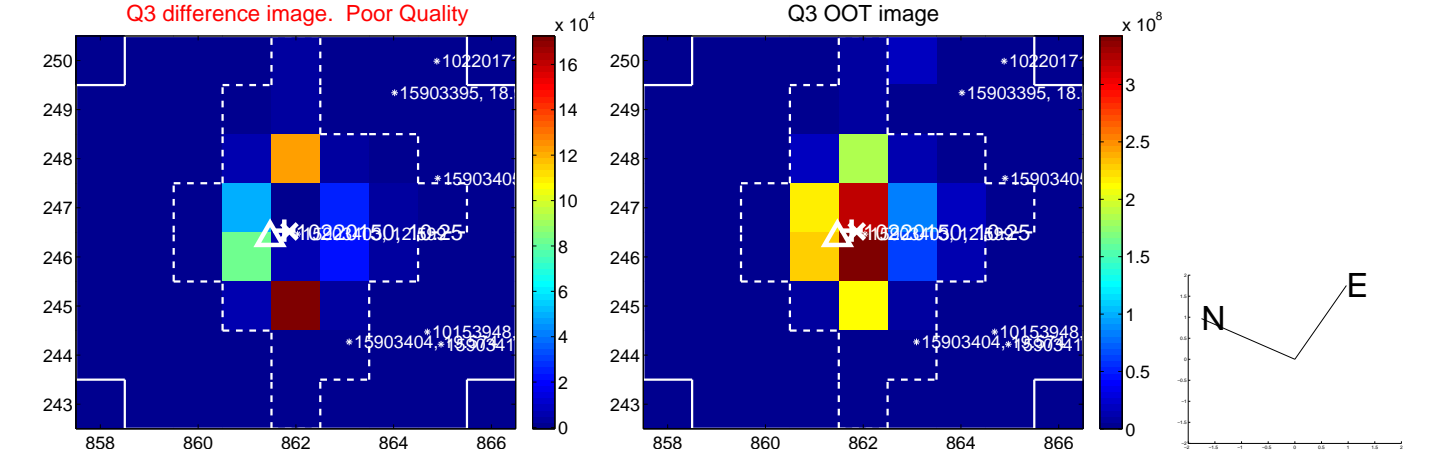
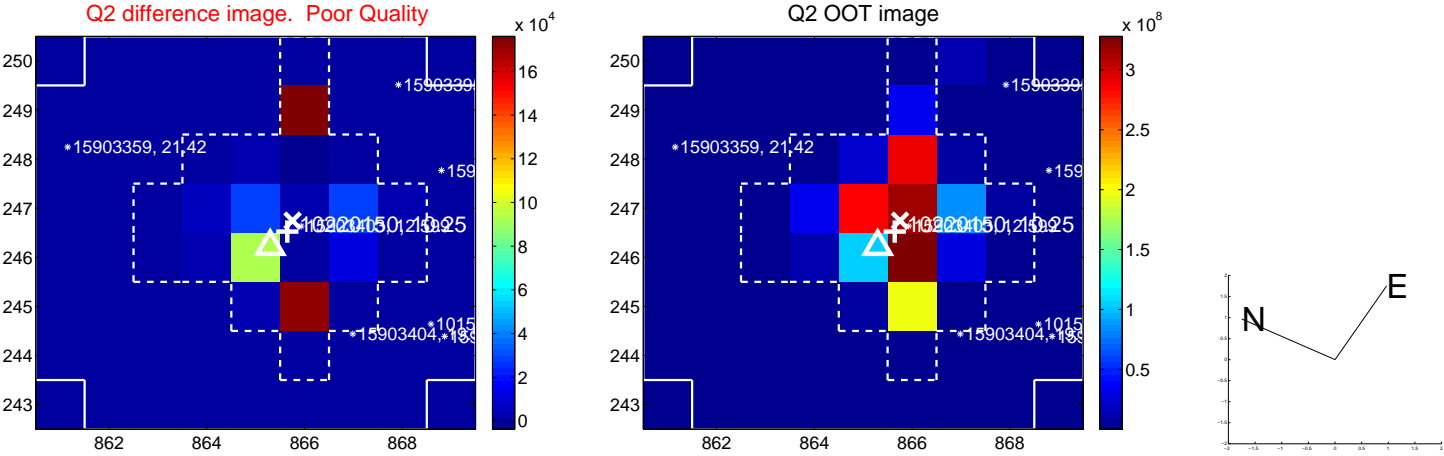
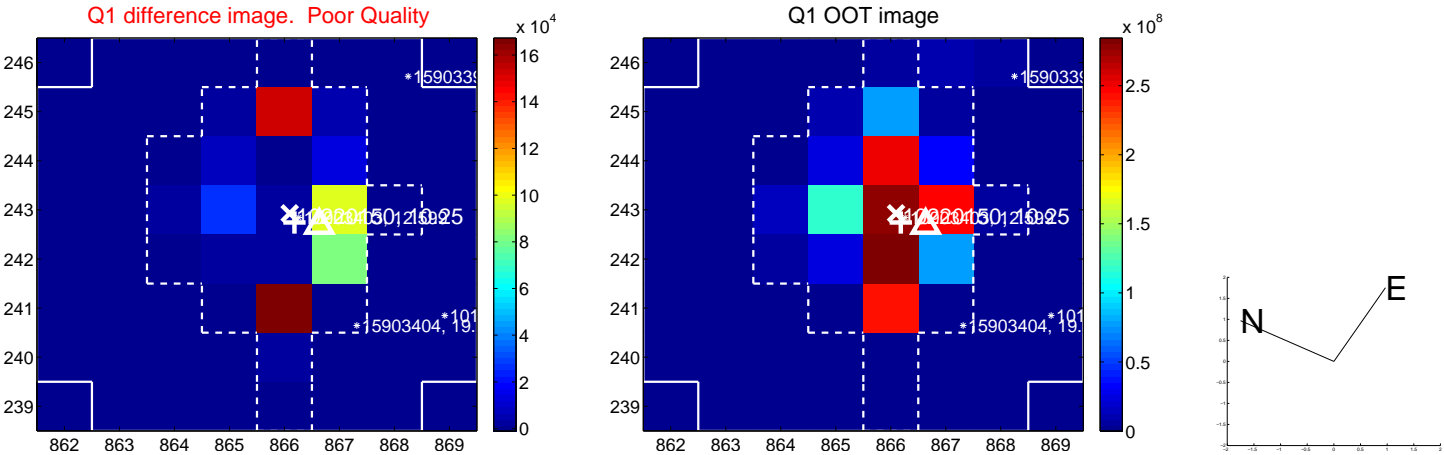
The direct PRF centroid is offset from the target star catalog position by about 0.88 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.914 \pm 0.535$	1.71	$-0.775 \pm 0.667$	$0.485 \pm 0.401$
PRF-fit source offset from KIC position	$1.421 \pm 0.680$	2.09	$-1.413 \pm 0.671$	$-0.147 \pm 0.448$
photometric centroid source offset	$0.26 \pm 0.15$	1.78	$0.25 \pm 0.15$	$-0.09 \pm 0.10$

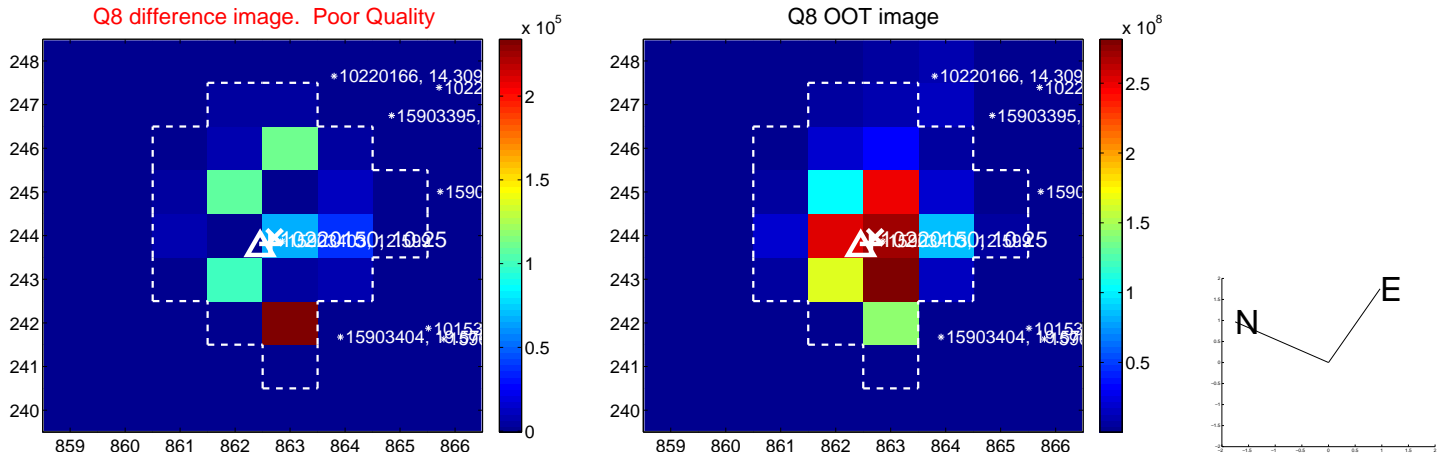
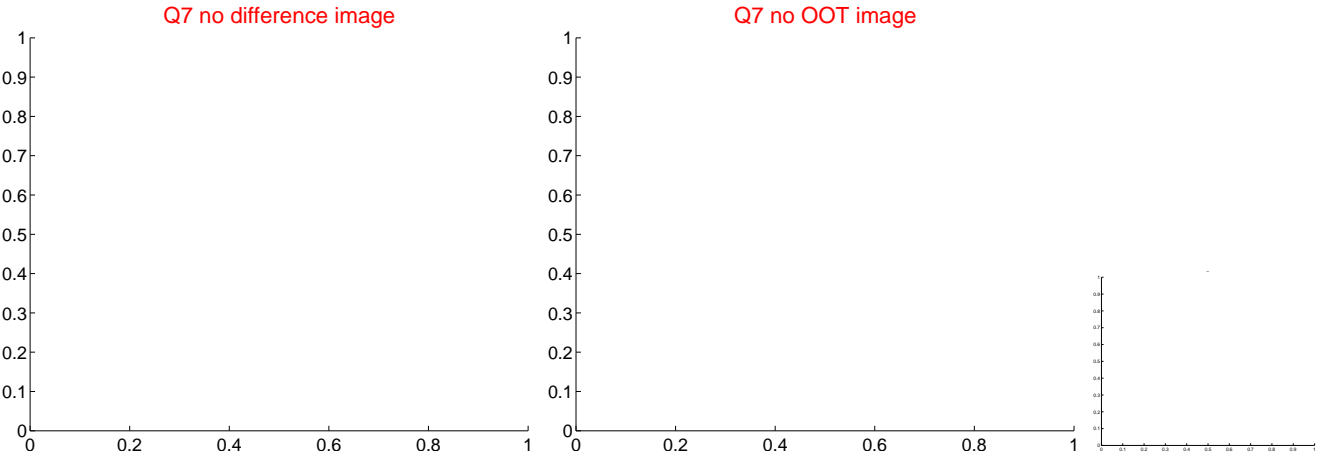
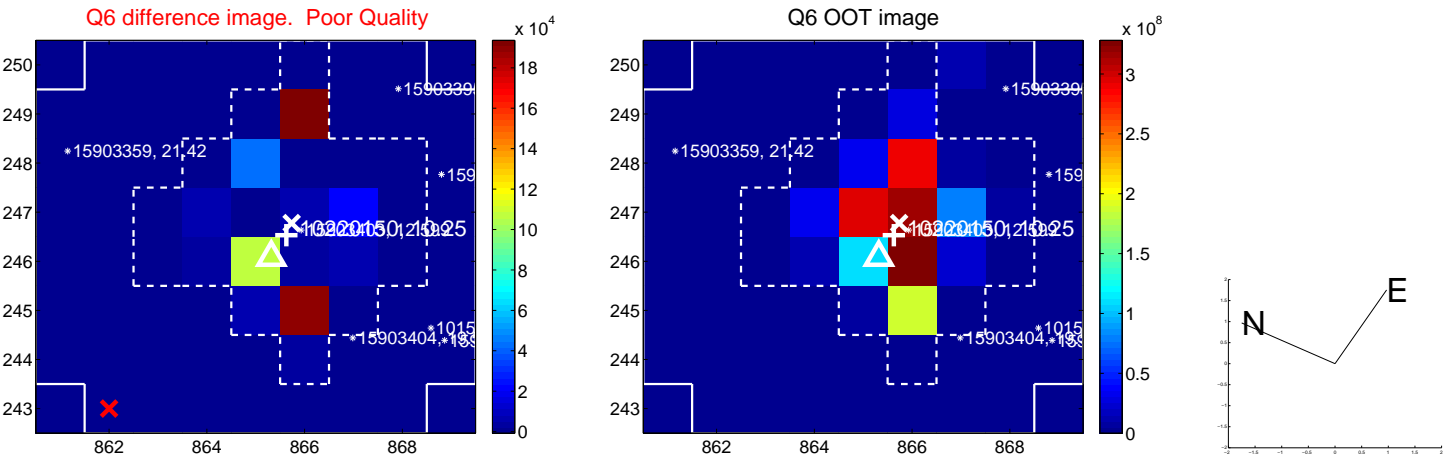
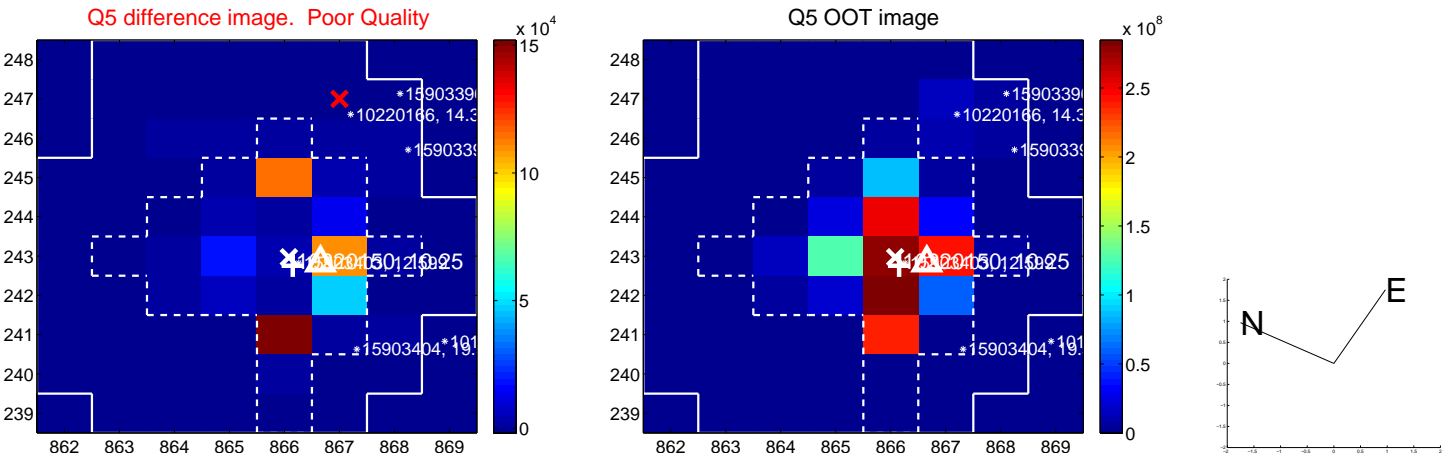


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

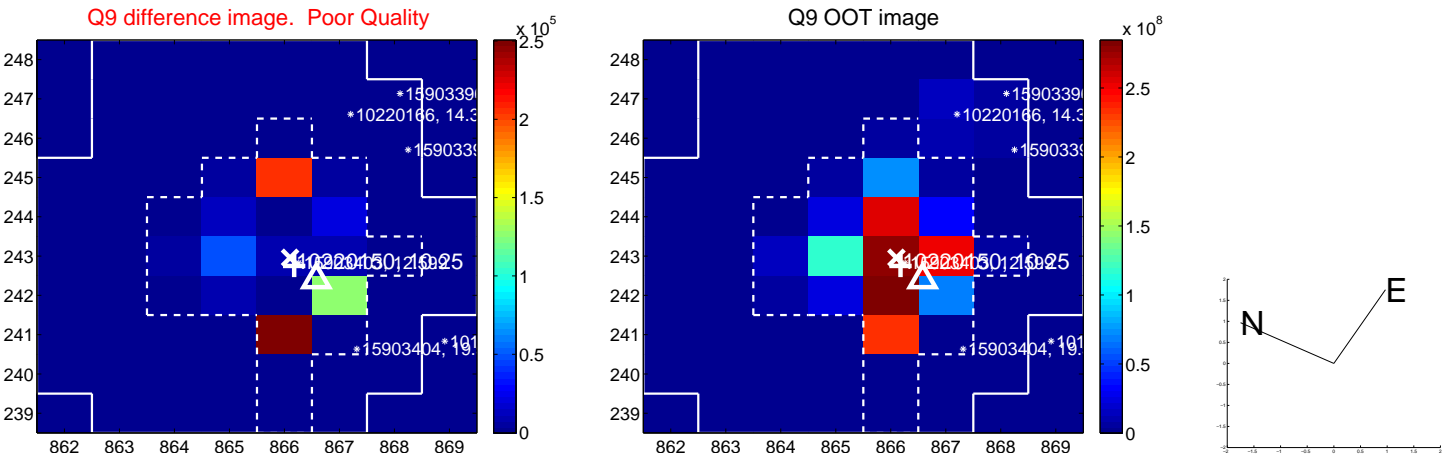


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

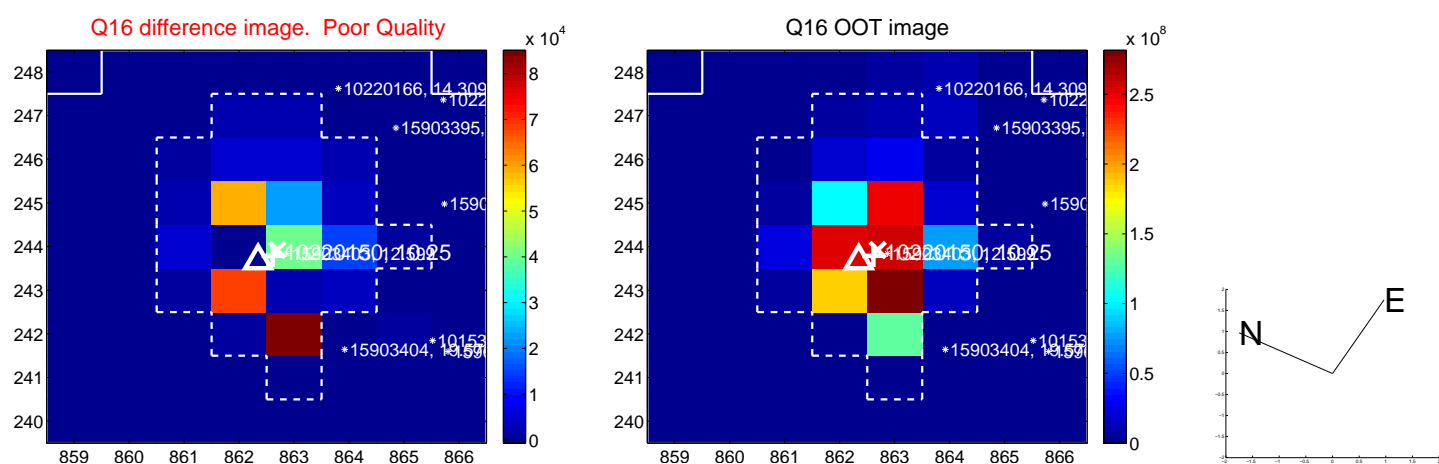
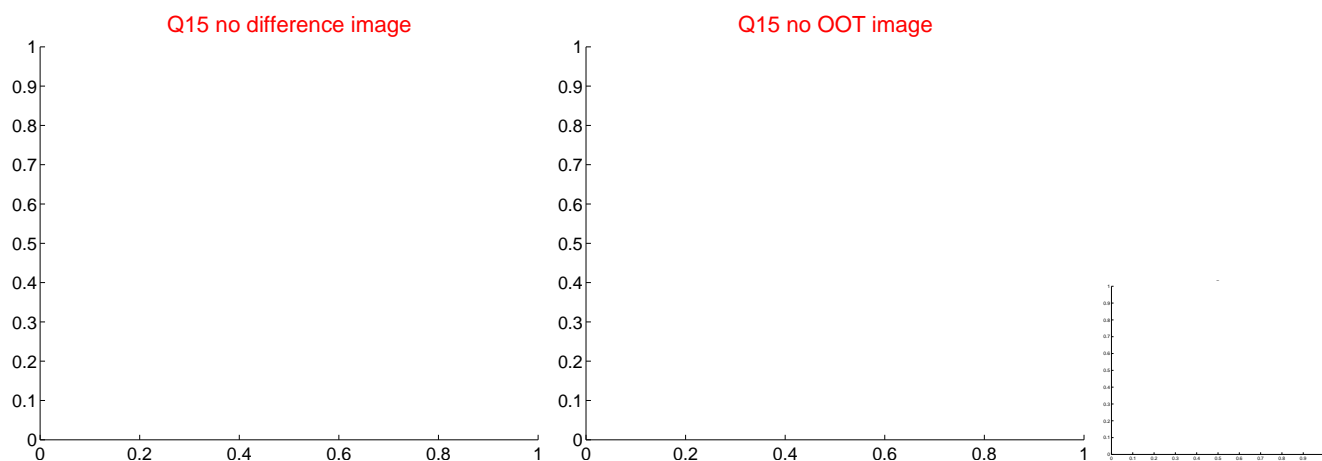
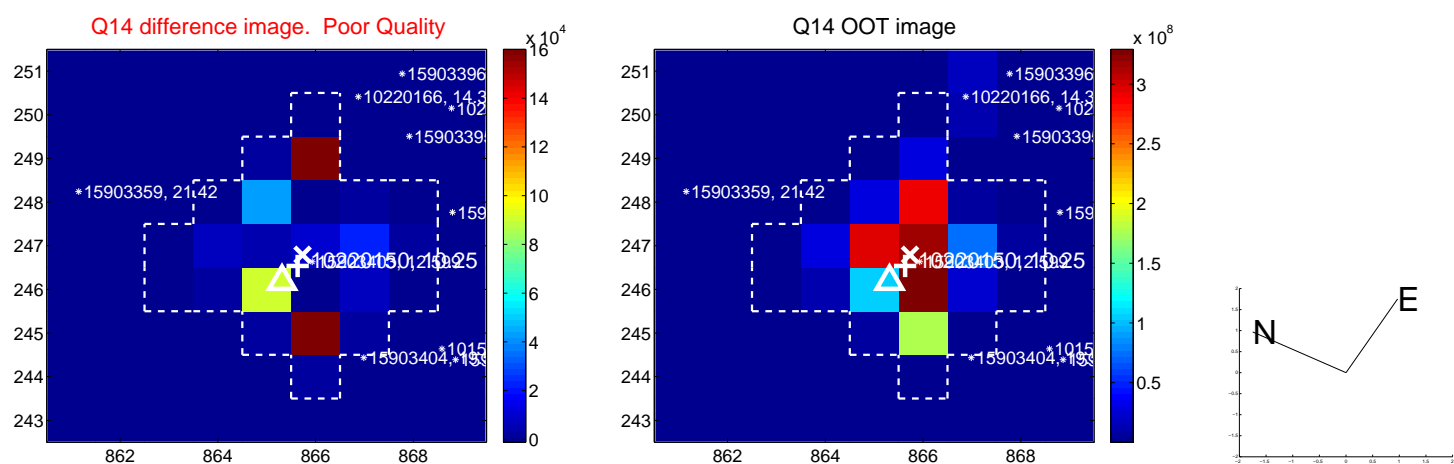
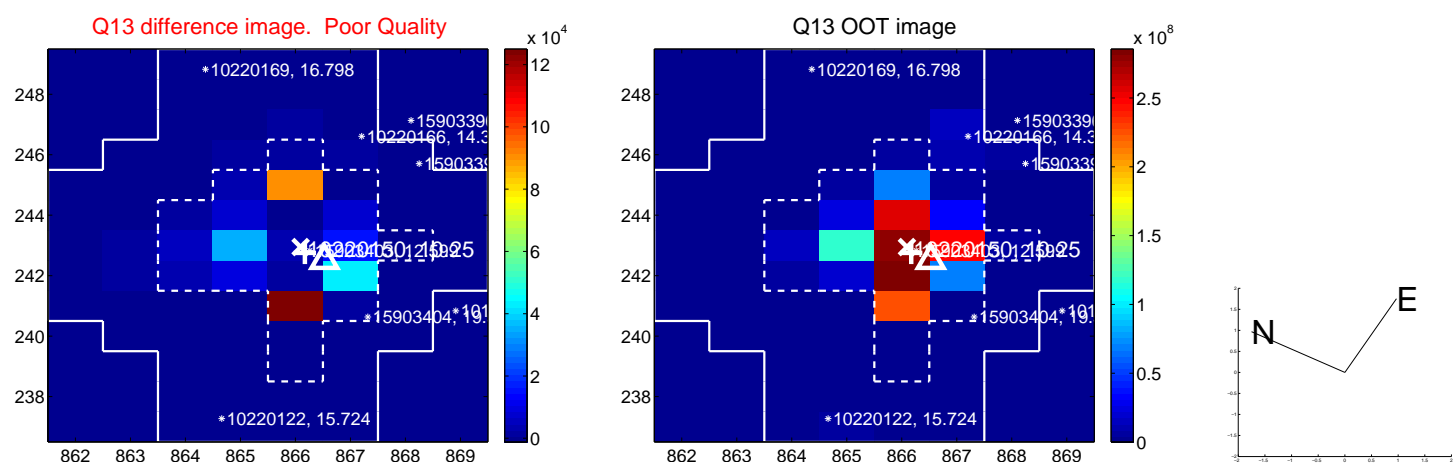




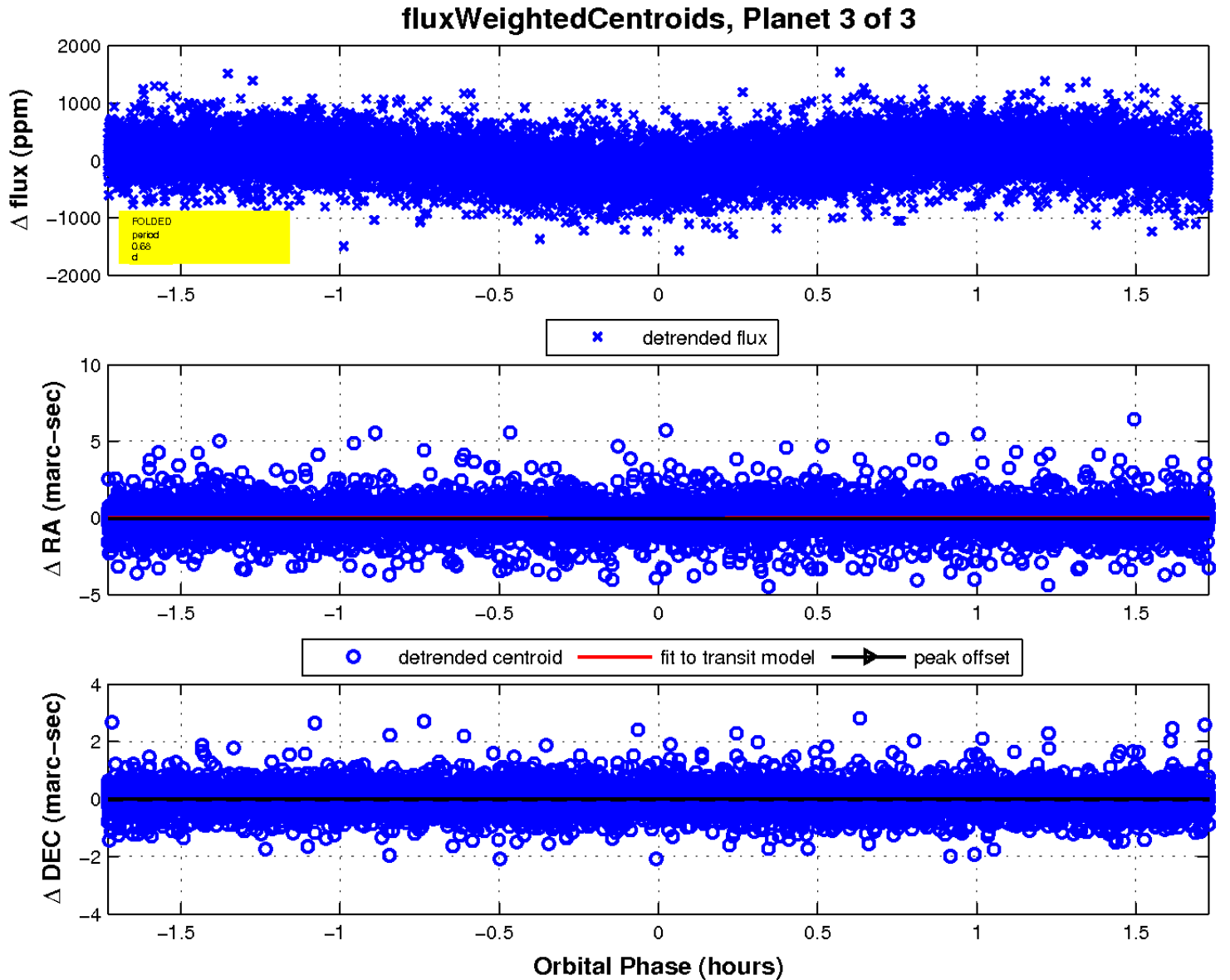
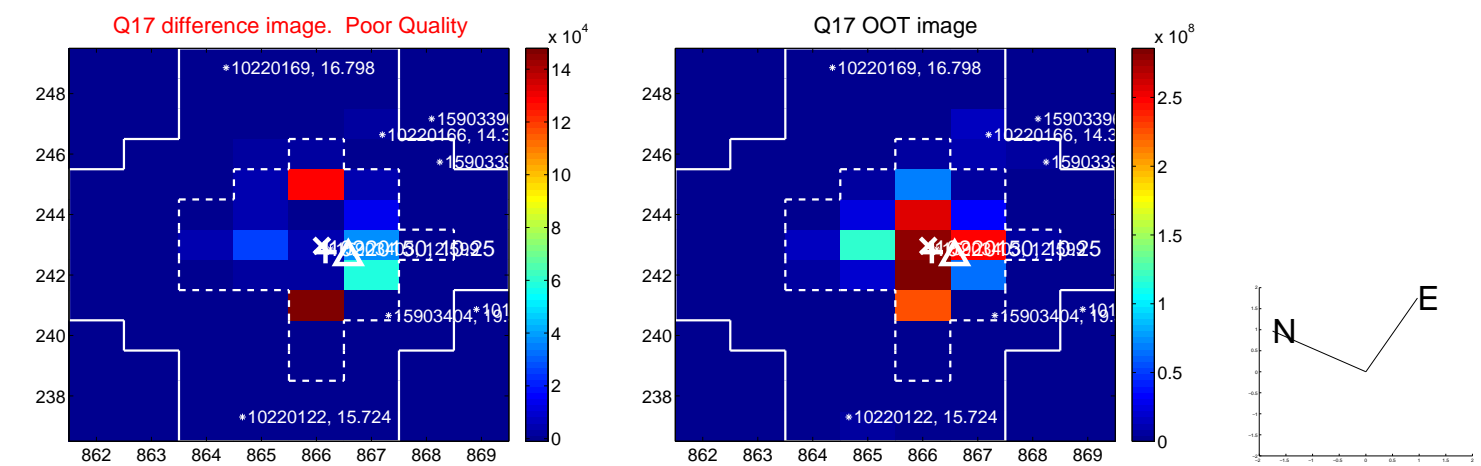
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

