

# KIC 010139275

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010139275-01	OBS	No	416.006744	185.098010	724.0	19.433	8.3	8.7	0.93	5997	2.54	0.83
010139275-02	OBS	No	270.122814	235.855087	597.4	10.624	7.5	7.6	0.93	5997	2.42	1.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010139275-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010139275-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

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

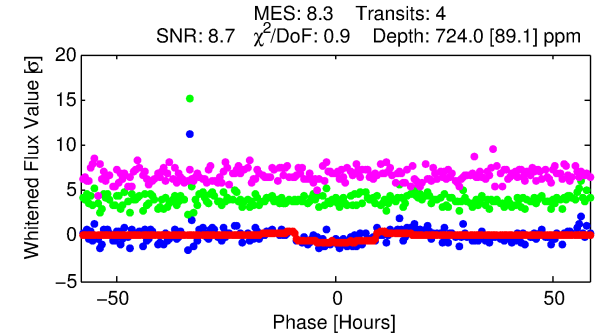
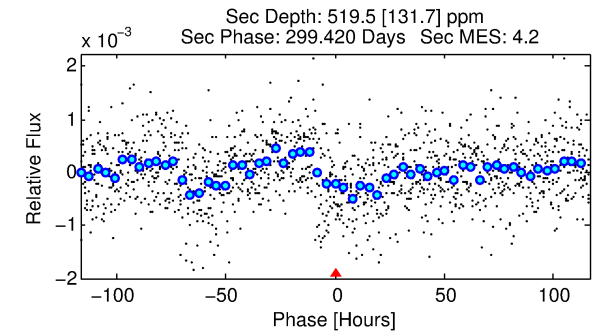
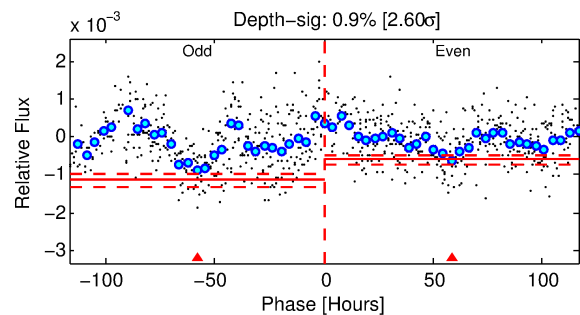
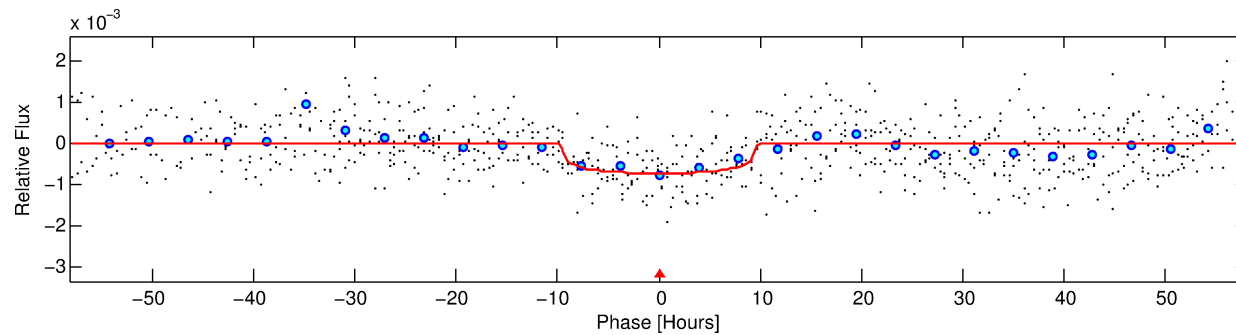
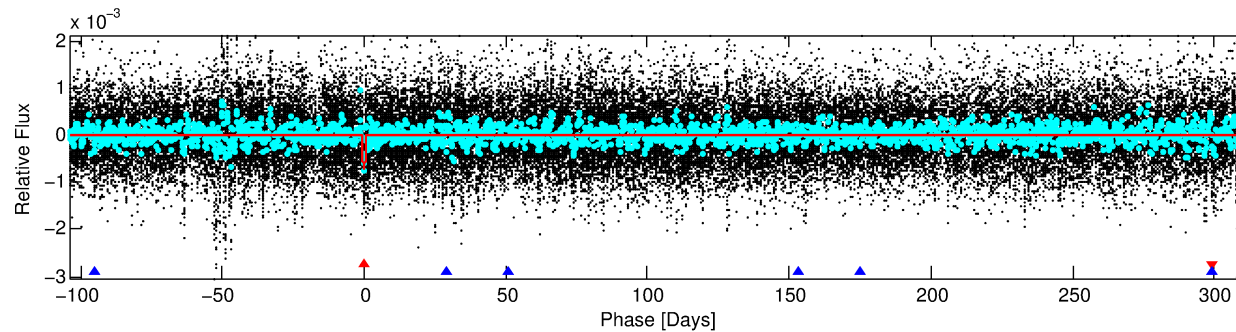
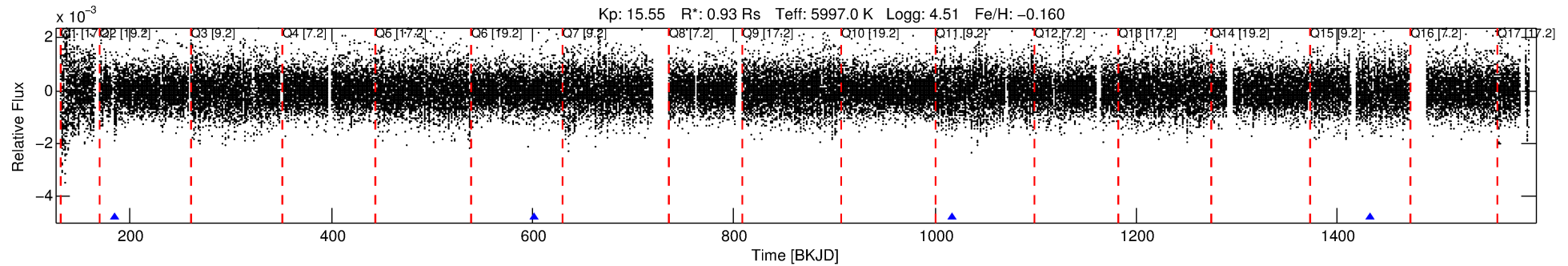
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010139275-01

No Significant Match Found

# DV One-Page Summary

KIC: 10139275 Candidate: 1 of 2 Period: 416.007 d



## DV Fit Results:

Period = 416.00674 [0.00989] d  
Epoch = 185.0980 [0.0171] BKJD  
Rp/R\* = 0.0250 [0.0092]  
a/R\* = 154.50 [262.85]  
b = 0.40 [3.63]  
Seff = 0.84 [0.35]  
Teq = 244 [26] K  
Rp = 2.53 [1.23] Re  
a = 1.0942 [0.2956] AU  
Ag = 53256.21 [46490.36] [1.15σ]  
Teffp = 5726 [1127] K [4.86σ]

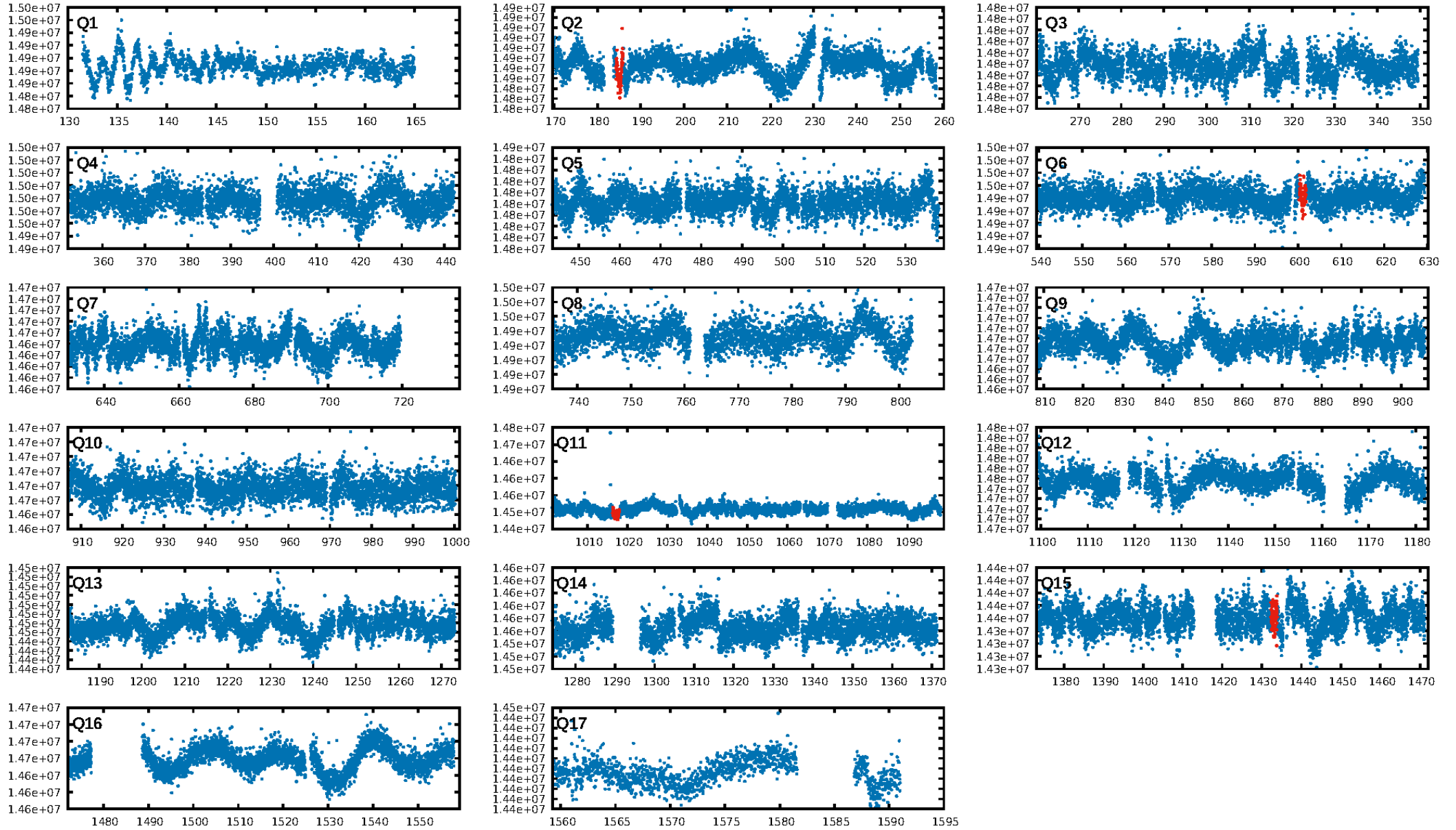
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [158.08σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 22.5%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 5.35e-10**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 1.109  
Centroid-sig: 5.0%  
Centroid-so: 2.977 arcsec [1.65σ]  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-st: 0/0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 1.00 [2/2]

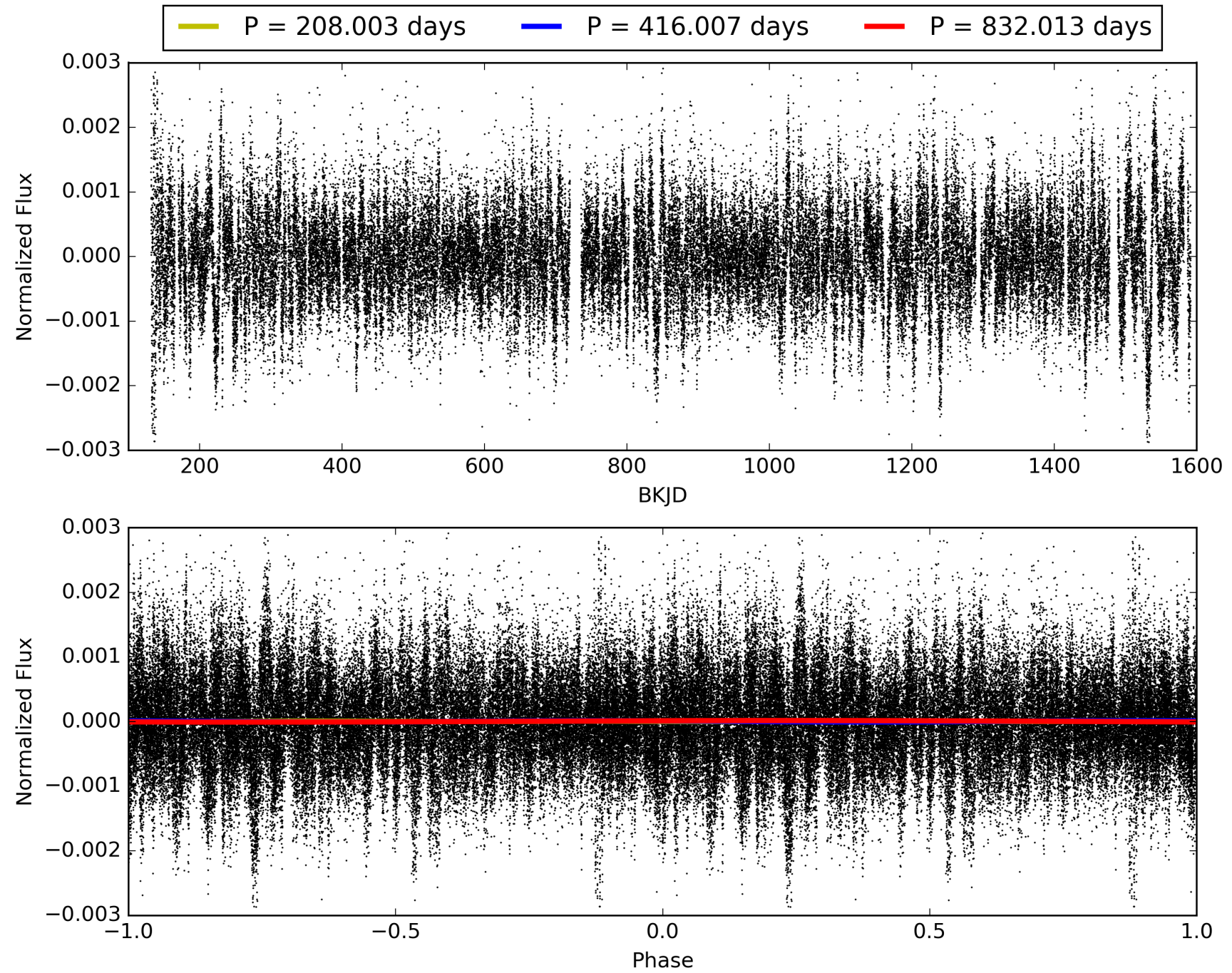
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:34:09 Z

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

# TCE 010139275-01, PDC Light Curves

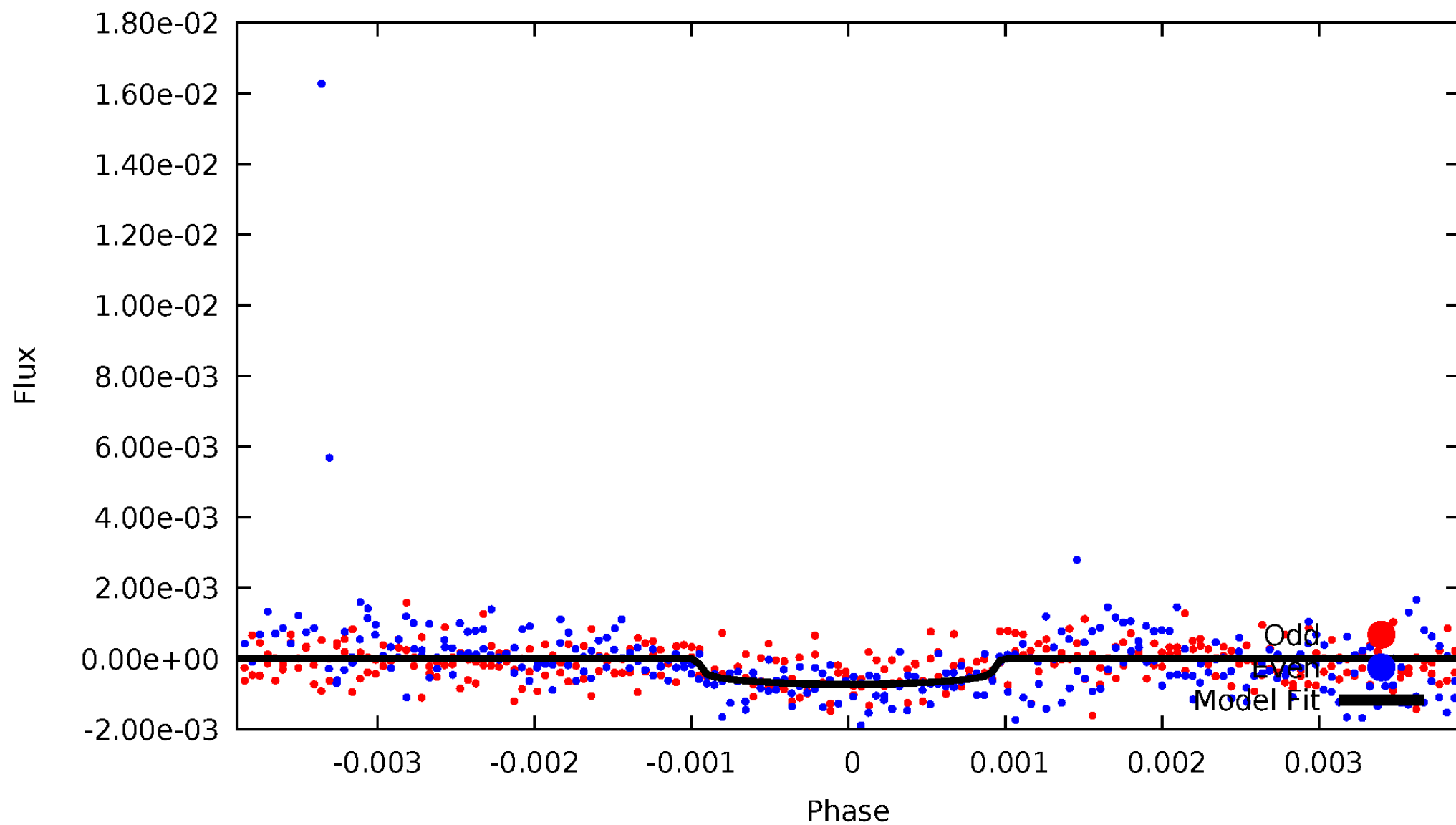


TCE 010139275-01



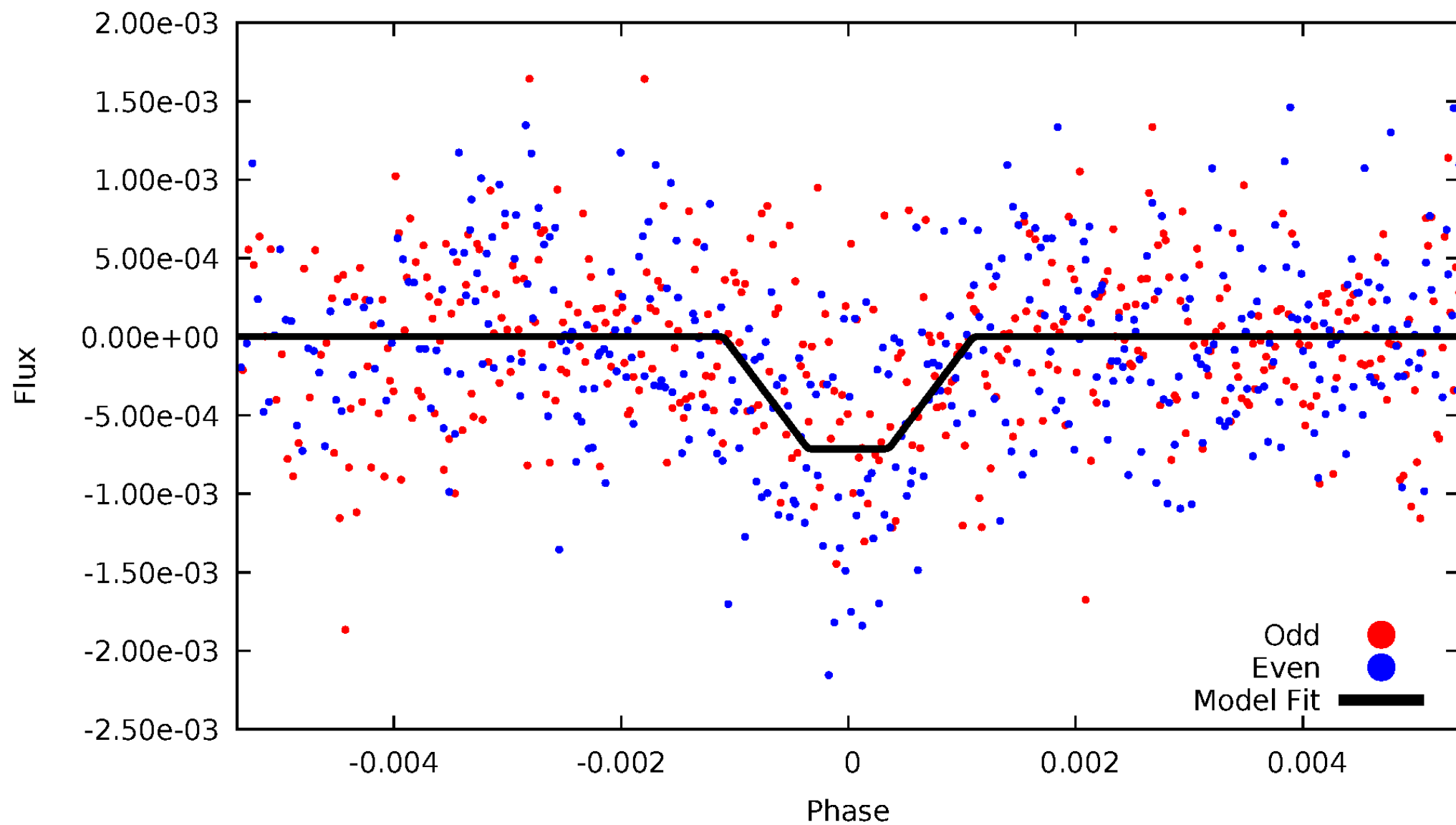
# DV Odd/Even

TCE 010139275-01



# ALT Odd/Even

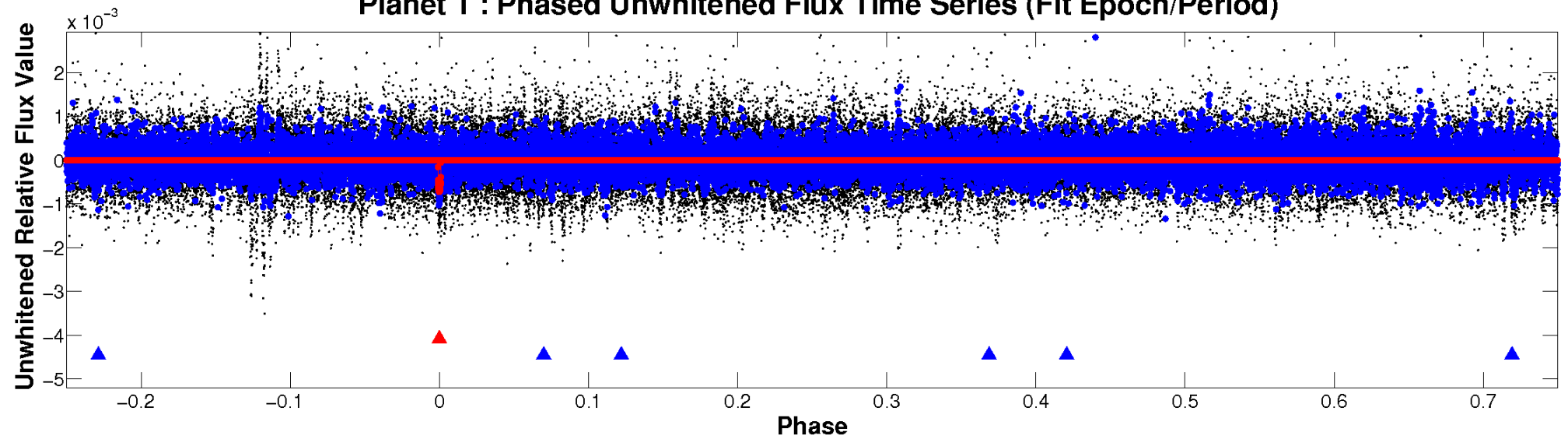
TCE 010139275-01



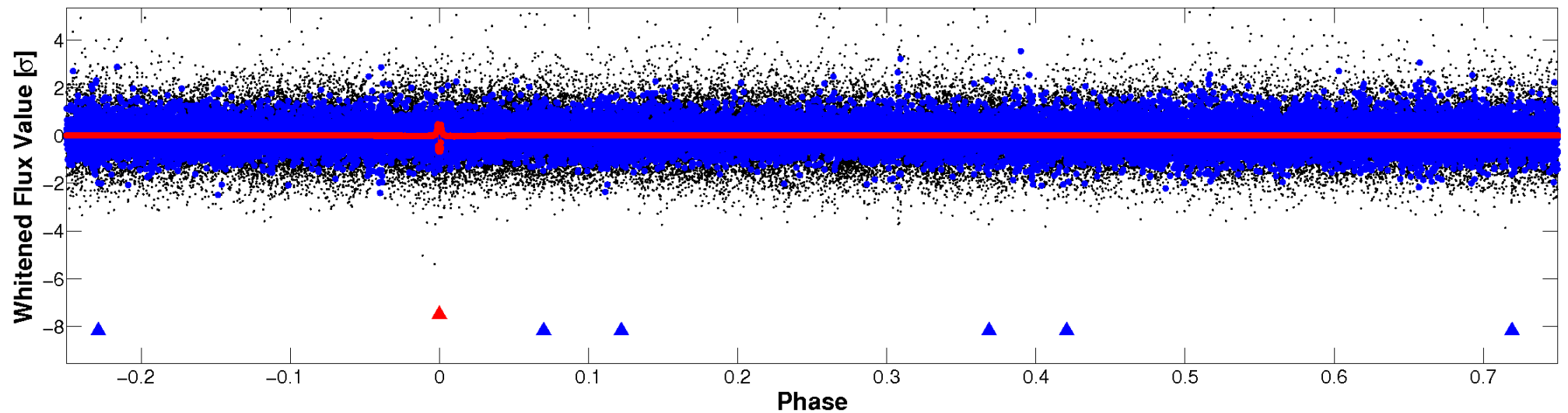


# Non-Whitened Vs. Whitened Light Curve

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

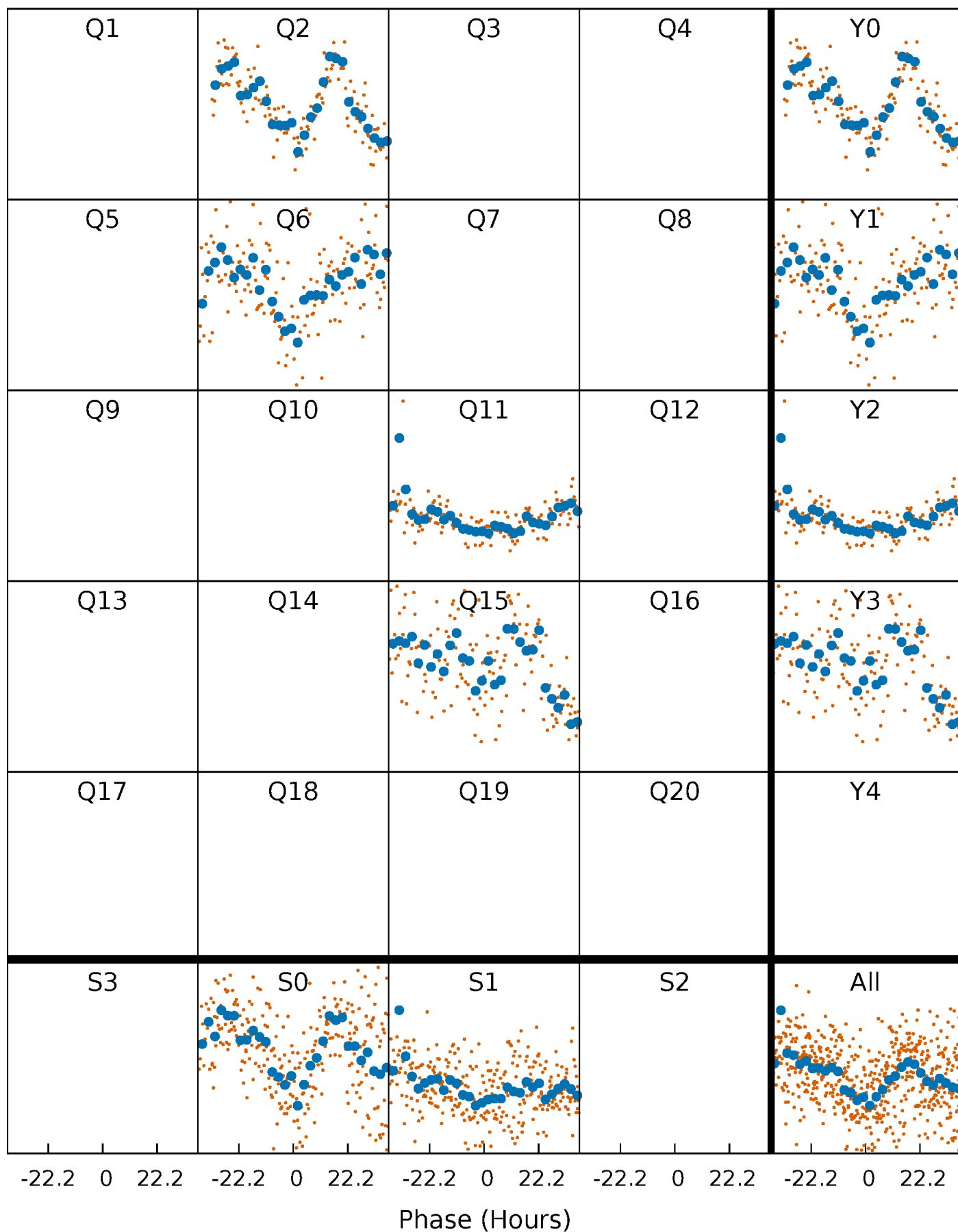


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

TCE 010139275-01 P=416.006744 Days  $T_0=185.098010$  (BKJD)





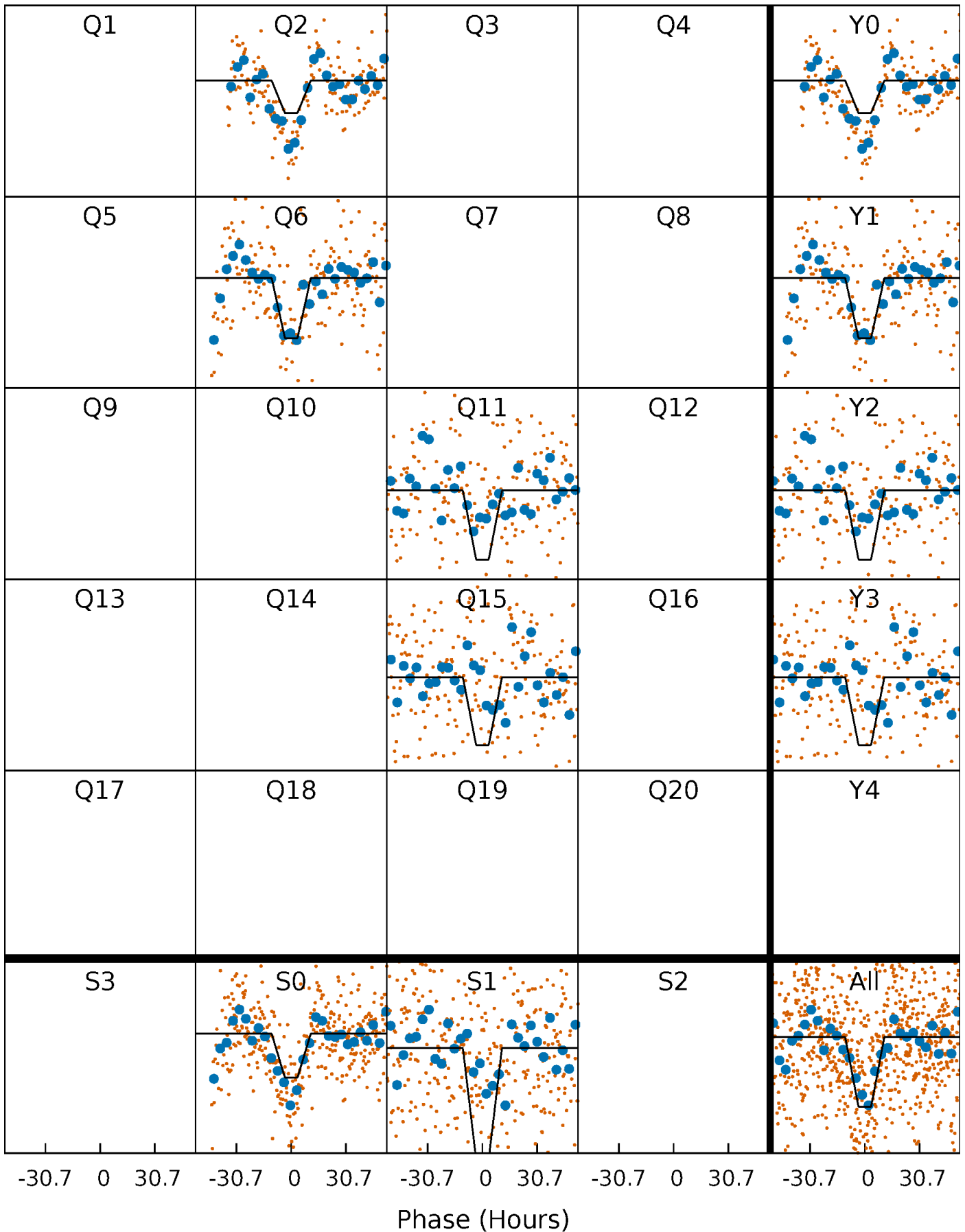
# DV Quarter-Phased Transit Curves

TCE 010139275-01     $P=416.006744$  Days     $T_0=185.098010$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

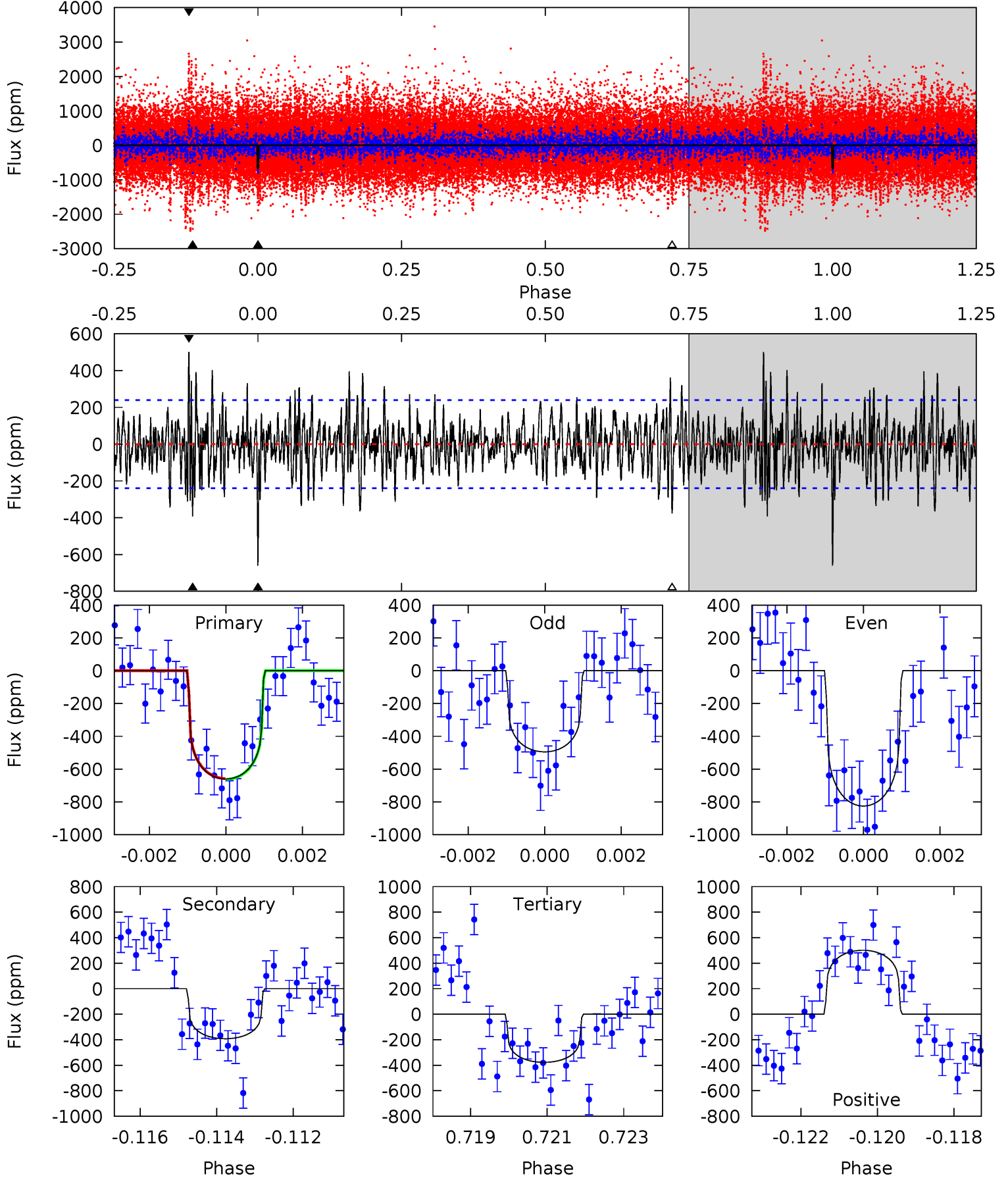
TCE 010139275-01 P=415.897869 Days  $T_0=185.203244$  (BKJD)



# DV Model-Shift Uniqueness Test

010139275-01, P = 416.006744 Days, E = 185.098010 Days

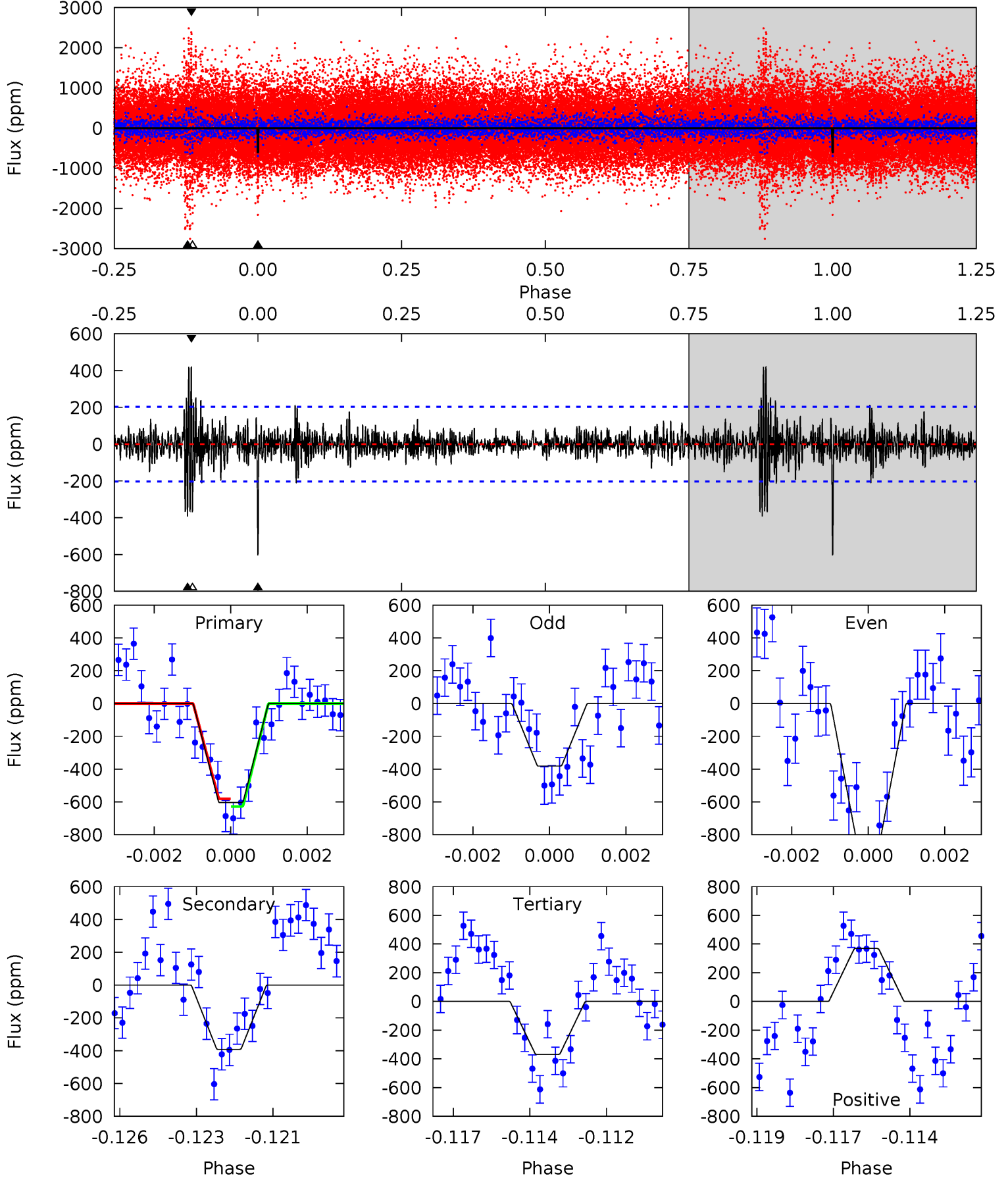
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.7	8.73	8.40	11.2	5.33	3.10	2.58	6.30	3.54	0.33	-2.43	3.66	1.02	0.43	0.05



# Alt Model-Shift Uniqueness Test

010139275-01, P = 415.897869 Days, E = 185.203244 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
15.8	10.2	9.64	9.63	5.31	3.06	1.53	6.14	6.15	0.60	0.60	5.81	1.24	0.41	0.61



### Stellar Parameters For KIC 010139275

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5997^{+179}_{-197}$	$4.506^{+0.052}_{-0.221}$	$-0.160^{+0.300}_{-0.300}$	$0.929^{+0.293}_{-0.098}$	$1.009^{+0.131}_{-0.131}$	$1.774^{+0.396}_{-0.947}$
	+3%/-3%	+1%/-5%	+188%/-188%	+32%/-11%	+13%/-13%	+22%/-53%
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 010139275-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-392 \pm 45$	$2.62^{+1.08}_{-0.99}$	$348^{+25}_{-17}$	$5404^{+1320}_{-714}$	$36719^{+54800}_{-18379}$
Alt.	$-392 \pm 38$	$2.90^{+1.07}_{-1.05}$	$349^{+25}_{-18}$	$5177^{+1223}_{-587}$	$30460^{+45613}_{-14340}$

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

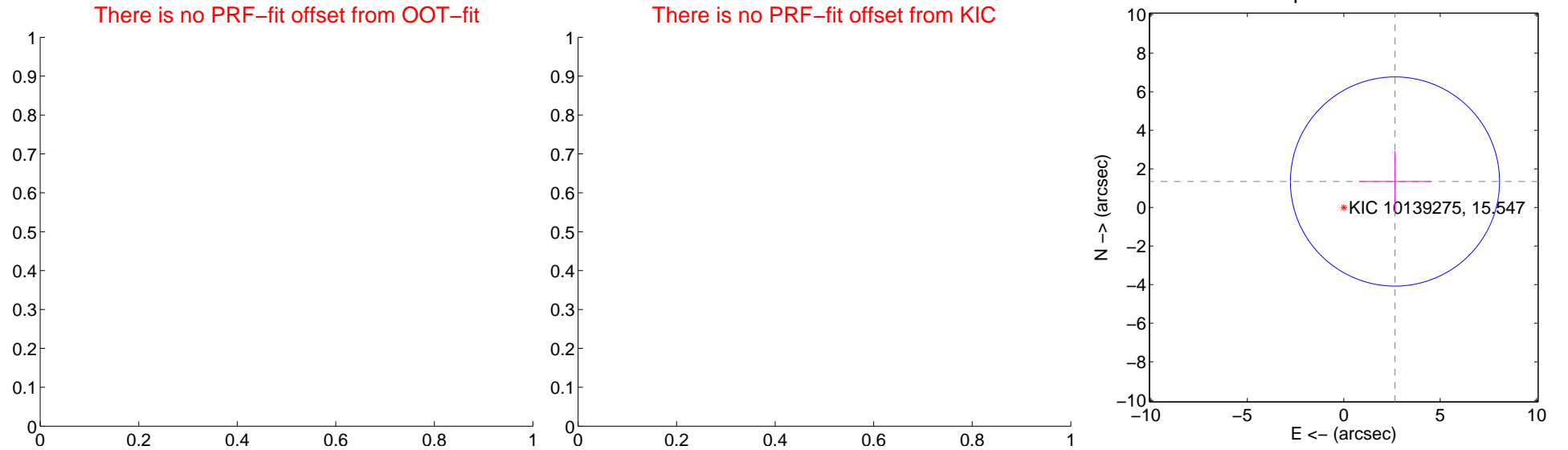
## DV Centroid Data

Supplemental centroid analysis for 010139275-01. Kepler magnitude: 15.55. Transit SNR 8.67

There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	$2.98 \pm 1.81$	1.65	$-2.65 \pm 1.86$	$1.35 \pm 1.58$



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.



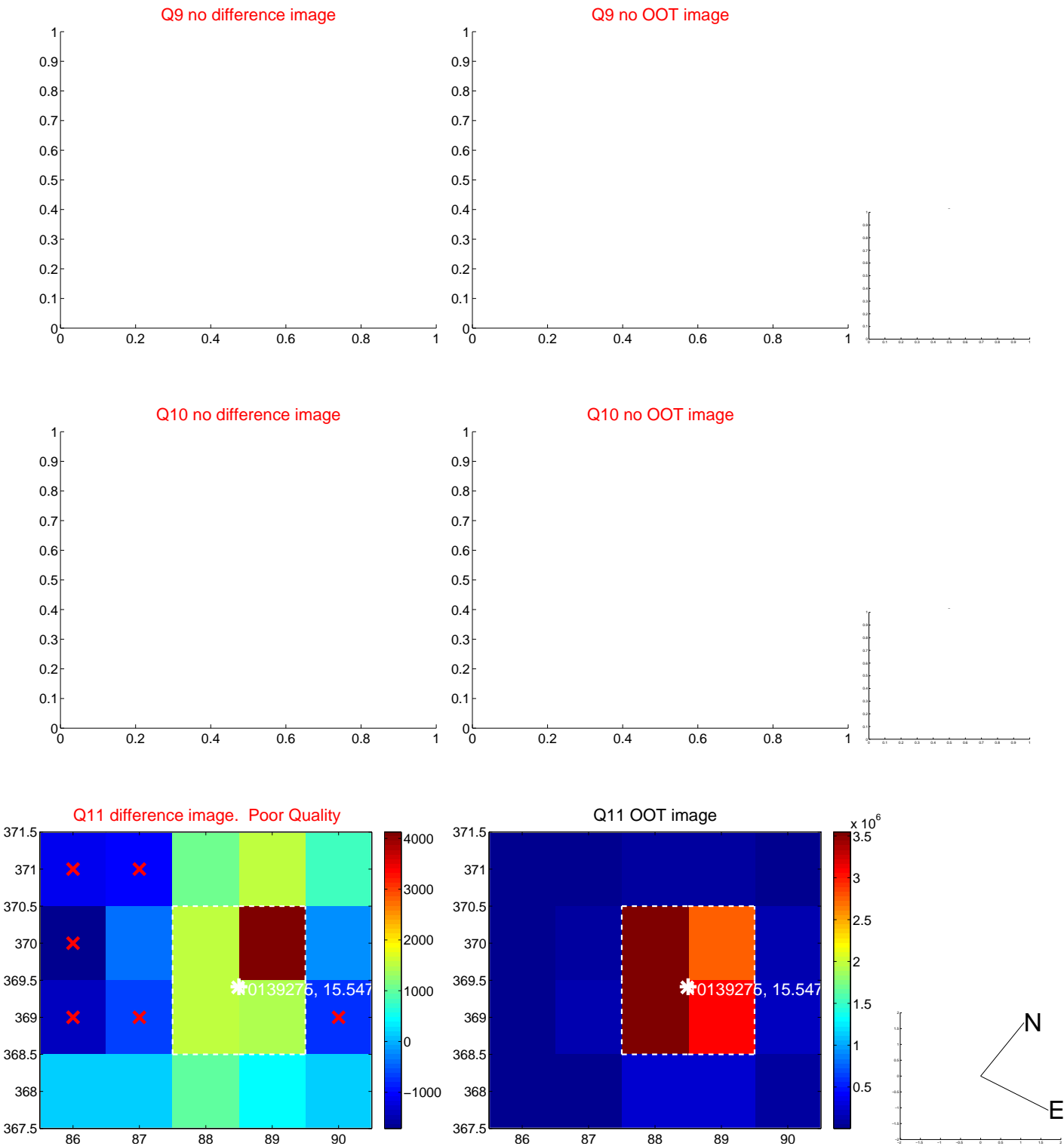
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



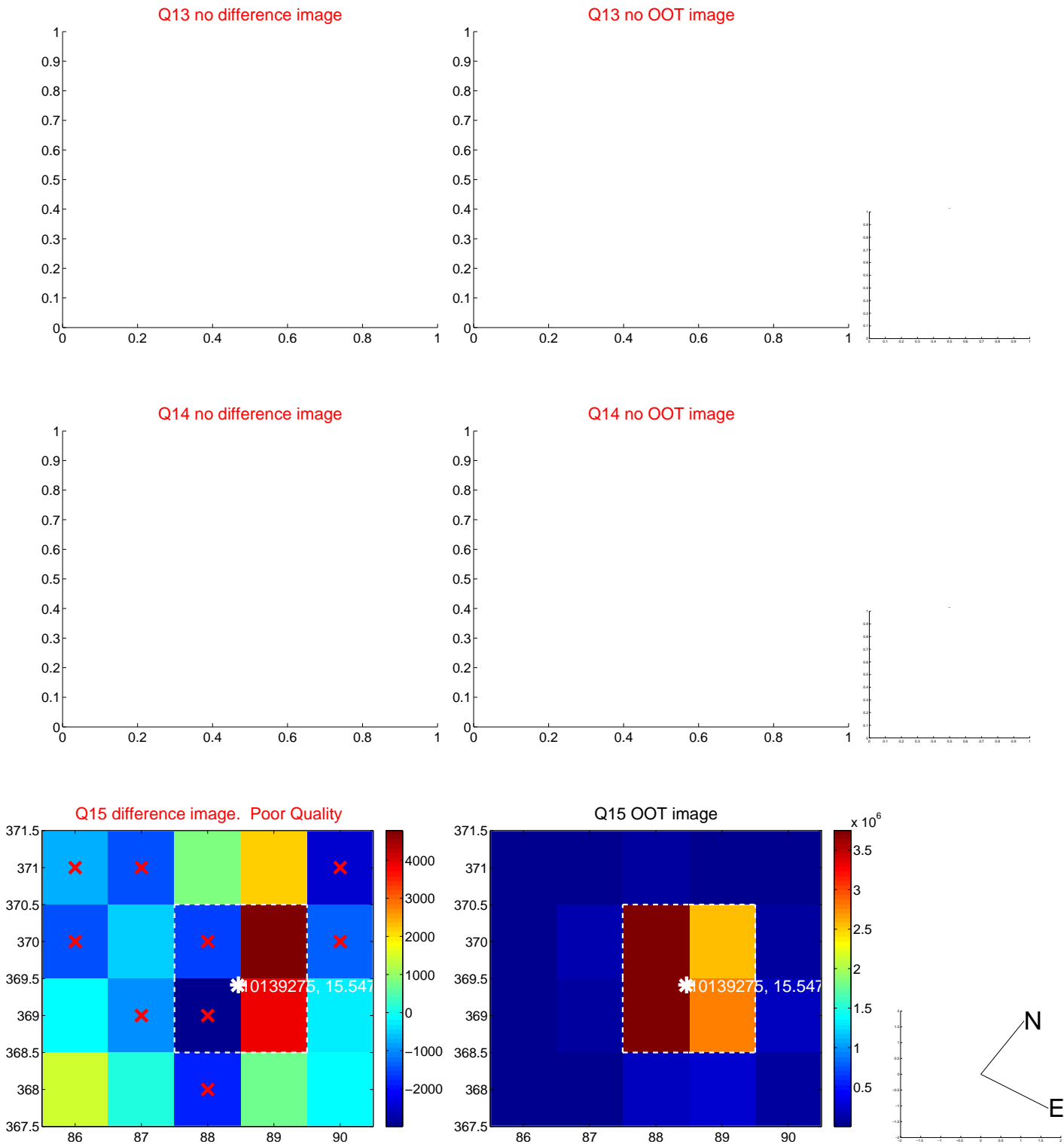
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



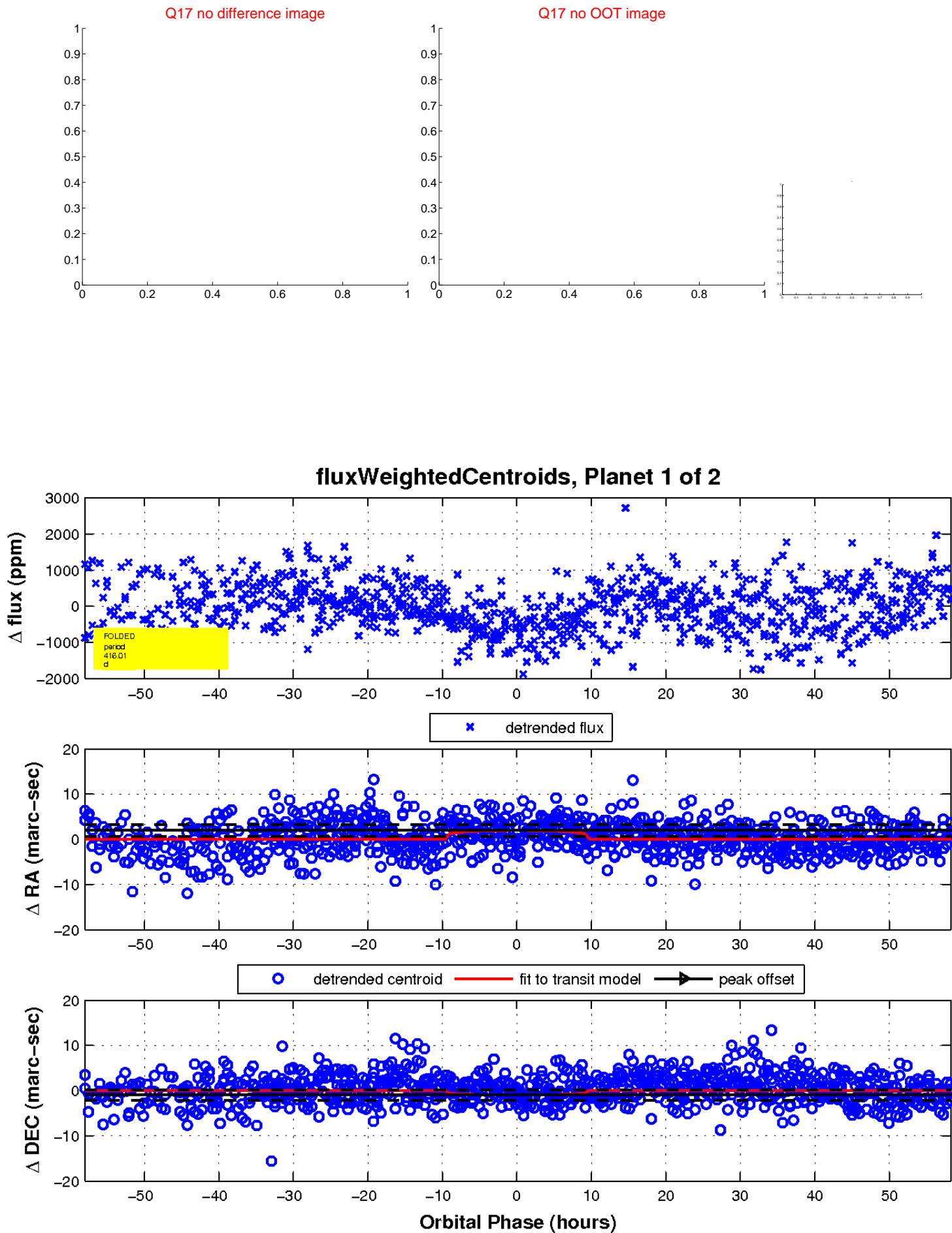
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

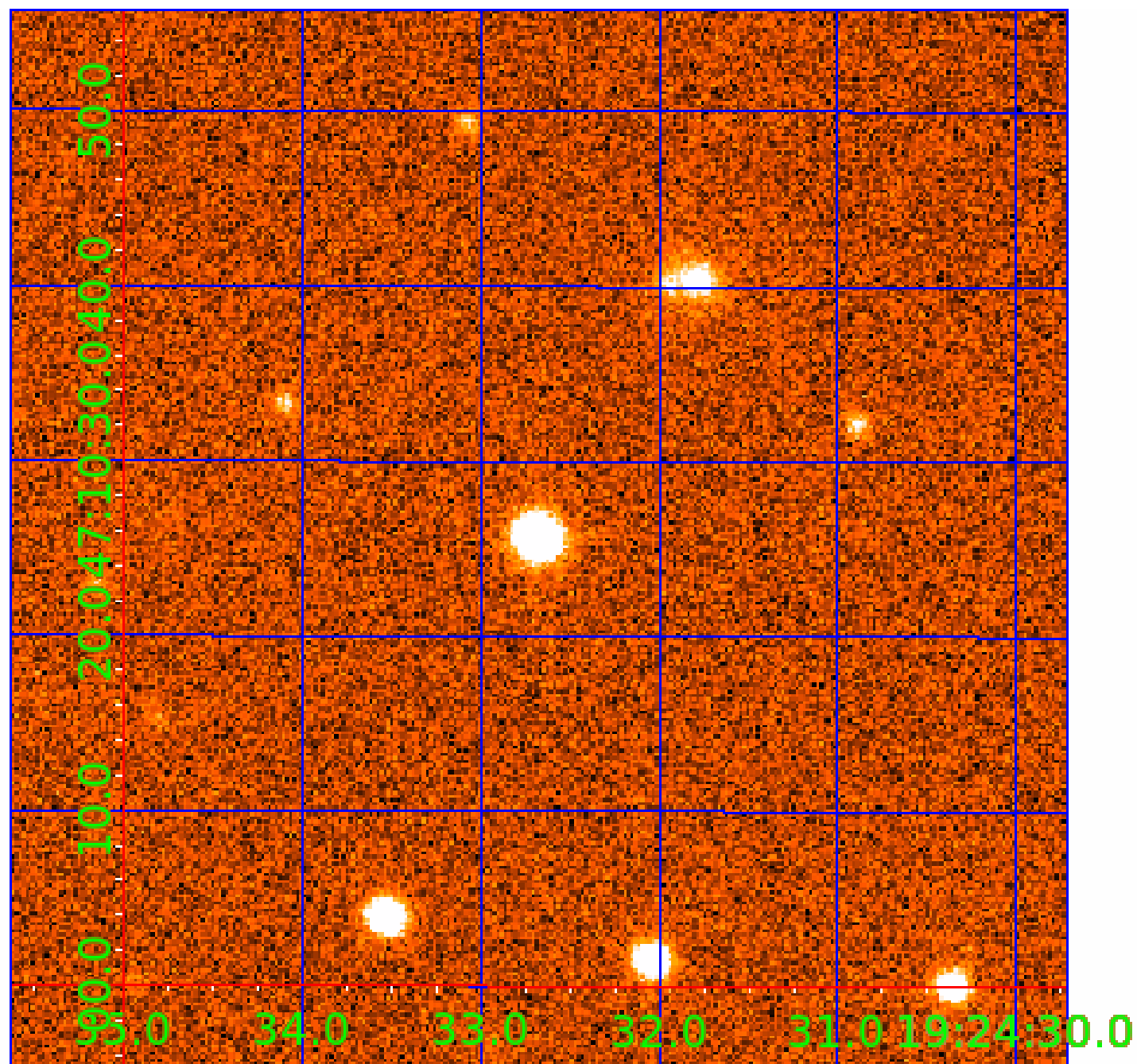


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010139275

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010139275-01	OBS	No	416.006744	185.098010	724.0	19.433	8.3	8.7	0.93	5997	2.54	0.83
010139275-02	OBS	No	270.122814	235.855087	597.4	10.624	7.5	7.6	0.93	5997	2.42	1.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010139275-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010139275-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

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

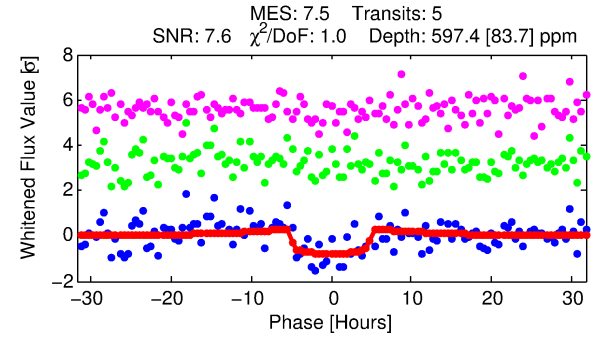
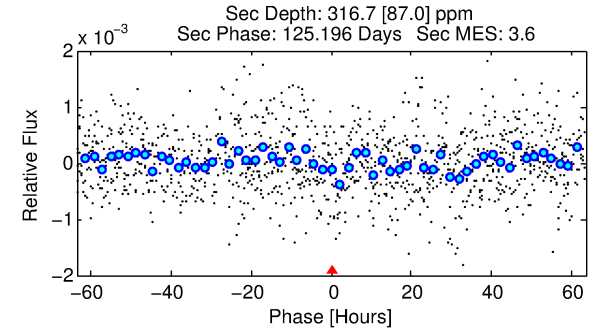
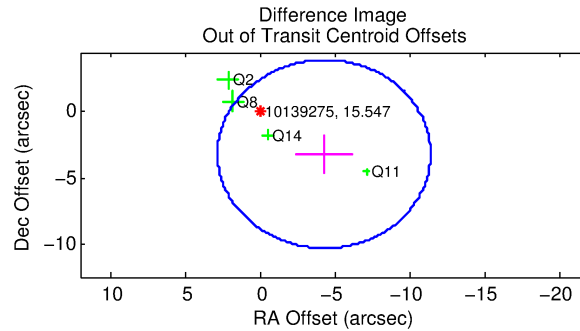
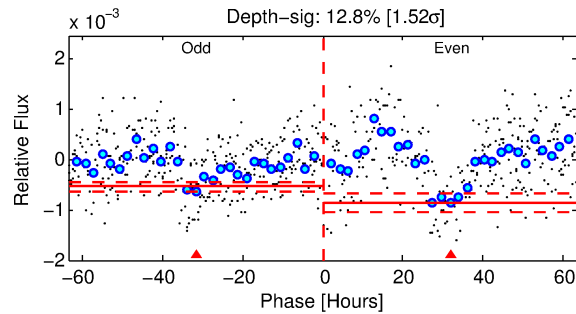
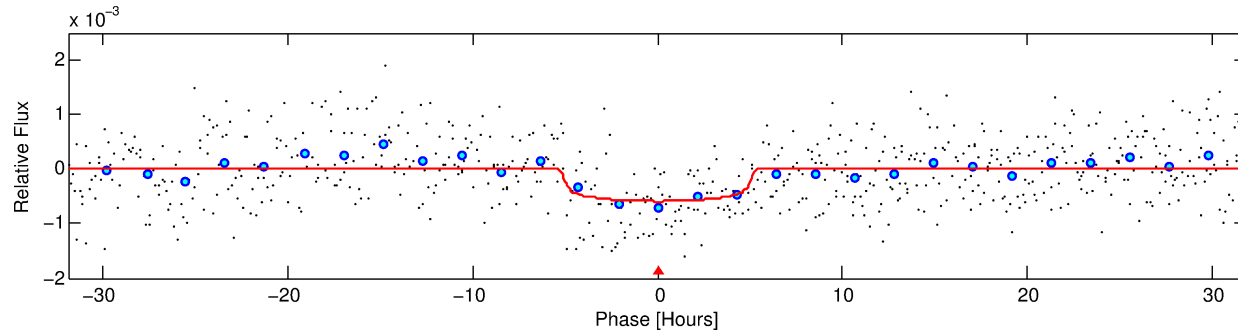
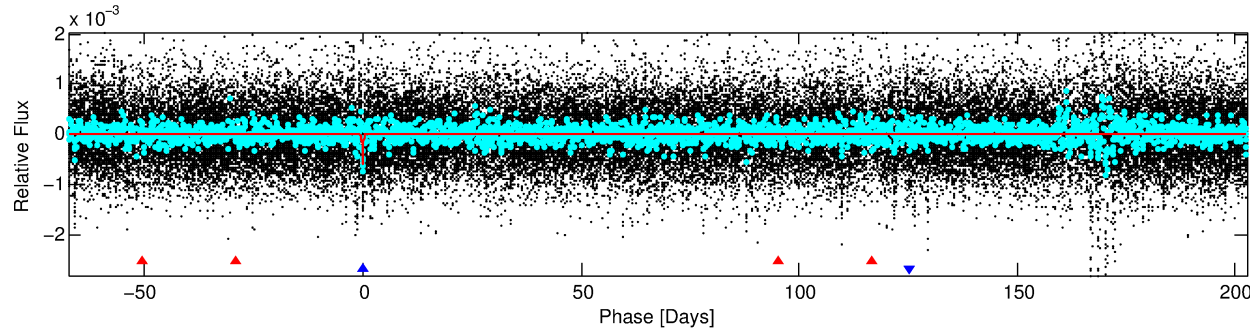
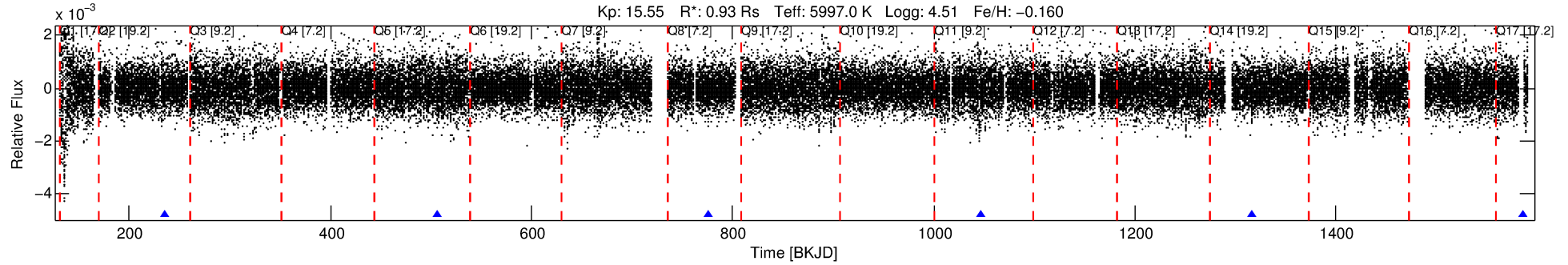
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010139275-02

No Significant Match Found

# DV One-Page Summary

KIC: 10139275 Candidate: 2 of 2 Period: 270.123 d



## DV Fit Results:

Period = 270.12281 [0.00665] d  
Epoch = 235.8551 [0.0172] BKJD  
Rp/R\* = 0.0239 [0.0103]  
a/R\* = 145.62 [294.41]  
b = 0.70 [1.50]  
Seff = 1.49 [0.62]  
Teq = 282 [30] K  
Rp = 2.42 [1.29] Re  
a = 0.8205 [0.2217] AU  
Ag = 19961.99 [19683.68] [1.01 $\sigma$ ]  
Teffp = 5174 [1179] K [4.15 $\sigma$ ]

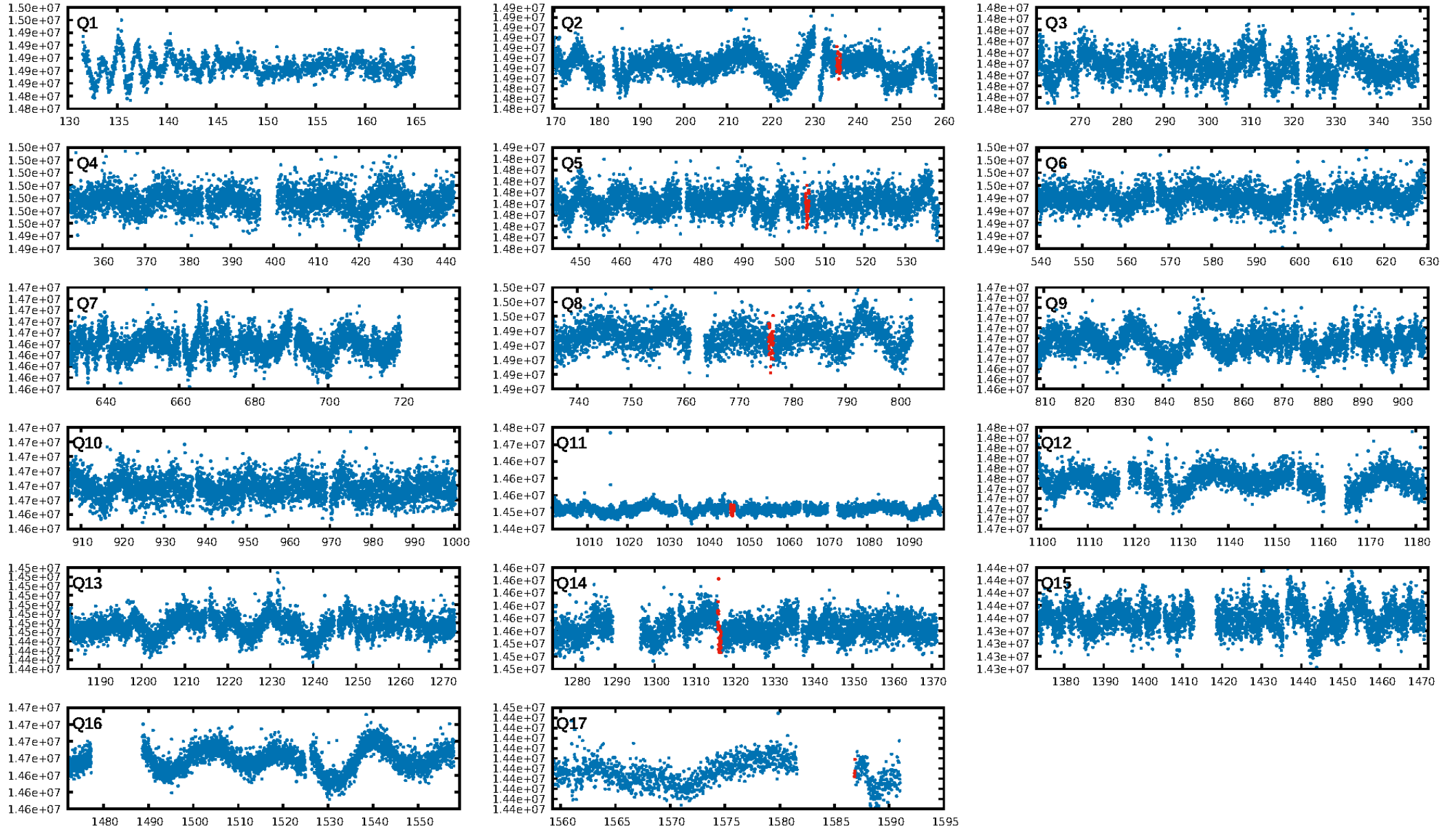
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [158.08 $\sigma$ ]  
ModelChiSquare2-sig: 18.7%  
ModelChiSquareGof-sig: 99.6%  
**Bootstrap-pfa: 1.75e-10**  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -5.45  
Centroid-sig: 80.8%  
Centroid-so: 0.686 arcsec [0.38 $\sigma$ ]  
OotOffset-rm: 5.368 arcsec [2.26 $\sigma$ ]  
OotOffset-st: 2/1/1/0 [4]  
KicOffset-rm: 5.336 arcsec [2.36 $\sigma$ ]  
KicOffset-st: 2/1/1/0 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 1.00 [4/4]

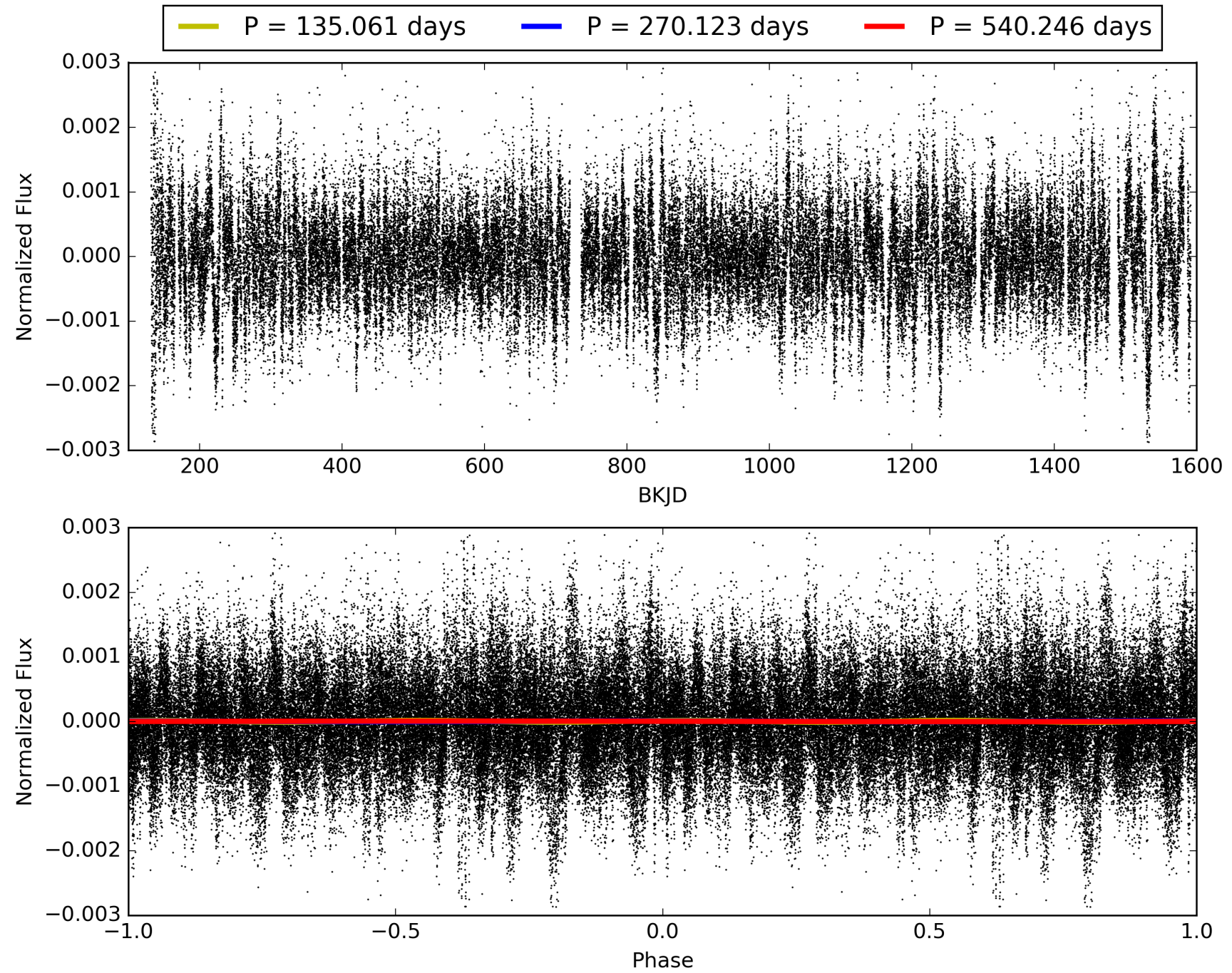
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:34:18 Z

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

# TCE 010139275-02, PDC Light Curves

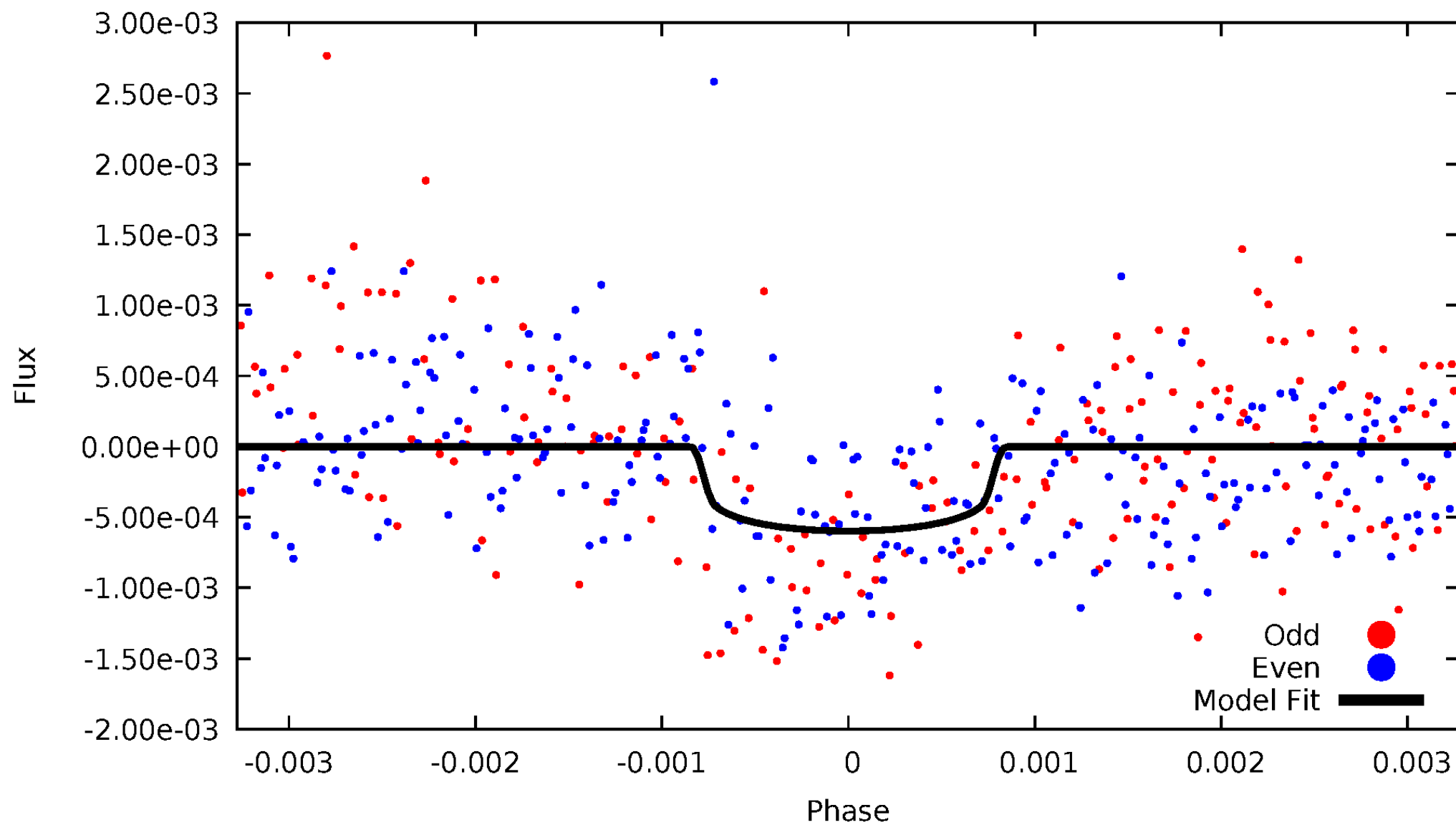


TCE 010139275-02



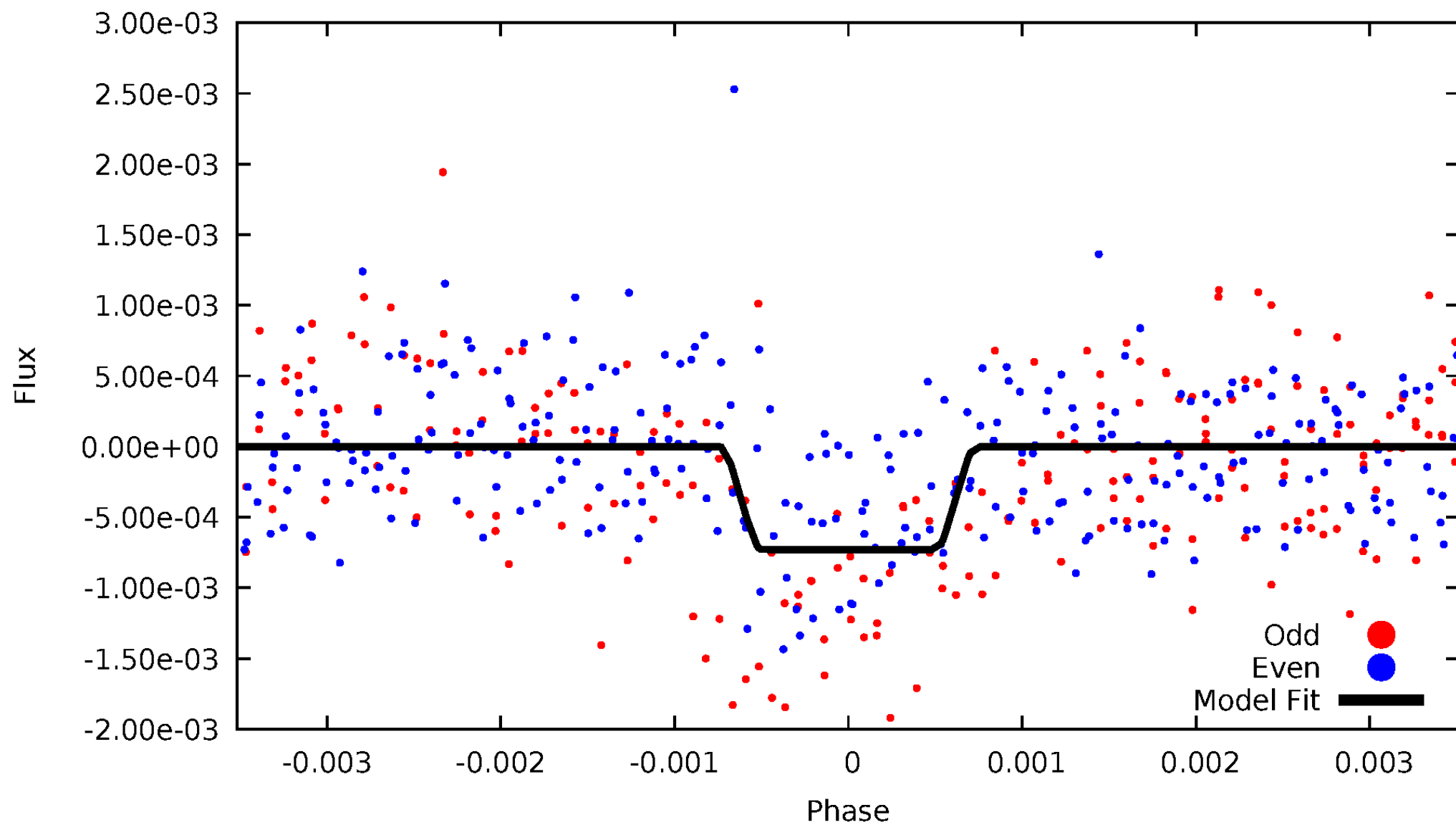
# DV Odd/Even

TCE 010139275-02



# ALT Odd/Even

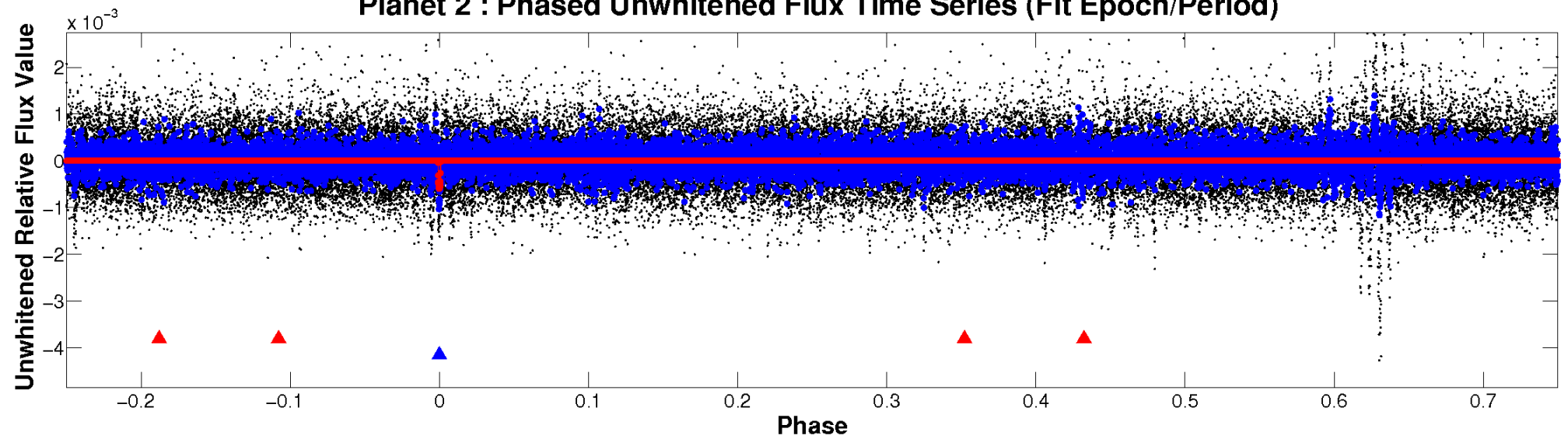
TCE 010139275-02



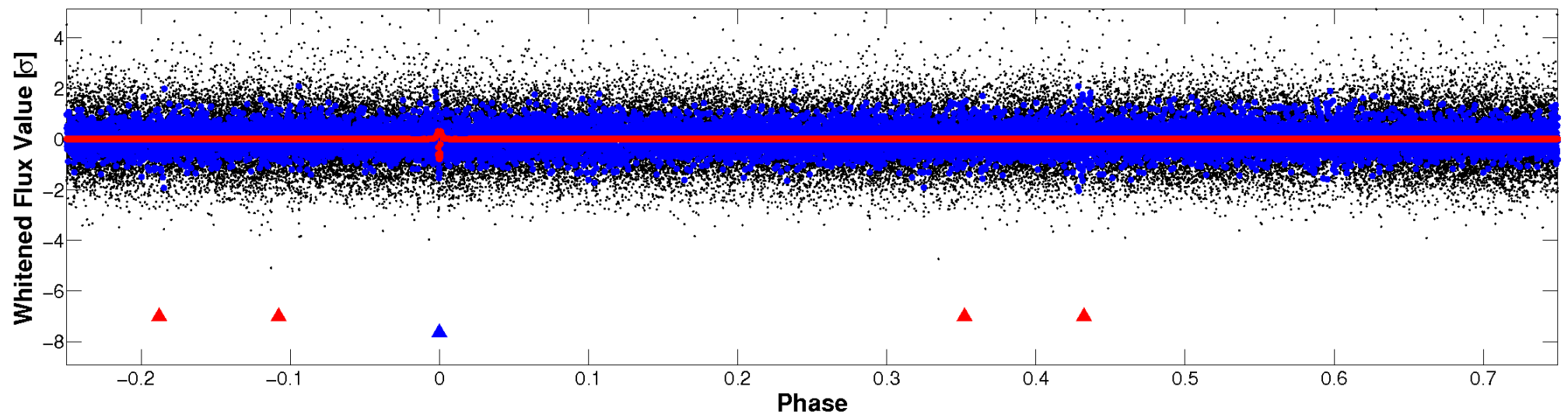


# Non-Whitened Vs. Whitened Light Curve

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

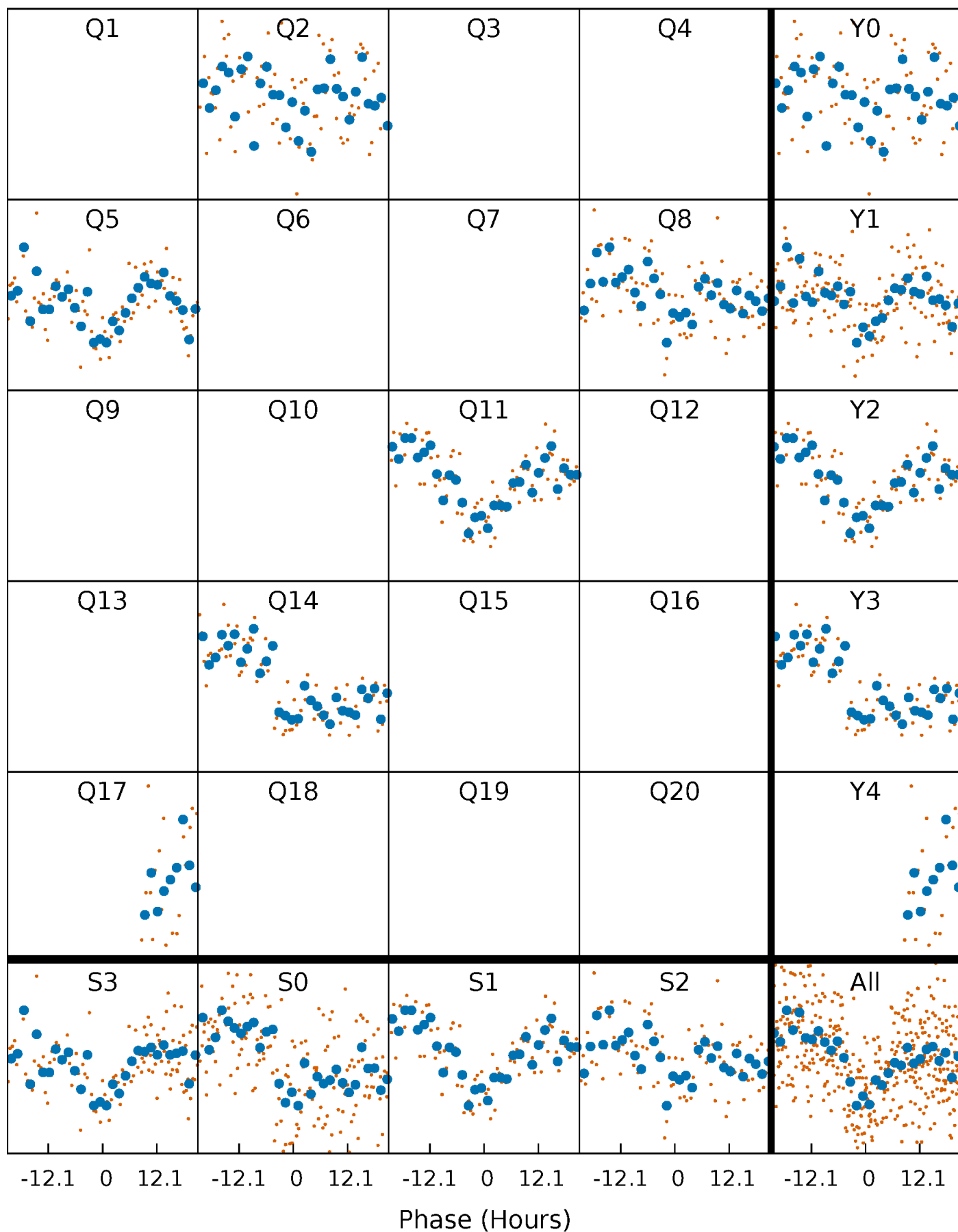


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



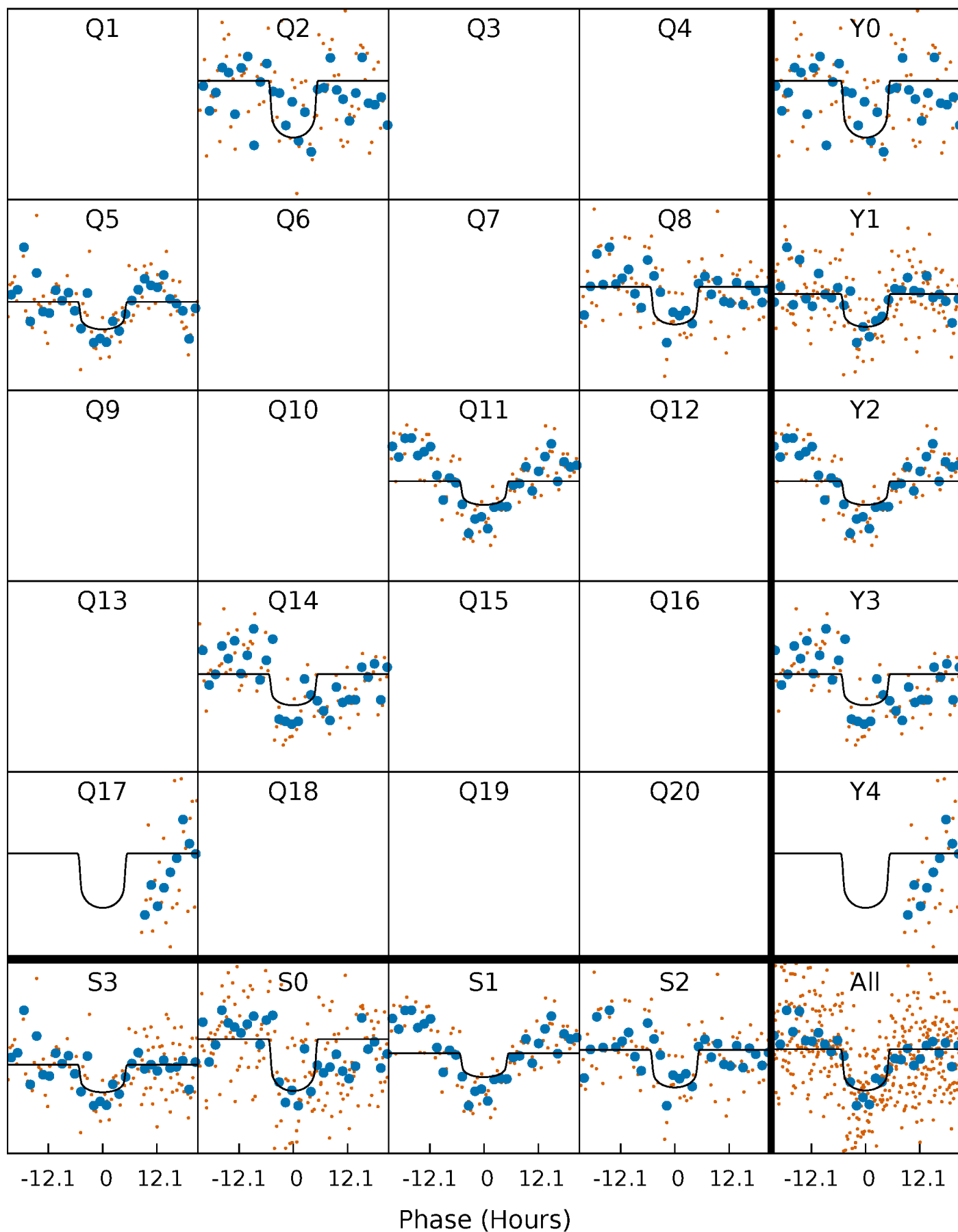
# PDC Quarter-Phased Transit Curves

TCE 010139275-02     $P=270.122815$  Days     $T_0=235.855087$  (BKJD)



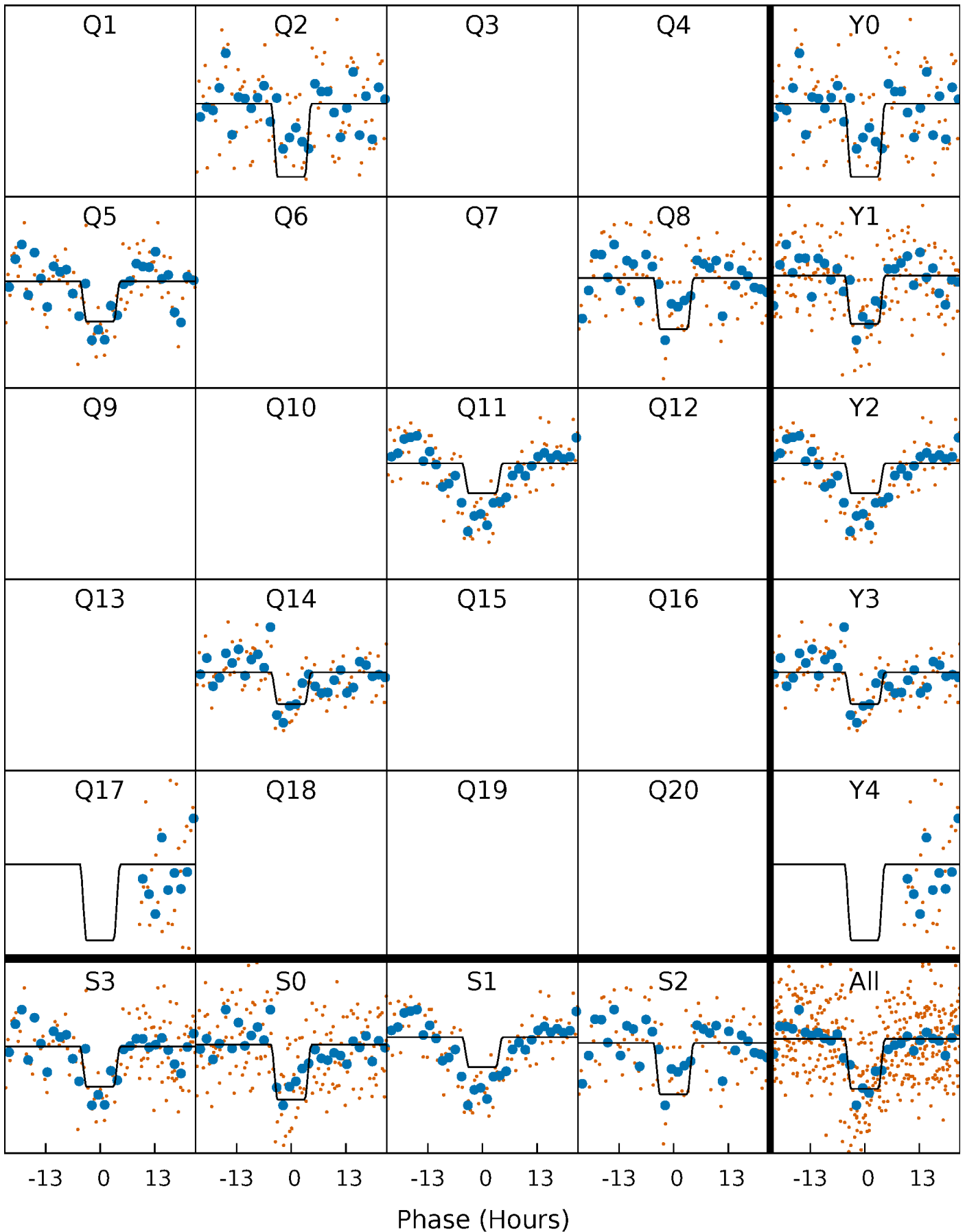
# DV Quarter-Phased Transit Curves

TCE 010139275-02   P=270.122815 Days    $T_0=235.855087$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

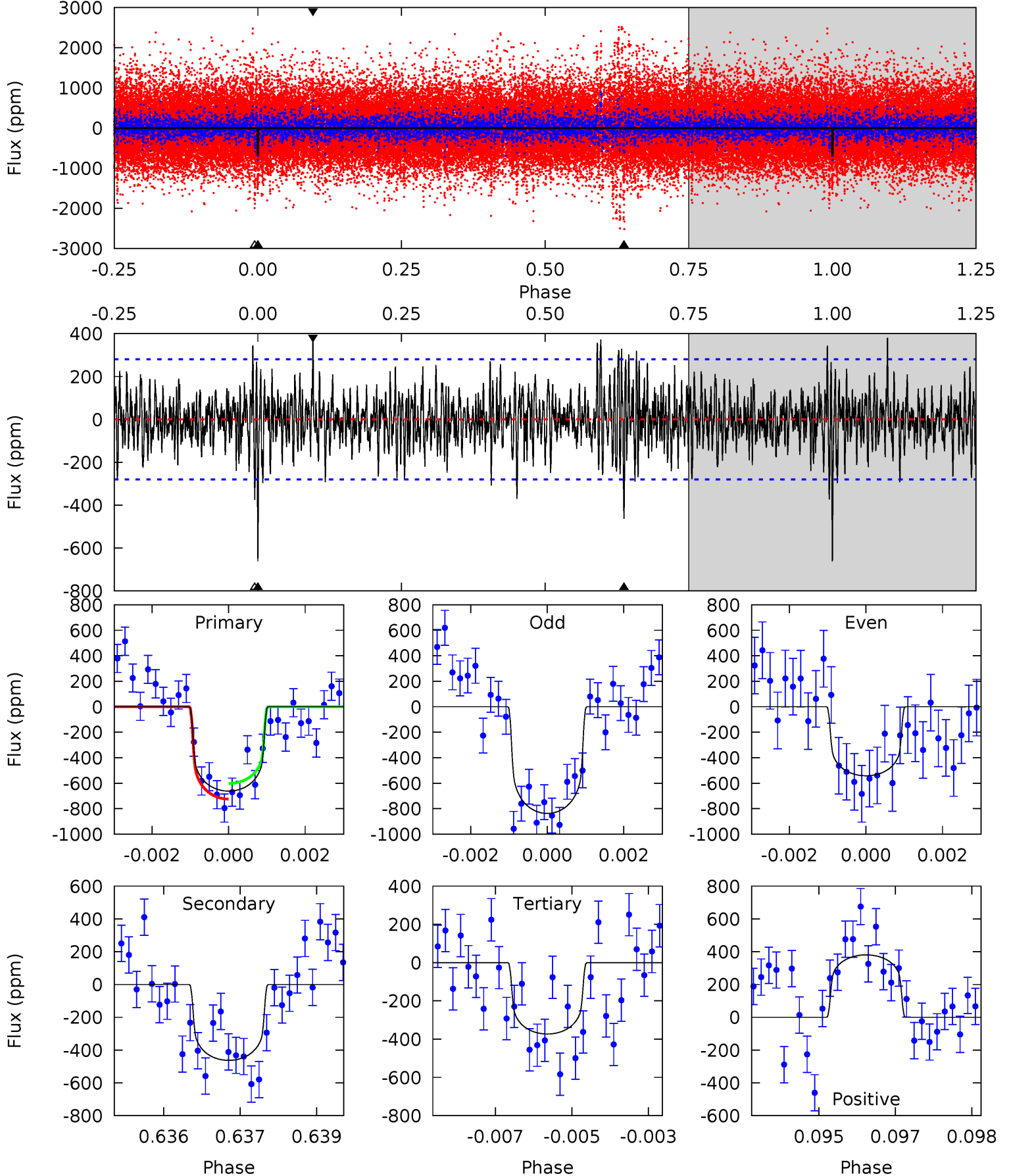
TCE 010139275-02     $P=270.111230$  Days     $T_0=235.884390$  (BKJD)



# DV Model-Shift Uniqueness Test

010139275-02,  $P = 270.122815$  Days,  $E = 235.855087$  Days

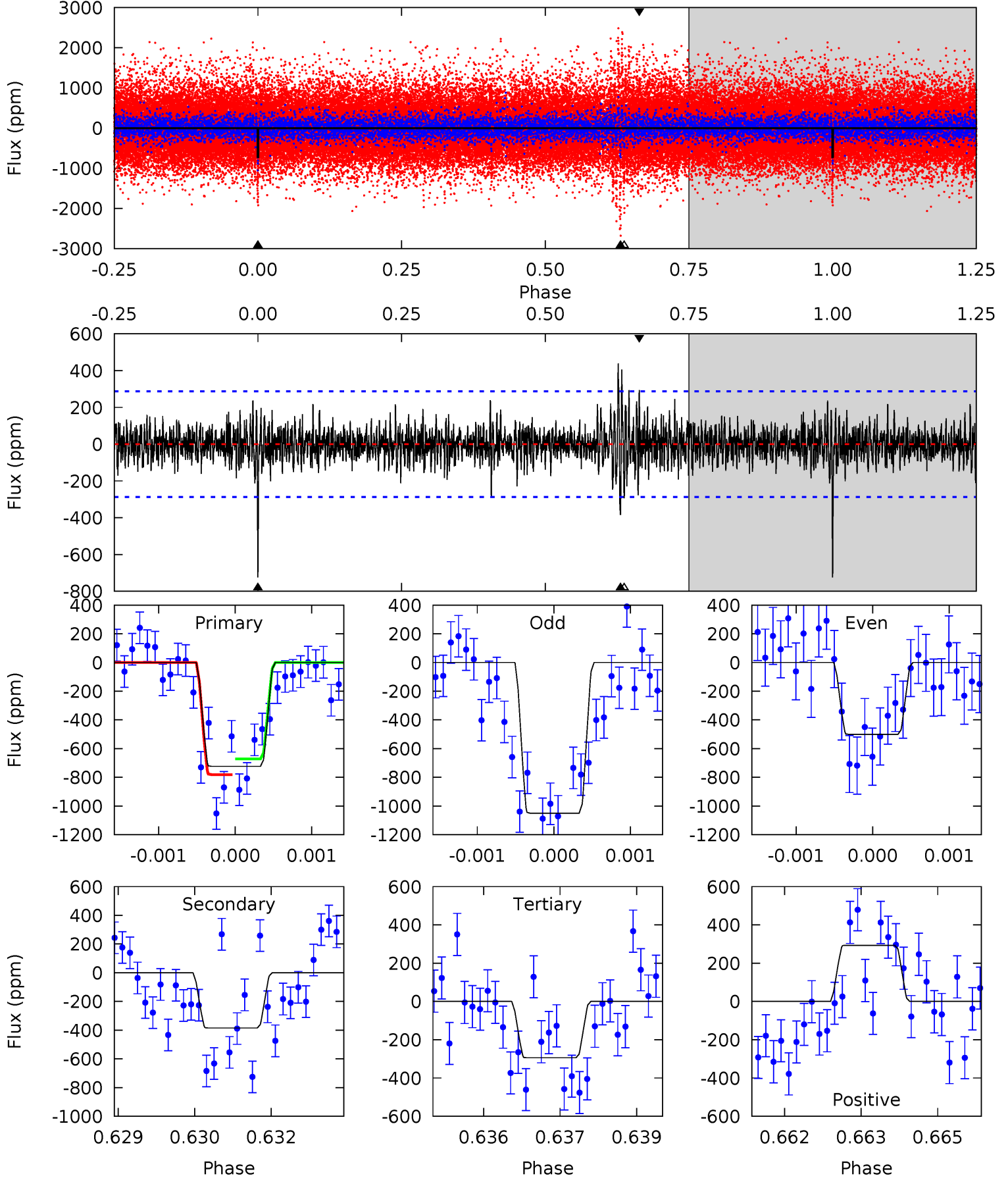
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	8.85	7.14	7.28	5.36	3.14	1.95	5.53	5.38	1.72	1.57	2.78	1.02	0.37	1.17



# Alt Model-Shift Uniqueness Test

010139275-02, P = 270.111230 Days, E = 235.884390 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
13.6	7.22	5.52	5.51	5.39	3.19	1.39	8.06	8.08	1.70	1.71	5.10	1.05	0.38	1.02



### Stellar Parameters For KIC 010139275

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5997^{+179}_{-197}$	$4.506^{+0.052}_{-0.221}$	$-0.160^{+0.300}_{-0.300}$	$0.929^{+0.293}_{-0.098}$	$1.009^{+0.131}_{-0.131}$	$1.774^{+0.396}_{-0.947}$
	+3%/-3%	+1%/-5%	+188%/-188%	+32%/-11%	+13%/-13%	+22%/-53%
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 010139275-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-463 \pm 52$	$2.51^{+1.11}_{-1.08}$	$402^{+29}_{-20}$	$5737^{+2032}_{-850}$	$27277^{+53428}_{-14751}$
Alt.	$-385 \pm 53$	$2.76^{+1.16}_{-1.06}$	$403^{+28}_{-21}$	$5231^{+1408}_{-715}$	$17619^{+31431}_{-8683}$

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

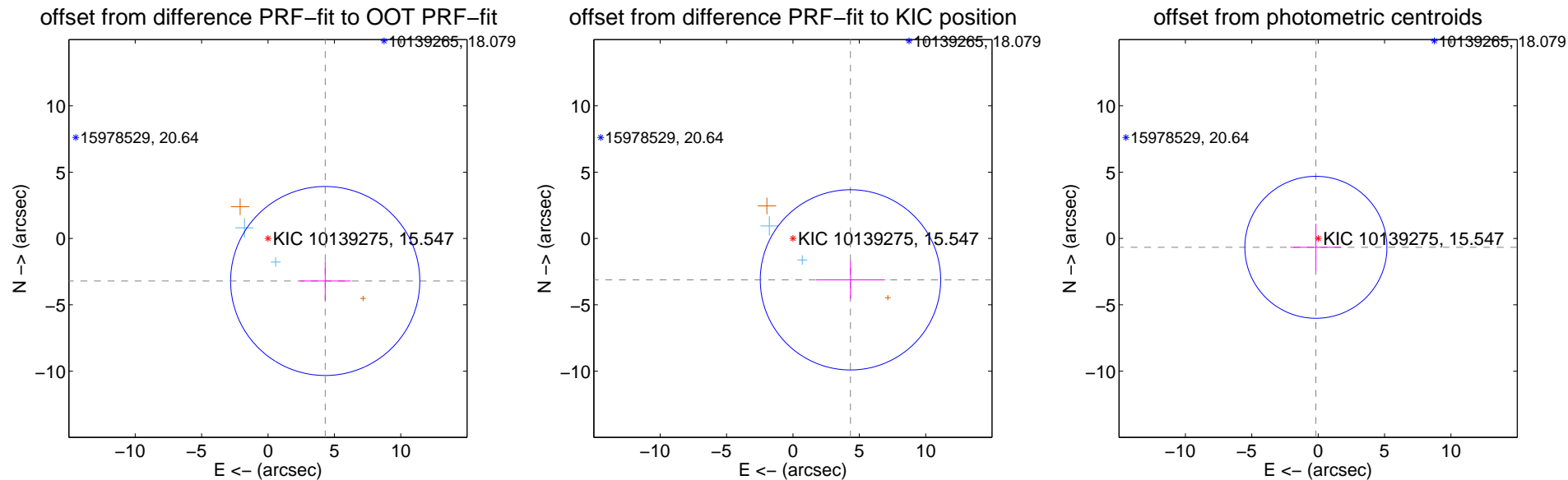
## DV Centroid Data

Supplemental centroid analysis for 010139275-02. Kepler magnitude: 15.55. Transit SNR 7.58

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

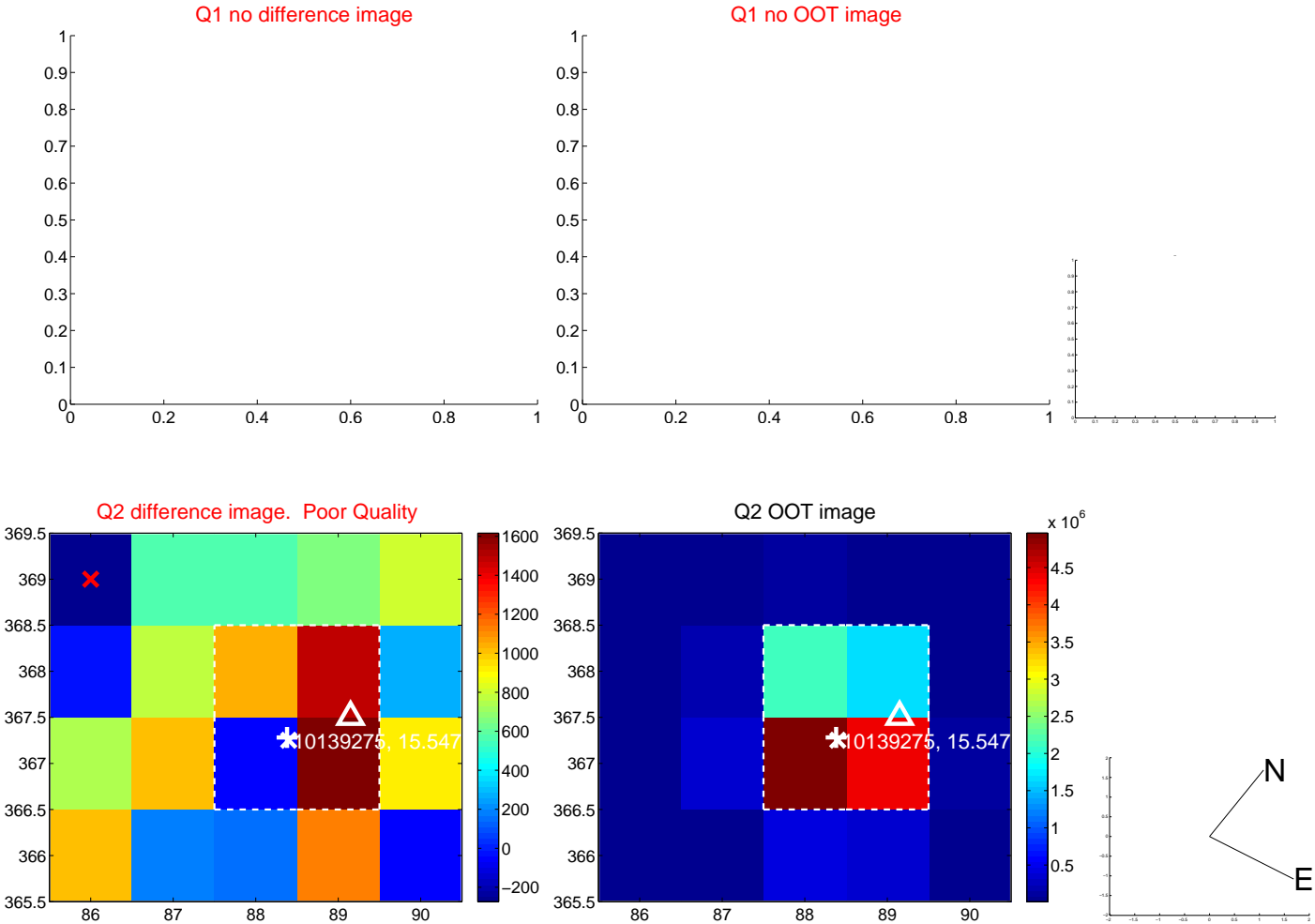
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.368 \pm 2.374$	2.26	$-4.307 \pm 1.912$	$-3.203 \pm 1.461$
PRF-fit source offset from KIC position	$5.336 \pm 2.264$	2.36	$-4.332 \pm 2.593$	$-3.117 \pm 1.427$
photometric centroid source offset	$0.69 \pm 1.78$	0.38	$0.17 \pm 1.92$	$-0.66 \pm 1.77$



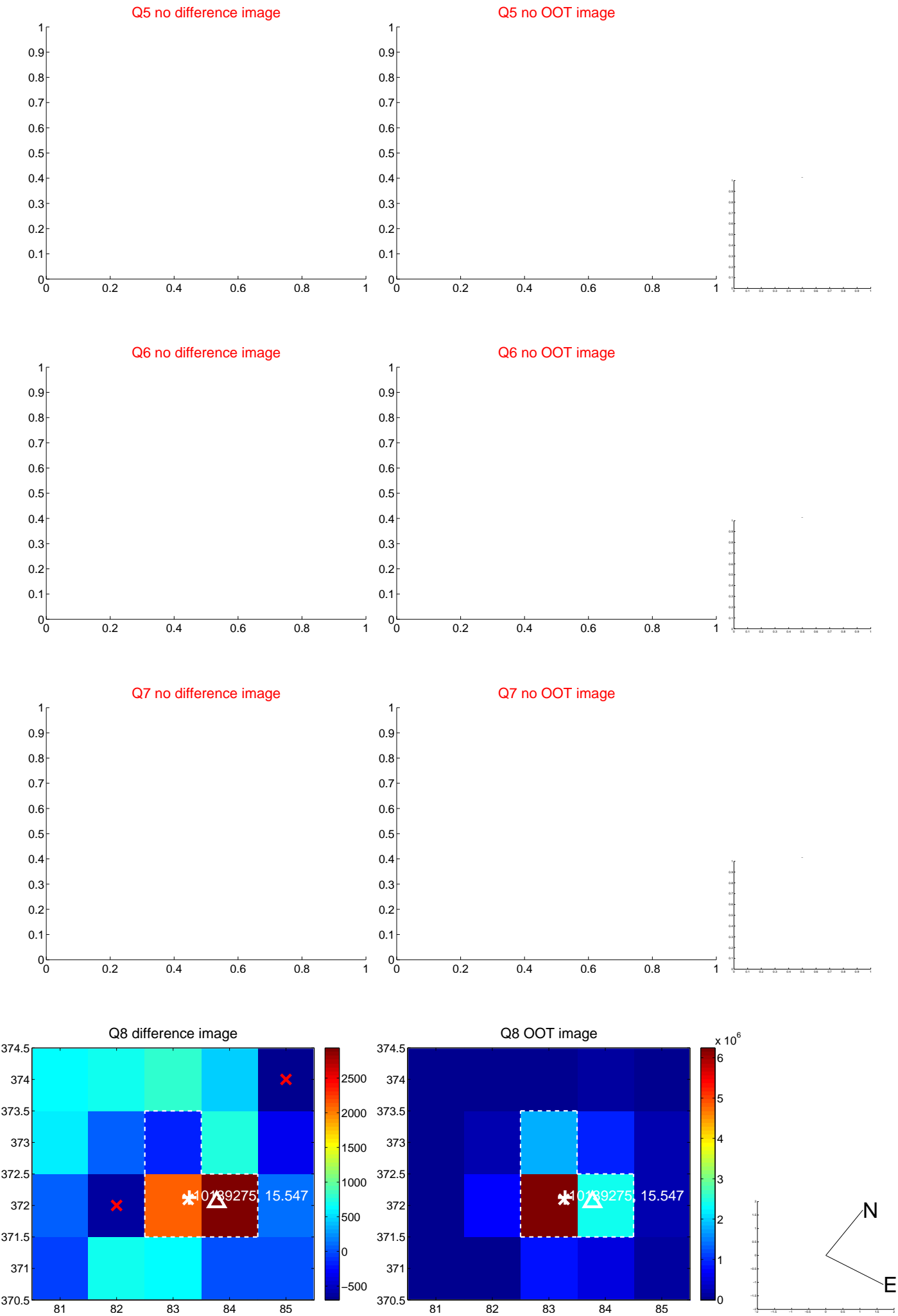
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



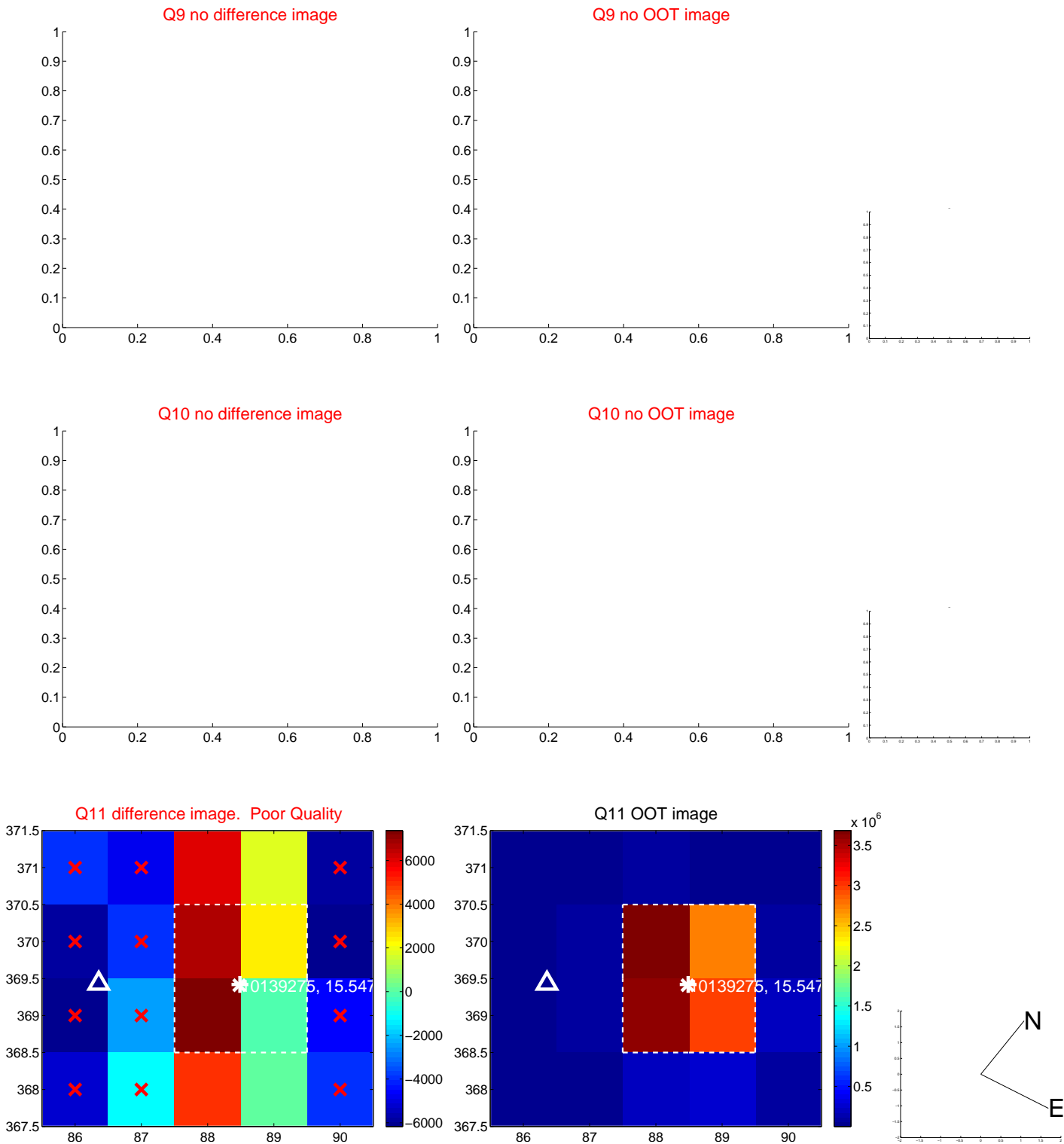
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

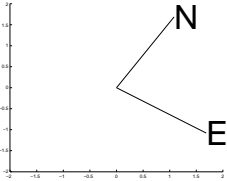
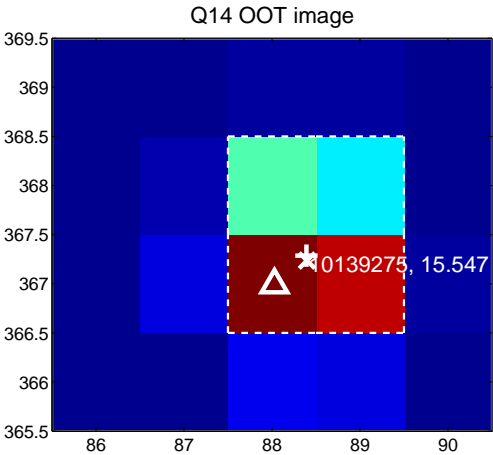
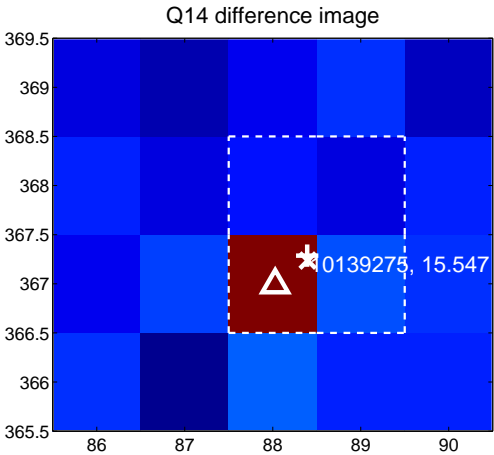


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

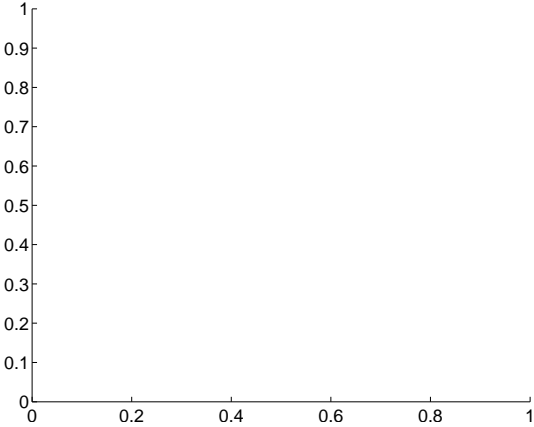
Q13 no difference image



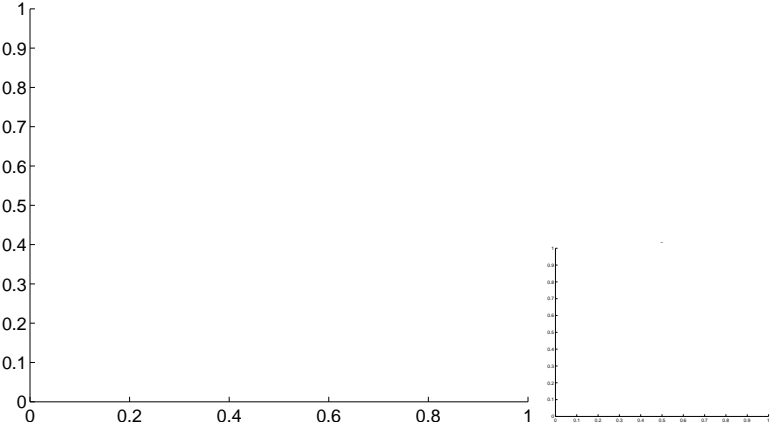
Q13 no OOT image



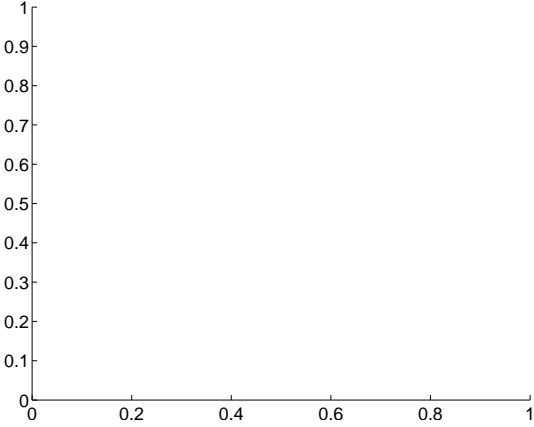
Q15 no difference image



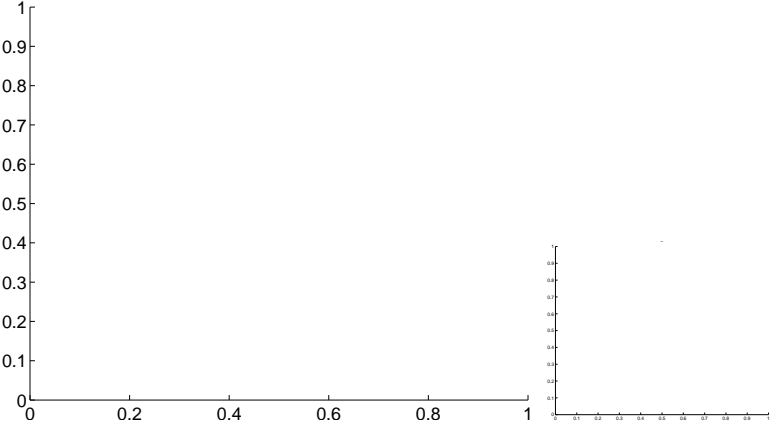
Q15 no OOT image



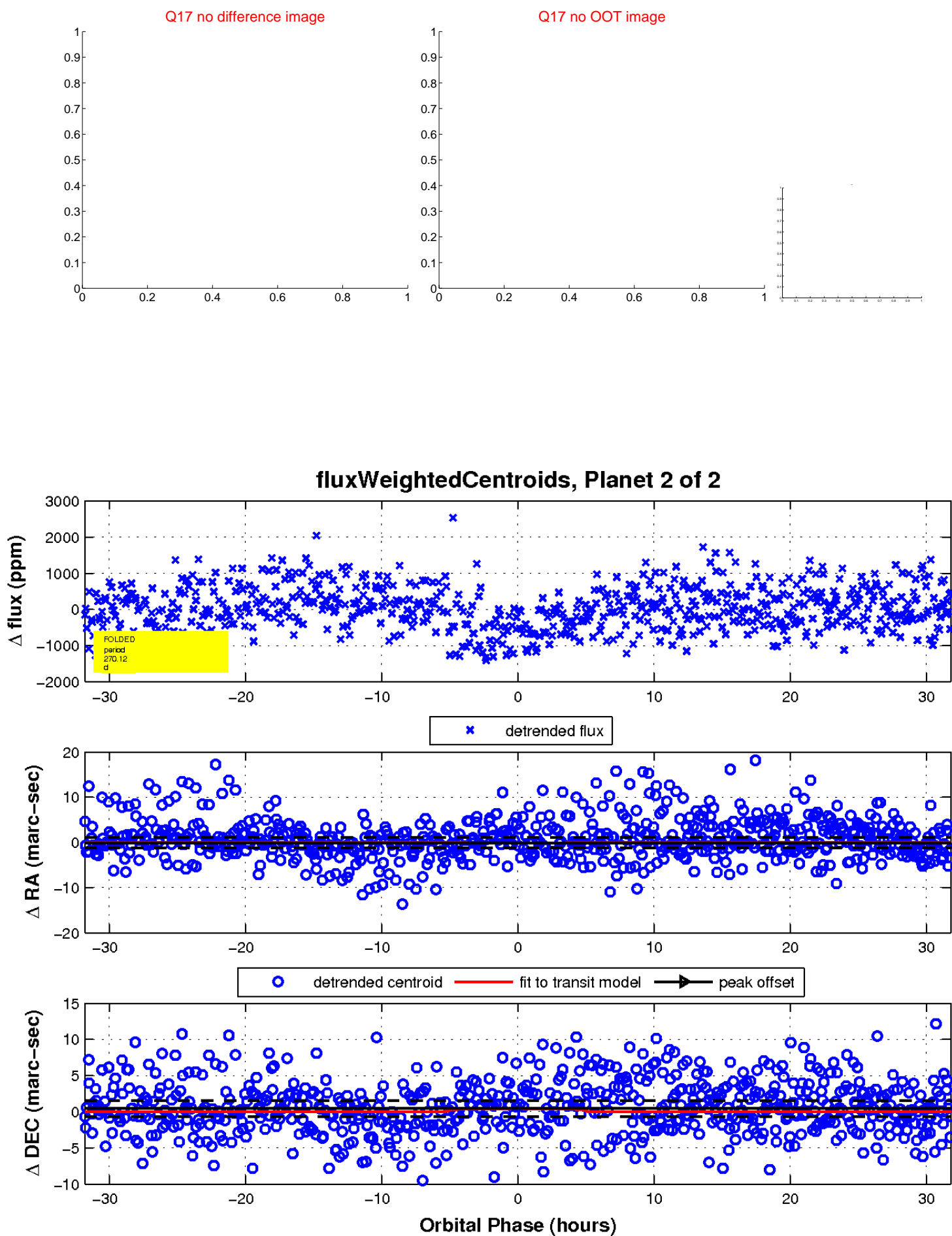
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

