

# KIC 008301013

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008301013-01	OBS	7013.01	2.214013	133.169527	372321.8	3.000	42297.8	-1.0	1.53	6604	72.98	3044.99
008301013-02	OBS	No	4.428005	132.948154	28689.8	15.000	9281.6	-1.0	1.53	6604	26.05	1208.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008301013-01	OBS	FP	0.00	0	1	0	0	DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
008301013-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—RESIDUAL_TCE—CENT_NOFITS

**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 008301013-01

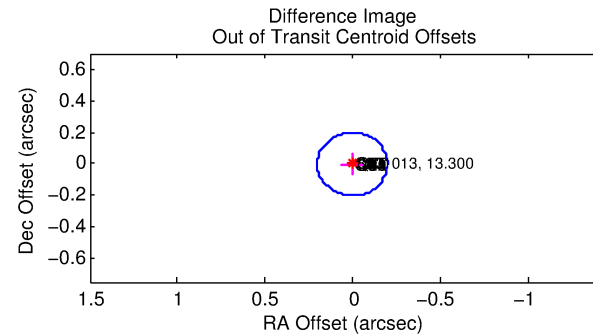
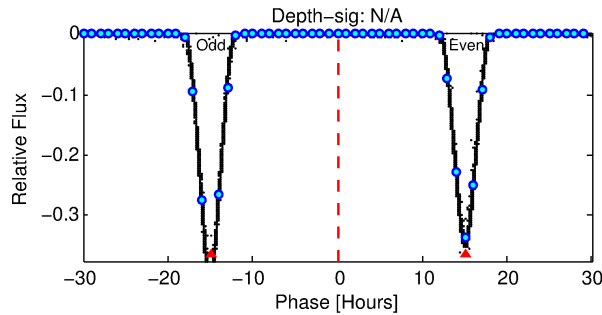
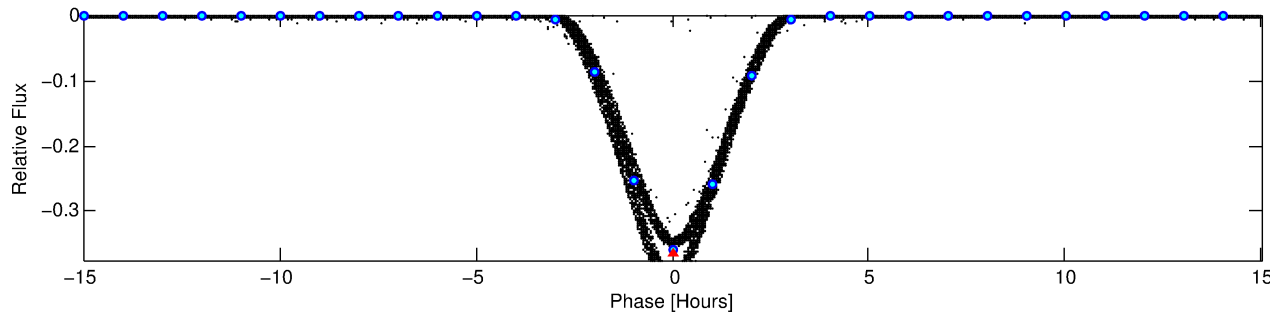
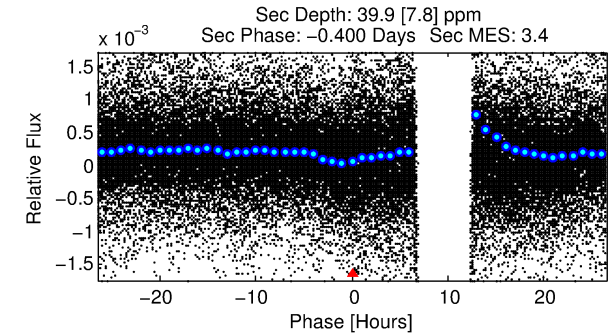
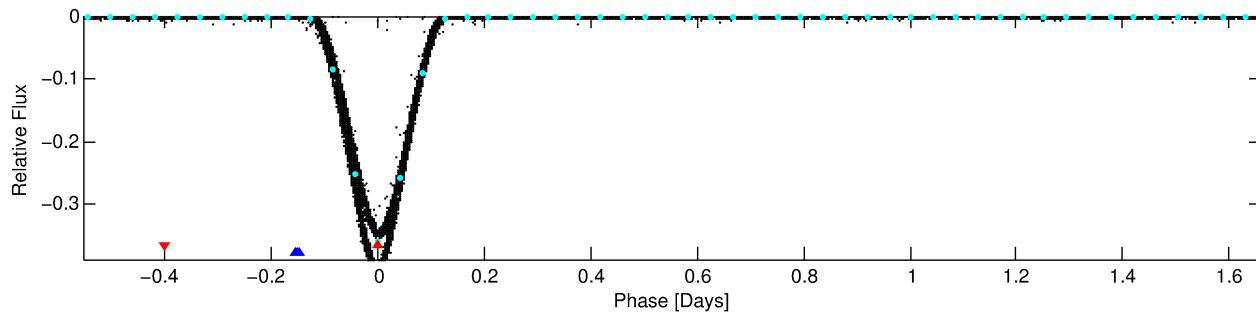
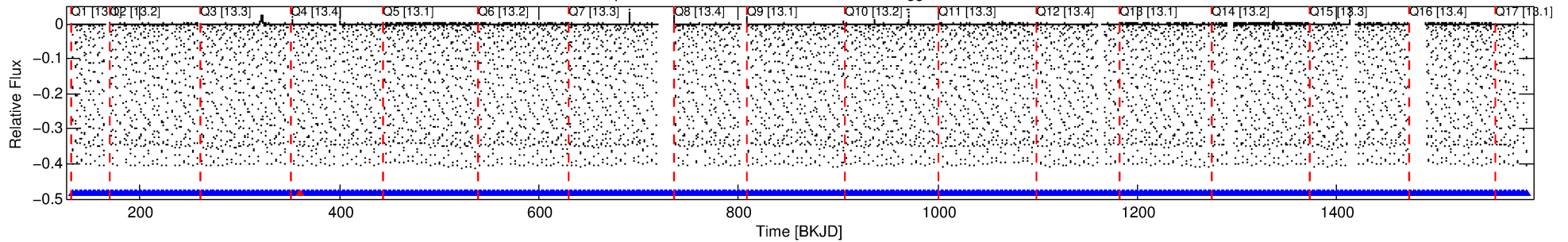
No Significant Match Found

# DV One-Page Summary

KIC: 8301013 Candidate: 1 of 2 Period: 2.214 d

KOI: K07013 Corr: No Ephemeris Match

Kp: 13.30 R\*: 1.53 Rs Teff: 6604.0 K Logg: 4.18 Fe/H: -0.120



TPS TCE Results:

Period = 2.21401 d  
Epoch = 133.1695 BKJD

DV fit results are unavailable

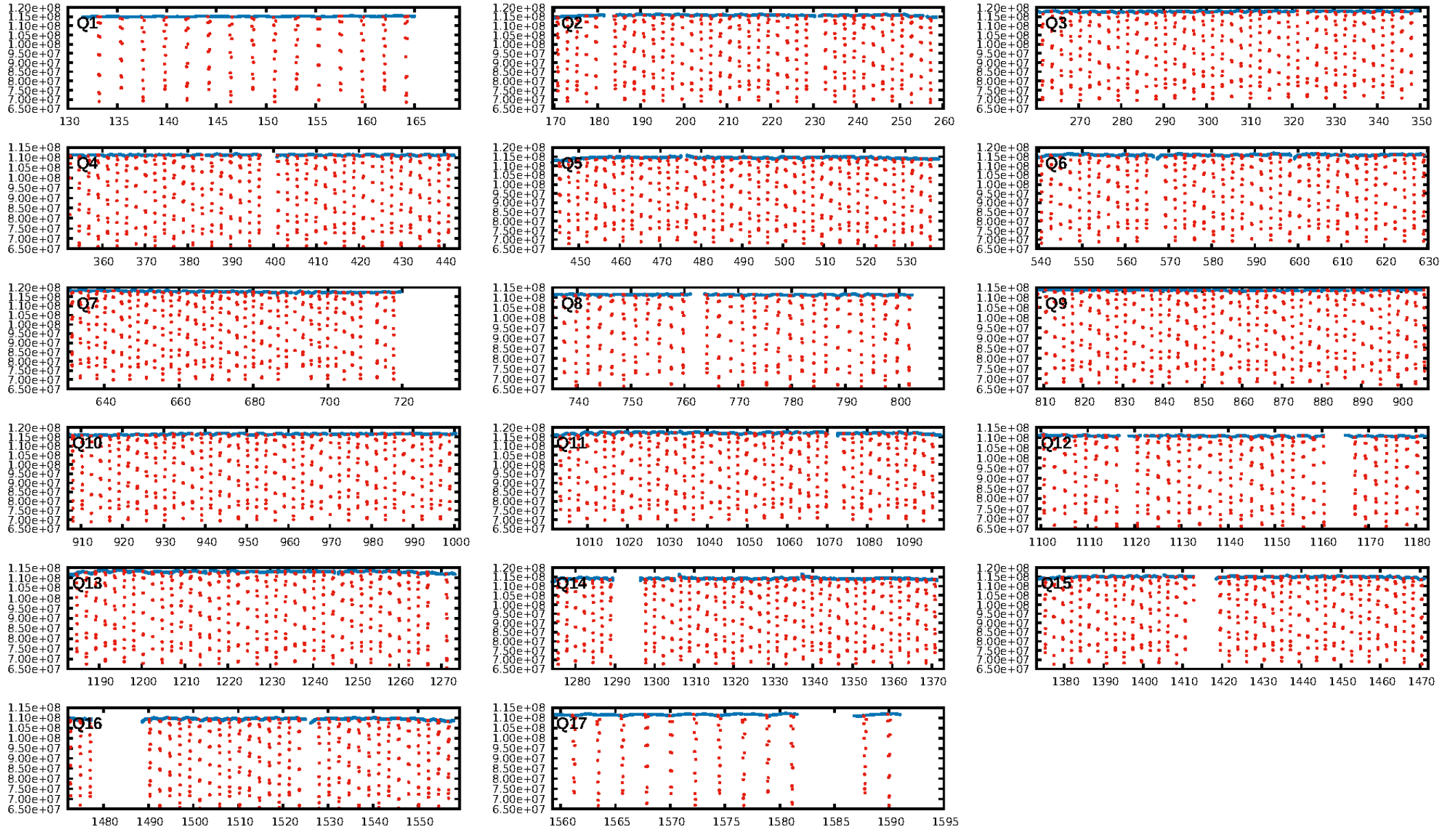
DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.9% [3.47 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [583/584]  
GhostDiagnostic-chr: 0.7351  
Centroid-sig: 0.0%  
Centroid-so: 0.240 arcsec [948.64 $\sigma$ ]  
OotOffset-rm: 0.005 arcsec [0.07 $\sigma$ ]  
KicOffset-rm: 0.164 arcsec [2.45 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

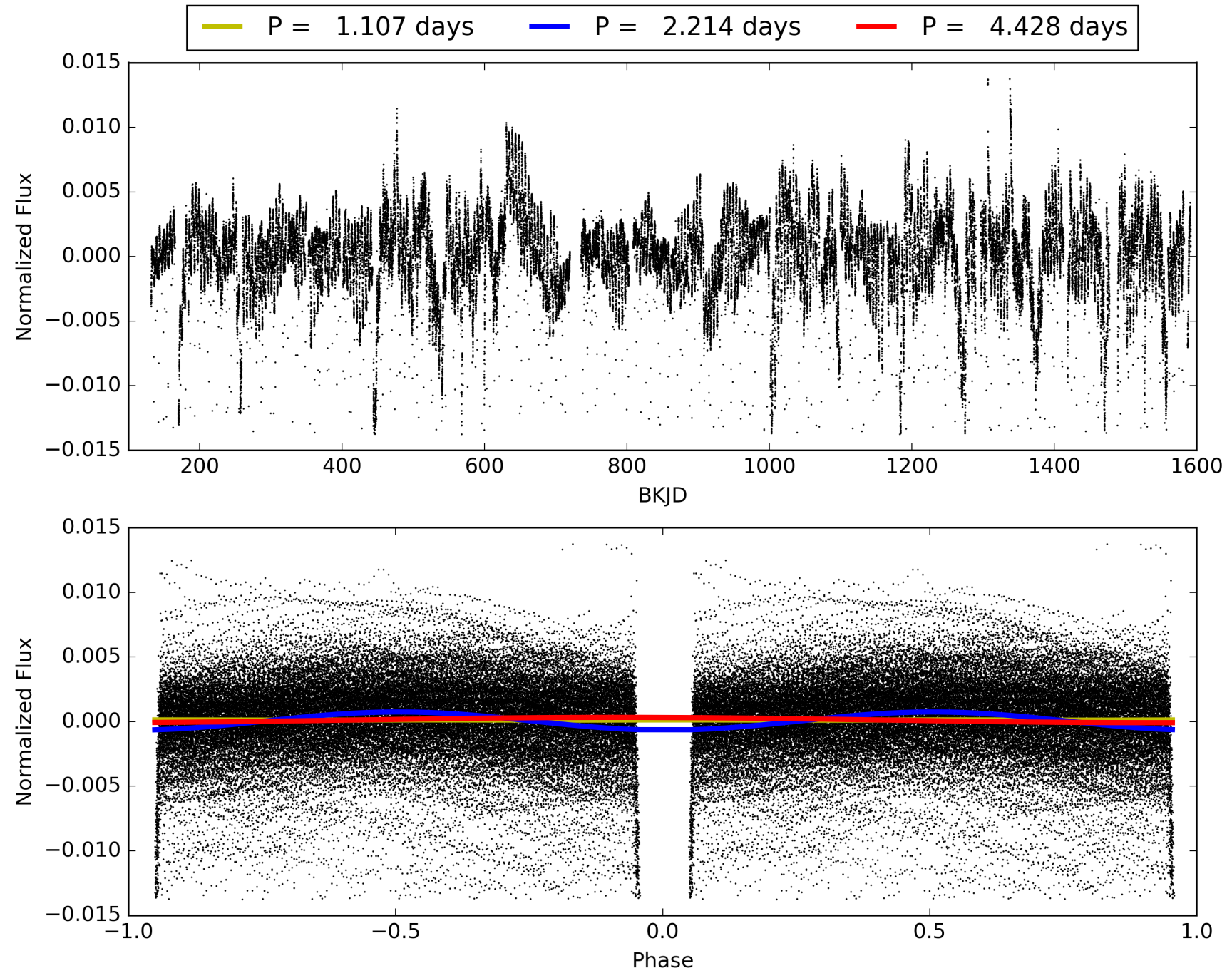
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:41:53 Z

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

# TCE 008301013-01, PDC Light Curves

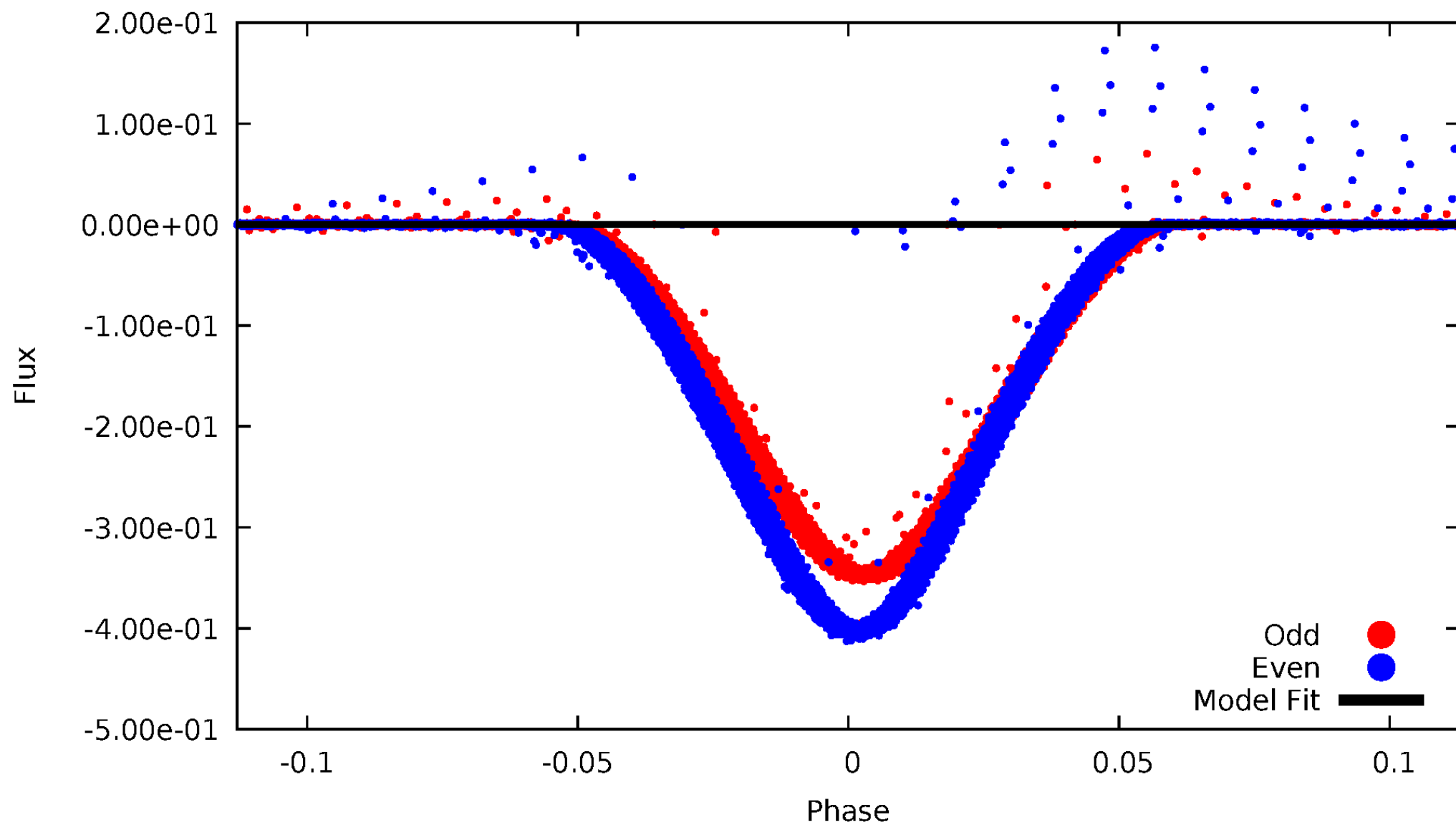


TCE 008301013-01



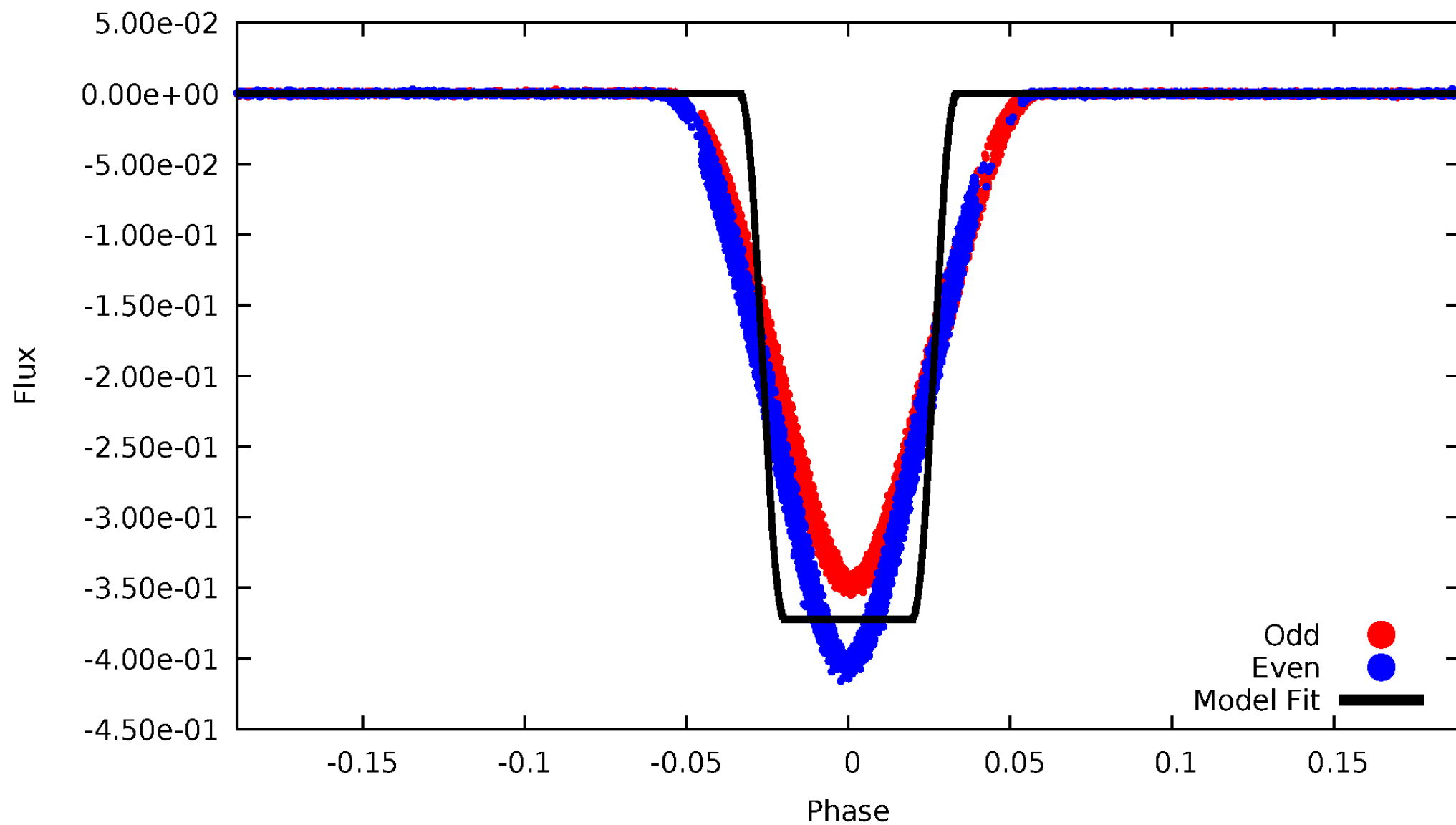
# DV Odd/Even

TCE 008301013-01



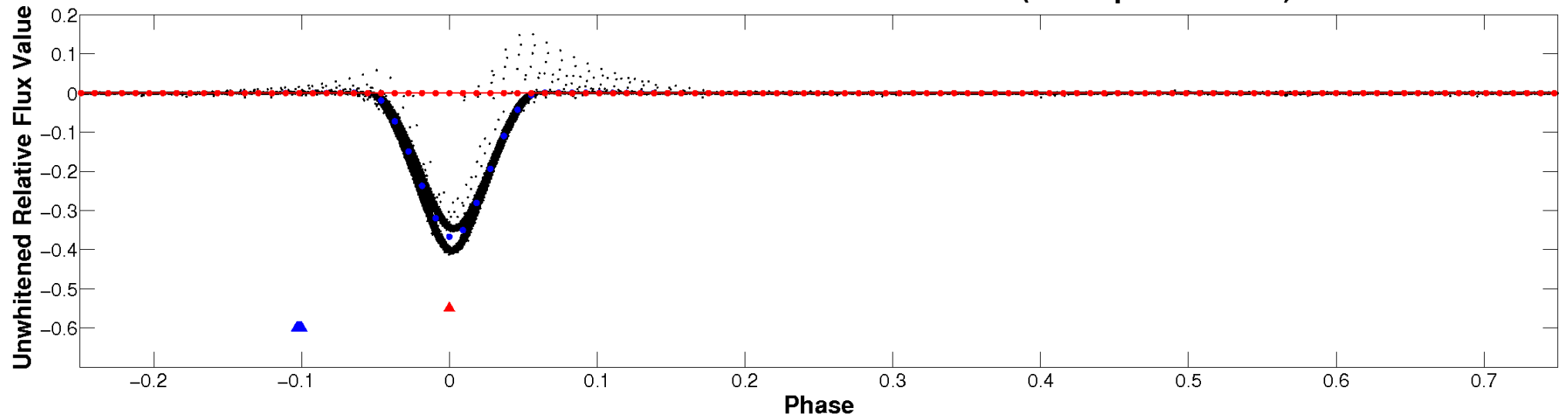
# ALT Odd/Even

TCE 008301013-01



# Non-Whitened Vs. Whitened Light Curve

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

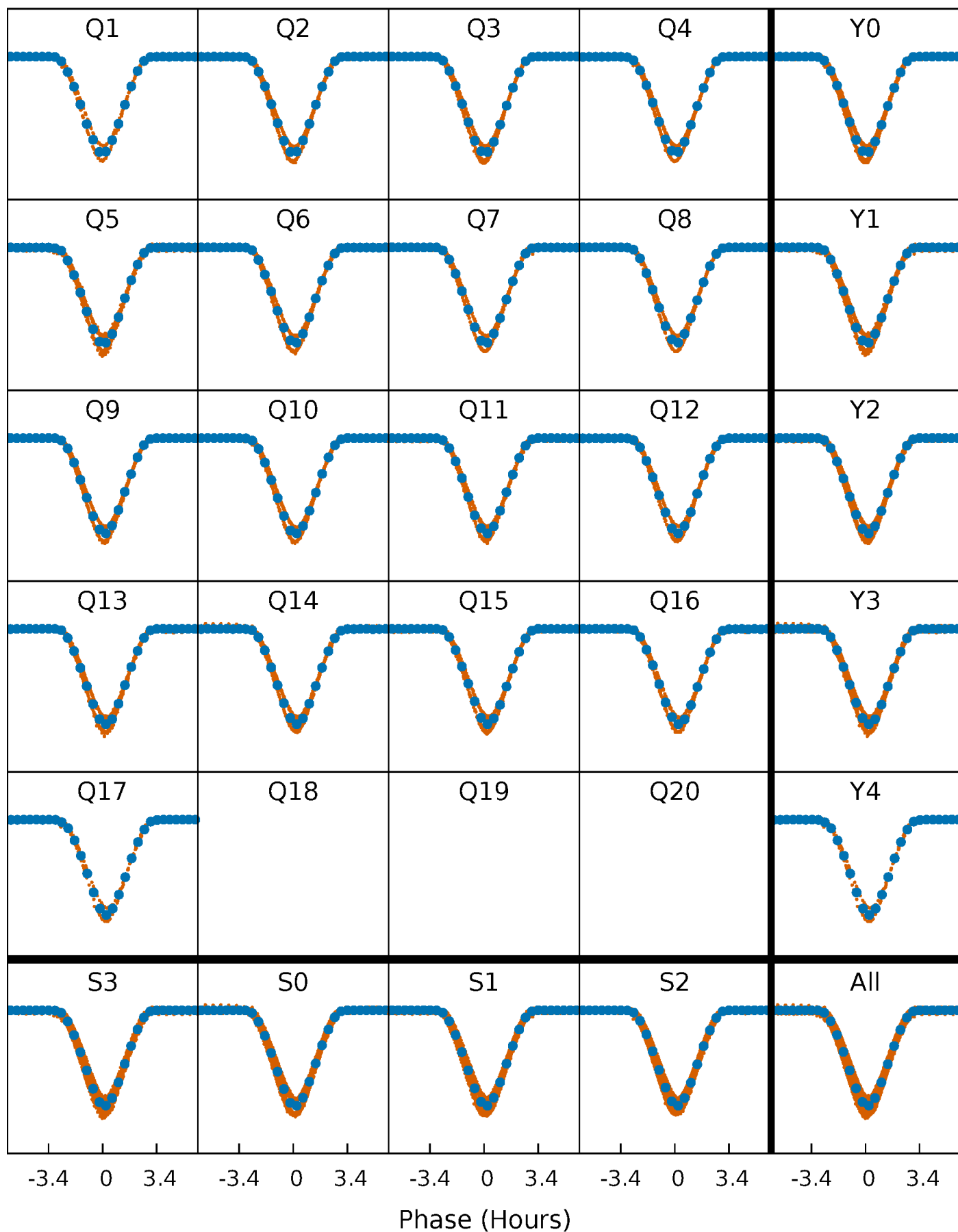


**Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

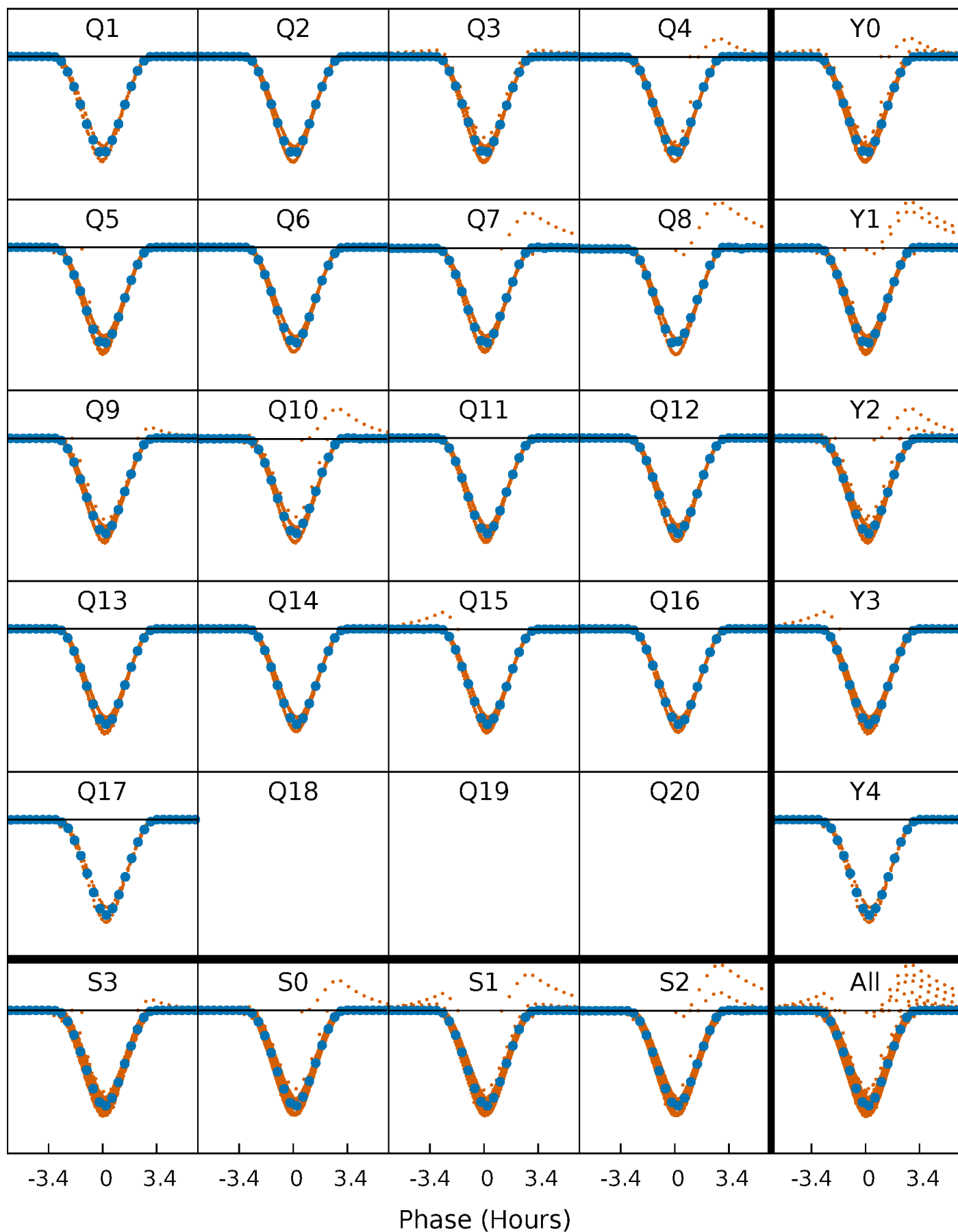
TCE 008301013-01 P= 2.214013 Days  $T_0=133.169527$  (BKJD)





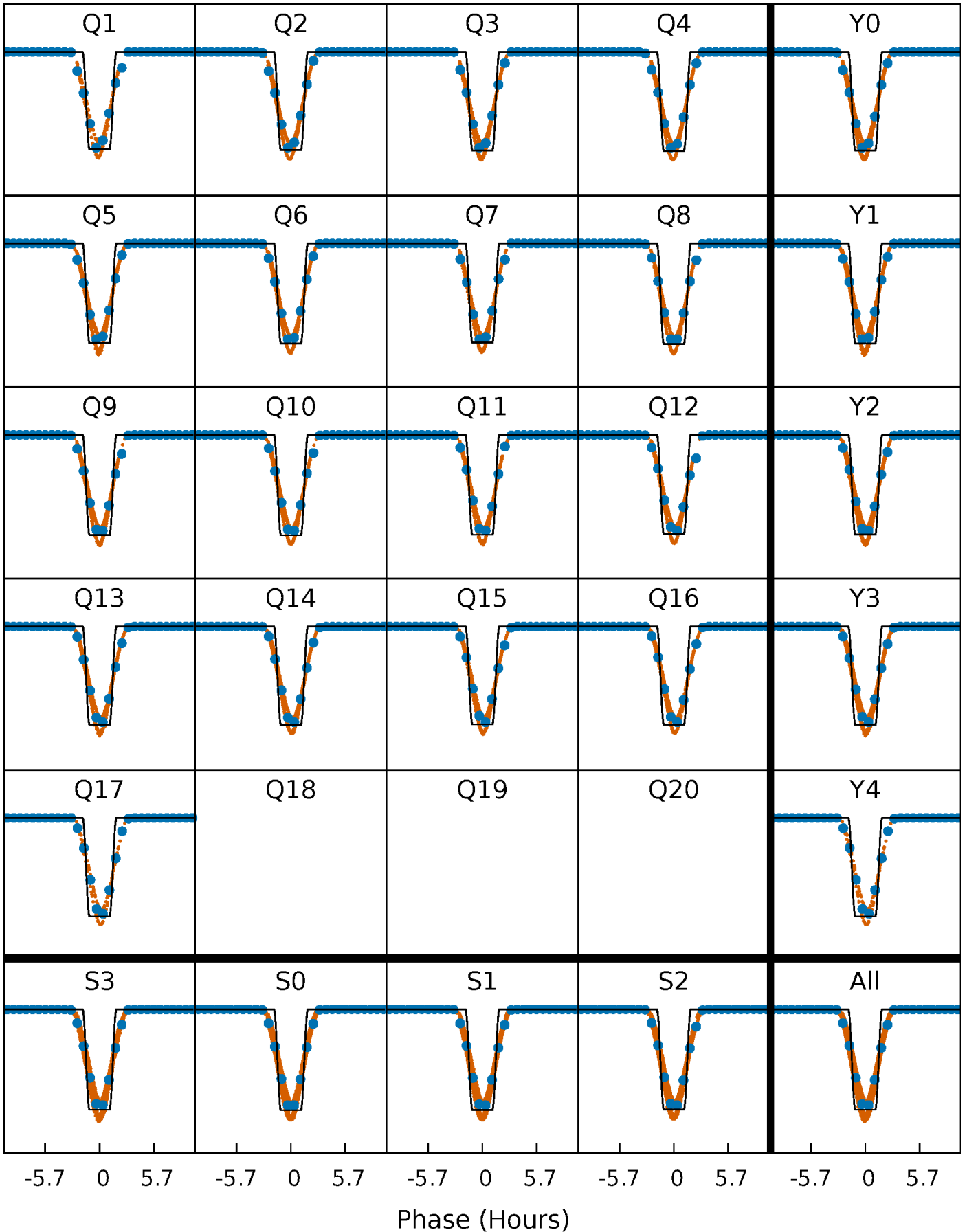
# DV Quarter-Phased Transit Curves

TCE 008301013-01 P= 2.214013 Days  $T_0=133.169527$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

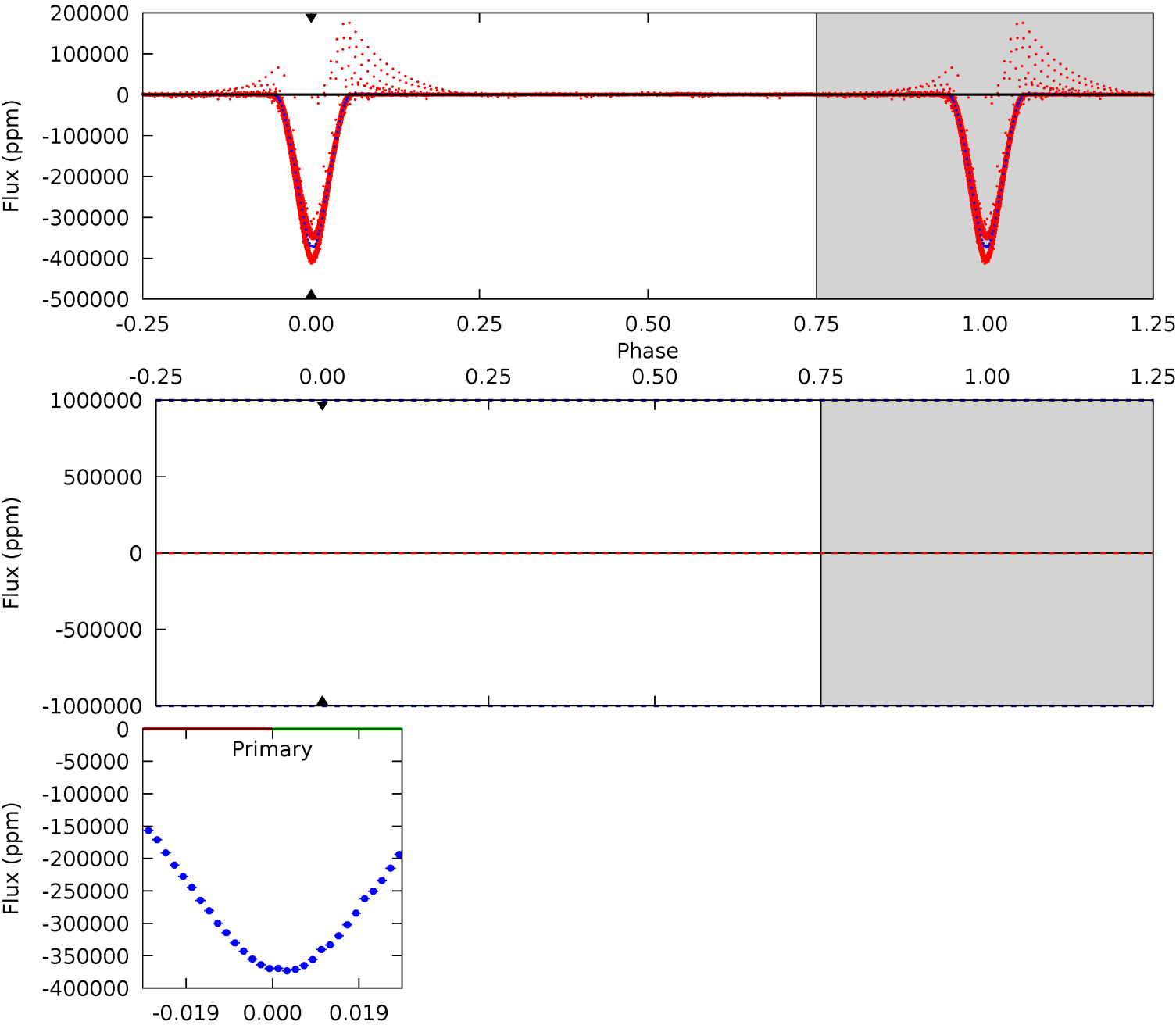
TCE 008301013-01 P= 2.214013 Days  $T_0=133.173997$  (BKJD)



# DV Model-Shift Uniqueness Test

008301013-01, P = 2.214013 Days, E = 130.955514 Days

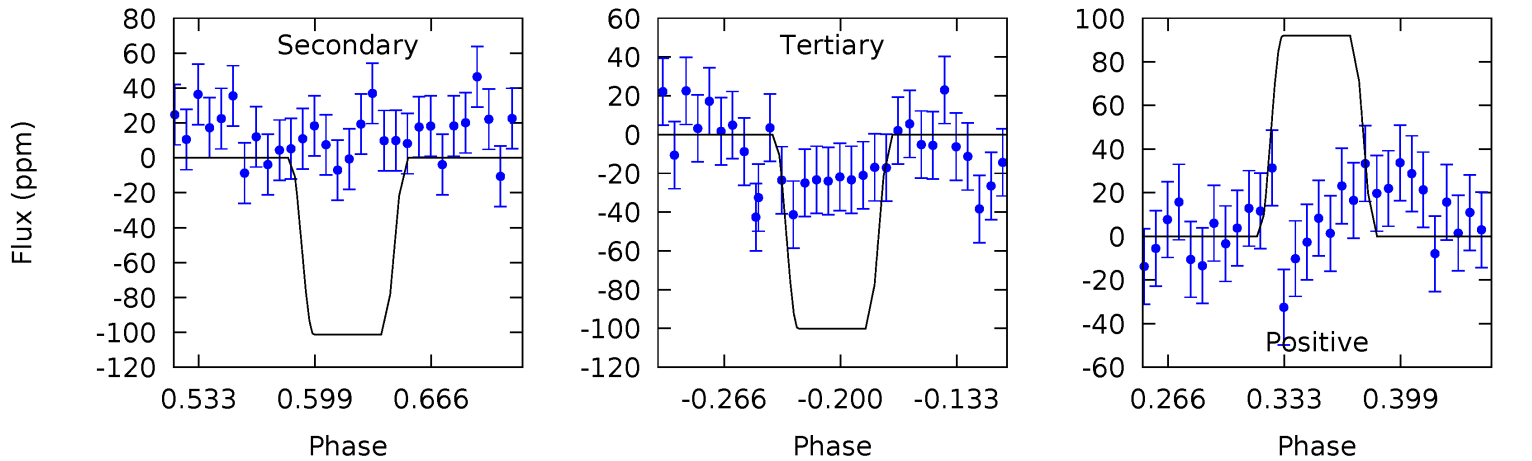
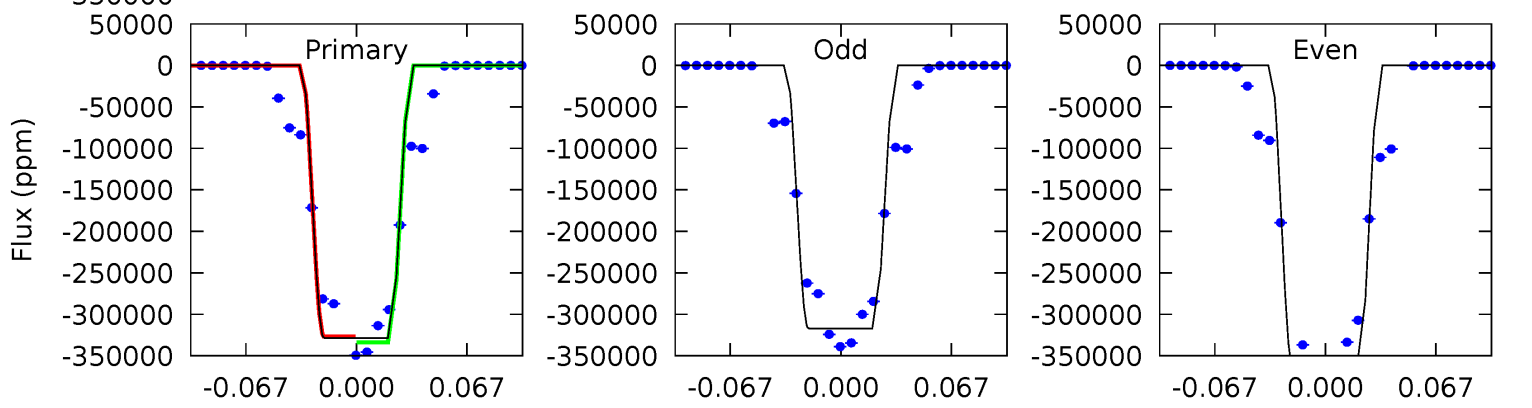
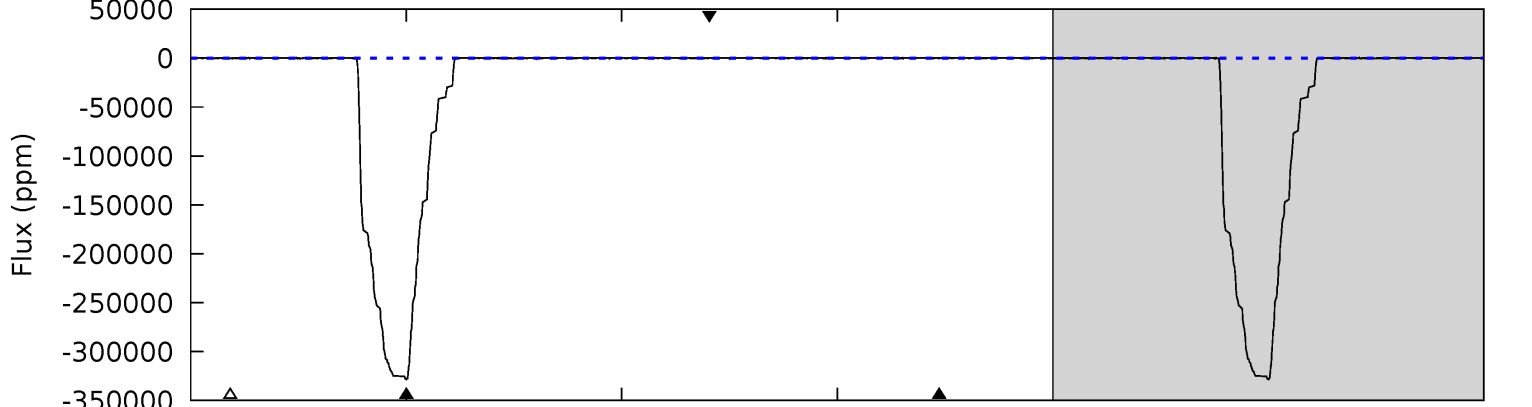
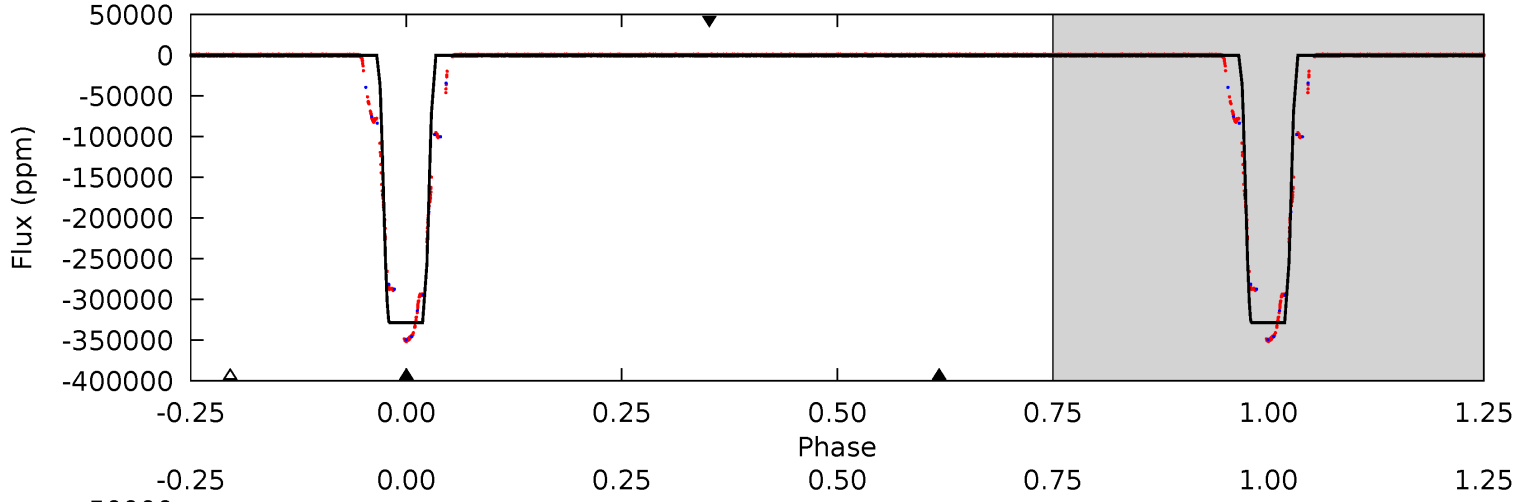
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008301013-01, P = 2.214013 Days, E = 130.959984 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
10940	3.37	3.34	3.06	4.65	1.83	1.12	10937	10937	0.04	0.31	1047	1.04	0.00	0



### Stellar Parameters For KIC 008301013

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6604^{+155}_{-214}$	$4.178^{+0.162}_{-0.180}$	$-0.120^{+0.250}_{-0.300}$	$1.526^{+0.463}_{-0.336}$	$1.283^{+0.181}_{-0.201}$	$0.509^{+0.469}_{-0.243}$
	+2%/-3%	+4%/-4%	+208%/-250%	+30%/-22%	+14%/-16%	+92%/-48%
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 008301013-01 / KOI 7013.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$72.74^{+20.99}_{-17.23}$	$2649^{+202}_{-168}$	$-2284^{+8184}_{-3230}$	$0.252^{+16.681}_{-12.588}$
Alt.	$-101 \pm 30$	$100.11^{+25.39}_{-20.47}$	$2646^{+202}_{-175}$	$-2869^{+102}_{-123}$	$0.007^{+0.005}_{-0.003}$

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

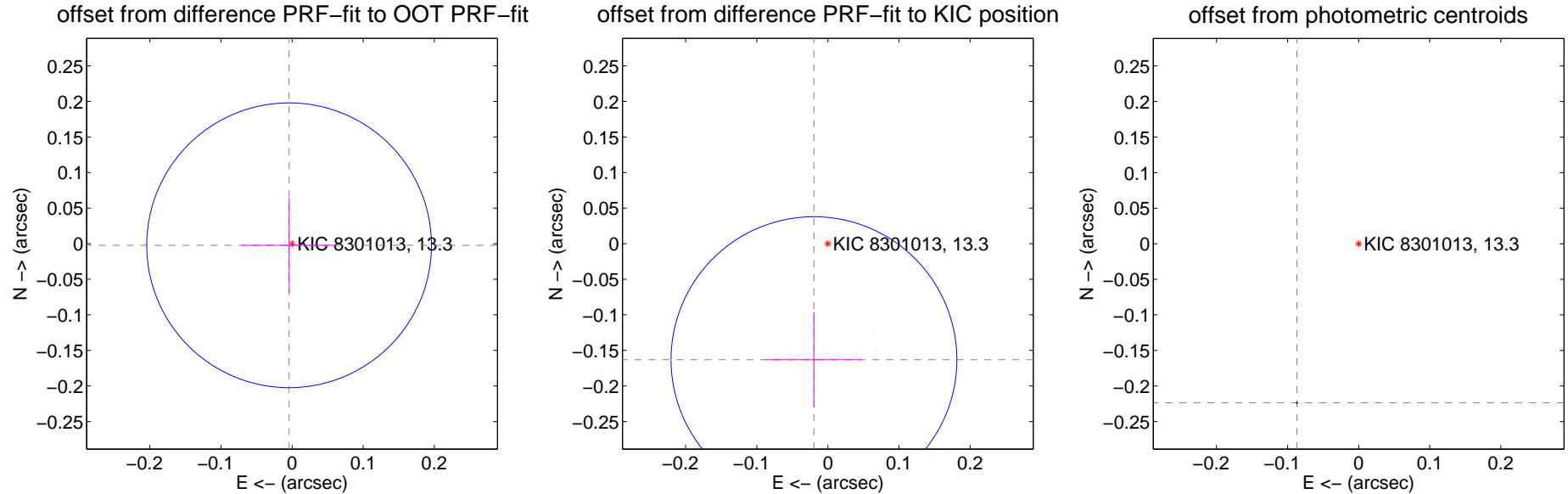
## DV Centroid Data

Supplemental centroid analysis for 008301013-01. Kepler magnitude: 13.30. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

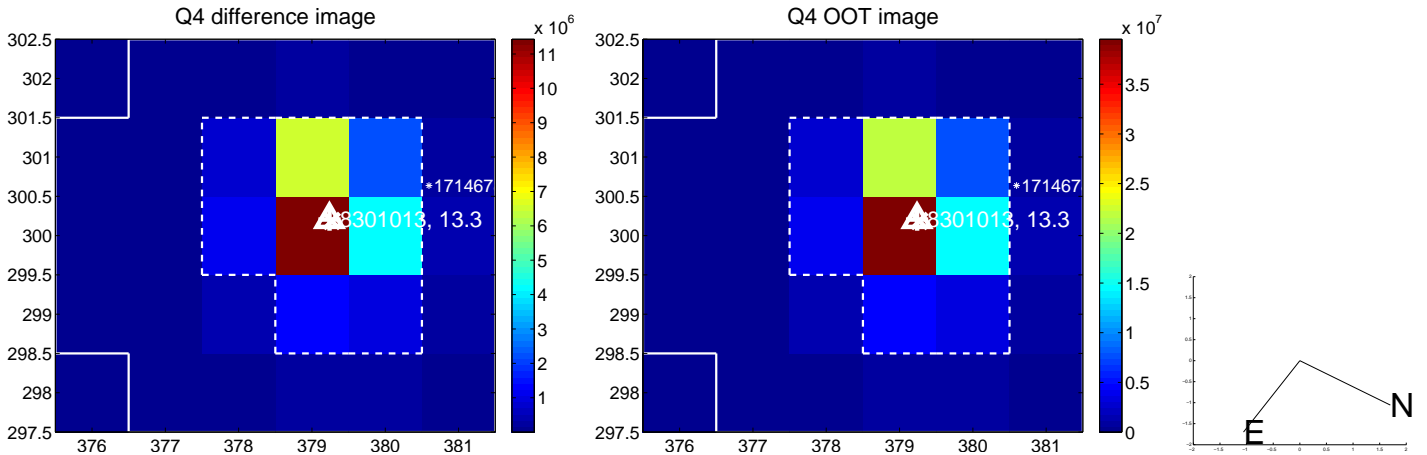
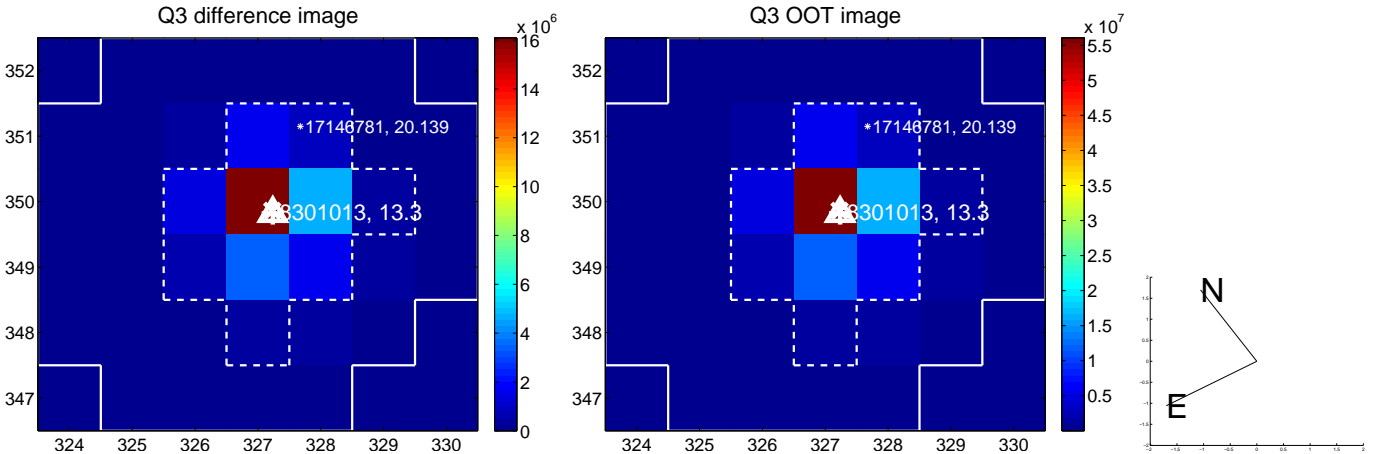
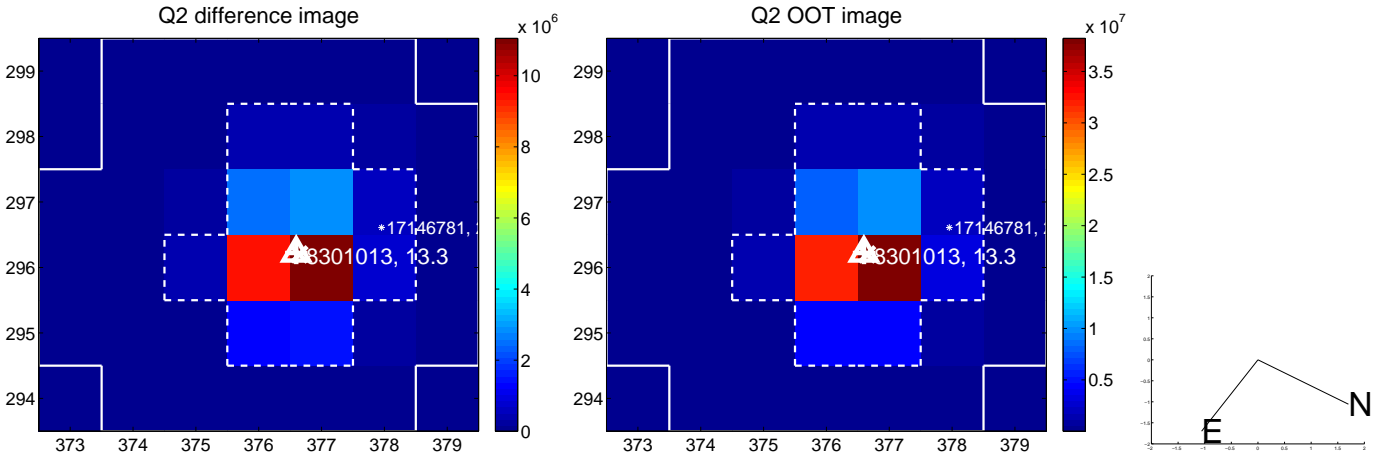
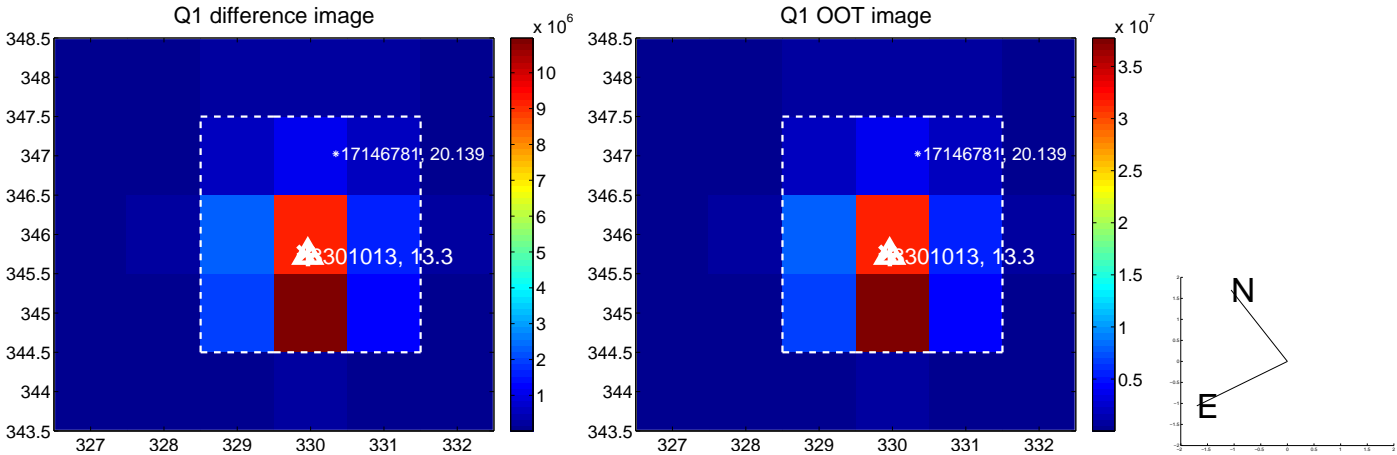
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.005 \pm 0.067$	0.07	$0.004 \pm 0.067$	$-0.002 \pm 0.067$
PRF-fit source offset from KIC position	$0.164 \pm 0.067$	2.45	$0.020 \pm 0.067$	$-0.163 \pm 0.067$
photometric centroid source offset	$0.24 \pm 0.00$	948.64	$0.09 \pm 0.00$	$-0.22 \pm 0.00$

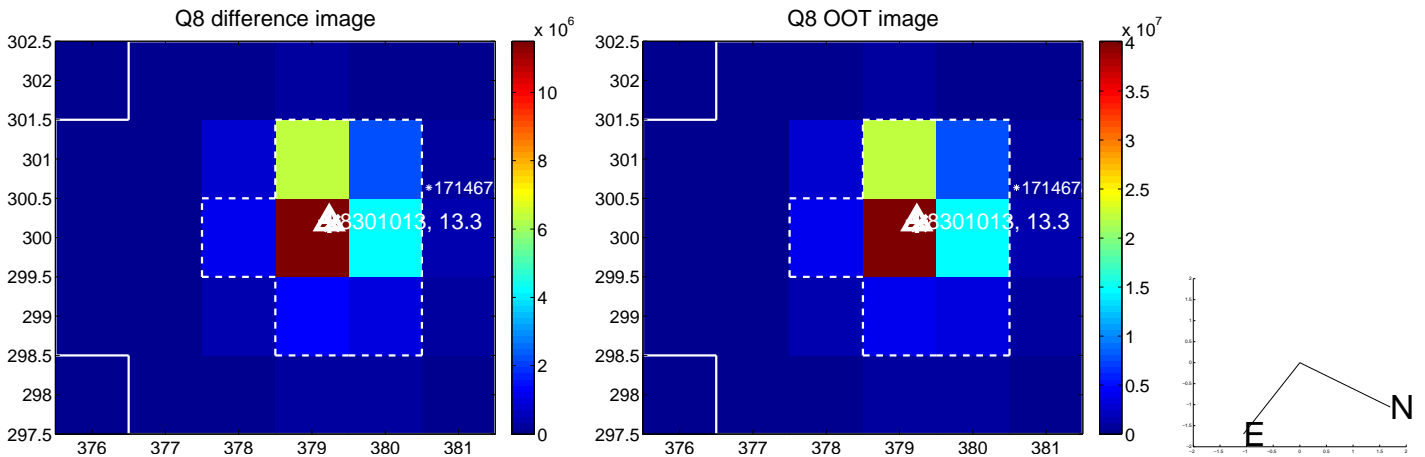
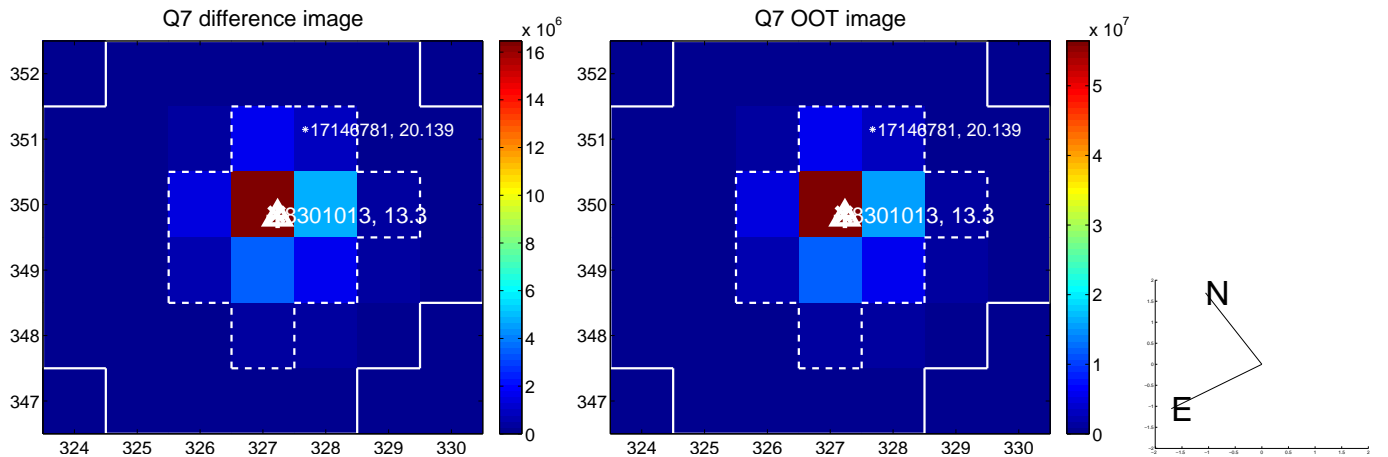
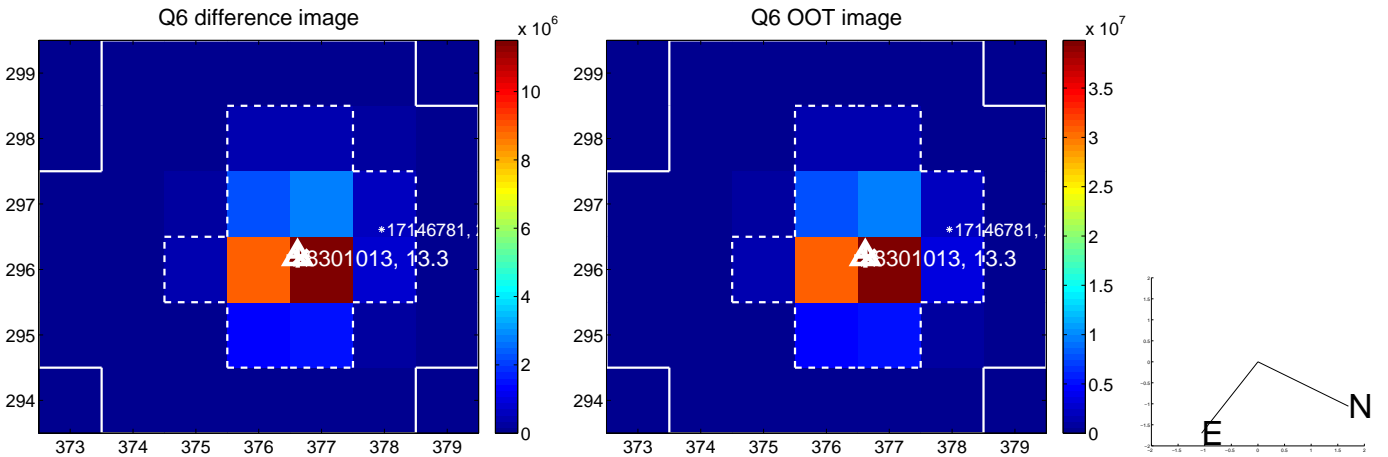
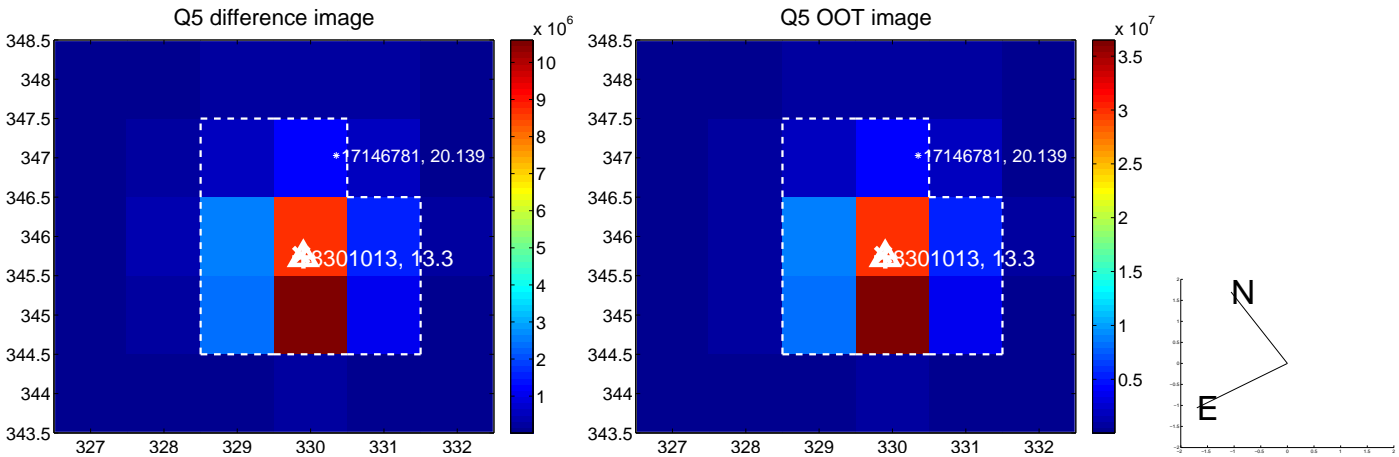


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

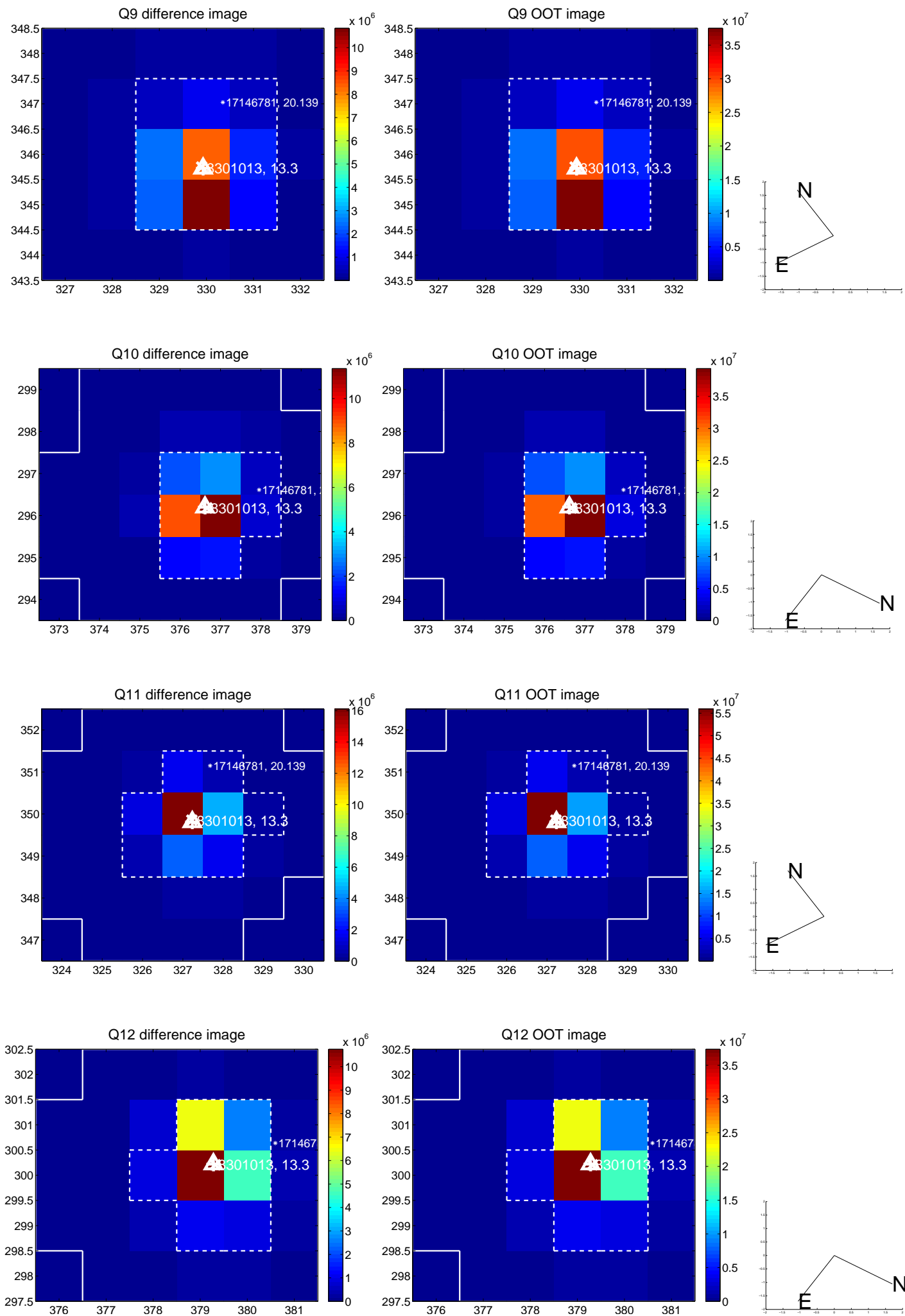


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

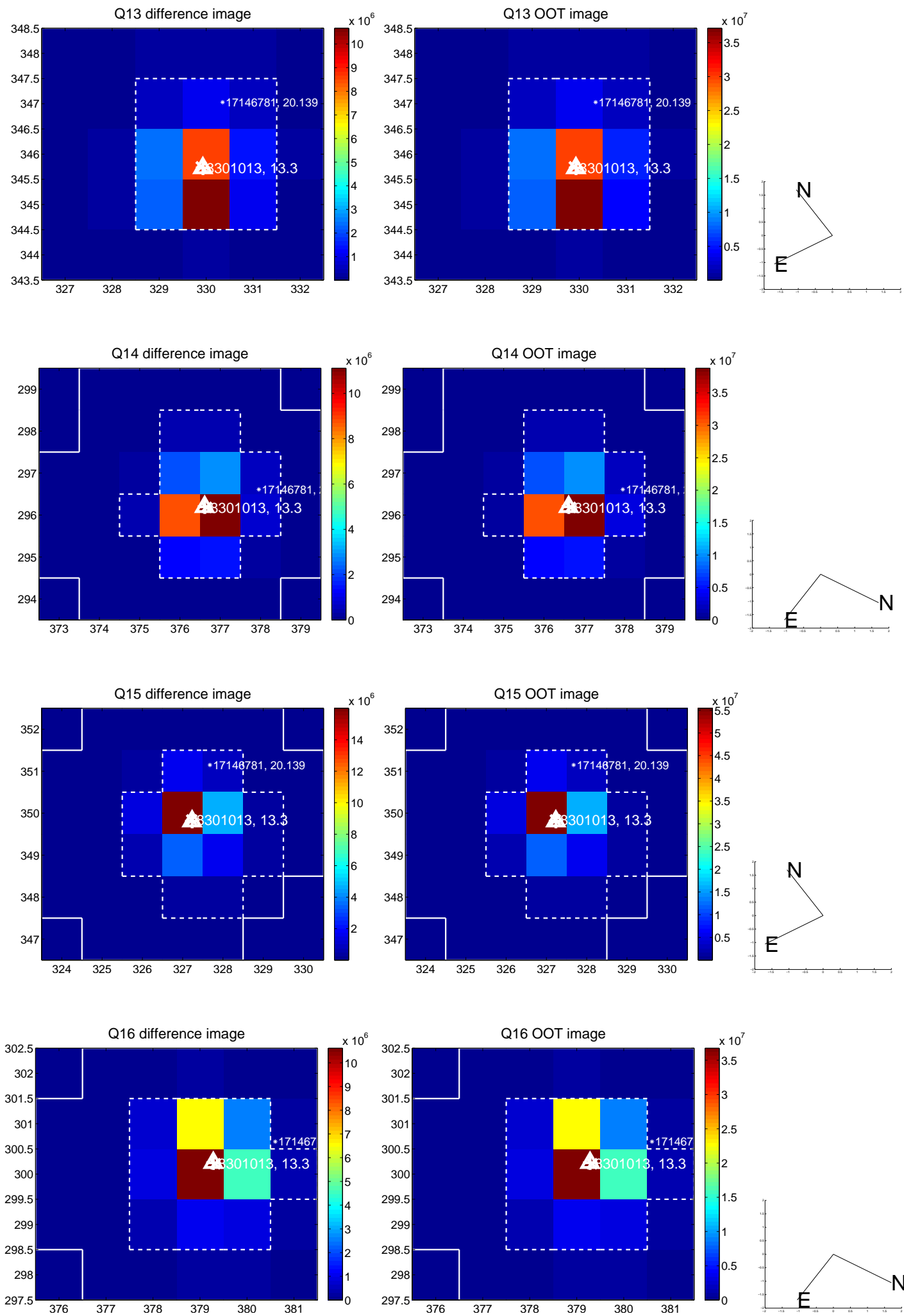




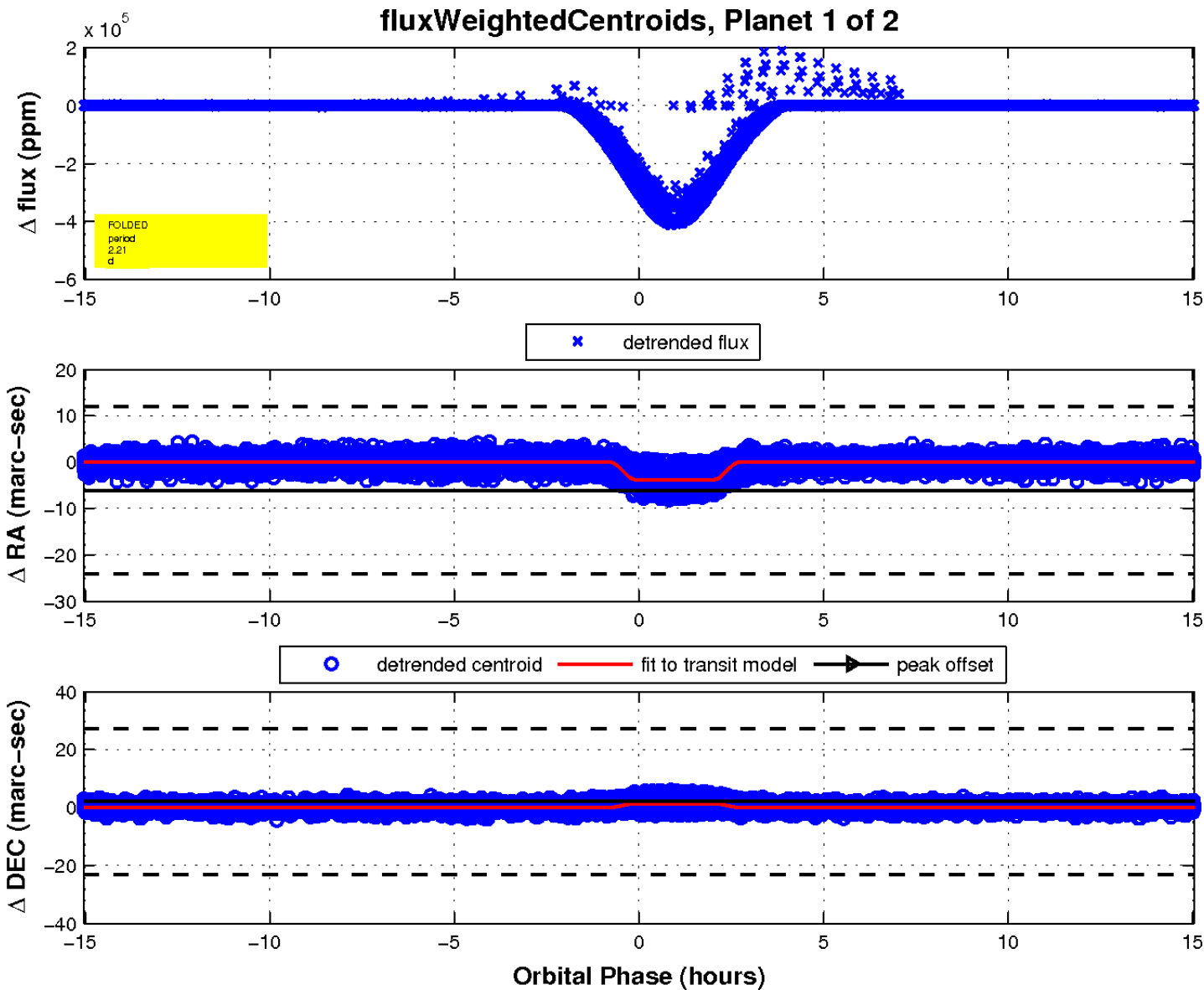
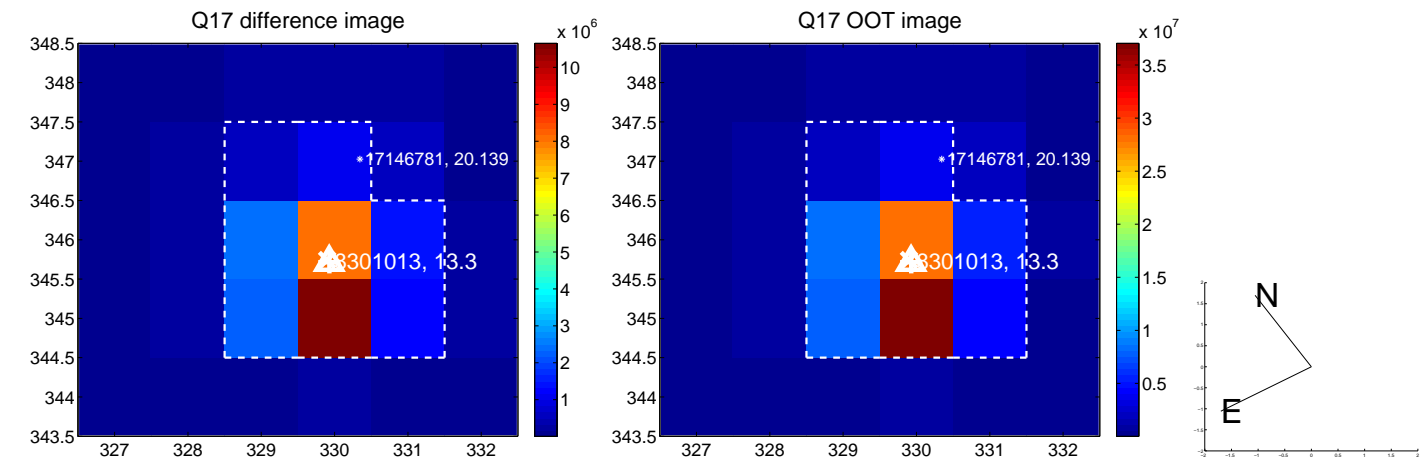
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

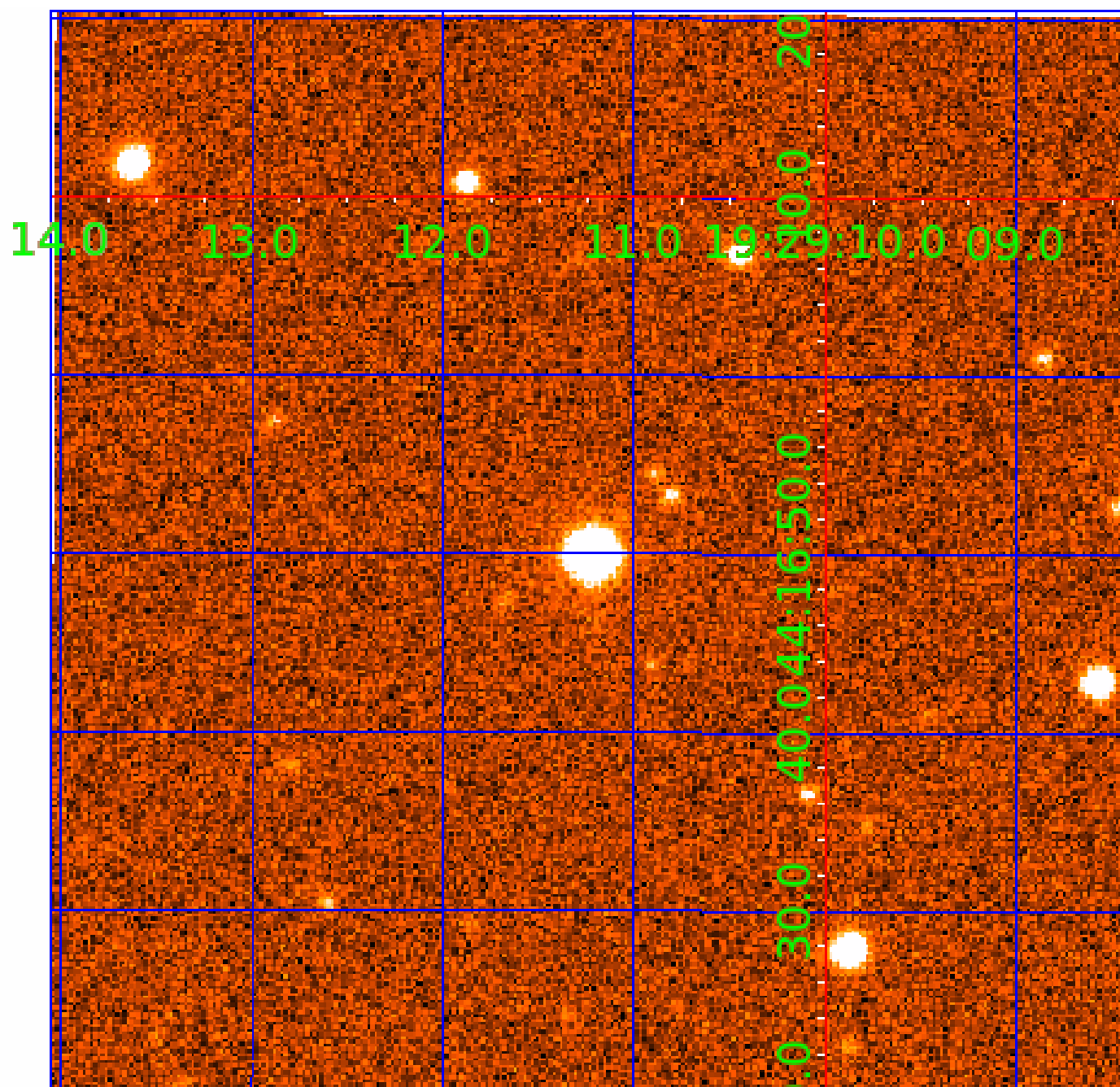


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008301013

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008301013-01	OBS	7013.01	2.214013	133.169527	372321.8	3.000	42297.8	-1.0	1.53	6604	72.98	3044.99
008301013-02	OBS	No	4.428005	132.948154	28689.8	15.000	9281.6	-1.0	1.53	6604	26.05	1208.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008301013-01	OBS	FP	0.00	0	1	0	0	DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
008301013-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—RESIDUAL_TCE—CENT_NOFITS

**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.

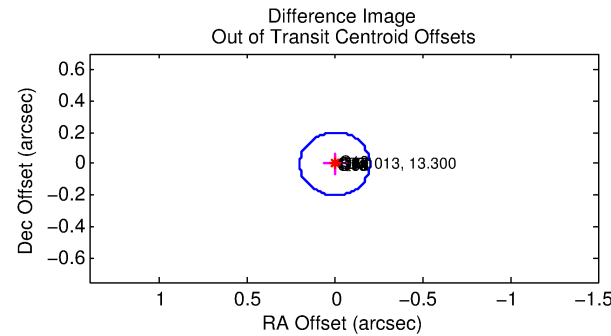
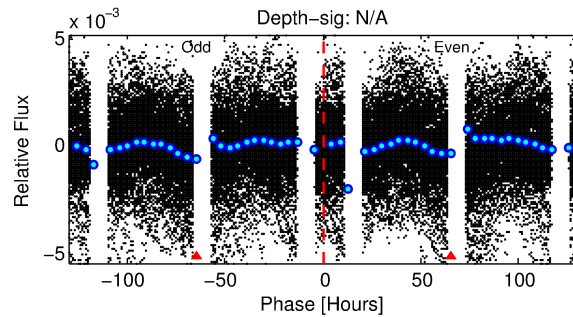
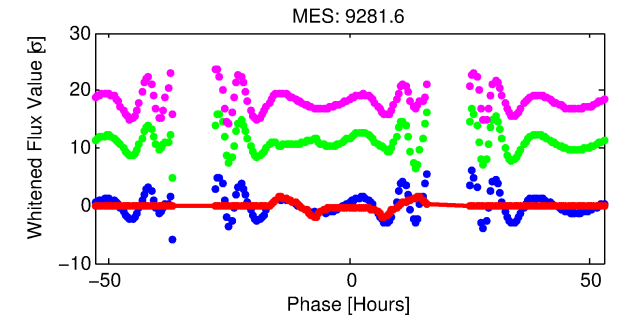
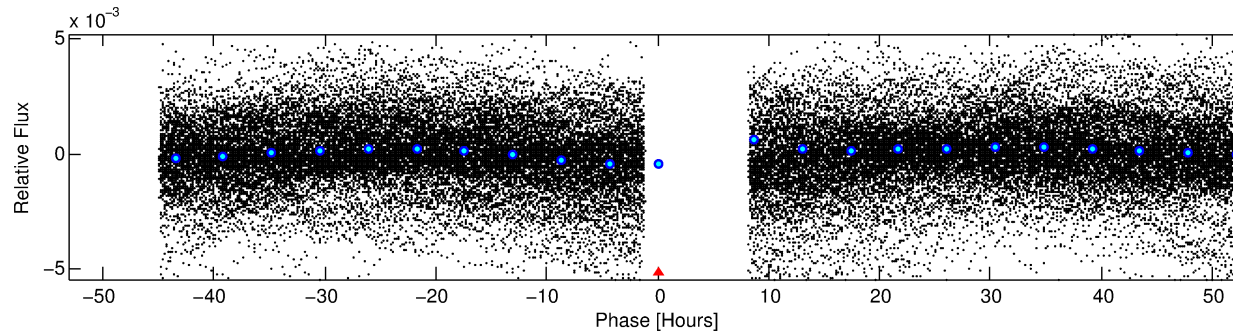
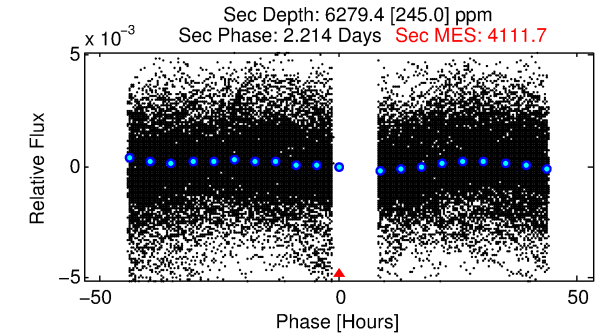
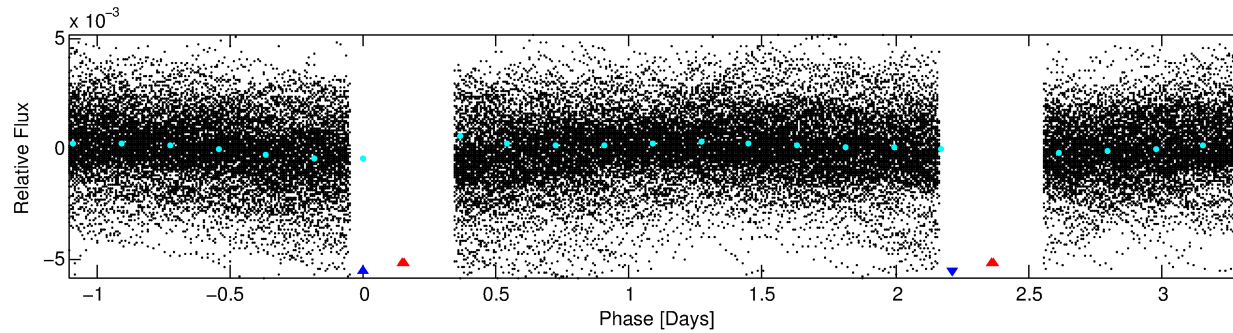
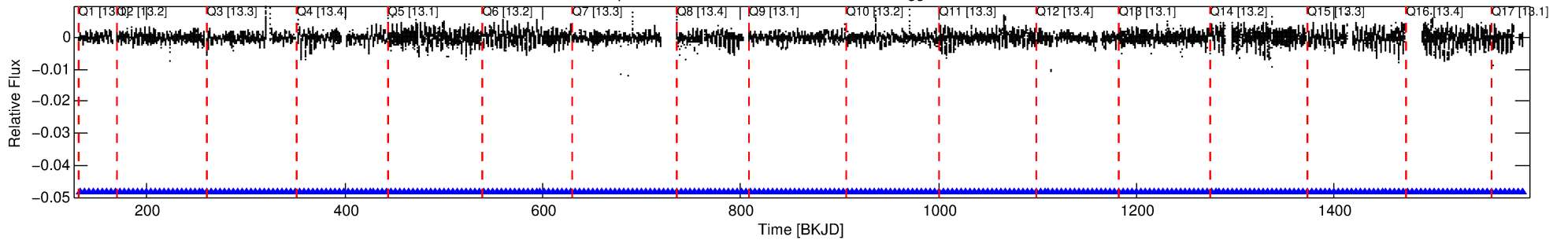
## Ephemeris Match Information For 008301013-02

No Significant Match Found

# DV One-Page Summary

KIC: 8301013 Candidate: 2 of 2 Period: 4.428 d  
KOI: K07013 Corr: No Ephemeris Match

Kp: 13.30 R\*: 1.53 Rs Teff: 6604.0 K Logg: 4.18 Fe/H: -0.120



## TPS TCE Results:

Period = 4.42800 d  
Epoch = 132.9482 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

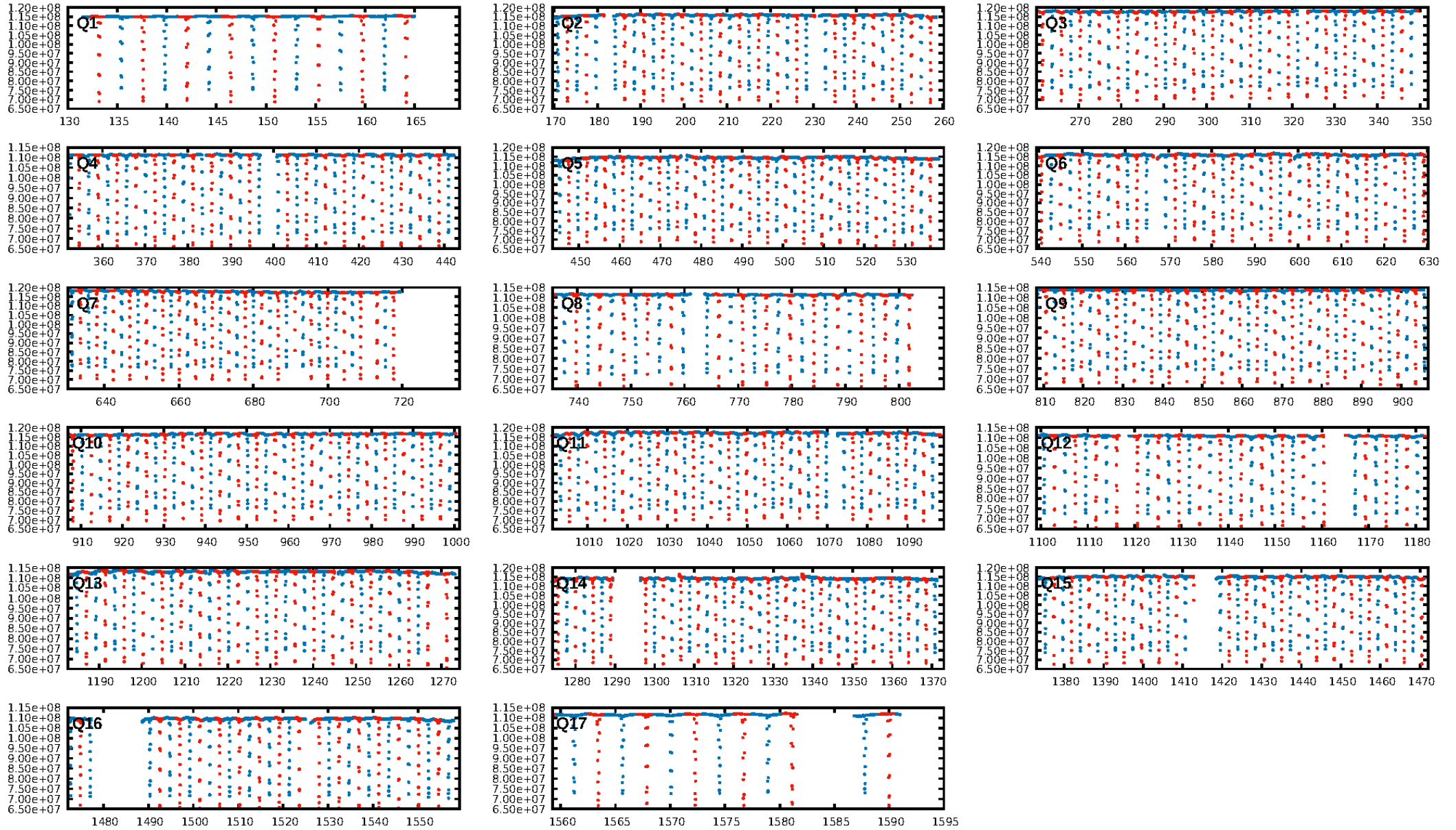
ShortPeriod-sig: 99.9% [3.47σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [297/297]  
GhostDiagnostic-chr: -1.933

Centroid-sig: 0.0%  
Centroid-so: 0.705 arcsec [5.43σ]  
OotOffset-rm: 0.000 arcsec [0.01σ]  
KicOffset-rm: 0.161 arcsec [2.40σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:42:02 Z

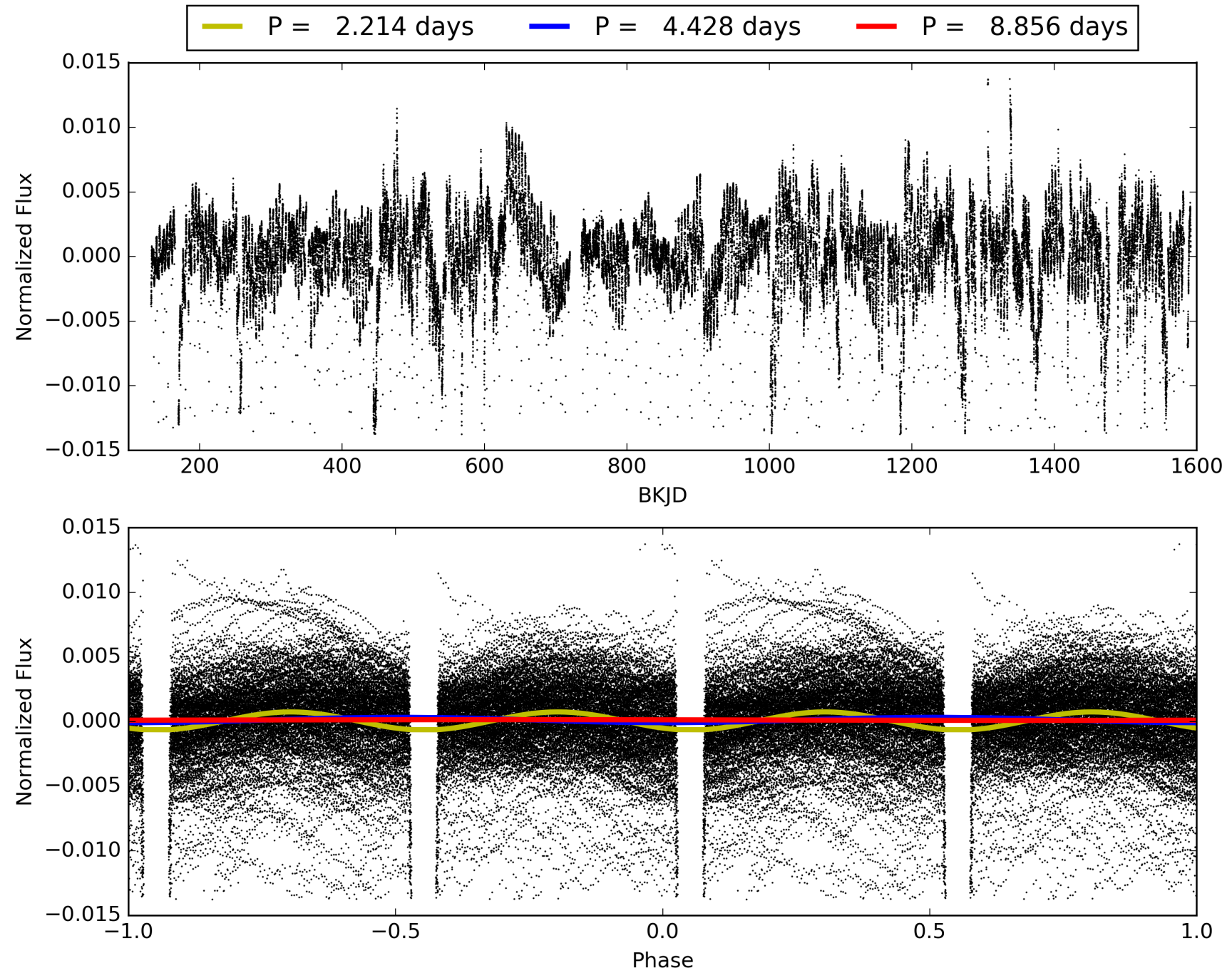
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008301013-02, PDC Light Curves





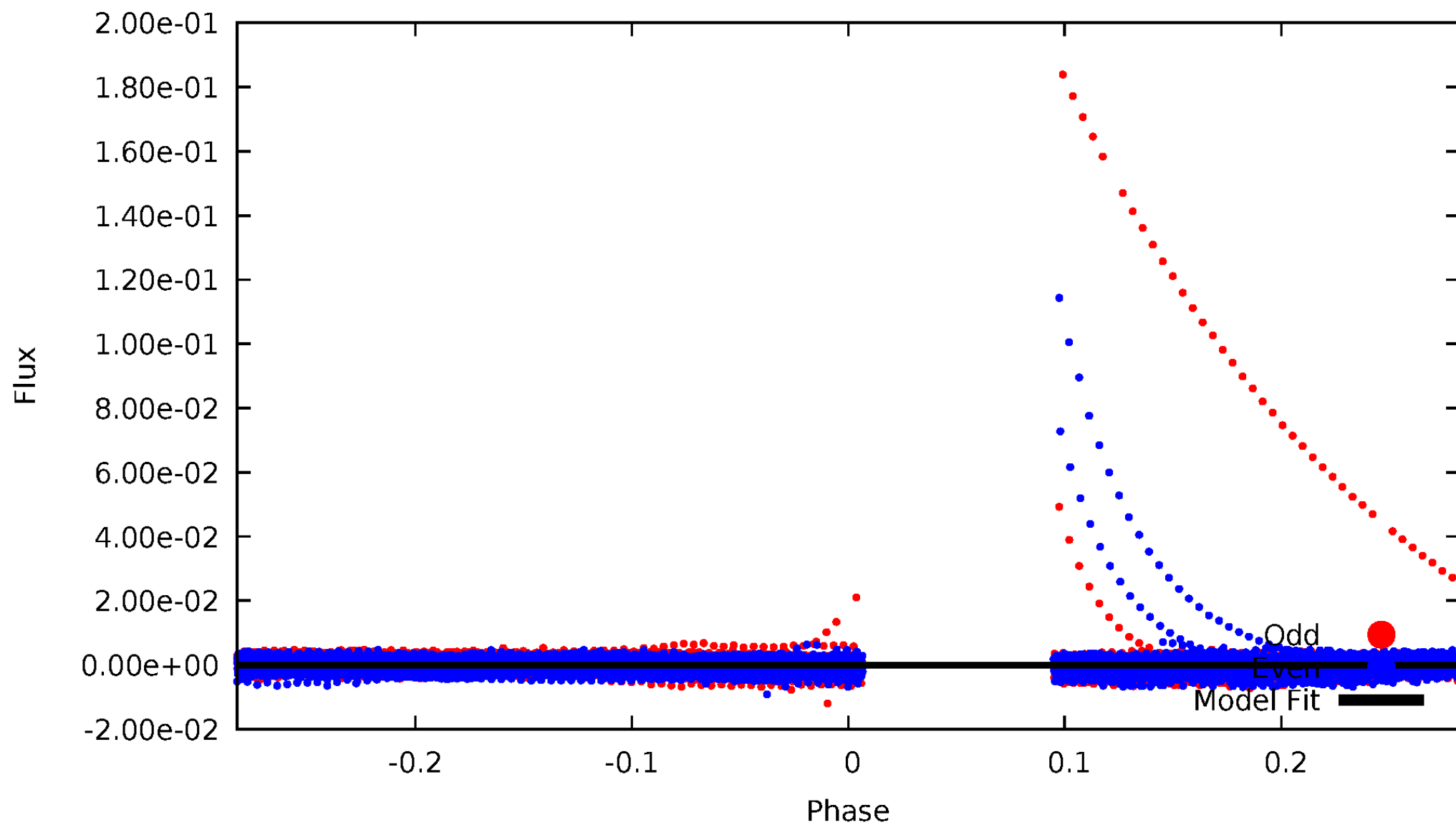
TCE 008301013-02





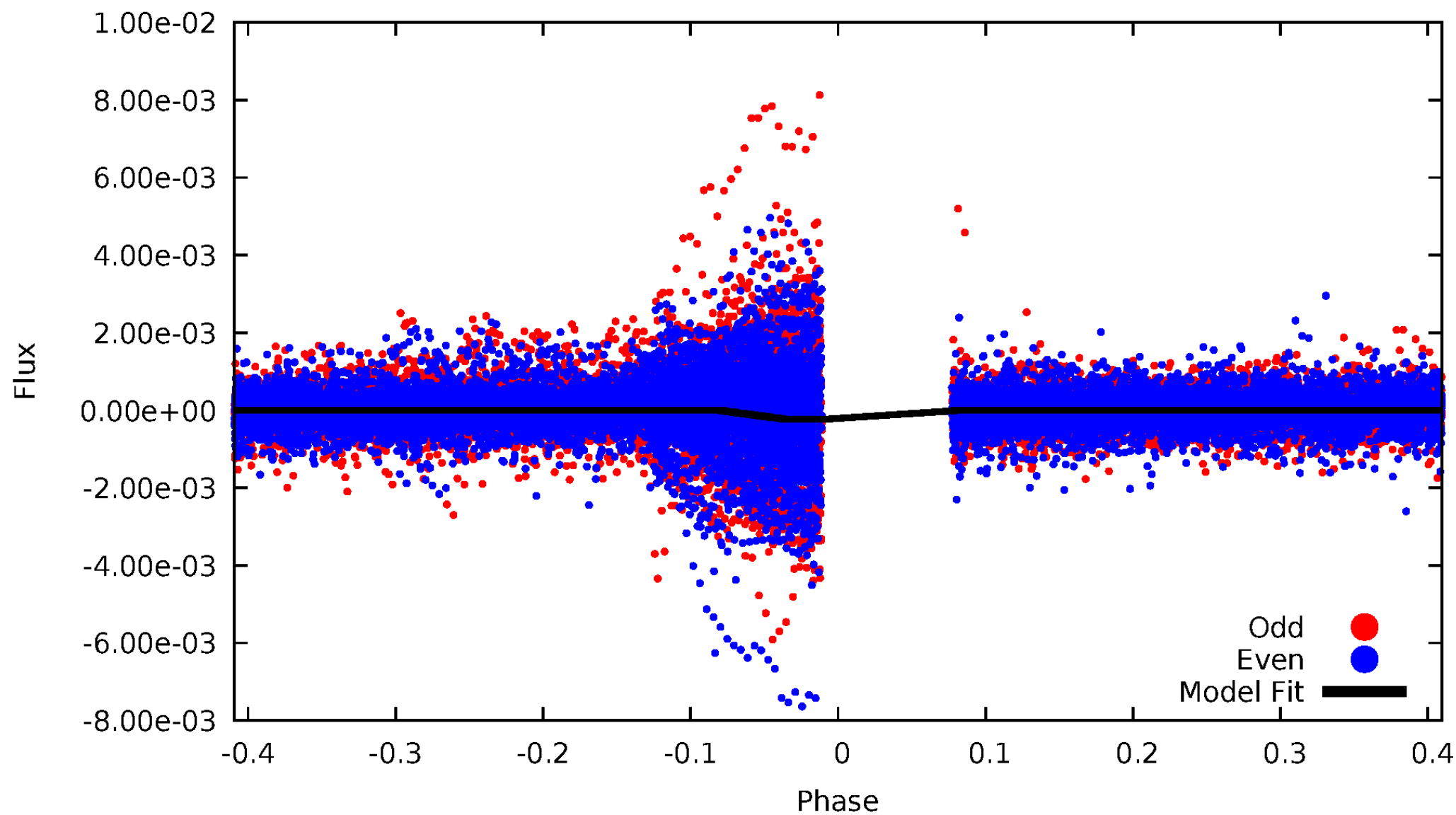
# DV Odd/Even

TCE 008301013-02



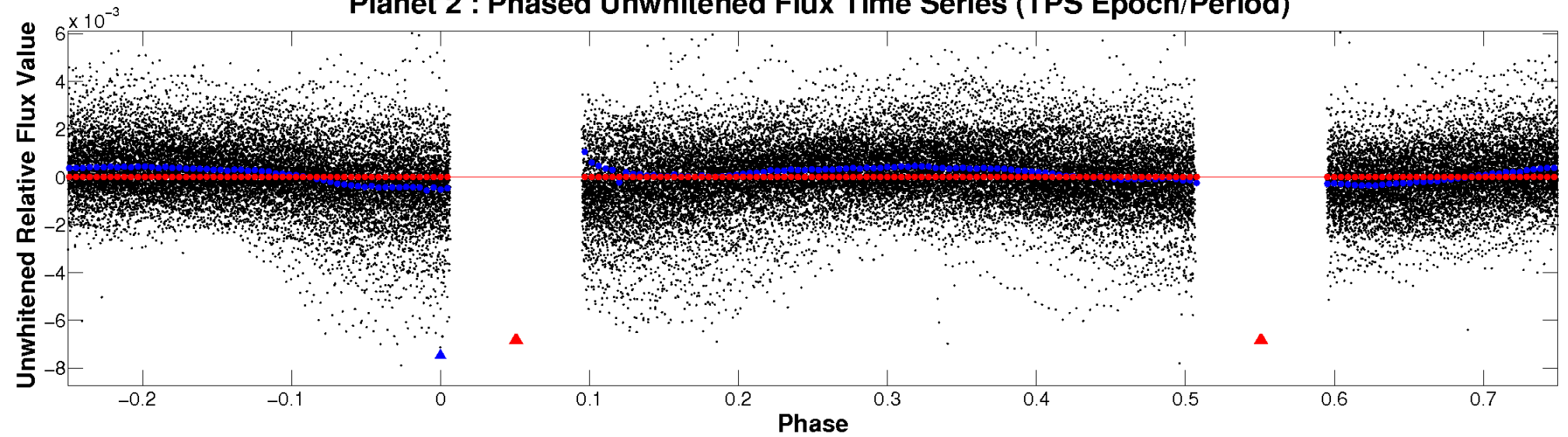
# ALT Odd/Even

TCE 008301013-02



# Non-Whitened Vs. Whitened Light Curve

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

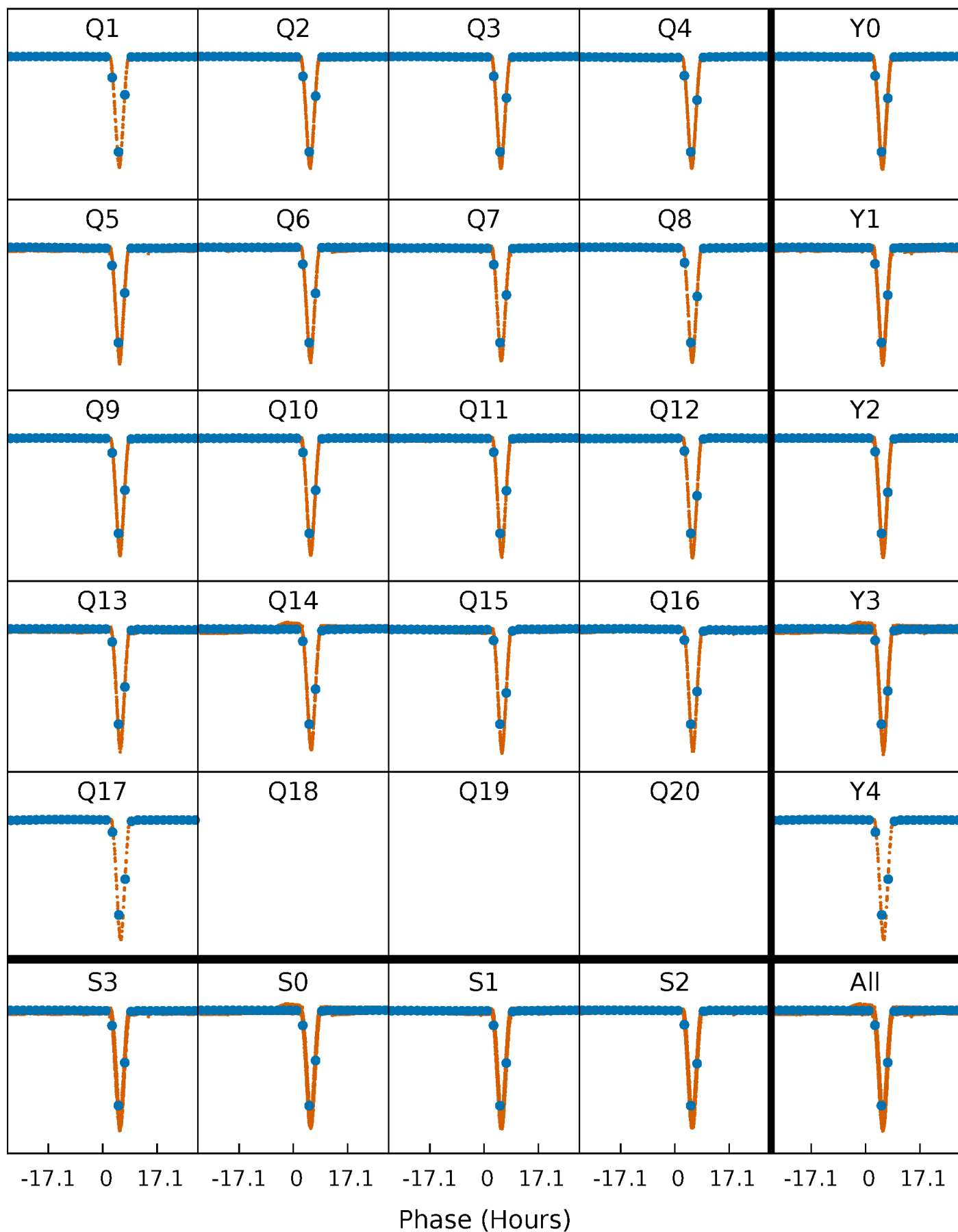


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



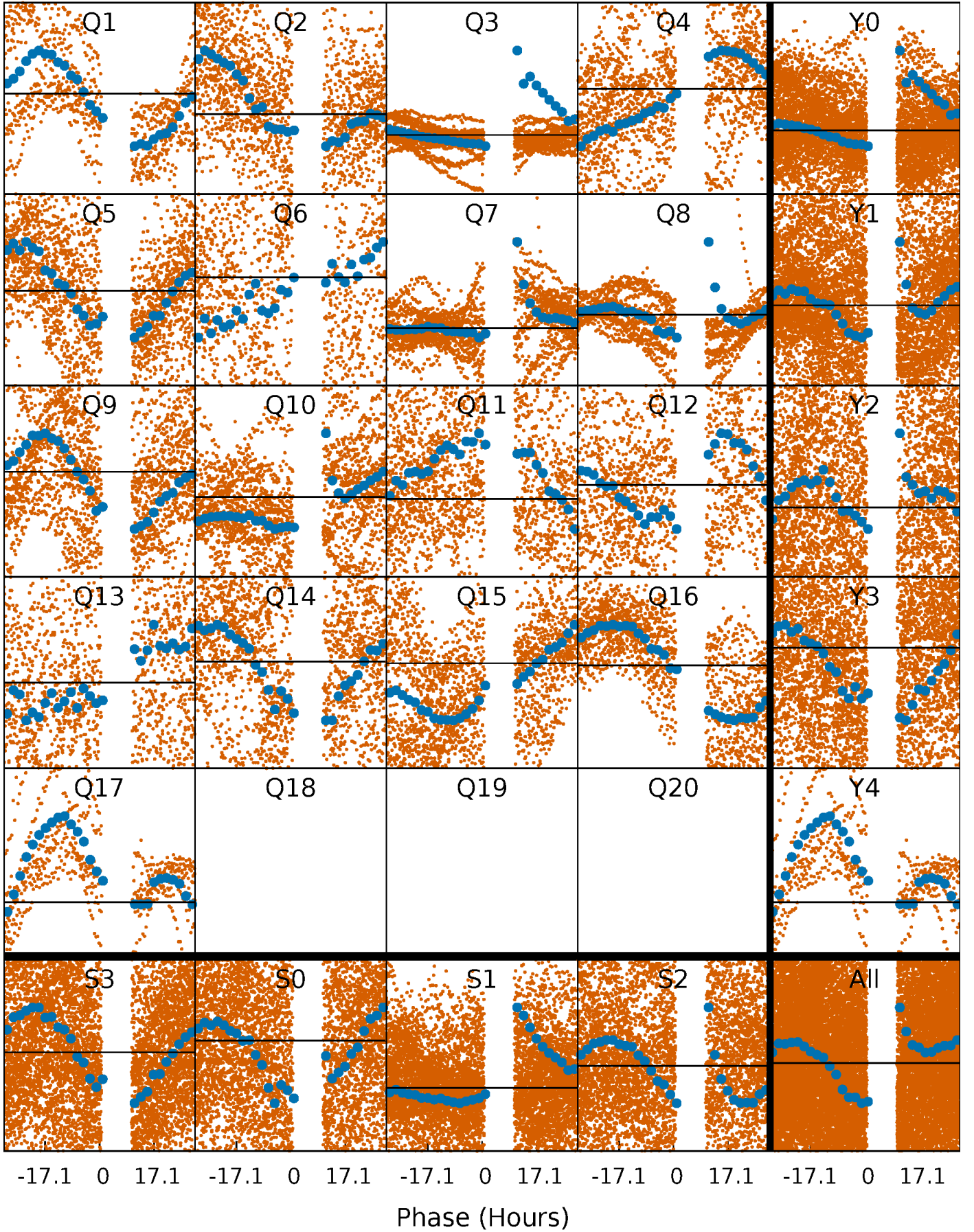
# PDC Quarter-Phased Transit Curves

TCE 008301013-02 P= 4.428005 Days  $T_0=132.948154$  (BKJD)



# DV Quarter-Phased Transit Curves

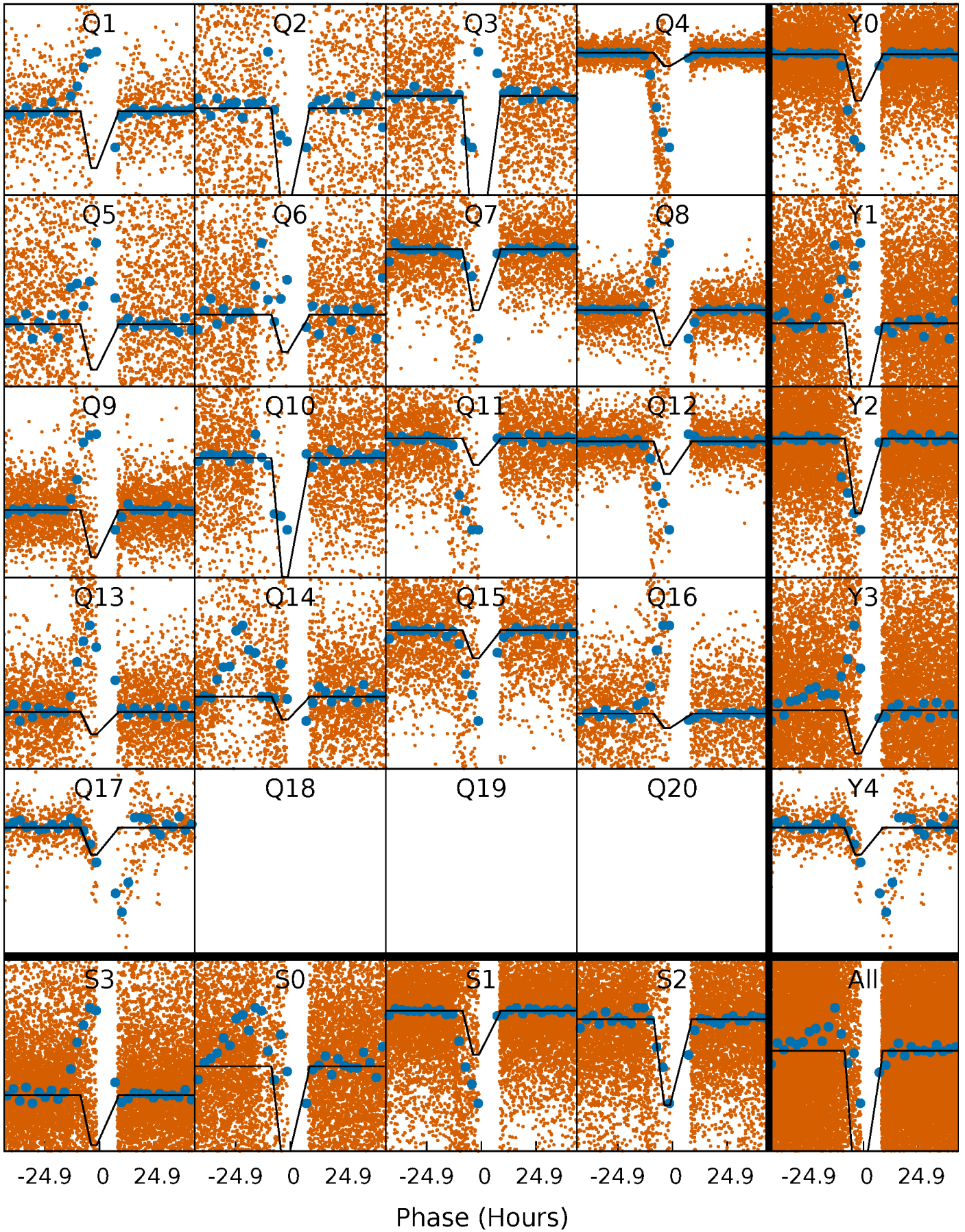
TCE 008301013-02   P= 4.428005 Days    $T_0=132.948154$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

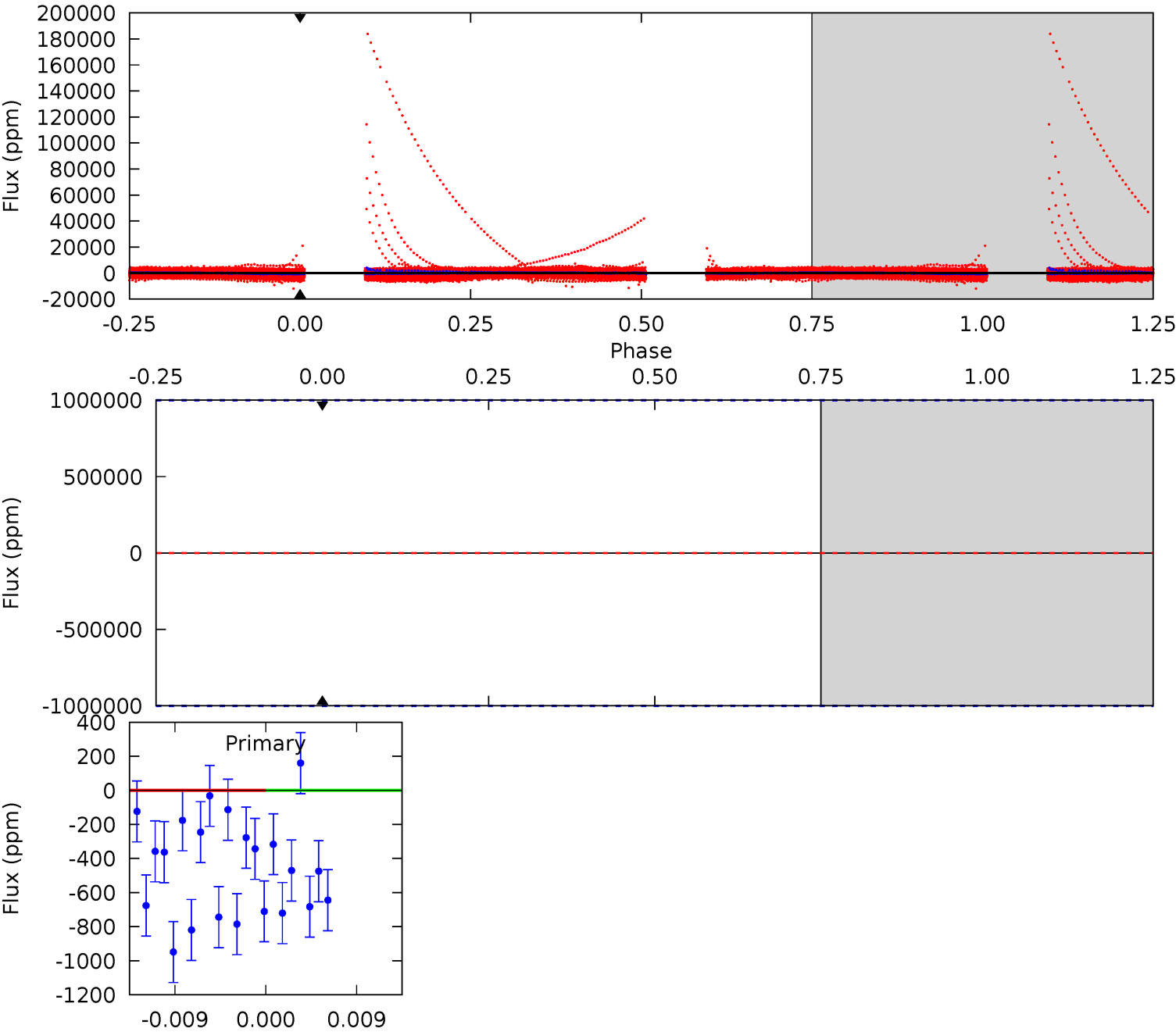
TCE 008301013-02 P= 4.428005 Days  $T_0=133.026438$  (BKJD)



# DV Model-Shift Uniqueness Test

008301013-02, P = 4.428005 Days, E = 128.520149 Days

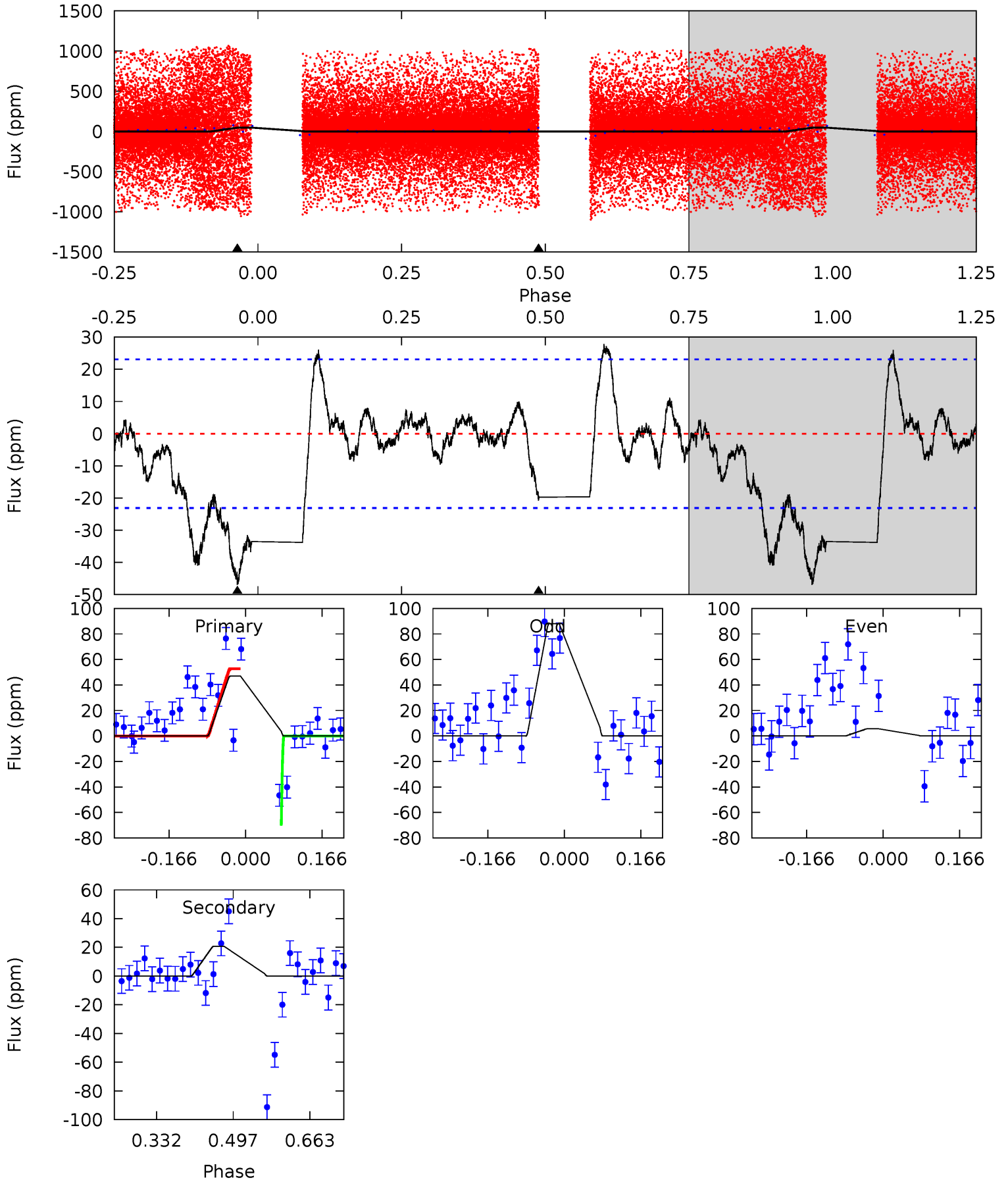
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008301013-02, P = 4.428005 Days, E = 128.598433 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.06	4.01	0	0	4.46	1.39	0.84	9.06	9.06	4.01	4.01	7.49	-0.60	0.37	1.09





### Stellar Parameters For KIC 008301013

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6604^{+155}_{-214}$	$4.178^{+0.162}_{-0.180}$	$-0.120^{+0.250}_{-0.300}$	$1.526^{+0.463}_{-0.336}$	$1.283^{+0.181}_{-0.201}$	$0.509^{+0.469}_{-0.243}$
	+2%/-3%	+4%/-4%	+208%/-250%	+30%/-22%	+14%/-16%	+92%/-48%
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 008301013-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$28.12^{+15.60}_{-15.48}$	$2098^{+179}_{-137}$	$4360^{+7591}_{-14837}$	$11^{+337}_{-308}$
Alt.	$-21 \pm 5$	$11.86^{+12.88}_{-8.55}$	$2100^{+152}_{-135}$	$-2005^{+5490}_{-492}$	$0.266^{+3.077}_{-0.208}$

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

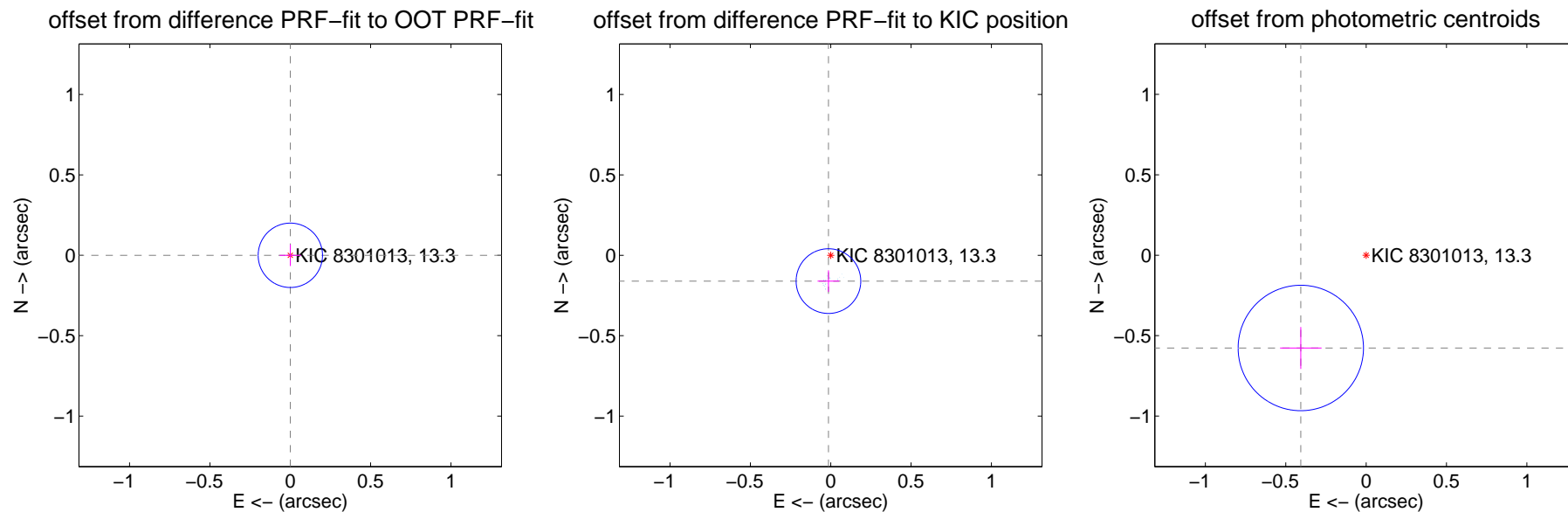
## DV Centroid Data

Supplemental centroid analysis for 008301013-02. Kepler magnitude: 13.30. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

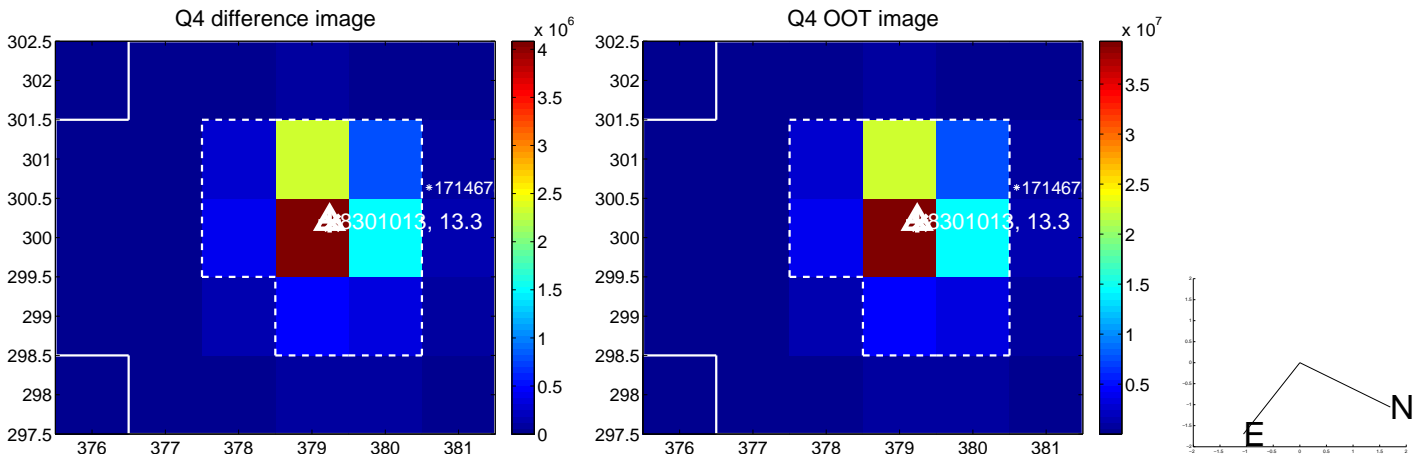
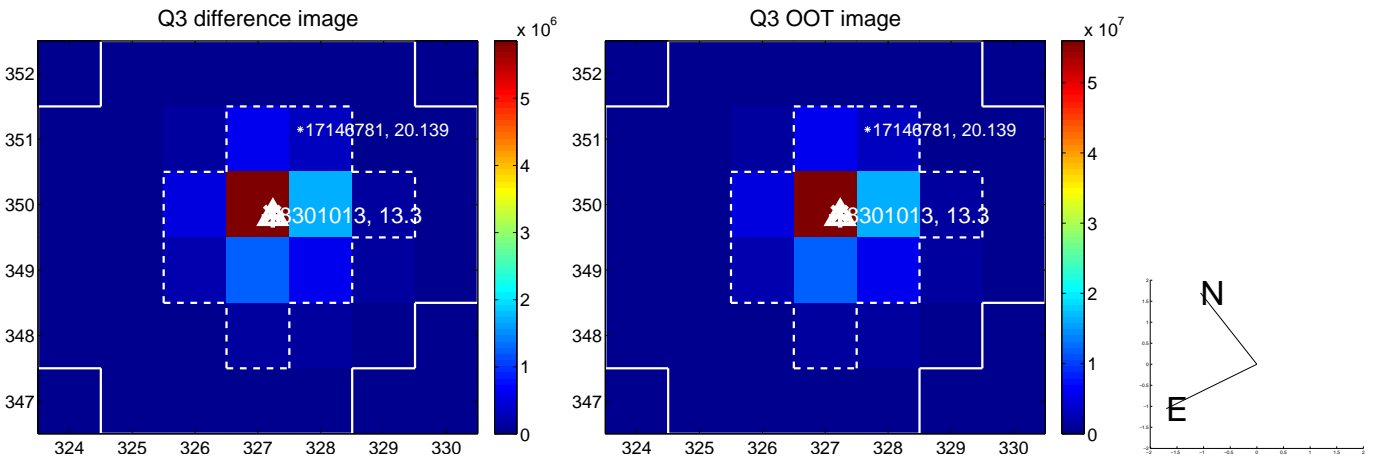
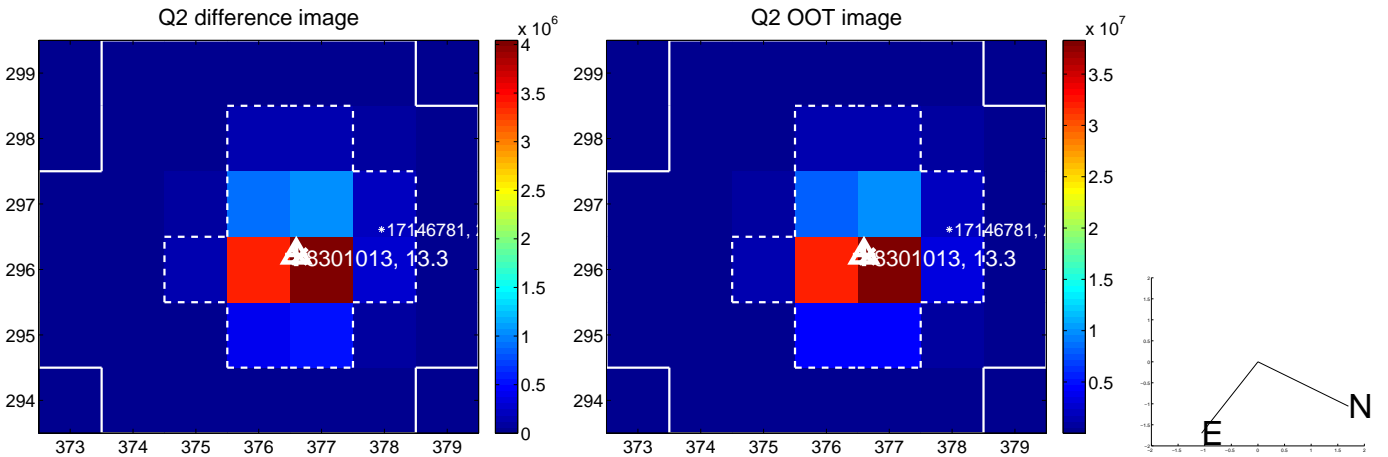
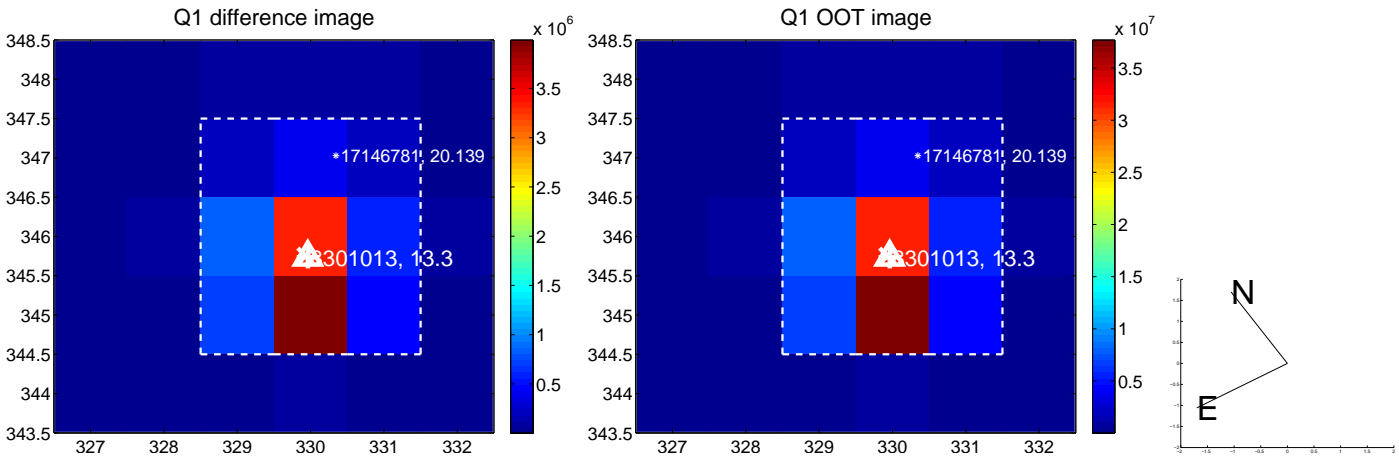
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.000 \pm 0.067$	0.01	$-0.000 \pm 0.067$	$-0.000 \pm 0.067$
PRF-fit source offset from KIC position	$0.161 \pm 0.067$	2.40	$0.014 \pm 0.067$	$-0.161 \pm 0.067$
photometric centroid source offset	$0.71 \pm 0.13$	5.43	$0.41 \pm 0.13$	$-0.58 \pm 0.13$

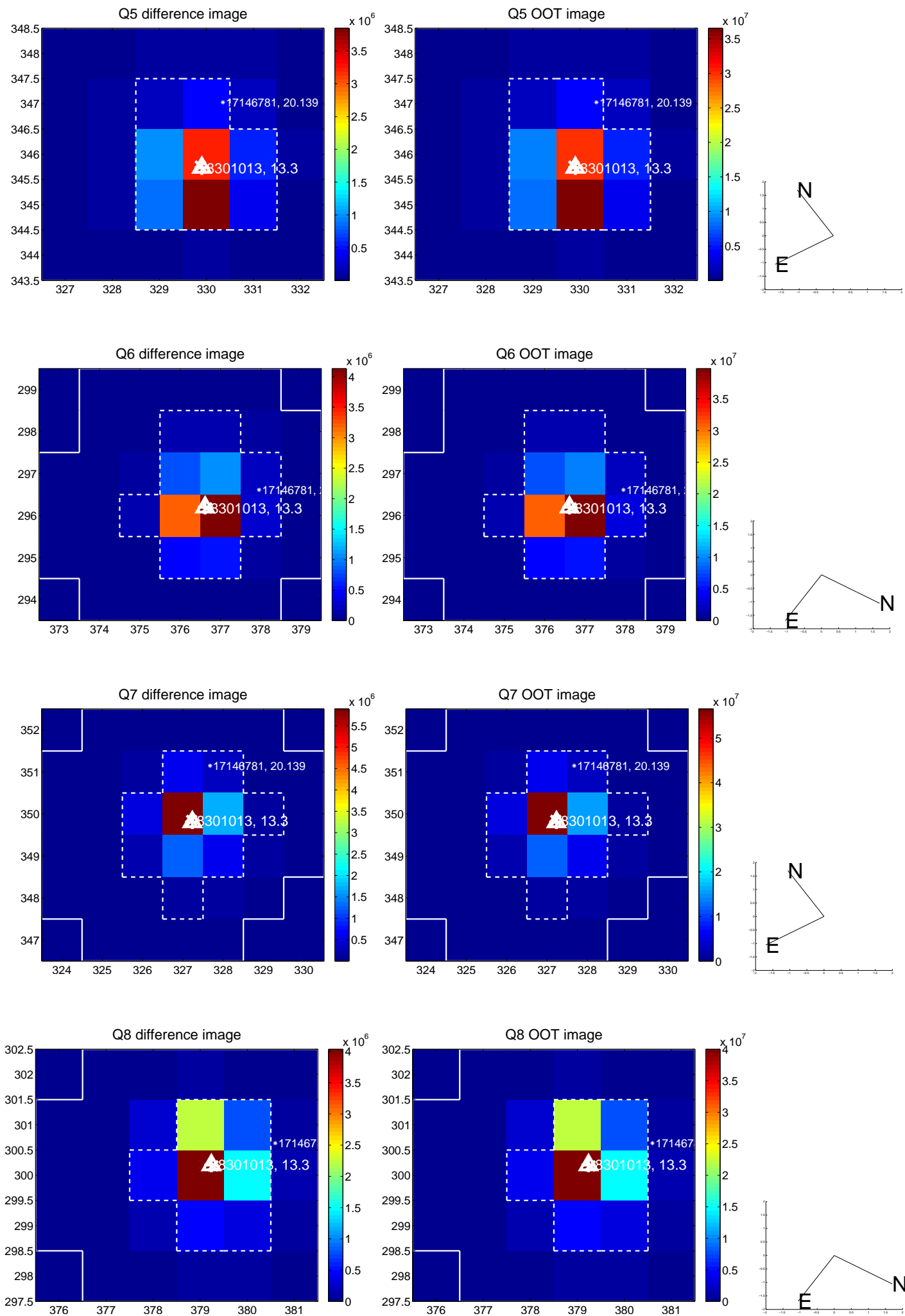


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

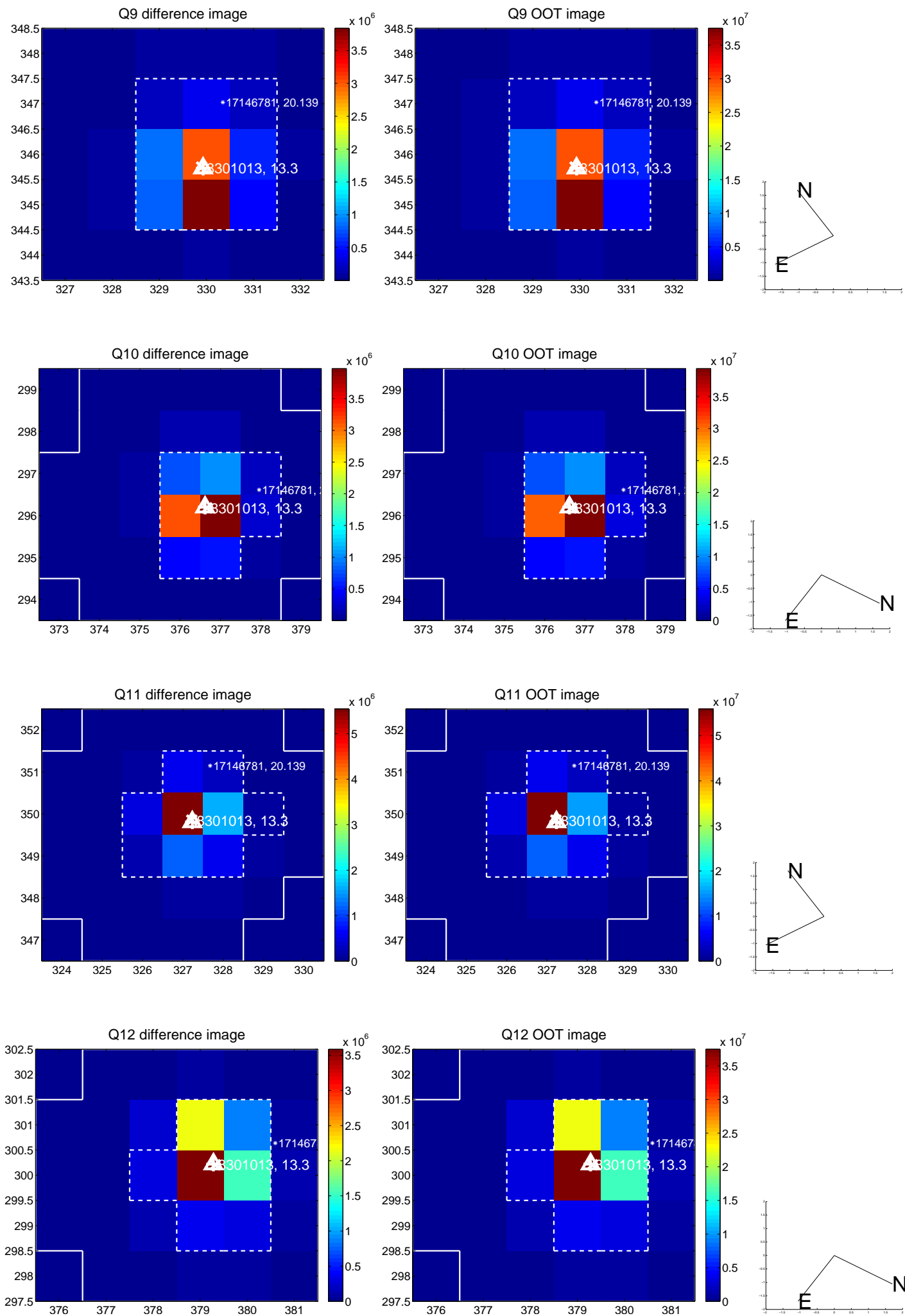
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



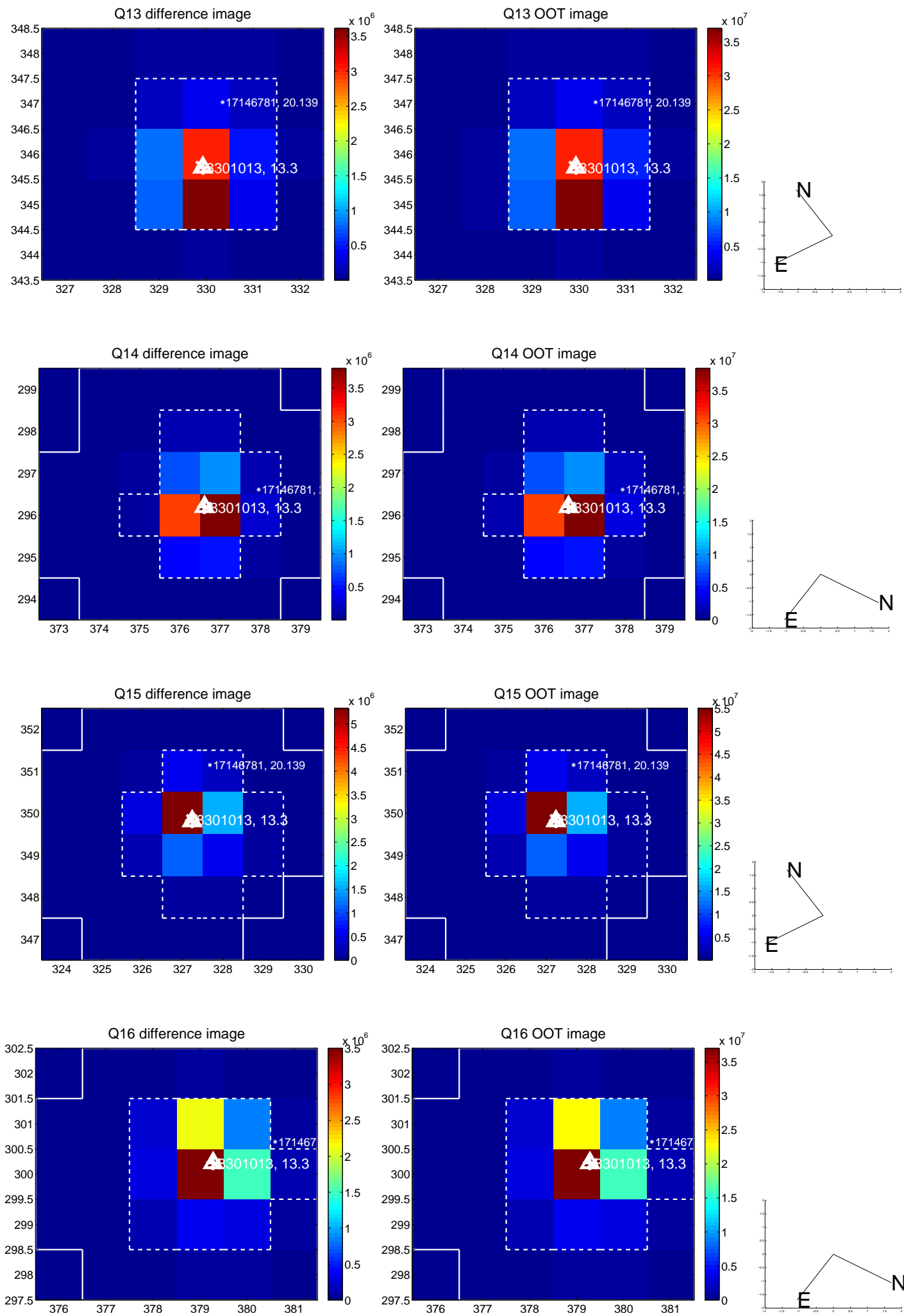
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



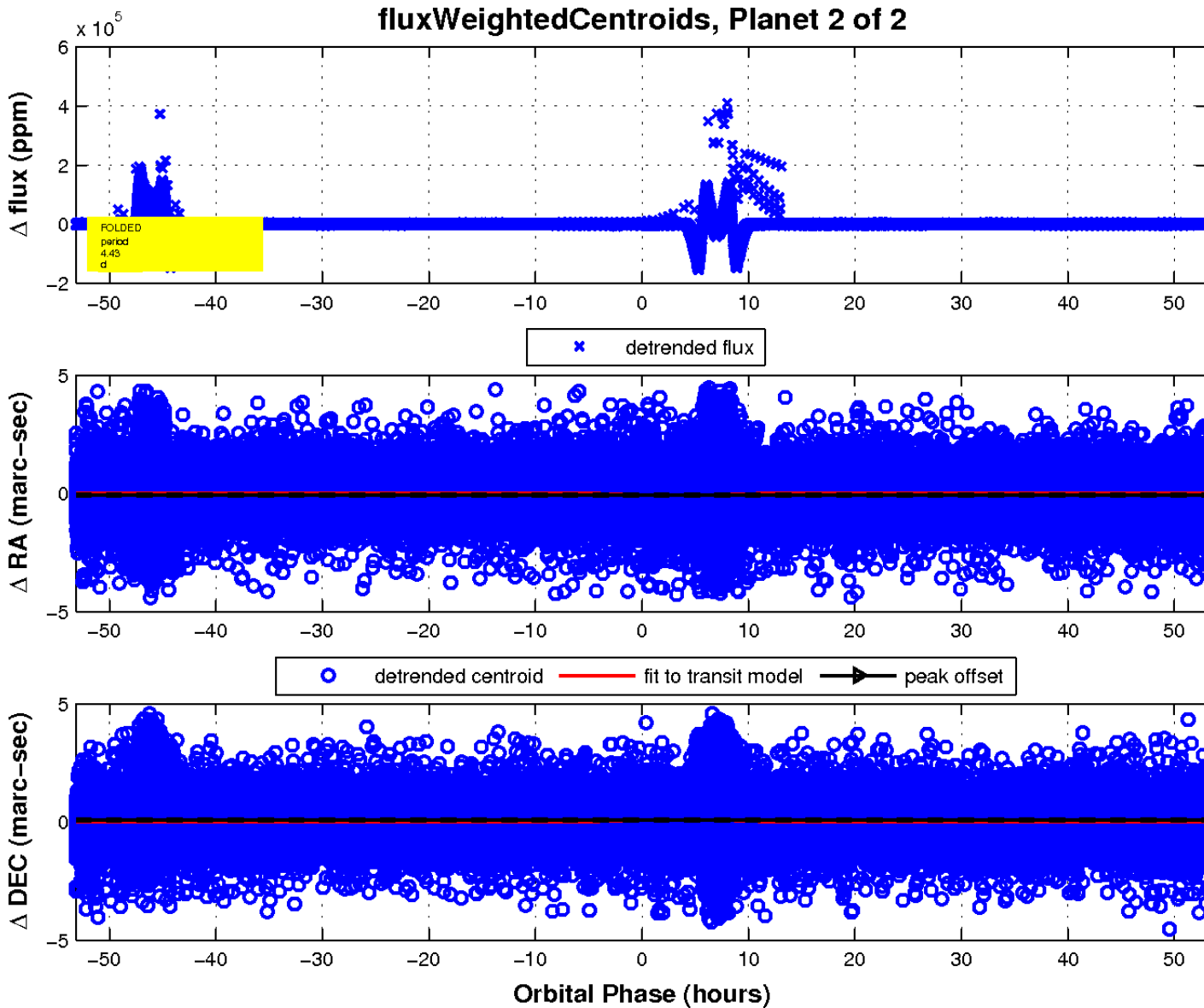
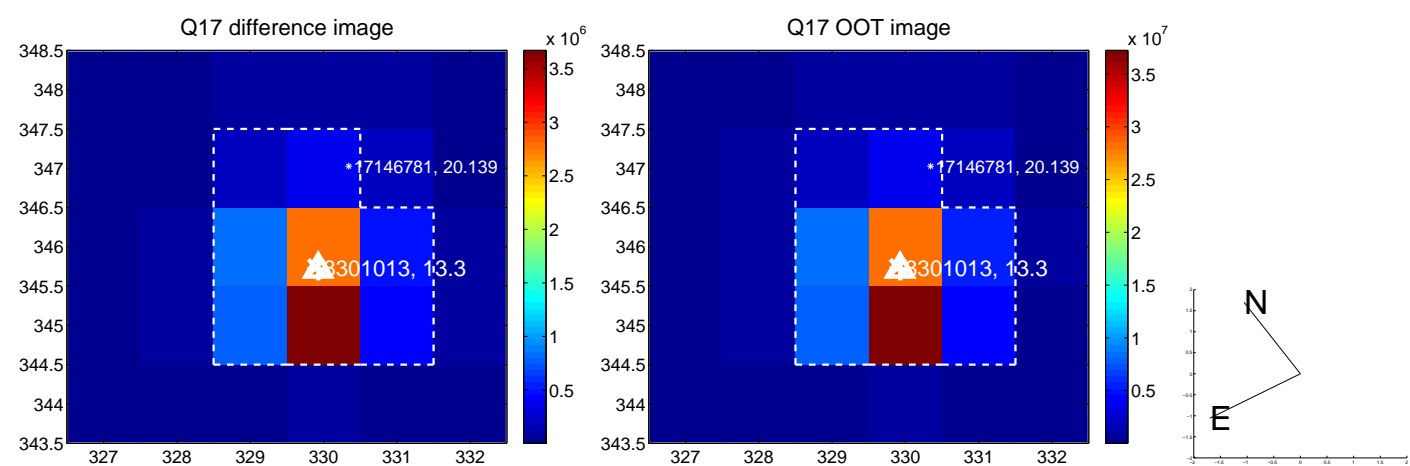
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Declination