

# KIC 004902030

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004902030-01	OBS	6467.01	0.878808	132.260994	395678.7	2.500	9404.6	-1.0	0.74	4524	37.35	780.02
004902030-02	OBS	No	7.030316	136.670656	33023.1	34.483	681.0	77.8	0.74	4524	14.37	48.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004902030-01	OBS	FP	0.00	0	1	0	0	DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
004902030-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—RESIDUAL_TCE—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.

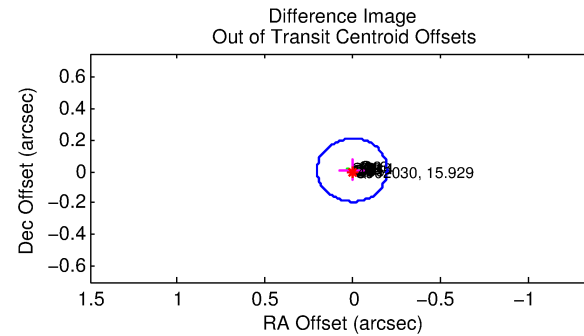
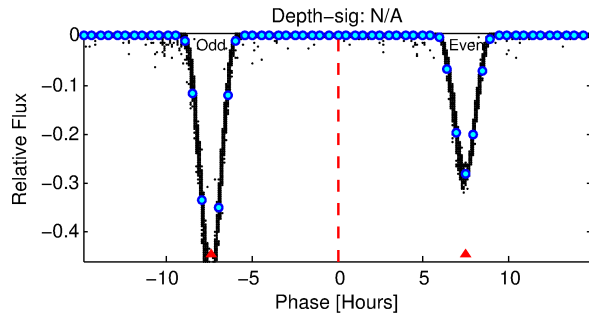
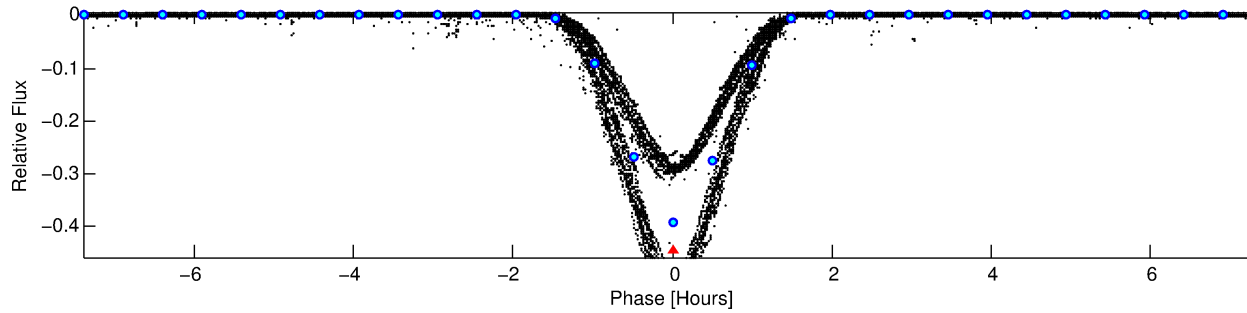
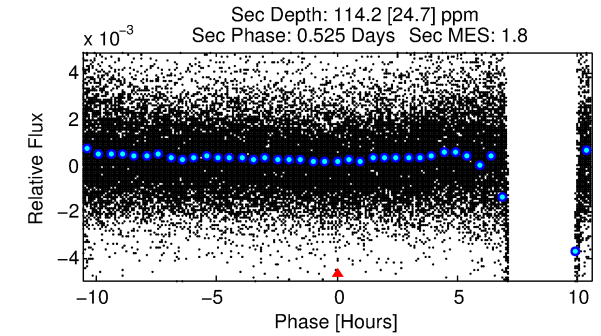
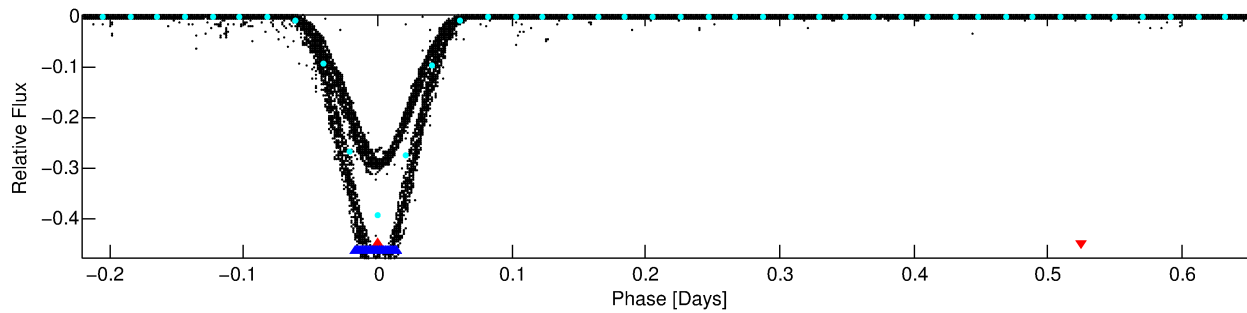
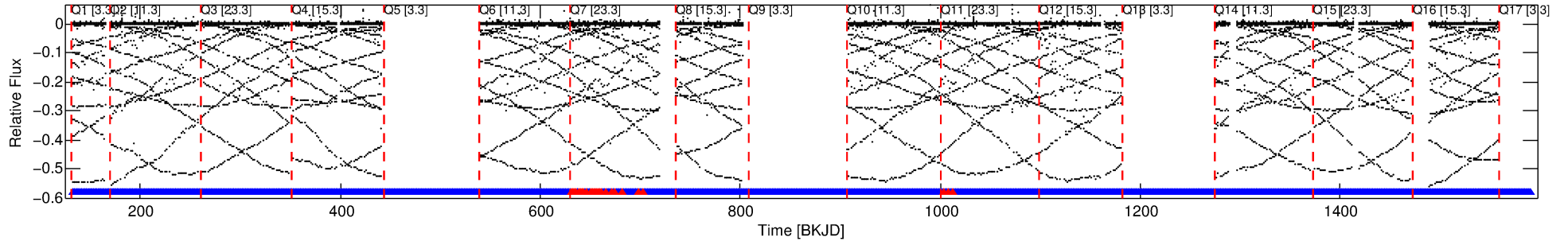
## Ephemeris Match Information For 004902030-01

No Significant Match Found

# DV One-Page Summary

KIC: 4902030 Candidate: 1 of 2 Period: 0.879 d  
KOI: K06467.01 Corr: 0.957

Kp: 15.93 R\*: 0.74 Rs Teff: 4524.0 K Logg: 4.57 Fe/H: 0.240



## TPS TCE Results:

Period = 0.87881 d  
Epoch = 132.2610 BKJD

DV fit results are unavailable

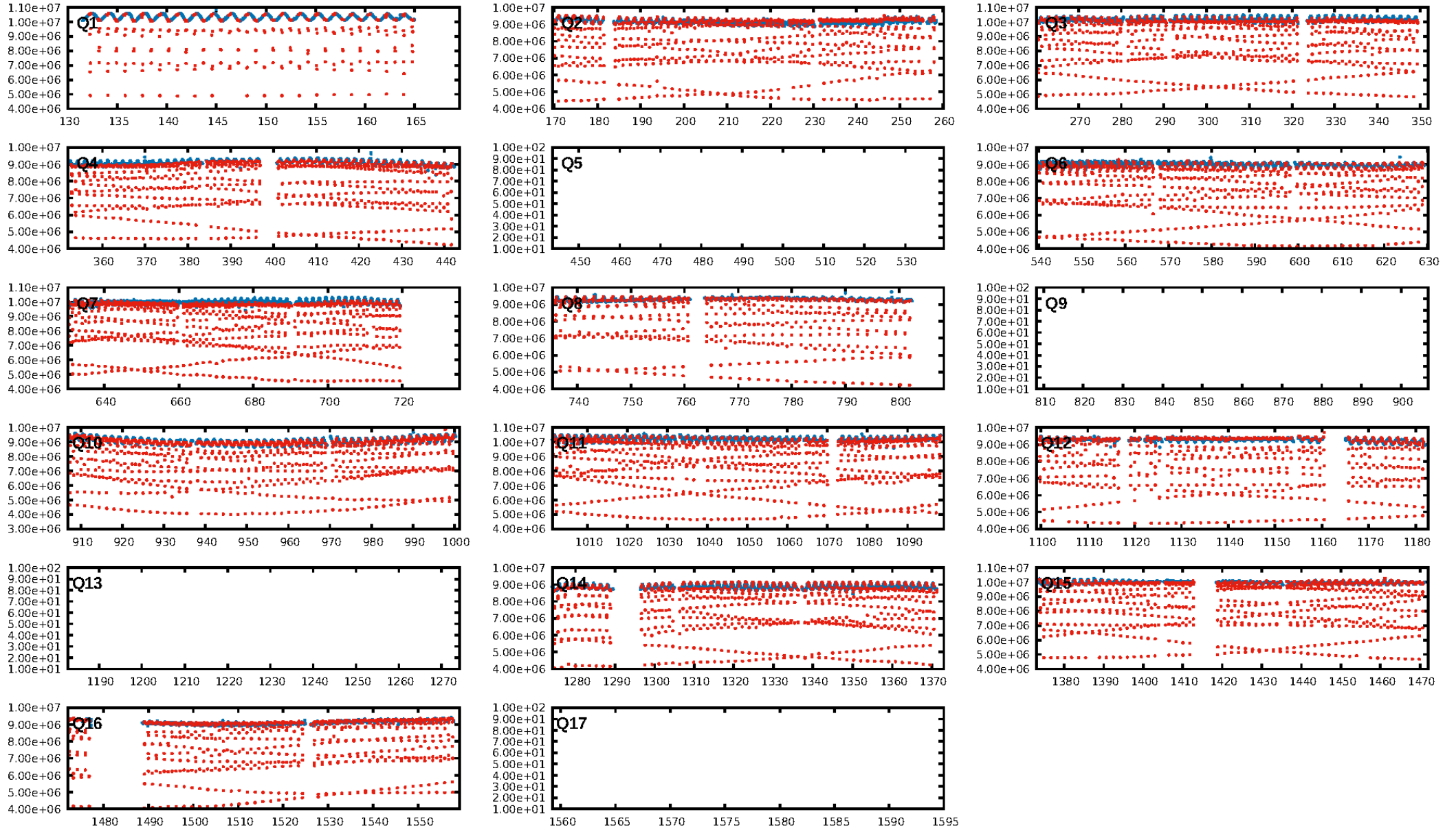
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [4.27 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.97 [1109/1141]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: 0.471 arcsec [490.14 $\sigma$ ]  
OotOffset-rm: 0.011 arcsec [0.17 $\sigma$ ]  
KicOffset-rm: 0.231 arcsec [3.18 $\sigma$ ]  
OotOffset-st: 4/4/4/1 [13]  
KicOffset-st: 4/4/4/1 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 1.00 [13/13]

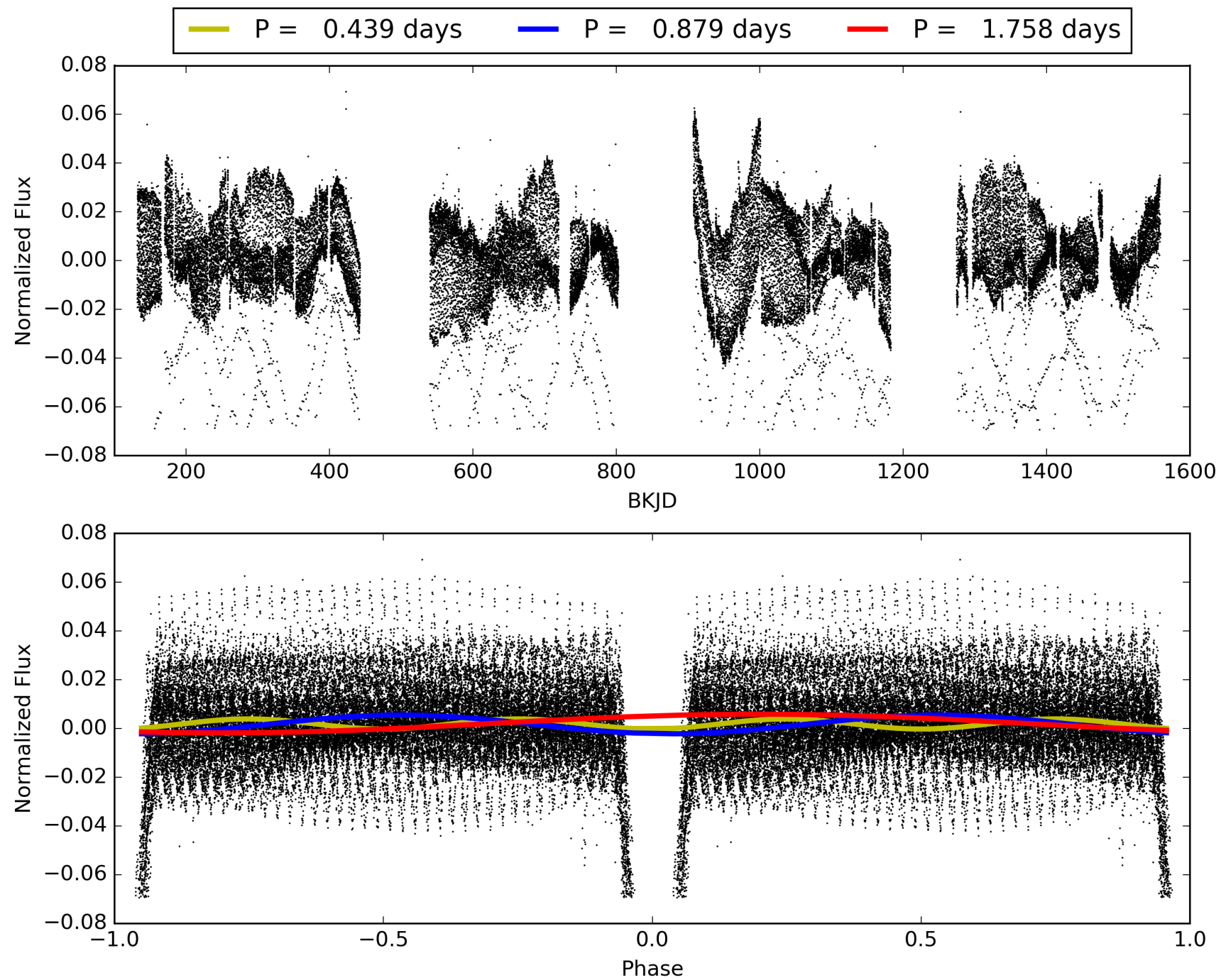
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 10:08:34 Z

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

# TCE 004902030-01, PDC Light Curves

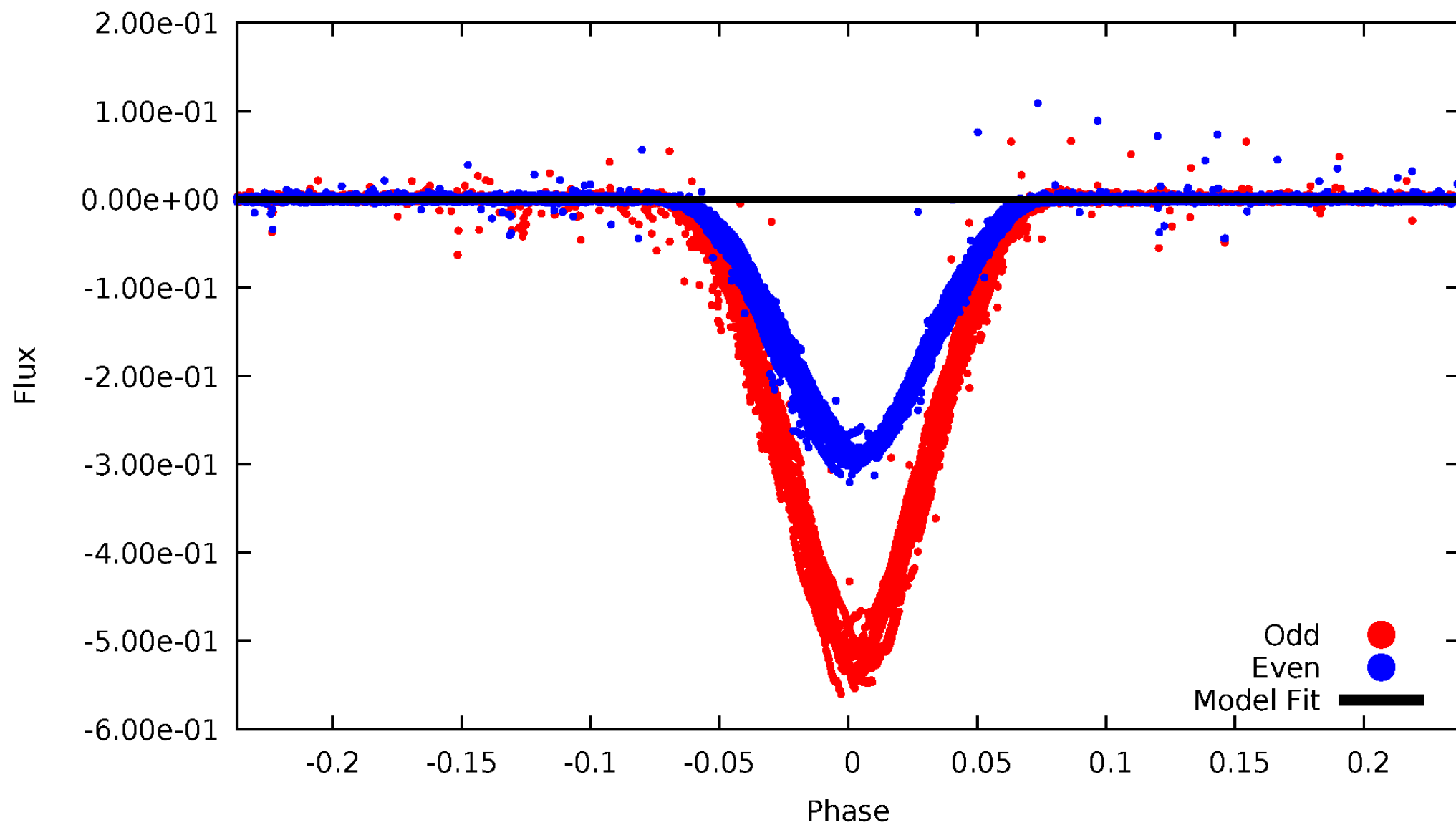


TCE 004902030-01



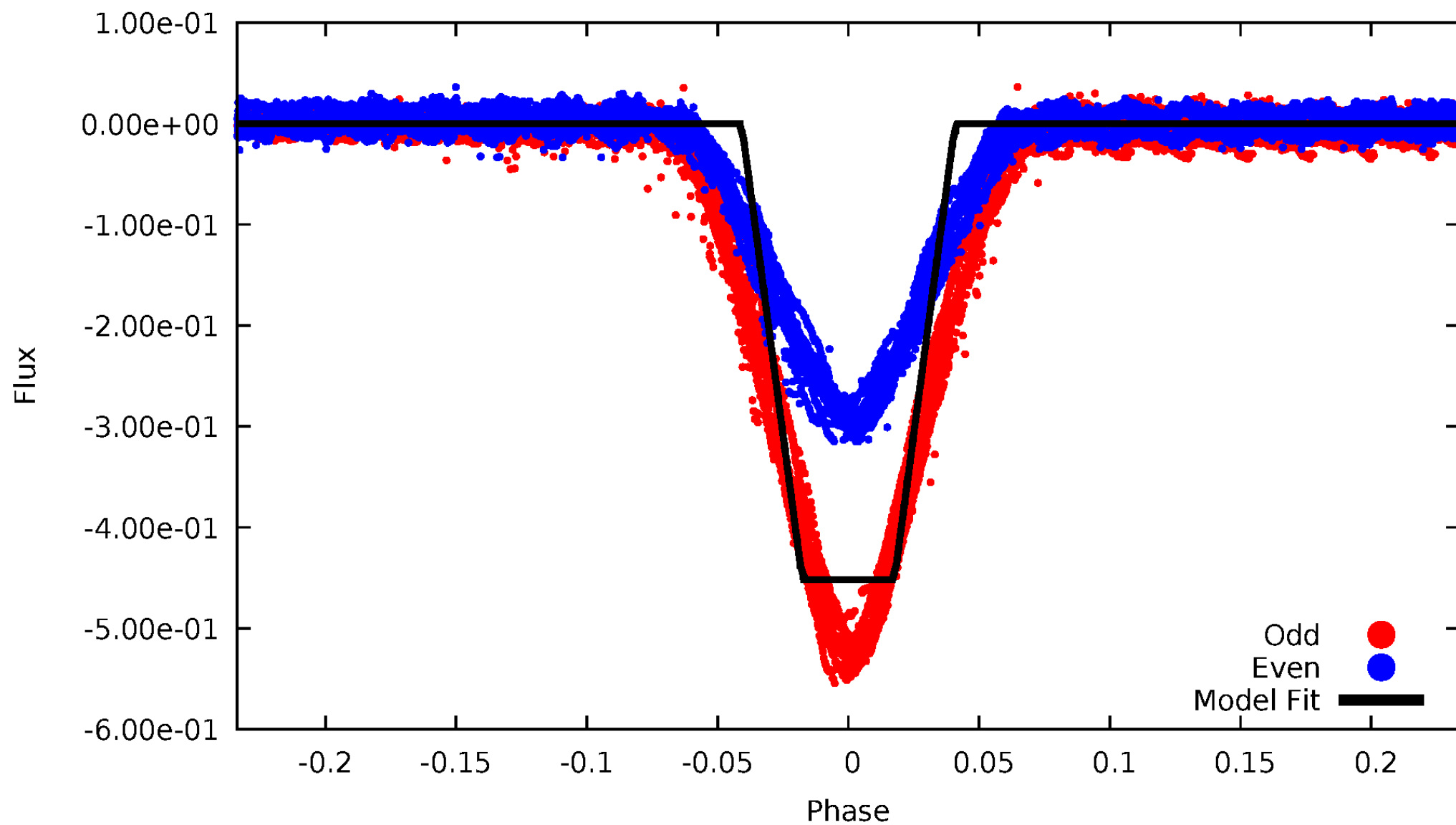
# DV Odd/Even

TCE 004902030-01



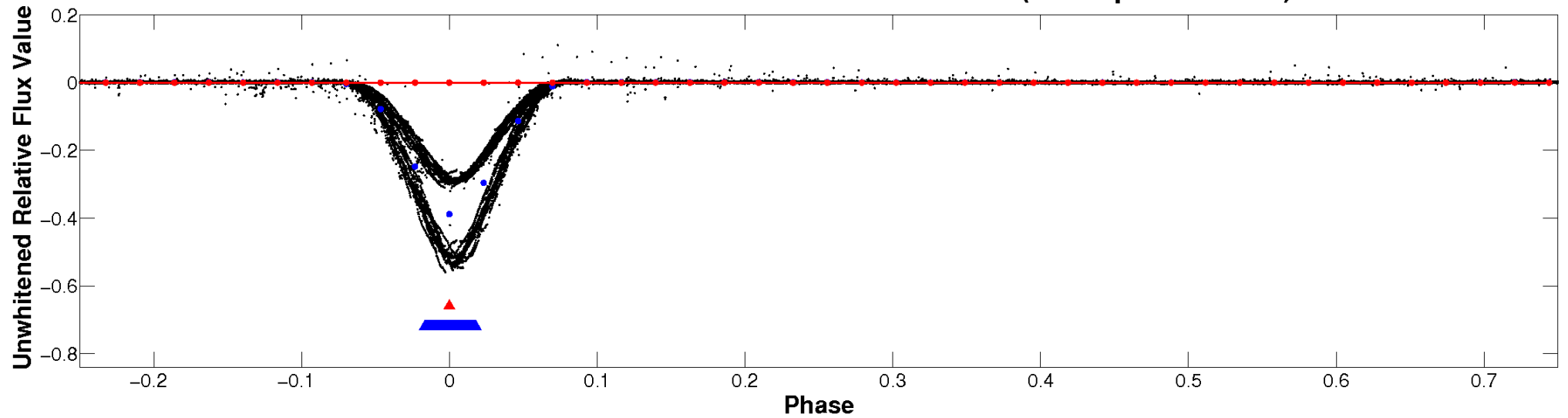
# ALT Odd/Even

TCE 004902030-01



# Non-Whitened Vs. Whitened Light Curve

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

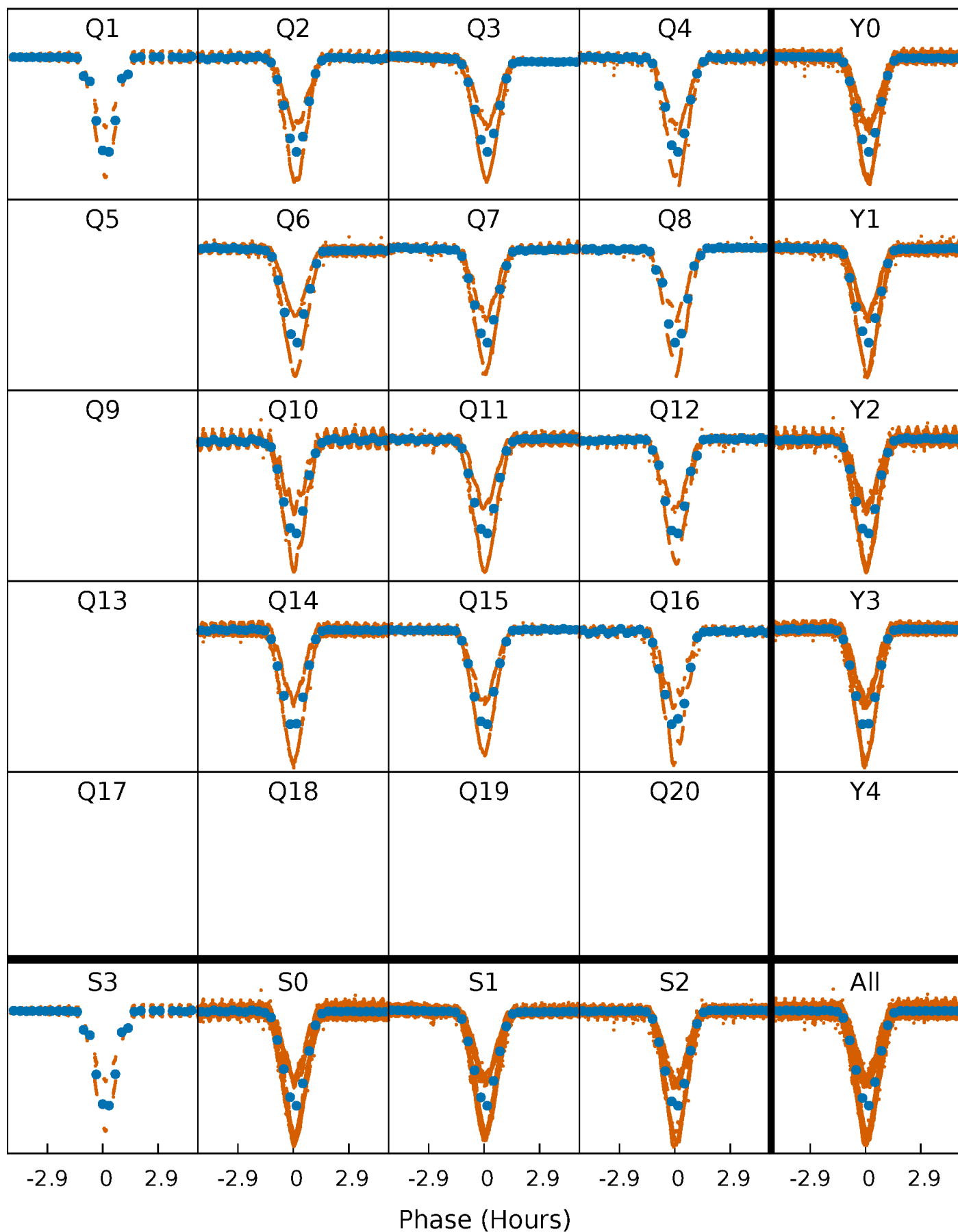


**Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

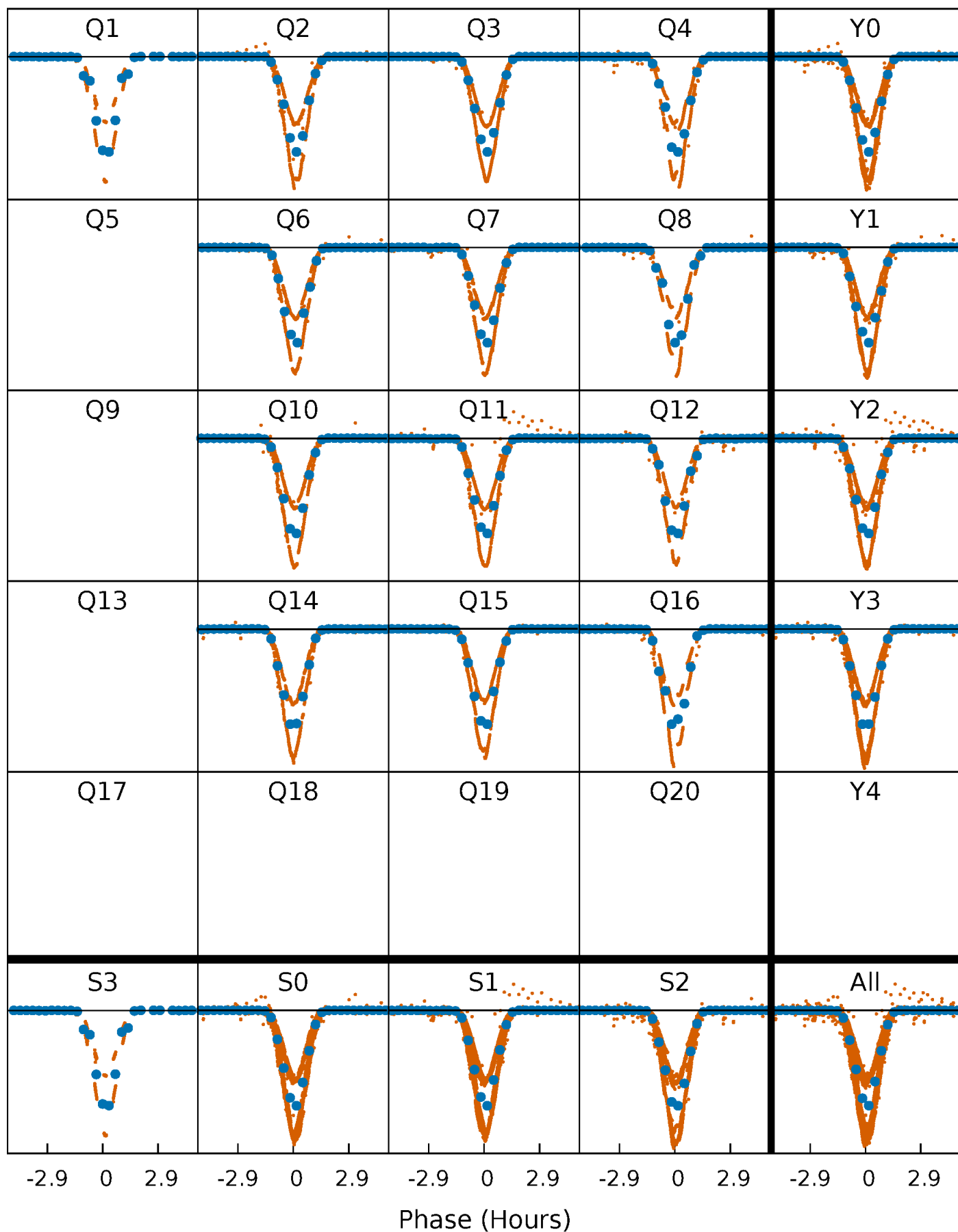
TCE 004902030-01 P= 0.878808 Days  $T_0=132.260994$  (BKJD)





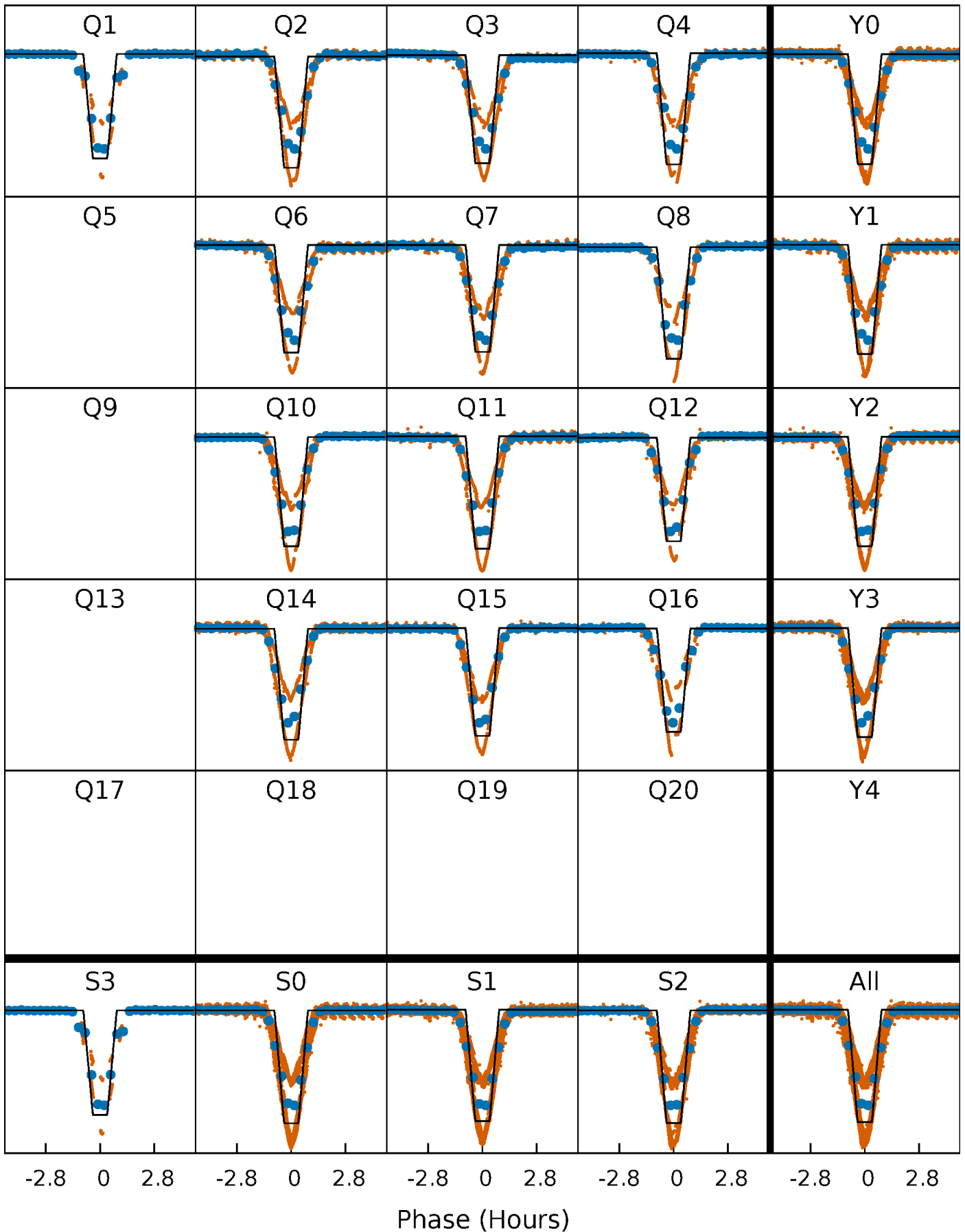
# DV Quarter-Phased Transit Curves

TCE 004902030-01 P= 0.878808 Days  $T_0=132.260994$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

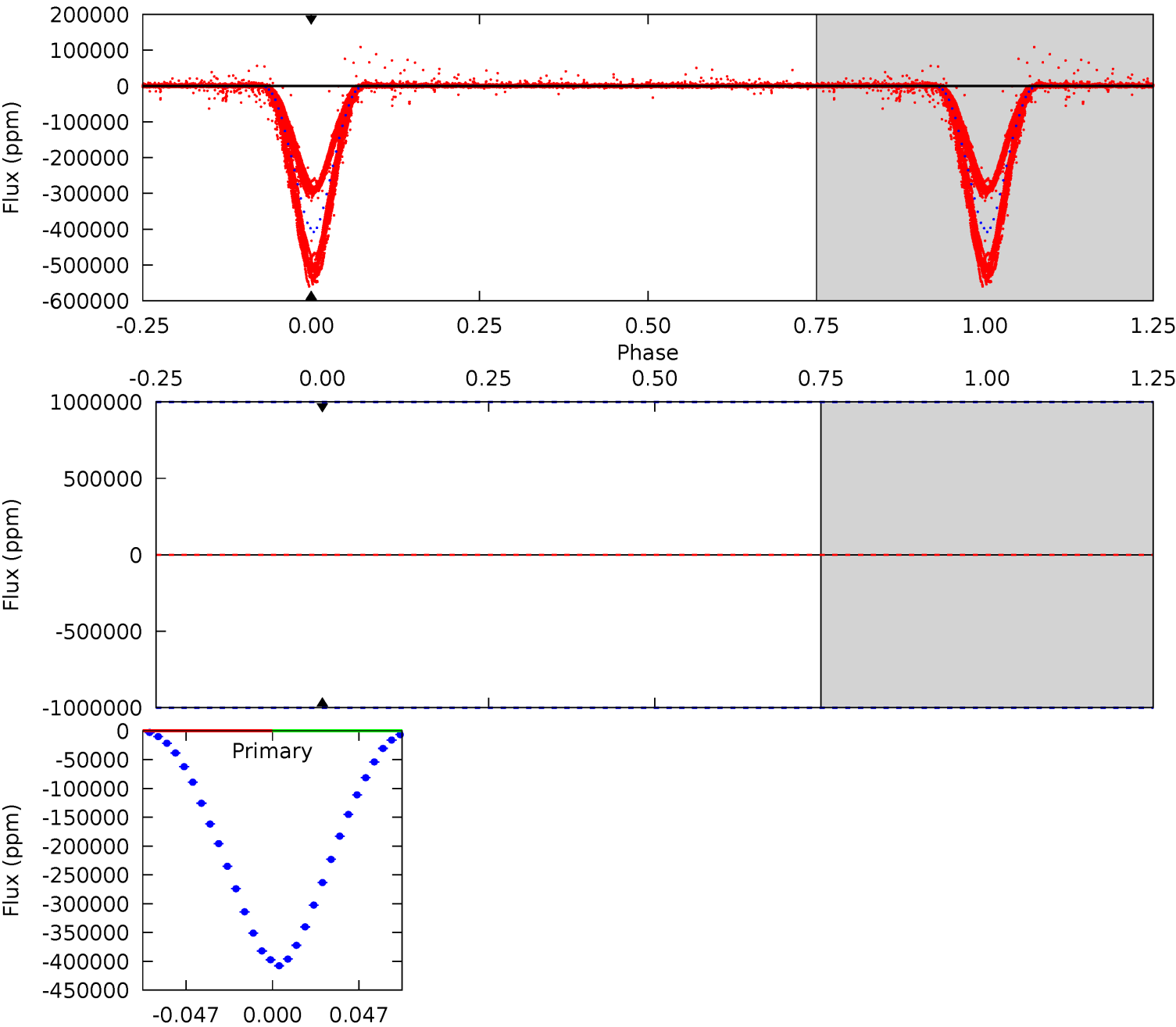
TCE 004902030-01 P= 0.878808 Days  $T_0=132.263109$  (BKJD)



DV Model-Shift Uniqueness Test

004902030-01, P = 0.878808 Days, E = 131.382186 Days

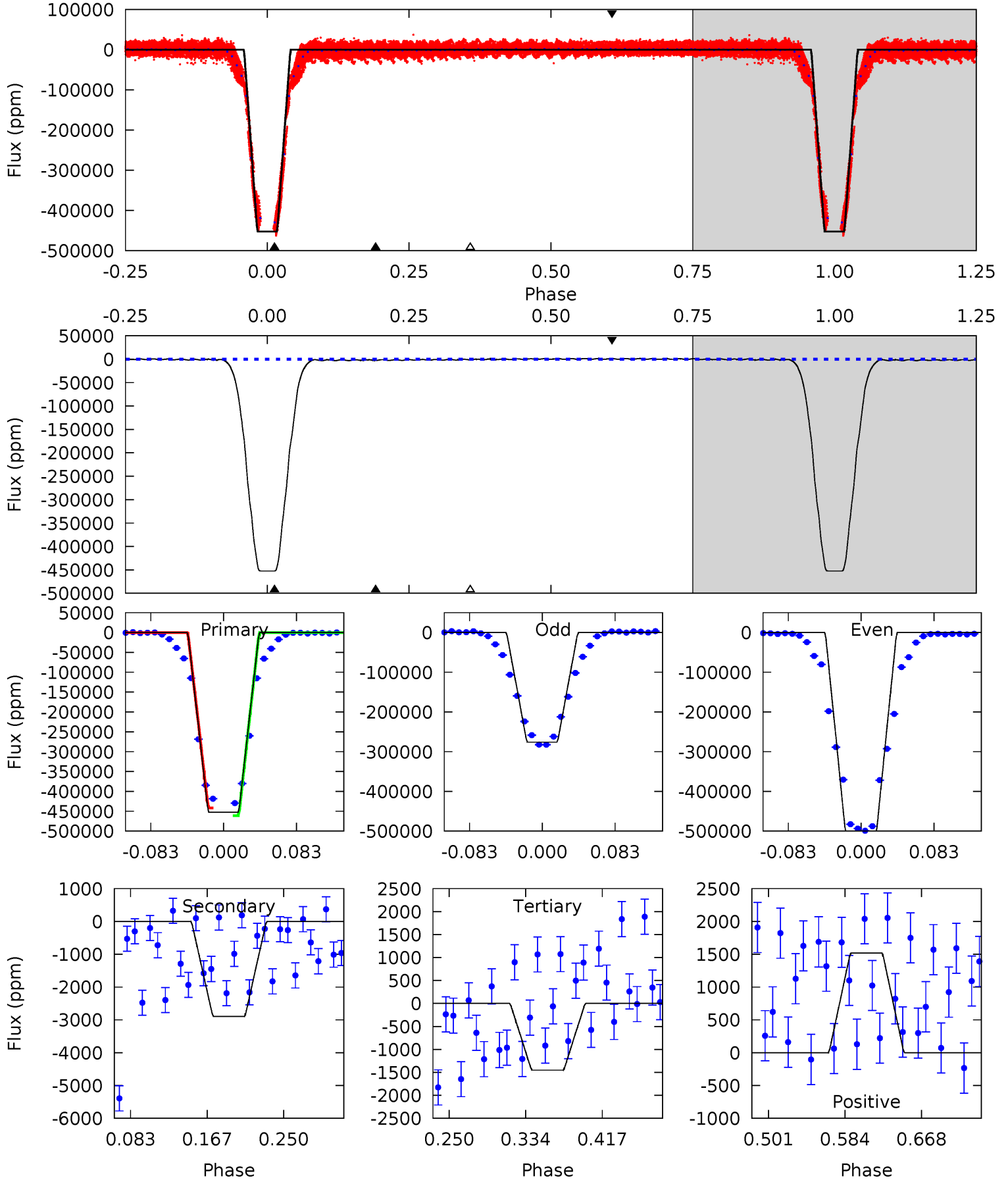
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

004902030-01, P = 0.878808 Days, E = 131.384301 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
1860	11.9	5.97	6.24	4.60	1.73	4.13	1855	1854	5.93	5.67	684.4	0.86	0.00	0



### Stellar Parameters For KIC 004902030

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4524^{+150}_{-150}$	$4.566^{+0.060}_{-0.020}$	$0.240^{+0.150}_{-0.300}$	$0.737^{+0.031}_{-0.062}$	$0.727^{+0.052}_{-0.052}$	$2.564^{+0.647}_{-0.221}$
	+3%/-3%	+1%/-0%	+62%/-125%	+4%/-8%	+7%/-7%	+25%/-9%
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 004902030-01 / KOI 6467.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$37.10^{+7.64}_{-8.05}$	$1871^{+70}_{-69}$	$-2469^{+6450}_{-1466}$	$-0.131^{+12.121}_{-10.154}$
Alt.	$-2896 \pm 243$	$53.48^{+7.92}_{-7.93}$	$1872^{+66}_{-68}$	$-2190^{+119}_{-76}$	$0.146^{+0.060}_{-0.035}$

$T_{\text{max}}$  = 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

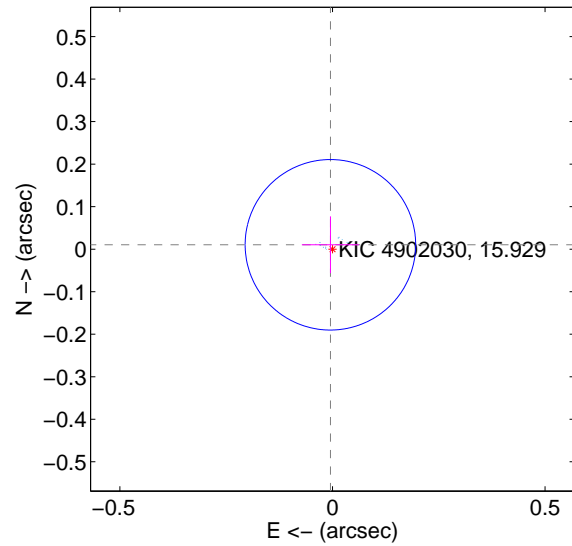
Supplemental centroid analysis for 004902030-01. Kepler magnitude: 15.93. Transit SNR -1.00

There are 13 quarters with good PRF difference image offsets

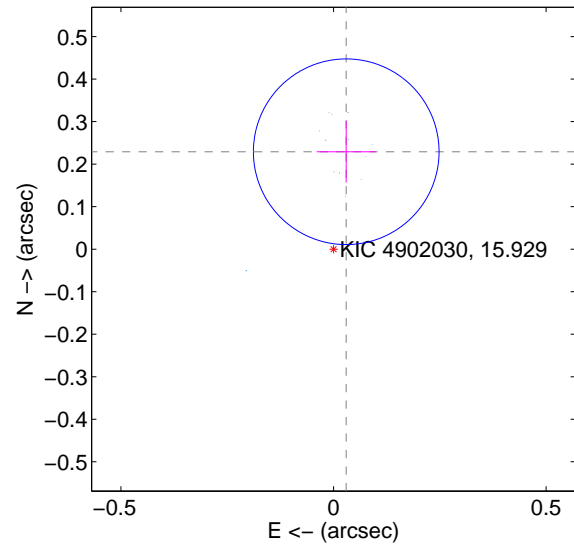
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.011 \pm 0.067$	0.17	$0.005 \pm 0.067$	$0.010 \pm 0.067$
PRF-fit source offset from KIC position	<b><math>0.231 \pm 0.073</math></b>	<b>3.18</b>	$-0.030 \pm 0.069$	$0.229 \pm 0.072$
photometric centroid source offset	<b><math>0.47 \pm 0.00</math></b>	<b>490.14</b>	$-0.45 \pm 0.00$	$-0.14 \pm 0.00$

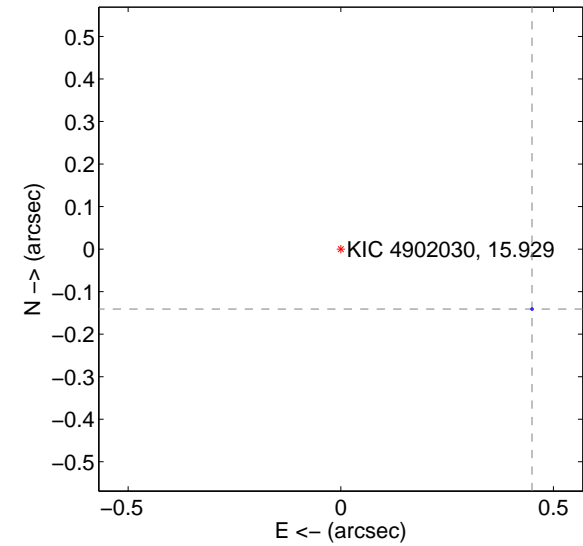
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

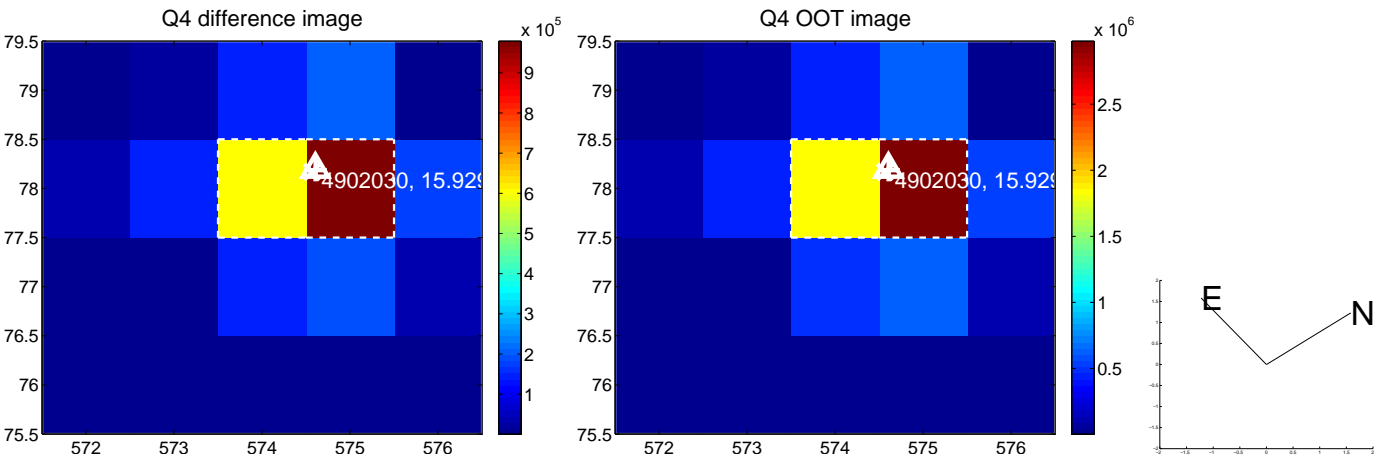
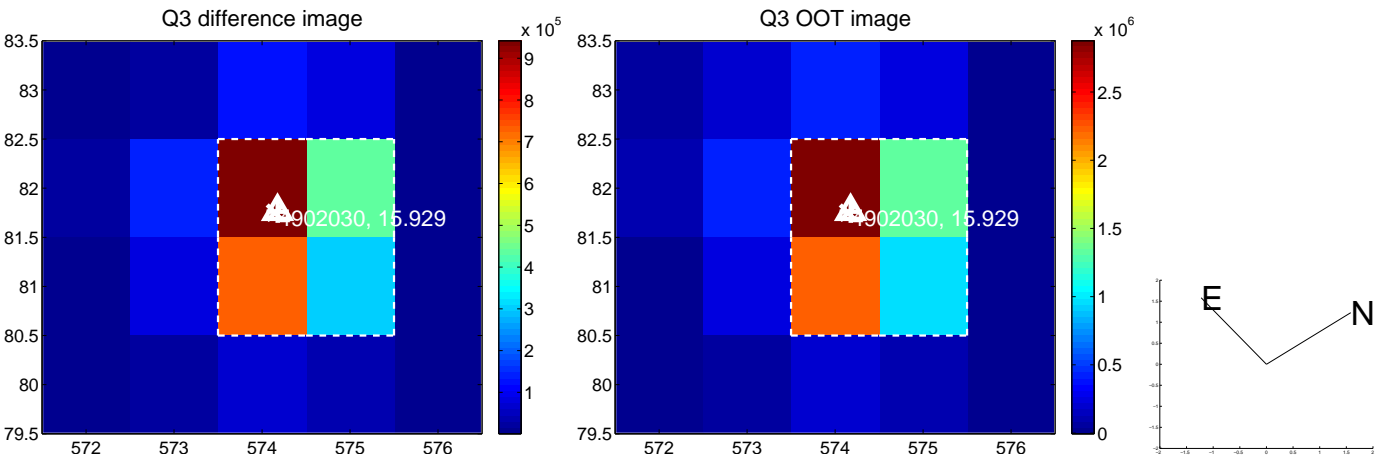
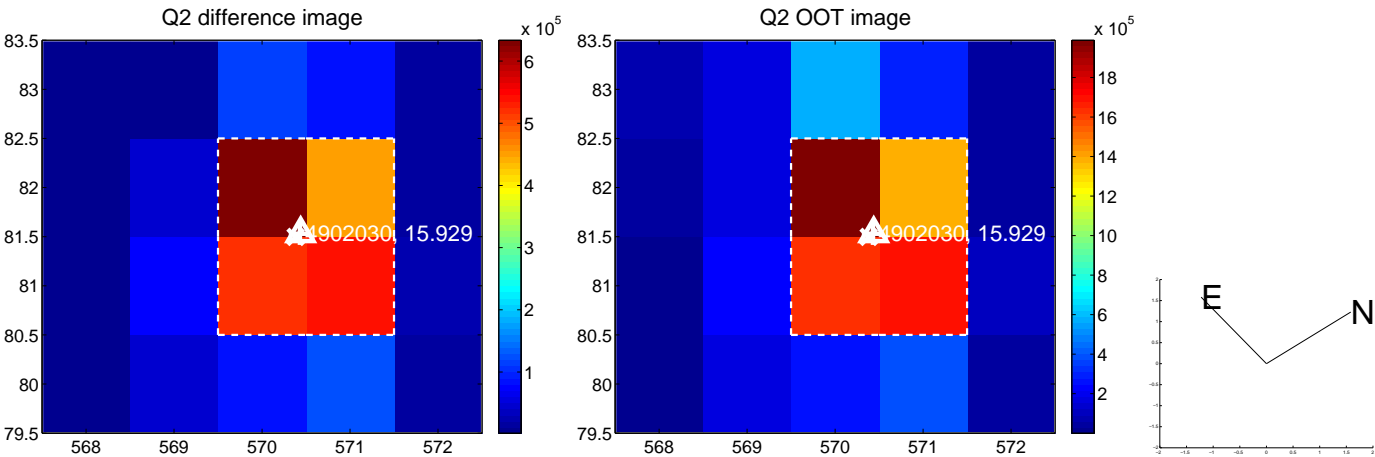
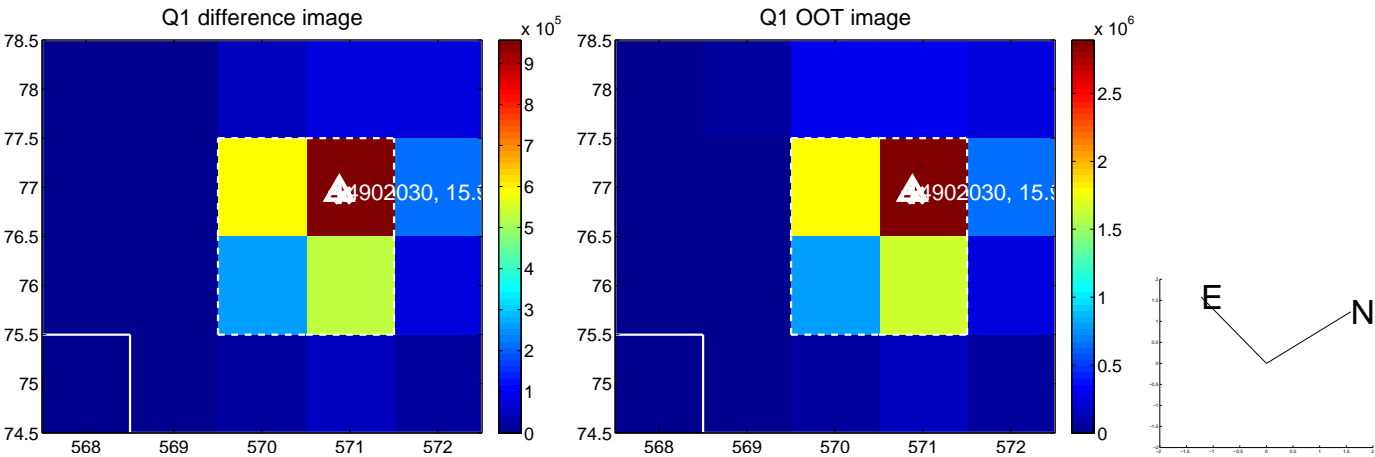


offset from photometric centroids

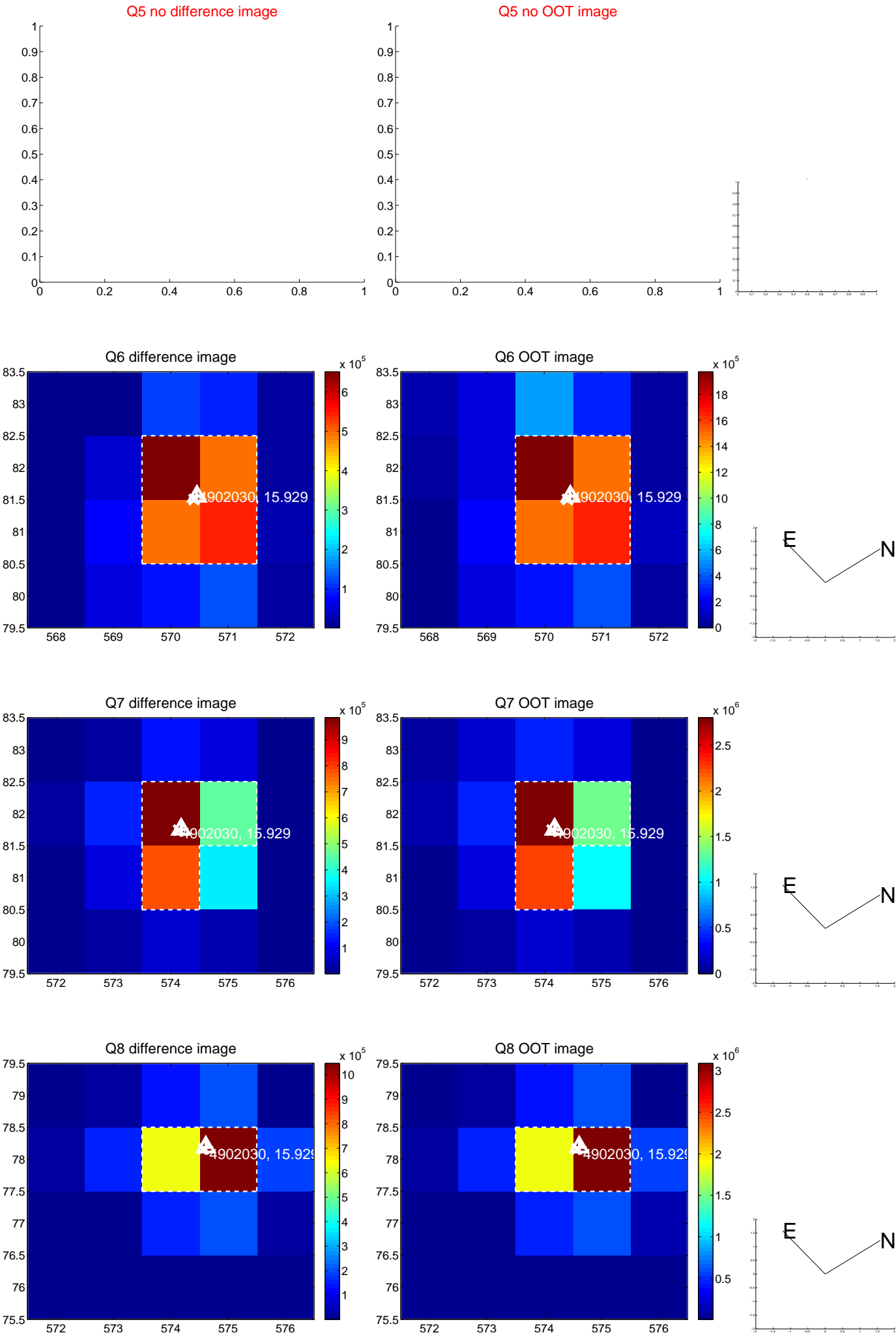


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

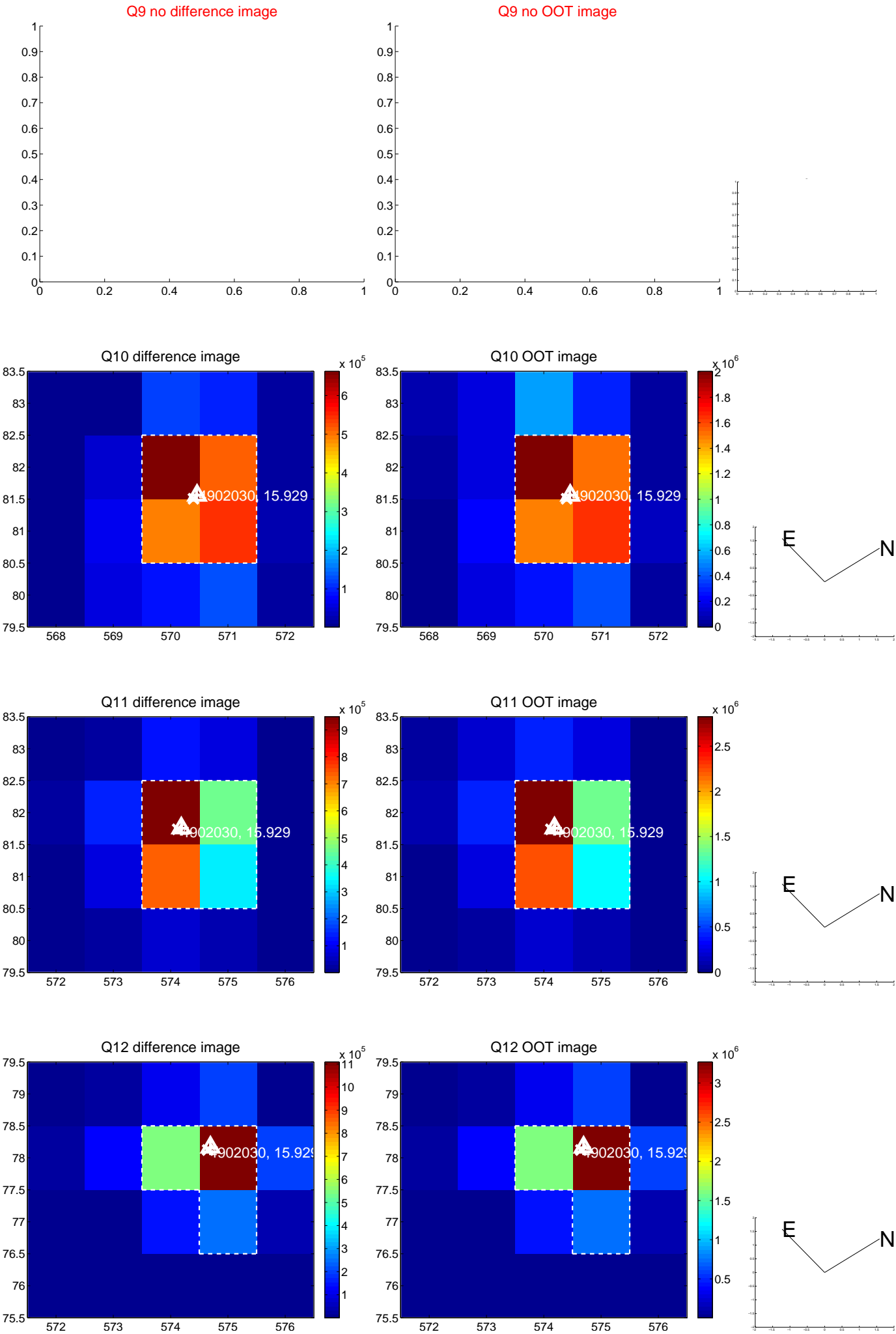


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

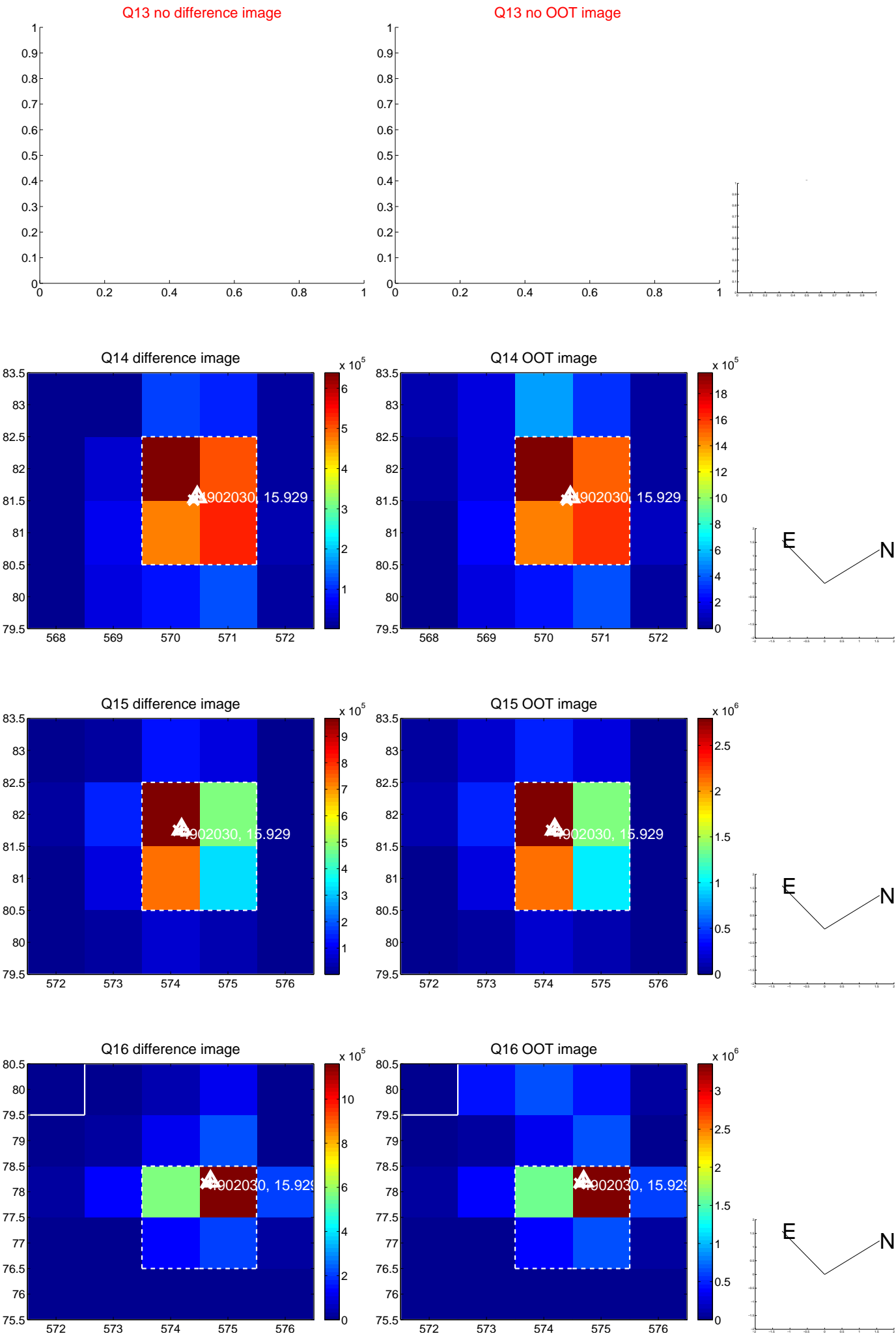




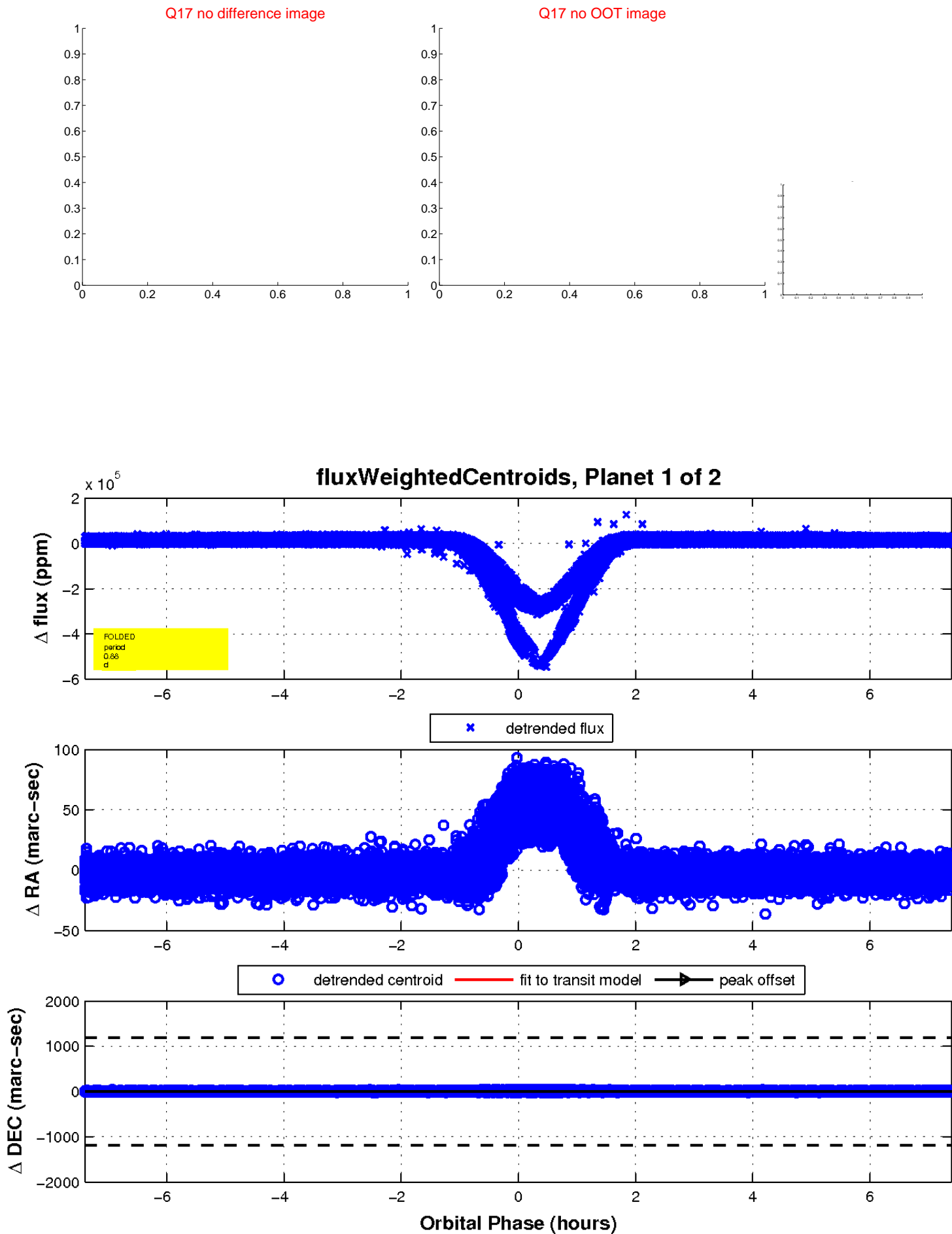
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

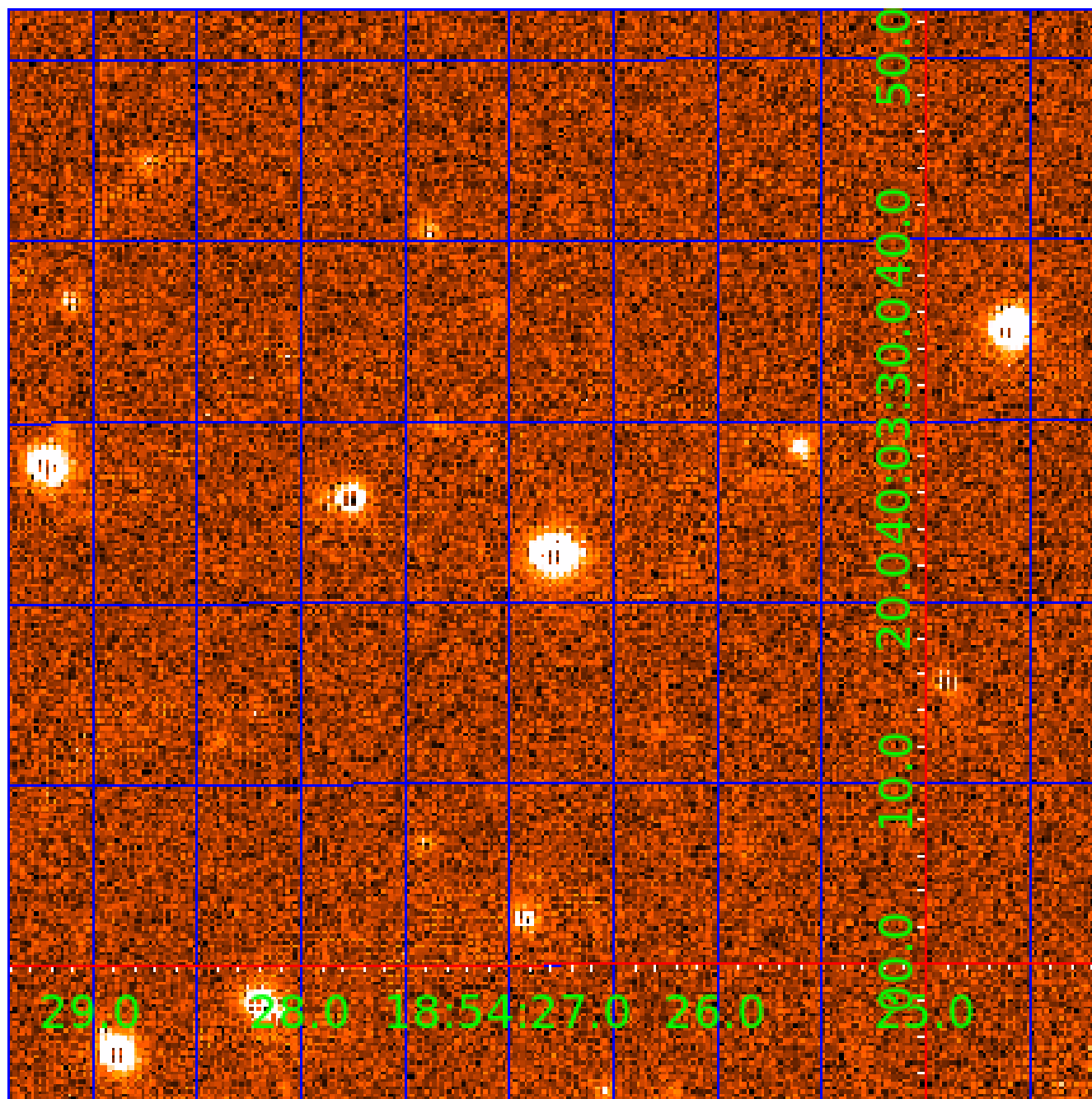


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 004902030

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004902030-01	OBS	6467.01	0.878808	132.260994	395678.7	2.500	9404.6	-1.0	0.74	4524	37.35	780.02
004902030-02	OBS	No	7.030316	136.670656	33023.1	34.483	681.0	77.8	0.74	4524	14.37	48.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004902030-01	OBS	FP	0.00	0	1	0	0	DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
004902030-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—RESIDUAL_TCE—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.

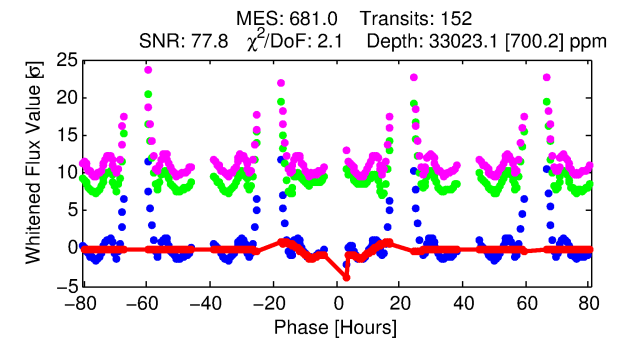
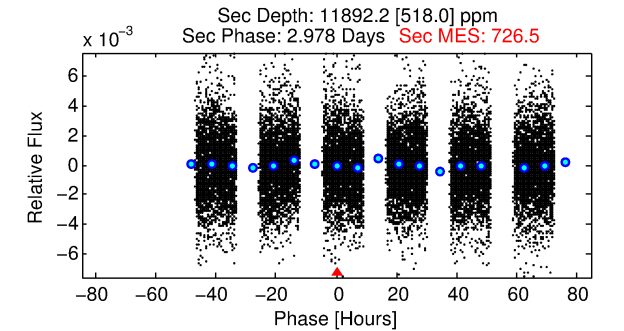
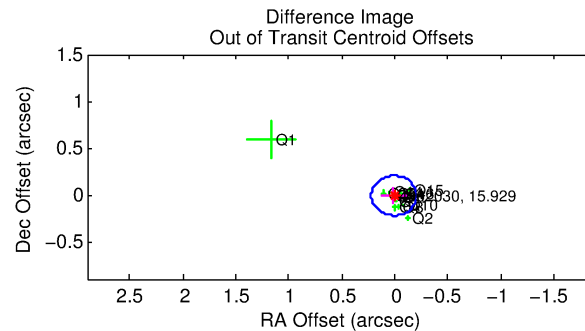
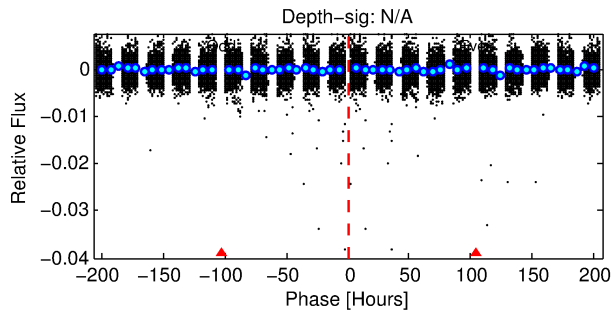
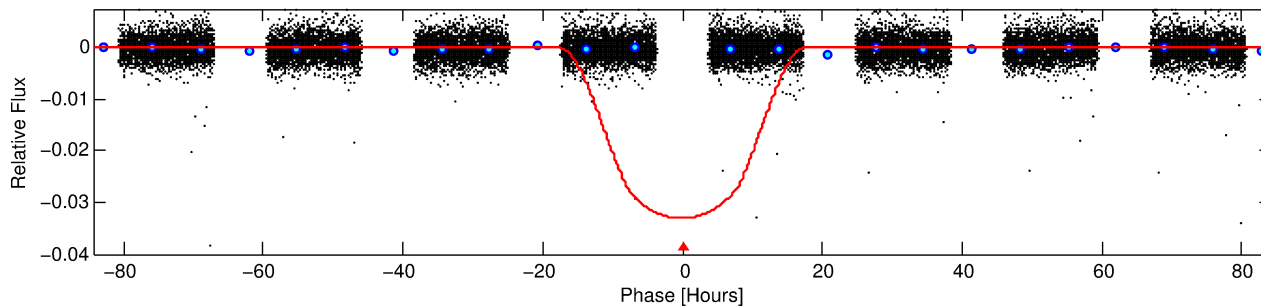
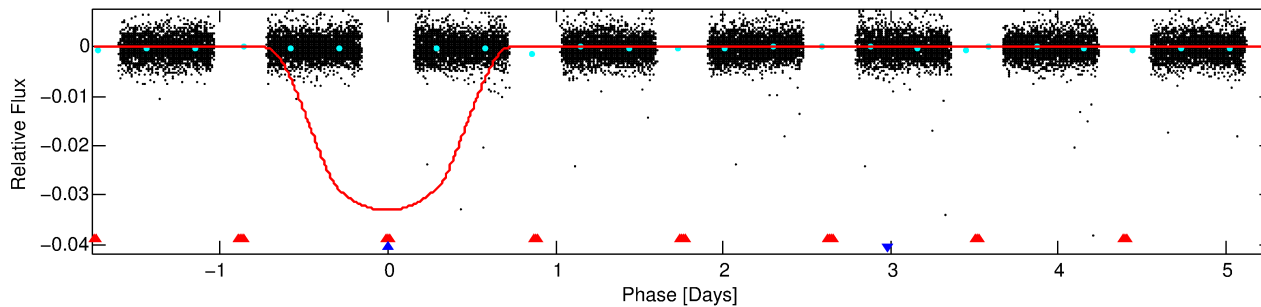
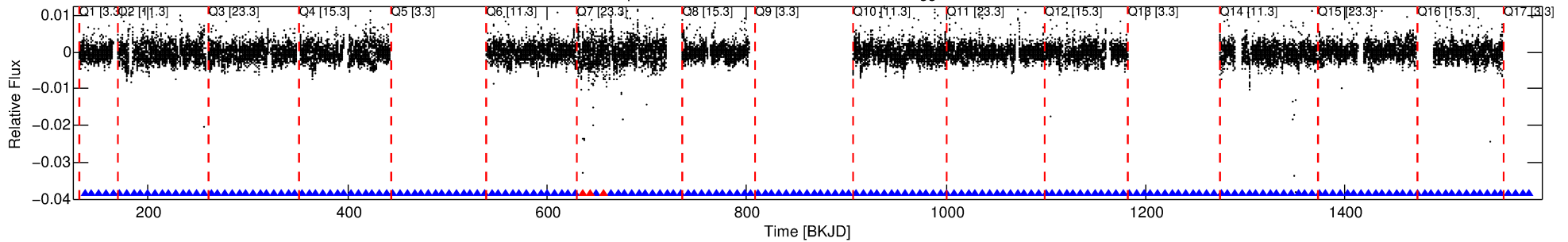
## Ephemeris Match Information For 004902030-02

No Significant Match Found

# DV One-Page Summary

KIC: 4902030 Candidate: 2 of 2 Period: 7.030 d  
KOI: K06467 Corr: No Ephemeris Match

Kp: 15.93 R\*: 0.74 Rs Teff: 4524.0 K Logg: 4.57 Fe/H: 0.240



## DV Fit Results:

Period = 7.03032 [0.00005] d  
Epoch = 136.6707 [0.0059] BKJD  
Rp/R\* = 0.1787 [0.0019]  
a/R\* = 1.73 [0.01]  
b = 0.70 [0.01]  
Seff = 48.75 [8.33]  
Teq = 674 [29] K  
Rp = 14.37 [1.22] Re  
a = 0.0647 [0.0047] AU  
Ag = 132.46 [15.66] [8.39σ]  
Teffp = 3534 [125] K [22.34σ]

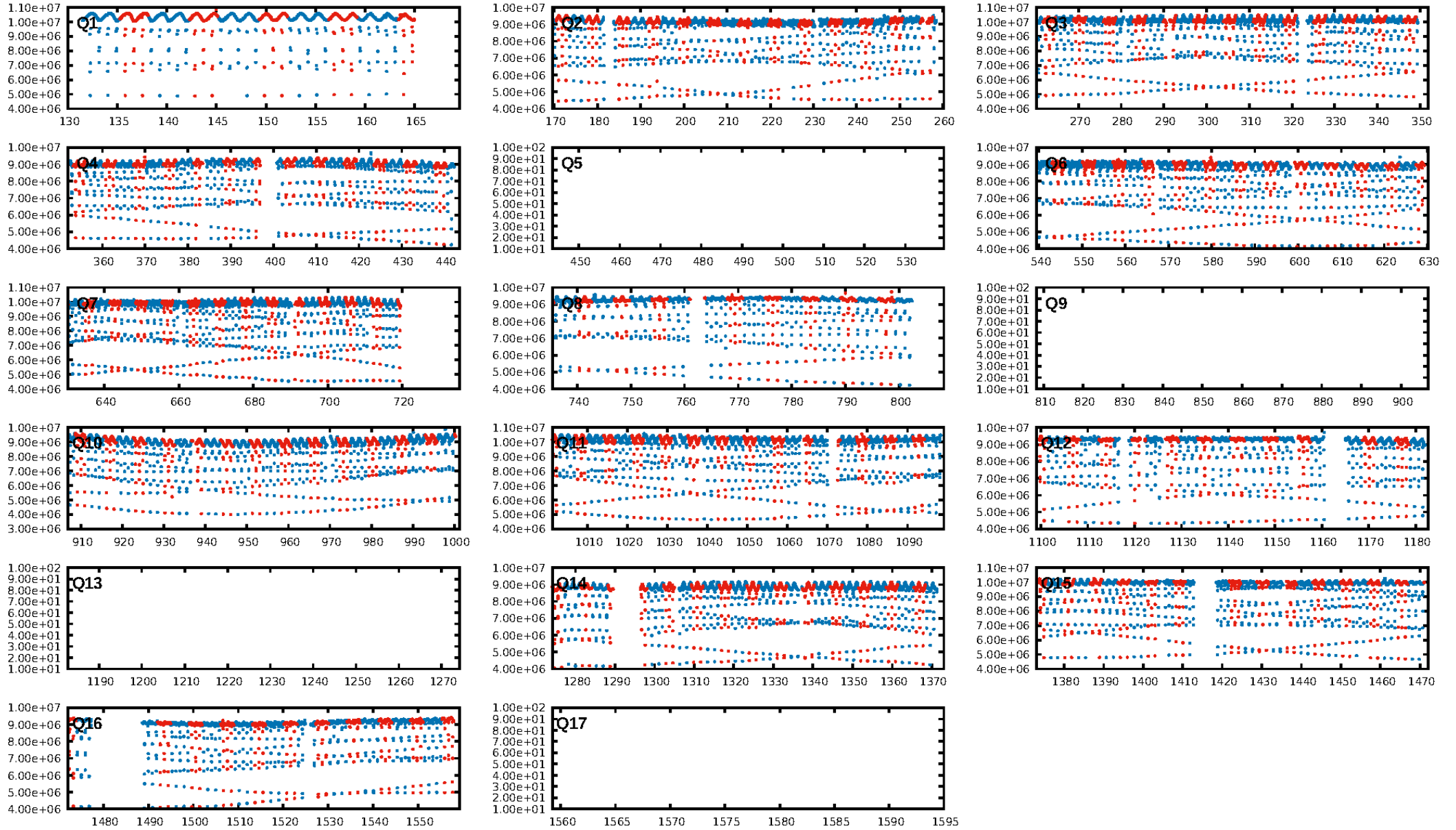
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.27σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.98 [144/147]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: 0.372 arcsec [45.33σ]  
OotOffset-rm: 0.012 arcsec [0.17σ]  
KicOffset-rm: 0.211 arcsec [2.84σ]  
OotOffset-st: 4/4/4/1 [13]  
KicOffset-st: 4/4/4/1 [13]  
DiffImageQuality-fgm: 0.08 [1/13]  
DiffImageOverlap-fno: 0.00 [0/13]

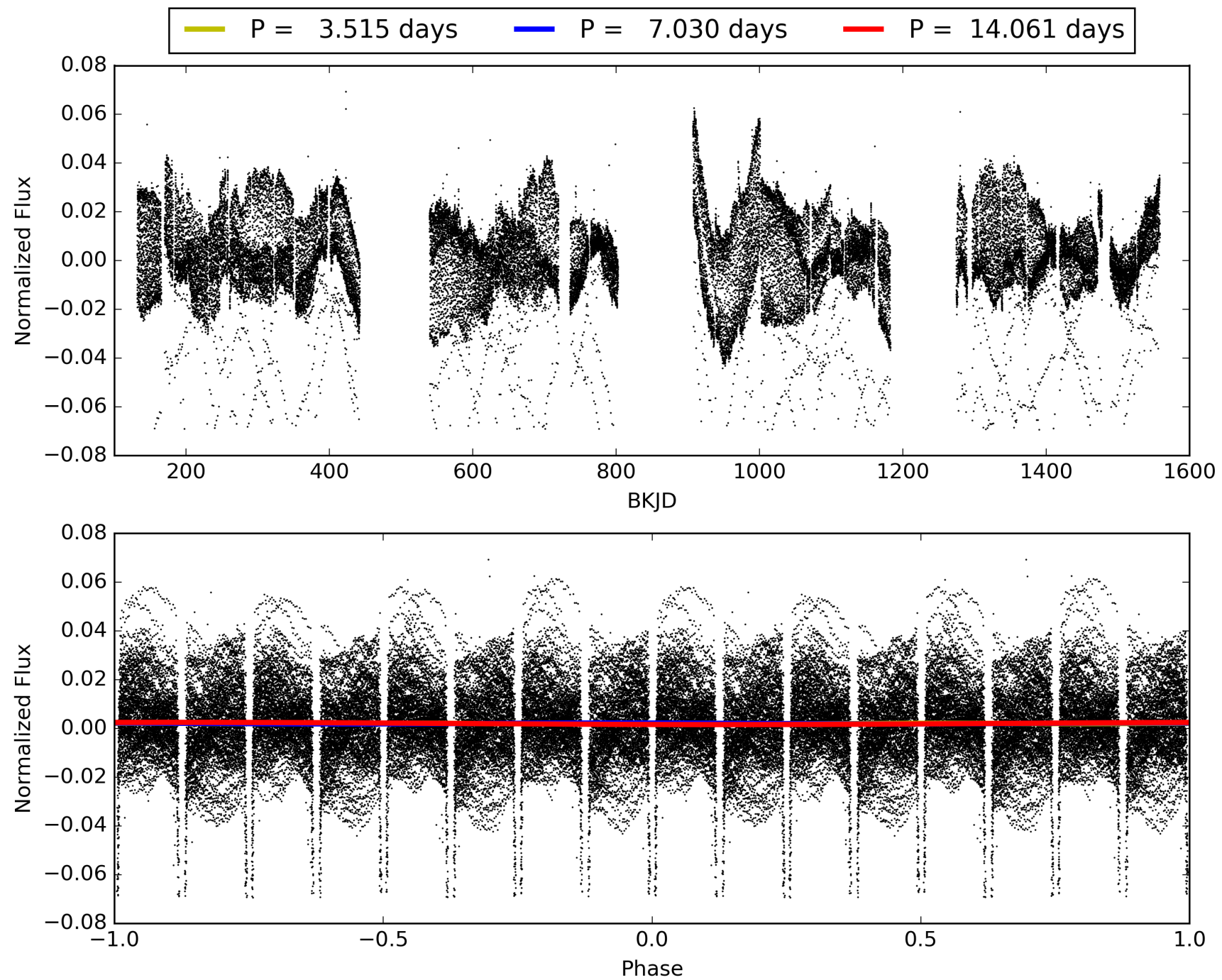
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 10:08:44 Z

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

# TCE 004902030-02, PDC Light Curves



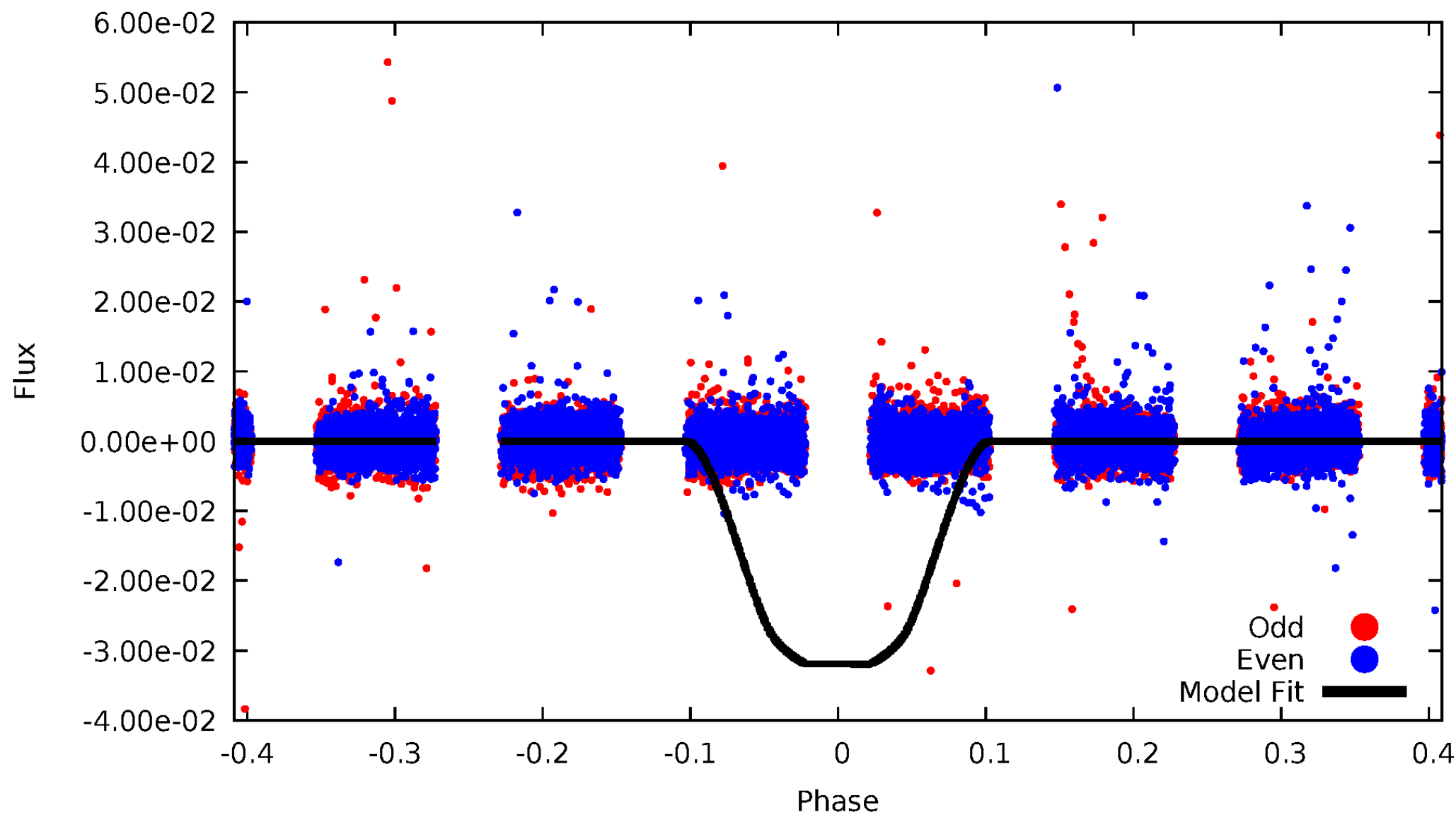
TCE 004902030-02





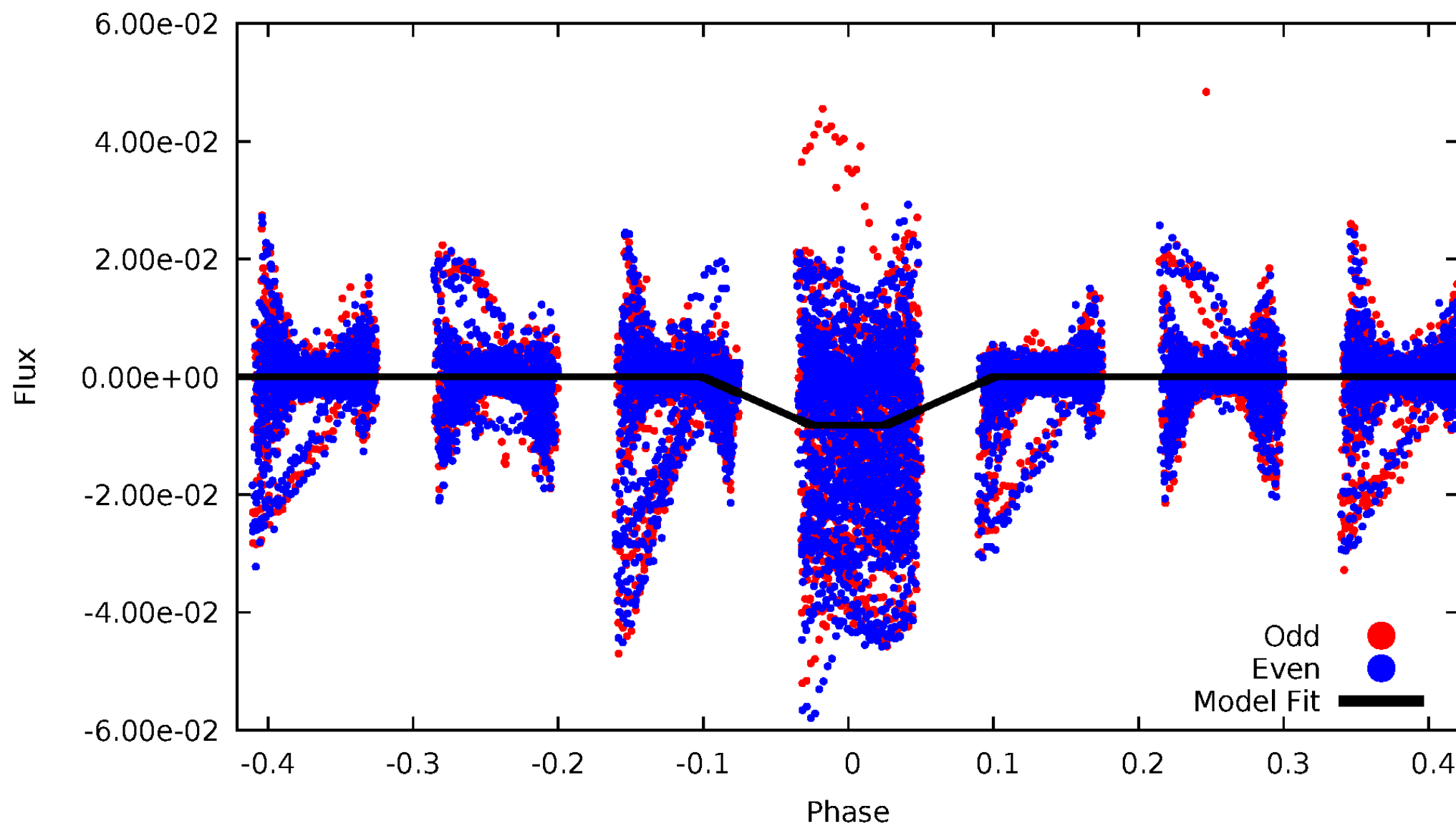
# DV Odd/Even

TCE 004902030-02



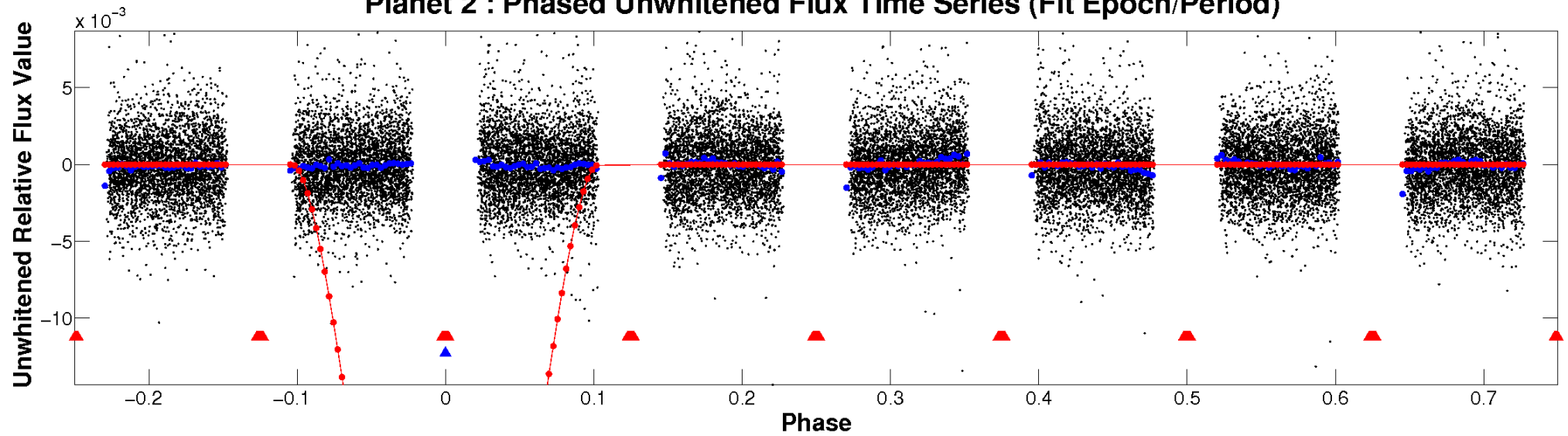
# ALT Odd/Even

TCE 004902030-02

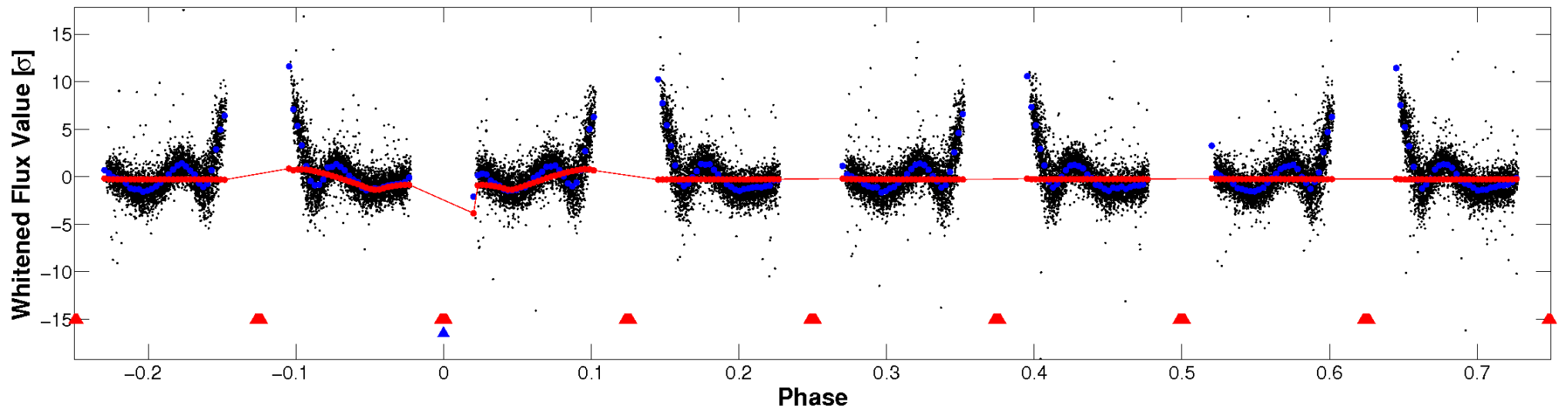


# Non-Whitened Vs. Whitened Light Curve

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

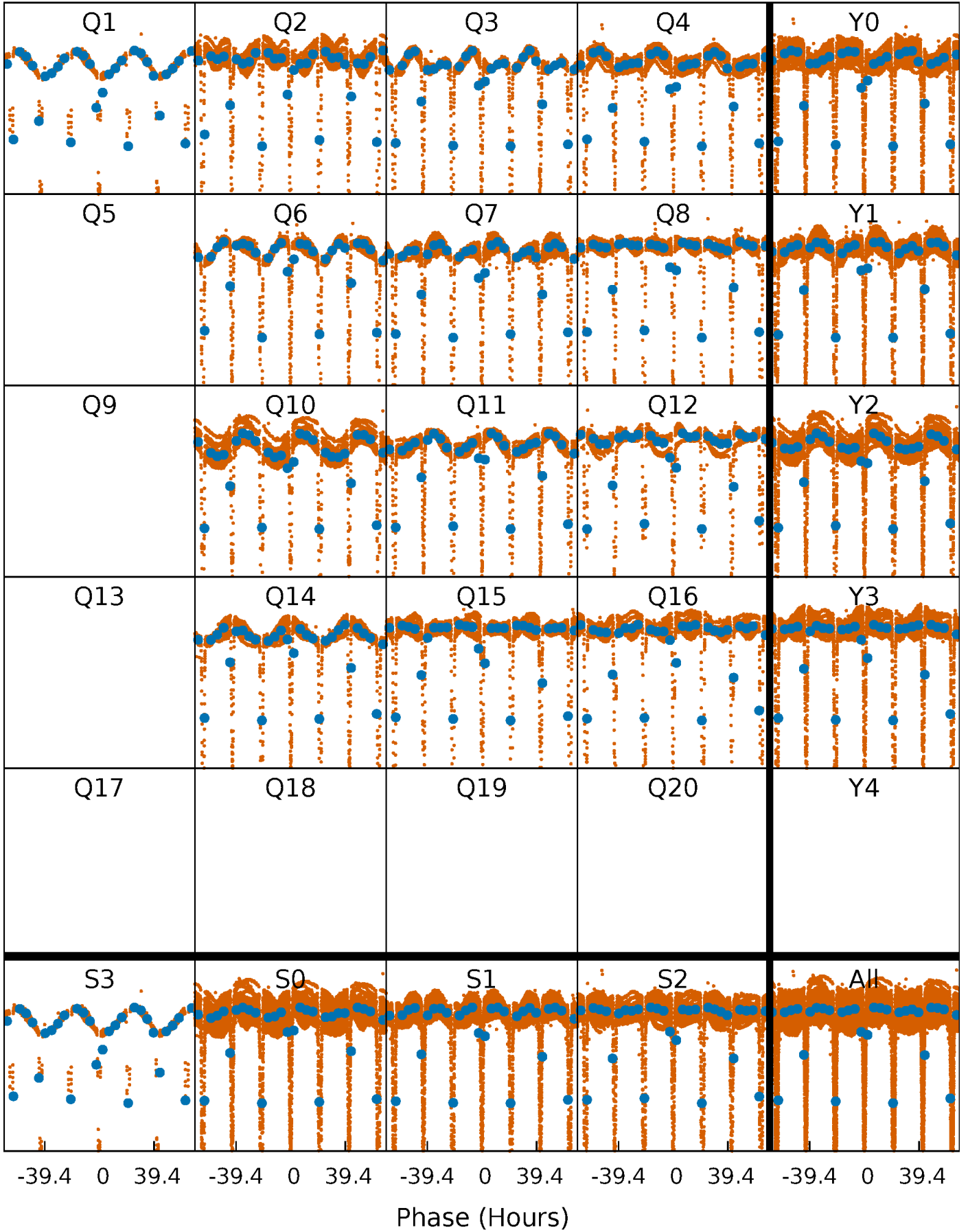


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



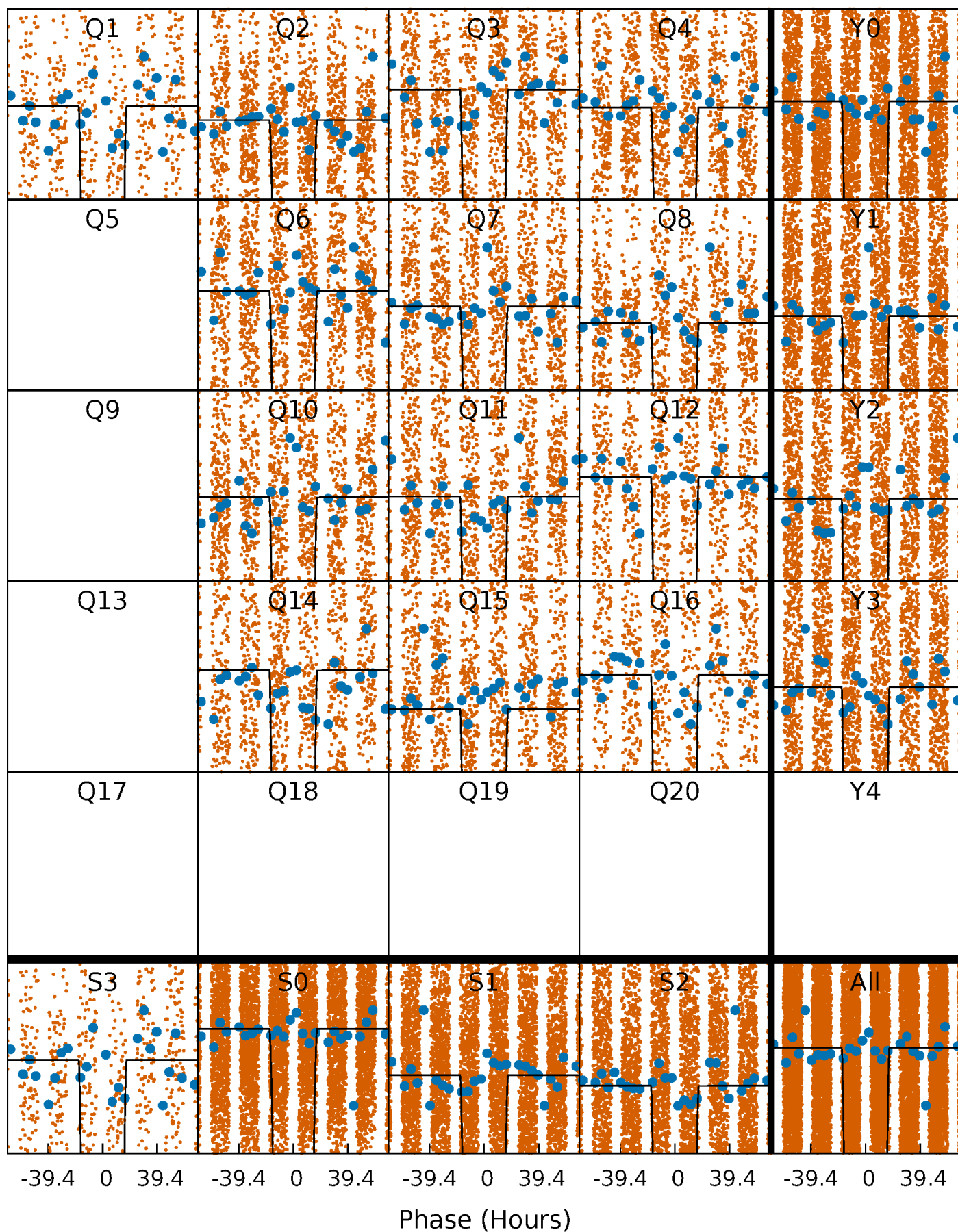
# PDC Quarter-Phased Transit Curves

TCE 004902030-02     $P = 7.030316$  Days     $T_0 = 136.670656$  (BKJD)



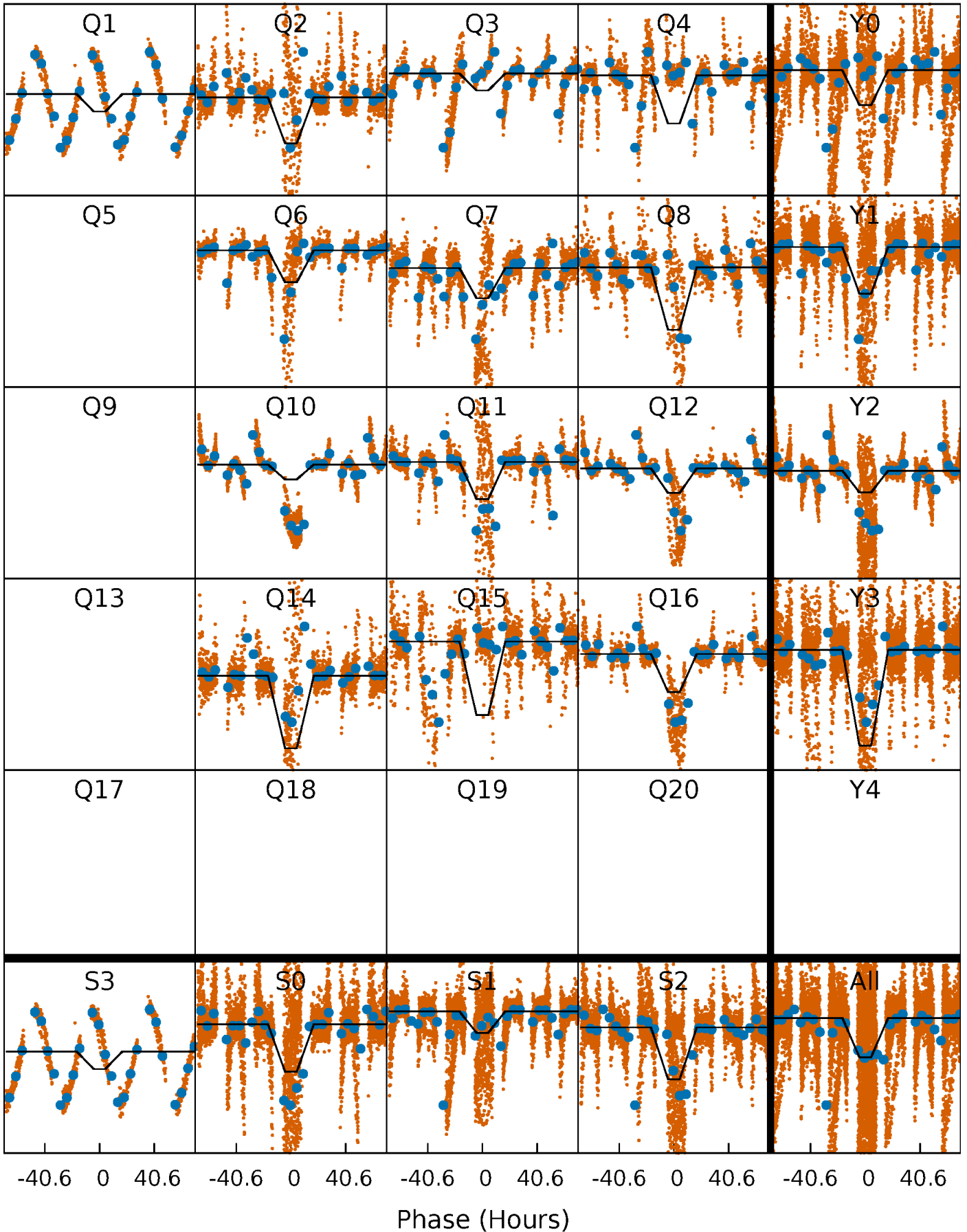
# DV Quarter-Phased Transit Curves

TCE 004902030-02 P= 7.030316 Days  $T_0=136.670656$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004902030-02     $P = 7.030158$  Days     $T_0 = 136.194374$  (BKJD)

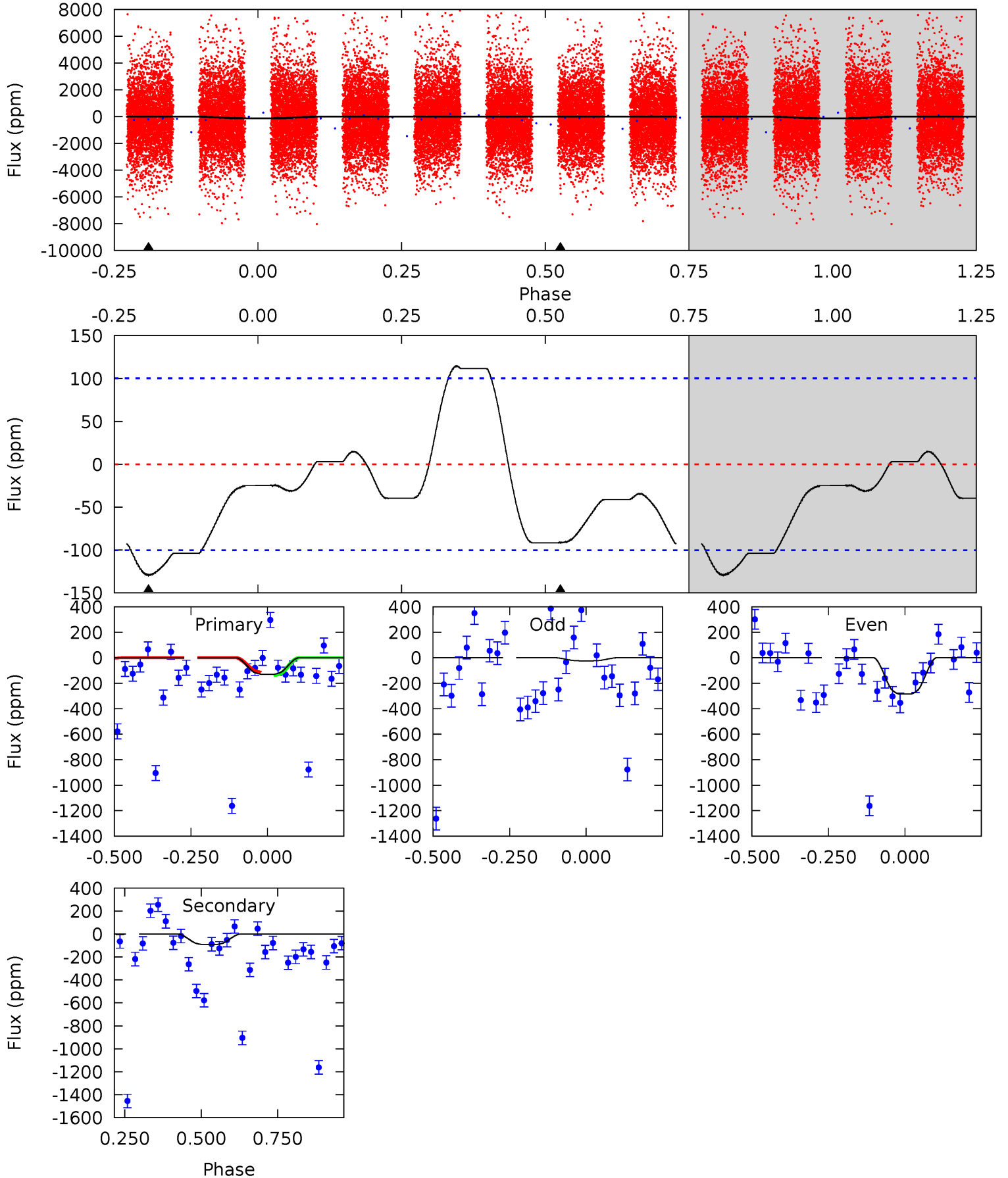




# DV Model-Shift Uniqueness Test

004902030-02, P = 7.030316 Days, E = 129.640340 Days

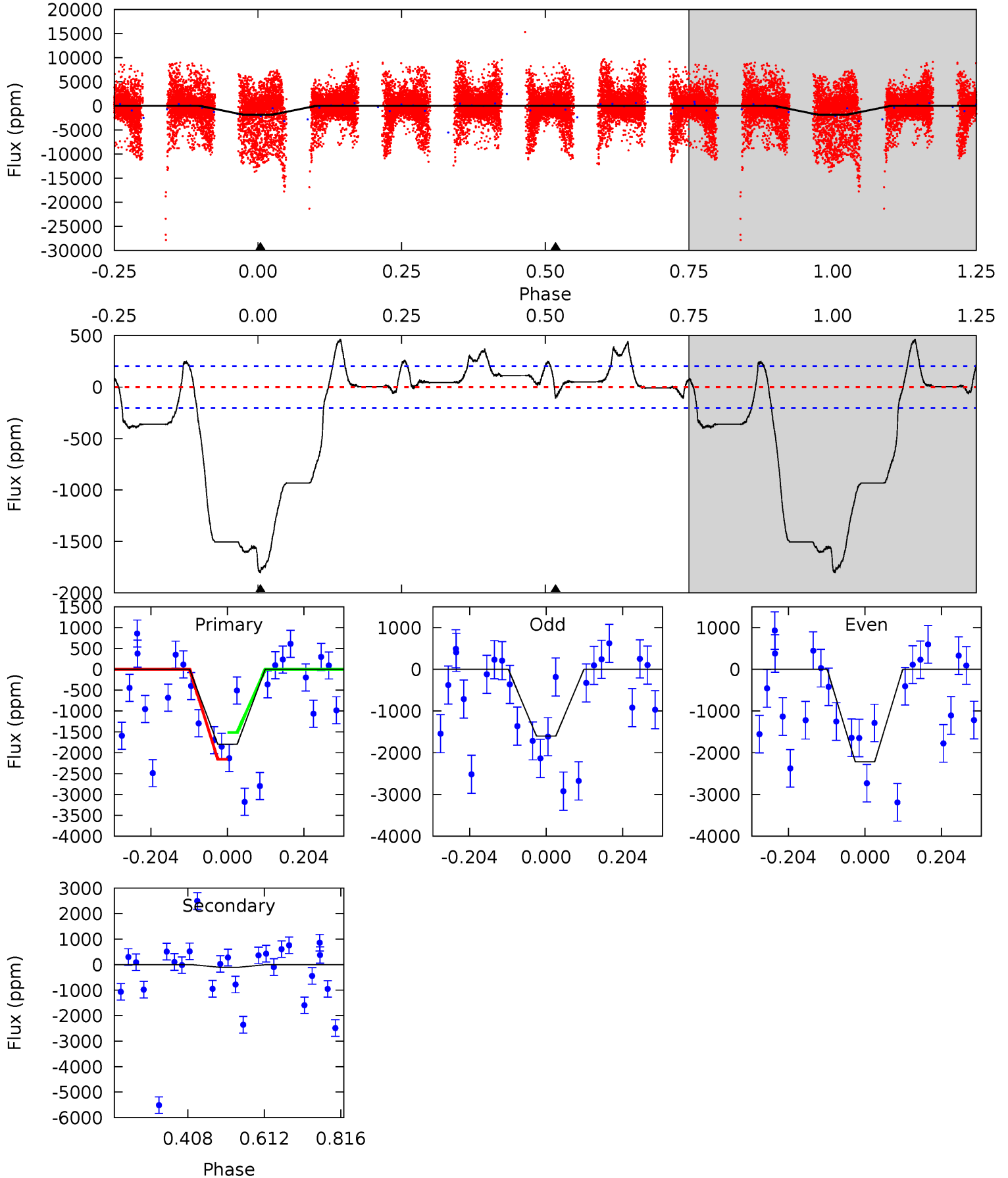
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.65	4.00	0	0	4.37	1.15	1.16	5.65	5.65	4.00	4.00	5.83	-9.62	0.47	0.54



# Alt Model-Shift Uniqueness Test

004902030-02, P = 7.030158 Days, E = 129.164216 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
38.9	2.24	0	0	4.41	1.27	3.95	38.9	38.9	2.24	2.24	6.88	1.64	0.21	0





### Stellar Parameters For KIC 004902030

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4524^{+150}_{-150}$	$4.566^{+0.060}_{-0.020}$	$0.240^{+0.150}_{-0.300}$	$0.737^{+0.031}_{-0.062}$	$0.727^{+0.052}_{-0.052}$	$2.564^{+0.647}_{-0.221}$
	+3%/-3%	+1%/-0%	+62%/-125%	+4%/-8%	+7%/-7%	+25%/-9%
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 004902030-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-92 \pm 23$	$14.27^{+0.51}_{-0.70}$	$934^{+38}_{-33}$	$1938^{+70}_{-87}$	$1.057^{+0.261}_{-0.276}$
Alt.	$-104 \pm 46$	$7.22^{+0.29}_{-0.39}$	$934^{+33}_{-36}$	$2338^{+120}_{-179}$	$4.658^{+2.091}_{-2.174}$

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

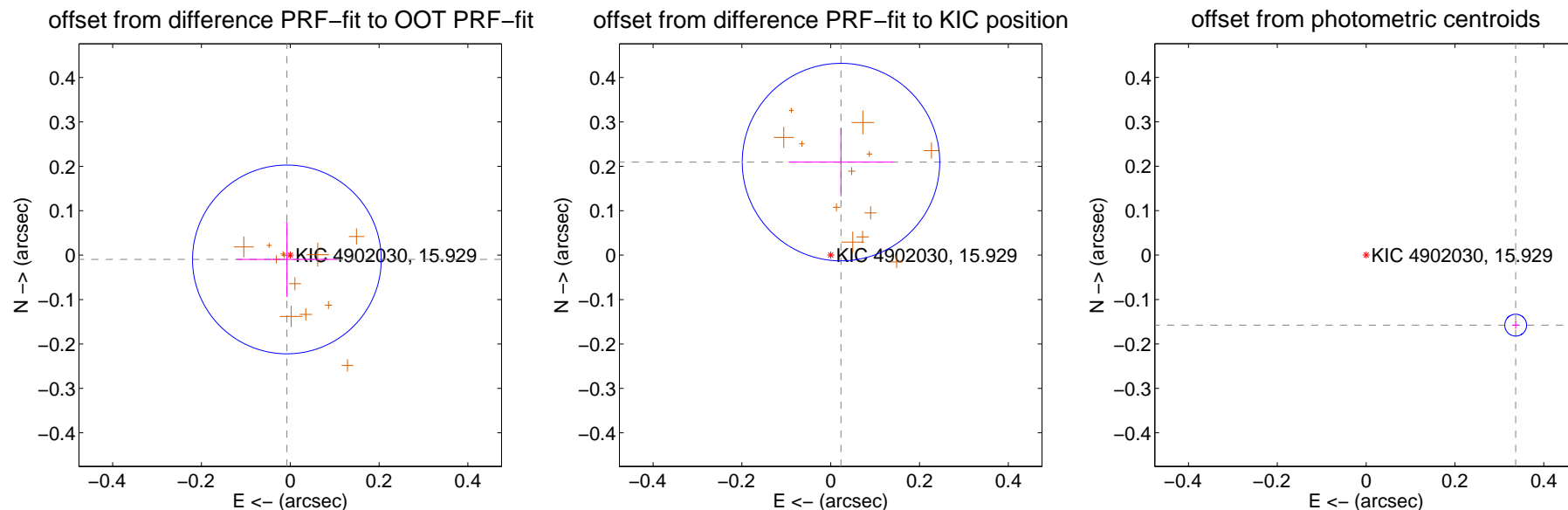
## DV Centroid Data

Supplemental centroid analysis for 004902030-02. Kepler magnitude: 15.93. Transit SNR 77.78

There are 1 quarters with good PRF difference image offsets

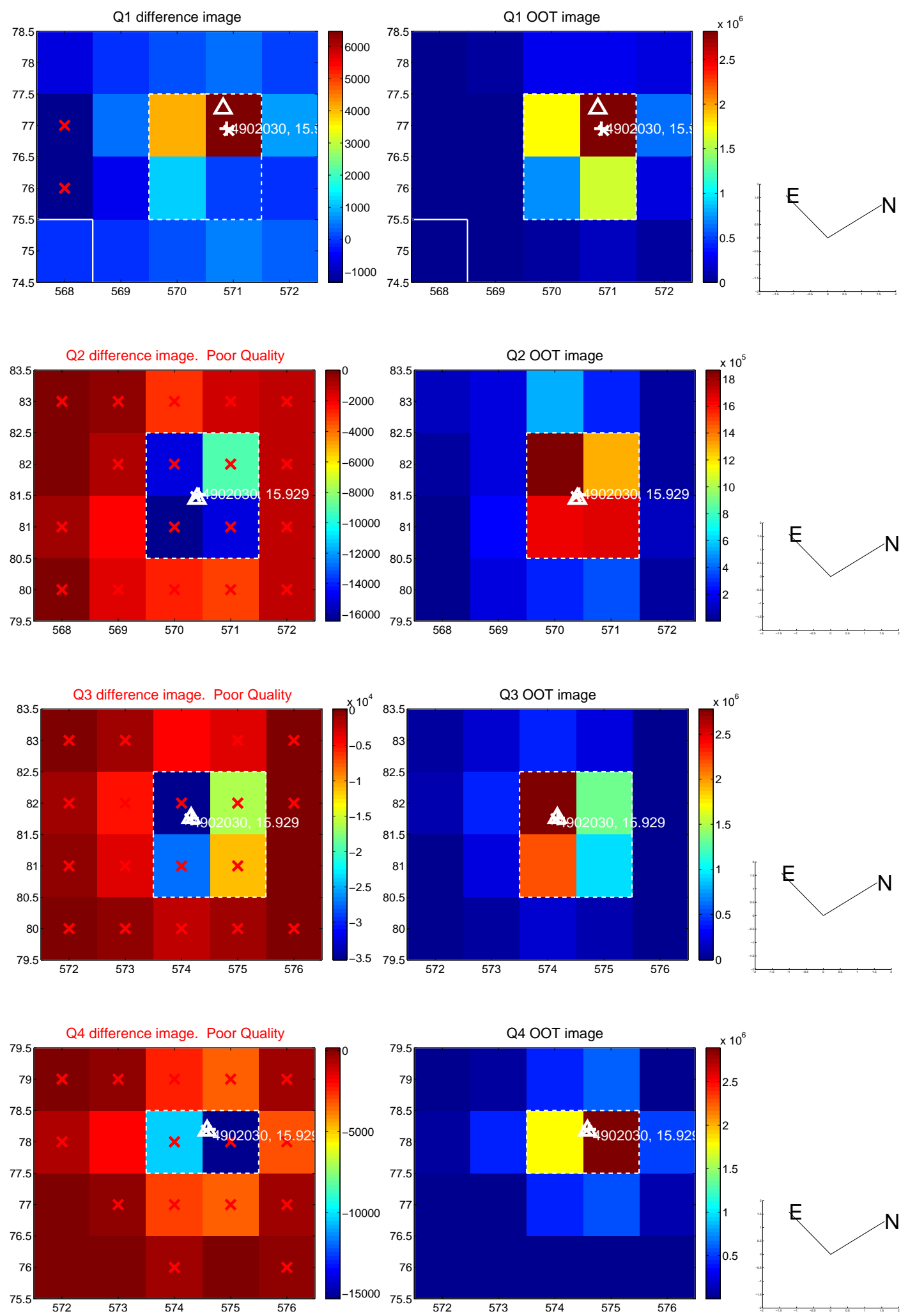
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.012 \pm 0.071$	0.17	$0.008 \pm 0.113$	$-0.010 \pm 0.084$
PRF-fit source offset from KIC position	$0.211 \pm 0.074$	2.84	$-0.023 \pm 0.118$	$0.210 \pm 0.077$
photometric centroid source offset	$0.37 \pm 0.01$	45.33	$-0.34 \pm 0.01$	$-0.16 \pm 0.01$

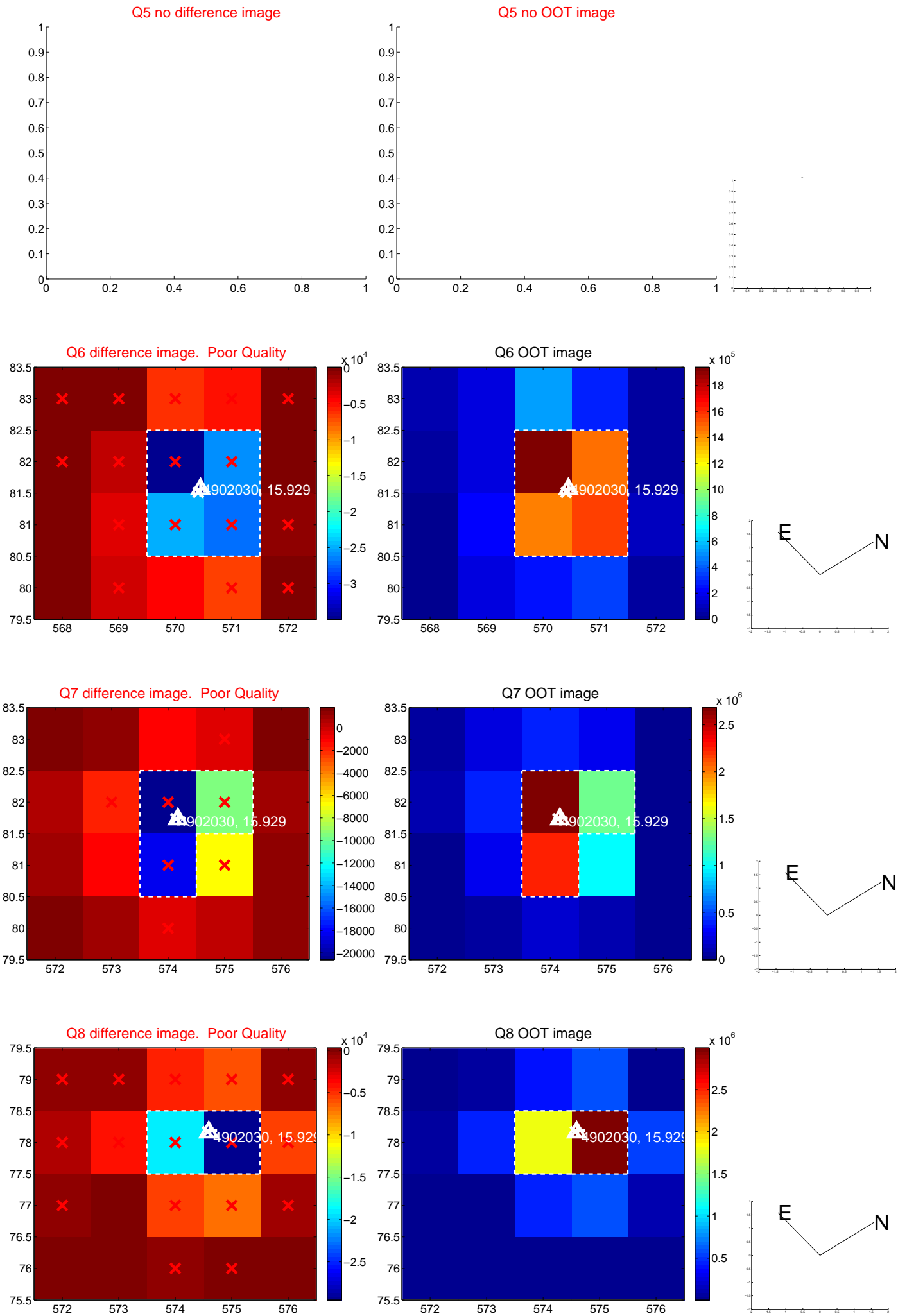


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

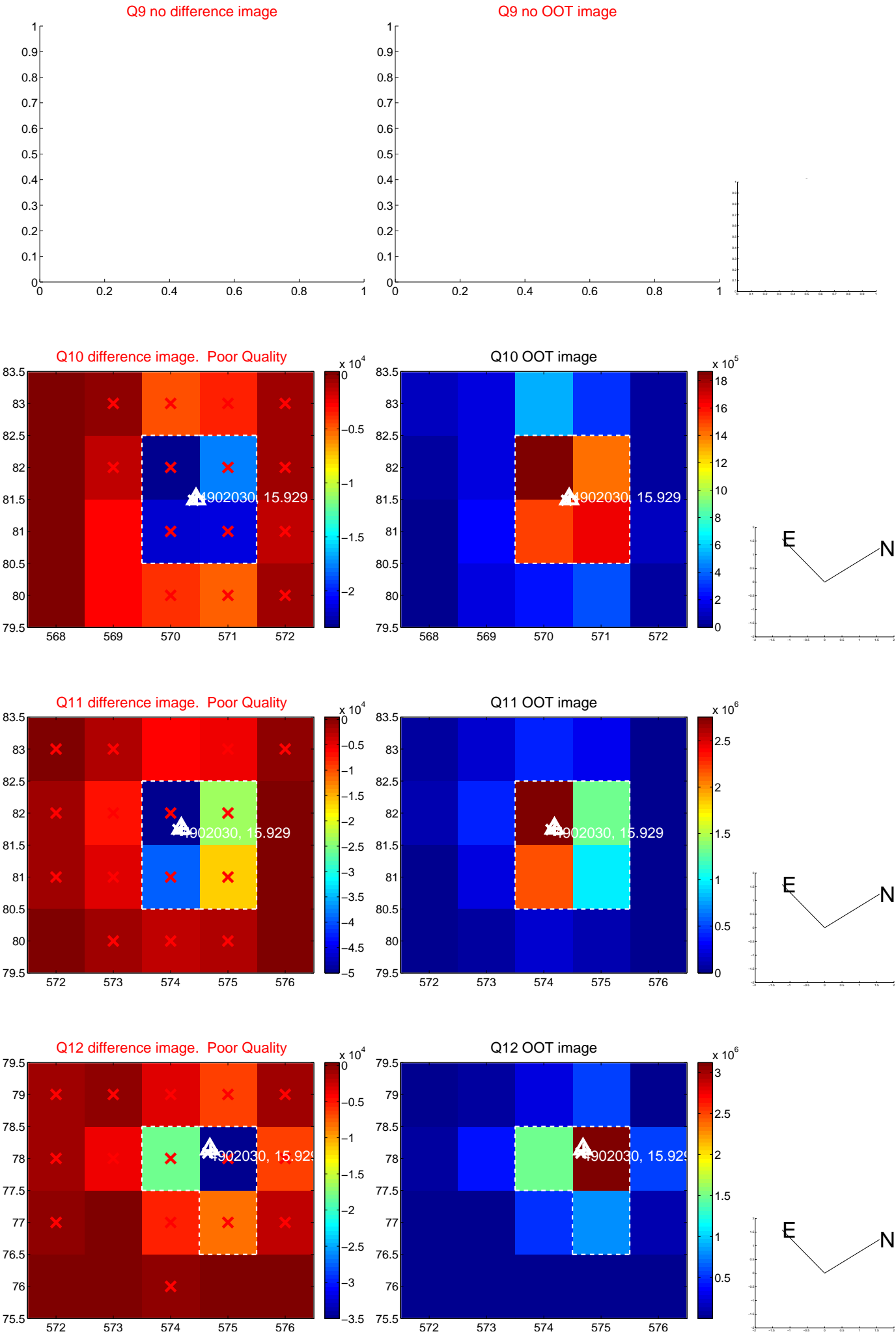
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



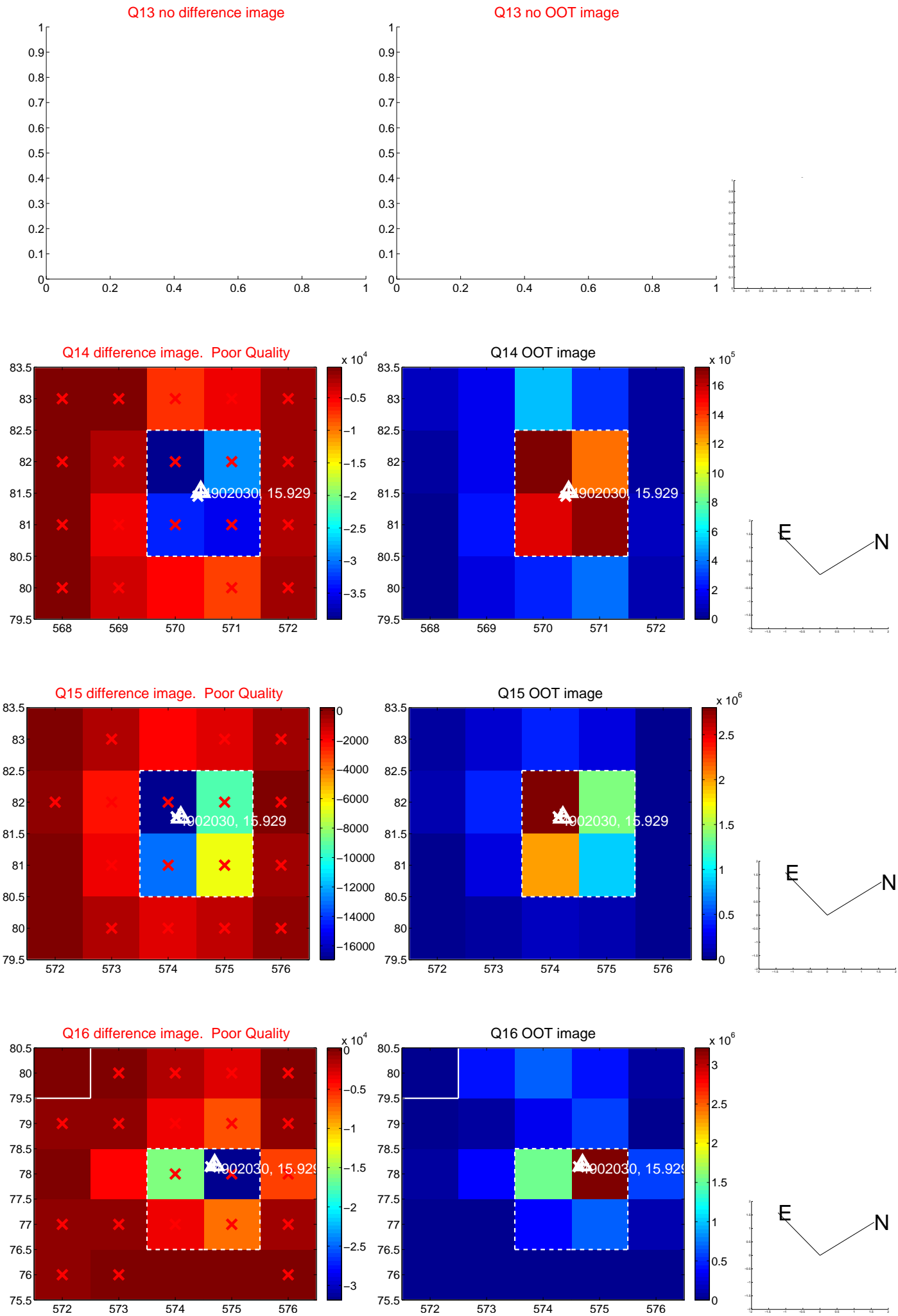
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



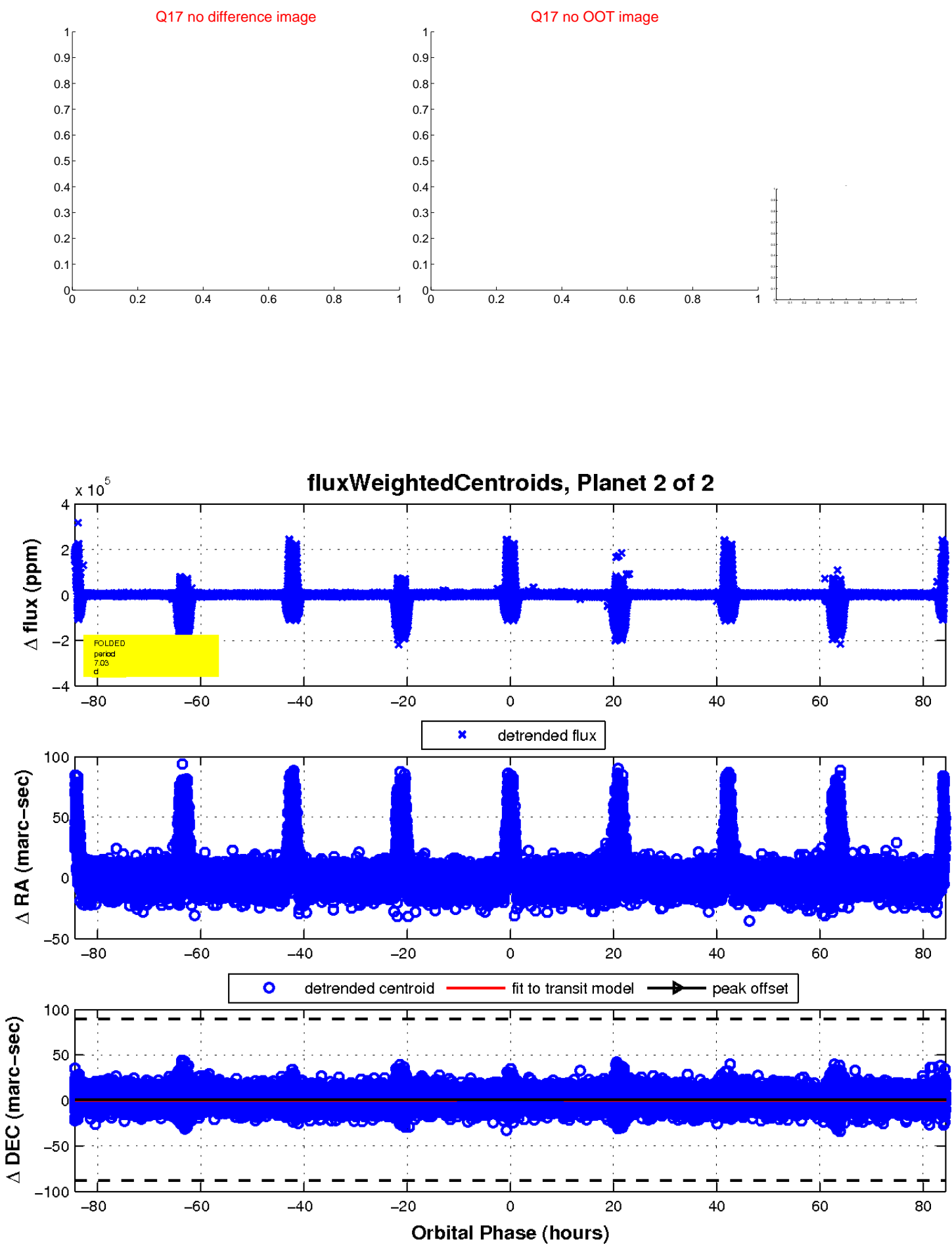
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

