

# KIC 006847018

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006847018-01	OBS	1349.01	16.662167	142.186569	27195.4	3.864	1759.6	1675.2	1.17	6440	27.13	114.64
006847018-02	OBS	No	16.662179	132.783232	1057.4	3.898	67.8	70.7	1.17	6440	5.11	114.64

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006847018-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
006847018-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

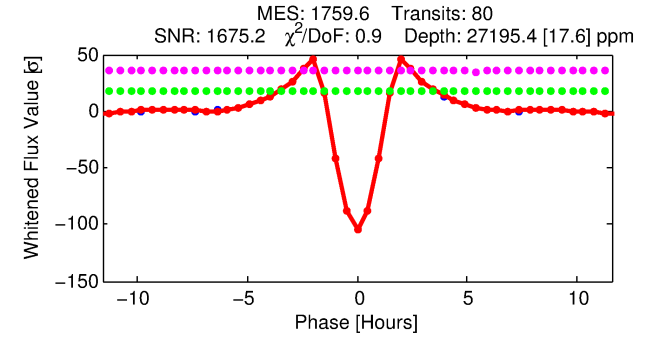
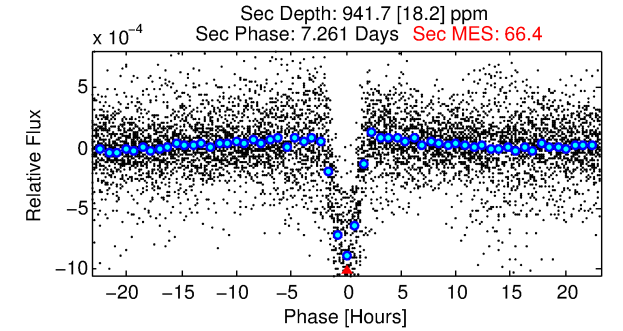
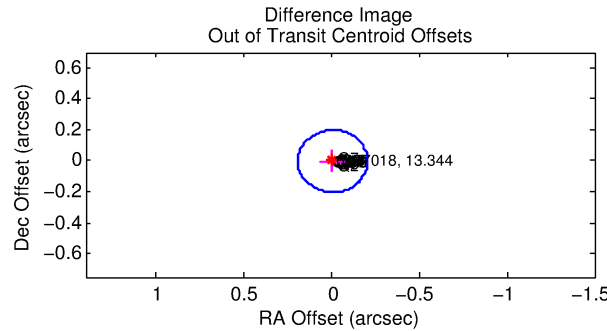
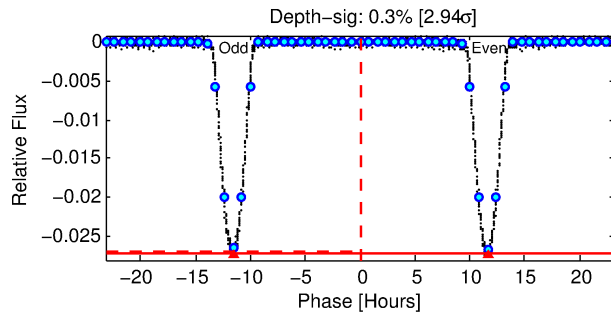
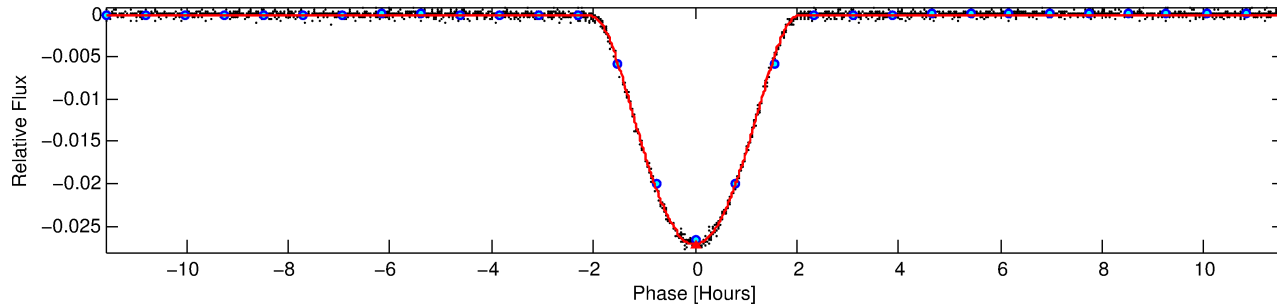
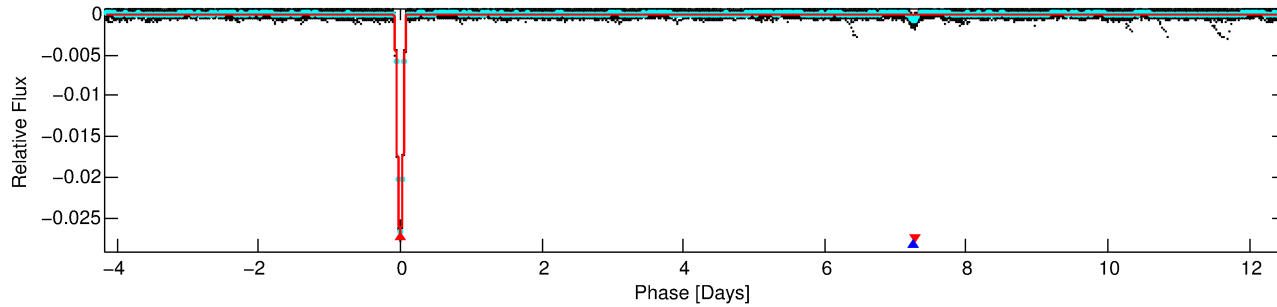
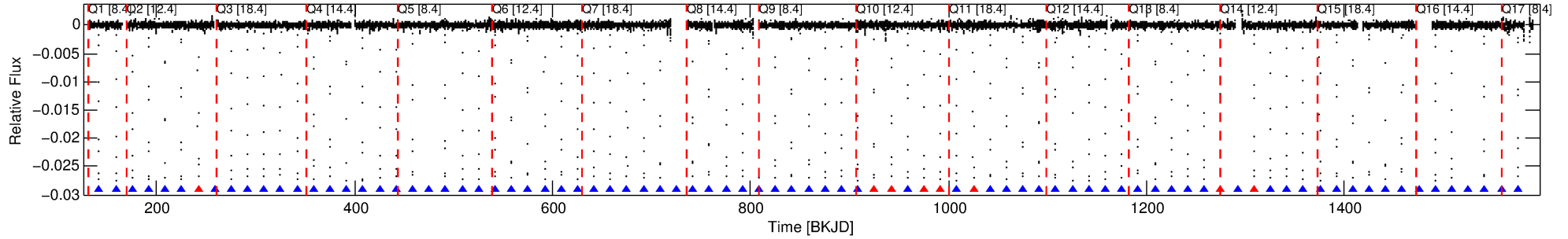
## Ephemeris Match Information For 006847018-01

No Significant Match Found

# DV One-Page Summary

KIC: 6847018 Candidate: 1 of 2 Period: 16.662 d  
KOI: K01349.01 Corr: 0.999

Kp: 13.34 R\*: 1.17 Rs Teff: 6440.0 K Logg: 4.38 Fe/H: -0.040



## DV Fit Results:

Period = 16.66217 [0.00000] d  
Epoch = 142.1866 [0.0000] BKJD  
Rp/R\* = 0.2127 [0.0020]  
a/R\* = 25.84 [0.05]  
b = 0.93 [0.00]  
Seff = 114.64 [47.73]  
Teq = 834 [87] K  
Rp = 27.13 [9.03] Re  
a = 0.1355 [0.0375] AU  
Ag = 12.93 [5.17] [2.31σ]  
Teffp = 2446 [75] K [14.06σ]

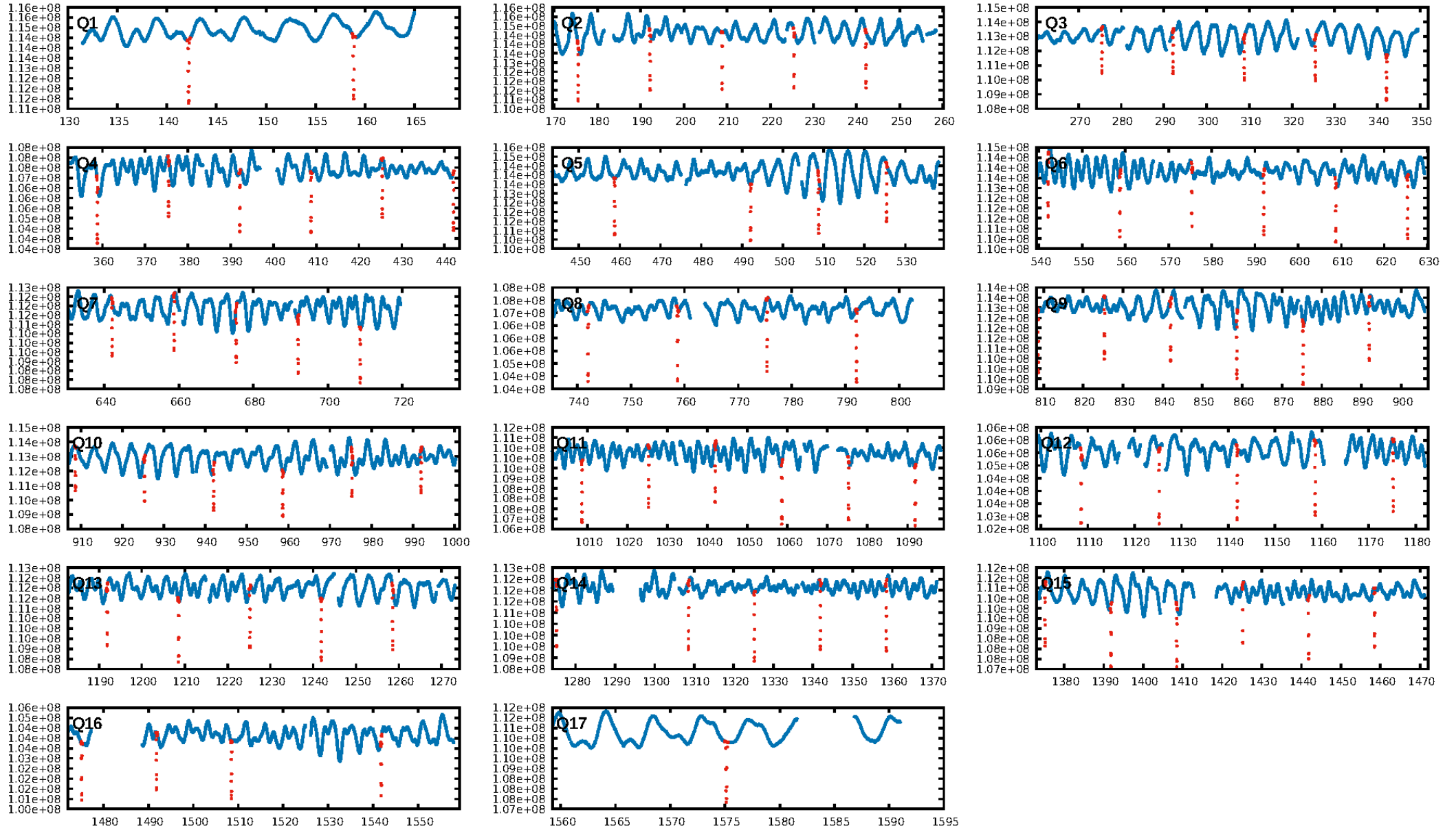
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.90 [69/77]  
GhostDiagnostic-chr: 3.733  
Centroid-sig: 0.0%  
Centroid-so: 0.117 arcsec [30.01σ]  
OotOffset-rm: 0.007 arcsec [0.10σ]  
KicOffset-rm: 0.059 arcsec [0.86σ]  
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]

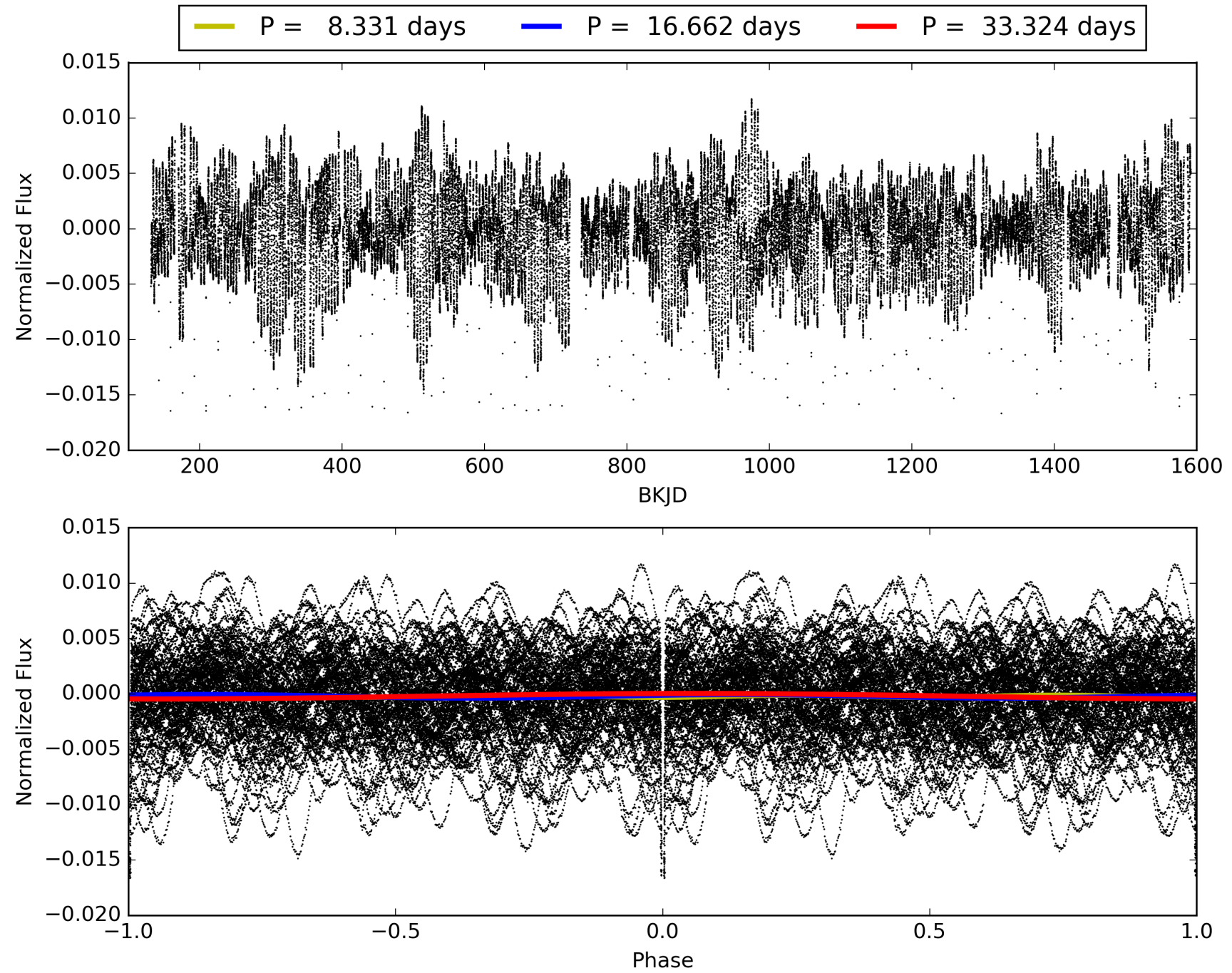
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 11:41:25 Z

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

# TCE 006847018-01, PDC Light Curves

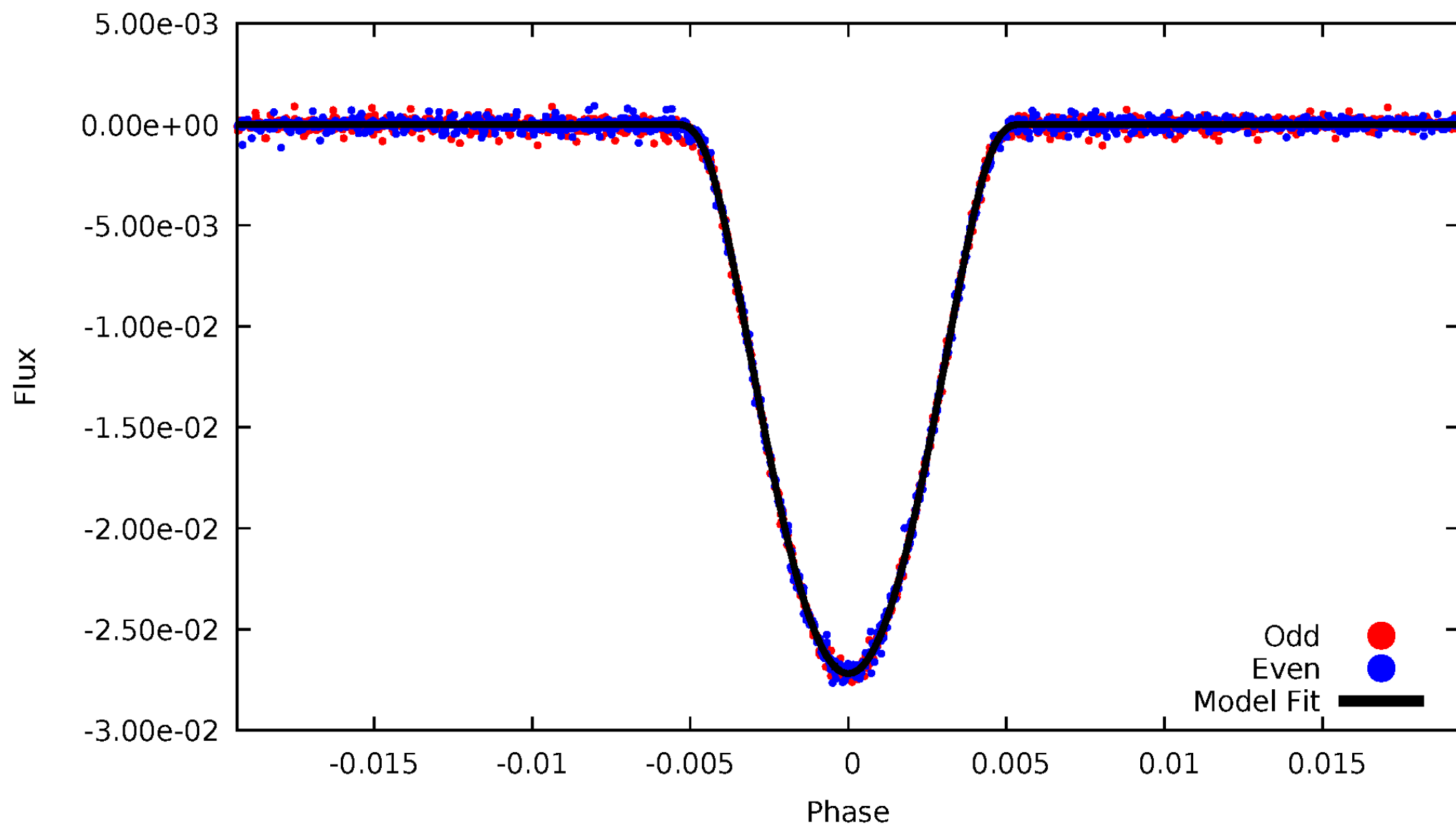


TCE 006847018-01



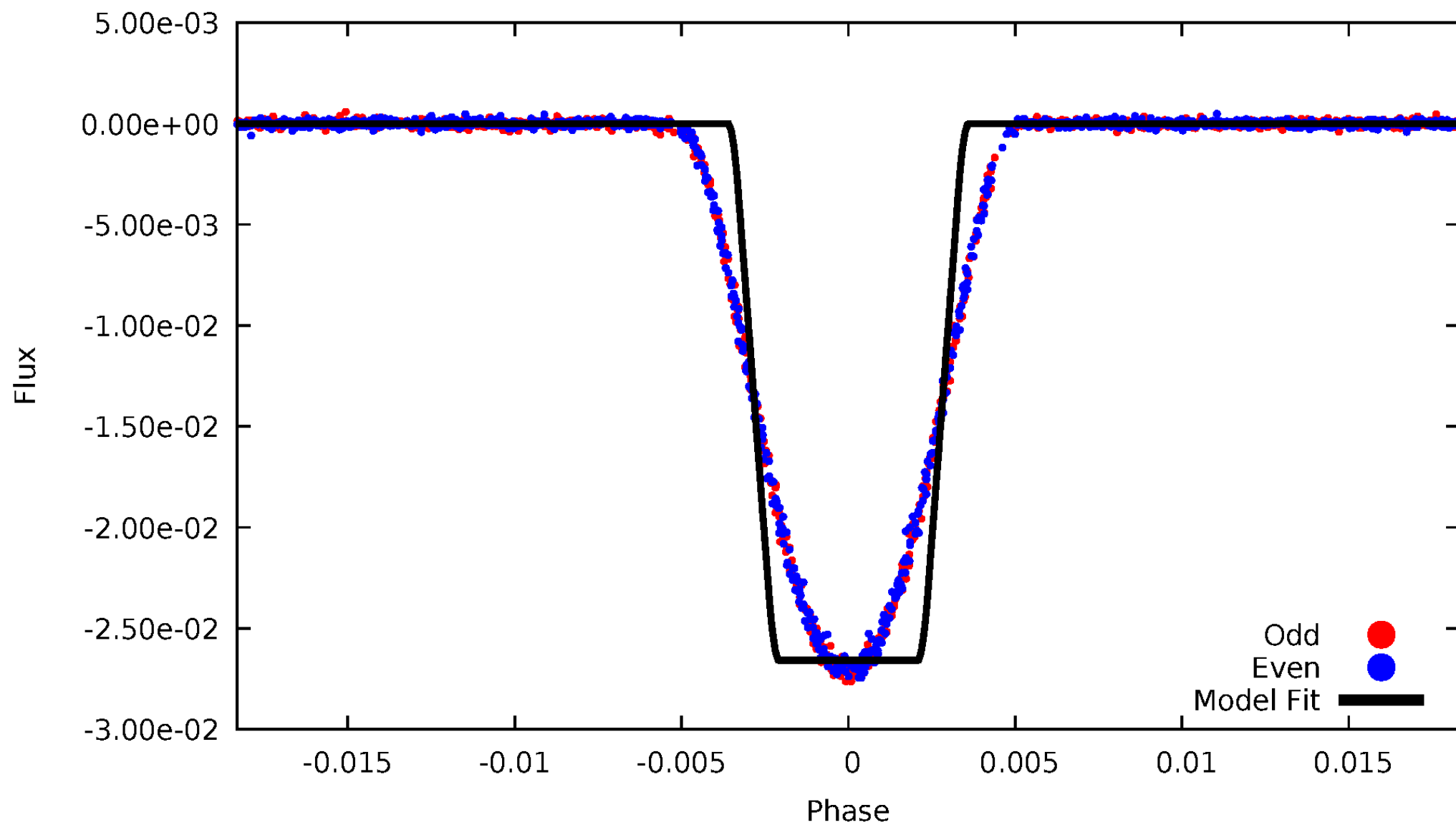
# DV Odd/Even

TCE 006847018-01



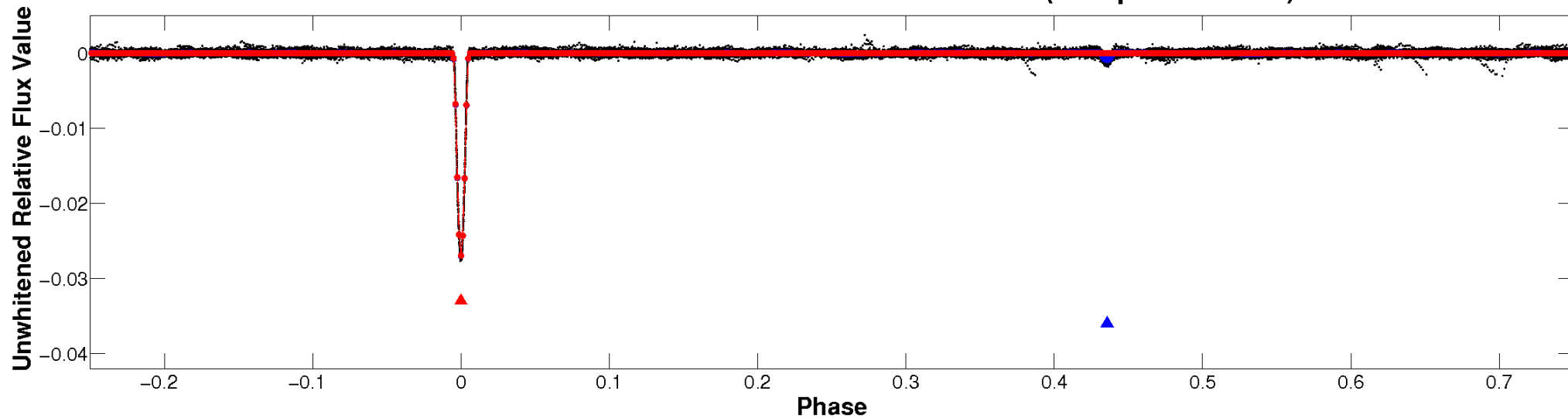
# ALT Odd/Even

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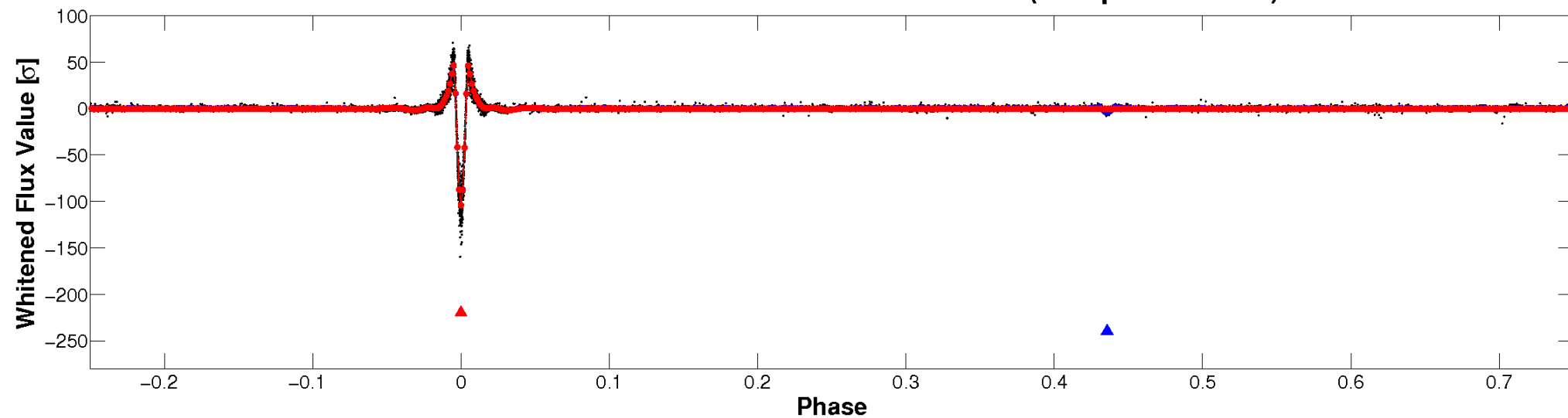


# Non-Whitened Vs. Whitened Light Curve

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

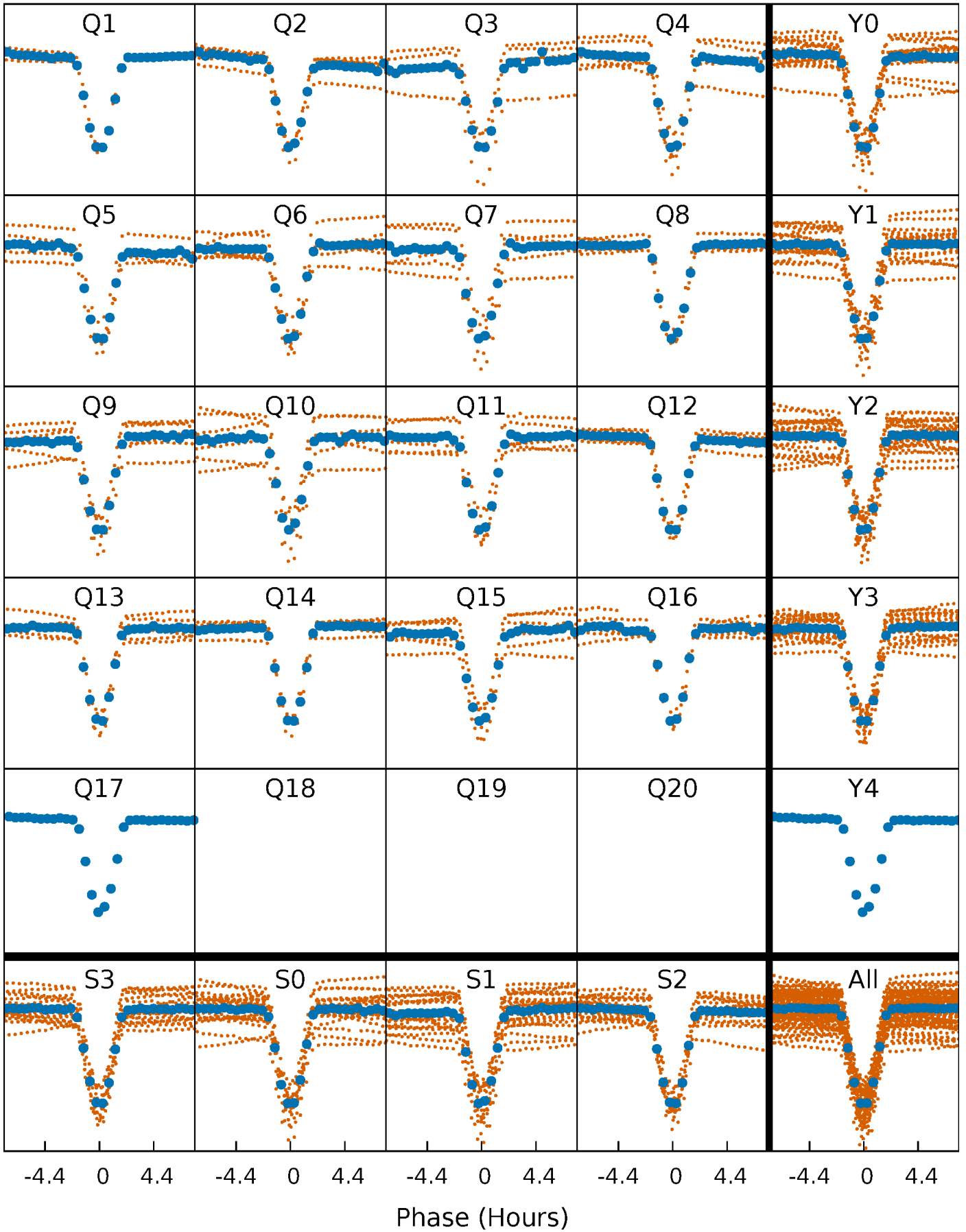


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

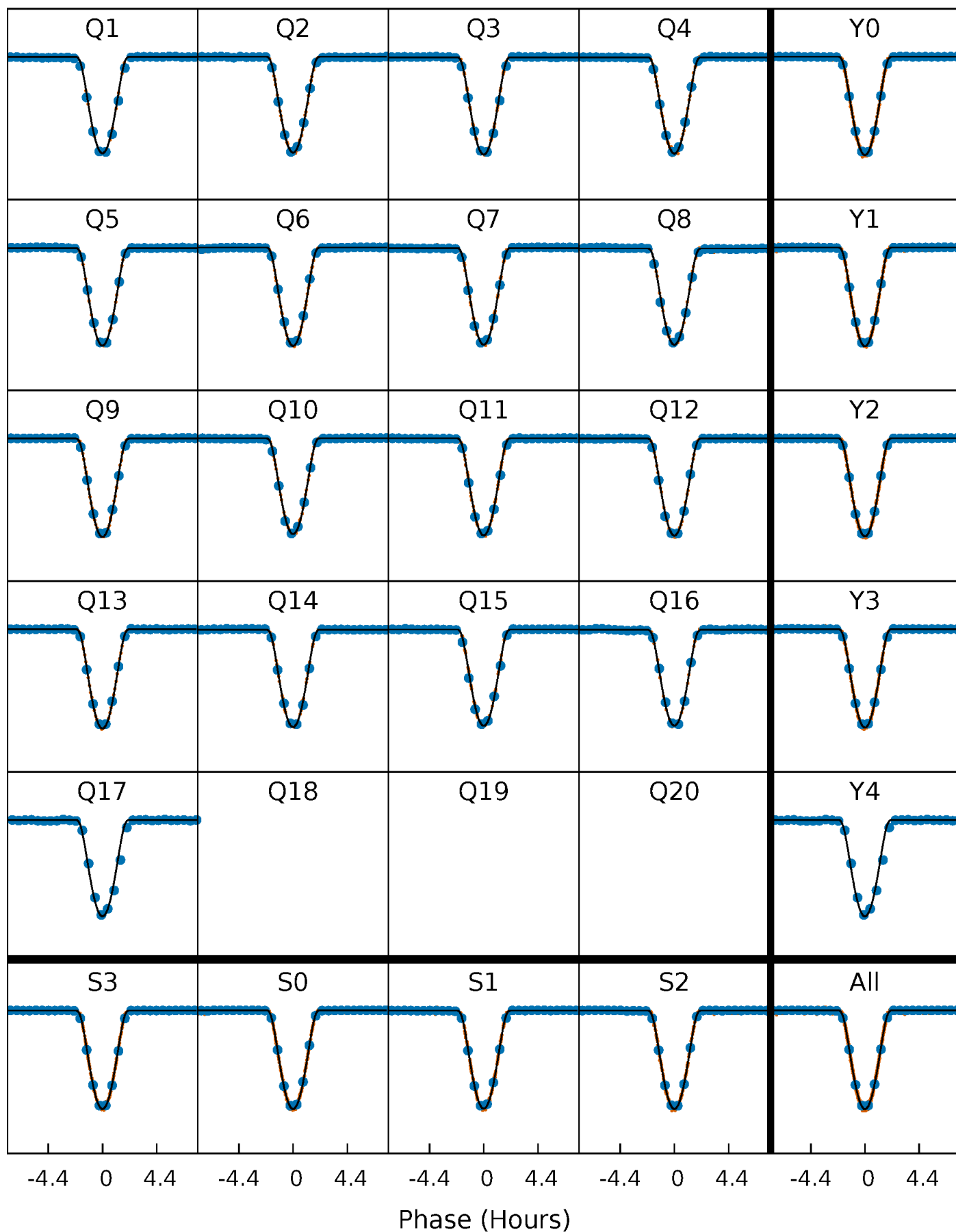
TCE 006847018-01 P= 16.662167 Days  $T_0=142.186569$  (BKJD)





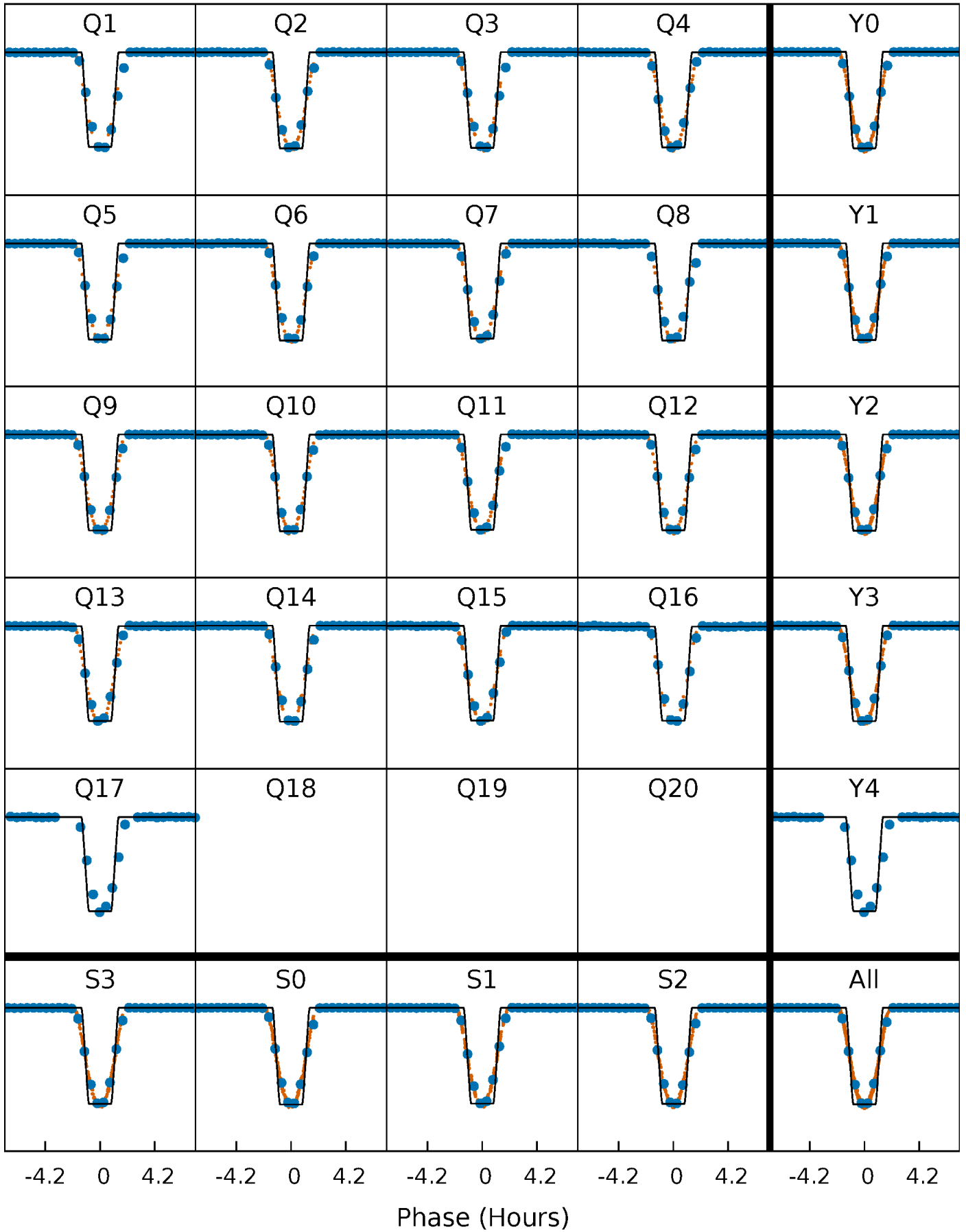
# DV Quarter-Phased Transit Curves

TCE 006847018-01 P= 16.662167 Days  $T_0=142.186569$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

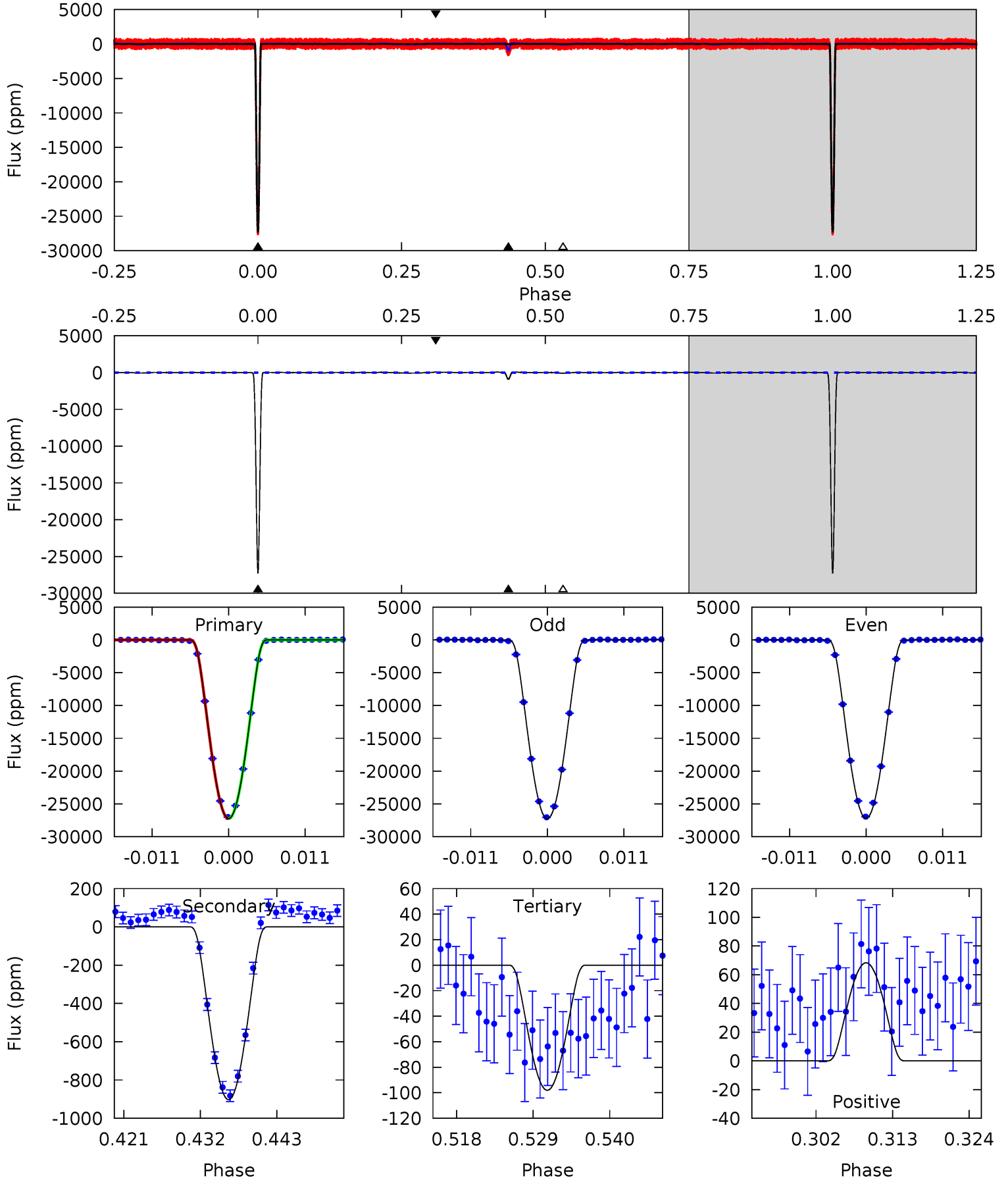
TCE 006847018-01 P= 16.662202 Days  $T_0=142.185112$  (BKJD)



# DV Model-Shift Uniqueness Test

006847018-01, P = 16.662167 Days, E = 125.524402 Days

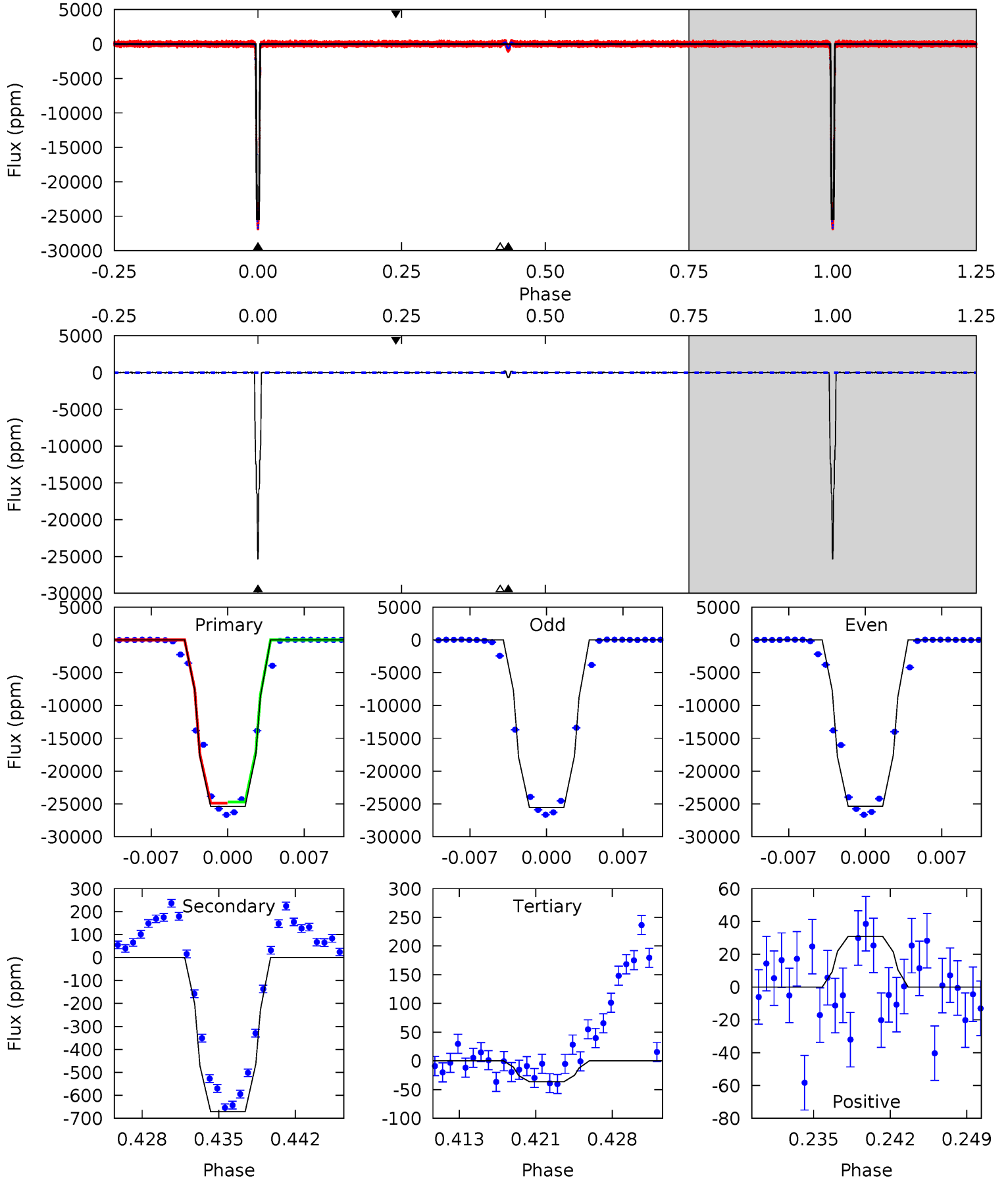
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3256	108.0	11.7	8.17	5.01	2.55	3.41	3245	3248	96.3	99.8	3.75	1.00	0.00	0.13



# Alt Model-Shift Uniqueness Test

006847018-01, P = 16.662202 Days, E = 125.522910 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
2753	72.8	3.94	3.35	5.09	2.69	1.34	2749	2750	68.9	69.5	8.42	1.00	0.01	0



### Stellar Parameters For KIC 006847018

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6440^{+153}_{-192}$	$4.380^{+0.068}_{-0.216}$	$-0.040^{+0.250}_{-0.300}$	$1.169^{+0.389}_{-0.130}$	$1.196^{+0.185}_{-0.152}$	$1.053^{+0.317}_{-0.580}$
	+2%/-3%	+2%/-5%	+625%/-750%	+33%/-11%	+15%/-13%	+30%/-55%
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 006847018-01 / KOI 1349.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-903 \pm 8$	$27.60^{+4.85}_{-2.08}$	$1182^{+85}_{-55}$	$3052^{+41}_{-54}$	$12^{+2}_{-3}$
Alt.	$-672 \pm 9$	$21.17^{+3.80}_{-1.64}$	$1186^{+90}_{-60}$	$3161^{+47}_{-54}$	$15^{+2}_{-4}$

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

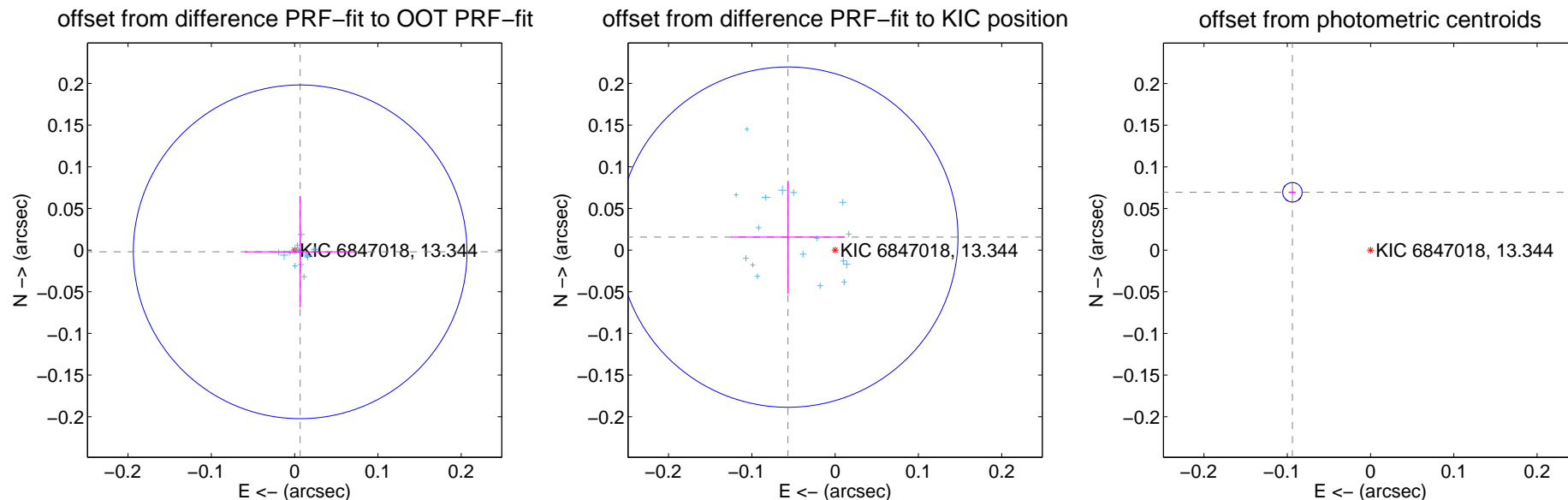
## DV Centroid Data

Supplemental centroid analysis for 006847018-01. Kepler magnitude: 13.34. Transit SNR 1675.20

There are 17 quarters with good PRF difference image offsets

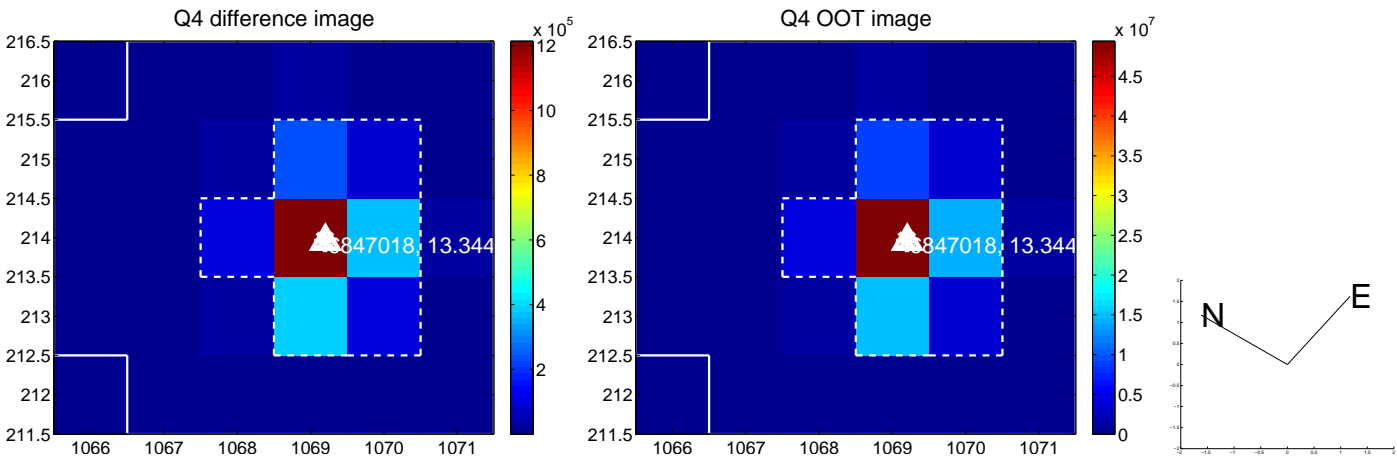
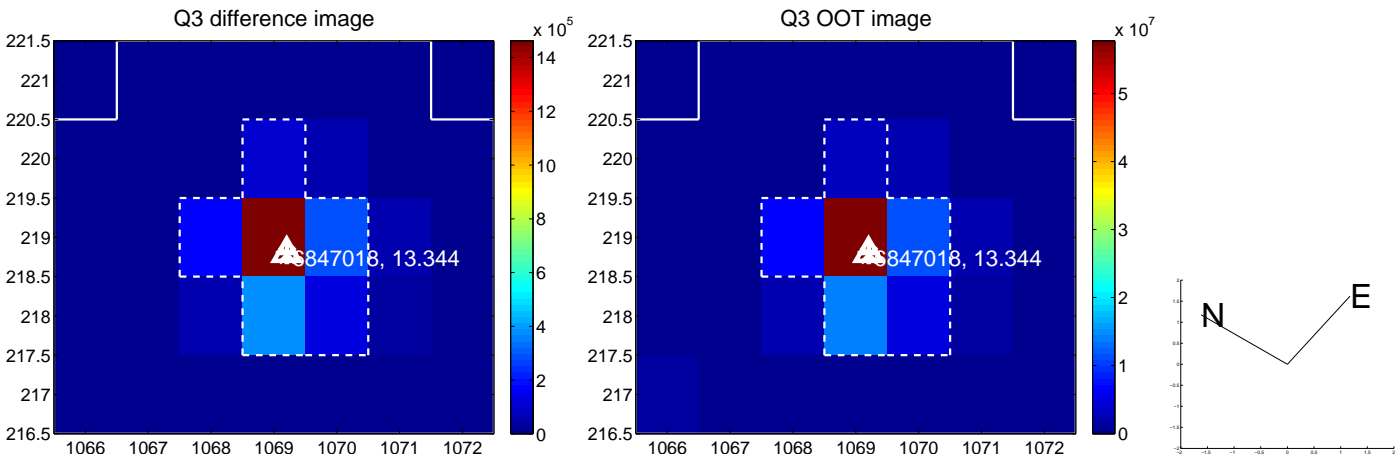
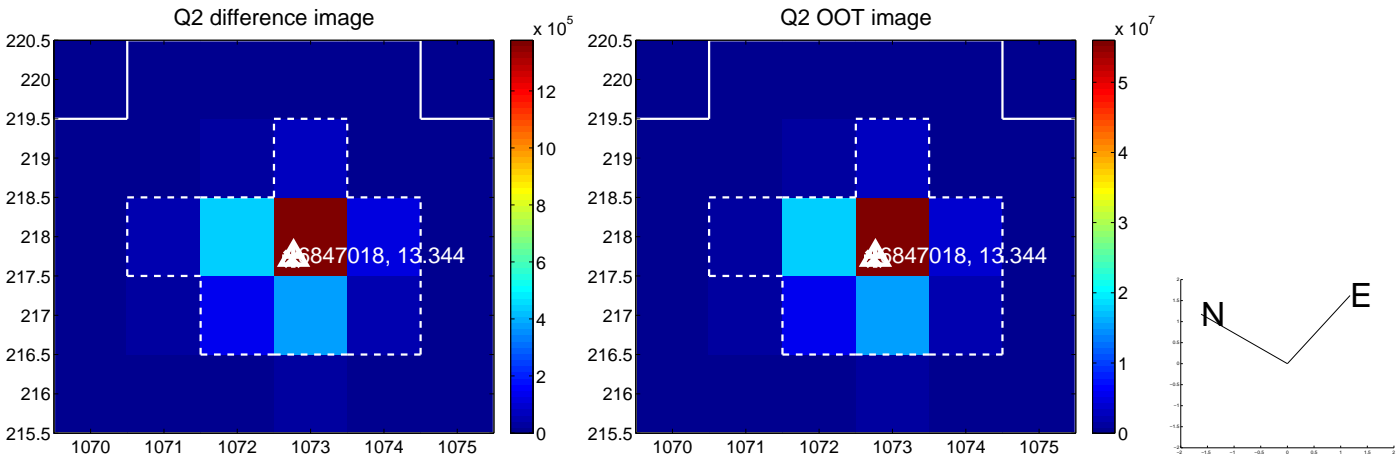
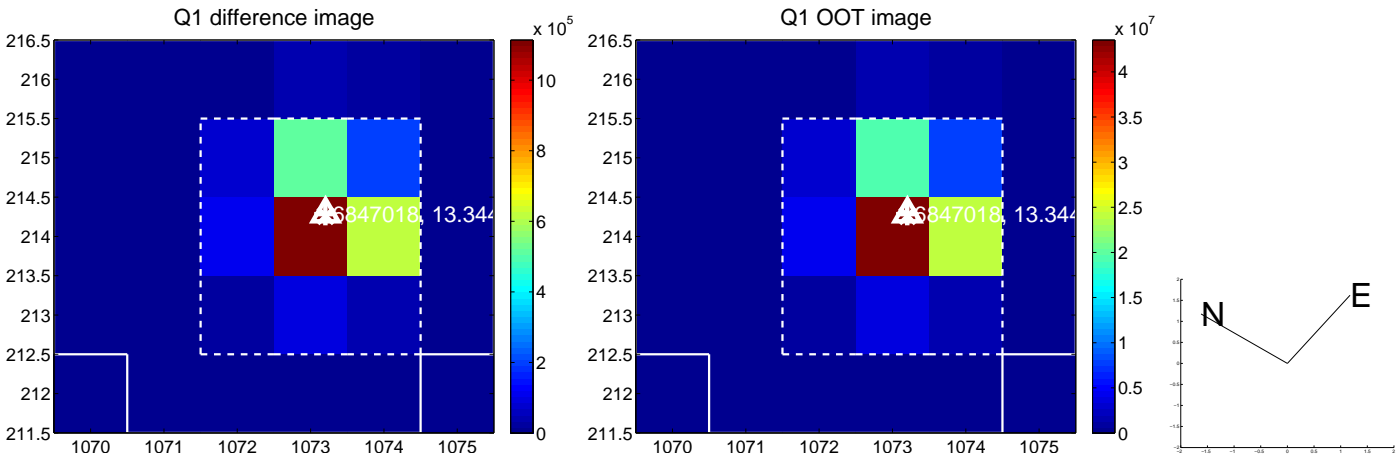
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.007 \pm 0.067$	0.10	$-0.007 \pm 0.067$	$-0.002 \pm 0.067$
PRF-fit source offset from KIC position	$0.059 \pm 0.068$	0.86	$0.057 \pm 0.068$	$0.016 \pm 0.068$
photometric centroid source offset	$0.12 \pm 0.00$	30.01	$0.09 \pm 0.00$	$0.07 \pm 0.00$

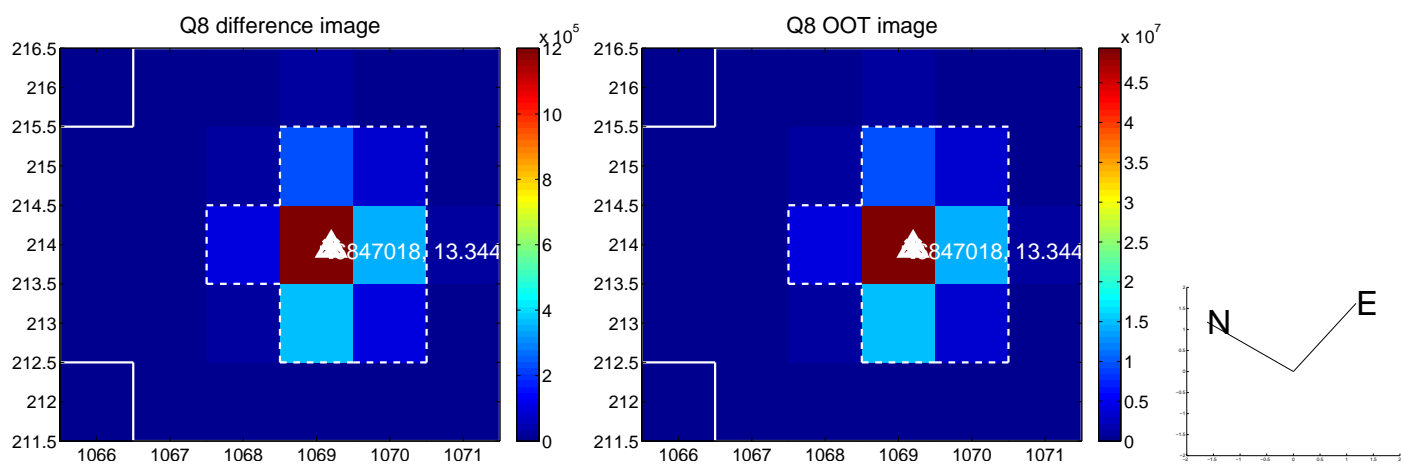
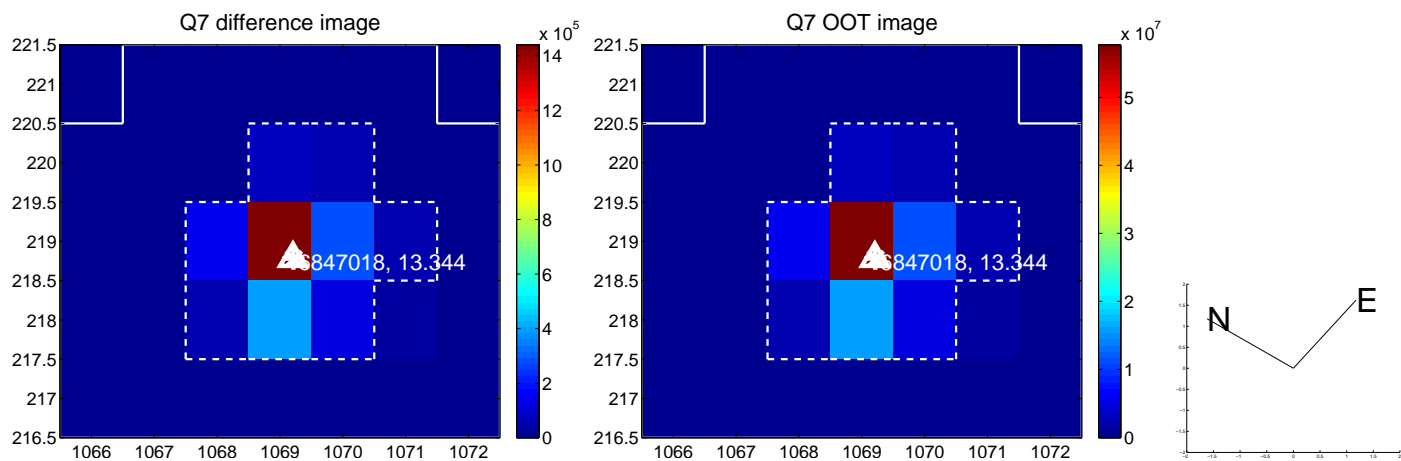
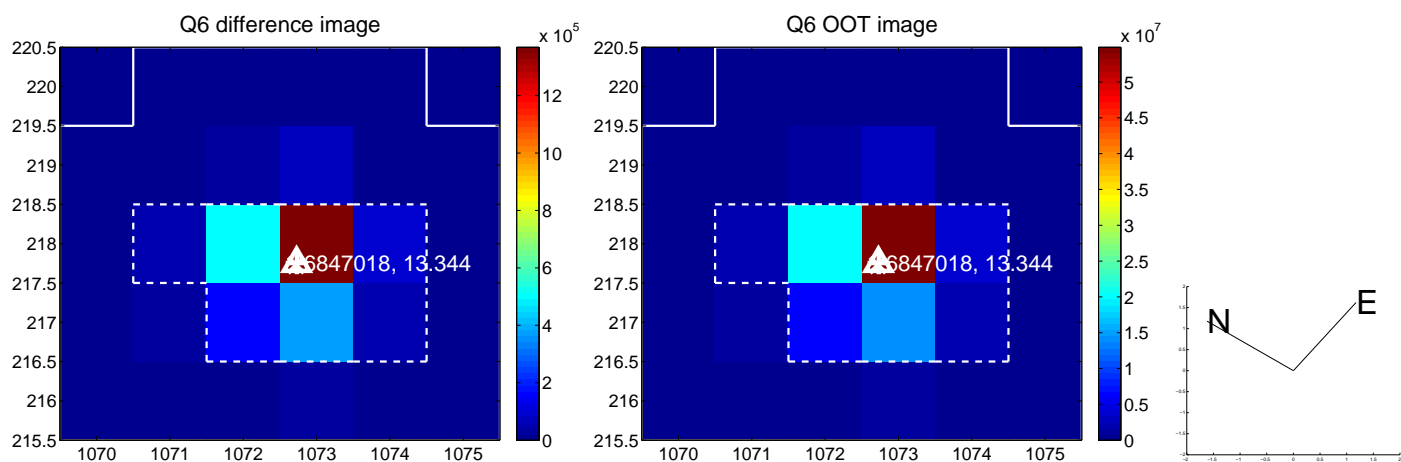
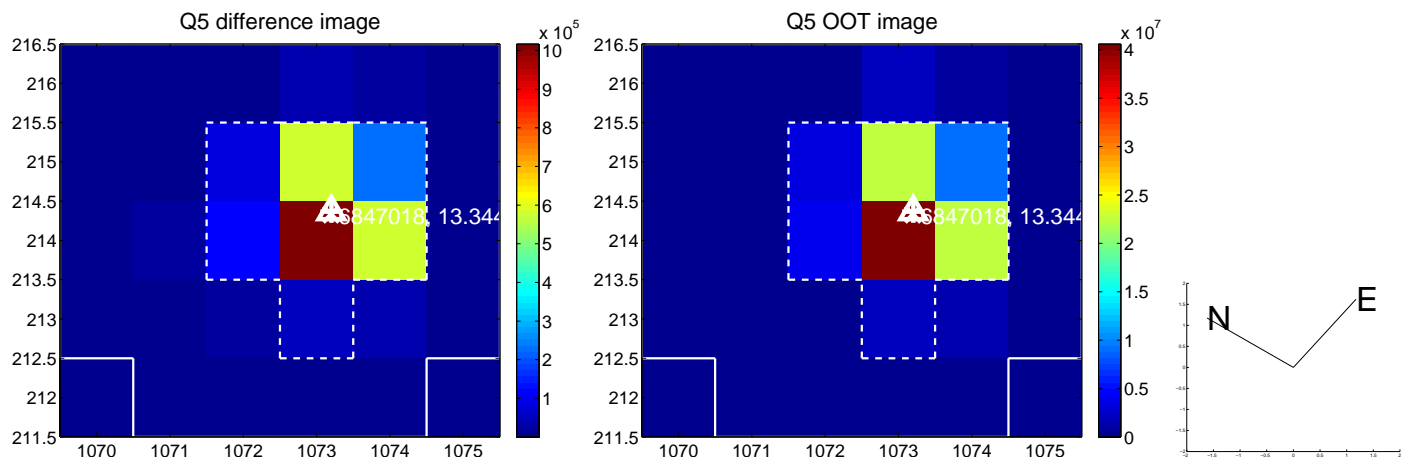


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

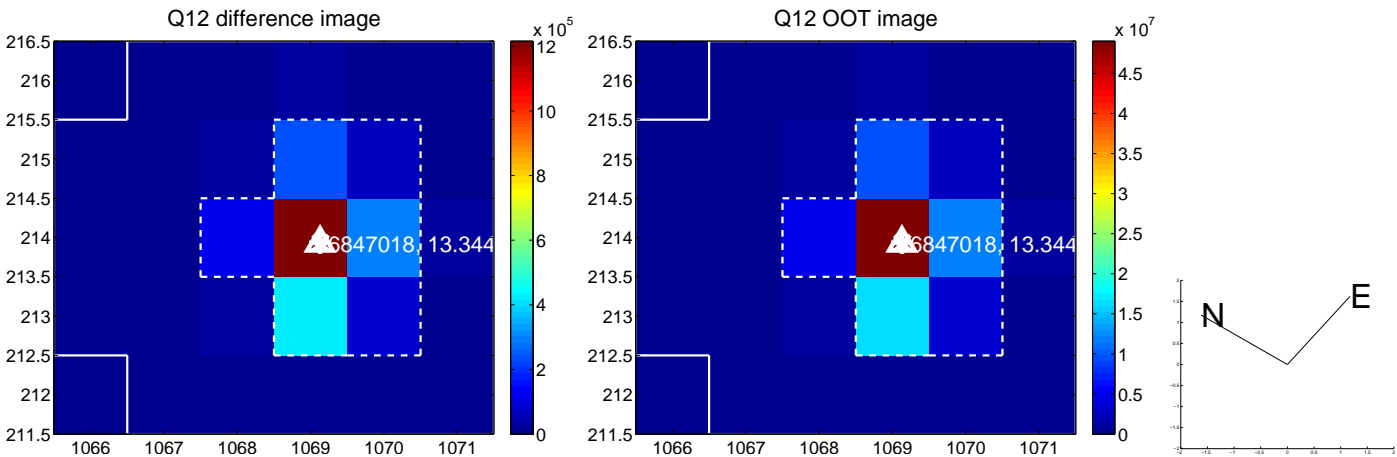
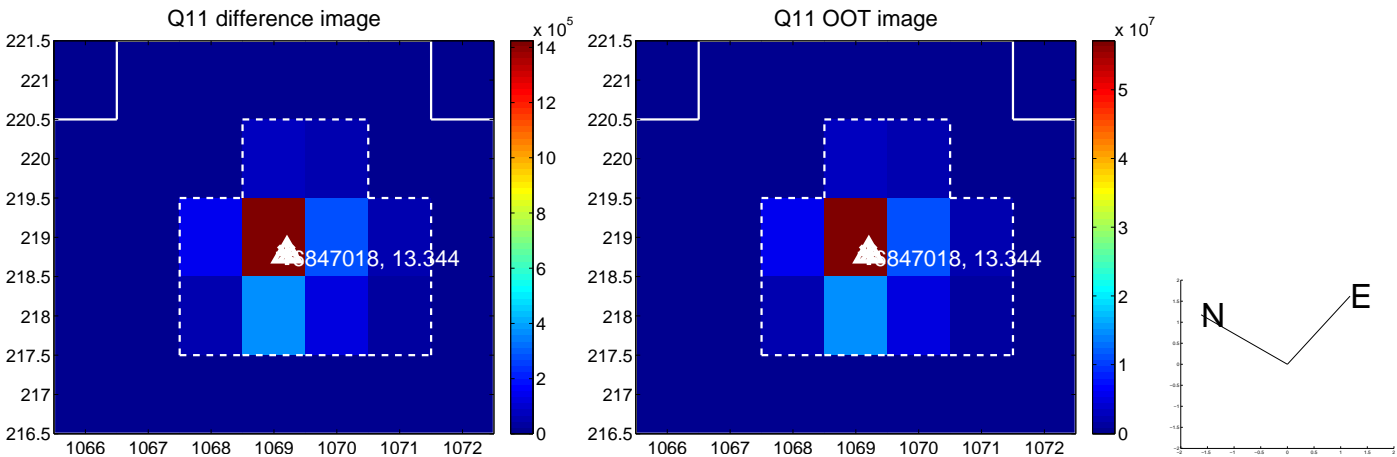
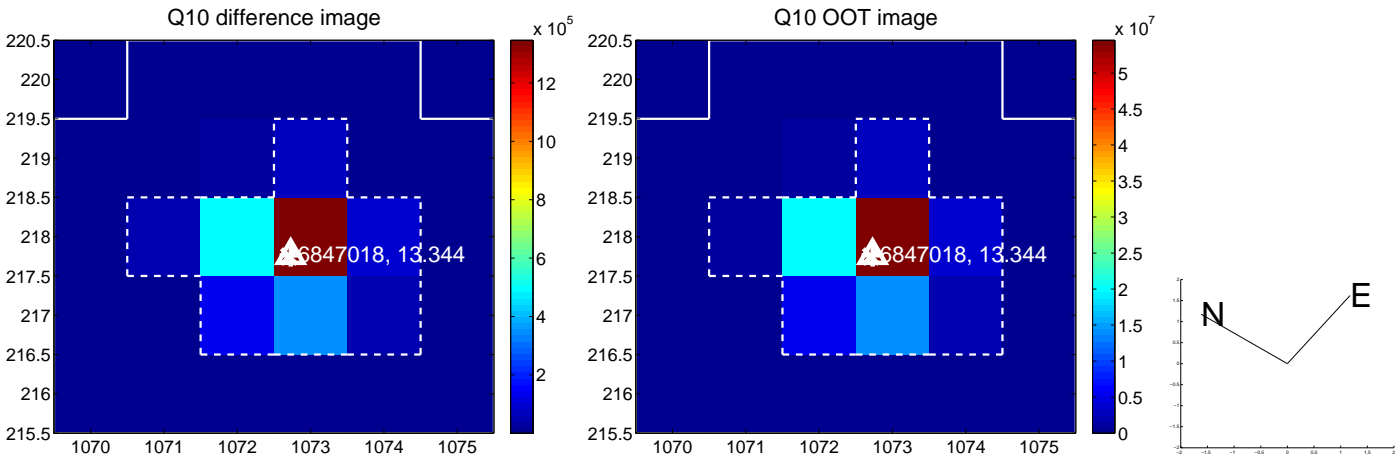
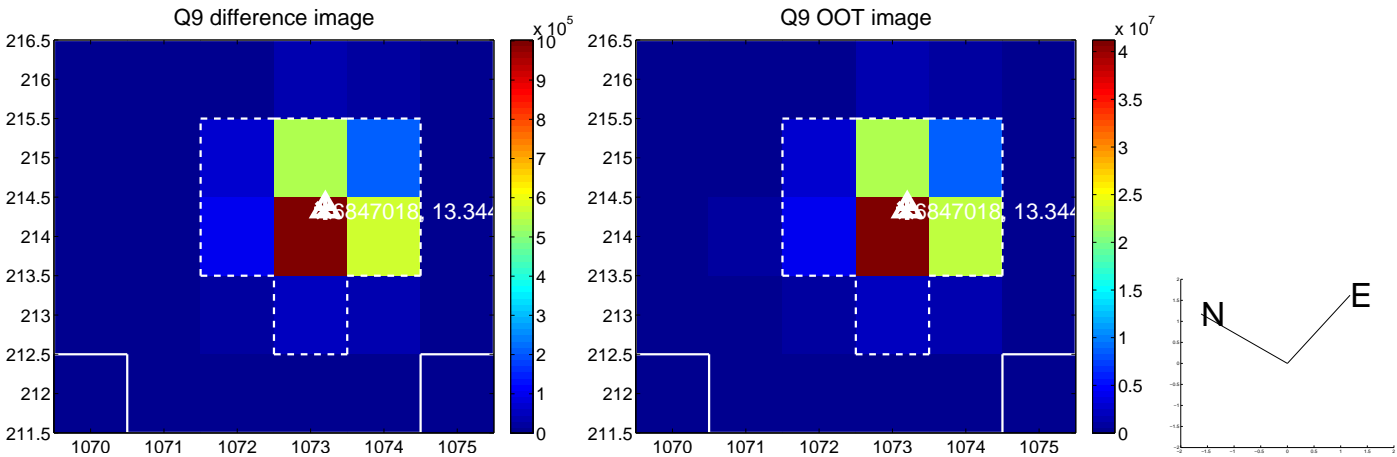


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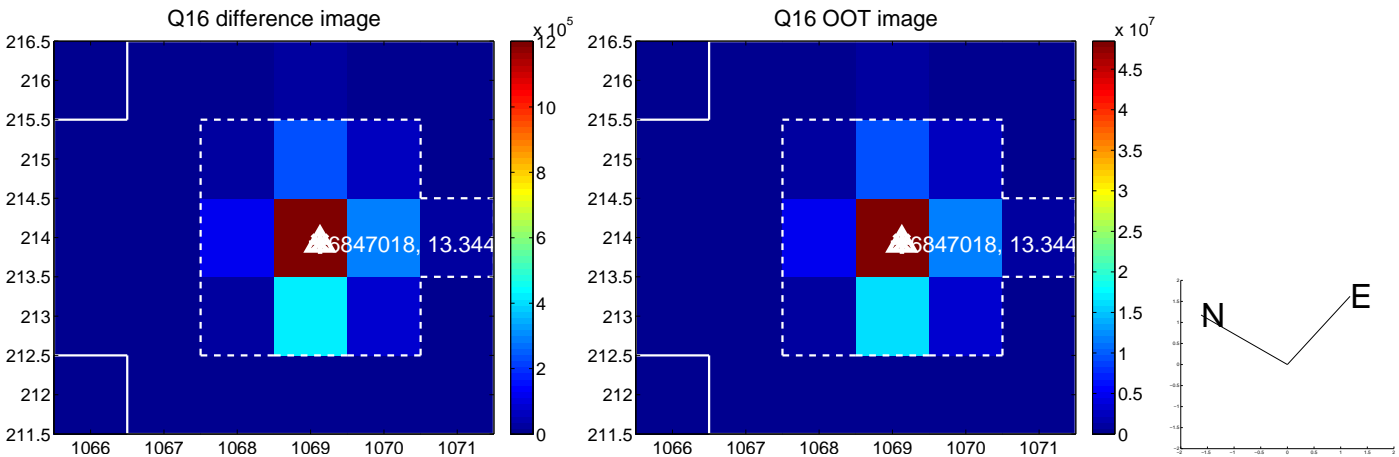
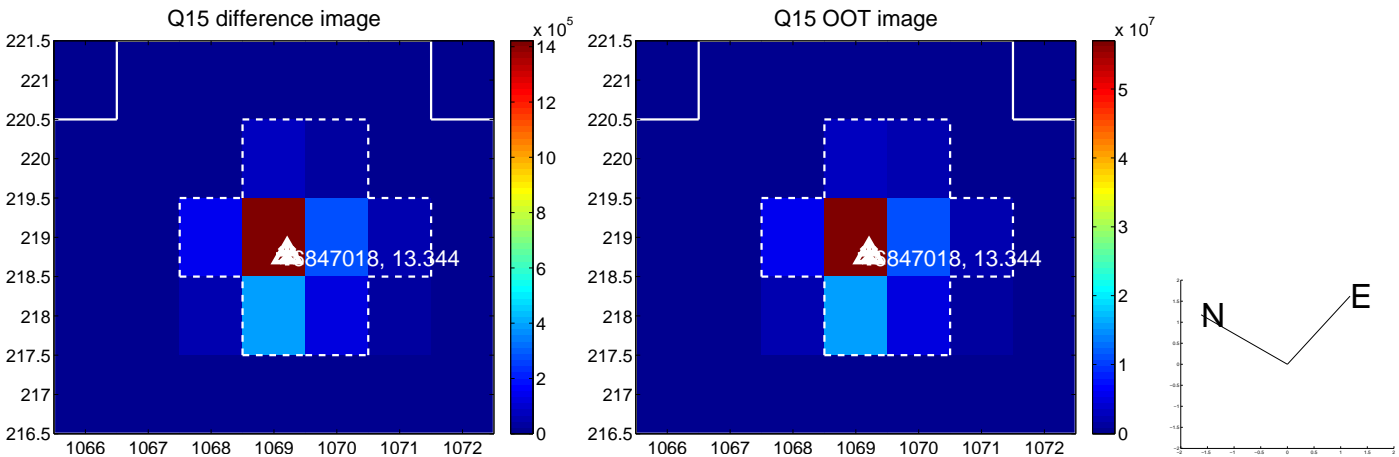
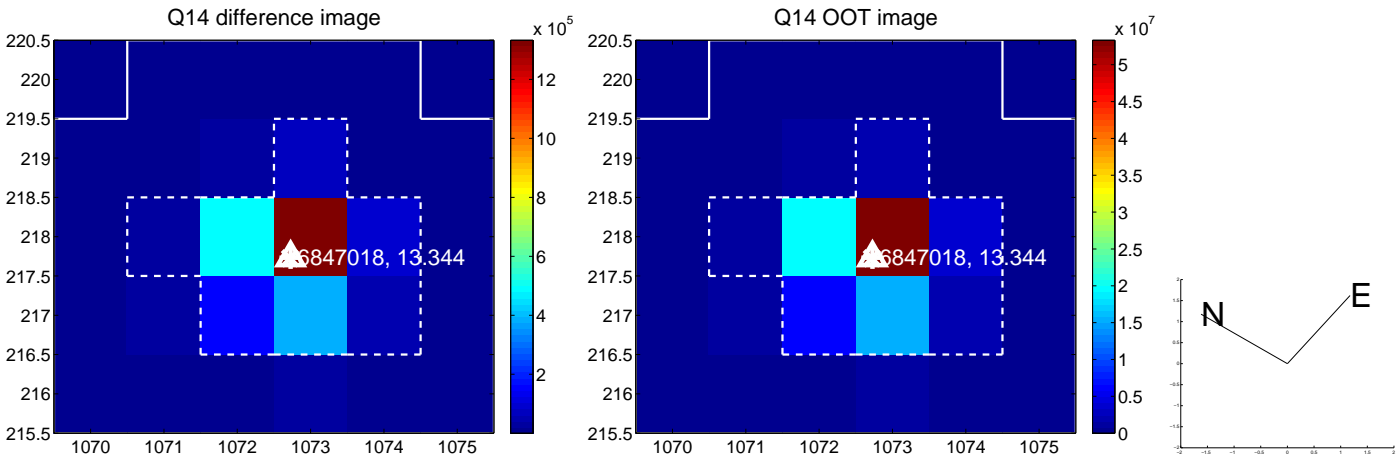
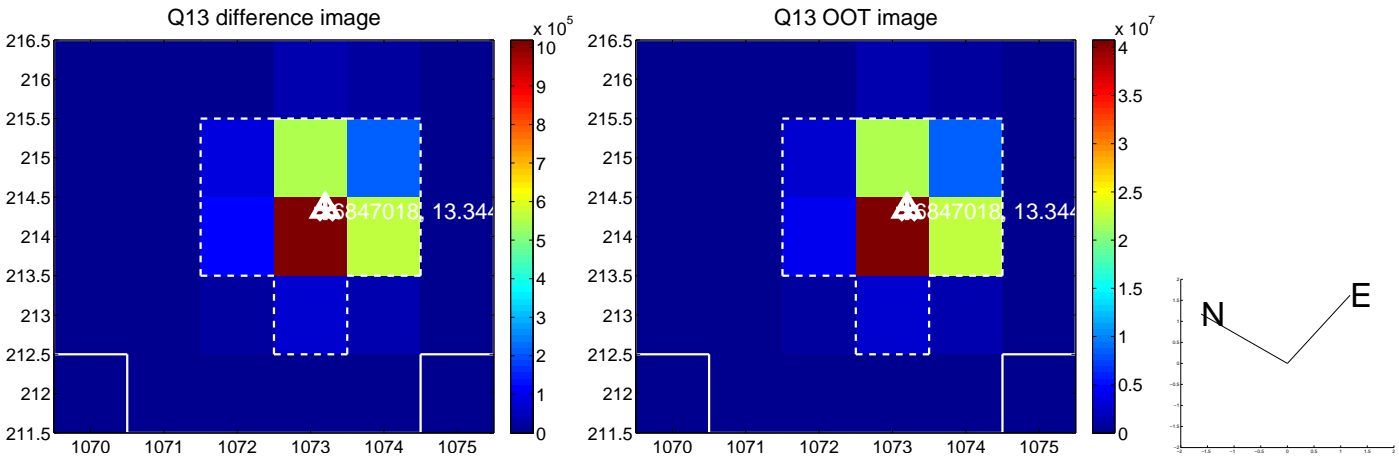




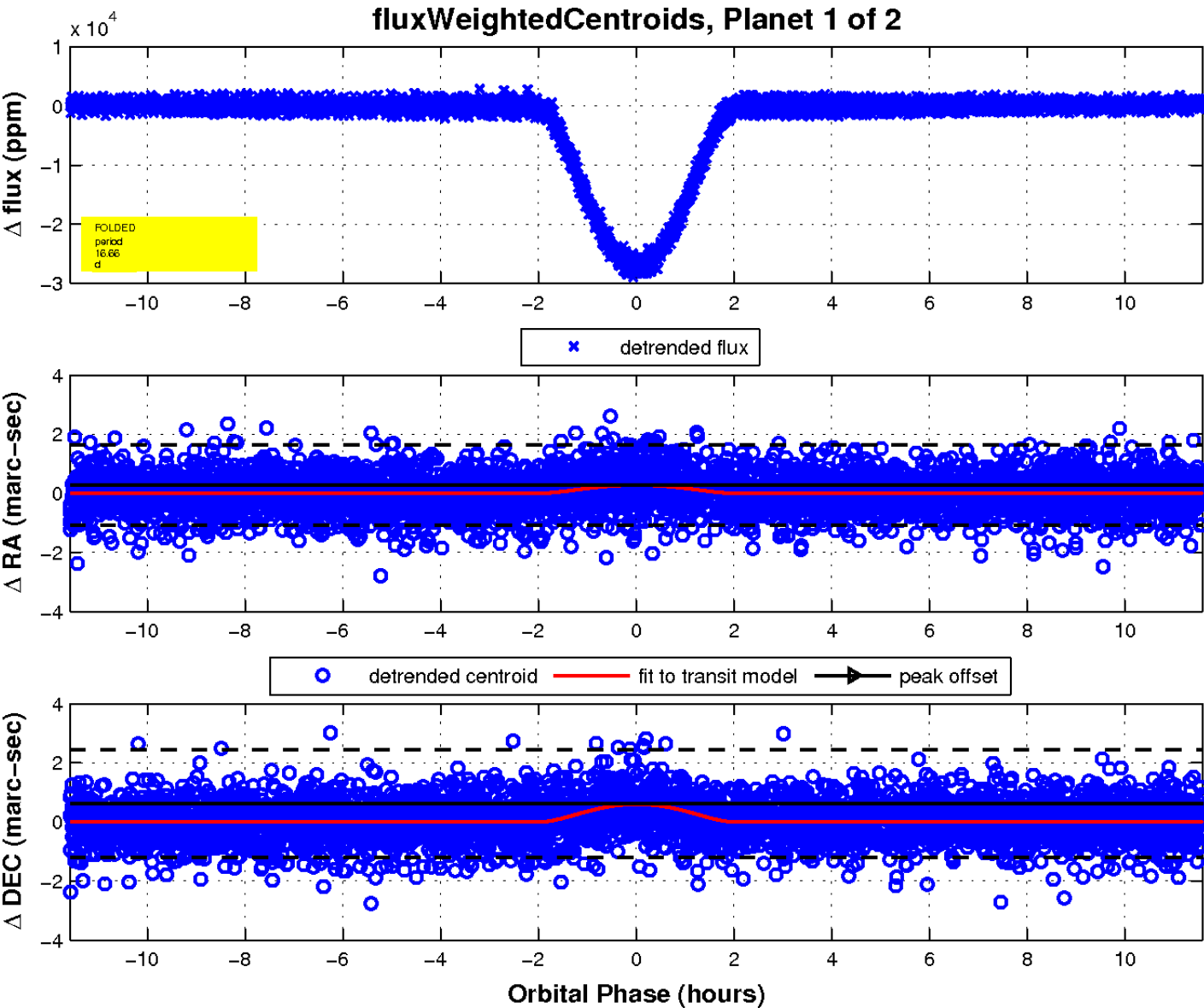
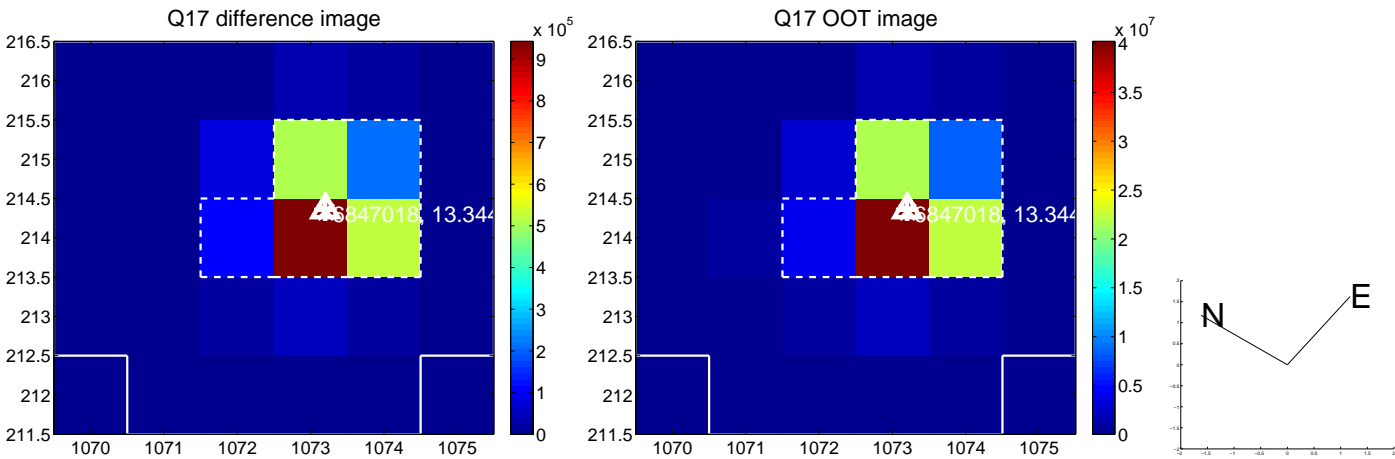
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

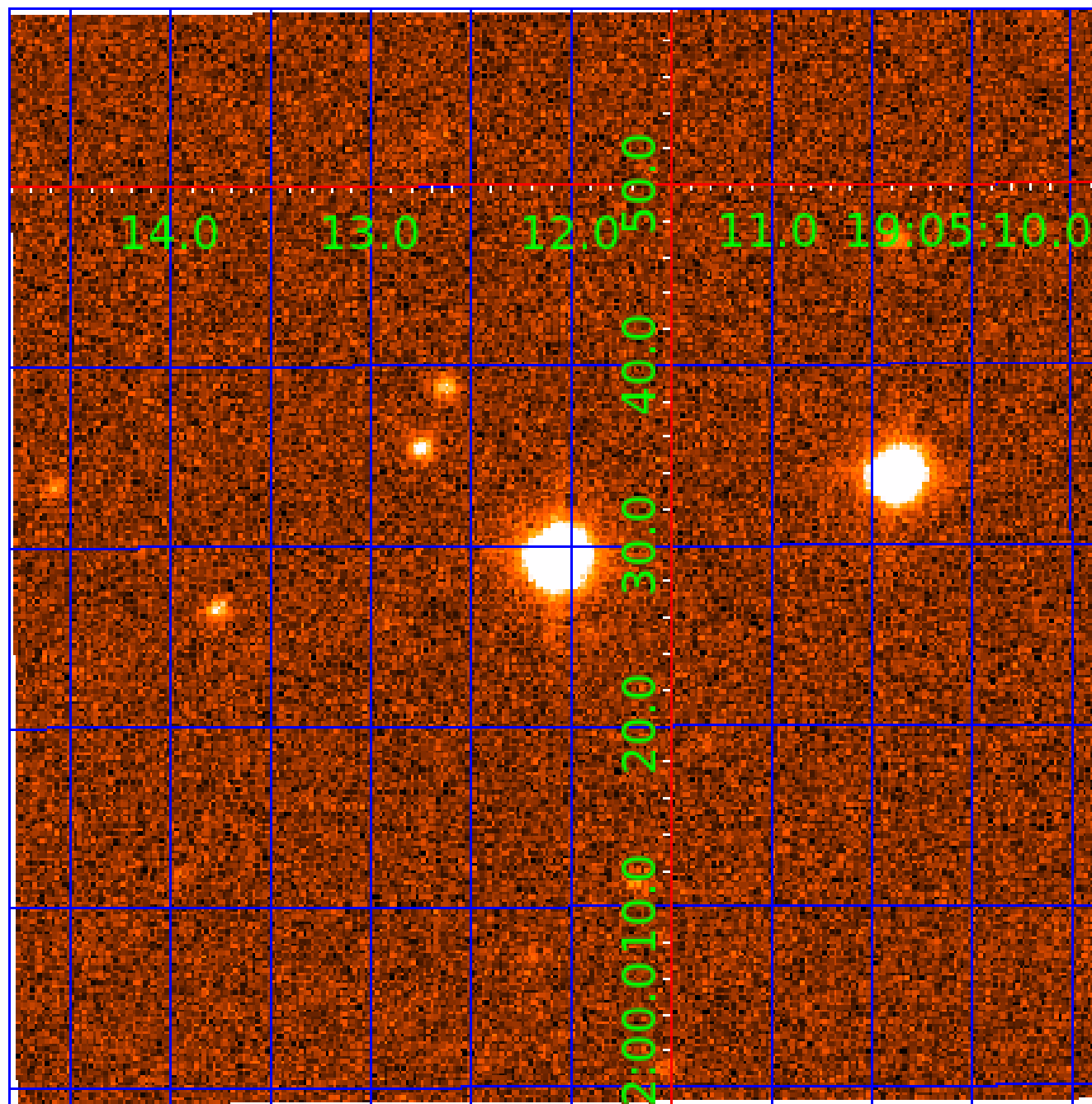


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006847018

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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006847018-02	OBS	No	16.662179	132.783232	1057.4	3.898	67.8	70.7	1.17	6440	5.11	114.64

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TCE	Run Type	Disp	Score	N	S	C	E	Comments
006847018-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
006847018-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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 006847018-02

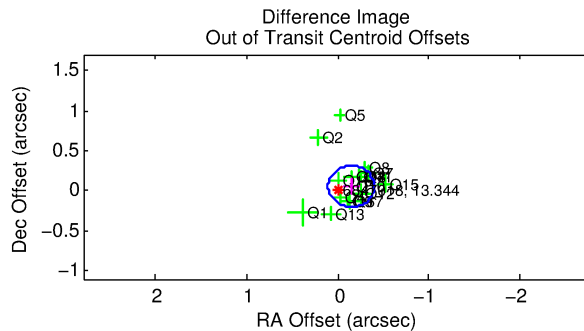
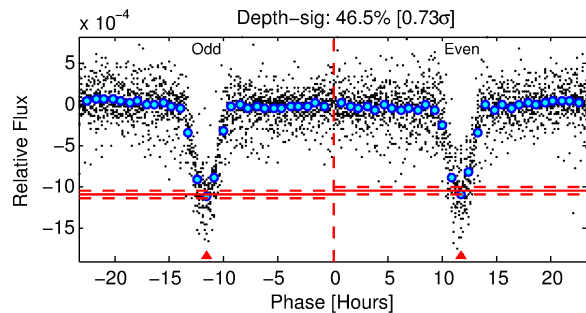
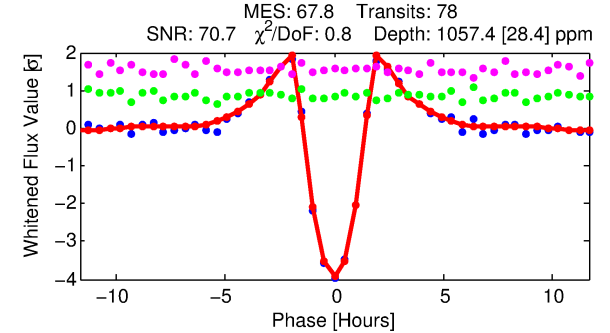
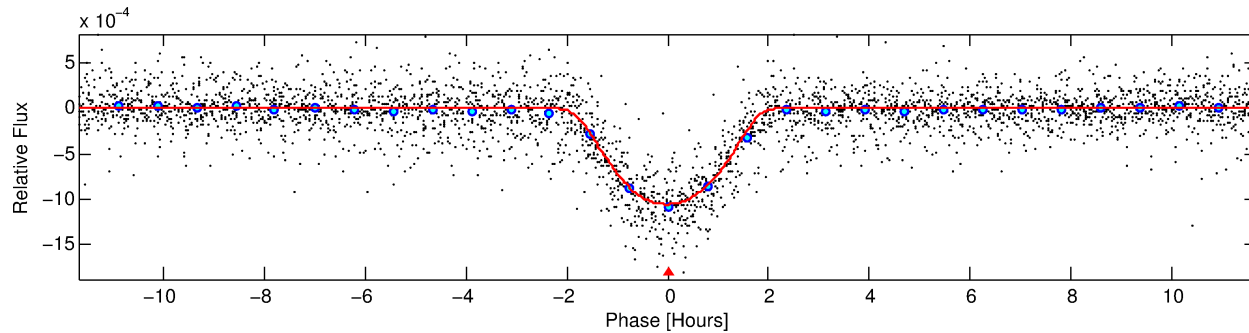
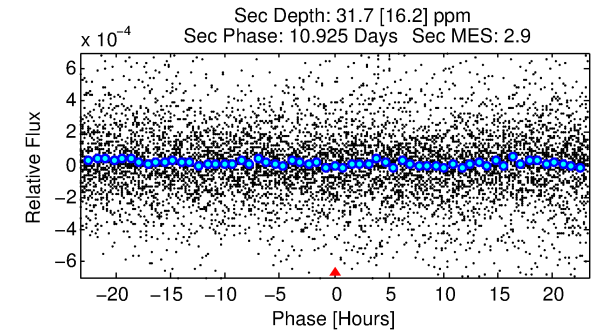
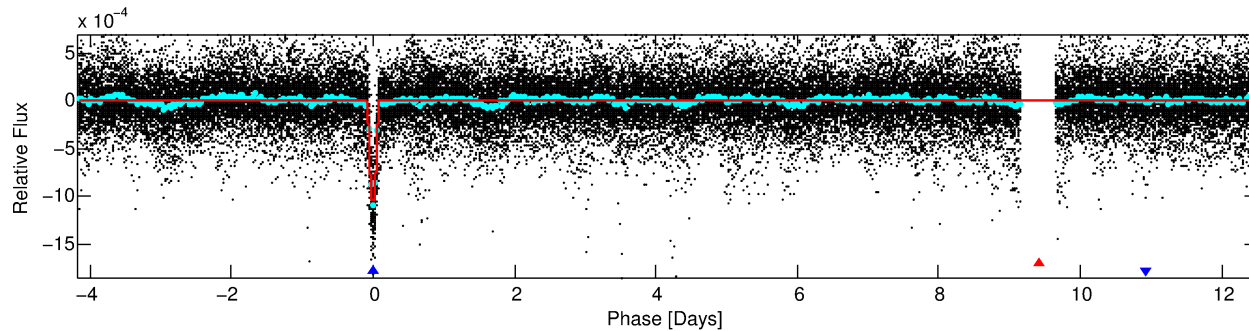
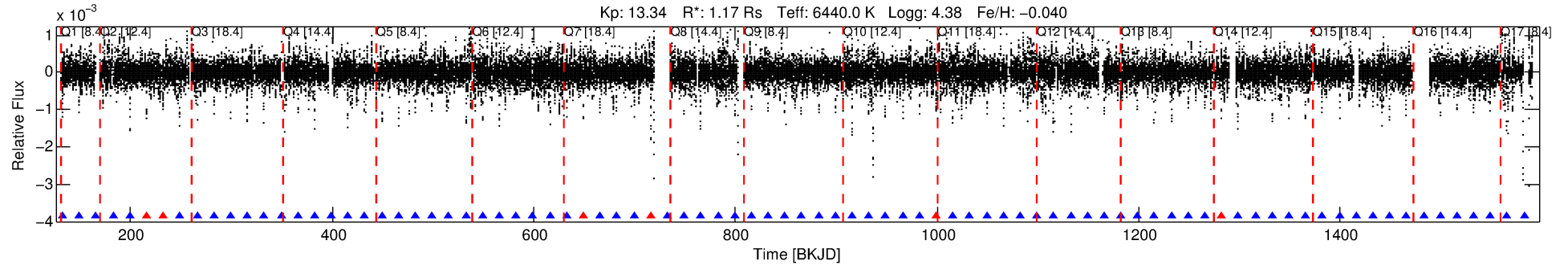
No Significant Match Found

# DV One-Page Summary

KIC: 6847018 Candidate: 2 of 2 Period: 16.662 d

KOI: K01349 Corr: No Ephemeris Match

Kp: 13.34 R\*: 1.17 Rs Teff: 6440.0 K Logg: 4.38 Fe/H: -0.040



## DV Fit Results:

Period = 16.66218 [0.00002] d  
Epoch = 132.7832 [0.0009] BKJD  
Rp/R\* = 0.0401 [0.0020]  
a/R\* = 12.35 [0.41]  
b = 0.97 [0.01]  
Seff = 114.64 [47.73]  
Teq = 834 [87] K  
Rp = 5.11 [1.72] Re  
a = 0.1355 [0.0375] AU  
Ag = 12.29 [8.06] [1.40σ]  
Teffp = 2415 [323] K [4.73σ]

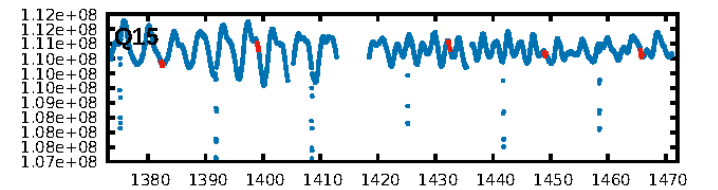
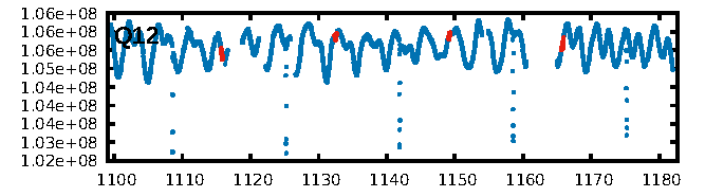
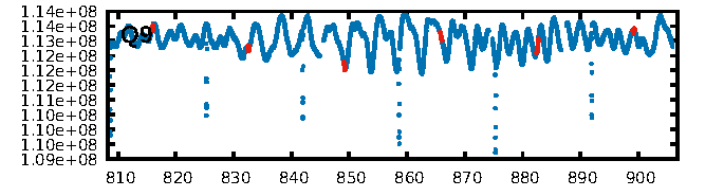
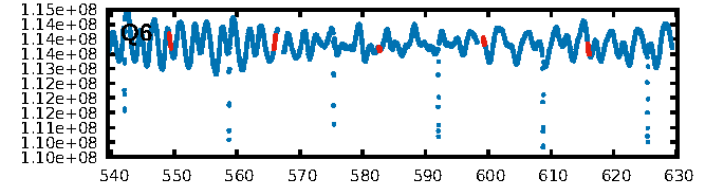
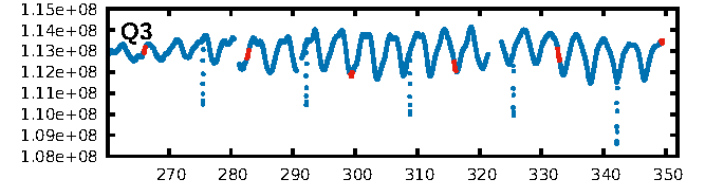
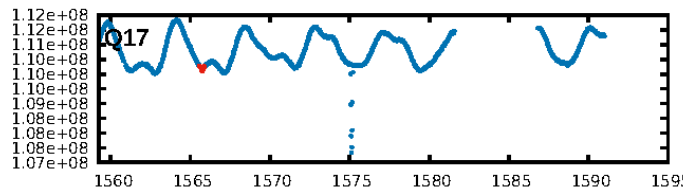
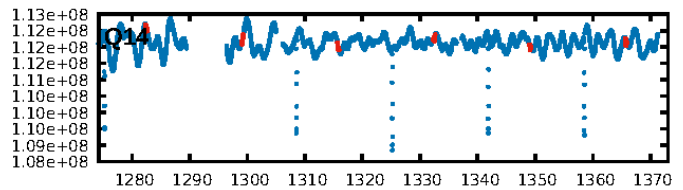
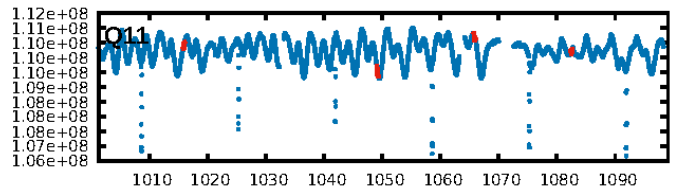
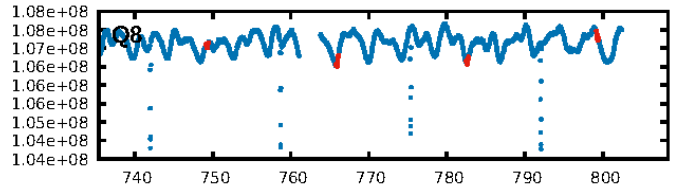
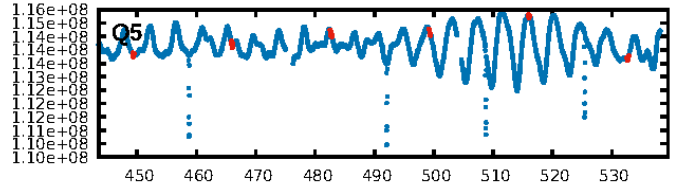
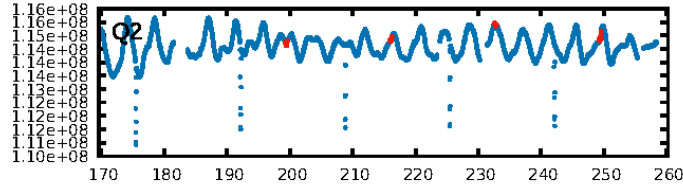
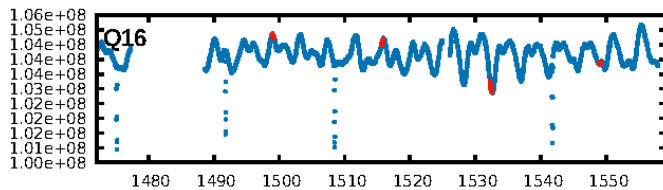
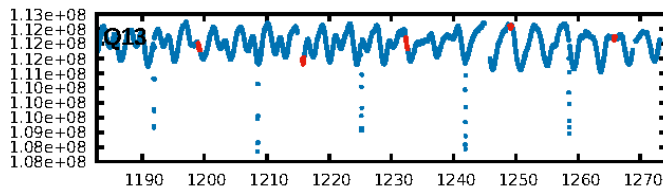
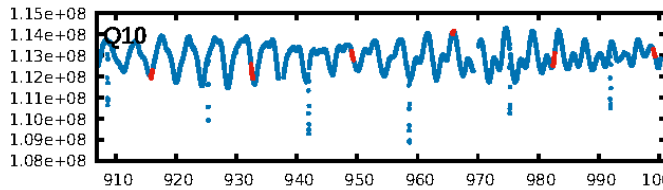
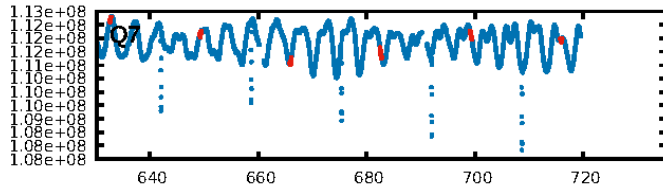
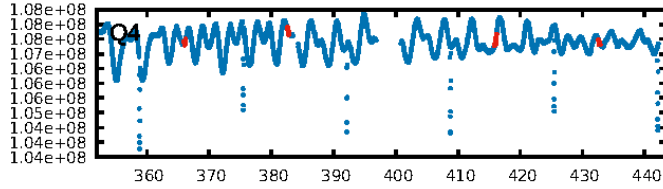
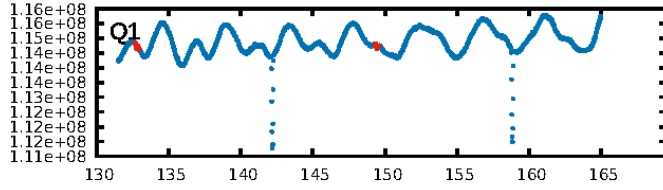
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 95.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.92 [69/75]  
GhostDiagnostic-chr: 1.914  
Centroid-sig: 1.6%  
Centroid-so: 0.049 arcsec [0.53σ]  
OotOffset-rm: 0.157 arcsec [1.84σ]  
KicOffset-rm: 0.108 arcsec [1.16σ]  
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 11:41:30 Z

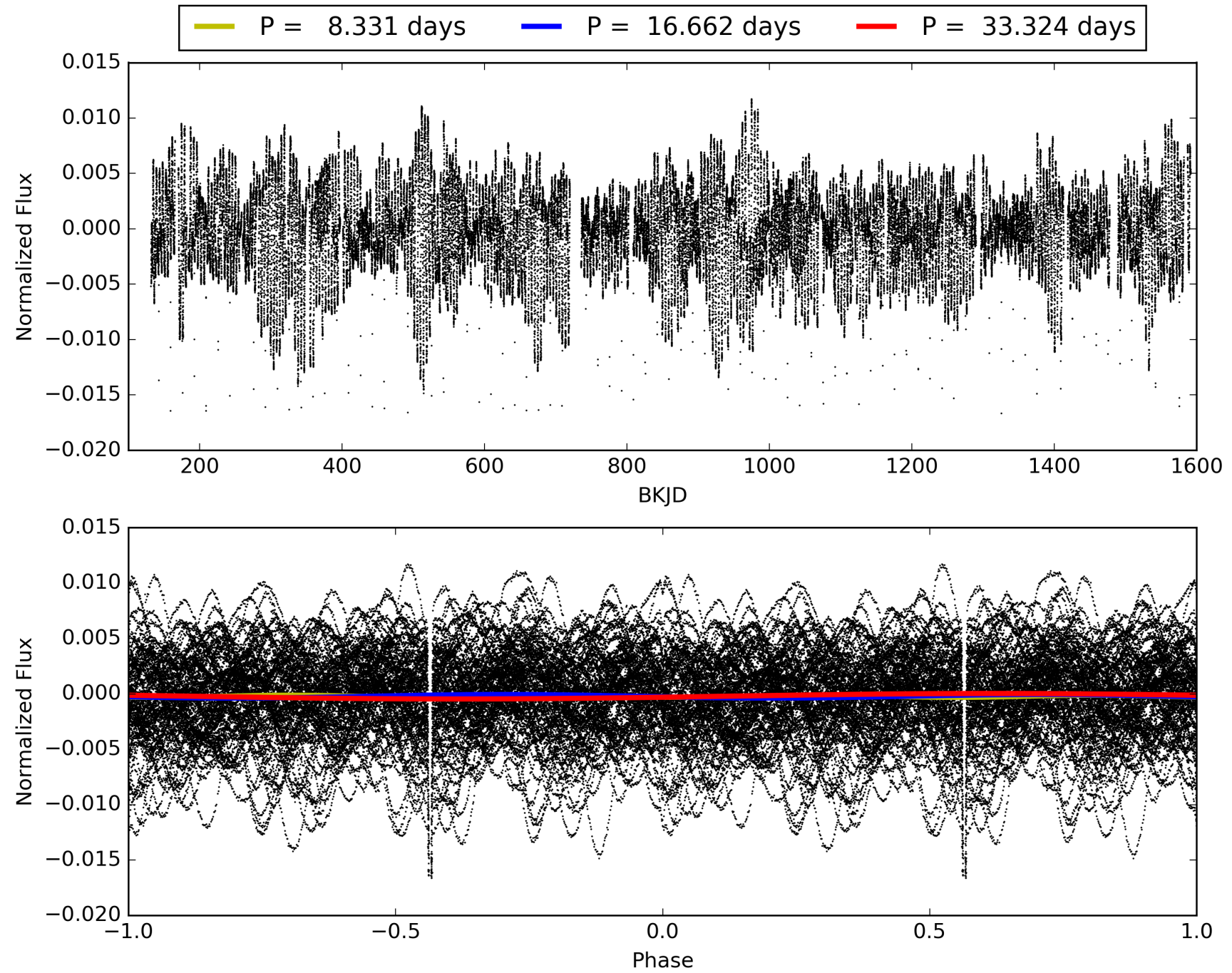
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006847018-02, PDC Light Curves





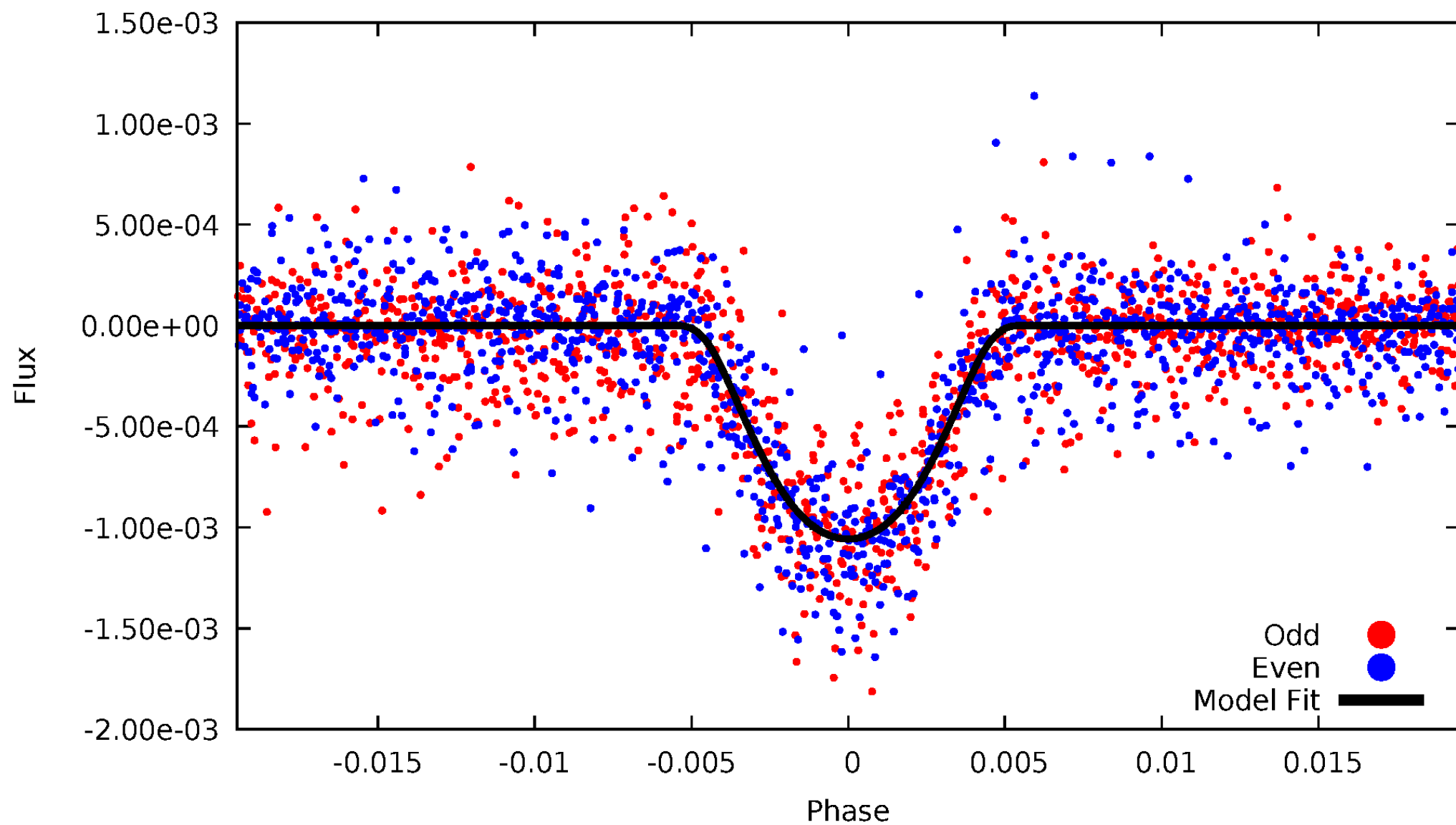
TCE 006847018-02





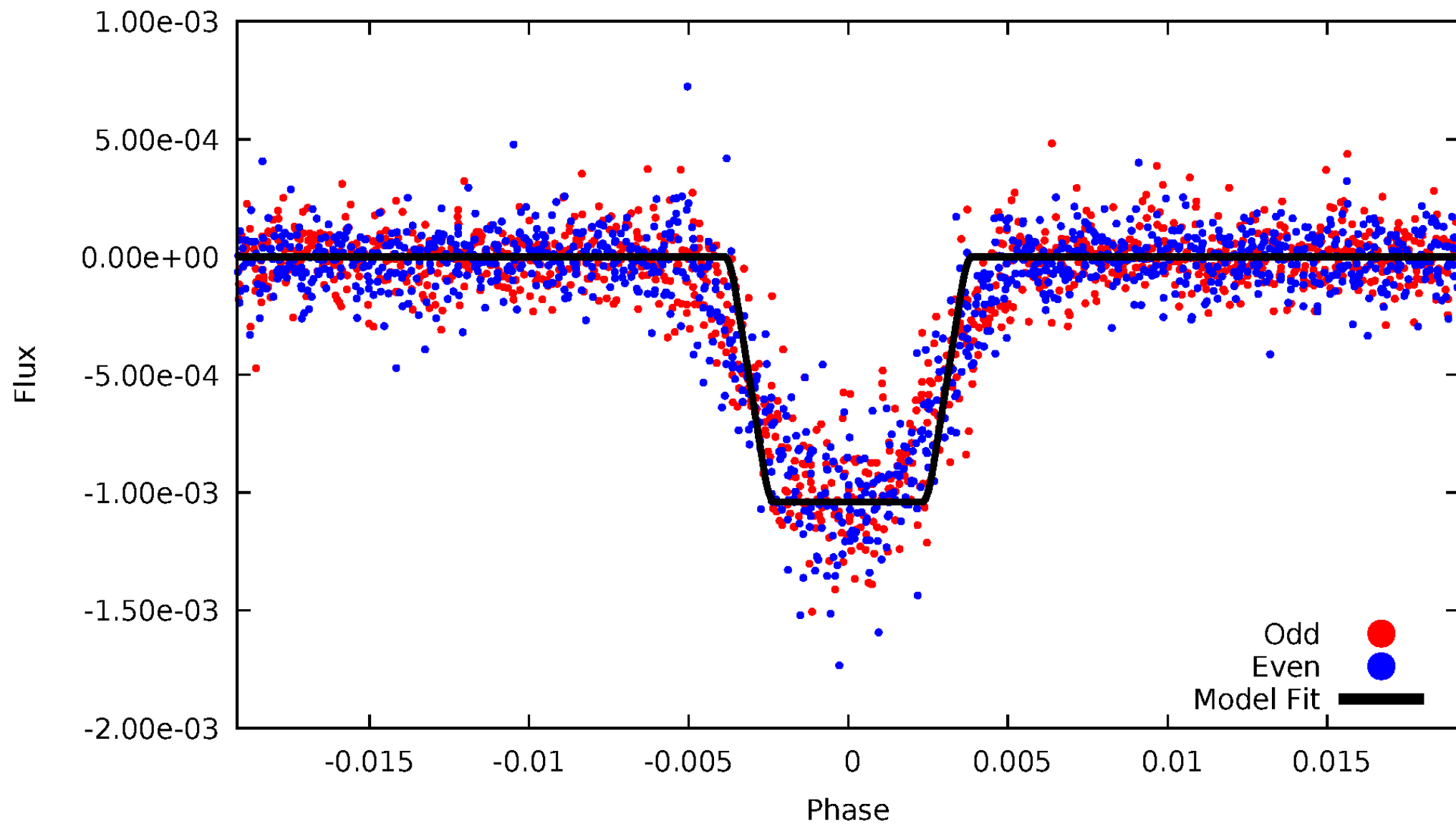
# DV Odd/Even

TCE 006847018-02



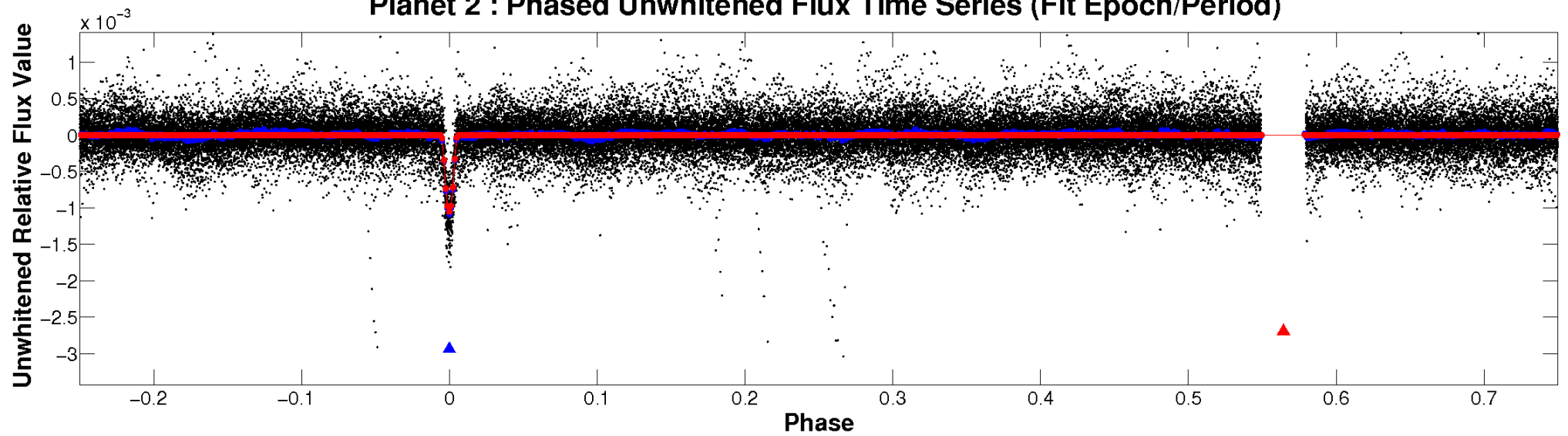
# ALT Odd/Even

TCE 006847018-02

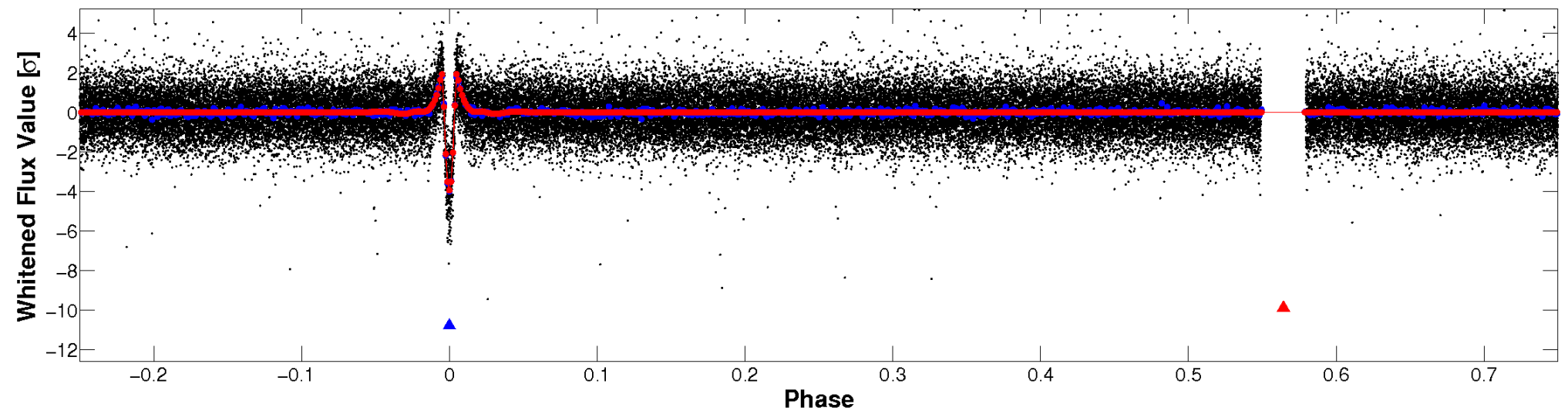


# Non-Whitened Vs. Whitened Light Curve

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

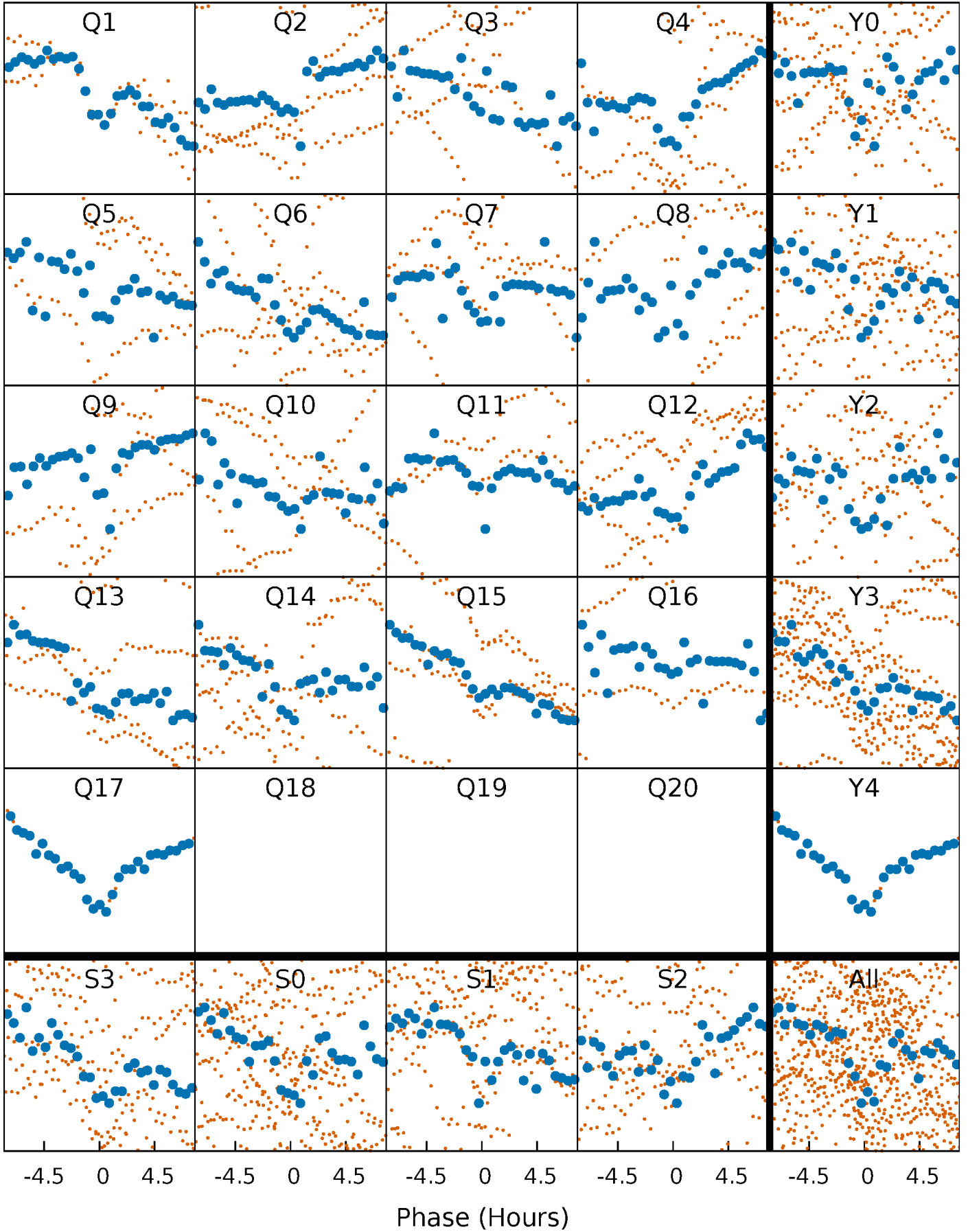


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



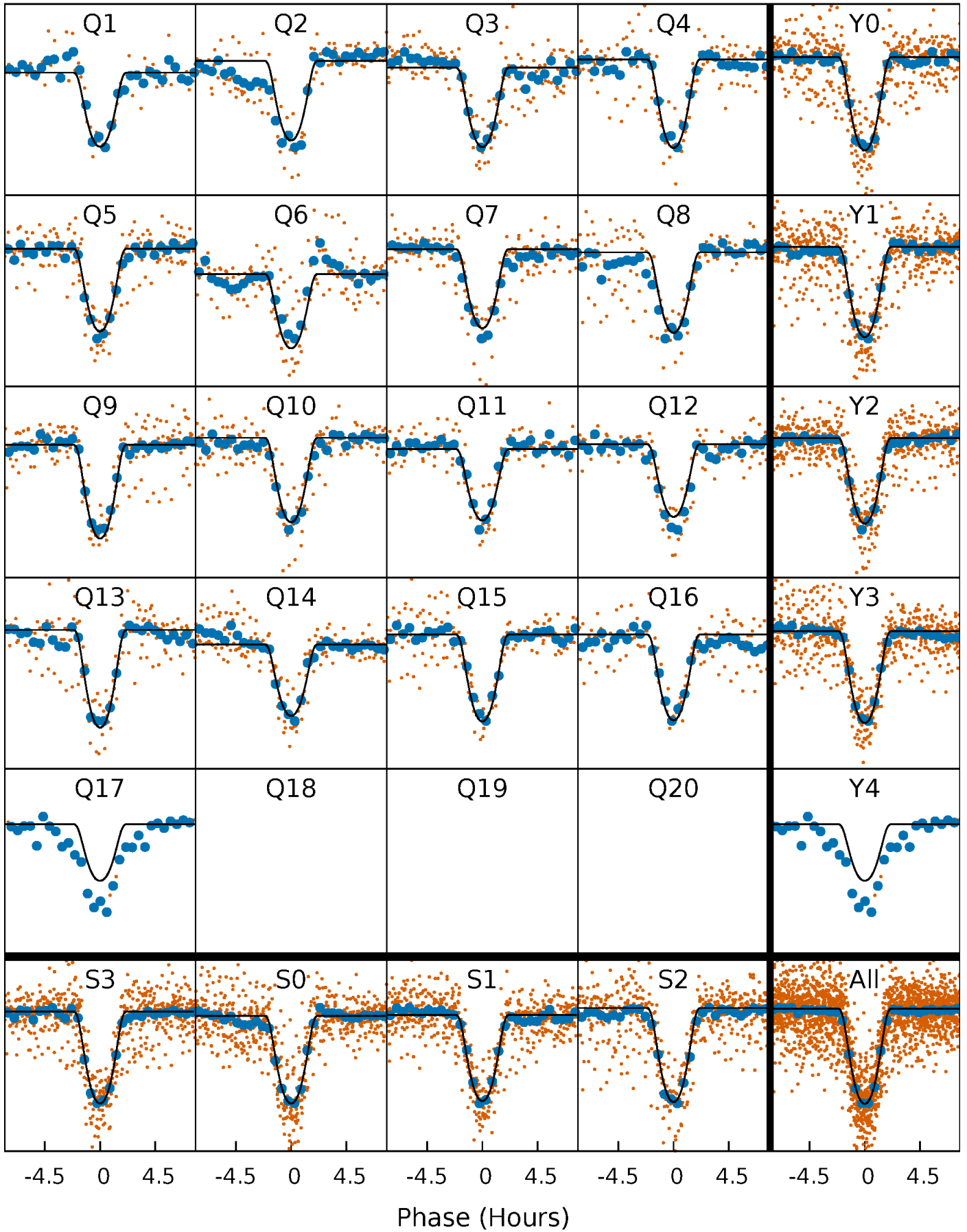
# PDC Quarter-Phased Transit Curves

TCE 006847018-02 P= 16.662179 Days  $T_0=132.783232$  (BKJD)



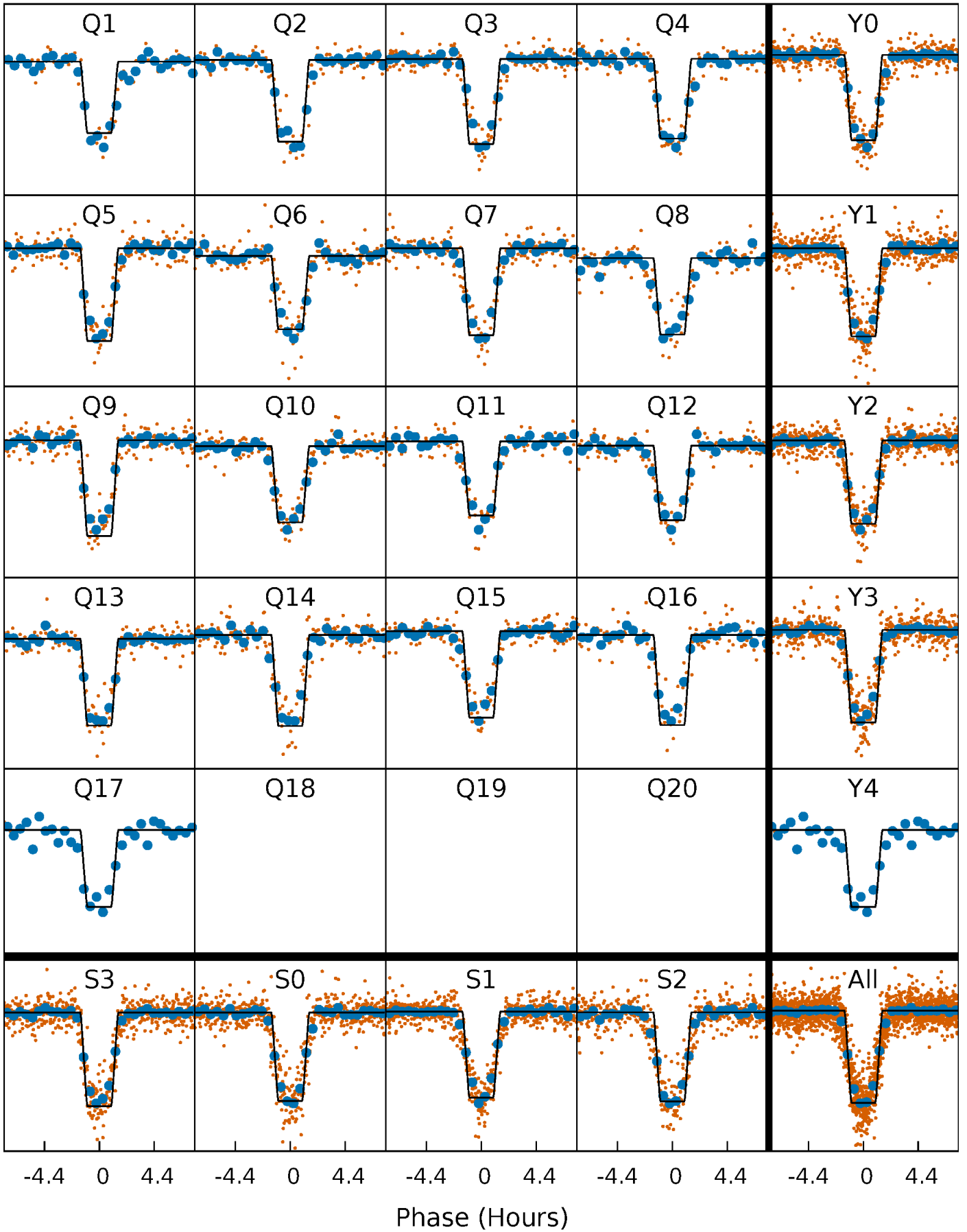
# DV Quarter-Phased Transit Curves

TCE 006847018-02   P= 16.662179 Days    $T_0=132.783232$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

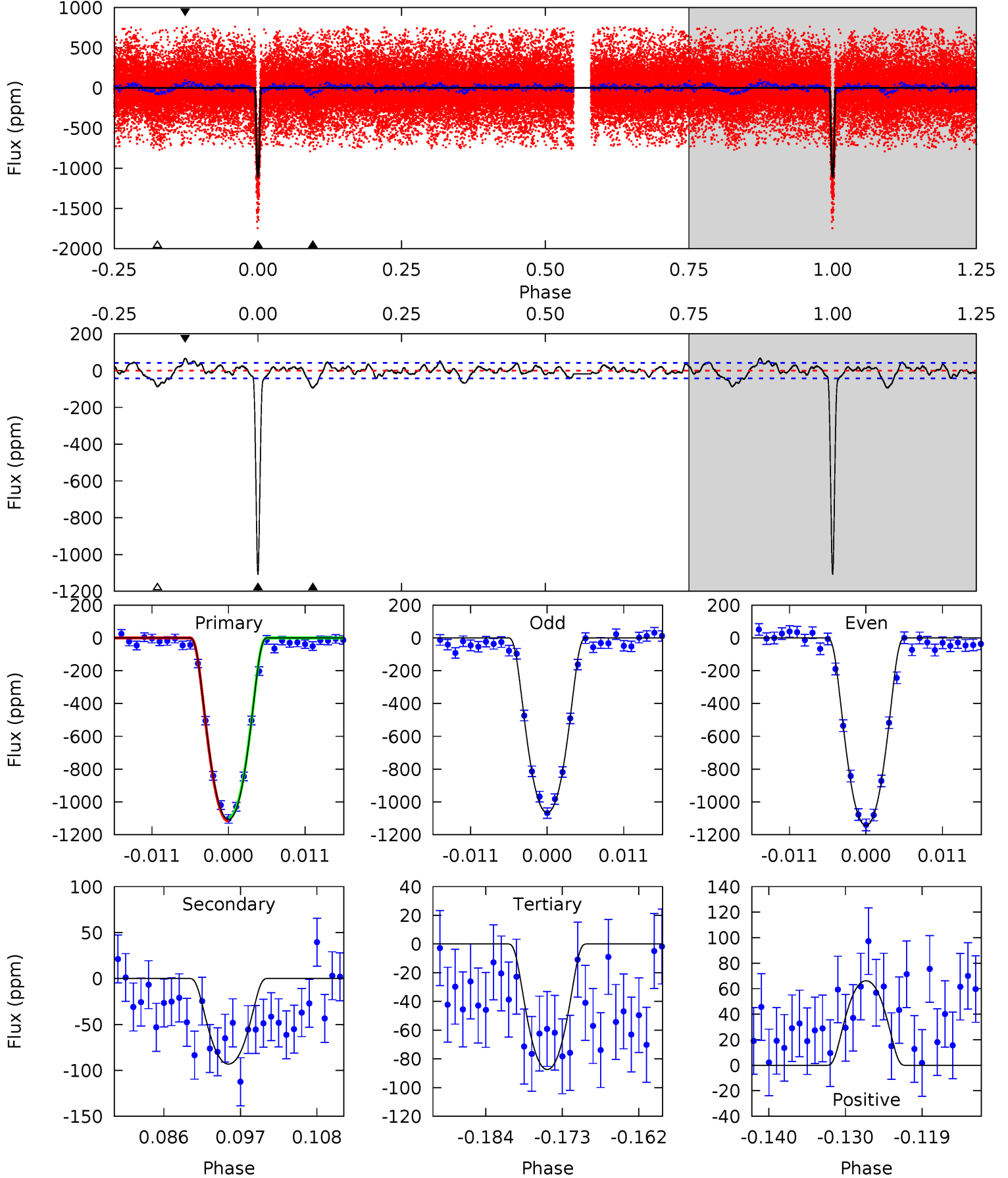
TCE 006847018-02 P= 16.662275 Days  $T_0=132.779450$  (BKJD)



# DV Model-Shift Uniqueness Test

006847018-02, P = 16.662179 Days, E = 116.121053 Days

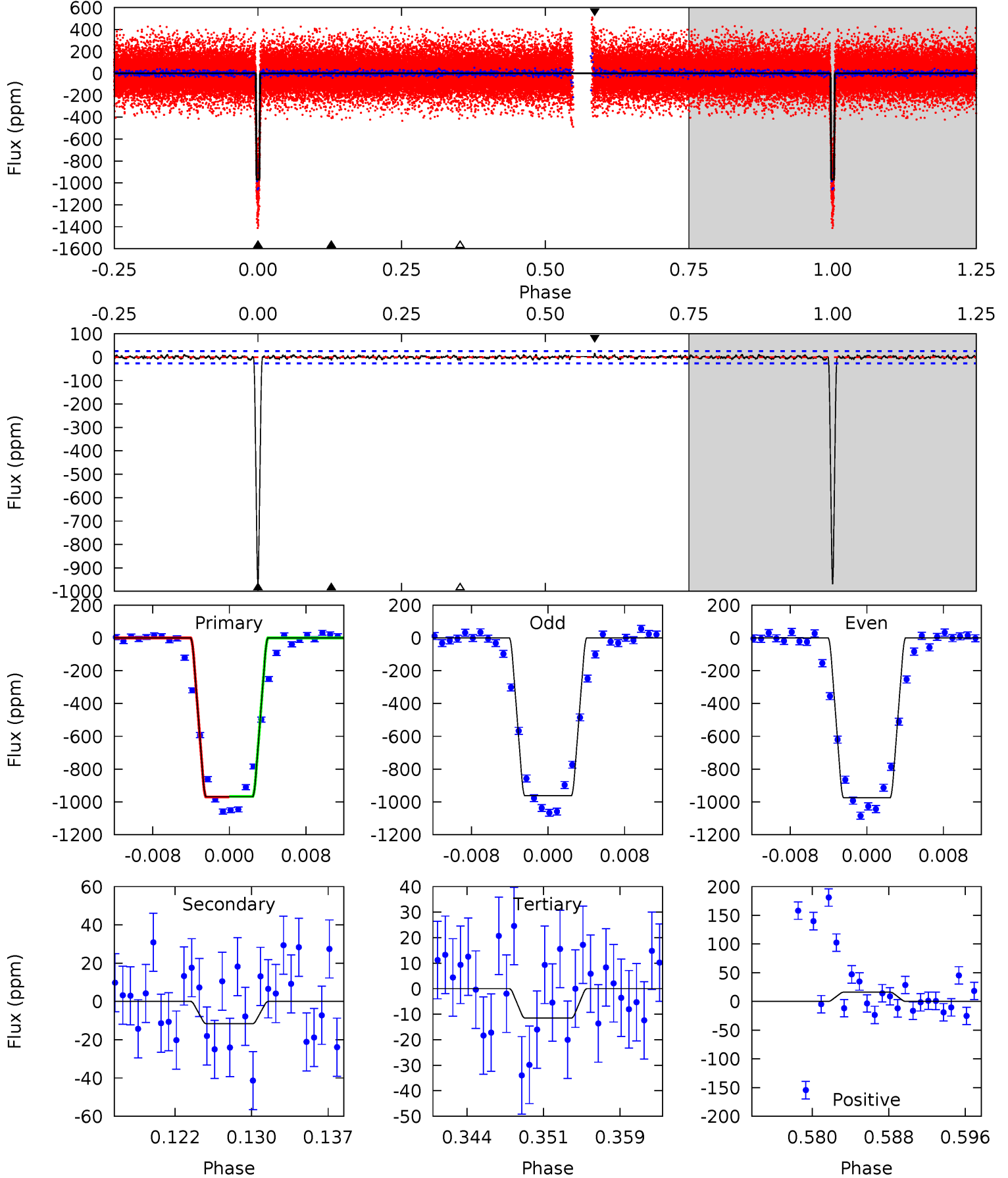
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
132.2	11.1	10.4	7.90	5.01	2.55	2.87	121.7	124.3	0.68	3.21	4.74	1.03	0.06	1.07



# Alt Model-Shift Uniqueness Test

006847018-02, P = 16.662275 Days, E = 116.117175 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
188.6	2.26	2.24	3.15	5.08	2.67	0.75	186.4	185.5	0.02	-0.89	1.18	1.00	0.02	0.44





### Stellar Parameters For KIC 006847018

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6440^{+153}_{-192}$	$4.380^{+0.068}_{-0.216}$	$-0.040^{+0.250}_{-0.300}$	$1.169^{+0.389}_{-0.130}$	$1.196^{+0.185}_{-0.152}$	$1.053^{+0.317}_{-0.580}$
	+2%/-3%	+2%/-5%	+625%/-750%	+33%/-11%	+15%/-13%	+30%/-55%
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 006847018-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-93 \pm 8$	$5.27^{+0.97}_{-0.54}$	$1188^{+91}_{-62}$	$3596^{+108}_{-101}$	$33^{+8}_{-8}$
Alt.	$-12 \pm 5$	$4.24^{+0.78}_{-0.48}$	$1187^{+93}_{-60}$	$2818^{+170}_{-247}$	$6.172^{+3.981}_{-3.084}$

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

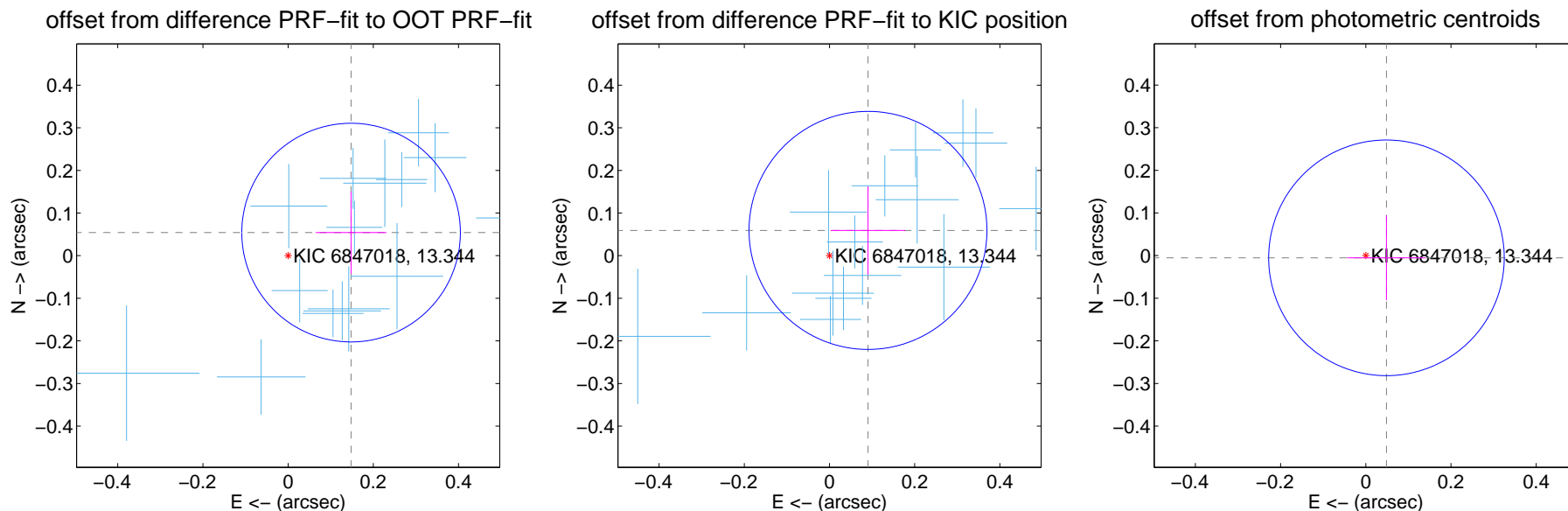
## DV Centroid Data

Supplemental centroid analysis for 006847018-02. Kepler magnitude: 13.34. Transit SNR 70.69

There are 17 quarters with good PRF difference image offsets

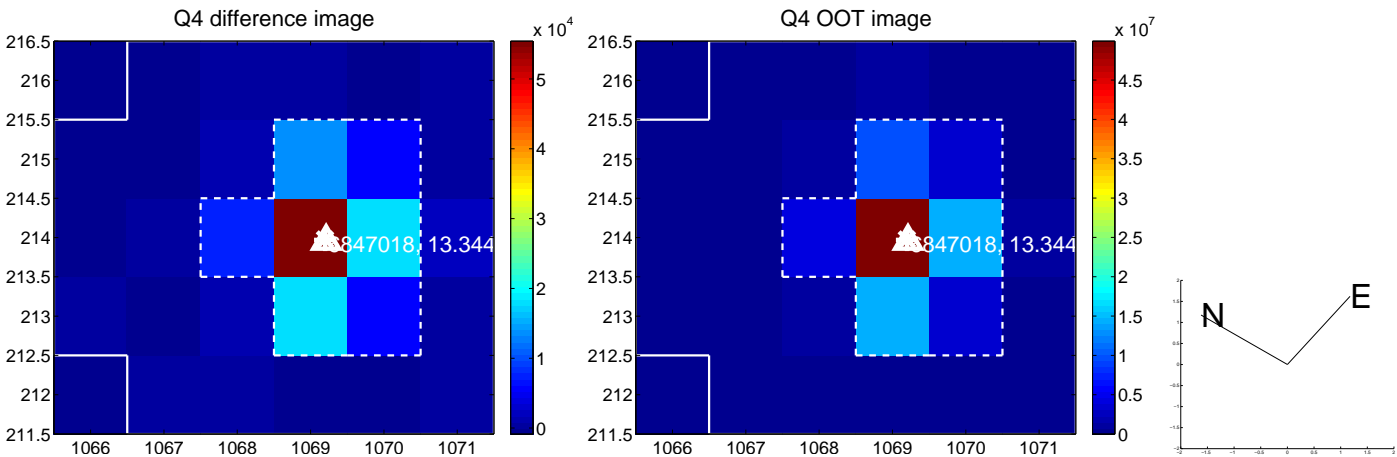
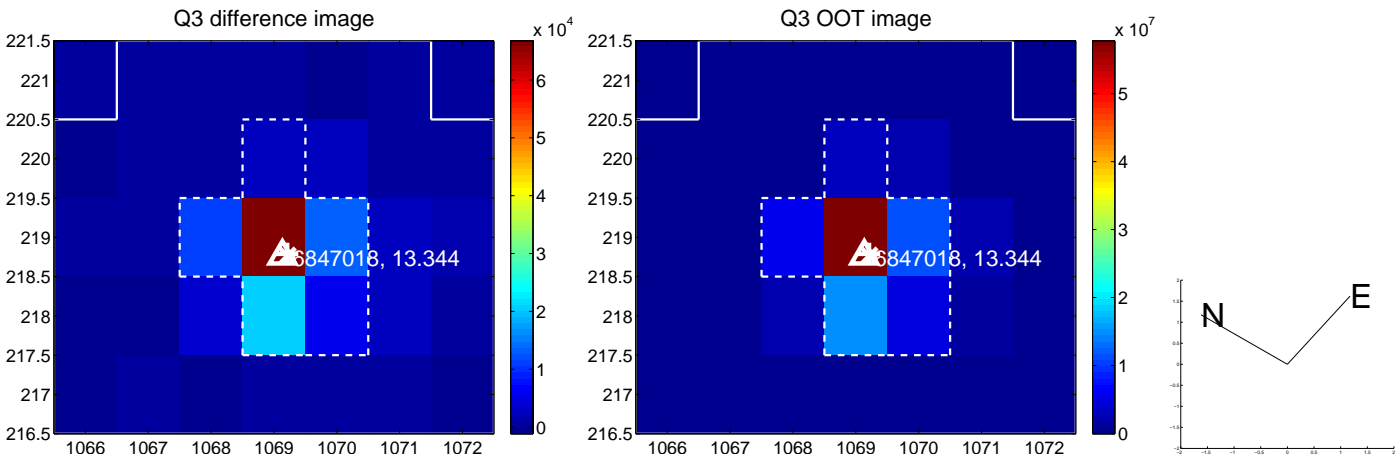
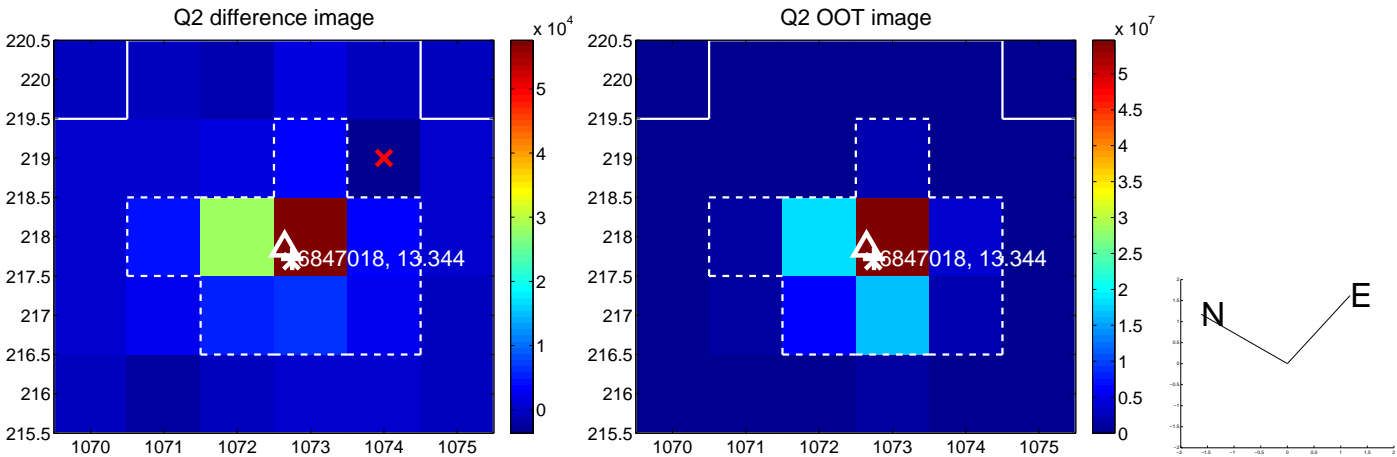
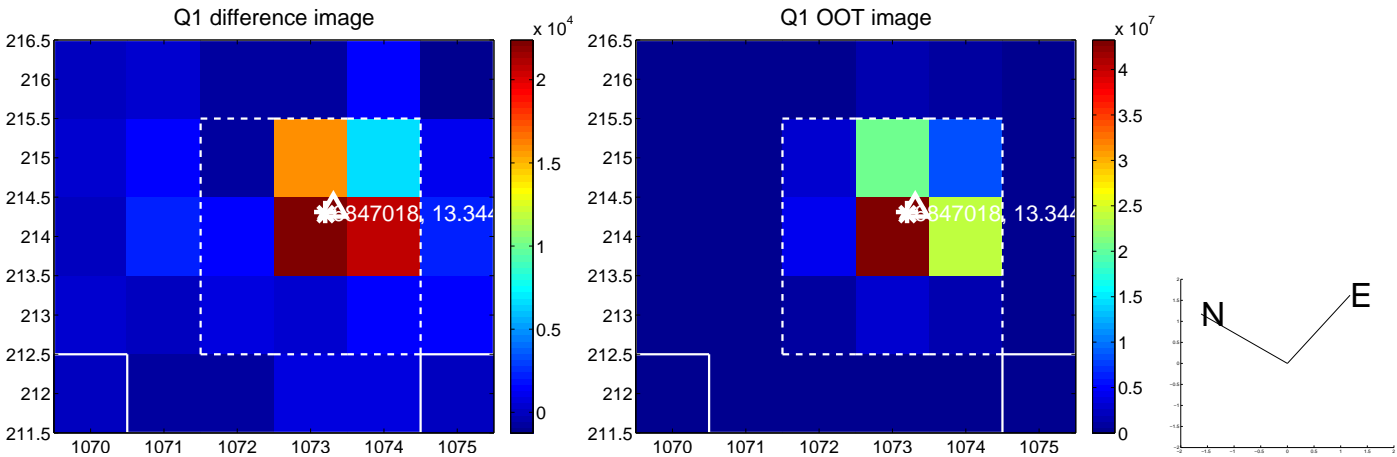
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.157 \pm 0.086$	1.84	$-0.148 \pm 0.083$	$0.054 \pm 0.096$
PRF-fit source offset from KIC position	$0.108 \pm 0.093$	1.16	$-0.090 \pm 0.088$	$0.059 \pm 0.103$
photometric centroid source offset	$0.05 \pm 0.09$	0.53	$-0.05 \pm 0.09$	$-0.01 \pm 0.10$

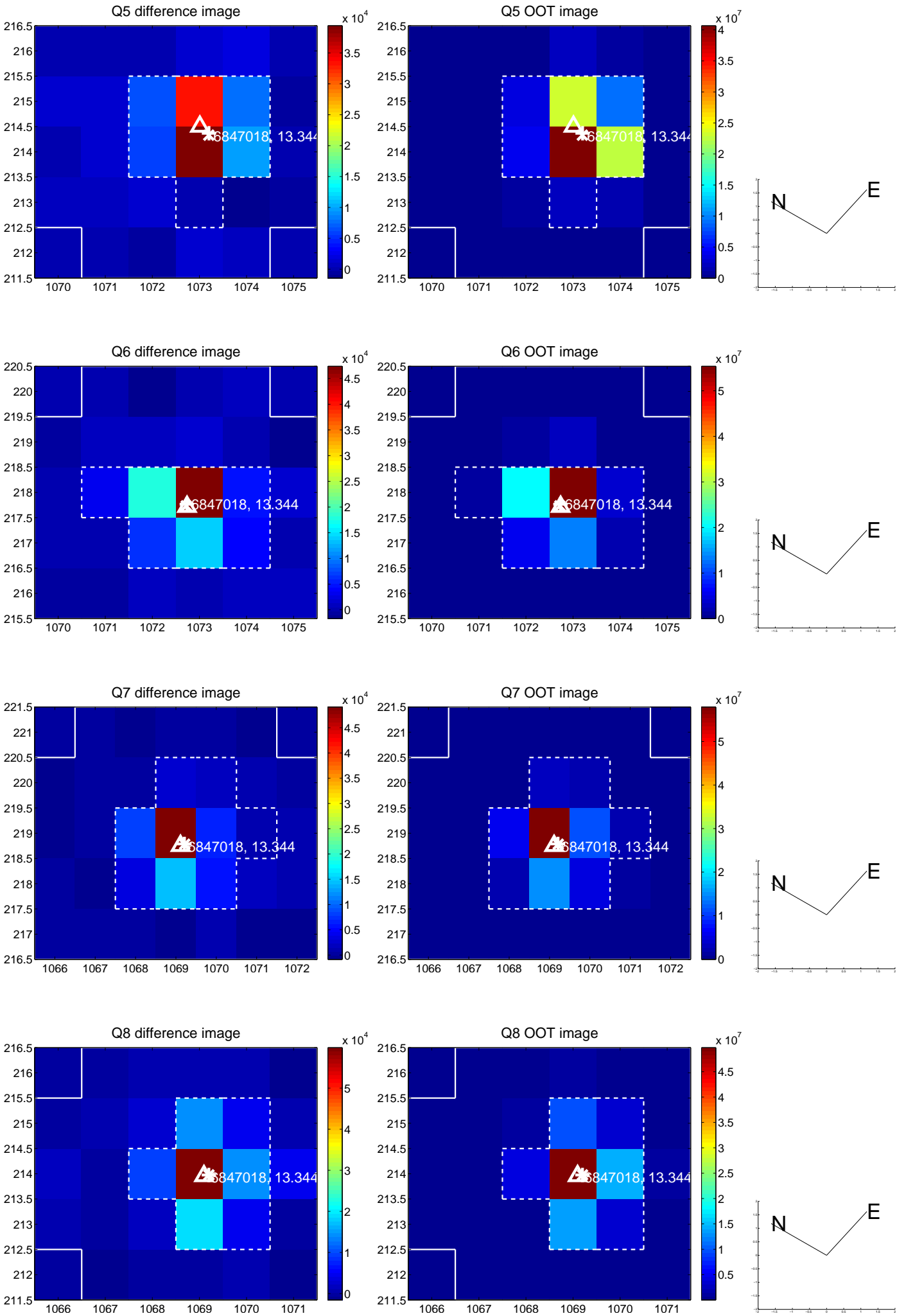


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

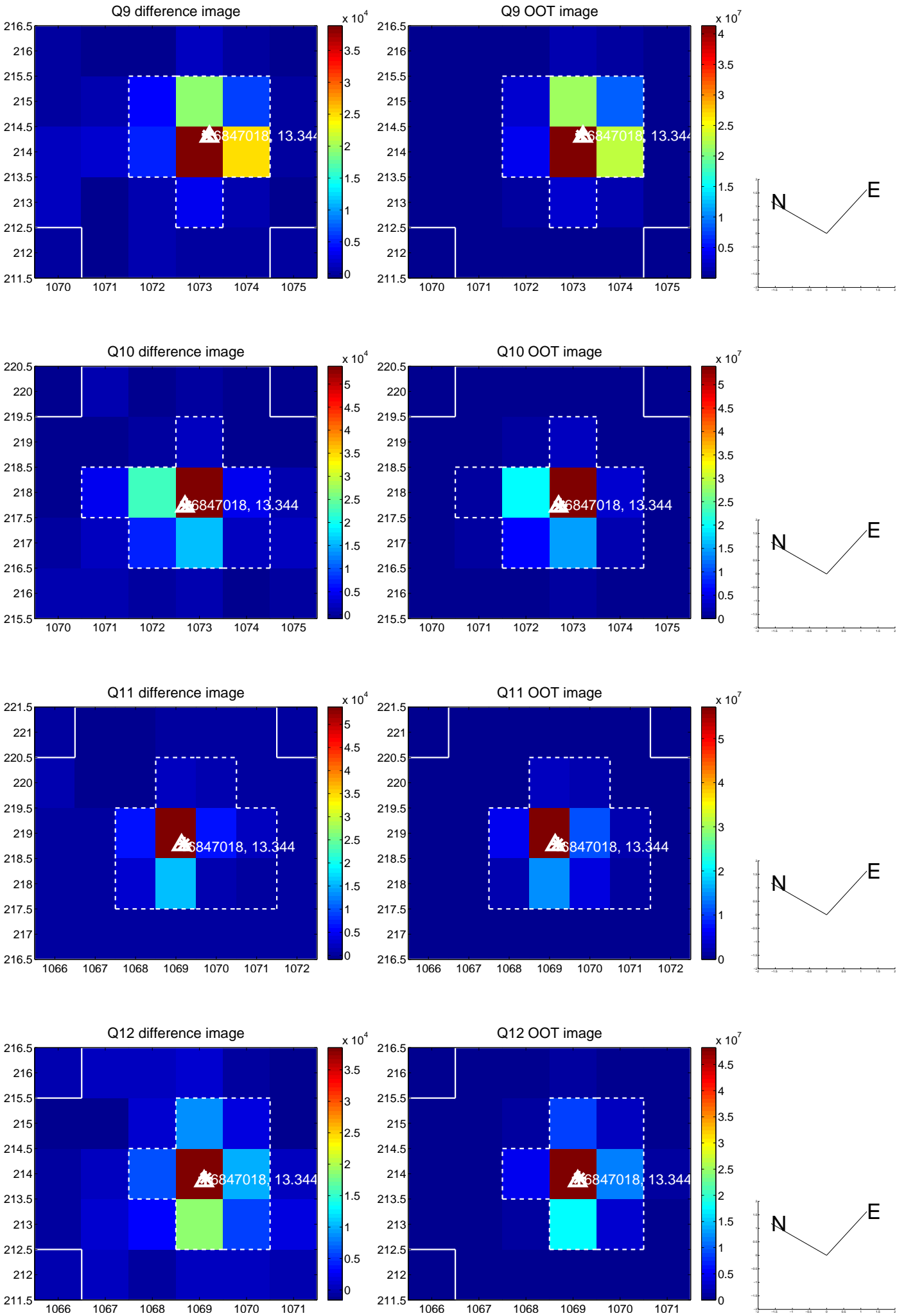
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



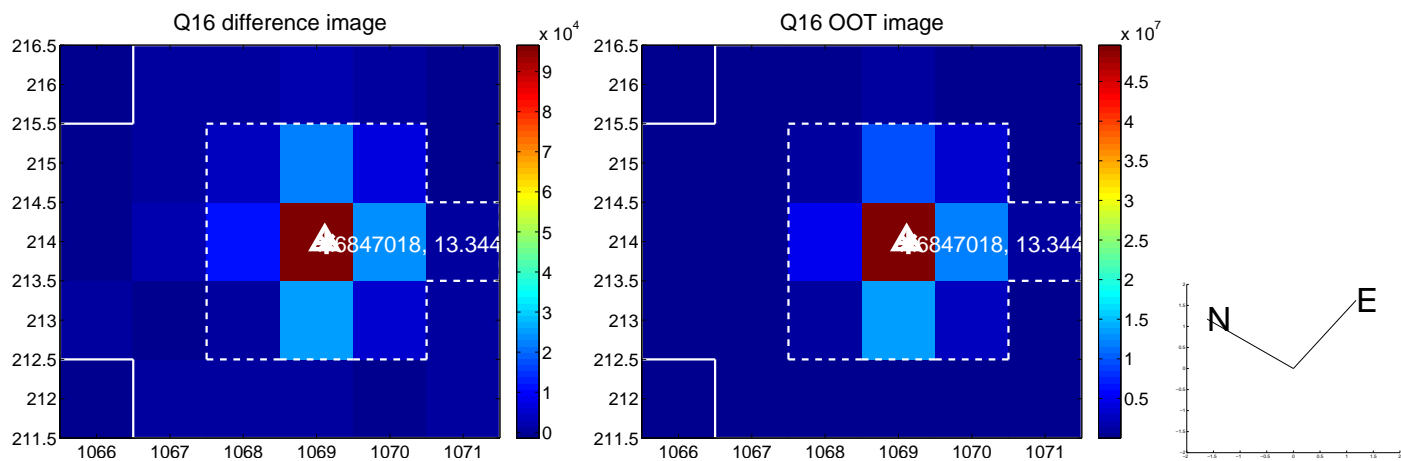
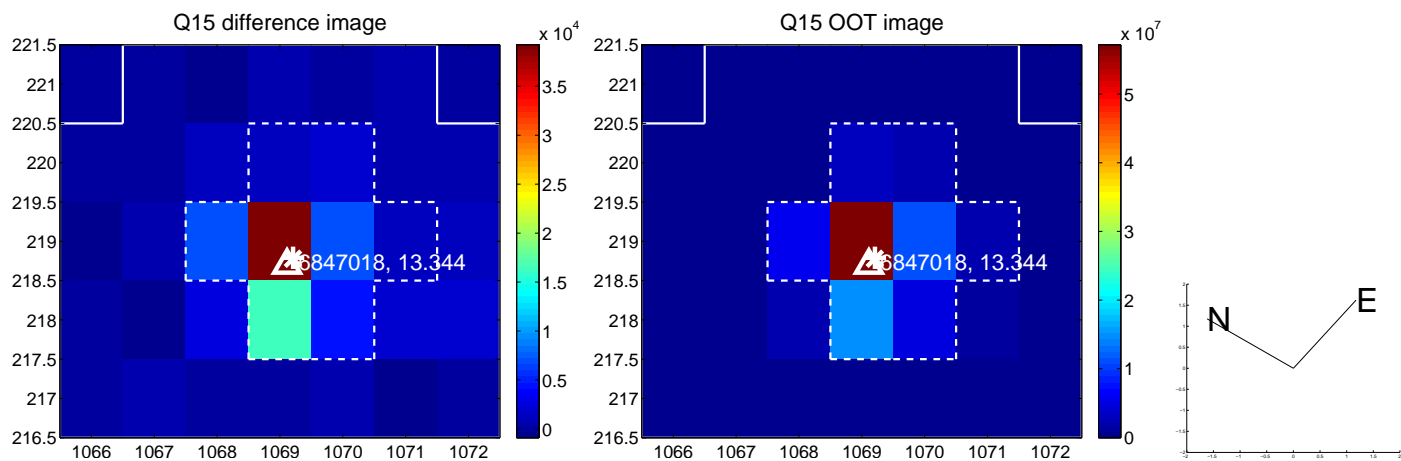
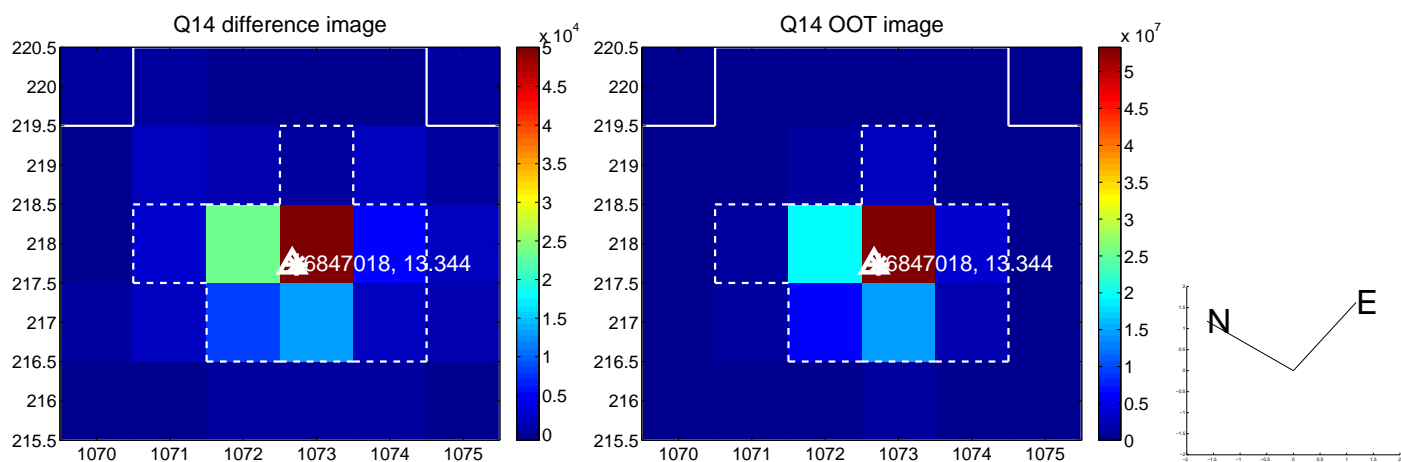
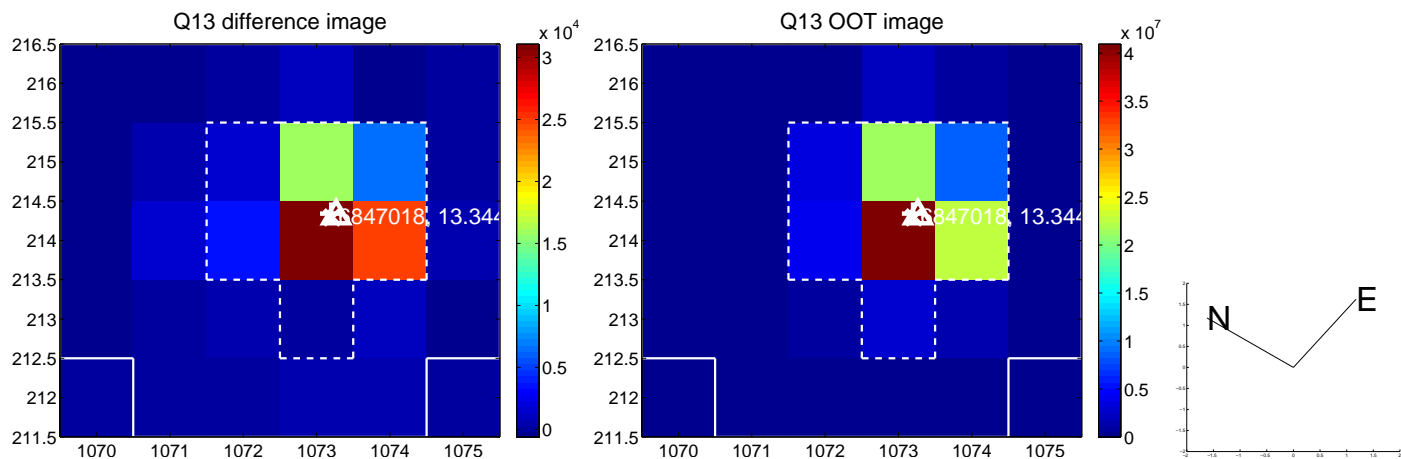
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



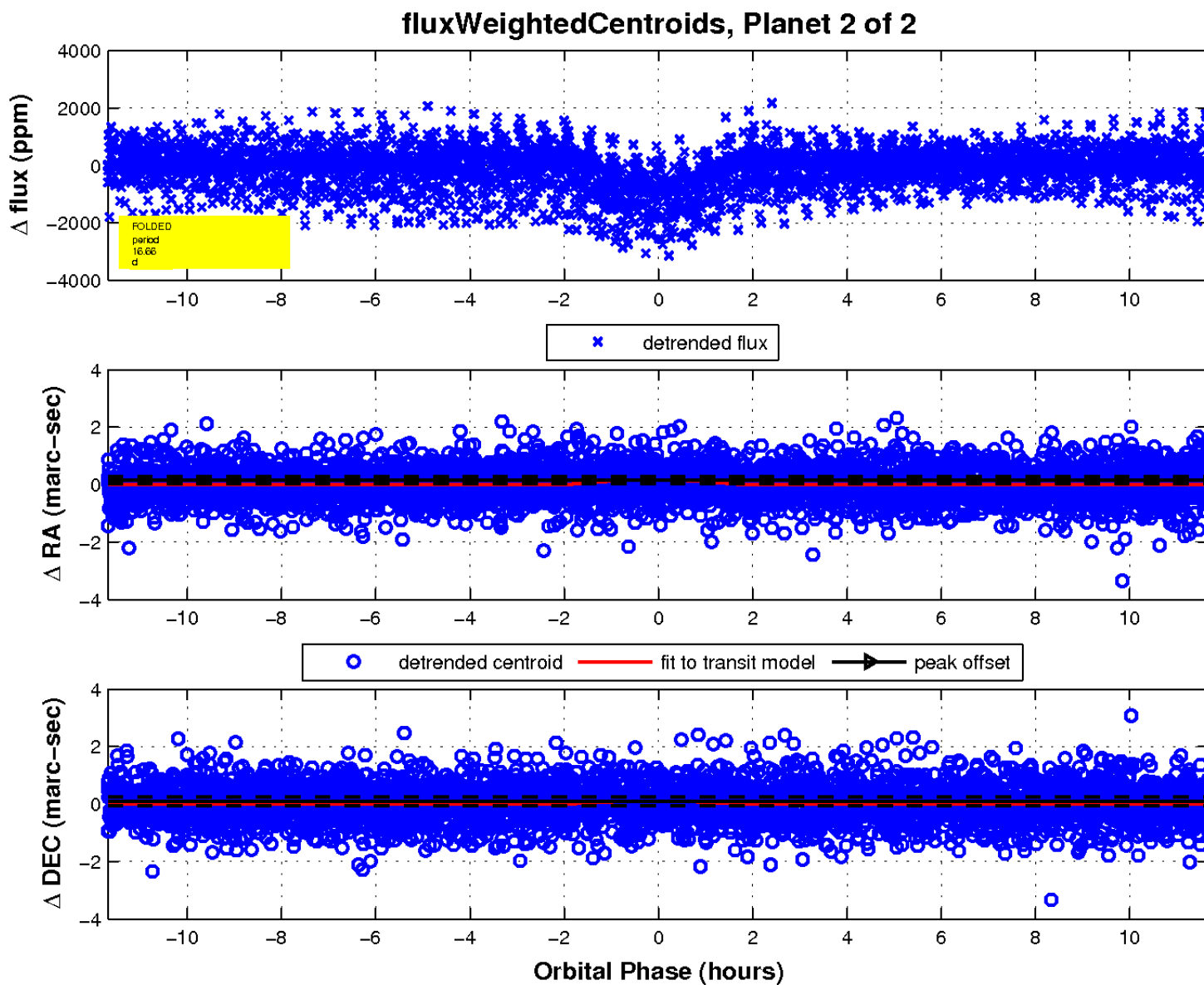
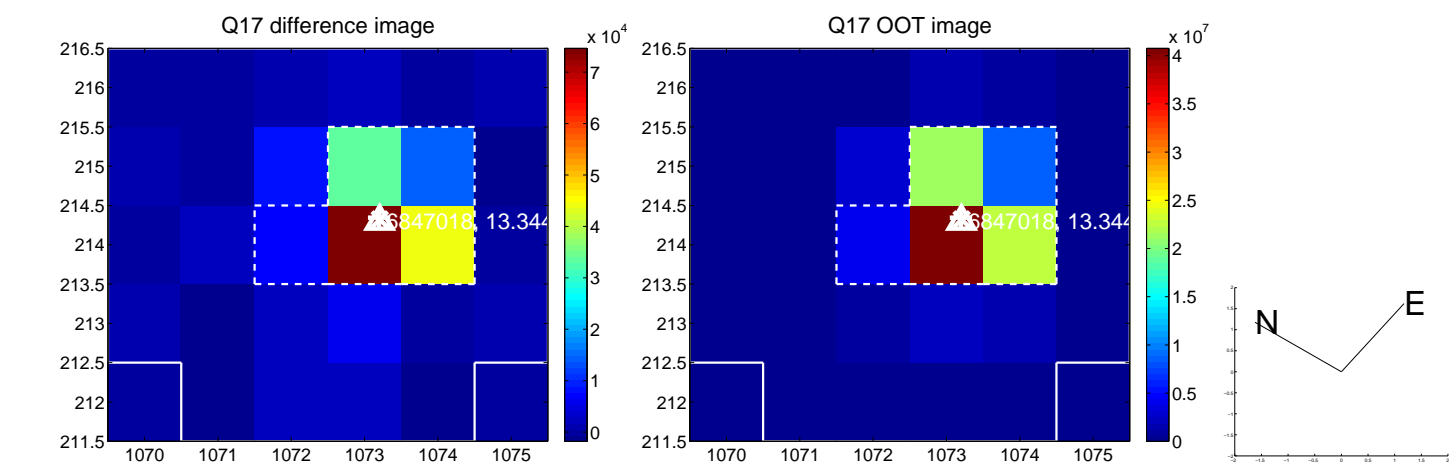
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

