

# KIC 006863840

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006863840-01	OBS	6779.01	1.926357	131.711924	401316.0	5.000	11023.3	-1.0	0.76	5176	23.73	497.09
006863840-02	OBS	No	5.779174	132.028644	29802.4	15.000	2129.9	-1.0	0.76	5176	12.84	114.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006863840-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_NOFITS
006863840-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS—HALO_GHOST

**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.

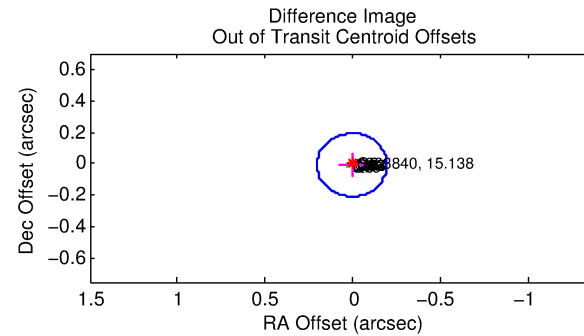
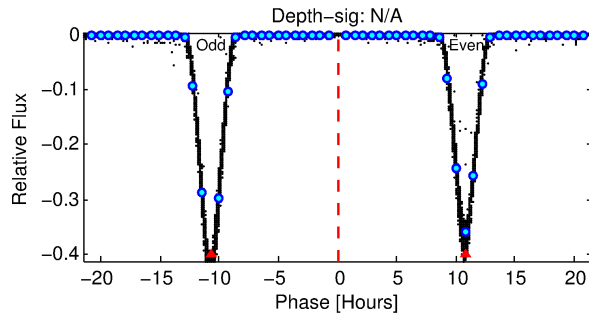
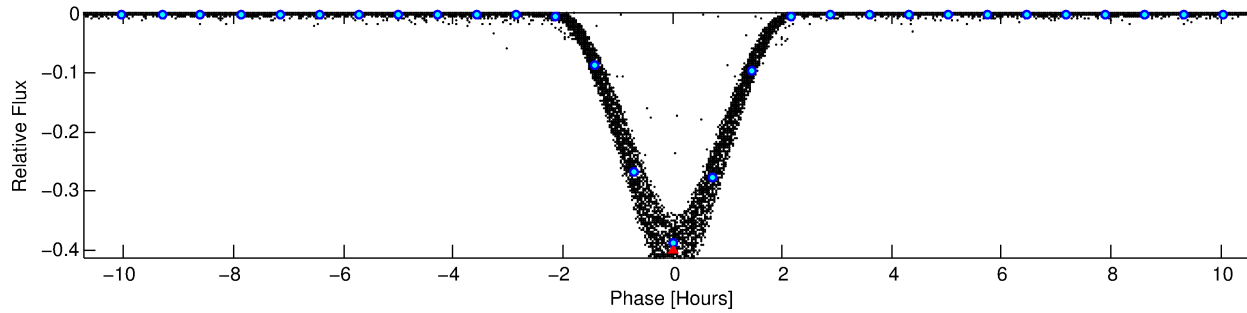
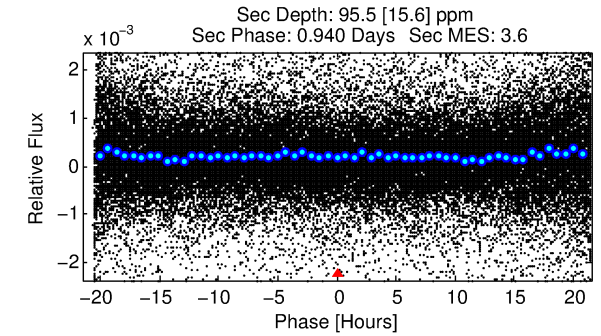
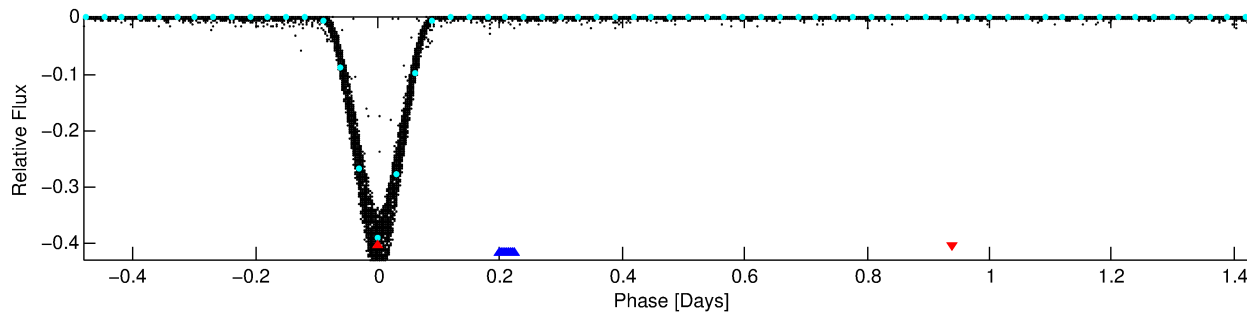
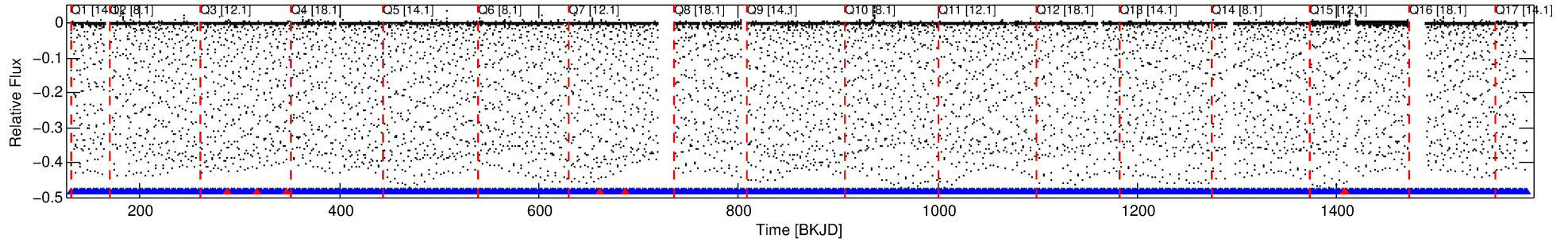
## Ephemeris Match Information For 006863840-01

No Significant Match Found

# DV One-Page Summary

KIC: 6863840 Candidate: 1 of 2 Period: 1.926 d  
KOI: K06779.01 Corr: 0.798

Kp: 15.14 R\*: 0.76 Rs Teff: 5176.0 K Logg: 4.54 Fe/H: -0.280



## TPS TCE Results:

Period = 1.92636 d  
Epoch = 131.7119 BKJD

DV fit results are unavailable

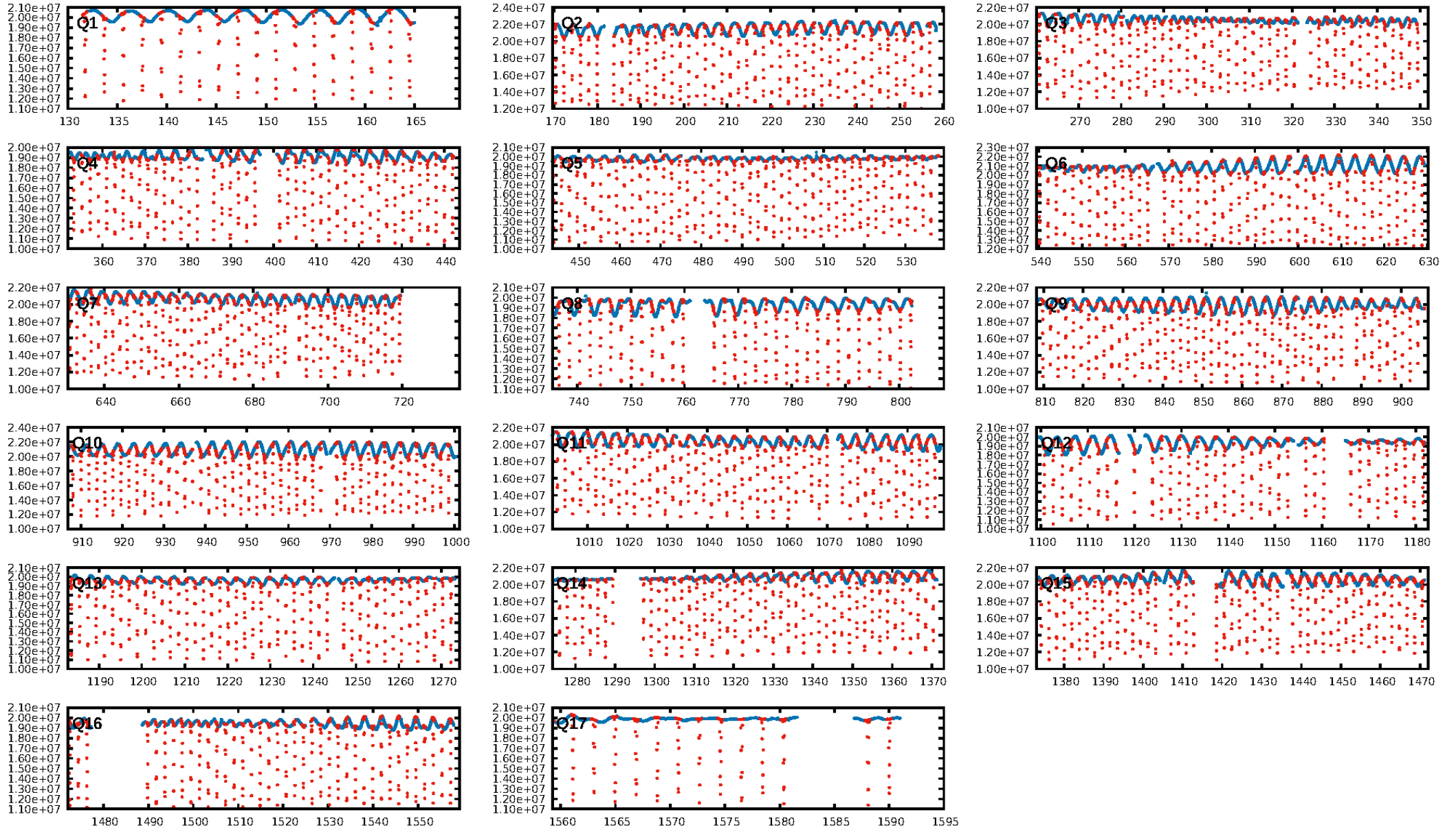
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [5.85s]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [661/668]  
GhostDiagnostic-chr: 1.269  
Centroid-sig: N/A  
Centroid-so: 0.140 arcsec [285.80σ]  
OotOffset-rm: 0.009 arcsec [0.13σ]  
KicOffset-rm: 0.049 arcsec [0.73σ]  
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]

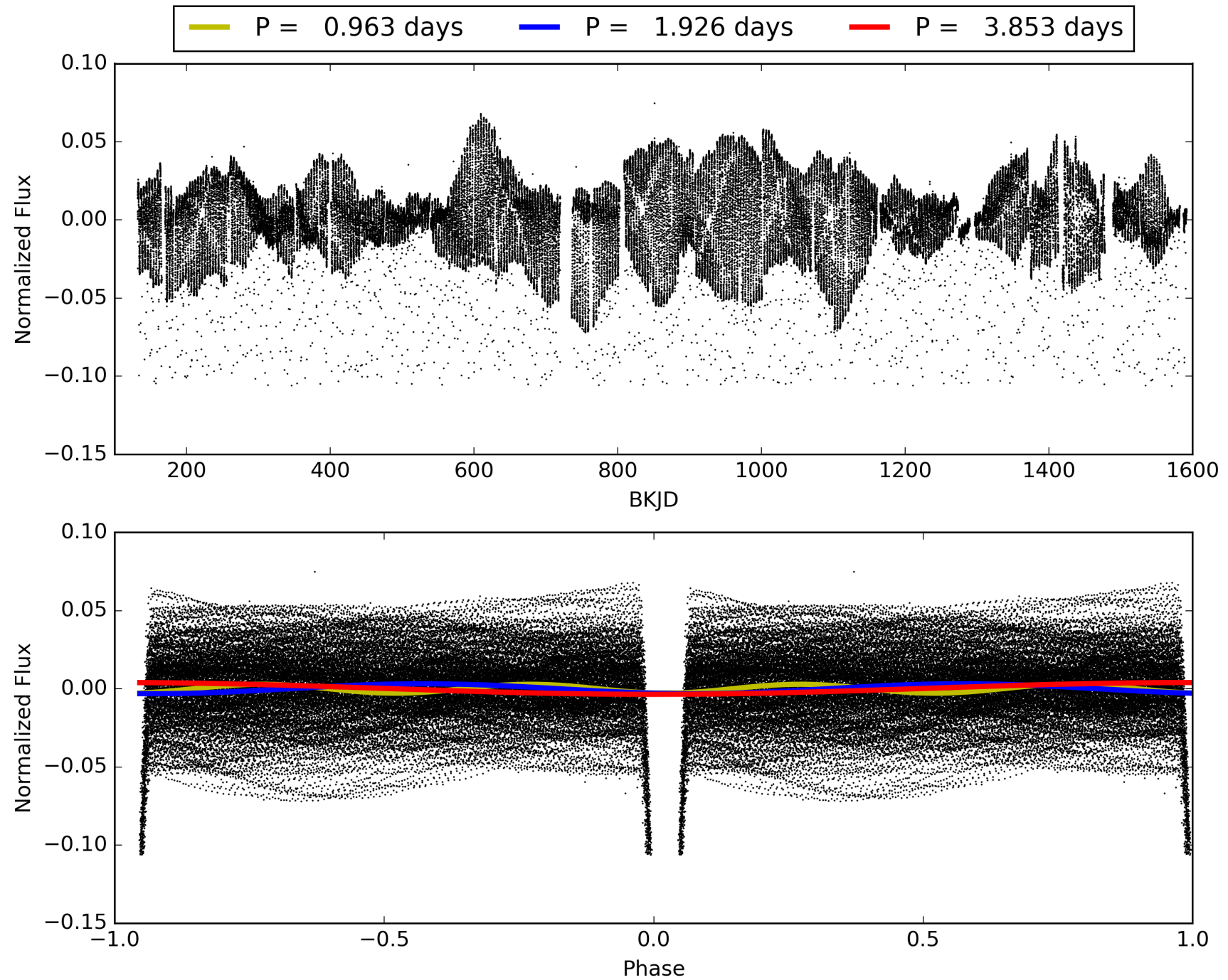
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:30:55 Z

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

# TCE 006863840-01, PDC Light Curves

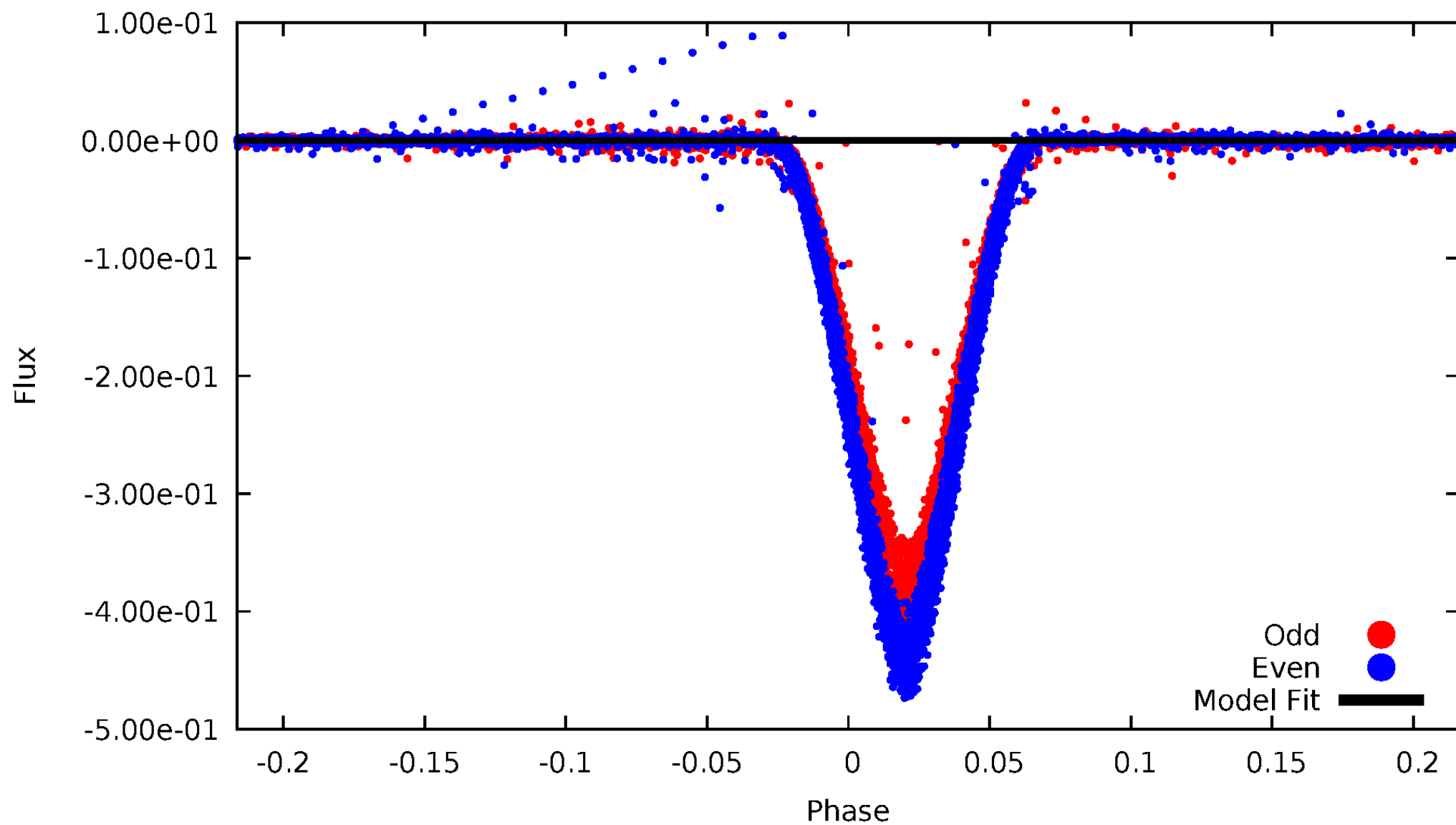


TCE 006863840-01



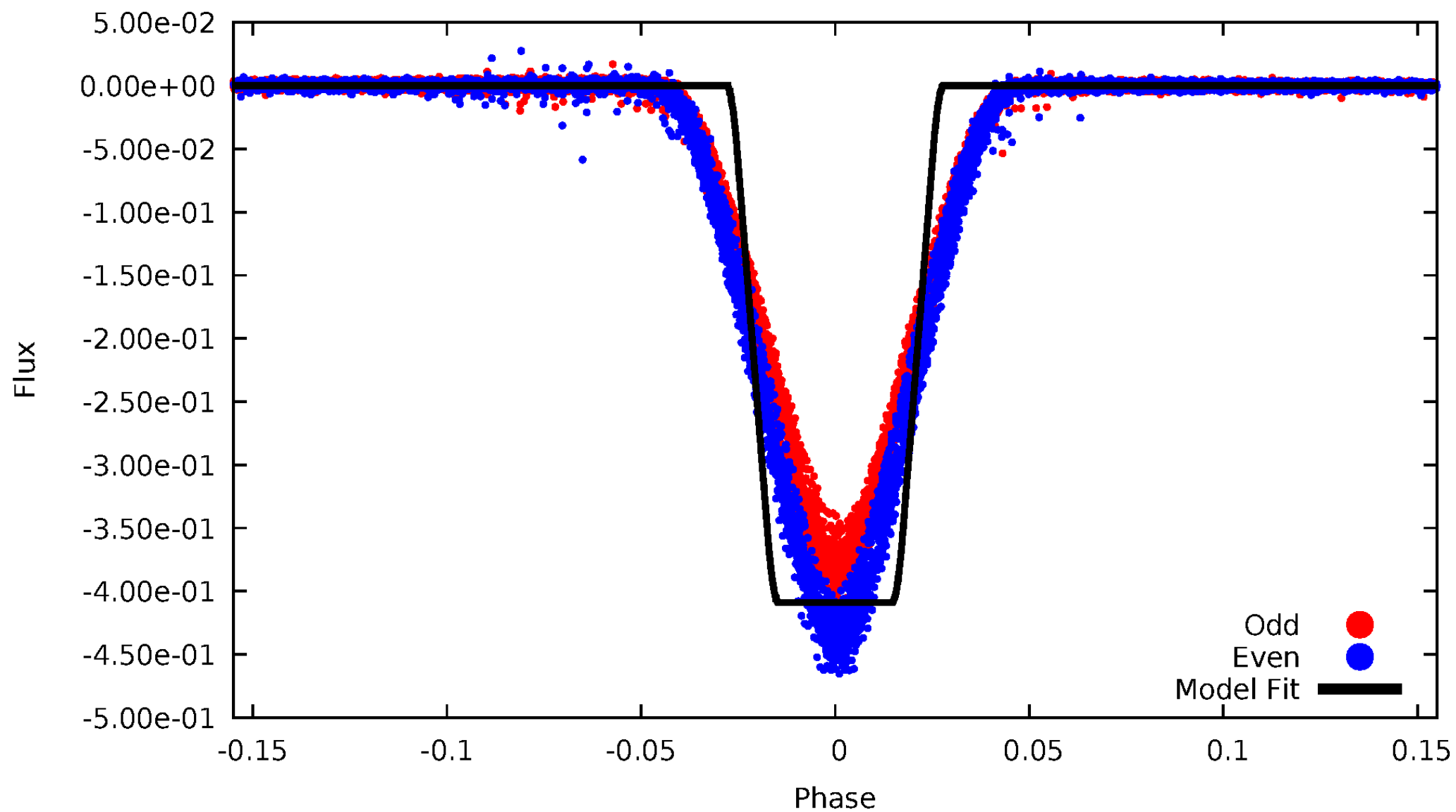
# DV Odd/Even

TCE 006863840-01



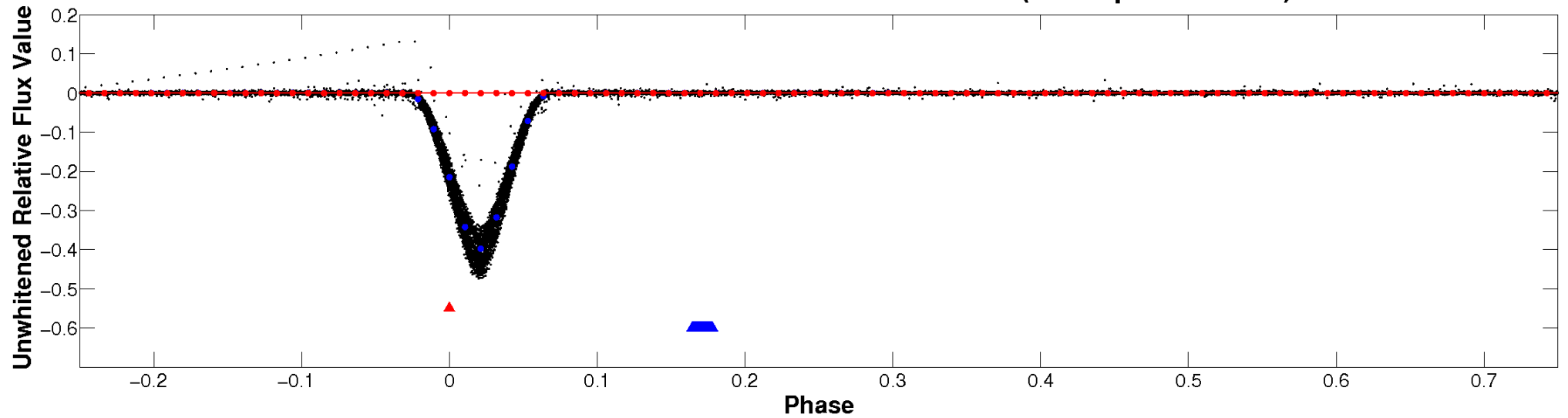
# ALT Odd/Even

TCE 006863840-01

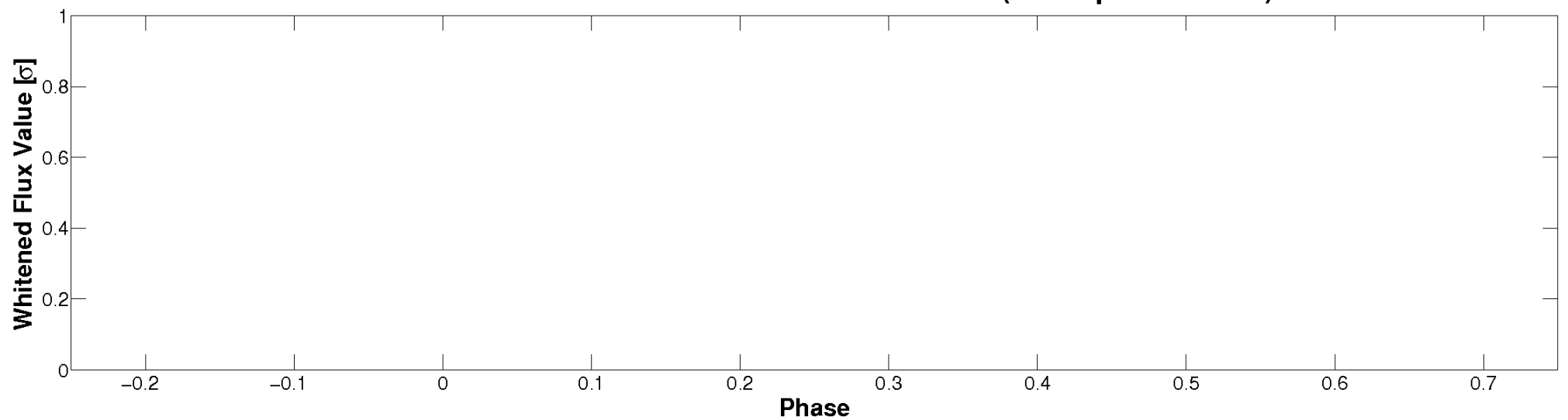


# Non-Whitened Vs. Whitened Light Curve

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

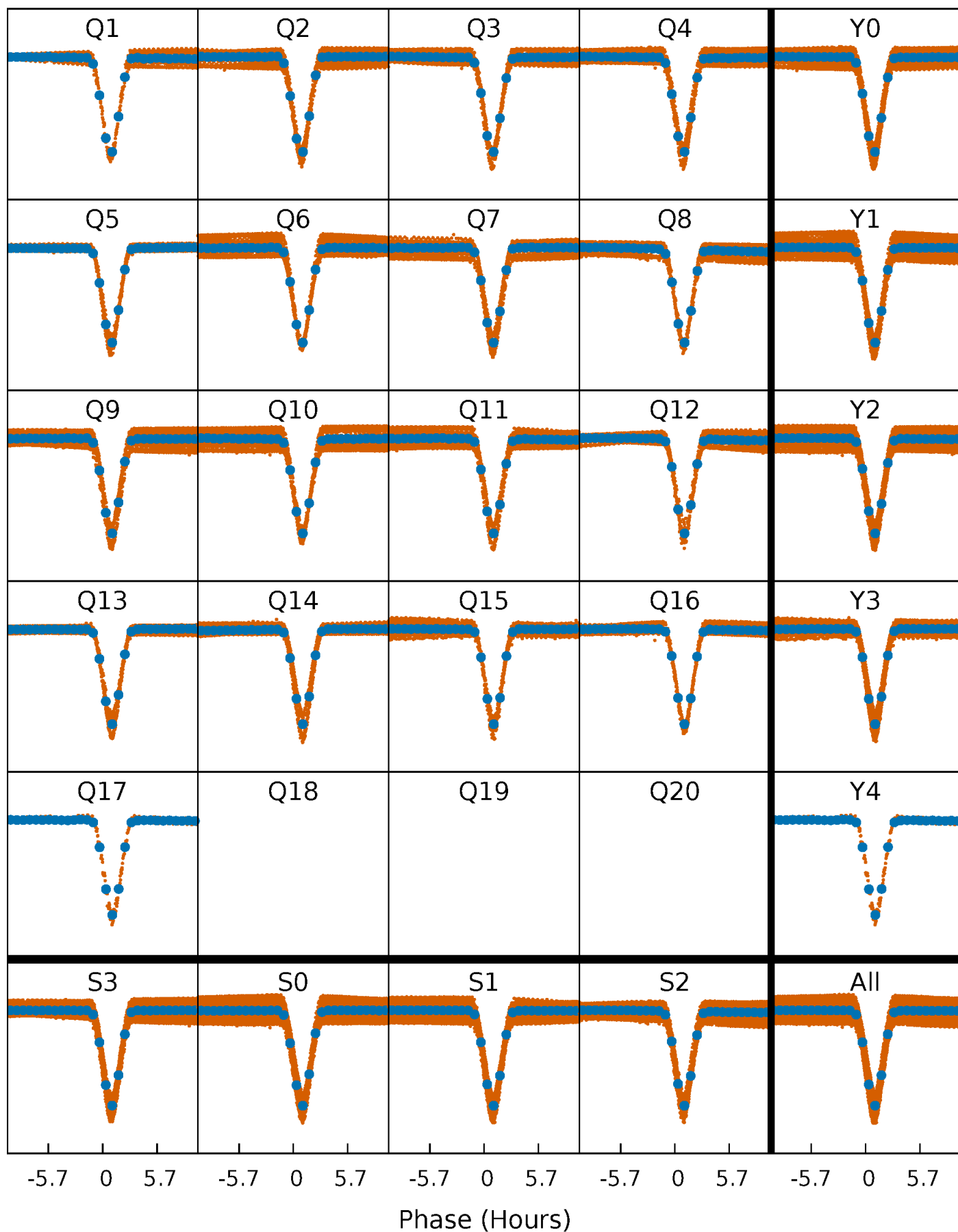


**Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

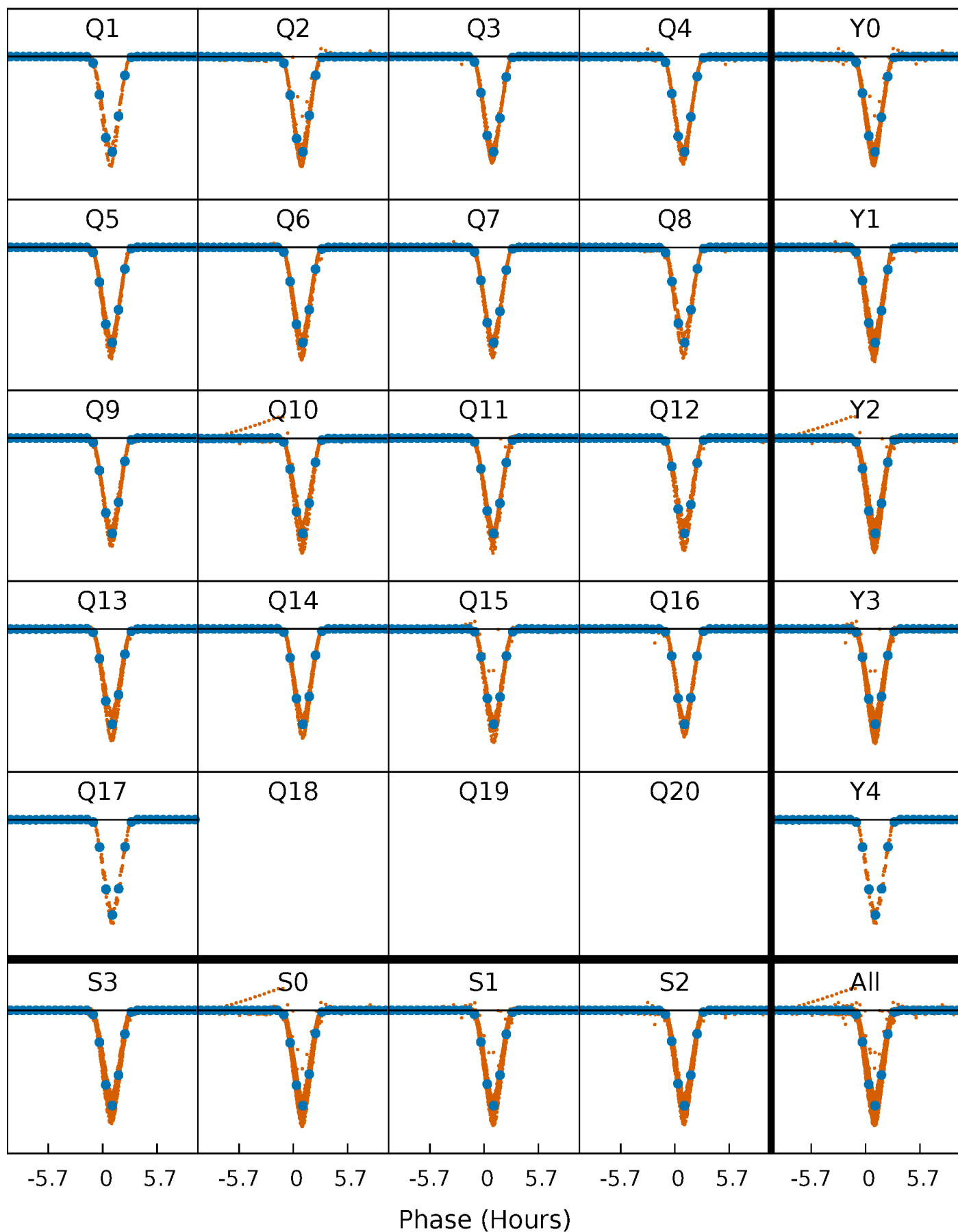
TCE 006863840-01 P= 1.926357 Days  $T_0=131.711924$  (BKJD)





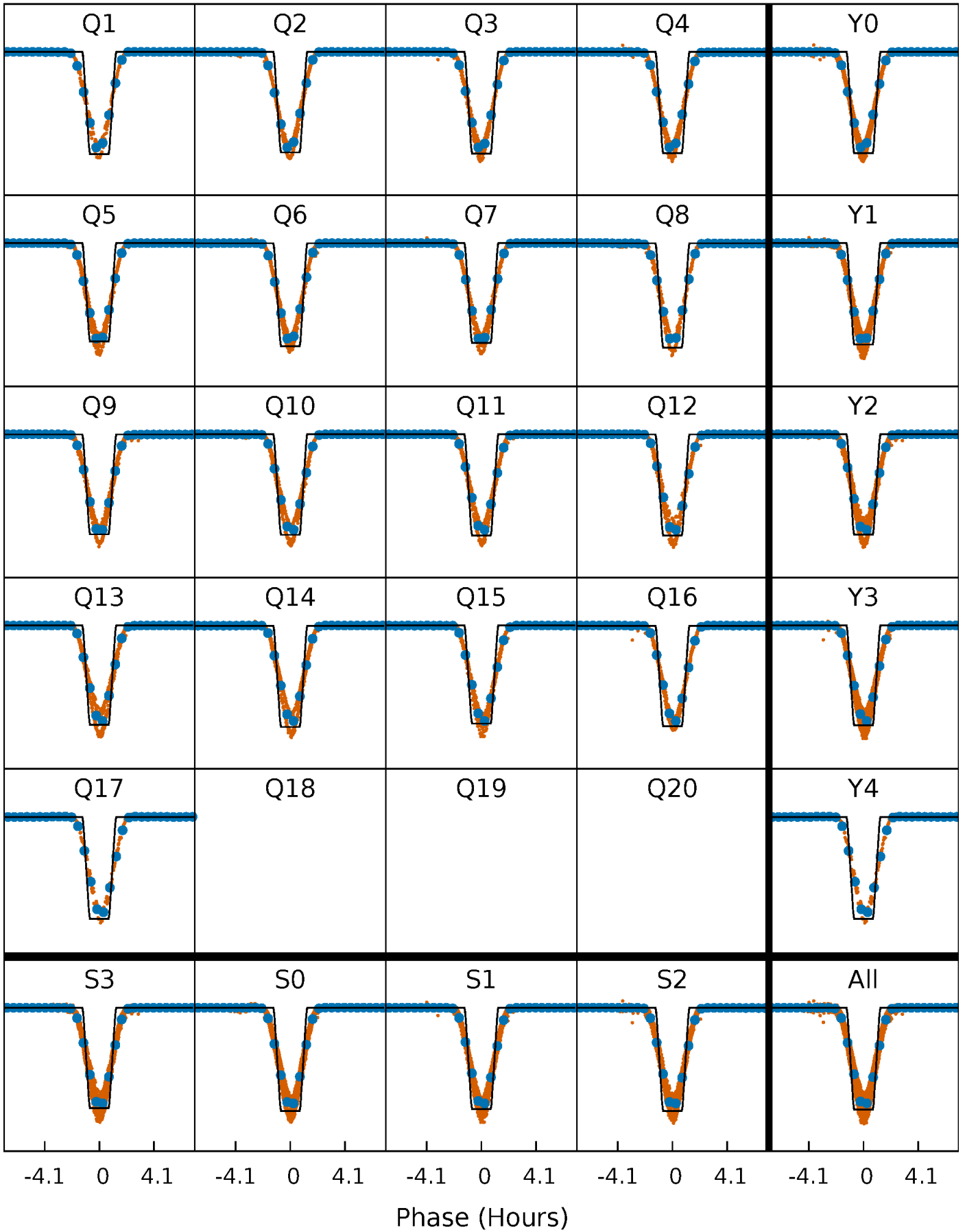
# DV Quarter-Phased Transit Curves

TCE 006863840-01 P= 1.926357 Days  $T_0=131.711924$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

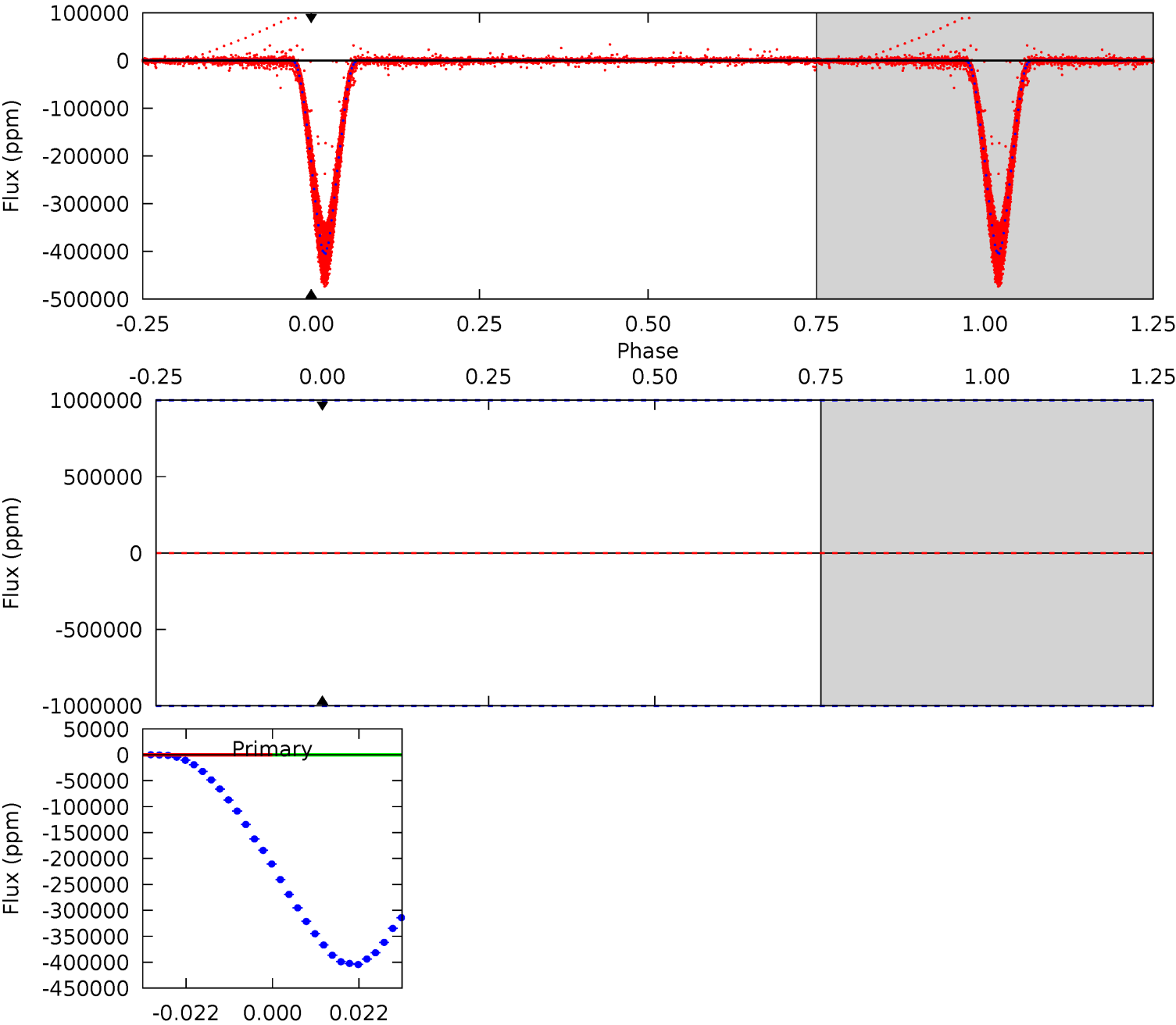
TCE 006863840-01   P= 1.926357 Days    $T_0=131.749620$  (BKJD)



DV Model-Shift Uniqueness Test

006863840-01, P = 1.926357 Days, E = 129.785567 Days

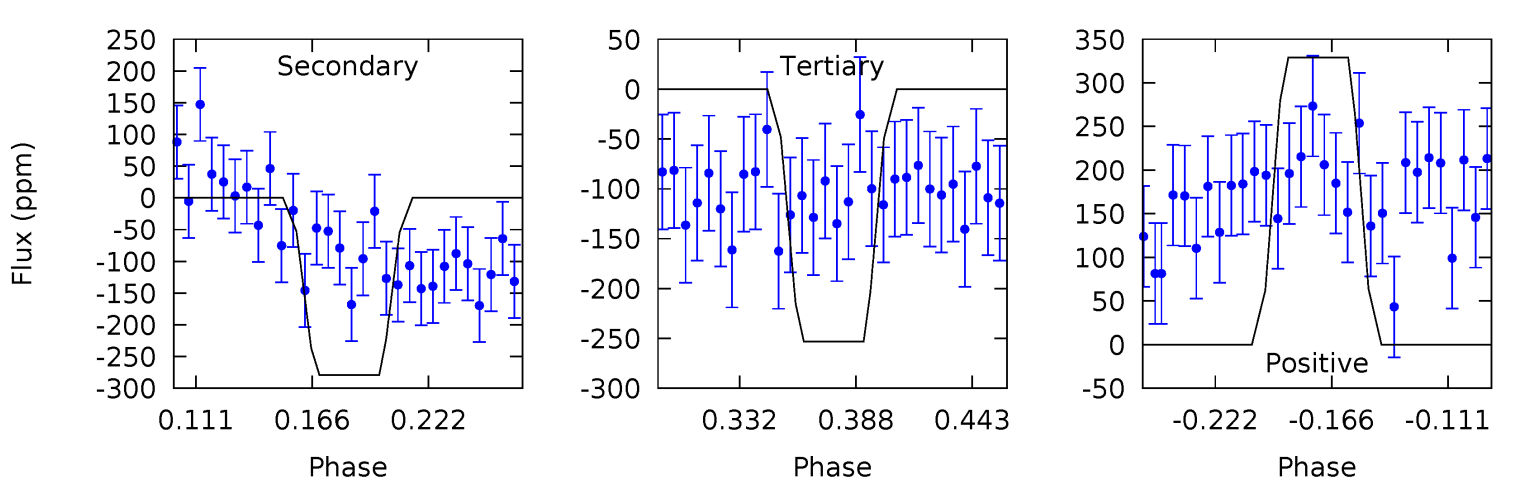
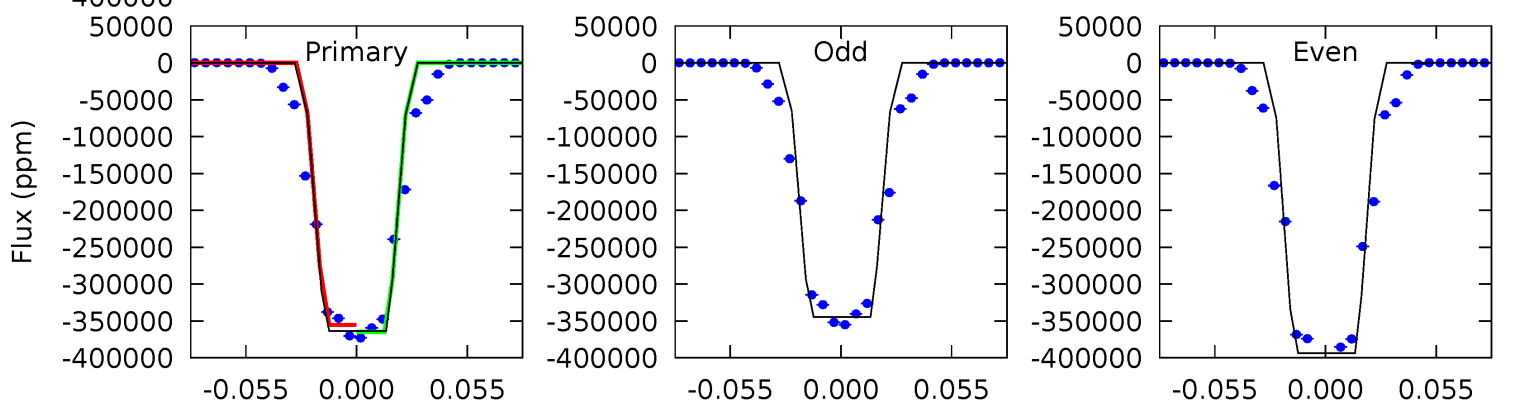
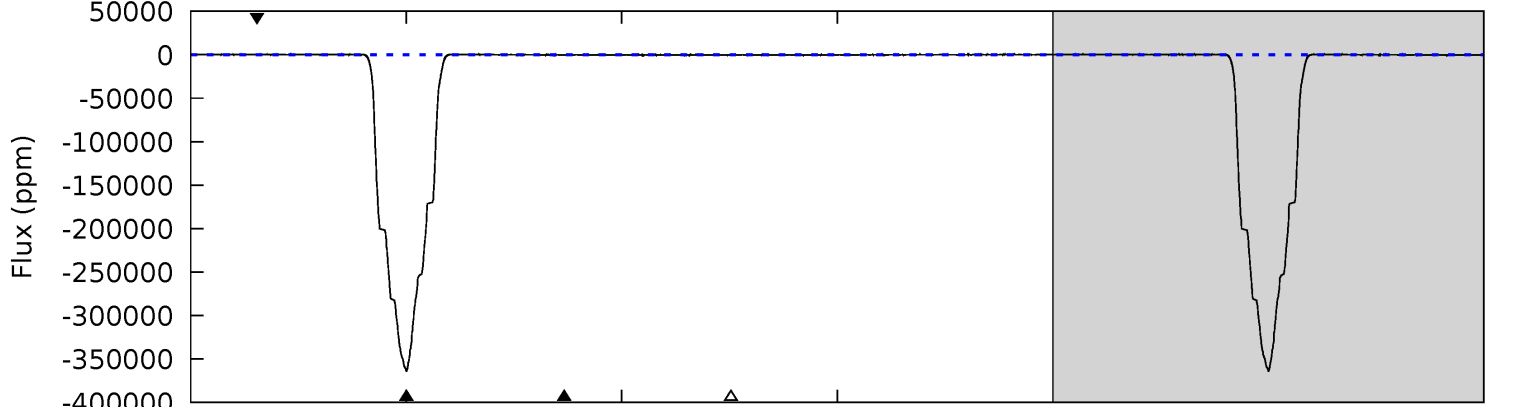
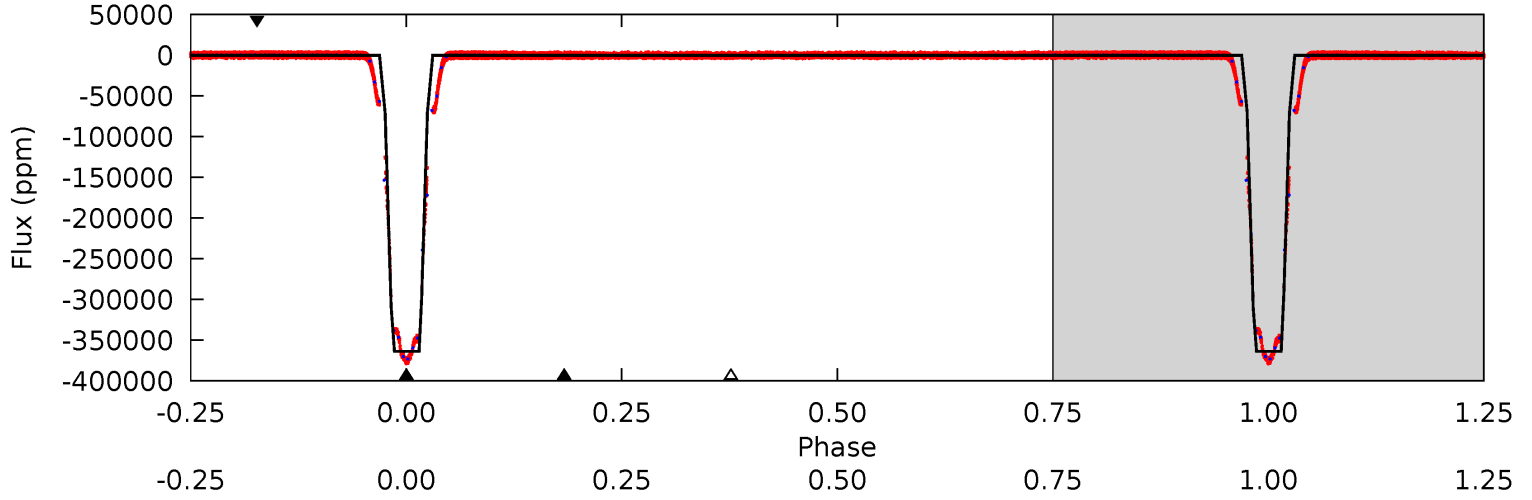
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006863840-01, P = 1.926357 Days, E = 129.823263 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
5049	3.87	3.51	4.56	4.69	1.92	1.88	5046	5045	0.36	-0.69	375.9	1.00	0.00	0



### Stellar Parameters For KIC 006863840

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5176^{+153}_{-153}$	$4.542^{+0.077}_{-0.063}$	$-0.280^{+0.300}_{-0.300}$	$0.760^{+0.080}_{-0.080}$	$0.735^{+0.098}_{-0.057}$	$2.356^{+0.755}_{-0.479}$
	+3%/-3%	+2%/-1%	+107%/-107%	+11%/-11%	+13%/-8%	+32%/-20%
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 006863840-01 / KOI 6779.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$23.54^{+8.29}_{-8.52}$	$1675^{+70}_{-65}$	$2617^{+3067}_{-8020}$	$1.095^{+89.572}_{-76.335}$
Alt.	$-279 \pm 72$	$52.98^{+9.46}_{-8.64}$	$1679^{+73}_{-67}$	$-2245^{+52}_{-53}$	$0.041^{+0.021}_{-0.014}$

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

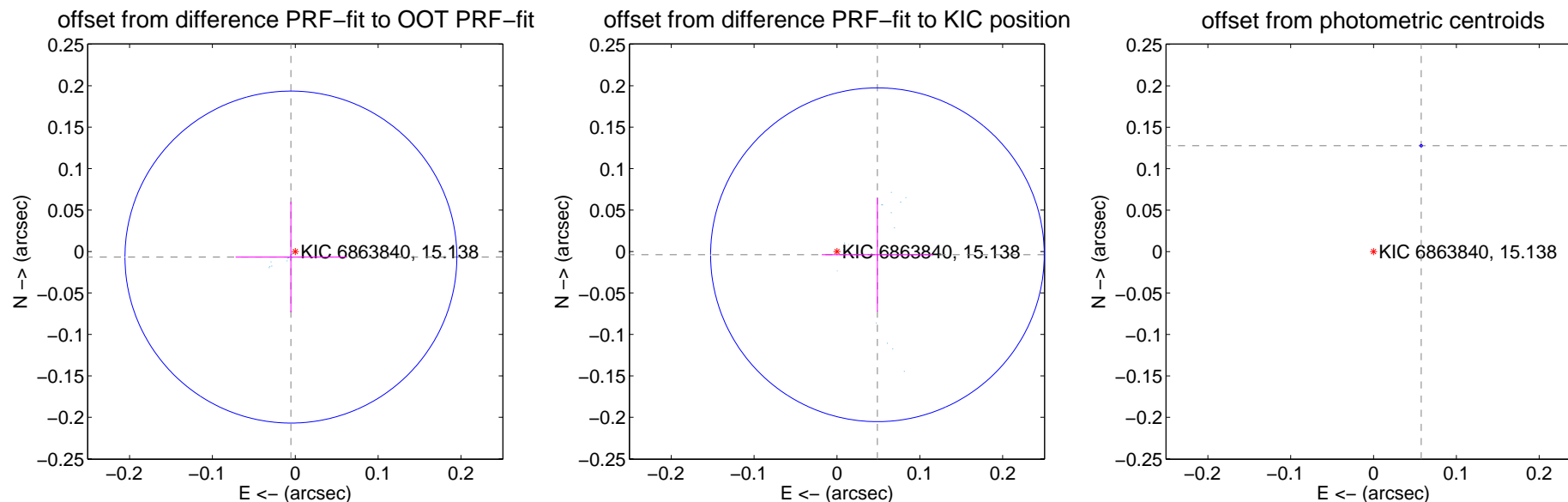
## DV Centroid Data

Supplemental centroid analysis for 006863840-01. Kepler magnitude: 15.14. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

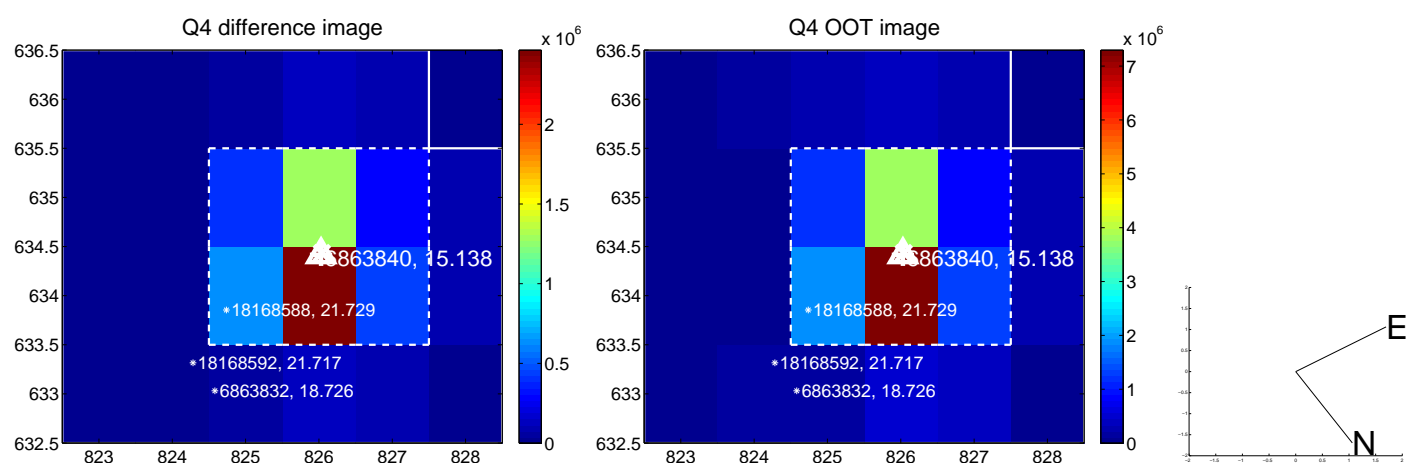
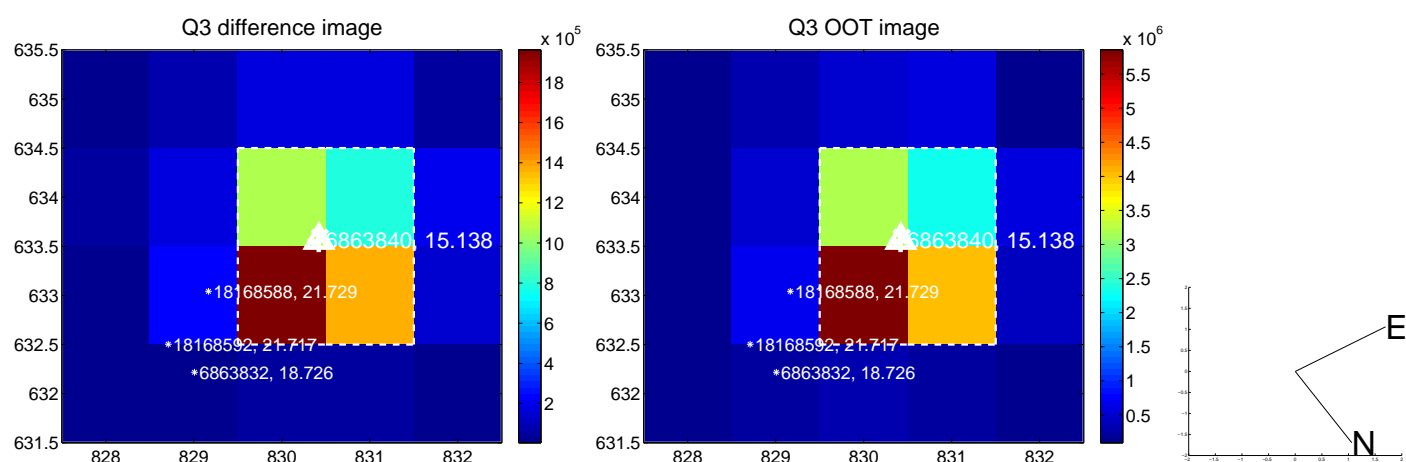
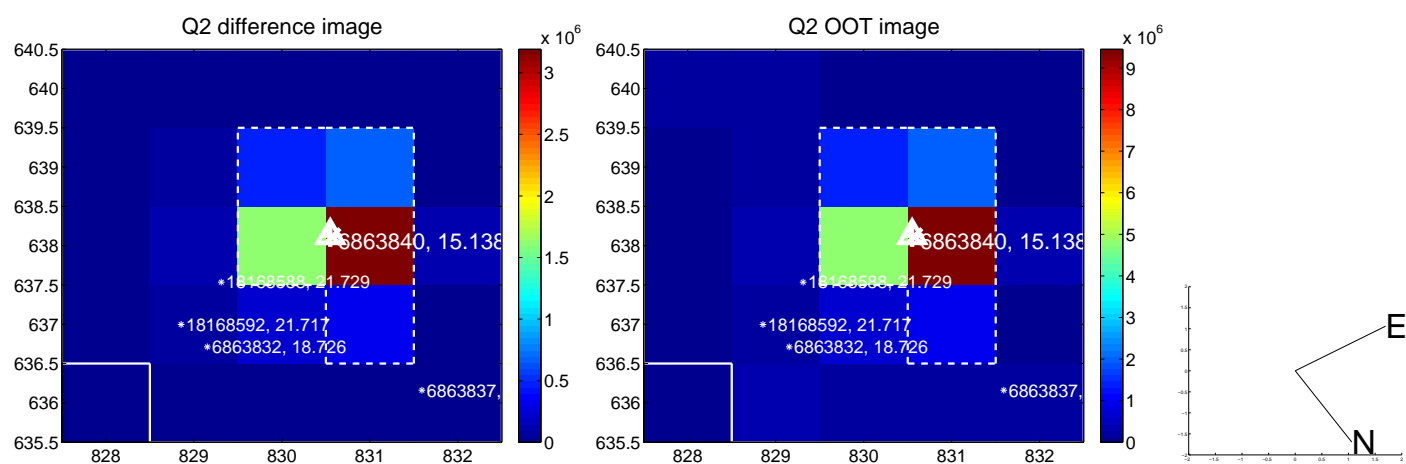
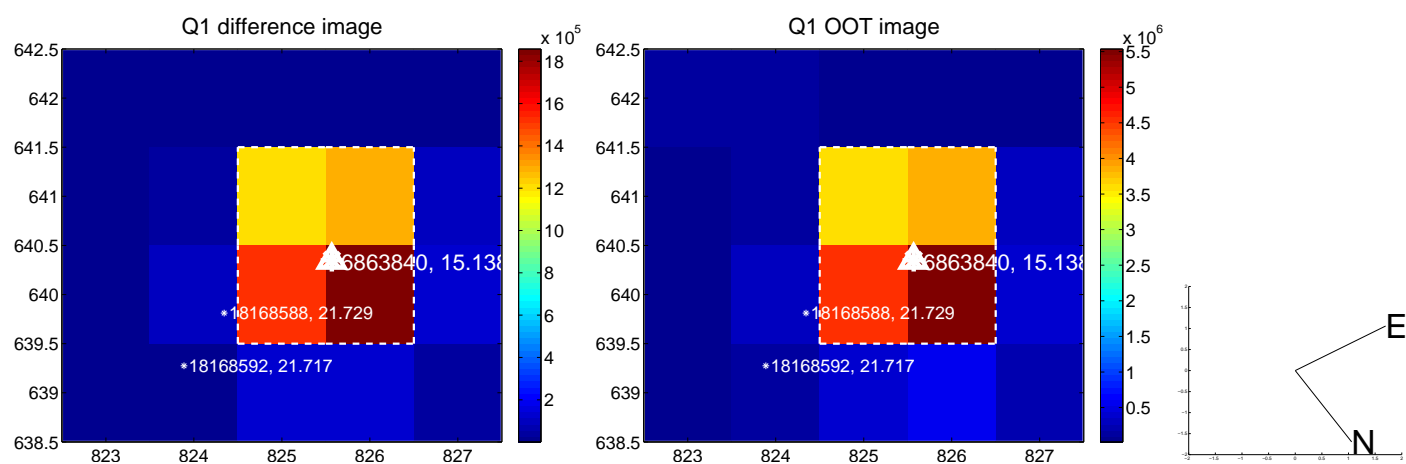
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.009 \pm 0.067$	0.13	$0.005 \pm 0.067$	$-0.007 \pm 0.067$
PRF-fit source offset from KIC position	$0.049 \pm 0.067$	0.73	$-0.049 \pm 0.067$	$-0.004 \pm 0.069$
photometric centroid source offset	$0.14 \pm 0.00$	285.80	$-0.06 \pm 0.00$	$0.13 \pm 0.00$

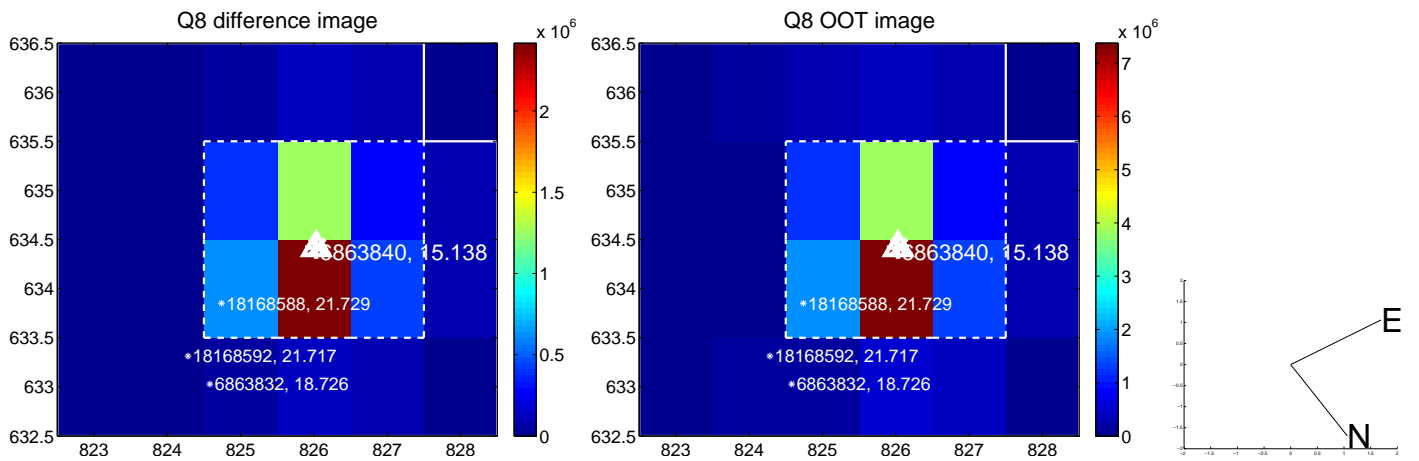
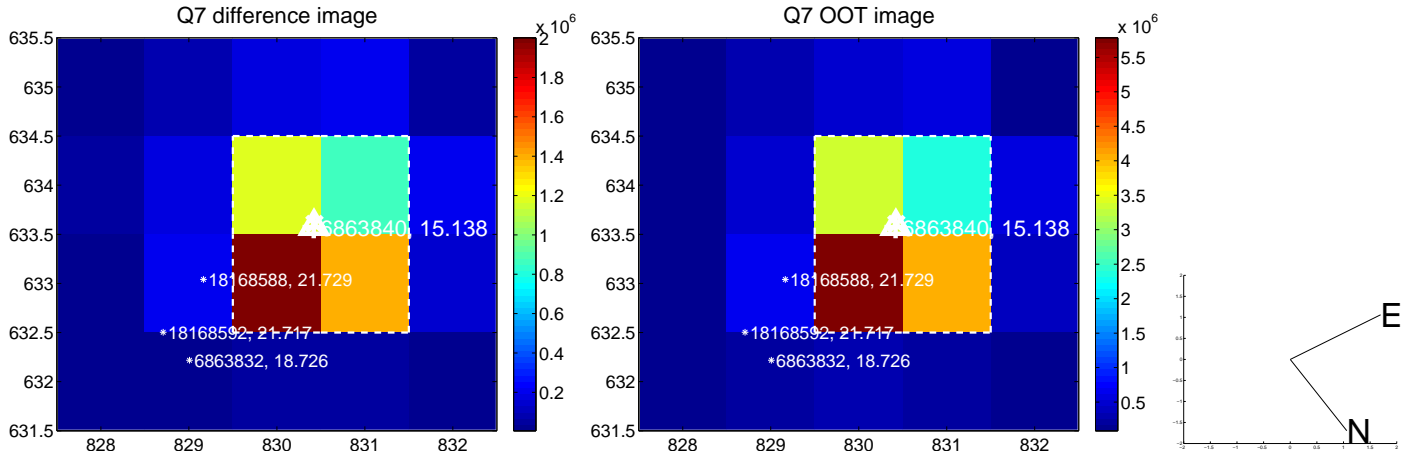
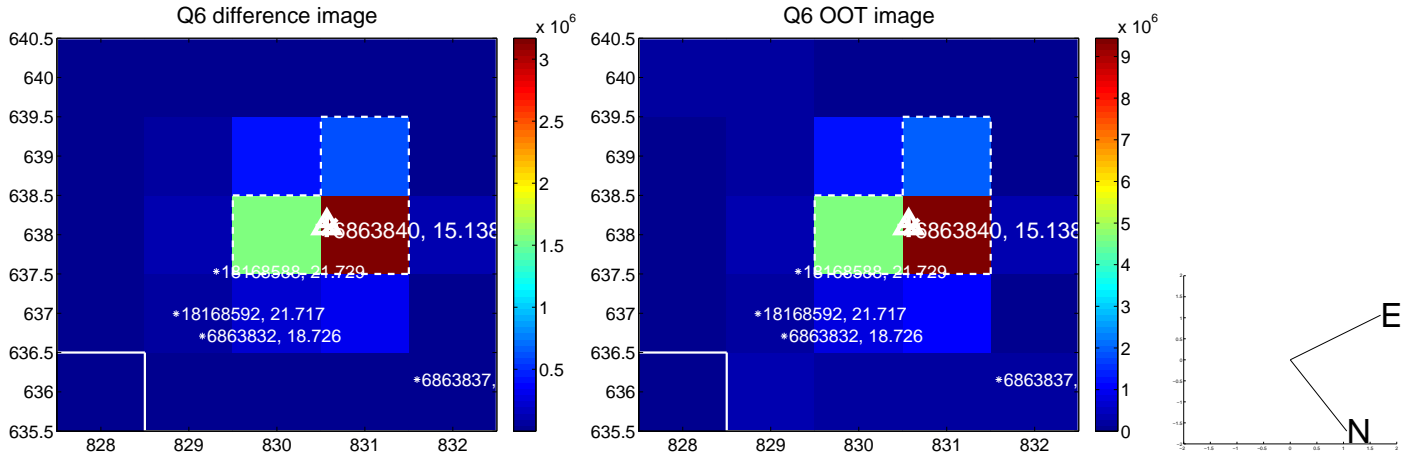
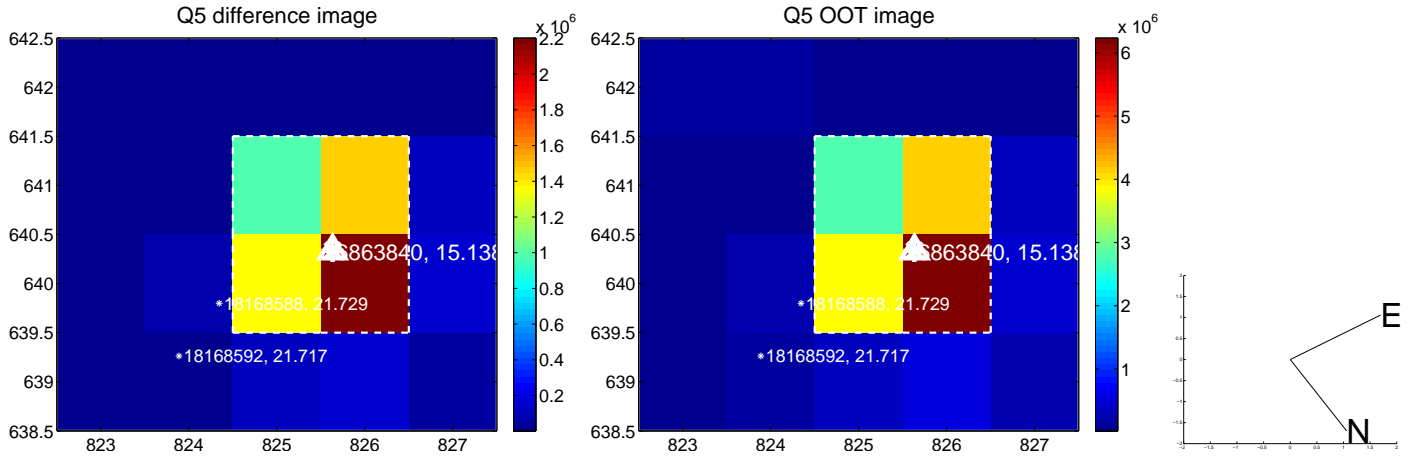


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

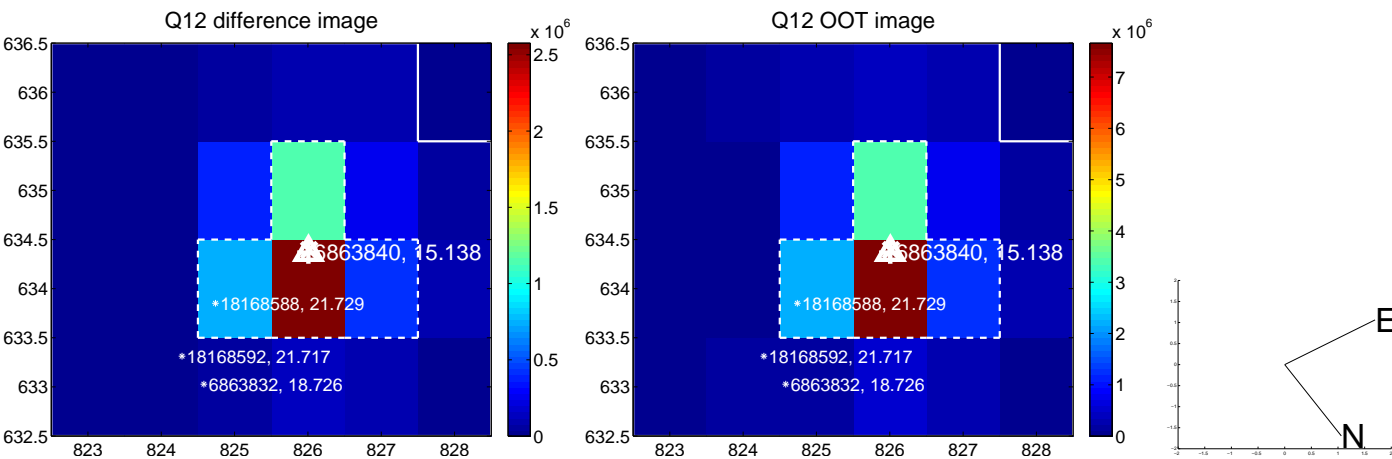
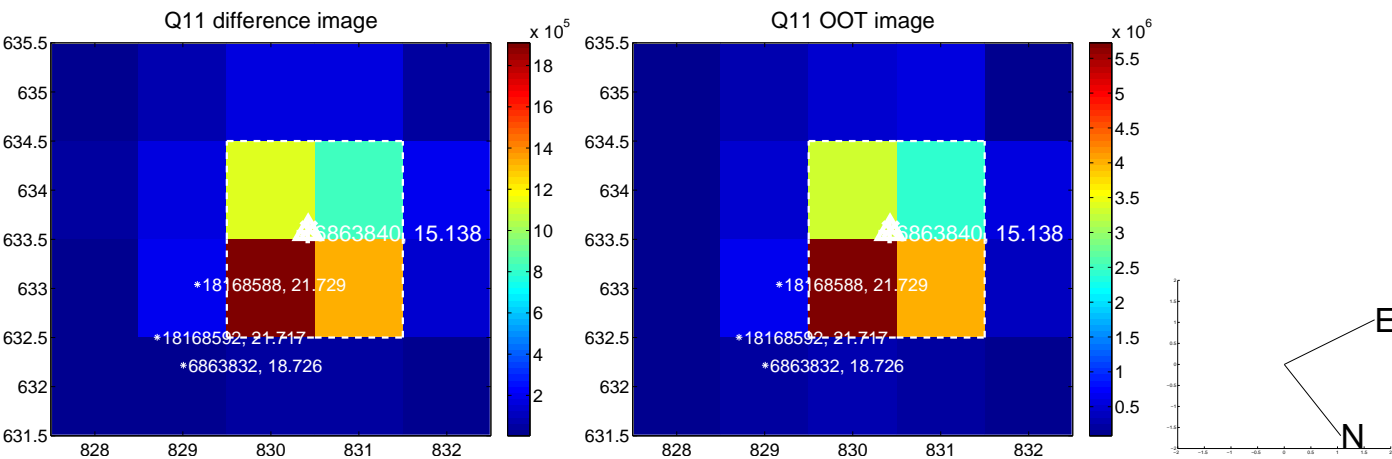
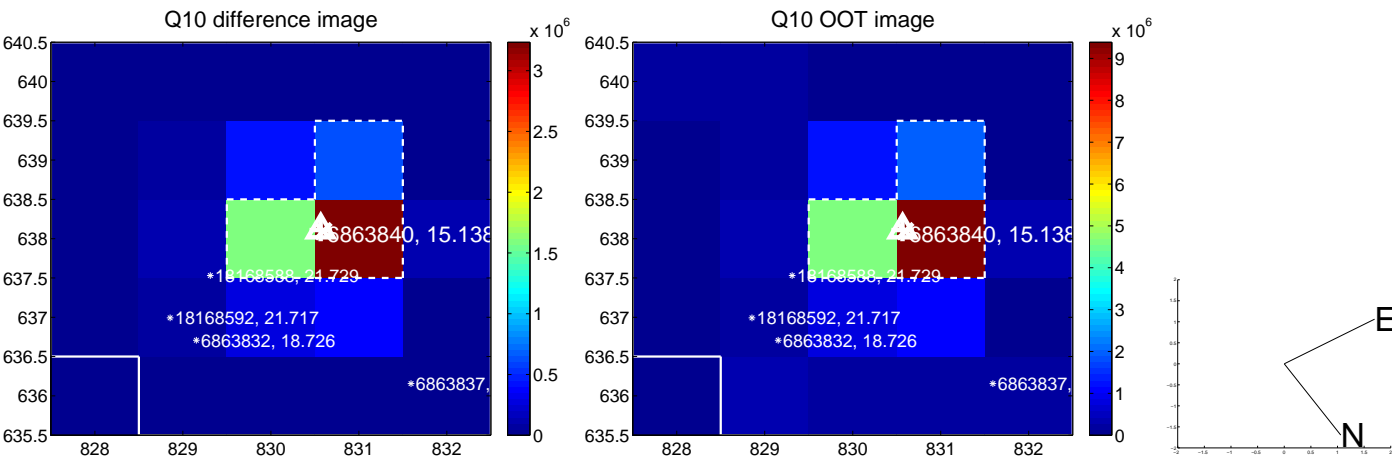
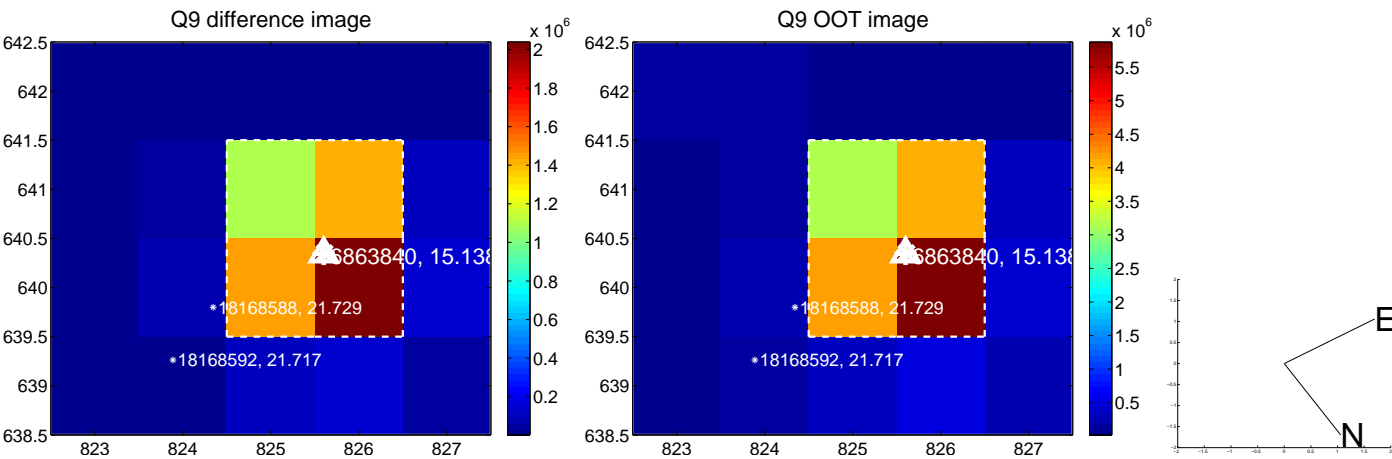


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

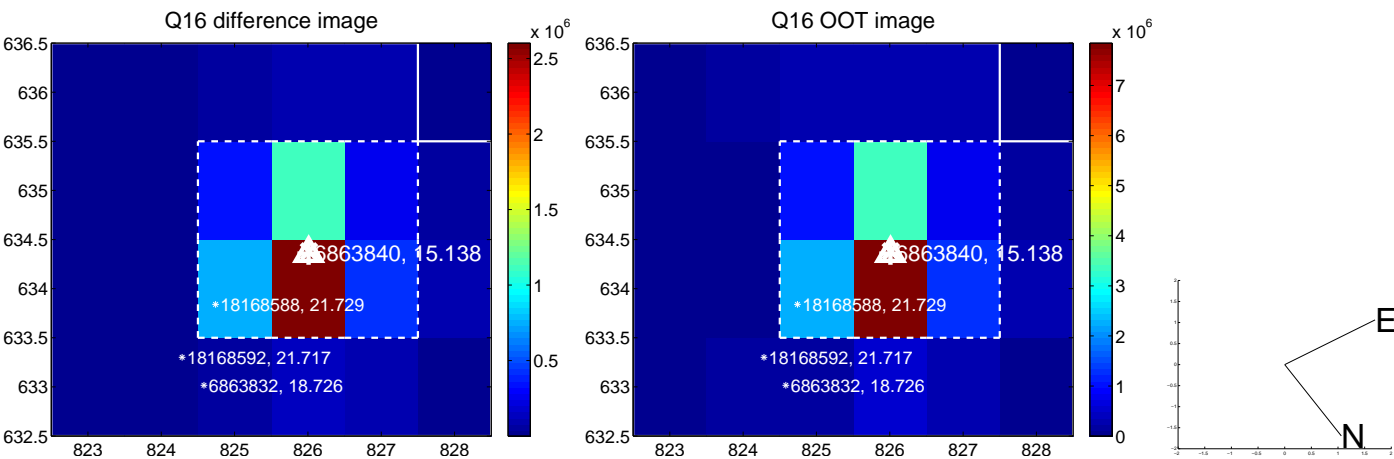
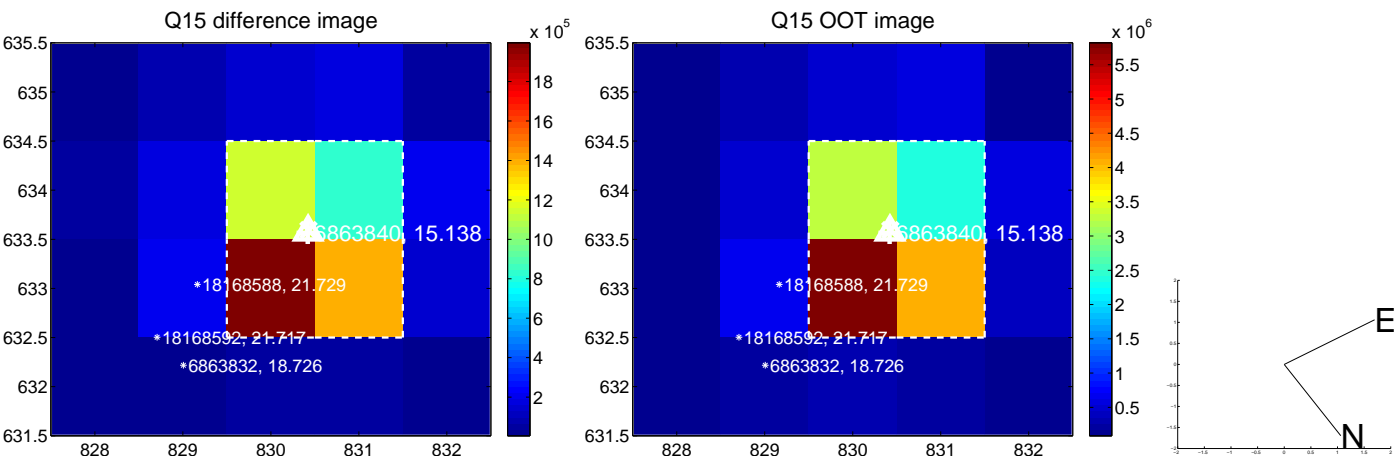
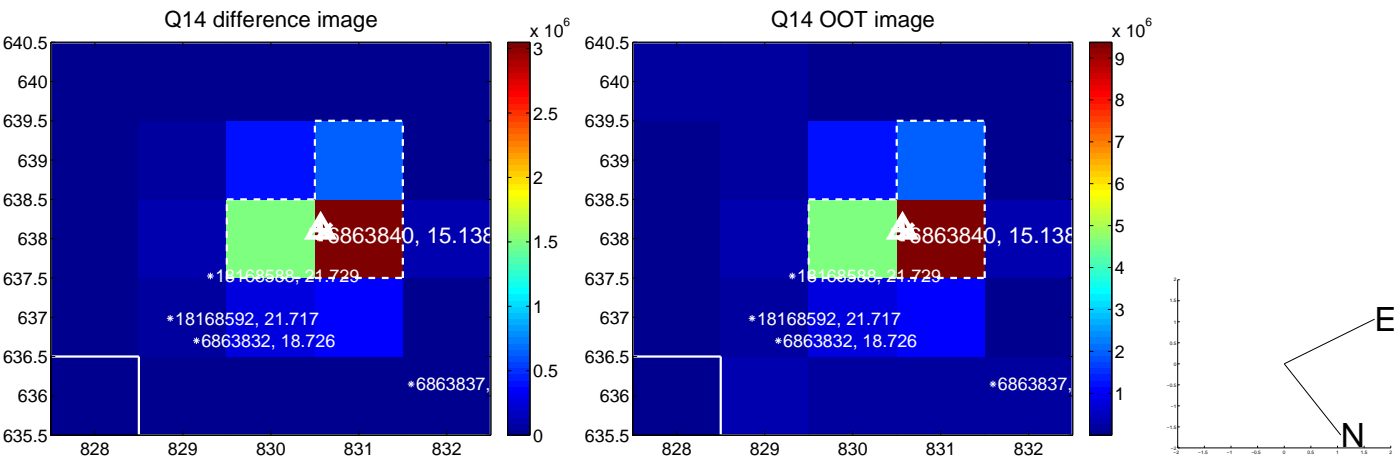
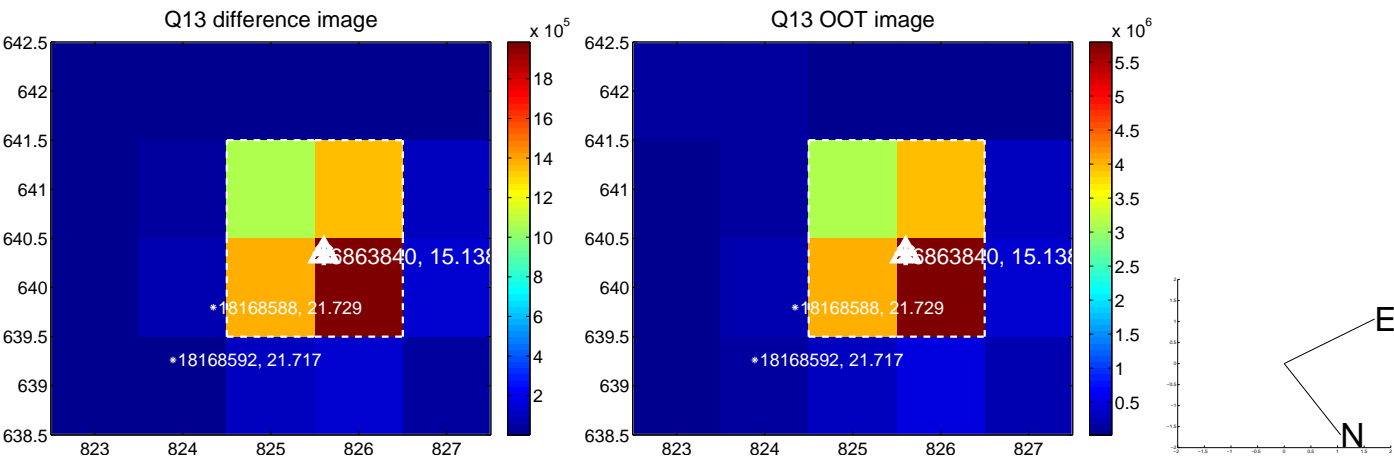




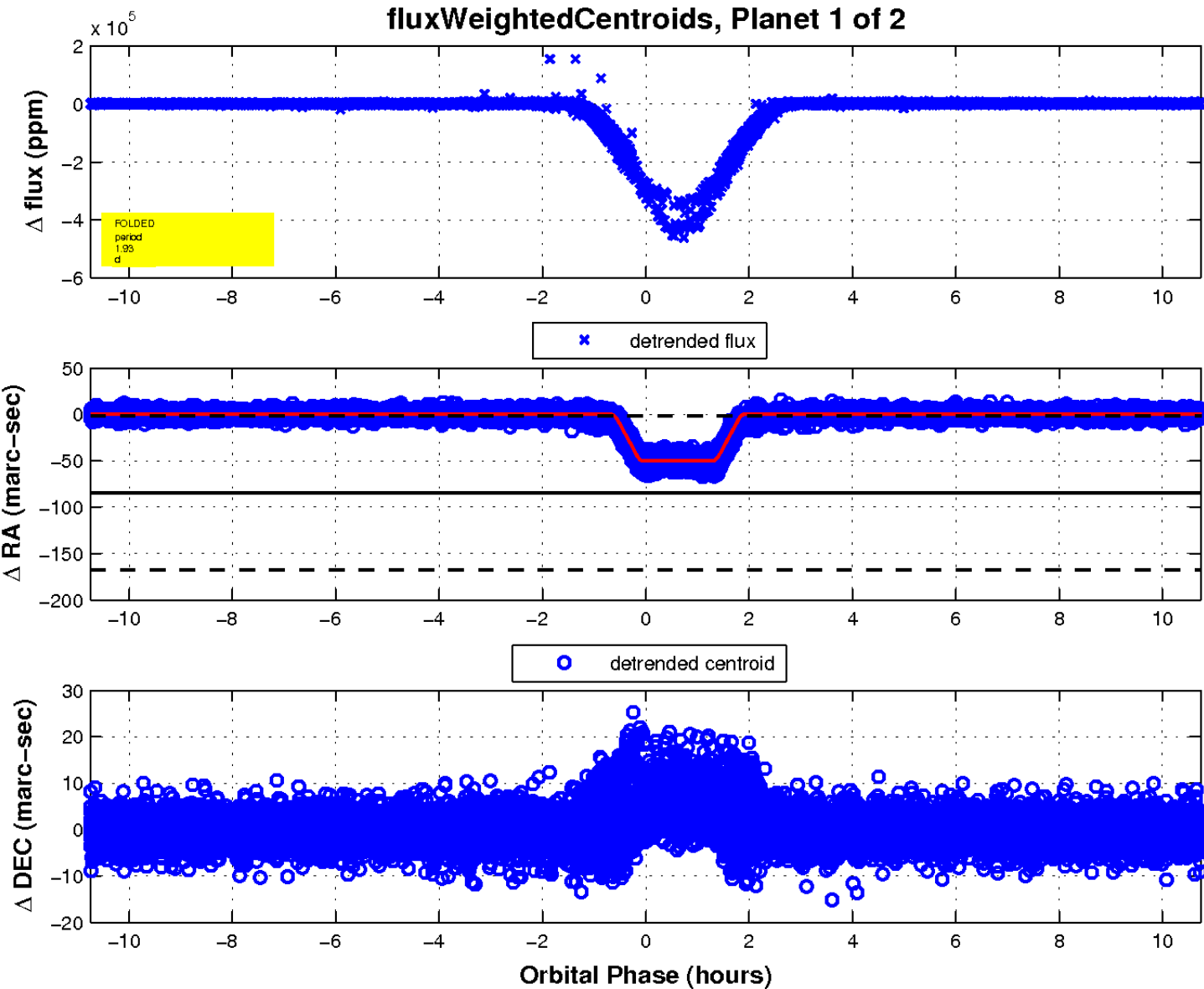
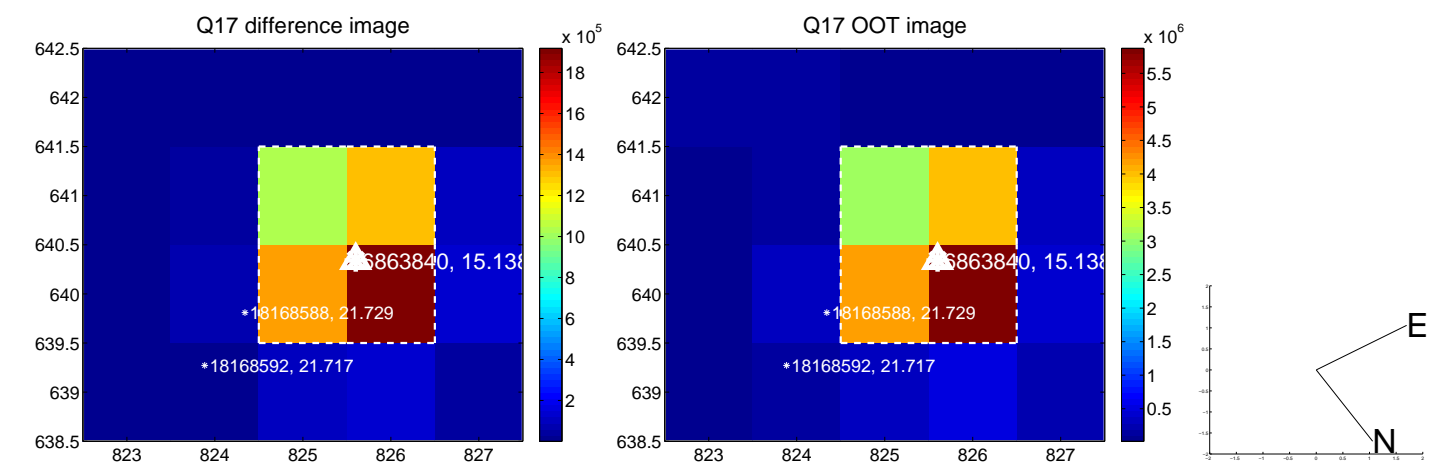
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

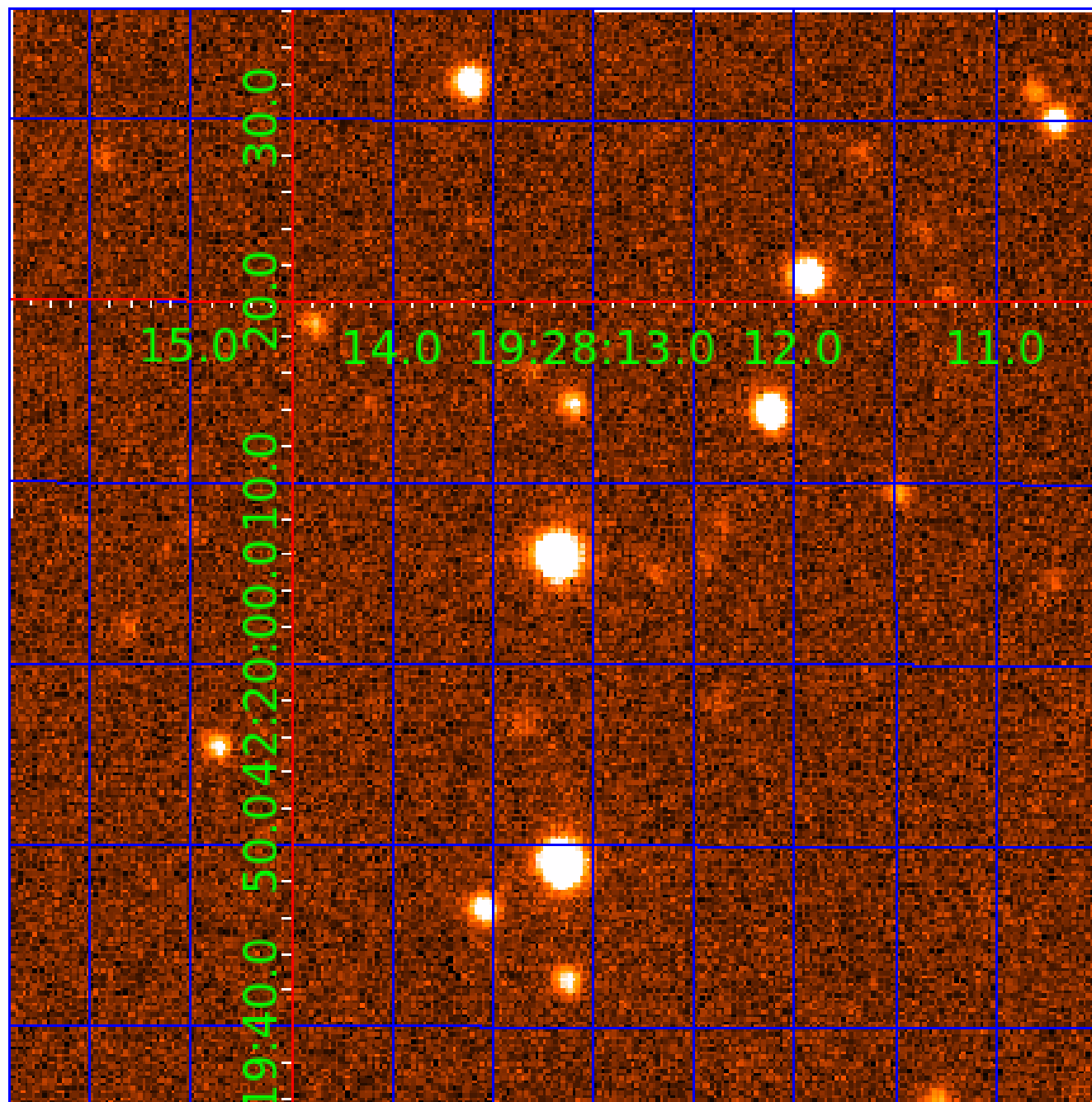


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006863840

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006863840-01	OBS	6779.01	1.926357	131.711924	401316.0	5.000	11023.3	-1.0	0.76	5176	23.73	497.09
006863840-02	OBS	No	5.779174	132.028644	29802.4	15.000	2129.9	-1.0	0.76	5176	12.84	114.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006863840-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_NOFITS
006863840-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS—HALO_GHOST

**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.

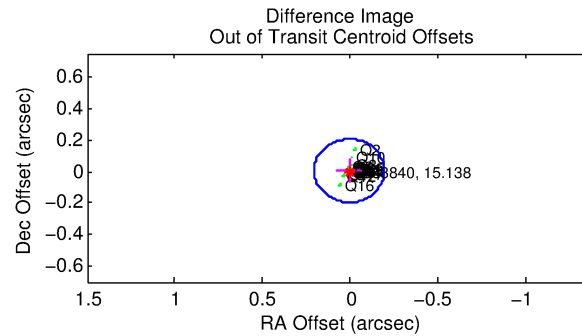
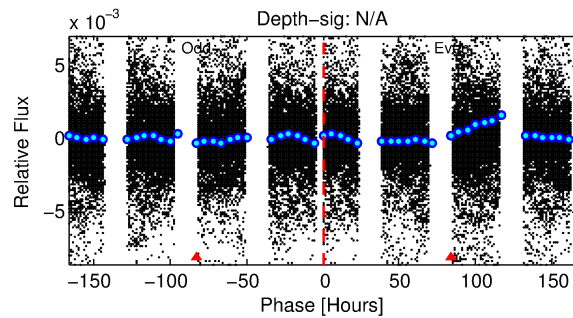
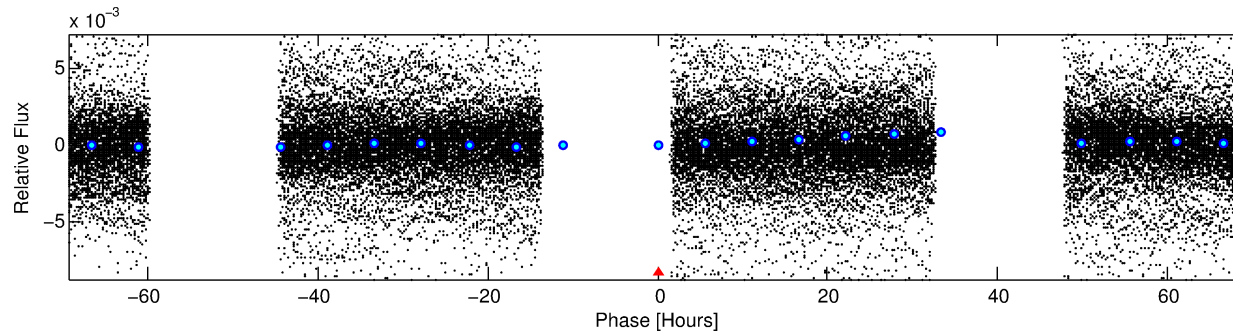
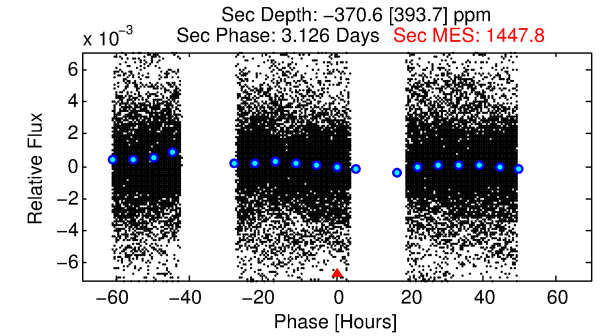
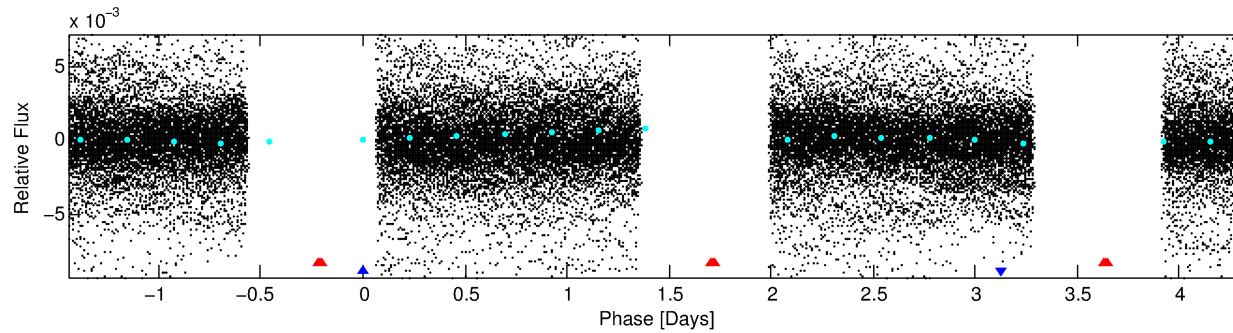
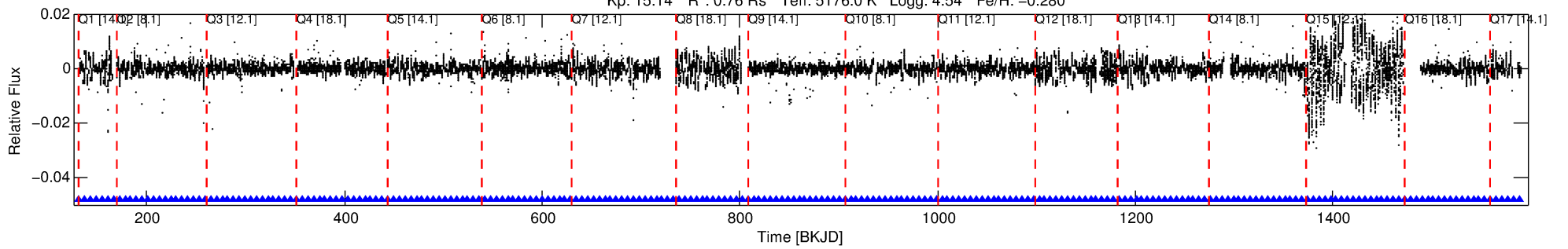
## Ephemeris Match Information For 006863840-02

No Significant Match Found

# DV One-Page Summary

KIC: 6863840 Candidate: 2 of 2 Period: 5.779 d  
KOI: K06779 Corr: No Ephemeris Match

Kp: 15.14 R\*: 0.76 Rs Teff: 5176.0 K Logg: 4.54 Fe/H: -0.280



## TPS TCE Results:

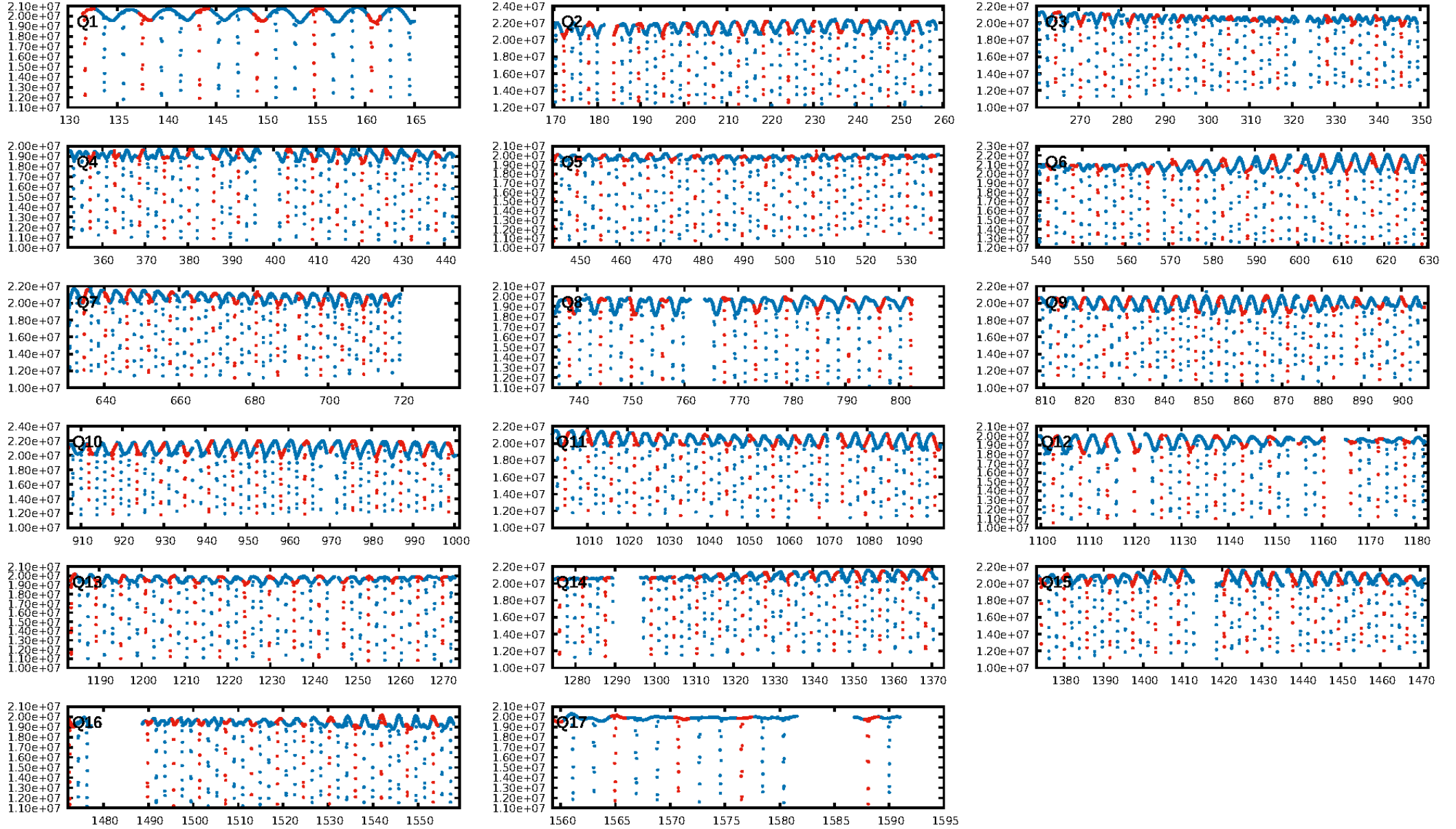
Period = 5.77917 d  
Epoch = 132.0286 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

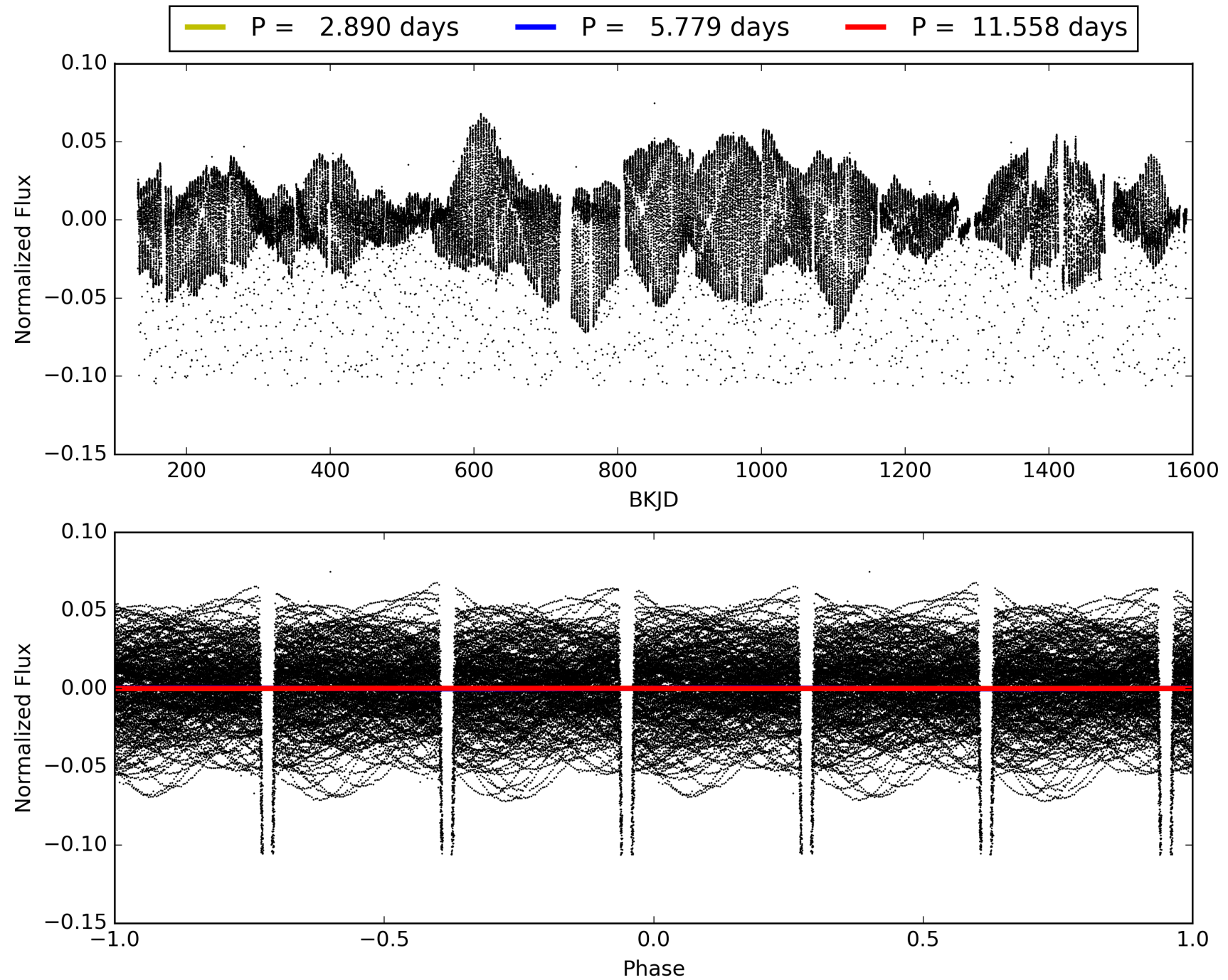
ShortPeriod-sig: 100.0% [5.85 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [226/226]  
GhostDiagnostic-chr: -0.1702  
Centroid-sig: N/A  
Centroid-so: 0.216 arcsec [3.63 $\sigma$ ]  
OotOffset-rm: 0.010 arcsec [0.14 $\sigma$ ]  
KicOffset-rm: 0.044 arcsec [0.64 $\sigma$ ]  
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]

# TCE 006863840-02, PDC Light Curves





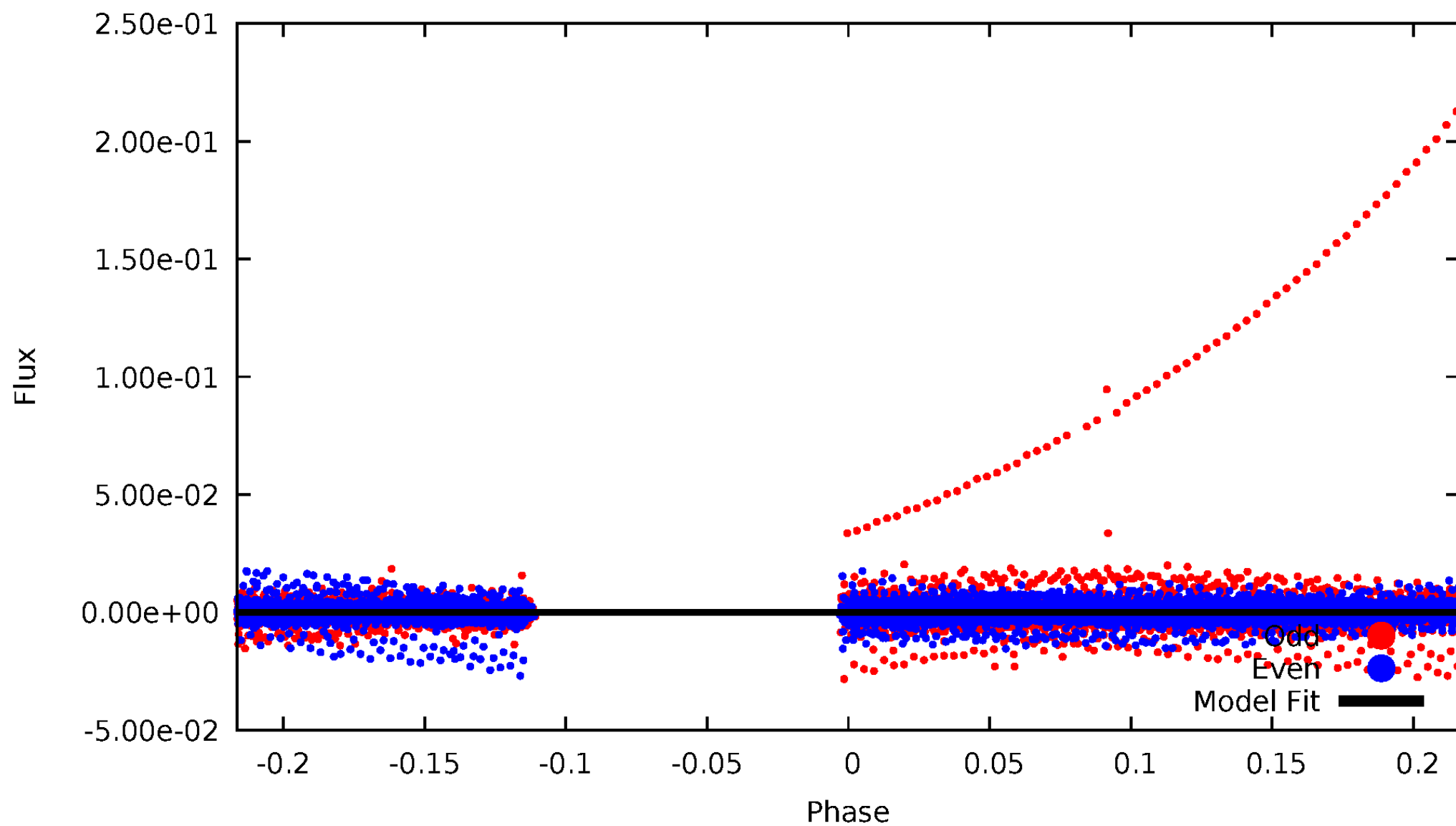
TCE 006863840-02





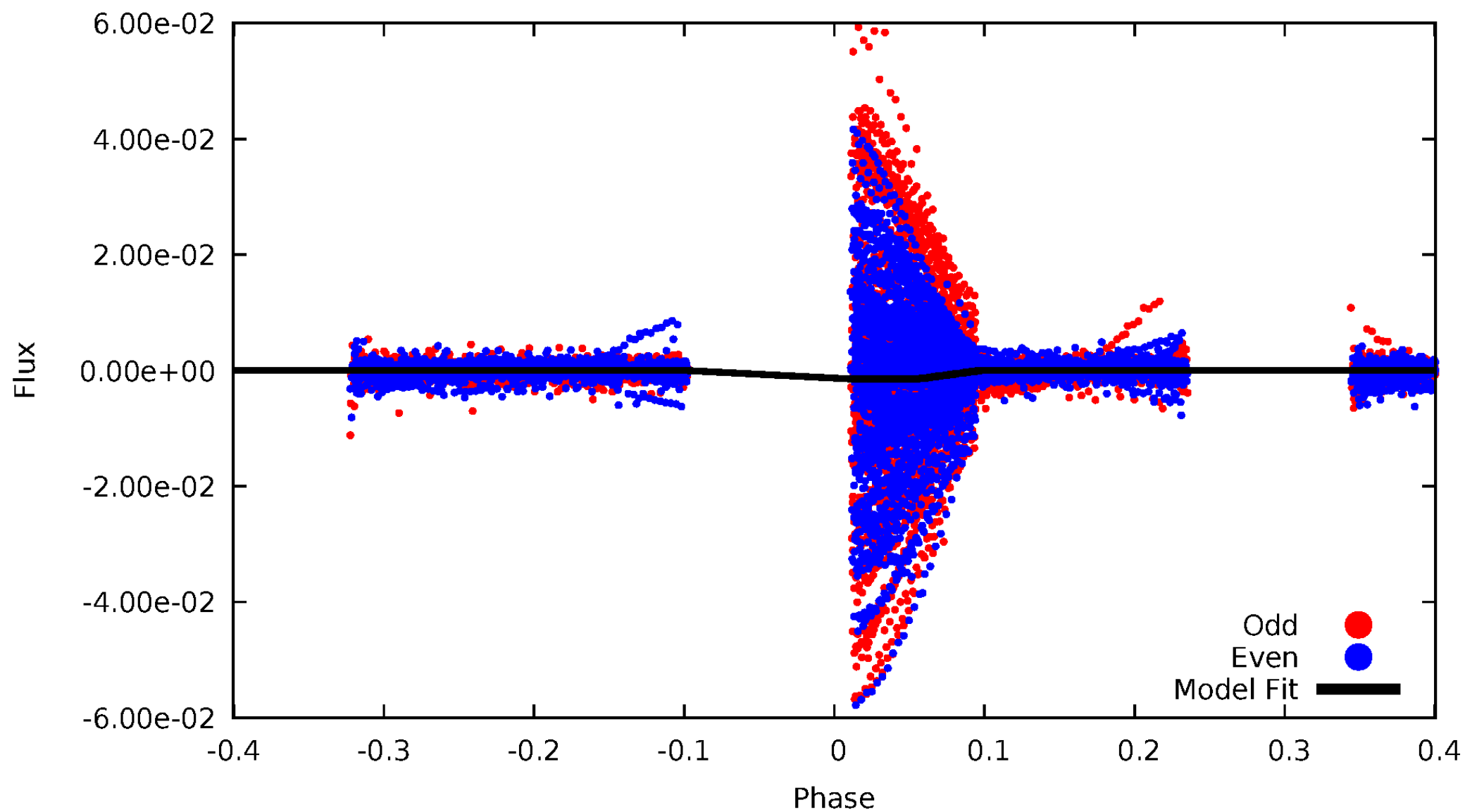
# DV Odd/Even

TCE 006863840-02



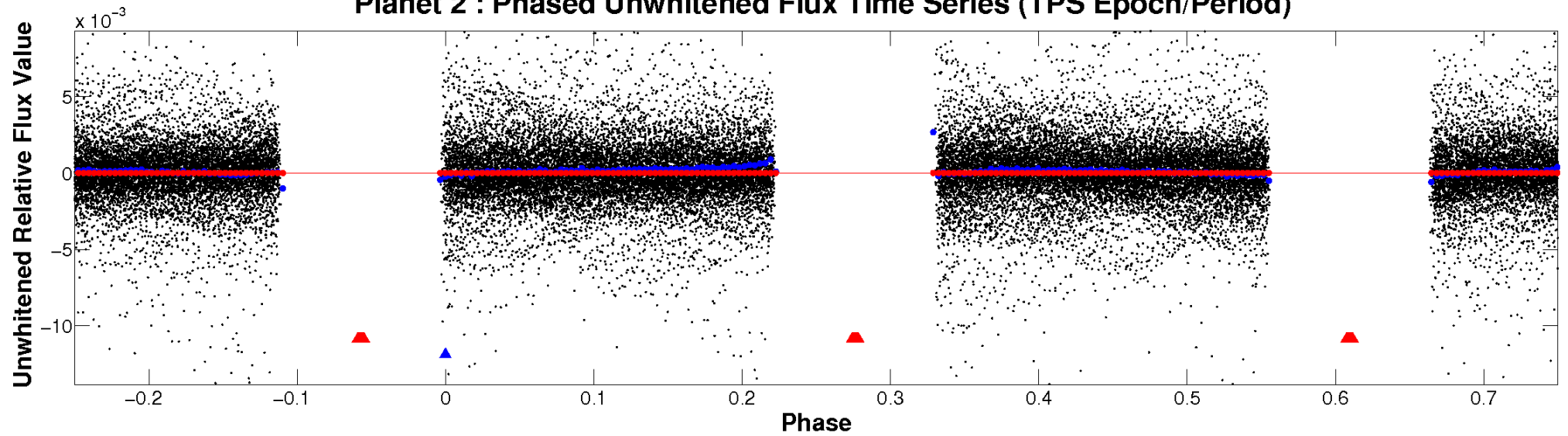
# ALT Odd/Even

TCE 006863840-02



# Non-Whitened Vs. Whitened Light Curve

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

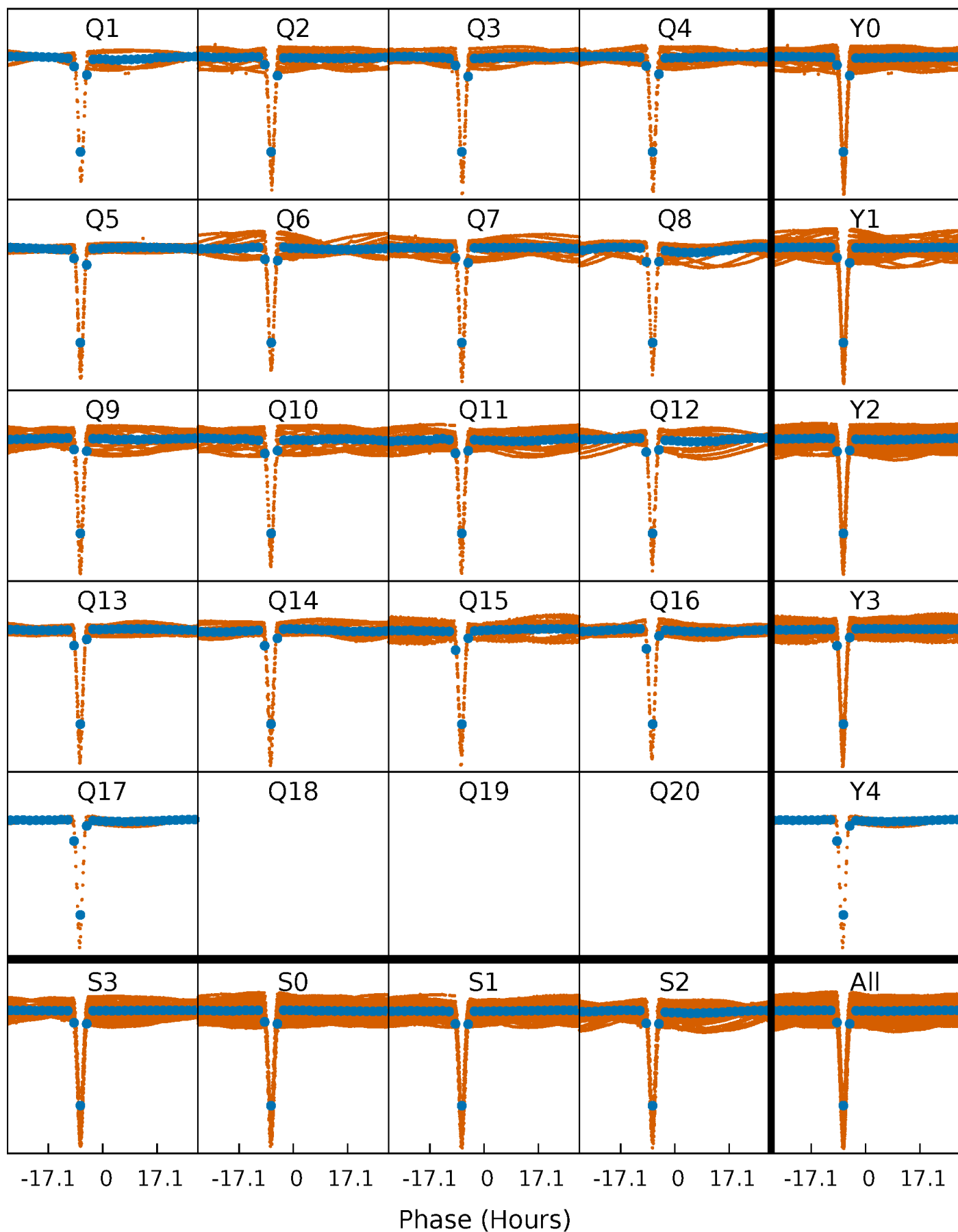


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



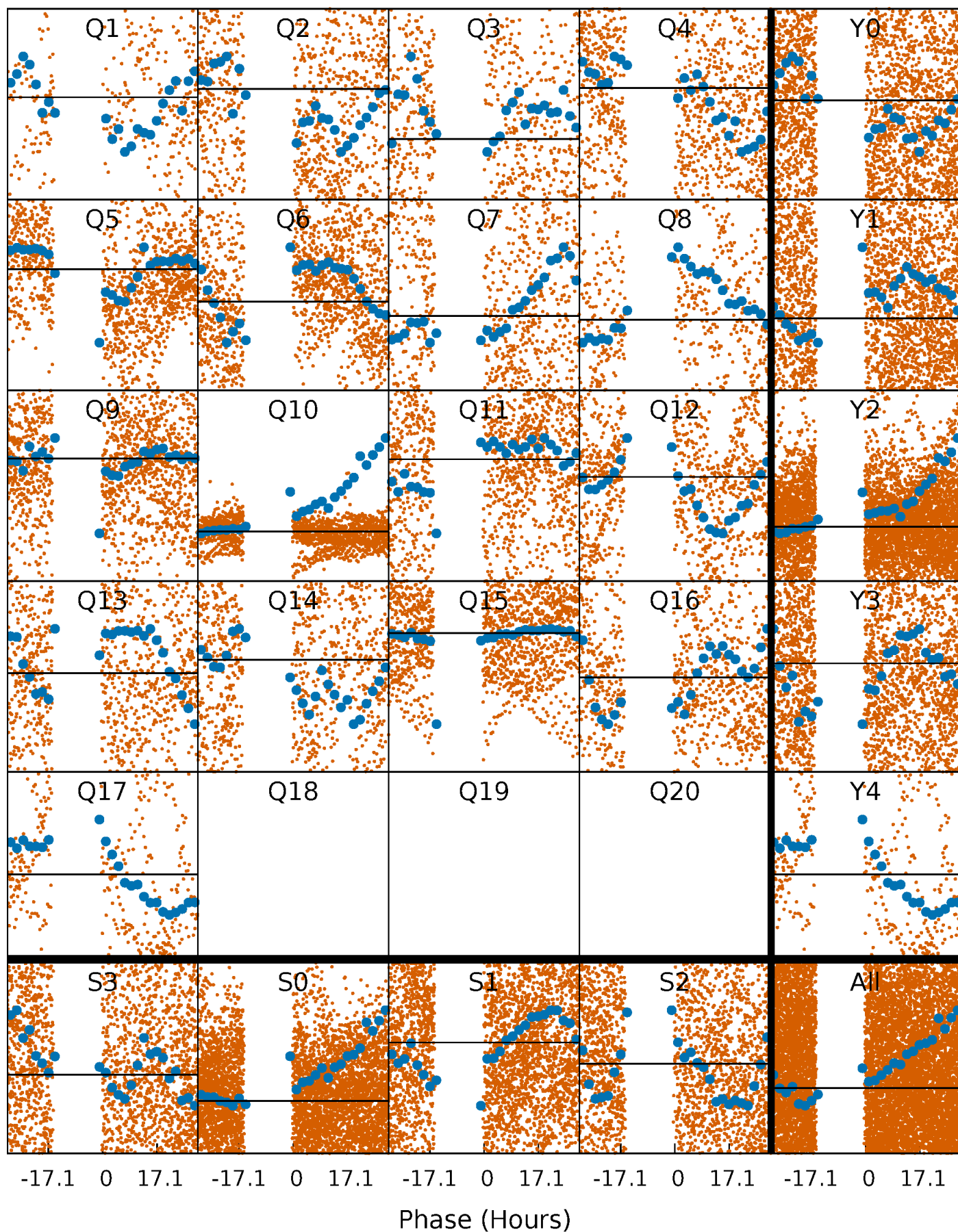
# PDC Quarter-Phased Transit Curves

TCE 006863840-02     $P = 5.779174$  Days     $T_0 = 132.028644$  (BKJD)



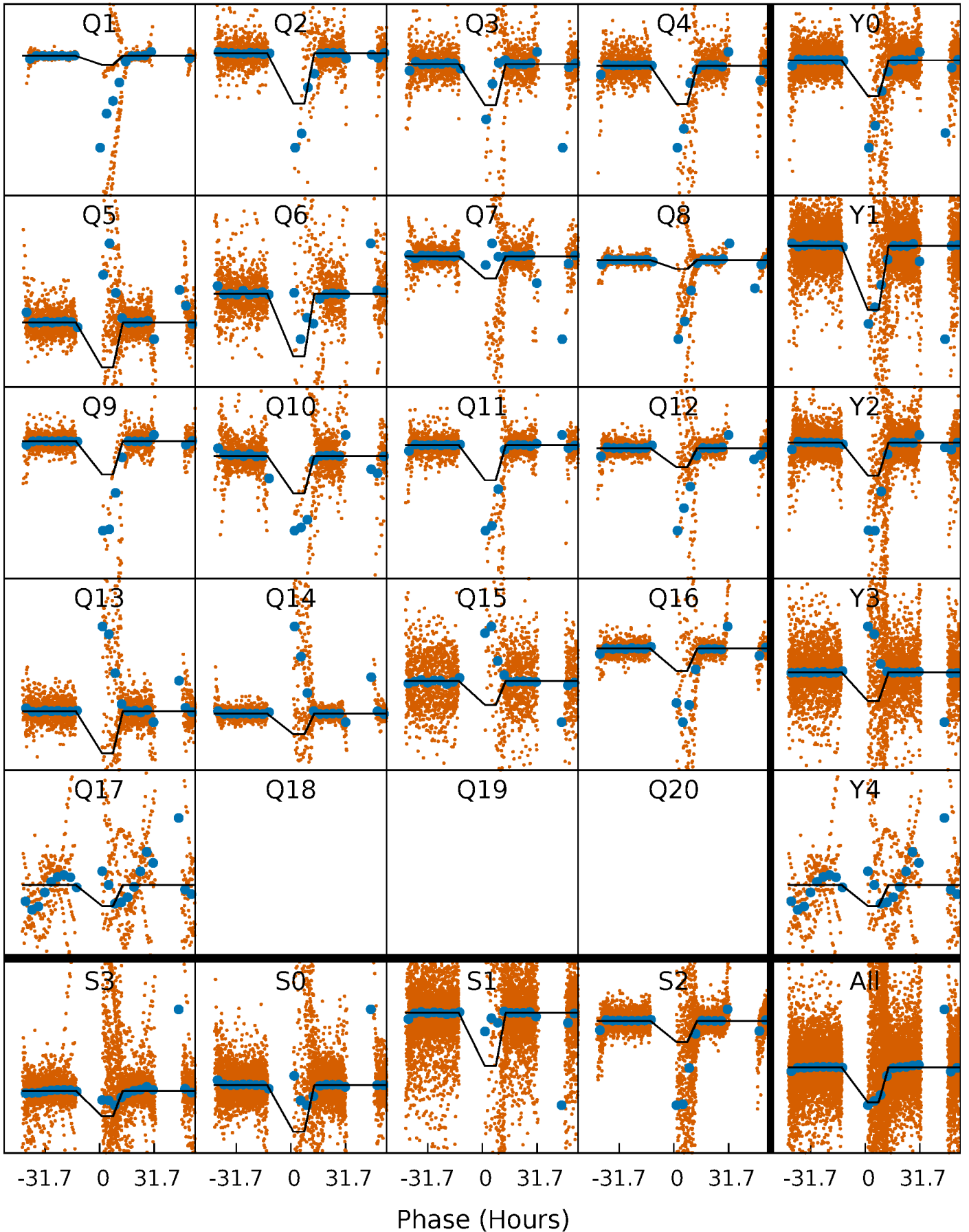
# DV Quarter-Phased Transit Curves

TCE 006863840-02   P= 5.779174 Days    $T_0=132.028644$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

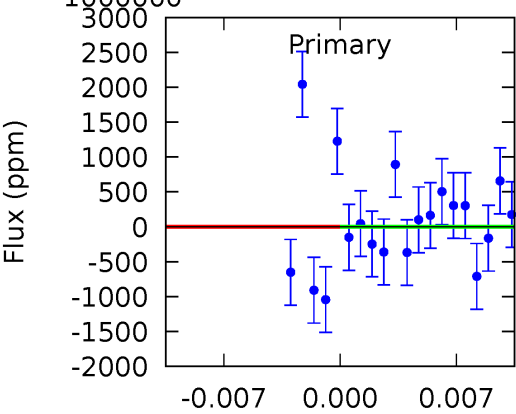
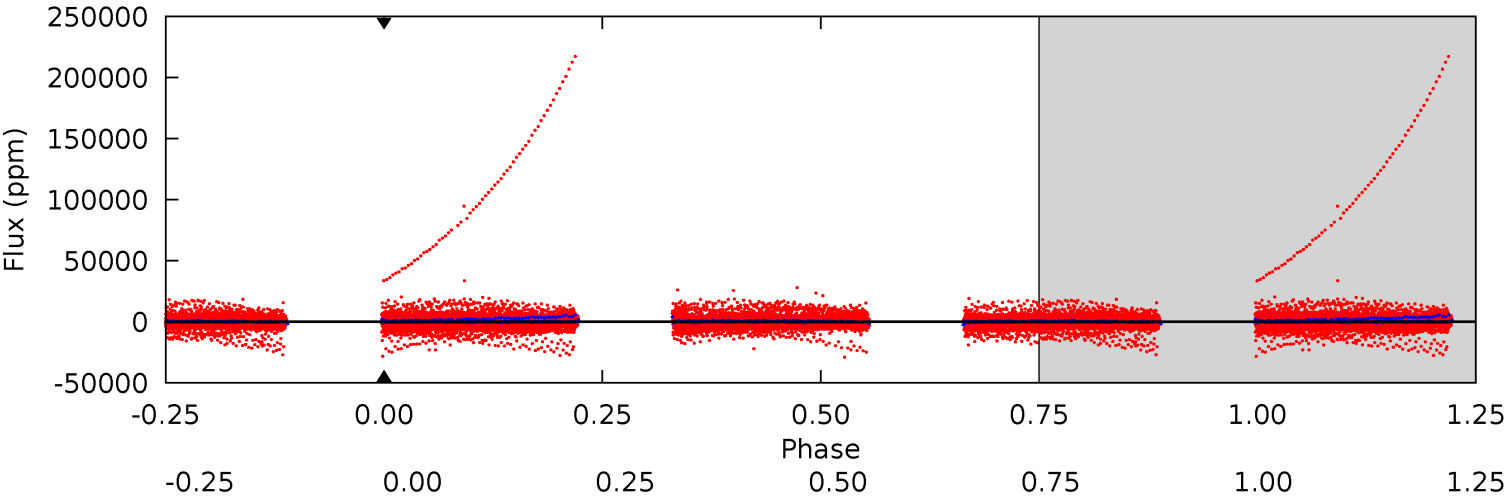
TCE 006863840-02   P= 5.779174 Days    $T_0=131.948146$  (BKJD)



# DV Model-Shift Uniqueness Test

006863840-02, P = 5.779174 Days, E = 132.028644 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

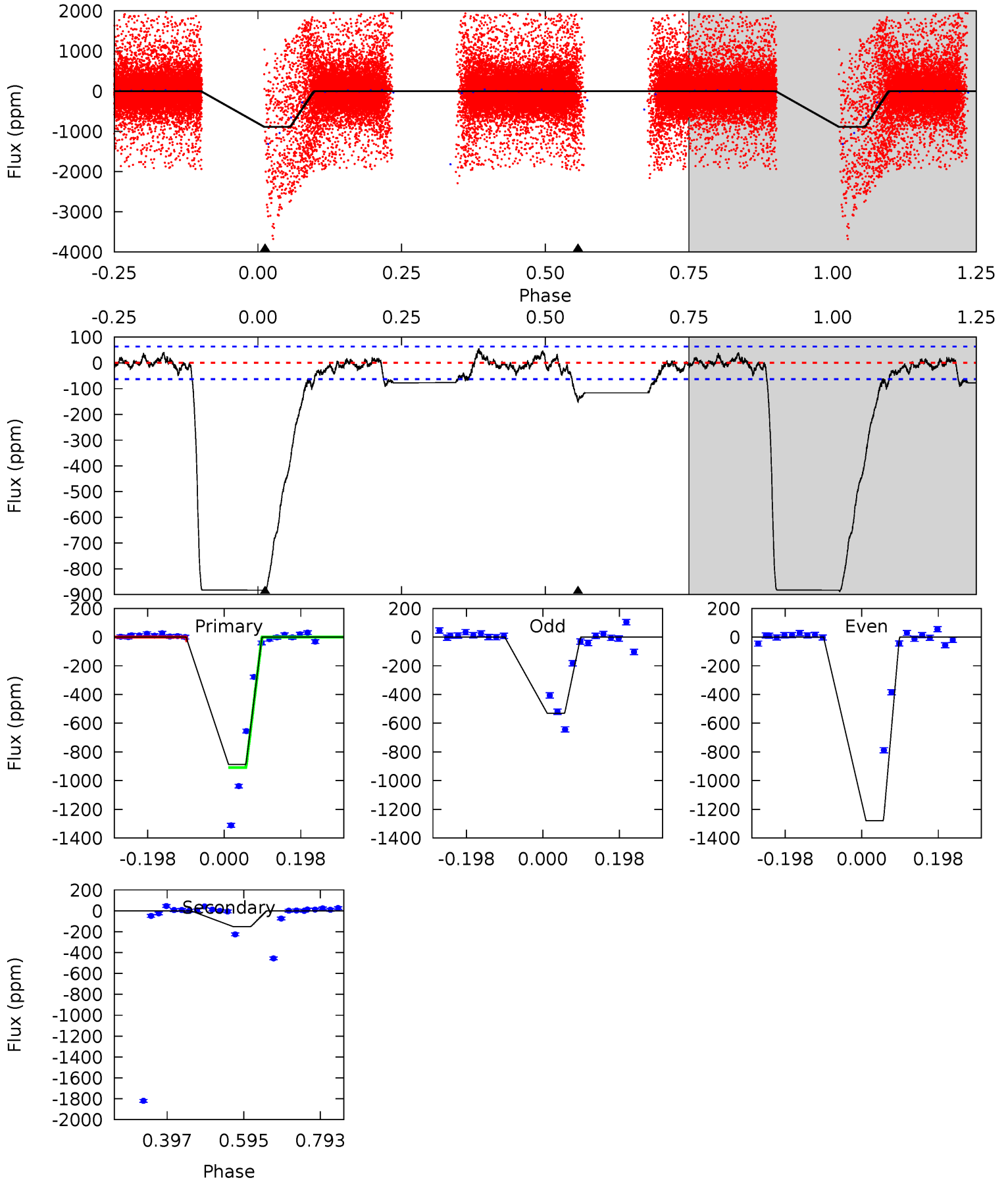




# Alt Model-Shift Uniqueness Test

006863840-02, P = 5.779174 Days, E = 131.948146 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
61.9	10.6	0	0	4.42	1.29	1.75	61.9	61.9	10.6	10.6	26.8	1.17	0.06	11.2





### Stellar Parameters For KIC 006863840

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5176^{+153}_{-153}$	$4.542^{+0.077}_{-0.063}$	$-0.280^{+0.300}_{-0.300}$	$0.760^{+0.080}_{-0.080}$	$0.735^{+0.098}_{-0.057}$	$2.356^{+0.755}_{-0.479}$
	+3%/-3%	+2%/-1%	+107%/-107%	+11%/-11%	+13%/-8%	+32%/-20%
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 006863840-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$13.69^{+7.99}_{-7.19}$	$1163^{+46}_{-46}$	$-3119^{+11055}_{-4549}$	$-12.194^{+1372.416}_{-1207.887}$
Alt.	$-151 \pm 14$	$6.69^{+6.95}_{-4.47}$	$1165^{+44}_{-51}$	$2751^{+1112}_{-499}$	$6.200^{+47.786}_{-4.739}$

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

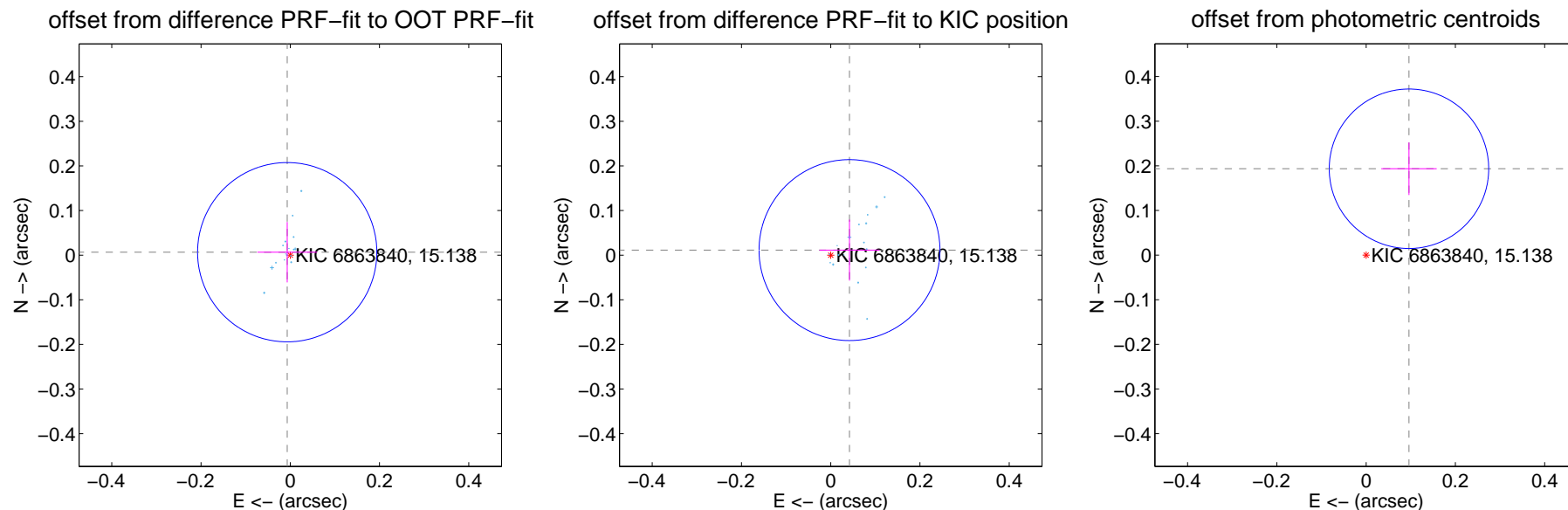
## DV Centroid Data

Supplemental centroid analysis for 006863840-02. Kepler magnitude: 15.14. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

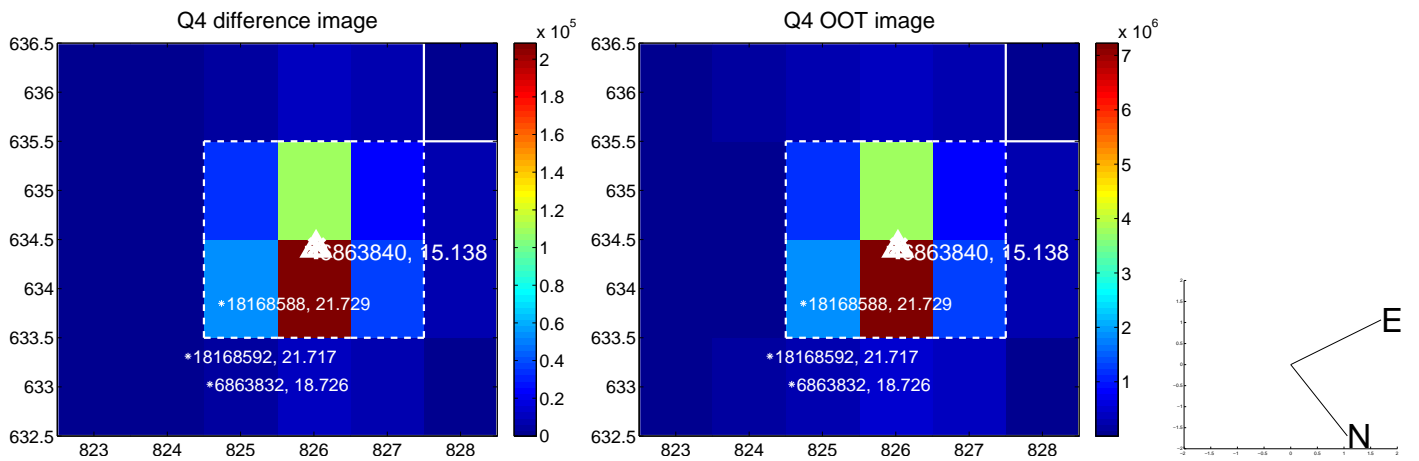
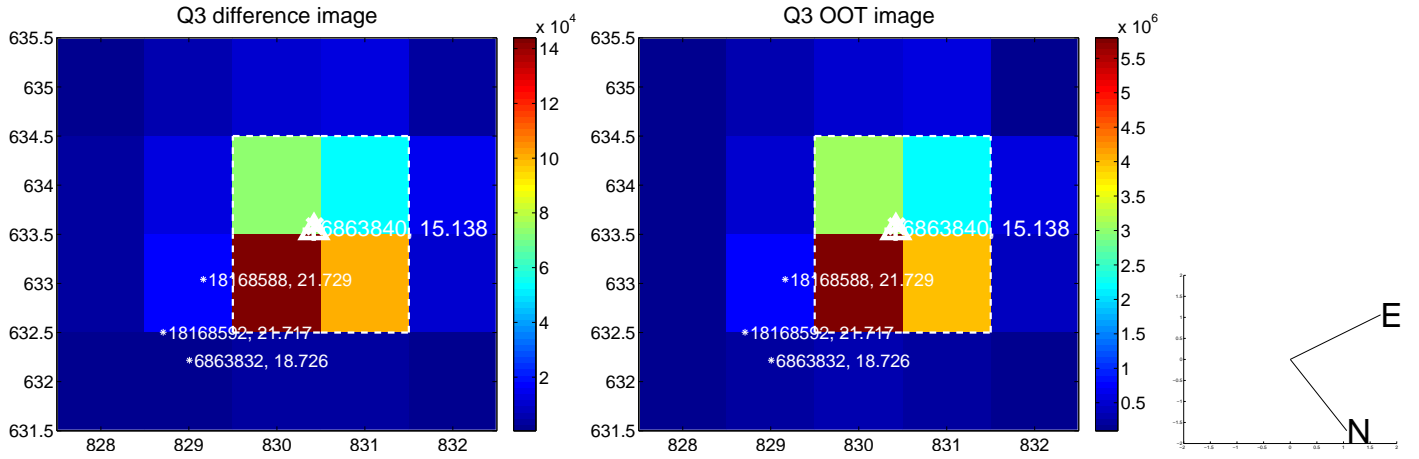
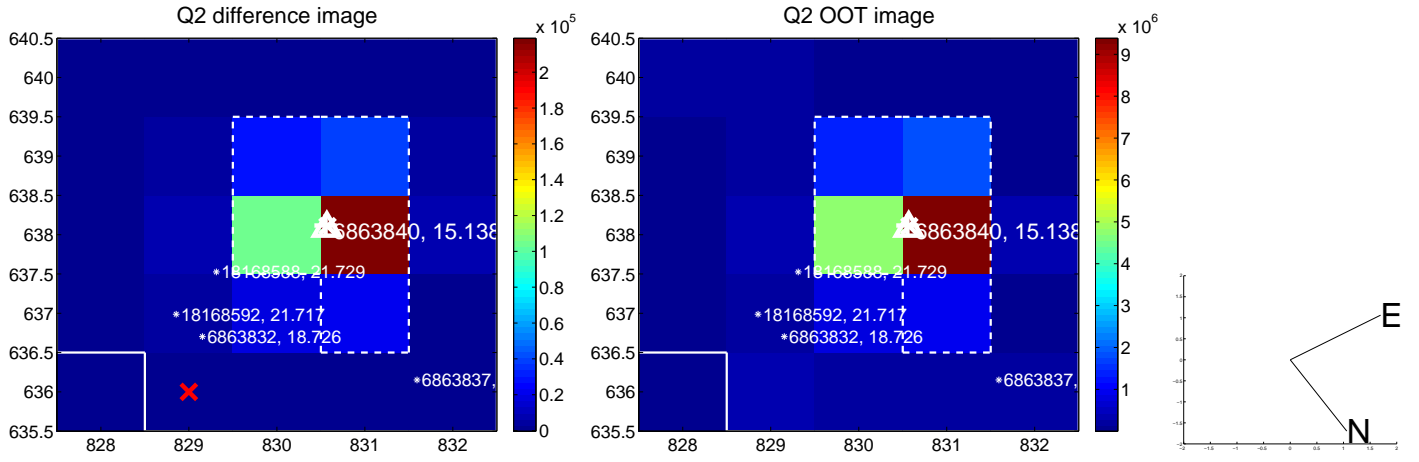
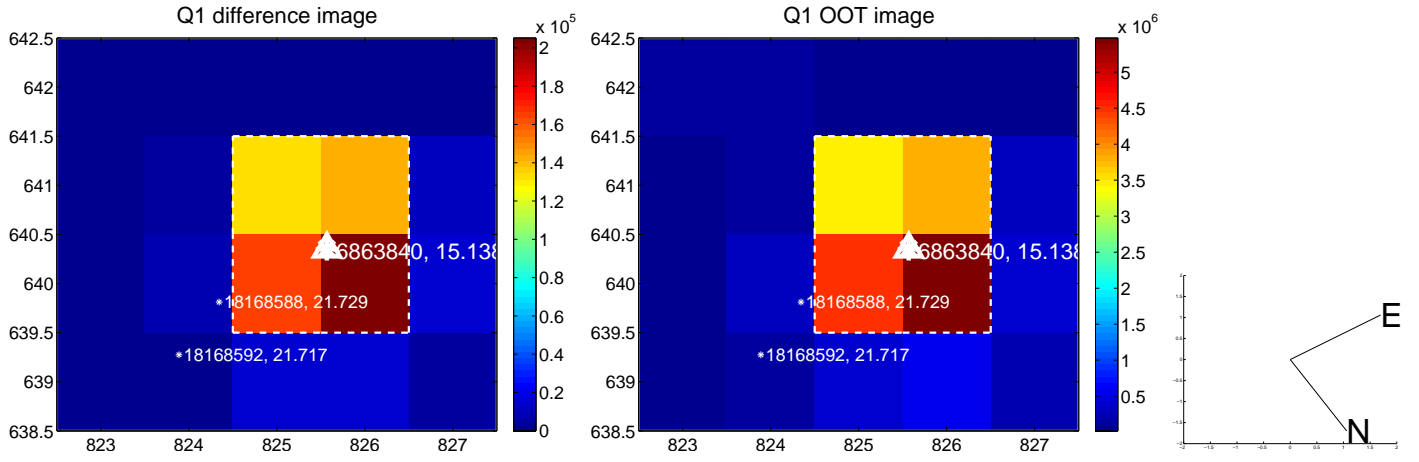
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.010 \pm 0.067$	0.14	$0.007 \pm 0.067$	$0.007 \pm 0.068$
PRF-fit source offset from KIC position	$0.044 \pm 0.068$	0.64	$-0.042 \pm 0.067$	$0.011 \pm 0.068$
photometric centroid source offset	$0.22 \pm 0.06$	<b>3.63</b>	$-0.10 \pm 0.06$	$0.19 \pm 0.06$

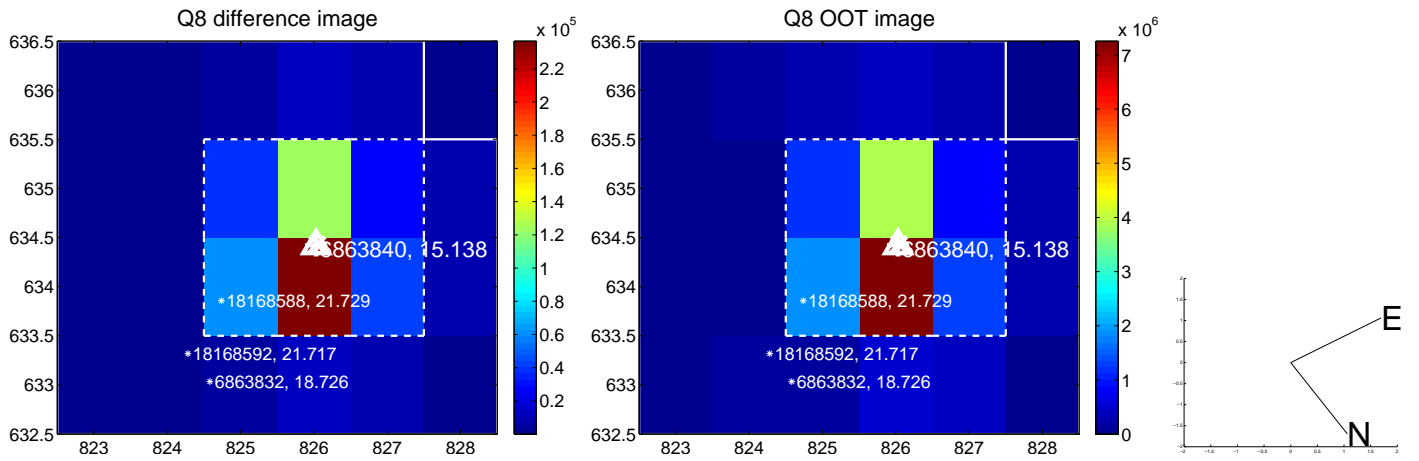
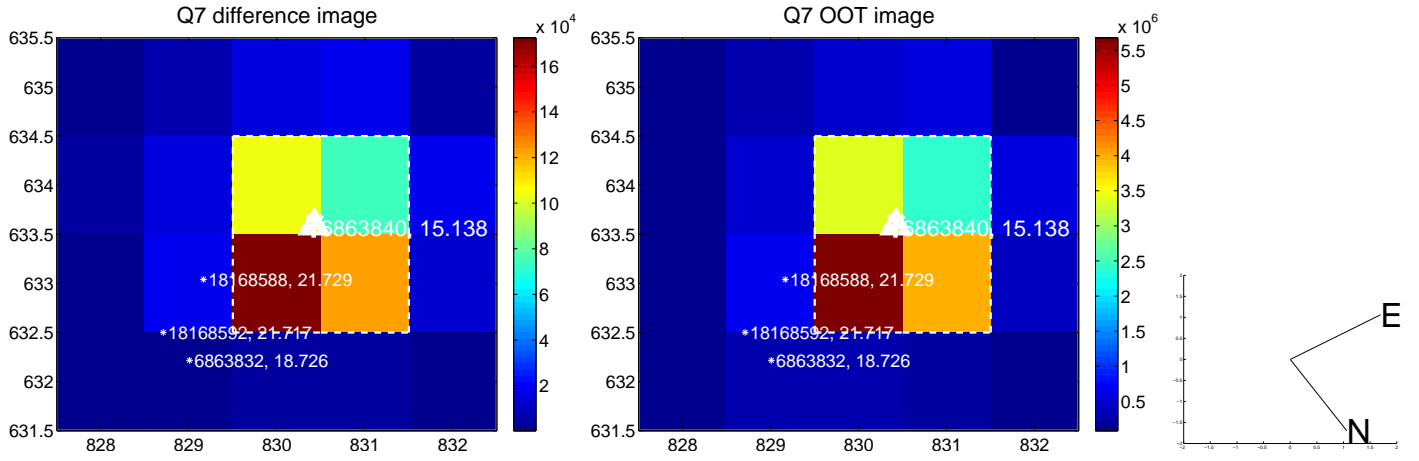
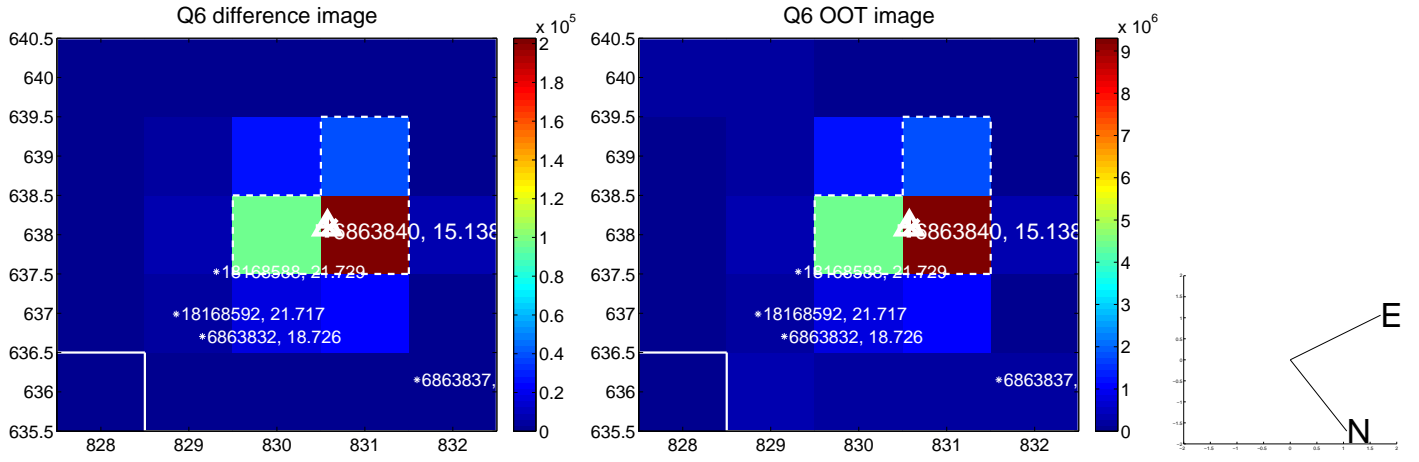
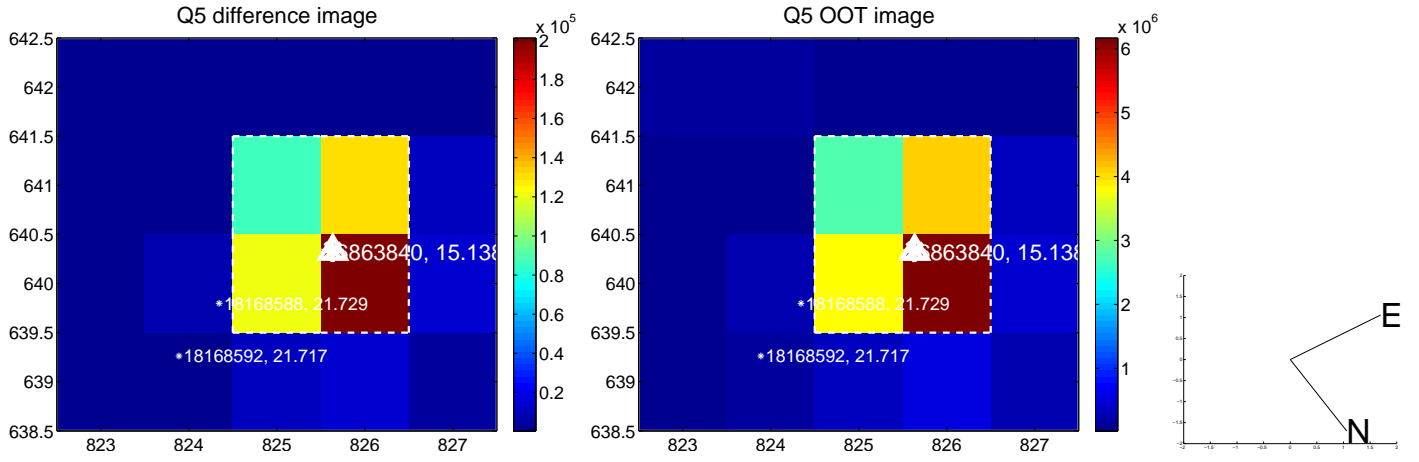


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

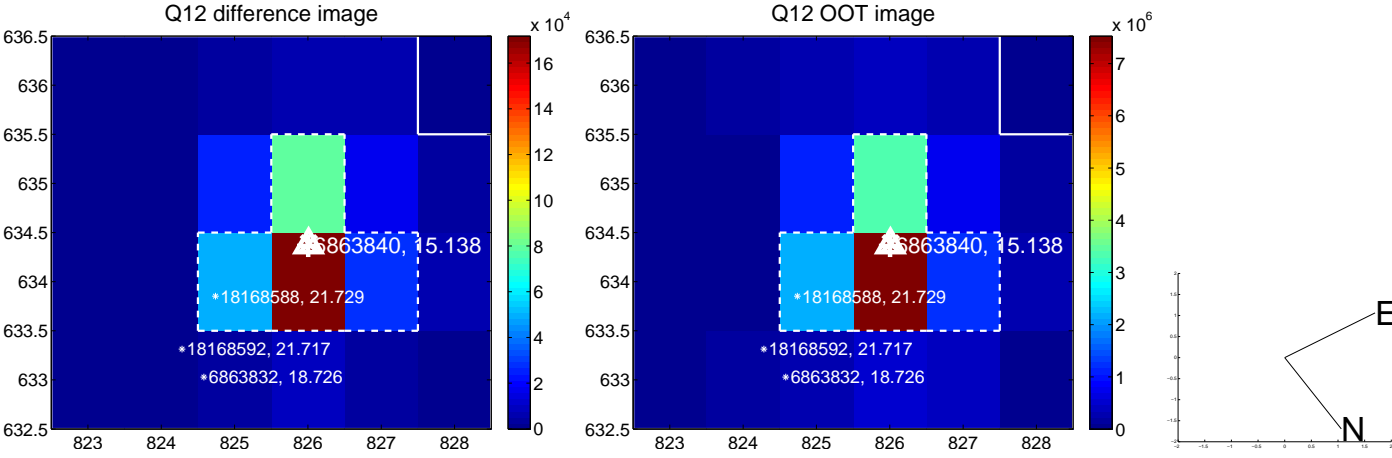
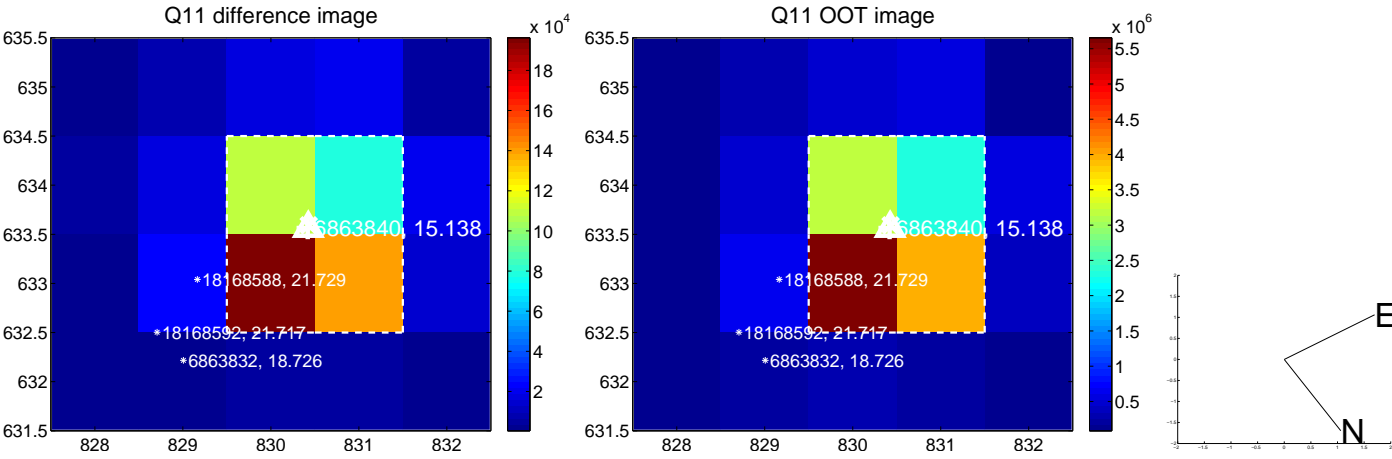
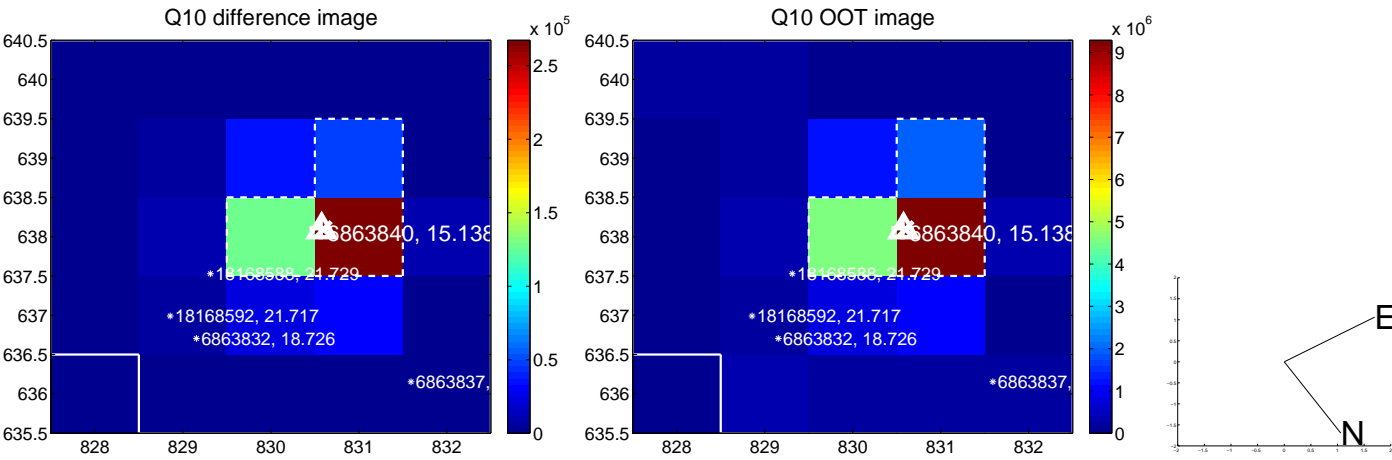
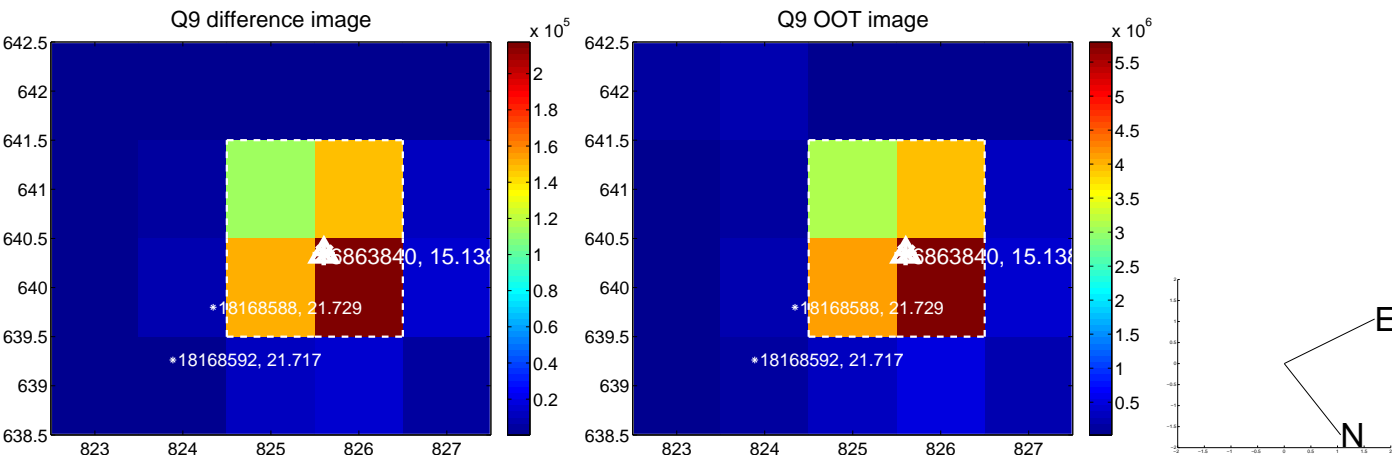
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



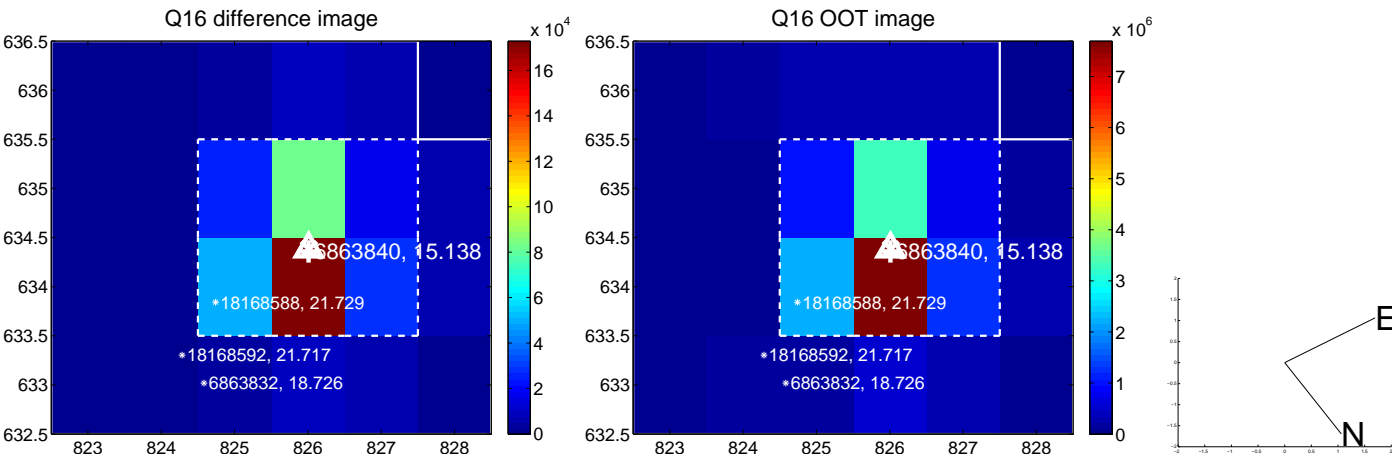
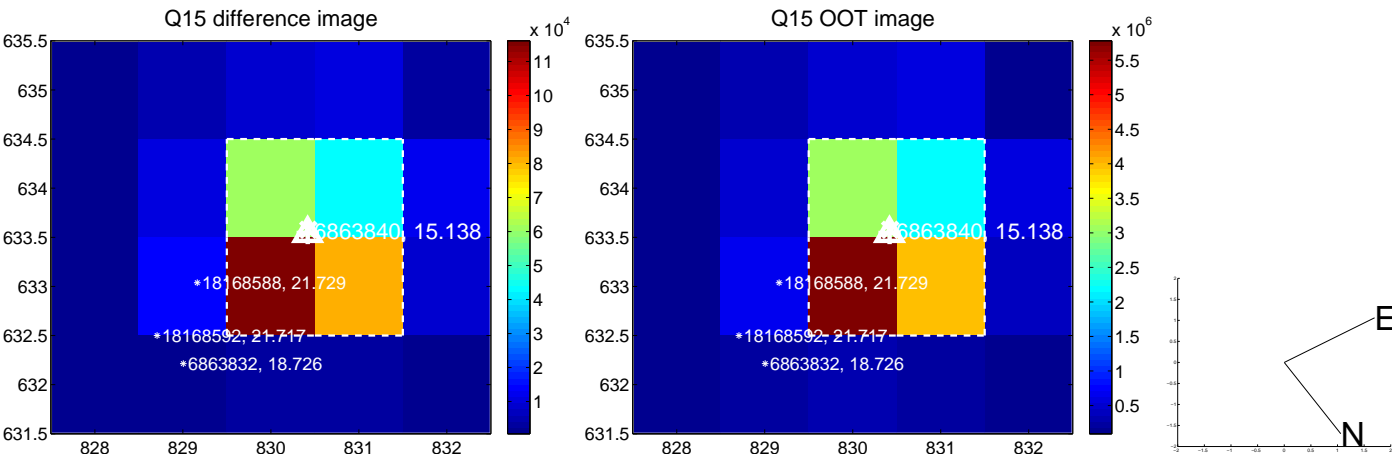
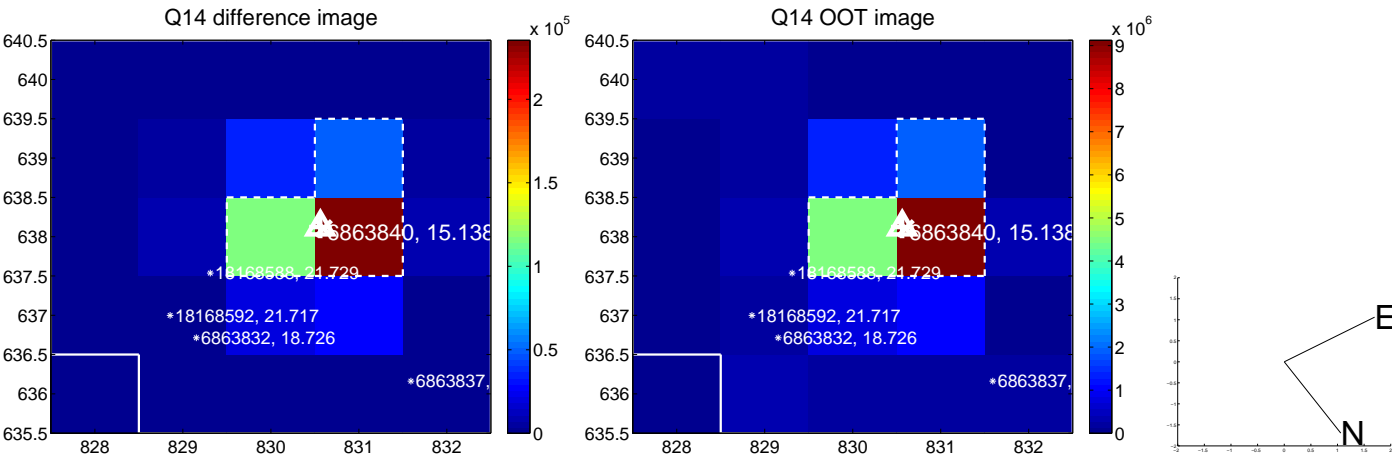
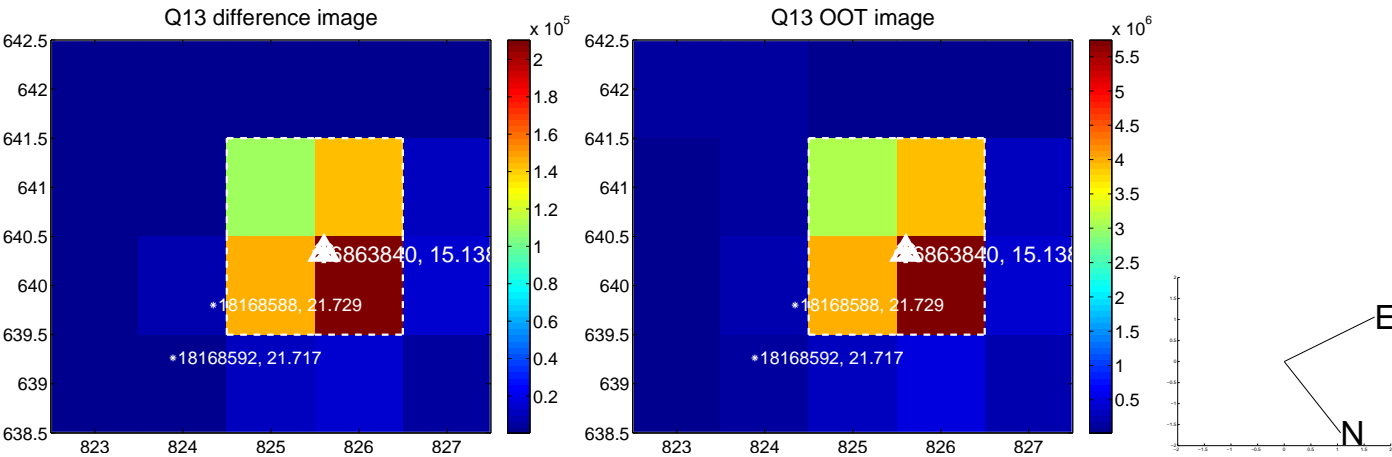
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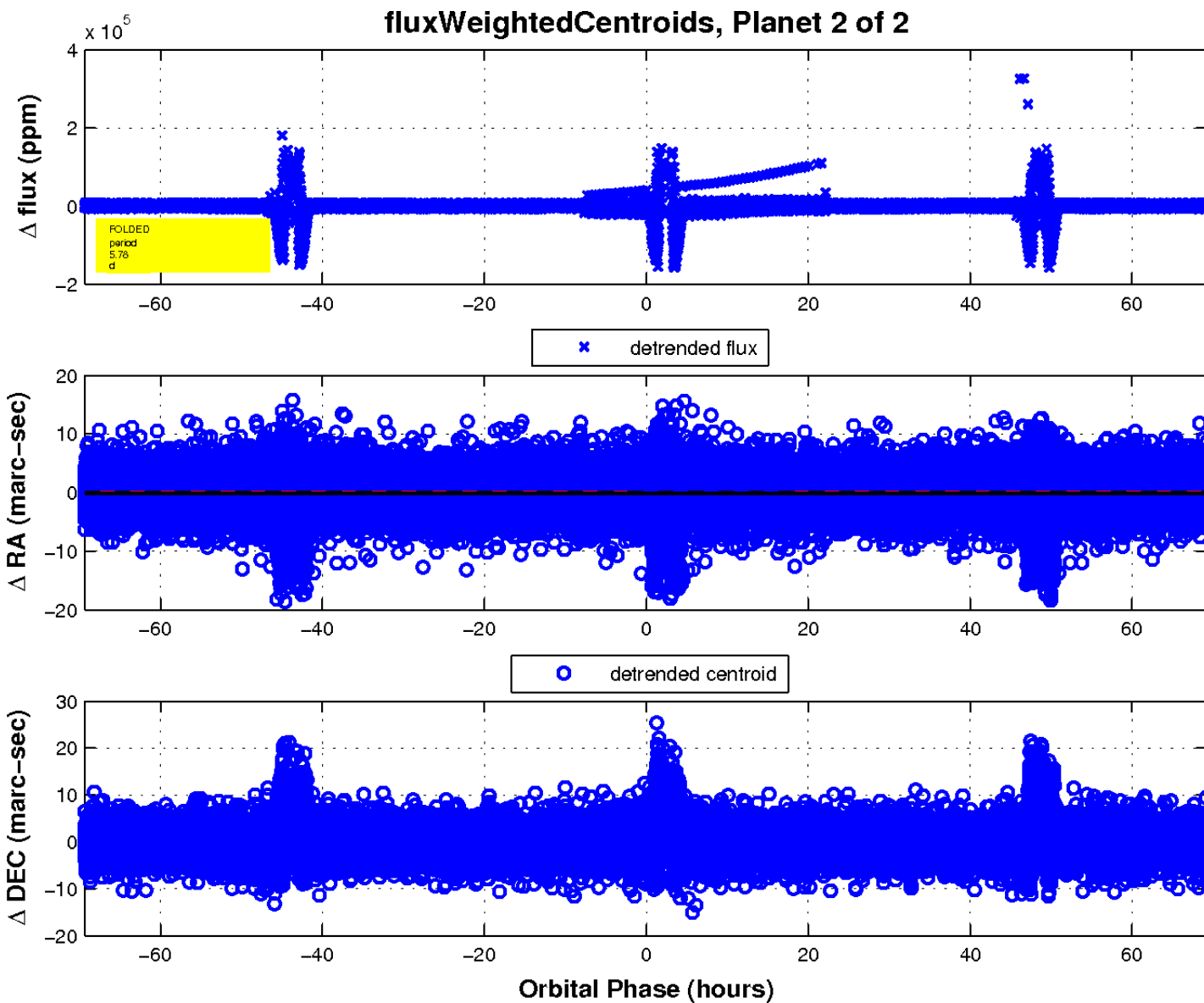
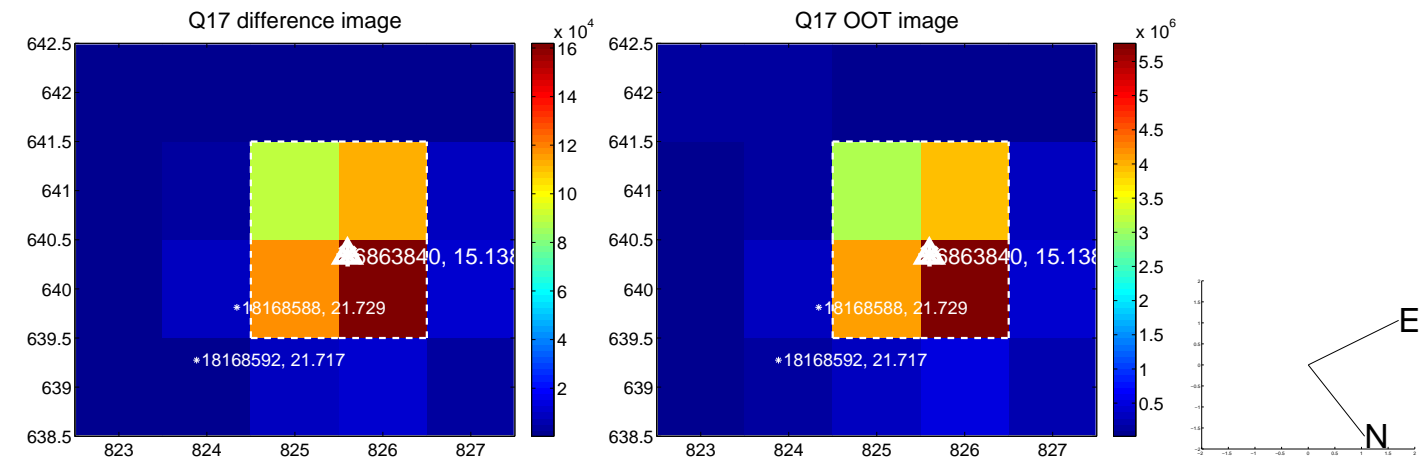
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

