

# KIC 008621353

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008621353-01	OBS	3682.01	11.344343	138.812505	252625.9	6.110	631.0	433.4	1.00	5780	66.04	102.38
008621353-02	OBS	No	11.344383	132.536425	76136.5	3.469	154.4	145.0	1.00	5780	40.82	102.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008621353-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
008621353-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

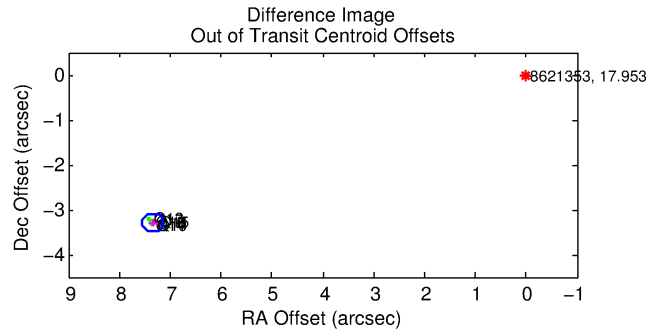
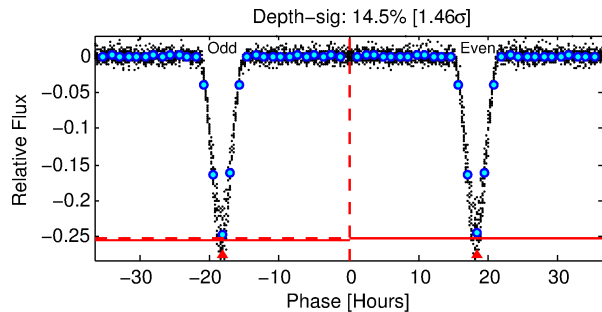
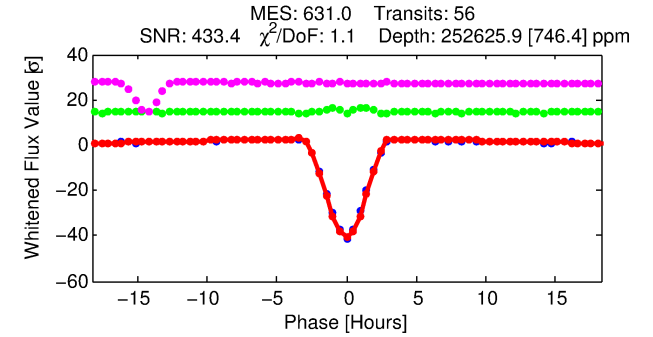
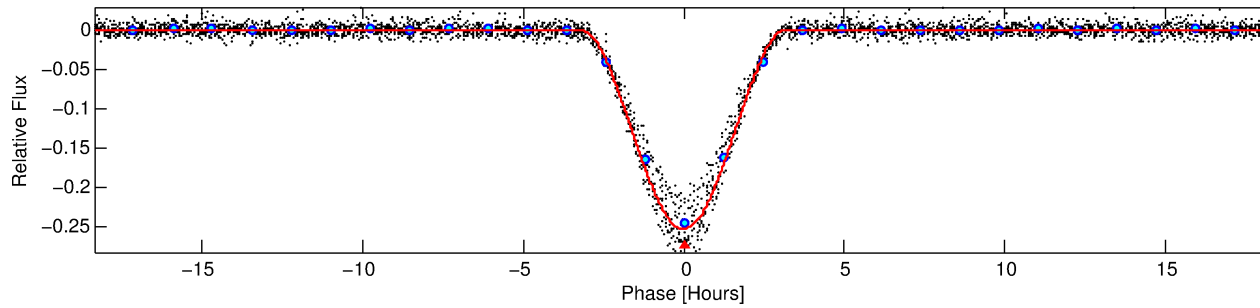
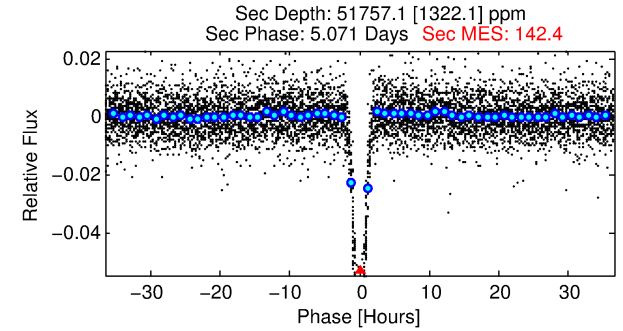
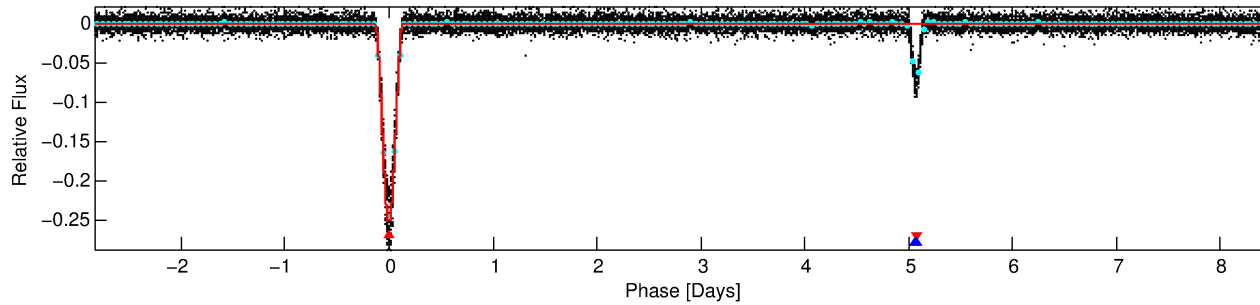
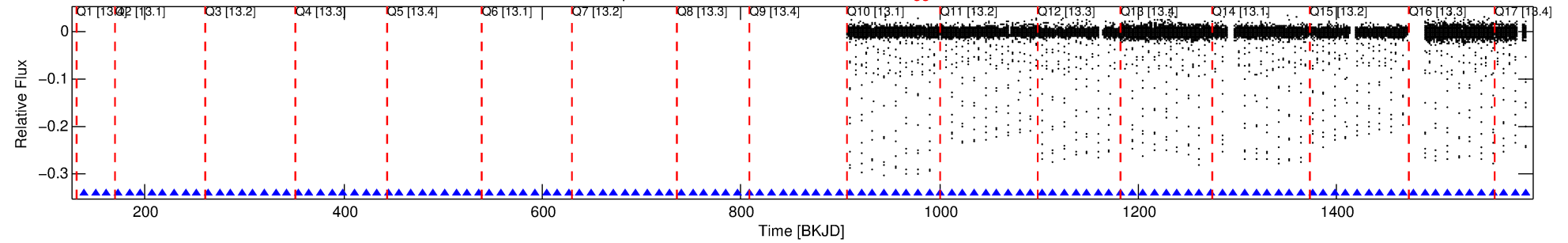
## Ephemeris Match Information For 008621353-01

No Significant Match Found

# DV One-Page Summary

KIC: 8621353 Candidate: 1 of 2 Period: 11.344 d  
KOI: K03682.01 Corr: 0.989

Kp: 17.95 R\*: 1.00 Rs Teff: 5780.0 K Logg: 4.44 Fe/H: 0.000



## DV Fit Results:

Period = 11.34434 [0.00001] d  
Epoch = 138.8125 [0.0007] BKJD  
Rp/R\* = 0.6052 [0.1170]  
a/R\* = 20.11 [0.64]  
b = 0.76 [0.18]  
Seff = 102.38 [0.00]  
Teq = 811 [0] K  
Rp = 66.04 [12.77] Re  
a = 0.0988 [0.0000] AU  
Ag = 63.76 [24.71] [2.54σ]  
Teffp = 3544 [343] K [7.96σ]

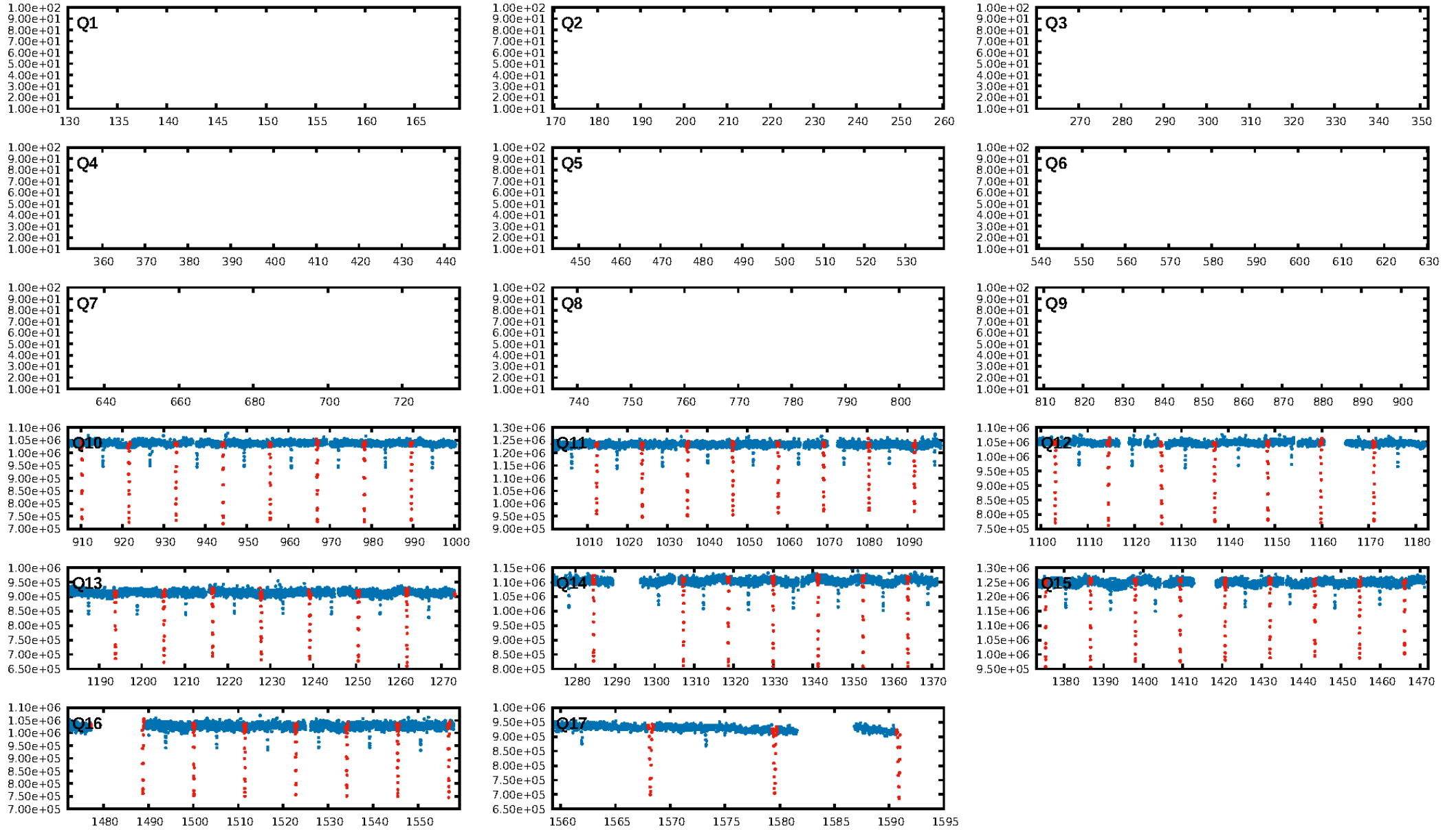
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [53/53]  
GhostDiagnostic-chr: 1.719  
Centroid-sig: 0.0%  
Centroid-so: 5.241 arcsec [3470.13σ]  
OotOffset-rm: 8.044 arcsec [116.73σ]  
KicOffset-rm: 0.865 arcsec [11.80σ]  
OotOffset-st: 2/2/2/2 [8]  
KicOffset-st: 2/2/2/2 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [8/8]

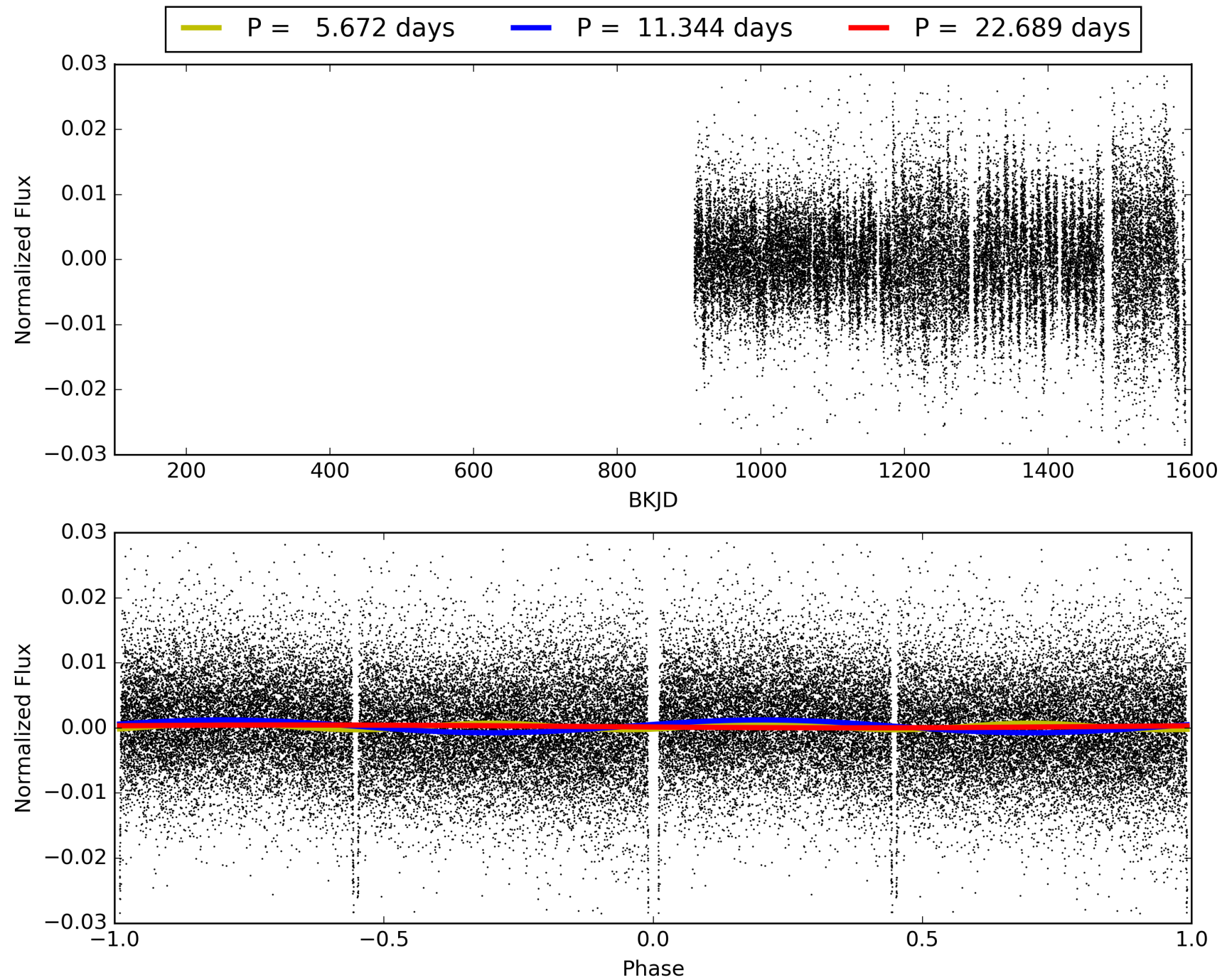
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:42:38 Z

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

# TCE 008621353-01, PDC Light Curves

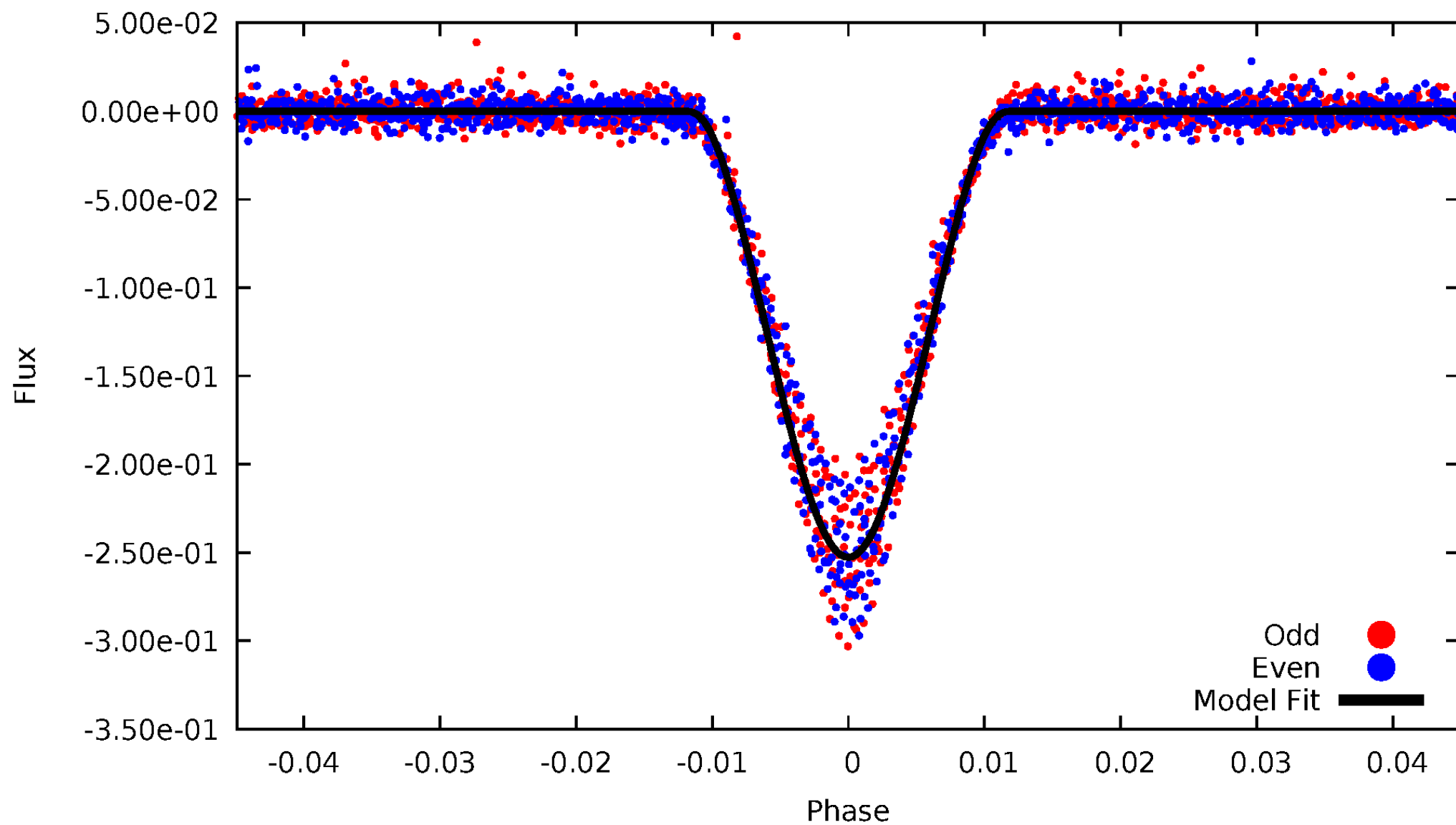


TCE 008621353-01



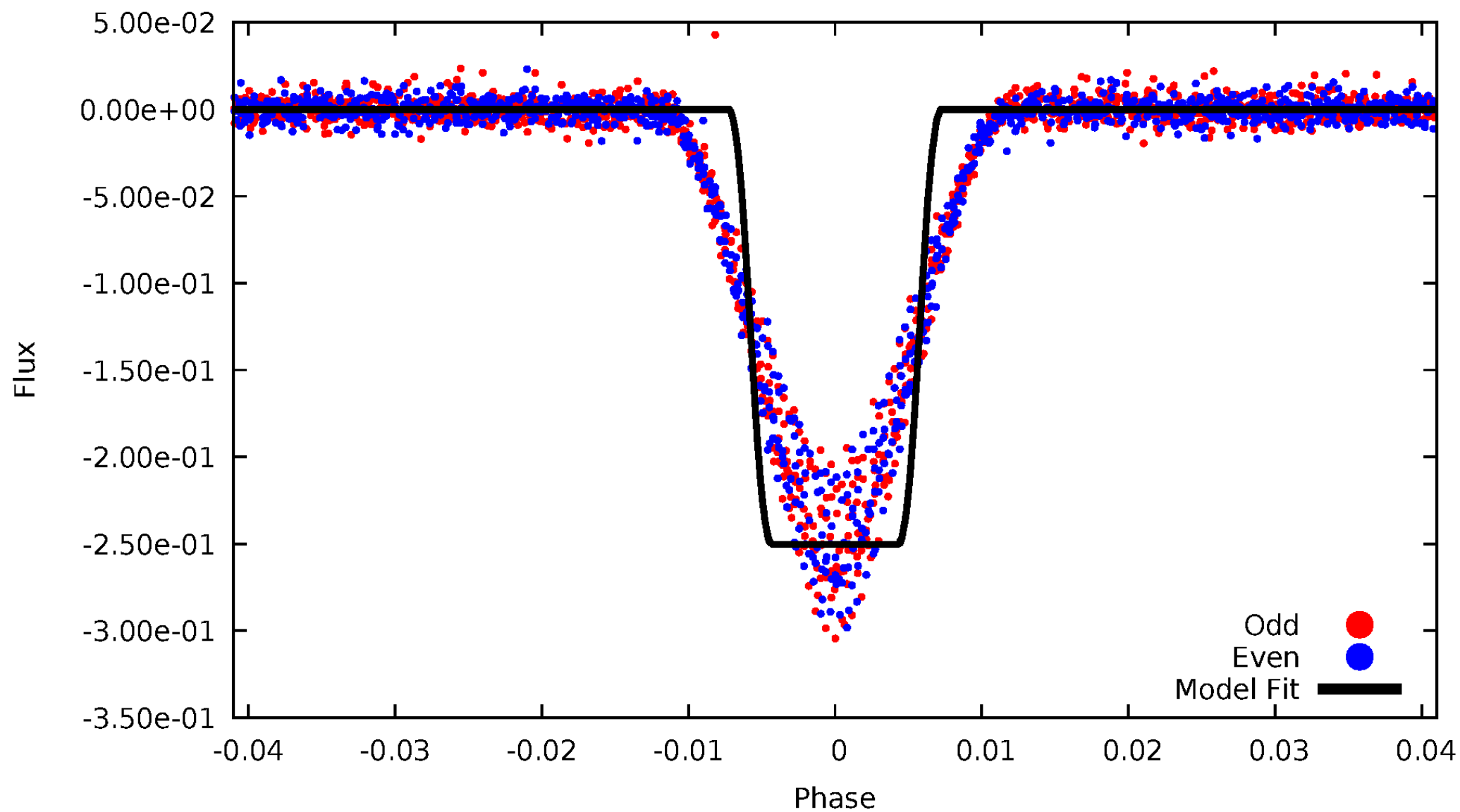
# DV Odd/Even

TCE 008621353-01



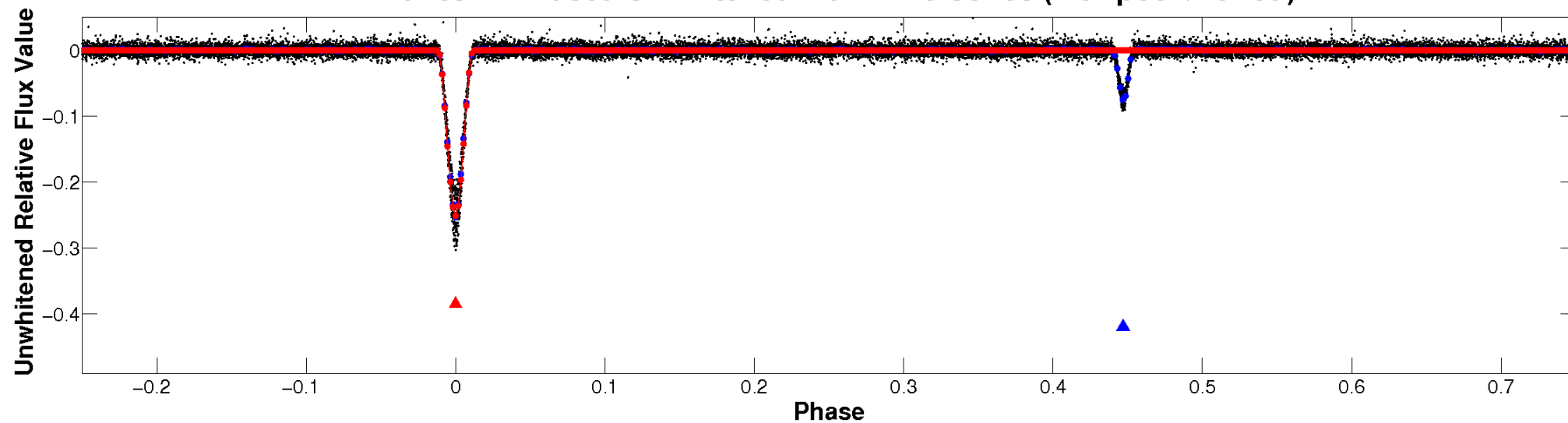
# ALT Odd/Even

TCE 008621353-01

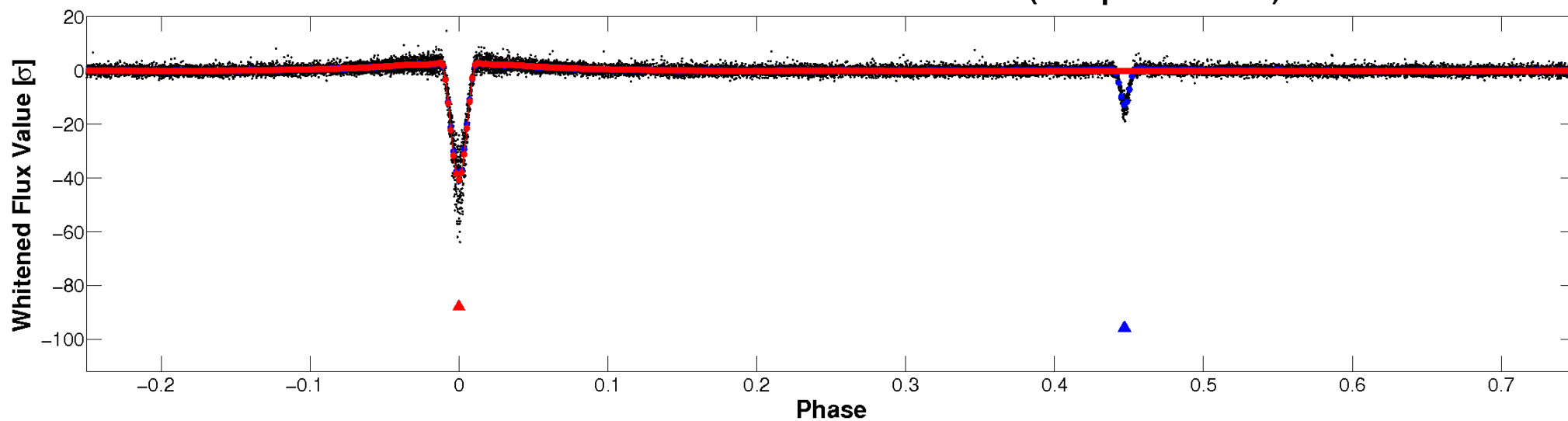


# Non-Whitened Vs. Whitened Light Curve

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

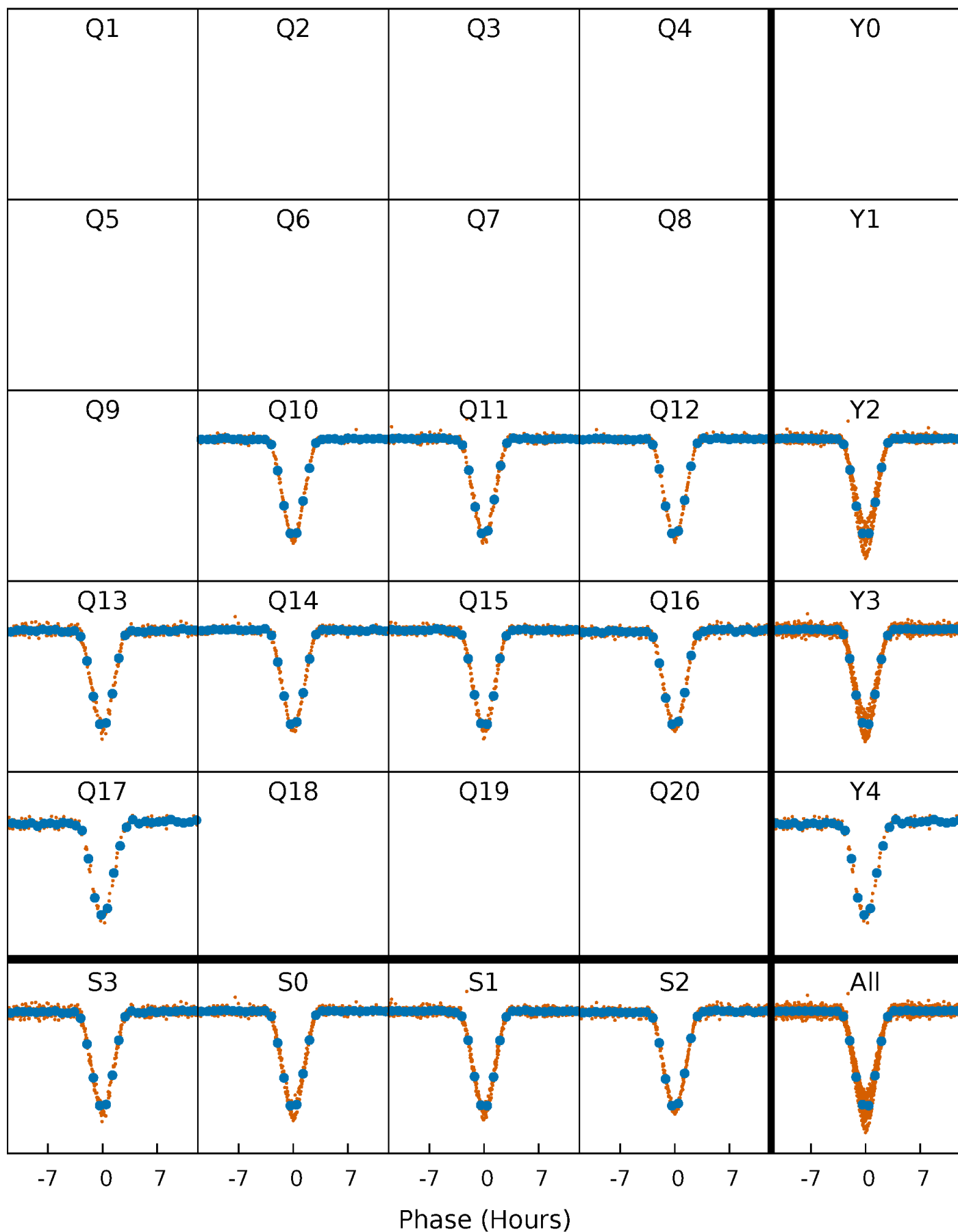


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

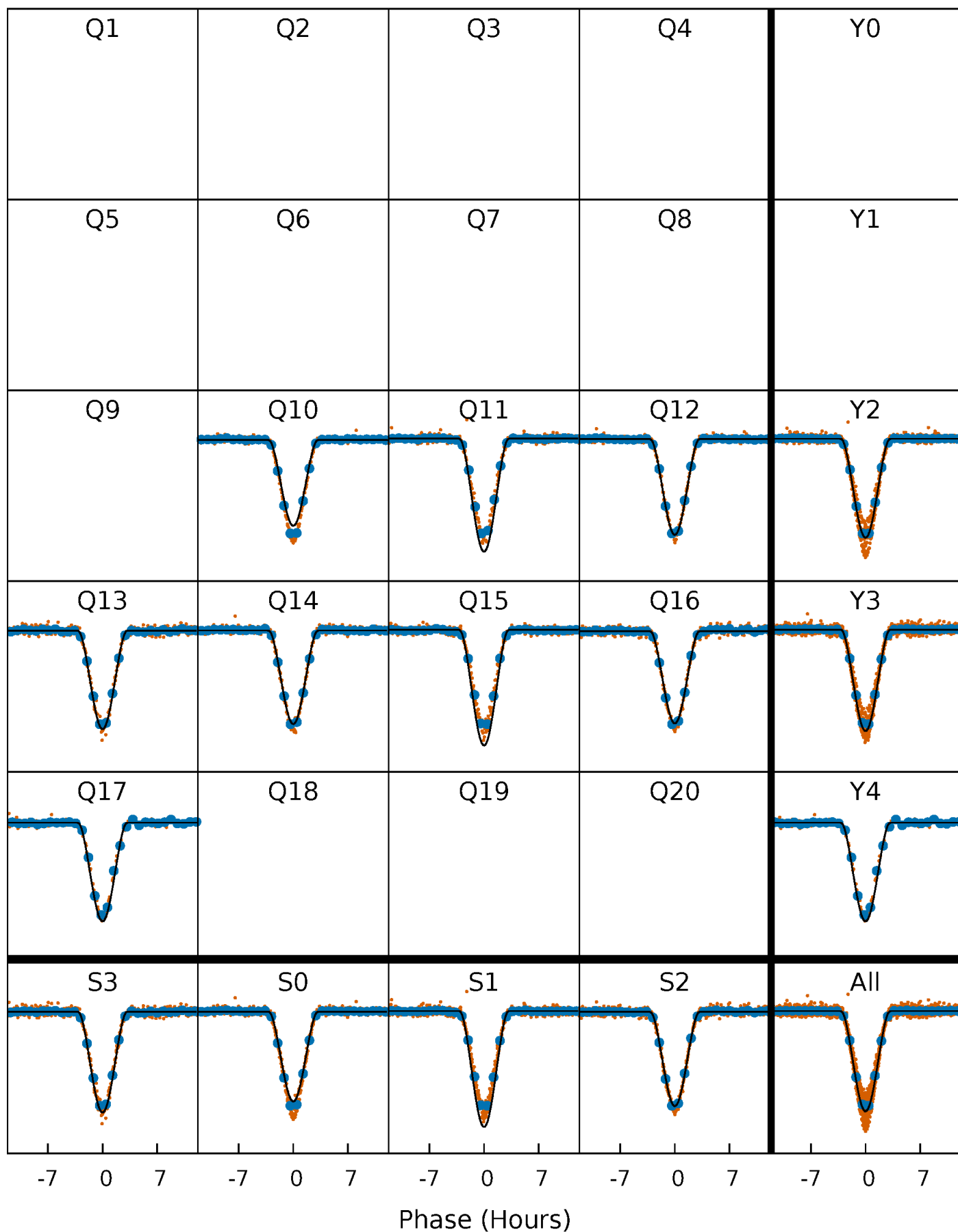
TCE 008621353-01 P= 11.344343 Days  $T_0=138.812505$  (BKJD)





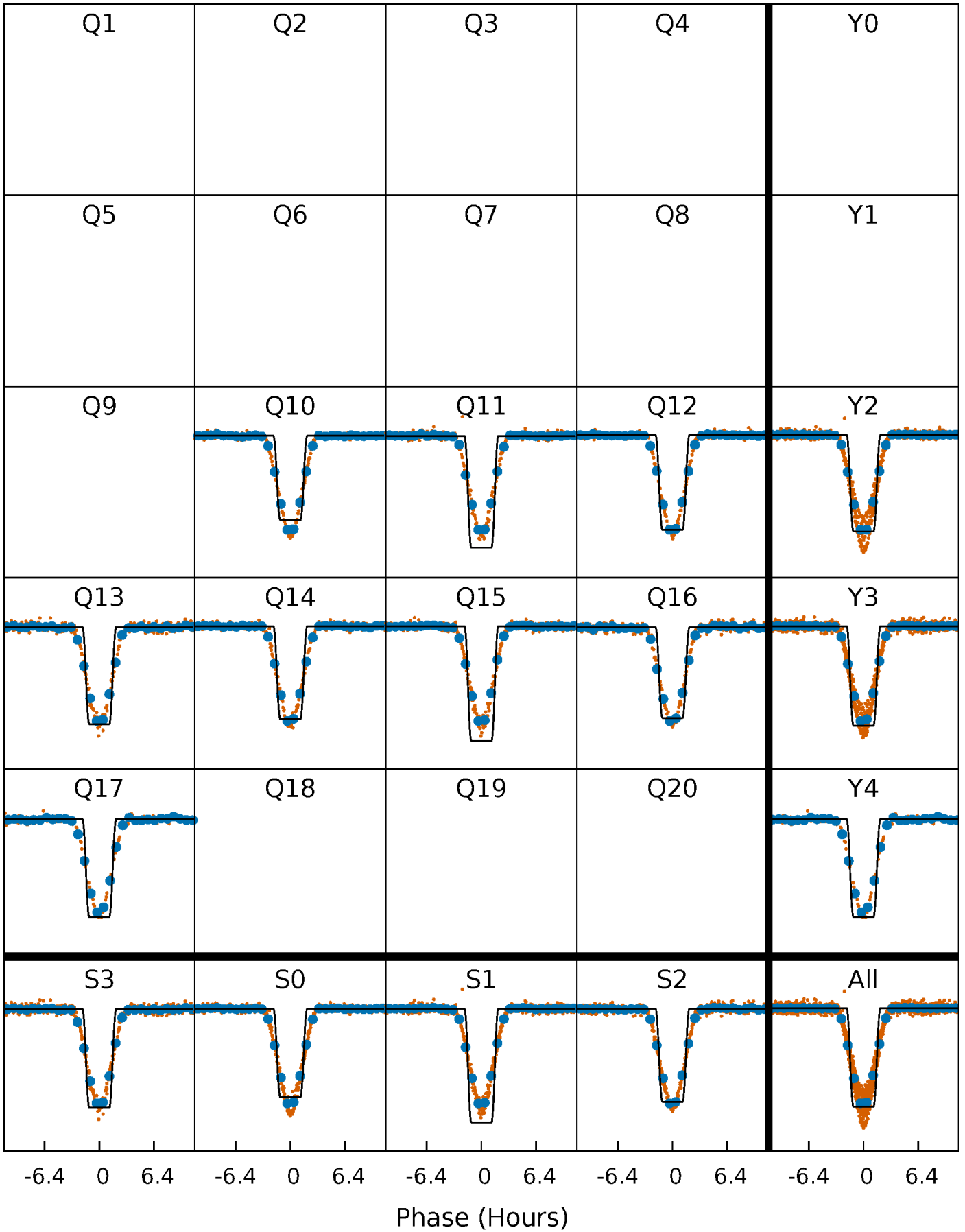
# DV Quarter-Phased Transit Curves

TCE 008621353-01 P= 11.344343 Days  $T_0=138.812505$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

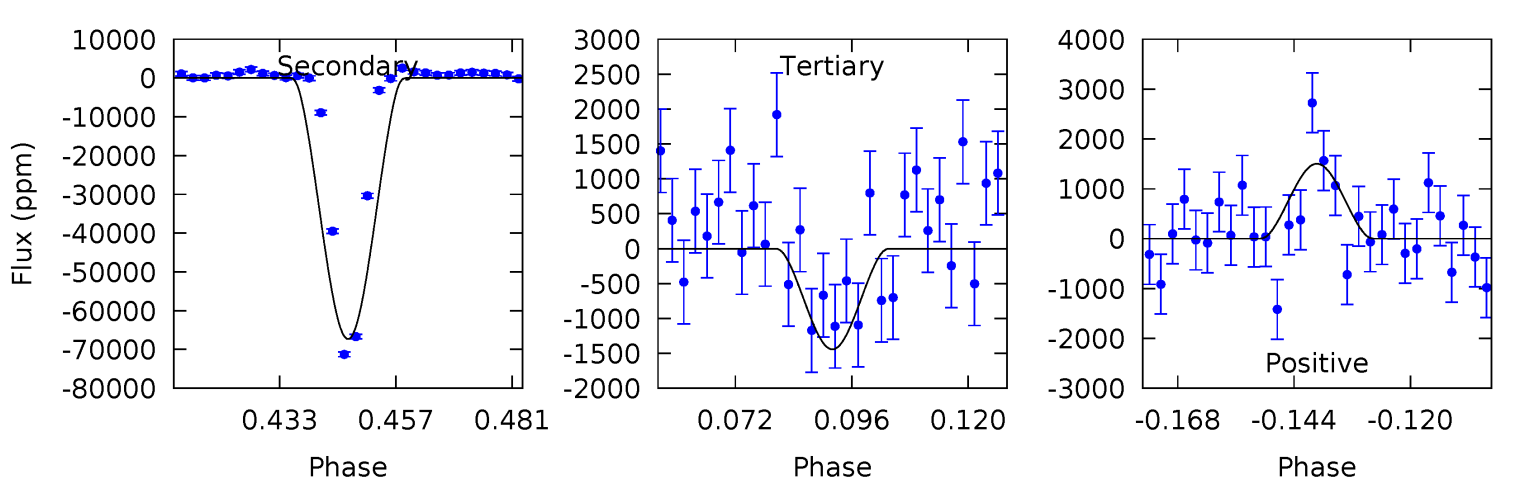
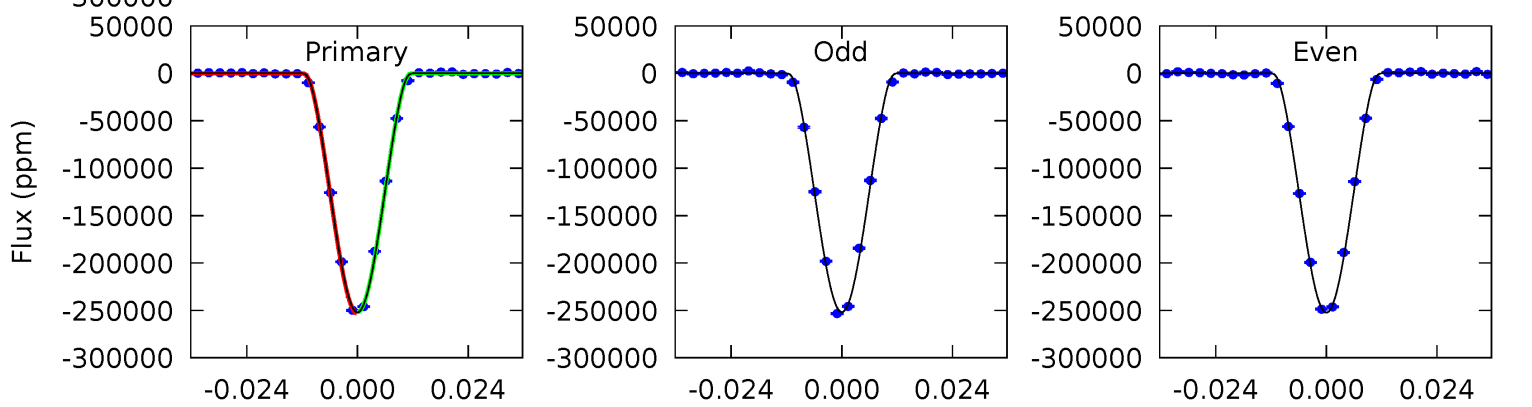
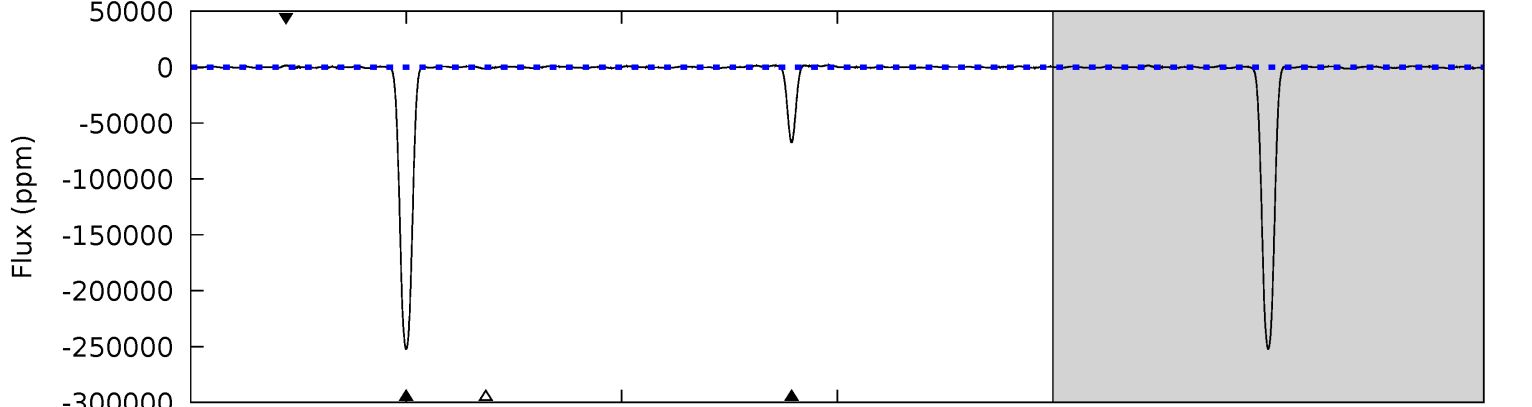
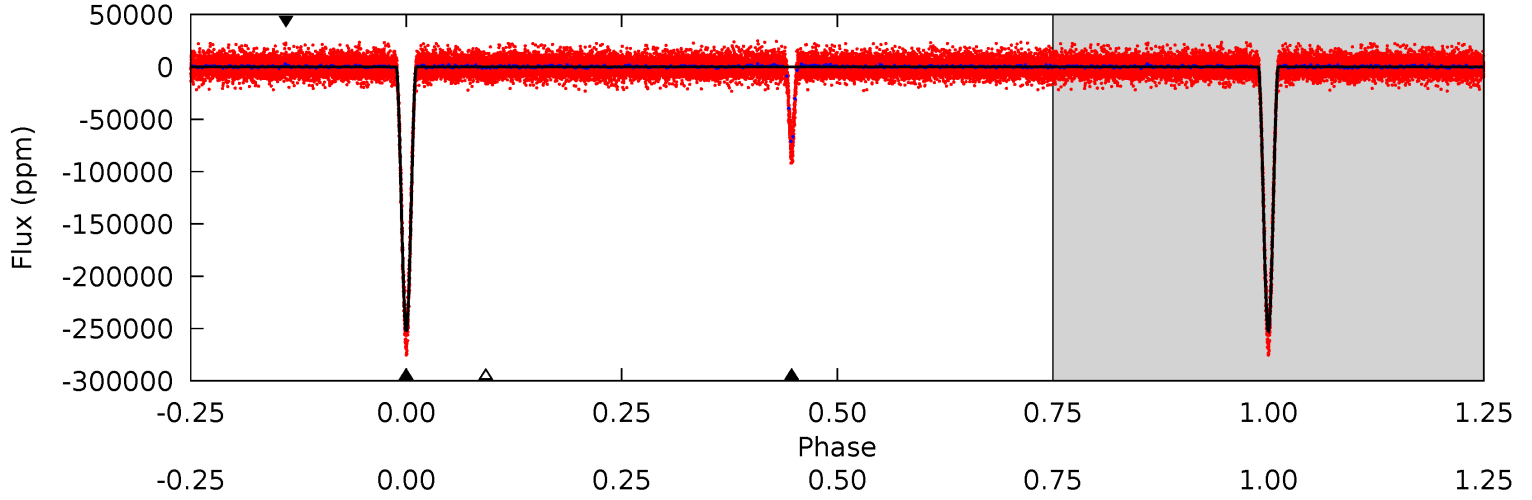
TCE 008621353-01 P= 11.344360 Days  $T_0=138.810856$  (BKJD)



# DV Model-Shift Uniqueness Test

008621353-01, P = 11.344343 Days, E = 138.812505 Days

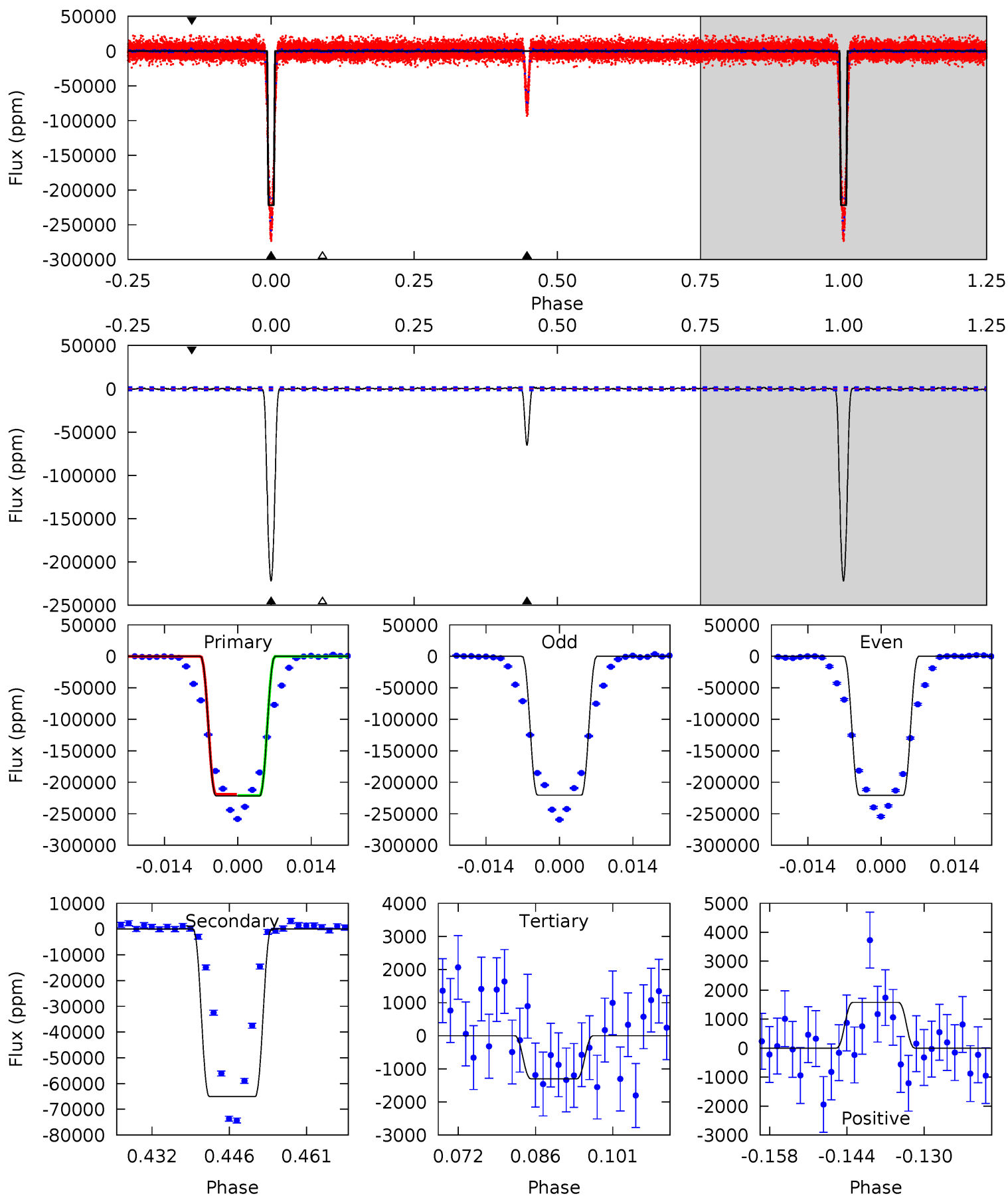
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1055	281.6	6.03	6.29	4.86	2.26	2.12	1049	1048	275.6	275.3	1.06	0.98	0.01	0



# Alt Model-Shift Uniqueness Test

008621353-01, P = 11.344360 Days, E = 138.810856 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
623.9	183.1	3.66	4.44	4.96	2.45	1.28	620.2	619.4	179.4	178.6	0.34	0.98	0.01	0



### Stellar Parameters For KIC 008621353

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5780^{+1}_{-1}$	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008621353-01 / KOI 3682.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-67307 \pm 239$	$66.68^{+14.30}_{-13.65}$	$1136^{+51}_{-55}$	$4129^{+365}_{-291}$	$88^{+51}_{-28}$
Alt.	$-65072 \pm 355$	$54.52^{+13.66}_{-13.35}$	$1137^{+56}_{-51}$	$4421^{+532}_{-363}$	$124^{+97}_{-44}$

$T_{\text{max}}$  = 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

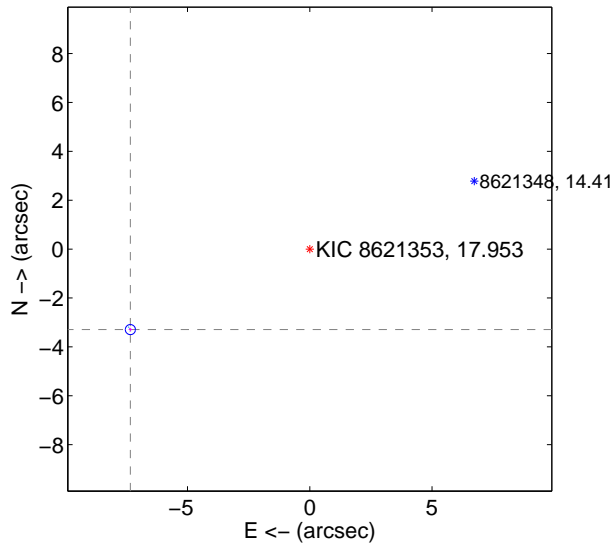
Supplemental centroid analysis for 008621353-01. Kepler magnitude: 17.95. Transit SNR 433.37

There are 8 quarters with good PRF difference image offsets

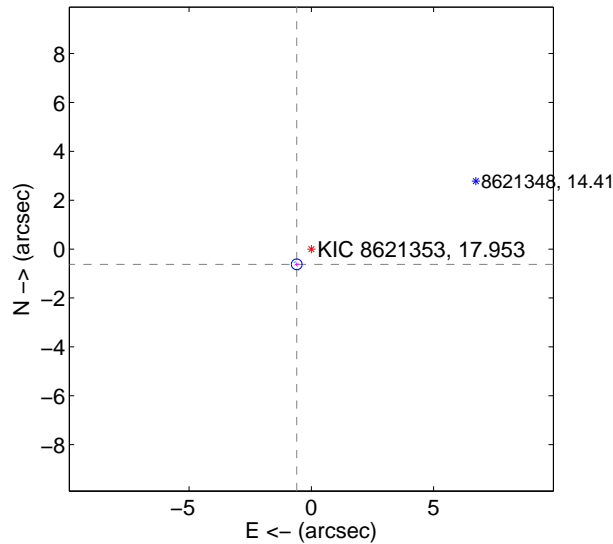
The OOT PRF centroid is offset from the target star catalog position by about 7.25 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$8.044 \pm 0.069$	<b>116.73</b>	$7.339 \pm 0.069$	$-3.293 \pm 0.071$
PRF-fit source offset from KIC position	$0.865 \pm 0.073$	<b>11.80</b>	$0.599 \pm 0.072$	$-0.623 \pm 0.074$
photometric centroid source offset	$5.24 \pm 0.00$	<b>3470.13</b>	$-4.95 \pm 0.00$	$1.73 \pm 0.00$

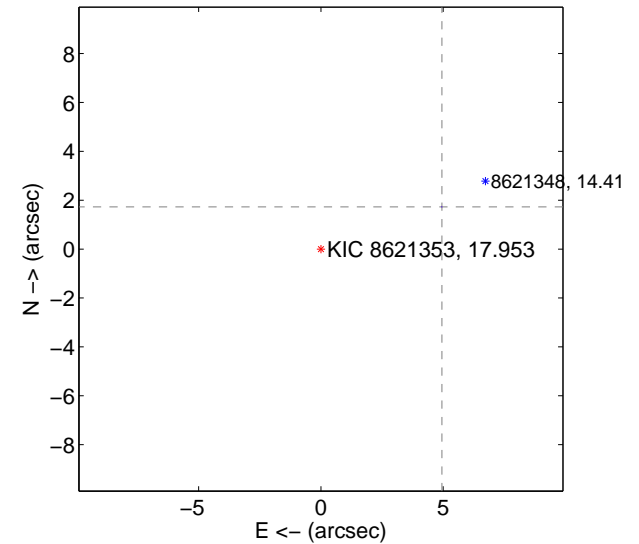
offset from difference PRF-fit to OOT PRF-fit



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.

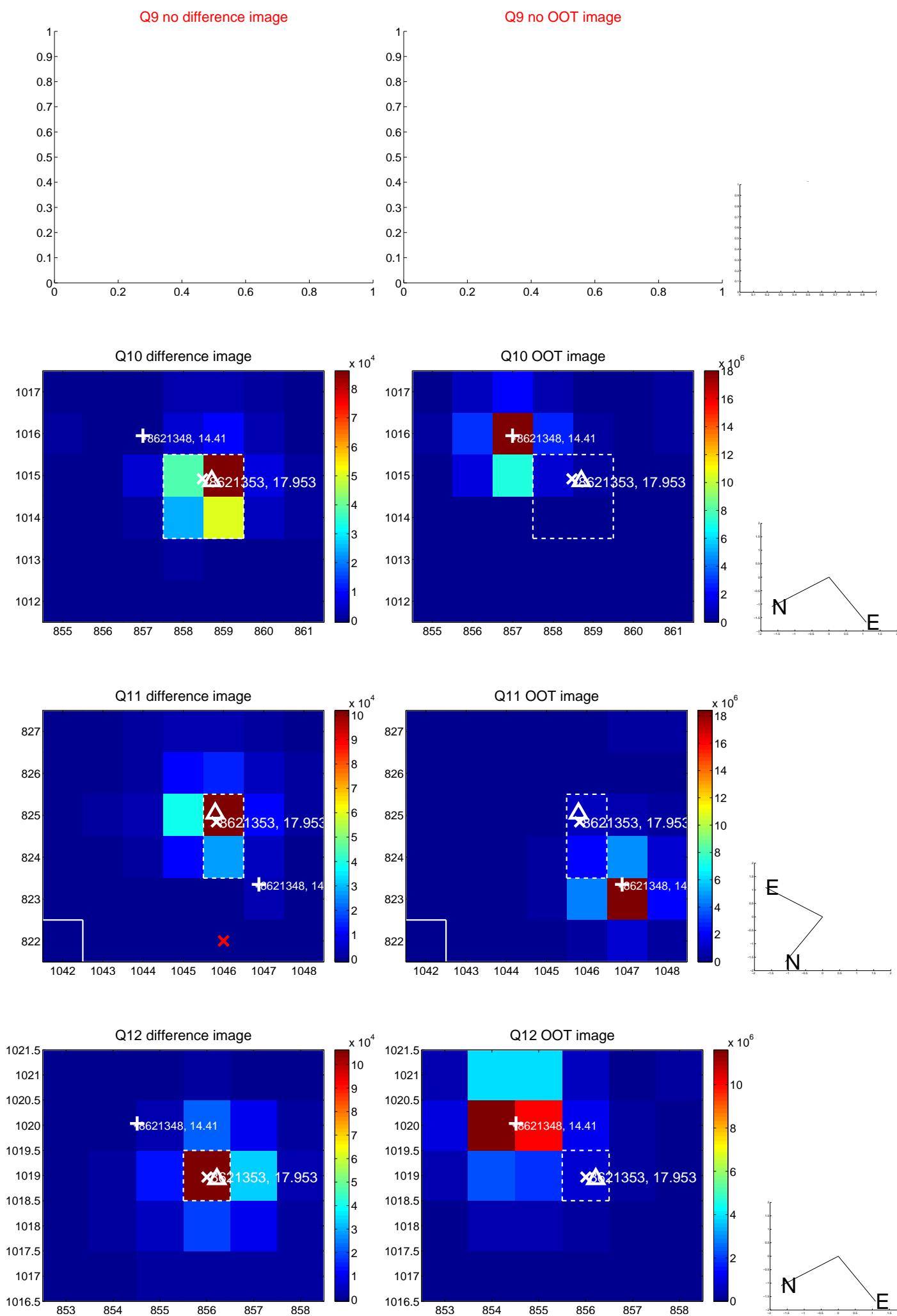


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

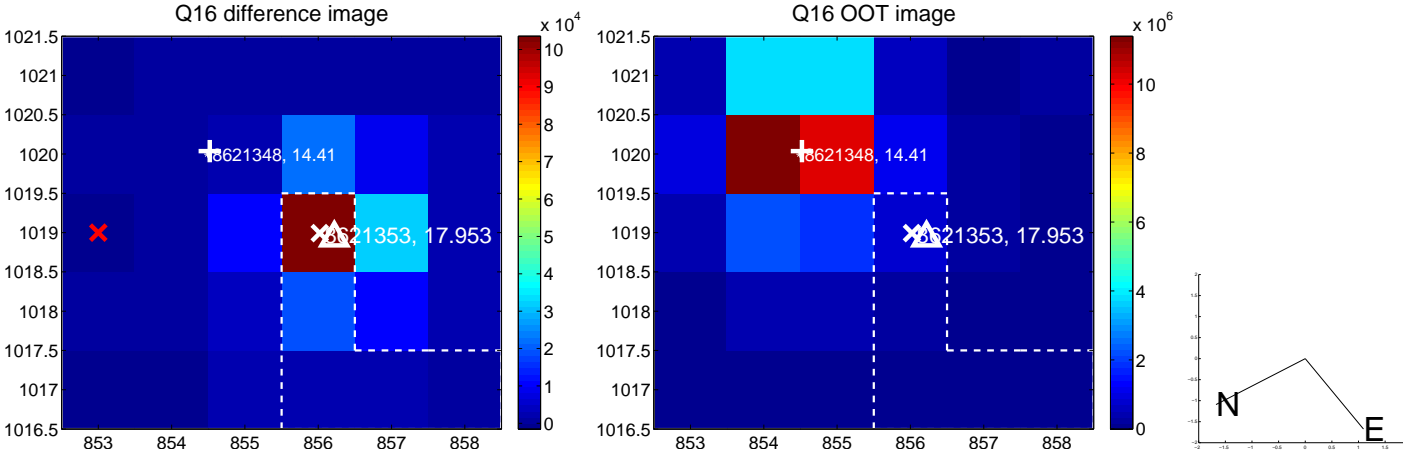
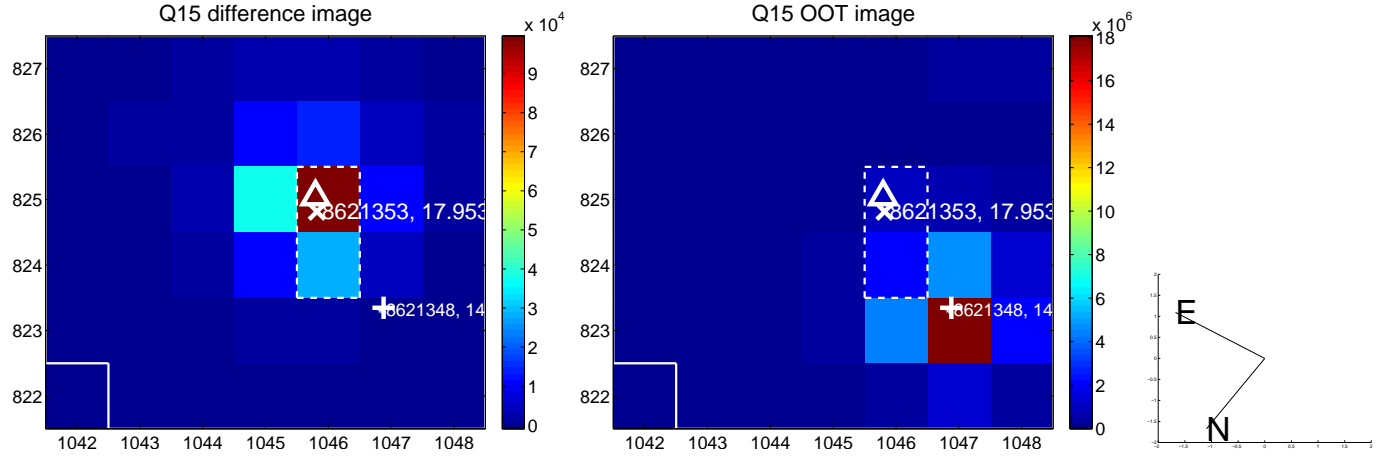
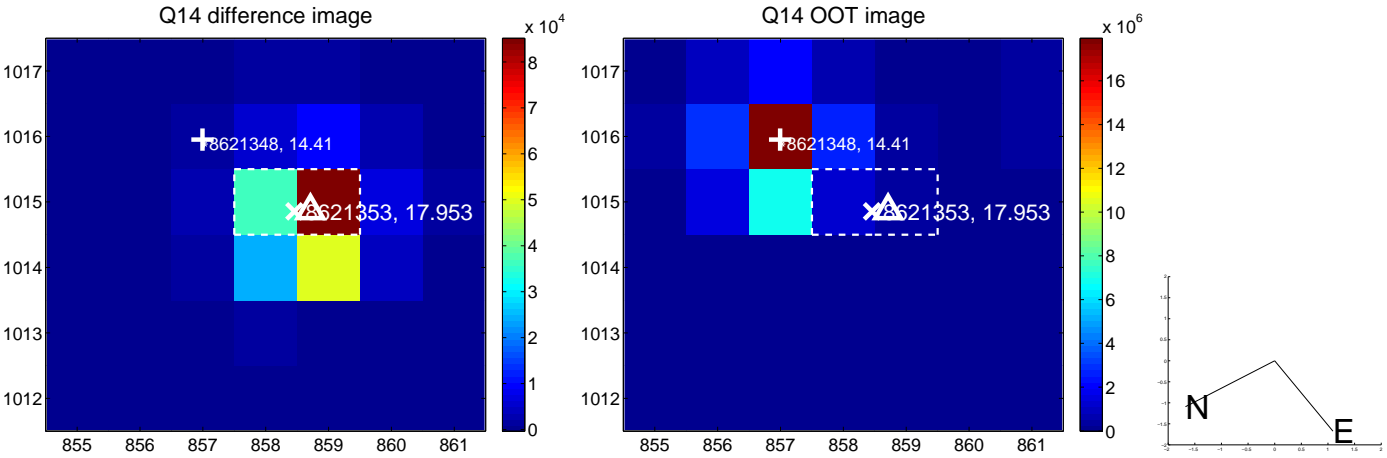
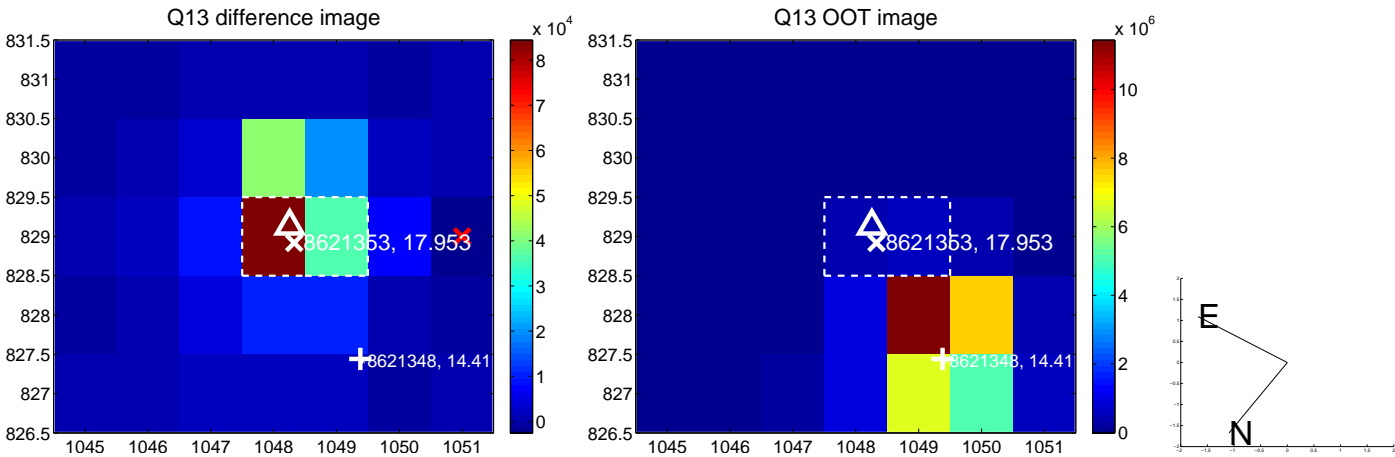




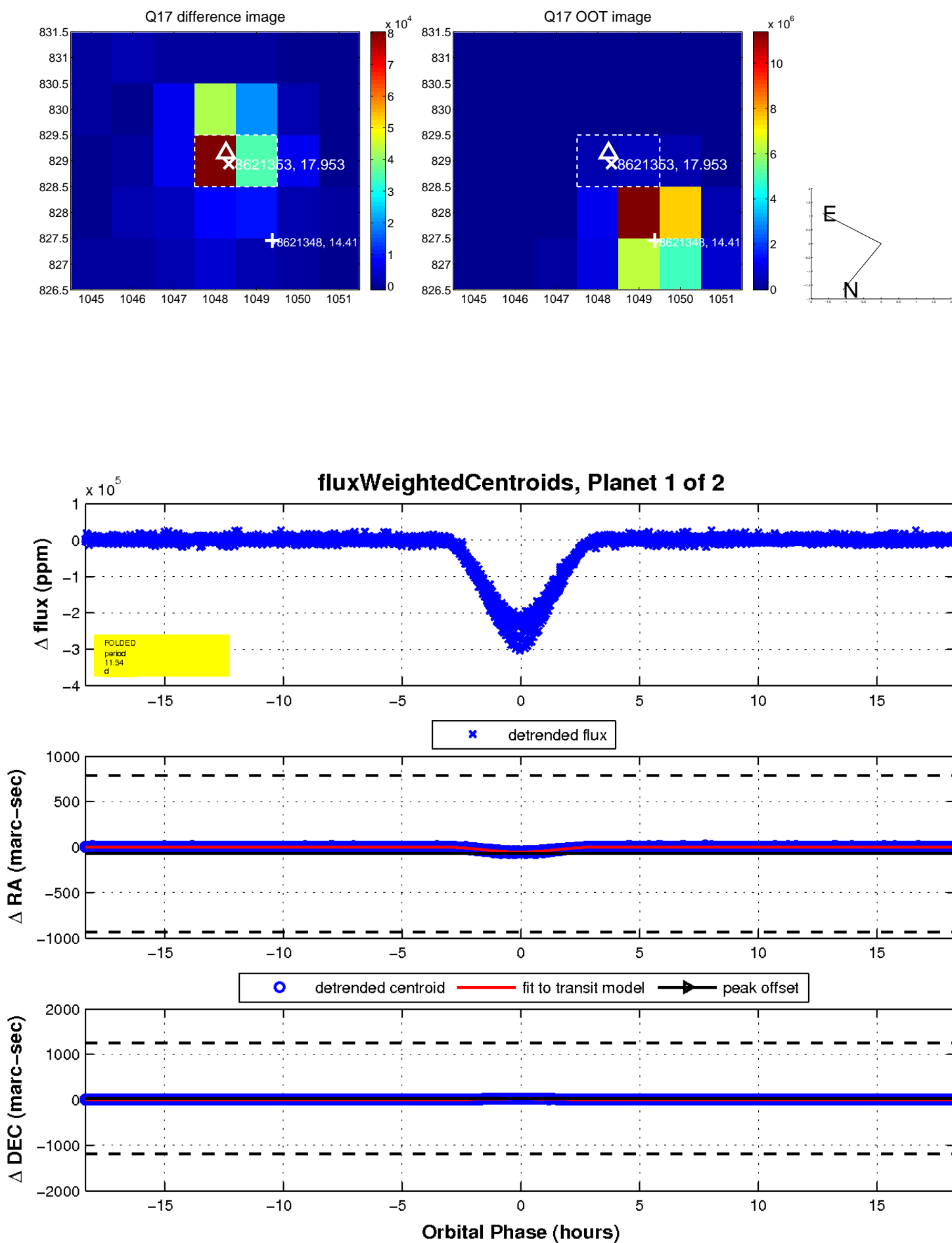
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

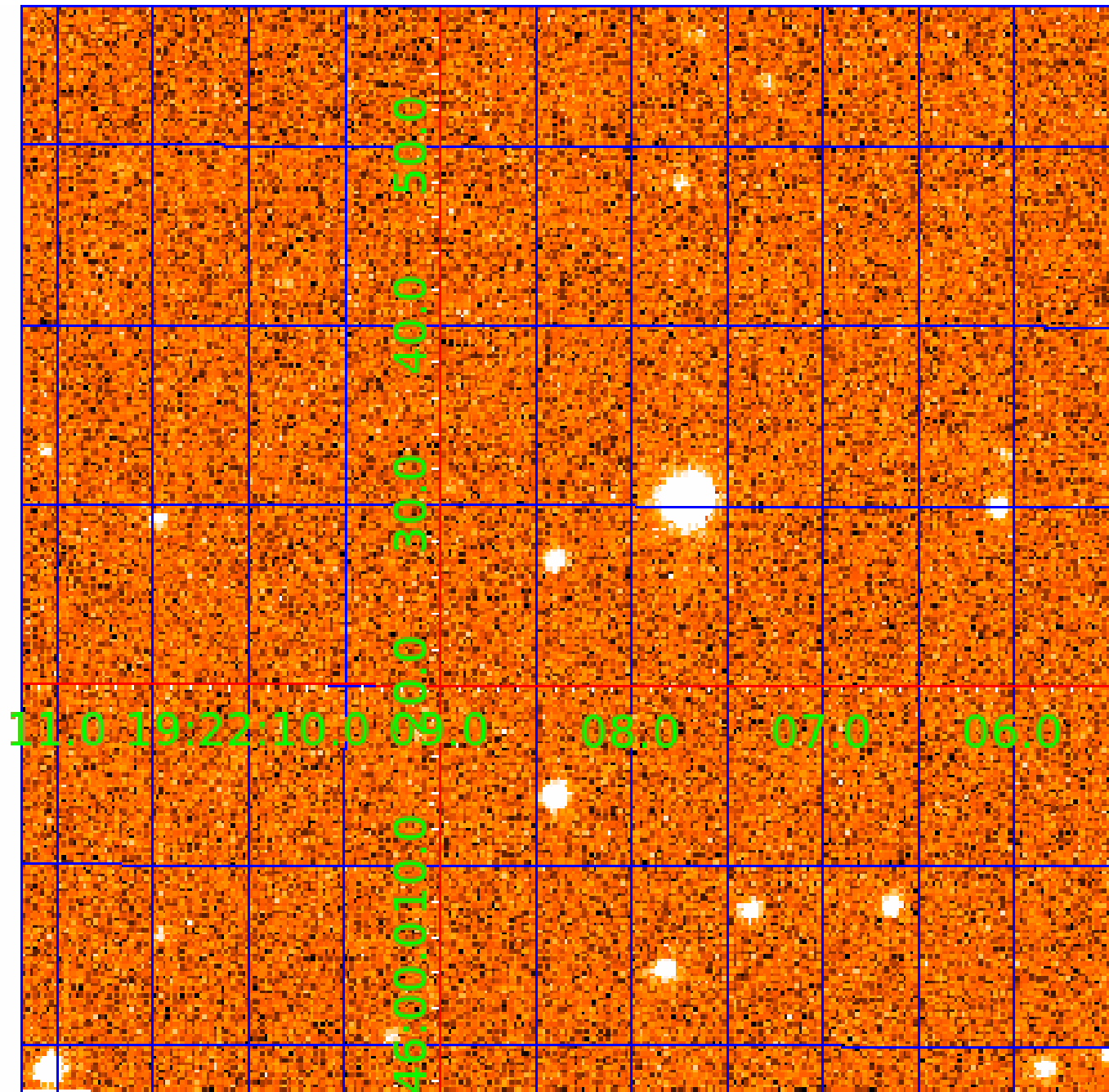


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008621353

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008621353-01	OBS	3682.01	11.344343	138.812505	252625.9	6.110	631.0	433.4	1.00	5780	66.04	102.38
008621353-02	OBS	No	11.344383	132.536425	76136.5	3.469	154.4	145.0	1.00	5780	40.82	102.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008621353-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
008621353-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

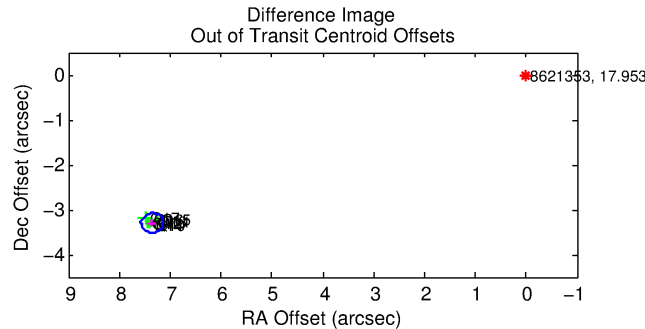
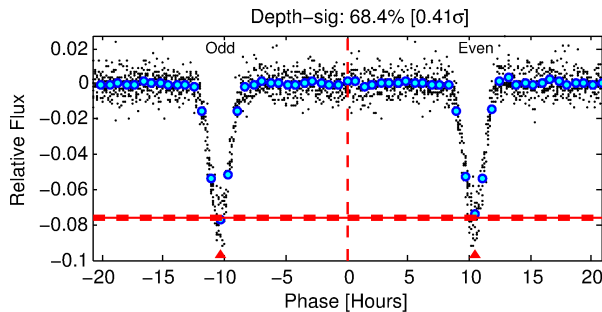
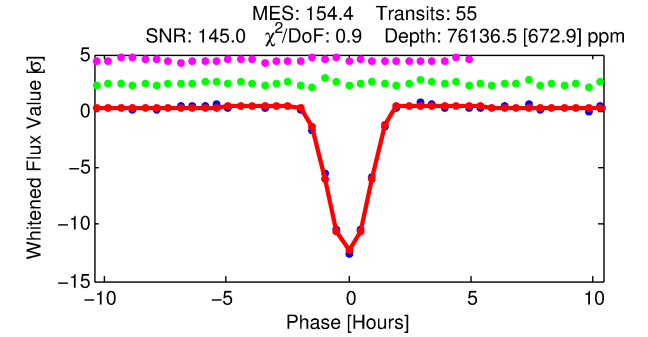
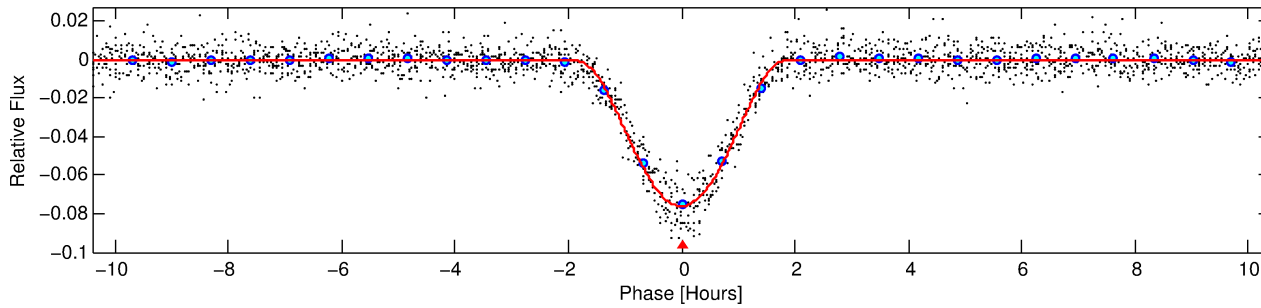
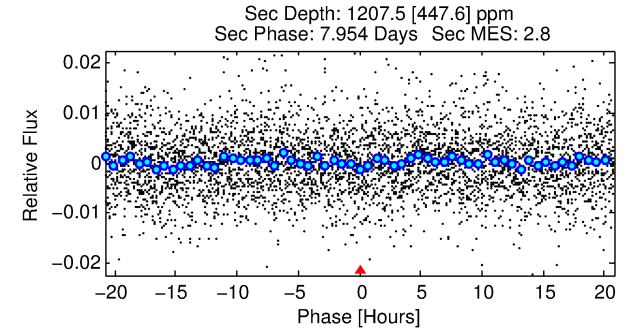
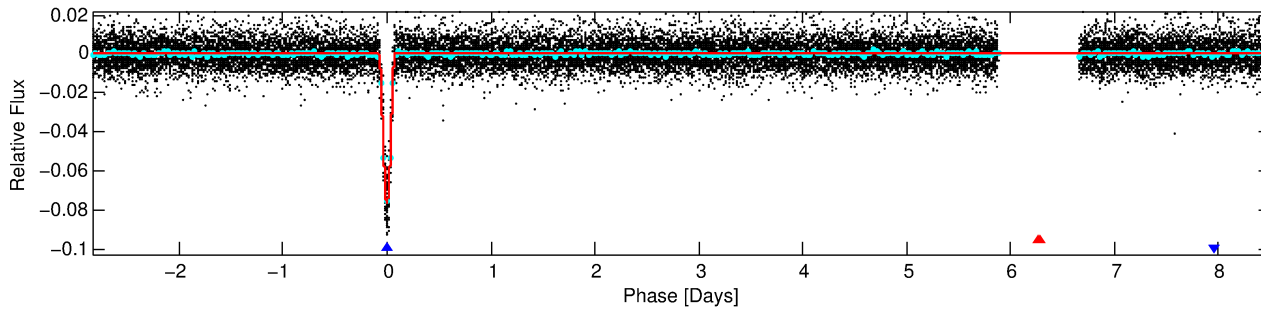
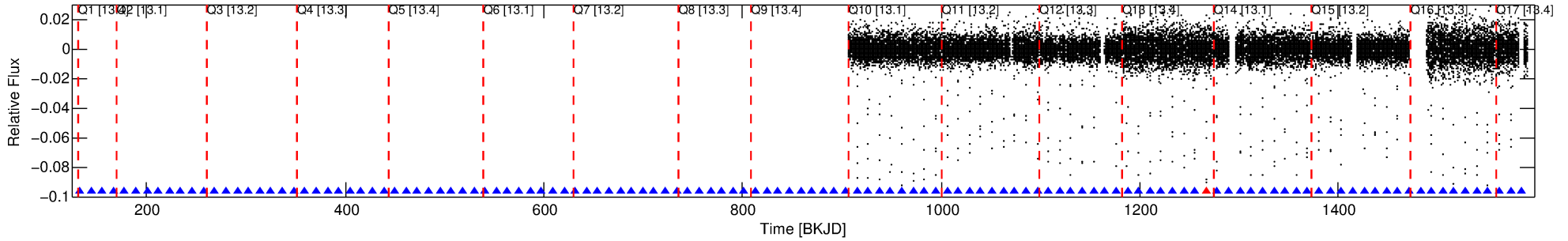
## Ephemeris Match Information For 008621353-02

No Significant Match Found

# DV One-Page Summary

KIC: 8621353 Candidate: 2 of 2 Period: 11.344 d  
KOI: K03682 Corr: No Ephemeris Match

Kp: 17.95  $R^*$ : 1.00  $R_s$   $T_{\text{eff}}$ : 5780.0 K Logg: 4.44 Fe/H: 0.000



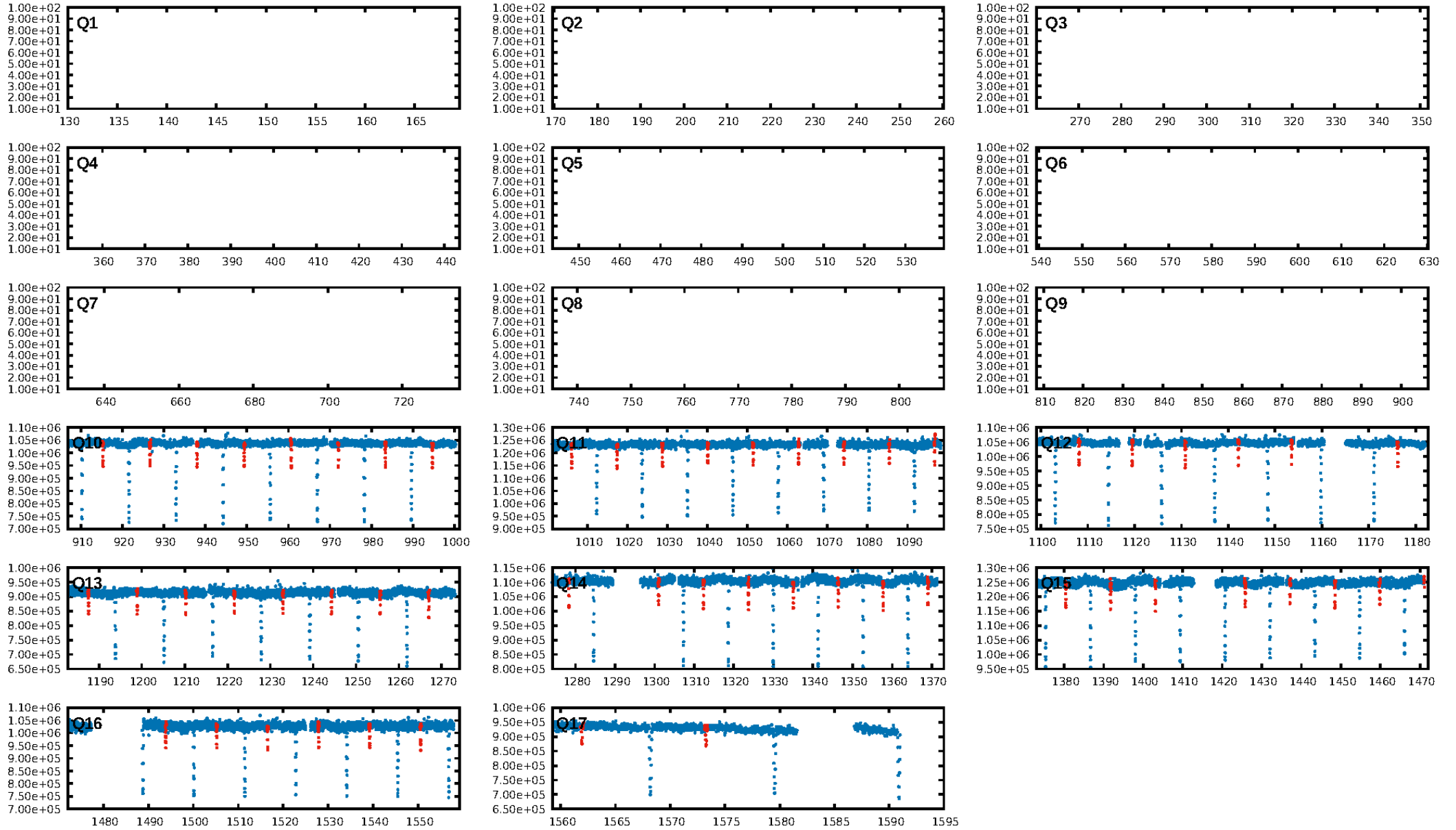
## DV Fit Results:

Period = 11.34438 [0.00002] d  
Epoch = 132.5364 [0.0016] BKJD  
 $R_p/R^*$  = 0.3740 [0.1988]  
 $a/R^*$  = 25.62 [0.31]  
 $b$  = 0.92 [0.30]  
 $S_{\text{eff}}$  = 102.38 [0.00]  
 $T_{\text{eq}}$  = 811 [0] K  
 $R_p$  = 40.82 [21.70]  $R_e$   
 $a$  = 0.0988 [0.0000] AU  
 $A_g$  = 3.89 [4.39] [0.66σ]  
 $T_{\text{eff}}$  = 1762 [496] K [1.92σ]

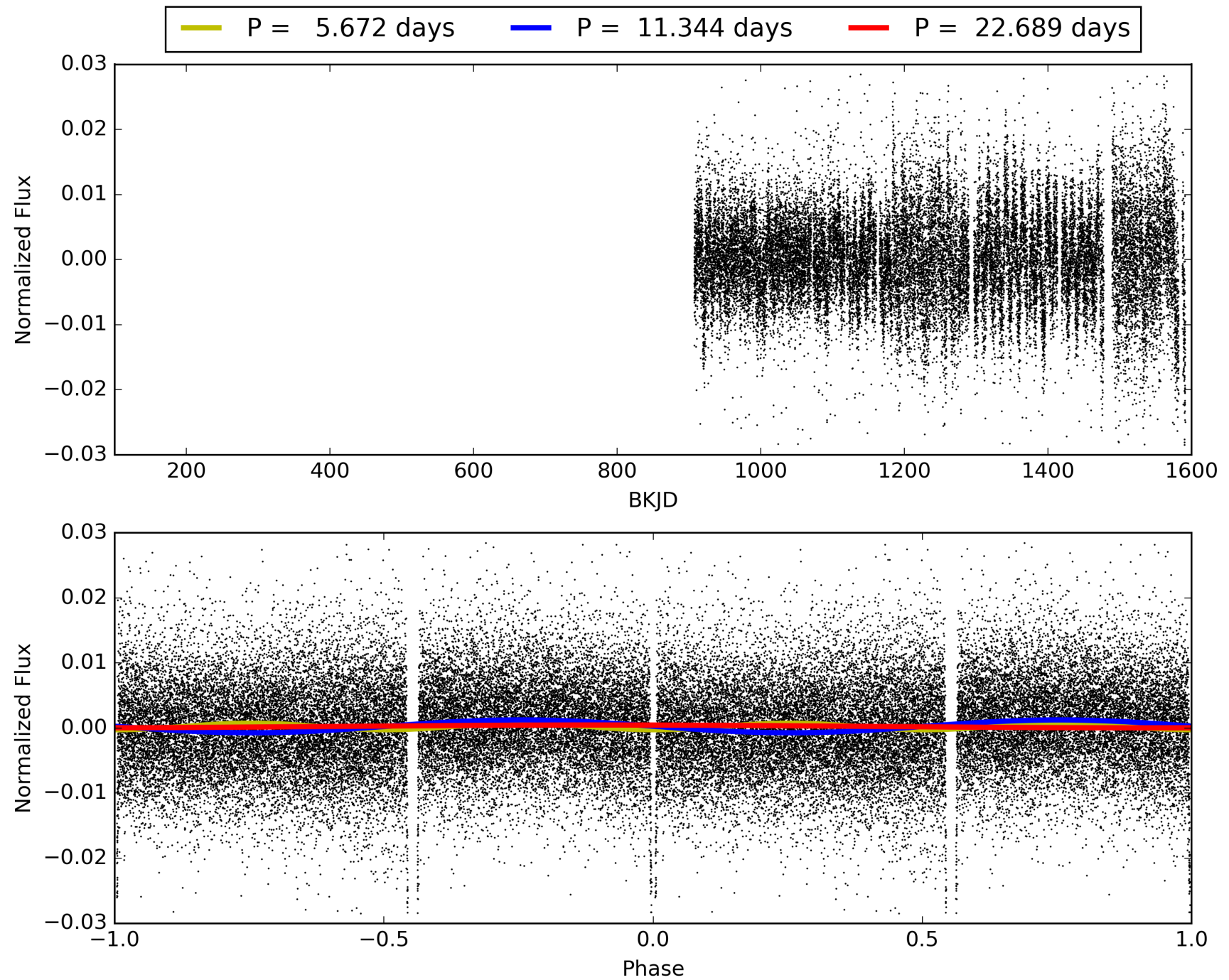
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.98 [52/53]  
GhostDiagnostic-chr: 2.417  
Centroid-sig: 0.0%  
Centroid-so: 5.216 arcsec [898.80σ]  
OotOffset-rm: 8.058 arcsec [111.53σ]  
KicOffset-rm: 0.860 arcsec [11.69σ]  
OotOffset-st: 2/2/2/2 [8]  
KicOffset-st: 2/2/2/2 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [8/8]

# TCE 008621353-02, PDC Light Curves



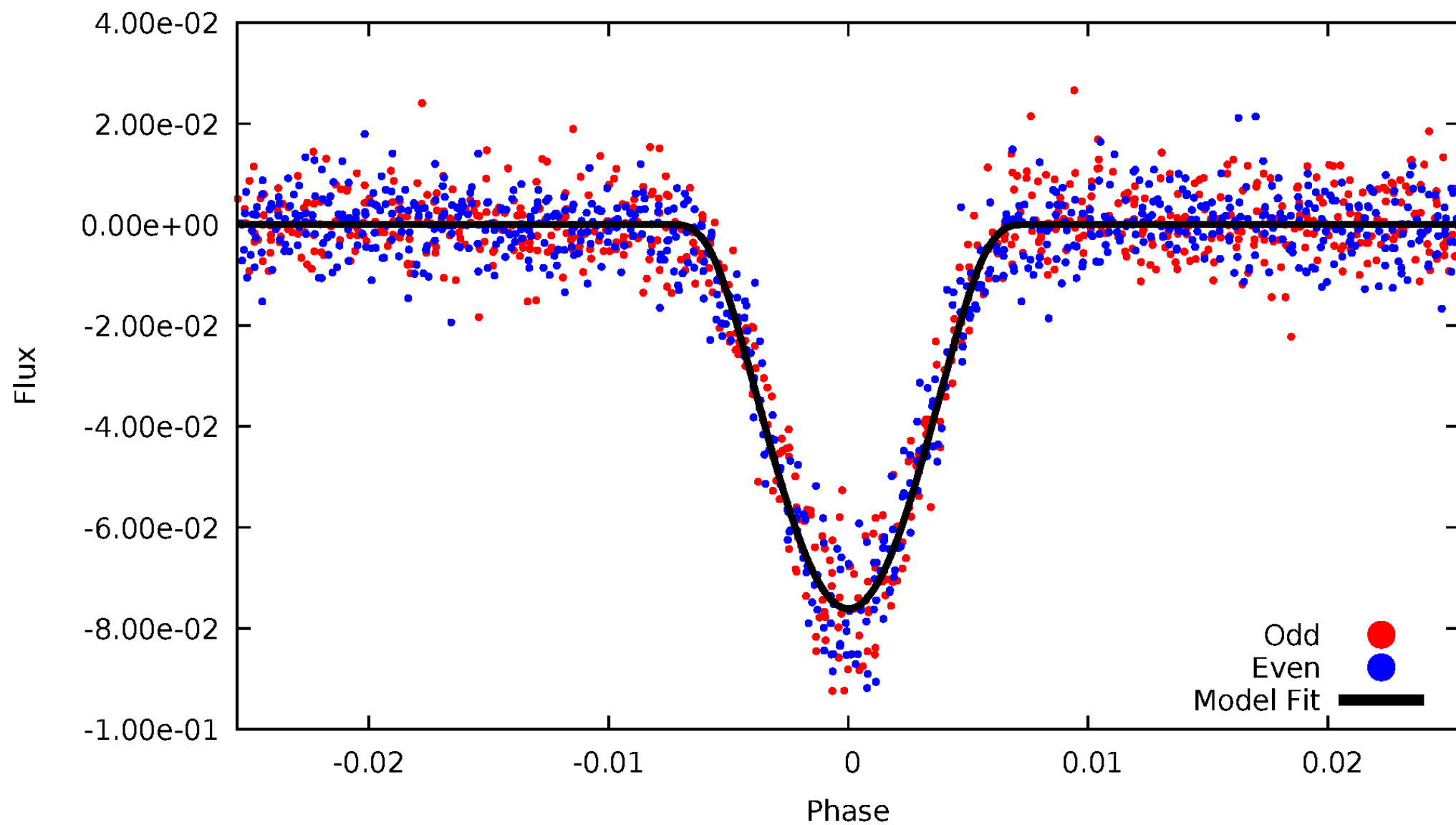
# TCE 008621353-02





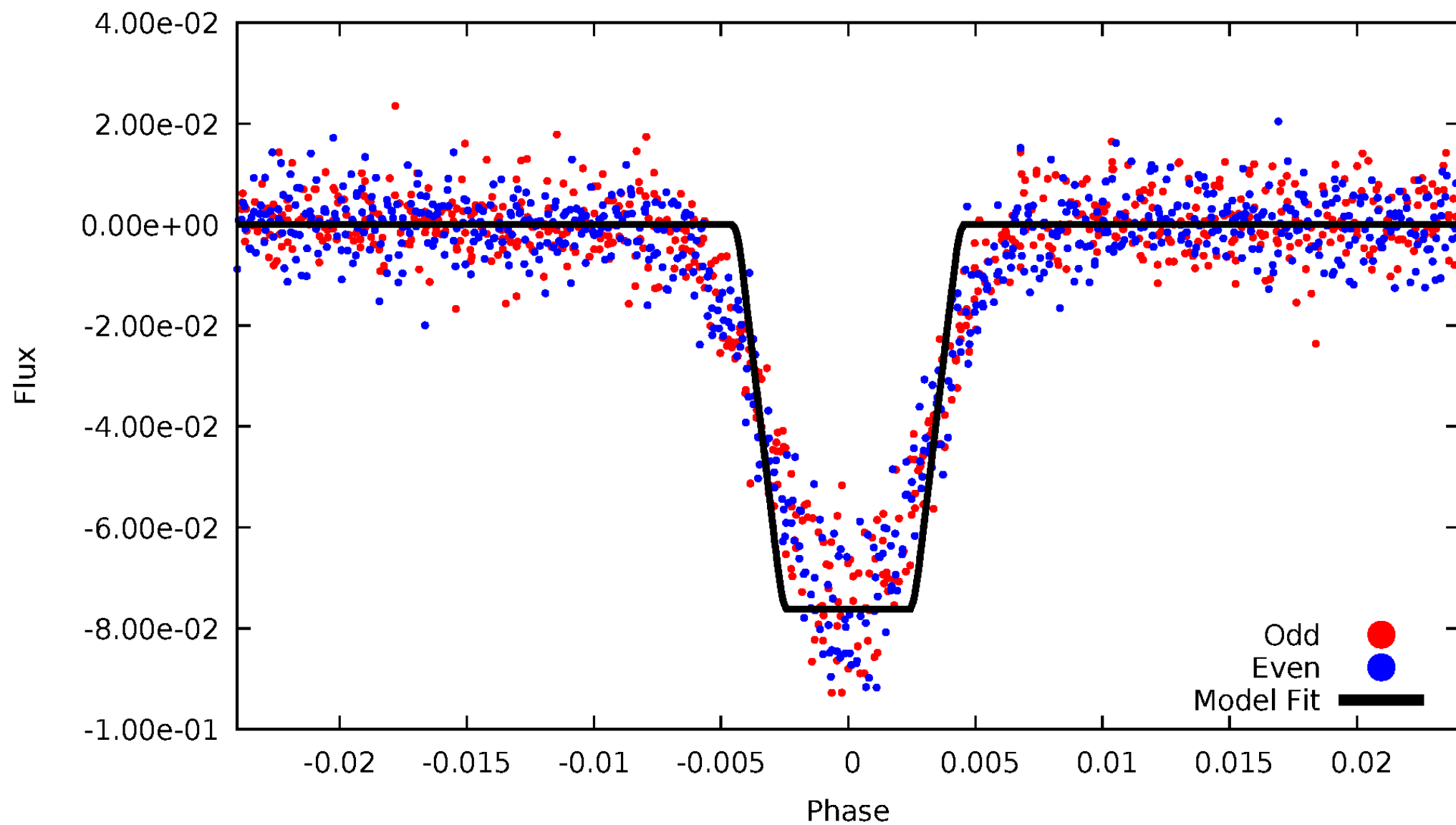
DV Odd/Even

TCE 008621353-02



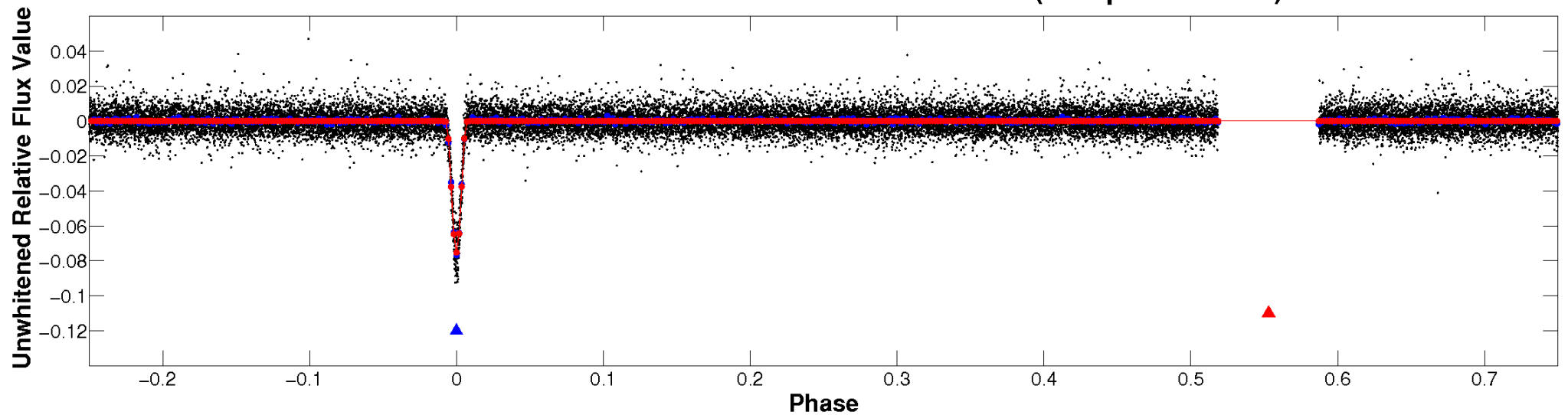
# ALT Odd/Even

TCE 008621353-02

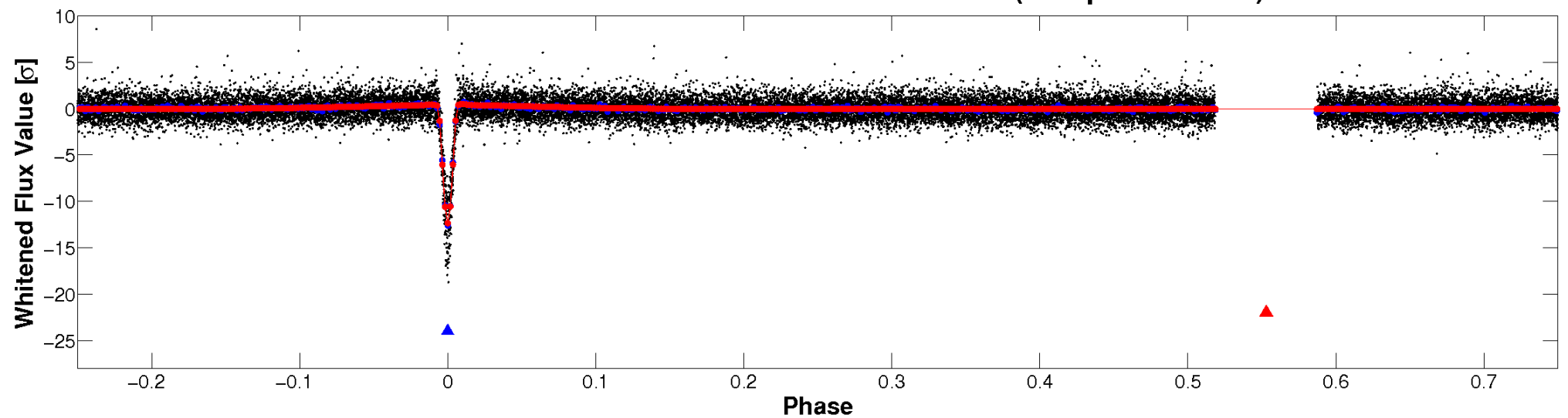


# Non-Whitened Vs. Whitened Light Curve

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

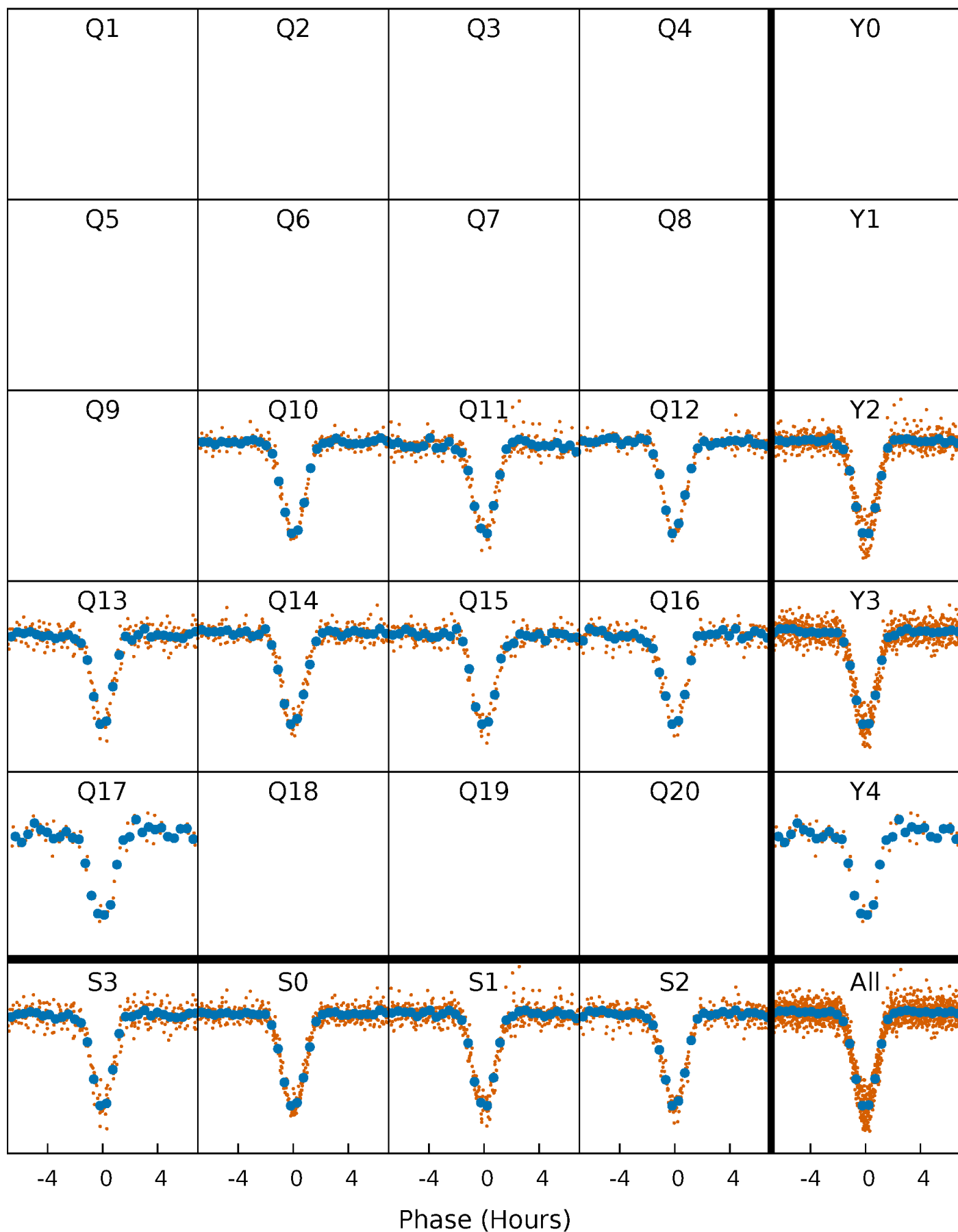


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



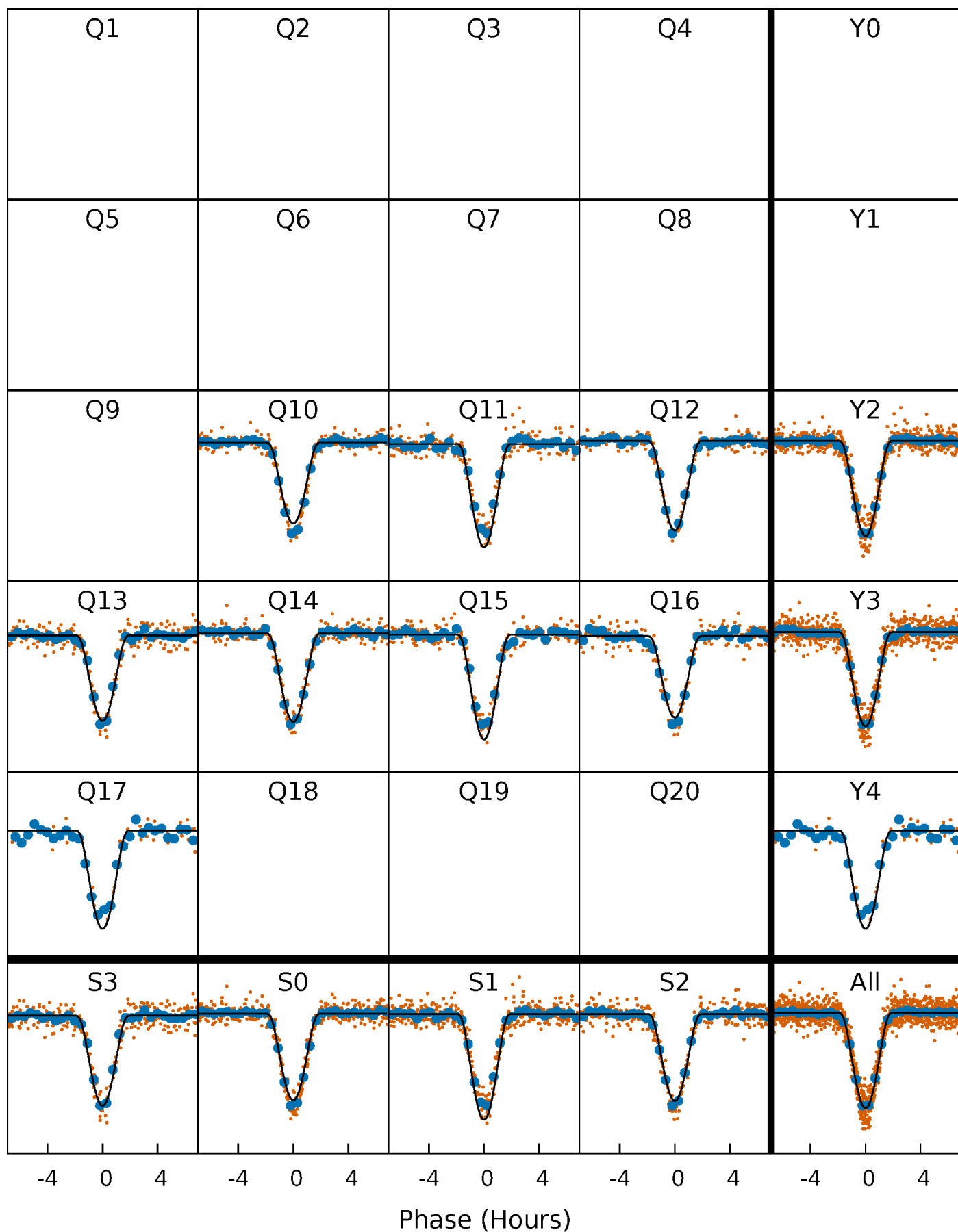
# PDC Quarter-Phased Transit Curves

TCE 008621353-02   P= 11.344383 Days    $T_0=132.536425$  (BKJD)



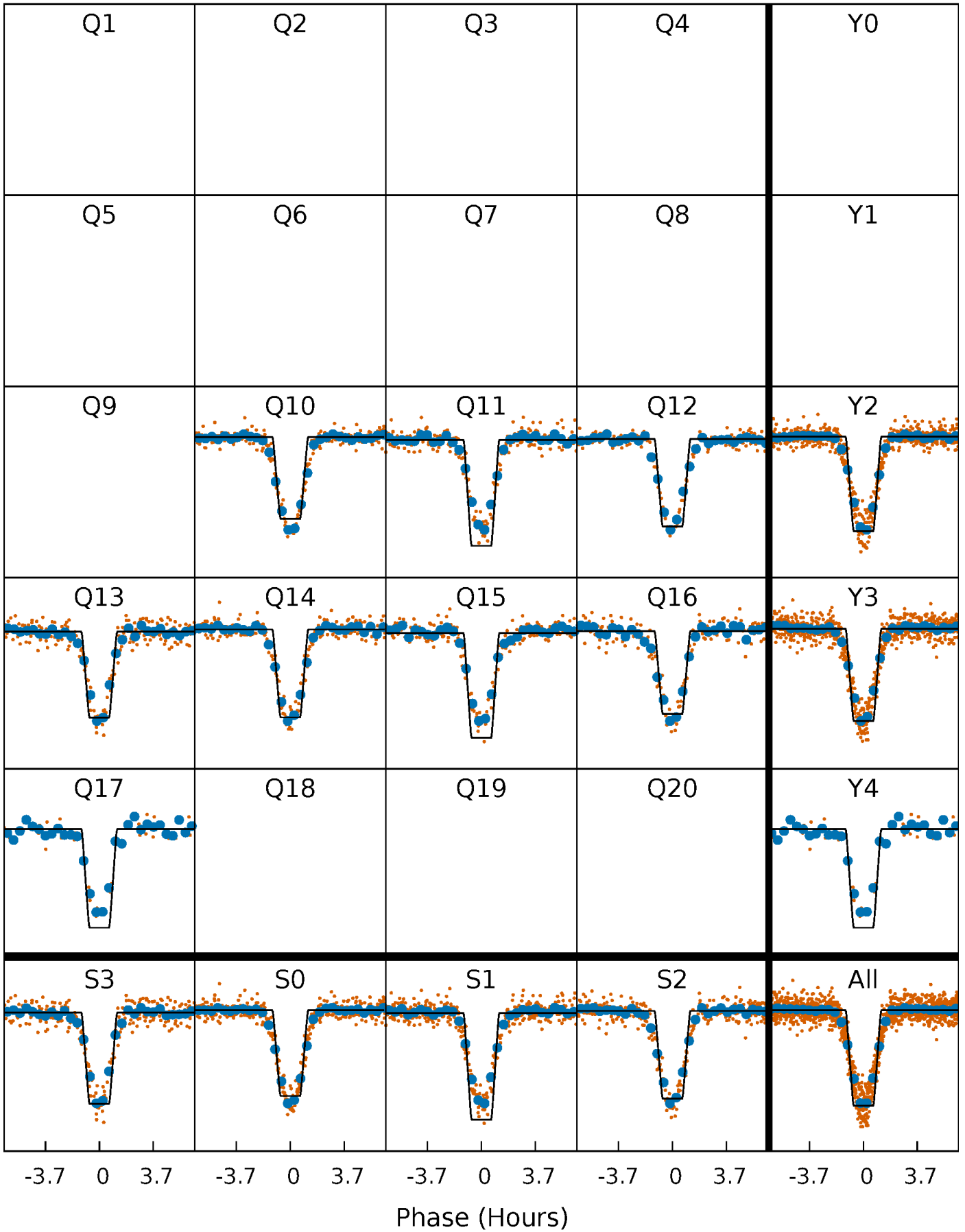
# DV Quarter-Phased Transit Curves

TCE 008621353-02   P= 11.344383 Days    $T_0=132.536425$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

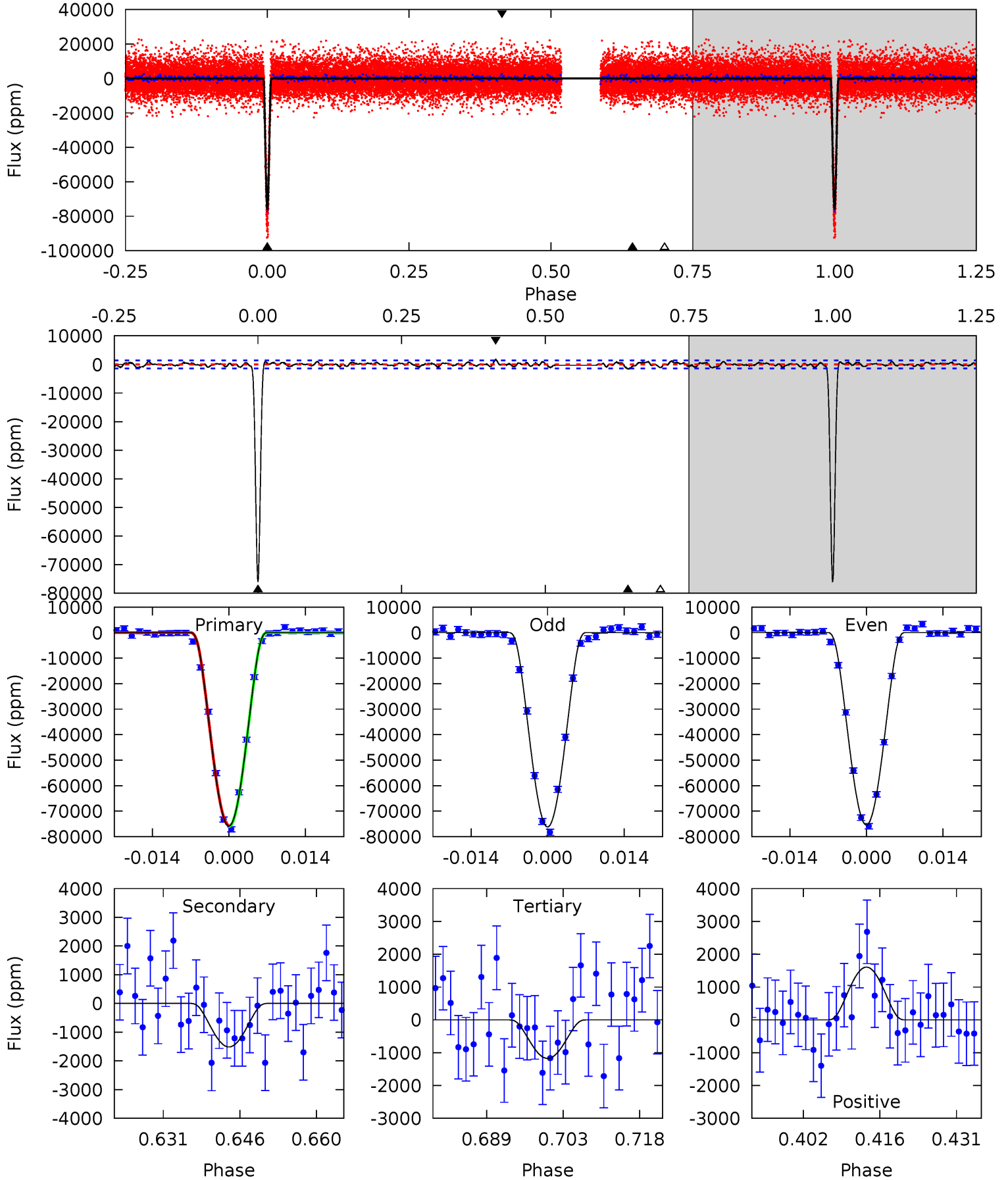
TCE 008621353-02 P= 11.344406 Days  $T_0=132.534511$  (BKJD)



# DV Model-Shift Uniqueness Test

008621353-02, P = 11.344383 Days, E = 132.536425 Days

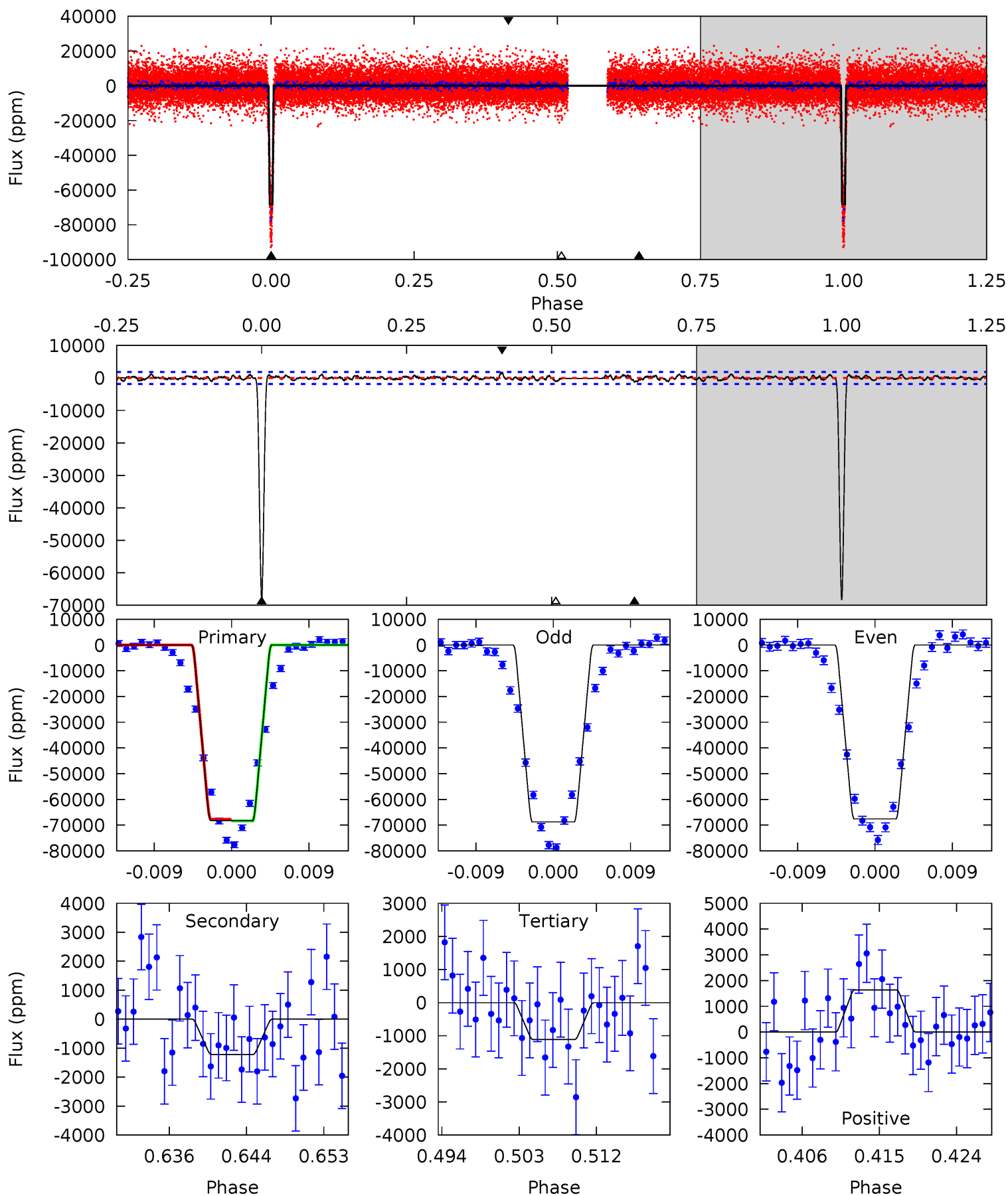
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
265.1	5.30	4.11	5.62	4.96	2.45	1.58	261.0	259.5	1.19	-0.32	1.42	0.99	0.02	0.88



# Alt Model-Shift Uniqueness Test

008621353-02, P = 11.344406 Days, E = 132.534511 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
187.9	3.35	3.06	4.52	5.05	2.62	1.17	184.9	183.4	0.28	-1.17	1.59	0.98	0.02	1.02





### Stellar Parameters For KIC 008621353

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5780^{+1}_{-1}$	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008621353-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1515 \pm 286$	$43.09^{+19.58}_{-20.84}$	$1135^{+53}_{-57}$	$2598^{+512}_{-263}$	$4.393^{+11.213}_{-2.434}$
Alt.	$-1214 \pm 363$	$34.45^{+20.83}_{-19.46}$	$1134^{+53}_{-49}$	$2672^{+727}_{-340}$	$5.277^{+23.324}_{-3.267}$

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

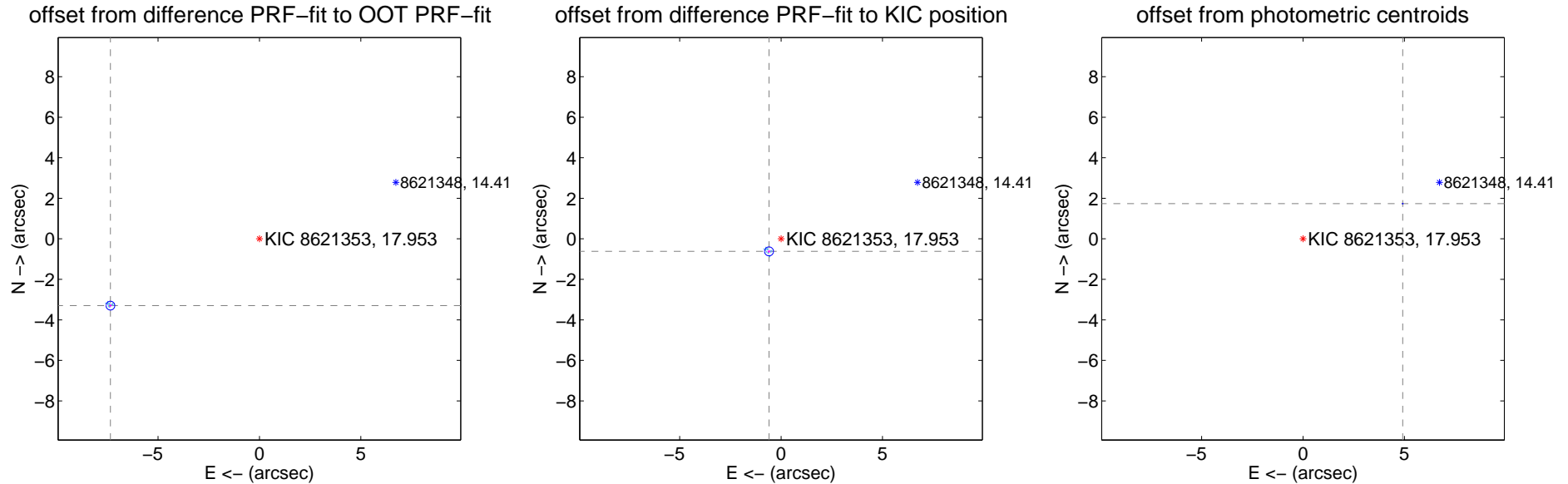
## DV Centroid Data

Supplemental centroid analysis for 008621353-02. Kepler magnitude: 17.95. Transit SNR 145.04

There are 8 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 7.25 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$8.058 \pm 0.072$	111.53	$7.352 \pm 0.073$	$-3.297 \pm 0.070$
PRF-fit source offset from KIC position	$0.860 \pm 0.074$	11.69	$0.596 \pm 0.076$	$-0.620 \pm 0.071$
photometric centroid source offset	$5.22 \pm 0.01$	898.81	$-4.92 \pm 0.01$	$1.74 \pm 0.00$



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.

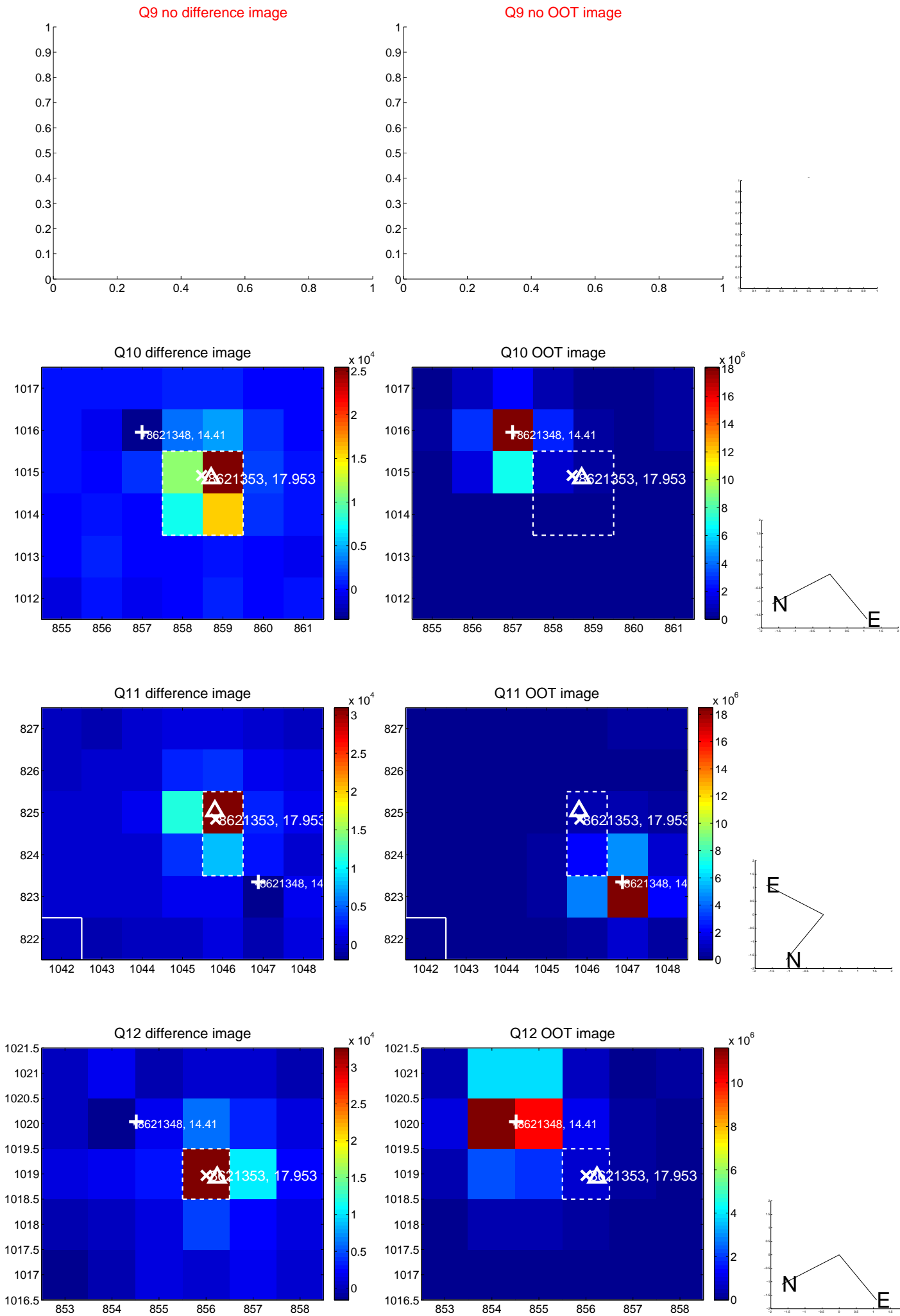
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



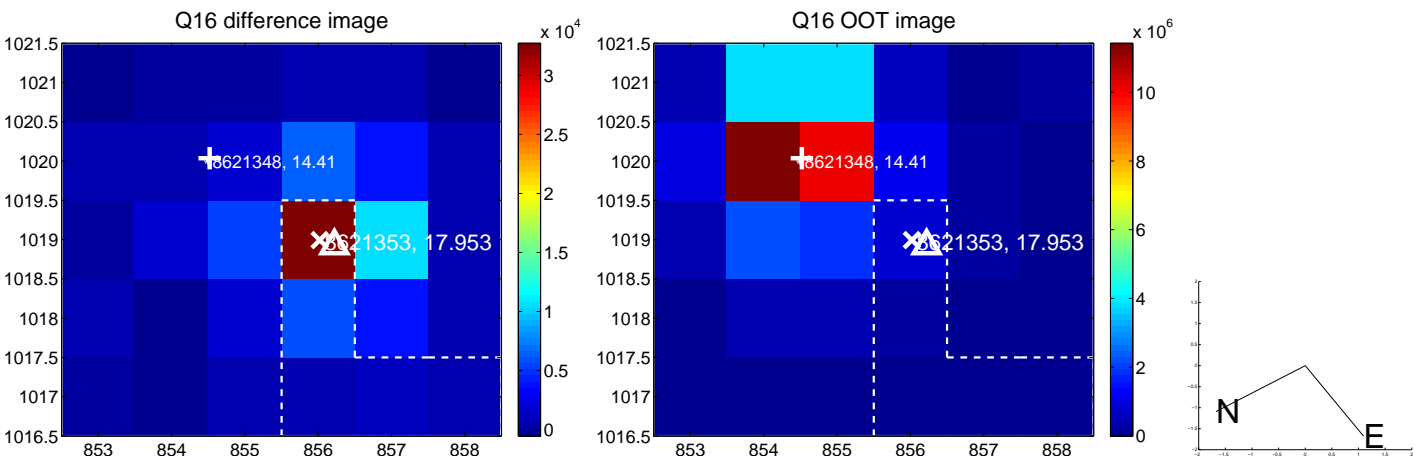
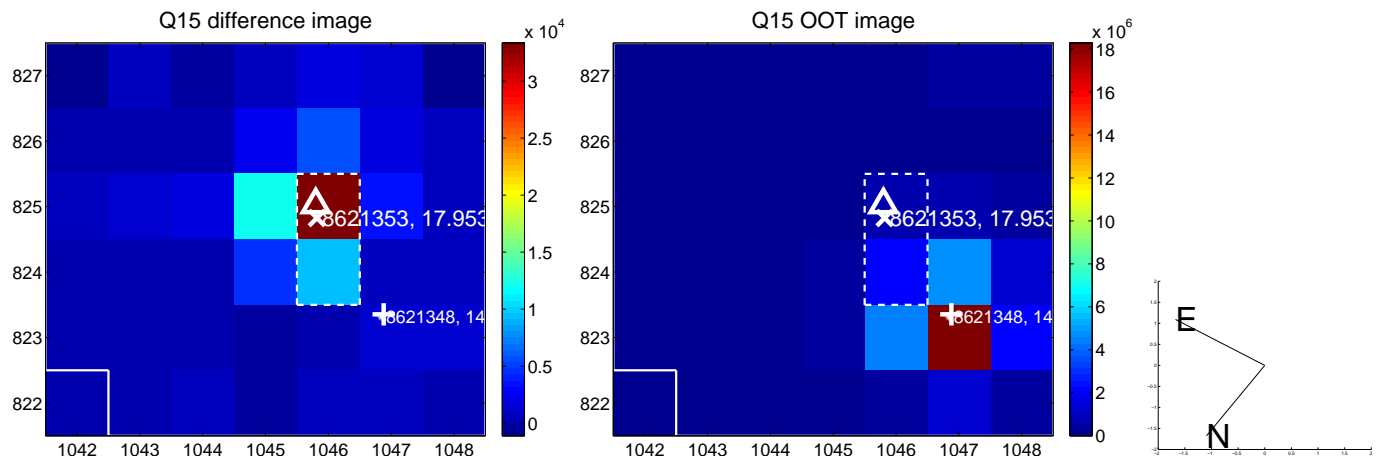
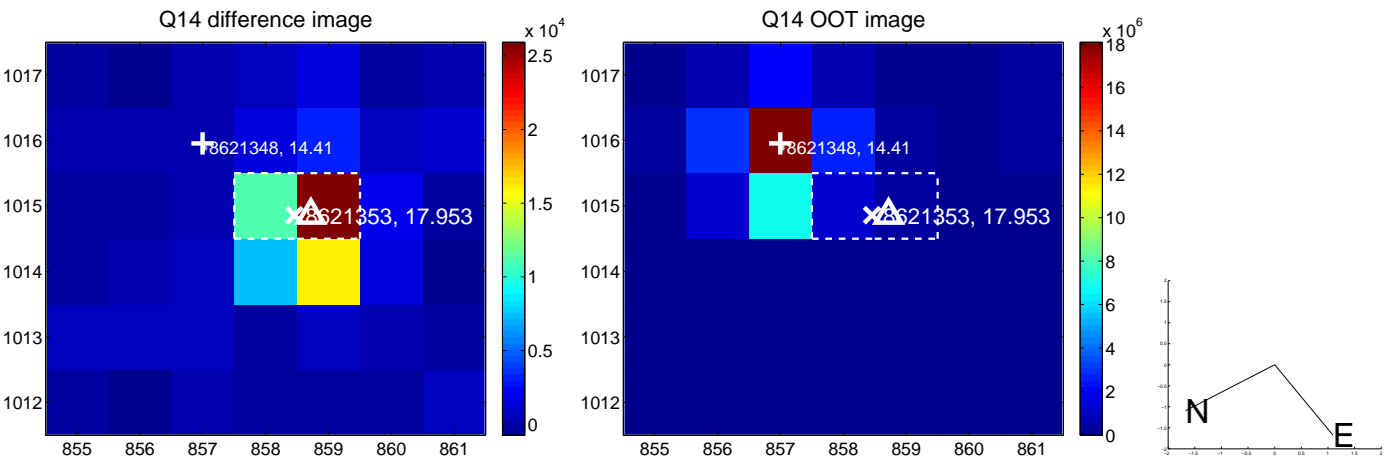
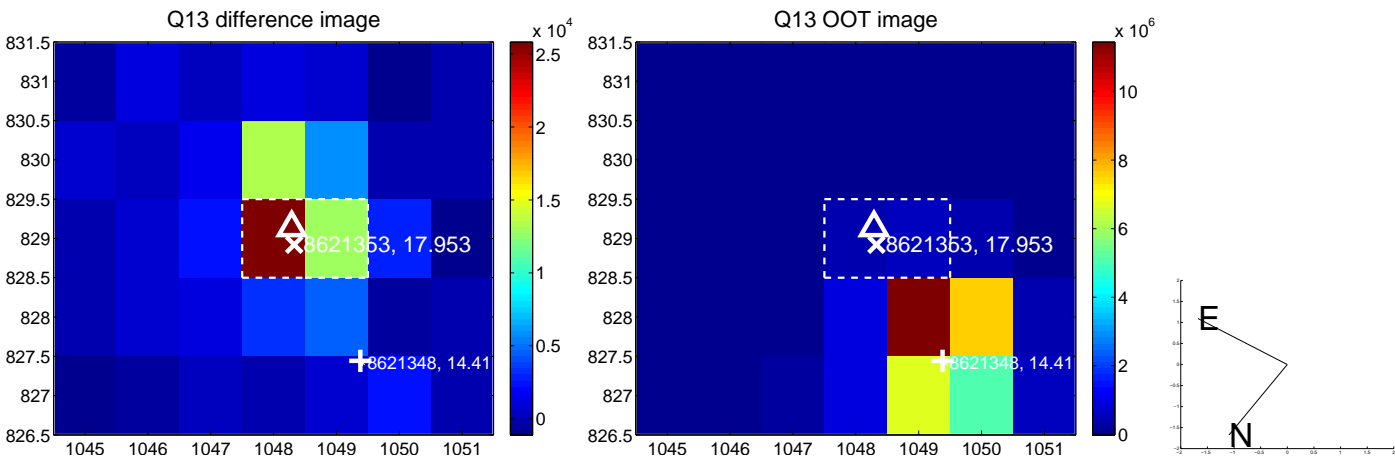
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



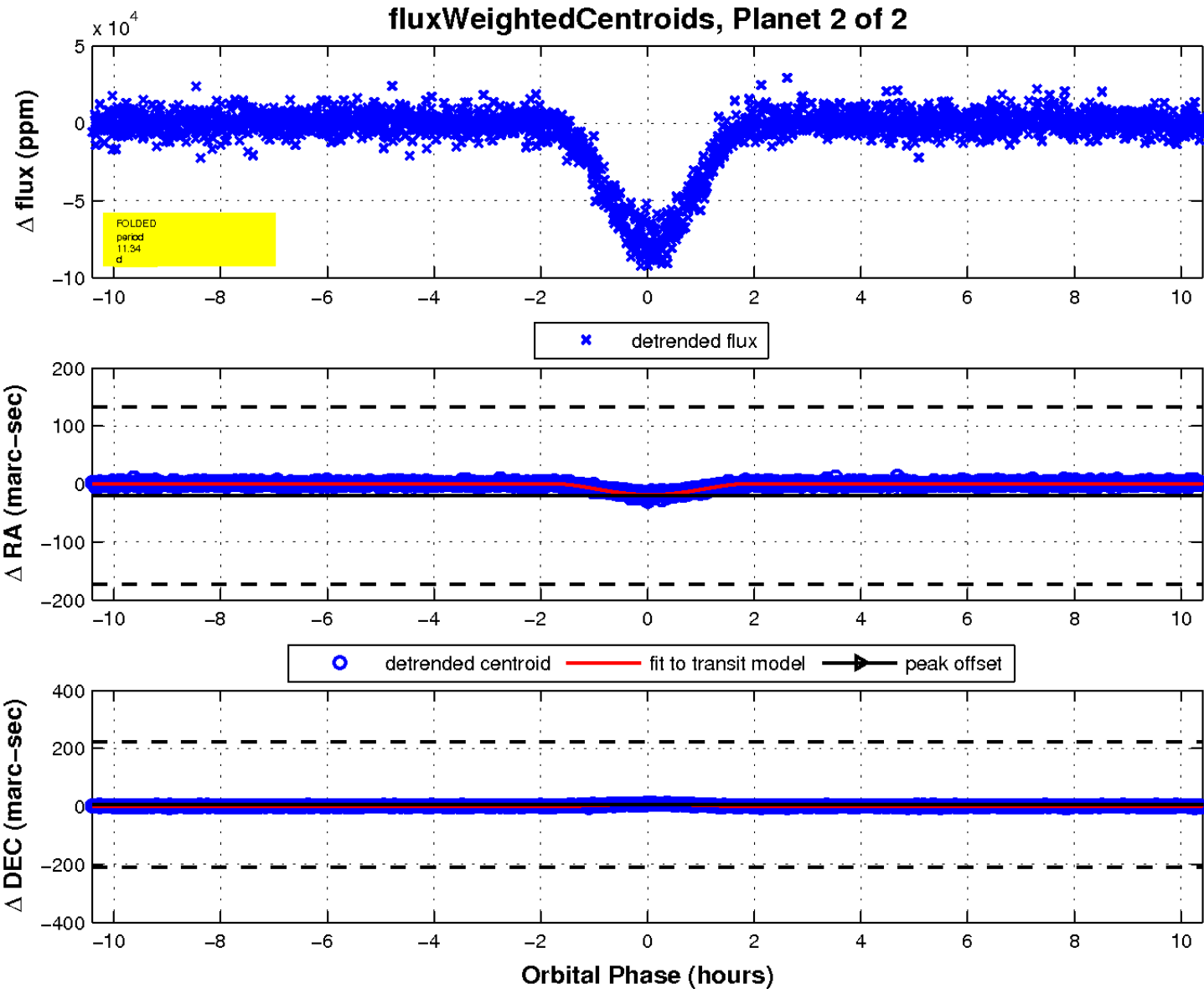
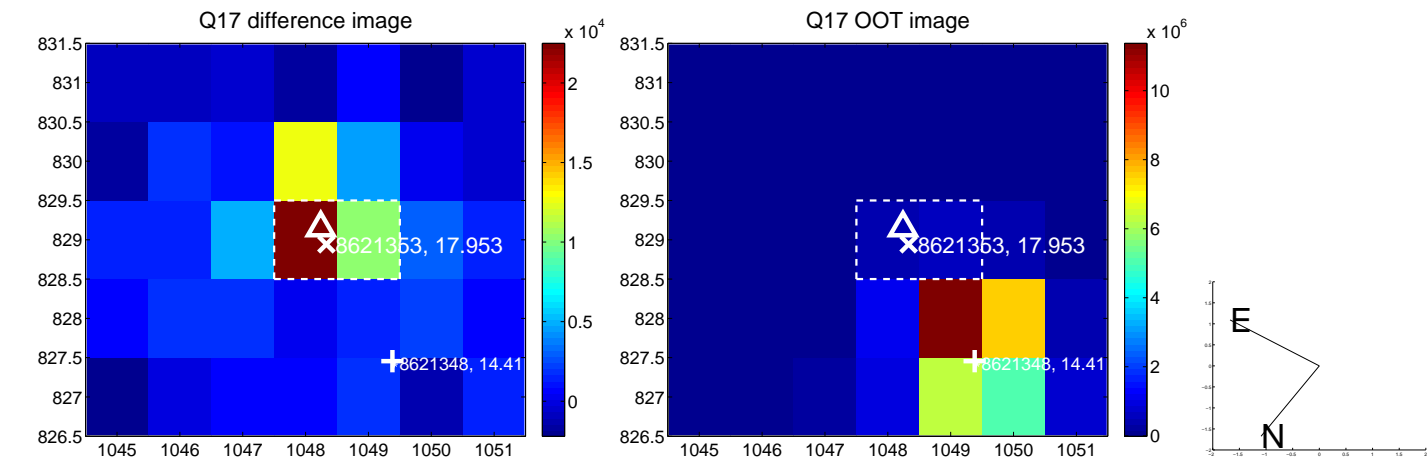
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



# UKIRT Image

Declination

