

# KIC 005021174

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005021174-01	OBS	3679.01	4.045081	132.225777	329330.7	2.000	1041.8	-1.0	1.00	5780	54.56	404.92
005021174-02	OBS	No	2.022541	132.226936	62656.3	3.420	203.7	194.9	1.00	5780	35.46	1020.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005021174-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_NOFITS
005021174-02	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.

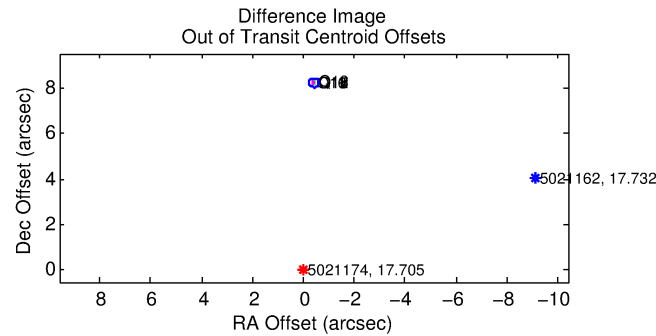
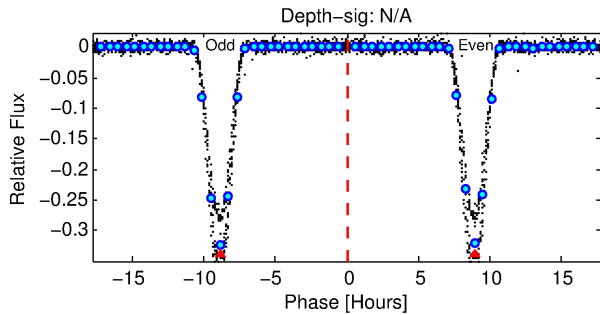
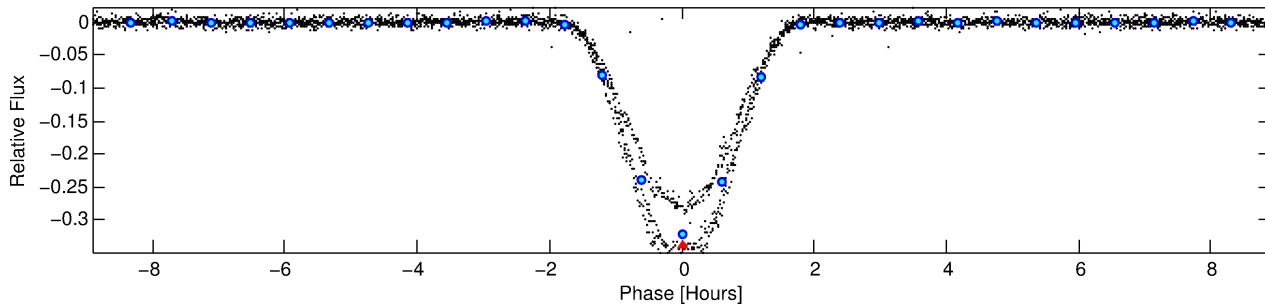
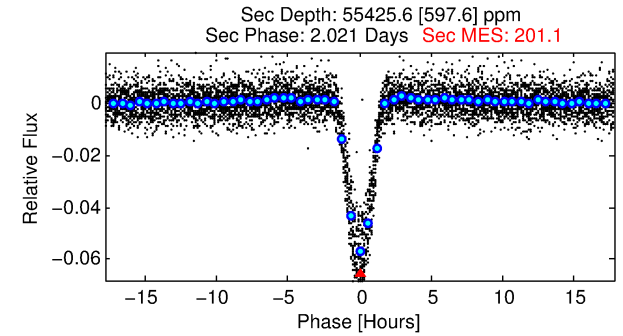
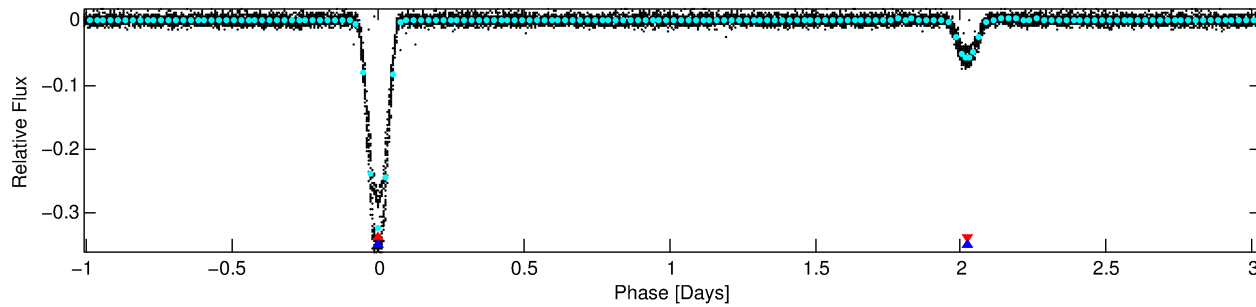
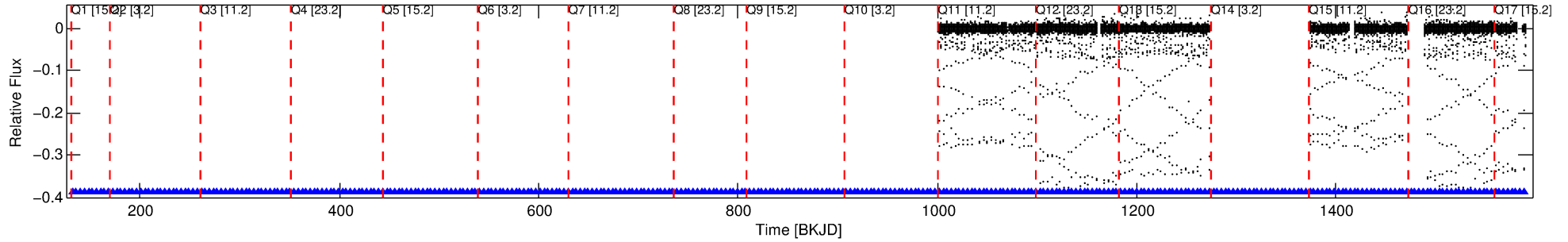
## Ephemeris Match Information For 005021174-01

No Significant Match Found

# DV One-Page Summary

KIC: 5021174 Candidate: 1 of 2 Period: 4.045 d  
KOI: K03679.01 Corr: 0.780

Kp: 17.70 R\*: 1.00 Rs Teff: 5780.0 K Logg: 4.44 Fe/H: 0.000



## TPS TCE Results:

Period = 4.04508 d  
Epoch = 132.2258 BKJD

DV fit results are unavailable

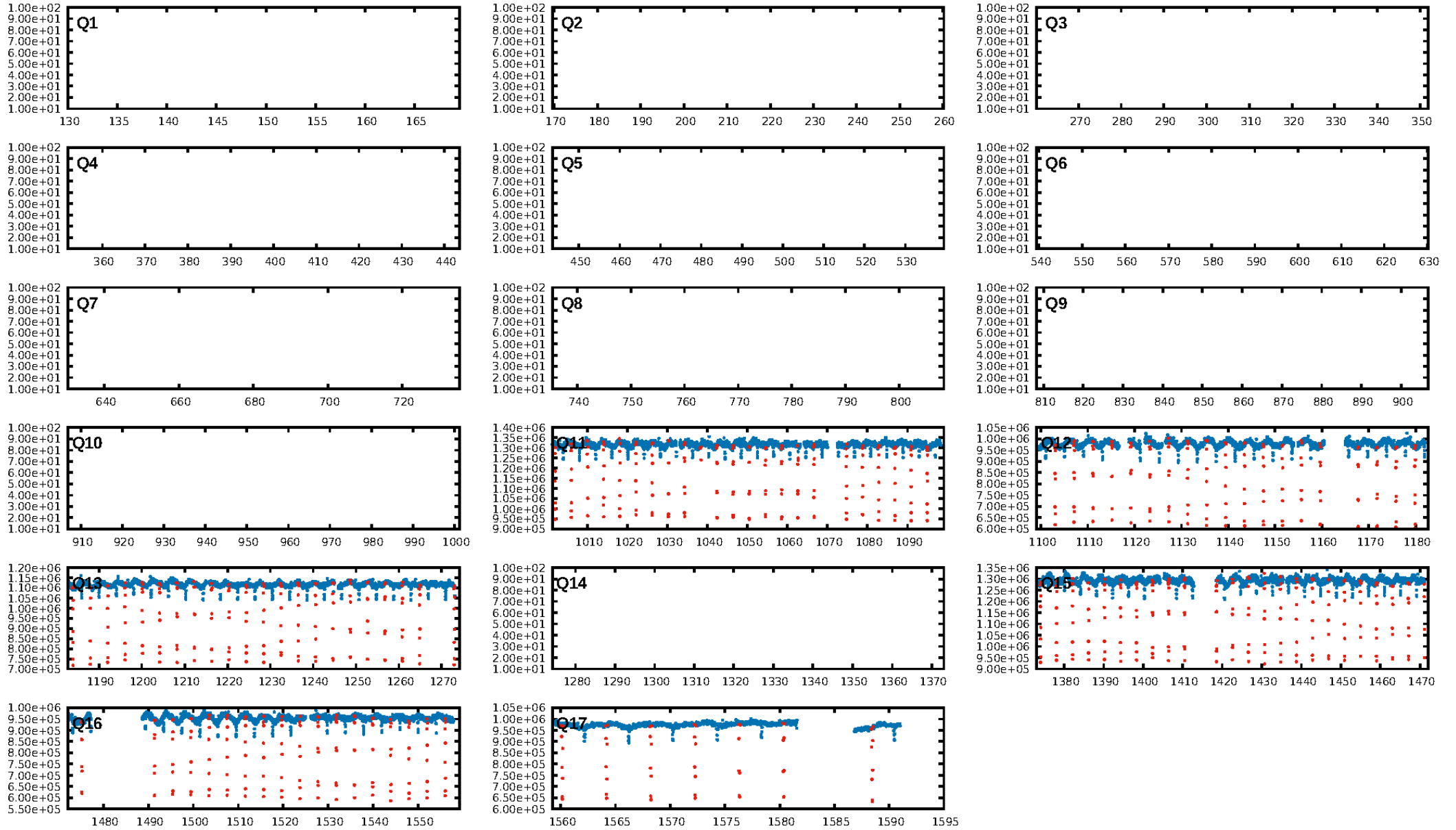
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.25 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [105/105]  
GhostDiagnostic-chr: 2.453  
Centroid-sig: 0.0%  
Centroid-so: 4.342 arcsec [1759.81 $\sigma$ ]  
OotOffset-rm: 8.230 arcsec [120.56 $\sigma$ ]  
KicOffset-rm: 0.957 arcsec [13.93 $\sigma$ ]  
OotOffset-st: 0/2/2/2 [6]  
KicOffset-st: 0/2/2/2 [6]  
DiffImageQuality-fgm: 1.00 [6/6]  
DiffImageOverlap-fno: 0.00 [0/6]

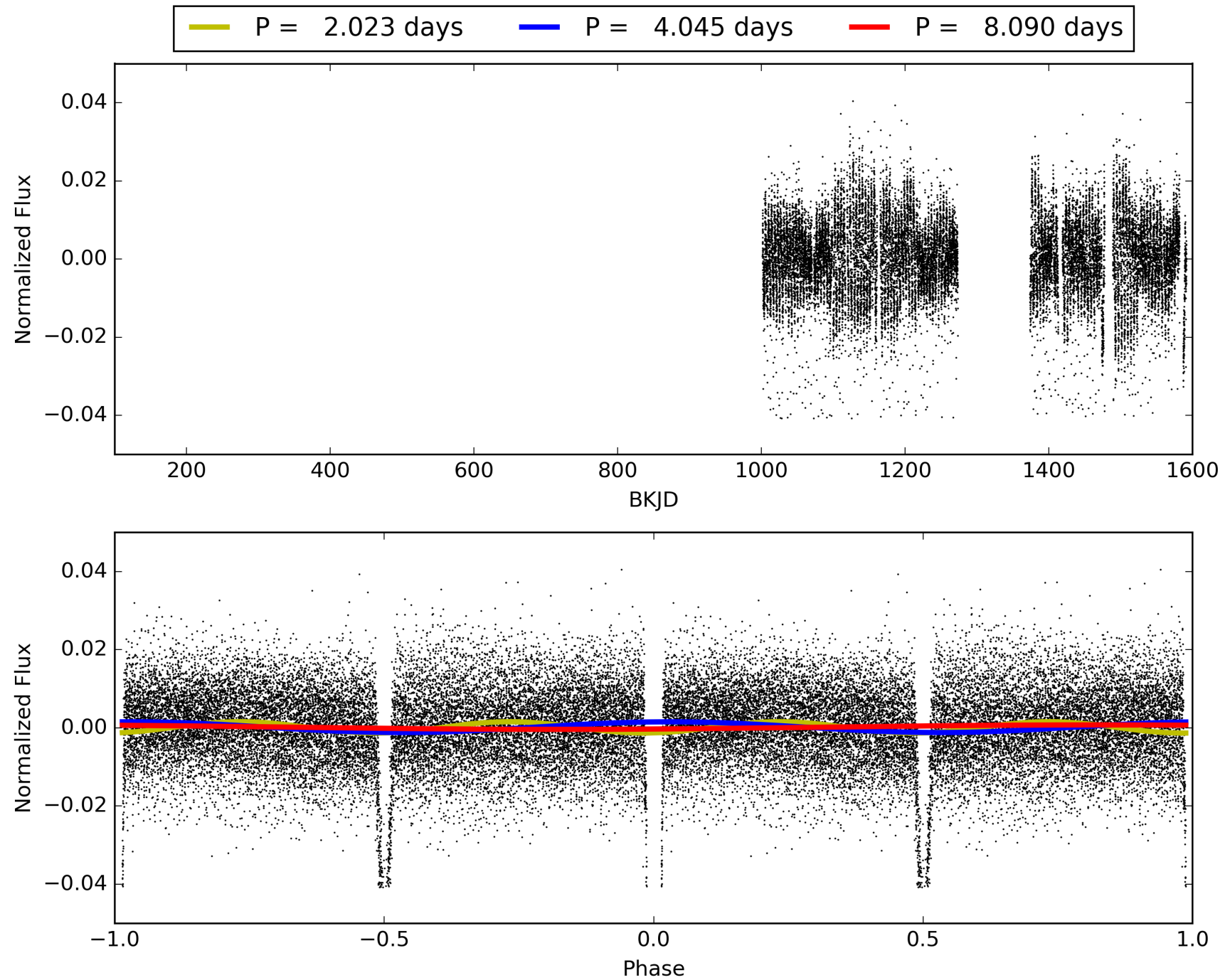
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 13:09:43 Z

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

# TCE 005021174-01, PDC Light Curves

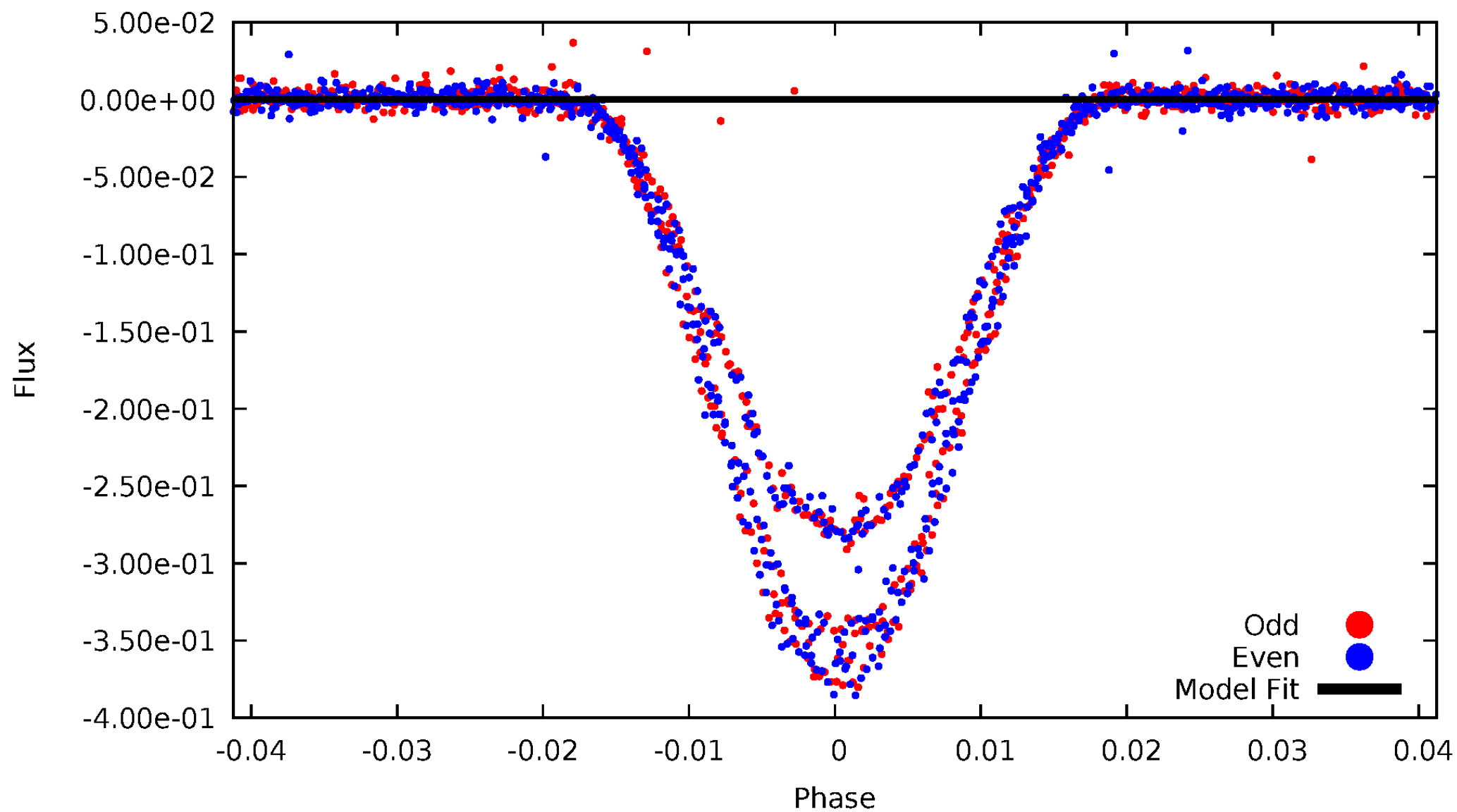


TCE 005021174-01



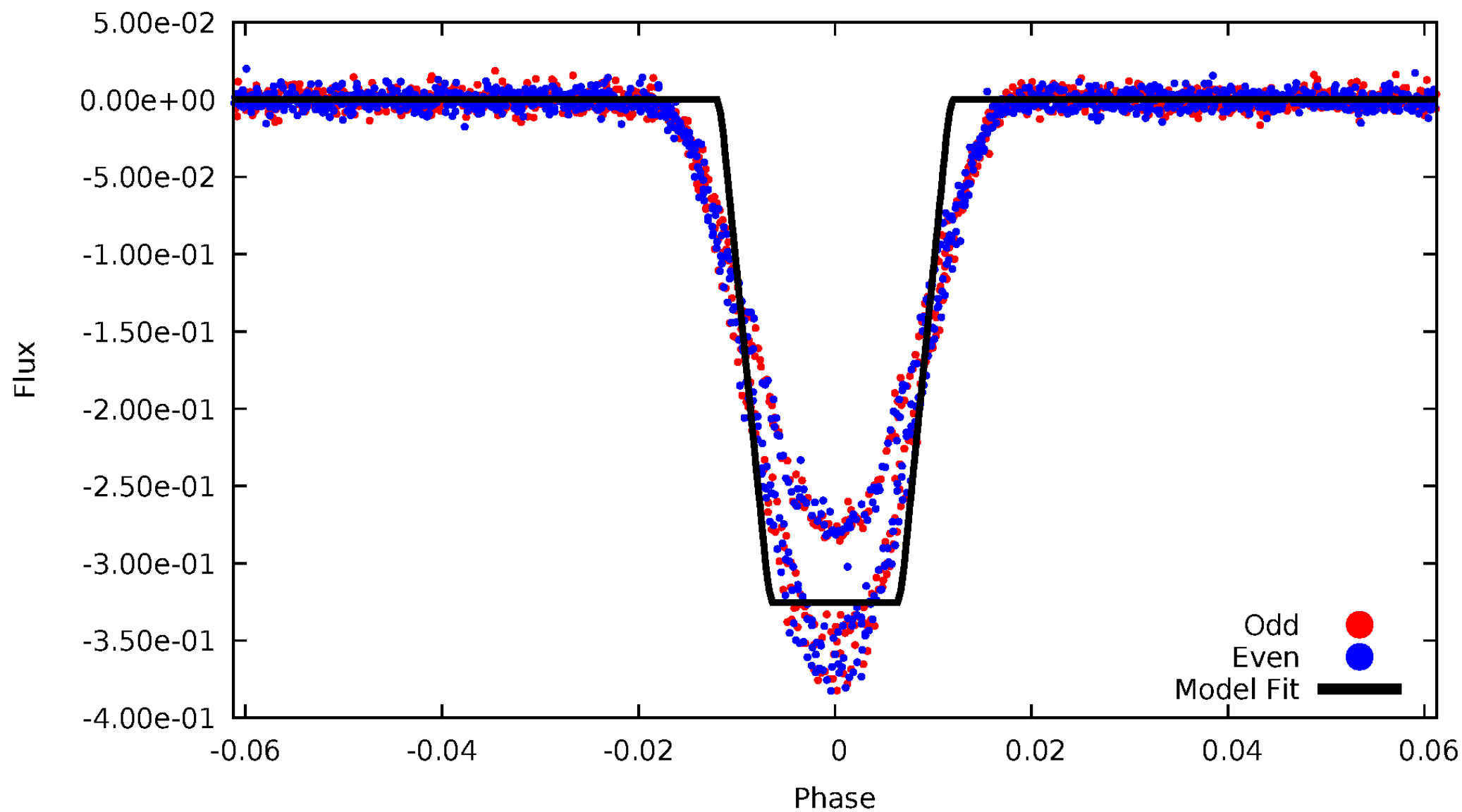
# DV Odd/Even

TCE 005021174-01



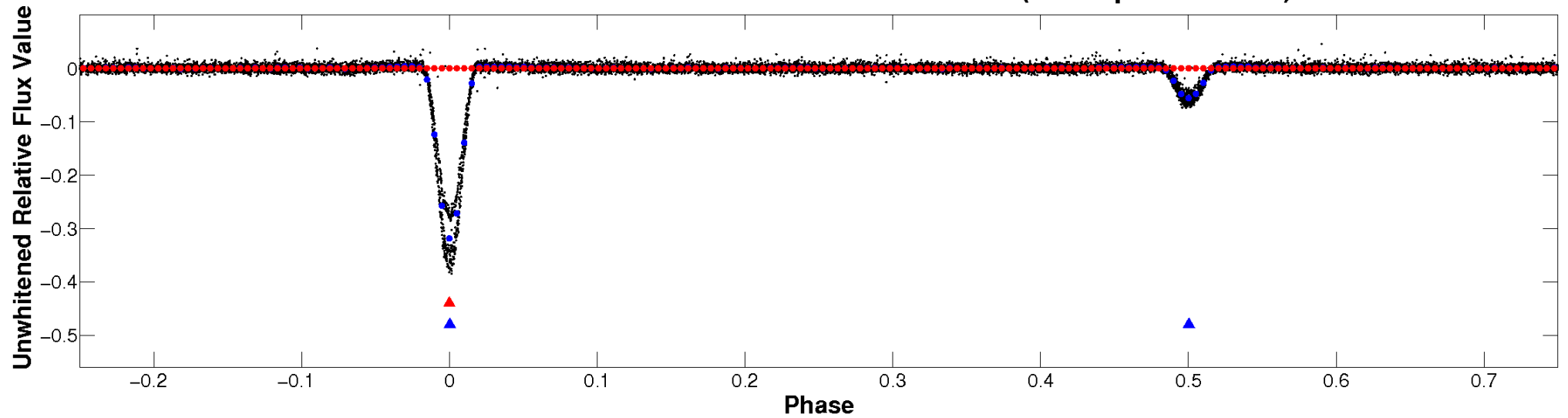
# ALT Odd/Even

TCE 005021174-01



# Non-Whitened Vs. Whitened Light Curve

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

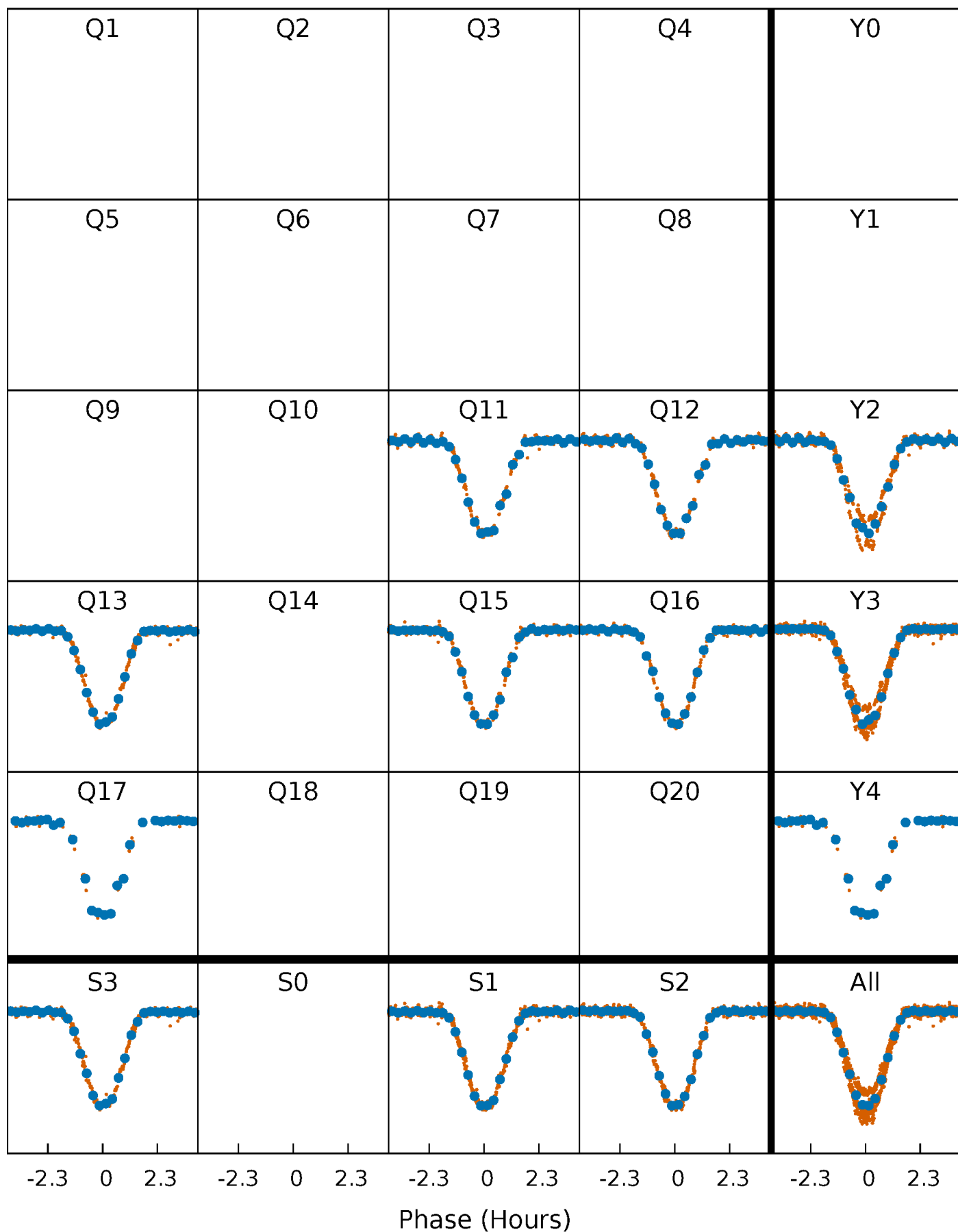


Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)



# PDC Quarter-Phased Transit Curves

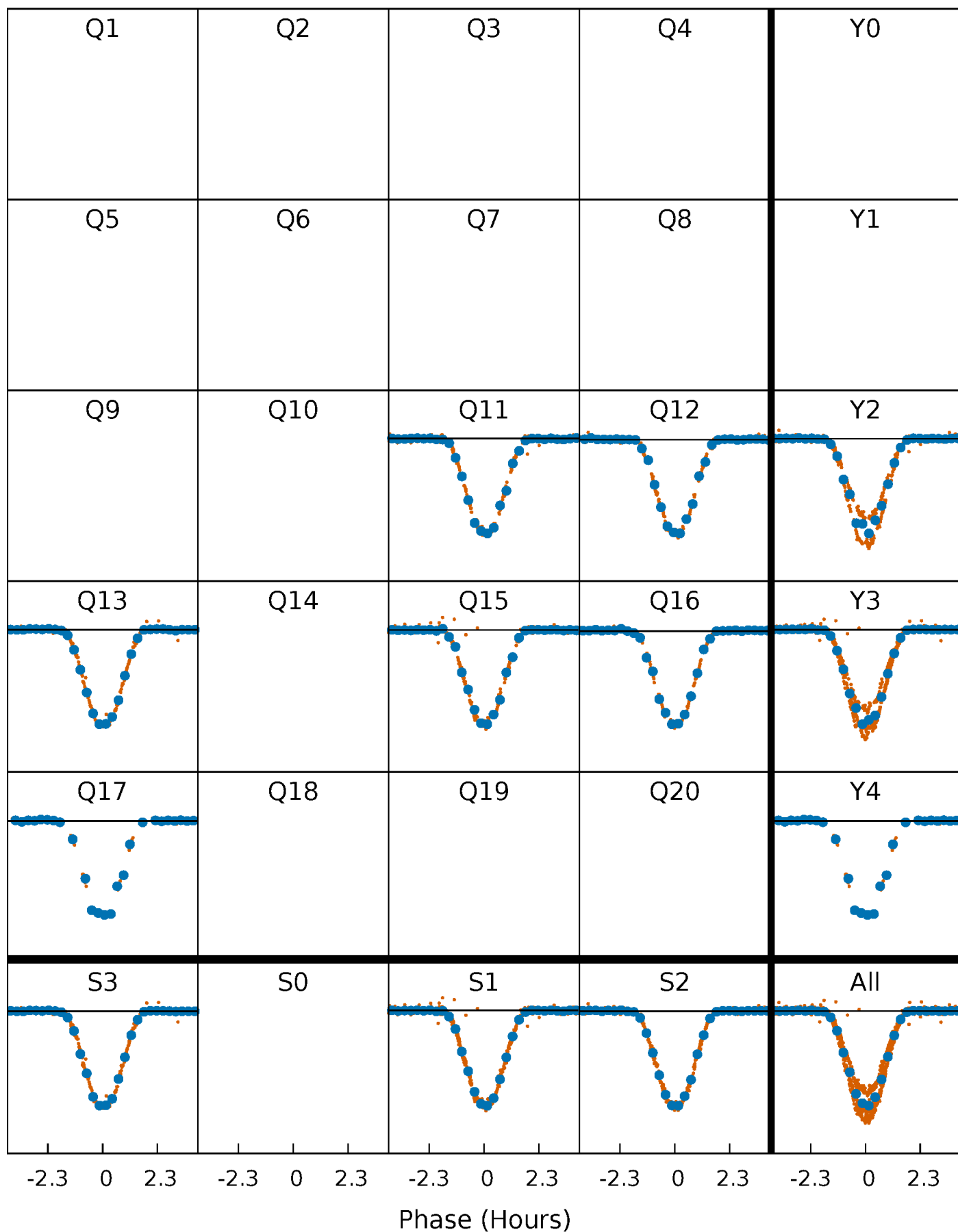
TCE 005021174-01 P= 4.045081 Days  $T_0=132.225777$  (BKJD)





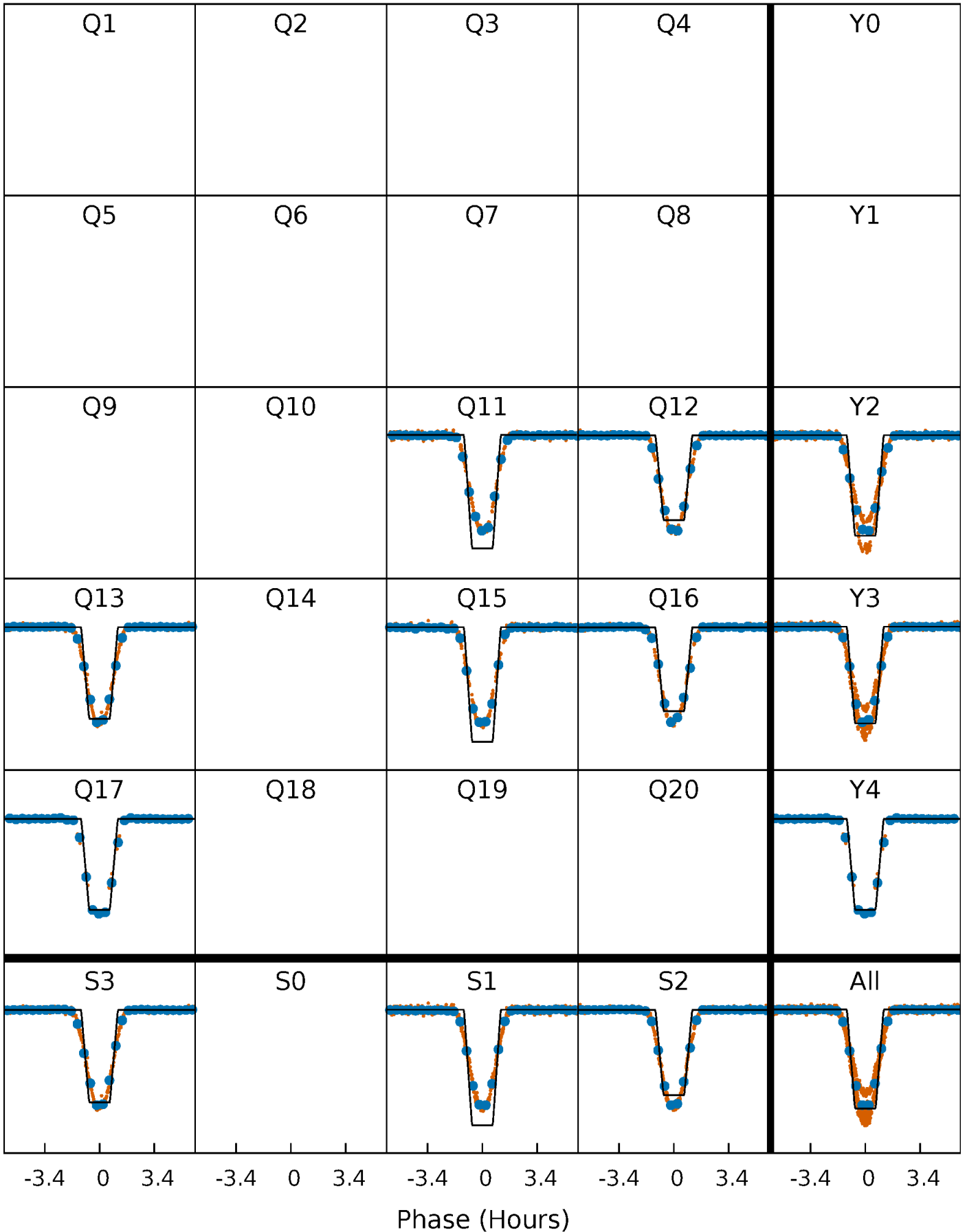
# DV Quarter-Phased Transit Curves

TCE 005021174-01 P= 4.045081 Days  $T_0=132.225777$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

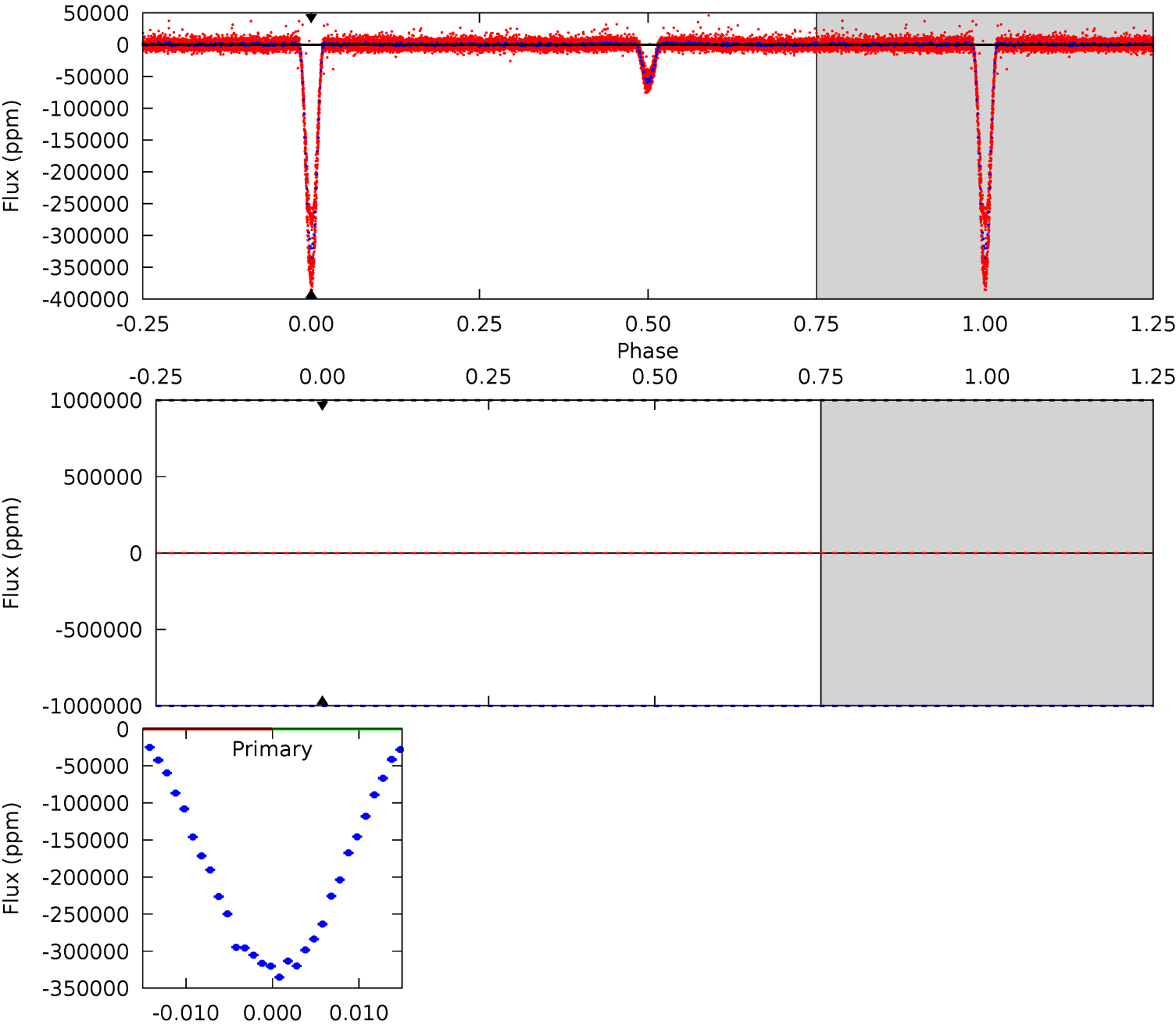
TCE 005021174-01   P= 4.045081 Days    $T_0=132.227113$  (BKJD)



DV Model-Shift Uniqueness Test

005021174-01, P = 4.045081 Days, E = 132.225777 Days

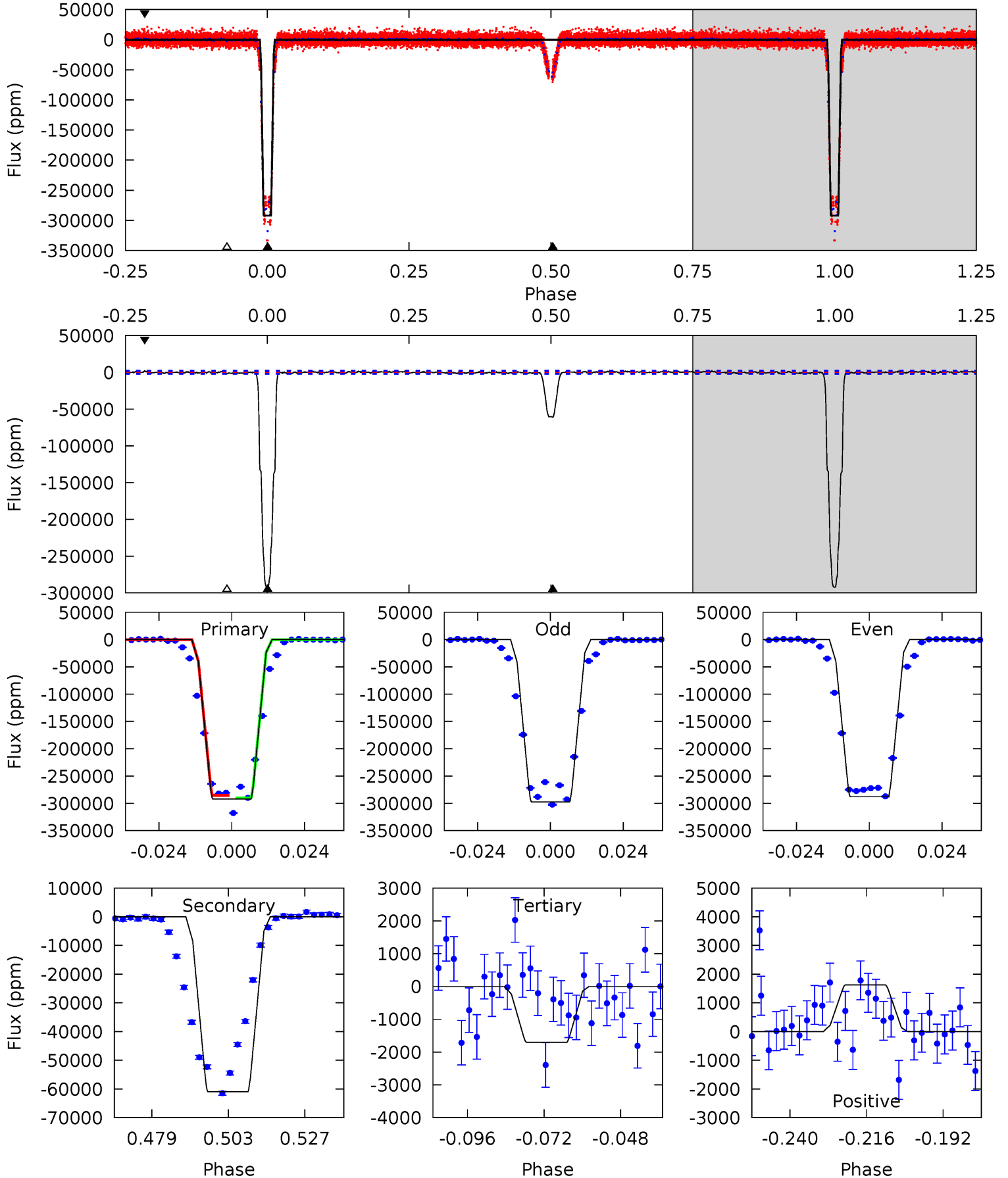
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

005021174-01, P = 4.045081 Days, E = 132.227113 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
684.8	142.8	3.99	3.81	4.86	2.26	1.40	680.8	681.0	138.8	139.0	10.7	0.96	0.01	0



### Stellar Parameters For KIC 005021174

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5780^{+1}_{-1}$	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+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 005021174-01 / KOI 3679.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$54.96^{+12.42}_{-12.18}$	$1601^{+74}_{-82}$	$-2989^{+7712}_{-1701}$	$-2.655^{+49.642}_{-42.587}$
Alt.	$-60917 \pm 427$	$63.09^{+12.10}_{-11.84}$	$1602^{+75}_{-76}$	$4123^{+324}_{-259}$	$22^{+11}_{-6}$

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

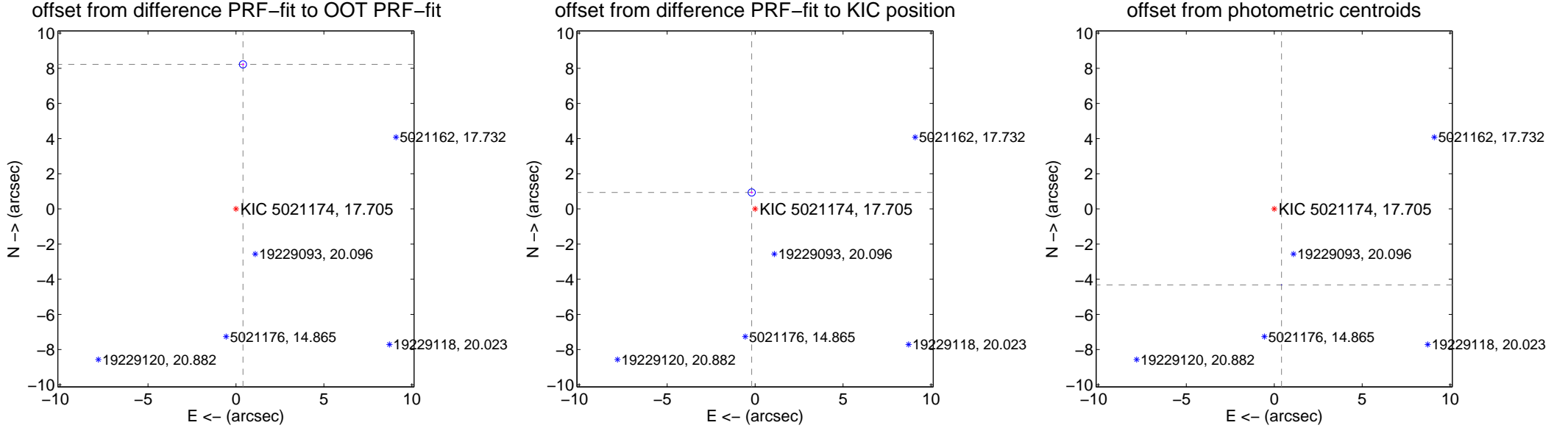
## DV Centroid Data

Supplemental centroid analysis for 005021174-01. Kepler magnitude: 17.70. Transit SNR -1.00

There are 6 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 7.38 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	8.230 $\pm$ 0.068	120.56	-0.398 $\pm$ 0.067	8.221 $\pm$ 0.068
PRF-fit source offset from KIC position	0.957 $\pm$ 0.069	13.93	0.194 $\pm$ 0.068	0.937 $\pm$ 0.068
photometric centroid source offset	4.34 $\pm$ 0.00	1759.81	-0.41 $\pm$ 0.00	-4.32 $\pm$ 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.

Q9 no difference image



Q9 no OOT image



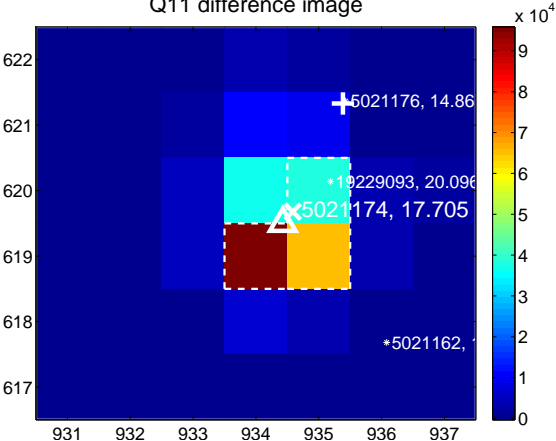
Q10 no difference image



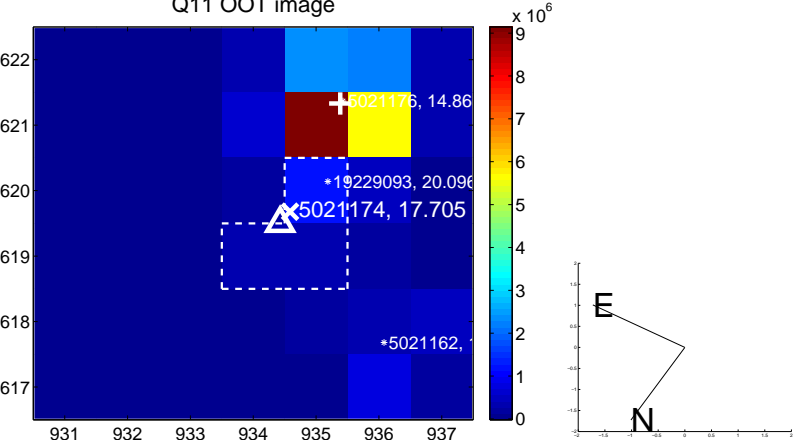
Q10 no OOT image



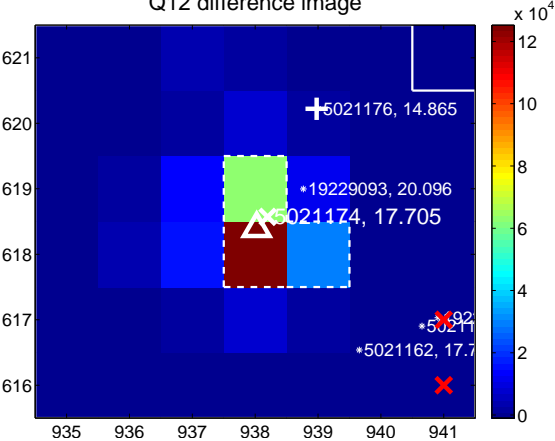
Q11 difference image



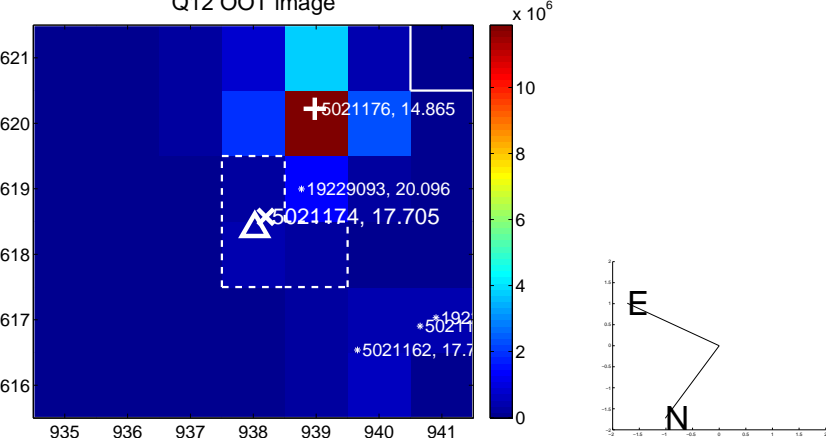
Q11 OOT image



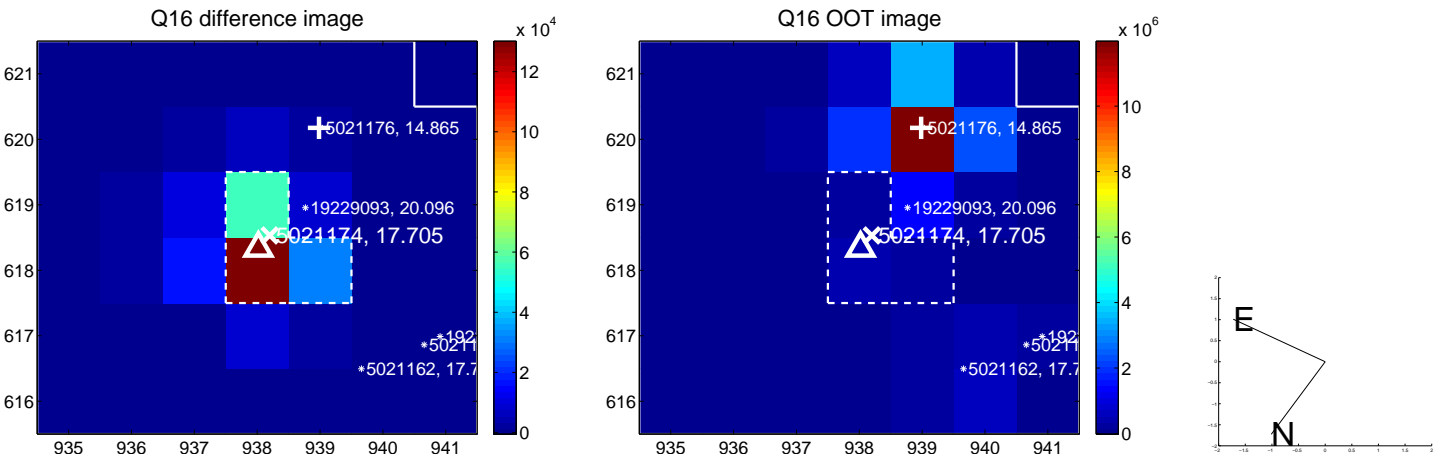
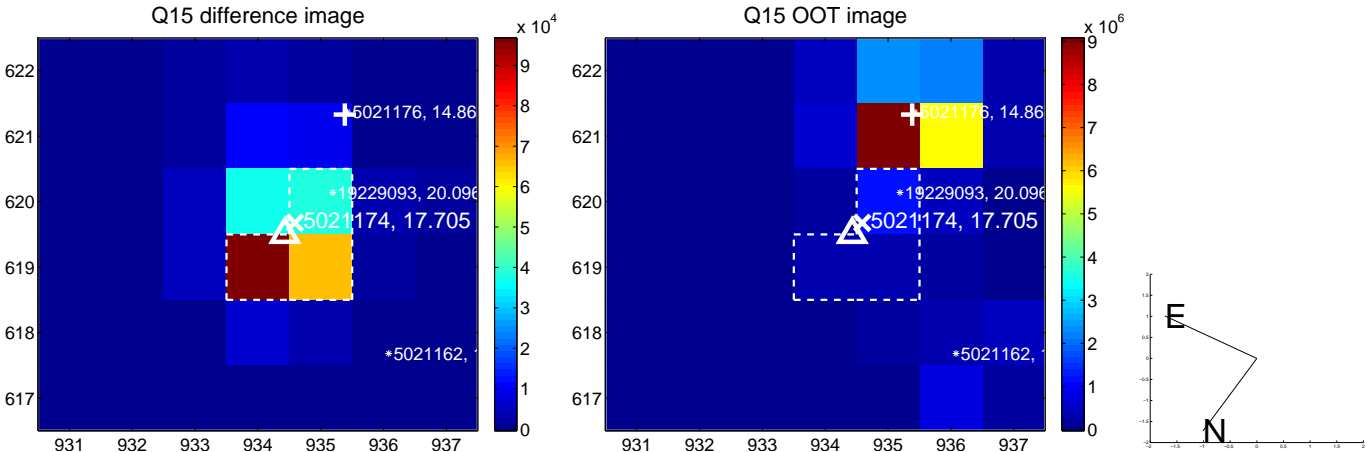
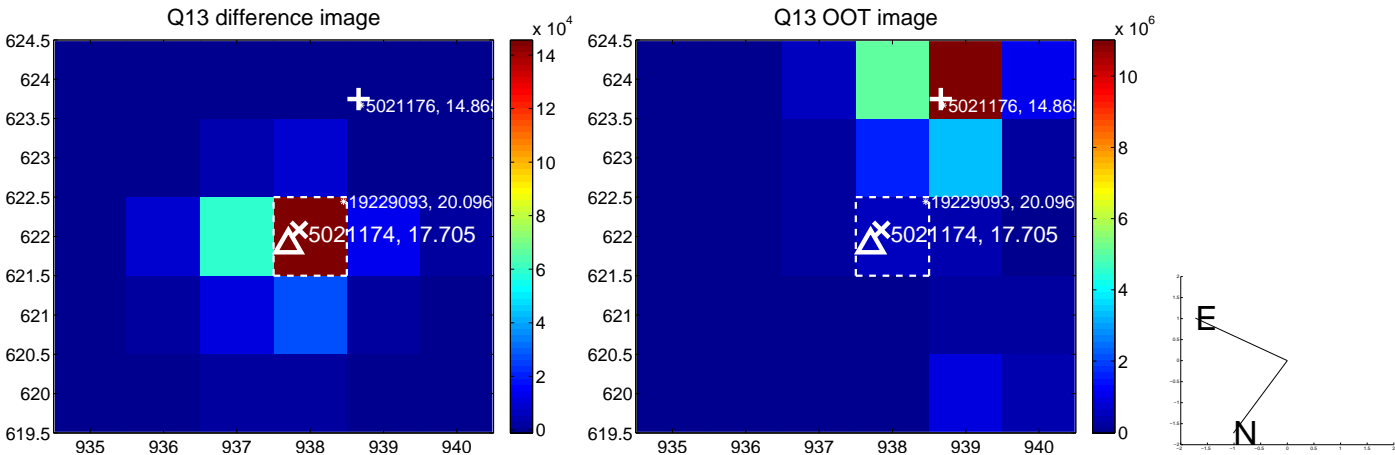
Q12 difference image



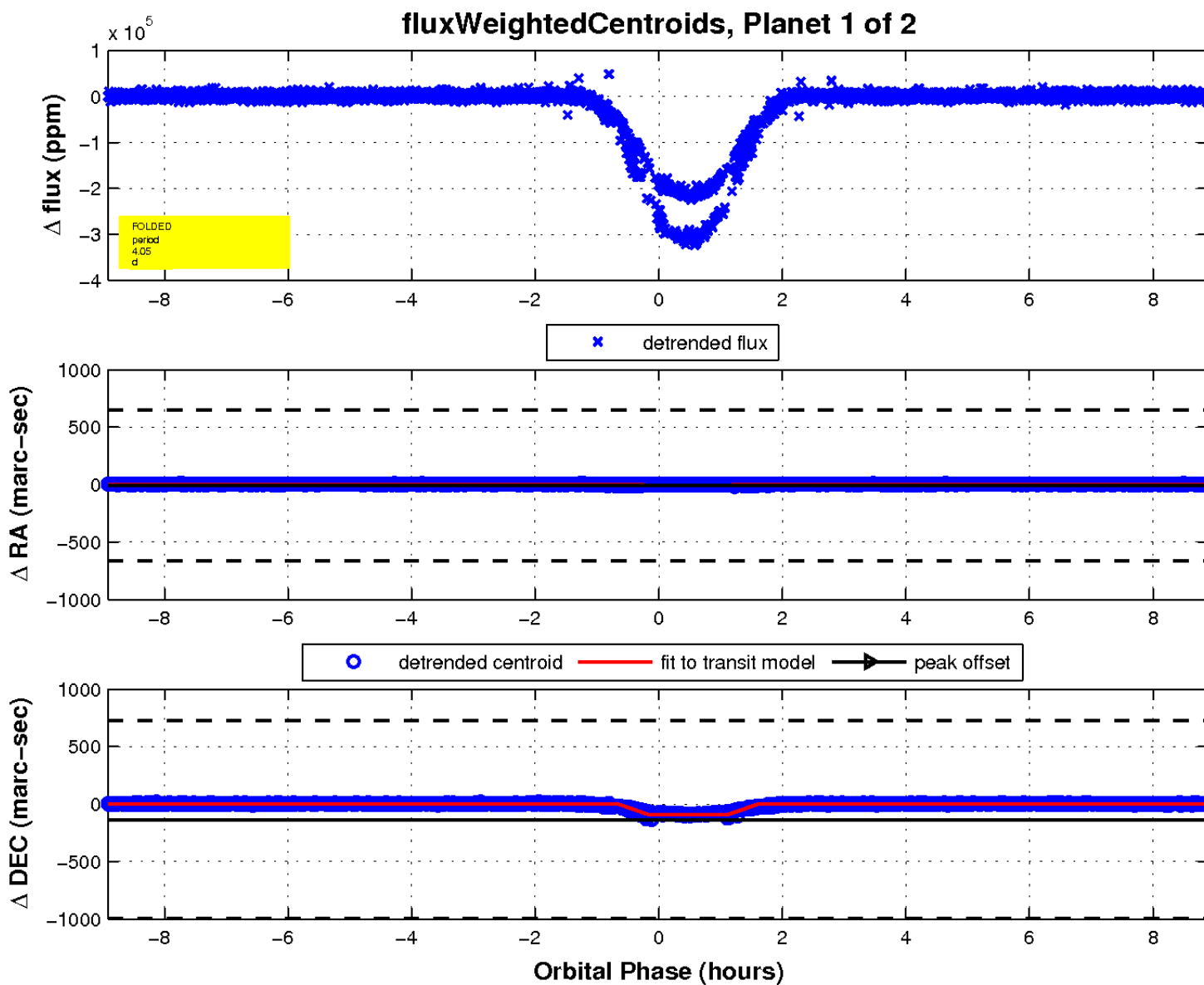
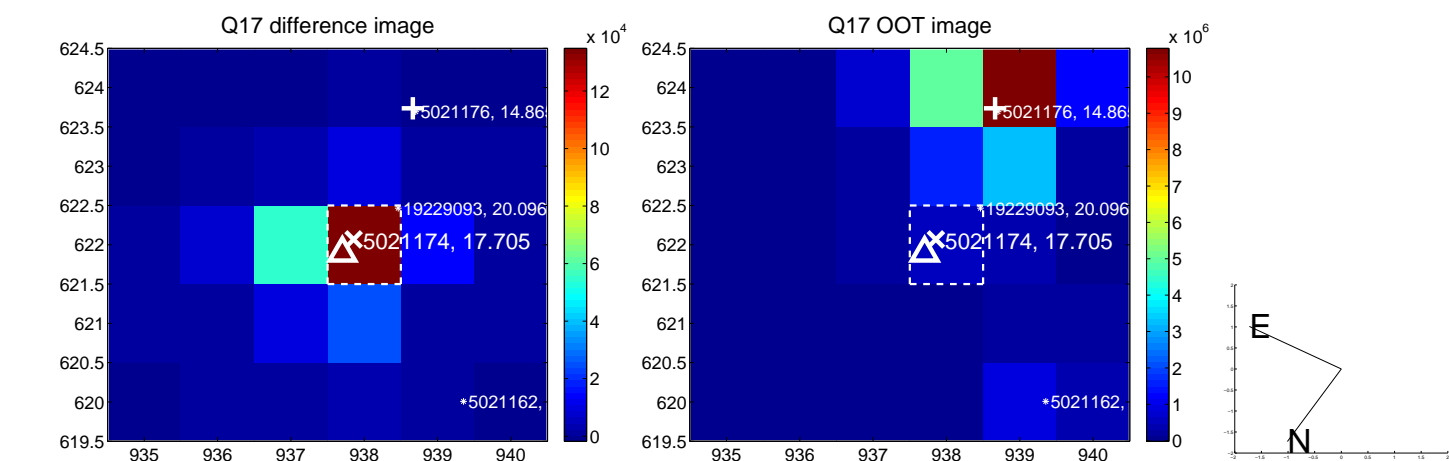
Q12 OOT image



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

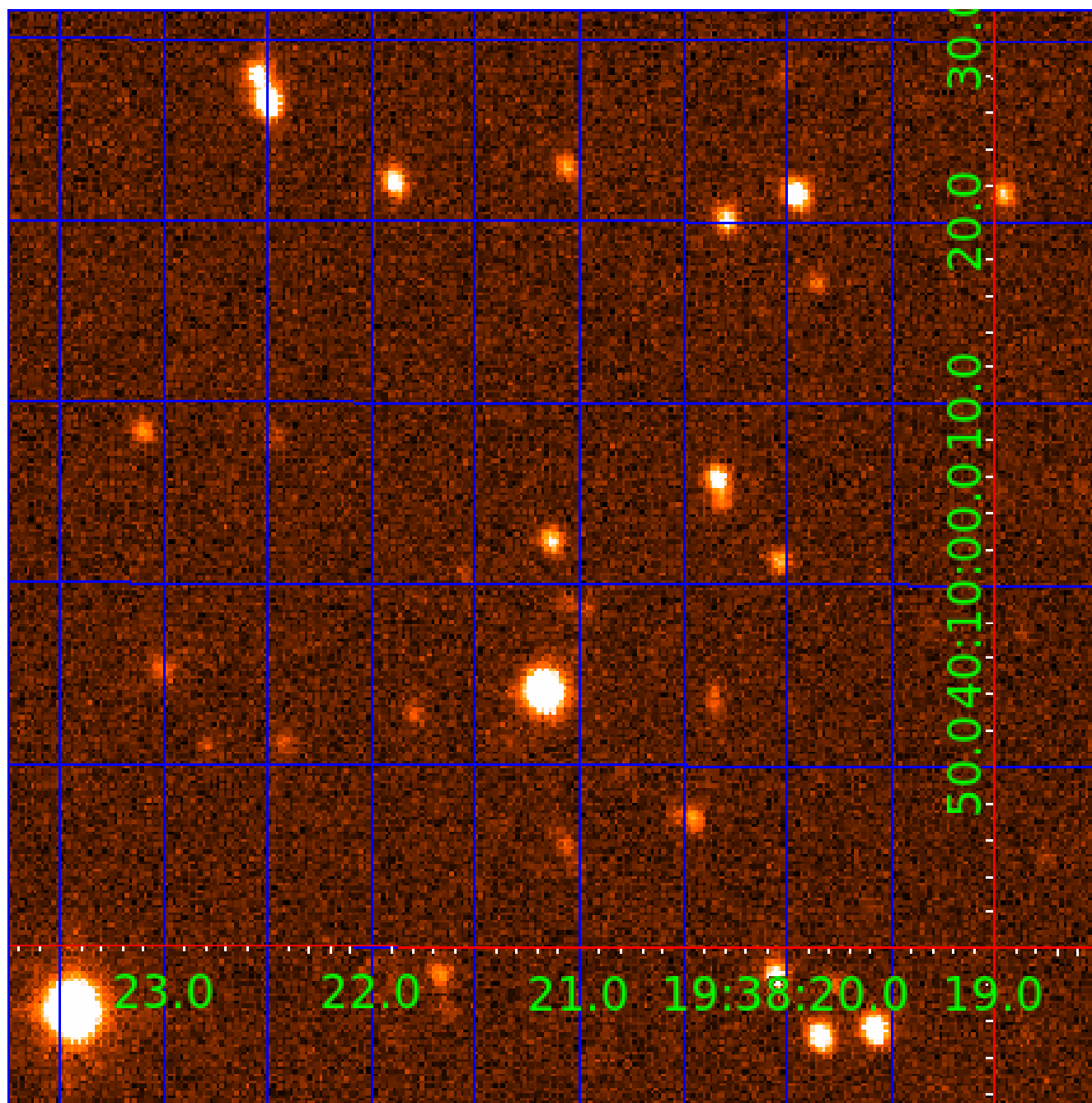


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005021174

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005021174-01	OBS	3679.01	4.045081	132.225777	329330.7	2.000	1041.8	-1.0	1.00	5780	54.56	404.92
005021174-02	OBS	No	2.022541	132.226936	62656.3	3.420	203.7	194.9	1.00	5780	35.46	1020.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005021174-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_NOFITS
005021174-02	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 005021174-02

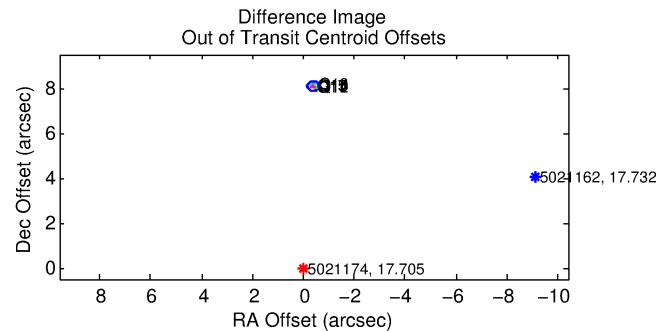
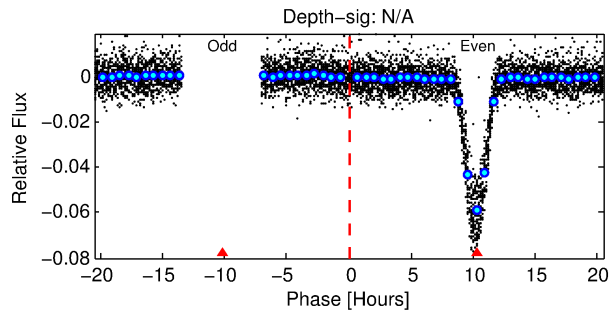
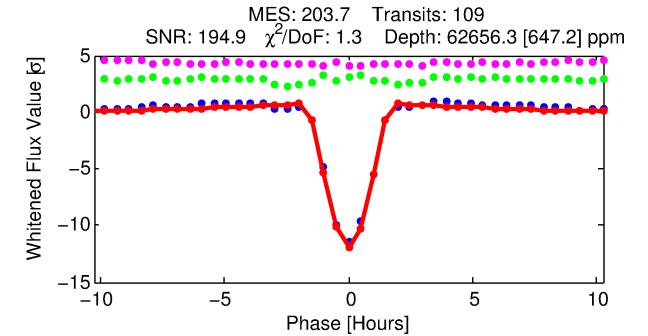
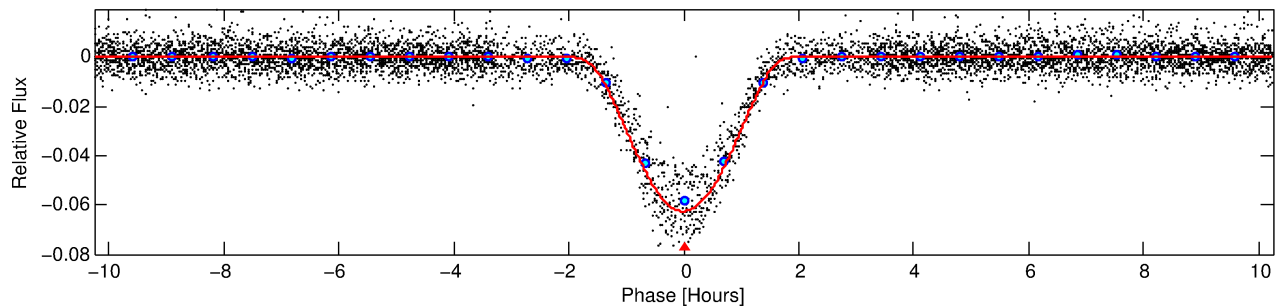
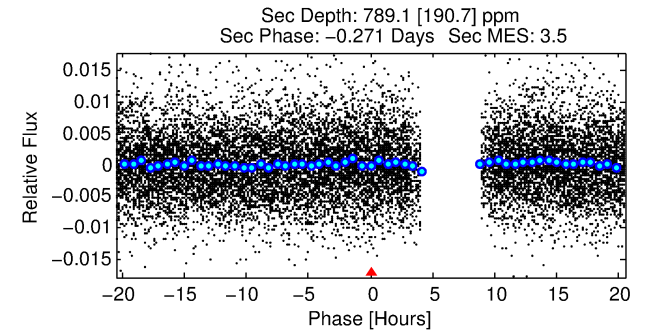
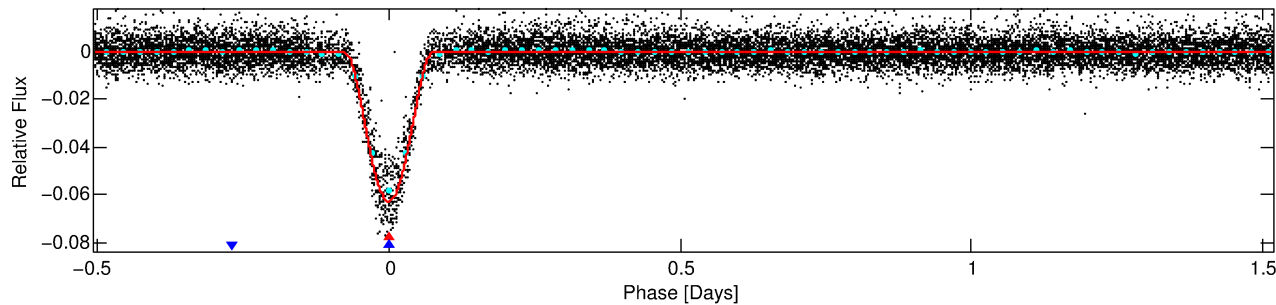
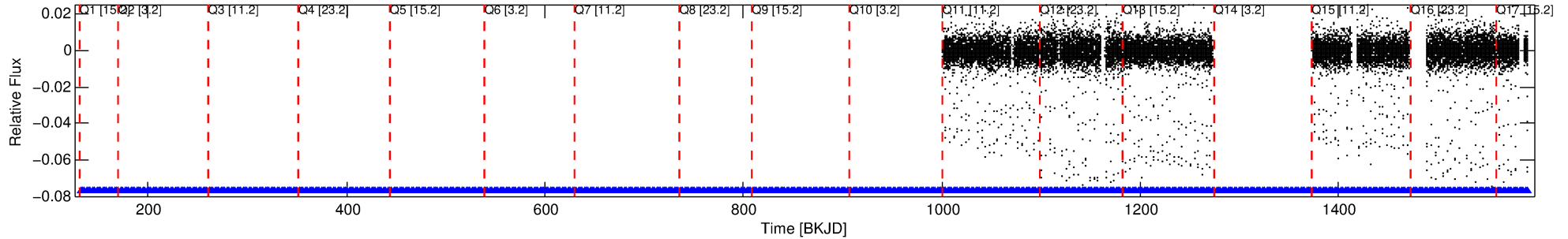
No Significant Match Found

# DV One-Page Summary

KIC: 5021174 Candidate: 2 of 2 Period: 2.023 d

KOI: K03679 Corr: No Ephemeris Match

Kp: 17.70 R\*: 1.00 Rs Teff: 5780.0 K Logg: 4.44 Fe/H: 0.000



## DV Fit Results:

Period = 2.02254 [0.00000] d  
Epoch = 132.2269 [0.0003] BKJD  
Rp/R\* = 0.3249 [0.0857]  
a/R\* = 4.53 [0.07]  
b = 0.90 [0.14]  
Seff = 1020.33 [0.00]  
Teff = 1441 [0] K  
Rp = 35.46 [9.36] Re  
a = 0.0313 [0.0000] AU  
Ag = 0.34 [0.20] [-3.37σ]  
Teffp = 1699 [247] K [1.05σ]

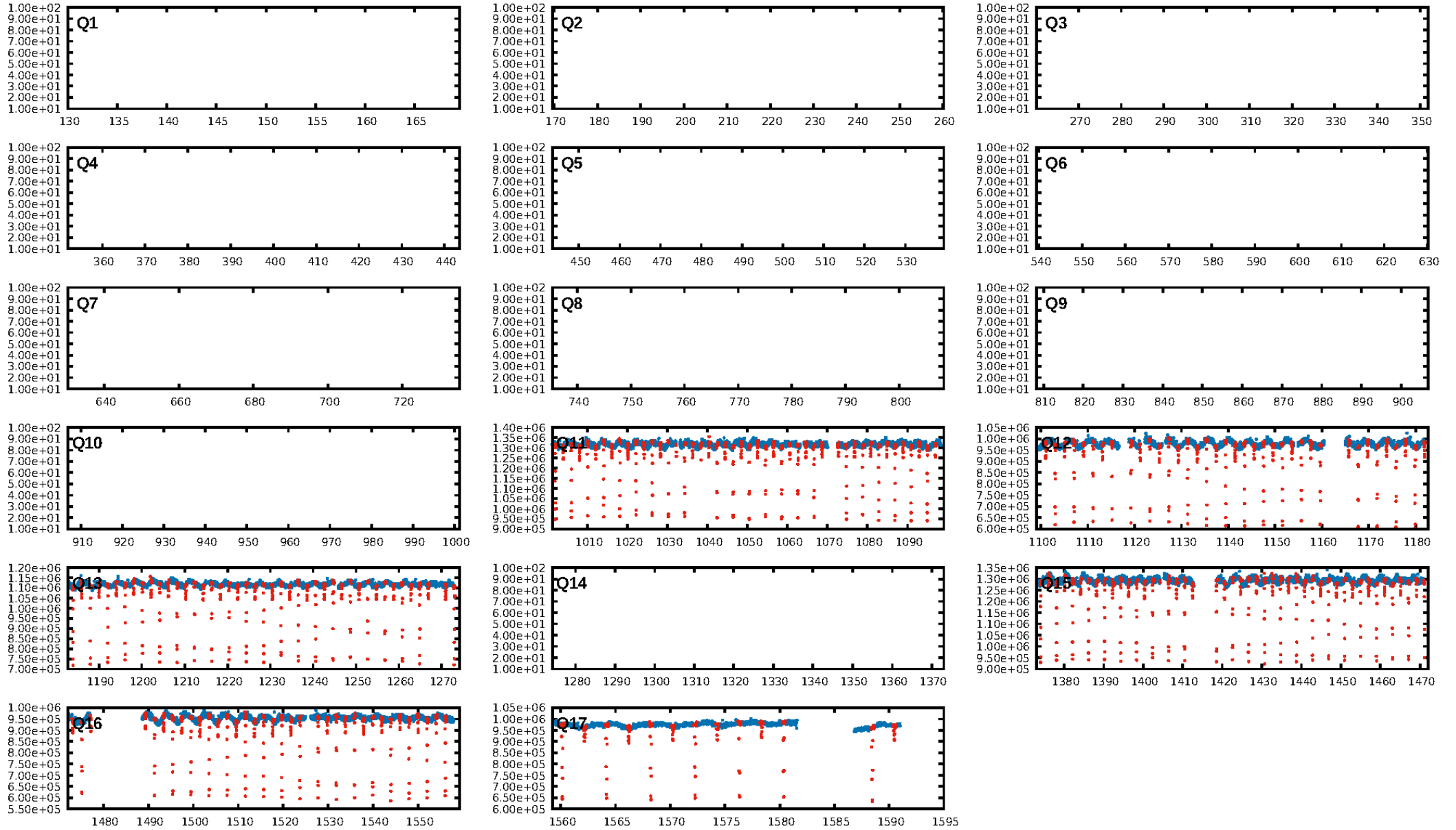
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [12.25σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 63.4%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [103/103]  
GhostDiagnostic-chr: 3.005  
Centroid-sig: 0.0%  
Centroid-so: 4.303 arcsec [472.39σ]  
OotOffset-rm: 8.090 arcsec [109.03σ]  
KicOffset-rm: 0.871 arcsec [12.35σ]  
OotOffset-st: 0/2/2/2 [6]  
KicOffset-st: 0/2/2/2 [6]  
DiffImageQuality-fgm: 1.00 [6/6]  
DiffImageOverlap-fno: 1.00 [6/6]

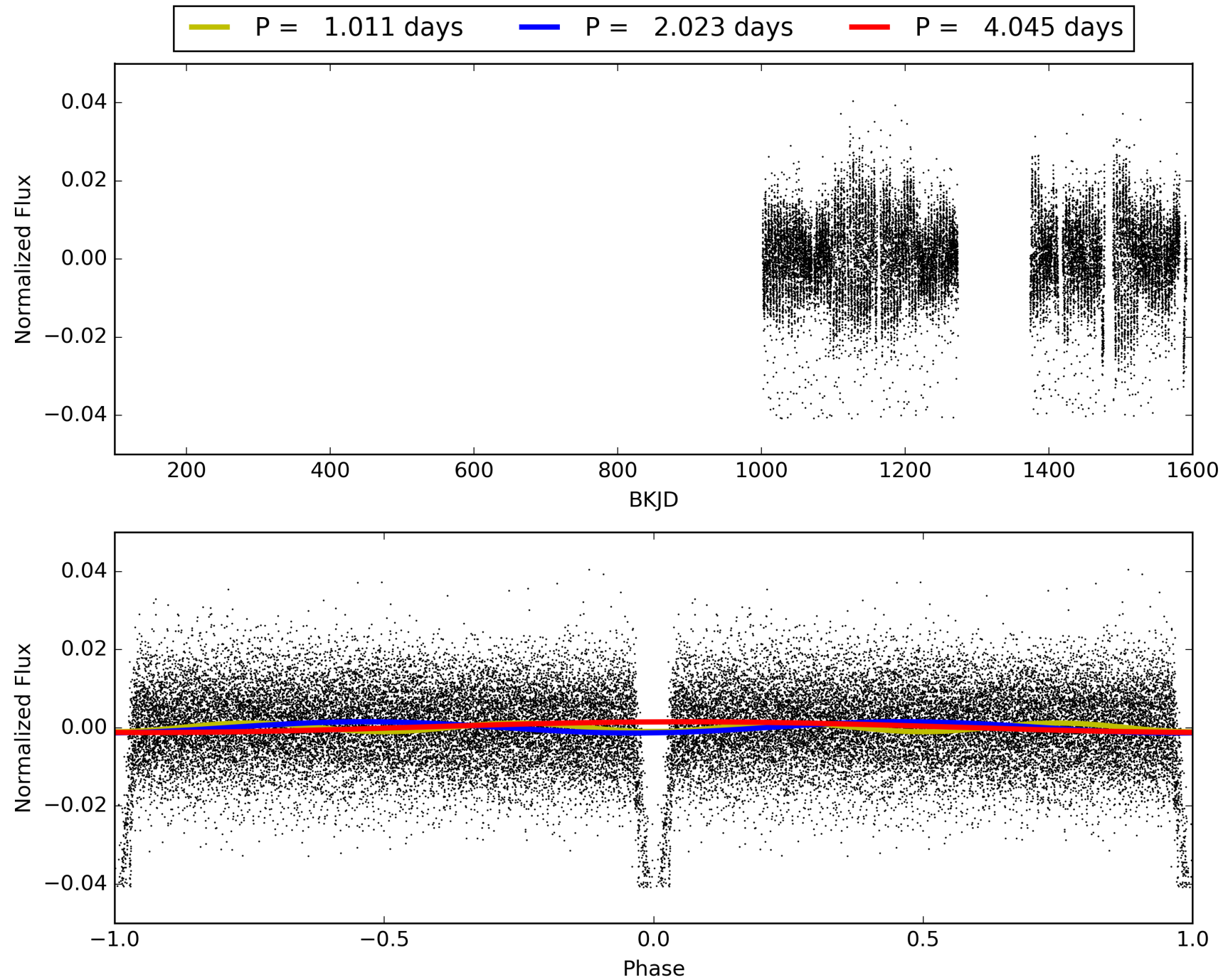
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 13:09:48 Z

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

# TCE 005021174-02, PDC Light Curves



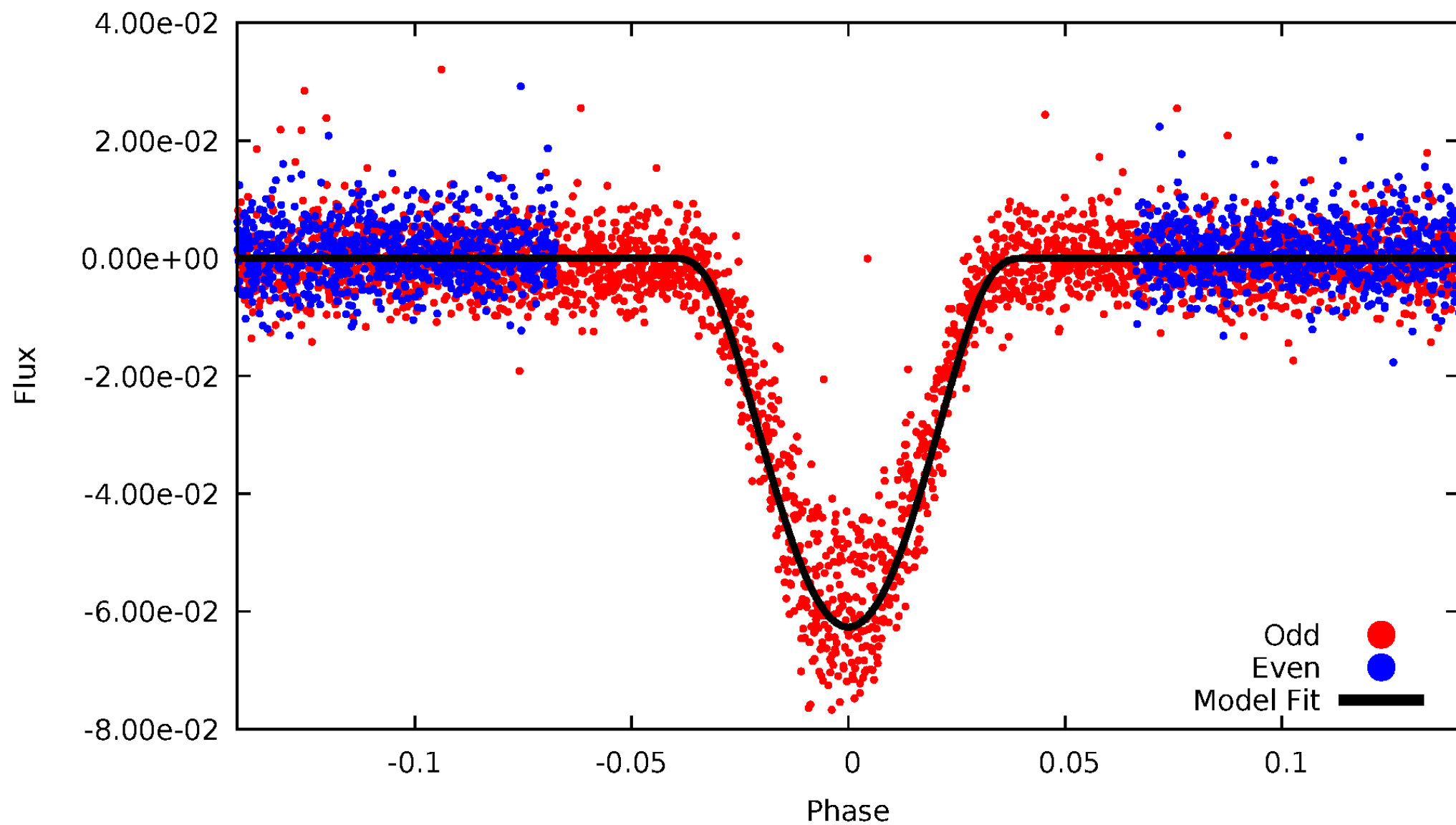
TCE 005021174-02





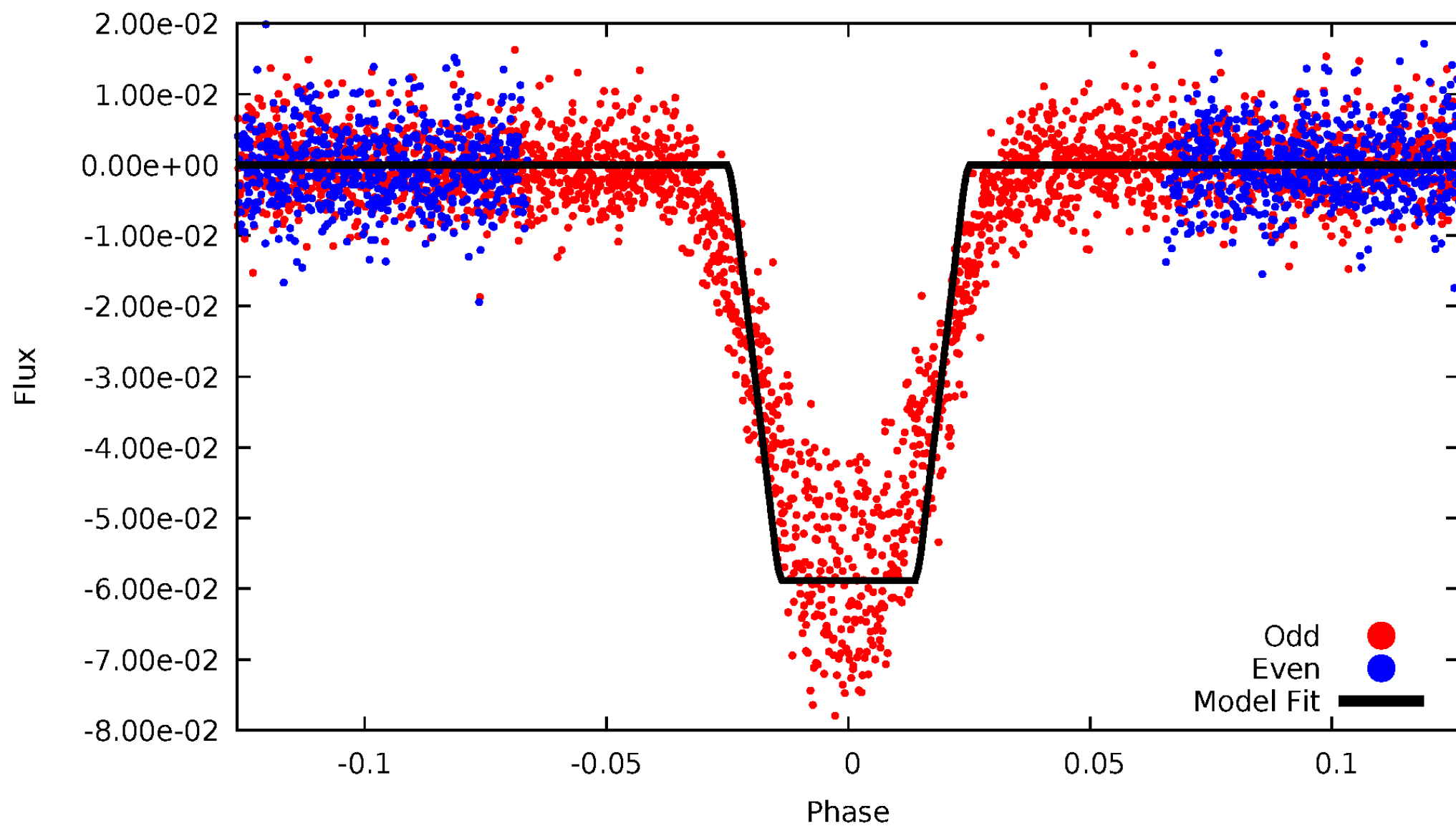
# DV Odd/Even

TCE 005021174-02



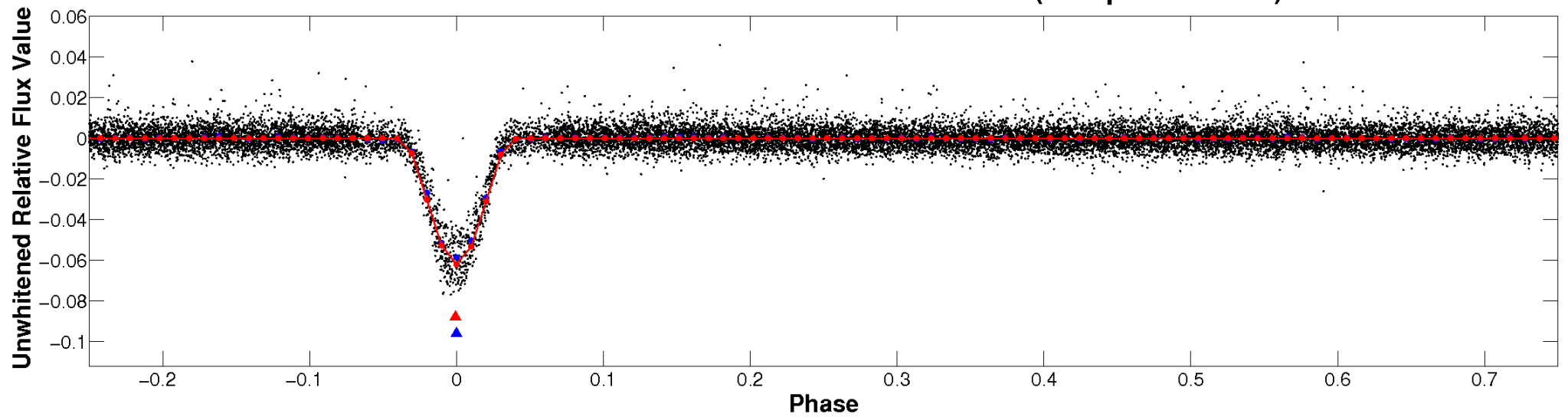
# ALT Odd/Even

TCE 005021174-02

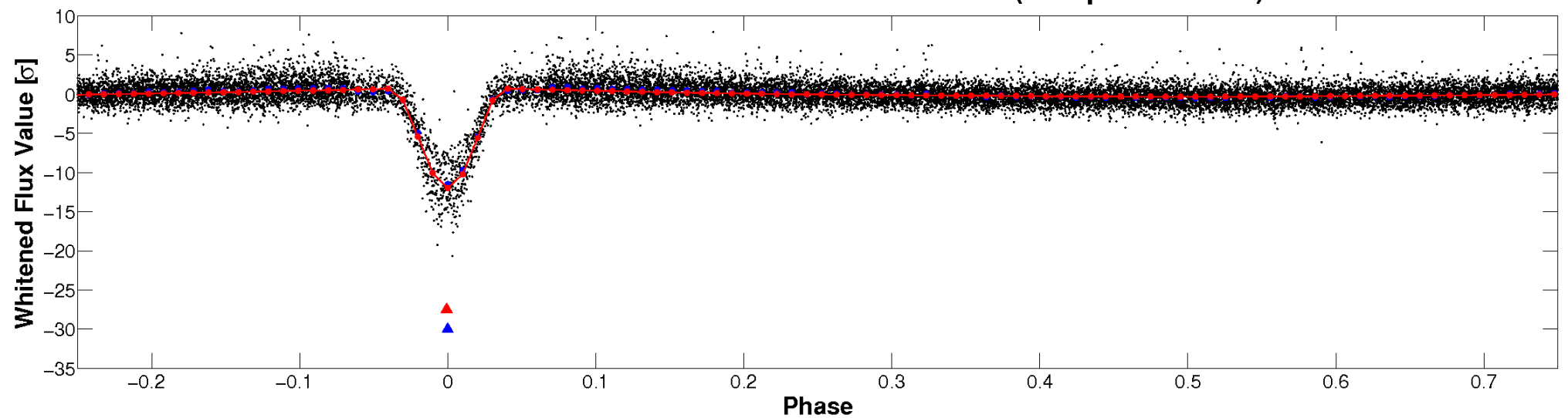


# Non-Whitened Vs. Whitened Light Curve

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

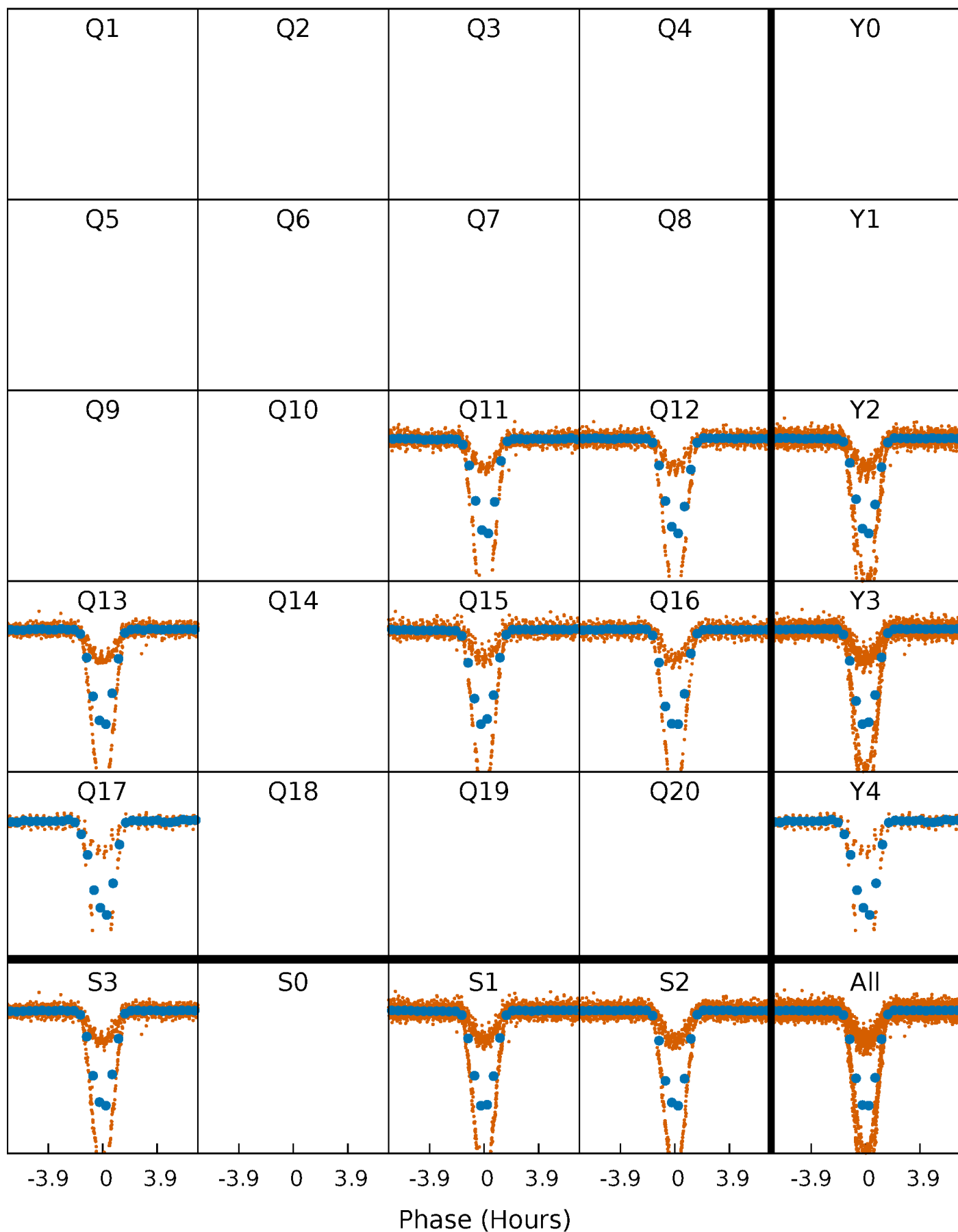


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



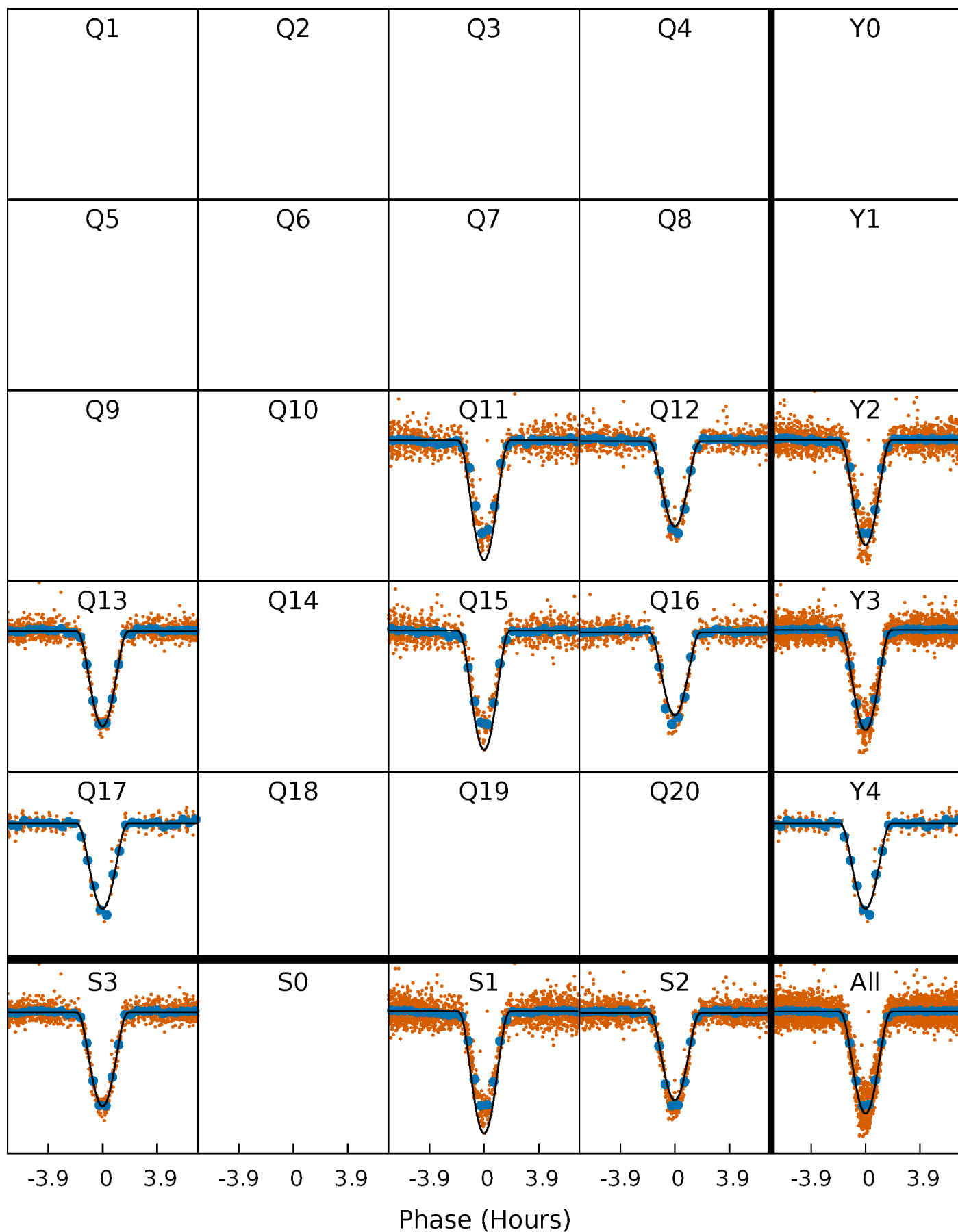
# PDC Quarter-Phased Transit Curves

TCE 005021174-02   P= 2.022541 Days    $T_0=132.226936$  (BKJD)



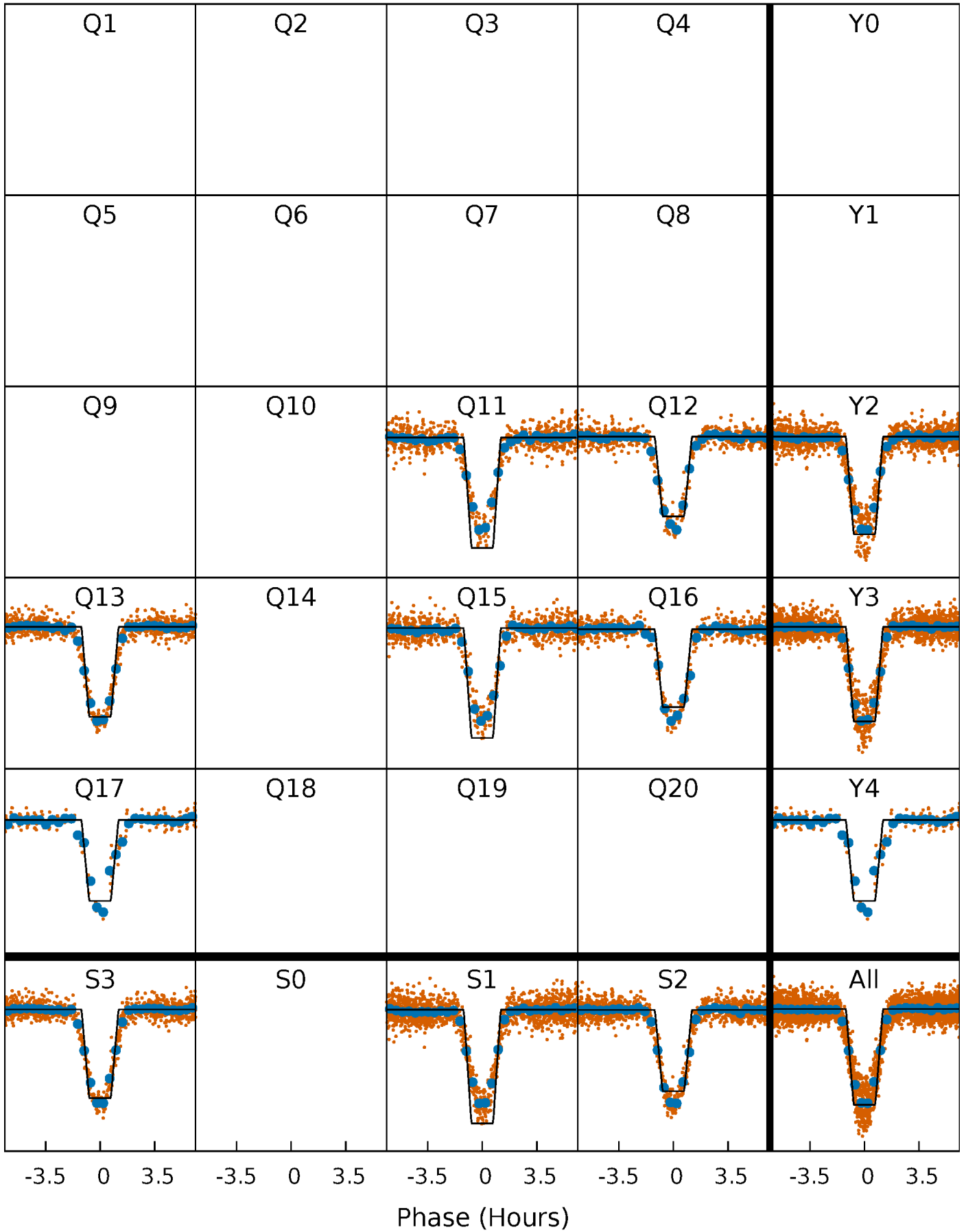
# DV Quarter-Phased Transit Curves

TCE 005021174-02   P= 2.022541 Days    $T_0=132.226936$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

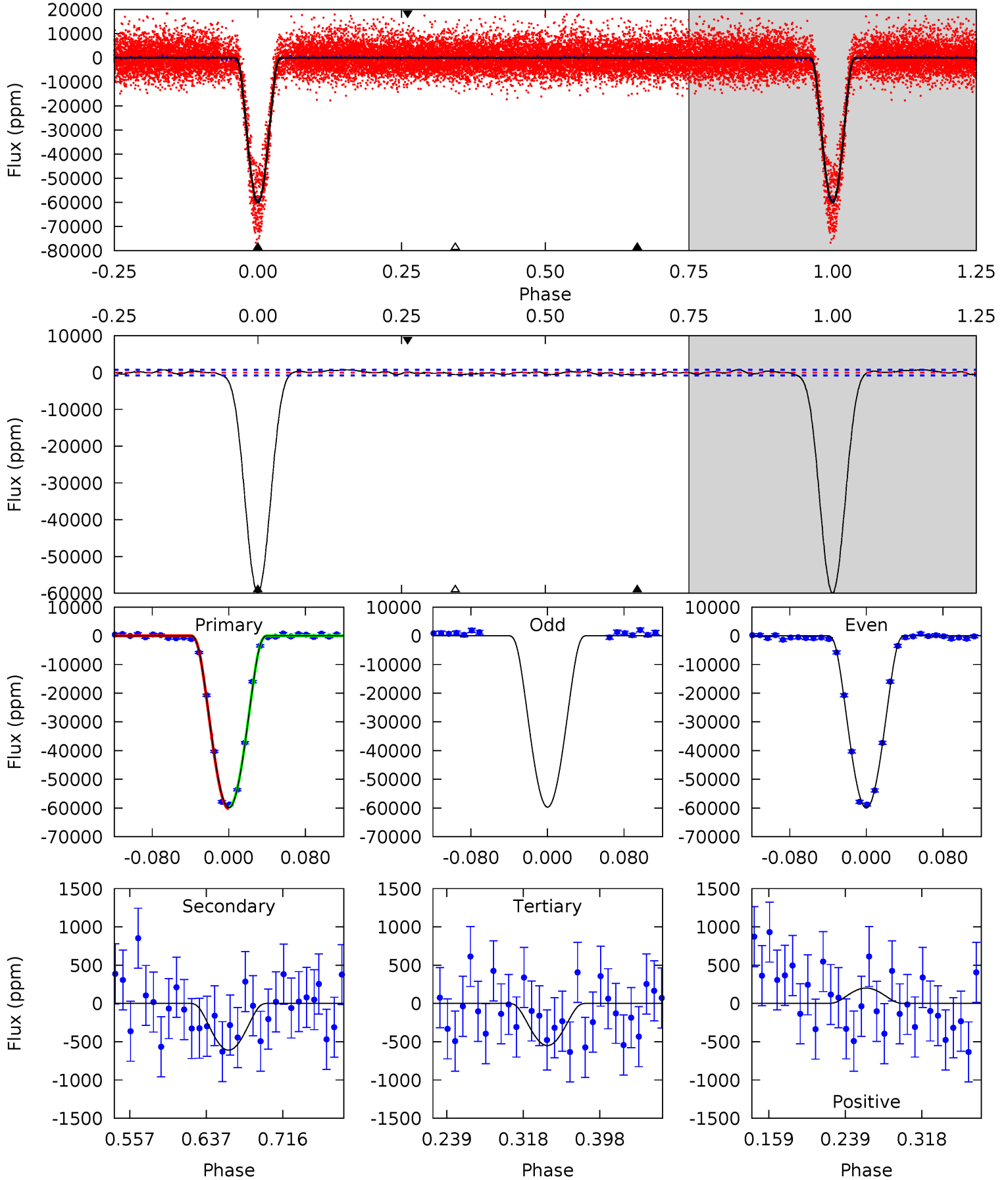
TCE 005021174-02 P= 2.022523 Days  $T_0=132.237050$  (BKJD)



# DV Model-Shift Uniqueness Test

005021174-02, P = 2.022541 Days, E = 132.226936 Days

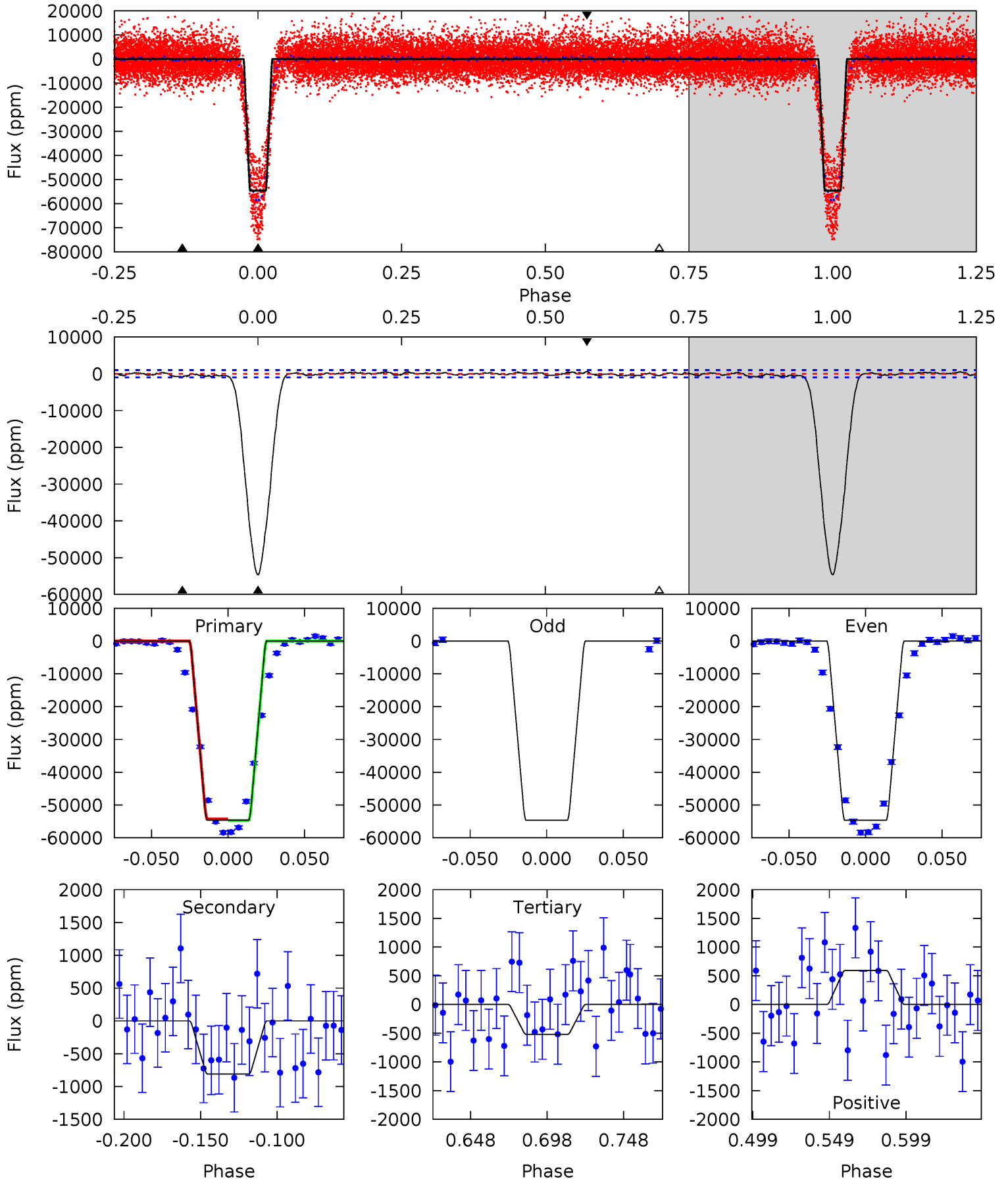
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
364.9	3.72	3.35	1.23	4.61	1.75	1.97	361.5	363.6	0.37	2.49	1.03	0.96	0.01	1.80



# Alt Model-Shift Uniqueness Test

005021174-02, P = 2.022523 Days, E = 132.237050 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
256.6	3.81	2.45	2.78	4.71	1.96	1.25	254.2	253.9	1.36	1.03	0.05	0.98	0.01	0.90





### Stellar Parameters For KIC 005021174

	$T_{\text{eff}}(K)$	$\log(g)$	[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 005021174-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	-610±164	$34.98^{+10.30}_{-9.51}$	$2008^{+111}_{-87}$	$-1982^{+4384}_{-332}$	$0.263^{+0.261}_{-0.118}$
Alt.	-810±213	$26.56^{+9.62}_{-8.95}$	$2018^{+93}_{-93}$	$2497^{+485}_{-4088}$	$0.599^{+0.936}_{-0.302}$

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

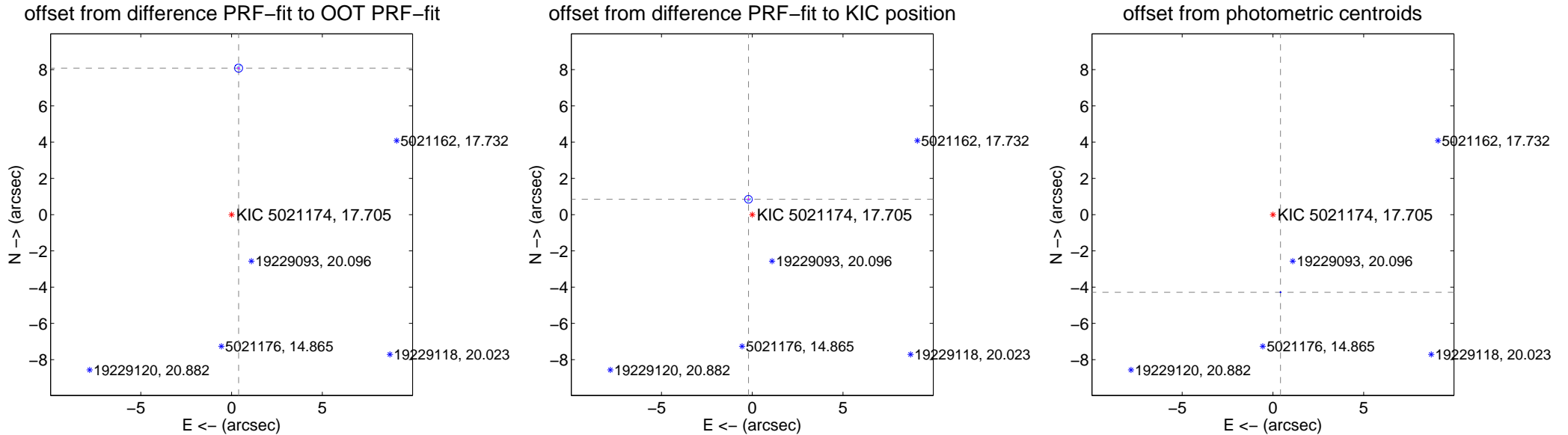
## DV Centroid Data

Supplemental centroid analysis for 005021174-02. Kepler magnitude: 17.70. Transit SNR 194.87

There are 6 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 7.36 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	8.090 $\pm$ 0.074	109.03	-0.388 $\pm$ 0.072	8.081 $\pm$ 0.074
PRF-fit source offset from KIC position	0.871 $\pm$ 0.070	12.35	0.207 $\pm$ 0.070	0.846 $\pm$ 0.071
photometric centroid source offset	4.30 $\pm$ 0.01	472.39	-0.42 $\pm$ 0.01	-4.28 $\pm$ 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.



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

Q9 no difference image



Q9 no OOT image



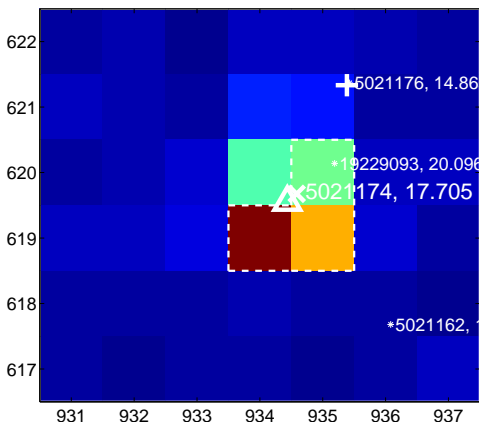
Q10 no difference image



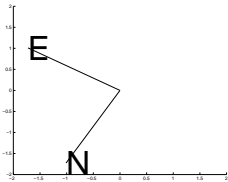
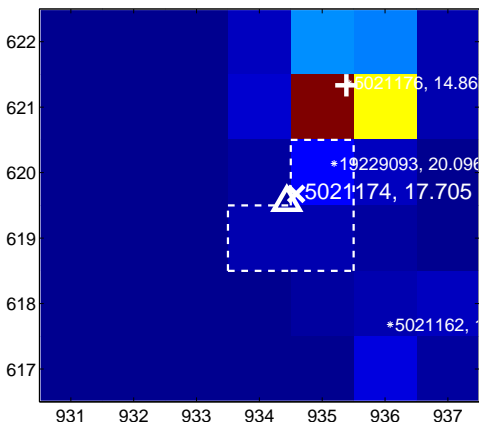
Q10 no OOT image



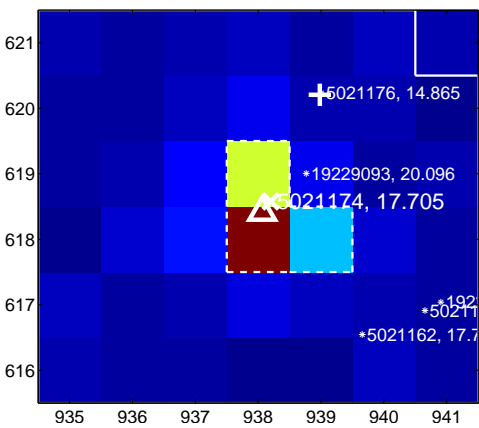
Q11 difference image



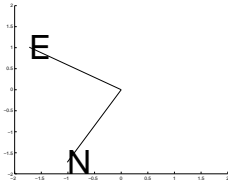
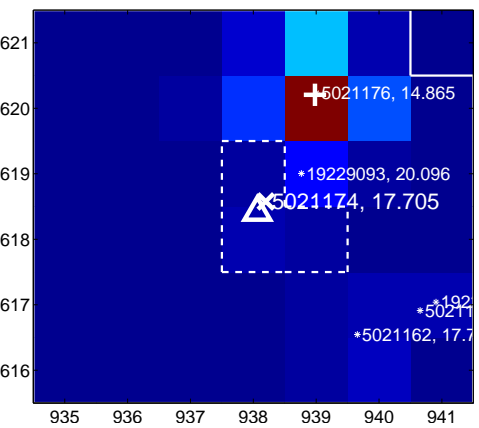
Q11 OOT image



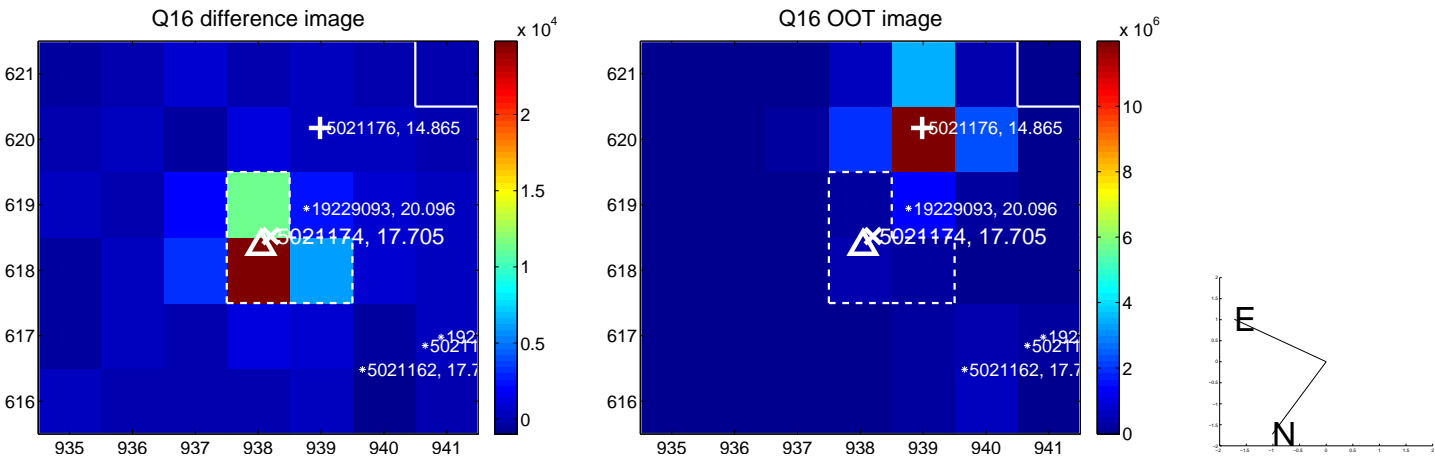
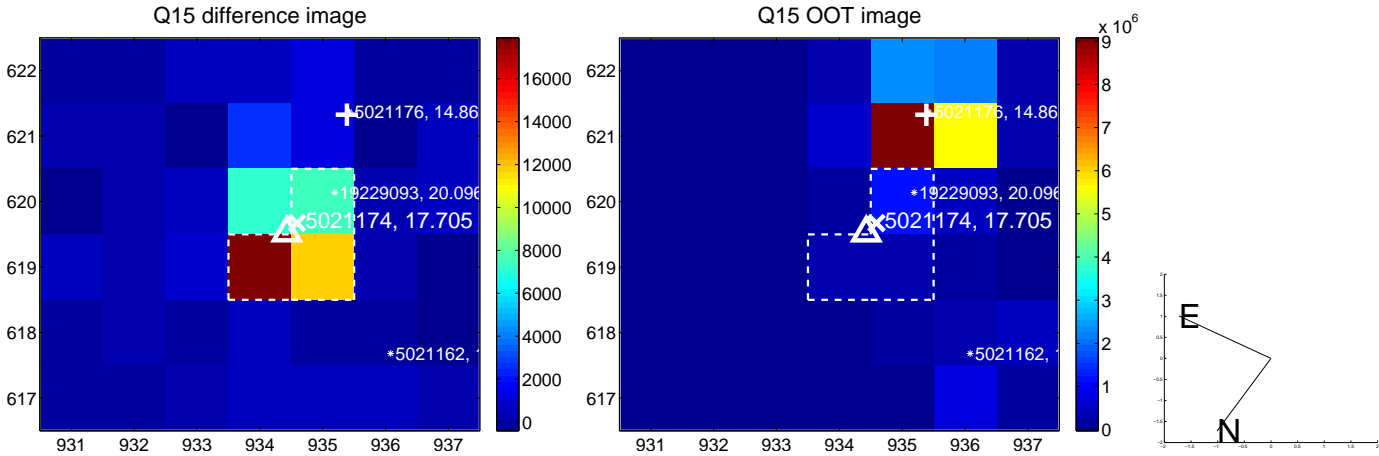
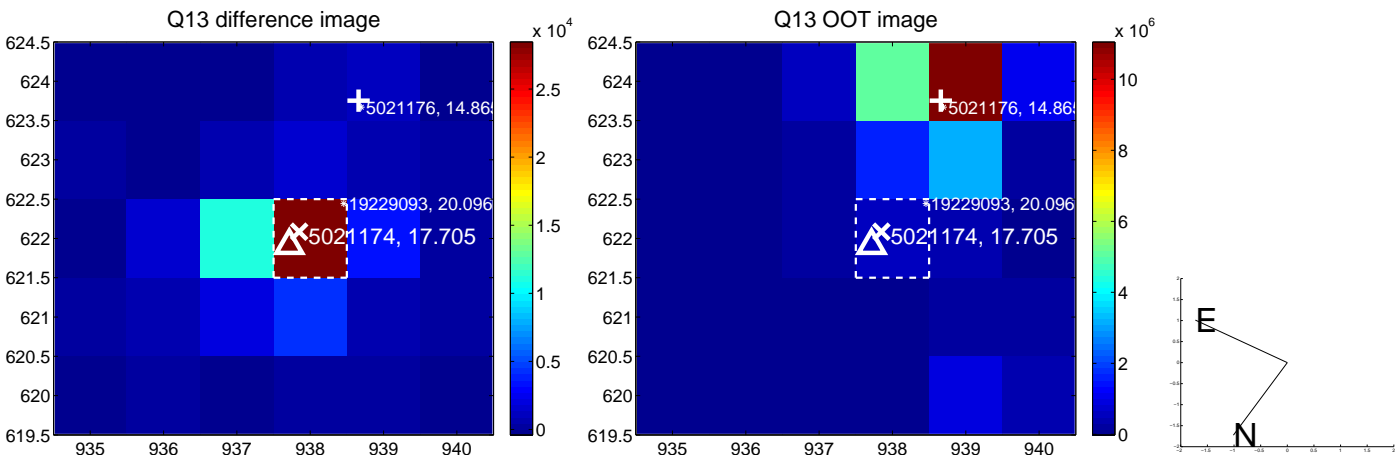
Q12 difference image



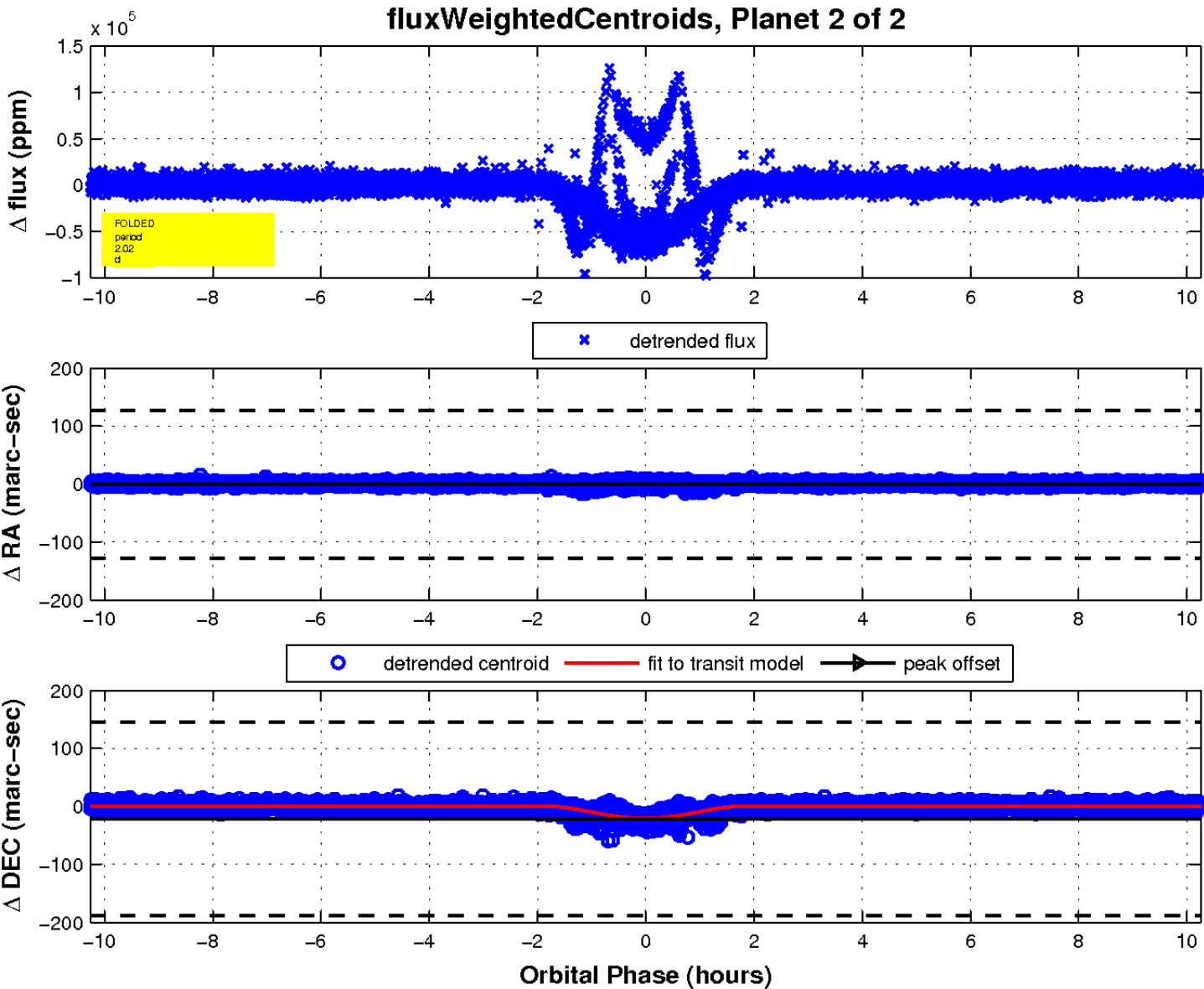
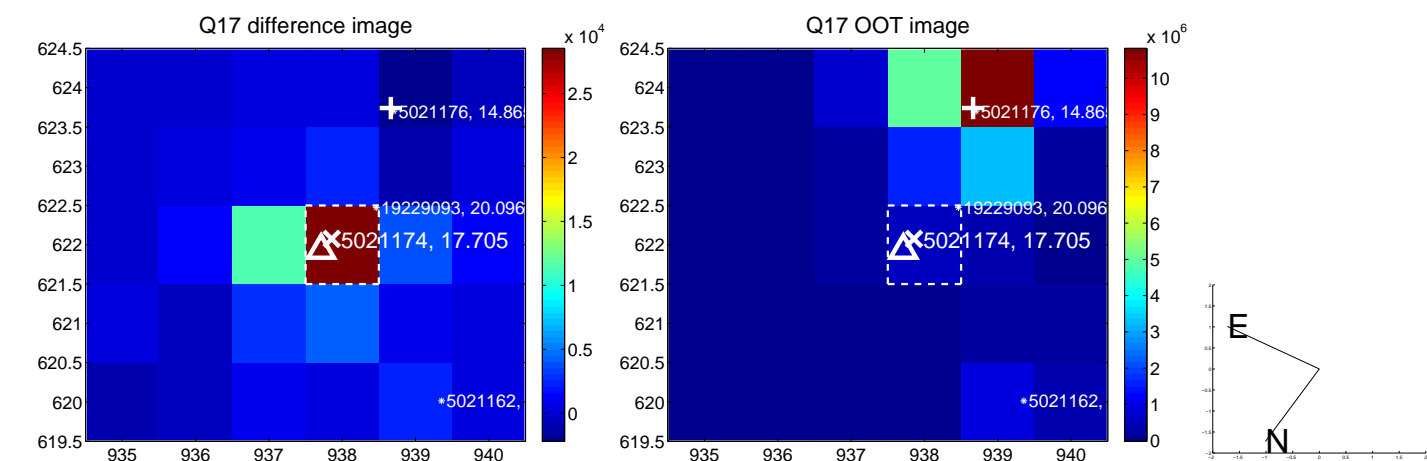
Q12 OOT image



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



UKIRT Image

Declination

