

# KIC 004274517

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004274517-01	OBS	No	285.647928	224.782390	1014.4	3.836	12.5	6.7	0.65	4447	2.21	0.28
004274517-02	OBS	No	702.812911	162.923592	856.2	3.638	11.3	4.7	0.65	4447	2.08	0.08
004274517-03	OBS	No	349.052883	201.662811	2621.5	12.000	23.7	-1.0	0.65	4447	3.18	0.21
004274517-04	OBS	No	353.577754	147.350249	1121.7	13.368	10.2	7.1	0.65	4447	2.21	0.21
004274517-05	OBS	No	582.583591	273.578985	1391.4	3.990	12.4	7.4	0.65	4447	2.44	0.11
004274517-06	OBS	No	401.856814	389.422325	1078.2	4.290	10.9	7.0	0.65	4447	2.40	0.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004274517-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004274517-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
004274517-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

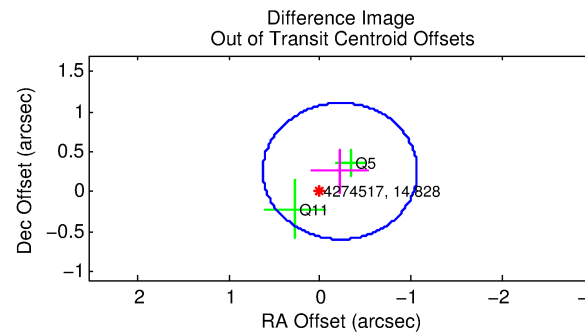
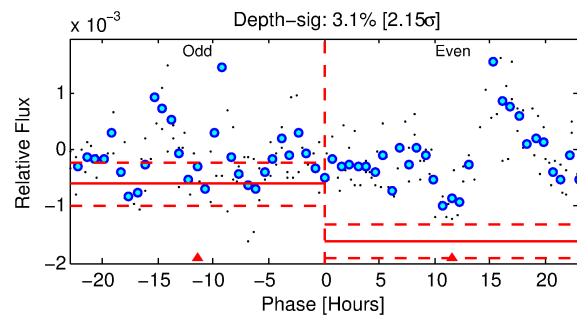
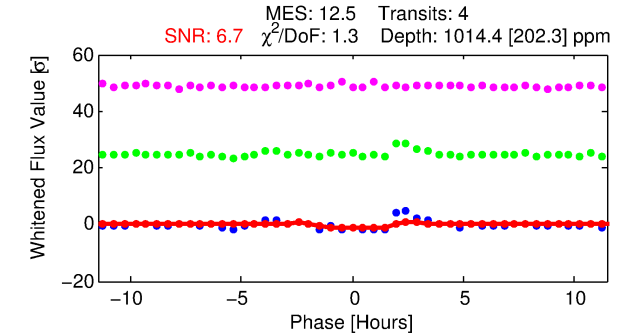
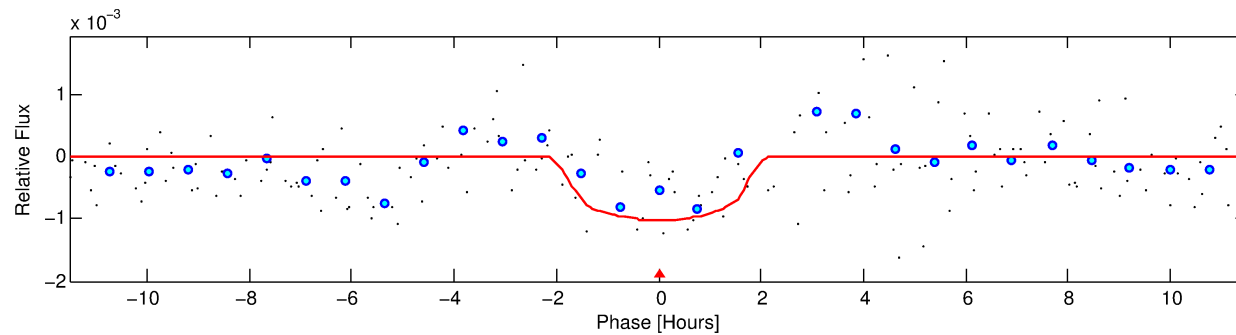
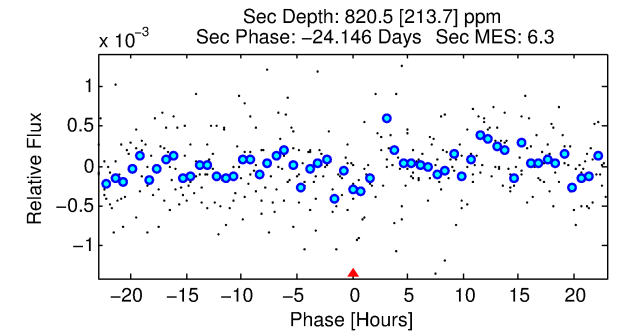
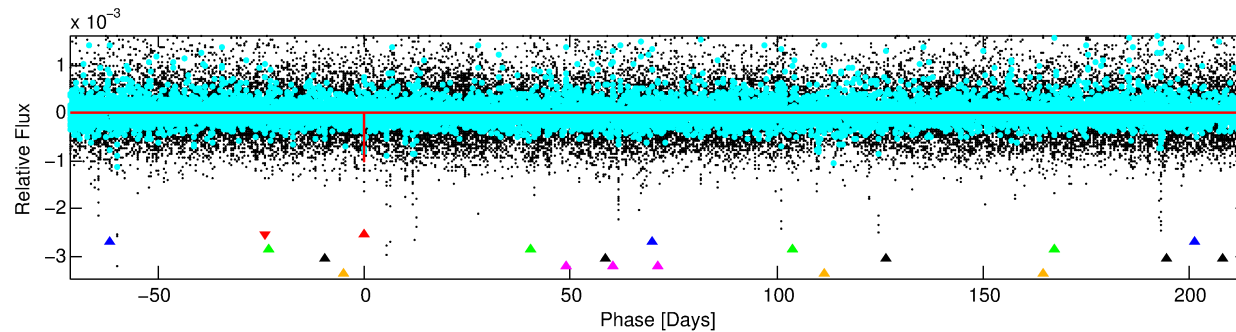
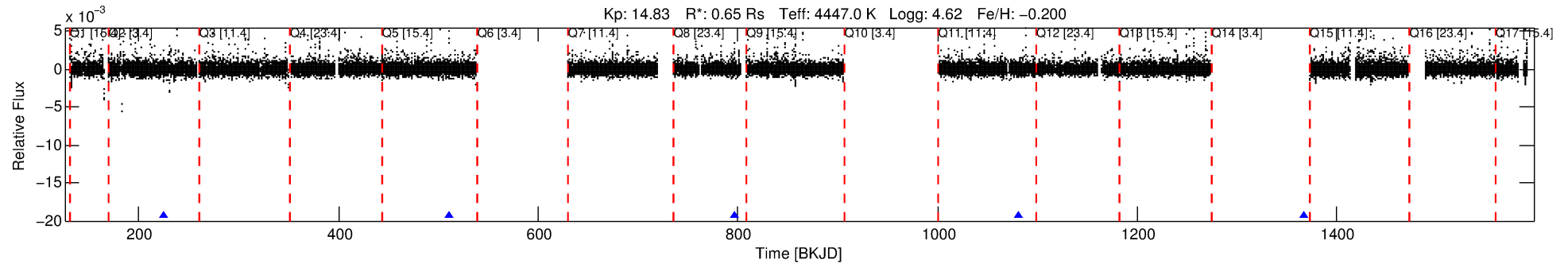
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004274517-01

No Significant Match Found

# DV One-Page Summary

KIC: 4274517 Candidate: 1 of 6 Period: 285.648 d



## DV Fit Results:

Period = 285.64793 [0.00503] d  
Epoch = 224.7824 [0.0093] BKJD  
Rp/R\* = 0.0312 [0.0466]  
a/R\* = 428.86 [2022.79]  
b = 0.70 [3.48]  
Seff = 0.28 [0.04]  
Teq = 185 [7] K  
Rp = 2.21 [3.30] Re  
a = 0.7311 [0.0503] AU  
Ag = 49515.83 [148322.76] [0.33 $\sigma$ ]  
Teffp = 4260 [3191] K [1.28 $\sigma$ ]

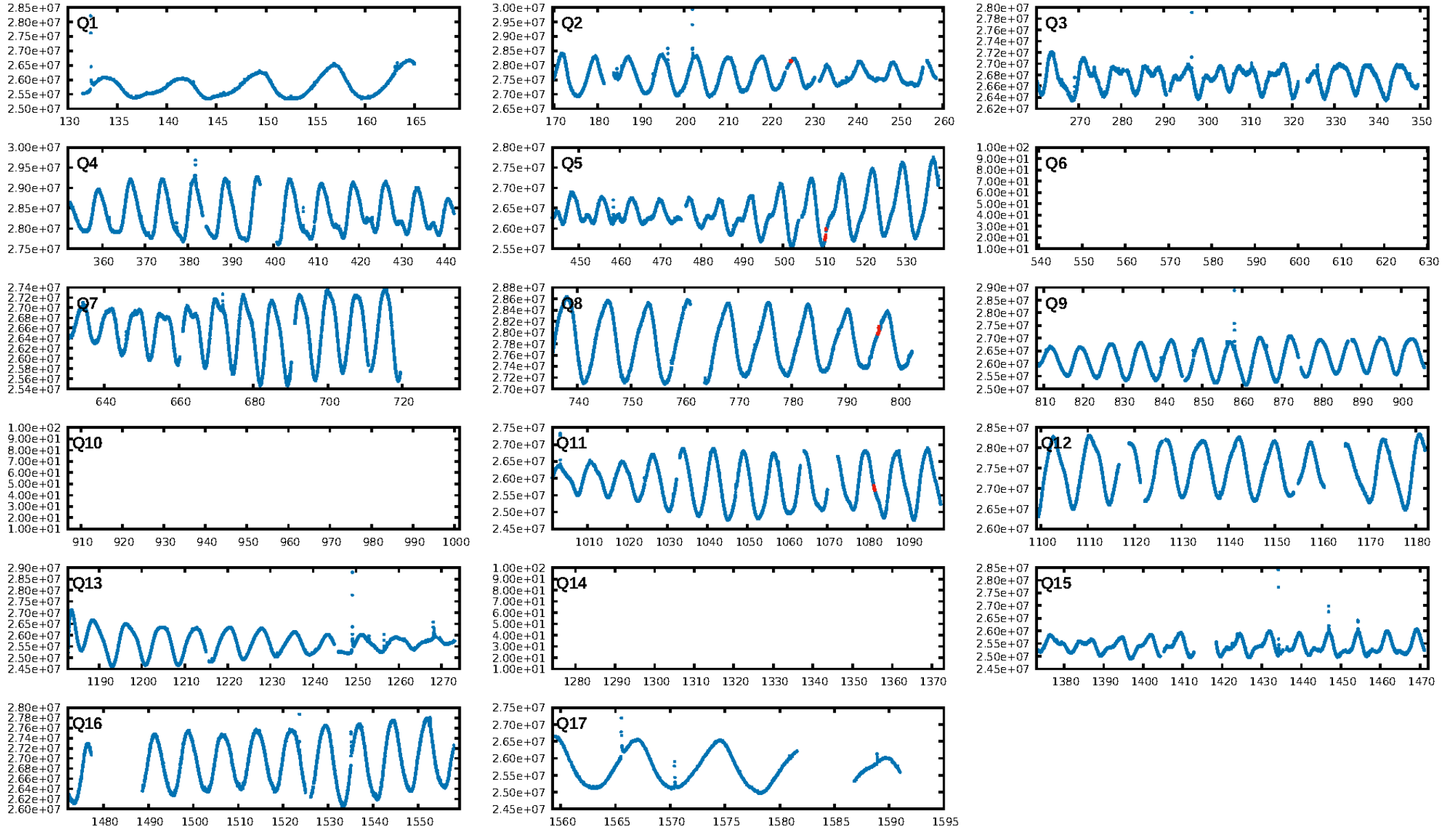
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [120.79 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGoF-sig: 40.0%  
Bootstrap-pfa: 5.24e-14  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 1.318  
Centroid-sig: 95.0%  
Centroid-so: 0.325 arcsec [0.22 $\sigma$ ]  
OotOffset-rm: 0.339 arcsec [1.20 $\sigma$ ]  
OotOffset-st: 0/1/0/1 [2]  
KicOffset-rm: 0.221 arcsec [0.83 $\sigma$ ]  
KicOffset-st: 0/1/0/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [4/4]

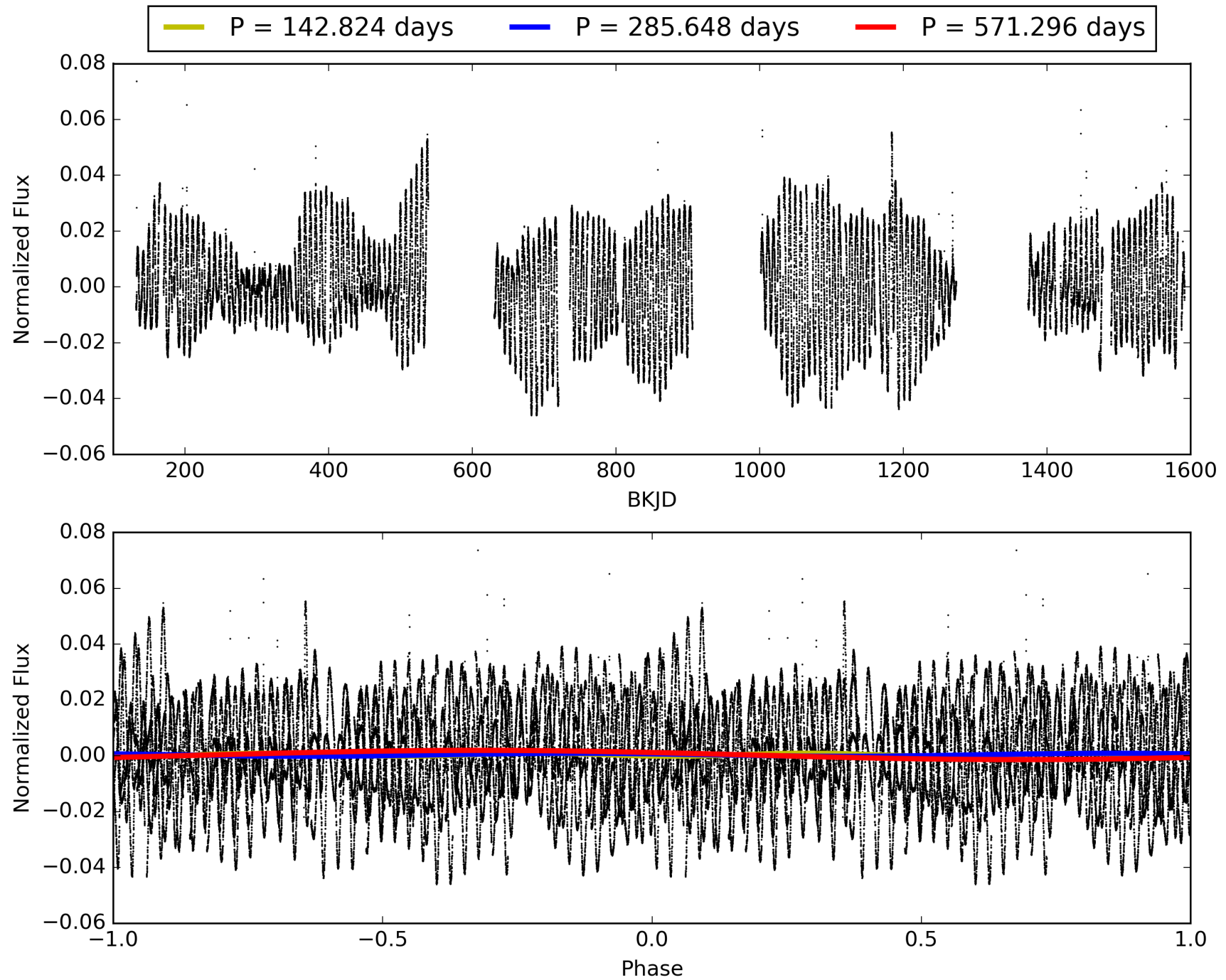
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:02:48 Z

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

# TCE 004274517-01, PDC Light Curves



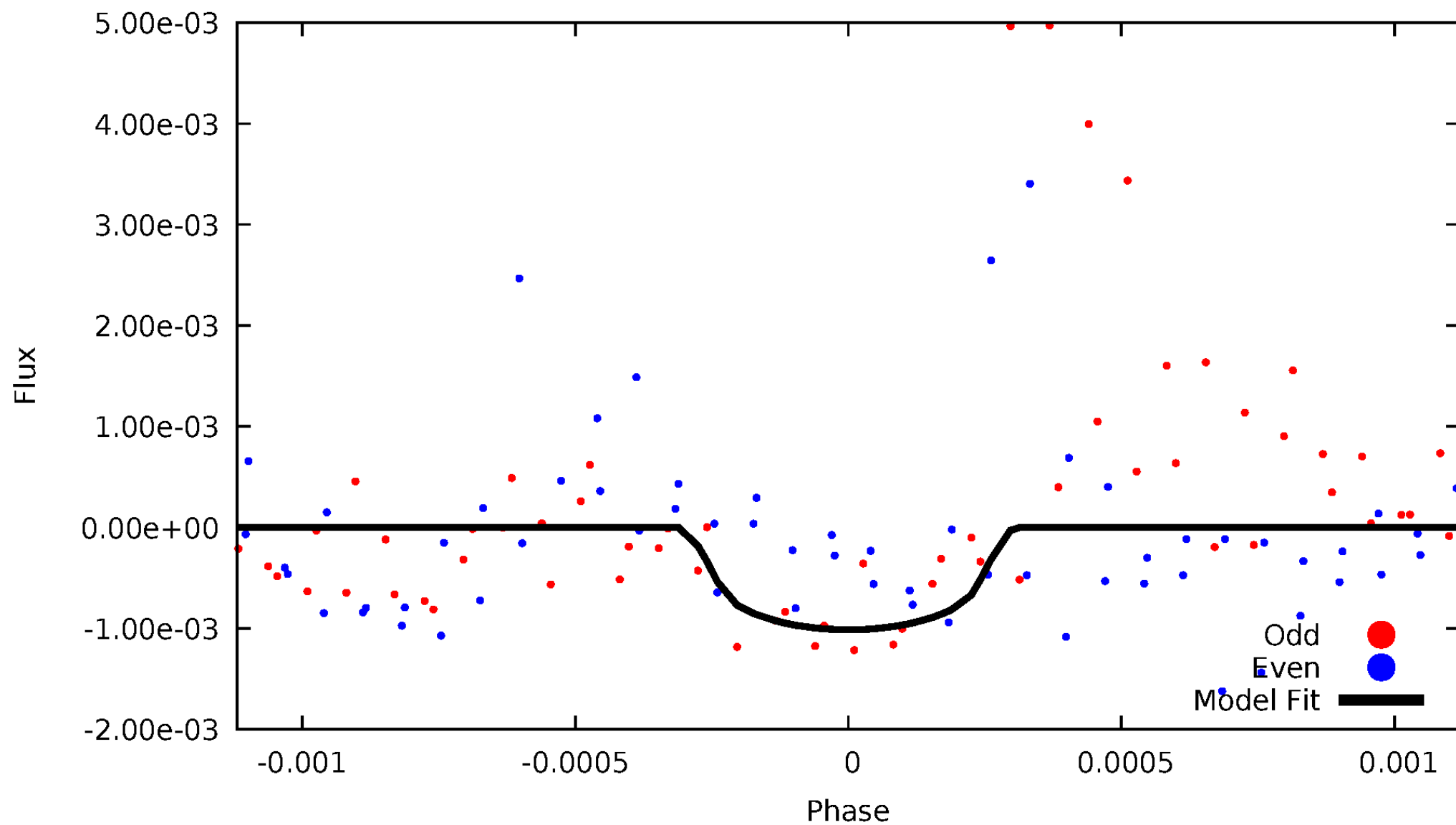
TCE 004274517-01





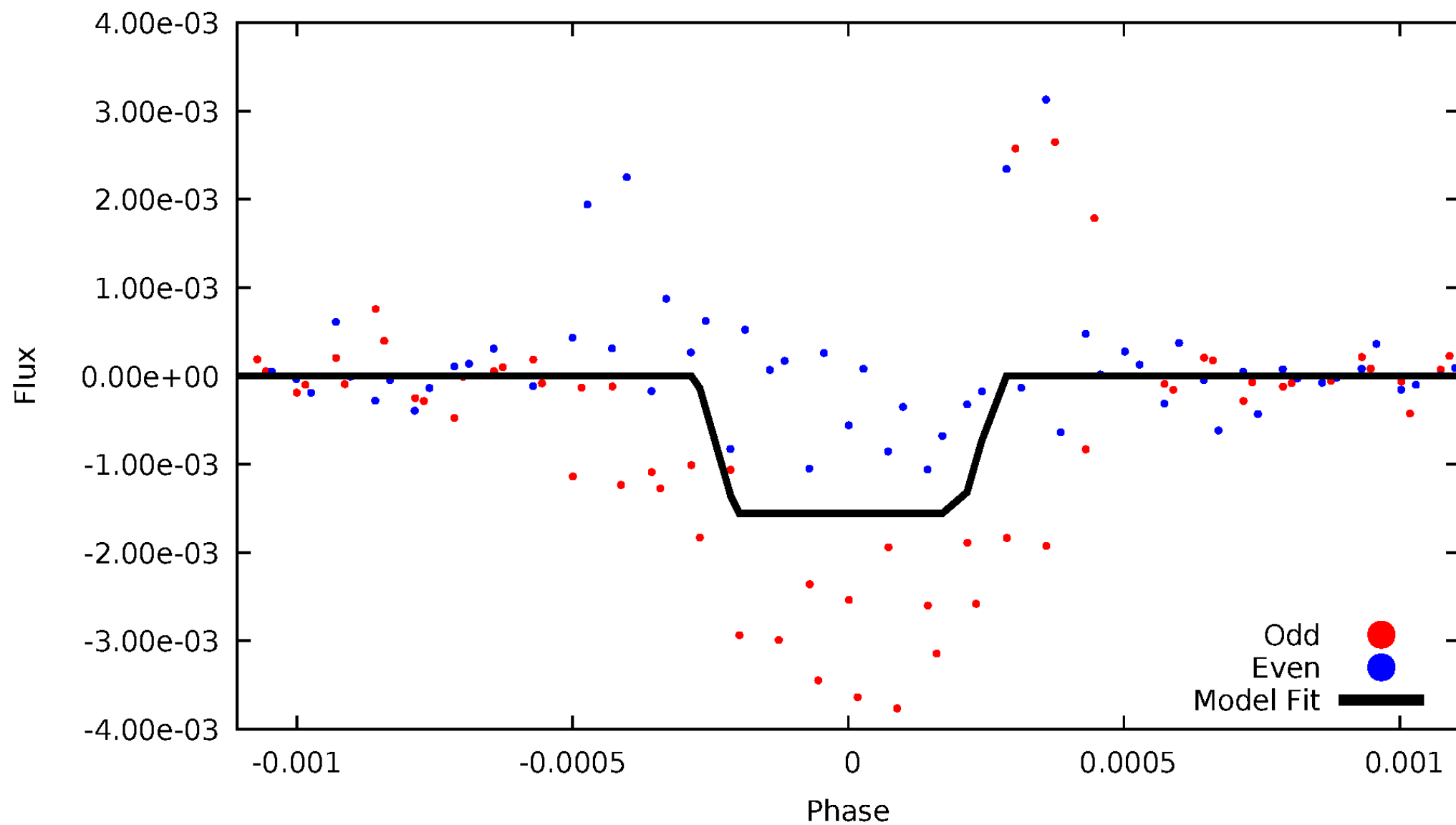
# DV Odd/Even

TCE 004274517-01



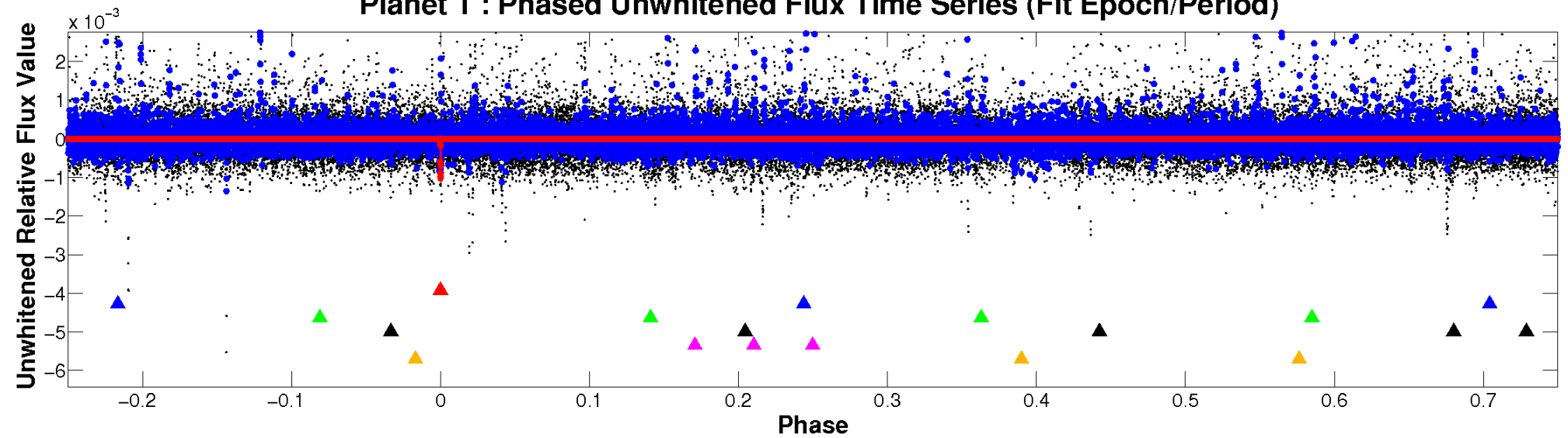
# ALT Odd/Even

TCE 004274517-01

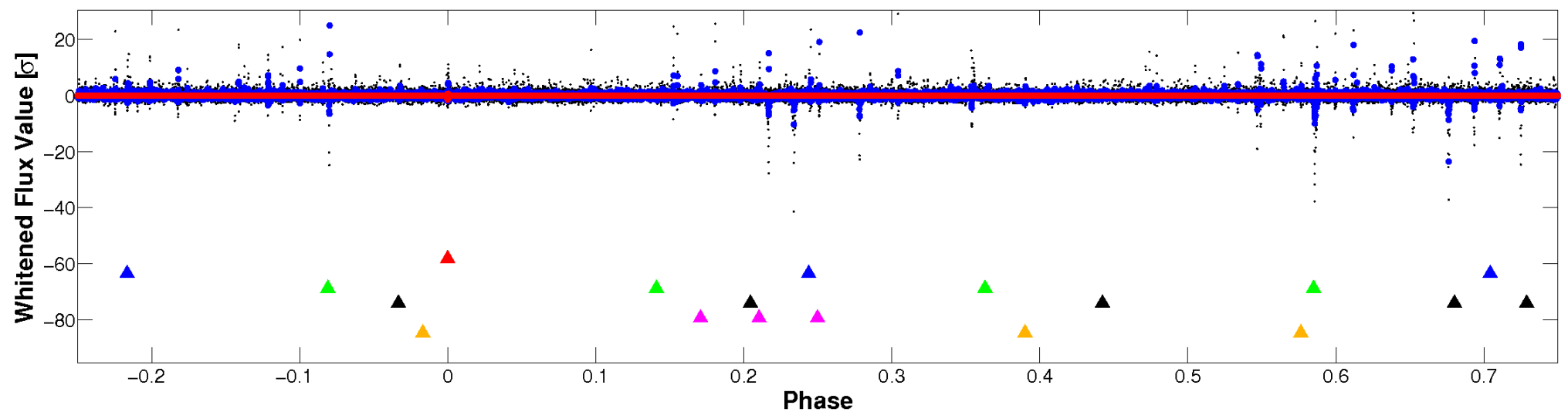


# Non-Whitened Vs. Whitened Light Curve

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

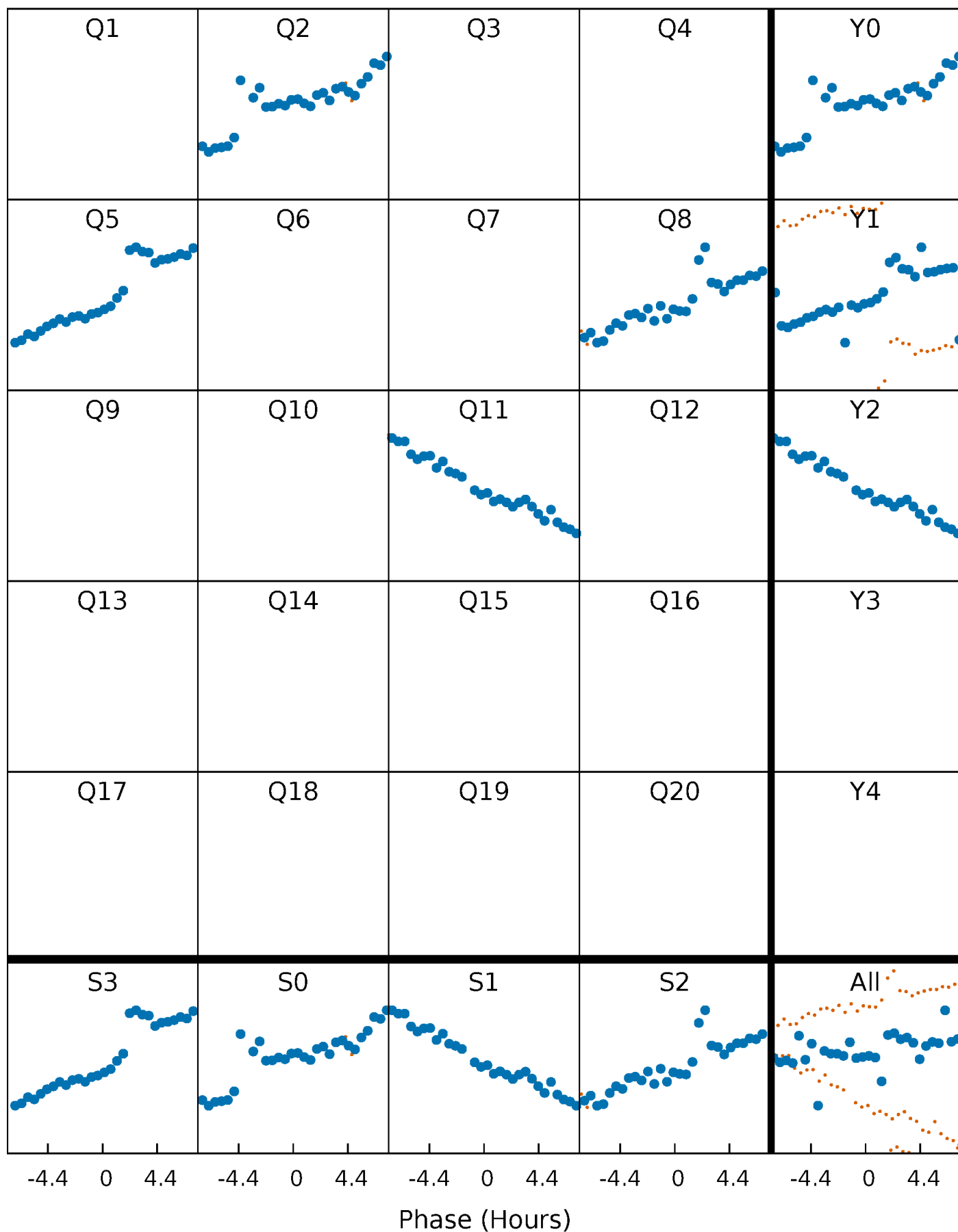


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



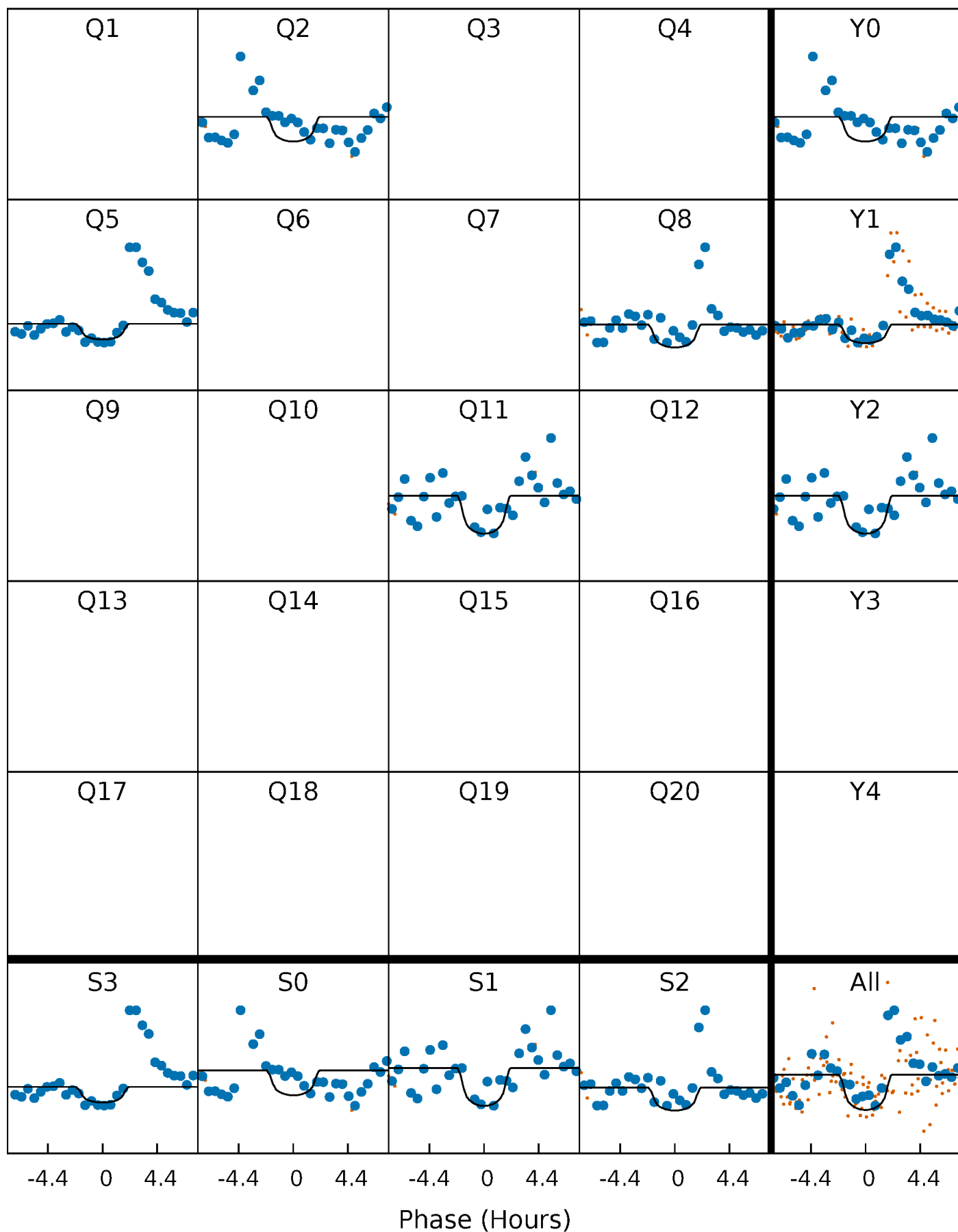
# PDC Quarter-Phased Transit Curves

TCE 004274517-01 P=285.647928 Days  $T_0=224.782390$  (BKJD)



# DV Quarter-Phased Transit Curves

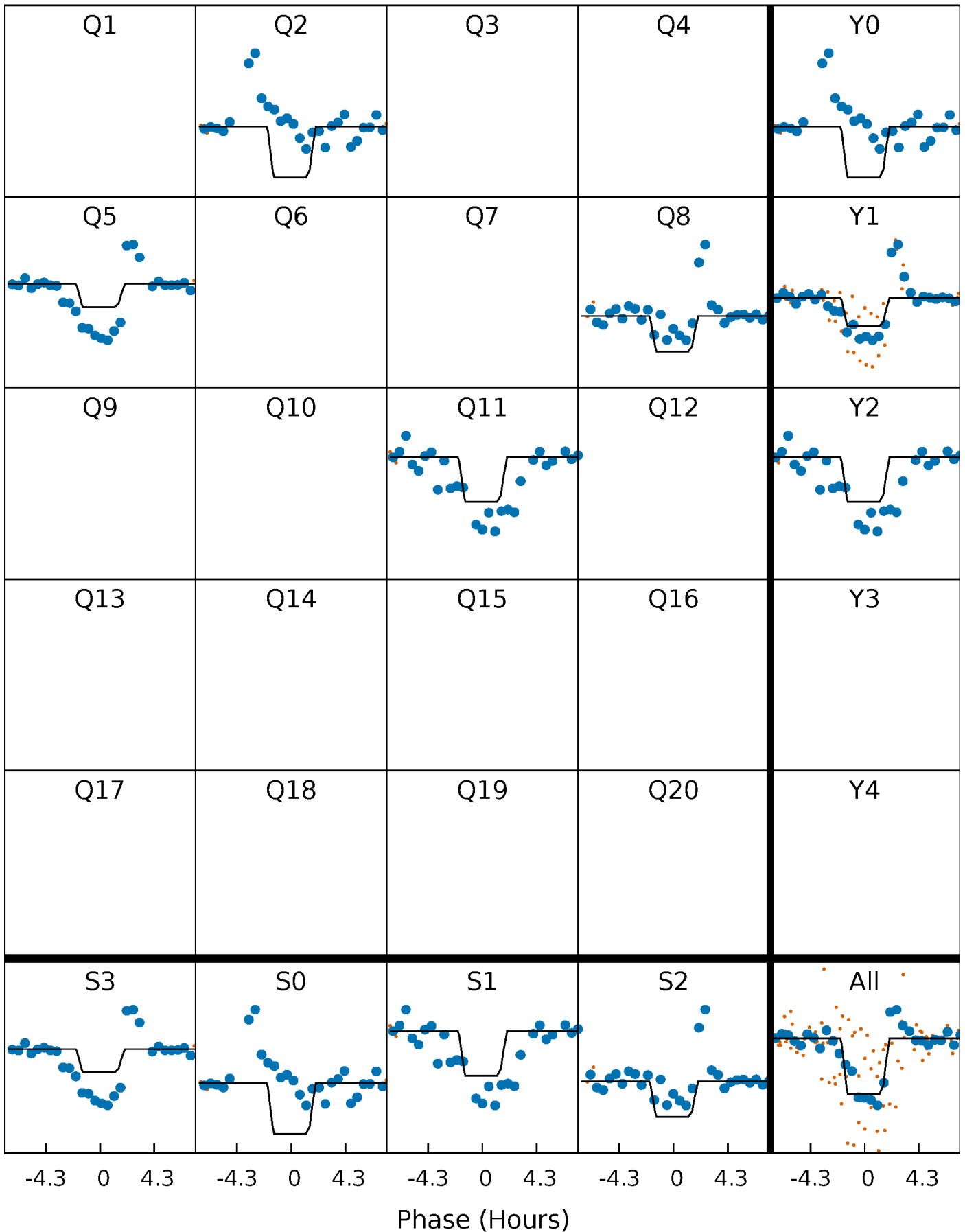
TCE 004274517-01 P=285.647928 Days  $T_0=224.782390$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

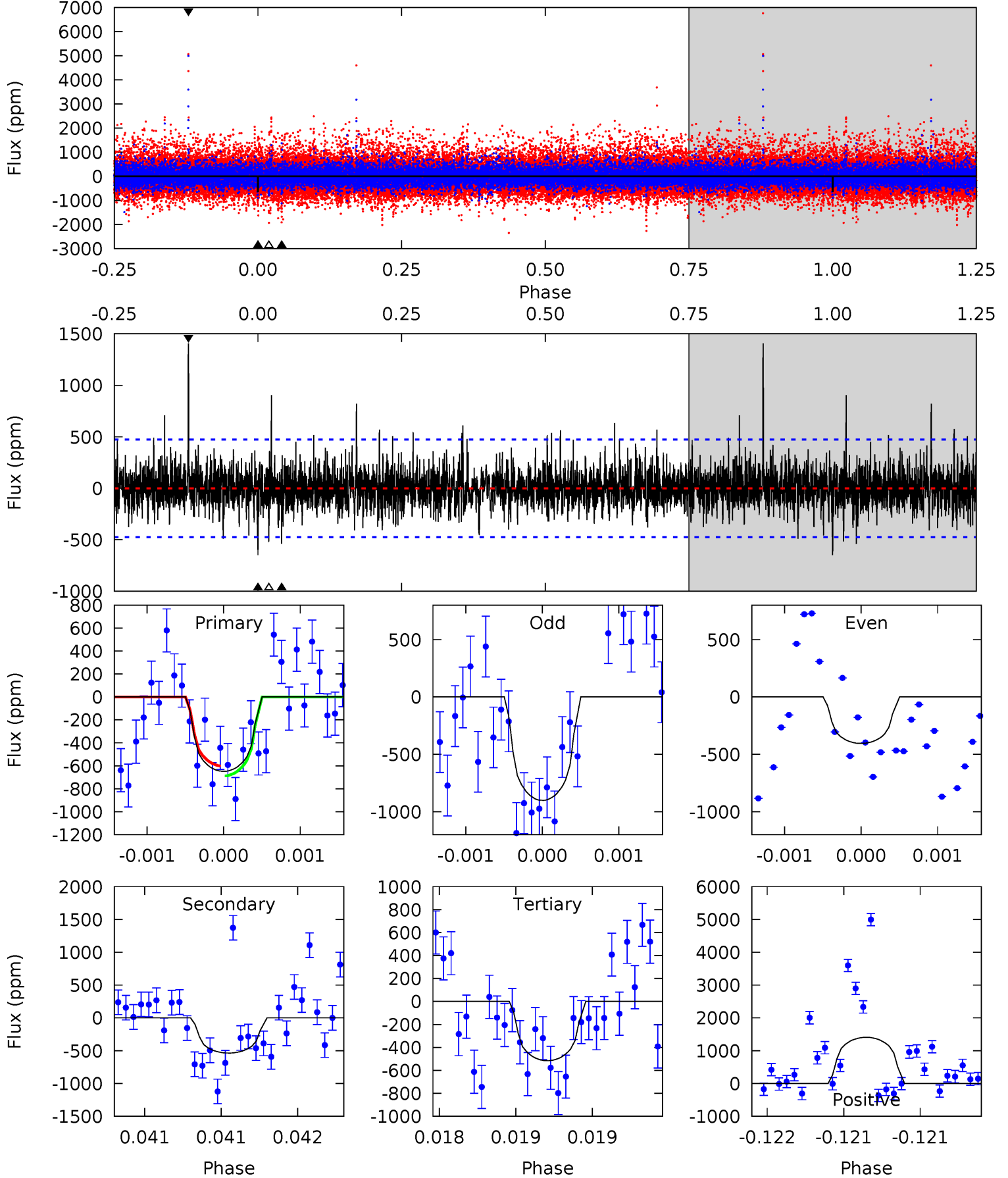
TCE 004274517-01 P=285.642304 Days  $T_0=224.786254$  (BKJD)



# DV Model-Shift Uniqueness Test

004274517-01, P = 285.647928 Days, E = 224.782390 Days

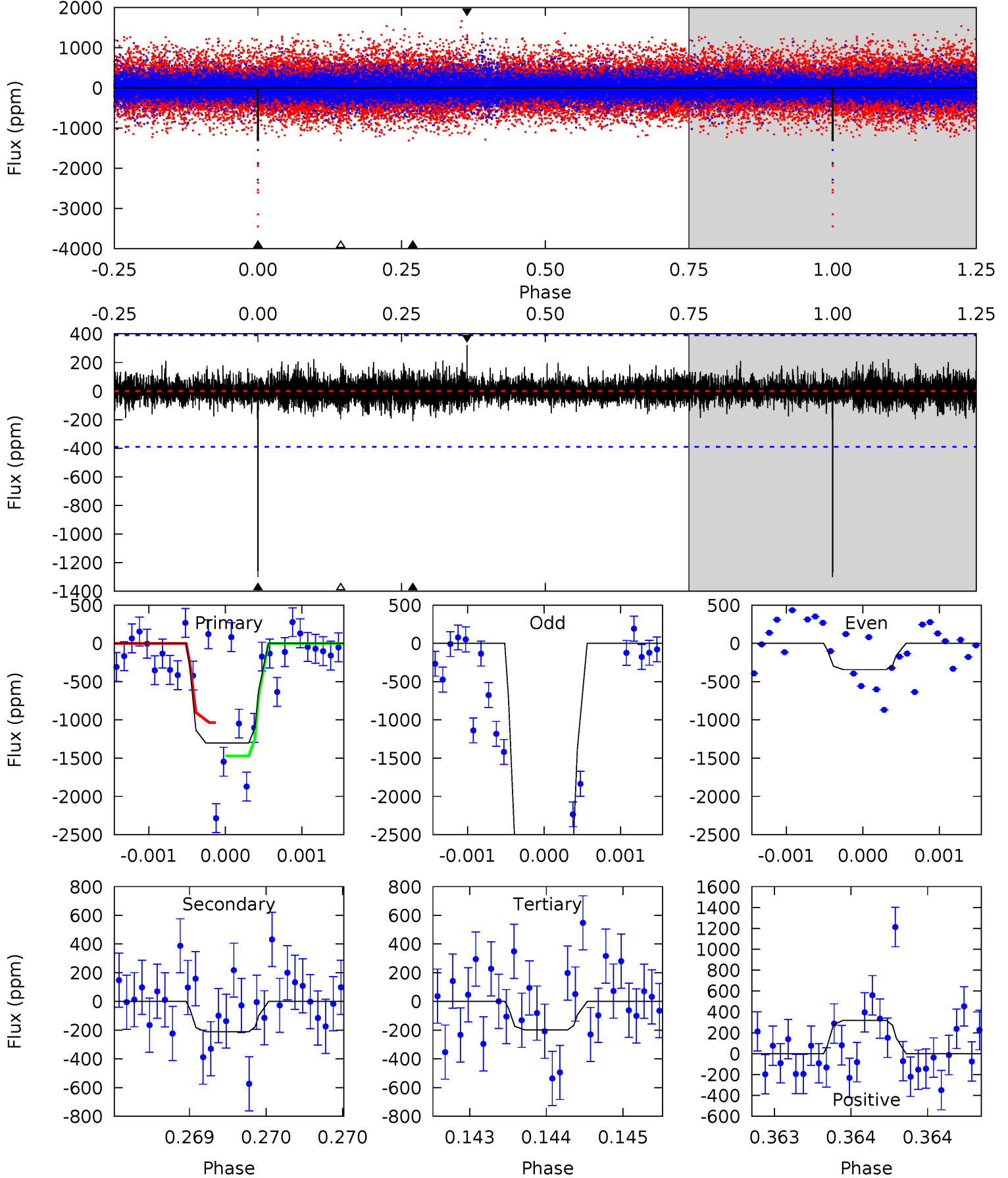
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.56	6.26	6.02	16.4	5.53	3.42	1.67	1.54	-8.87	0.24	-10.2	2.66	1.11	0.68	0.51



# Alt Model-Shift Uniqueness Test

004274517-01, P = 285.642304 Days, E = 224.786254 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
18.5	3.00	2.82	4.55	5.55	3.45	0.70	15.7	14.0	0.18	-1.55	21.2	1.09	0.20	0



### Stellar Parameters For KIC 004274517

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4447^{+133}_{-133}$	$4.620^{+0.049}_{-0.024}$	$-0.200^{+0.300}_{-0.300}$	$0.648^{+0.046}_{-0.056}$	$0.638^{+0.068}_{-0.051}$	$3.308^{+0.767}_{-0.351}$
	+3%/-3%	+1%/-1%	+150%/-150%	+7%/-9%	+11%/-8%	+23%/-11%
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 004274517-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-537 \pm 86$	$3.14^{+3.08}_{-2.09}$	$256^{+9}_{-9}$	$3527^{+1710}_{-652}$	$16277^{+121281}_{-12252}$
Alt.	$-210 \pm 70$	$3.71^{+2.99}_{-2.54}$	$256^{+9}_{-9}$	$2924^{+1243}_{-453}$	$4467^{+39971}_{-3223}$

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

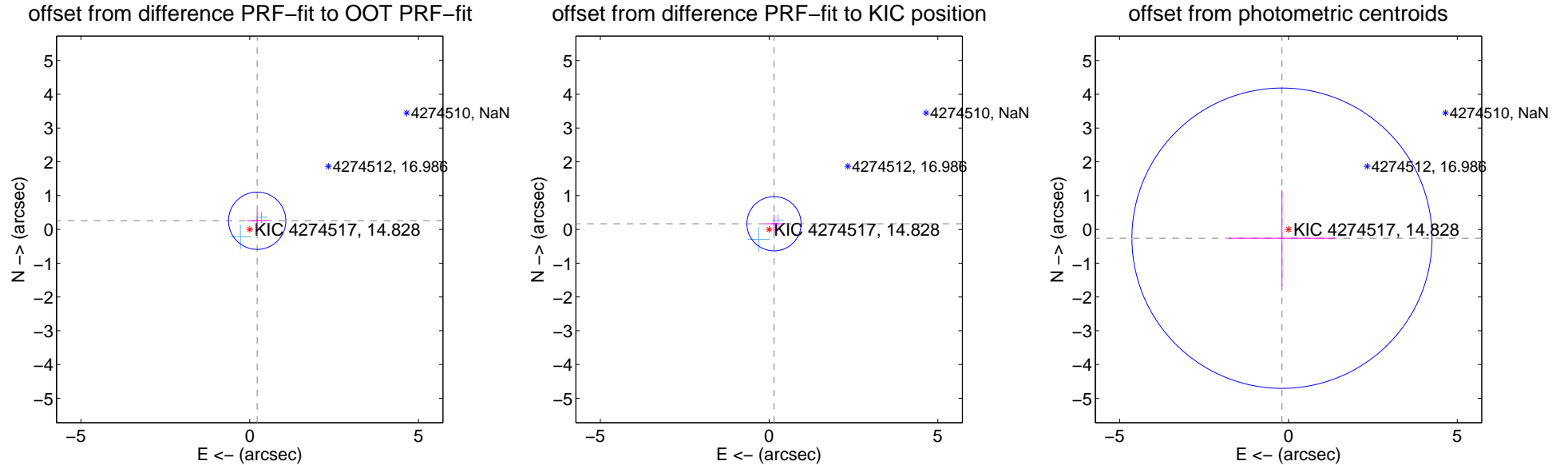
## DV Centroid Data

Supplemental centroid analysis for 004274517-01. Kepler magnitude: 14.83. Transit SNR 6.71

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.339 \pm 0.283$	1.20	$-0.221 \pm 0.302$	$0.256 \pm 0.268$
PRF-fit source offset from KIC position	$0.221 \pm 0.268$	0.83	$-0.145 \pm 0.275$	$0.168 \pm 0.262$
photometric centroid source offset	$0.32 \pm 1.48$	0.22	$0.19 \pm 1.57$	$-0.26 \pm 1.43$



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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

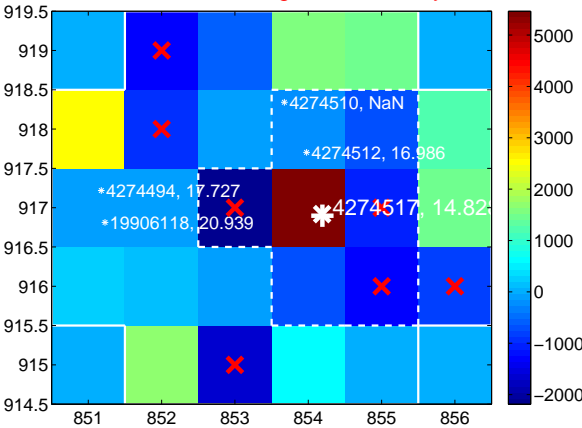
Q1 no difference image



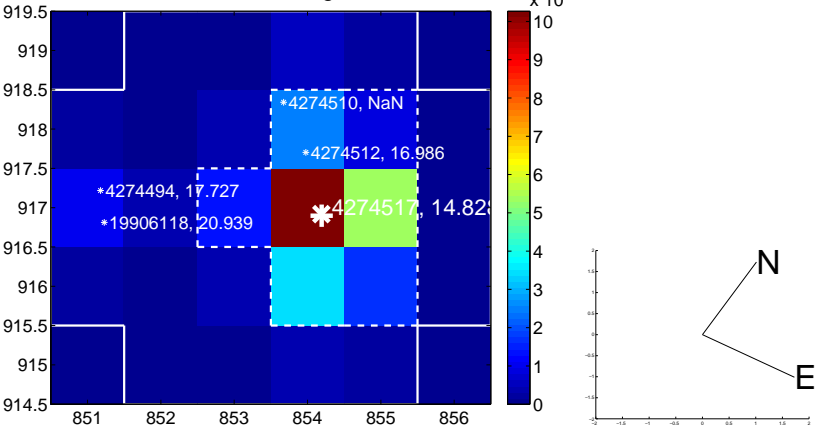
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



Q3 no difference image



Q3 no OOT image



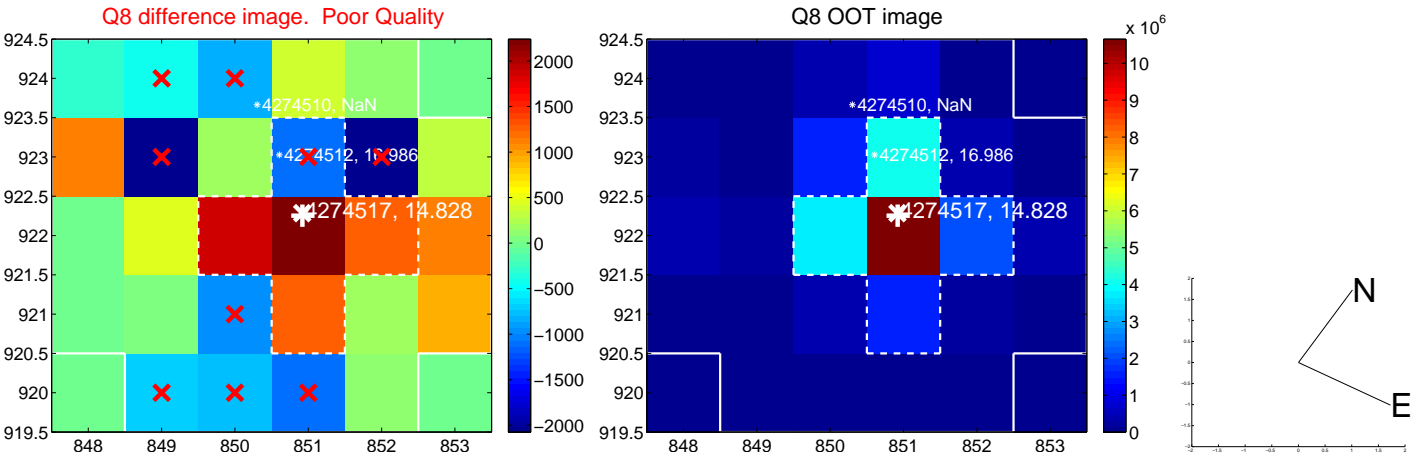
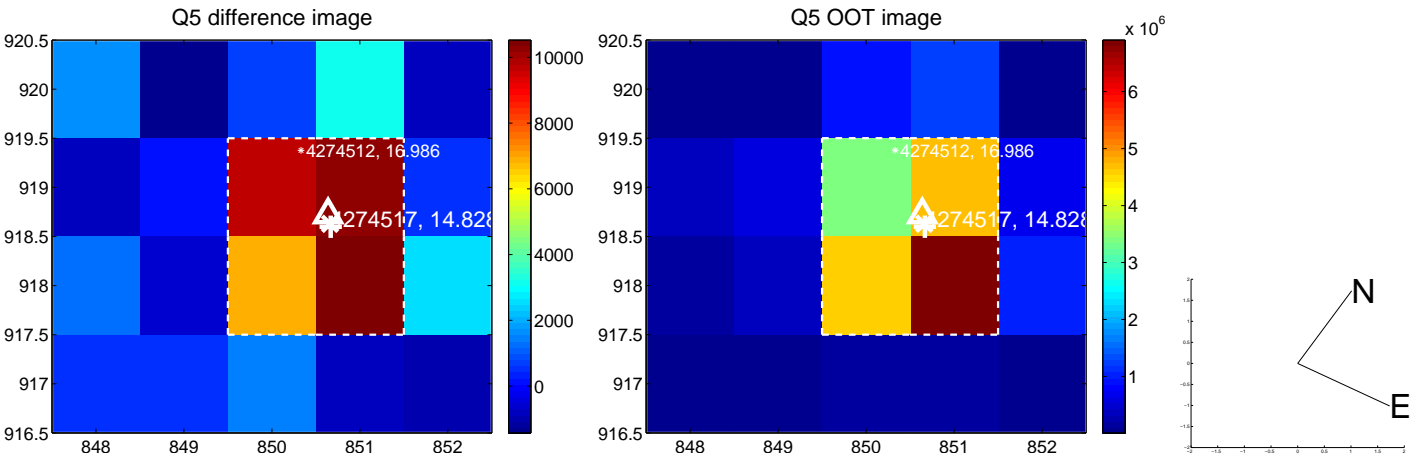
Q4 no difference image



Q4 no OOT image



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: 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



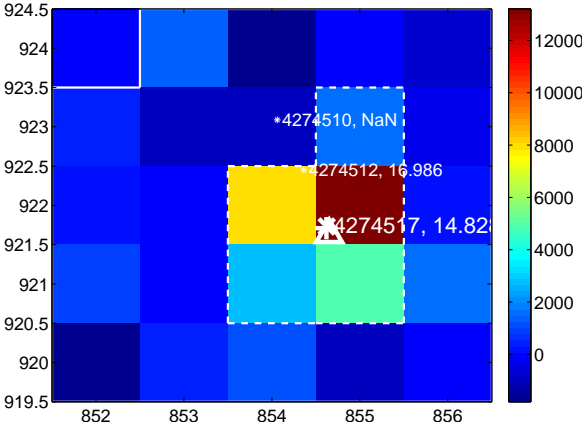
Q10 no difference image



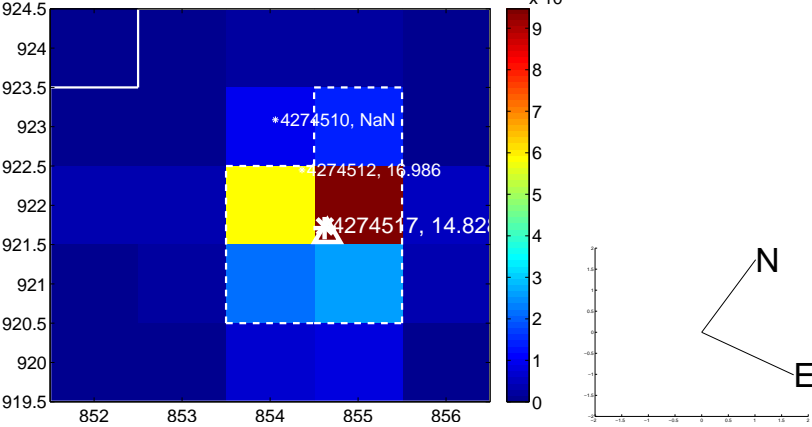
Q10 no OOT image



Q11 difference image



Q11 OOT image



Q12 no difference image



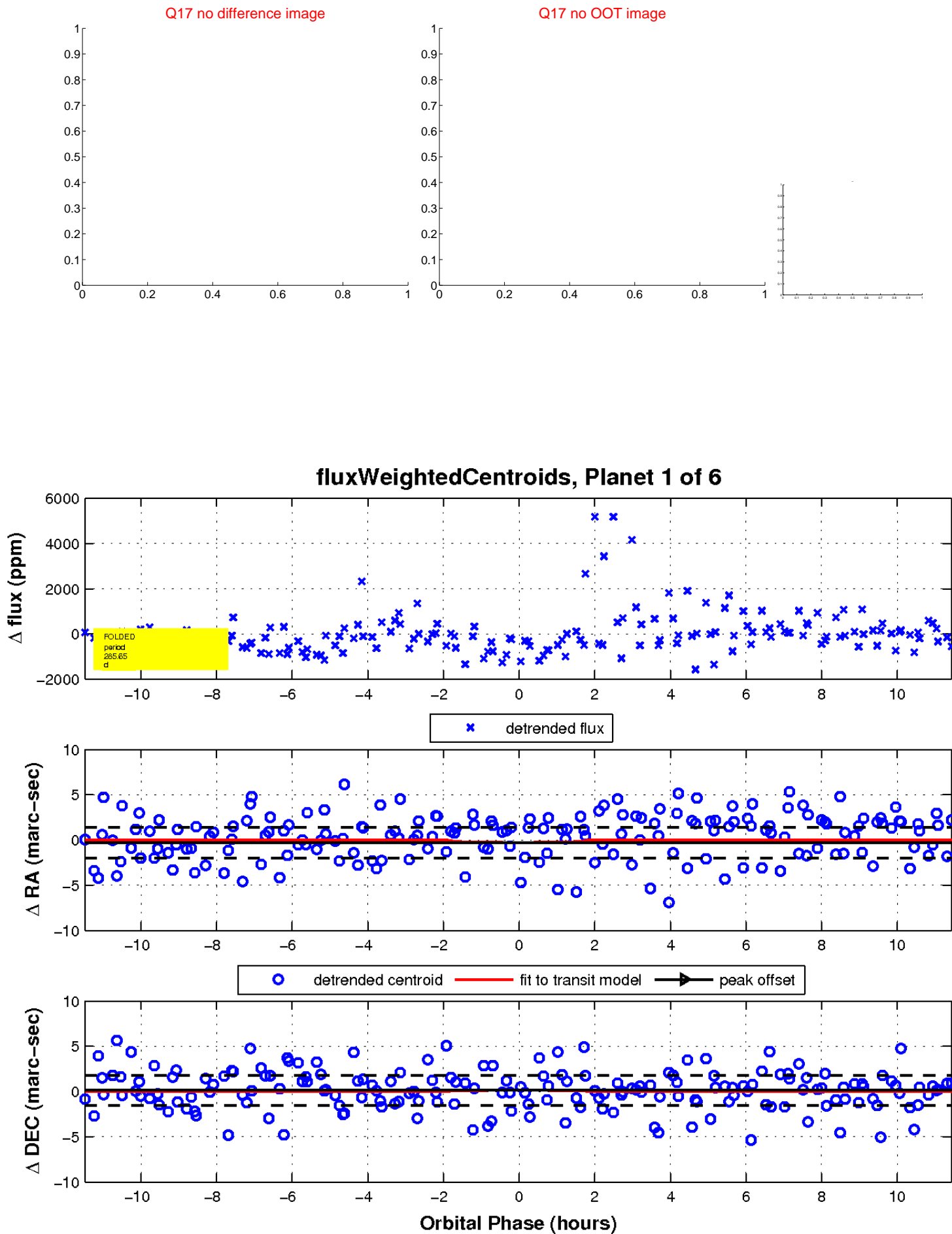
Q12 no OOT image



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



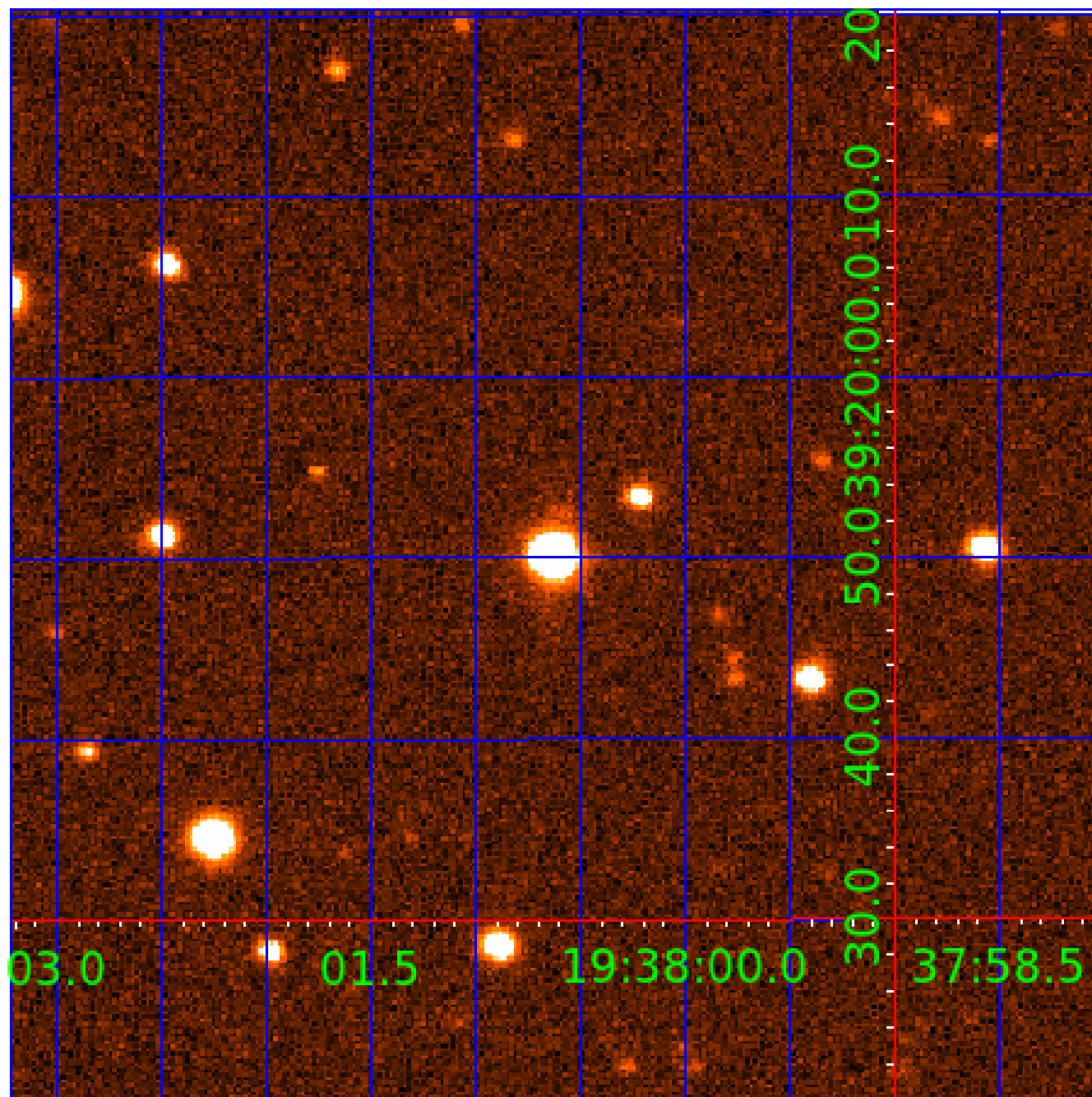
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 004274517

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004274517-01	OBS	No	285.647928	224.782390	1014.4	3.836	12.5	6.7	0.65	4447	2.21	0.28
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004274517-03	OBS	No	349.052883	201.662811	2621.5	12.000	23.7	-1.0	0.65	4447	3.18	0.21
004274517-04	OBS	No	353.577754	147.350249	1121.7	13.368	10.2	7.1	0.65	4447	2.21	0.21
004274517-05	OBS	No	582.583591	273.578985	1391.4	3.990	12.4	7.4	0.65	4447	2.44	0.11
004274517-06	OBS	No	401.856814	389.422325	1078.2	4.290	10.9	7.0	0.65	4447	2.40	0.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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004274517-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
004274517-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

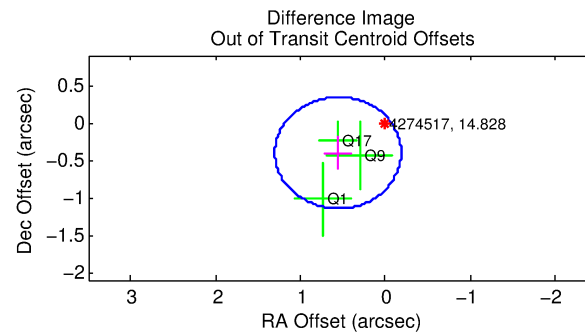
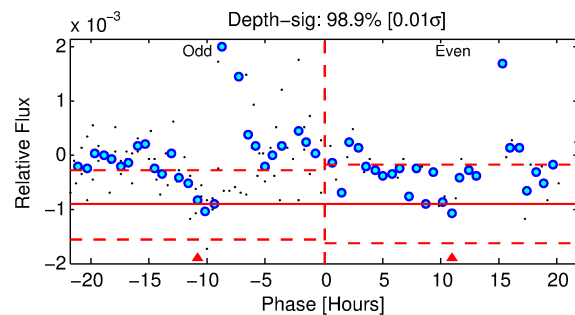
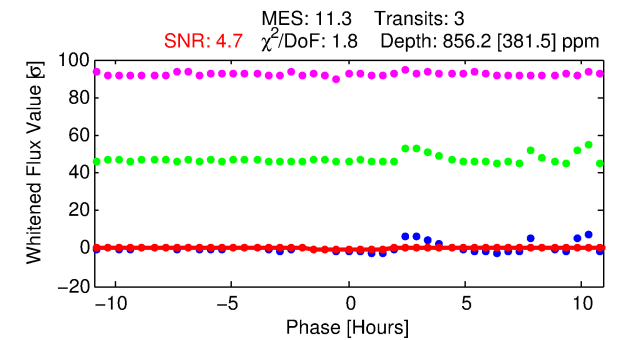
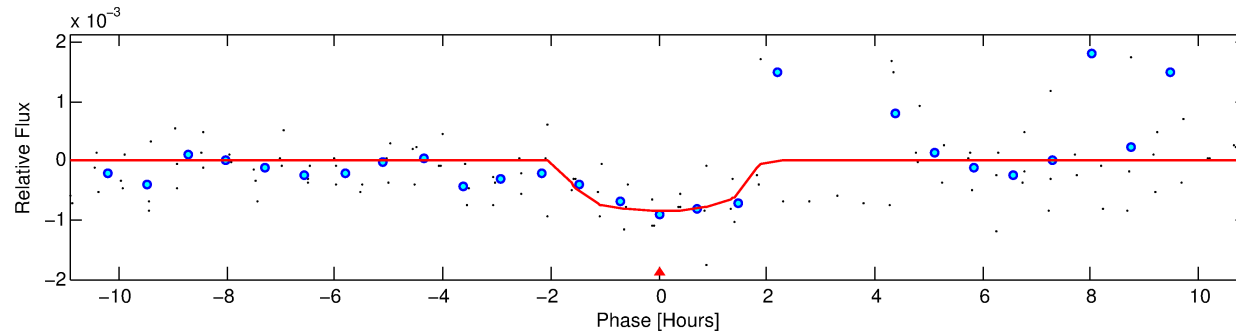
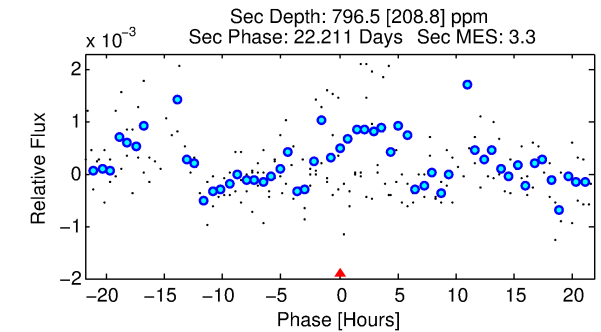
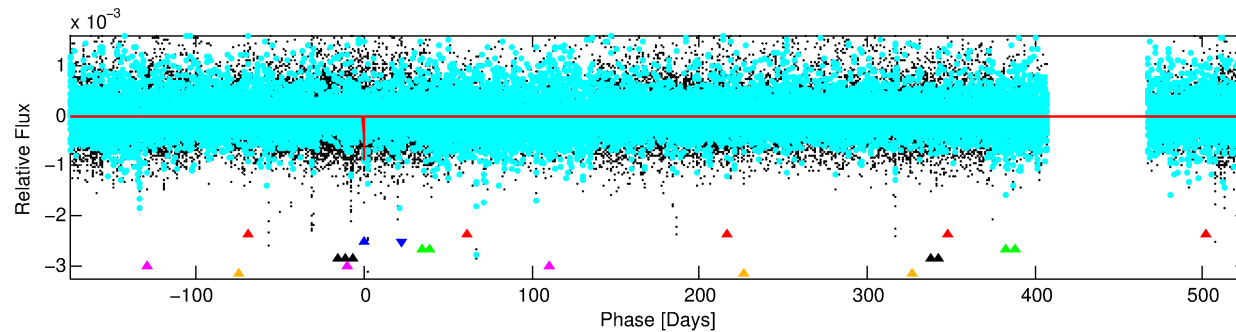
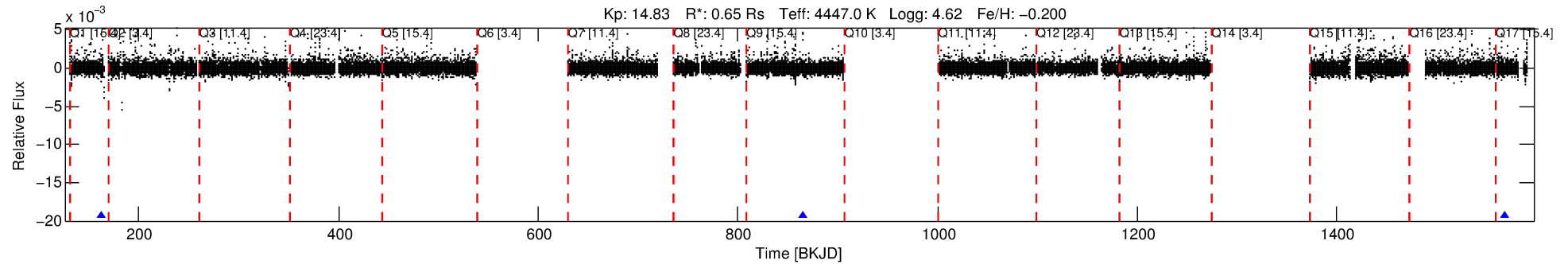
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004274517-02

No Significant Match Found

# DV One-Page Summary

KIC: 4274517 Candidate: 2 of 6 Period: 702.813 d



## DV Fit Results:

Period = 702.81291 [0.01539] d  
Epoch = 162.9236 [0.0214] BKJD  
Rp/R\* = 0.0295 [0.1113]  
a/R\* = 1027.78 [12651.25]  
b = 0.76 [7.12]  
Seff = 0.08 [0.01]  
Teq = 137 [5] K  
Rp = 2.08 [7.87] Re  
a = 1.3324 [0.0917] AU  
Ag = 179275.09 [1355809.24] [0.13 $\sigma$ ]  
Teffp = 4353 [8230] K [0.51 $\sigma$ ]

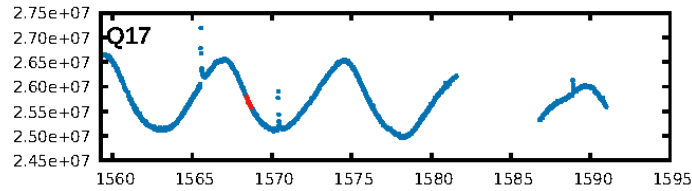
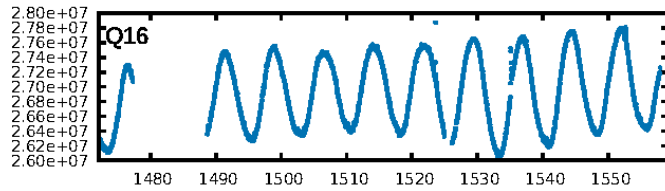
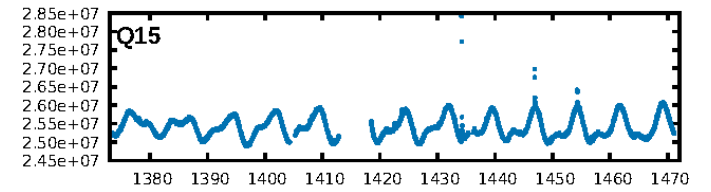
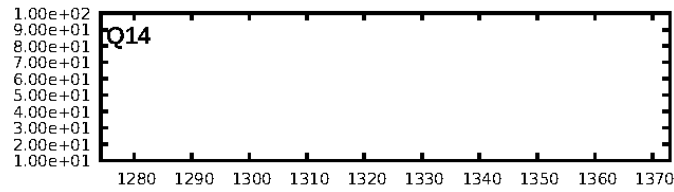
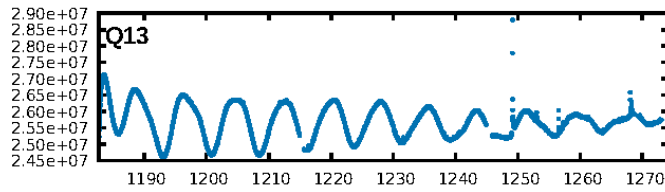
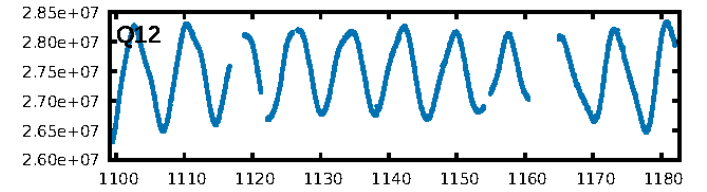
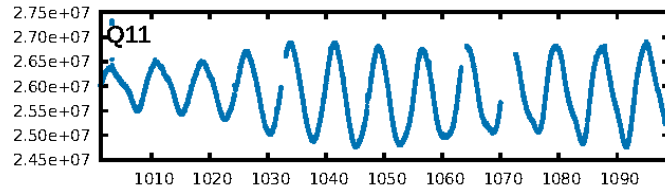
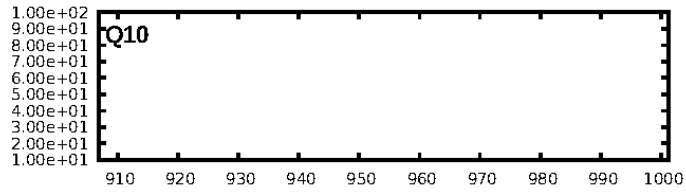
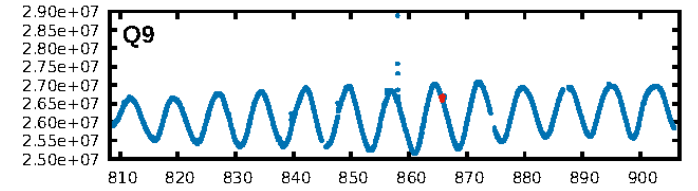
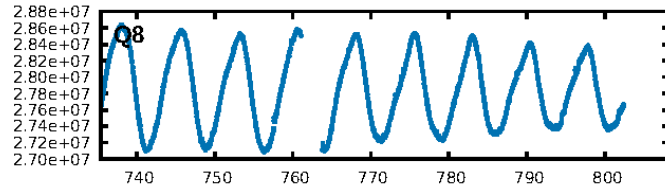
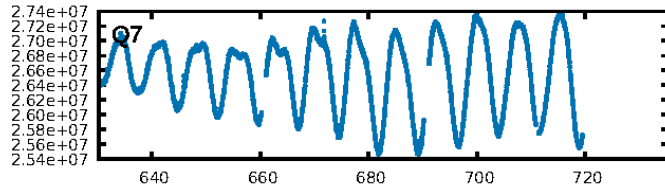
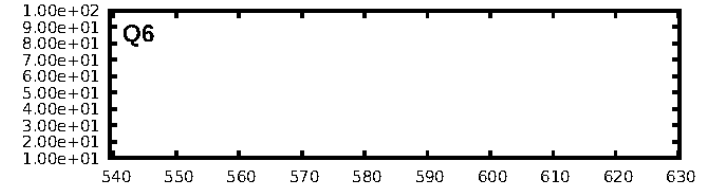
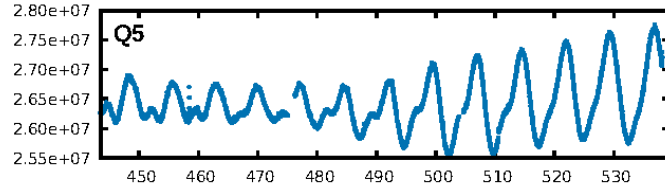
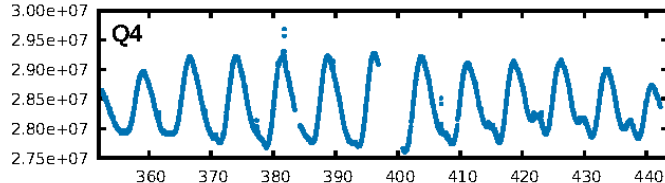
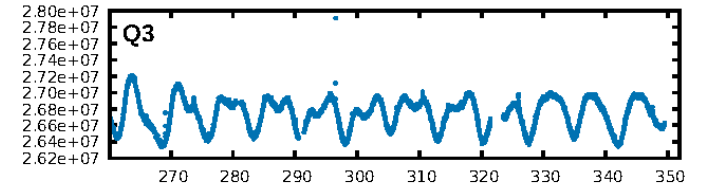
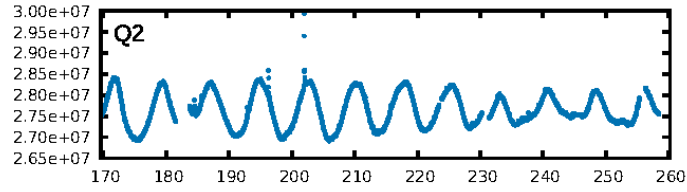
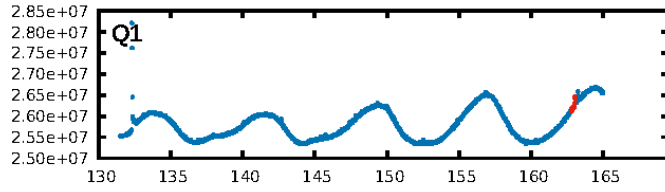
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [534.43 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 7.6%  
ModelChiSquareGoF-sig: 83.1%  
**Bootstrap-pfa: 1.14e-09**  
RollingBand-fgt: 1.00 [1/1]  
GhostDiagnostic-chr: 1.098  
Centroid-sig: 18.4%  
Centroid-so: 1.926 arcsec [1.08 $\sigma$ ]  
OotOffset-rm: 0.686 arcsec [2.77 $\sigma$ ]  
OotOffset-st: 0/0/0/3 [3]  
KicOffset-rm: 0.764 arcsec [2.73 $\sigma$ ]  
KicOffset-st: 0/0/0/3 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

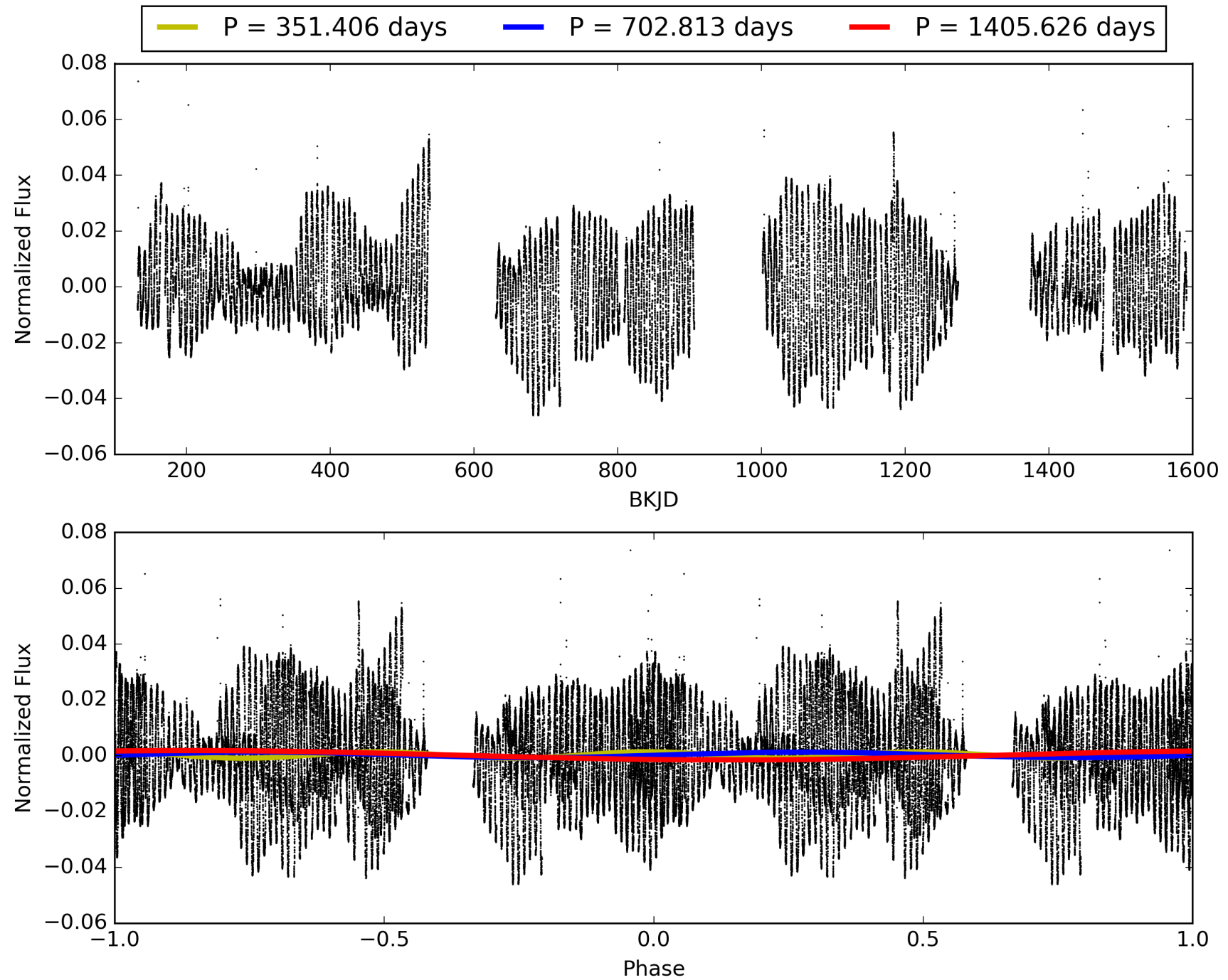
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:03:09 Z

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

# TCE 004274517-02, PDC Light Curves



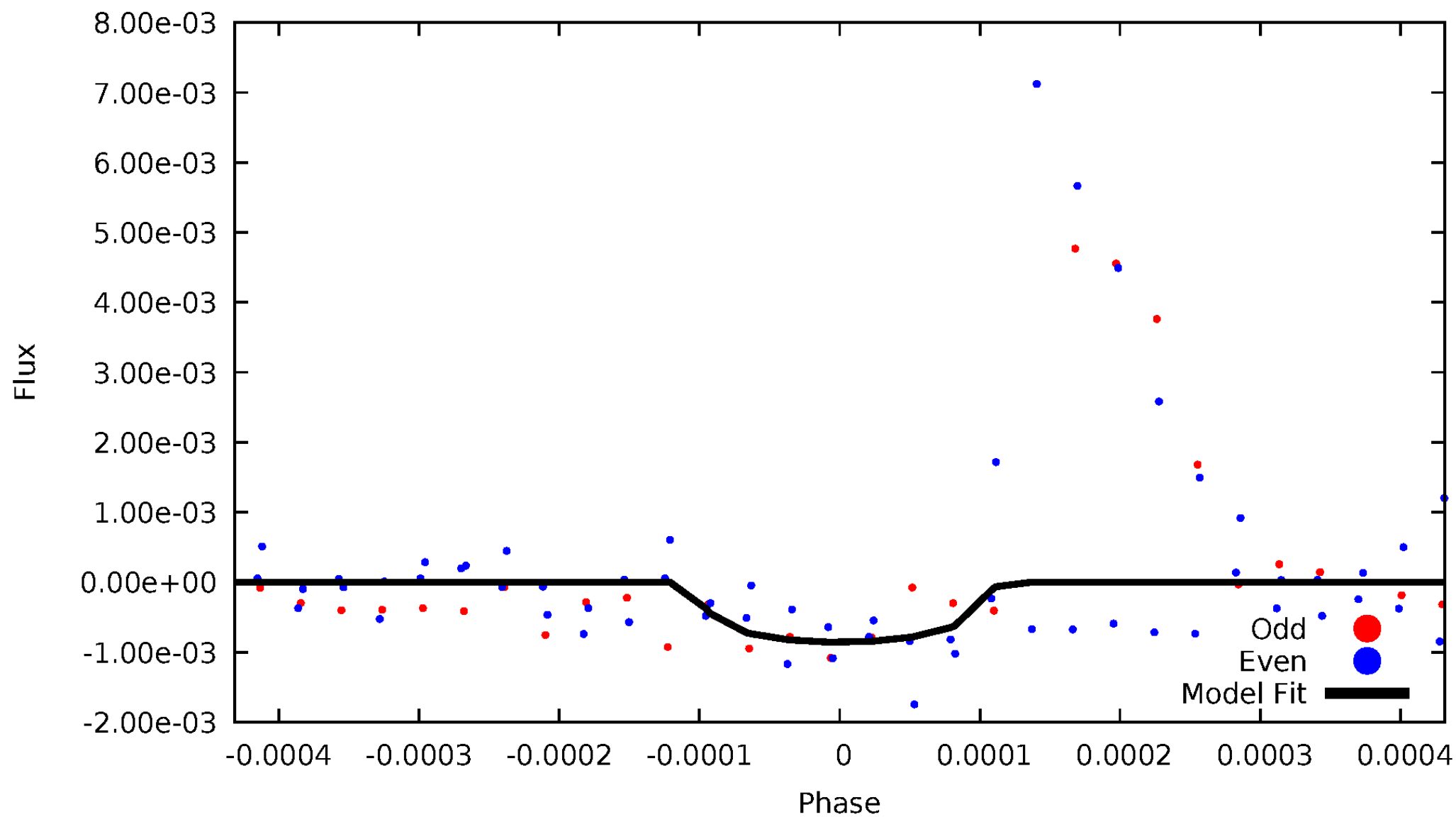
# TCE 004274517-02





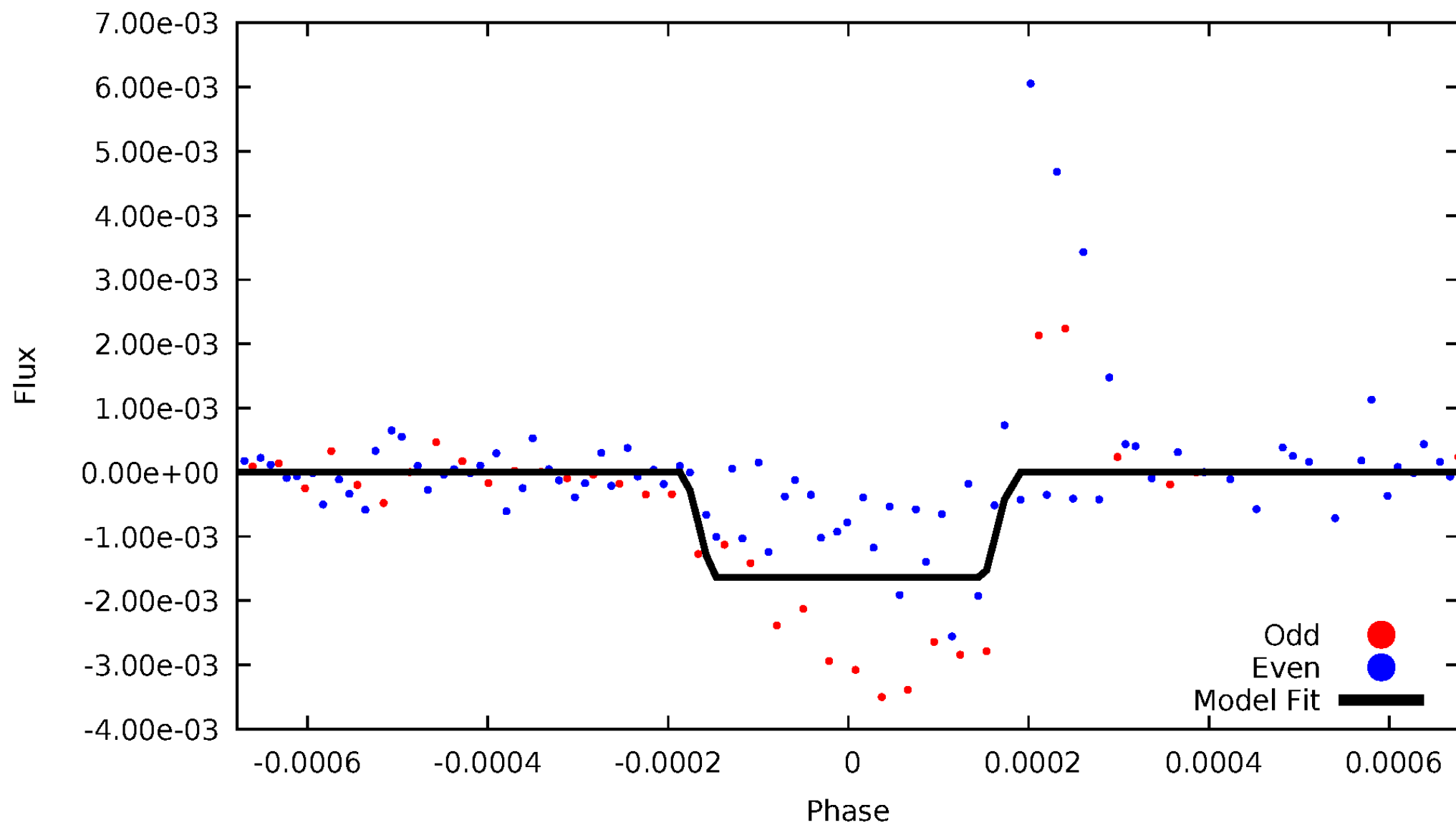
# DV Odd/Even

TCE 004274517-02



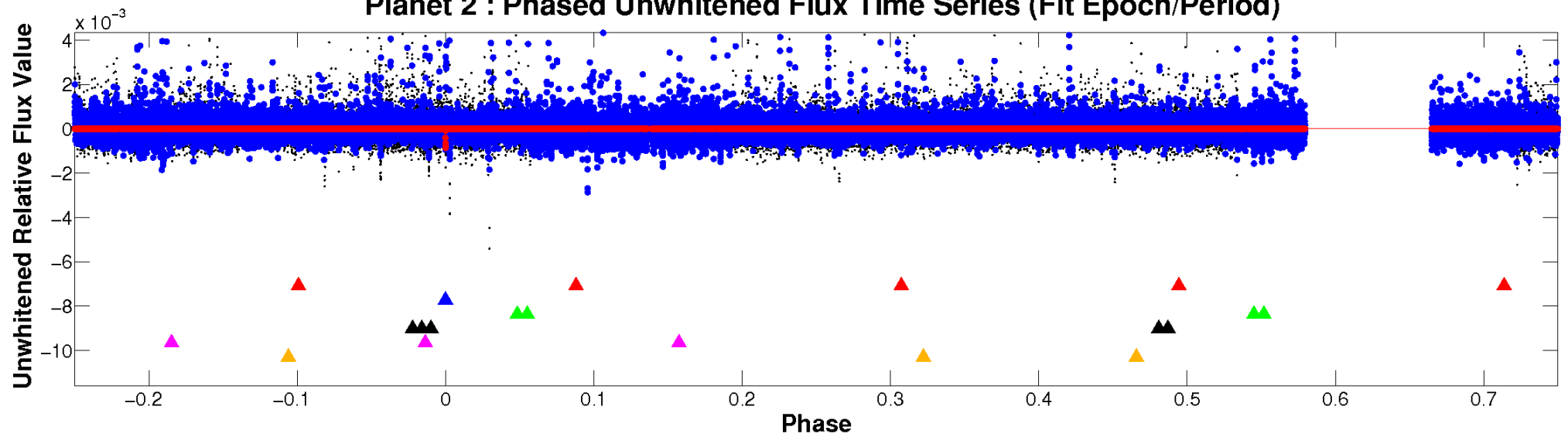
# ALT Odd/Even

TCE 004274517-02

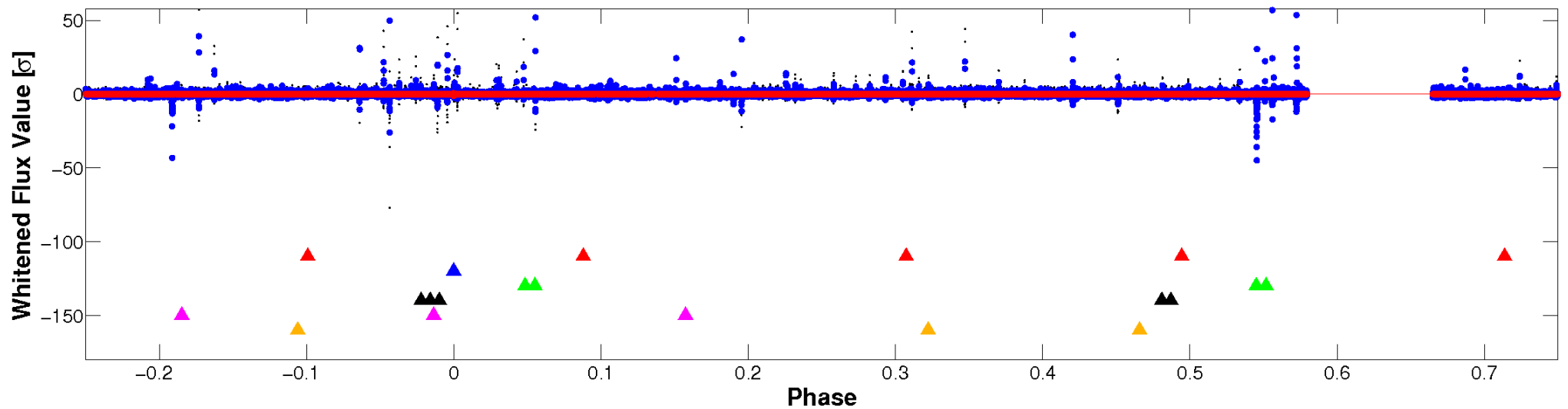


# Non-Whitened Vs. Whitened Light Curve

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

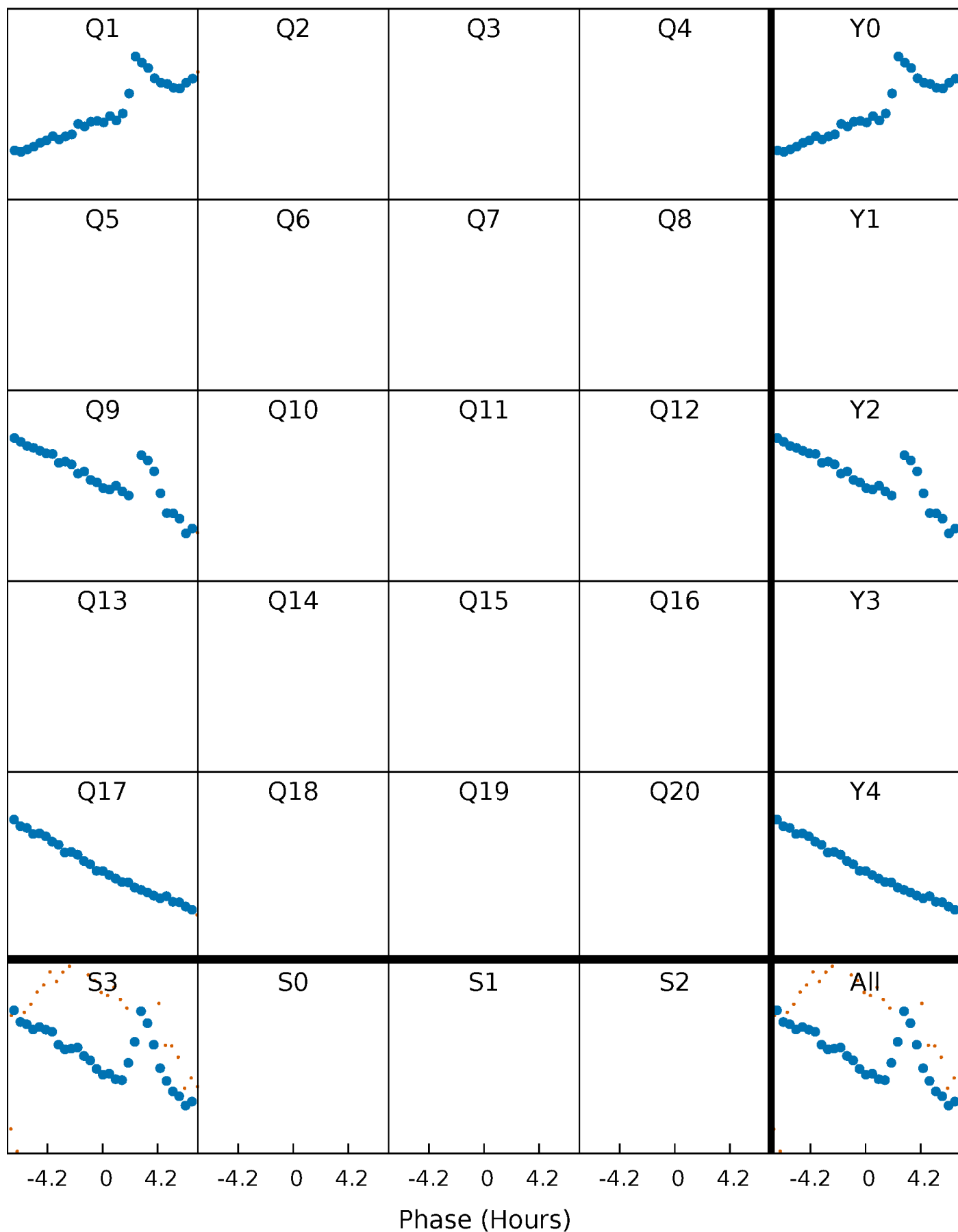


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



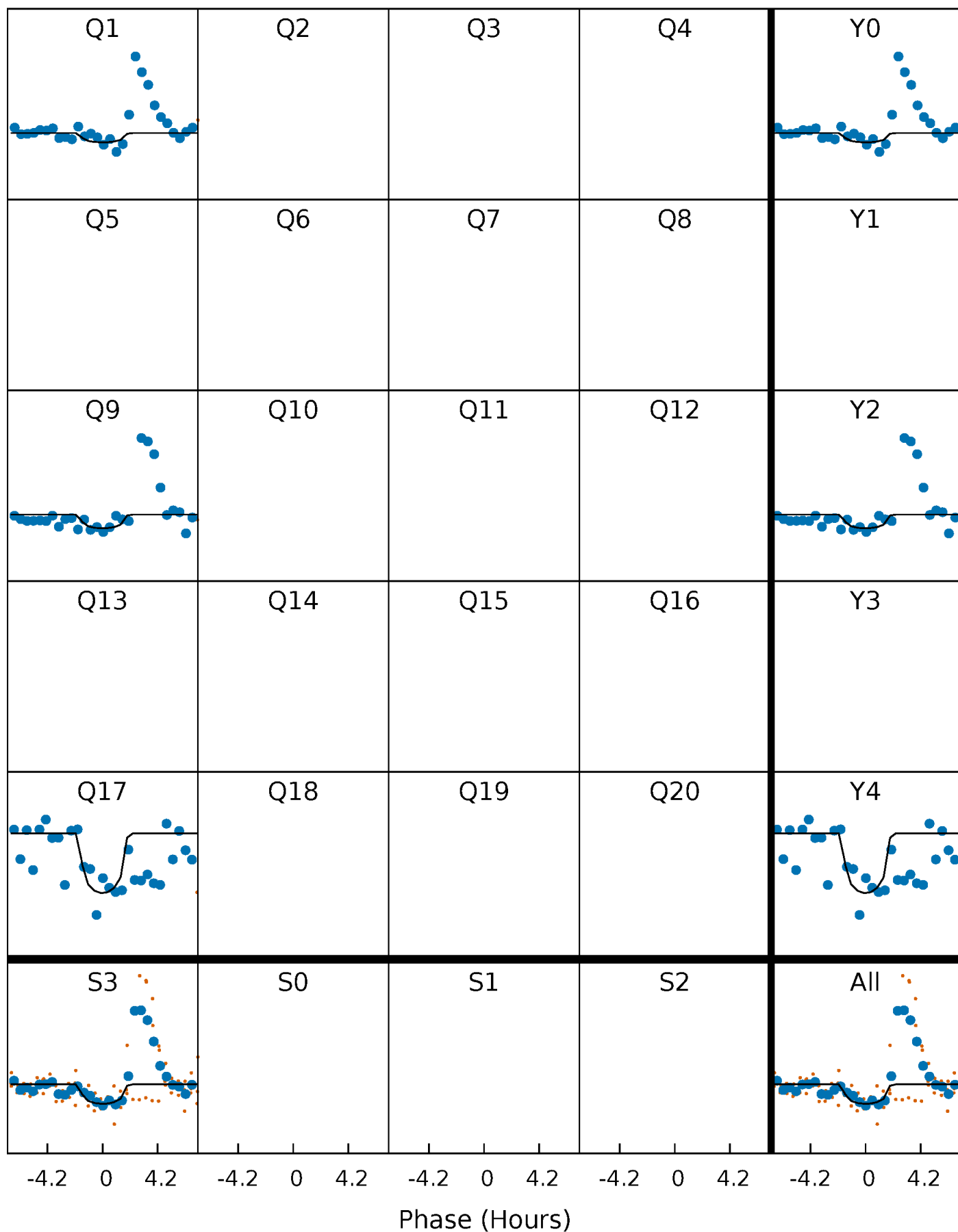
# PDC Quarter-Phased Transit Curves

TCE 004274517-02 P=702.812911 Days  $T_0=162.923591$  (BKJD)



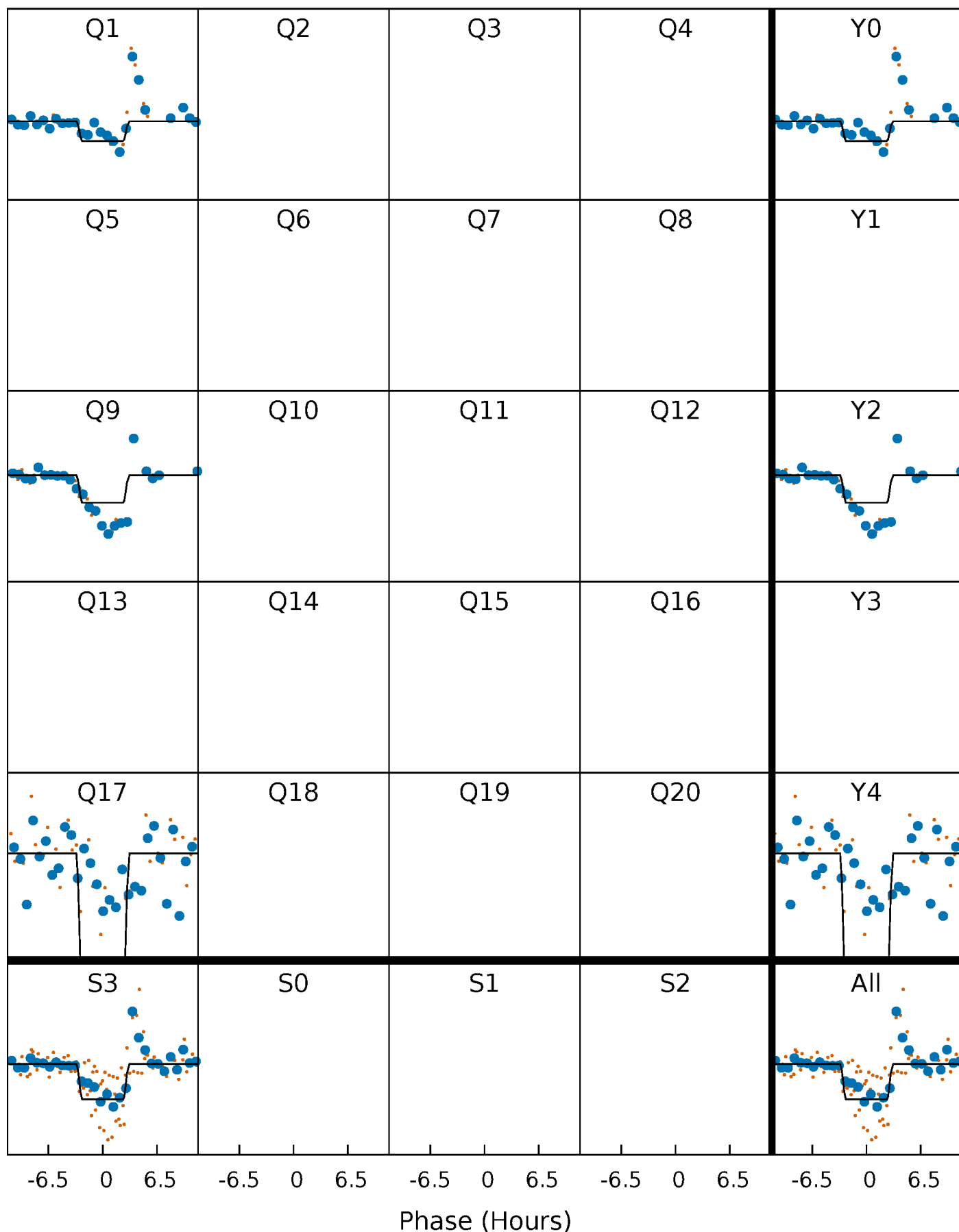
# DV Quarter-Phased Transit Curves

TCE 004274517-02 P=702.812911 Days  $T_0=162.923591$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

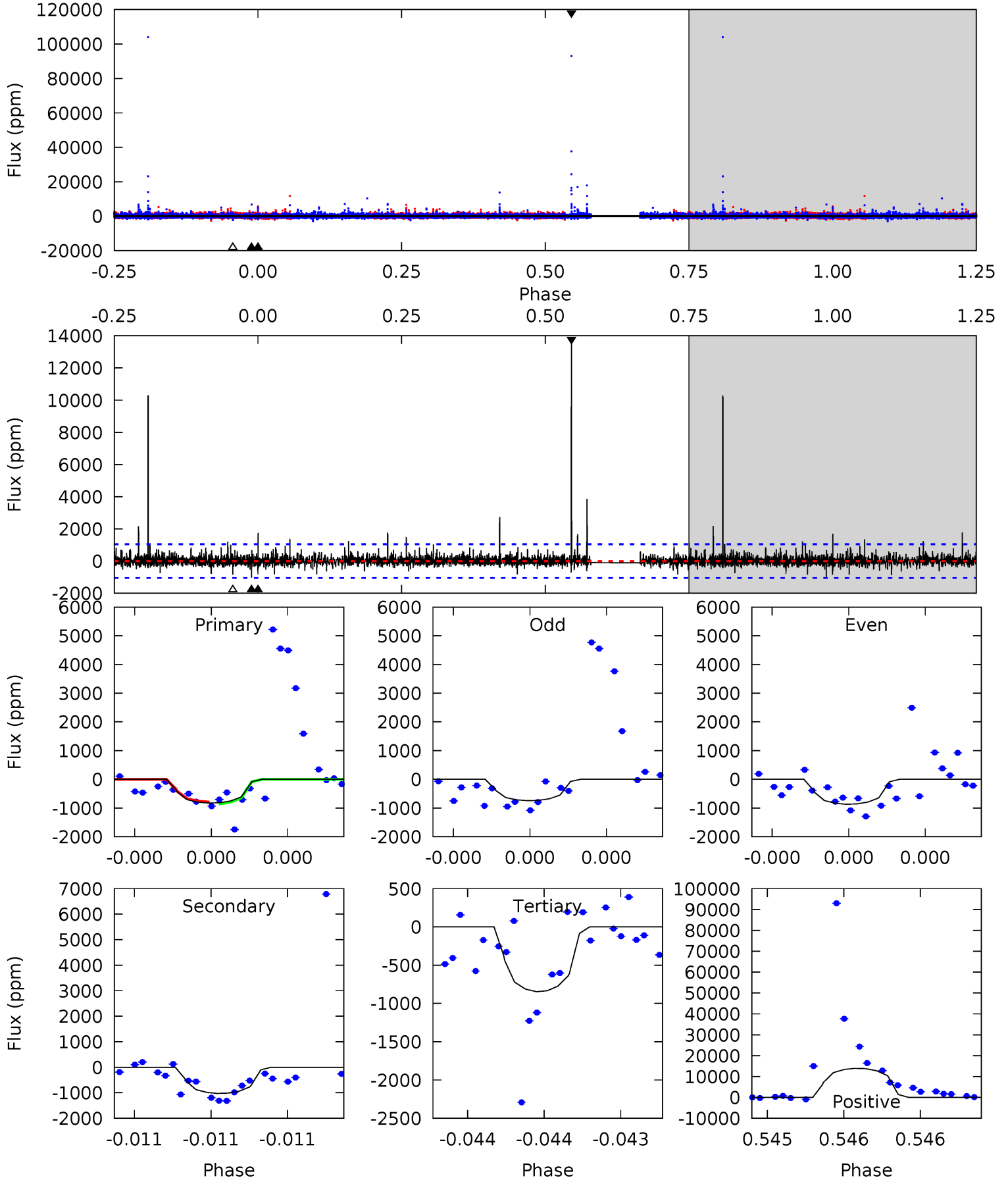
TCE 004274517-02 P=702.825918 Days  $T_0=162.880126$  (BKJD)



# DV Model-Shift Uniqueness Test

004274517-02, P = 702.812911 Days, E = 162.923591 Days

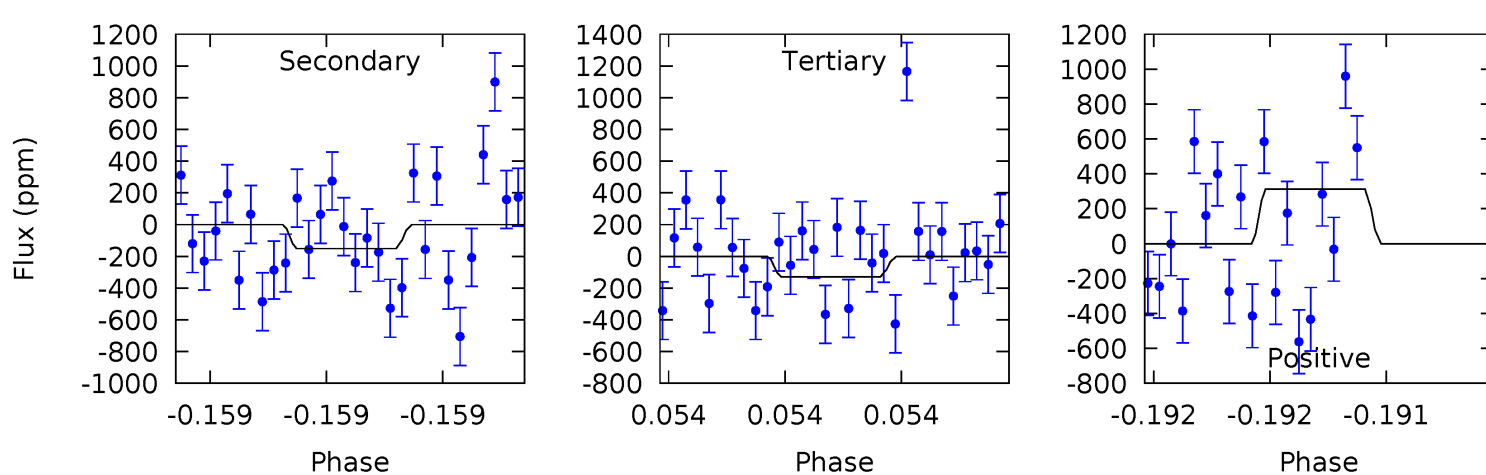
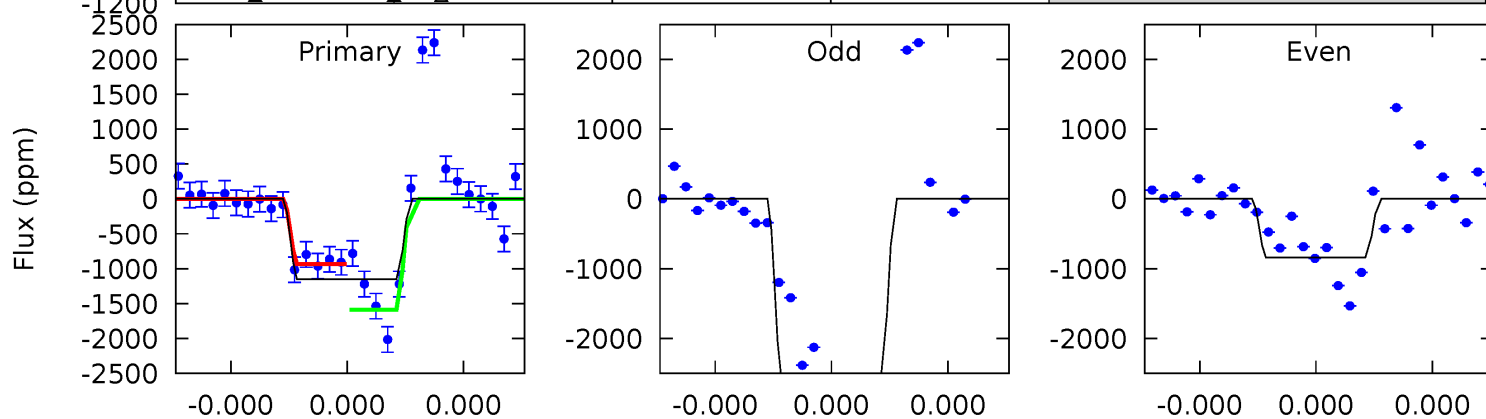
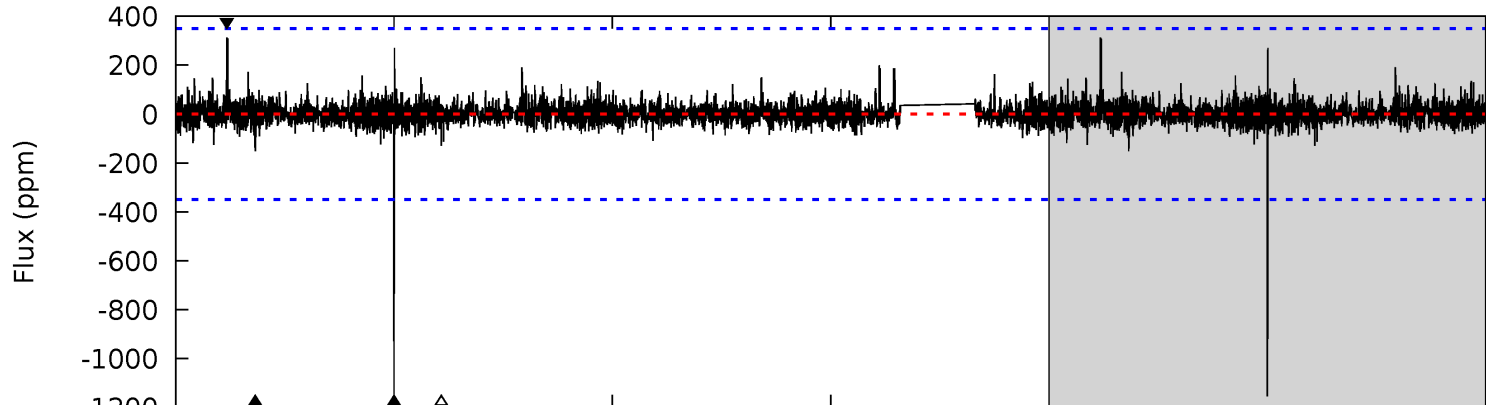
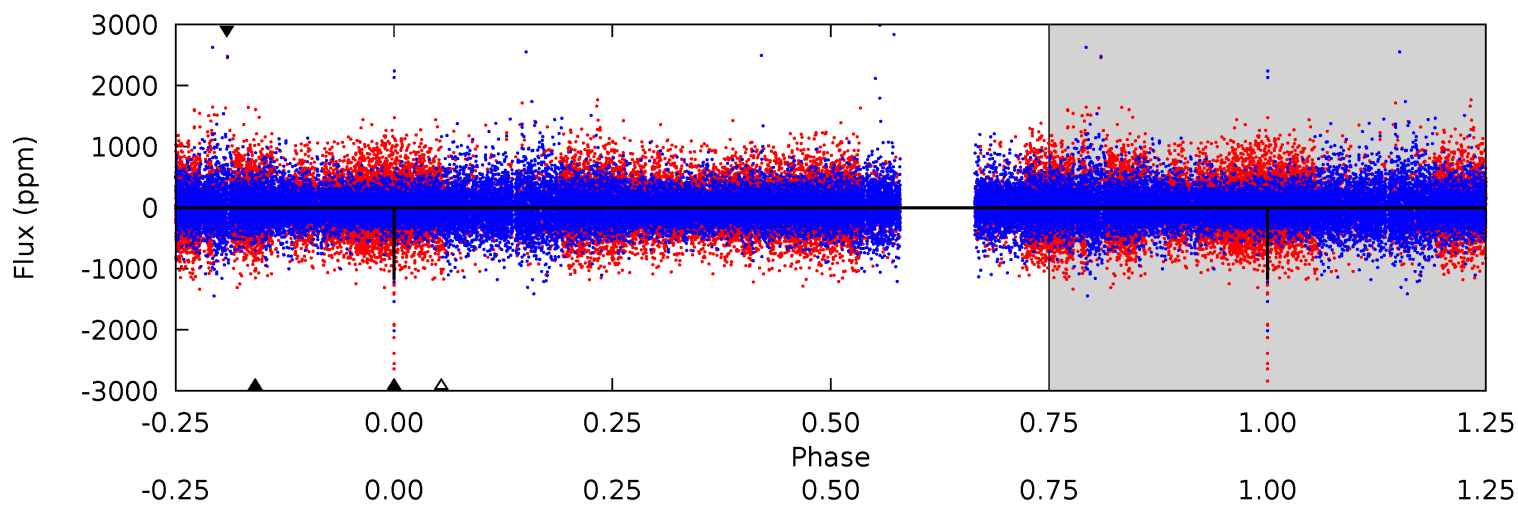
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.52	5.60	4.62	76.0	5.73	3.71	1.97	-0.10	-71.5	0.98	-70.4	0.31	0.98	0.93	0.18



# Alt Model-Shift Uniqueness Test

004274517-02, P = 702.825918 Days, E = 162.880126 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
18.6	2.44	2.07	5.04	5.64	3.58	0.49	16.5	13.6	0.36	-2.60	14.7	1.13	0.21	5.36





### Stellar Parameters For KIC 004274517

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4447^{+133}_{-133}$	$4.620^{+0.049}_{-0.024}$	$-0.200^{+0.300}_{-0.300}$	$0.648^{+0.046}_{-0.056}$	$0.638^{+0.068}_{-0.051}$	$3.308^{+0.767}_{-0.351}$
	+3%/-3%	+1%/-1%	+150%/-150%	+7%/-9%	+11%/-8%	+23%/-11%
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 004274517-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1025 \pm 183$	$6.18^{+6.12}_{-4.20}$	$190^{+6}_{-6}$	$3177^{+1425}_{-563}$	$26991^{+225954}_{-20381}$
Alt.	$-151 \pm 62$	$6.99^{+6.04}_{-4.69}$	$190^{+6}_{-7}$	$2377^{+819}_{-348}$	$2877^{+24778}_{-2183}$

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

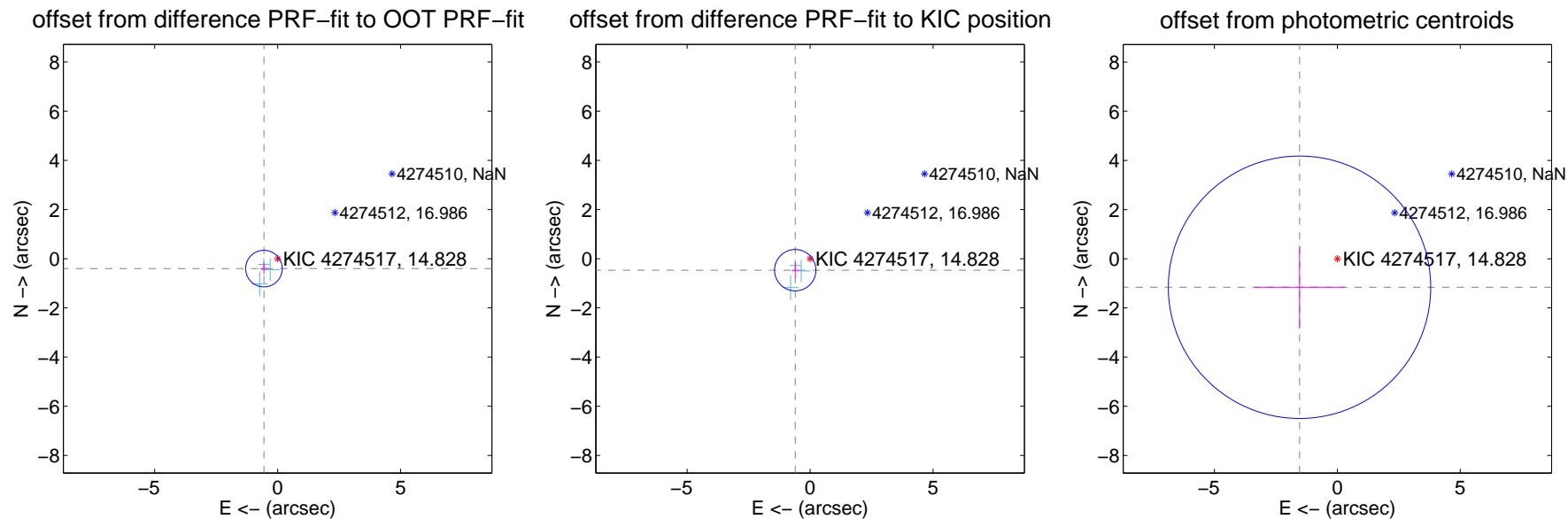
## DV Centroid Data

Supplemental centroid analysis for 004274517-02. Kepler magnitude: 14.83. Transit SNR 4.70

There are 3 quarters with good PRF difference image offsets

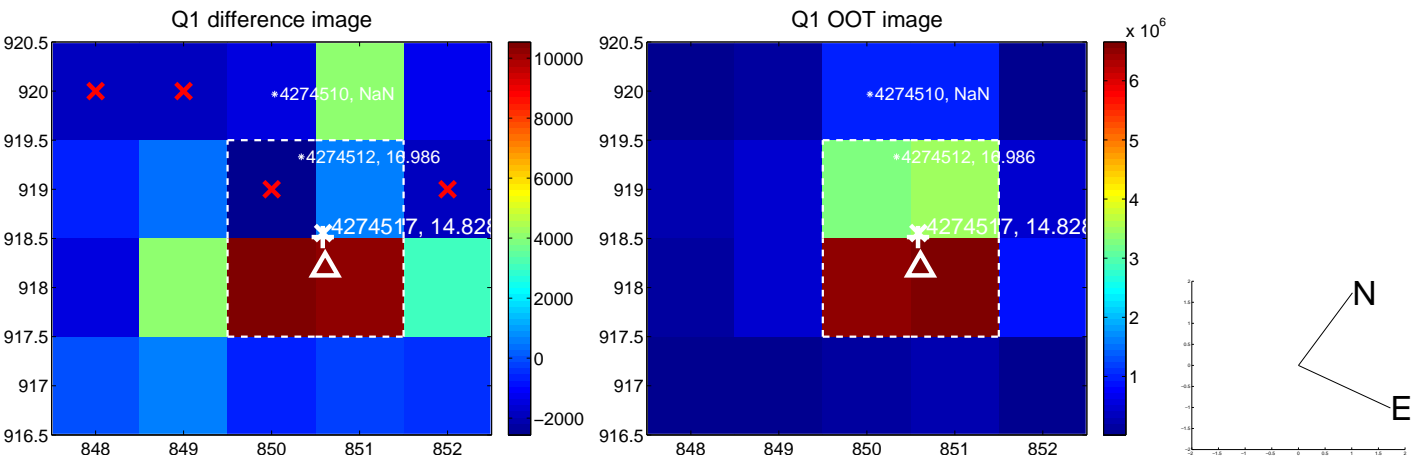
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.686 \pm 0.248$	2.77	$0.555 \pm 0.162$	$-0.402 \pm 0.223$
PRF-fit source offset from KIC position	$0.764 \pm 0.280$	2.73	$0.605 \pm 0.140$	$-0.466 \pm 0.302$
photometric centroid source offset	$1.93 \pm 1.78$	1.08	$1.54 \pm 1.83$	$-1.16 \pm 1.68$



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.

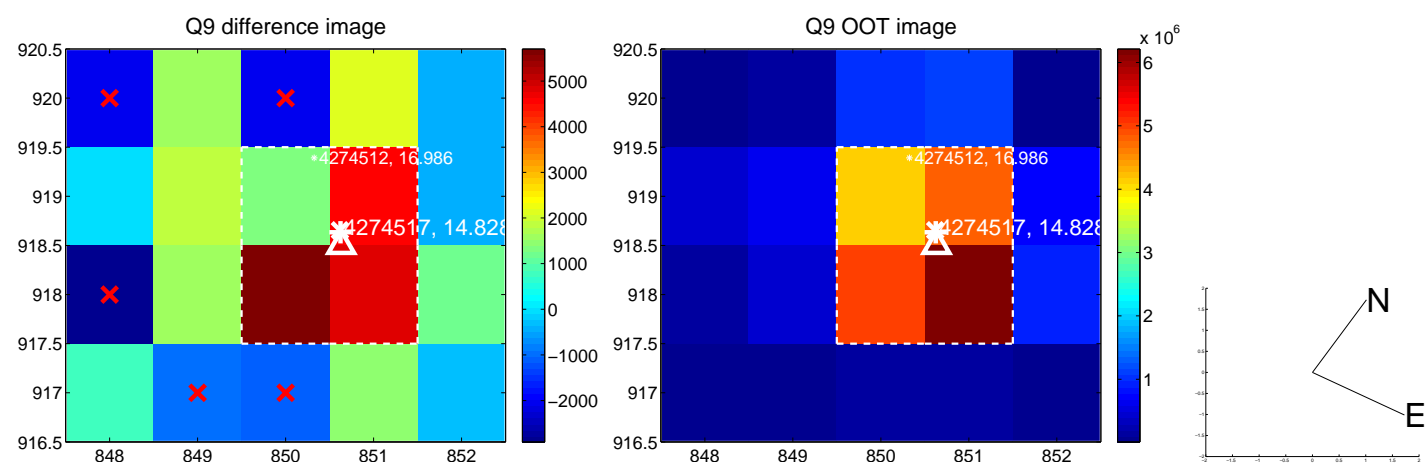
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



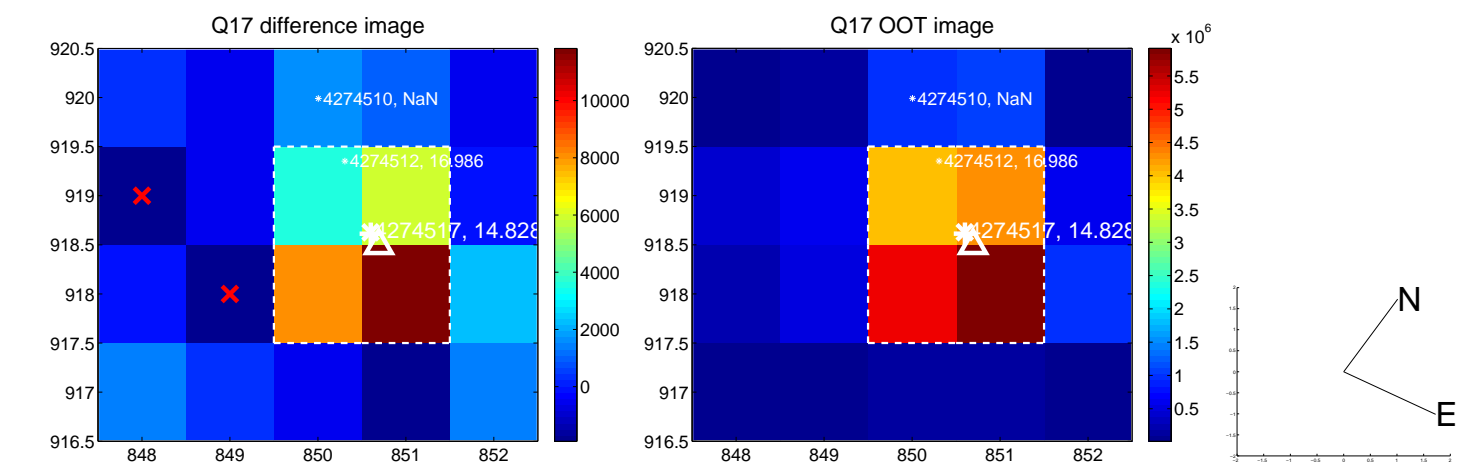
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



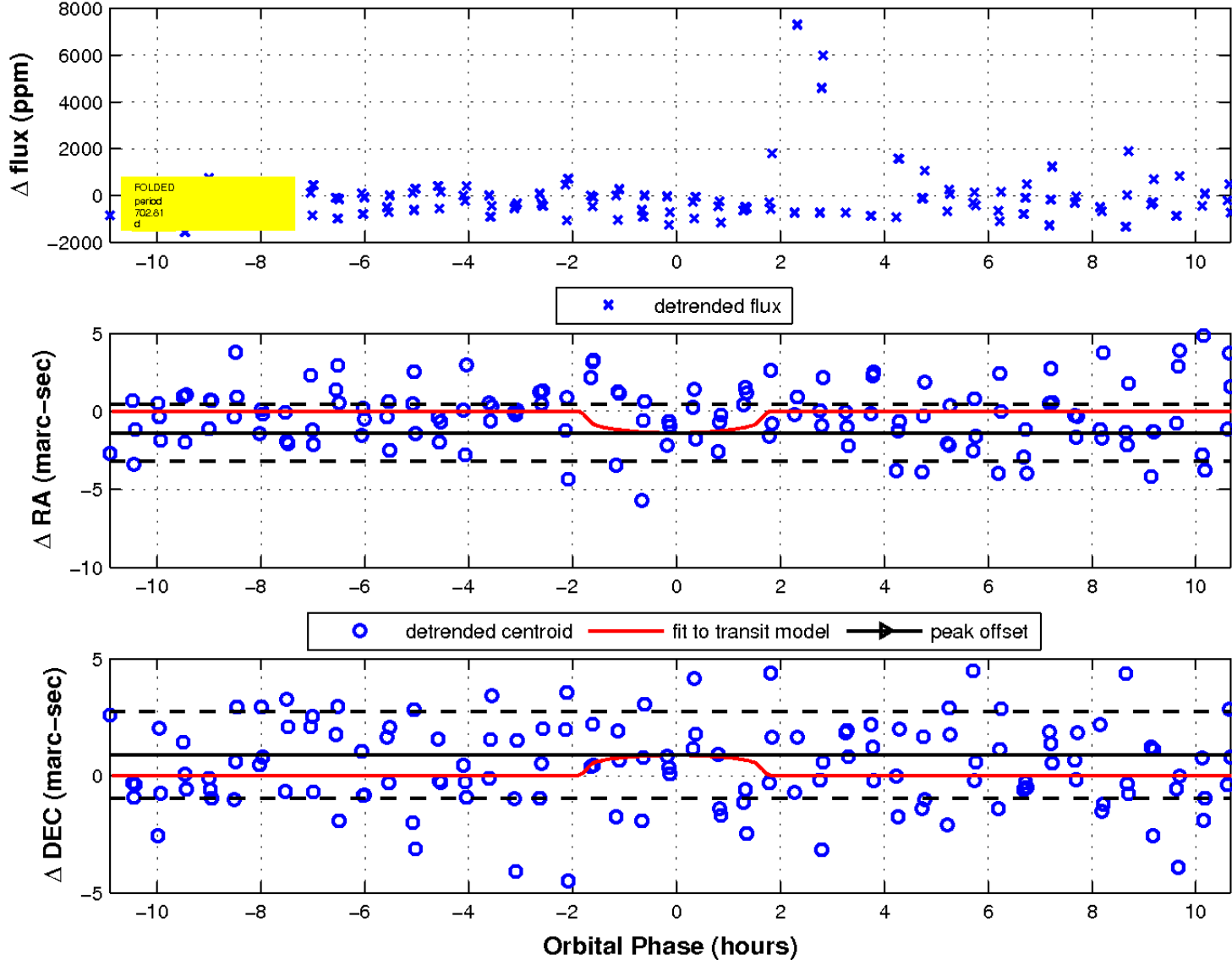
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

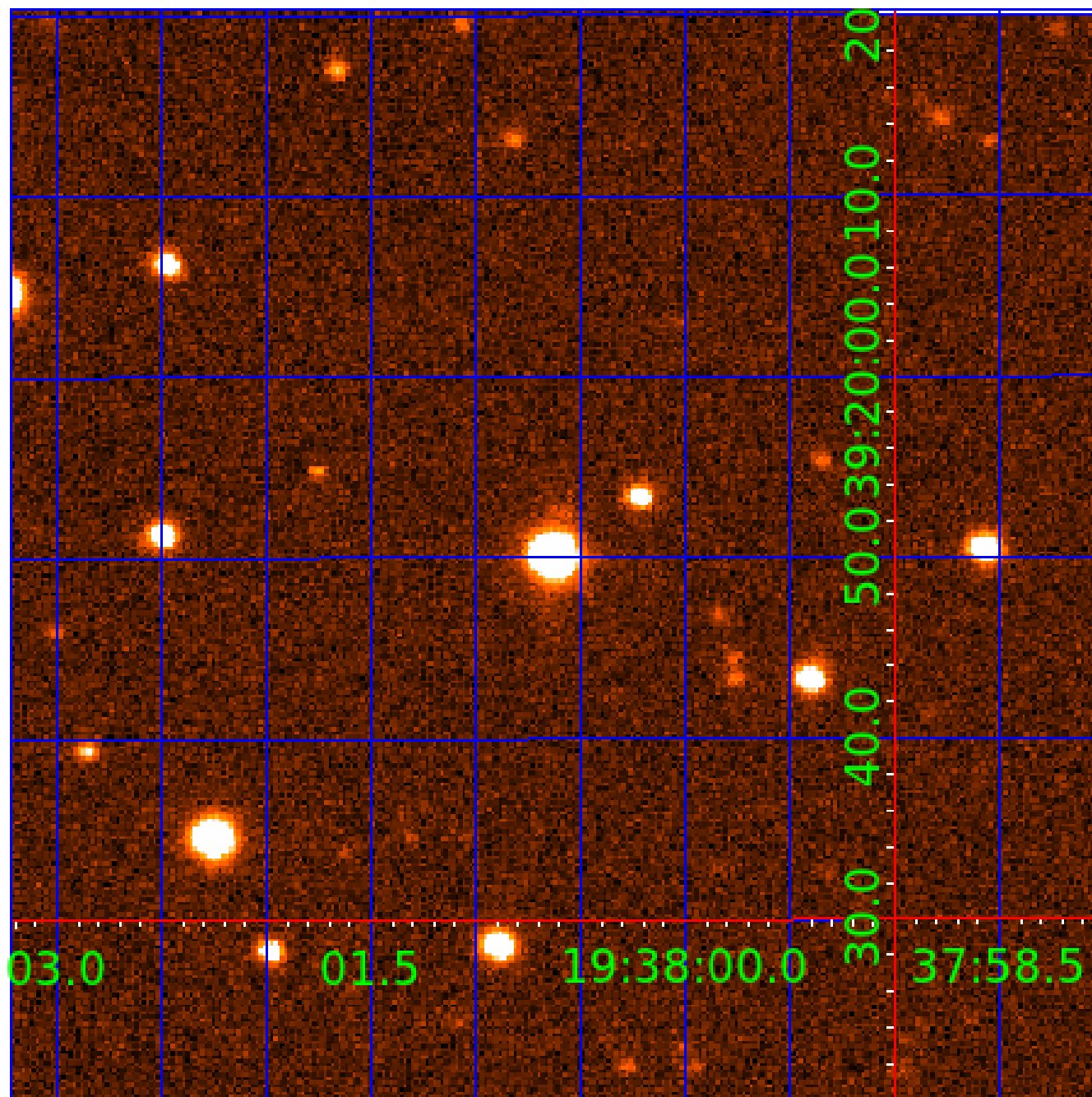


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination





# KIC 004274517

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004274517-01	OBS	No	285.647928	224.782390	1014.4	3.836	12.5	6.7	0.65	4447	2.21	0.28
004274517-02	OBS	No	702.812911	162.923592	856.2	3.638	11.3	4.7	0.65	4447	2.08	0.08
004274517-03	OBS	No	349.052883	201.662811	2621.5	12.000	23.7	-1.0	0.65	4447	3.18	0.21
004274517-04	OBS	No	353.577754	147.350249	1121.7	13.368	10.2	7.1	0.65	4447	2.21	0.21
004274517-05	OBS	No	582.583591	273.578985	1391.4	3.990	12.4	7.4	0.65	4447	2.44	0.11
004274517-06	OBS	No	401.856814	389.422325	1078.2	4.290	10.9	7.0	0.65	4447	2.40	0.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004274517-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004274517-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
004274517-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

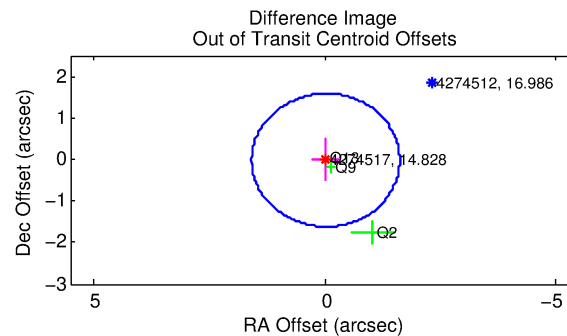
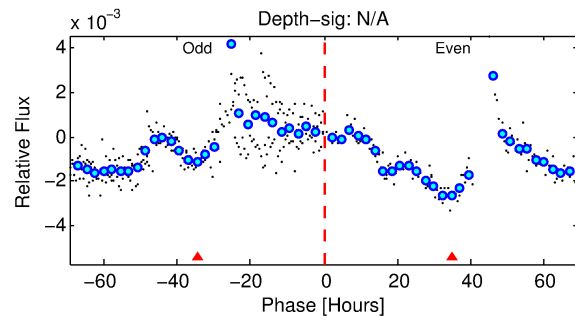
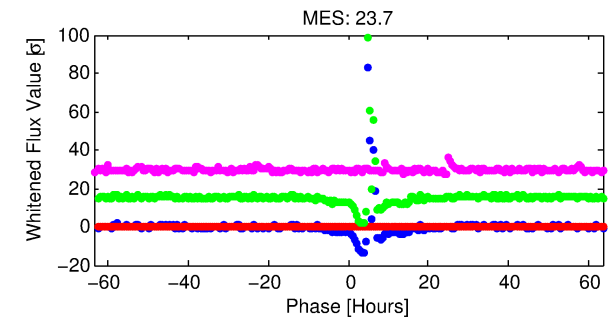
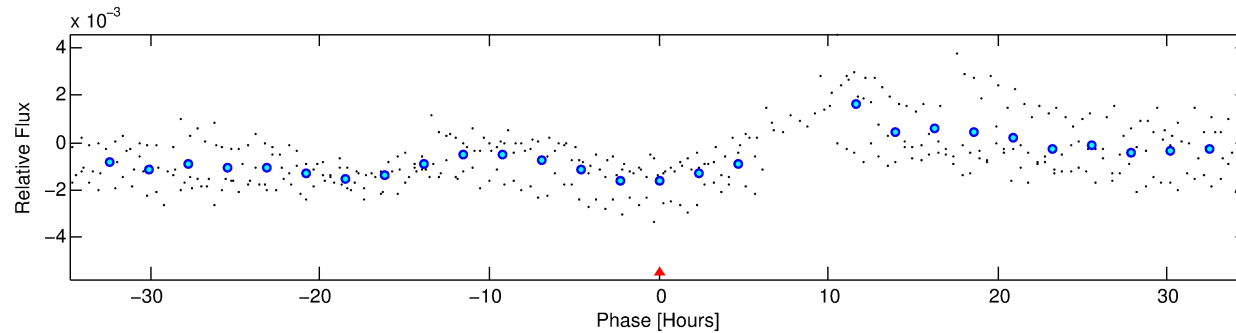
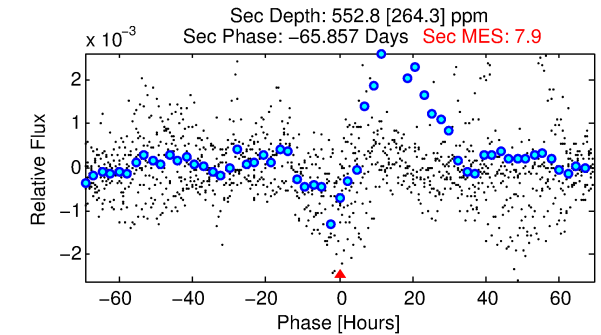
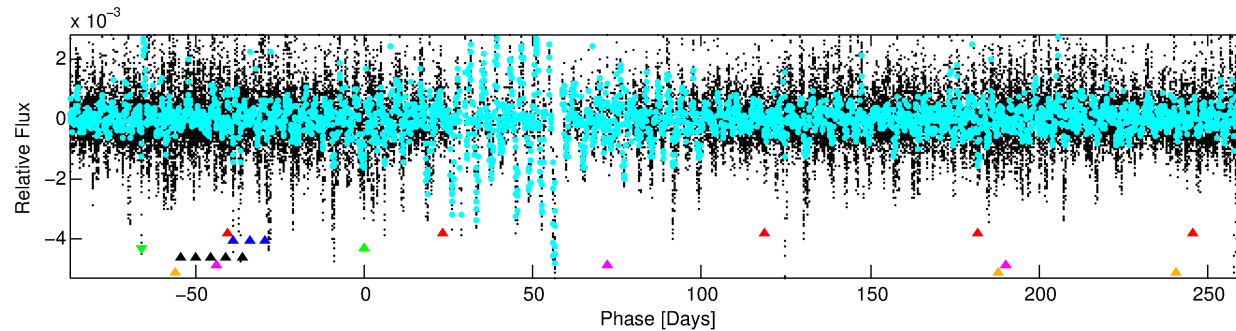
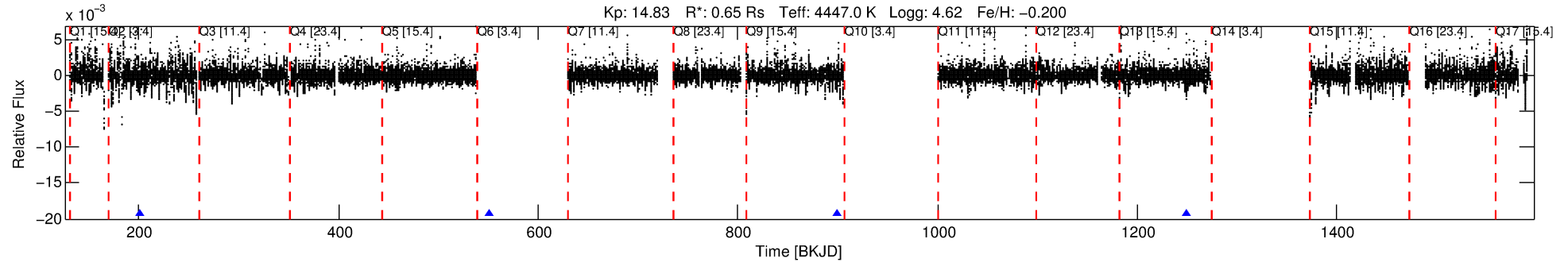
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004274517-03

No Significant Match Found

# DV One-Page Summary

KIC: 4274517 Candidate: 3 of 6 Period: 349.053 d



## TPS TCE Results:

Period = 349.05288 d  
Epoch = 201.6628 BKJD

DV fit results are unavailable

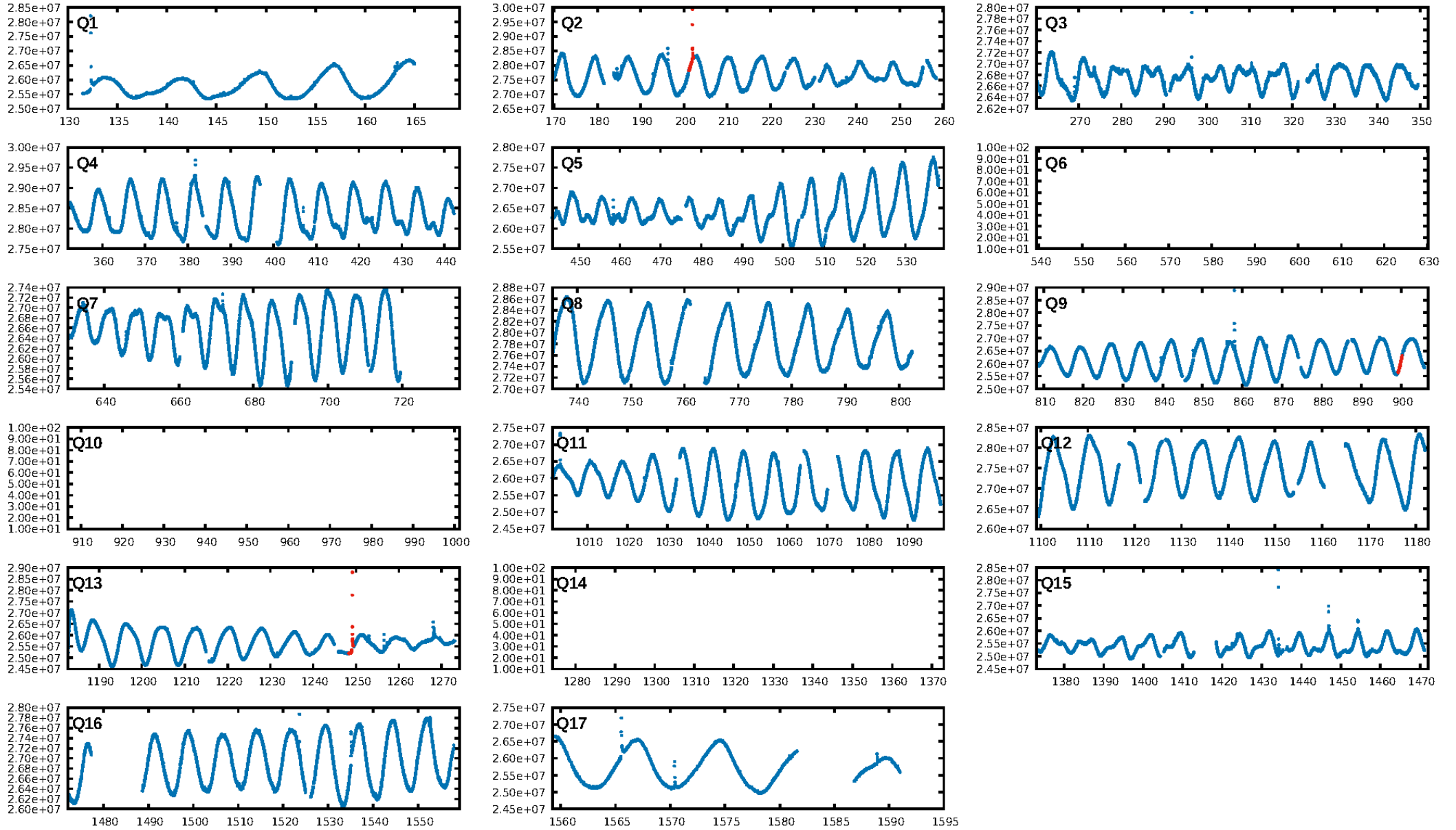
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [120.79σ]  
LongPeriod-sig: 100.0% [6.05σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.02e-25  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -0.5007  
Centroid-sig: 78.5%  
Centroid-so: 0.508 arcsec [0.54σ]  
OotOffset-rm: 0.030 arcsec [0.06σ]  
KicOffset-rm: 0.142 arcsec [0.53σ]  
OotOffset-st: 1/0/0/2 [3]  
KicOffset-st: 1/0/0/2 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

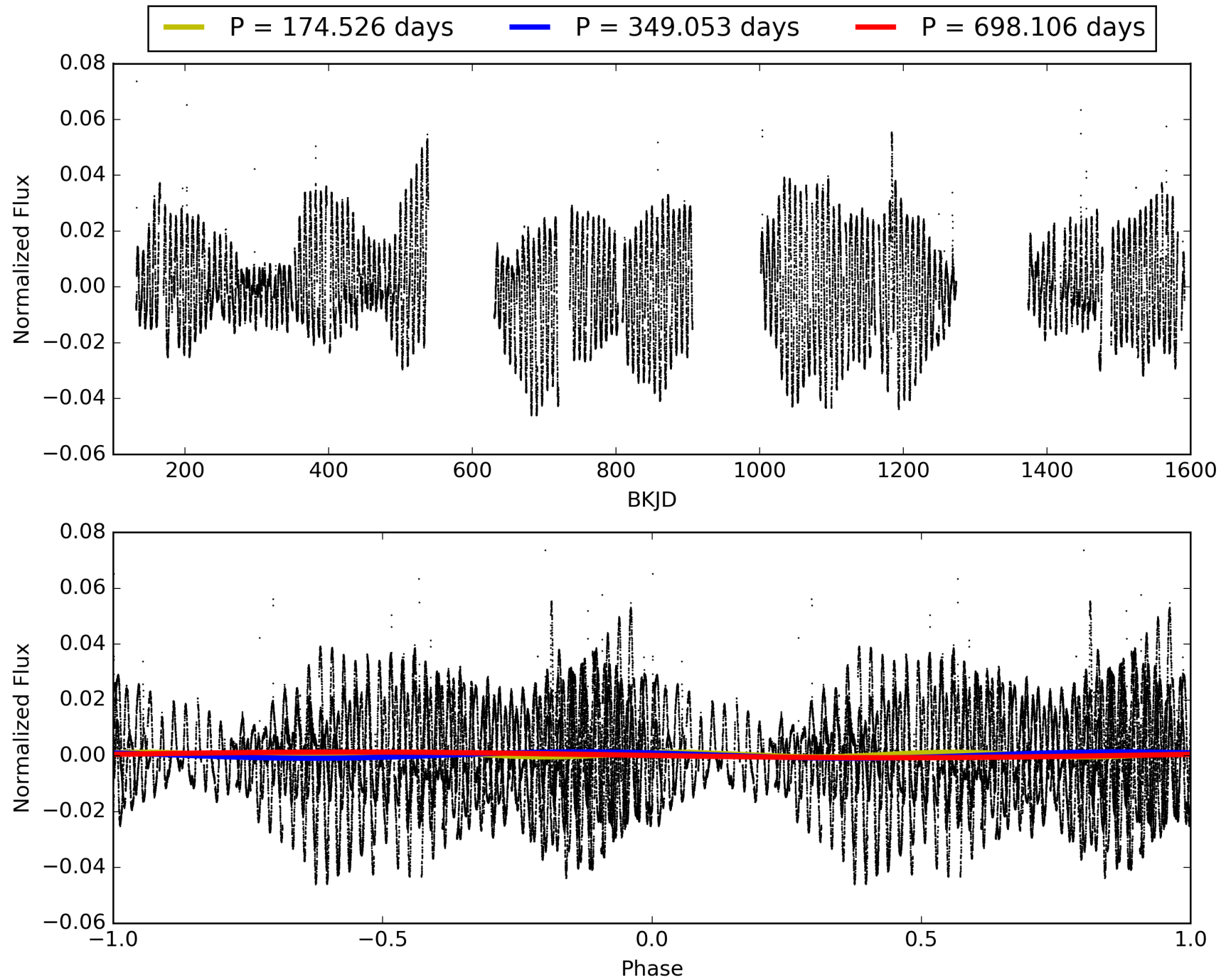
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:03:17 Z

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

# TCE 004274517-03, PDC Light Curves

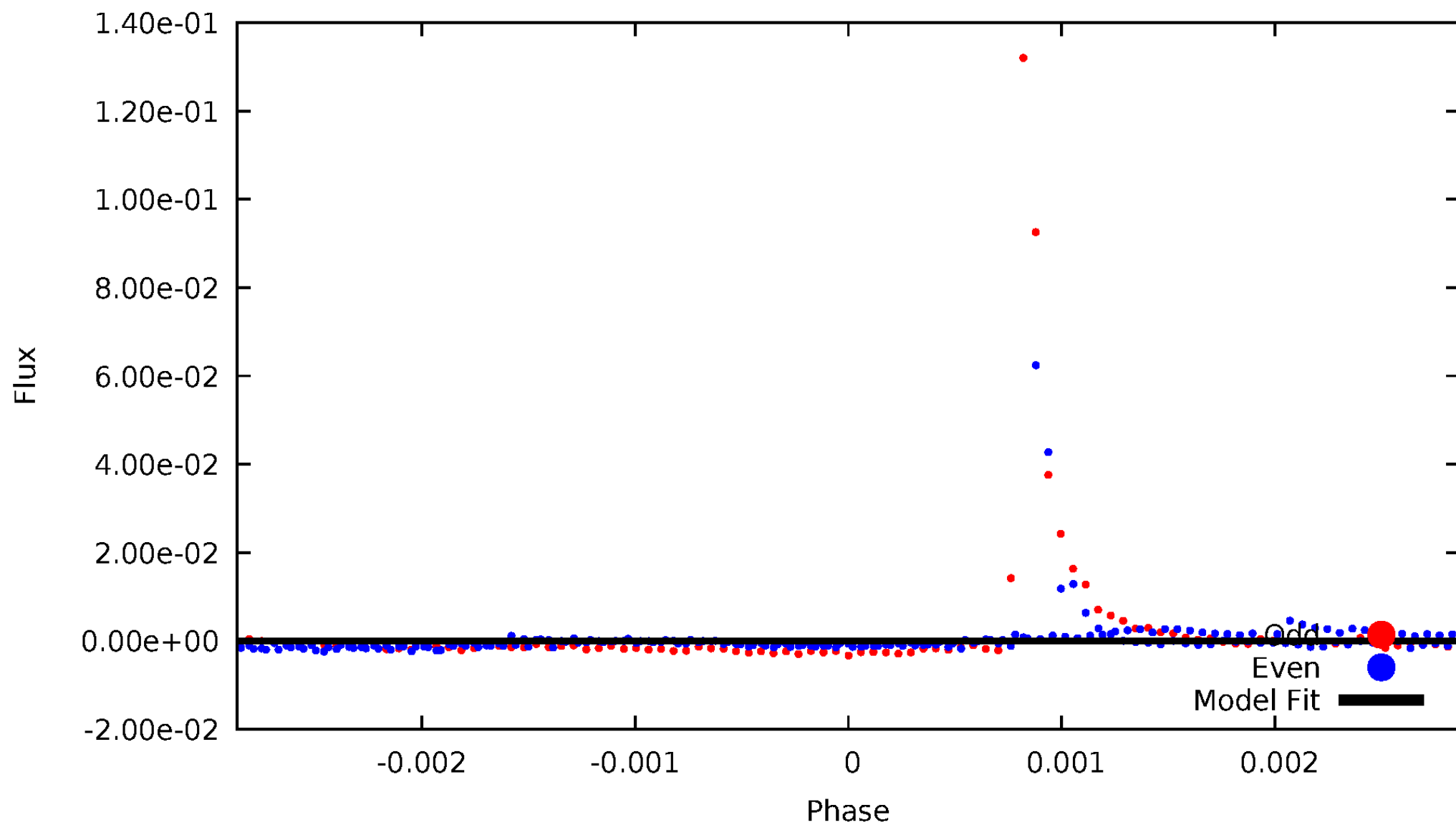


TCE 004274517-03



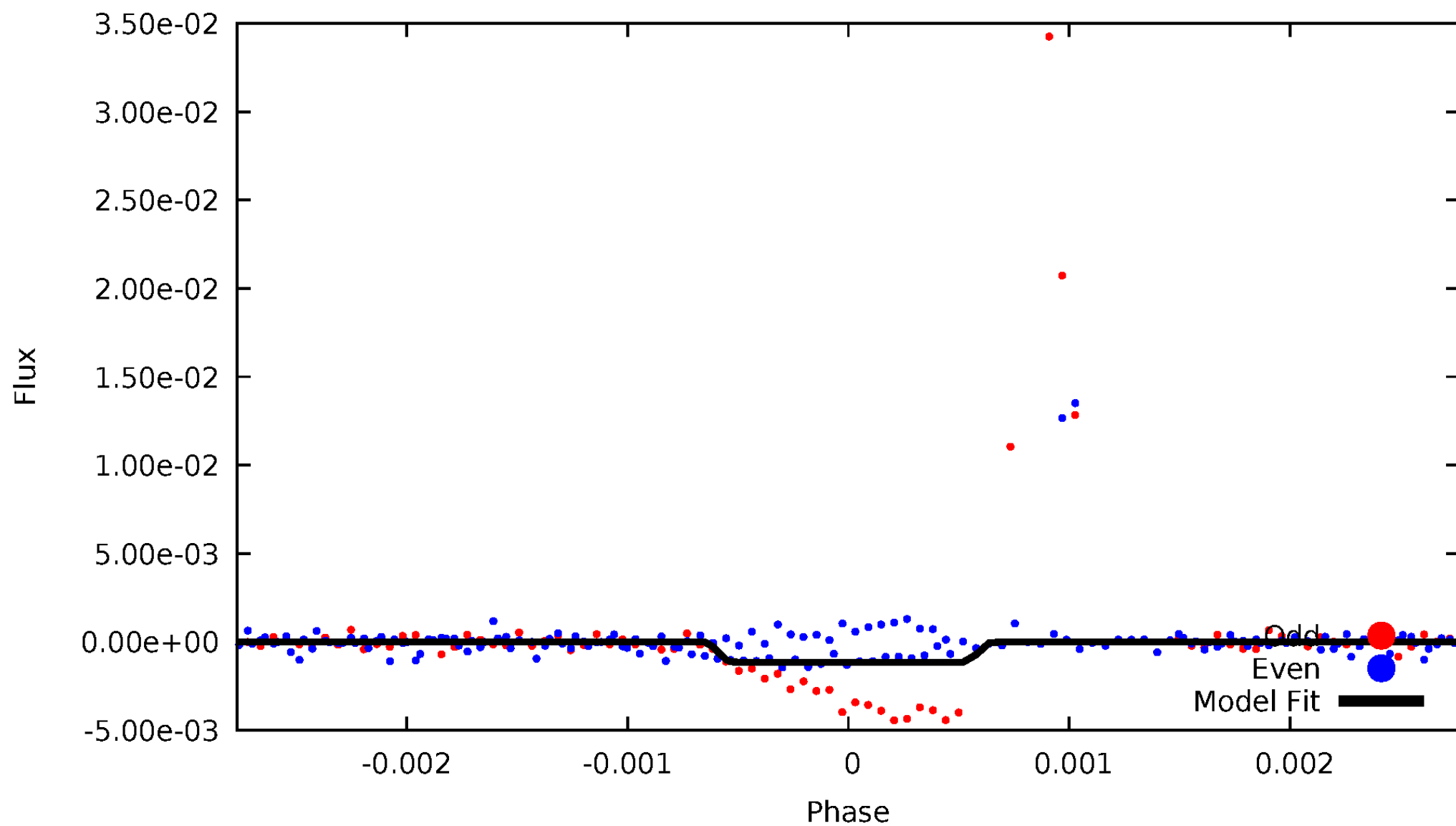
# DV Odd/Even

TCE 004274517-03

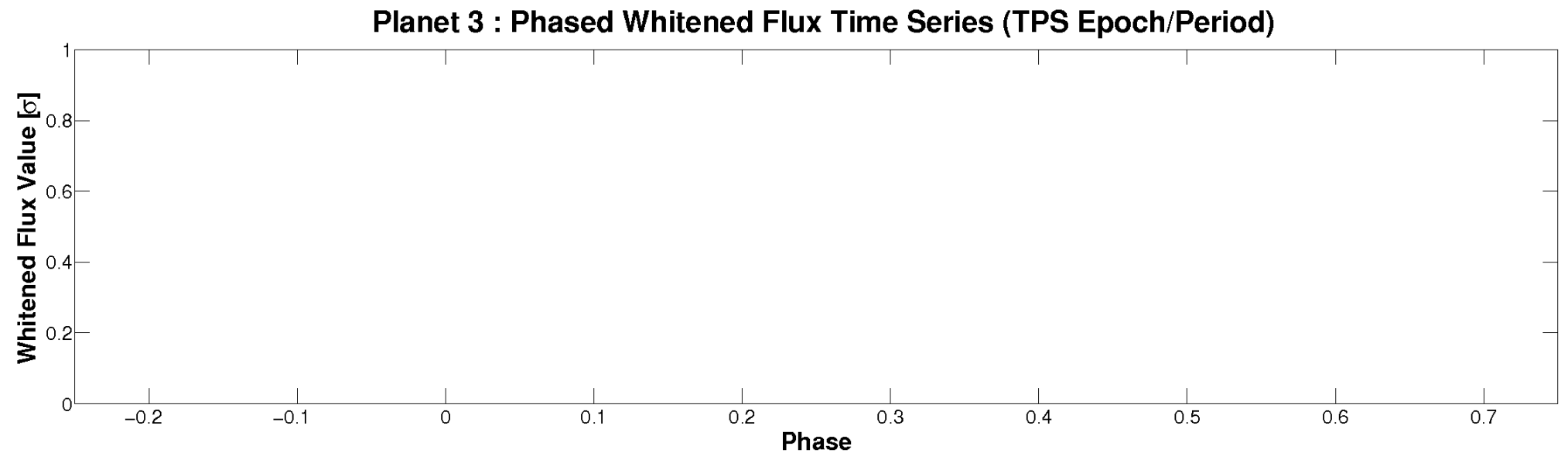
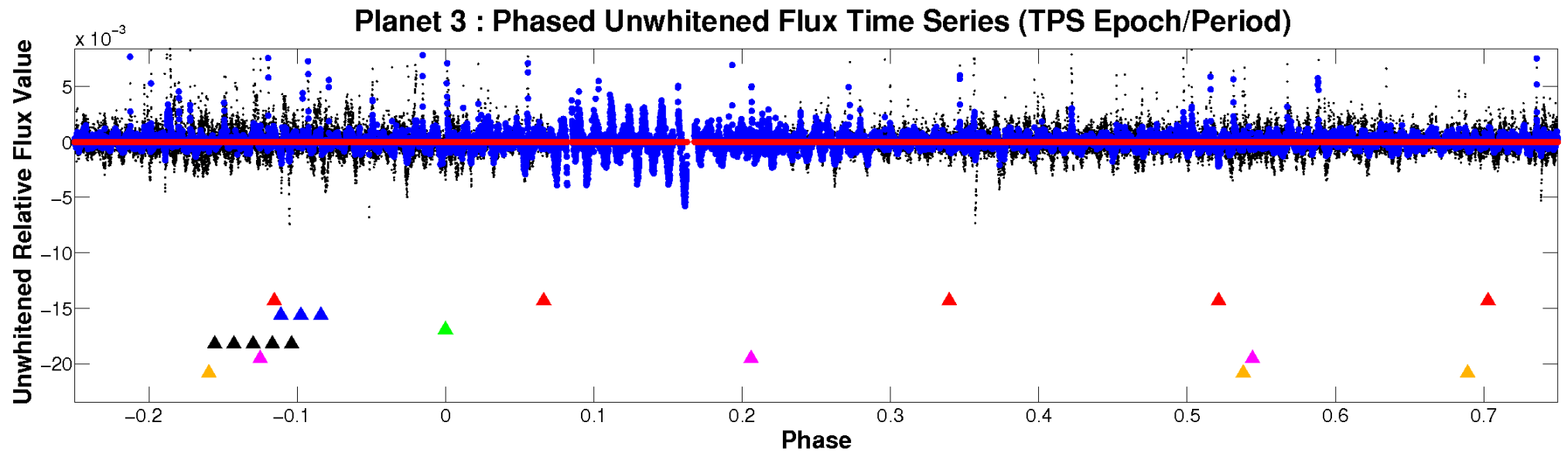


# ALT Odd/Even

TCE 004274517-03

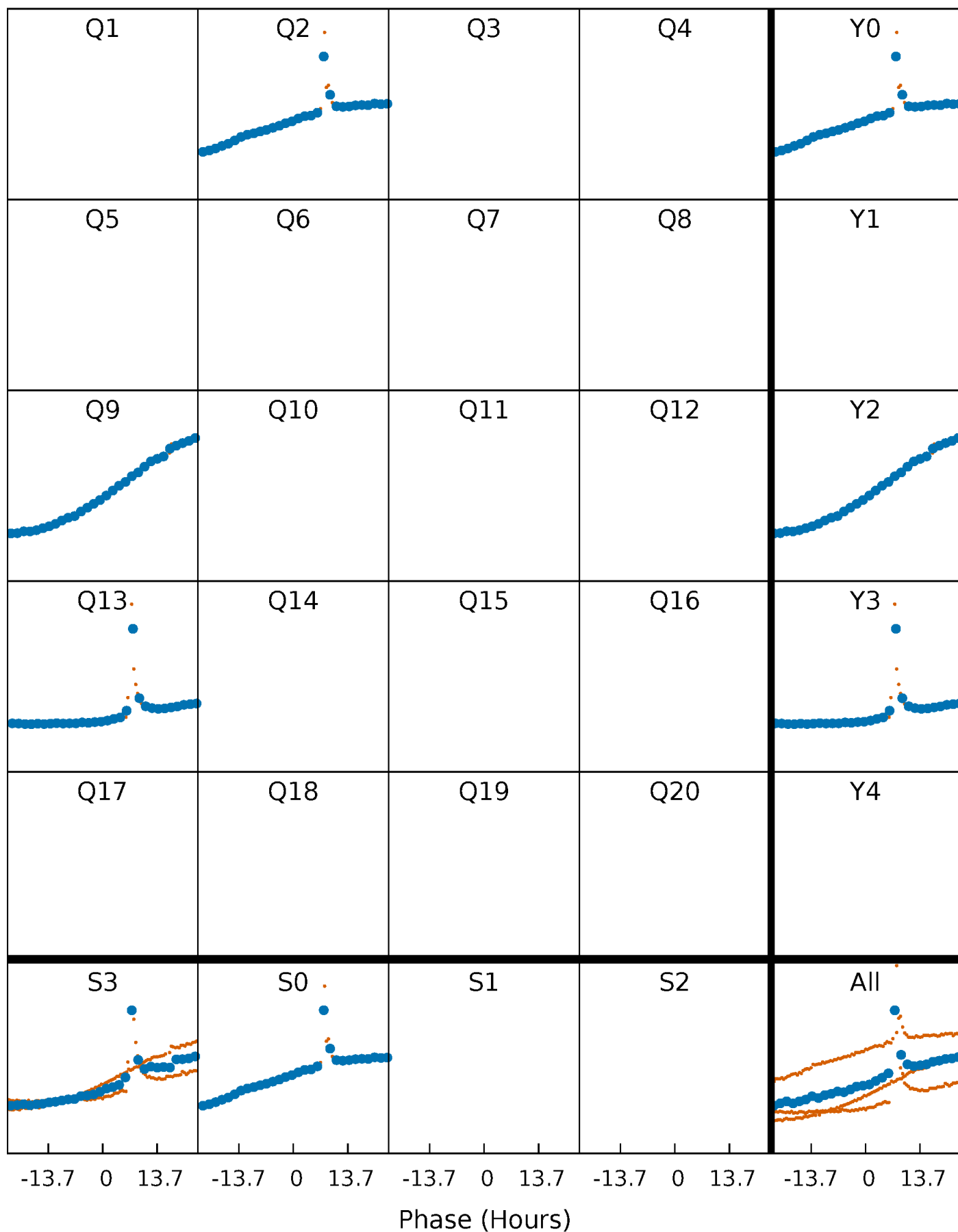


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

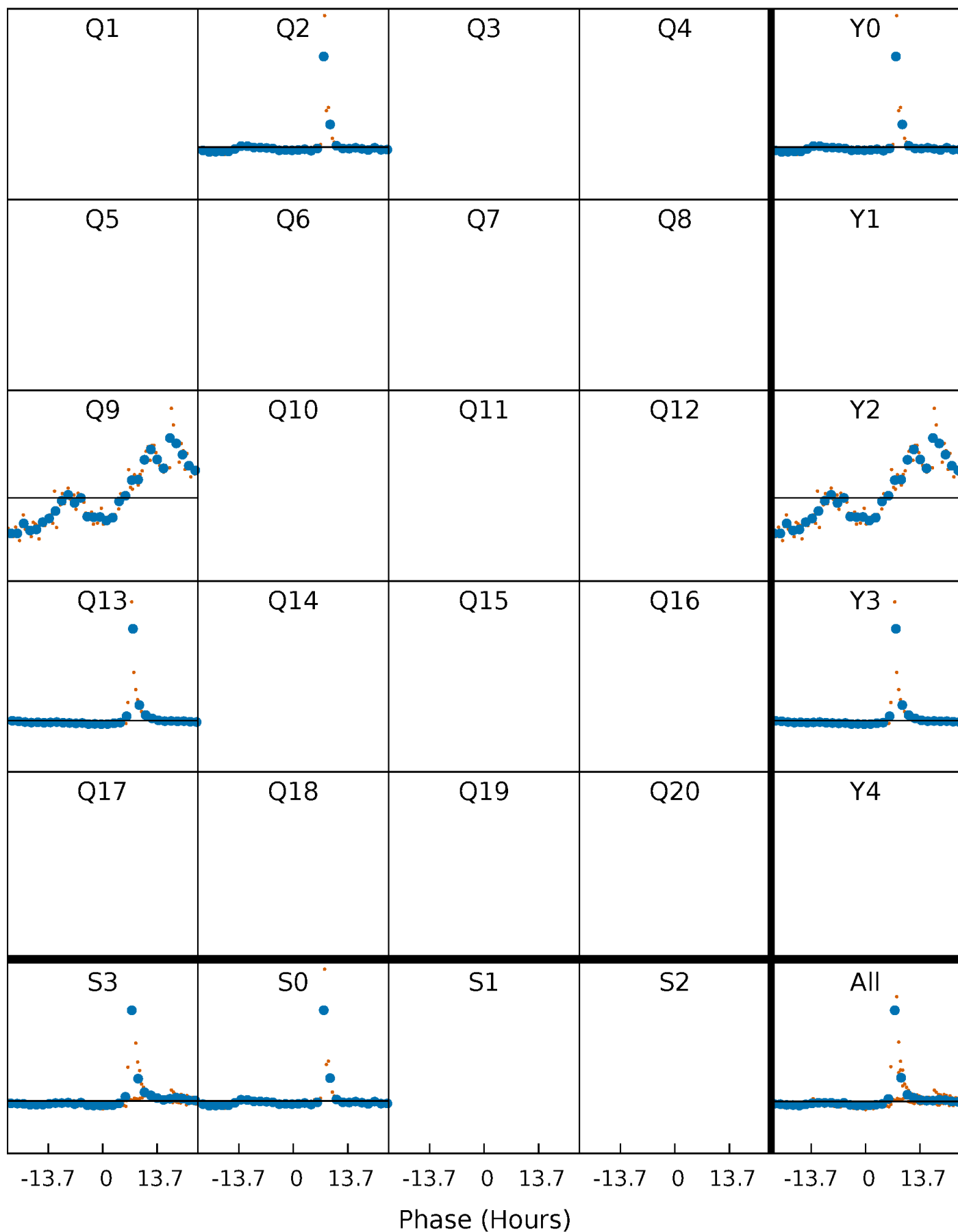
TCE 004274517-03 P=349.052883 Days  $T_0=201.662811$  (BKJD)





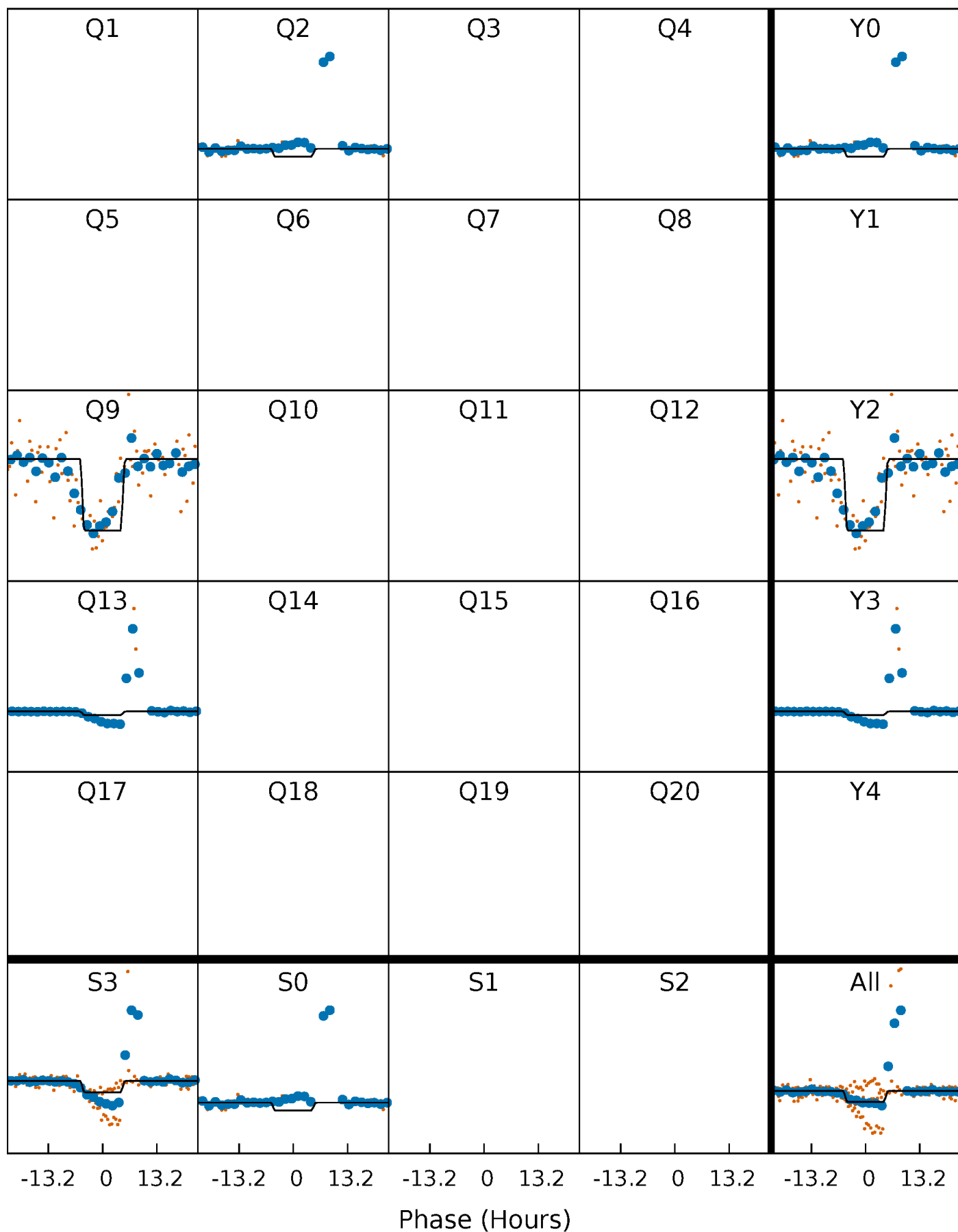
# DV Quarter-Phased Transit Curves

TCE 004274517-03     $P=349.052883$  Days     $T_0=201.662811$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

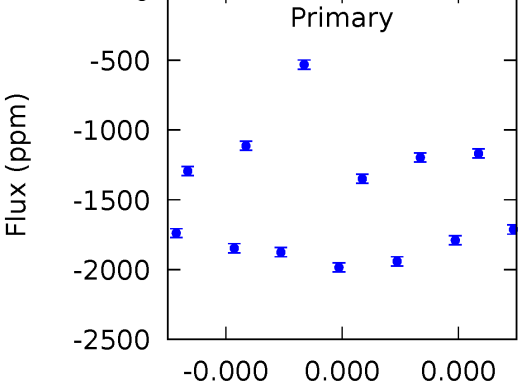
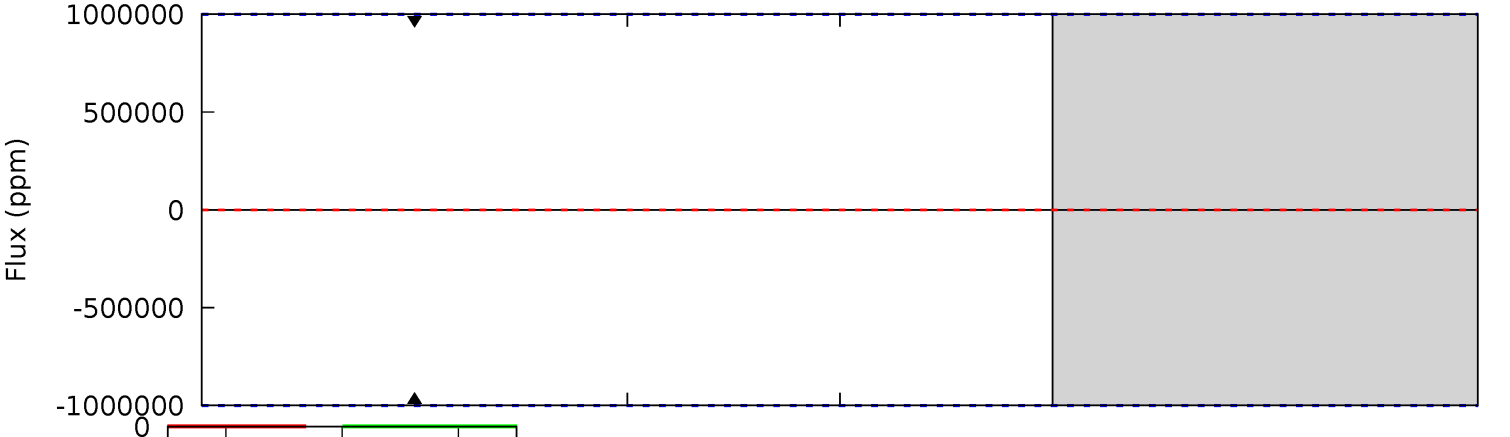
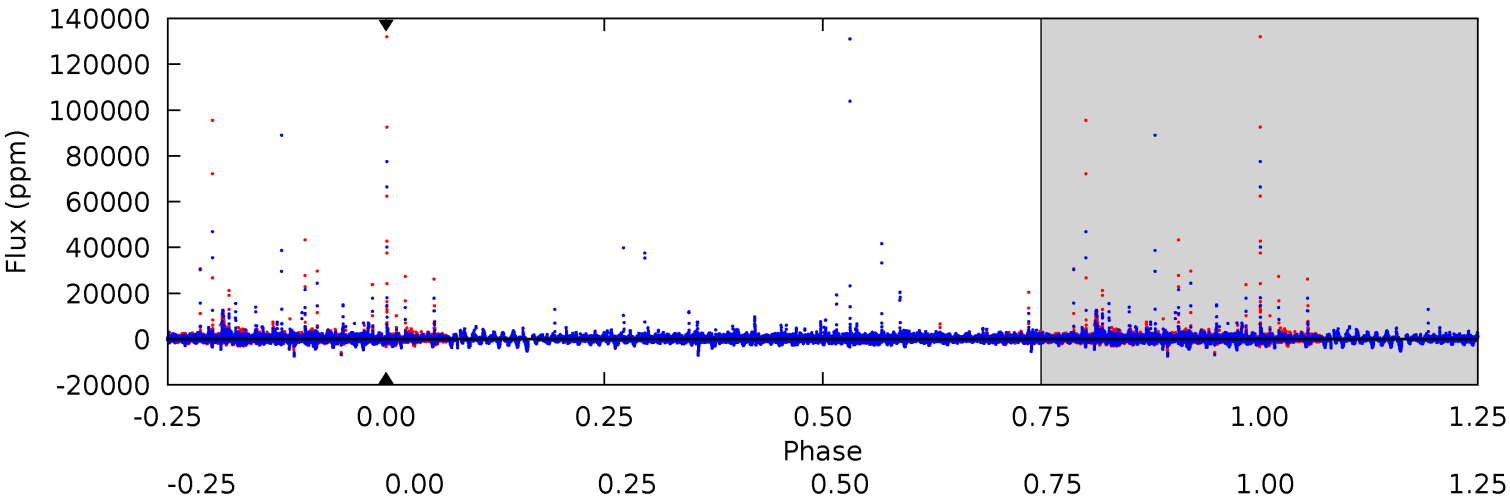
TCE 004274517-03 P=349.052883 Days  $T_0=201.672536$  (BKJD)



# DV Model-Shift Uniqueness Test

004274517-03, P = 349.052883 Days, E = 201.662811 Days

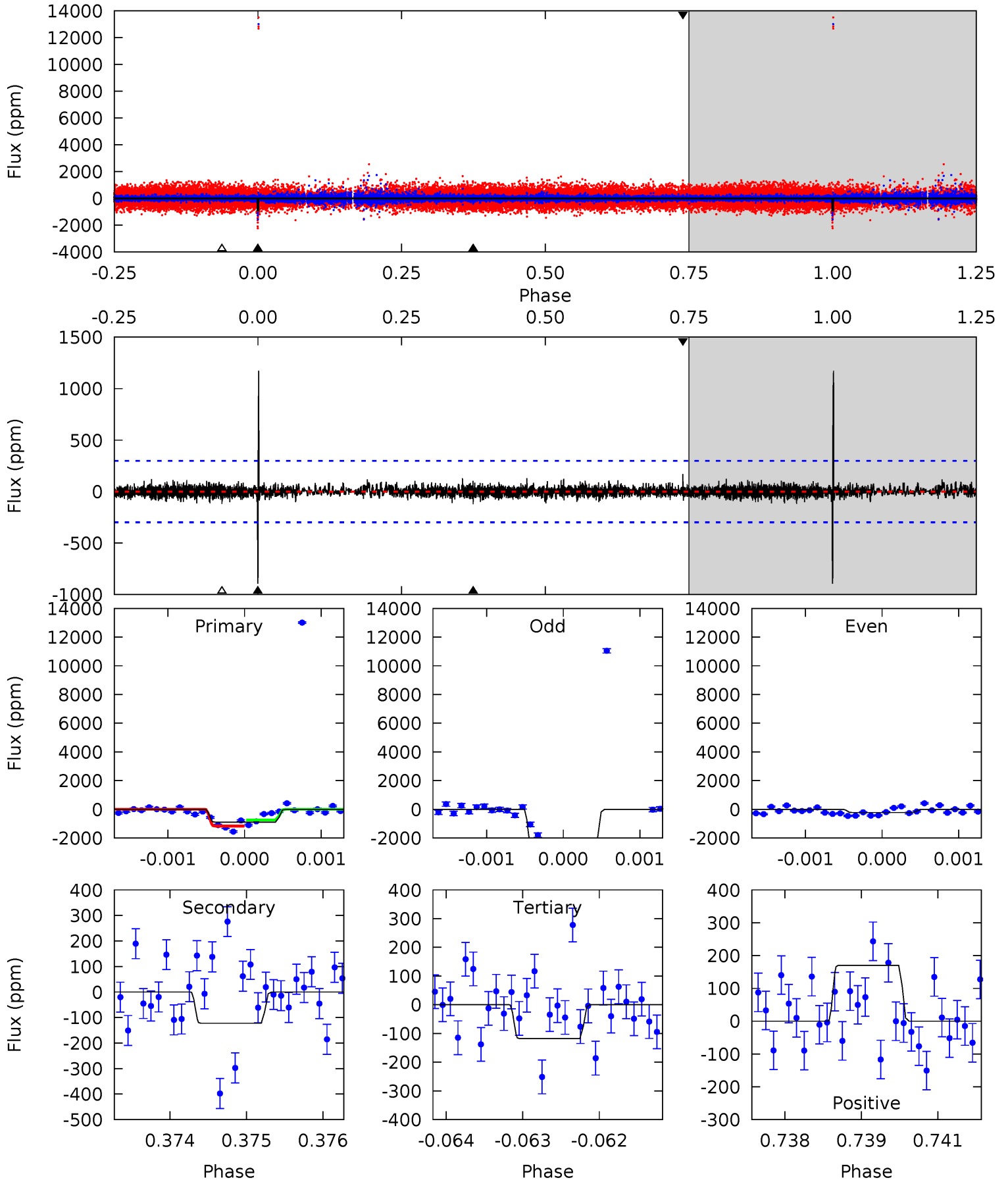
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

004274517-03, P = 349.052883 Days, E = 201.672536 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
16.2	2.22	2.14	3.08	5.41	3.22	0.65	14.1	13.1	0.08	-0.86	32.3	1.23	0.57	3.55



### Stellar Parameters For KIC 004274517

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4447^{+133}_{-133}$	$4.620^{+0.049}_{-0.024}$	$-0.200^{+0.300}_{-0.300}$	$0.648^{+0.046}_{-0.056}$	$0.638^{+0.068}_{-0.051}$	$3.308^{+0.767}_{-0.351}$
	+3%/-3%	+1%/-1%	+150%/-150%	+7%/-9%	+11%/-8%	+23%/-11%
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 004274517-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$6.17^{+6.02}_{-3.94}$	$240^{+8}_{-8}$	$3474^{+6490}_{-12921}$	$18275^{+1736630}_{-1469959}$
Alt.	$-122 \pm 55$	$5.70^{+5.36}_{-3.81}$	$240^{+8}_{-8}$	$2431^{+844}_{-373}$	$1396^{+10699}_{-1083}$

$T_{max}$  = 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

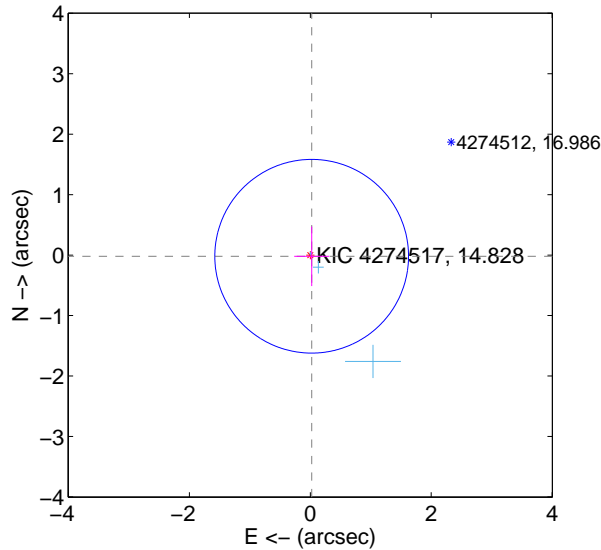
Supplemental centroid analysis for 004274517-03. Kepler magnitude: 14.83. Transit SNR -1.00

There are 3 quarters with good PRF difference image offsets

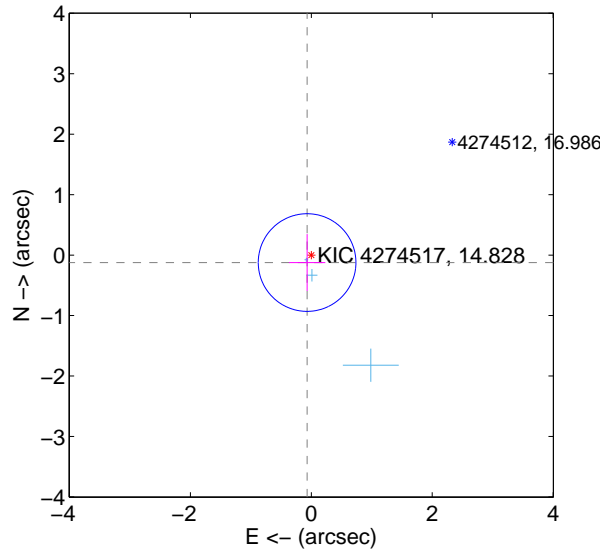
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.030 \pm 0.534$	0.06	$-0.023 \pm 0.290$	$-0.019 \pm 0.493$
PRF-fit source offset from KIC position	$0.142 \pm 0.269$	0.53	$0.070 \pm 0.301$	$-0.123 \pm 0.470$
photometric centroid source offset	$0.51 \pm 0.94$	0.54	$-0.34 \pm 0.99$	$-0.38 \pm 0.90$

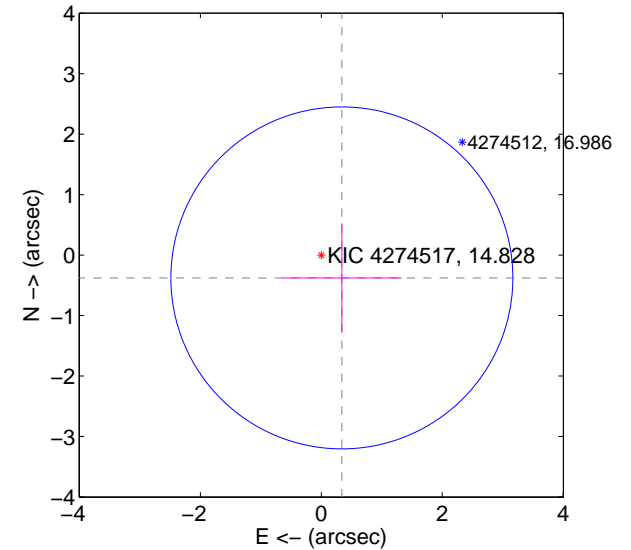
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

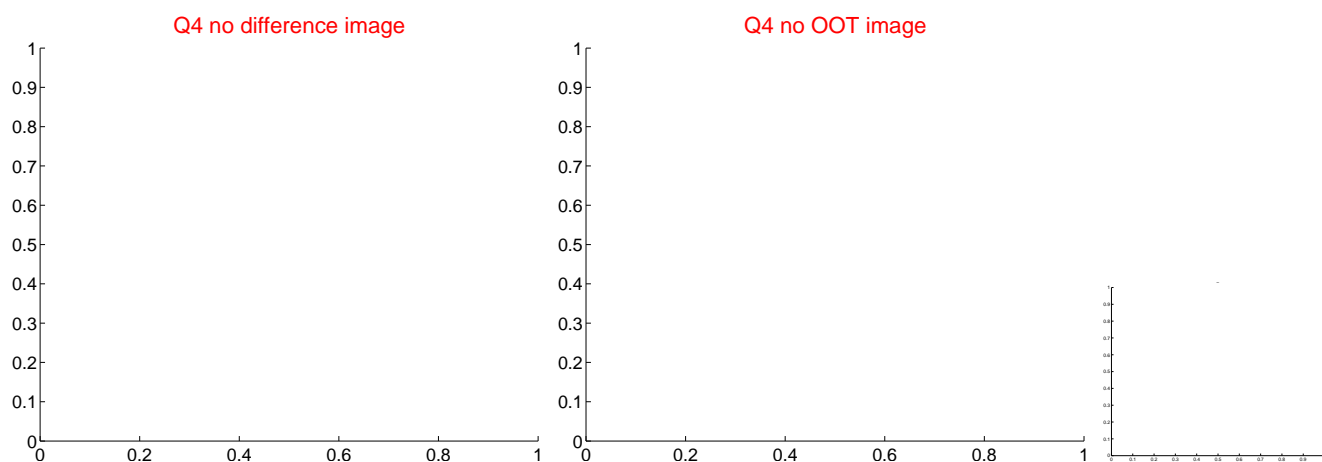
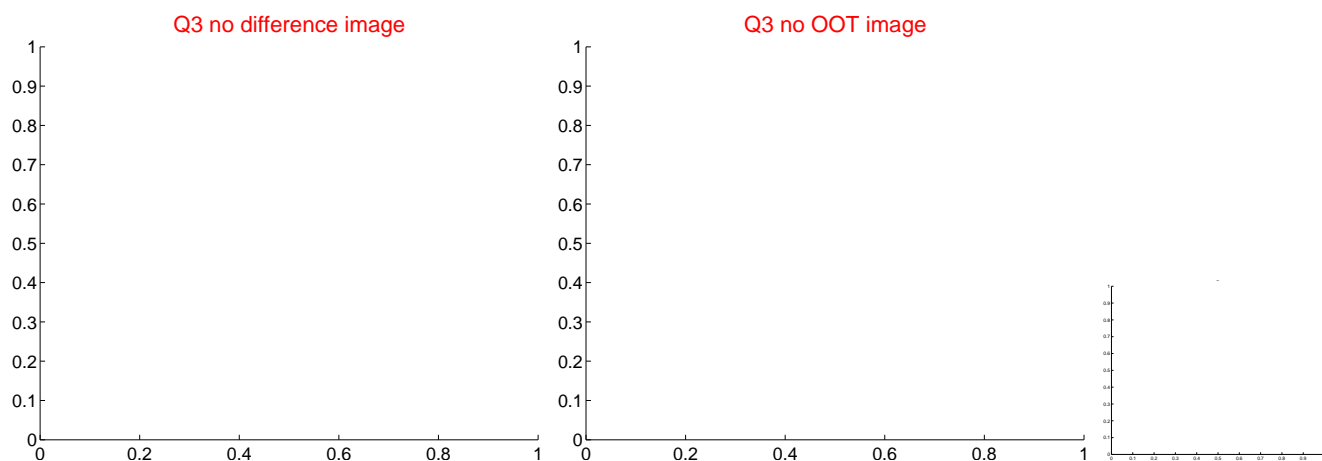
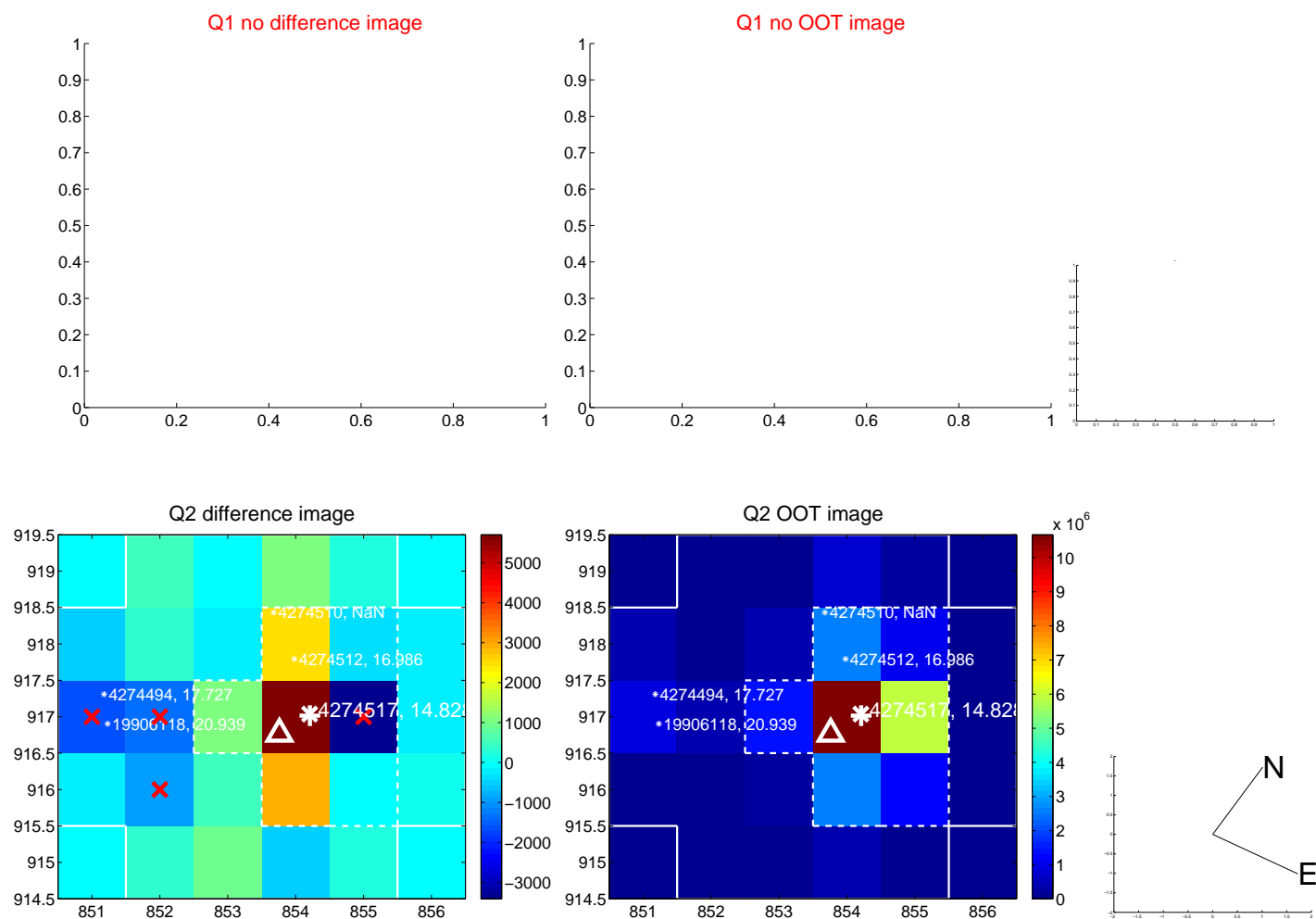


offset from photometric centroids



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

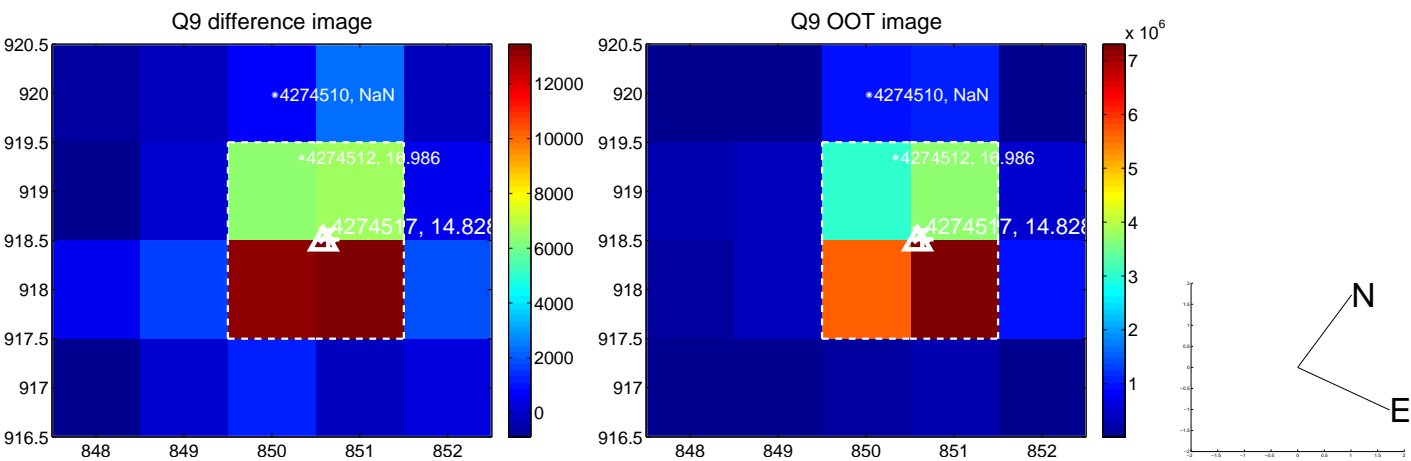


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

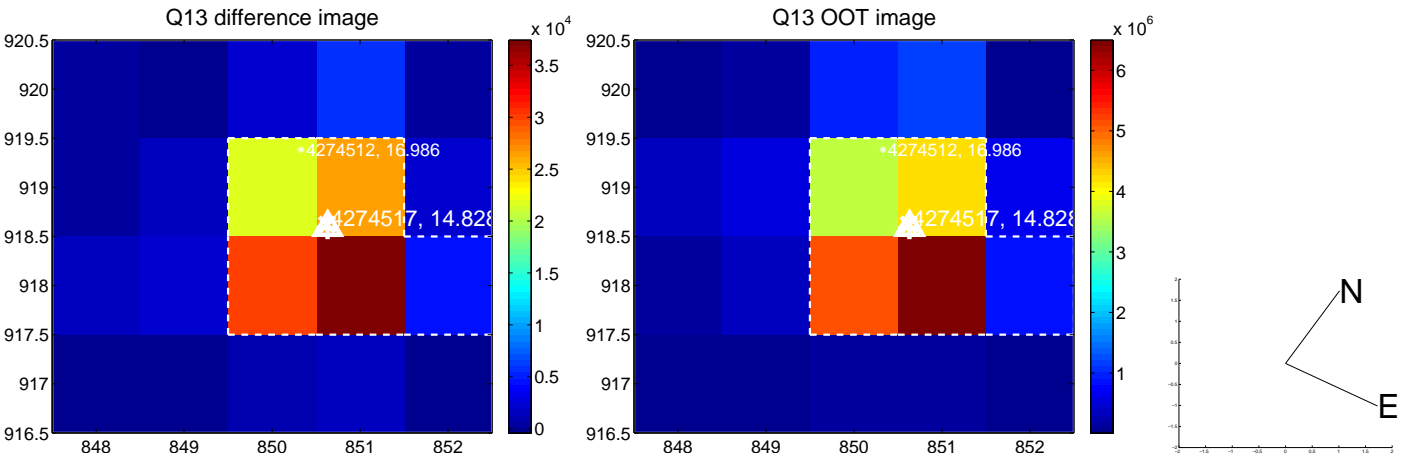




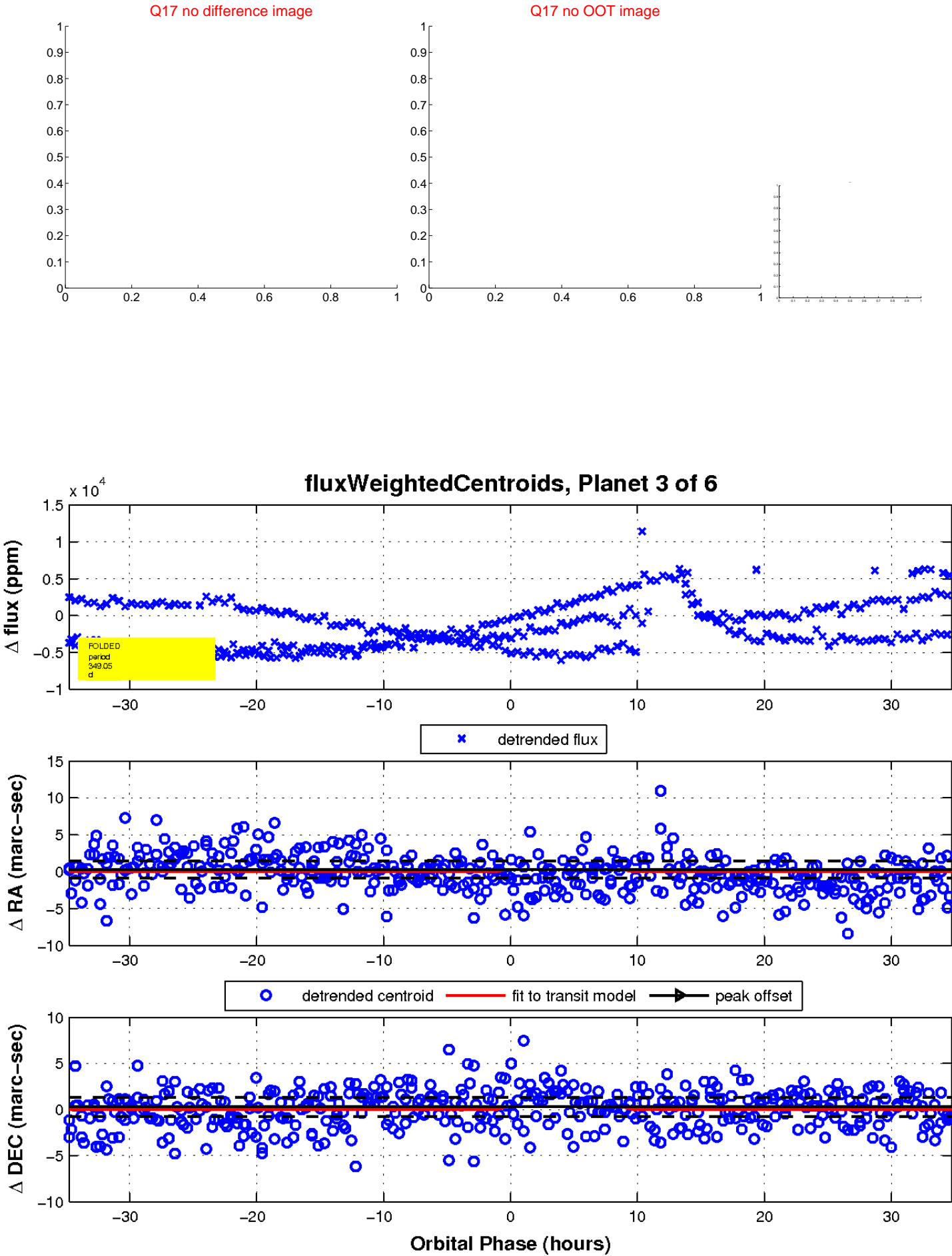
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

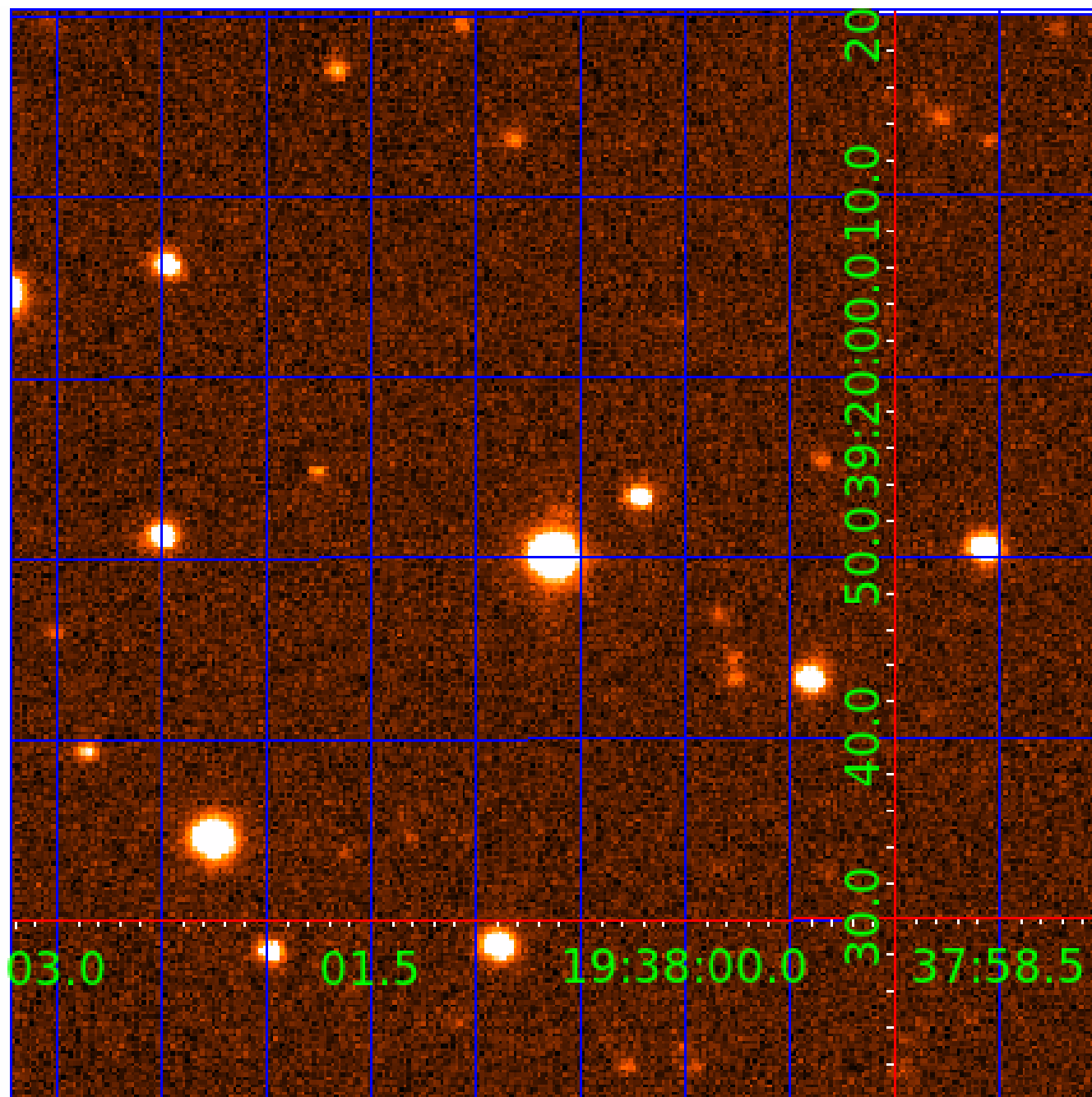


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 004274517

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004274517-01	OBS	No	285.647928	224.782390	1014.4	3.836	12.5	6.7	0.65	4447	2.21	0.28
004274517-02	OBS	No	702.812911	162.923592	856.2	3.638	11.3	4.7	0.65	4447	2.08	0.08
004274517-03	OBS	No	349.052883	201.662811	2621.5	12.000	23.7	-1.0	0.65	4447	3.18	0.21
004274517-04	OBS	No	353.577754	147.350249	1121.7	13.368	10.2	7.1	0.65	4447	2.21	0.21
004274517-05	OBS	No	582.583591	273.578985	1391.4	3.990	12.4	7.4	0.65	4447	2.44	0.11
004274517-06	OBS	No	401.856814	389.422325	1078.2	4.290	10.9	7.0	0.65	4447	2.40	0.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004274517-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004274517-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
004274517-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

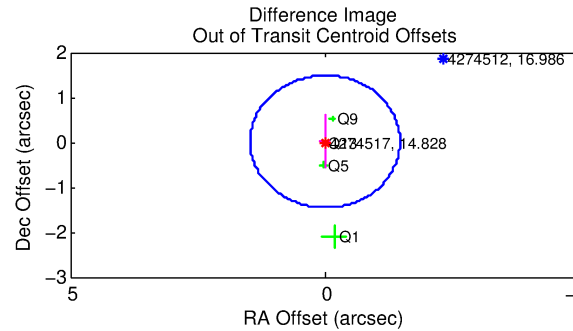
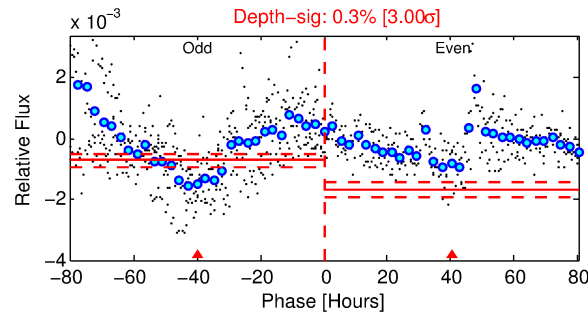
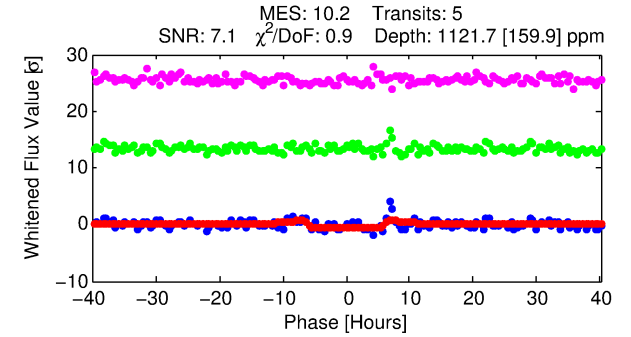
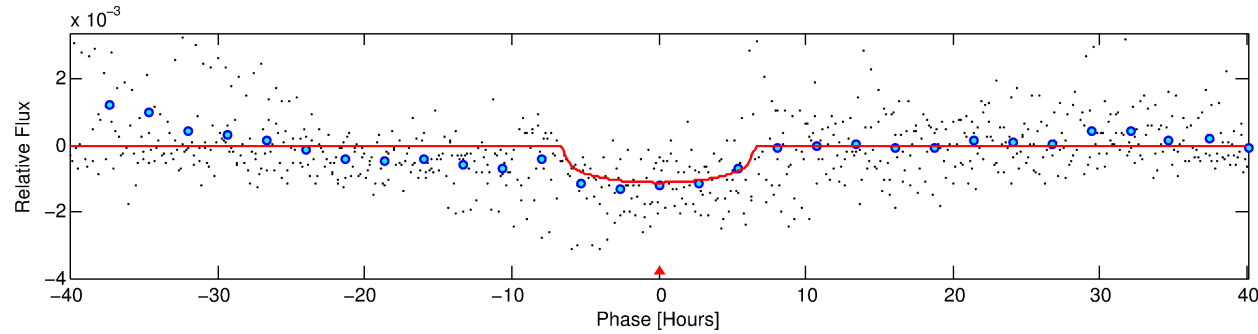
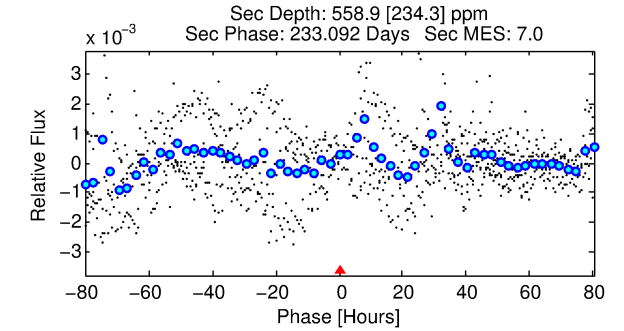
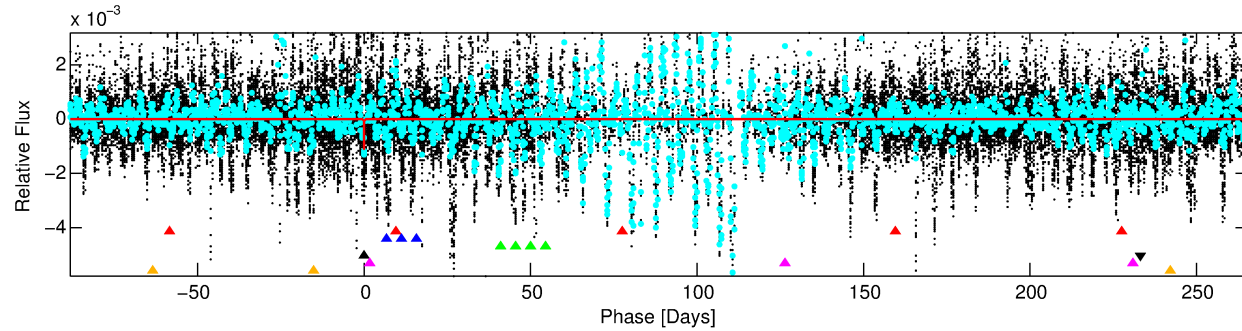
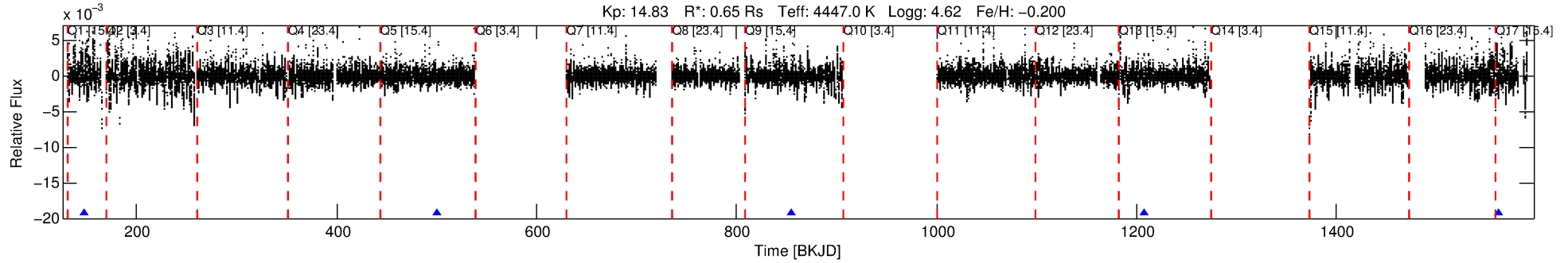
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004274517-04

No Significant Match Found

# DV One-Page Summary

KIC: 4274517 Candidate: 4 of 6 Period: 353.578 d



## DV Fit Results:

Period = 353.57775 [0.00472] d  
Epoch = 147.3502 [0.0111] BKJD  
Rp/R\* = 0.0312 [0.0097]  
a/R\* = 175.14 [163.47]  
b = 0.56 [1.17]  
Seff = 0.21 [0.03]  
Teq = 172 [7] K  
Rp = 2.21 [0.71] Re  
a = 0.8428 [0.0580] AU  
Ag = 44851.44 [33964.02] [1.32 $\sigma$ ]  
Teffp = 3871 [736] K [5.02 $\sigma$ ]

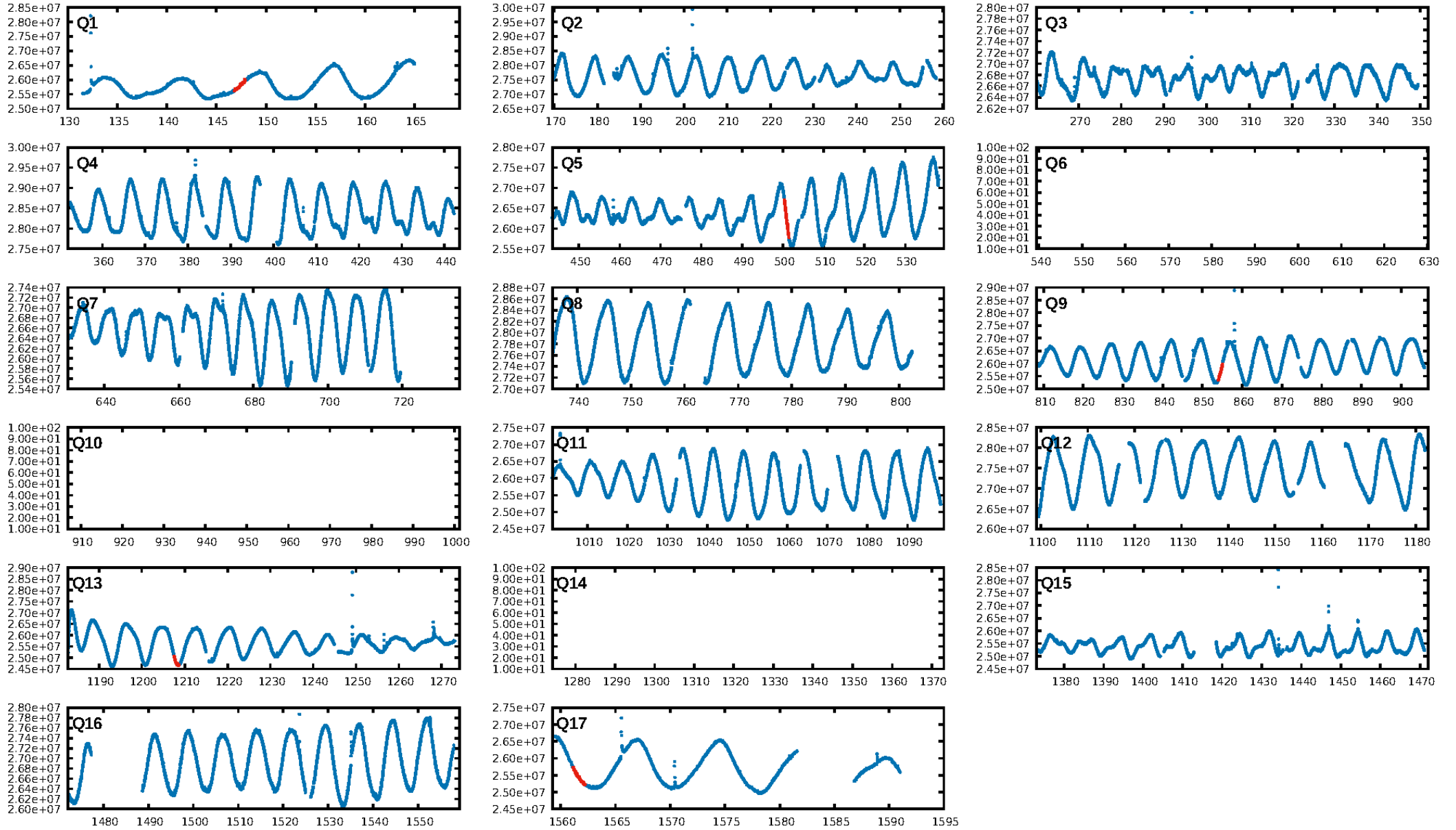
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.05 $\sigma$ ]  
LongPeriod-sig: 100.0% [82.53 $\sigma$ ]  
ModelChiSquare2-sig: 29.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 9.63e-09**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.6141  
Centroid-sig: 36.9%  
Centroid-so: 0.718 arcsec [0.99 $\sigma$ ]  
OotOffset-rm: 0.016 arcsec [0.03 $\sigma$ ]  
OotOffset-st: 0/0/0/4 [4]  
KicOffset-rm: 0.050 arcsec [0.13 $\sigma$ ]  
KicOffset-st: 0/0/0/4 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 1.00 [4/4]

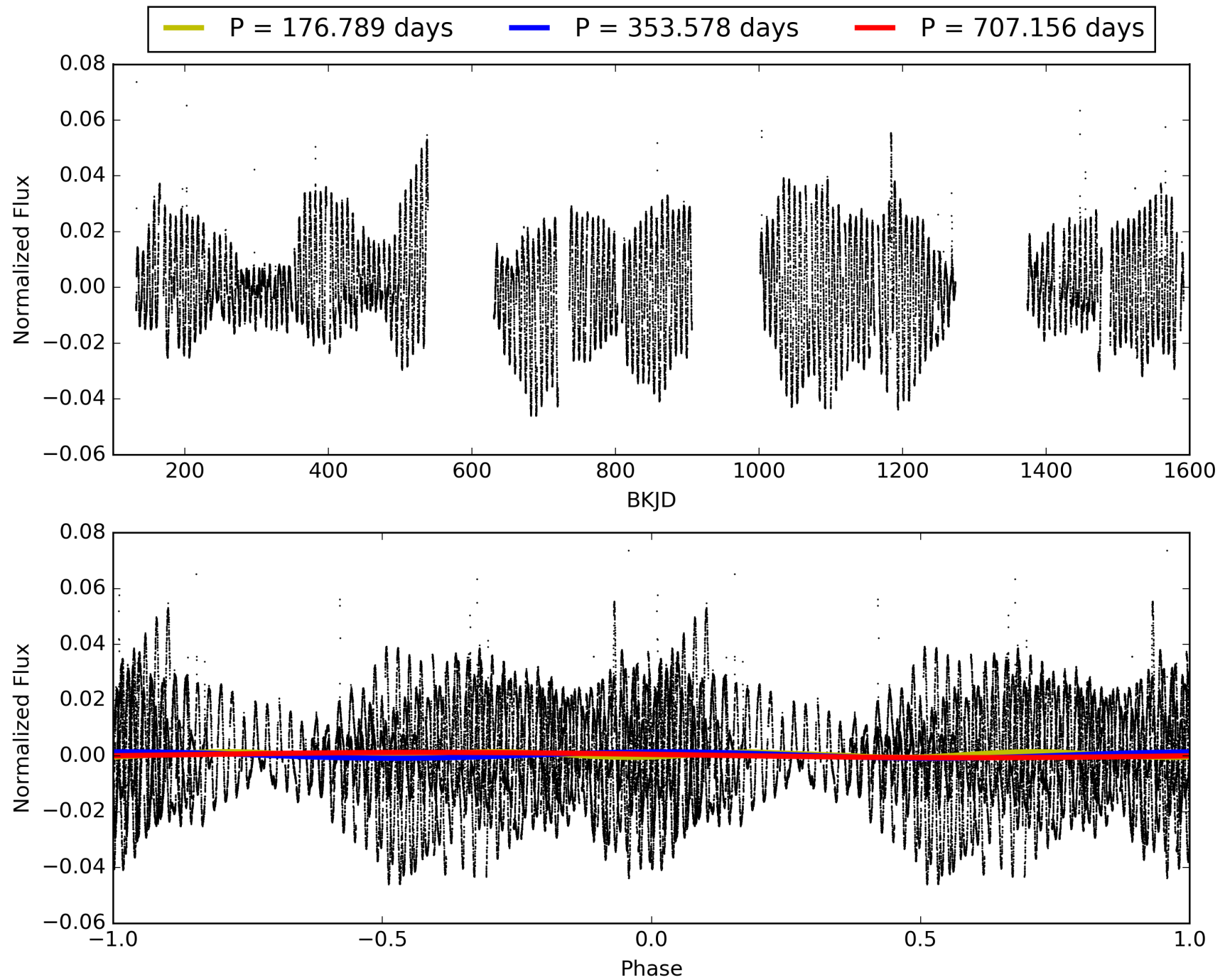
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:03:24 Z

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

# TCE 004274517-04, PDC Light Curves



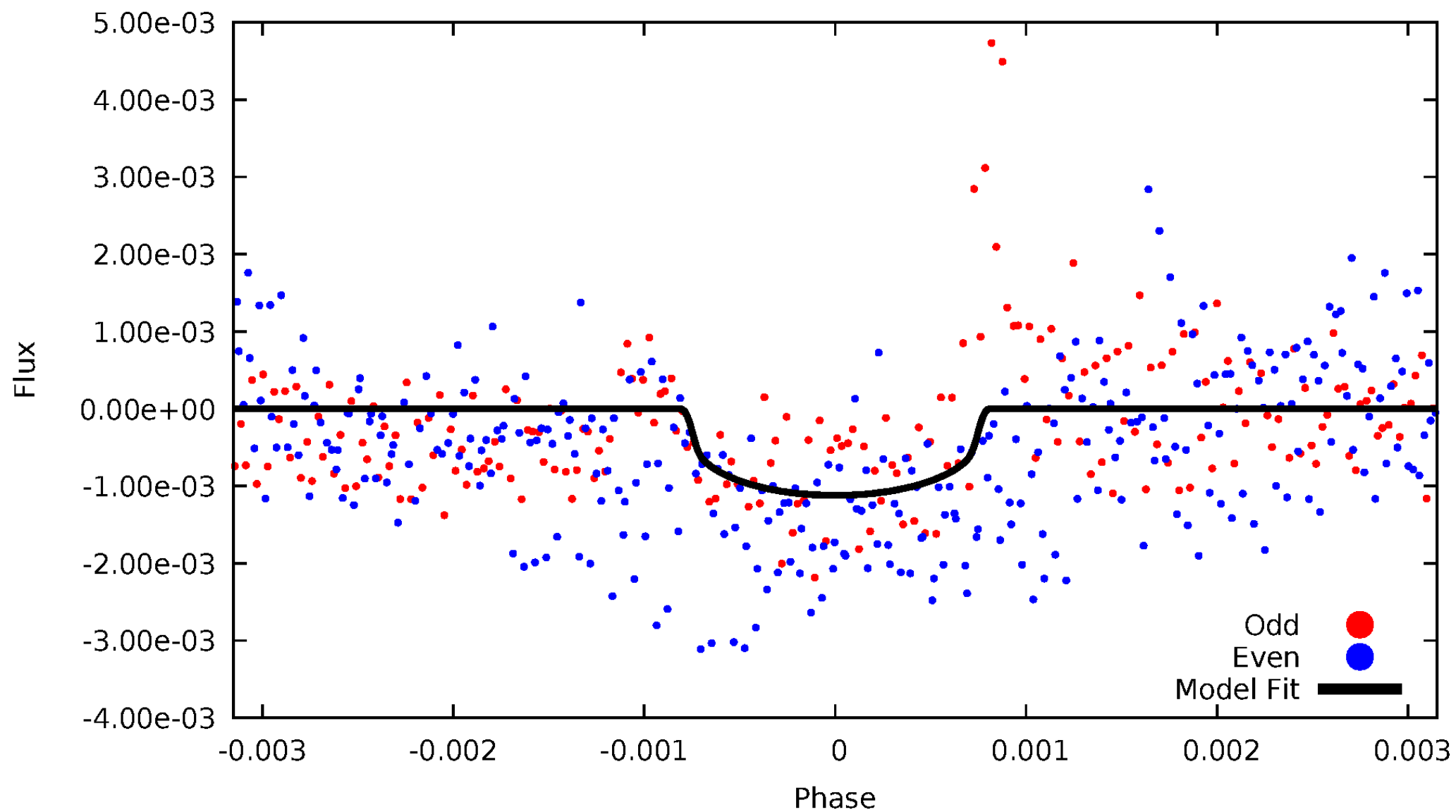
TCE 004274517-04





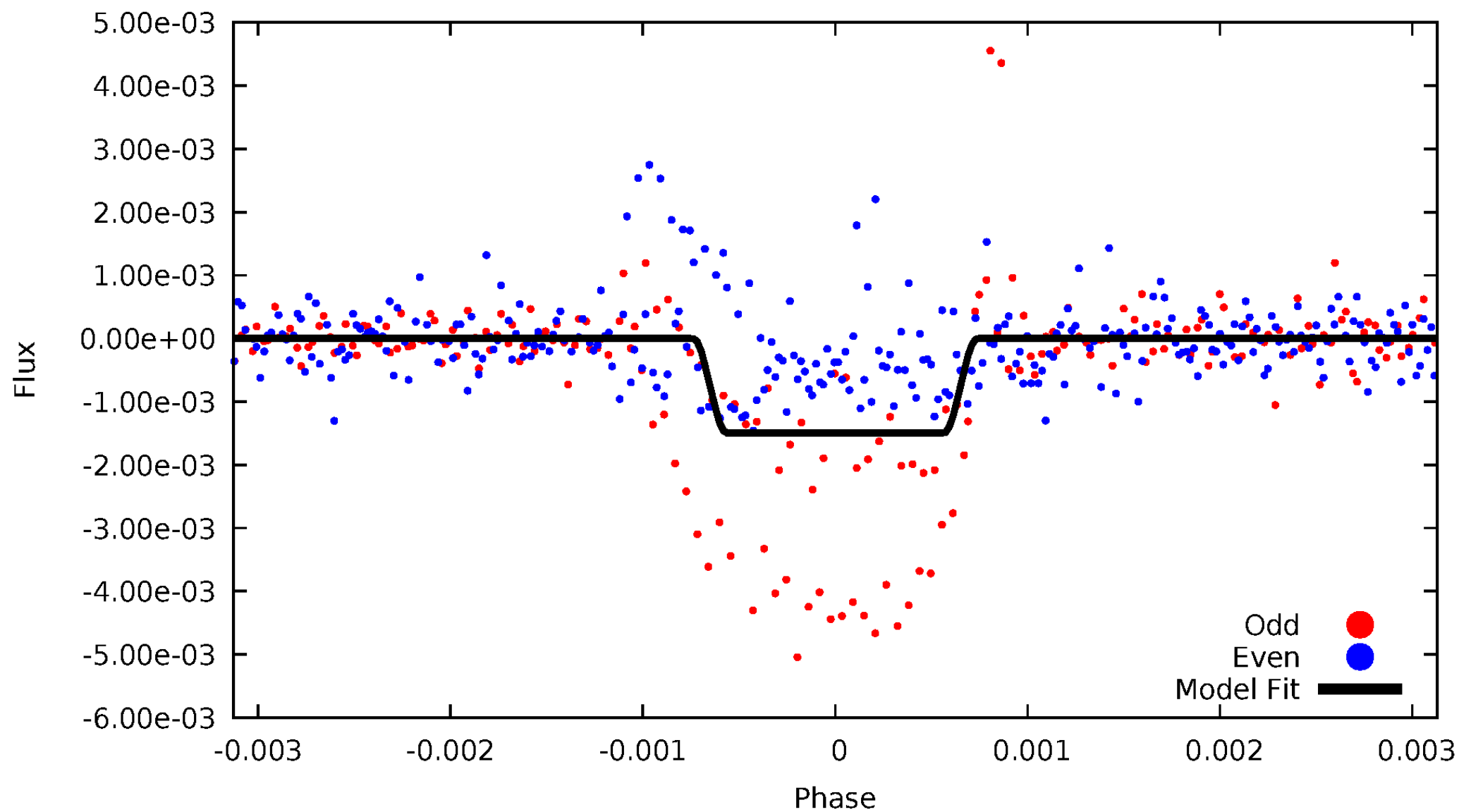
# DV Odd/Even

TCE 004274517-04



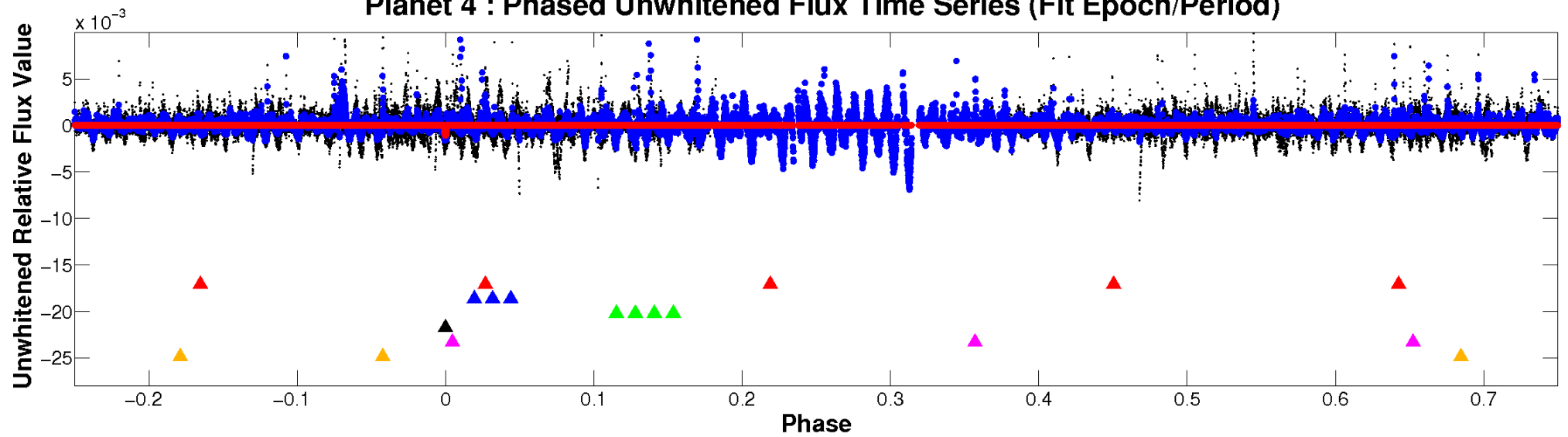
# ALT Odd/Even

TCE 004274517-04

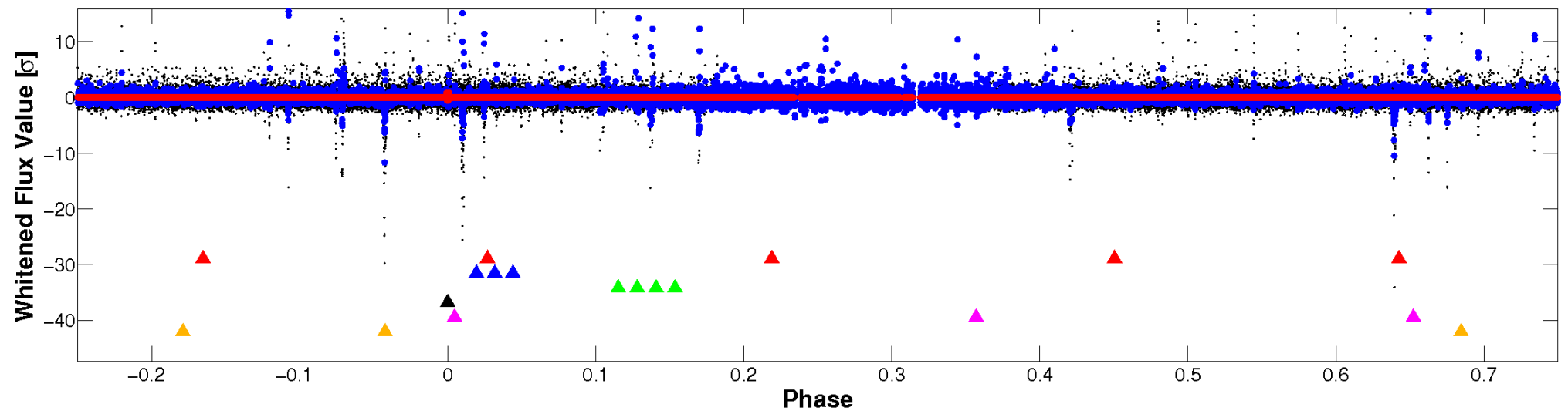


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

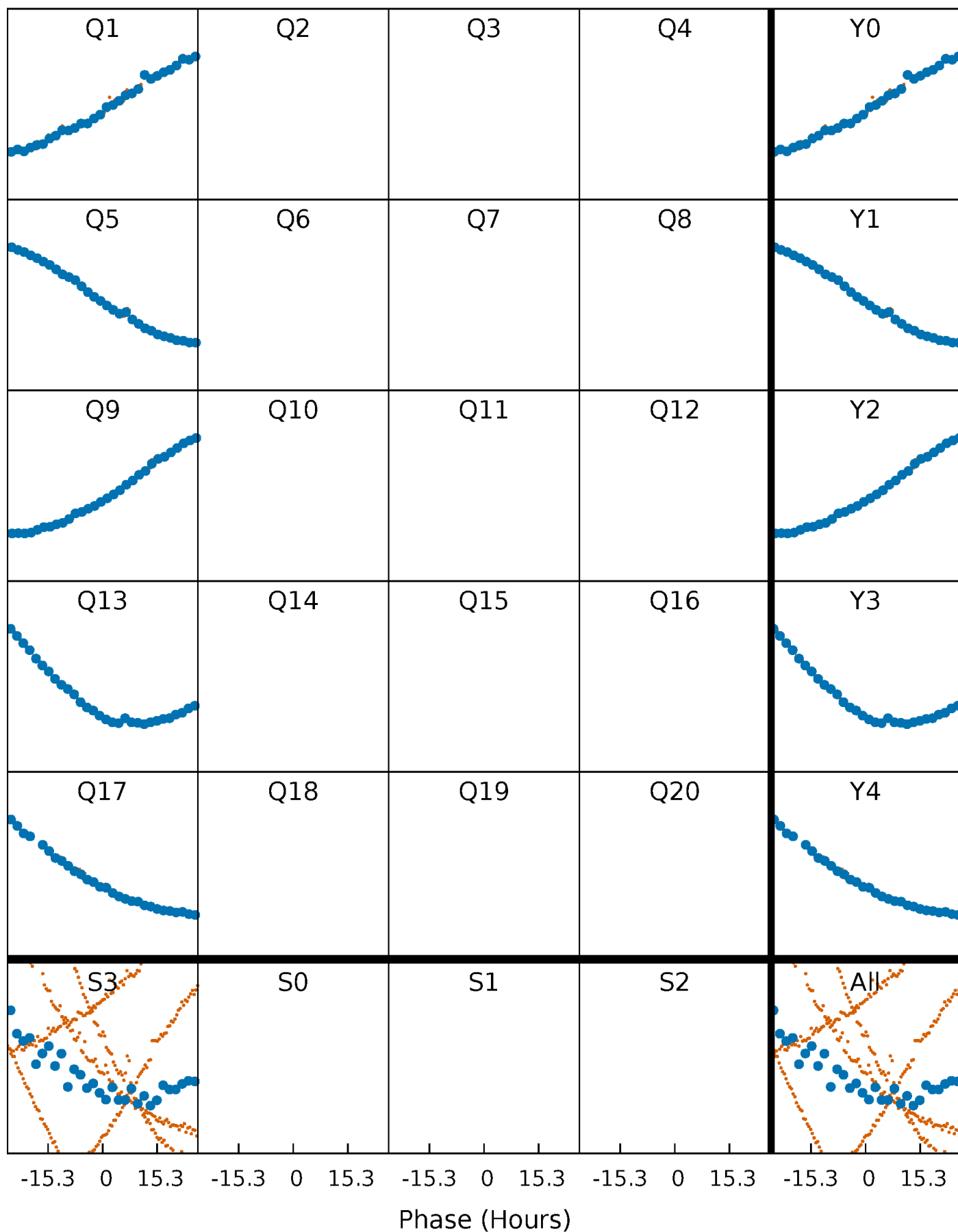


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



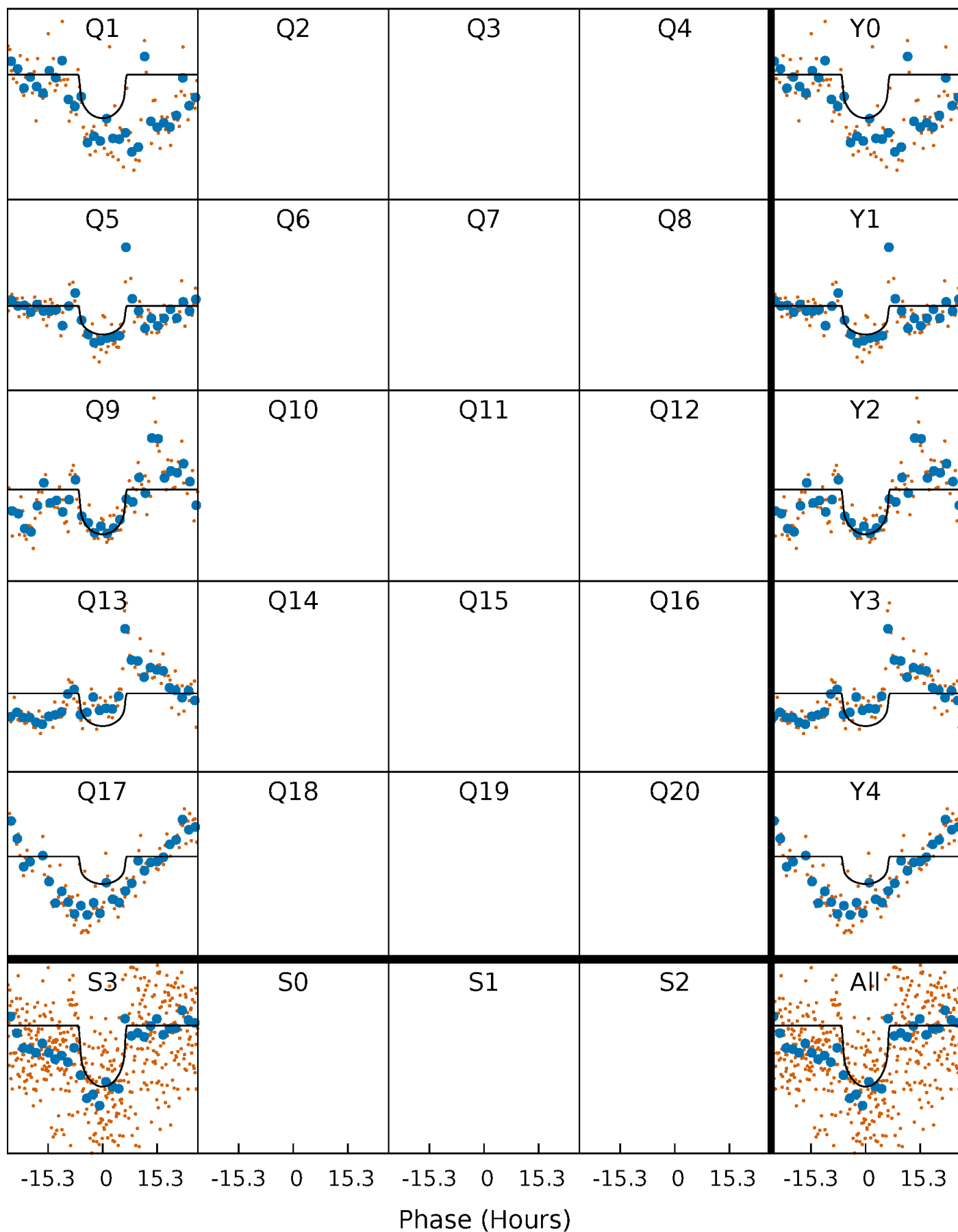
# PDC Quarter-Phased Transit Curves

TCE 004274517-04     $P=353.577754$  Days     $T_0=147.350249$  (BKJD)



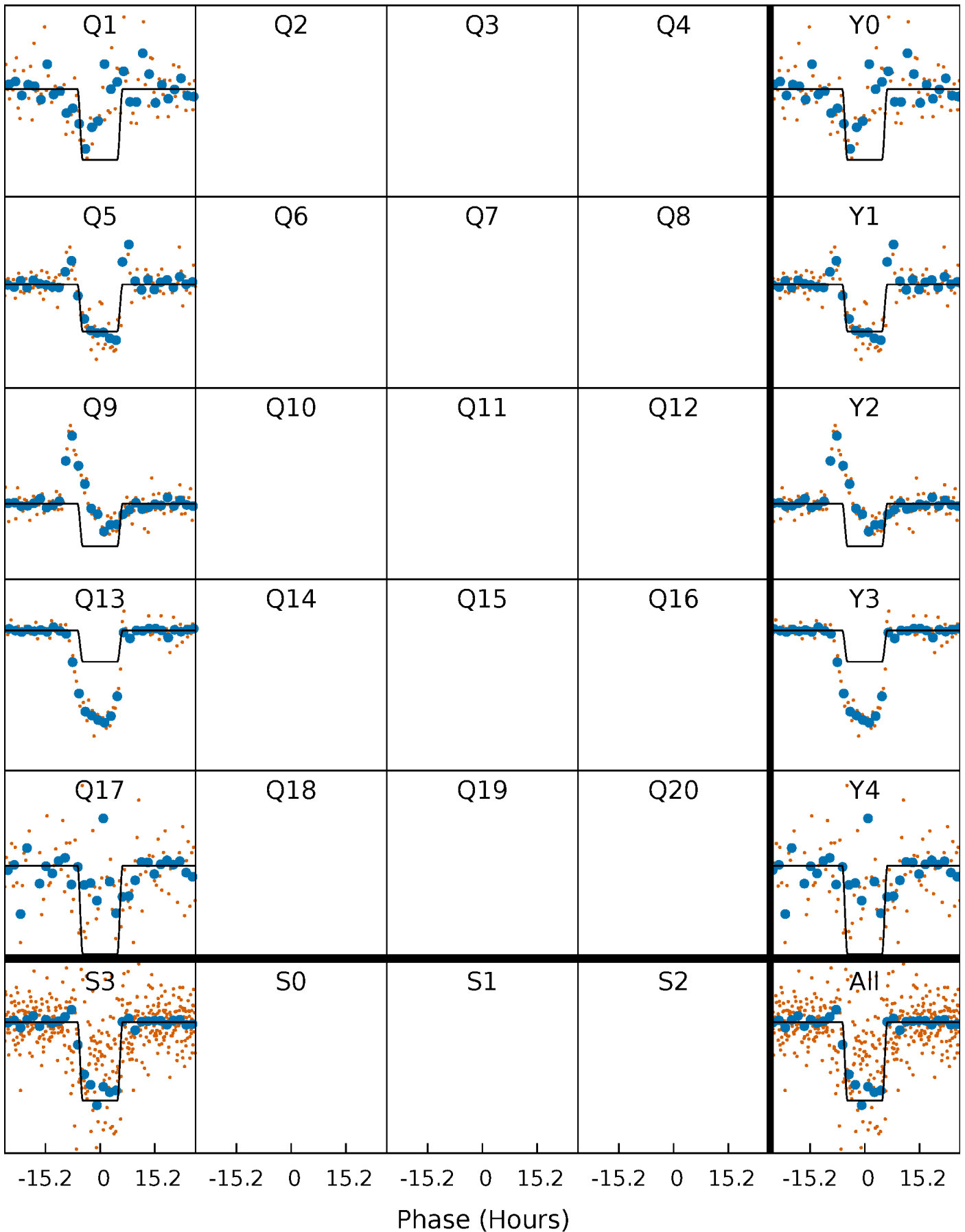
# DV Quarter-Phased Transit Curves

TCE 004274517-04     $P=353.577754$  Days     $T_0=147.350249$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

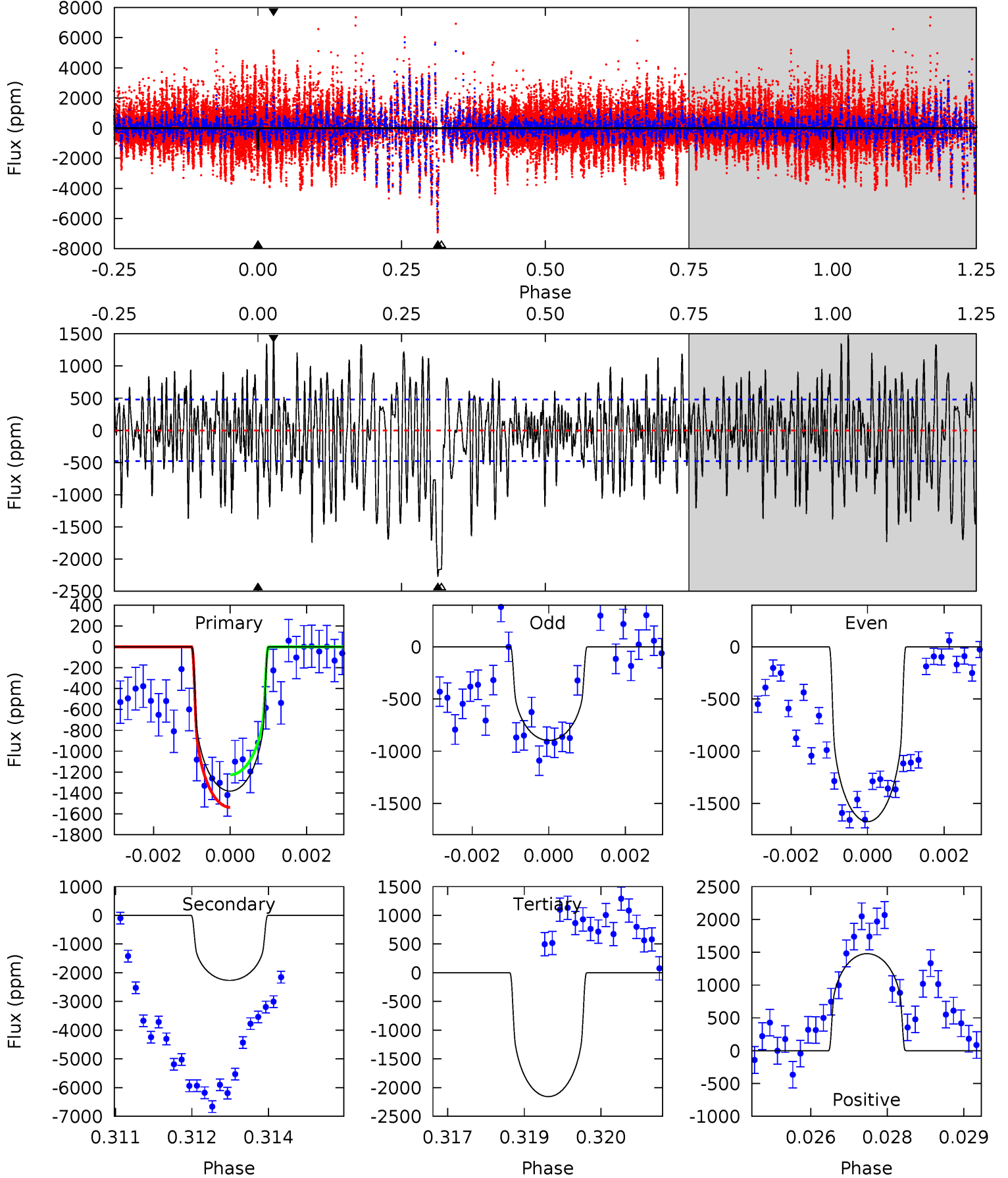
TCE 004274517-04     $P=353.575511$  Days     $T_0=147.356947$  (BKJD)



# DV Model-Shift Uniqueness Test

004274517-04, P = 353.577754 Days, E = 147.350249 Days

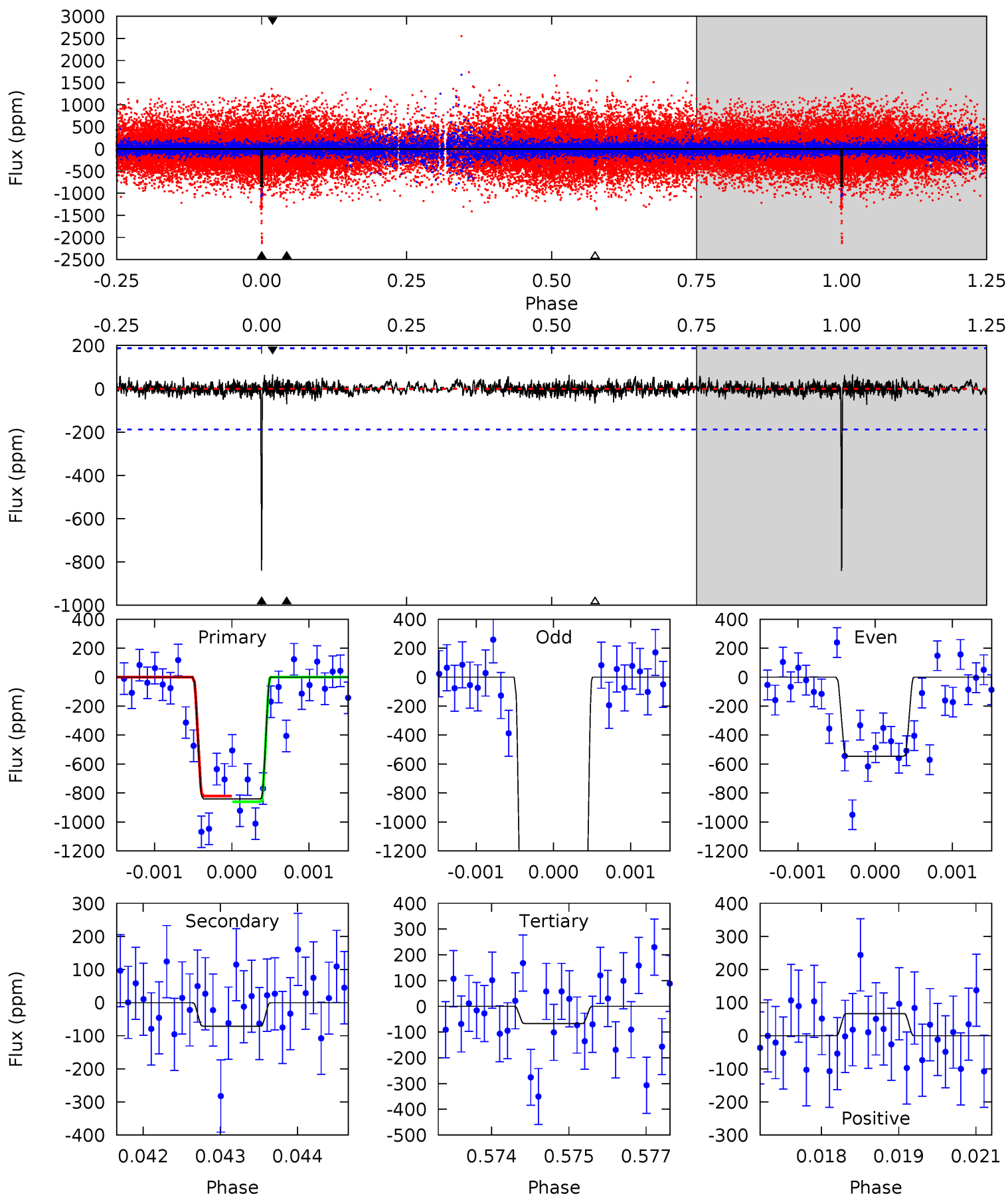
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.5	25.4	24.2	16.6	5.37	3.15	5.52	-8.69	-1.08	1.23	8.84	3.66	0.99	0.39	1.69



# Alt Model-Shift Uniqueness Test

004274517-04, P = 353.575511 Days, E = 147.356947 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
24.1	2.04	1.93	1.92	5.38	3.18	0.48	22.2	22.2	0.11	0.12	35.5	3.05	0.07	0.56





### Stellar Parameters For KIC 004274517

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4447^{+133}_{-133}$	$4.620^{+0.049}_{-0.024}$	$-0.200^{+0.300}_{-0.300}$	$0.648^{+0.046}_{-0.056}$	$0.638^{+0.068}_{-0.051}$	$3.308^{+0.767}_{-0.351}$
	+3%/-3%	+1%/-1%	+150%/-150%	+7%/-9%	+11%/-8%	+23%/-11%
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 004274517-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2267 \pm 89$	$2.15^{+0.71}_{-0.60}$	$239^{+8}_{-8}$	$5315^{+994}_{-599}$	$193811^{+180596}_{-83353}$
Alt.	$-71 \pm 35$	$2.70^{+0.68}_{-0.66}$	$240^{+8}_{-8}$	$2746^{+288}_{-267}$	$3734^{+4034}_{-2046}$

$T_{max}$  = 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

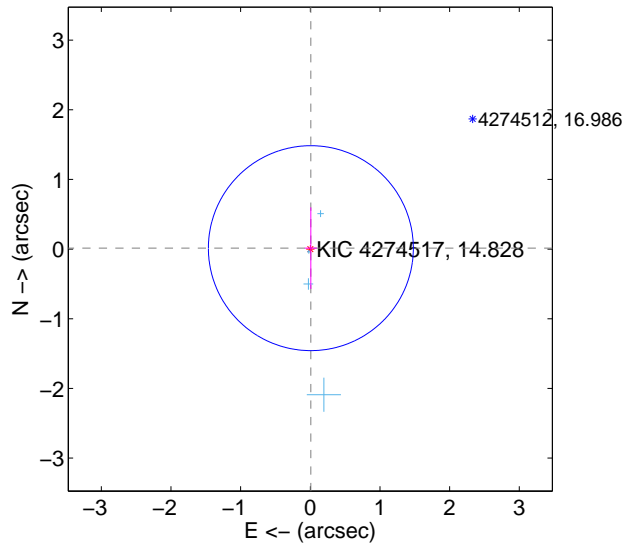
Supplemental centroid analysis for 004274517-04. Kepler magnitude: 14.83. Transit SNR 7.13

There are 4 quarters with good PRF difference image offsets

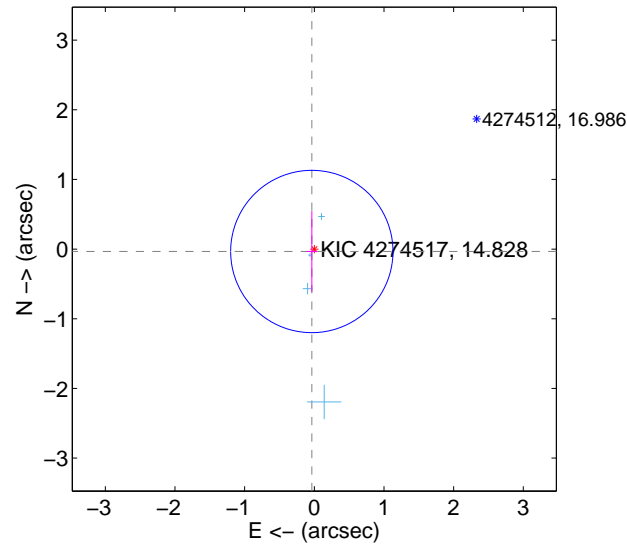
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.016 \pm 0.490$	0.03	$-0.008 \pm 0.087$	$0.013 \pm 0.586$
PRF-fit source offset from KIC position	$0.050 \pm 0.388$	0.13	$0.036 \pm 0.077$	$-0.034 \pm 0.580$
photometric centroid source offset	$0.72 \pm 0.73$	0.99	$-0.71 \pm 0.73$	$-0.08 \pm 0.60$

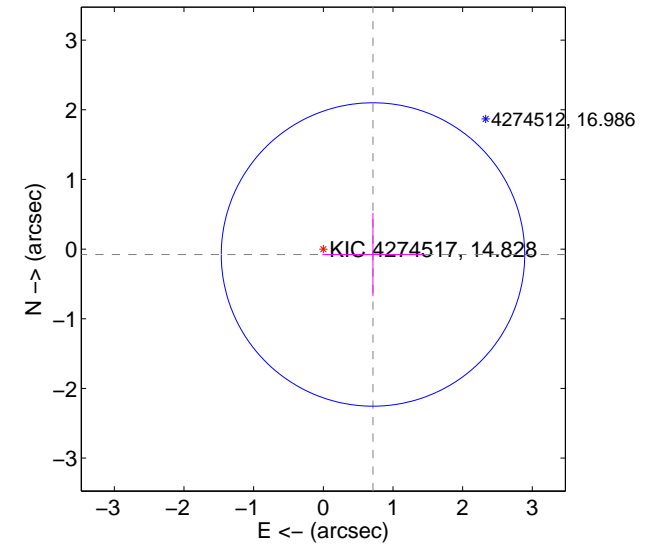
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

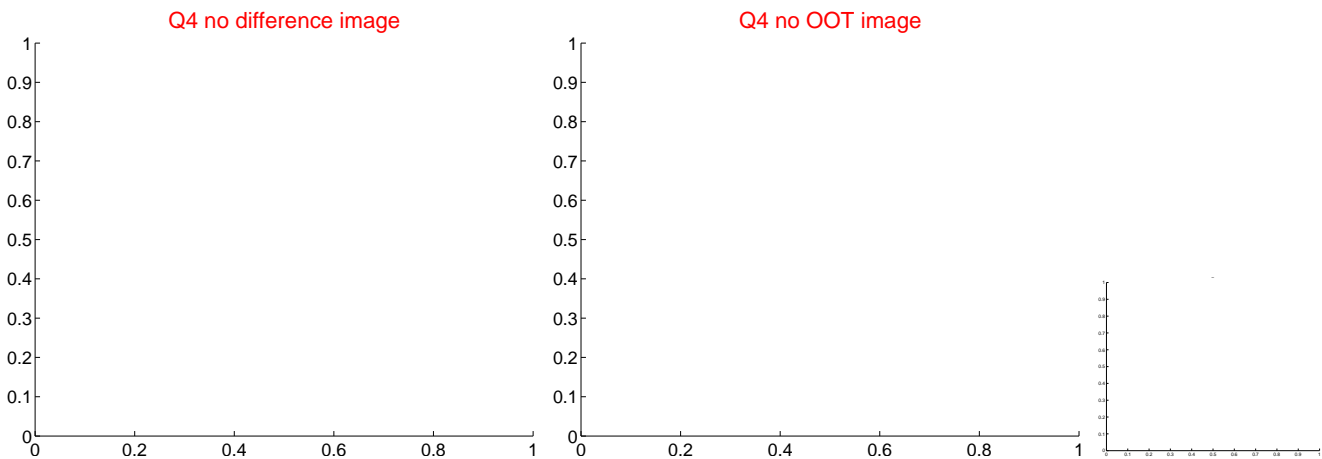
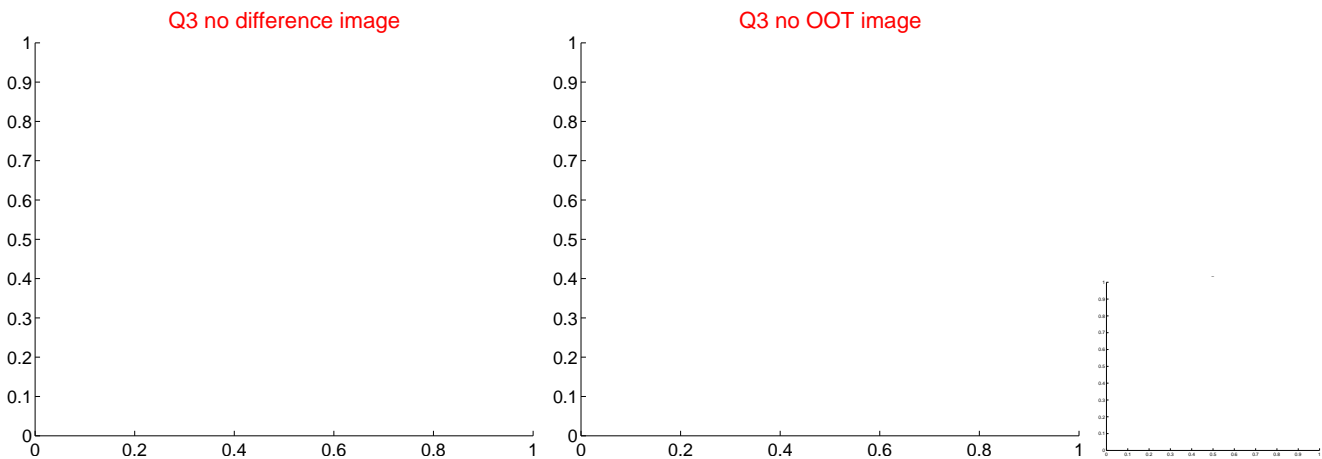
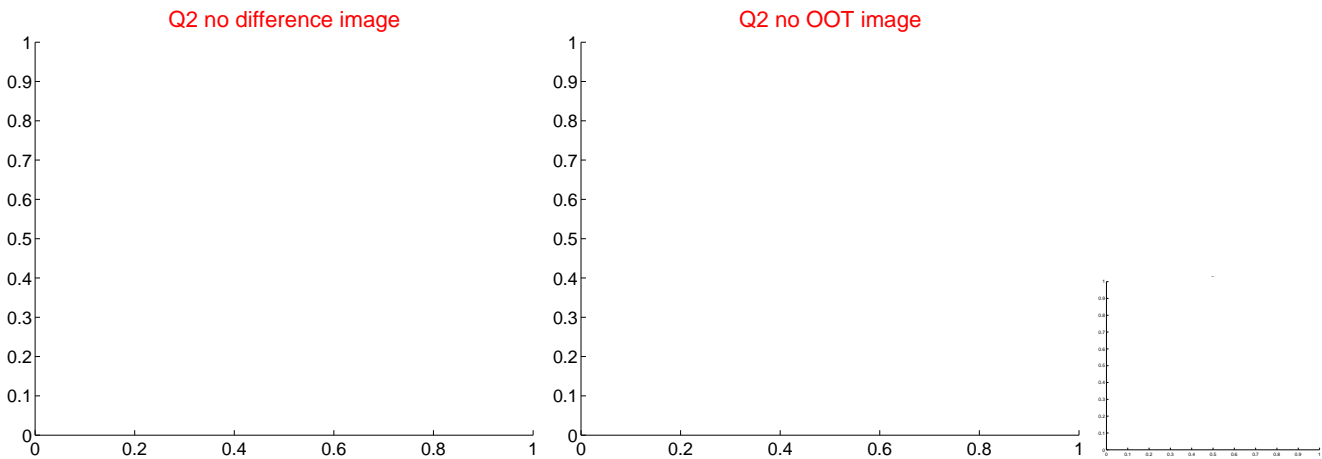
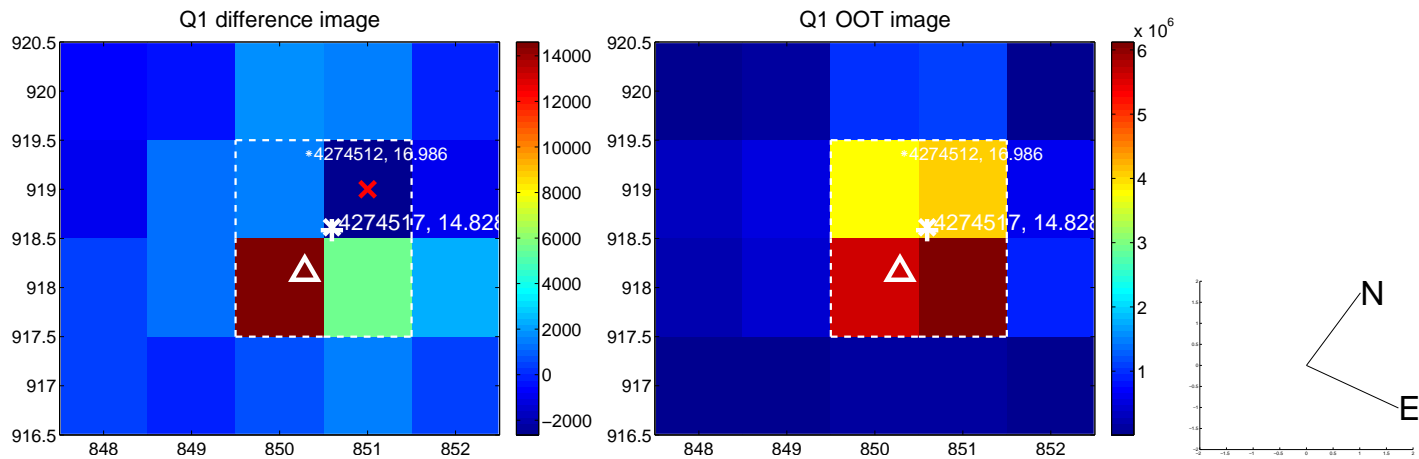


offset from photometric centroids

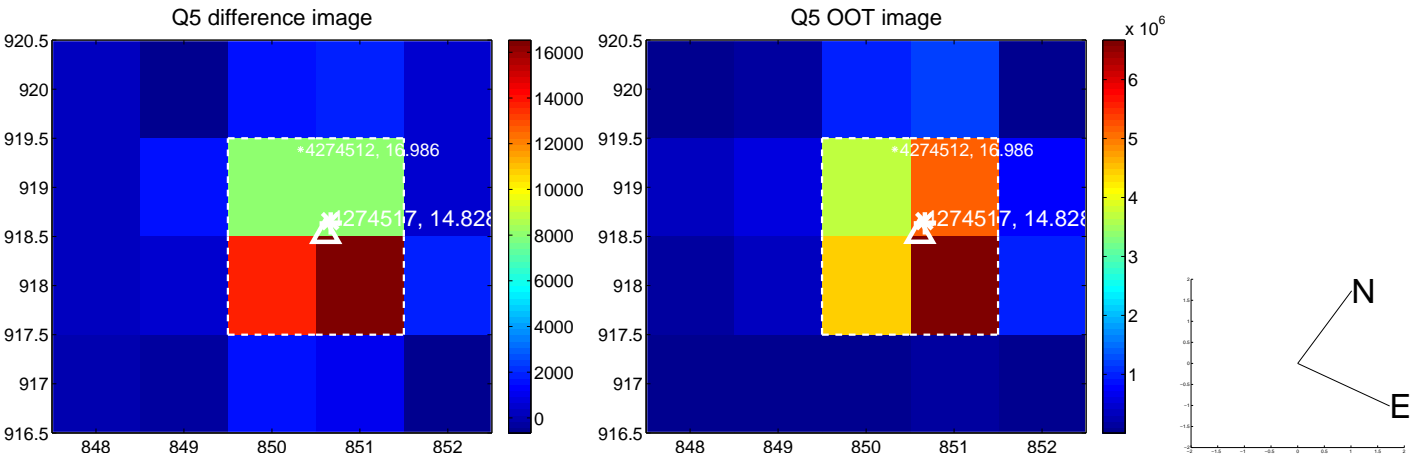


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

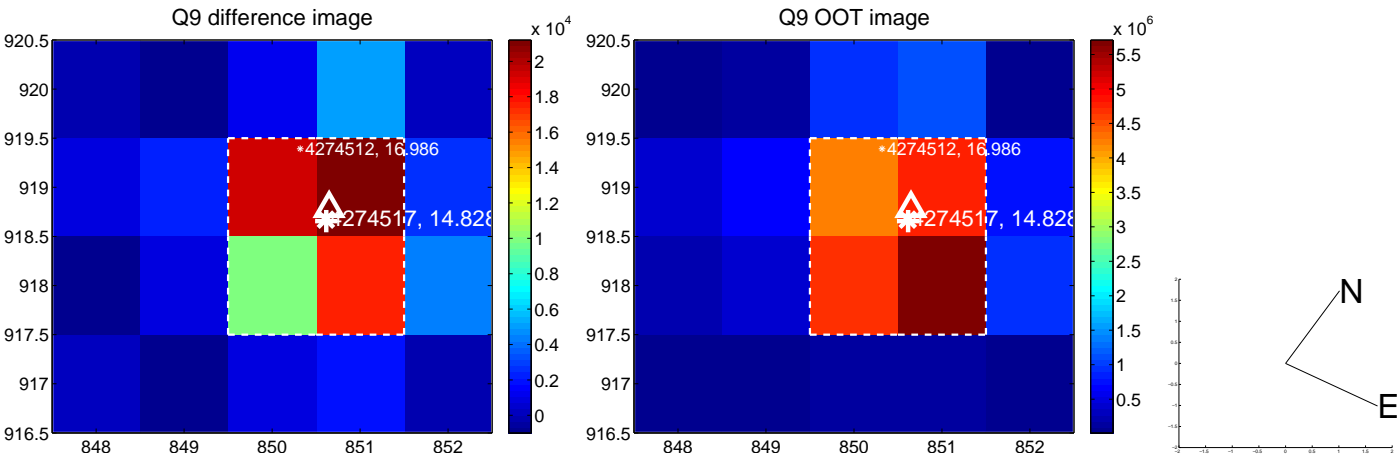
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



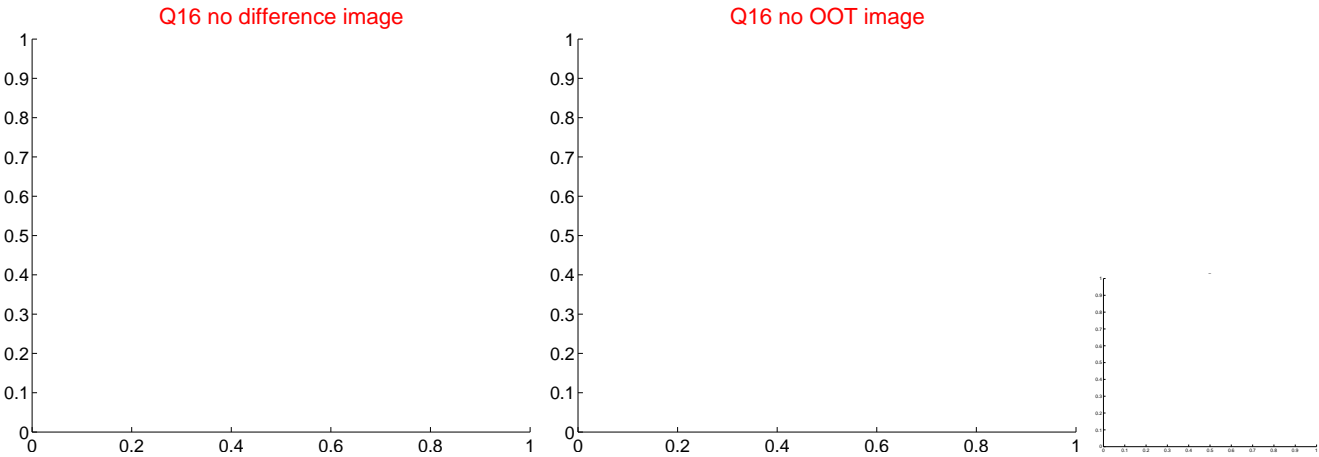
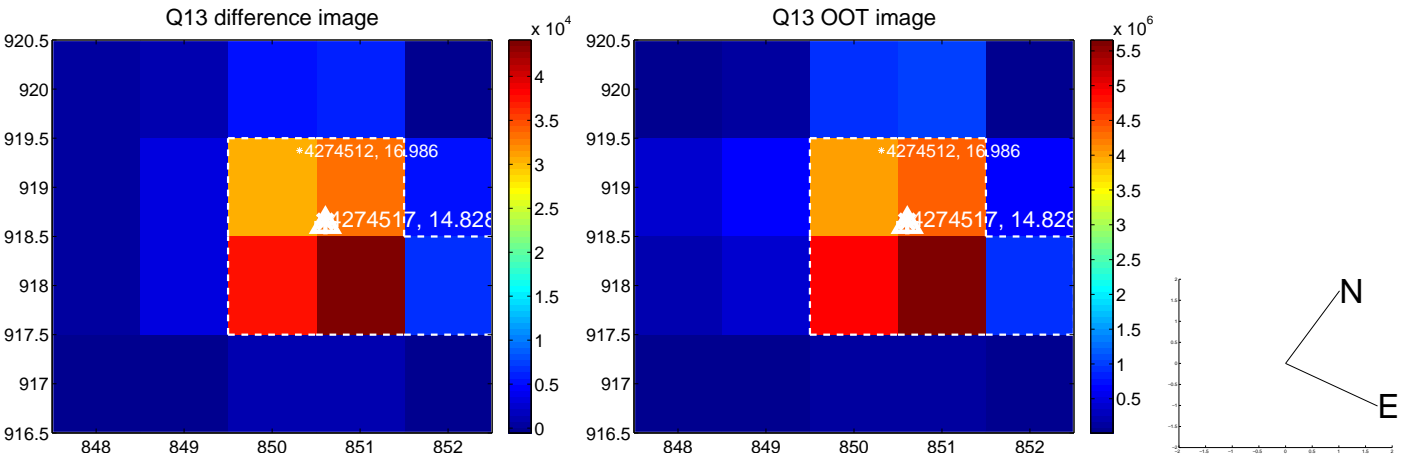
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



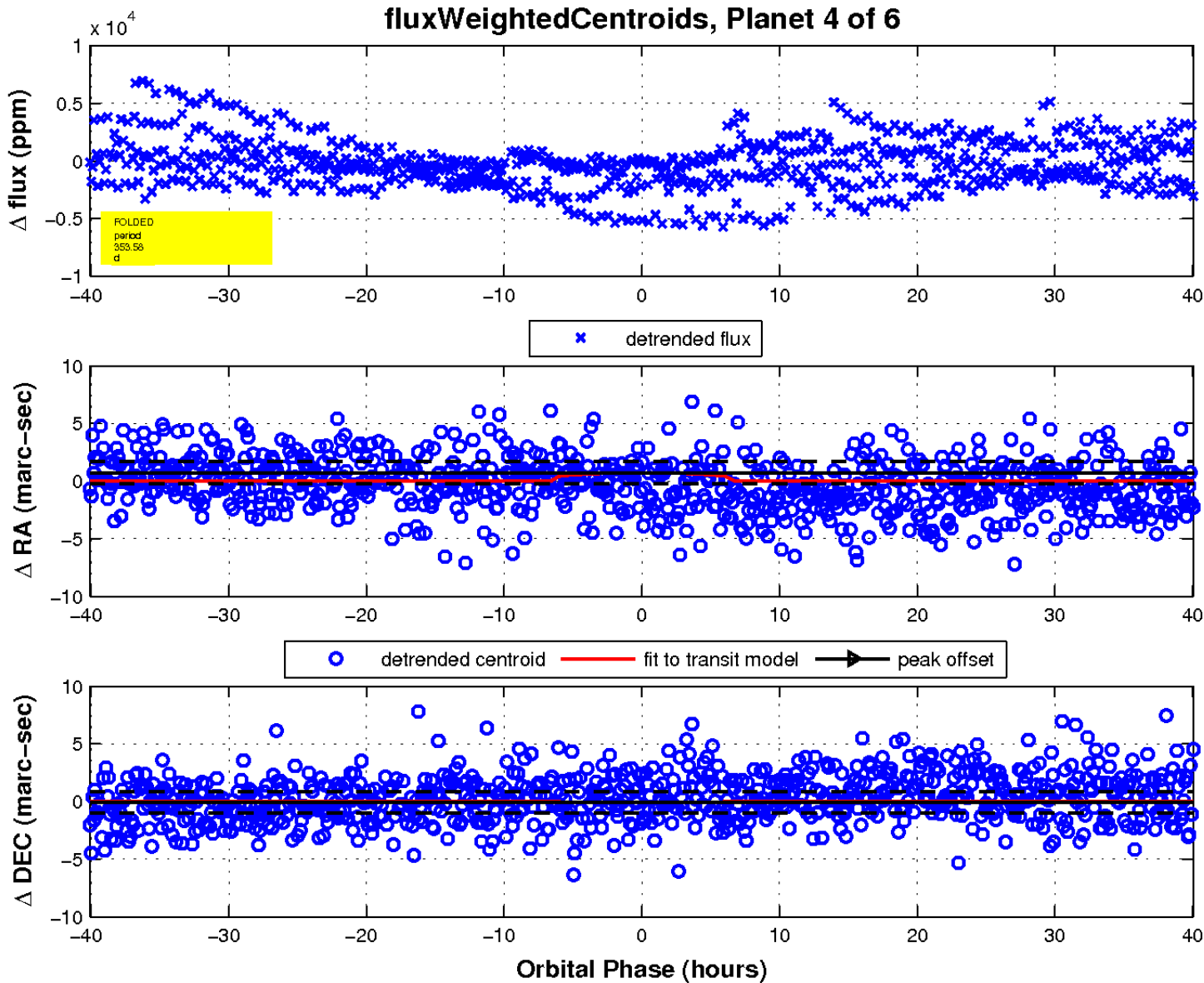
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

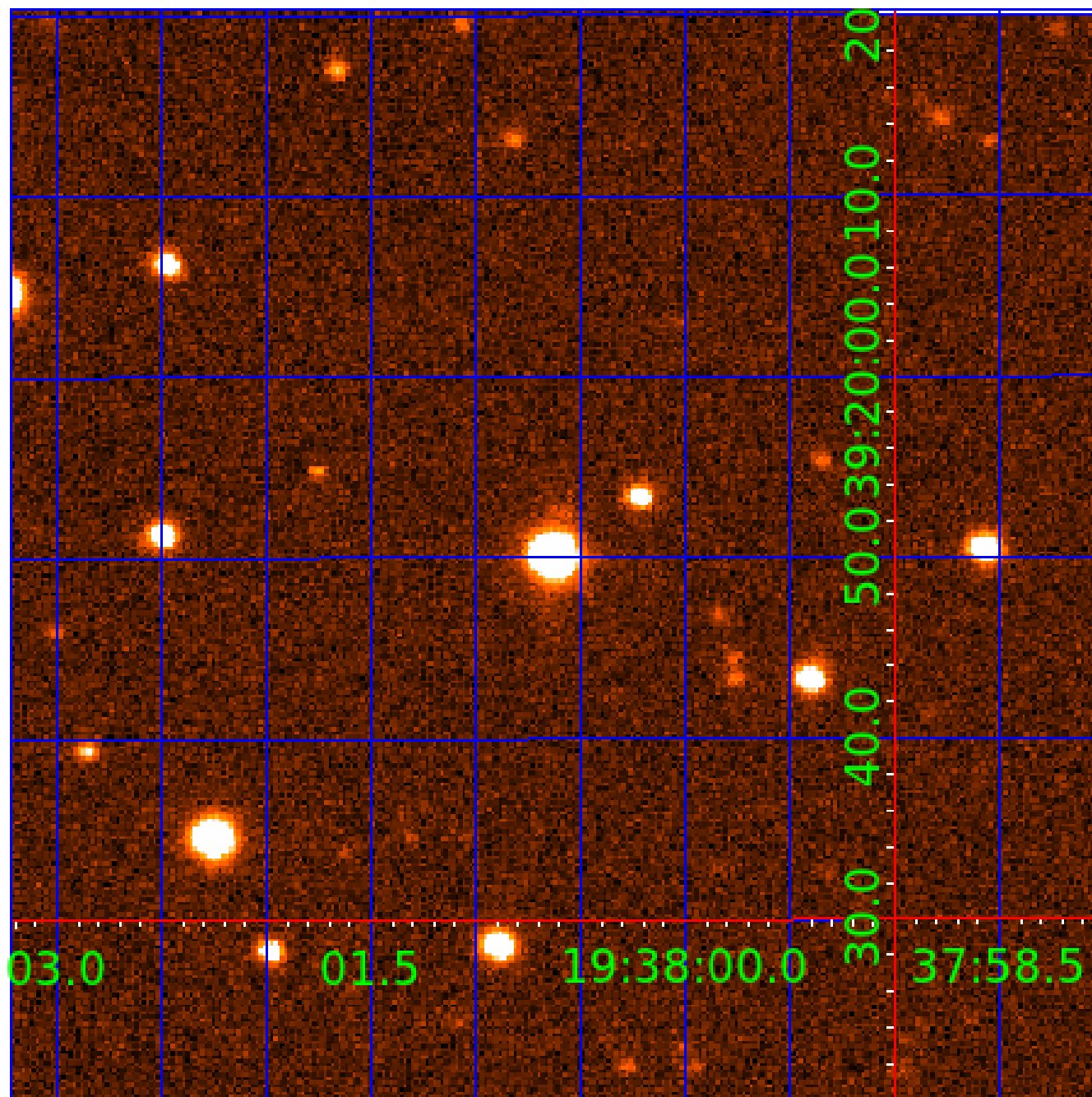
Q17 no difference image

Q17 no OOT image



UKIRT Image

Declination





# KIC 004274517

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004274517-01	OBS	No	285.647928	224.782390	1014.4	3.836	12.5	6.7	0.65	4447	2.21	0.28
004274517-02	OBS	No	702.812911	162.923592	856.2	3.638	11.3	4.7	0.65	4447	2.08	0.08
004274517-03	OBS	No	349.052883	201.662811	2621.5	12.000	23.7	-1.0	0.65	4447	3.18	0.21
004274517-04	OBS	No	353.577754	147.350249	1121.7	13.368	10.2	7.1	0.65	4447	2.21	0.21
004274517-05	OBS	No	582.583591	273.578985	1391.4	3.990	12.4	7.4	0.65	4447	2.44	0.11
004274517-06	OBS	No	401.856814	389.422325	1078.2	4.290	10.9	7.0	0.65	4447	2.40	0.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004274517-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004274517-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
004274517-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

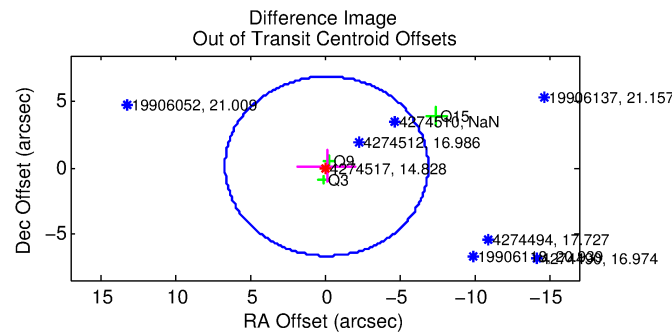
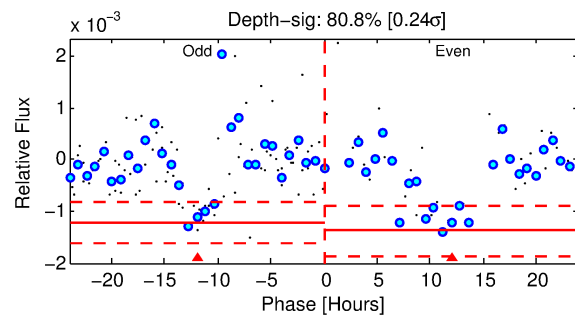
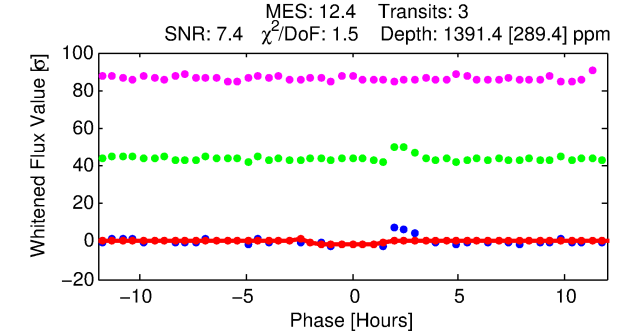
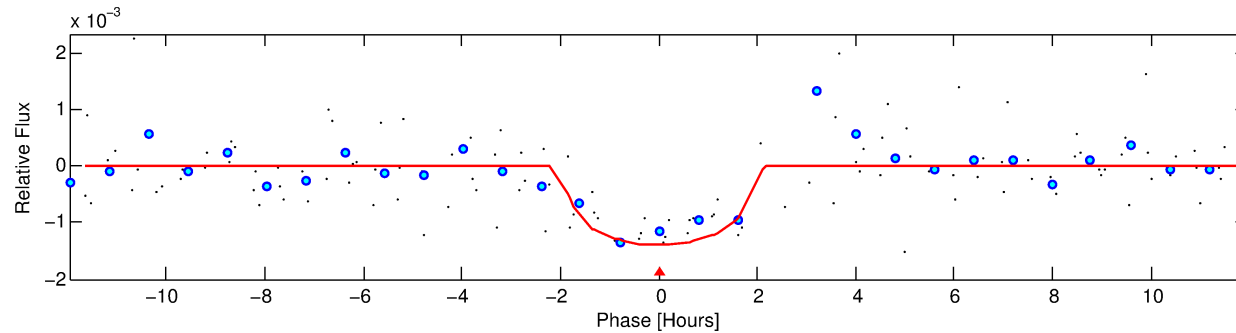
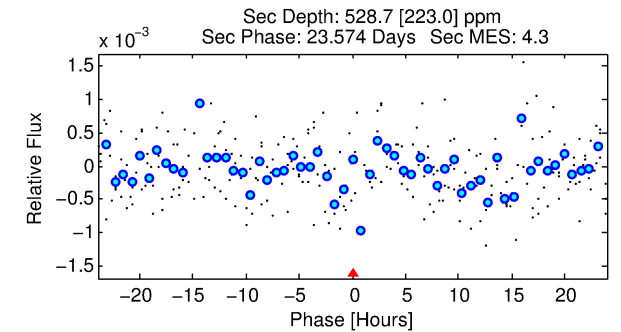
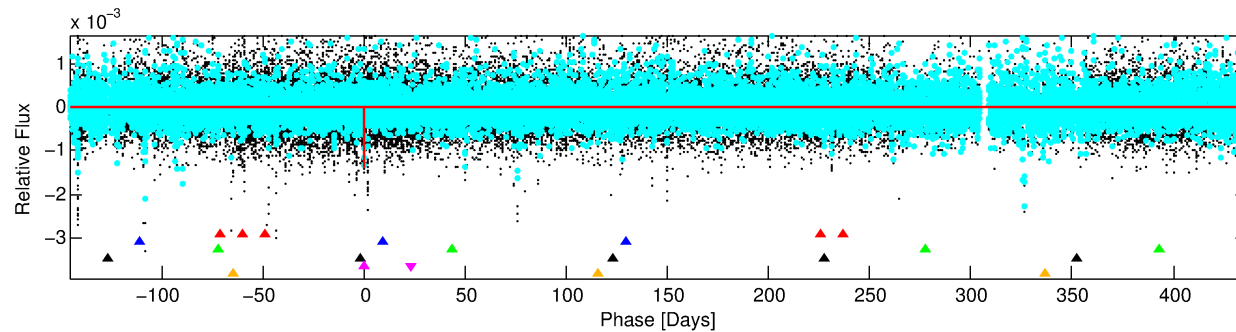
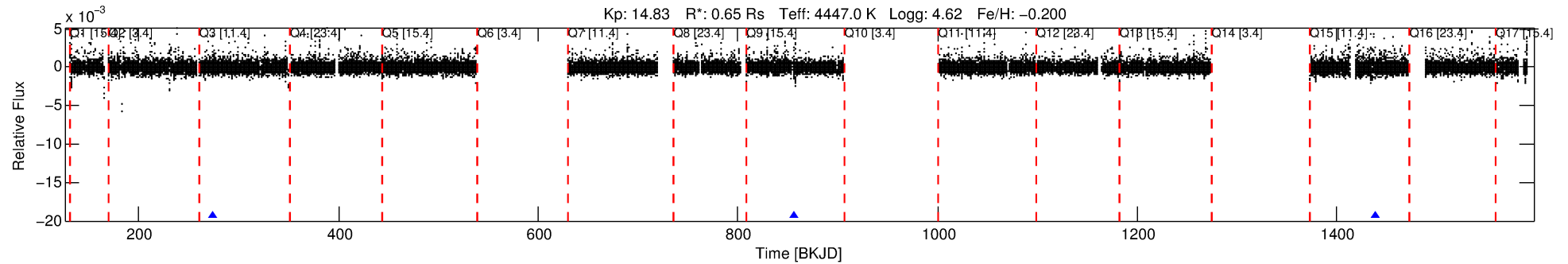
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004274517-05

No Significant Match Found

# DV One-Page Summary

KIC: 4274517 Candidate: 5 of 6 Period: 582.584 d



## DV Fit Results:

Period = 582.58359 [0.00795] d  
Epoch = 273.5790 [0.0108] BKJD  
Rp/R\* = 0.0344 [0.0721]  
a/R\* = 999.81 [6329.42]  
b = 0.52 [9.24]  
Seff = 0.11 [0.02]  
Teq = 146 [6] K  
Rp = 2.44 [5.10] Re  
a = 1.1758 [0.0809] AU  
Ag = 67780.22 [285150.18] [0.24 $\sigma$ ]  
Teffp = 3633 [3822] K [0.91 $\sigma$ ]

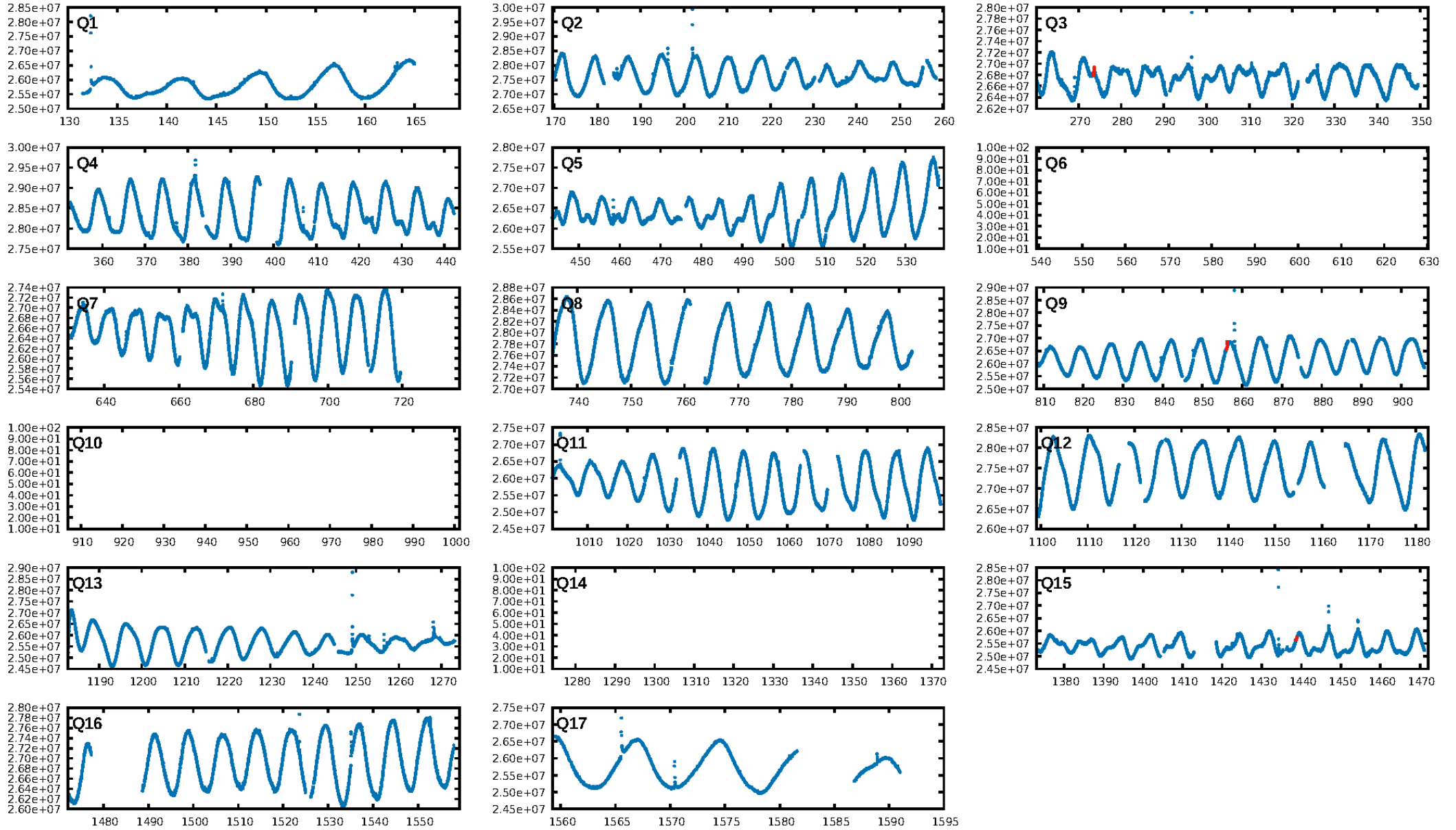
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [740.31 $\sigma$ ]  
LongPeriod-sig: 100.0% [534.43 $\sigma$ ]  
ModelChiSquare2-sig: 5.6%  
ModelChiSquareGof-sig: 86.7%  
**Bootstrap-pfa: 1.50e-12**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.2614**  
Centroid-sig: 18.7%  
Centroid-so: 1.489 arcsec [1.23 $\sigma$ ]  
OotOffset-rm: 0.169 arcsec [0.07 $\sigma$ ]  
OotOffset-st: 0/2/0/1 [3]  
KicOffset-rm: 0.090 arcsec [0.04 $\sigma$ ]  
KicOffset-st: 0/2/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

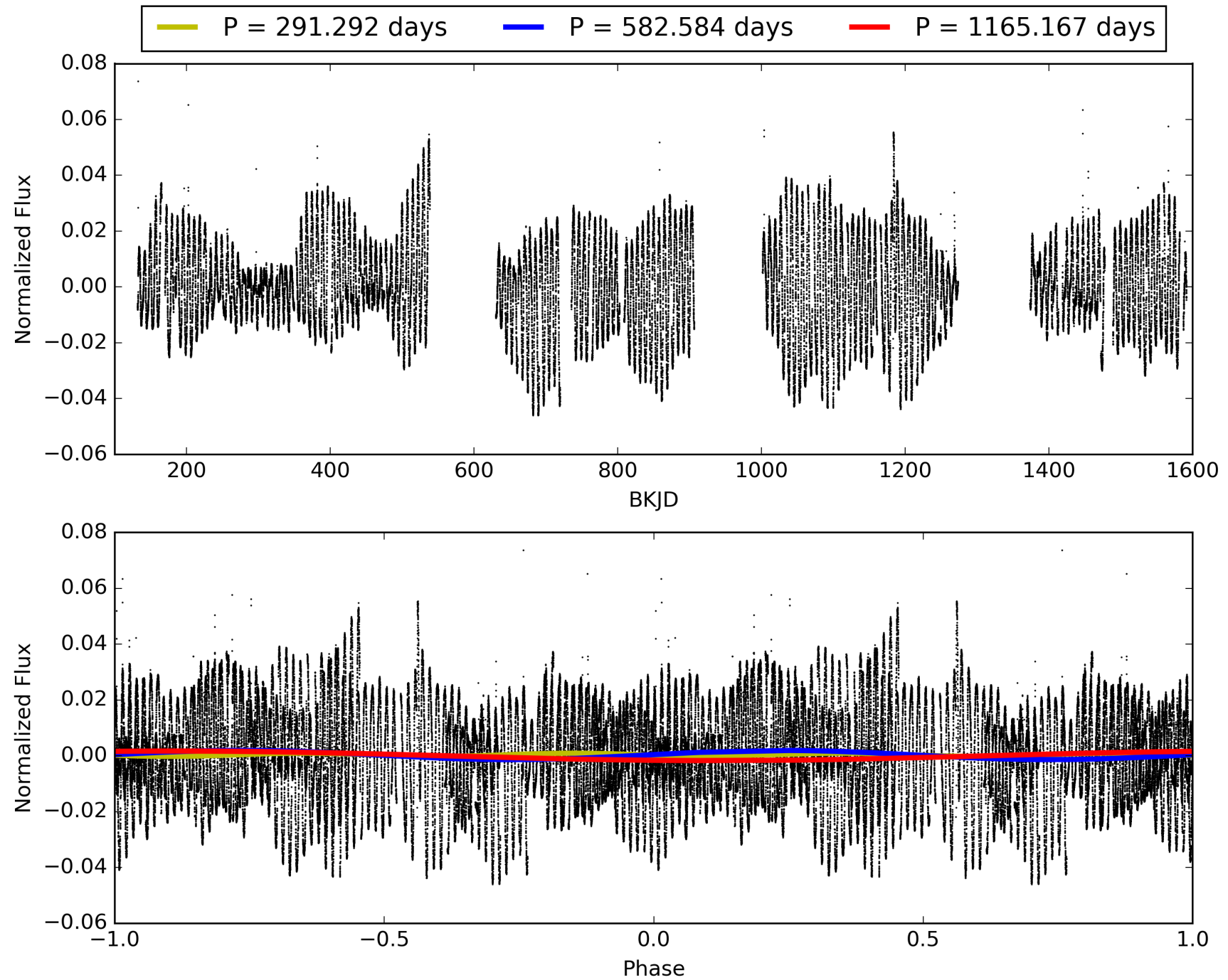
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:03:40 Z

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

# TCE 004274517-05, PDC Light Curves

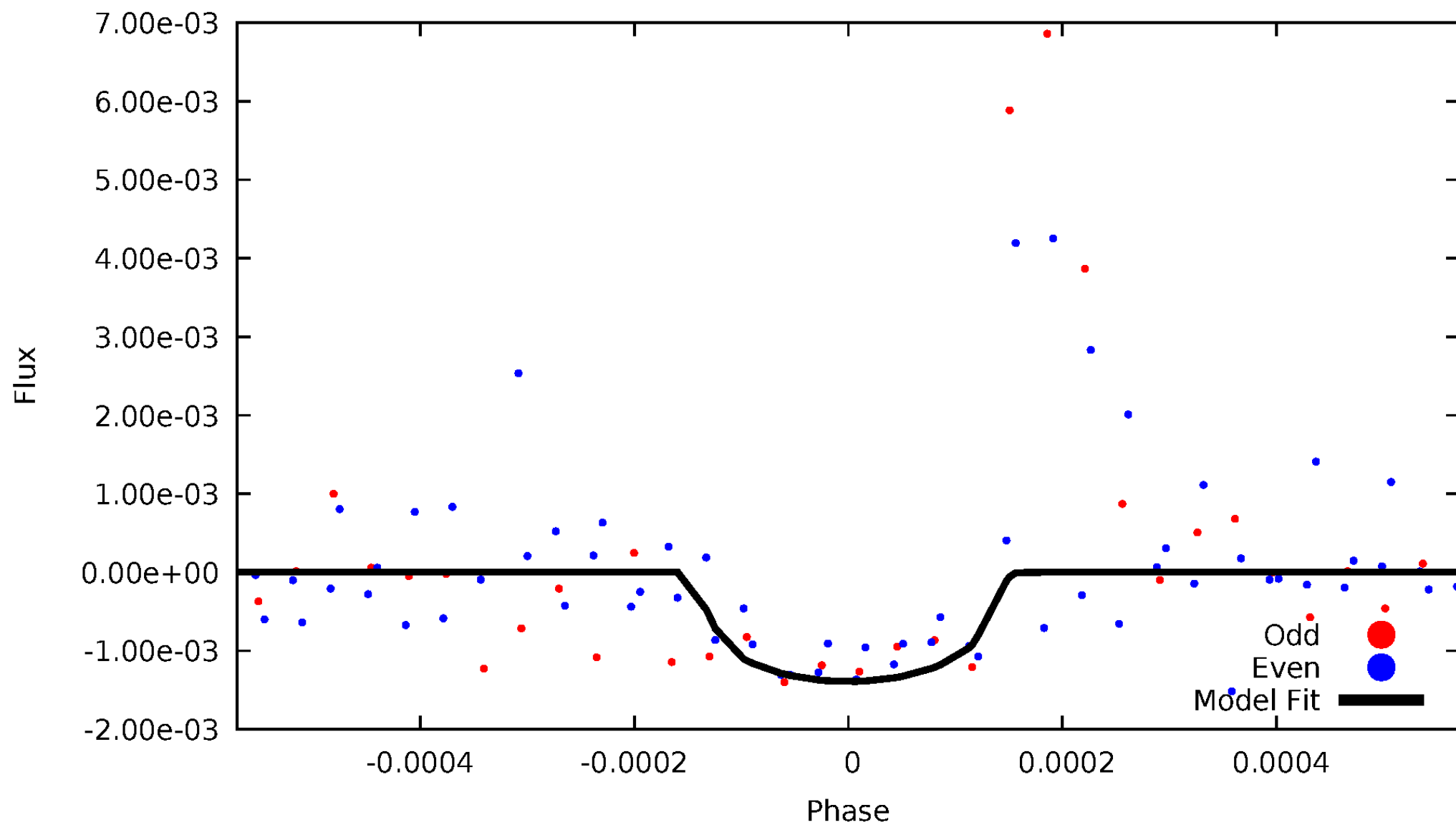


TCE 004274517-05



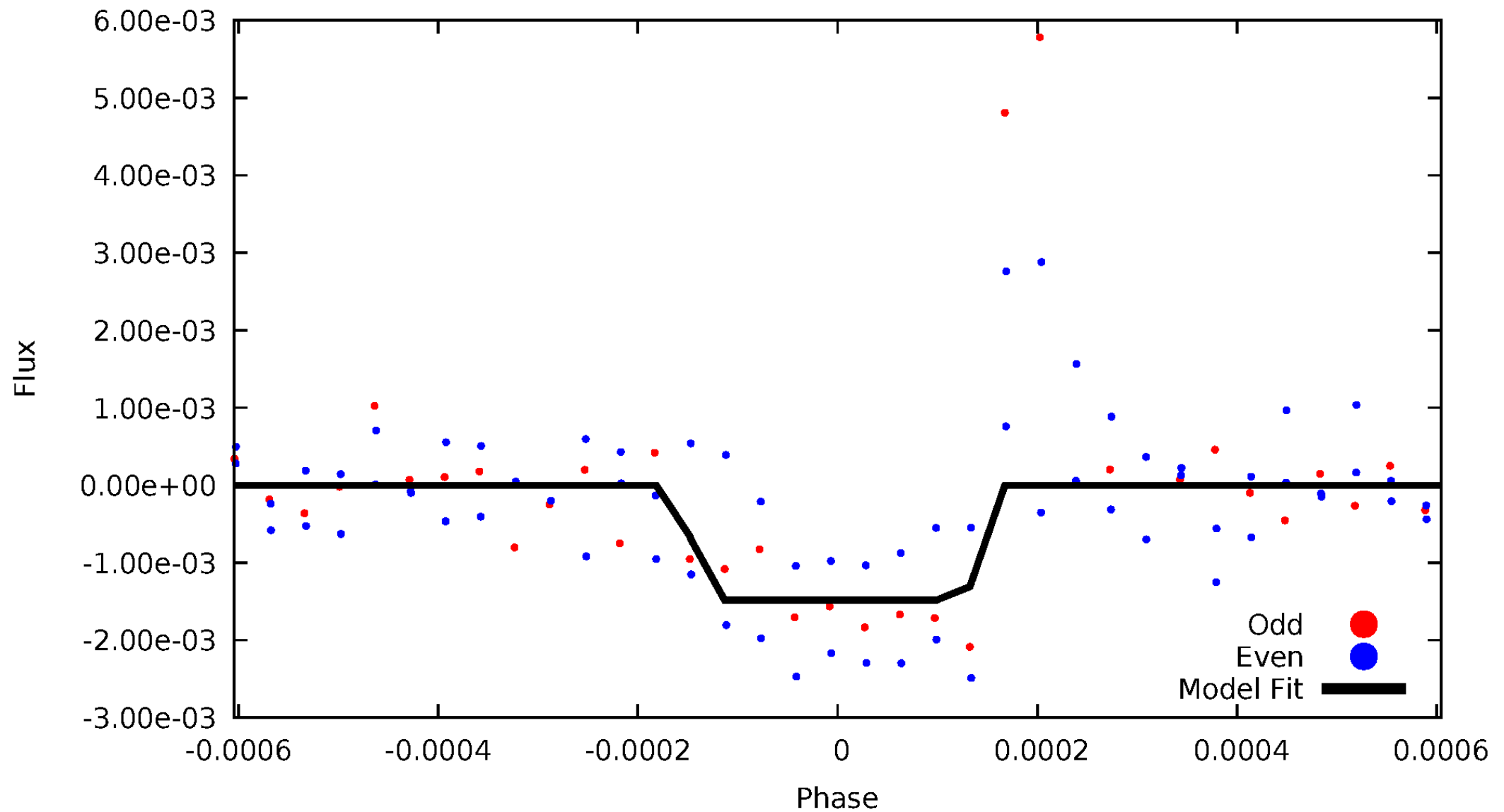
# DV Odd/Even

TCE 004274517-05



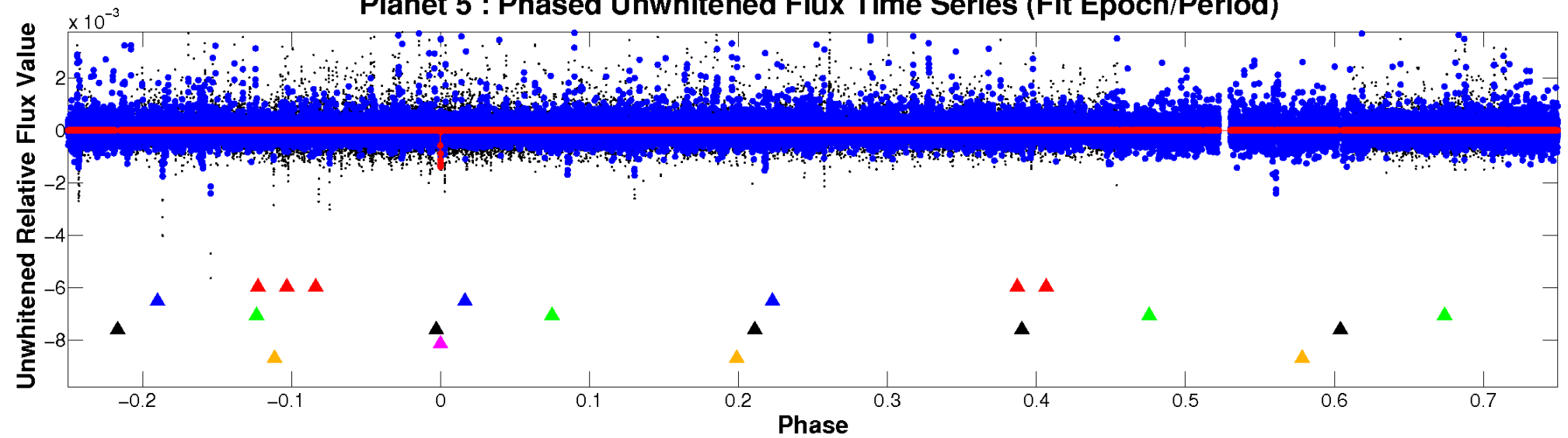
# ALT Odd/Even

TCE 004274517-05

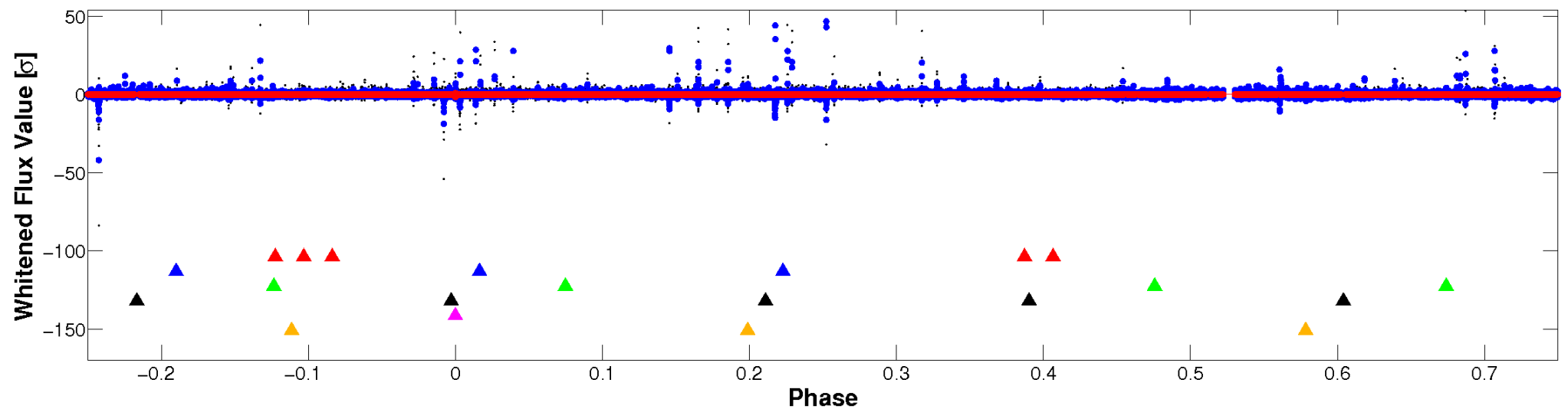


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

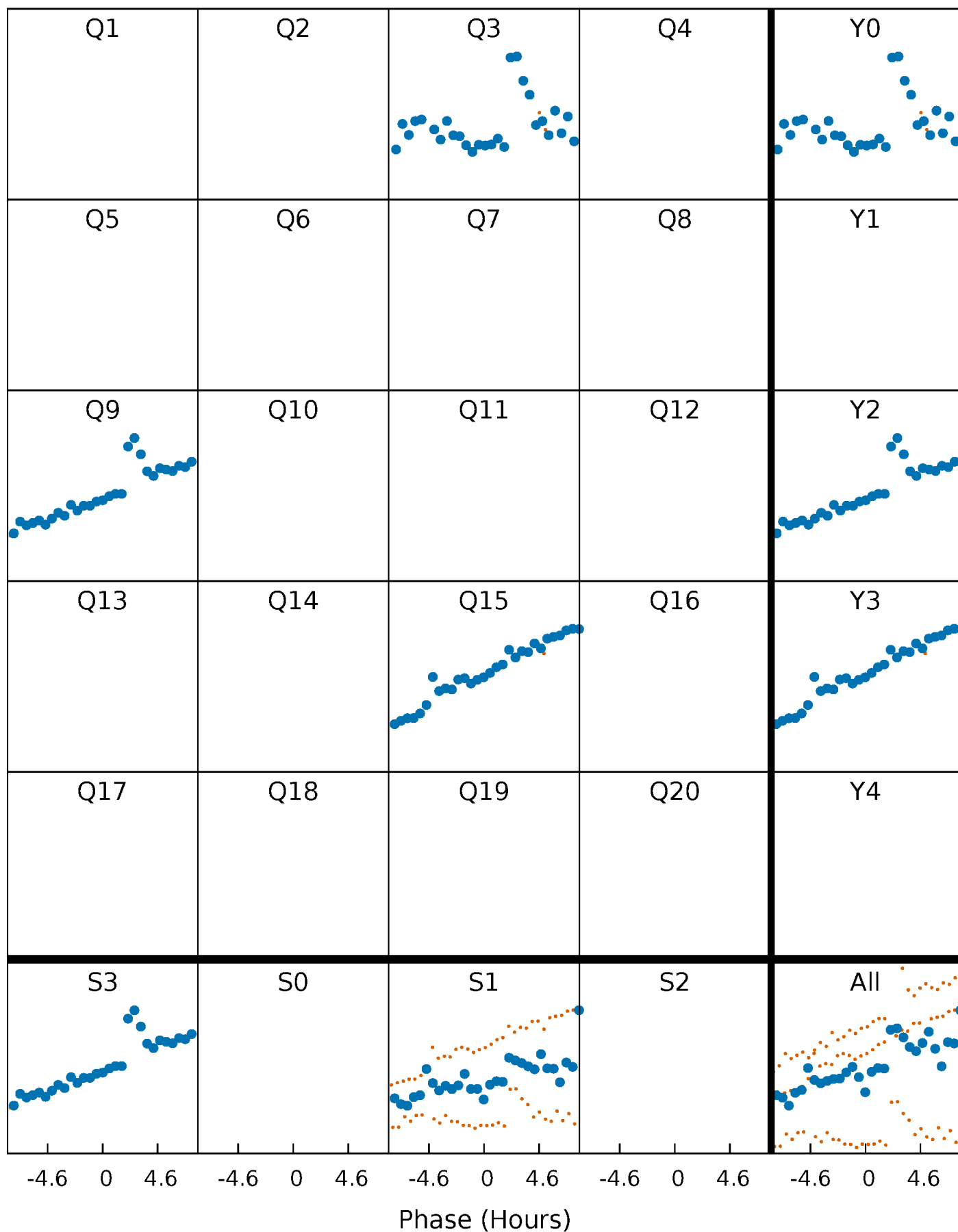


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

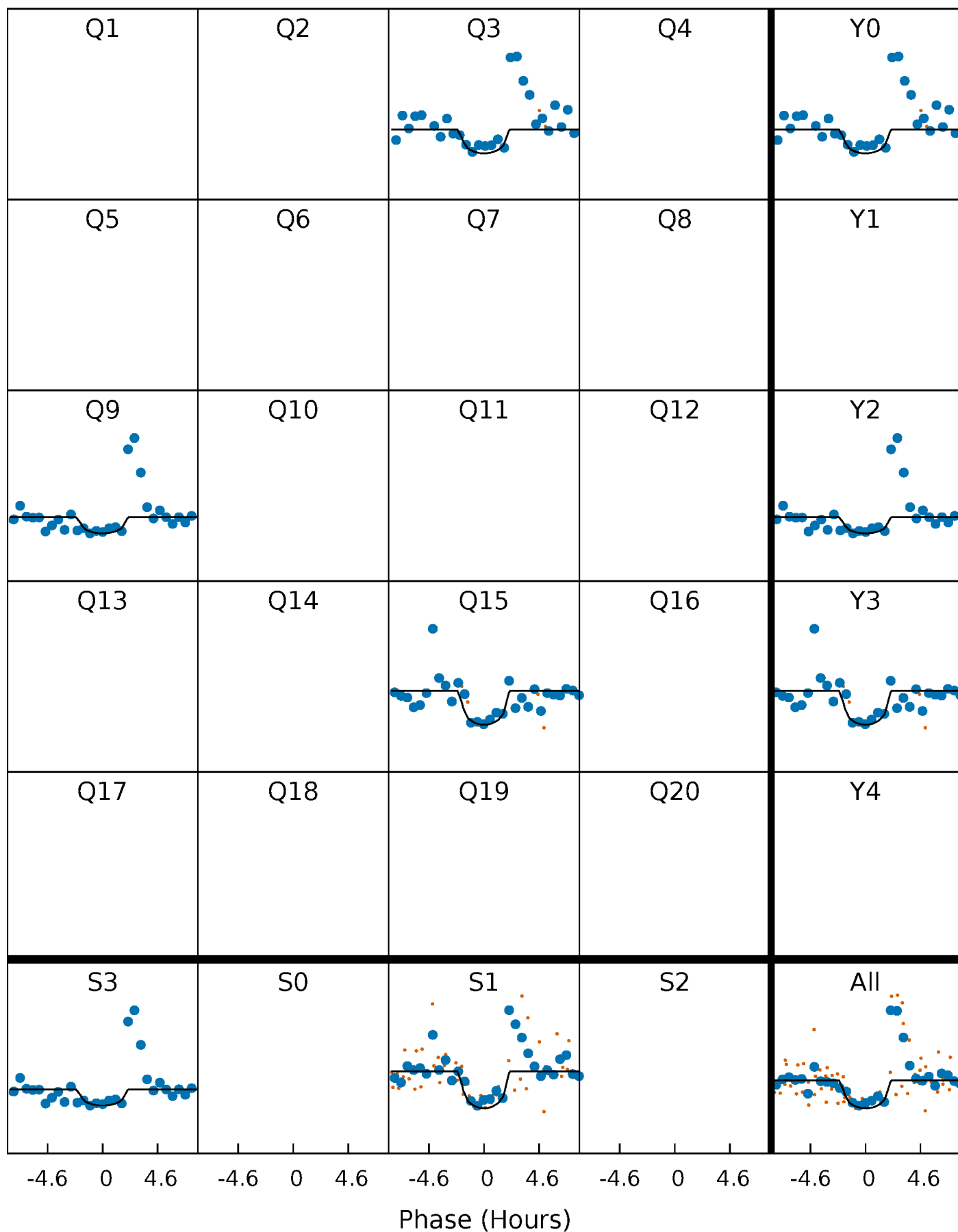
TCE 004274517-05     $P=582.583591$  Days     $T_0=273.578985$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 004274517-05     $P=582.583591$  Days     $T_0=273.578985$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

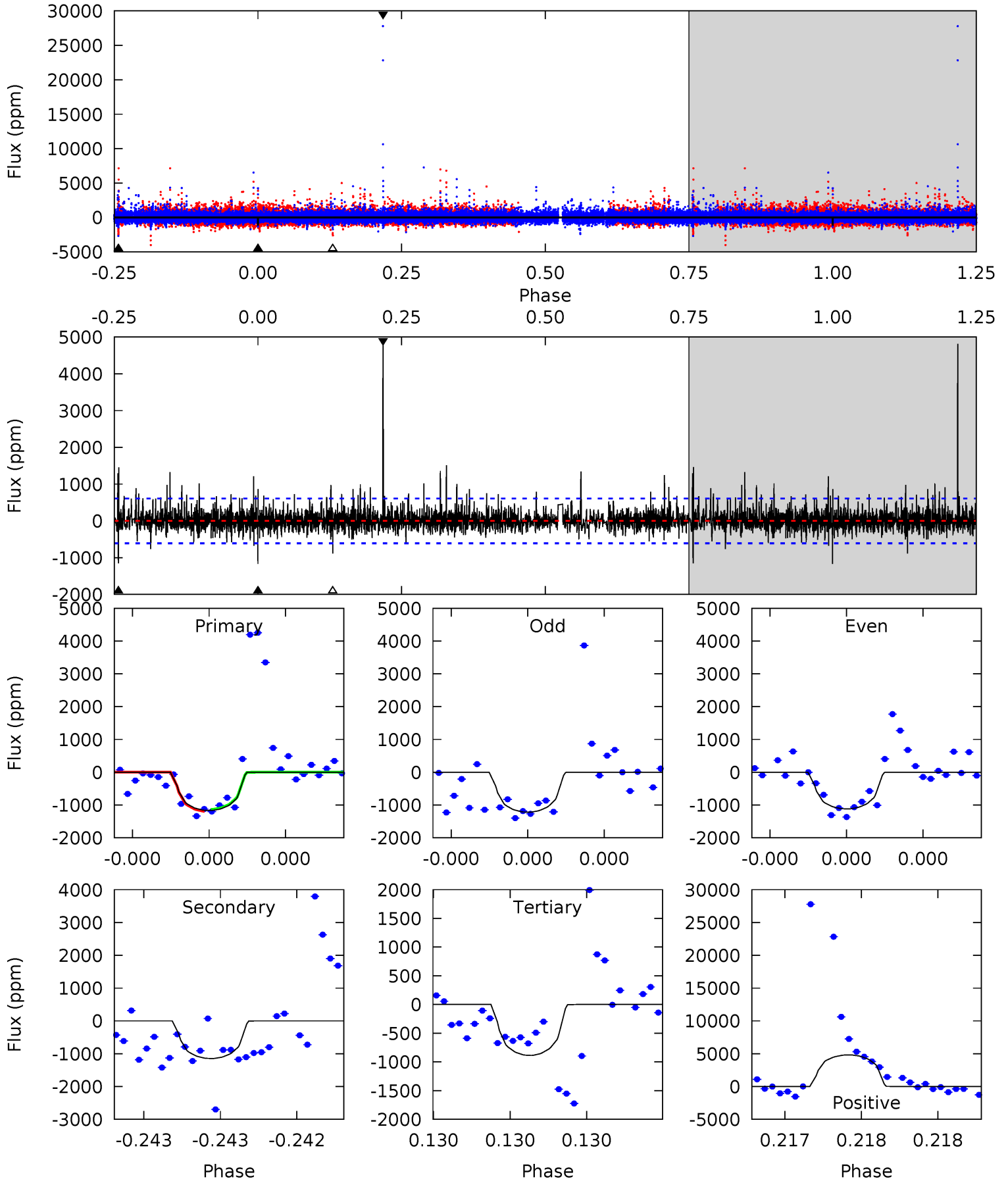
TCE 004274517-05 P=582.581229 Days  $T_0=273.571539$  (BKJD)



# DV Model-Shift Uniqueness Test

004274517-05, P = 582.583591 Days, E = 273.578985 Days

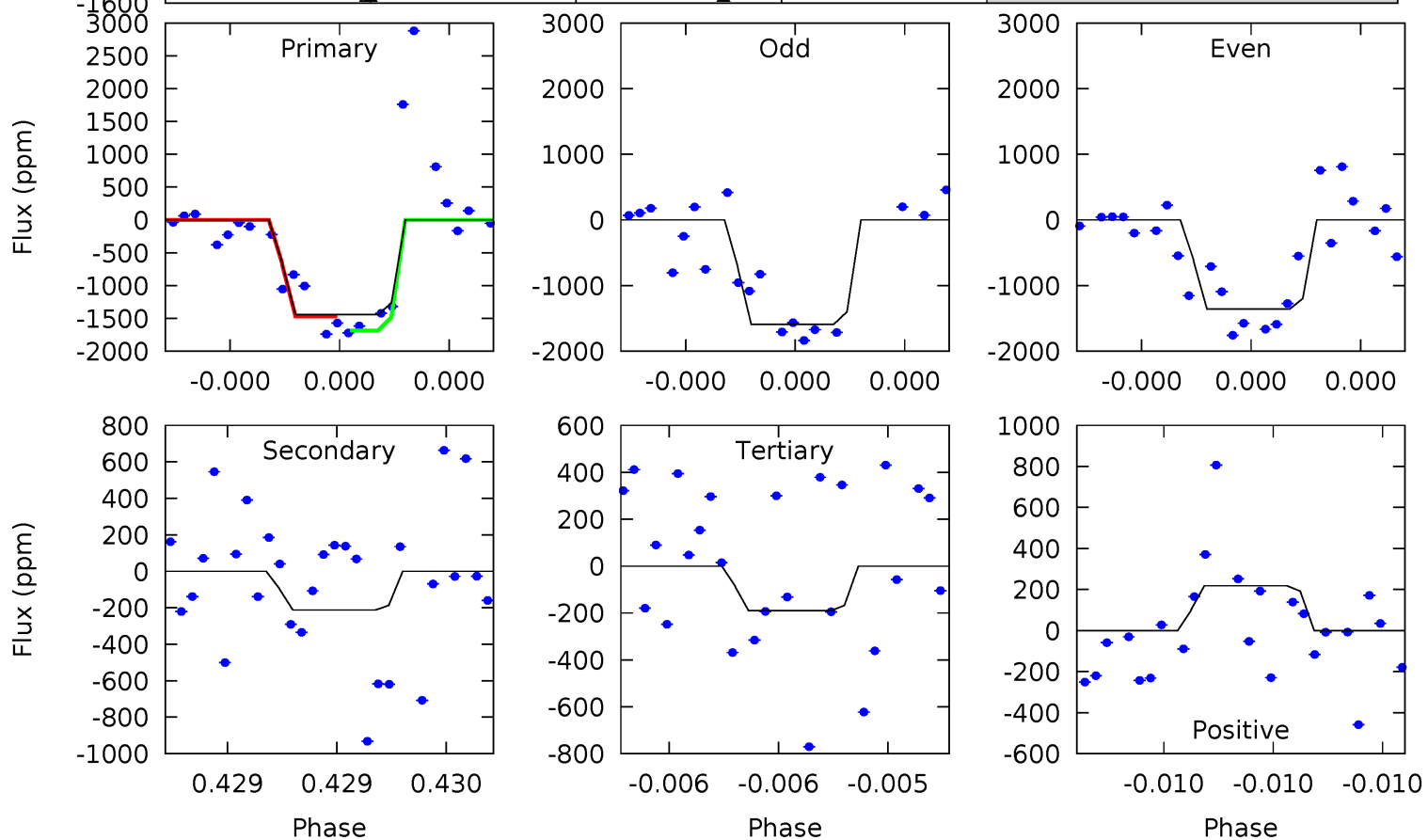
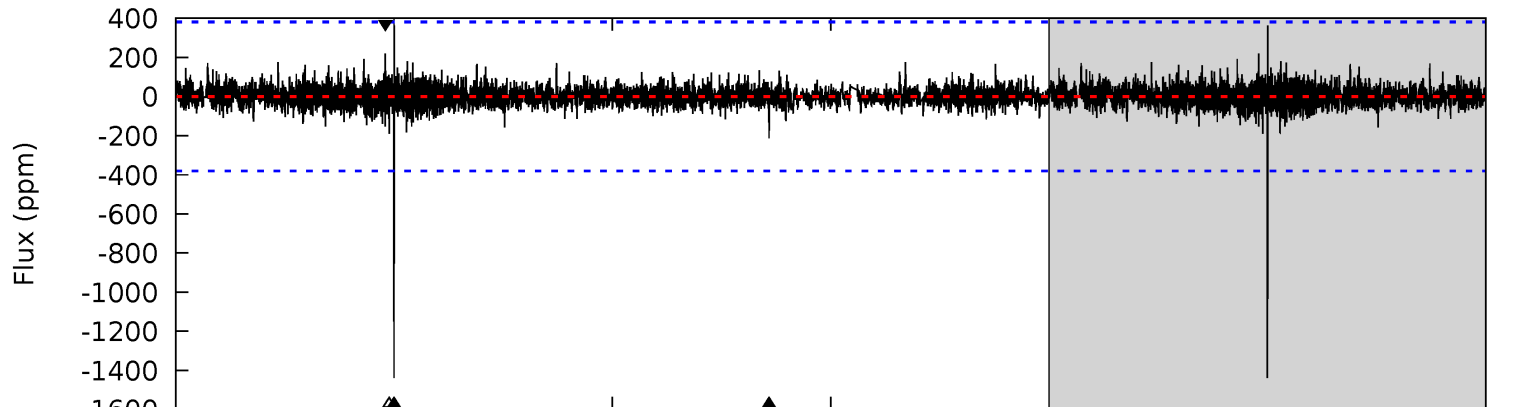
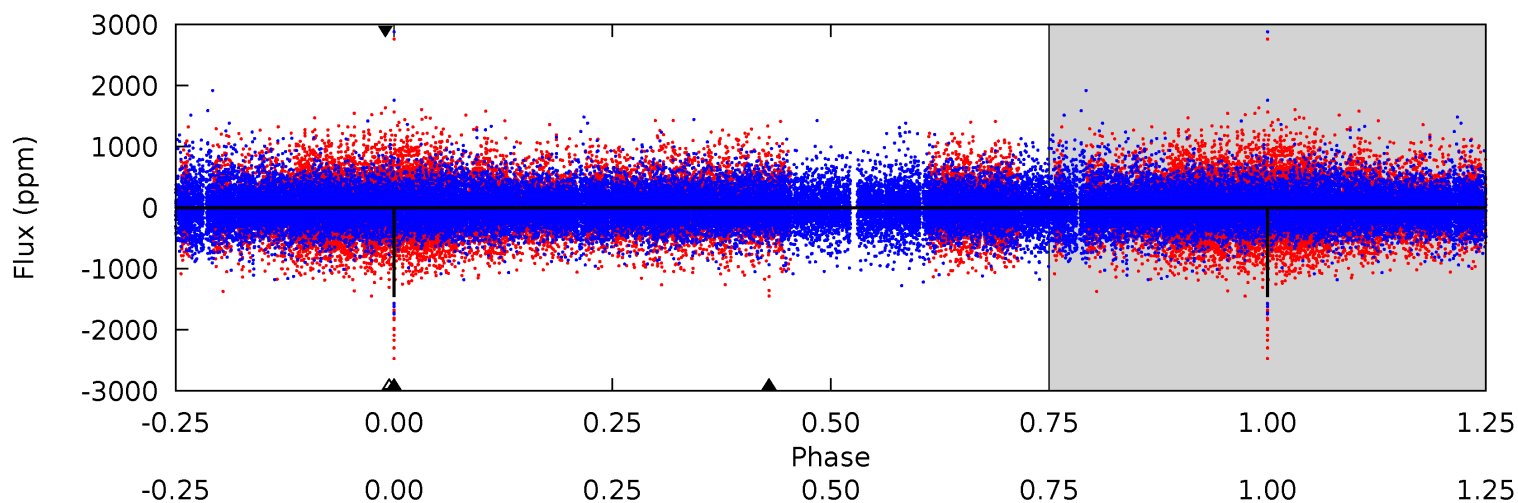
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	10.7	8.25	44.8	5.65	3.60	2.00	2.61	-33.9	2.43	-34.1	0.37	1.00	0.80	0.26



# Alt Model-Shift Uniqueness Test

004274517-05, P = 582.581229 Days, E = 273.571539 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
21.5	3.16	2.84	3.25	5.67	3.63	0.53	18.6	18.2	0.33	-0.09	1.60	0.92	0.20	1.52



### Stellar Parameters For KIC 004274517

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4447^{+133}_{-133}$	$4.620^{+0.049}_{-0.024}$	$-0.200^{+0.300}_{-0.300}$	$0.648^{+0.046}_{-0.056}$	$0.638^{+0.068}_{-0.051}$	$3.308^{+0.767}_{-0.351}$
	+3%/-3%	+1%/-1%	+150%/-150%	+7%/-9%	+11%/-8%	+23%/-11%
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 004274517-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1147 \pm 107$	$4.45^{+4.03}_{-2.89}$	$203^{+6}_{-7}$	$3556^{+1821}_{-622}$	$44258^{+343996}_{-32303}$
Alt.	$-212 \pm 67$	$4.84^{+4.20}_{-3.15}$	$203^{+7}_{-7}$	$2712^{+1006}_{-396}$	$6534^{+52272}_{-4649}$

$T_{max}$  = 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

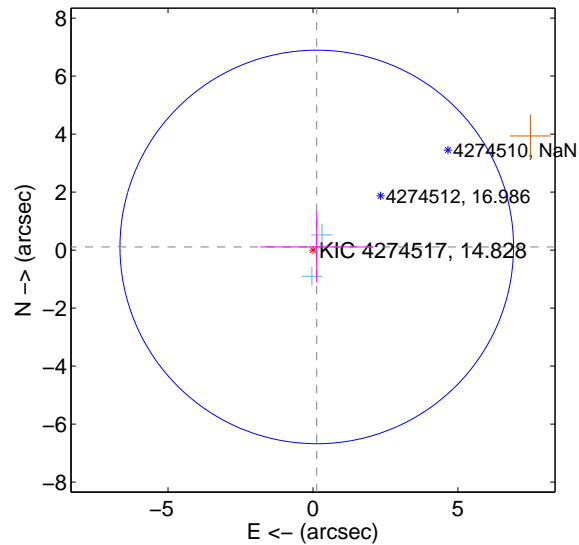
Supplemental centroid analysis for 004274517-05. Kepler magnitude: 14.83. Transit SNR 7.36

There are 2 quarters with good PRF difference image offsets

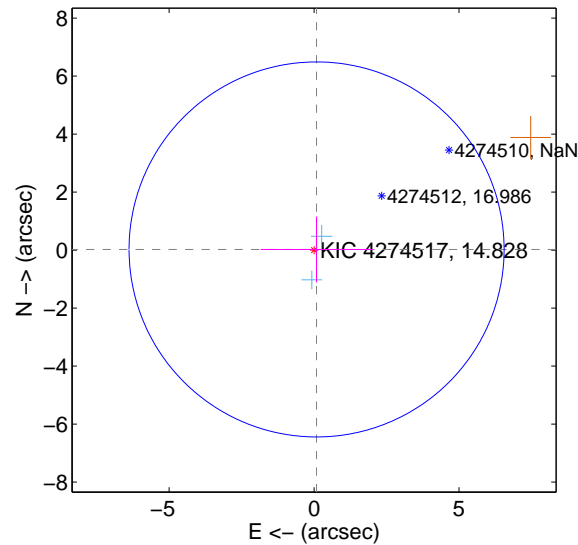
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.169 \pm 2.262$	0.07	$-0.130 \pm 1.944$	$0.108 \pm 1.231$
PRF-fit source offset from KIC position	$0.090 \pm 2.155$	0.04	$-0.087 \pm 1.932$	$0.023 \pm 1.138$
photometric centroid source offset	$1.49 \pm 1.21$	1.23	$-1.41 \pm 1.21$	$-0.47 \pm 1.24$

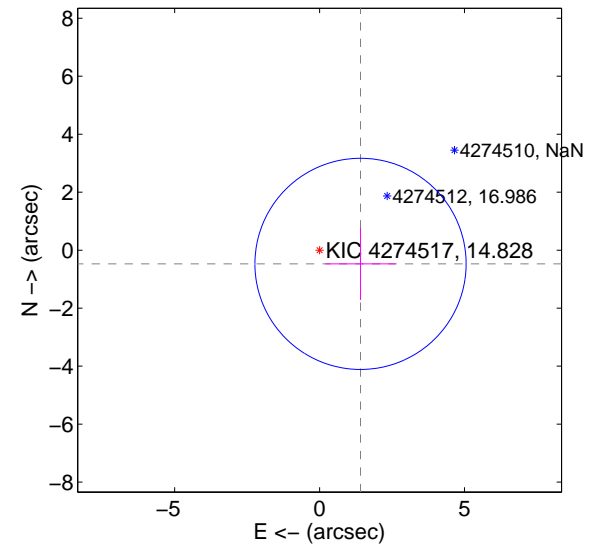
offset from difference PRF-fit to OOT PRF-fit



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.

Q1 no difference image



Q1 no OOT image



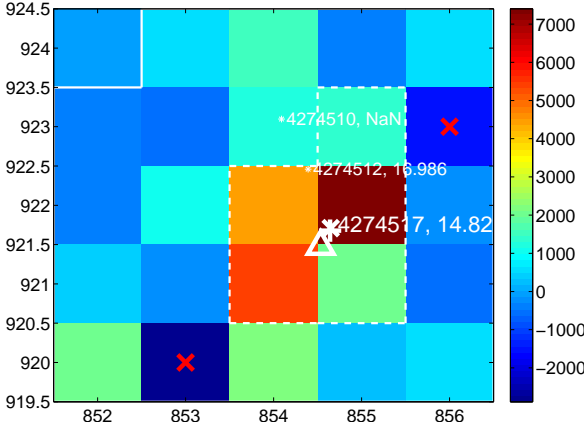
Q2 no difference image



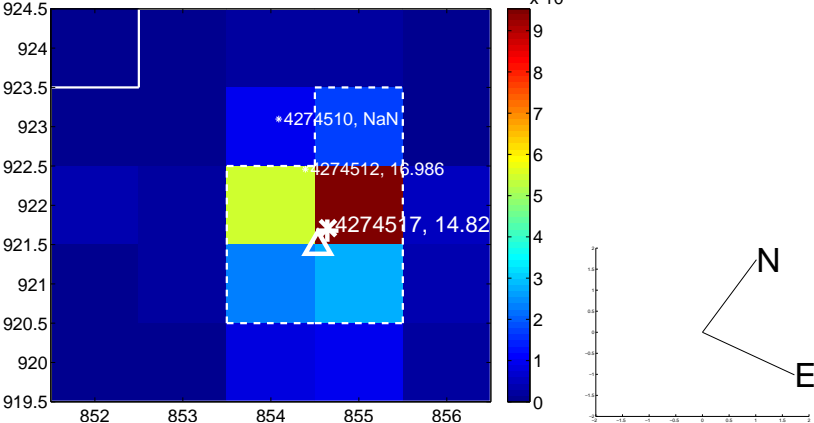
Q2 no OOT image



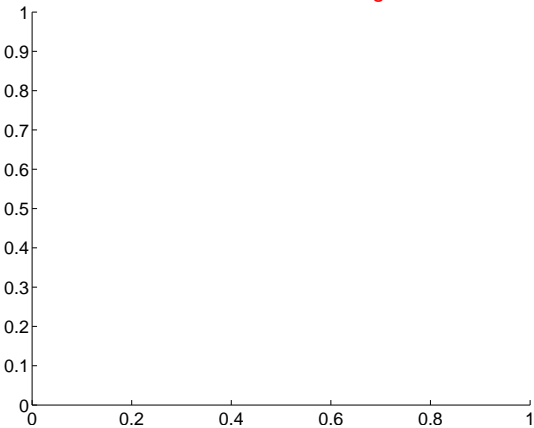
Q3 difference image



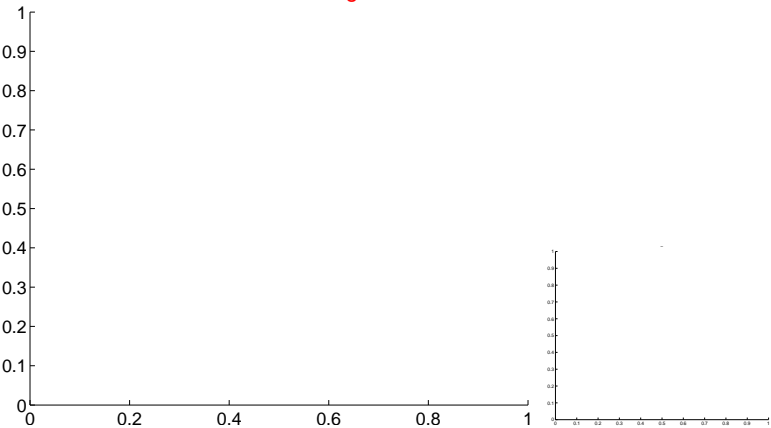
Q3 OOT image



Q4 no difference image



Q4 no OOT image

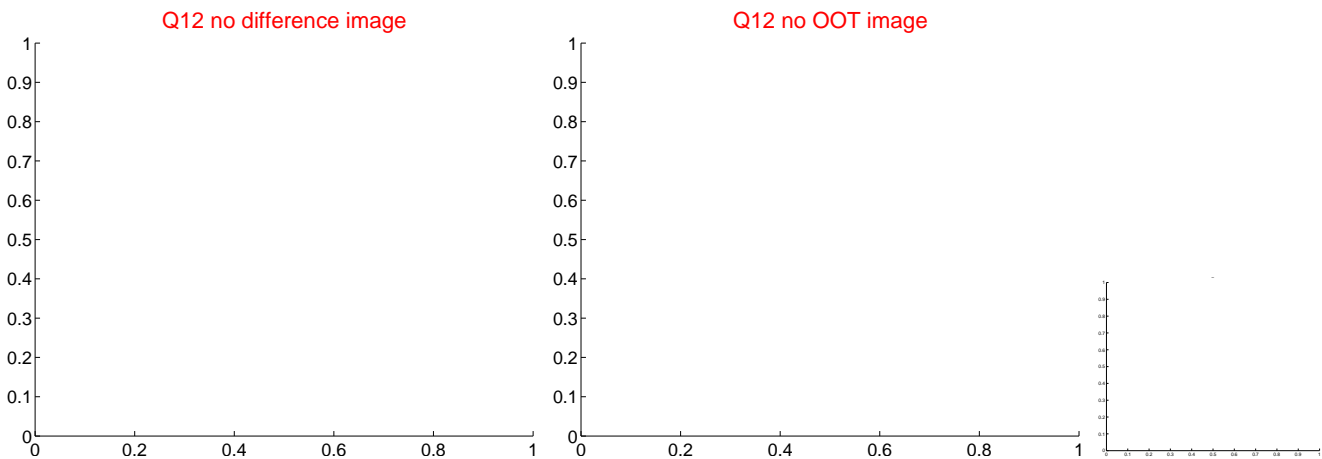
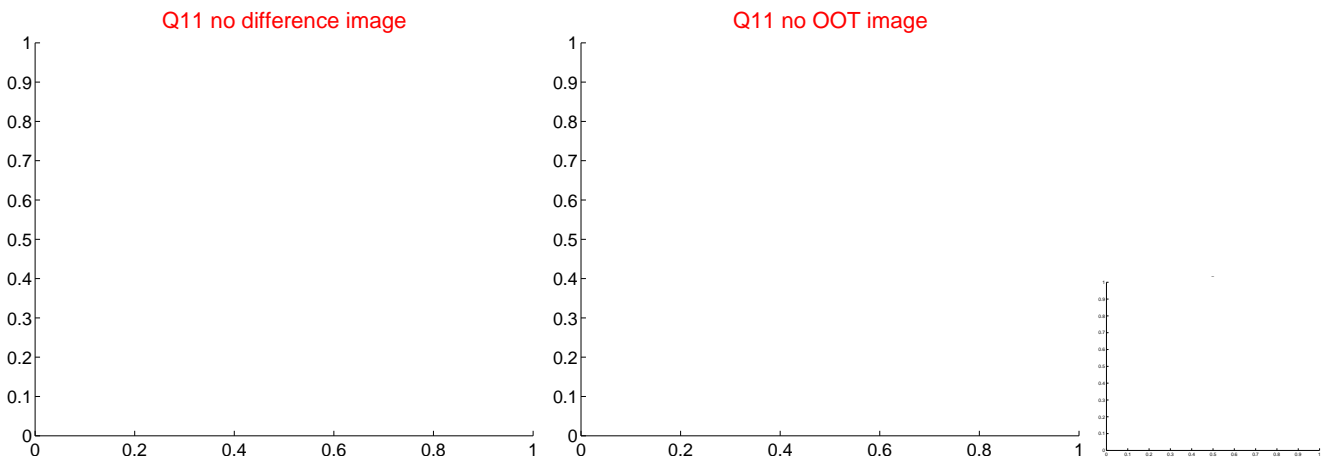
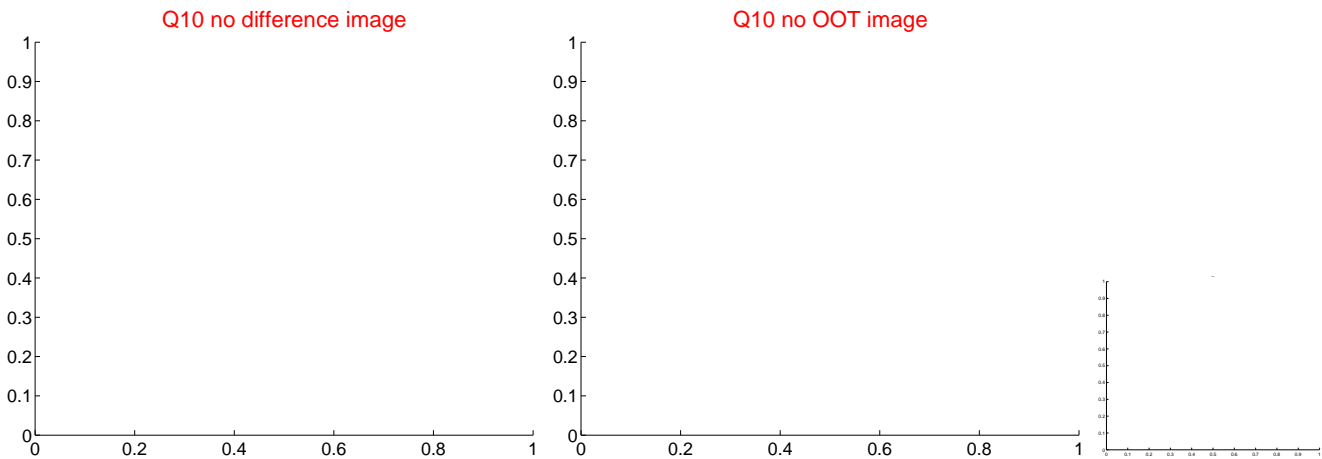
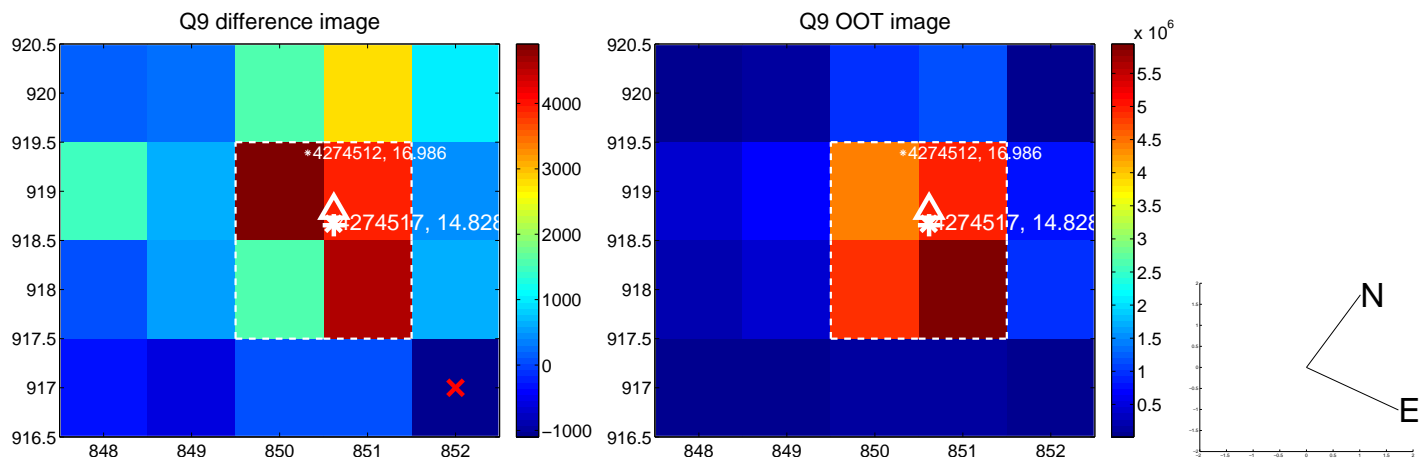


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



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

Q13 no difference image



Q13 no OOT image



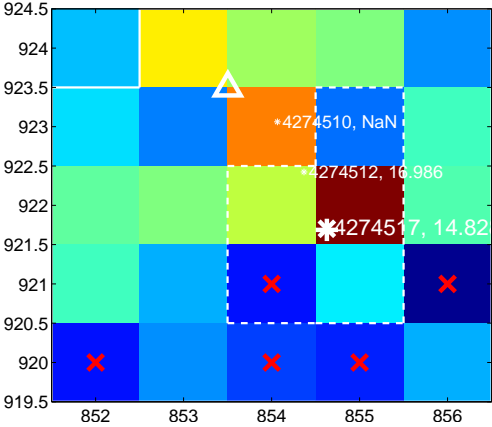
Q14 no difference image



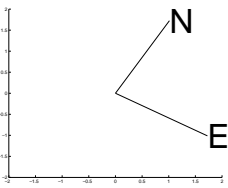
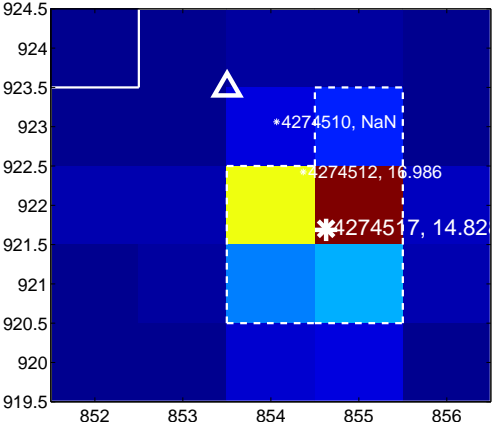
Q14 no OOT image



Q15 difference image. Poor Quality



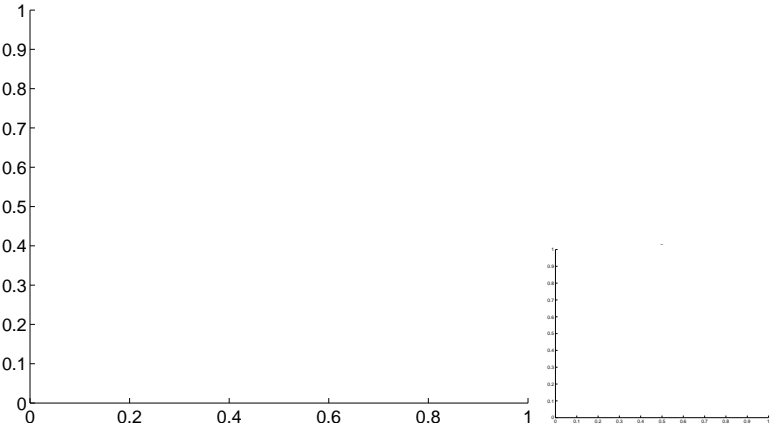
Q15 OOT image



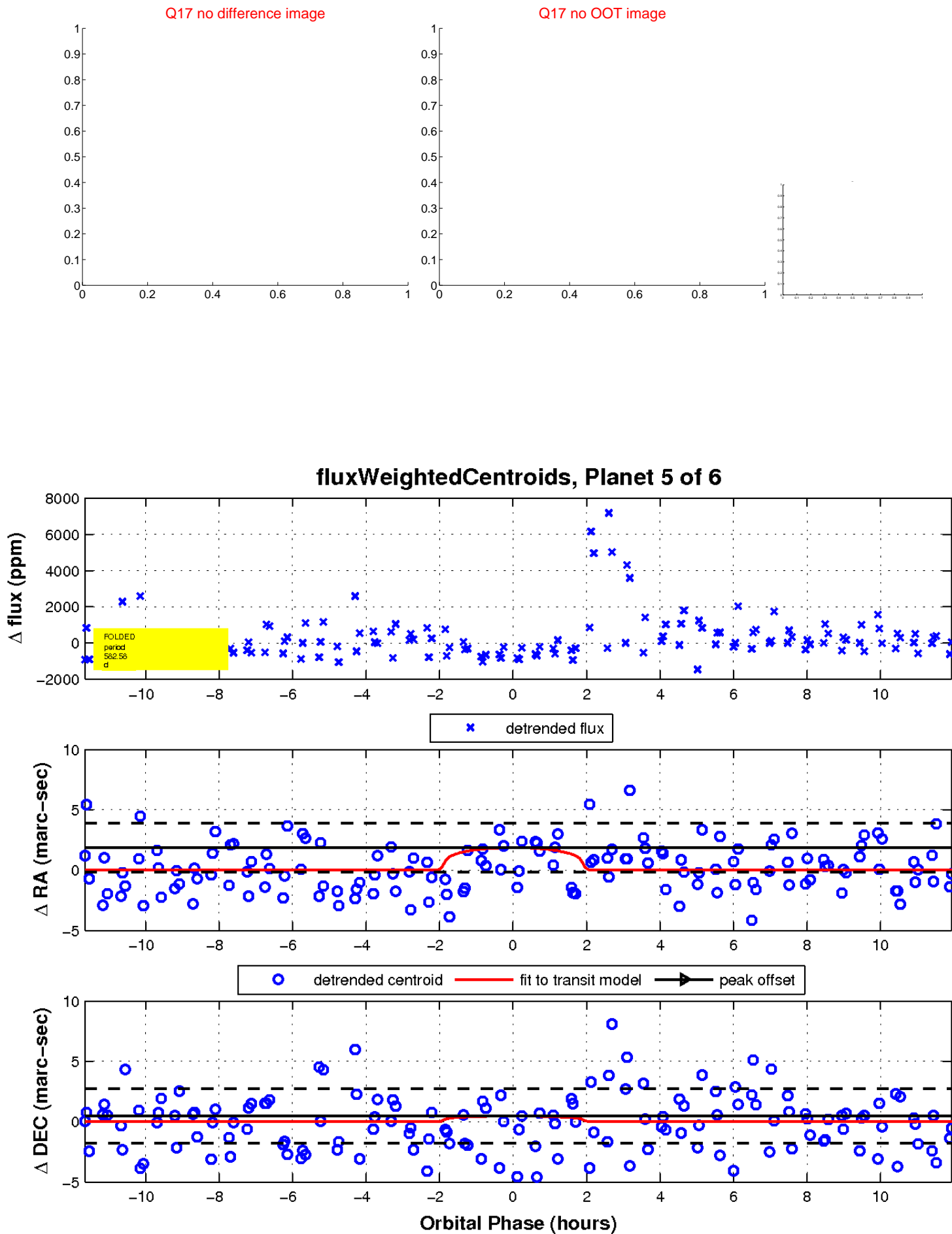
Q16 no difference image



Q16 no OOT image

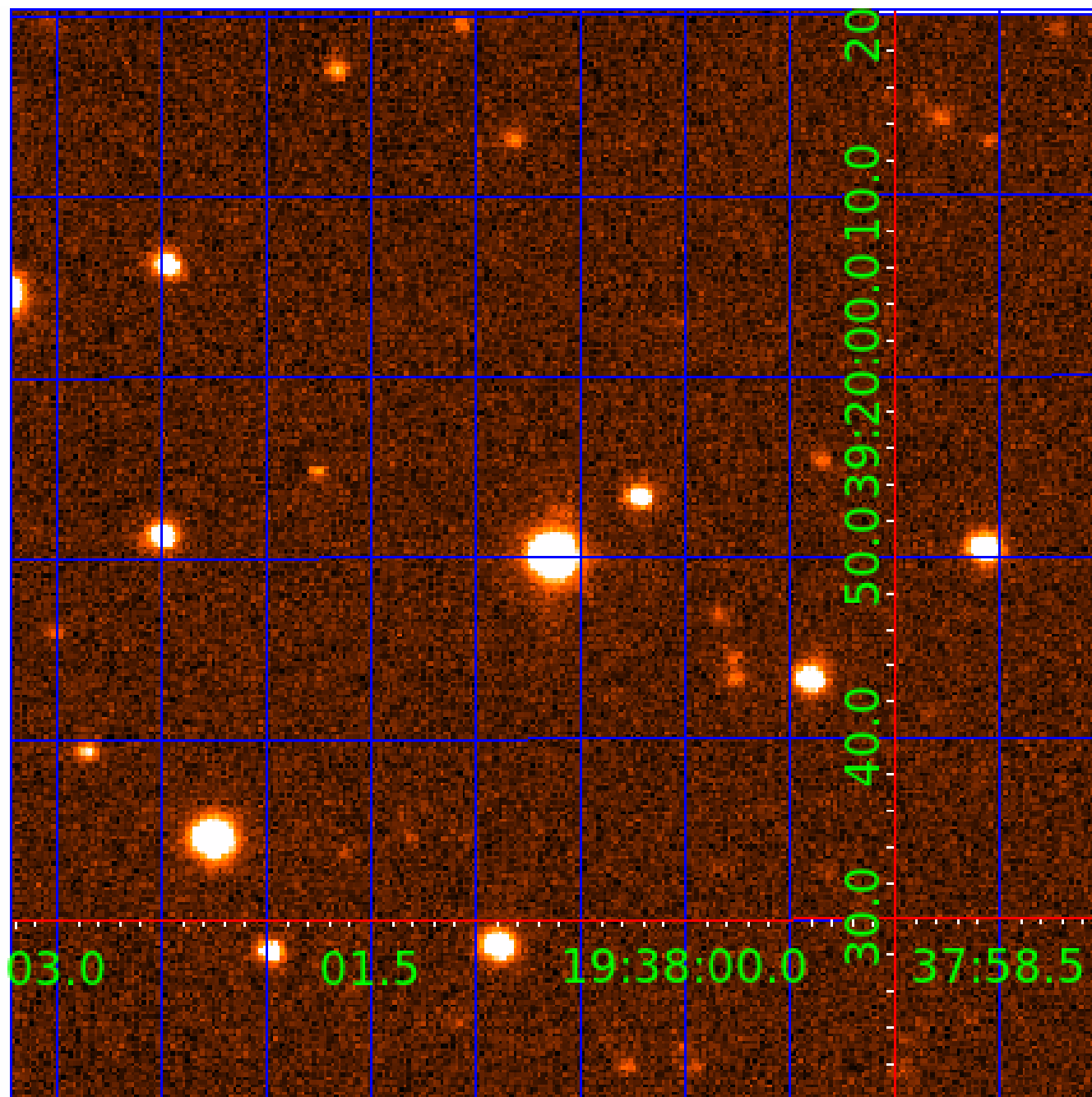


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 004274517

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004274517-01	OBS	No	285.647928	224.782390	1014.4	3.836	12.5	6.7	0.65	4447	2.21	0.28
004274517-02	OBS	No	702.812911	162.923592	856.2	3.638	11.3	4.7	0.65	4447	2.08	0.08
004274517-03	OBS	No	349.052883	201.662811	2621.5	12.000	23.7	-1.0	0.65	4447	3.18	0.21
004274517-04	OBS	No	353.577754	147.350249	1121.7	13.368	10.2	7.1	0.65	4447	2.21	0.21
004274517-05	OBS	No	582.583591	273.578985	1391.4	3.990	12.4	7.4	0.65	4447	2.44	0.11
004274517-06	OBS	No	401.856814	389.422325	1078.2	4.290	10.9	7.0	0.65	4447	2.40	0.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004274517-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004274517-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
004274517-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS
004274517-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

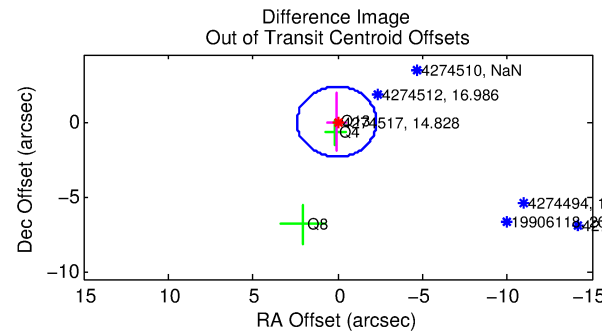
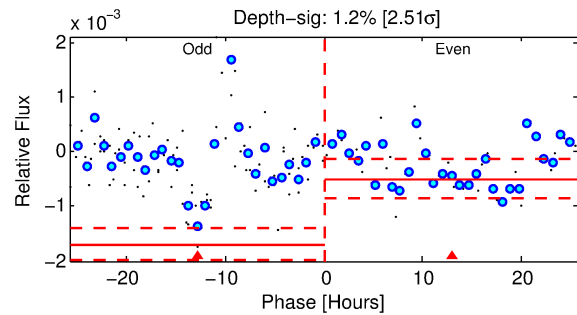
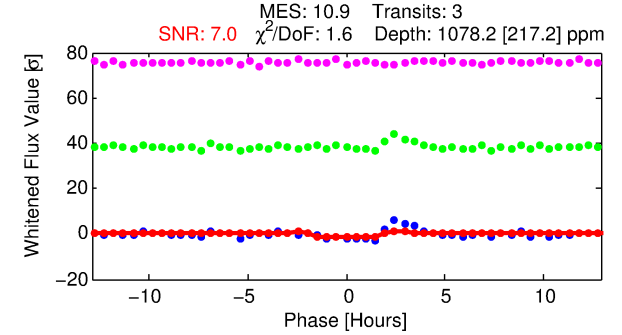
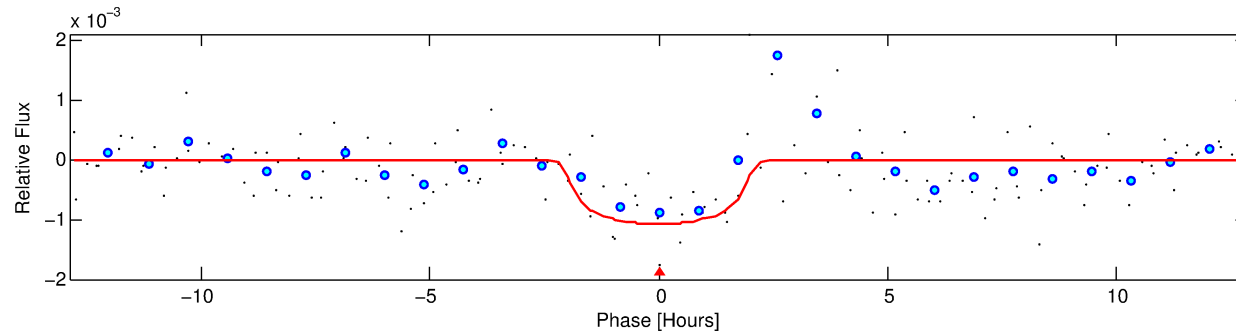
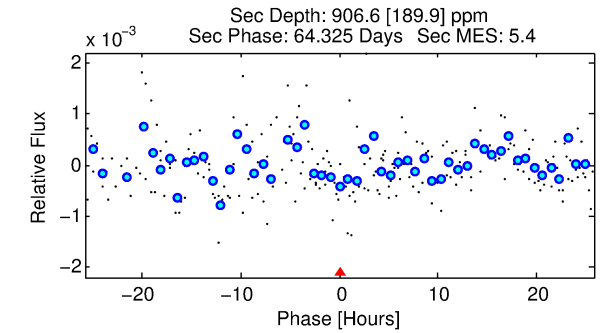
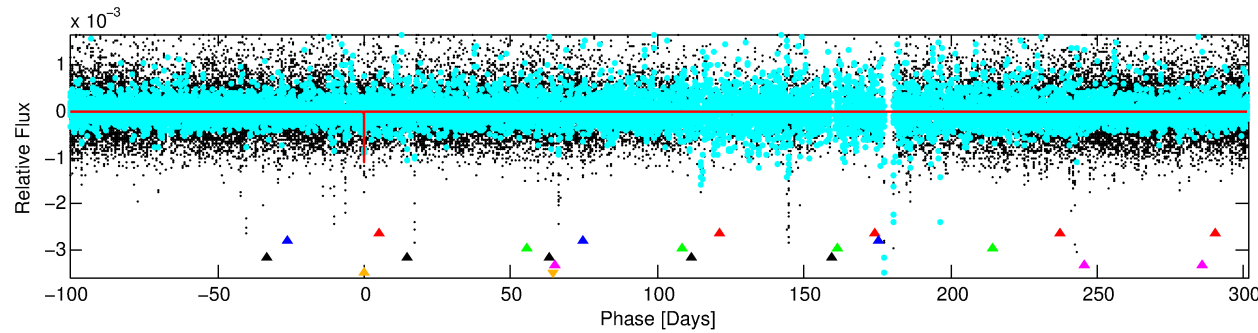
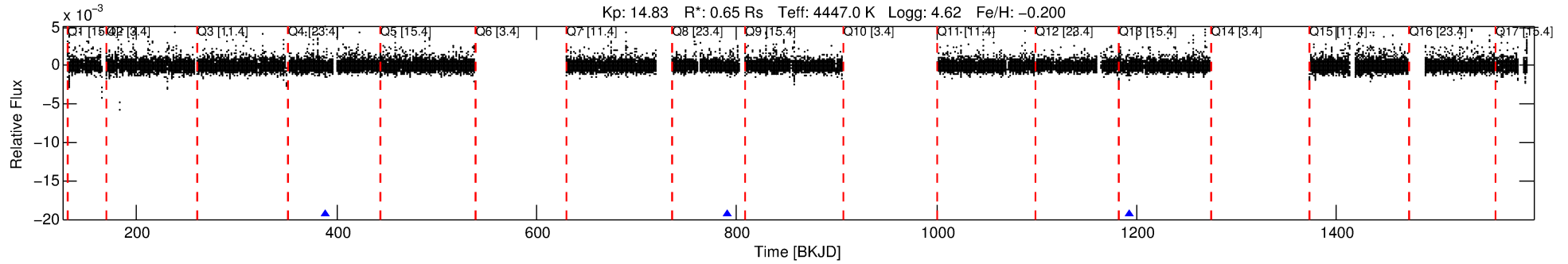
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004274517-06

No Significant Match Found

# DV One-Page Summary

KIC: 4274517 Candidate: 6 of 6 Period: 401.857 d



## DV Fit Results:

Period = 401.85681 [0.00795] d  
Epoch = 389.4223 [0.0108] BKJD  
Rp/R\* = 0.0339 [0.0244]  
a/R\* = 466.74 [1093.31]  
b = 0.80 [1.07]  
Seff = 0.17 [0.03]  
Teq = 165 [6] K  
Rp = 2.40 [1.74] Re  
a = 0.9179 [0.0632] AU  
Ag = 73007.26 [106341.23] [0.69 $\sigma$ ]  
Teffp = 4189 [1527] K [2.63 $\sigma$ ]

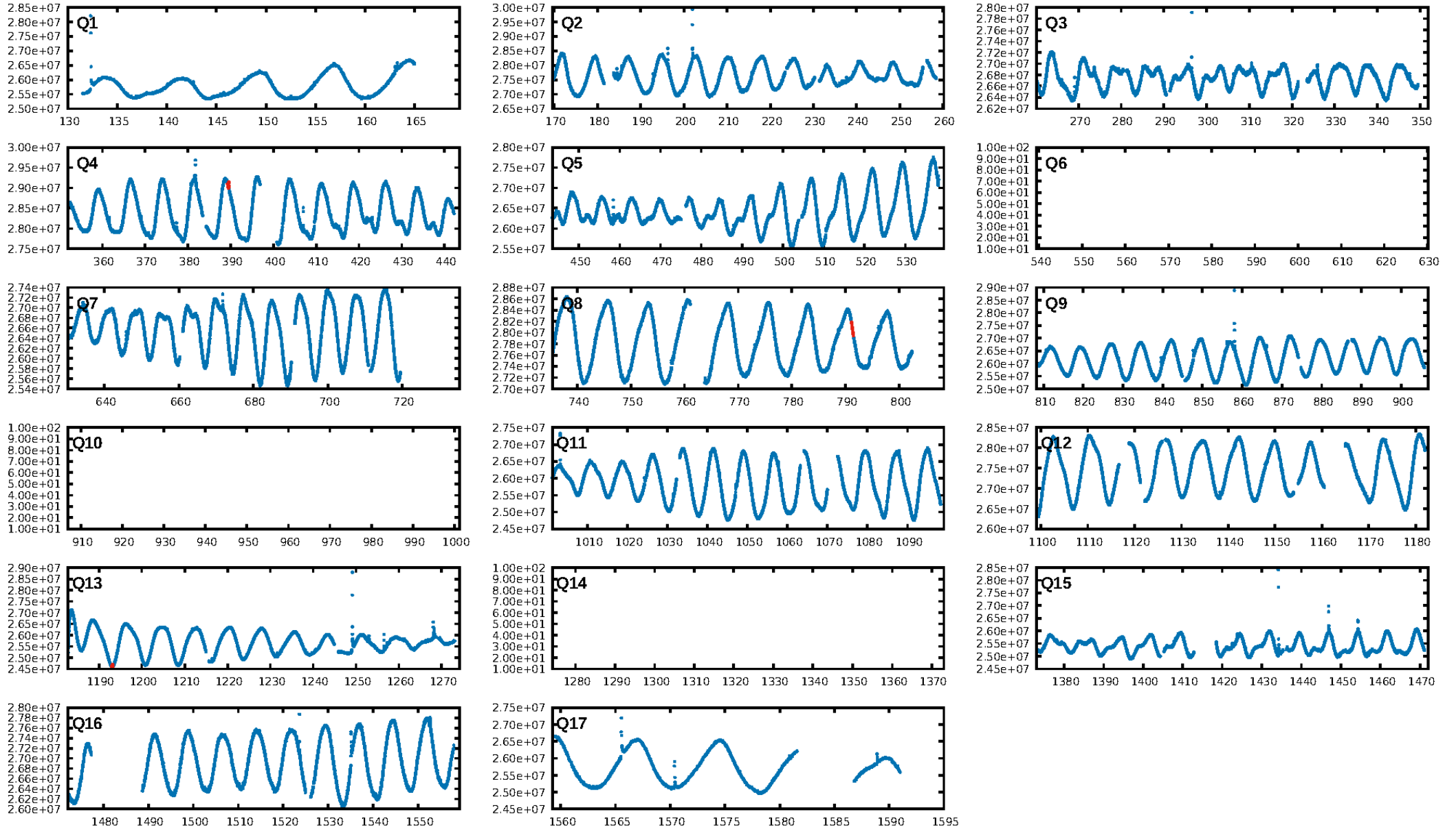
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [82.53 $\sigma$ ]  
LongPeriod-sig: 100.0% [740.31 $\sigma$ ]  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 37.8%  
Bootstrap-pfa: 3.92e-10  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.3861  
Centroid-sig: 100.0%  
Centroid-so: 0.166 arcsec [0.11 $\sigma$ ]  
OotOffset-rm: 0.055 arcsec [0.07 $\sigma$ ]  
KicOffset-rm: 0.109 arcsec [0.08 $\sigma$ ]  
OotOffset-st: 0/0/2/1 [3]  
KicOffset-st: 0/0/2/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

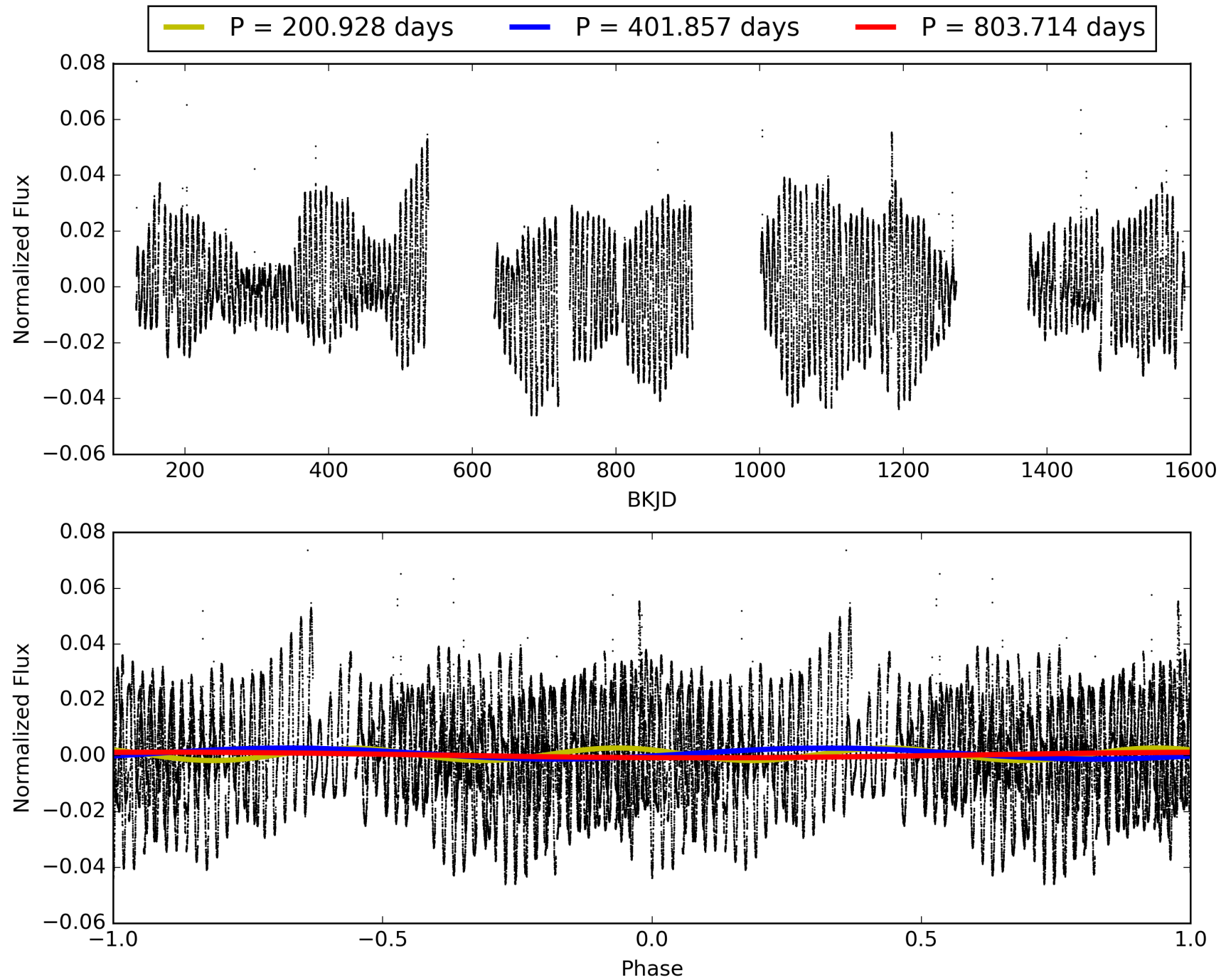
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:03:53 Z

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

# TCE 004274517-06, PDC Light Curves



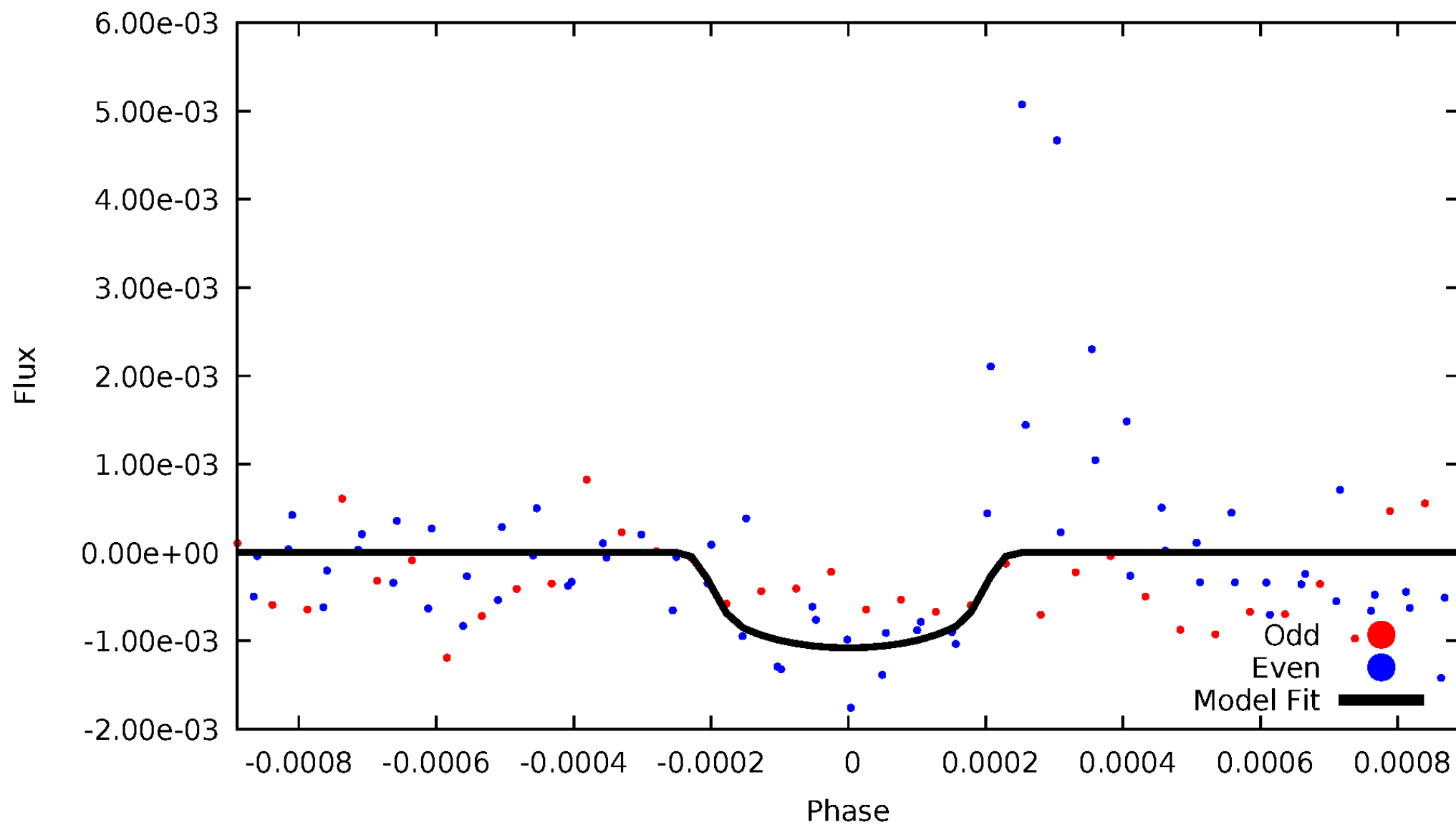
TCE 004274517-06





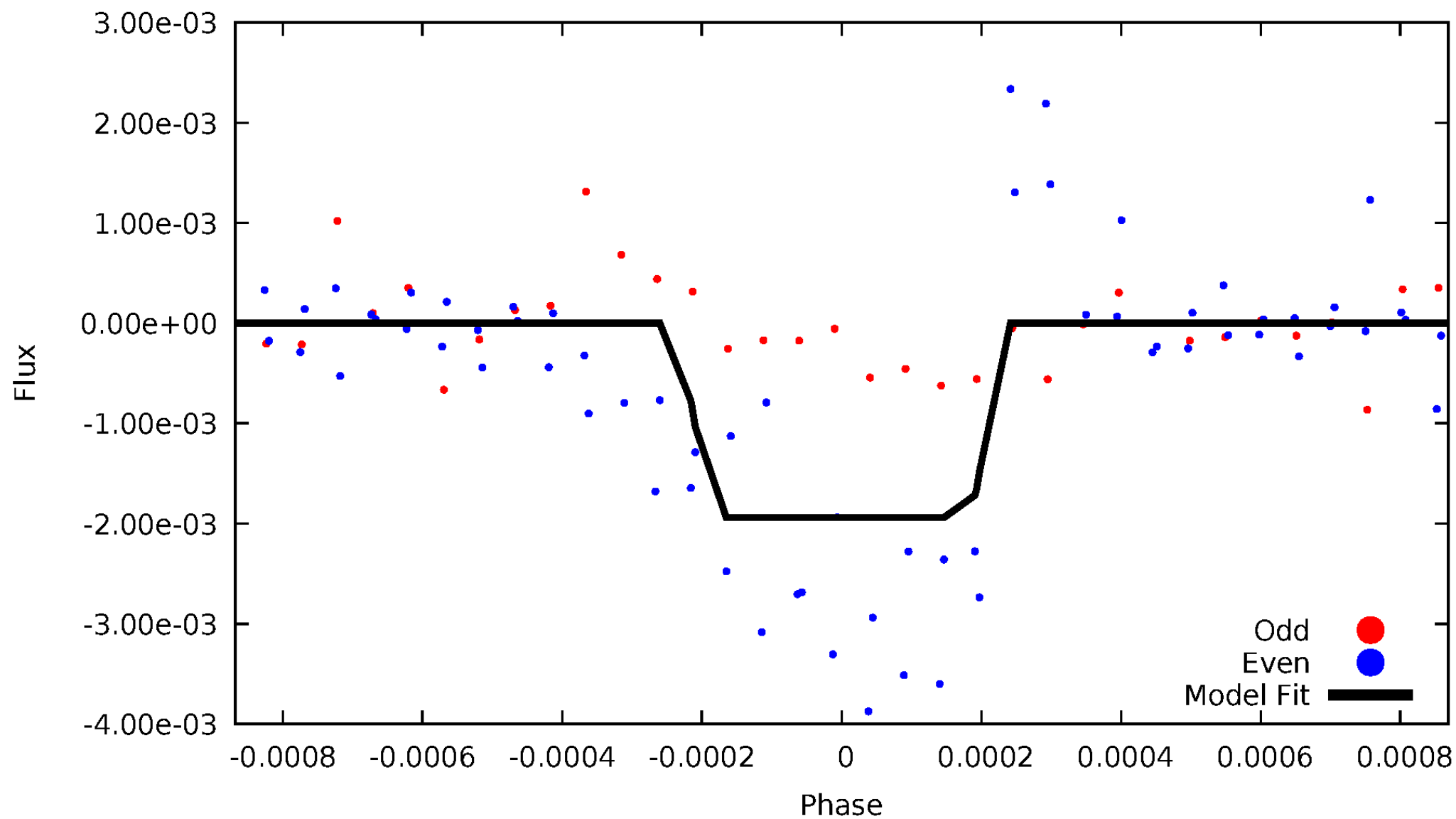
# DV Odd/Even

TCE 004274517-06



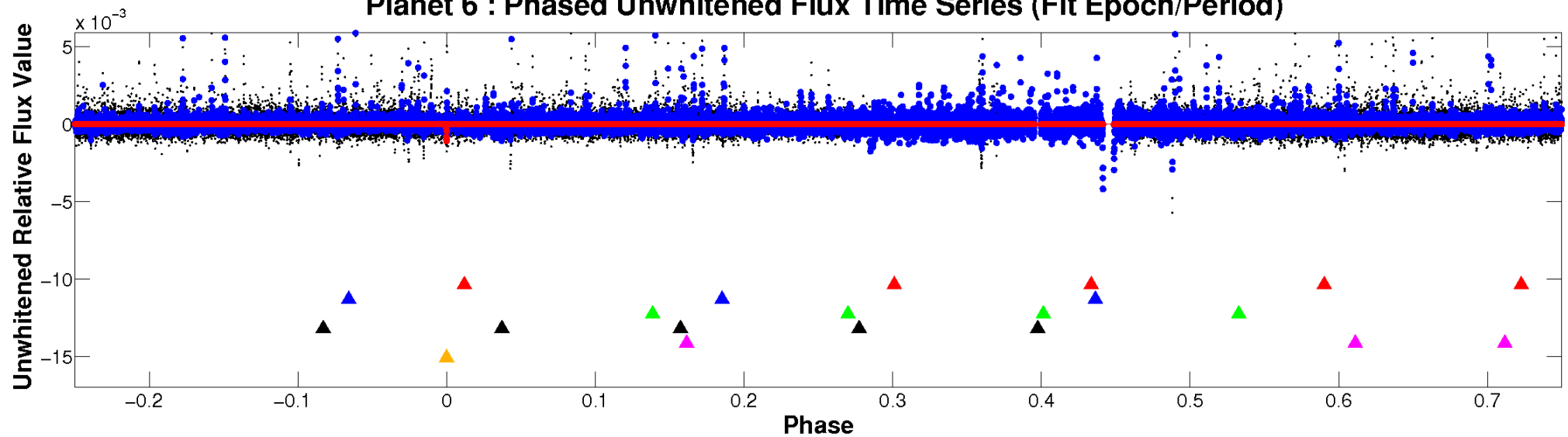
# ALT Odd/Even

TCE 004274517-06

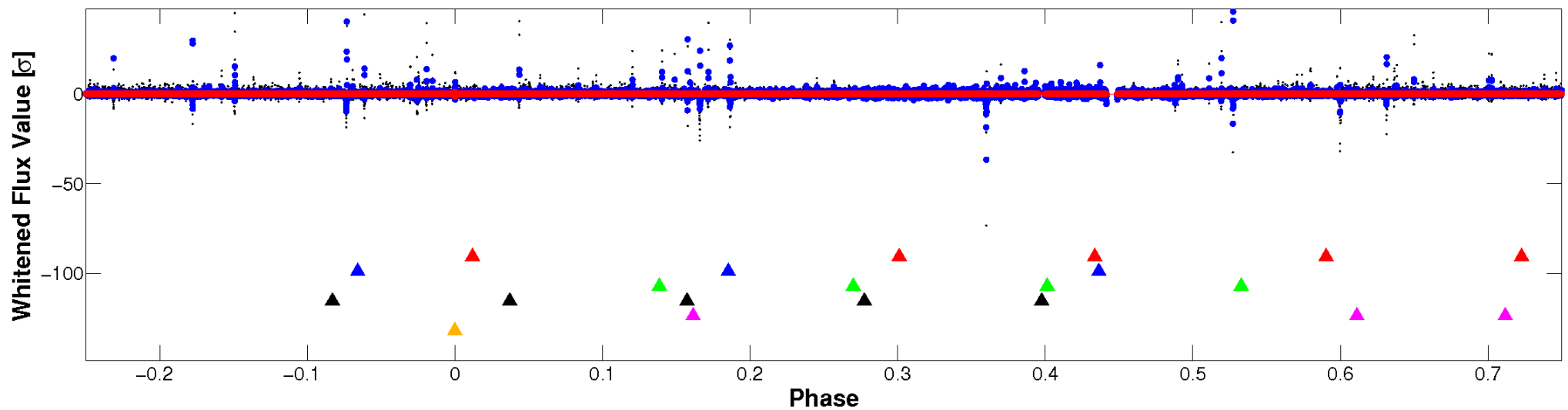


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

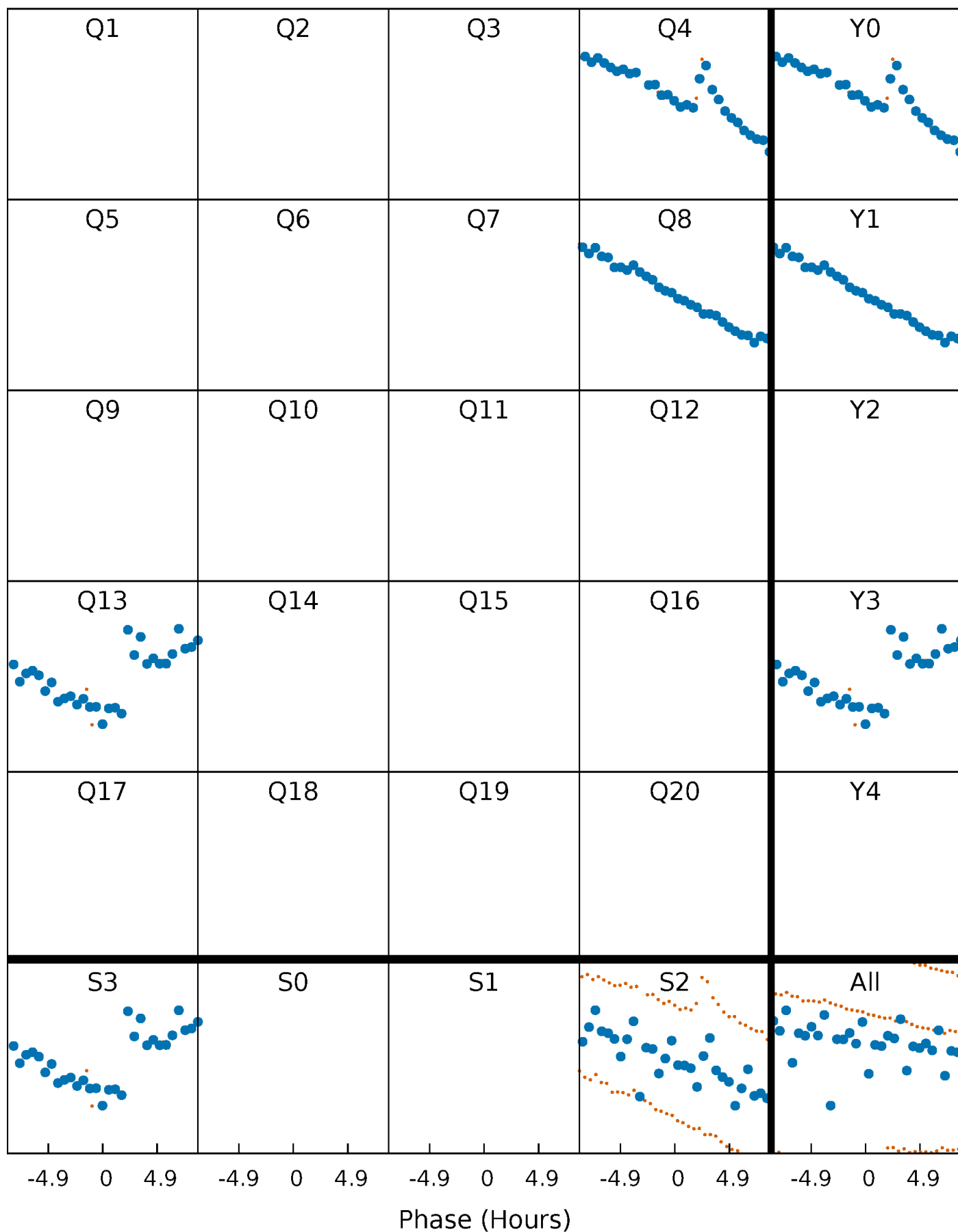


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



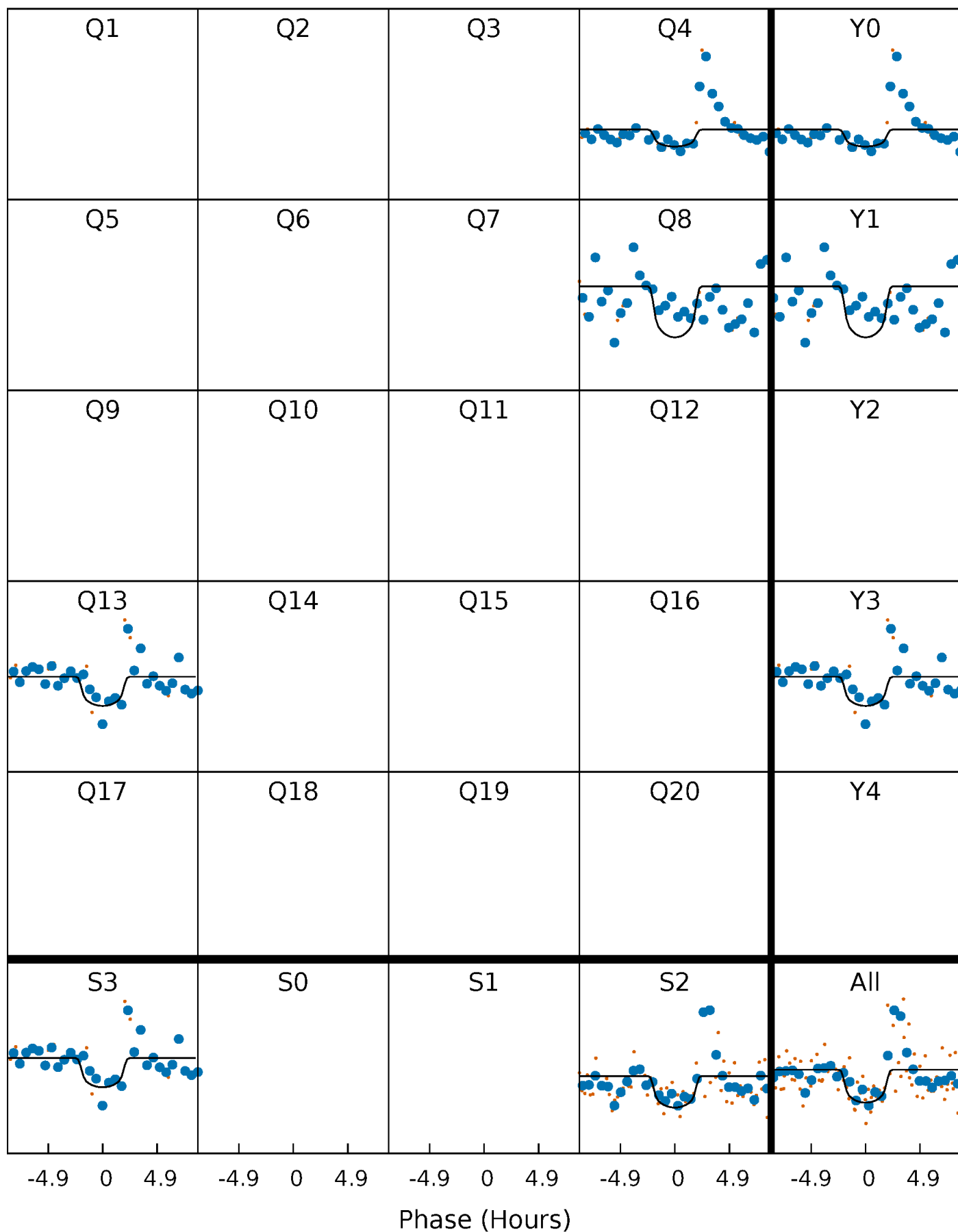
# PDC Quarter-Phased Transit Curves

TCE 004274517-06 P=401.856814 Days  $T_0=389.422325$  (BKJD)



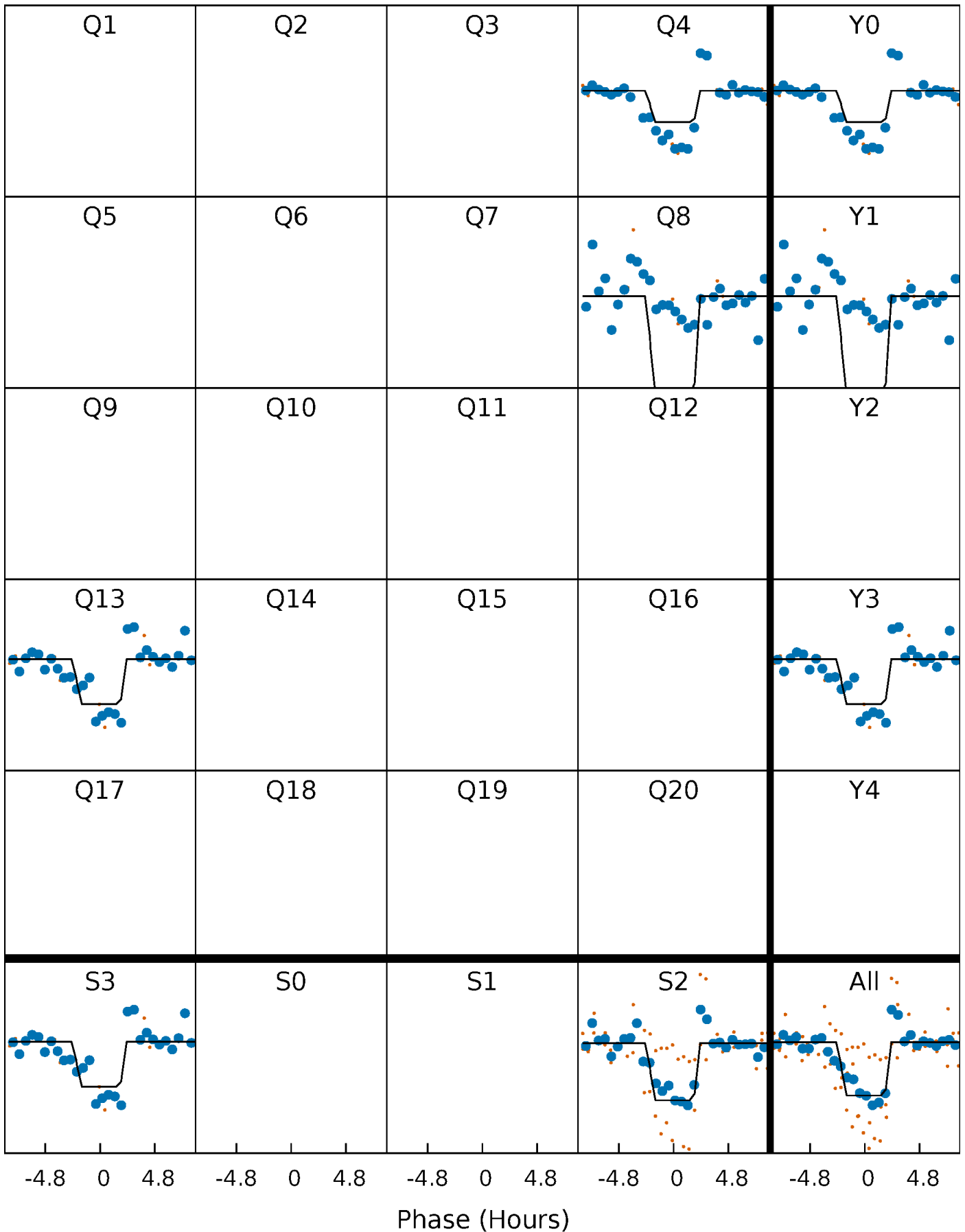
# DV Quarter-Phased Transit Curves

TCE 004274517-06     $P=401.856814$  Days     $T_0=389.422325$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

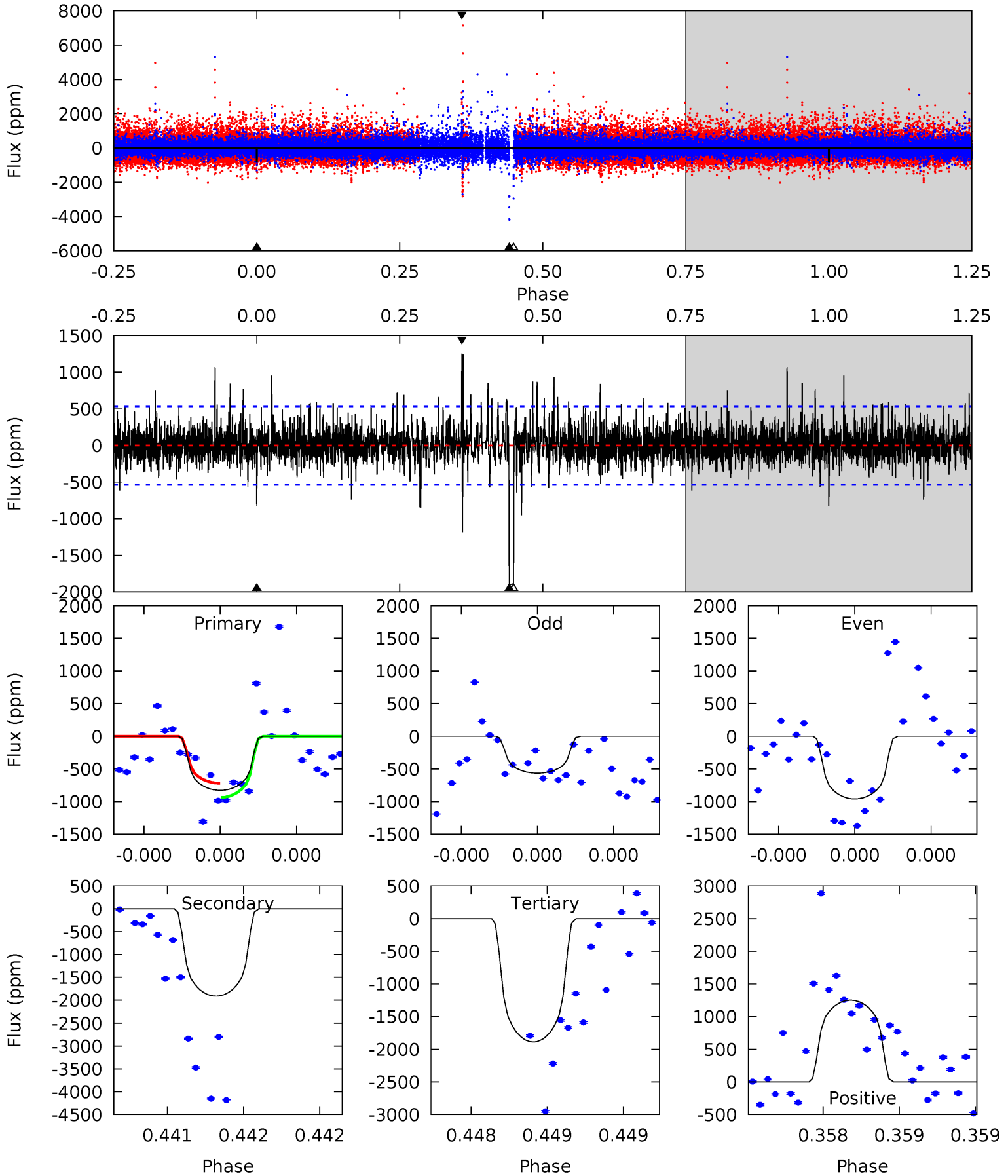
TCE 004274517-06 P=401.846391 Days  $T_0=389.426785$  (BKJD)



# DV Model-Shift Uniqueness Test

004274517-06, P = 401.856814 Days, E = 389.422325 Days

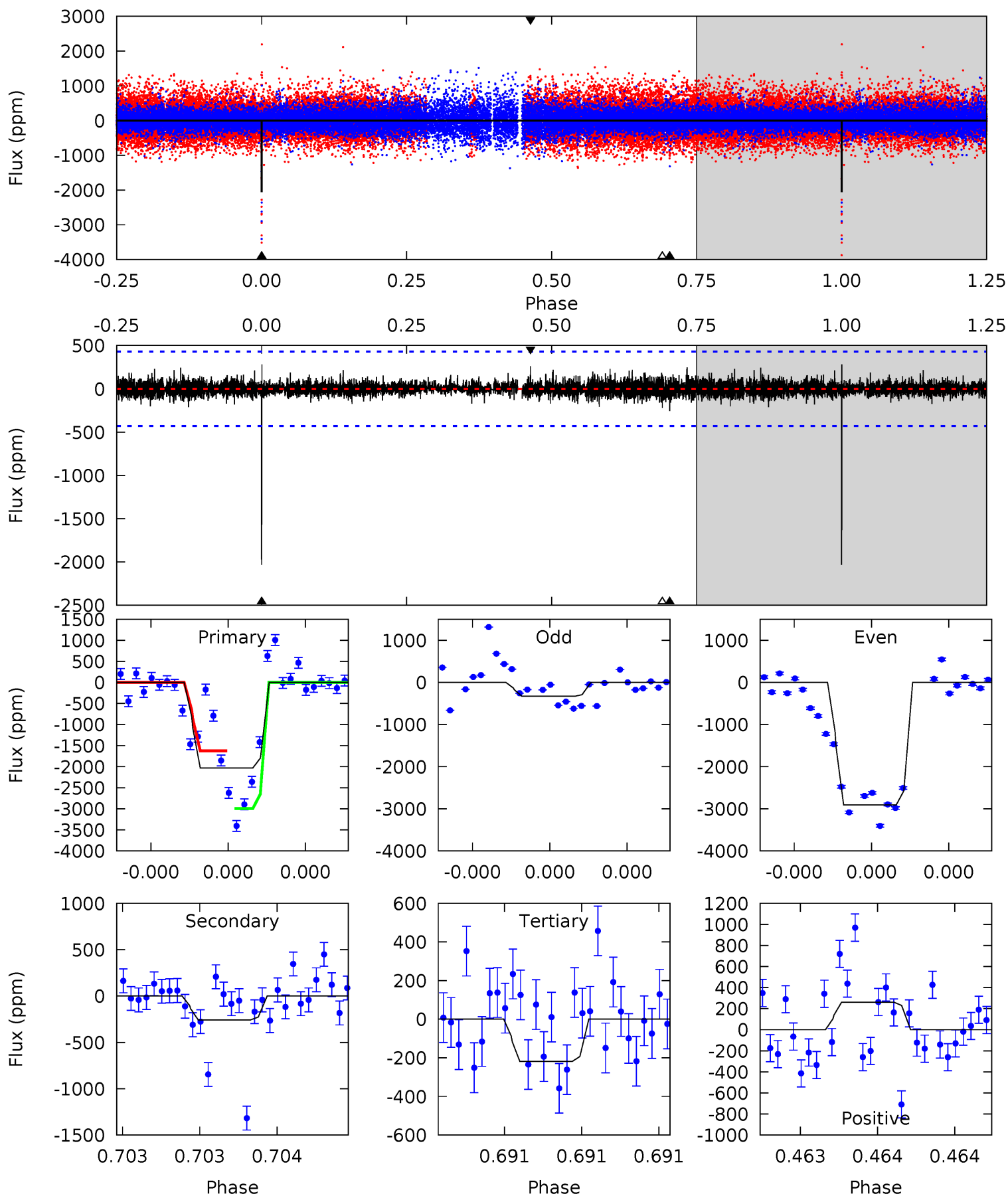
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.63	19.9	19.7	13.0	5.59	3.50	1.87	-11.0	-4.40	0.22	6.86	1.13	0.95	0.40	1.13



# Alt Model-Shift Uniqueness Test

004274517-06, P = 401.846391 Days, E = 389.426785 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
26.3	3.33	2.83	3.38	5.59	3.50	0.63	23.5	23.0	0.50	-0.05	18.5	0.88	0.12	8.67





### Stellar Parameters For KIC 004274517

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4447^{+133}_{-133}$	$4.620^{+0.049}_{-0.024}$	$-0.200^{+0.300}_{-0.300}$	$0.648^{+0.046}_{-0.056}$	$0.638^{+0.068}_{-0.051}$	$3.308^{+0.767}_{-0.351}$
	+3%/-3%	+1%/-1%	+150%/-150%	+7%/-9%	+11%/-8%	+23%/-11%
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 004274517-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1910 \pm 96$	$2.48^{+1.78}_{-1.31}$	$228^{+8}_{-8}$	$4837^{+2141}_{-862}$	$145470^{+511388}_{-94338}$
Alt.	$-257 \pm 77$	$3.14^{+1.82}_{-1.56}$	$229^{+7}_{-8}$	$3134^{+775}_{-394}$	$11699^{+38829}_{-7213}$

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

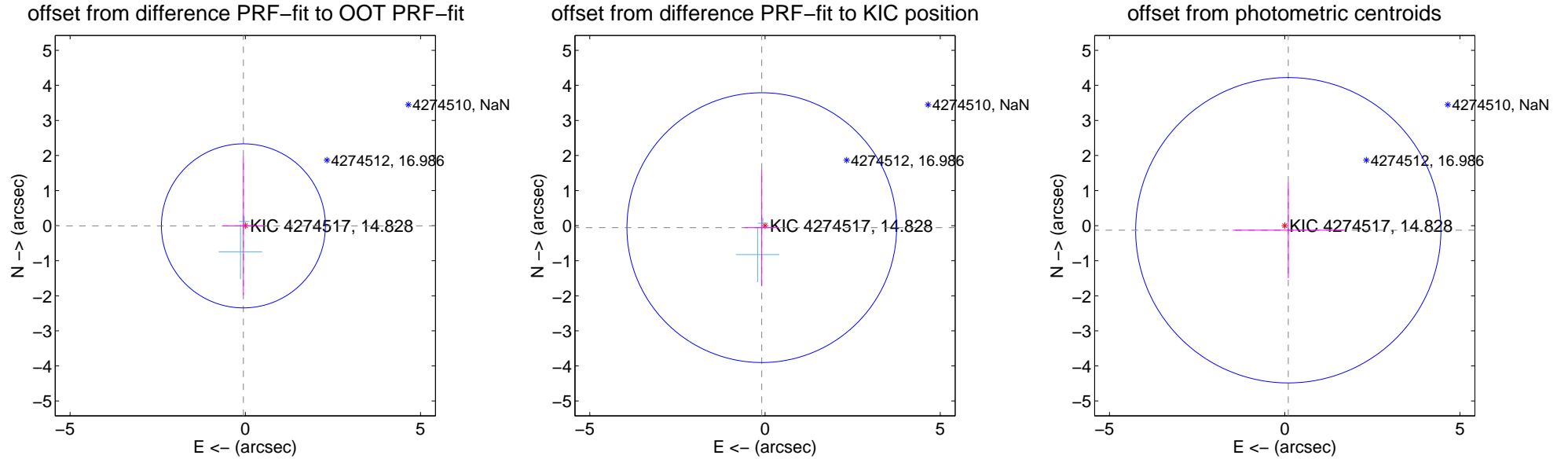
## DV Centroid Data

Supplemental centroid analysis for 004274517-06. Kepler magnitude: 14.83. Transit SNR 6.96

There are 2 quarters with good PRF difference image offsets

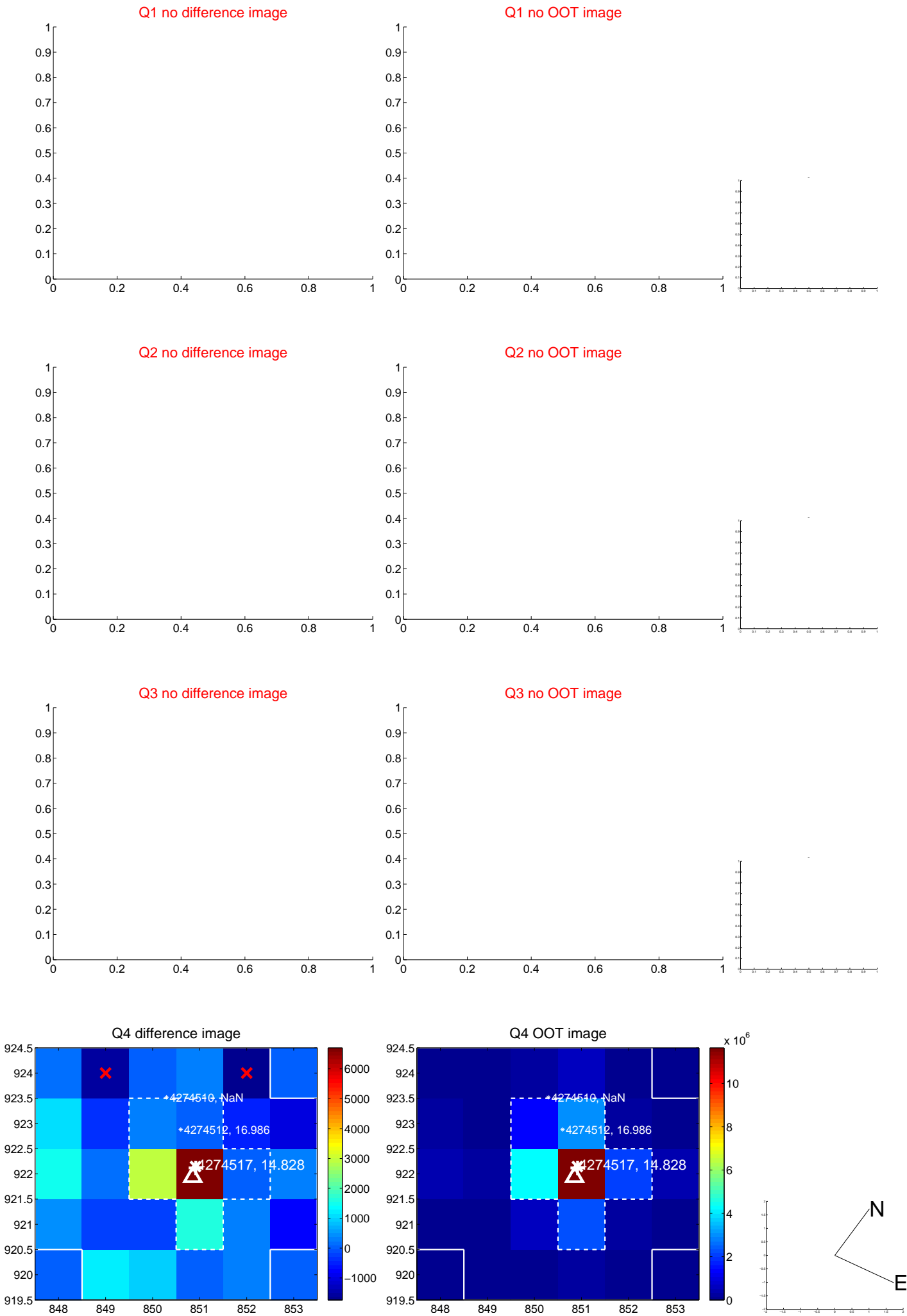
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.055 \pm 0.780$	0.07	$0.055 \pm 0.582$	$-0.006 \pm 1.978$
PRF-fit source offset from KIC position	$0.109 \pm 1.282$	0.08	$0.093 \pm 0.496$	$-0.057 \pm 1.657$
photometric centroid source offset	$0.17 \pm 1.45$	0.11	$-0.10 \pm 1.58$	$-0.13 \pm 1.37$

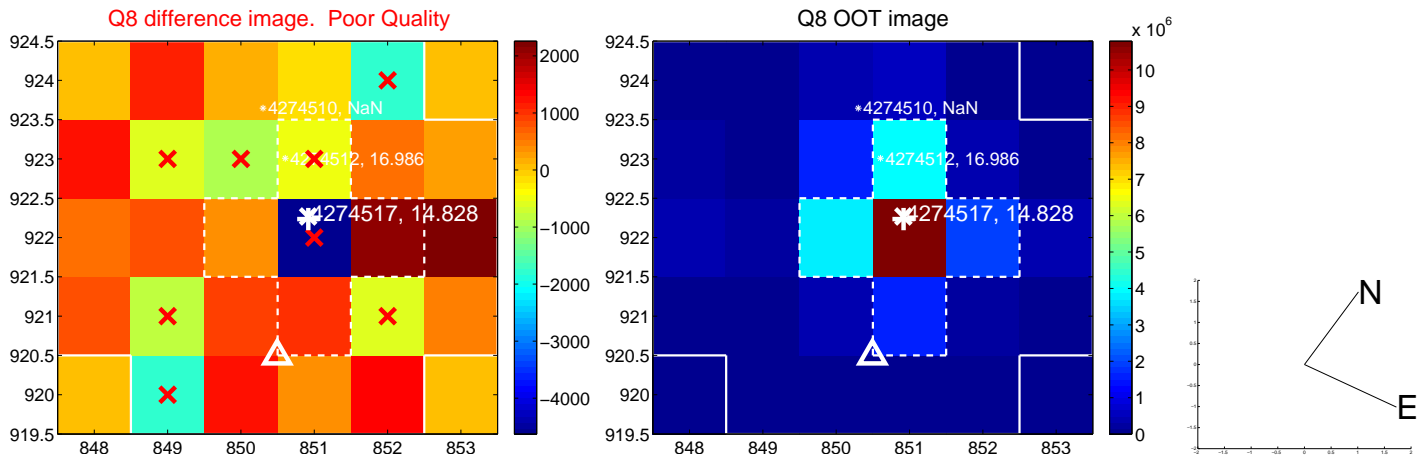
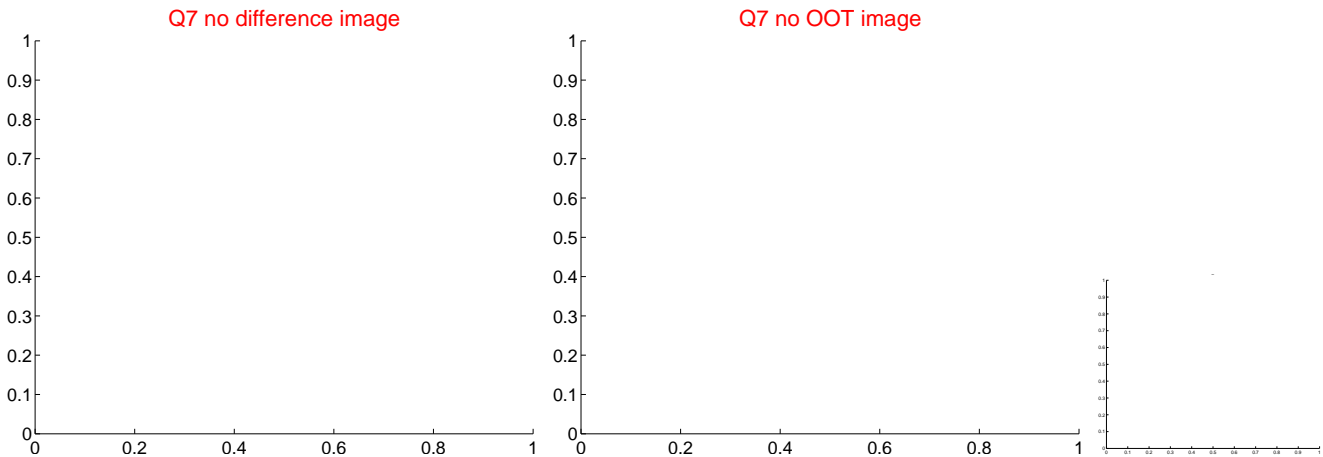
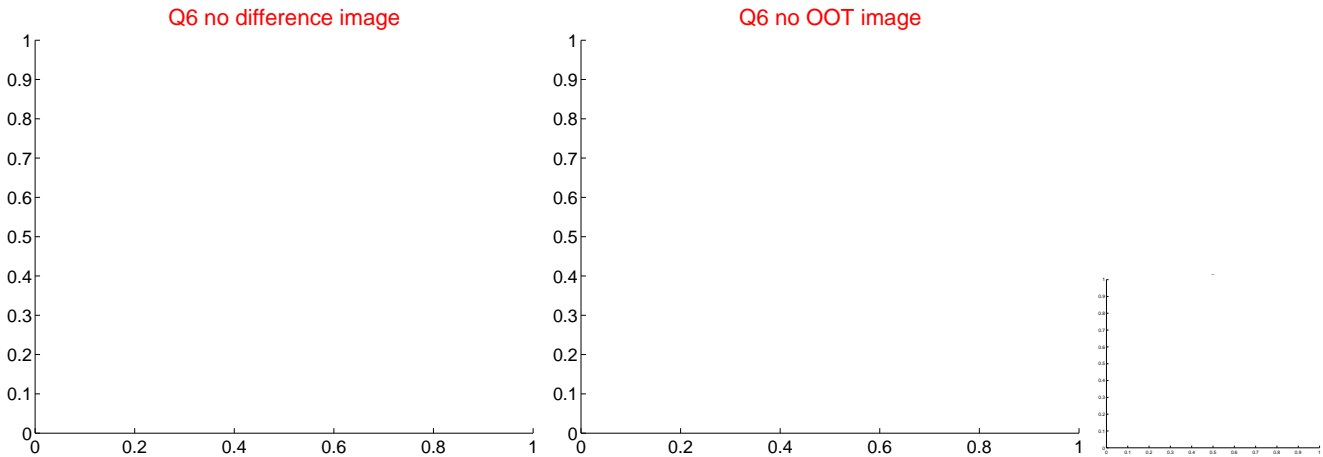
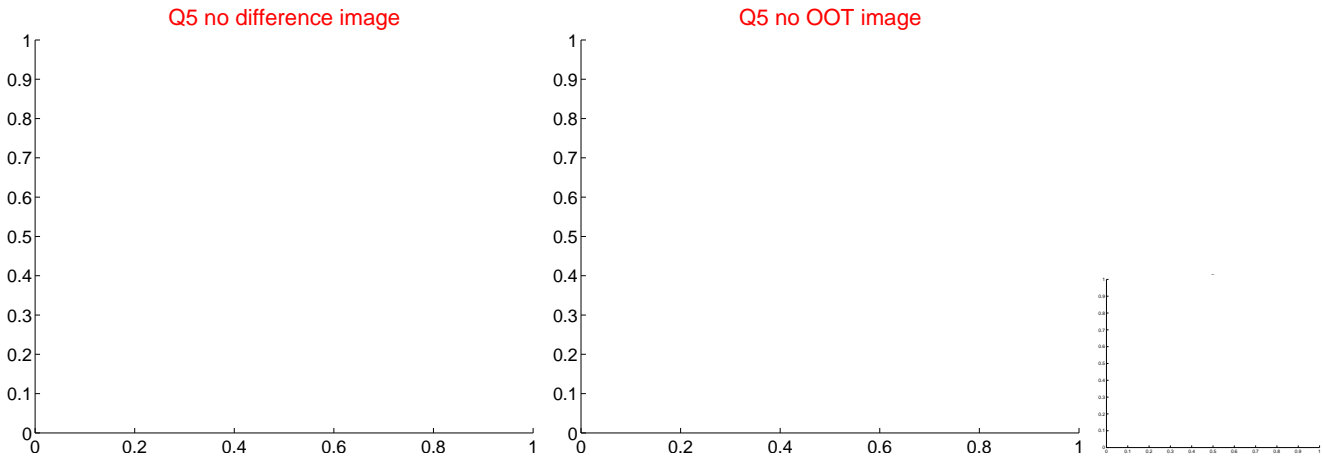


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



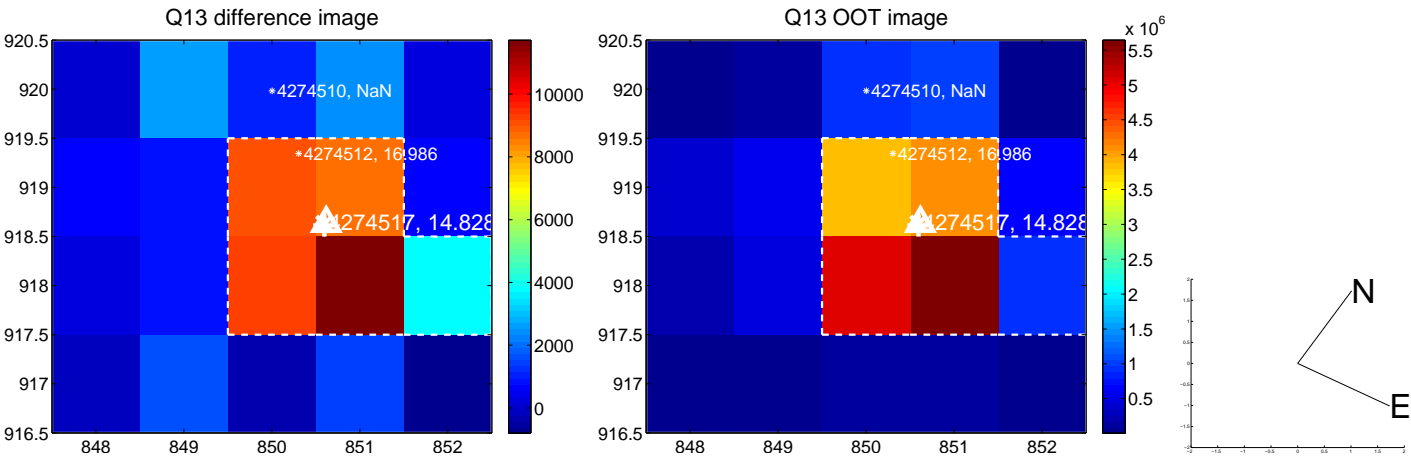
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



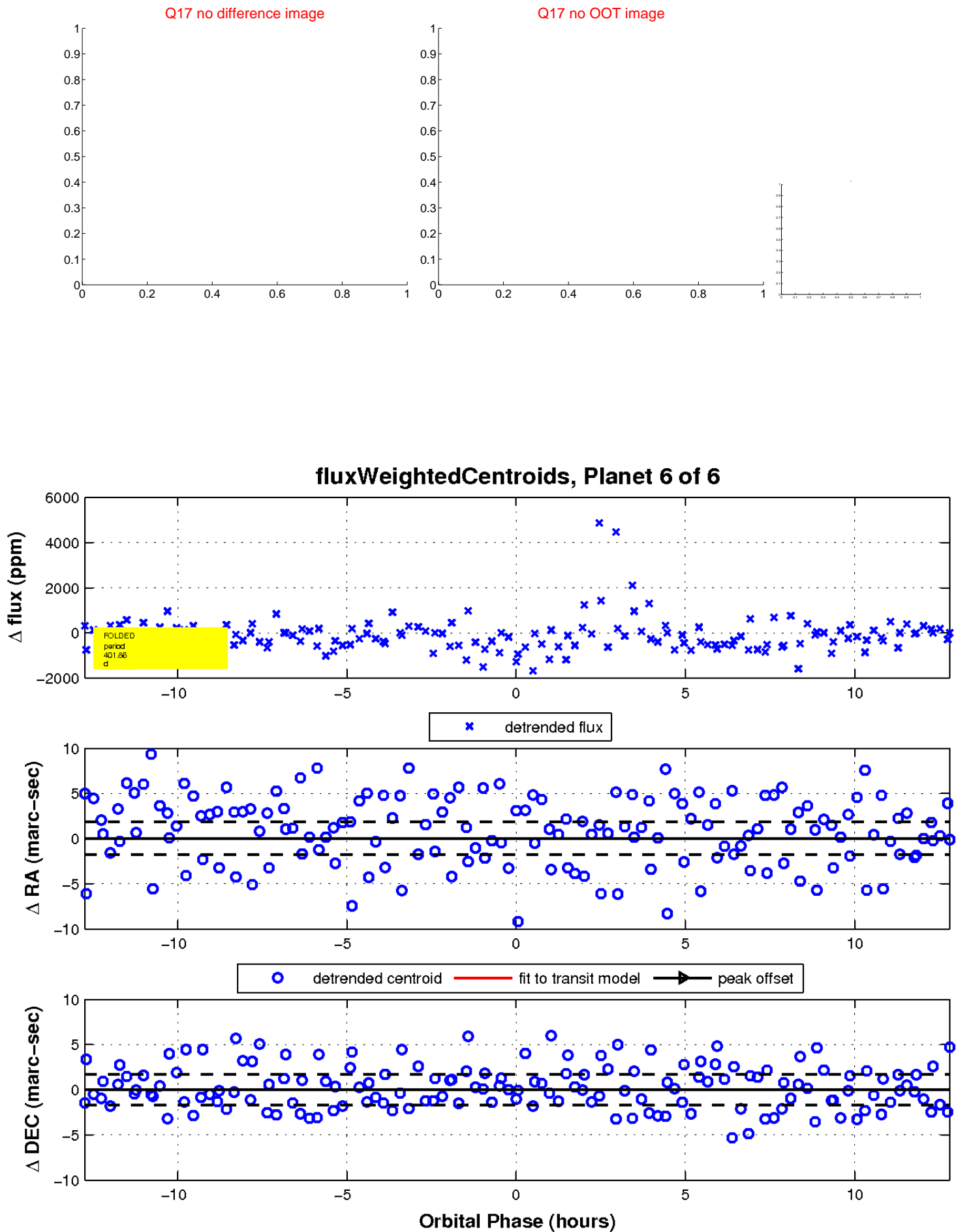
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image

Declination

