

# KIC 004374669

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004374669-01	OBS	No	245.312097	135.069845	13385.5	18.140	90.5	81.8	13.60	6223	276.87	184.08
004374669-04	OBS	No	219.885539	149.172401	469.0	15.000	44.8	-1.0	13.60	6223	29.49	212.99
004374669-05	OBS	No	703.472585	161.473609	3560.3	60.365	64.9	32.1	13.60	6223	93.64	45.18
004374669-06	OBS	No	284.971283	151.215757	611.7	3.500	35.9	-1.0	13.60	6223	33.70	150.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004374669-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA—LPP_DV—LPP_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004374669-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
004374669-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004374669-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

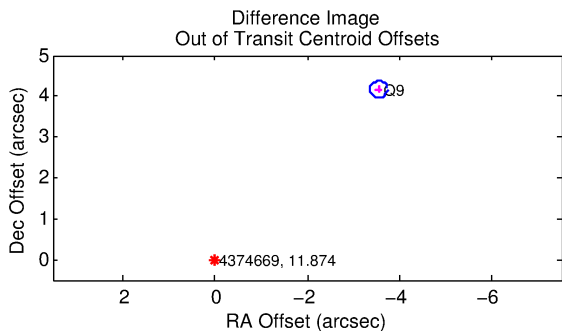
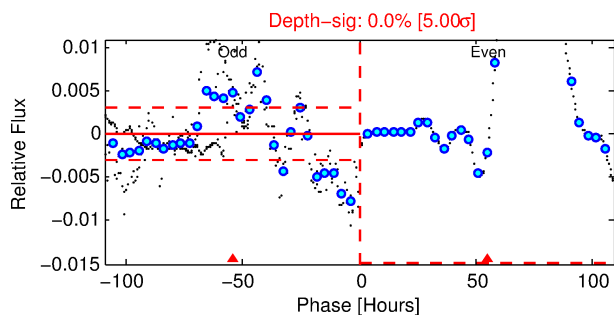
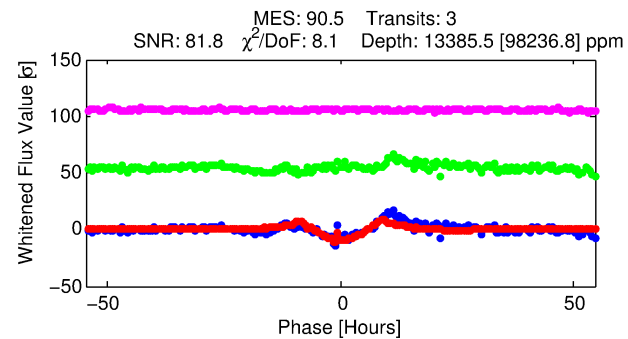
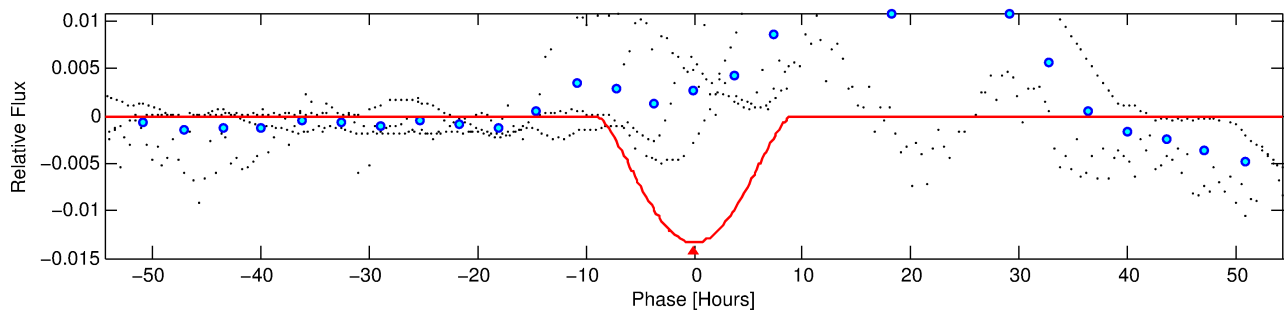
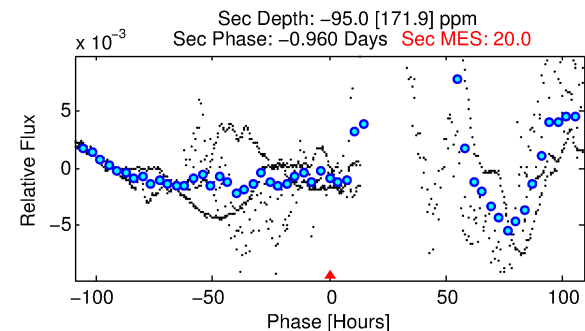
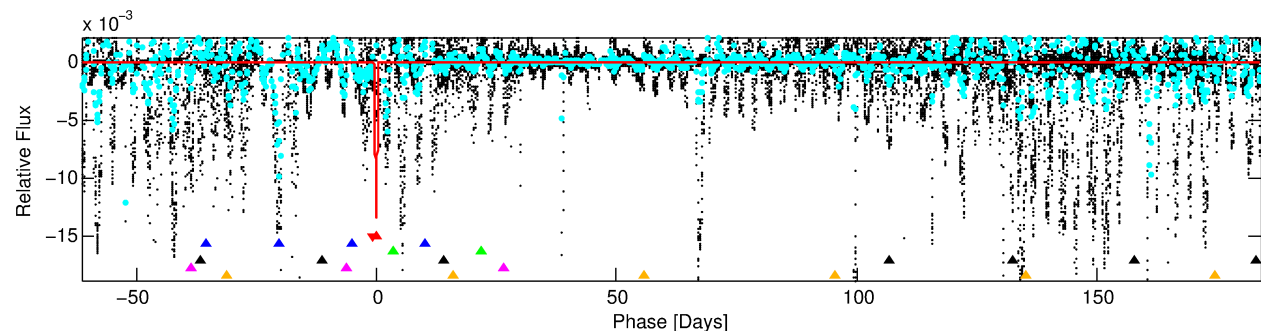
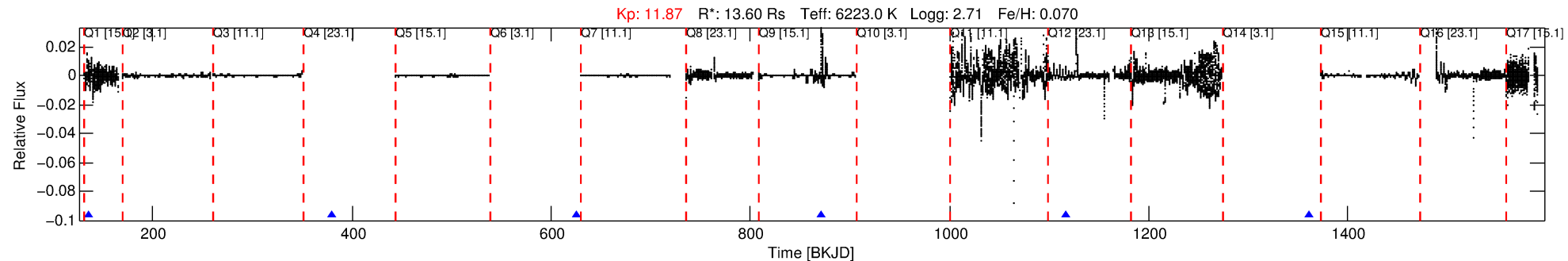
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004374669-01

No Significant Match Found

# DV One-Page Summary

KIC: 4374669 Candidate: 1 of 6 Period: 245.312 d



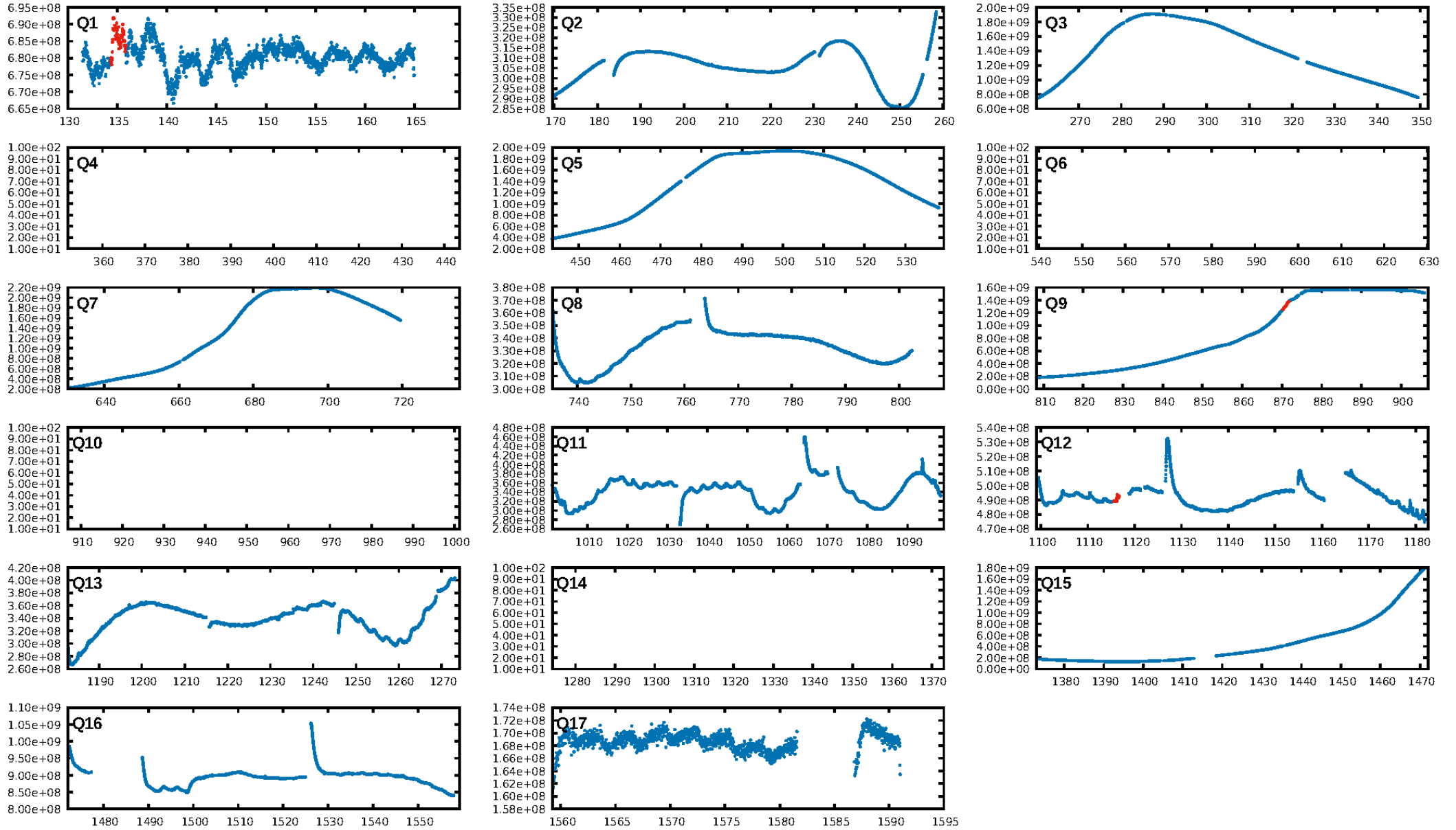
## DV Fit Results:

Period = 245.31210 [0.01088] d  
Epoch = 135.0698 [0.0329] BKJD  
Rp/R\* = 0.1865 [0.1223]  
a/R\* = 65.99 [5.41]  
b = 1.00 [0.74]  
Seff = 184.08 [348.51]  
Teff = 939 [445] K  
Rp = 276.87 [287.93] Re  
a = 1.1621 [1.2236] AU  
Ag = N/A  
Teffp = N/A

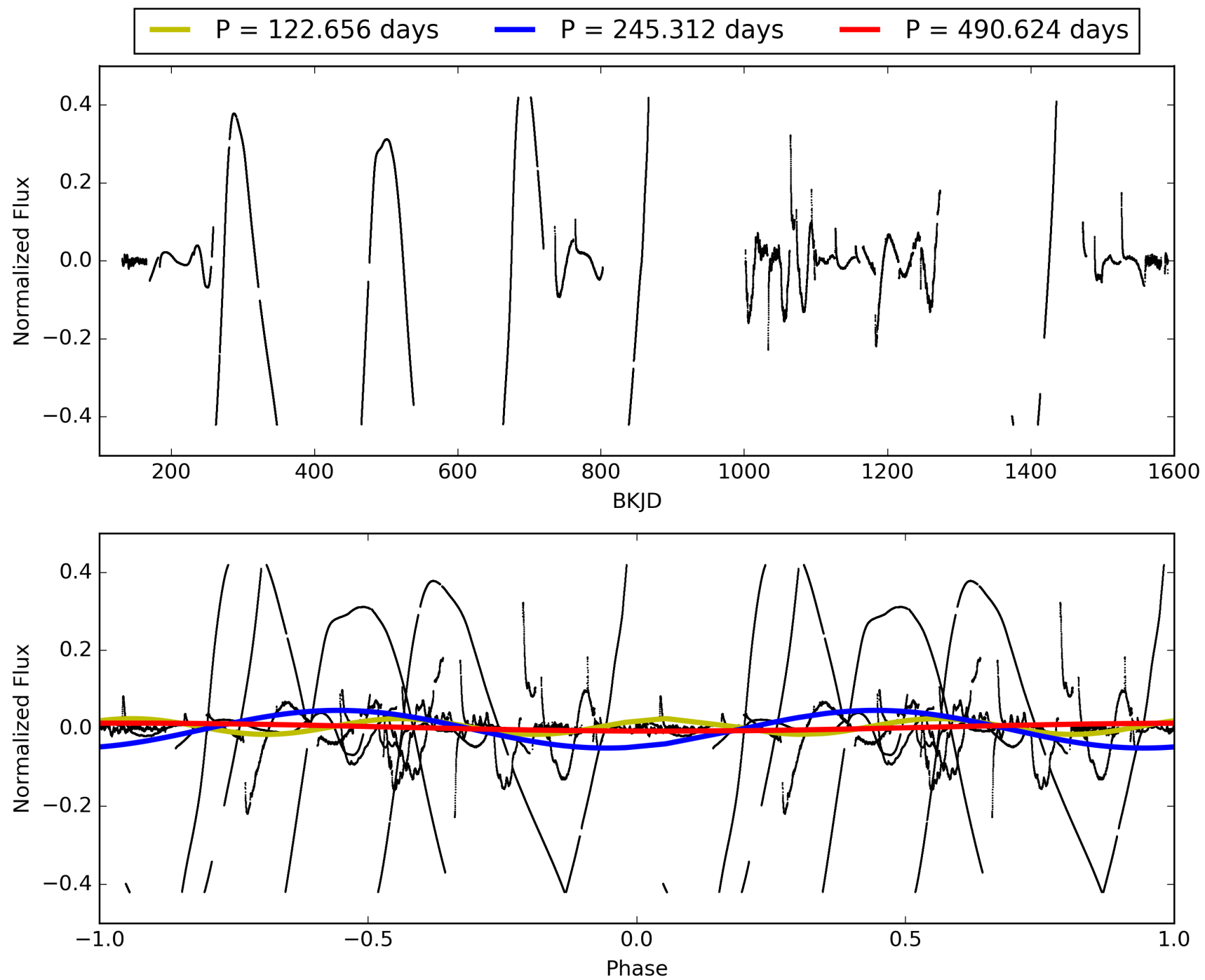
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [25.93 $\sigma$ ]  
LongPeriod-sig: 100.0% [51.52 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGoF-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -5.526  
Centroid-sig: 78.4%  
Centroid-so: 0.035 arcsec [0.11 $\sigma$ ]  
OotOffset-rm: 5.472 arcsec [82.02 $\sigma$ ]  
KicOffset-rm: 6.750 arcsec [101.17 $\sigma$ ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [2/2]

# TCE 004374669-01, PDC Light Curves

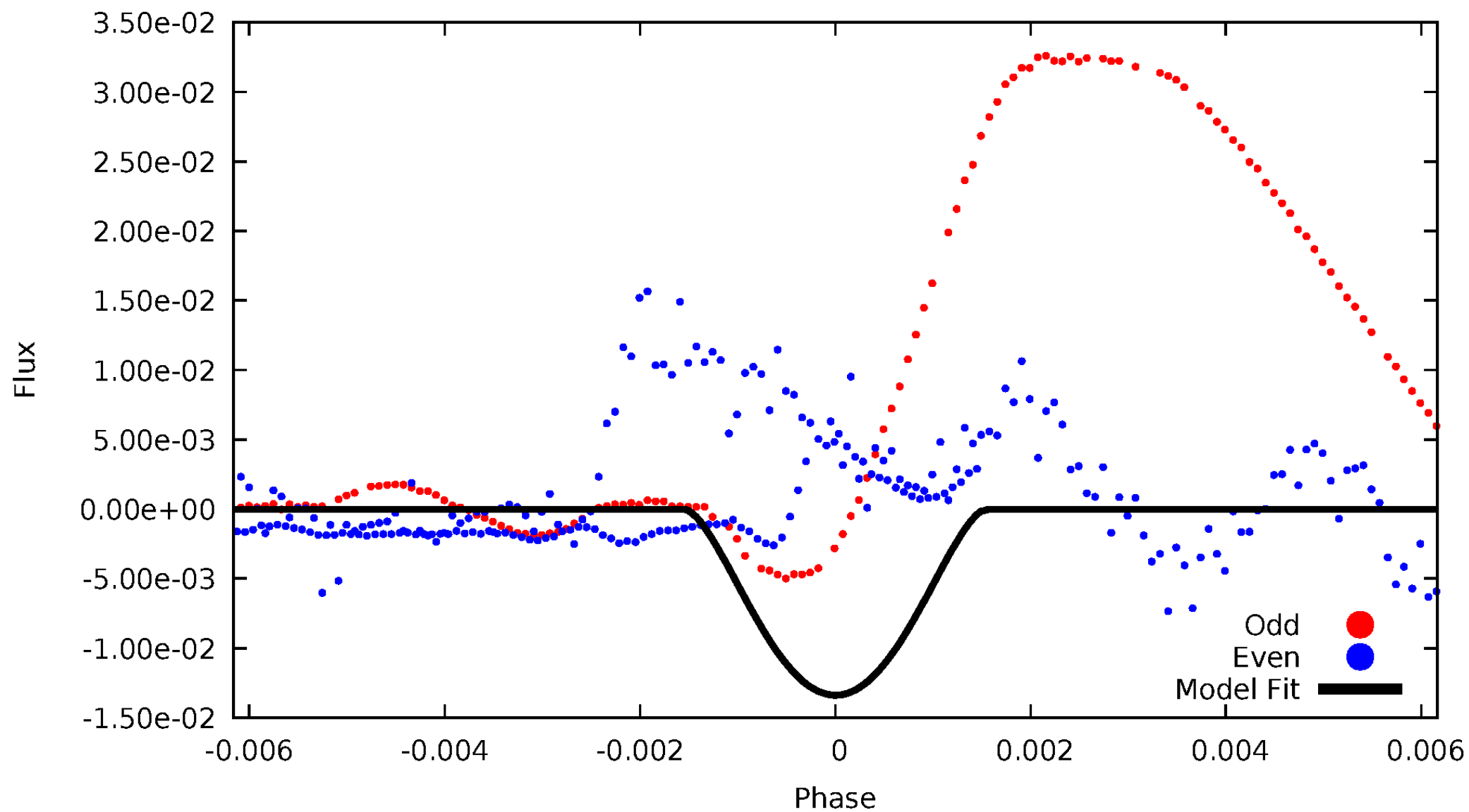


TCE 004374669-01



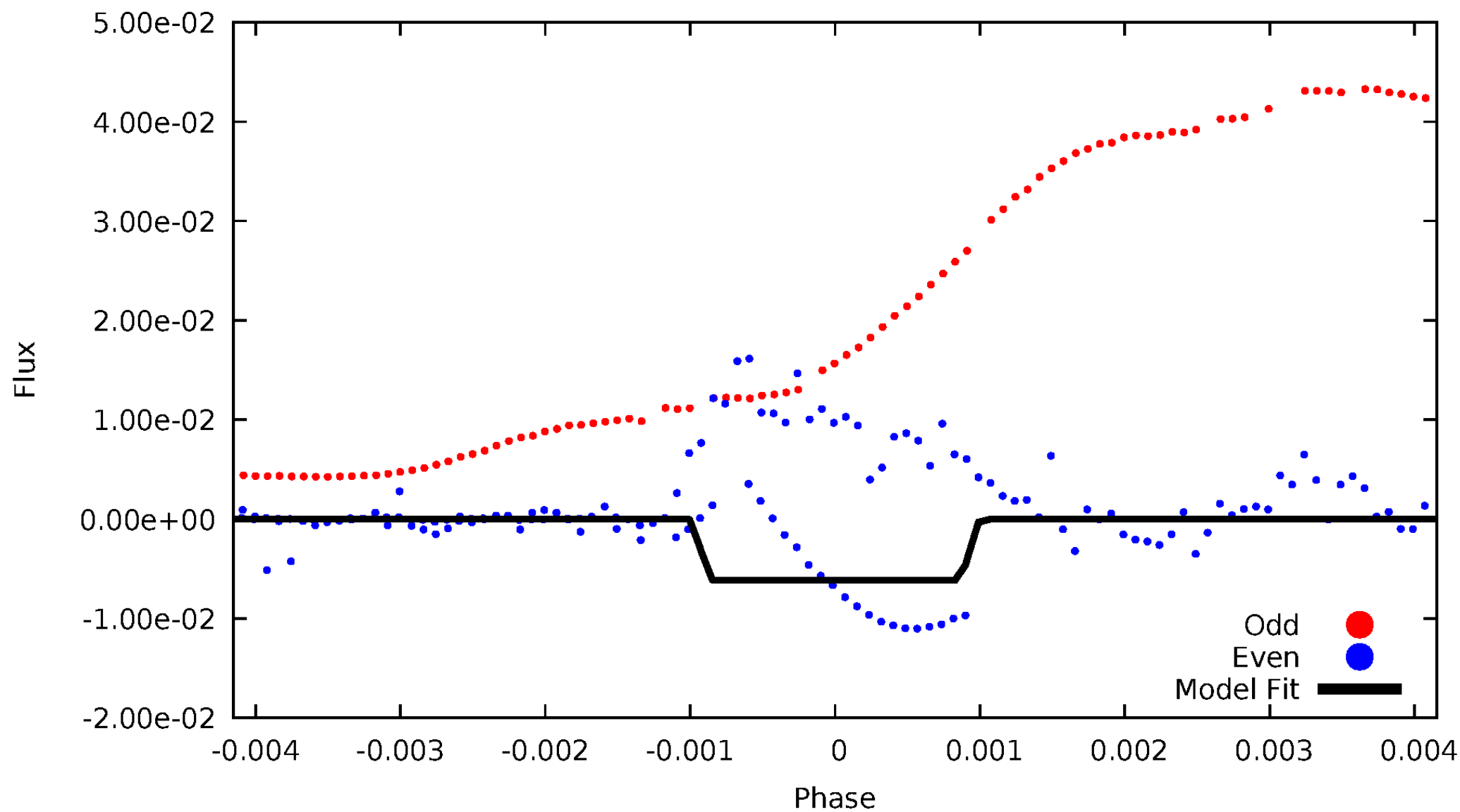
# DV Odd/Even

TCE 004374669-01



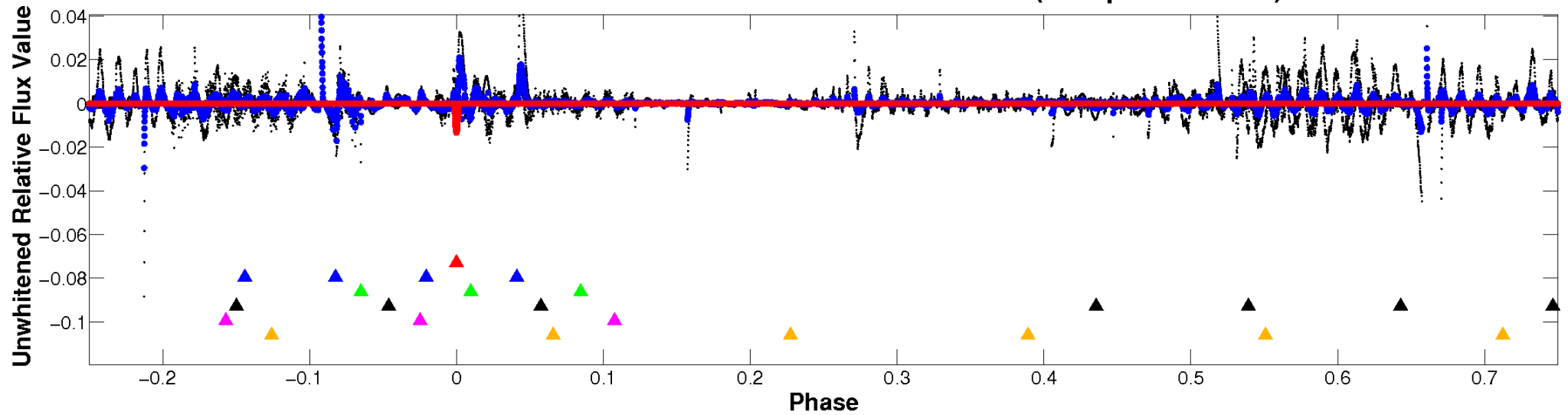
# ALT Odd/Even

TCE 004374669-01

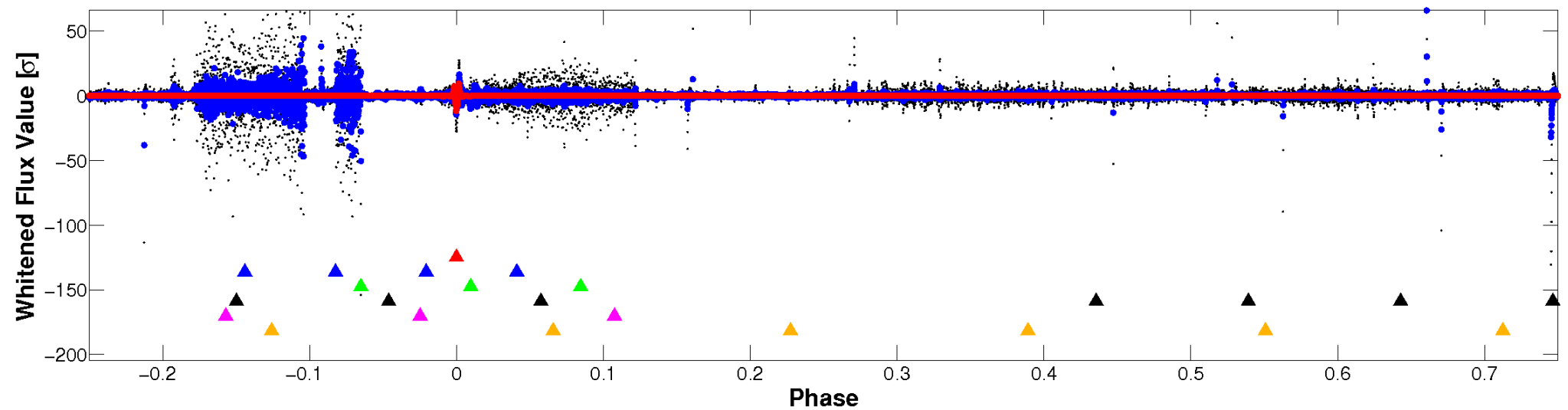


# Non-Whitened Vs. Whitened Light Curve

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

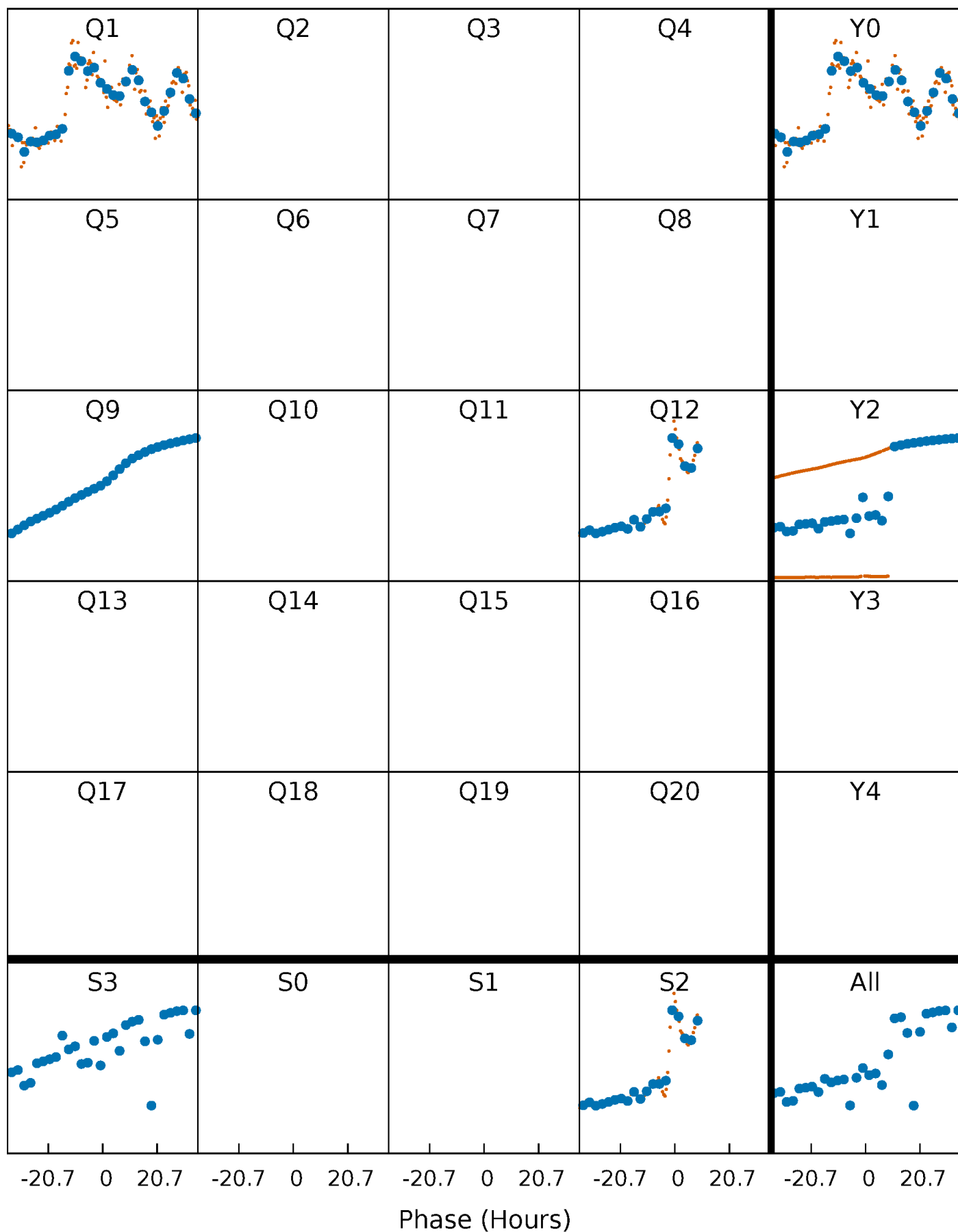


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

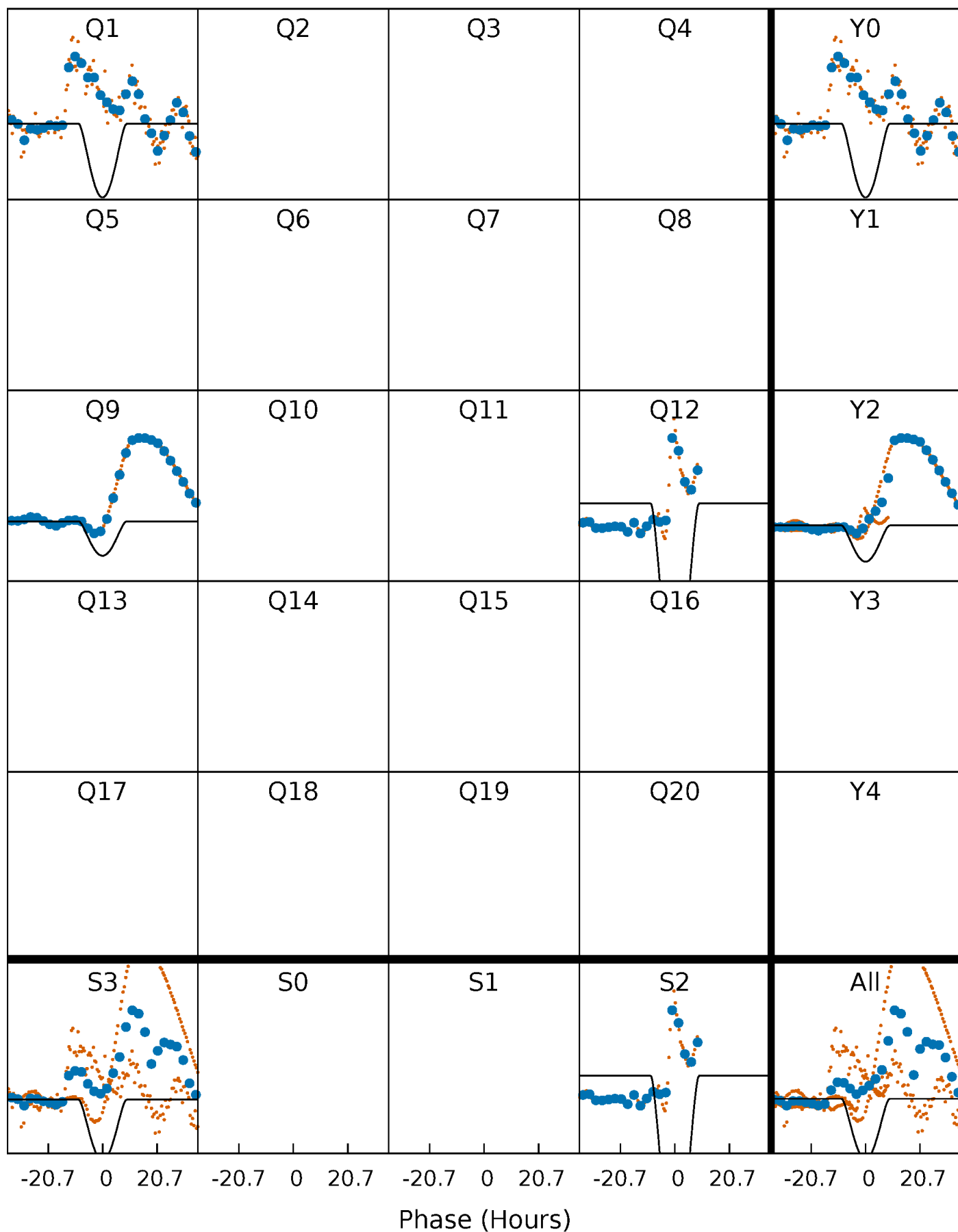
TCE 004374669-01     $P=245.312097$  Days     $T_0=135.069845$  (BKJD)





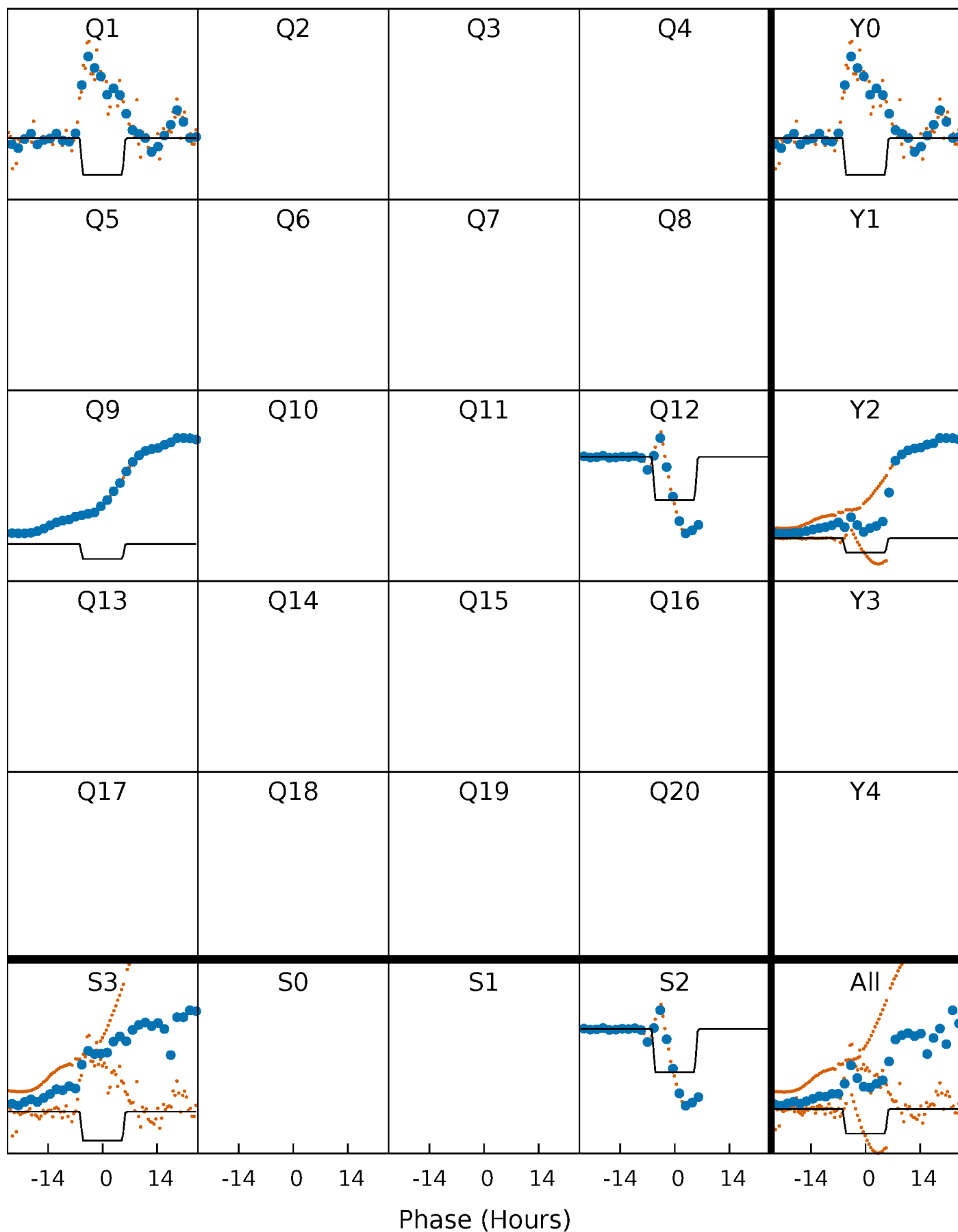
# DV Quarter-Phased Transit Curves

TCE 004374669-01 P=245.312097 Days  $T_0=135.069845$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

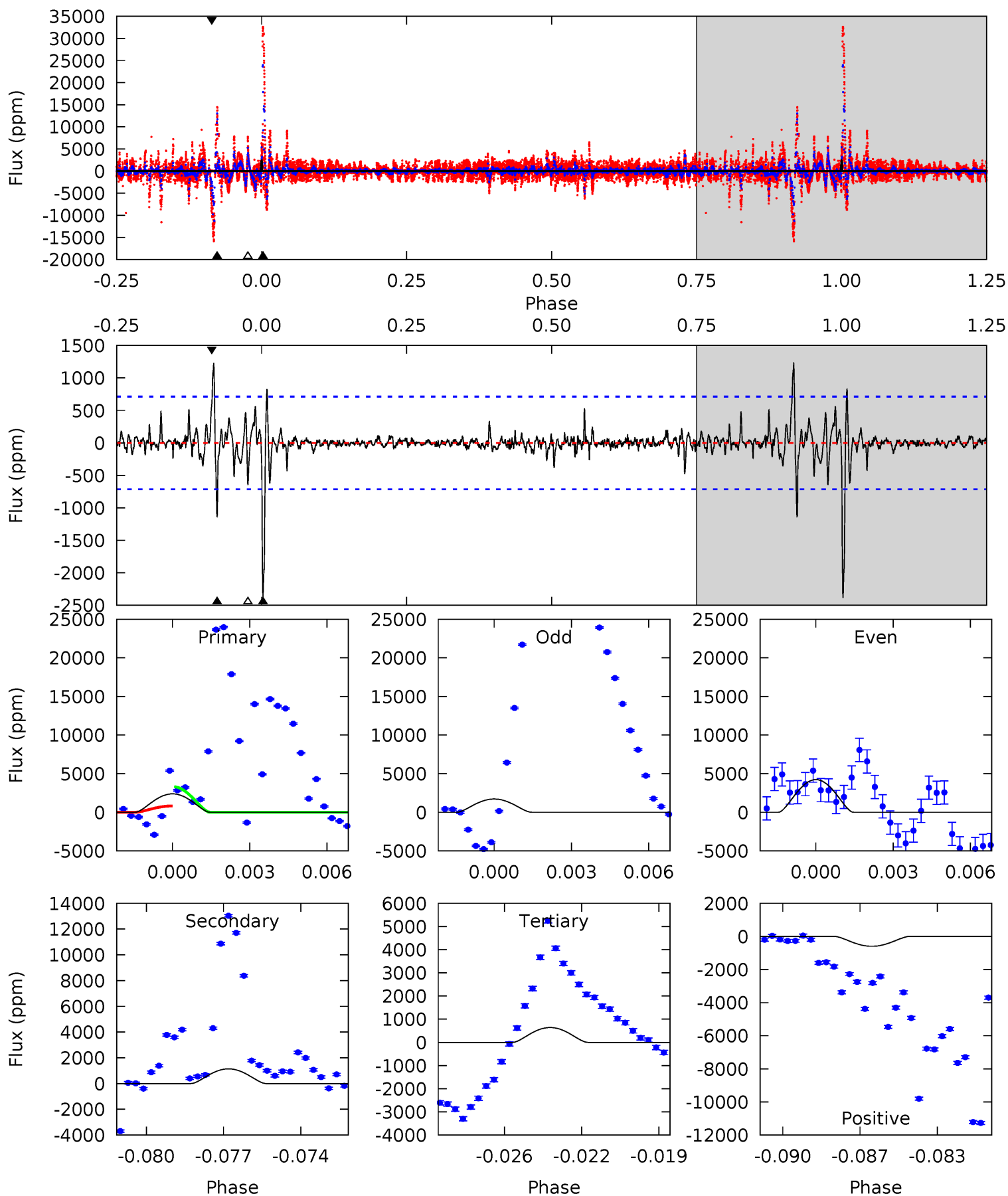
TCE 004374669-01 P=245.427489 Days  $T_0=134.743172$  (BKJD)



# DV Model-Shift Uniqueness Test

004374669-01, P = 245.312097 Days, E = 135.069845 Days

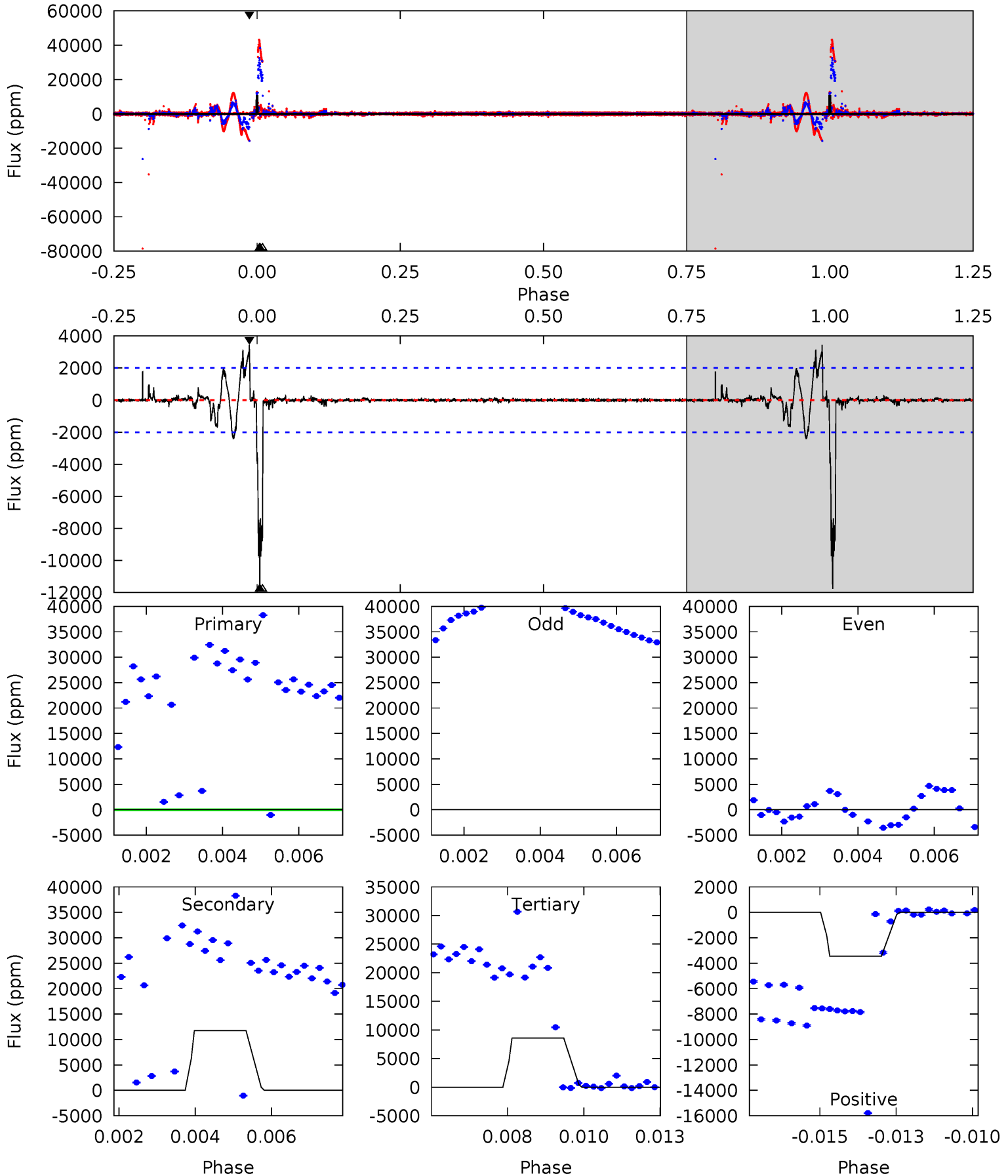
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.5	8.38	4.70	4.38	5.24	2.95	0.81	12.8	13.1	3.68	4.00	5.01	1.78	0.34	7.67



# Alt Model-Shift Uniqueness Test

004374669-01, P = 245.427489 Days, E = 134.743172 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
27.6	31.1	22.8	9.12	5.32	3.08	1.24	4.86	18.5	8.36	22.0	1.03	0.71	0.23	0



### Stellar Parameters For KIC 004374669

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6223^{+194}_{-216}$	$2.712^{+1.179}_{-0.197}$	$0.070^{+0.200}_{-0.400}$	$13.602^{+1.938}_{-10.982}$	$3.480^{+0.070}_{-2.137}$	$0.002^{+0.170}_{-0.001}$
	+3%/-3%	+43%/-7%	+286%/-571%	+14%/-81%	+2%/-61%	+8742%/-43%
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 004374669-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1142 \pm 136$	$232.82^{+212.23}_{-143.27}$	$1299^{+107}_{-276}$	$3183^{+1034}_{-429}$	$14^{+79}_{-10}$
Alt.	$-11759 \pm 378$	$140.55^{+161.01}_{-97.25}$	$1289^{+112}_{-286}$	$5952^{+5476}_{-1390}$	$426^{+3897}_{-335}$

$T_{max}$  = 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

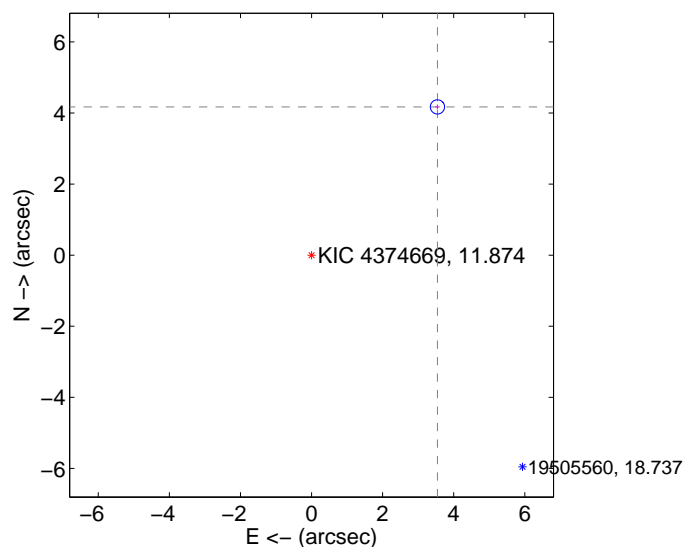
Supplemental centroid analysis for 004374669-01. **Kepler magnitude: 11.87.** Transit SNR 81.78

**There are 0 quarters with good PRF difference image offsets**

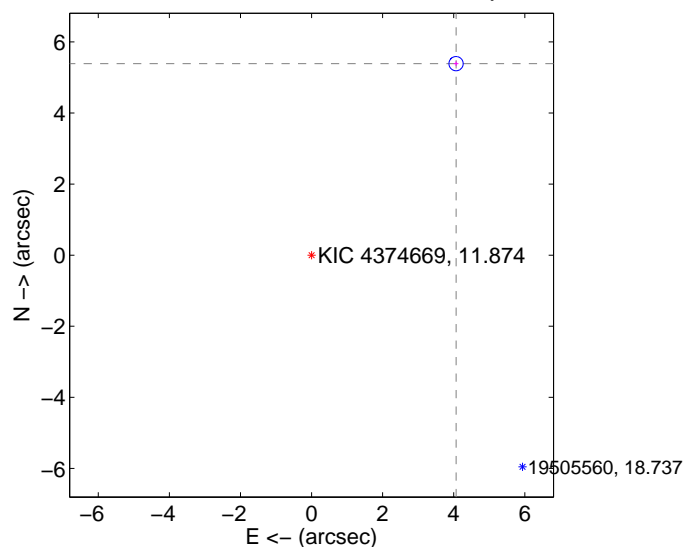
The direct PRF centroid is offset from the target star catalog position by about 1.32 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>5.472 <math>\pm</math> 0.067</b>	<b>82.02</b>	-3.542 $\pm$ 0.067	4.171 $\pm$ 0.067
PRF-fit source offset from KIC position	<b>6.750 <math>\pm</math> 0.067</b>	<b>101.17</b>	-4.065 $\pm$ 0.067	5.388 $\pm$ 0.067
photometric centroid source offset	0.04 $\pm$ 0.32	0.11	-0.02 $\pm$ 0.23	0.03 $\pm$ 0.36

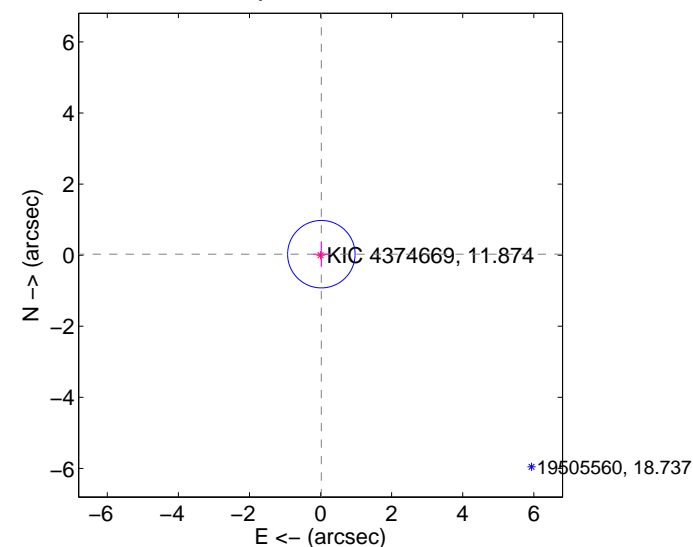
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

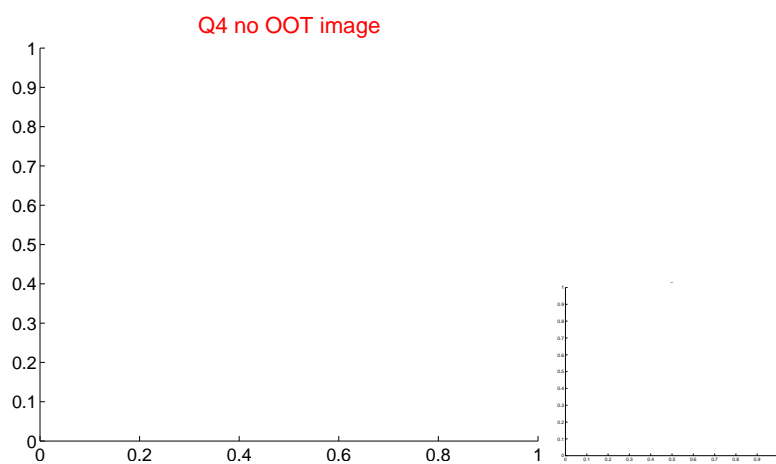
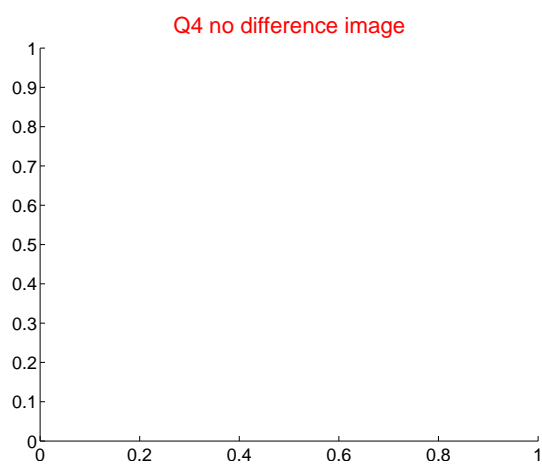
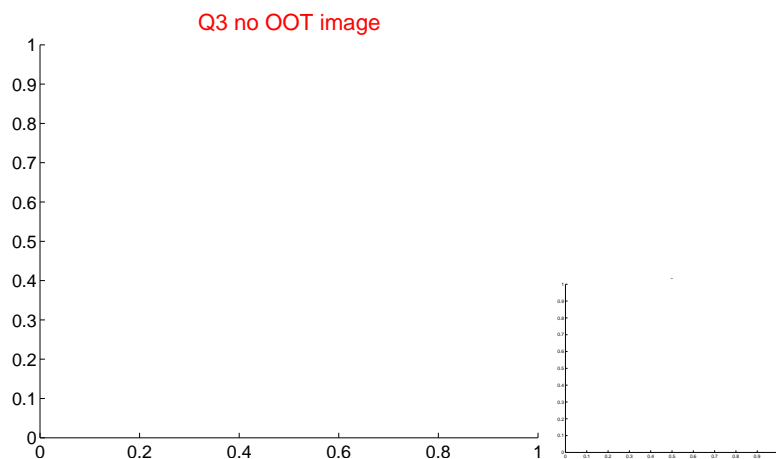
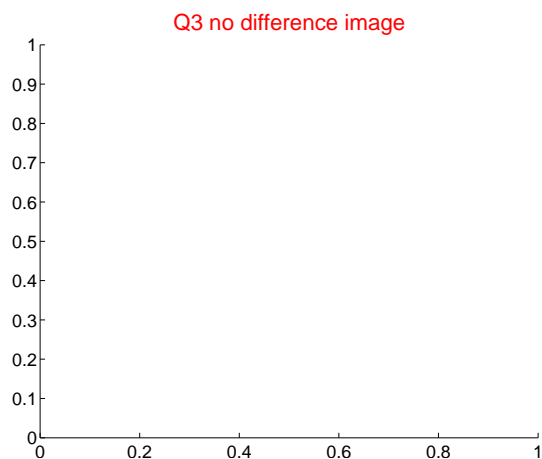
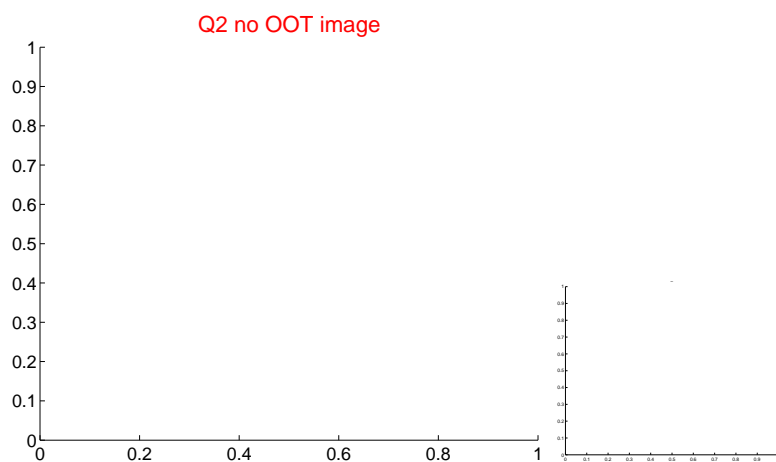
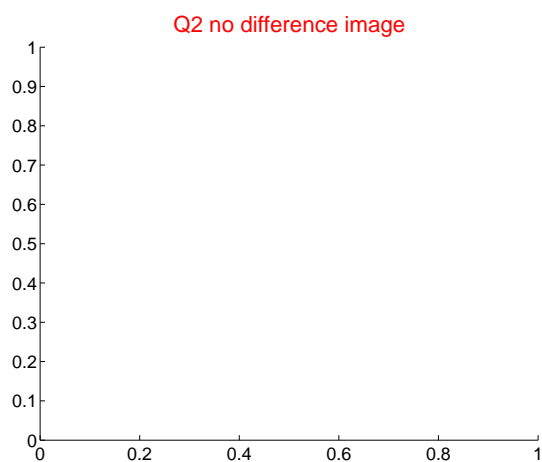
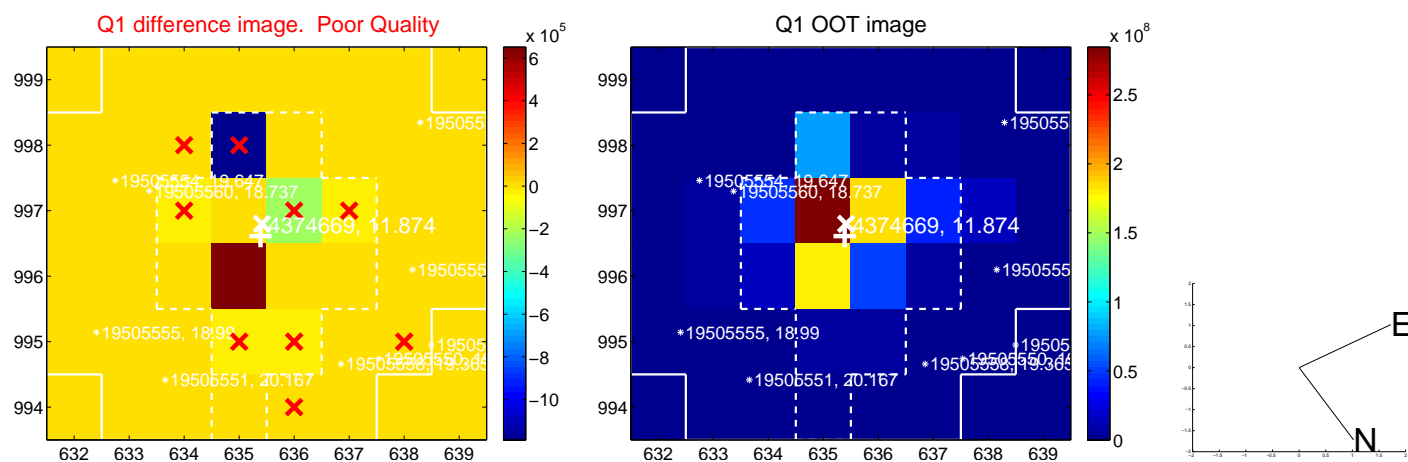


offset from photometric centroids



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

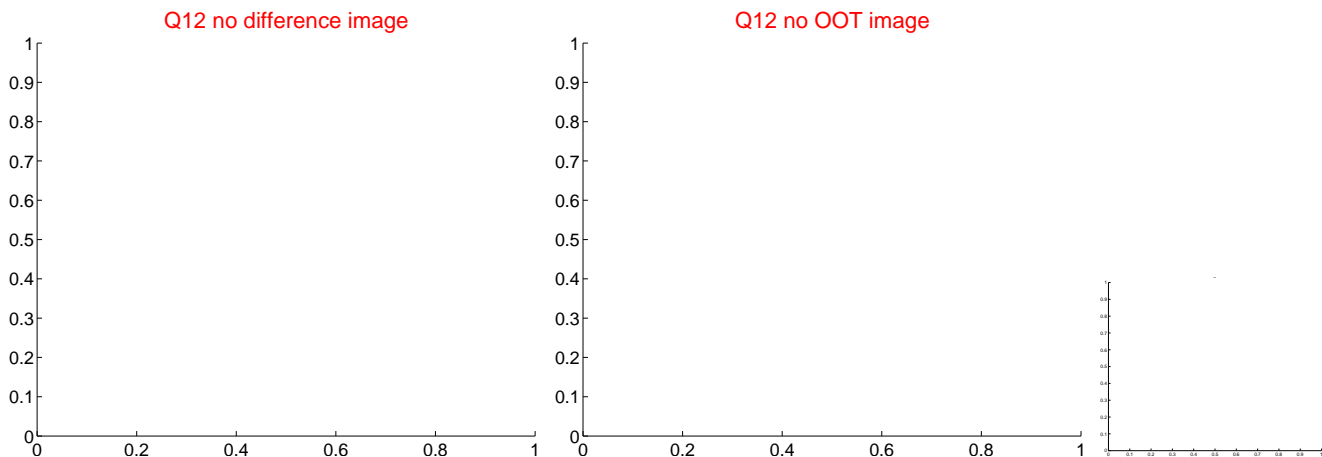
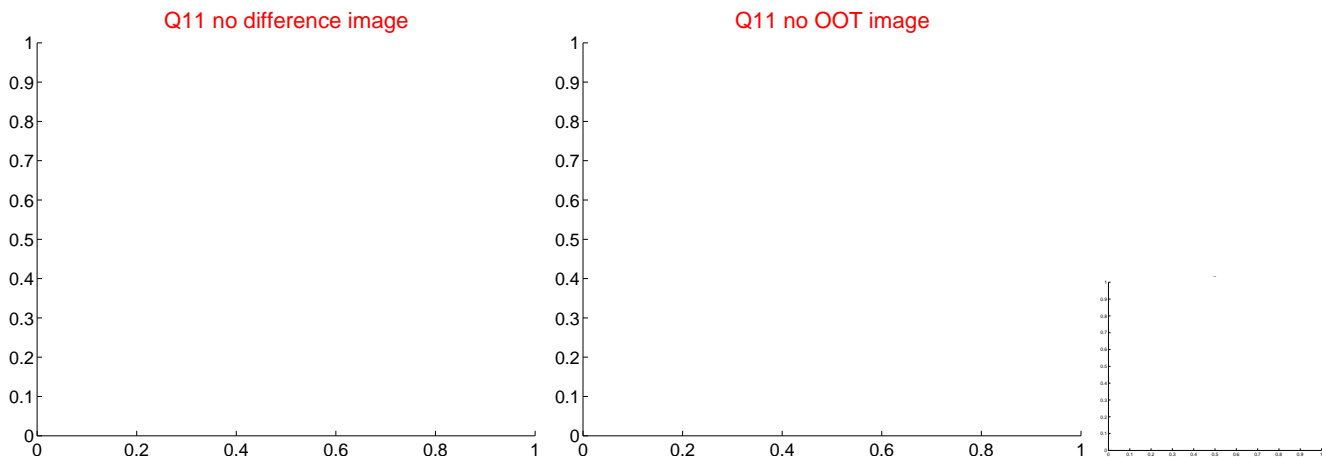
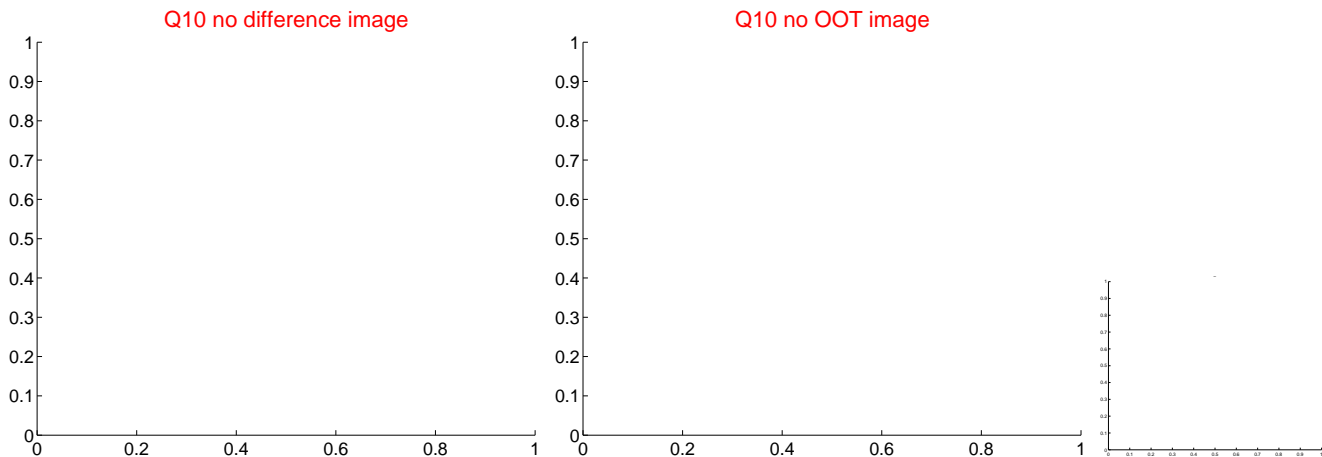
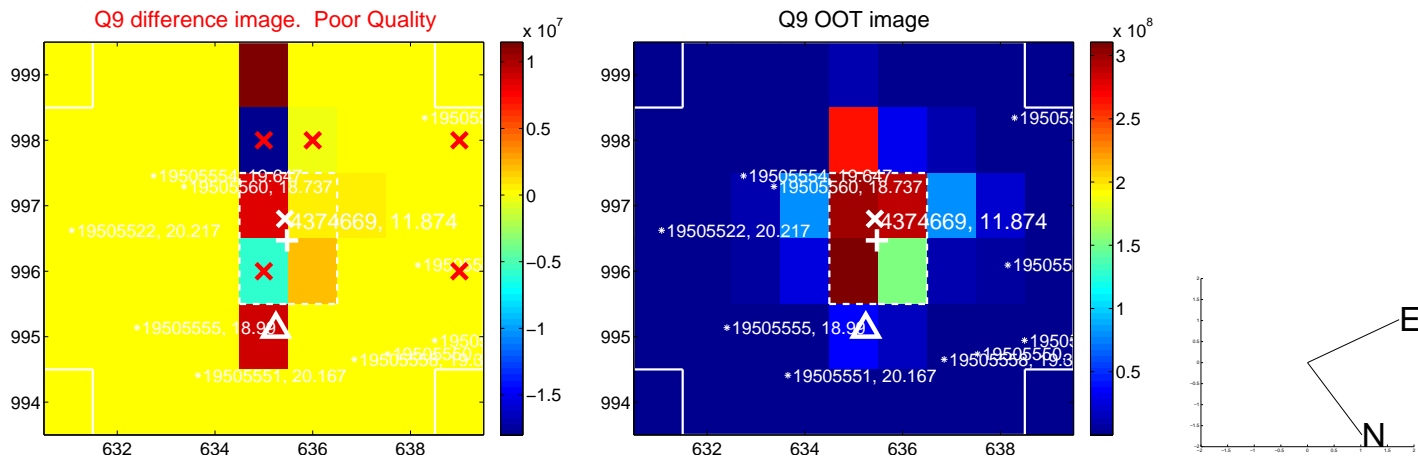


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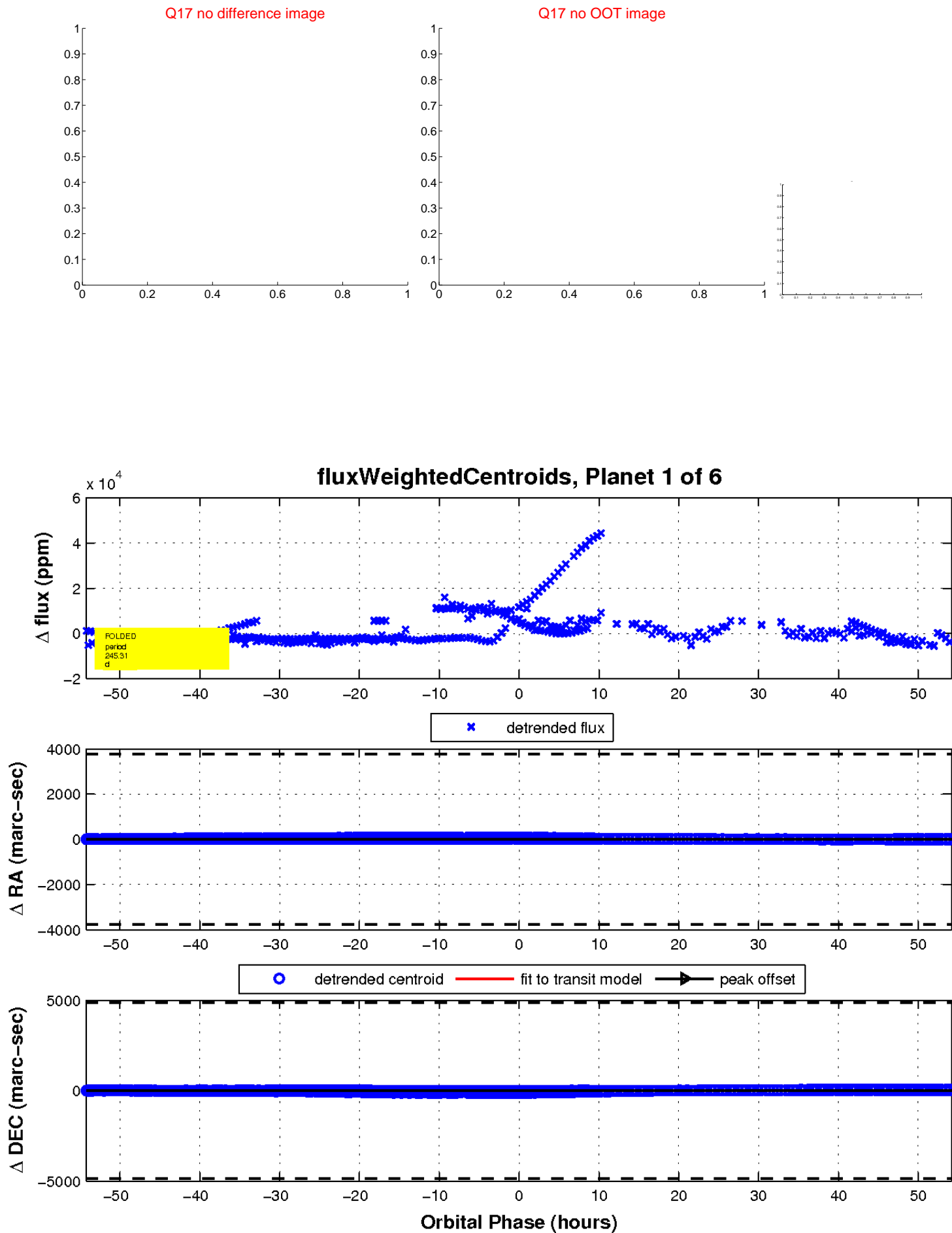
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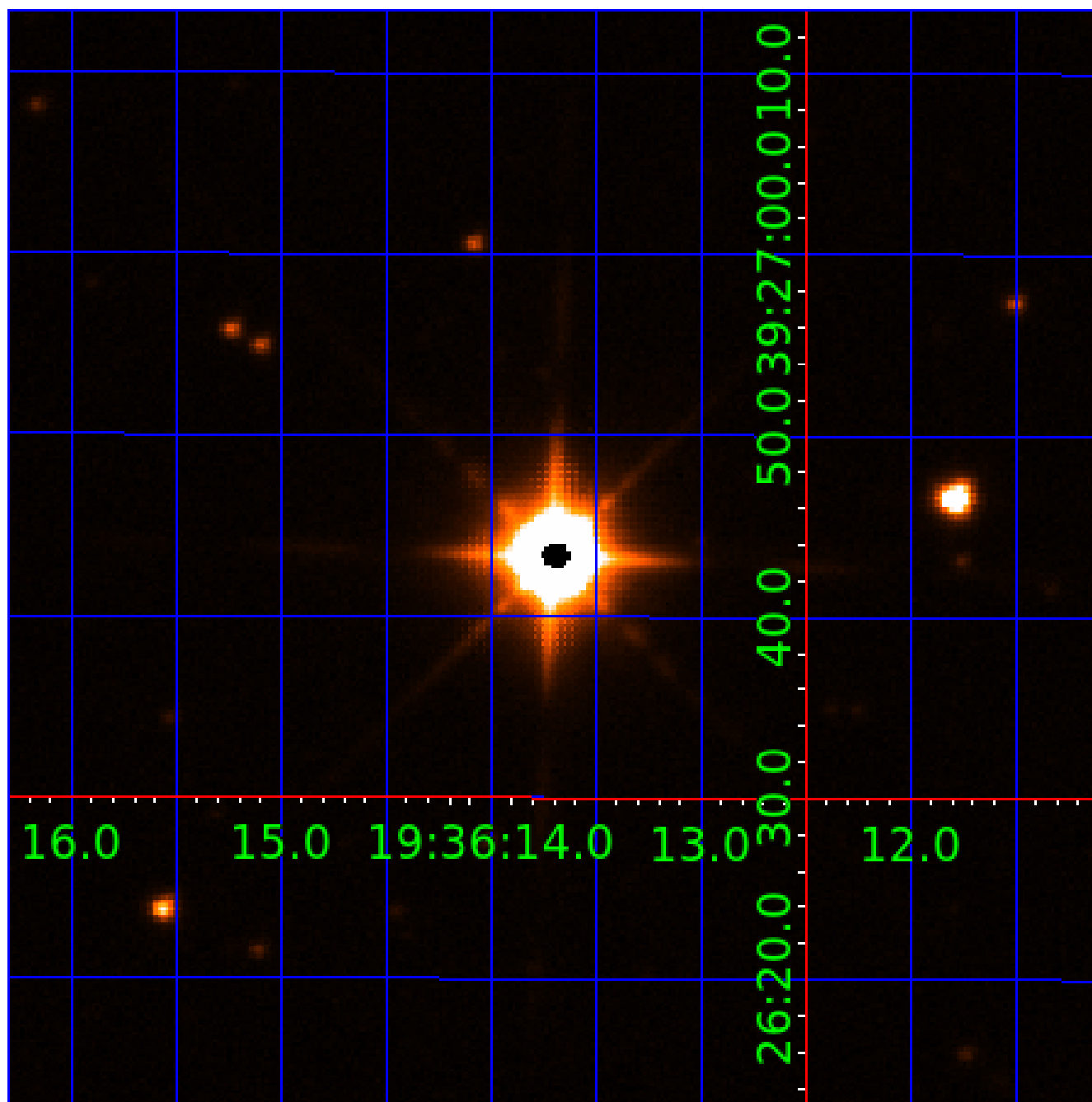


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UKIRT Image

Declination



# KIC 004374669

## Q1-17 DR25 TCE Parameters

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## Robovetter Results

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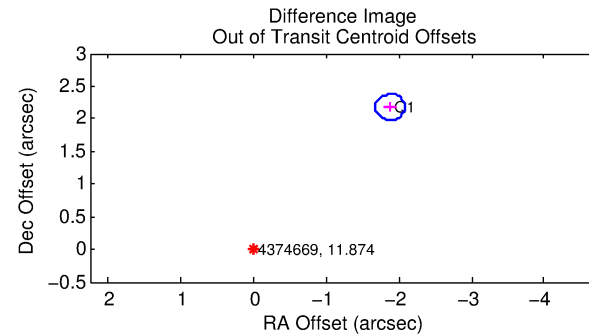
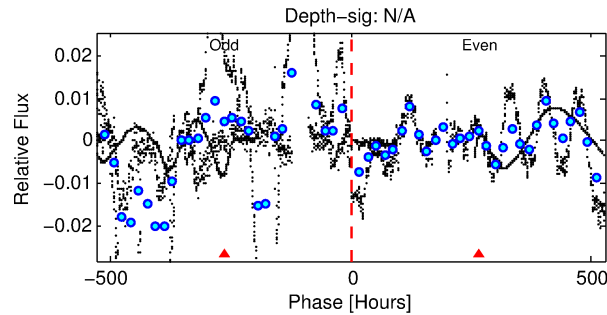
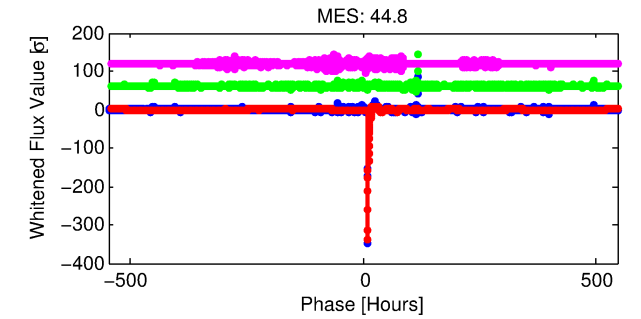
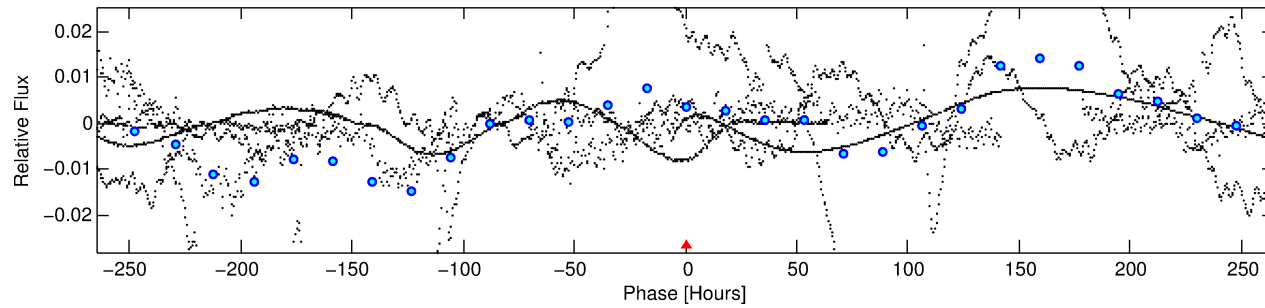
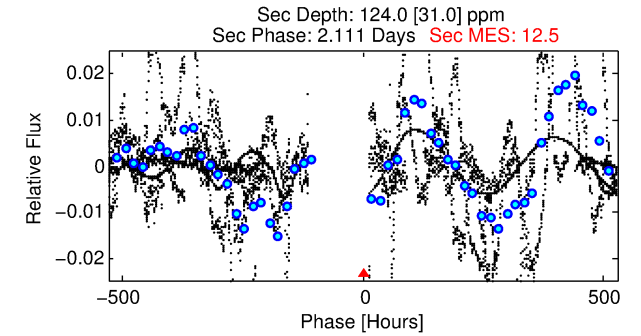
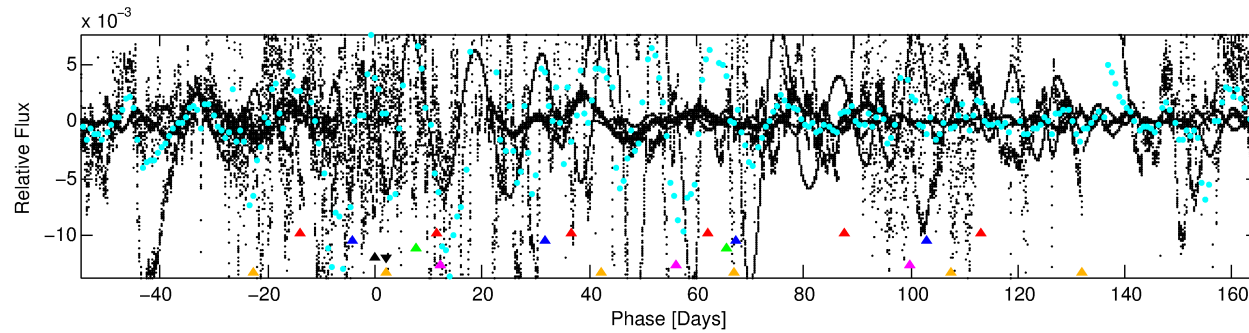
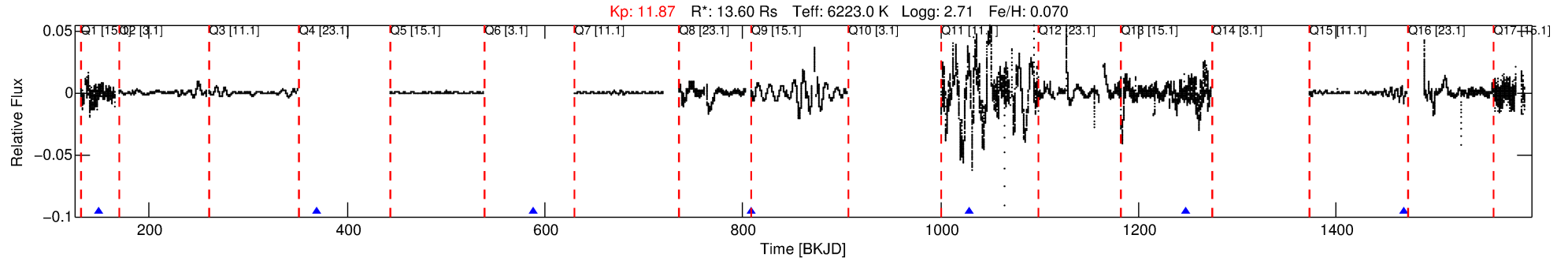
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004374669-04

No Significant Match Found

# DV One-Page Summary

KIC: 4374669 Candidate: 4 of 6 Period: 219.886 d



## TPS TCE Results:

Period = 219.88554 d  
Epoch = 149.1724 BKJD

DV fit results are unavailable

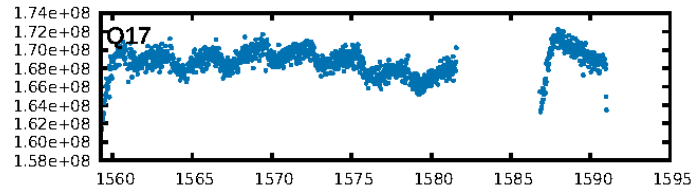
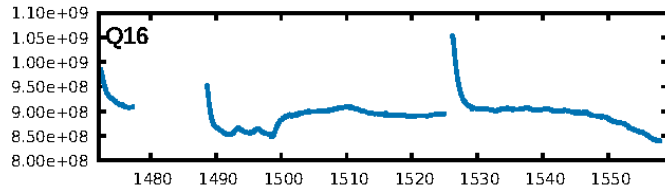
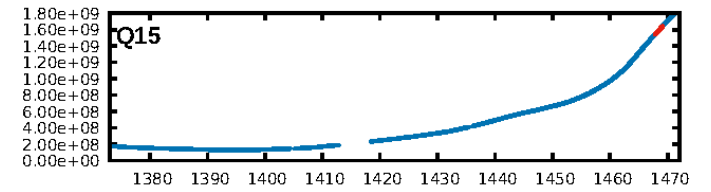
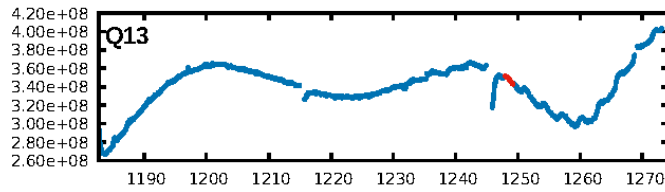
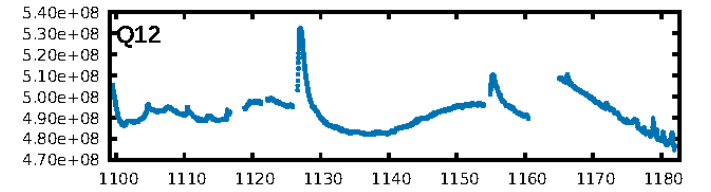
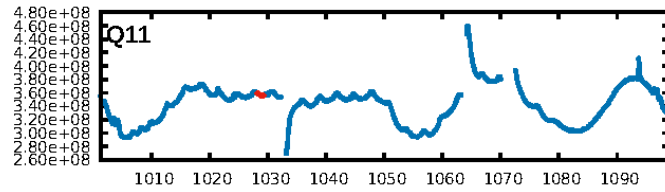
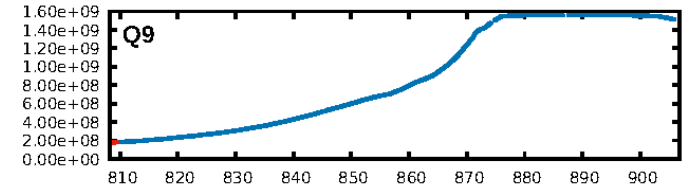
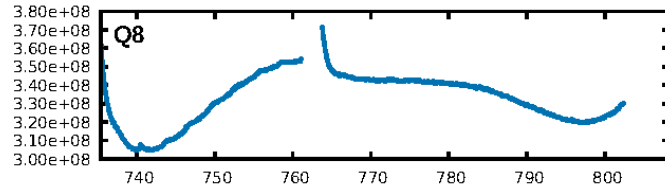
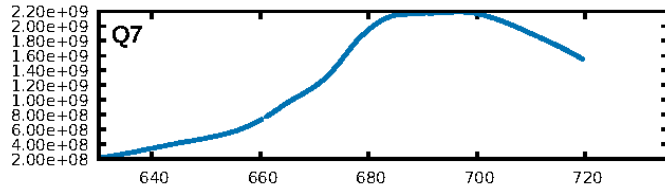
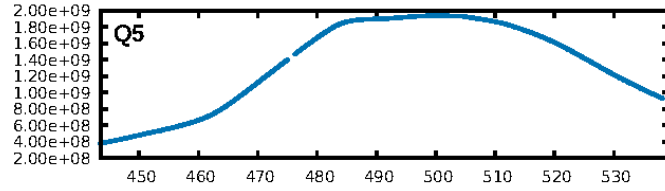
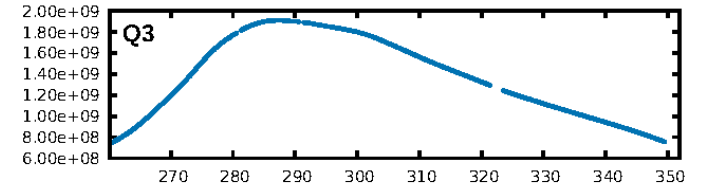
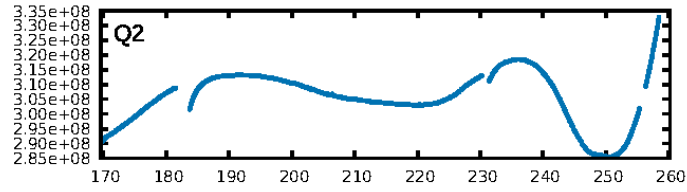
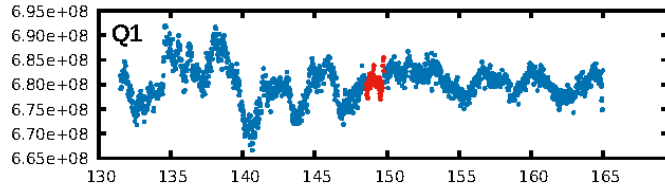
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [25.93σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.4646  
Centroid-sig: 0.7%  
Centroid-so: 2.440 arcsec [1.94σ]  
OotOffset-rm: 2.879 arcsec [43.15σ]  
KicOffset-rm: 3.268 arcsec [48.98σ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.00 [0/1]

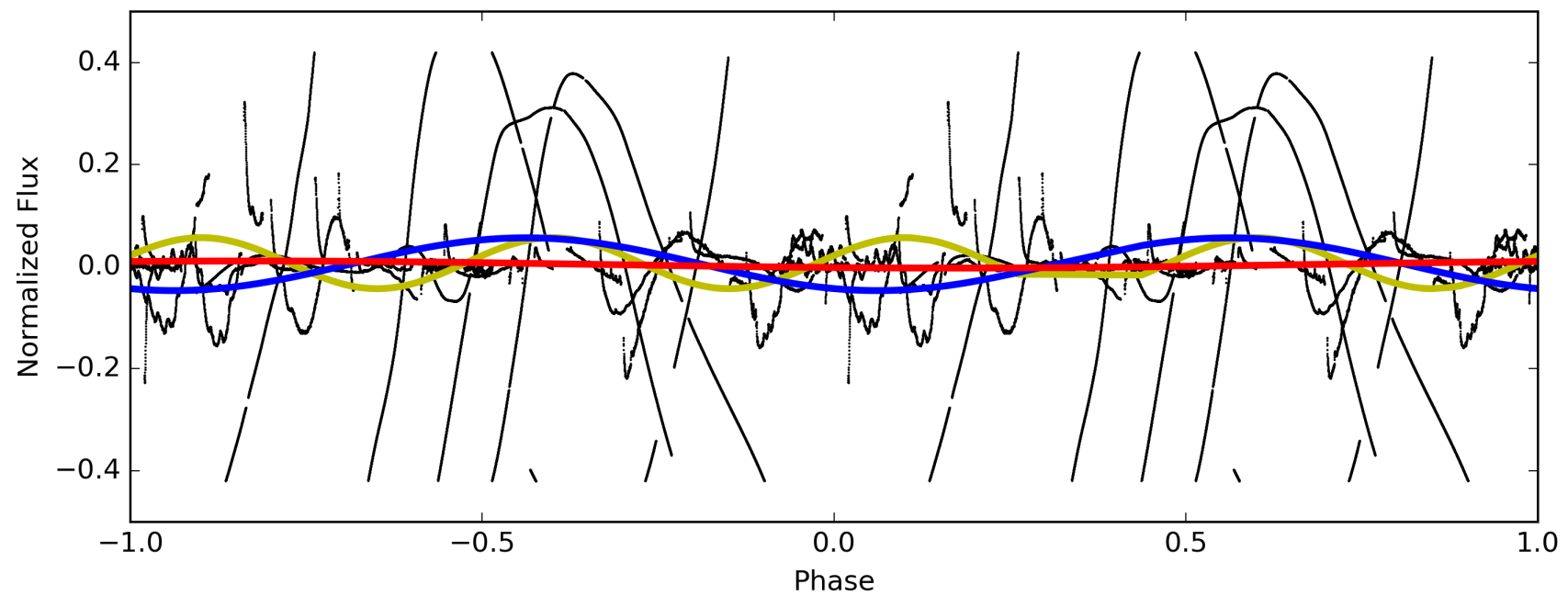
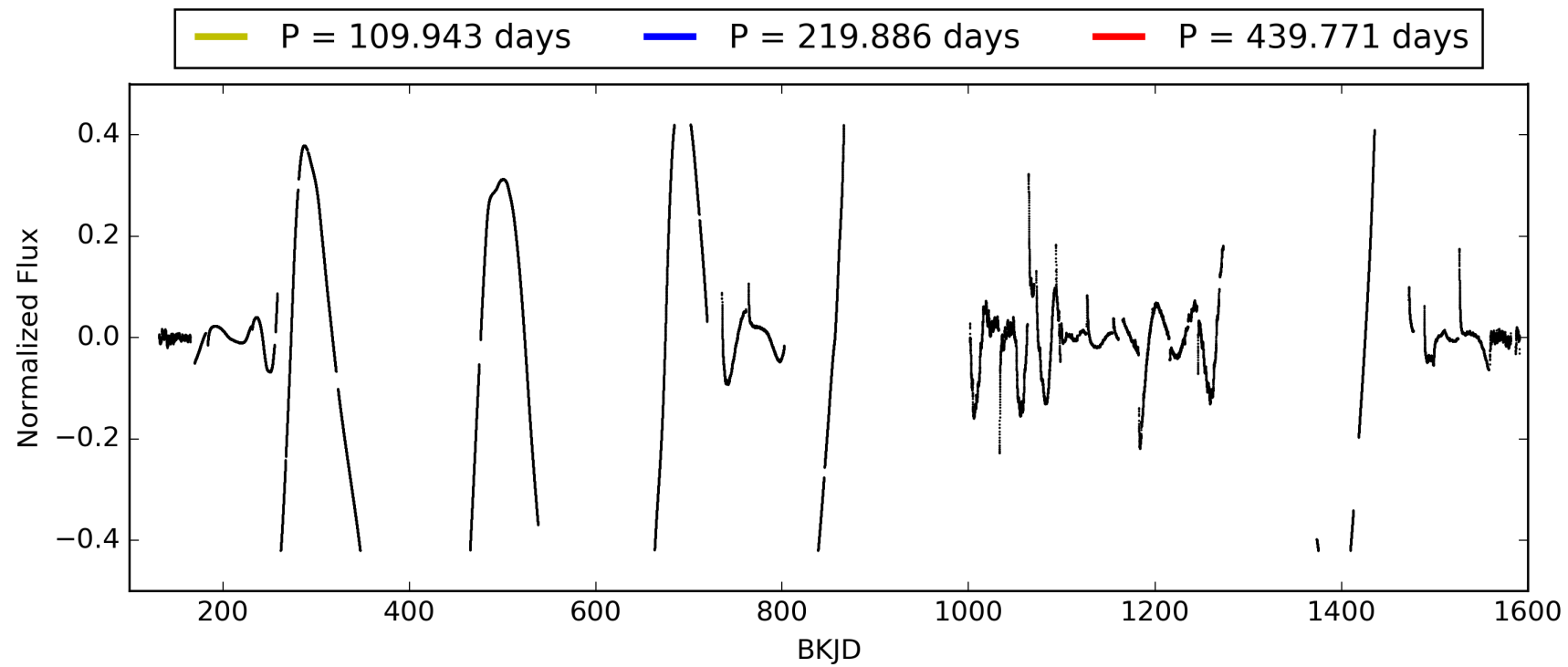
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:53:15 Z

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

# TCE 004374669-04, PDC Light Curves



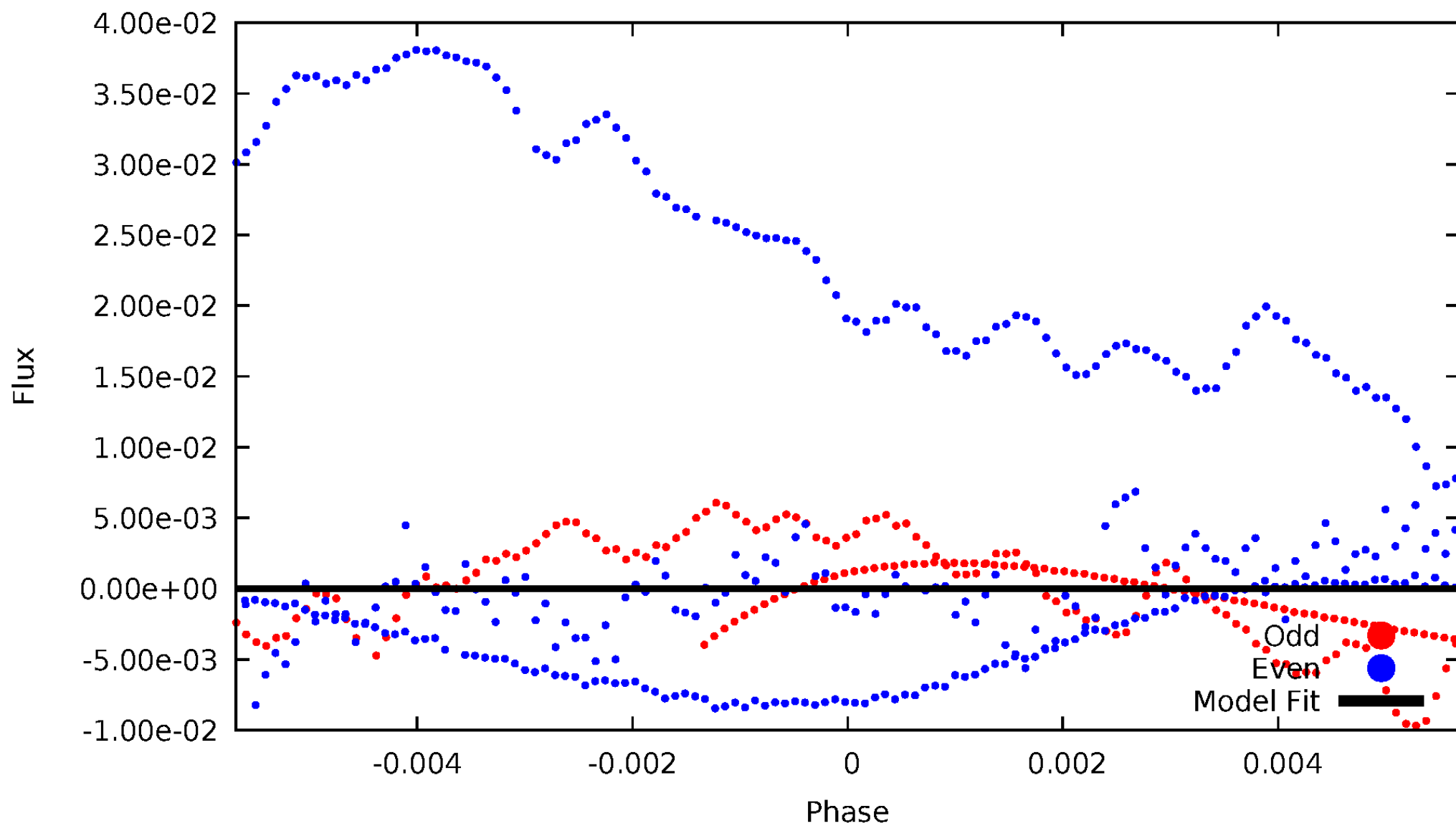
TCE 004374669-04





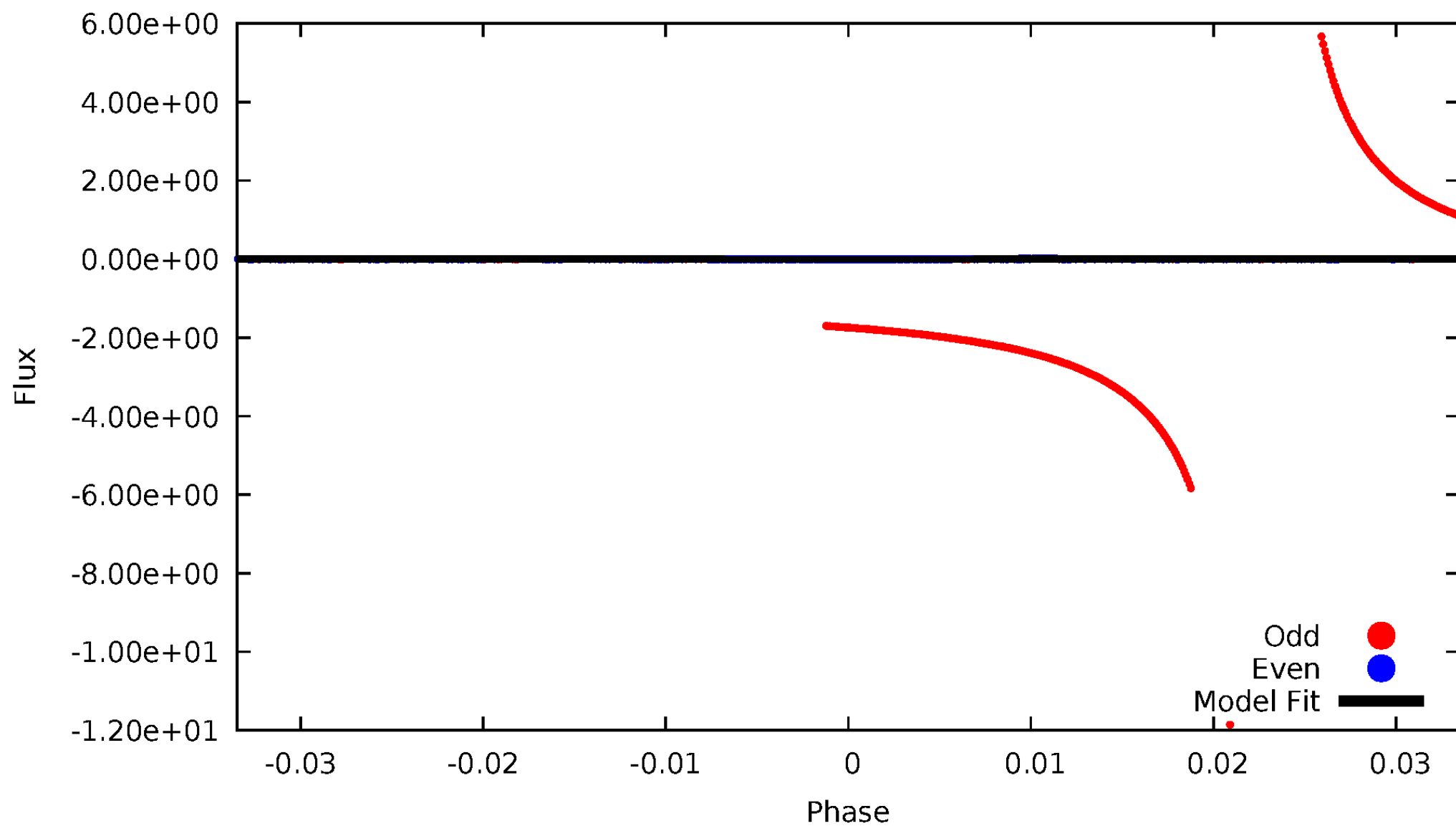
# DV Odd/Even

TCE 004374669-04



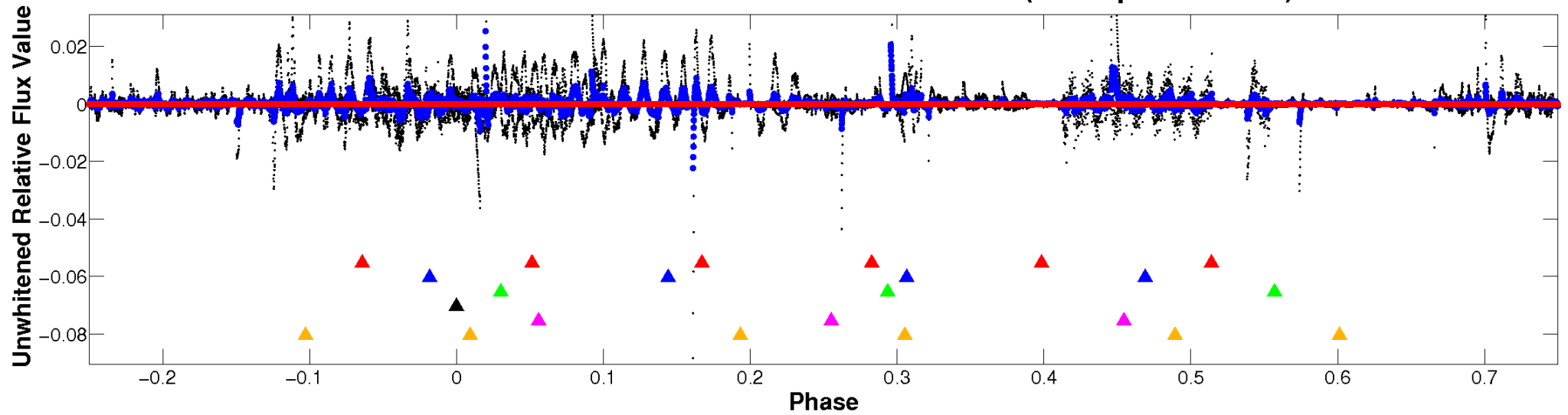
# ALT Odd/Even

TCE 004374669-04



# Non-Whitened Vs. Whitened Light Curve

**Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

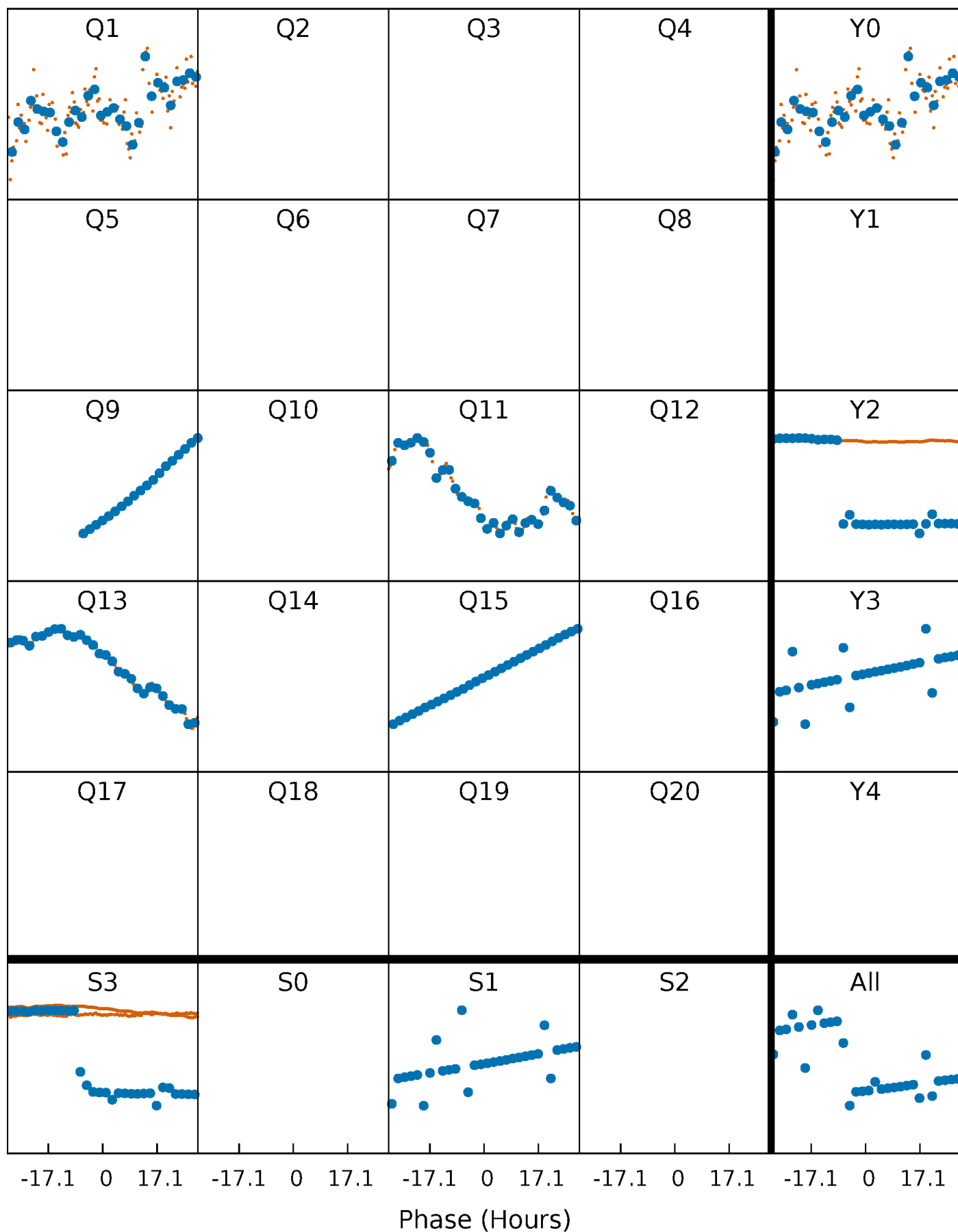


**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

TCE 004374669-04 P=219.885539 Days  $T_0=149.172401$  (BKJD)



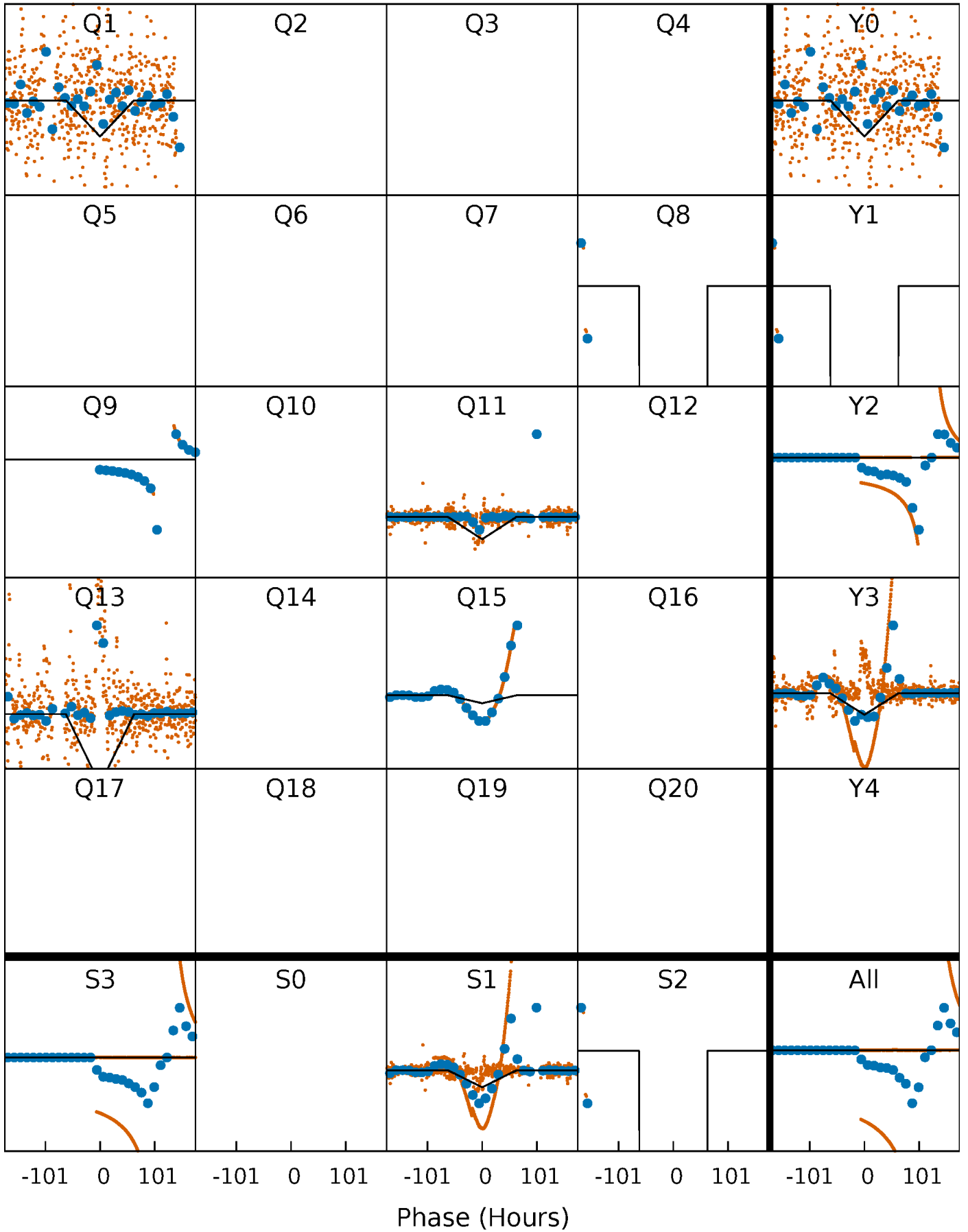
# DV Quarter-Phased Transit Curves

TCE 004374669-04     $P=219.885539$  Days     $T_0=149.172401$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

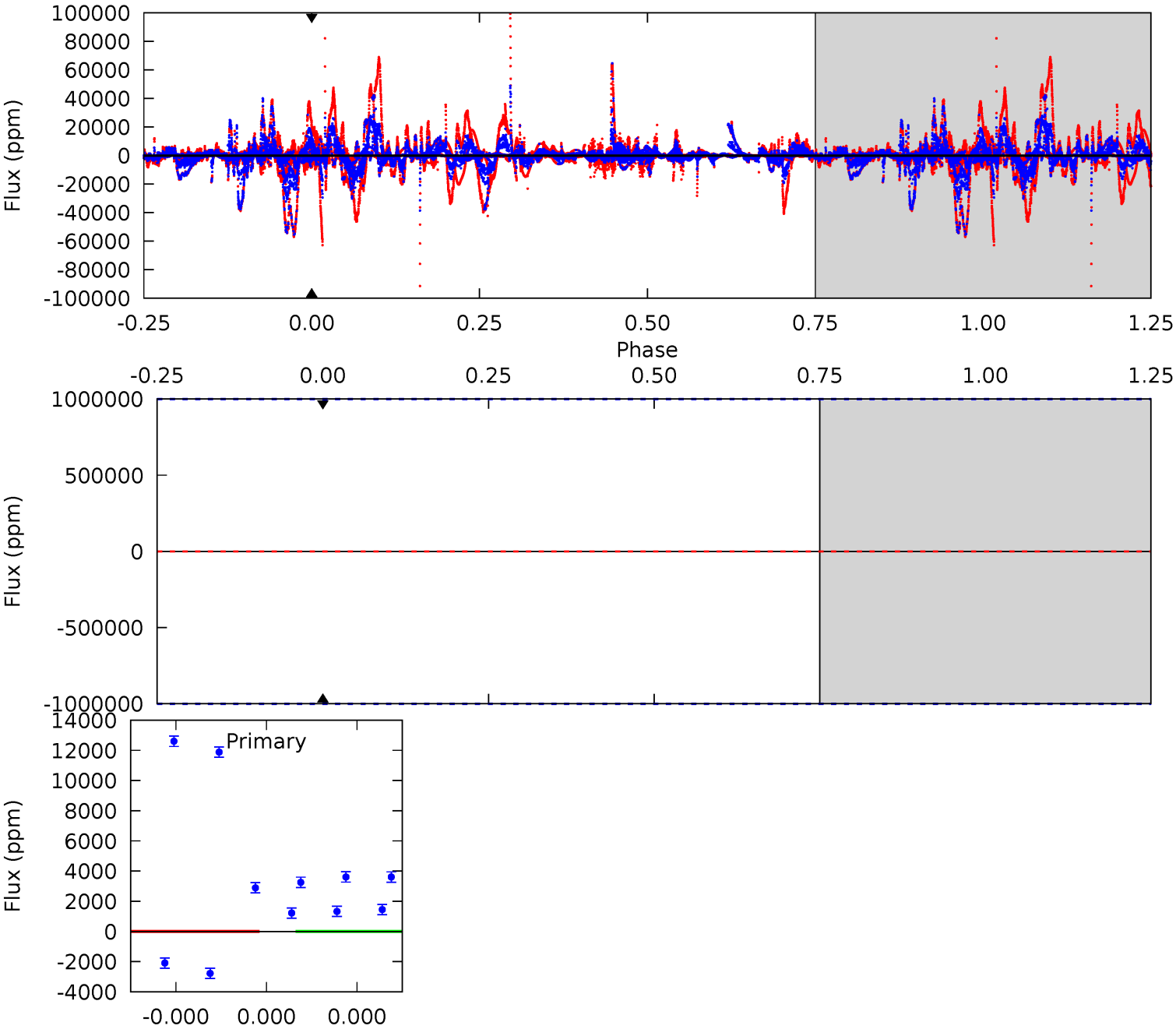
TCE 004374669-04 P=219.885539 Days  $T_0=149.144850$  (BKJD)



# DV Model-Shift Uniqueness Test

004374669-04, P = 219.885539 Days, E = 149.172401 Days

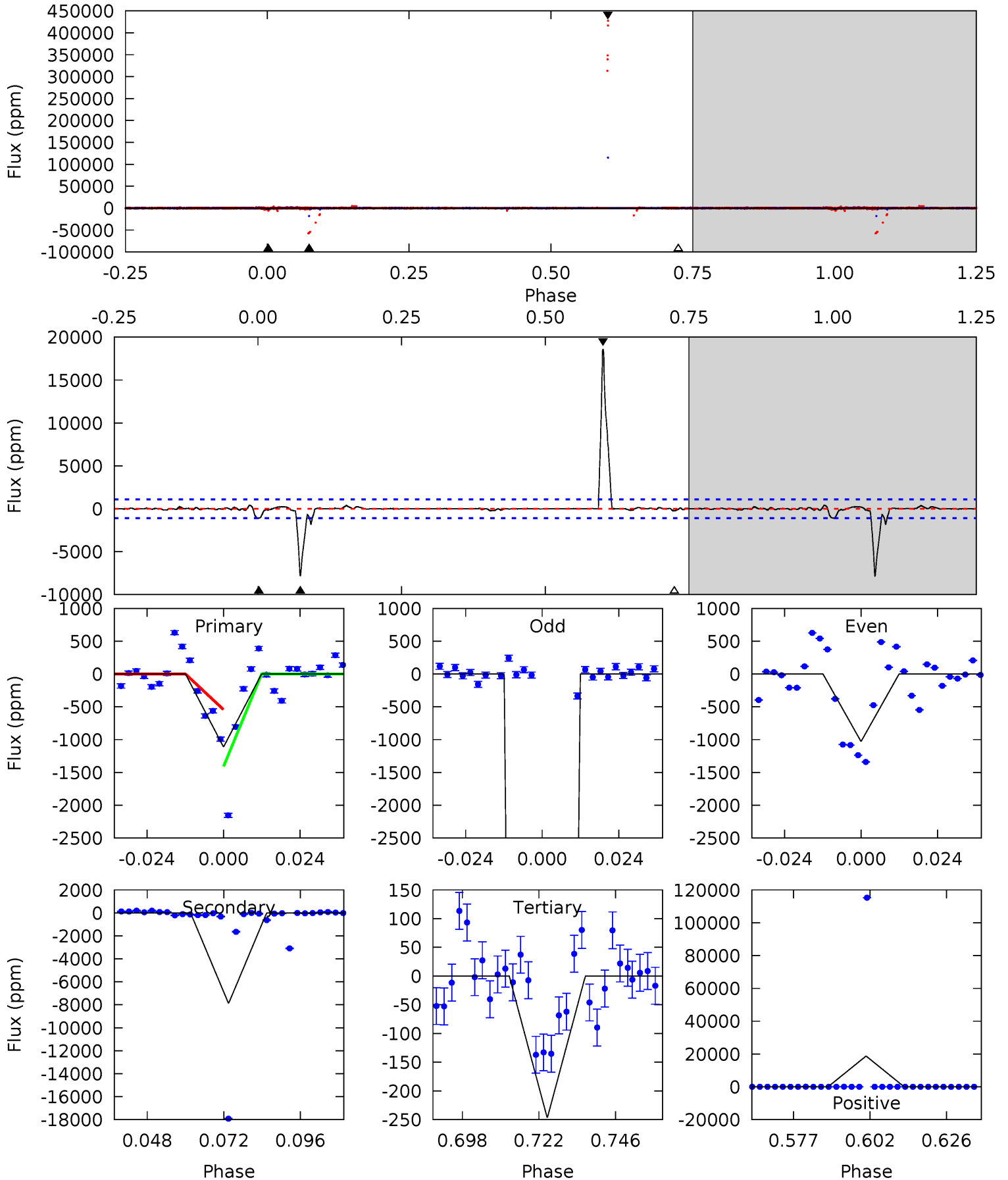
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

004374669-04, P = 219.885539 Days, E = 149.144850 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
4.89	34.7	1.09	82.4	4.86	2.26	4.42	3.80	-77.5	33.6	-47.7	17.8	1311	0.70	1.80





### Stellar Parameters For KIC 004374669

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6223^{+194}_{-216}$	$2.712^{+1.179}_{-0.197}$	$0.070^{+0.200}_{-0.400}$	$13.602^{+1.938}_{-10.982}$	$3.480^{+0.070}_{-2.137}$	$0.002^{+0.170}_{-0.001}$
	+3%/-3%	+43%/-7%	+286%/-571%	+14%/-81%	+2%/-61%	+8742%/-43%
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 004374669-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$92.14^{+99.95}_{-68.10}$	$1345^{+107}_{-318}$	$4515^{+20704}_{-28995}$	$92^{+14880}_{-14963}$
Alt.	$-7820 \pm 225$	$107.72^{+130.82}_{-73.99}$	$1346^{+107}_{-275}$	$6137^{+6365}_{-1578}$	$401^{+3689}_{-317}$

$T_{max}$  = 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

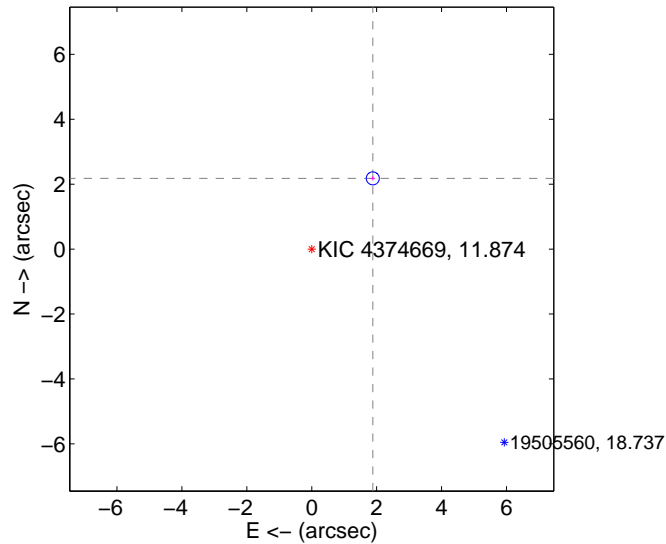
Supplemental centroid analysis for 004374669-04. **Kepler magnitude: 11.87.** Transit SNR -1.00

**There are 0 quarters with good PRF difference image offsets**

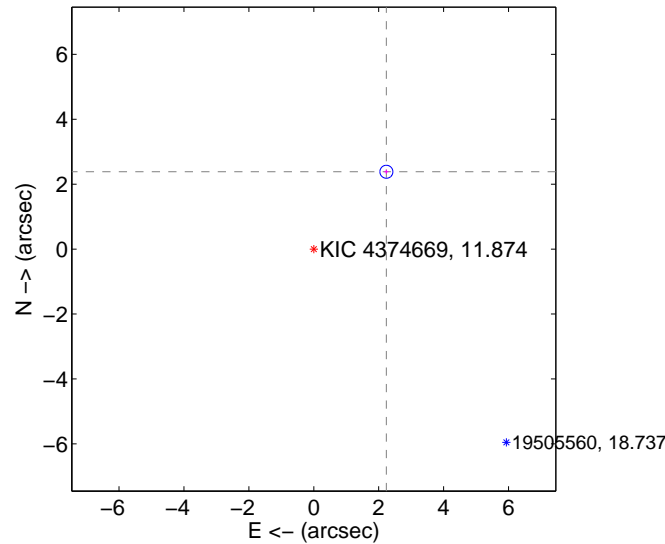
The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>2.879 \pm 0.067</math></b>	<b>43.15</b>	$-1.881 \pm 0.067$	$2.179 \pm 0.067$
PRF-fit source offset from KIC position	<b><math>3.268 \pm 0.067</math></b>	<b>48.98</b>	$-2.236 \pm 0.067$	$2.383 \pm 0.067$
photometric centroid source offset	$2.44 \pm 1.26$	1.94	$-1.20 \pm 1.06$	$2.12 \pm 1.32$

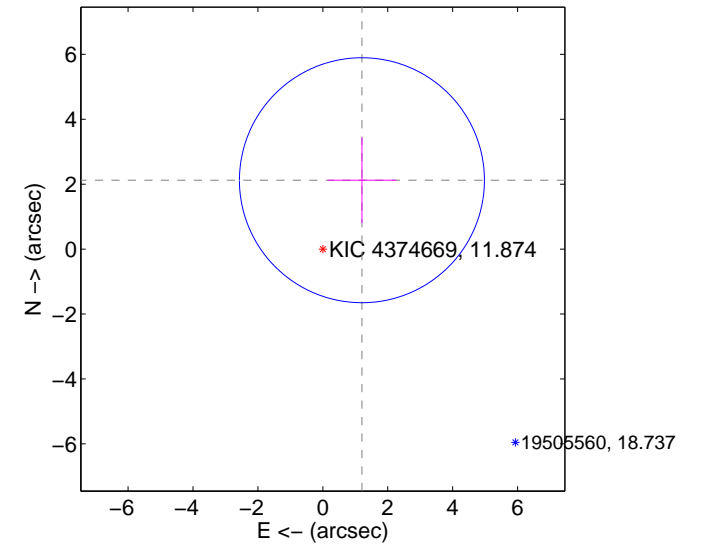
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

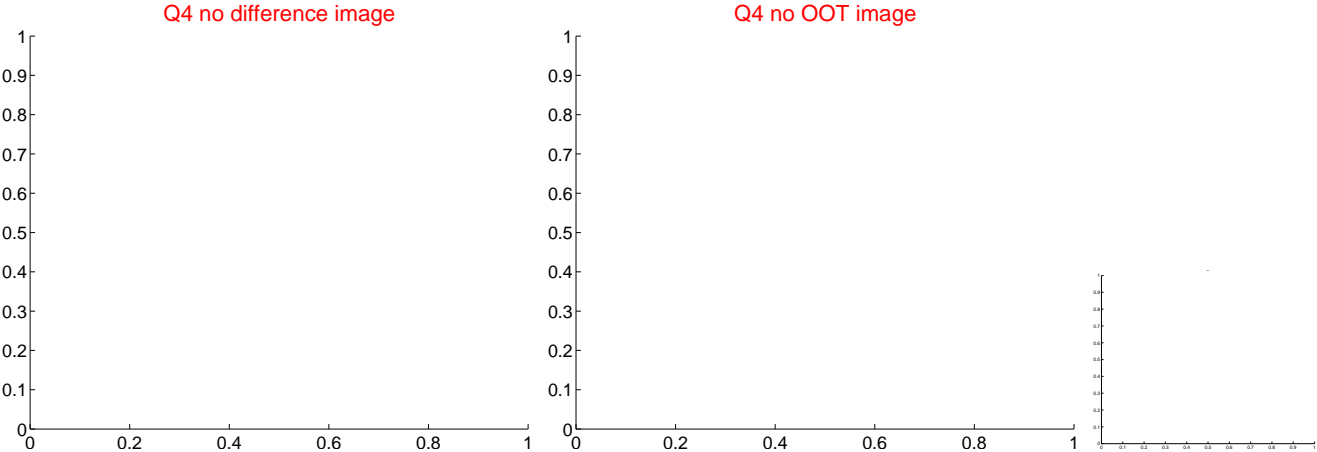
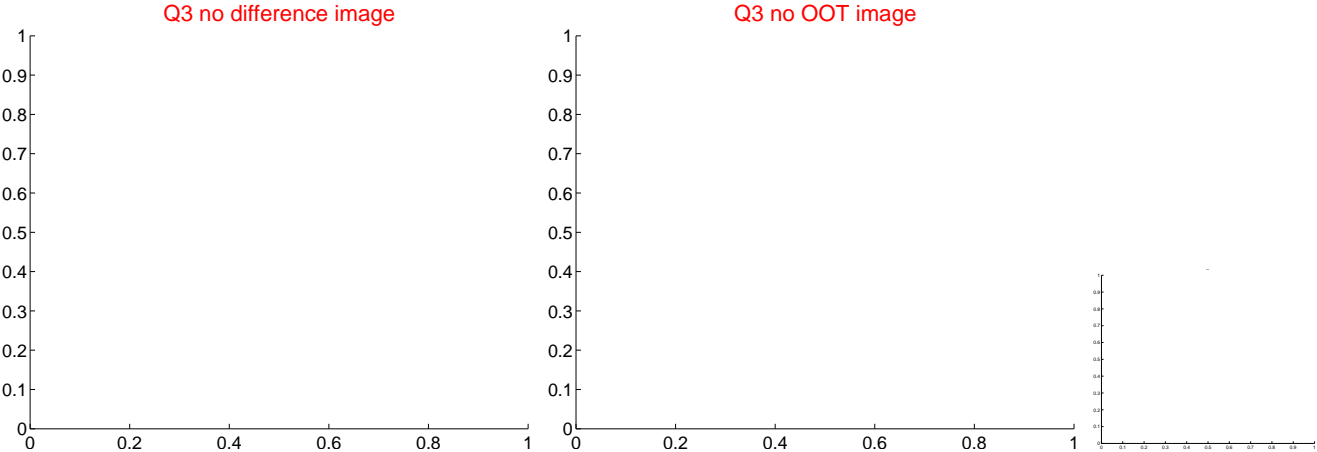
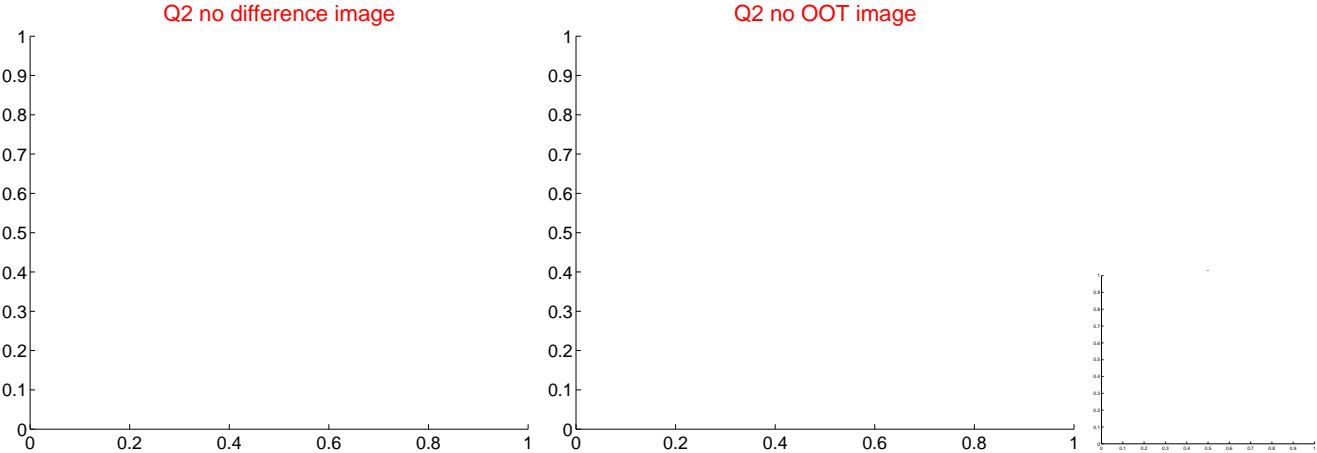
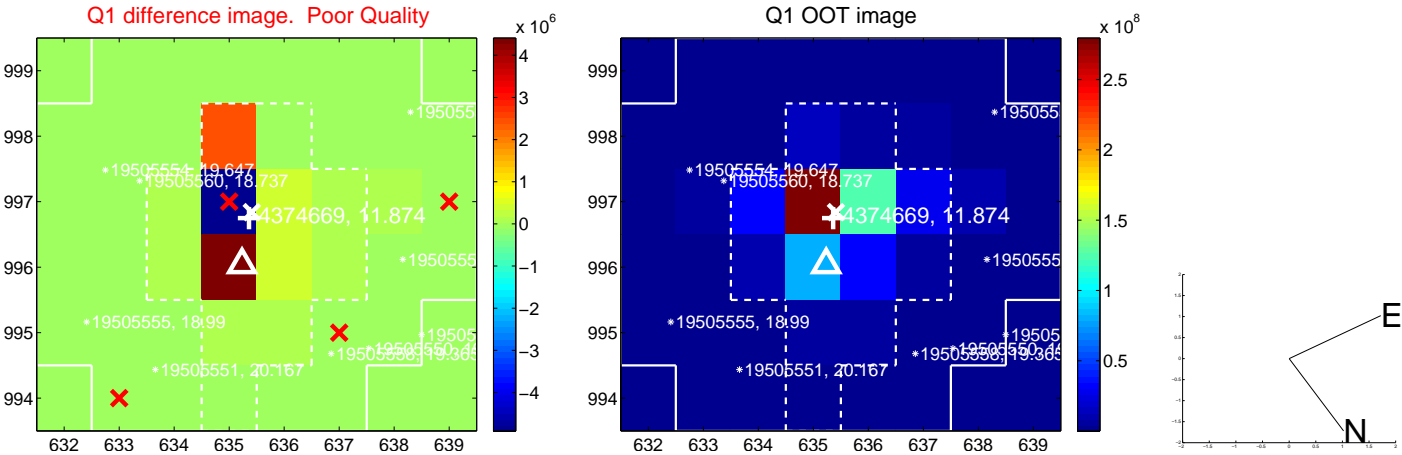


offset from photometric centroids



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.



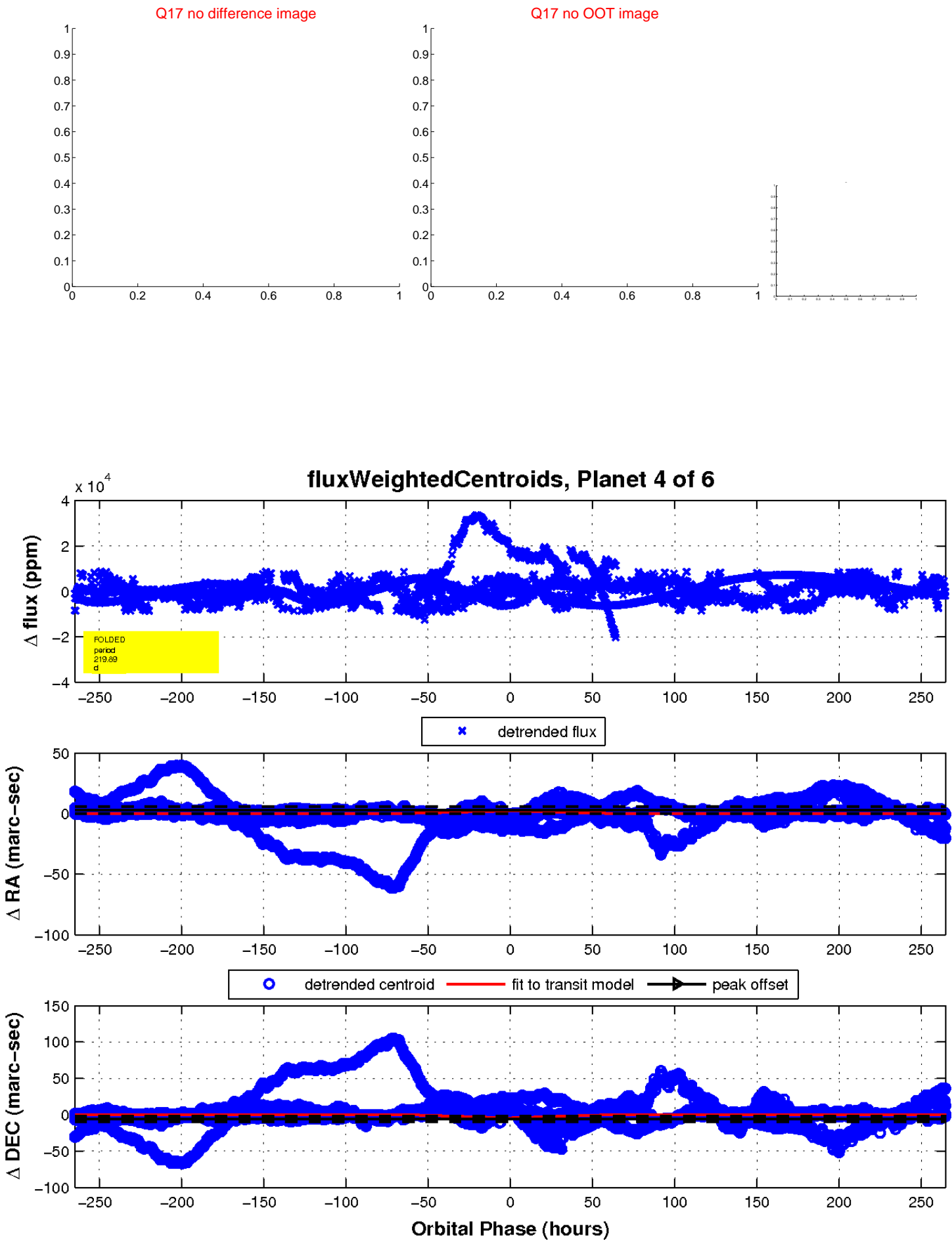
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

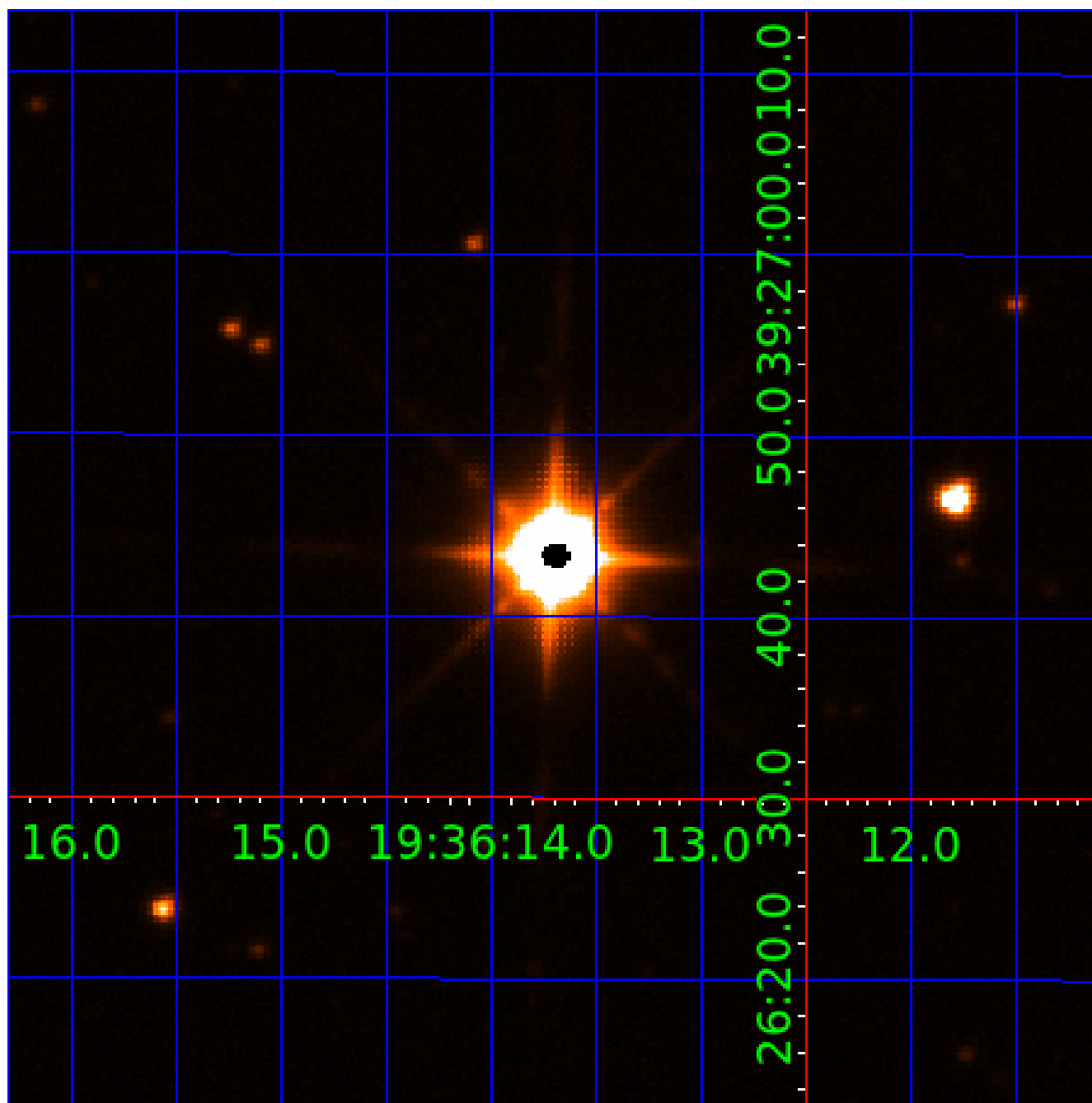


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 004374669

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004374669-01	OBS	No	245.312097	135.069845	13385.5	18.140	90.5	81.8	13.60	6223	276.87	184.08
004374669-04	OBS	No	219.885539	149.172401	469.0	15.000	44.8	-1.0	13.60	6223	29.49	212.99
004374669-05	OBS	No	703.472585	161.473609	3560.3	60.365	64.9	32.1	13.60	6223	93.64	45.18
004374669-06	OBS	No	284.971283	151.215757	611.7	3.500	35.9	-1.0	13.60	6223	33.70	150.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004374669-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA—LPP_DV—LPP_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004374669-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
004374669-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004374669-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

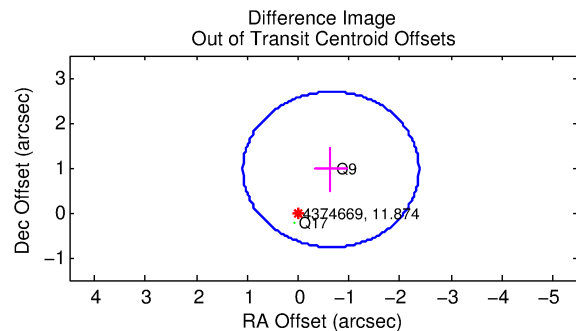
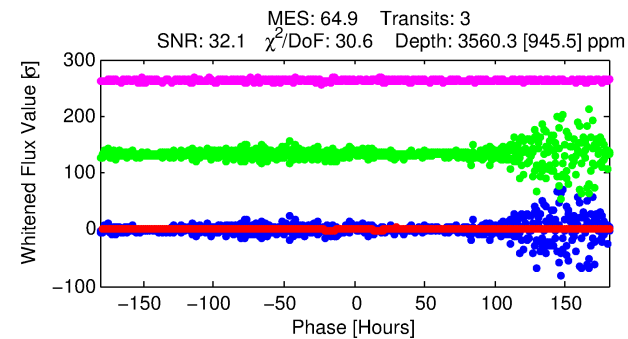
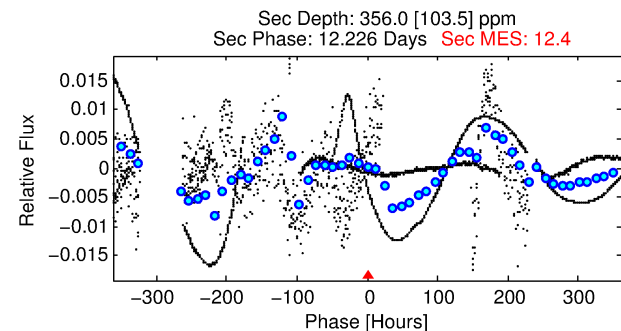
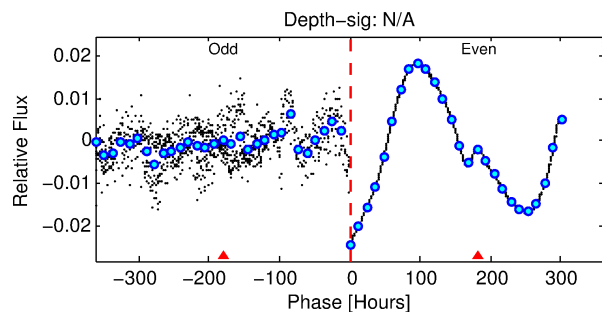
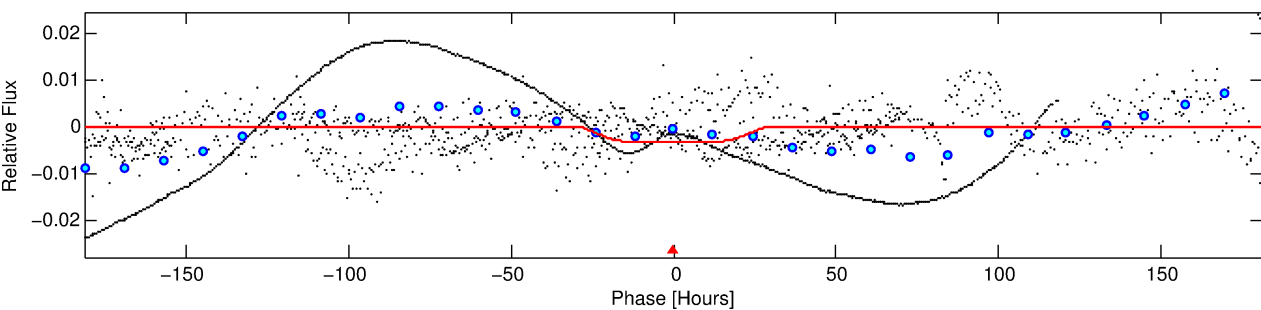
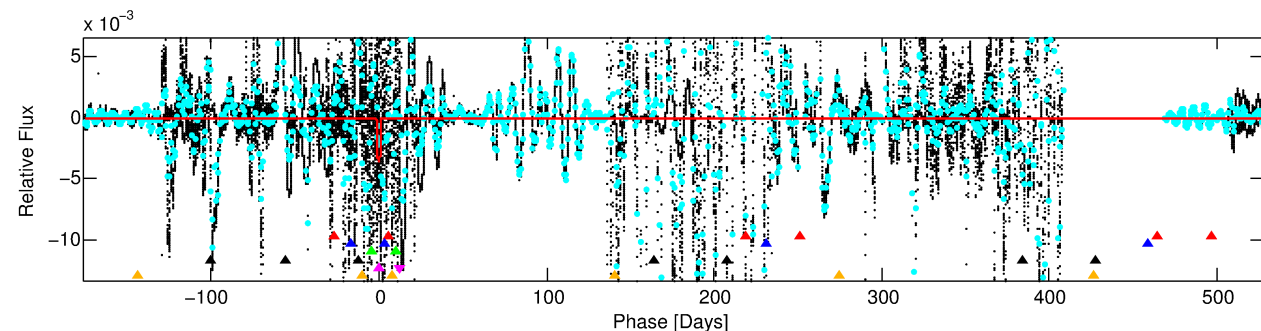
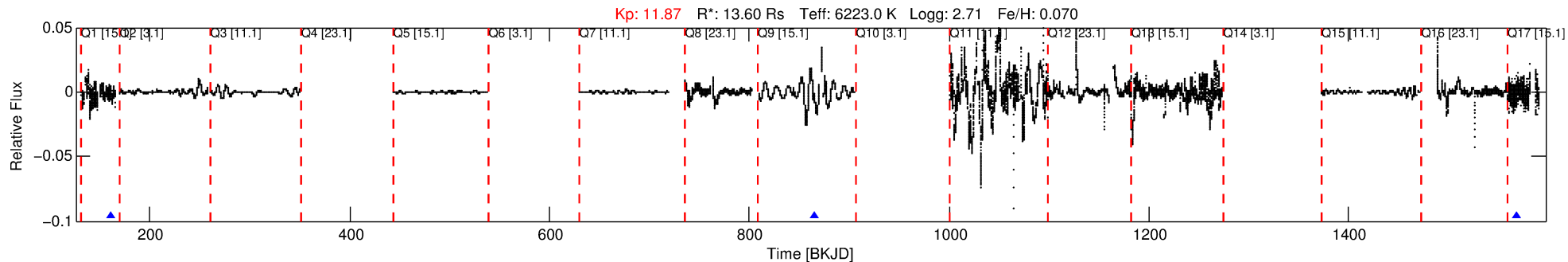
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004374669-05

No Significant Match Found

# DV One-Page Summary

KIC: 4374669 Candidate: 5 of 6 Period: 703.473 d



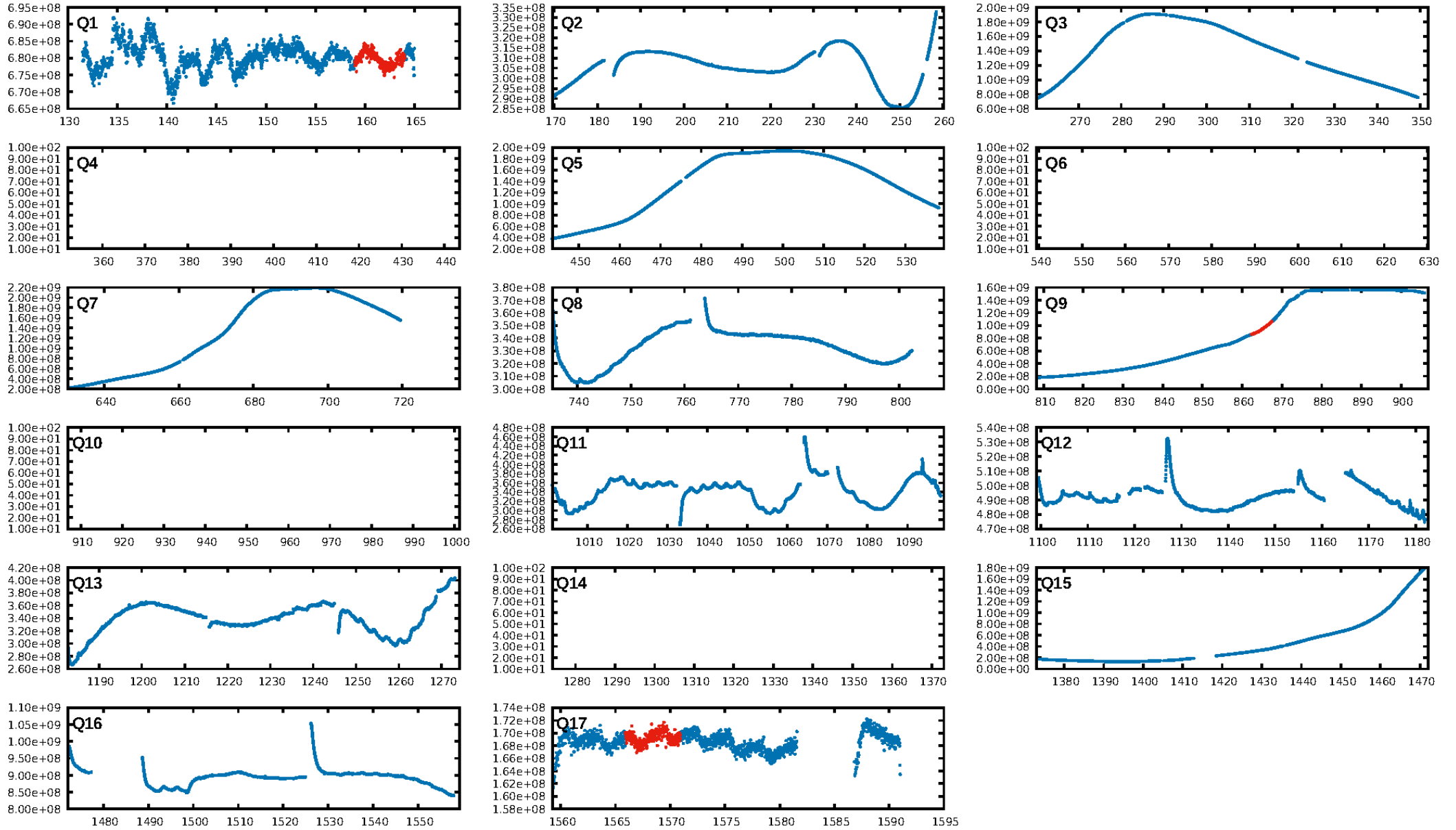
## DV Fit Results:

Period = 703.47259 [0.26941] d  
Epoch = 161.4736 [0.2691] BKJD  
Rp/R\* = 0.0631 [0.0086]  
a/R\* = 53.63 [4.45]  
b = 0.88 [0.02]  
Seff = 45.18 [85.54]  
Teq = 661 [313] K  
Rp = 93.64 [76.67] Re  
a = 2.3457 [2.4697] AU  
Ag = 122.90 [237.16] [0.51] $\sigma$   
Teffp = 3403 [359] K [5.76] $\sigma$

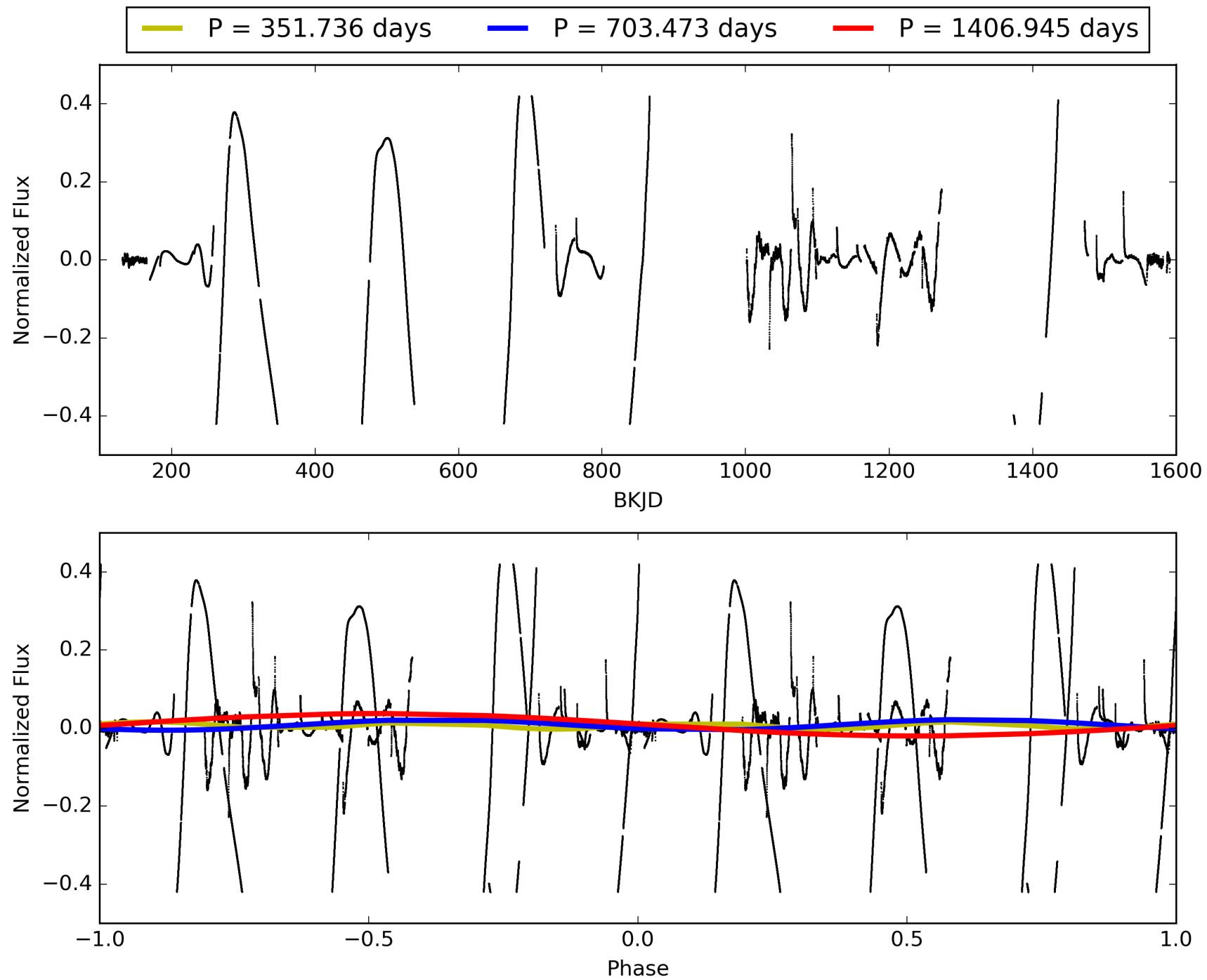
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [90.39] $\sigma$   
LongPeriod-sig: 100.0% [5.50] $\sigma$   
ModelChiSquare2-sig: 0.6%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1/1]  
GhostDiagnostic-chr: -1.537  
Centroid-sig: 94.6%  
Centroid-so: 0.129 arcsec [2.85] $\sigma$   
OotOffset-rm: 1.157 arcsec [2.01] $\sigma$   
OotOffset-st: 0/0/0/2 [2]  
KicOffset-rm: 1.924 arcsec [1.91] $\sigma$   
KicOffset-st: 0/0/0/2 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.50 [1/2]

# TCE 004374669-05, PDC Light Curves

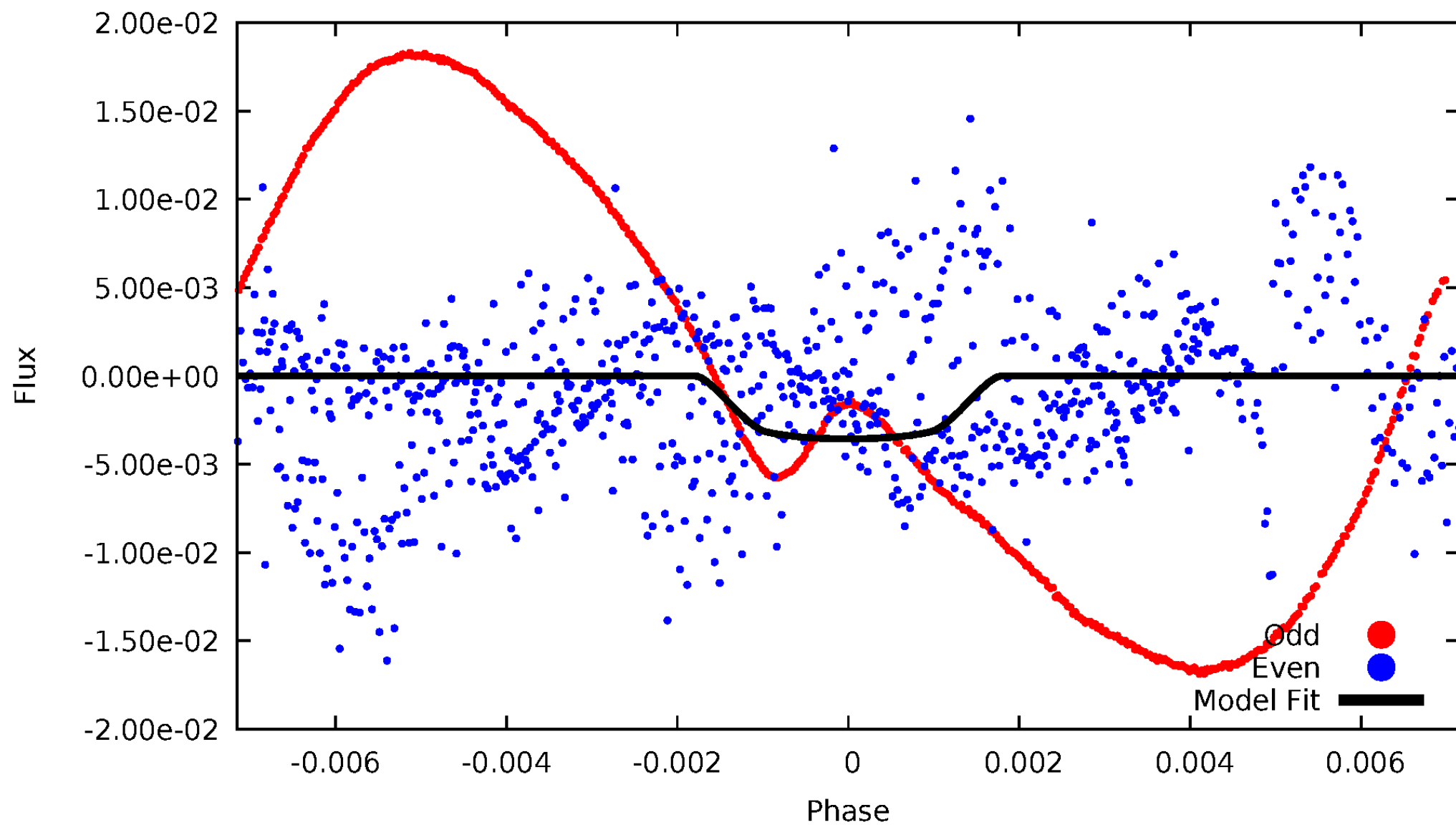


TCE 004374669-05



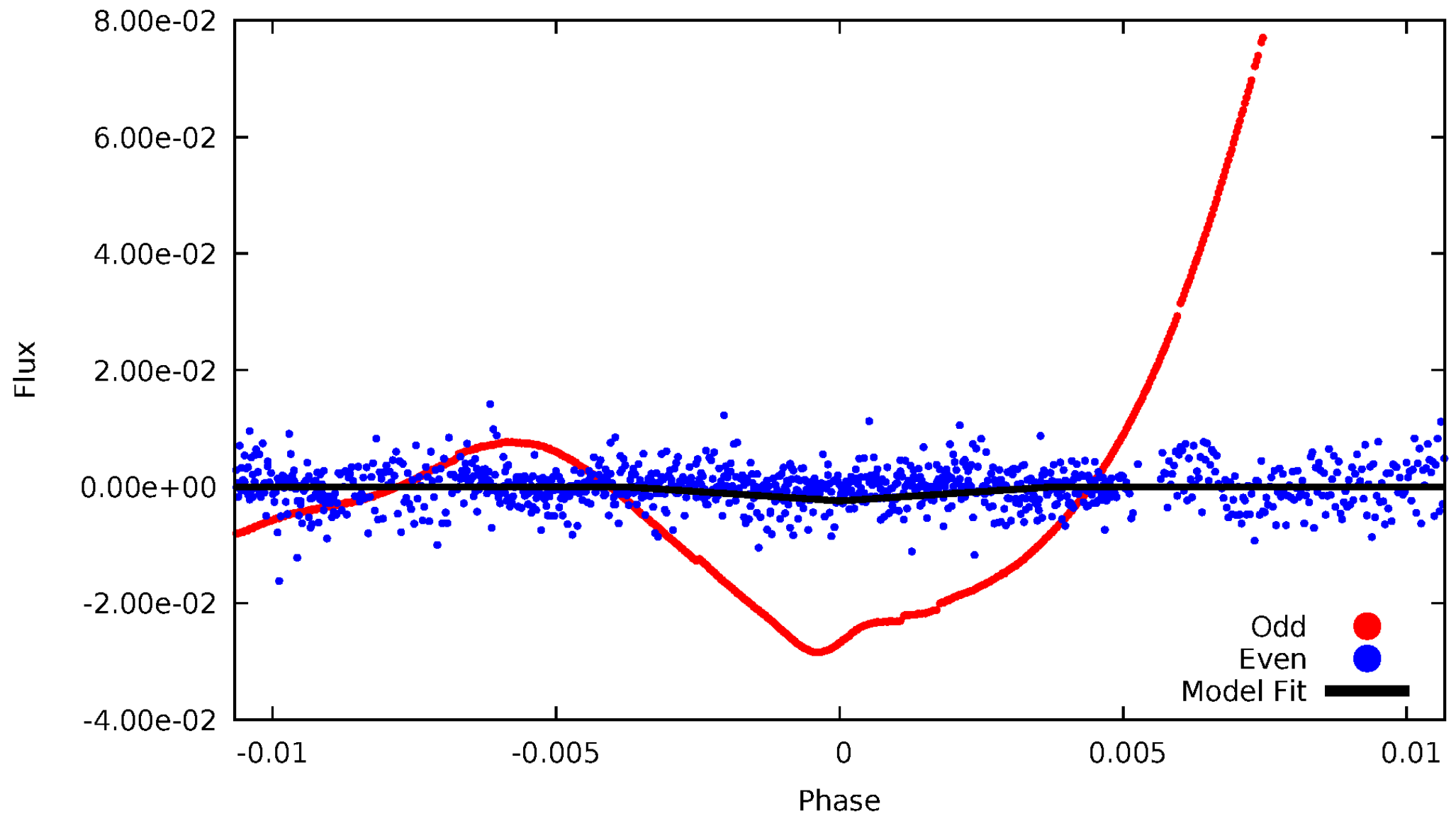
# DV Odd/Even

TCE 004374669-05



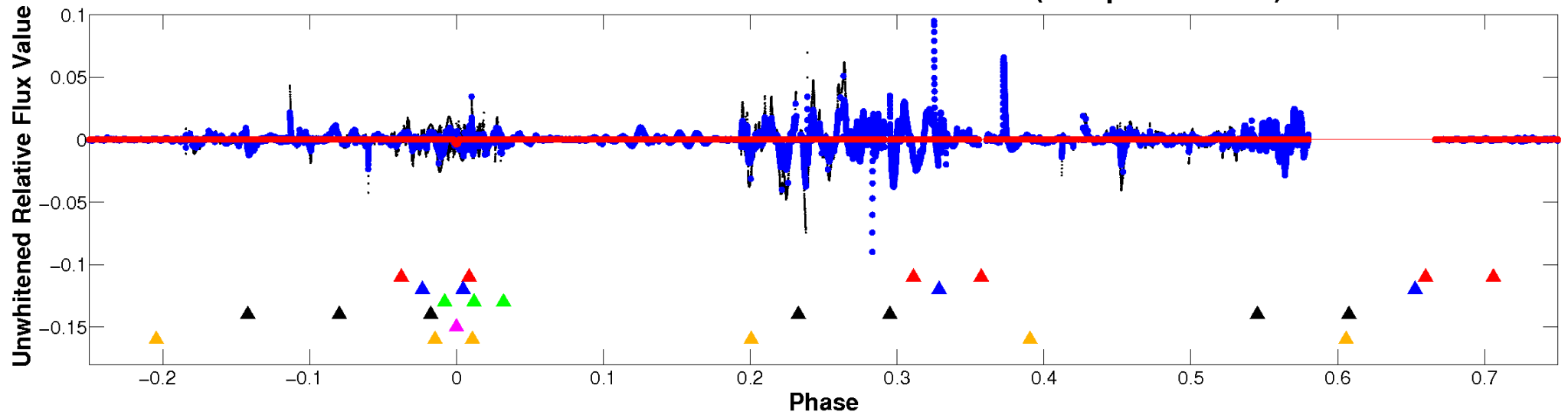
# ALT Odd/Even

TCE 004374669-05

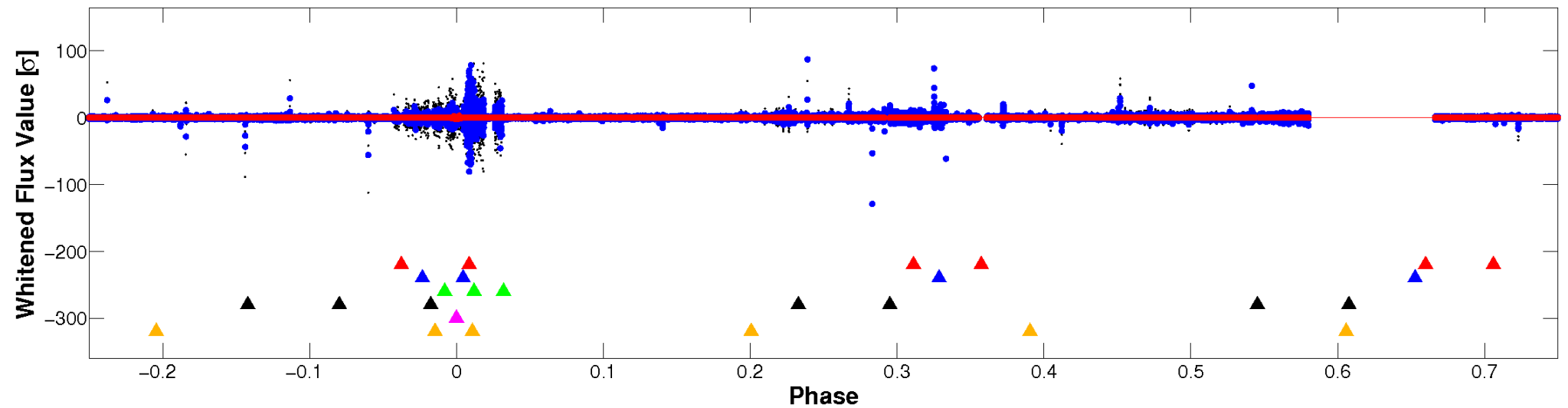


# Non-Whitened Vs. Whitened Light Curve

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

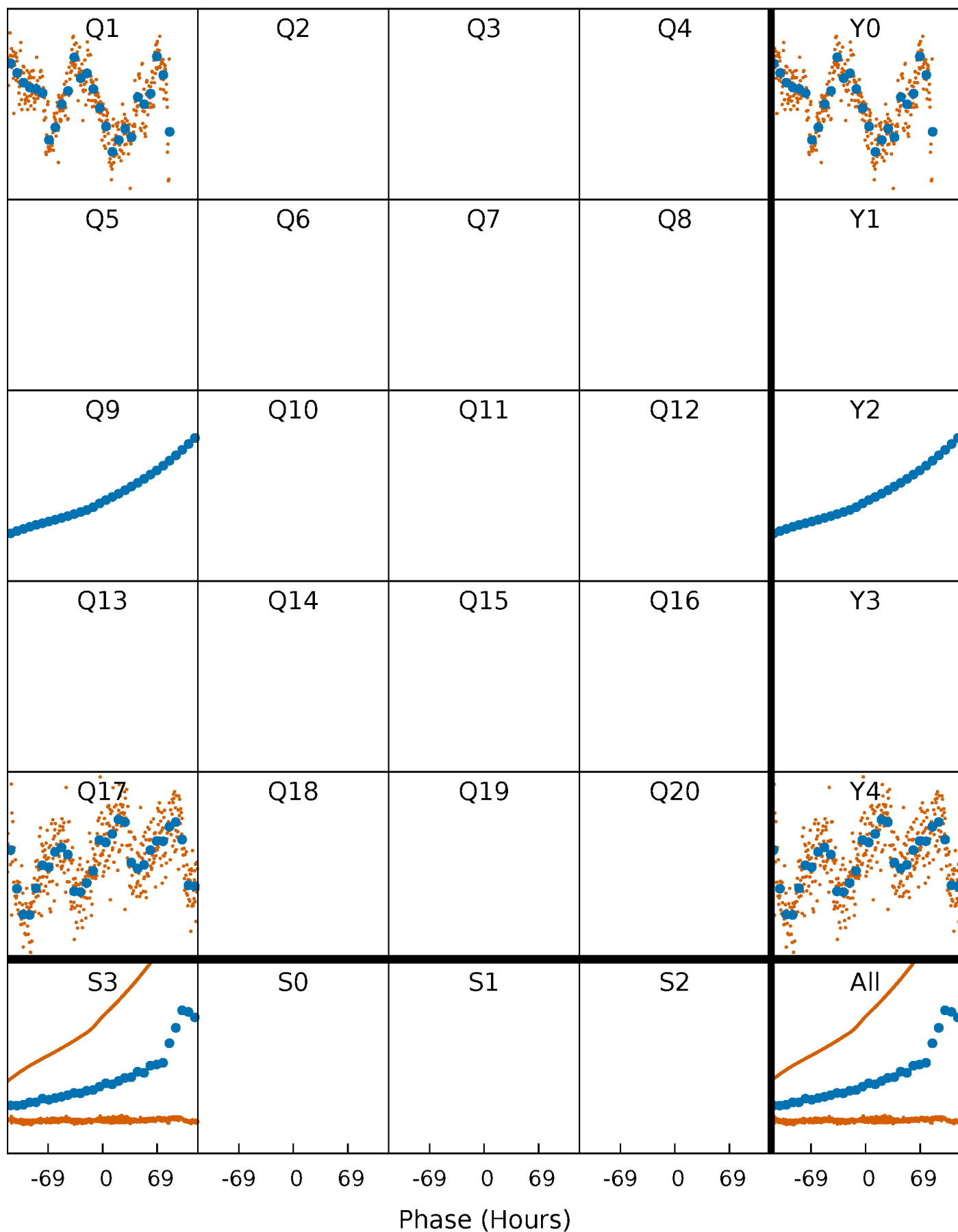


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

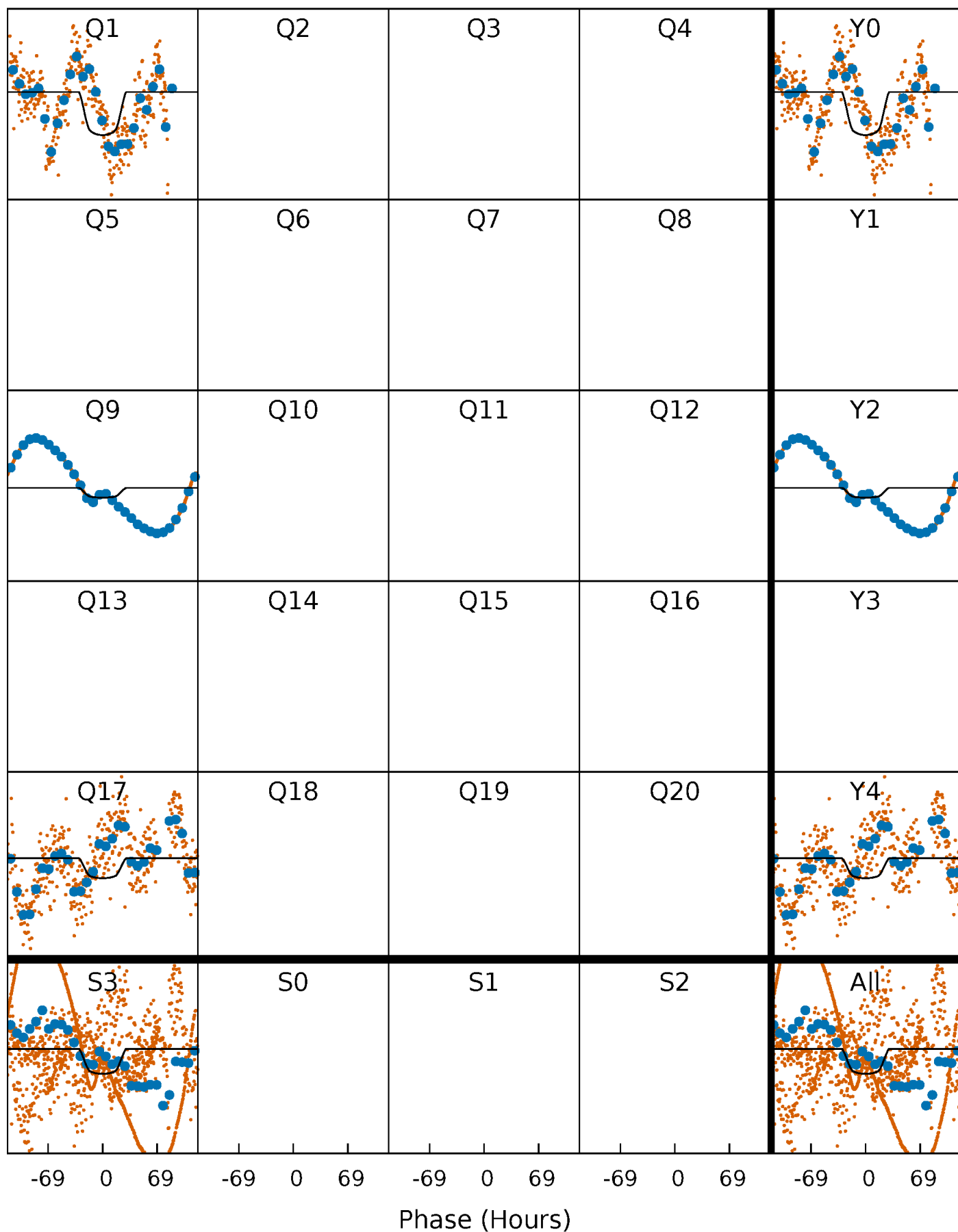
TCE 004374669-05     $P=703.472585$  Days     $T_0=161.473609$  (BKJD)





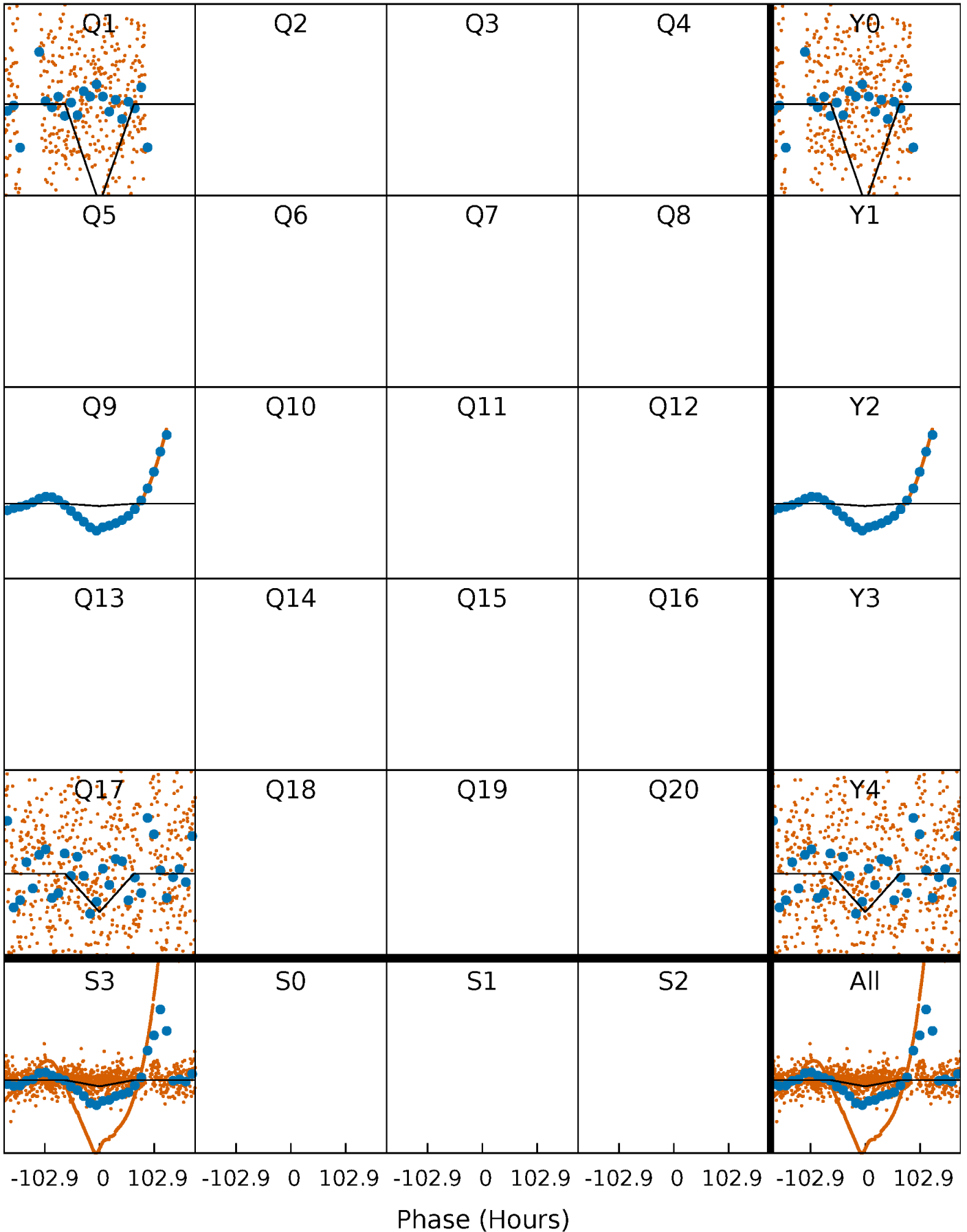
# DV Quarter-Phased Transit Curves

TCE 004374669-05     $P=703.472585$  Days     $T_0=161.473609$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

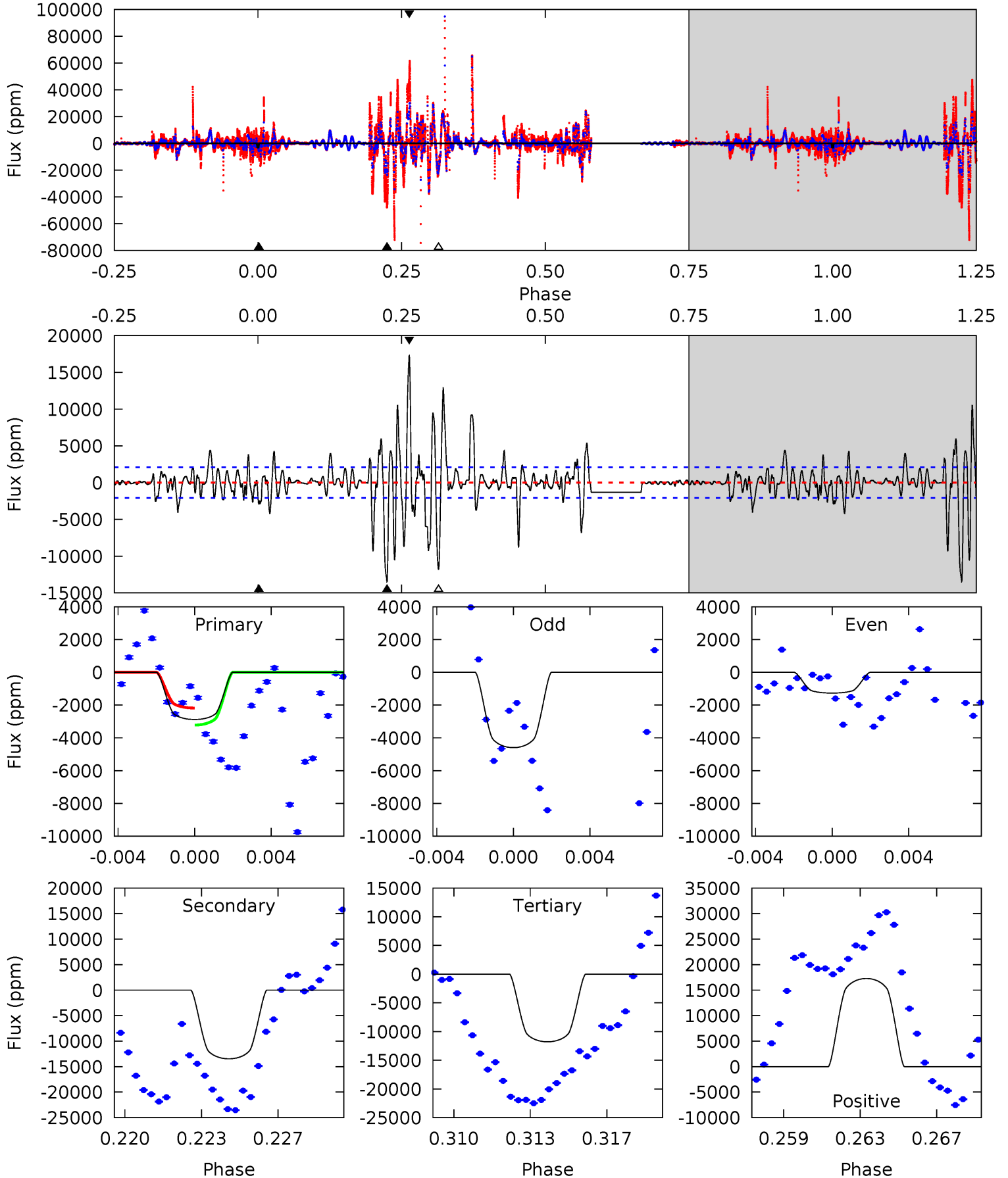
TCE 004374669-05     $P=703.323135$  Days     $T_0=161.286723$  (BKJD)



# DV Model-Shift Uniqueness Test

004374669-05, P = 703.472585 Days, E = 161.473609 Days

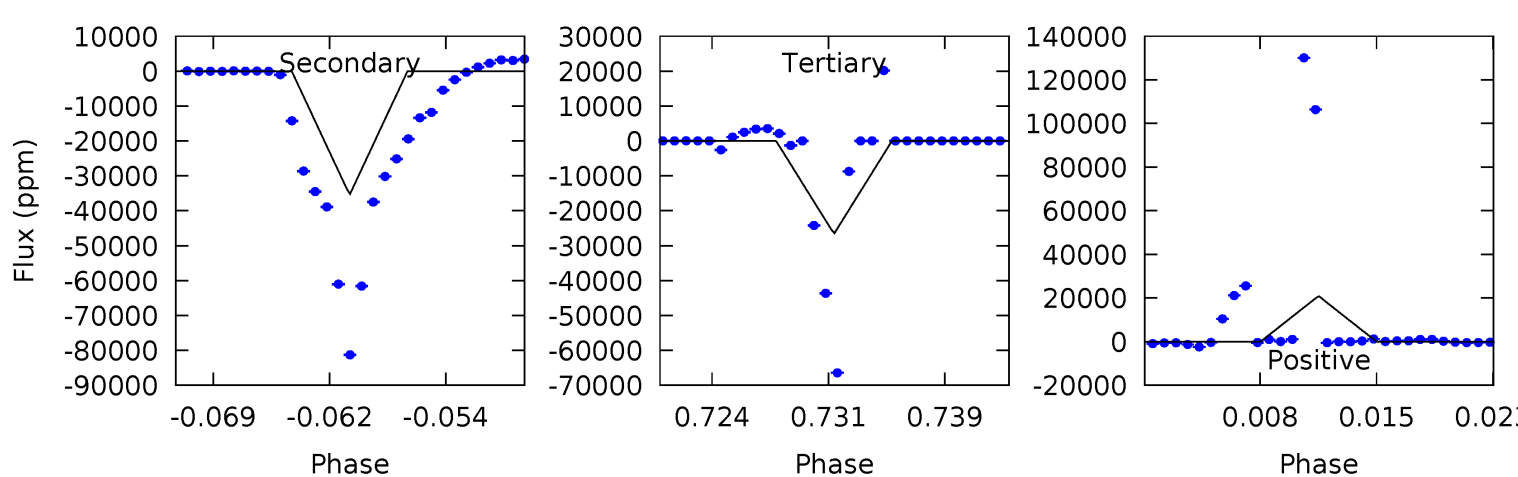
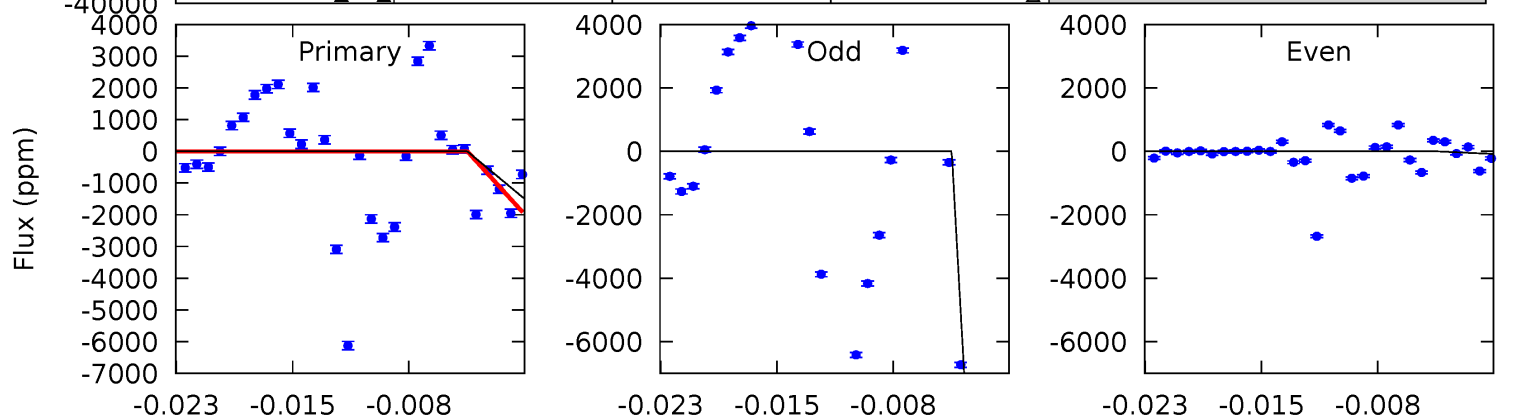
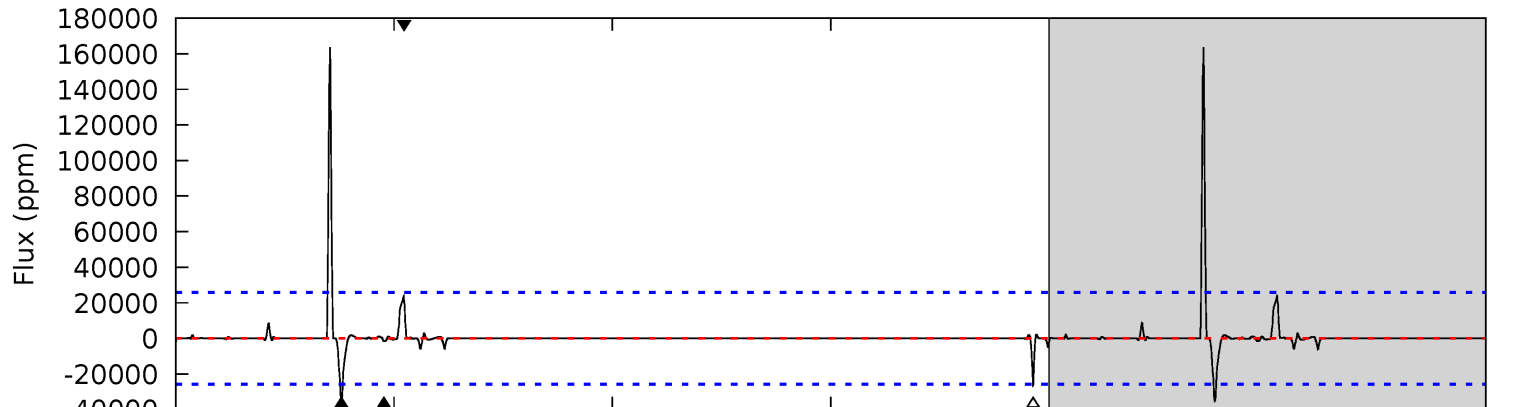
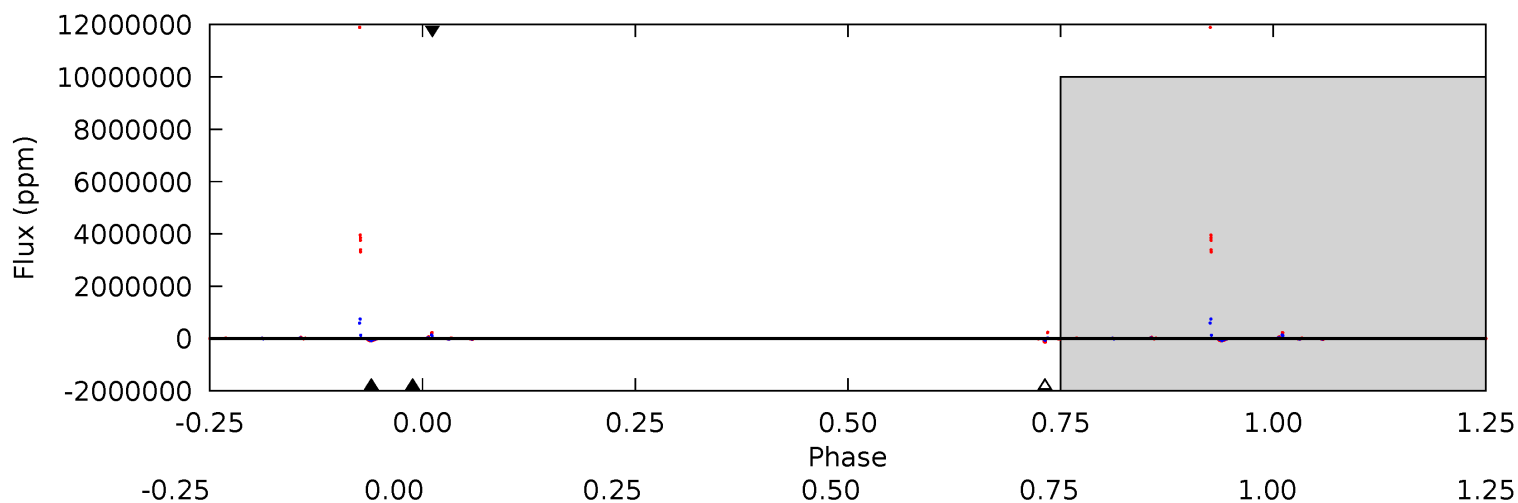
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.21	33.7	29.5	43.2	5.22	2.91	7.10	-22.3	-36.0	4.22	-9.53	3.59	0.79	0.56	1.27



# Alt Model-Shift Uniqueness Test

004374669-05, P = 703.323135 Days, E = 161.286723 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
0.30	6.92	5.20	4.09	5.08	2.67	1.44	-4.90	-3.79	1.73	2.84	5.12	13.3	0.82	0



### Stellar Parameters For KIC 004374669

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6223^{+194}_{-216}$	$2.712^{+1.179}_{-0.197}$	$0.070^{+0.200}_{-0.400}$	$13.602^{+1.938}_{-10.982}$	$3.480^{+0.070}_{-2.137}$	$0.002^{+0.170}_{-0.001}$
	+3%/-3%	+43%/-7%	+286%/-571%	+14%/-81%	+2%/-61%	+8742%/-43%
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 004374669-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-13469 \pm 400$	$86.20^{+22.22}_{-36.34}$	$912^{+77}_{-199}$	$8885^{+1042}_{-793}$	$5341^{+8307}_{-1962}$
Alt.	$-35214 \pm 5086$	$75.36^{+22.97}_{-33.01}$	$907^{+78}_{-217}$	$14165^{+2795}_{-2103}$	$18581^{+35850}_{-7908}$

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

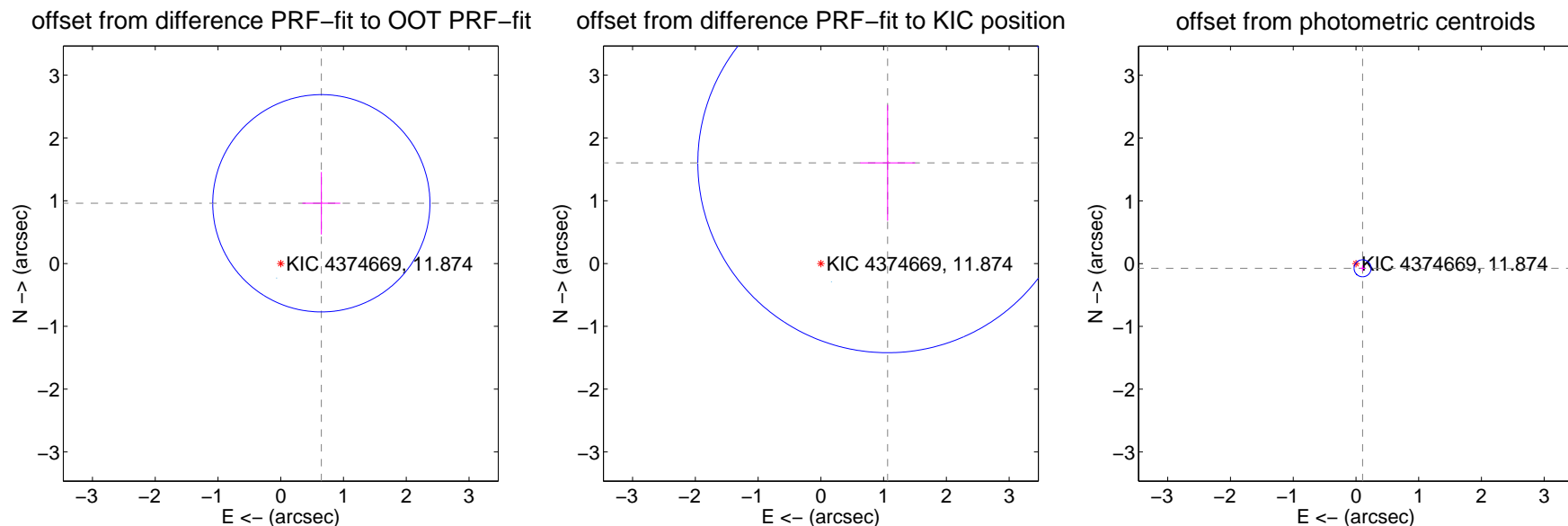
## DV Centroid Data

Supplemental centroid analysis for 004374669-05. **Kepler magnitude: 11.87.** Transit SNR 32.11

**There are 1 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.157 \pm 0.577$	2.01	$-0.647 \pm 0.301$	$0.960 \pm 0.497$
PRF-fit source offset from KIC position	$1.924 \pm 1.008$	1.91	$-1.063 \pm 0.438$	$1.603 \pm 0.922$
photometric centroid source offset	$0.13 \pm 0.05$	2.85	$-0.11 \pm 0.04$	$-0.07 \pm 0.05$



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.

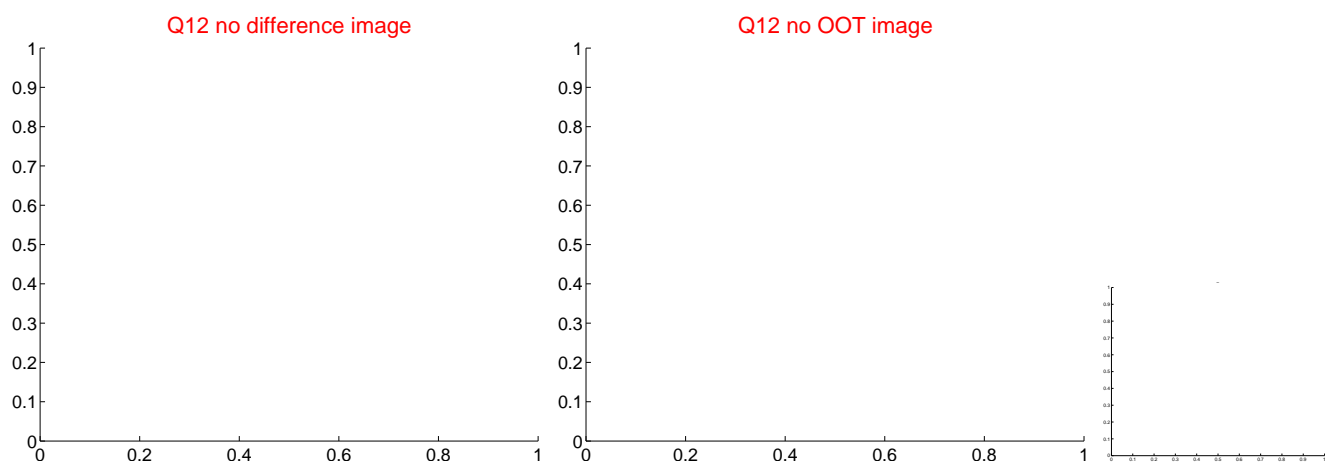
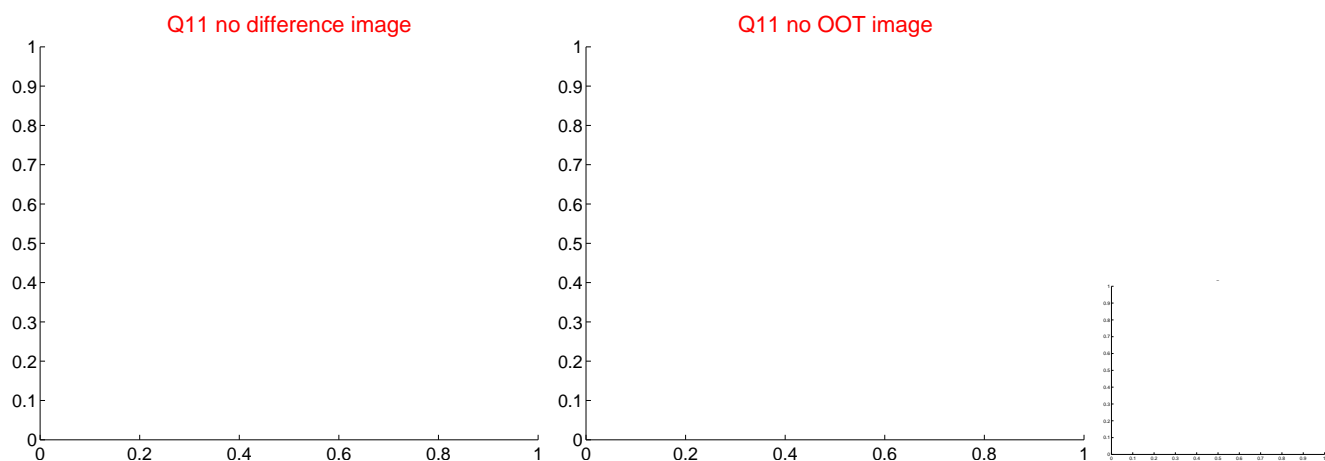
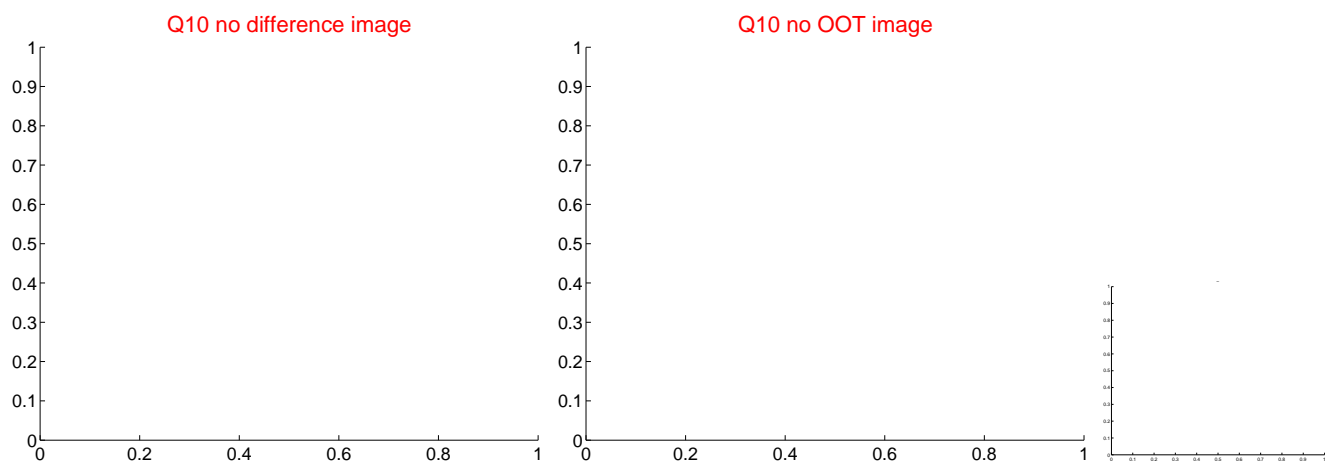
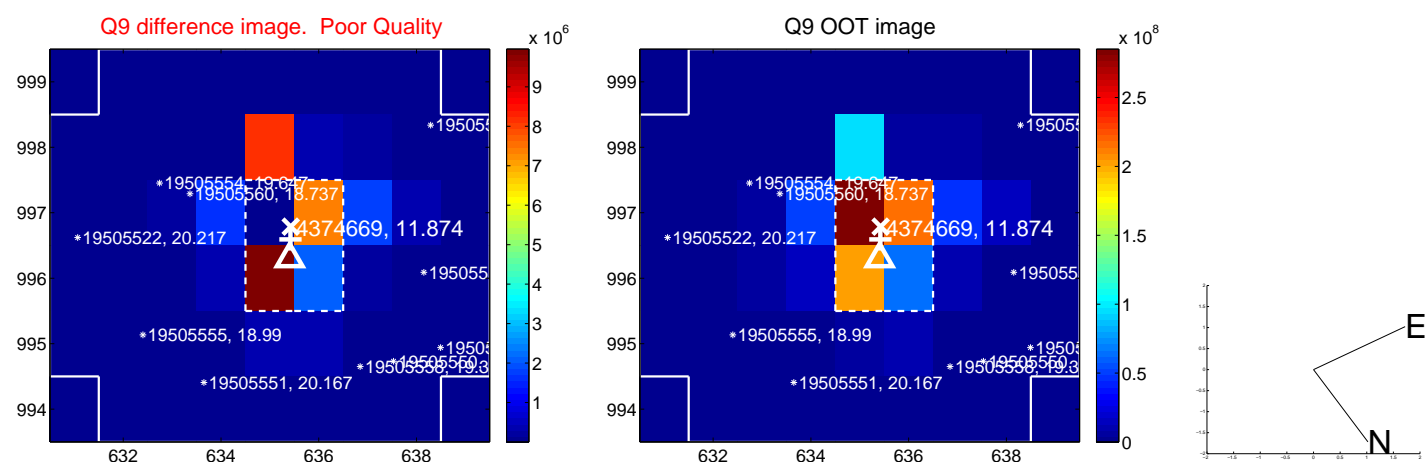


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





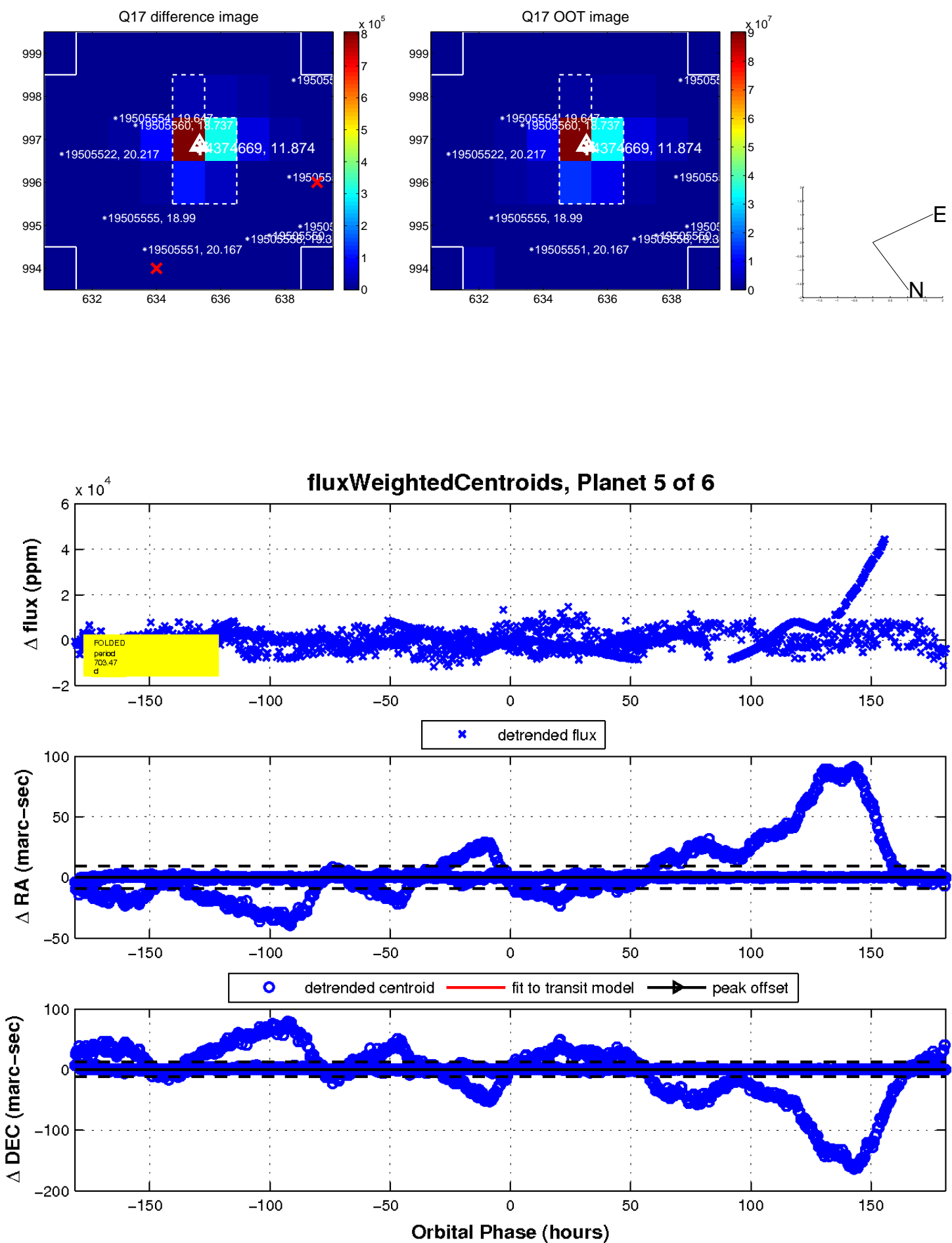
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



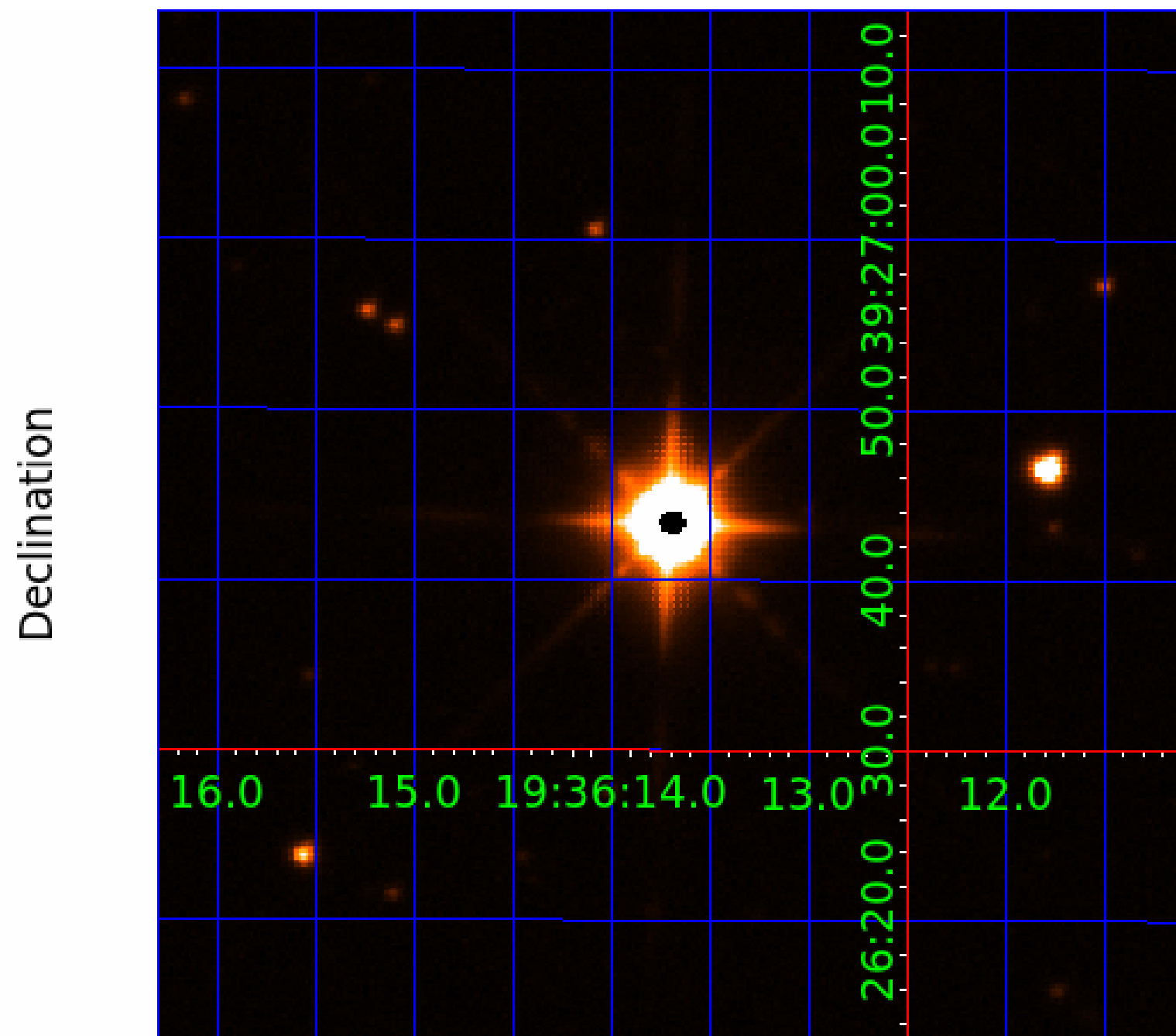
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 004374669

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004374669-01	OBS	No	245.312097	135.069845	13385.5	18.140	90.5	81.8	13.60	6223	276.87	184.08
004374669-04	OBS	No	219.885539	149.172401	469.0	15.000	44.8	-1.0	13.60	6223	29.49	212.99
004374669-05	OBS	No	703.472585	161.473609	3560.3	60.365	64.9	32.1	13.60	6223	93.64	45.18
004374669-06	OBS	No	284.971283	151.215757	611.7	3.500	35.9	-1.0	13.60	6223	33.70	150.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004374669-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA—LPP_DV—LPP_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004374669-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
004374669-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004374669-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

**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.

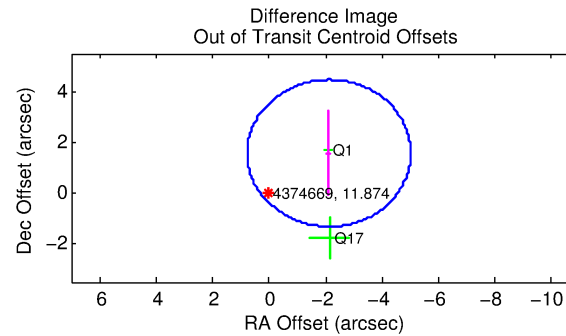
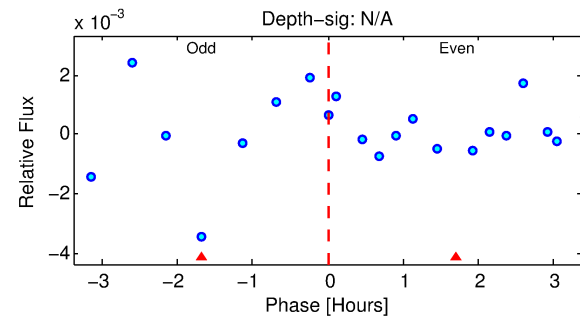
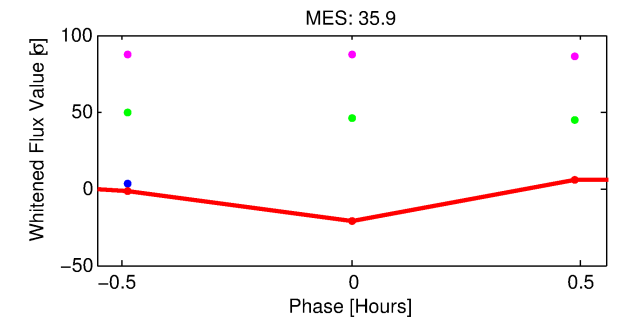
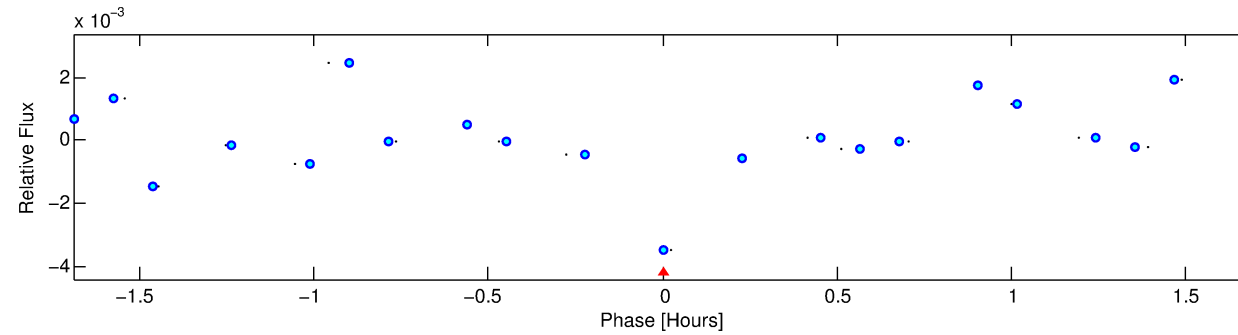
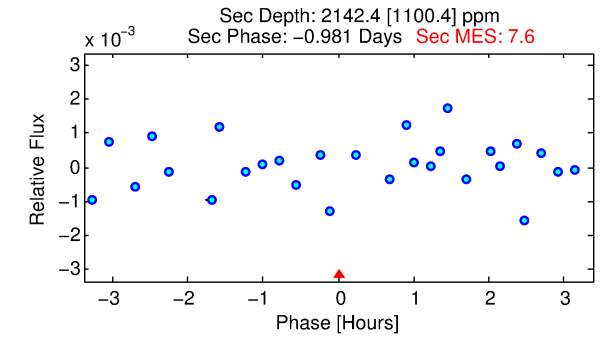
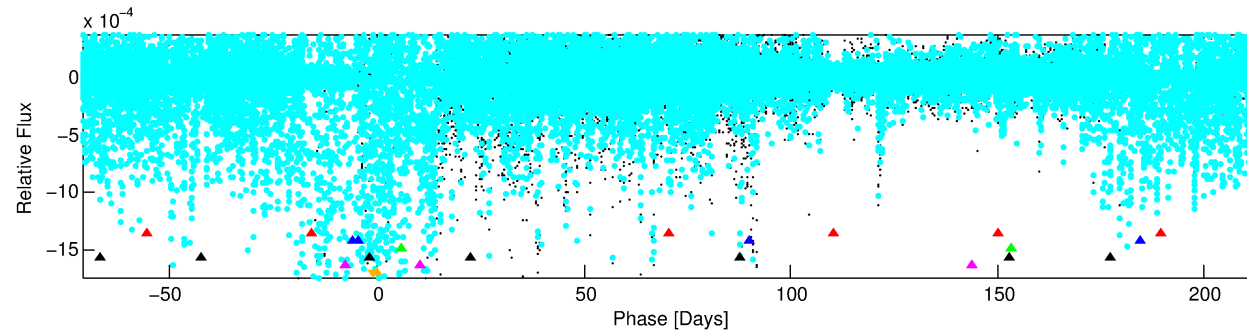
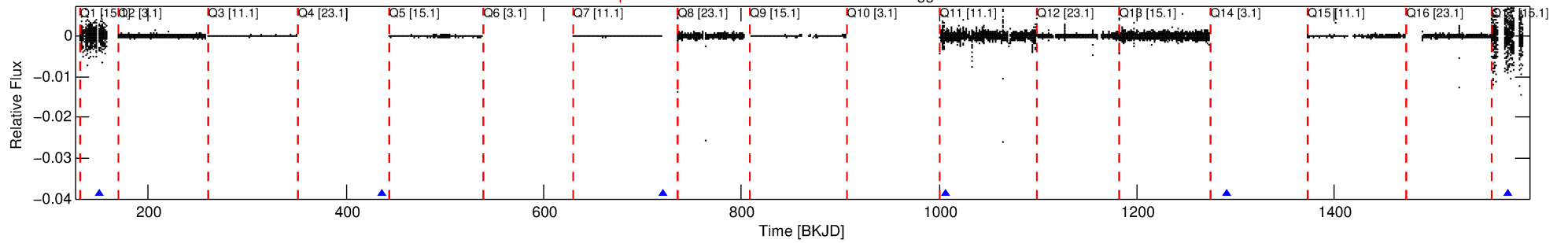
## Ephemeris Match Information For 004374669-06

No Significant Match Found

# DV One-Page Summary

KIC: 4374669 Candidate: 6 of 6 Period: 284.971 d

Kp: 11.87 R\*: 13.60 Rs Teff: 6223.0 K Logg: 2.71 Fe/H: 0.070



## TPS TCE Results:

Period = 284.97128 d  
Epoch = 151.2158 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

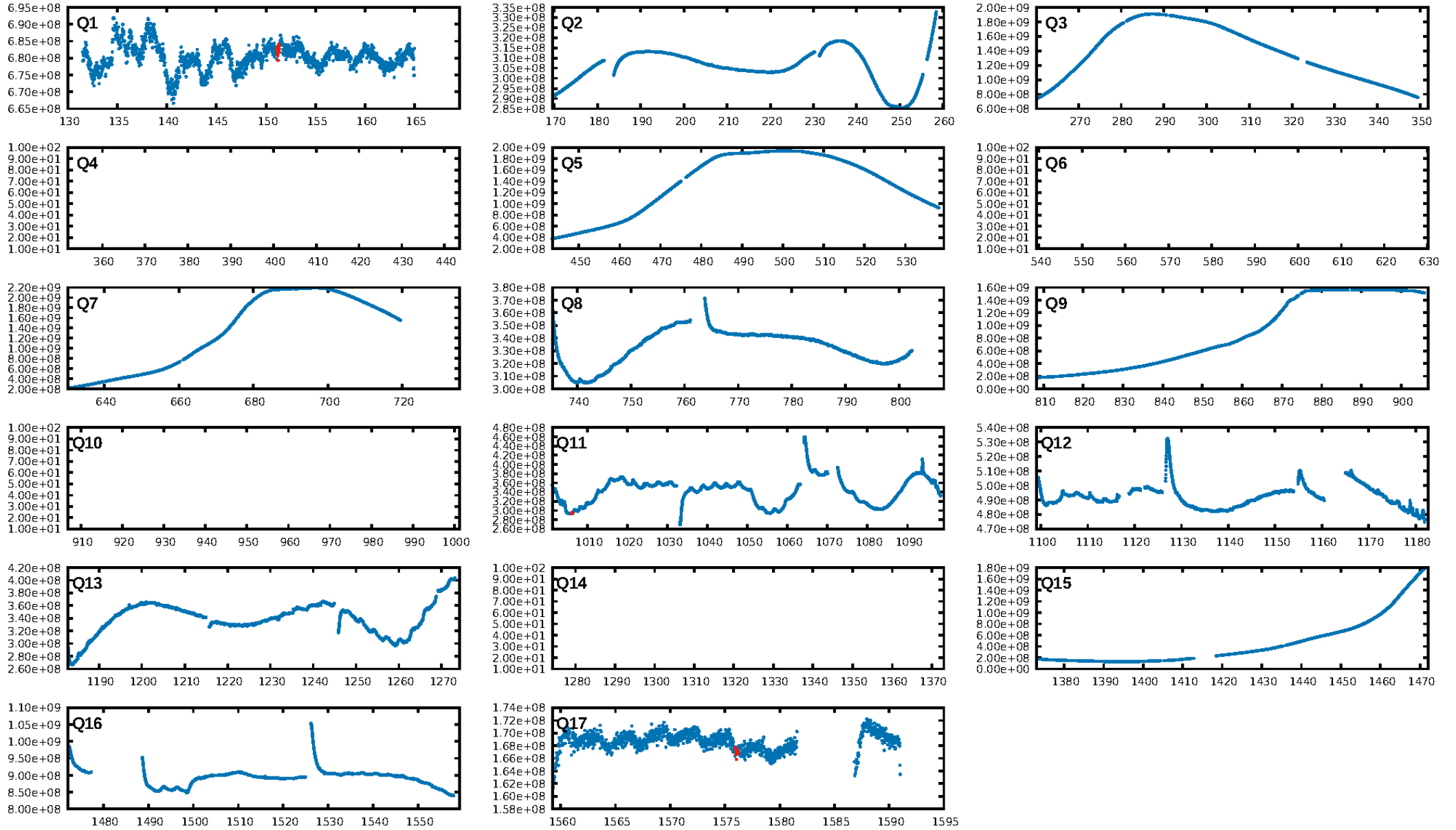
ShortPeriod-sig: 100.0% [51.52σ]  
LongPeriod-sig: 100.0% [802.03σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1/1]  
GhostDiagnostic-chr: 5.098

Centroid-sig: 92.2%  
Centroid-so: 0.290 arcsec [0.28σ]  
OotOffset-rm: 2.639 arcsec [2.74σ]  
OotOffset-st: 0/0/0/2 [2]  
KicOffset-rm: 2.919 arcsec [5.52σ]  
KicOffset-st: 0/0/0/2 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.50 [1/2]

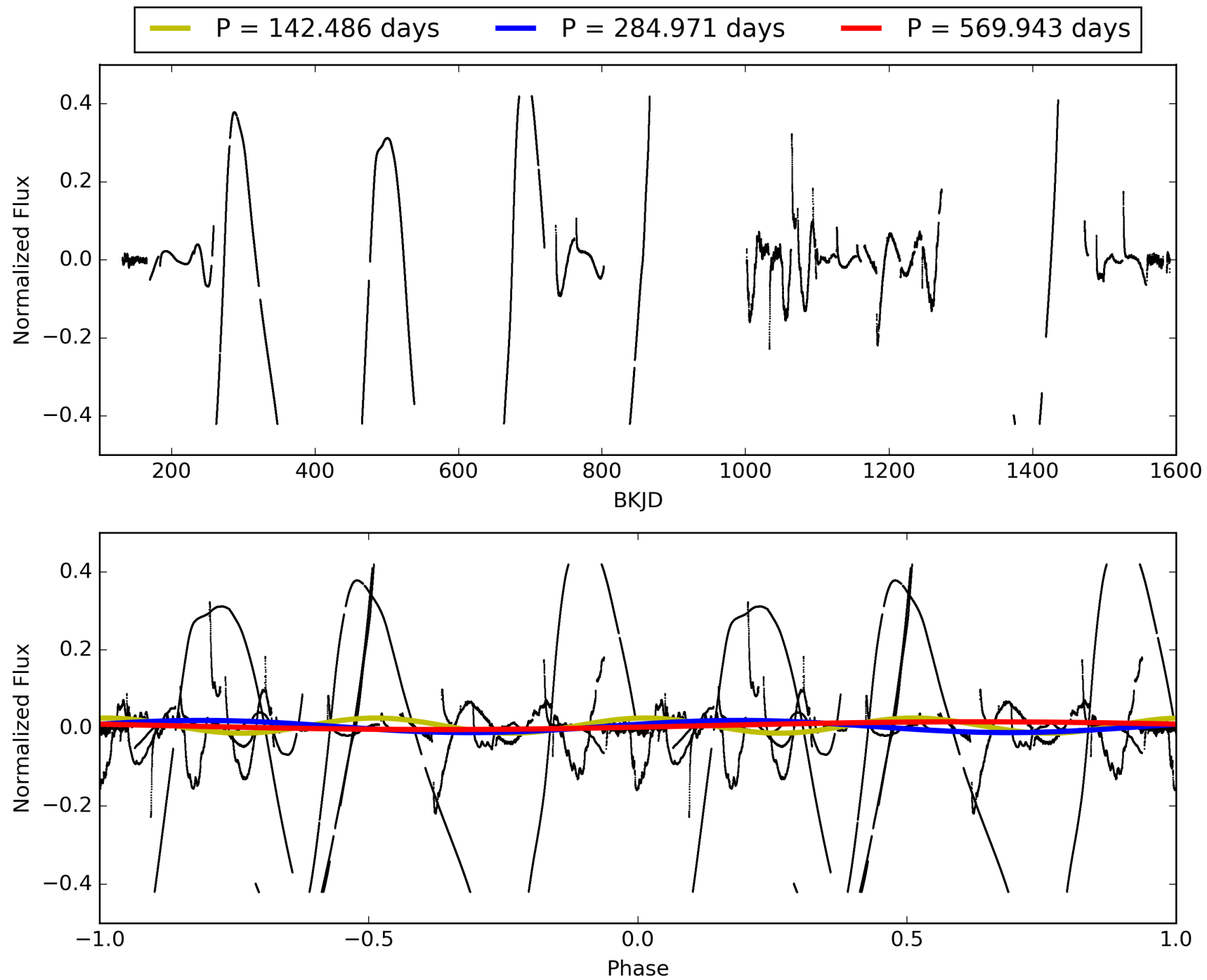
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:54:02 Z

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

# TCE 004374669-06, PDC Light Curves



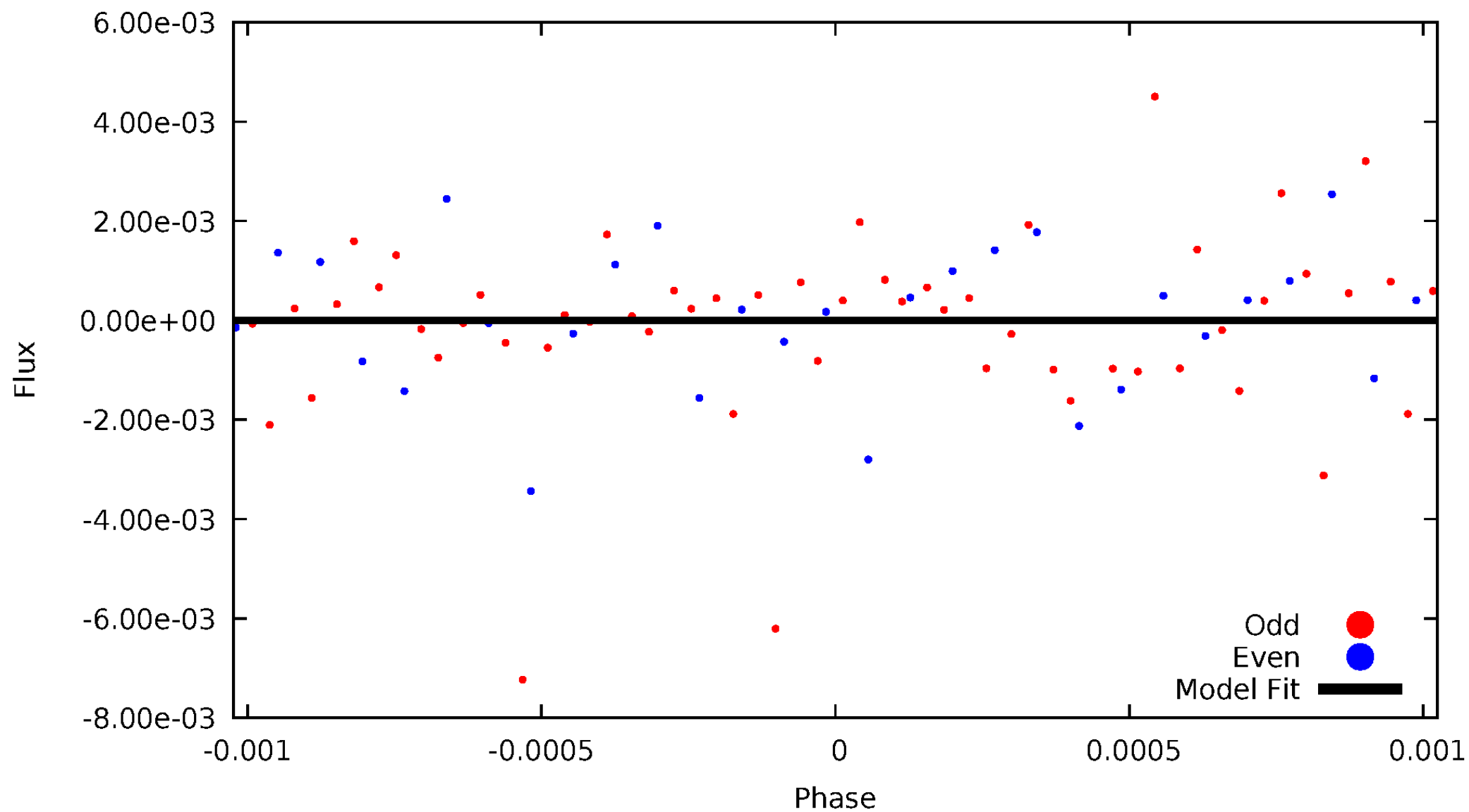
TCE 004374669-06





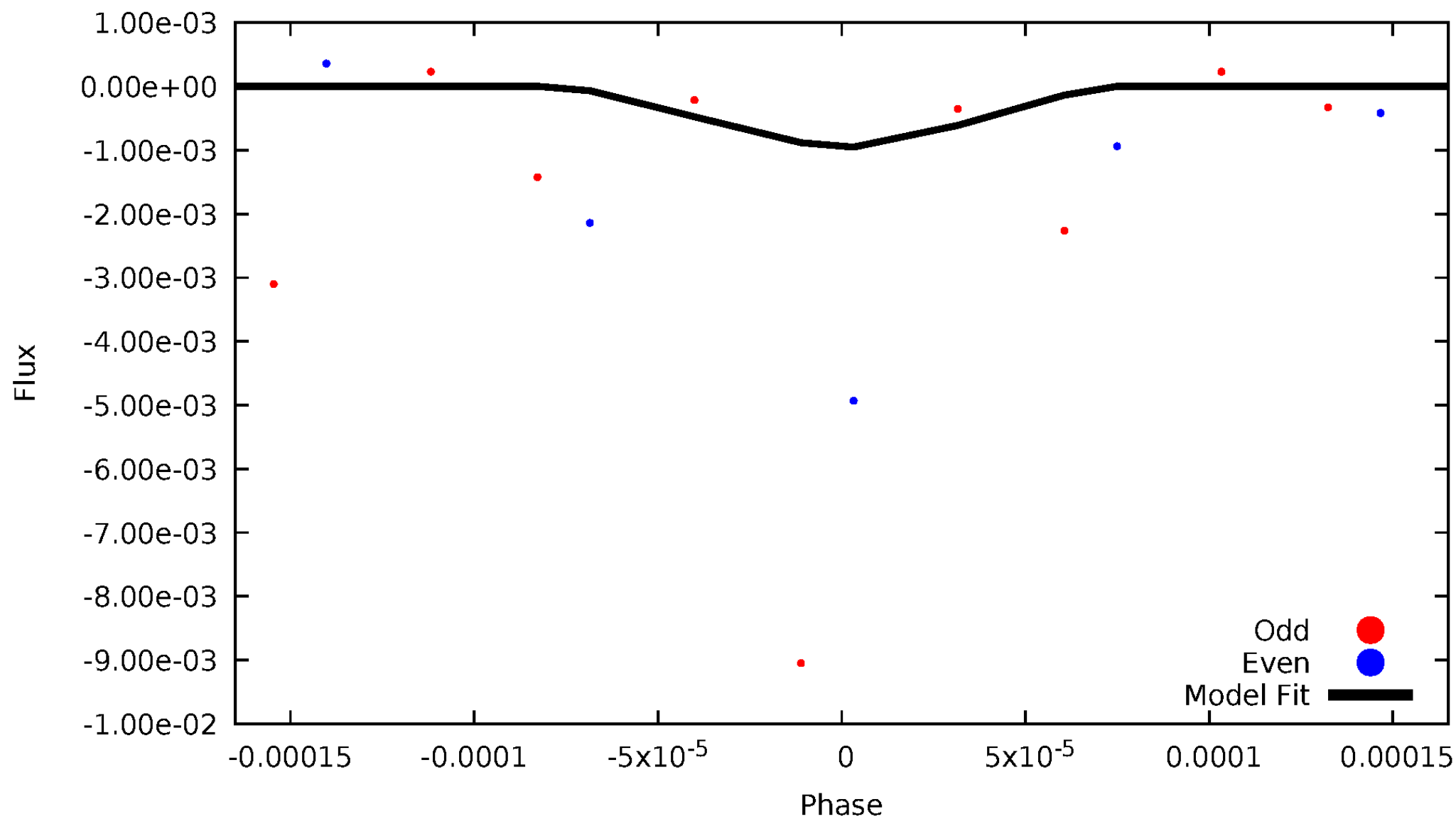
# DV Odd/Even

TCE 004374669-06



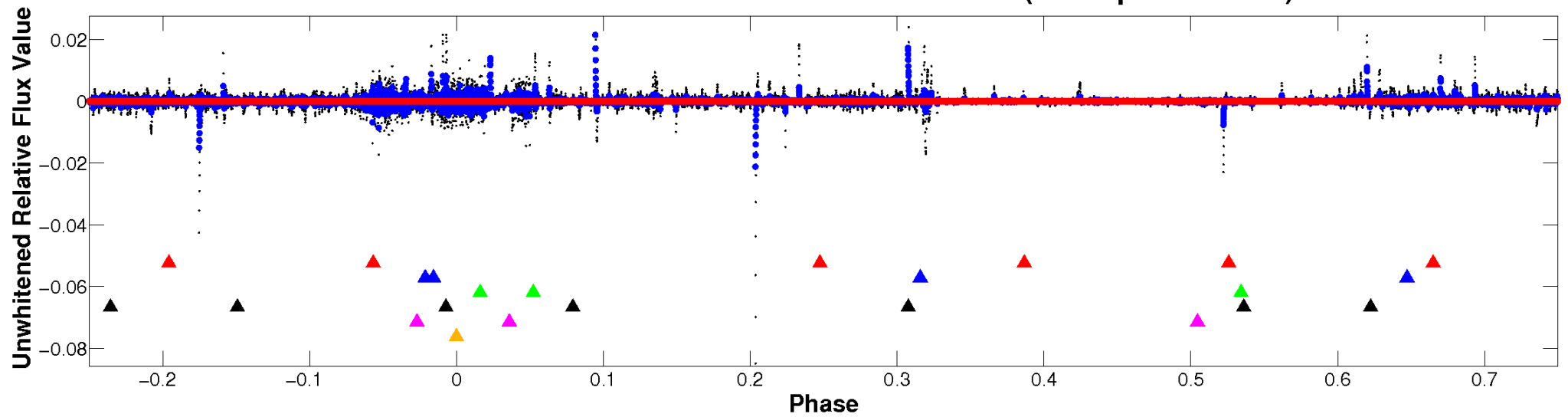
# ALT Odd/Even

TCE 004374669-06



# Non-Whitened Vs. Whitened Light Curve

**Planet 6 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

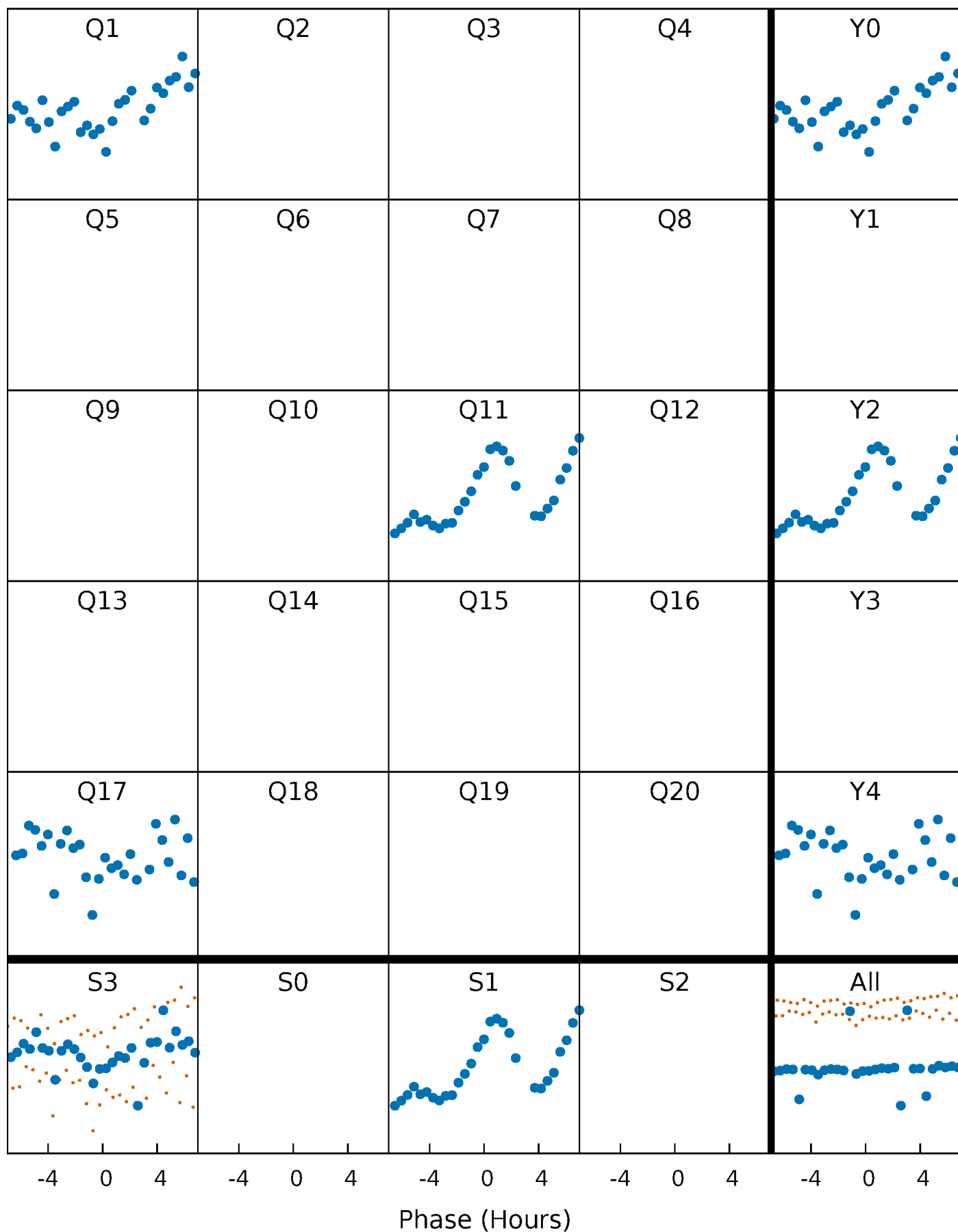


**Planet 6 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



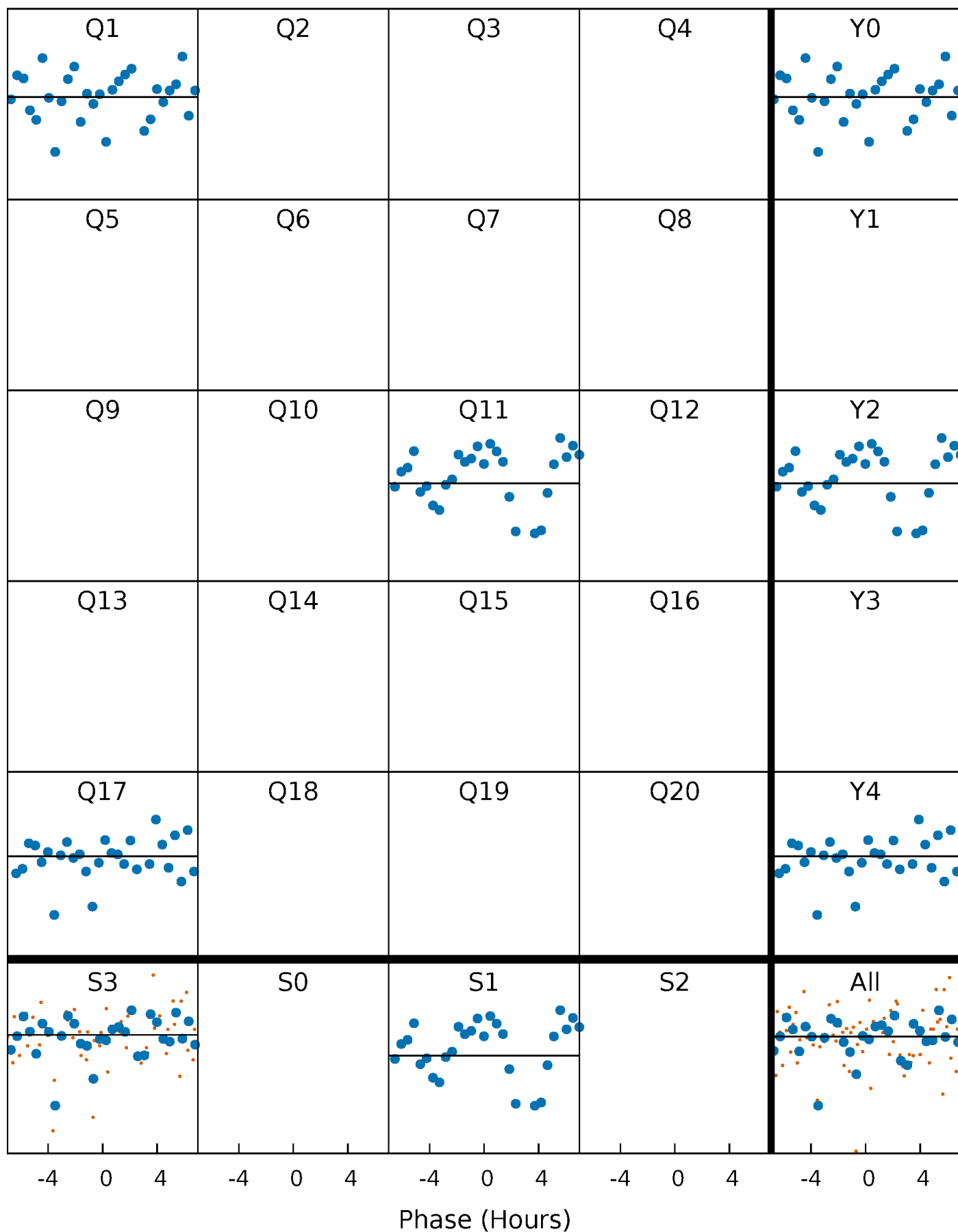
# PDC Quarter-Phased Transit Curves

TCE 004374669-06     $P=284.971283$  Days     $T_0=151.215757$  (BKJD)



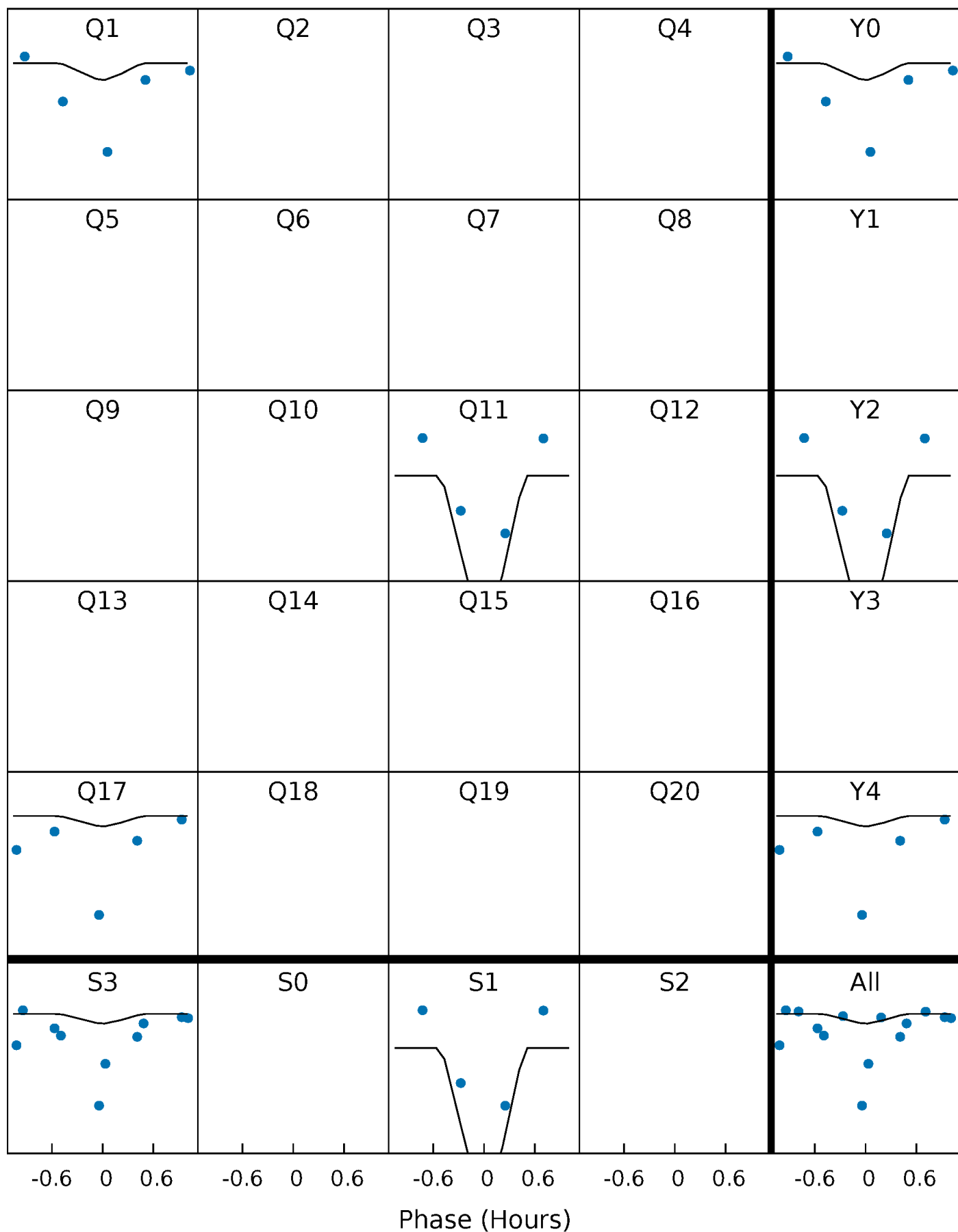
# DV Quarter-Phased Transit Curves

TCE 004374669-06     $P=284.971283$  Days     $T_0=151.215757$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

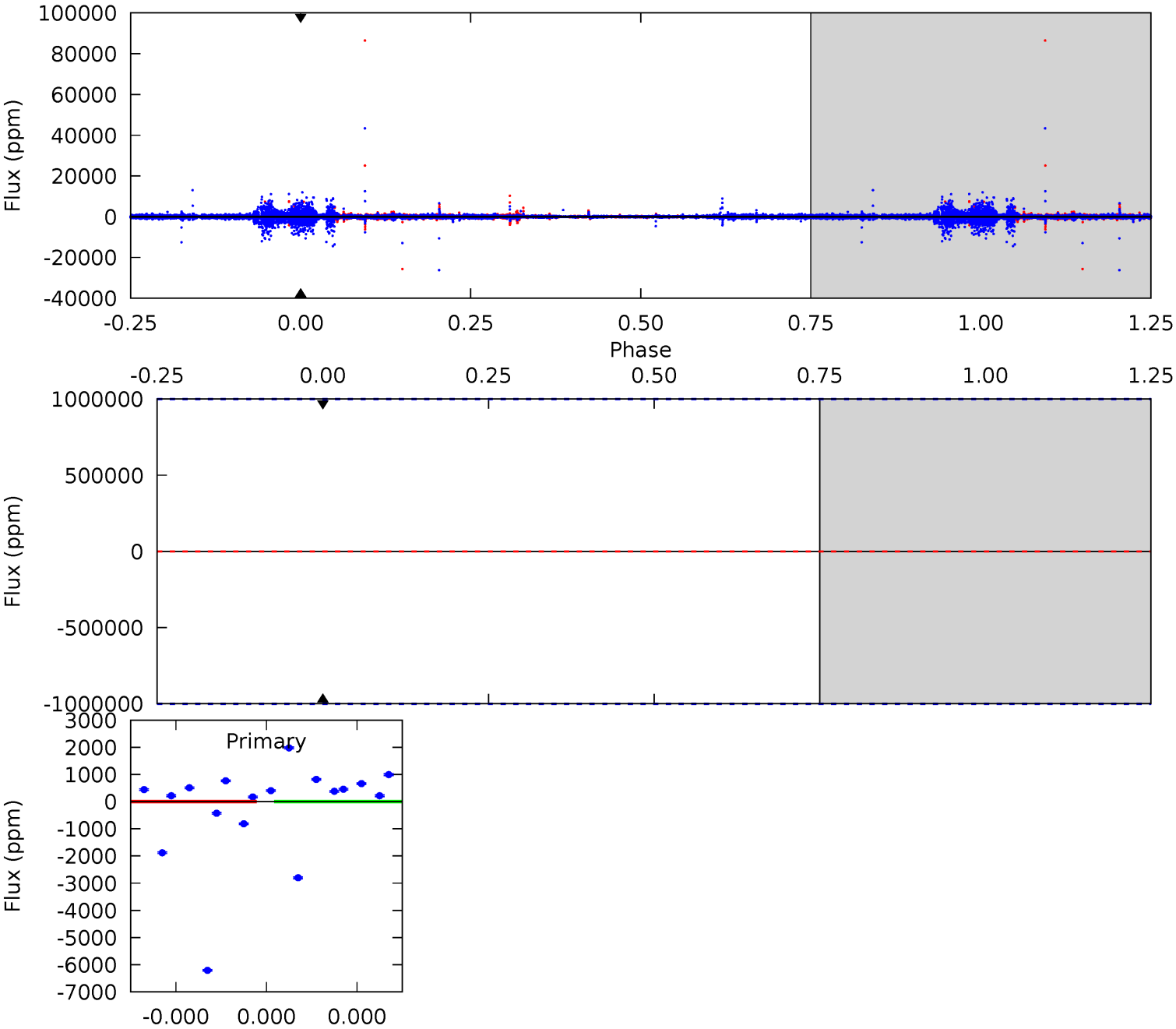
TCE 004374669-06 P=284.971283 Days  $T_0=151.067295$  (BKJD)



# DV Model-Shift Uniqueness Test

004374669-06, P = 284.971283 Days, E = 151.215757 Days

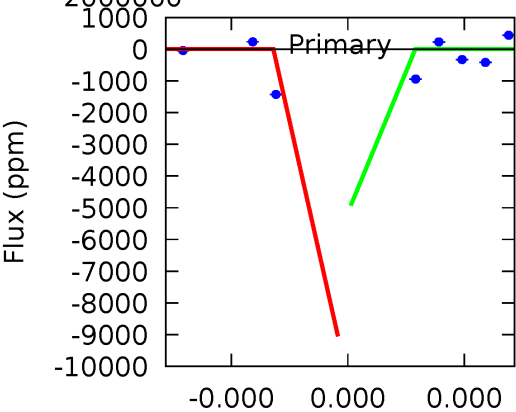
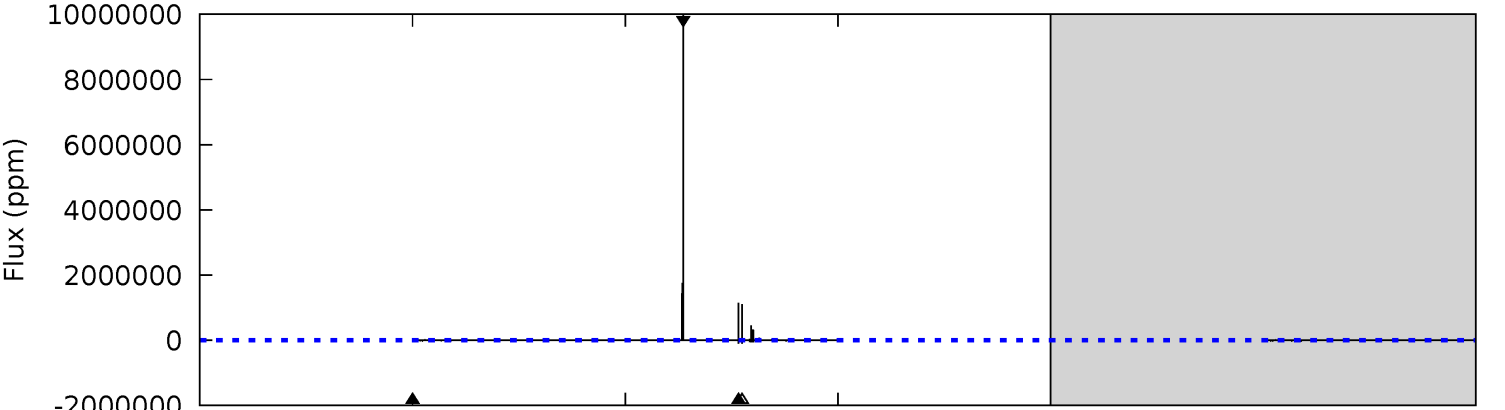
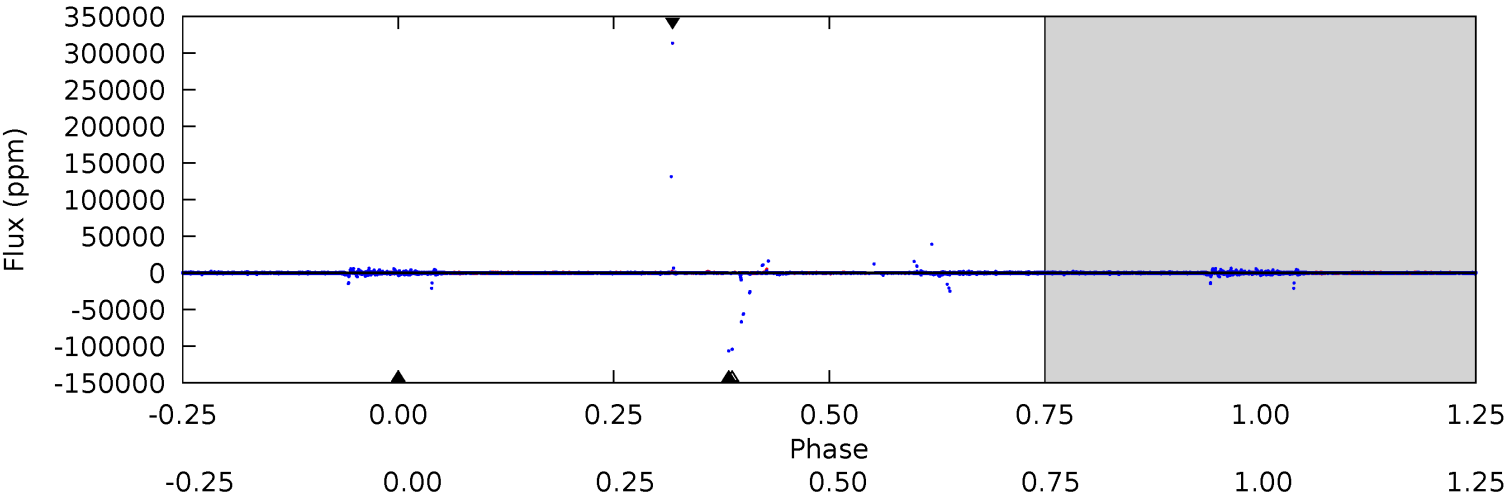
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

004374669-06, P = 284.971283 Days, E = 151.067295 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
1.59	34.3	33.6	3214	5.80	3.83	24.2	-32.0	-3213	0.76	-3180	0	1.02	0.99	1.30





### Stellar Parameters For KIC 004374669

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6223^{+194}_{-216}$	$2.712^{+1.179}_{-0.197}$	$0.070^{+0.200}_{-0.400}$	$13.602^{+1.938}_{-10.982}$	$3.480^{+0.070}_{-2.137}$	$0.002^{+0.170}_{-0.001}$
	+3%/-3%	+43%/-7%	+286%/-571%	+14%/-81%	+2%/-61%	+8742%/-43%
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 004374669-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$92.64^{+120.18}_{-67.11}$	$1228^{+108}_{-261}$	$5241^{+22552}_{-23507}$	$315^{+25963}_{-12021}$
Alt.	$-0 \pm 3100$	$90.39^{+124.34}_{-64.38}$	$1227^{+105}_{-268}$	$2327^{+4023}_{-8511}$	$1.918^{+688.701}_{-639.232}$

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

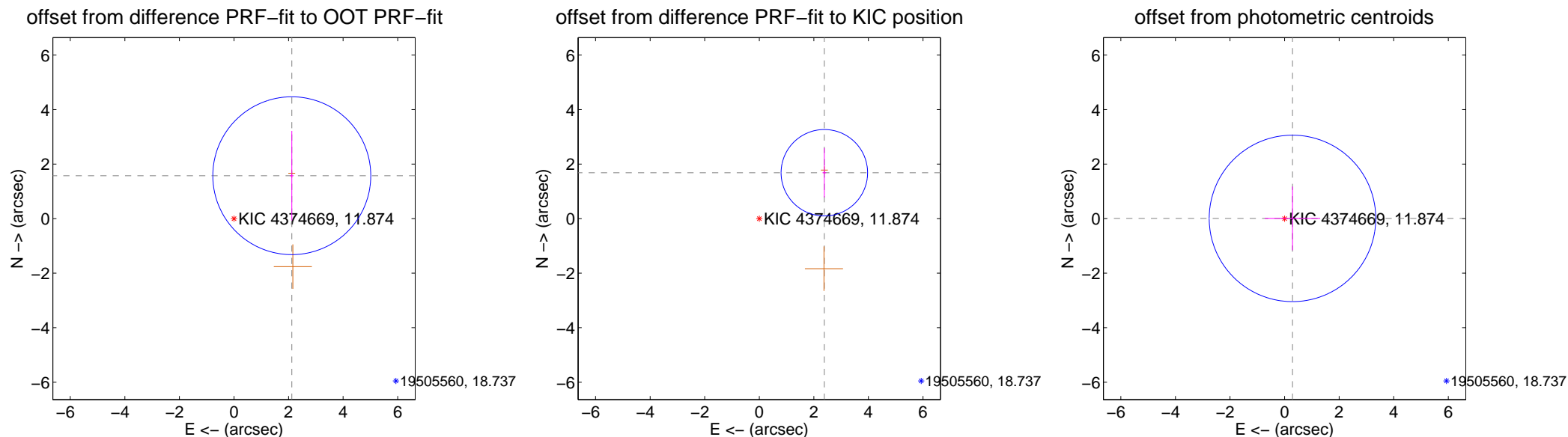
## DV Centroid Data

Supplemental centroid analysis for 004374669-06. **Kepler magnitude: 11.87.** Transit SNR -1.00

**There are 0 quarters with good PRF difference image offsets**

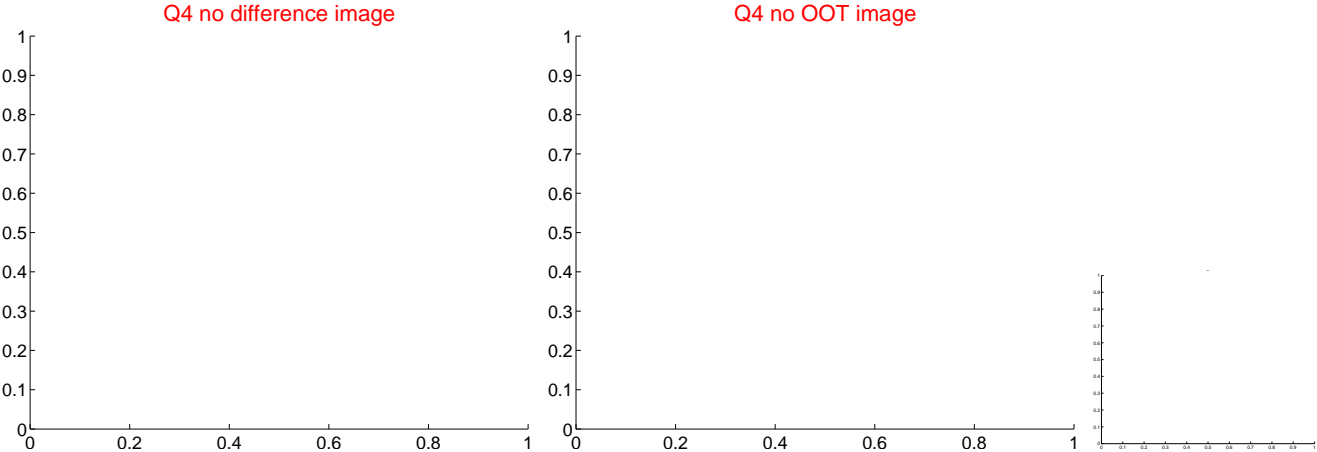
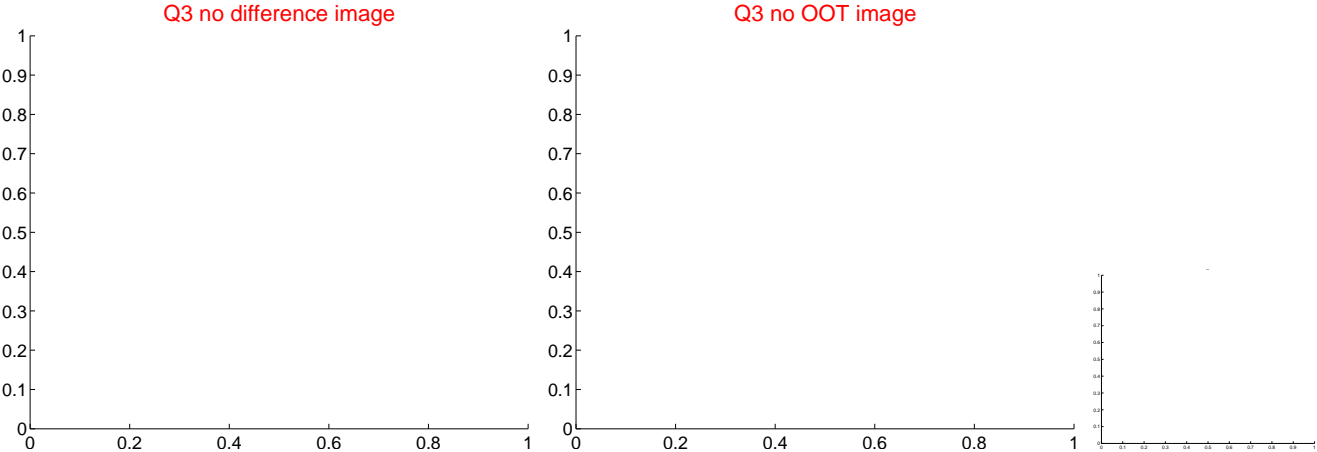
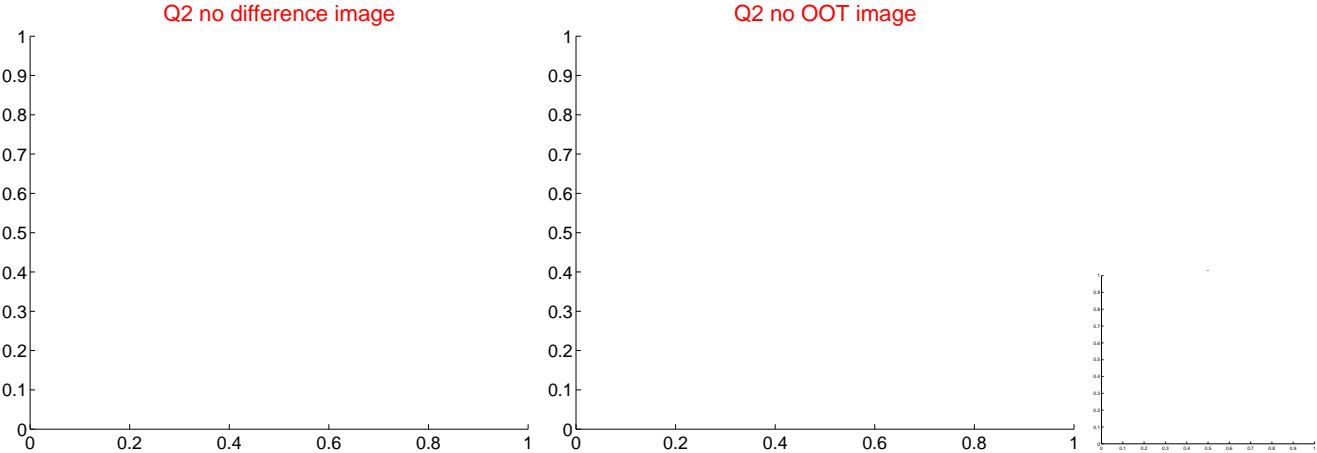
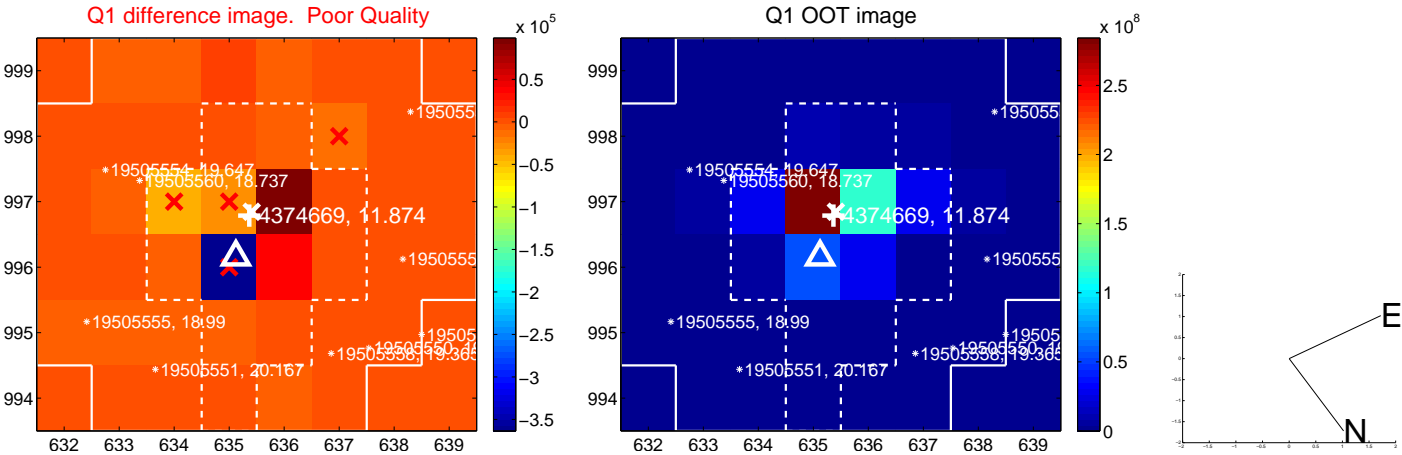
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.639 \pm 0.965$	2.74	$-2.118 \pm 0.070$	$1.574 \pm 1.642$
PRF-fit source offset from KIC position	<b><math>2.919 \pm 0.528</math></b>	<b>5.52</b>	$-2.385 \pm 0.067$	$1.683 \pm 0.906$
photometric centroid source offset	$0.29 \pm 1.02$	0.28	$-0.29 \pm 1.02$	$0.01 \pm 1.17$



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.



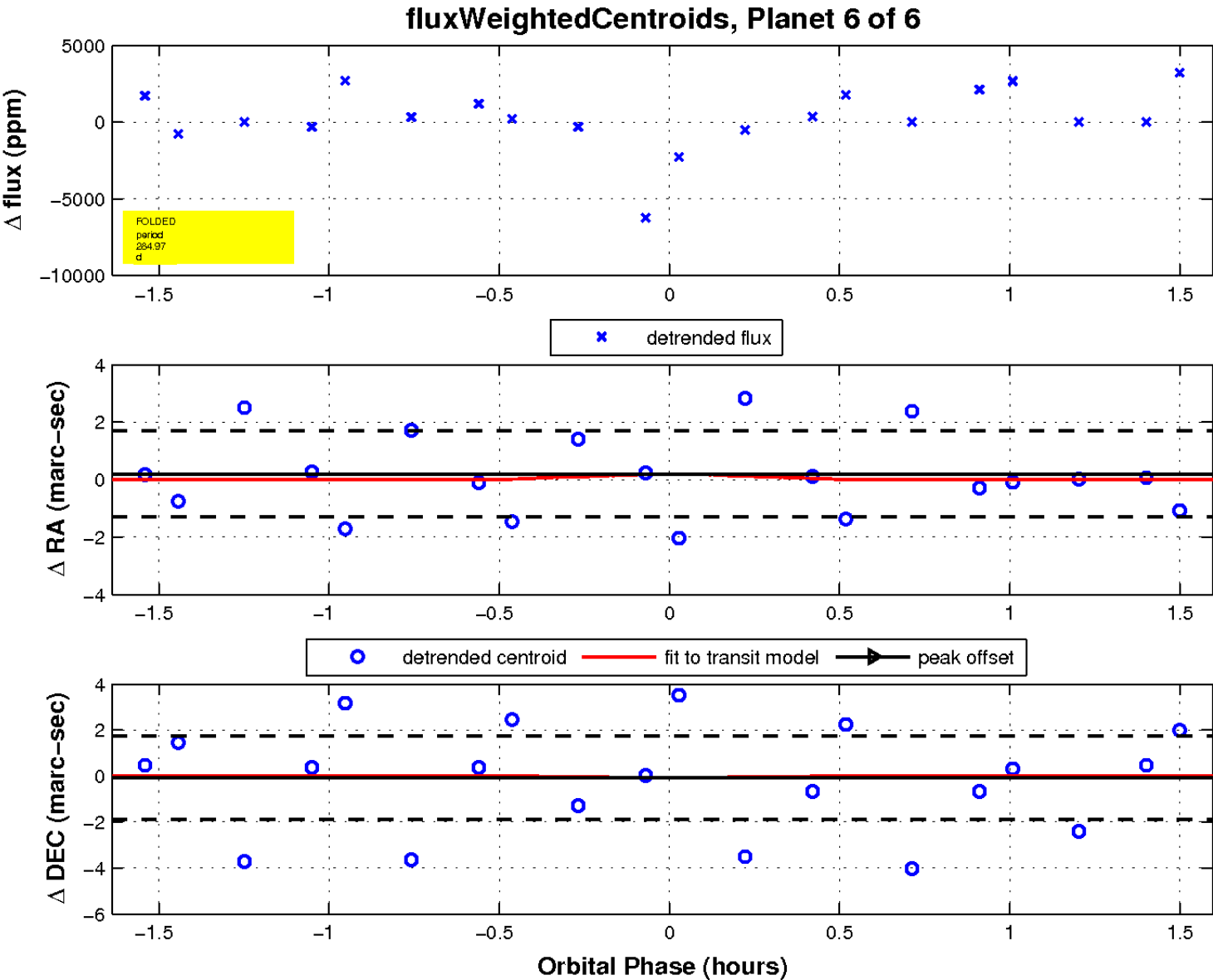
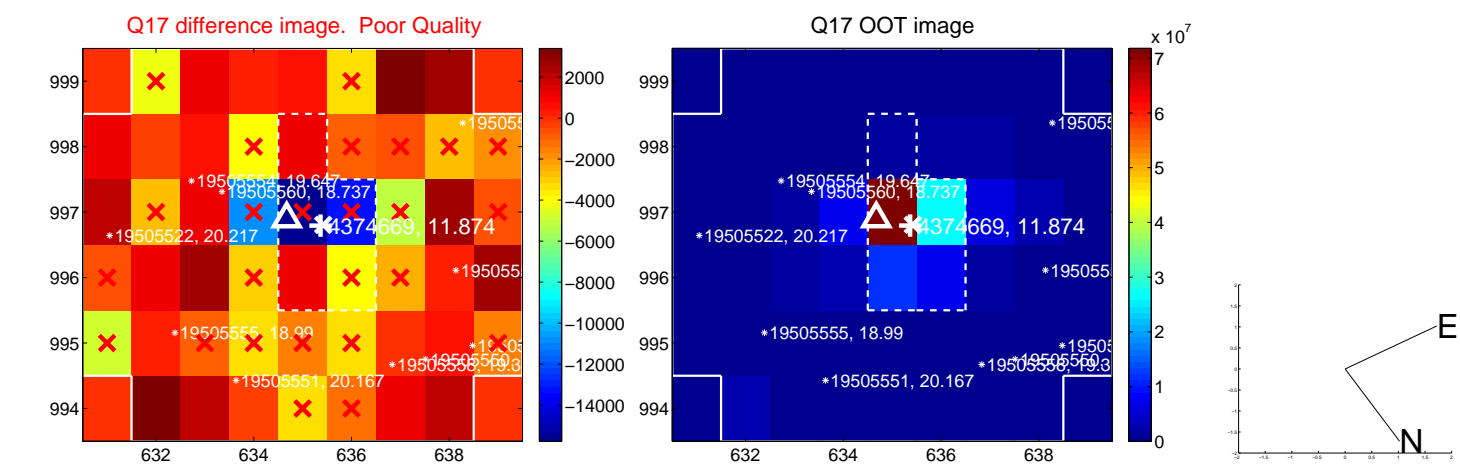
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

