

# KIC 002307249

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002307249-01	OBS	No	443.240912	460.377527	3794.6	4.841	18.3	10.1	0.56	4889	4.41	0.18
002307249-02	OBS	No	285.942428	337.467052	4279.8	6.412	12.7	9.0	0.56	4889	3.65	0.32
002307249-03	OBS	No	495.701002	455.692868	2346.6	4.542	11.3	6.1	0.56	4889	2.66	0.15
002307249-04	OBS	No	352.446266	209.048827	2982.8	7.083	11.7	6.7	0.56	4889	3.00	0.24
002307249-05	OBS	No	369.019414	203.606121	3821.5	12.203	12.0	5.9	0.56	4889	3.50	0.23
002307249-06	OBS	No	340.157936	239.395276	3424.6	7.325	12.4	7.6	0.56	4889	3.21	0.26
002307249-07	OBS	No	401.069916	174.237568	1861.9	7.500	11.2	-1.0	0.56	4889	2.37	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002307249-01	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
002307249-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
002307249-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002307249-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

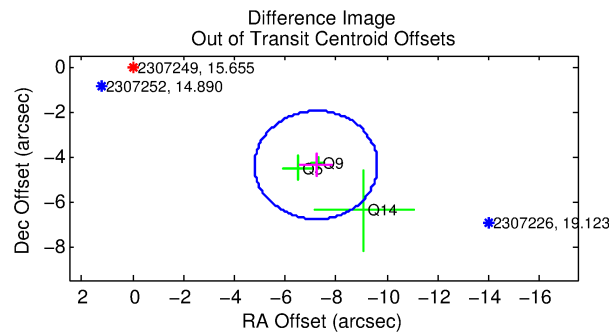
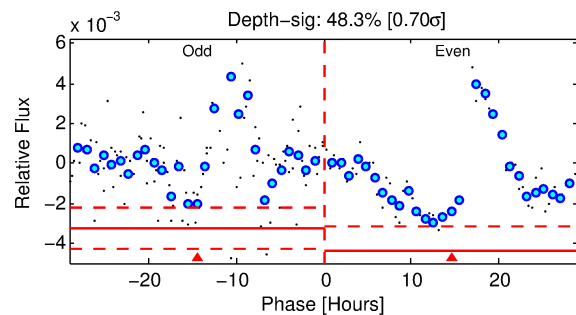
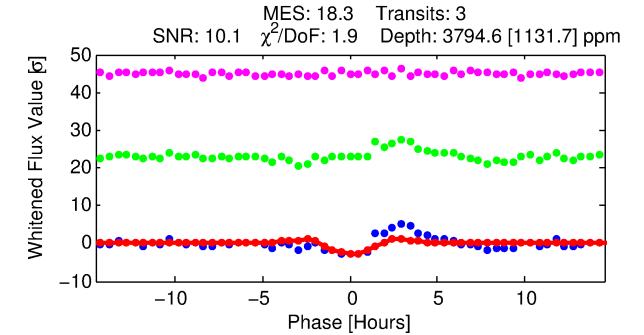
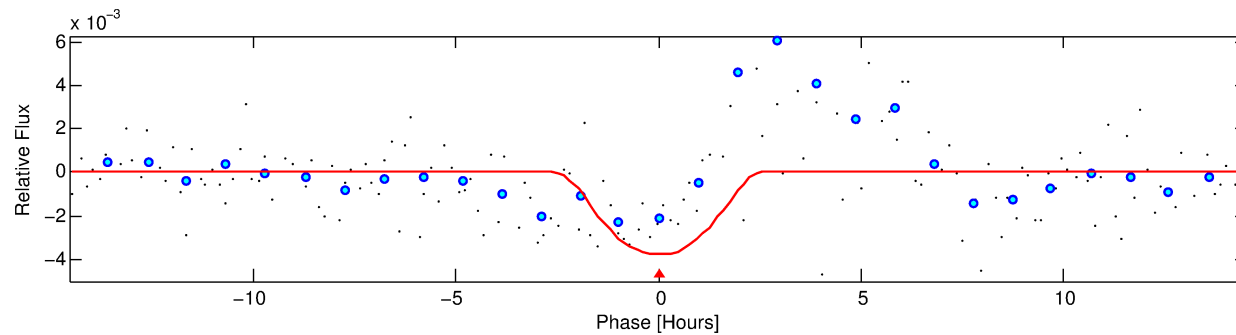
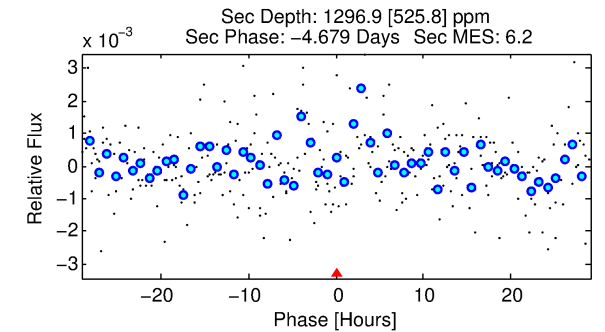
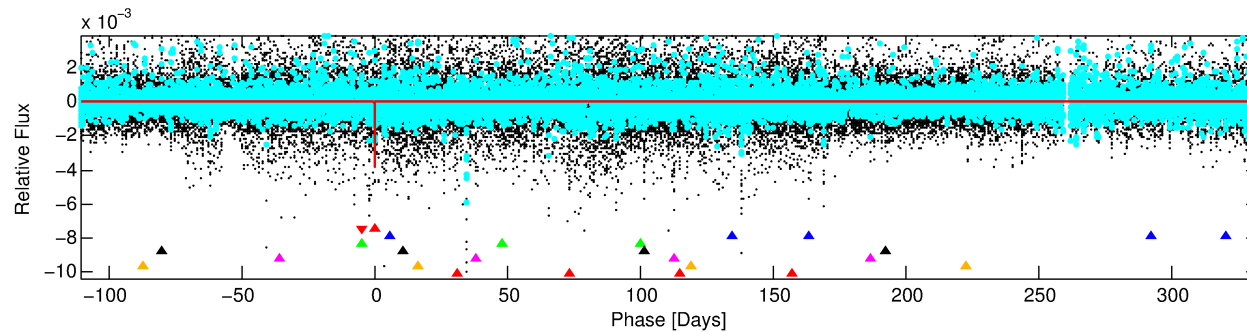
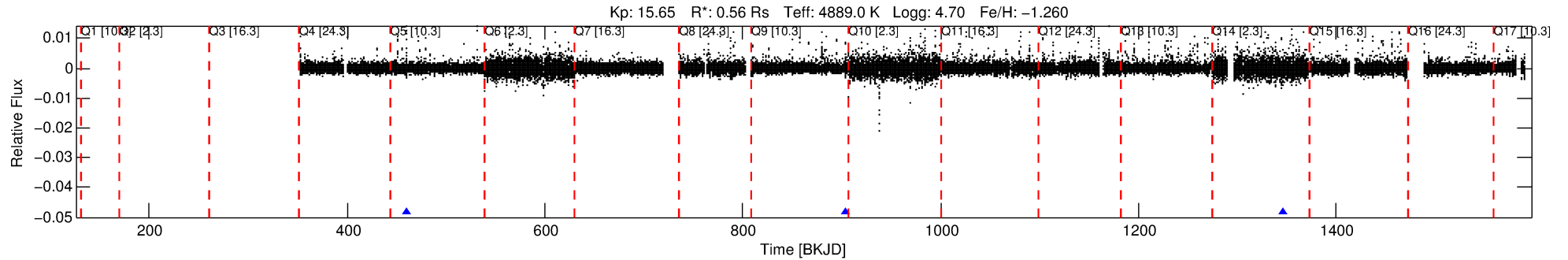
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 002307249-01

No Significant Match Found

# DV One-Page Summary

KIC: 2307249 Candidate: 1 of 7 Period: 443.241 d



## DV Fit Results:

Period = 443.24091 [0.01095] d  
Epoch = 460.3775 [0.0104] BKJD  
Rp/R\* = 0.0725 [0.0365]  
a/R\* = 366.44 [139.39]  
b = 0.94 [0.10]  
Seff = 0.18 [0.03]  
Teq = 166 [7] K  
Rp = 4.41 [2.23] Re  
a = 0.9412 [0.0542] AU  
Ag = 32531.62 [35374.72] [0.92σ]  
Teffp = 3445 [942] K [3.48σ]

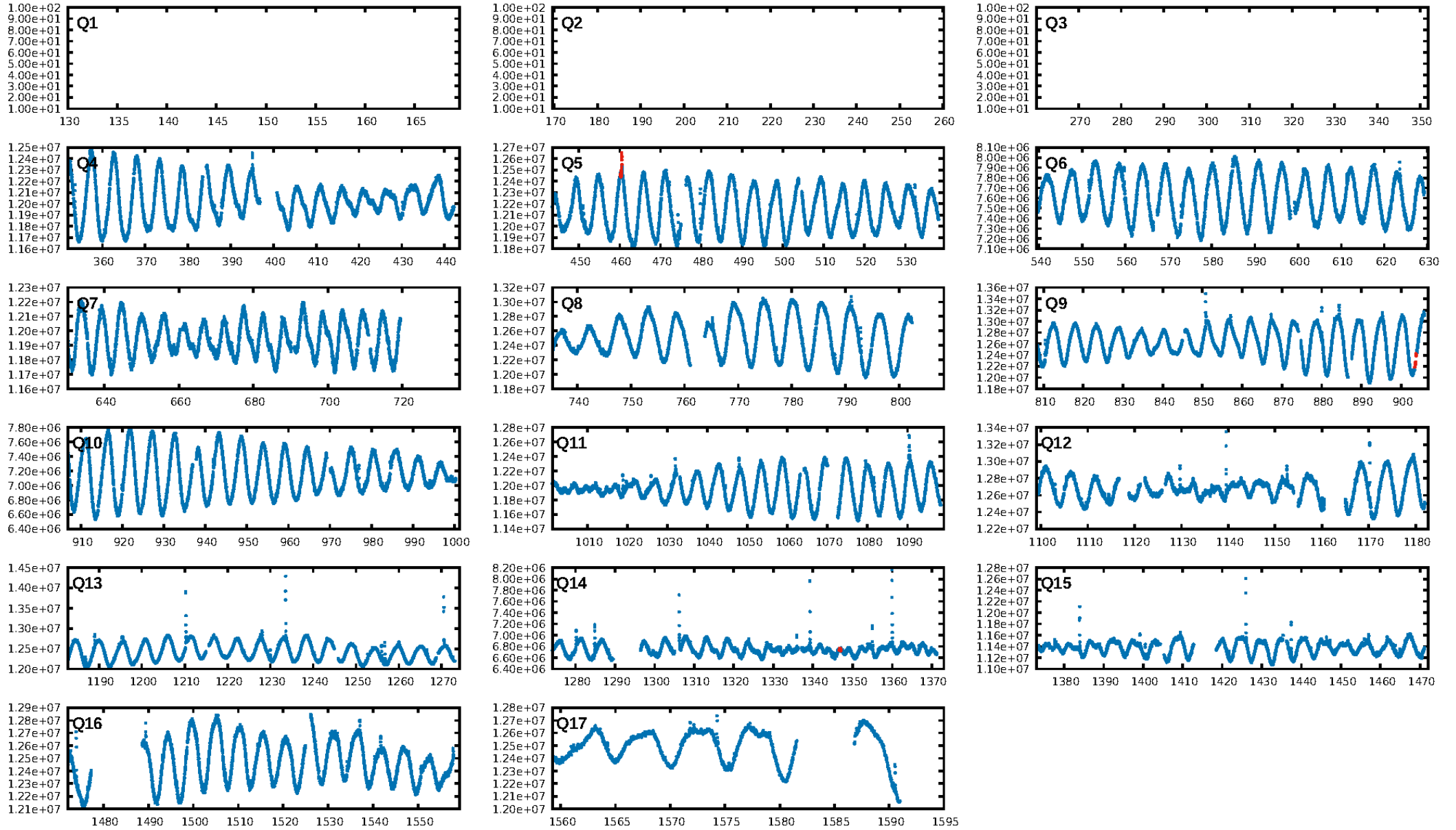
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [113.38σ]  
LongPeriod-sig: 100.0% [189.67σ]  
ModelChiSquare2-sig: 1.0%  
ModelChiSquareGof-sig: 23.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 53.15  
Centroid-sig: 3.0%  
Centroid-so: 1.834 arcsec [2.11σ]  
OotOffset-rm: 8.441 arcsec [10.49σ]  
KicOffset-rm: 0.539 arcsec [0.85σ]  
OotOffset-st: 1/0/0/2 [3]  
KicOffset-st: 1/0/0/2 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

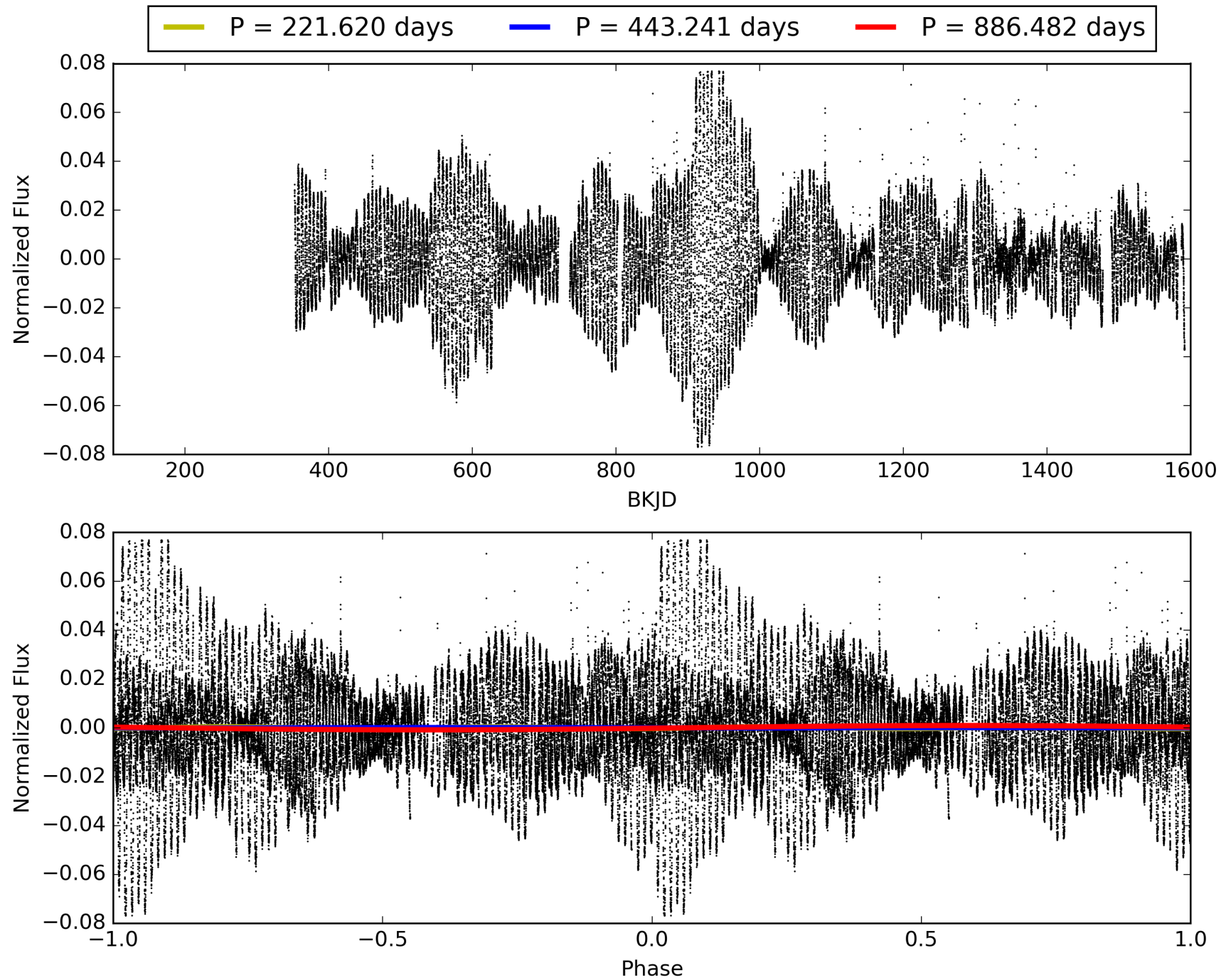
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:51:51 Z

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

# TCE 002307249-01, PDC Light Curves



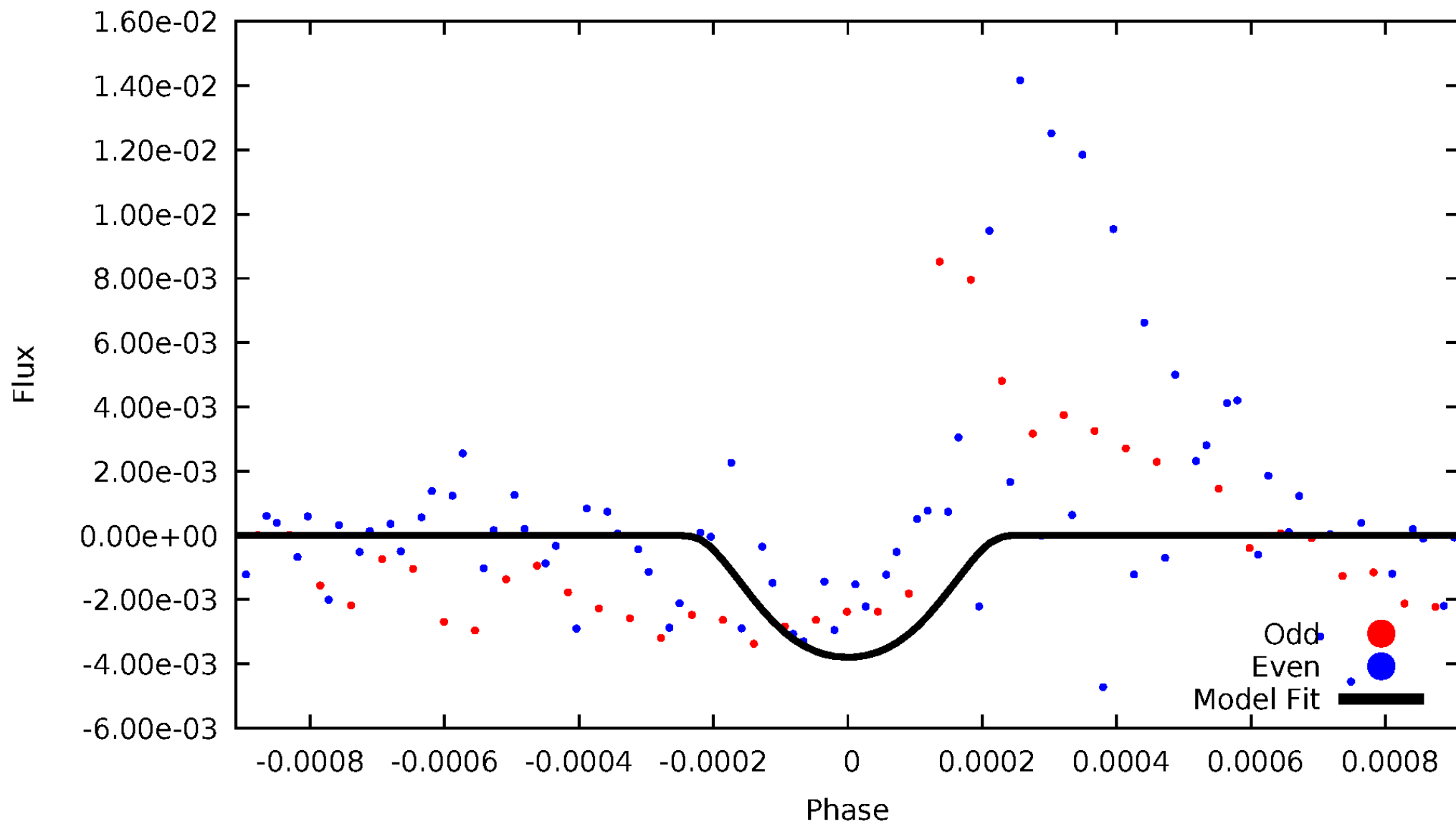
TCE 002307249-01





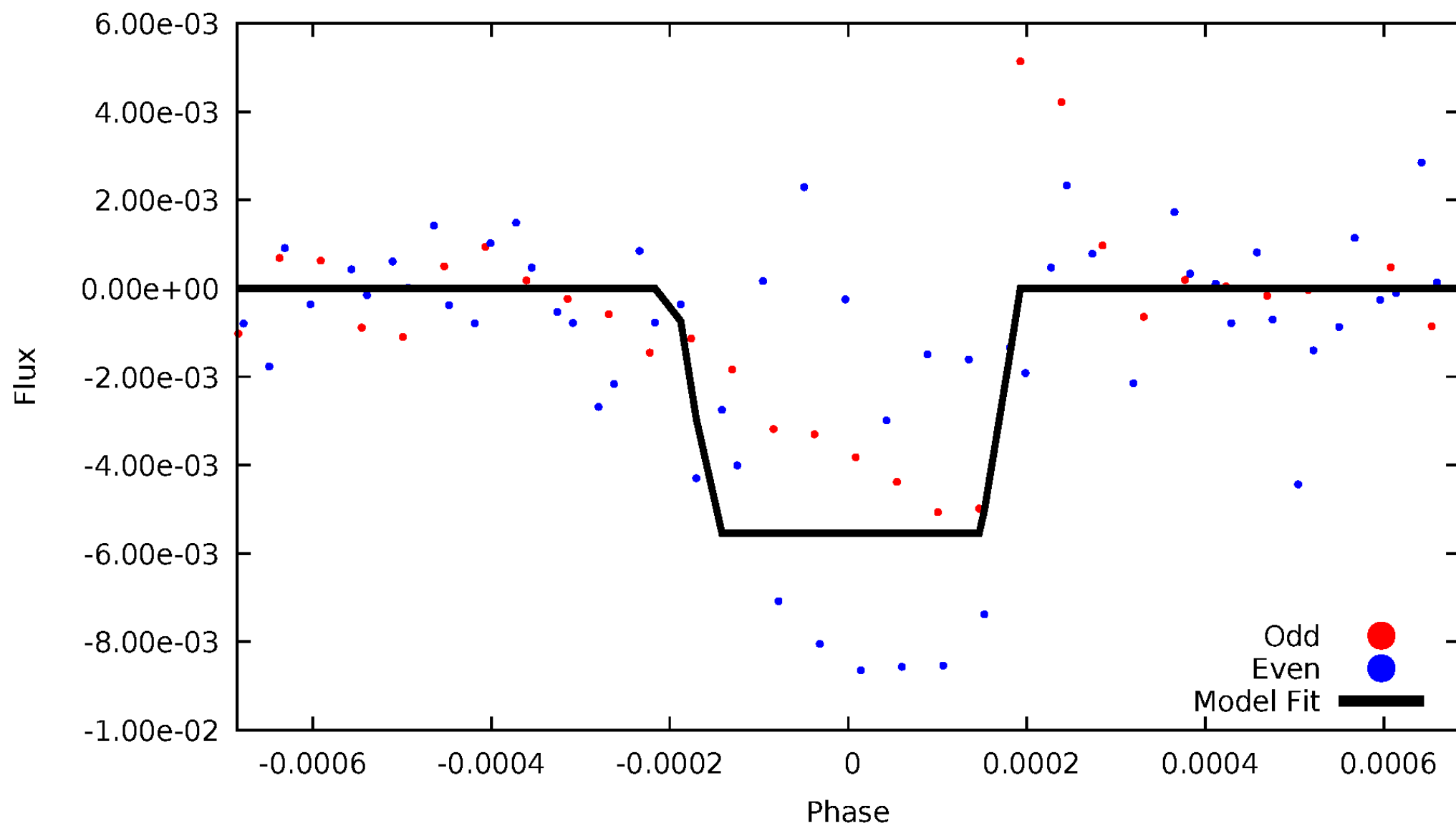
# DV Odd/Even

TCE 002307249-01



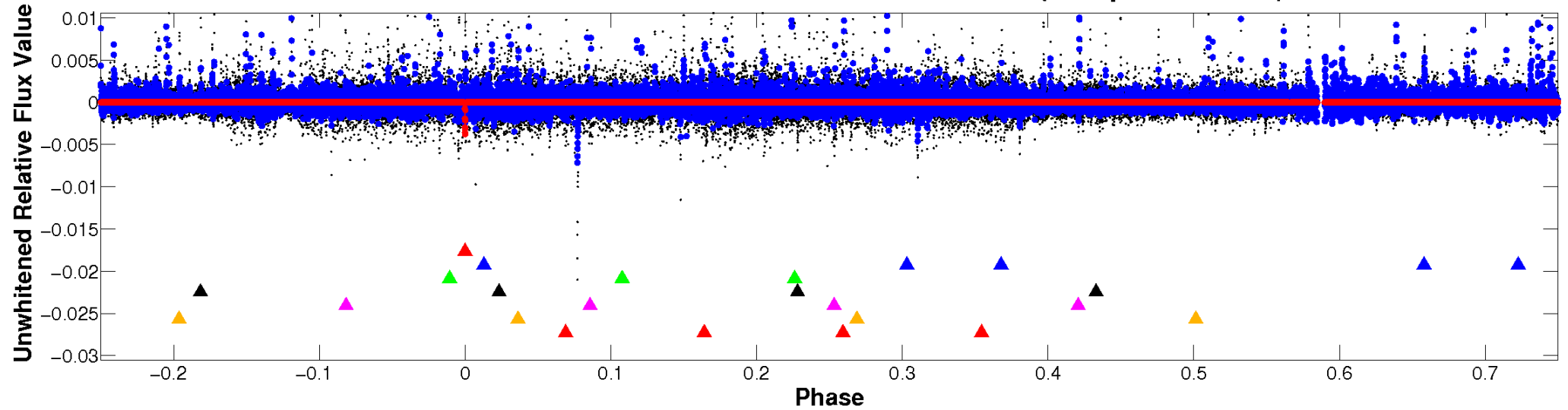
# ALT Odd/Even

TCE 002307249-01

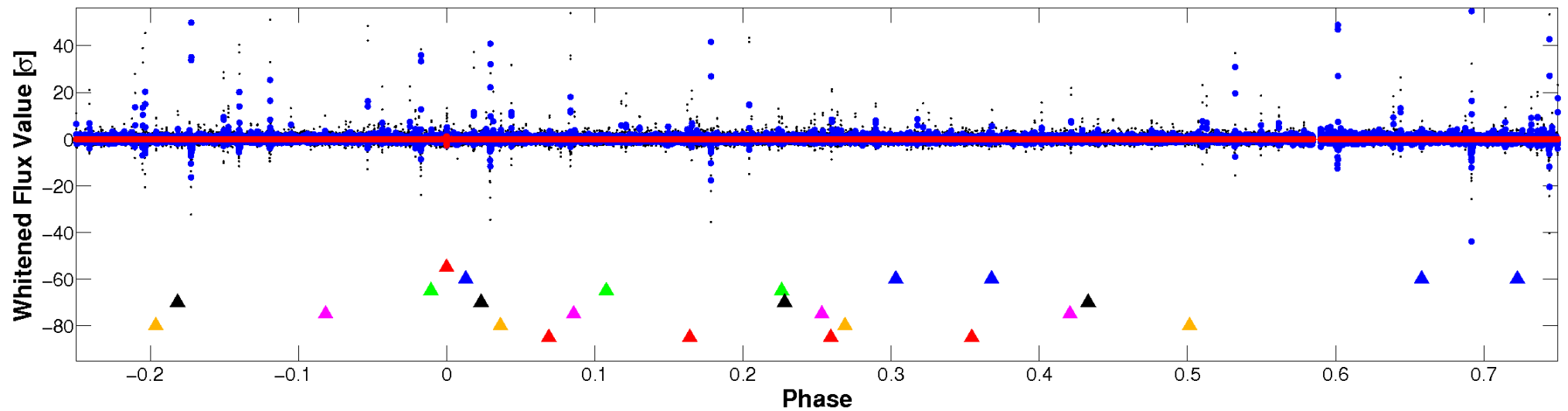


# Non-Whitened Vs. Whitened Light Curve

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

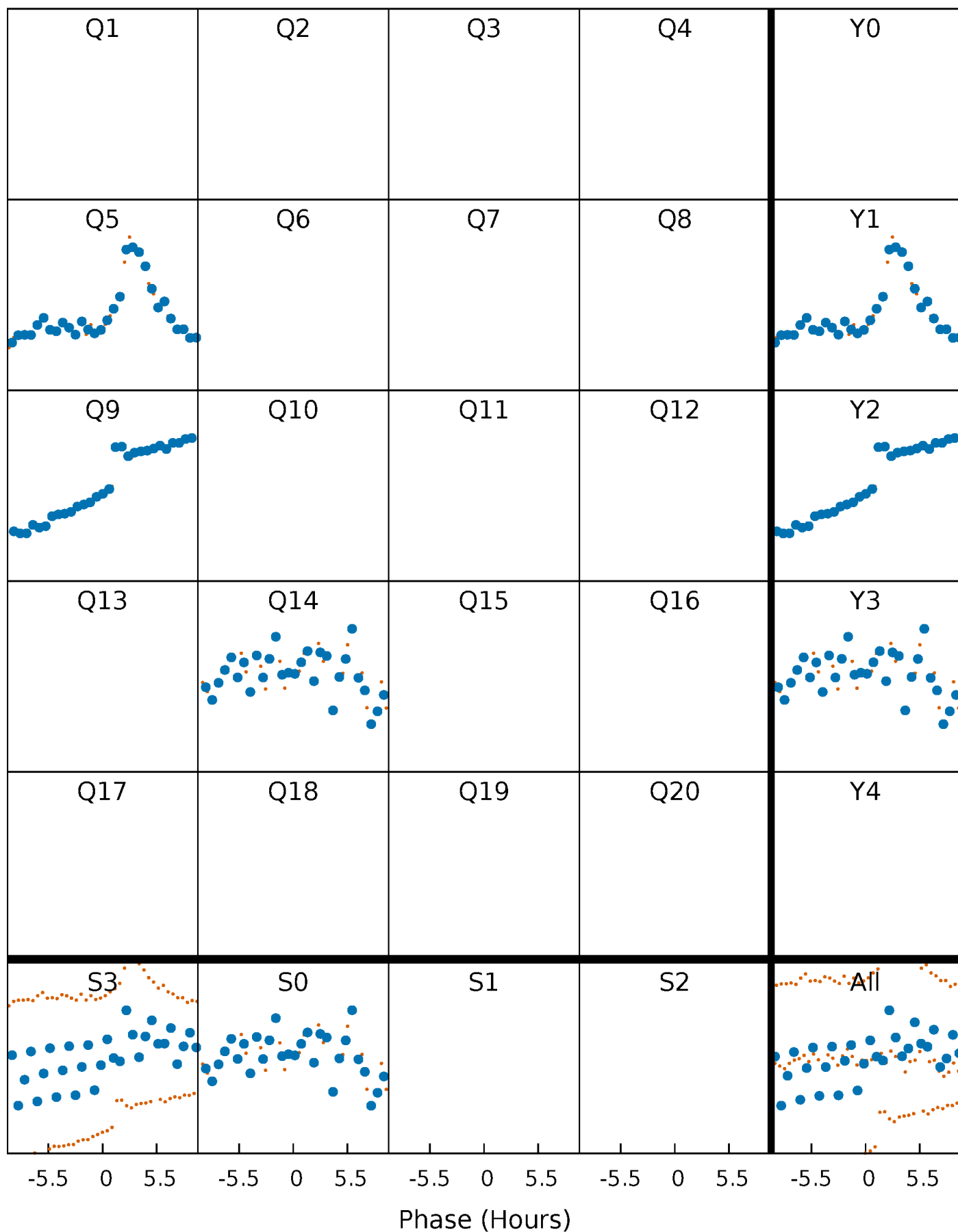


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



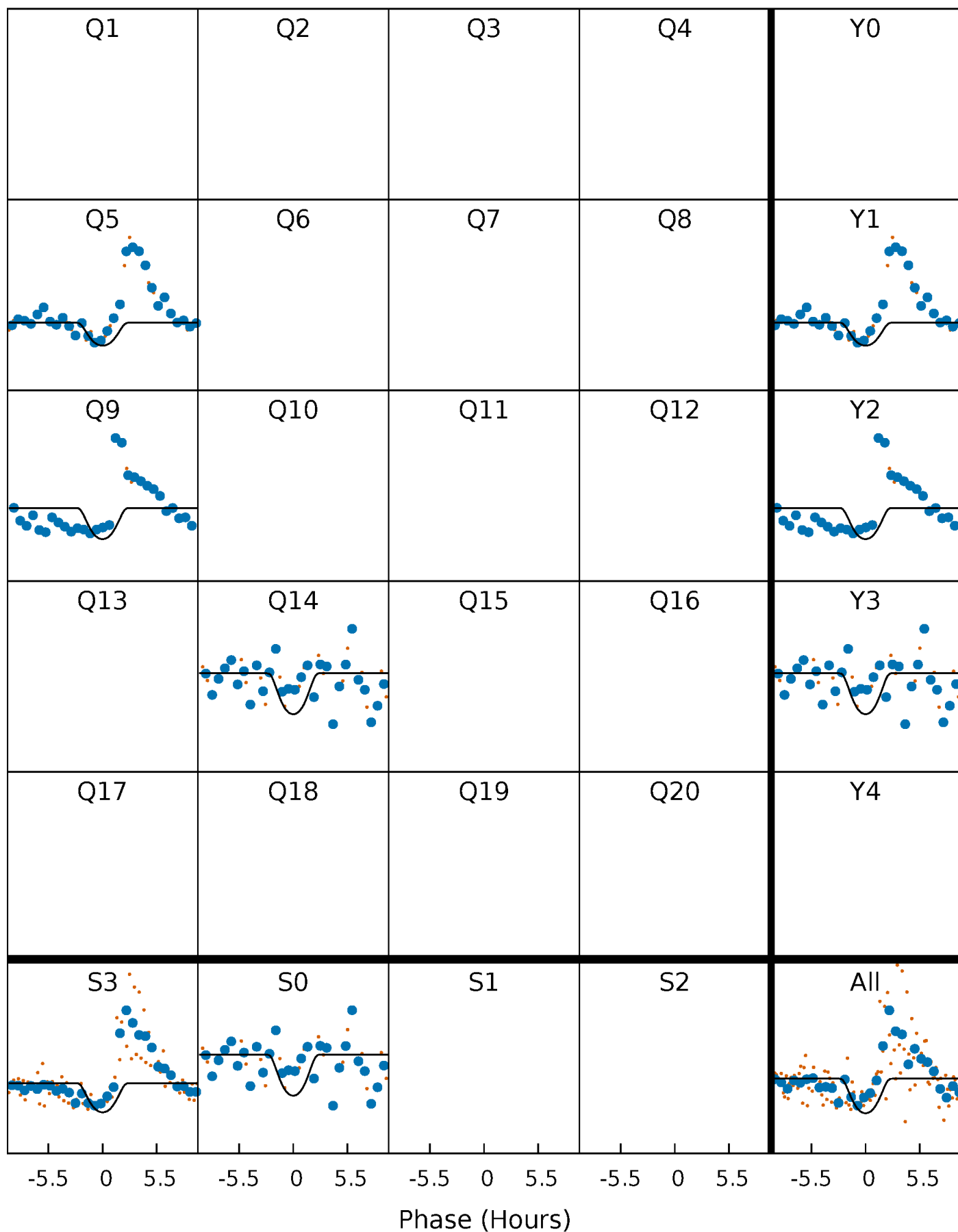
# PDC Quarter-Phased Transit Curves

TCE 002307249-01 P=443.240912 Days  $T_0=460.377527$  (BKJD)



# DV Quarter-Phased Transit Curves

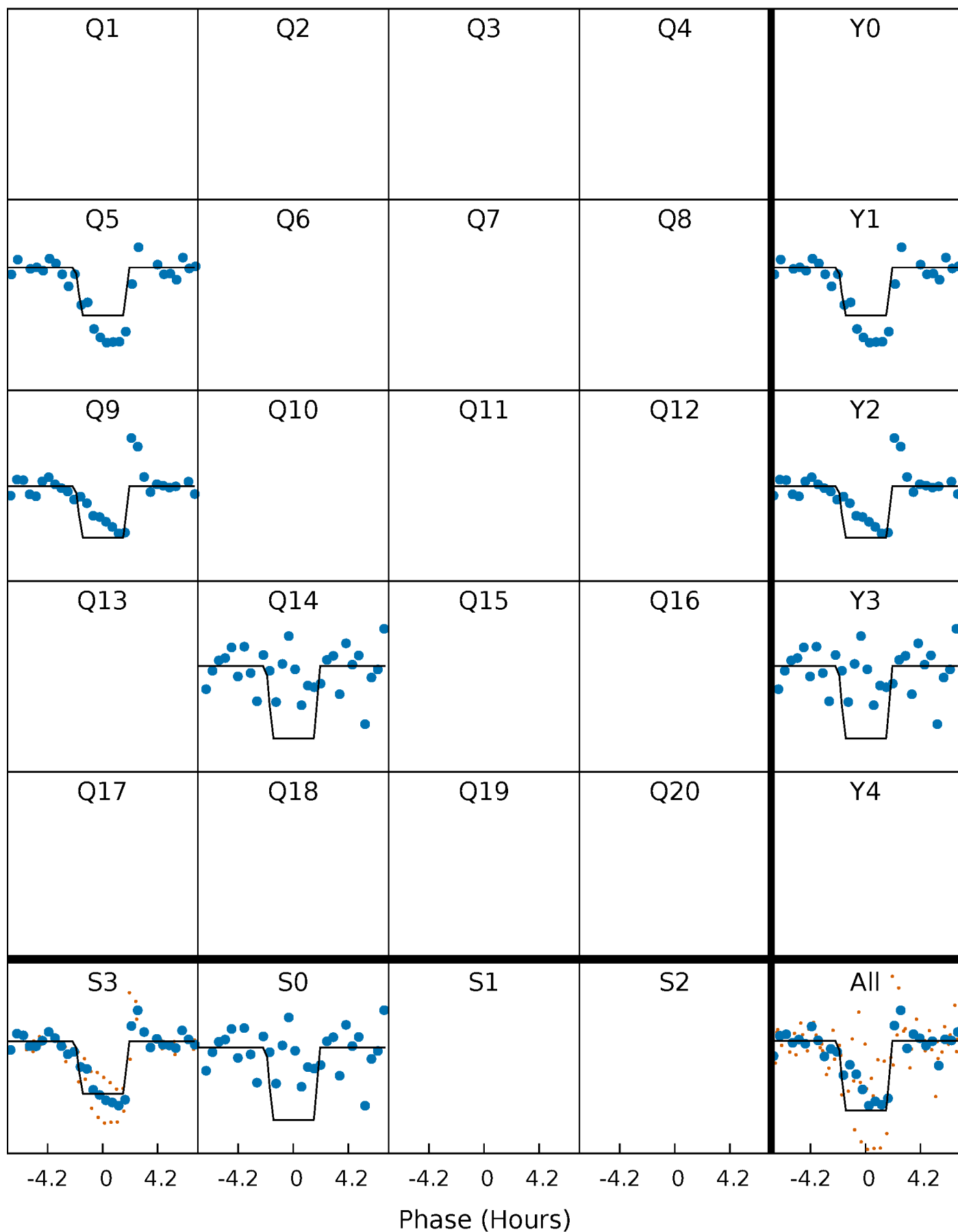
TCE 002307249-01 P=443.240912 Days  $T_0=460.377527$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

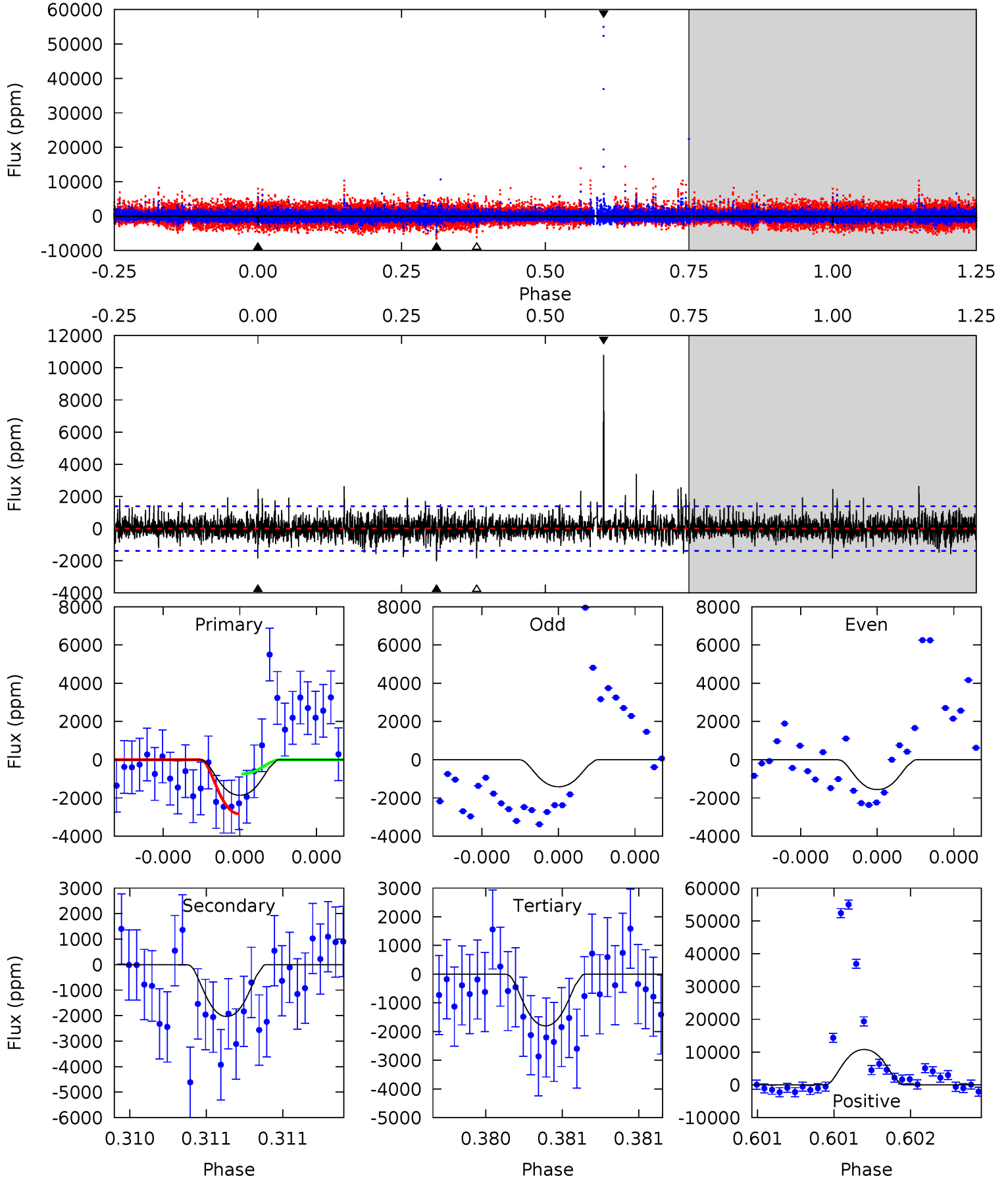
TCE 002307249-01 P=443.210728 Days  $T_0=460.383044$  (BKJD)



# DV Model-Shift Uniqueness Test

002307249-01, P = 443.240912 Days, E = 17.136615 Days

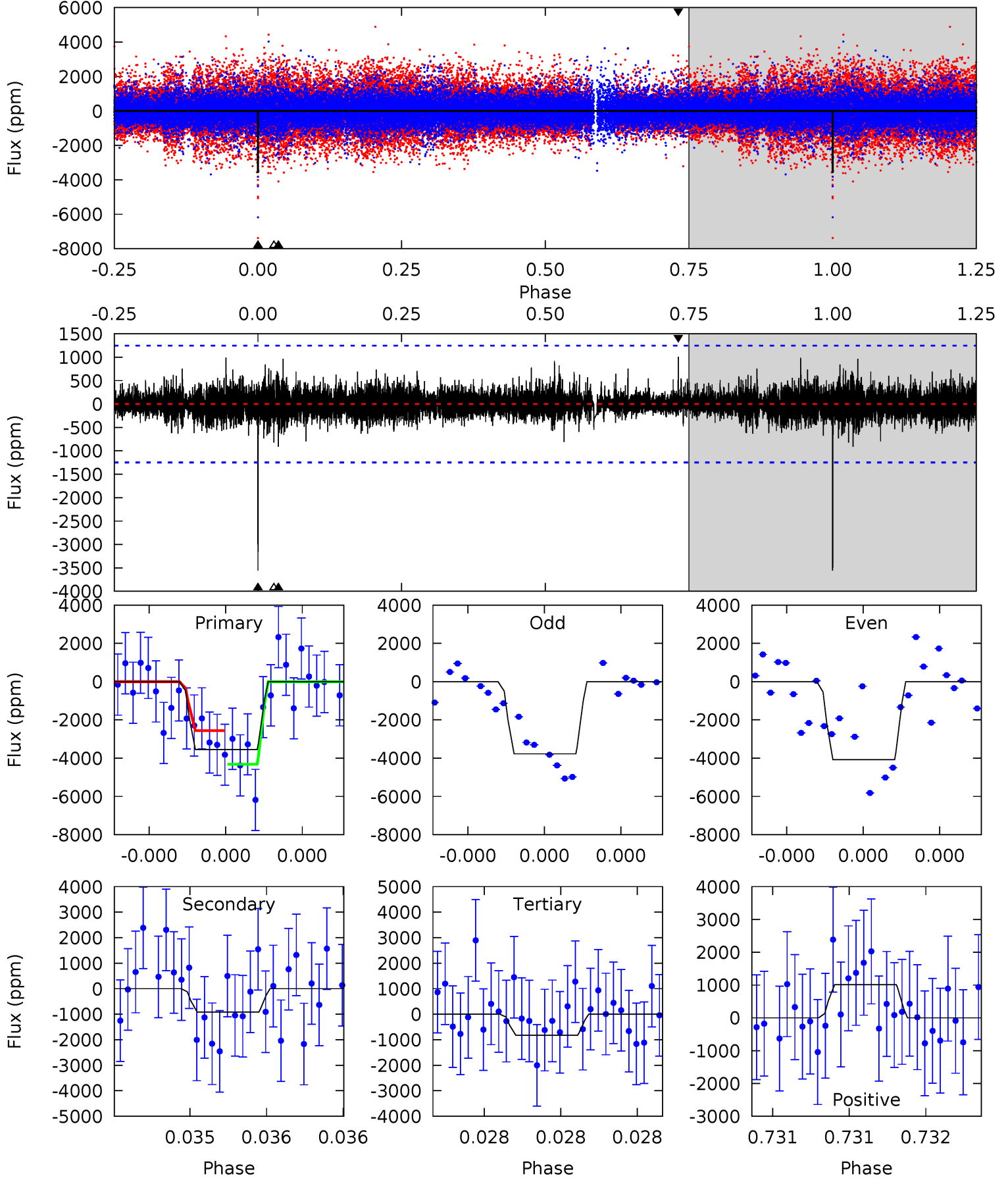
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.46	8.16	7.23	43.3	5.58	3.50	1.82	0.23	-35.8	0.94	-35.1	0.22	1.04	0.84	4.17



# Alt Model-Shift Uniqueness Test

002307249-01, P = 443.210728 Days, E = 17.172316 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
16.0	4.11	3.72	4.55	5.63	3.57	0.77	12.3	11.5	0.39	-0.44	0.80	1.09	0.22	3.88



### Stellar Parameters For KIC 002307249

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4889^{+176}_{-176}$	$4.699^{+0.048}_{-0.028}$	$-1.260^{+0.300}_{-0.300}$	$0.557^{+0.033}_{-0.037}$	$0.565^{+0.041}_{-0.024}$	$4.611^{+0.903}_{-0.537}$
	+4%/-4%	+1%/-1%	+24%/-24%	+6%/-7%	+7%/-4%	+20%/-12%
Source	KIC0	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 002307249-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-2036 \pm 249$	$4.30^{+2.17}_{-2.09}$	$231^{+9}_{-8}$	$4111^{+1155}_{-549}$	$54026^{+144145}_{-30194}$
Alt.	$-911 \pm 222$	$4.47^{+2.32}_{-1.92}$	$231^{+9}_{-9}$	$3538^{+762}_{-460}$	$22373^{+49844}_{-13118}$

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

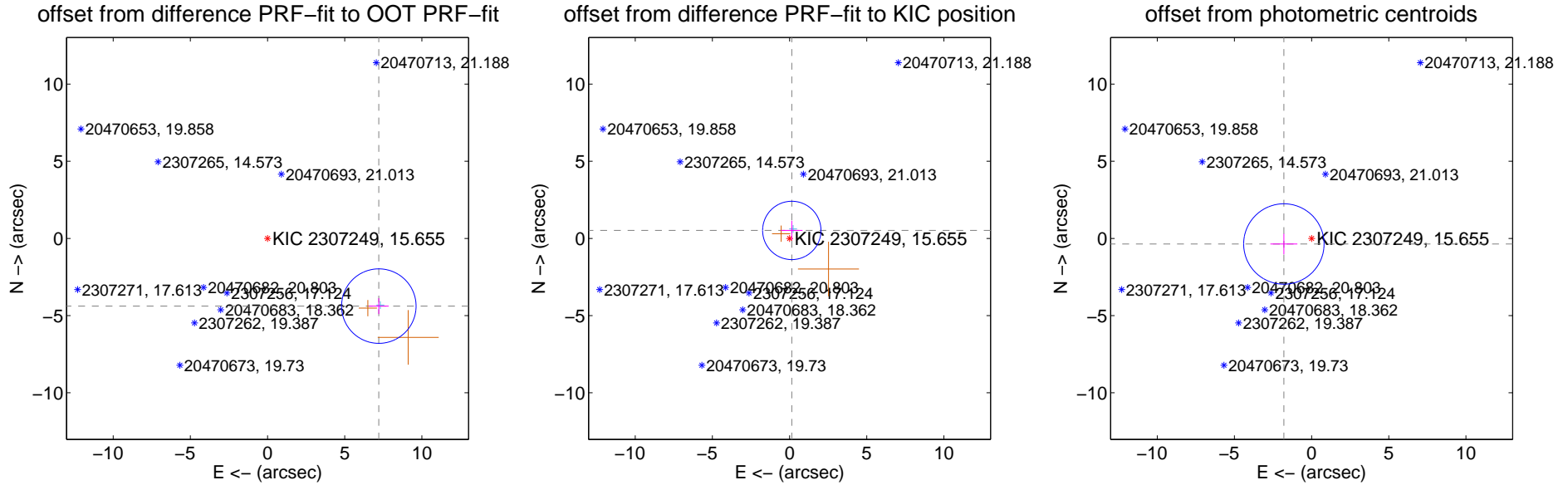
## DV Centroid Data

Supplemental centroid analysis for 002307249-01. Kepler magnitude: 15.65. Transit SNR 10.07

There are 1 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 7.94 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$8.441 \pm 0.805$	10.49	$-7.212 \pm 0.639$	$-4.386 \pm 0.513$
PRF-fit source offset from KIC position	$0.539 \pm 0.630$	0.85	$-0.144 \pm 0.696$	$0.519 \pm 0.625$
photometric centroid source offset	$1.83 \pm 0.87$	2.11	$1.80 \pm 0.88$	$-0.36 \pm 0.67$



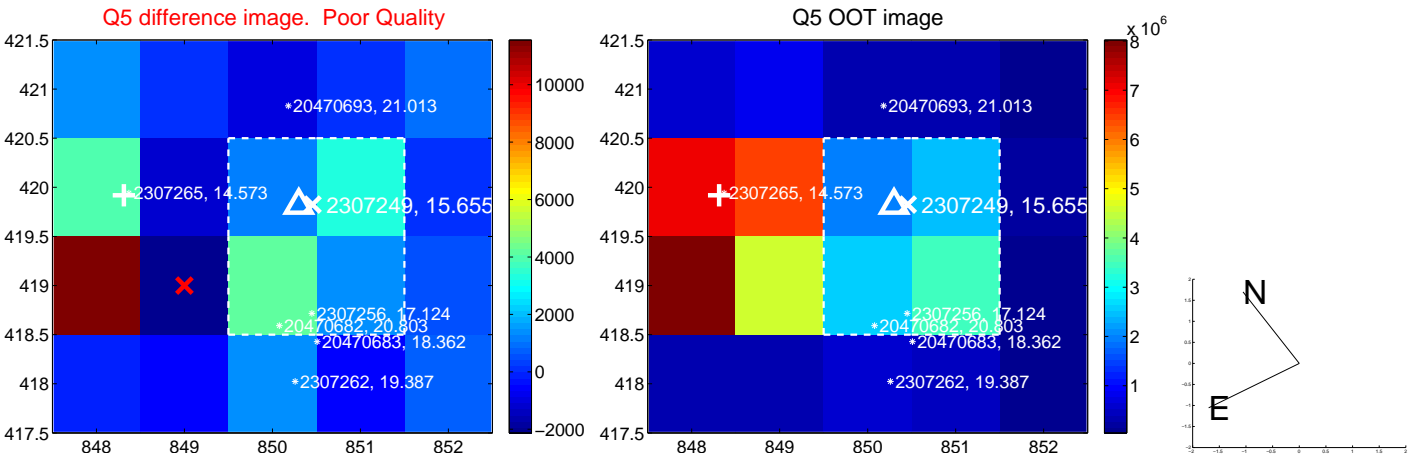
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



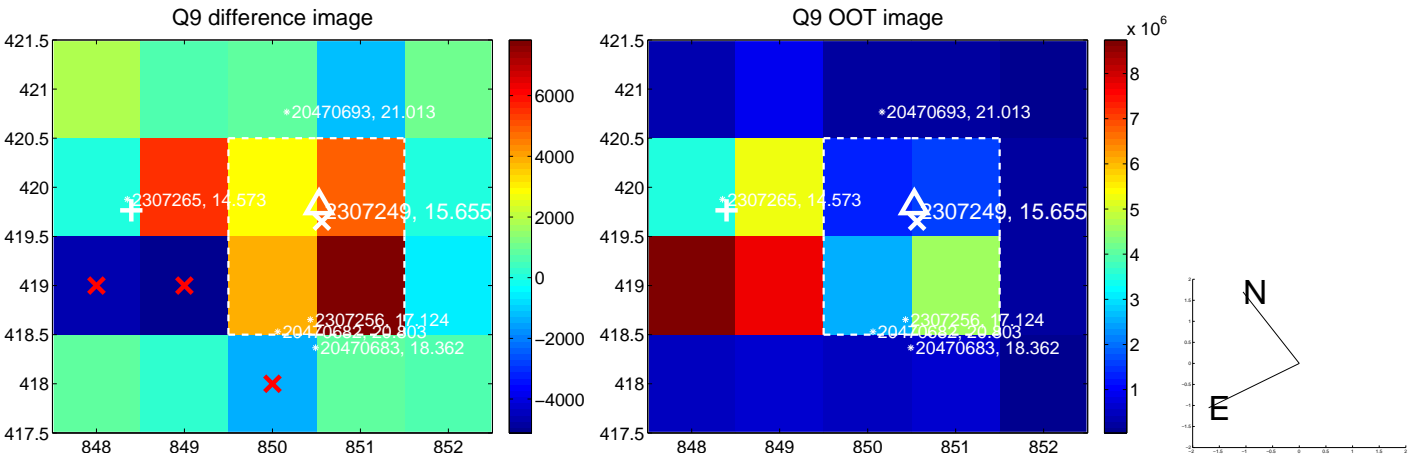
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



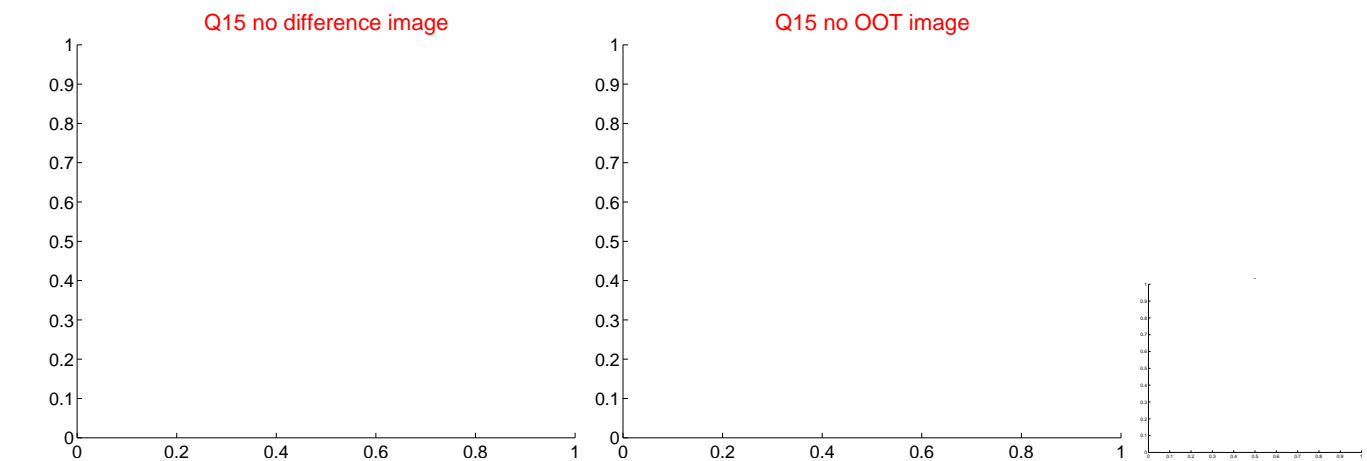
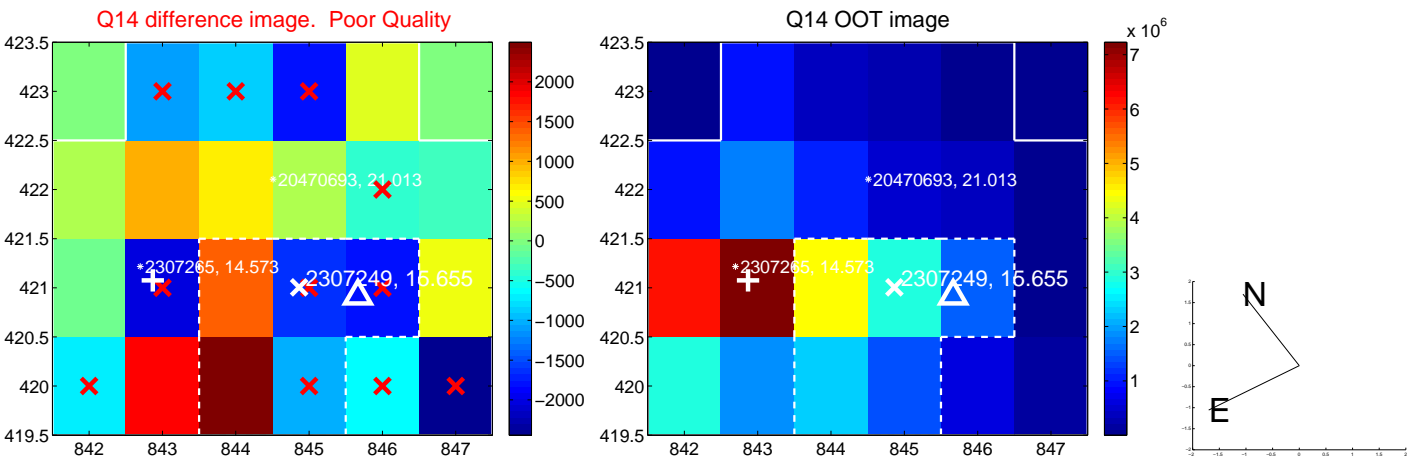
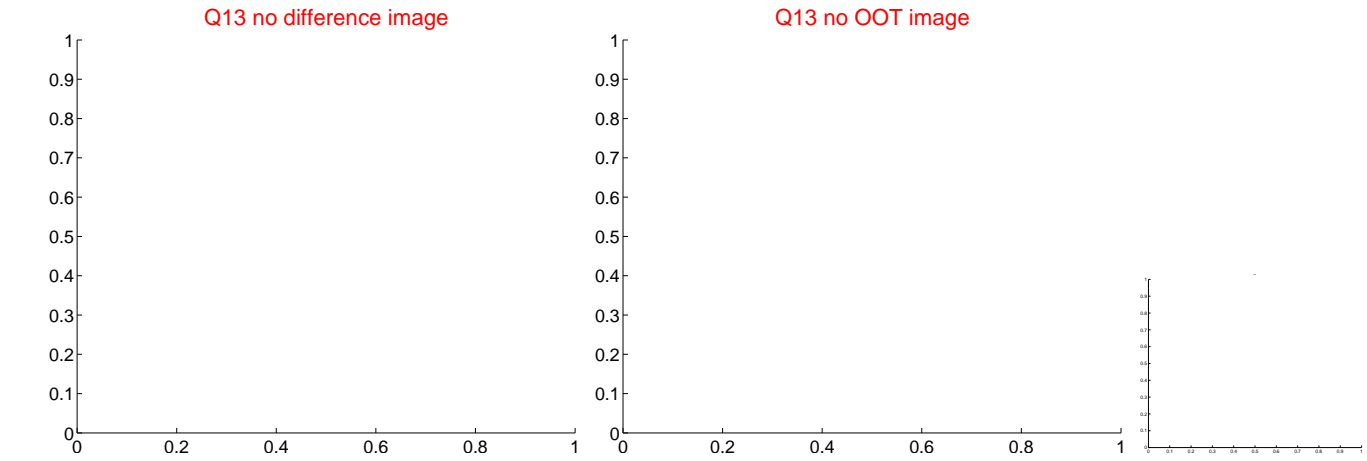
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



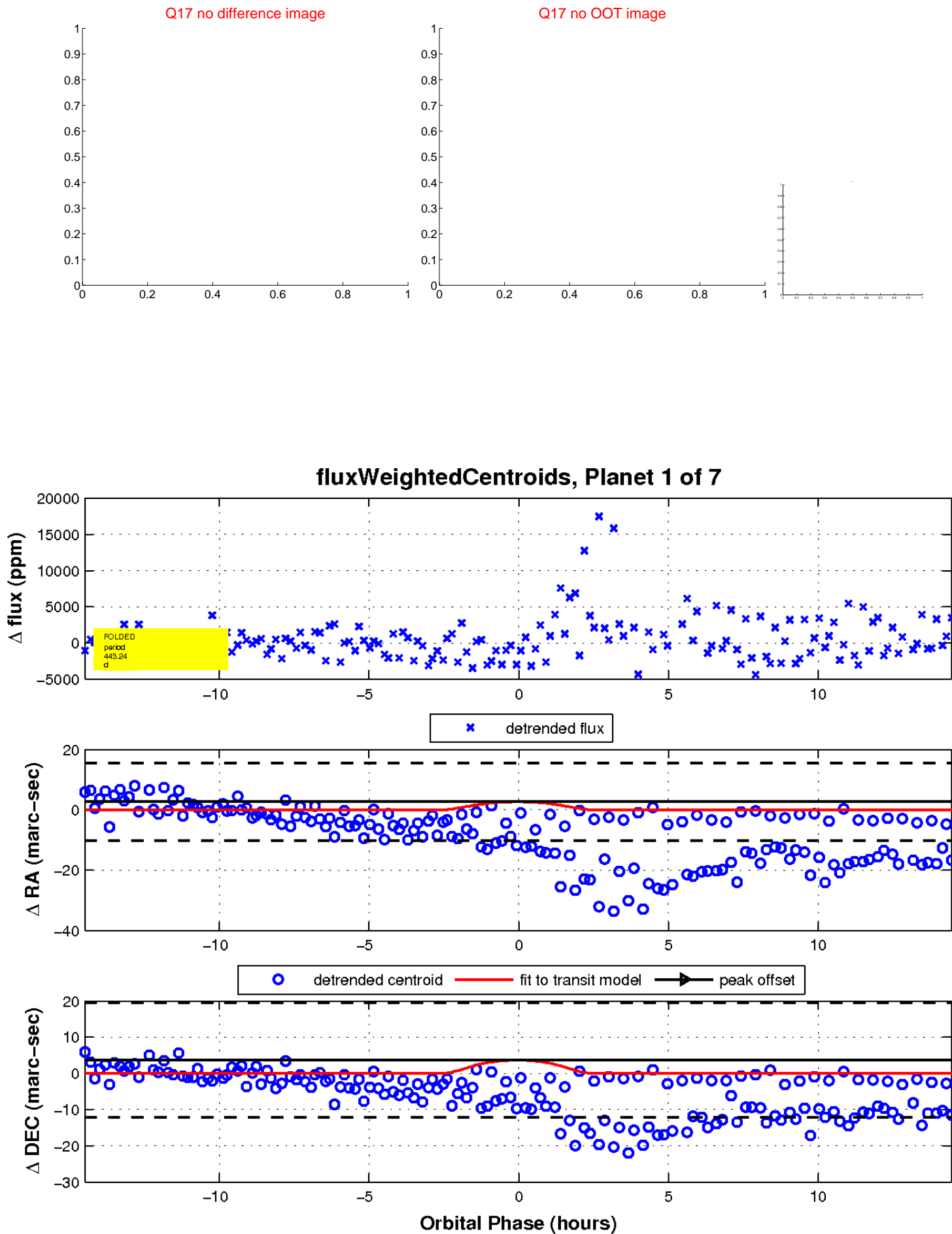
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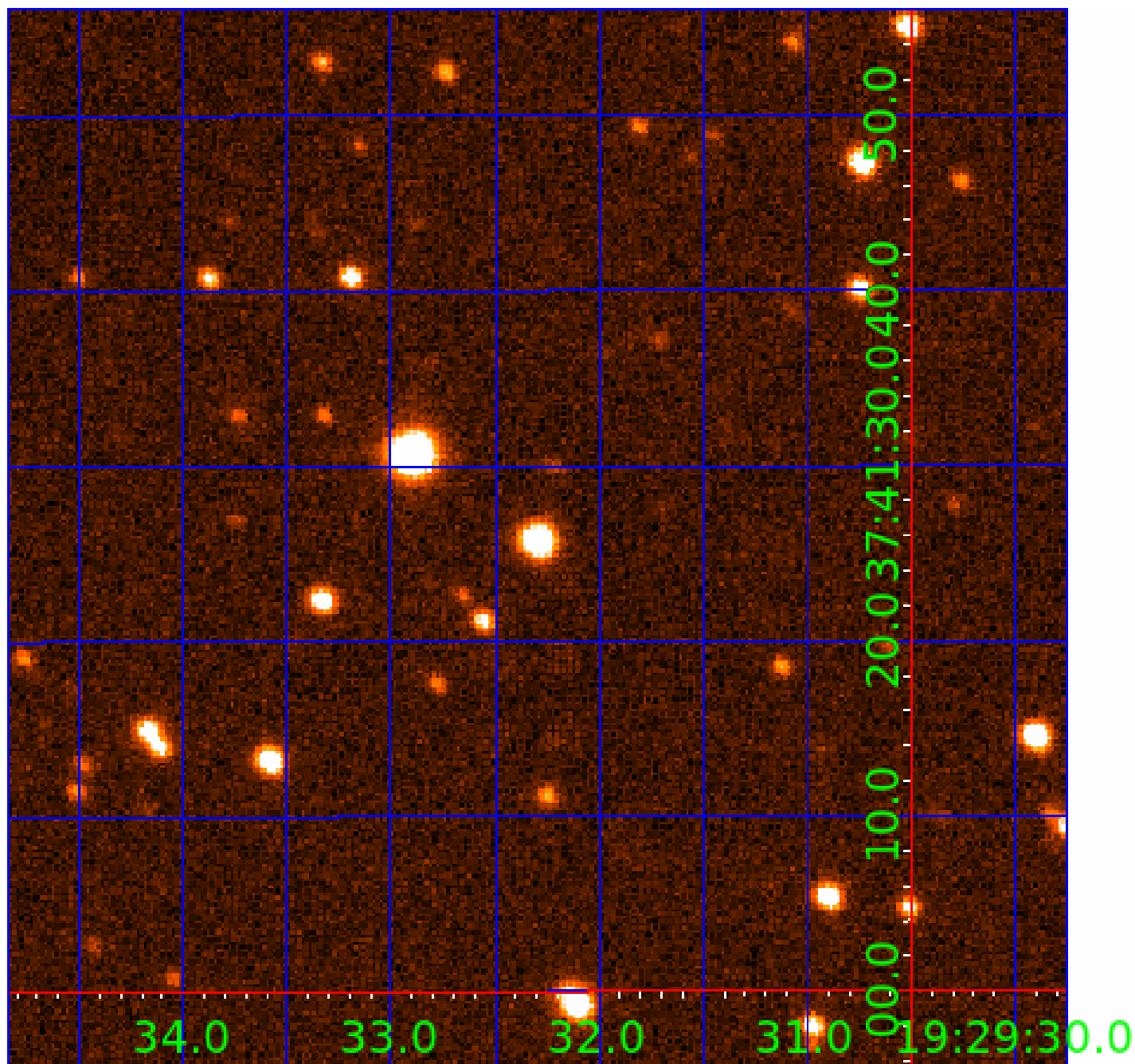
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 002307249

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002307249-01	OBS	No	443.240912	460.377527	3794.6	4.841	18.3	10.1	0.56	4889	4.41	0.18
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002307249-07	OBS	No	401.069916	174.237568	1861.9	7.500	11.2	-1.0	0.56	4889	2.37	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002307249-01	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
002307249-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
002307249-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002307249-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

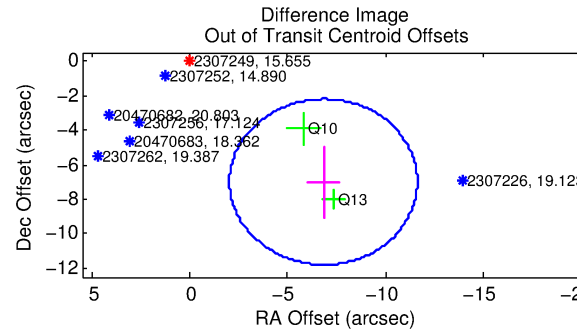
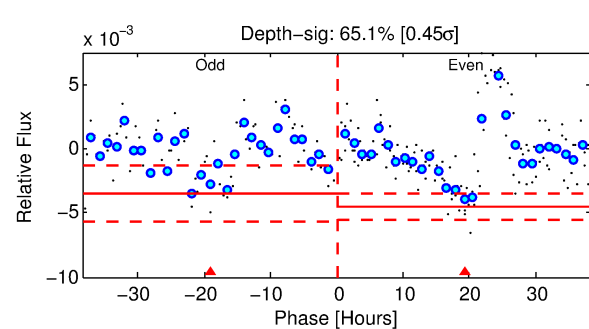
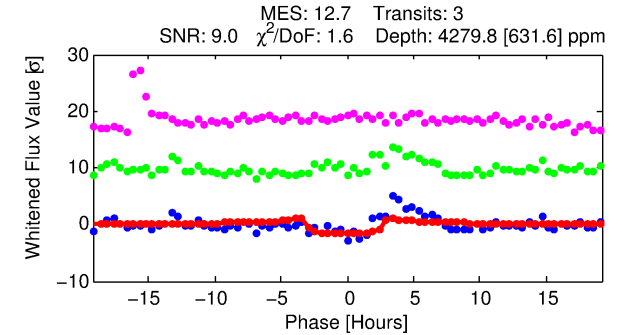
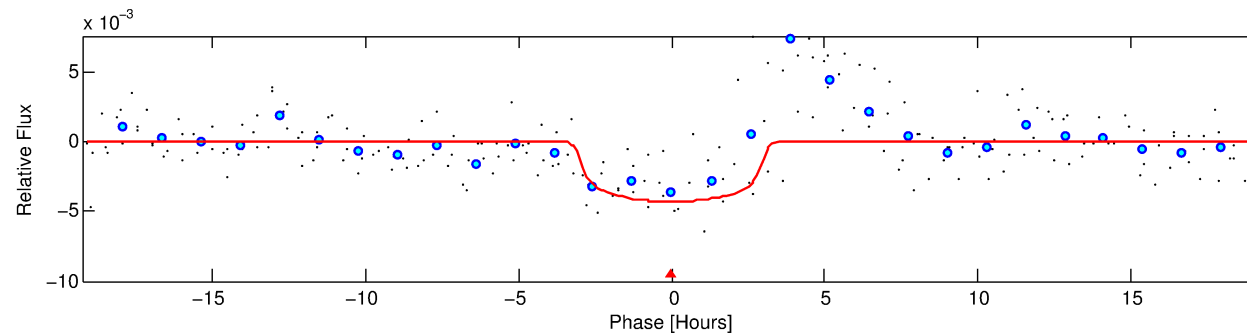
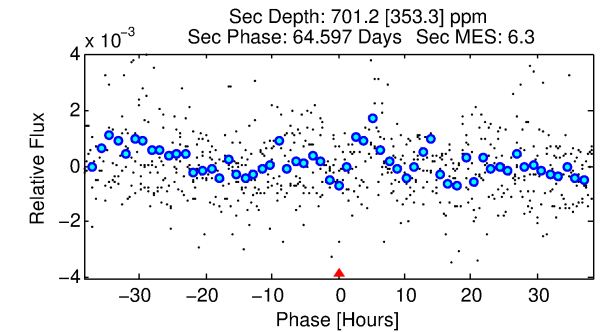
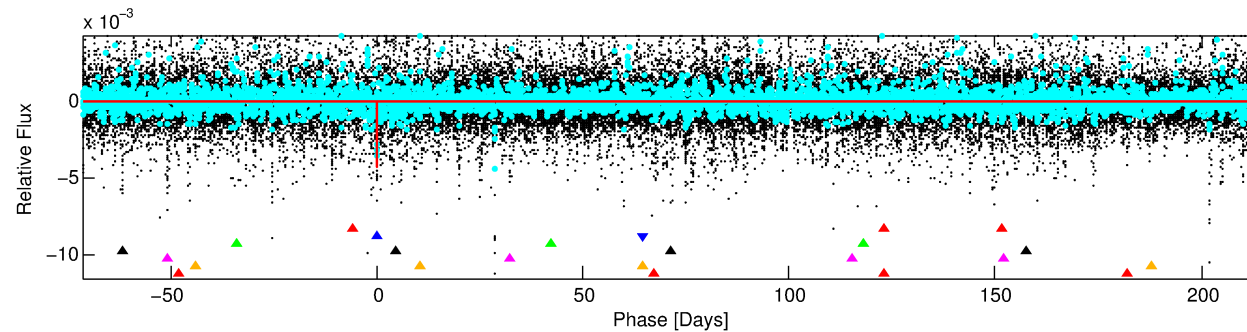
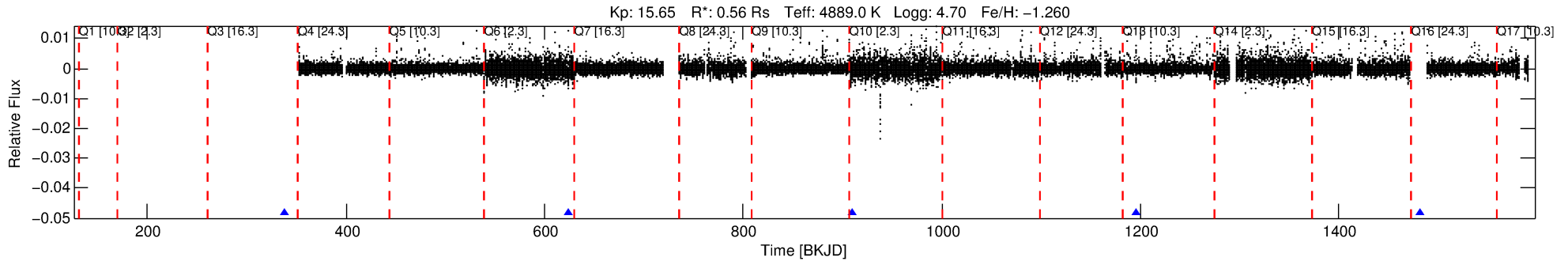
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## Ephemeris Match Information For 002307249-02

No Significant Match Found

# DV One-Page Summary

KIC: 2307249 Candidate: 2 of 7 Period: 285.942 d



## DV Fit Results:

Period = 285.94243 [0.00725] d  
Epoch = 337.4671 [0.0185] BKJD  
Rp/R\* = 0.0601 [0.0220]  
a/R\* = 337.98 [479.68]  
b = 0.37 [3.28]  
Seff = 0.32 [0.05]  
Teq = 192 [8] K  
Rp = 3.65 [1.36] Re  
a = 0.7027 [0.0405] AU  
Ag = 14293.01 [12756.58] [1.12σ]  
Teffp = 3246 [730] K [4.18σ]

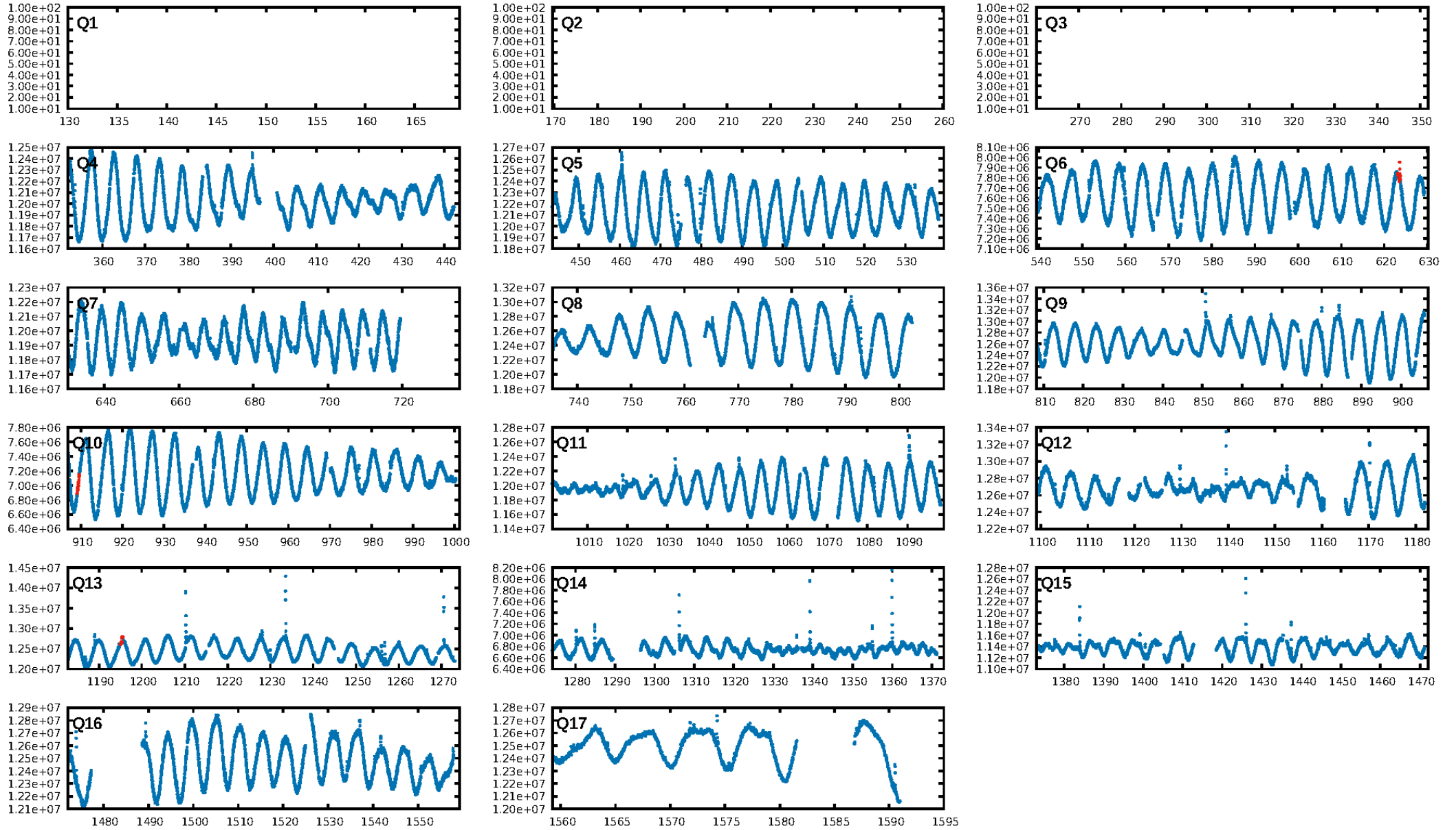
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [133.67σ]  
ModelChiSquare2-sig: 6.4%  
ModelChiSquareGof-sig: 36.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.033  
Centroid-sig: 0.0%  
Centroid-so: 2.480 arcsec [3.05σ]  
OotOffset-rm: 9.781 arcsec [6.12σ]  
KicOffset-rm: 2.203 arcsec [1.12σ]  
OotOffset-st: 1/0/0/1 [2]  
KicOffset-st: 1/0/0/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

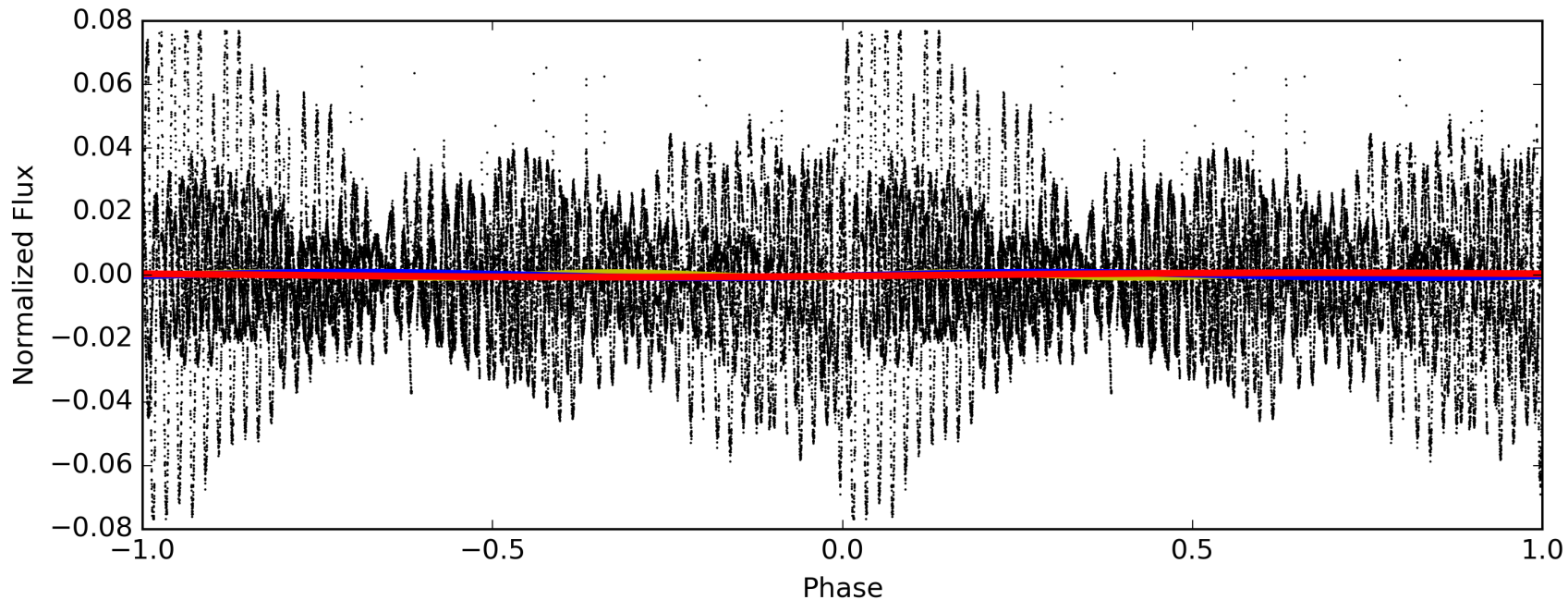
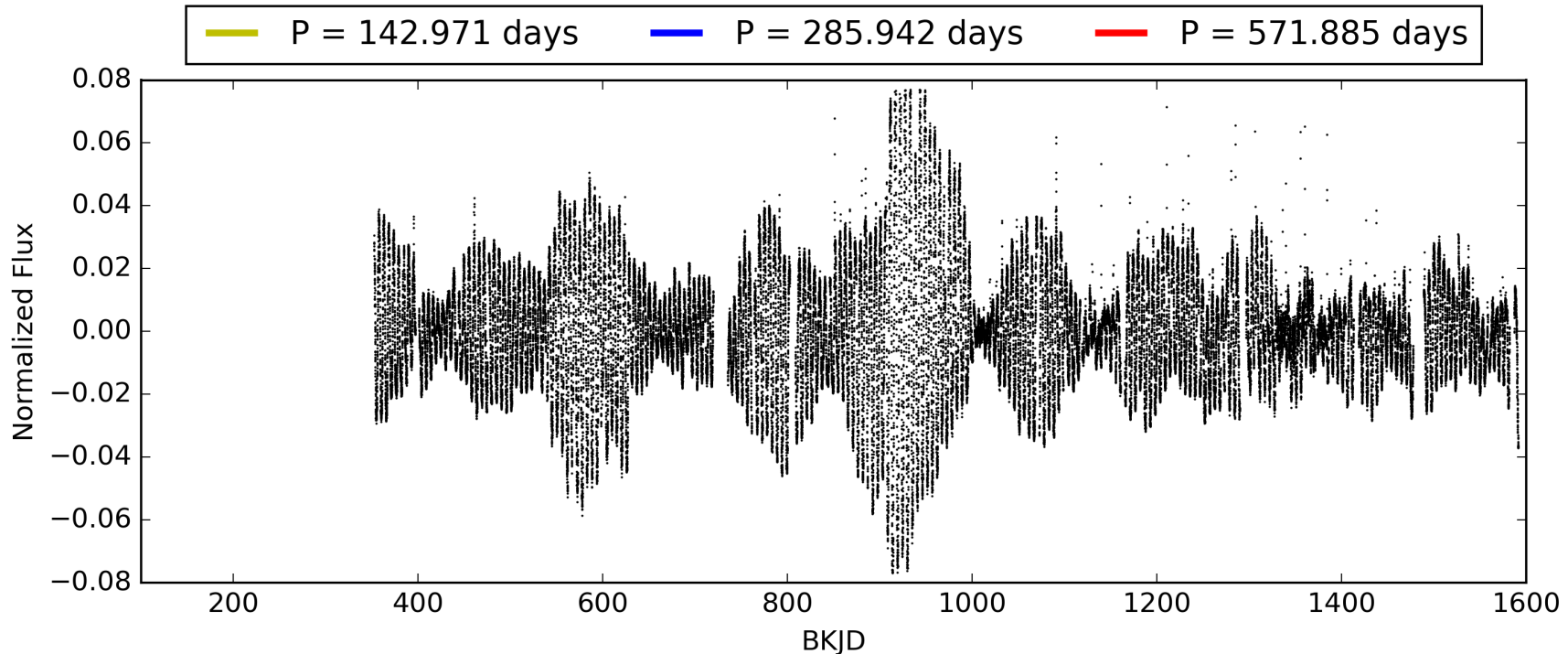
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:52:00 Z

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

# TCE 002307249-02, PDC Light Curves



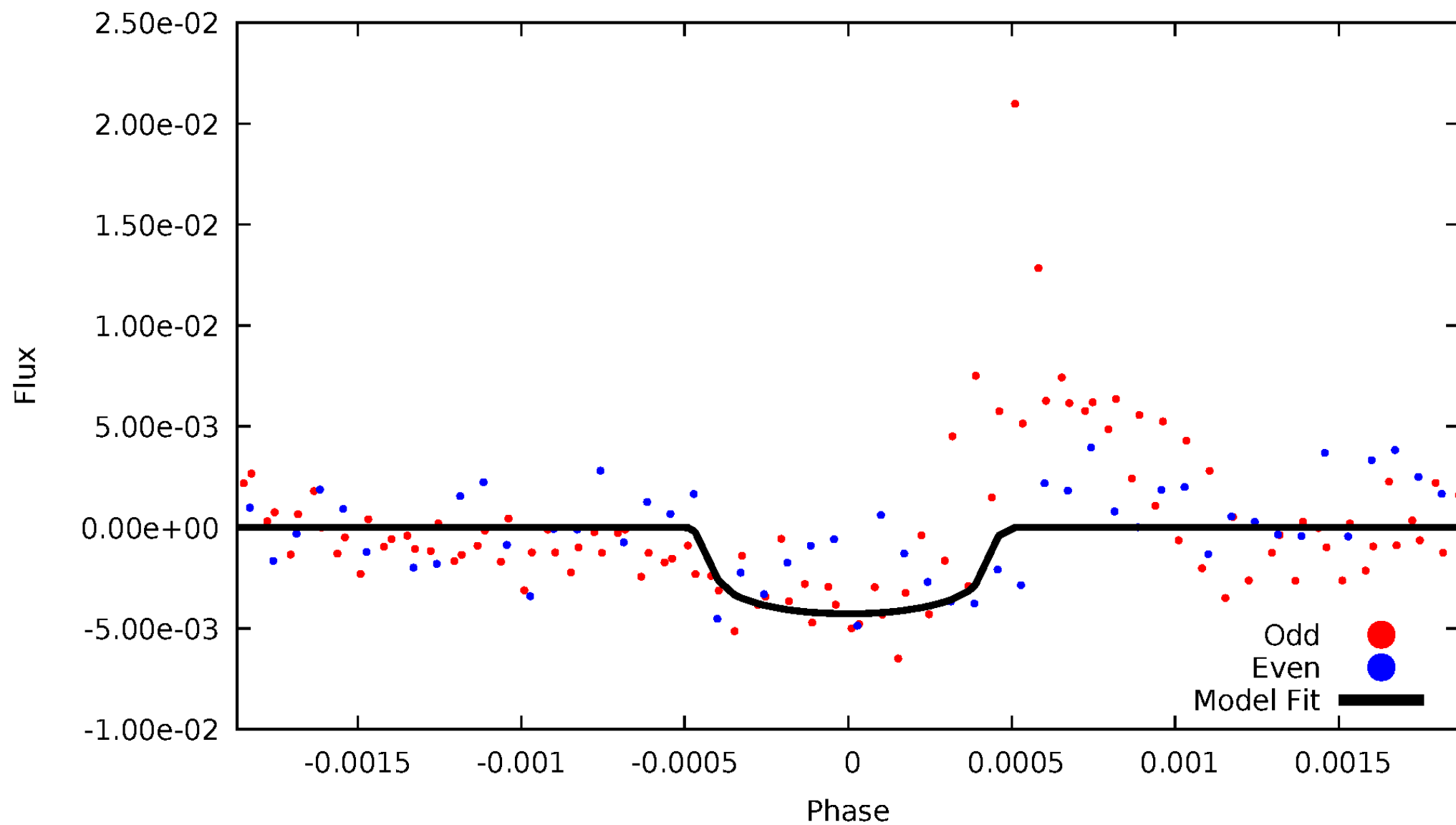
TCE 002307249-02





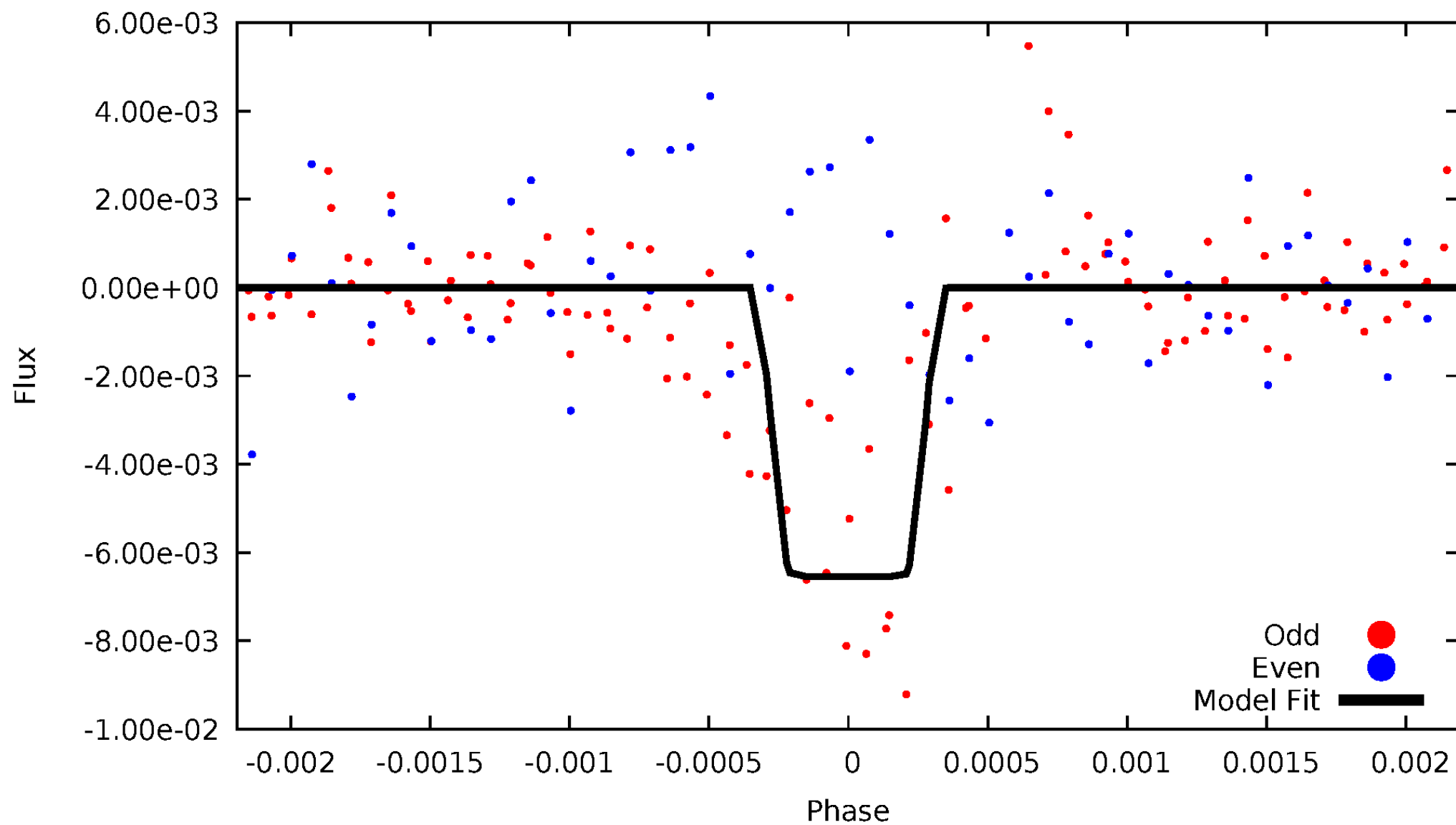
# DV Odd/Even

TCE 002307249-02



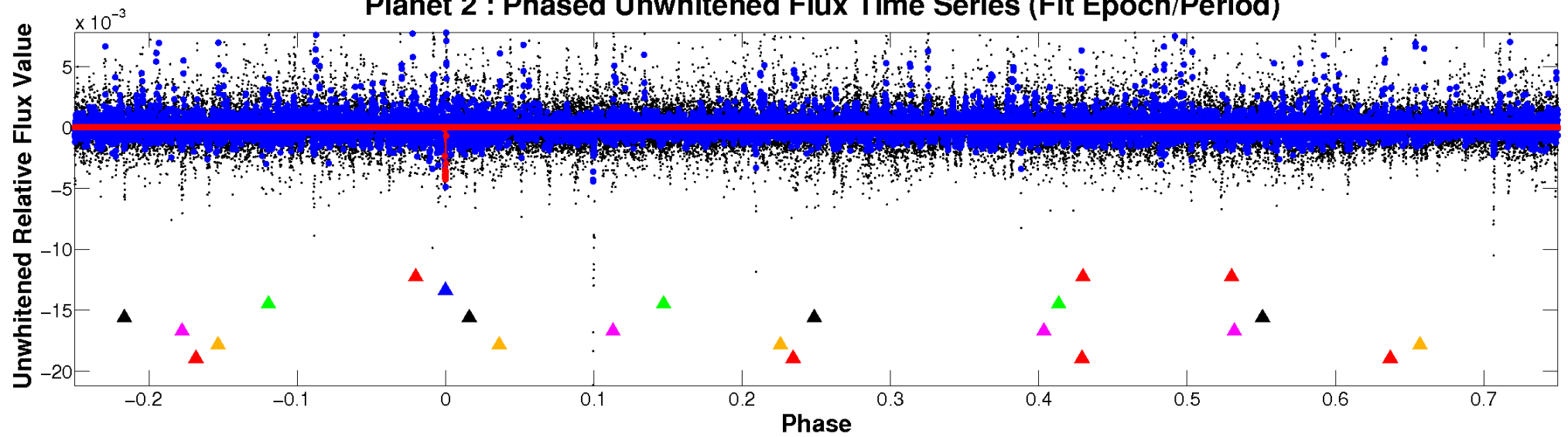
# ALT Odd/Even

TCE 002307249-02

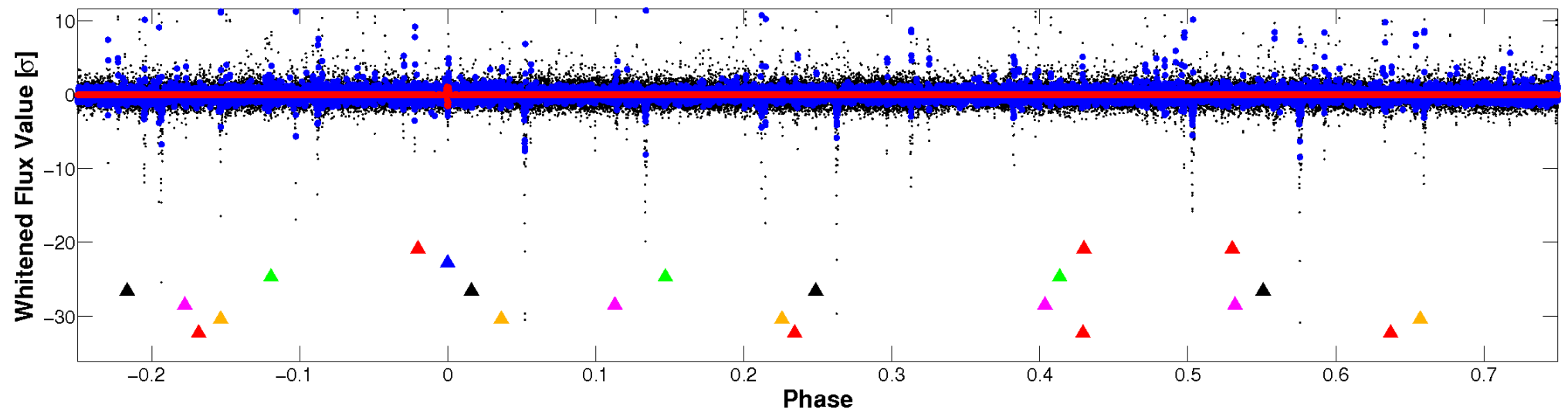


# Non-Whitened Vs. Whitened Light Curve

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

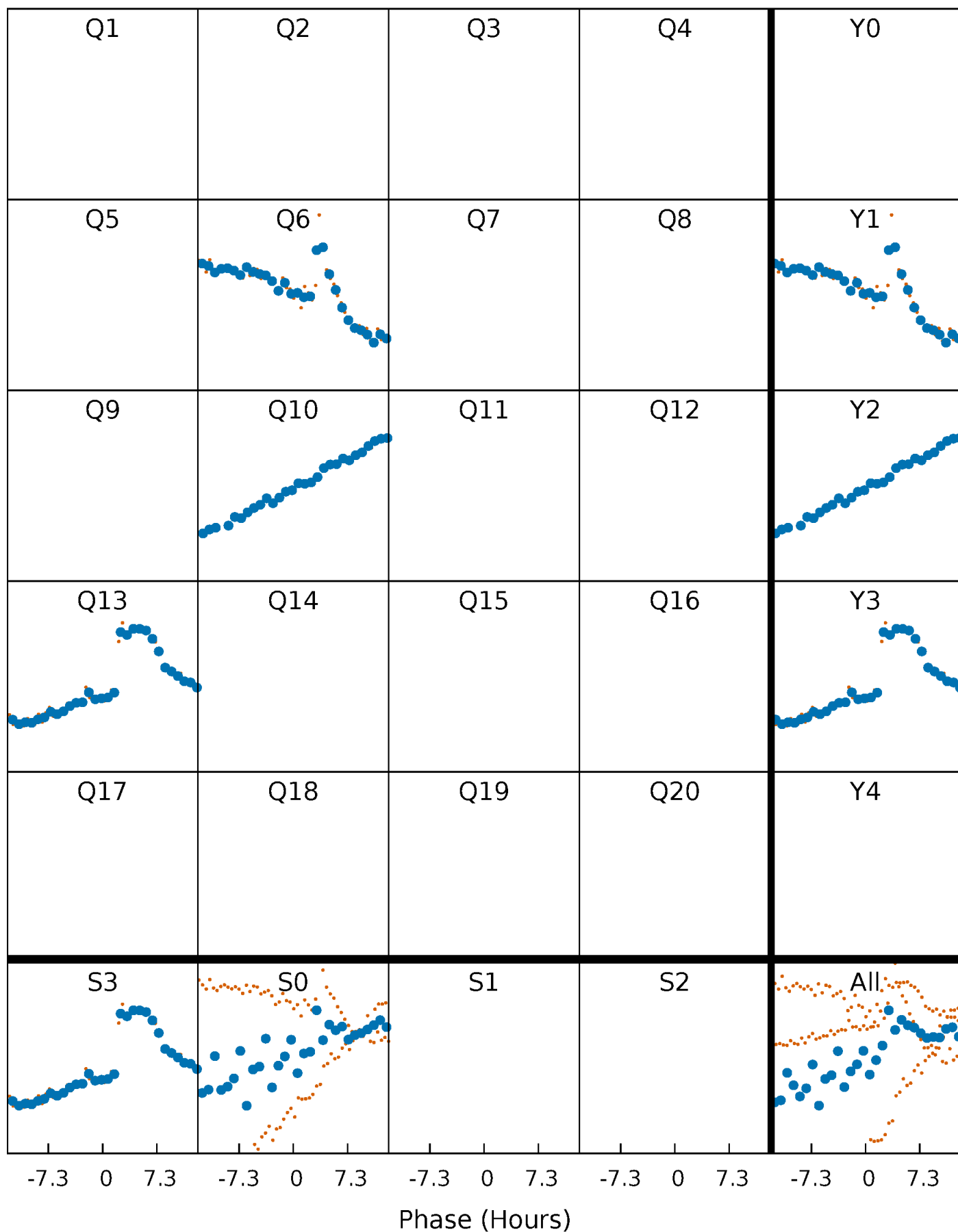


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



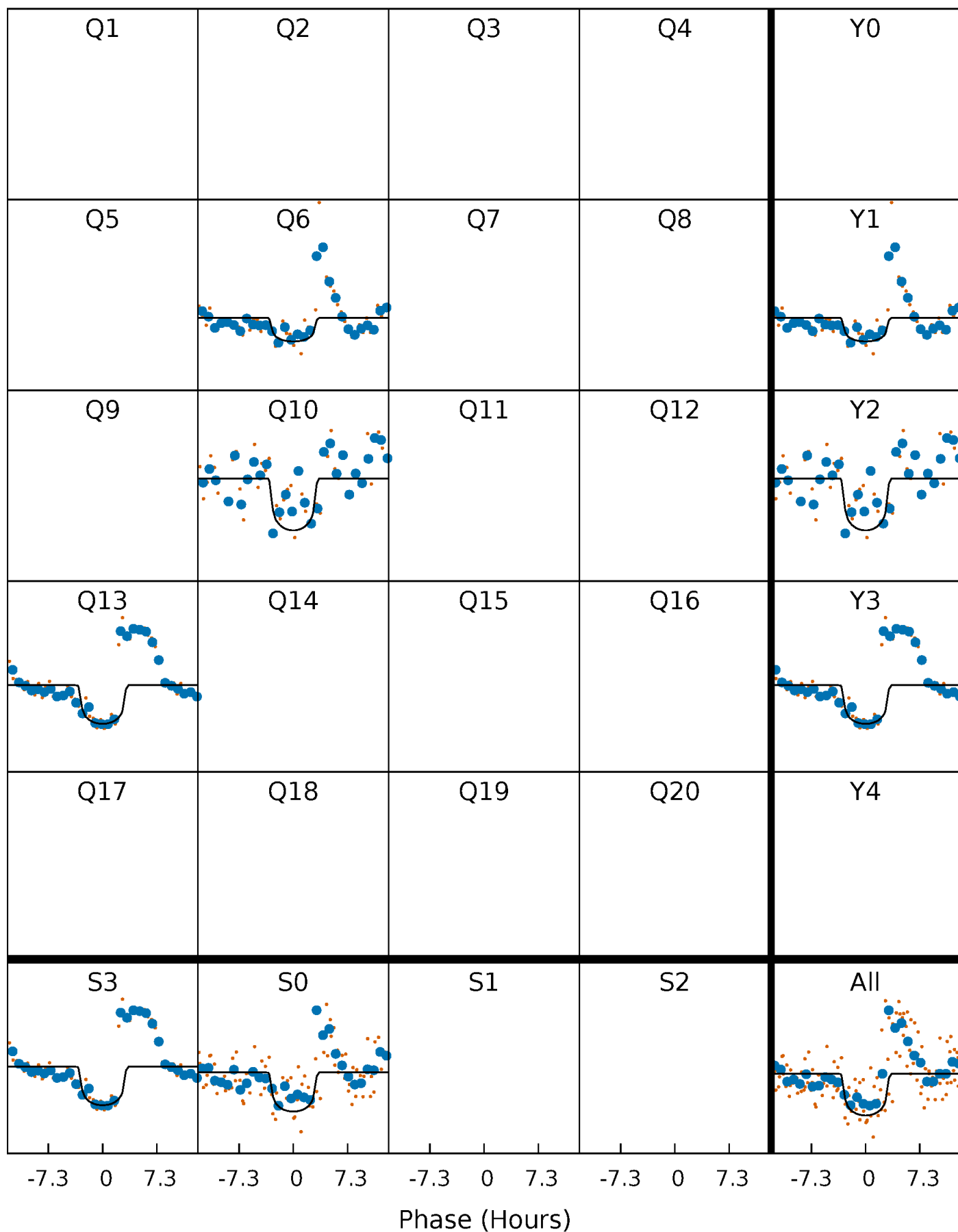
# PDC Quarter-Phased Transit Curves

TCE 002307249-02     $P=285.942428$  Days     $T_0=337.467052$  (BKJD)



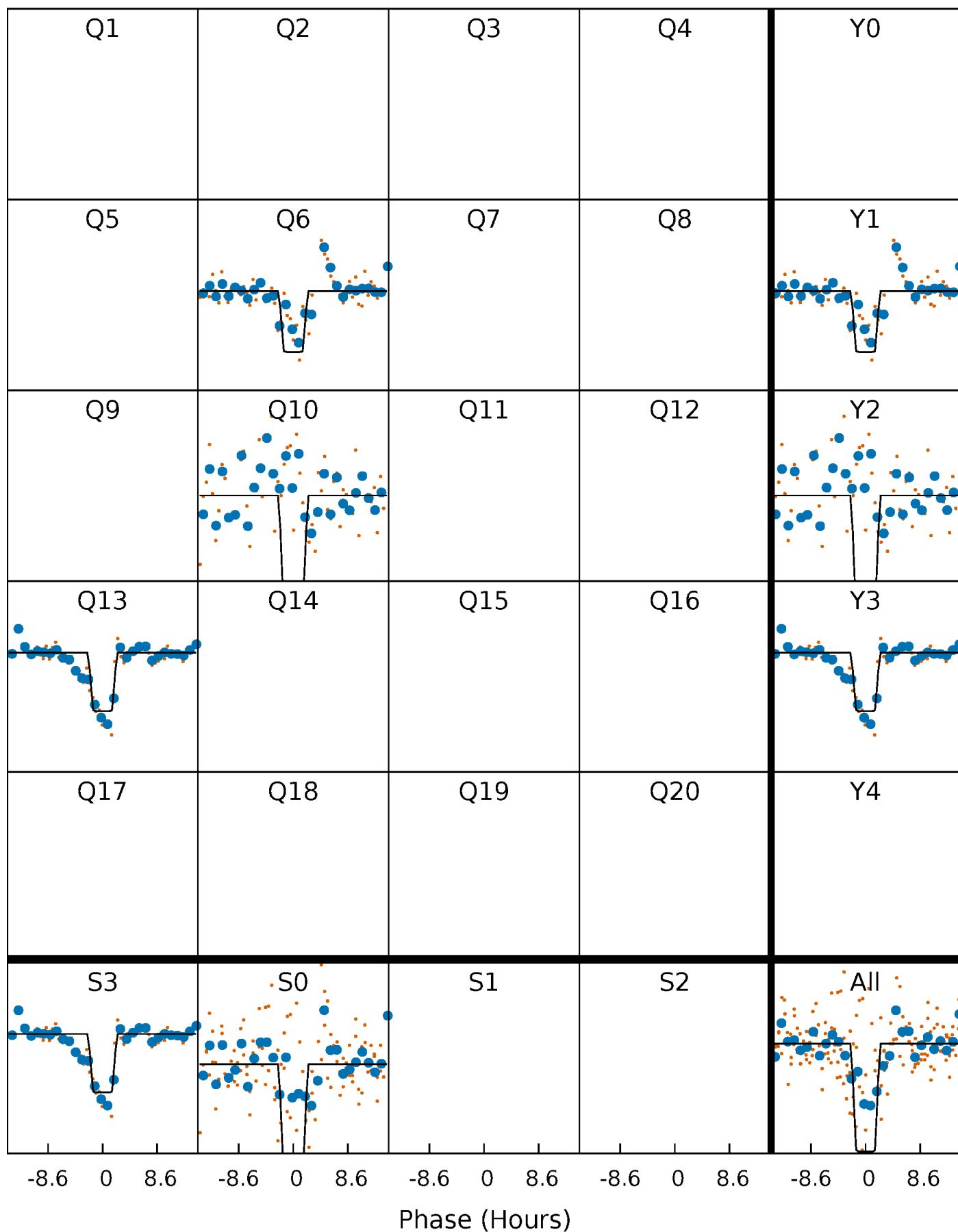
# DV Quarter-Phased Transit Curves

TCE 002307249-02     $P=285.942428$  Days     $T_0=337.467052$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

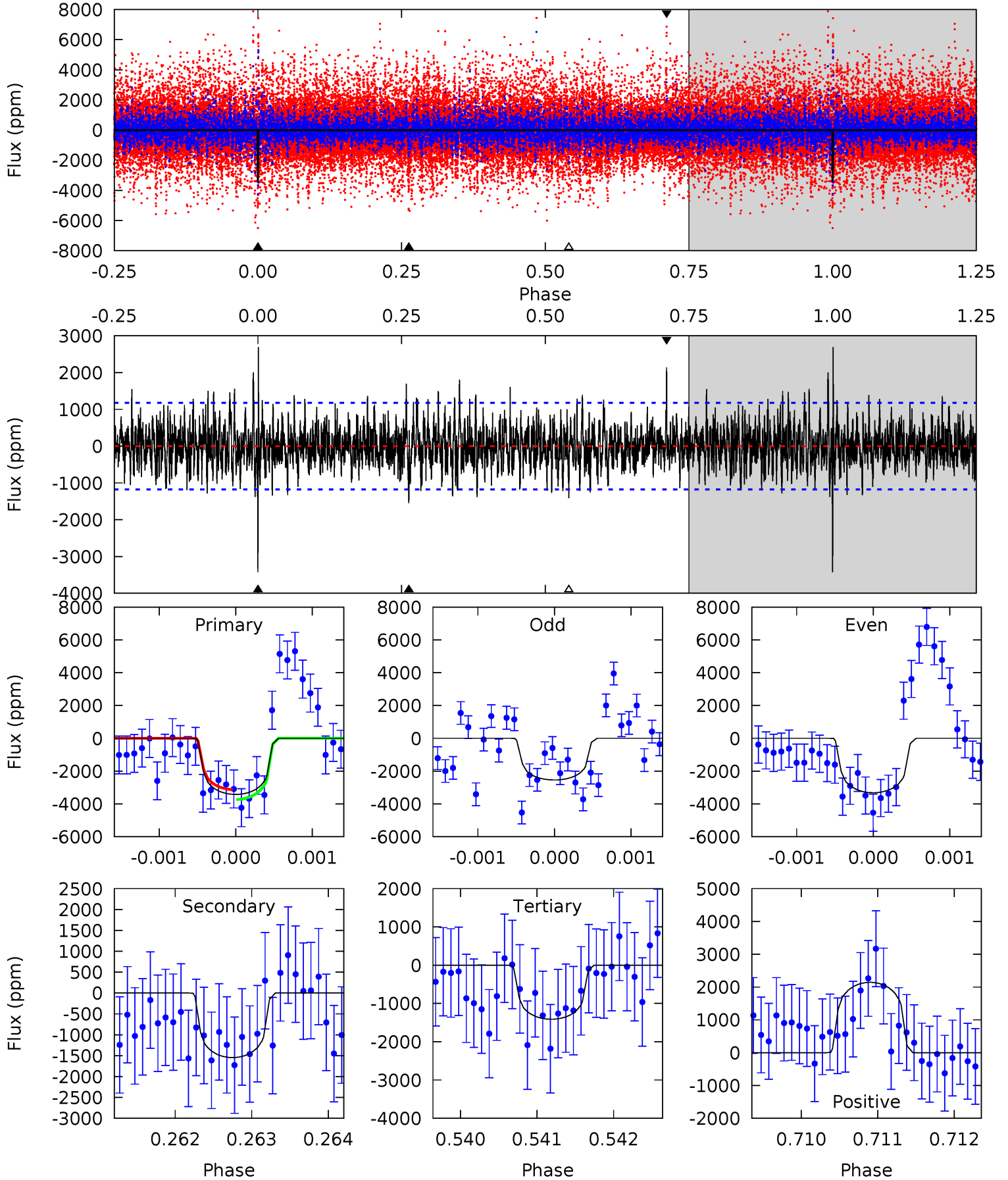
TCE 002307249-02 P=285.947239 Days  $T_0=337.463994$  (BKJD)



# DV Model-Shift Uniqueness Test

002307249-02, P = 285.942428 Days, E = 337.467052 Days

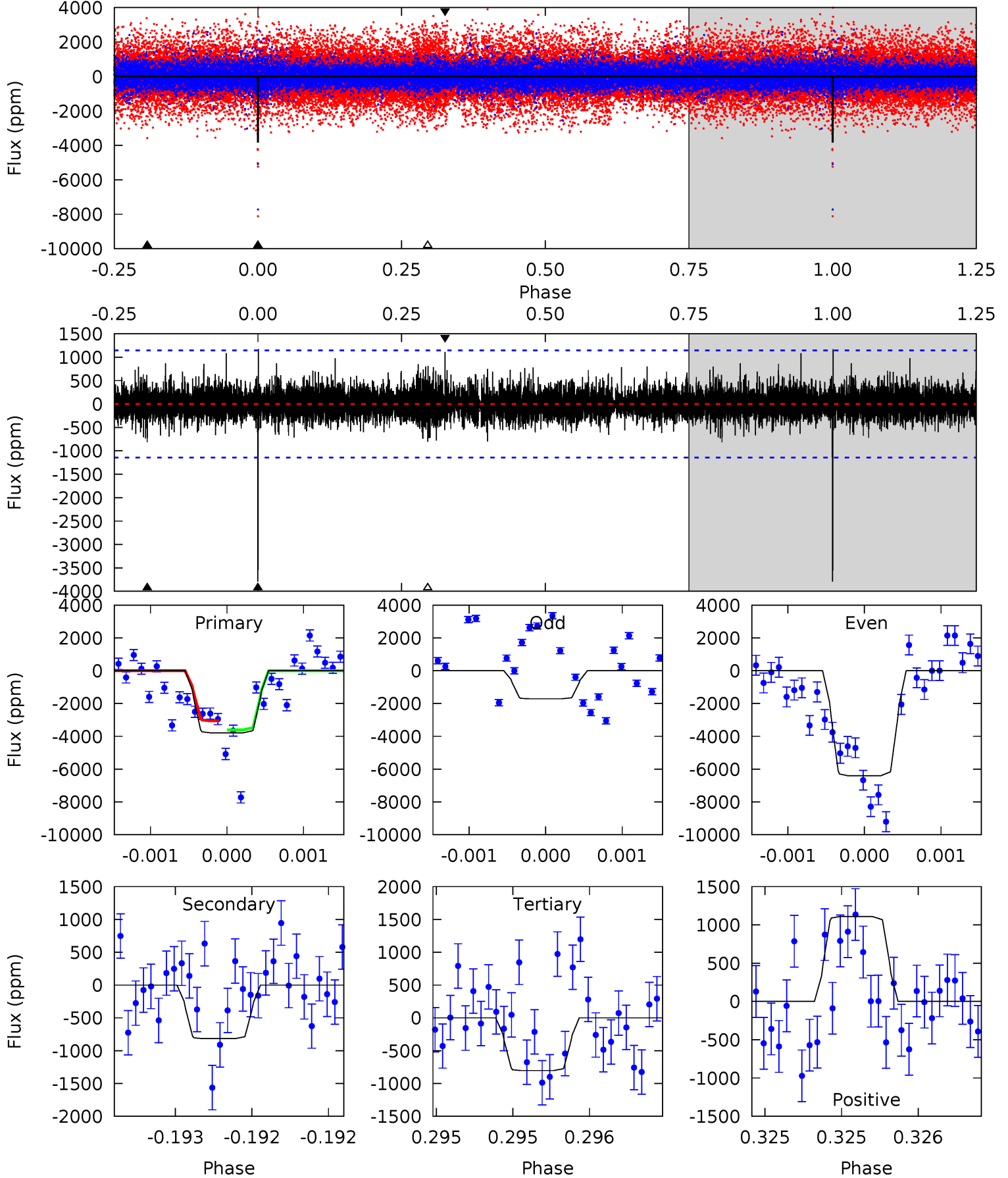
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	7.16	6.54	9.93	5.46	3.30	2.10	9.31	5.93	0.62	-2.77	1.65	1.09	0.44	1.39



# Alt Model-Shift Uniqueness Test

002307249-02, P = 285.947239 Days, E = 337.463994 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
18.3	3.95	3.88	5.36	5.53	3.41	0.99	14.4	12.9	0.06	-1.41	12.5	0.90	0.24	0





### Stellar Parameters For KIC 002307249

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4889^{+176}_{-176}$	$4.699^{+0.048}_{-0.028}$	$-1.260^{+0.300}_{-0.300}$	$0.557^{+0.033}_{-0.037}$	$0.565^{+0.041}_{-0.024}$	$4.611^{+0.903}_{-0.537}$
	+4%/-4%	+1%/-1%	+24%/-24%	+6%/-7%	+7%/-4%	+20%/-12%
Source	KIC0	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 002307249-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1546 \pm 216$	$3.67^{+1.27}_{-1.32}$	$268^{+11}_{-10}$	$4119^{+868}_{-432}$	$31294^{+48400}_{-14538}$
Alt.	$-817 \pm 207$	$4.95^{+1.46}_{-1.37}$	$266^{+11}_{-11}$	$3343^{+399}_{-280}$	$8769^{+9040}_{-3708}$

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

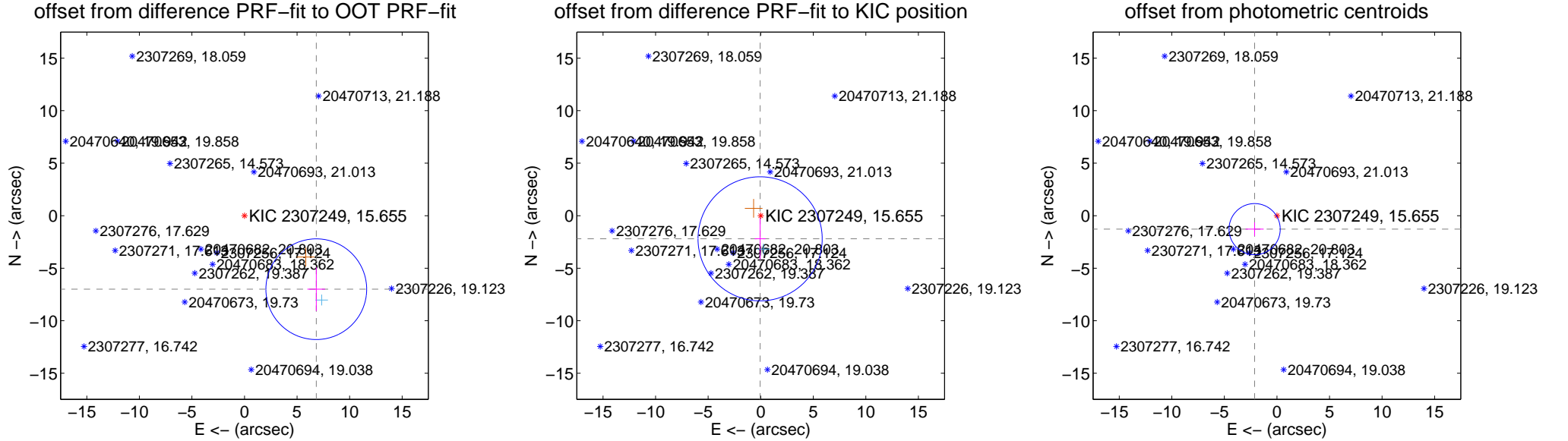
## DV Centroid Data

Supplemental centroid analysis for 002307249-02. Kepler magnitude: 15.65. Transit SNR 9.04

There are 1 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 8.59 arcsec so the offset from difference PRF-fit to OOT-PRF-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$9.781 \pm 1.598$	6.12	$-6.832 \pm 0.840$	$-7.000 \pm 2.077$
PRF-fit source offset from KIC position	$2.203 \pm 1.969$	1.12	$0.057 \pm 0.518$	$-2.202 \pm 1.970$
photometric centroid source offset	$2.48 \pm 0.81$	3.05	$2.12 \pm 0.86$	$-1.28 \pm 0.65$

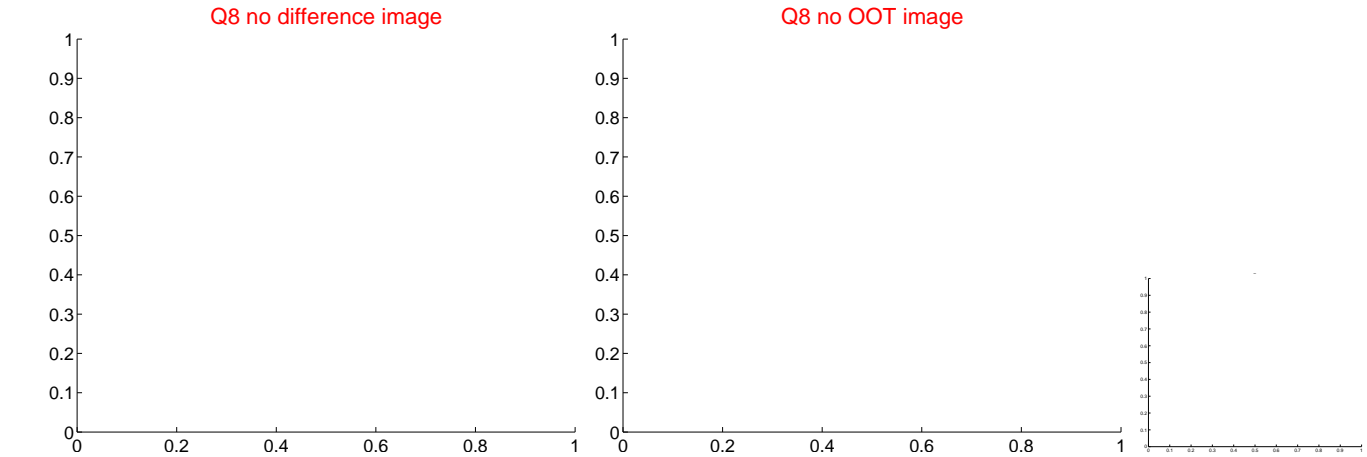
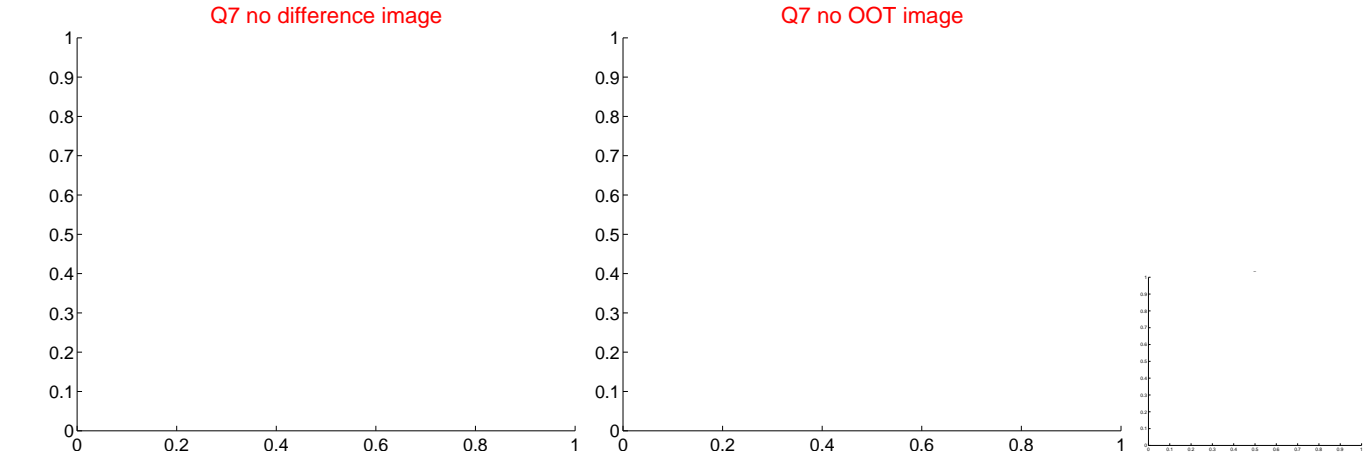
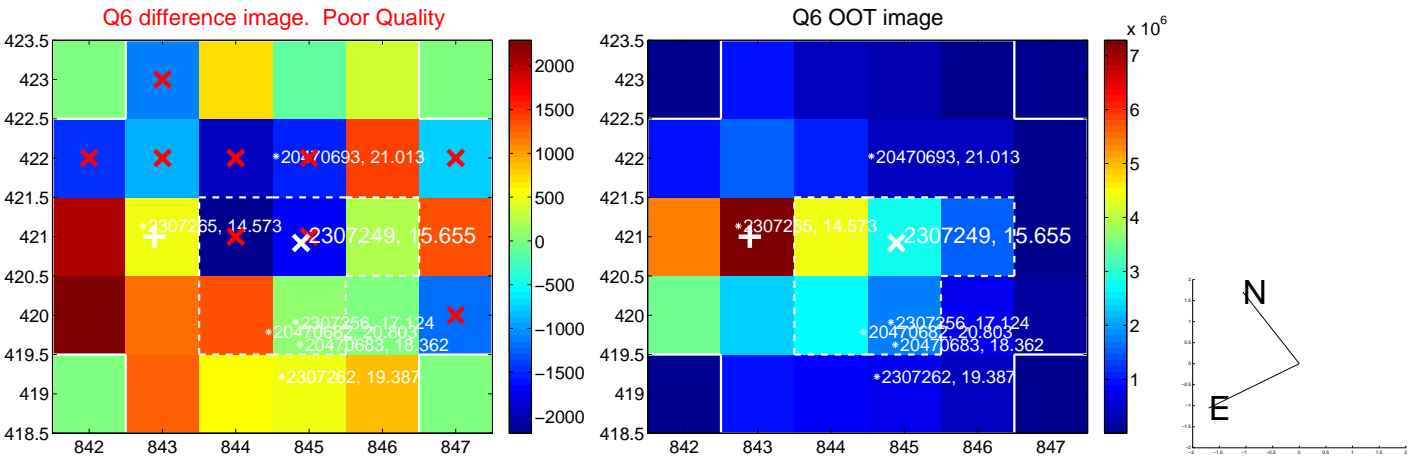
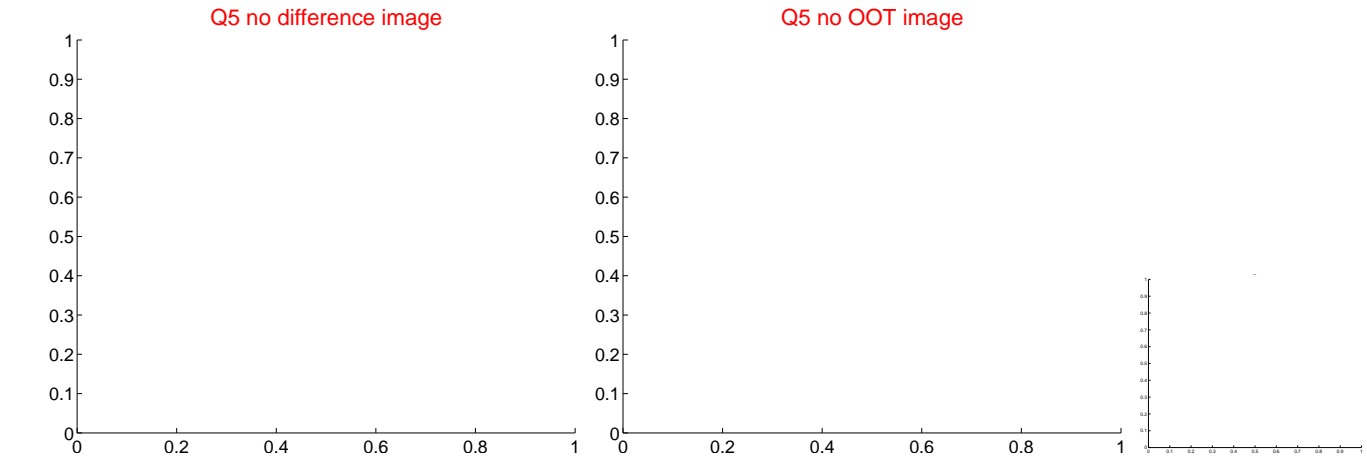


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

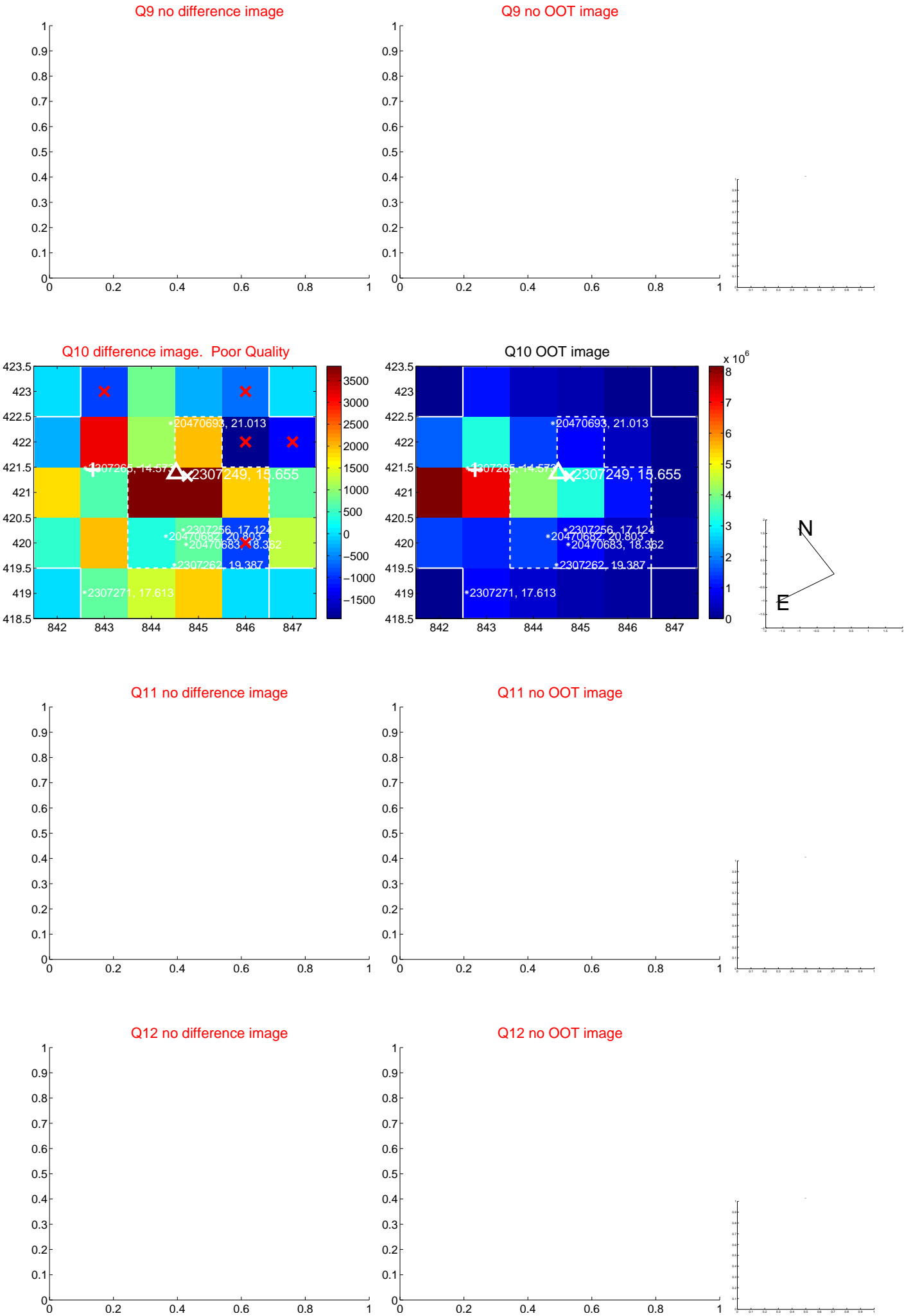
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



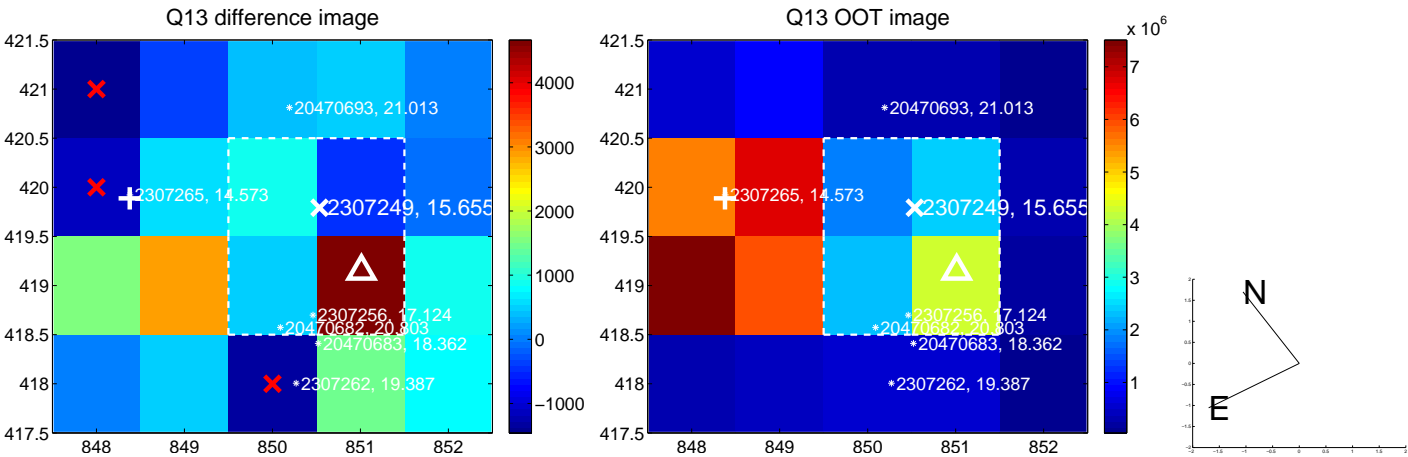
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



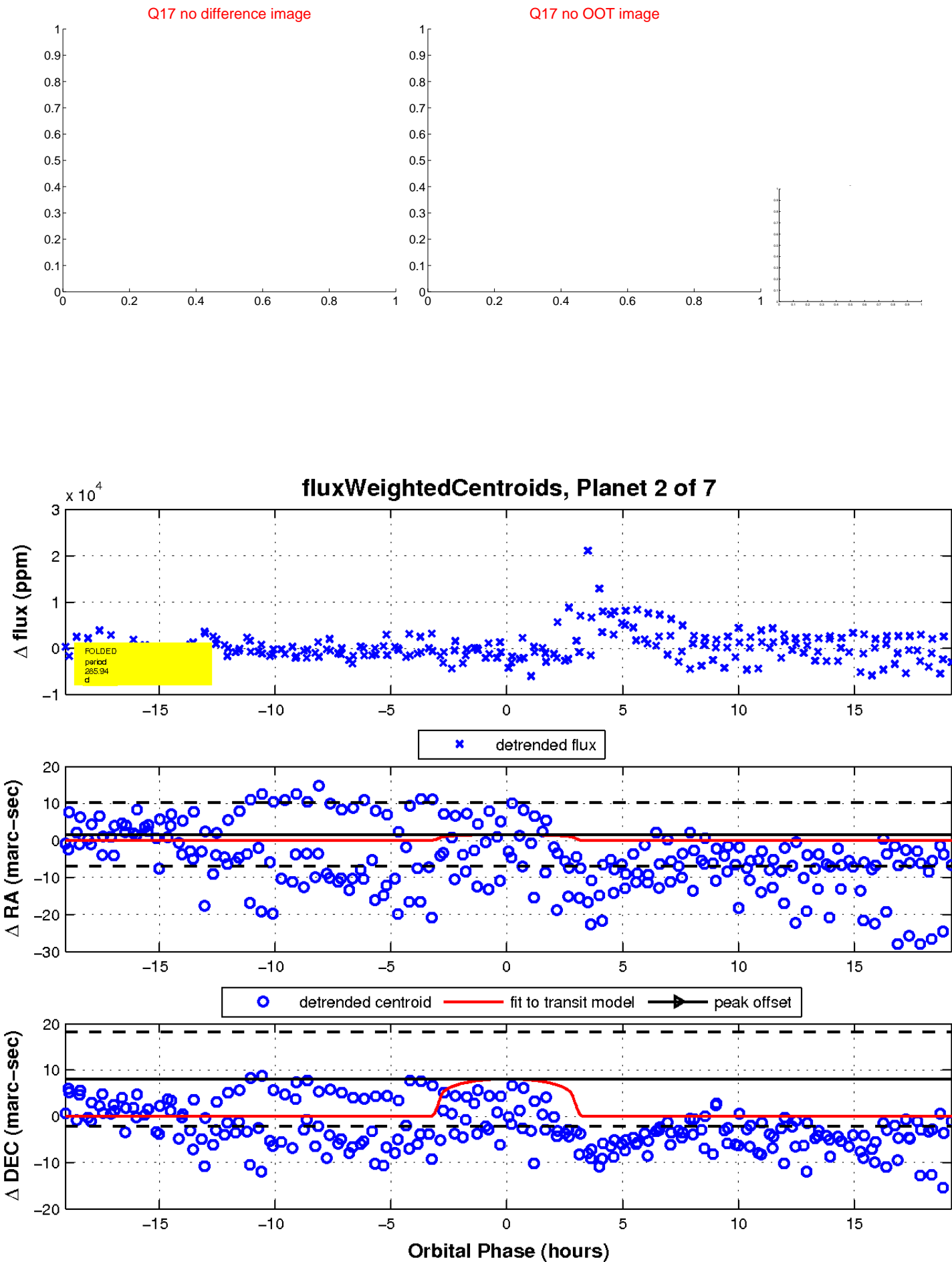
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

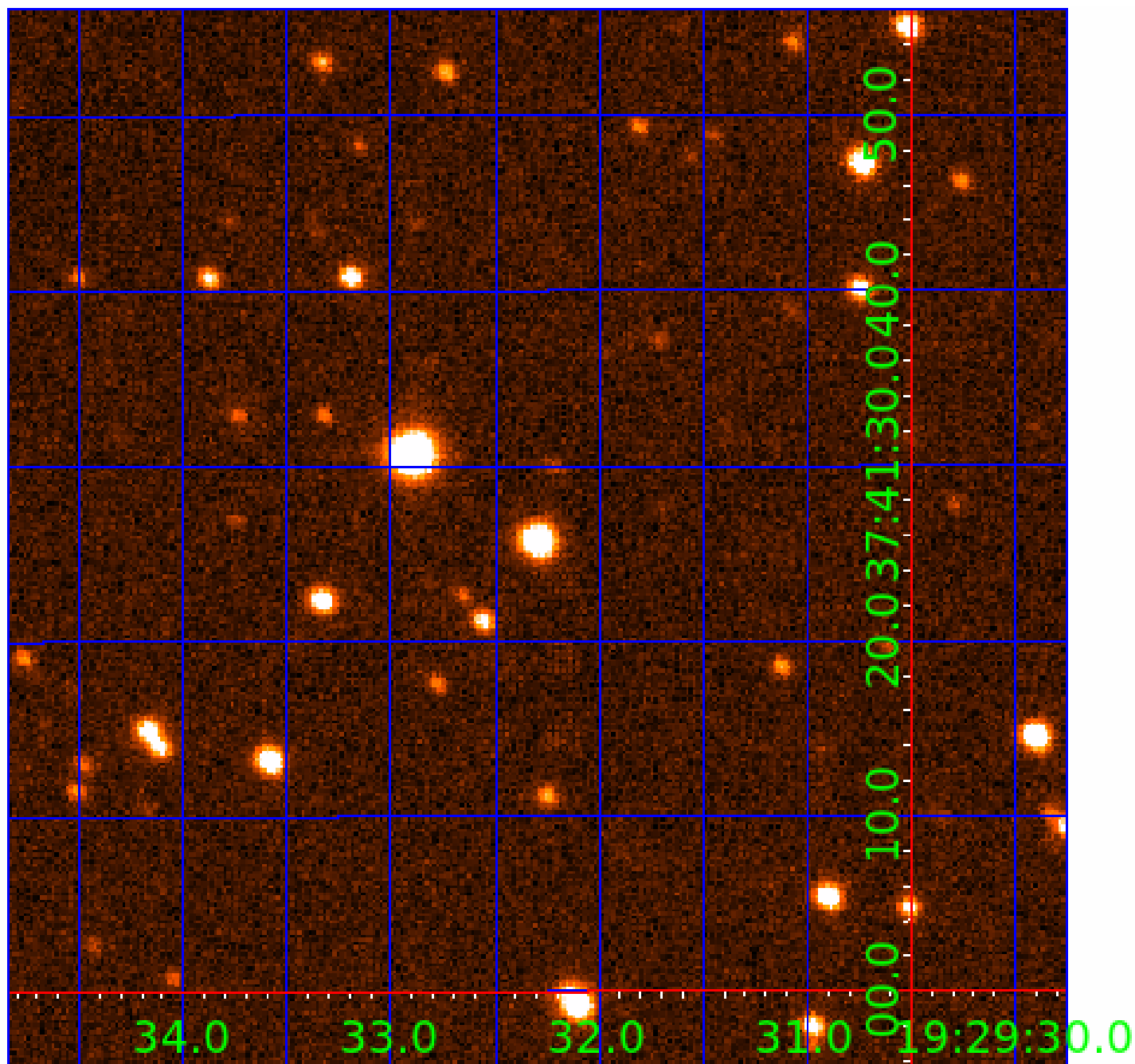


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 002307249

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002307249-01	OBS	No	443.240912	460.377527	3794.6	4.841	18.3	10.1	0.56	4889	4.41	0.18
002307249-02	OBS	No	285.942428	337.467052	4279.8	6.412	12.7	9.0	0.56	4889	3.65	0.32
002307249-03	OBS	No	495.701002	455.692868	2346.6	4.542	11.3	6.1	0.56	4889	2.66	0.15
002307249-04	OBS	No	352.446266	209.048827	2982.8	7.083	11.7	6.7	0.56	4889	3.00	0.24
002307249-05	OBS	No	369.019414	203.606121	3821.5	12.203	12.0	5.9	0.56	4889	3.50	0.23
002307249-06	OBS	No	340.157936	239.395276	3424.6	7.325	12.4	7.6	0.56	4889	3.21	0.26
002307249-07	OBS	No	401.069916	174.237568	1861.9	7.500	11.2	-1.0	0.56	4889	2.37	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002307249-01	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
002307249-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
002307249-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002307249-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

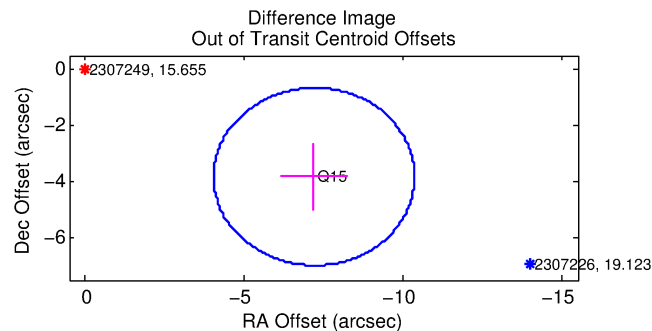
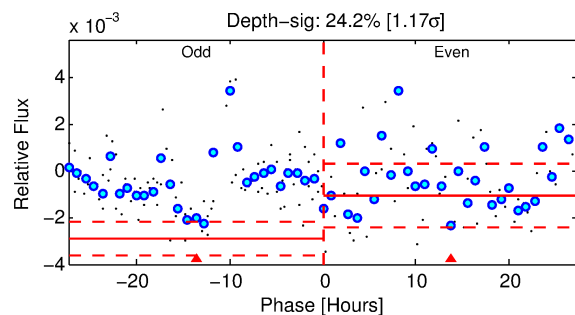
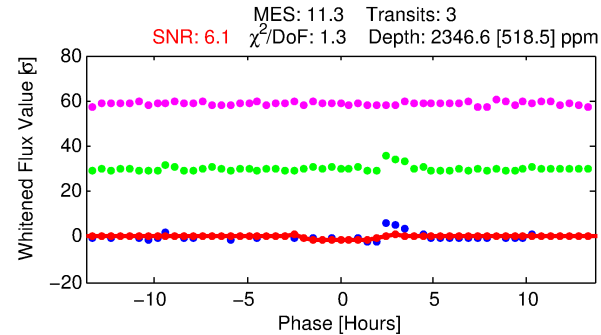
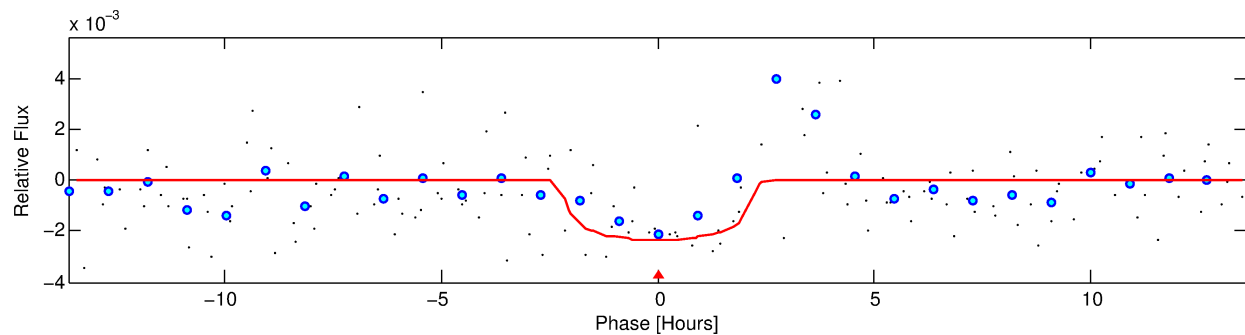
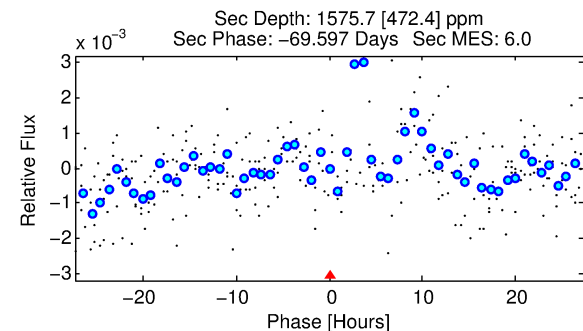
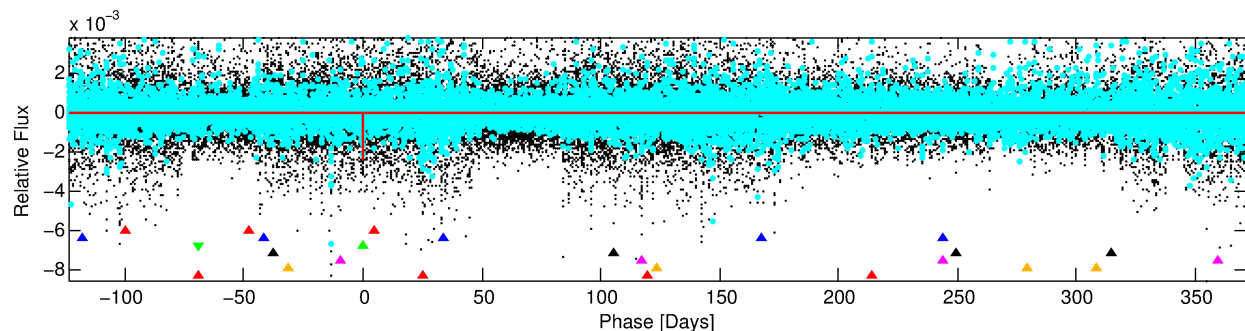
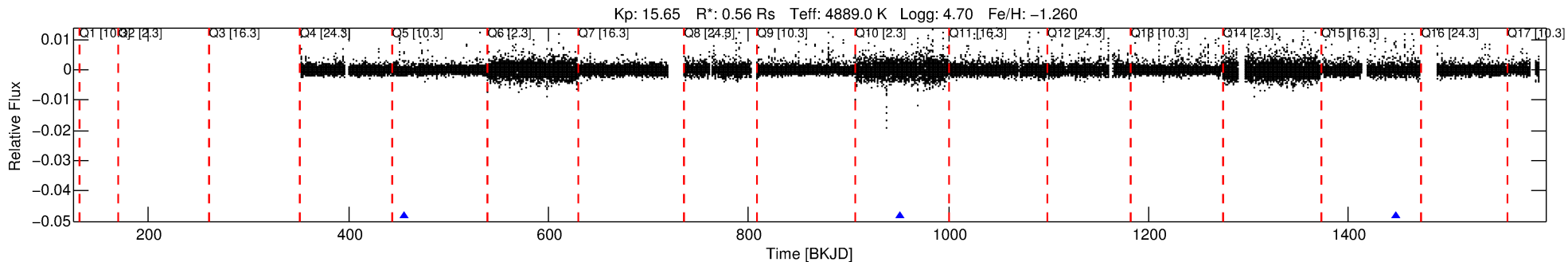
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002307249-03

No Significant Match Found

# DV One-Page Summary

KIC: 2307249 Candidate: 3 of 7 Period: 495.701 d



## DV Fit Results:

Period = 495.70100 [0.00717] d  
Epoch = 455.6929 [0.0096] BKJD  
Rp/R\* = 0.0437 [0.0832]  
a/R\* = 866.12 [6746.17]  
b = 0.10 [76.13]  
Seff = 0.15 [0.03]  
Teq = 160 [7] K  
Rp = 2.66 [5.06] Re  
a = 1.0141 [0.0584] AU  
Ag = 126108.72 [481209.84] [0.26σ]  
Teffp = 4657 [4445] K [1.01σ]

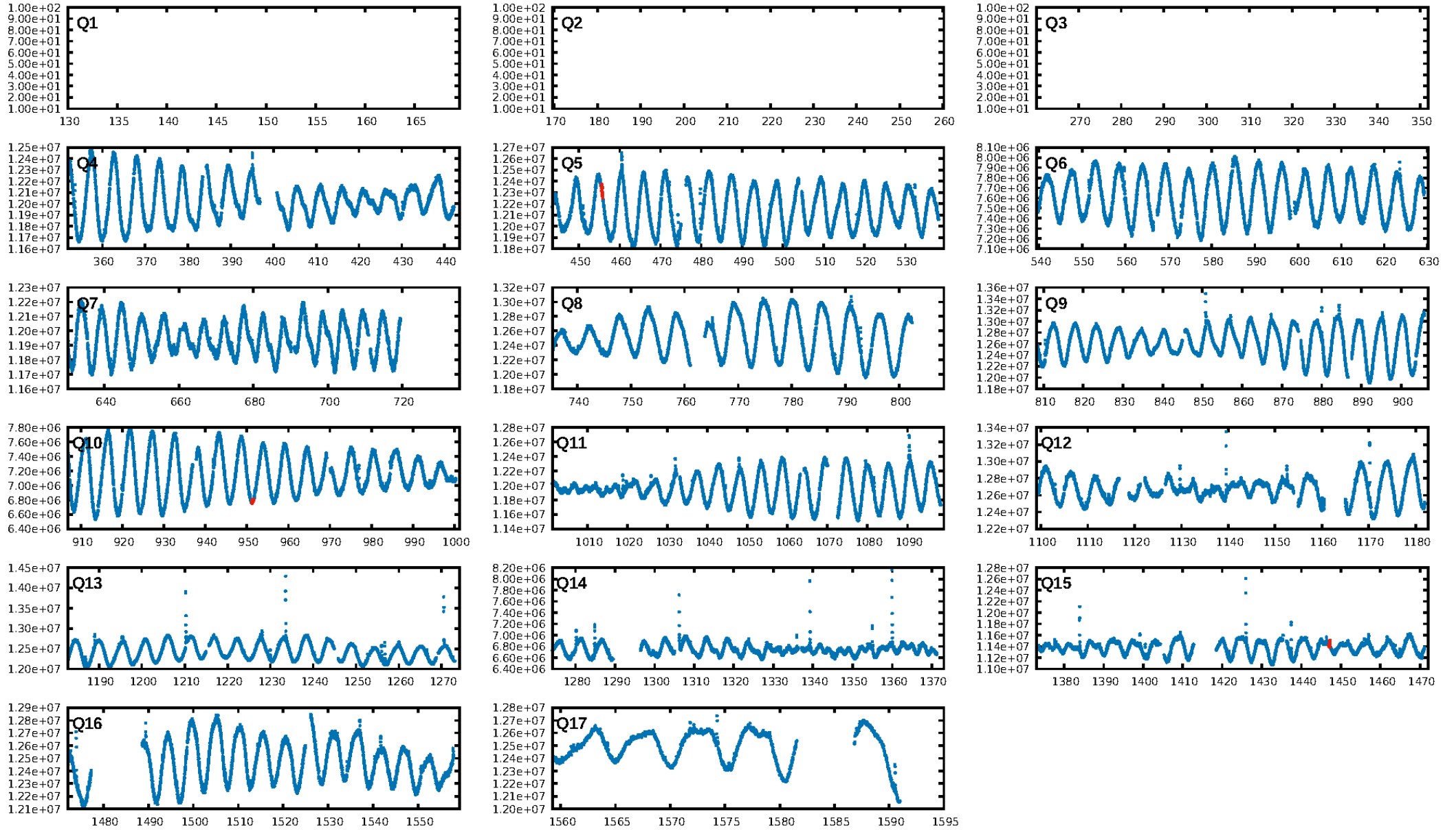
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [189.67σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 10.7%  
ModelChiSquareGof-sig: 81.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.534  
Centroid-sig: 1.8%  
Centroid-so: 0.477 arcsec [0.43σ]  
OotOffset-rm: 8.154 arcsec [7.74σ]  
KicOffset-rm: 1.118 arcsec [1.06σ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [3/3]

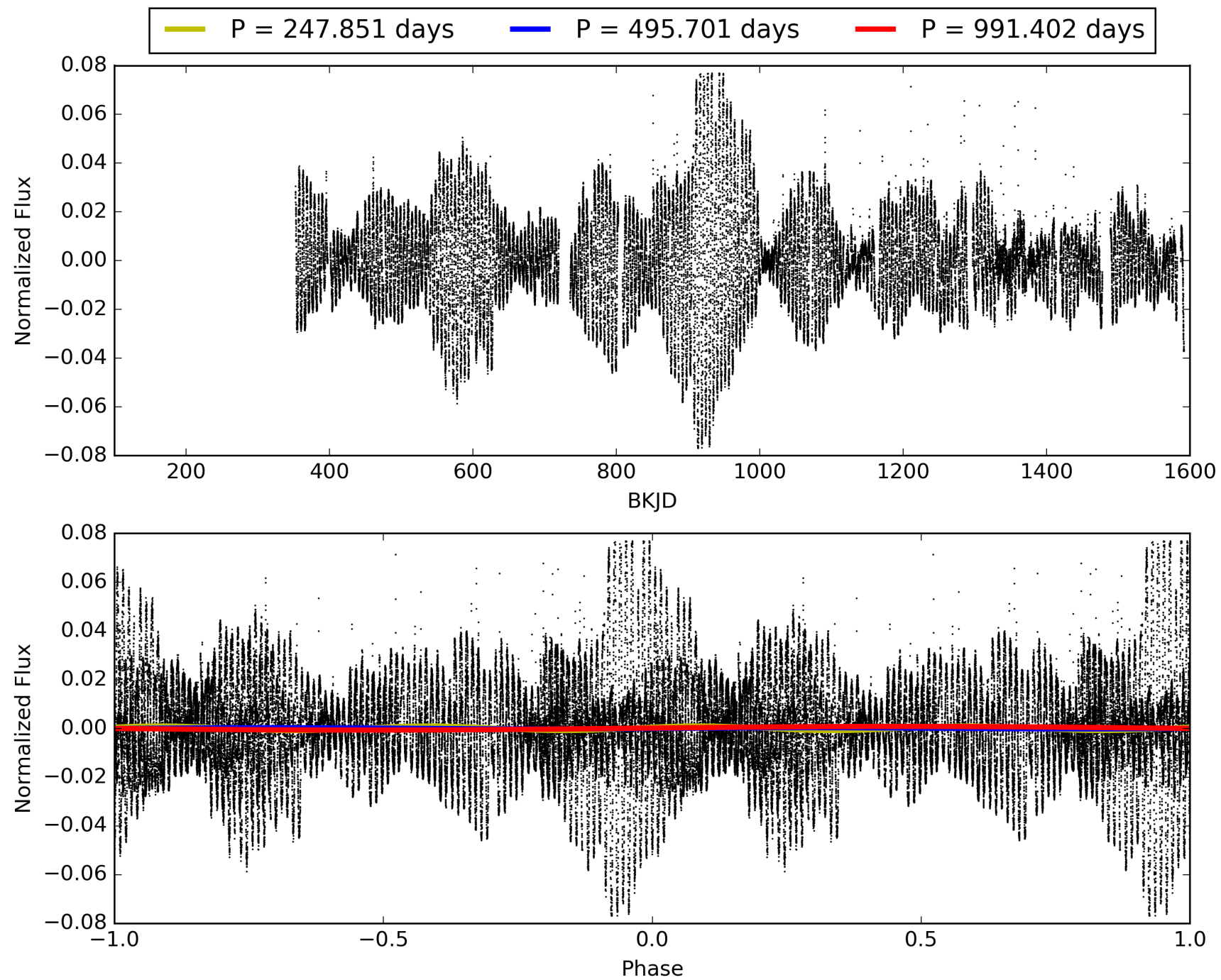
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:52:15 Z

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

# TCE 002307249-03, PDC Light Curves

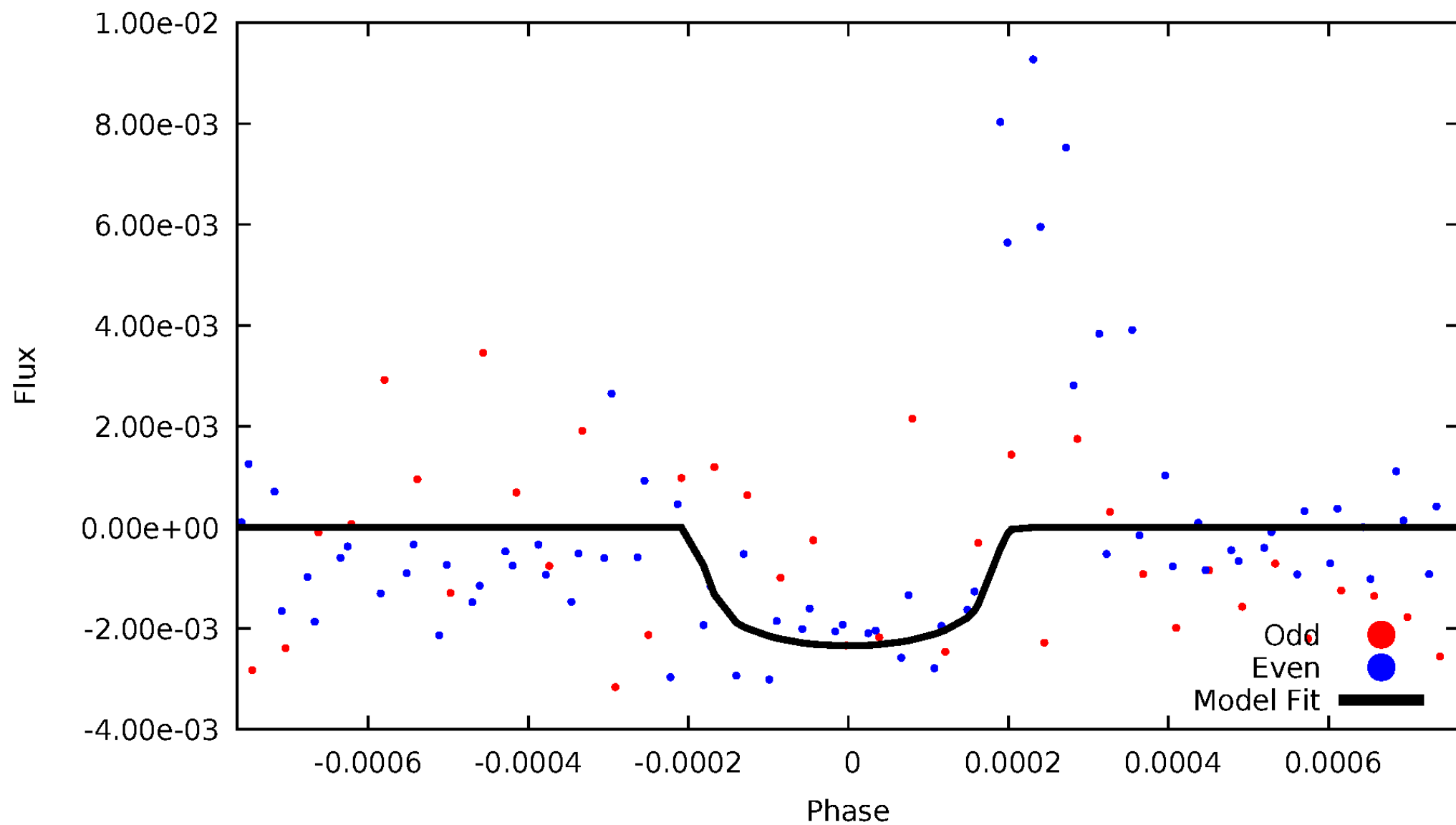


# TCE 002307249-03



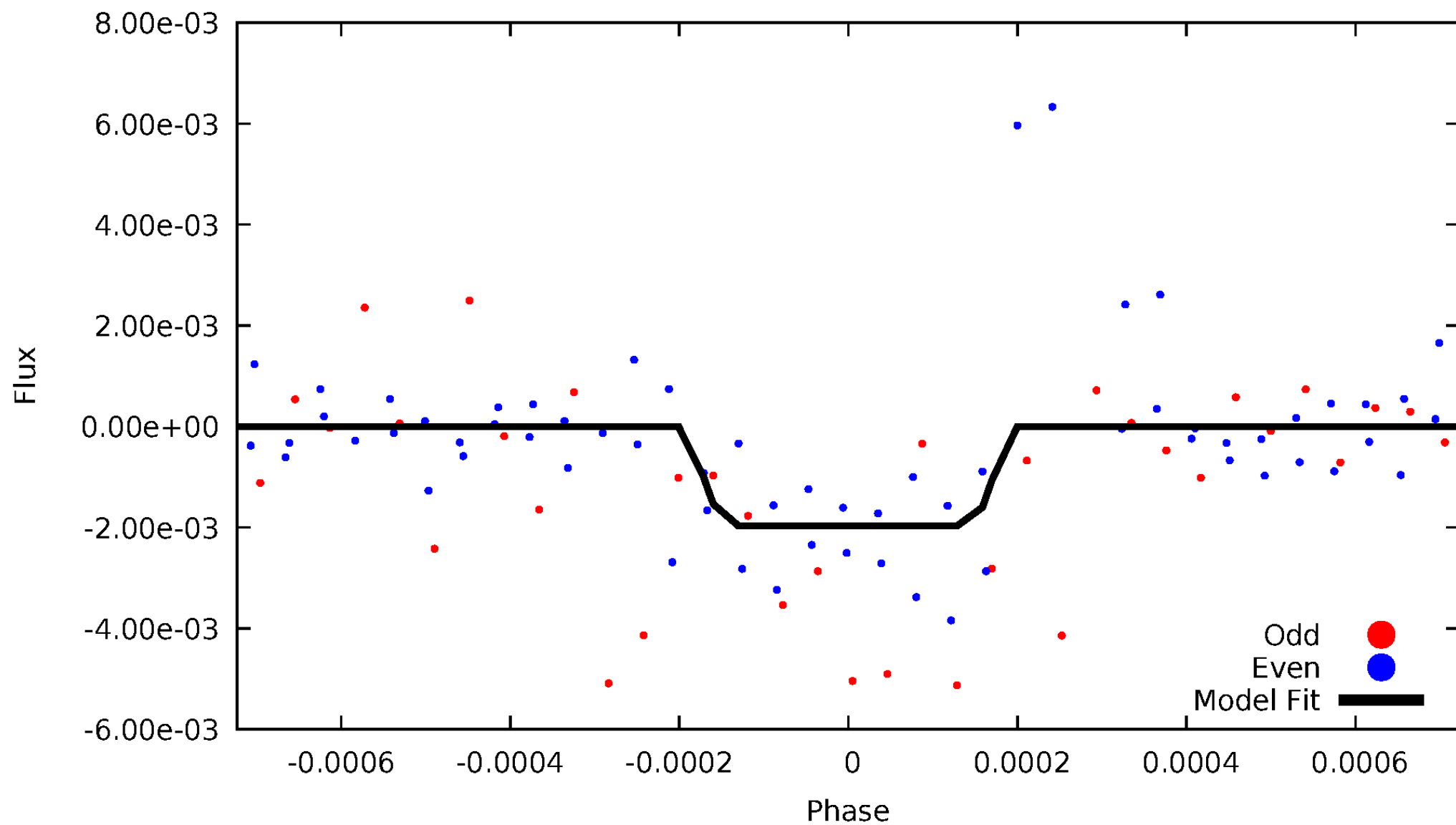
# DV Odd/Even

TCE 002307249-03



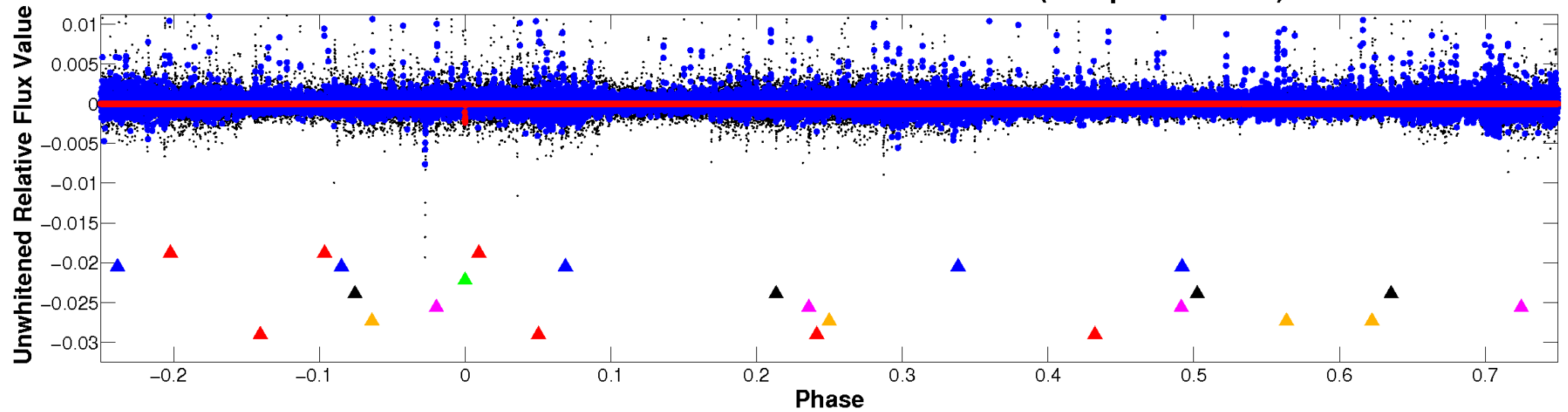
# ALT Odd/Even

TCE 002307249-03

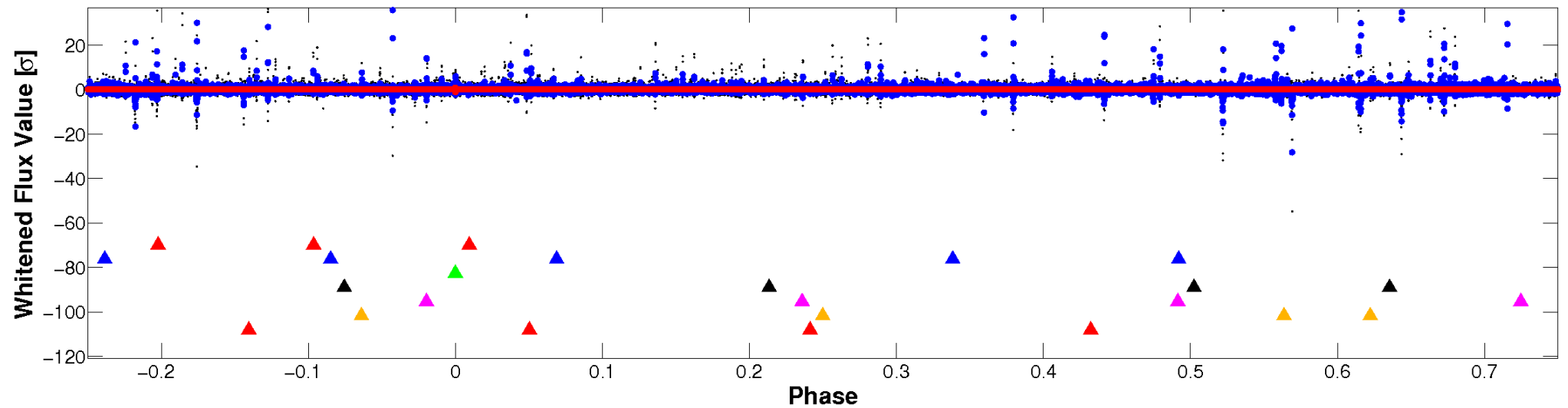


# Non-Whitened Vs. Whitened Light Curve

## Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

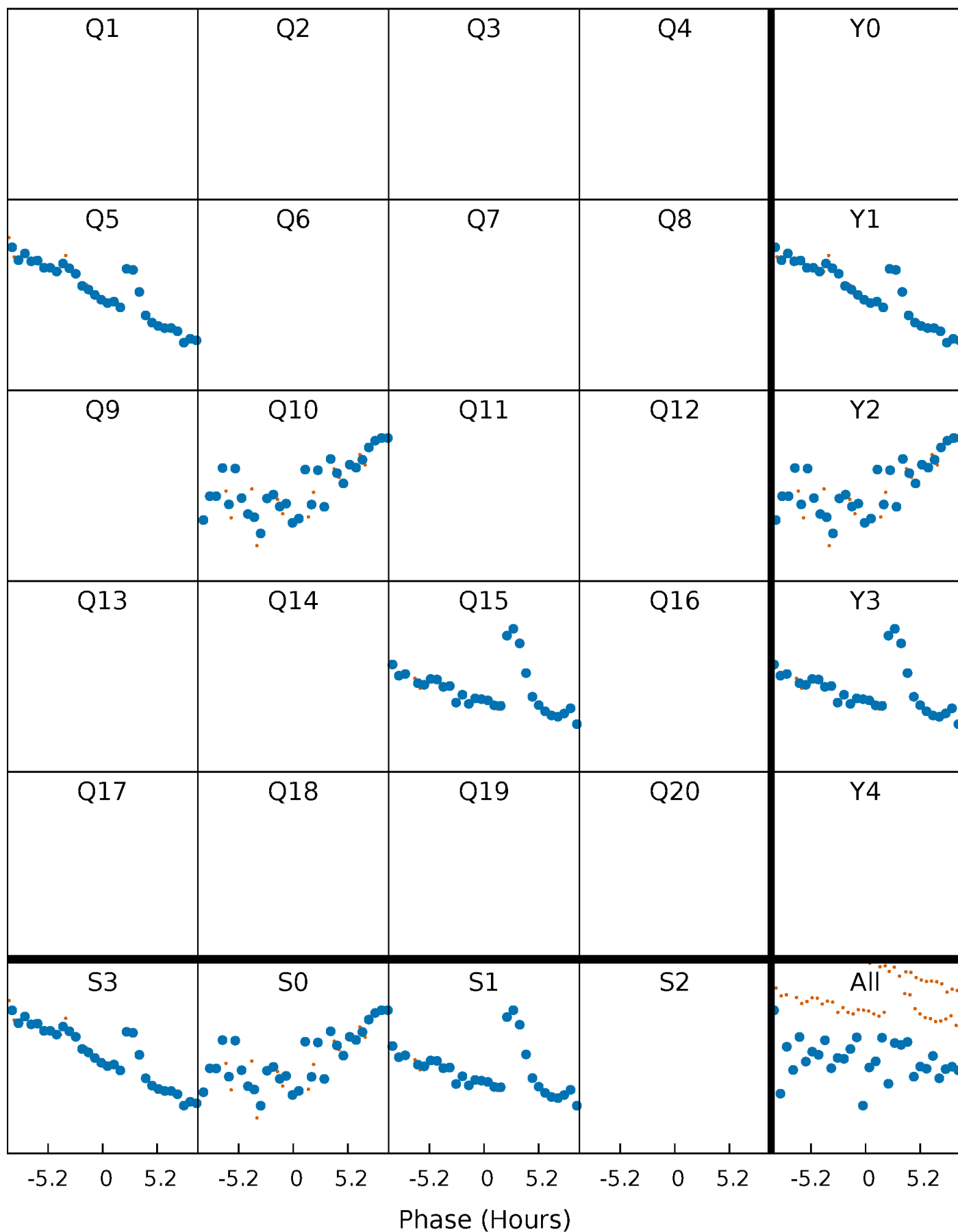


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

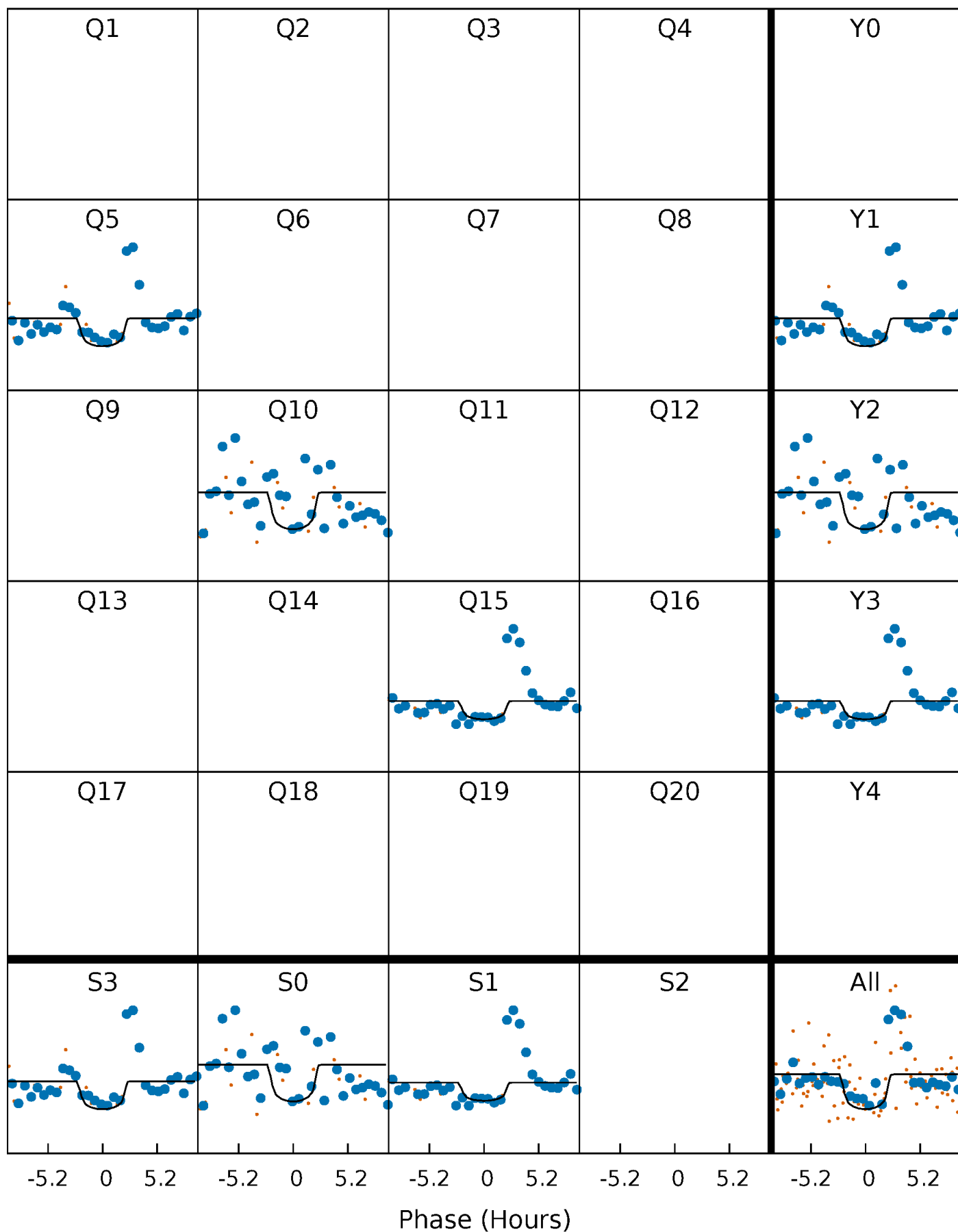
TCE 002307249-03     $P=495.701002$  Days     $T_0=455.692868$  (BKJD)





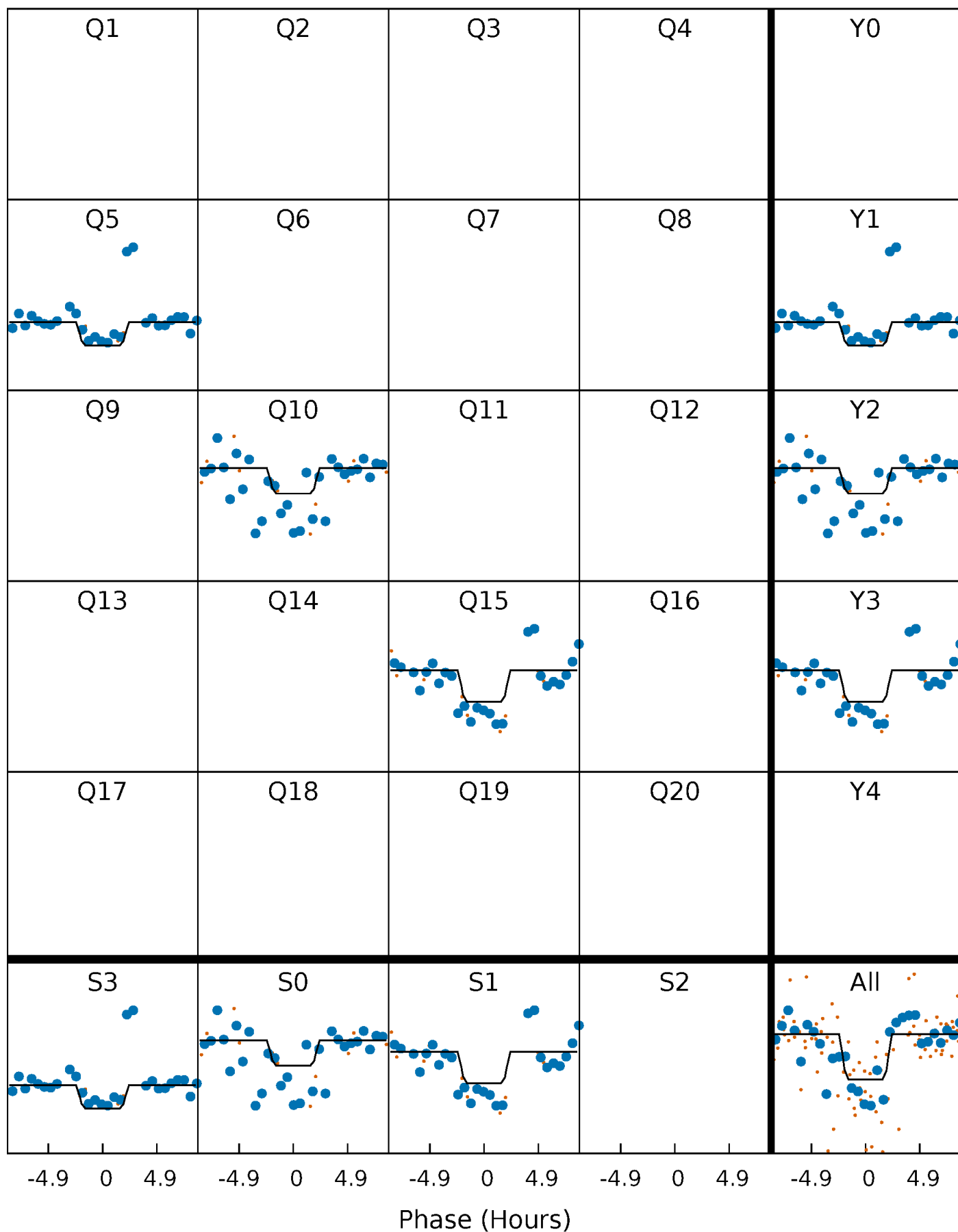
# DV Quarter-Phased Transit Curves

TCE 002307249-03     $P=495.701002$  Days     $T_0=455.692868$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

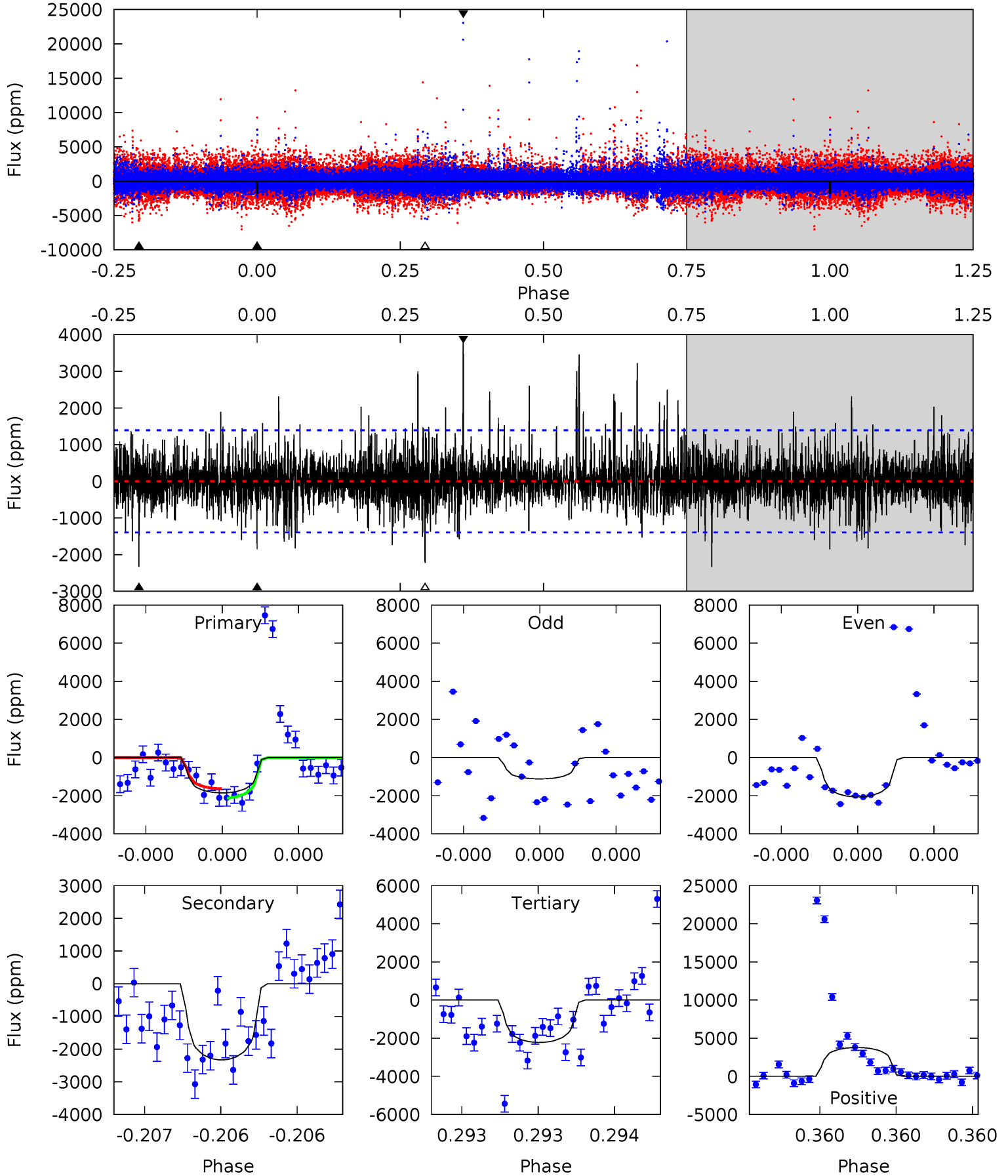
TCE 002307249-03 P=495.697732 Days  $T_0=455.692365$  (BKJD)



# DV Model-Shift Uniqueness Test

002307249-03, P = 495.701002 Days, E = 455.692868 Days

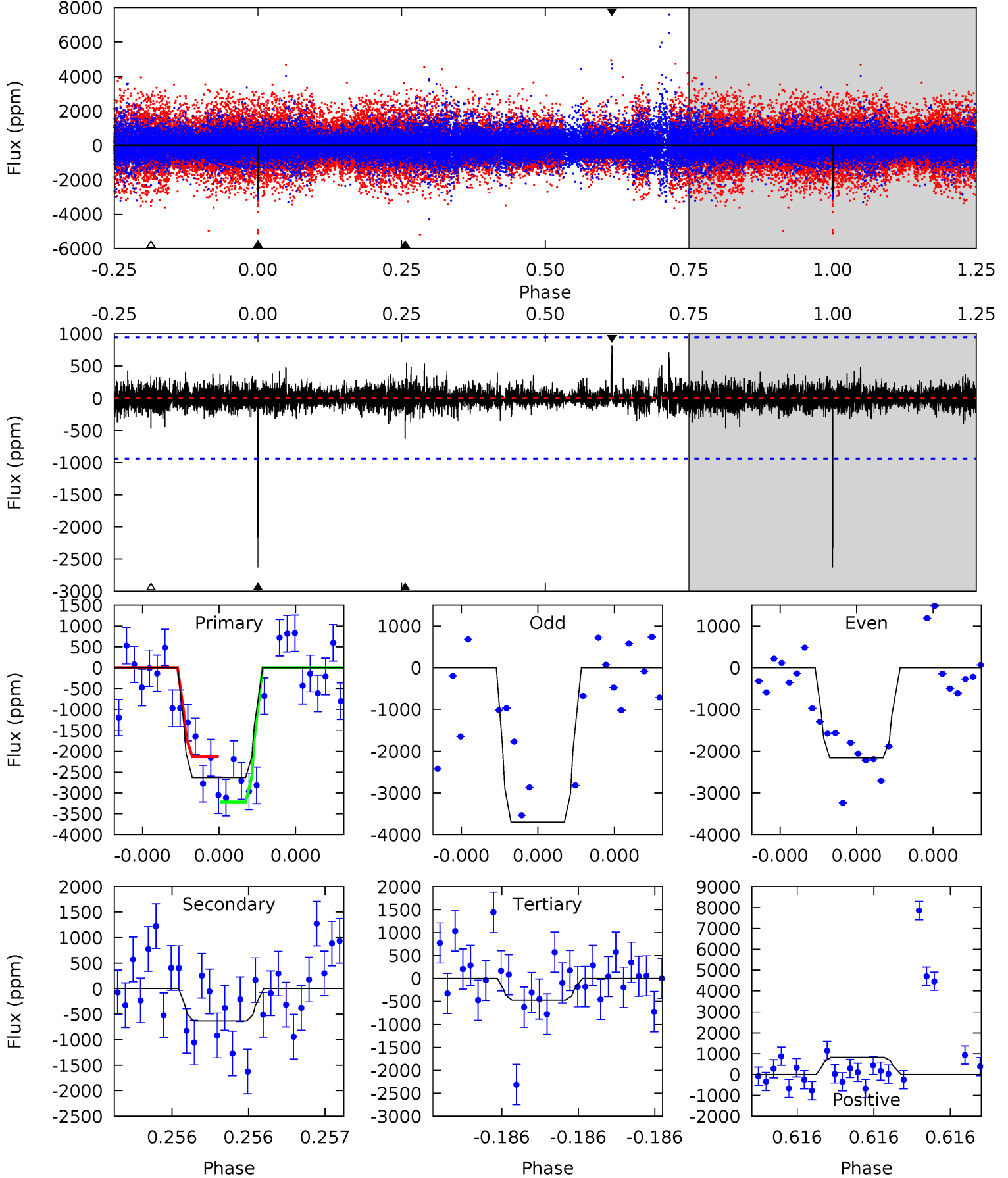
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.46	9.39	8.95	15.2	5.62	3.55	1.90	-1.49	-7.77	0.44	-5.84	1.12	0.94	0.62	0.99



# Alt Model-Shift Uniqueness Test

002307249-03, P = 495.697732 Days, E = 455.692365 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
15.7	3.76	2.81	4.90	5.63	3.56	0.58	12.9	10.8	0.95	-1.15	4.32	0.84	0.24	3.27



### Stellar Parameters For KIC 002307249

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4889^{+176}_{-176}$	$4.699^{+0.048}_{-0.028}$	$-1.260^{+0.300}_{-0.300}$	$0.557^{+0.033}_{-0.037}$	$0.565^{+0.041}_{-0.024}$	$4.611^{+0.903}_{-0.537}$
	+4%/-4%	+1%/-1%	+24%/-24%	+6%/-7%	+7%/-4%	+20%/-12%
Source	KIC0	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 002307249-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-2332 \pm 248$	$4.41^{+4.36}_{-2.70}$	$223^{+9}_{-9}$	$4170^{+2135}_{-861}$	$68462^{+390641}_{-51062}$
Alt.	$-630 \pm 168$	$4.52^{+4.12}_{-3.03}$	$223^{+9}_{-9}$	$3317^{+1576}_{-586}$	$17349^{+146789}_{-12675}$

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

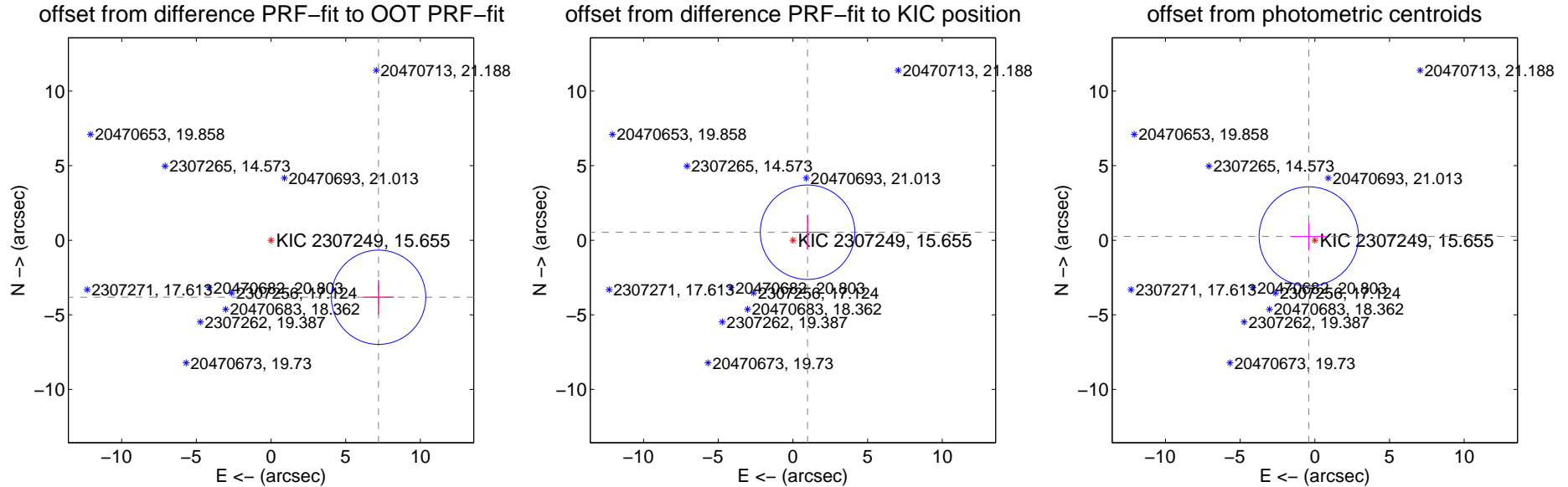
## DV Centroid Data

Supplemental centroid analysis for 002307249-03. Kepler magnitude: 15.65. Transit SNR 6.11

There are 0 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 7.60 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$8.154 \pm 1.054$	7.74	$-7.203 \pm 1.025$	$-3.823 \pm 1.148$
PRF-fit source offset from KIC position	$1.118 \pm 1.055$	1.06	$-0.980 \pm 1.025$	$0.539 \pm 1.148$
photometric centroid source offset	$0.48 \pm 1.11$	0.43	$0.40 \pm 1.17$	$0.26 \pm 0.93$

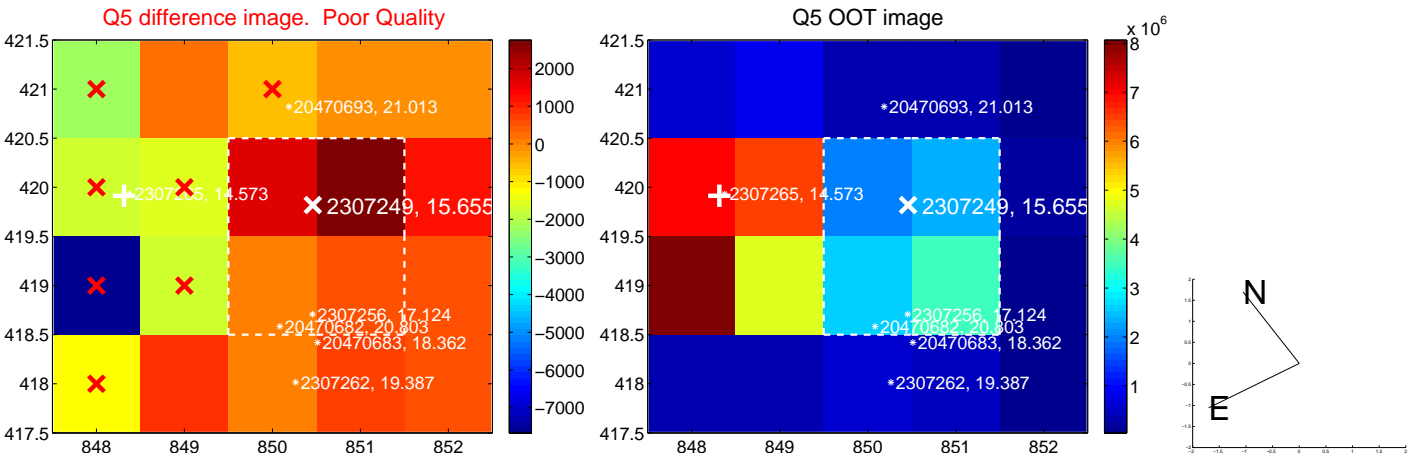


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

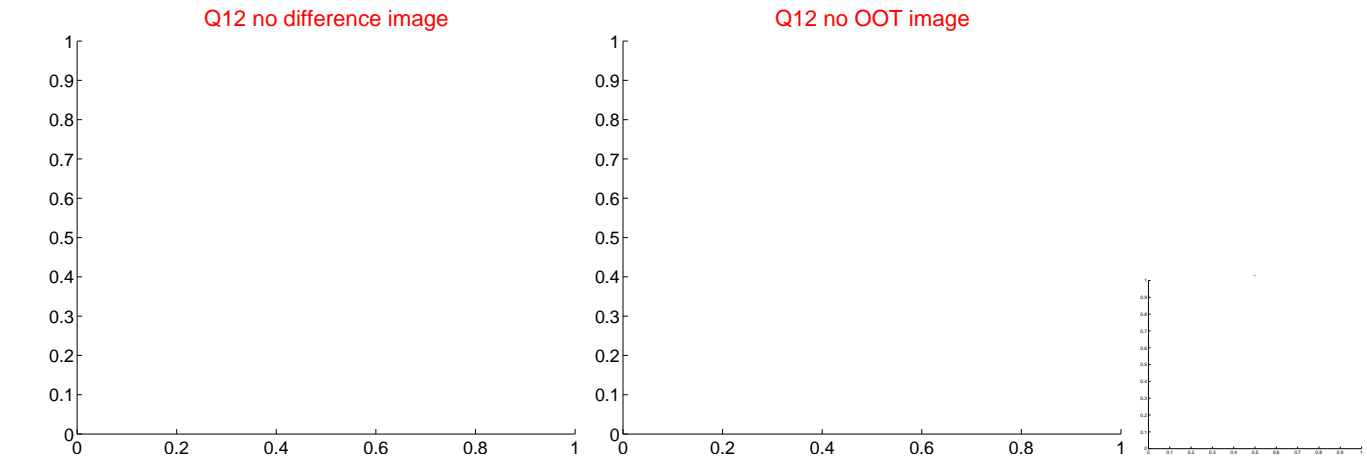
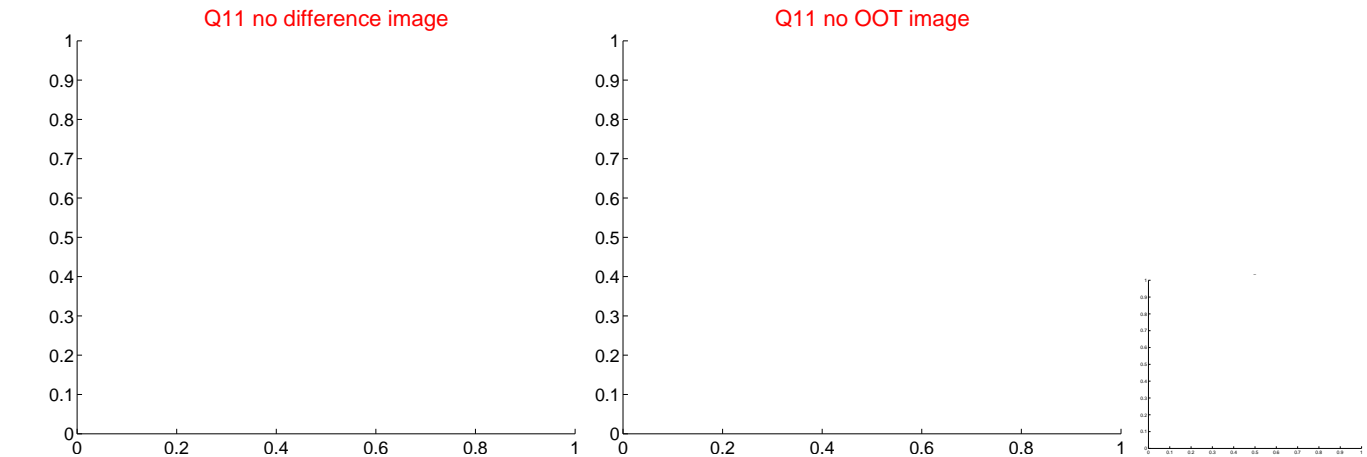
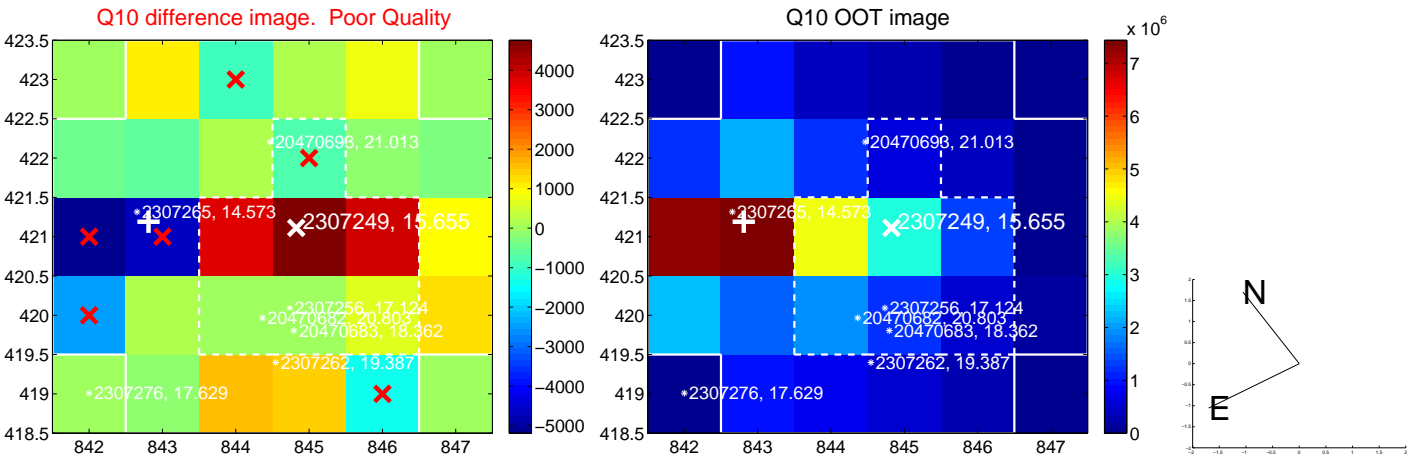
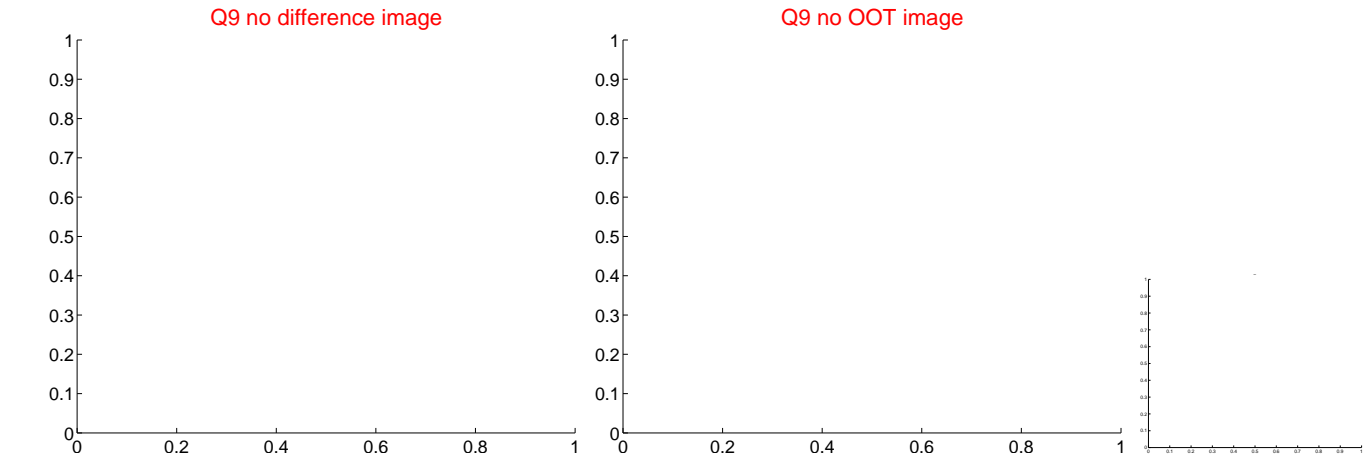


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

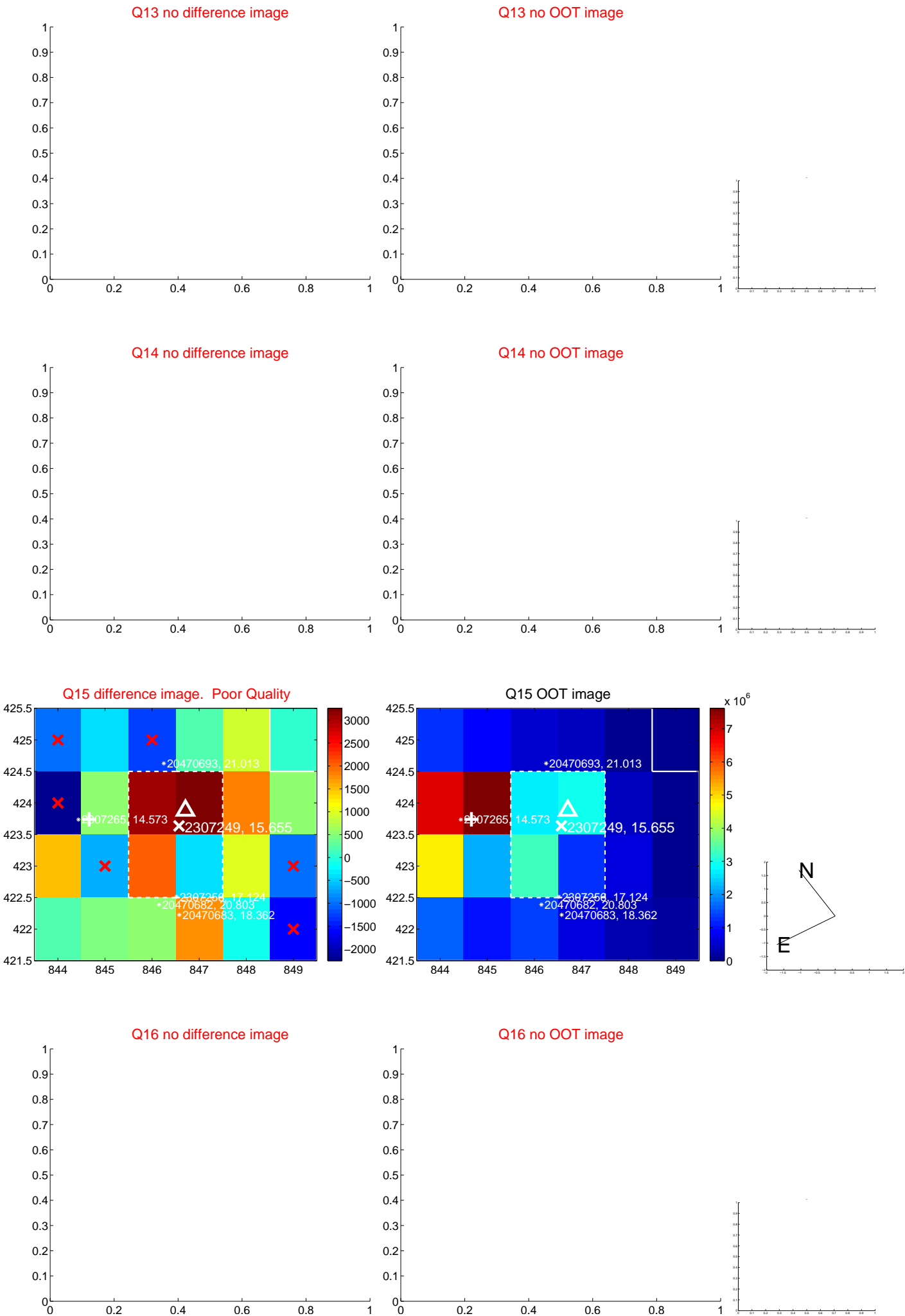




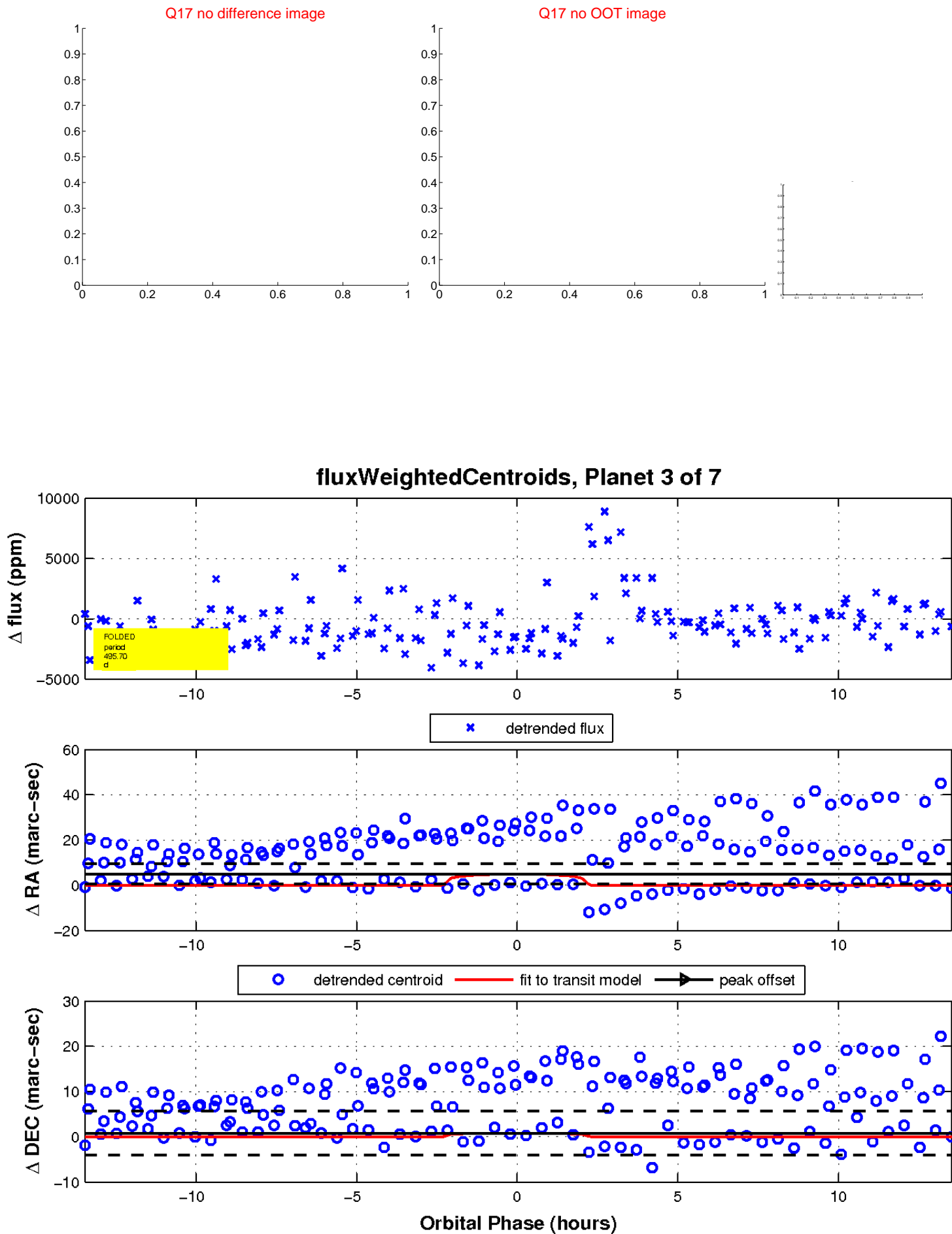
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

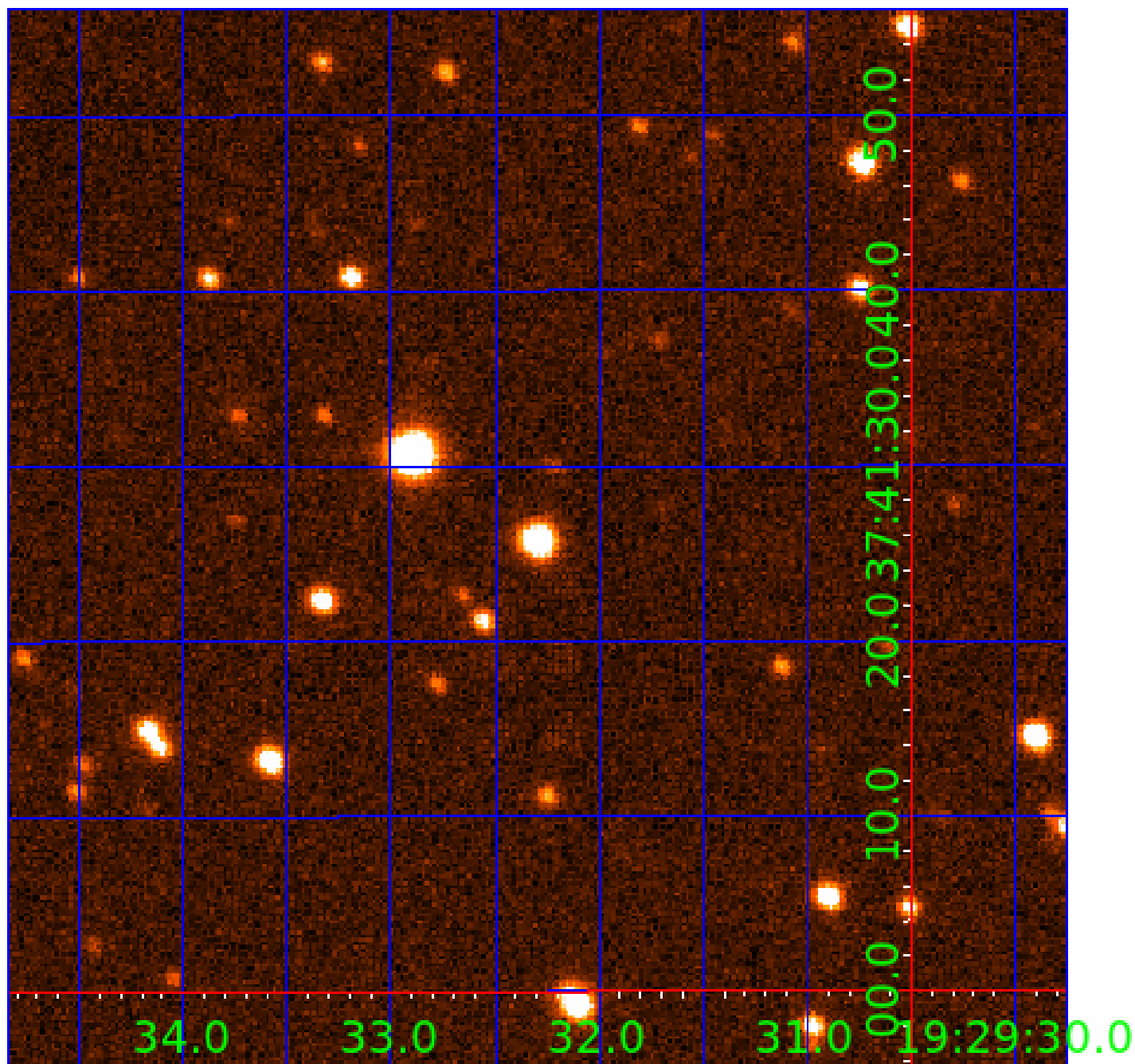


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 002307249

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002307249-01	OBS	No	443.240912	460.377527	3794.6	4.841	18.3	10.1	0.56	4889	4.41	0.18
002307249-02	OBS	No	285.942428	337.467052	4279.8	6.412	12.7	9.0	0.56	4889	3.65	0.32
002307249-03	OBS	No	495.701002	455.692868	2346.6	4.542	11.3	6.1	0.56	4889	2.66	0.15
002307249-04	OBS	No	352.446266	209.048827	2982.8	7.083	11.7	6.7	0.56	4889	3.00	0.24
002307249-05	OBS	No	369.019414	203.606121	3821.5	12.203	12.0	5.9	0.56	4889	3.50	0.23
002307249-06	OBS	No	340.157936	239.395276	3424.6	7.325	12.4	7.6	0.56	4889	3.21	0.26
002307249-07	OBS	No	401.069916	174.237568	1861.9	7.500	11.2	-1.0	0.56	4889	2.37	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002307249-01	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
002307249-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
002307249-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002307249-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

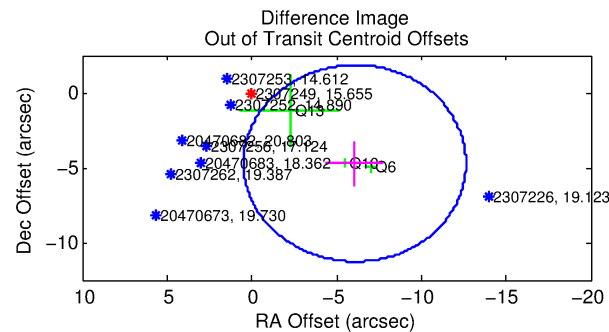
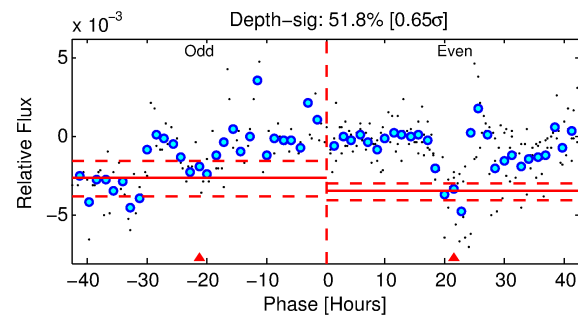
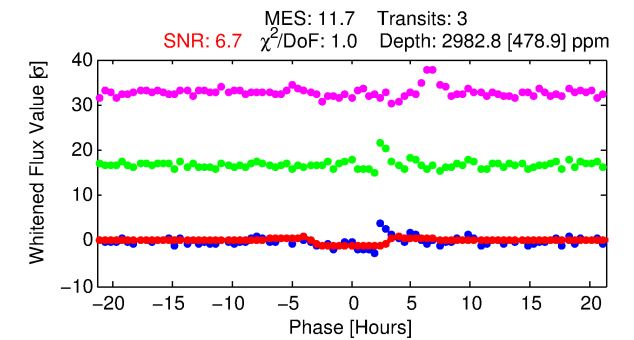
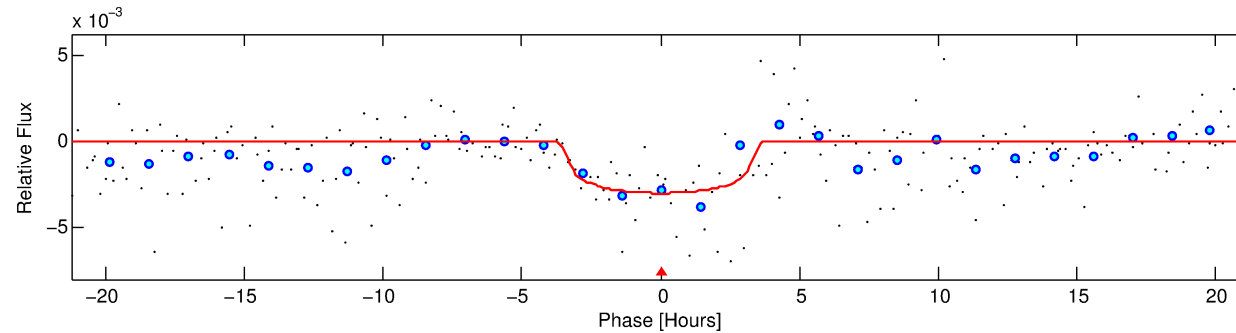
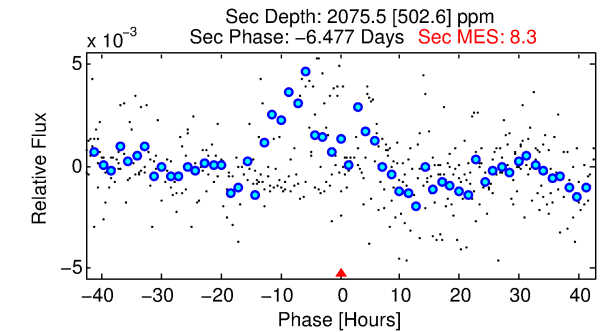
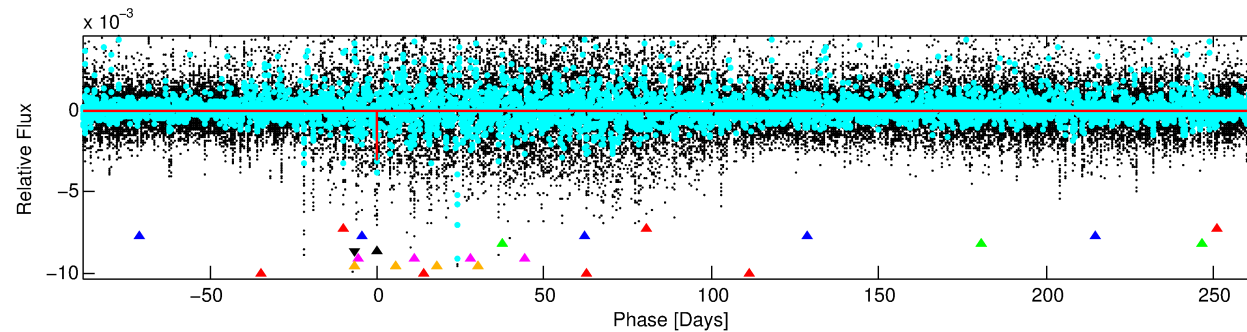
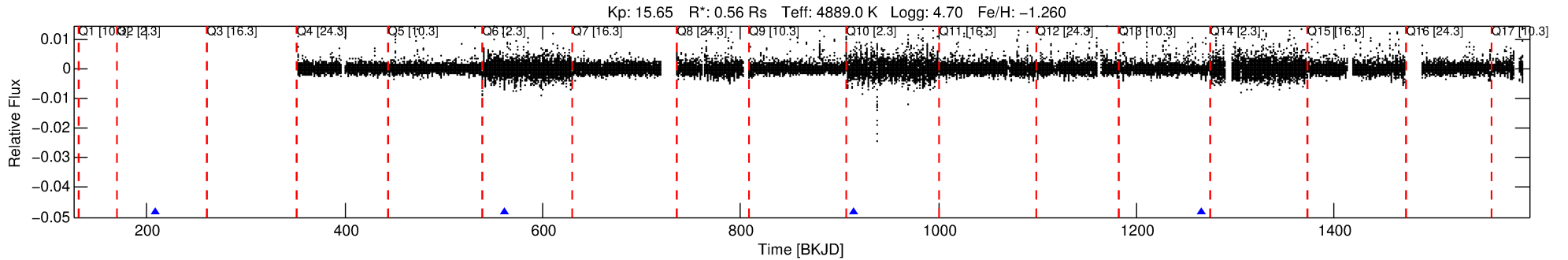
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 002307249-04

No Significant Match Found

# DV One-Page Summary

KIC: 2307249 Candidate: 4 of 7 Period: 352.446 d



## DV Fit Results:

Period = 352.44627 [0.00811] d  
Epoch = 209.0488 [0.0220] BKJD  
Rp/R\* = 0.0493 [0.0298]  
a/R\* = 396.61 [963.31]  
b = 0.11 [21.63]  
Seff = 0.24 [0.04]  
Teq = 179 [8] K  
Rp = 3.00 [1.82] Re  
a = 0.8078 [0.0465] AU  
Ag = 82917.41 [102476.36] [0.81σ]  
**Teffp = 4699 [1458] K [3.10σ]**

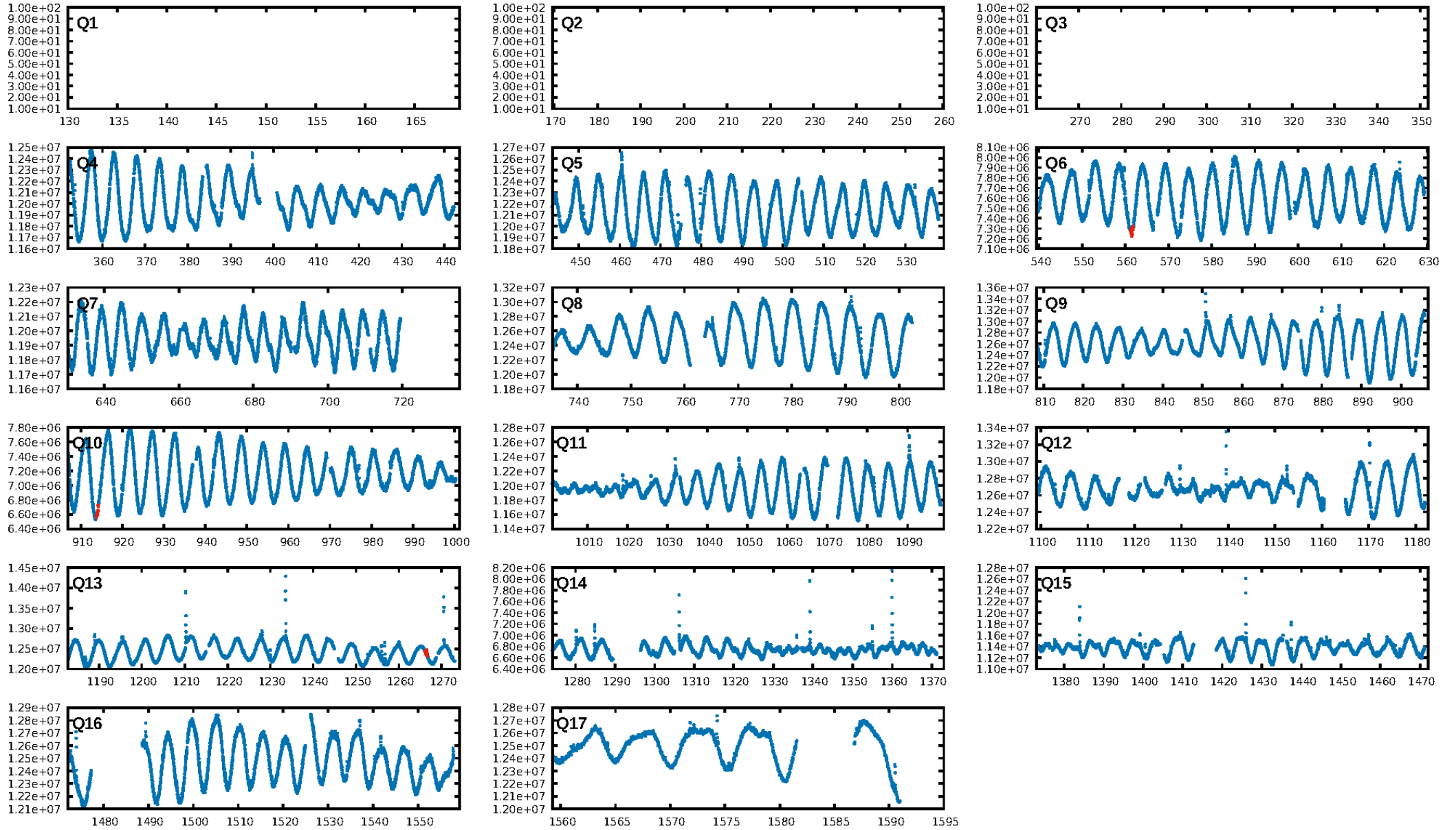
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [28.94σ]  
LongPeriod-sig: 100.0% [28.19σ]  
ModelChiSquare2-sig: 8.0%  
ModelChiSquareGof-sig: 97.4%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: -0.08948**  
Centroid-sig: 42.7%  
Centroid-so: 1.908 arcsec [1.50σ]  
**OotOffset-rm: 7.691 arcsec [3.52σ]**  
OotOffset-st: 2/0/0/1 [3]  
KicOffset-rm: 0.458 arcsec [0.40σ]  
KicOffset-st: 2/0/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

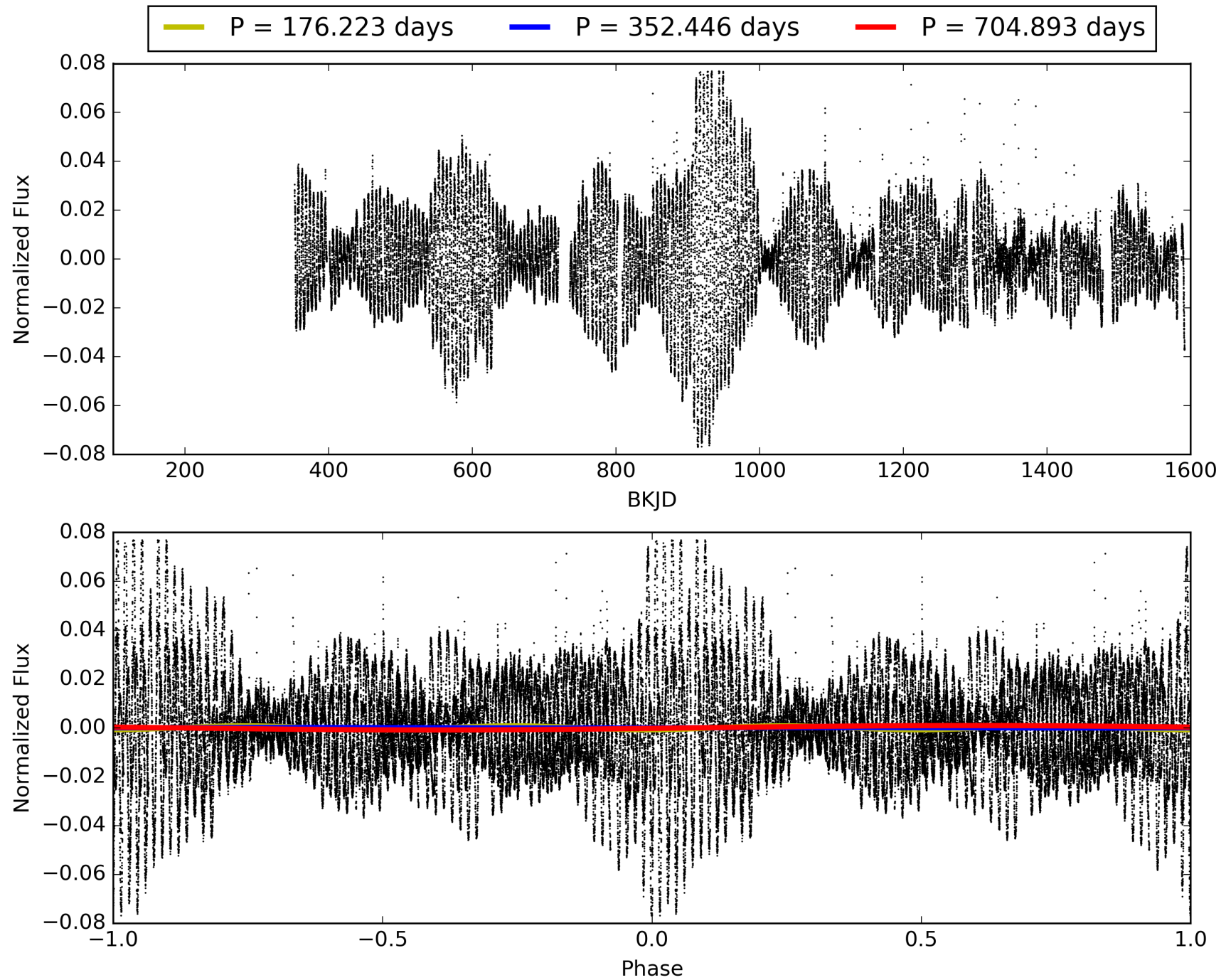
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:52:25 Z

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

# TCE 002307249-04, PDC Light Curves



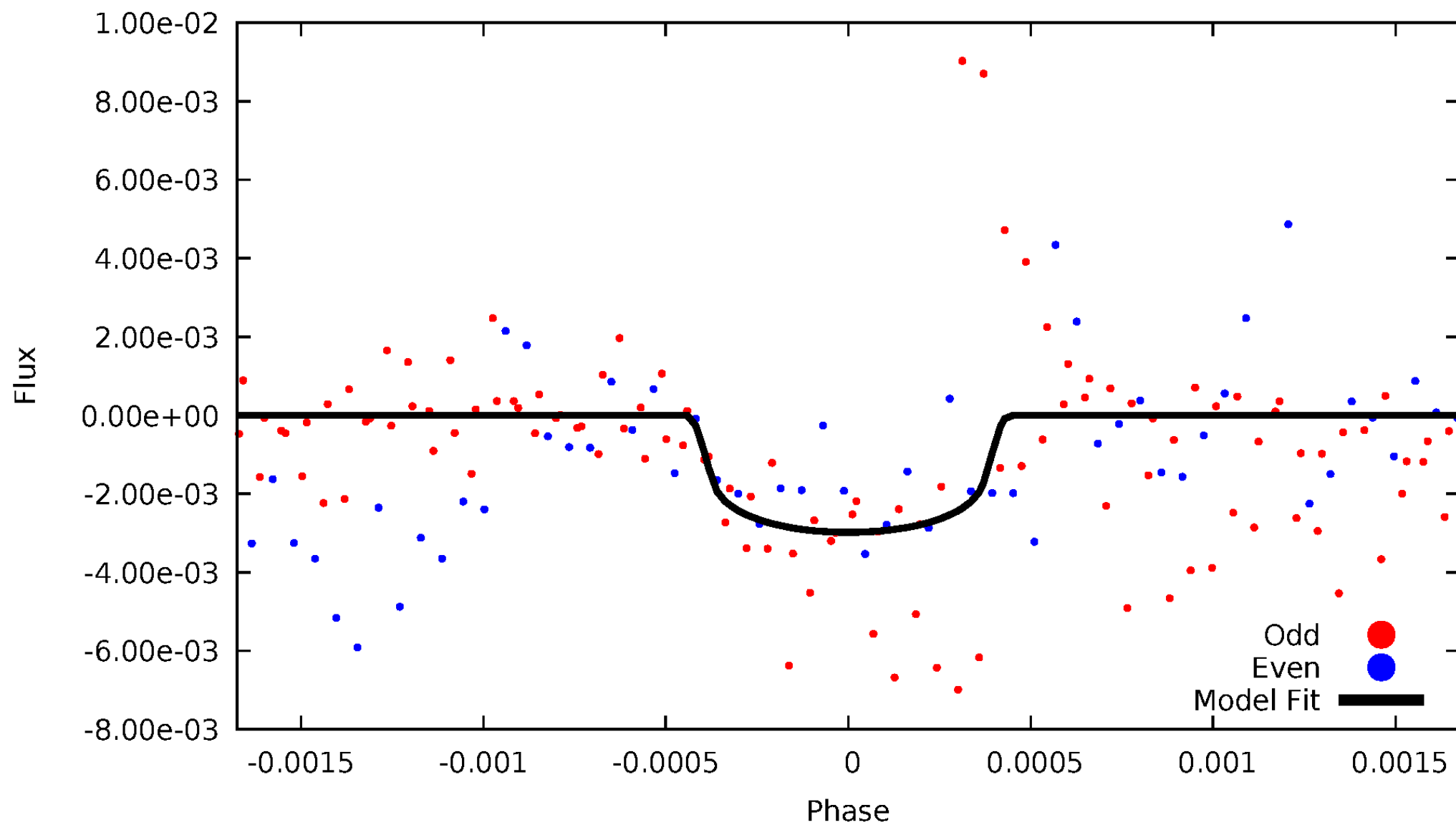
TCE 002307249-04





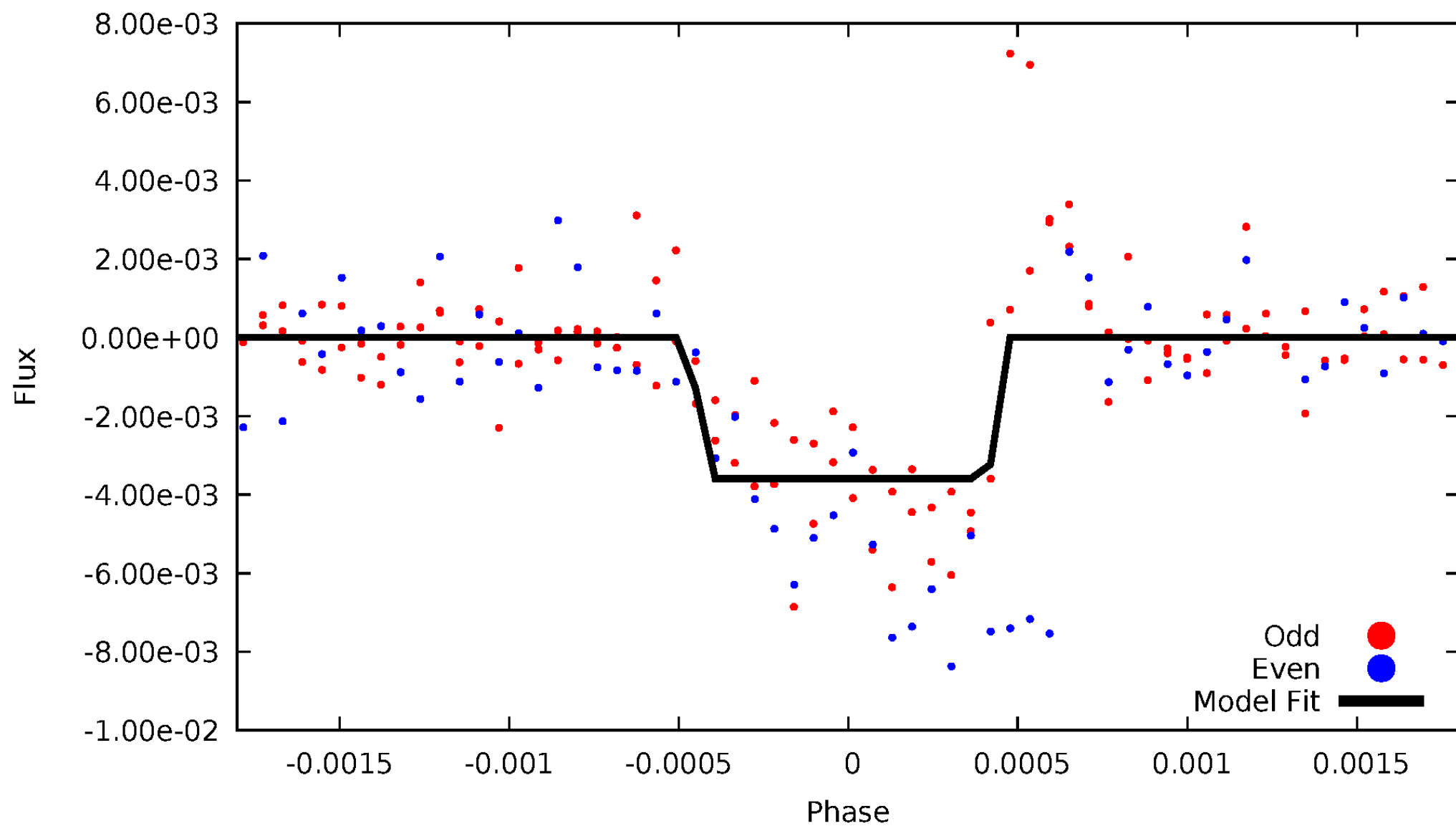
# DV Odd/Even

TCE 002307249-04



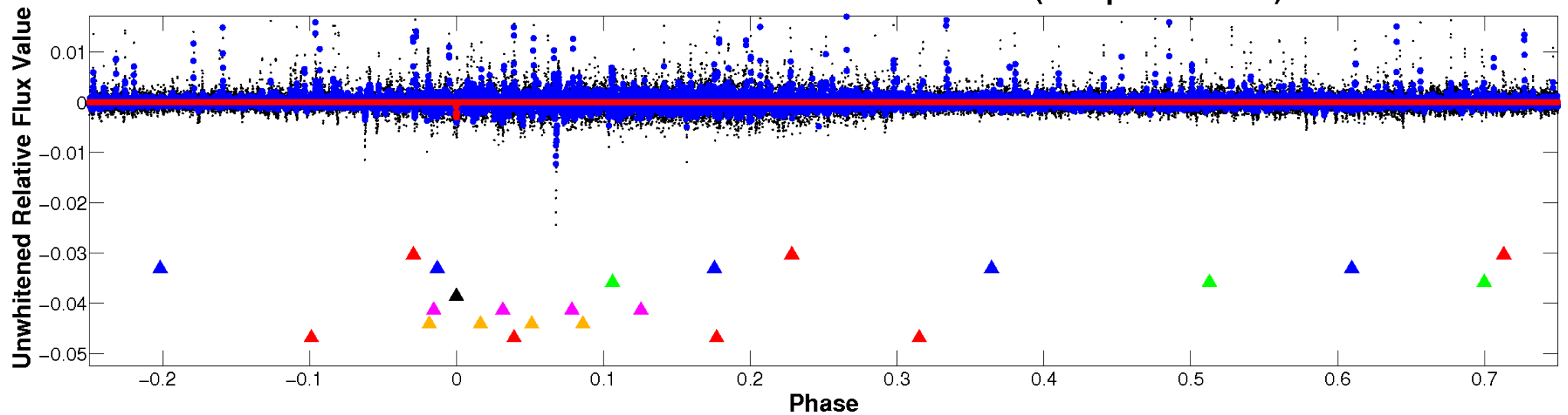
# ALT Odd/Even

TCE 002307249-04

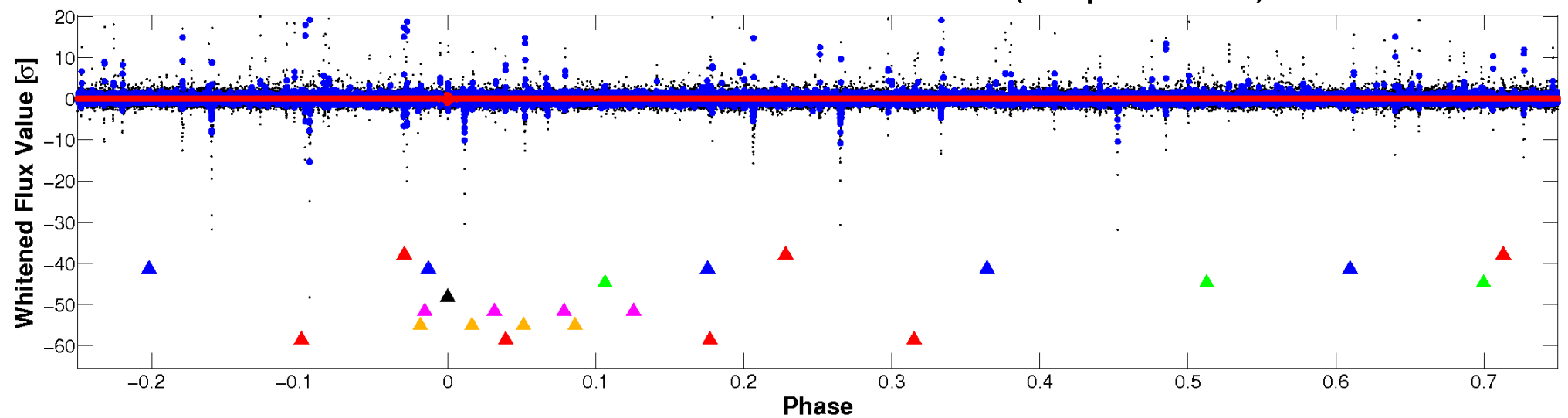


# Non-Whitened Vs. Whitened Light Curve

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

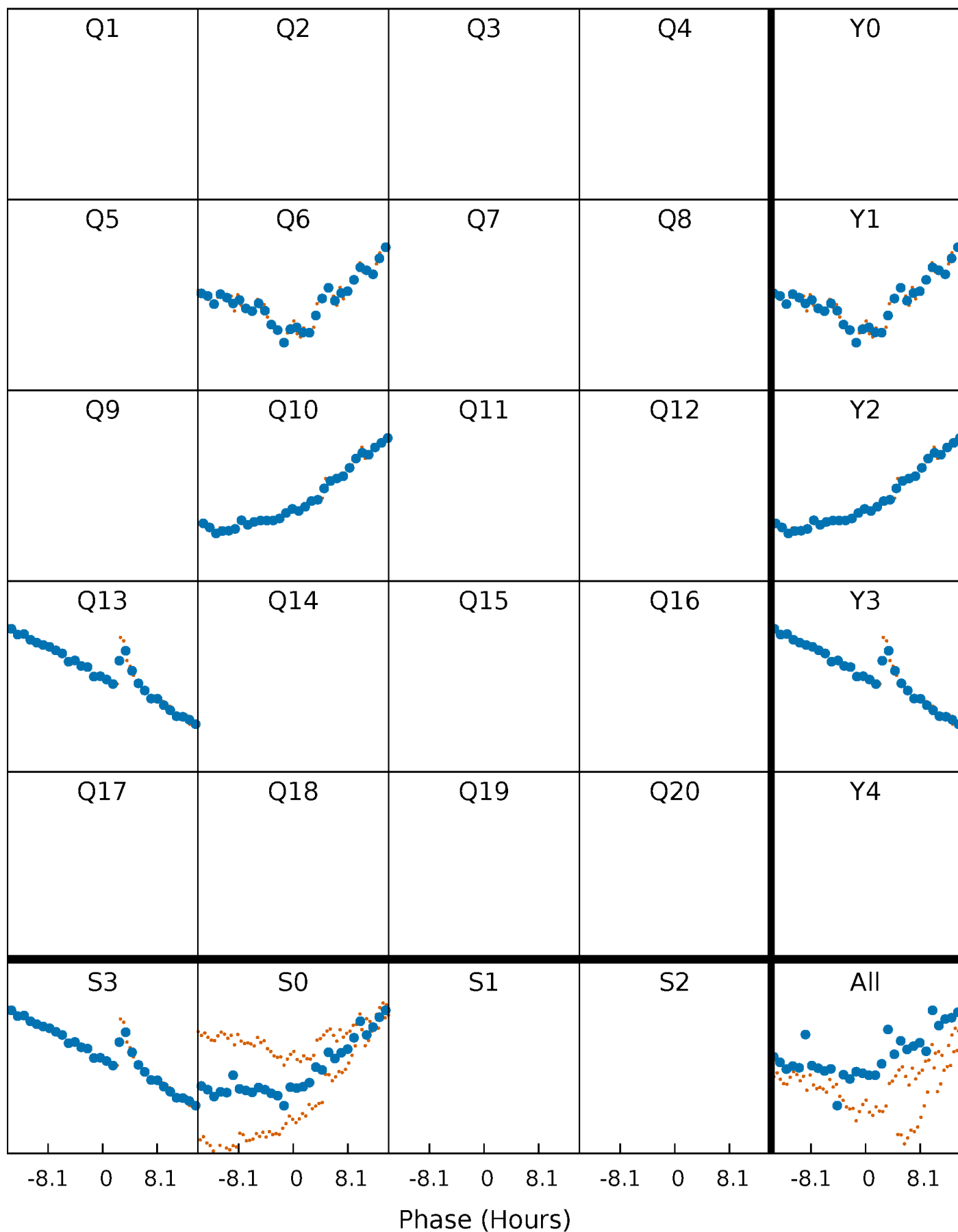


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



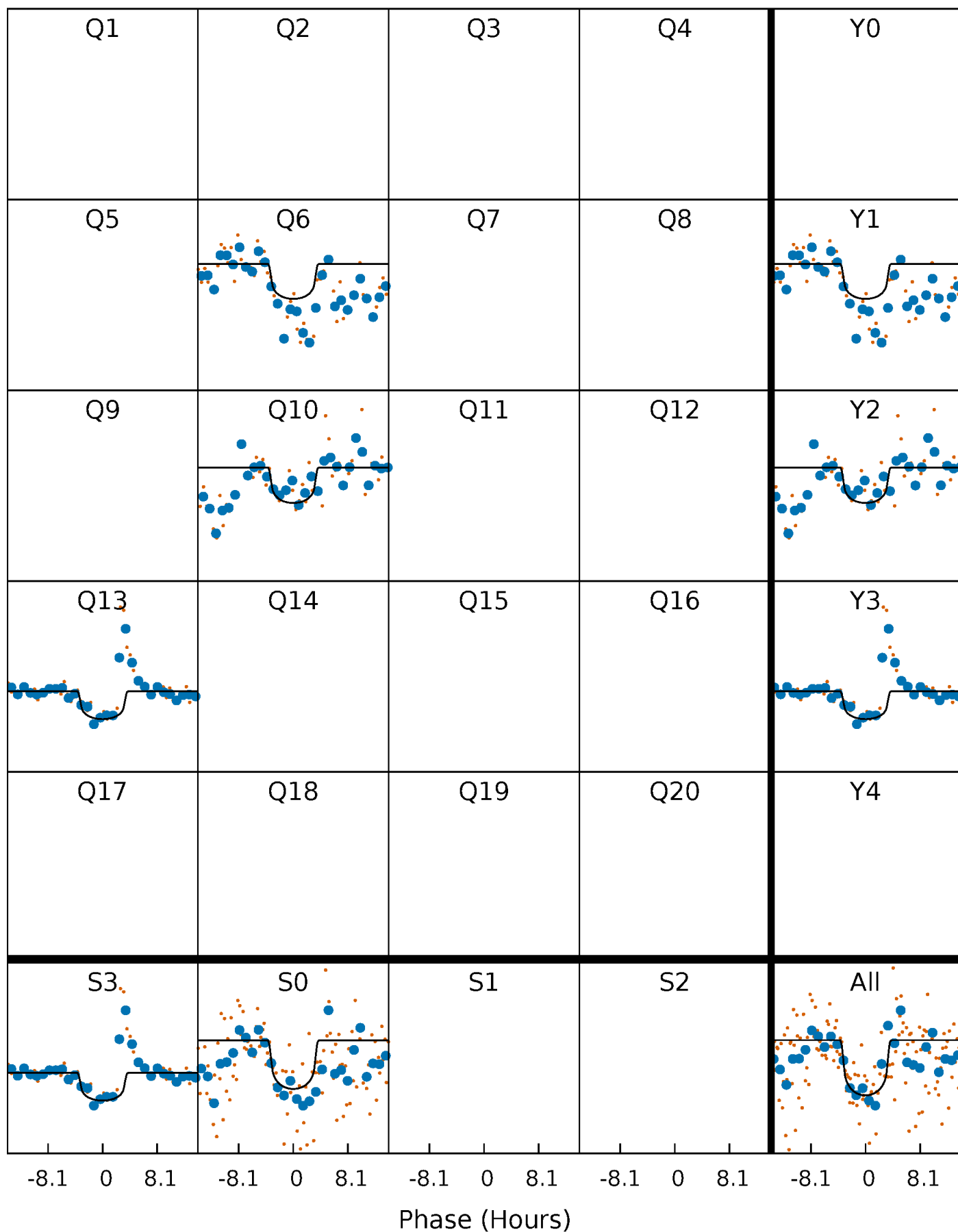
# PDC Quarter-Phased Transit Curves

TCE 002307249-04     $P=352.446266$  Days     $T_0=209.048827$  (BKJD)



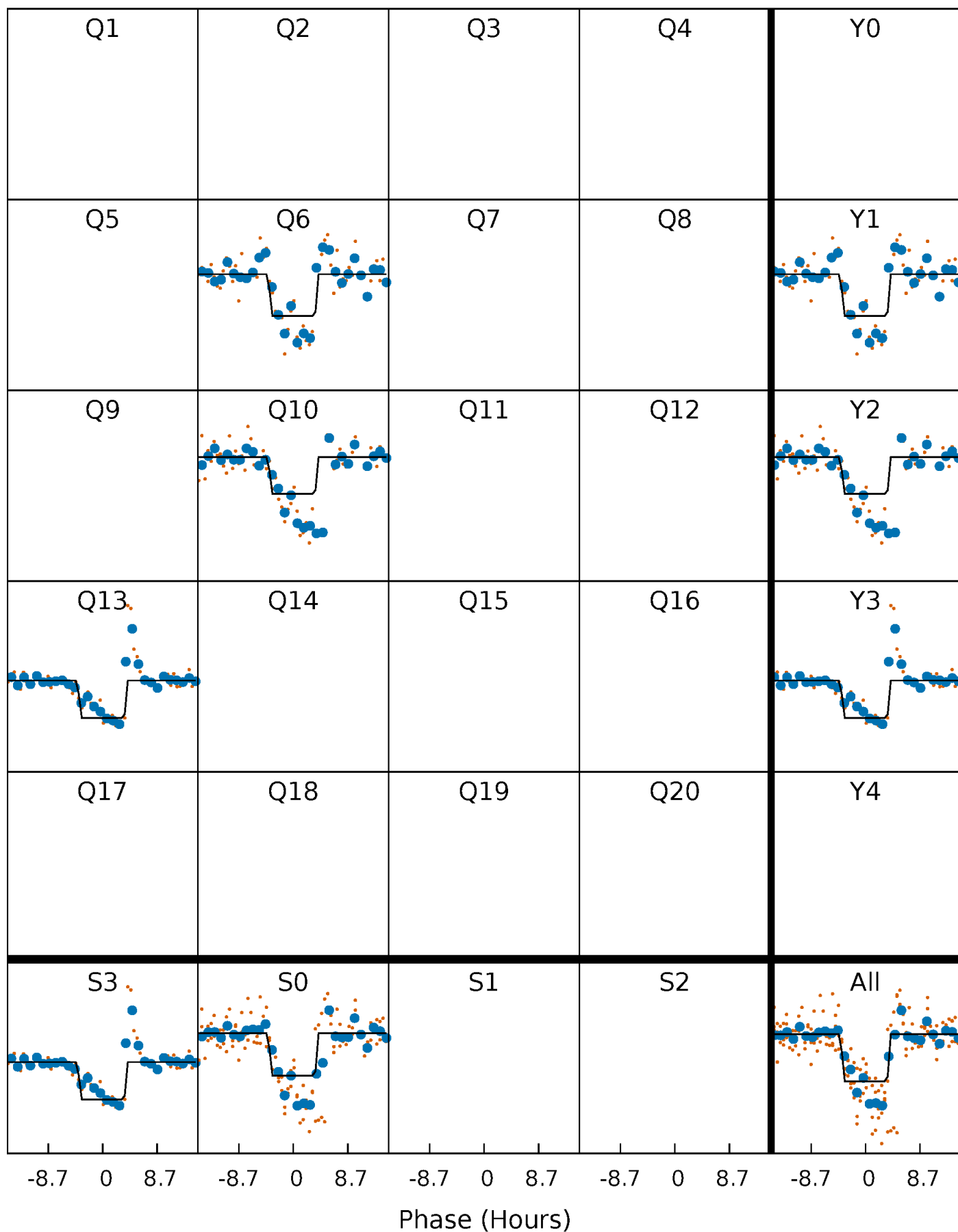
# DV Quarter-Phased Transit Curves

TCE 002307249-04     $P=352.446266$  Days     $T_0=209.048827$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

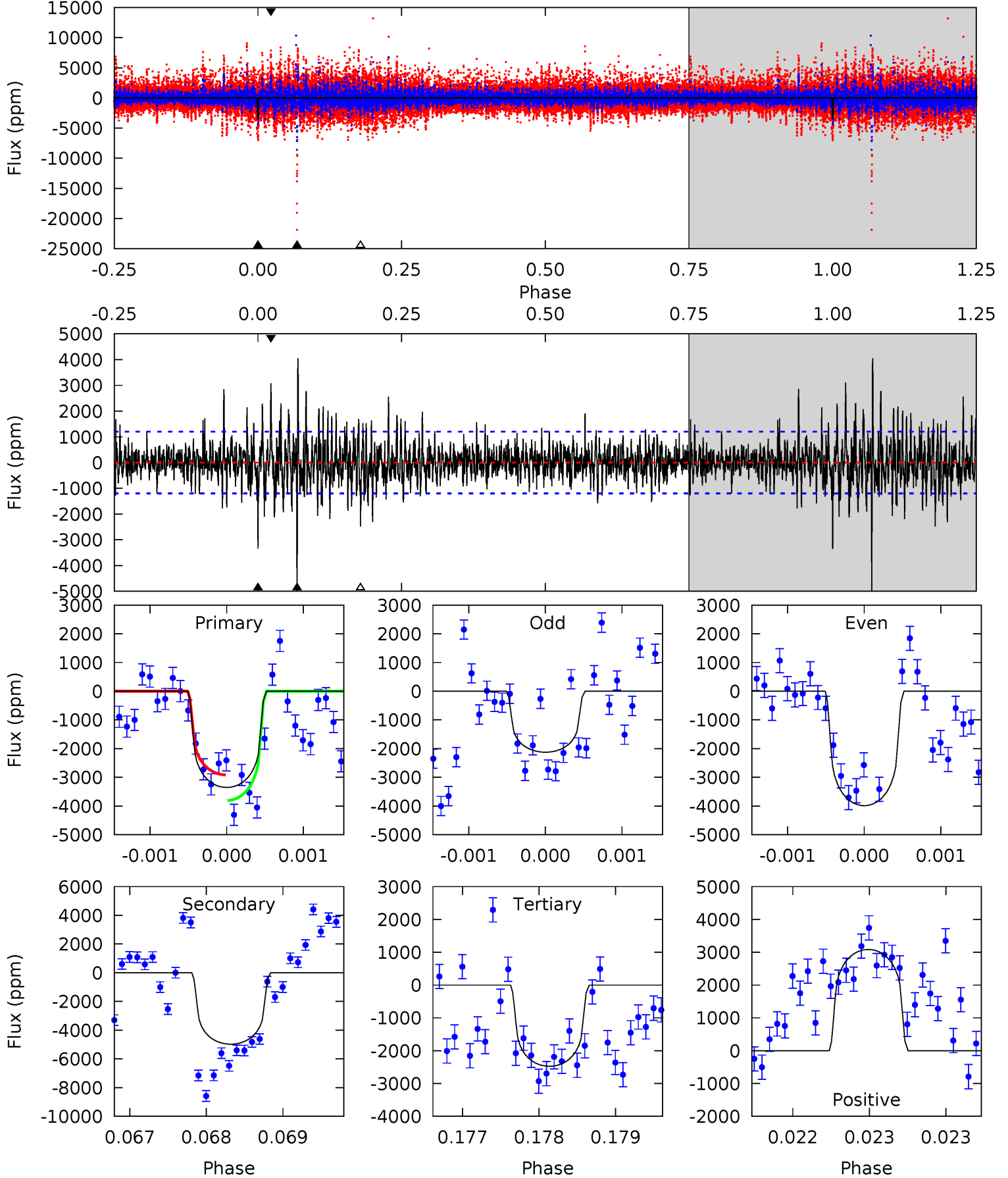
TCE 002307249-04     $P=352.417609$  Days     $T_0=209.076652$  (BKJD)



# DV Model-Shift Uniqueness Test

002307249-04, P = 352.446266 Days, E = 209.048827 Days

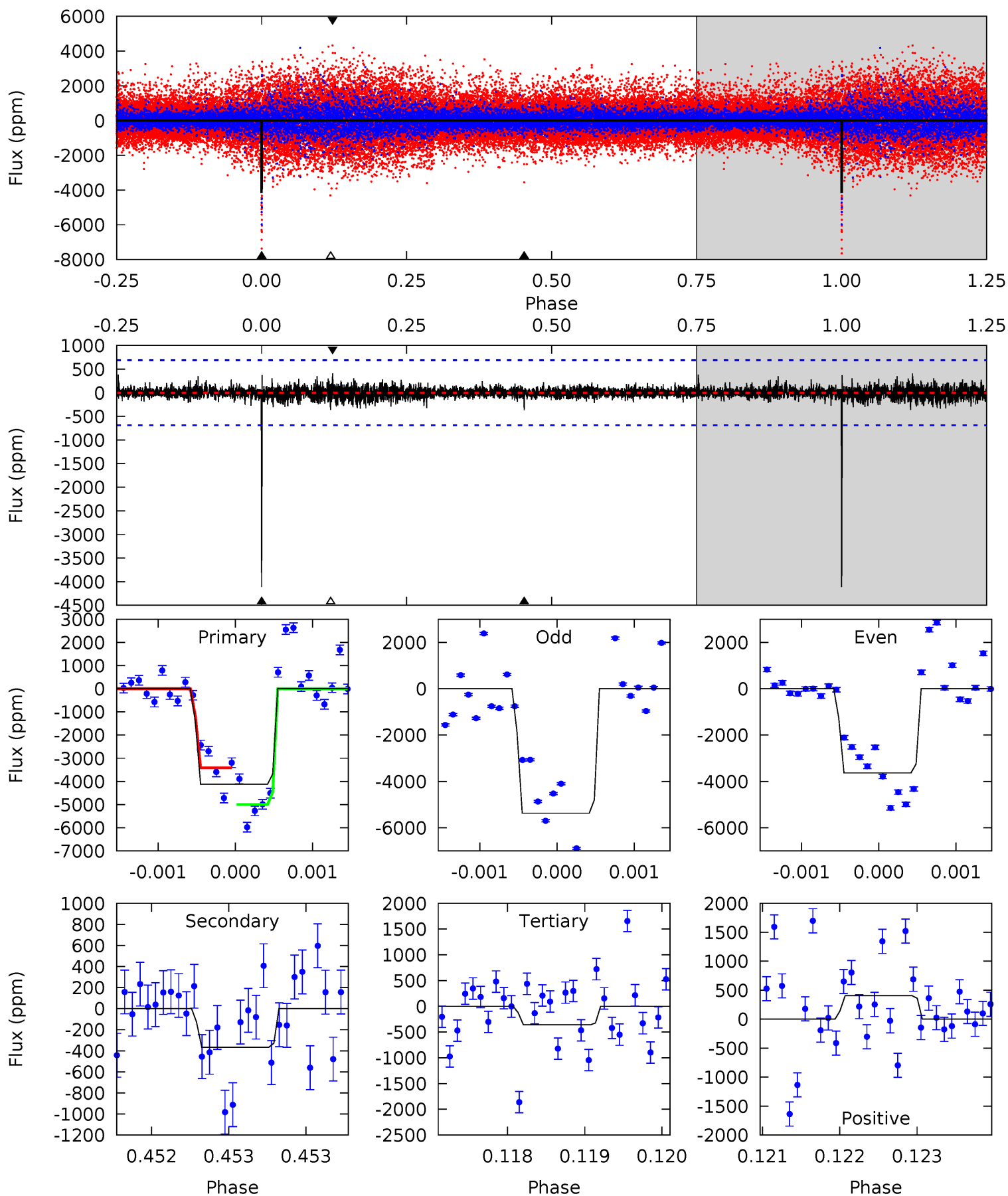
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.3	22.7	11.3	14.0	5.48	3.33	2.63	4.00	1.23	11.4	8.61	3.47	1.35	0.45	1.96



# Alt Model-Shift Uniqueness Test

002307249-04, P = 352.417609 Days, E = 209.076652 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
32.7	2.92	2.87	3.22	5.48	3.33	0.56	29.9	29.5	0.05	-0.30	6.48	1.01	0.09	6.02





### Stellar Parameters For KIC 002307249

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4889^{+176}_{-176}$	$4.699^{+0.048}_{-0.028}$	$-1.260^{+0.300}_{-0.300}$	$0.557^{+0.033}_{-0.037}$	$0.565^{+0.041}_{-0.024}$	$4.611^{+0.903}_{-0.537}$
	+4%/-4%	+1%/-1%	+24%/-24%	+6%/-7%	+7%/-4%	+20%/-12%
Source	KIC0	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 002307249-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-4975 \pm 220$	$3.08^{+1.77}_{-1.57}$	$250^{+9}_{-10}$	$5721^{+2688}_{-1071}$	$190172^{+600378}_{-112573}$
Alt.	$-367 \pm 126$	$3.77^{+1.82}_{-1.63}$	$250^{+9}_{-10}$	$3238^{+655}_{-396}$	$9297^{+19471}_{-5481}$

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

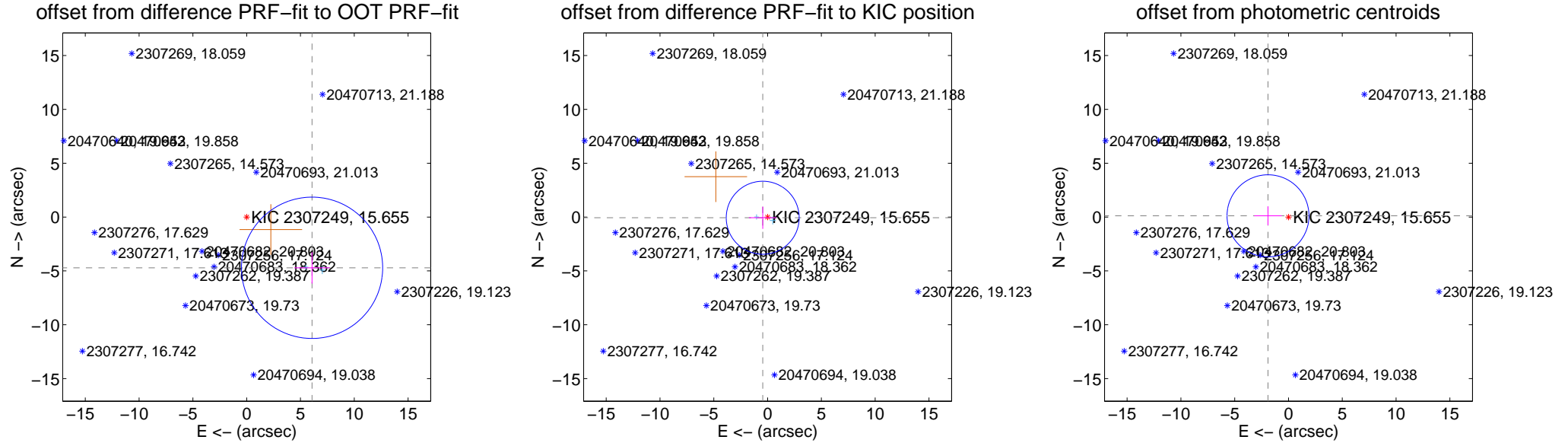
## DV Centroid Data

Supplemental centroid analysis for 002307249-04. Kepler magnitude: 15.65. Transit SNR 6.75

There are 2 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 8.60 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$7.691 \pm 2.188$	<b>3.52</b>	$-6.078 \pm 1.650$	$-4.712 \pm 1.458$
PRF-fit source offset from KIC position	$0.458 \pm 1.130$	0.40	$0.453 \pm 1.282$	$-0.064 \pm 1.032$
photometric centroid source offset	$1.91 \pm 1.27$	1.50	$1.90 \pm 1.27$	$0.12 \pm 0.89$



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.

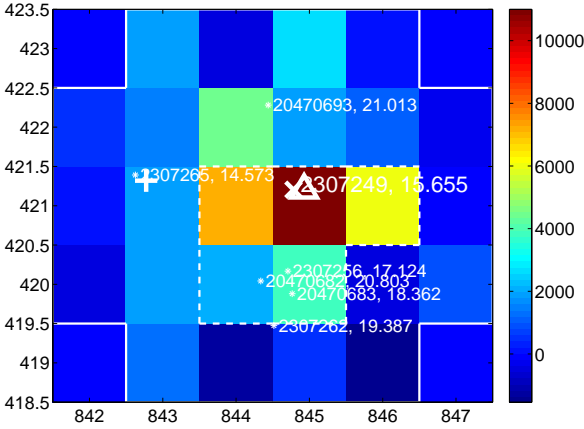
Q5 no difference image



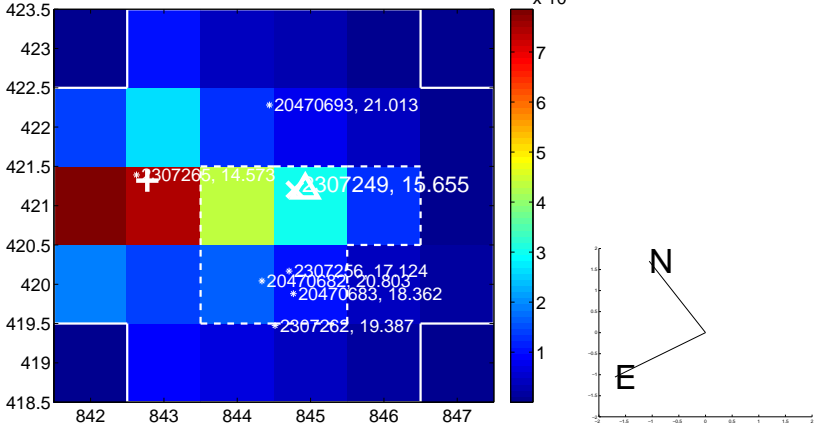
Q5 no OOT image



Q6 difference image



Q6 OOT image



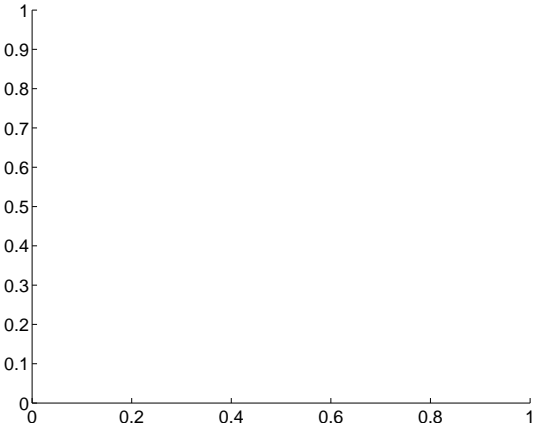
Q7 no difference image



Q7 no OOT image



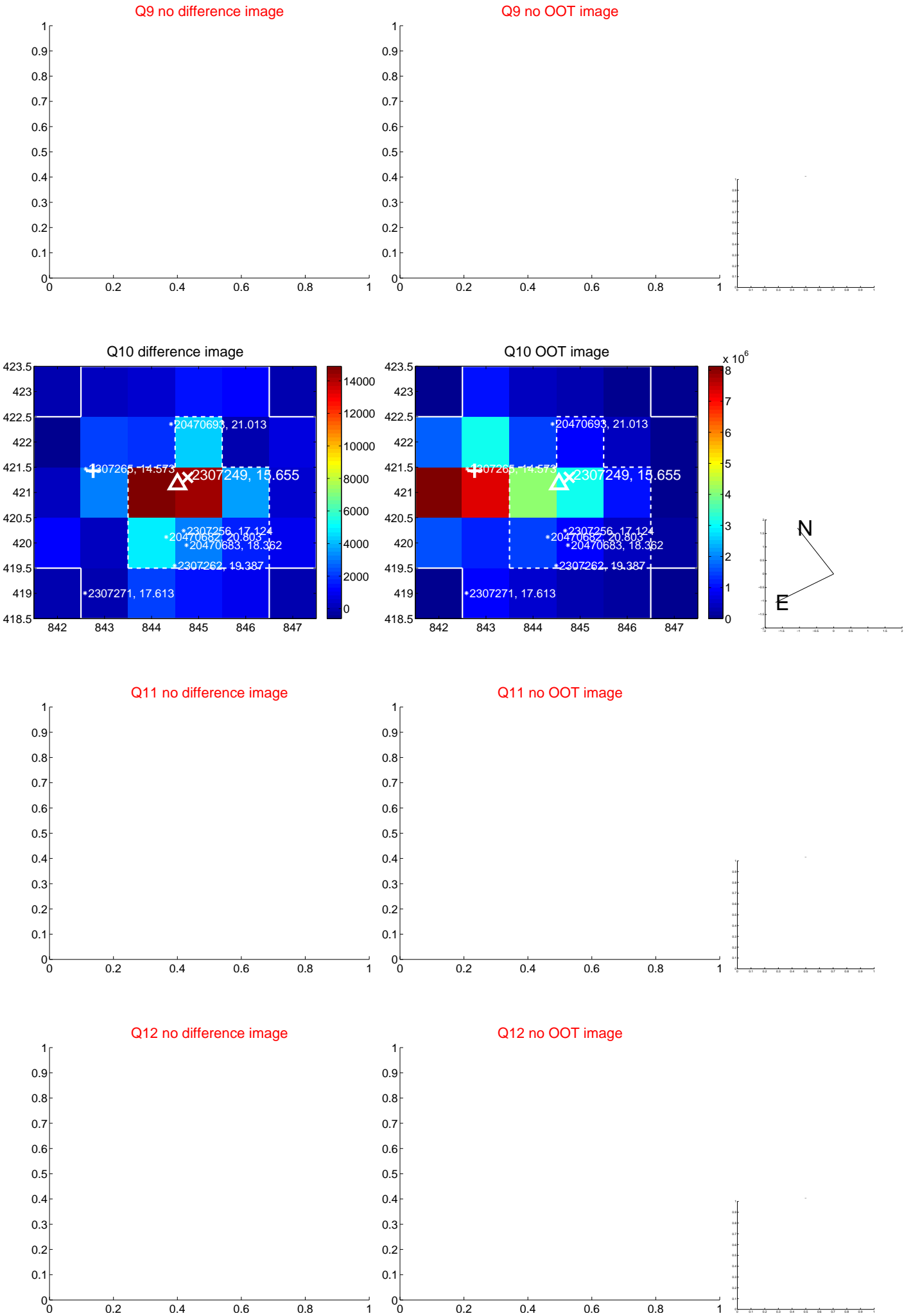
Q8 no difference image



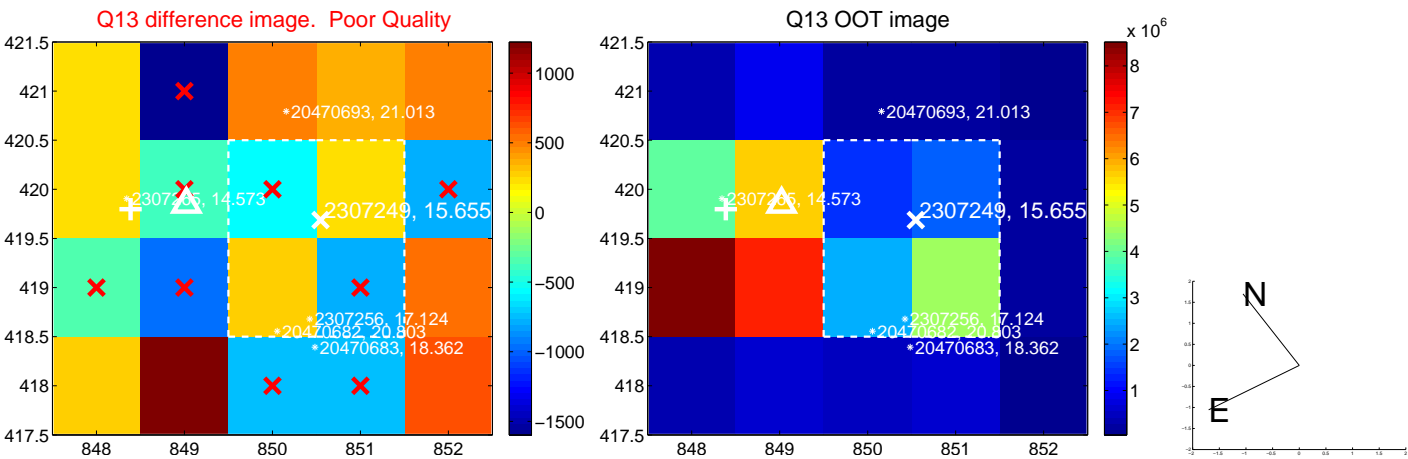
Q8 no OOT image



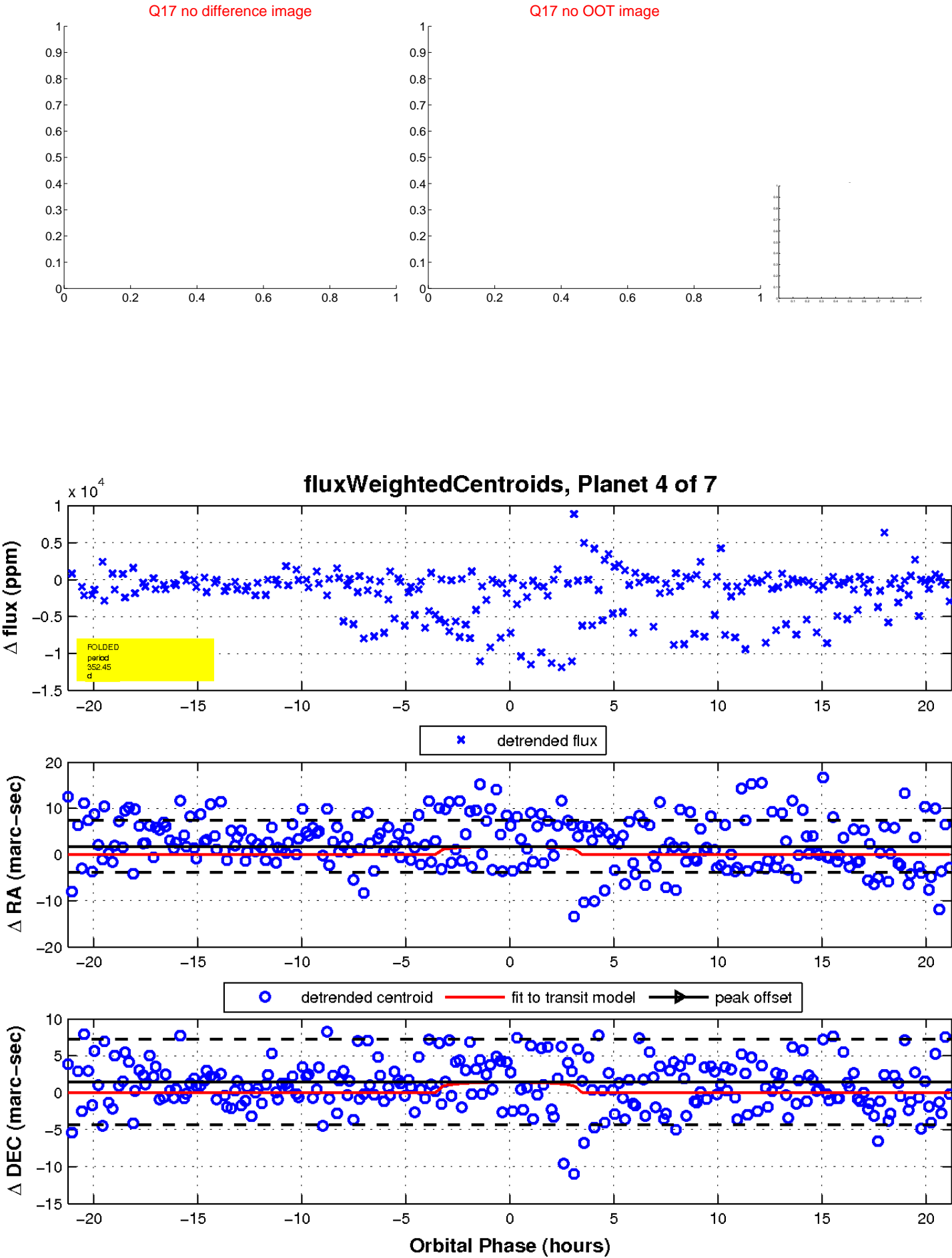
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.



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

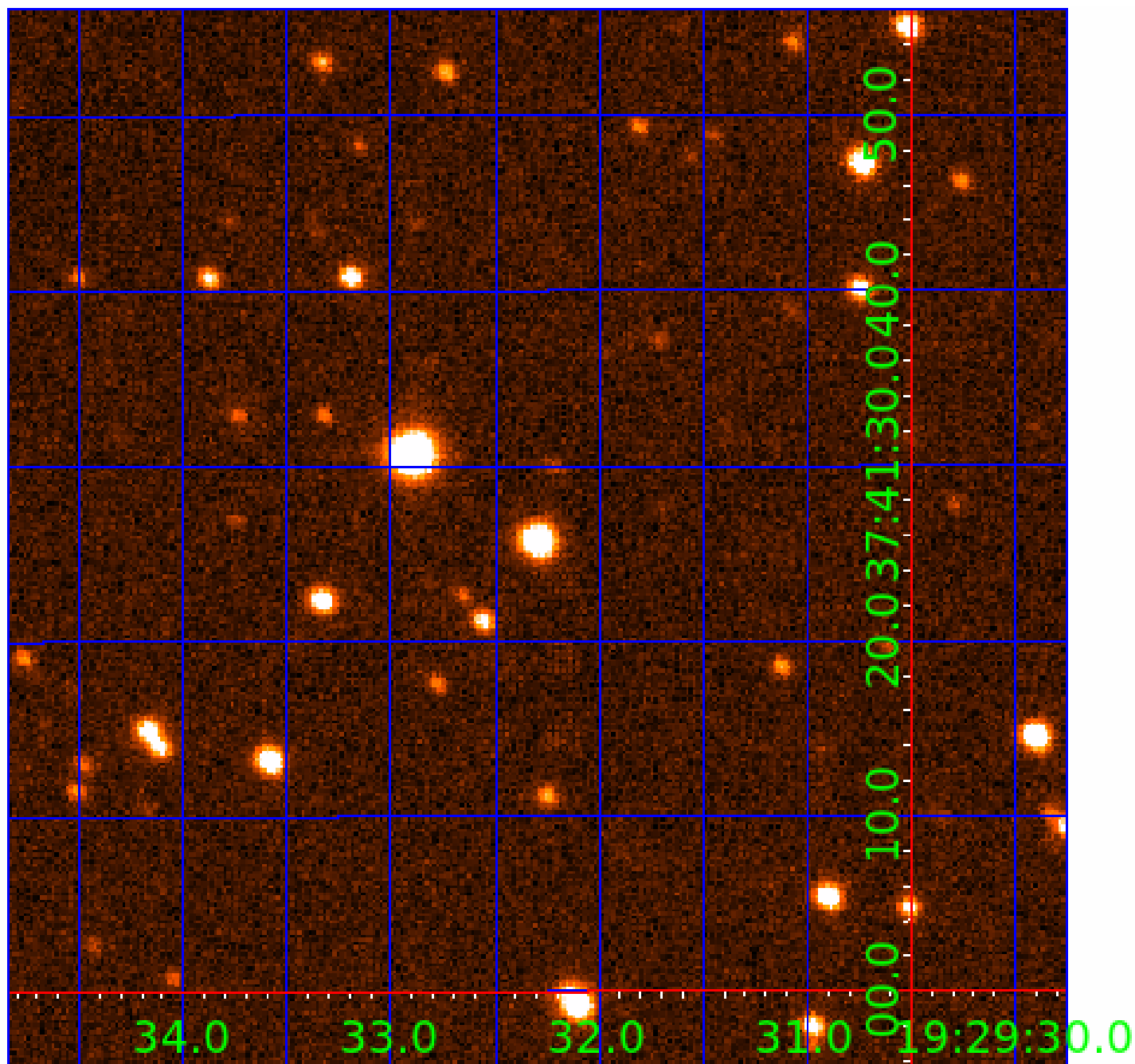


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 002307249

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002307249-01	OBS	No	443.240912	460.377527	3794.6	4.841	18.3	10.1	0.56	4889	4.41	0.18
002307249-02	OBS	No	285.942428	337.467052	4279.8	6.412	12.7	9.0	0.56	4889	3.65	0.32
002307249-03	OBS	No	495.701002	455.692868	2346.6	4.542	11.3	6.1	0.56	4889	2.66	0.15
002307249-04	OBS	No	352.446266	209.048827	2982.8	7.083	11.7	6.7	0.56	4889	3.00	0.24
002307249-05	OBS	No	369.019414	203.606121	3821.5	12.203	12.0	5.9	0.56	4889	3.50	0.23
002307249-06	OBS	No	340.157936	239.395276	3424.6	7.325	12.4	7.6	0.56	4889	3.21	0.26
002307249-07	OBS	No	401.069916	174.237568	1861.9	7.500	11.2	-1.0	0.56	4889	2.37	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002307249-01	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
002307249-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
002307249-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002307249-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

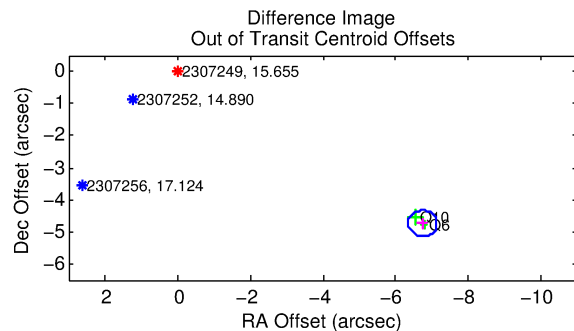
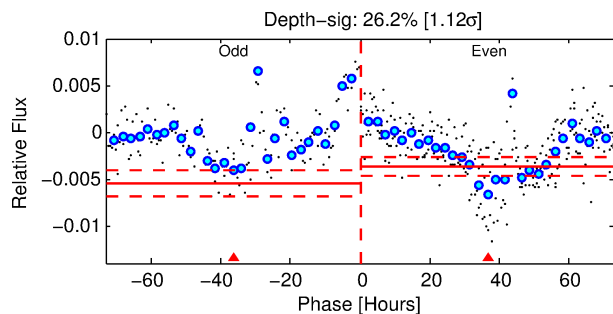
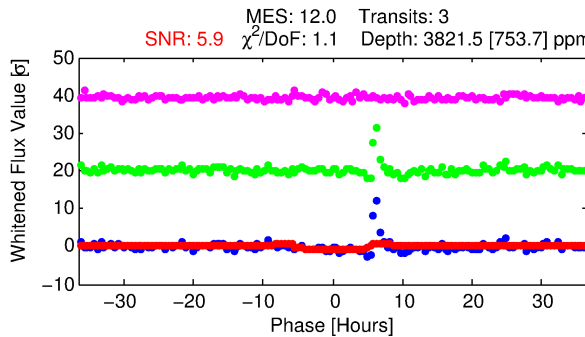
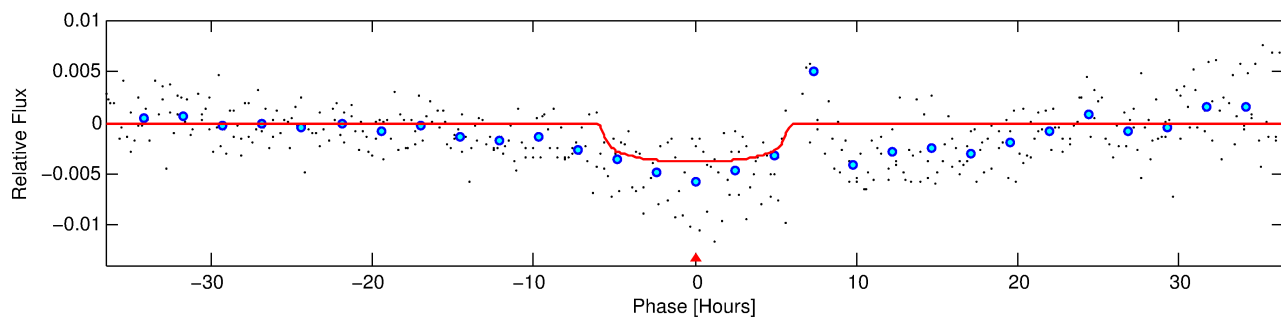
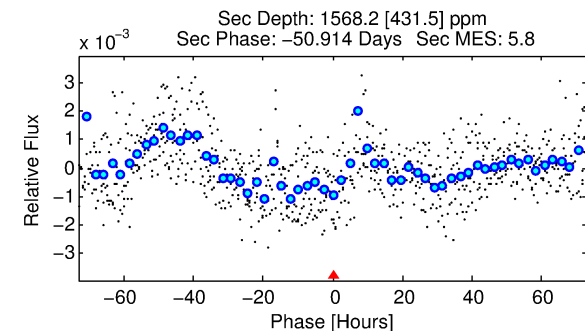
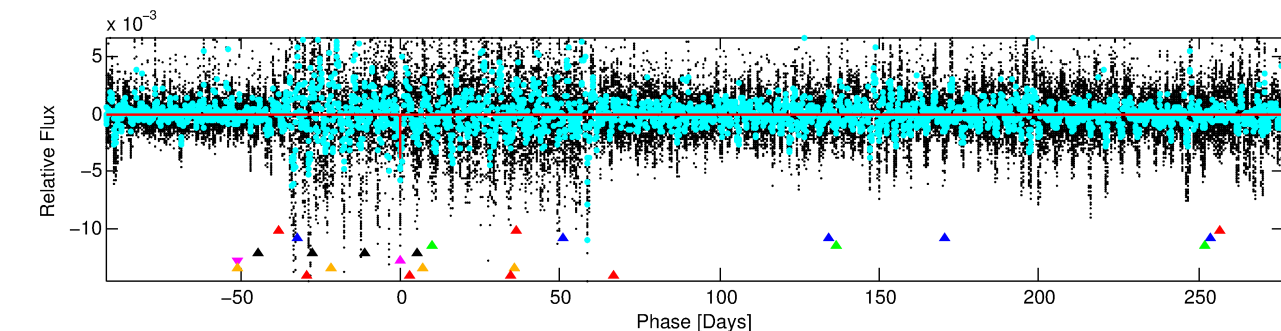
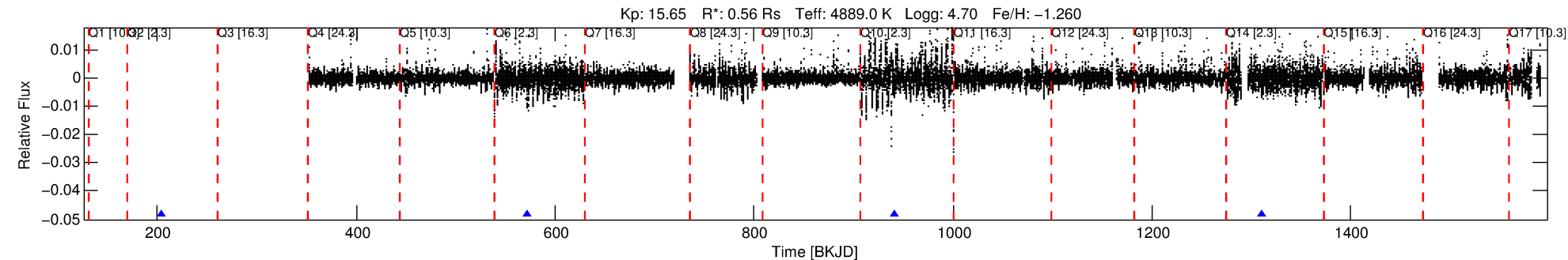
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002307249-05

No Significant Match Found

# DV One-Page Summary

KIC: 2307249 Candidate: 5 of 7 Period: 369.019 d



## DV Fit Results:

Period = 369.01941 [0.01230] d  
Epoch = 203.6061 [0.0255] BKJD  
Rp/R\* = 0.0575 [0.0158]  
a/R\* = 217.25 [212.43]  
b = 0.48 [1.56]  
Seff = 0.23 [0.04]  
Teff = 176 [7] K  
Rp = 3.50 [0.99] Re  
a = 0.8330 [0.0480] AU  
Ag = 48947.03 [30392.43] [1.61σ]  
Teffp = 4056 [640] K [6.06σ]

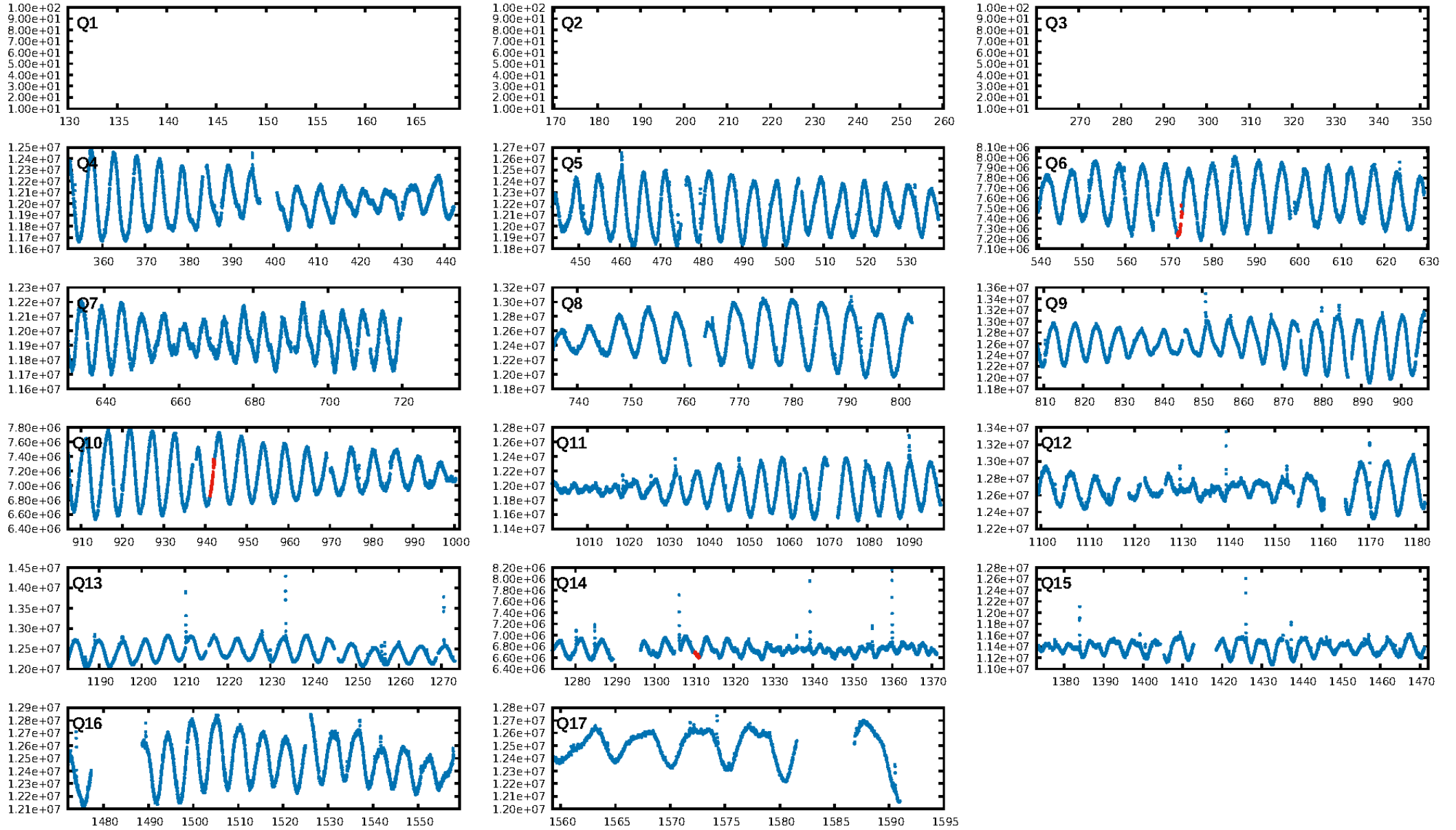
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [28.19σ]  
LongPeriod-sig: 100.0% [53.70σ]  
ModelChiSquare2-sig: 8.5%  
ModelChiSquareGof-sig: 94.2%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -2.741  
Centroid-sig: 4.1%  
Centroid-so: 1.195 arcsec [1.30σ]  
**OotOffset-rm: 8.235 arcsec [61.67σ]**  
KicOffset-rm: 0.239 arcsec [1.48σ]  
OotOffset-st: 2/0/0/0 [2]  
KicOffset-st: 2/0/0/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [3/3]

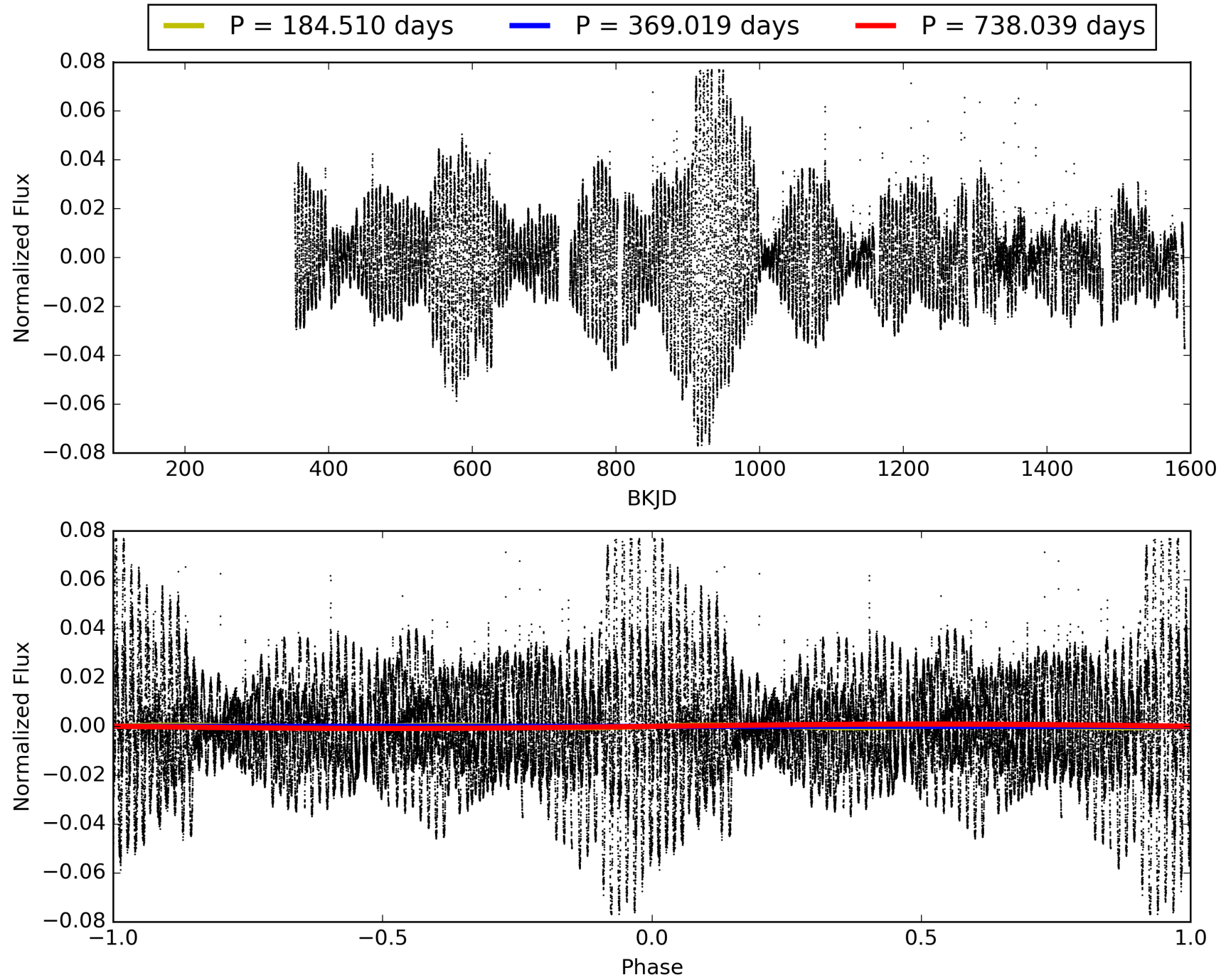
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:52:33 Z

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

# TCE 002307249-05, PDC Light Curves

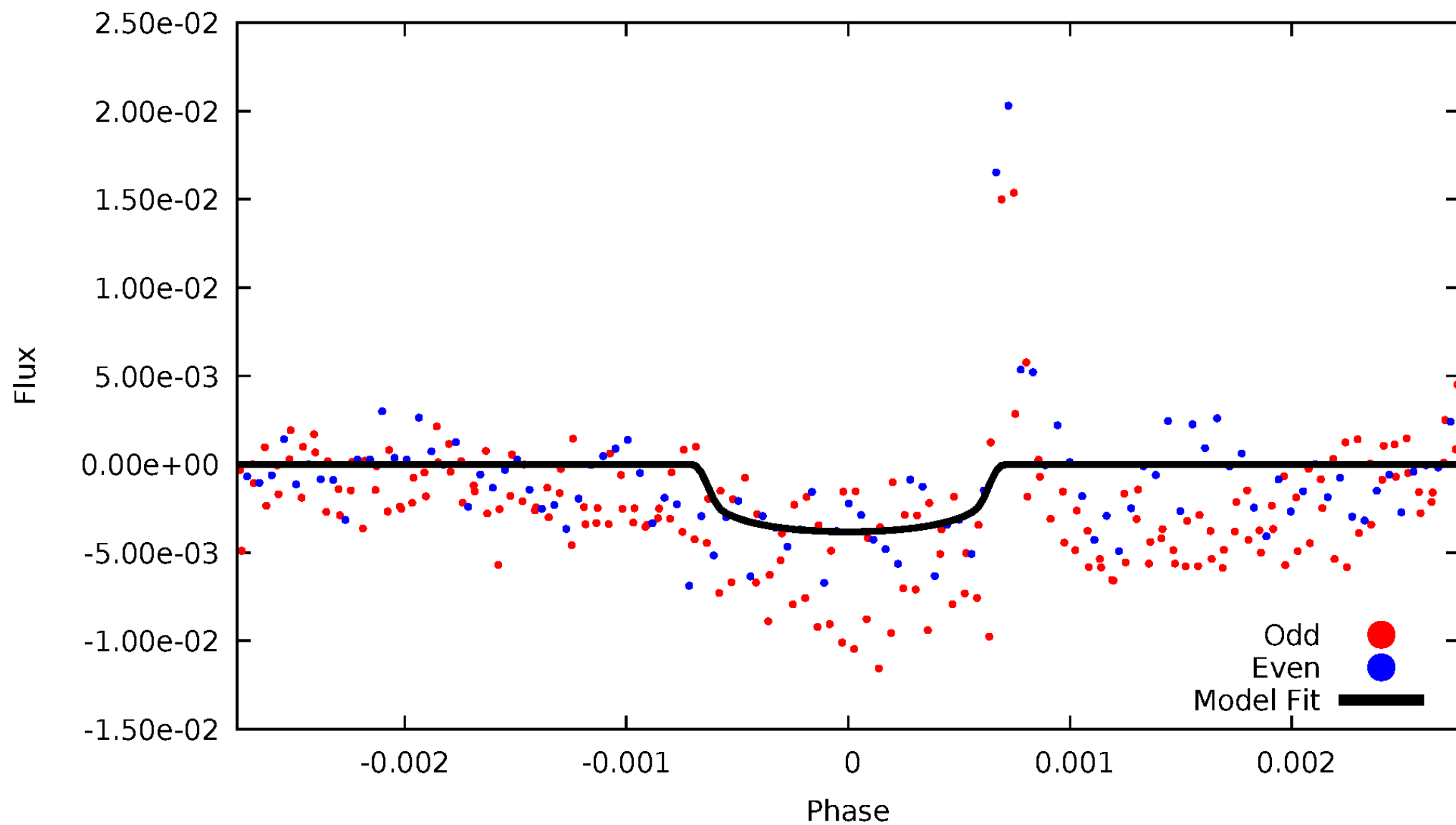


TCE 002307249-05



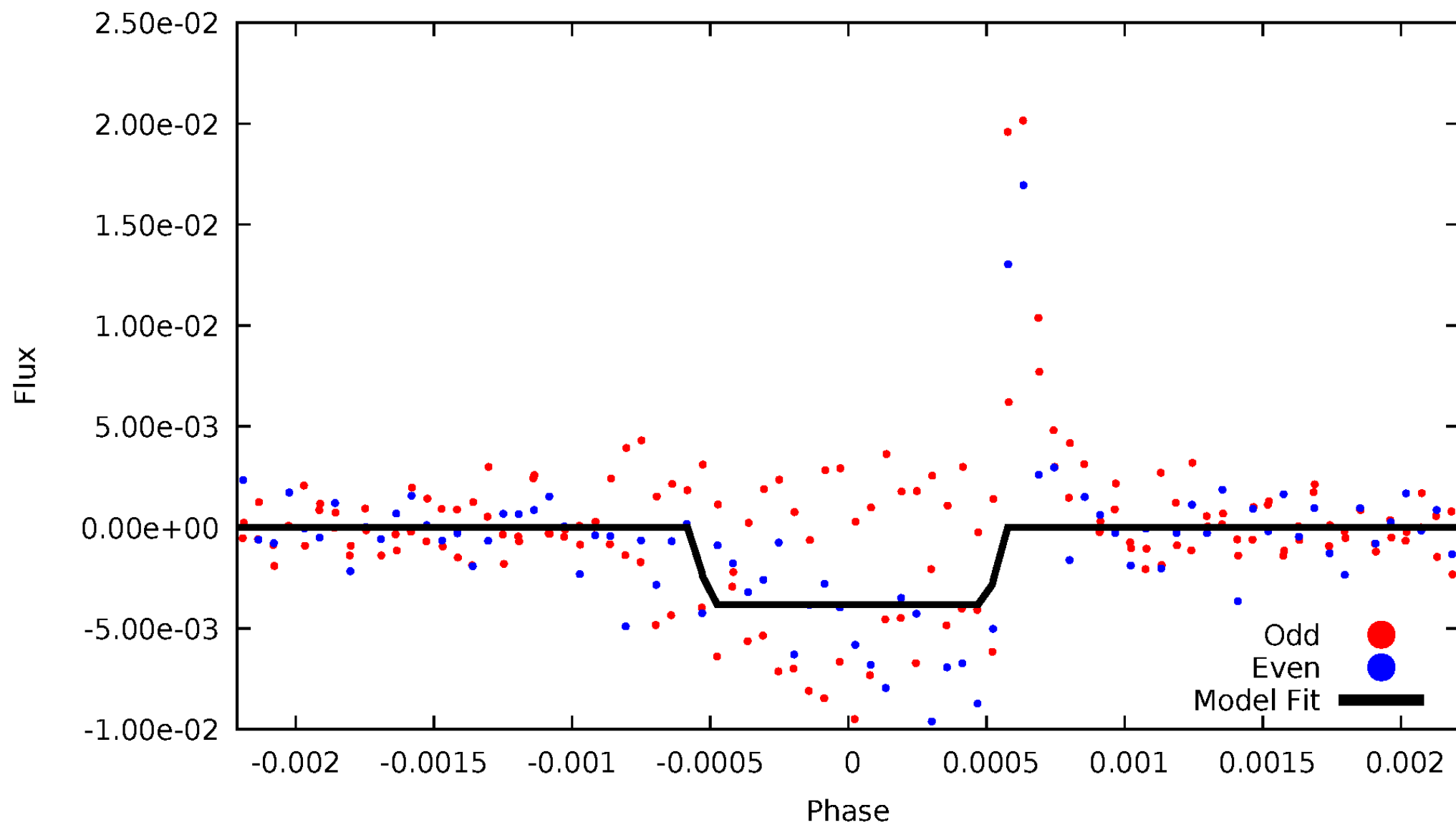
# DV Odd/Even

TCE 002307249-05



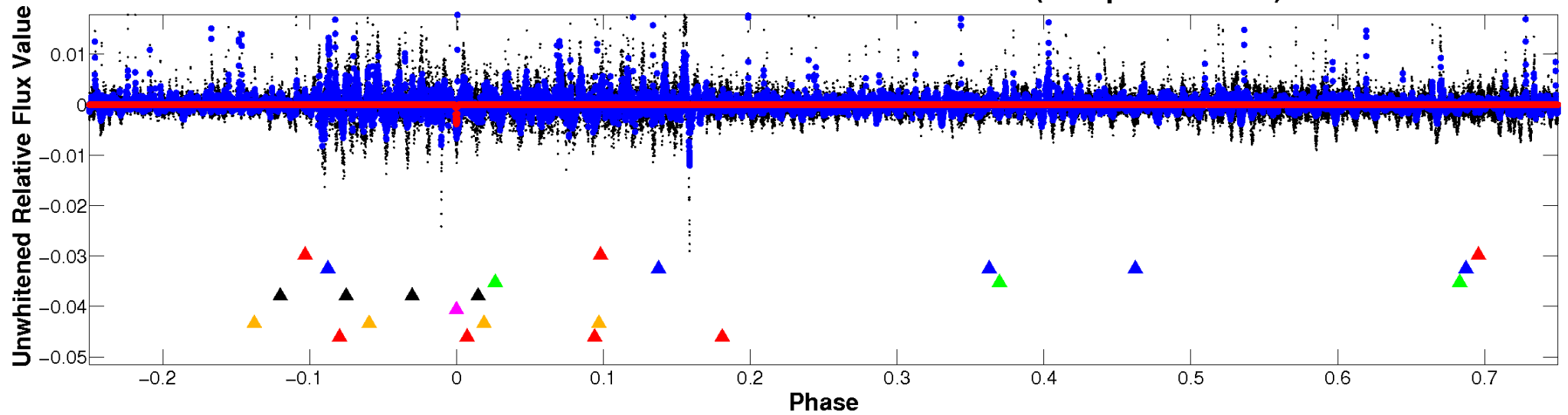
# ALT Odd/Even

TCE 002307249-05

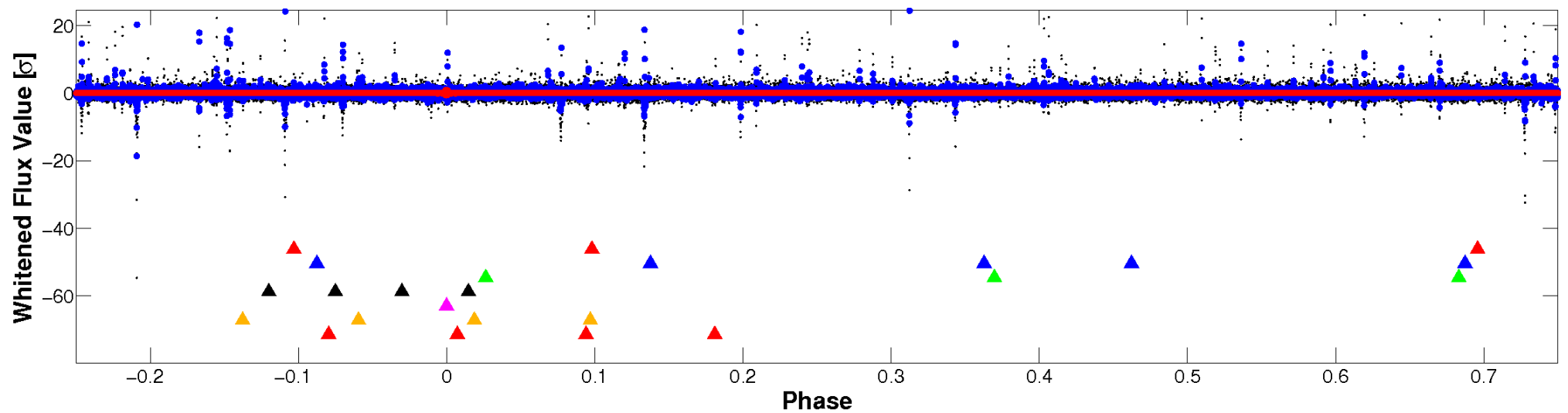


# Non-Whitened Vs. Whitened Light Curve

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

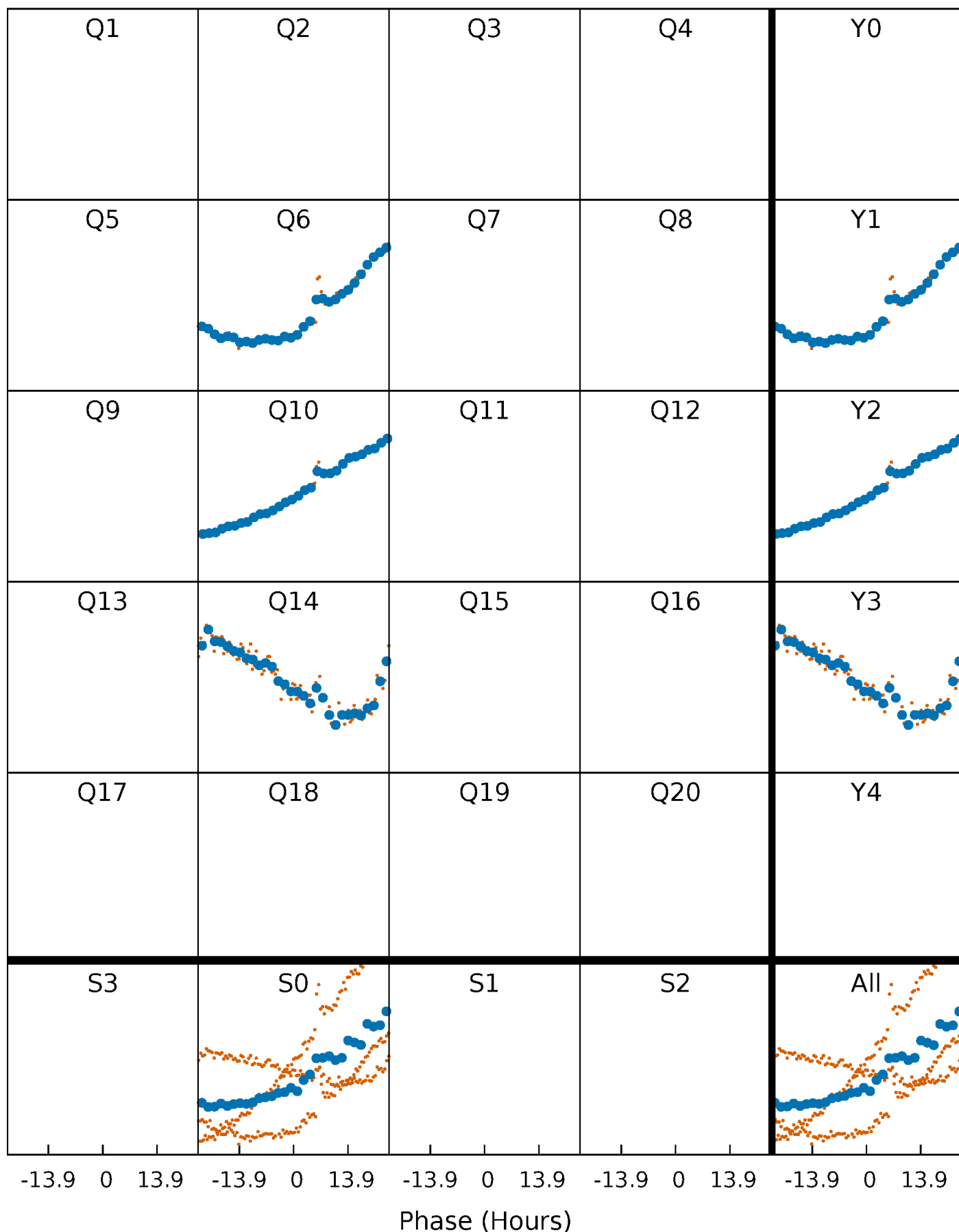


**Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

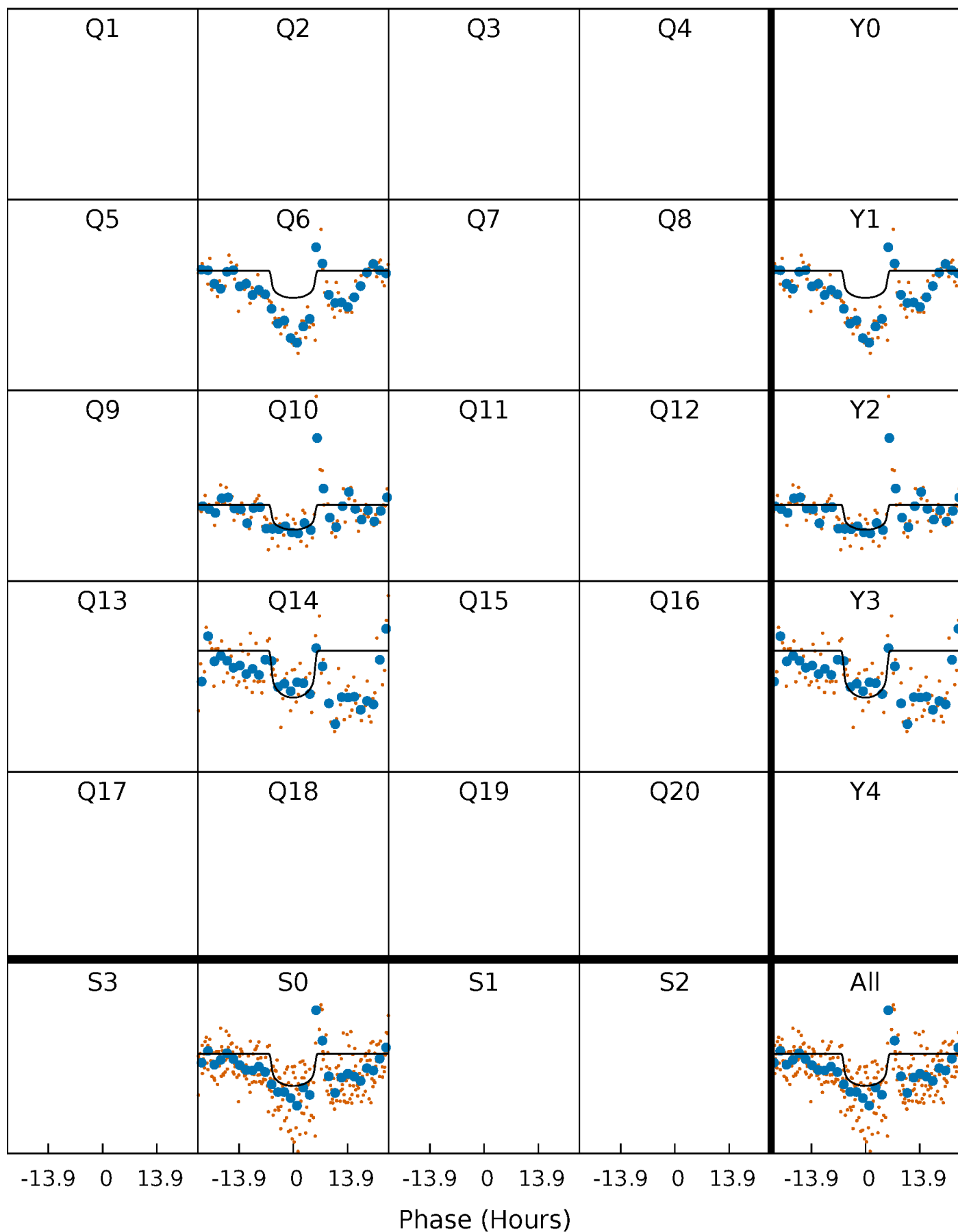
TCE 002307249-05 P=369.019414 Days  $T_0=203.606121$  (BKJD)





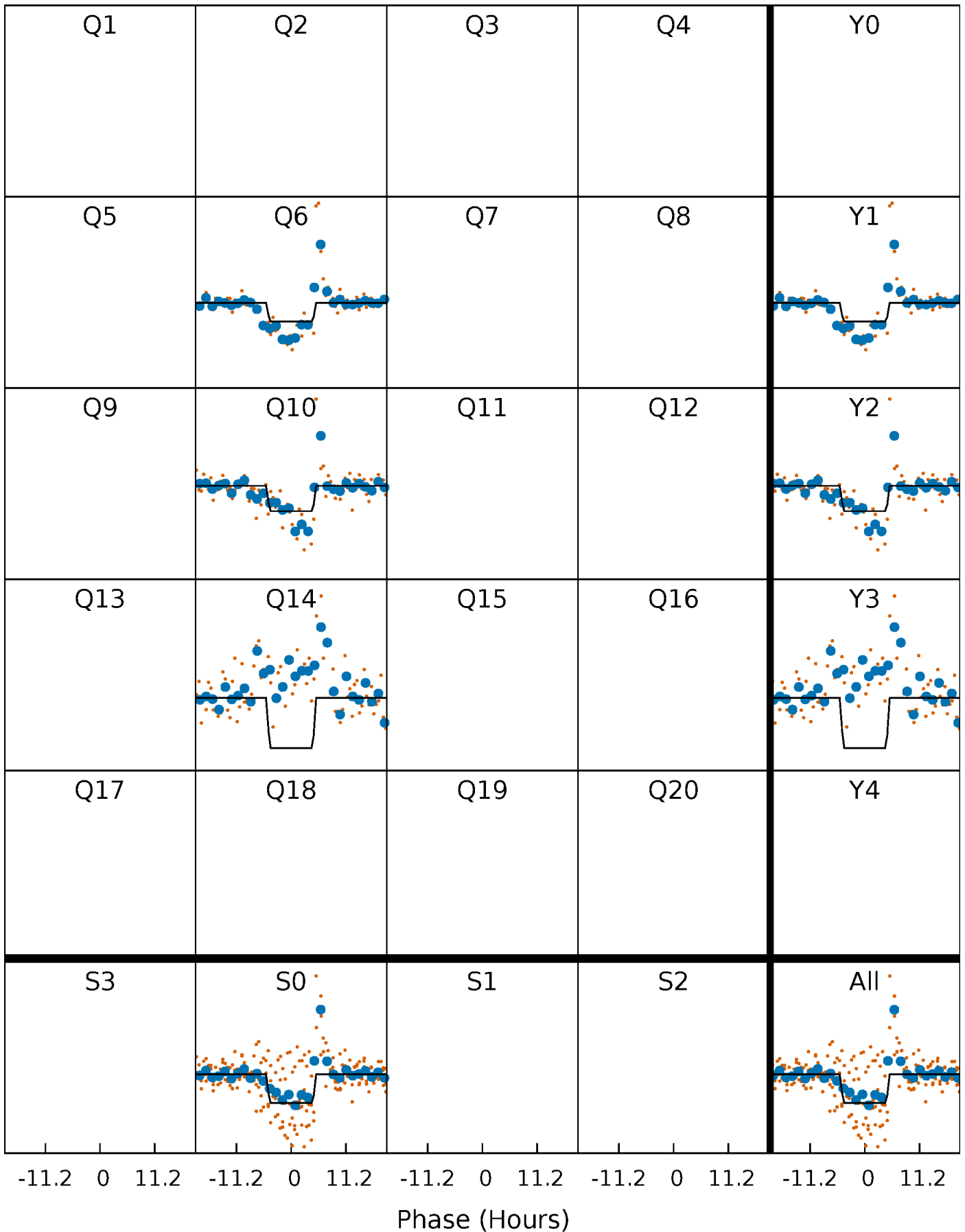
# DV Quarter-Phased Transit Curves

TCE 002307249-05     $P=369.019414$  Days     $T_0=203.606121$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

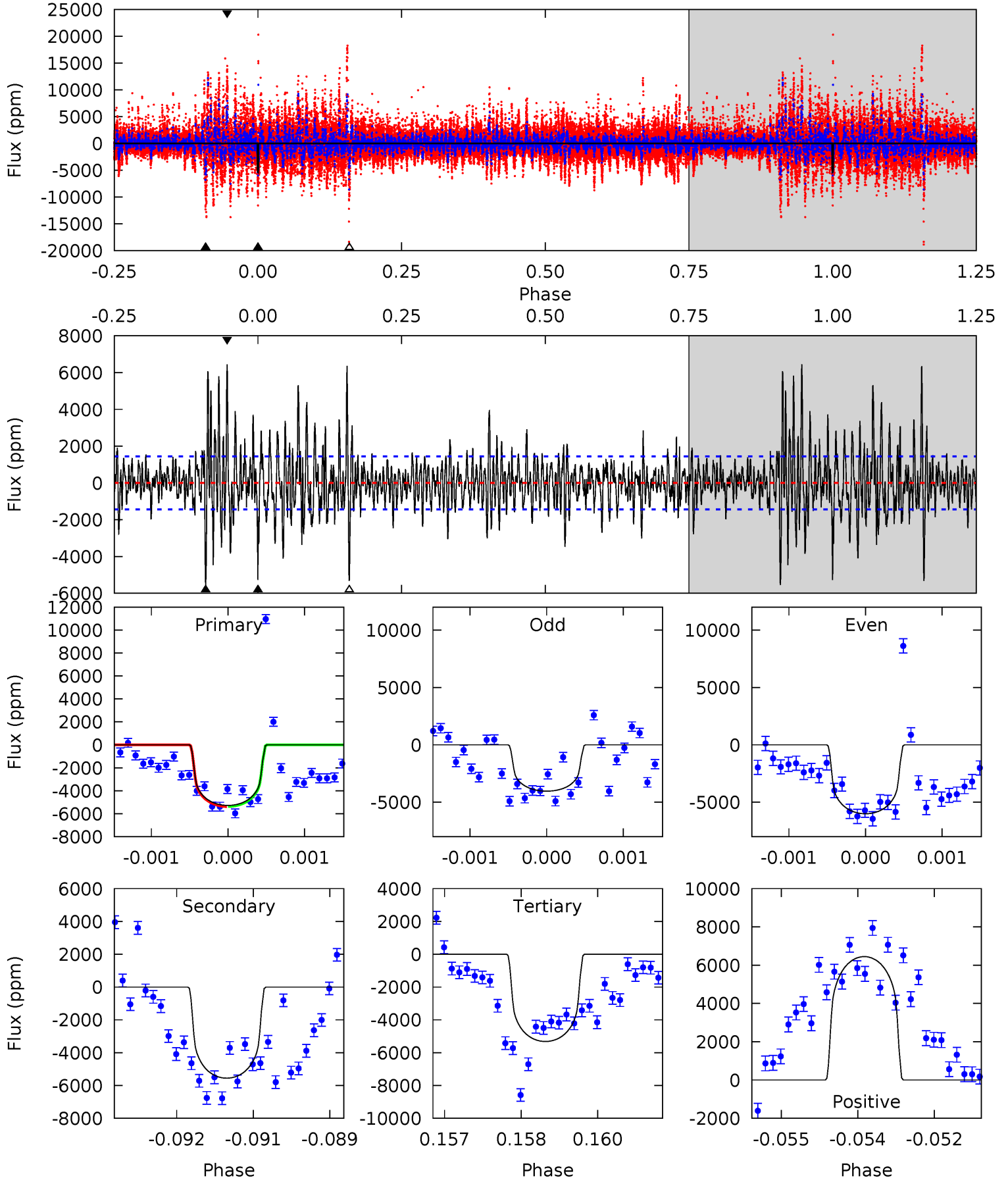
TCE 002307249-05     $P=369.009660$  Days     $T_0=203.658043$  (BKJD)



# DV Model-Shift Uniqueness Test

002307249-05, P = 369.019414 Days, E = 203.606121 Days

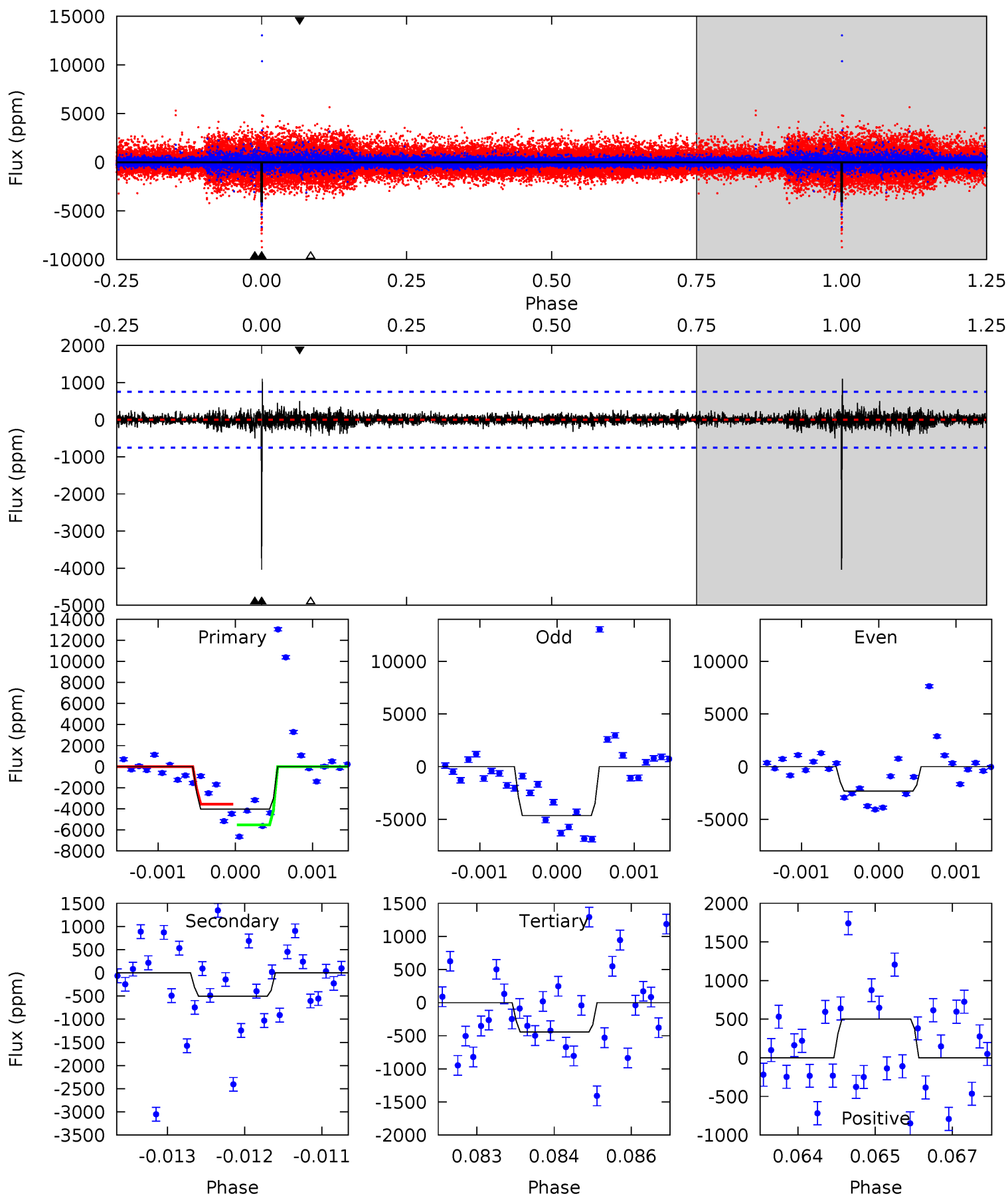
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.7	20.7	19.9	24.1	5.39	3.19	4.43	-0.16	-4.38	0.88	-3.34	2.99	1.35	0.54	0.02



# Alt Model-Shift Uniqueness Test

002307249-05, P = 369.009660 Days, E = 203.658043 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
29.2	3.64	3.20	3.62	5.44	3.28	0.56	26.0	25.6	0.44	0.01	9.93	0.64	0.21	0



### Stellar Parameters For KIC 002307249

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4889^{+176}_{-176}$	$4.699^{+0.048}_{-0.028}$	$-1.260^{+0.300}_{-0.300}$	$0.557^{+0.033}_{-0.037}$	$0.565^{+0.041}_{-0.024}$	$4.611^{+0.903}_{-0.537}$
	+4%/-4%	+1%/-1%	+24%/-24%	+6%/-7%	+7%/-4%	+20%/-12%
Source	KIC0	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 002307249-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-5554 \pm 268$	$3.53^{+0.95}_{-0.98}$	$246^{+9}_{-10}$	$5450^{+957}_{-594}$	$169463^{+163417}_{-63912}$
Alt.	$-503 \pm 138$	$3.80^{+0.96}_{-0.94}$	$246^{+9}_{-9}$	$3390^{+362}_{-273}$	$13389^{+10792}_{-5605}$

$T_{\text{max}}$  = 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

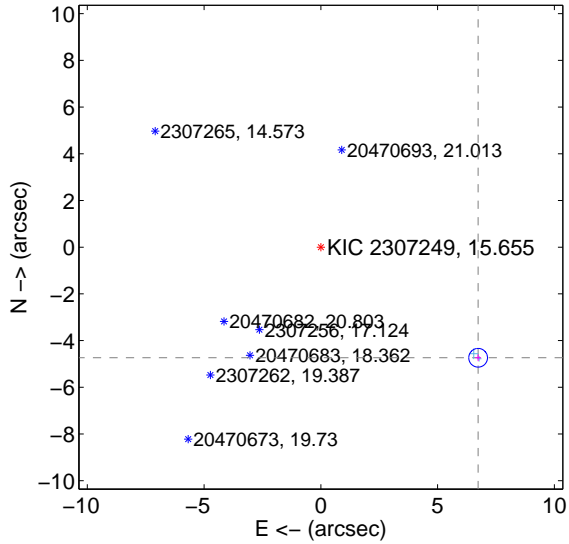
Supplemental centroid analysis for 002307249-05. Kepler magnitude: 15.65. Transit SNR 5.92

There are 2 quarters with good PRF difference image offsets

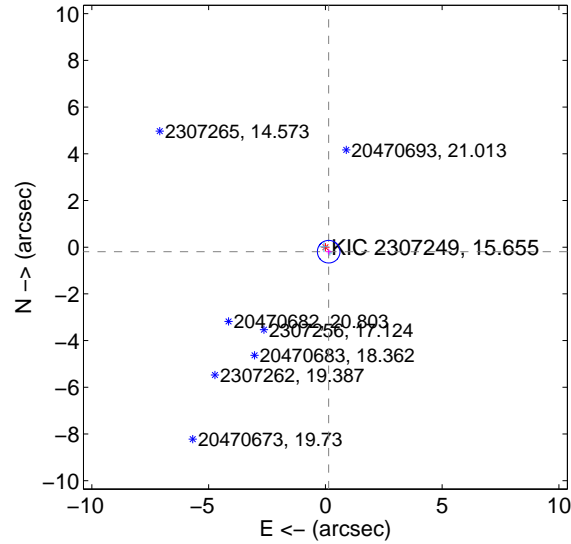
The OOT PRF centroid is offset from the target star catalog position by about 8.04 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$8.235 \pm 0.134$	61.67	$-6.736 \pm 0.128$	$-4.736 \pm 0.144$
PRF-fit source offset from KIC position	$0.239 \pm 0.161$	1.48	$-0.141 \pm 0.122$	$-0.193 \pm 0.126$
photometric centroid source offset	$1.19 \pm 0.92$	1.30	$1.19 \pm 0.92$	$0.01 \pm 0.66$

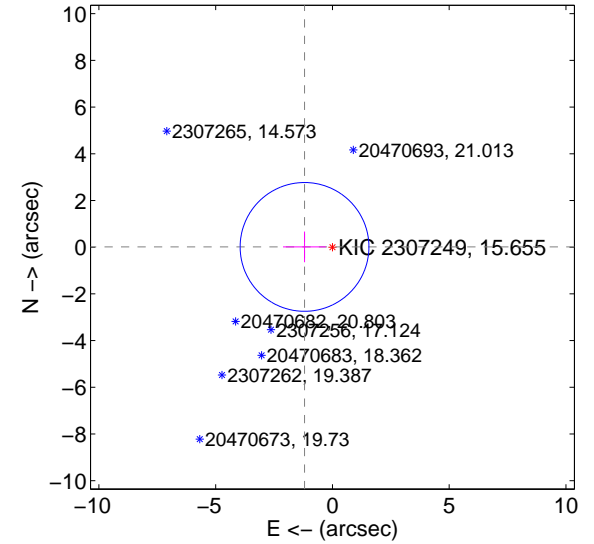
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

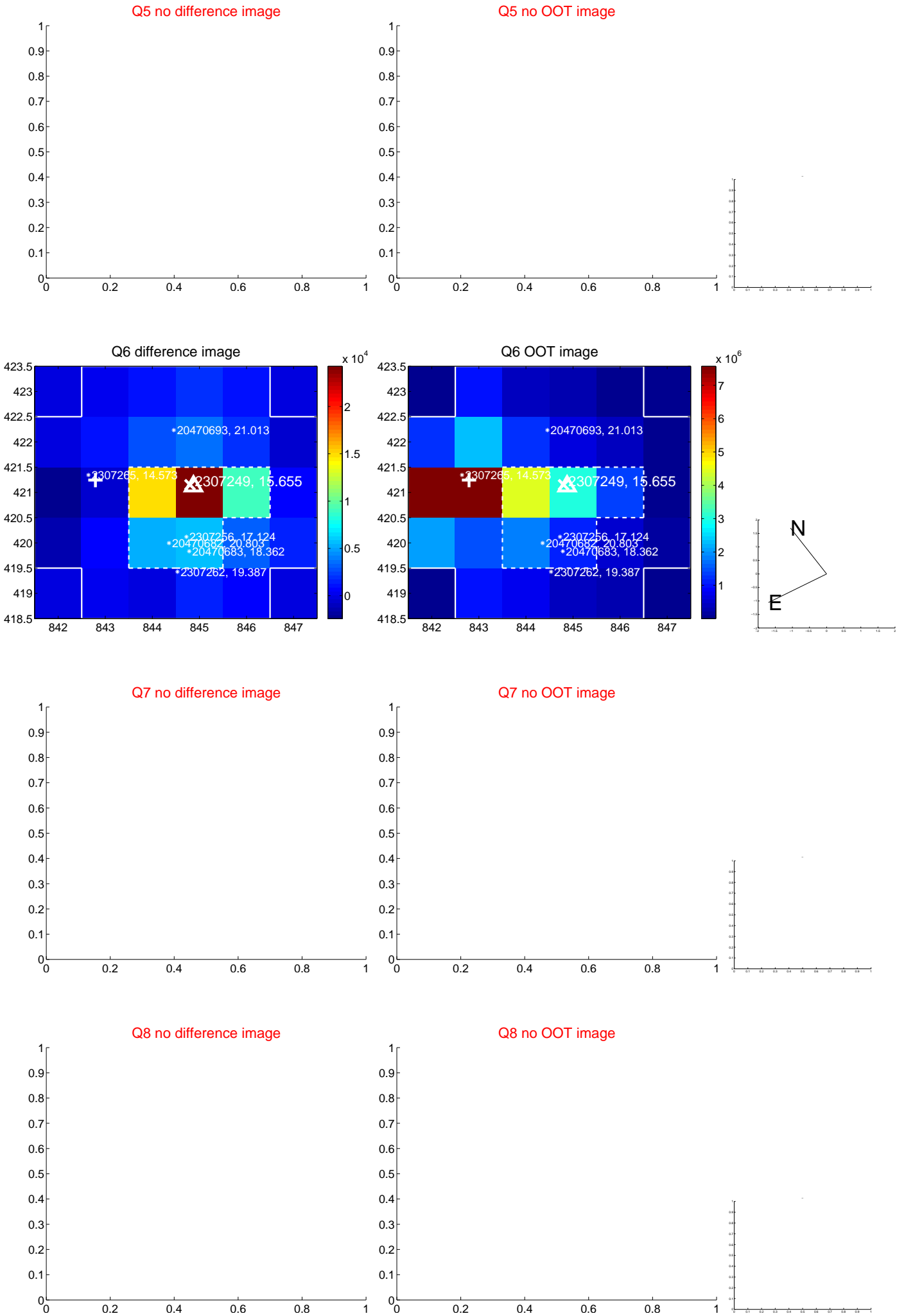


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

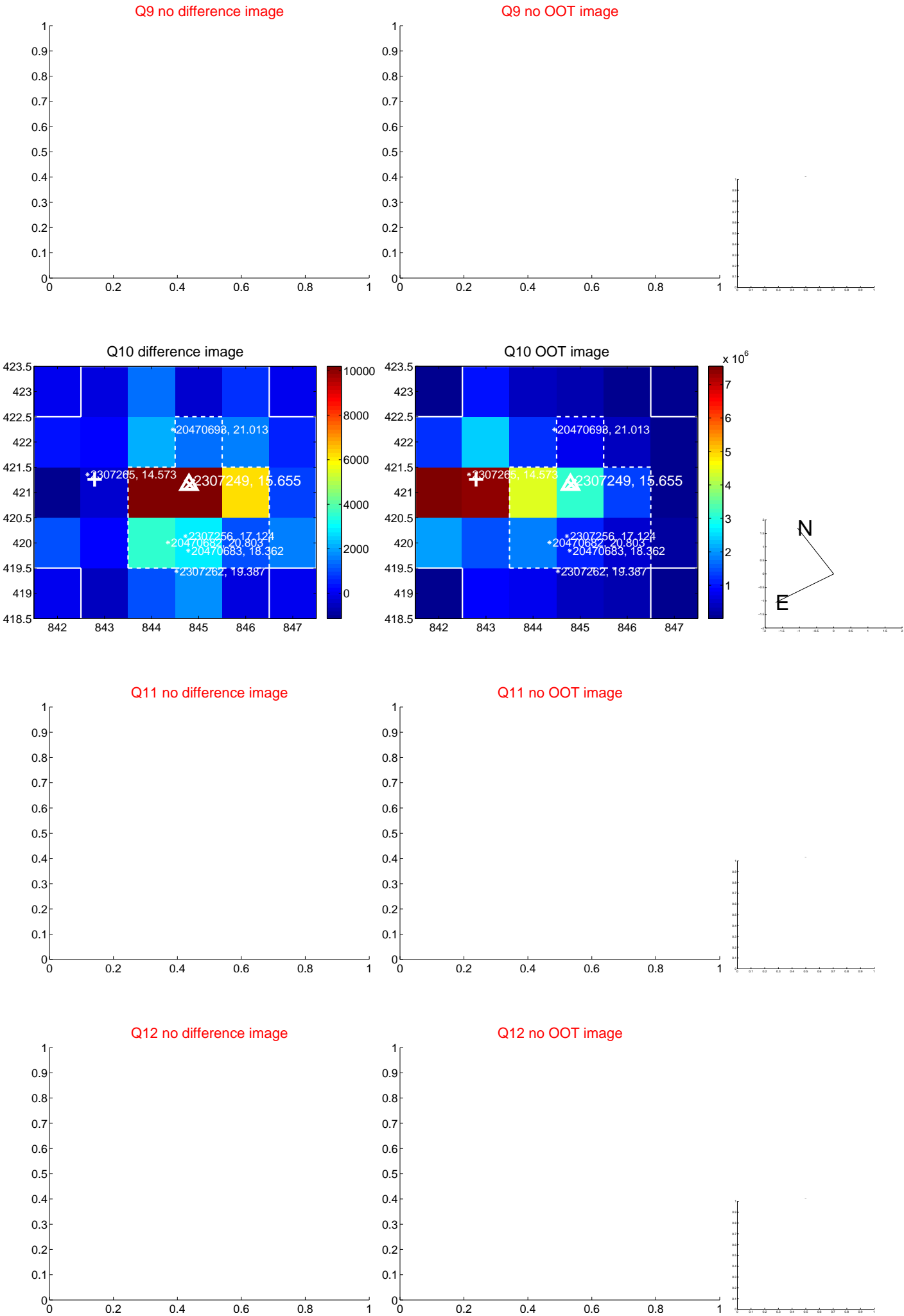


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

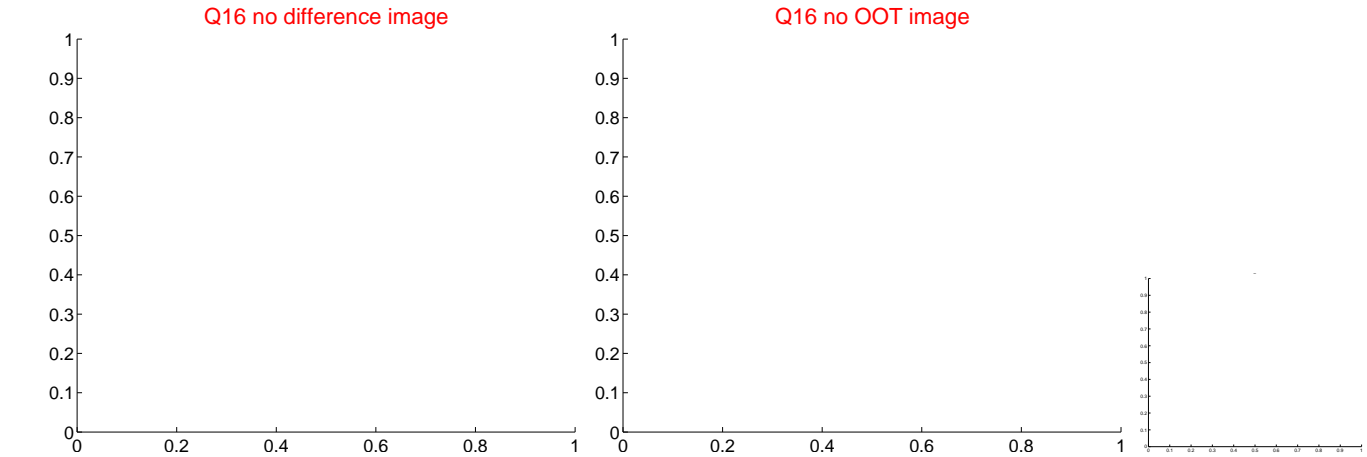
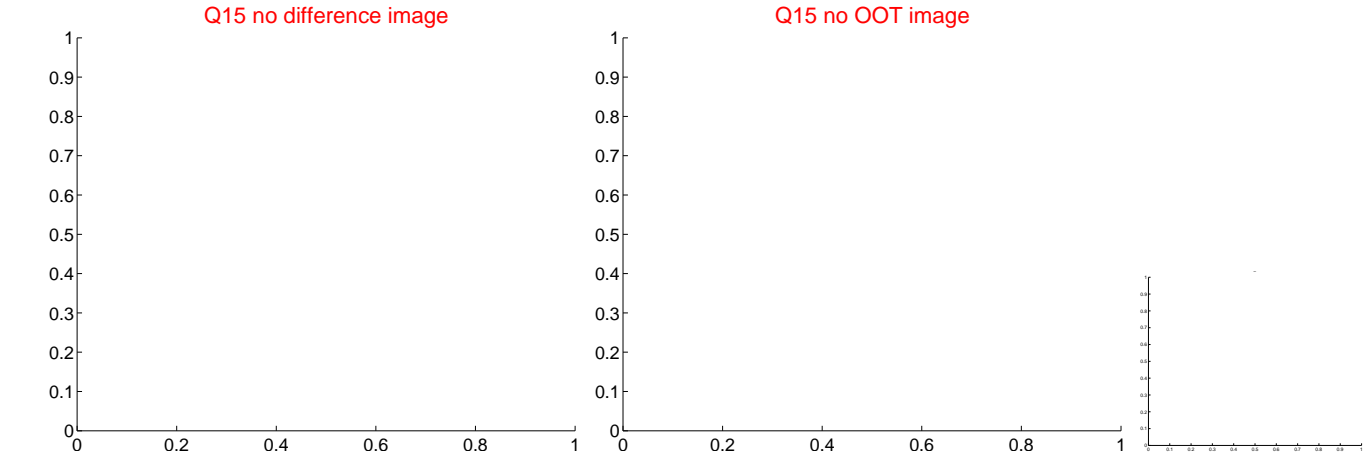
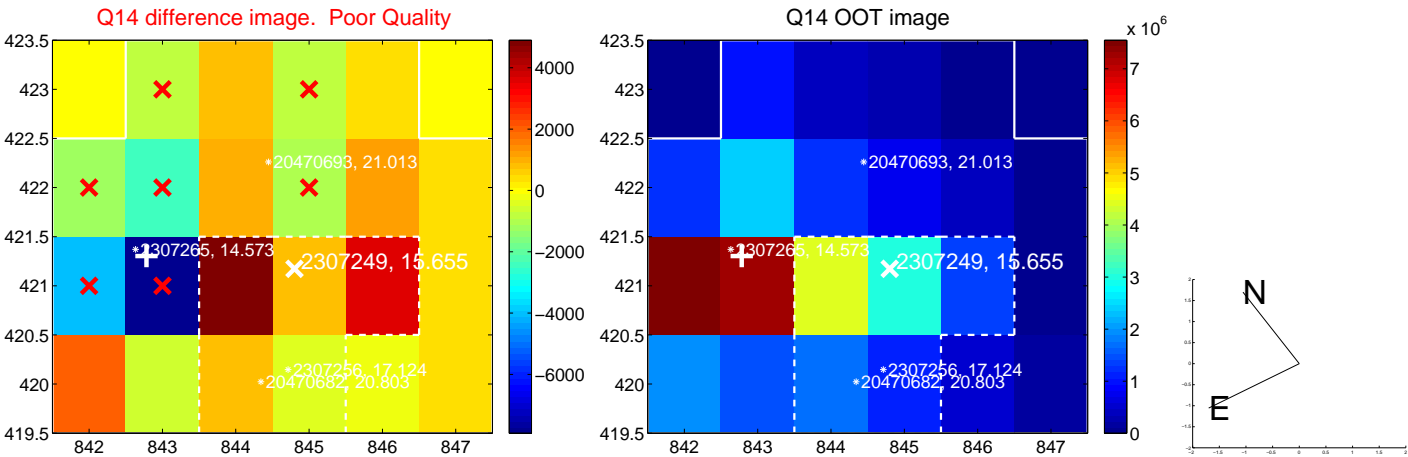
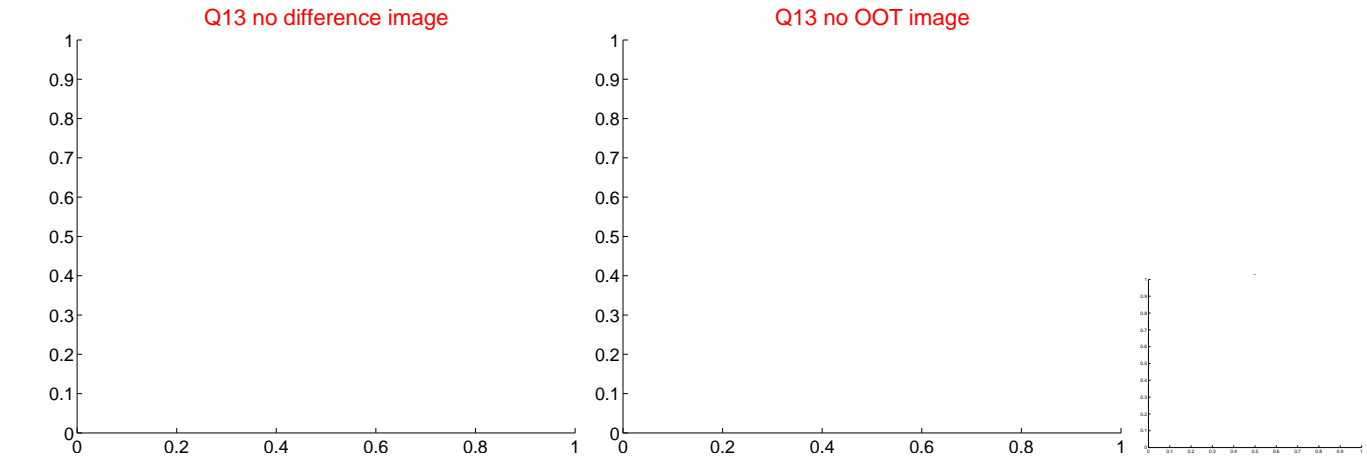




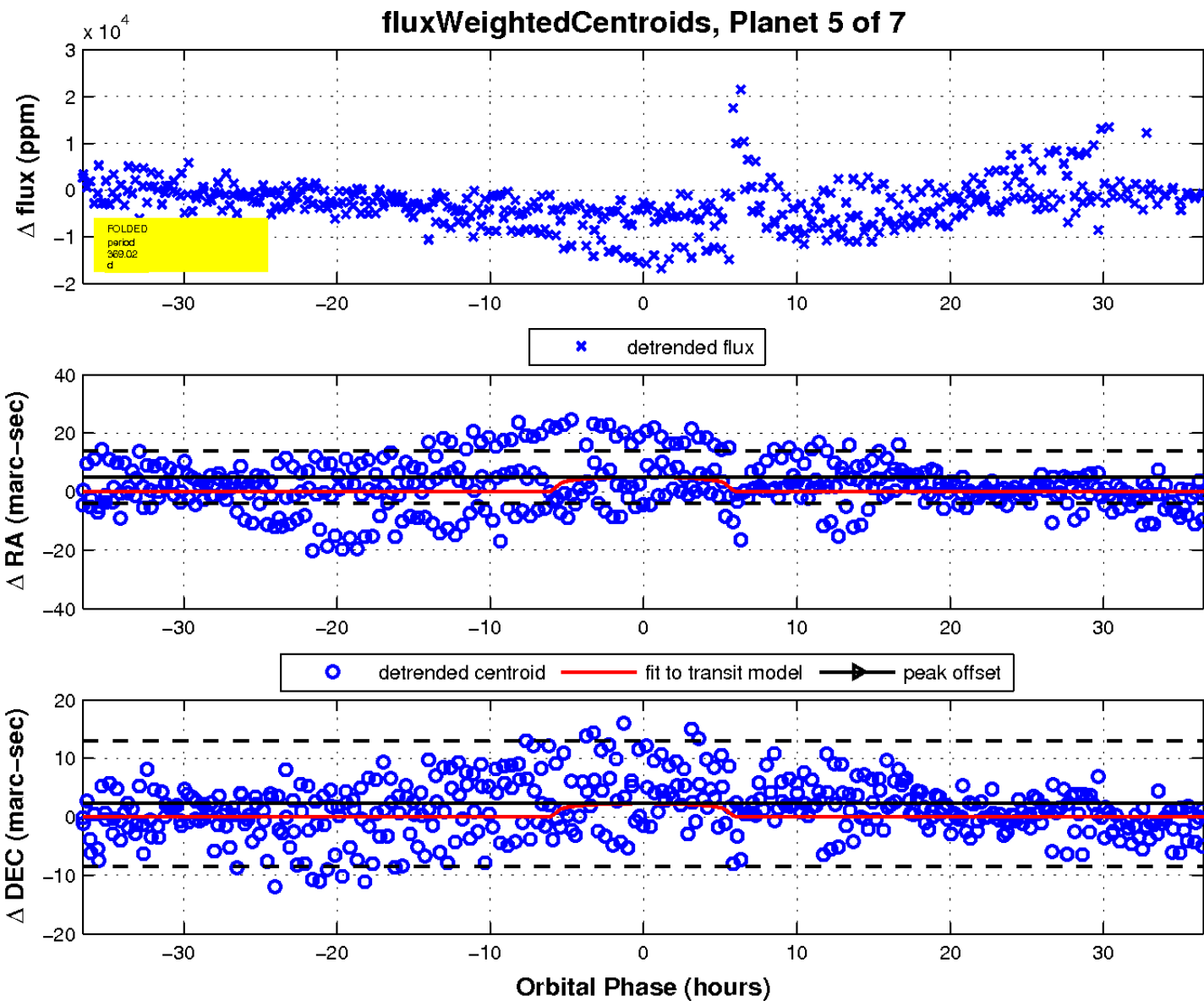
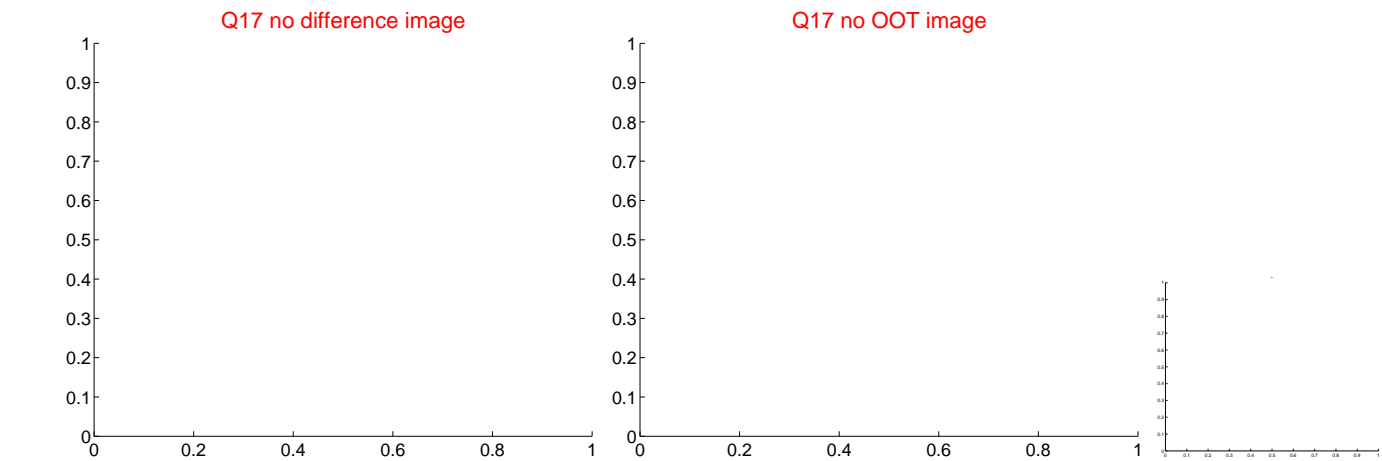
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

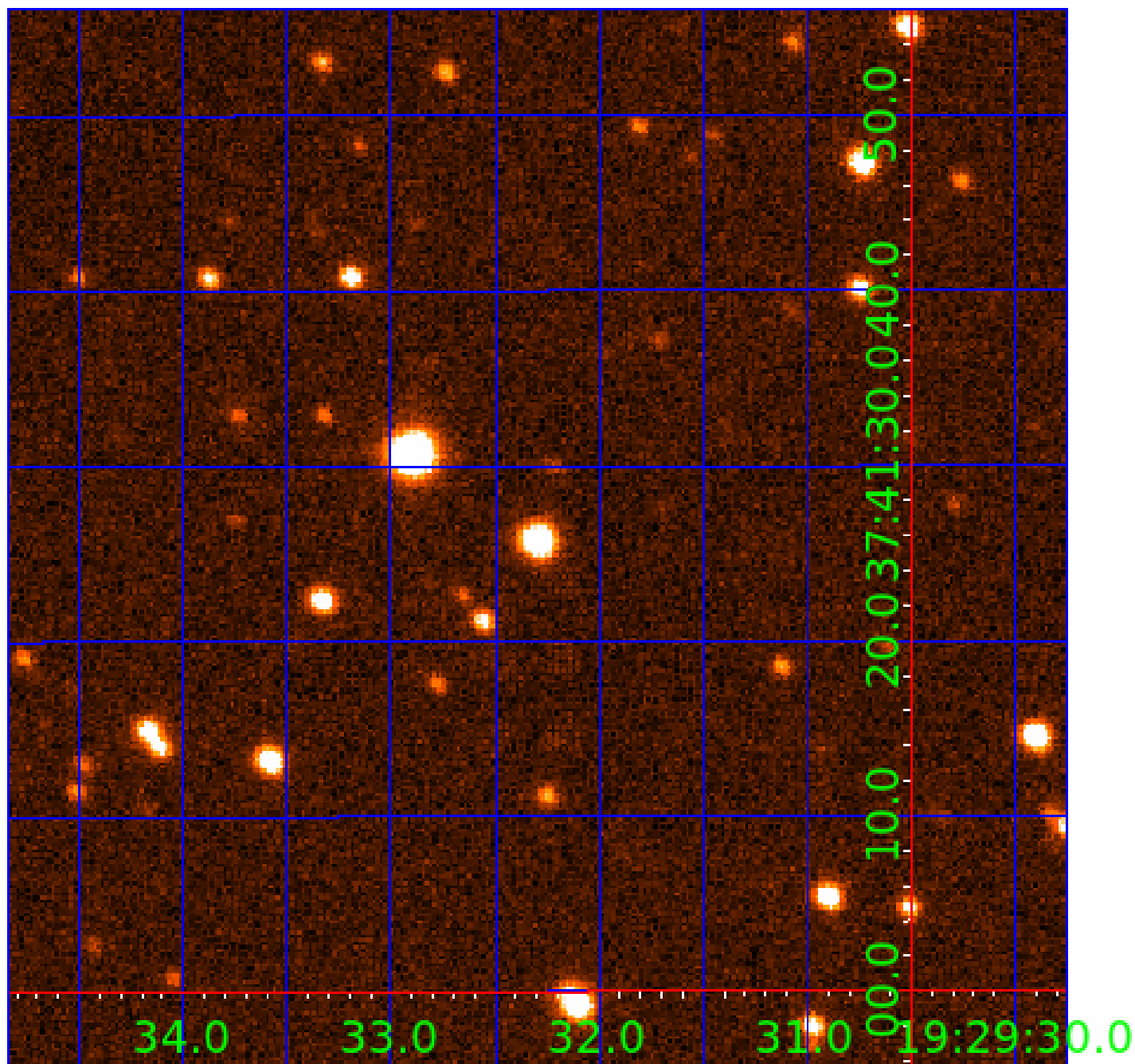


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 002307249

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002307249-01	OBS	No	443.240912	460.377527	3794.6	4.841	18.3	10.1	0.56	4889	4.41	0.18
002307249-02	OBS	No	285.942428	337.467052	4279.8	6.412	12.7	9.0	0.56	4889	3.65	0.32
002307249-03	OBS	No	495.701002	455.692868	2346.6	4.542	11.3	6.1	0.56	4889	2.66	0.15
002307249-04	OBS	No	352.446266	209.048827	2982.8	7.083	11.7	6.7	0.56	4889	3.00	0.24
002307249-05	OBS	No	369.019414	203.606121	3821.5	12.203	12.0	5.9	0.56	4889	3.50	0.23
002307249-06	OBS	No	340.157936	239.395276	3424.6	7.325	12.4	7.6	0.56	4889	3.21	0.26
002307249-07	OBS	No	401.069916	174.237568	1861.9	7.500	11.2	-1.0	0.56	4889	2.37	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002307249-01	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
002307249-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
002307249-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002307249-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

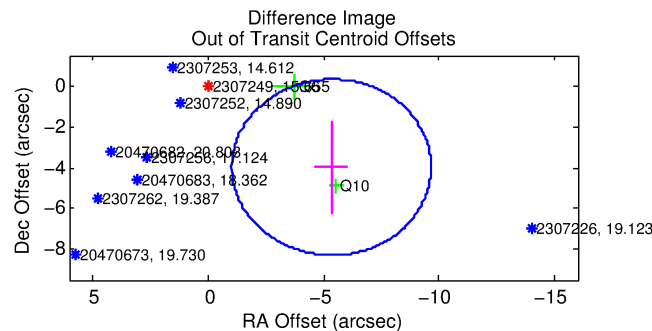
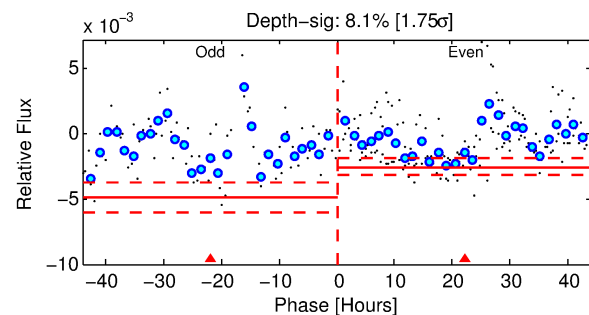
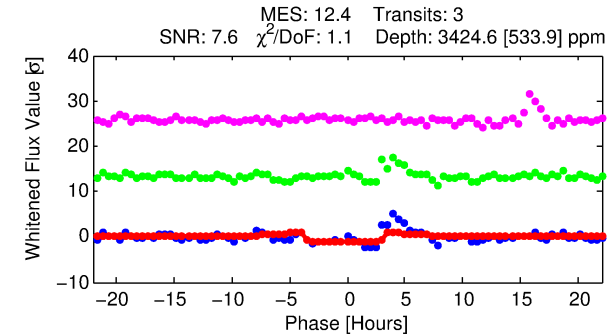
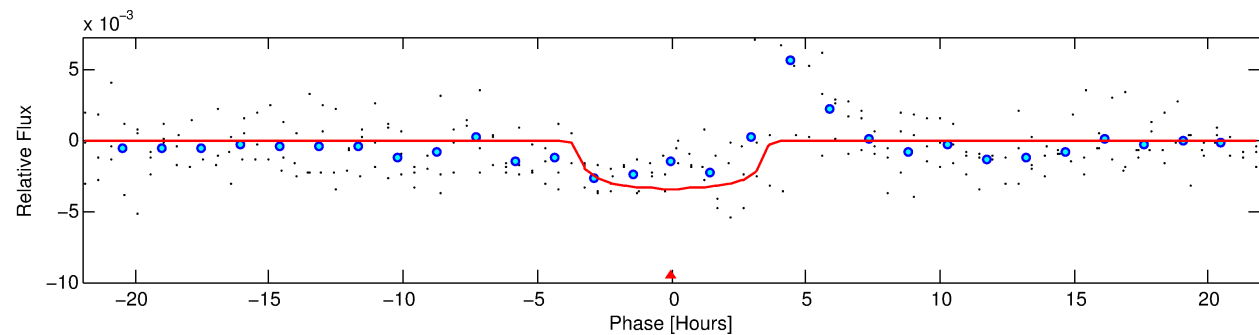
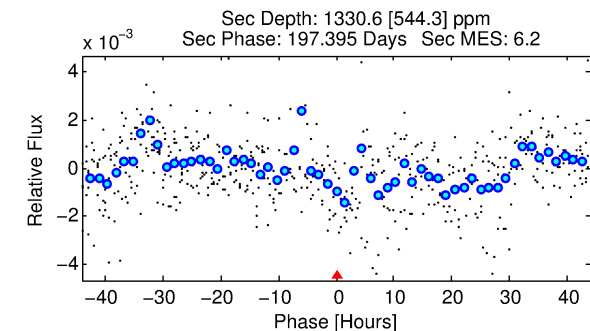
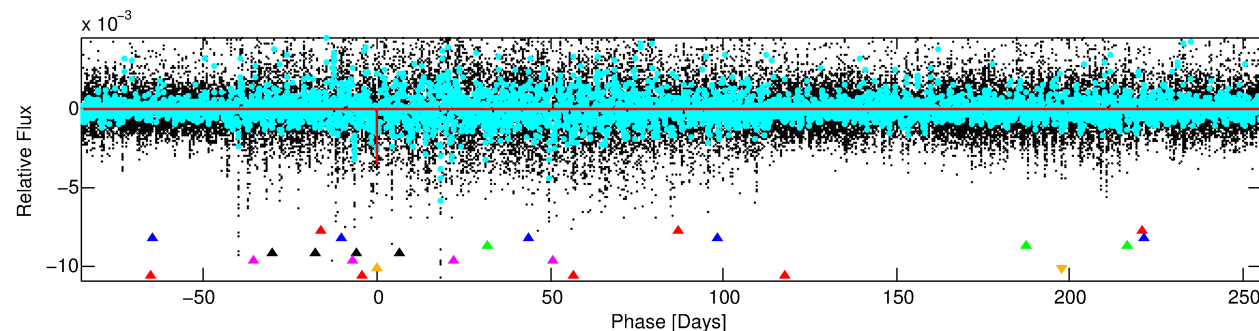
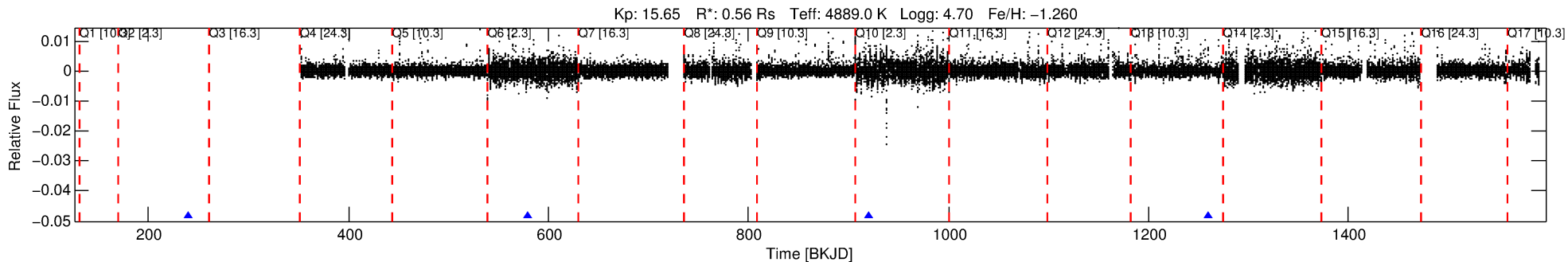
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 002307249-06

No Significant Match Found

# DV One-Page Summary

KIC: 2307249 Candidate: 6 of 7 Period: 340.158 d



## DV Fit Results:

Period = 340.15794 [0.00861] d  
Epoch = 239.3953 [0.0235] BKJD  
Rp/R\* = 0.0528 [0.0249]  
a/R\* = 373.50 [694.50]  
b = 0.01 [342.13]  
Seff = 0.26 [0.04]  
Teq = 181 [8] K  
Rp = 3.21 [1.53] Re  
a = 0.7890 [0.0454] AU  
Ag = 44265.66 [45705.14] [0.97σ]  
Teffp = 4064 [1056] K [3.68σ]

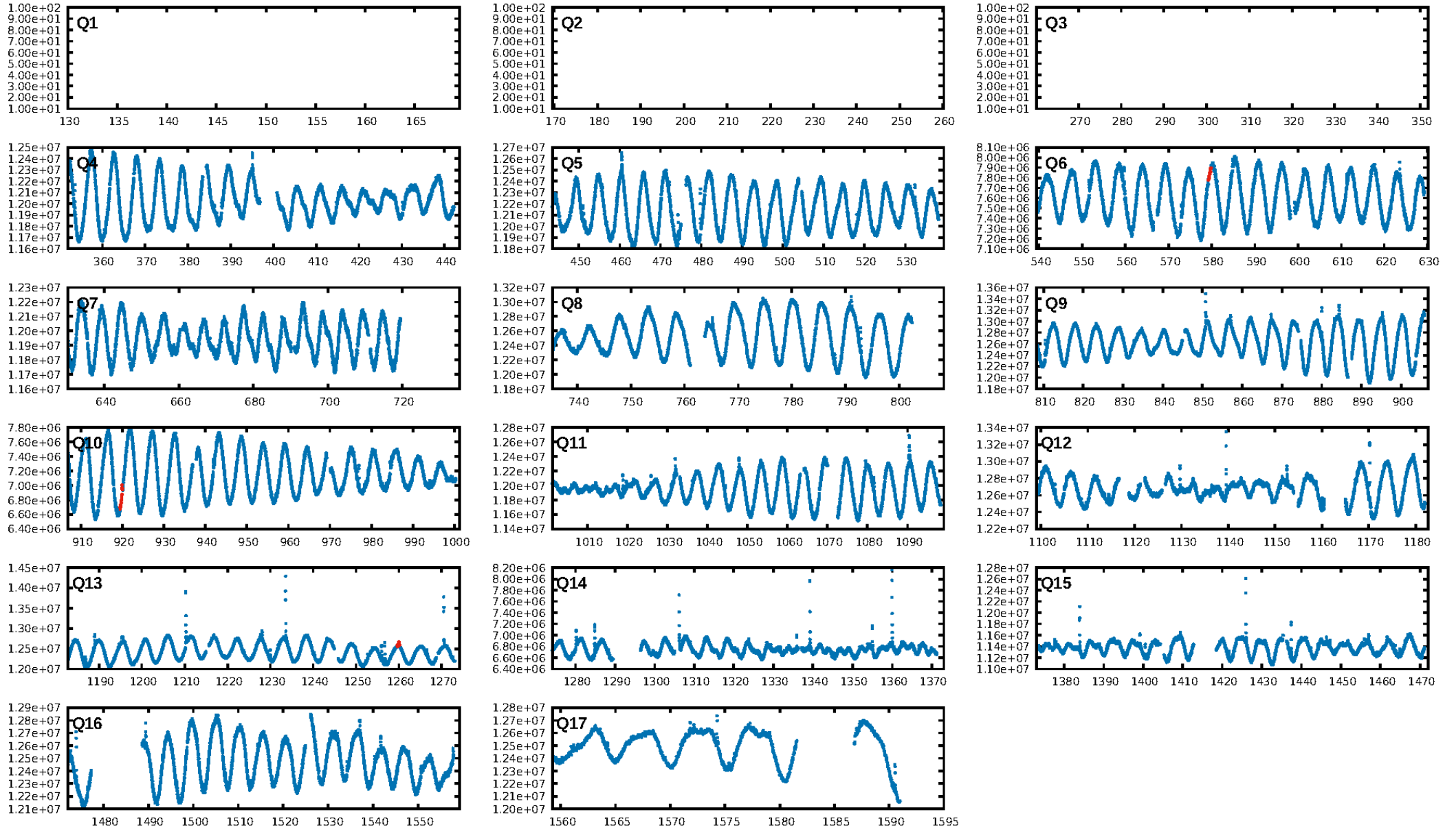
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [133.67σ]  
LongPeriod-sig: 100.0% [28.94σ]  
ModelChiSquare2-sig: 10.6%  
ModelChiSquareGof-sig: 95.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.268  
Centroid-sig: 22.4%  
Centroid-so: 1.834 arcsec [1.69σ]  
OotOffset-rm: 6.664 arcsec [4.64σ]  
KicOffset-rm: 1.353 arcsec [1.12σ]  
OotOffset-st: 2/0/0/0 [2]  
KicOffset-st: 2/0/0/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:52:42 Z

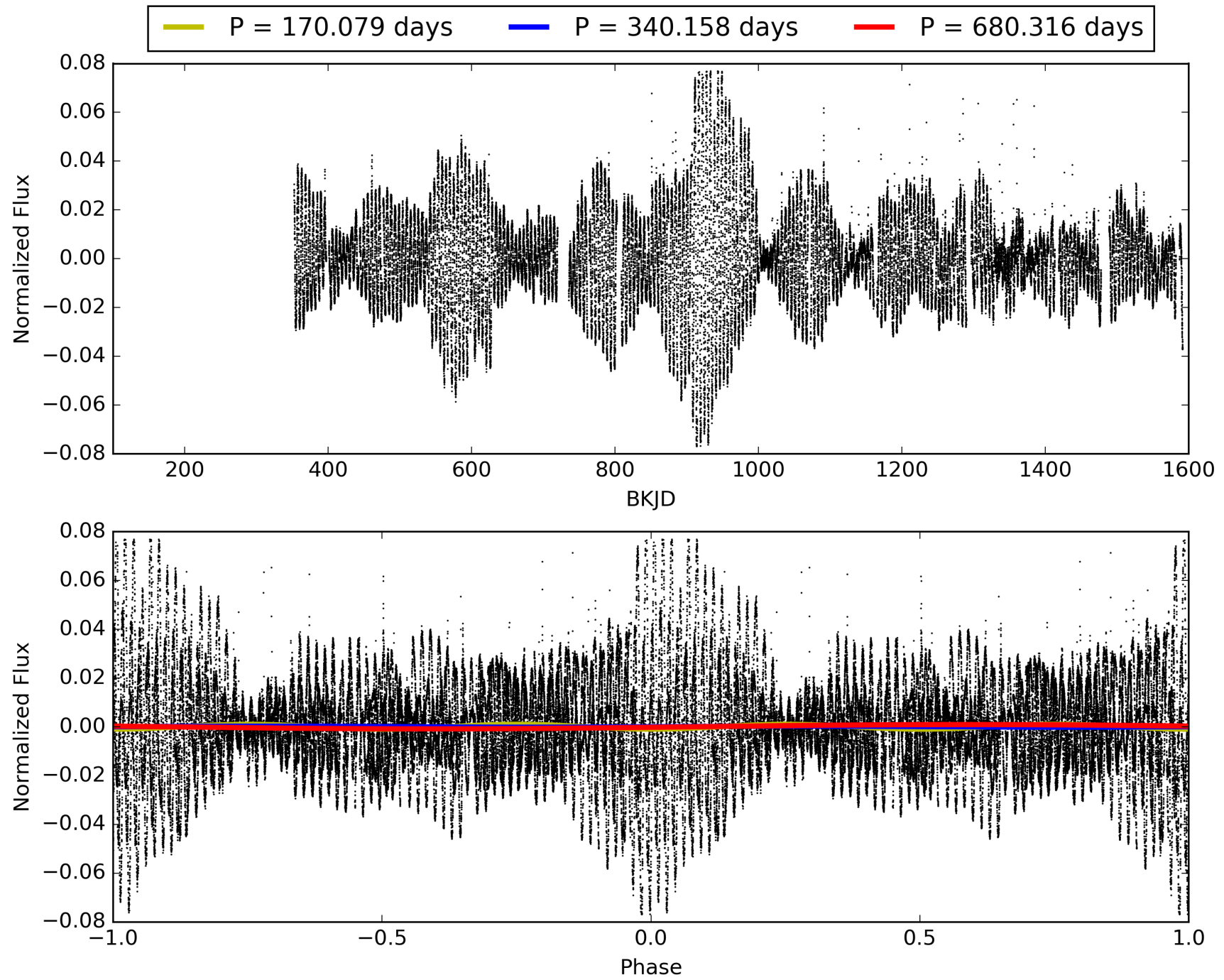
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 002307249-06, PDC Light Curves





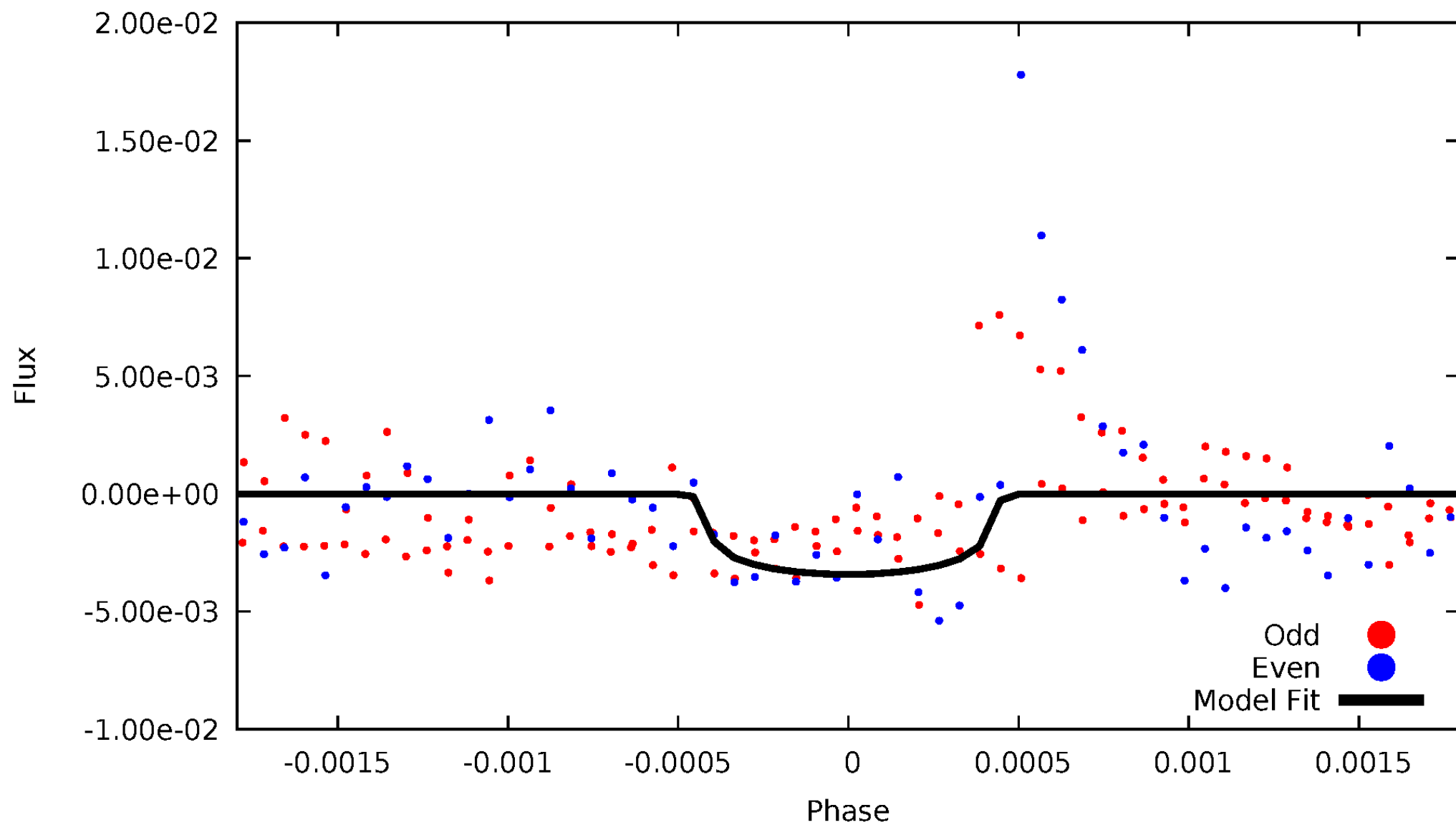
# TCE 002307249-06





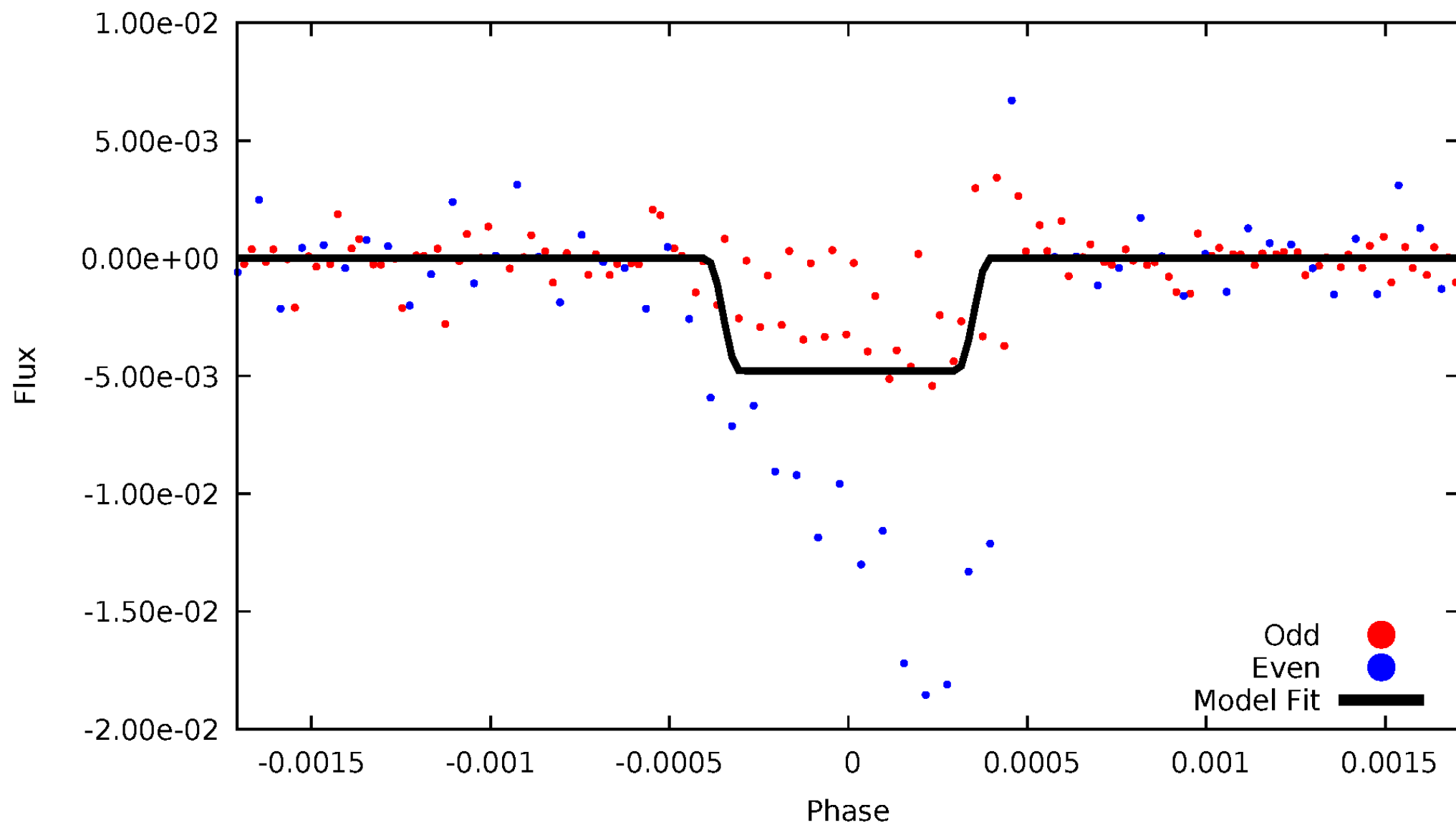
# DV Odd/Even

TCE 002307249-06



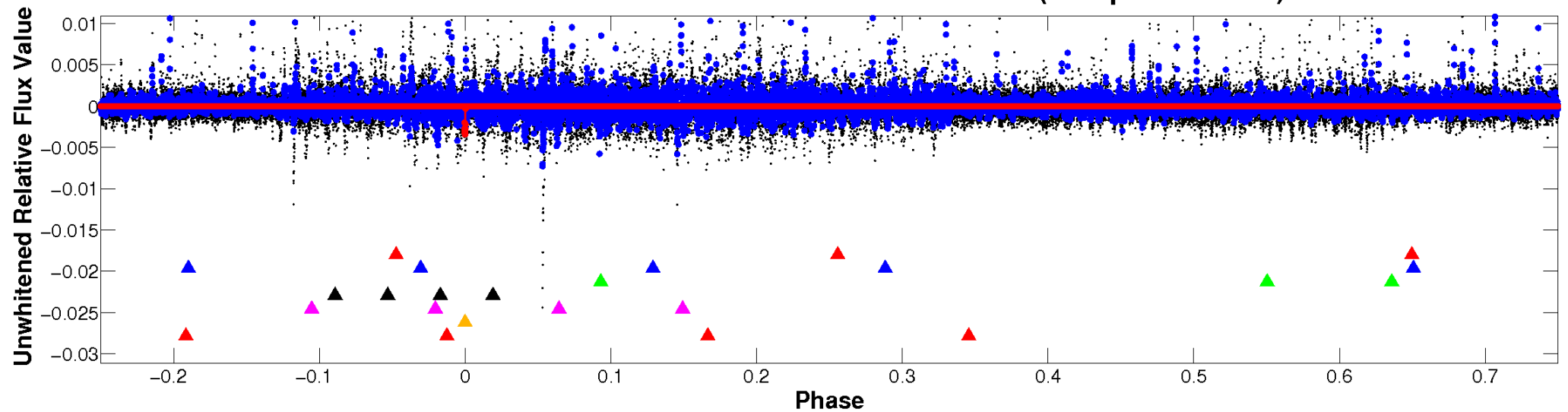
# ALT Odd/Even

TCE 002307249-06

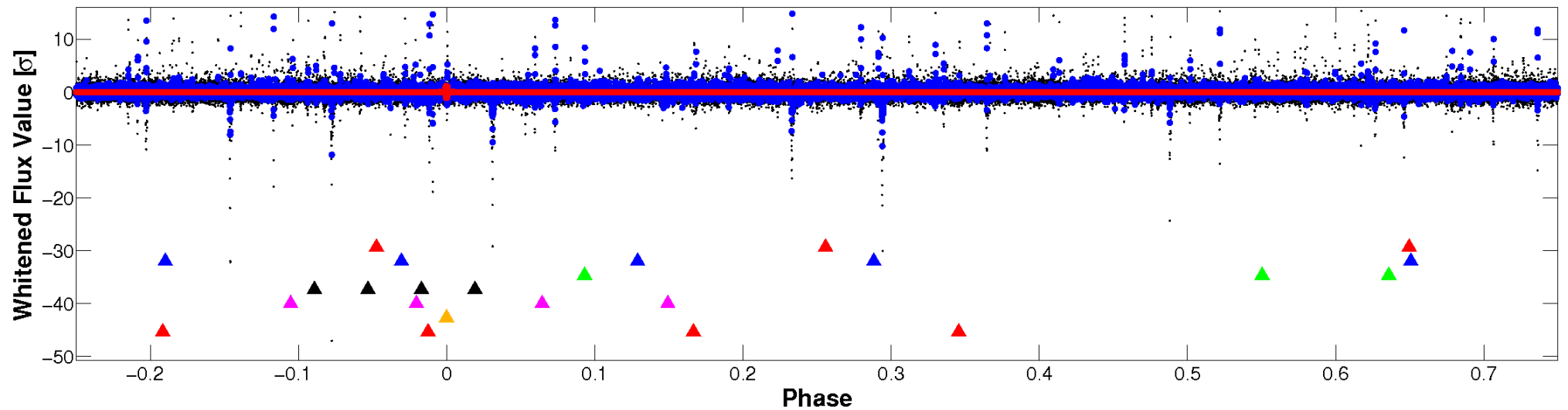


# Non-Whitened Vs. Whitened Light Curve

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

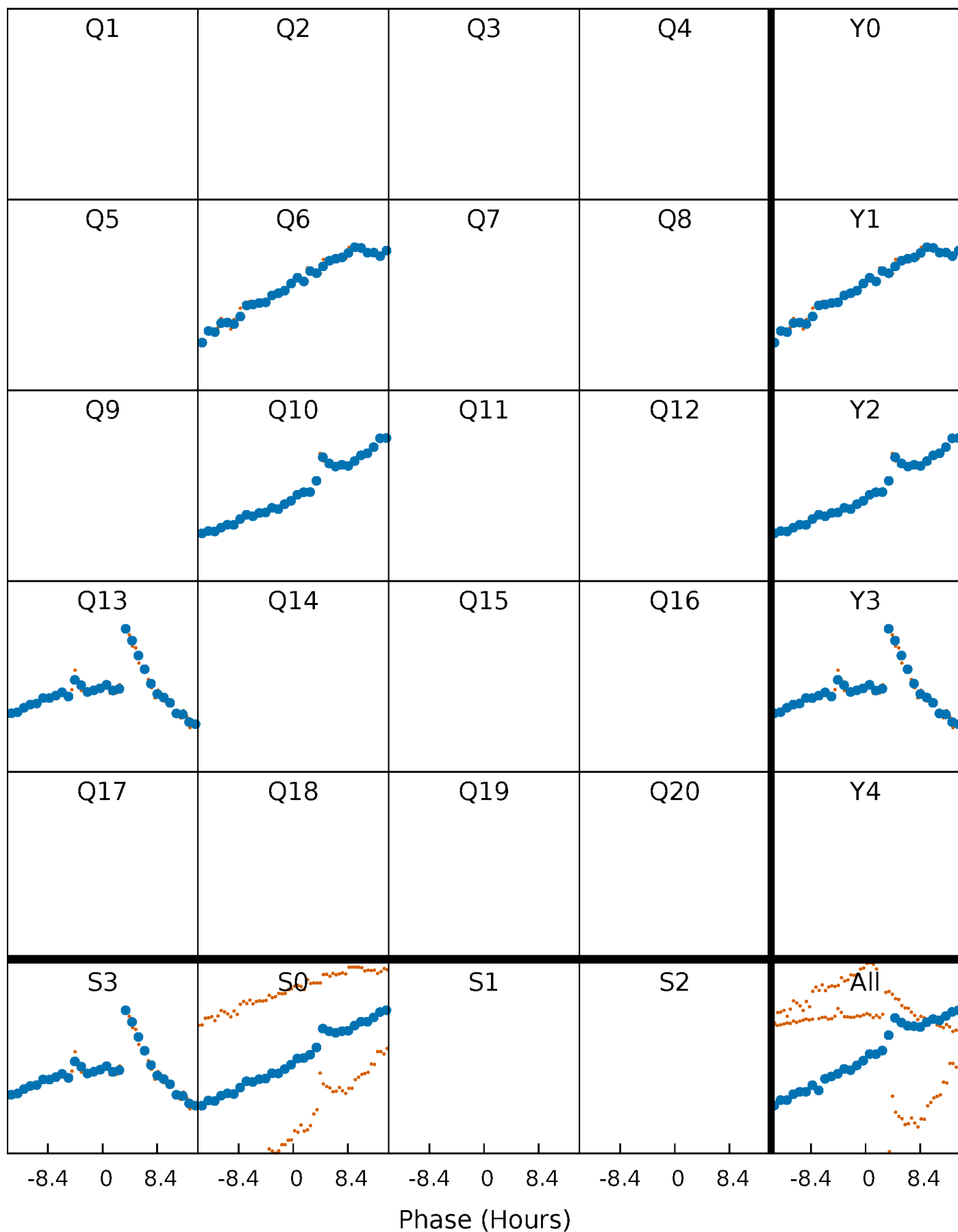


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



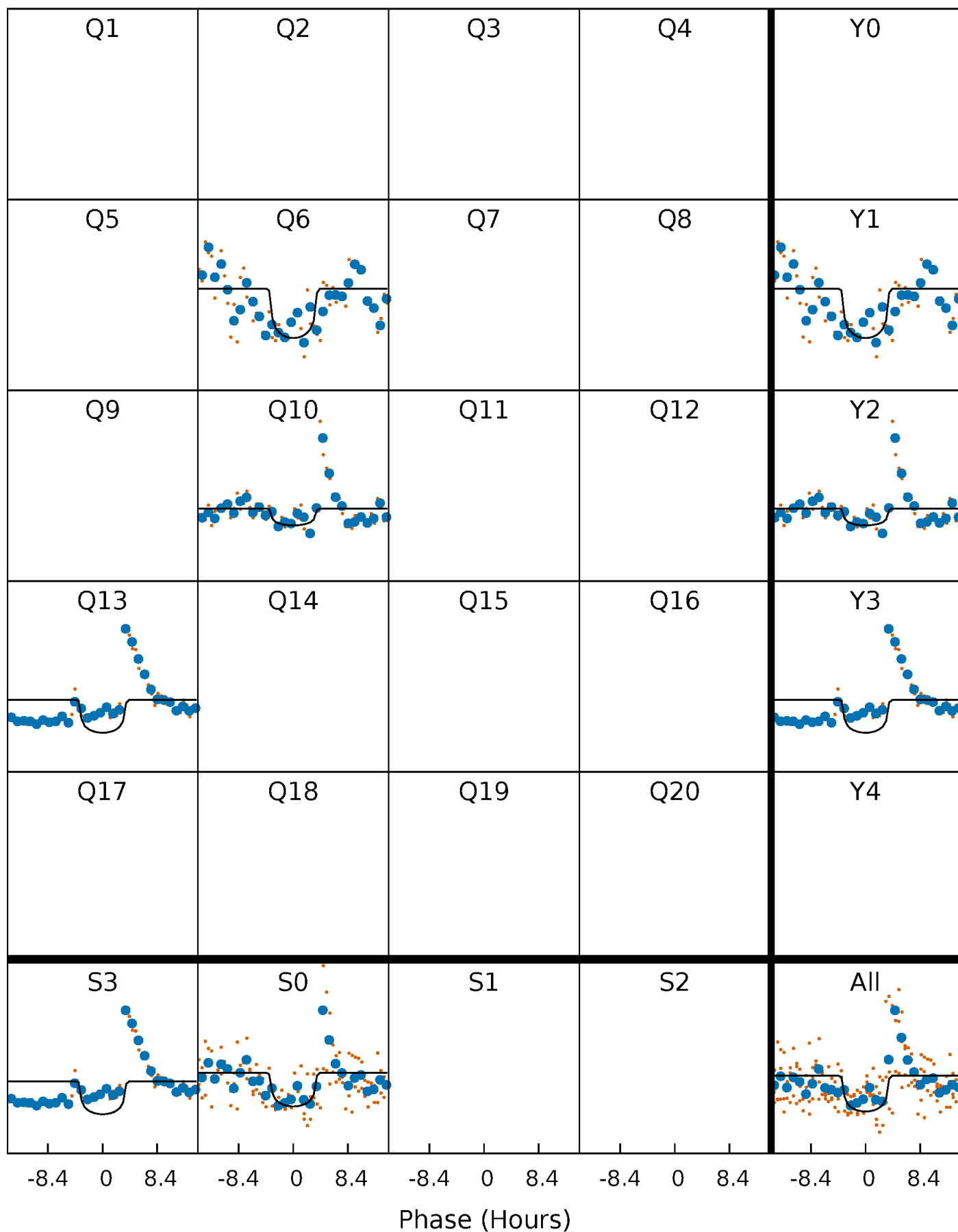
# PDC Quarter-Phased Transit Curves

TCE 002307249-06     $P=340.157936$  Days     $T_0=239.395276$  (BKJD)



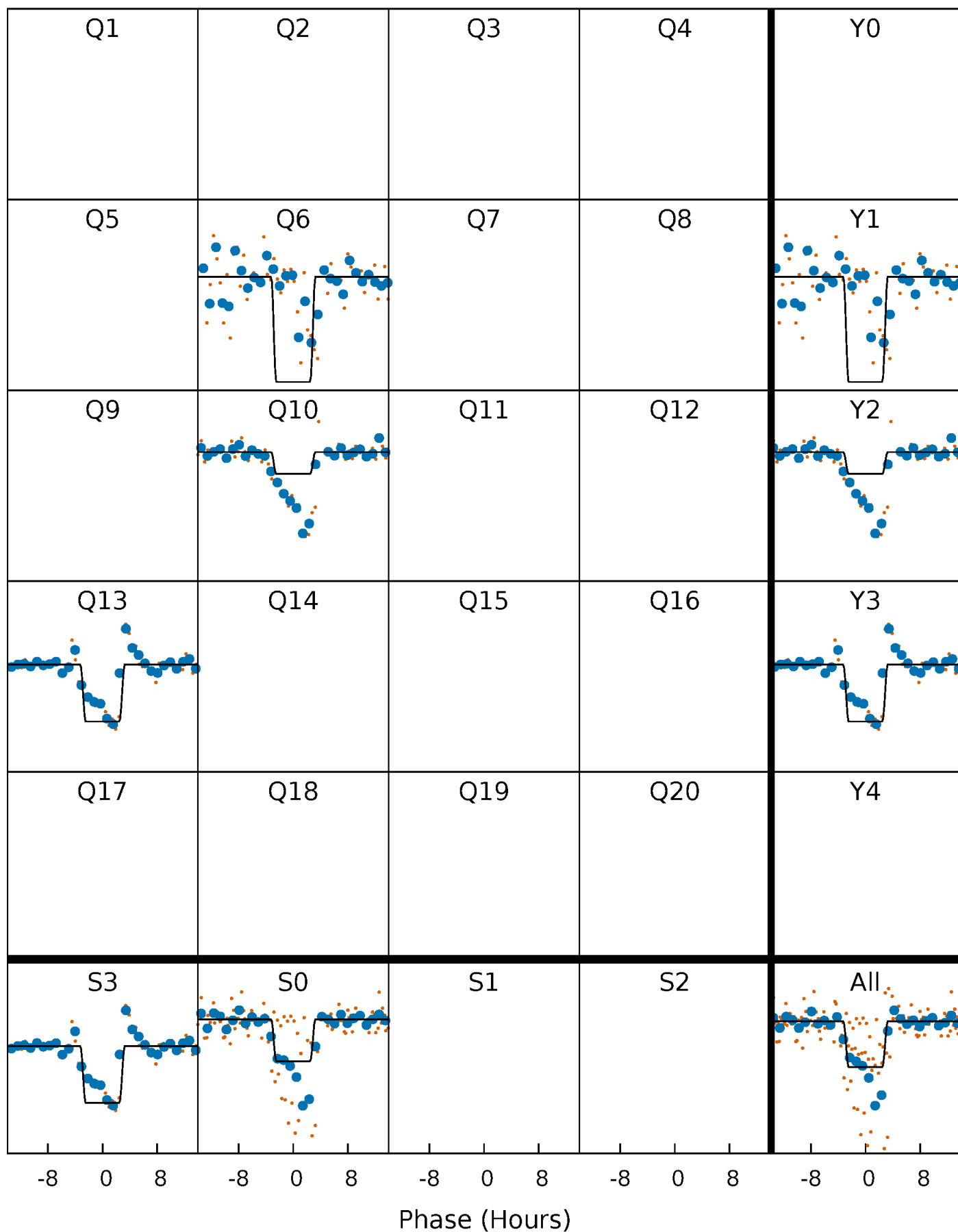
# DV Quarter-Phased Transit Curves

TCE 002307249-06 P=340.157936 Days  $T_0=239.395276$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

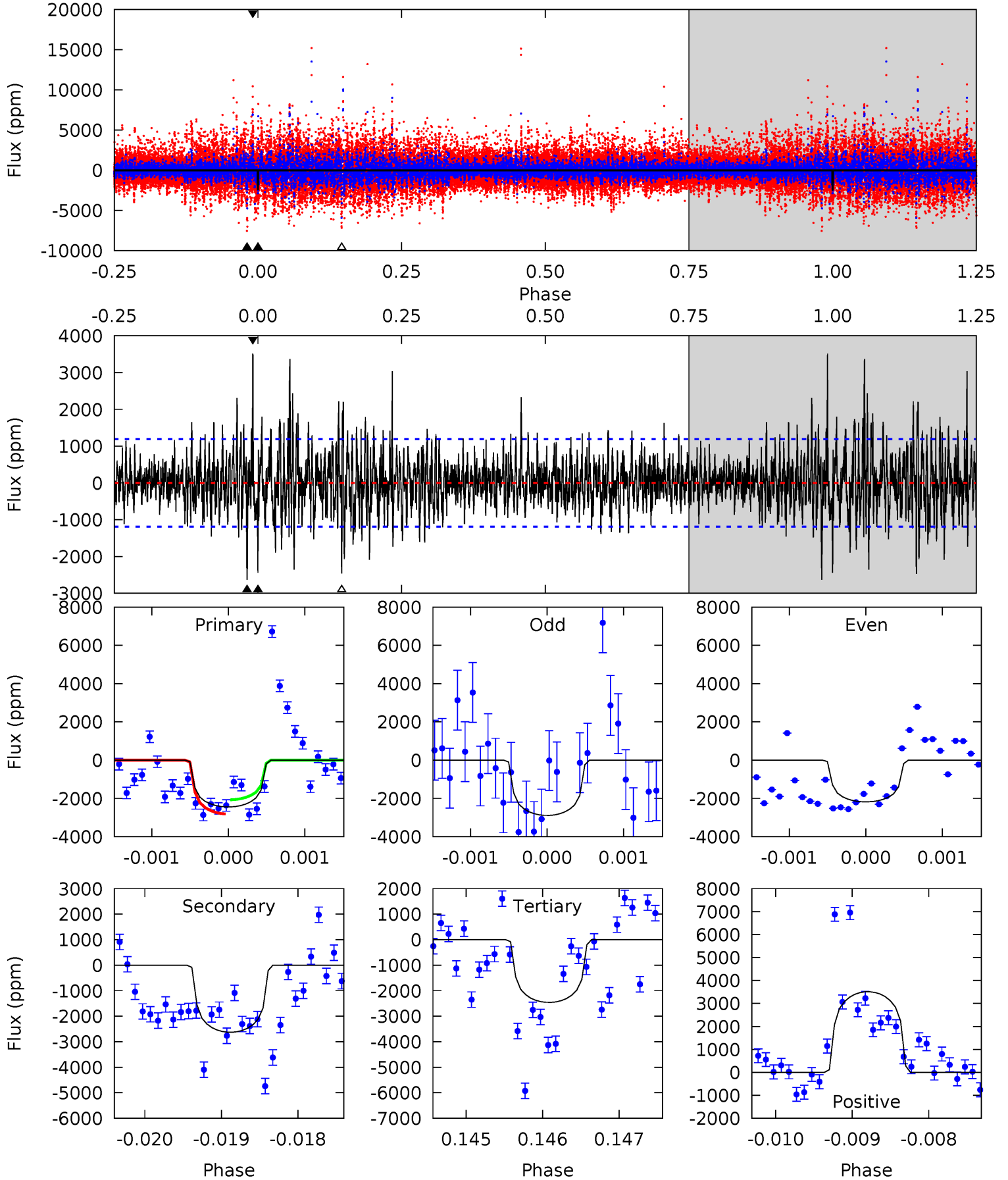
TCE 002307249-06     $P=340.150662$  Days     $T_0=239.426991$  (BKJD)



# DV Model-Shift Uniqueness Test

002307249-06, P = 340.157936 Days, E = 239.395276 Days

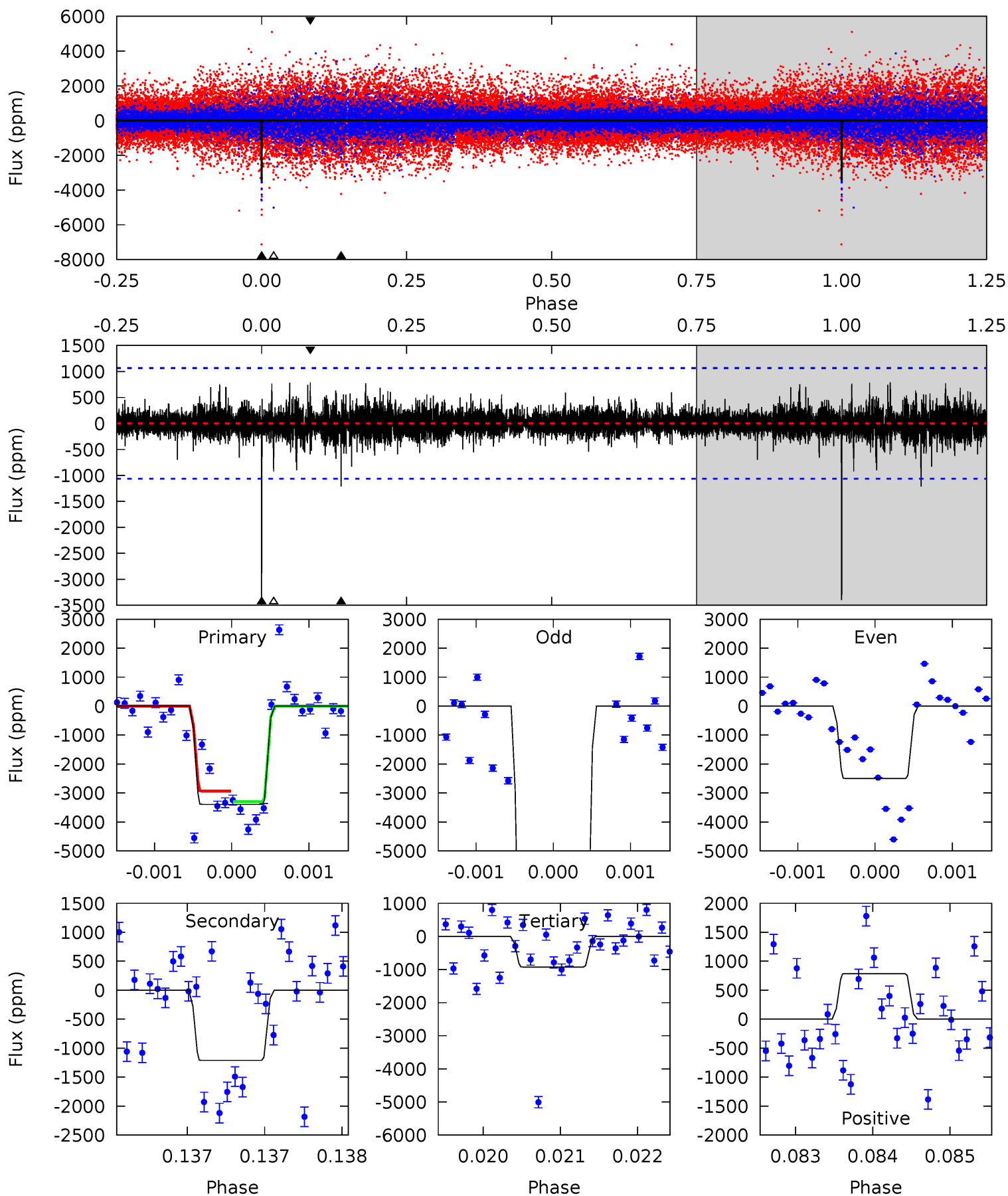
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.2	12.1	11.3	16.1	5.47	3.32	2.63	-0.06	-4.90	0.78	-4.05	1.40	0.78	0.57	1.66



# Alt Model-Shift Uniqueness Test

002307249-06, P = 340.150662 Days, E = 239.426991 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
17.6	6.26	4.78	4.06	5.50	3.37	0.76	12.8	13.5	1.48	2.20	34.5	1.56	0.19	0.97





### Stellar Parameters For KIC 002307249

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4889^{+176}_{-176}$	$4.699^{+0.048}_{-0.028}$	$-1.260^{+0.300}_{-0.300}$	$0.557^{+0.033}_{-0.037}$	$0.565^{+0.041}_{-0.024}$	$4.611^{+0.903}_{-0.537}$
	+4%/-4%	+1%/-1%	+24%/-24%	+6%/-7%	+7%/-4%	+20%/-12%
Source	KIC0	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 002307249-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-2628 \pm 218$	$3.29^{+1.39}_{-1.49}$	$253^{+10}_{-11}$	$4753^{+1505}_{-640}$	$83910^{+193037}_{-42676}$
Alt.	$-1211 \pm 193$	$4.18^{+1.56}_{-1.48}$	$252^{+11}_{-11}$	$3783^{+710}_{-389}$	$23647^{+37723}_{-11192}$

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

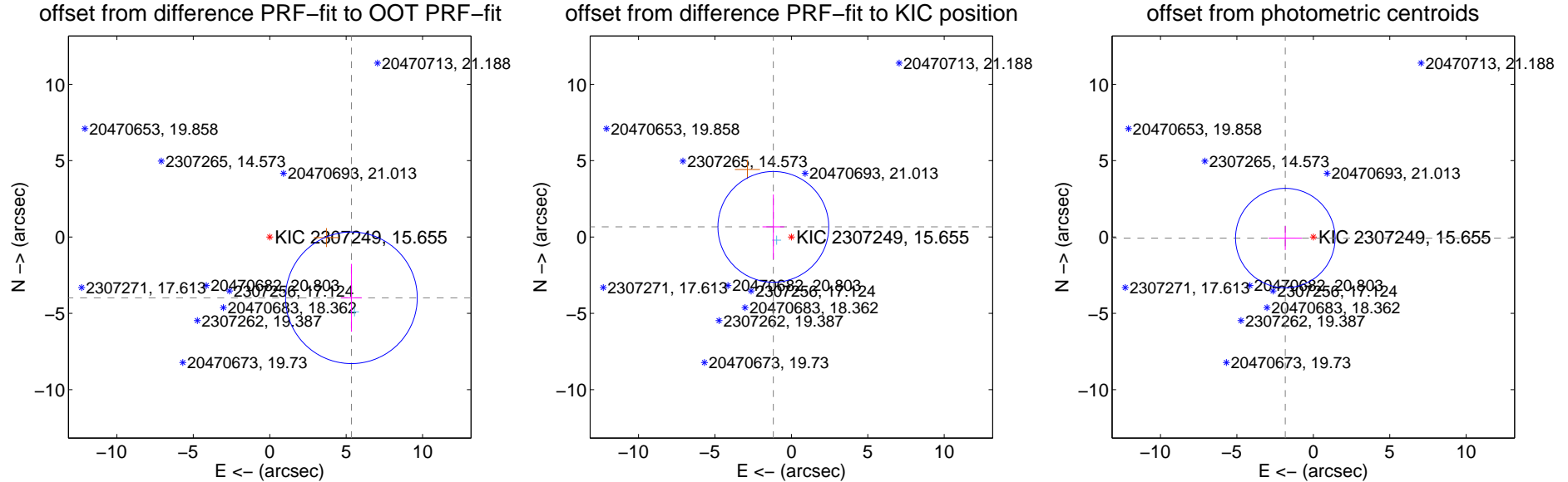
## DV Centroid Data

Supplemental centroid analysis for 002307249-06. Kepler magnitude: 15.65. Transit SNR 7.65

There are 1 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 8.03 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.664 \pm 1.436$	4.64	$-5.344 \pm 0.682$	$-3.982 \pm 2.222$
PRF-fit source offset from KIC position	$1.353 \pm 1.208$	1.12	$1.180 \pm 0.710$	$0.663 \pm 2.118$
photometric centroid source offset	$1.83 \pm 1.09$	1.69	$1.83 \pm 1.09$	$-0.07 \pm 0.78$

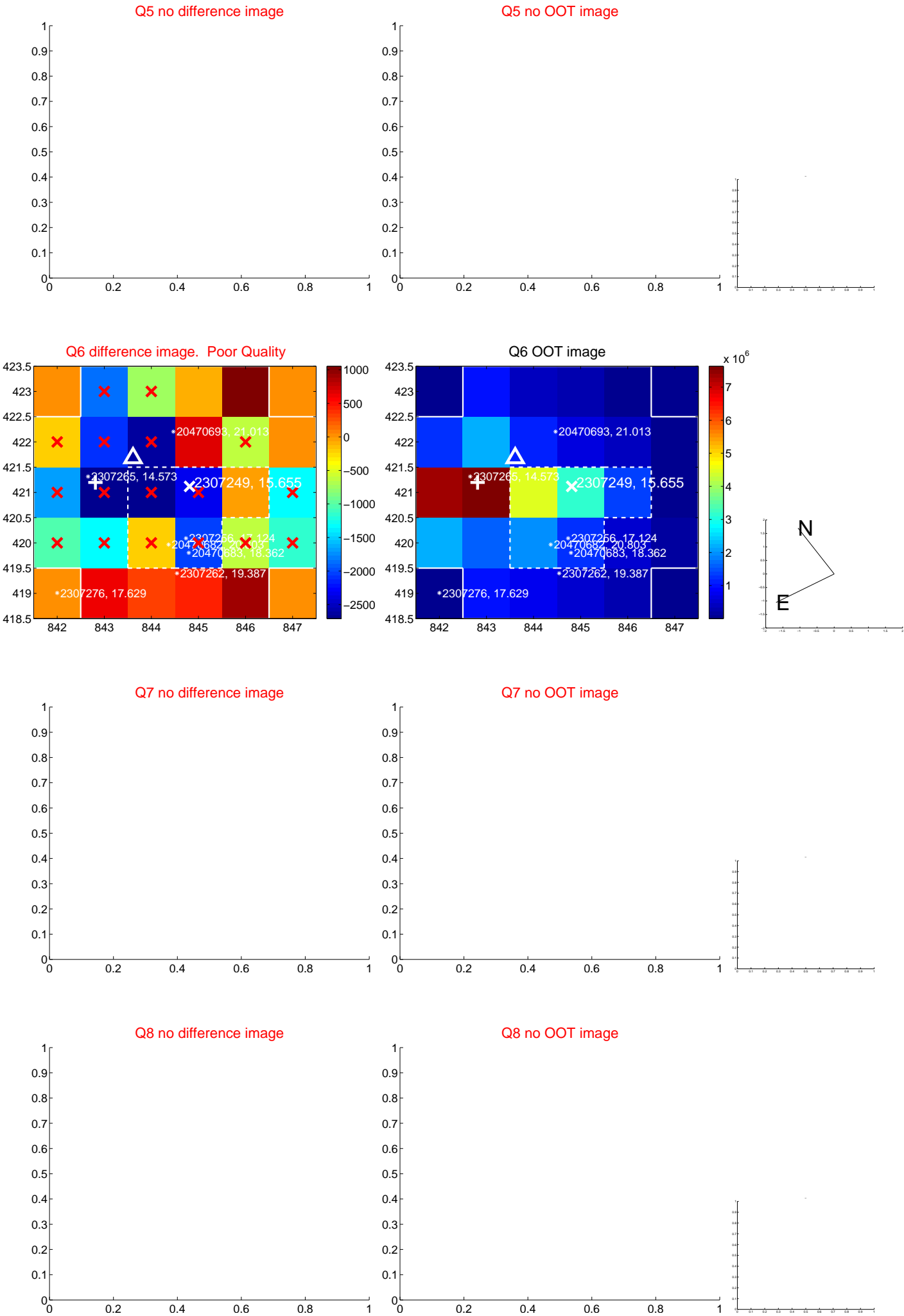


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

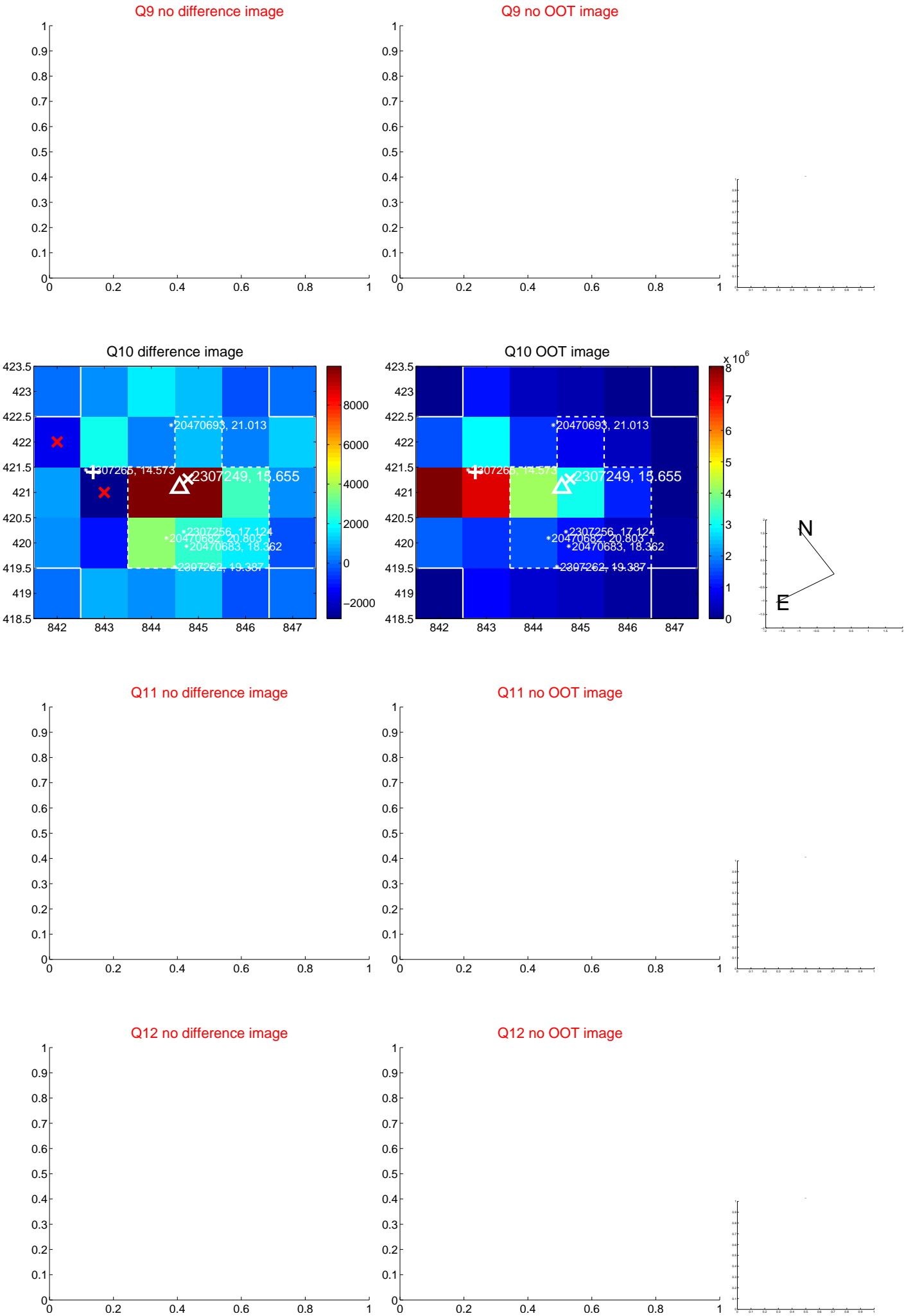
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



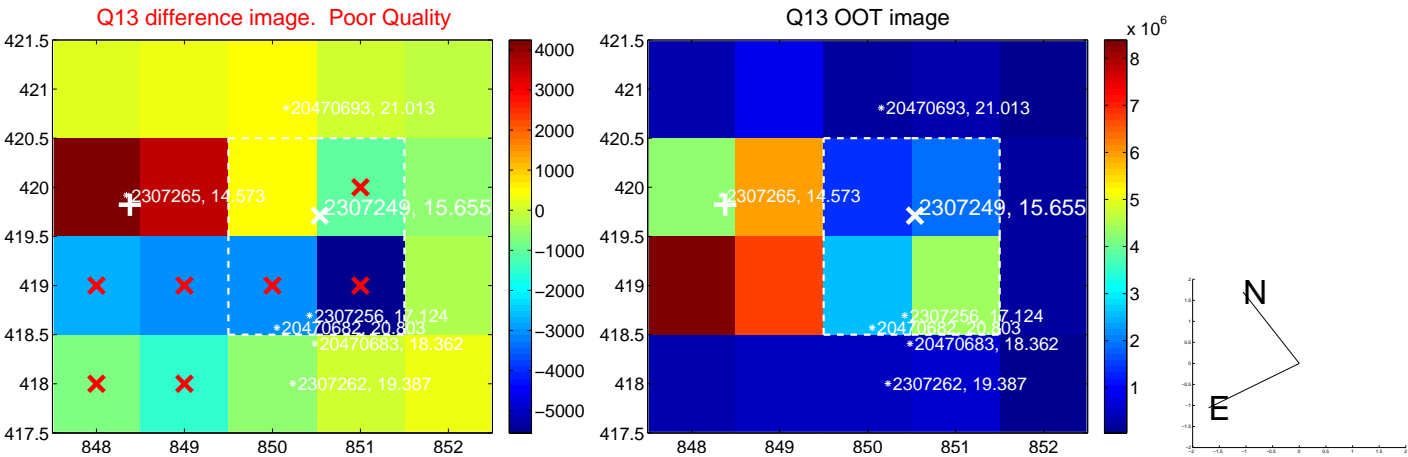
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



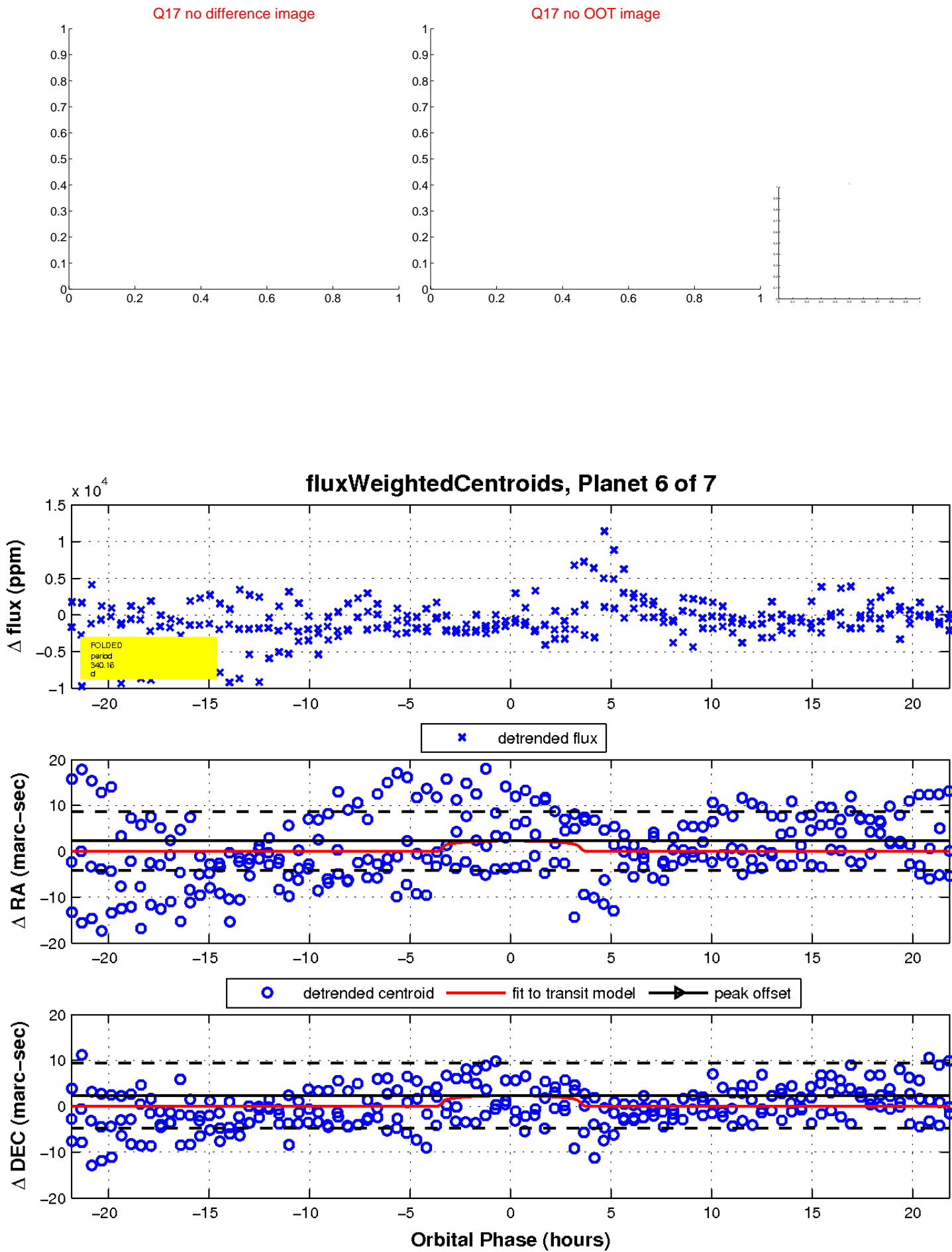
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

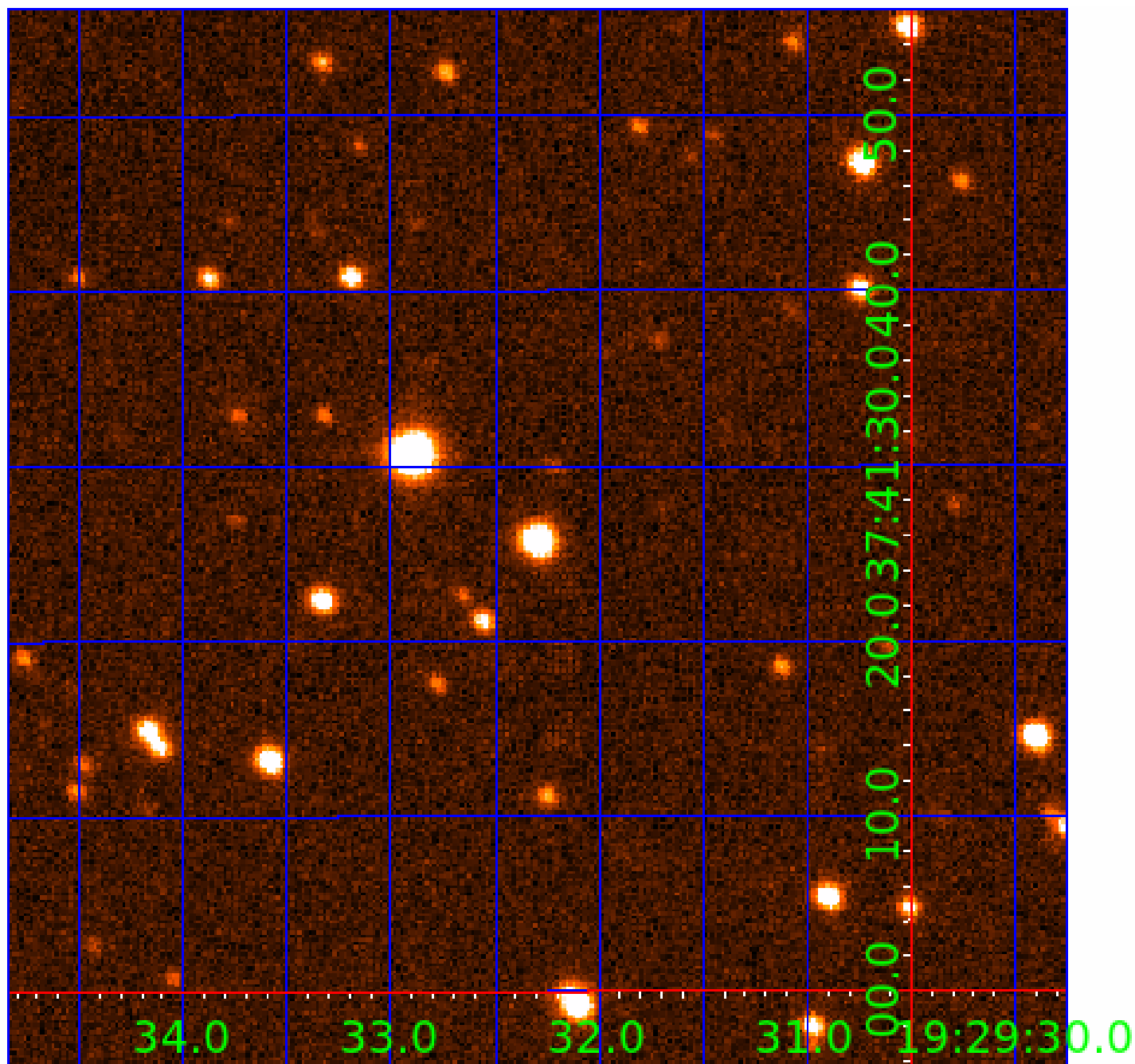


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 002307249

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002307249-01	OBS	No	443.240912	460.377527	3794.6	4.841	18.3	10.1	0.56	4889	4.41	0.18
002307249-02	OBS	No	285.942428	337.467052	4279.8	6.412	12.7	9.0	0.56	4889	3.65	0.32
002307249-03	OBS	No	495.701002	455.692868	2346.6	4.542	11.3	6.1	0.56	4889	2.66	0.15
002307249-04	OBS	No	352.446266	209.048827	2982.8	7.083	11.7	6.7	0.56	4889	3.00	0.24
002307249-05	OBS	No	369.019414	203.606121	3821.5	12.203	12.0	5.9	0.56	4889	3.50	0.23
002307249-06	OBS	No	340.157936	239.395276	3424.6	7.325	12.4	7.6	0.56	4889	3.21	0.26
002307249-07	OBS	No	401.069916	174.237568	1861.9	7.500	11.2	-1.0	0.56	4889	2.37	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002307249-01	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
002307249-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
002307249-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002307249-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002307249-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

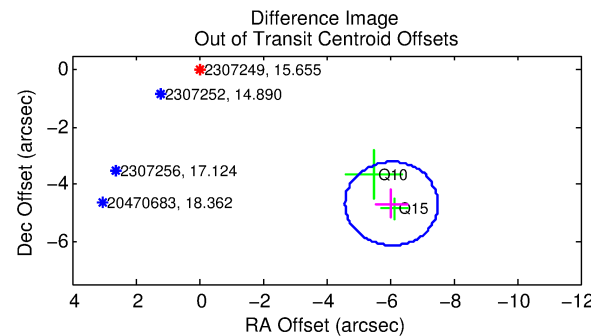
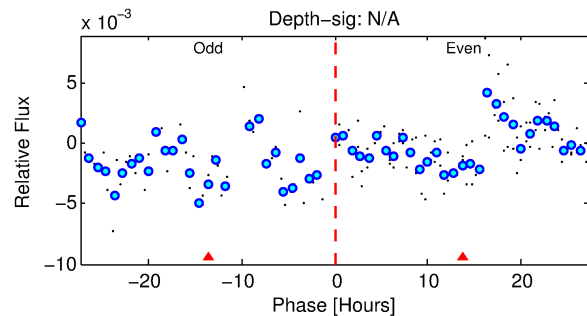
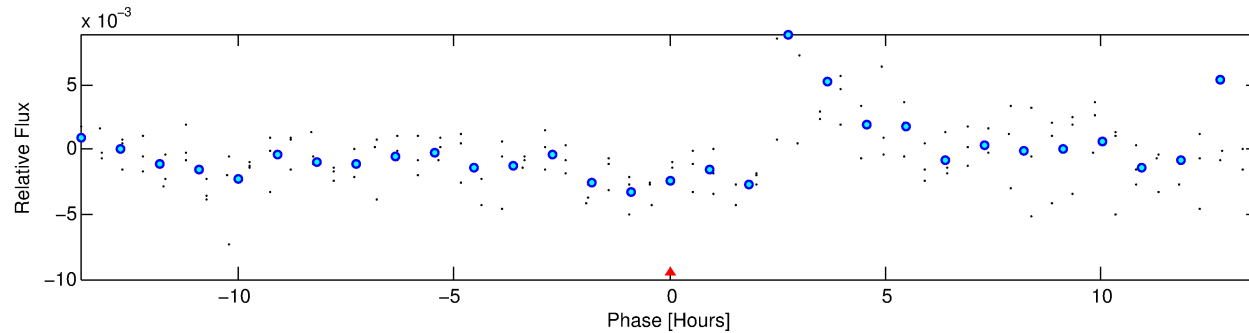
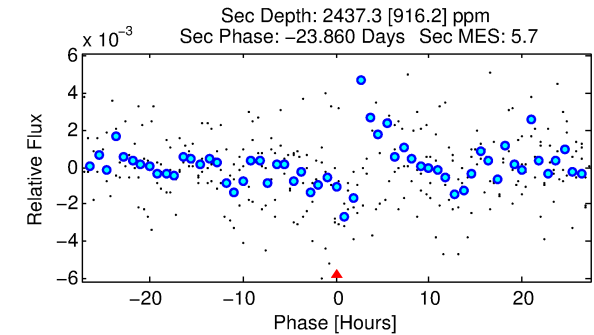
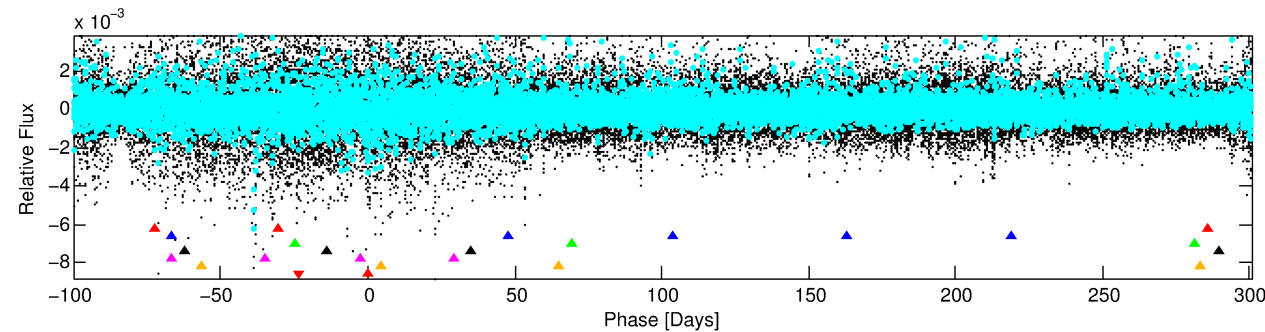
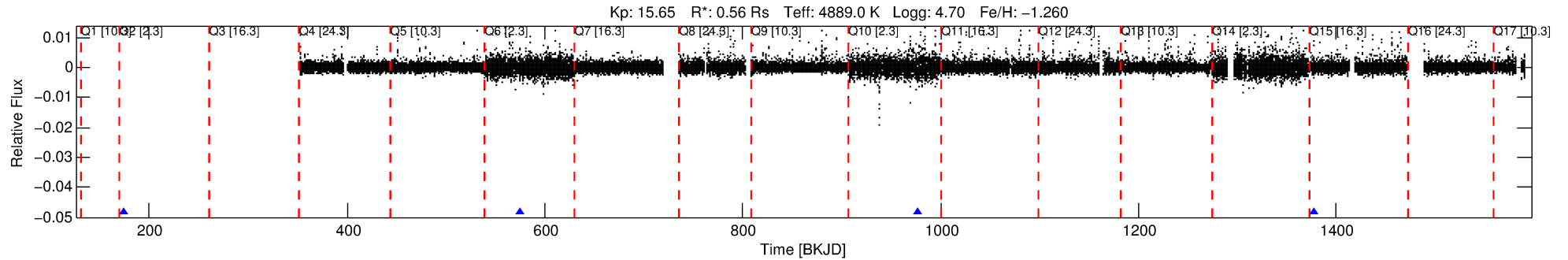
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 002307249-07

No Significant Match Found

# DV One-Page Summary

KIC: 2307249 Candidate: 7 of 7 Period: 401.070 d



## TPS TCE Results:

Period = 401.06992 d  
Epoch = 174.2376 BKJD

DV fit results are unavailable

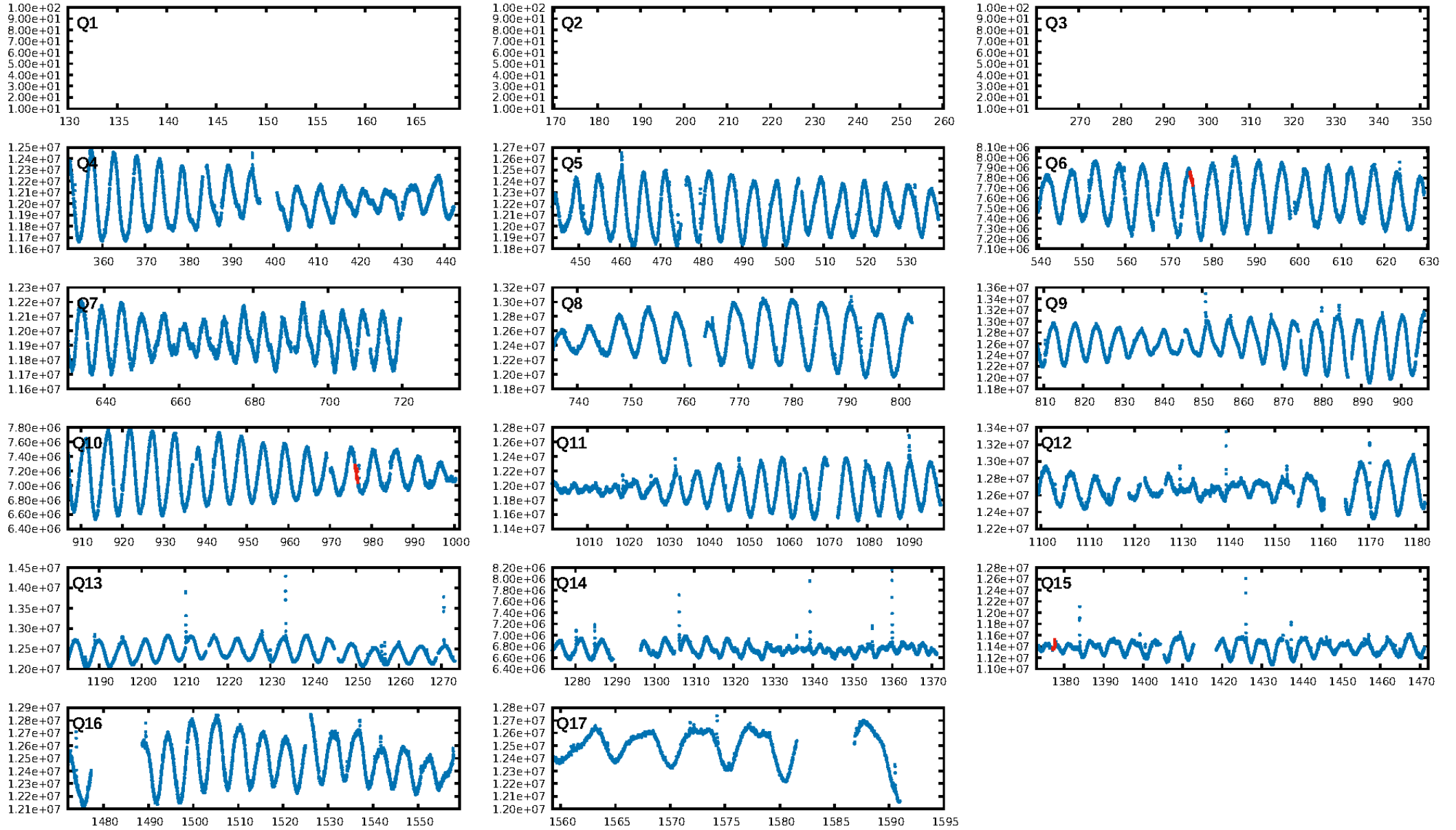
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [53.70 $\sigma$ ]  
LongPeriod-sig: 100.0% [113.38 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.297  
Centroid-sig: 18.7%  
Centroid-so: 1.617 arcsec [1.55 $\sigma$ ]  
OotOffset-rm: 7.652 arcsec [15.69 $\sigma$ ]  
KicOffset-rm: 0.595 arcsec [0.74 $\sigma$ ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

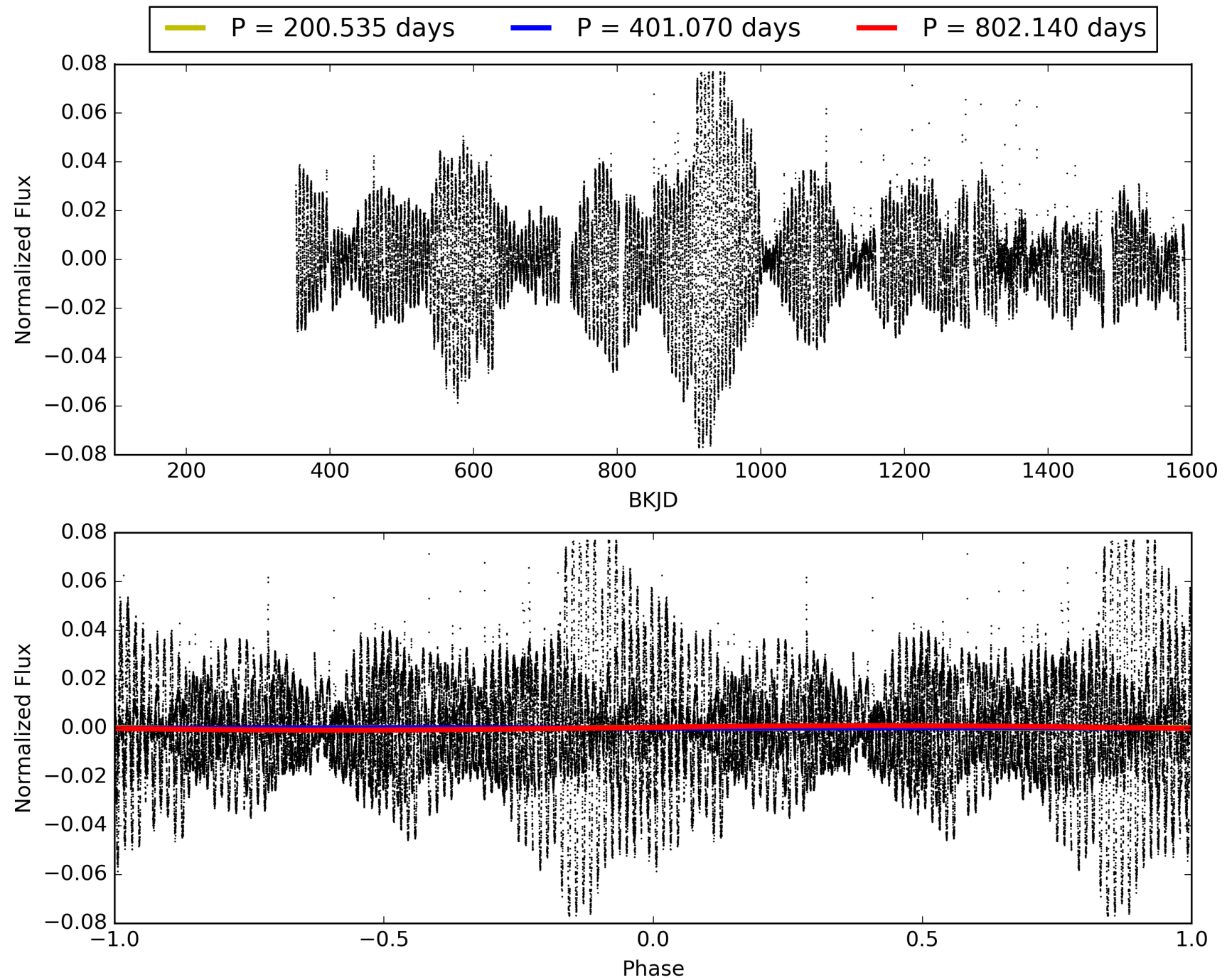
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:52:55 Z

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

# TCE 002307249-07, PDC Light Curves

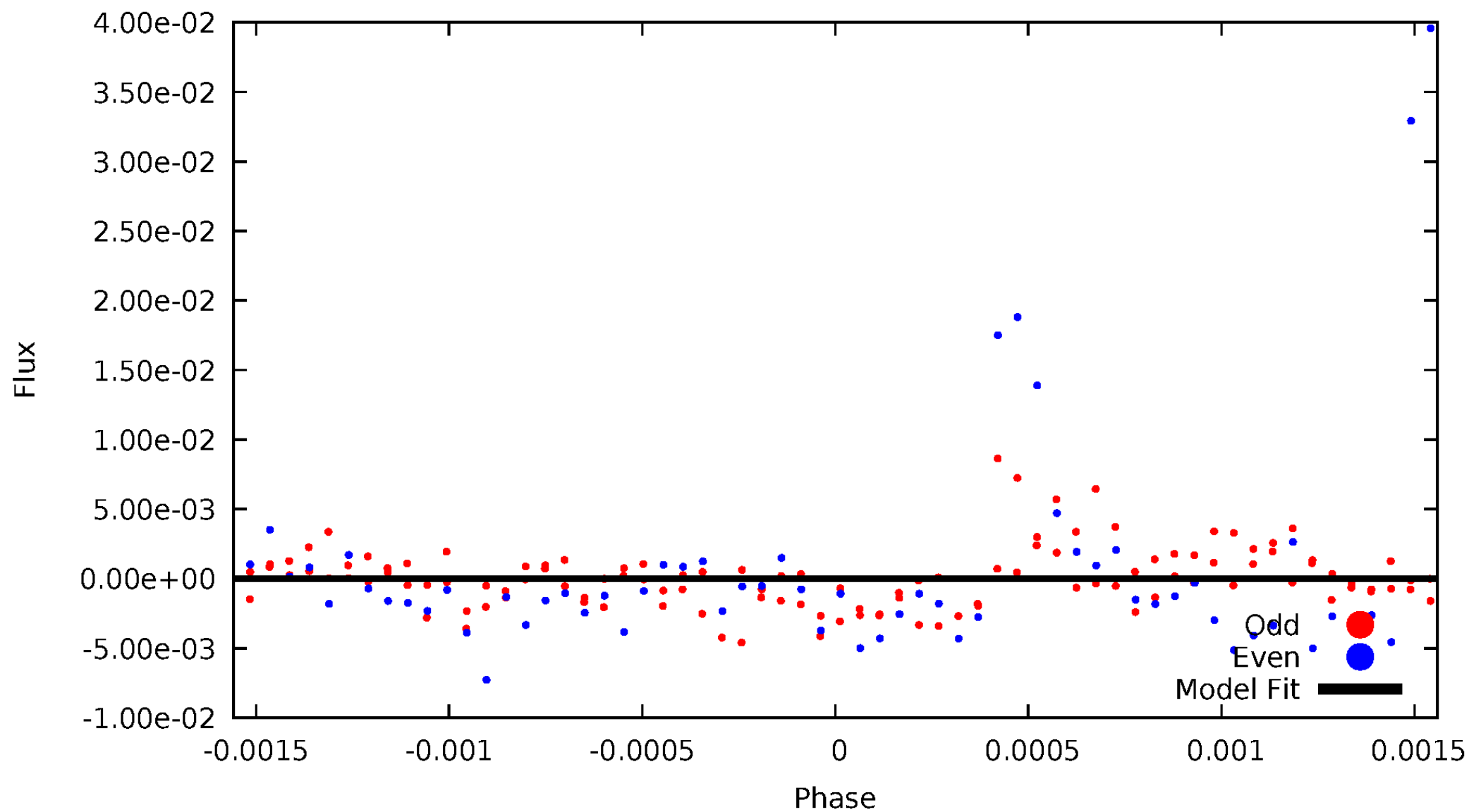


TCE 002307249-07



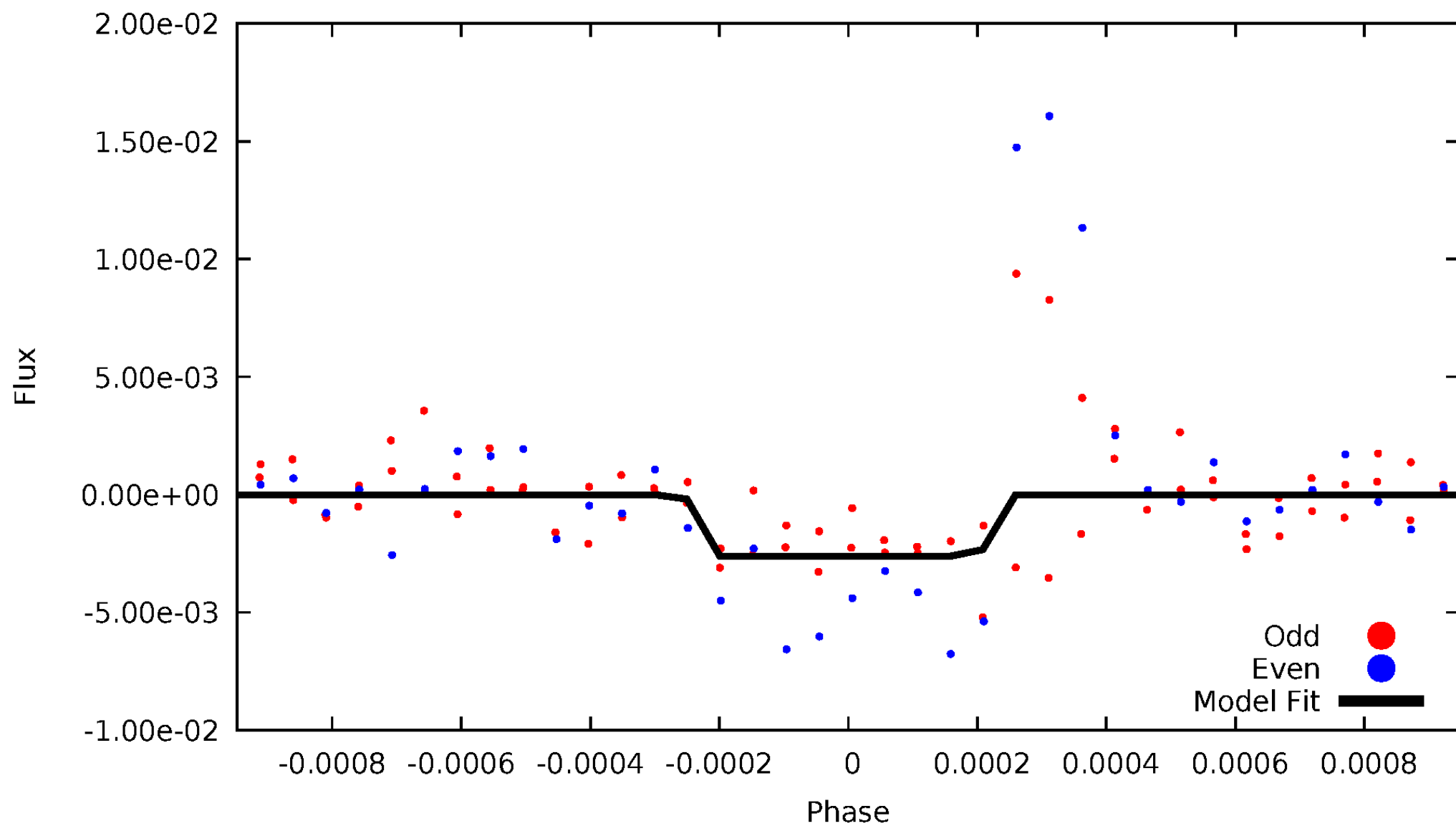
# DV Odd/Even

TCE 002307249-07



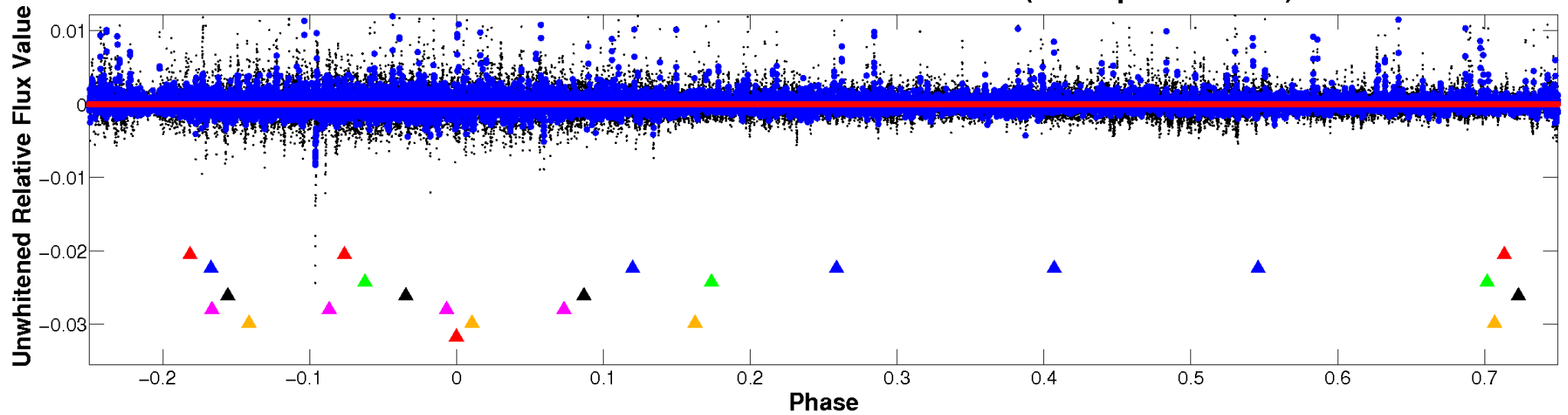
# ALT Odd/Even

TCE 002307249-07



# Non-Whitened Vs. Whitened Light Curve

**Planet 7 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

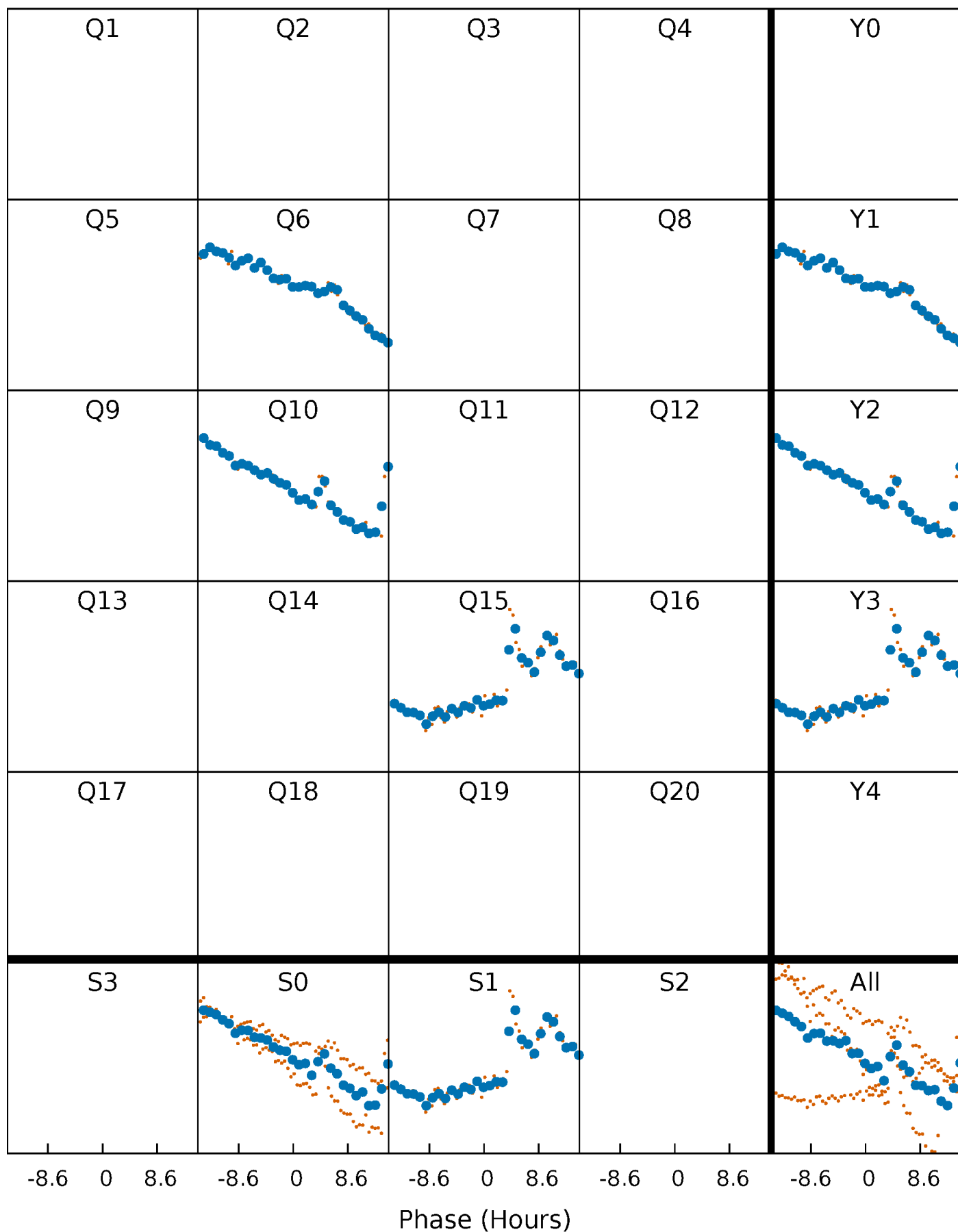


**Planet 7 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

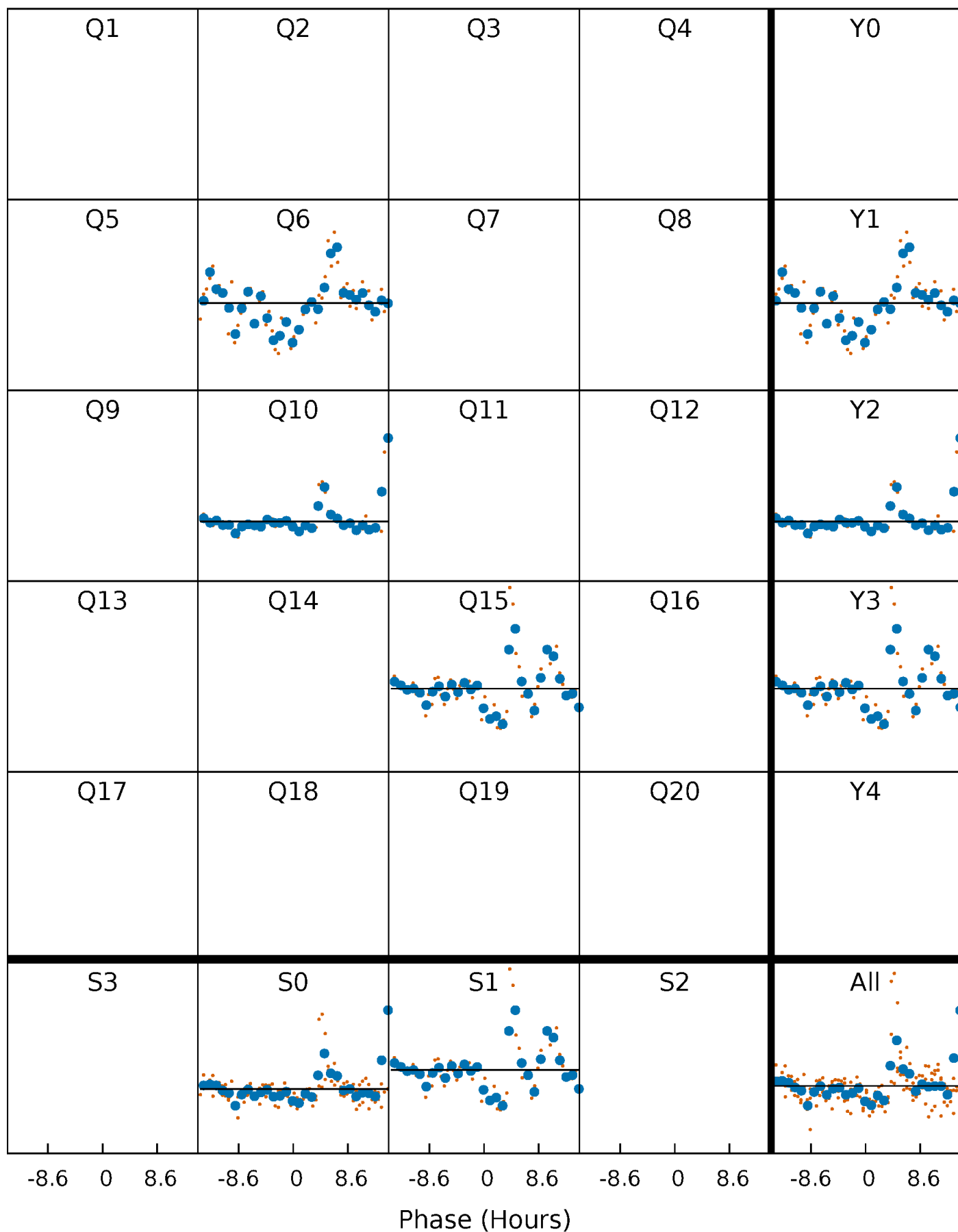
TCE 002307249-07     $P=401.069916$  Days     $T_0=174.237568$  (BKJD)





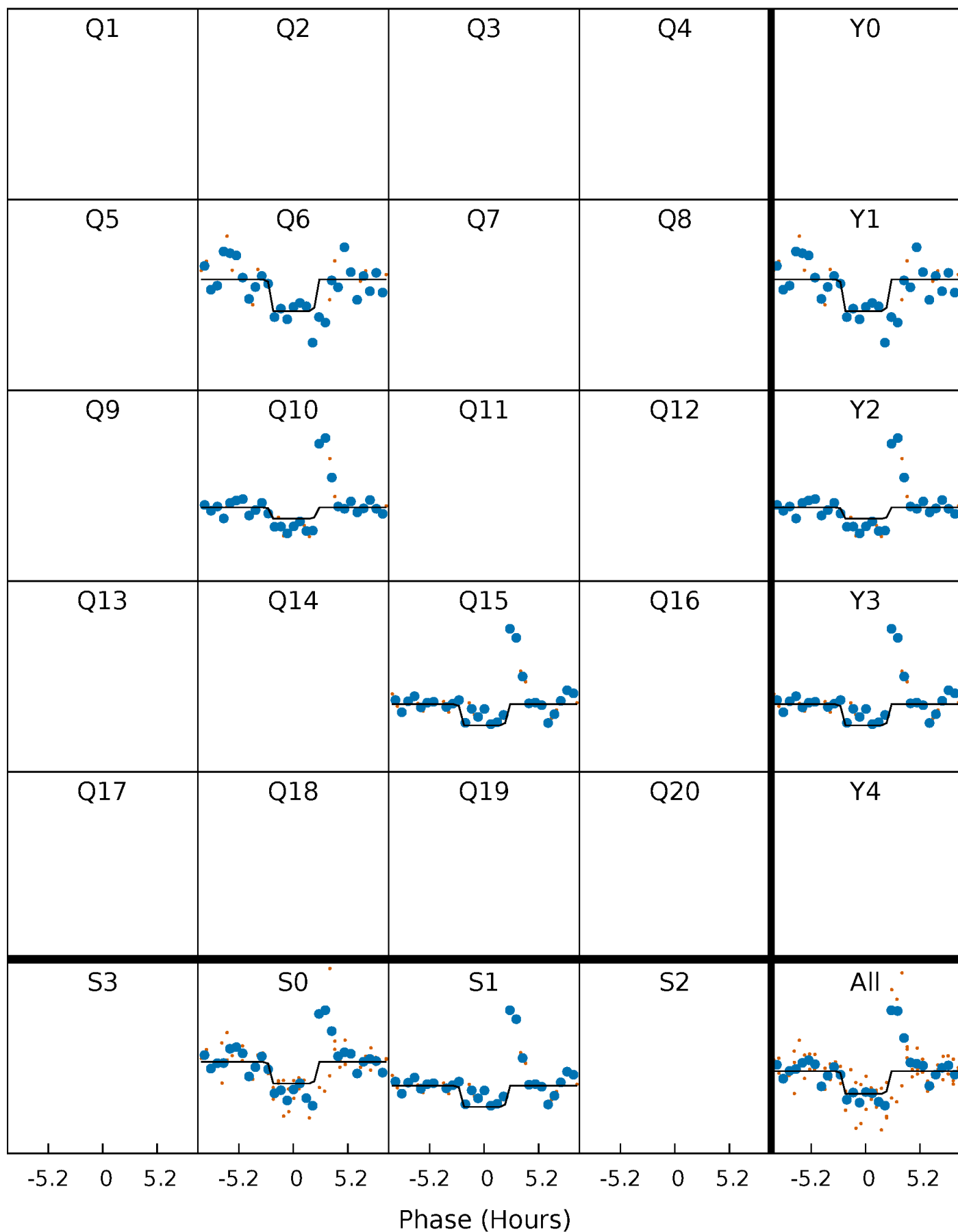
# DV Quarter-Phased Transit Curves

TCE 002307249-07     $P=401.069916$  Days     $T_0=174.237568$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

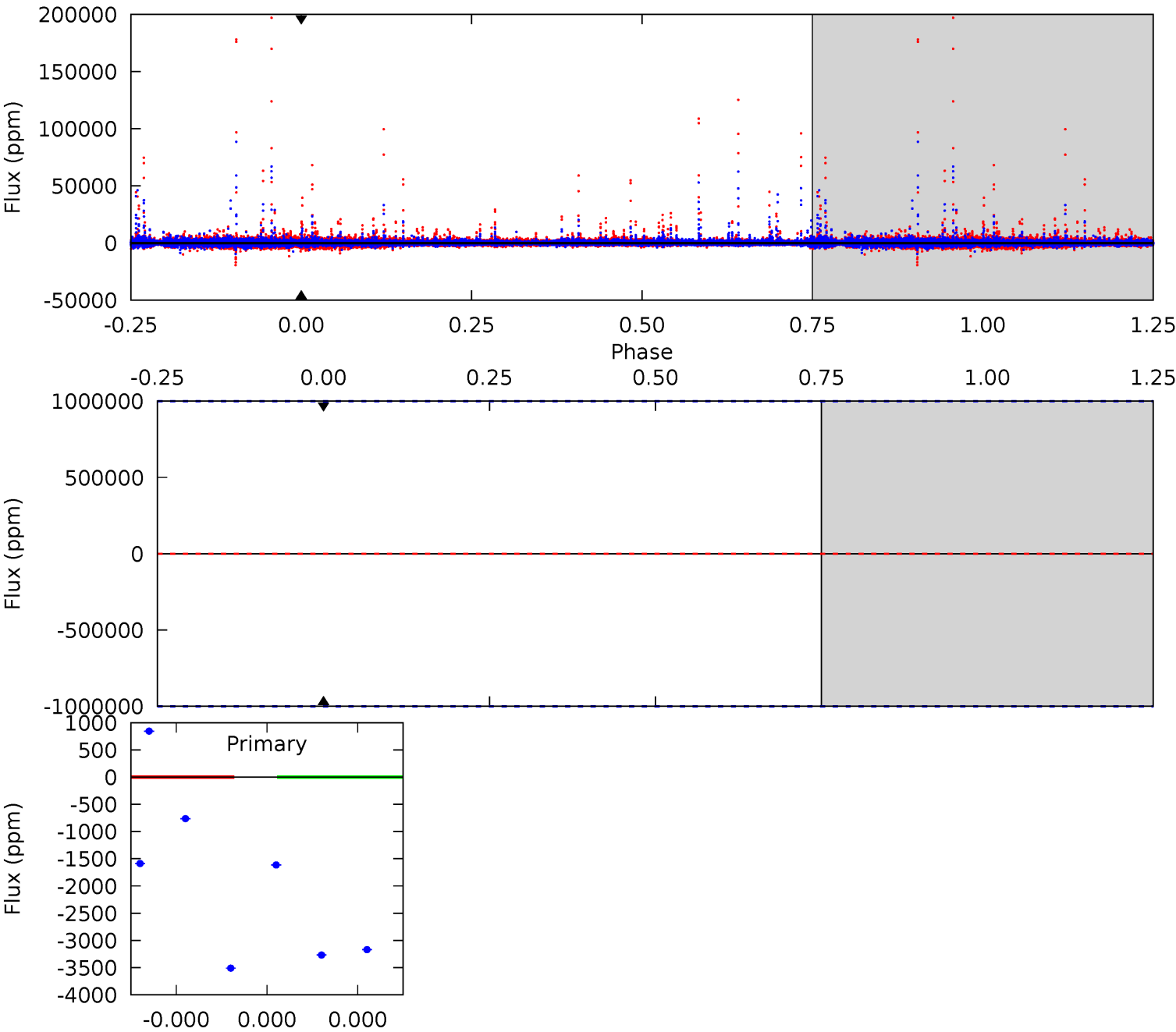
TCE 002307249-07 P=401.069916 Days  $T_0=174.301757$  (BKJD)



# DV Model-Shift Uniqueness Test

002307249-07, P = 401.069916 Days, E = 174.237568 Days

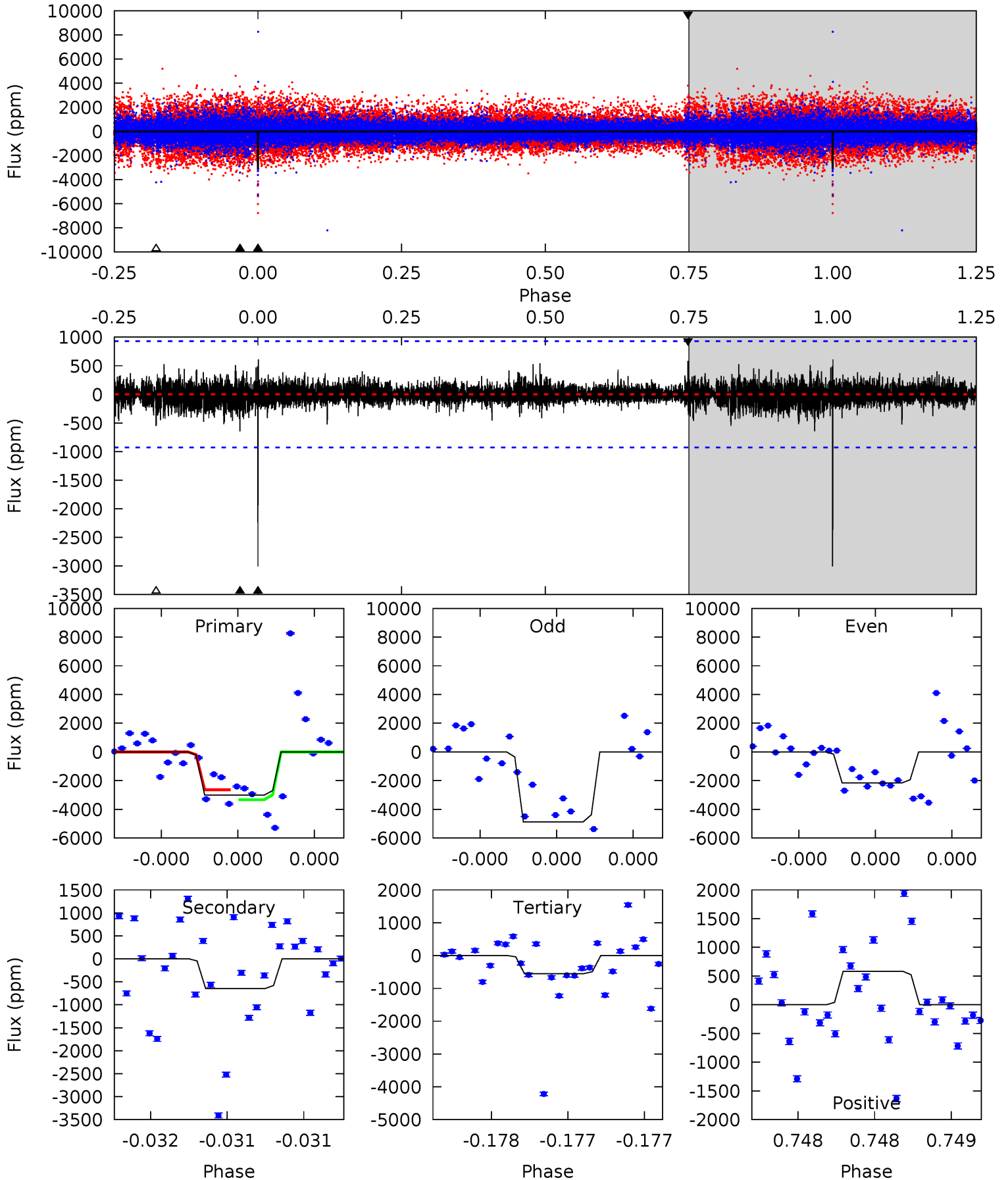
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

002307249-07, P = 401.069916 Days, E = 174.301757 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
18.1	3.88	3.30	3.50	5.59	3.50	0.63	14.8	14.6	0.58	0.38	7.98	1.08	0.17	2.09



### Stellar Parameters For KIC 002307249

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4889^{+176}_{-176}$	$4.699^{+0.048}_{-0.028}$	$-1.260^{+0.300}_{-0.300}$	$0.557^{+0.033}_{-0.037}$	$0.565^{+0.041}_{-0.024}$	$4.611^{+0.903}_{-0.537}$
	+4%/-4%	+1%/-1%	+24%/-24%	+6%/-7%	+7%/-4%	+20%/-12%
Source	KIC0	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 002307249-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$5.37^{+4.90}_{-3.69}$	$239^{+9}_{-9}$	$4336^{+9601}_{-14838}$	$68178^{+3554519}_{-1804304}$
Alt.	$-645 \pm 166$	$5.53^{+4.98}_{-3.83}$	$239^{+9}_{-9}$	$3101^{+1517}_{-482}$	$8575^{+84532}_{-6162}$

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

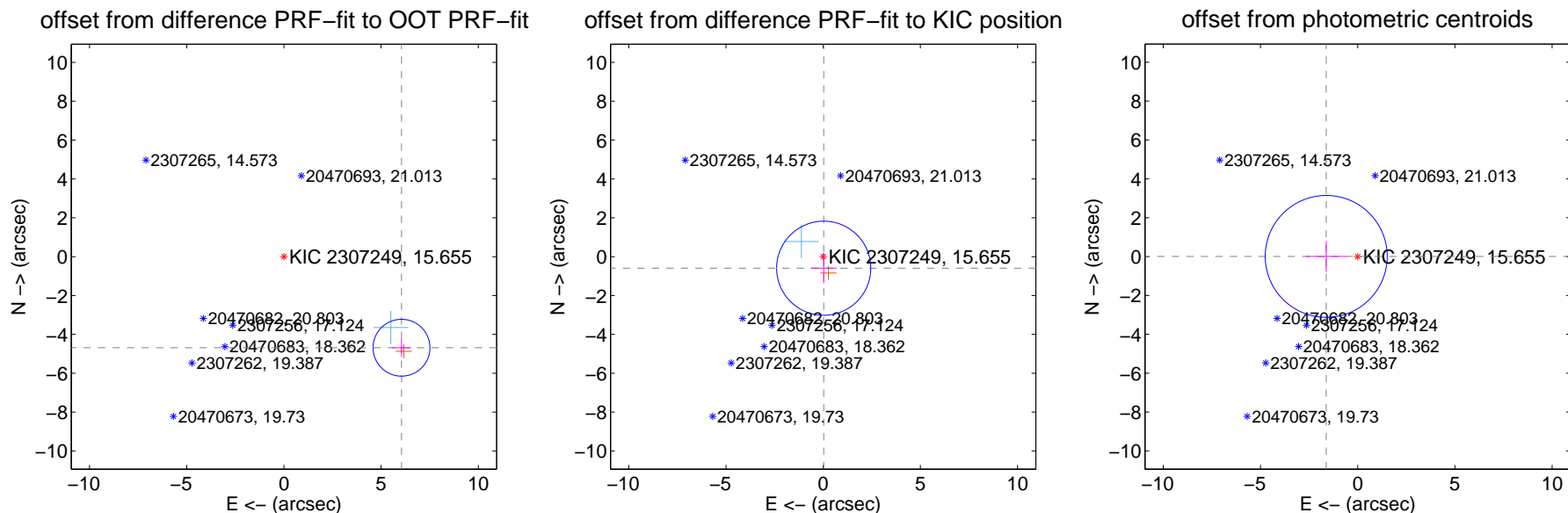
## DV Centroid Data

Supplemental centroid analysis for 002307249-07. Kepler magnitude: 15.65. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 7.14 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$7.652 \pm 0.488$	15.69	$-6.048 \pm 0.498$	$-4.687 \pm 0.469$
PRF-fit source offset from KIC position	$0.595 \pm 0.807$	0.74	$-0.027 \pm 0.669$	$-0.595 \pm 0.778$
photometric centroid source offset	$1.62 \pm 1.05$	1.55	$1.62 \pm 1.05$	$0.01 \pm 0.80$

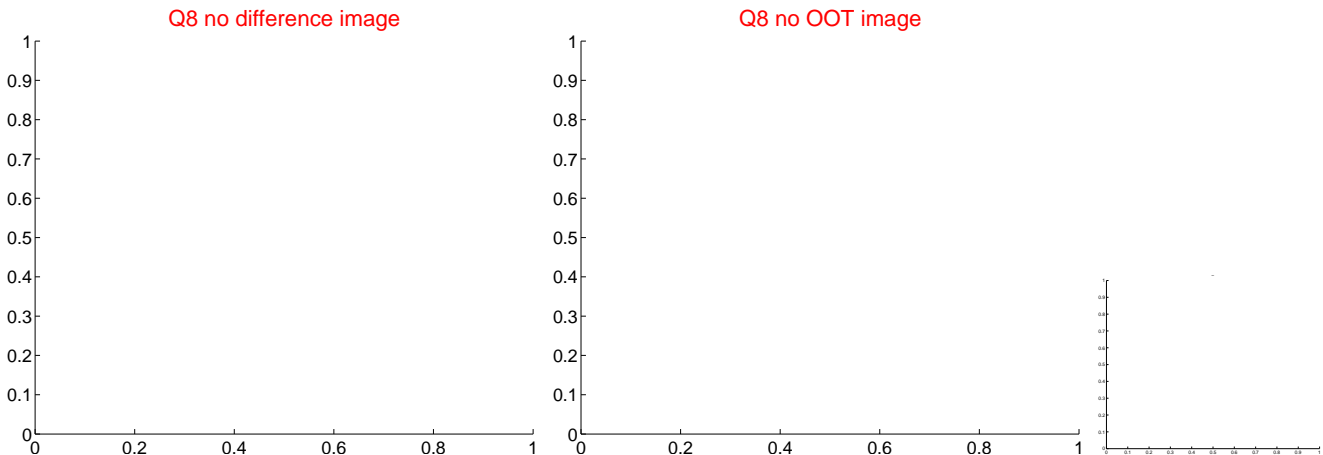
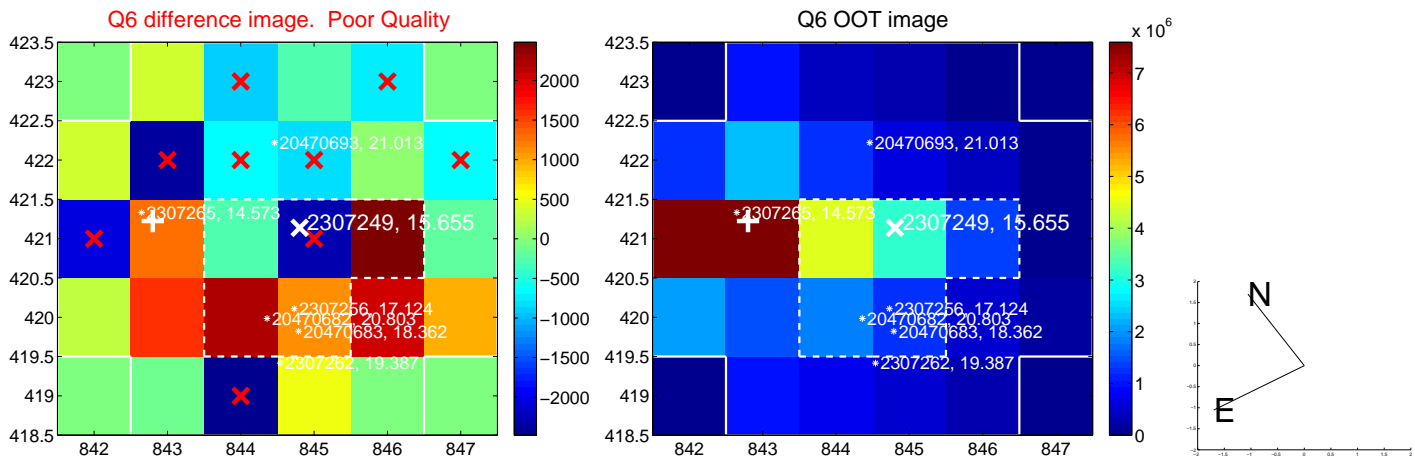


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

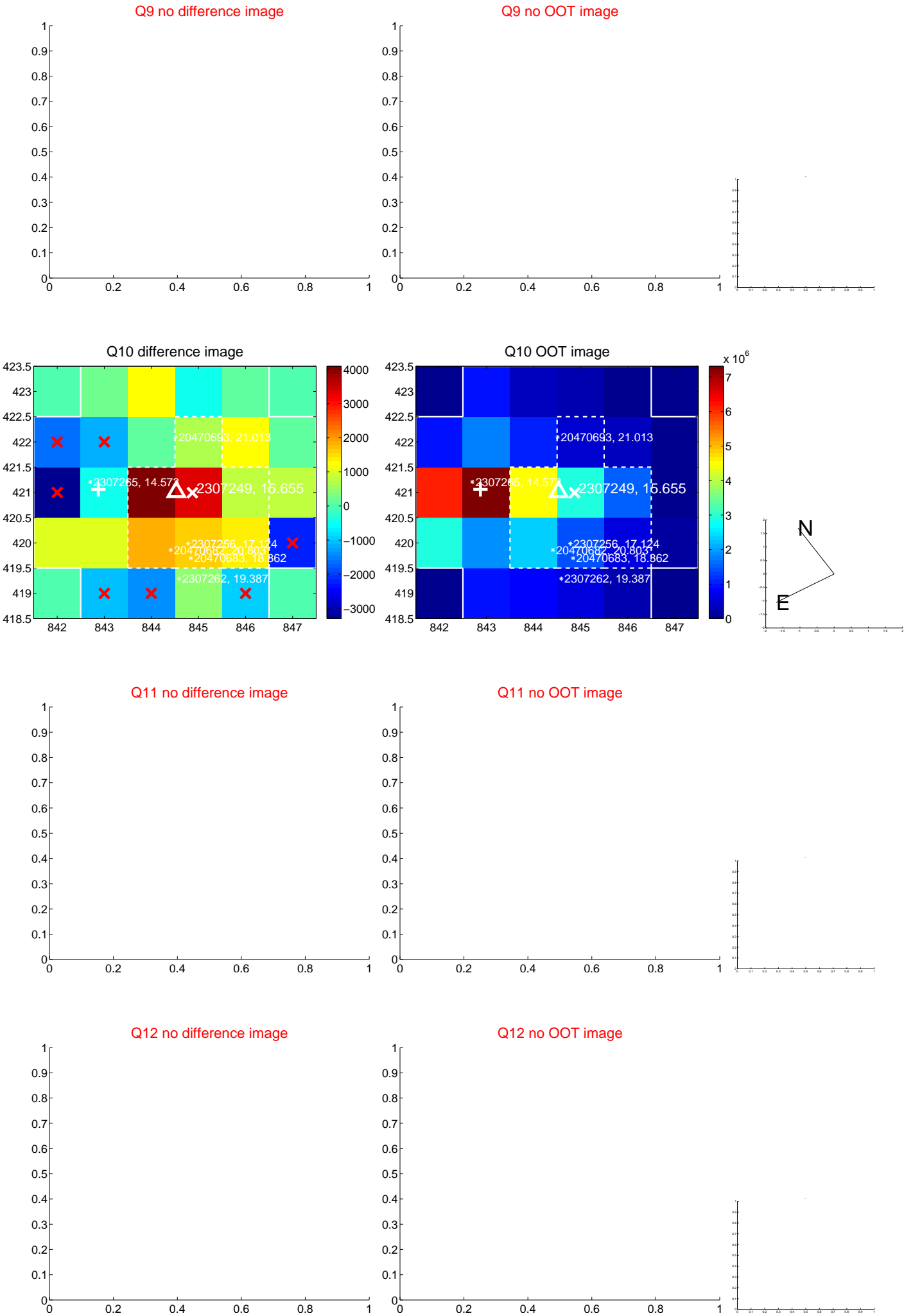


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

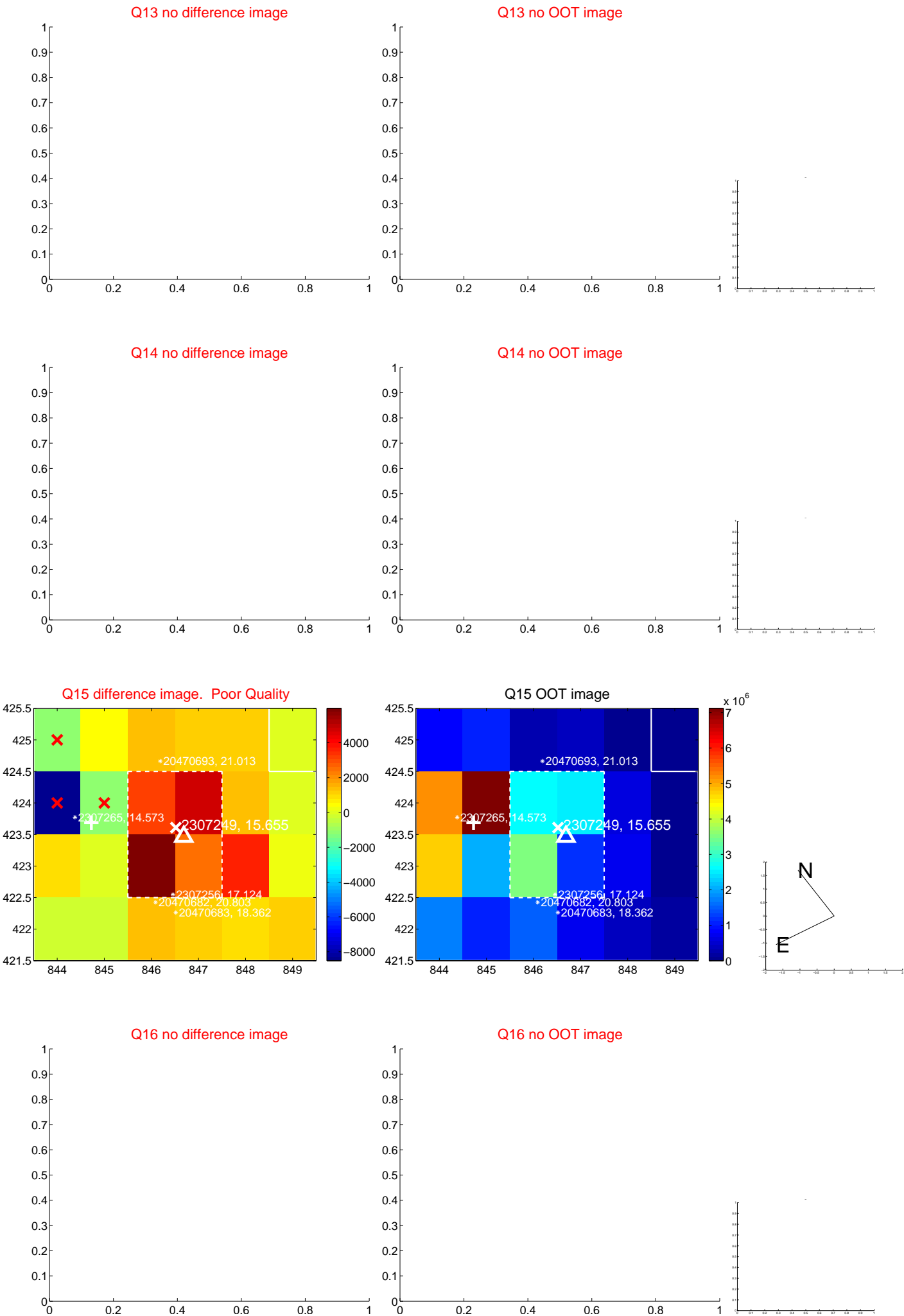




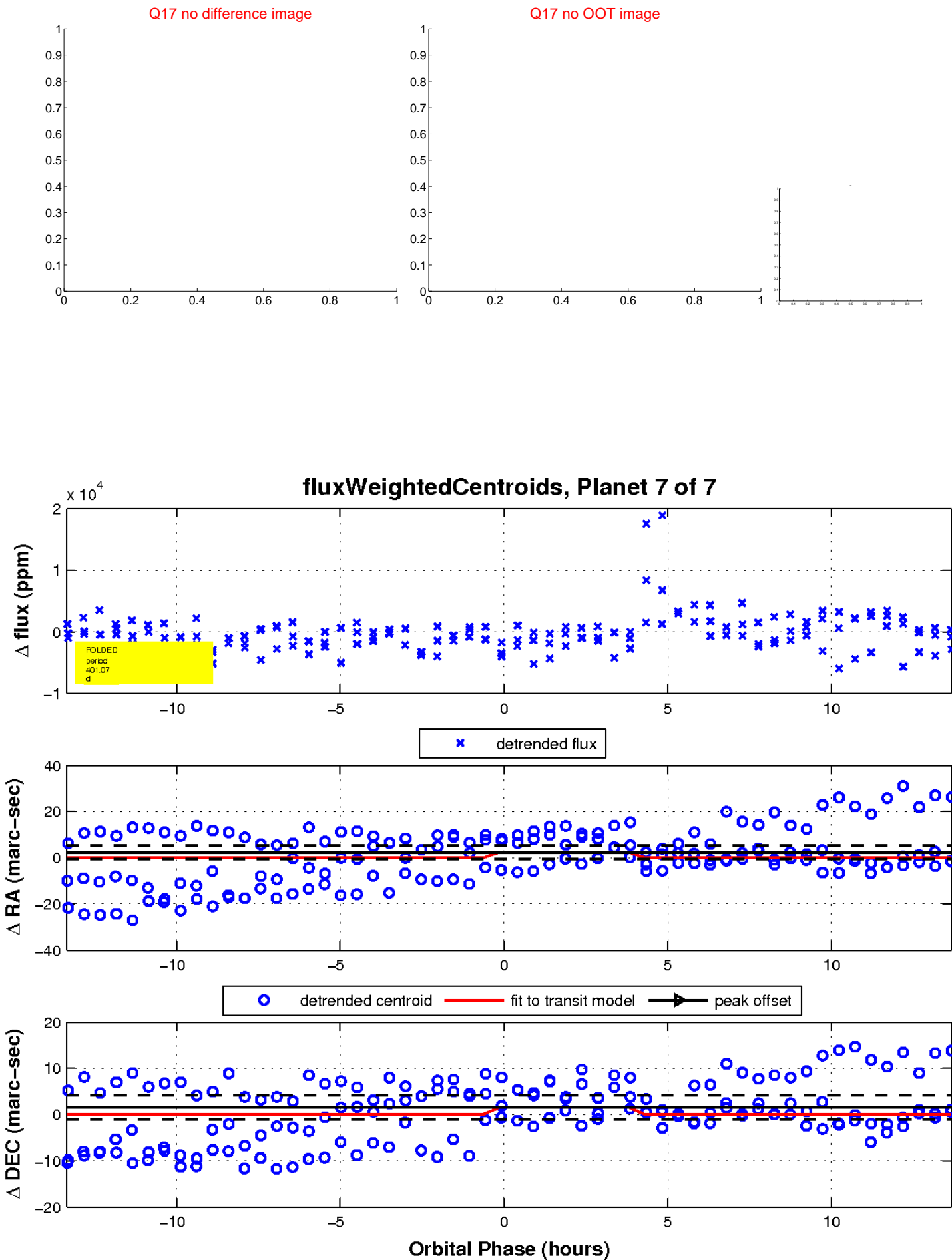
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

