

# KIC 004347340

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004347340-01	OBS	No	3.158864	133.148926	242.9	15.009	8.8	10.4	0.72	5520	2.27	316.45
004347340-02	OBS	No	135.677907	224.619027	2088.6	46.049	10.1	7.9	0.72	5520	6.22	2.10
004347340-03	OBS	No	87.991096	213.154786	368.8	3.537	8.3	2.9	0.72	5520	1.48	3.75
004347340-04	OBS	No	382.441320	469.090433	709.9	9.000	9.2	-1.0	0.72	5520	1.92	0.53
004347340-05	OBS	No	124.986879	180.255833	1131.3	5.349	8.4	8.3	0.72	5520	2.57	2.35
004347340-06	OBS	No	67.732451	157.191789	1000.9	1.868	7.6	6.9	0.72	5520	2.58	5.31
004347340-07	OBS	No	117.676012	221.262001	646.1	7.500	8.5	-1.0	0.72	5520	1.83	2.54
004347340-08	OBS	No	184.597816	283.138226	2018.4	5.000	12.1	-1.0	0.72	5520	3.23	1.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004347340-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_KIC_POS
004347340-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004347340-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
004347340-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—CENT_NOFITS
004347340-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
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**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

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

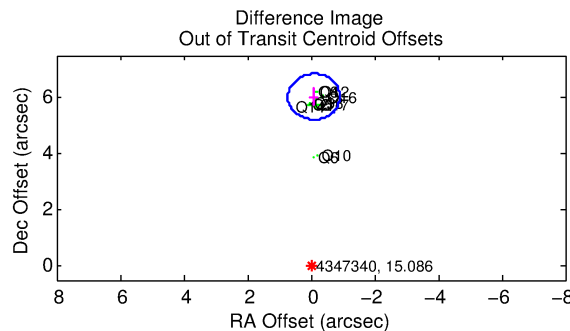
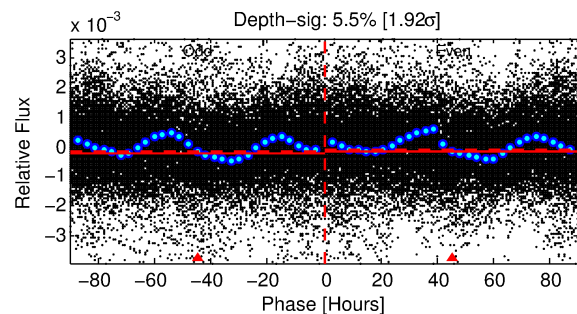
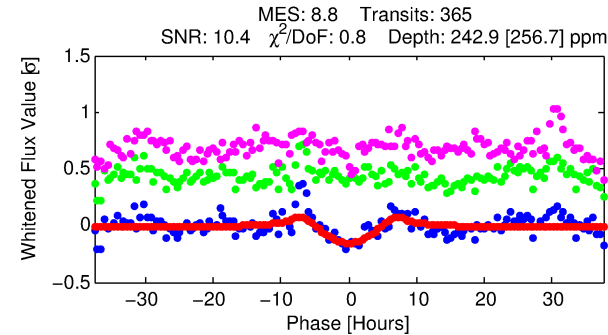
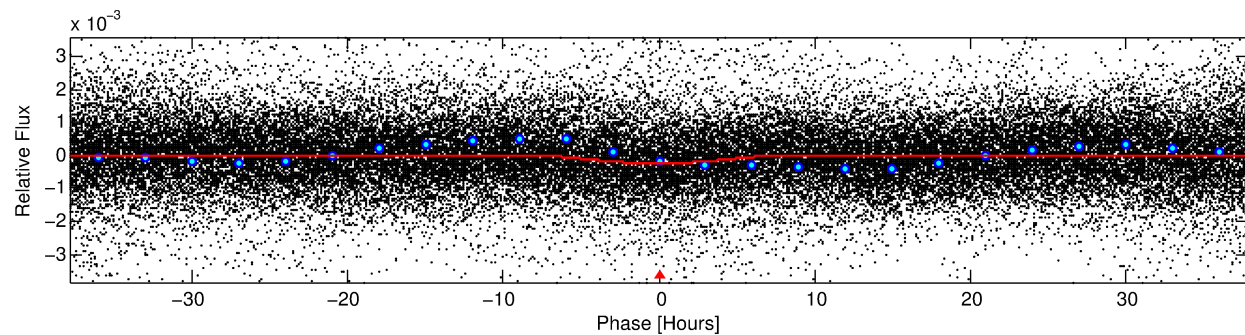
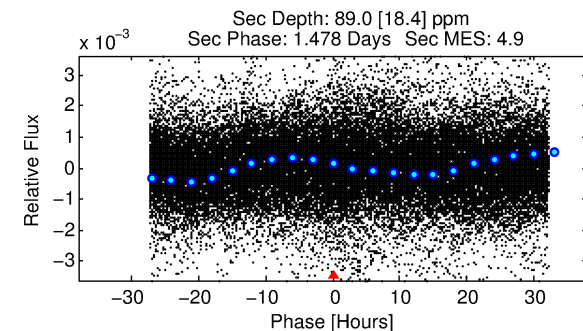
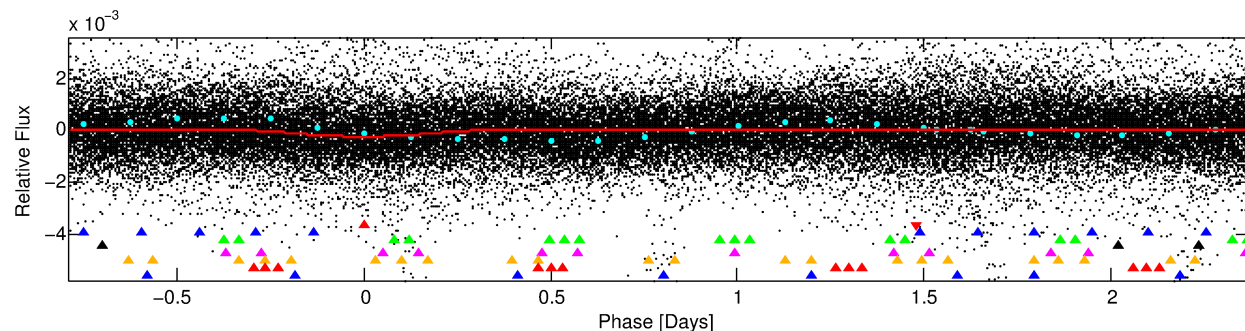
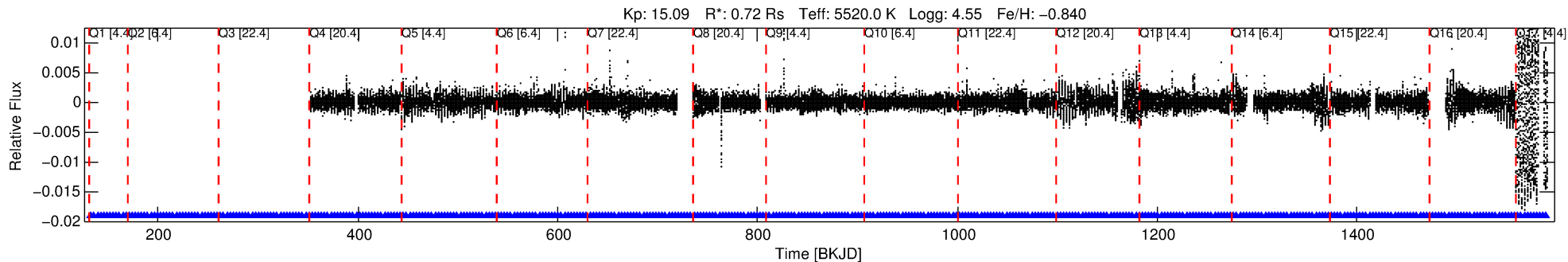
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004347340-01

No Significant Match Found

# DV One-Page Summary

KIC: 4347340 Candidate: 1 of 8 Period: 3.159 d



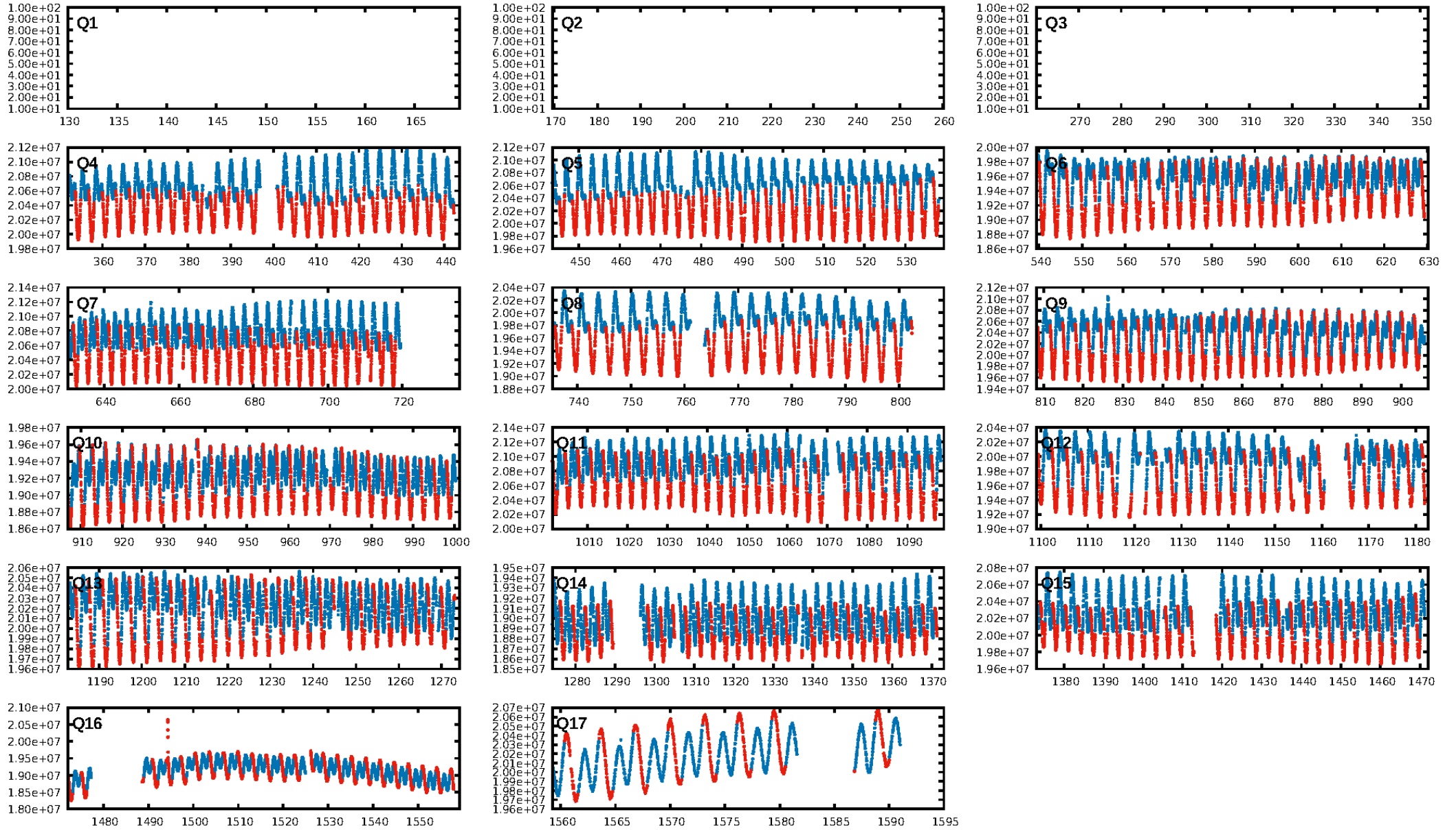
## DV Fit Results:

Period = 3.15886 [0.00010] d  
Epoch = 133.1489 [0.0259] BKJD  
Rp/R\* = 0.0289 [0.0396]  
a/R\* = 1.08 [0.01]  
b = 1.00 [0.04]  
Seff = 316.45 [70.09]  
Teff = 1075 [60] K  
Rp = 2.28 [3.13] Re  
a = 0.0370 [0.0043] AU  
Ag = 12.97 [35.71] [0.34 $\sigma$ ]  
Teffp = 3155 [2171] K [0.96 $\sigma$ ]

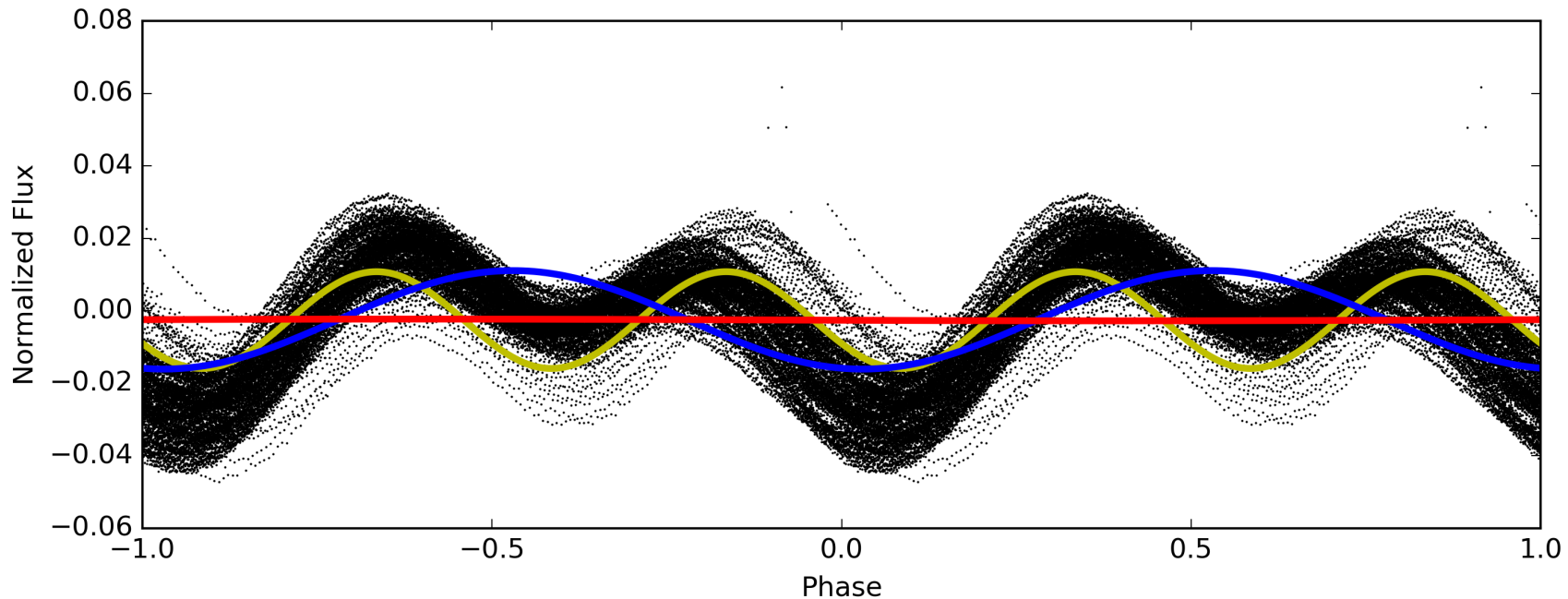
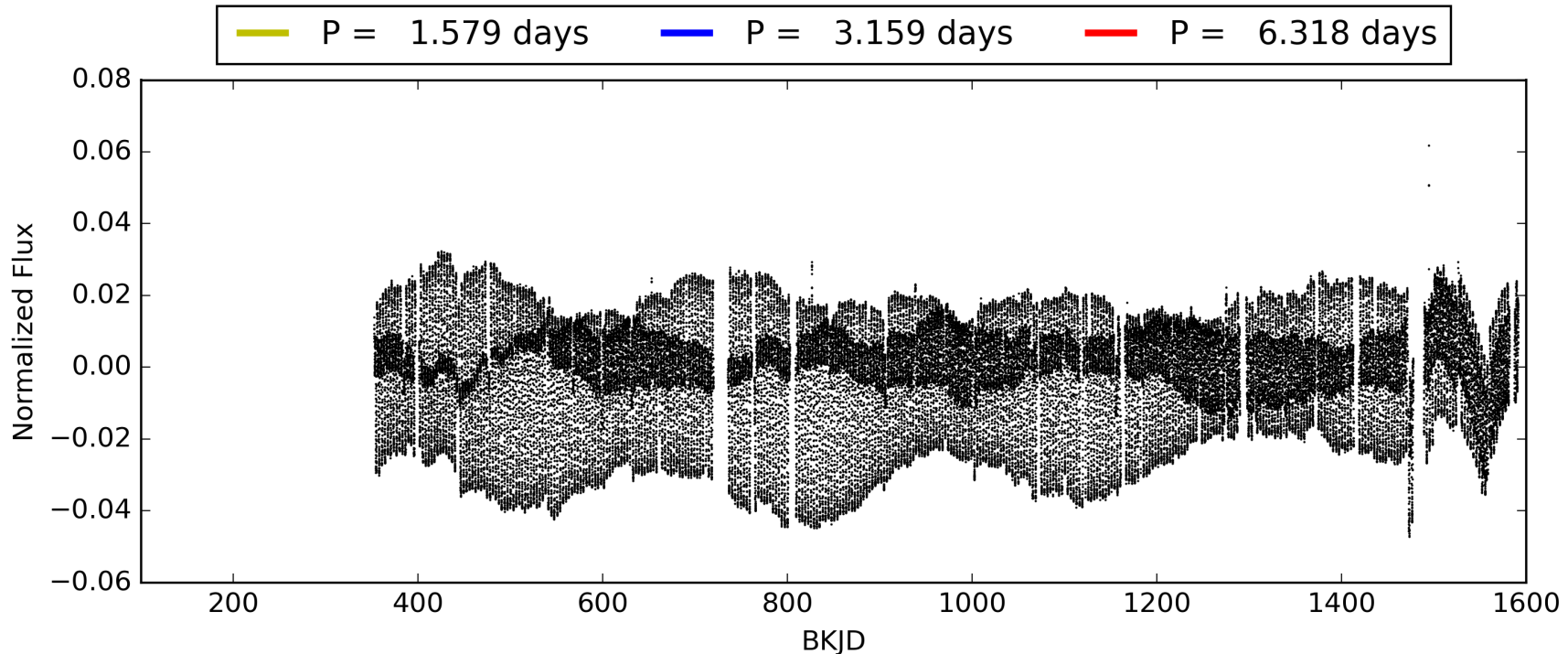
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [102.47 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [357/357]  
GhostDiagnostic-chr: 6.42  
Centroid-sig: 0.1%  
Centroid-so: 0.579 arcsec [0.46 $\sigma$ ]  
OotOffset-rm: 6.029 arcsec [22.17 $\sigma$ ]  
KicOffset-rm: 0.120 arcsec [1.73 $\sigma$ ]  
OotOffset-st: 3/0/4/4 [11]  
KicOffset-st: 3/3/4/4 [14]  
DiffImageQuality-fgm: 0.93 [13/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 004347340-01, PDC Light Curves



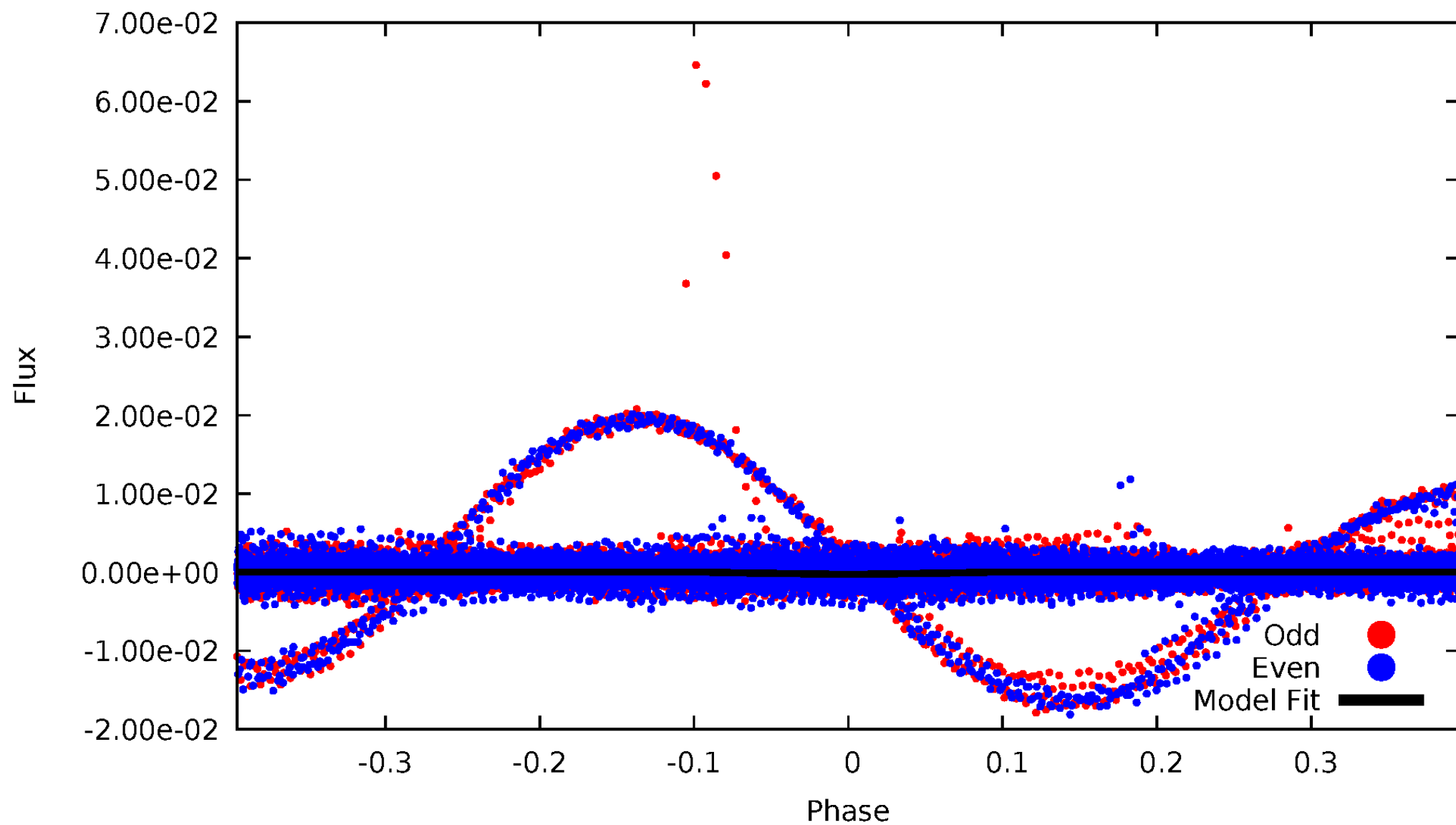
TCE 004347340-01





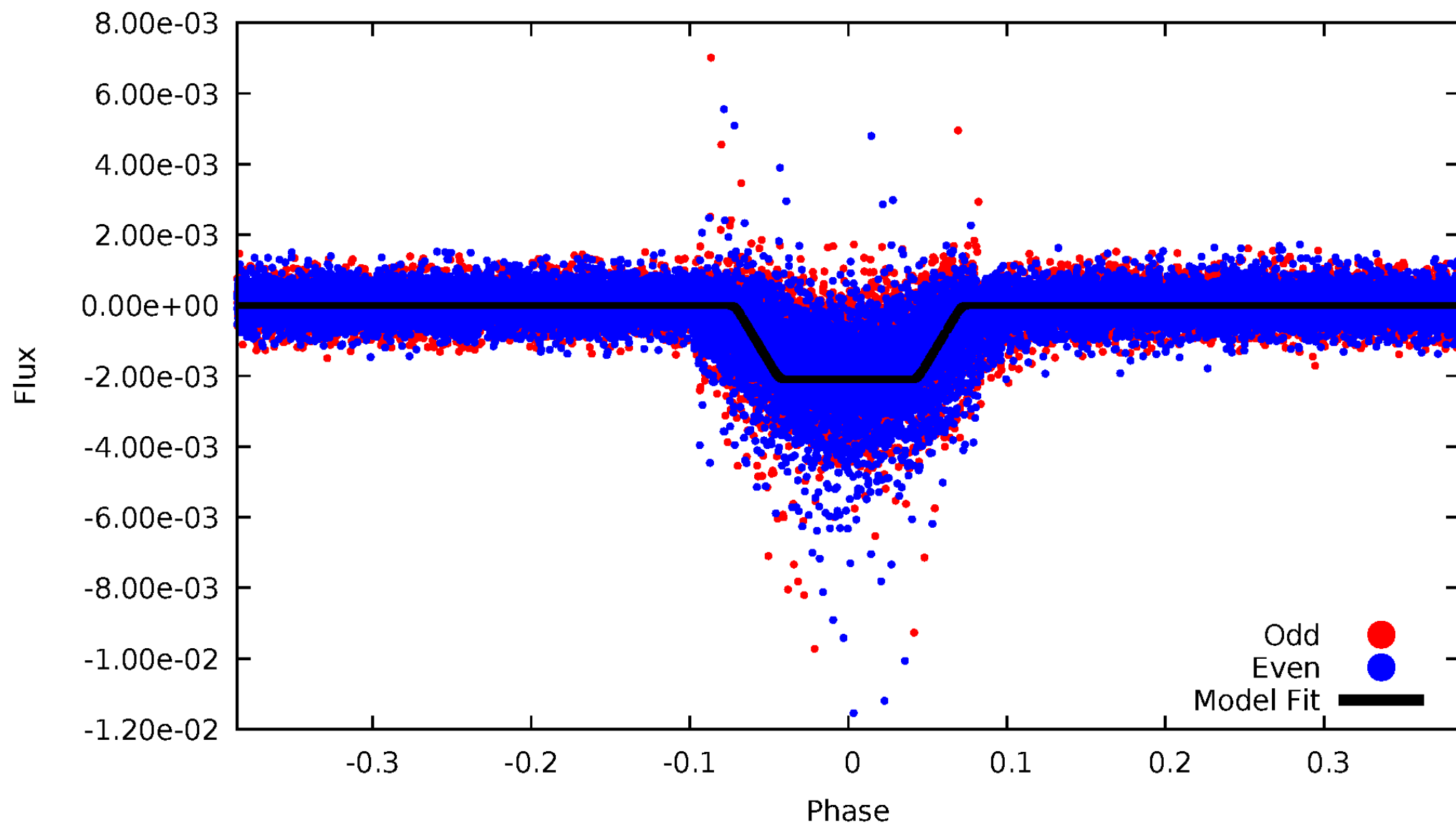
# DV Odd/Even

TCE 004347340-01

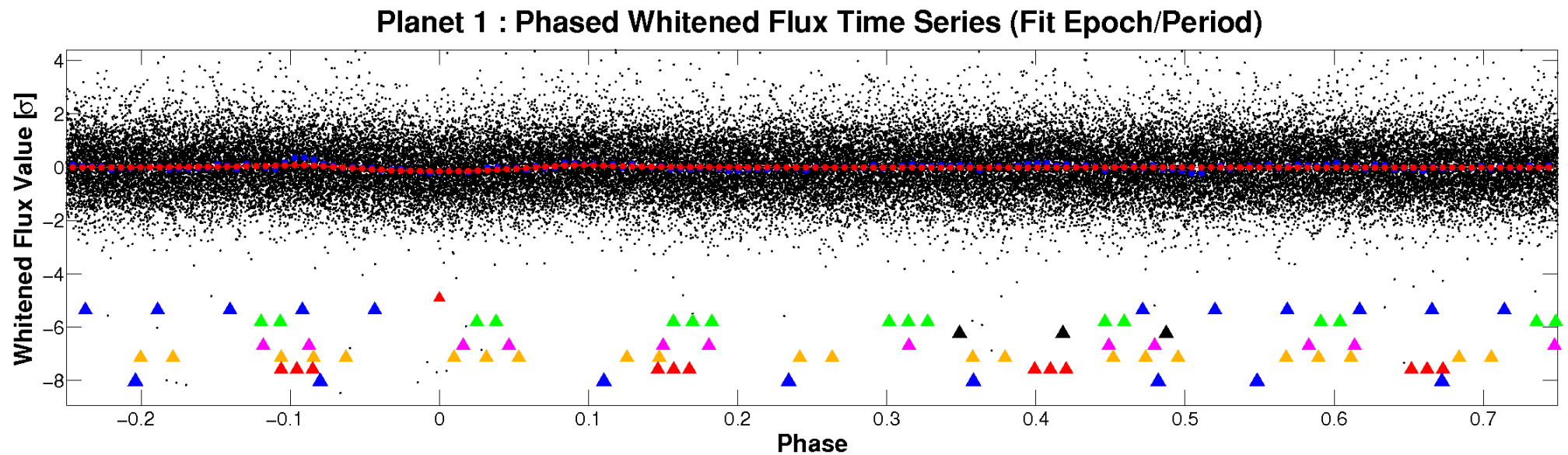
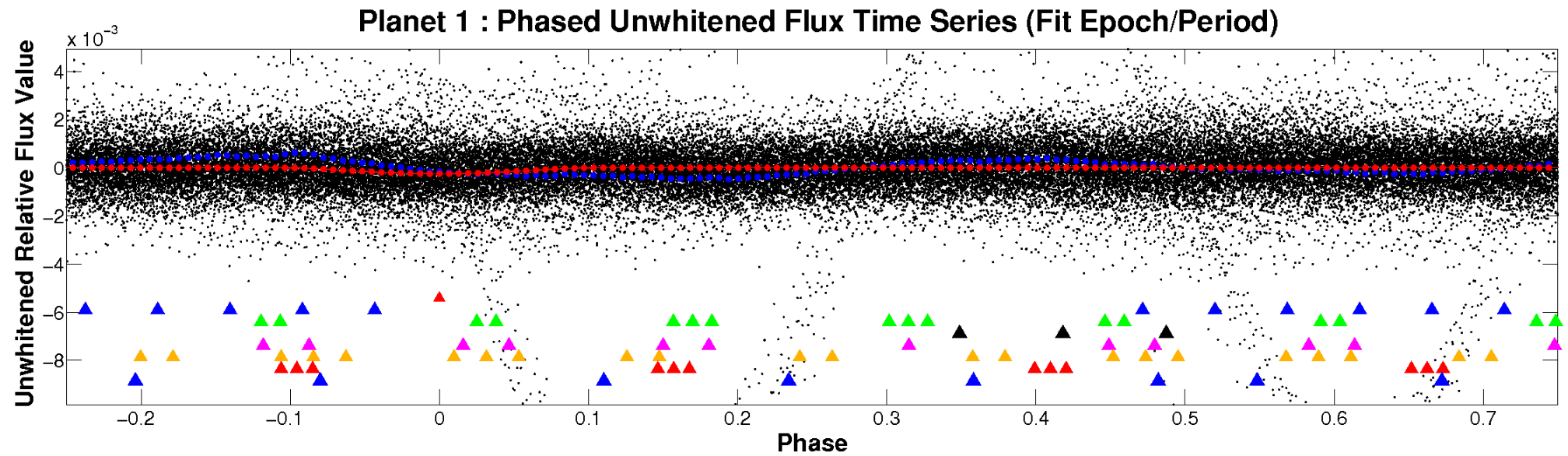


# ALT Odd/Even

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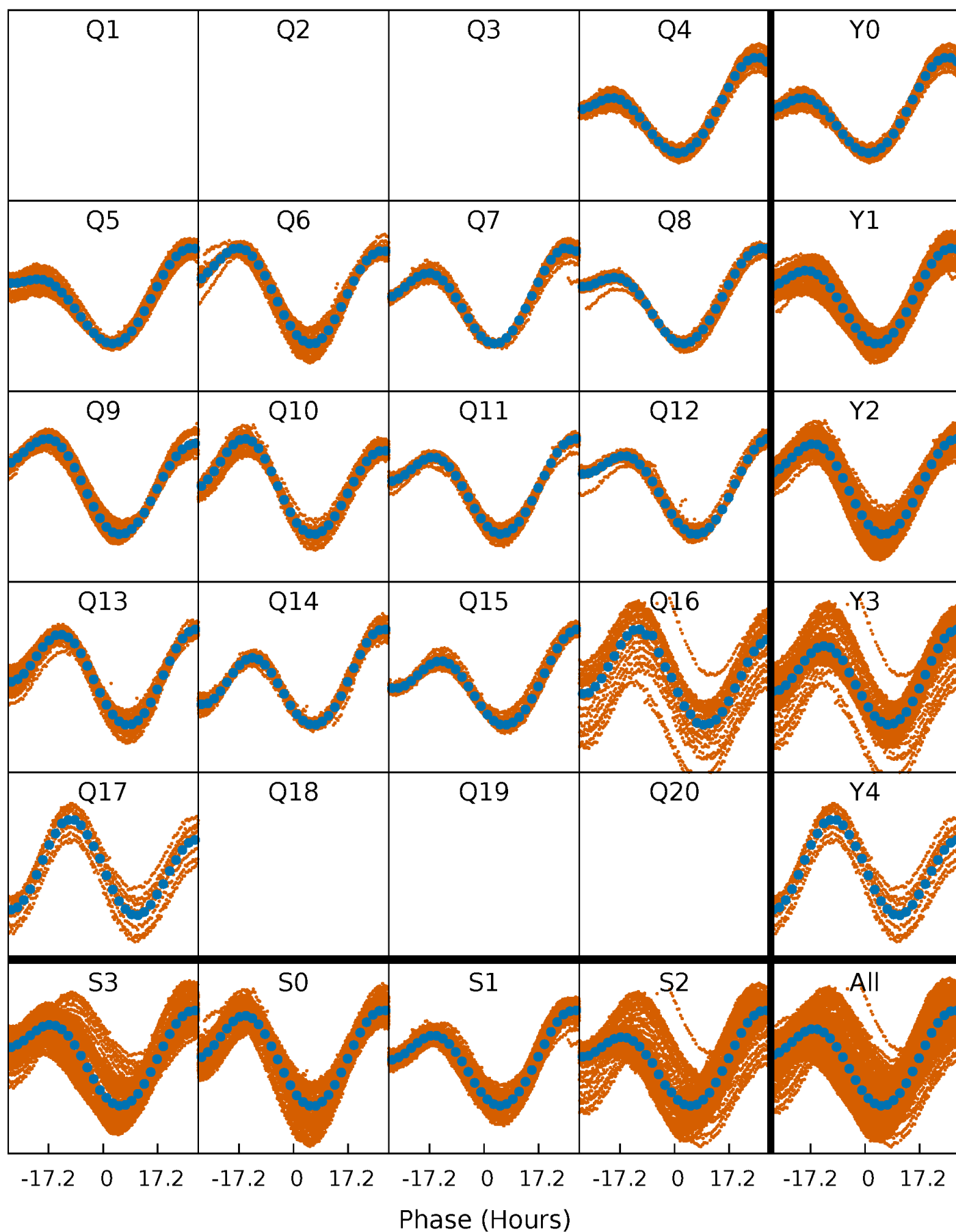


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

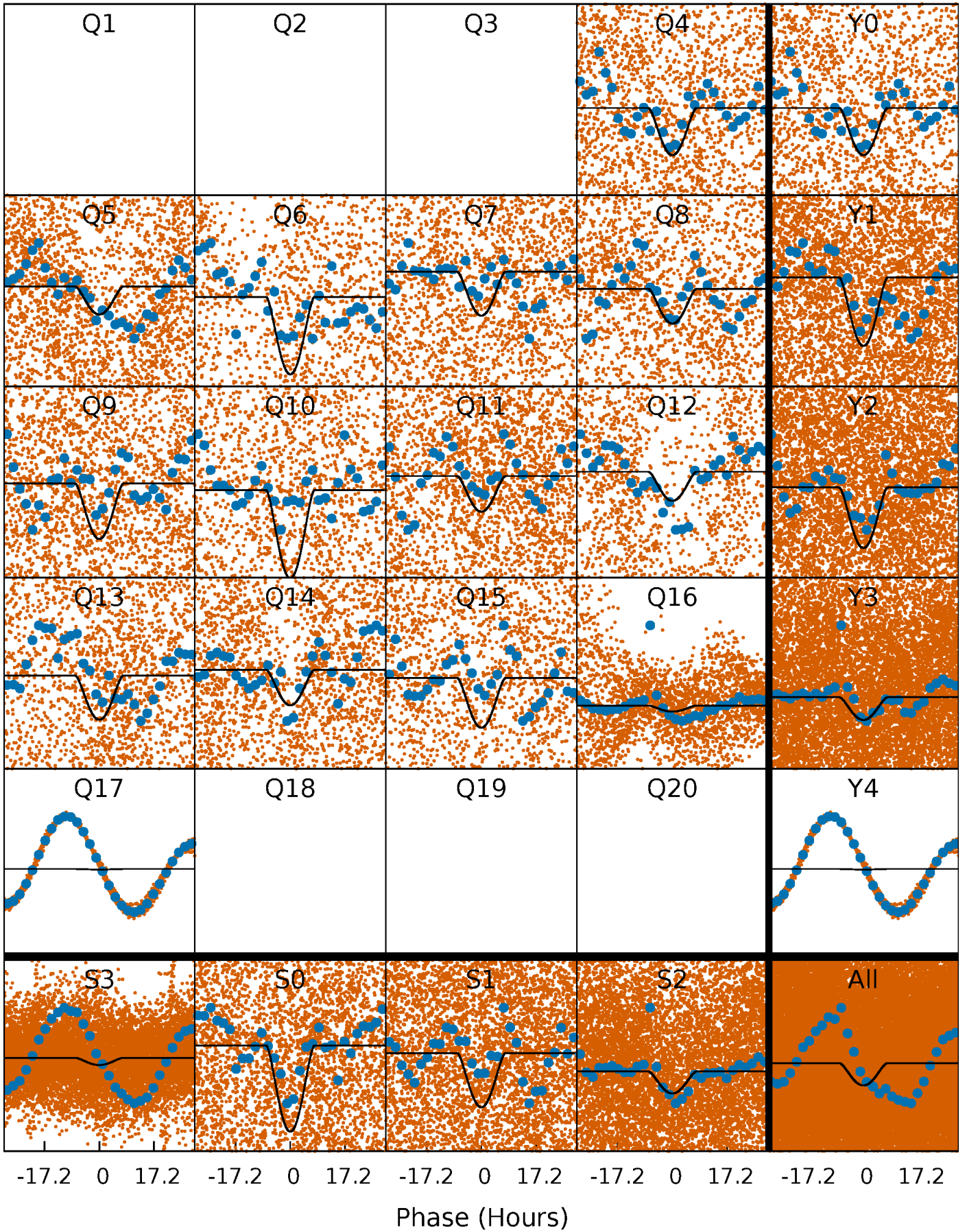
TCE 004347340-01   P= 3.158864 Days    $T_0=133.148926$  (BKJD)





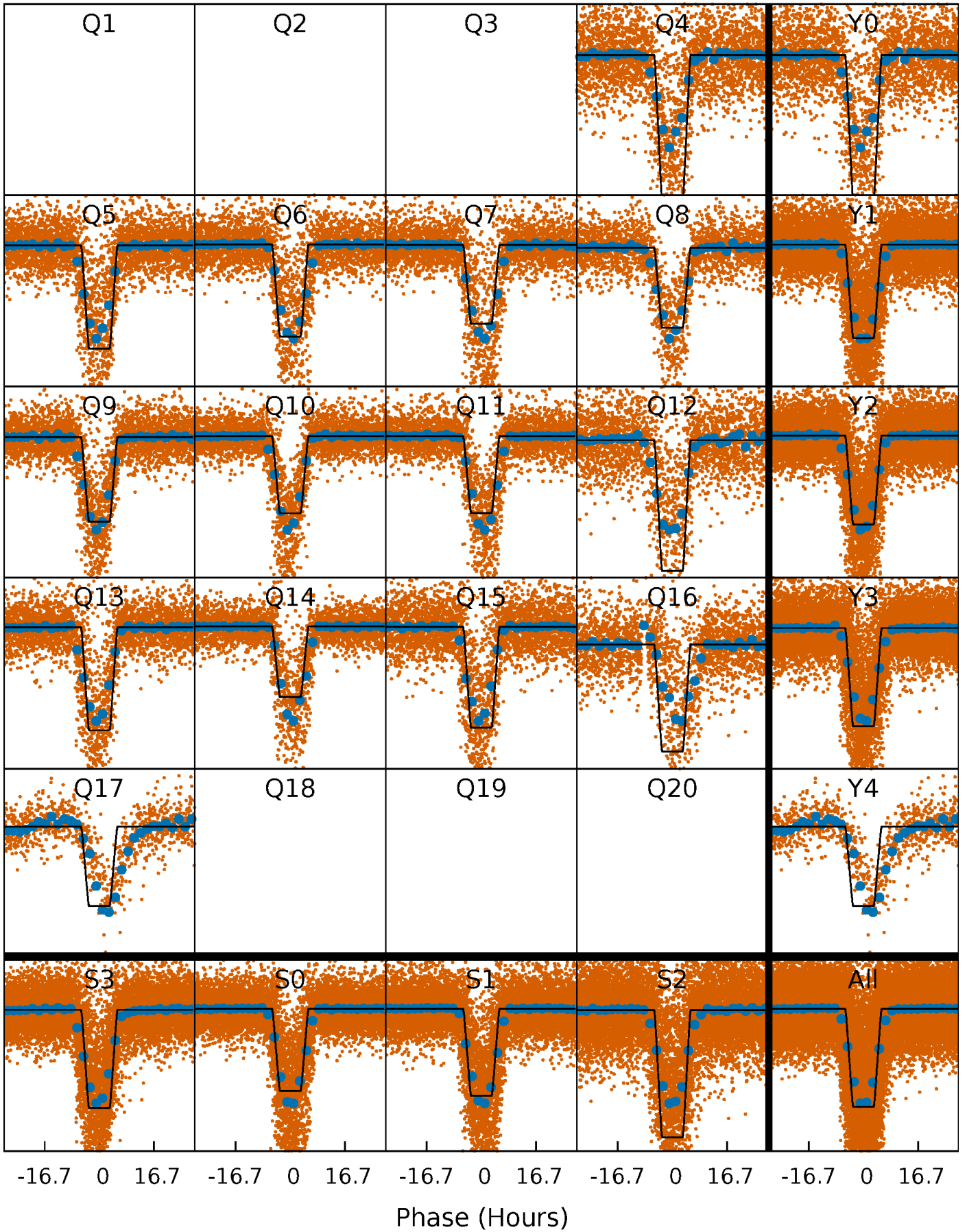
# DV Quarter-Phased Transit Curves

TCE 004347340-01 P= 3.158864 Days  $T_0=133.148926$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

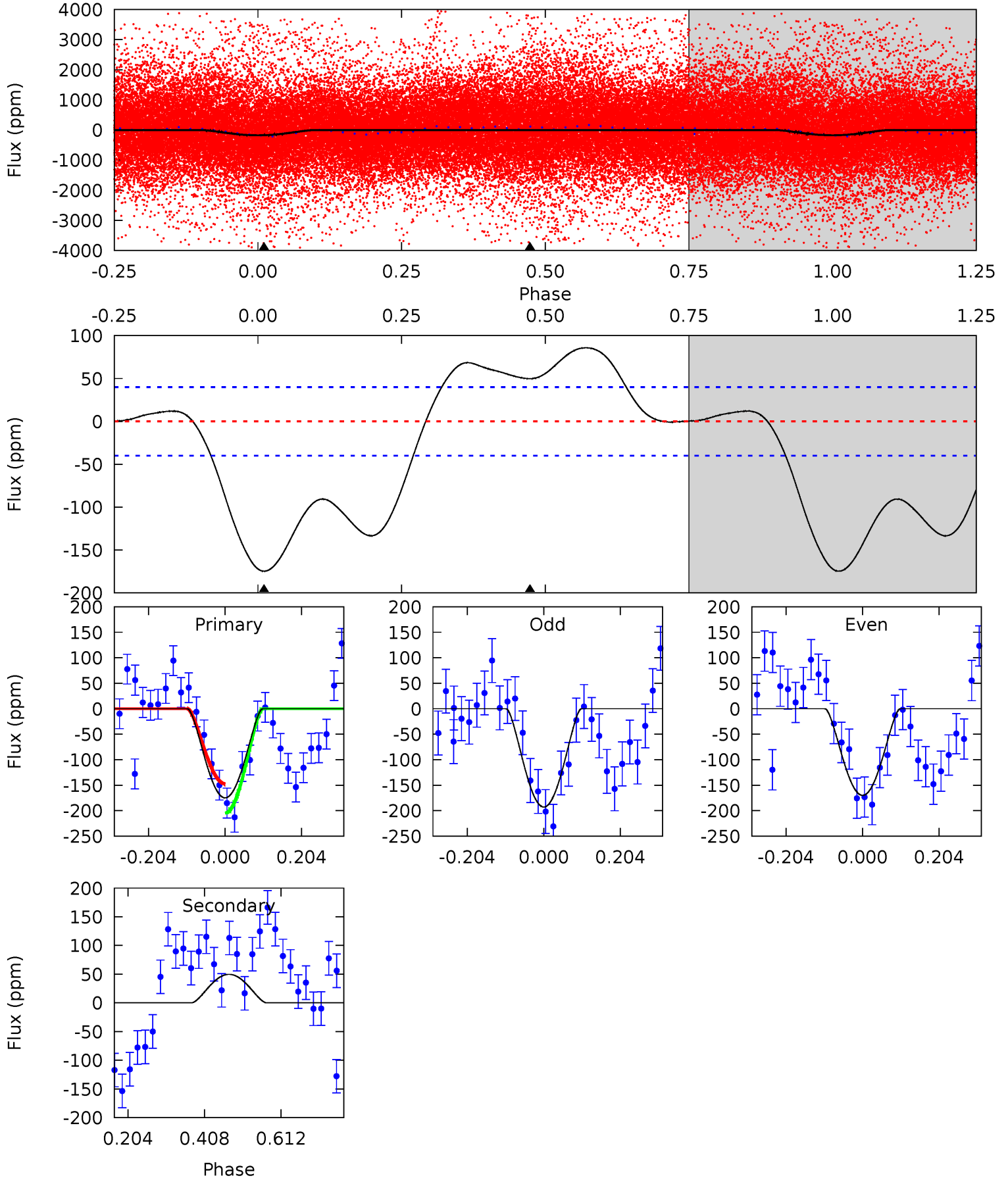
TCE 004347340-01 P= 3.158919 Days  $T_0=133.188698$  (BKJD)



# DV Model-Shift Uniqueness Test

004347340-01, P = 3.158864 Days, E = 133.148926 Days

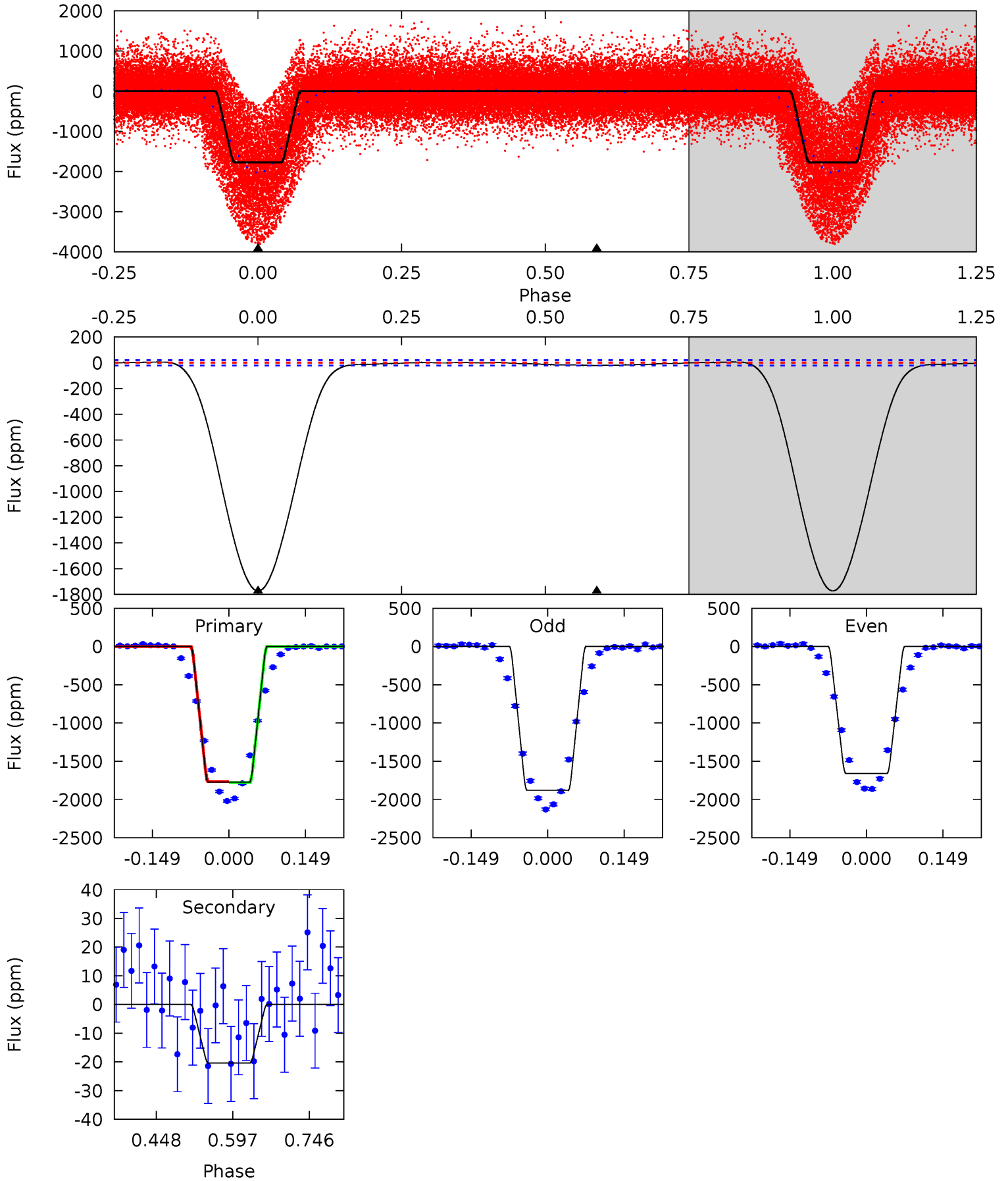
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.3	-5.49	0	0	4.41	1.27	4.90	19.3	19.3	-5.49	-5.49	1.28	0.65	0.33	3.26



# Alt Model-Shift Uniqueness Test

004347340-01, P = 3.158919 Days, E = 133.188698 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
385.0	4.43	0	0	4.48	1.44	1.34	385.0	385.0	4.43	4.43	23.9	1.11	0.00	0





### Stellar Parameters For KIC 004347340

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5520^{+194}_{-194}$	$4.552^{+0.095}_{-0.085}$	$-0.840^{+0.300}_{-0.300}$	$0.722^{+0.097}_{-0.088}$	$0.678^{+0.081}_{-0.035}$	$2.536^{+1.006}_{-0.659}$
	+4%/-4%	+2%/-2%	+36%/-36%	+13%/-12%	+12%/-5%	+40%/-26%
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 004347340-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$50 \pm 9$	$3.20^{+2.74}_{-2.06}$	$1496^{+78}_{-69}$	$-3007^{+402}_{-1164}$	$-3.666^{+2.594}_{-25.037}$
Alt.	$-20 \pm 5$	$4.21^{+2.85}_{-2.49}$	$1501^{+70}_{-73}$	$2338^{+739}_{-4052}$	$0.845^{+4.414}_{-0.572}$

$T_{max}$  = 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

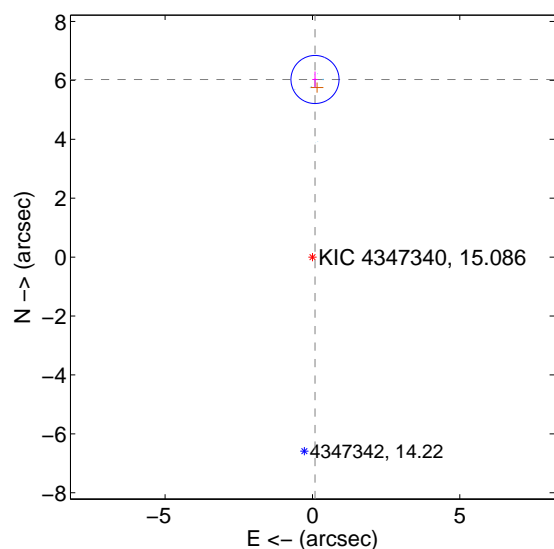
Supplemental centroid analysis for 004347340-01. Kepler magnitude: 15.09. Transit SNR 10.45

There are 13 quarters with good PRF difference image offsets

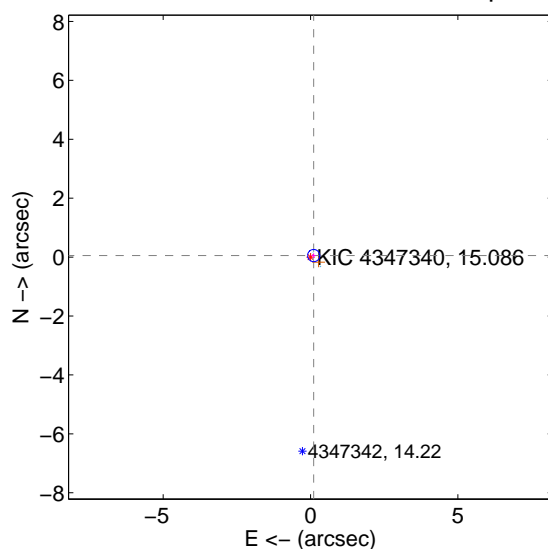
The OOT PRF centroid is offset from the target star catalog position by about 5.93 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.029 \pm 0.272$	22.17	$-0.087 \pm 0.094$	$6.029 \pm 0.272$
PRF-fit source offset from KIC position	$0.120 \pm 0.069$	1.73	$-0.108 \pm 0.071$	$0.052 \pm 0.077$
photometric centroid source offset	$0.58 \pm 1.25$	0.46	$-0.25 \pm 0.19$	$-0.52 \pm 1.38$

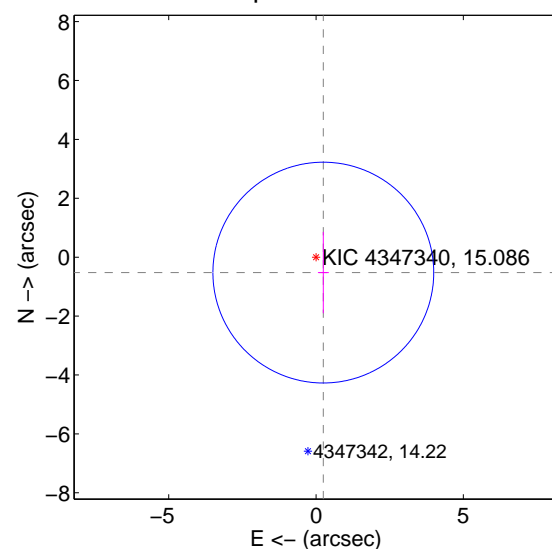
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

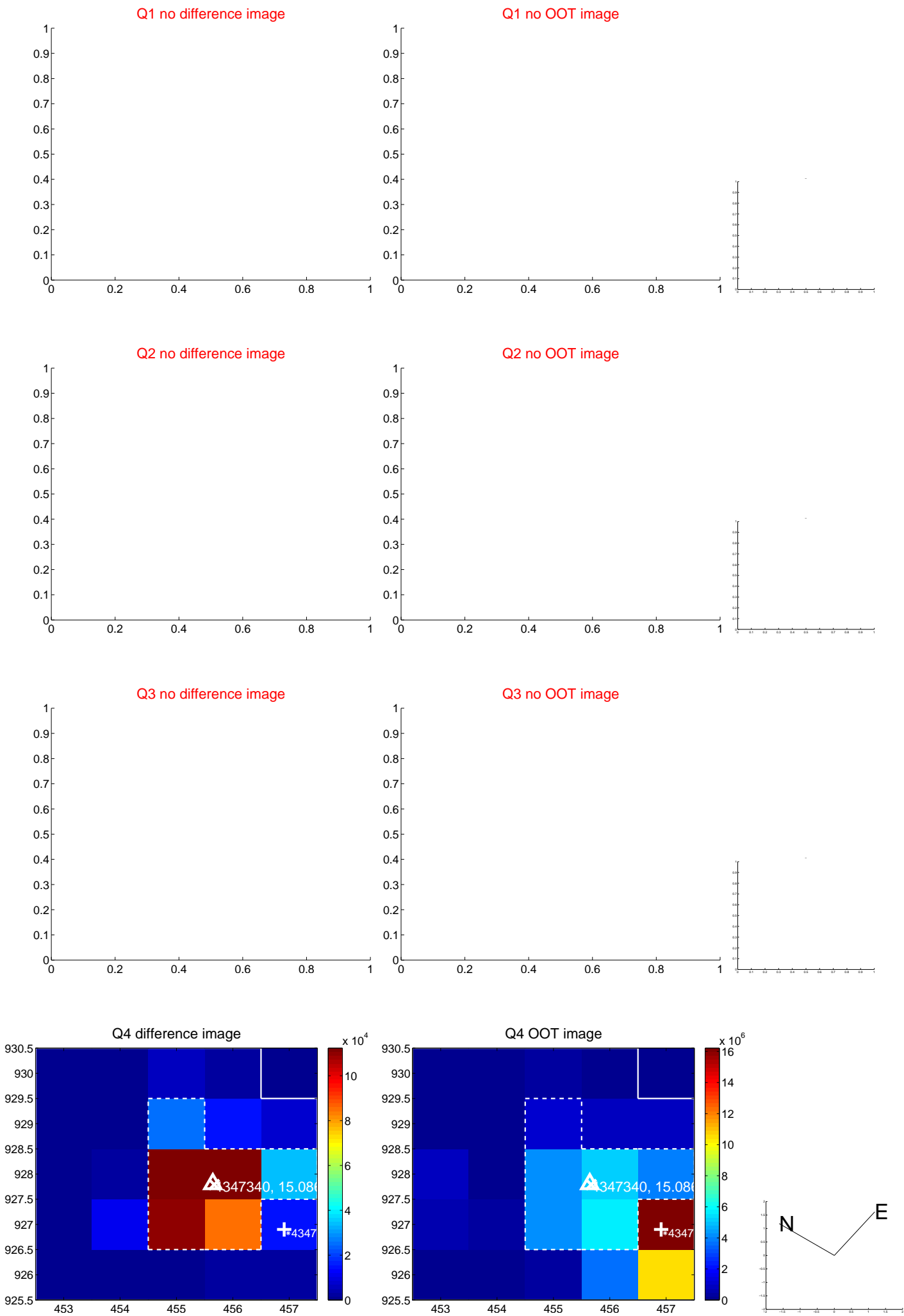


offset from photometric centroids

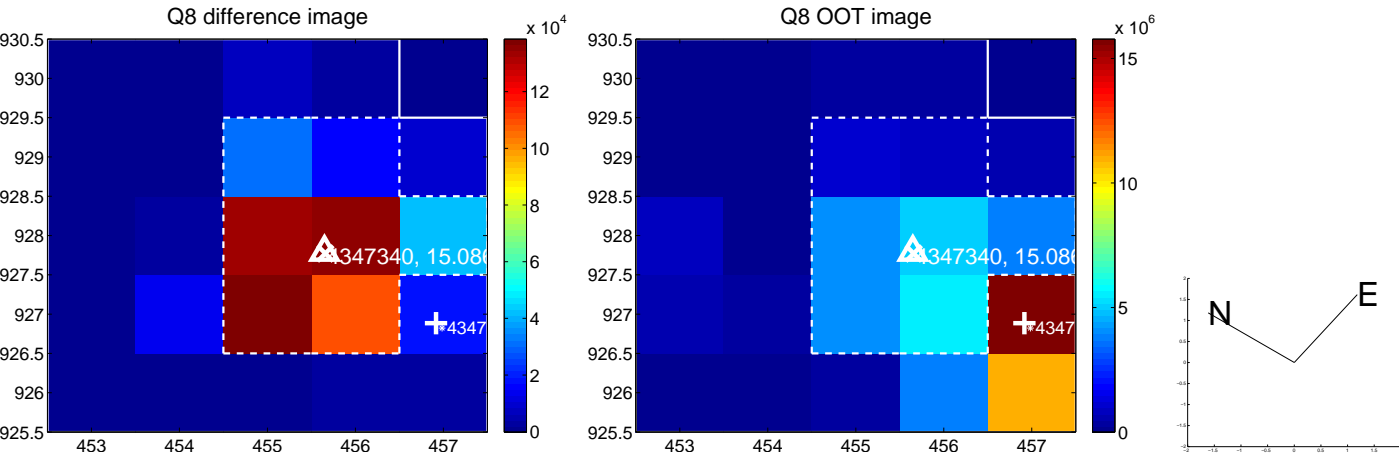
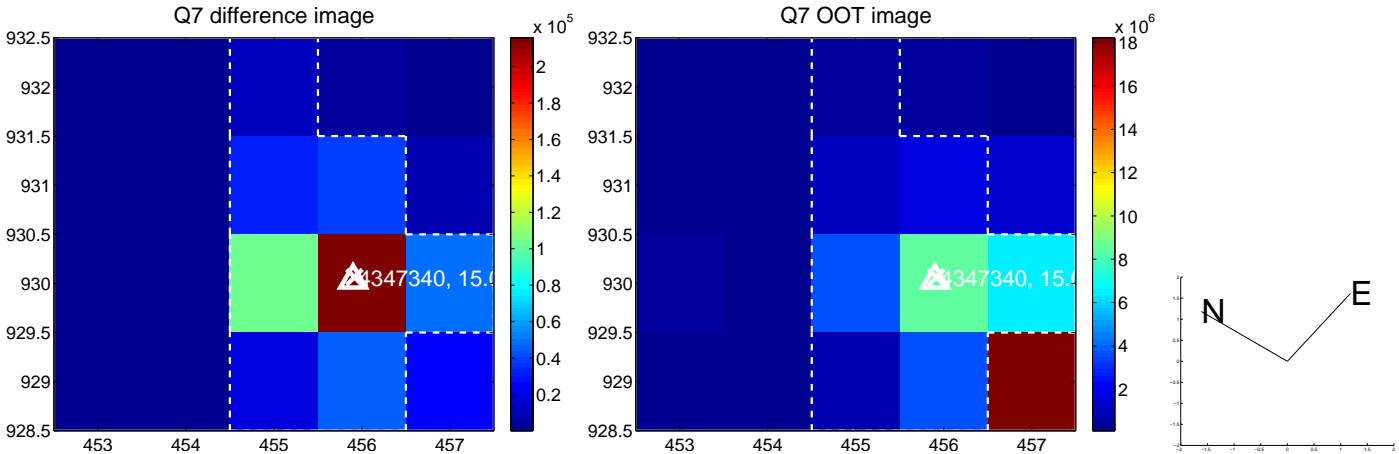
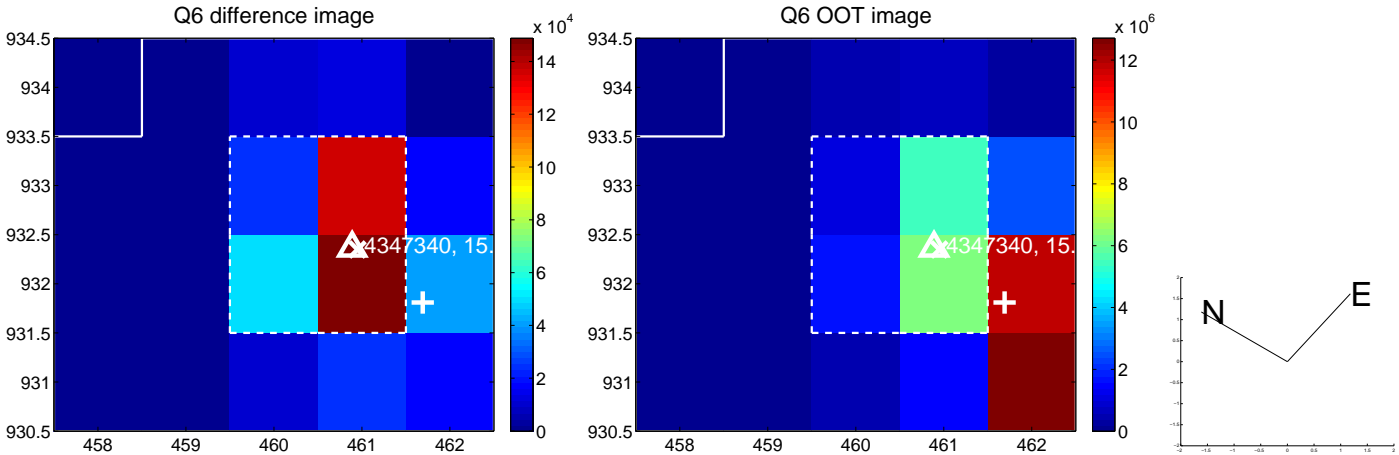
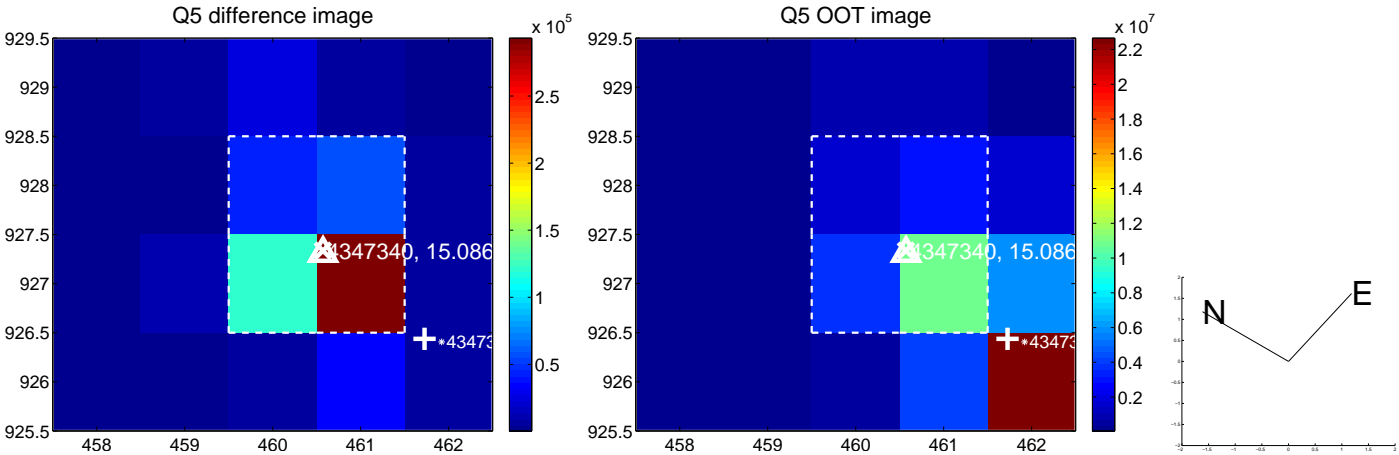


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

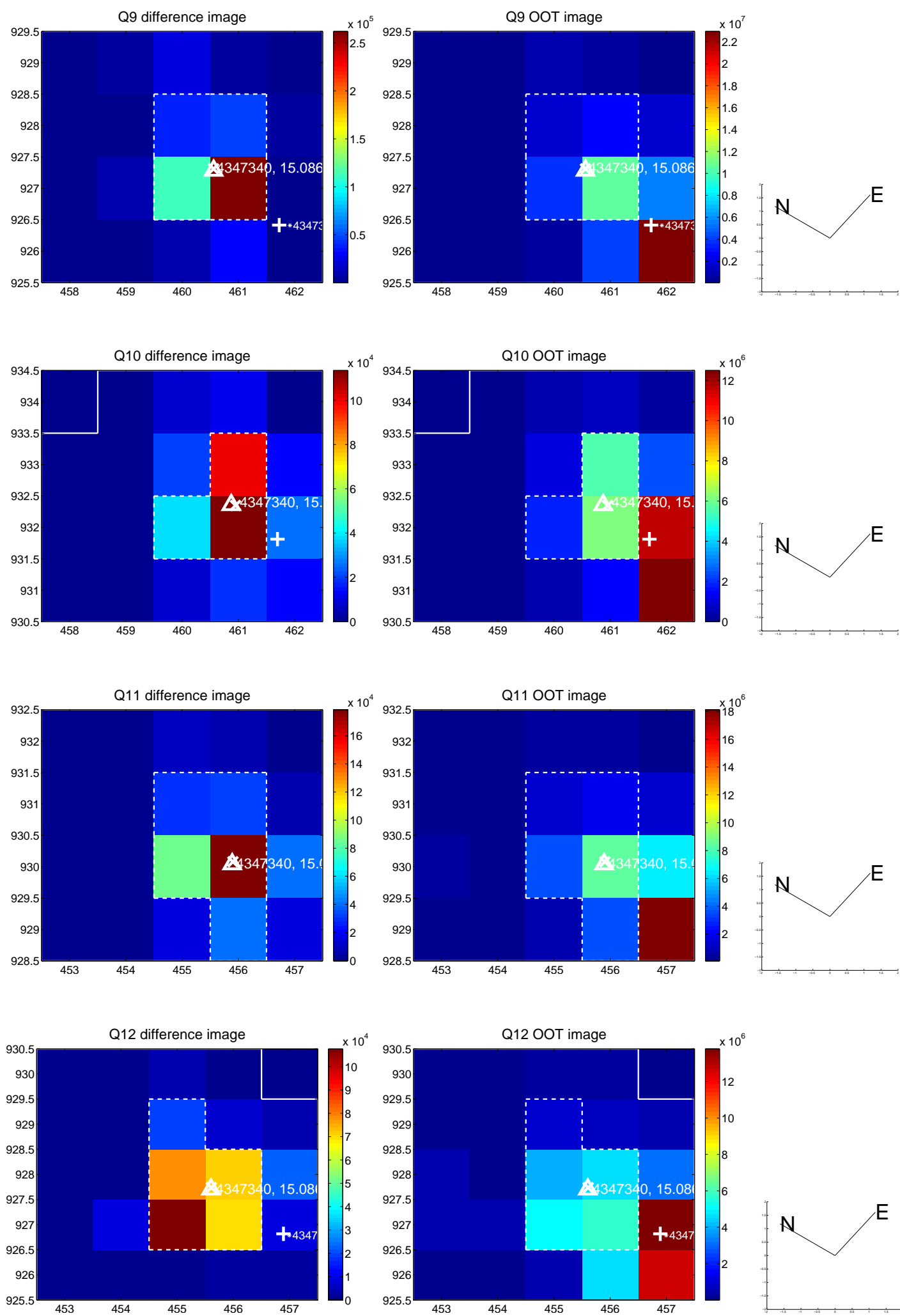


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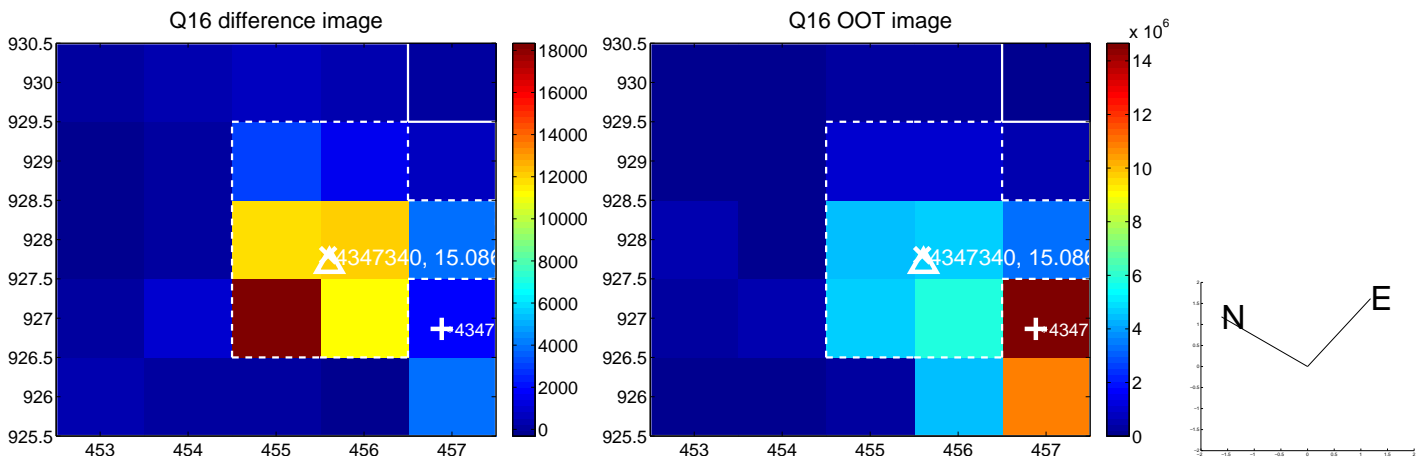
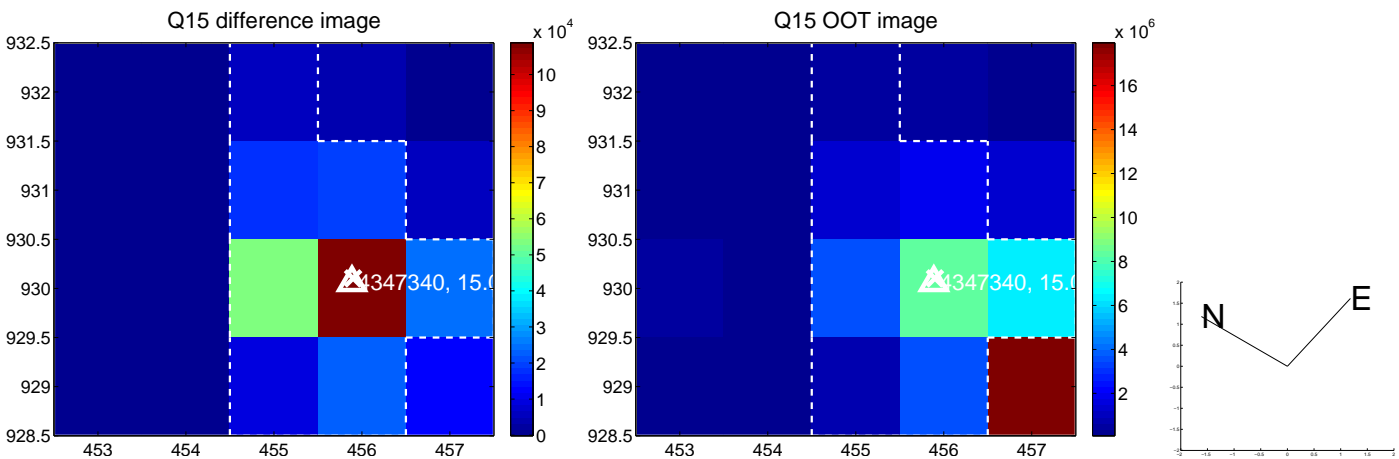
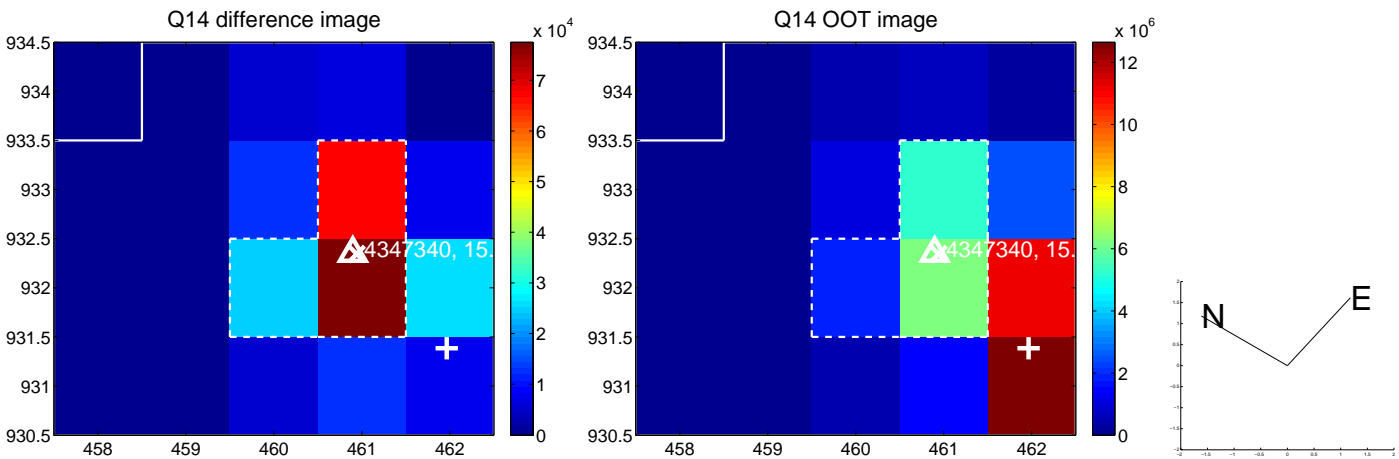
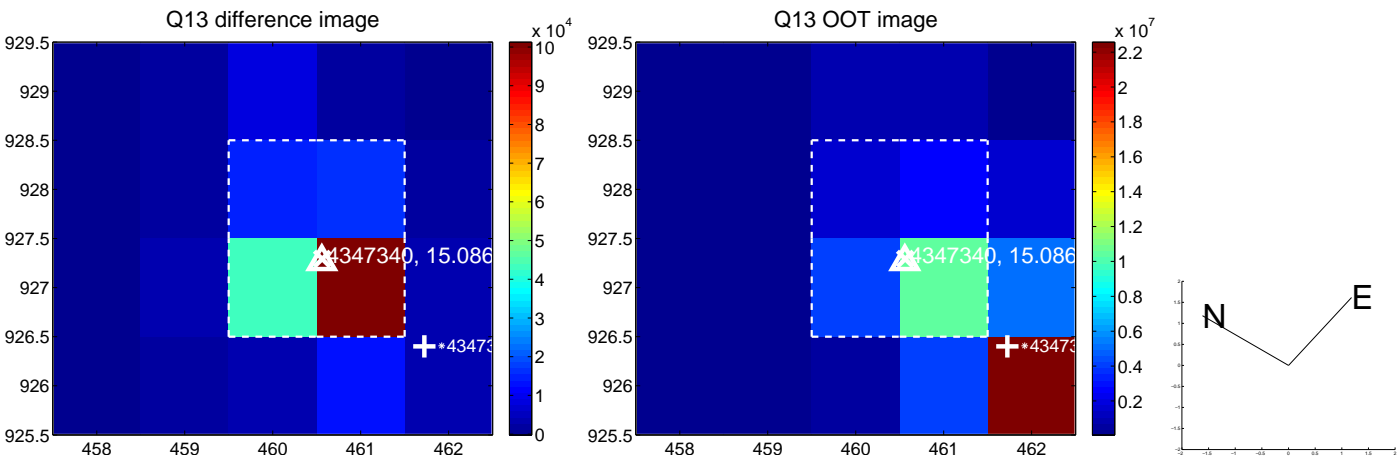




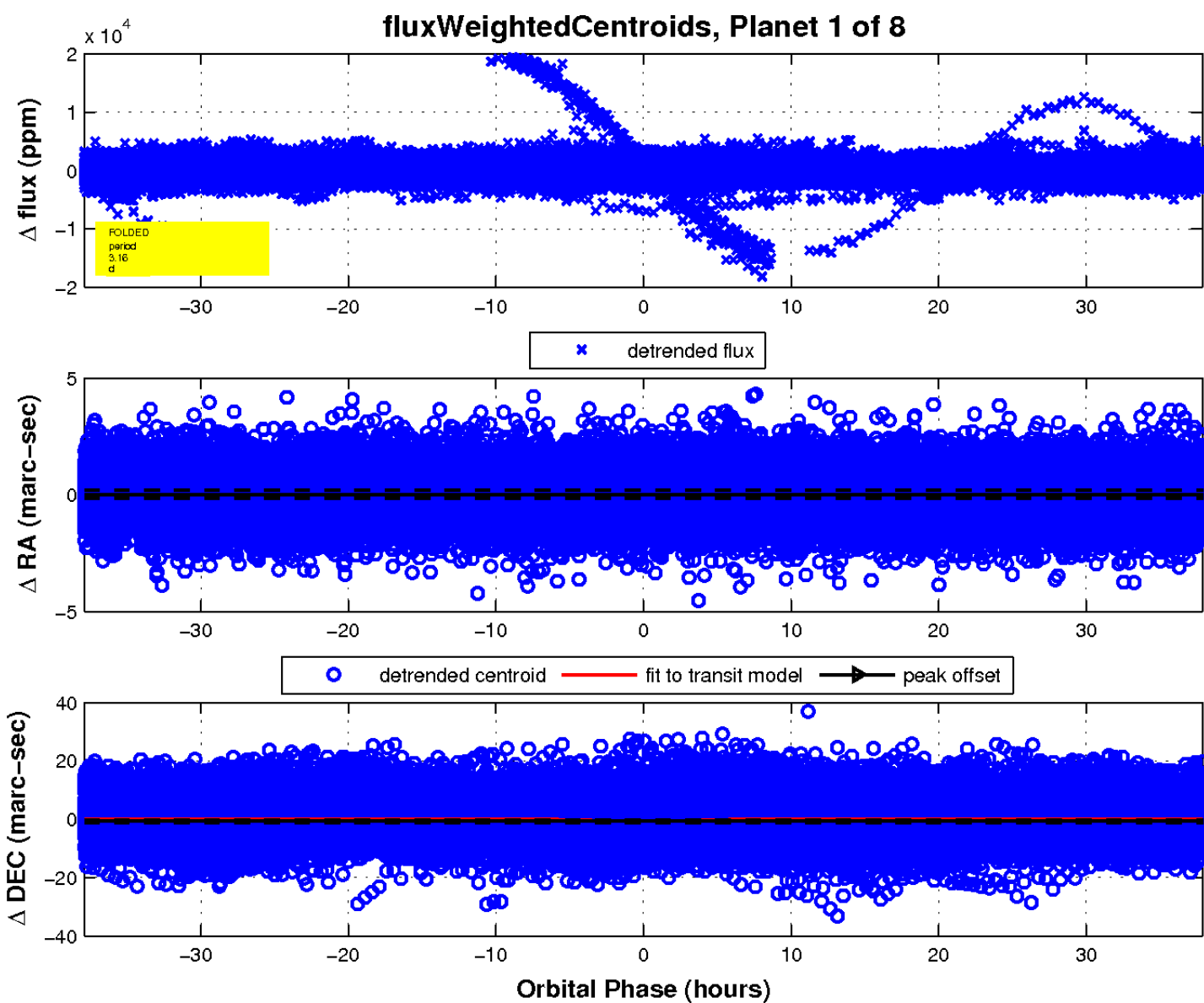
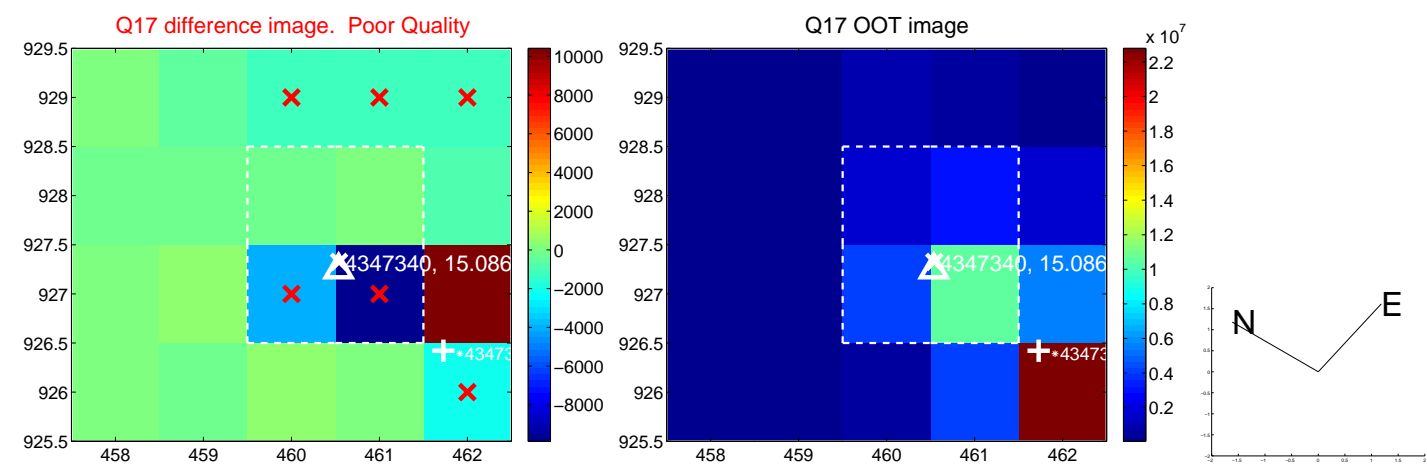
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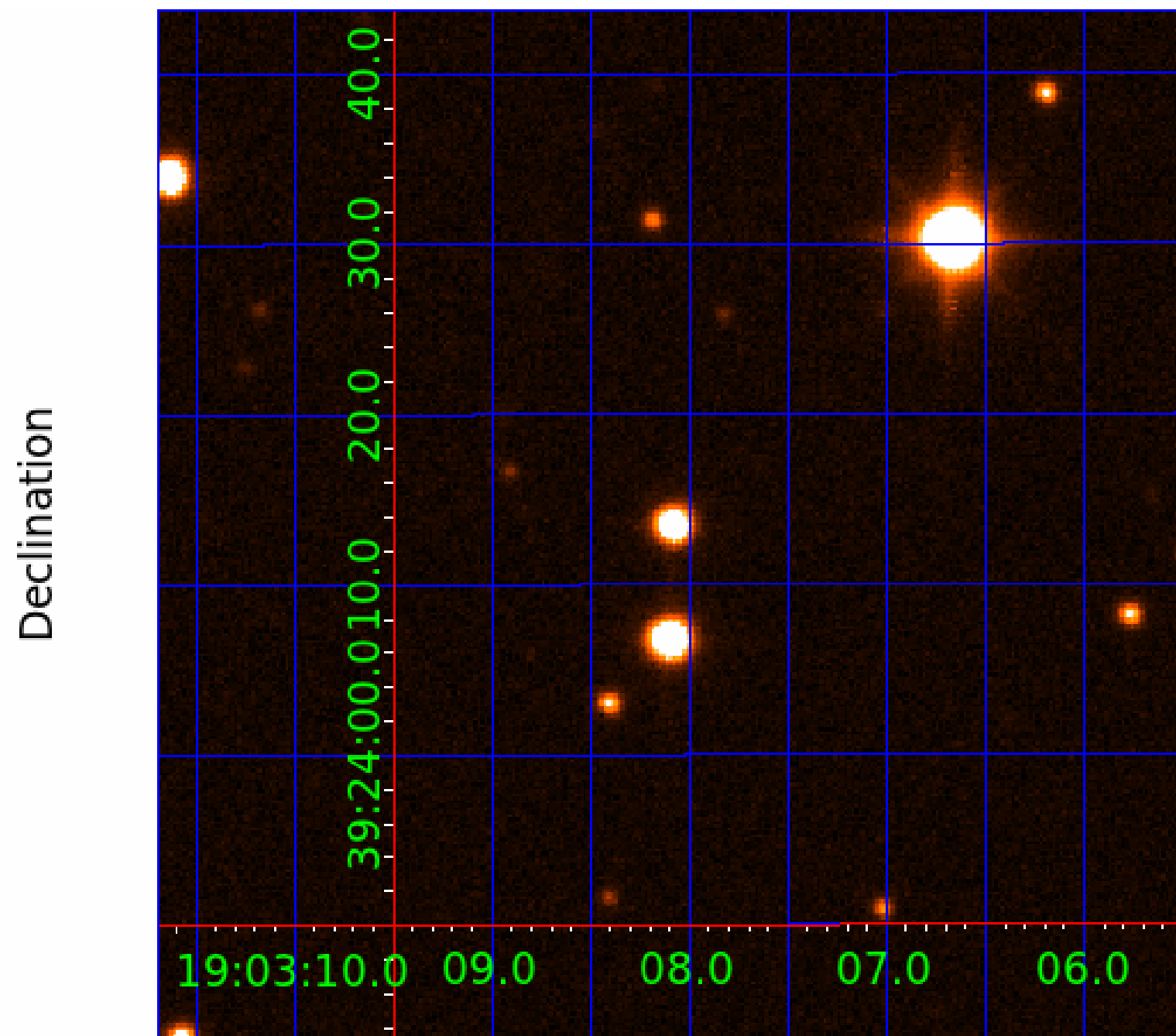
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UKIRT Image





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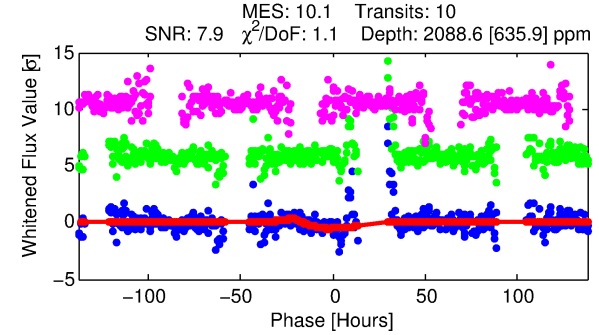
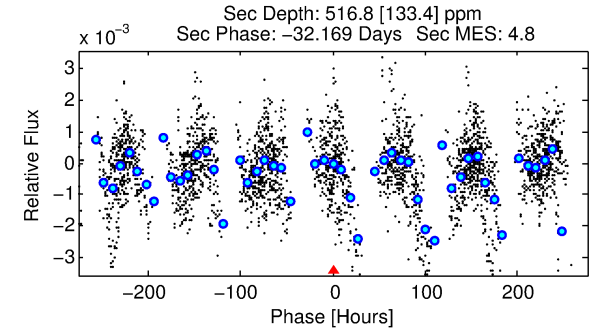
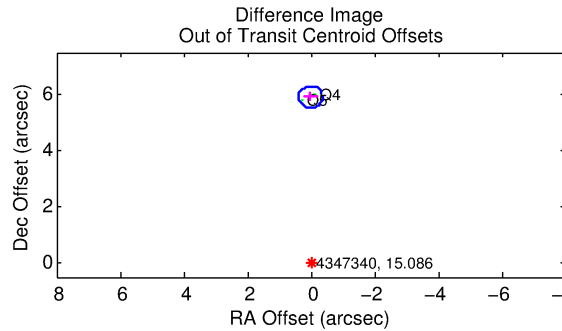
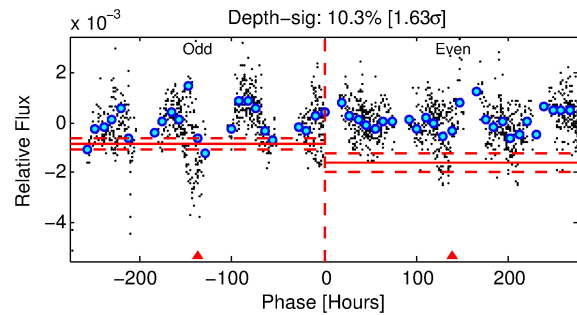
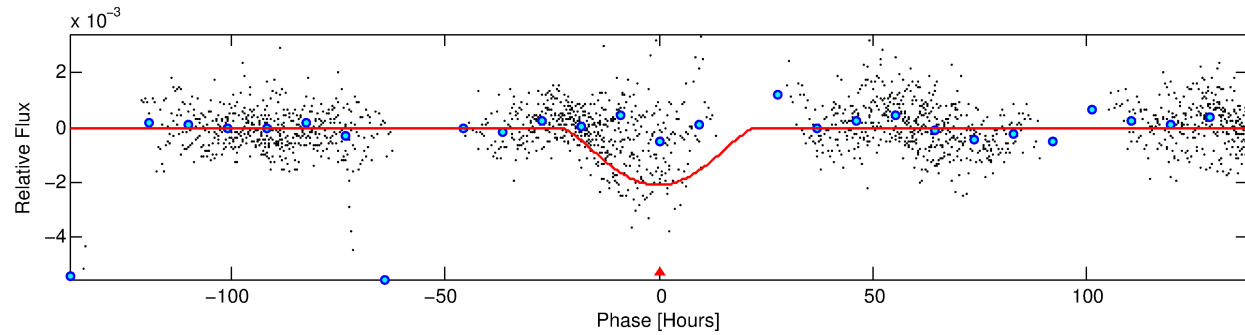
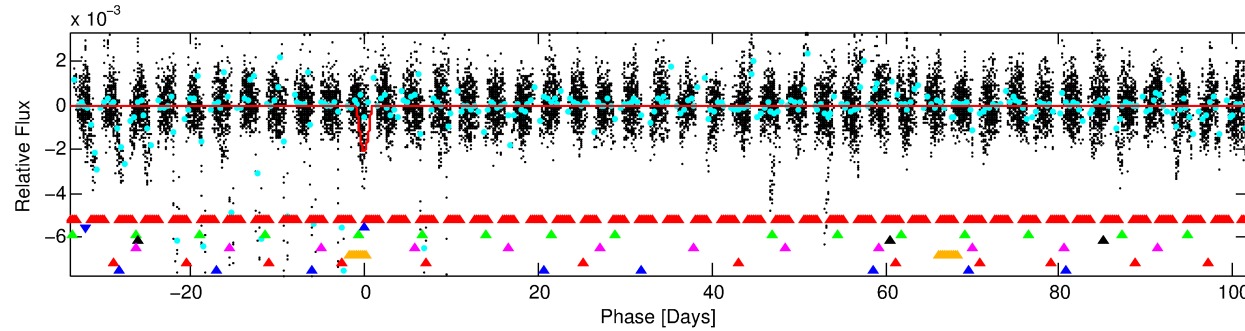
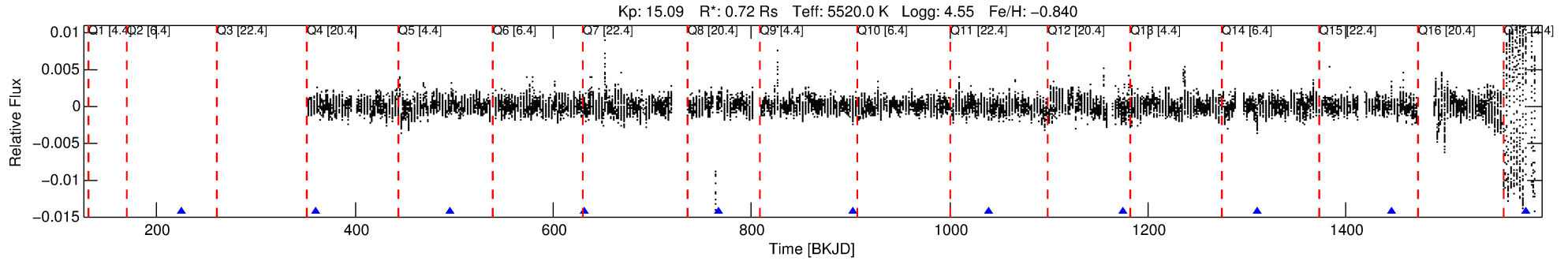
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004347340-02

No Significant Match Found

# DV One-Page Summary

KIC: 4347340 Candidate: 2 of 8 Period: 135.678 d



## DV Fit Results:

Period = 135.67791 [0.02223] d  
Epoch = 224.6190 [0.1831] BKJD  
Rp/R\* = 0.0789 [0.1442]  
a/R\* = 9.18 [3.50]  
b = 1.00 [0.22]  
Seff = 2.10 [0.47]  
Teq = 307 [17] K  
Rp = 6.22 [11.39] Re  
a = 0.4540 [0.0524] AU  
Ag = 1516.28 [5562.23] [0.27σ]  
Teffp = 2963 [2716] K [0.98σ]

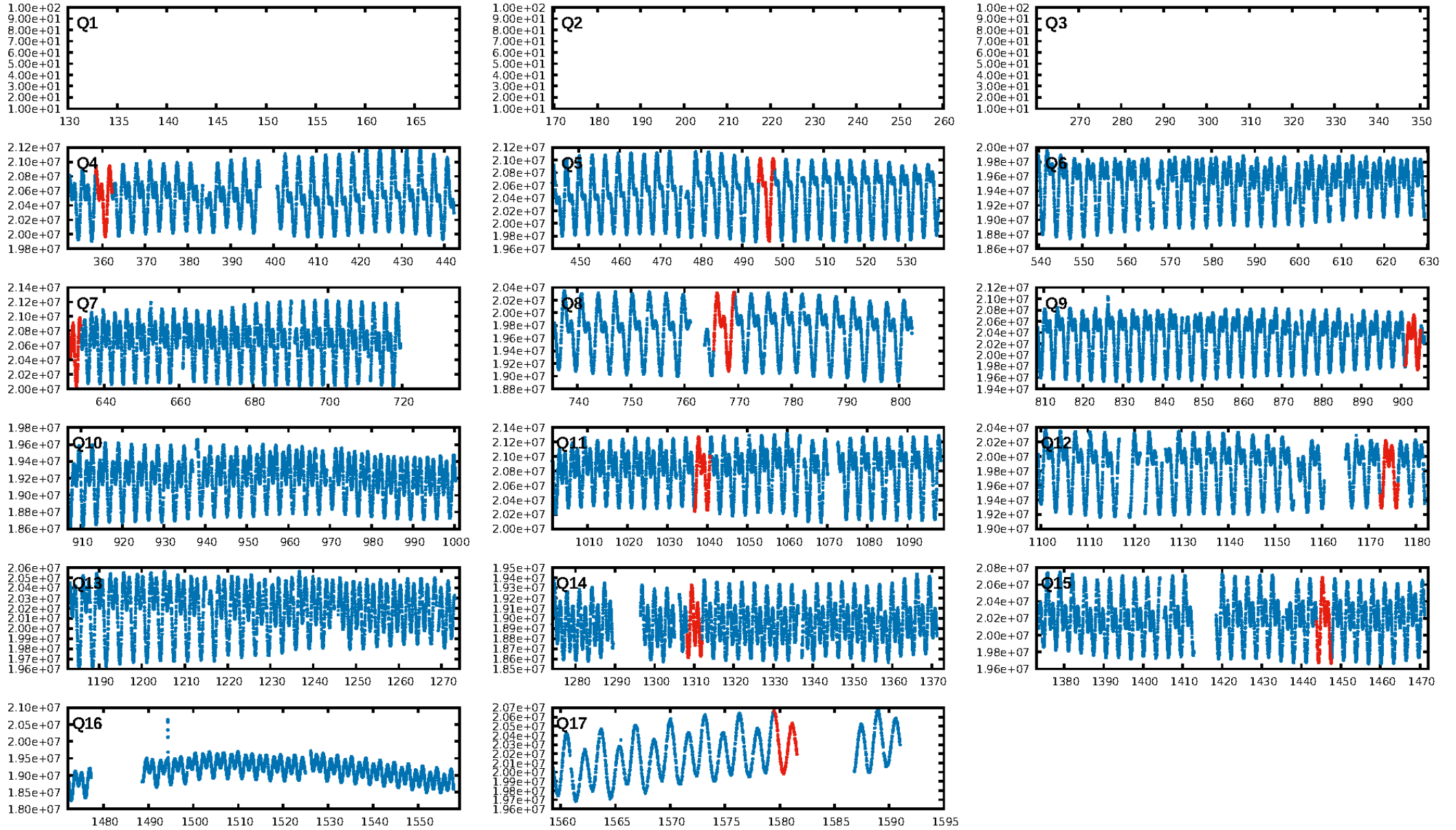
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.53σ]  
LongPeriod-sig: 100.0% [25.35σ]  
**ModelChiSquare2-sig: 0.3%**  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [9/9]  
**GhostDiagnostic-chr: 0.2687**  
Centroid-sig: 1.0%  
Centroid-so: 1.070 arcsec [0.78σ]  
**OotOffset-rm: 5.910 arcsec [46.31σ]**  
KicOffset-rm: 0.034 arcsec [0.36σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/3]

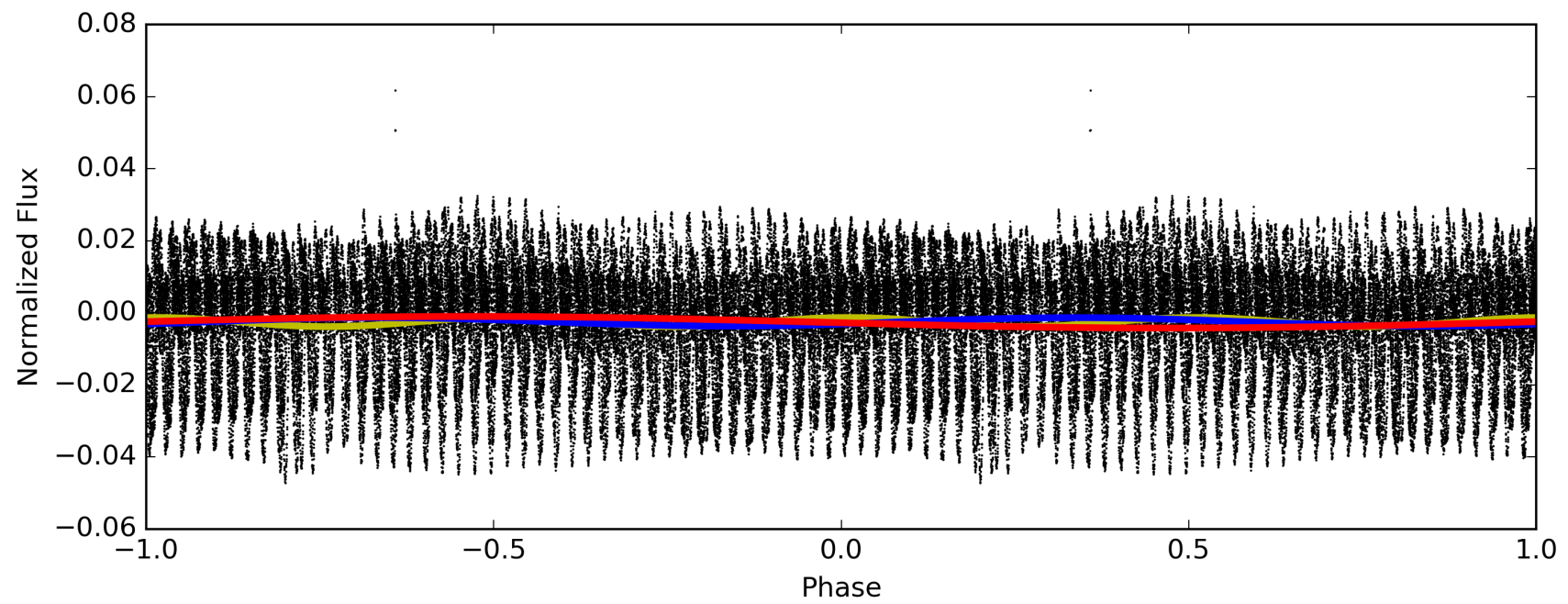
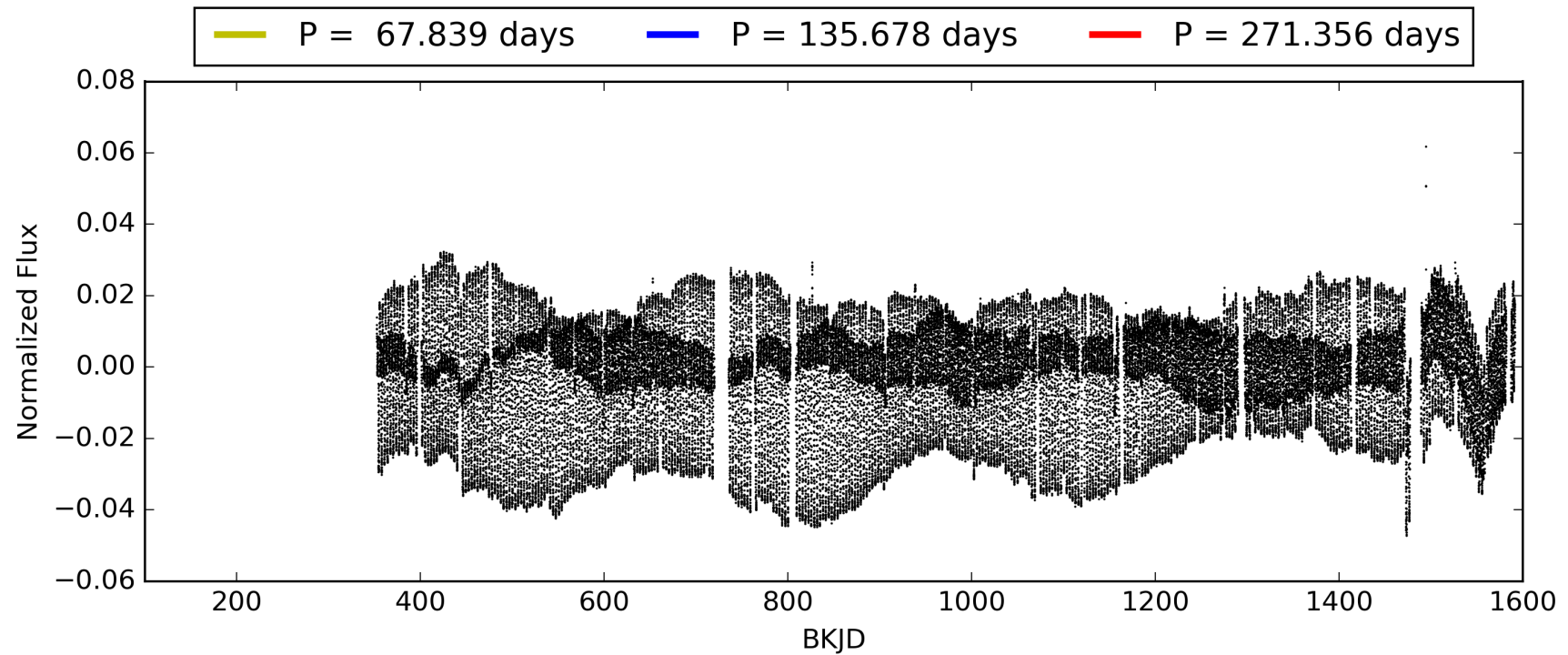
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:53:57 Z

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

# TCE 004347340-02, PDC Light Curves

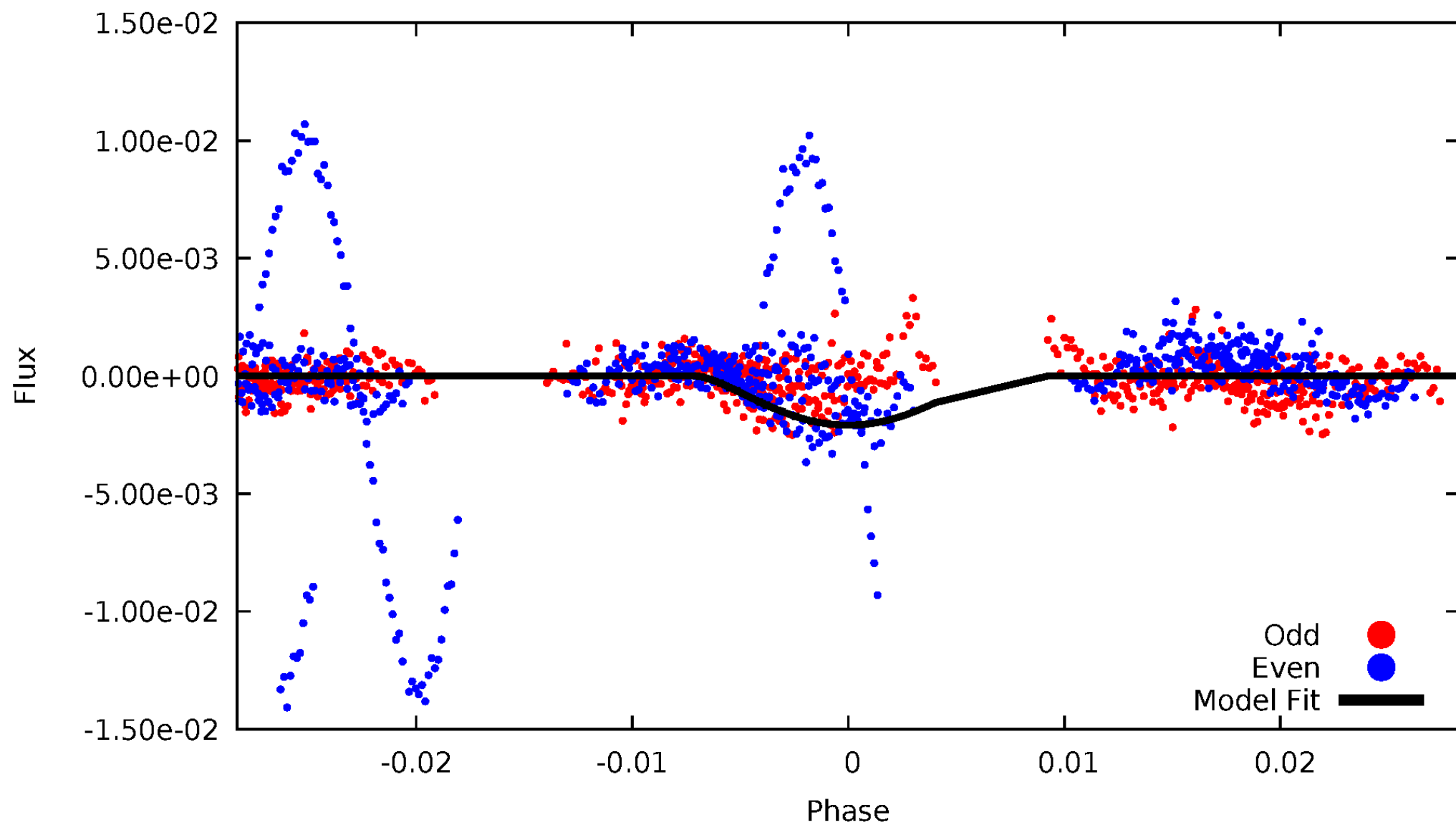


TCE 004347340-02



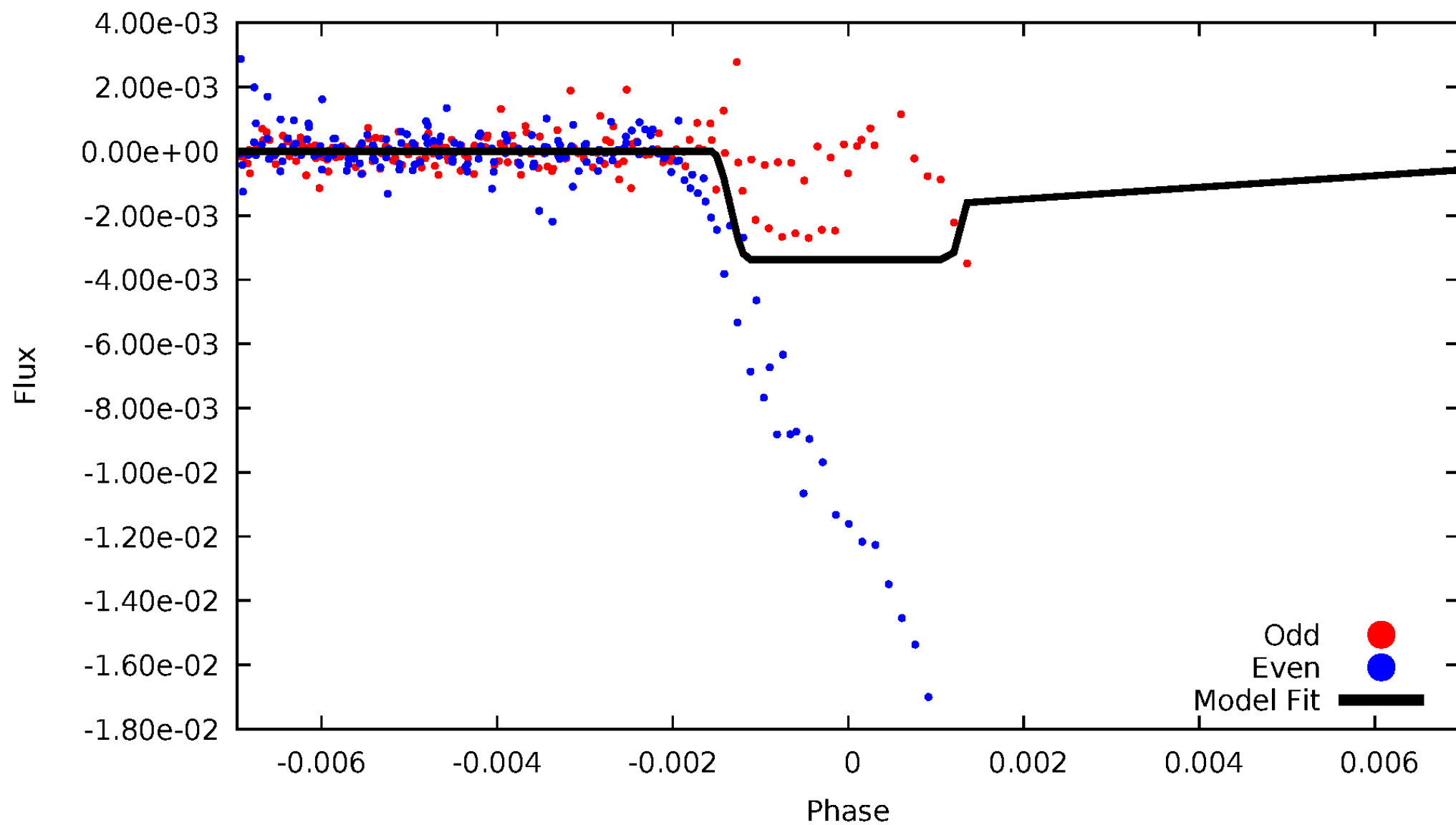
# DV Odd/Even

TCE 004347340-02



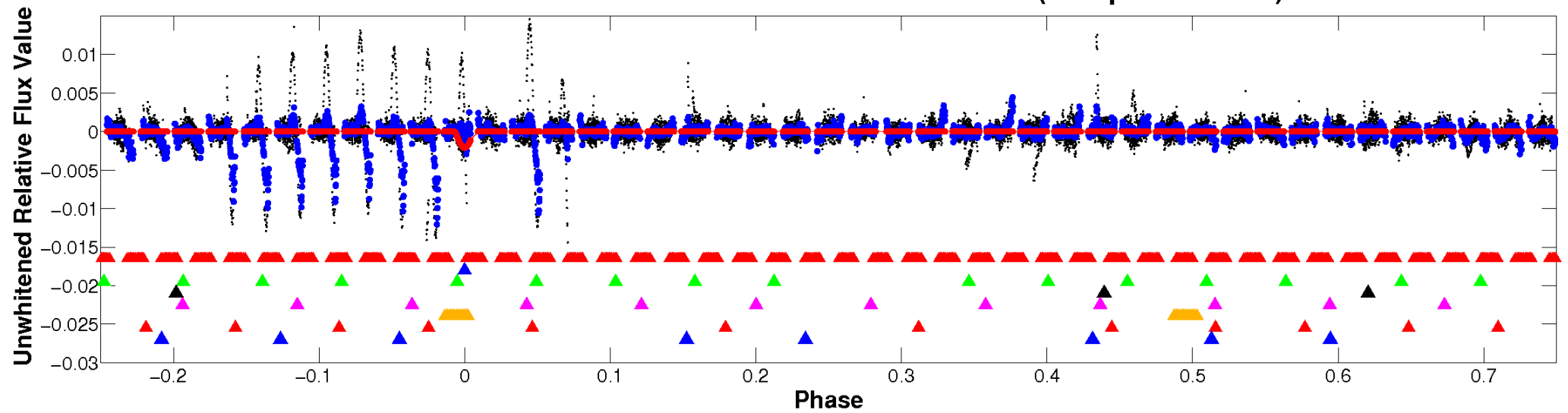
# ALT Odd/Even

TCE 004347340-02

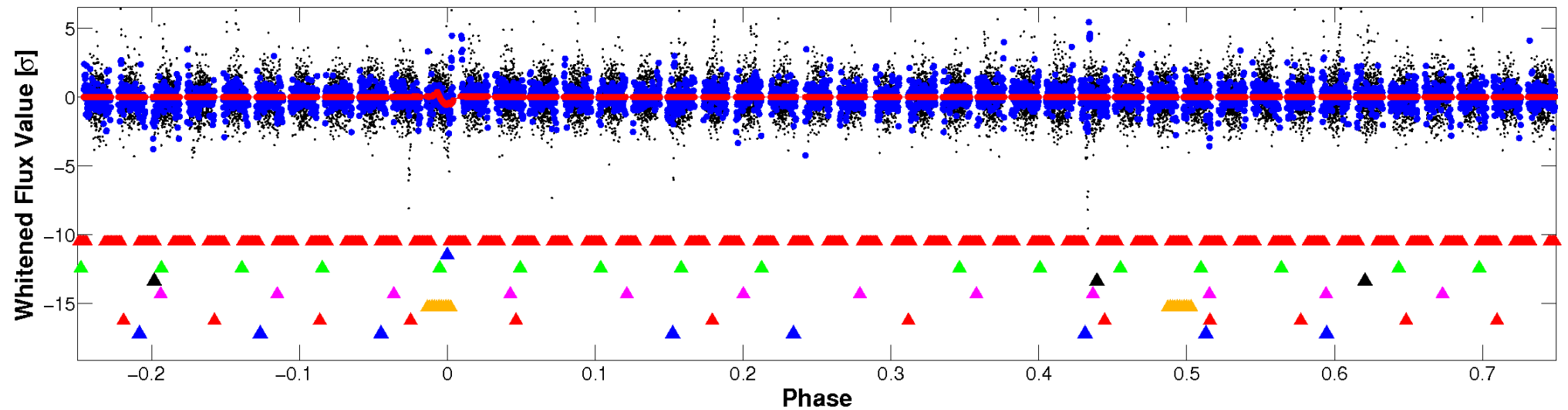


# Non-Whitened Vs. Whitened Light Curve

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



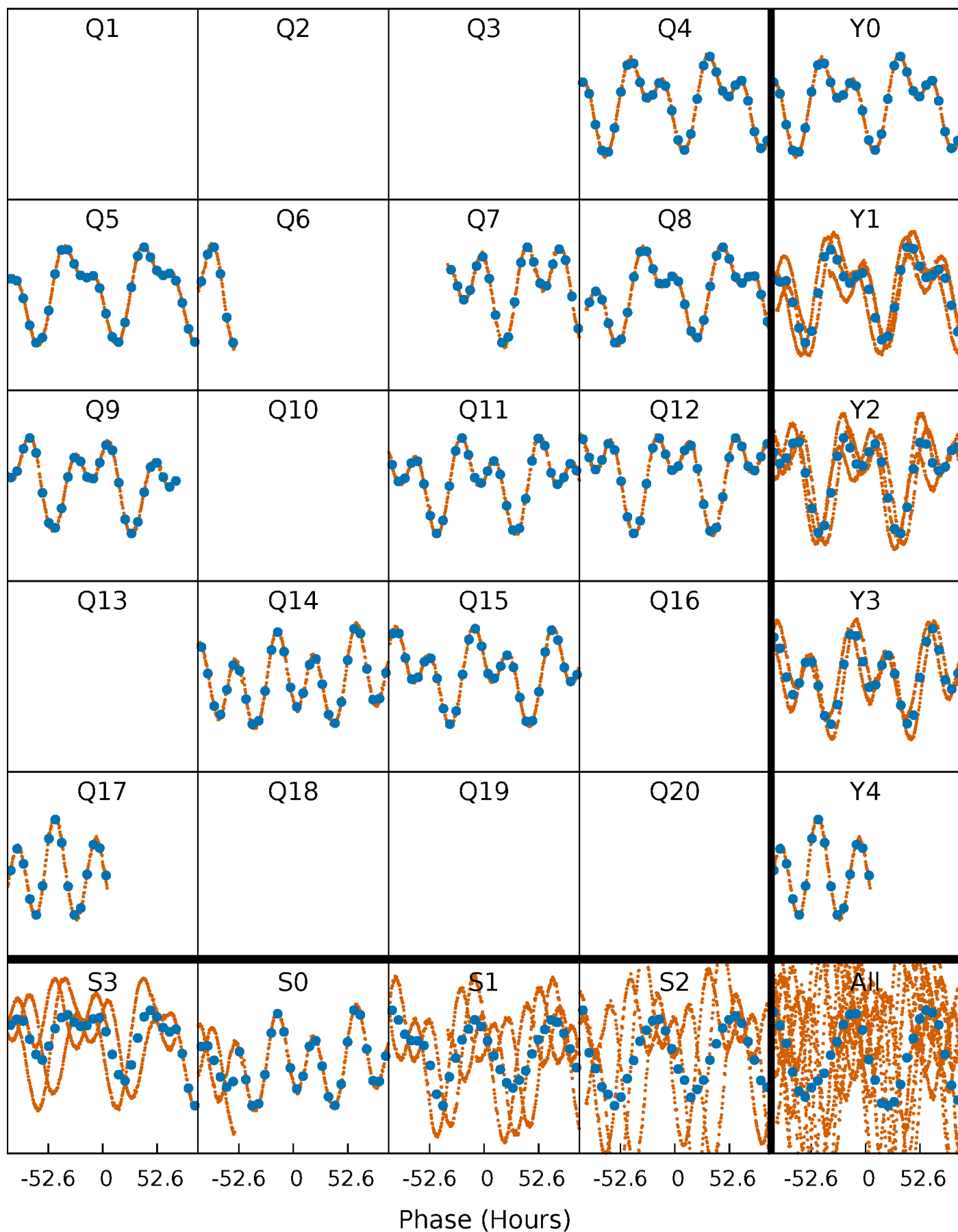
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





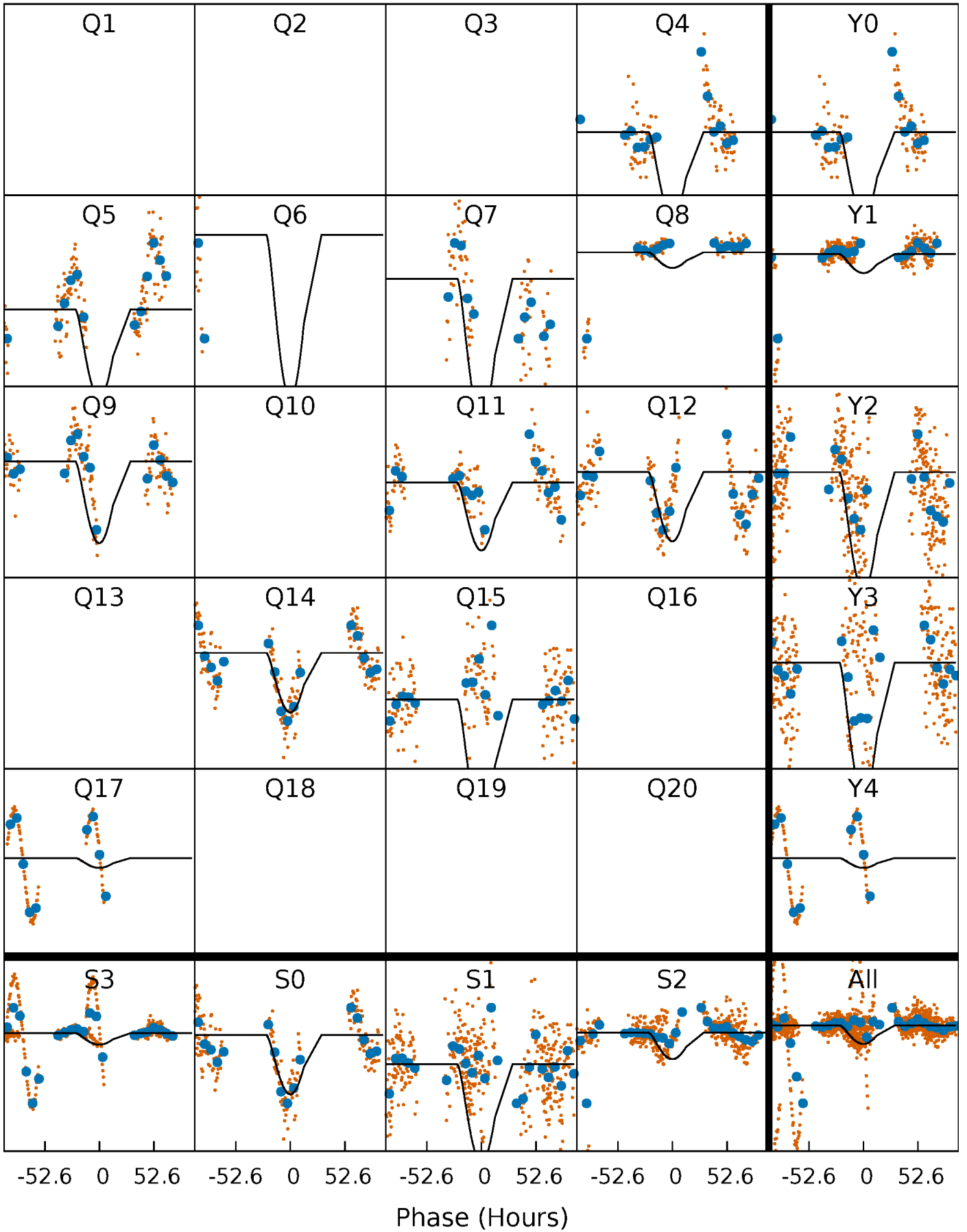
# PDC Quarter-Phased Transit Curves

TCE 004347340-02     $P=135.677907$  Days     $T_0=224.619027$  (BKJD)



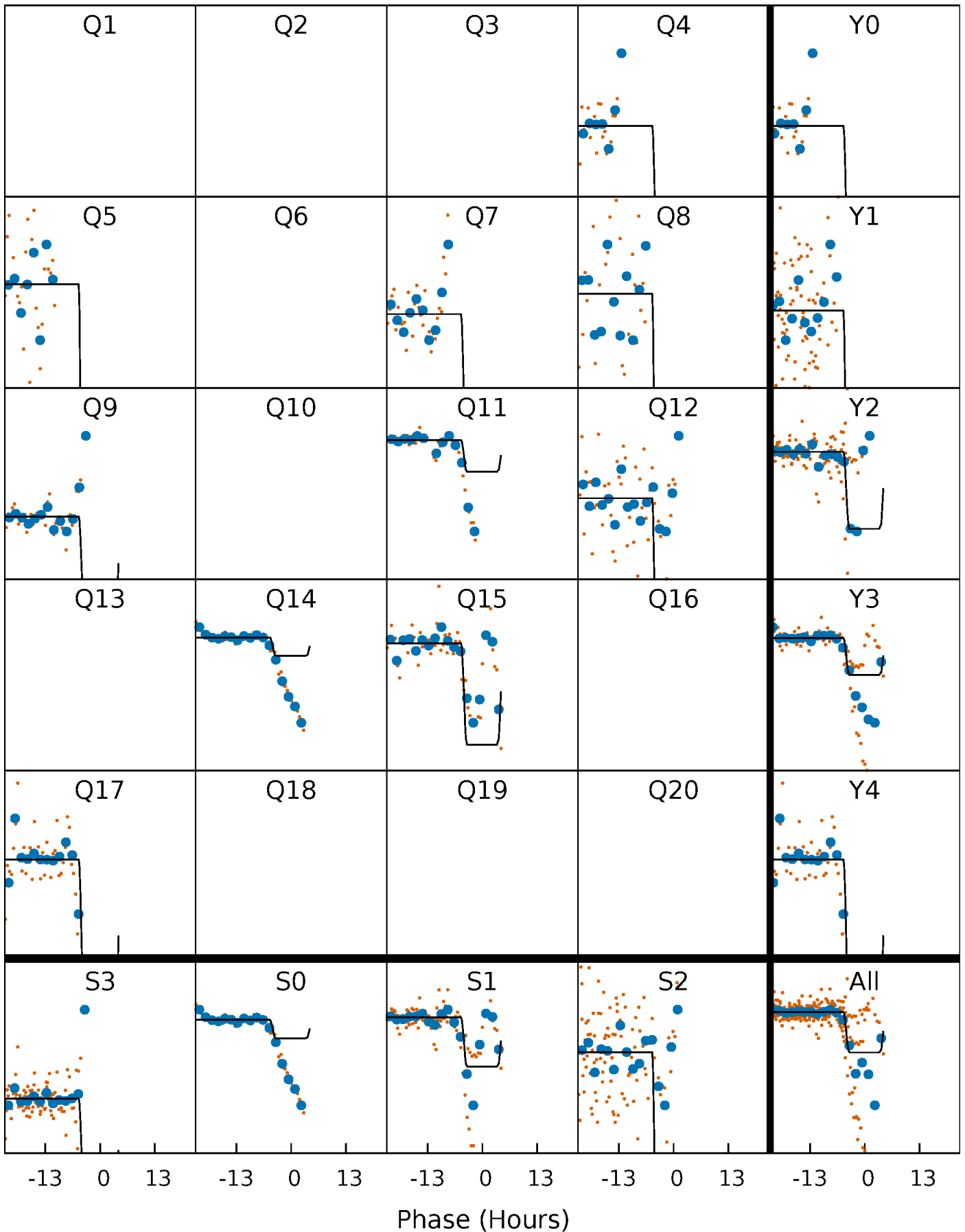
# DV Quarter-Phased Transit Curves

TCE 004347340-02   P=135.677907 Days    $T_0=224.619027$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

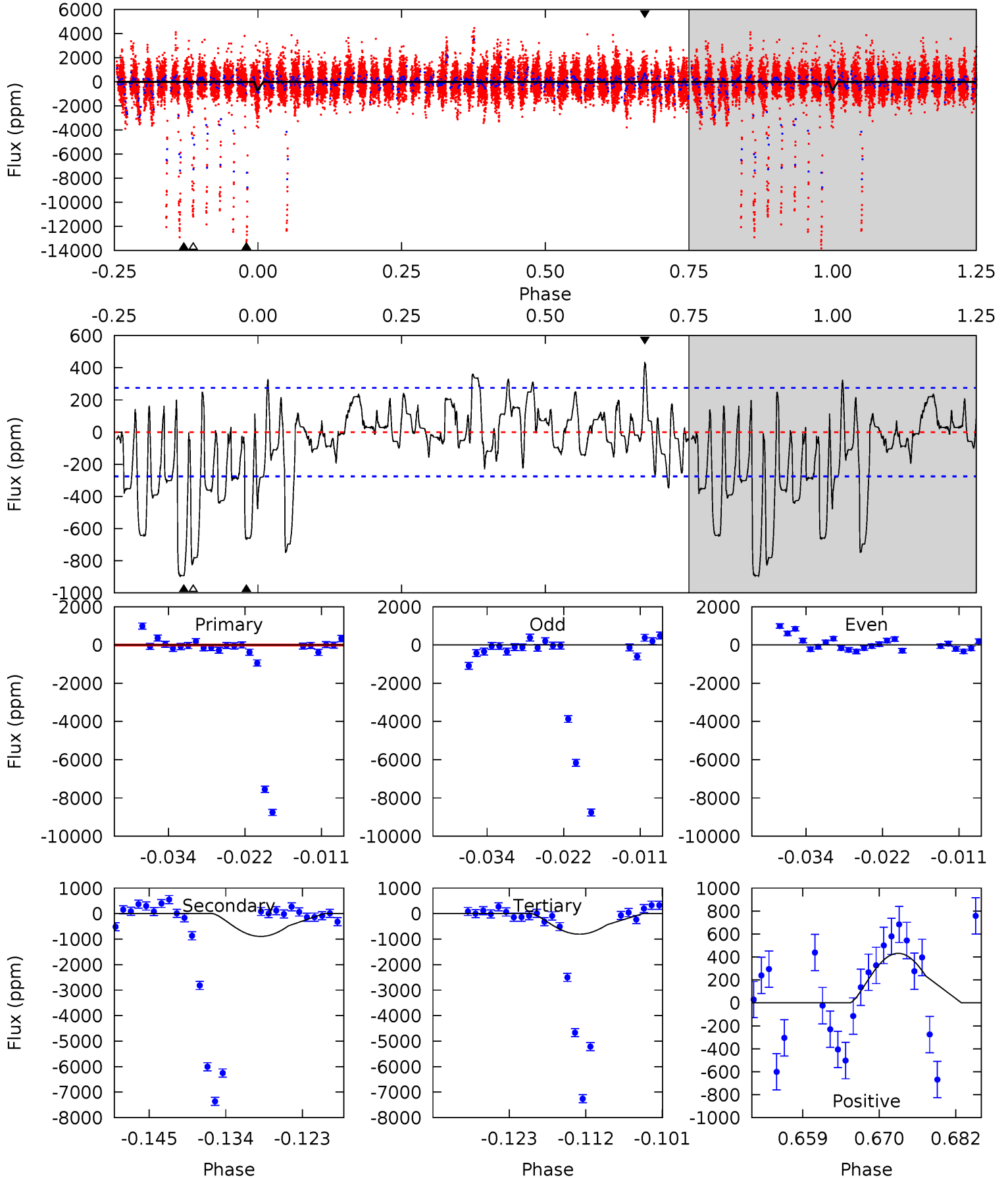
TCE 004347340-02 P=135.737263 Days  $T_0=224.429725$  (BKJD)



# DV Model-Shift Uniqueness Test

004347340-02, P = 135.677907 Days, E = 224.619027 Days

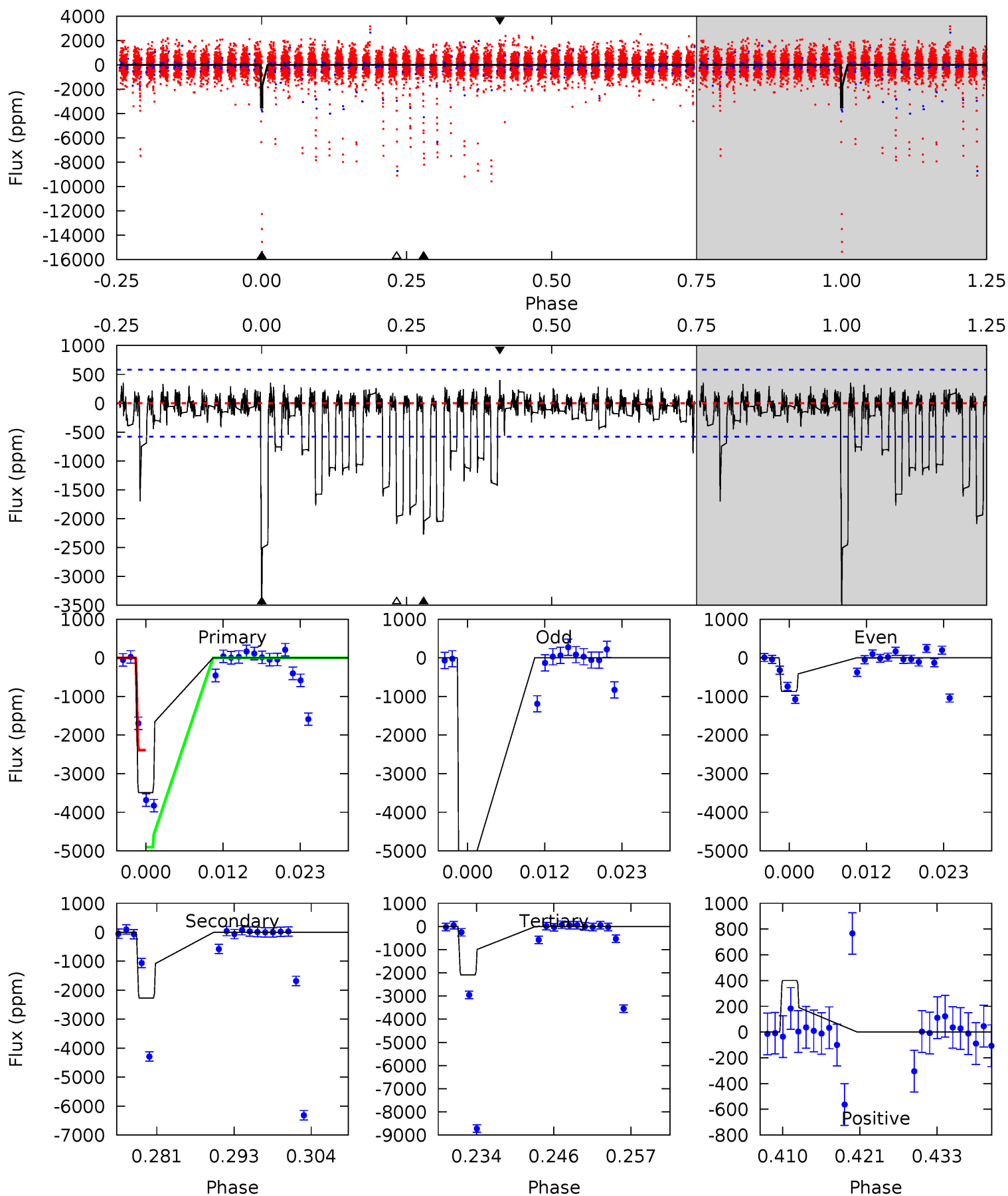
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	16.3	14.7	7.86	5.00	2.54	3.40	-2.61	4.21	1.61	8.43	7.29	0.06	0.33	1.43



# Alt Model-Shift Uniqueness Test

004347340-02, P = 135.737263 Days, E = 224.429725 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
30.0	19.5	18.0	3.45	5.00	2.52	1.91	12.1	26.6	1.59	16.1	41.0	2.25	0.10	9.97



### Stellar Parameters For KIC 004347340

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5520^{+194}_{-194}$	$4.552^{+0.095}_{-0.085}$	$-0.840^{+0.300}_{-0.300}$	$0.722^{+0.097}_{-0.088}$	$0.678^{+0.081}_{-0.035}$	$2.536^{+1.006}_{-0.659}$
	+4%/-4%	+2%/-2%	+36%/-36%	+13%/-12%	+12%/-5%	+40%/-26%
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 004347340-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-895 \pm 55$	$10.58^{+10.30}_{-7.07}$	$428^{+22}_{-20}$	$3180^{+1471}_{-520}$	$911^{+7470}_{-669}$
Alt.	$-2272 \pm 116$	$9.35^{+9.23}_{-6.27}$	$429^{+23}_{-22}$	$3847^{+2185}_{-738}$	$3048^{+23927}_{-2306}$

$T_{max}$  = 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

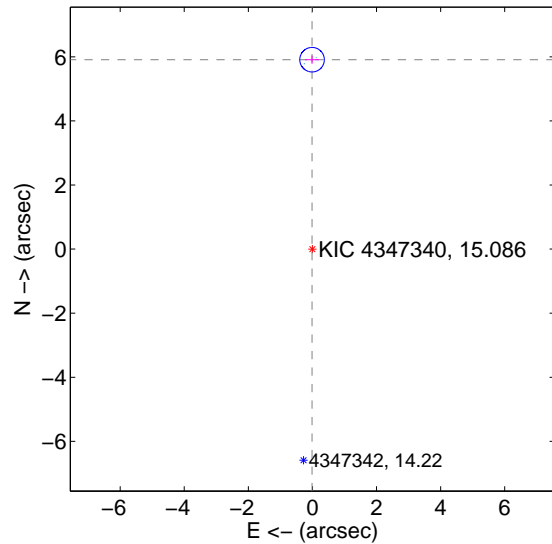
Supplemental centroid analysis for 004347340-02. Kepler magnitude: 15.09. Transit SNR 7.92

There are 2 quarters with good PRF difference image offsets

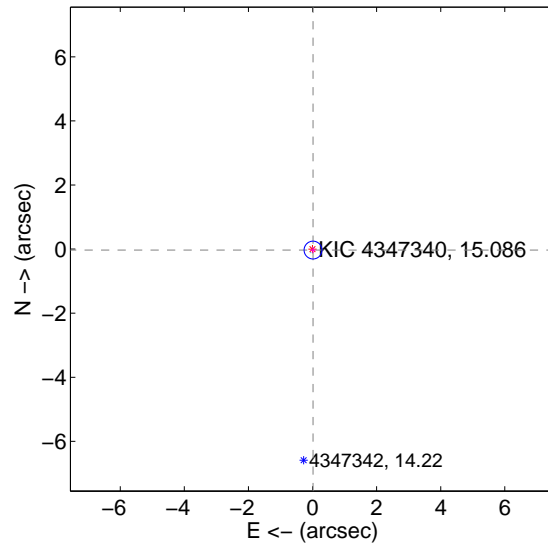
The OOT PRF centroid is offset from the target star catalog position by about 5.90 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.910 \pm 0.128$	46.31	$0.012 \pm 0.219$	$5.910 \pm 0.128$
PRF-fit source offset from KIC position	$0.034 \pm 0.093$	0.36	$-0.015 \pm 0.085$	$-0.030 \pm 0.095$
photometric centroid source offset	$1.07 \pm 1.38$	0.78	$-0.19 \pm 0.10$	$-1.05 \pm 1.40$

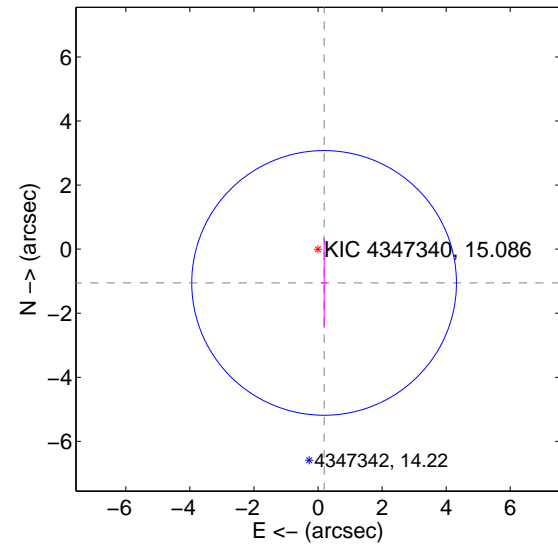
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

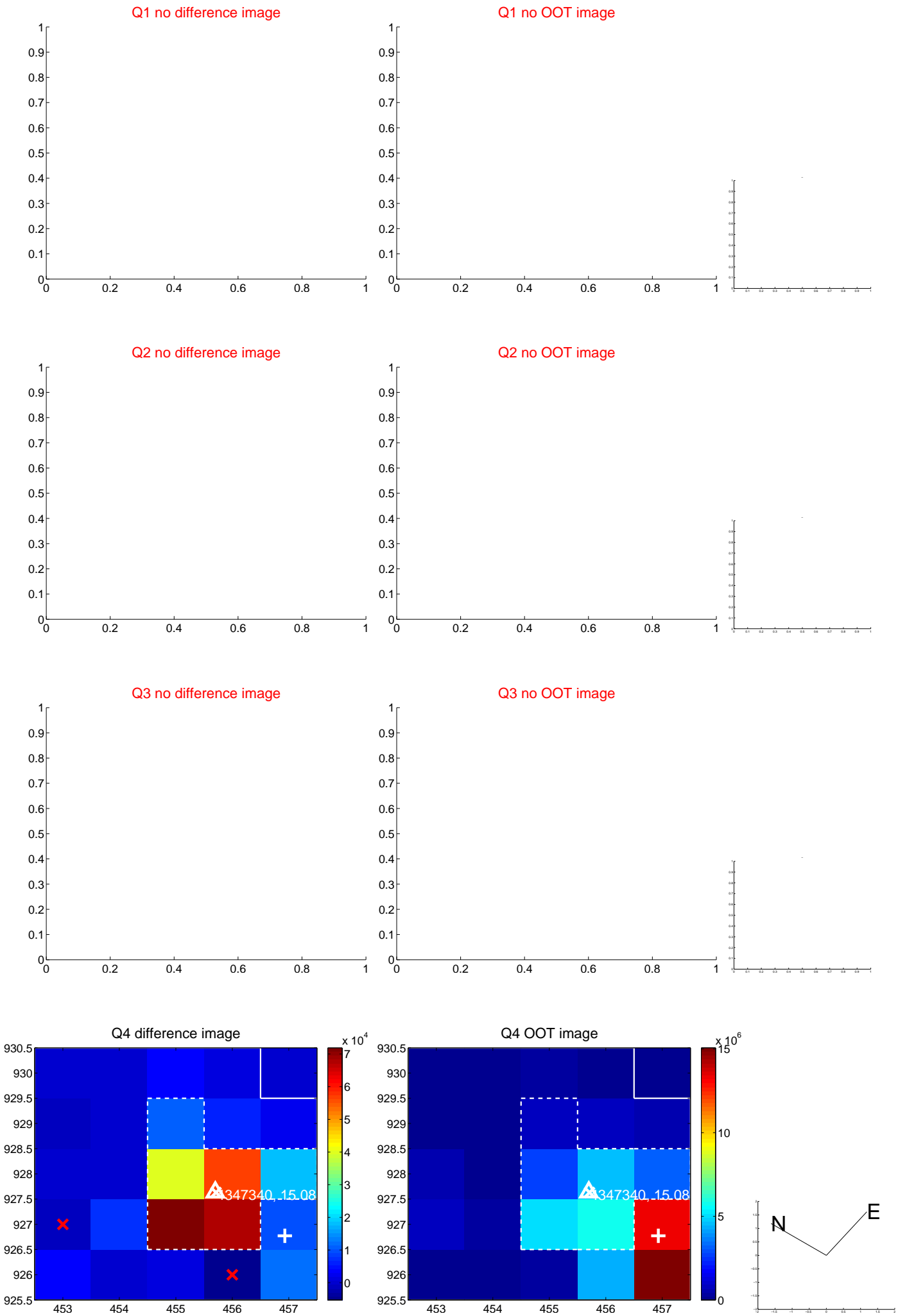


offset from photometric centroids



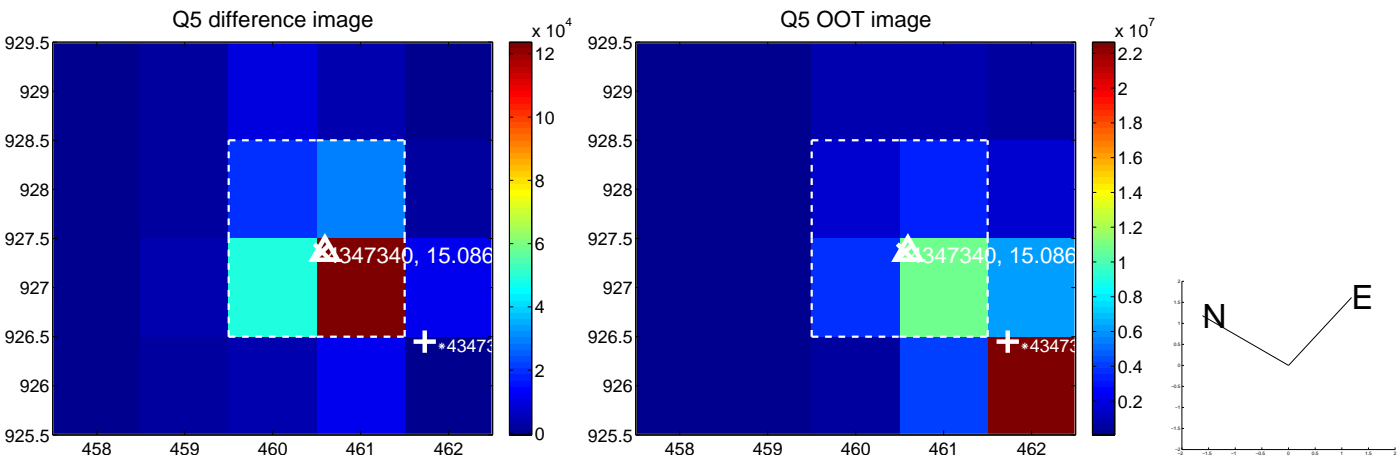
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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





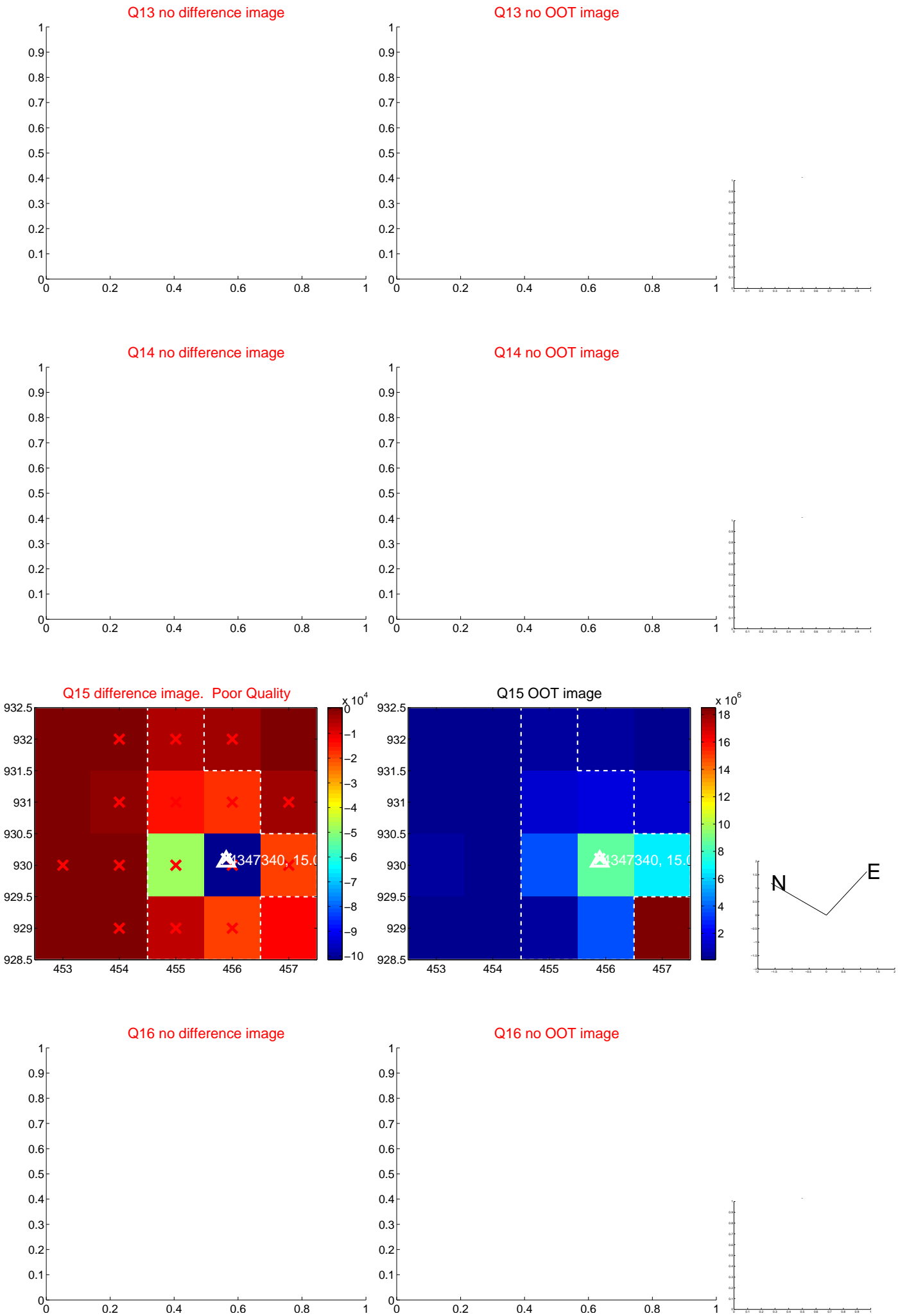
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



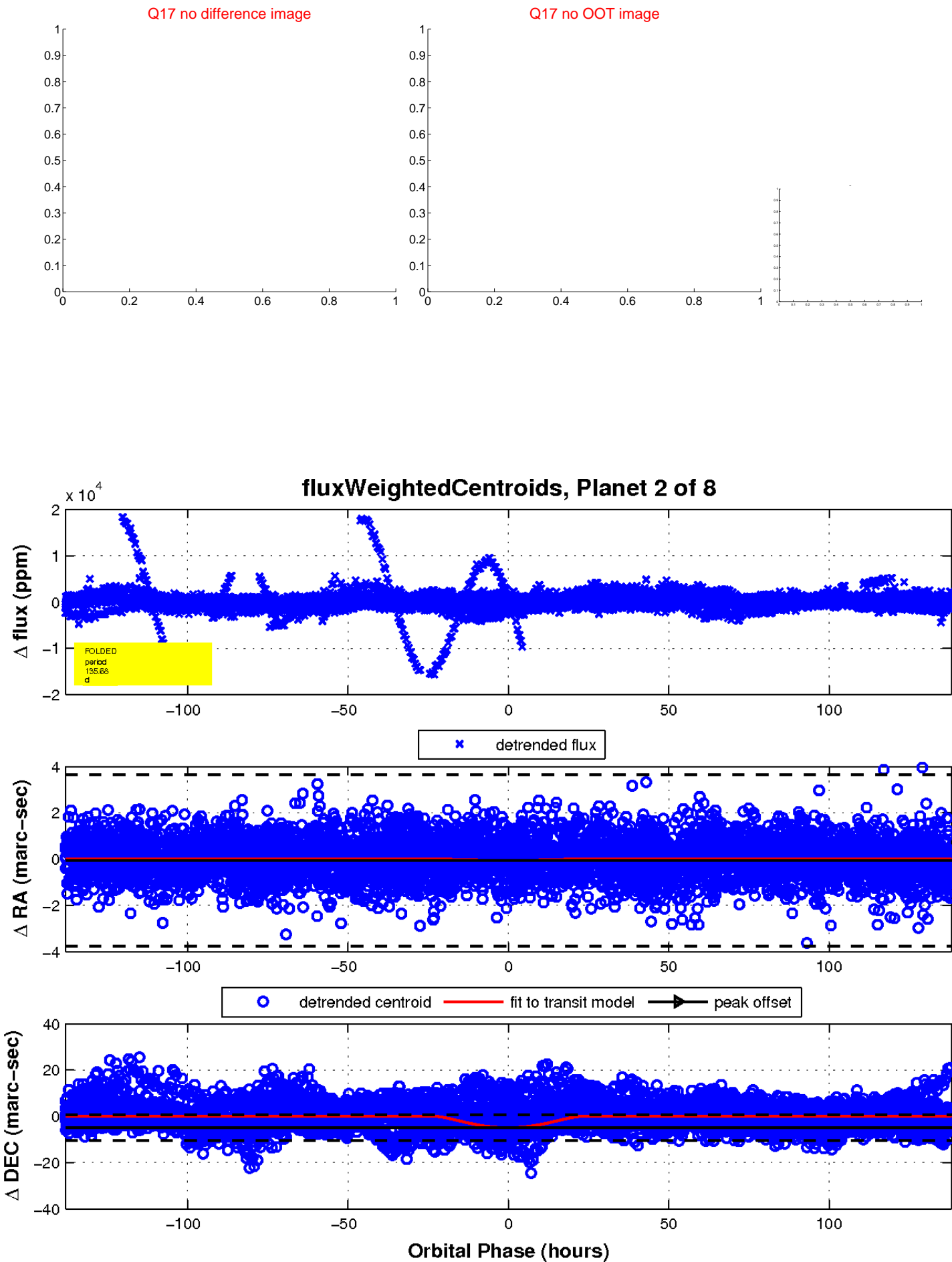
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



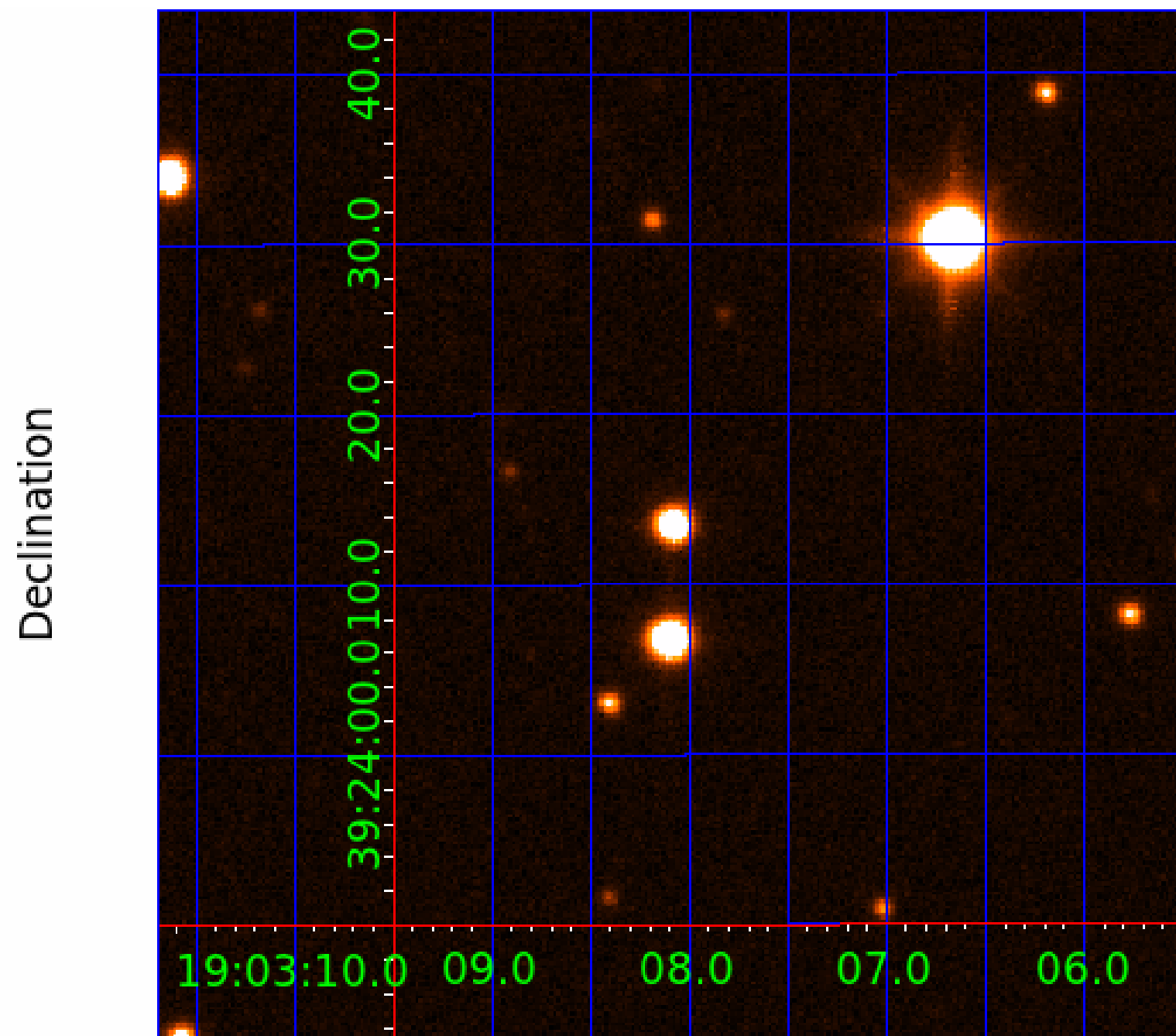
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image



# KIC 004347340

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004347340-01	OBS	No	3.158864	133.148926	242.9	15.009	8.8	10.4	0.72	5520	2.27	316.45
004347340-02	OBS	No	135.677907	224.619027	2088.6	46.049	10.1	7.9	0.72	5520	6.22	2.10
004347340-03	OBS	No	87.991096	213.154786	368.8	3.537	8.3	2.9	0.72	5520	1.48	3.75
004347340-04	OBS	No	382.441320	469.090433	709.9	9.000	9.2	-1.0	0.72	5520	1.92	0.53
004347340-05	OBS	No	124.986879	180.255833	1131.3	5.349	8.4	8.3	0.72	5520	2.57	2.35
004347340-06	OBS	No	67.732451	157.191789	1000.9	1.868	7.6	6.9	0.72	5520	2.58	5.31
004347340-07	OBS	No	117.676012	221.262001	646.1	7.500	8.5	-1.0	0.72	5520	1.83	2.54
004347340-08	OBS	No	184.597816	283.138226	2018.4	5.000	12.1	-1.0	0.72	5520	3.23	1.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004347340-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_KIC_POS
004347340-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004347340-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
004347340-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—CENT_NOFITS
004347340-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
004347340-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

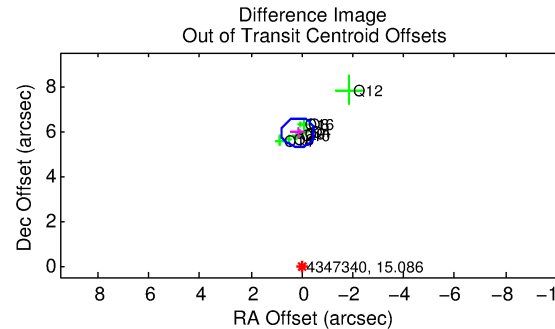
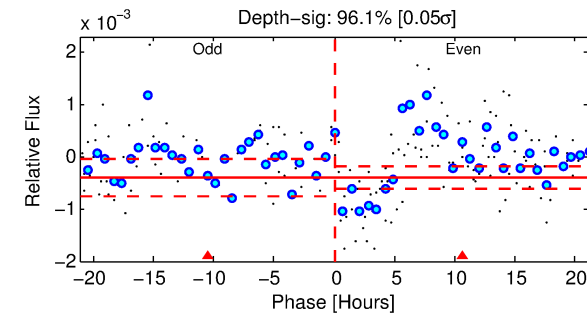
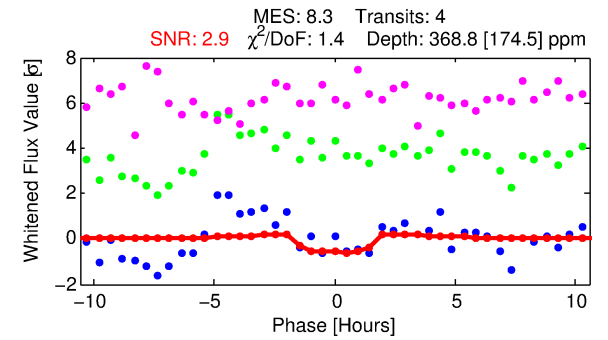
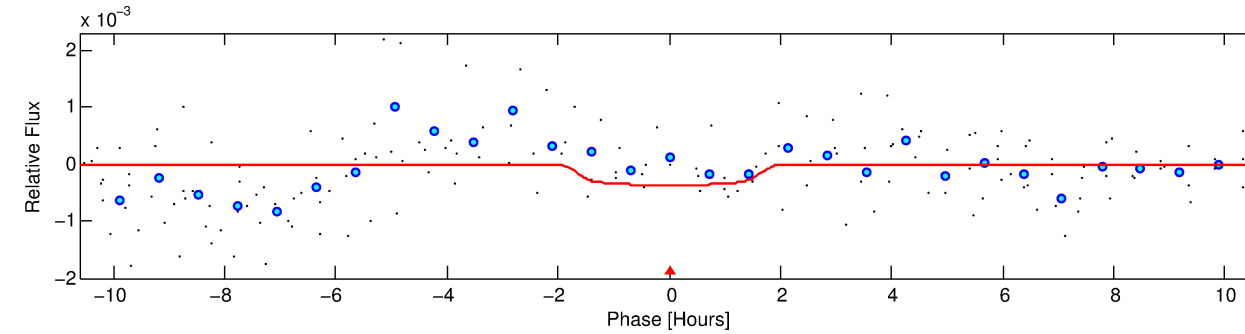
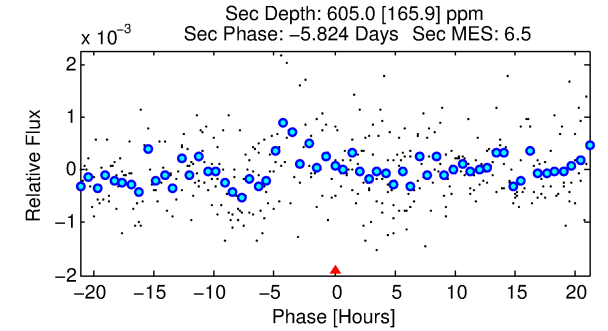
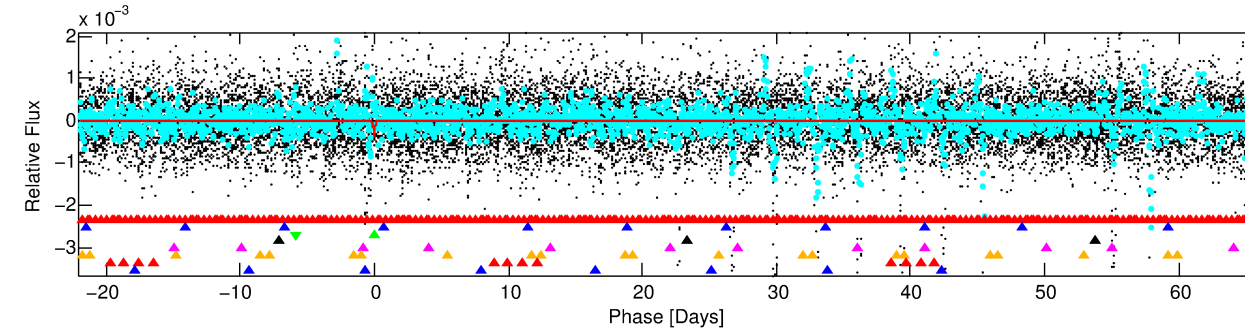
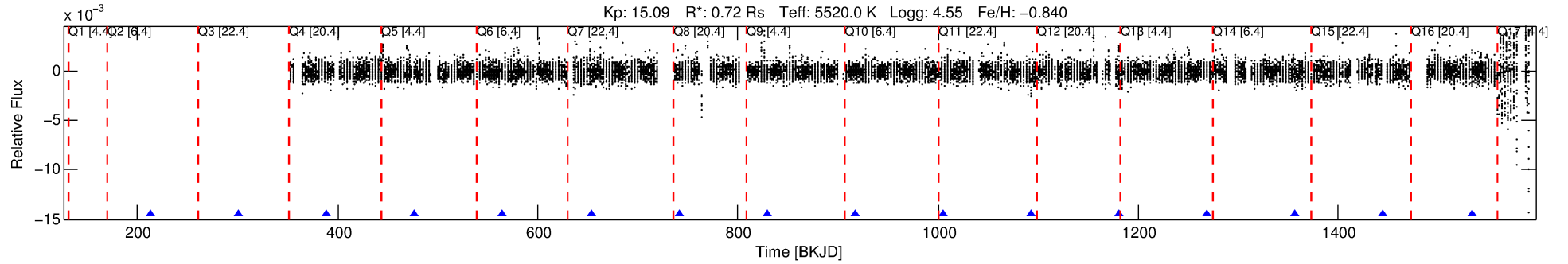
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004347340-03

No Significant Match Found

# DV One-Page Summary

KIC: 4347340 Candidate: 3 of 8 Period: 87.991 d



## DV Fit Results:

Period = 87.99110 [0.00466] d  
Epoch = 213.1548 [0.0413] BKJD  
Rp/R\* = 0.0188 [0.0902]  
a/R\* = 140.62 [3200.08]  
b = 0.70 [16.69]  
Seff = 3.75 [0.83]  
Teq = 355 [20] K  
Rp = 1.48 [7.11] Re  
a = 0.3402 [0.0393] AU  
Ag = 17542.61 [168385.40] [0.10σ]  
Teffp = 6313 [15148] K [0.39σ]

## DV Diagnostic Results:

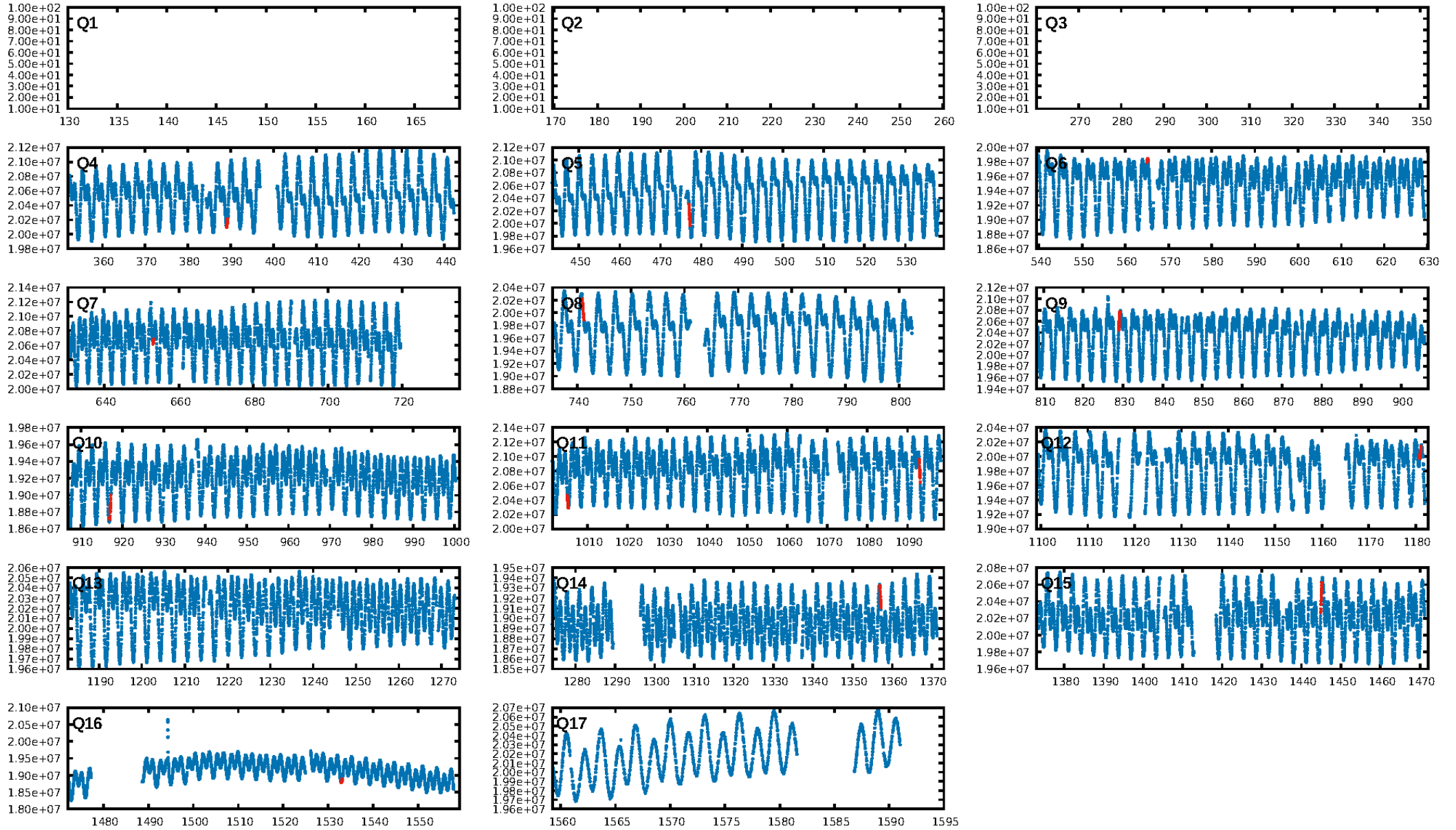
ShortPeriod-sig: 100.0% [121.56σ]  
LongPeriod-sig: 100.0% [85.92σ]  
ModelChiSquare2-sig: 76.2%  
ModelChiSquareGof-sig: 99.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.592  
Centroid-sig: 0.3%  
Centroid-so: 9.335 arcsec [2.84σ]  
OOTOffset-rm: 5.942 arcsec [27.75σ]  
KicOffset-rm: 0.074 arcsec [0.33σ]  
OOTOffset-st: 3/0/4/1 [8]  
KicOffset-st: 3/3/4/1 [11]  
DiffImageQuality-fgm: 0.45 [5/11]  
DiffImageOverlap-fno: 0.55 [6/11]

Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:54:02 Z

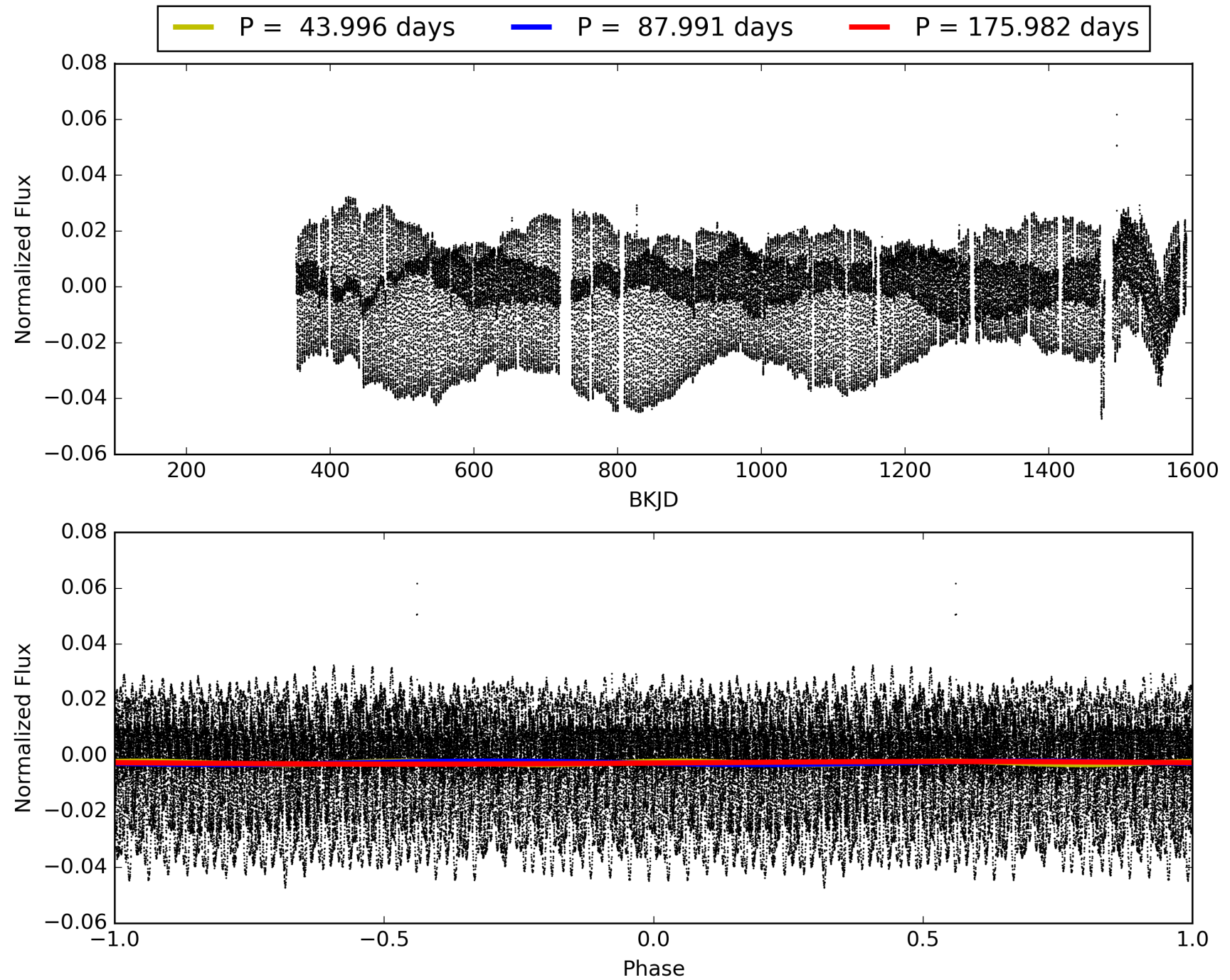
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 004347340-03, PDC Light Curves

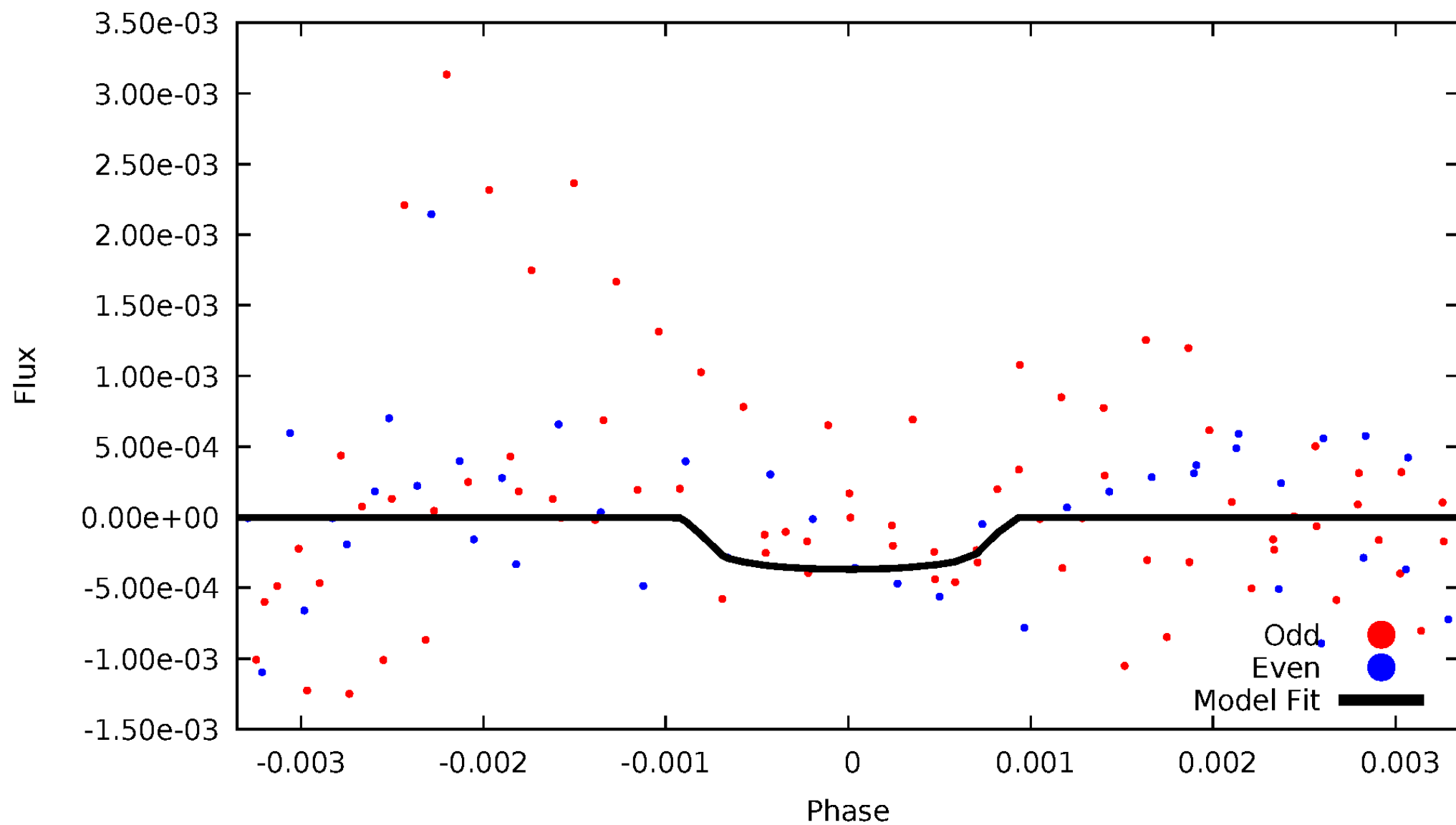


# TCE 004347340-03



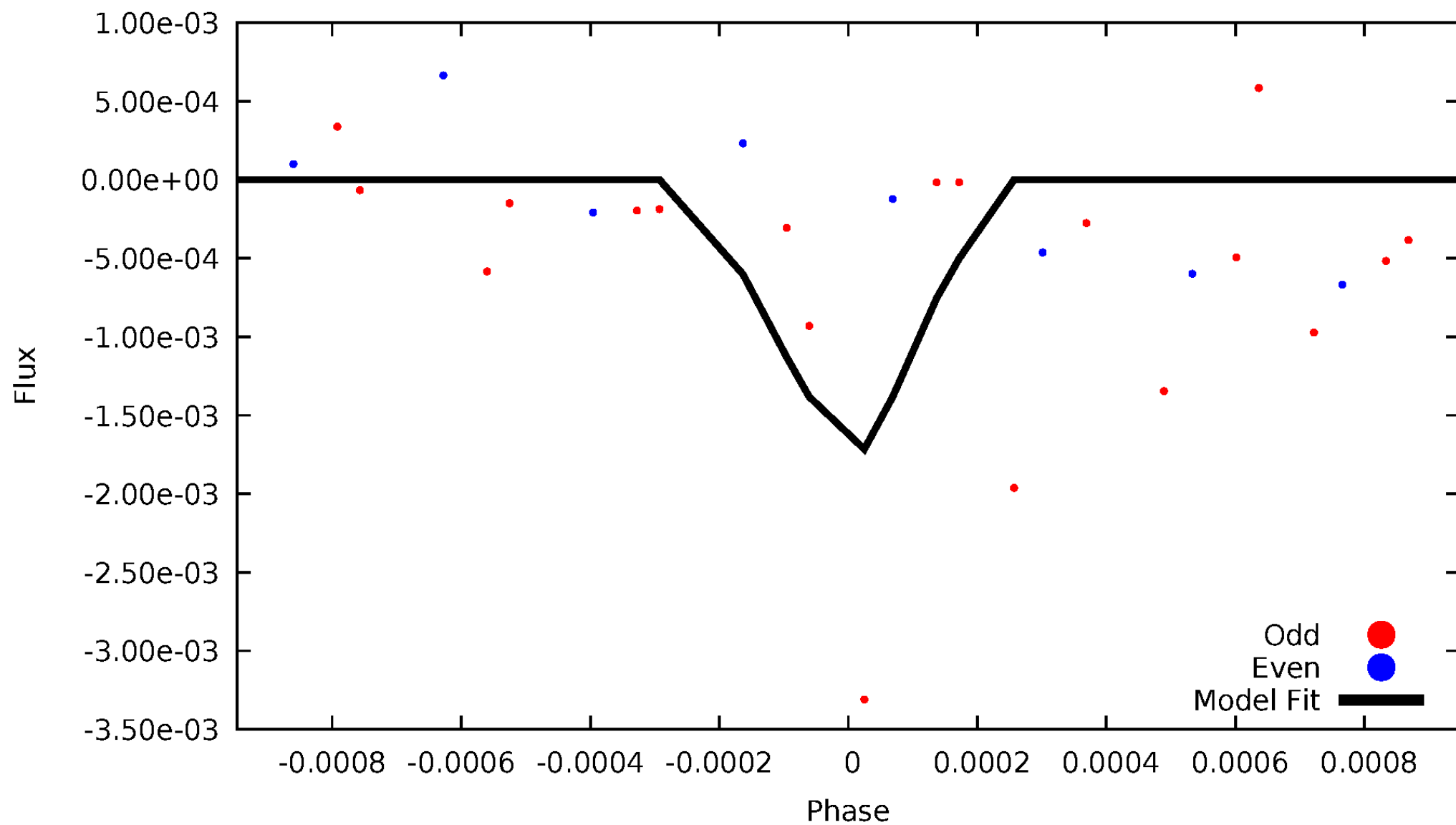
# DV Odd/Even

TCE 004347340-03



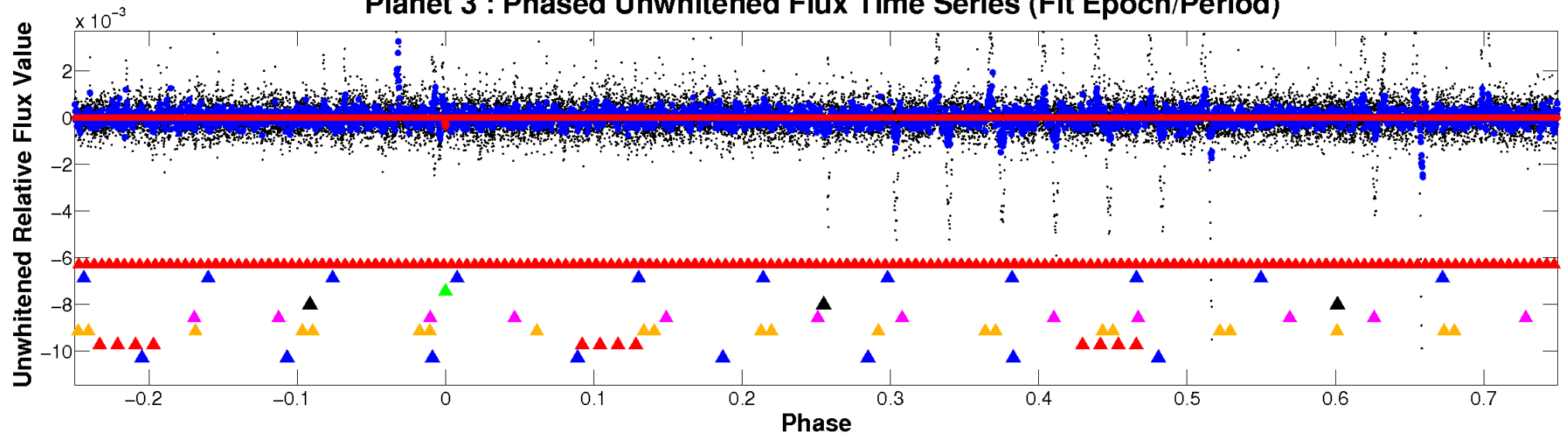
# ALT Odd/Even

TCE 004347340-03

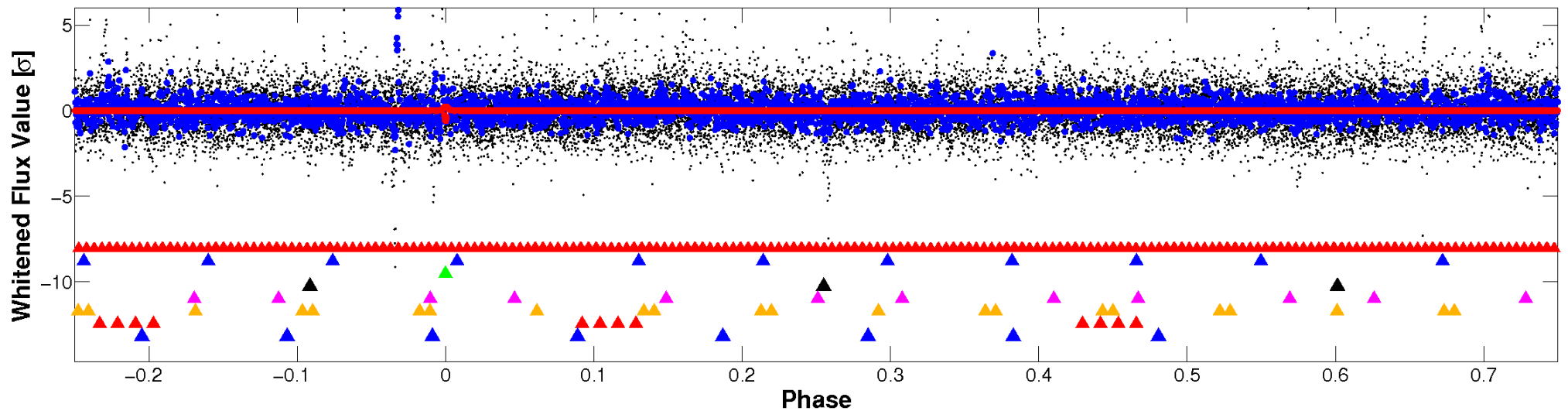


# Non-Whitened Vs. Whitened Light Curve

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

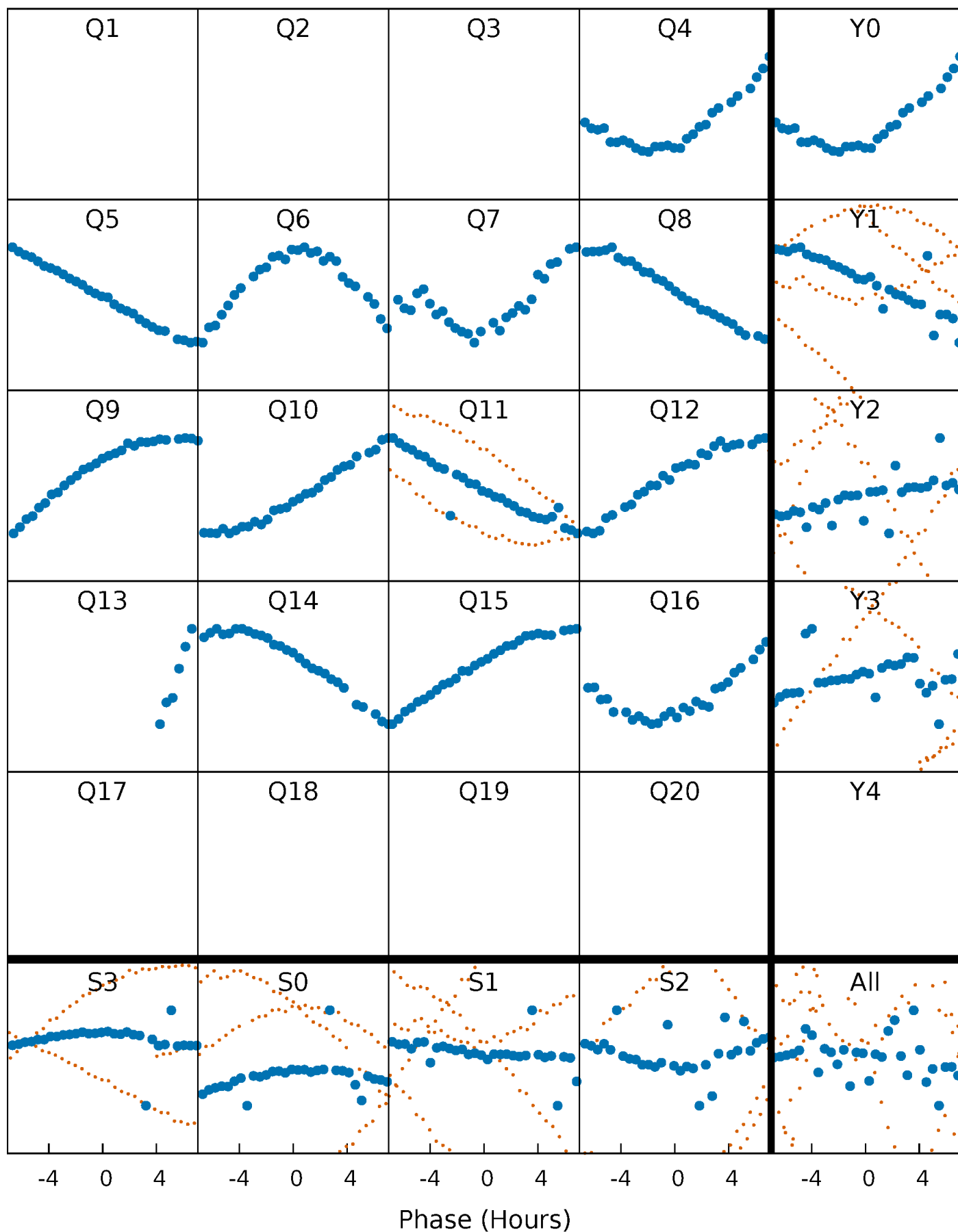


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



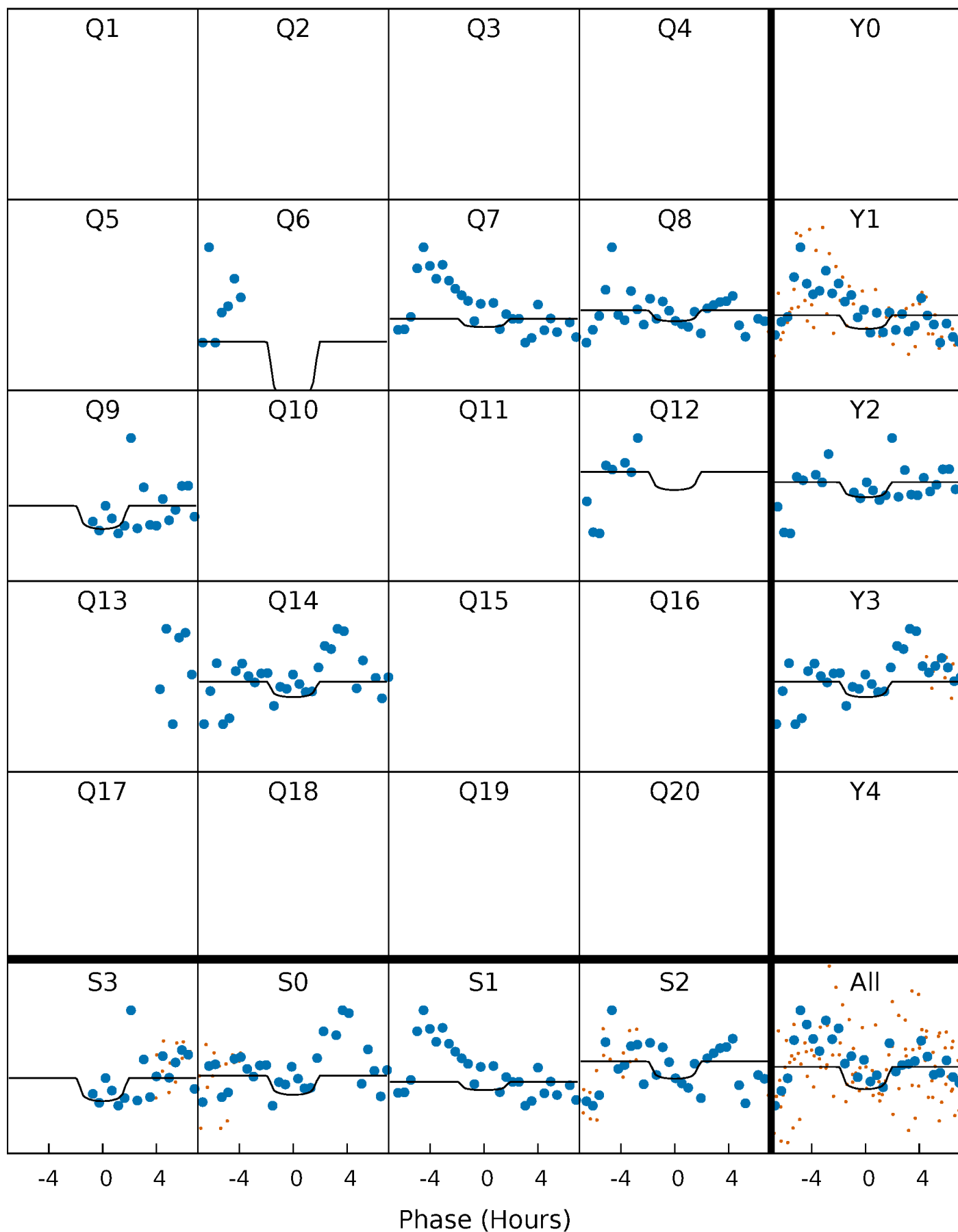
# PDC Quarter-Phased Transit Curves

TCE 004347340-03   P= 87.991096 Days    $T_0=213.154786$  (BKJD)



# DV Quarter-Phased Transit Curves

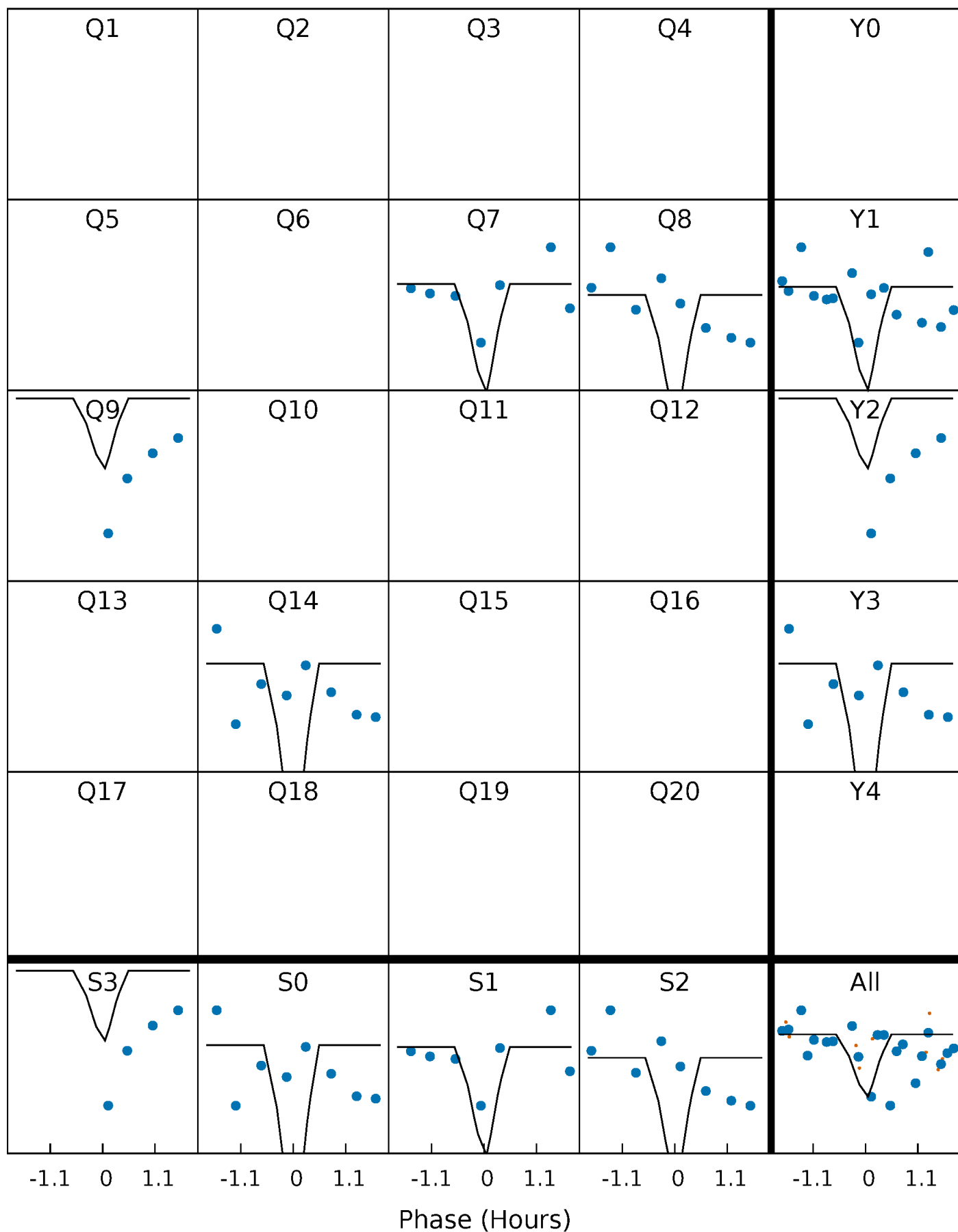
TCE 004347340-03 P= 87.991096 Days  $T_0=213.154786$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

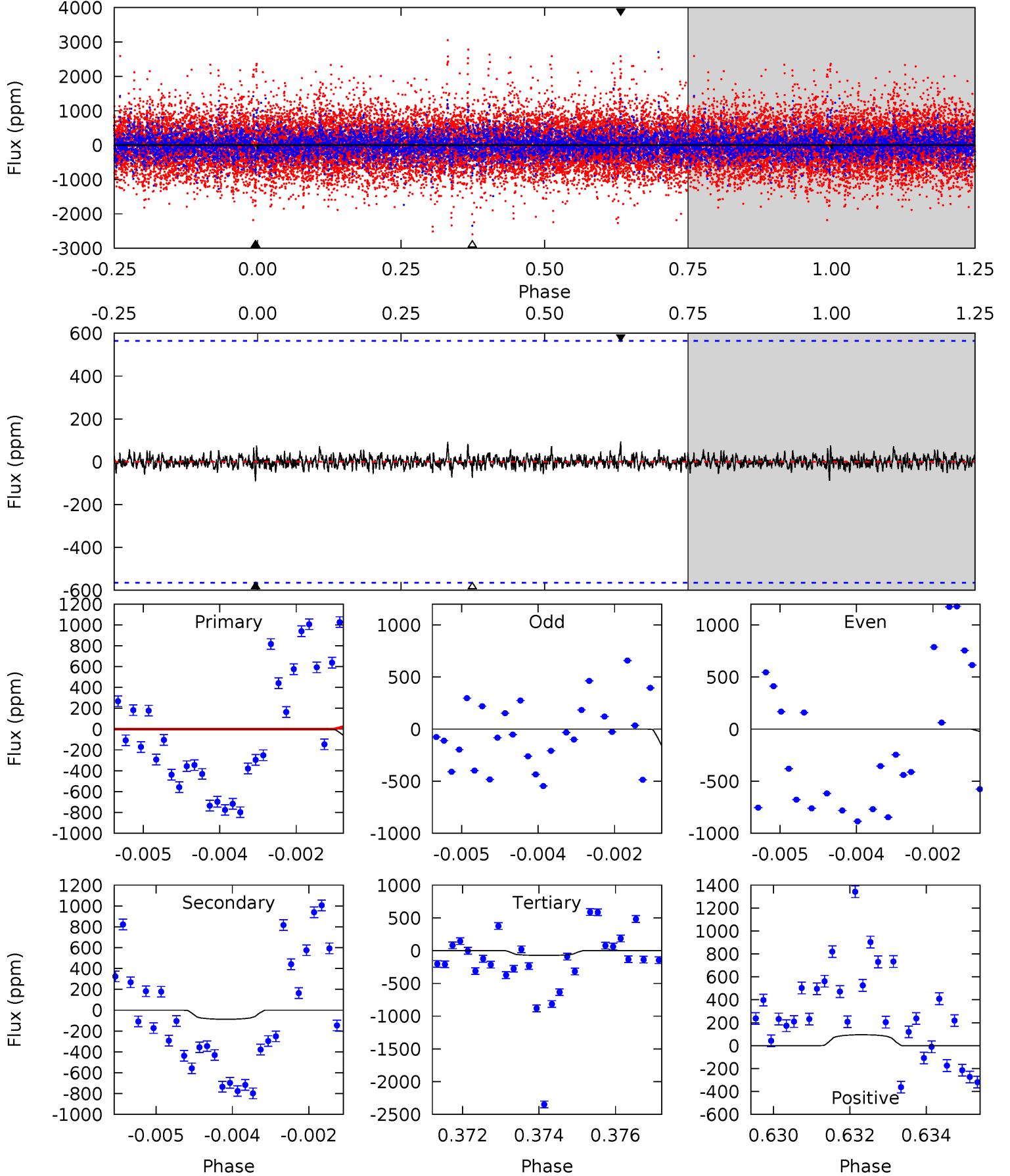
TCE 004347340-03 P= 87.992768 Days  $T_0=213.121537$  (BKJD)



# DV Model-Shift Uniqueness Test

004347340-03, P = 87.991096 Days, E = 213.154786 Days

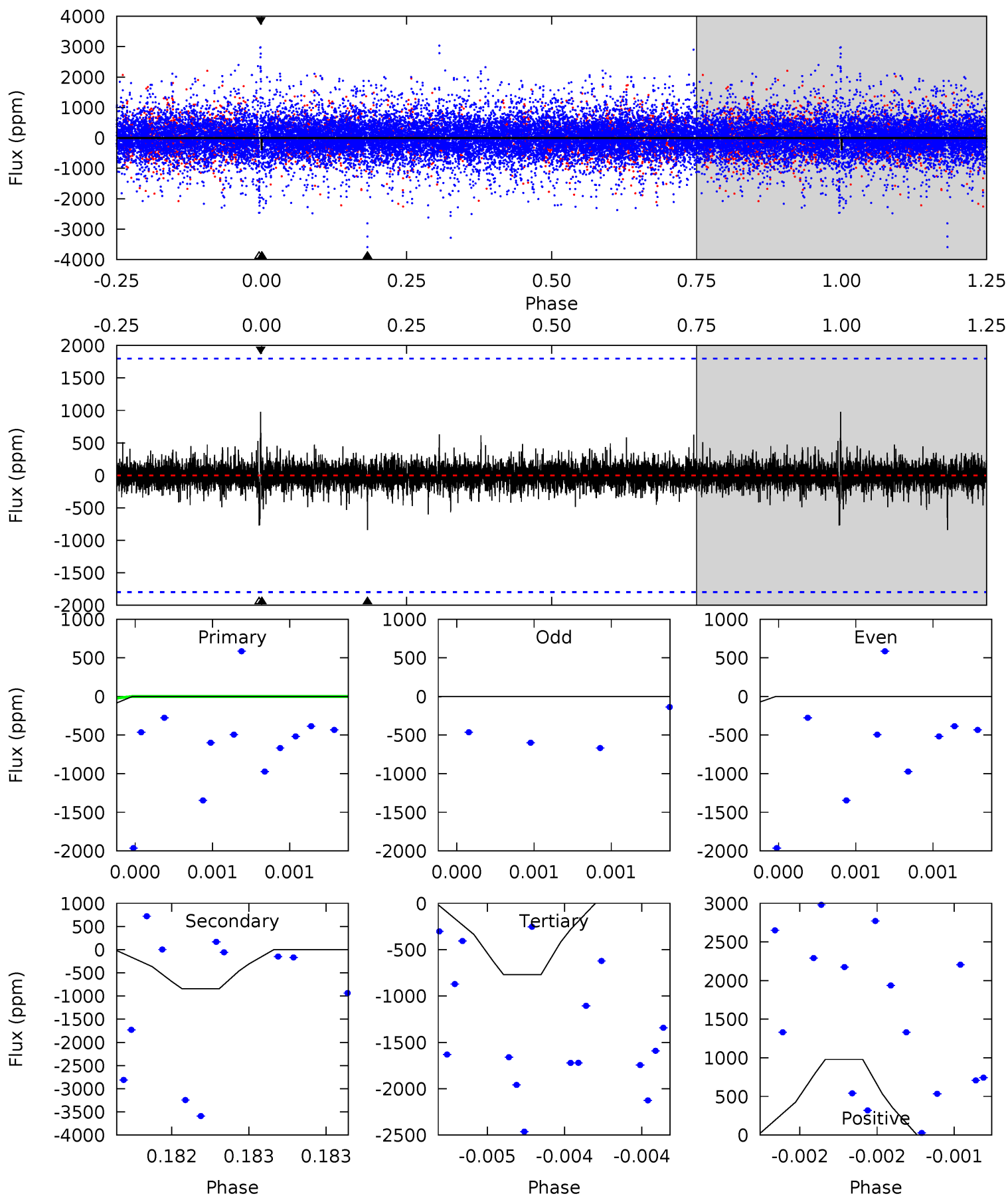
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.82	0.83	0.70	0.90	5.34	3.12	0.19	0.12	-0.08	0.13	-0.07	0.75	0.33	0.52	0.72



# Alt Model-Shift Uniqueness Test

004347340-03, P = 87.992768 Days, E = 213.121537 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
1.17	2.66	2.43	3.09	5.68	3.65	0.39	-1.26	-1.92	0.23	-0.43	0.40	1.38	0.54	0.73



### Stellar Parameters For KIC 004347340

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5520^{+194}_{-194}$	$4.552^{+0.095}_{-0.085}$	$-0.840^{+0.300}_{-0.300}$	$0.722^{+0.097}_{-0.088}$	$0.678^{+0.081}_{-0.035}$	$2.536^{+1.006}_{-0.659}$
	+4%/-4%	+2%/-2%	+36%/-36%	+13%/-12%	+12%/-5%	+40%/-26%
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 004347340-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-88 \pm 106$	$5.18^{+5.27}_{-3.56}$	$496^{+24}_{-26}$	$2674^{+1215}_{-4754}$	$150^{+1502}_{-166}$
Alt.	$-841 \pm 316$	$6.06^{+6.45}_{-4.13}$	$496^{+24}_{-25}$	$3731^{+2106}_{-765}$	$1359^{+12549}_{-1057}$

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

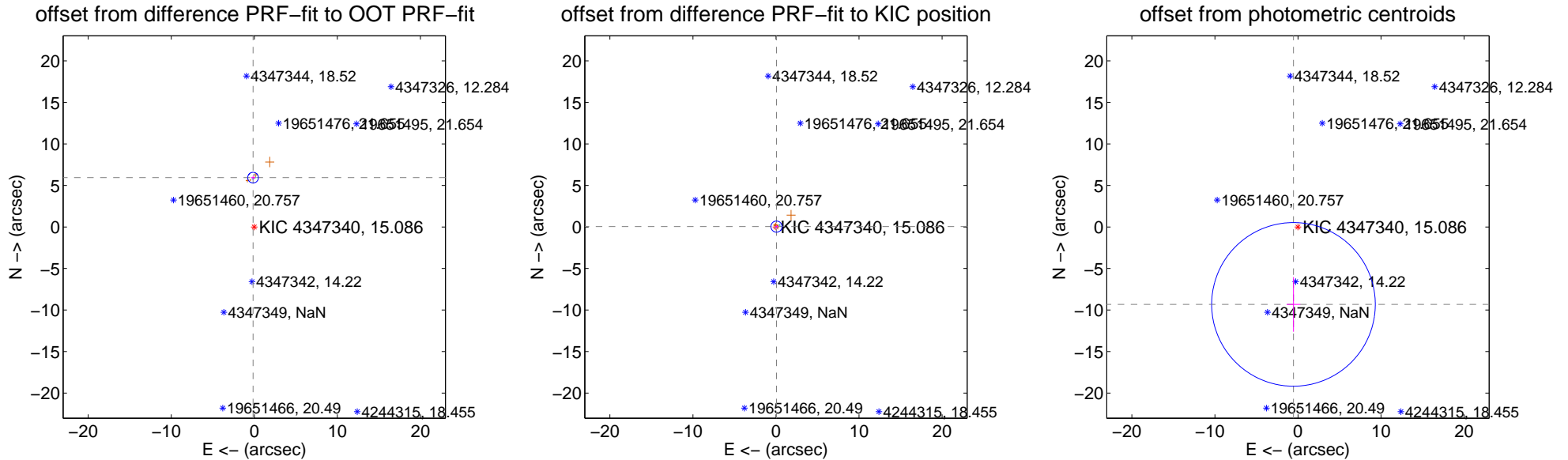
## DV Centroid Data

Supplemental centroid analysis for 004347340-03. Kepler magnitude: 15.09. Transit SNR 2.88

There are 5 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 6.38 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.942 \pm 0.214$	$27.75$	$0.150 \pm 0.249$	$5.940 \pm 0.220$
PRF-fit source offset from KIC position	$0.074 \pm 0.224$	$0.33$	$-0.059 \pm 0.186$	$0.044 \pm 0.147$
photometric centroid source offset	$9.34 \pm 3.28$	$2.84$	$0.54 \pm 0.83$	$-9.32 \pm 3.29$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

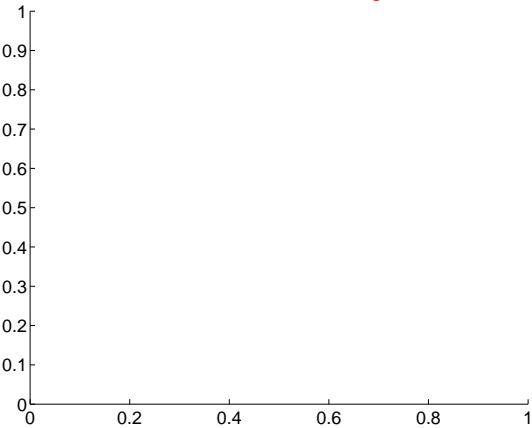
Q1 no difference image



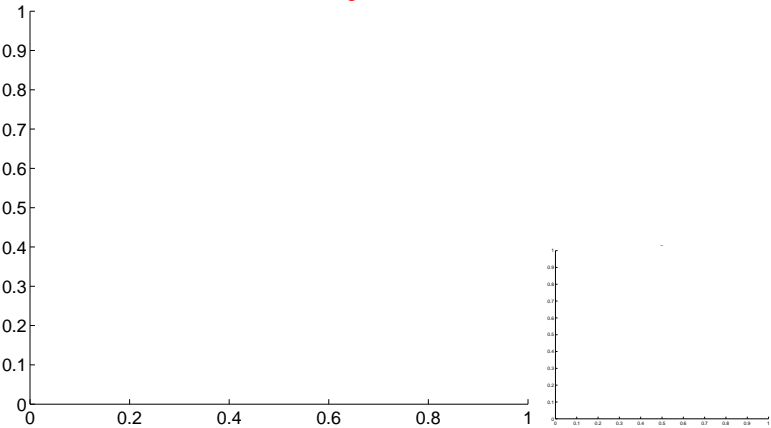
Q1 no OOT image



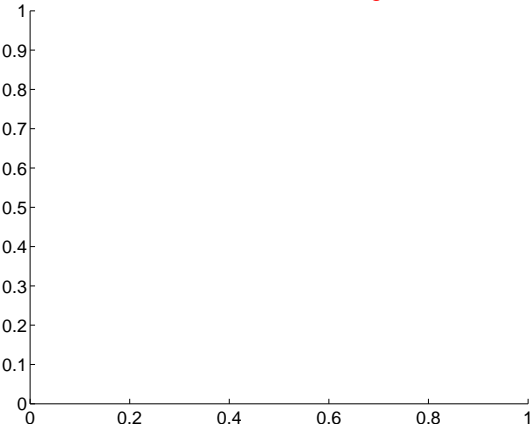
Q2 no difference image



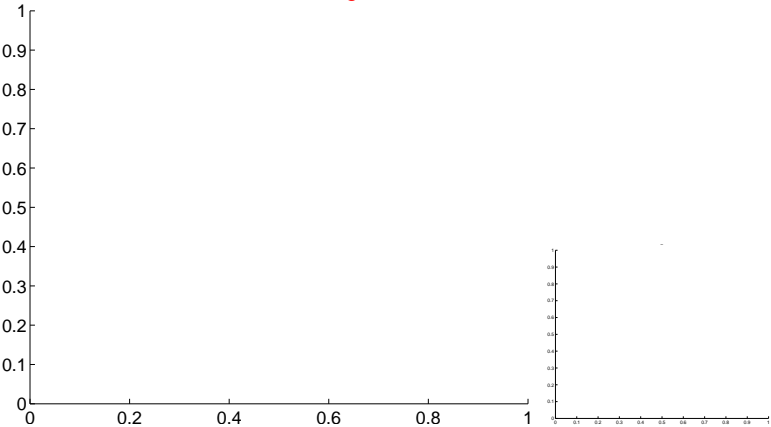
Q2 no OOT image



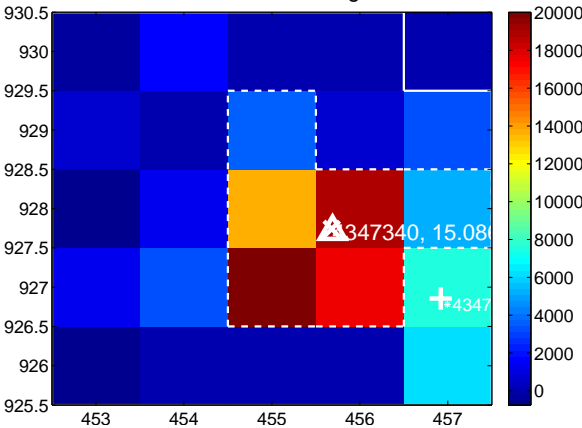
Q3 no difference image



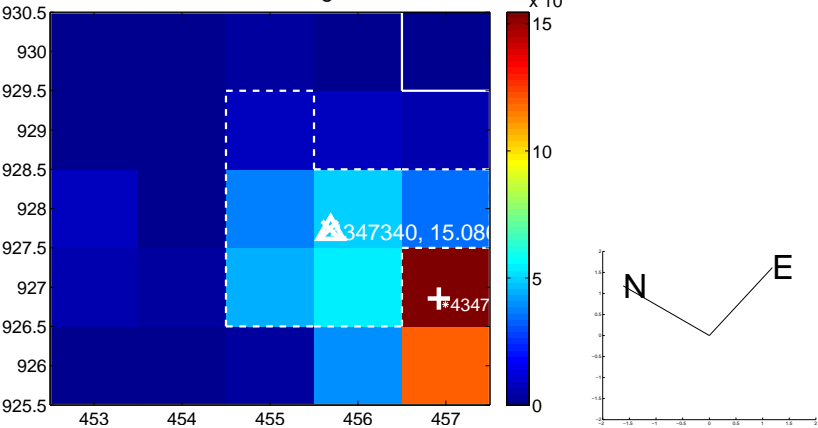
Q3 no OOT image



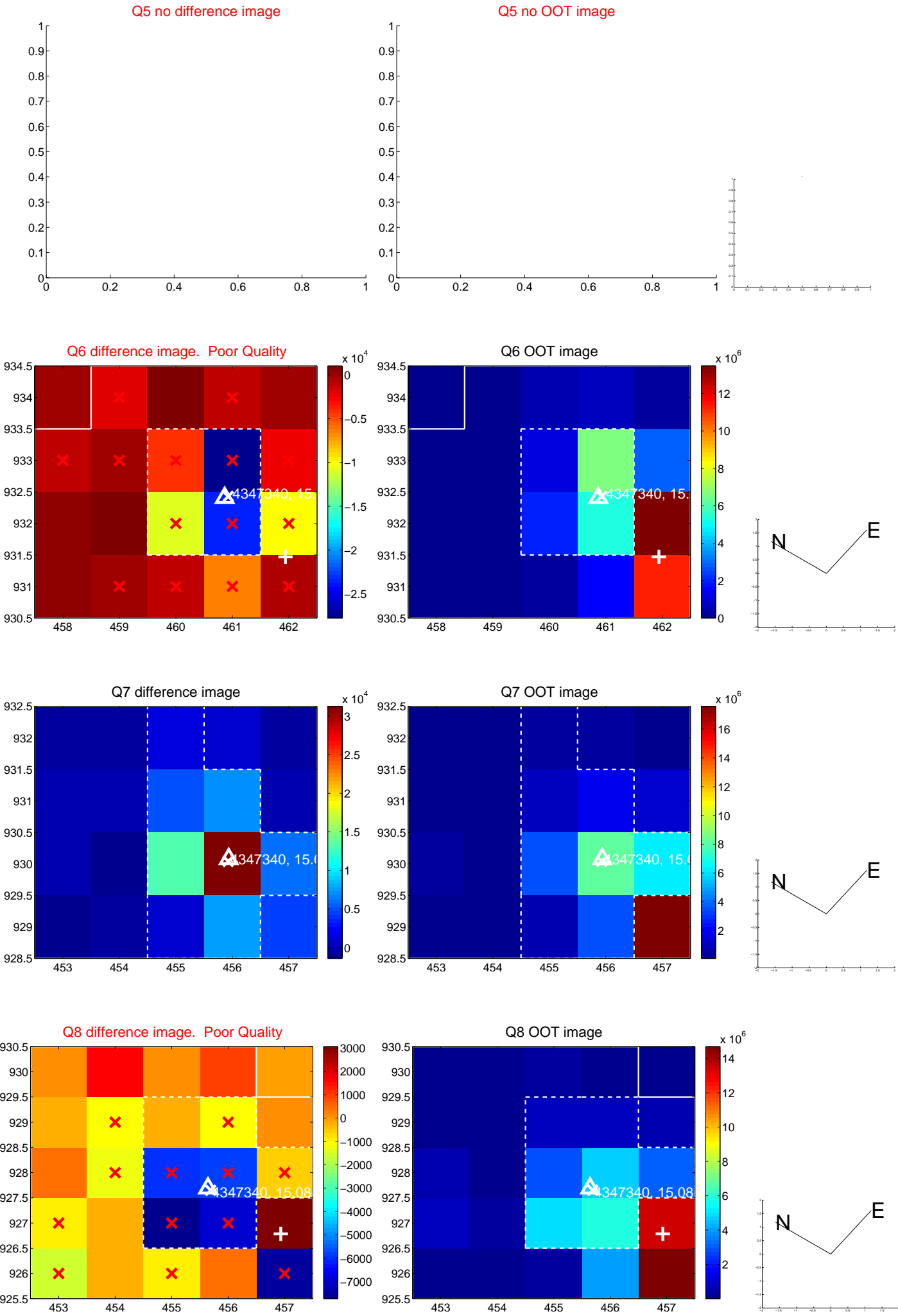
Q4 difference image



Q4 OOT image

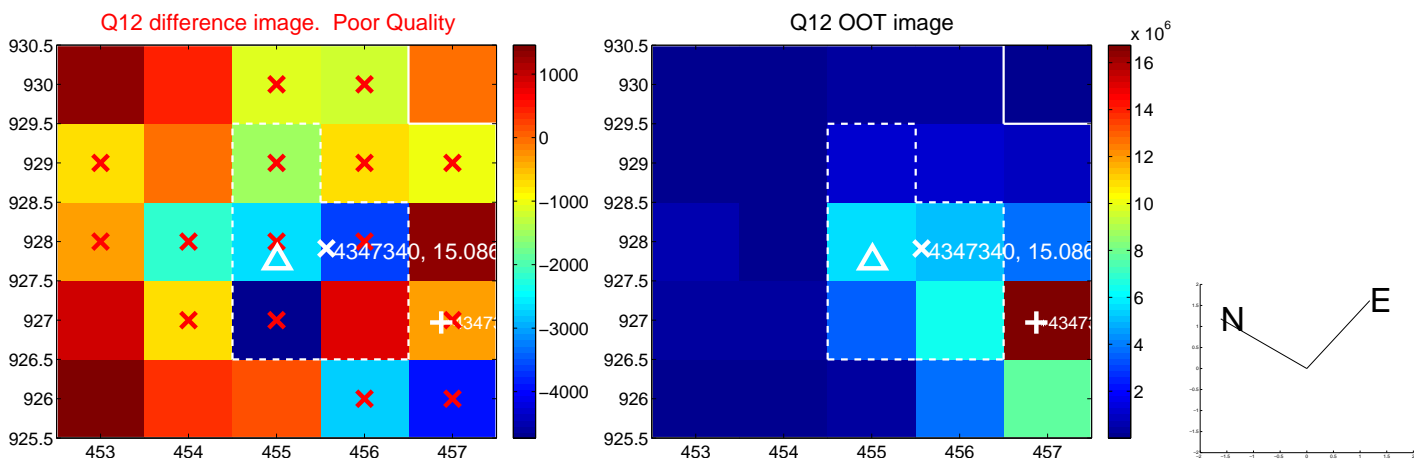
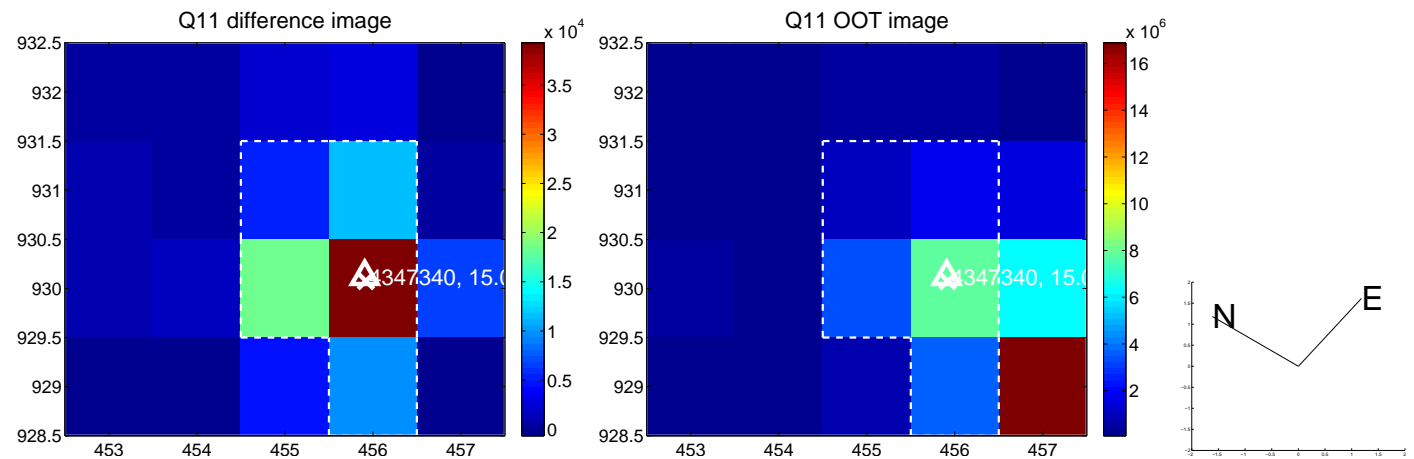
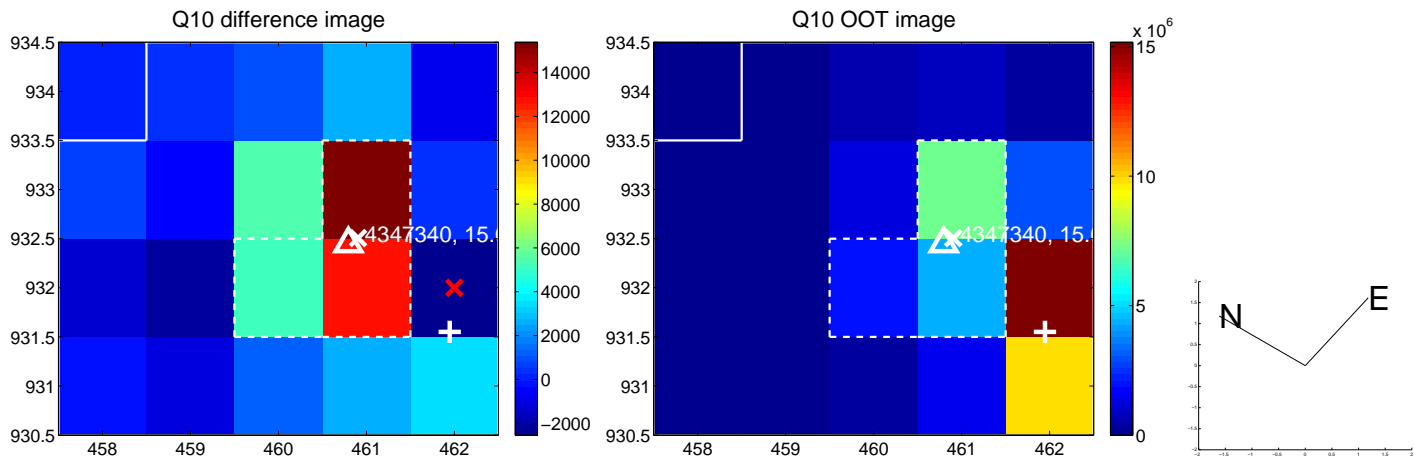
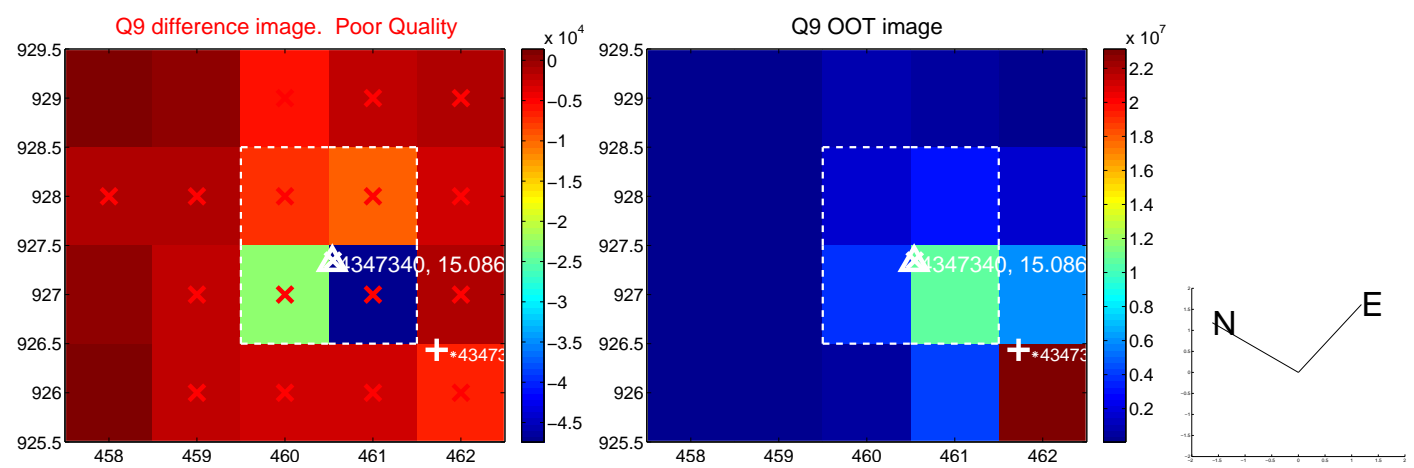


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

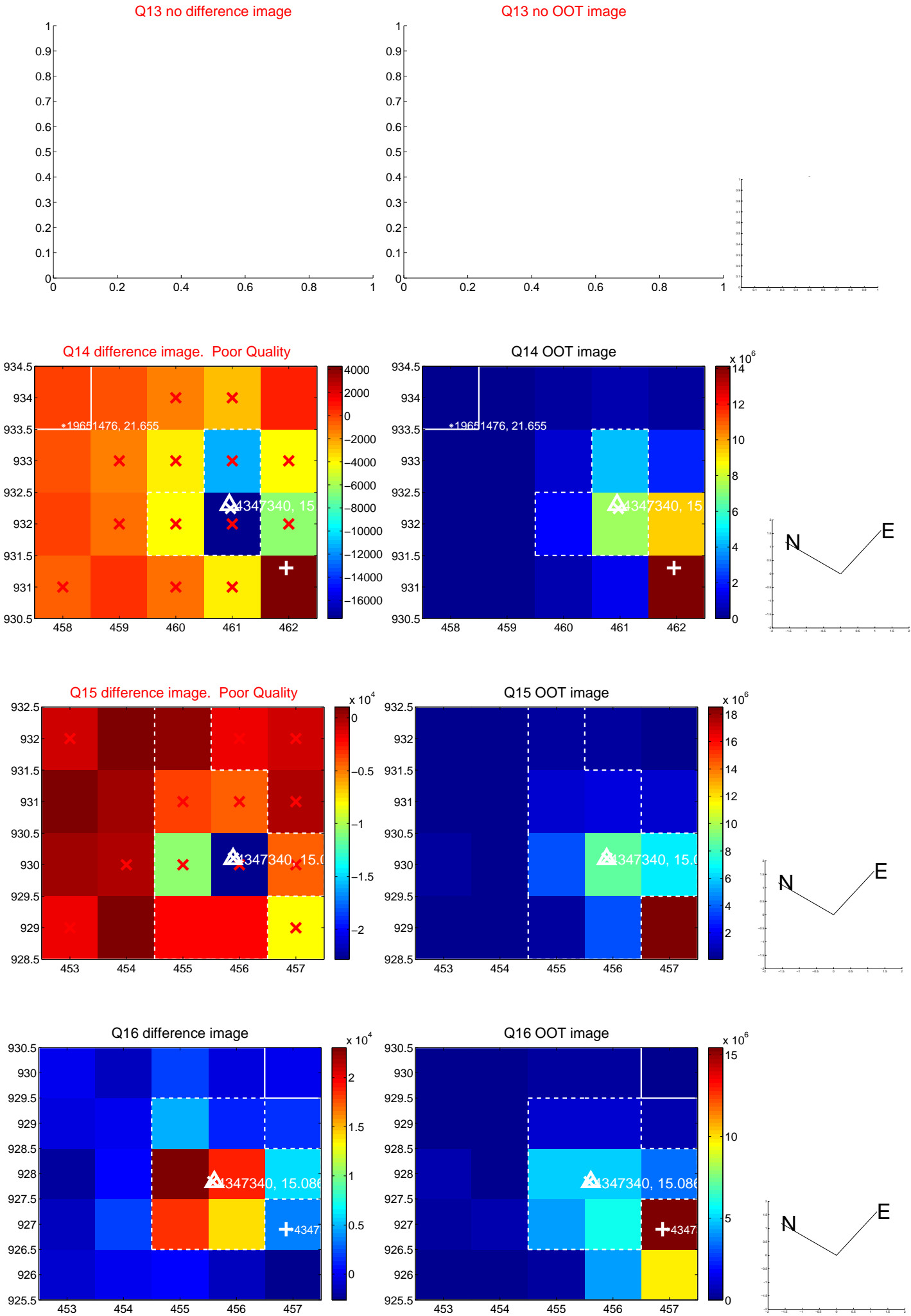




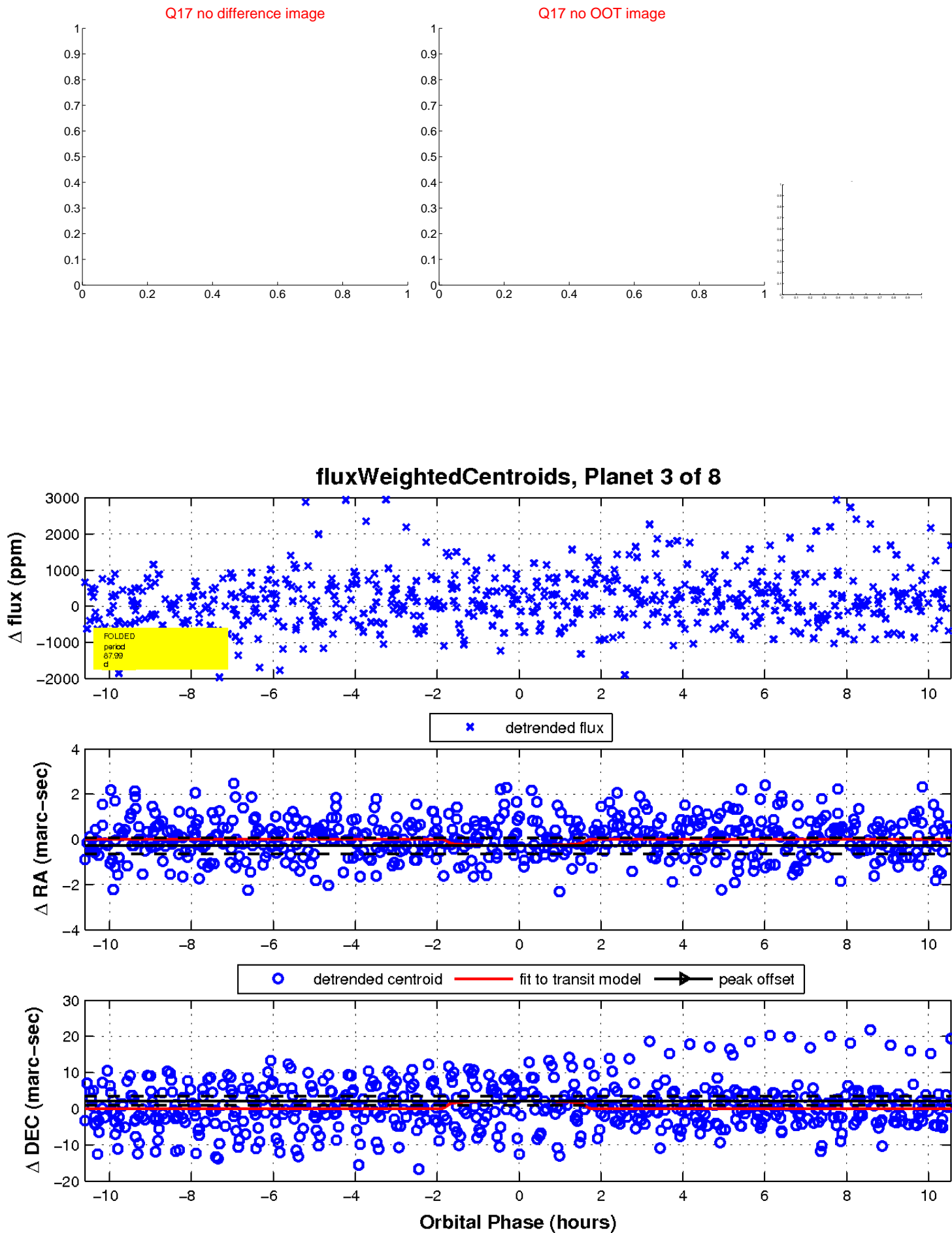
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



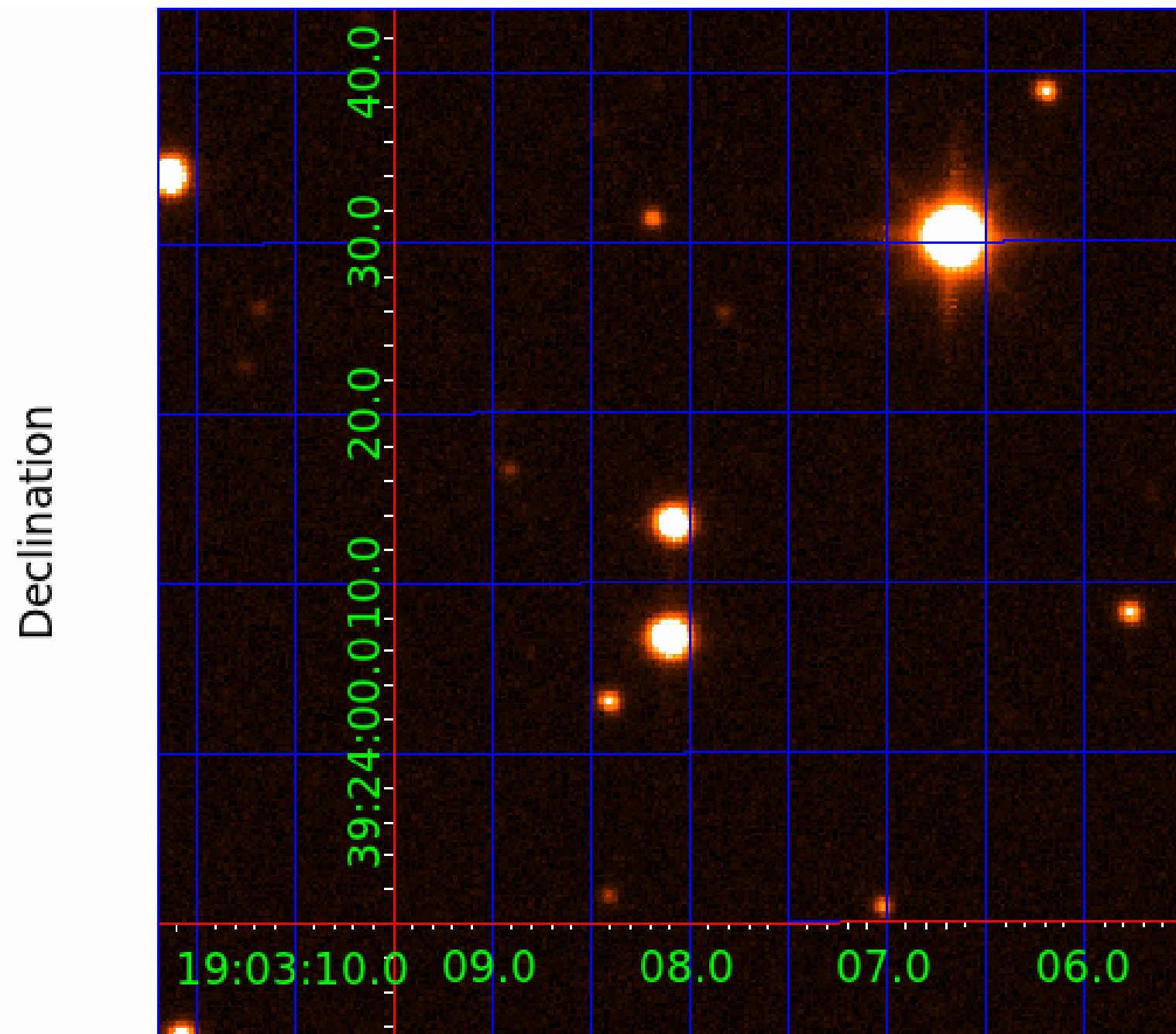
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 004347340

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004347340-01	OBS	No	3.158864	133.148926	242.9	15.009	8.8	10.4	0.72	5520	2.27	316.45
004347340-02	OBS	No	135.677907	224.619027	2088.6	46.049	10.1	7.9	0.72	5520	6.22	2.10
004347340-03	OBS	No	87.991096	213.154786	368.8	3.537	8.3	2.9	0.72	5520	1.48	3.75
004347340-04	OBS	No	382.441320	469.090433	709.9	9.000	9.2	-1.0	0.72	5520	1.92	0.53
004347340-05	OBS	No	124.986879	180.255833	1131.3	5.349	8.4	8.3	0.72	5520	2.57	2.35
004347340-06	OBS	No	67.732451	157.191789	1000.9	1.868	7.6	6.9	0.72	5520	2.58	5.31
004347340-07	OBS	No	117.676012	221.262001	646.1	7.500	8.5	-1.0	0.72	5520	1.83	2.54
004347340-08	OBS	No	184.597816	283.138226	2018.4	5.000	12.1	-1.0	0.72	5520	3.23	1.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004347340-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_KIC_POS
004347340-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004347340-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
004347340-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—CENT_NOFITS
004347340-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
004347340-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

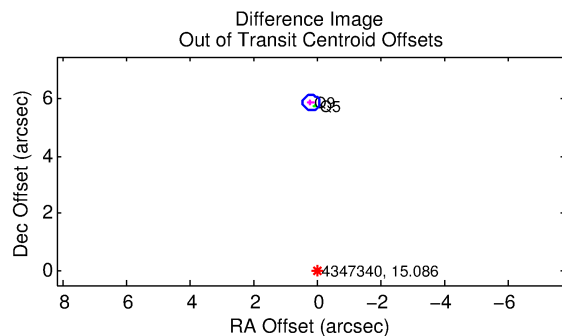
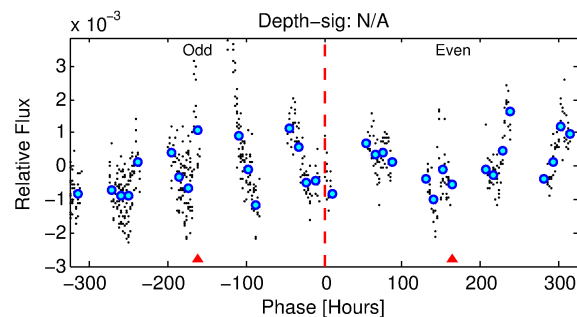
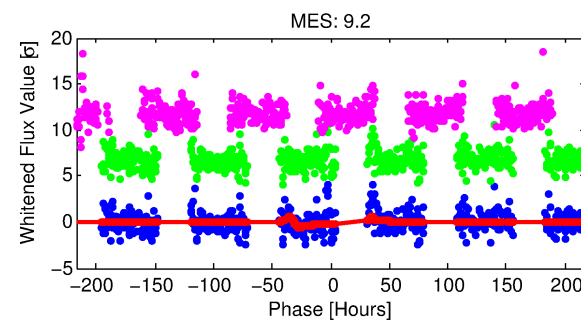
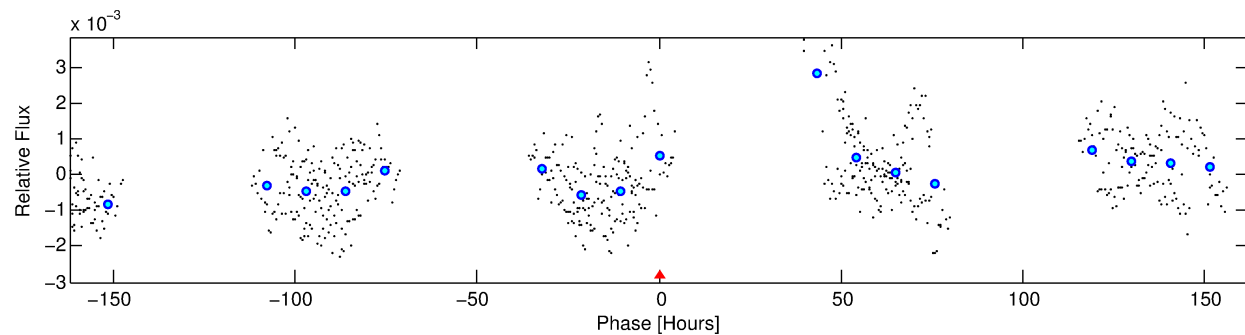
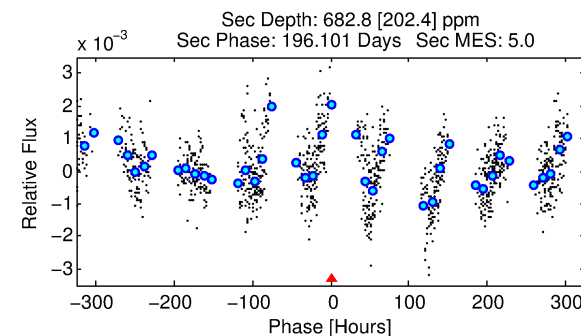
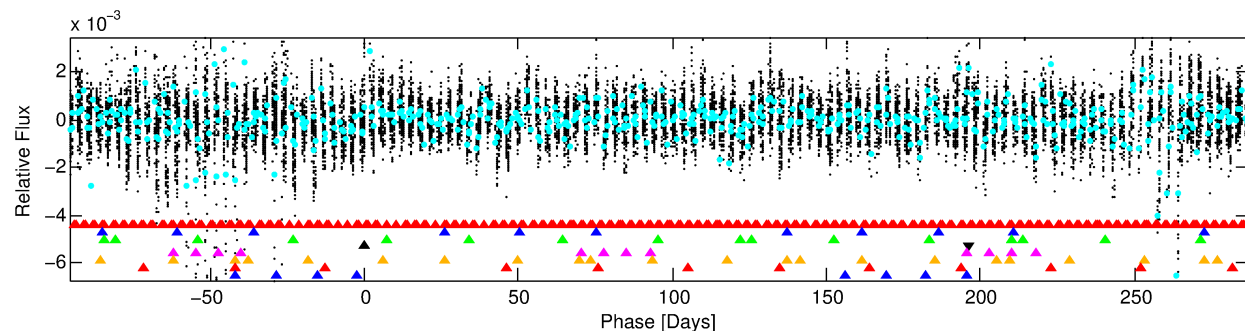
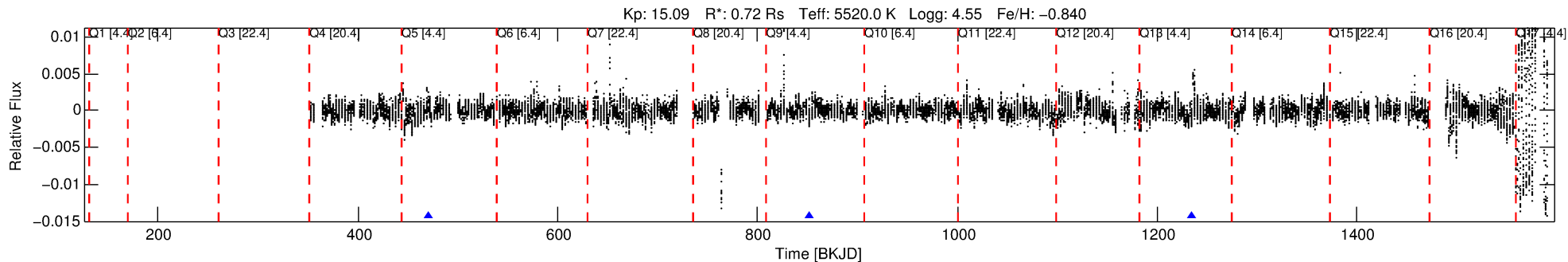
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004347340-04

No Significant Match Found

# DV One-Page Summary

KIC: 4347340 Candidate: 4 of 8 Period: 382.441 d



## TPS TCE Results:

Period = 382.44132 d  
Epoch = 469.0904 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

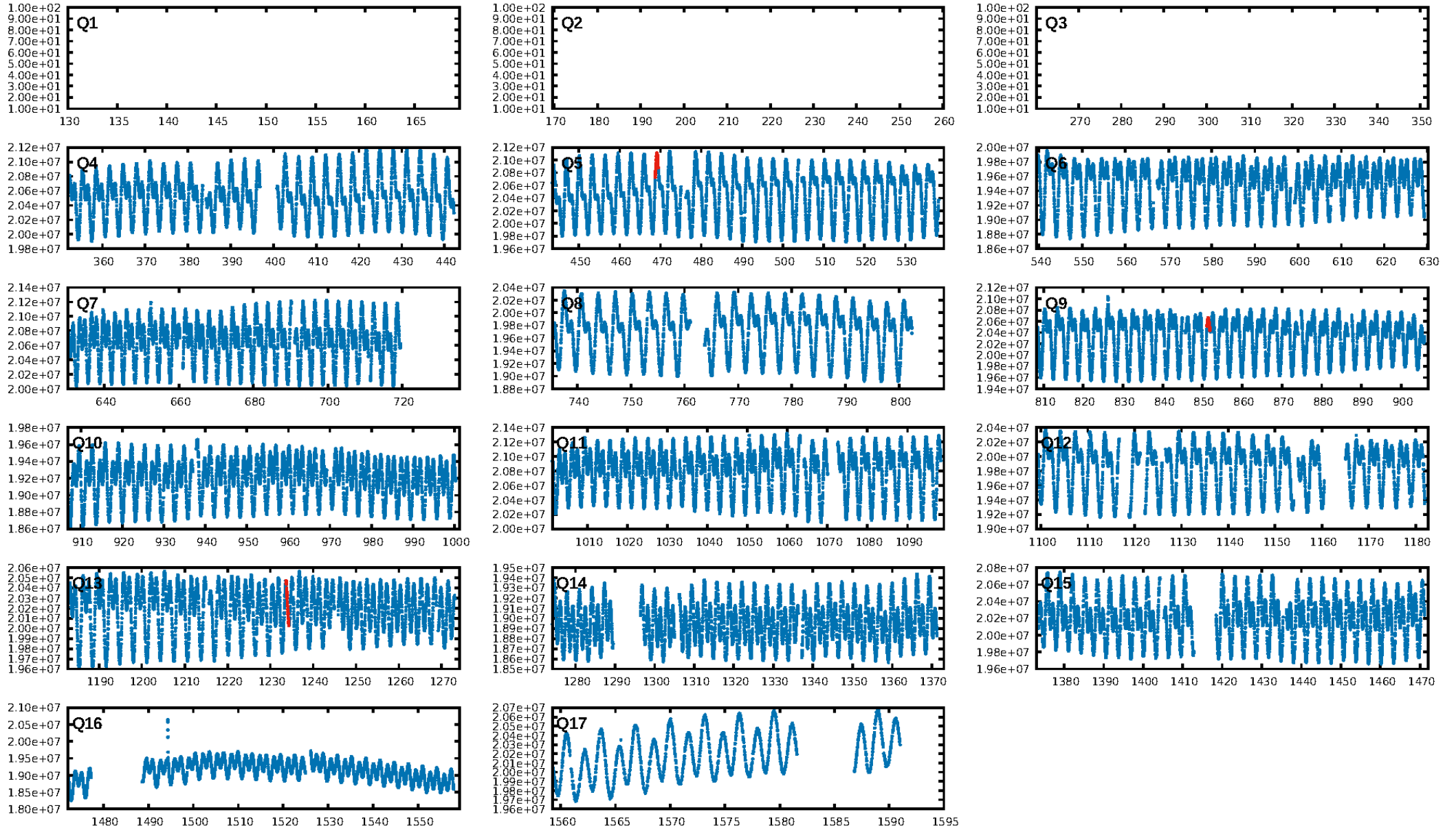
ShortPeriod-sig: 100.0% [461.19σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.211

Centroid-sig: 2.8%  
Centroid-so: 7.461 arcsec [1.58σ]  
OotOffset-rm: 5.894 arcsec [67.00σ]  
OotOffset-st: 0/0/0/2 [2]  
KicOffset-st: 0/0/0/2 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:54:07 Z

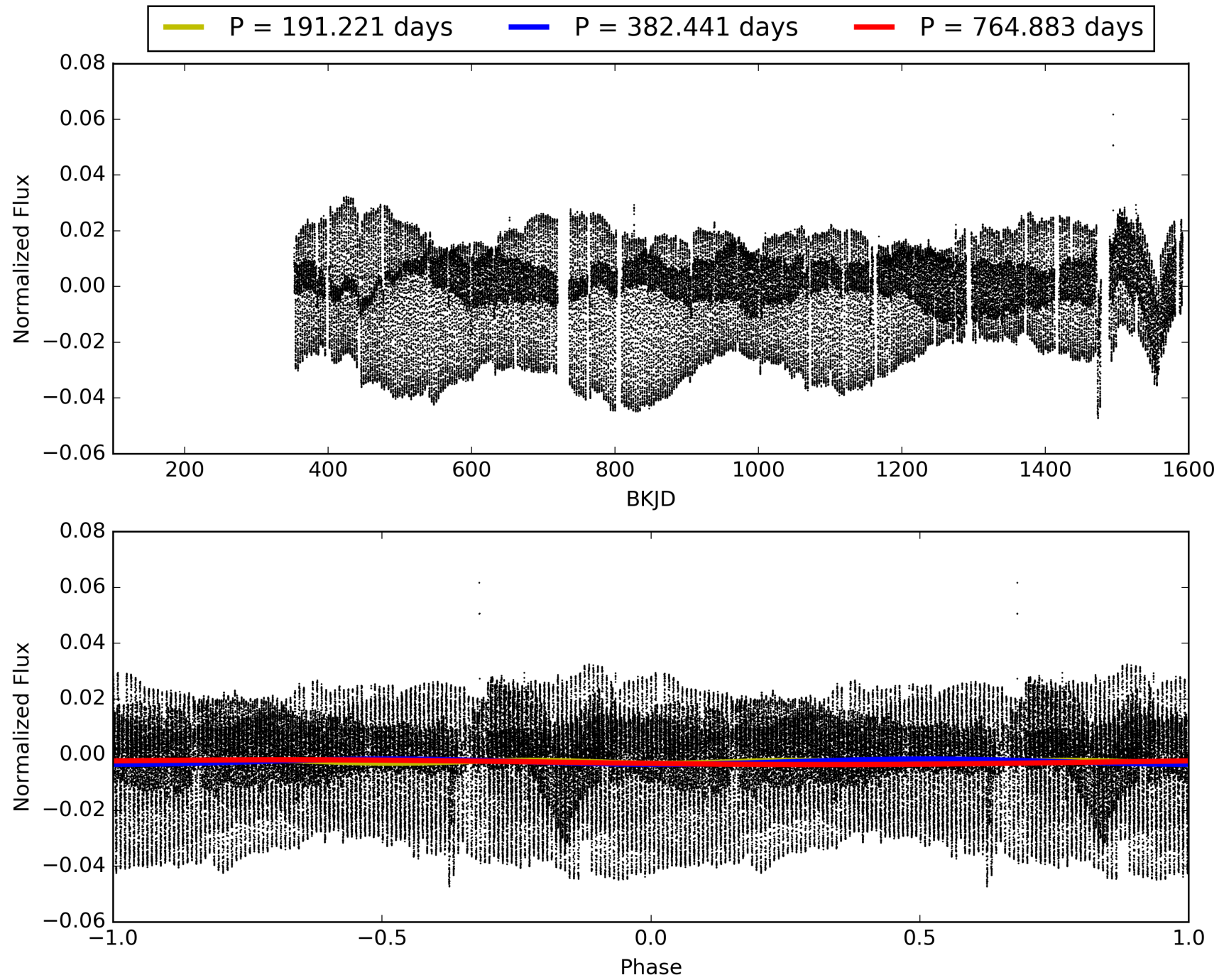
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 004347340-04, PDC Light Curves





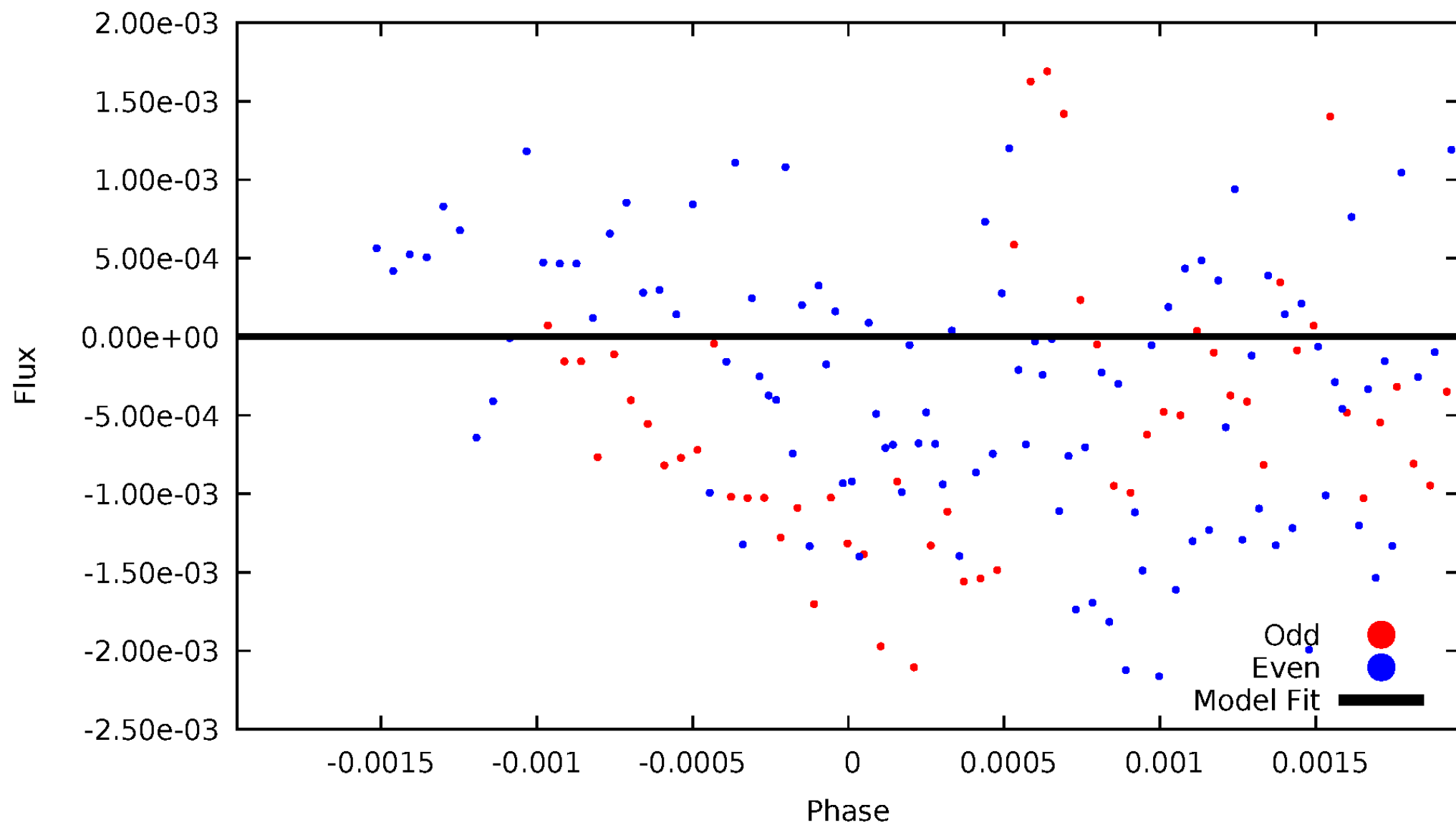
TCE 004347340-04





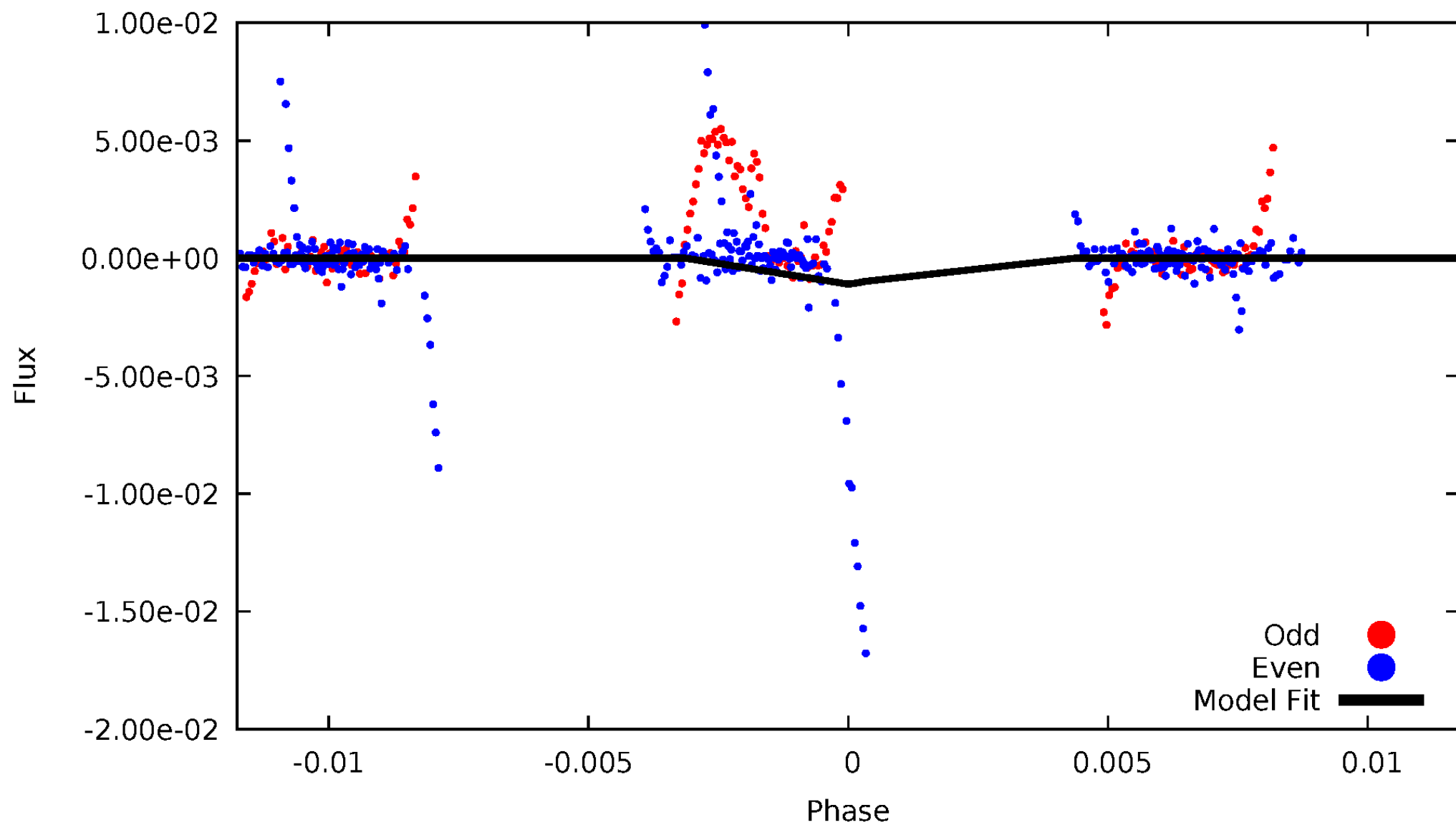
# DV Odd/Even

TCE 004347340-04



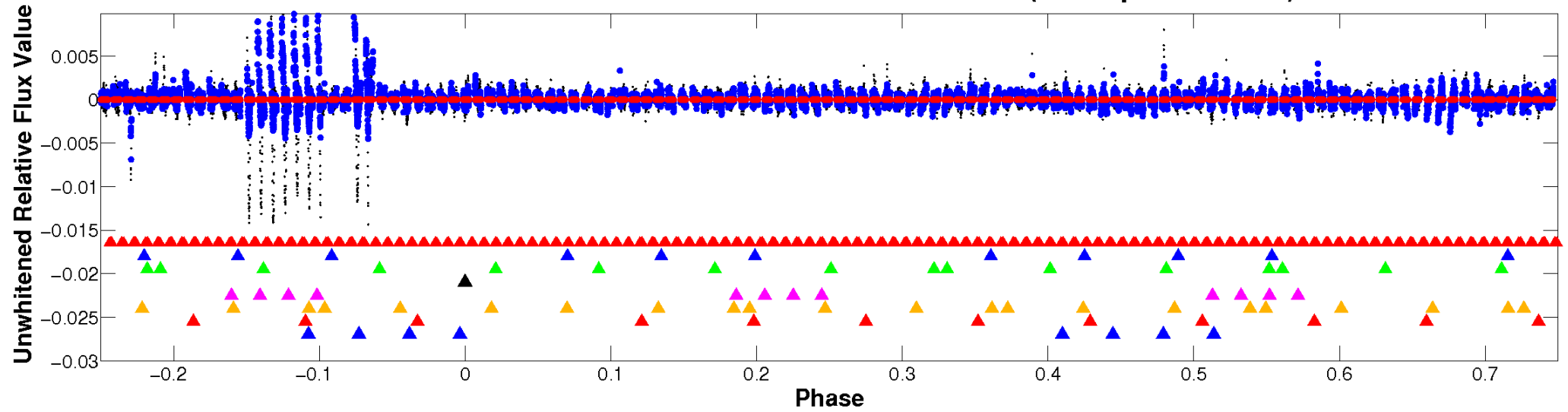
# ALT Odd/Even

TCE 004347340-04

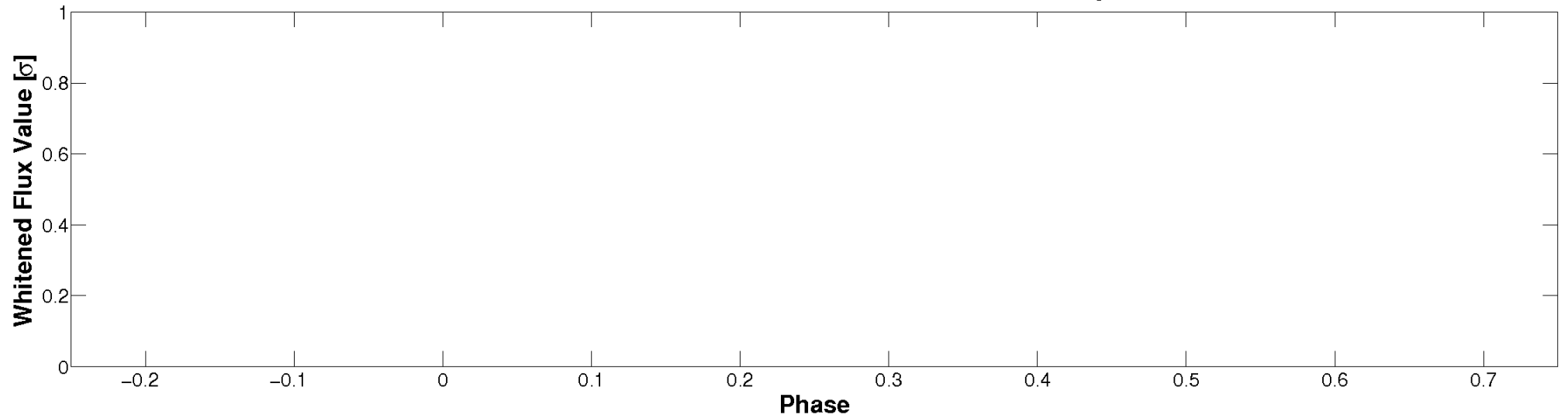


# Non-Whitened Vs. Whitened Light Curve

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

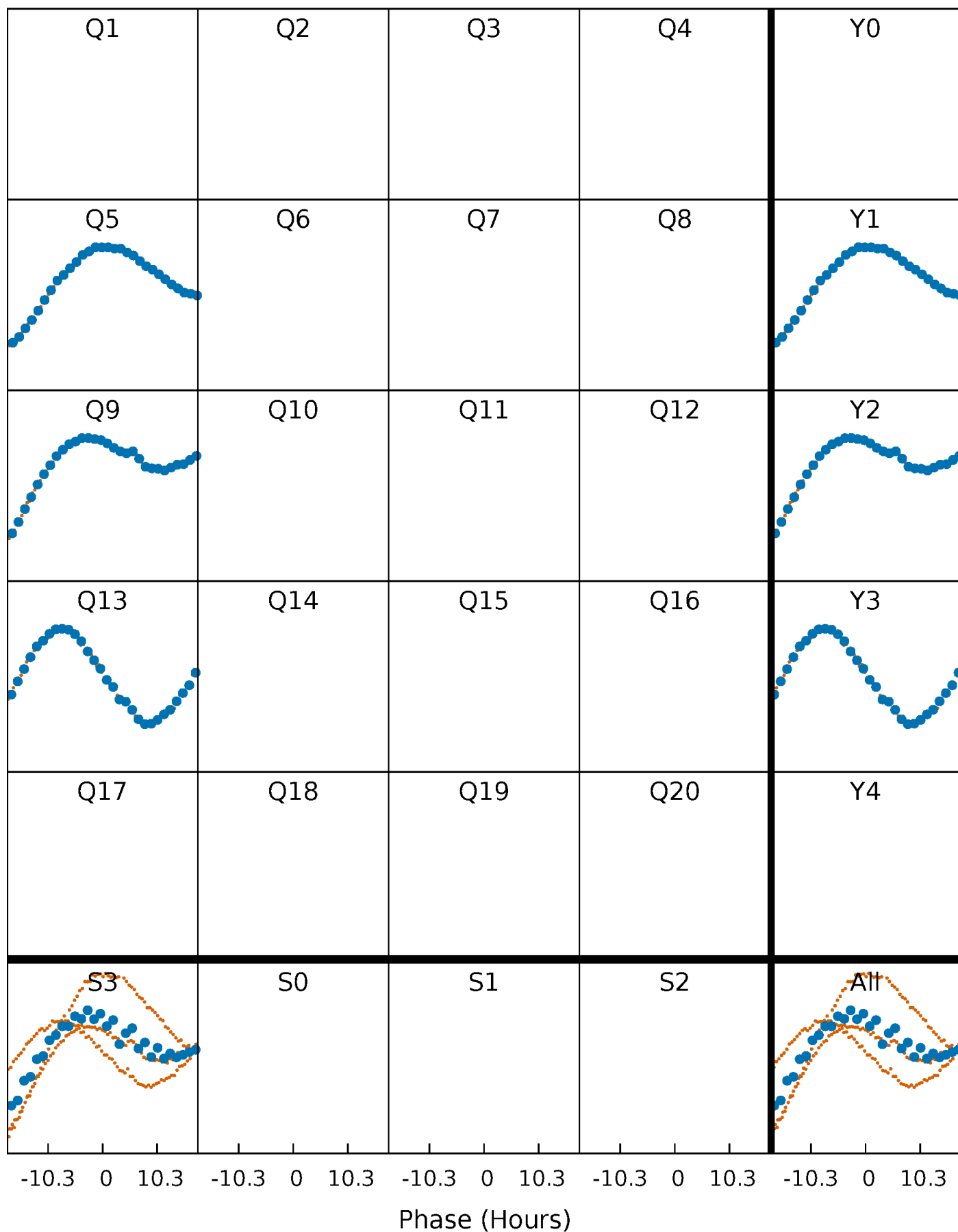


**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



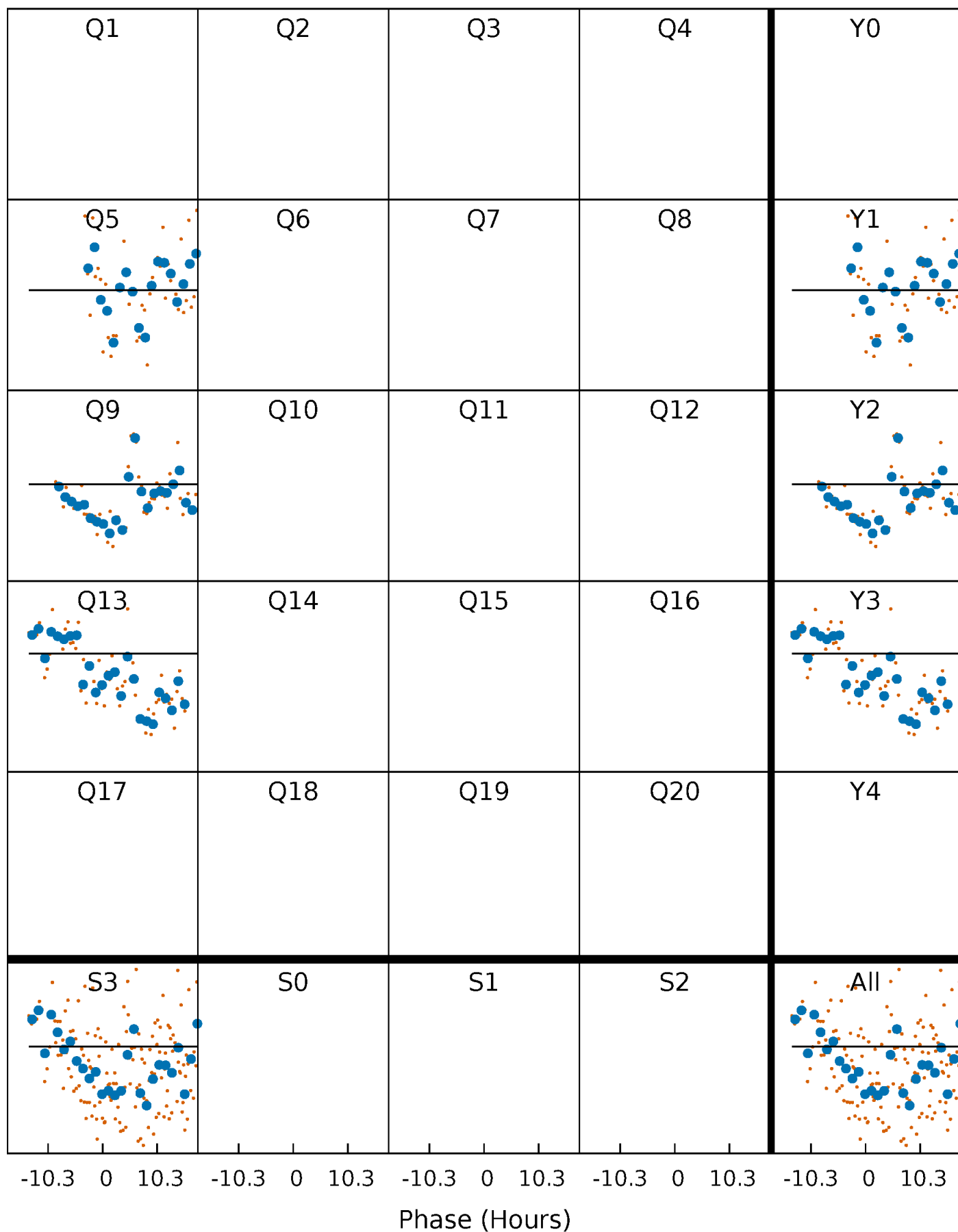
# PDC Quarter-Phased Transit Curves

TCE 004347340-04     $P=382.441320$  Days     $T_0=469.090433$  (BKJD)



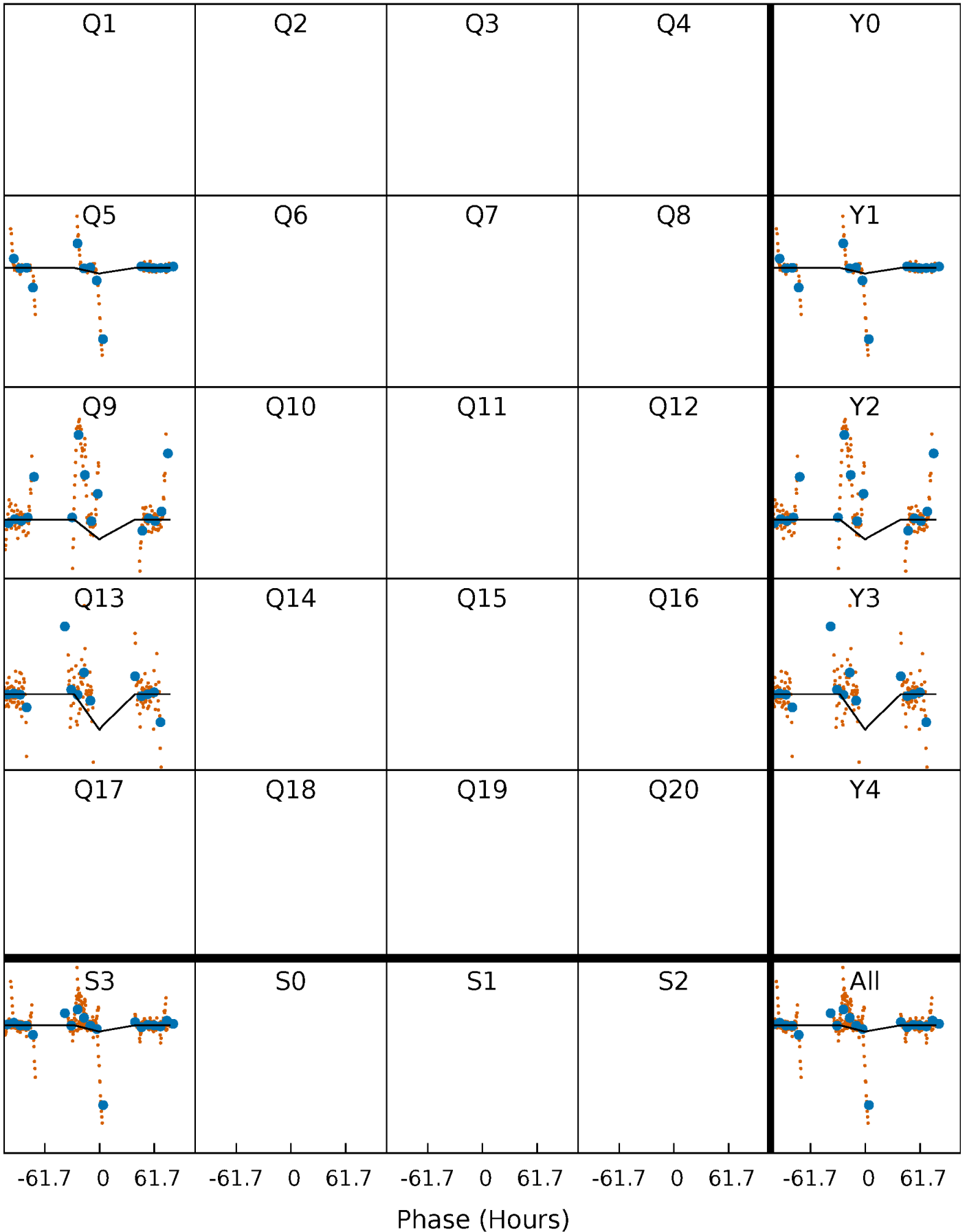
# DV Quarter-Phased Transit Curves

TCE 004347340-04     $P=382.441320$  Days     $T_0=469.090433$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

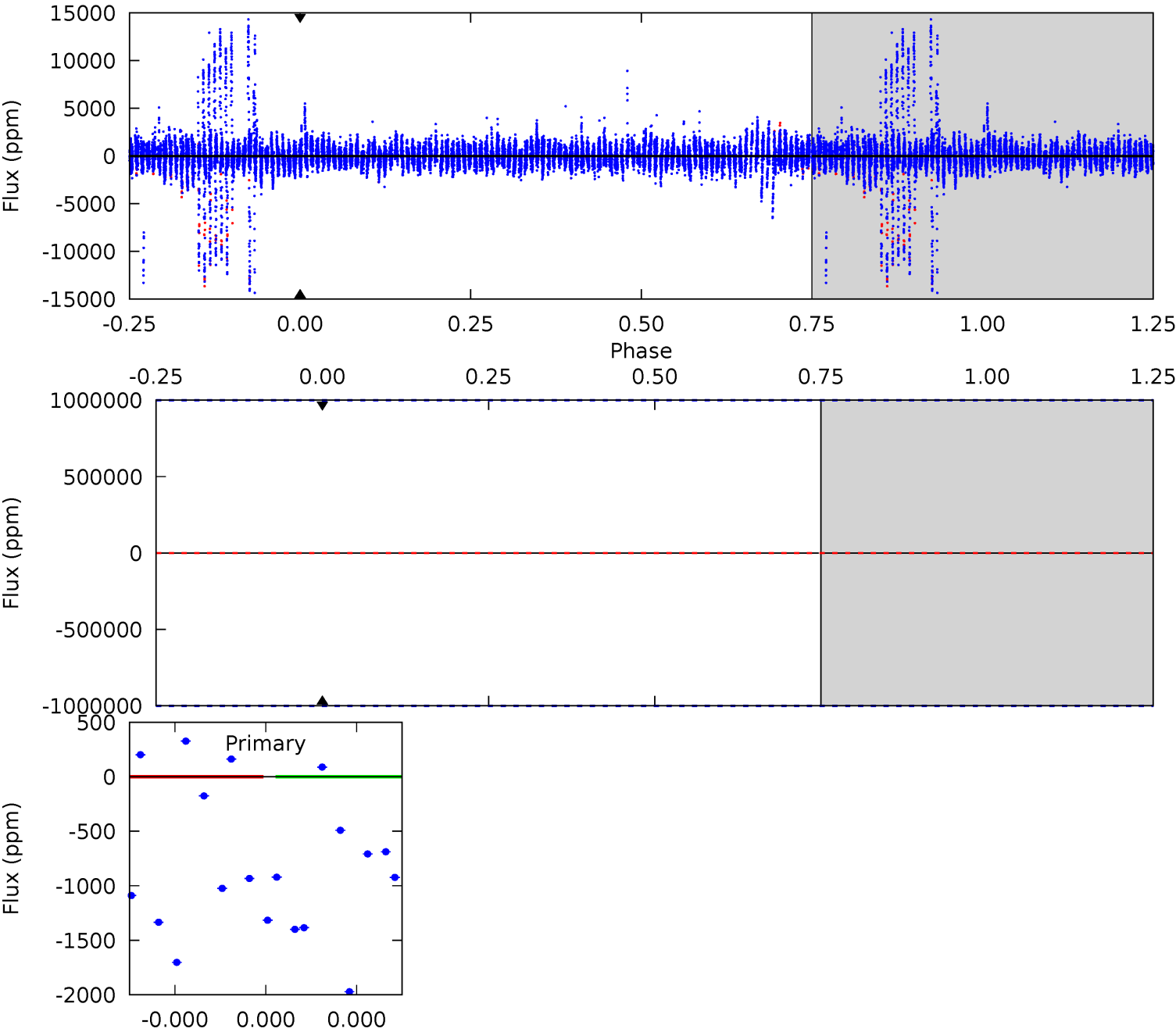
TCE 004347340-04     $P=382.441320$  Days     $T_0=470.007965$  (BKJD)



# DV Model-Shift Uniqueness Test

004347340-04, P = 382.441320 Days, E = 86.649113 Days

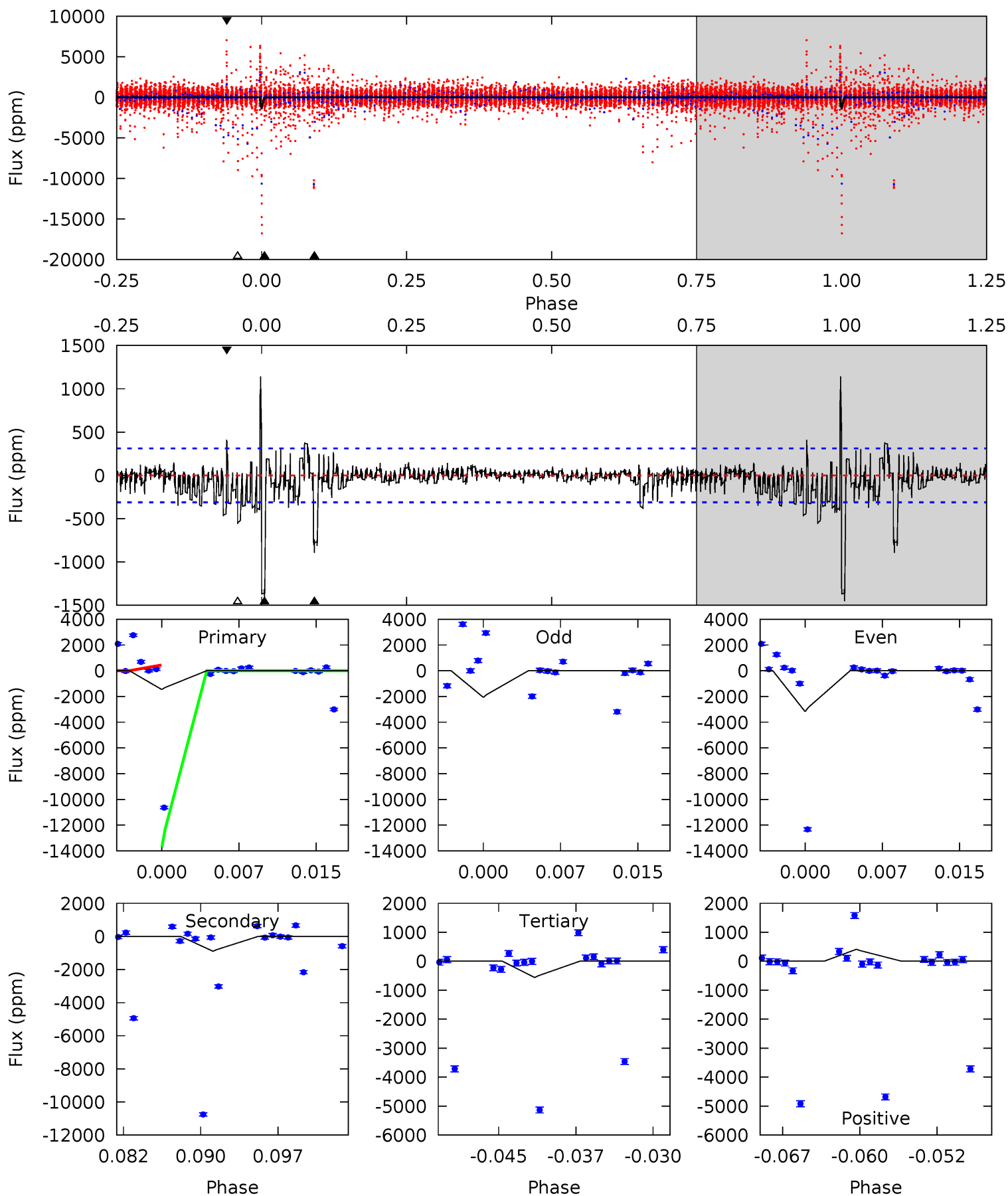
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

004347340-04, P = 382.441320 Days, E = 87.566645 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
23.7	14.6	9.14	6.71	5.08	2.67	1.71	14.6	17.0	5.42	7.85	8.92	-4.62	0.44	49.4





### Stellar Parameters For KIC 004347340

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5520^{+194}_{-194}$	$4.552^{+0.095}_{-0.085}$	$-0.840^{+0.300}_{-0.300}$	$0.722^{+0.097}_{-0.088}$	$0.678^{+0.081}_{-0.035}$	$2.536^{+1.006}_{-0.659}$
	+4%/-4%	+2%/-2%	+36%/-36%	+13%/-12%	+12%/-5%	+40%/-26%
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 004347340-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$5.82^{+6.49}_{-4.04}$	$303^{+15}_{-16}$	$4534^{+15794}_{-21508}$	$24306^{+2534414}_{-2209554}$
Alt.	$-892 \pm 61$	$6.52^{+5.87}_{-4.29}$	$303^{+14}_{-14}$	$3716^{+1991}_{-677}$	$9758^{+76460}_{-7088}$

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

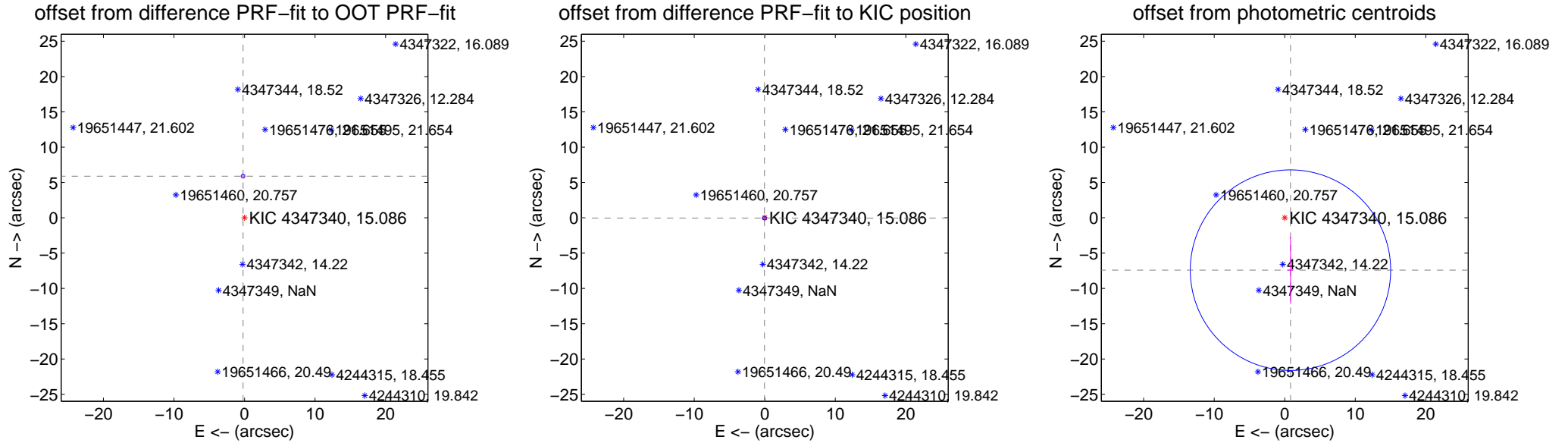
## DV Centroid Data

Supplemental centroid analysis for 004347340-04. Kepler magnitude: 15.09. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 5.93 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	5.894 $\pm$ 0.088	67.00	0.207 $\pm$ 0.103	5.890 $\pm$ 0.086
PRF-fit source offset from KIC position	0.053 $\pm$ 0.089	0.59	0.037 $\pm$ 0.100	-0.038 $\pm$ 0.077
photometric centroid source offset	7.46 $\pm$ 4.73	1.58	-0.81 $\pm$ 0.37	-7.42 $\pm$ 4.76

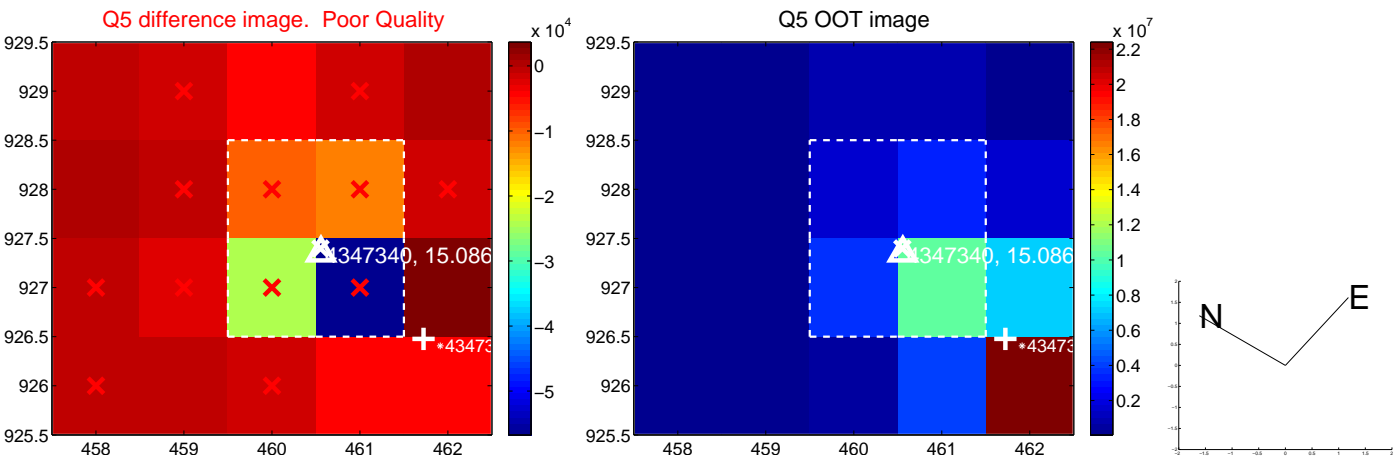


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

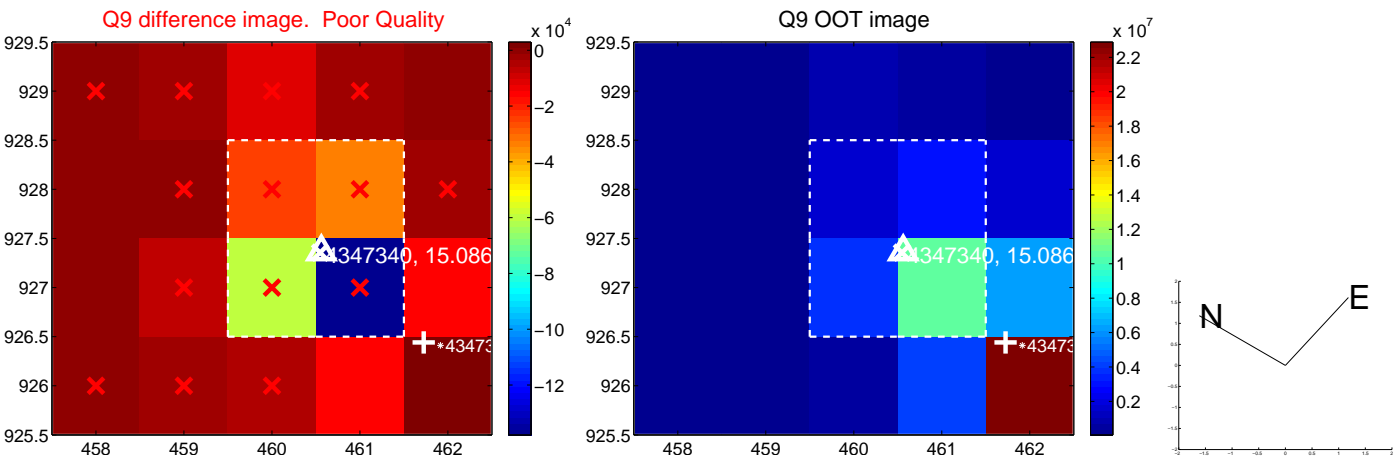
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



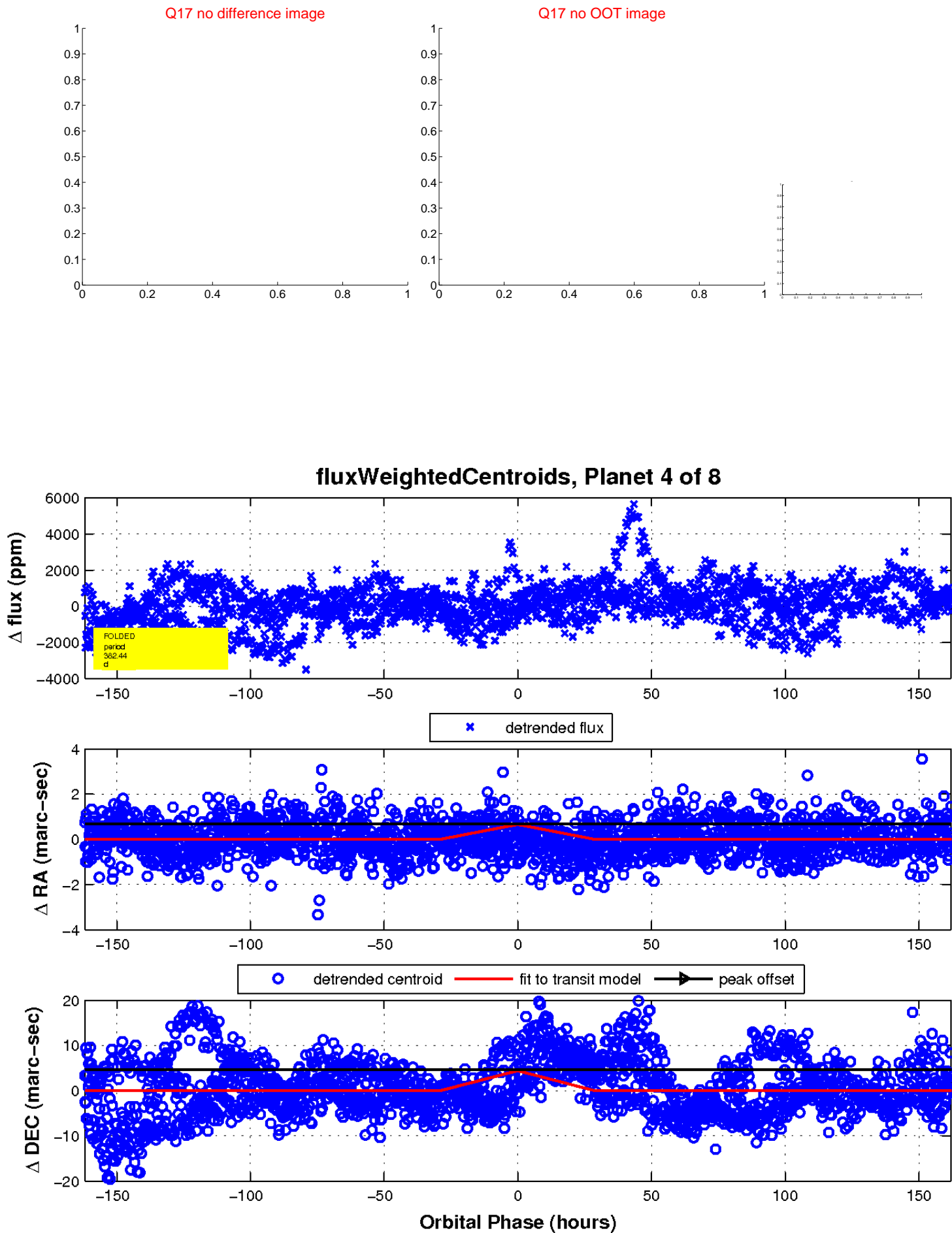
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



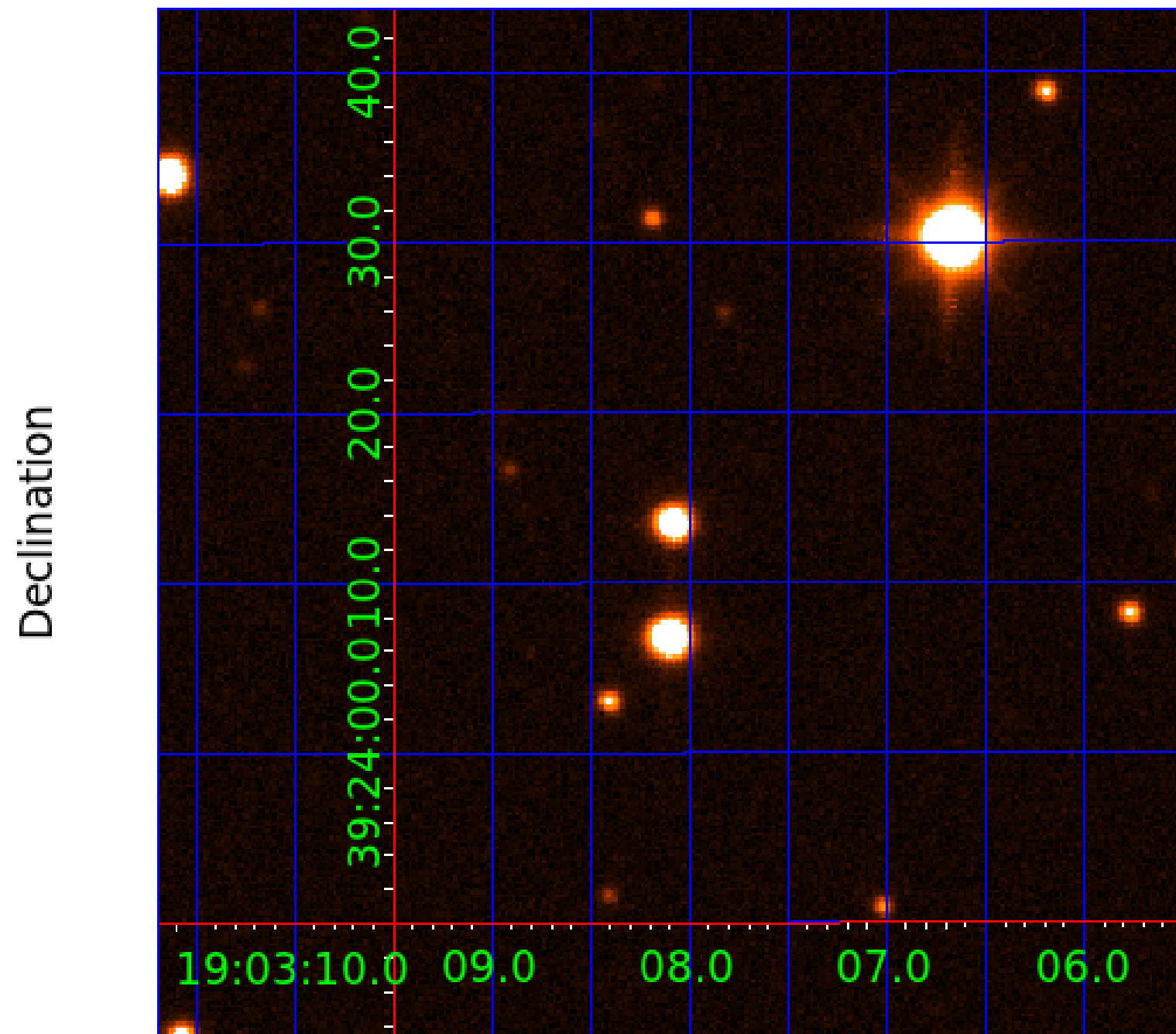
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 004347340

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004347340-01	OBS	No	3.158864	133.148926	242.9	15.009	8.8	10.4	0.72	5520	2.27	316.45
004347340-02	OBS	No	135.677907	224.619027	2088.6	46.049	10.1	7.9	0.72	5520	6.22	2.10
004347340-03	OBS	No	87.991096	213.154786	368.8	3.537	8.3	2.9	0.72	5520	1.48	3.75
004347340-04	OBS	No	382.441320	469.090433	709.9	9.000	9.2	-1.0	0.72	5520	1.92	0.53
004347340-05	OBS	No	124.986879	180.255833	1131.3	5.349	8.4	8.3	0.72	5520	2.57	2.35
004347340-06	OBS	No	67.732451	157.191789	1000.9	1.868	7.6	6.9	0.72	5520	2.58	5.31
004347340-07	OBS	No	117.676012	221.262001	646.1	7.500	8.5	-1.0	0.72	5520	1.83	2.54
004347340-08	OBS	No	184.597816	283.138226	2018.4	5.000	12.1	-1.0	0.72	5520	3.23	1.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004347340-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_KIC_POS
004347340-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004347340-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
004347340-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—CENT_NOFITS
004347340-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
004347340-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

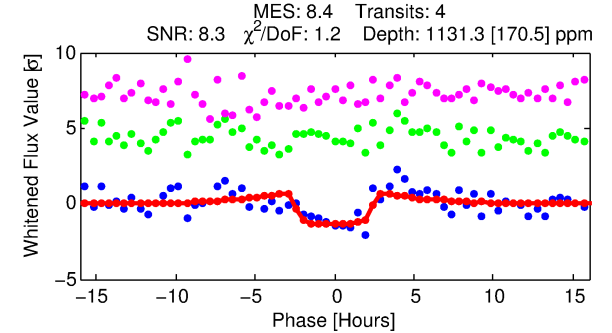
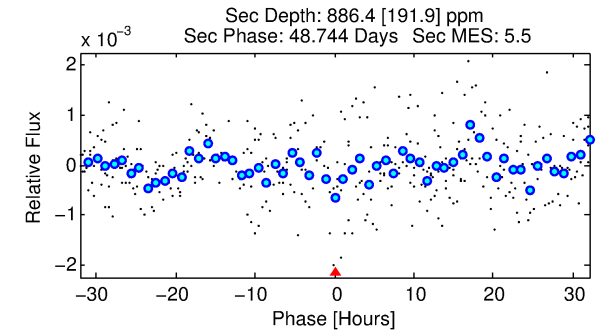
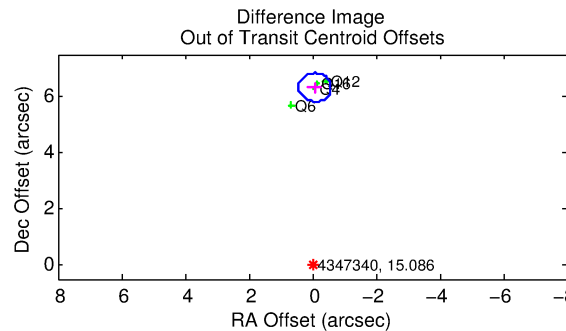
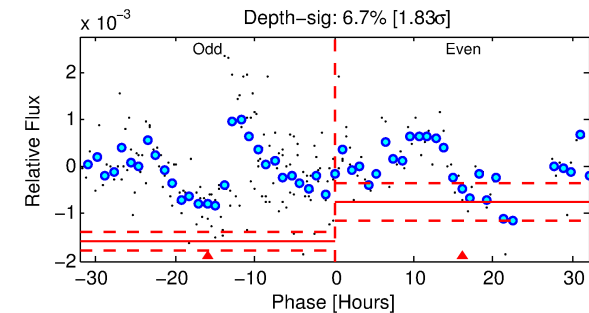
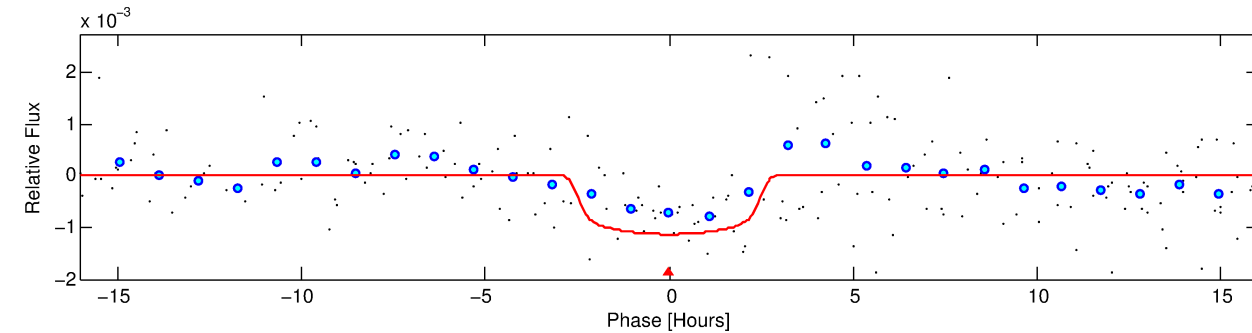
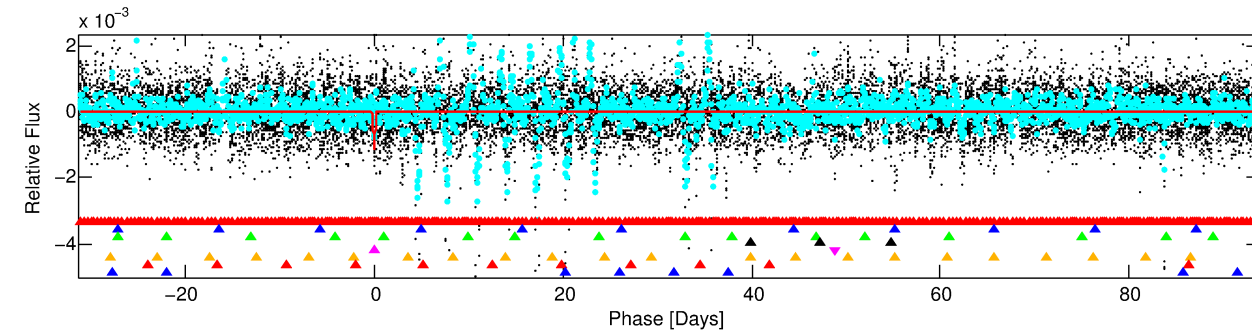
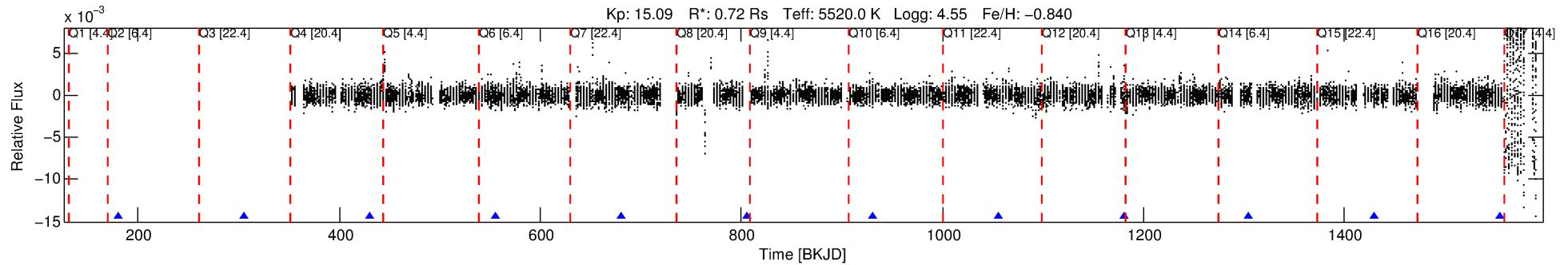
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004347340-05

No Significant Match Found

# DV One-Page Summary

KIC: 4347340 Candidate: 5 of 8 Period: 124.987 d



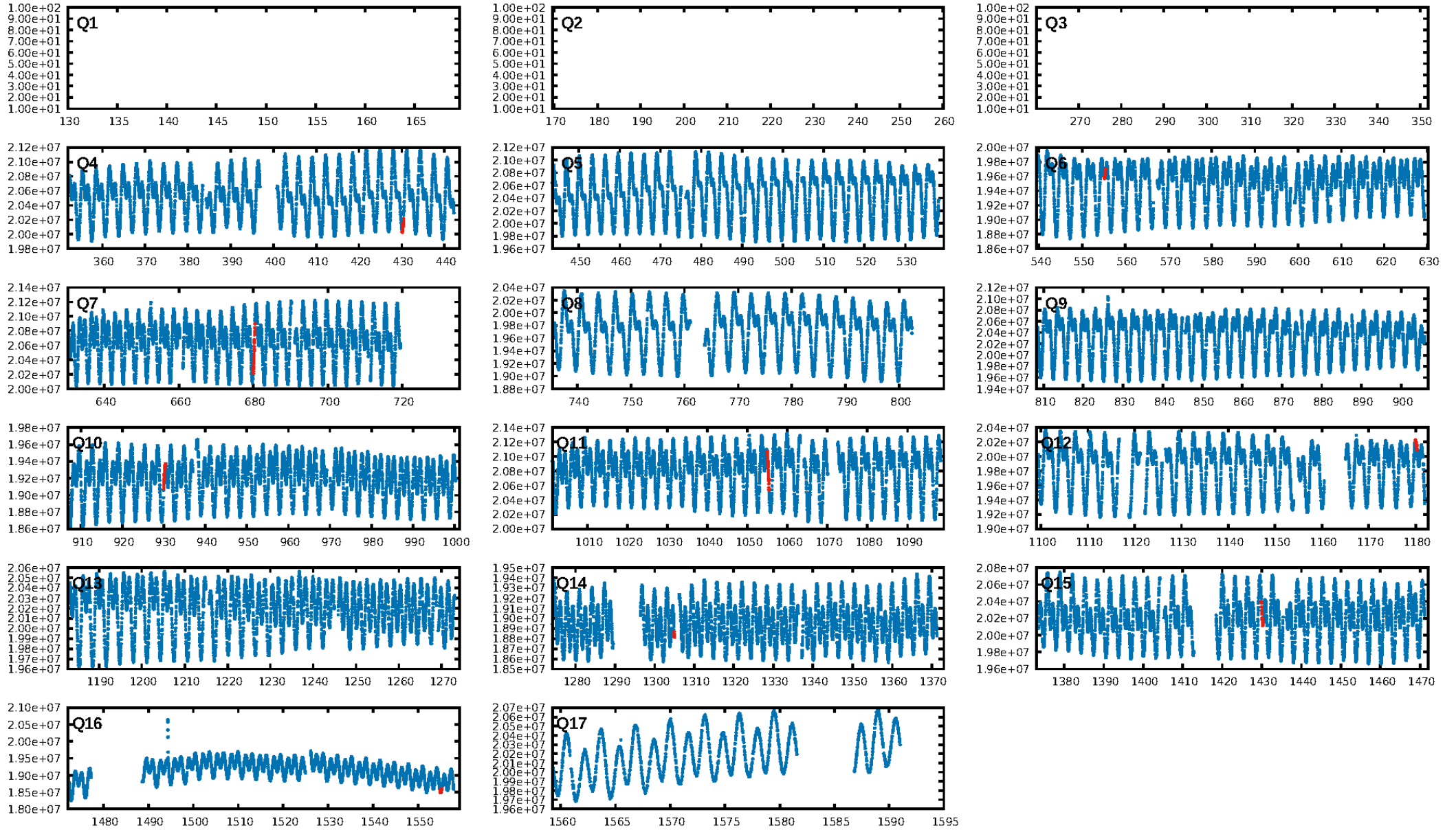
## DV Fit Results:

Period = 124.98688 [0.00243] d  
Epoch = 180.2558 [0.0200] BKJD  
Rp/R\* = 0.0327 [0.0248]  
a/R\* = 140.13 [494.31]  
b = 0.67 [2.92]  
Seff = 2.35 [0.52]  
Teq = 316 [17] K  
Rp = 2.57 [1.99] Re  
a = 0.4298 [0.0496] AU  
Ag = 13599.62 [21007.52] [0.65 $\sigma$ ]  
Teffp = 5270 [2031] K [2.44 $\sigma$ ]

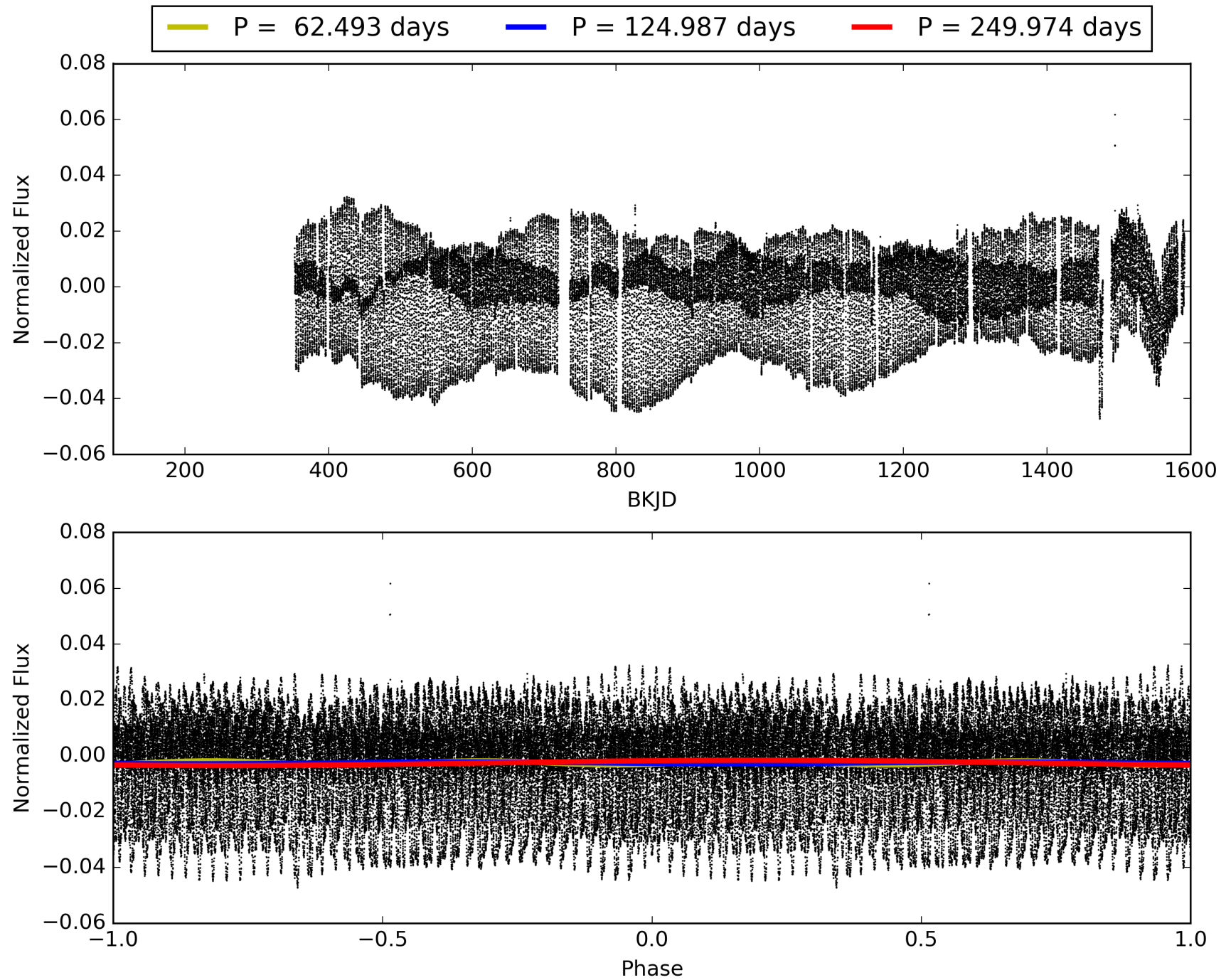
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [19.05 $\sigma$ ]  
LongPeriod-sig: 100.0% [5.53 $\sigma$ ]  
ModelChiSquare2-sig: 13.0%  
ModelChiSquareGof-sig: 96.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -3.209  
Centroid-sig: 50.8%  
Centroid-so: 2.681 arcsec [2.08 $\sigma$ ]  
OOTOffset-rm: 6.325 arcsec [37.25 $\sigma$ ]  
KicOffset-rm: 0.113 arcsec [1.33 $\sigma$ ]  
OOTOffset-st: 1/0/3/0 [4]  
KicOffset-st: 1/3/3/0 [7]  
DiffImageQuality-fgm: 0.71 [5/7]  
DiffImageOverlap-fno: 0.43 [3/7]

# TCE 004347340-05, PDC Light Curves

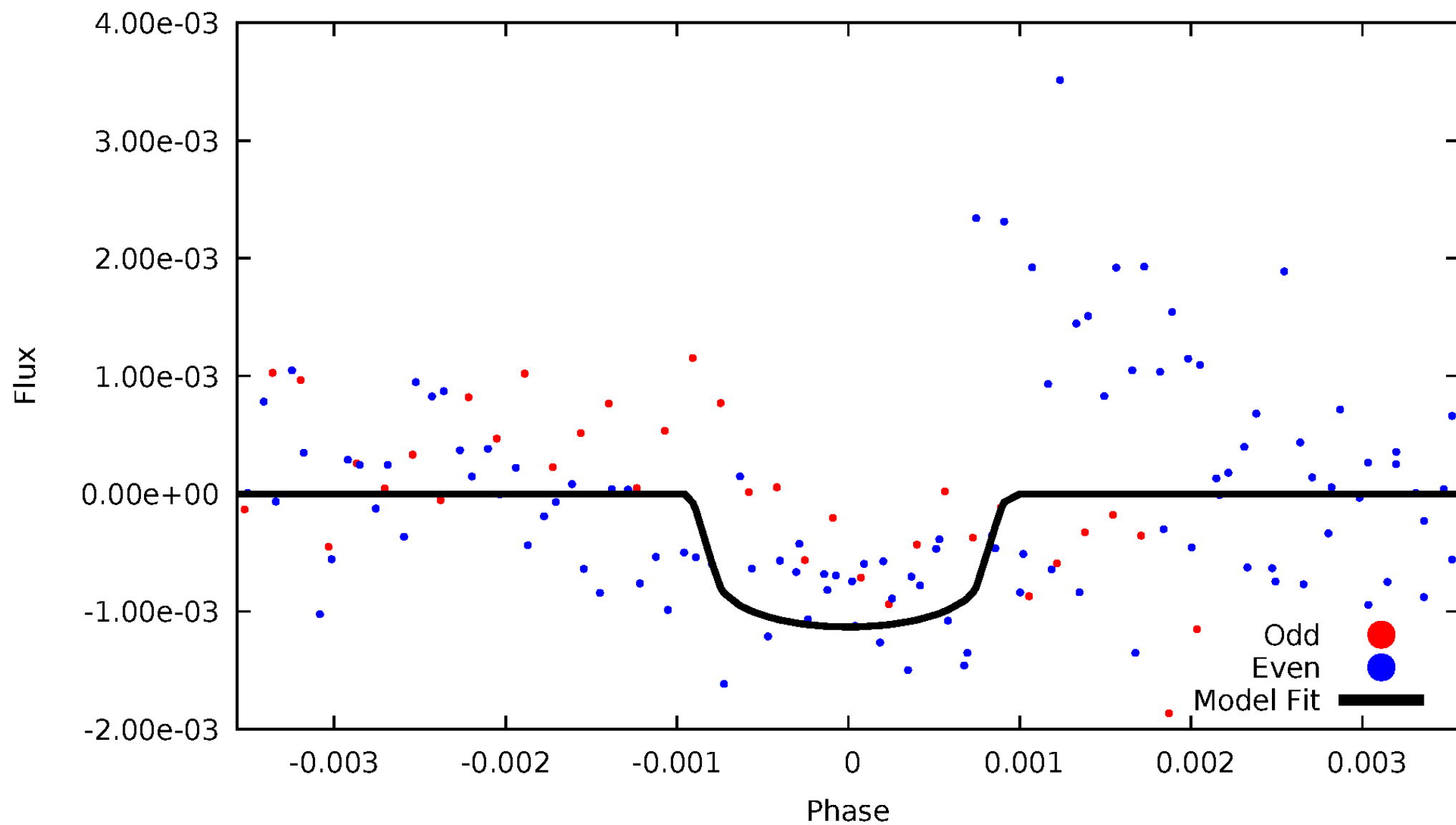


# TCE 004347340-05



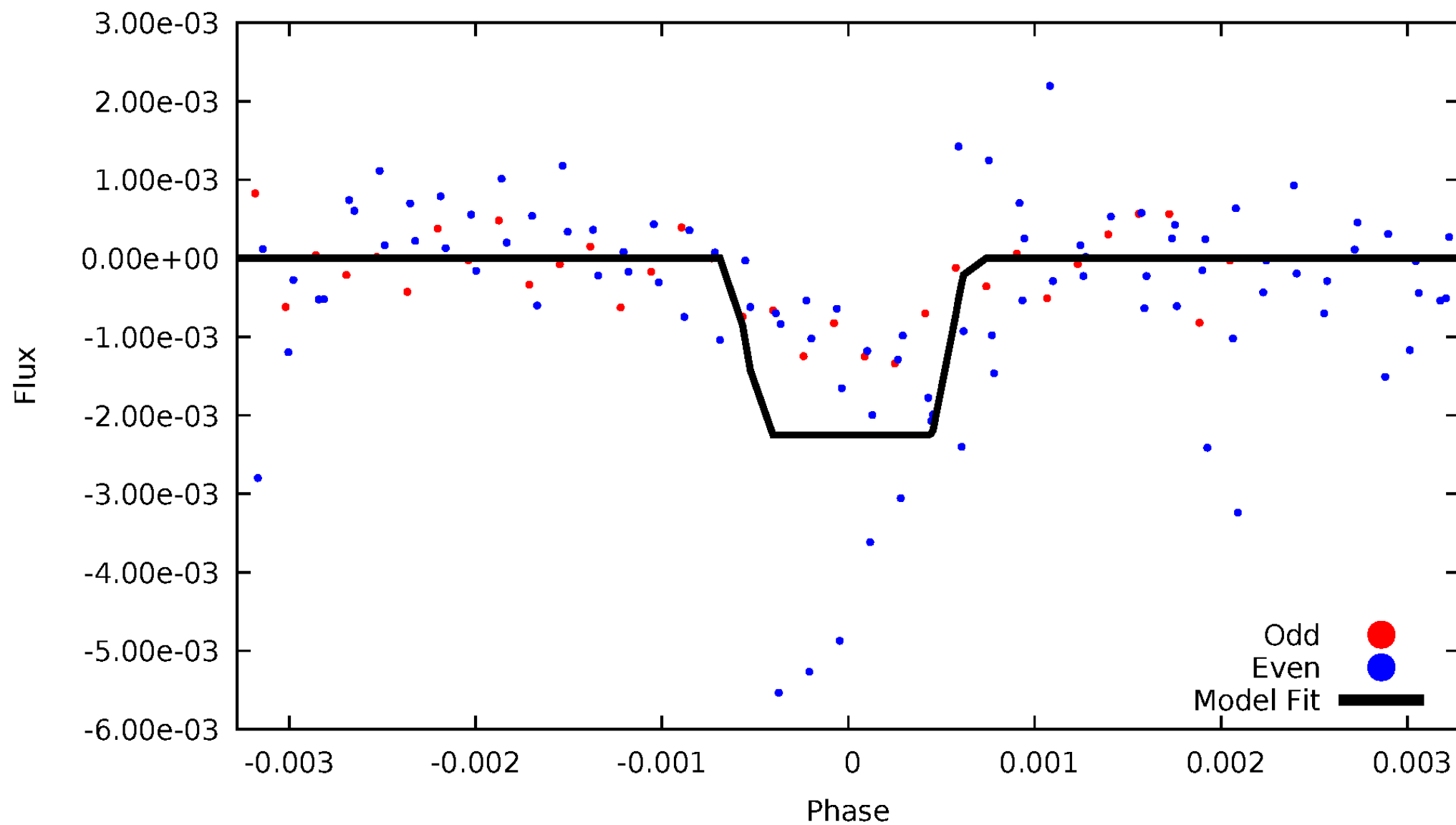
# DV Odd/Even

TCE 004347340-05



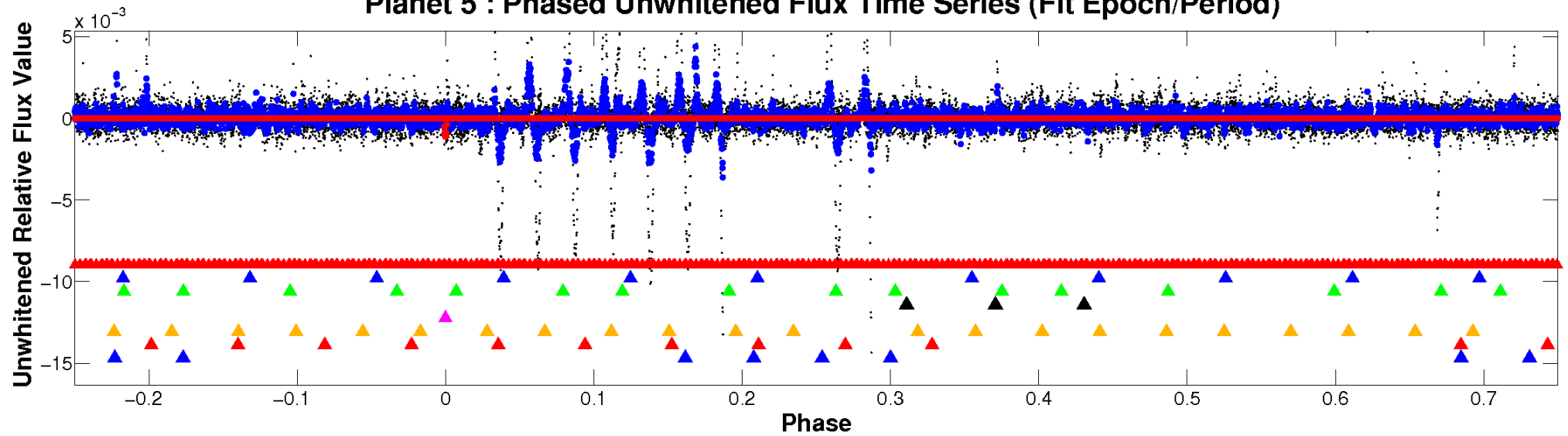
# ALT Odd/Even

TCE 004347340-05

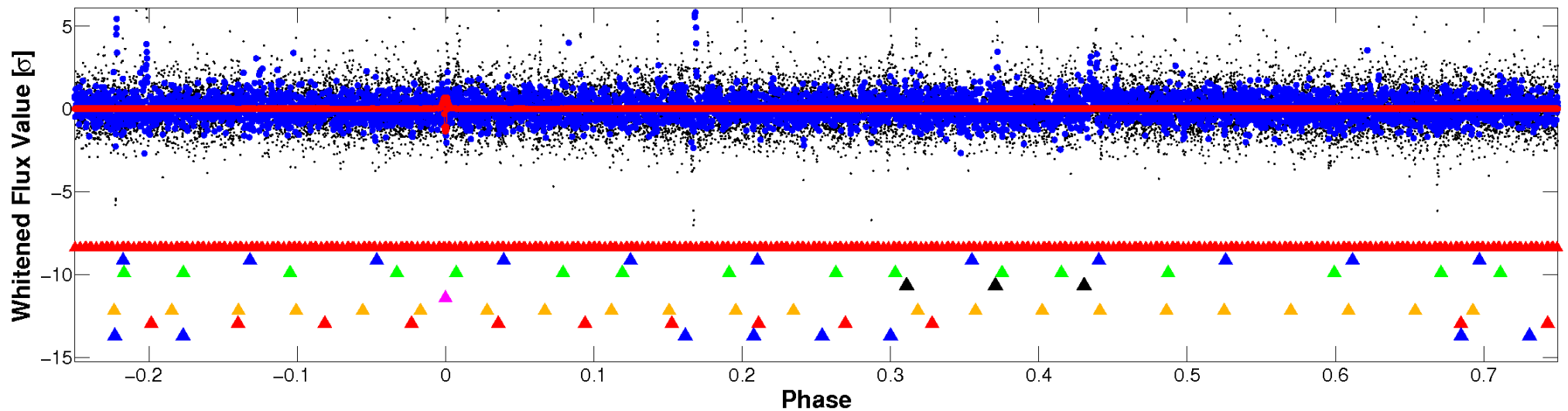


# Non-Whitened Vs. Whitened Light Curve

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



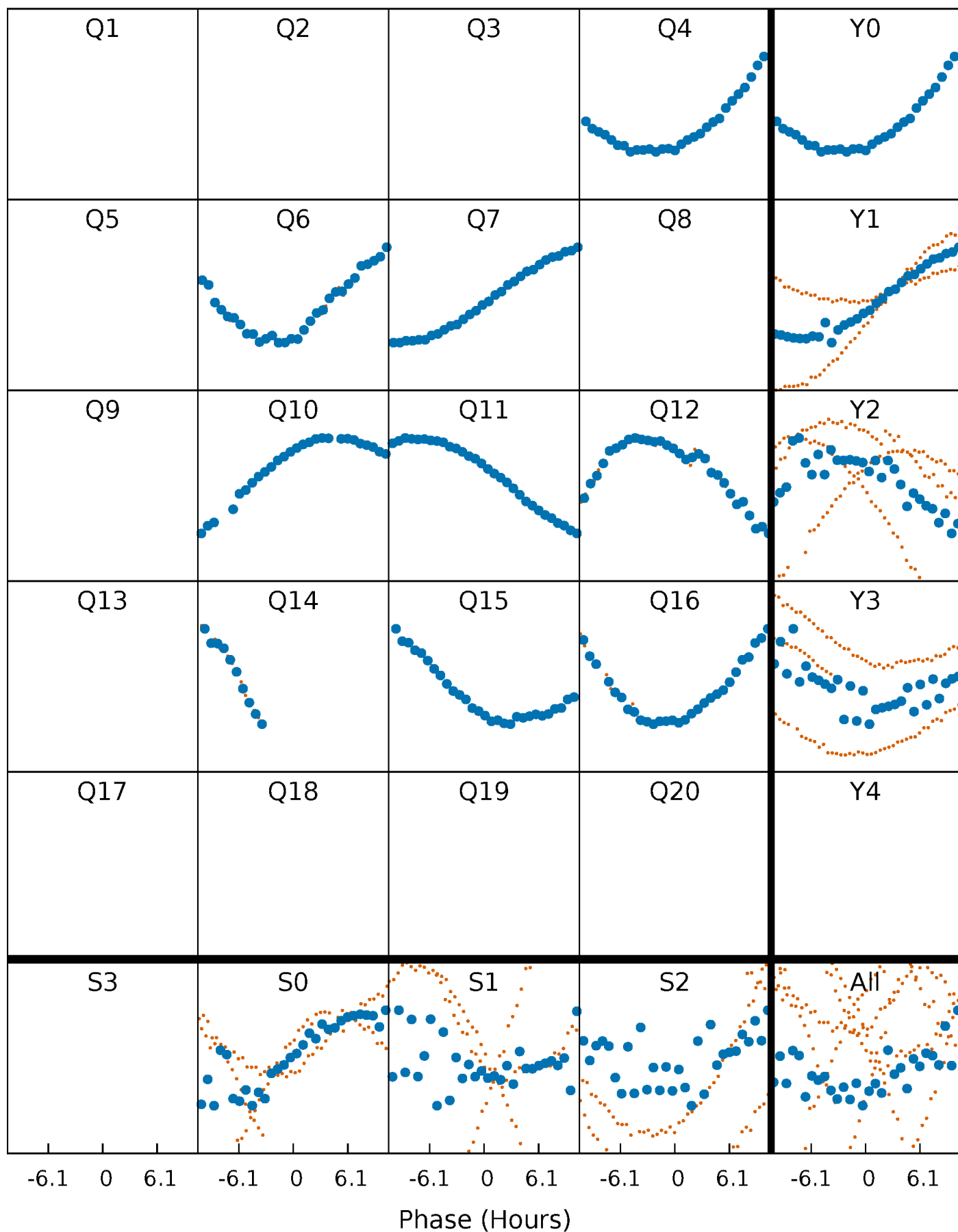
Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

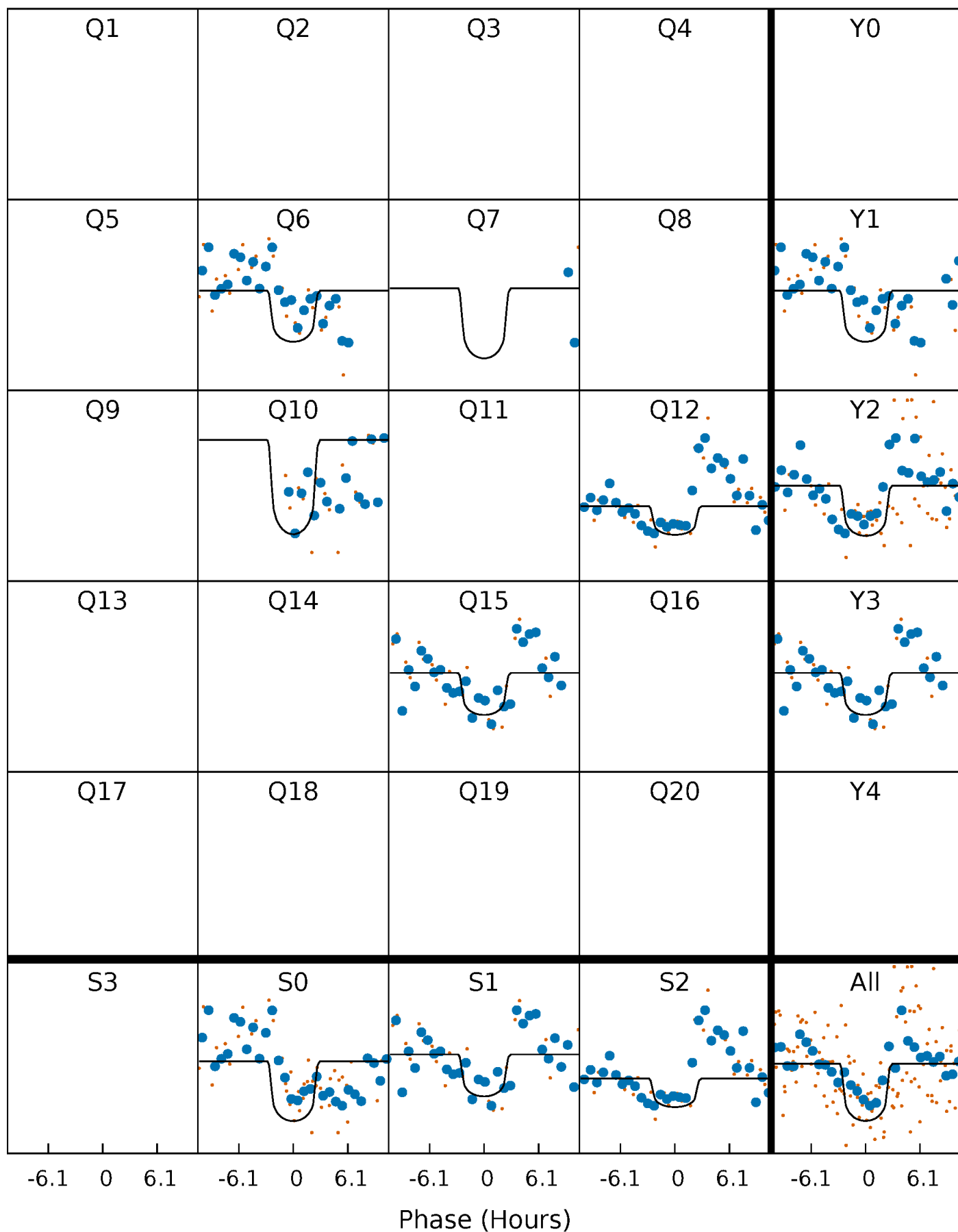
TCE 004347340-05     $P=124.986879$  Days     $T_0=180.255833$  (BKJD)





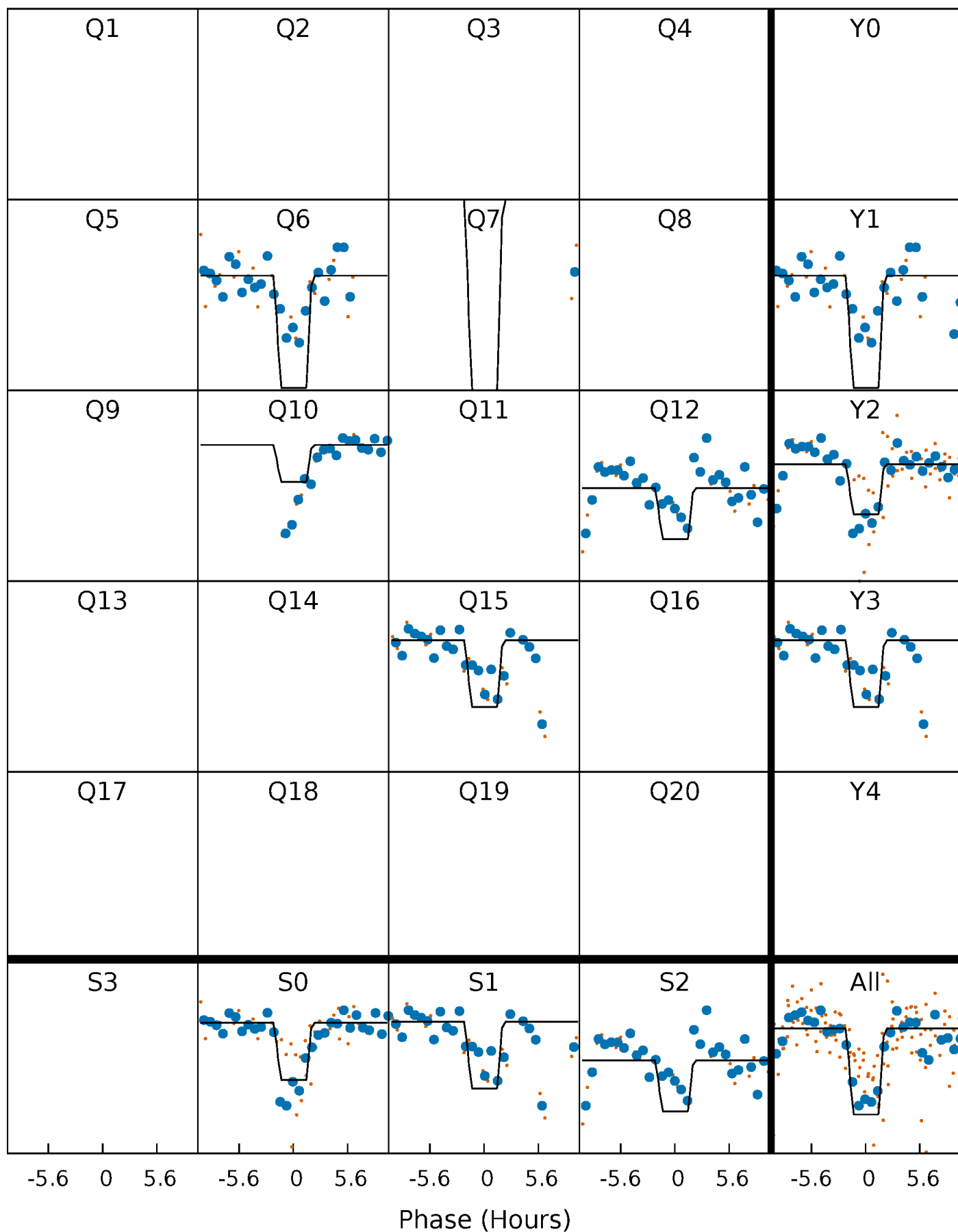
# DV Quarter-Phased Transit Curves

TCE 004347340-05     $P=124.986879$  Days     $T_0=180.255833$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

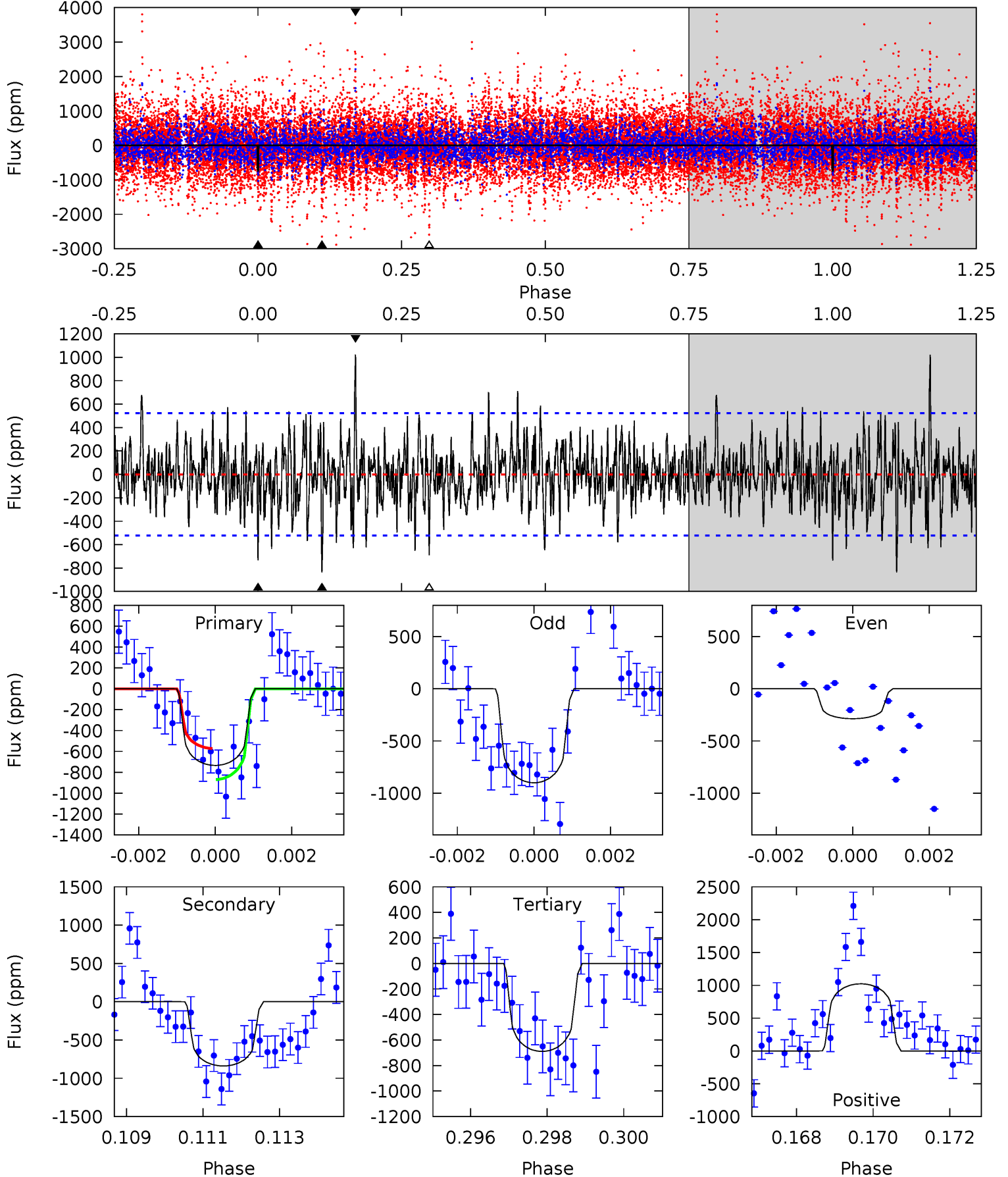
TCE 004347340-05     $P=124.991059$  Days     $T_0=180.241626$  (BKJD)



# DV Model-Shift Uniqueness Test

004347340-05,  $P = 124.986879$  Days,  $E = 180.255833$  Days

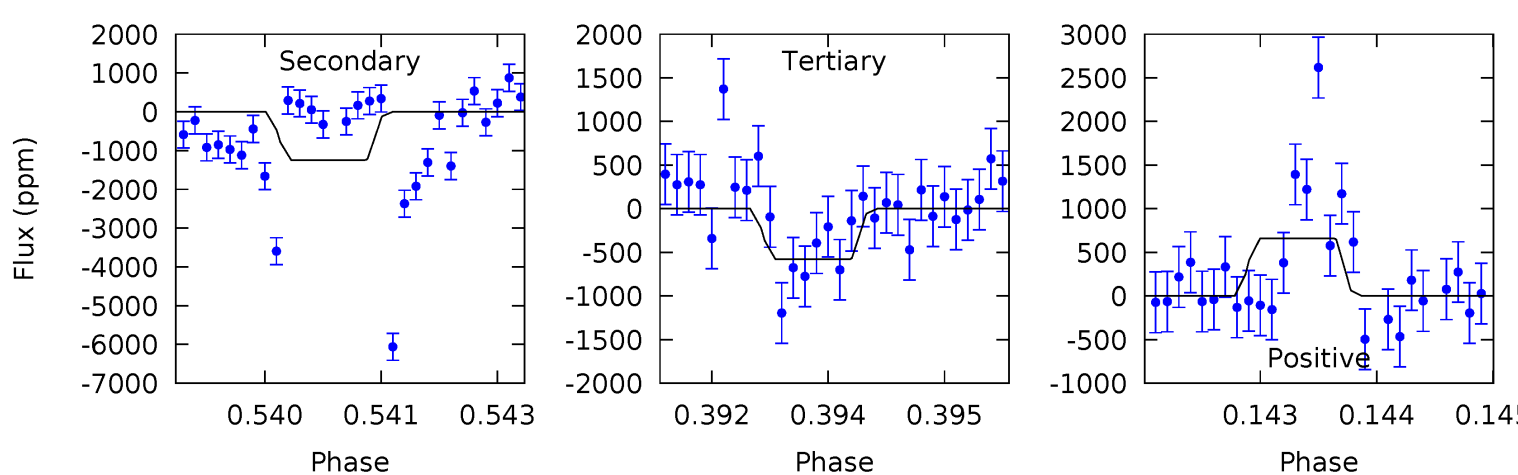
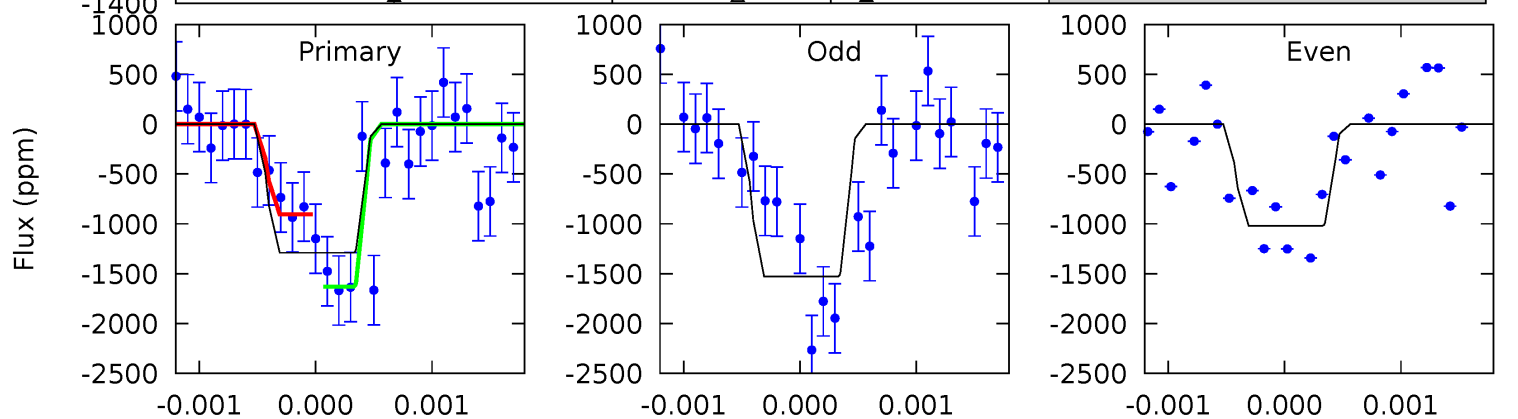
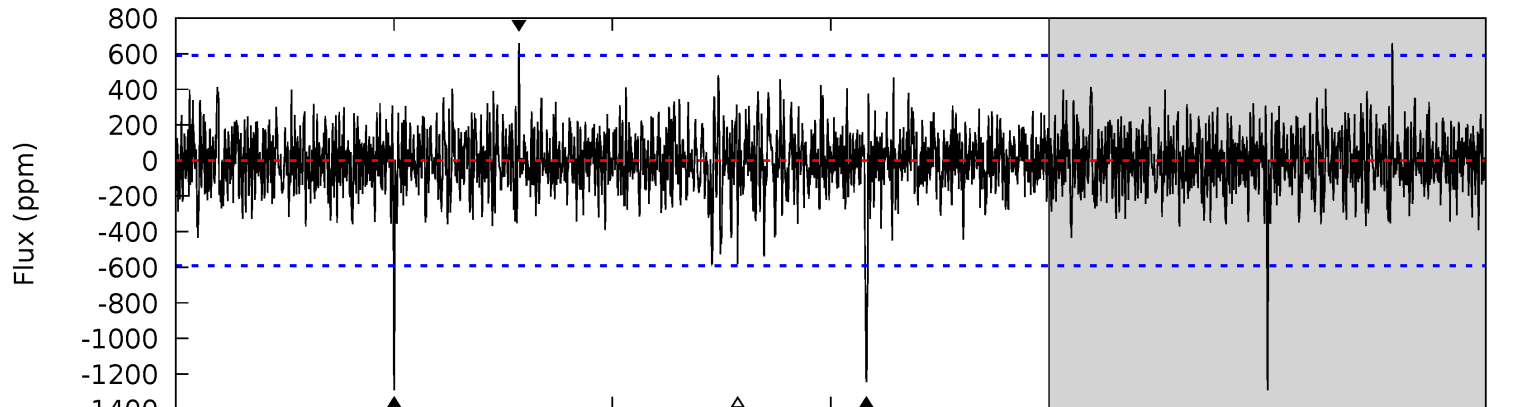
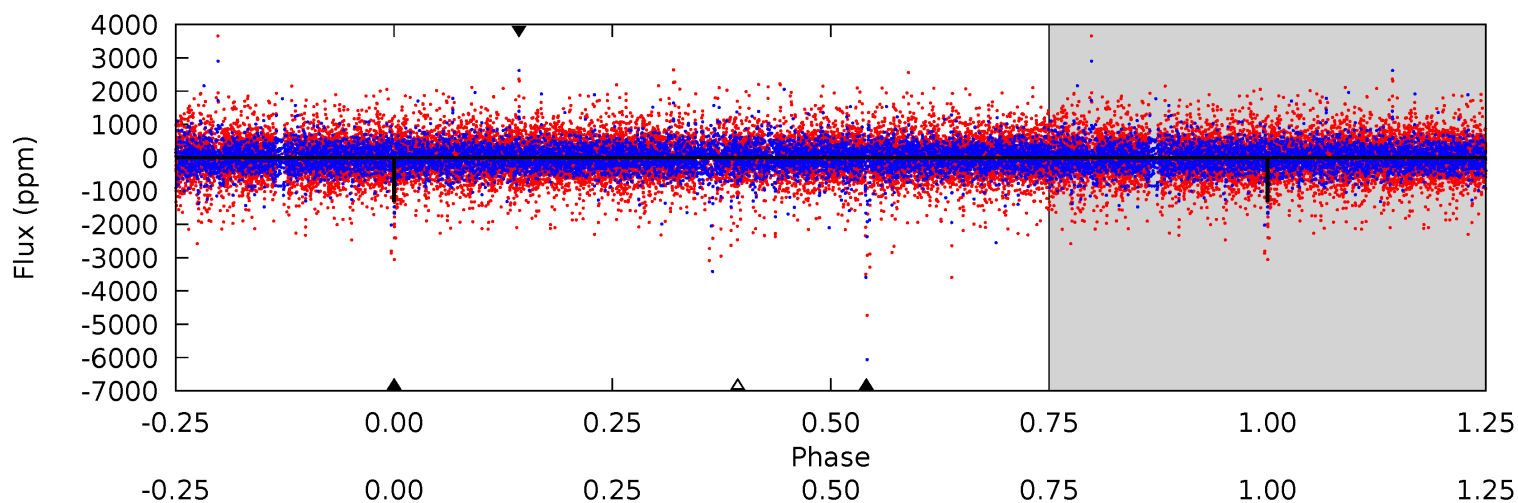
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.50	8.56	7.04	10.4	5.34	3.10	2.09	0.46	-2.95	1.53	-1.88	1.68	0.92	0.55	1.51



# Alt Model-Shift Uniqueness Test

004347340-05, P = 124.991059 Days, E = 180.241626 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
11.8	11.4	5.31	6.03	5.40	3.21	1.24	6.49	5.78	6.07	5.35	1.91	1.54	0.34	3.33



### Stellar Parameters For KIC 004347340

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5520^{+194}_{-194}$	$4.552^{+0.095}_{-0.085}$	$-0.840^{+0.300}_{-0.300}$	$0.722^{+0.097}_{-0.088}$	$0.678^{+0.081}_{-0.035}$	$2.536^{+1.006}_{-0.659}$
	+4%/-4%	+2%/-2%	+36%/-36%	+13%/-12%	+12%/-5%	+40%/-26%
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 004347340-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-838 \pm 98$	$2.89^{+1.74}_{-1.69}$	$442^{+20}_{-20}$	$4980^{+2704}_{-820}$	$10089^{+50170}_{-6032}$
Alt.	$-1244 \pm 109$	$3.93^{+1.85}_{-2.05}$	$441^{+22}_{-21}$	$4770^{+1938}_{-702}$	$8366^{+27435}_{-4566}$

$T_{\text{max}}$  = 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

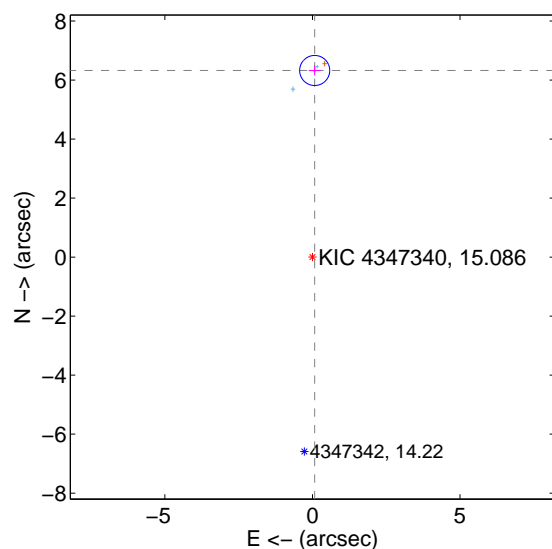
Supplemental centroid analysis for 004347340-05. Kepler magnitude: 15.09. Transit SNR 8.30

There are 5 quarters with good PRF difference image offsets

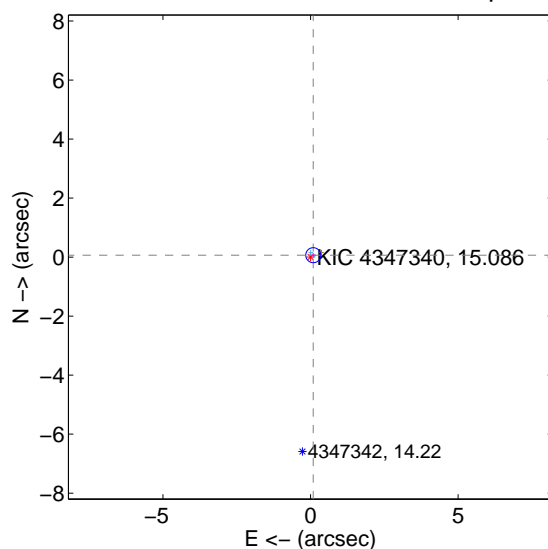
The OOT PRF centroid is offset from the target star catalog position by about 6.42 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>6.325 \pm 0.170</math></b>	<b>37.25</b>	$-0.076 \pm 0.201$	$6.325 \pm 0.170$
PRF-fit source offset from KIC position	$0.113 \pm 0.085$	1.33	$-0.093 \pm 0.089$	$0.065 \pm 0.076$
photometric centroid source offset	$2.68 \pm 1.29$	2.08	$-0.28 \pm 0.30$	$-2.67 \pm 1.29$

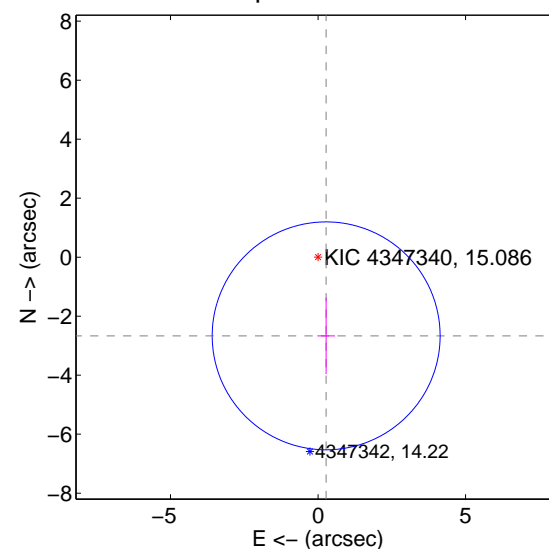
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

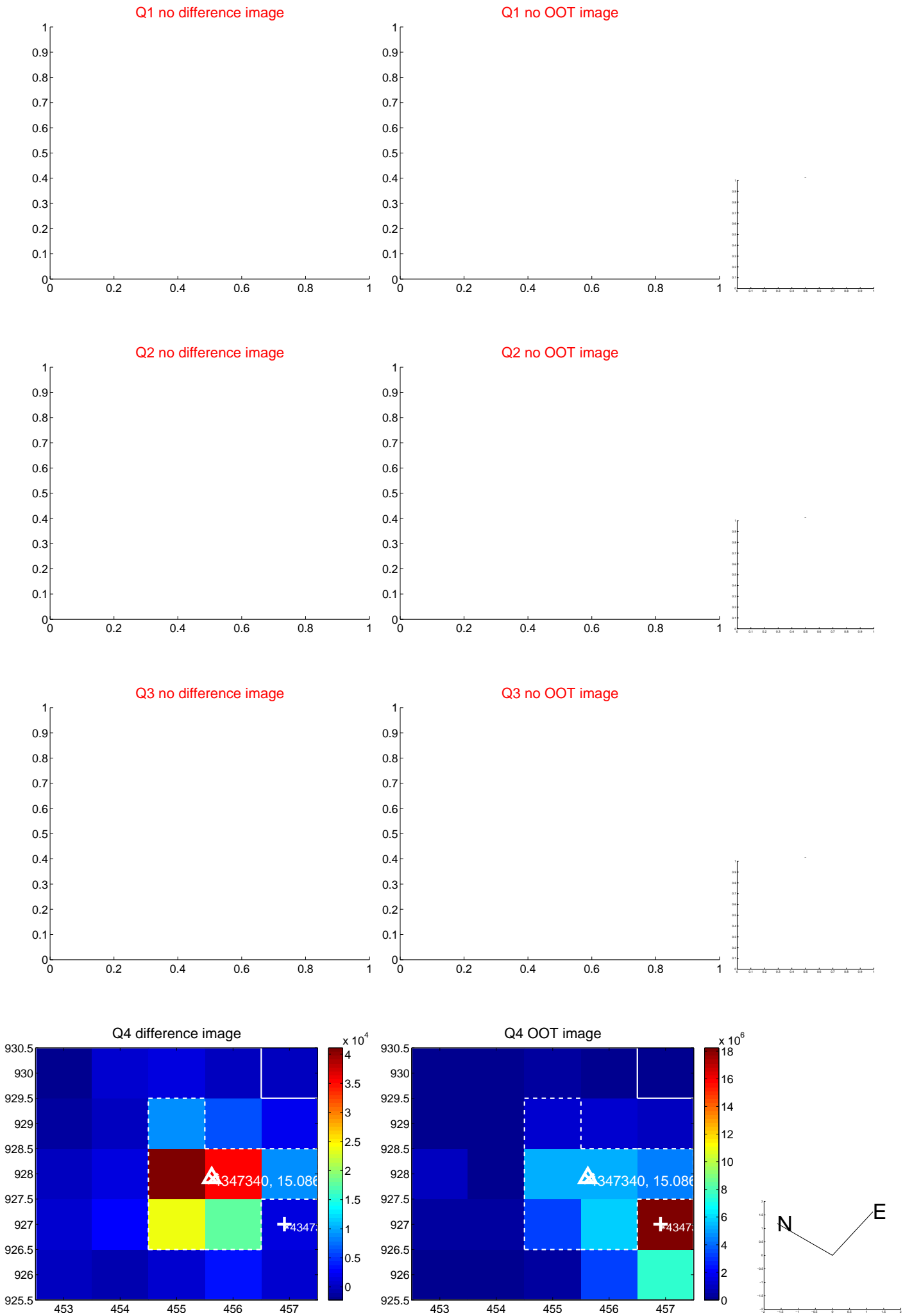


offset from photometric centroids

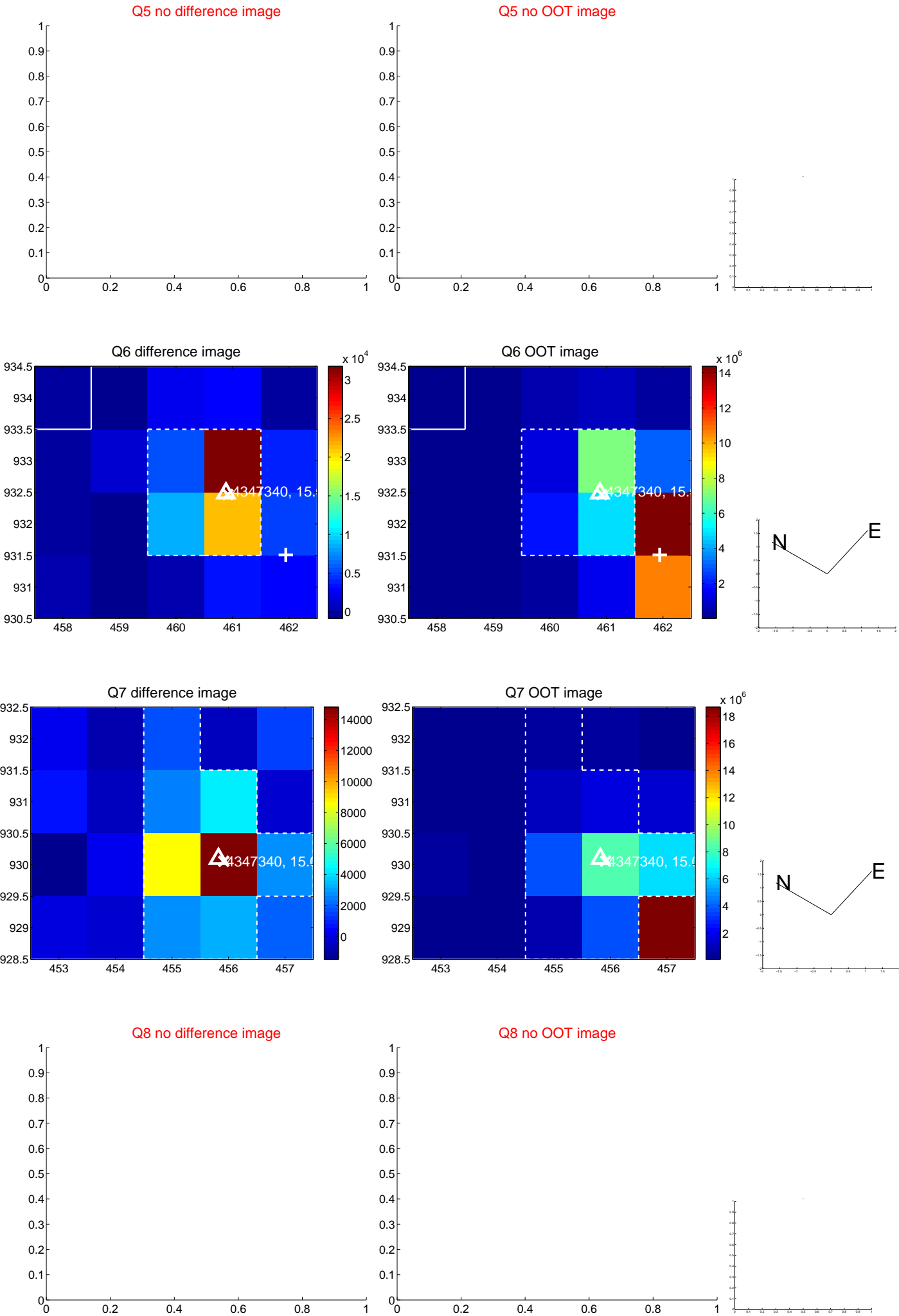


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

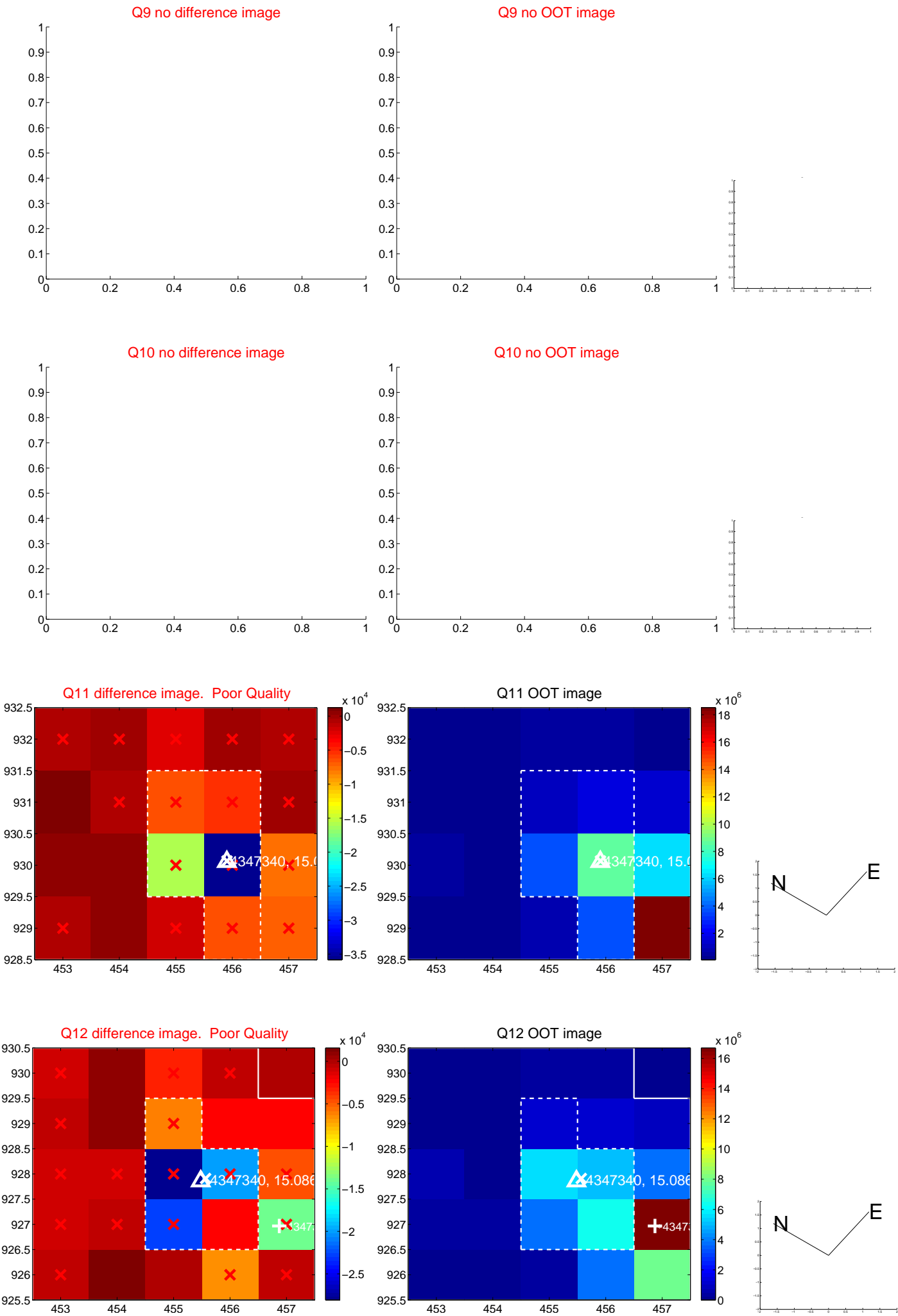


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

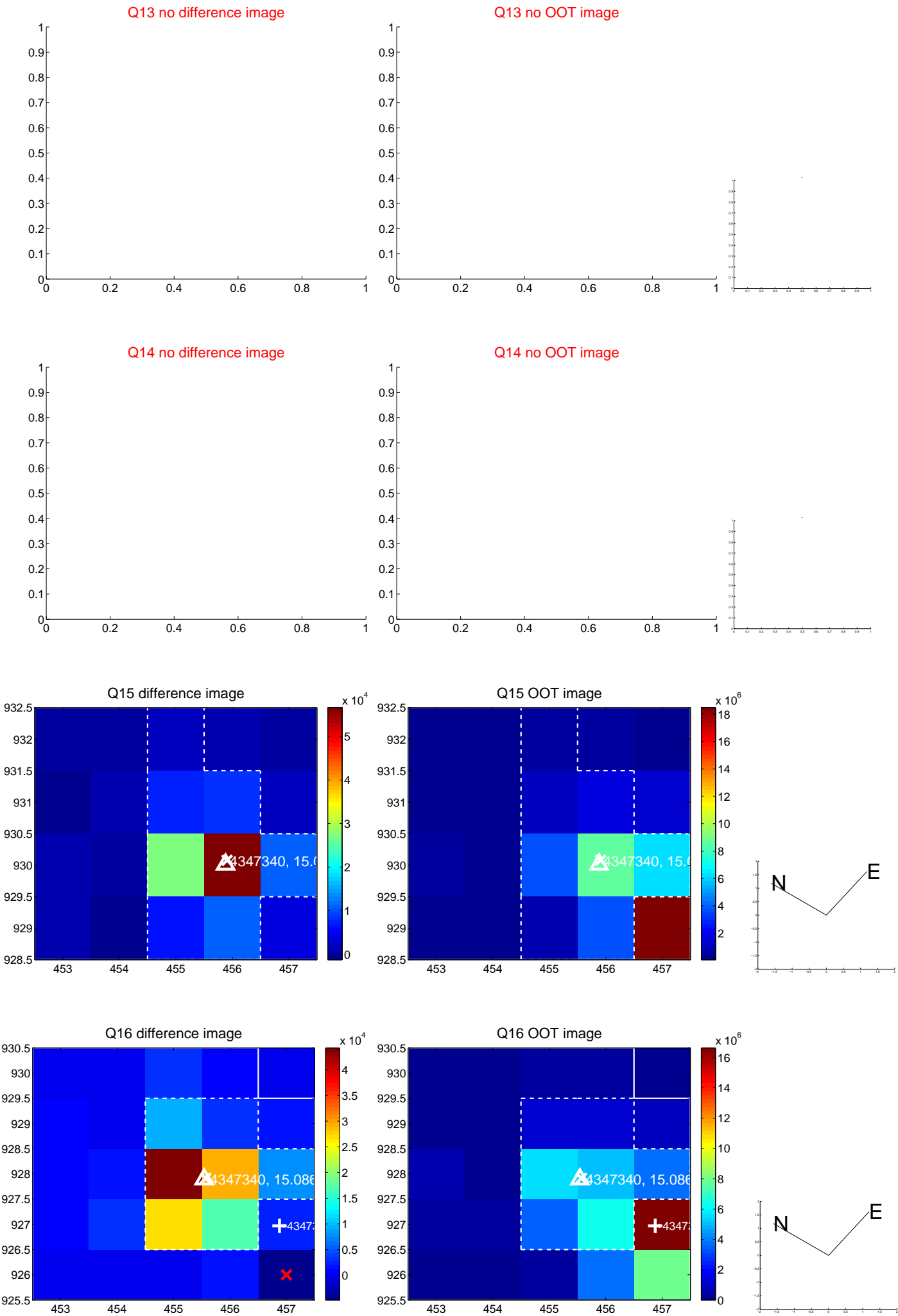




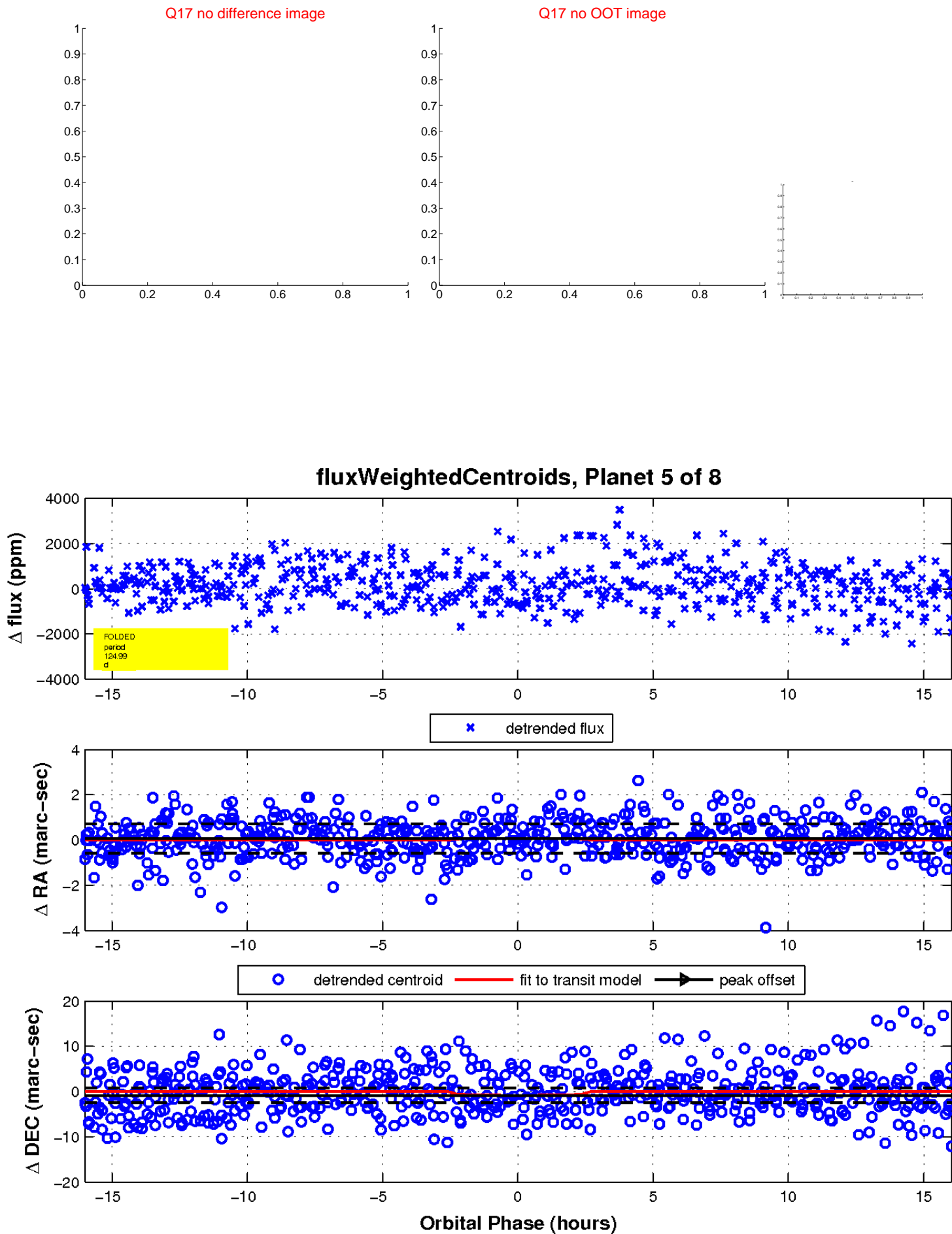
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



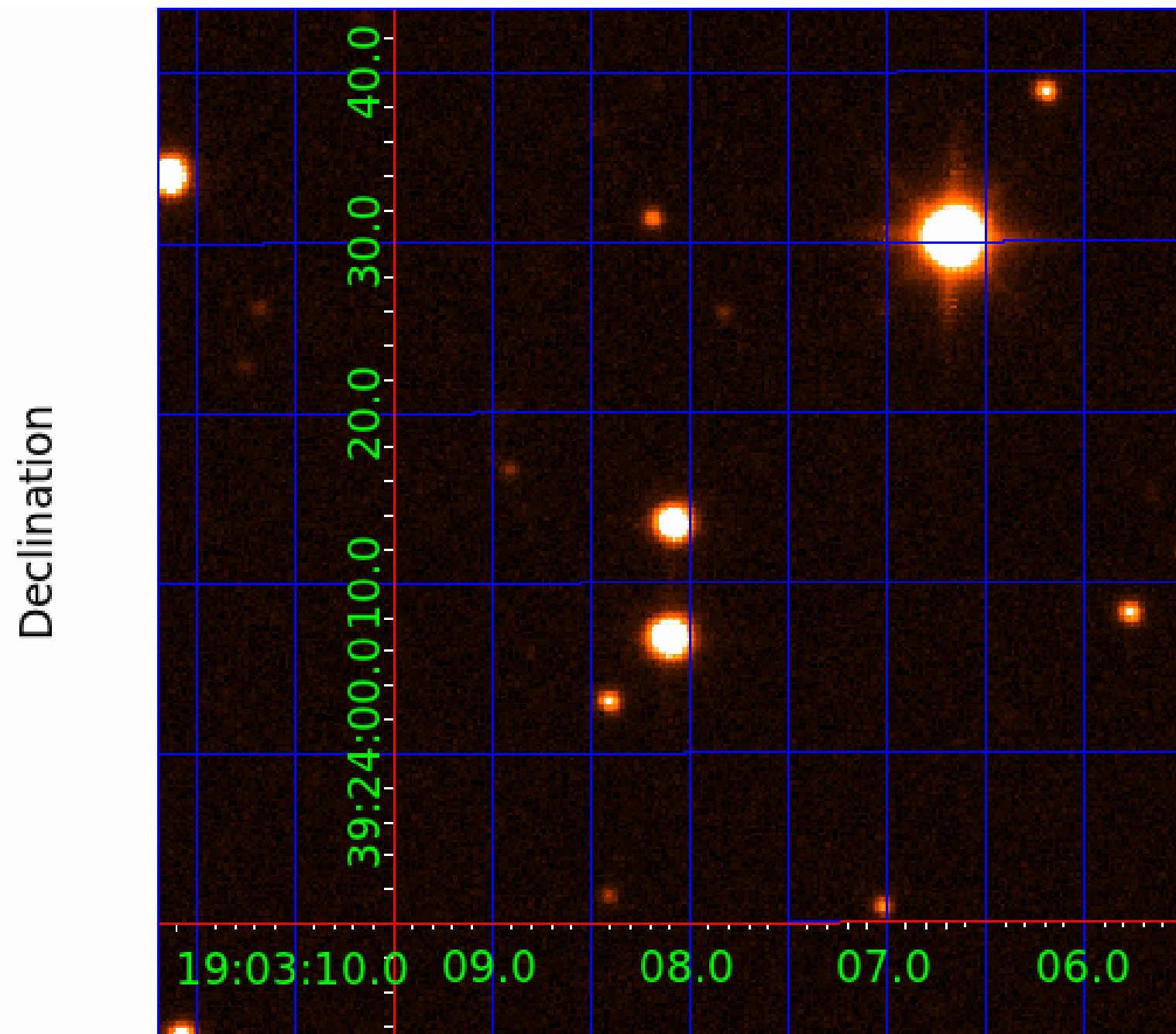
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 004347340

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004347340-01	OBS	No	3.158864	133.148926	242.9	15.009	8.8	10.4	0.72	5520	2.27	316.45
004347340-02	OBS	No	135.677907	224.619027	2088.6	46.049	10.1	7.9	0.72	5520	6.22	2.10
004347340-03	OBS	No	87.991096	213.154786	368.8	3.537	8.3	2.9	0.72	5520	1.48	3.75
004347340-04	OBS	No	382.441320	469.090433	709.9	9.000	9.2	-1.0	0.72	5520	1.92	0.53
004347340-05	OBS	No	124.986879	180.255833	1131.3	5.349	8.4	8.3	0.72	5520	2.57	2.35
004347340-06	OBS	No	67.732451	157.191789	1000.9	1.868	7.6	6.9	0.72	5520	2.58	5.31
004347340-07	OBS	No	117.676012	221.262001	646.1	7.500	8.5	-1.0	0.72	5520	1.83	2.54
004347340-08	OBS	No	184.597816	283.138226	2018.4	5.000	12.1	-1.0	0.72	5520	3.23	1.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004347340-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_KIC_POS
004347340-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004347340-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
004347340-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—CENT_NOFITS
004347340-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
004347340-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

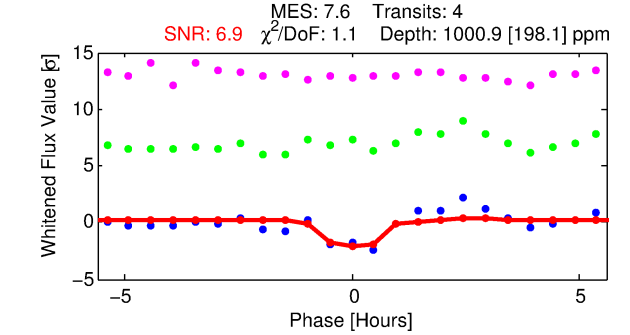
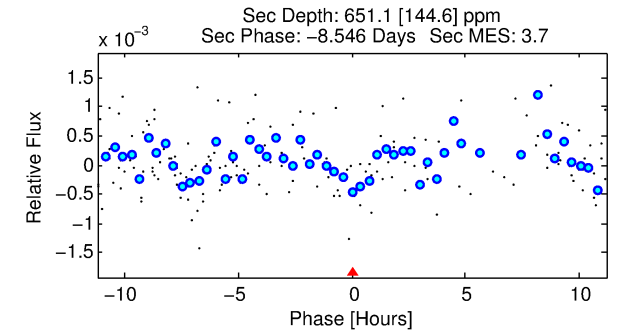
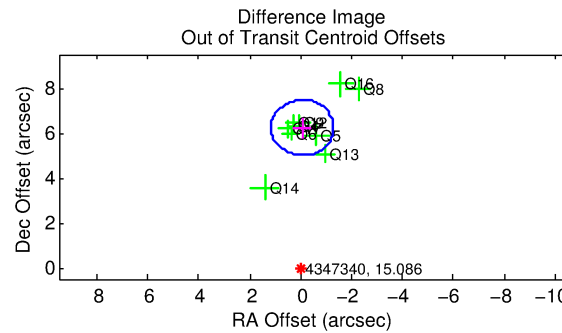
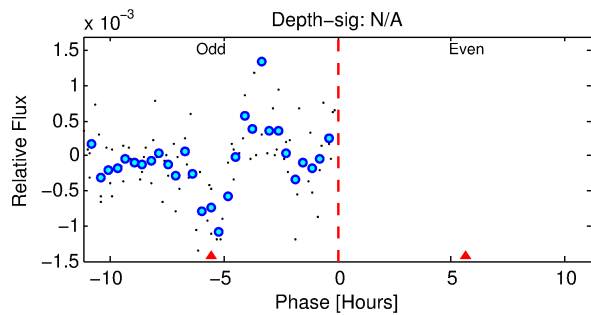
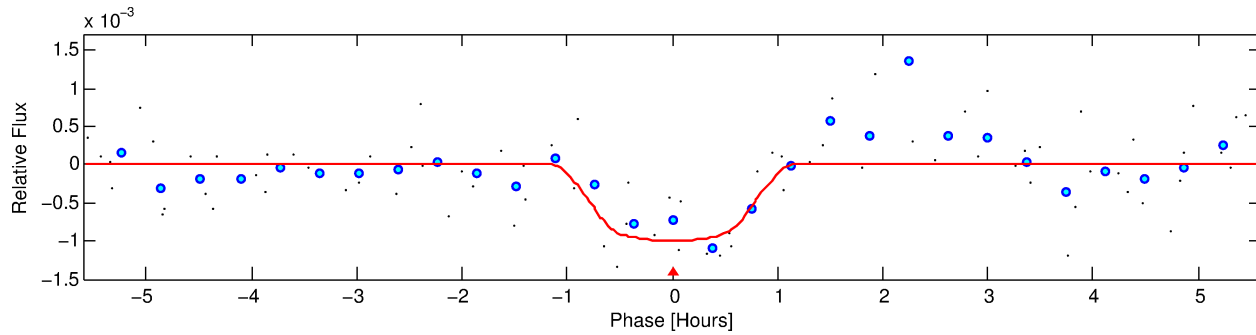
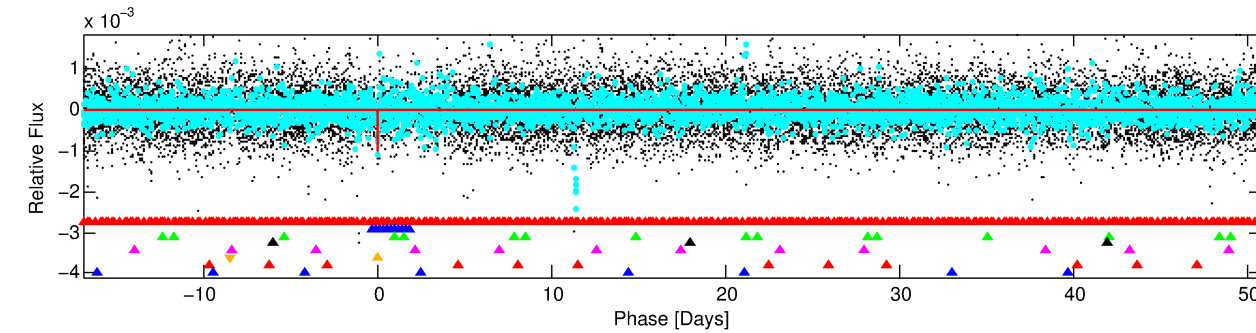
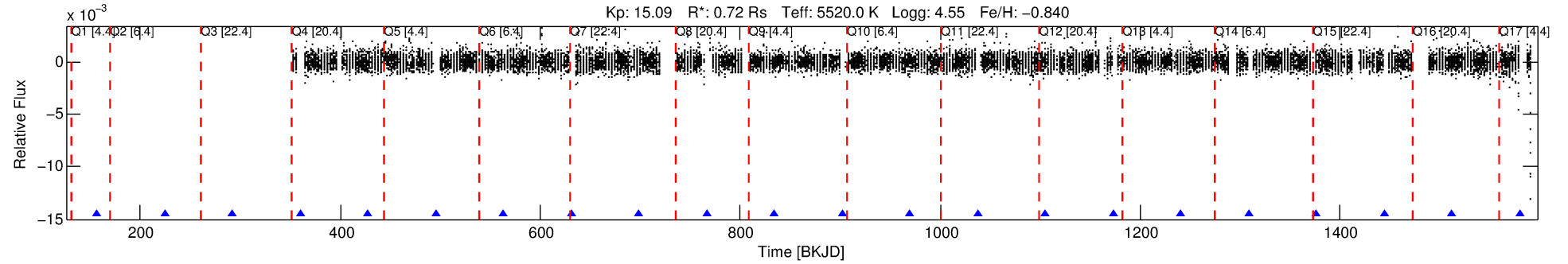
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004347340-06

No Significant Match Found

# DV One-Page Summary

KIC: 4347340 Candidate: 6 of 8 Period: 67.732 d



## DV Fit Results:

Period = 67.73245 [0.00074] d  
Epoch = 157.1918 [0.0116] BKJD  
Rp/R\* = 0.0327 [0.0331]  
a/R\* = 168.84 [788.30]  
b = 0.83 [1.75]  
Seff = 5.31 [1.18]  
Teq = 387 [21] K  
Rp = 2.58 [2.63] Re  
a = 0.2857 [0.0330] AU  
Ag = 4392.75 [8961.33] [0.49σ]  
Teffp = 4873 [2482] K [1.81σ]

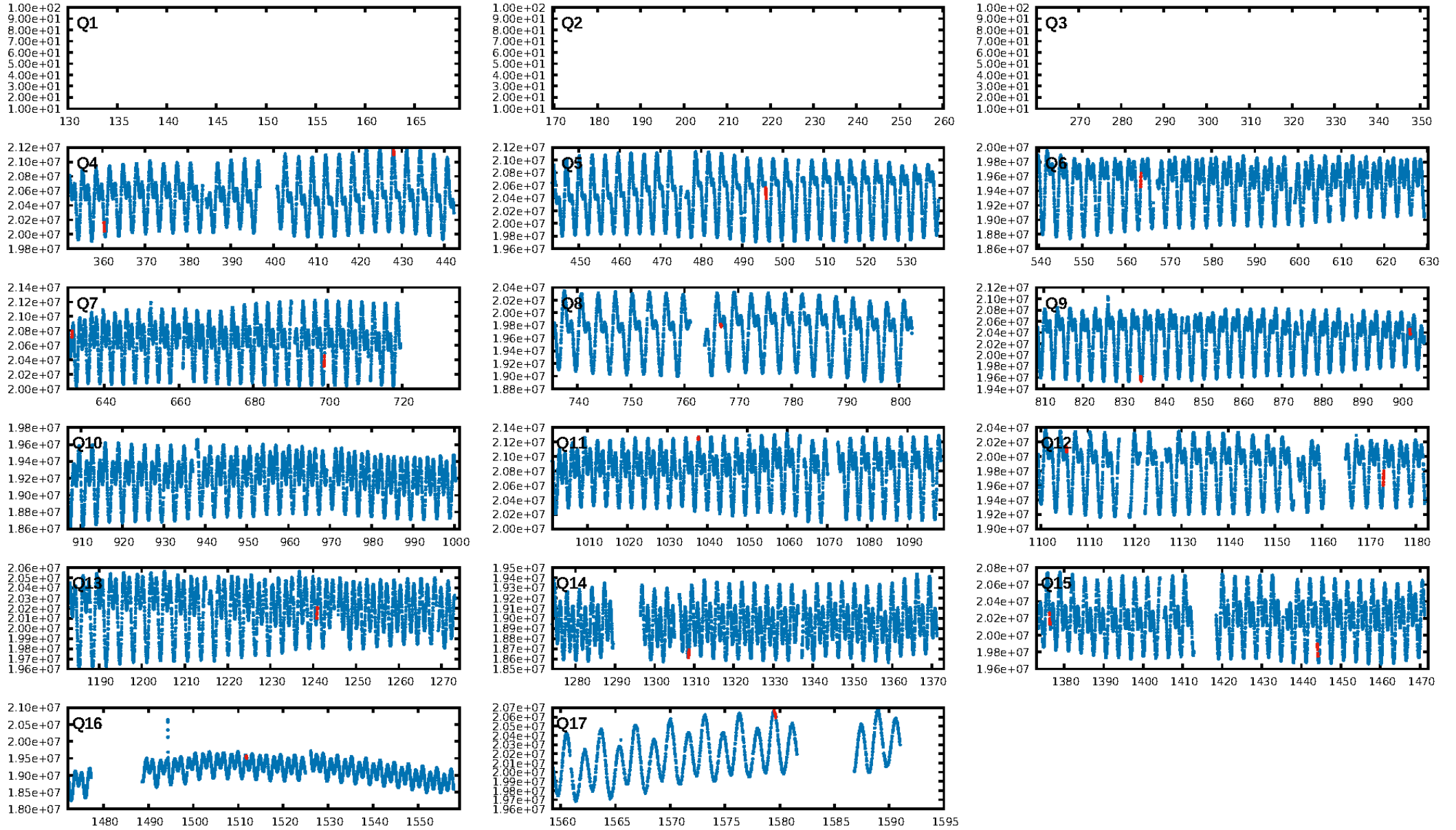
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [102.47σ]  
LongPeriod-sig: 100.0% [121.56σ]  
ModelChiSquare2-sig: 61.4%  
ModelChiSquareGof-sig: 94.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.3771  
Centroid-sig: 2.1%  
Centroid-so: 3.412 arcsec [2.90σ]  
OotOffset-rm: 6.237 arcsec [15.15σ]  
KicOffset-rm: 0.322 arcsec [0.94σ]  
OotOffset-st: 2/0/4/4 [10]  
KicOffset-st: 2/3/4/4 [13]  
DiffImageQuality-fgm: 0.31 [4/13]  
DiffImageOverlap-fno: 0.46 [6/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:54:17 Z

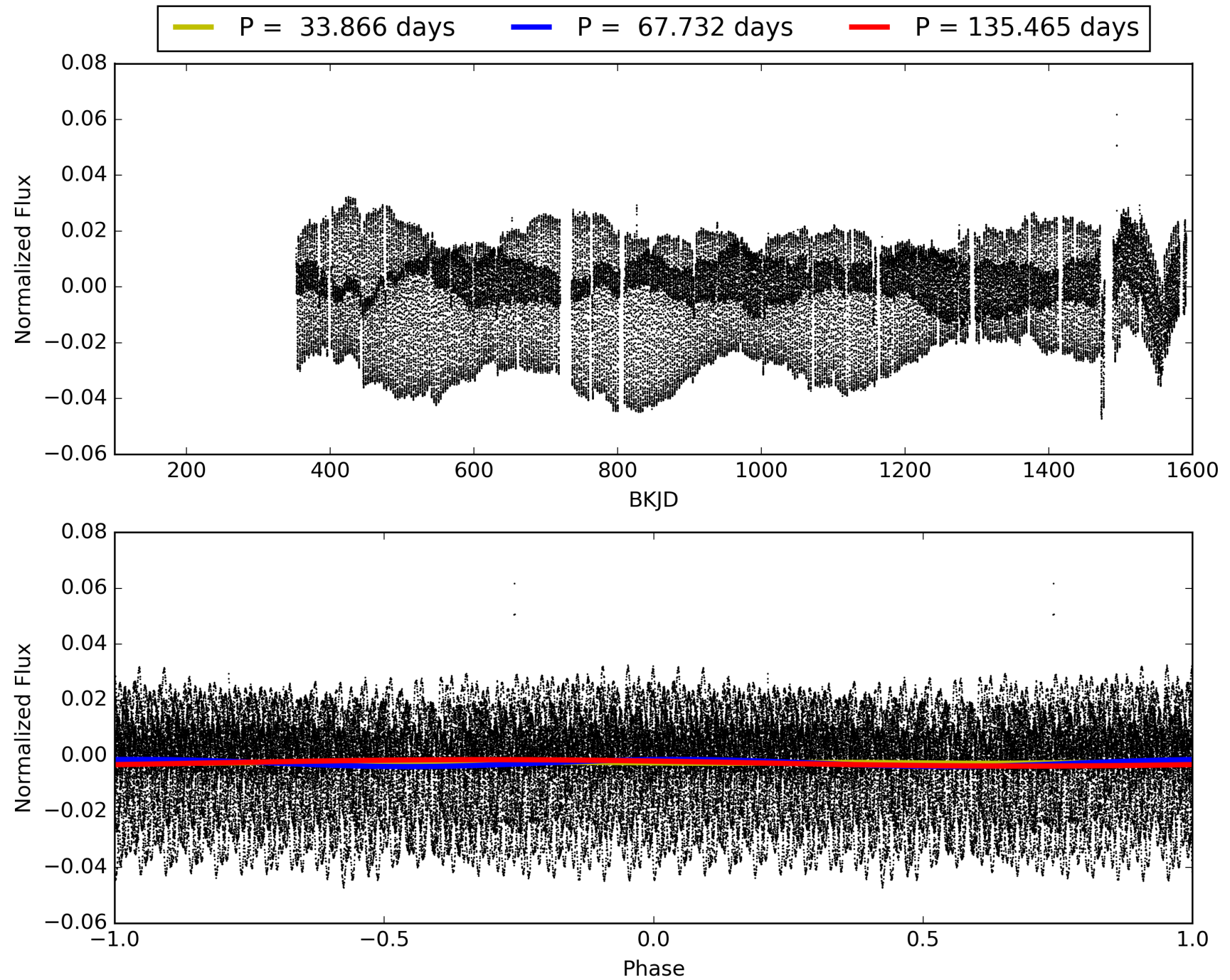
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 004347340-06, PDC Light Curves





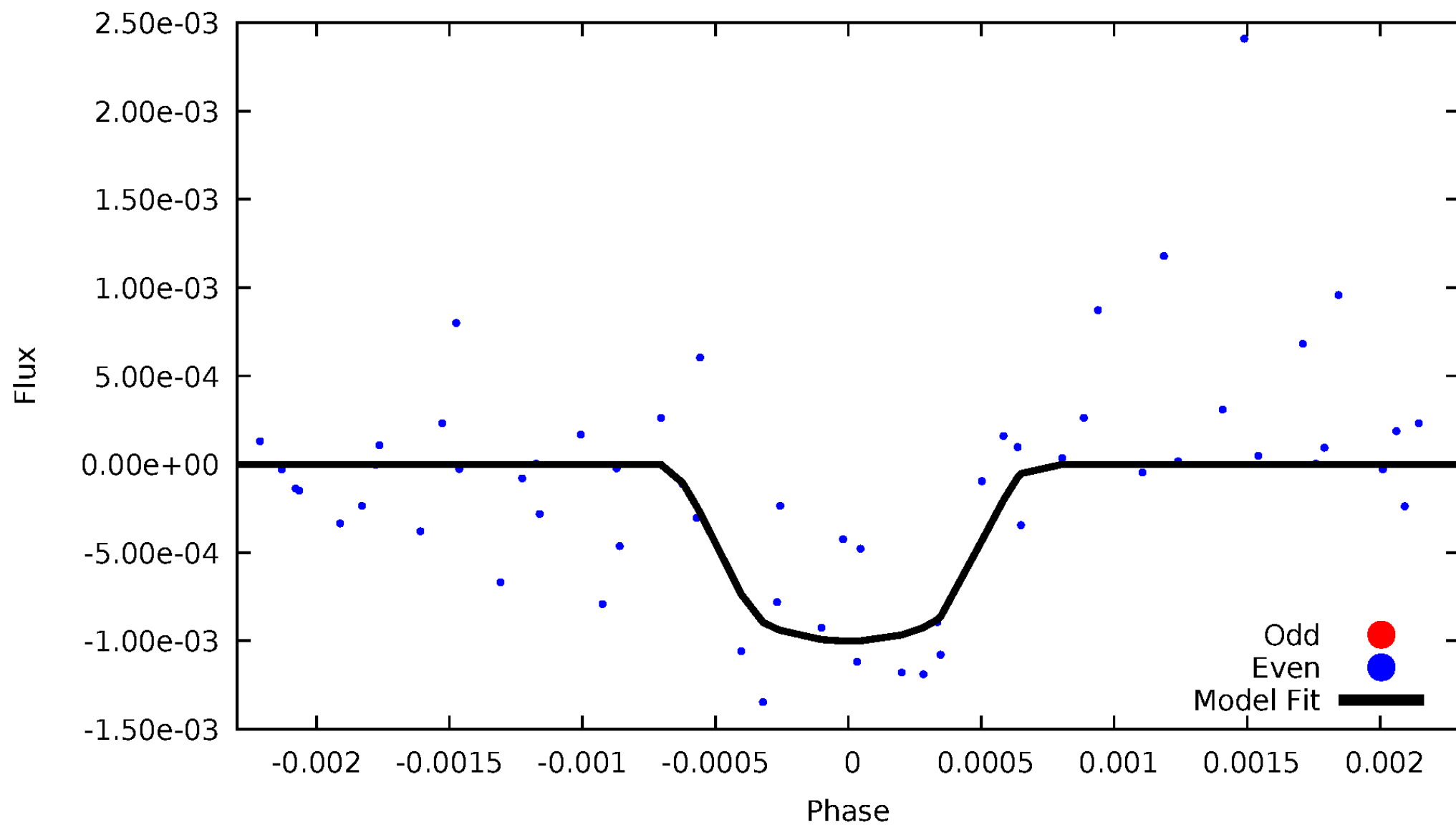
# TCE 004347340-06





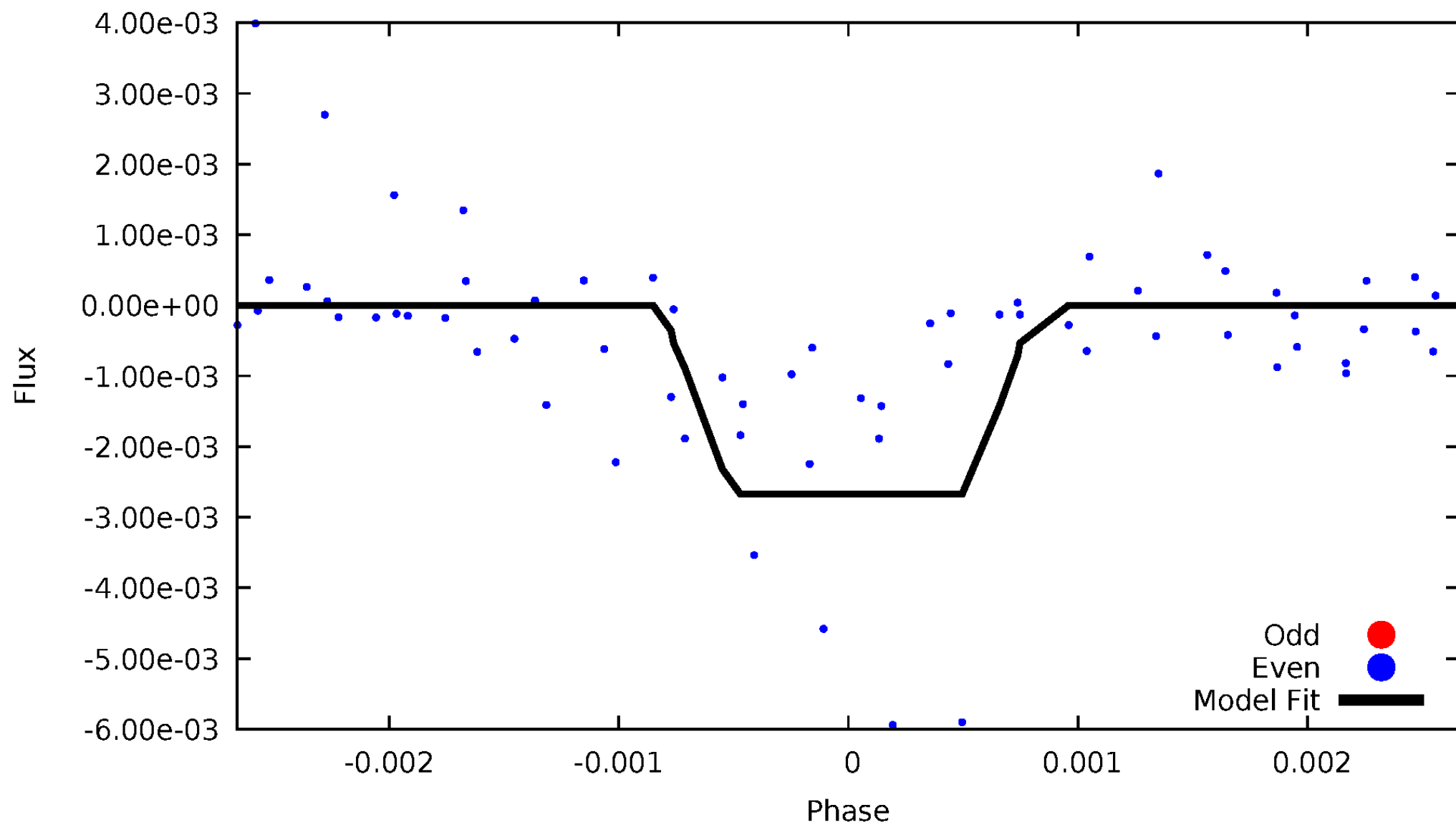
# DV Odd/Even

TCE 004347340-06



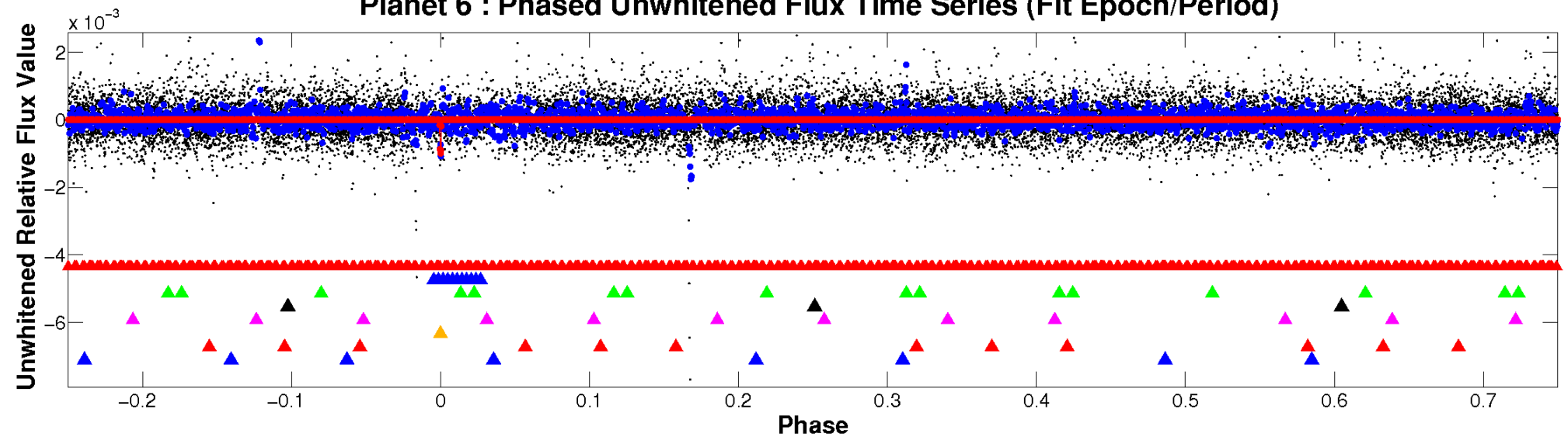
# ALT Odd/Even

TCE 004347340-06

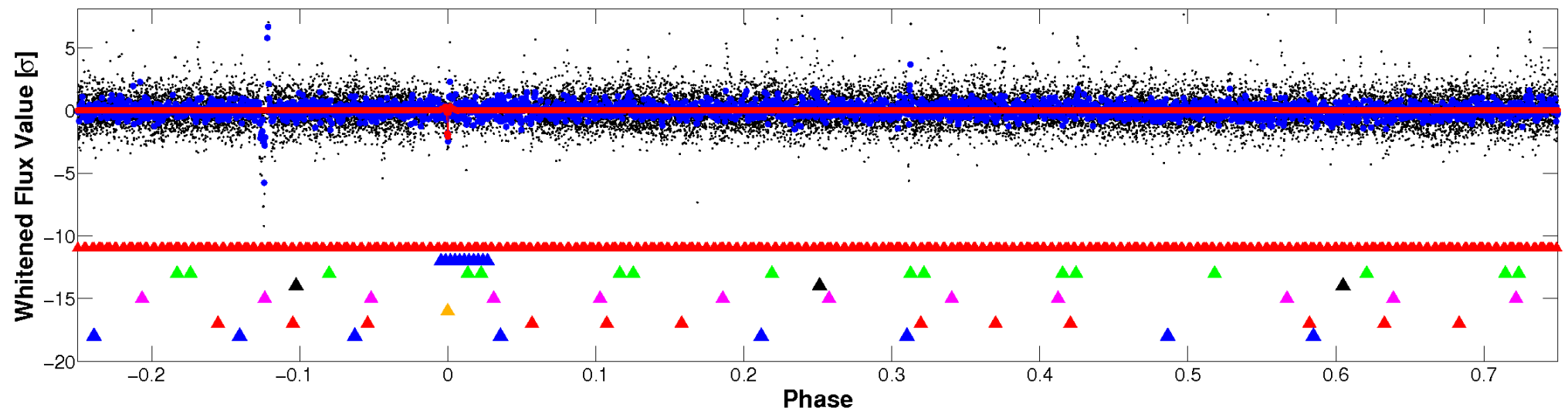


# Non-Whitened Vs. Whitened Light Curve

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

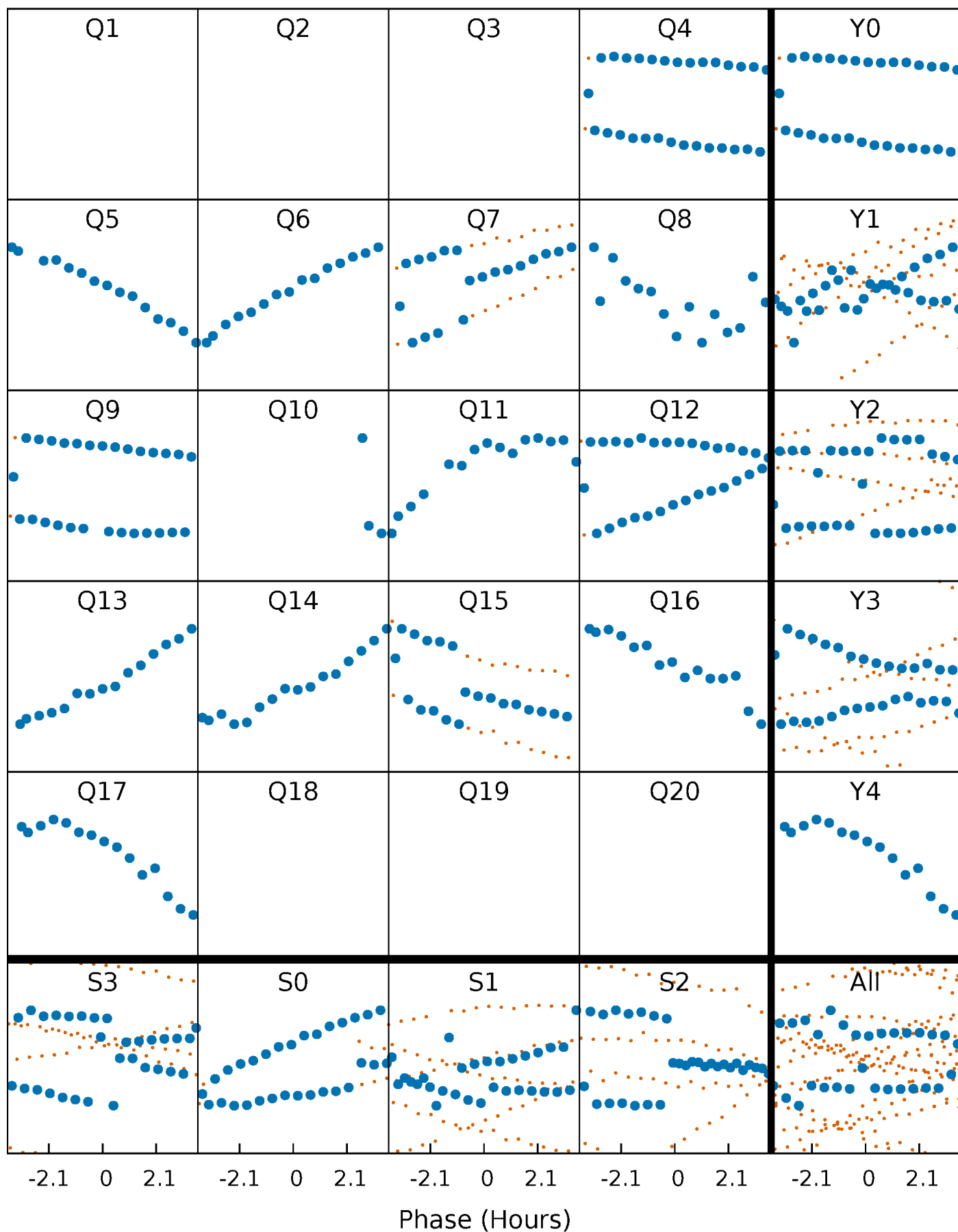


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



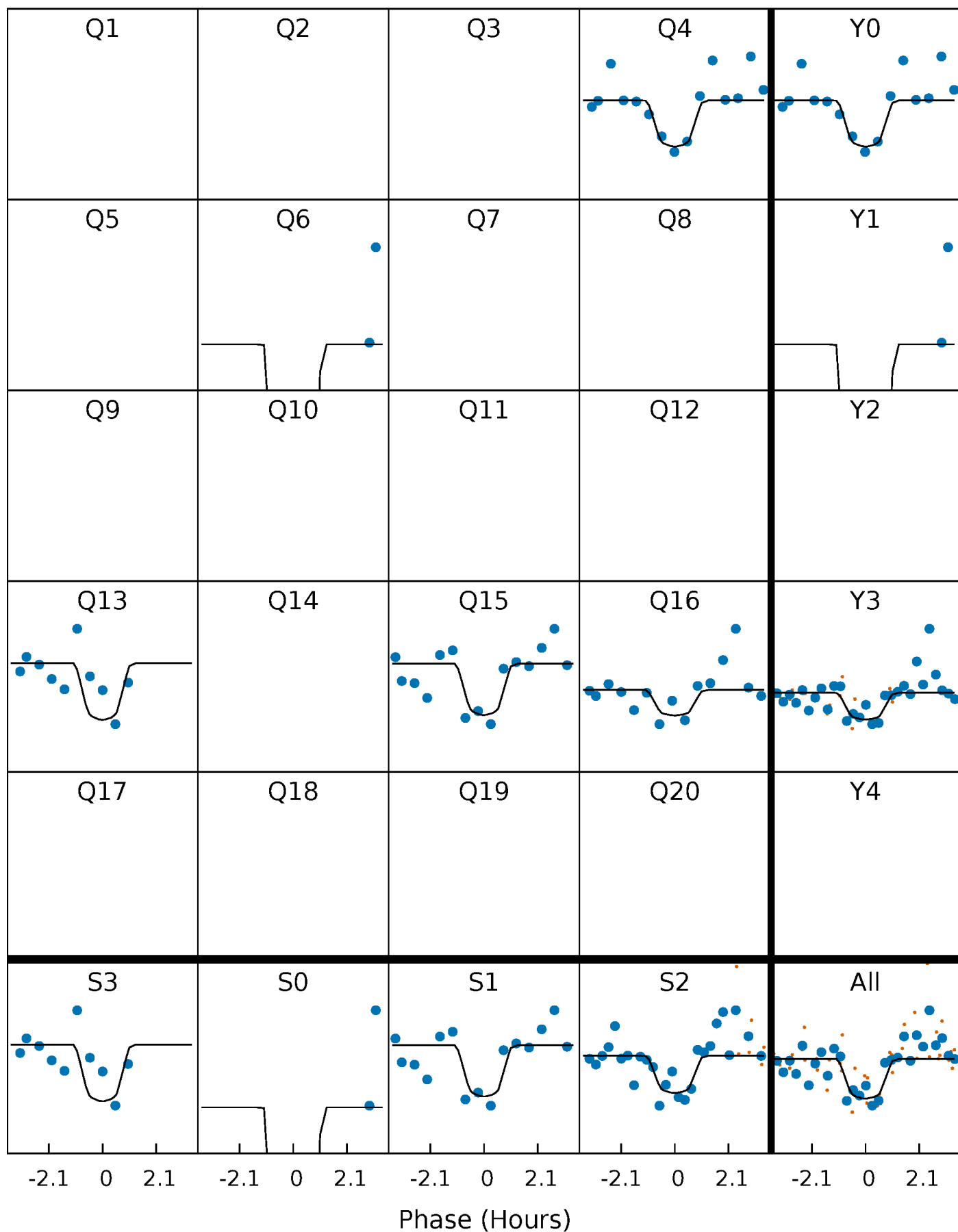
# PDC Quarter-Phased Transit Curves

TCE 004347340-06 P= 67.732451 Days  $T_0=157.191789$  (BKJD)



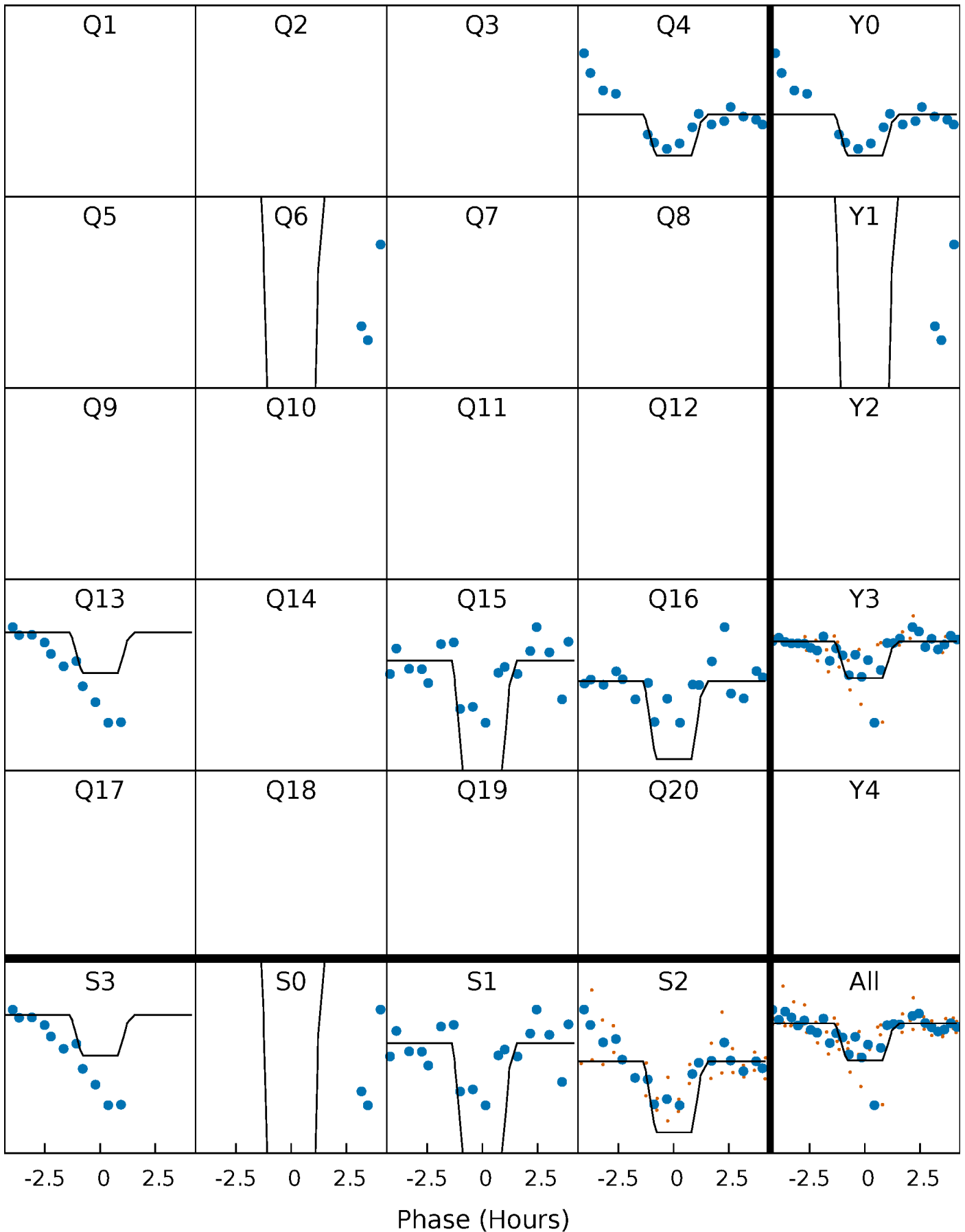
# DV Quarter-Phased Transit Curves

TCE 004347340-06 P= 67.732451 Days  $T_0=157.191789$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

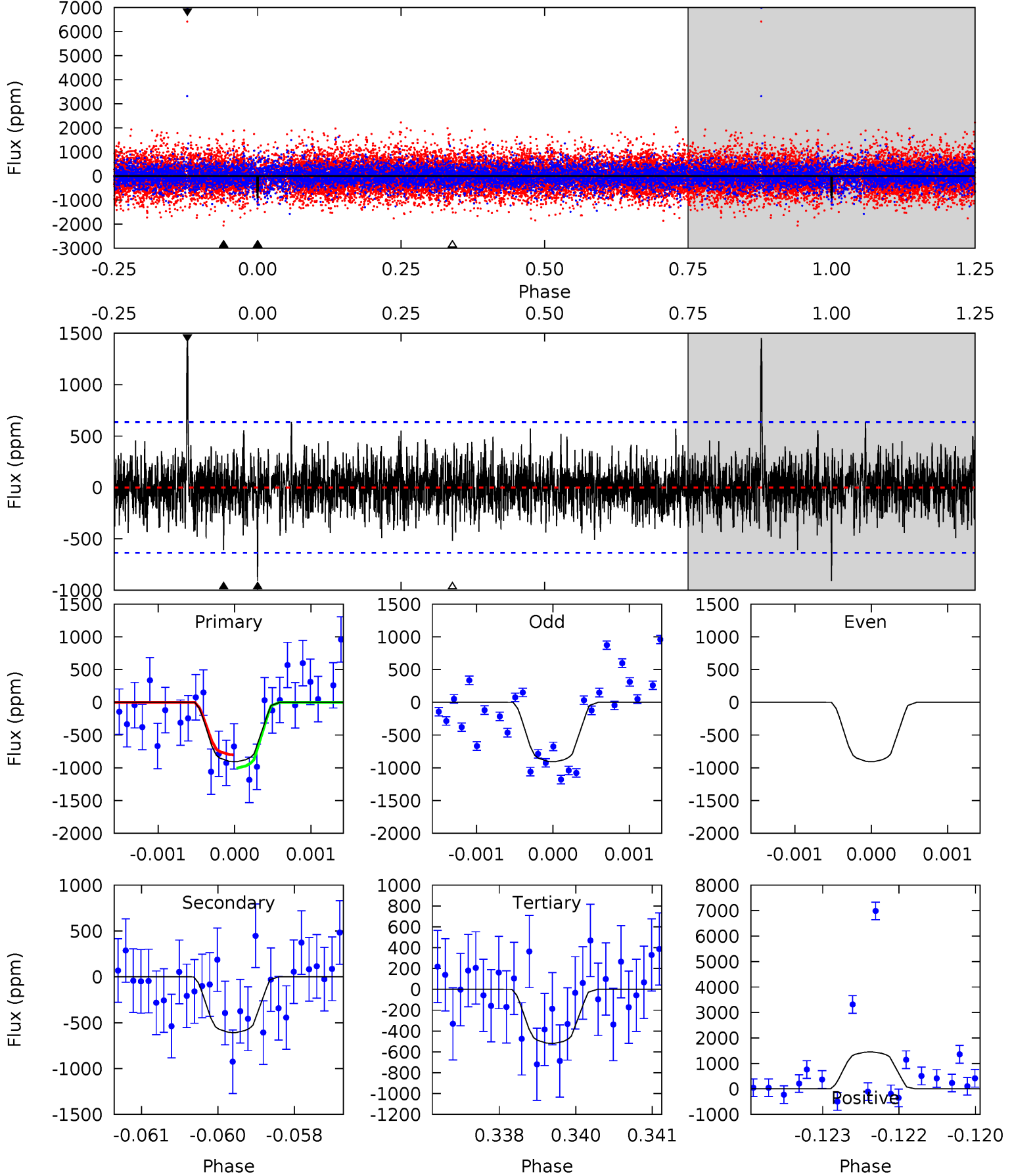
TCE 004347340-06   P= 67.732182 Days    $T_0=157.206511$  (BKJD)



# DV Model-Shift Uniqueness Test

004347340-06, P = 67.732451 Days, E = 157.191789 Days

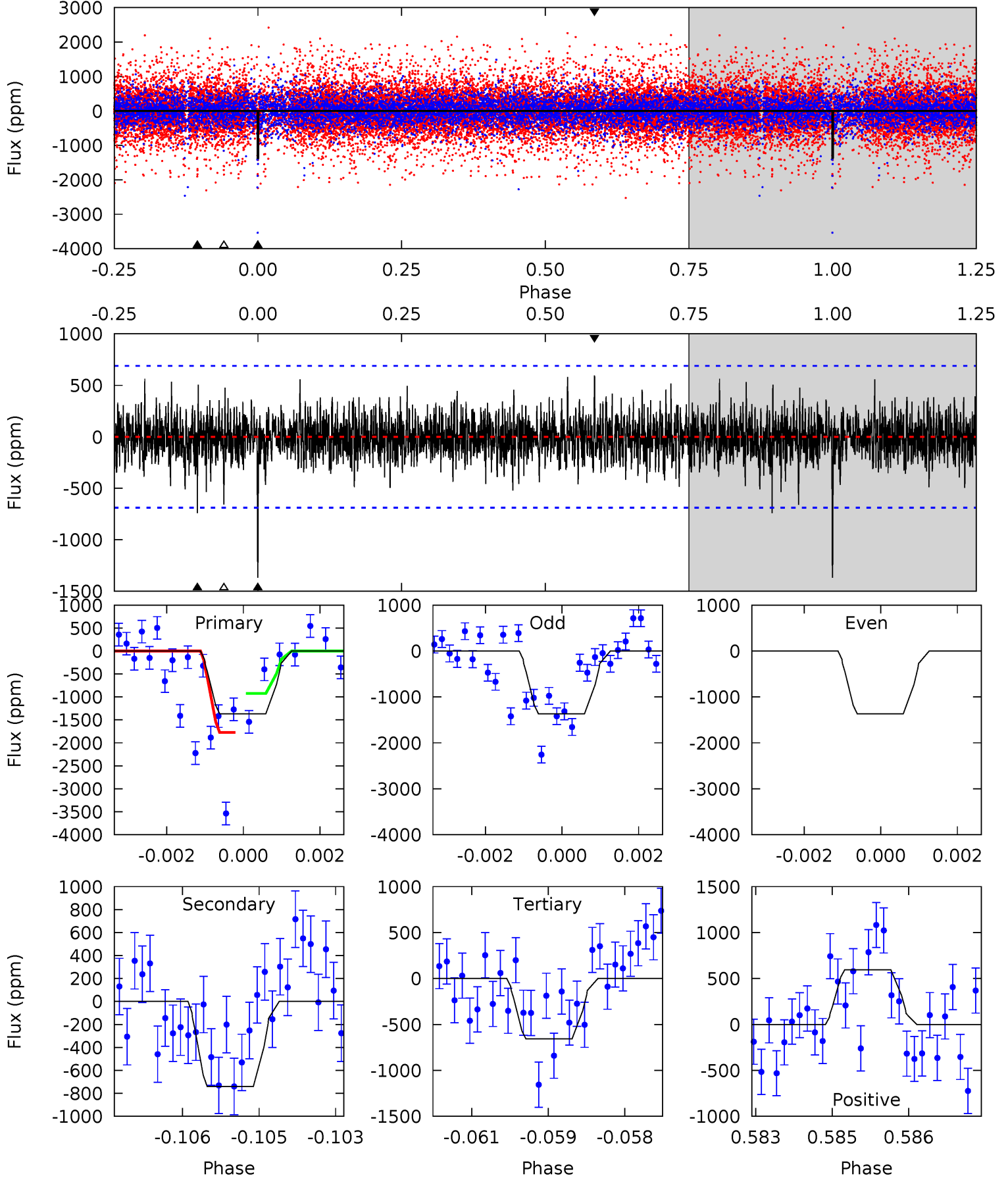
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.71	5.16	4.41	12.3	5.40	3.20	1.40	3.30	-4.62	0.75	-7.17	0	0.91	0.62	0.86



# Alt Model-Shift Uniqueness Test

004347340-06, P = 67.732182 Days, E = 157.206511 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	5.78	5.14	4.65	5.38	3.17	1.20	5.53	6.02	0.65	1.14	0	1.64	0.30	0





### Stellar Parameters For KIC 004347340

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5520^{+194}_{-194}$	$4.552^{+0.095}_{-0.085}$	$-0.840^{+0.300}_{-0.300}$	$0.722^{+0.097}_{-0.088}$	$0.678^{+0.081}_{-0.035}$	$2.536^{+1.006}_{-0.659}$
	+4%/-4%	+2%/-2%	+36%/-36%	+13%/-12%	+12%/-5%	+40%/-26%
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 004347340-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-608 \pm 118$	$3.18^{+2.50}_{-2.04}$	$539^{+25}_{-25}$	$4462^{+2663}_{-808}$	$2637^{+17569}_{-1784}$
Alt.	$-741 \pm 128$	$4.30^{+2.58}_{-2.26}$	$540^{+26}_{-26}$	$4149^{+1411}_{-642}$	$1786^{+5980}_{-1099}$

$T_{max}$  = 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

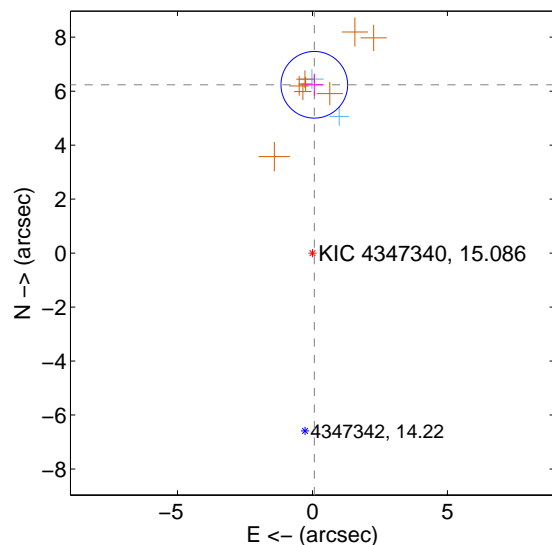
Supplemental centroid analysis for 004347340-06. Kepler magnitude: 15.09. Transit SNR 6.87

There are 4 quarters with good PRF difference image offsets

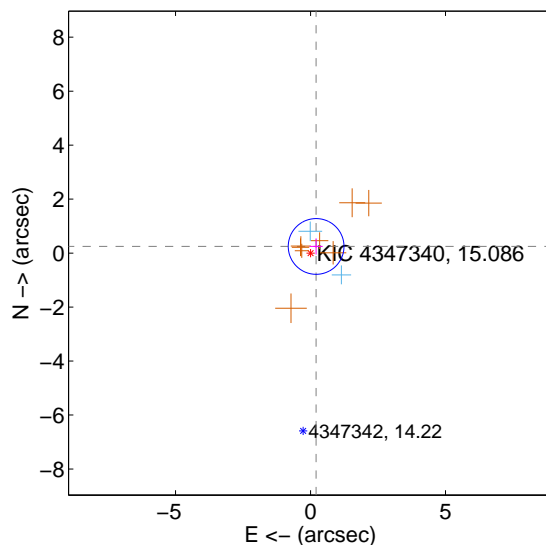
The OOT PRF centroid is offset from the target star catalog position by about 5.93 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>6.237 \pm 0.412</math></b>	<b>15.15</b>	$-0.069 \pm 0.326$	$6.237 \pm 0.409$
PRF-fit source offset from KIC position	$0.322 \pm 0.344$	0.94	$-0.207 \pm 0.243$	$0.246 \pm 0.301$
photometric centroid source offset	$3.41 \pm 1.18$	2.90	$-0.91 \pm 0.35$	$-3.29 \pm 1.22$

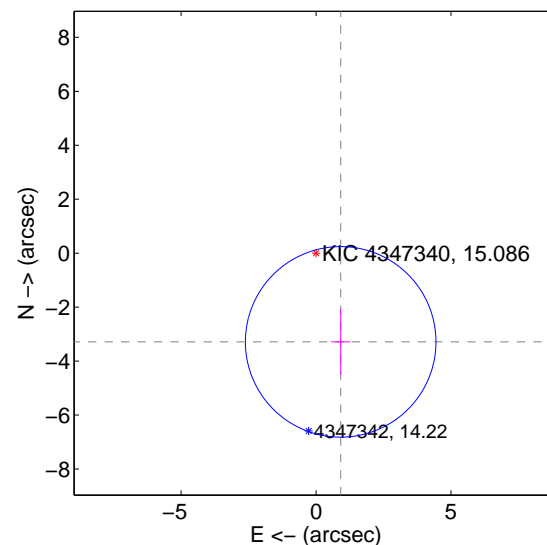
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

Q1 no difference image



Q1 no OOT image



Q2 no difference image



Q2 no OOT image



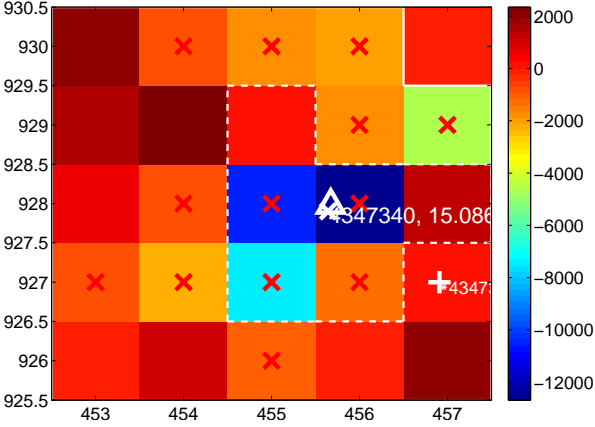
Q3 no difference image



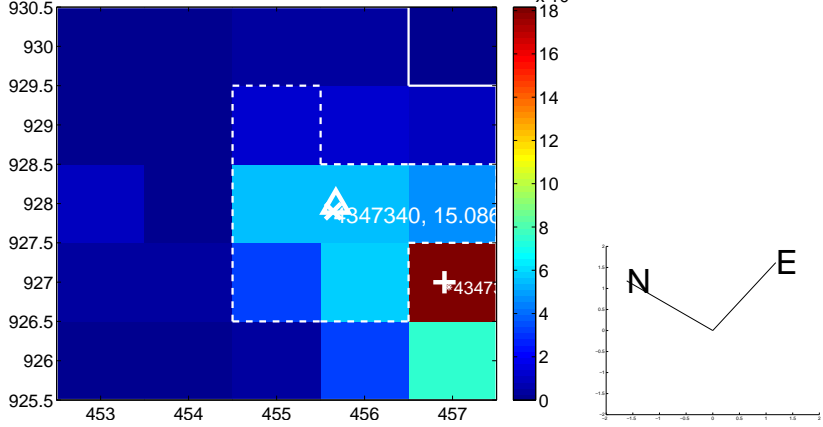
Q3 no OOT image



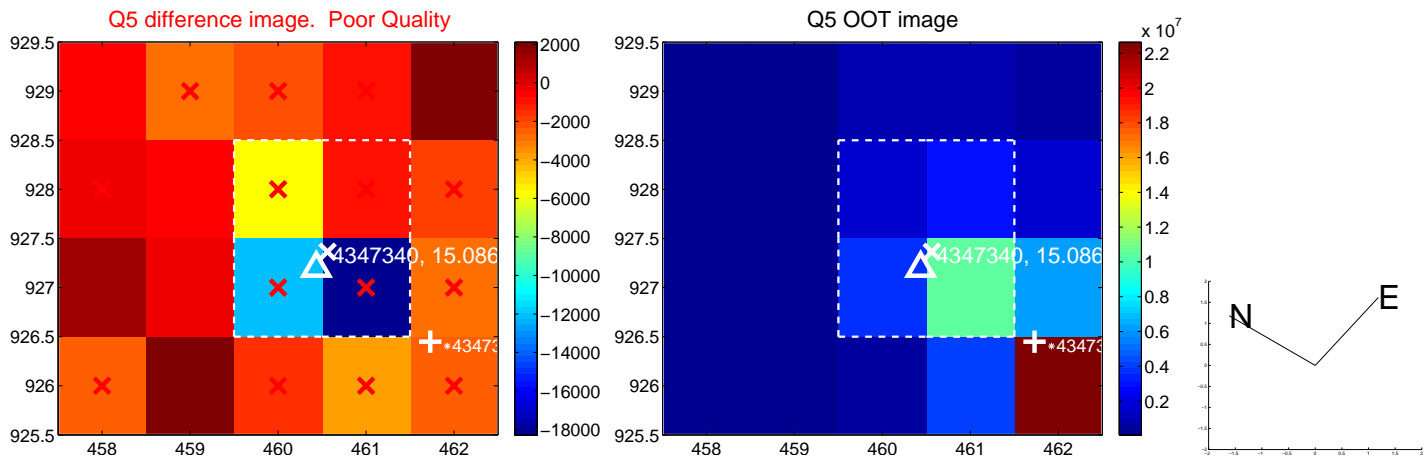
Q4 difference image. Poor Quality



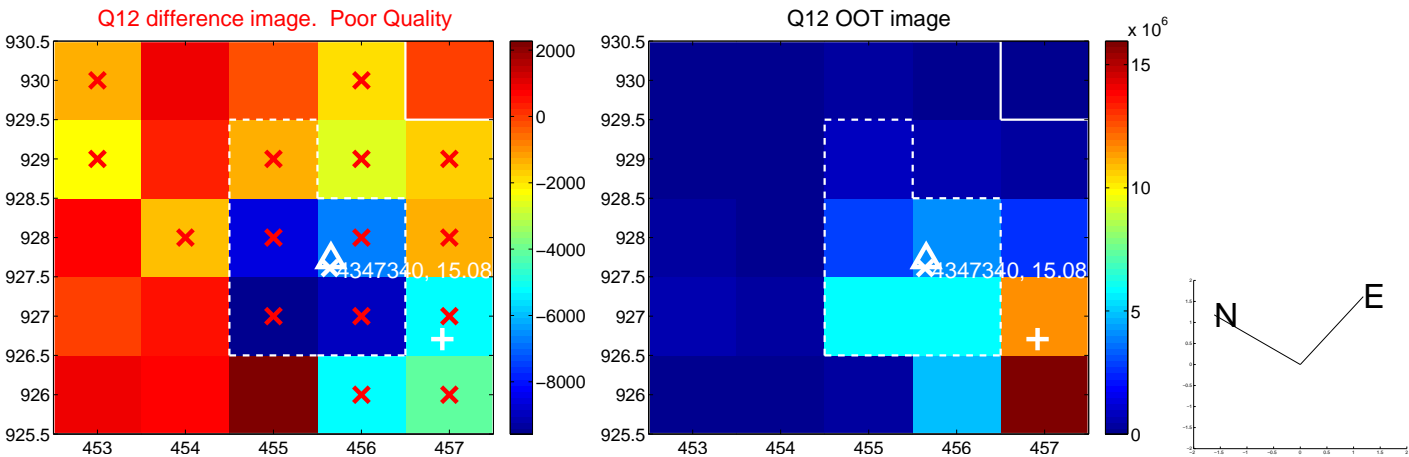
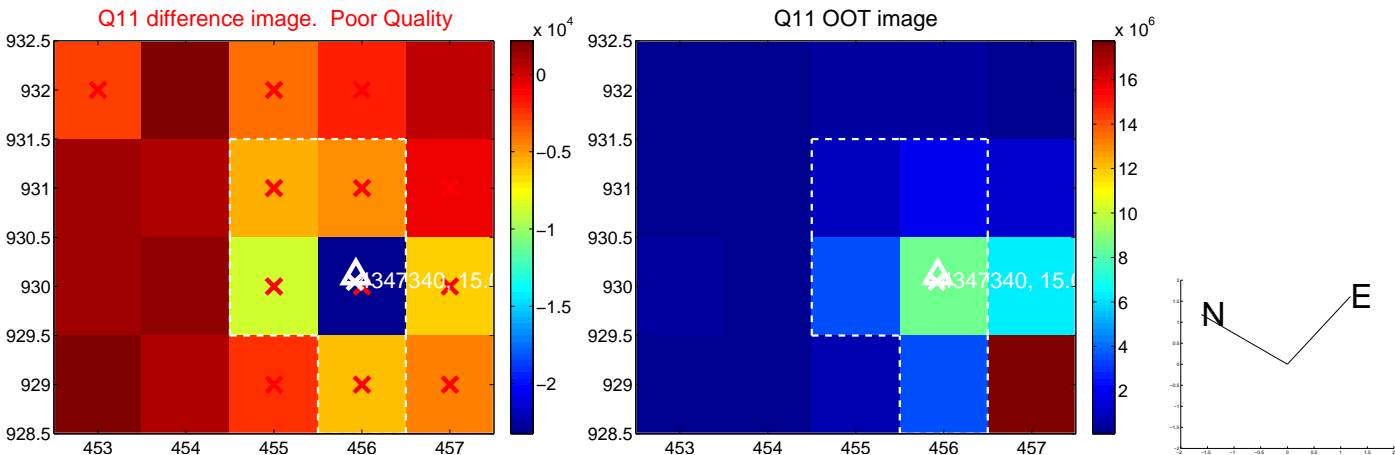
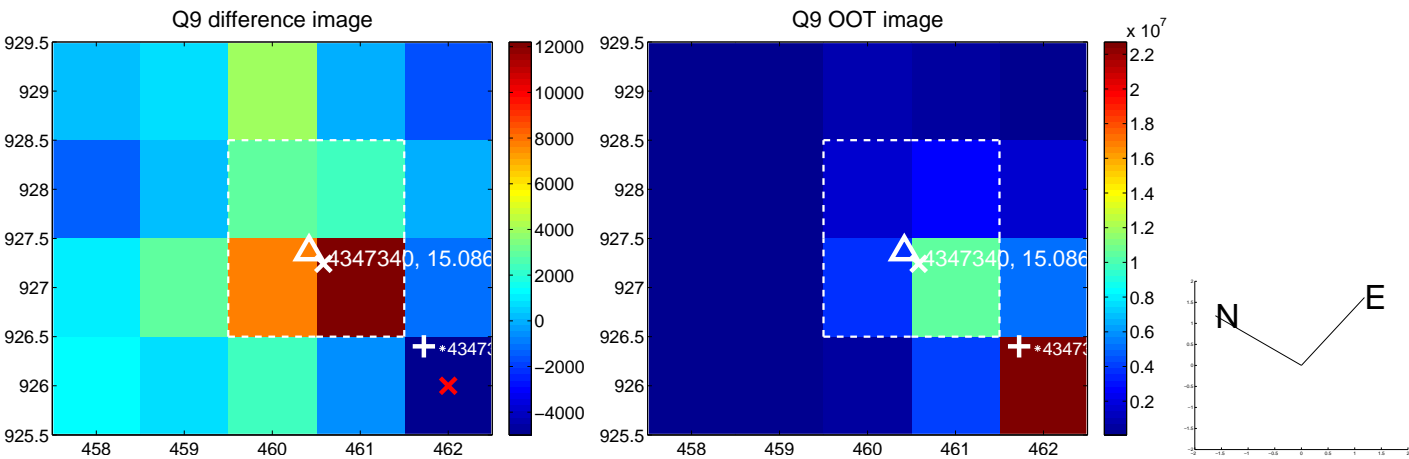
Q4 OOT image



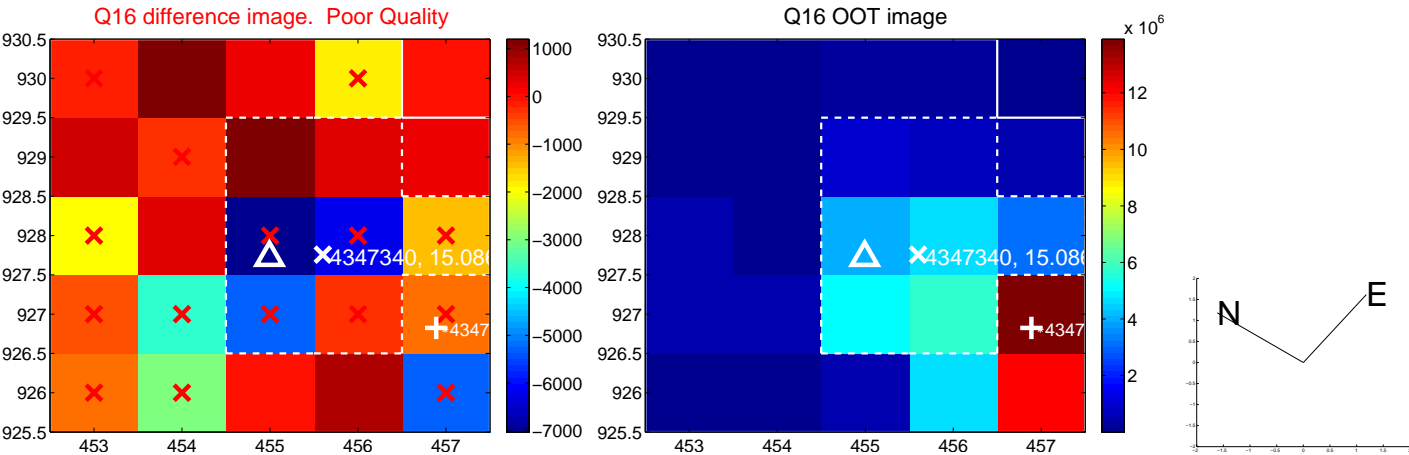
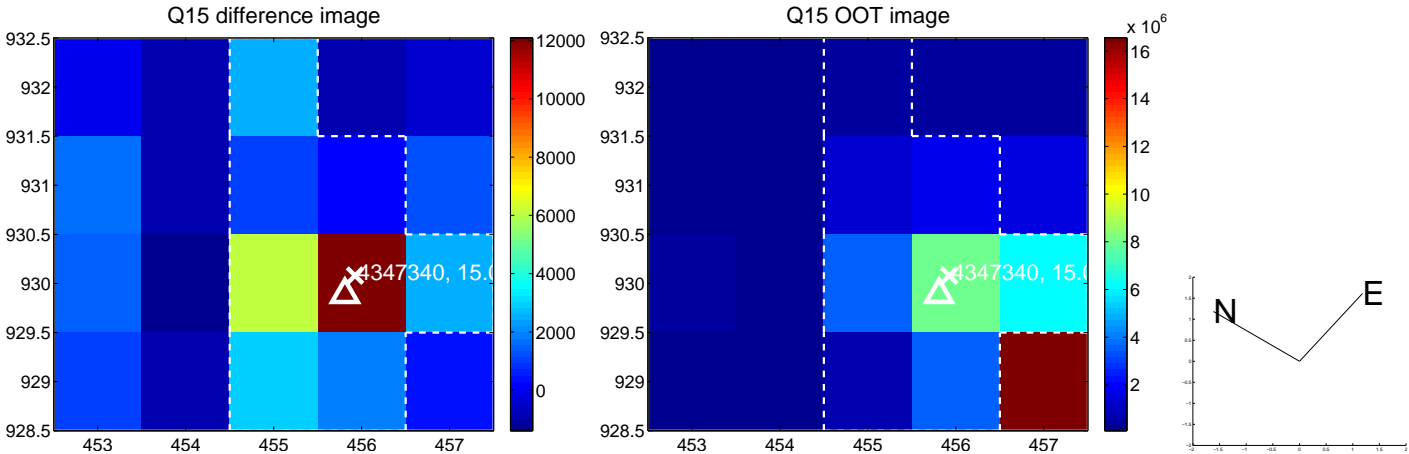
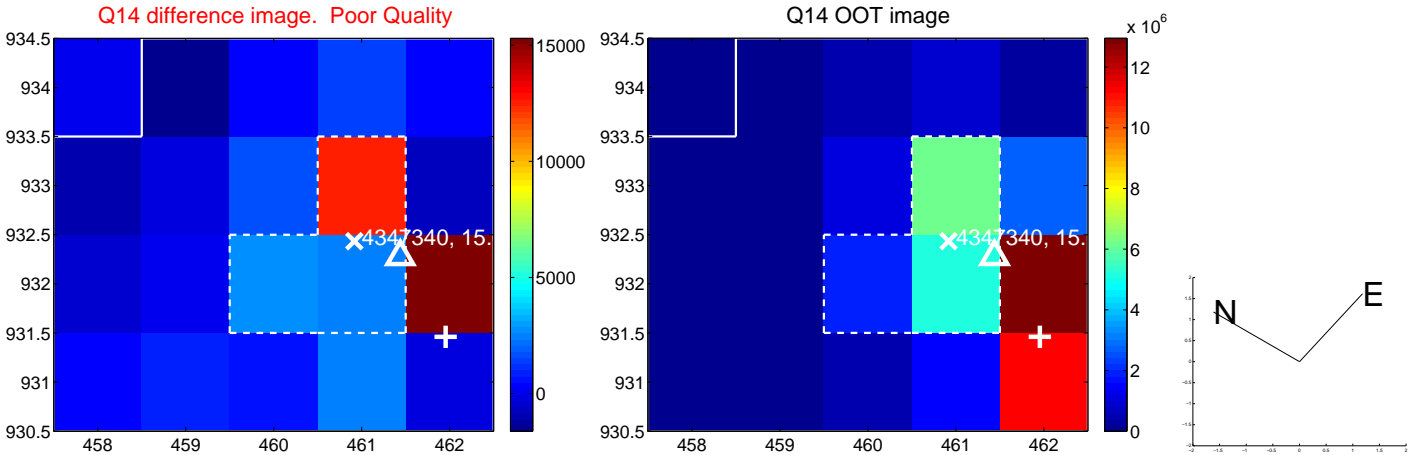
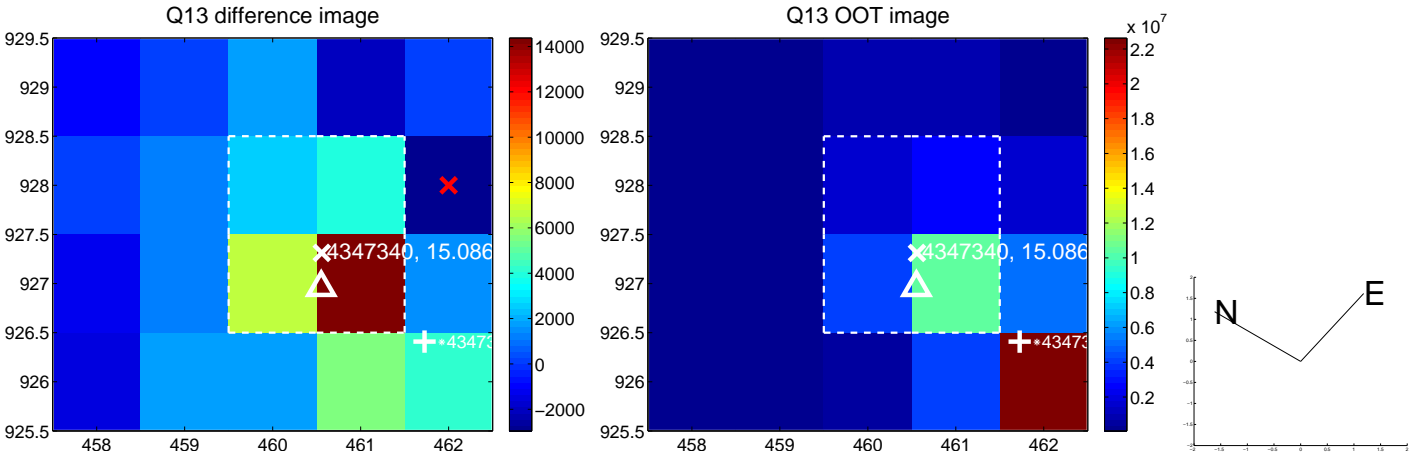
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



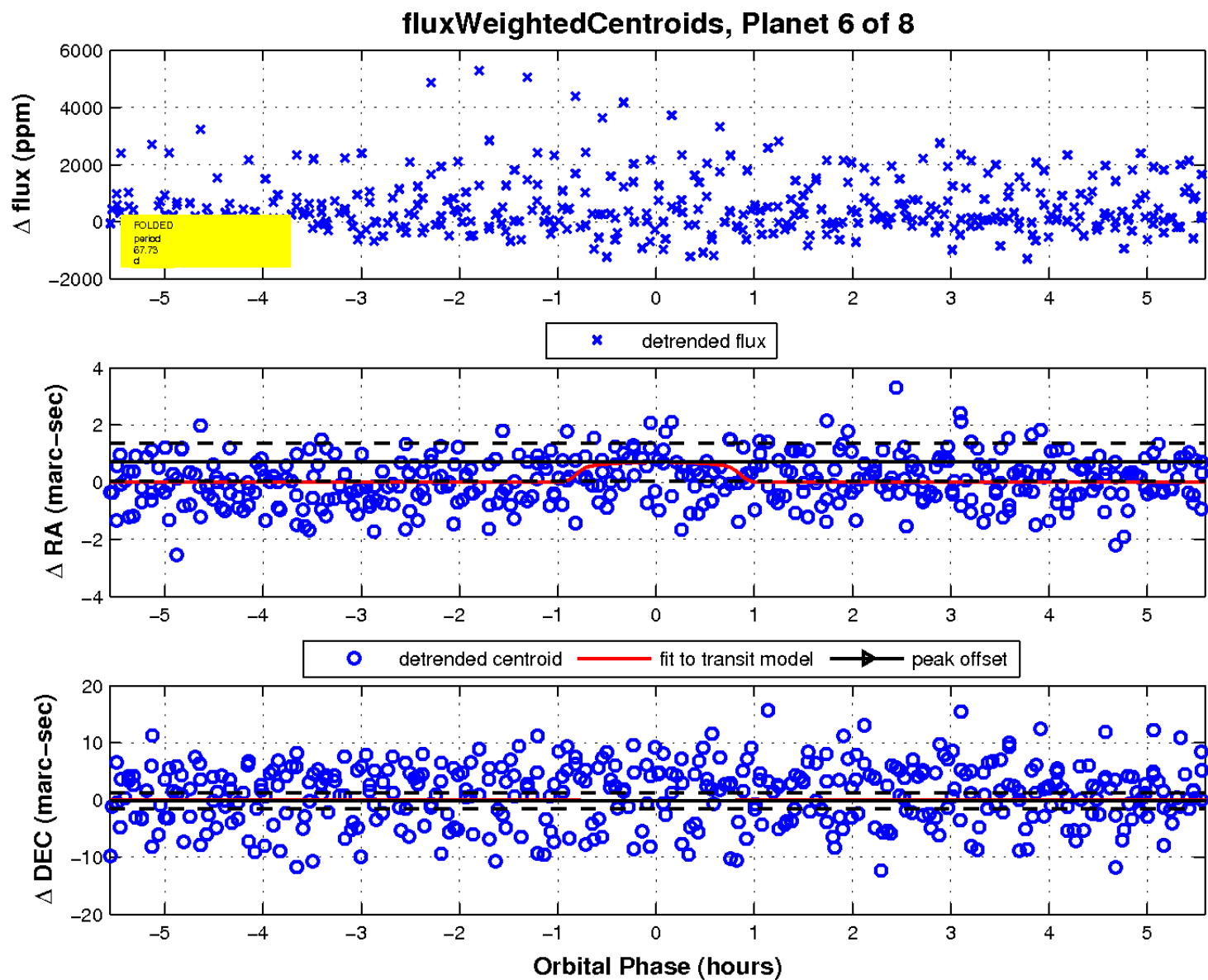
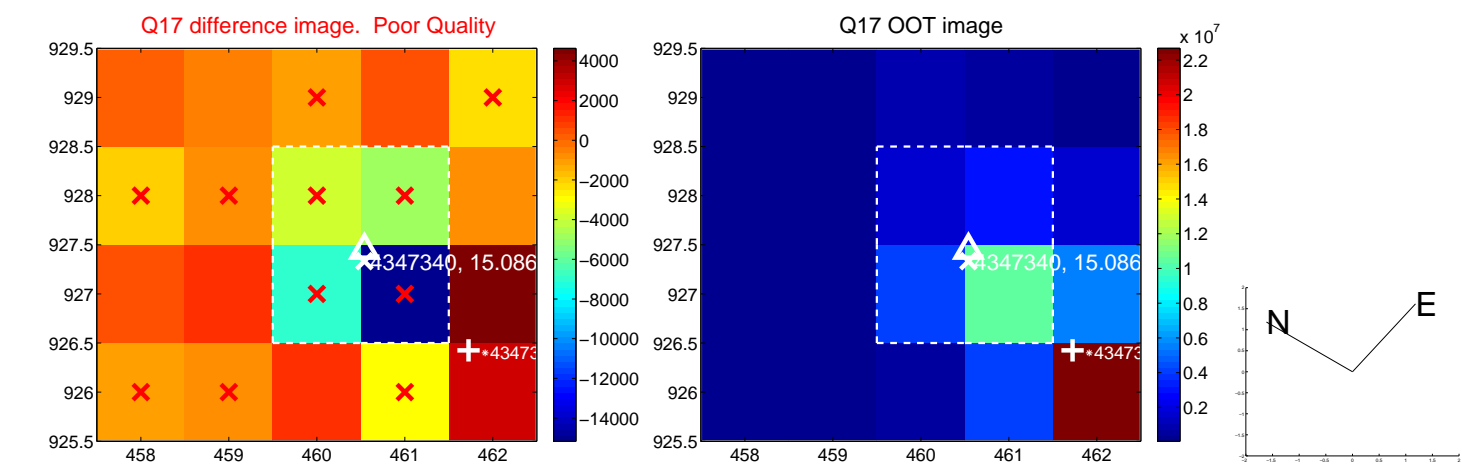
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



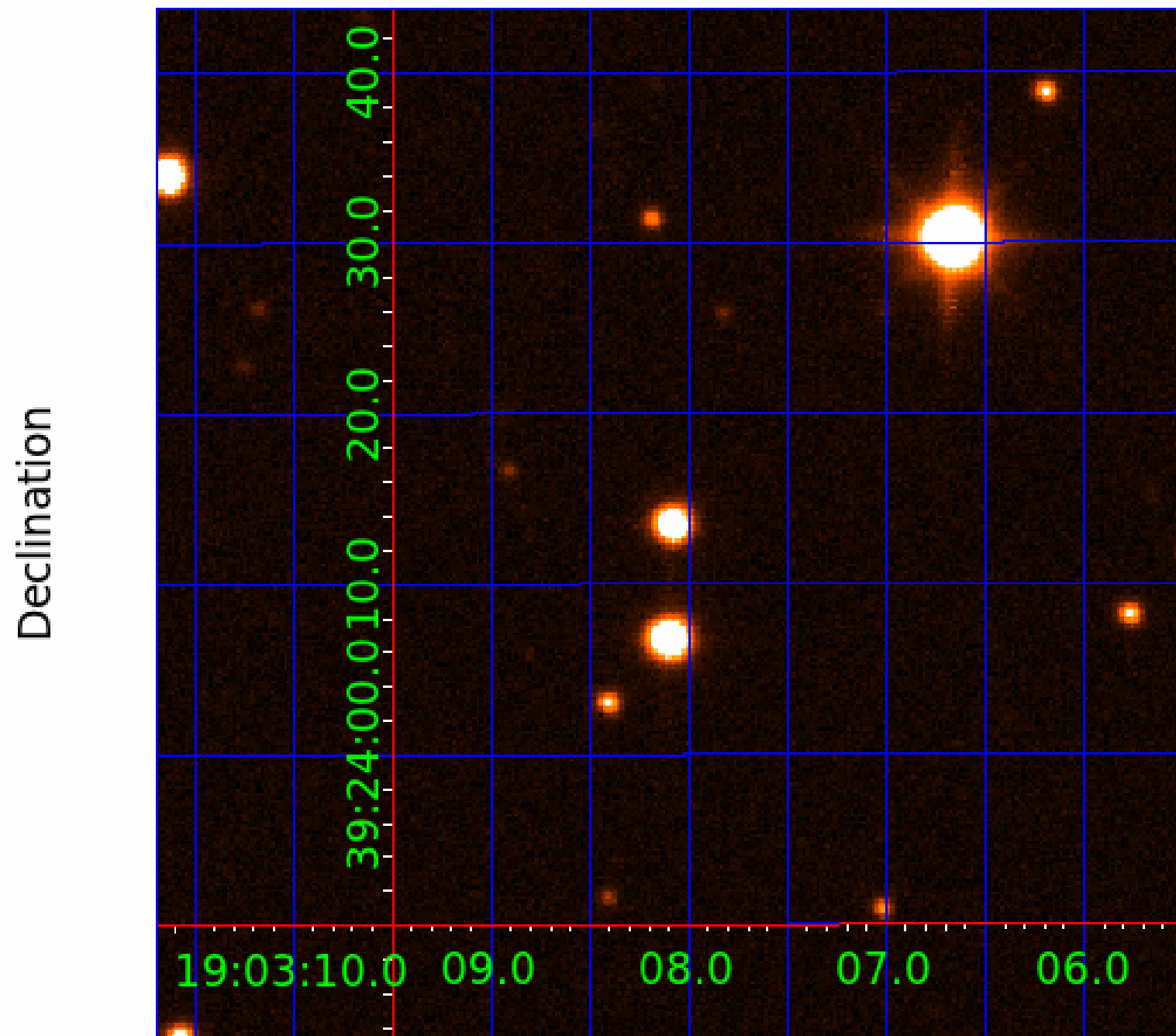
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 004347340

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004347340-01	OBS	No	3.158864	133.148926	242.9	15.009	8.8	10.4	0.72	5520	2.27	316.45
004347340-02	OBS	No	135.677907	224.619027	2088.6	46.049	10.1	7.9	0.72	5520	6.22	2.10
004347340-03	OBS	No	87.991096	213.154786	368.8	3.537	8.3	2.9	0.72	5520	1.48	3.75
004347340-04	OBS	No	382.441320	469.090433	709.9	9.000	9.2	-1.0	0.72	5520	1.92	0.53
004347340-05	OBS	No	124.986879	180.255833	1131.3	5.349	8.4	8.3	0.72	5520	2.57	2.35
004347340-06	OBS	No	67.732451	157.191789	1000.9	1.868	7.6	6.9	0.72	5520	2.58	5.31
004347340-07	OBS	No	117.676012	221.262001	646.1	7.500	8.5	-1.0	0.72	5520	1.83	2.54
004347340-08	OBS	No	184.597816	283.138226	2018.4	5.000	12.1	-1.0	0.72	5520	3.23	1.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004347340-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_KIC_POS
004347340-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004347340-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
004347340-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—CENT_NOFITS
004347340-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
004347340-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

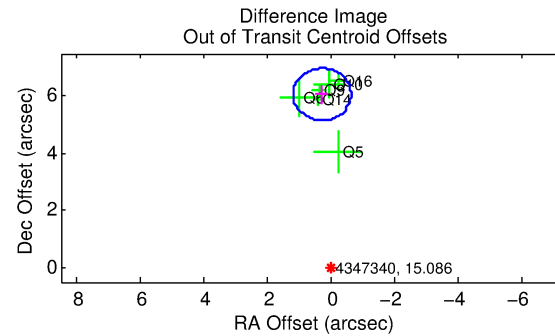
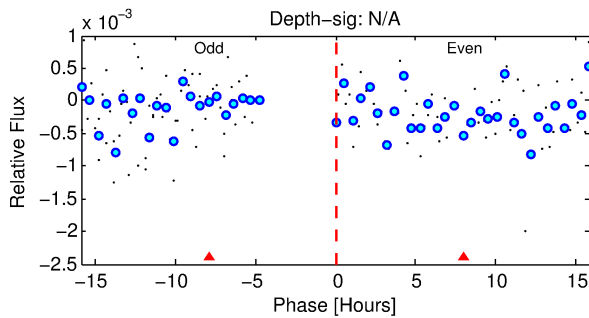
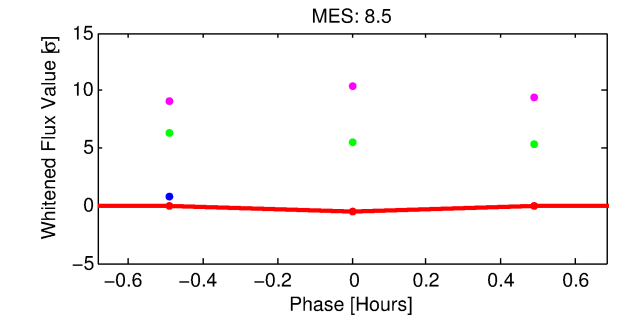
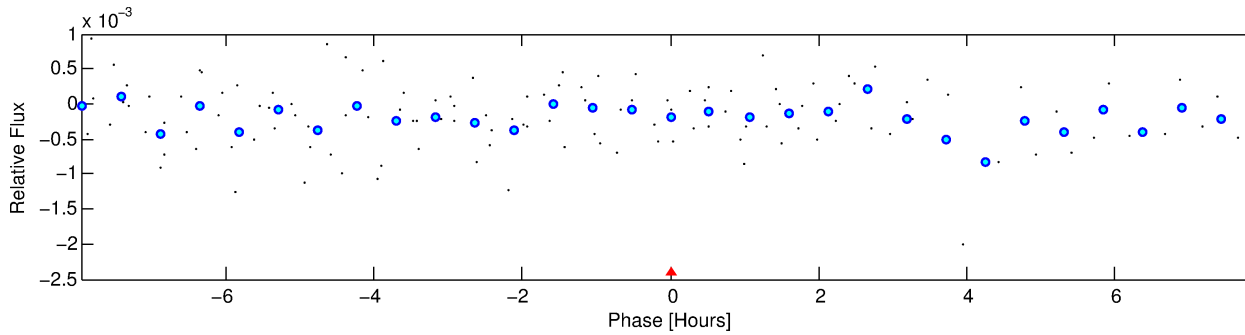
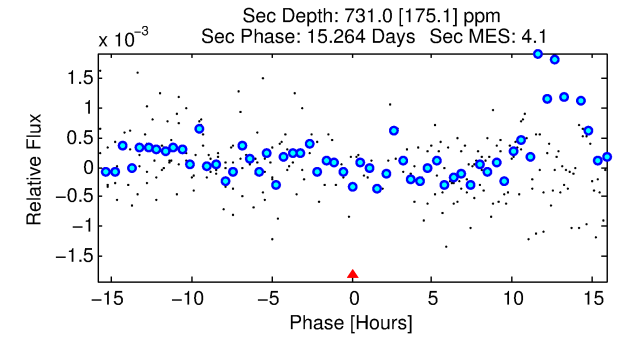
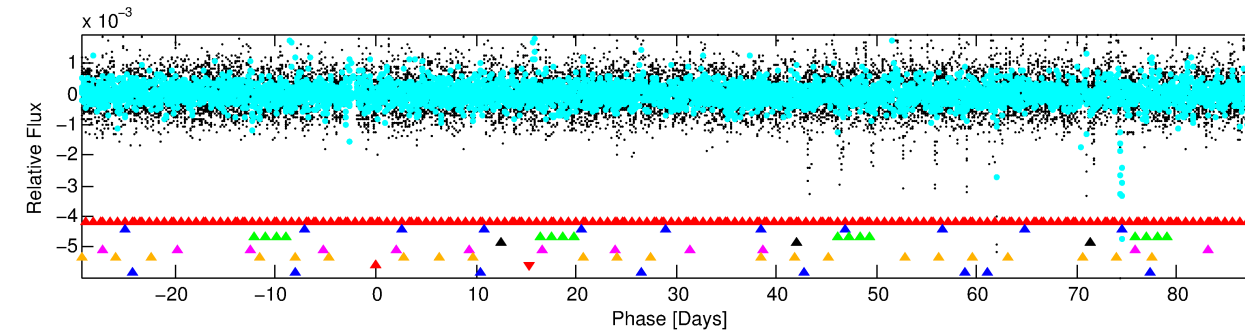
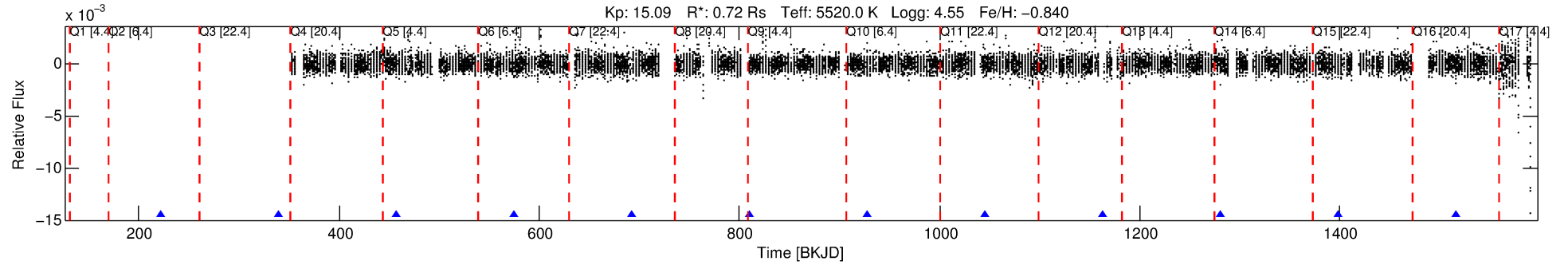
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004347340-07

No Significant Match Found

# DV One-Page Summary

KIC: 4347340 Candidate: 7 of 8 Period: 117.676 d



## TPS TCE Results:

Period = 117.67601 d  
Epoch = 221.2620 BKJD

DV fit results are unavailable

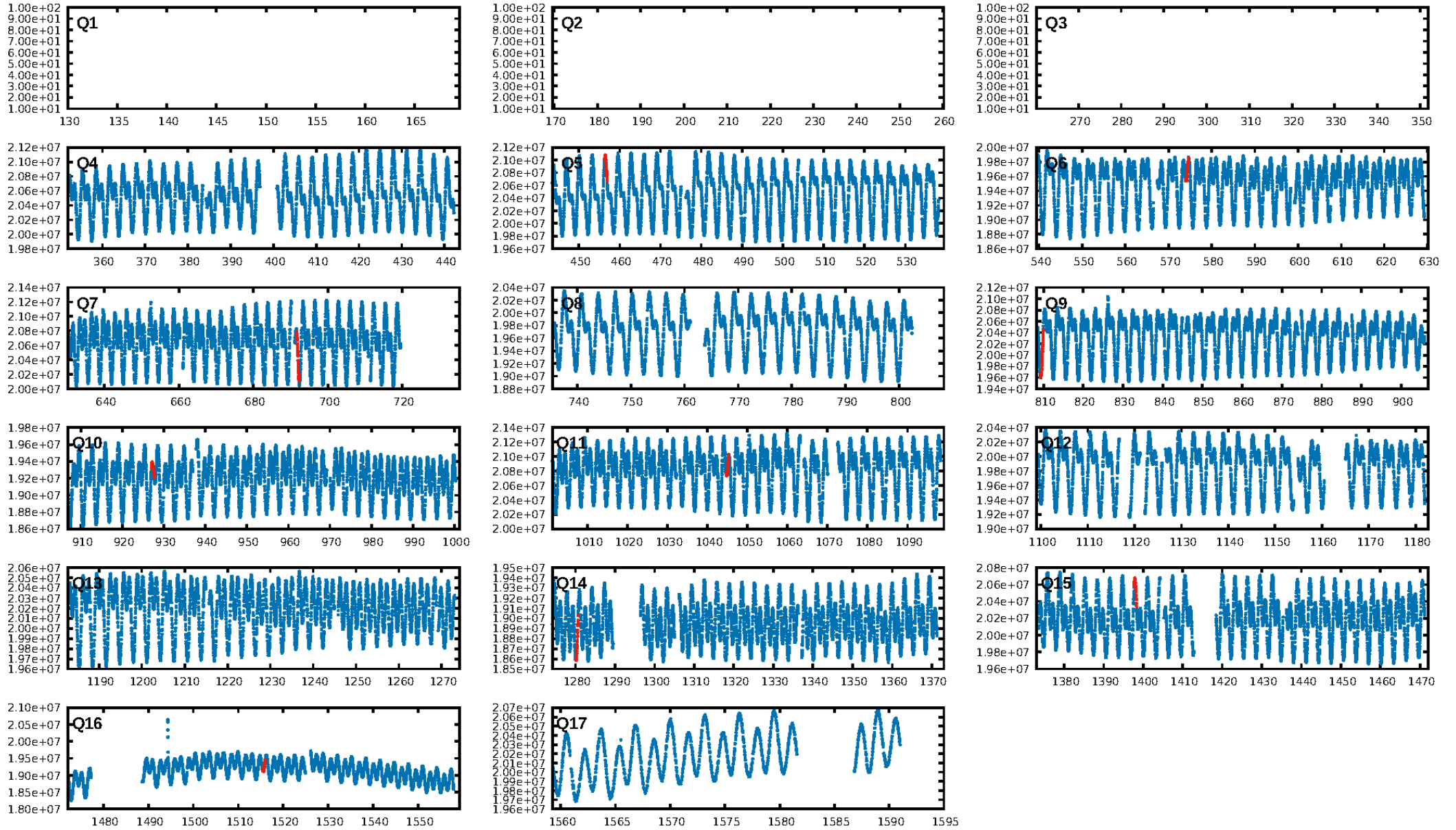
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [85.92σ]  
LongPeriod-sig: 100.0% [19.05σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -1.011  
Centroid-sig: 18.5%  
Centroid-so: 3.892 arcsec [7.06σ]  
OotOffset-rm: 6.079 arcsec [20.00σ]  
KicOffset-rm: 0.275 arcsec [0.97σ]  
OotOffset-st: 3/0/1/2 [6]  
KicOffset-st: 3/3/1/2 [9]  
DiffImageQuality-fgm: 0.44 [4/9]  
DiffImageOverlap-fno: 0.56 [5/9]

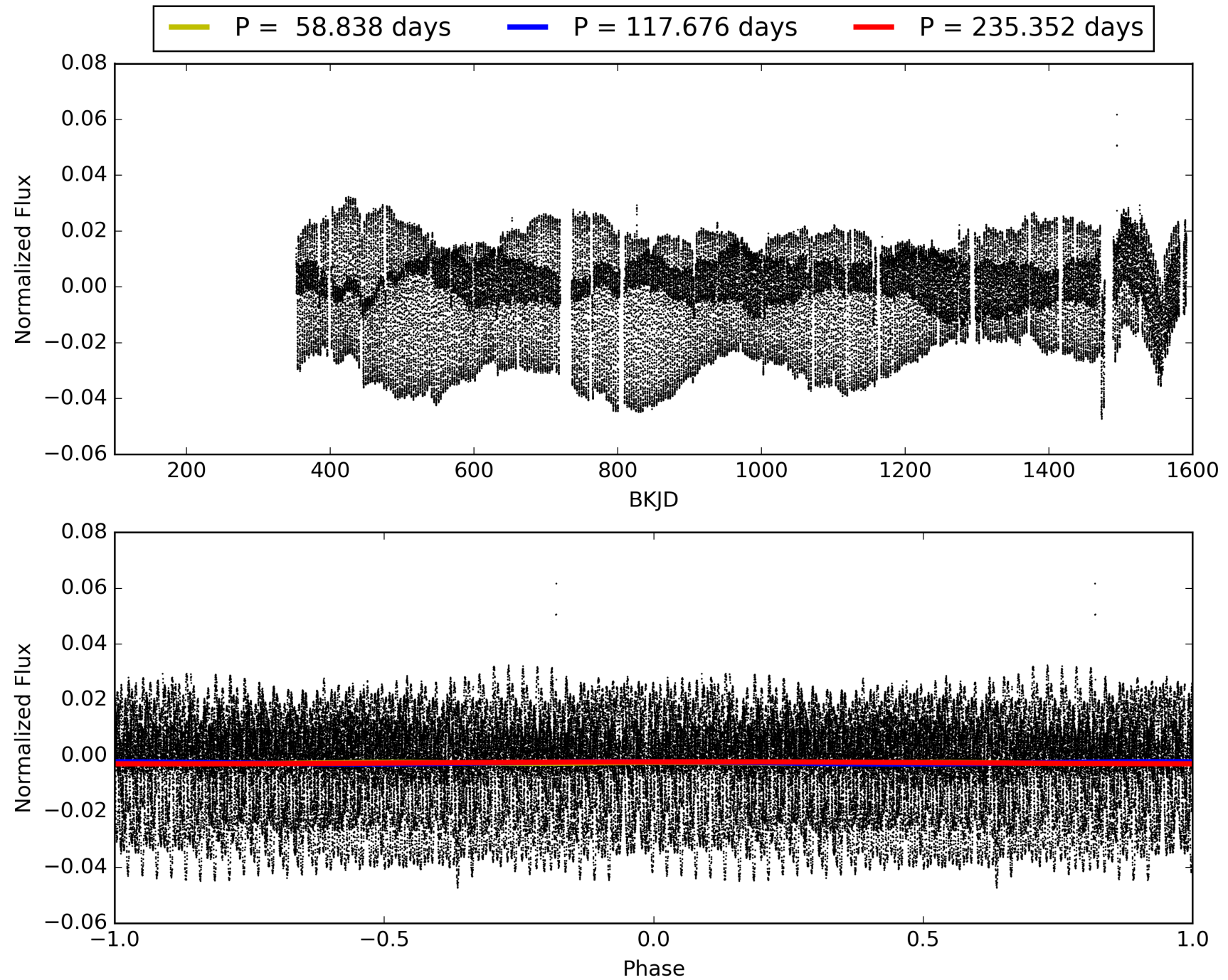
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:54:22 Z

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

# TCE 004347340-07, PDC Light Curves

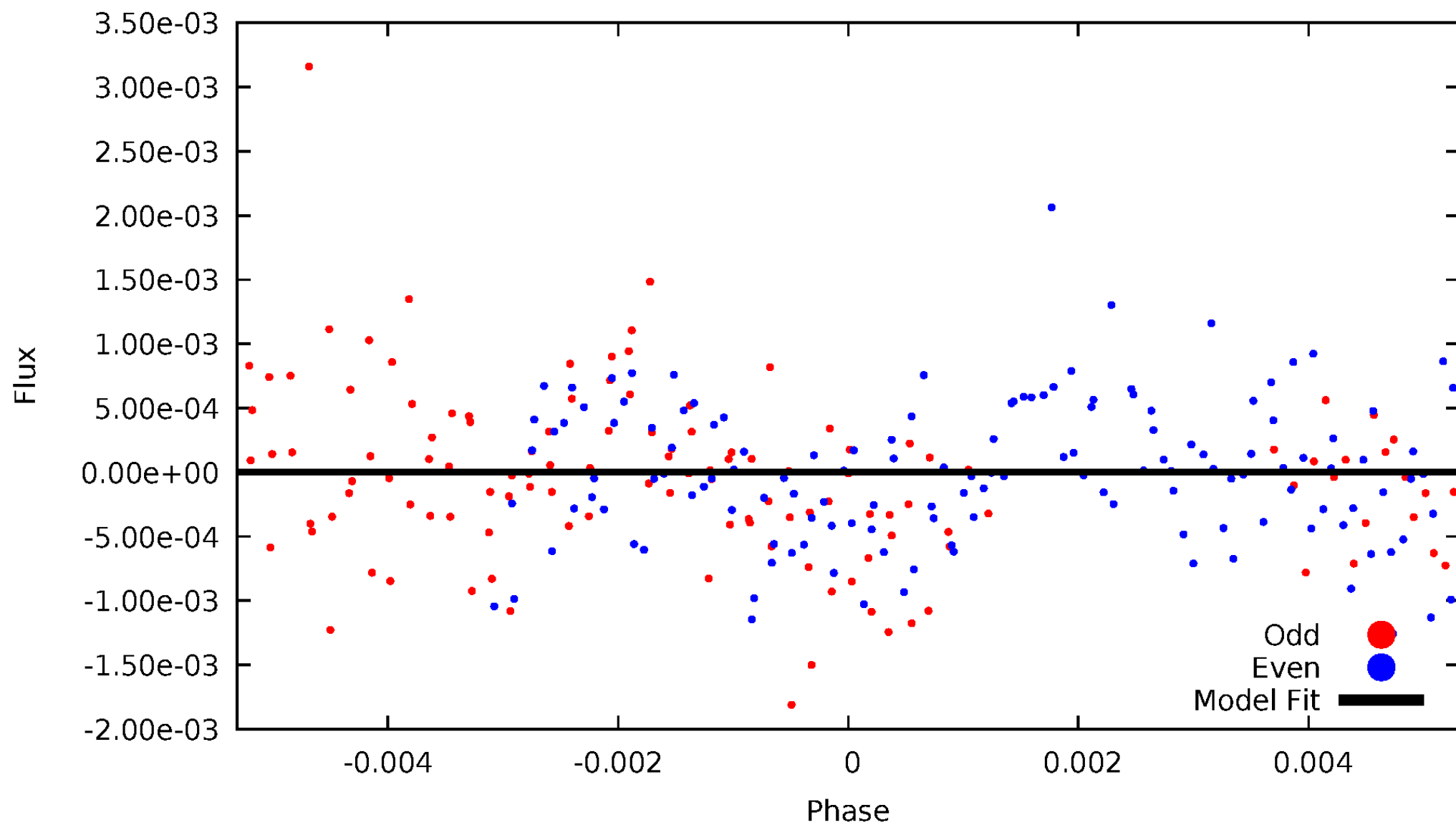


TCE 004347340-07



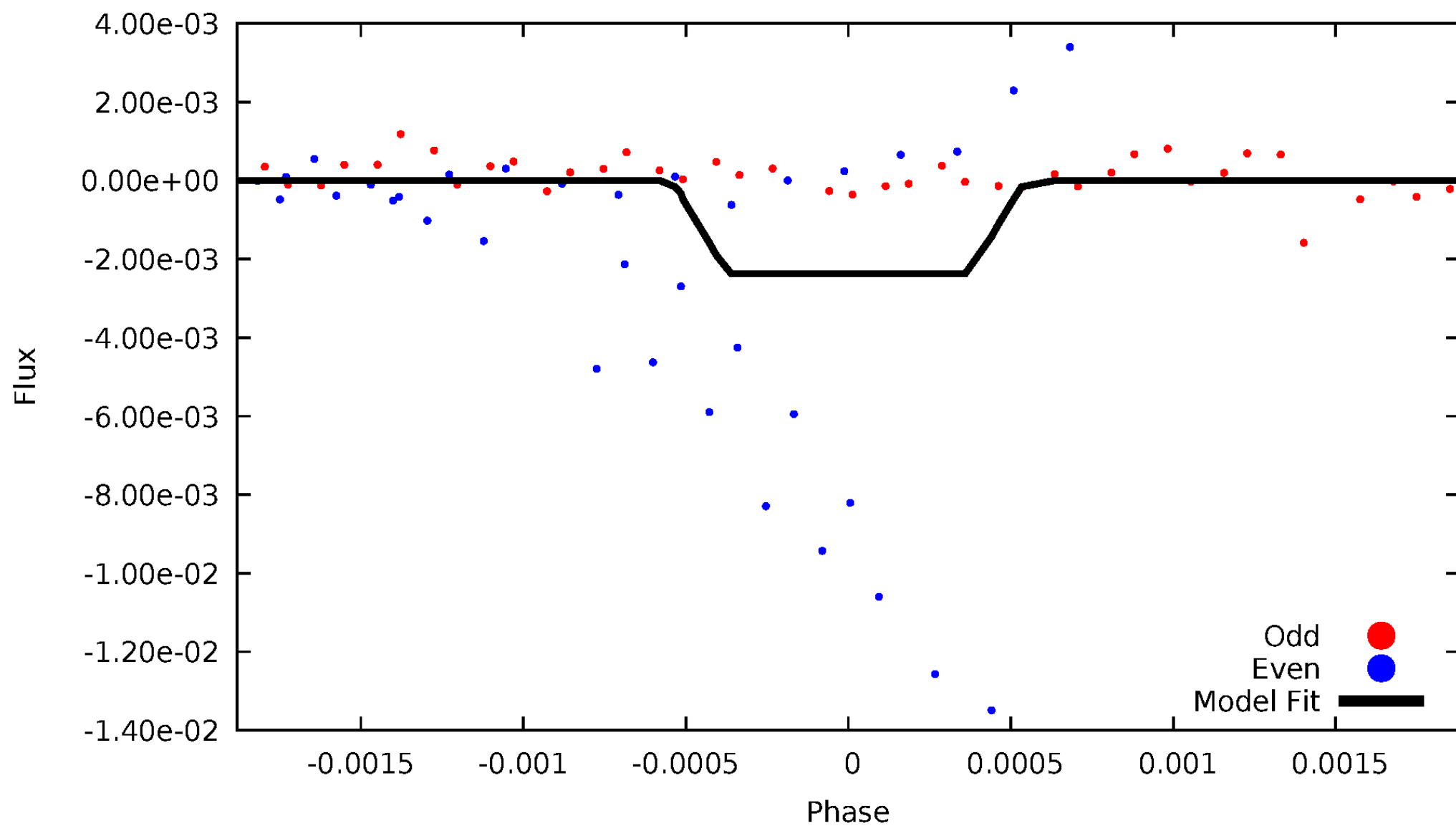
# DV Odd/Even

TCE 004347340-07

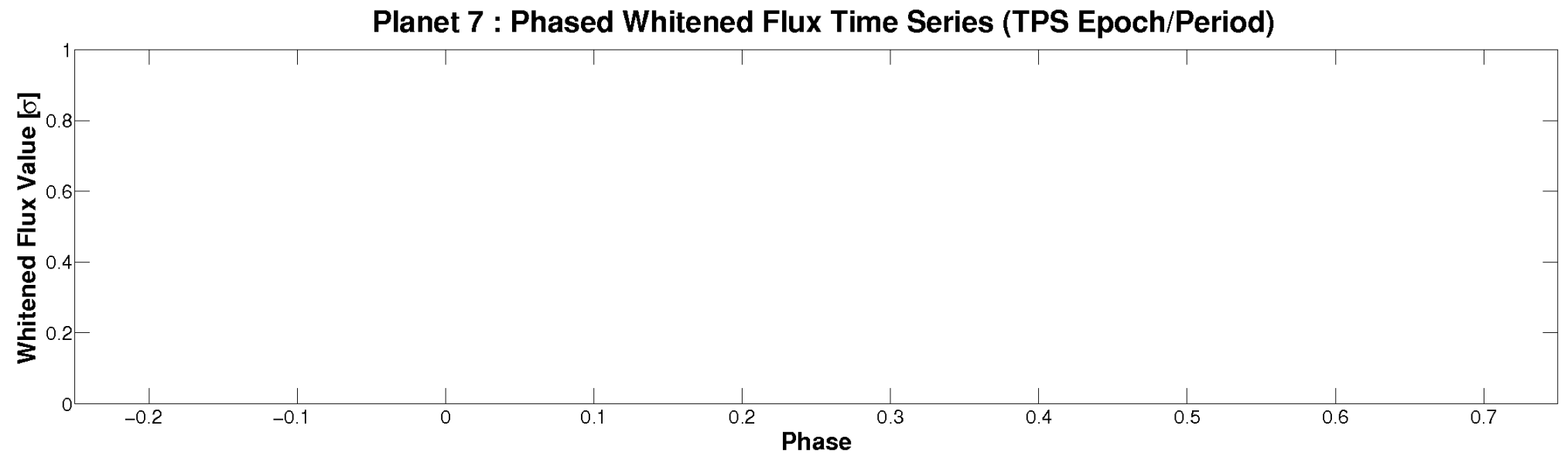
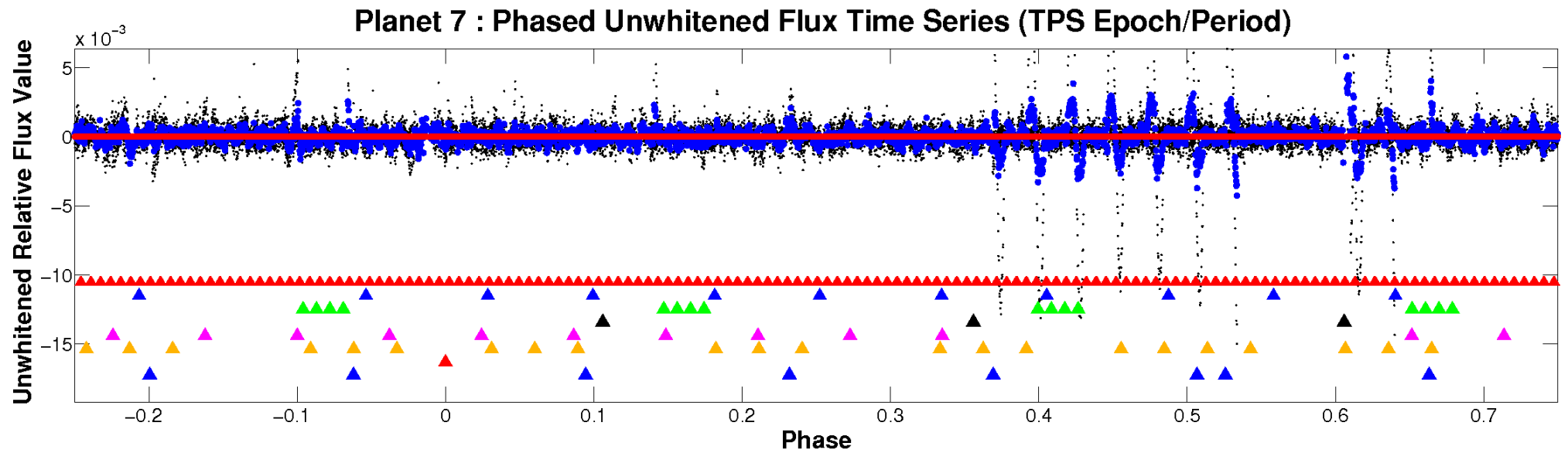


# ALT Odd/Even

TCE 004347340-07

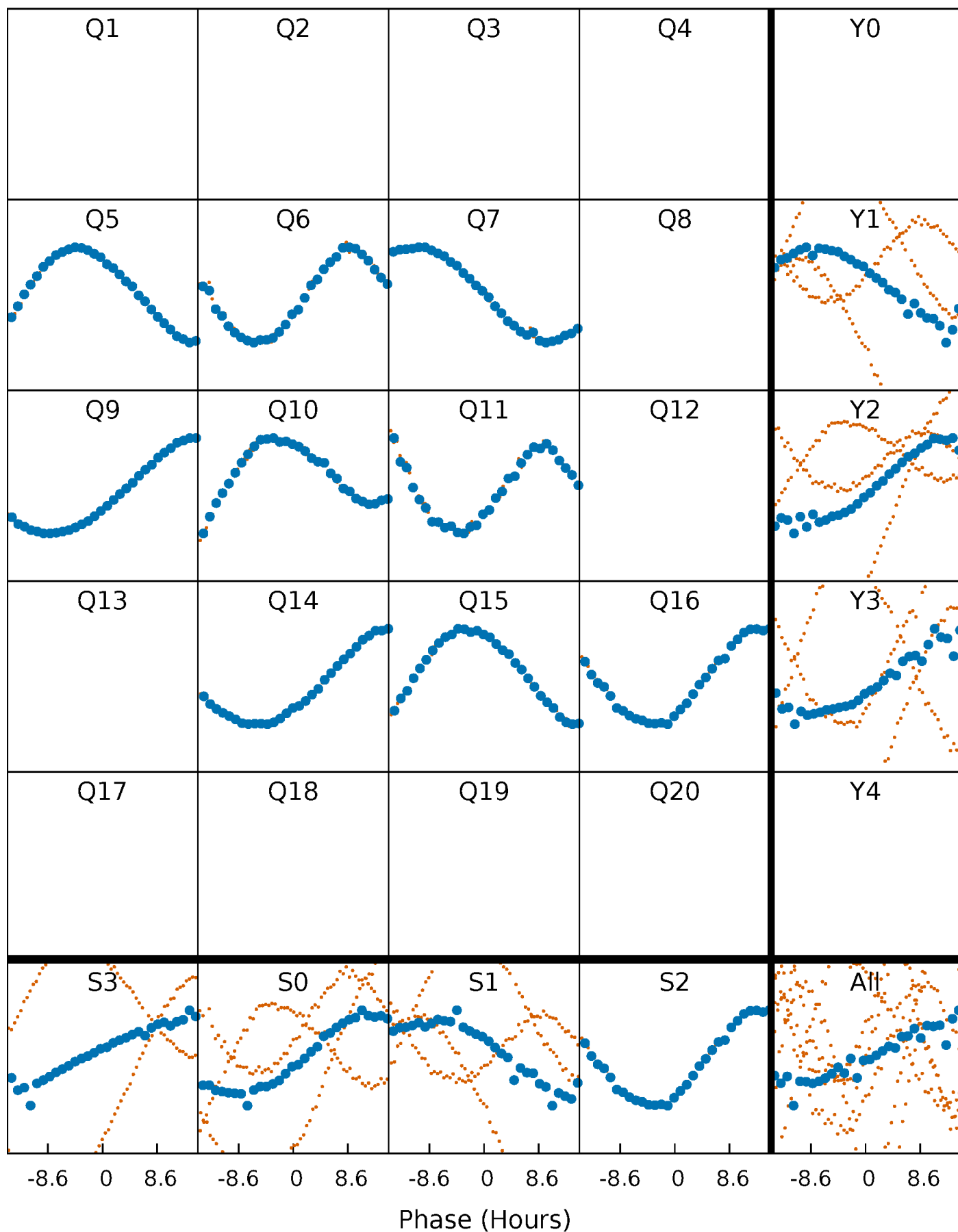


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

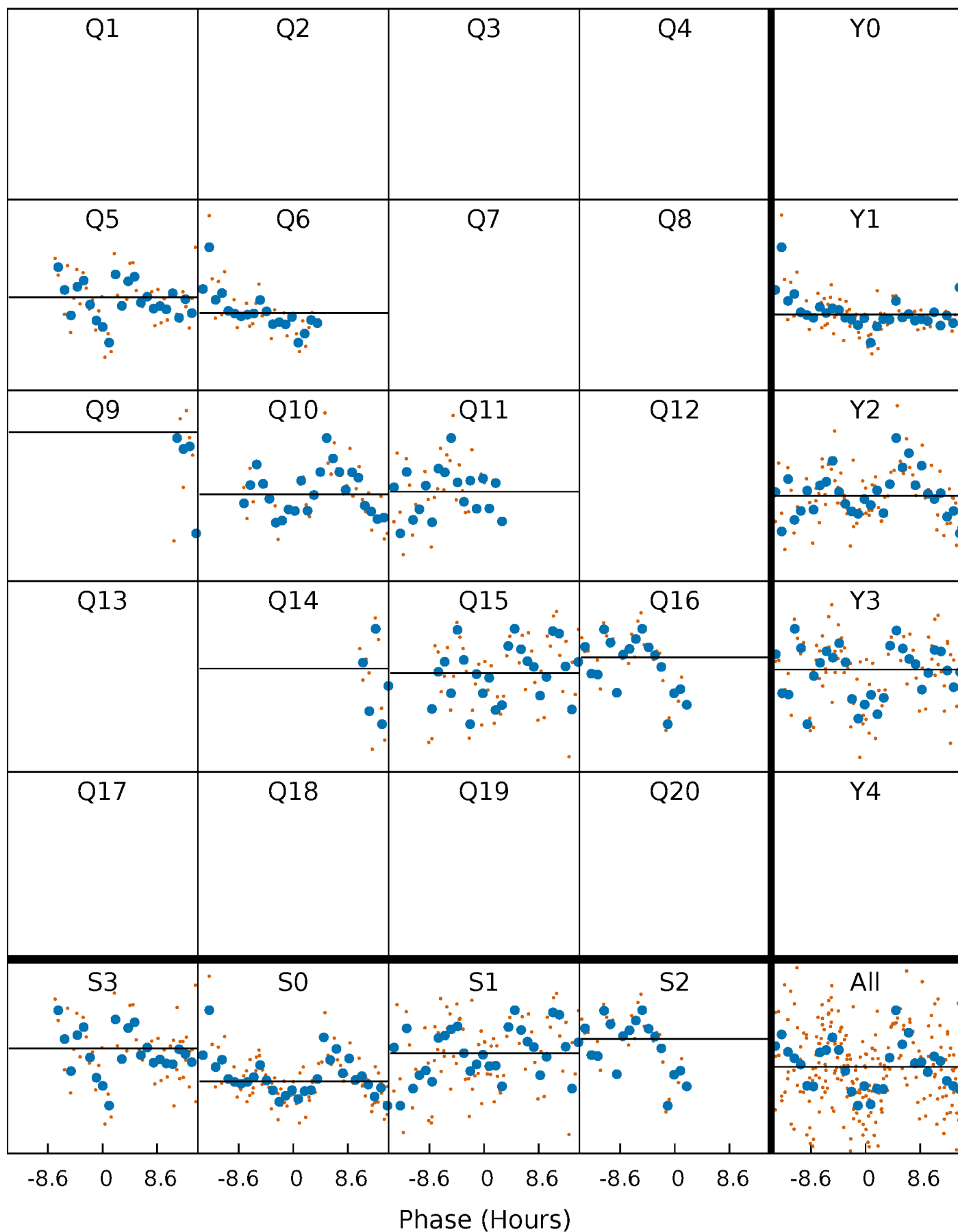
TCE 004347340-07     $P=117.676012$  Days     $T_0=221.262000$  (BKJD)





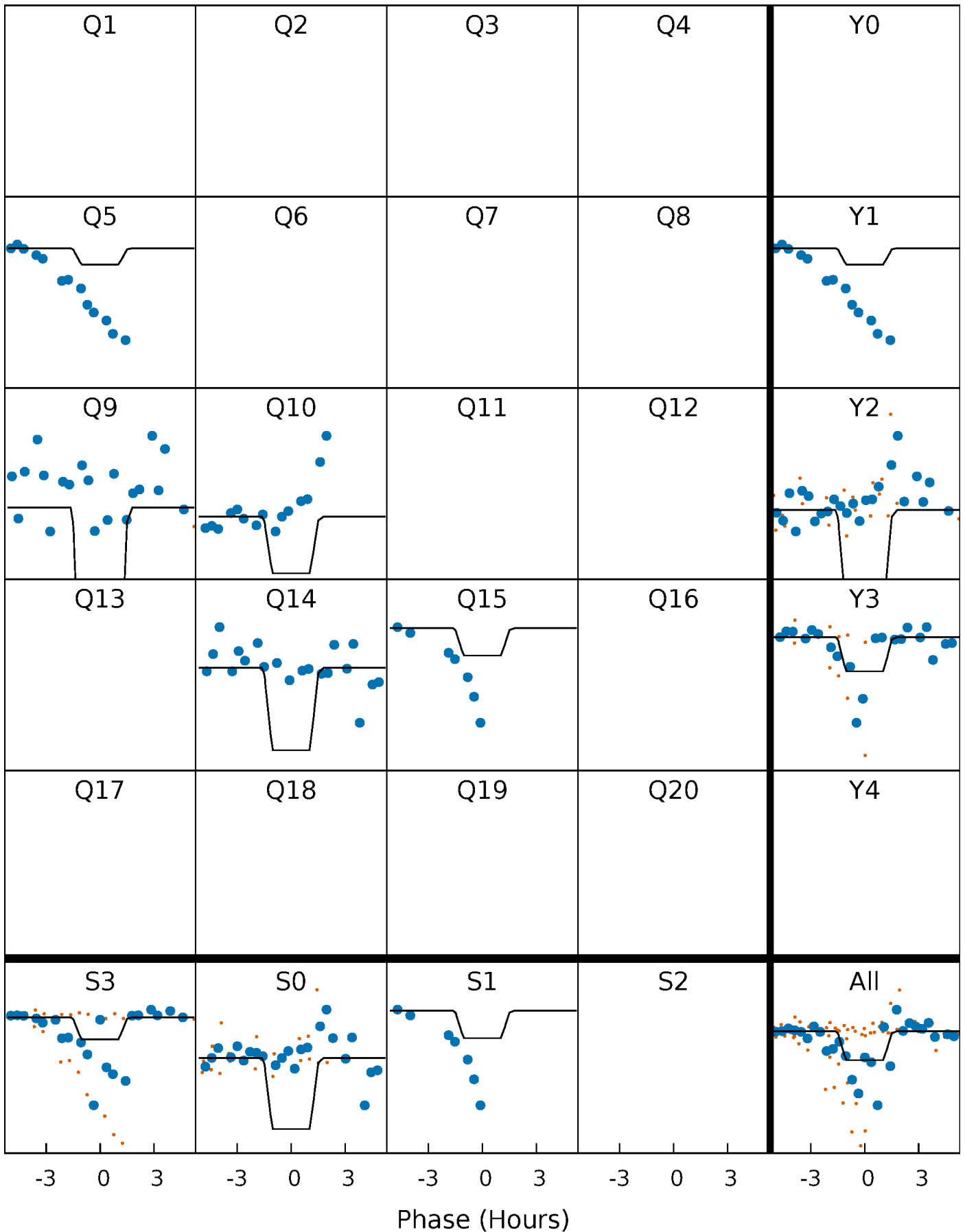
# DV Quarter-Phased Transit Curves

TCE 004347340-07     $P=117.676012$  Days     $T_0=221.262000$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

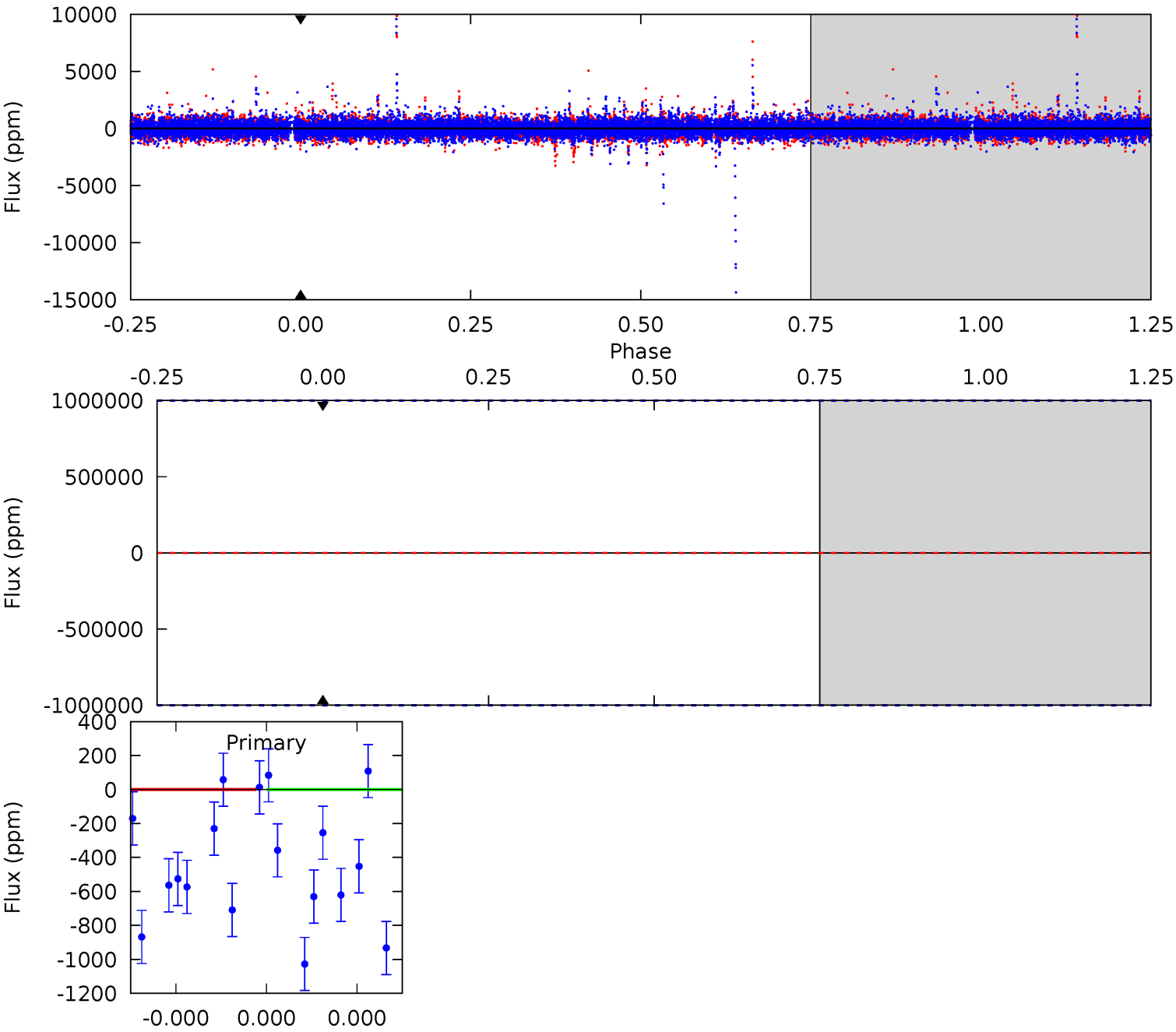
TCE 004347340-07     $P=117.676012$  Days     $T_0=222.063758$  (BKJD)



# DV Model-Shift Uniqueness Test

004347340-07, P = 117.676012 Days, E = 221.262000 Days

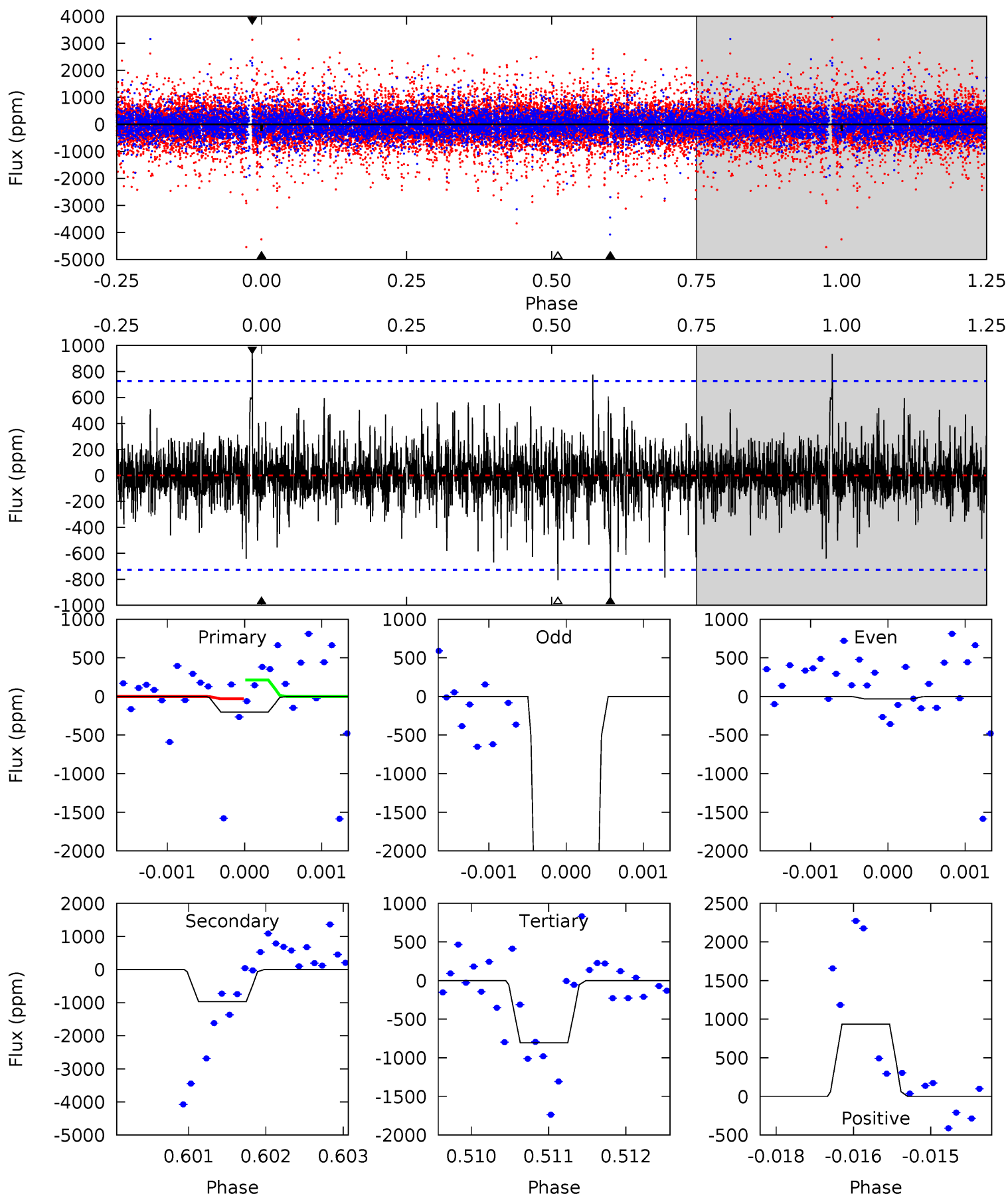
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

004347340-07, P = 117.676012 Days, E = 222.063758 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
1.51	7.25	6.01	6.97	5.42	3.25	1.15	-4.51	-5.46	1.24	0.28	23.8	41.8	0.49	0.66



### Stellar Parameters For KIC 004347340

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5520^{+194}_{-194}$	$4.552^{+0.095}_{-0.085}$	$-0.840^{+0.300}_{-0.300}$	$0.722^{+0.097}_{-0.088}$	$0.678^{+0.081}_{-0.035}$	$2.536^{+1.006}_{-0.659}$
	+4%/-4%	+2%/-2%	+36%/-36%	+13%/-12%	+12%/-5%	+40%/-26%
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 004347340-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$6.46^{+6.35}_{-4.48}$	$451^{+19}_{-24}$	$4014^{+13406}_{-22046}$	$3262^{+406747}_{-481451}$
Alt.	$-972 \pm 134$	$7.34^{+6.32}_{-4.91}$	$449^{+22}_{-22}$	$3614^{+1963}_{-601}$	$1716^{+13696}_{-1211}$

$T_{max}$  = 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

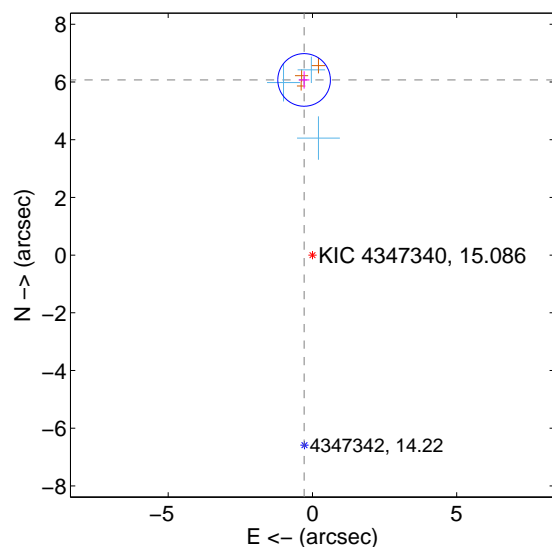
Supplemental centroid analysis for 004347340-07. Kepler magnitude: 15.09. Transit SNR -1.00

There are 4 quarters with good PRF difference image offsets

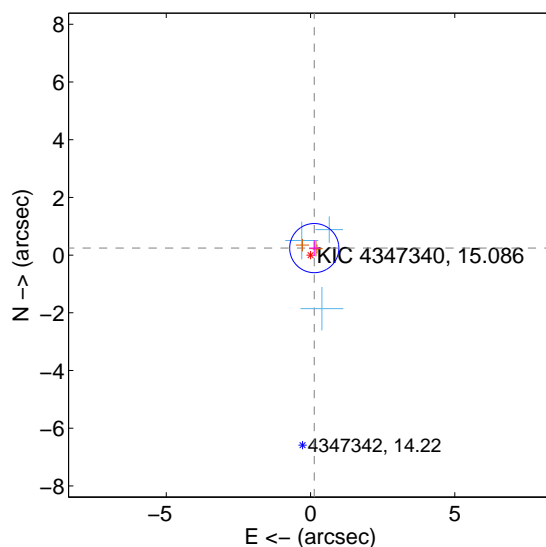
The OOT PRF centroid is offset from the target star catalog position by about 6.35 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.079 \pm 0.304$	20.00	$0.289 \pm 0.185$	$6.072 \pm 0.302$
PRF-fit source offset from KIC position	$0.275 \pm 0.284$	0.97	$-0.130 \pm 0.179$	$0.243 \pm 0.278$
photometric centroid source offset	$3.89 \pm 0.55$	7.06	$-0.33 \pm 0.16$	$-3.88 \pm 0.55$

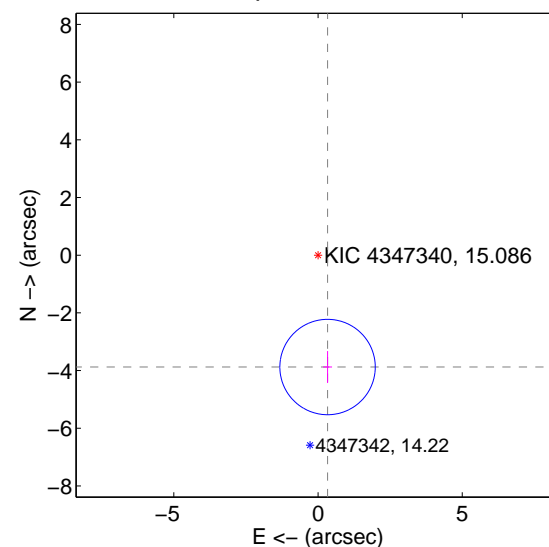
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

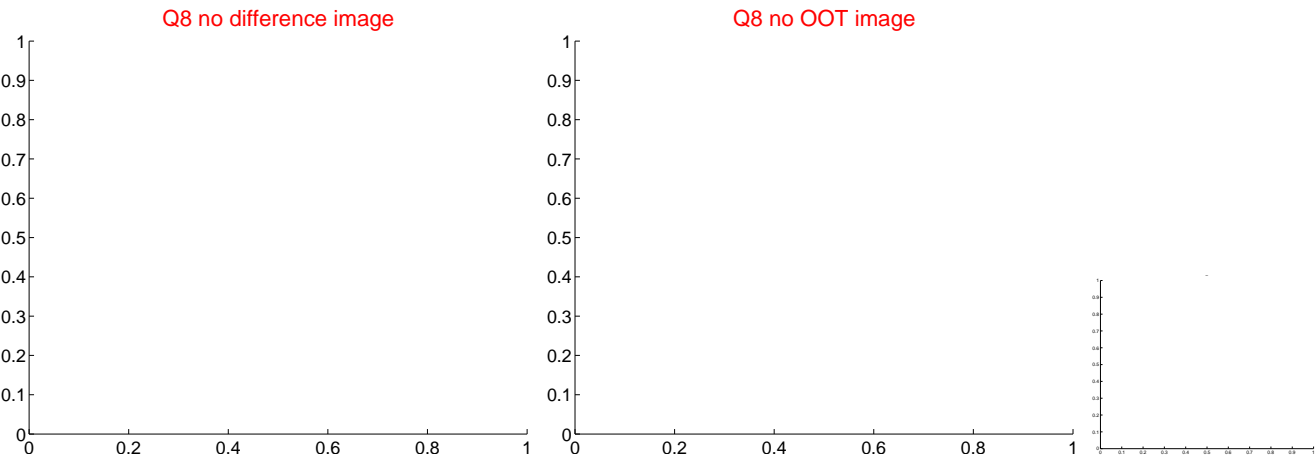
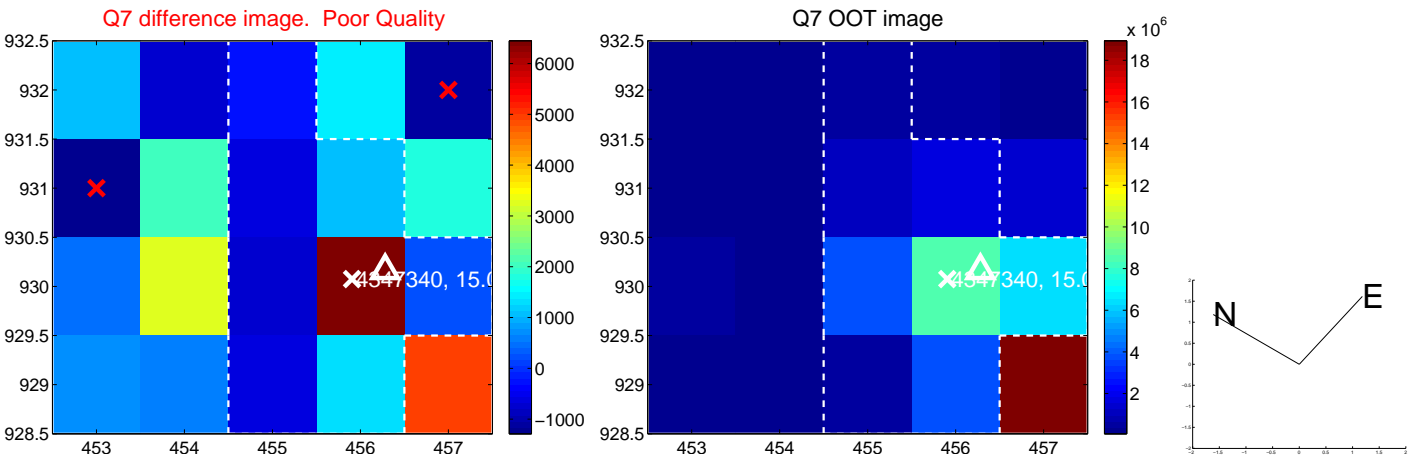
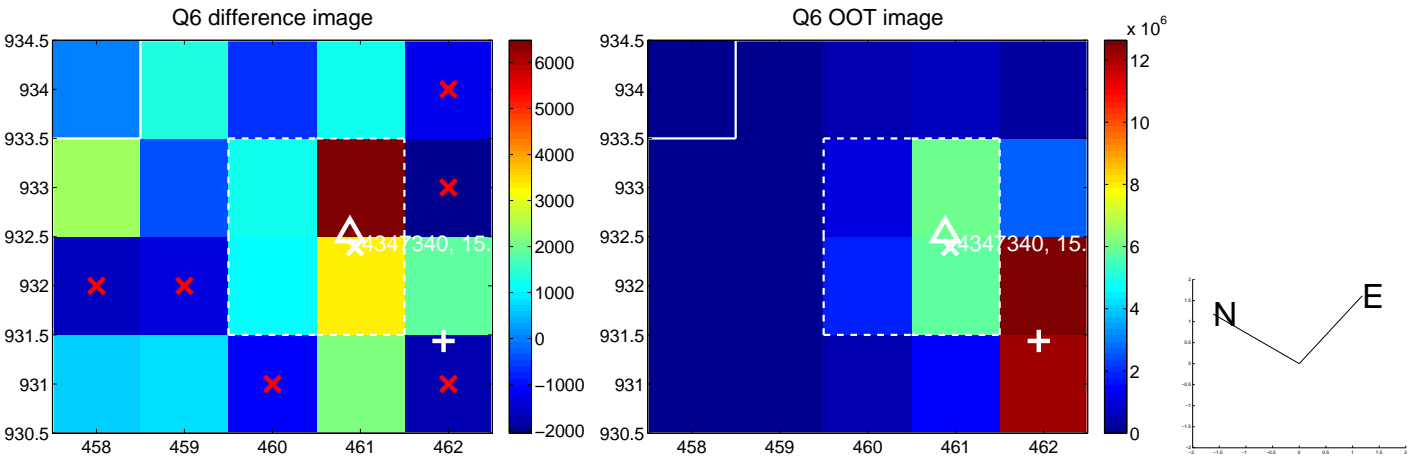
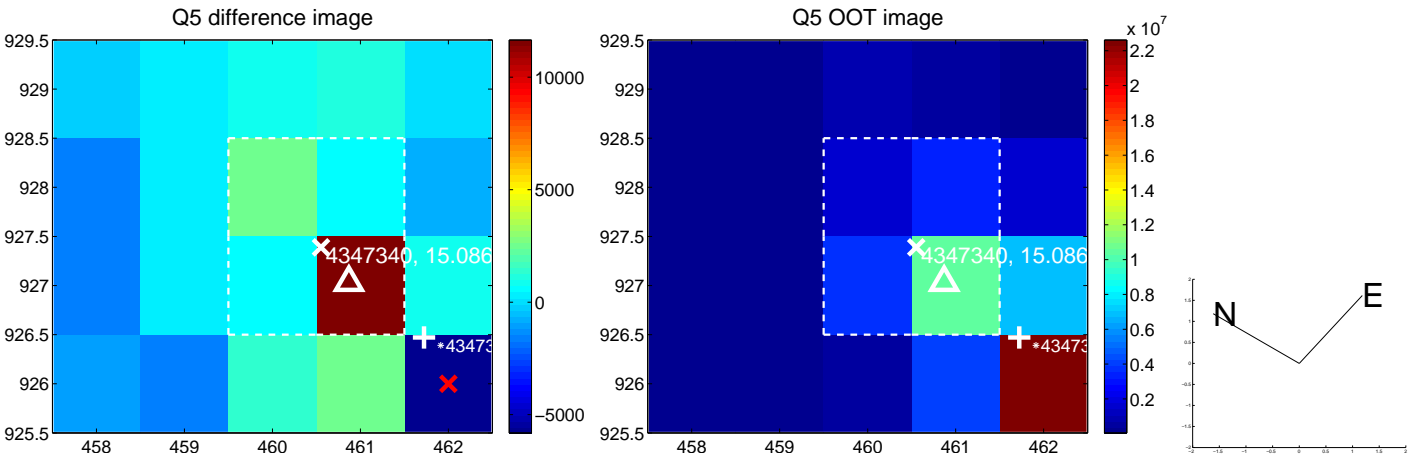


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

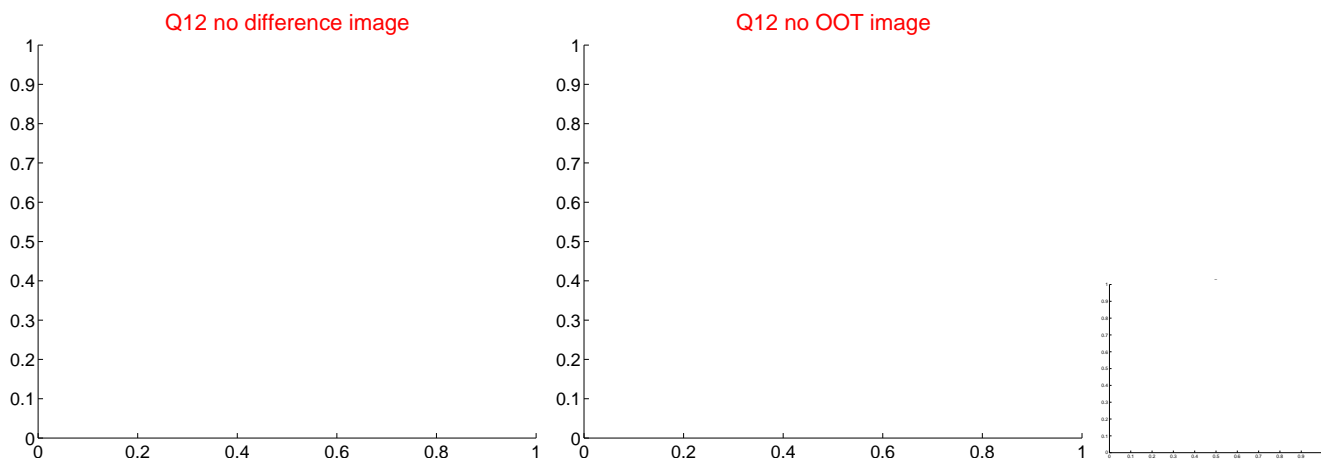
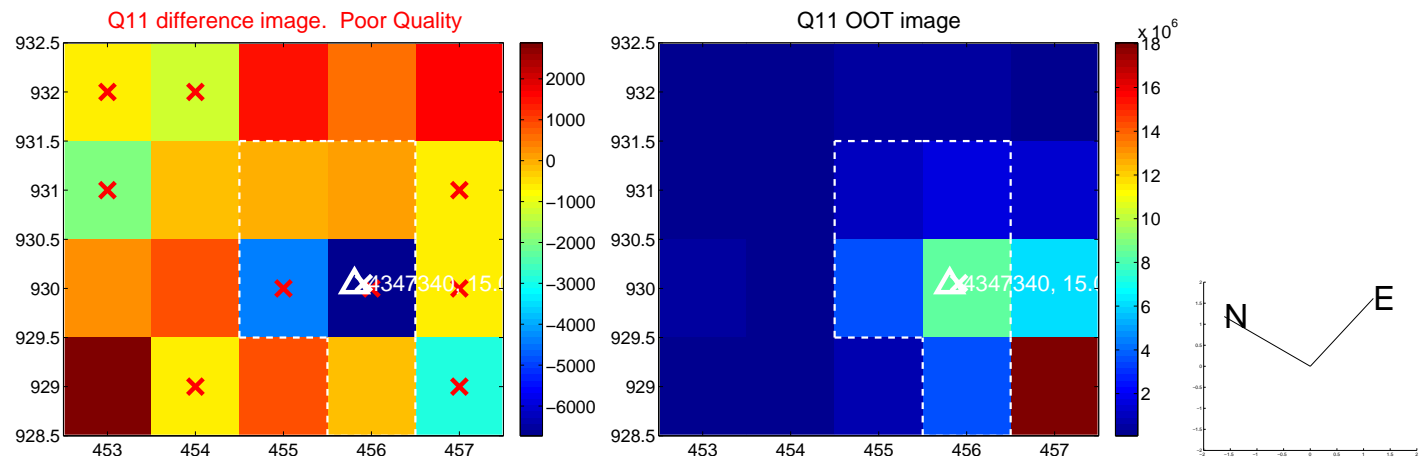
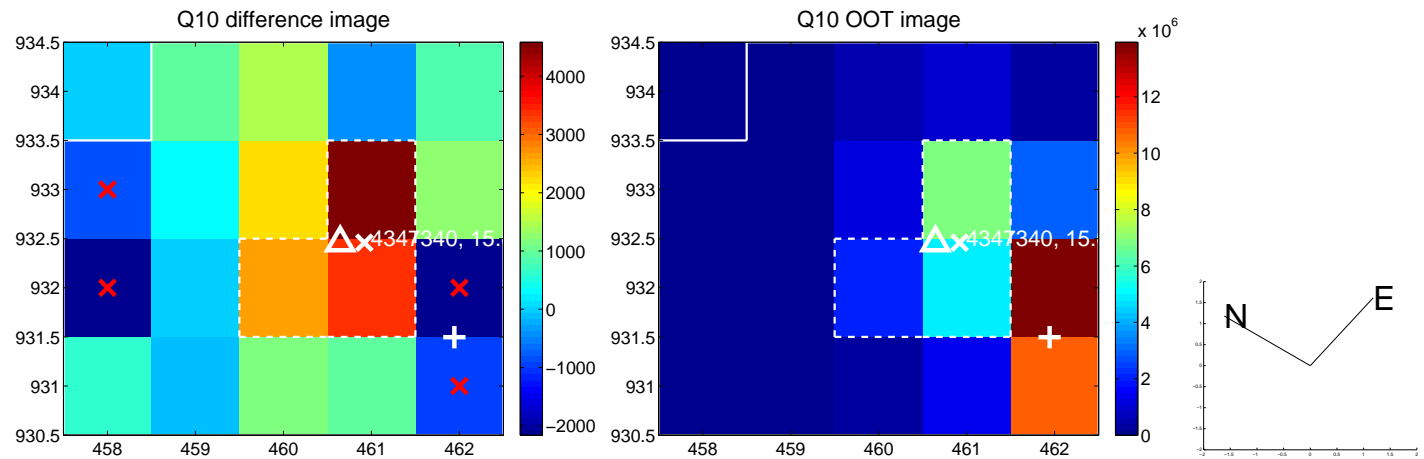
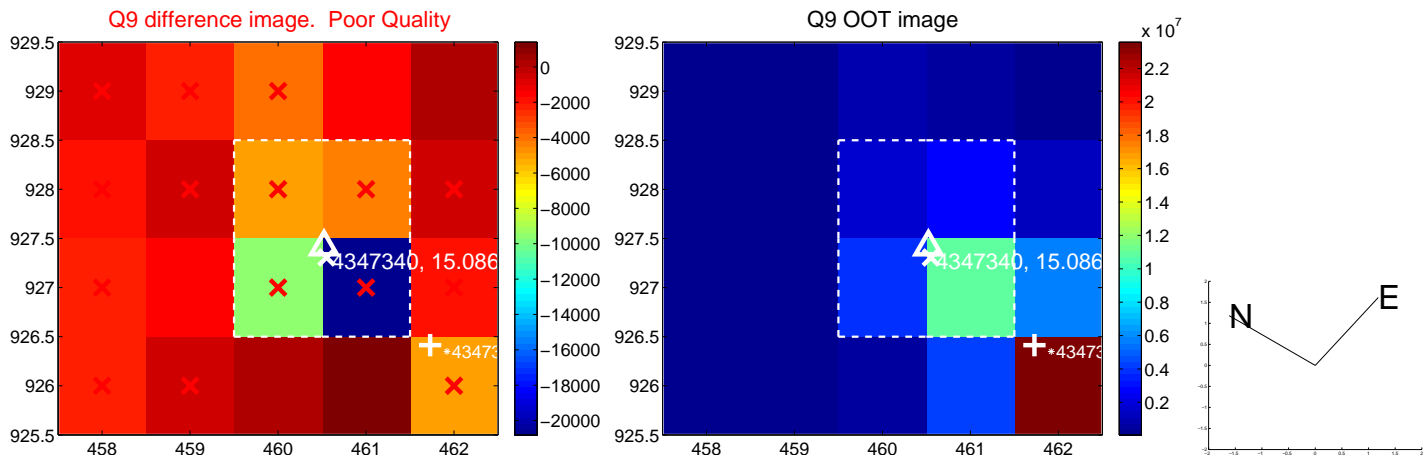


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

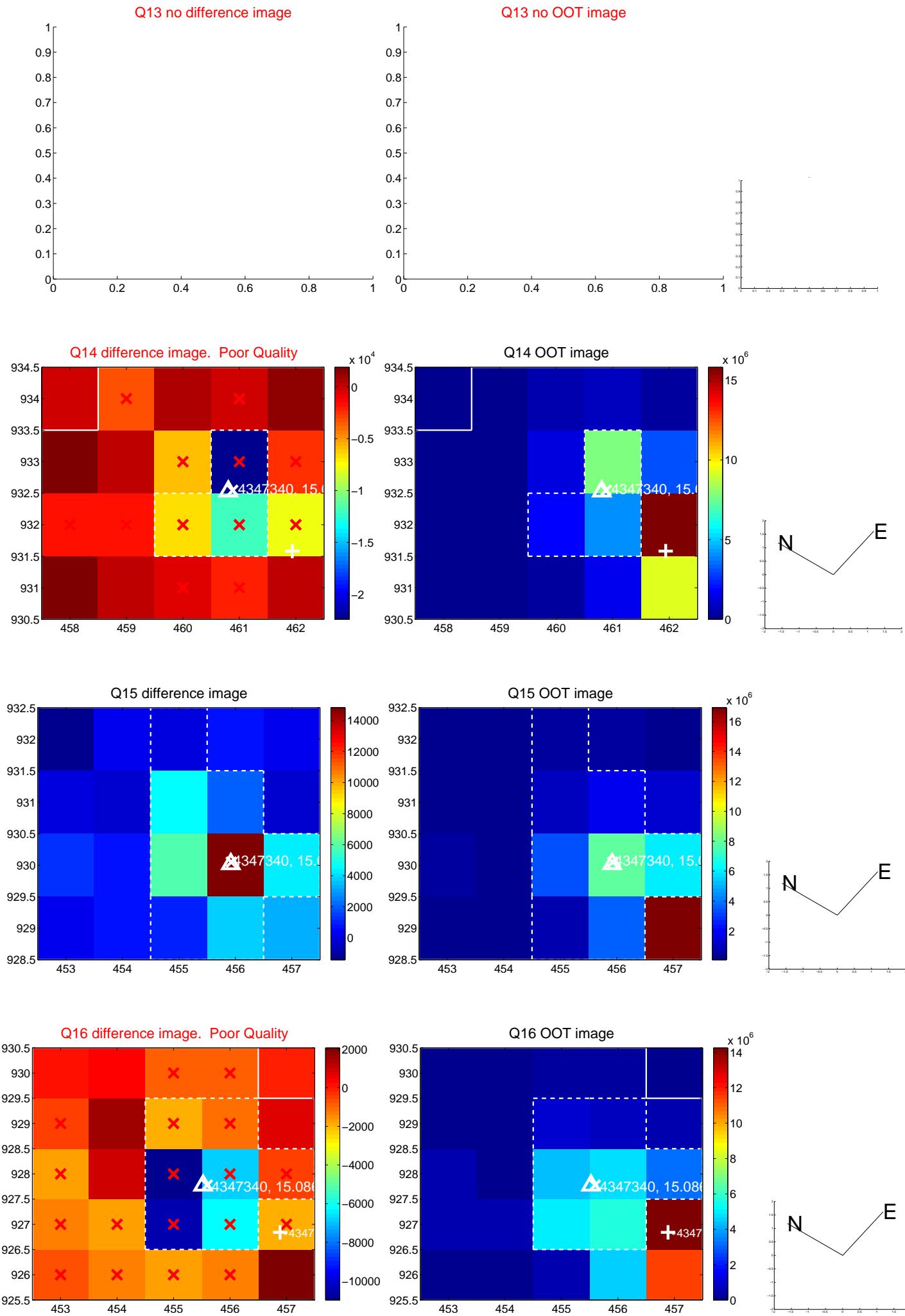




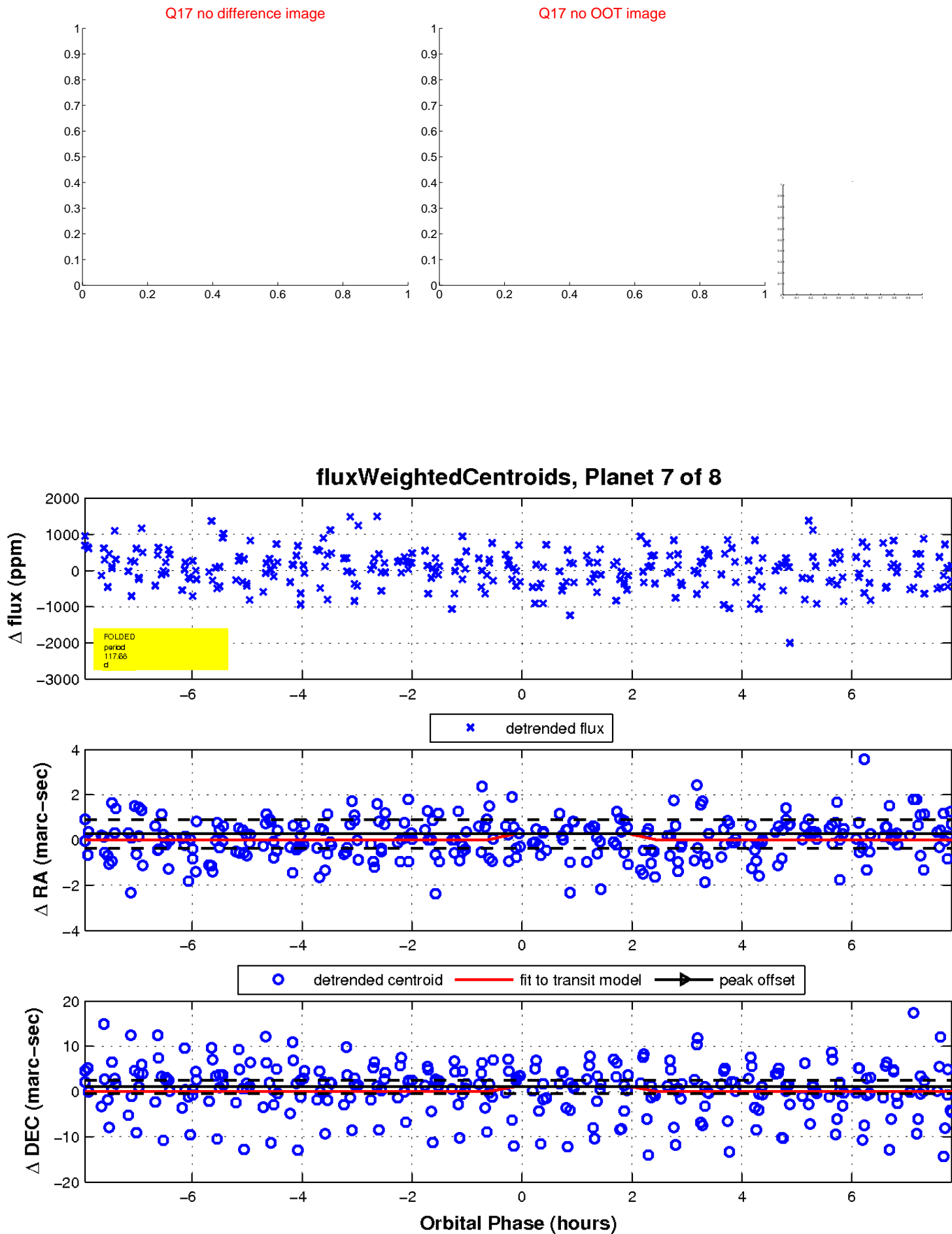
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



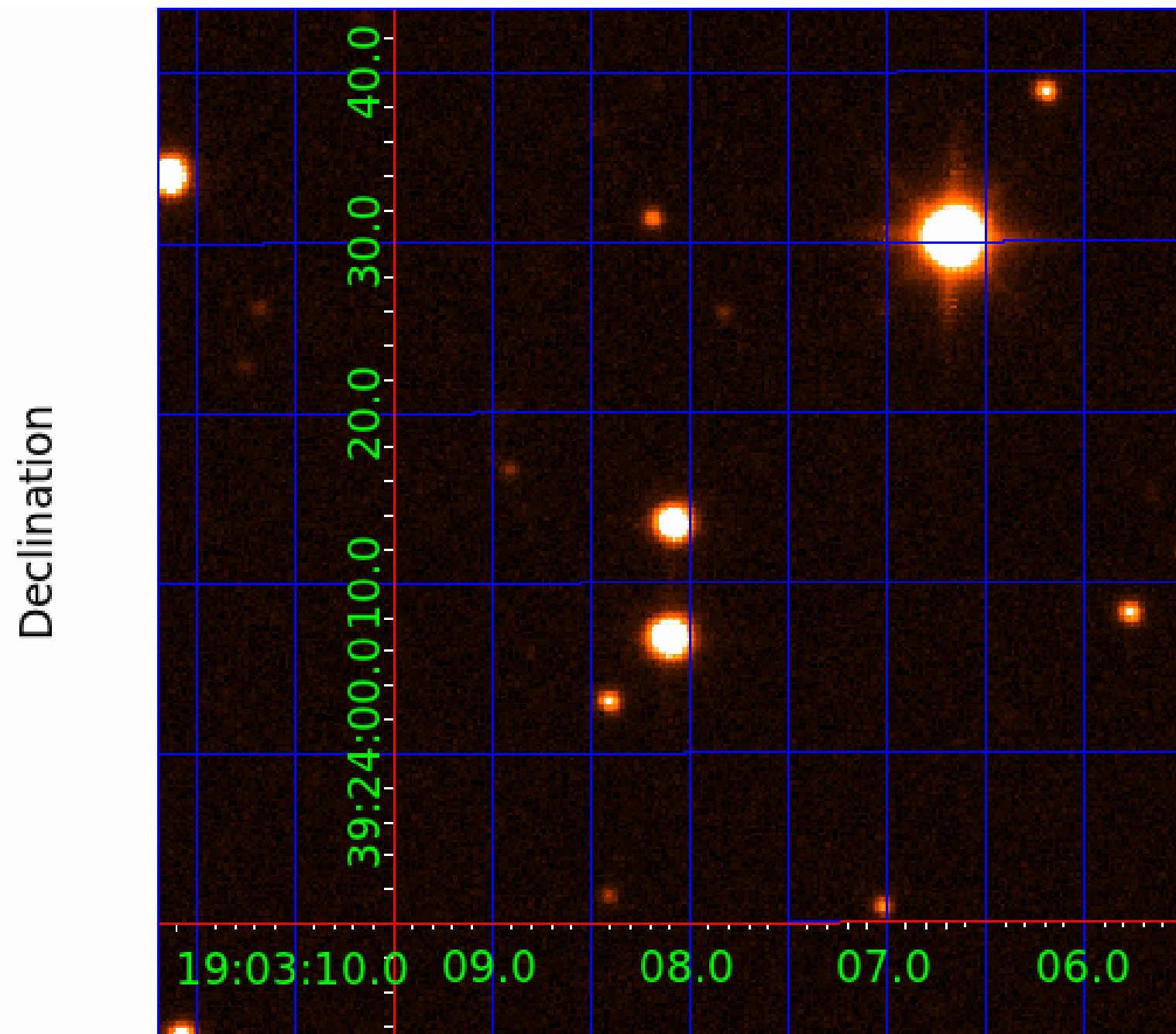
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 004347340

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004347340-01	OBS	No	3.158864	133.148926	242.9	15.009	8.8	10.4	0.72	5520	2.27	316.45
004347340-02	OBS	No	135.677907	224.619027	2088.6	46.049	10.1	7.9	0.72	5520	6.22	2.10
004347340-03	OBS	No	87.991096	213.154786	368.8	3.537	8.3	2.9	0.72	5520	1.48	3.75
004347340-04	OBS	No	382.441320	469.090433	709.9	9.000	9.2	-1.0	0.72	5520	1.92	0.53
004347340-05	OBS	No	124.986879	180.255833	1131.3	5.349	8.4	8.3	0.72	5520	2.57	2.35
004347340-06	OBS	No	67.732451	157.191789	1000.9	1.868	7.6	6.9	0.72	5520	2.58	5.31
004347340-07	OBS	No	117.676012	221.262001	646.1	7.500	8.5	-1.0	0.72	5520	1.83	2.54
004347340-08	OBS	No	184.597816	283.138226	2018.4	5.000	12.1	-1.0	0.72	5520	3.23	1.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004347340-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_KIC_POS
004347340-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004347340-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
004347340-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—CENT_NOFITS
004347340-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
004347340-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
004347340-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

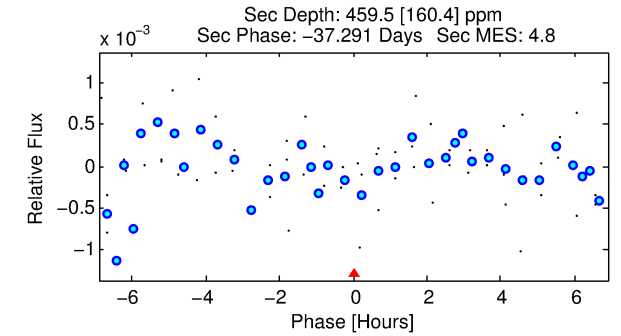
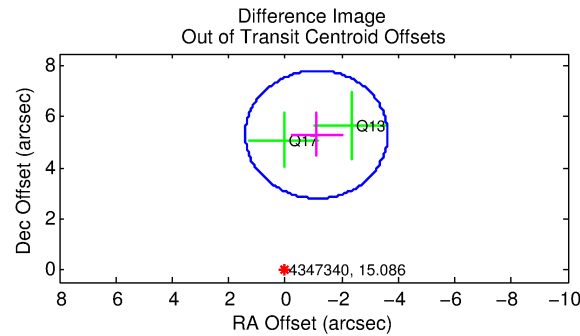
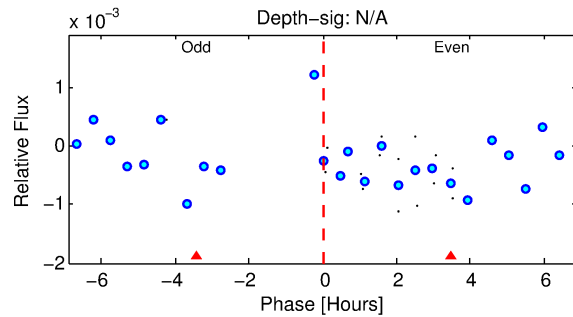
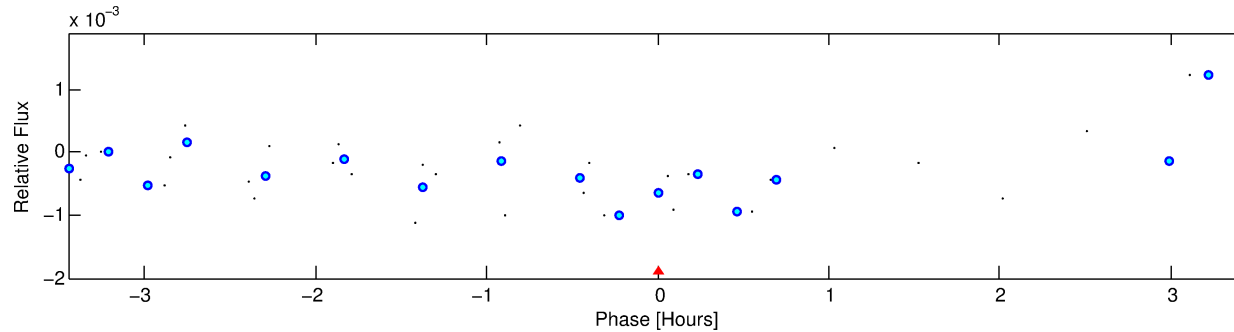
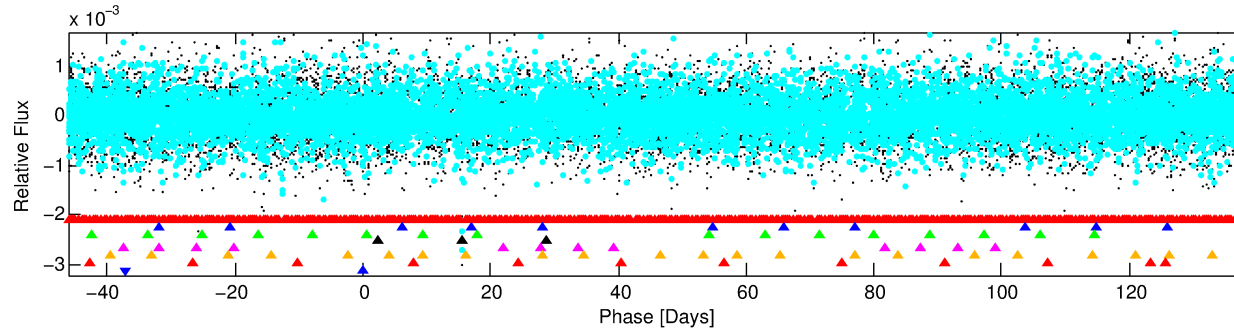
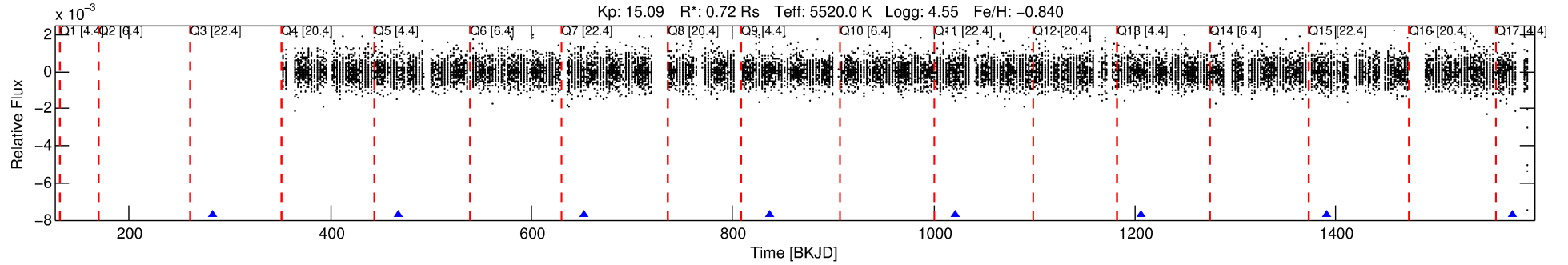
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004347340-08

No Significant Match Found

# DV One-Page Summary

KIC: 4347340 Candidate: 8 of 8 Period: 184.598 d



## TPS TCE Results:

Period = 184.59782 d  
Epoch = 283.1382 BKJD

DV fit results are unavailable

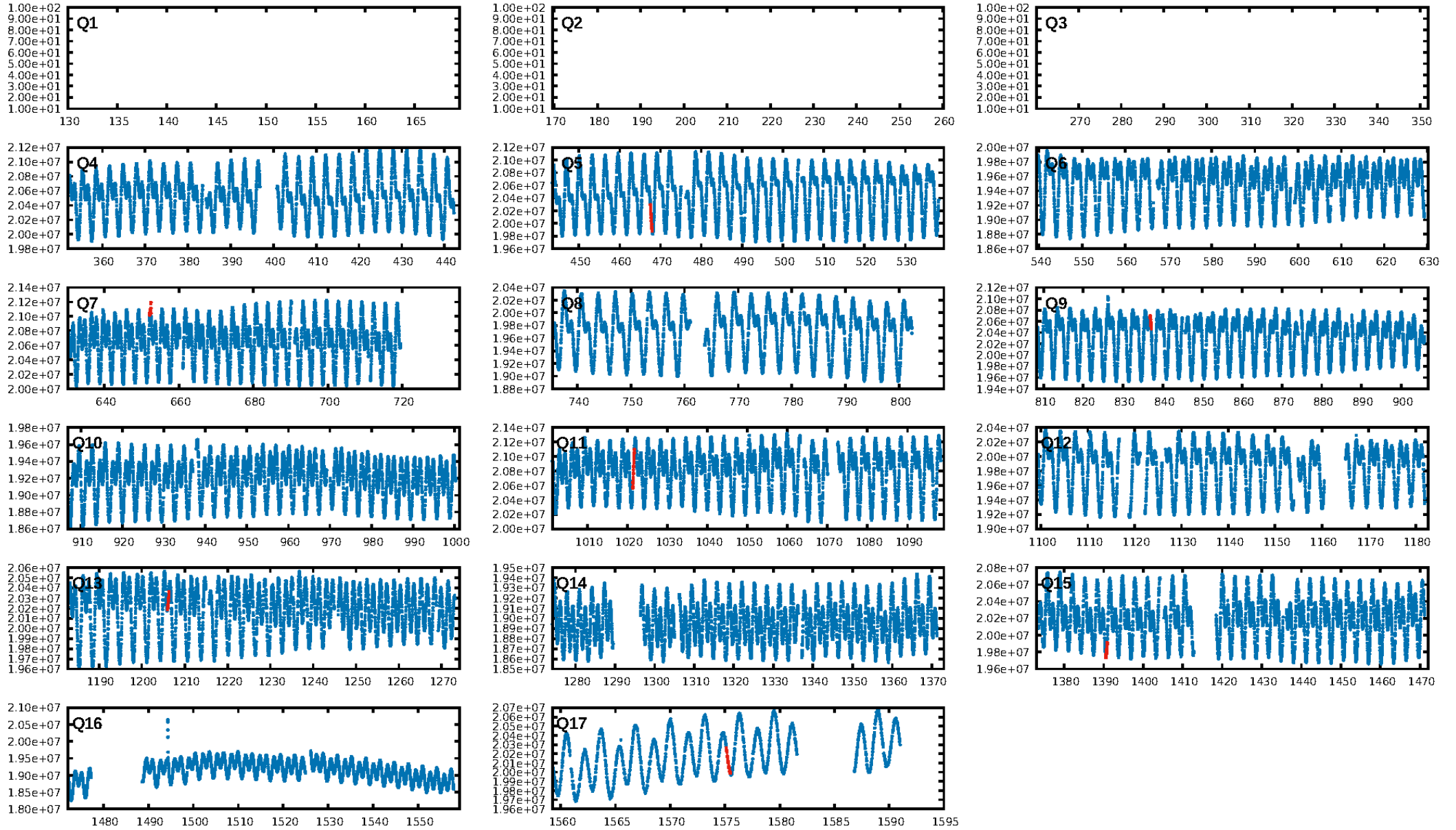
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [25.35 $\sigma$ ]  
LongPeriod-sig: 100.0% [461.19 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -5.914  
Centroid-sig: 66.1%  
Centroid-so: 5.606 arcsec [0.98 $\sigma$ ]  
OotOffset-rm: 5.426 arcsec [6.46 $\sigma$ ]  
KicOffset-rm: 1.048 arcsec [1.59 $\sigma$ ]  
OotOffset-st: 0/0/0/2 [2]  
KicOffset-st: 0/2/0/2 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.80 [4/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:54:31 Z

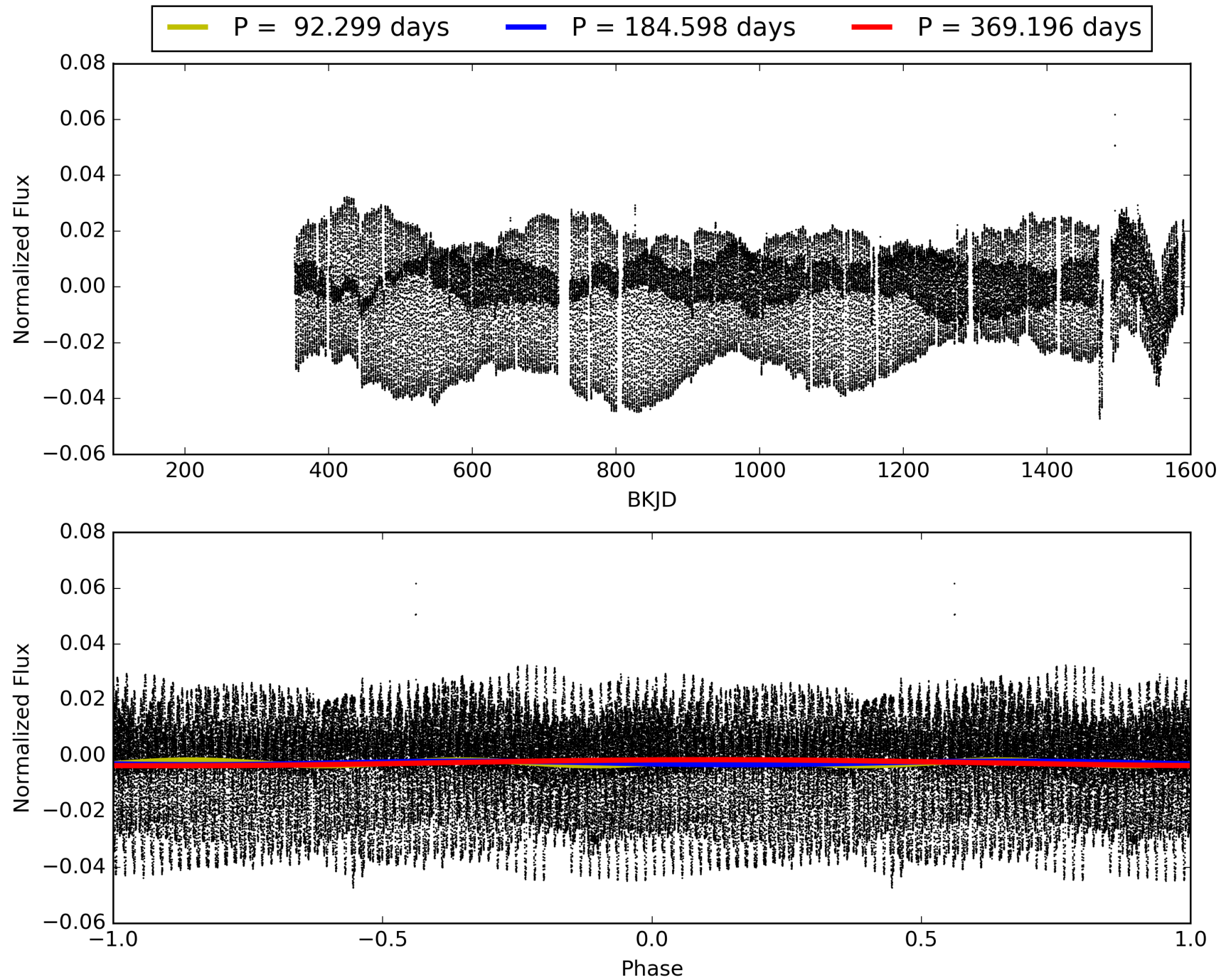
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 004347340-08, PDC Light Curves





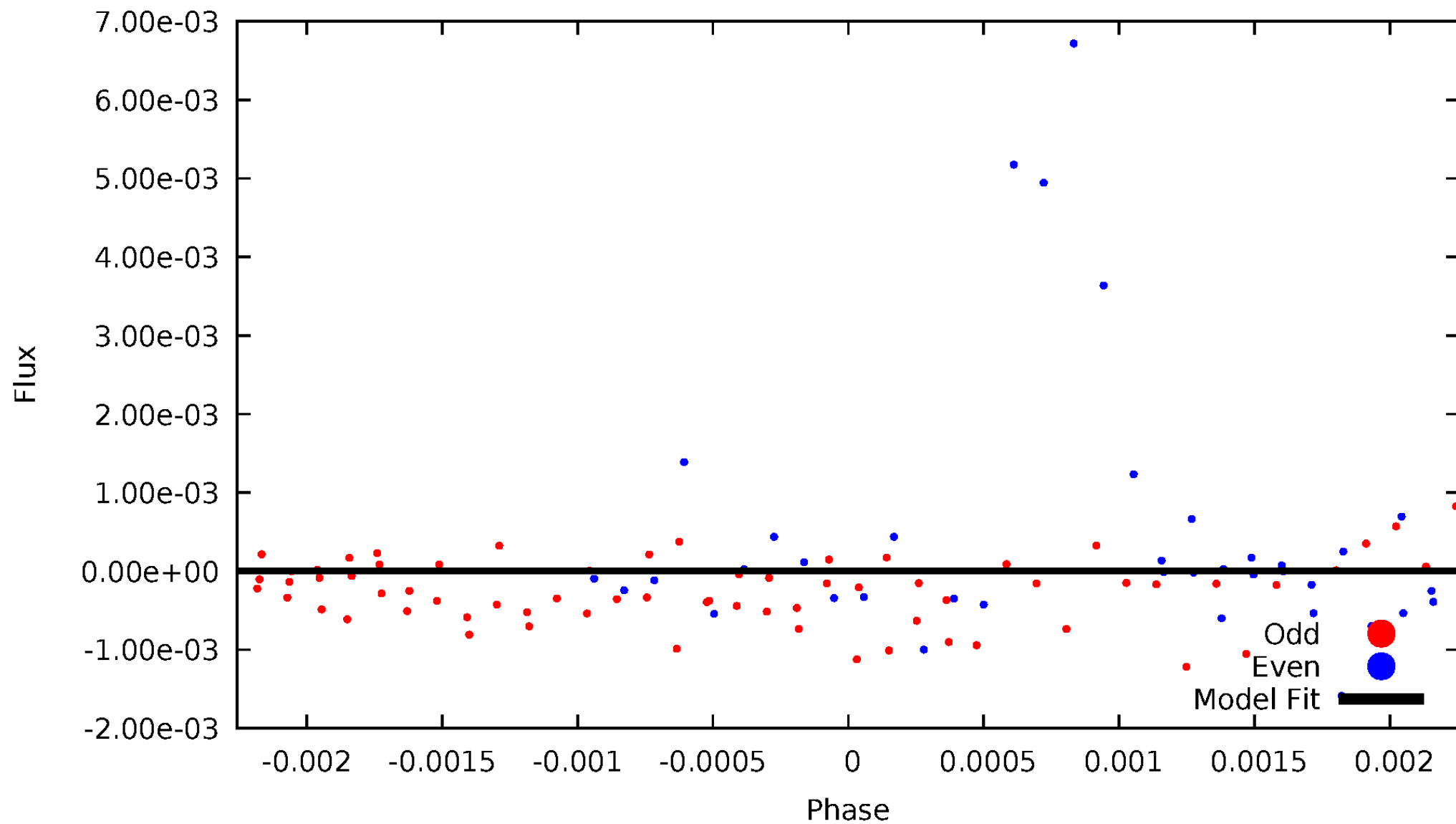
# TCE 004347340-08





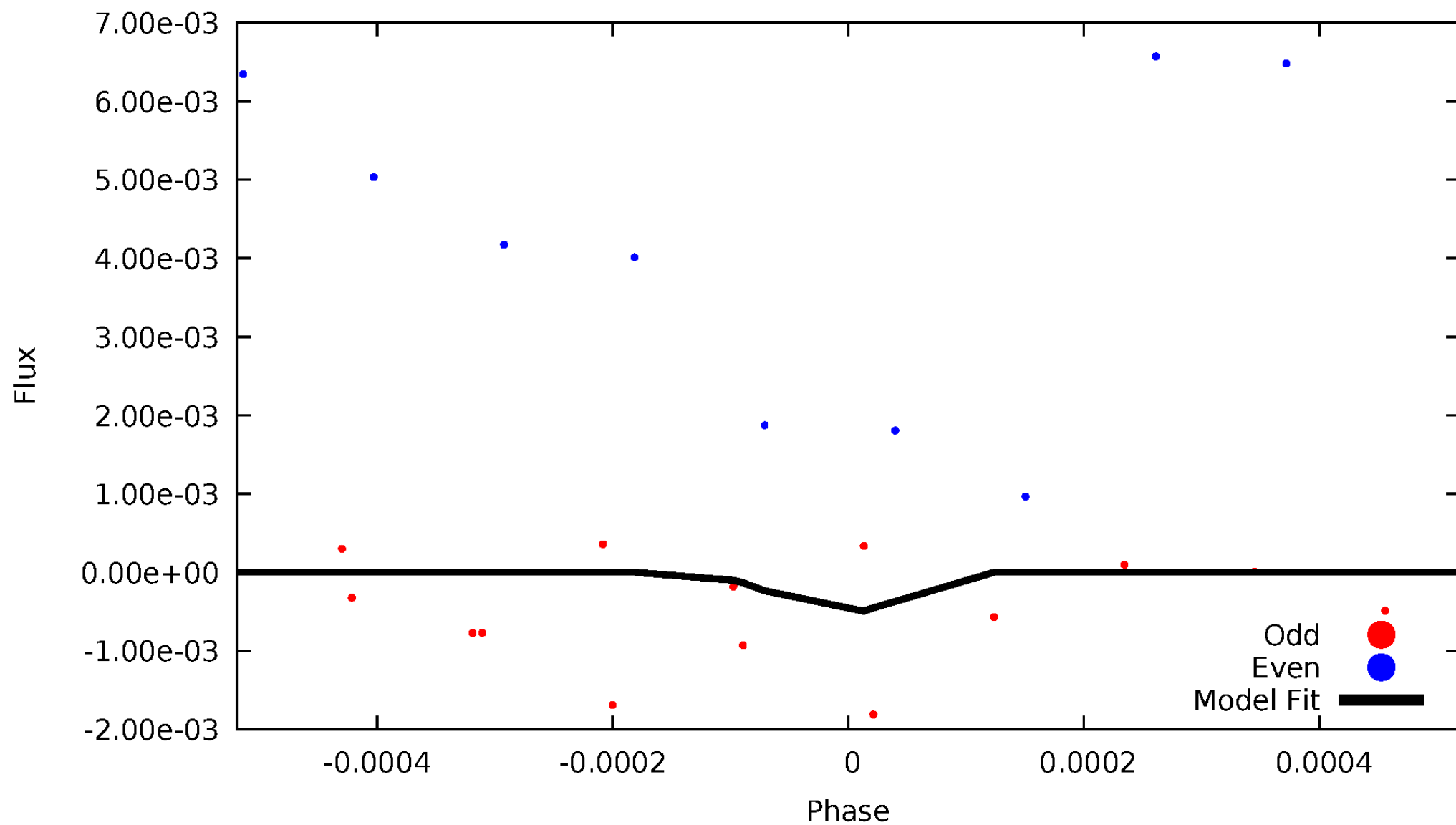
# DV Odd/Even

TCE 004347340-08



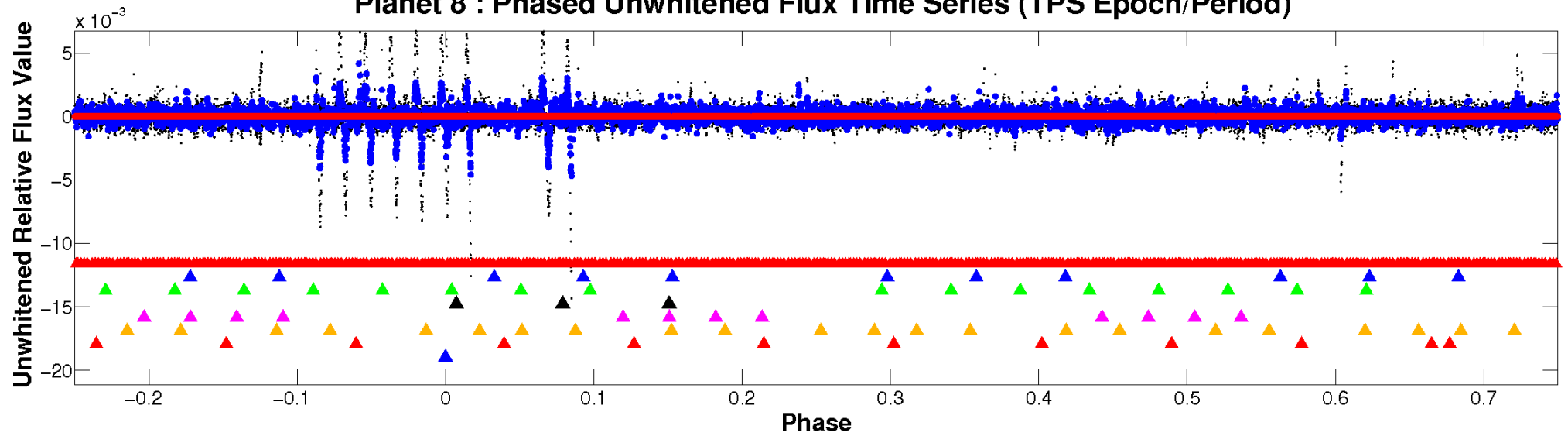
# ALT Odd/Even

TCE 004347340-08



# Non-Whitened Vs. Whitened Light Curve

**Planet 8 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

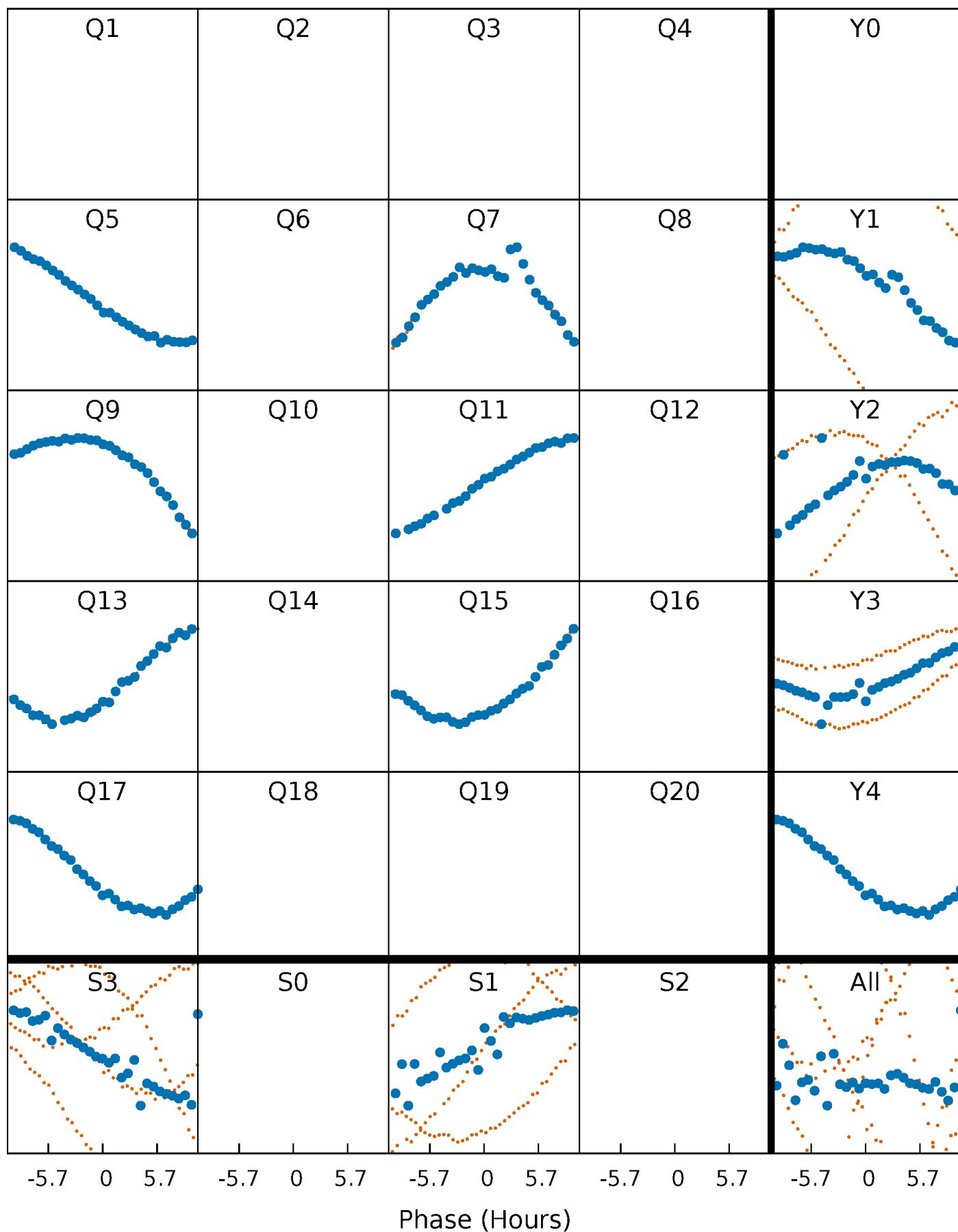


**Planet 8 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



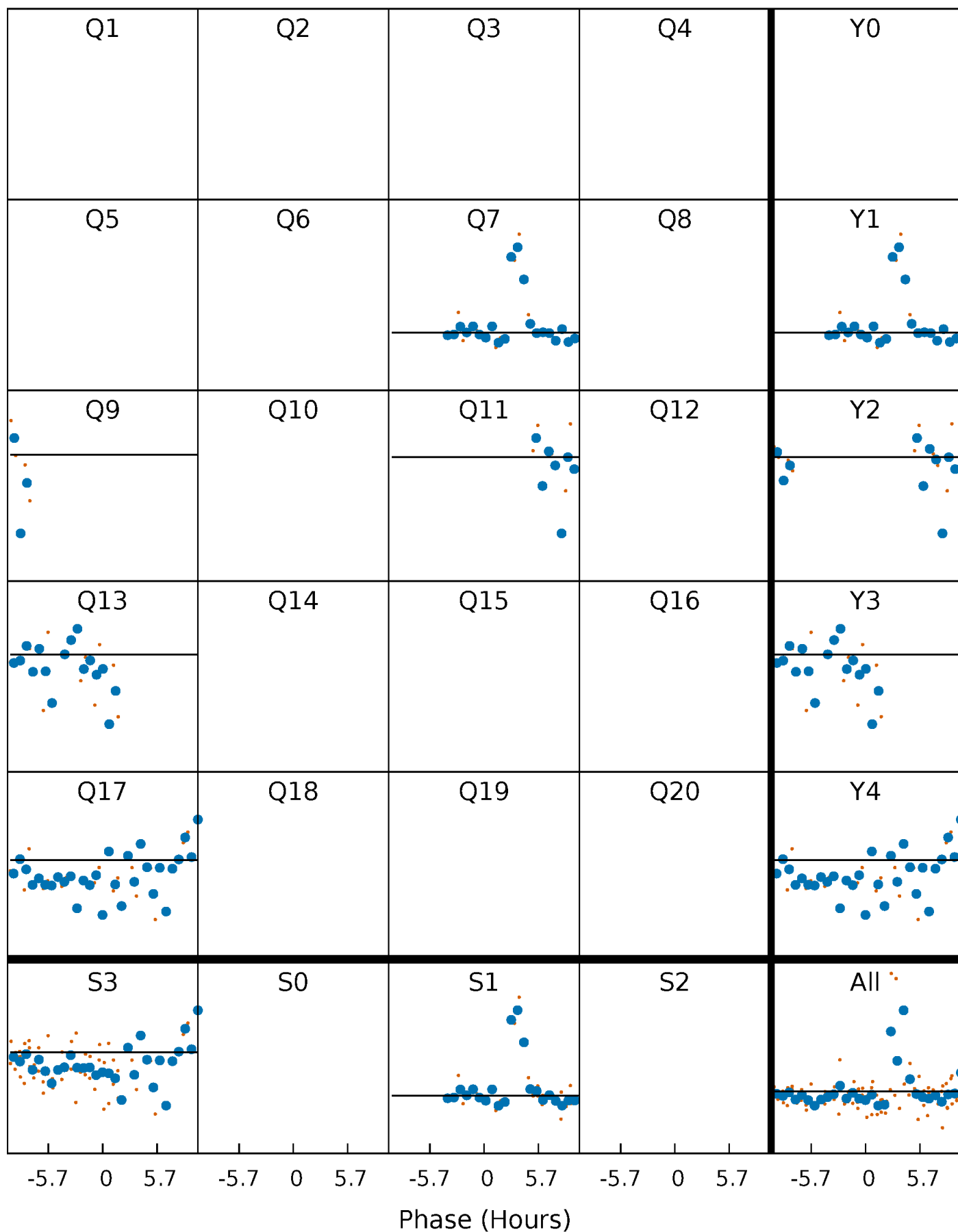
# PDC Quarter-Phased Transit Curves

TCE 004347340-08 P=184.597816 Days  $T_0=283.138226$  (BKJD)



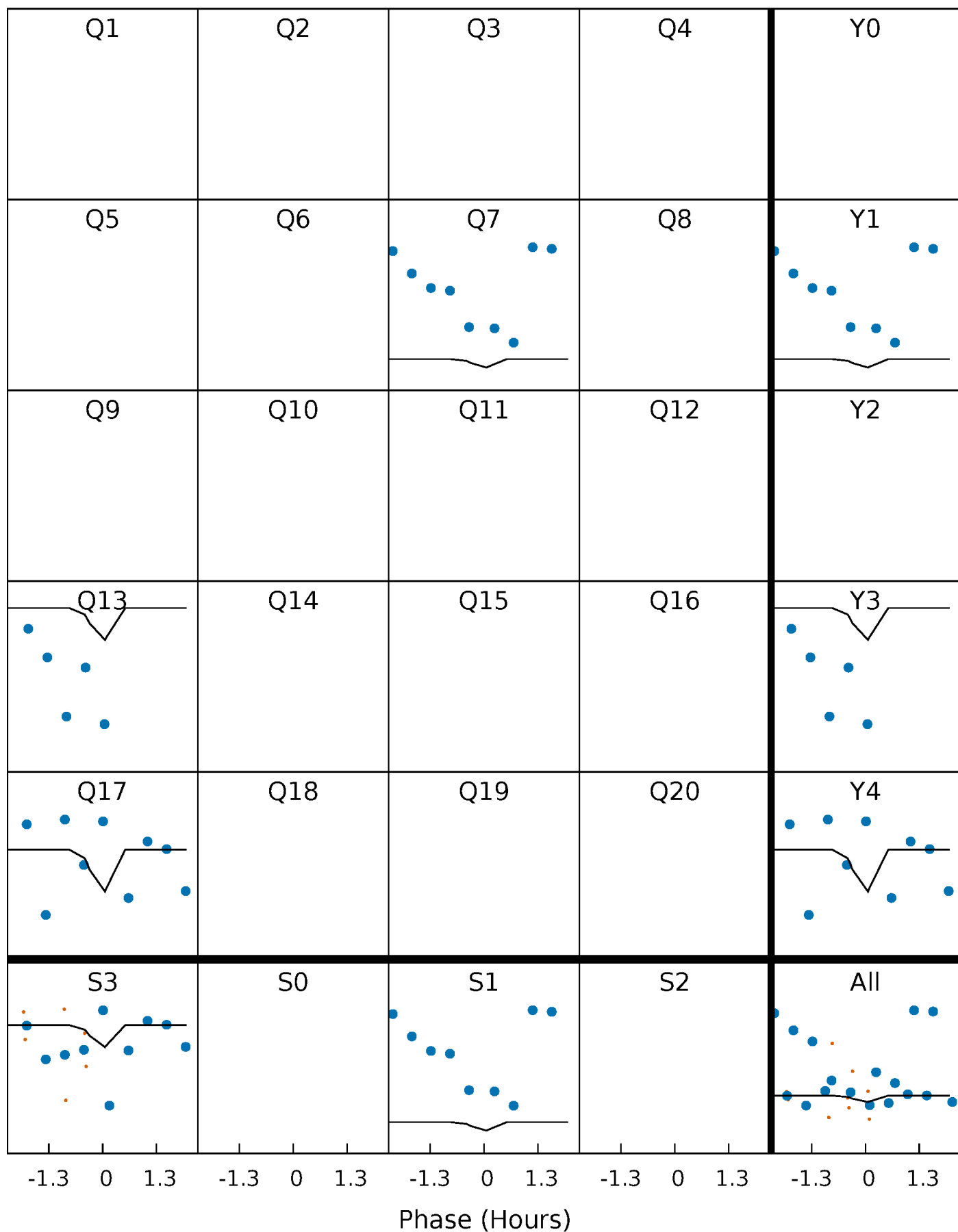
# DV Quarter-Phased Transit Curves

TCE 004347340-08     $P=184.597816$  Days     $T_0=283.138226$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

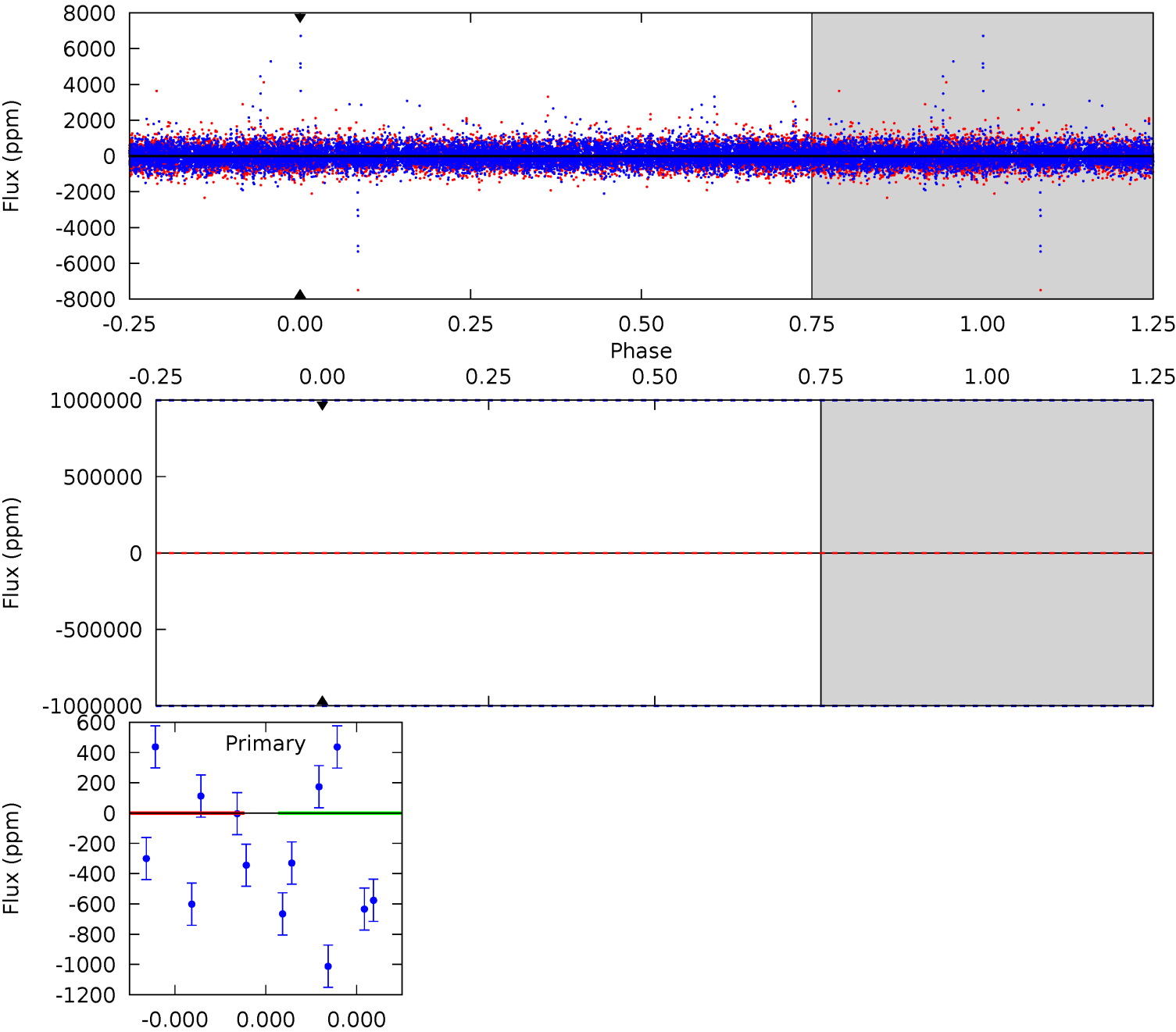
TCE 004347340-08 P=184.597816 Days  $T_0=283.202798$  (BKJD)



# DV Model-Shift Uniqueness Test

004347340-08, P = 184.597816 Days, E = 283.138226 Days

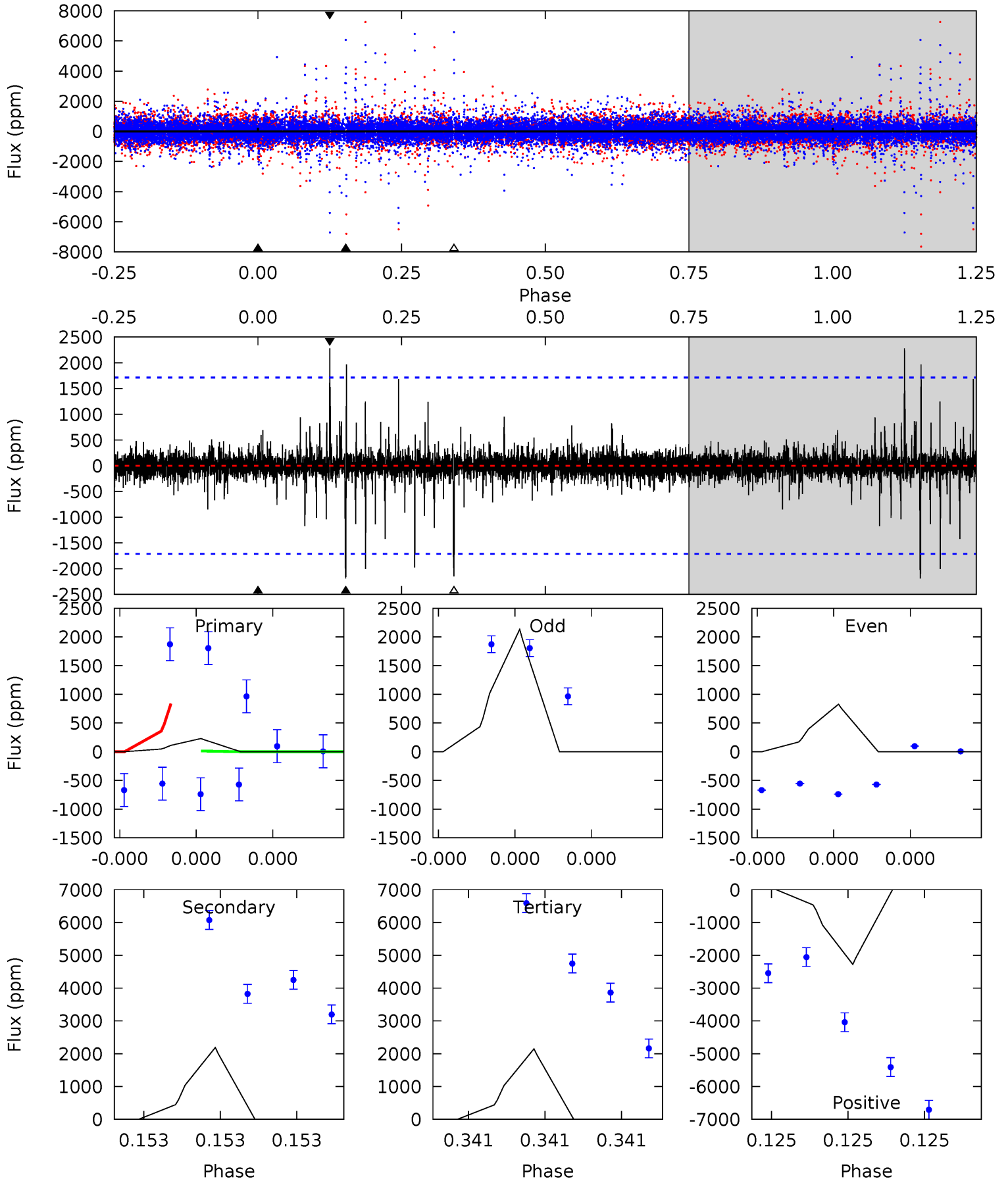
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

004347340-08, P = 184.597816 Days, E = 283.202798 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
0.77	7.31	7.18	7.60	5.72	3.70	0.56	-6.41	-6.83	0.13	-0.29	2.08	1.21	0.51	1.25





### Stellar Parameters For KIC 004347340

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5520^{+194}_{-194}$	$4.552^{+0.095}_{-0.085}$	$-0.840^{+0.300}_{-0.300}$	$0.722^{+0.097}_{-0.088}$	$0.678^{+0.081}_{-0.035}$	$2.536^{+1.006}_{-0.659}$
	+4%/-4%	+2%/-2%	+36%/-36%	+13%/-12%	+12%/-5%	+40%/-26%
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 004347340-08 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$6.68^{+5.98}_{-4.42}$	$387^{+18}_{-17}$	$3548^{+15877}_{-18316}$	$2967^{+938524}_{-558161}$
Alt.	$-2189 \pm 300$	$5.70^{+6.39}_{-3.79}$	$388^{+18}_{-20}$	$4586^{+3247}_{-1047}$	$11923^{+96469}_{-9359}$

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

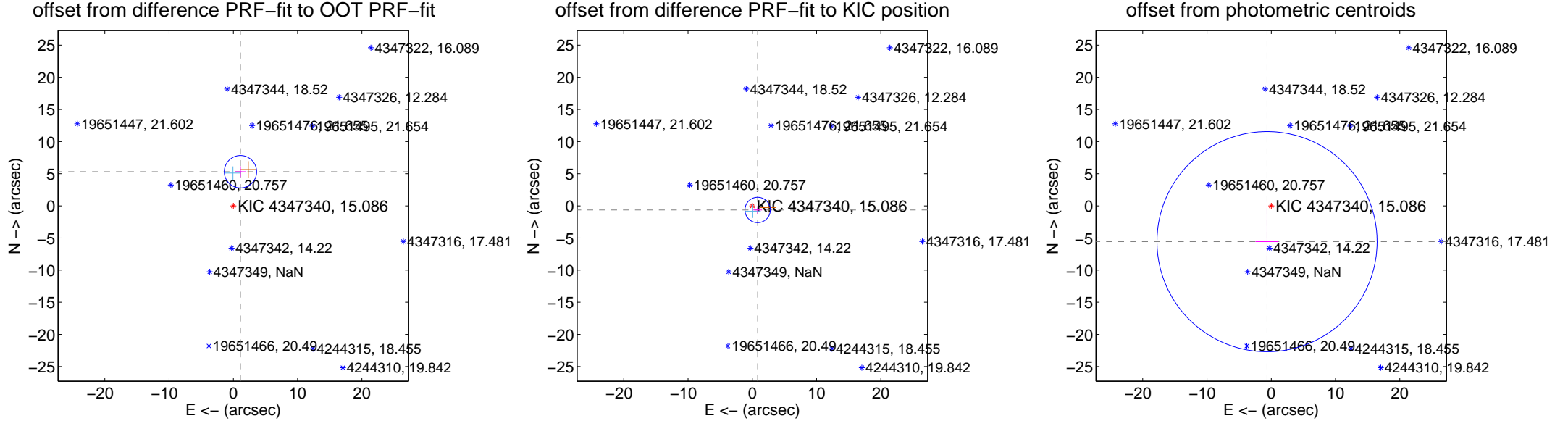
## DV Centroid Data

Supplemental centroid analysis for 004347340-08. Kepler magnitude: 15.09. 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 5.94 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	<b><math>5.426 \pm 0.840</math></b>	<b>6.46</b>	$-1.106 \pm 0.893$	$5.312 \pm 0.837$
PRF-fit source offset from KIC position	$1.048 \pm 0.658$	1.59	$-0.831 \pm 0.687$	$-0.639 \pm 0.605$
photometric centroid source offset	$5.61 \pm 5.71$	0.98	$0.65 \pm 1.79$	$-5.57 \pm 5.74$



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.

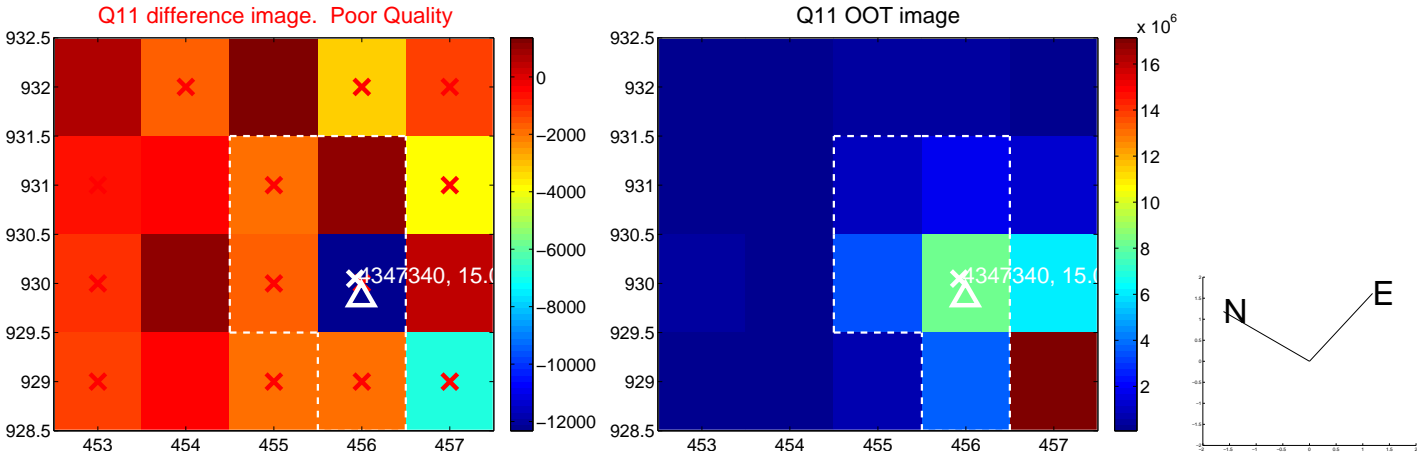
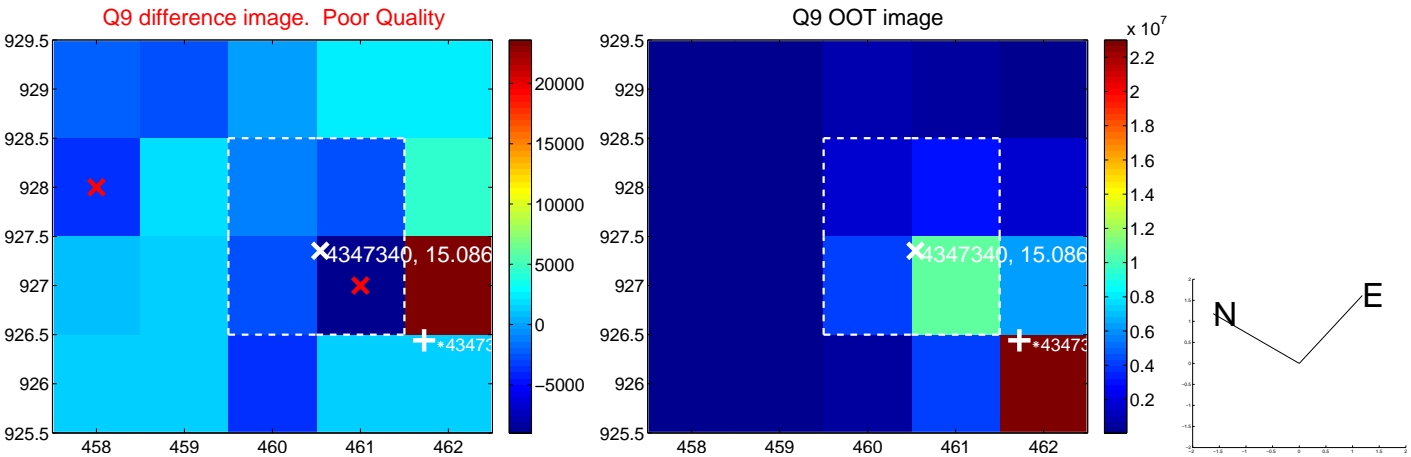
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



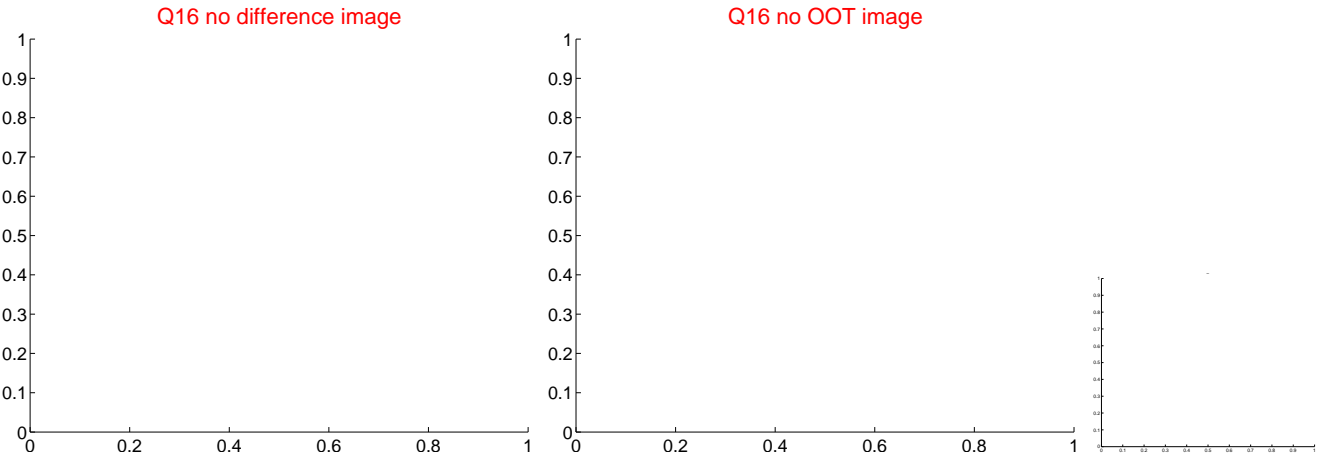
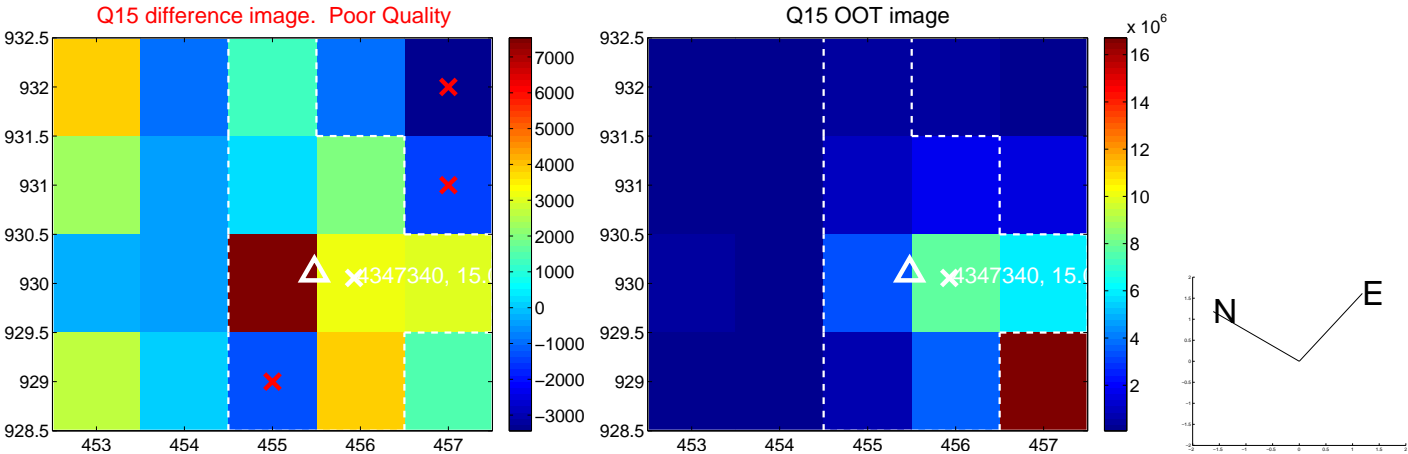
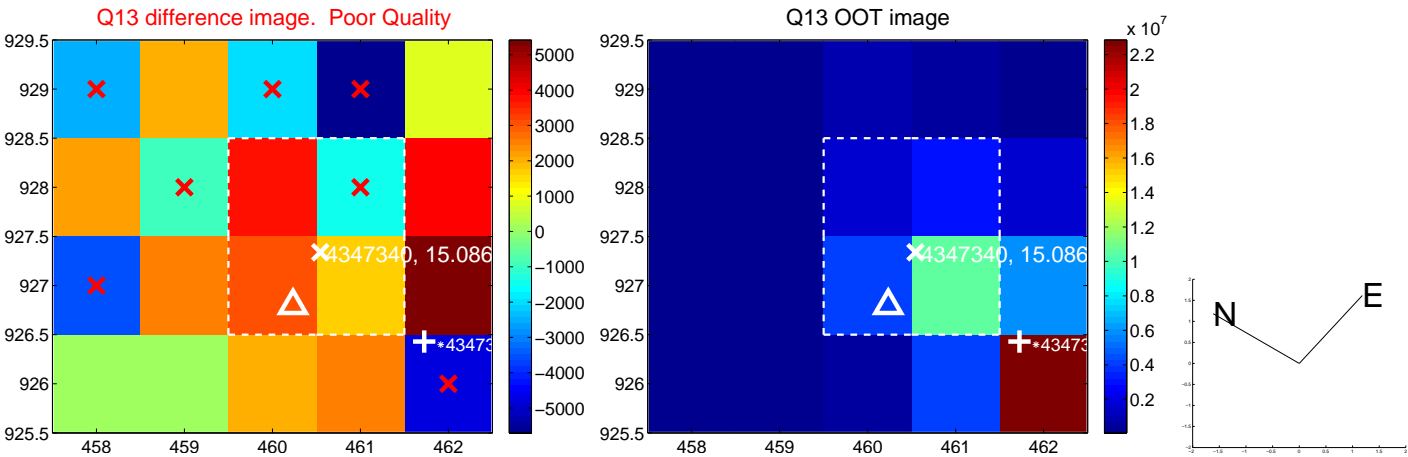
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



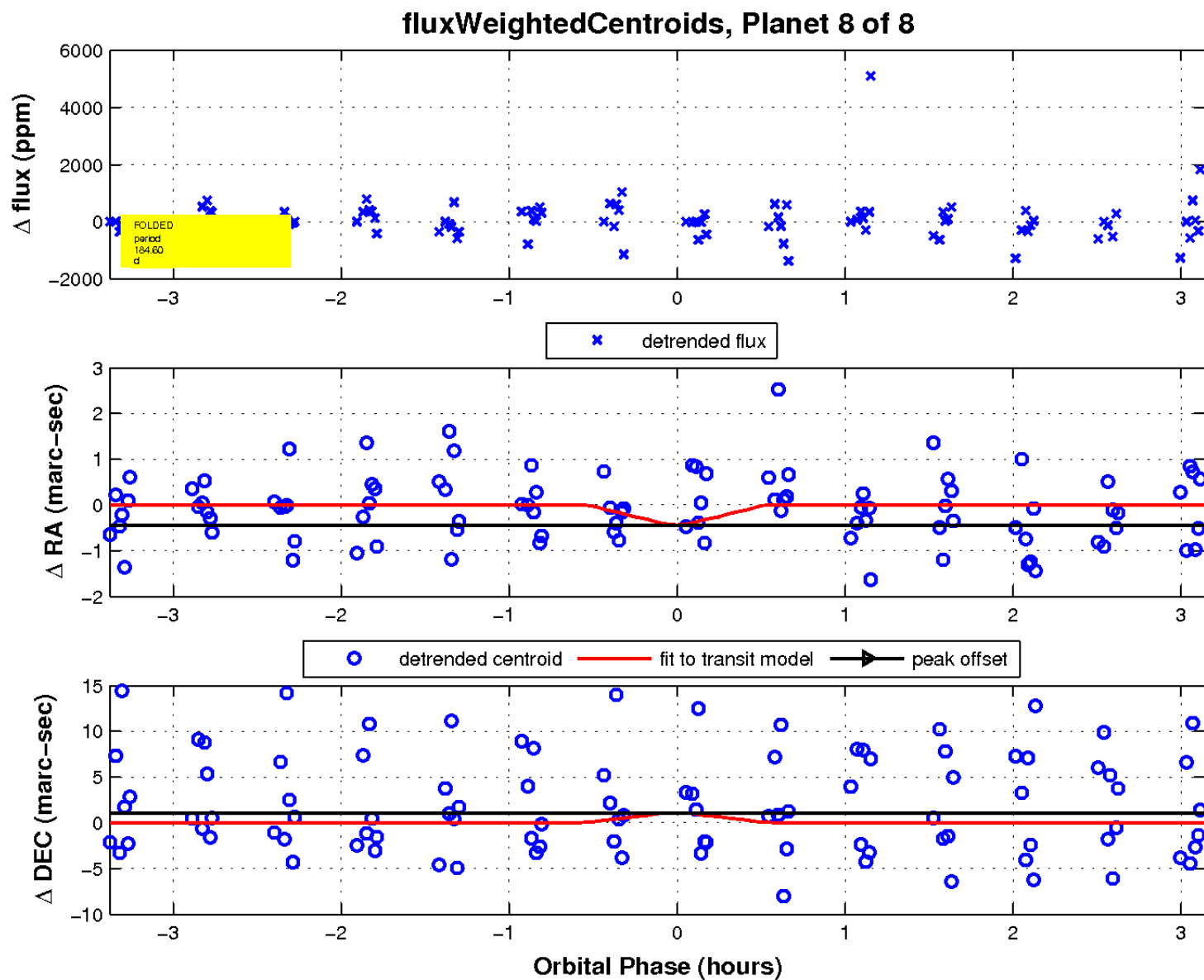
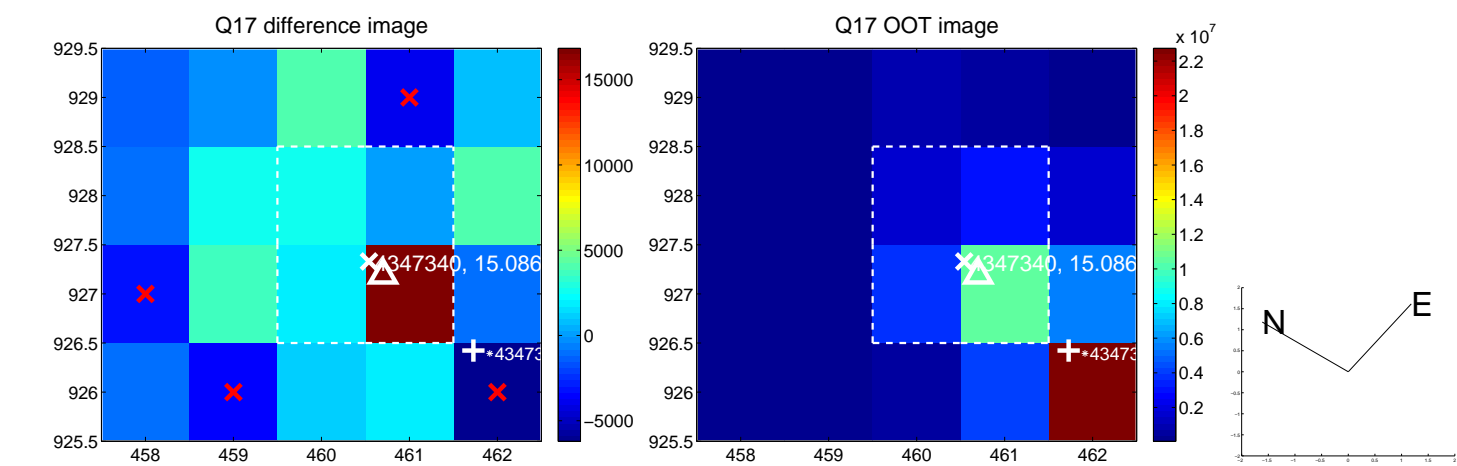
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

