

# KIC 011760959

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011760959-01	OBS	1484.01	3.470177	134.013741	1014.1	2.554	37.1	41.2	0.74	4922	2.90	179.22
011760959-02	OBS	No	368.989557	215.895597	5535.7	5.148	12.4	6.4	0.74	4922	5.42	0.36
011760959-03	OBS	No	467.457322	158.900681	3615.3	8.110	10.2	10.4	0.74	4922	4.50	0.26
011760959-04	OBS	No	127.765806	202.410414	1648.8	18.806	8.3	8.3	0.74	4922	2.99	1.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011760959-01	OBS	FP	0.13	0	0	1	0	CENT_RESOLVED_OFFSET
011760959-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011760959-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011760959-04	OBS	FP	0.03	1	0	0	0	MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

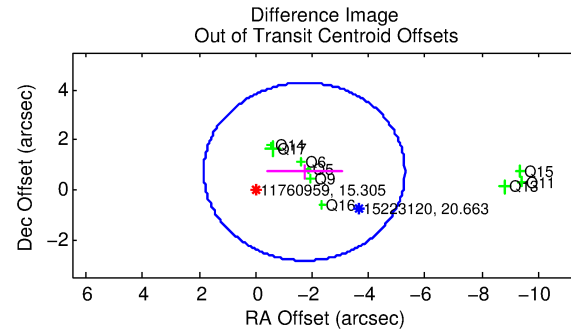
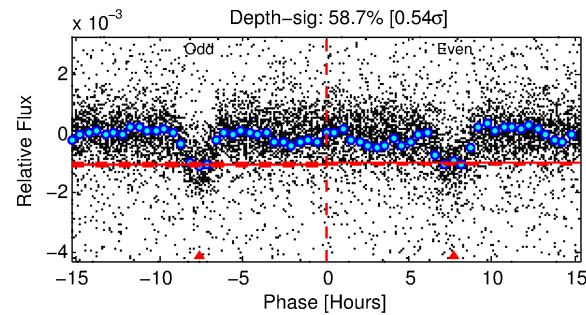
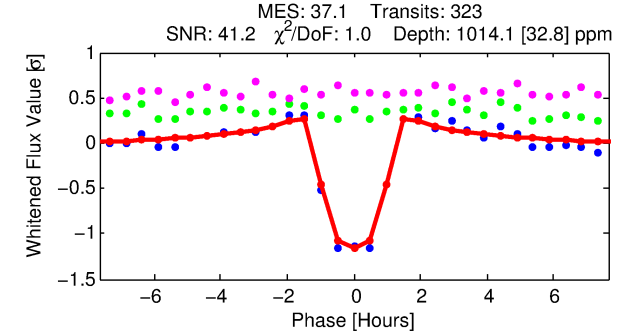
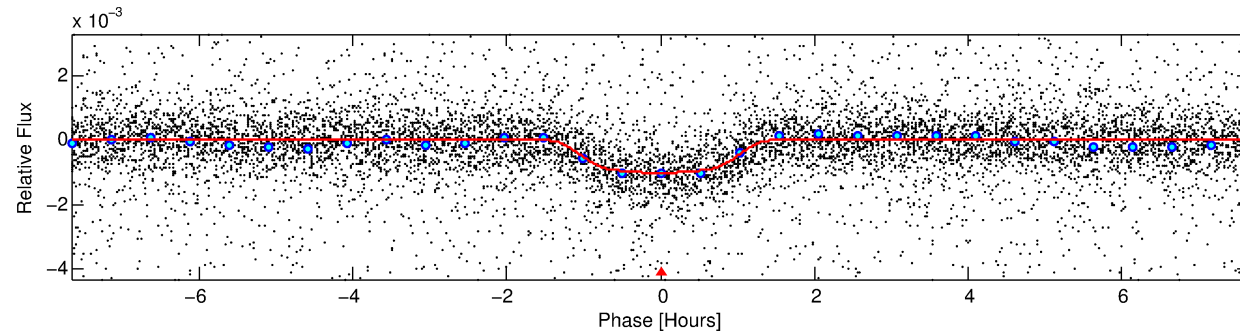
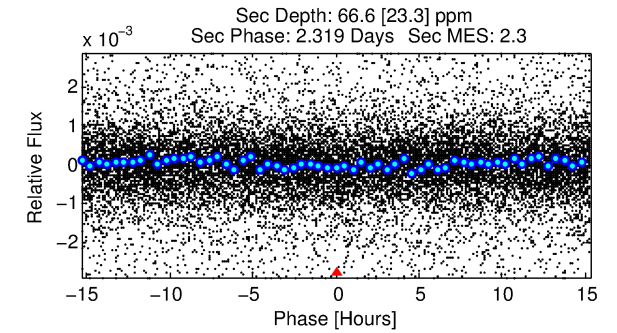
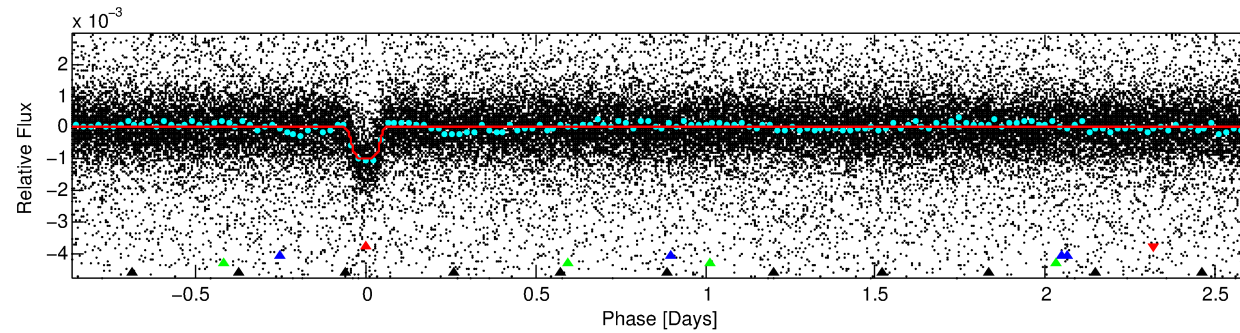
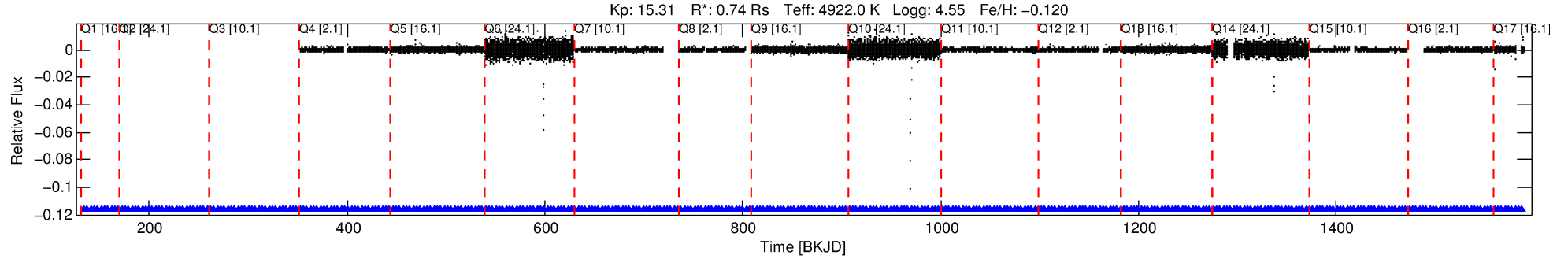
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011760959-01

No Significant Match Found

# DV One-Page Summary

KIC: 11760959 Candidate: 1 of 4 Period: 3.470 d  
KOI: K01484.01 Corr: 0.951



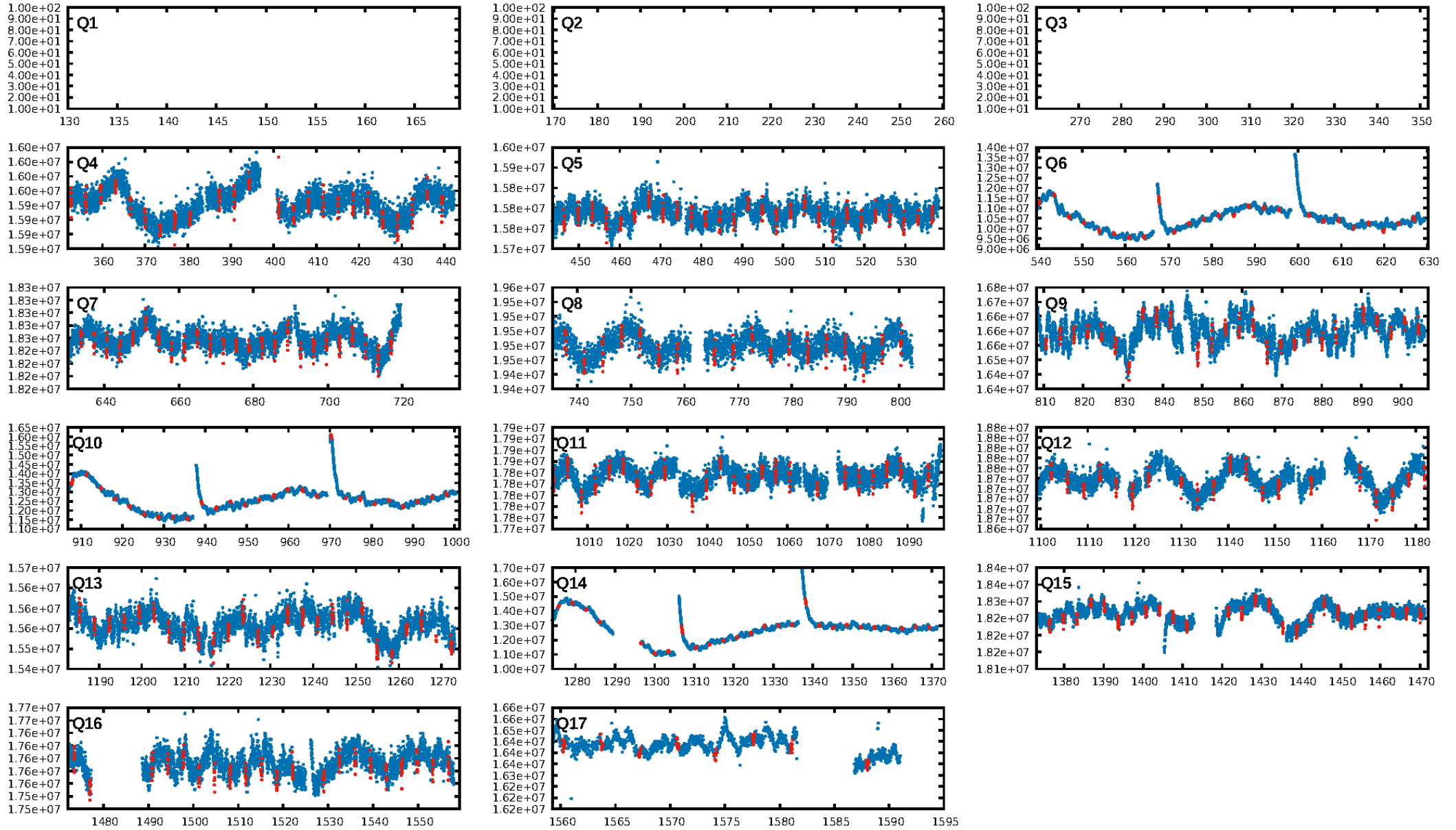
## DV Fit Results:

Period = 3.47018 [0.00001] d  
Epoch = 134.0137 [0.0011] BKJD  
Rp/R\* = 0.0357 [0.0025]  
a/R\* = 5.41 [1.34]  
b = 0.90 [0.06]  
Seff = 179.21 [33.47]  
Teff = 933 [44] K  
Rp = 2.89 [0.35] Re  
a = 0.0403 [0.0033] AU  
Ag = 7.10 [2.82] [2.17σ]  
Teffp = 2355 [238] K [5.88σ]

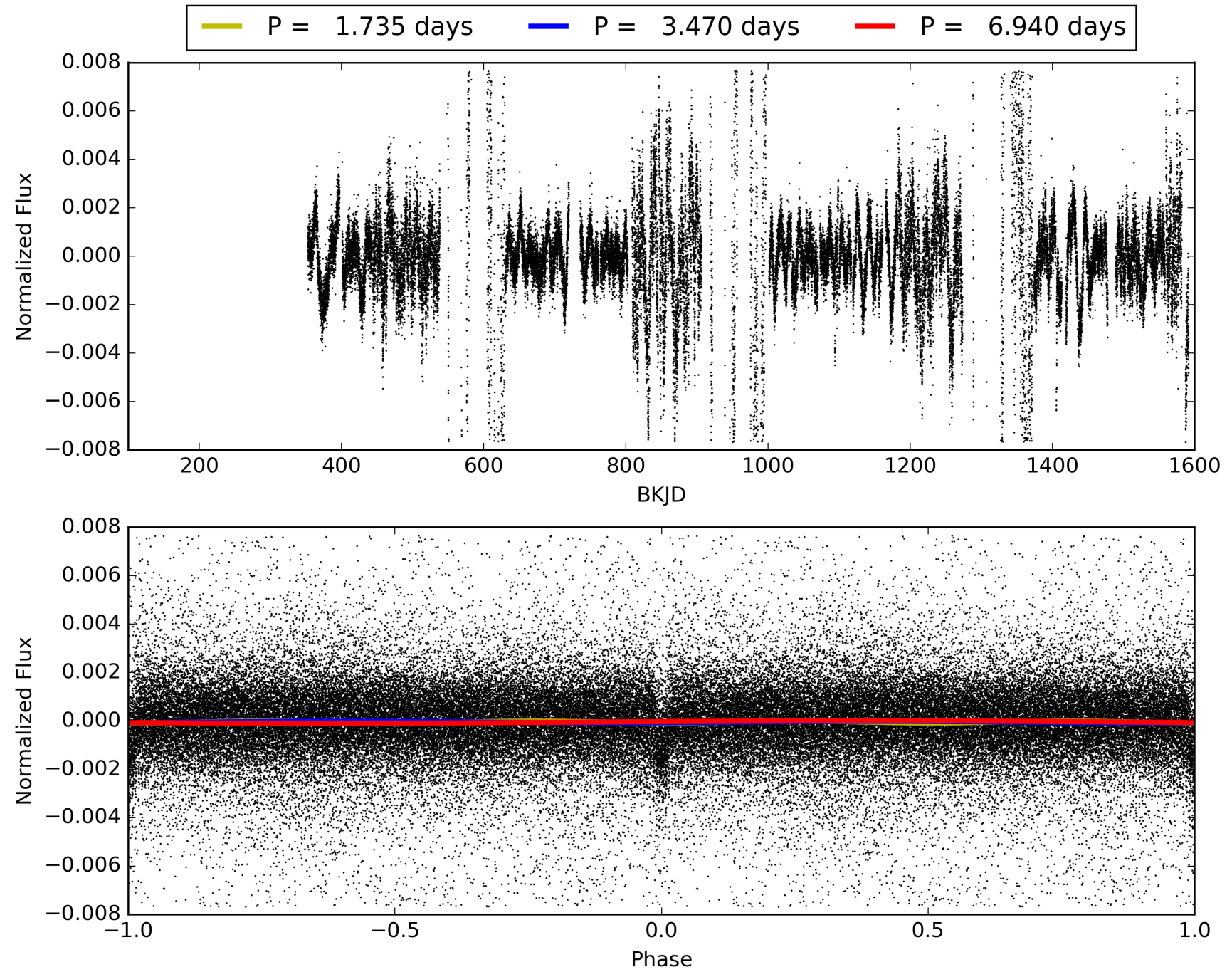
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [157.18σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.23e-288  
RollingBand-fgt: 1.00 [315/315]  
GhostDiagnostic-chr: 14.4  
Centroid-sig: 0.0%  
Centroid-so: 5.578 arcsec [170.94σ]  
OotOffset-rm: 1.868 arcsec [1.57σ]  
KicOffset-rm: 6.793 arcsec [5.70σ]  
OotOffset-st: 2/2/1/4 [9]  
KicOffset-st: 2/2/1/4 [9]  
DiffImageQuality-fgm: 0.67 [6/9]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 011760959-01, PDC Light Curves



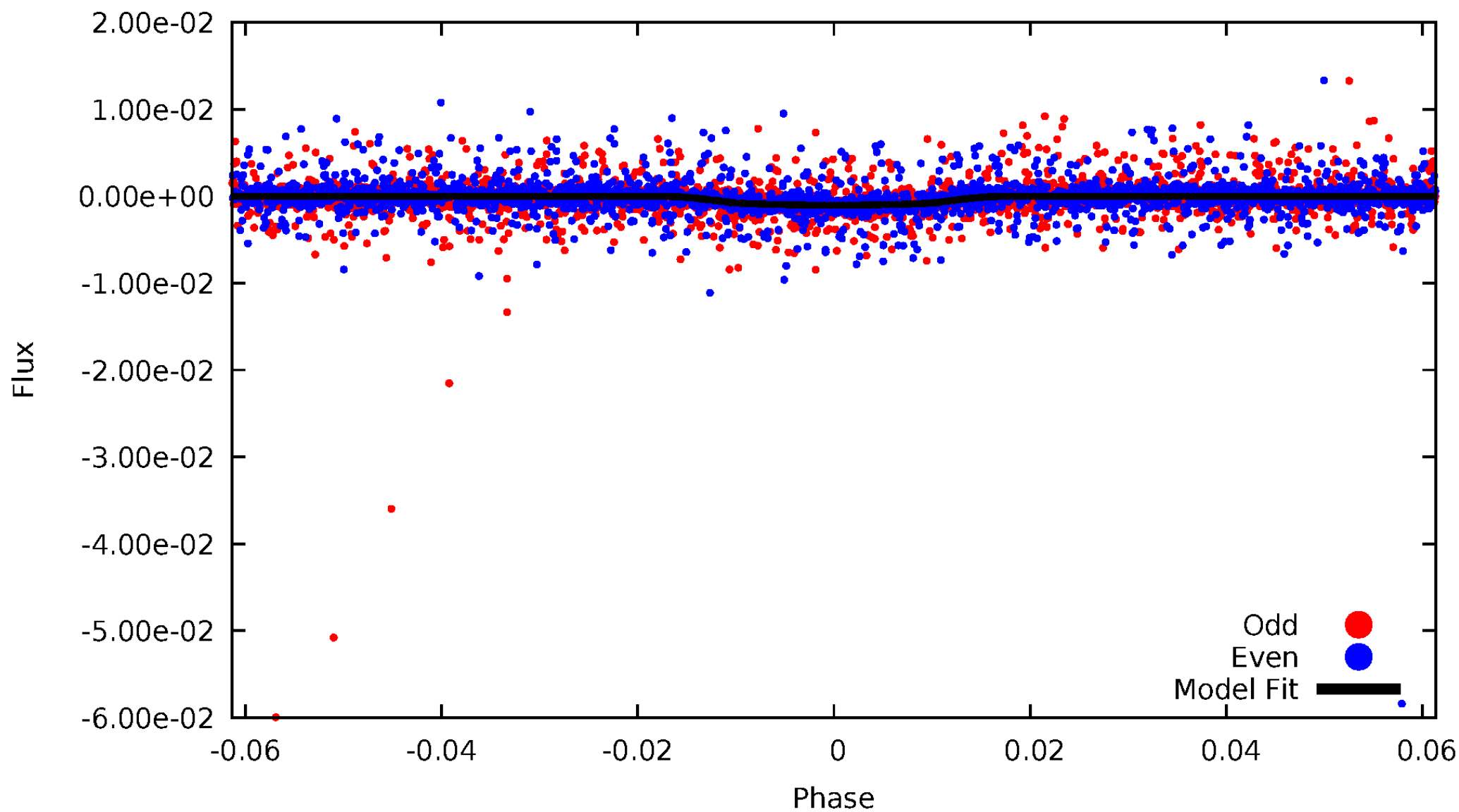
# TCE 011760959-01





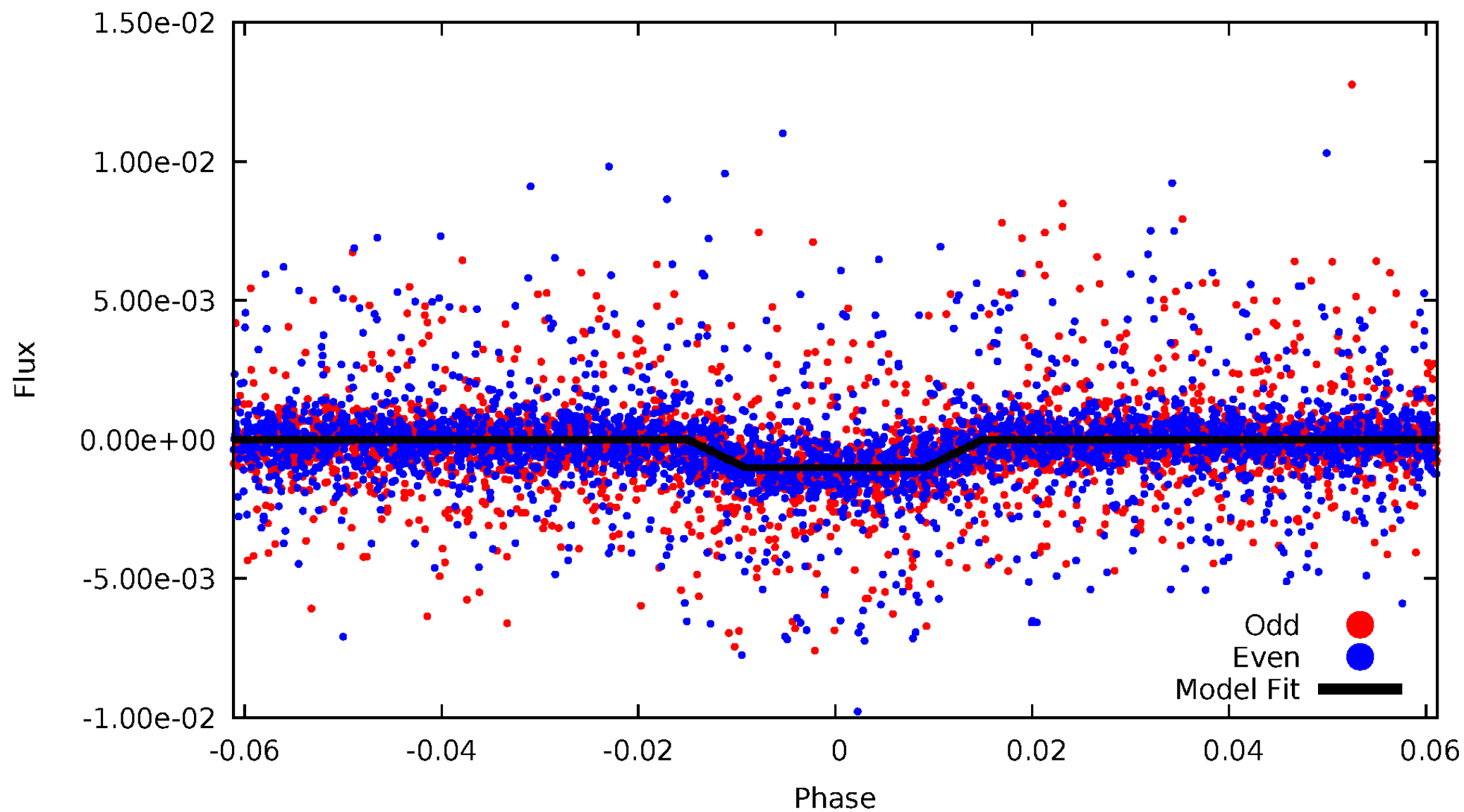
# DV Odd/Even

TCE 011760959-01



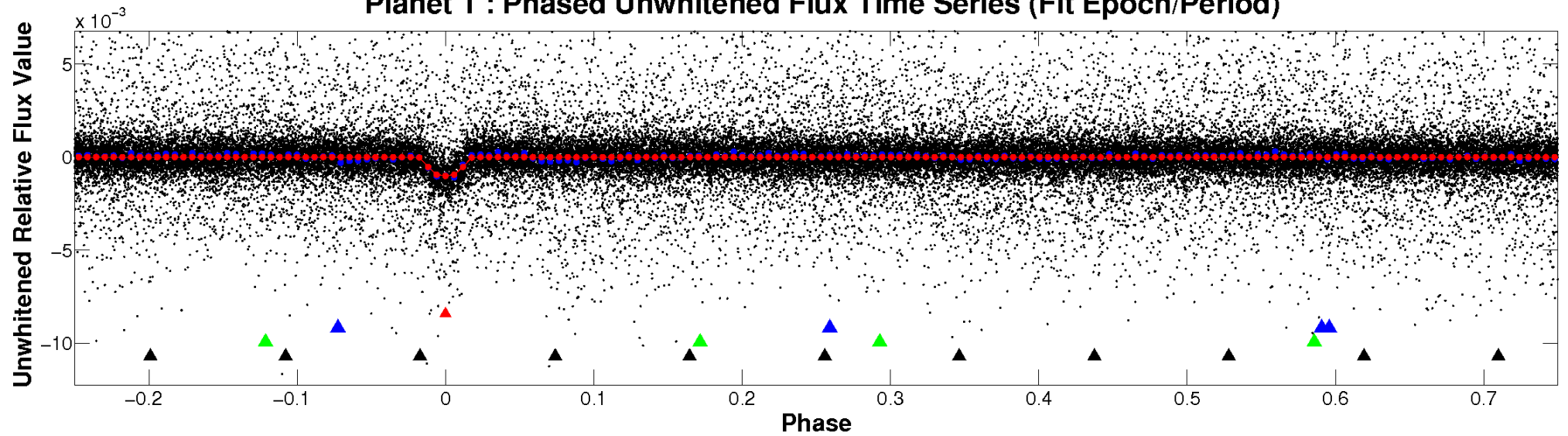
# ALT Odd/Even

TCE 011760959-01

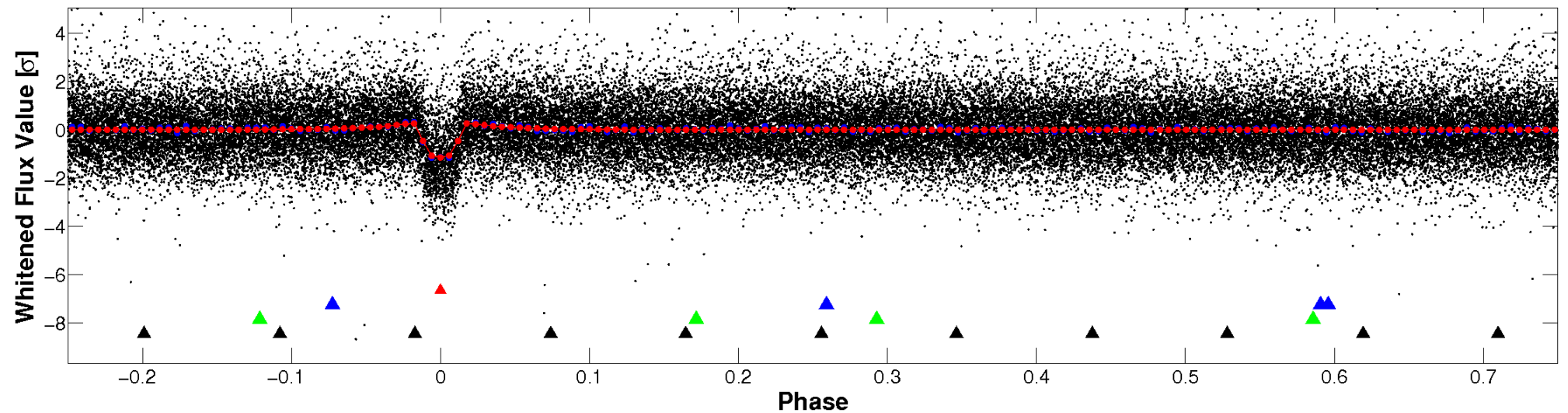


# Non-Whitened Vs. Whitened Light Curve

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

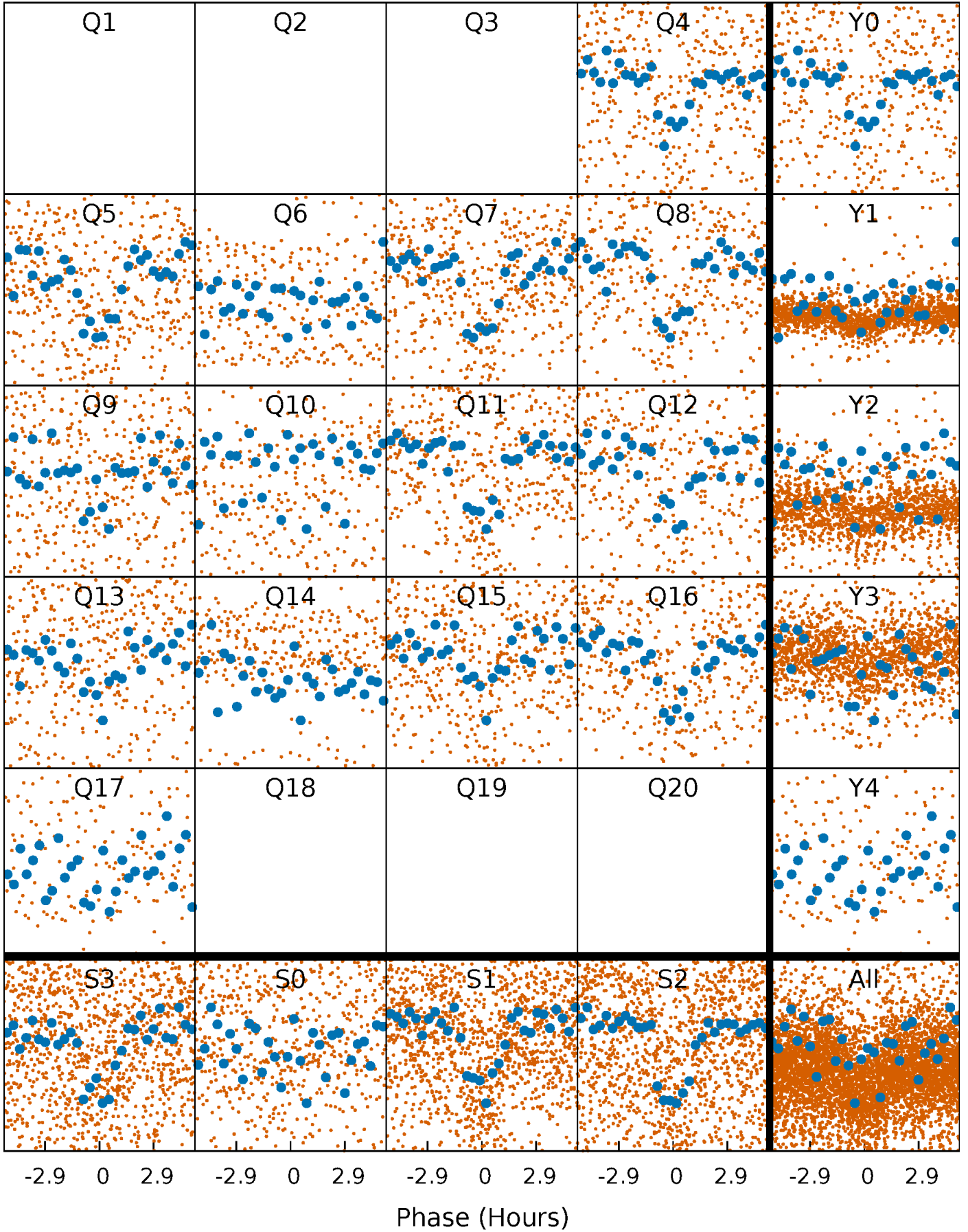


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

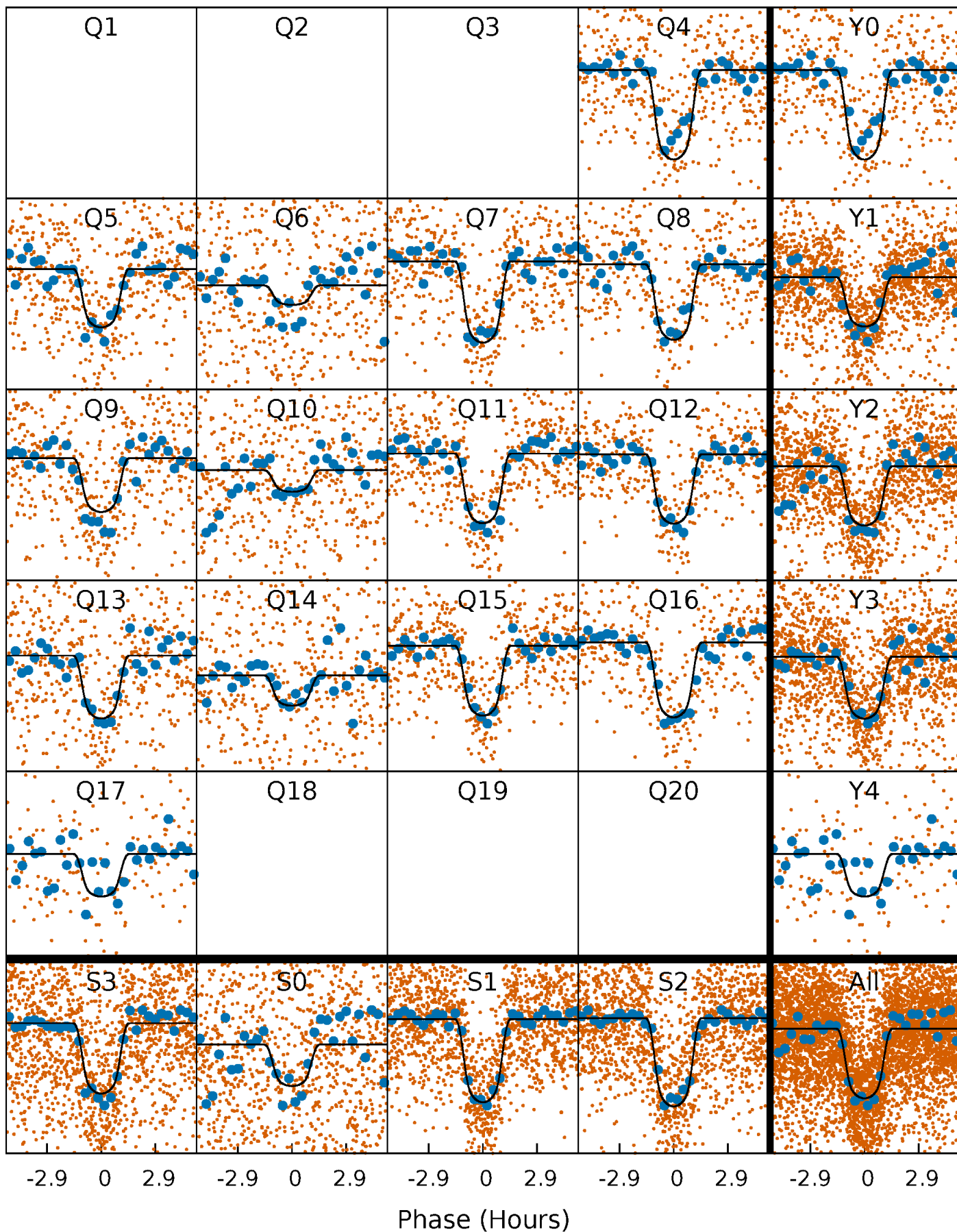
TCE 011760959-01 P= 3.470177 Days  $T_0=134.013741$  (BKJD)





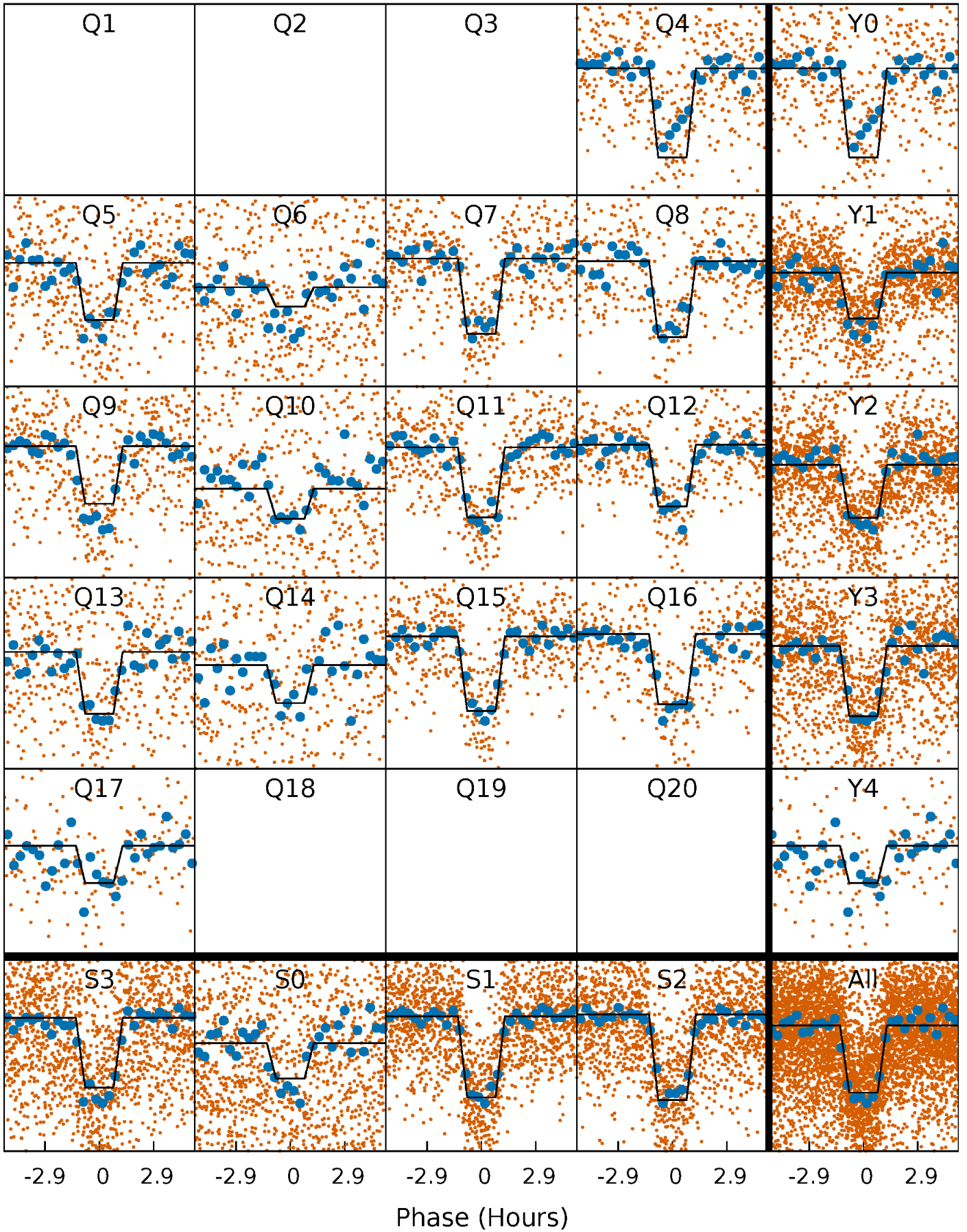
# DV Quarter-Phased Transit Curves

TCE 011760959-01 P= 3.470177 Days  $T_0=134.013741$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

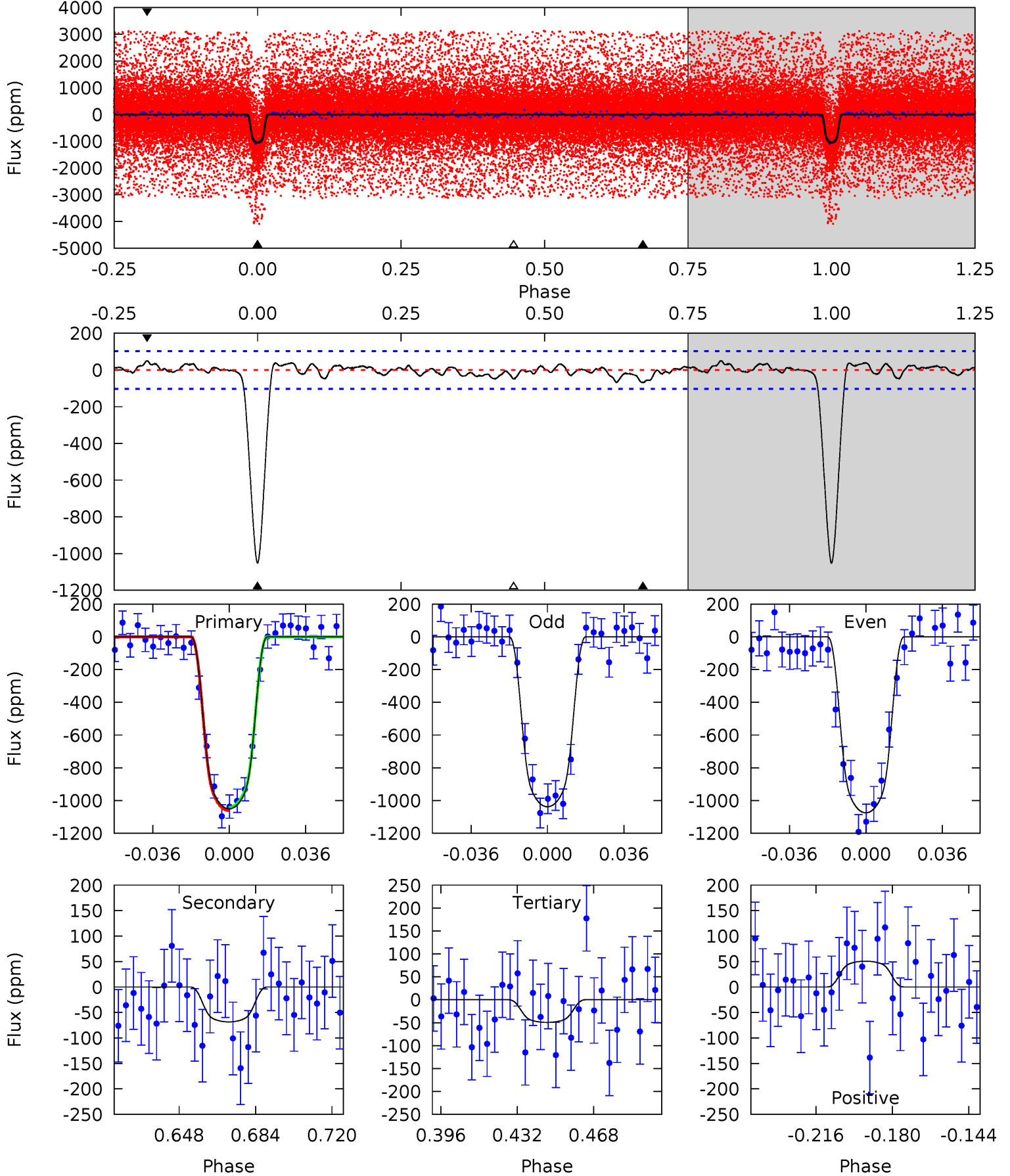
TCE 011760959-01 P= 3.470182 Days  $T_0=134.013172$  (BKJD)



# DV Model-Shift Uniqueness Test

011760959-01, P = 3.470177 Days, E = 134.013741 Days

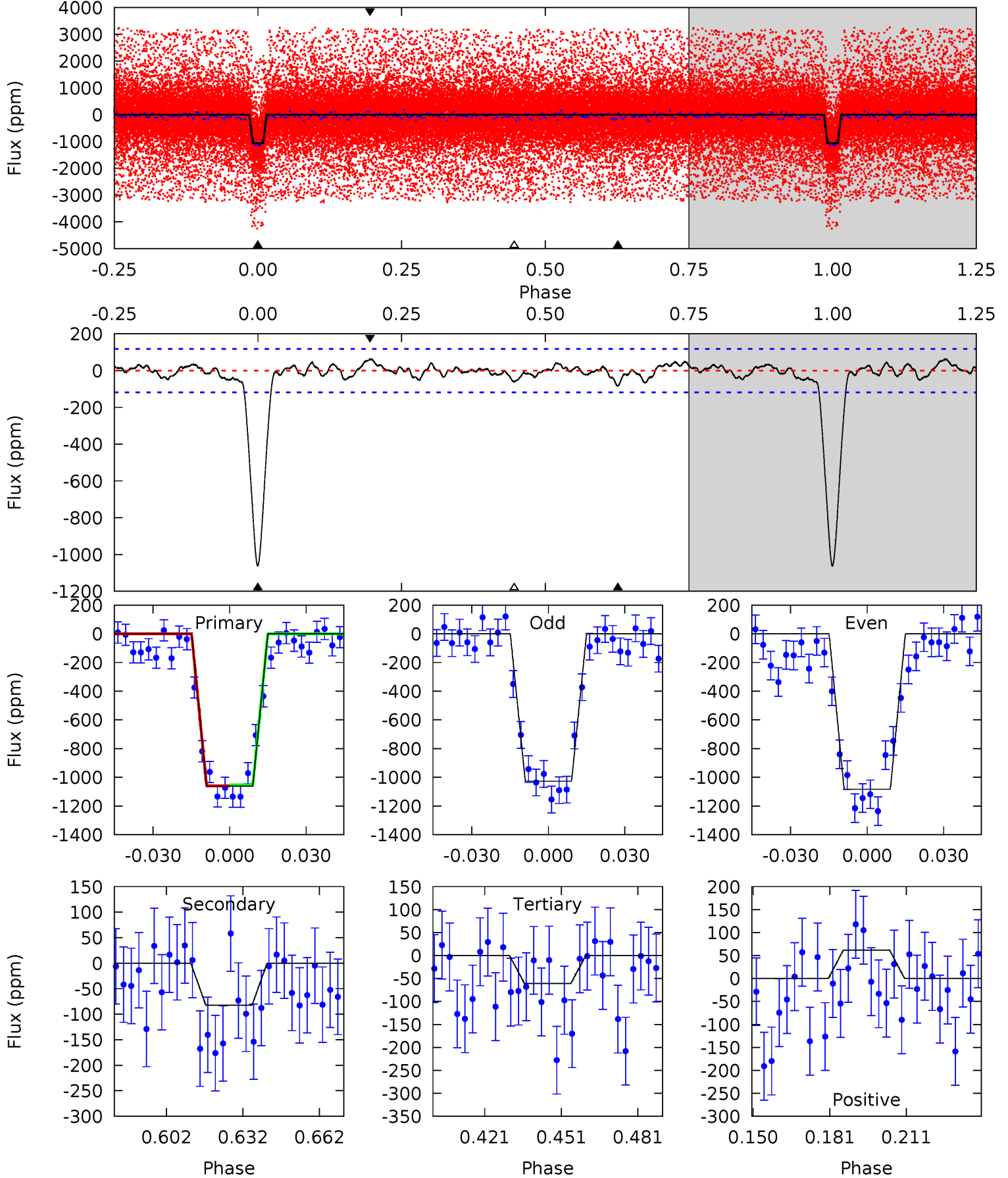
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
48.9	3.19	2.30	2.36	4.77	2.10	0.99	46.6	46.6	0.89	0.83	0.88	1.05	0.05	0.44



# Alt Model-Shift Uniqueness Test

011760959-01, P = 3.470182 Days, E = 134.013172 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
43.2	3.35	2.49	2.52	4.81	2.17	1.06	40.7	40.7	0.86	0.83	1.18	1.05	0.06	0.14





### Stellar Parameters For KIC 011760959

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4922^{+176}_{-176}$	$4.555^{+0.066}_{-0.044}$	$-0.120^{+0.300}_{-0.300}$	$0.744^{+0.065}_{-0.072}$	$0.726^{+0.093}_{-0.057}$	$2.479^{+0.736}_{-0.394}$
	+4%/-4%	+1%/-1%	+250%/-250%	+9%/-10%	+13%/-8%	+30%/-16%
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 011760959-01 / KOI 1484.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-69 \pm 21$	$2.89^{+0.29}_{-0.25}$	$1302^{+57}_{-51}$	$2980^{+162}_{-185}$	$7.450^{+2.998}_{-2.576}$
Alt.	$-82 \pm 25$	$2.59^{+0.26}_{-0.23}$	$1302^{+50}_{-56}$	$3150^{+170}_{-175}$	$11^{+4}_{-4}$

$T_{\text{max}}$  = 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

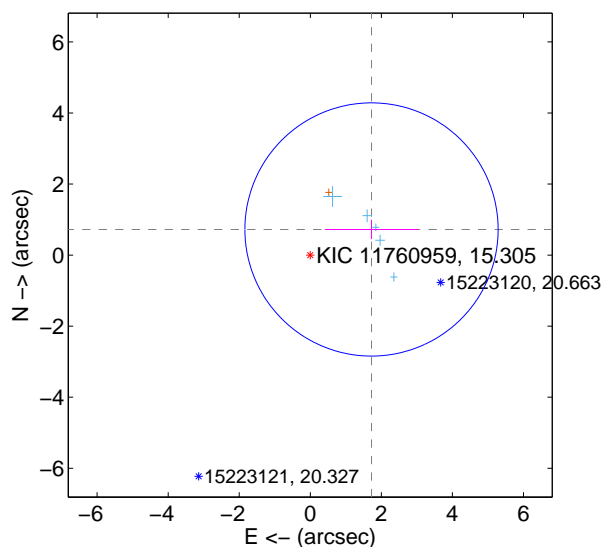
Supplemental centroid analysis for 011760959-01. Kepler magnitude: 15.30. Transit SNR 41.21

There are 6 quarters with good PRF difference image offsets

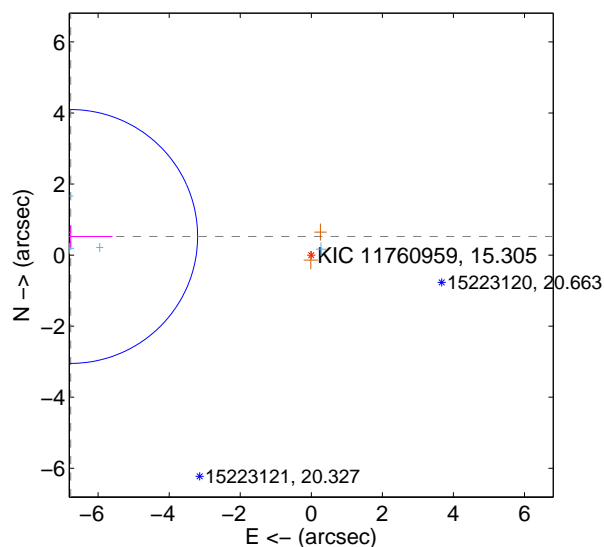
The OOT PRF centroid is offset from the target star catalog position by about 8.78 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.868 \pm 1.188$	1.57	$-1.723 \pm 1.313$	$0.721 \pm 0.273$
PRF-fit source offset from KIC position	$6.793 \pm 1.191$	5.70	$6.773 \pm 1.180$	$0.524 \pm 0.307$
photometric centroid source offset	$5.58 \pm 0.03$	170.94	$5.56 \pm 0.03$	$-0.50 \pm 0.03$

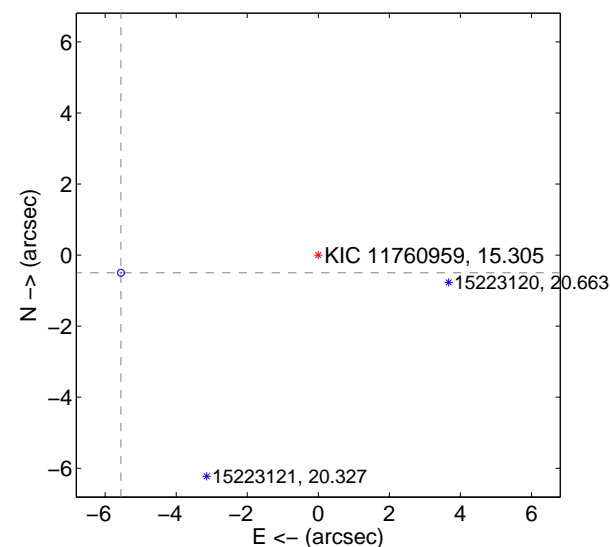
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

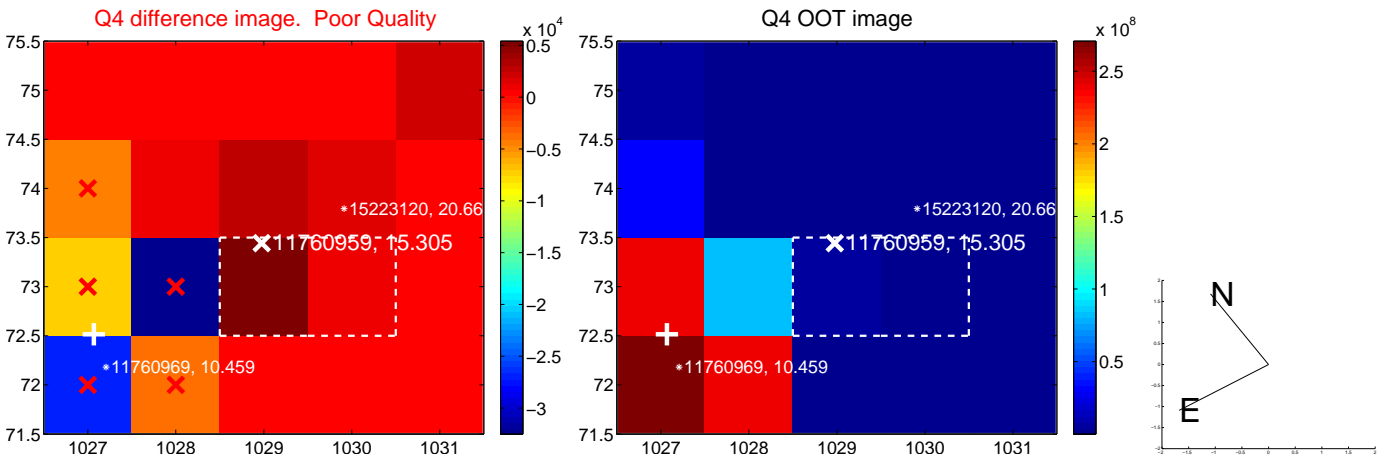
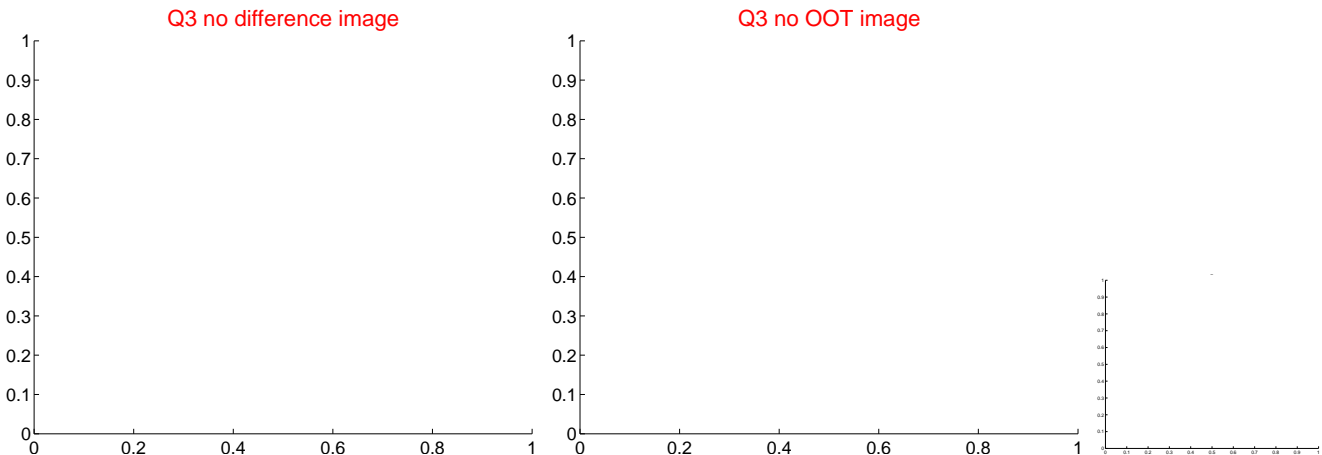
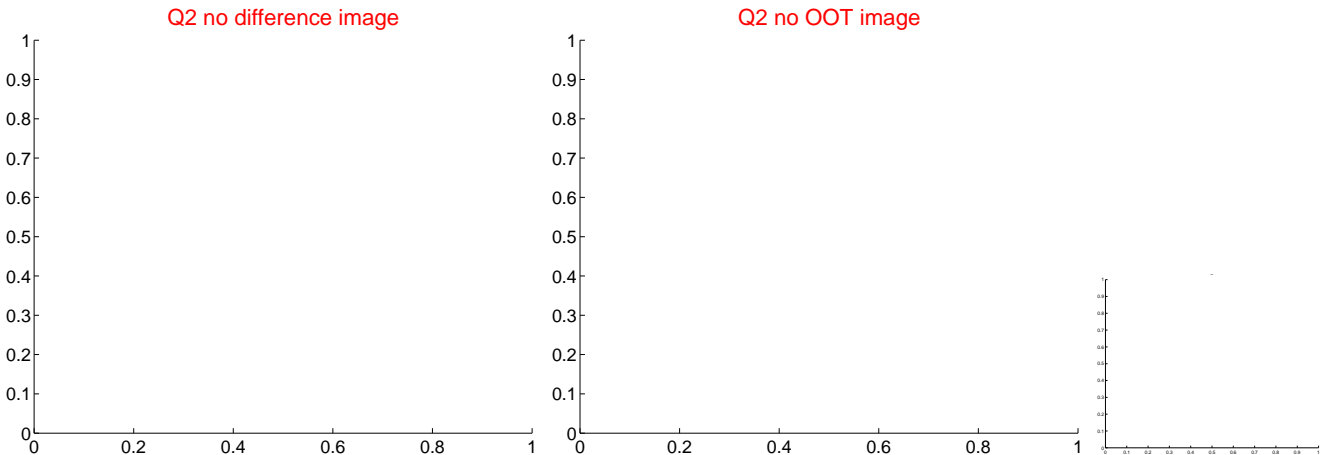
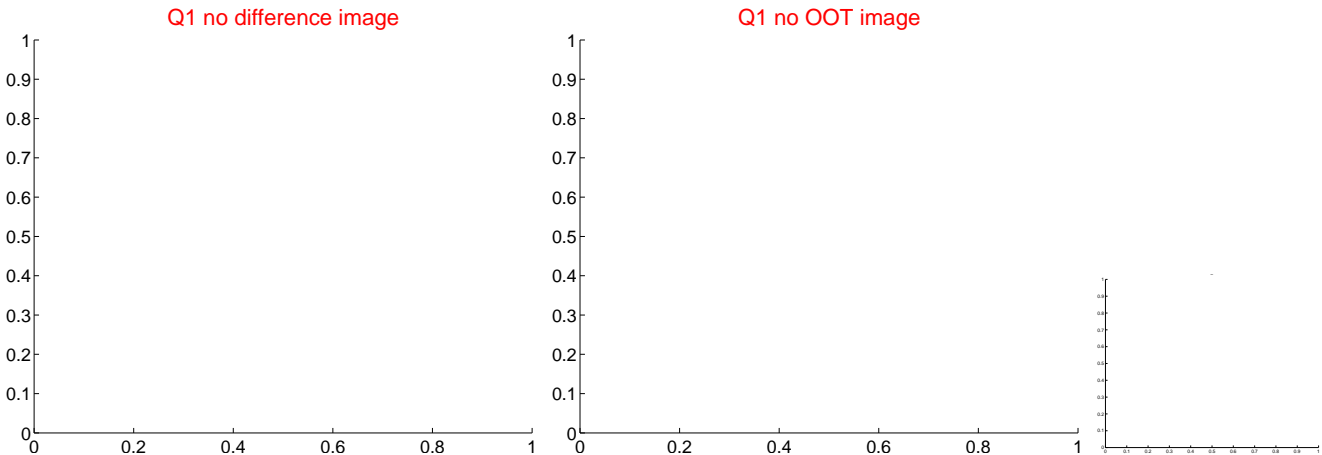


offset from photometric centroids

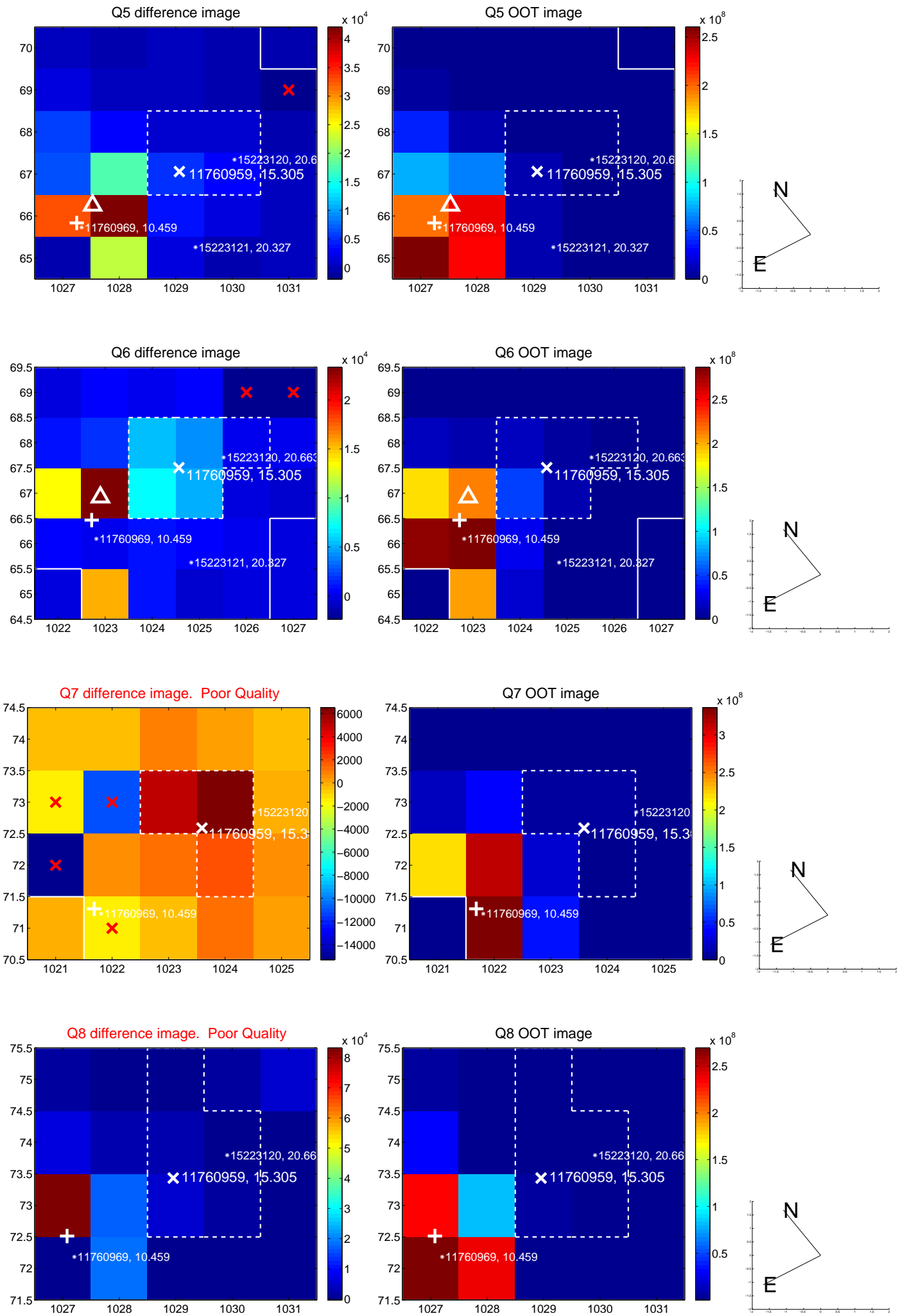


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

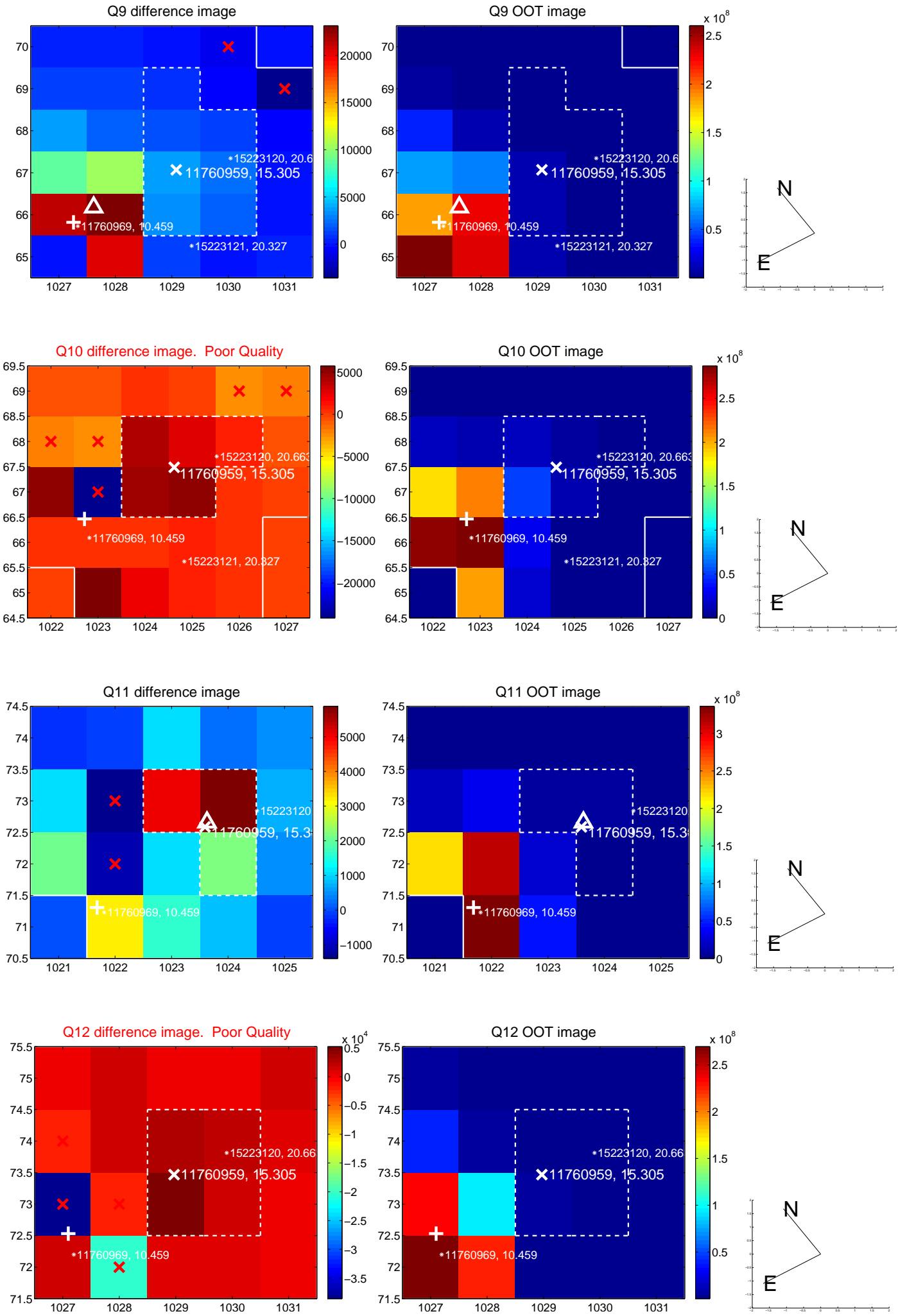


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

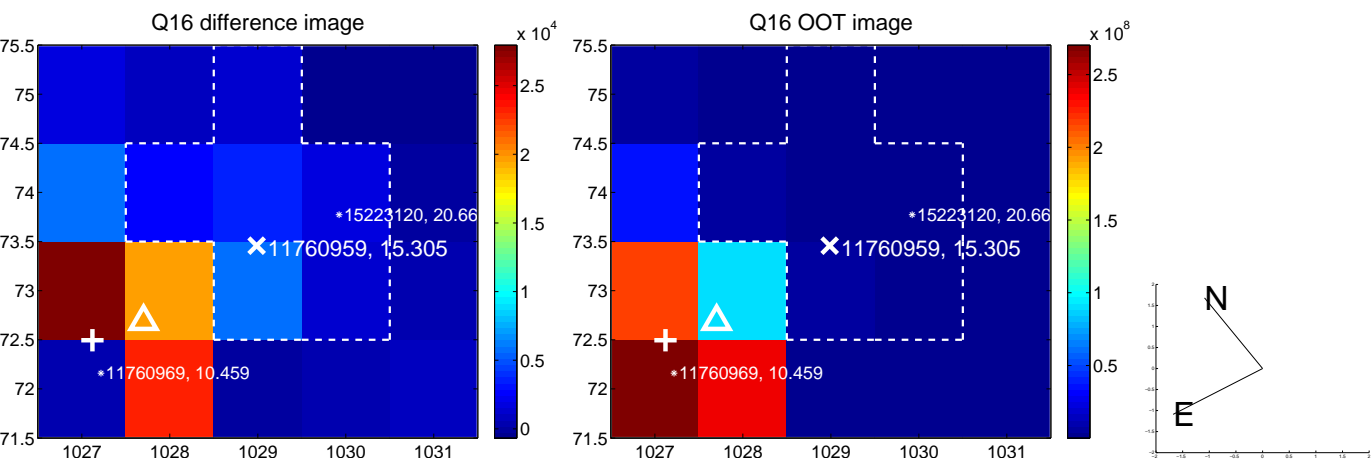
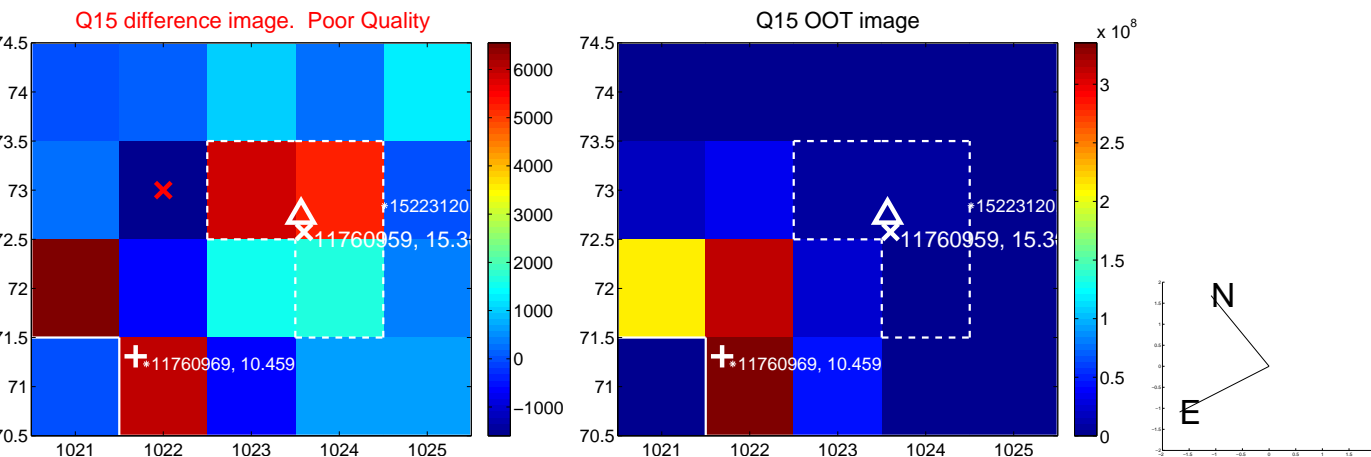
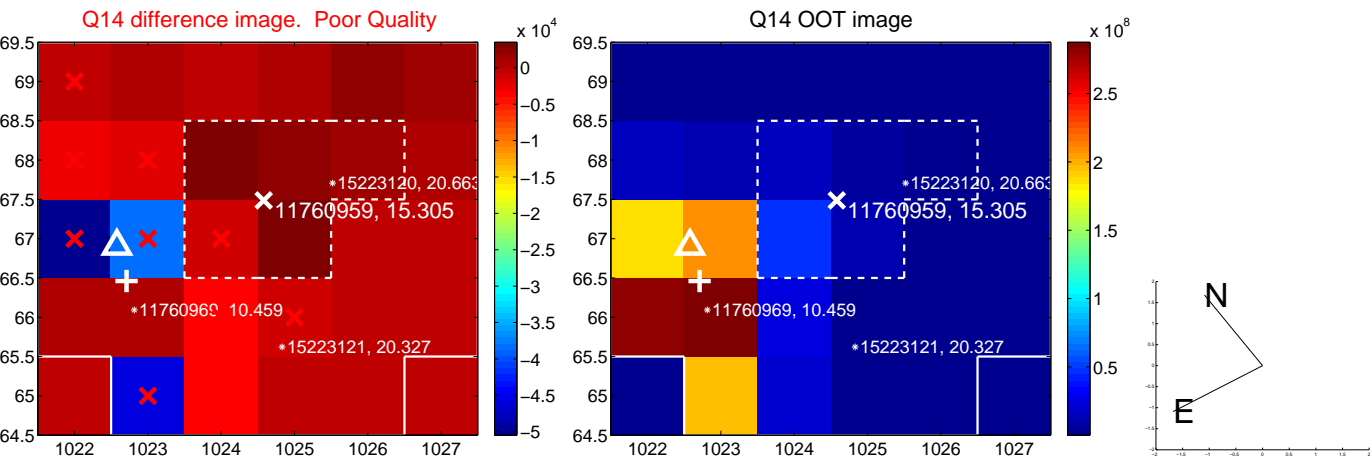
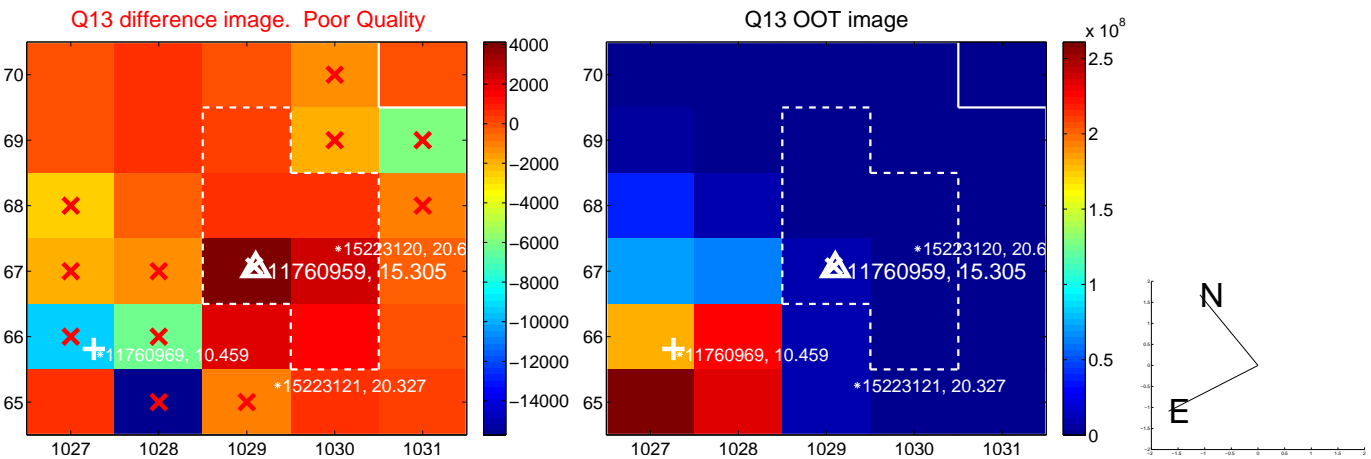




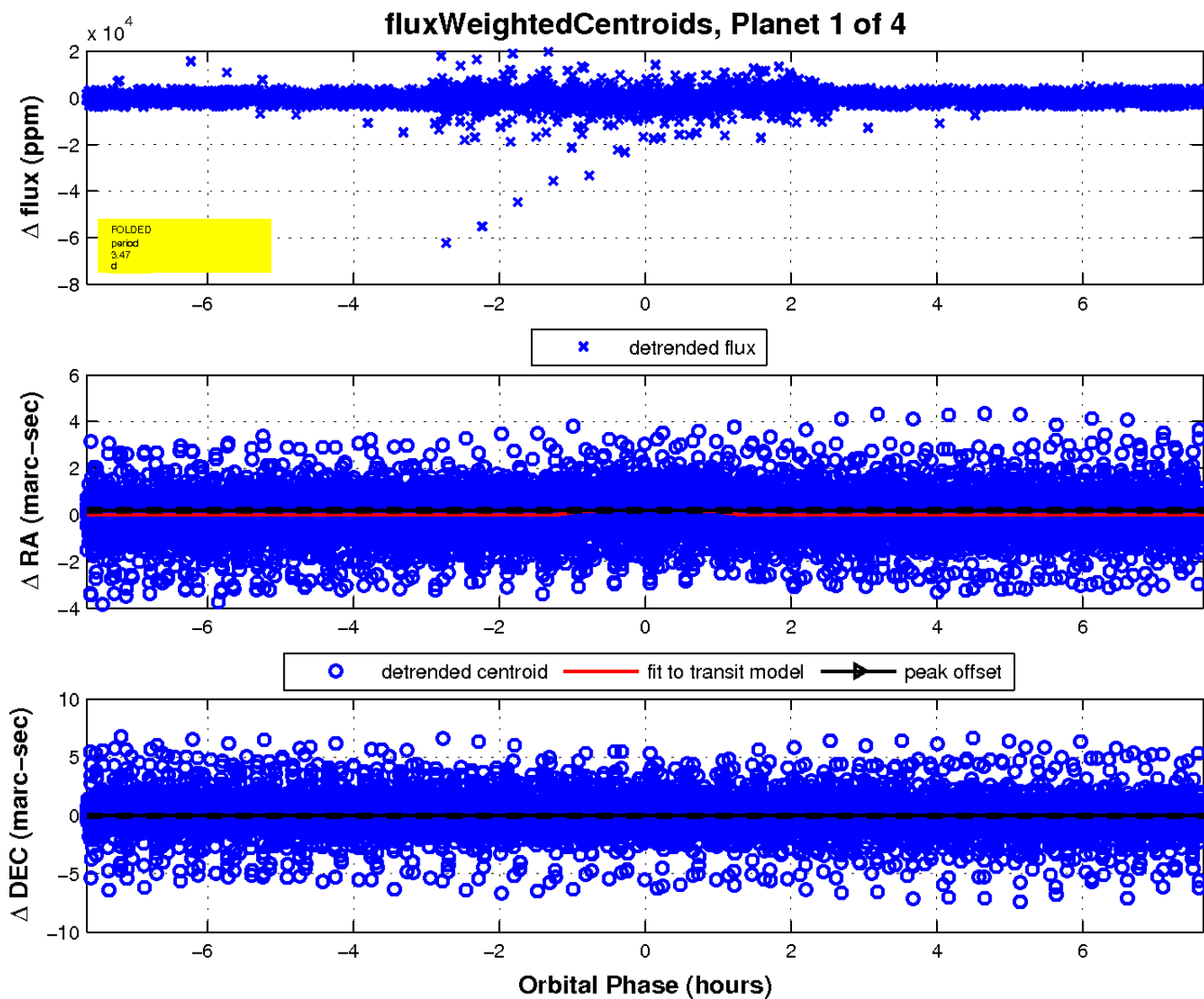
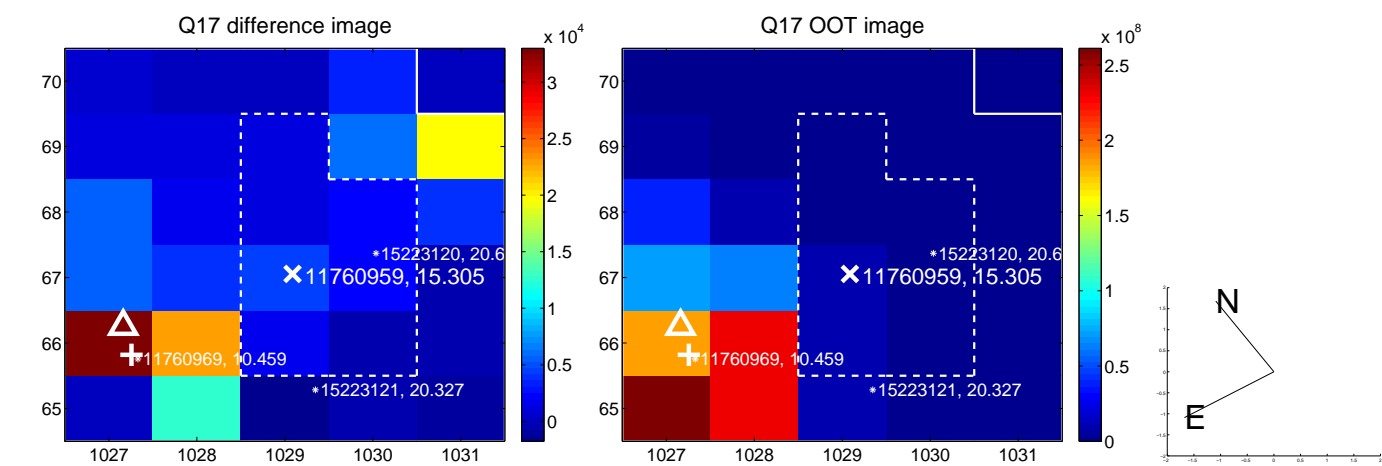
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



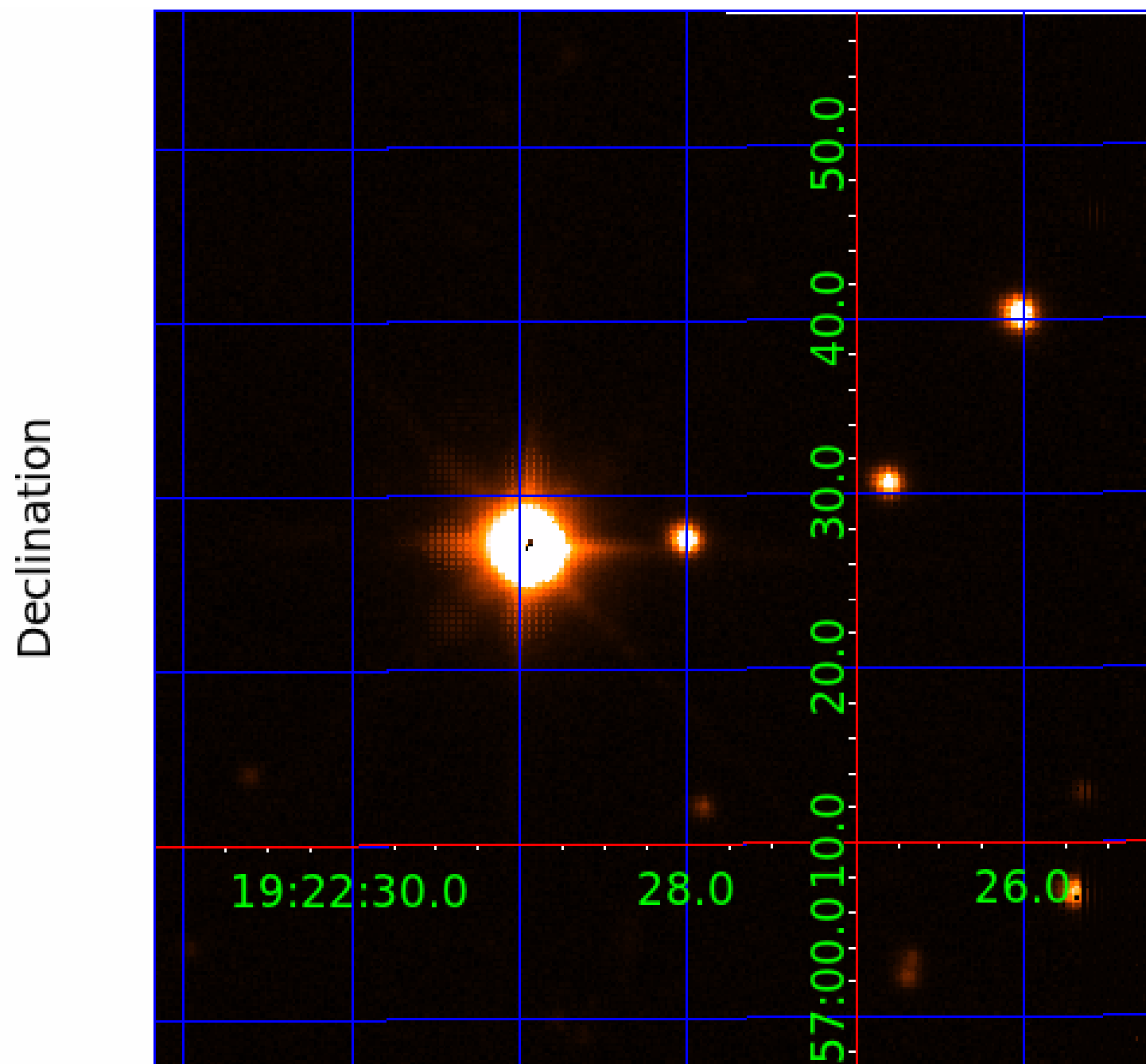
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 011760959

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011760959-01	OBS	1484.01	3.470177	134.013741	1014.1	2.554	37.1	41.2	0.74	4922	2.90	179.22
011760959-02	OBS	No	368.989557	215.895597	5535.7	5.148	12.4	6.4	0.74	4922	5.42	0.36
011760959-03	OBS	No	467.457322	158.900681	3615.3	8.110	10.2	10.4	0.74	4922	4.50	0.26
011760959-04	OBS	No	127.765806	202.410414	1648.8	18.806	8.3	8.3	0.74	4922	2.99	1.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011760959-01	OBS	FP	0.13	0	0	1	0	CENT_RESOLVED_OFFSET
011760959-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011760959-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011760959-04	OBS	FP	0.03	1	0	0	0	MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

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

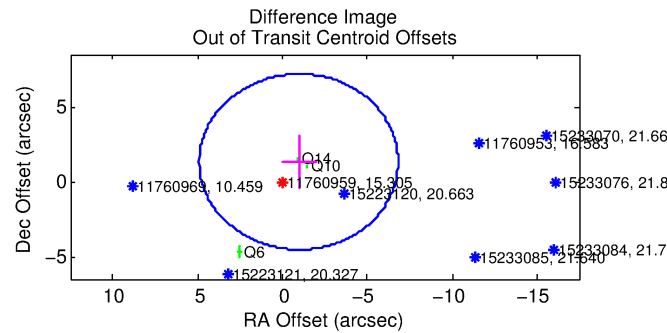
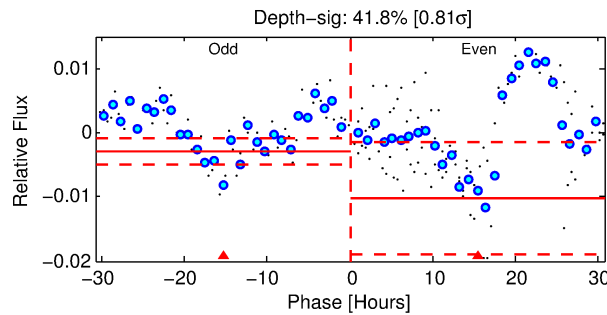
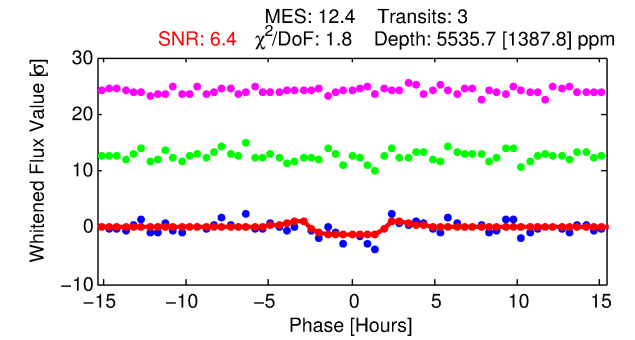
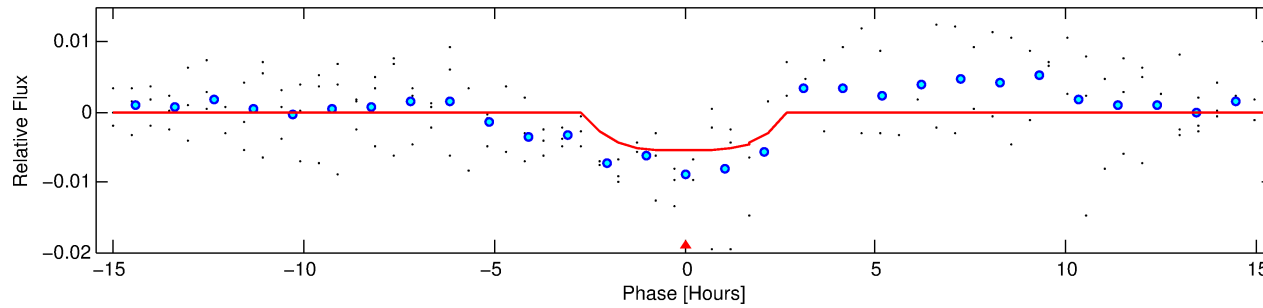
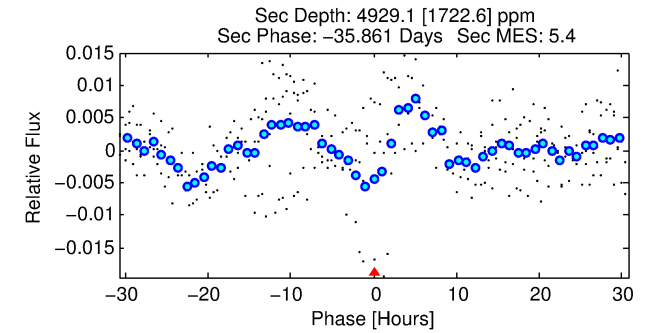
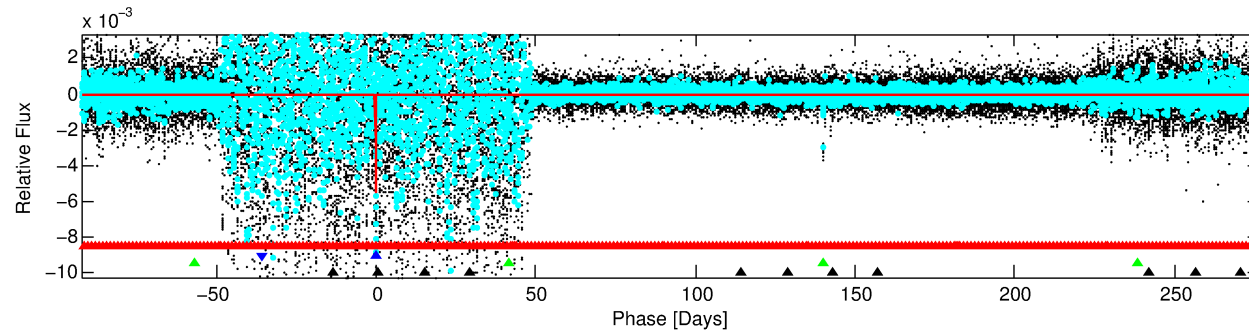
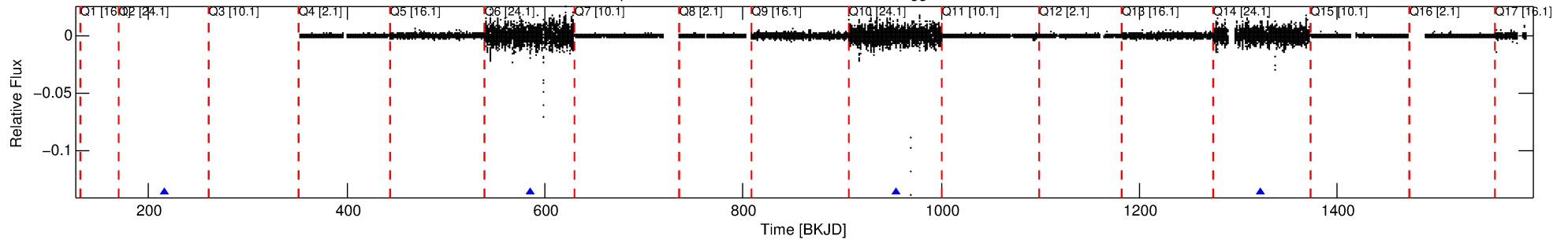
## Ephemeris Match Information For 011760959-02

No Significant Match Found

# DV One-Page Summary

KIC: 11760959 Candidate: 2 of 4 Period: 368.990 d  
KOI: K01484 Corr: No Ephemeris Match

Kp: 15.31 R\*: 0.74 Rs Teff: 4922.0 K Logg: 4.55 Fe/H: -0.120



## DV Fit Results:

Period = 368.98956 [0.01092] d  
Epoch = 215.8956 [0.0251] BKJD  
Rp/R\* = 0.0668 [0.0820]  
a/R\* = 563.16 [2214.50]  
b = 0.28 [12.87]  
Seff = 0.36 [0.07]  
Teq = 197 [9] K  
Rp = 5.42 [6.68] Re  
a = 0.9045 [0.0742] AU  
Ag = 75470.87 [187364.87] [0.40σ]  
Teffp = 5047 [3134] K [1.55σ]

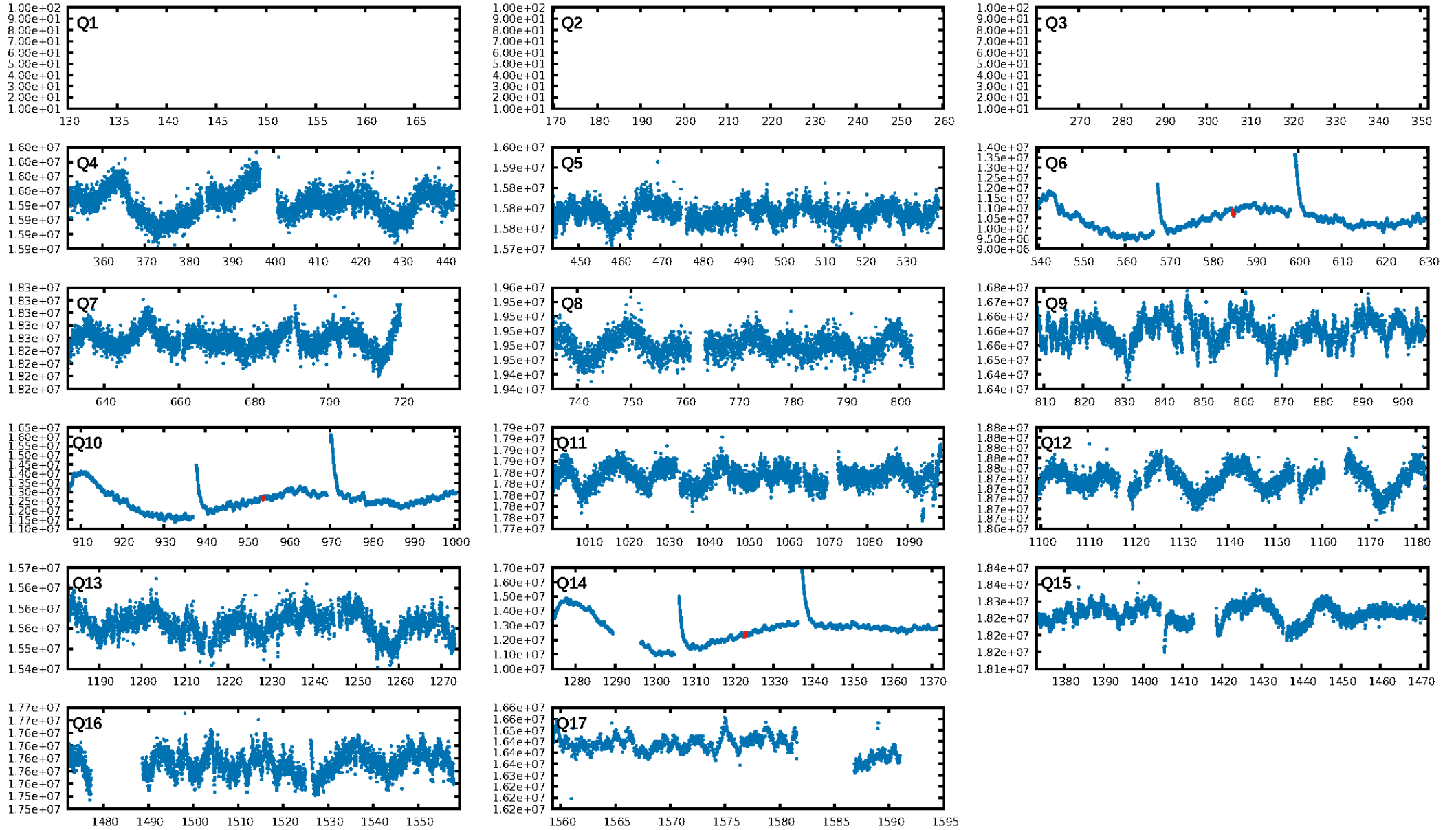
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [296.93σ]  
LongPeriod-sig: 100.0% [246.03σ]  
ModelChiSquare2-sig: 63.3%  
ModelChiSquareGof-sig: 48.7%  
Bootstrap-pfa: 4.16e-13  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -0.4796  
Centroid-sig: 25.3%  
Centroid-so: 5.690 arcsec [84.11σ]  
OotOffset-rm: 1.636 arcsec [0.84σ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-rm: 7.777 arcsec [11.55σ]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.67 [2/3]

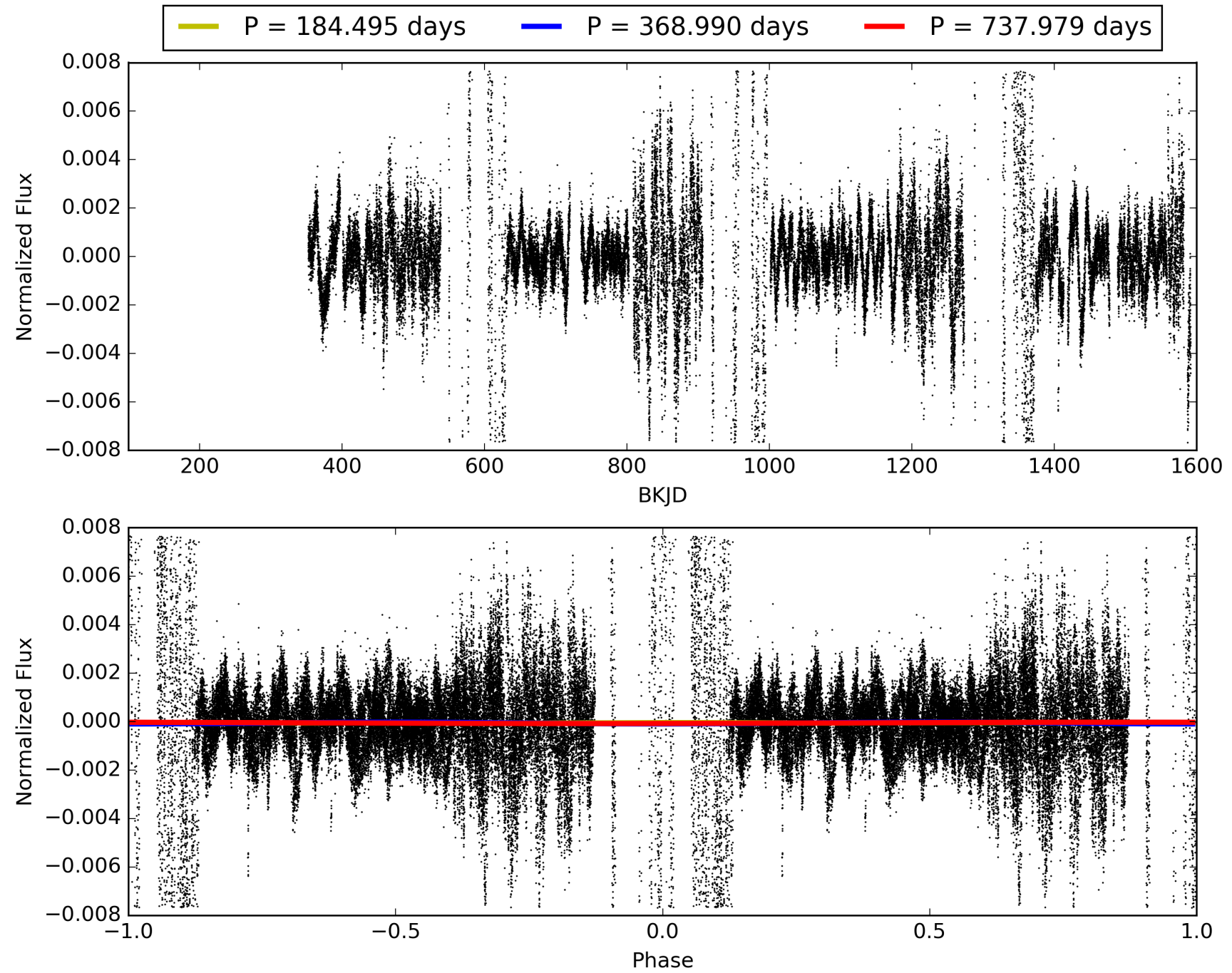
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 21:14:51 Z

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

# TCE 011760959-02, PDC Light Curves

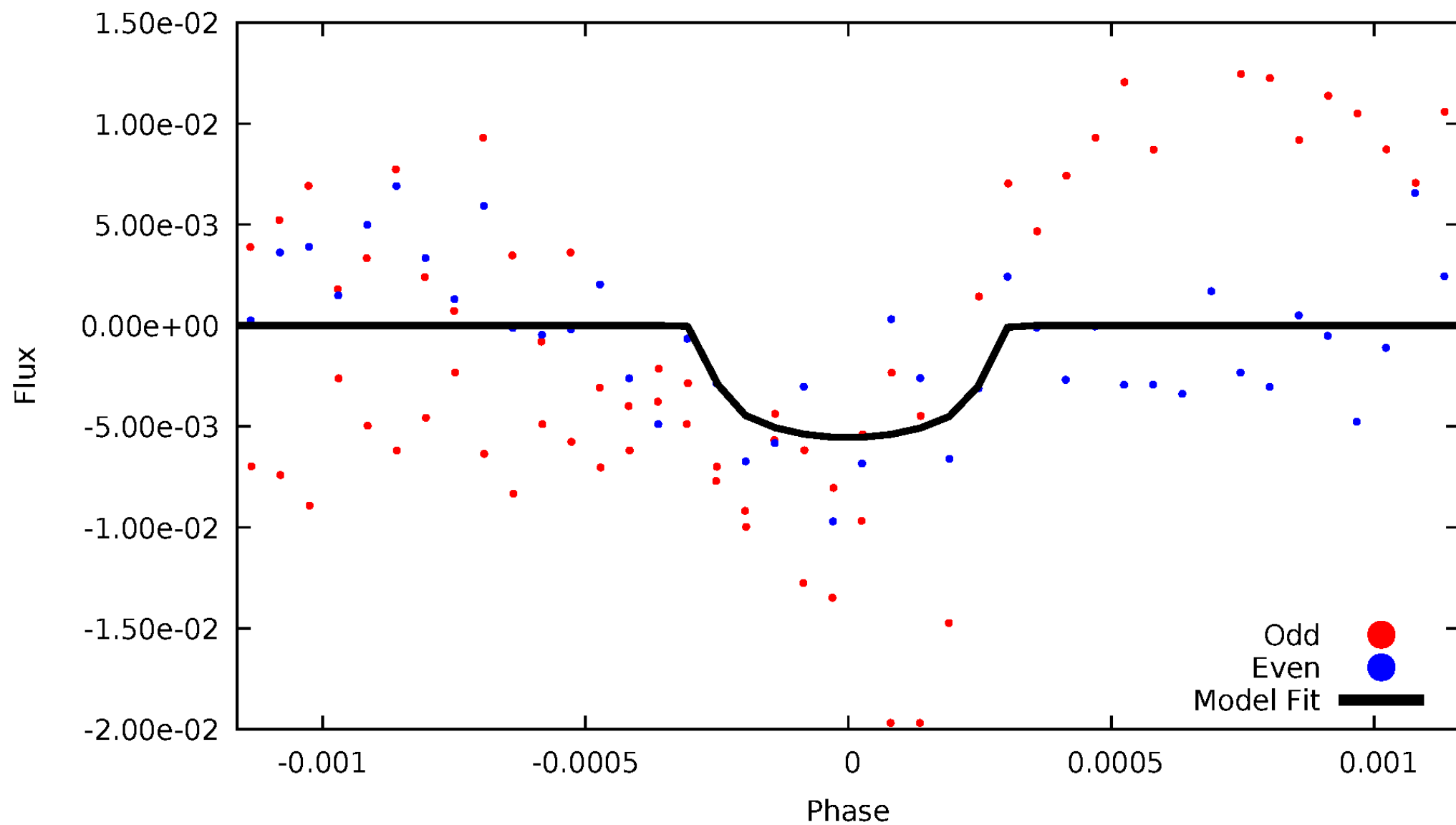


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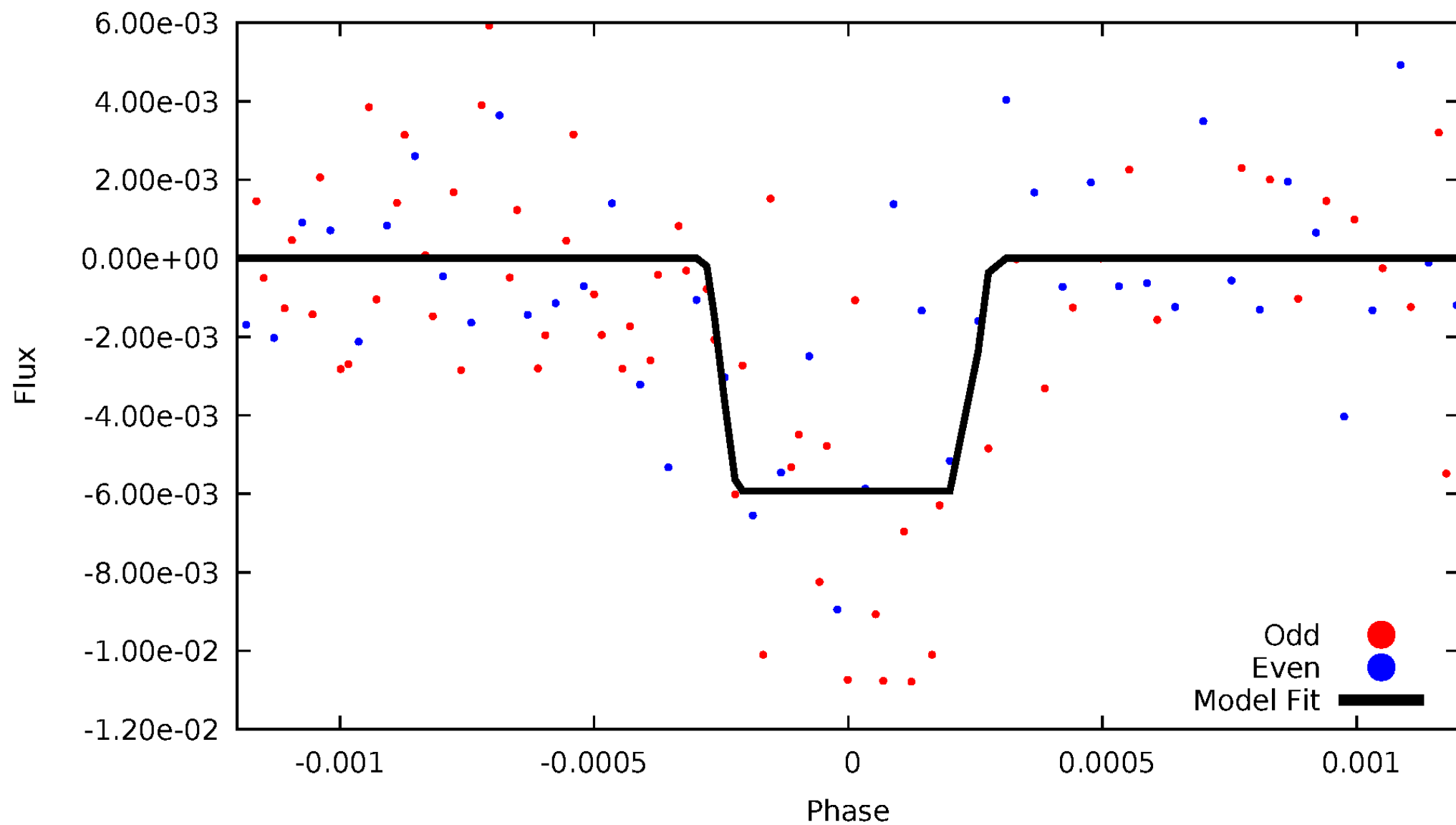
# DV Odd/Even

TCE 011760959-02



# ALT Odd/Even

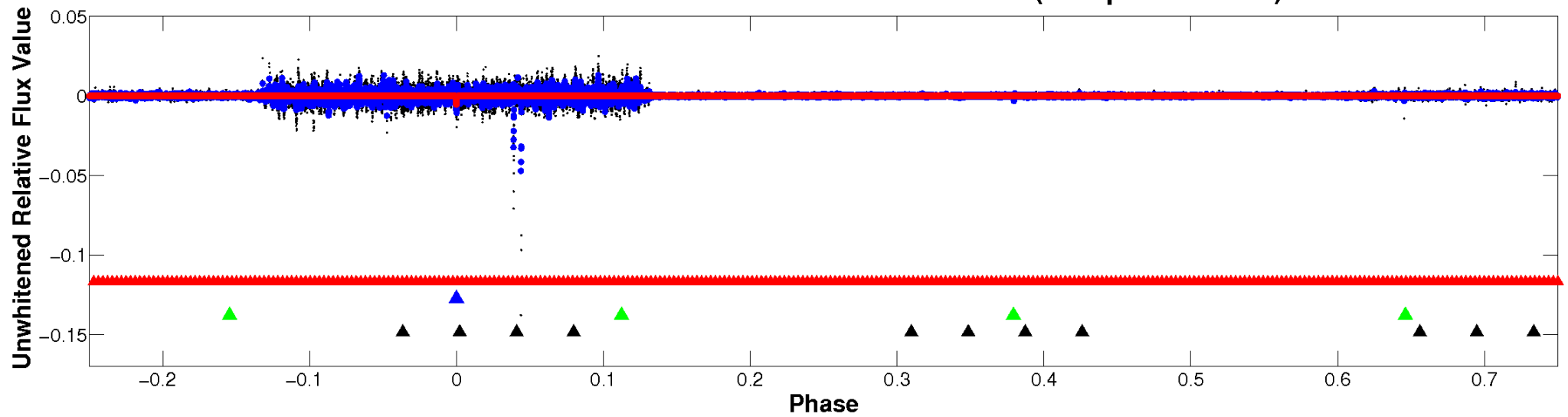
TCE 011760959-02



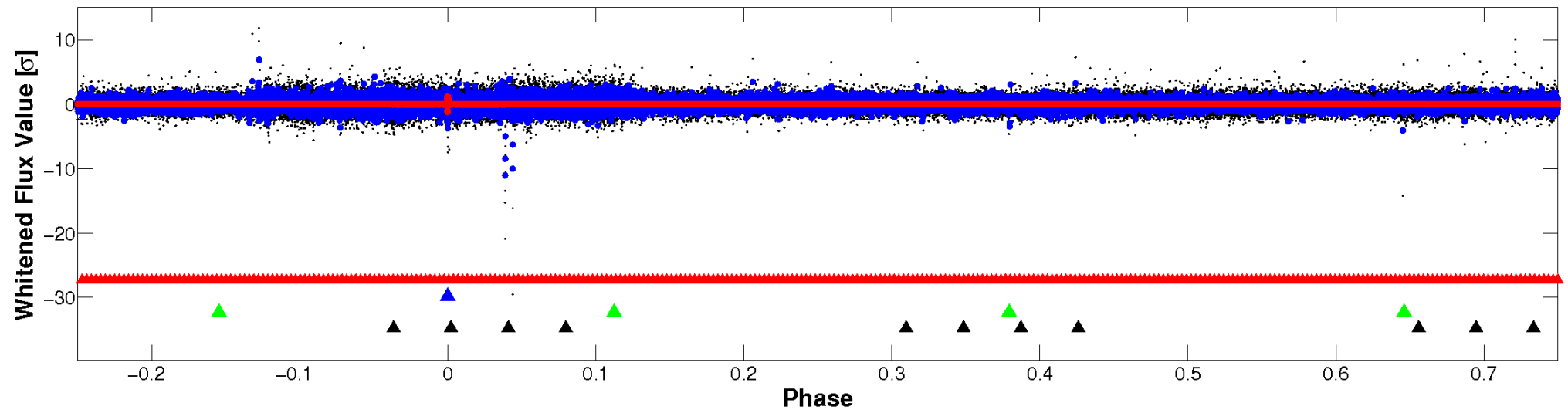


# Non-Whitened Vs. Whitened Light Curve

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

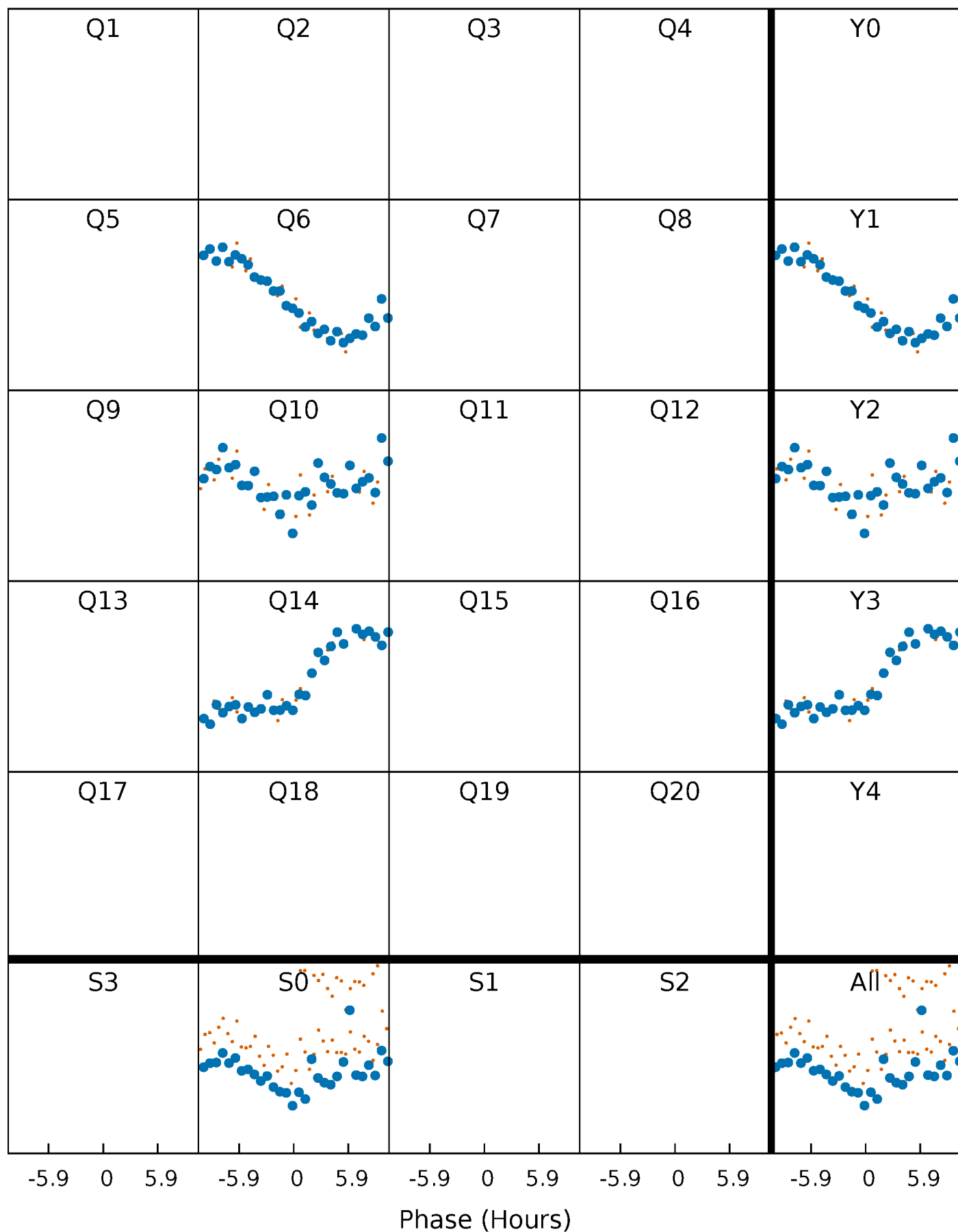


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



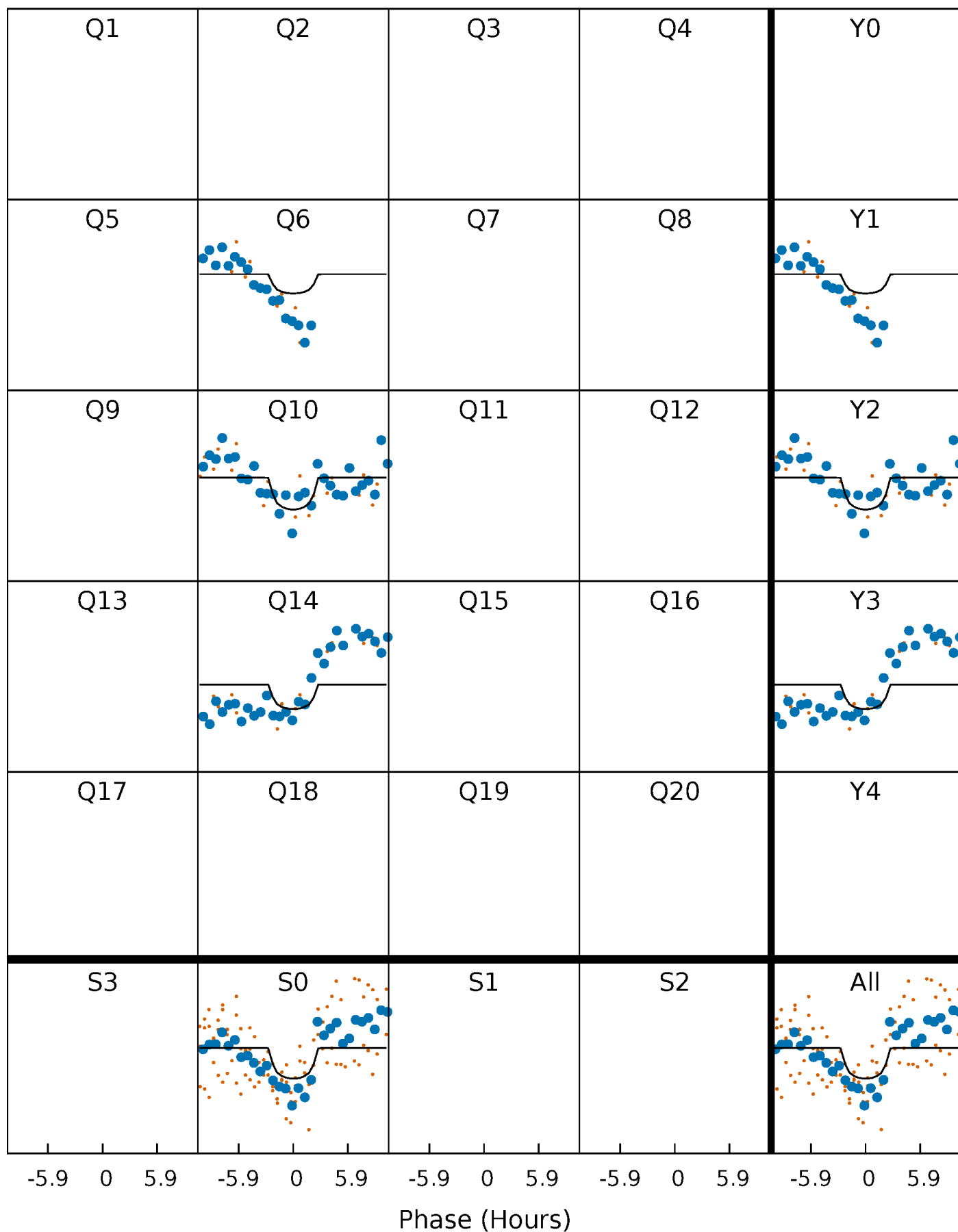
# PDC Quarter-Phased Transit Curves

TCE 011760959-02 P=368.989557 Days  $T_0=215.895597$  (BKJD)



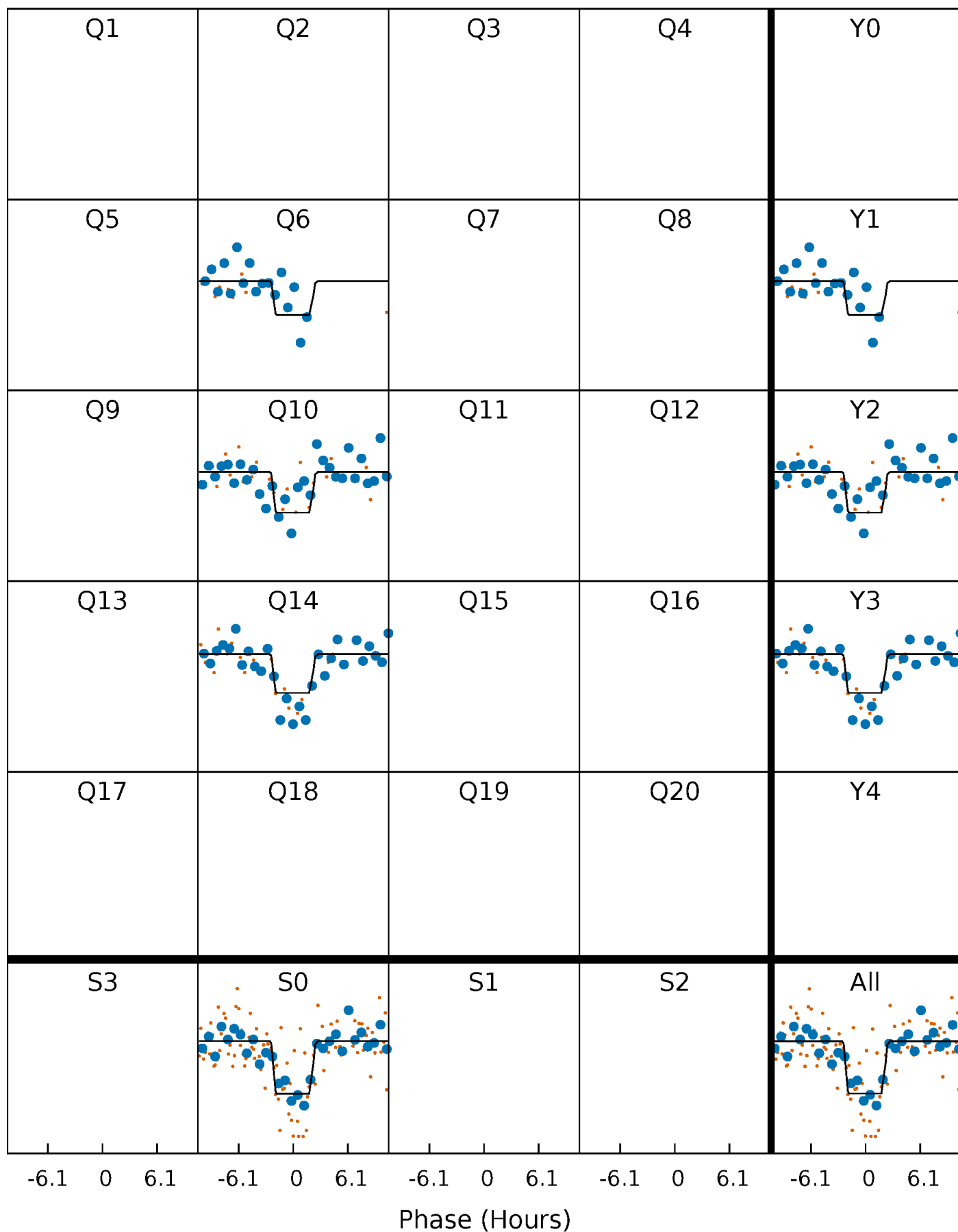
# DV Quarter-Phased Transit Curves

TCE 011760959-02     $P=368.989557$  Days     $T_0=215.895597$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

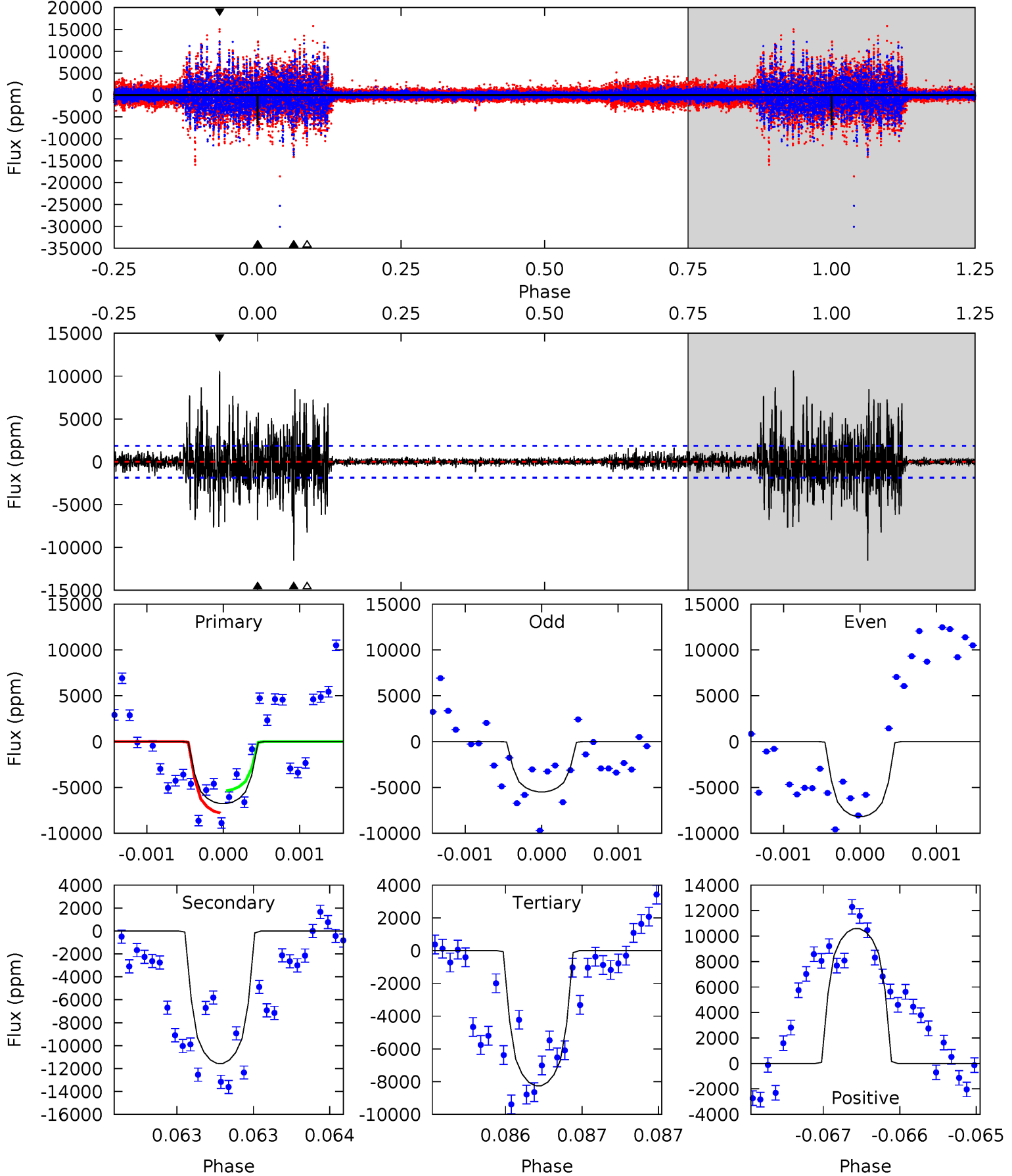
TCE 011760959-02 P=368.982415 Days  $T_0=215.907091$  (BKJD)



# DV Model-Shift Uniqueness Test

011760959-02, P = 368.989557 Days, E = 215.895597 Days

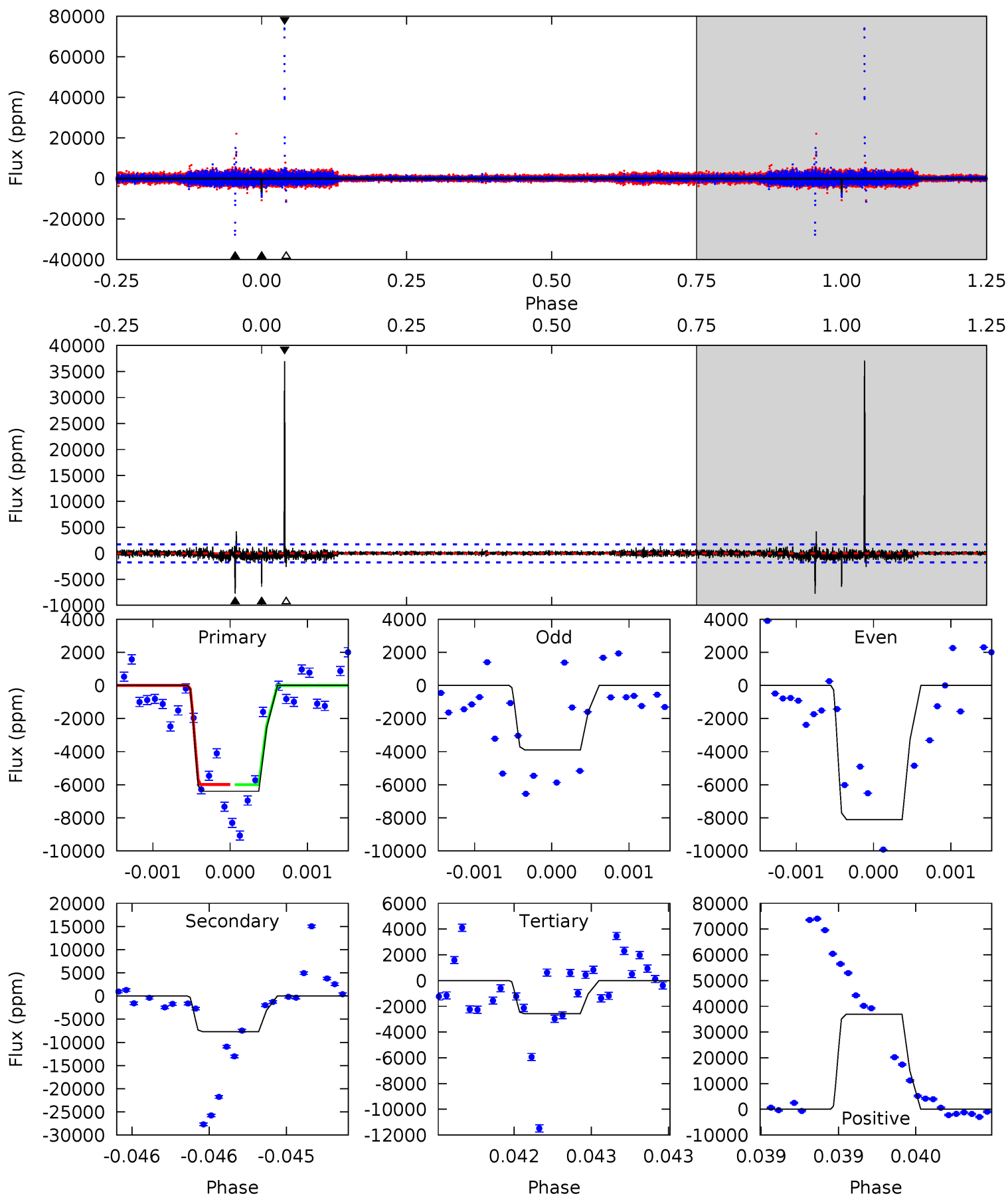
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.0	34.2	24.4	31.3	5.52	3.40	3.43	-4.39	-11.3	9.78	2.88	3.34	1.43	0.48	3.69



# Alt Model-Shift Uniqueness Test

011760959-02, P = 368.982415 Days, E = 215.907091 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
20.4	24.6	8.22	117.8	5.56	3.46	2.19	12.2	-97.4	16.4	-93.1	4.20	1.19	0.83	0.01





### Stellar Parameters For KIC 011760959

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4922^{+176}_{-176}$	$4.555^{+0.066}_{-0.044}$	$-0.120^{+0.300}_{-0.300}$	$0.744^{+0.065}_{-0.072}$	$0.726^{+0.093}_{-0.057}$	$2.479^{+0.736}_{-0.394}$
	+4%/-4%	+1%/-1%	+250%/-250%	+9%/-10%	+13%/-8%	+30%/-16%
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 011760959-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-11556 \pm 338$	$7.41^{+5.52}_{-4.57}$	$274^{+11}_{-11}$	$5294^{+3574}_{-1069}$	$98976^{+542325}_{-67547}$
Alt.	$-7720 \pm 314$	$7.59^{+6.04}_{-4.60}$	$274^{+12}_{-11}$	$4818^{+2794}_{-930}$	$61758^{+326107}_{-42574}$

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

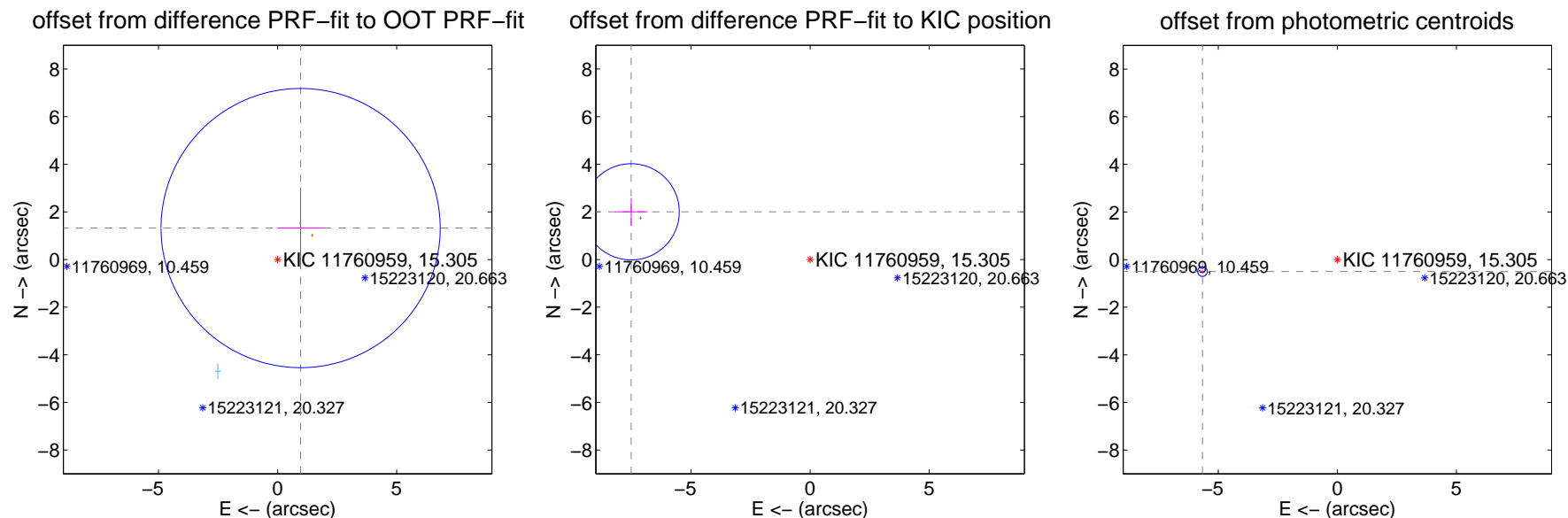
## DV Centroid Data

Supplemental centroid analysis for 011760959-02. Kepler magnitude: 15.30. Transit SNR 6.38

There are 2 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 8.49 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	$1.636 \pm 1.954$	0.84	$-0.967 \pm 0.993$	$1.320 \pm 1.701$
PRF-fit source offset from KIC position	$7.777 \pm 0.674$	11.55	$7.515 \pm 0.680$	$2.003 \pm 0.582$
photometric centroid source offset	$5.69 \pm 0.07$	84.11	$5.67 \pm 0.07$	$-0.50 \pm 0.06$



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

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



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

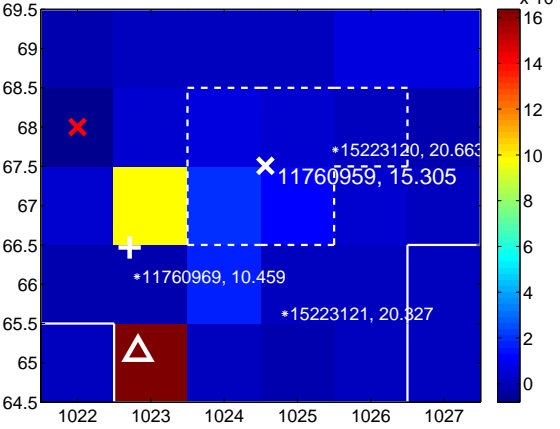
Q5 no difference image



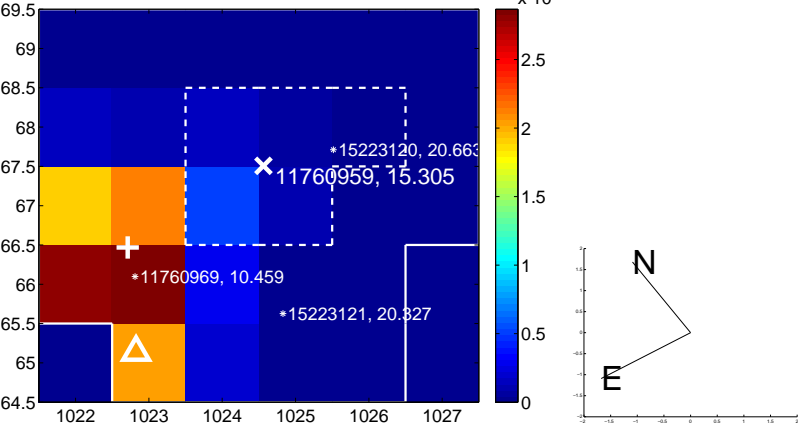
Q5 no OOT image



Q6 difference image



Q6 OOT image



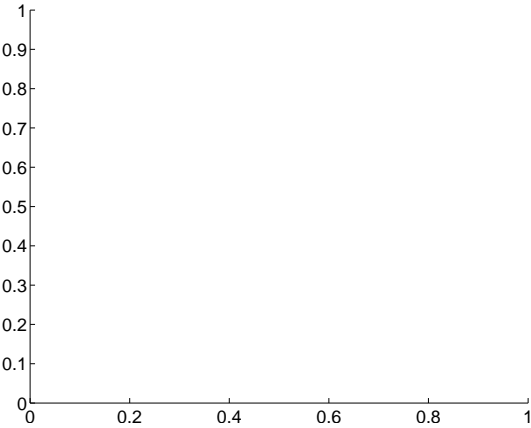
Q7 no difference image



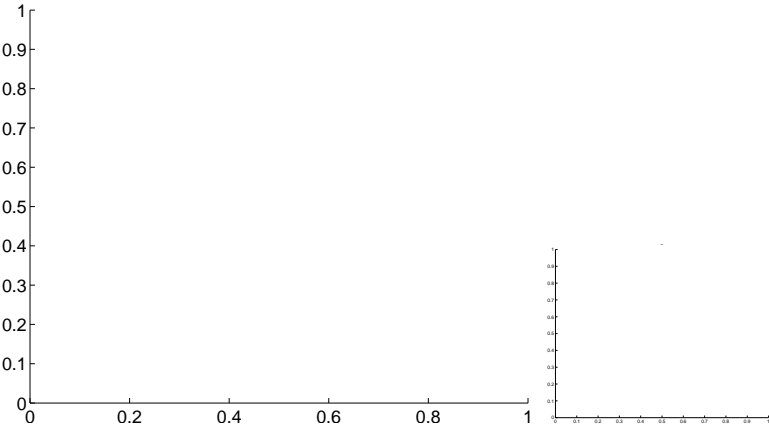
Q7 no OOT image



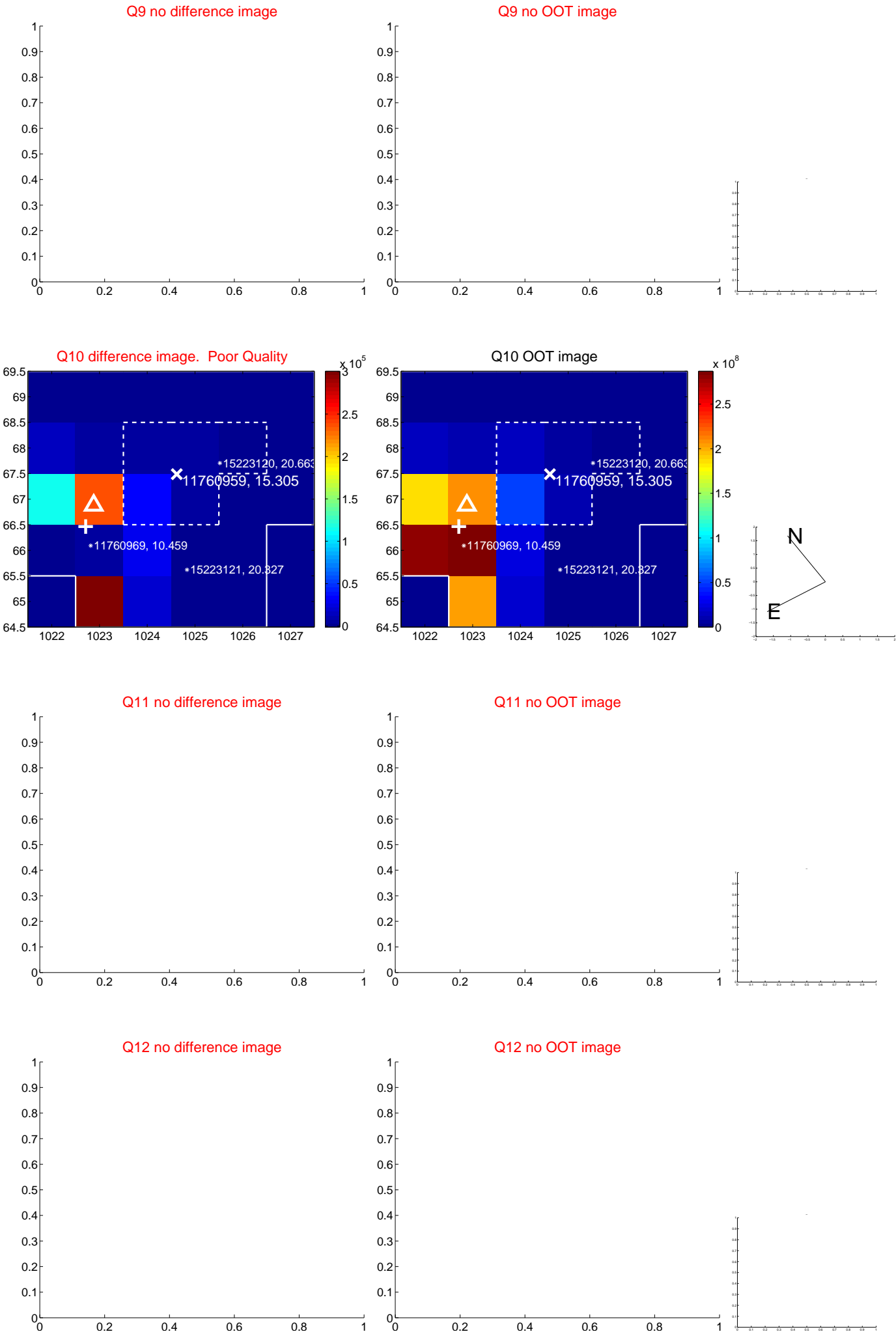
Q8 no difference image



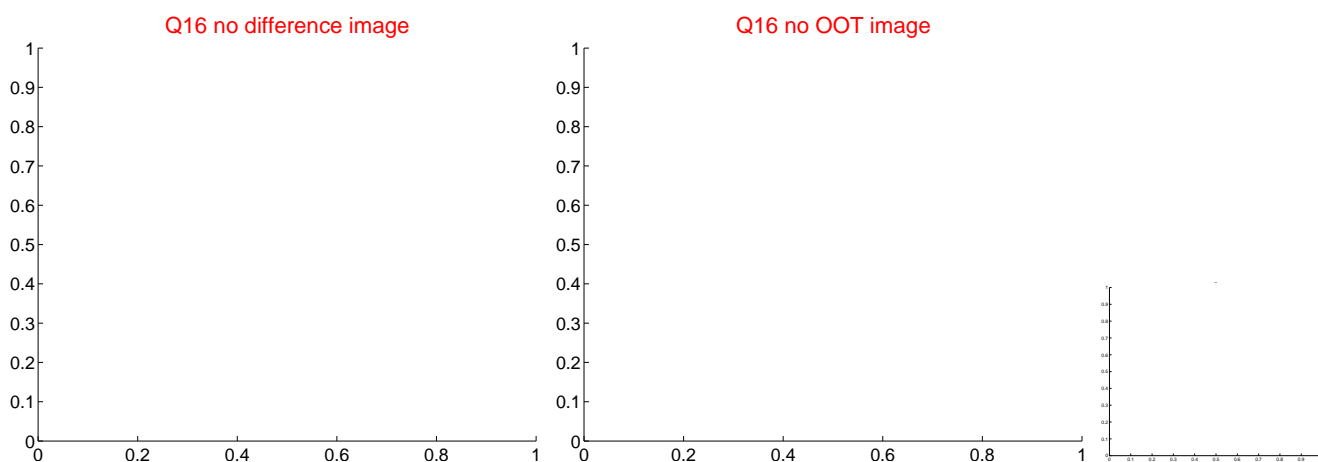
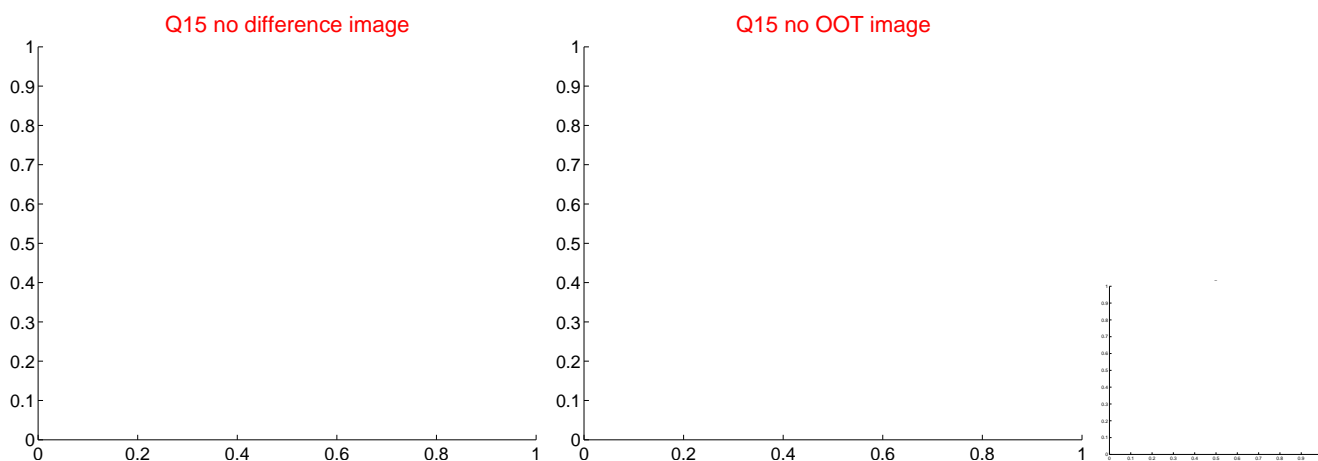
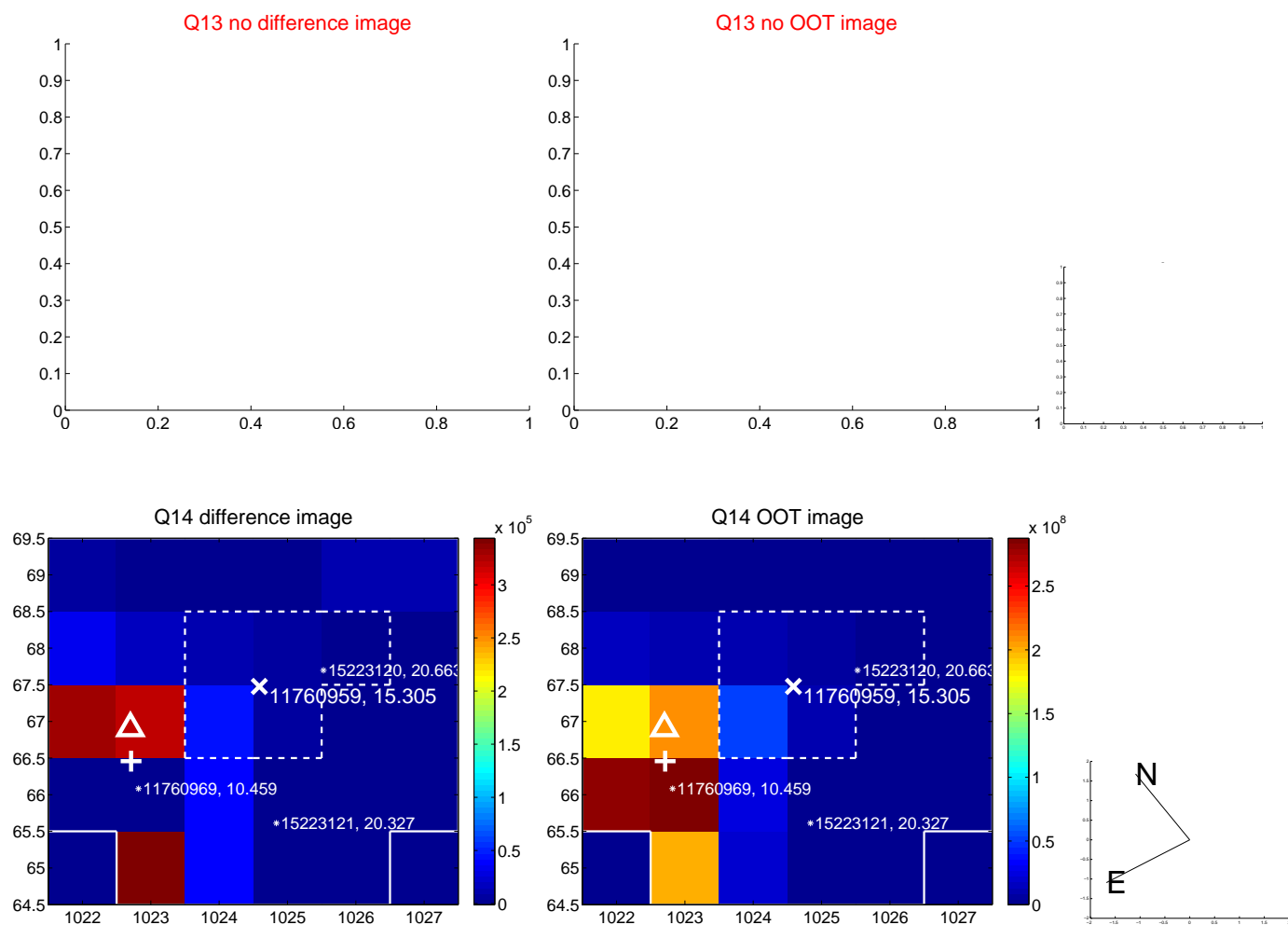
Q8 no OOT image



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

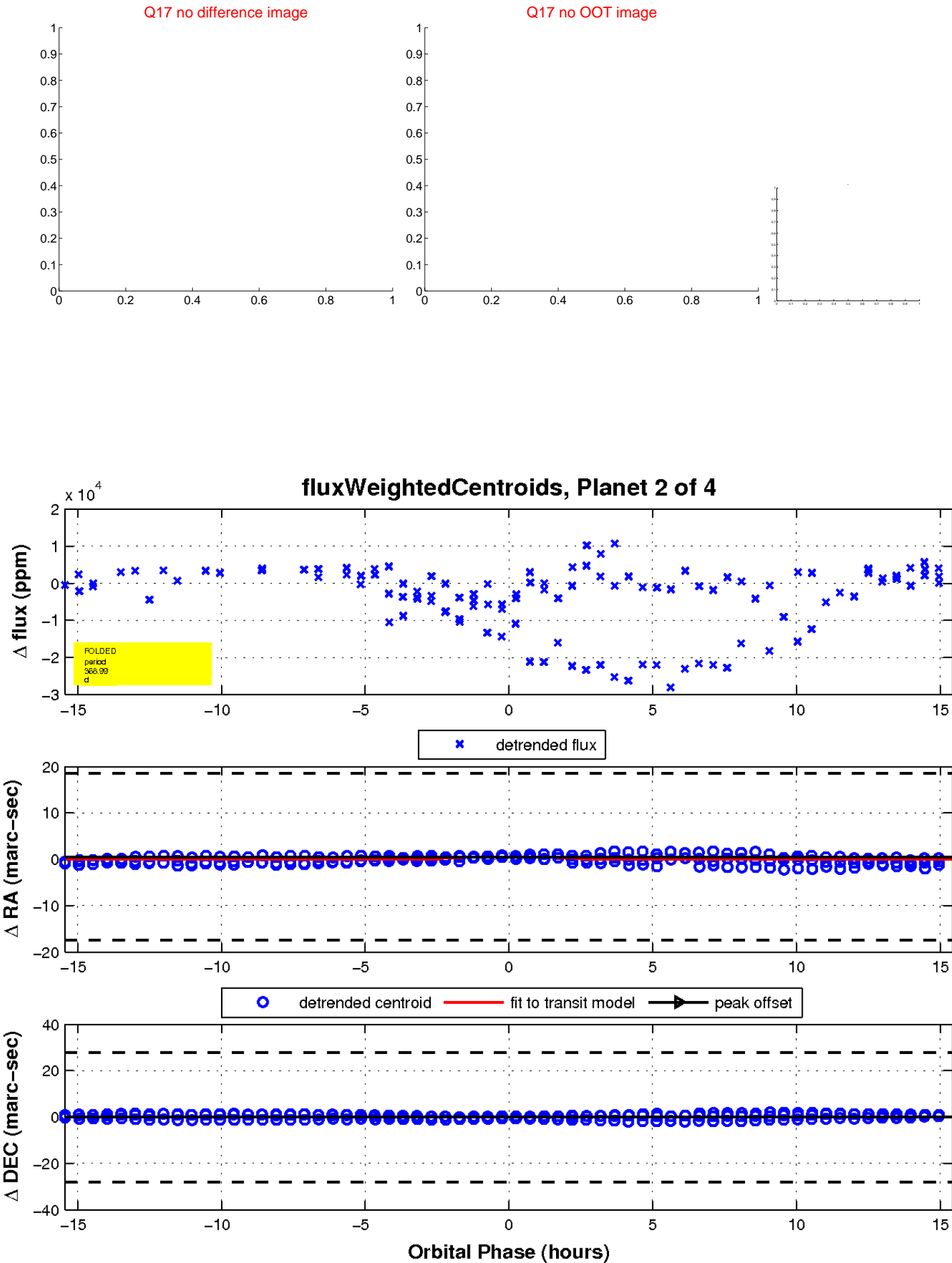


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

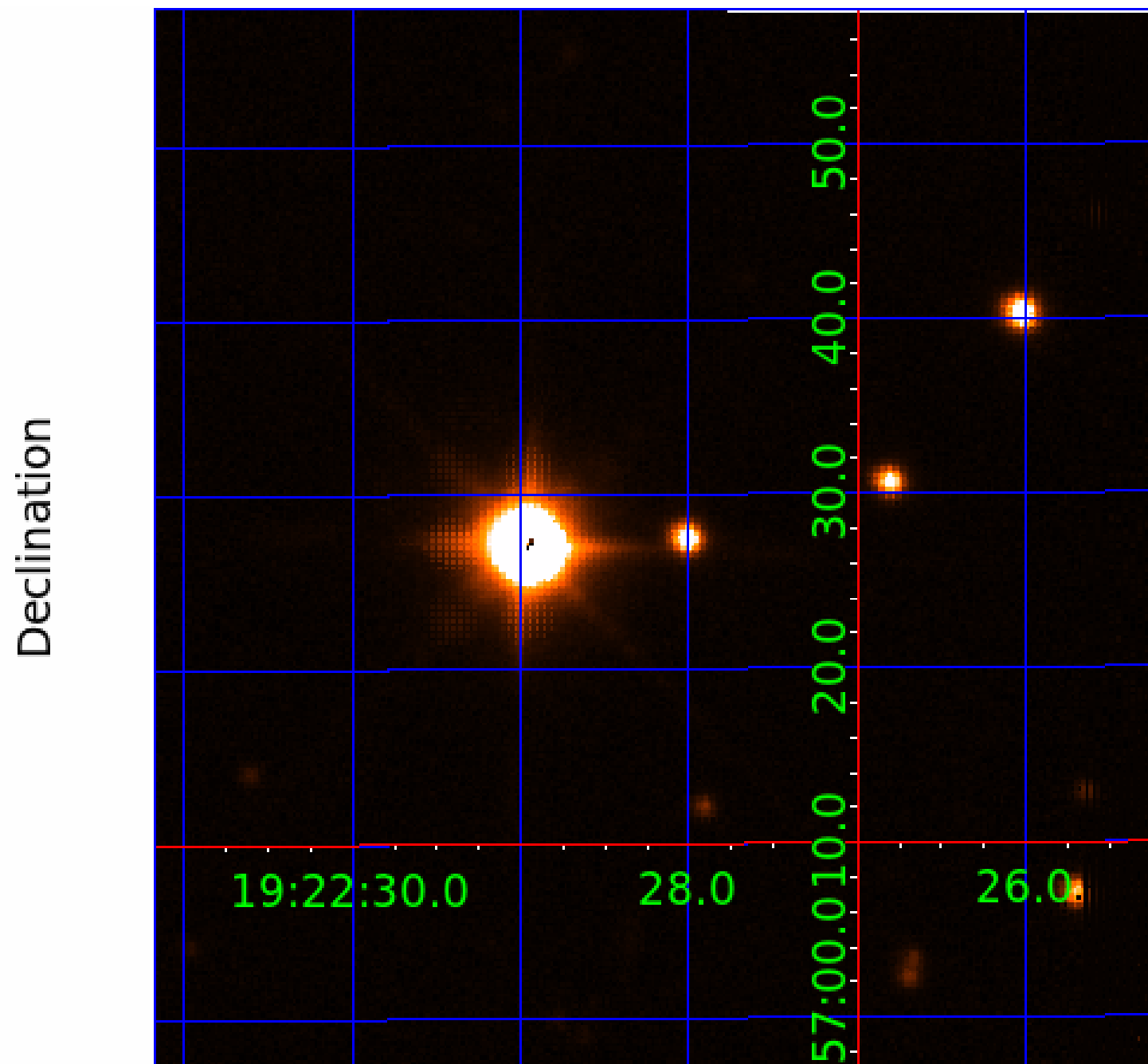




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



# KIC 011760959

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011760959-01	OBS	1484.01	3.470177	134.013741	1014.1	2.554	37.1	41.2	0.74	4922	2.90	179.22
011760959-02	OBS	No	368.989557	215.895597	5535.7	5.148	12.4	6.4	0.74	4922	5.42	0.36
011760959-03	OBS	No	467.457322	158.900681	3615.3	8.110	10.2	10.4	0.74	4922	4.50	0.26
011760959-04	OBS	No	127.765806	202.410414	1648.8	18.806	8.3	8.3	0.74	4922	2.99	1.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011760959-01	OBS	FP	0.13	0	0	1	0	CENT_RESOLVED_OFFSET
011760959-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011760959-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011760959-04	OBS	FP	0.03	1	0	0	0	MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

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

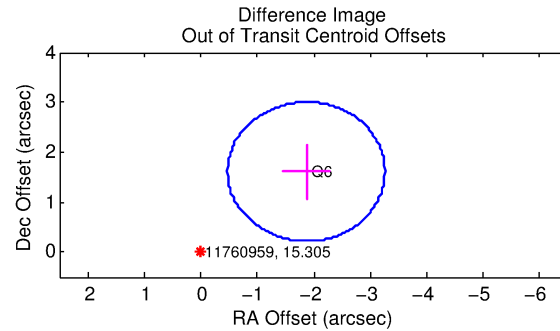
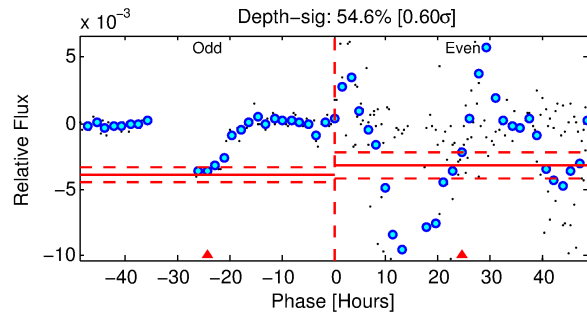
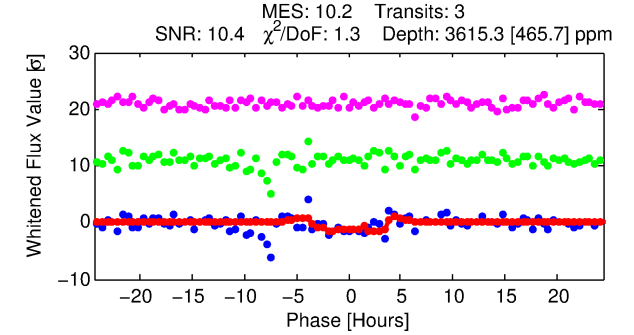
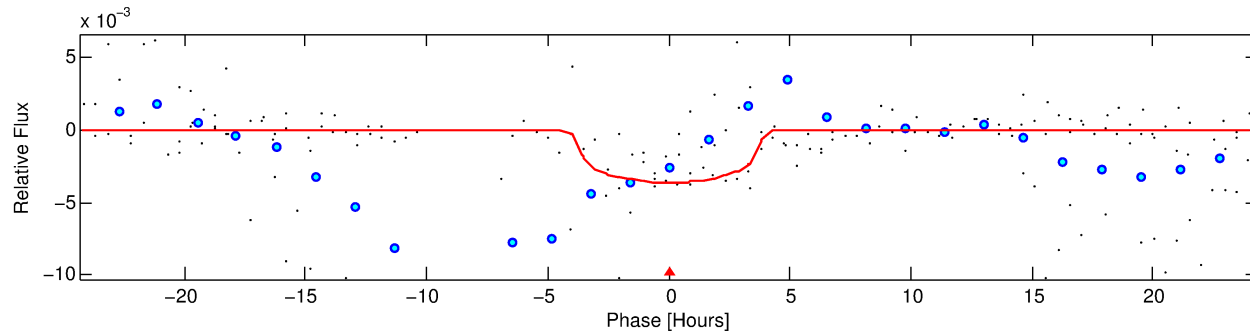
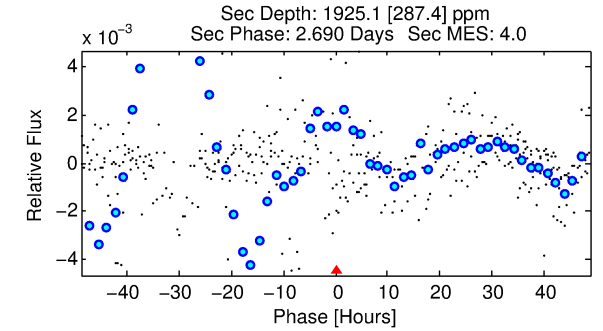
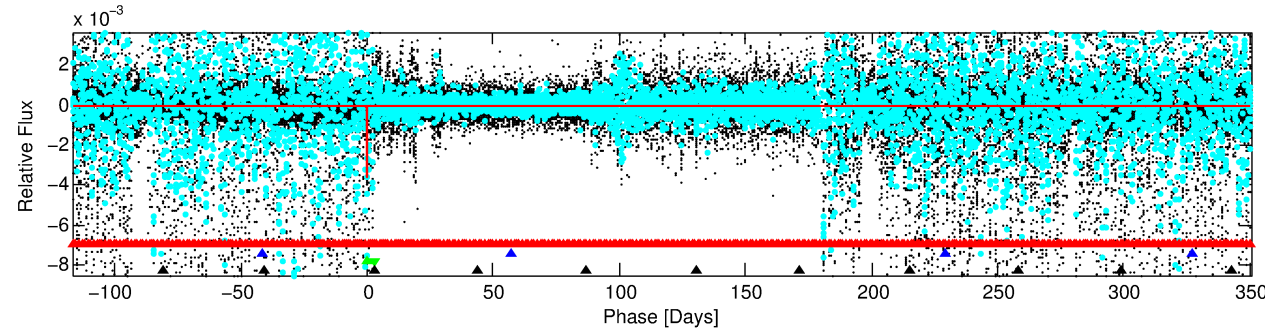
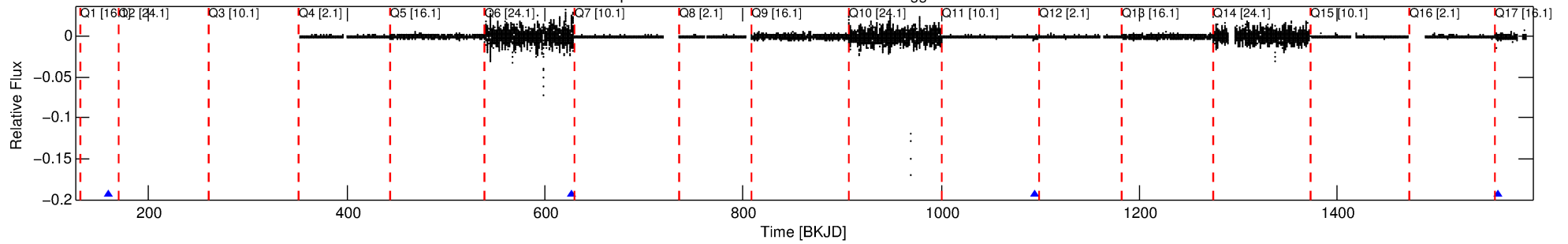
## Ephemeris Match Information For 011760959-03

No Significant Match Found

# DV One-Page Summary

KIC: 11760959 Candidate: 3 of 4 Period: 467.457 d  
KOI: K01484 Corr: No Ephemeris Match

Kp: 15.31 R\*: 0.74 Rs Teff: 4922.0 K Logg: 4.55 Fe/H: -0.120



## DV Fit Results:

Period = 467.45732 [0.01037] d  
Epoch = 158.9007 [0.0249] BKJD  
Rp/R\* = 0.0555 [0.0293]  
a/R\* = 410.59 [704.33]  
b = 0.49 [2.66]  
Seff = 0.26 [0.05]  
Teq = 182 [8] K  
Rp = 4.50 [2.42] Re  
a = 1.0590 [0.0869] AU  
Ag = 58541.58 [62777.86] [0.93σ]  
Teffp = 4377 [1177] K [3.57σ]

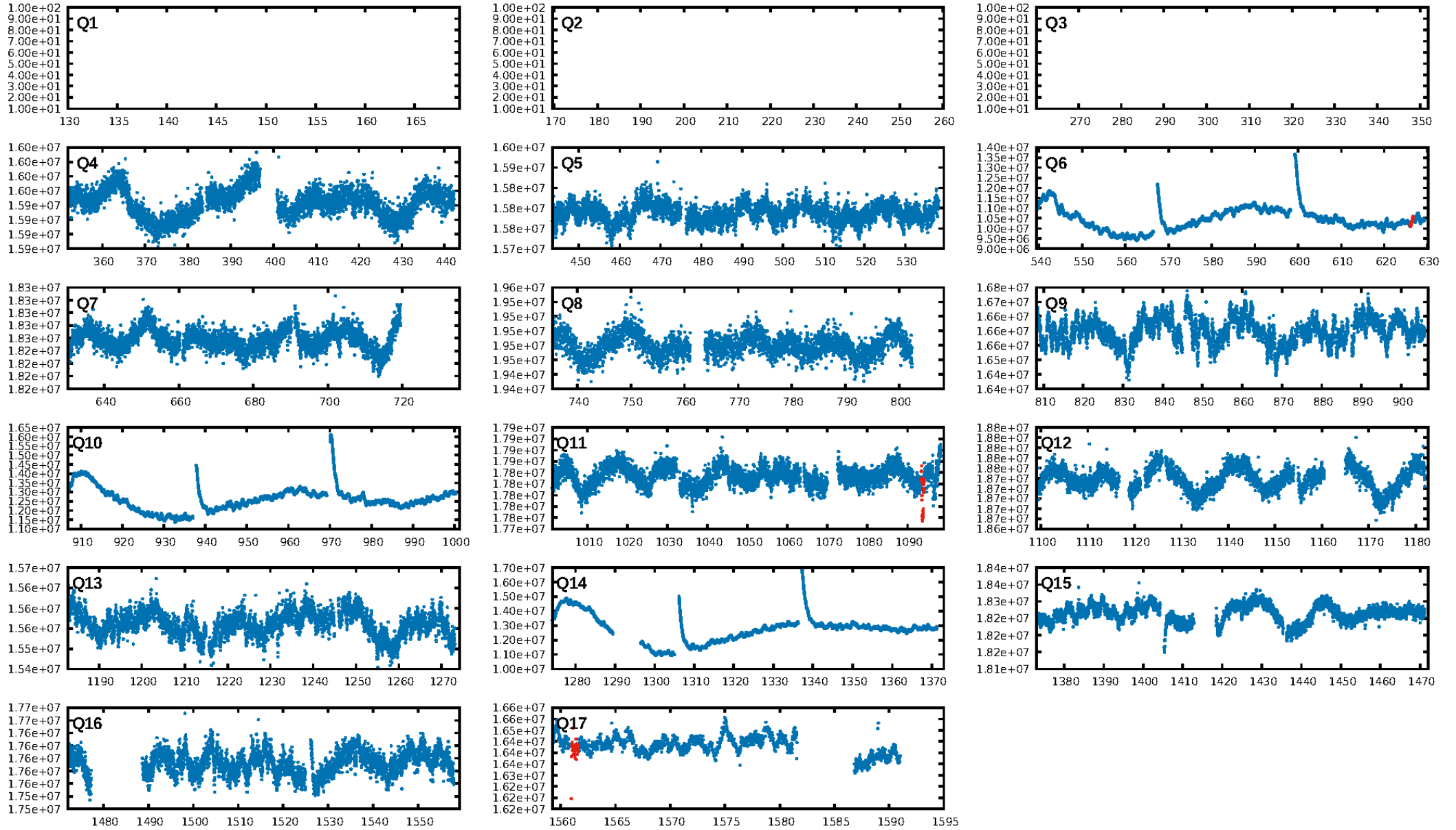
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [246.03σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 39.3%  
ModelChiSquareGoF-sig: 92.2%  
**Bootstrap-pfa: 3.17e-12**  
RollingBand-fgt: 1.00 [2/2]  
**GhostDiagnostic-chr: 1.07**  
Centroid-sig: 26.8%  
Centroid-so: 5.886 arcsec [63.44σ]  
OotOffset-rm: 2.466 arcsec [5.31σ]  
KicOffset-rm: 6.819 arcsec [16.51σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.00 [0/1]

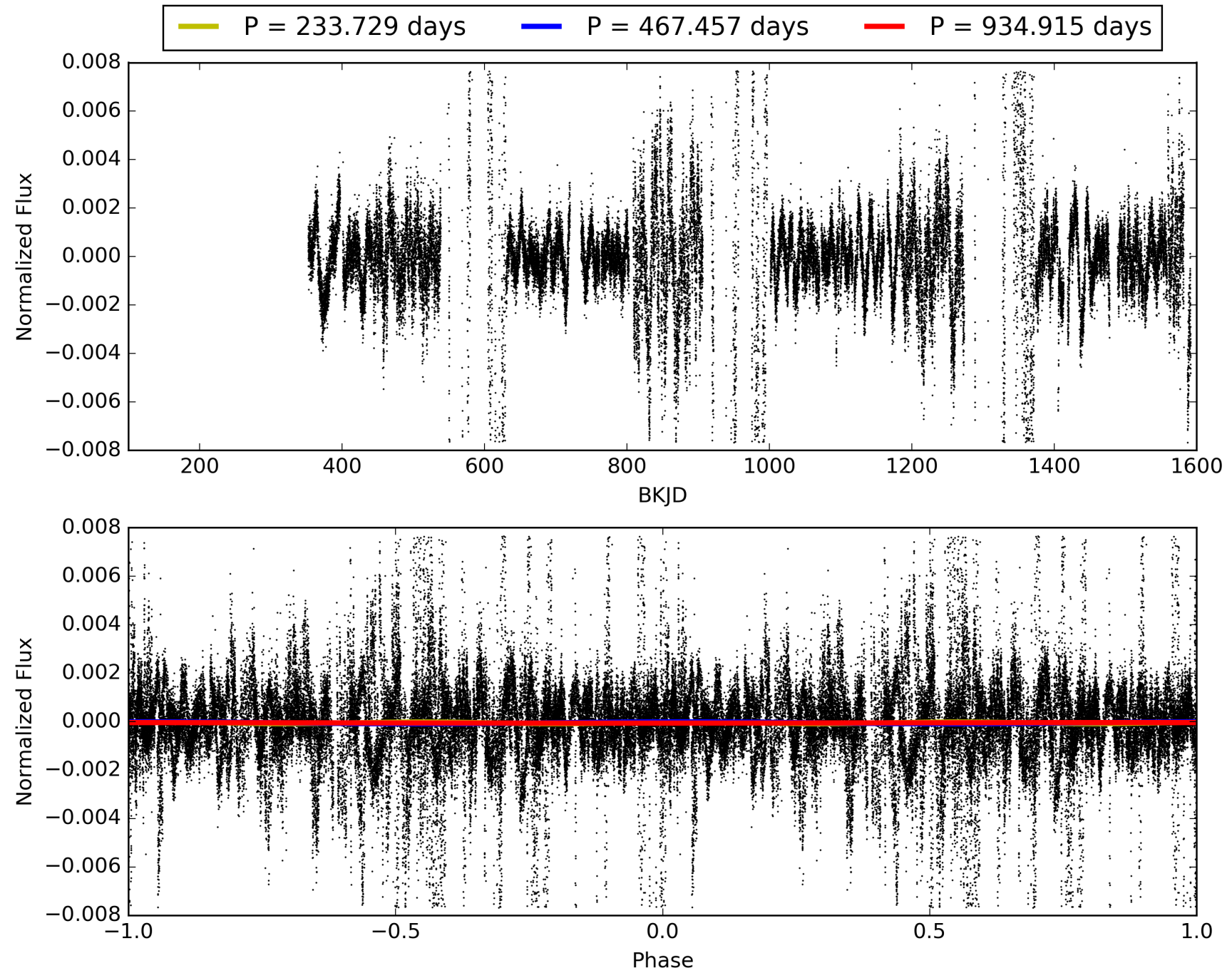
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 21:15:01 Z

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

# TCE 011760959-03, PDC Light Curves



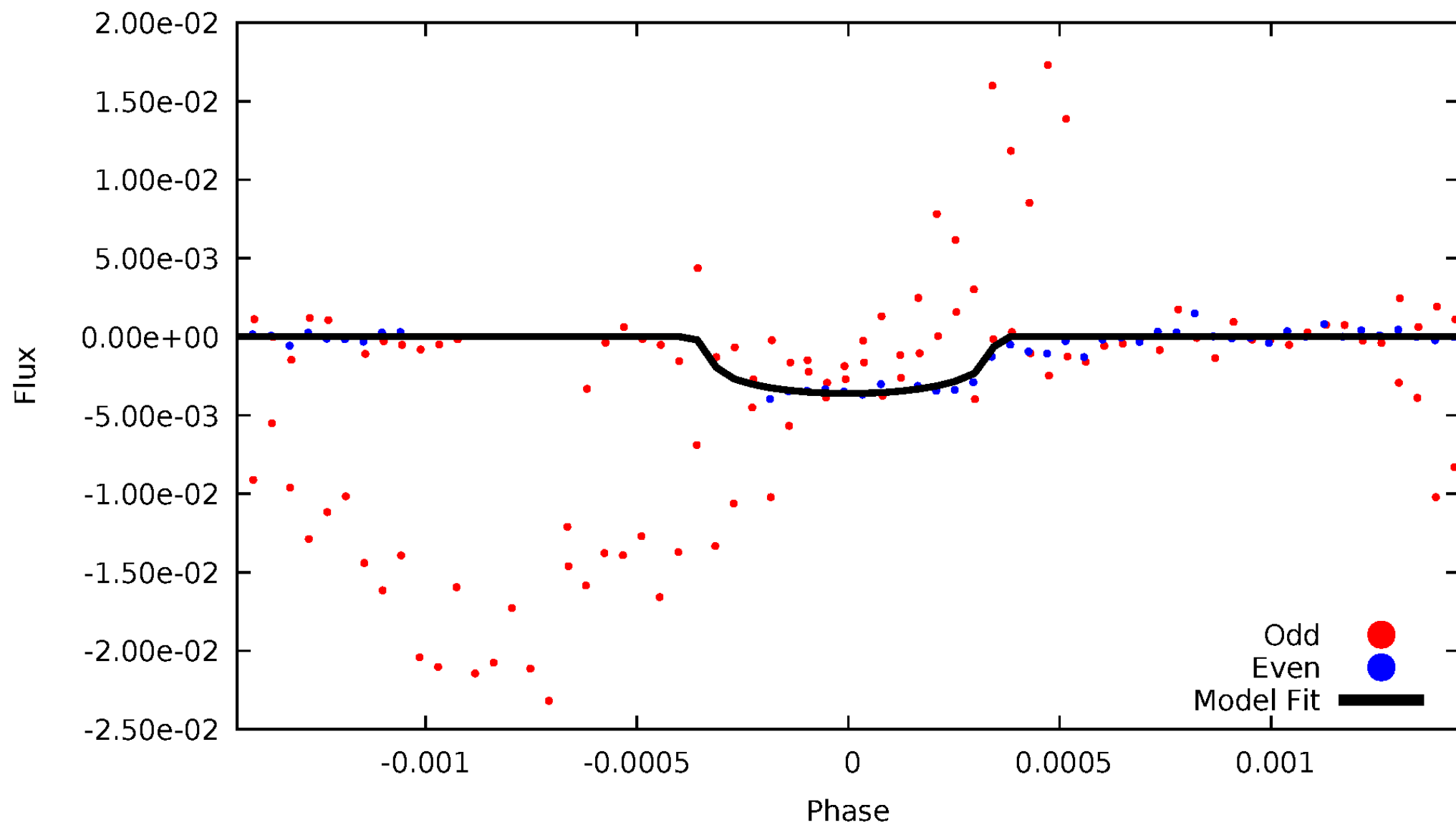
# TCE 011760959-03





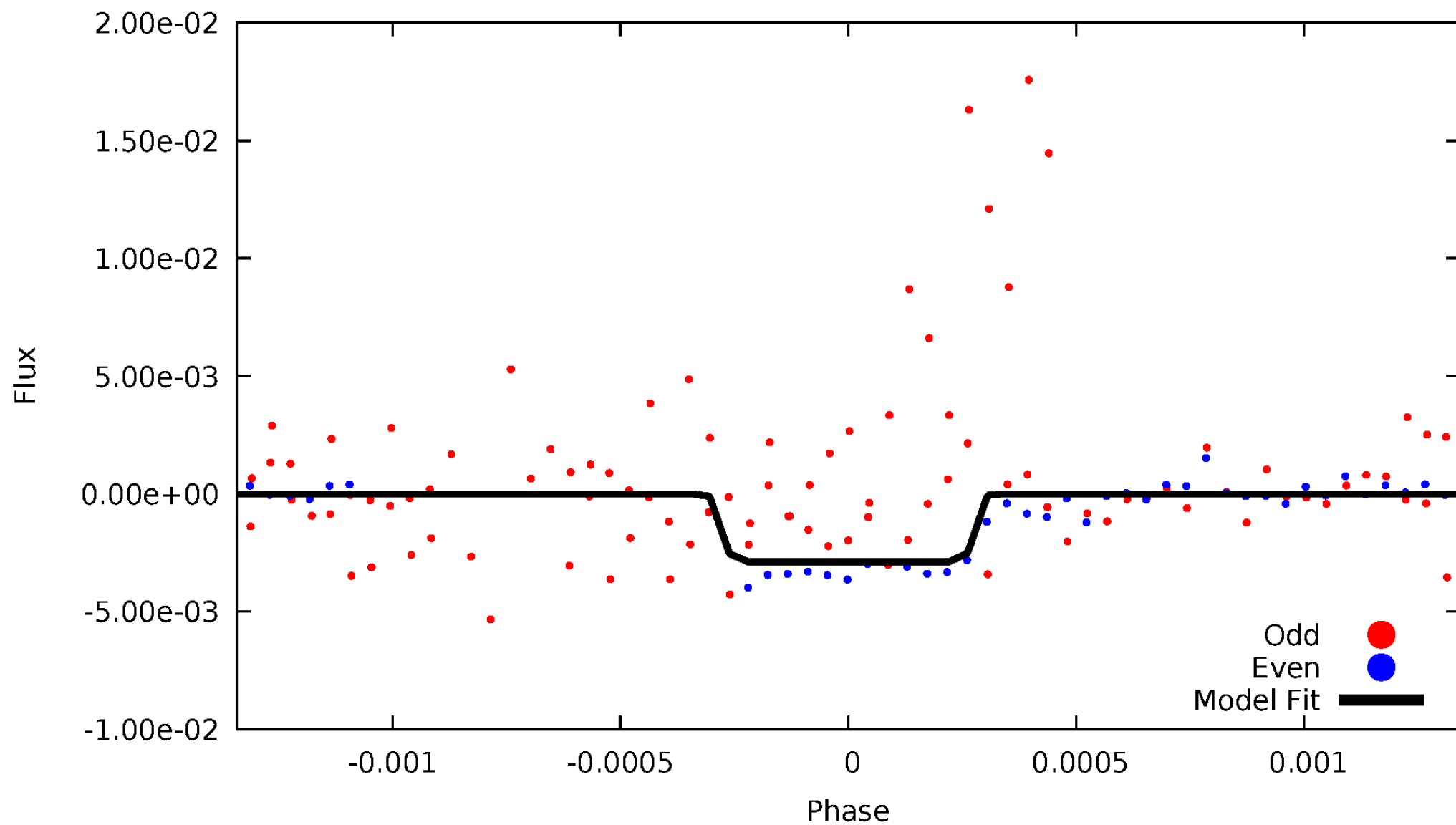
# DV Odd/Even

TCE 011760959-03



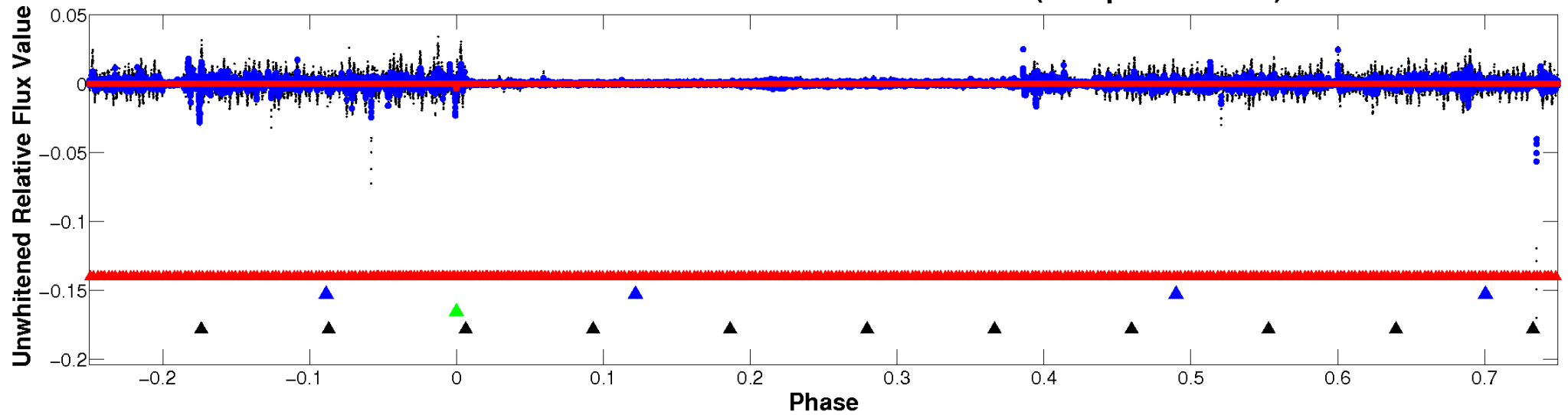
# ALT Odd/Even

TCE 011760959-03

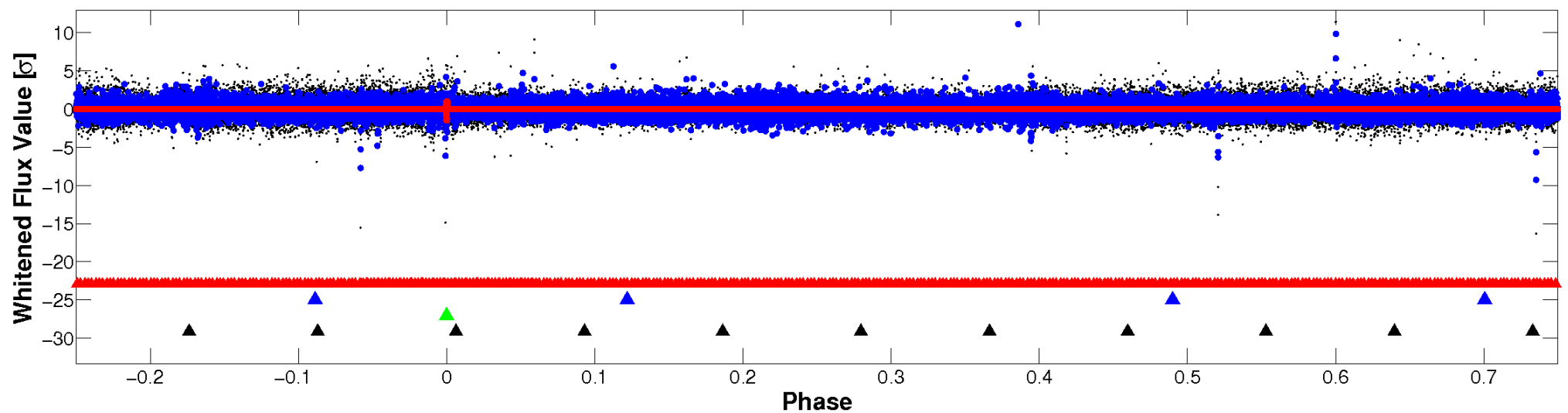


# Non-Whitened Vs. Whitened Light Curve

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

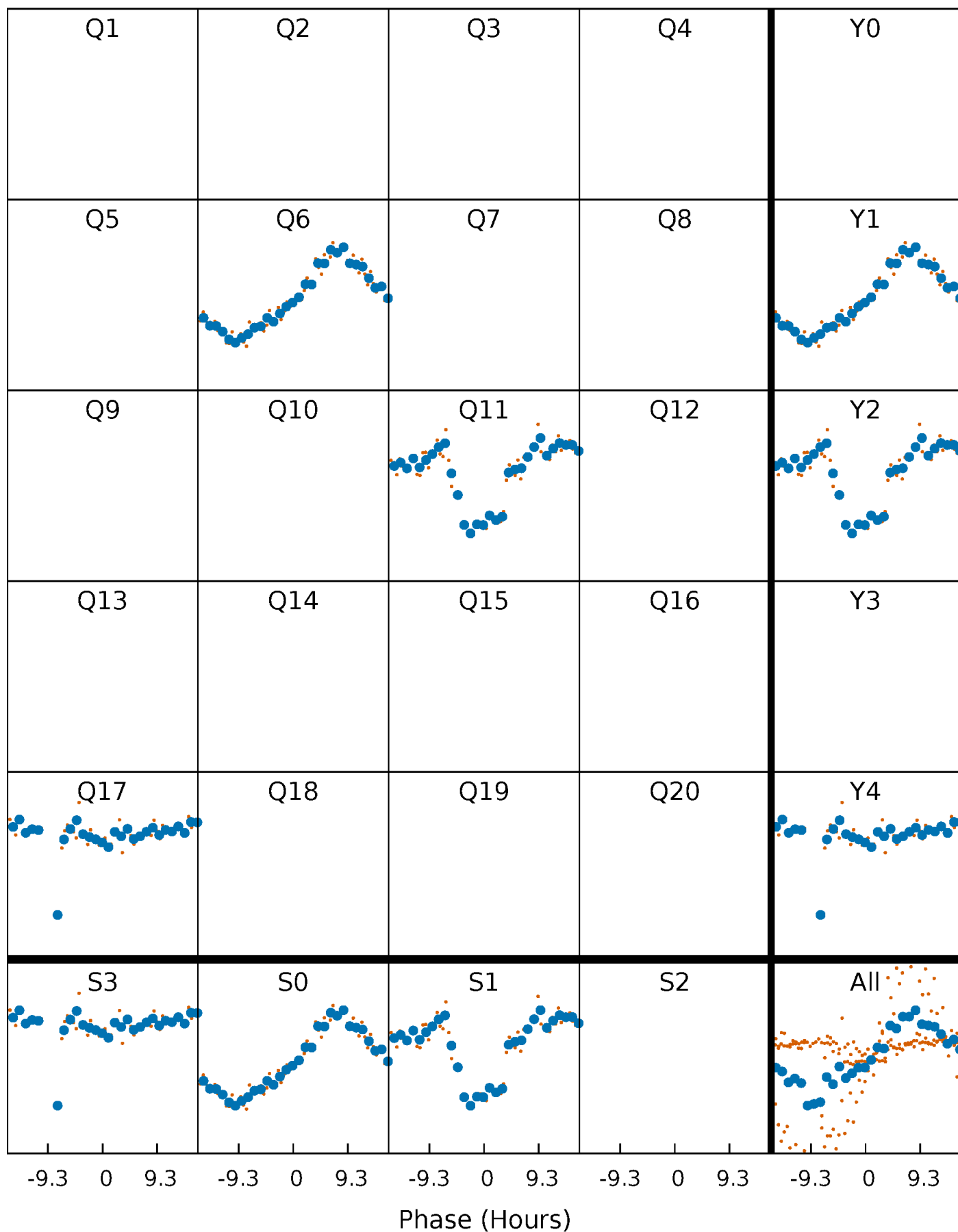


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



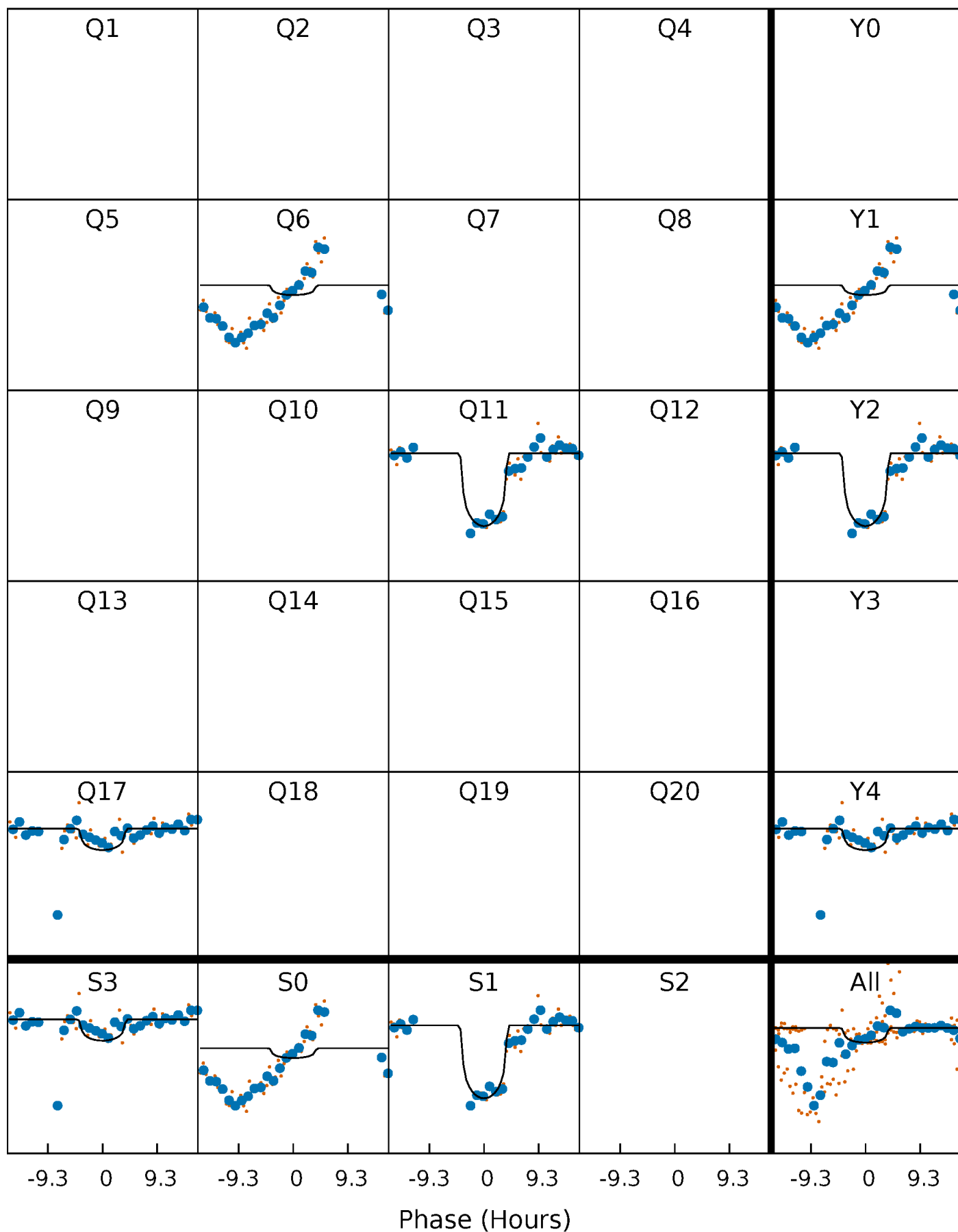
# PDC Quarter-Phased Transit Curves

TCE 011760959-03     $P=467.457322$  Days     $T_0=158.900681$  (BKJD)



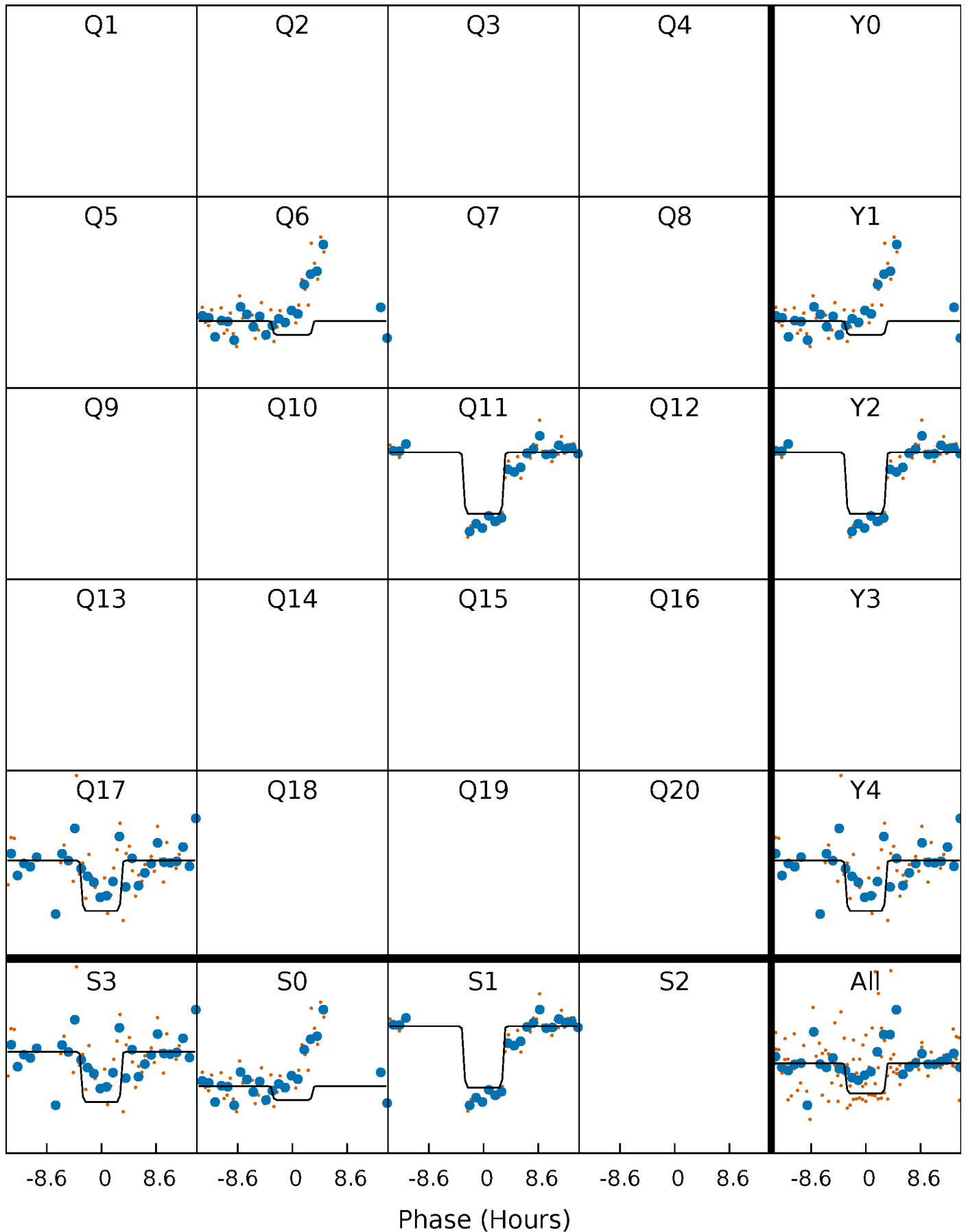
# DV Quarter-Phased Transit Curves

TCE 011760959-03     $P=467.457322$  Days     $T_0=158.900681$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

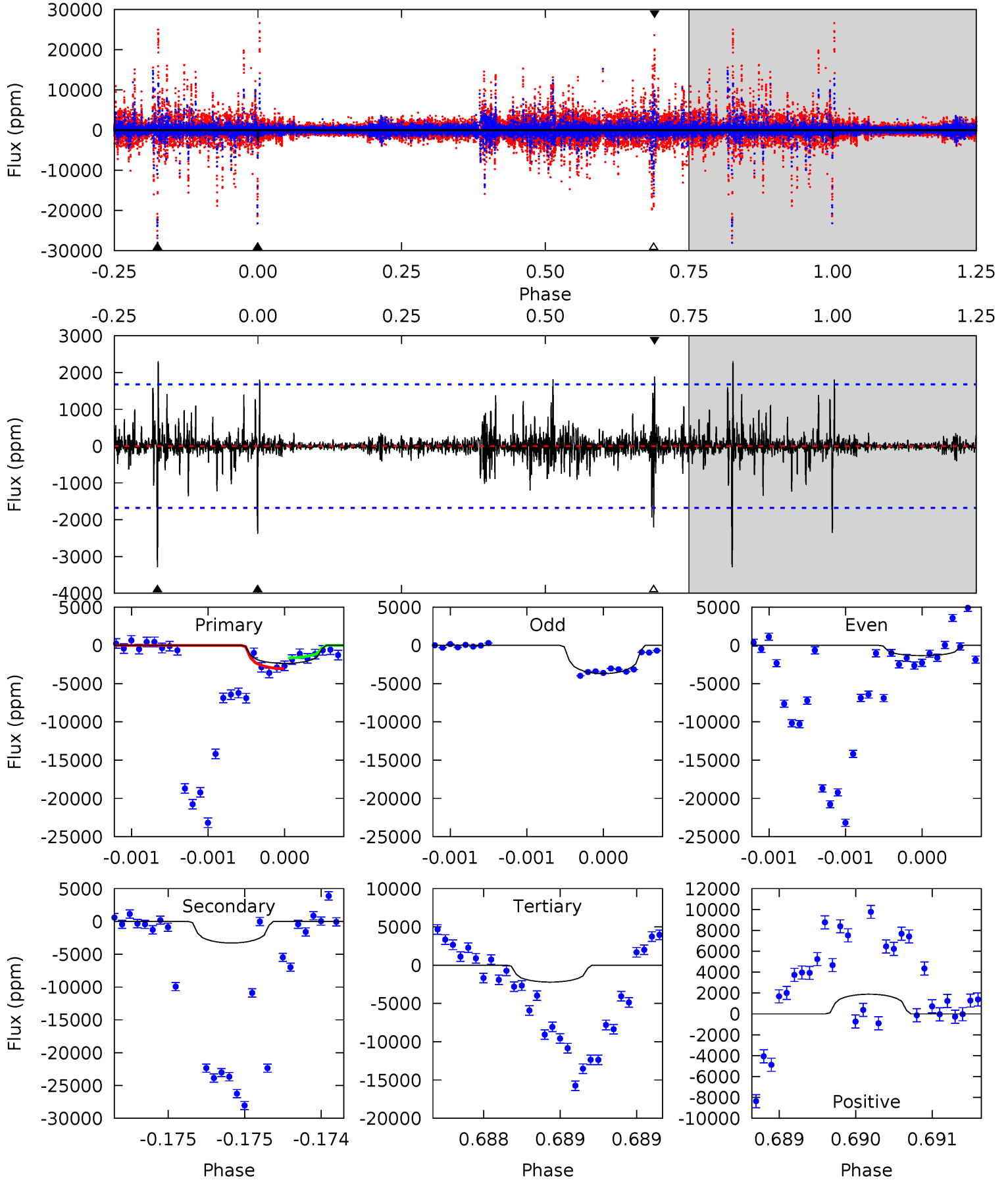
TCE 011760959-03     $P=467.438118$  Days     $T_0=158.955409$  (BKJD)



# DV Model-Shift Uniqueness Test

011760959-03, P = 467.457322 Days, E = 158.900681 Days

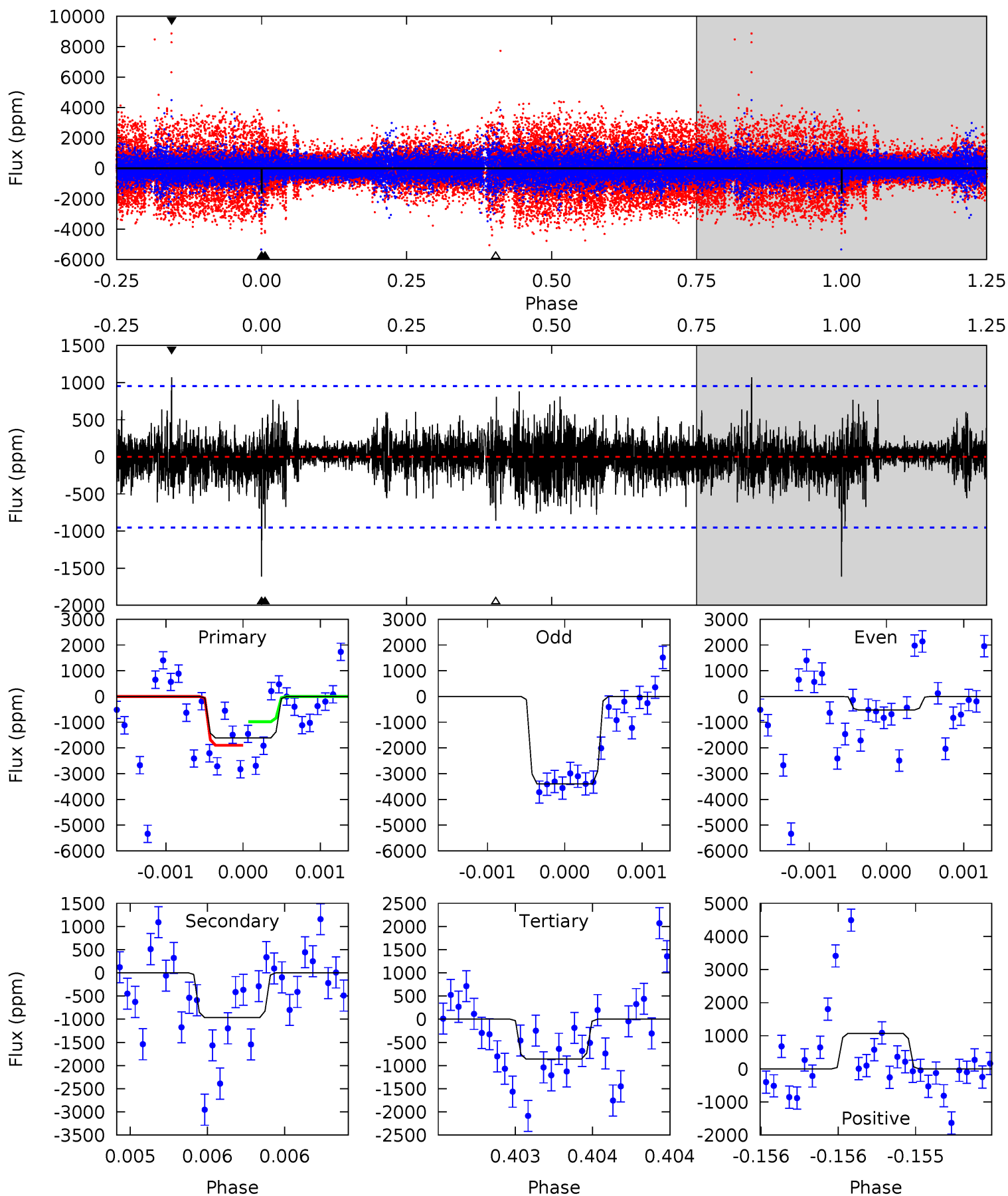
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.75	10.8	7.25	6.19	5.51	3.39	0.85	0.50	1.56	3.54	4.60	2.12	1.28	0.41	2.23



# Alt Model-Shift Uniqueness Test

011760959-03, P = 467.438118 Days, E = 158.955409 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
9.35	5.60	4.99	6.21	5.54	3.43	1.15	4.36	3.14	0.61	-0.61	7.45	0.49	0.40	2.65





### Stellar Parameters For KIC 011760959

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4922^{+176}_{-176}$	$4.555^{+0.066}_{-0.044}$	$-0.120^{+0.300}_{-0.300}$	$0.744^{+0.065}_{-0.072}$	$0.726^{+0.093}_{-0.057}$	$2.479^{+0.736}_{-0.394}$
	+4%/-4%	+1%/-1%	+250%/-250%	+9%/-10%	+13%/-8%	+30%/-16%
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 011760959-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-3287 \pm 305$	$4.60^{+2.24}_{-2.19}$	$254^{+11}_{-11}$	$4957^{+1757}_{-744}$	$98353^{+256206}_{-54537}$
Alt.	$-965 \pm 172$	$4.39^{+2.46}_{-2.35}$	$254^{+11}_{-11}$	$3970^{+1476}_{-557}$	$31276^{+114393}_{-18995}$

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

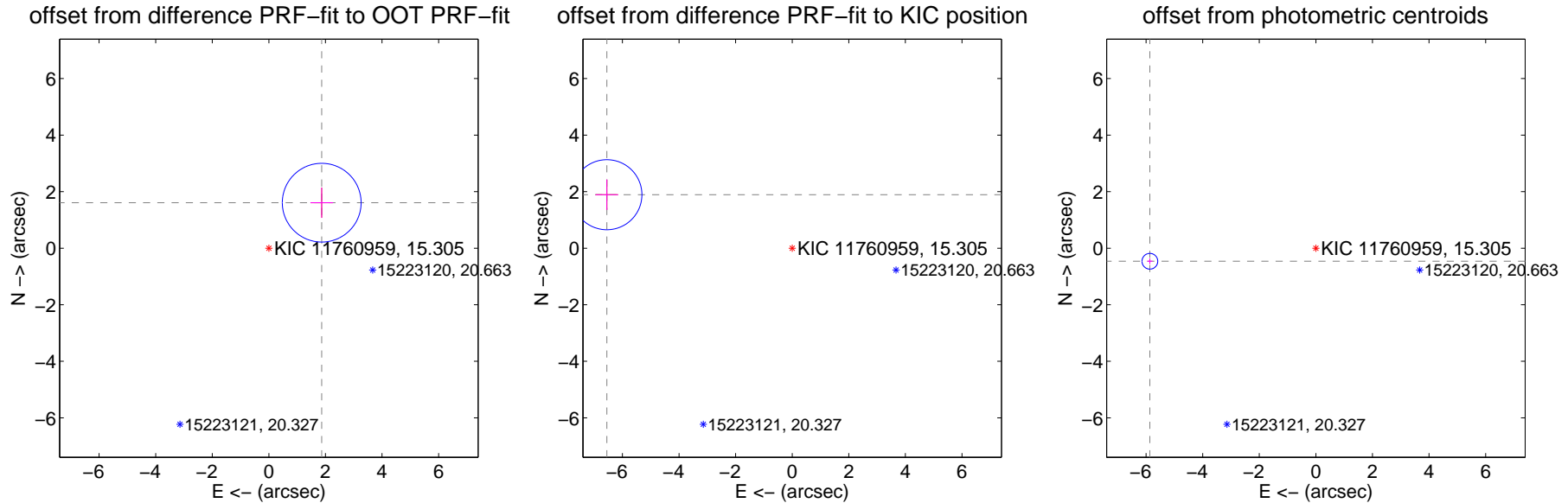
## DV Centroid Data

Supplemental centroid analysis for 011760959-03. Kepler magnitude: 15.30. Transit SNR 10.37

There are 0 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 8.42 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	$2.466 \pm 0.464$	5.31	$-1.868 \pm 0.401$	$1.610 \pm 0.538$
PRF-fit source offset from KIC position	$6.819 \pm 0.413$	16.51	$6.551 \pm 0.401$	$1.892 \pm 0.538$
photometric centroid source offset	$5.89 \pm 0.09$	63.44	$5.87 \pm 0.09$	$-0.46 \pm 0.10$

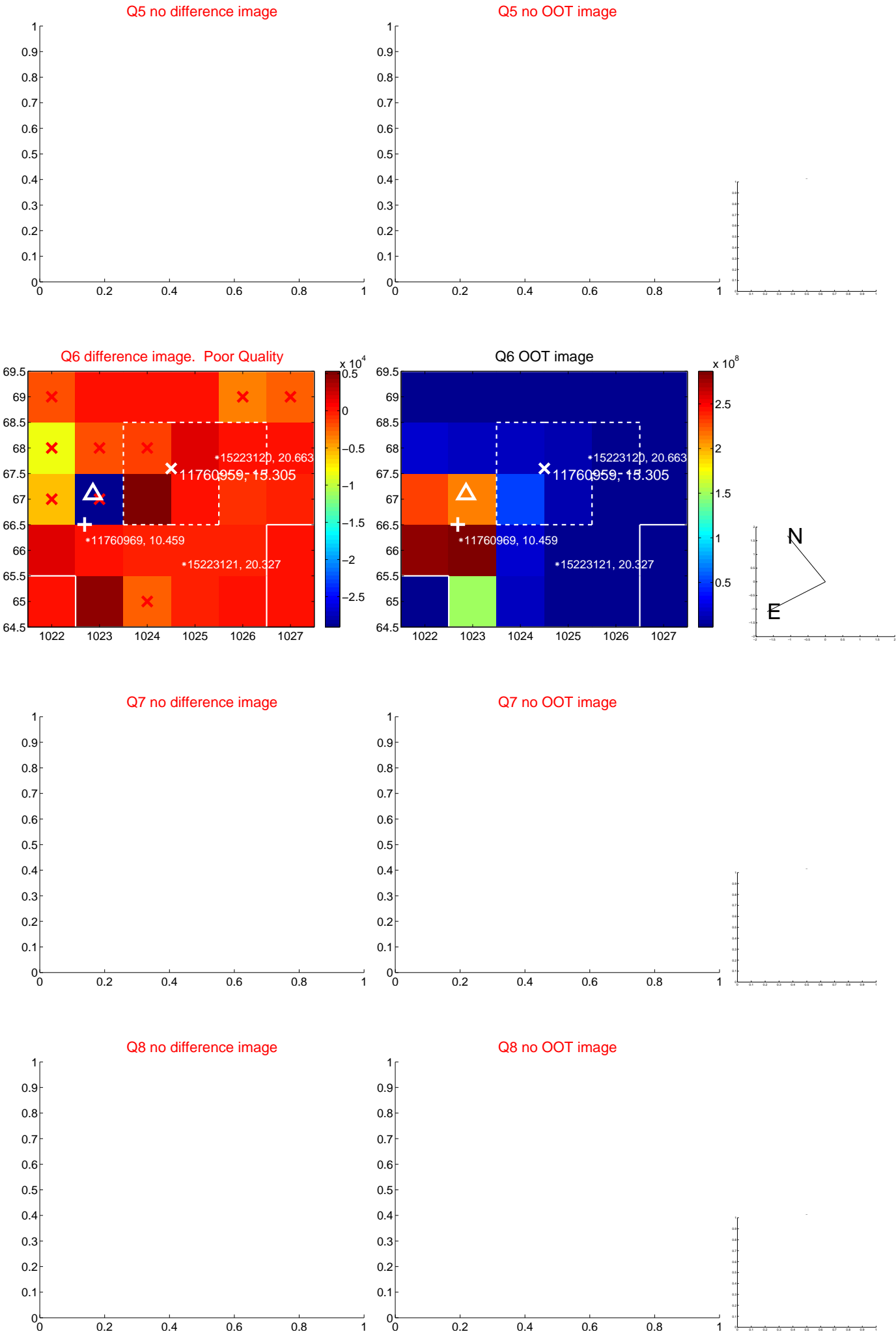


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



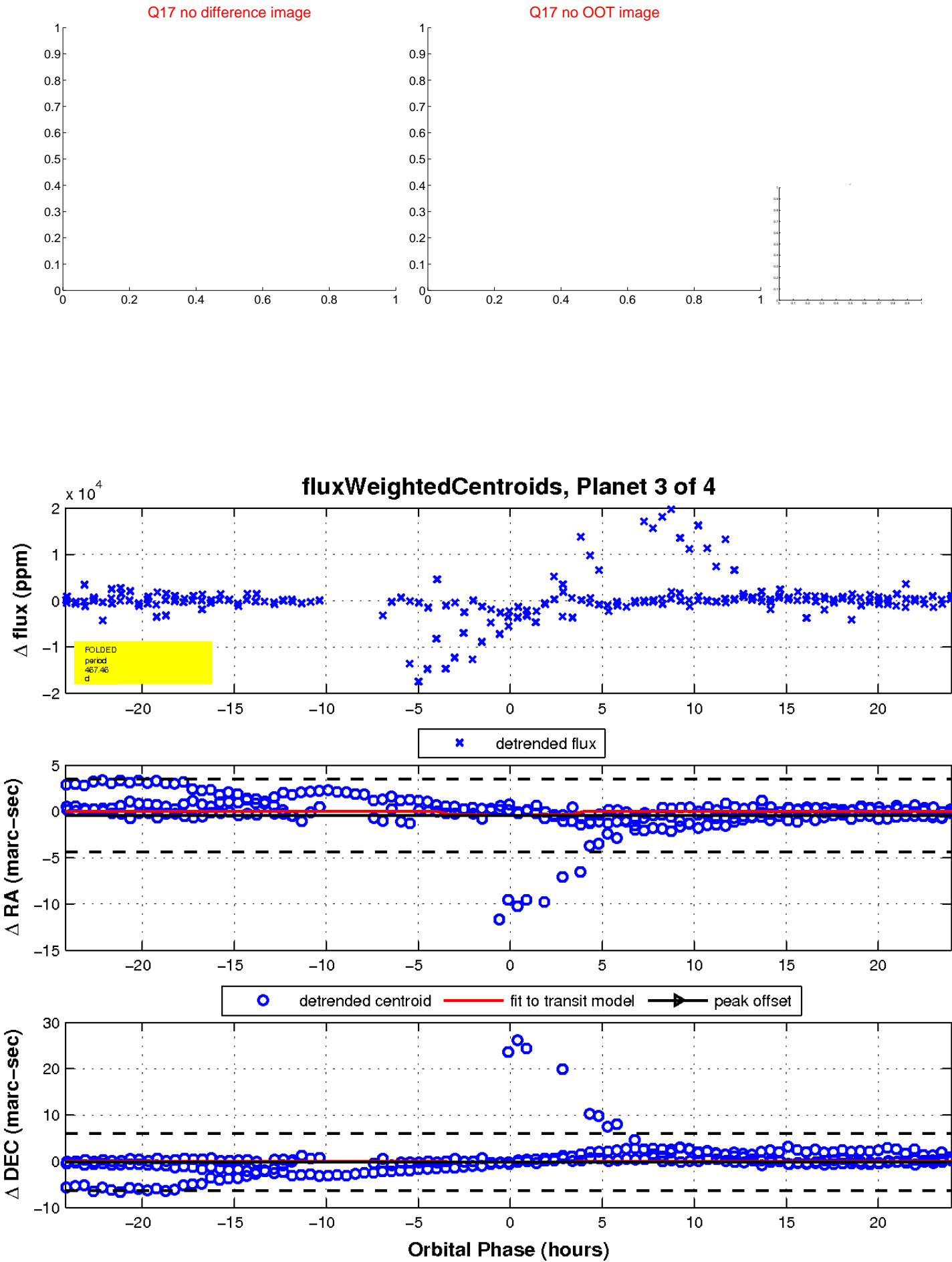
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



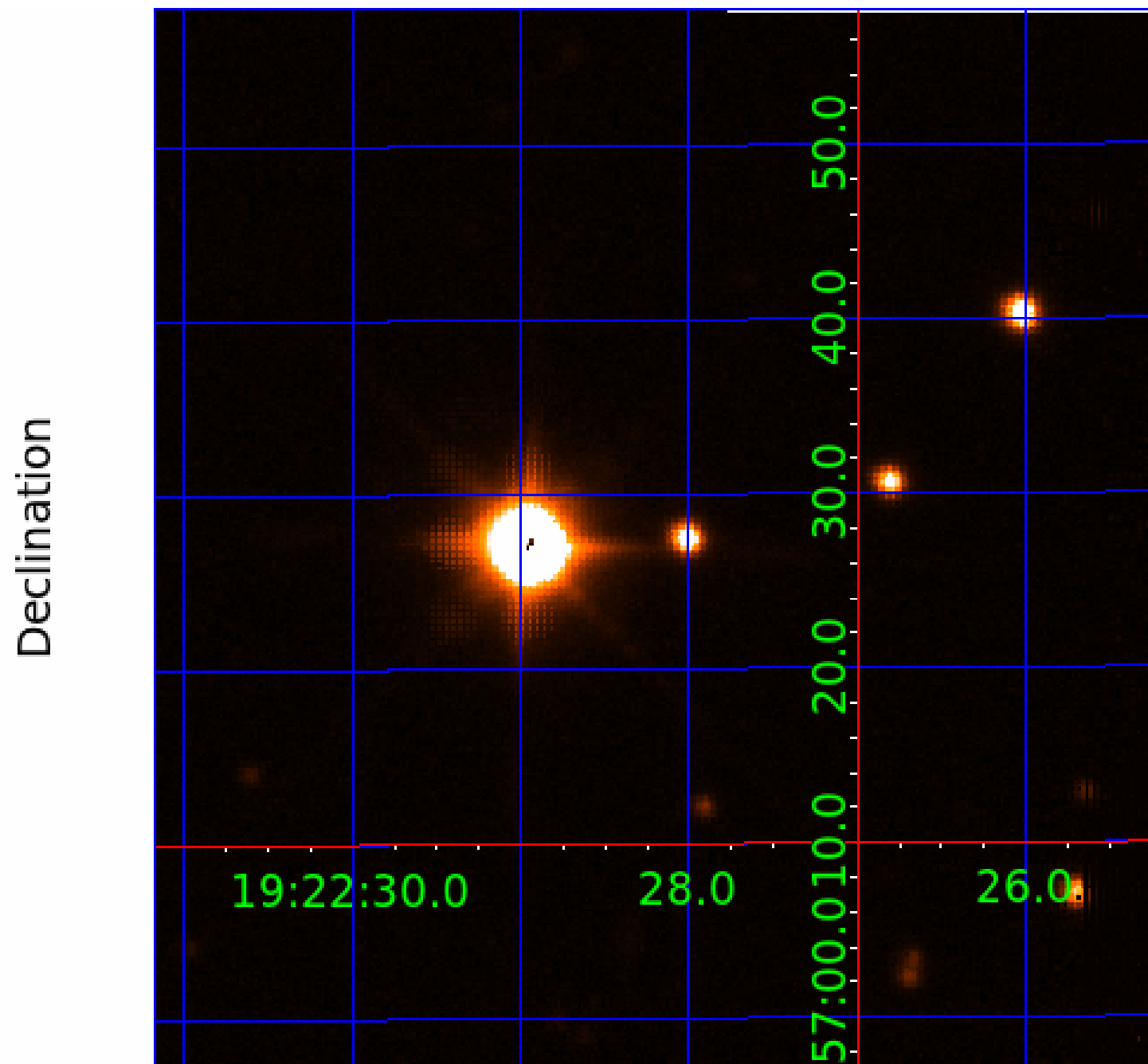
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 011760959

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011760959-01	OBS	1484.01	3.470177	134.013741	1014.1	2.554	37.1	41.2	0.74	4922	2.90	179.22
011760959-02	OBS	No	368.989557	215.895597	5535.7	5.148	12.4	6.4	0.74	4922	5.42	0.36
011760959-03	OBS	No	467.457322	158.900681	3615.3	8.110	10.2	10.4	0.74	4922	4.50	0.26
011760959-04	OBS	No	127.765806	202.410414	1648.8	18.806	8.3	8.3	0.74	4922	2.99	1.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011760959-01	OBS	FP	0.13	0	0	1	0	CENT_RESOLVED_OFFSET
011760959-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011760959-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011760959-04	OBS	FP	0.03	1	0	0	0	MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

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

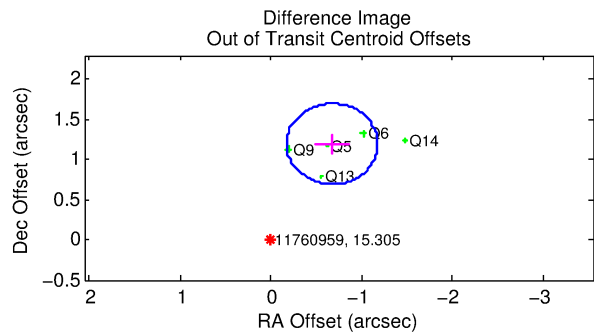
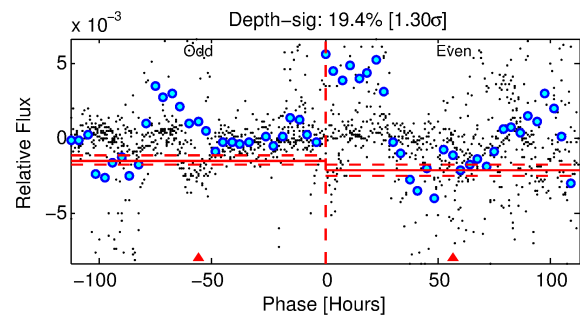
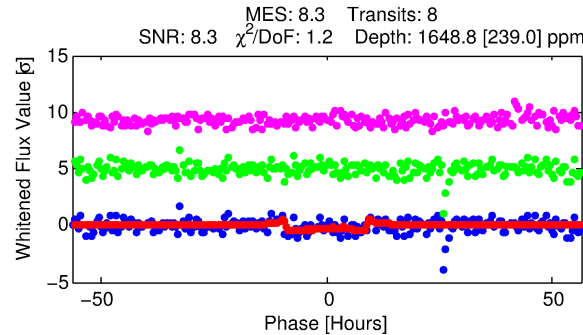
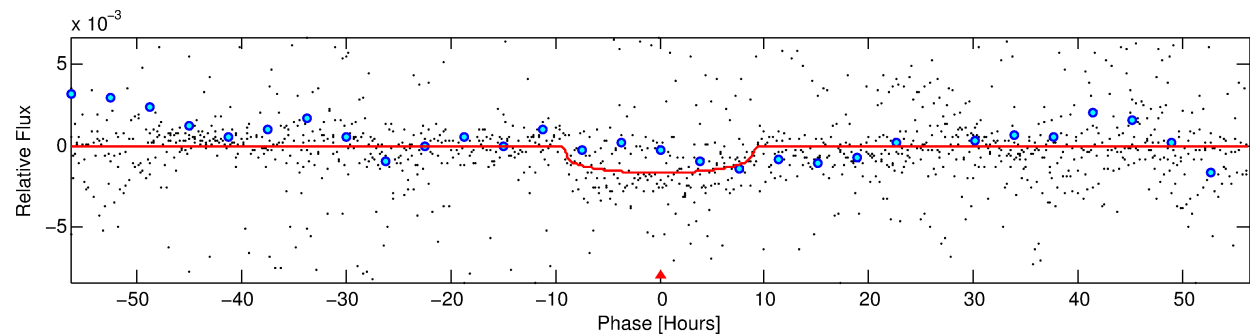
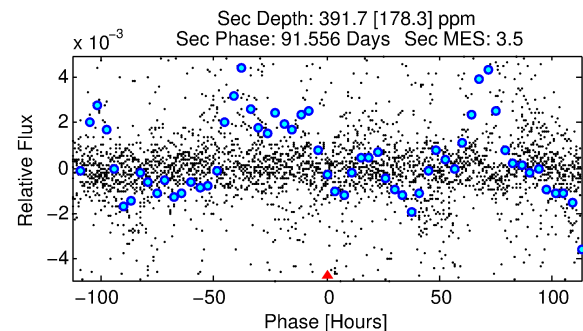
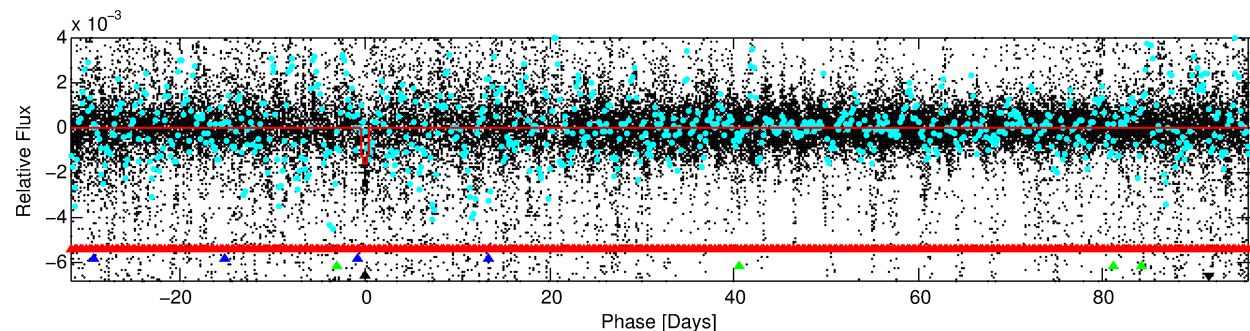
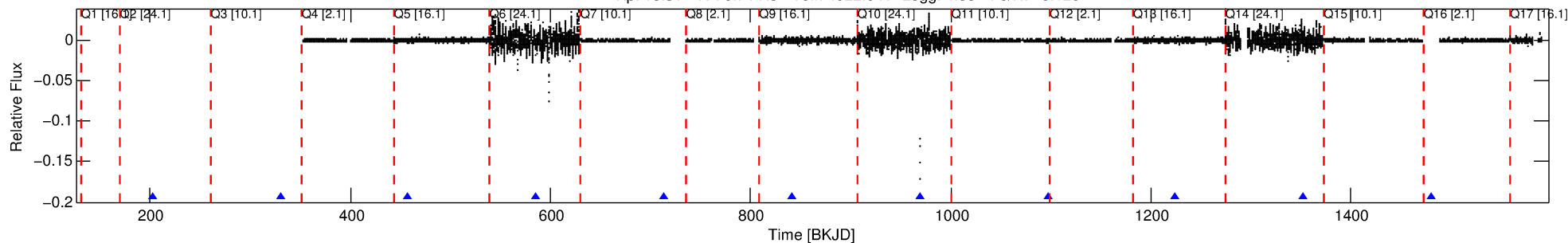
## Ephemeris Match Information For 011760959-04

No Significant Match Found

# DV One-Page Summary

KIC: 11760959 Candidate: 4 of 4 Period: 127.766 d  
KOI: K01484 Corr: No Ephemeris Match

Kp: 15.31 R\*: 0.74 Rs Teff: 4922.0 K Logg: 4.55 Fe/H: -0.120



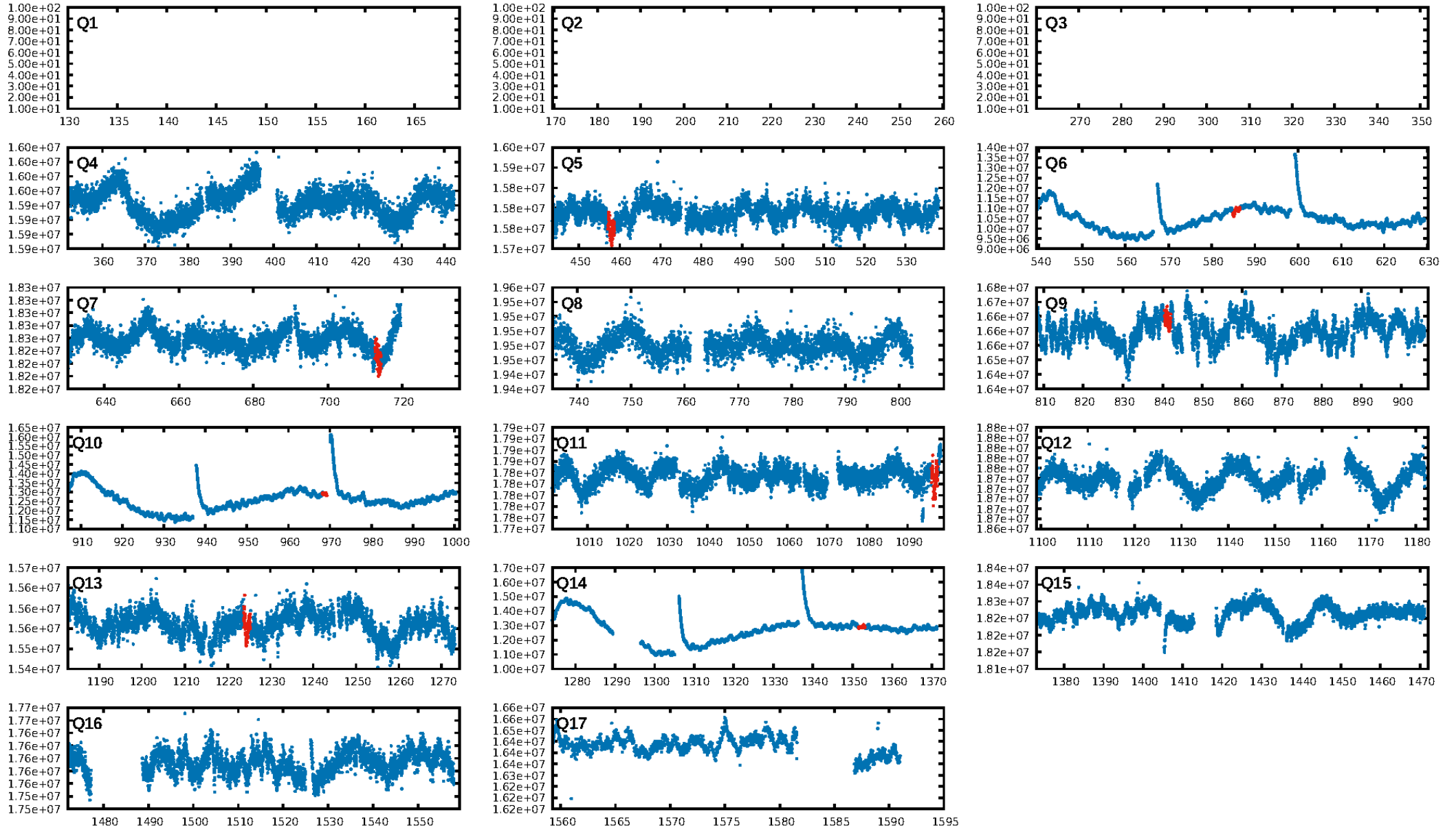
## DV Fit Results:

Period = 127.76581 [0.00489] d  
Epoch = 202.4104 [0.0255] BKJD  
Rp/R\* = 0.0369 [0.0107]  
a/R\* = 49.71 [46.31]  
b = 0.40 [2.00]  
Seff = 1.46 [0.27]  
Teq = 280 [13] K  
Rp = 2.99 [0.91] Re  
a = 0.4460 [0.0366] AU  
Ag = 4787.91 [3573.41] [1.34σ]  
Teffp = 3607 [677] K [4.92σ]

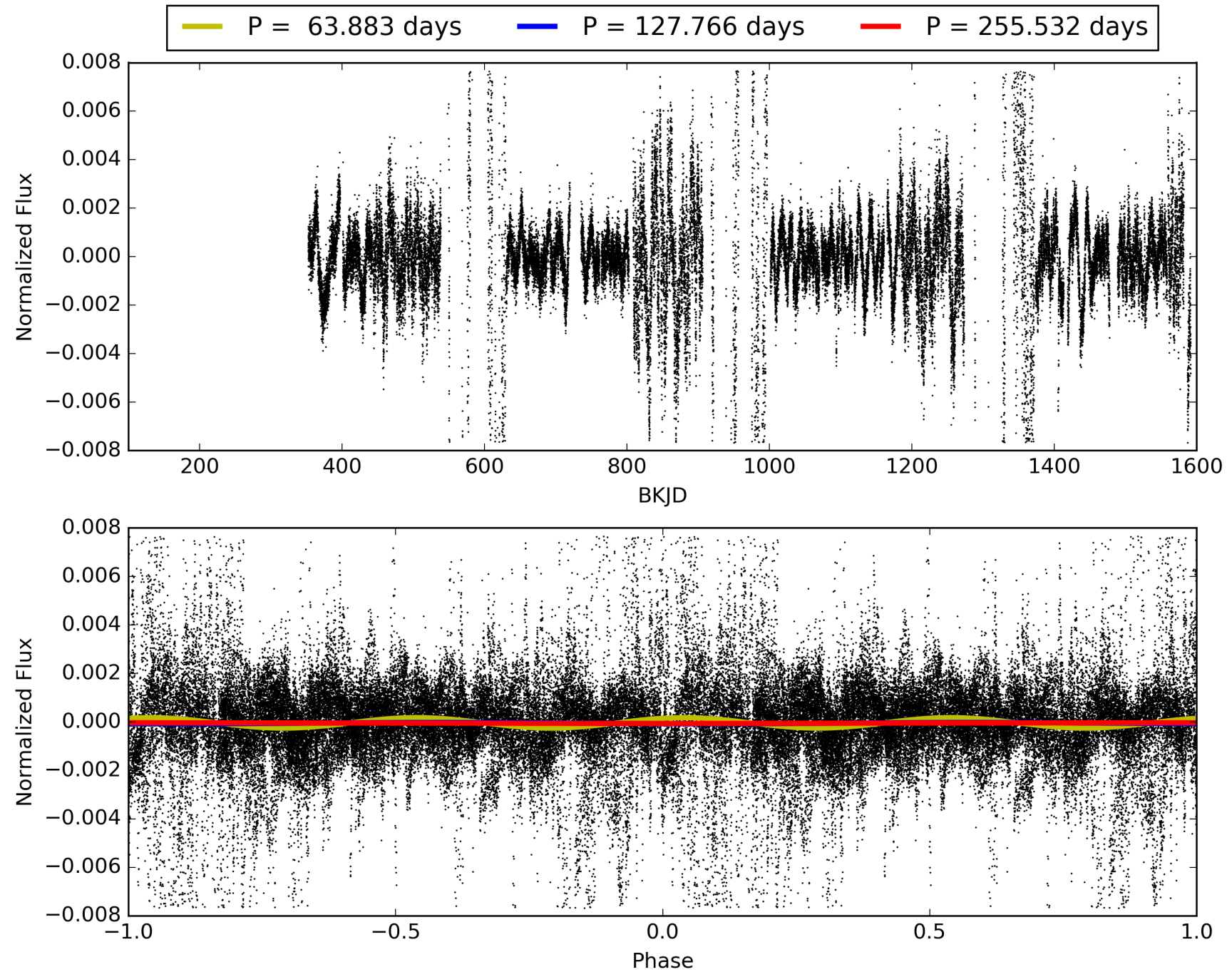
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [157.18σ]  
LongPeriod-sig: 100.0% [296.93σ]  
ModelChiSquare2-sig: 67.0%  
ModelChiSquareGoF-sig: 100.0%  
Bootstrap-pfa: 3.95e-13  
RollingBand-fgt: 1.00 [8/8]  
**GhostDiagnostic-chr: -2.401**  
Centroid-sig: 78.3%  
Centroid-so: 5.730 arcsec [33.60σ]  
OotOffset-rm: 1.374 arcsec [8.21σ]  
KicOffset-rm: 8.099 arcsec [25.22σ]  
OotOffset-st: 2/0/0/3 [5]  
KicOffset-st: 2/0/0/3 [5]  
DiffImageQuality-fgm: 0.60 [3/5]  
DiffImageOverlap-fno: 0.00 [0/5]

# TCE 011760959-04, PDC Light Curves

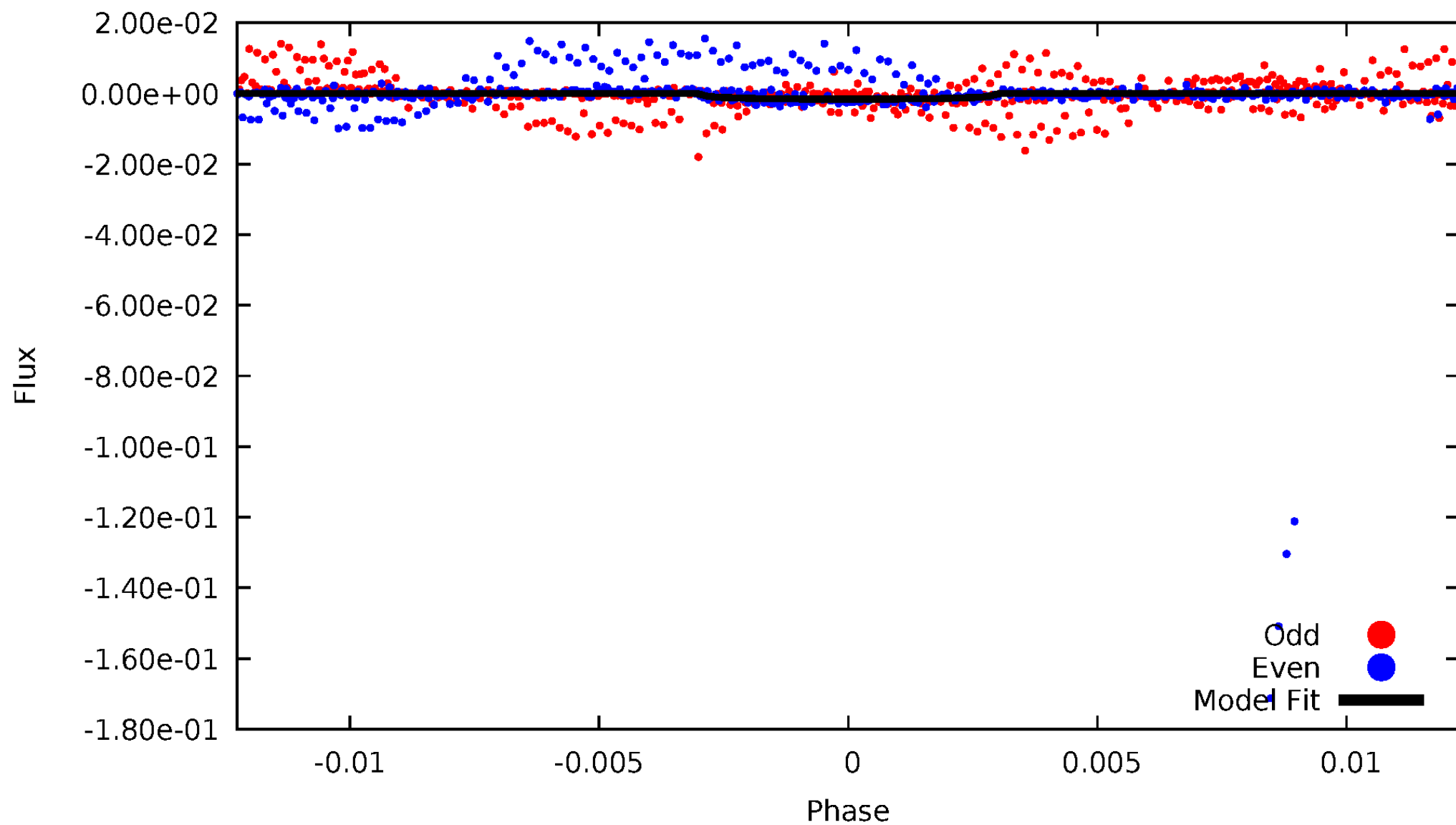


# TCE 011760959-04



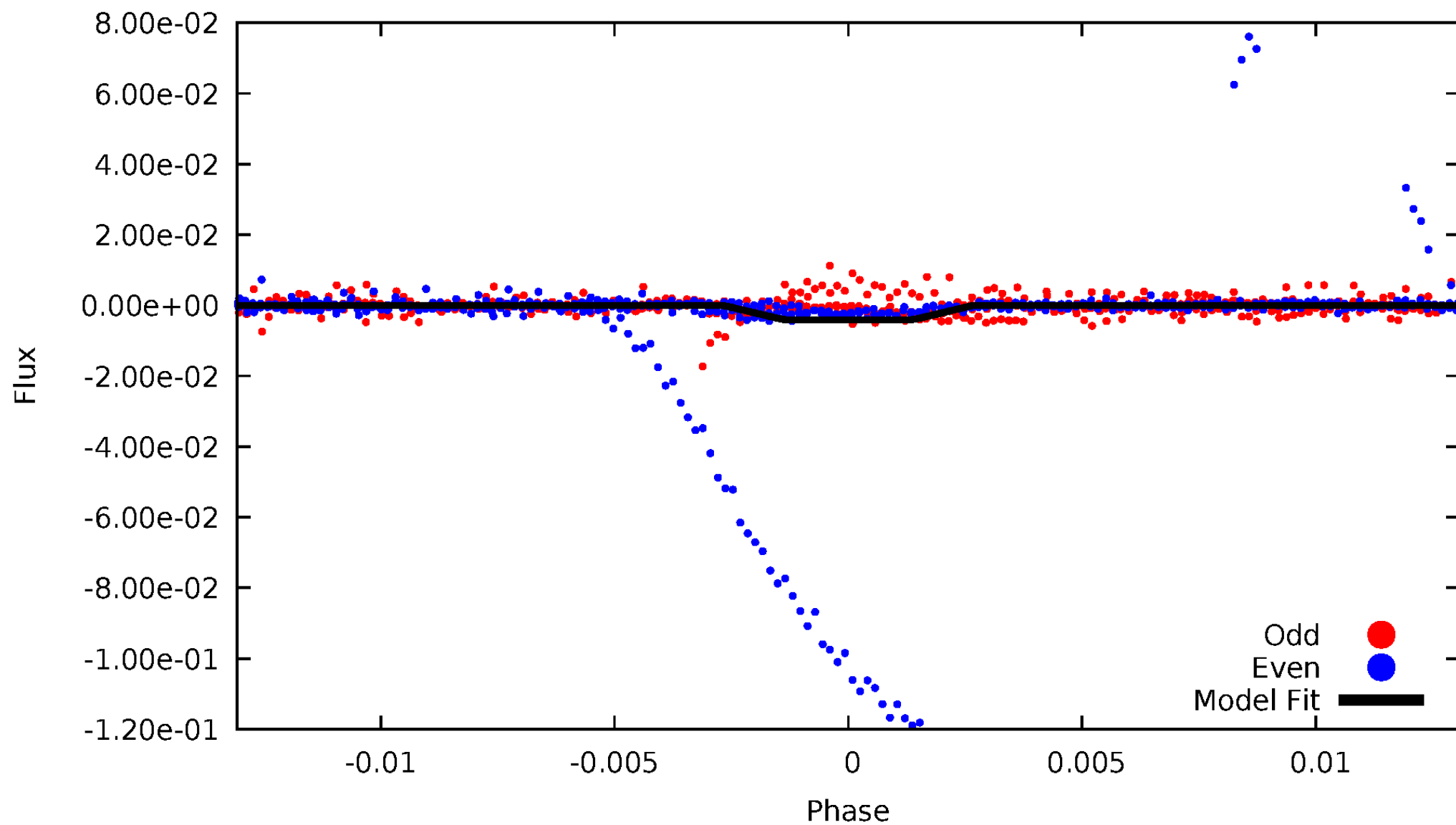
# DV Odd/Even

TCE 011760959-04



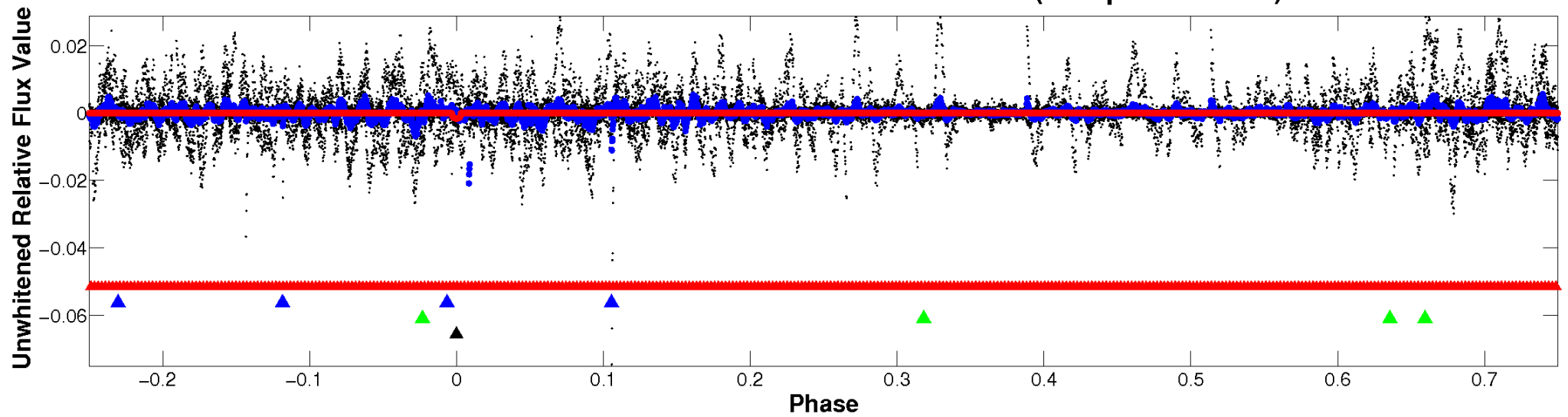
# ALT Odd/Even

TCE 011760959-04

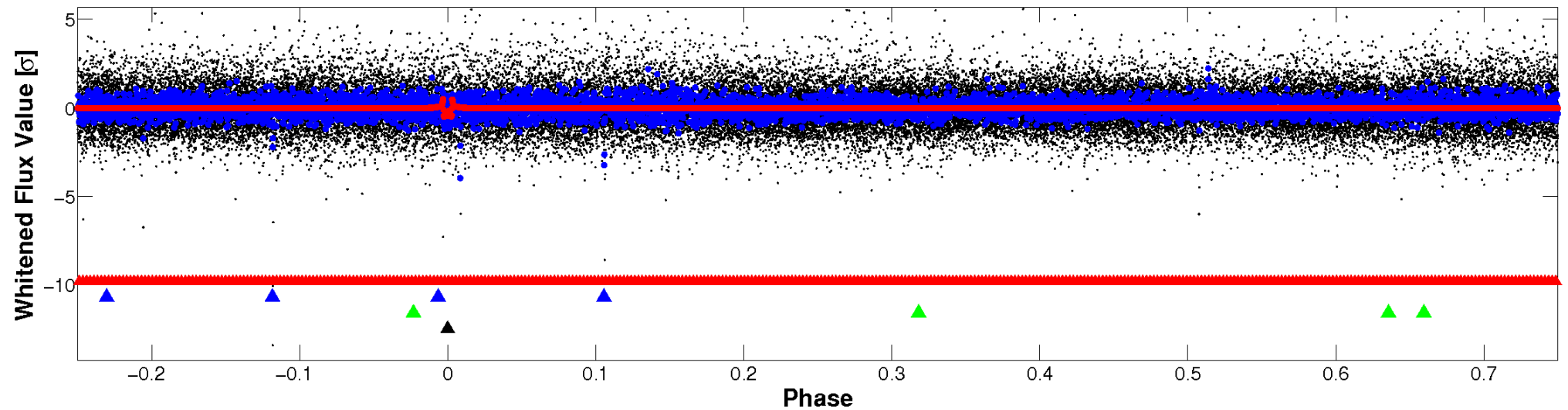


# Non-Whitened Vs. Whitened Light Curve

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



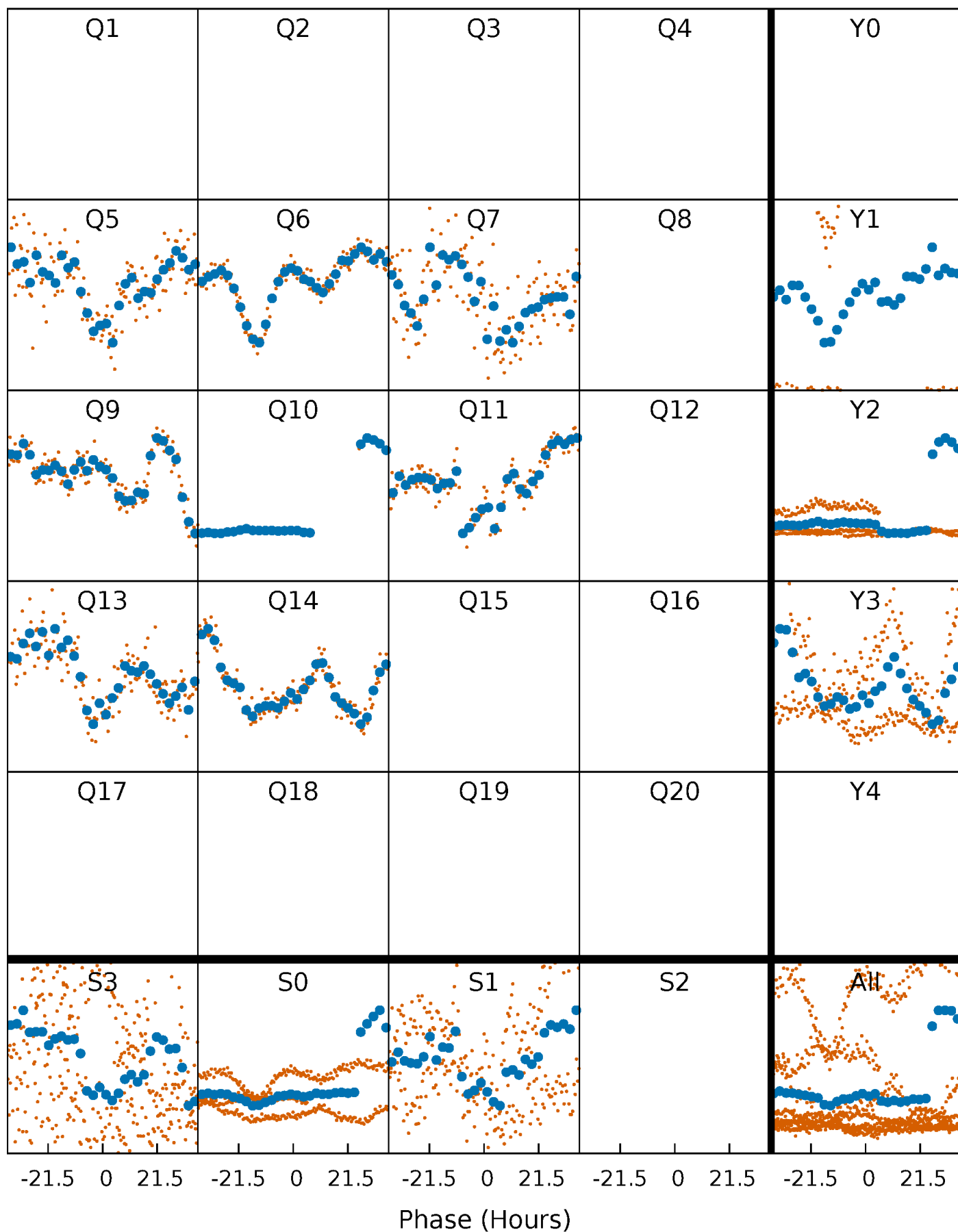
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

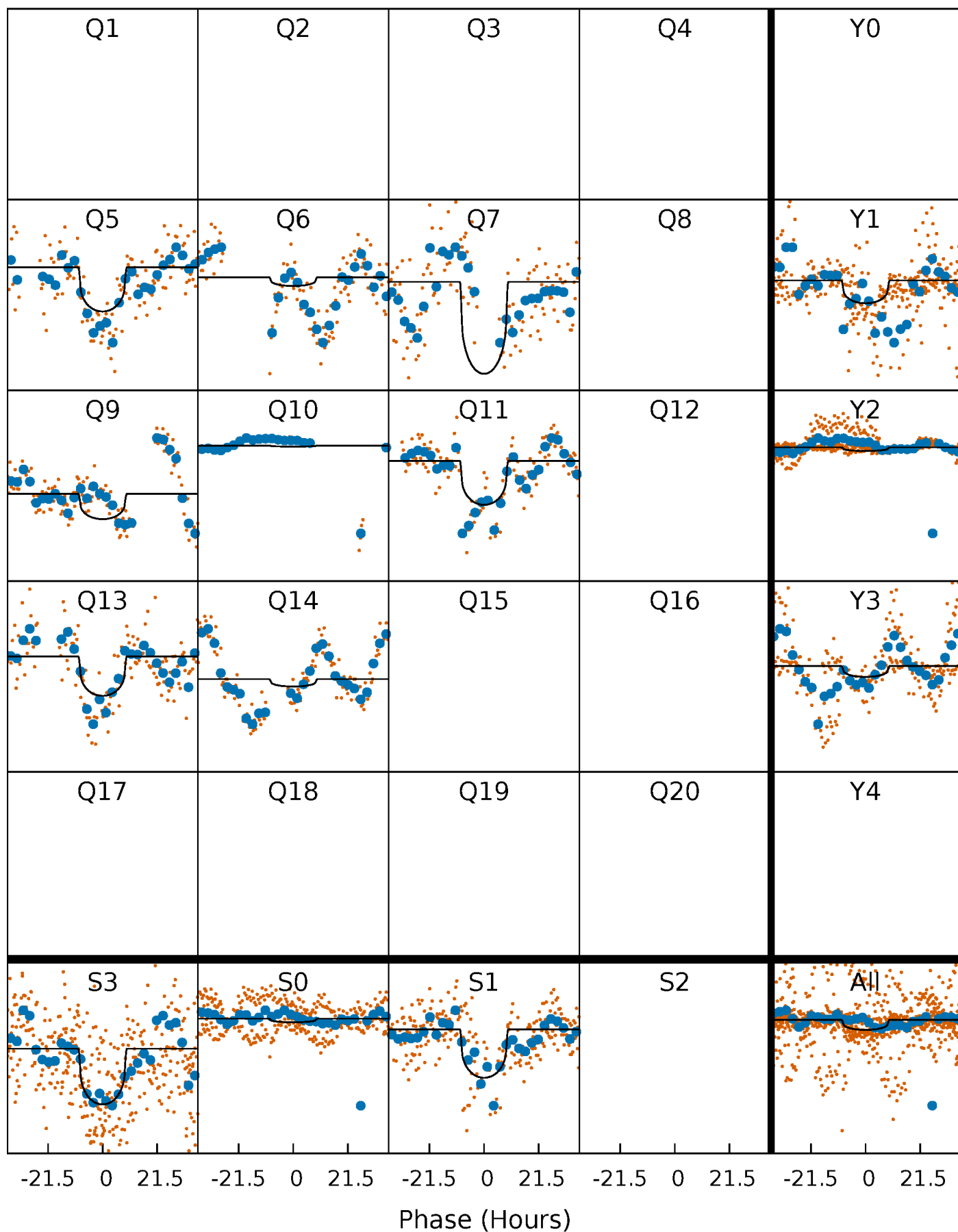
TCE 011760959-04 P=127.765806 Days  $T_0=202.410414$  (BKJD)





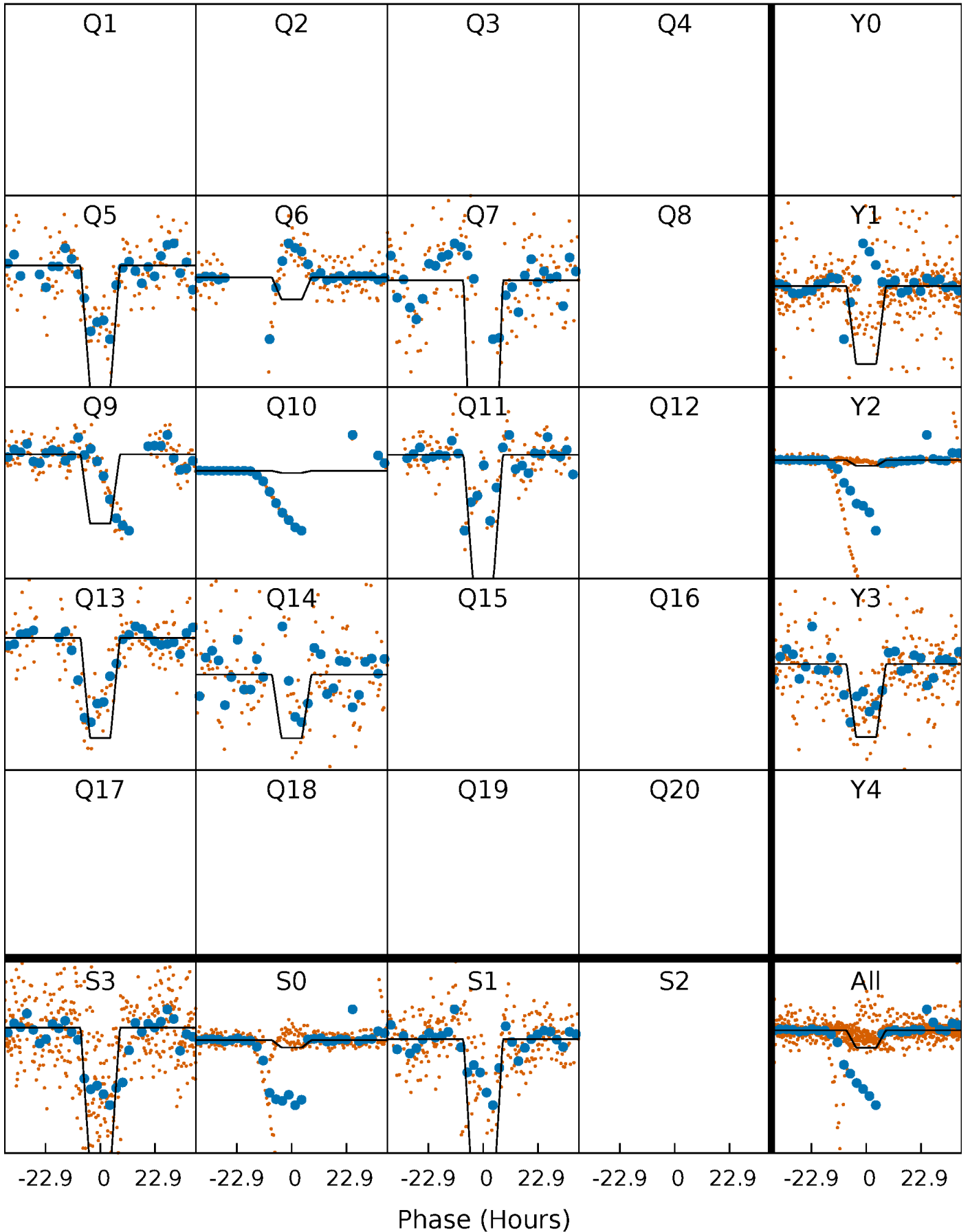
# DV Quarter-Phased Transit Curves

TCE 011760959-04 P=127.765806 Days  $T_0=202.410414$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

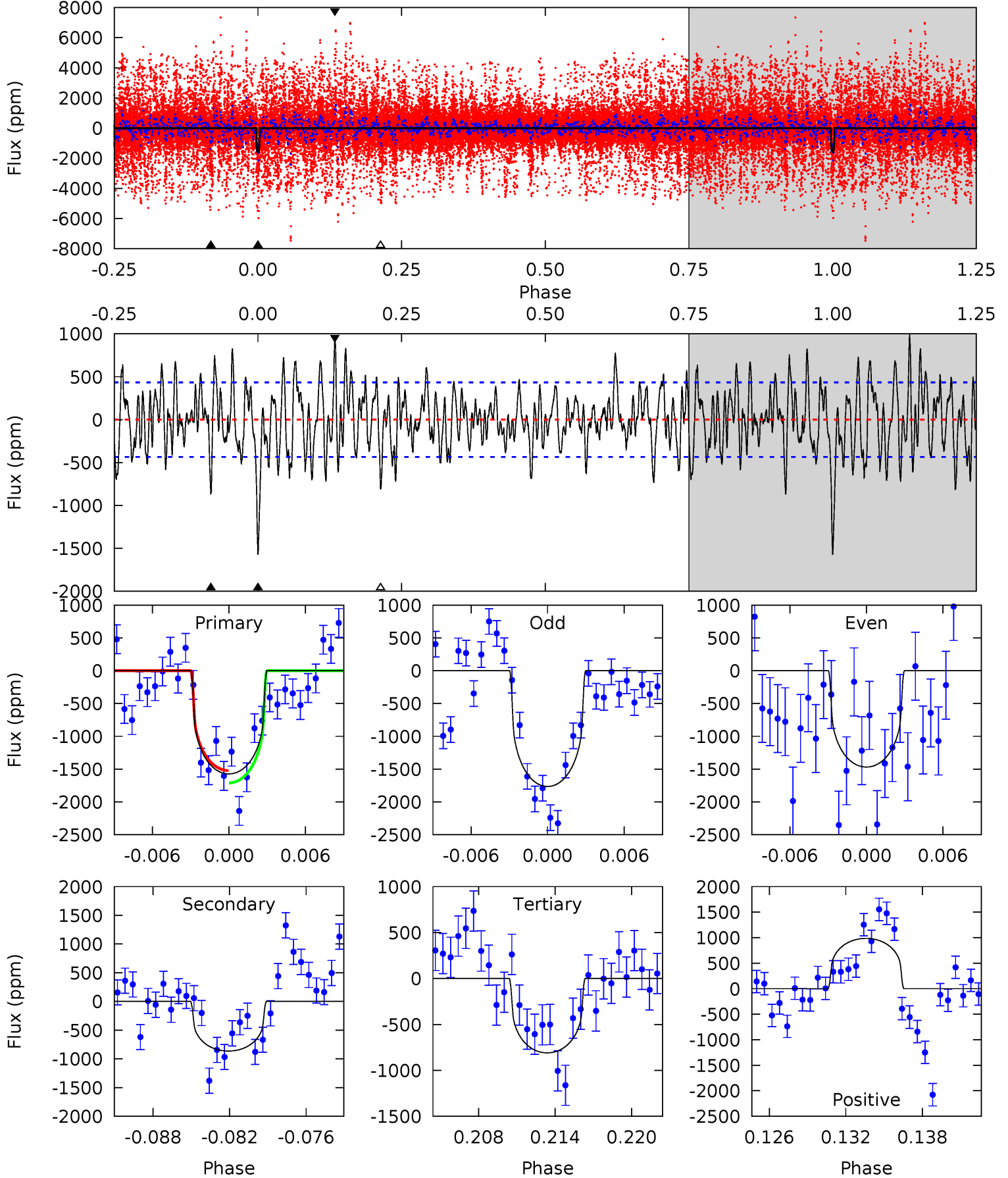
TCE 011760959-04 P=127.771051 Days  $T_0=202.408392$  (BKJD)



# DV Model-Shift Uniqueness Test

011760959-04, P = 127.765806 Days, E = 202.410414 Days

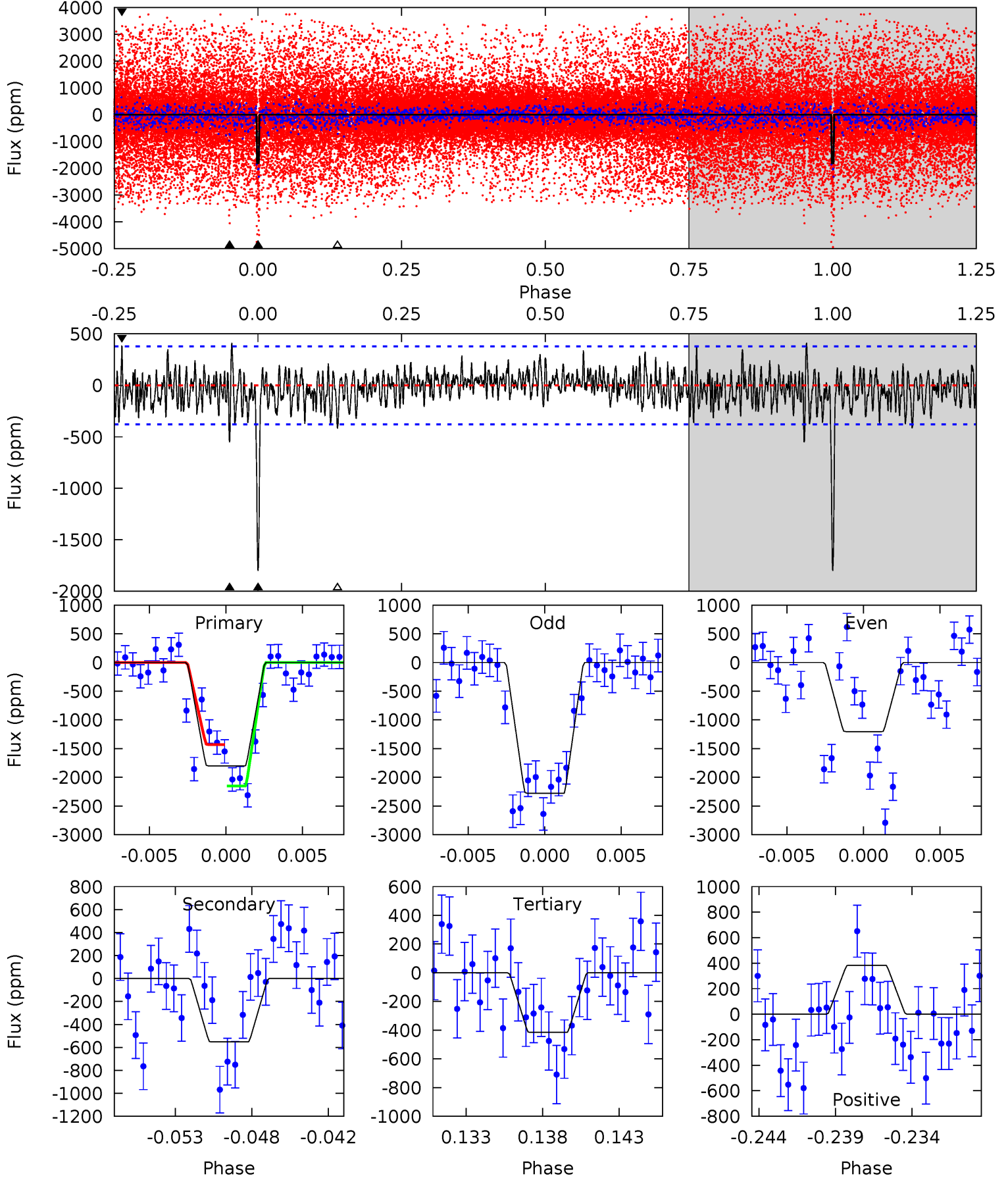
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.5	10.2	9.52	11.6	5.11	2.73	3.40	8.98	6.91	0.64	-1.44	1.27	0.27	0.39	0



# Alt Model-Shift Uniqueness Test

011760959-04, P = 127.771051 Days, E = 202.408392 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.5	7.50	5.64	5.22	5.15	2.79	1.62	18.8	19.2	1.85	2.28	7.26	8.61	0.19	4.91



### Stellar Parameters For KIC 011760959

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4922^{+176}_{-176}$	$4.555^{+0.066}_{-0.044}$	$-0.120^{+0.300}_{-0.300}$	$0.744^{+0.065}_{-0.072}$	$0.726^{+0.093}_{-0.057}$	$2.479^{+0.736}_{-0.394}$
	+4%/-4%	+1%/-1%	+250%/-250%	+9%/-10%	+13%/-8%	+30%/-16%
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 011760959-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-864 \pm 85$	$2.94^{+0.94}_{-0.87}$	$390^{+15}_{-15}$	$4528^{+733}_{-467}$	$11257^{+11389}_{-4803}$
Alt.	$-552 \pm 74$	$5.20^{+0.88}_{-0.93}$	$391^{+15}_{-17}$	$3431^{+245}_{-184}$	$2259^{+1063}_{-617}$

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

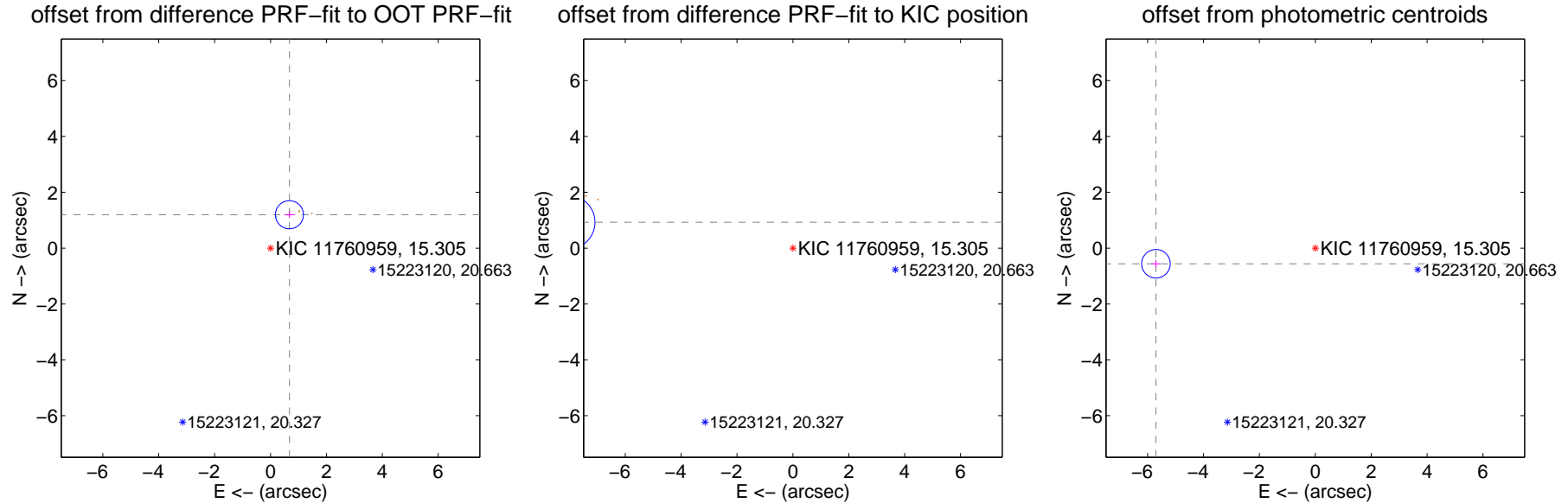
## DV Centroid Data

Supplemental centroid analysis for 011760959-04. Kepler magnitude: 15.30. Transit SNR 8.27

There are 3 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 8.48 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	$1.374 \pm 0.167$	8.21	$-0.677 \pm 0.181$	$1.196 \pm 0.122$
PRF-fit source offset from KIC position	$8.099 \pm 0.321$	25.22	$8.046 \pm 0.350$	$0.927 \pm 0.277$
photometric centroid source offset	$5.73 \pm 0.17$	33.60	$5.70 \pm 0.17$	$-0.56 \pm 0.14$

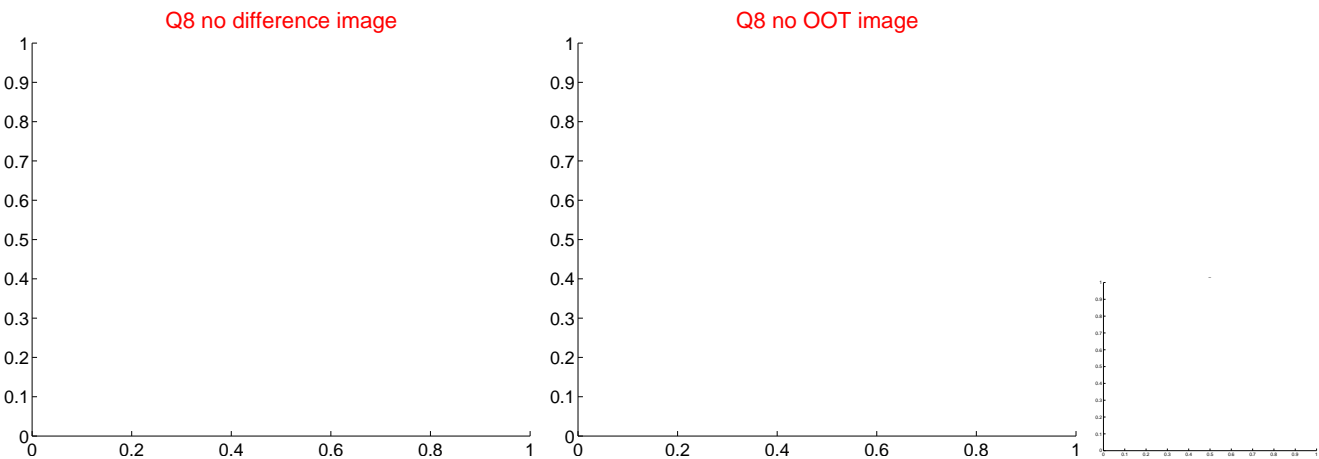
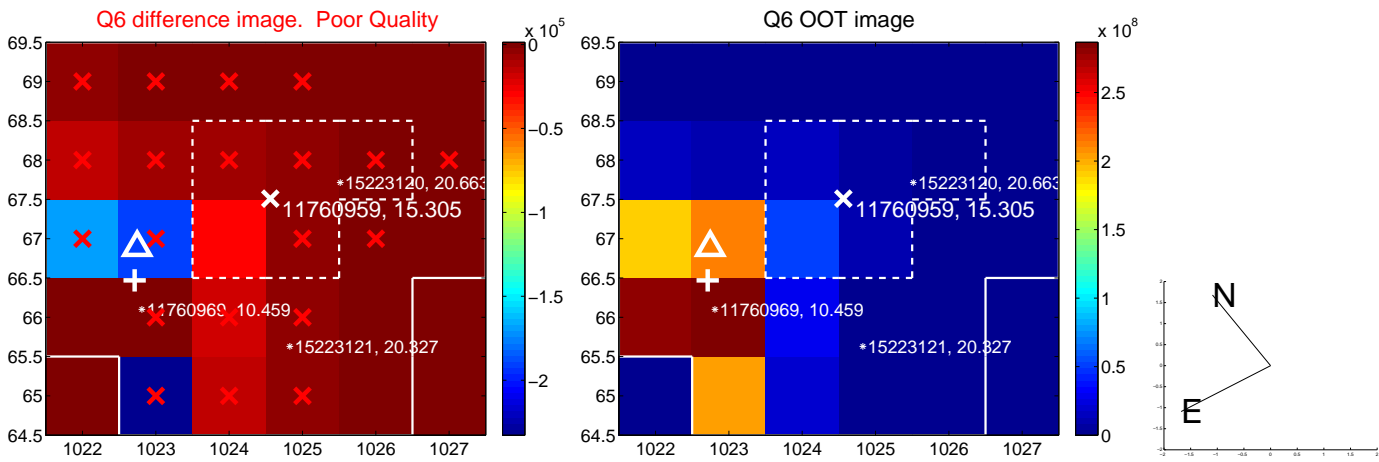
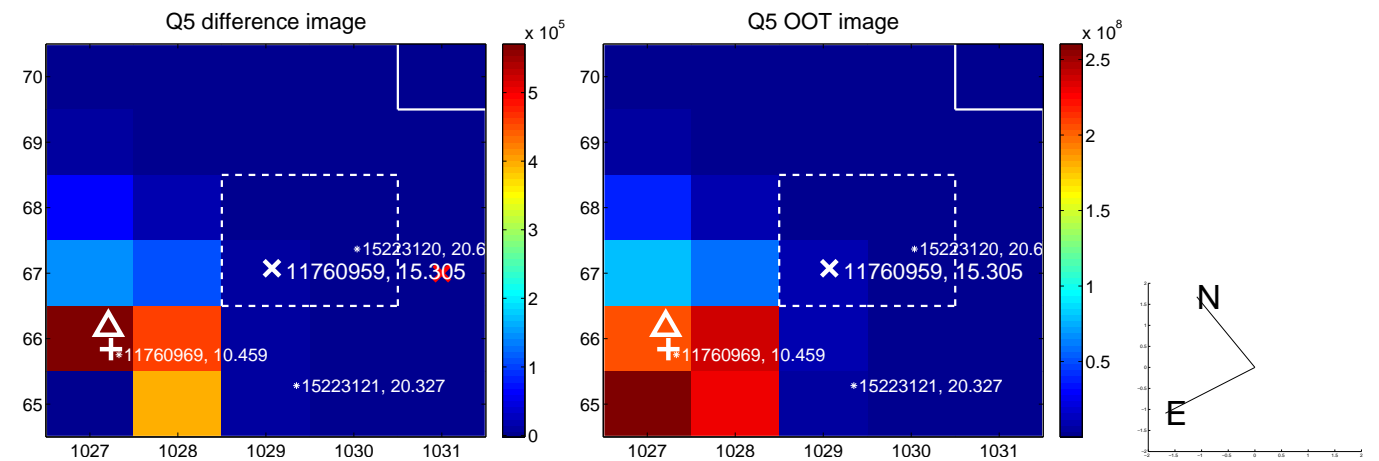


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

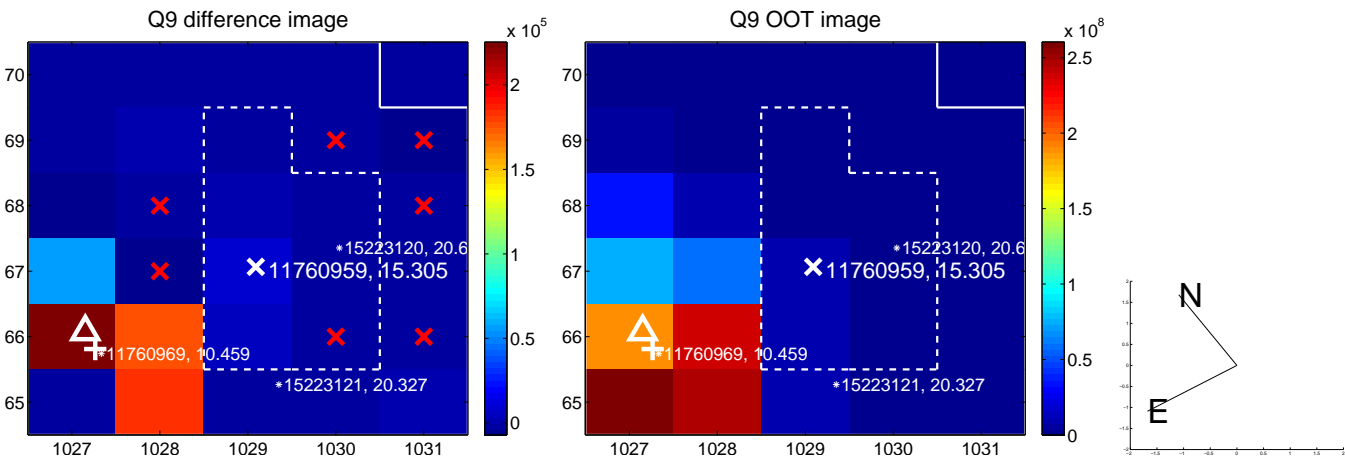


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

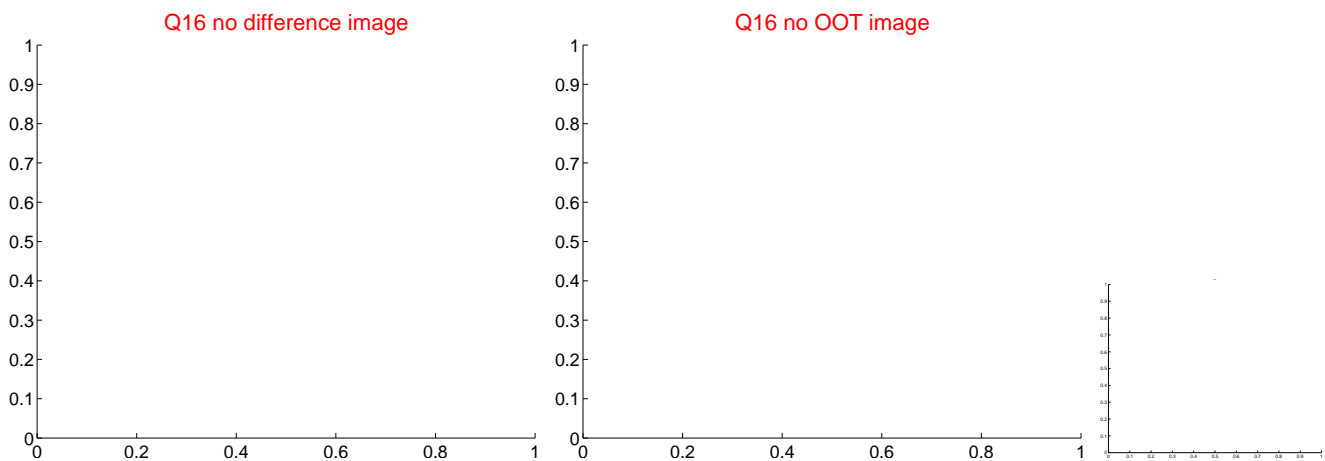
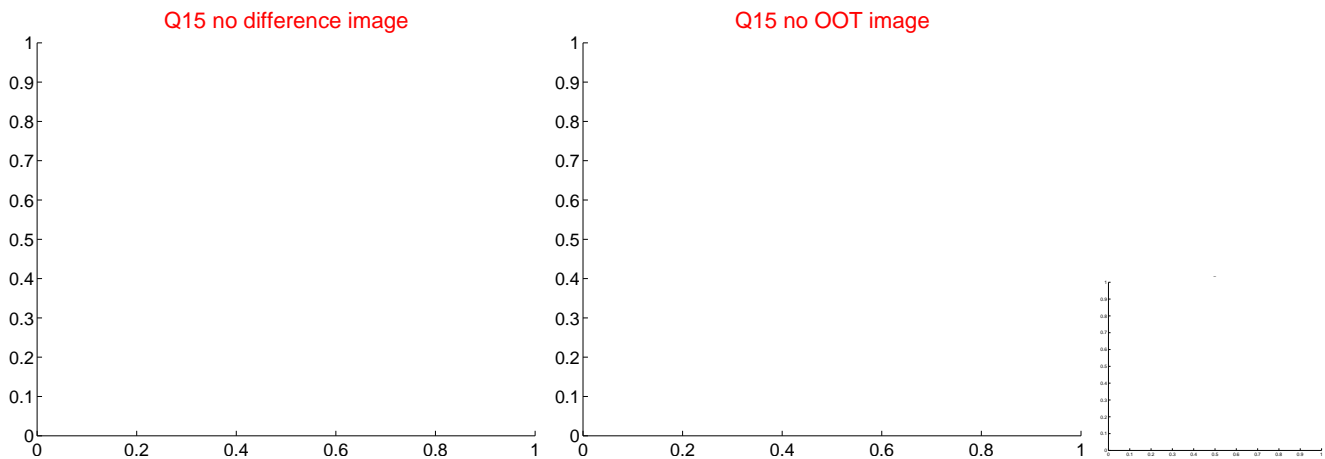
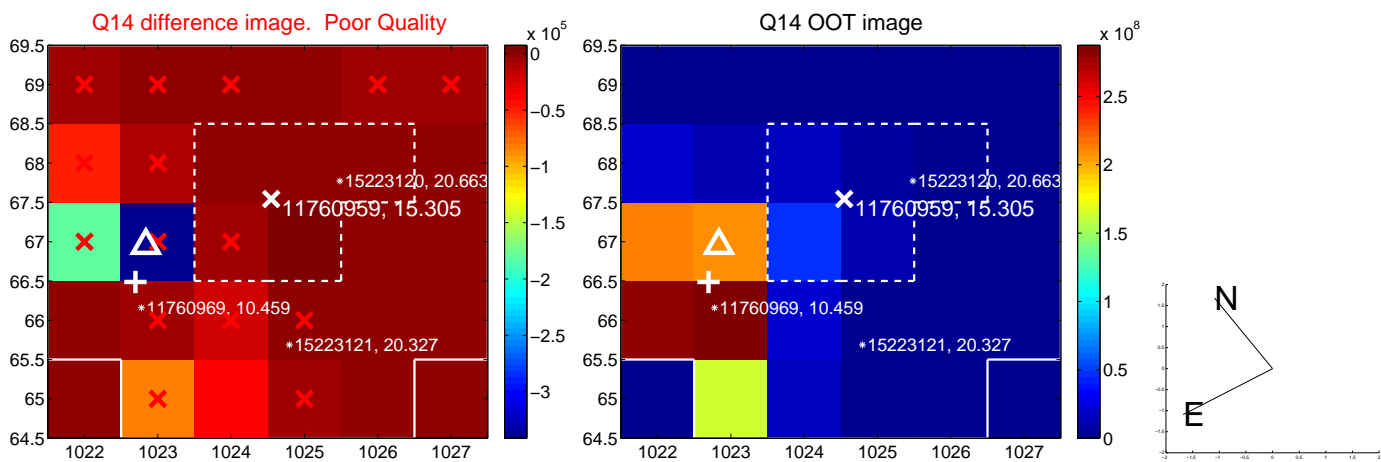
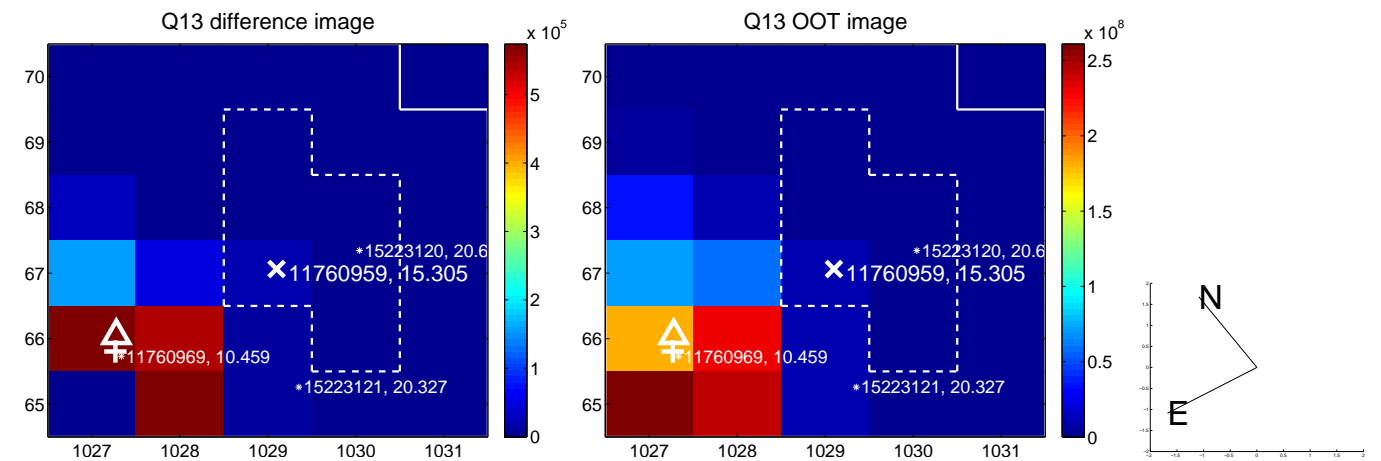




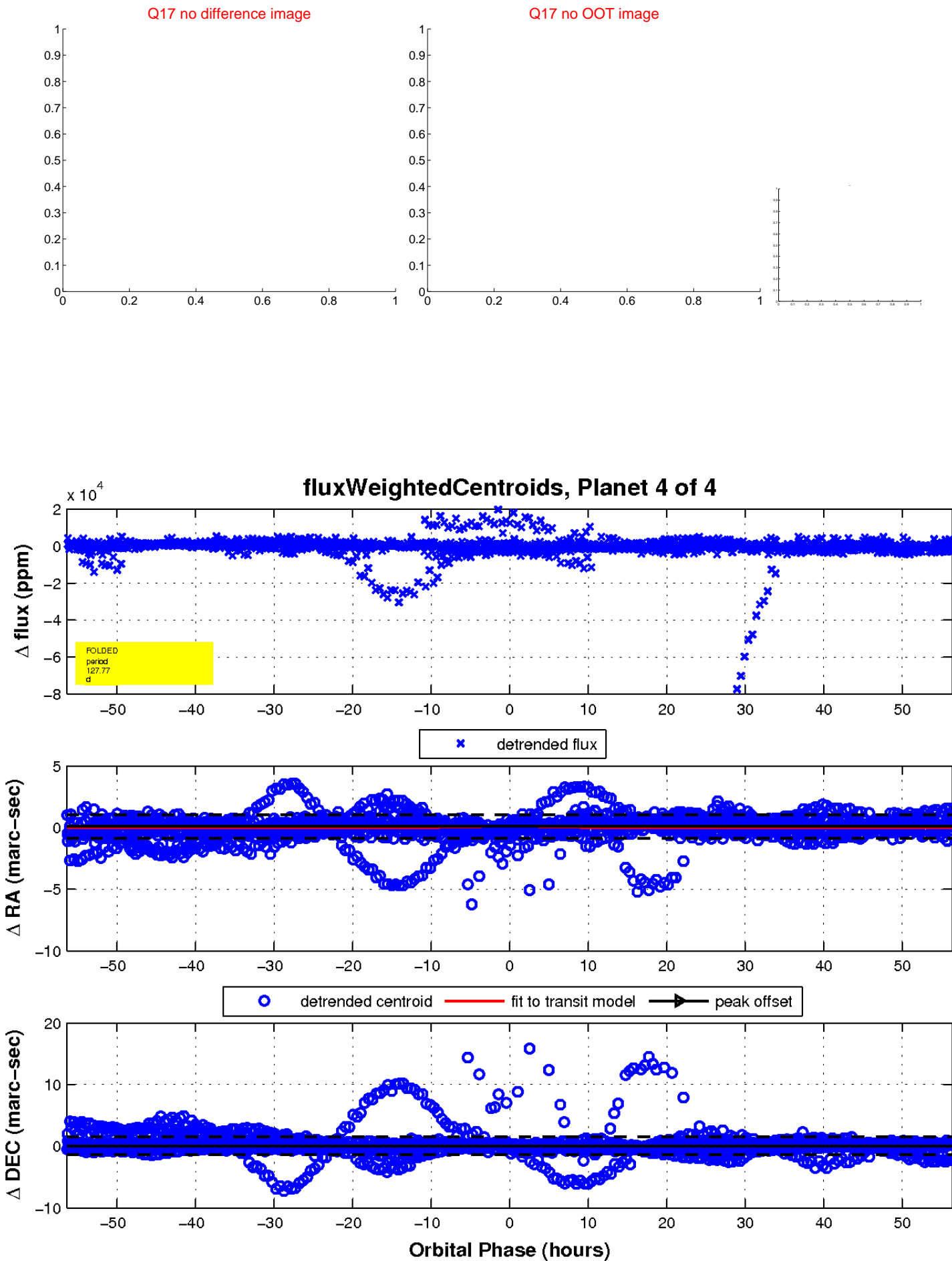
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UKIRT Image

