

# KIC 011400356

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011400356-01	OBS	8222.01	677.559066	214.239257	689.5	10.287	7.5	7.0	0.87	5511	2.30	0.31
011400356-02	OBS	No	1.731874	132.399669	43.2	9.232	8.3	6.6	0.87	5511	0.67	891.54
011400356-03	OBS	No	66.853725	183.595549	825.6	2.080	8.5	9.3	0.87	5511	2.69	6.83
011400356-04	OBS	No	120.095184	165.444125	845.1	2.461	7.7	8.2	0.87	5511	2.83	3.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011400356-01	OBS	FP	0.11	1	0	0	0	MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011400356-02	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_FEW_DIFFS
011400356-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
011400356-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—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.

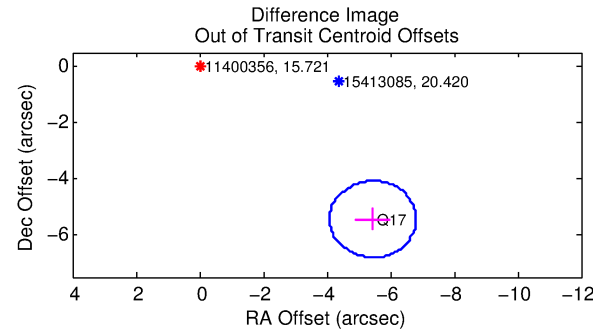
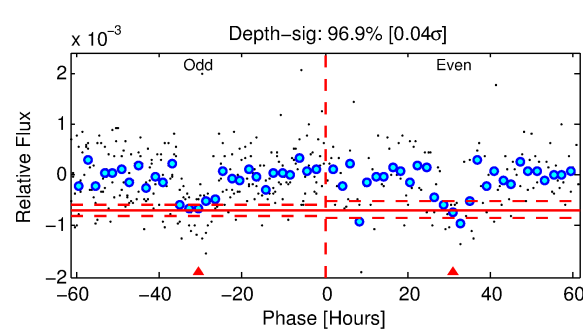
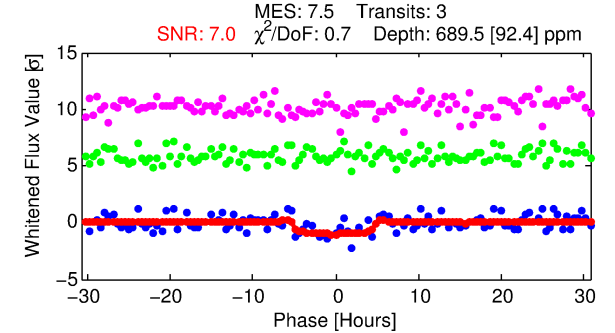
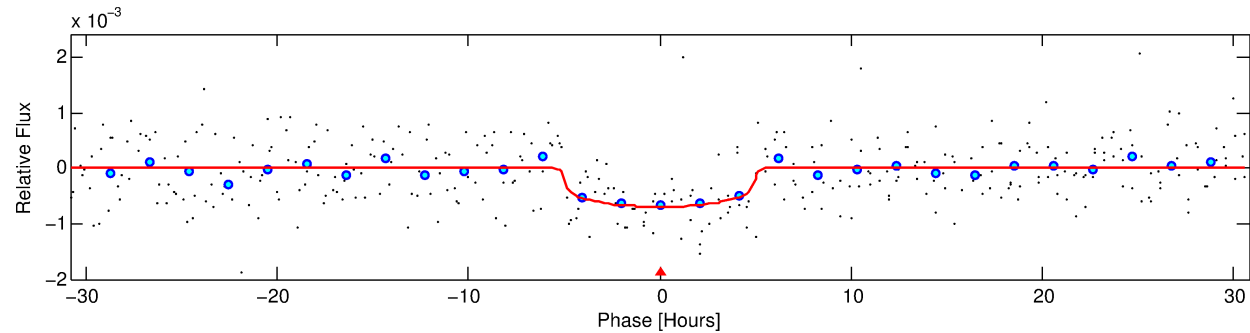
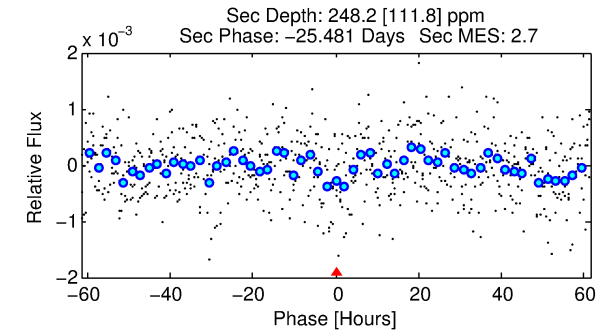
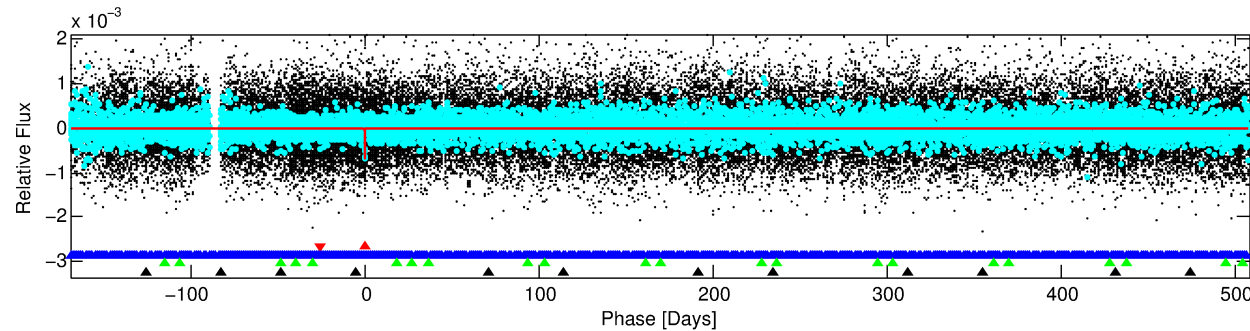
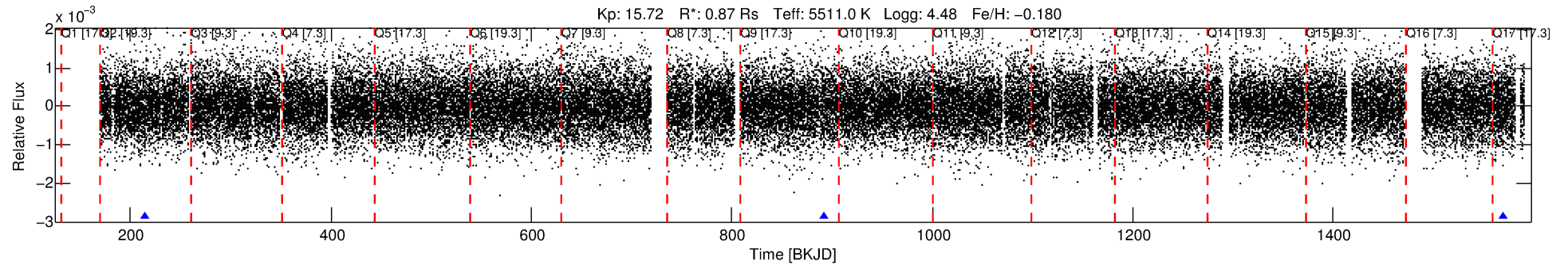
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011400356-01

No Significant Match Found

# DV One-Page Summary

KIC: 11400356 Candidate: 1 of 4 Period: 677.559 d



## DV Fit Results:

Period = 677.55907 [0.01362] d  
Epoch = 214.2393 [0.0186] BKJD  
Rp/R\* = 0.0241 [0.0413]  
a/R\* = 477.76 [3379.45]  
b = 0.38 [15.84]  
Seff = 0.31 [0.09]  
Teq = 191 [14] K  
Rp = 2.30 [3.97] Re  
a = 1.4202 [0.2644] AU  
Ag = 52207.43 [180892.82] [0.29σ]  
Teff = 4452 [3848] K [1.11σ]

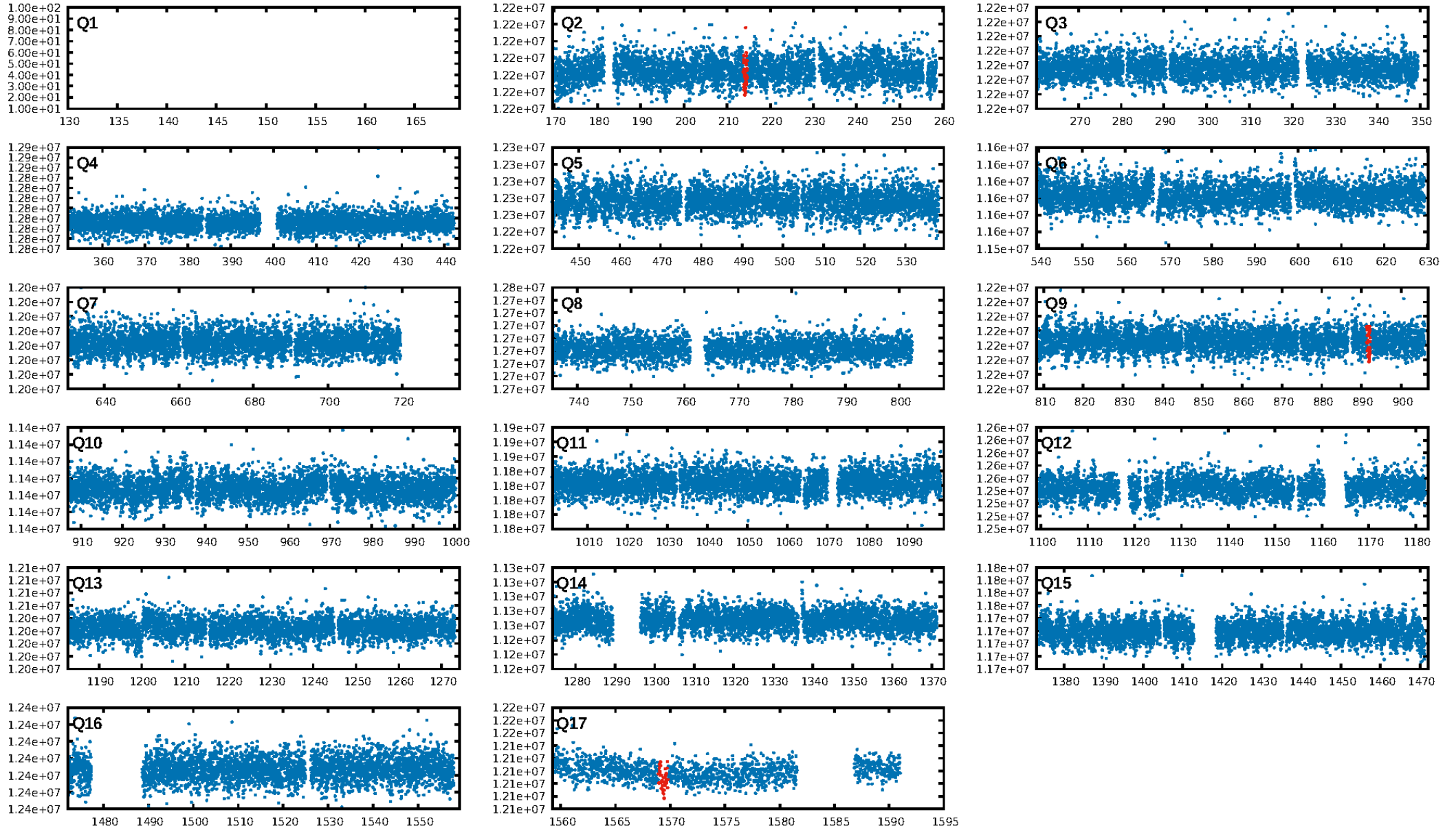
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1264.96σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 96.1%  
ModelChiSquareGoF-sig: 100.0%  
**Bootstrap-pfa: 1.13e-10**  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -17.78  
Centroid-sig: 30.2%  
Centroid-so: 1.784 arcsec [0.81σ]  
**OotOffset-rm: 7.701 arcsec [16.97σ]**  
**KicOffset-rm: 7.596 arcsec [16.64σ]**  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.00 [0/3]

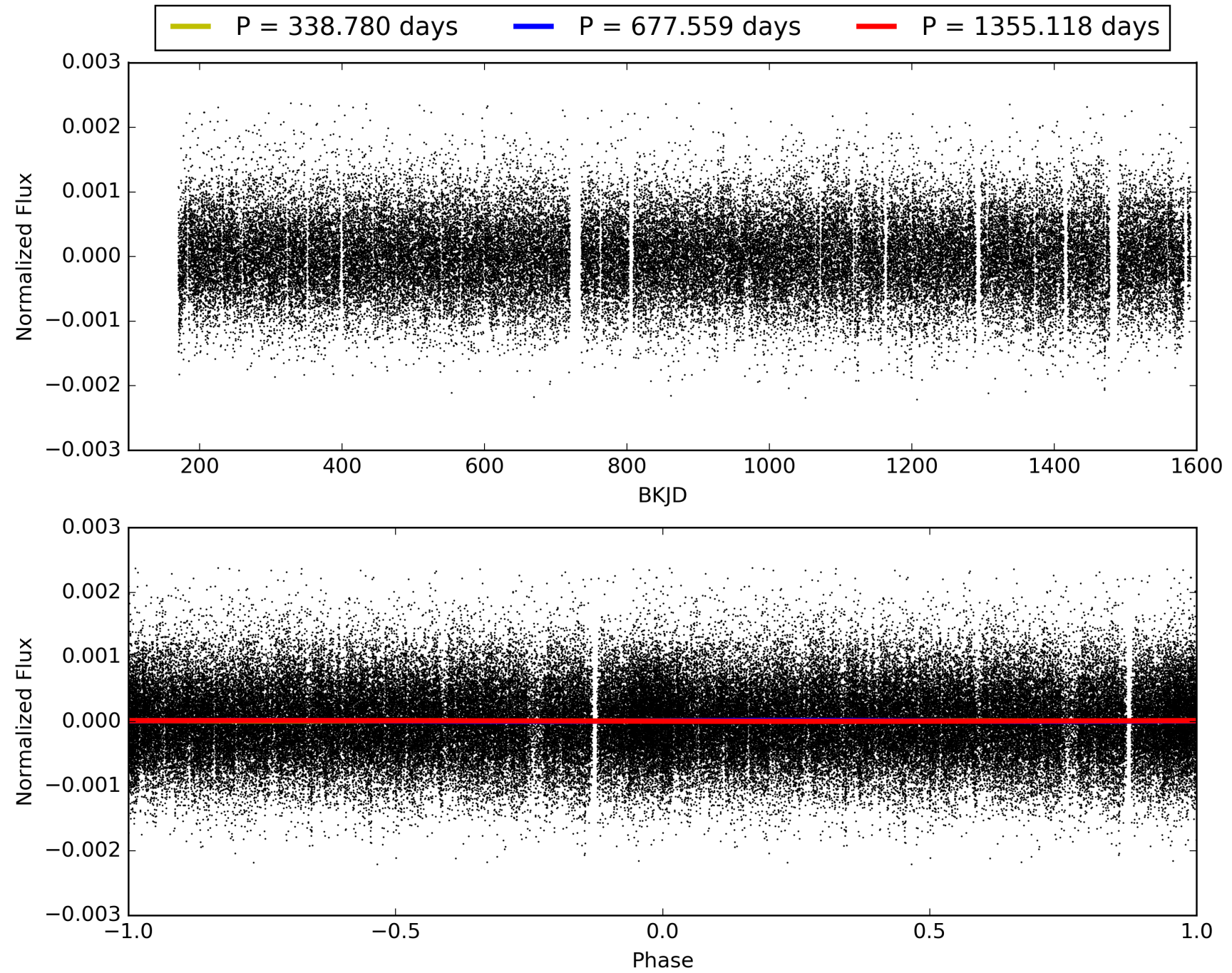
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:28:00 Z

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

# TCE 011400356-01, PDC Light Curves



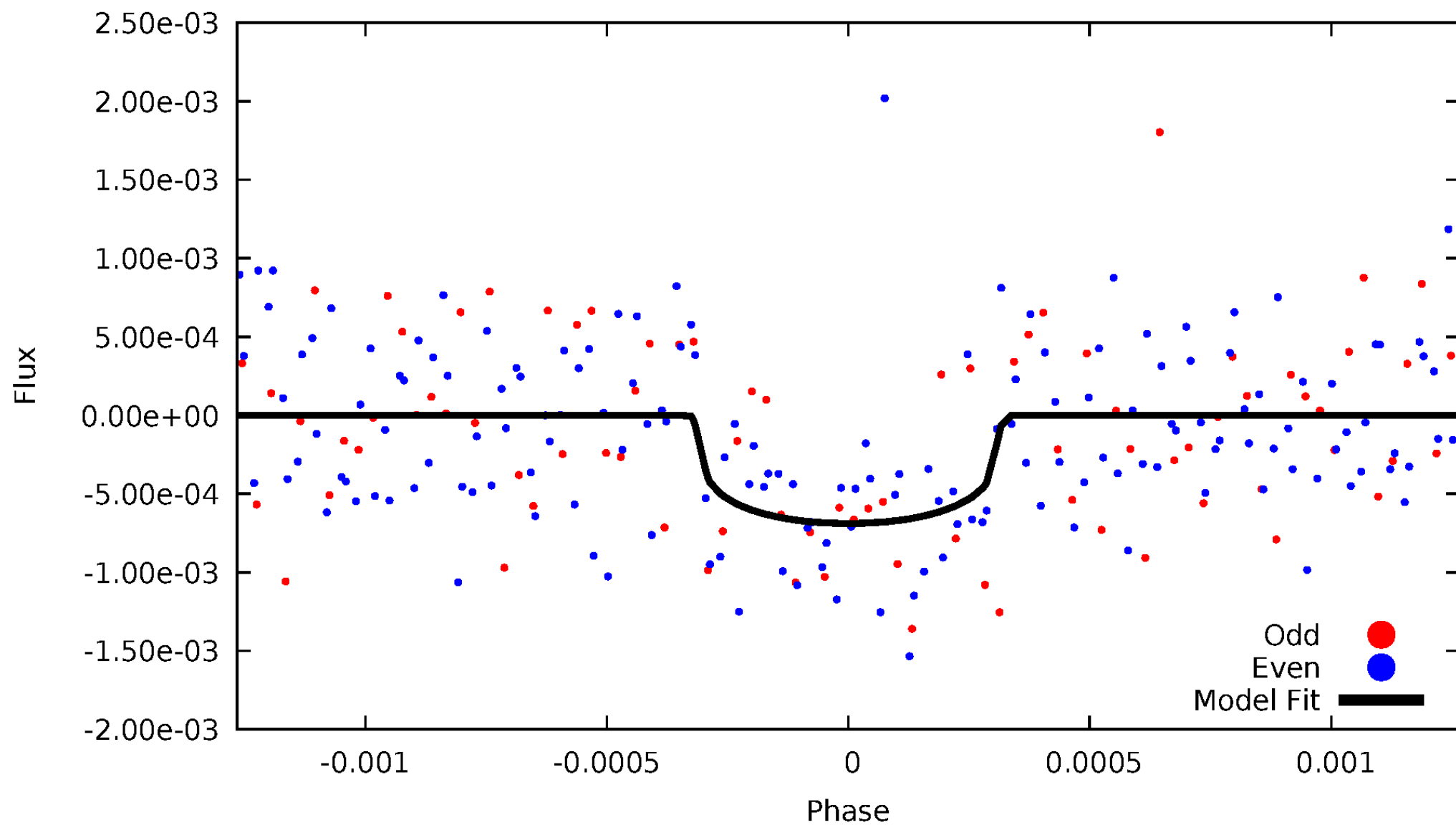
TCE 011400356-01





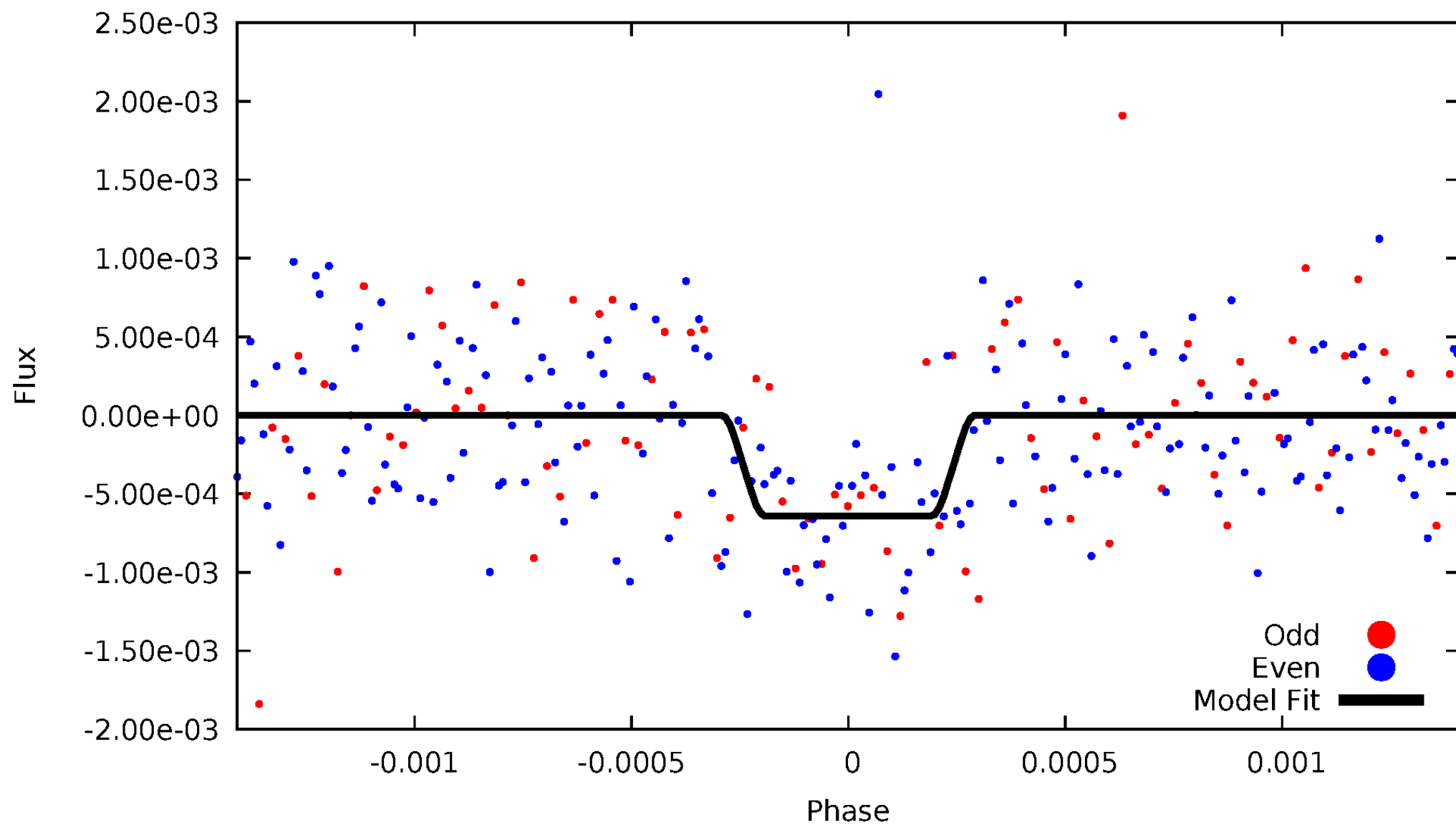
# DV Odd/Even

TCE 011400356-01



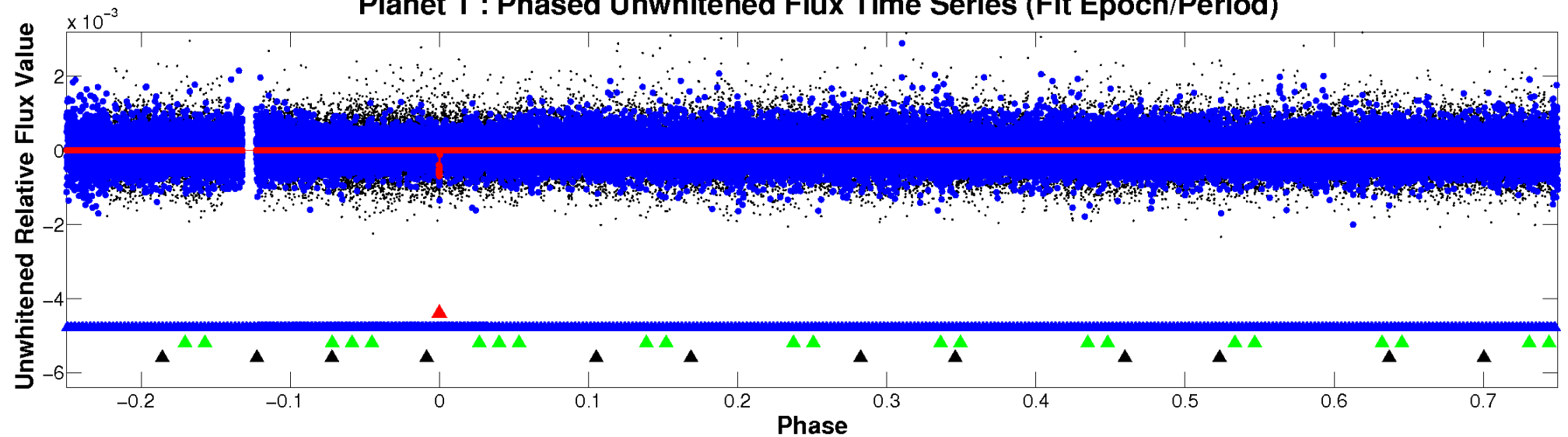
# ALT Odd/Even

TCE 011400356-01

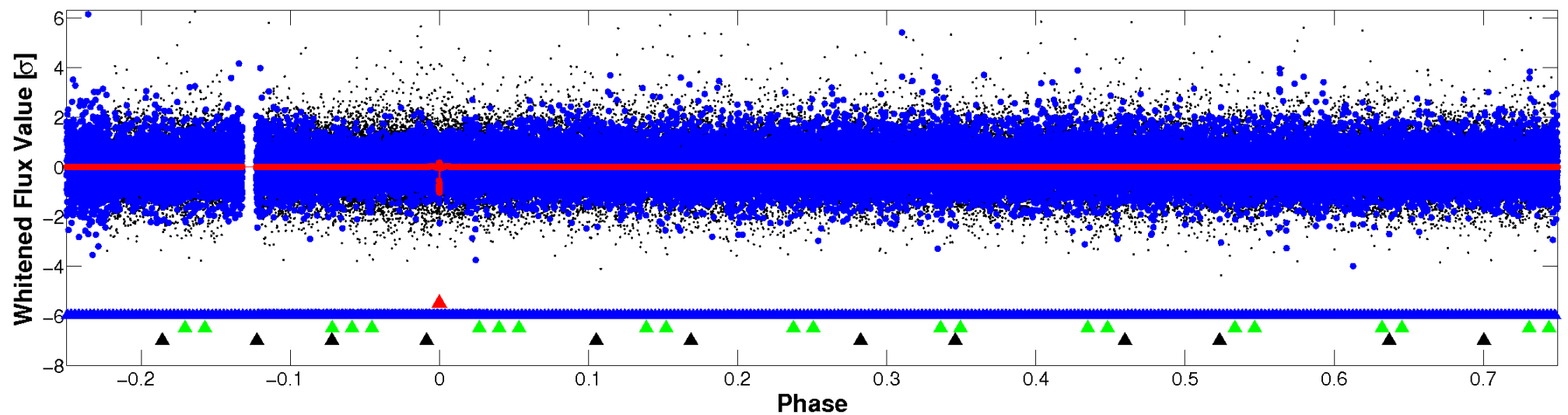


# Non-Whitened Vs. Whitened Light Curve

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

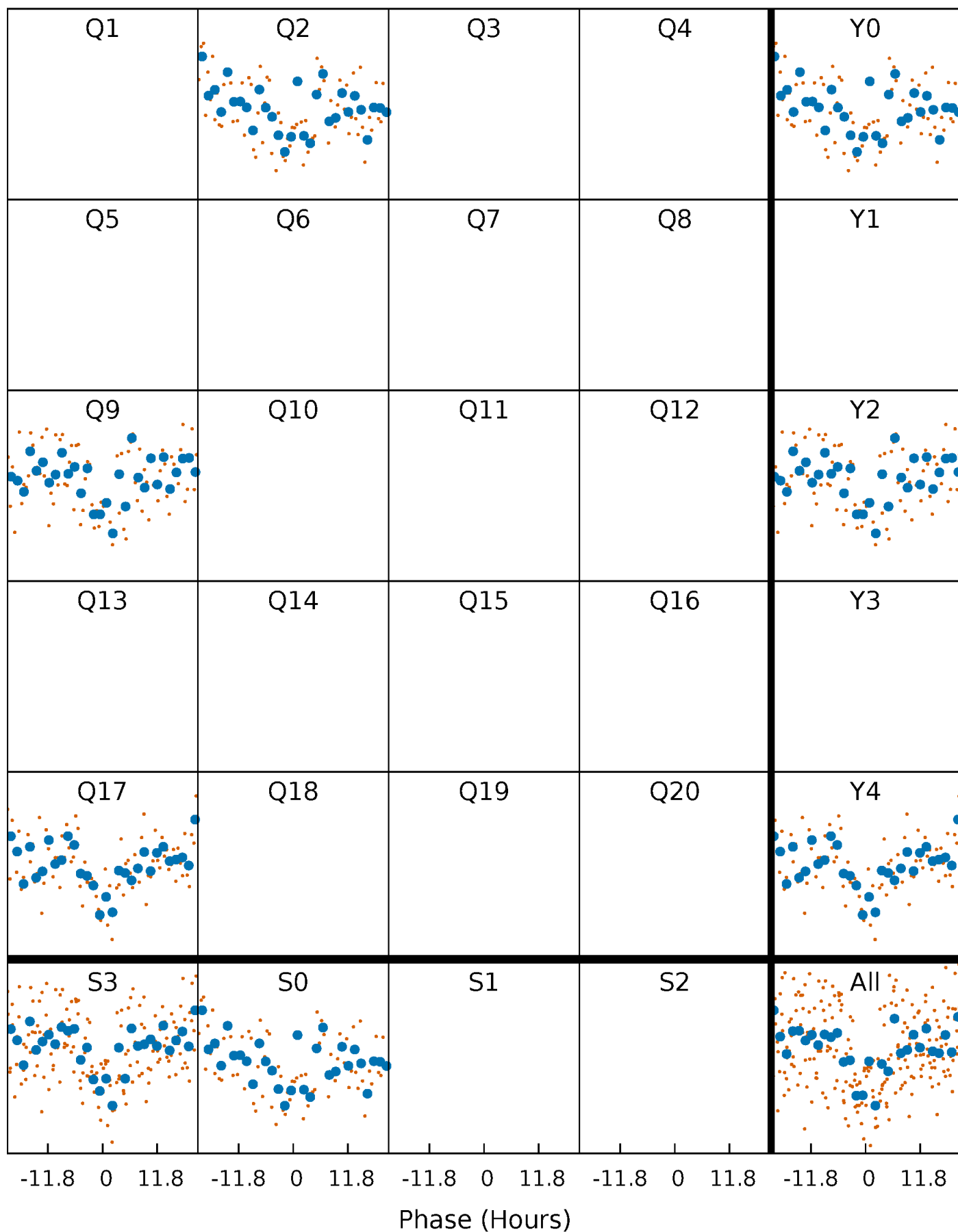


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

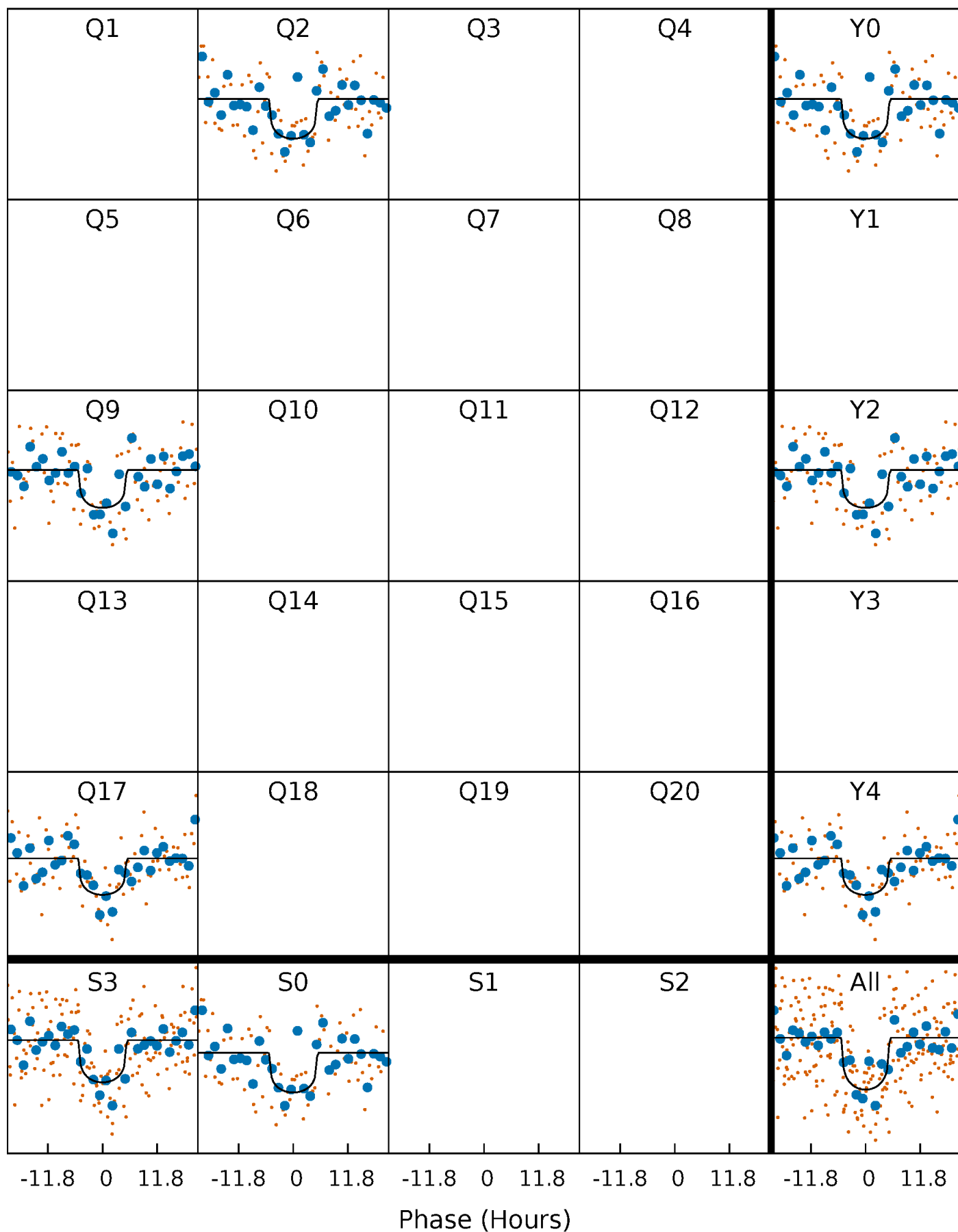
TCE 011400356-01 P=677.559066 Days  $T_0=214.239257$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 011400356-01 P=677.559066 Days  $T_0=214.239257$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

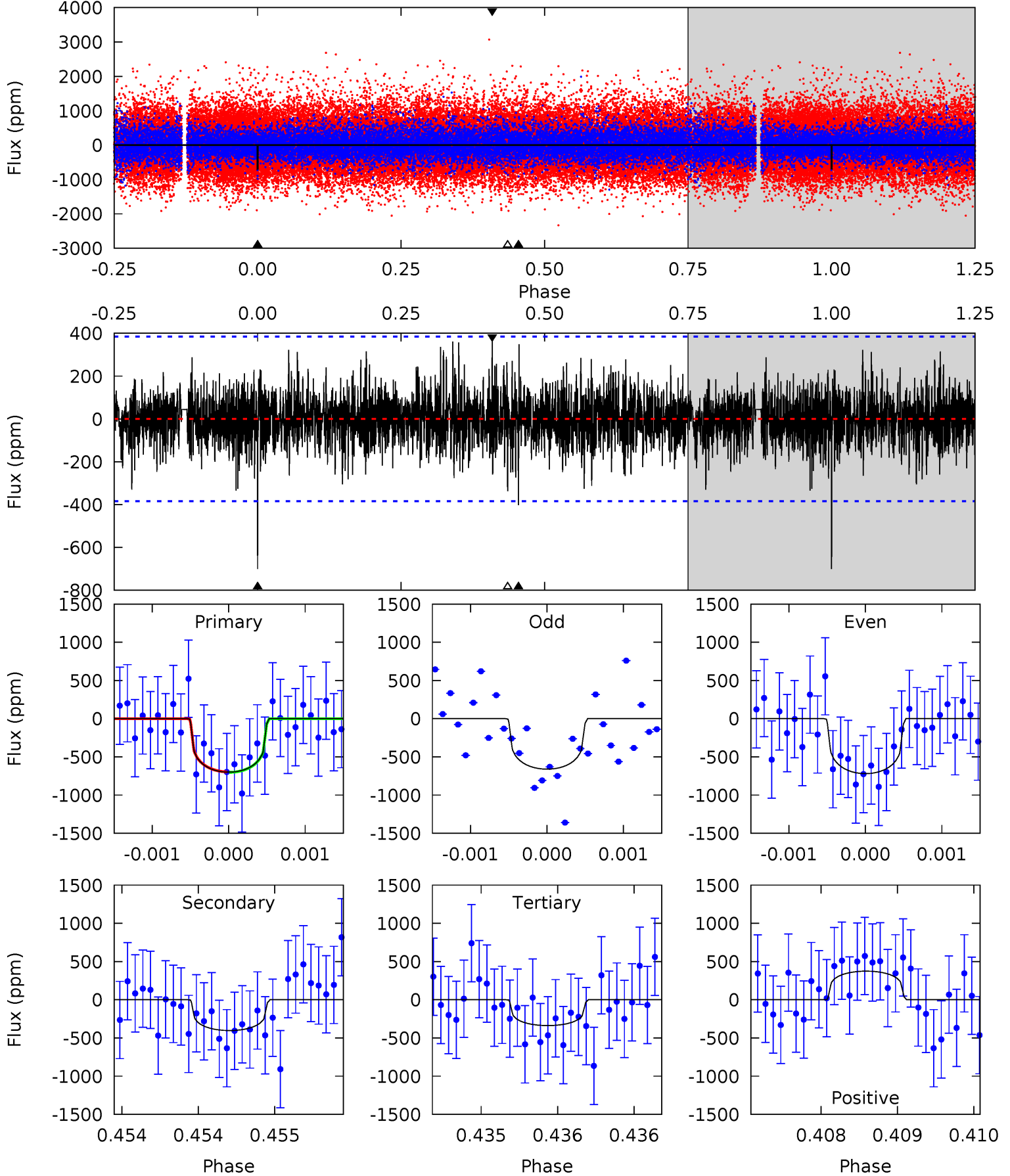
TCE 011400356-01 P=677.563227 Days  $T_0=214.243480$  (BKJD)



# DV Model-Shift Uniqueness Test

011400356-01, P = 677.559066 Days, E = 214.239257 Days

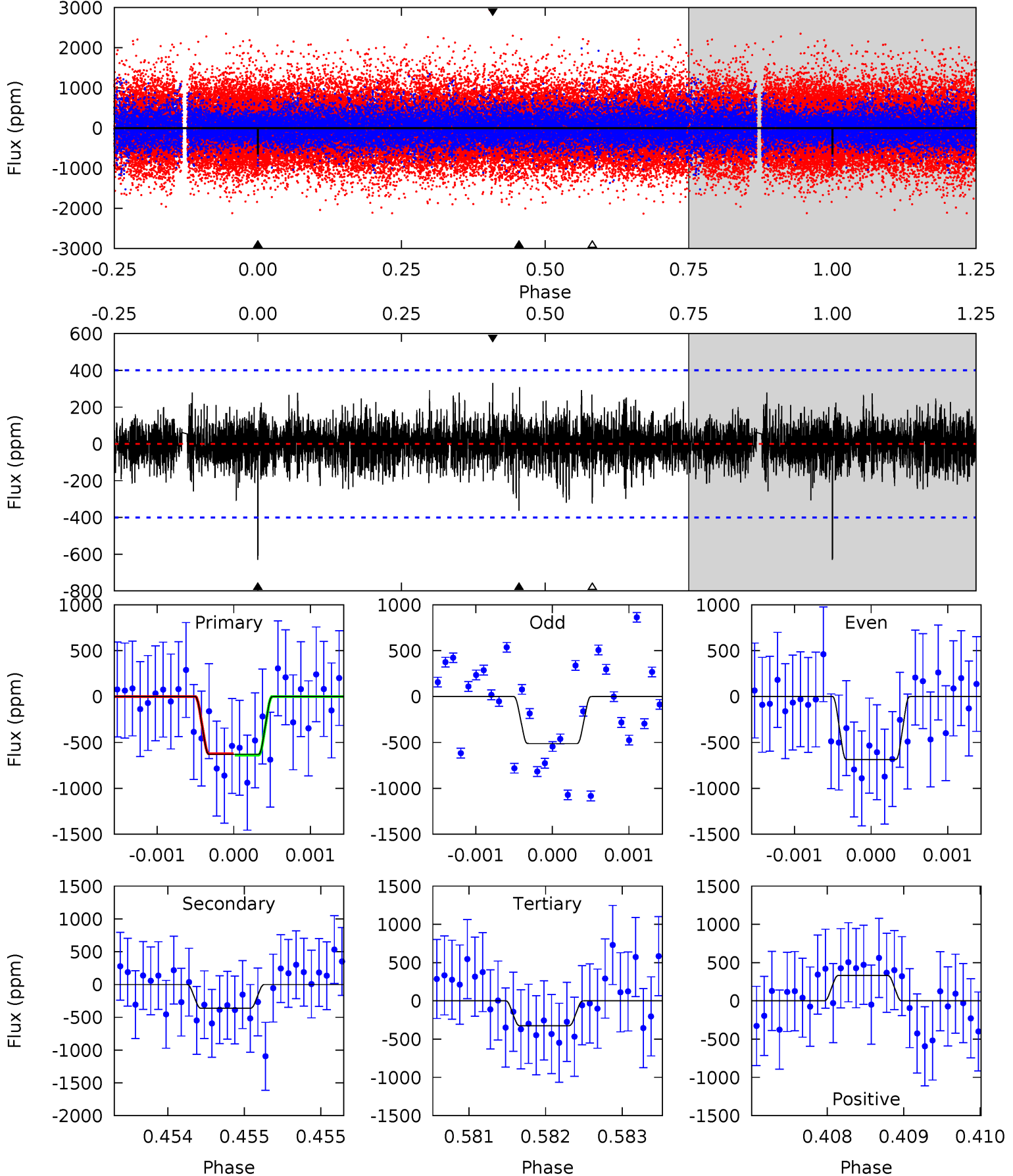
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	5.80	4.86	5.39	5.53	3.42	1.35	5.22	4.69	0.94	0.41	0.40	0.98	0.35	0.05



# Alt Model-Shift Uniqueness Test

011400356-01, P = 677.563227 Days, E = 214.243480 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.72	5.04	4.49	4.58	5.55	3.44	1.14	4.23	4.14	0.55	0.46	1.13	1.11	0.34	0.10





### Stellar Parameters For KIC 011400356

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5511^{+166}_{-166}$	$4.477^{+0.096}_{-0.144}$	$-0.180^{+0.300}_{-0.300}$	$0.872^{+0.196}_{-0.105}$	$0.833^{+0.111}_{-0.074}$	$1.770^{+0.749}_{-0.722}$
	+3%/-3%	+2%/-3%	+167%/-167%	+22%/-12%	+13%/-9%	+42%/-41%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011400356-01 / KOI 8222.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-403 \pm 69$	$3.82^{+3.74}_{-2.61}$	$268^{+17}_{-14}$	$4188^{+2926}_{-837}$	$30971^{+283187}_{-23264}$
Alt.	$-364 \pm 72$	$4.12^{+3.53}_{-2.97}$	$268^{+15}_{-13}$	$3979^{+2718}_{-719}$	$24641^{+249557}_{-17880}$

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

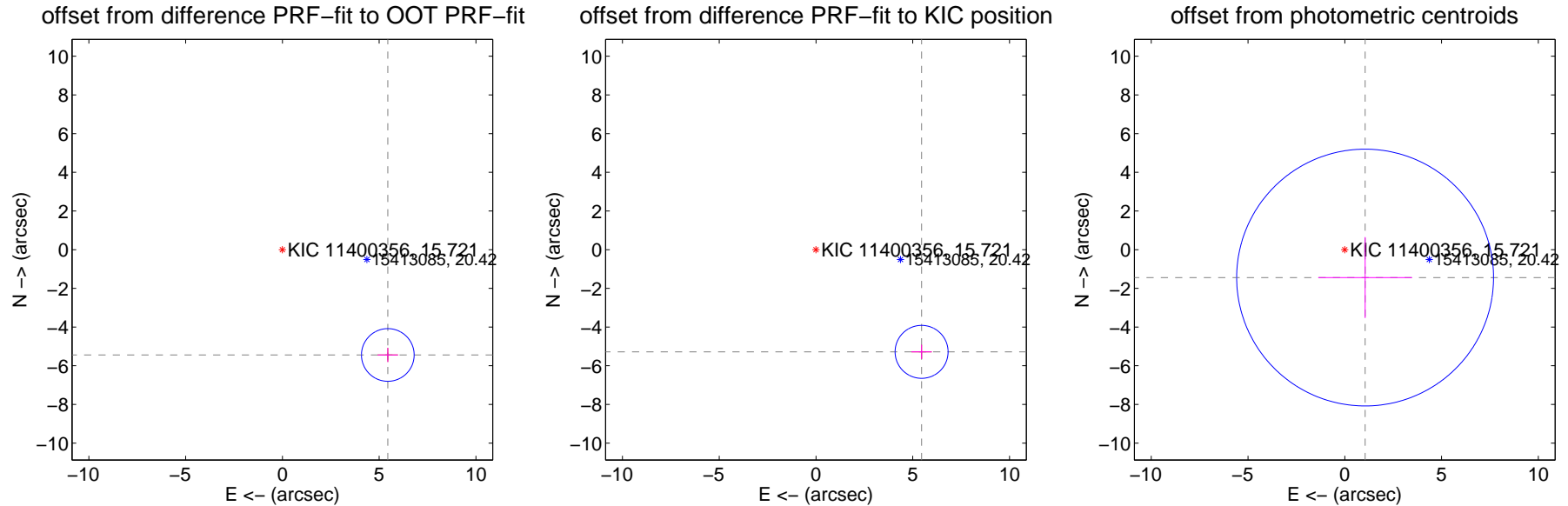
## DV Centroid Data

Supplemental centroid analysis for 011400356-01. Kepler magnitude: 15.72. Transit SNR 6.99

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$7.701 \pm 0.454$	16.97	$-5.448 \pm 0.527$	$-5.443 \pm 0.366$
PRF-fit source offset from KIC position	$7.596 \pm 0.456$	16.64	$-5.458 \pm 0.527$	$-5.282 \pm 0.366$
photometric centroid source offset	$1.78 \pm 2.21$	0.81	$-1.05 \pm 2.42$	$-1.44 \pm 2.09$



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.

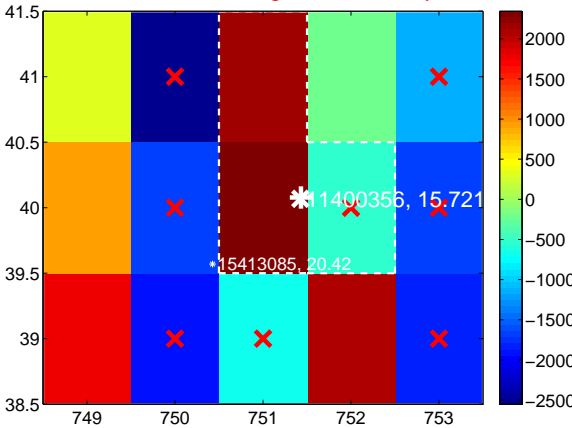
Q1 no difference image



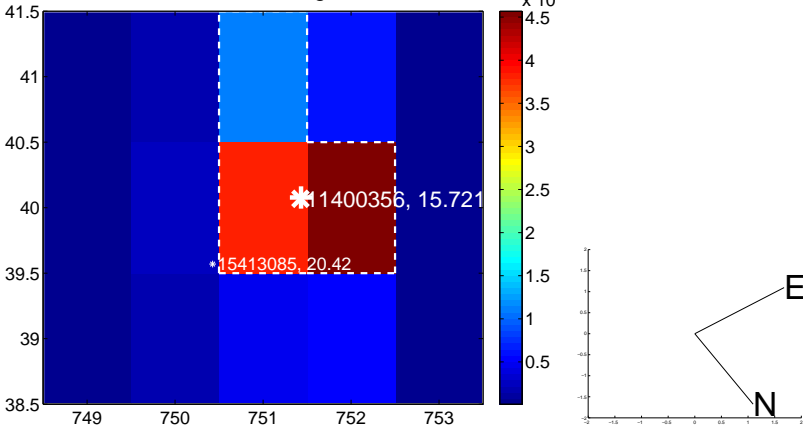
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



Q3 no difference image



Q3 no OOT image



Q4 no difference image



Q4 no OOT image

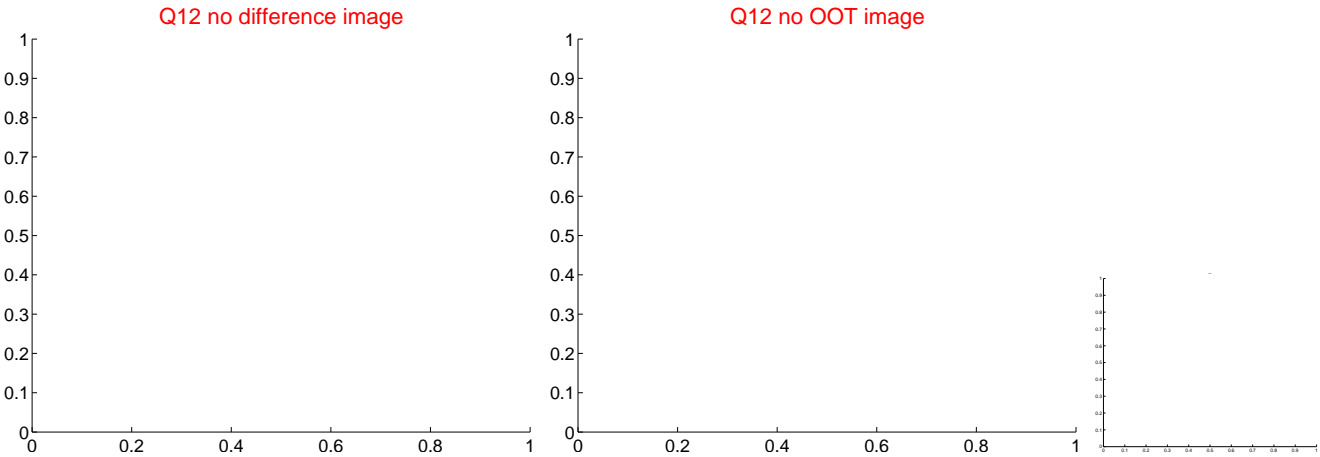
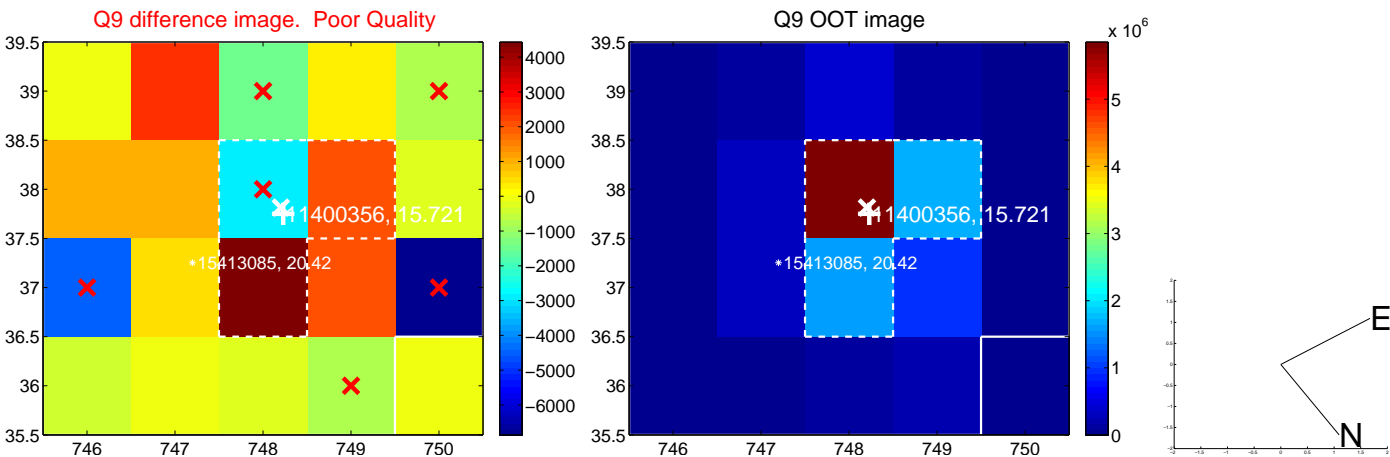


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





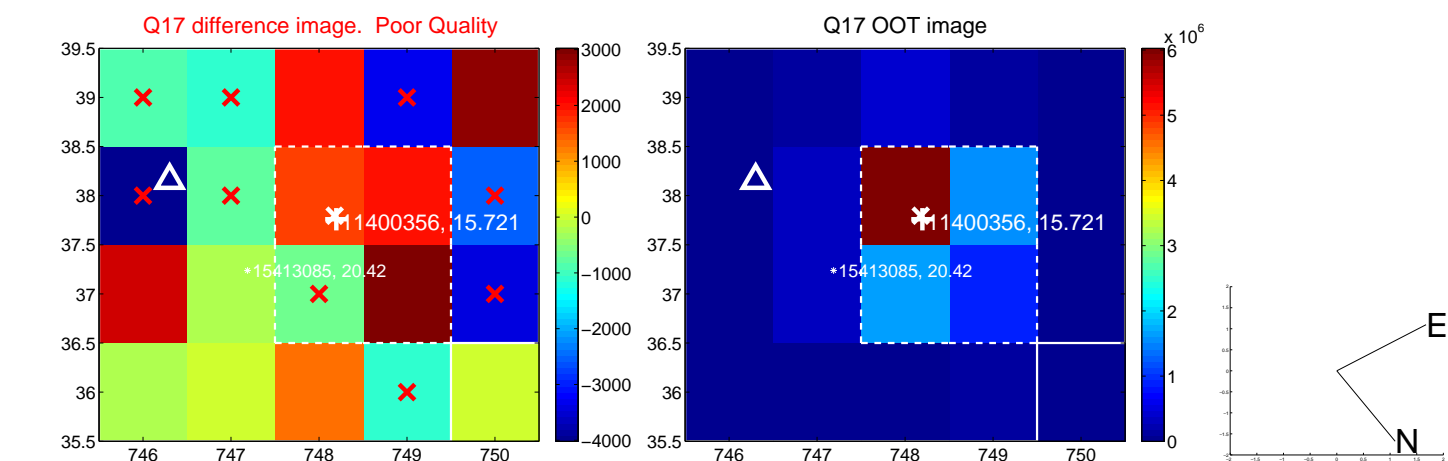
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



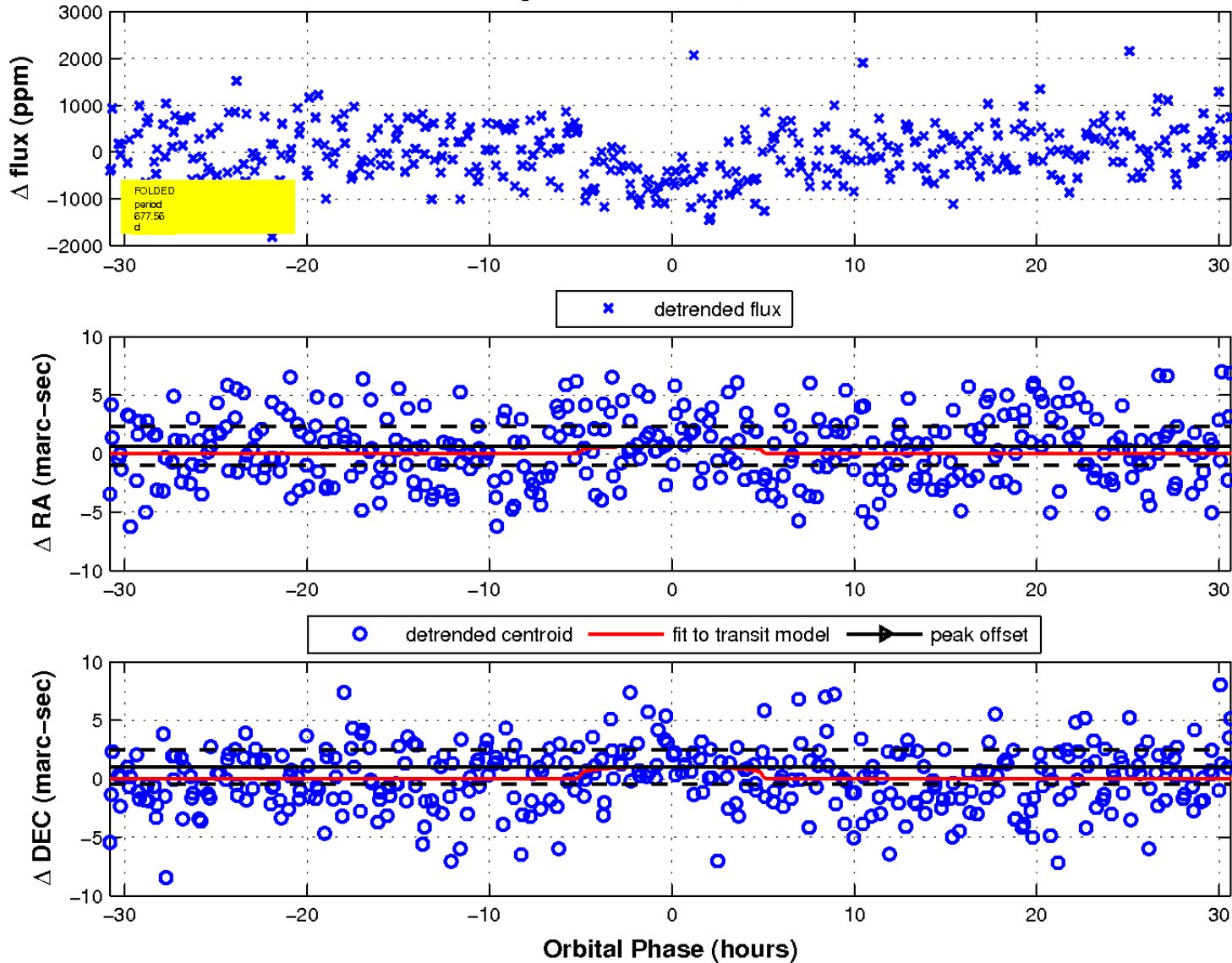
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

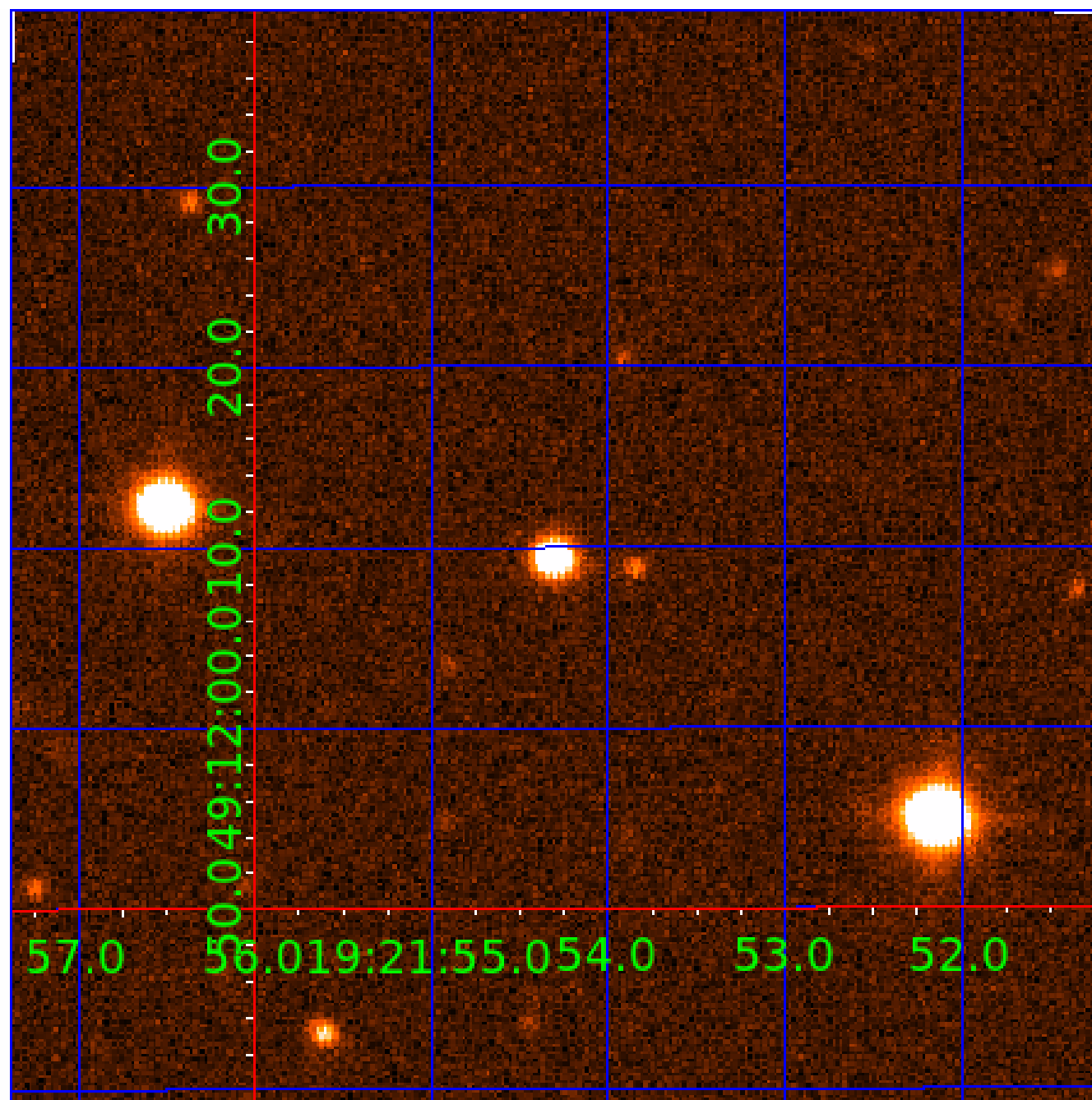


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination





# KIC 011400356

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011400356-01	OBS	8222.01	677.559066	214.239257	689.5	10.287	7.5	7.0	0.87	5511	2.30	0.31
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011400356-03	OBS	No	66.853725	183.595549	825.6	2.080	8.5	9.3	0.87	5511	2.69	6.83
011400356-04	OBS	No	120.095184	165.444125	845.1	2.461	7.7	8.2	0.87	5511	2.83	3.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011400356-01	OBS	FP	0.11	1	0	0	0	MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011400356-02	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_FEW_DIFFS
011400356-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
011400356-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—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.

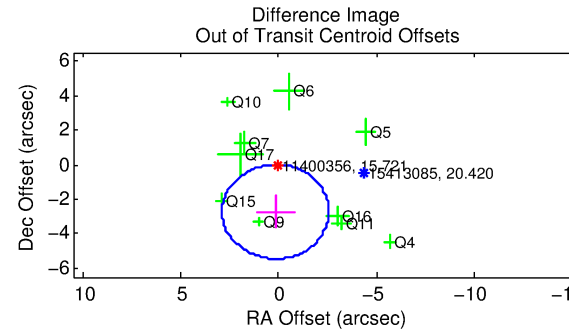
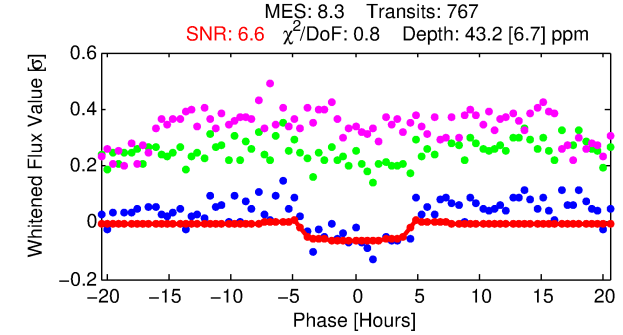
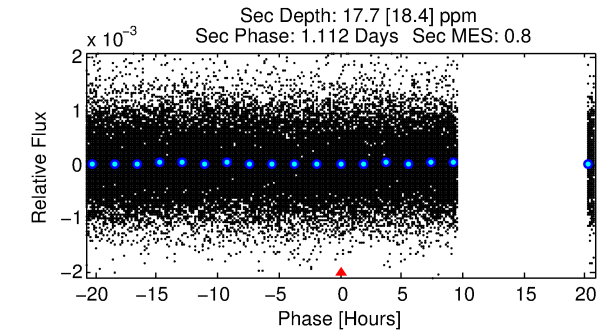
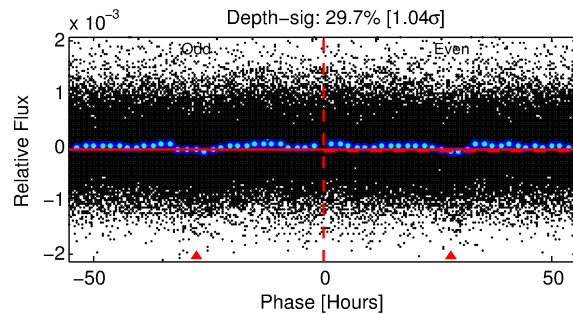
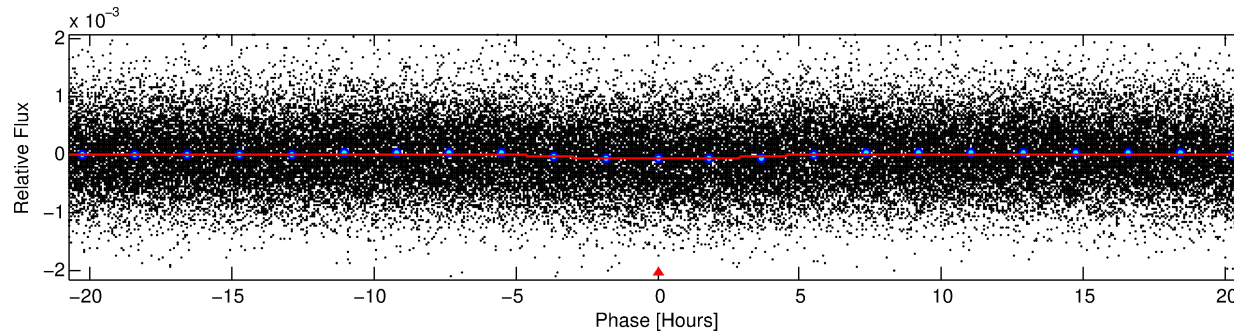
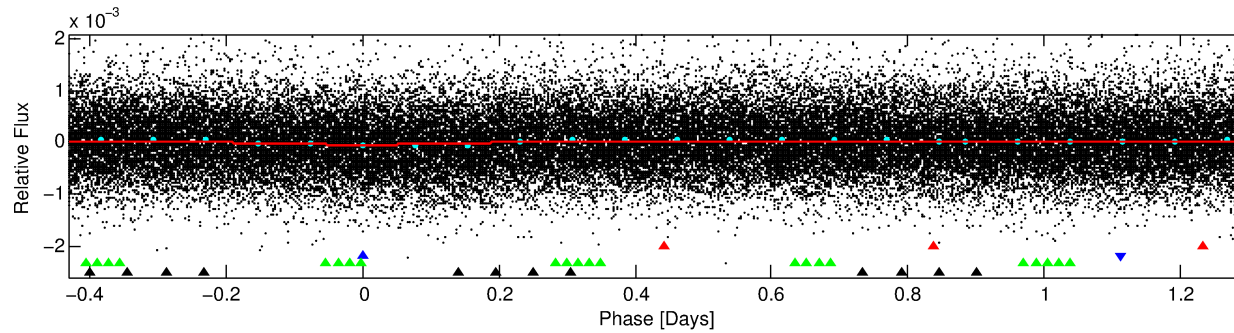
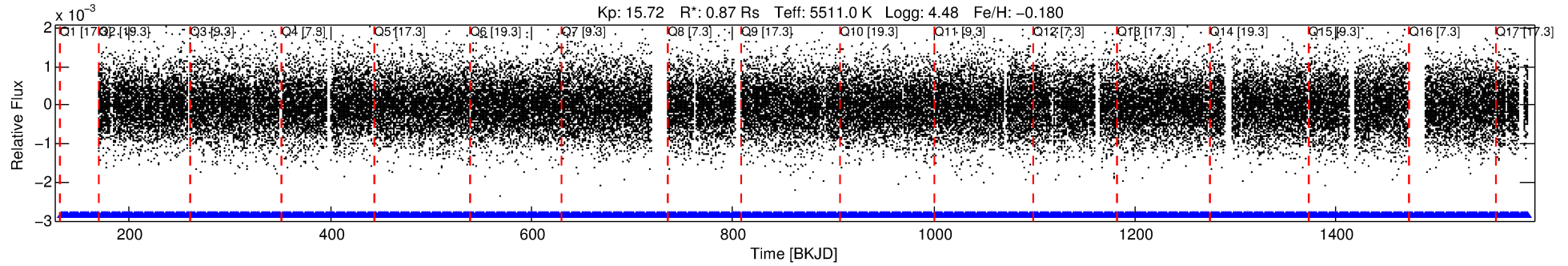
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011400356-02

No Significant Match Found

# DV One-Page Summary

KIC: 11400356 Candidate: 2 of 4 Period: 1.732 d



## DV Fit Results:

Period = 1.73187 [0.00004] d  
Epoch = 132.3997 [0.0127] BKJD  
Rp/R\* = 0.0071 [0.0043]  
a/R\* = 1.16 [0.83]  
b = 0.88 [0.70]  
Seff = 891.54 [261.20]  
Teq = 1393 [102] K  
Rp = 0.67 [0.44] Re  
a = 0.0265 [0.0049] AU  
Ag = 15.13 [24.51] [0.58 $\sigma$ ]  
Teffp = 4249 [1701] K [1.68 $\sigma$ ]

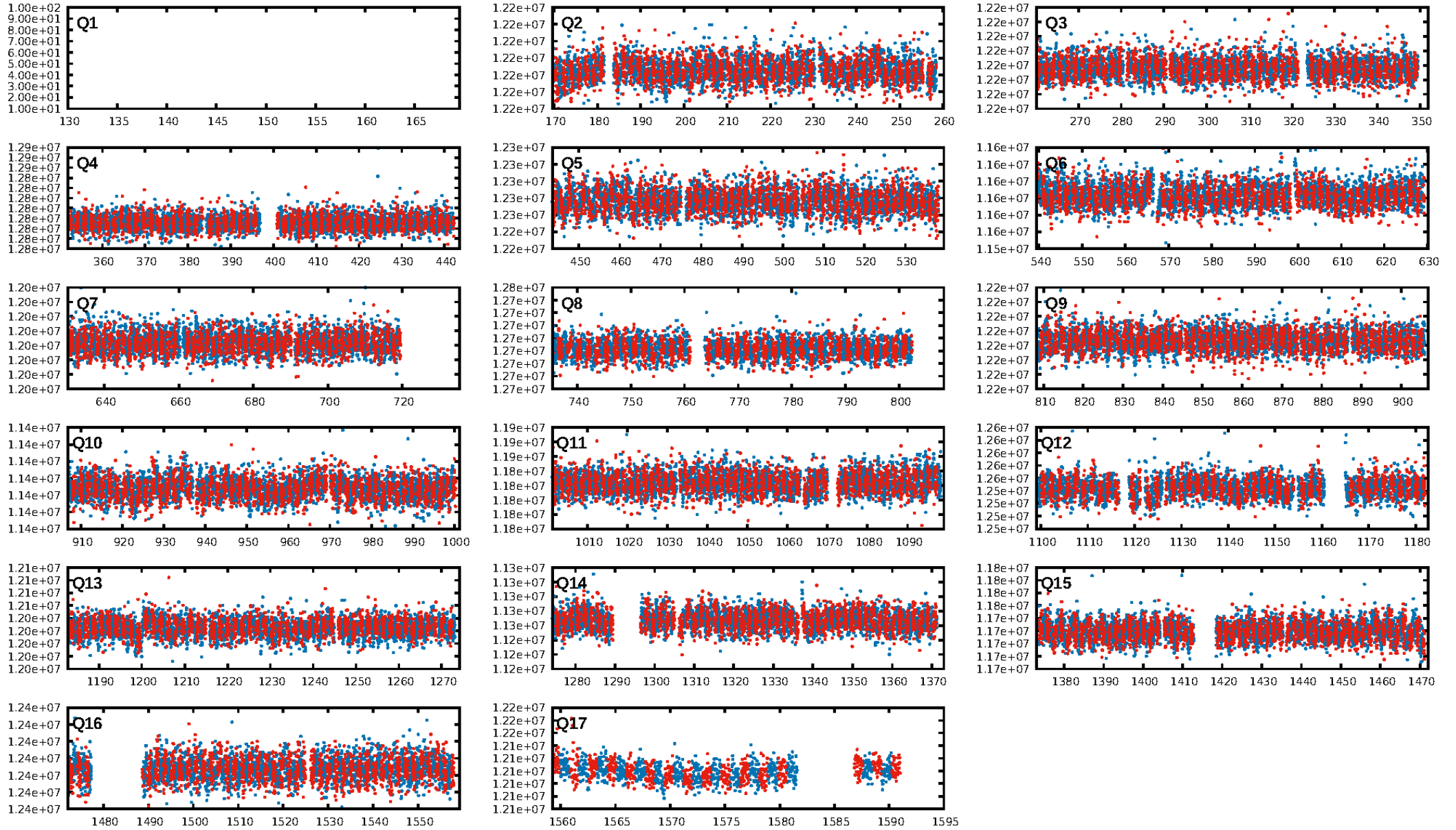
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [165.14 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 2.95e-11**  
RollingBand-fgt: 1.00 [751/751]  
GhostDiagnostic-chr: -6.925  
Centroid-sig: 98.2%  
Centroid-so: 0.433 arcsec [0.19 $\sigma$ ]  
**OotOffset-rm: 2.729 arcsec [3.00 $\sigma$ ]**  
KicOffset-rm: 2.589 arcsec [2.74 $\sigma$ ]  
OotOffset-st: 2/3/2/3 [10]  
KicOffset-st: 2/3/2/3 [10]  
DiffImageQuality-fgm: 0.00 [0/10]  
DiffImageOverlap-fno: 1.00 [16/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:28:10 Z

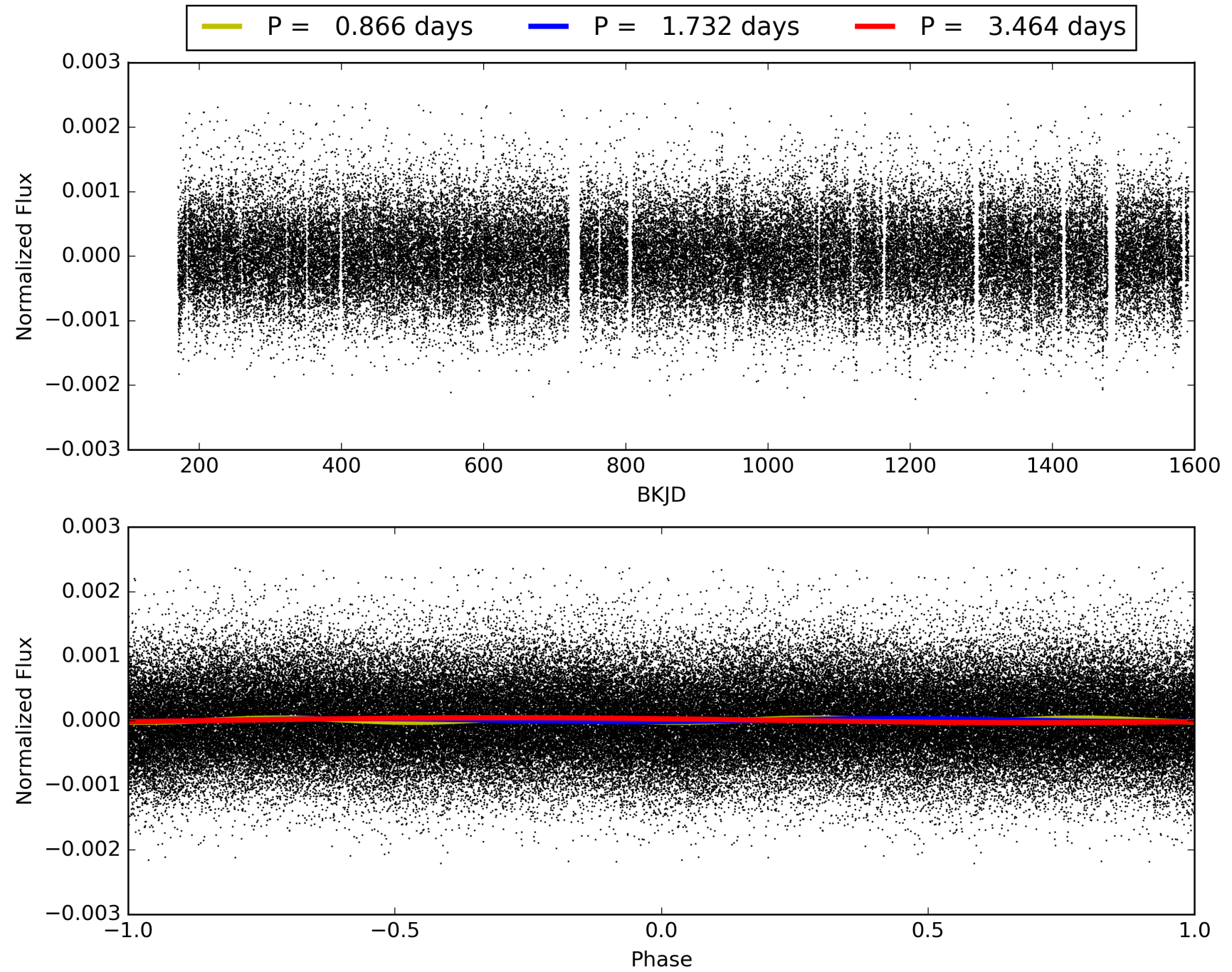
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011400356-02, PDC Light Curves



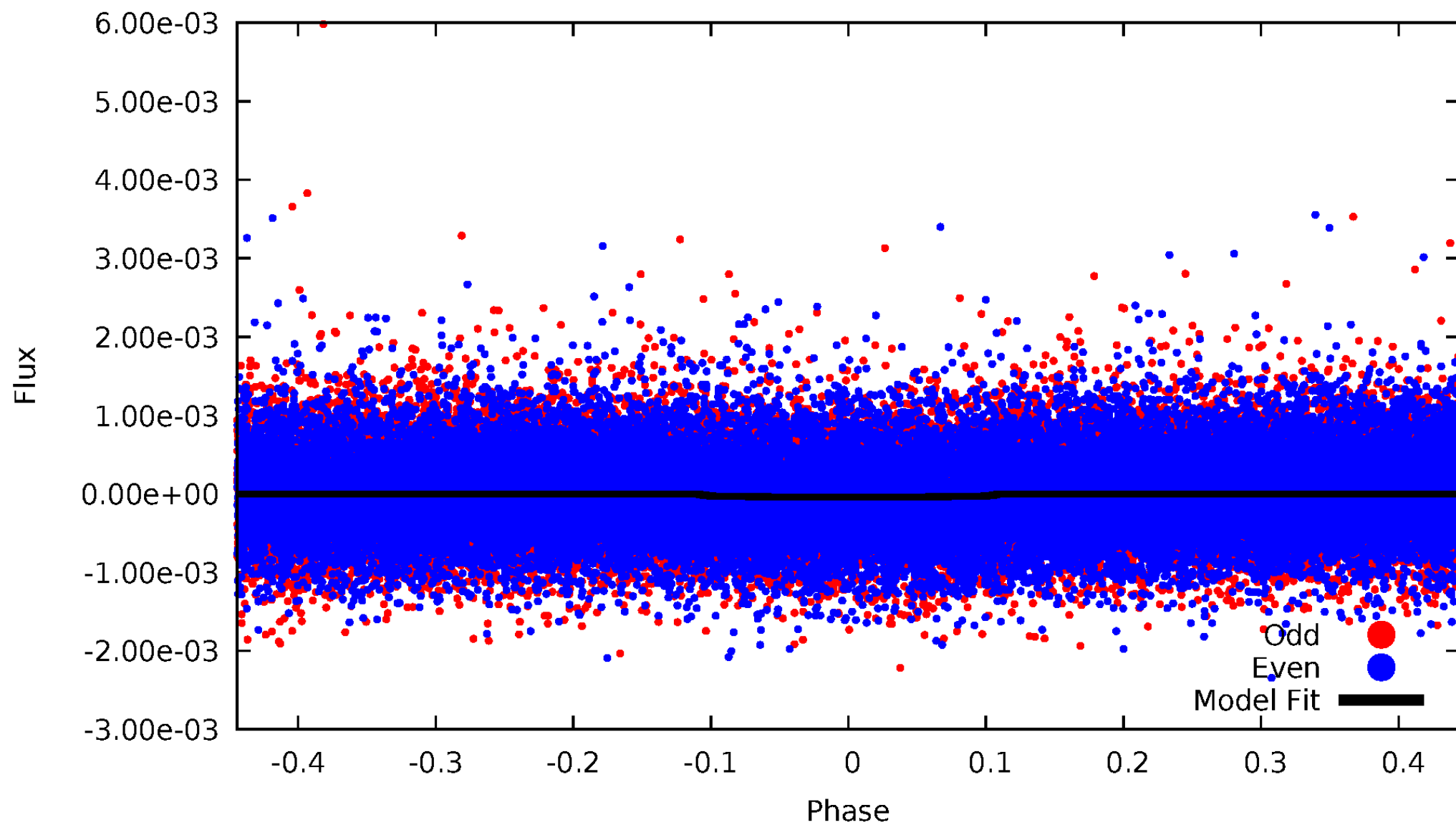


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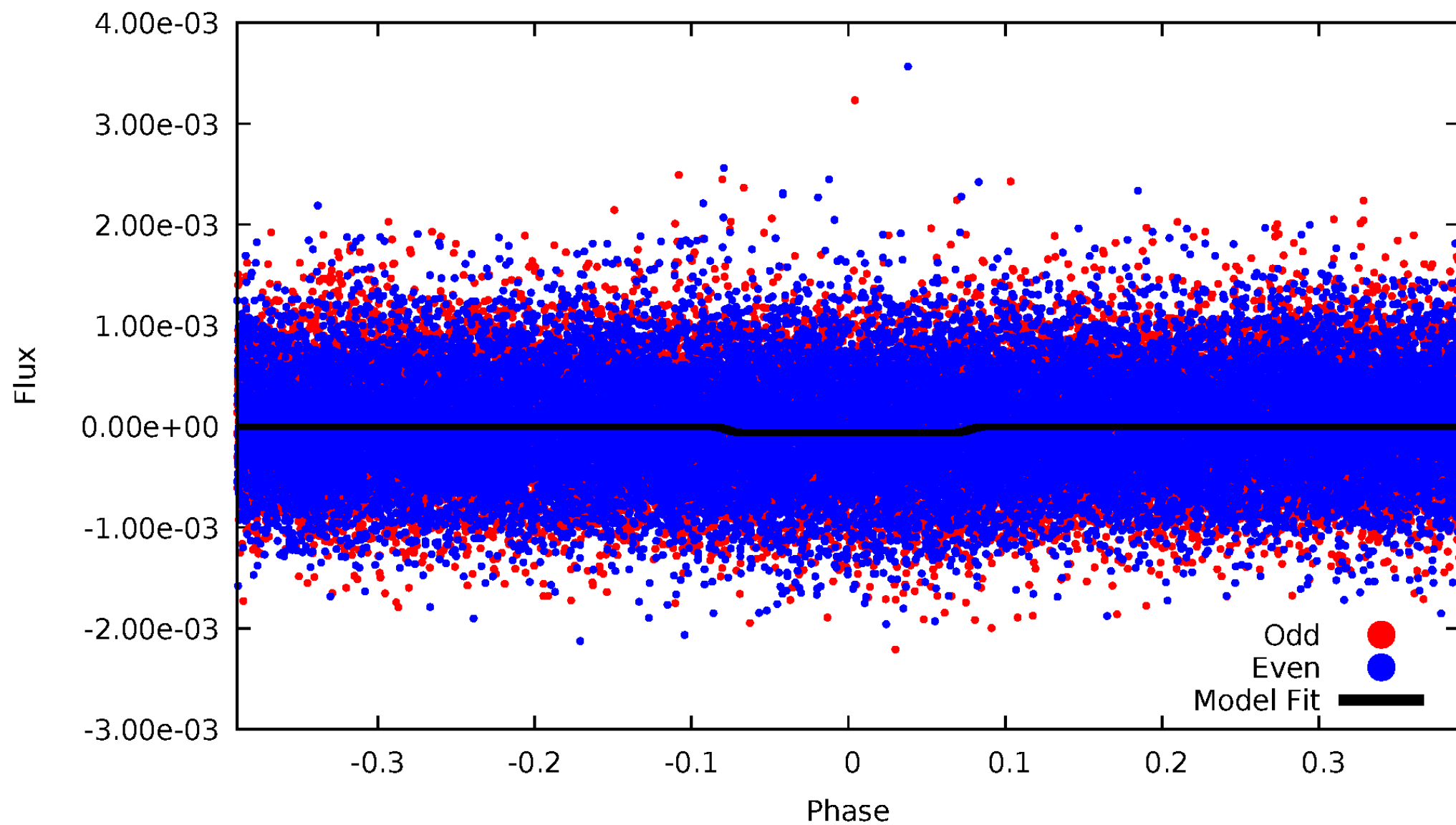
# DV Odd/Even

TCE 011400356-02



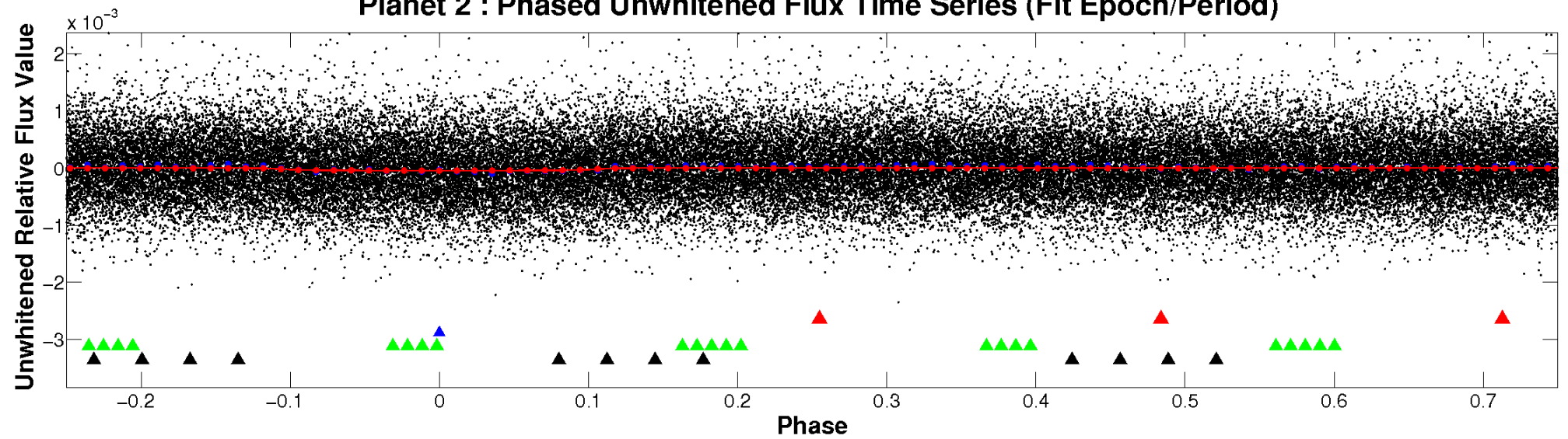
# ALT Odd/Even

TCE 011400356-02

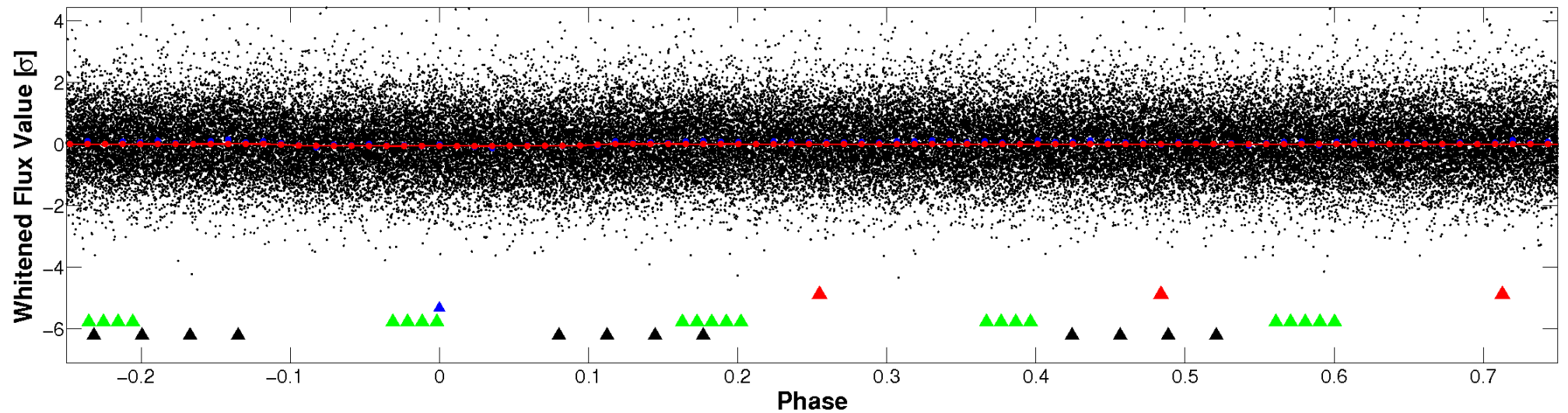


# Non-Whitened Vs. Whitened Light Curve

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



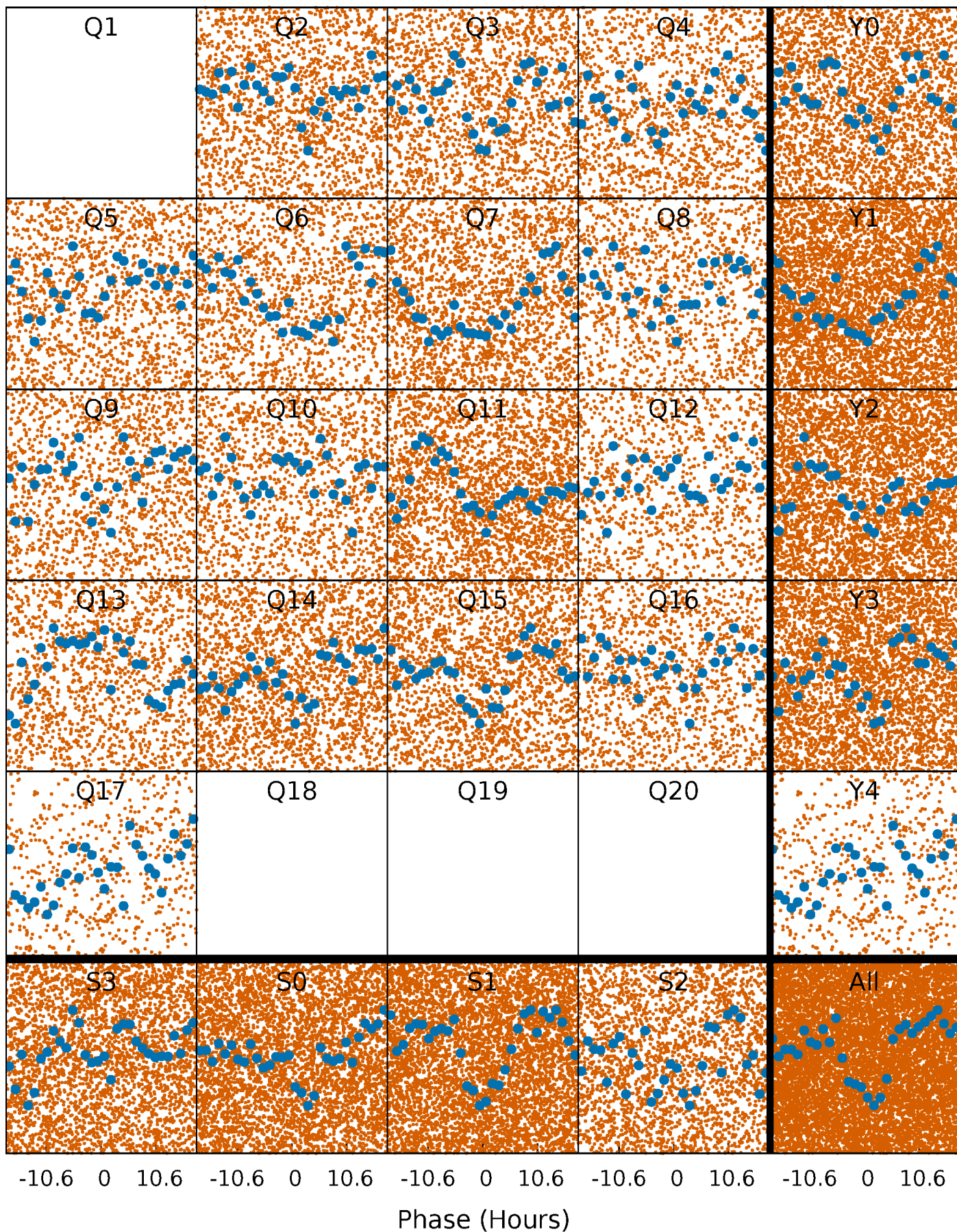
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

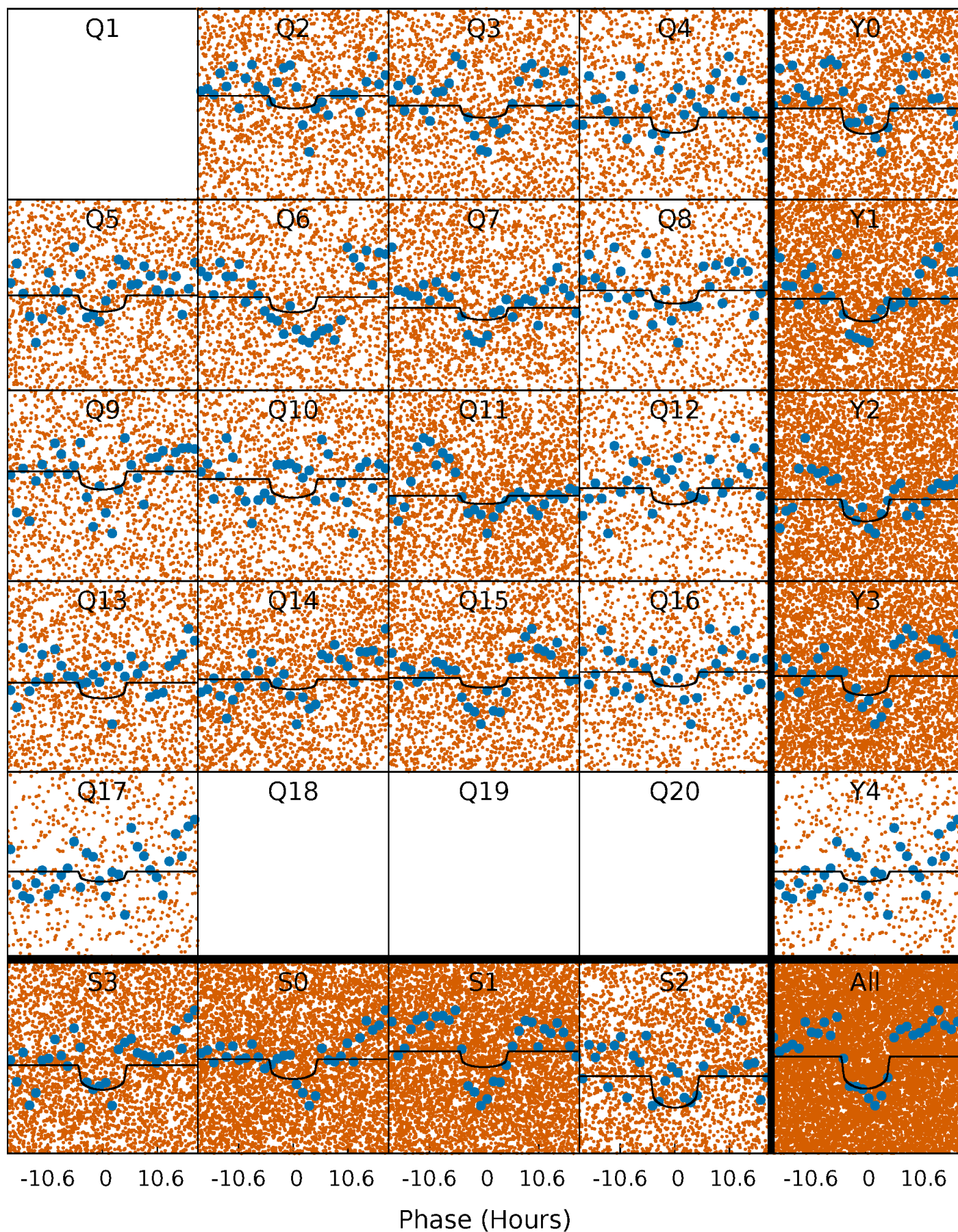
TCE 011400356-02 P= 1.731874 Days  $T_0=132.399669$  (BKJD)





# DV Quarter-Phased Transit Curves

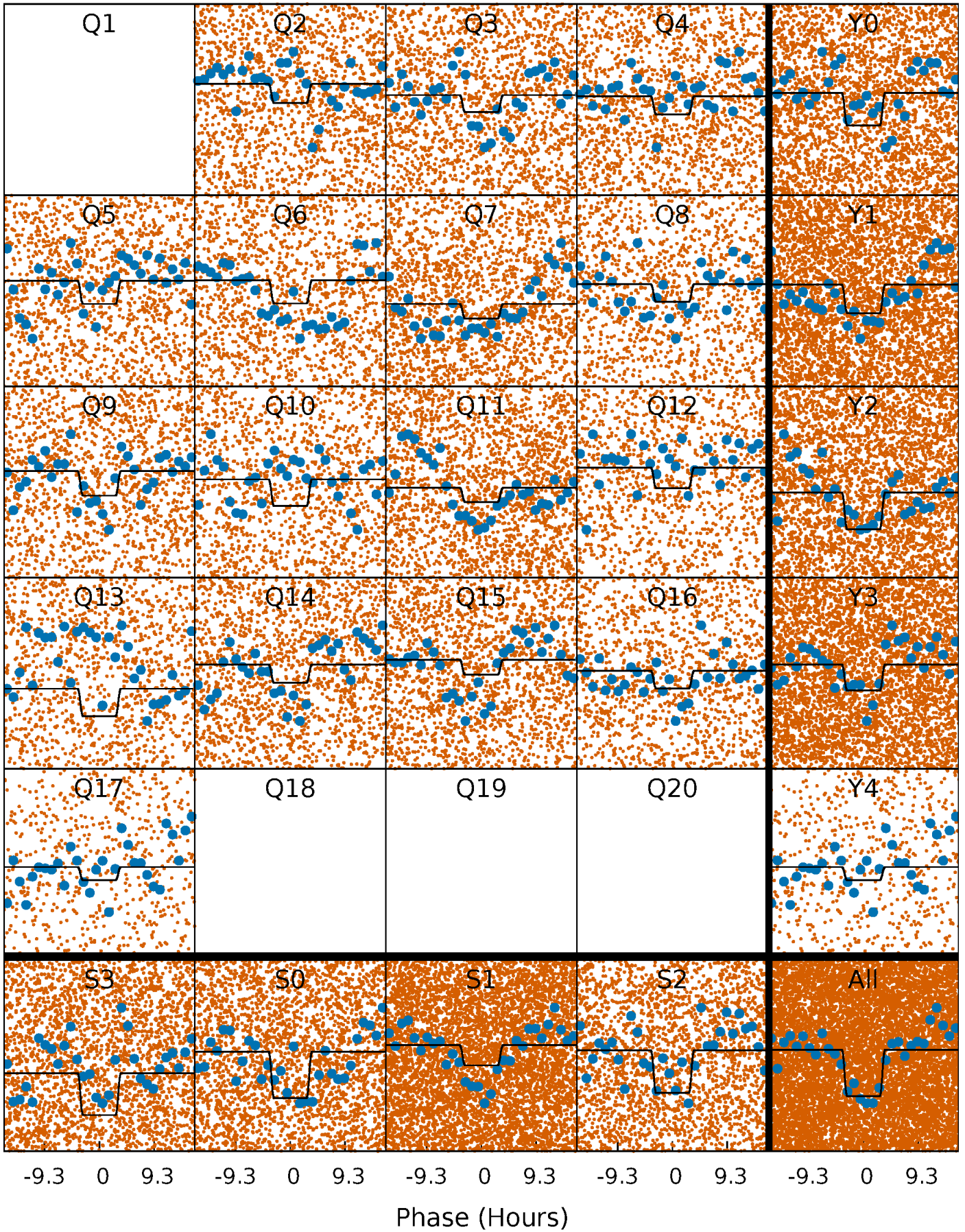
TCE 011400356-02 P= 1.731874 Days  $T_0=132.399669$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

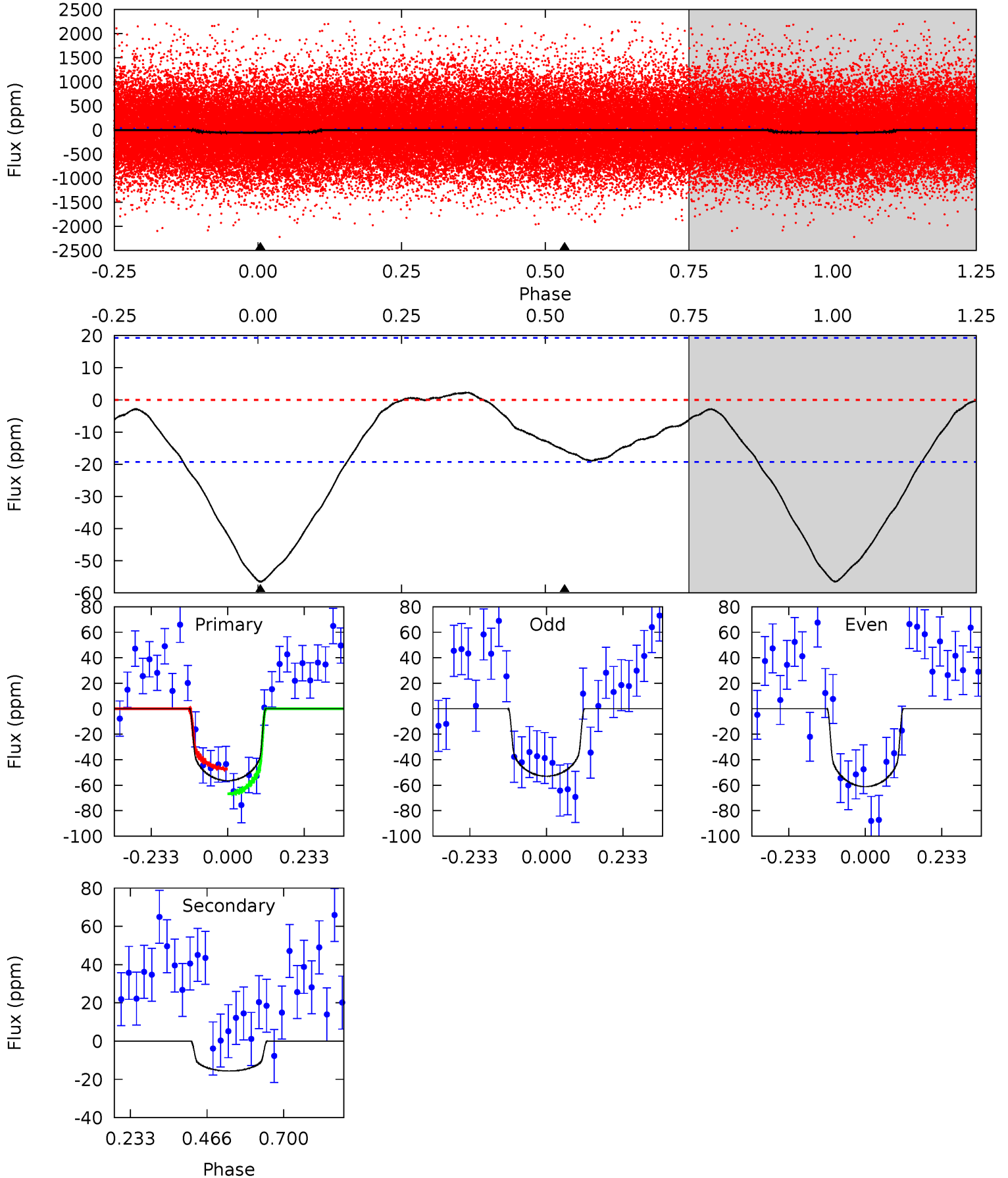
TCE 011400356-02 P= 1.732058 Days  $T_0=132.335387$  (BKJD)



# DV Model-Shift Uniqueness Test

011400356-02, P = 1.731874 Days, E = 132.399669 Days

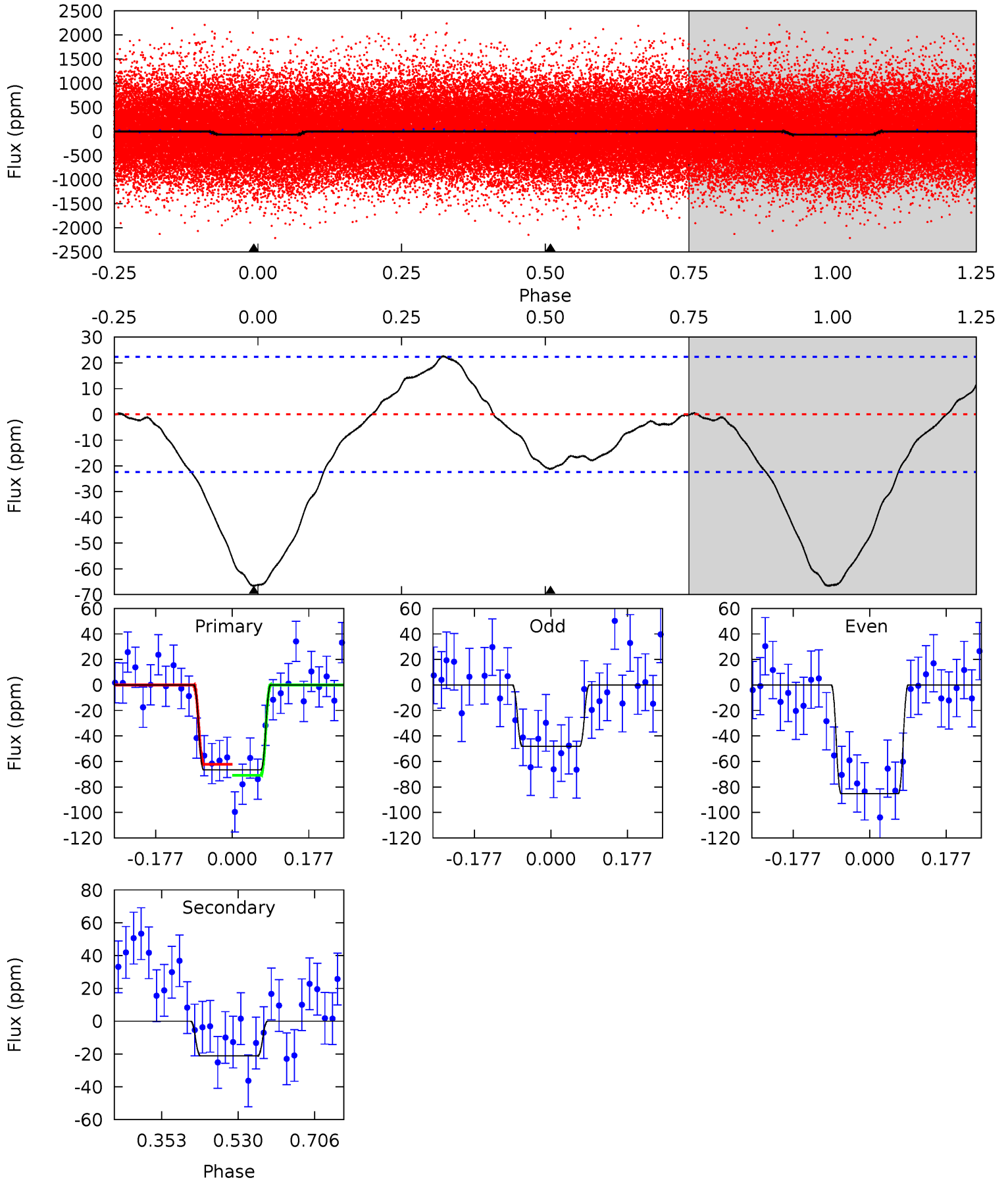
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	3.55	0	0	4.38	1.19	0.44	12.8	12.8	3.55	3.55	0.93	1.19	0.04	2.21



# Alt Model-Shift Uniqueness Test

011400356-02, P = 1.732058 Days, E = 132.335387 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
13.2	4.21	0	0	4.44	1.35	1.73	13.2	13.2	4.21	4.21	3.69	1.13	0.25	0.87



### Stellar Parameters For KIC 011400356

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5511^{+166}_{-166}$	$4.477^{+0.096}_{-0.144}$	$-0.180^{+0.300}_{-0.300}$	$0.872^{+0.196}_{-0.105}$	$0.833^{+0.111}_{-0.074}$	$1.770^{+0.749}_{-0.722}$
	+3%/-3%	+2%/-3%	+167%/-167%	+22%/-12%	+13%/-9%	+42%/-41%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011400356-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-16 \pm 4$	$0.72^{+0.40}_{-0.38}$	$1964^{+117}_{-98}$	$4225^{+1626}_{-684}$	$11^{+43}_{-7}$
Alt.	$-21 \pm 5$	$0.78^{+0.44}_{-0.37}$	$1955^{+119}_{-95}$	$4319^{+1356}_{-652}$	$13^{+35}_{-8}$

$T_{max}$  = 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

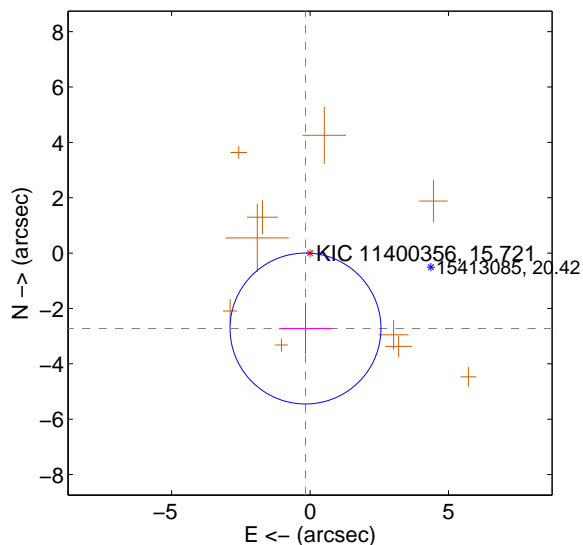
Supplemental centroid analysis for 011400356-02. Kepler magnitude: 15.72. Transit SNR 6.60

There are 0 quarters with good PRF difference image offsets

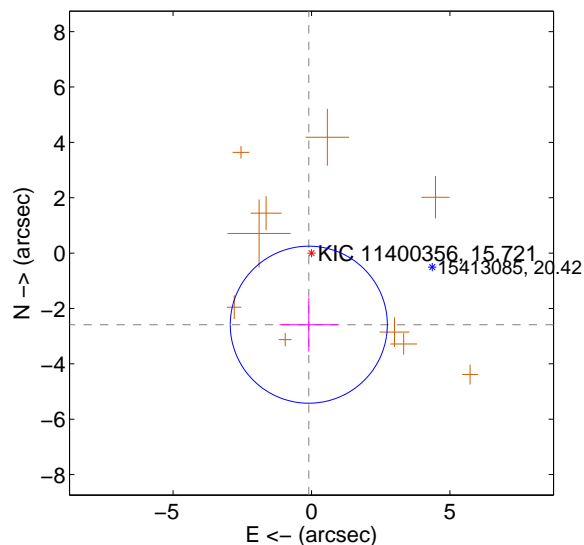
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>2.729 <math>\pm</math> 0.909</b>	<b>3.00</b>	0.164 $\pm$ 0.953	-2.724 $\pm$ 0.931
PRF-fit source offset from KIC position	2.589 $\pm$ 0.946	2.74	0.097 $\pm$ 1.056	-2.587 $\pm$ 0.967
photometric centroid source offset	0.43 $\pm$ 2.28	0.19	-0.38 $\pm$ 2.34	0.21 $\pm$ 2.09

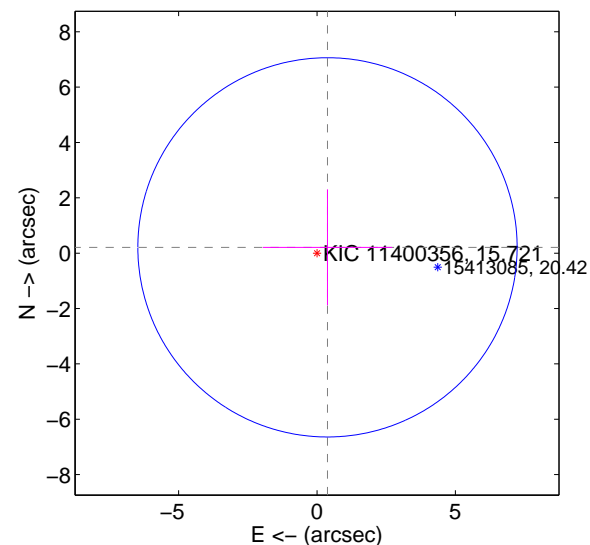
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

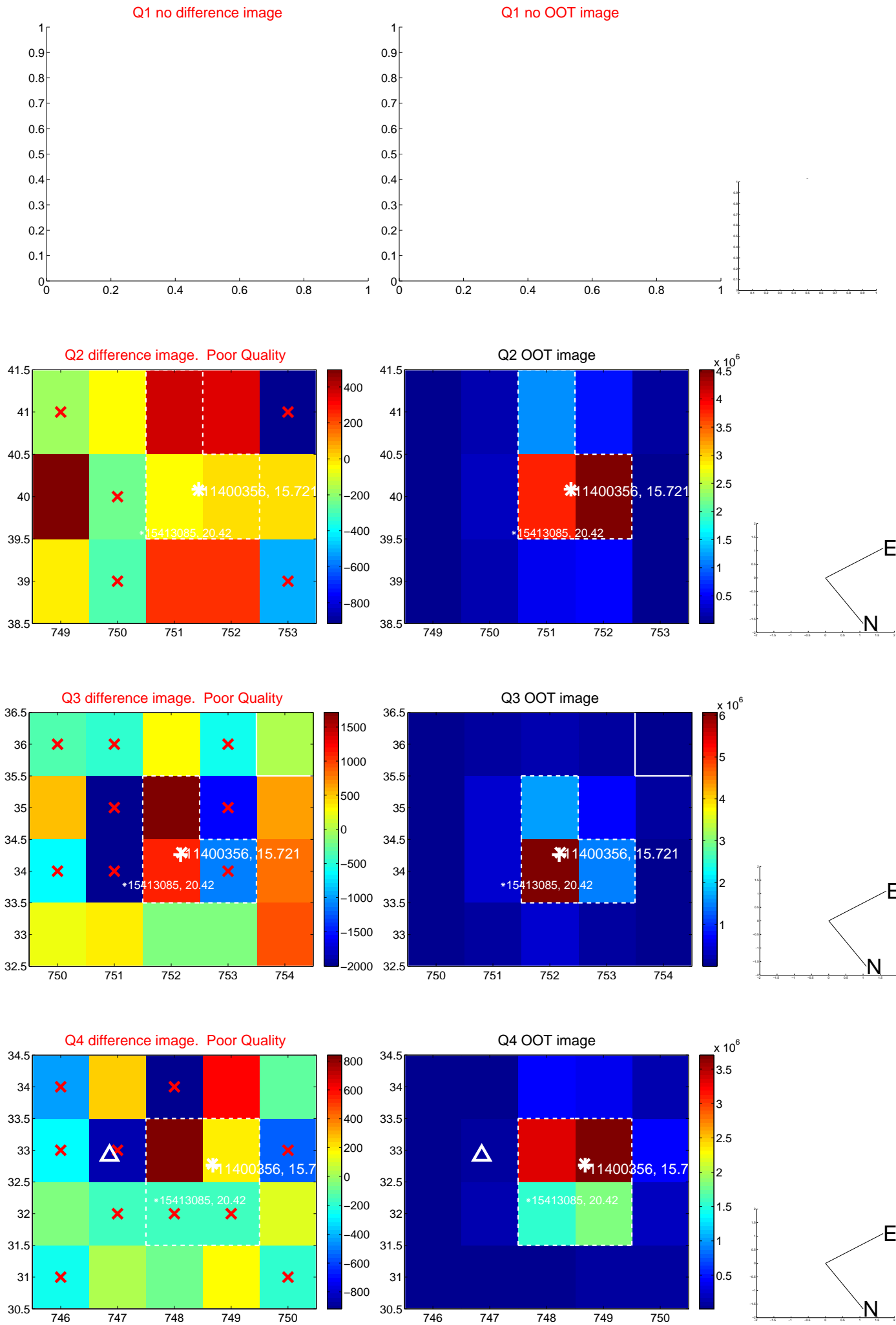


offset from photometric centroids



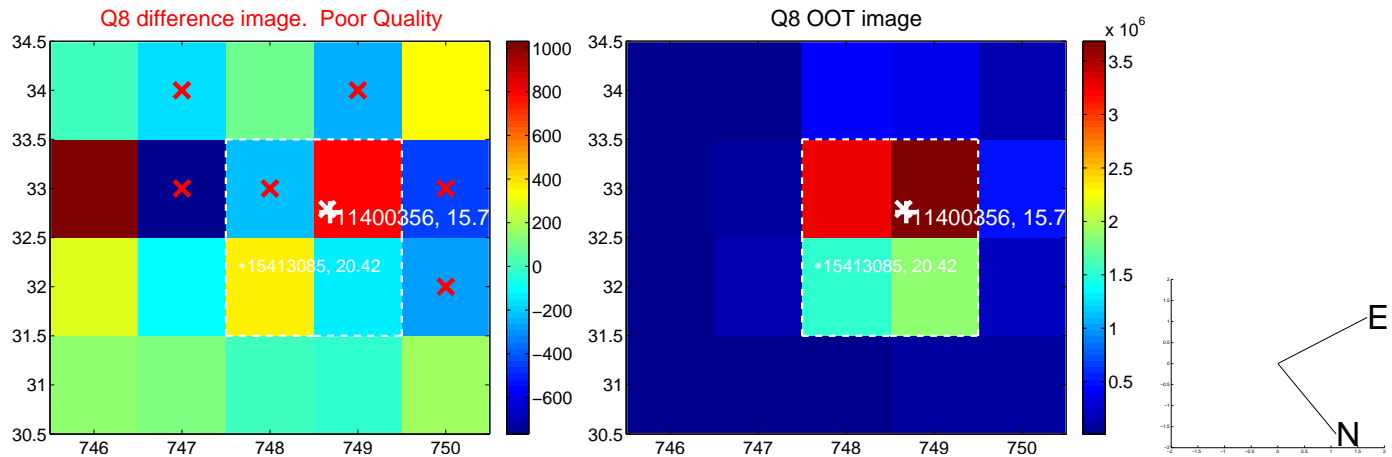
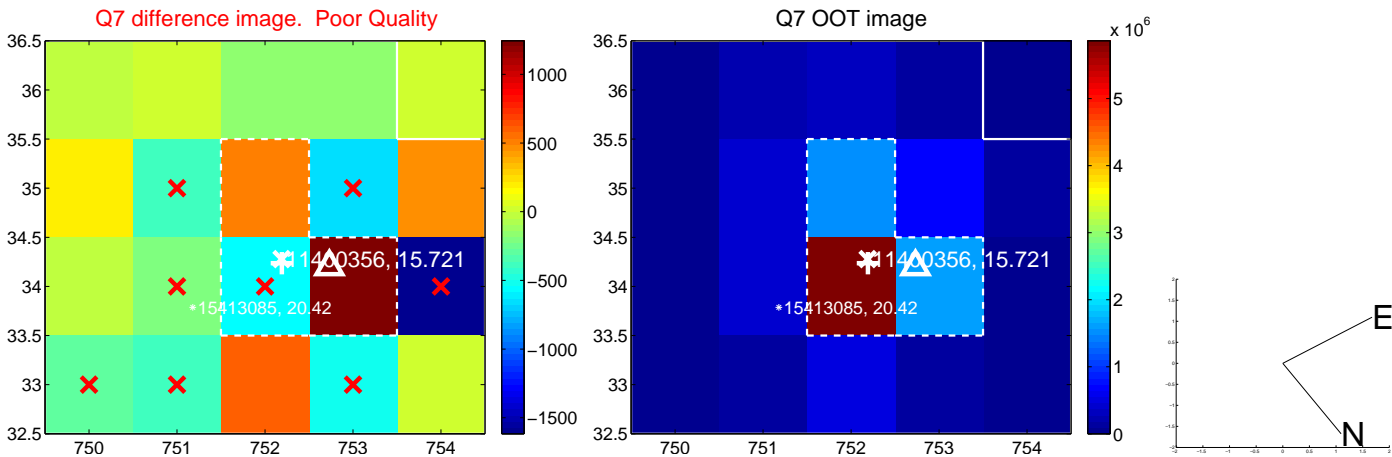
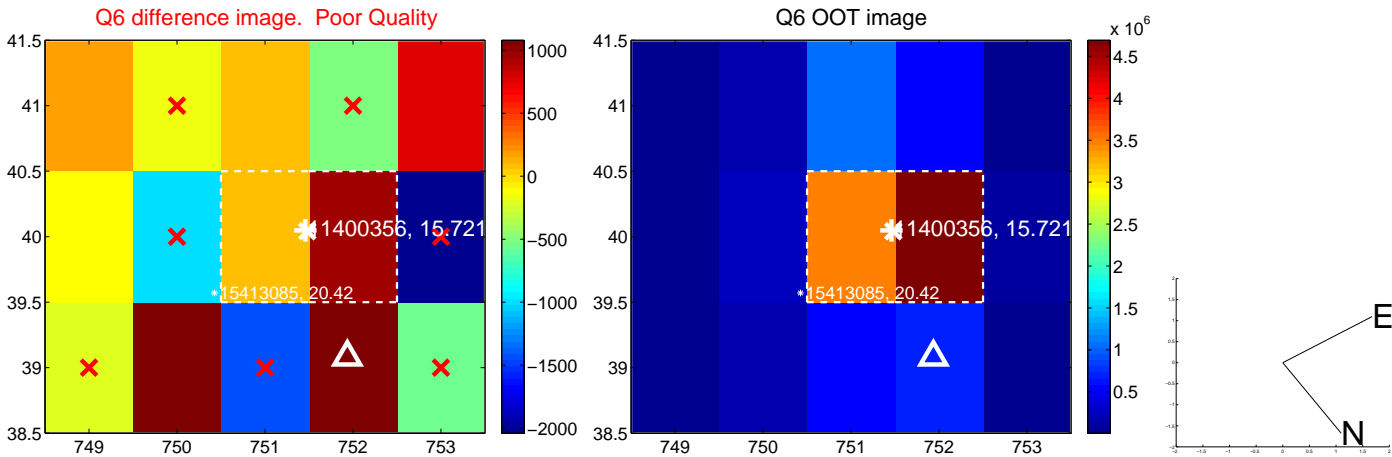
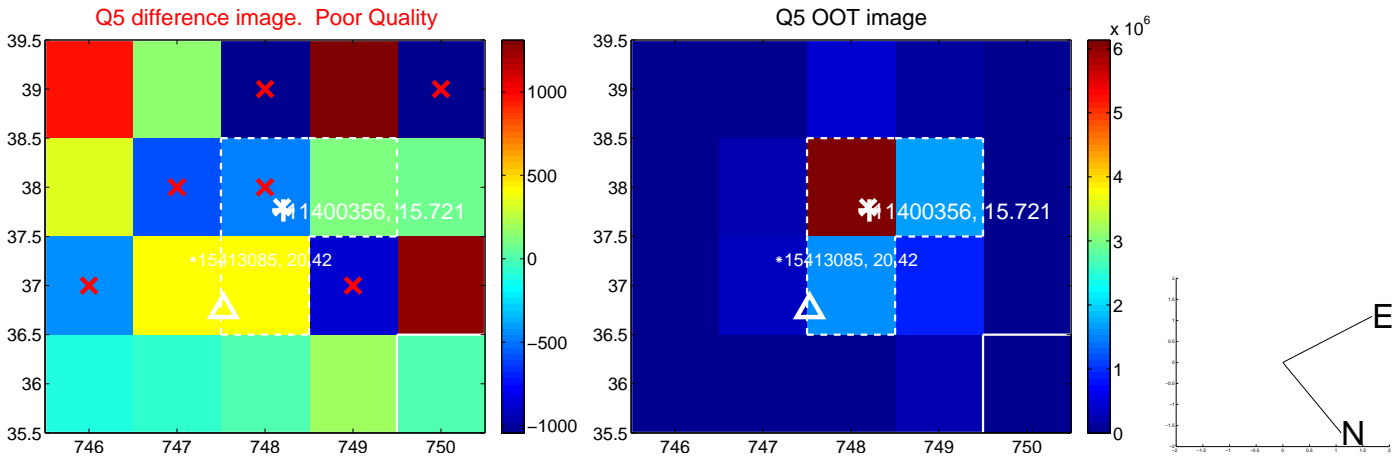
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

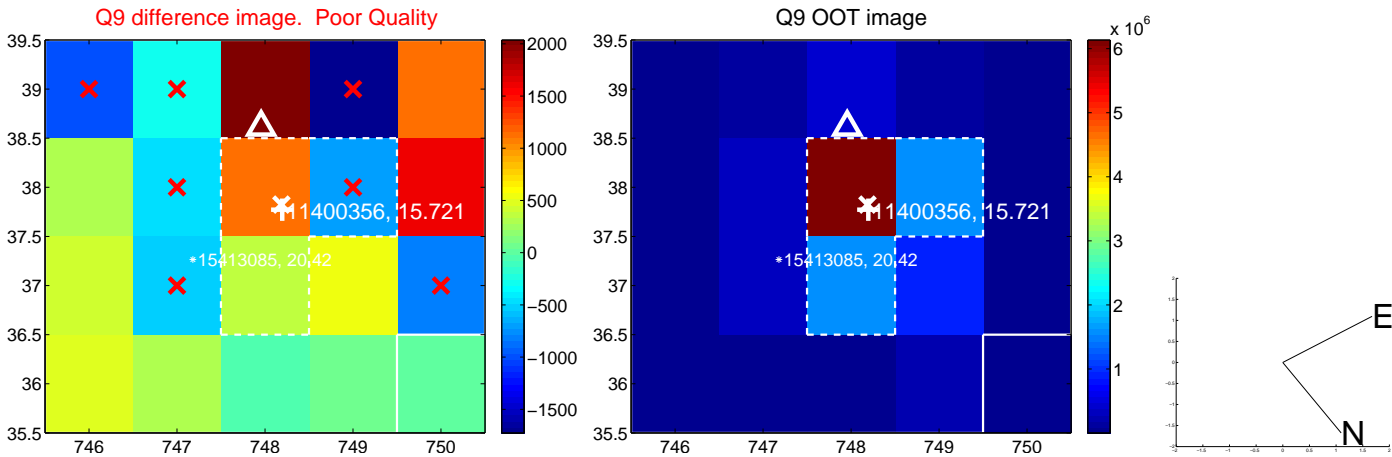




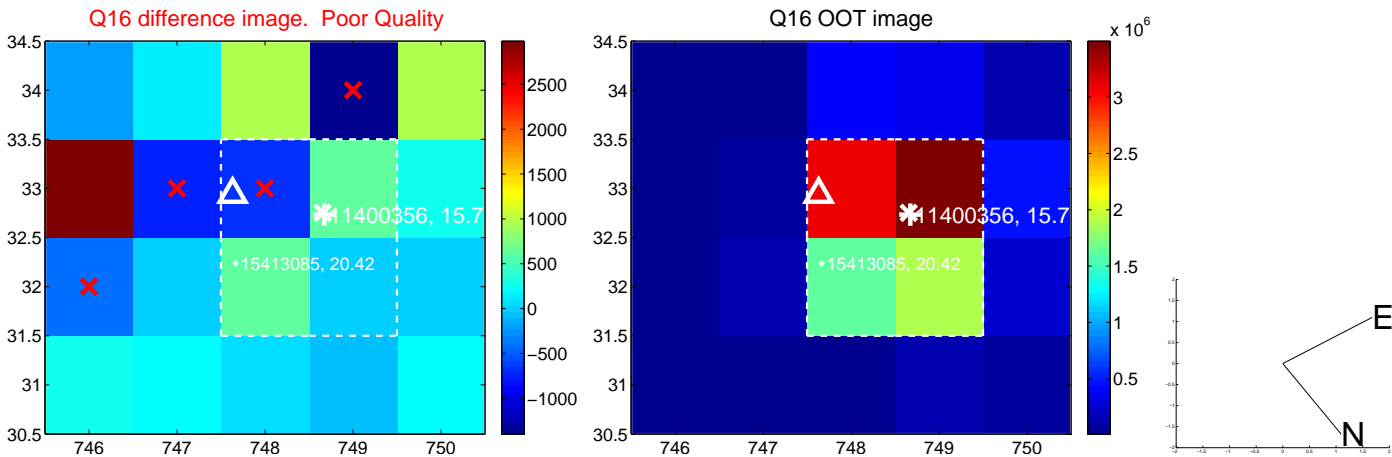
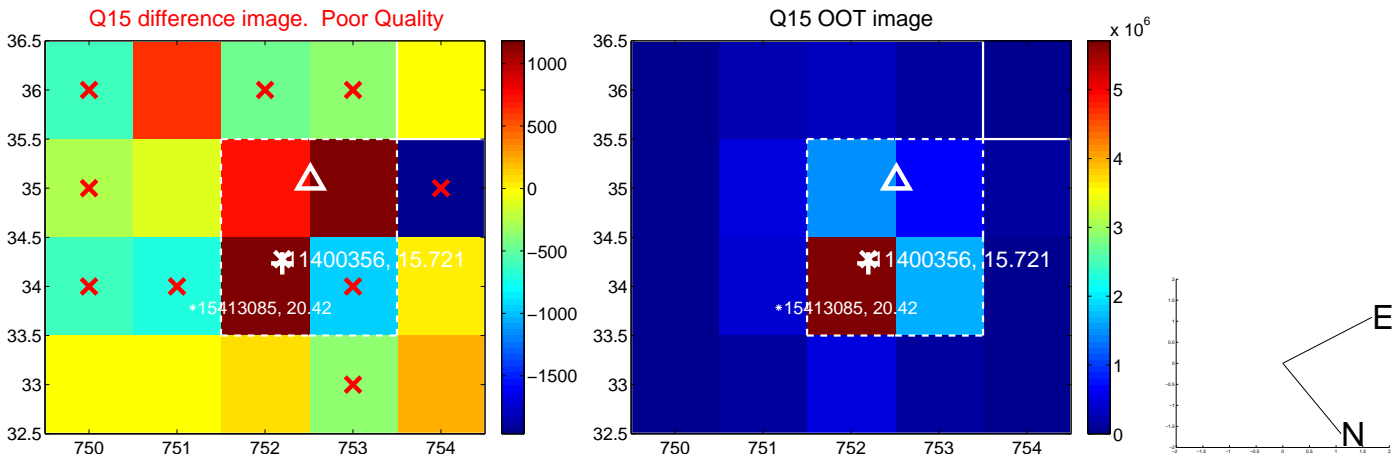
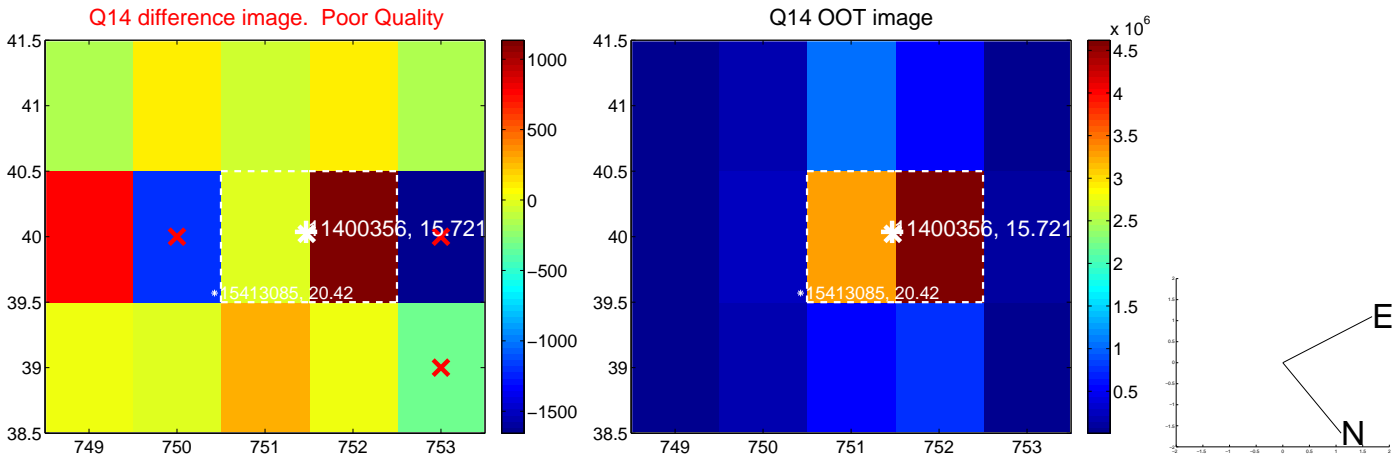
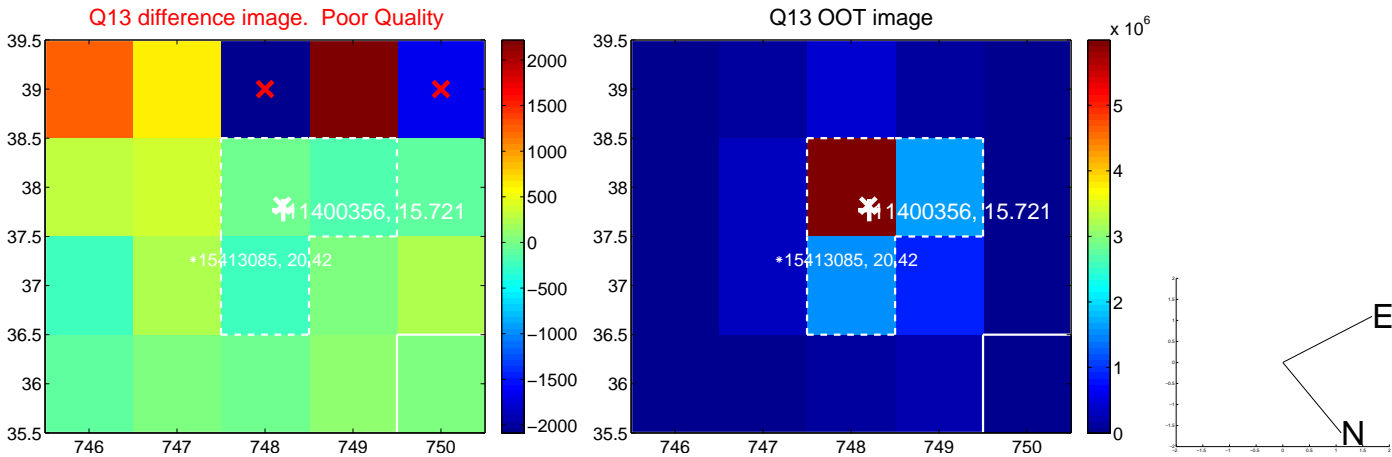
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



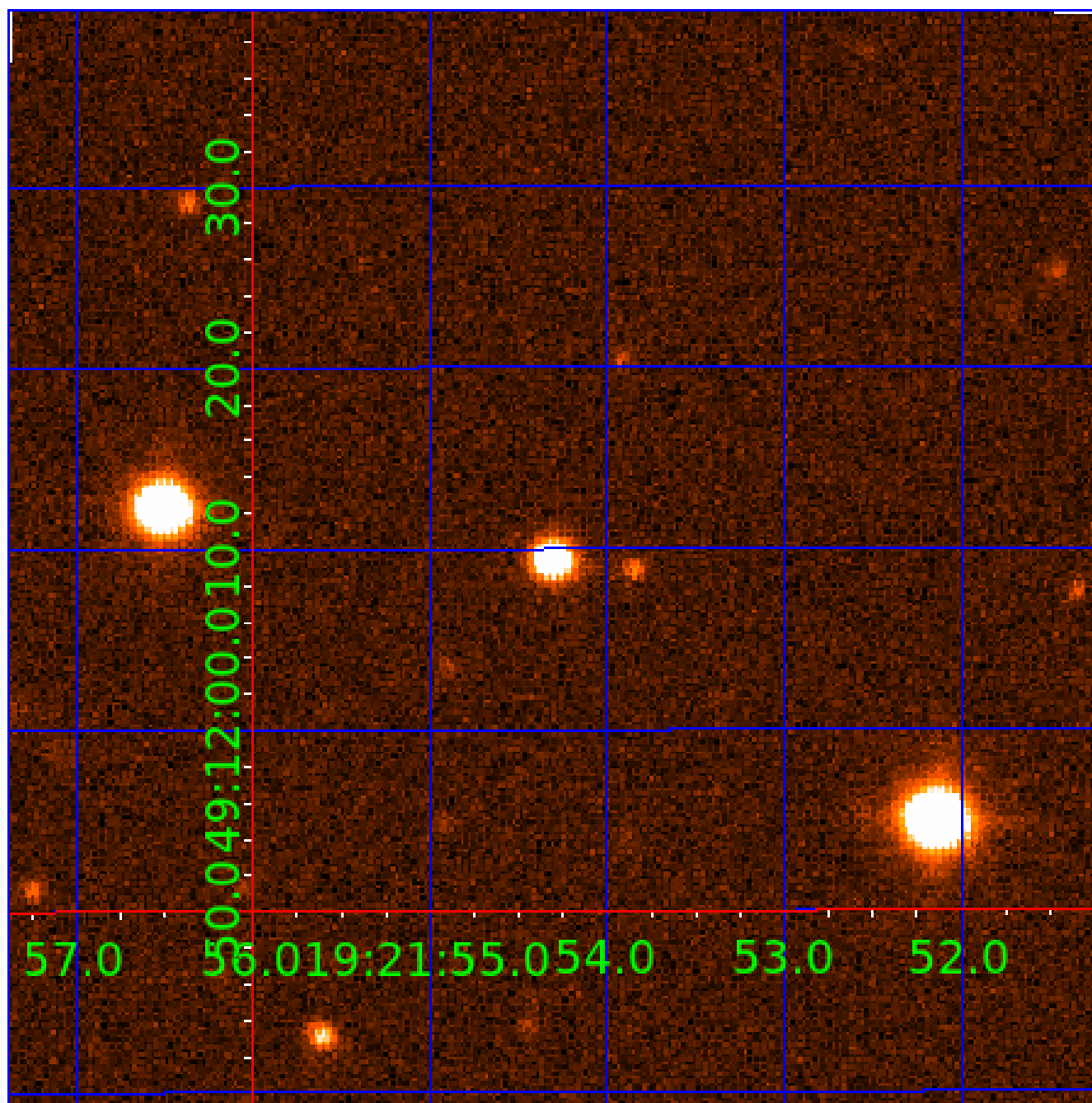
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 011400356

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011400356-01	OBS	8222.01	677.559066	214.239257	689.5	10.287	7.5	7.0	0.87	5511	2.30	0.31
011400356-02	OBS	No	1.731874	132.399669	43.2	9.232	8.3	6.6	0.87	5511	0.67	891.54
011400356-03	OBS	No	66.853725	183.595549	825.6	2.080	8.5	9.3	0.87	5511	2.69	6.83
011400356-04	OBS	No	120.095184	165.444125	845.1	2.461	7.7	8.2	0.87	5511	2.83	3.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011400356-01	OBS	FP	0.11	1	0	0	0	MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011400356-02	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_FEW_DIFFS
011400356-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
011400356-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—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.

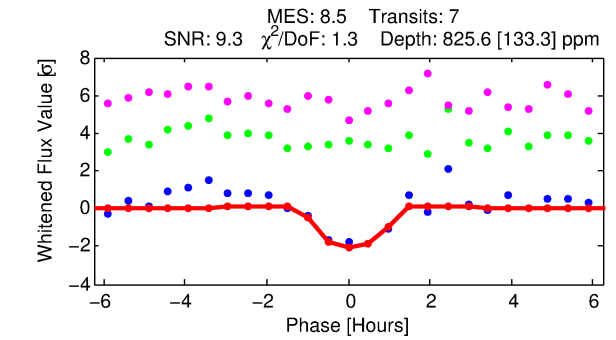
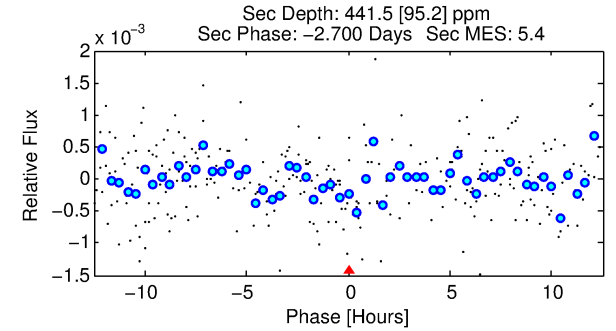
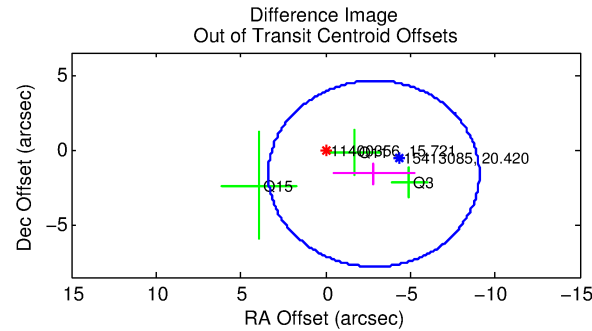
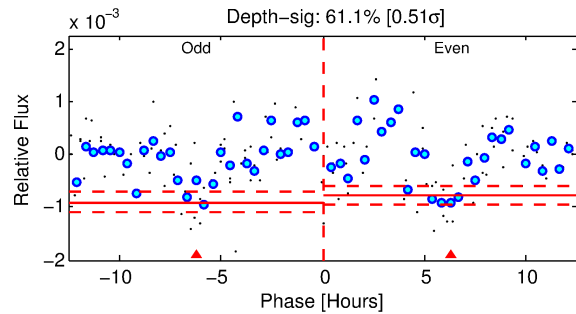
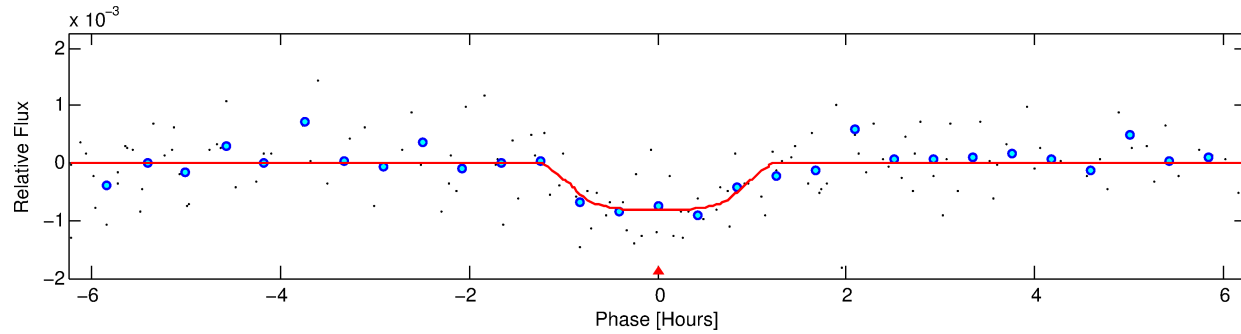
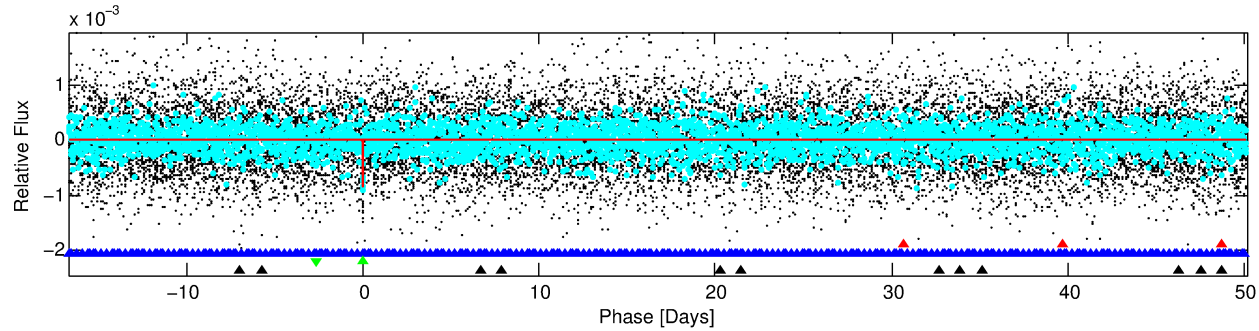
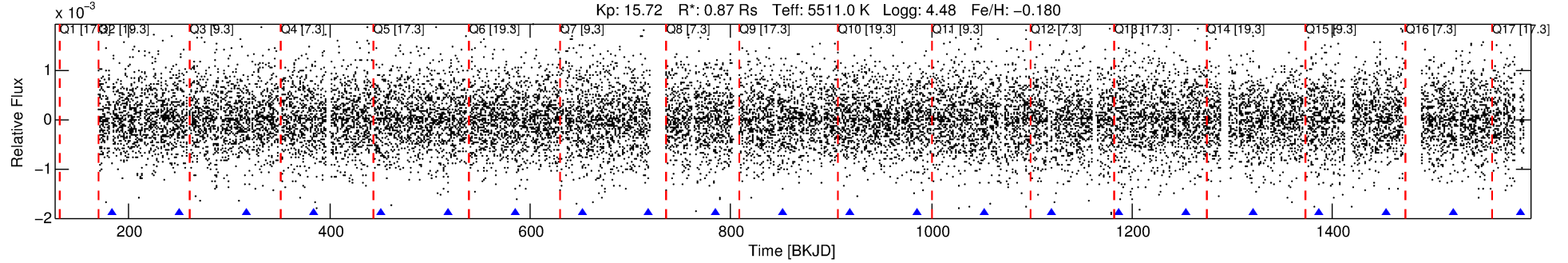
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011400356-03

No Significant Match Found

# DV One-Page Summary

KIC: 11400356 Candidate: 3 of 4 Period: 66.854 d



## DV Fit Results:

Period = 66.85372 [0.00086] d  
Epoch = 183.5955 [0.0117] BKJD  
Rp/R\* = 0.0283 [0.0580]  
a/R\* = 182.30 [1531.82]  
b = 0.71 [5.96]  
Seff = 6.83 [2.00]  
Teq = 412 [30] K  
Rp = 2.69 [5.55] Re  
a = 0.3032 [0.0565] AU  
Ag = 3087.82 [12717.66] [0.24 $\sigma$ ]  
Teff = 4752 [4884] K [0.89 $\sigma$ ]

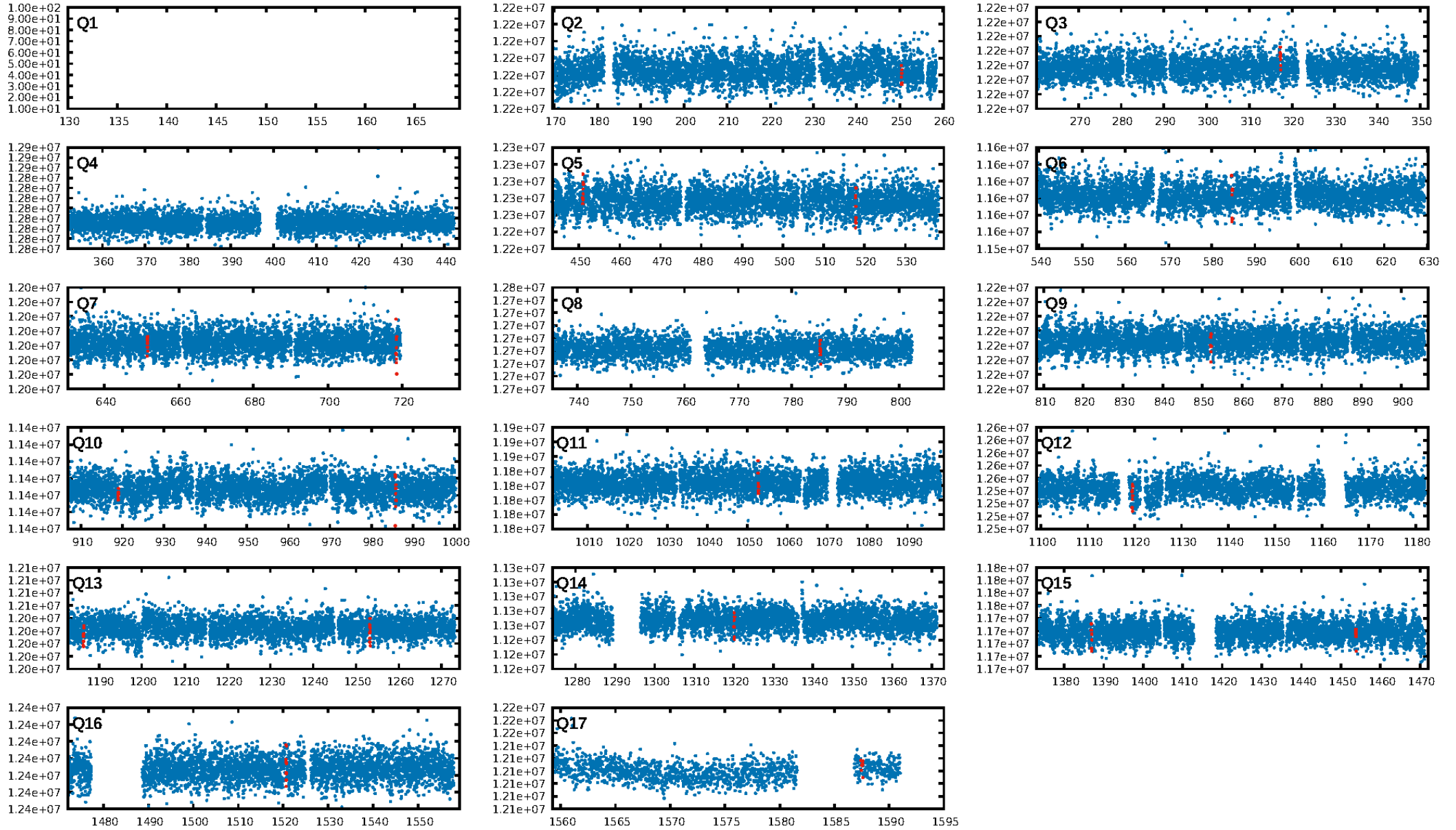
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [165.14 $\sigma$ ]  
LongPeriod-sig: 100.0% [396.56 $\sigma$ ]  
ModelChiSquare2-sig: 81.9%  
ModelChiSquareGof-sig: 80.7%  
**Bootstrap-pfa: 4.72e-11**  
RollingBand-fgt: 1.00 [7/7]  
**GhostDiagnostic-chr: 1.002**  
**Centroid-sig: 0.2%**  
Centroid-so: 2.634 arcsec [2.02 $\sigma$ ]  
OotOffset-rm: 3.273 arcsec [1.58 $\sigma$ ]  
KicOffset-rm: 3.367 arcsec [1.60 $\sigma$ ]  
OotOffset-st: 0/3/0/0 [3]  
KicOffset-st: 0/3/0/0 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 0.43 [6/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:28:21 Z

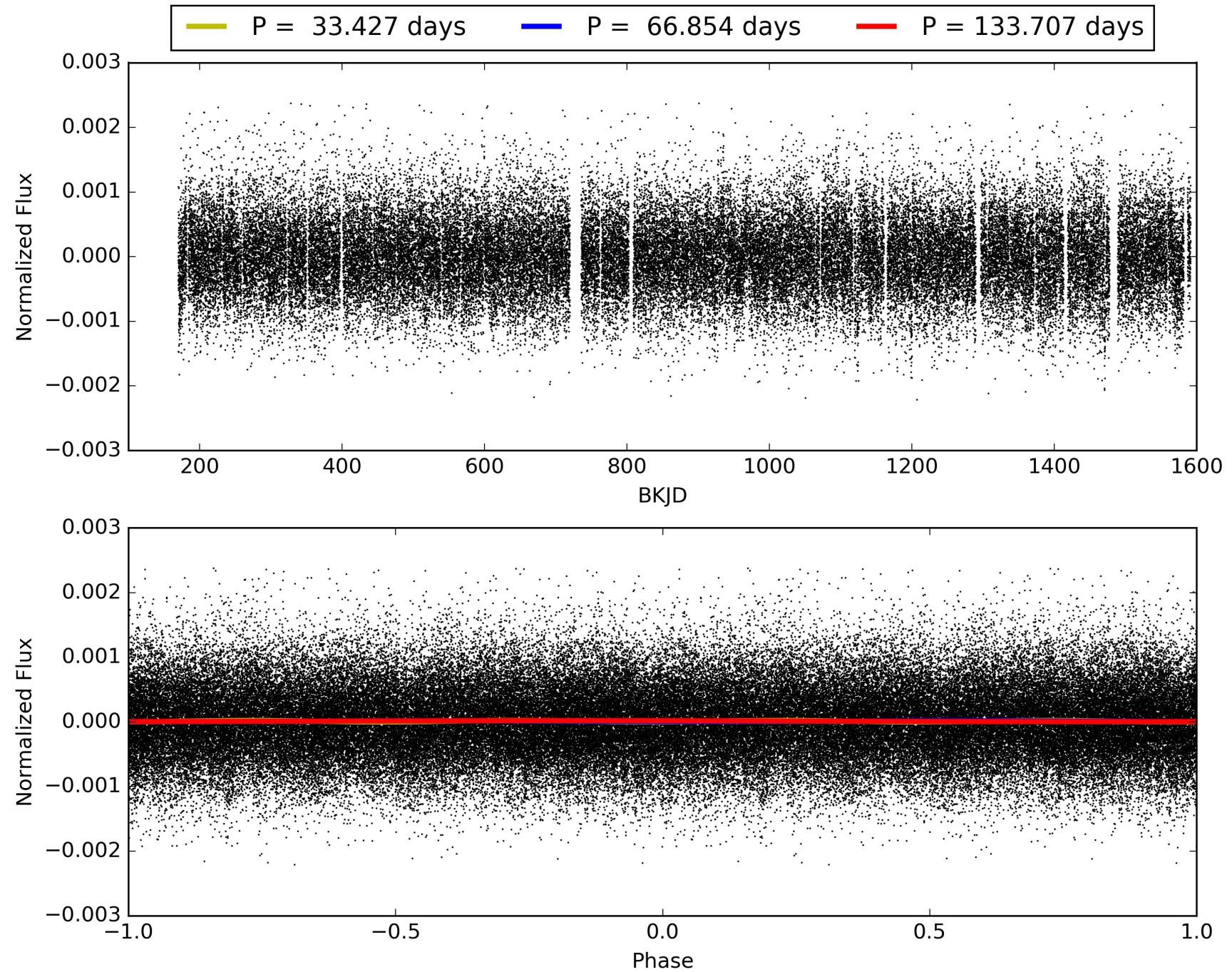
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011400356-03, PDC Light Curves



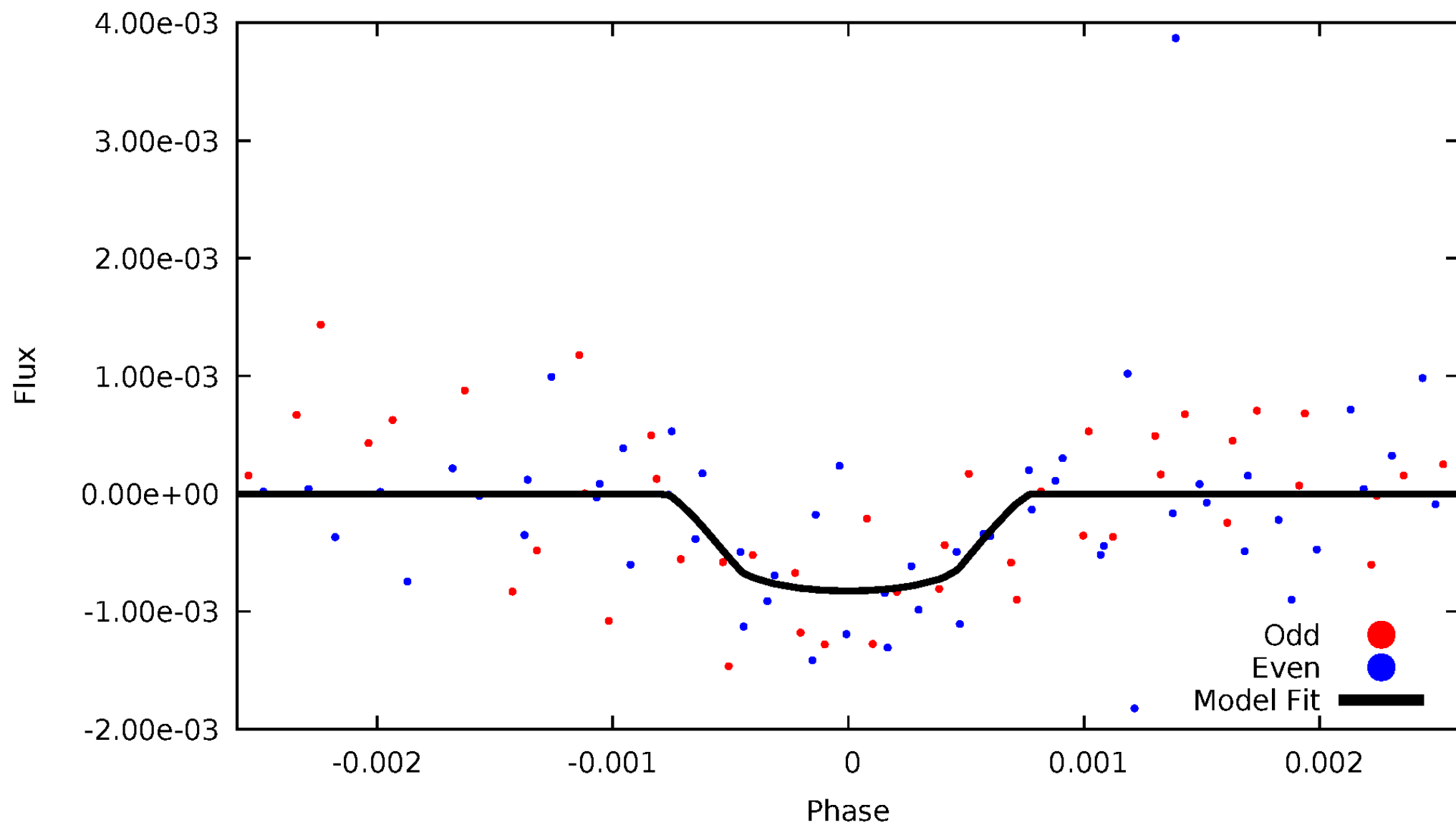


# TCE 011400356-03



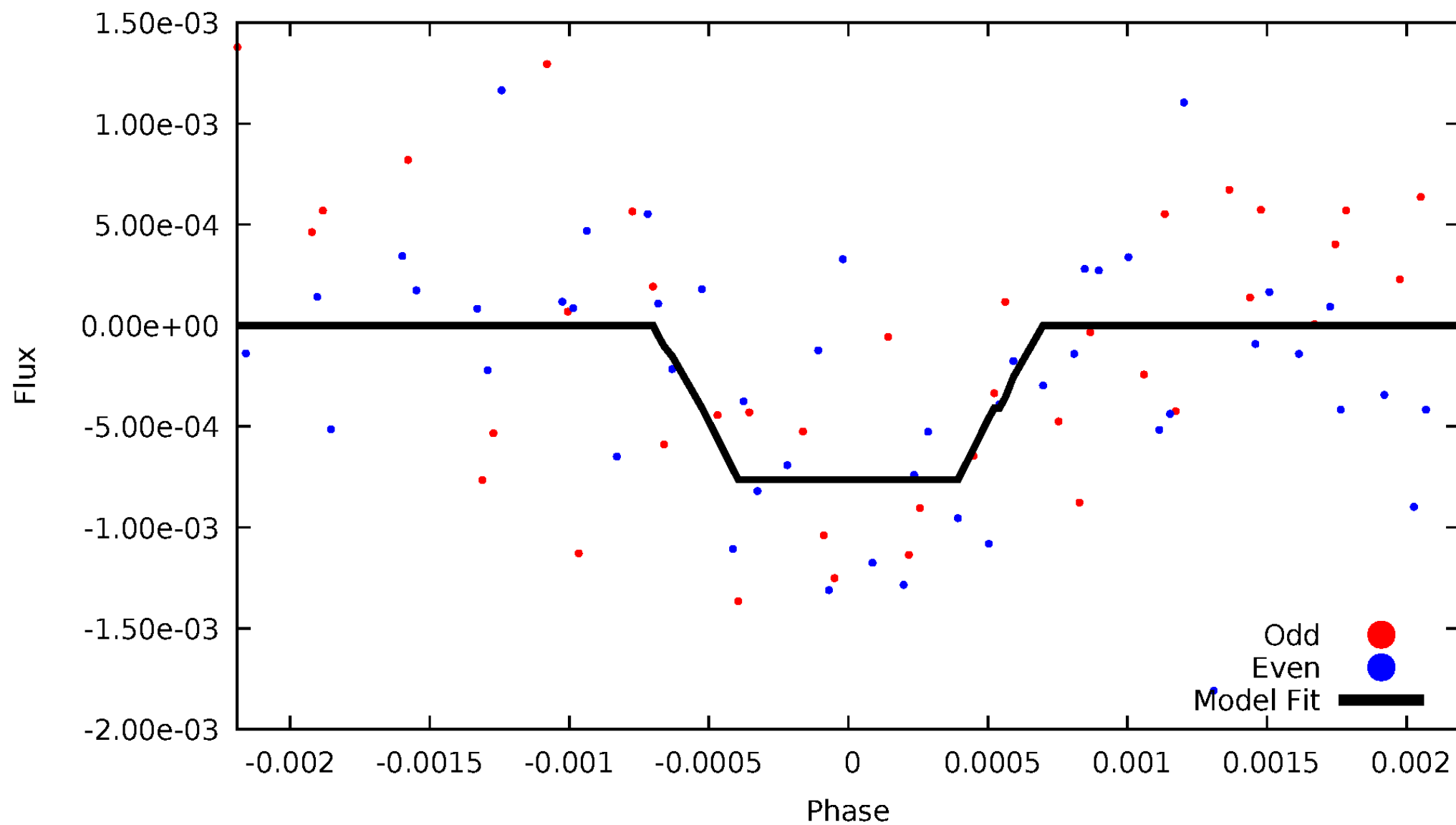
# DV Odd/Even

TCE 011400356-03



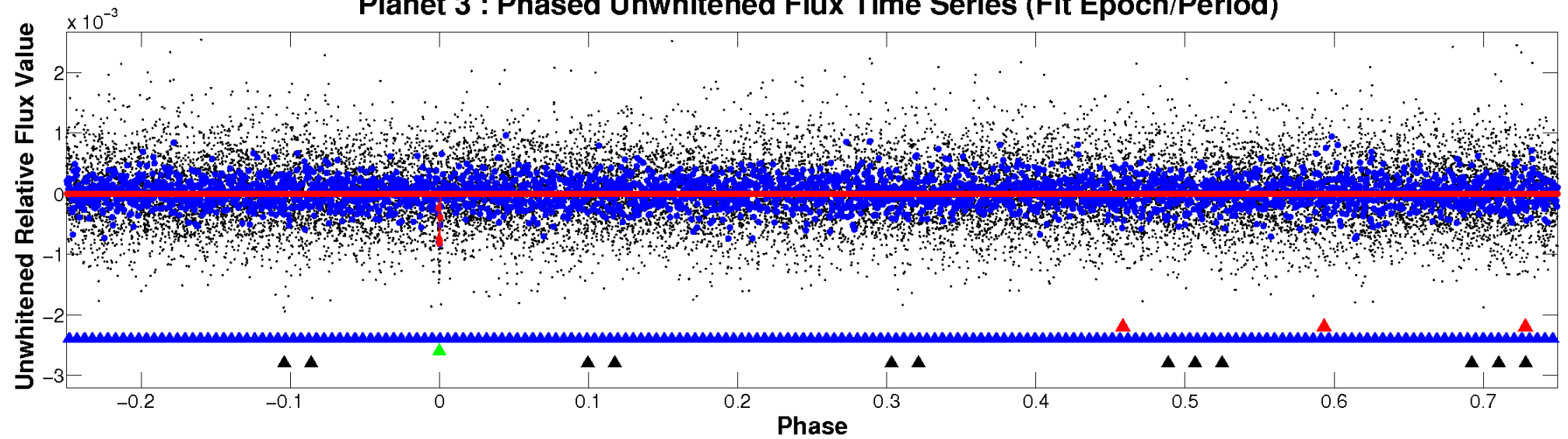
# ALT Odd/Even

TCE 011400356-03

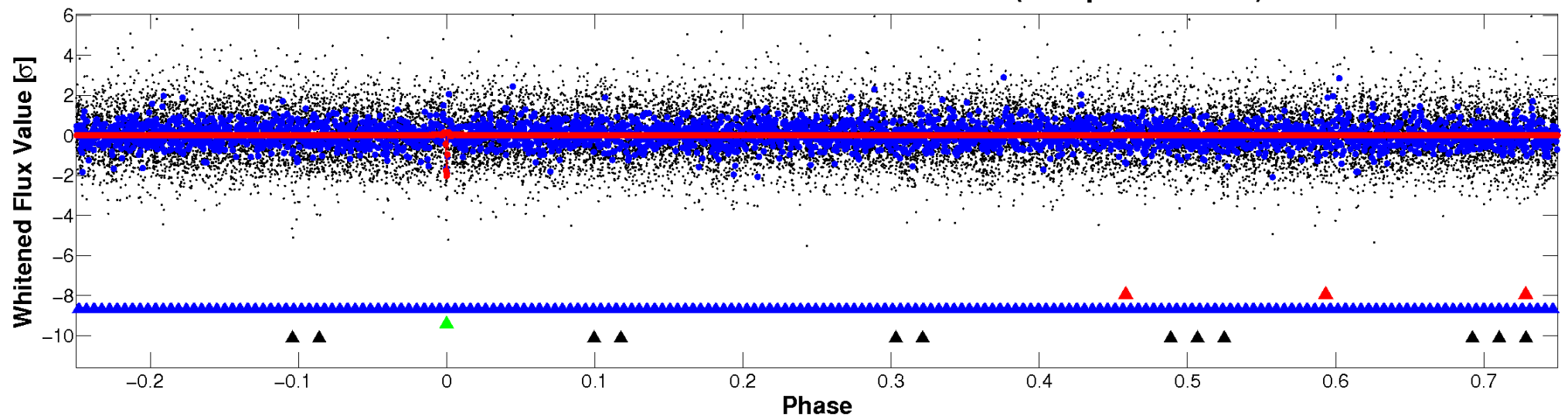


# Non-Whitened Vs. Whitened Light Curve

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

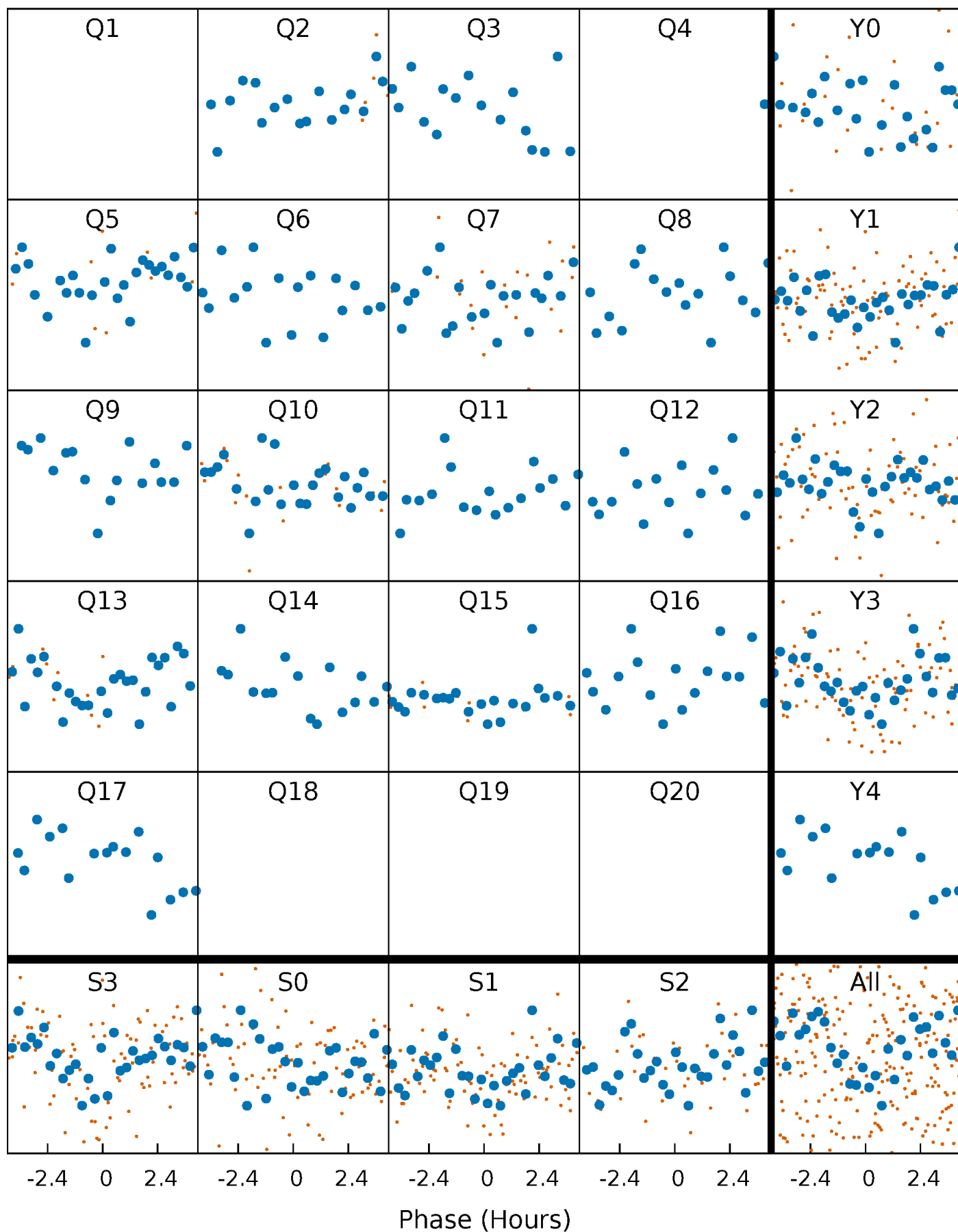


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



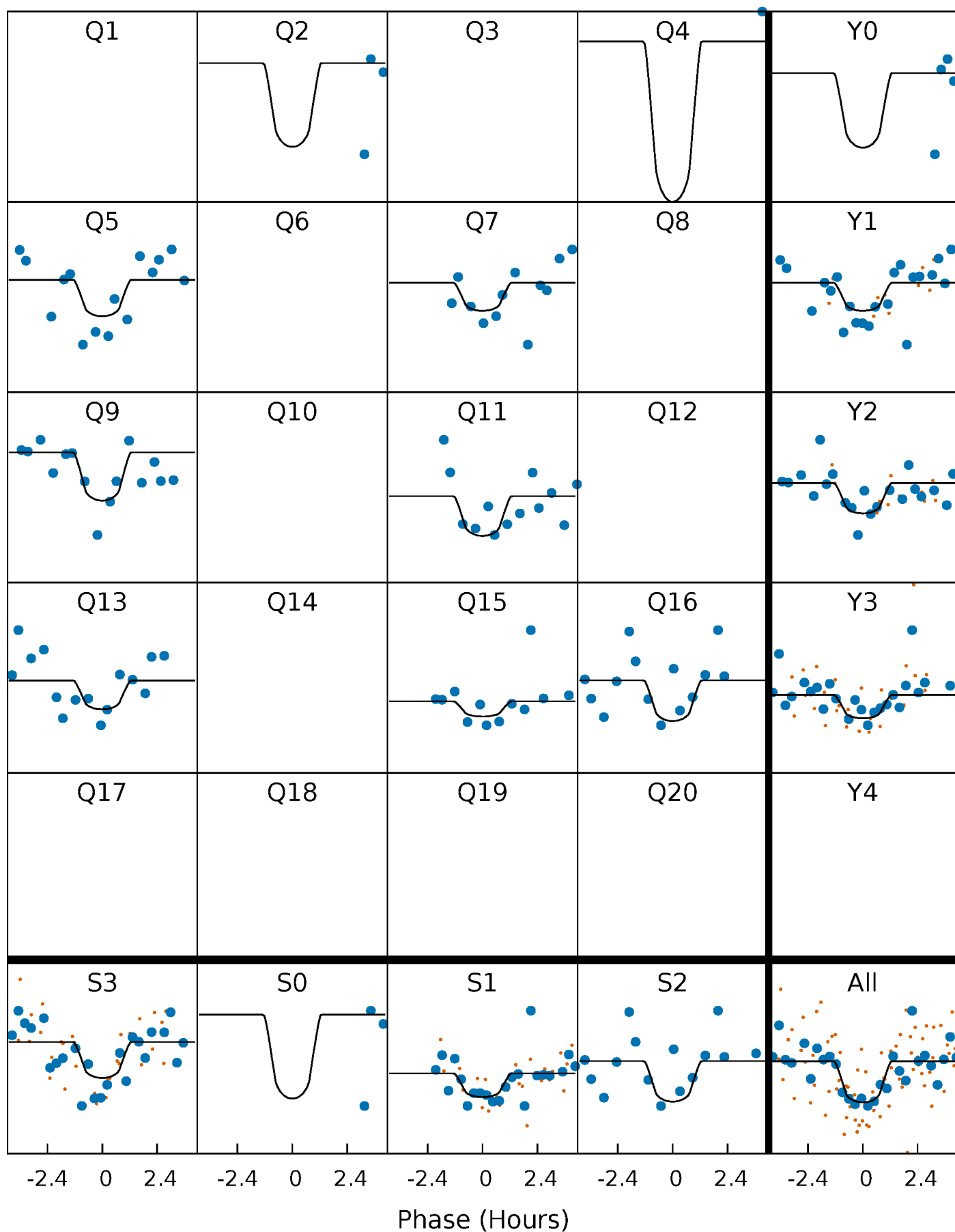
# PDC Quarter-Phased Transit Curves

TCE 011400356-03 P= 66.853725 Days  $T_0=183.595549$  (BKJD)



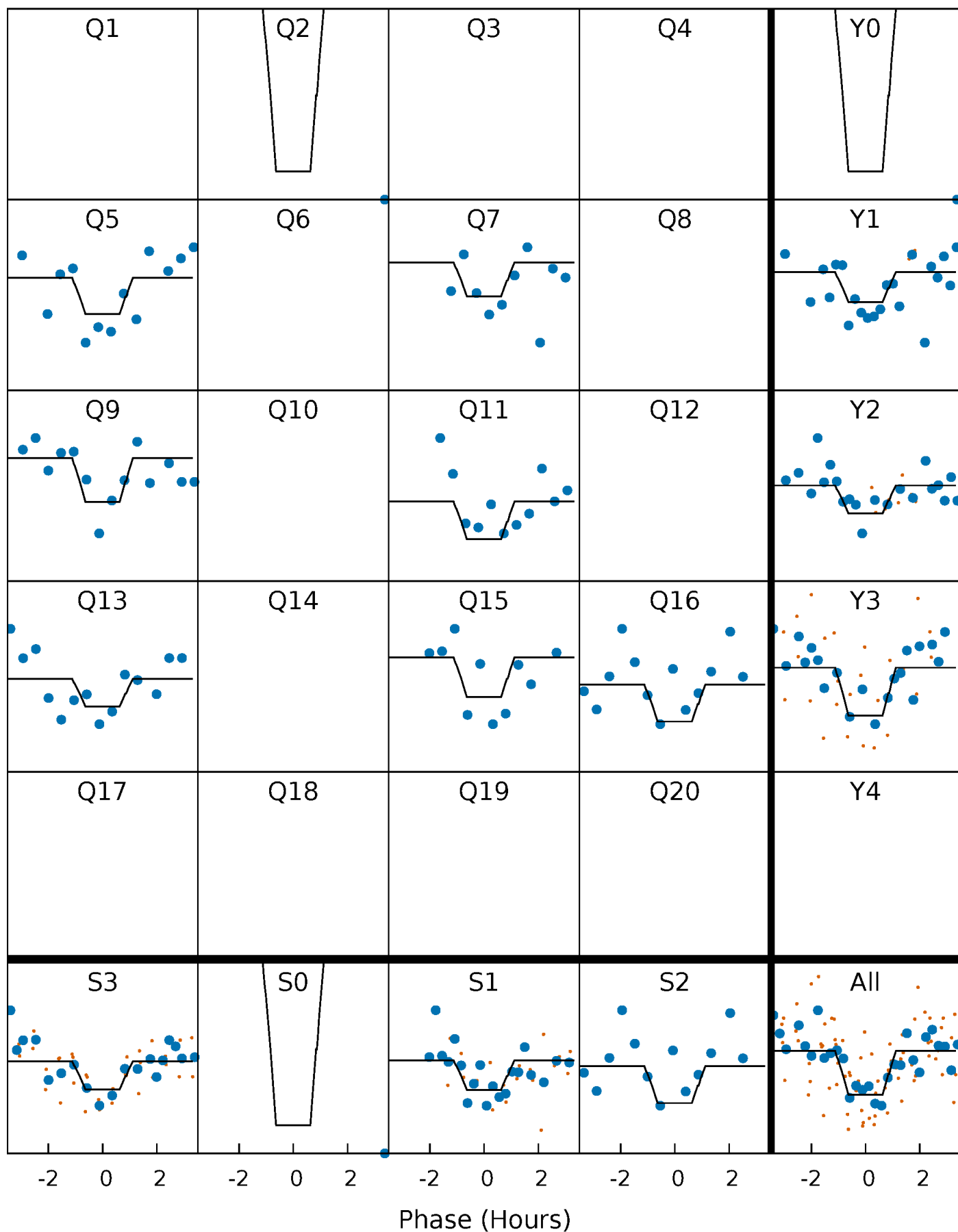
# DV Quarter-Phased Transit Curves

TCE 011400356-03   P= 66.853725 Days    $T_0=183.595549$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

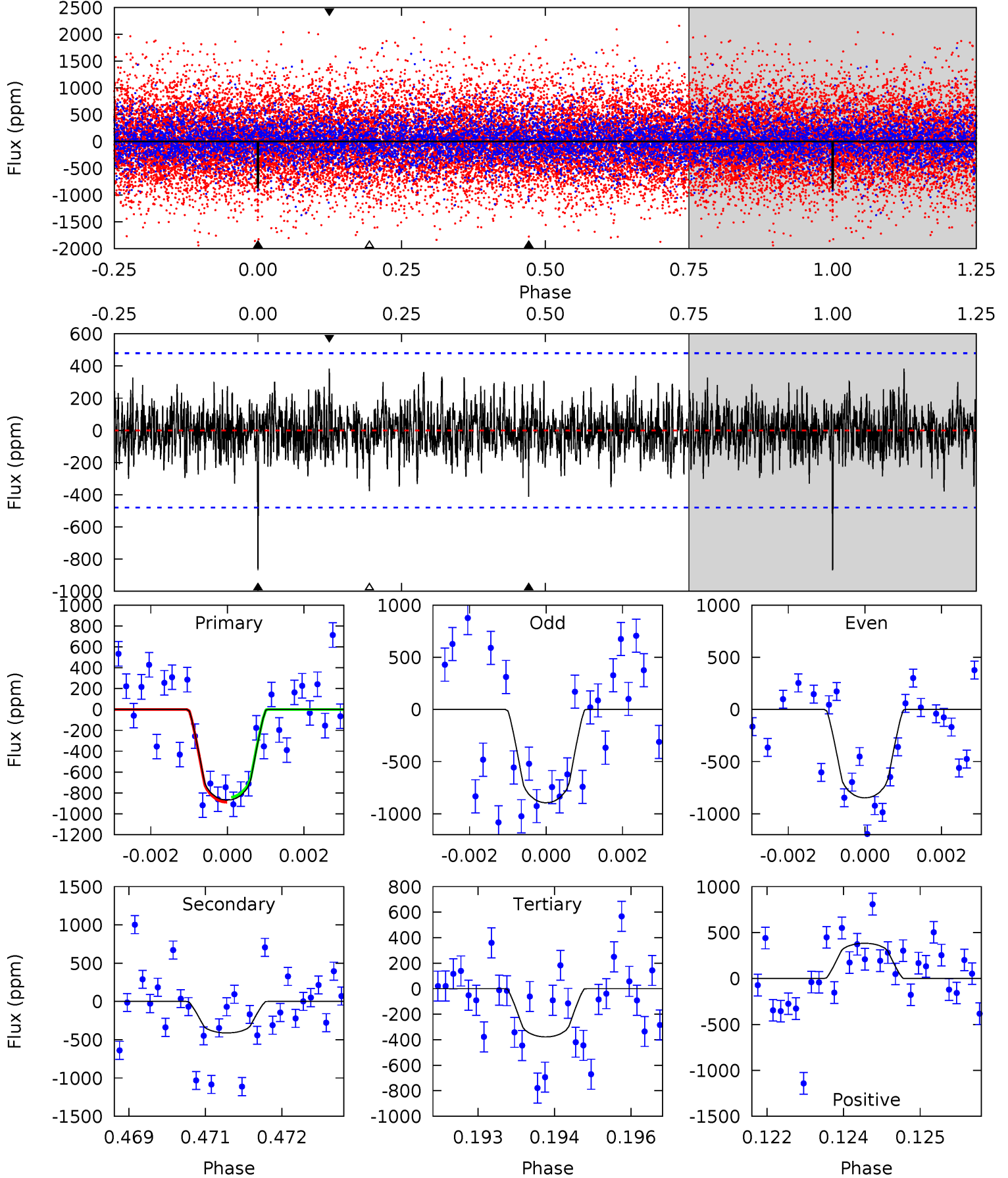
TCE 011400356-03 P= 66.854152 Days  $T_0=183.585799$  (BKJD)



# DV Model-Shift Uniqueness Test

011400356-03, P = 66.853725 Days, E = 116.741824 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
9.74	4.61	4.24	4.30	5.38	3.17	1.23	5.50	5.44	0.38	0.32	0.26	0.92	0.31	0.26

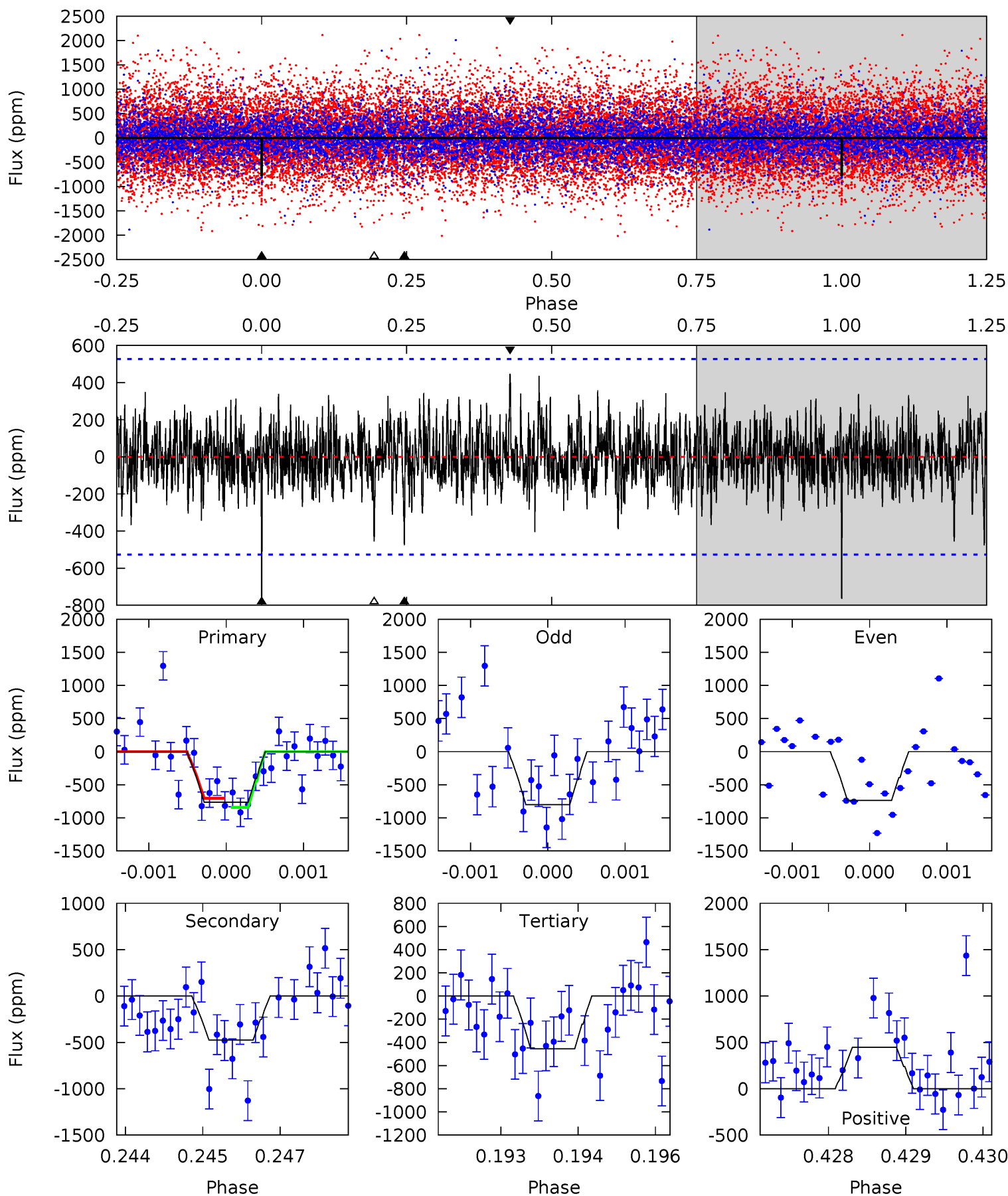




# Alt Model-Shift Uniqueness Test

011400356-03, P = 66.854152 Days, E = 116.731647 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
7.83	4.87	4.67	4.58	5.39	3.20	1.23	3.17	3.25	0.21	0.29	0.32	0.94	0.37	0.70



### Stellar Parameters For KIC 011400356

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5511^{+166}_{-166}$	$4.477^{+0.096}_{-0.144}$	$-0.180^{+0.300}_{-0.300}$	$0.872^{+0.196}_{-0.105}$	$0.833^{+0.111}_{-0.074}$	$1.770^{+0.749}_{-0.722}$
	+3%/-3%	+2%/-3%	+167%/-167%	+22%/-12%	+13%/-9%	+42%/-41%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011400356-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-412 \pm 89$	$5.04^{+4.83}_{-3.39}$	$579^{+35}_{-28}$	$3769^{+2196}_{-688}$	$792^{+6853}_{-590}$
Alt.	$-476 \pm 98$	$5.03^{+4.67}_{-3.39}$	$579^{+36}_{-28}$	$3895^{+2420}_{-758}$	$916^{+8066}_{-664}$

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

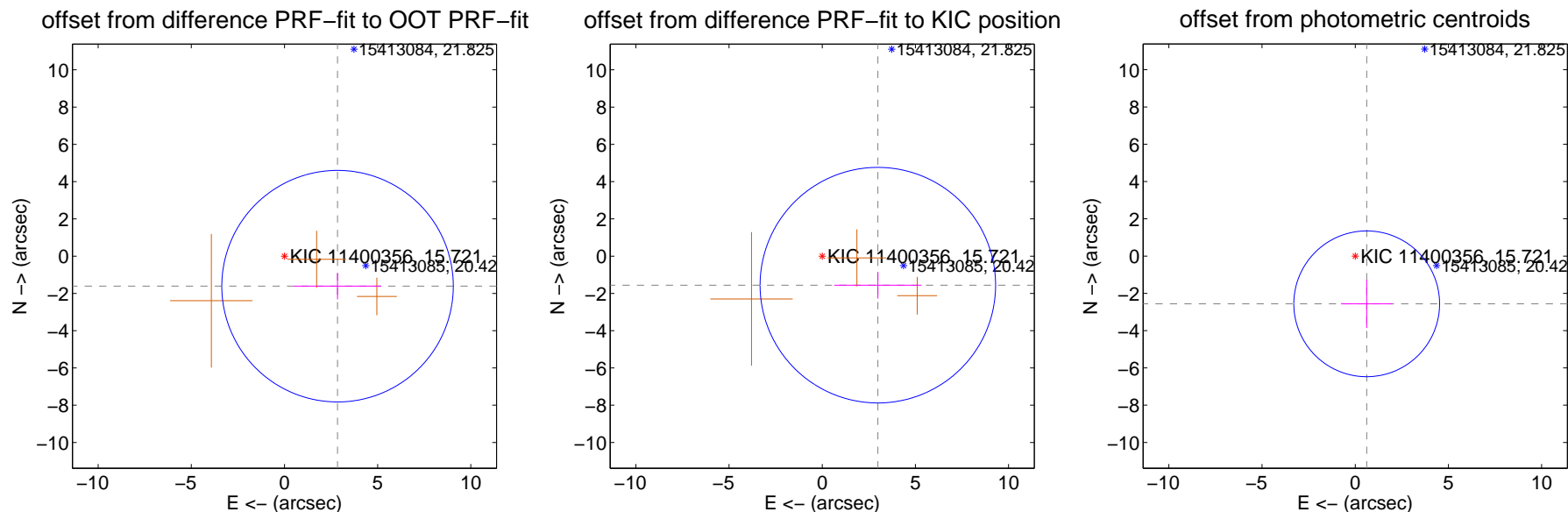
## DV Centroid Data

Supplemental centroid analysis for 011400356-03. Kepler magnitude: 15.72. Transit SNR 9.29

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.273 \pm 2.071$	1.58	$-2.849 \pm 2.345$	$-1.611 \pm 0.707$
PRF-fit source offset from KIC position	$3.367 \pm 2.107$	1.60	$-2.985 \pm 2.347$	$-1.557 \pm 0.716$
photometric centroid source offset	$2.63 \pm 1.30$	2.02	$-0.62 \pm 1.38$	$-2.56 \pm 1.30$



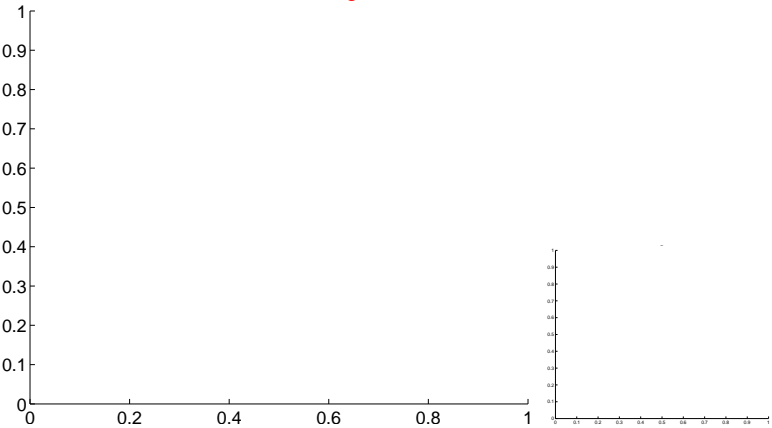
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

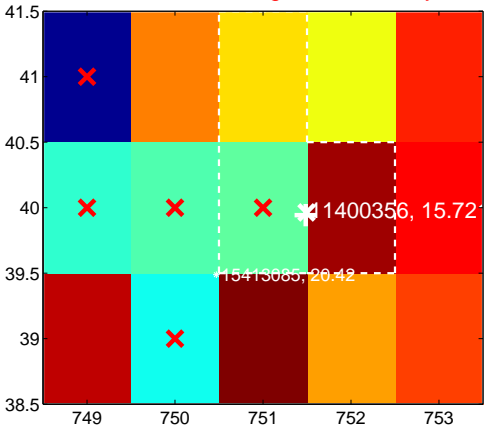
Q1 no difference image



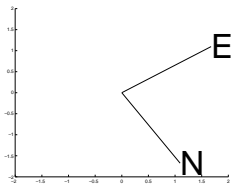
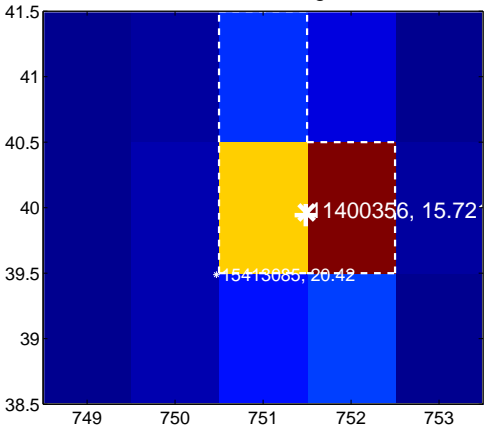
Q1 no OOT image



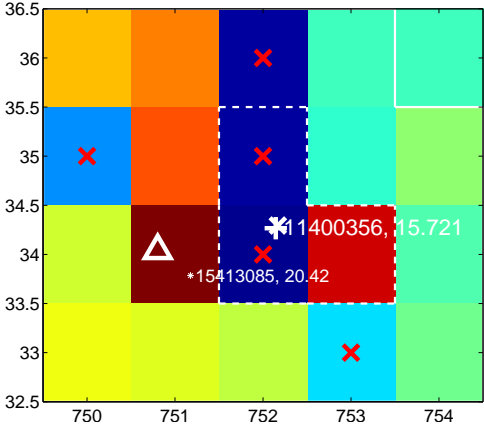
Q2 difference image. Poor Quality



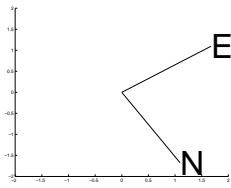
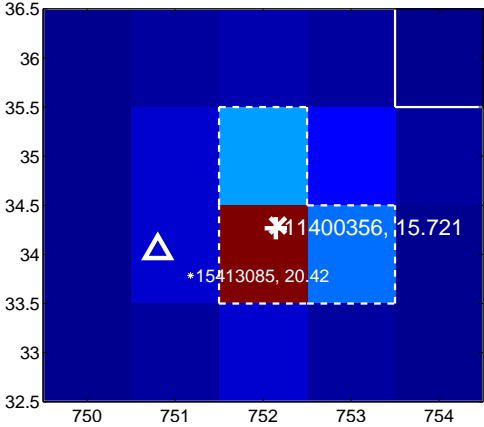
Q2 OOT image



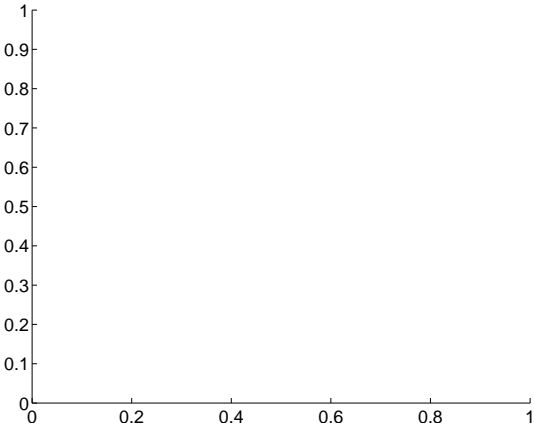
Q3 difference image. Poor Quality



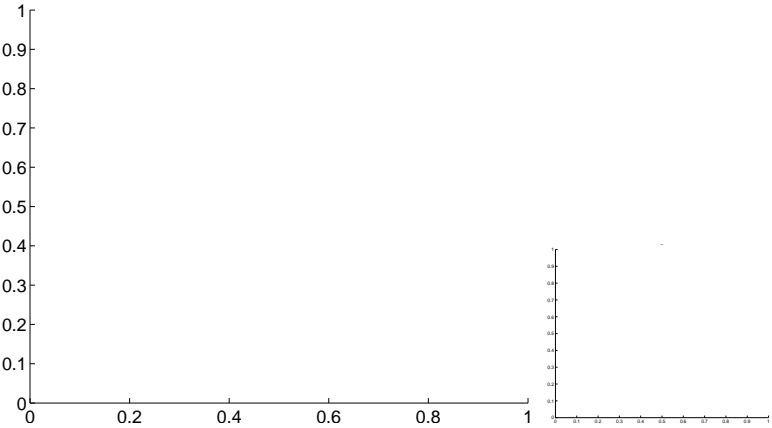
Q3 OOT image



Q4 no difference image

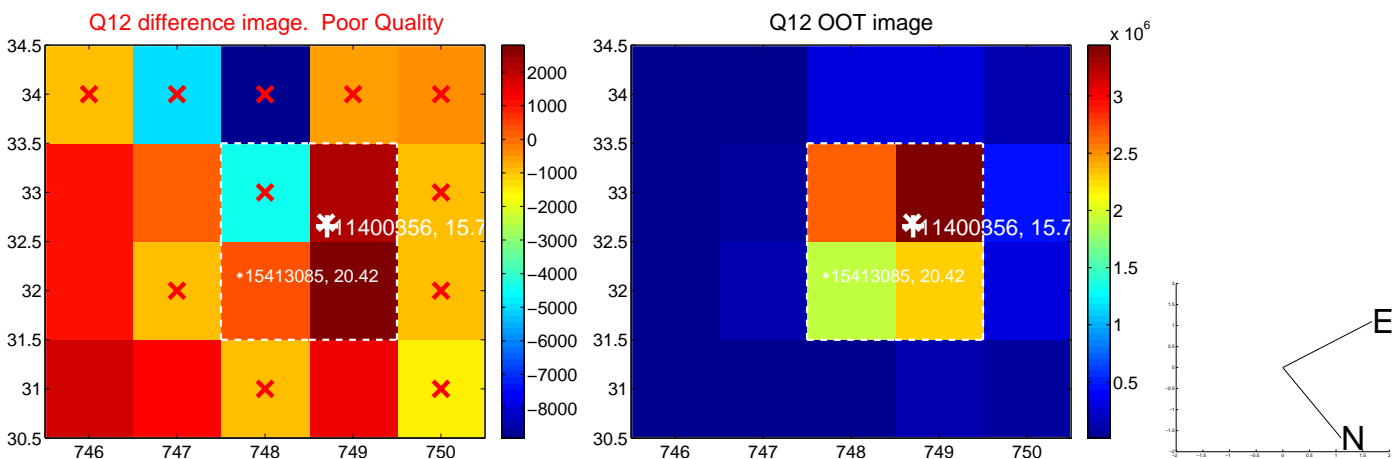
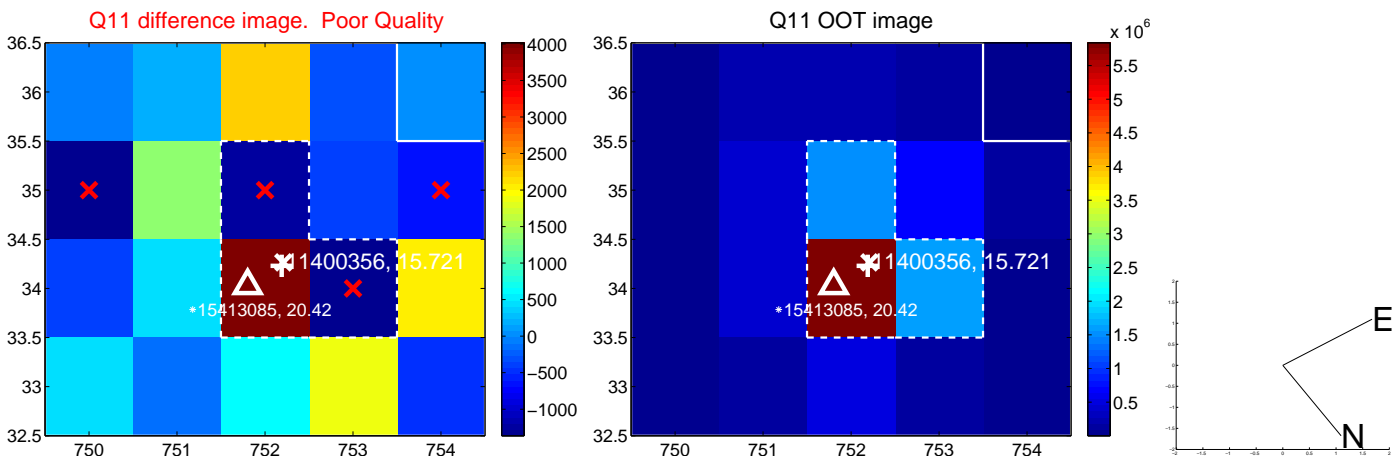
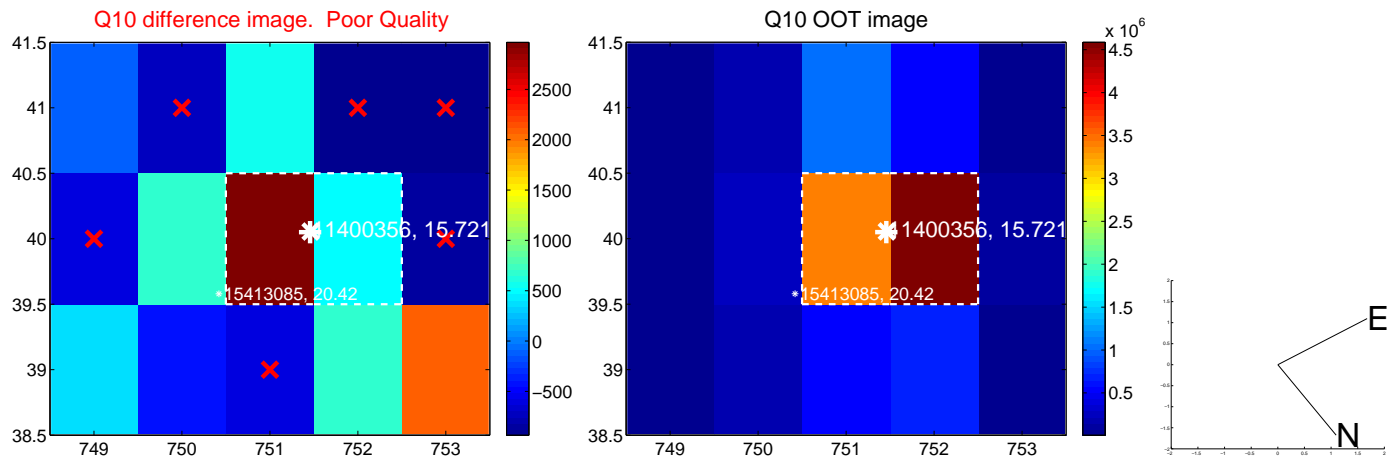
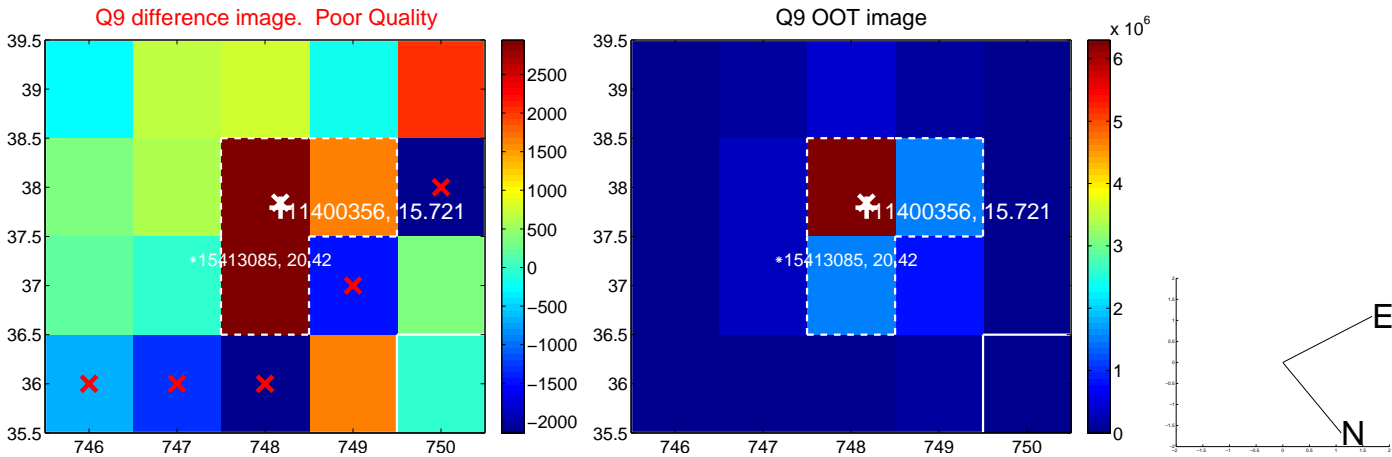


Q4 no OOT image

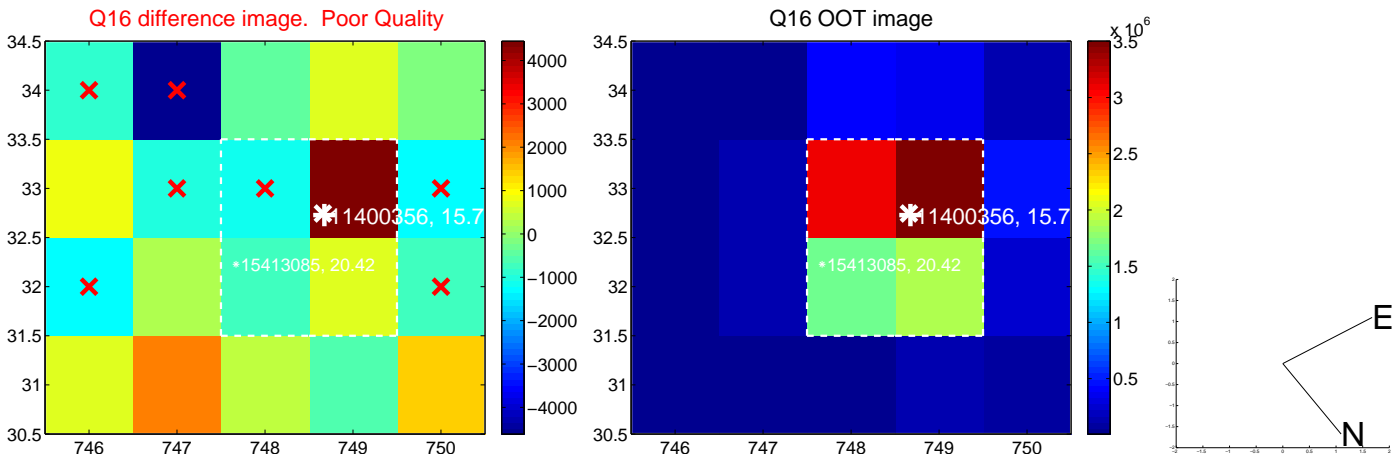
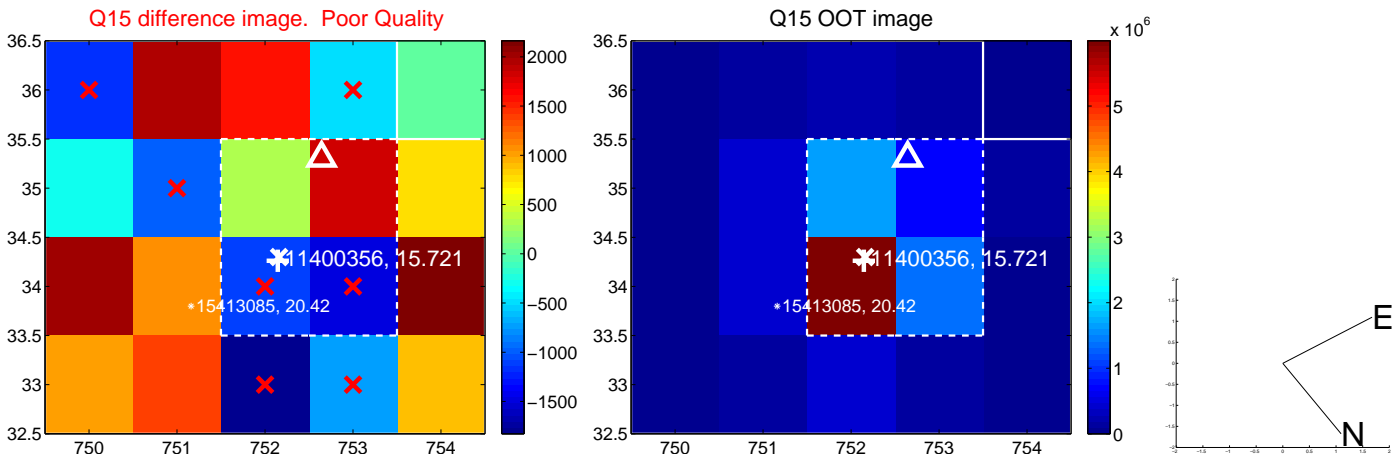
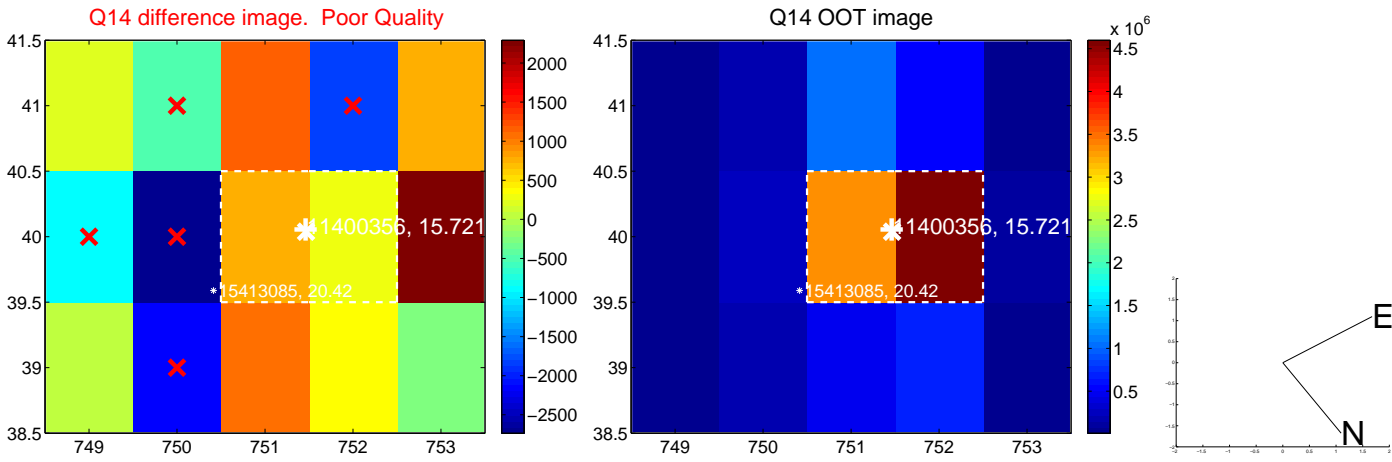
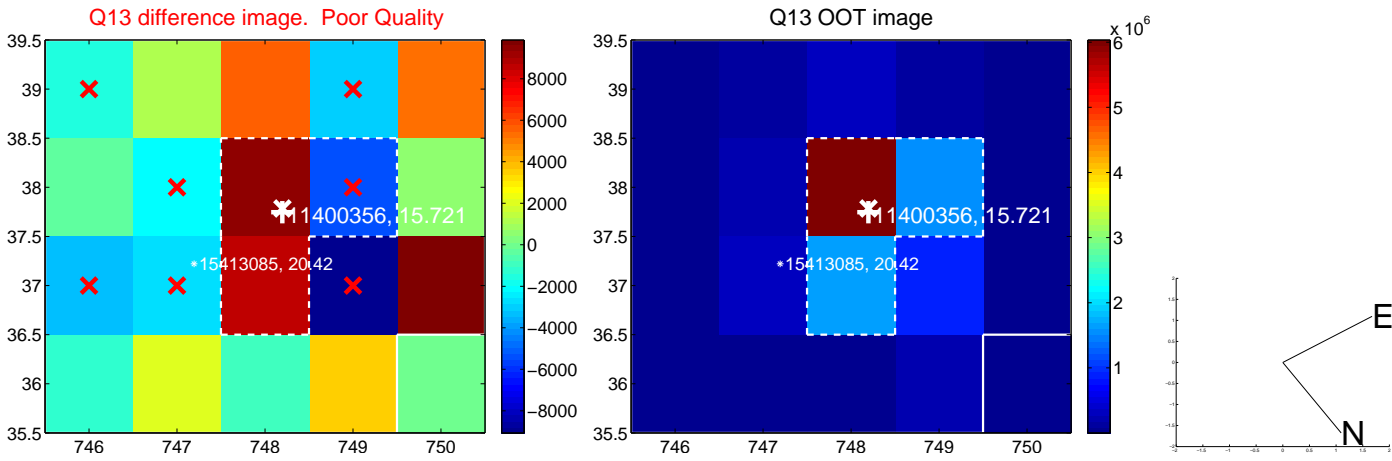




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

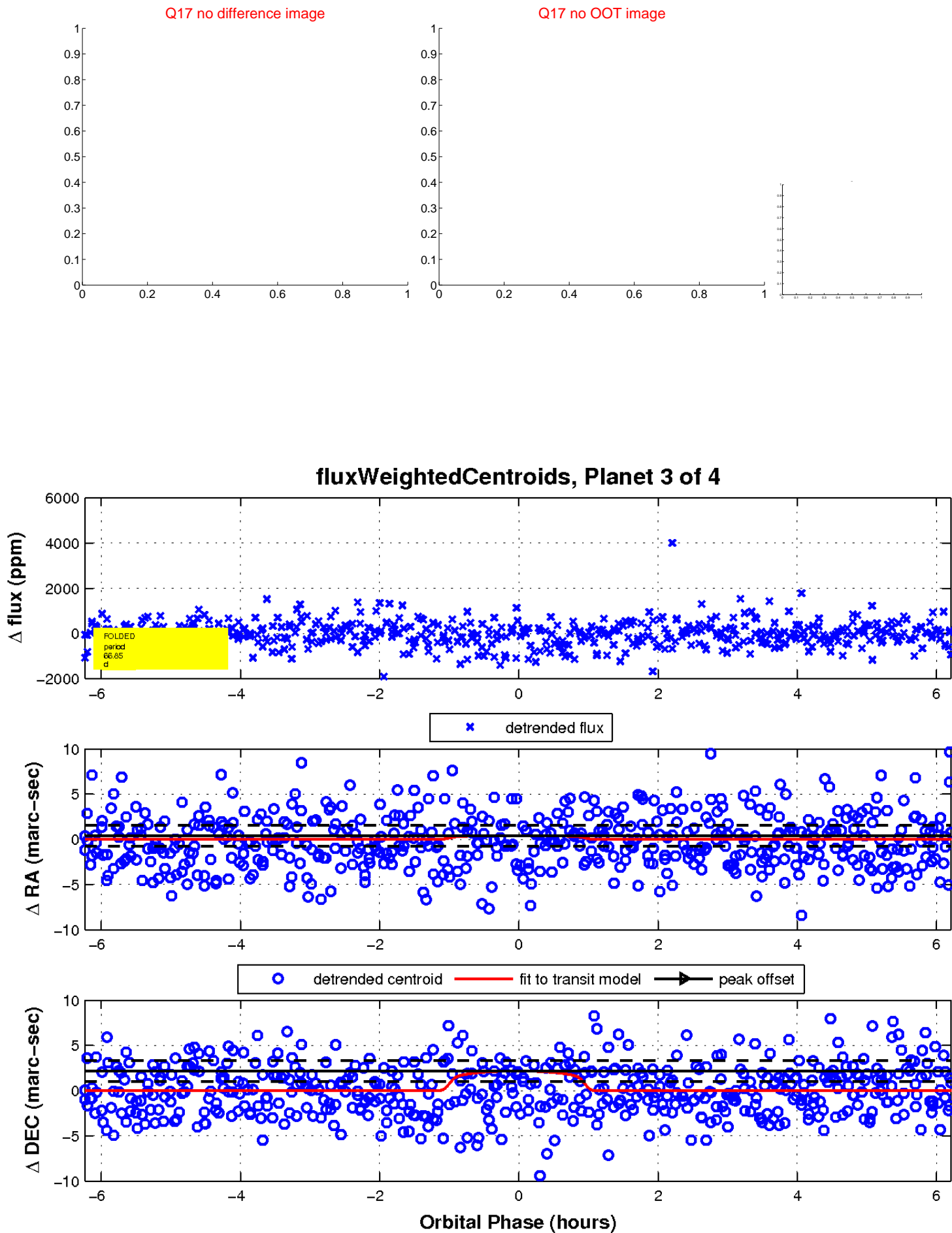


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



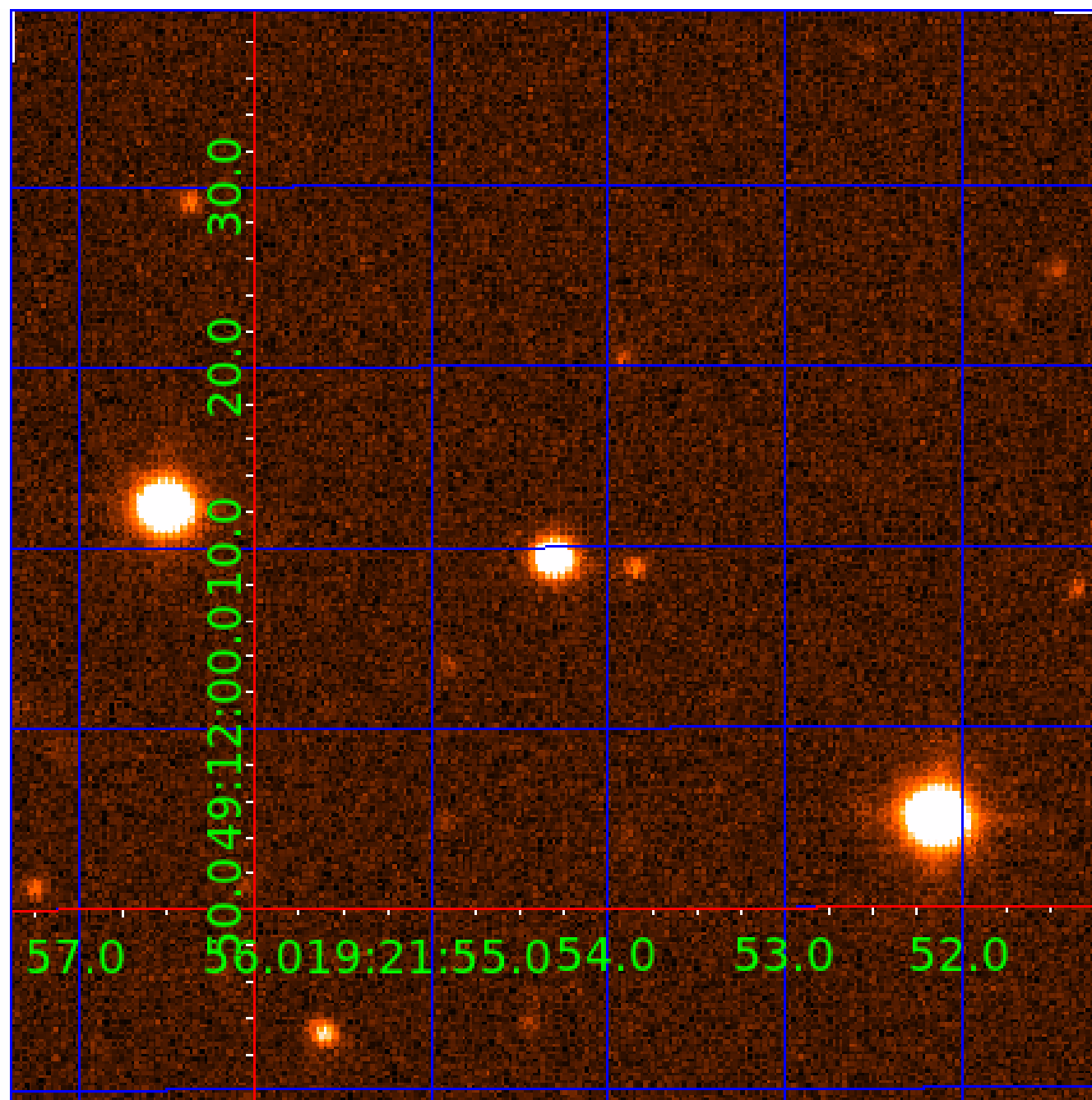


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011400356

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011400356-01	OBS	8222.01	677.559066	214.239257	689.5	10.287	7.5	7.0	0.87	5511	2.30	0.31
011400356-02	OBS	No	1.731874	132.399669	43.2	9.232	8.3	6.6	0.87	5511	0.67	891.54
011400356-03	OBS	No	66.853725	183.595549	825.6	2.080	8.5	9.3	0.87	5511	2.69	6.83
011400356-04	OBS	No	120.095184	165.444125	845.1	2.461	7.7	8.2	0.87	5511	2.83	3.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011400356-01	OBS	FP	0.11	1	0	0	0	MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011400356-02	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_FEW_DIFFS
011400356-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
011400356-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—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.

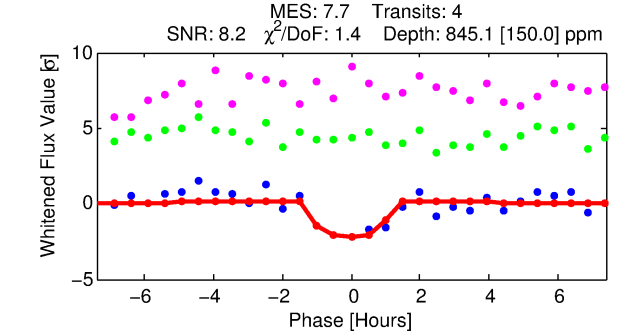
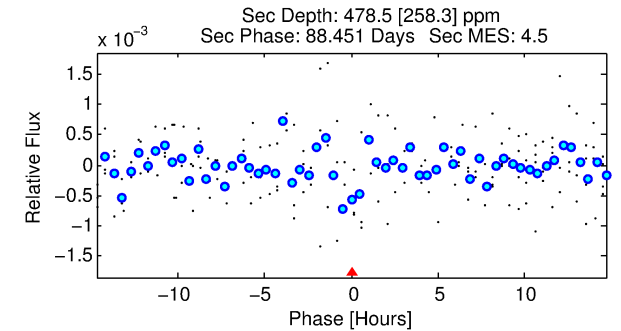
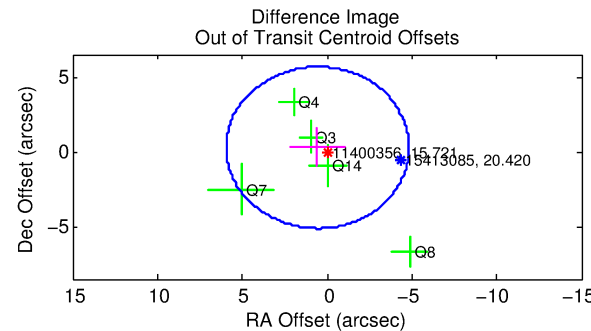
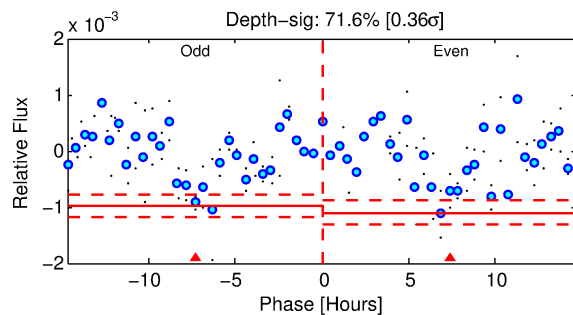
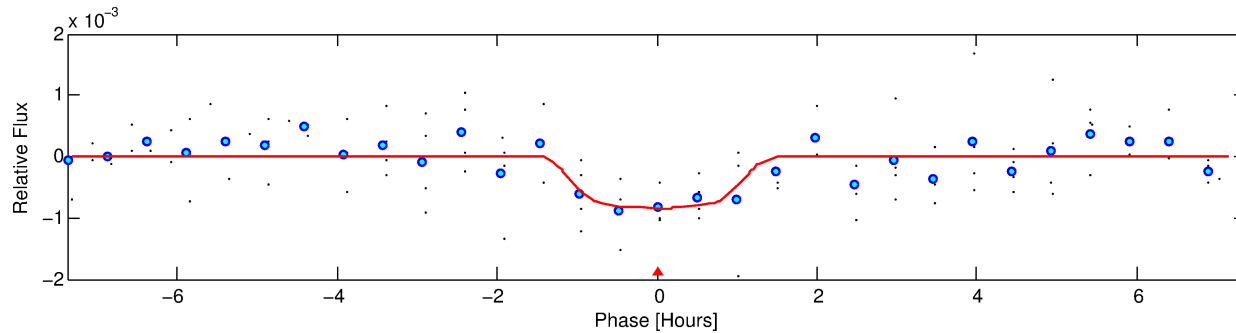
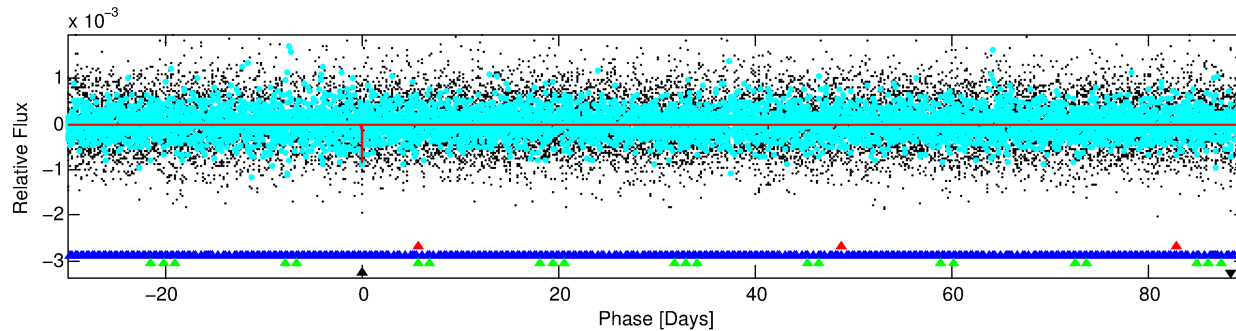
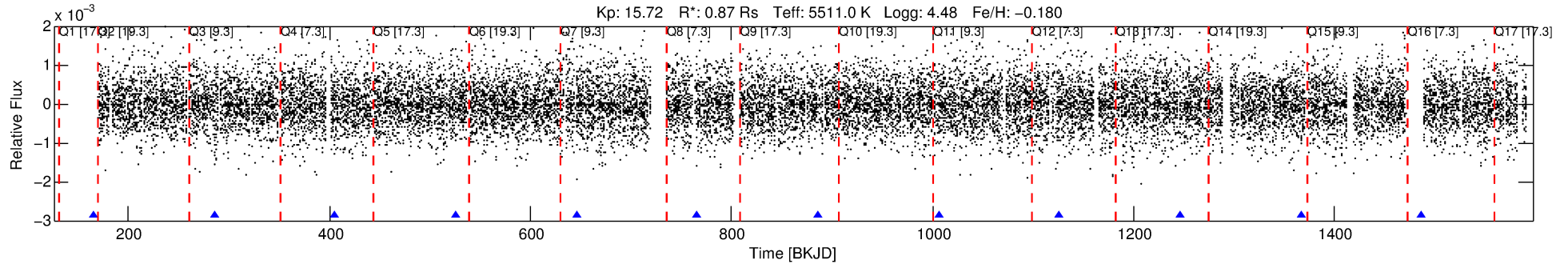
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011400356-04

No Significant Match Found

# DV One-Page Summary

KIC: 11400356 Candidate: 4 of 4 Period: 120.095 d



## DV Fit Results:

Period = 120.09518 [0.00156] d  
Epoch = 165.4441 [0.0117] BKJD  
Rp/R<sup>\*</sup> = 0.0298 [0.0600]  
a/R<sup>\*</sup> = 238.19 [2019.03]  
b = 0.81 [3.73]  
Seff = 3.13 [0.92]  
Teq = 339 [25] K  
Rp = 2.84 [5.75] Re  
a = 0.4481 [0.0834] AU  
Ag = 6574.98 [26777.66] [0.25σ]  
Teffp = 4722 [4799] K [0.91σ]

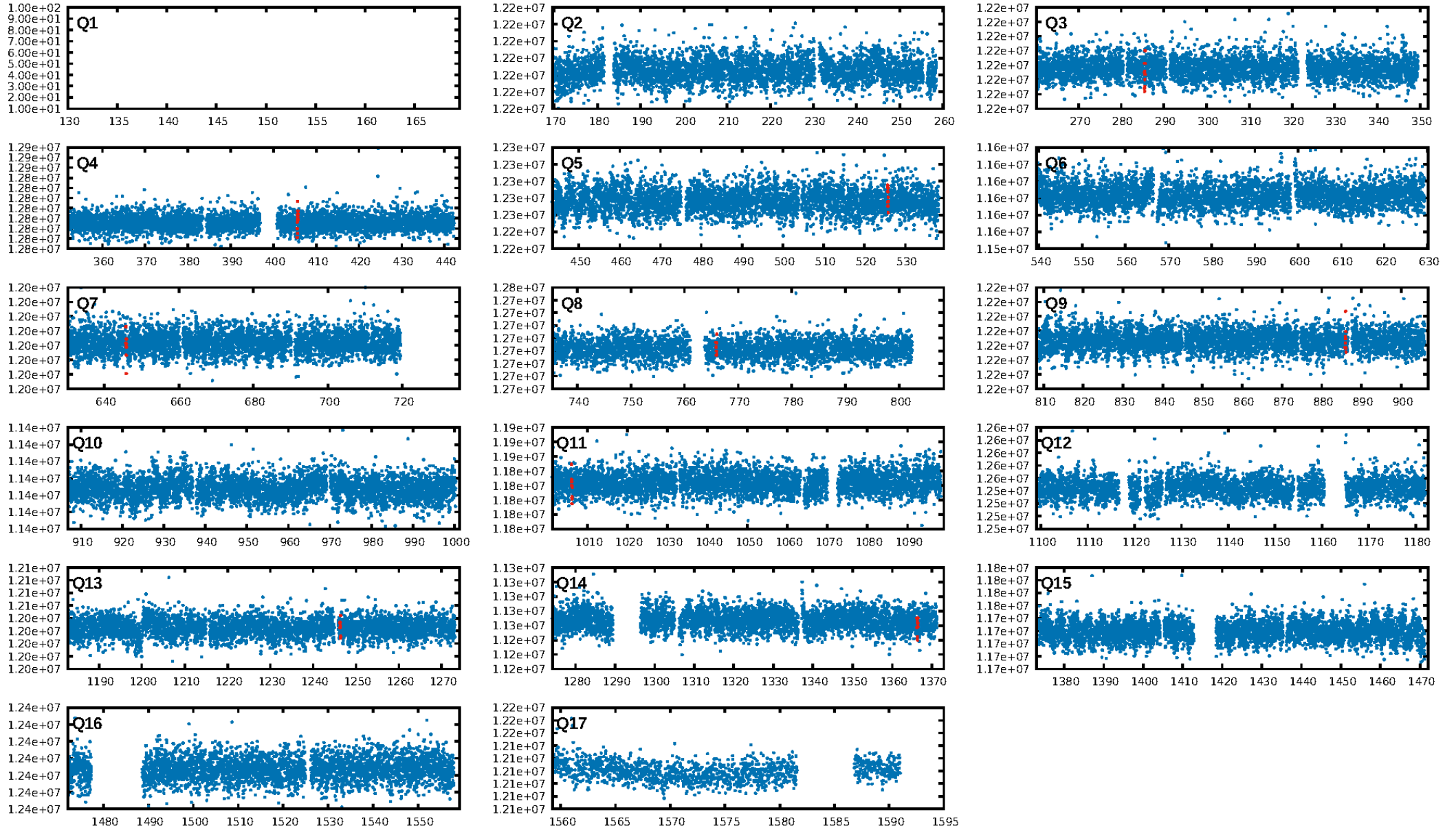
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [396.56σ]  
LongPeriod-sig: 100.0% [1264.96σ]  
ModelChiSquare2-sig: 65.7%  
ModelChiSquareGof-sig: 65.6%  
**Bootstrap-pfa: 1.12e-08**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 2.41  
Centroid-sig: 0.5%  
Centroid-so: 3.201 arcsec [1.69σ]  
OotOffset-rm: 0.617 arcsec [0.34σ]  
KicOffset-rm: 0.578 arcsec [0.29σ]  
OotOffset-st: 1/2/2/0 [5]  
KicOffset-st: 1/2/2/0 [5]  
DiffImageQuality-fgm: 0.20 [1/5]  
DiffImageOverlap-fno: 0.50 [4/8]

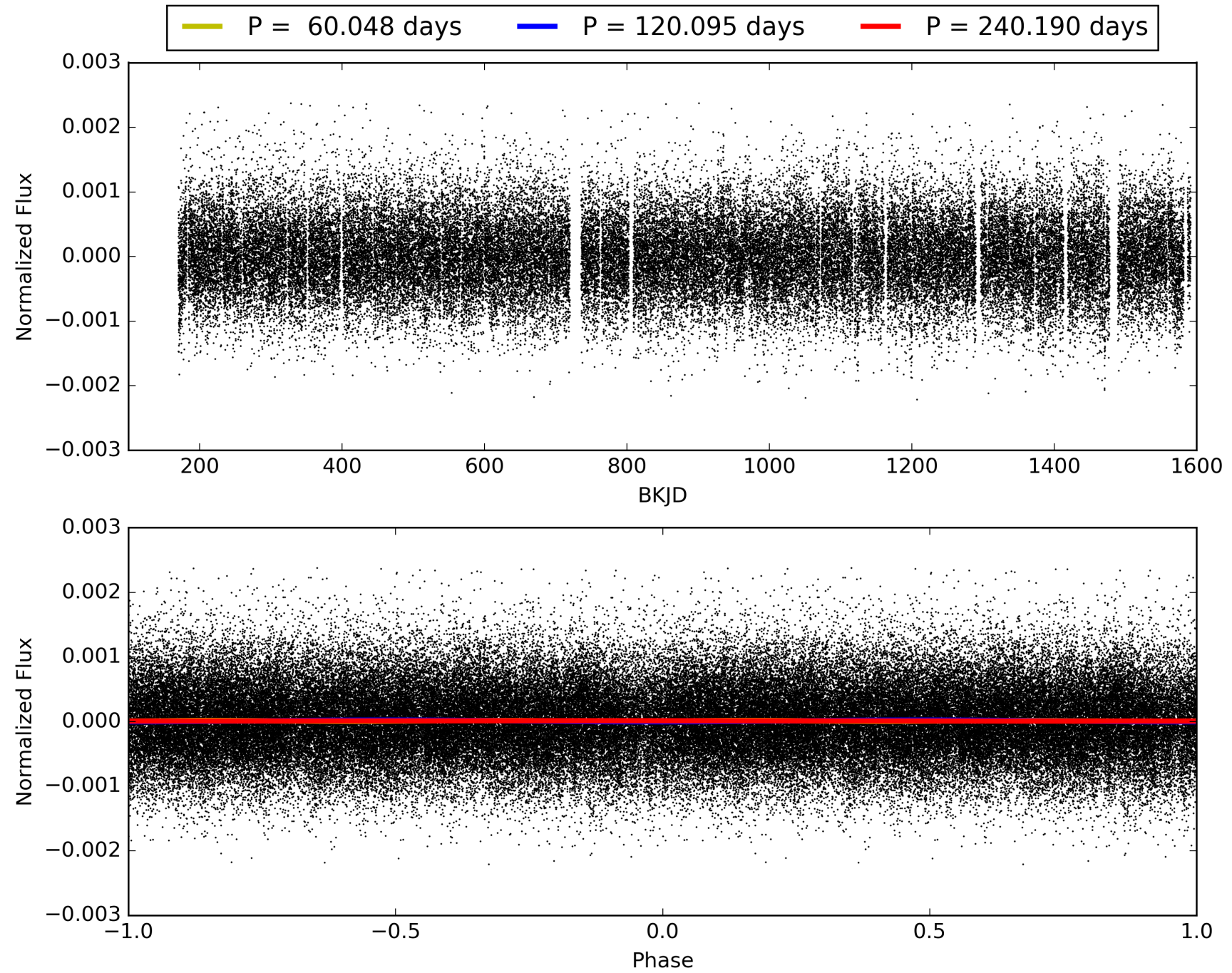
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:28:27 Z

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

# TCE 011400356-04, PDC Light Curves



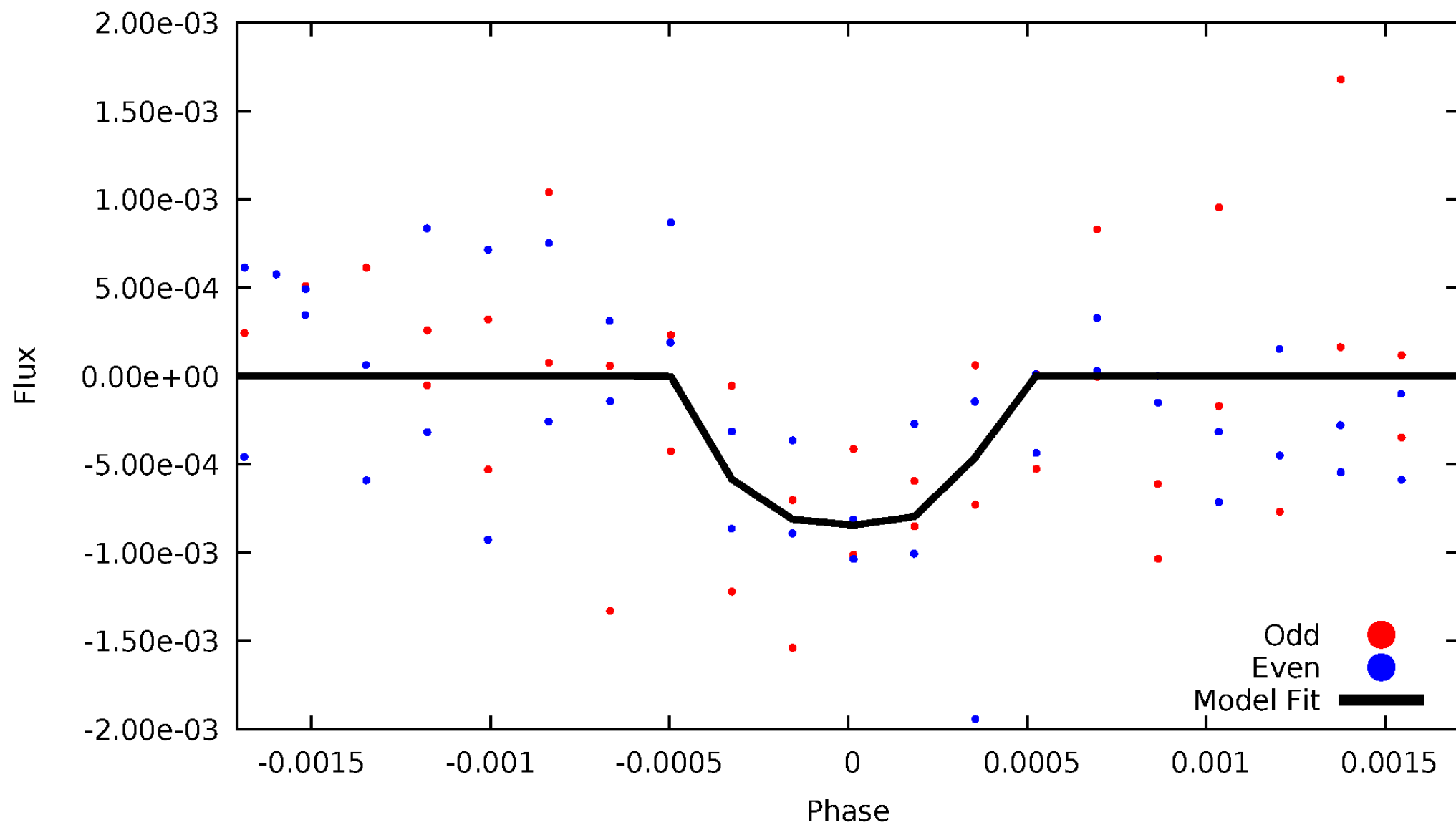
TCE 011400356-04





# DV Odd/Even

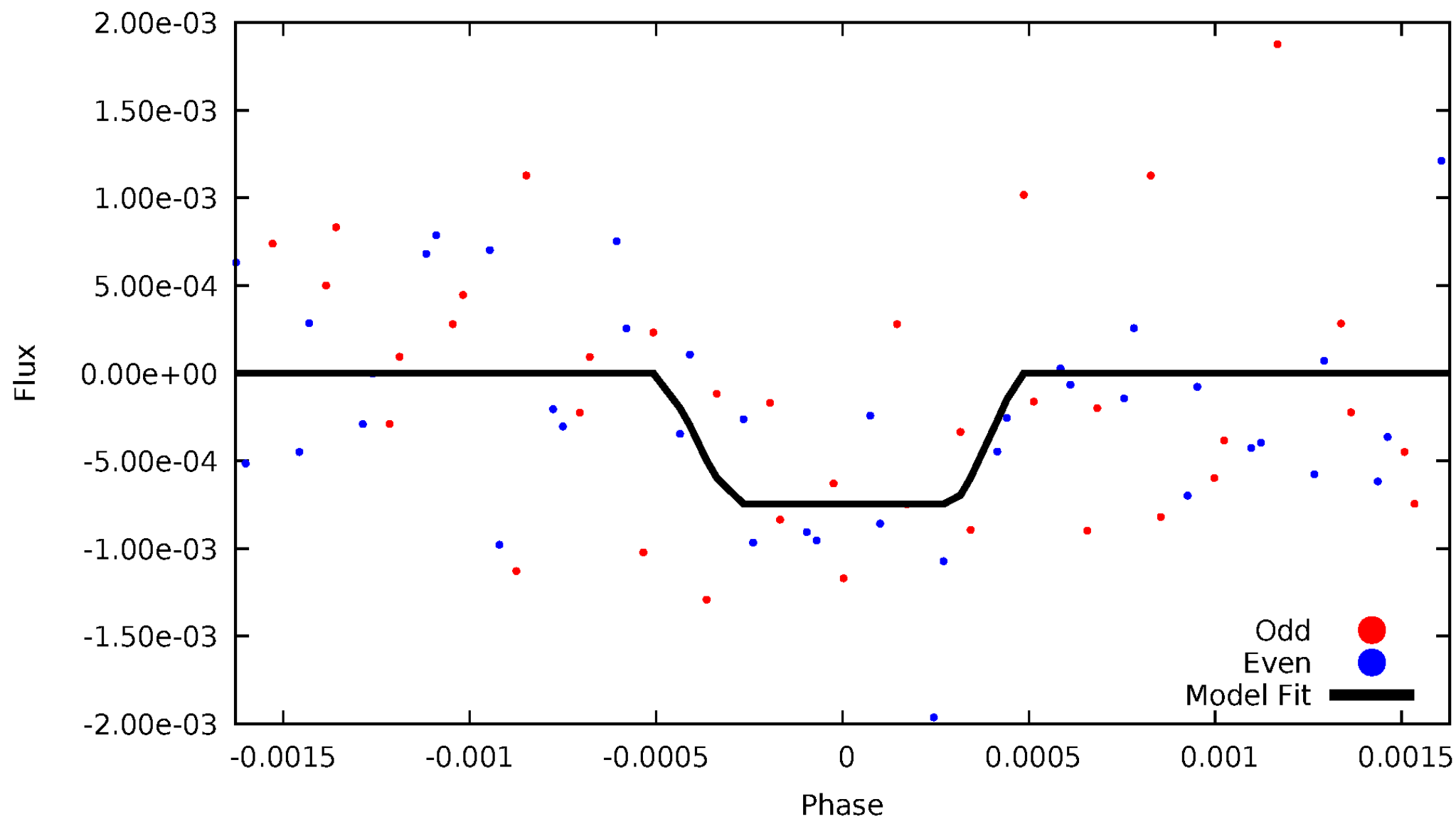
TCE 011400356-04





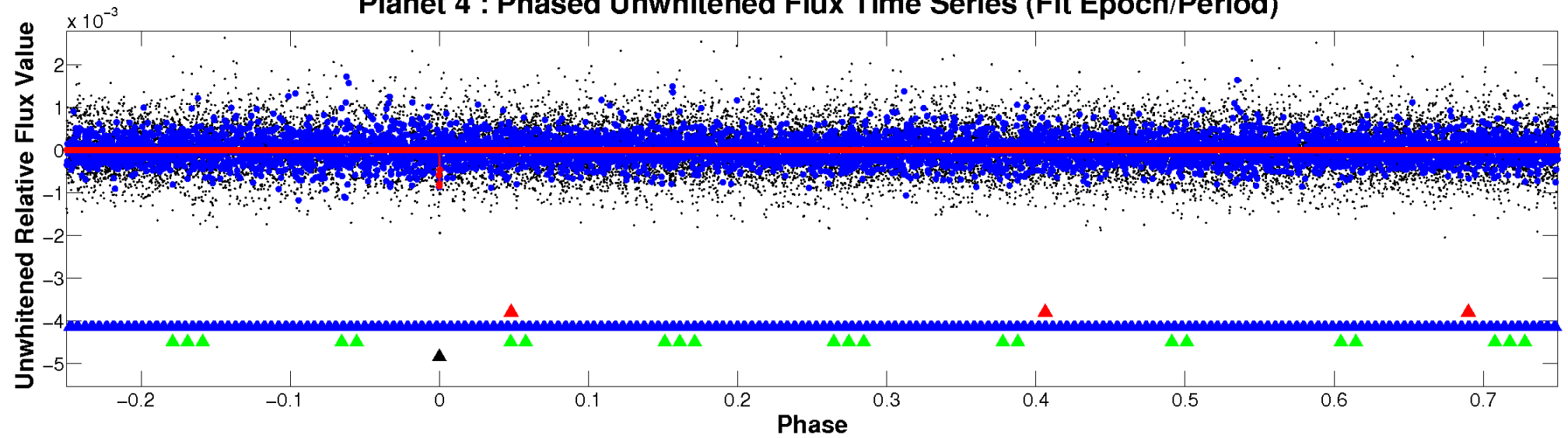
# ALT Odd/Even

TCE 011400356-04

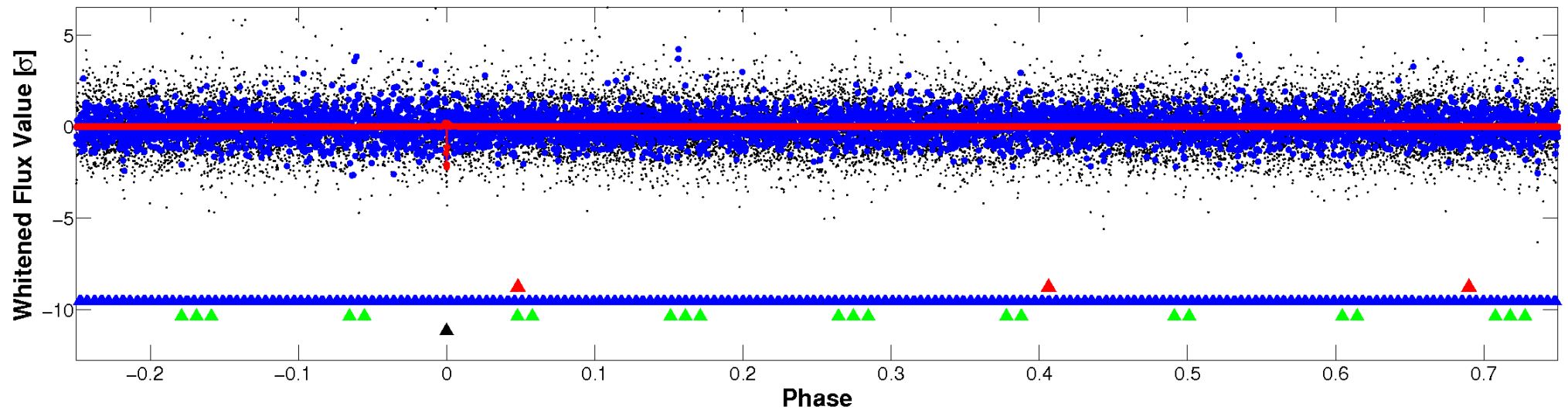


# Non-Whitened Vs. Whitened Light Curve

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

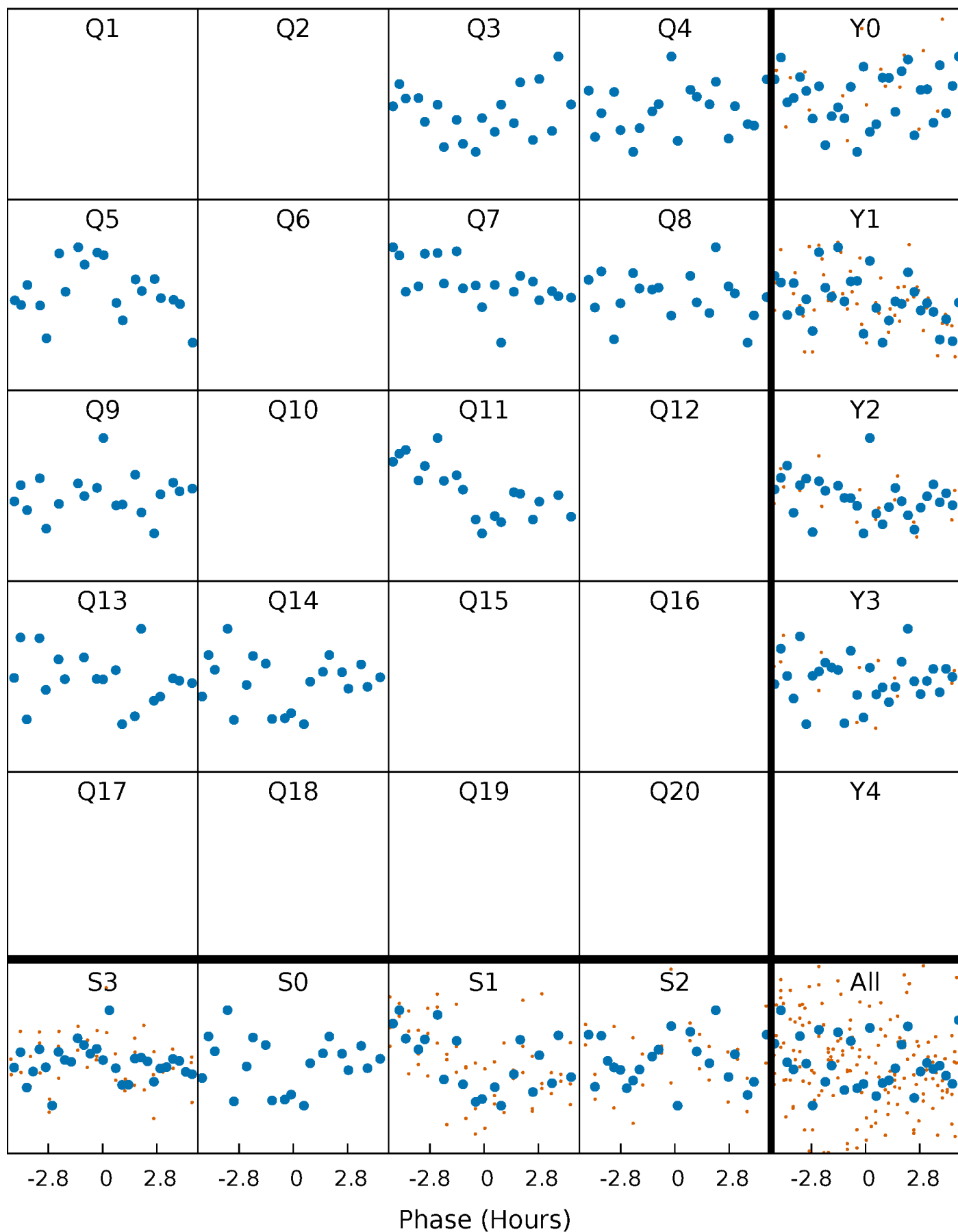


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



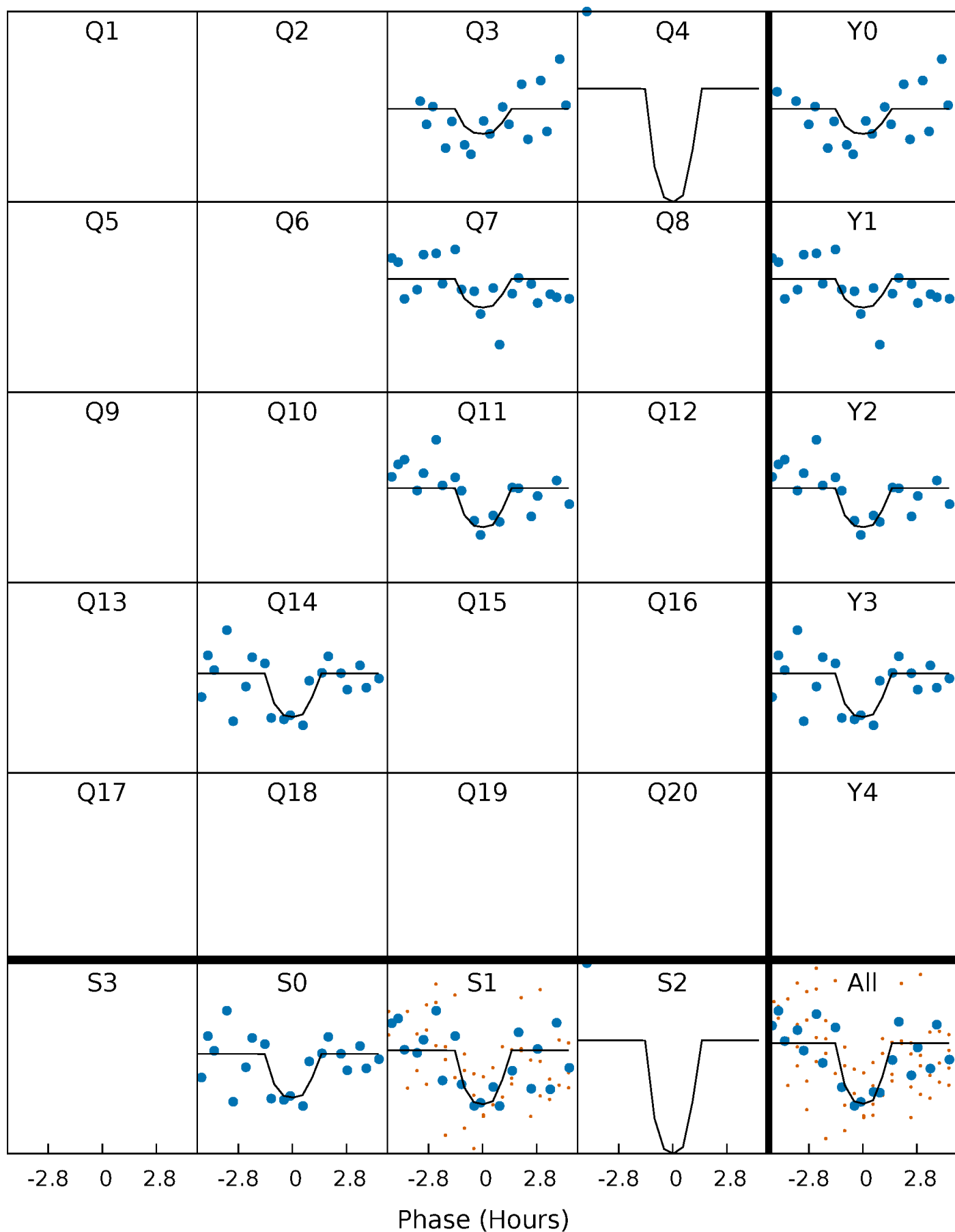
# PDC Quarter-Phased Transit Curves

TCE 011400356-04 P=120.095184 Days  $T_0=165.444125$  (BKJD)



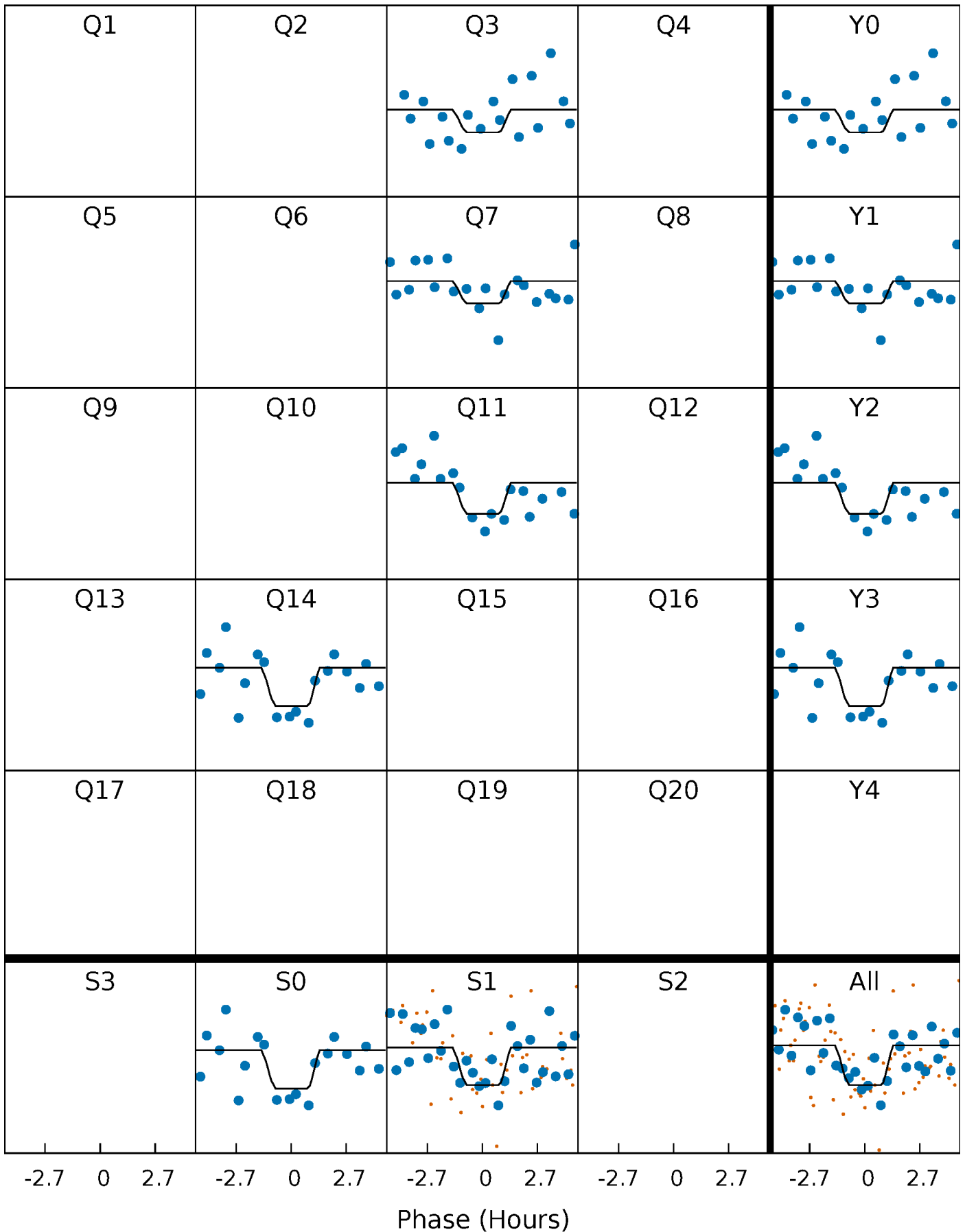
# DV Quarter-Phased Transit Curves

TCE 011400356-04 P=120.095184 Days  $T_0=165.444125$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

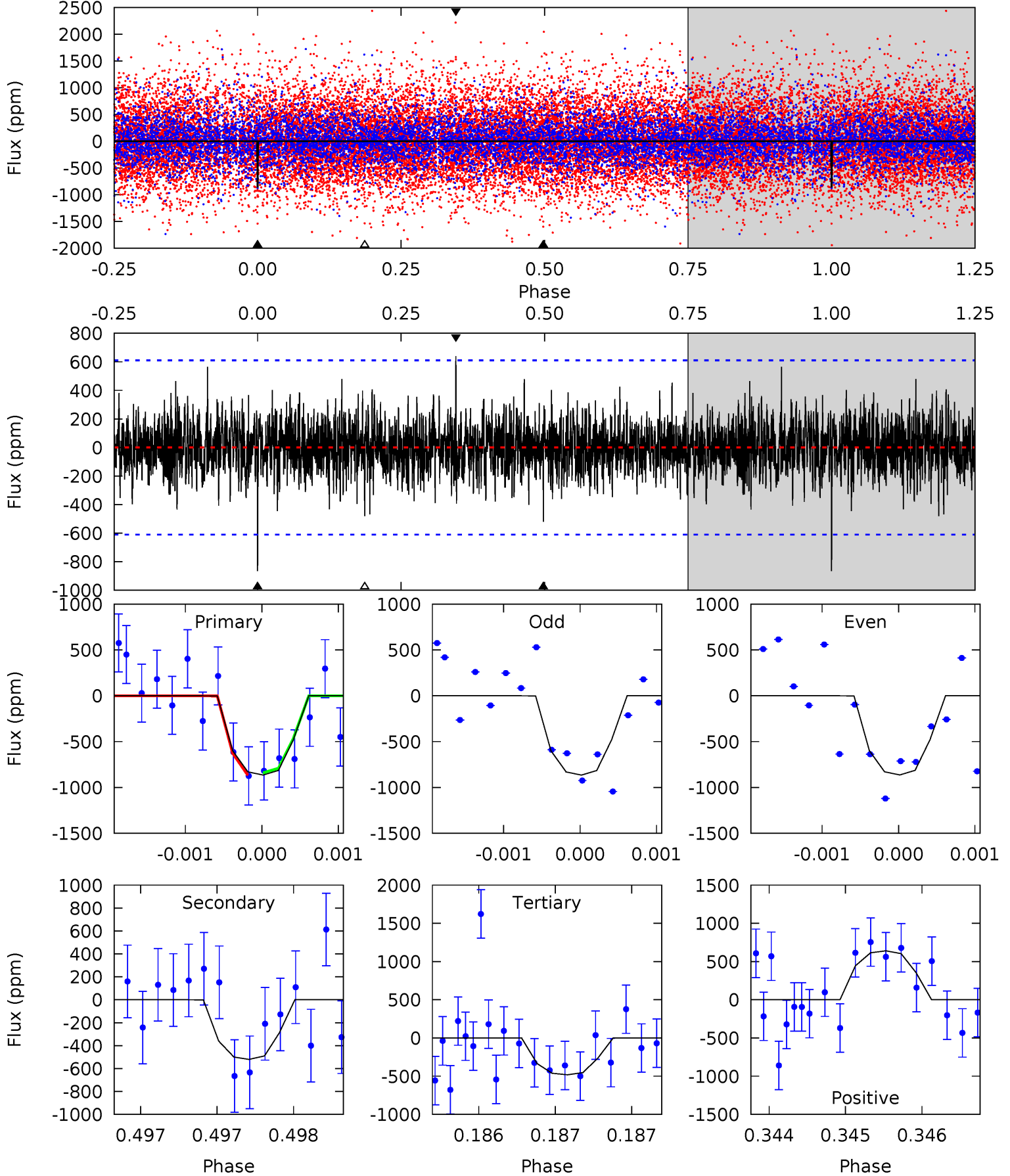
TCE 011400356-04 P=120.091233 Days  $T_0=165.473165$  (BKJD)



# DV Model-Shift Uniqueness Test

011400356-04, P = 120.095184 Days, E = 165.444125 Days

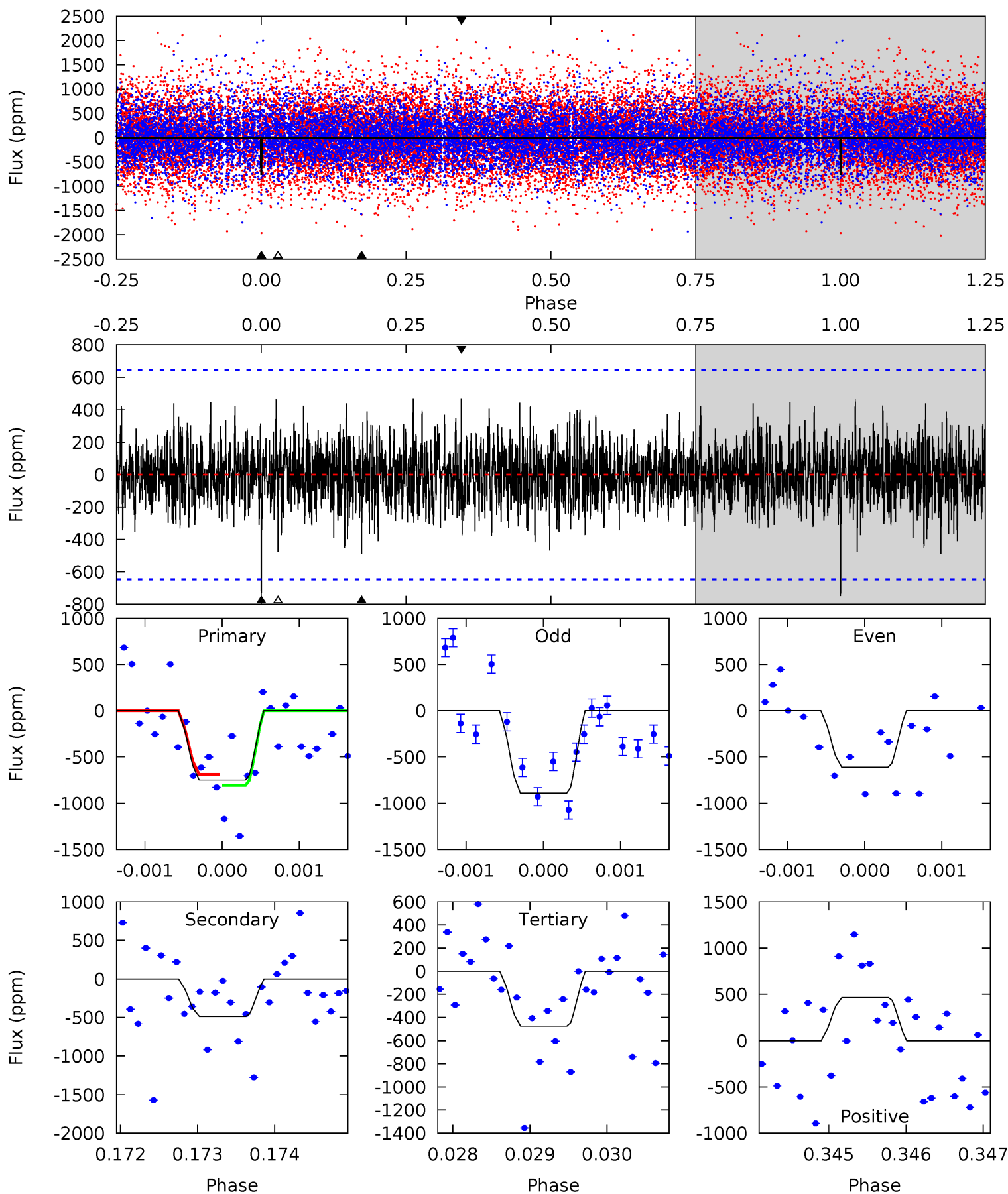
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.76	4.67	4.32	5.75	5.48	3.34	1.23	3.44	2.02	0.35	-1.08	0.01	1.00	0.43	0.12



# Alt Model-Shift Uniqueness Test

011400356-04, P = 120.091233 Days, E = 165.473165 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
6.34	4.12	4.02	3.95	5.47	3.32	1.17	2.31	2.39	0.10	0.17	1.19	0.89	0.38	0.50





### Stellar Parameters For KIC 011400356

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5511^{+166}_{-166}$	$4.477^{+0.096}_{-0.144}$	$-0.180^{+0.300}_{-0.300}$	$0.872^{+0.196}_{-0.105}$	$0.833^{+0.111}_{-0.074}$	$1.770^{+0.749}_{-0.722}$
	+3%/-3%	+2%/-3%	+167%/-167%	+22%/-12%	+13%/-9%	+42%/-41%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011400356-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-520 \pm 111$	$5.15^{+4.42}_{-3.67}$	$476^{+28}_{-23}$	$3932^{+2600}_{-727}$	$2156^{+22535}_{-1551}$
Alt.	$-487 \pm 118$	$5.01^{+4.90}_{-3.41}$	$476^{+28}_{-23}$	$3897^{+2377}_{-779}$	$2130^{+18780}_{-1613}$

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

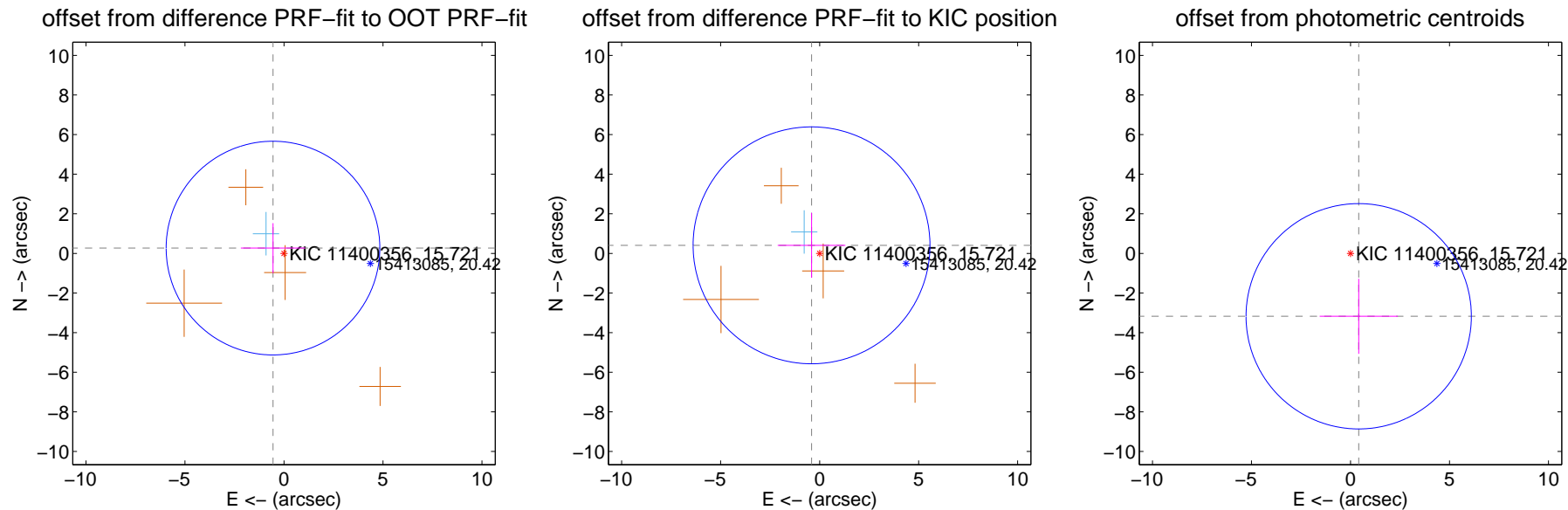
## DV Centroid Data

Supplemental centroid analysis for 011400356-04. Kepler magnitude: 15.72. Transit SNR 8.19

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.617 \pm 1.798$	0.34	$0.555 \pm 1.623$	$0.269 \pm 1.260$
PRF-fit source offset from KIC position	$0.578 \pm 1.994$	0.29	$0.409 \pm 1.710$	$0.408 \pm 1.638$
photometric centroid source offset	$3.20 \pm 1.90$	1.69	$-0.41 \pm 1.97$	$-3.17 \pm 1.89$



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

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

Q1 no difference image



Q1 no OOT image



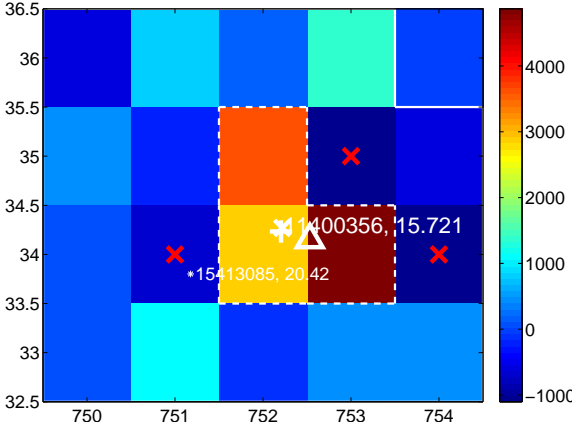
Q2 no difference image



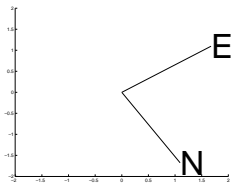
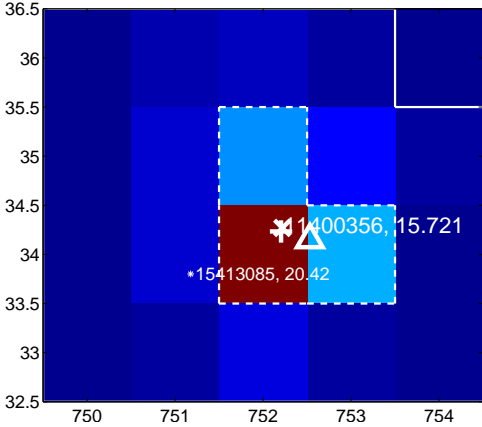
Q2 no OOT image



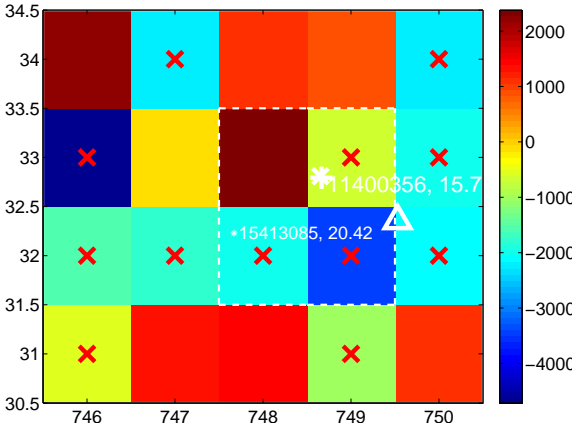
Q3 difference image



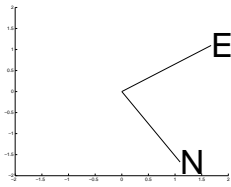
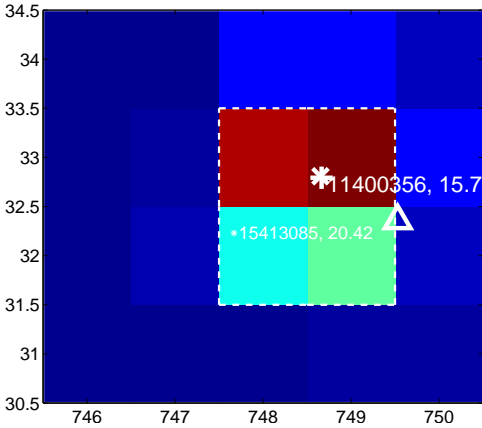
Q3 OOT image



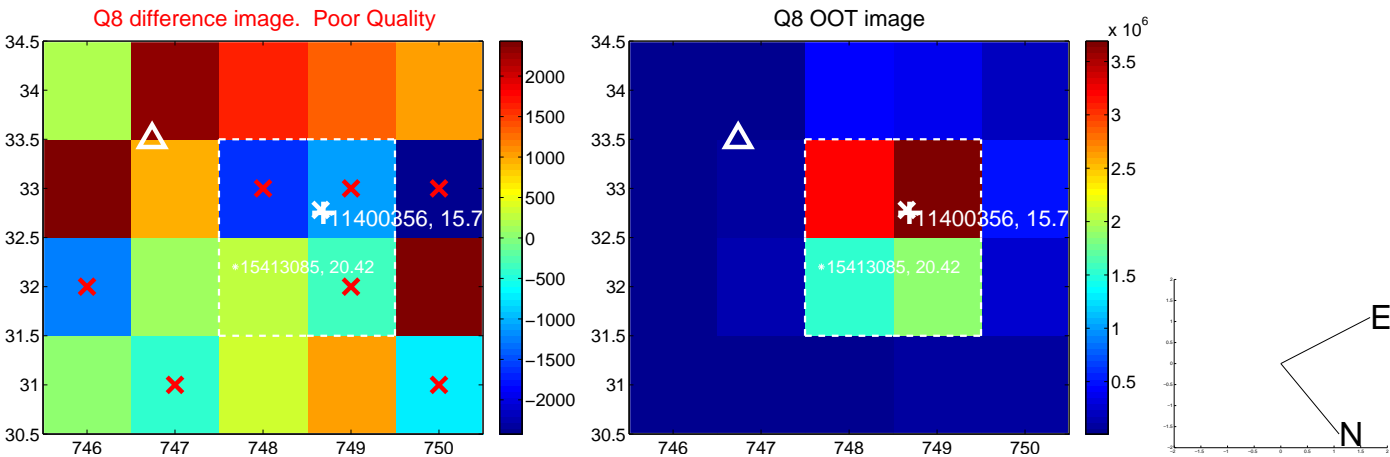
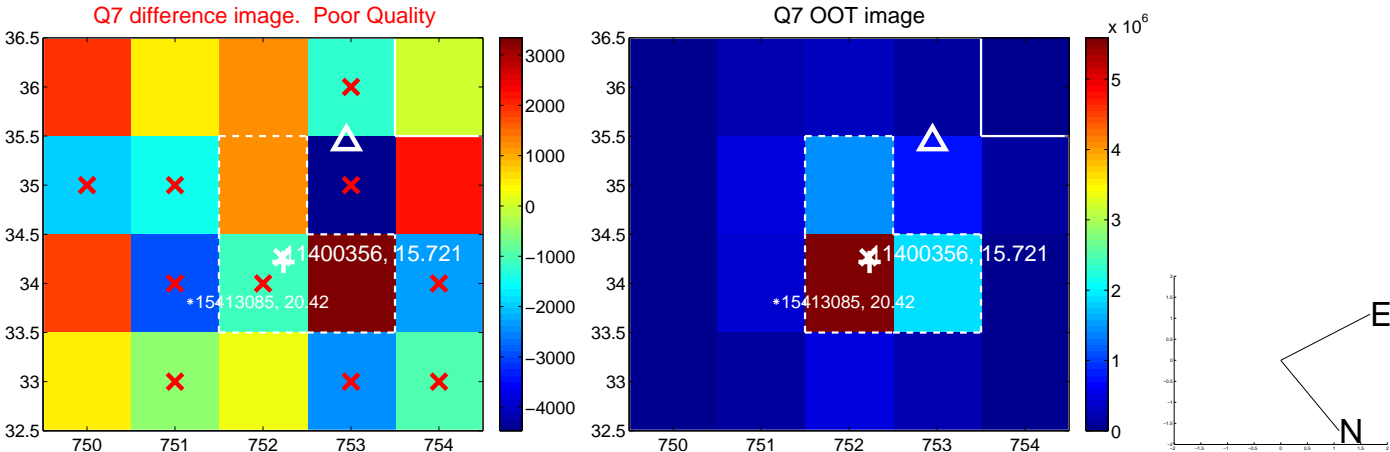
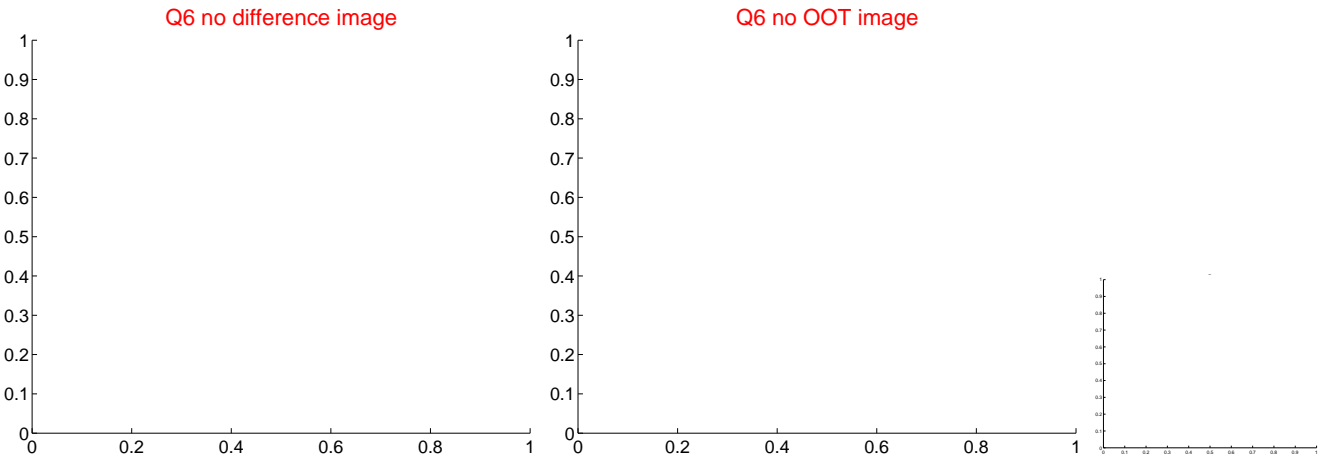
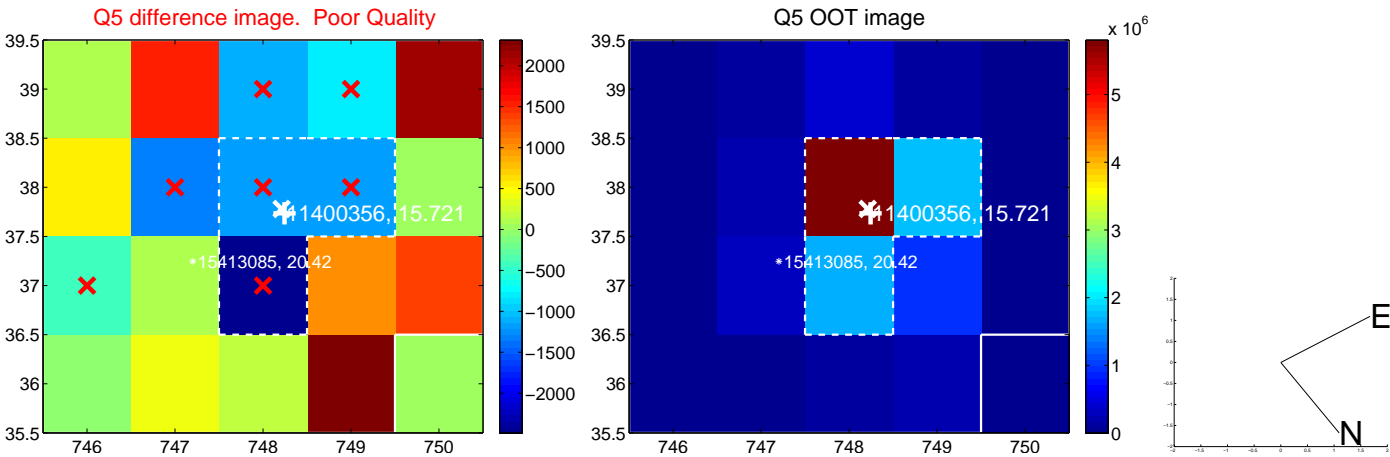
Q4 difference image. Poor Quality



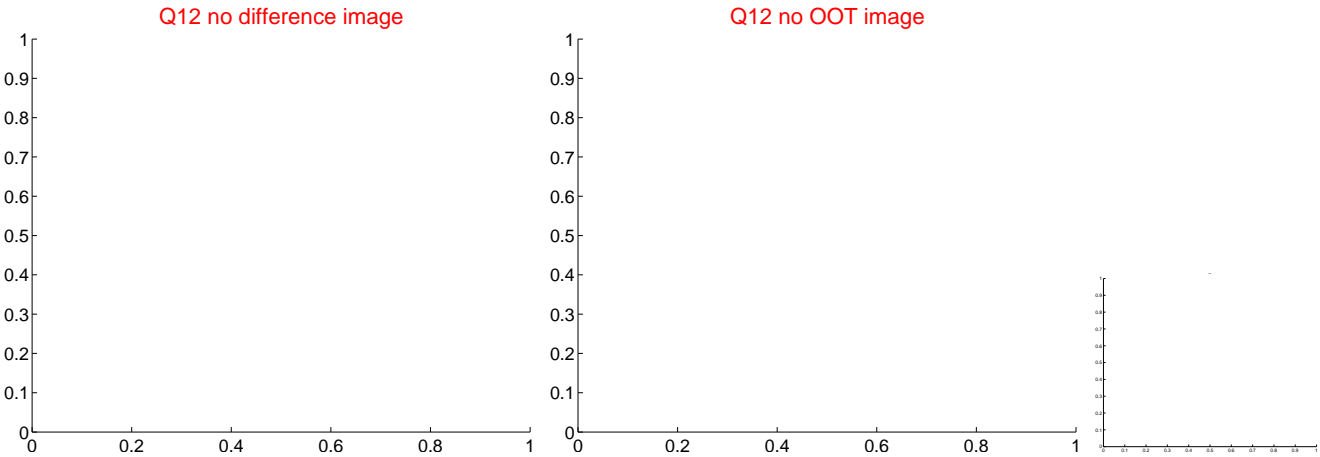
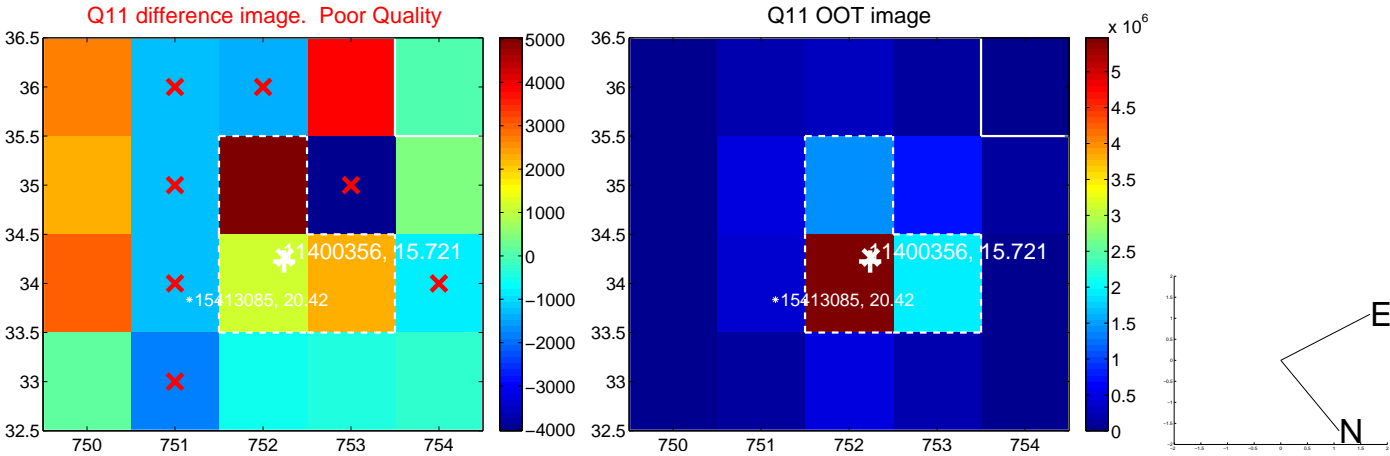
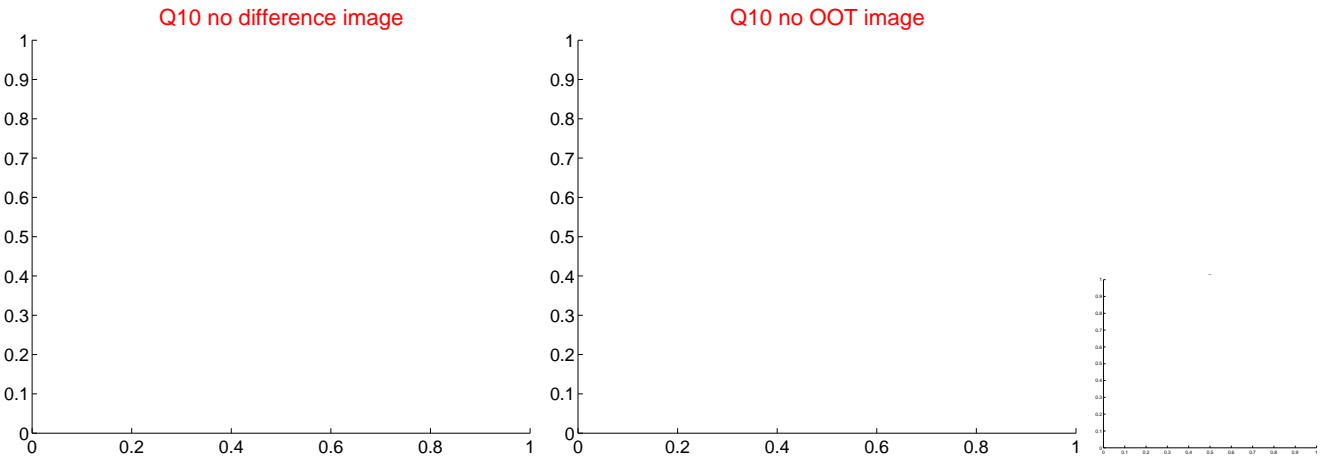
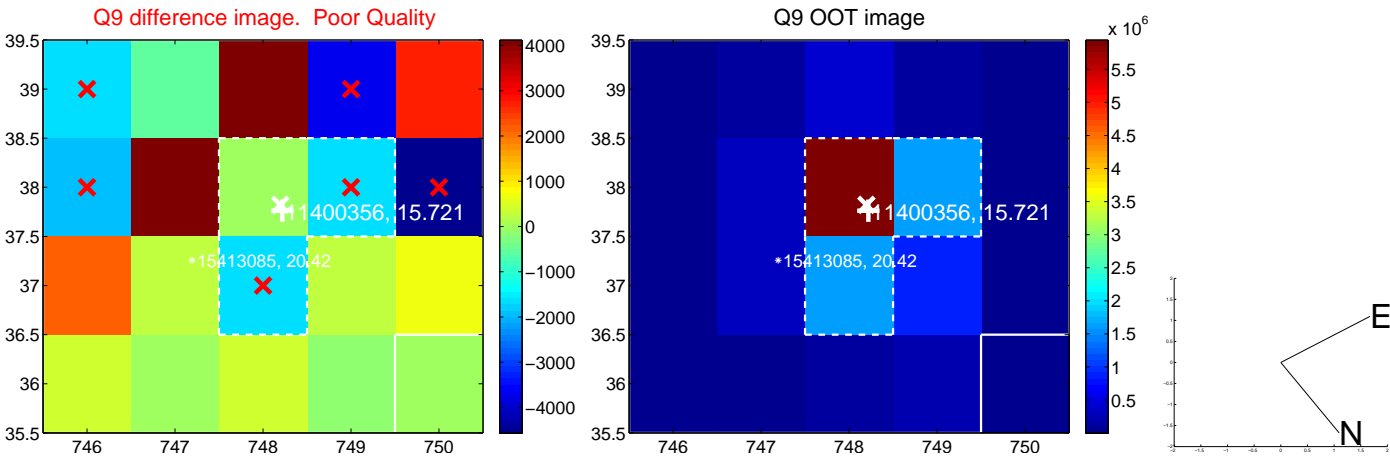
Q4 OOT image



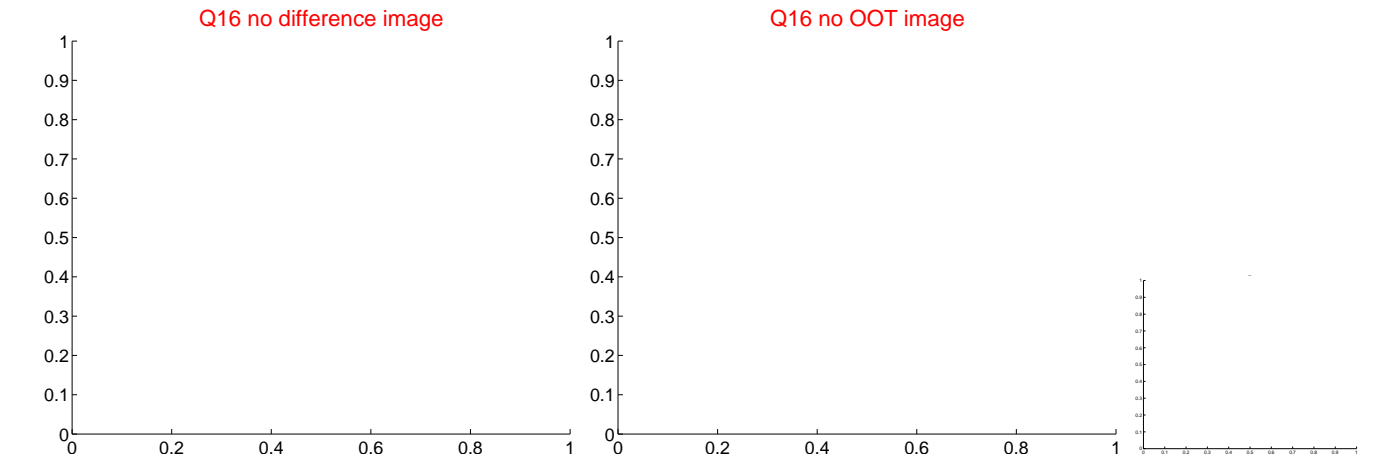
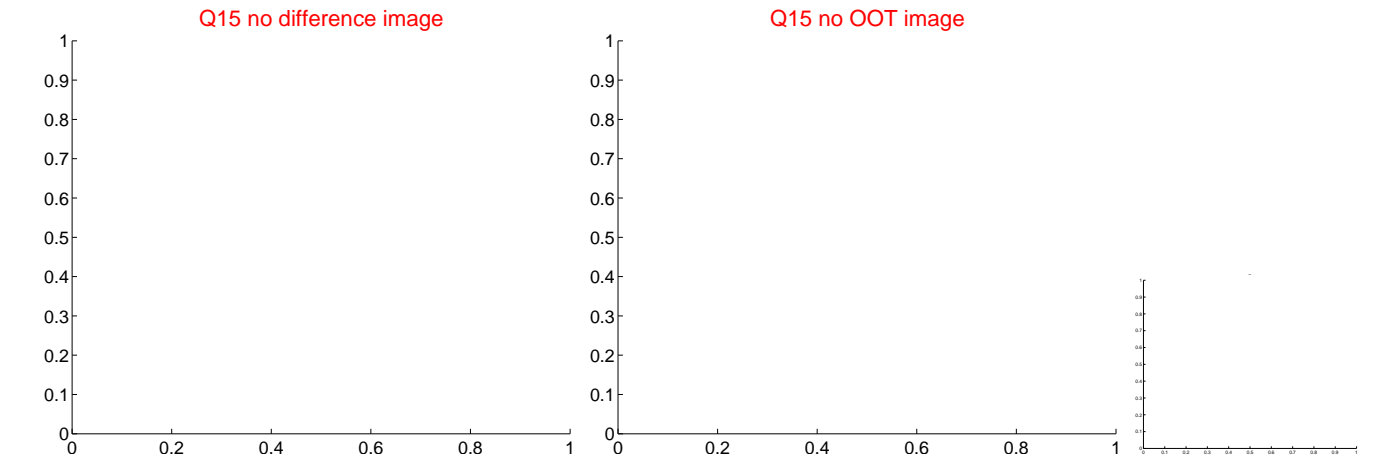
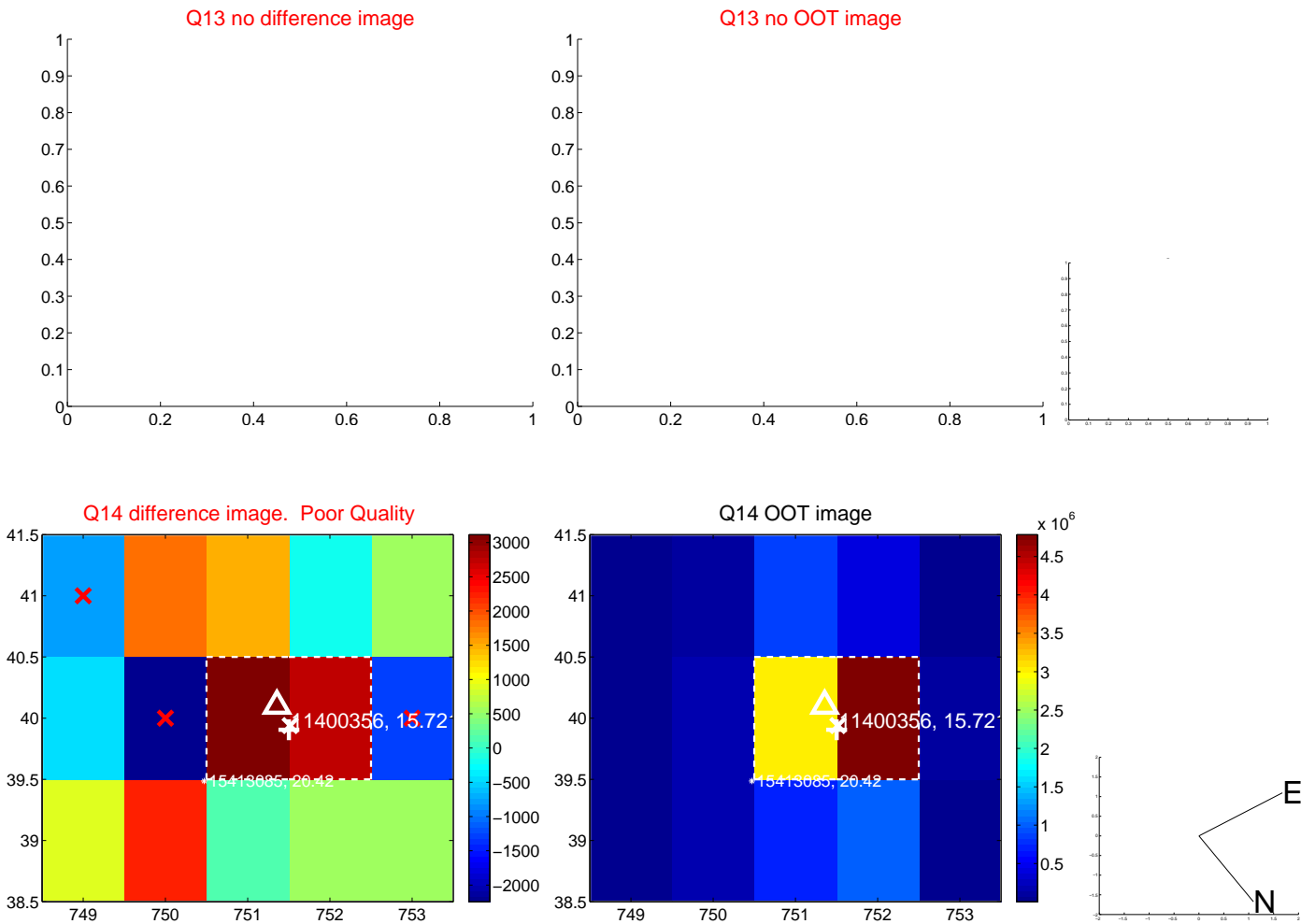
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



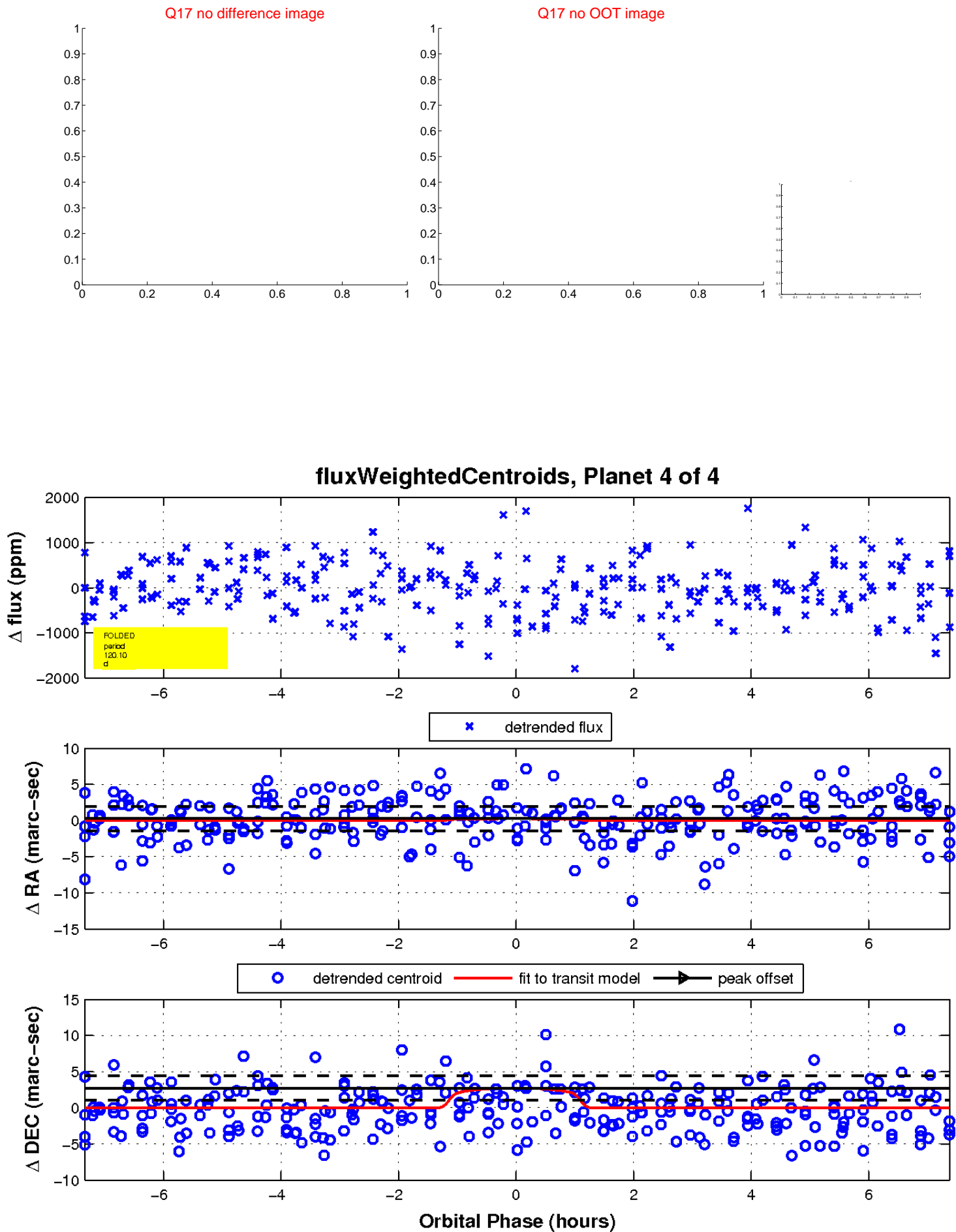
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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





UKIRT Image

Declination

