

# KIC 010035772

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010035772-01	OBS	No	0.576548	131.975854	109.6	1.135	10.5	9.0	4.50	7504	5.51	0.00
010035772-02	OBS	No	0.536434	131.684486	100.5	3.337	11.7	10.3	4.50	7504	4.71	0.00
010035772-03	OBS	No	22.485213	150.720857	1161.7	2.067	13.2	9.7	4.50	7504	26.49	1293.43
010035772-04	OBS	No	29.344394	150.375488	970.5	3.975	11.0	10.5	4.50	7504	15.32	906.92
010035772-05	OBS	No	31.778434	143.614221	1344.3	1.242	10.6	9.2	4.50	7504	16.74	815.51
010035772-06	OBS	No	20.222738	147.997585	1439.9	1.574	10.5	11.3	4.50	7504	26.42	1489.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010035772-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
010035772-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
010035772-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_SATURATED
010035772-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010035772-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010035772-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

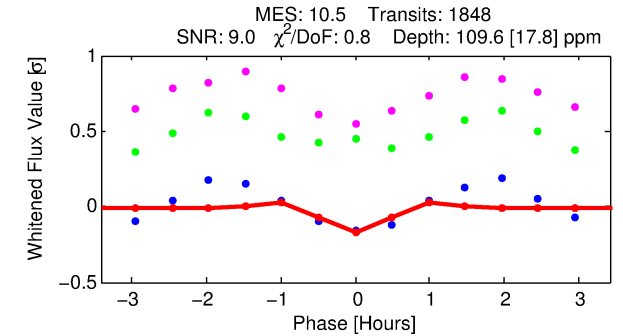
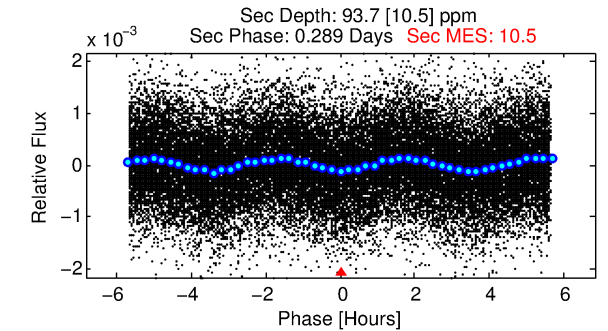
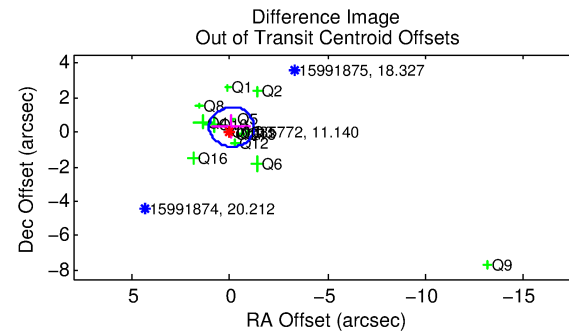
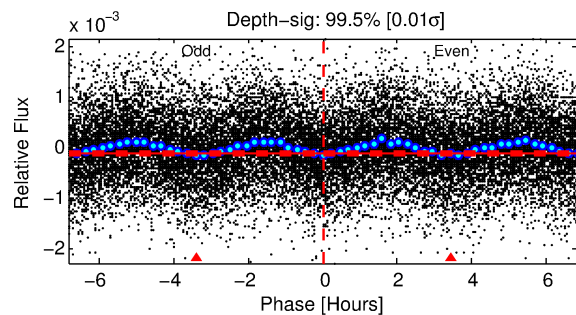
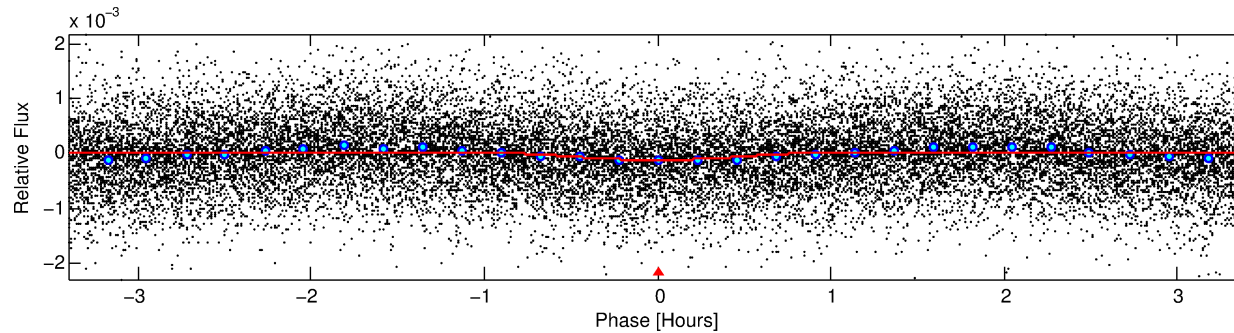
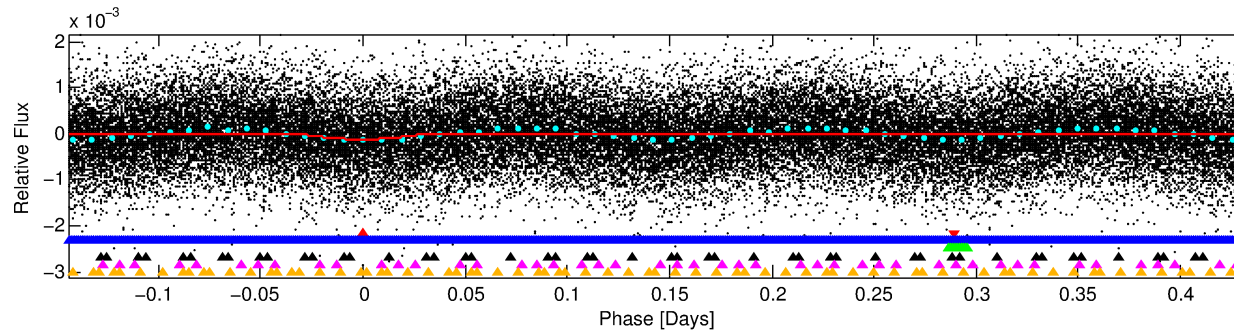
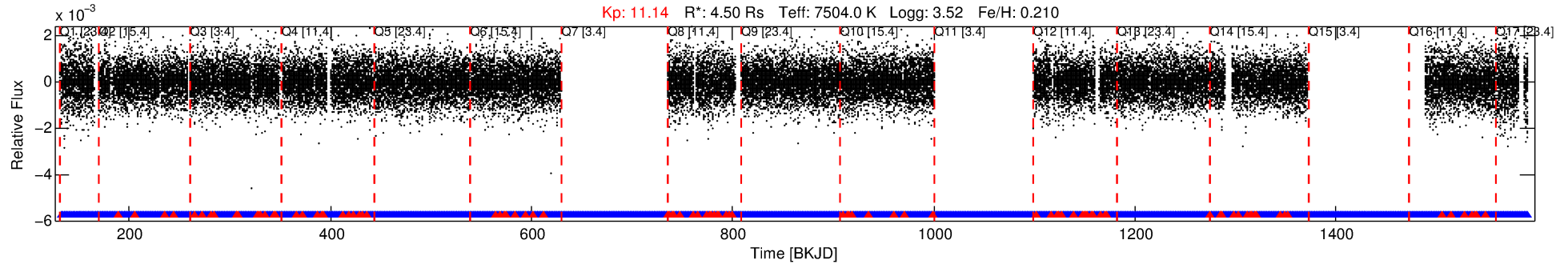
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010035772-01

No Significant Match Found

# DV One-Page Summary

KIC: 10035772 Candidate: 1 of 6 Period: 0.577 d



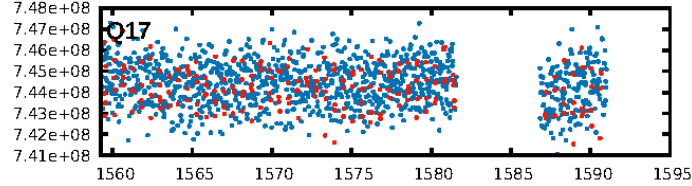
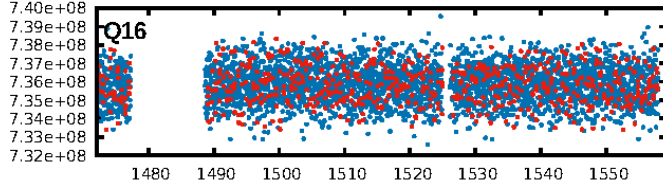
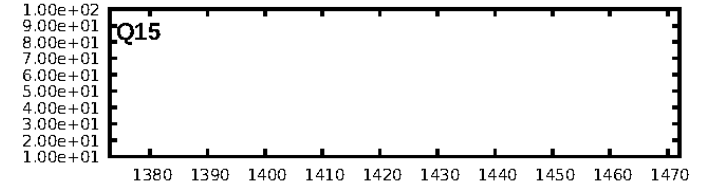
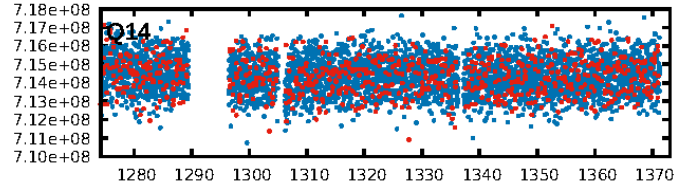
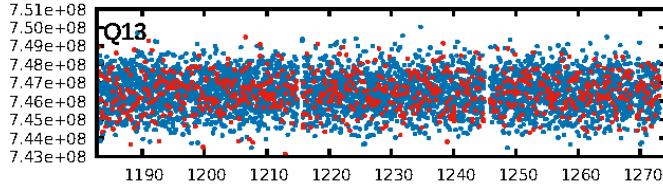
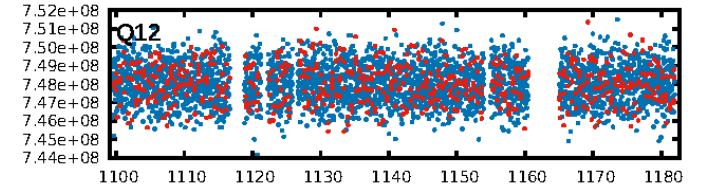
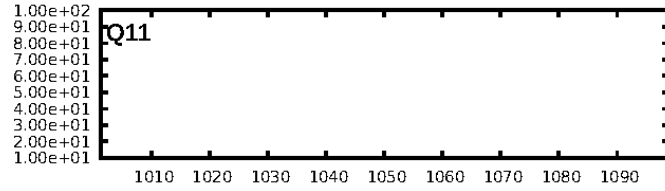
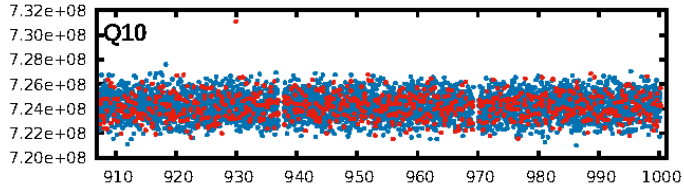
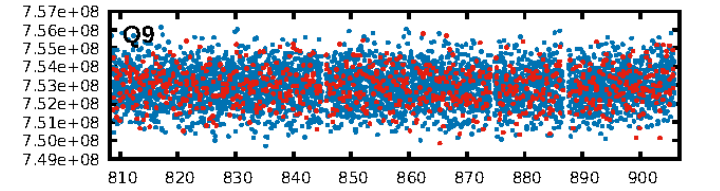
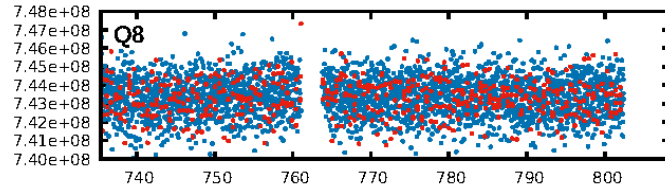
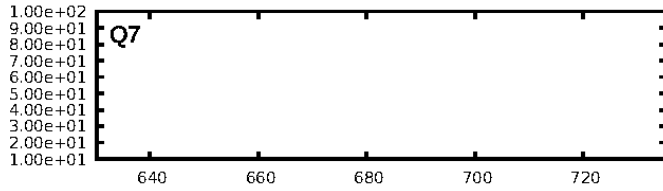
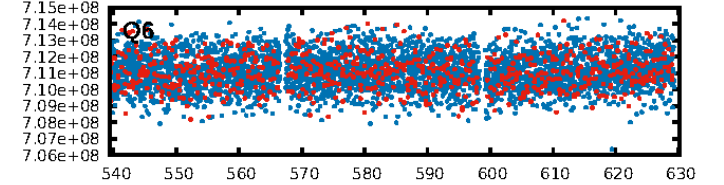
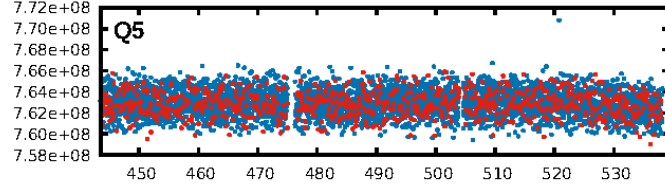
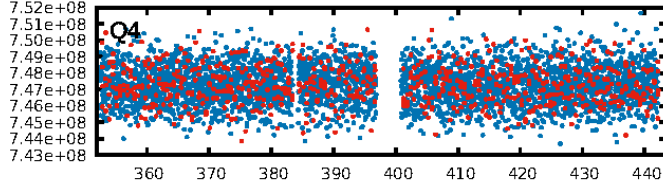
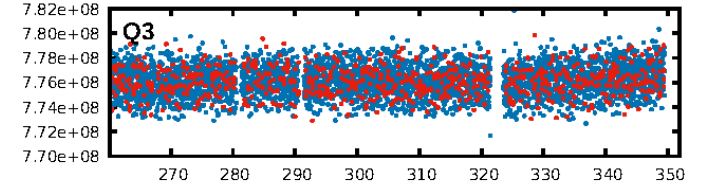
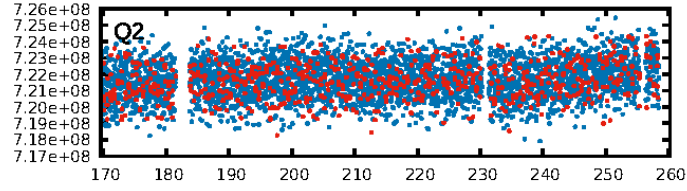
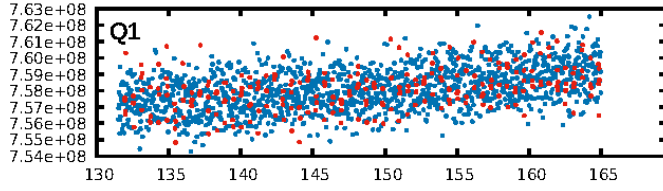
## DV Fit Results:

Period = 0.57655 [0.00001] d  
Epoch = 131.9759 [0.0017] BKJD  
Rp/R\* = 0.0112 [0.0060]  
a/R\* = 2.03 [5.00]  
b = 0.90 [0.71]  
Seff = N/A  
Teq = N/A  
Rp = 5.51 [4.25] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

## DV Diagnostic Results:

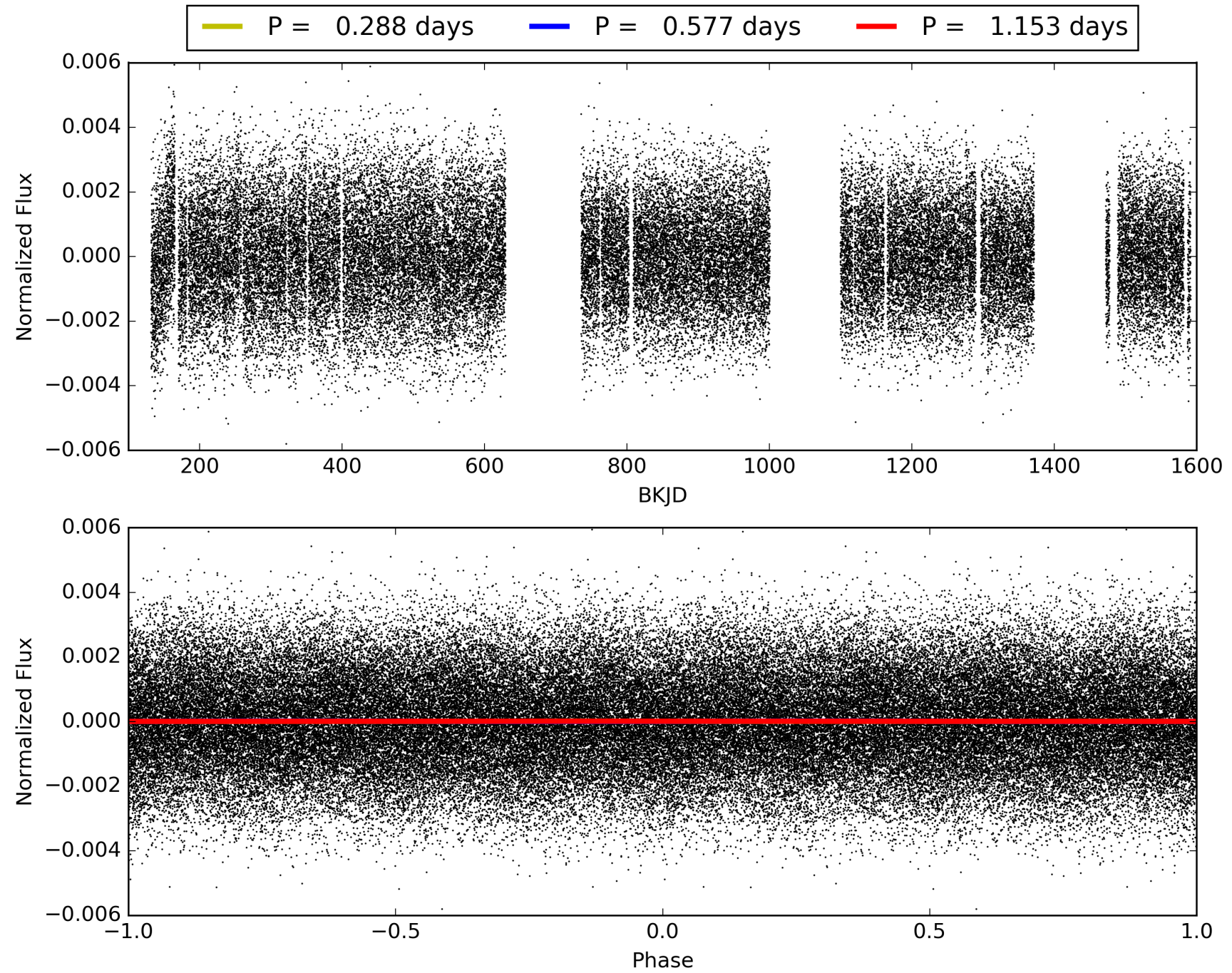
ShortPeriod-sig: 21.5% [0.27 $\sigma$ ]  
LongPeriod-sig: 100.0% [242.94 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.94 [1642/1744]  
GhostDiagnostic-chr: 3.343  
Centroid-sig: N/A  
Centroid-so: 0.268 arcsec [1.76 $\sigma$ ]  
OotOffset-rm: 0.311 arcsec [0.82 $\sigma$ ]  
KicOffset-rm: 0.194 arcsec [0.26 $\sigma$ ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.57 [8/14]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 010035772-01, PDC Light Curves





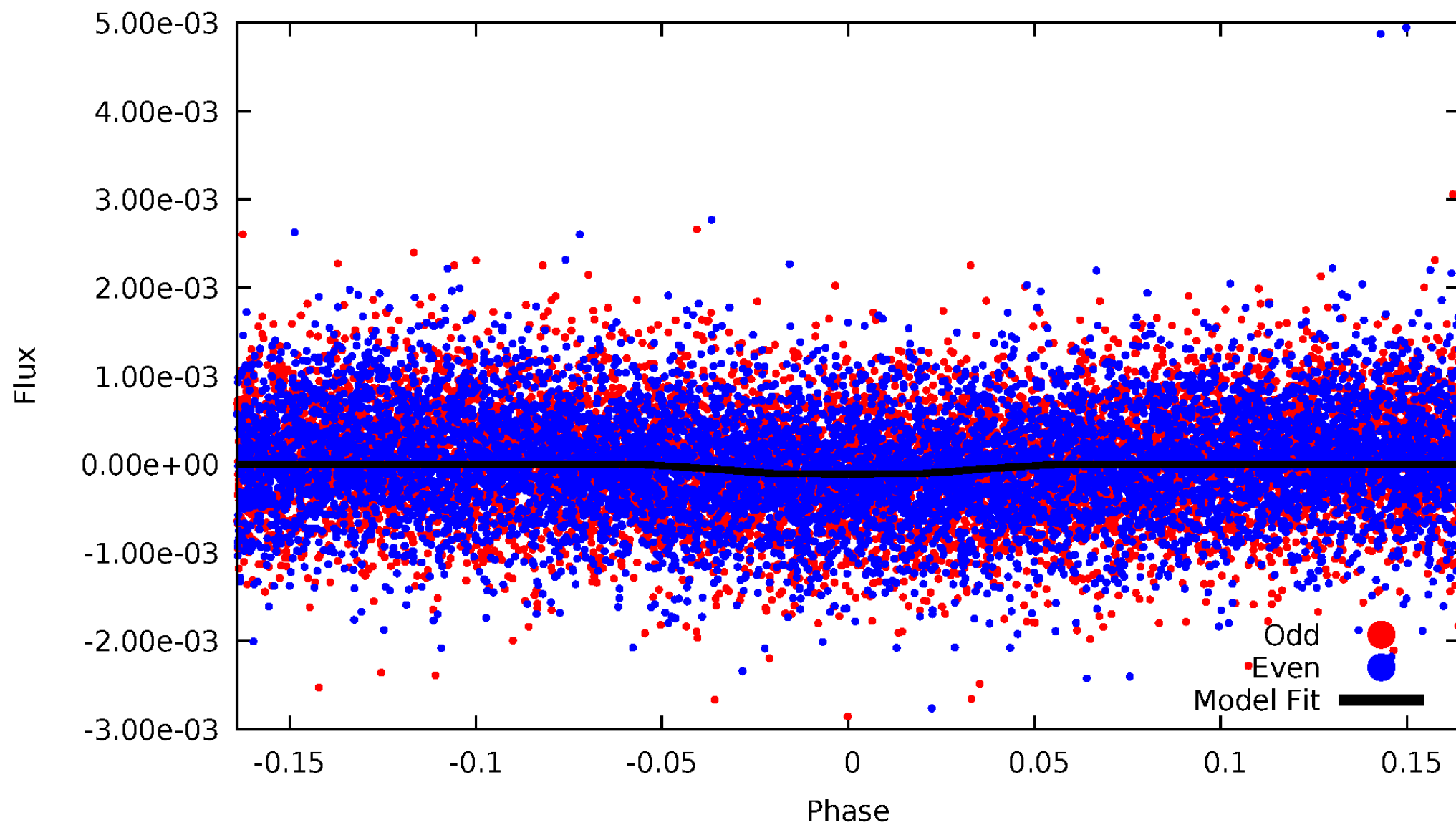
TCE 010035772-01





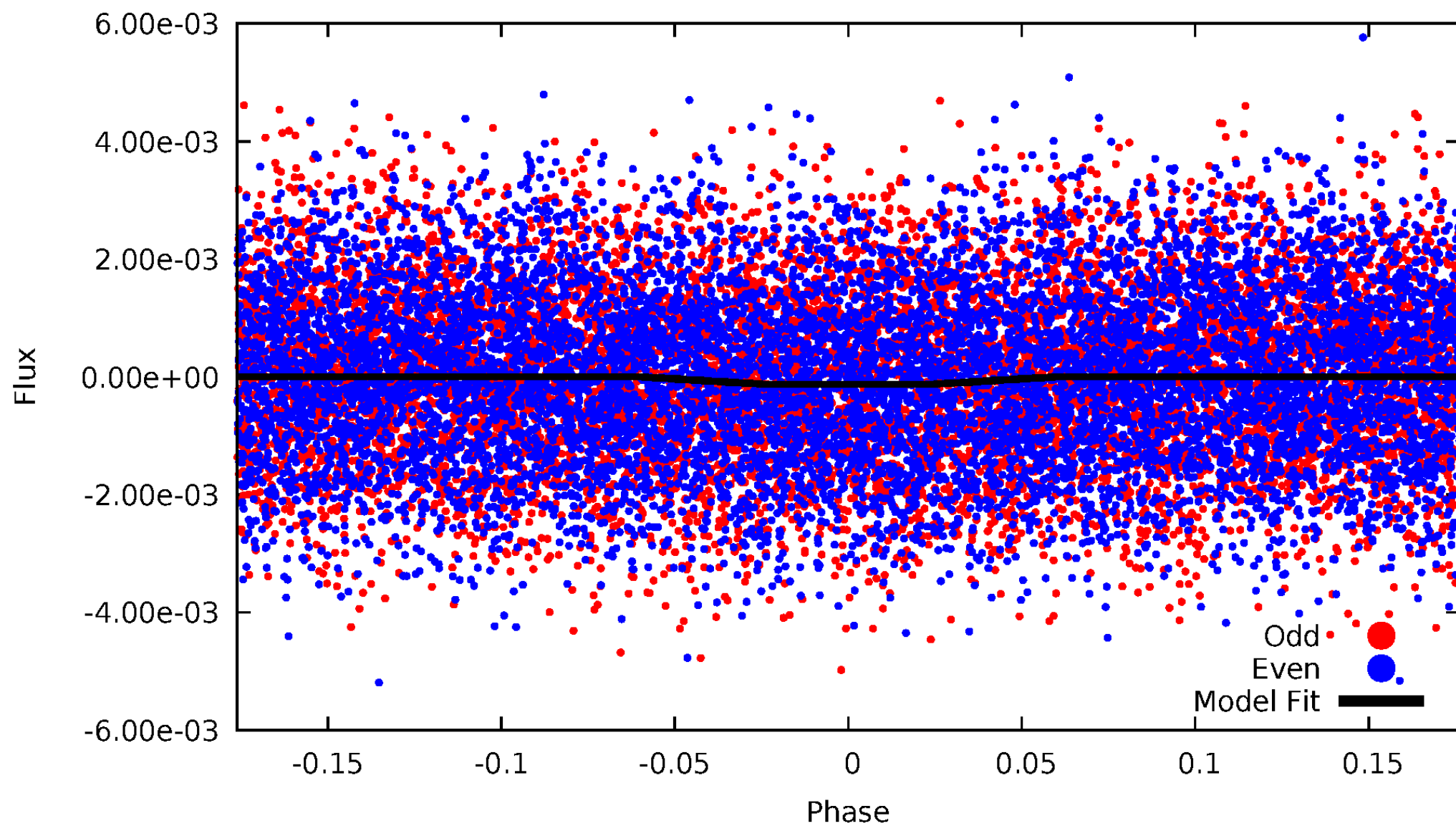
# DV Odd/Even

TCE 010035772-01



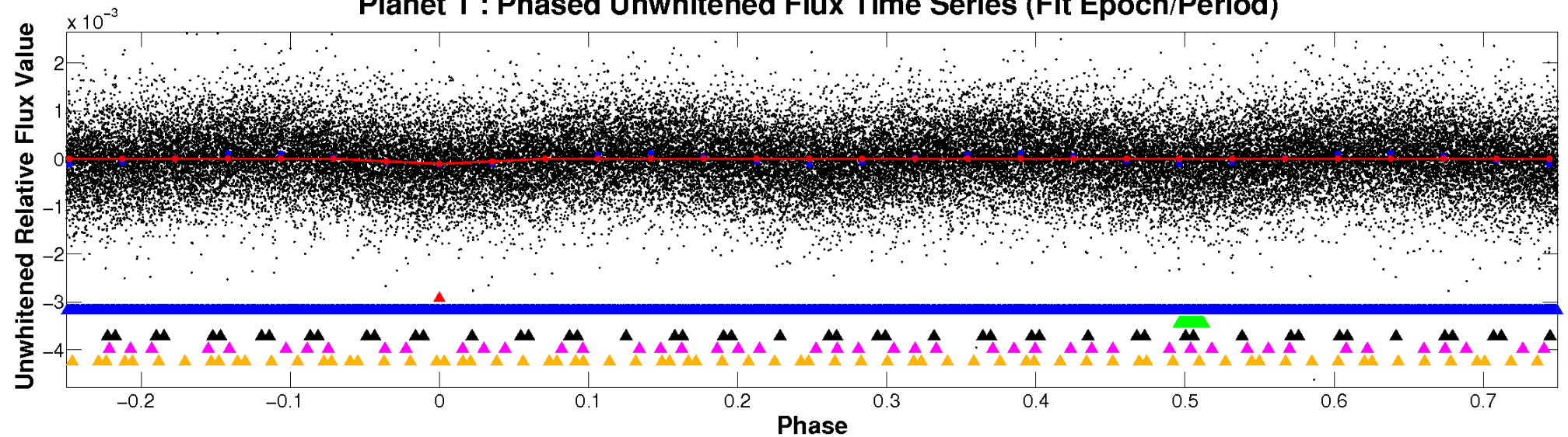
# ALT Odd/Even

TCE 010035772-01

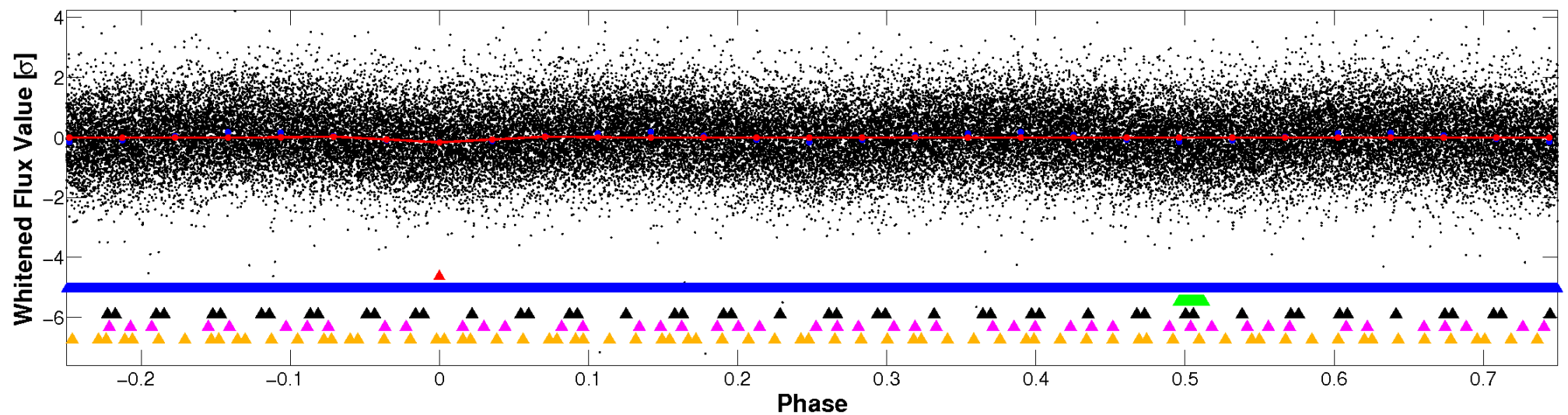


# Non-Whitened Vs. Whitened Light Curve

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



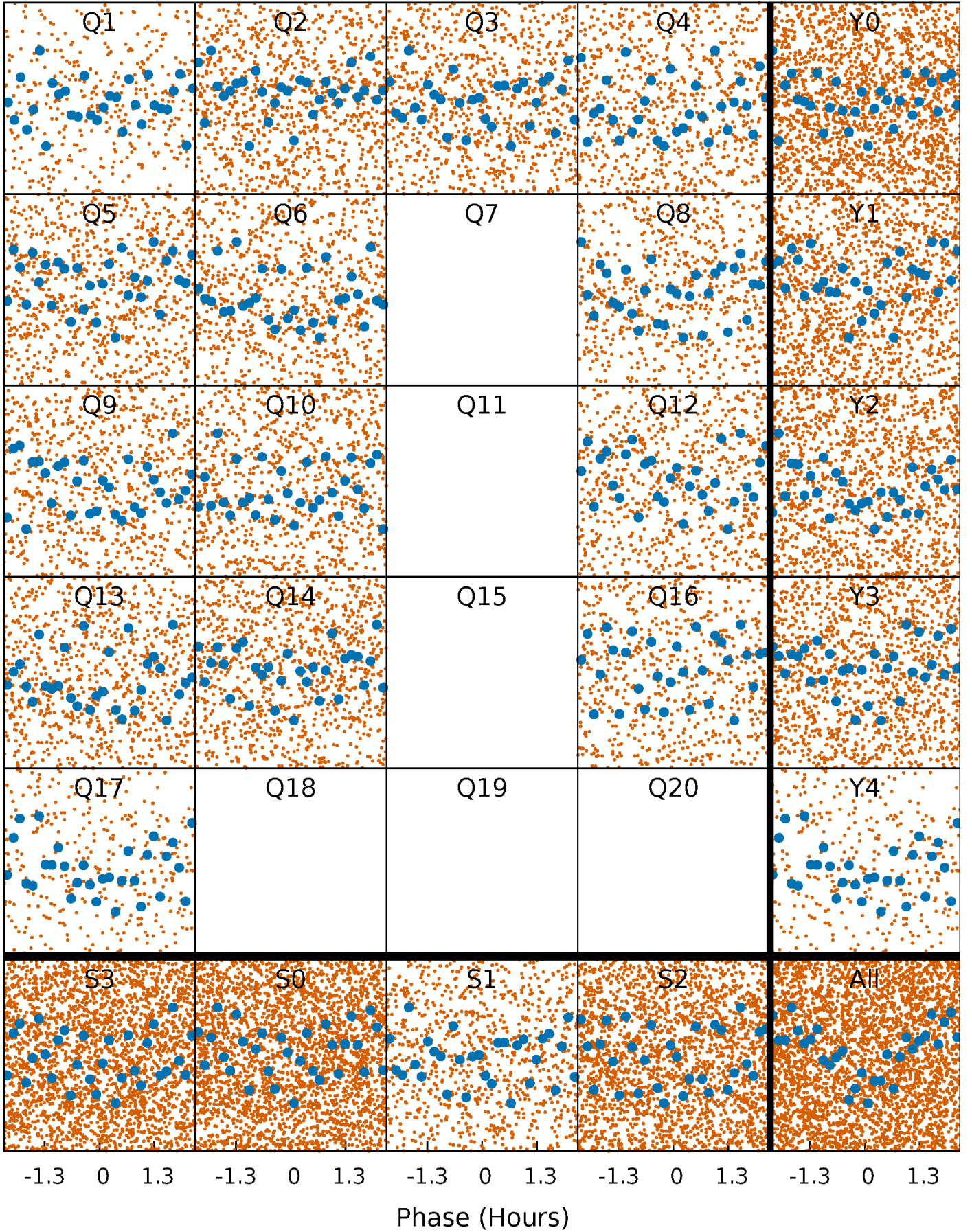
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





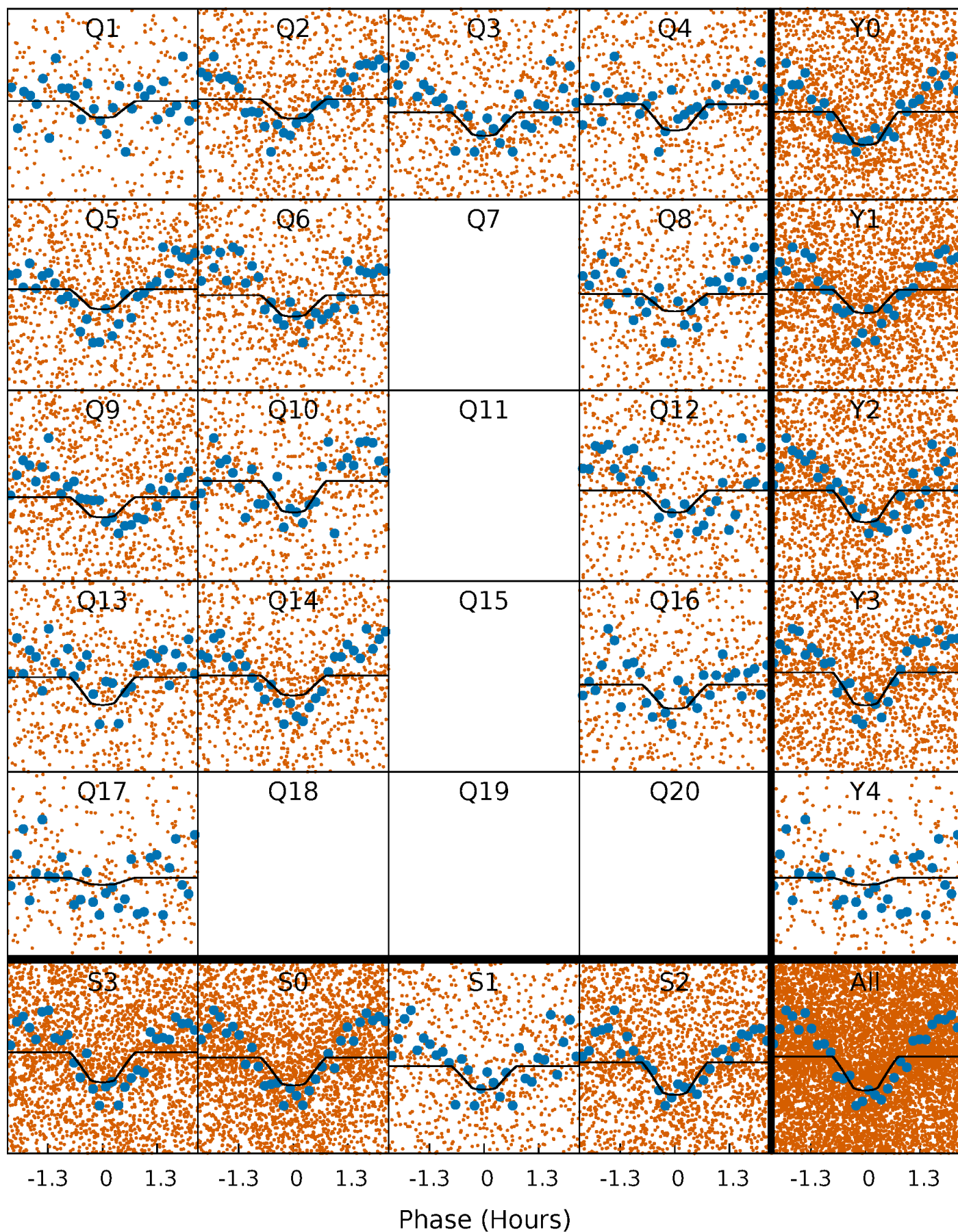
# PDC Quarter-Phased Transit Curves

TCE 010035772-01   P= 0.576548 Days    $T_0=131.975854$  (BKJD)



# DV Quarter-Phased Transit Curves

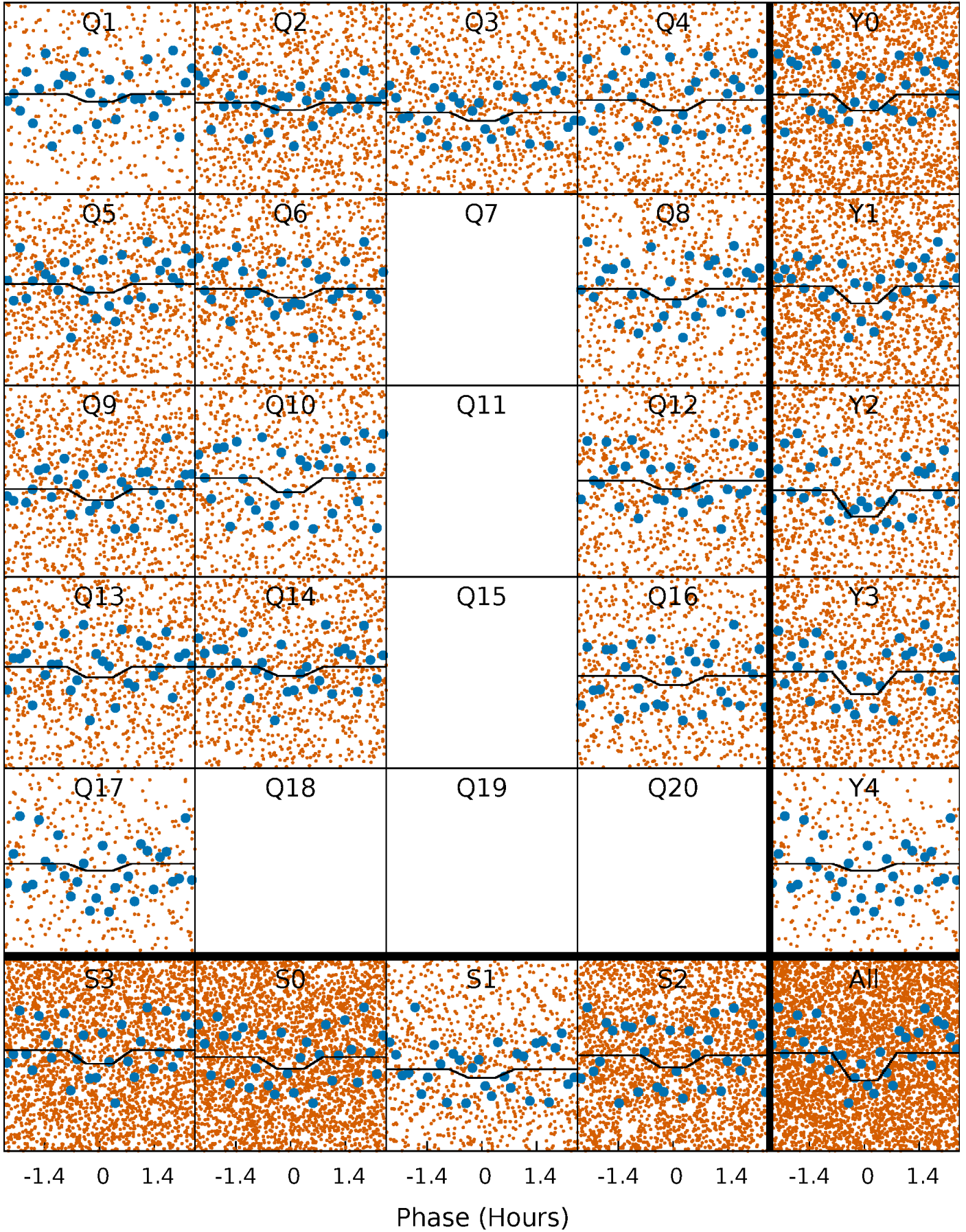
TCE 010035772-01 P= 0.576548 Days  $T_0=131.975854$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 010035772-01   P= 0.576549 Days    $T_0=131.975791$  (BKJD)

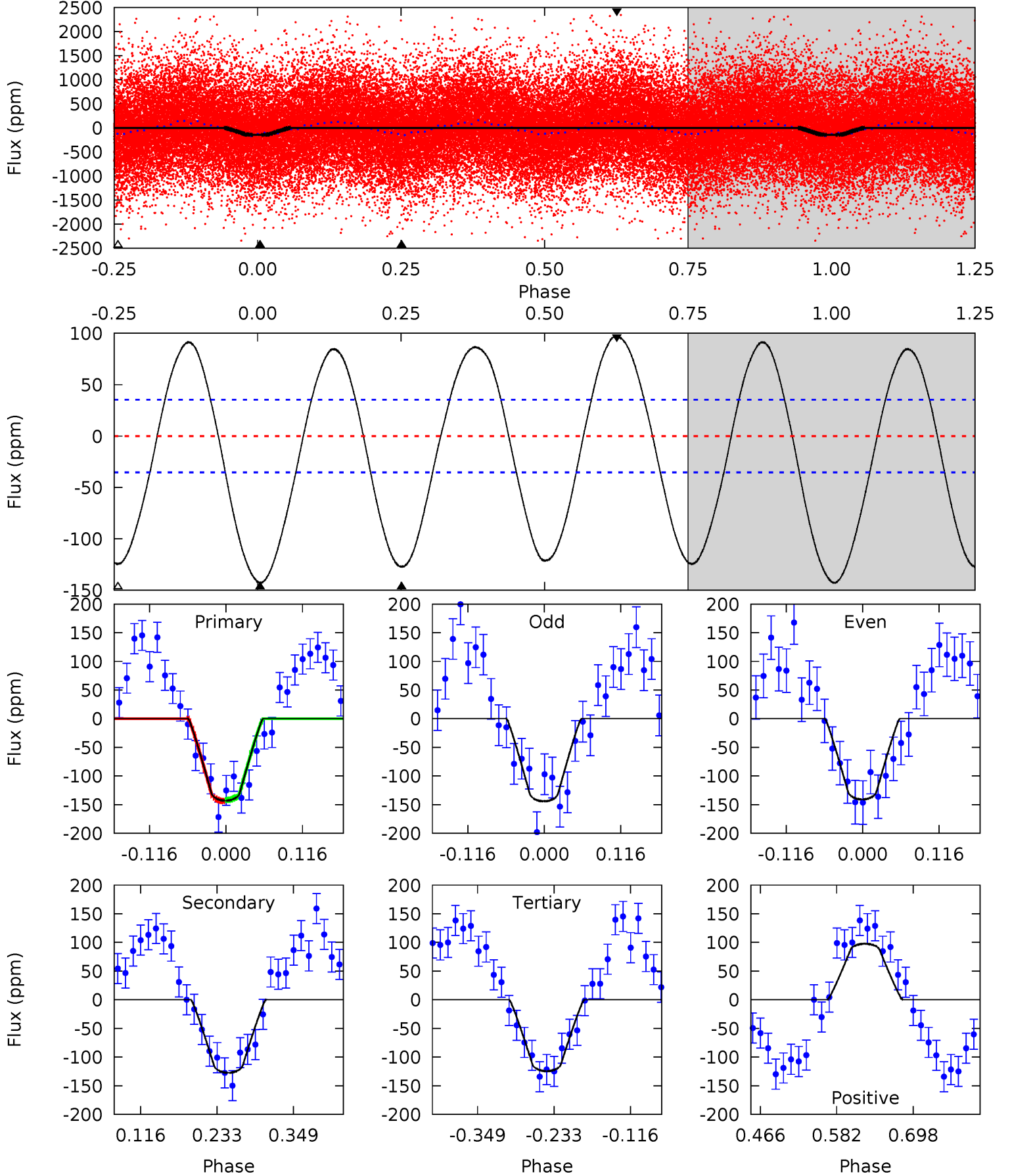




# DV Model-Shift Uniqueness Test

010035772-01, P = 0.576548 Days, E = 131.399306 Days

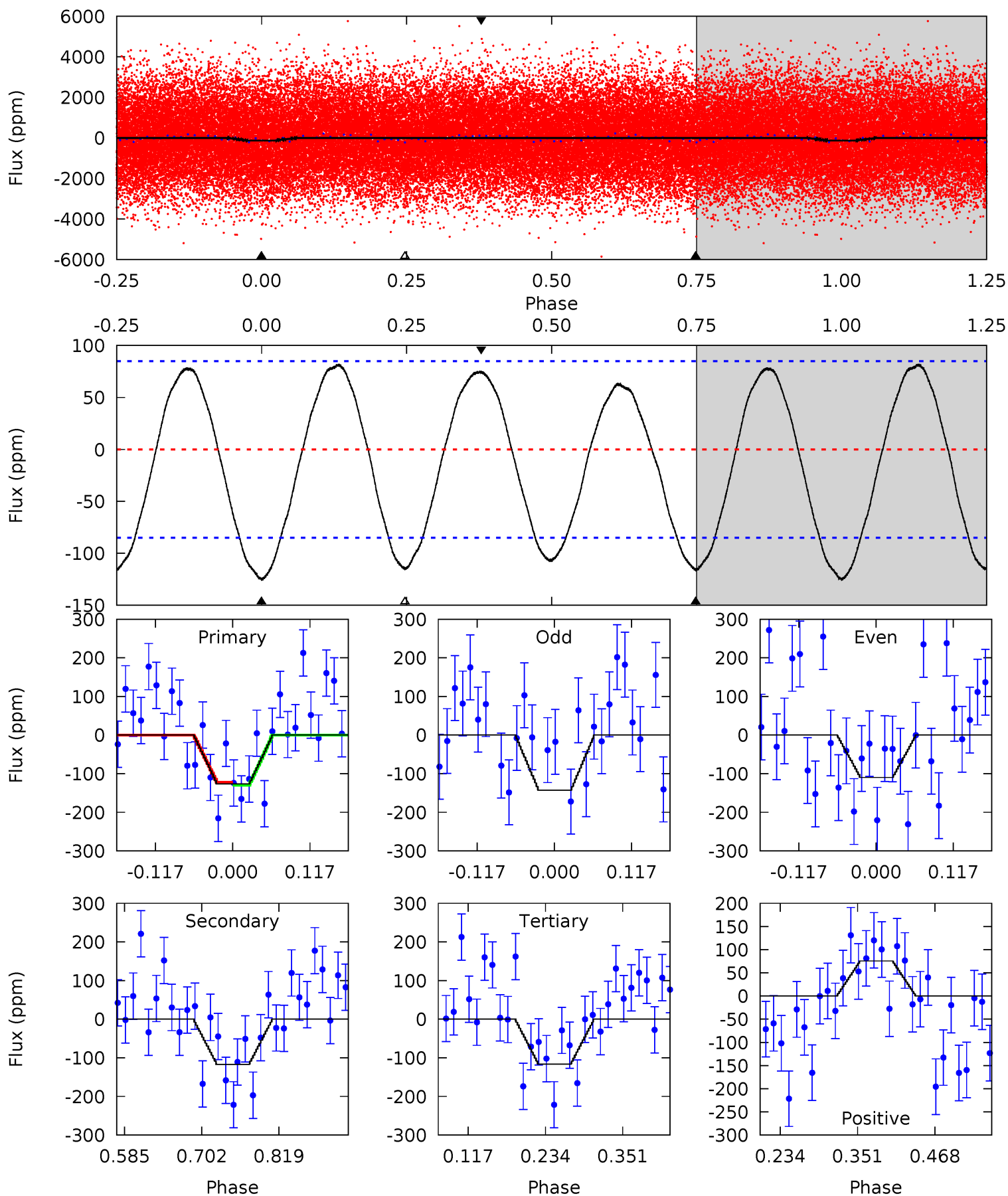
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.4	16.4	16.0	12.5	4.53	1.57	9.98	2.39	5.85	0.36	3.83	0.21	1.10	0.41	0.14



# Alt Model-Shift Uniqueness Test

010035772-01, P = 0.576549 Days, E = 131.399242 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
6.73	6.22	6.20	4.03	4.53	1.57	3.56	0.53	2.70	0.03	2.19	0.88	2.05	0.40	0.18



### Stellar Parameters For KIC 010035772

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7504^{+209}_{-328}$	$3.525^{+0.532}_{-0.028}$	$0.210^{+0.150}_{-0.350}$	$4.501^{+0.278}_{-2.499}$	$2.472^{+0.147}_{-0.832}$	$0.038^{+0.253}_{-0.004}$
	+3%/-4%	+15%/-1%	+71%/-167%	+6%/-56%	+6%/-34%	+663%/-10%
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 010035772-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-127 \pm 8$	$4.67^{+3.08}_{-2.57}$	$6907^{+461}_{-953}$	$6703^{+5584}_{-2264}$	$1.039^{+3.927}_{-0.647}$
Alt.	$-117 \pm 19$	$4.63^{+3.26}_{-2.34}$	$6949^{+420}_{-971}$	$6508^{+4425}_{-2680}$	$0.960^{+3.095}_{-0.618}$

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



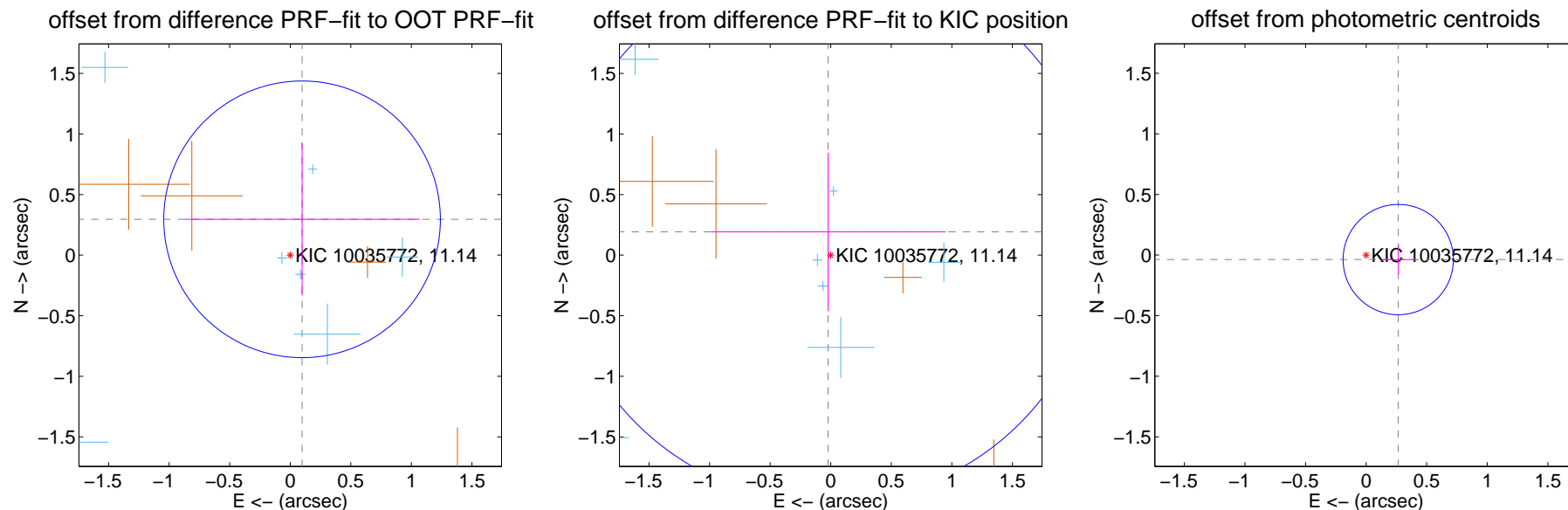
## DV Centroid Data

Supplemental centroid analysis for 010035772-01. **Kepler magnitude: 11.14.** Transit SNR 8.95

There are 8 quarters with good PRF difference image offsets

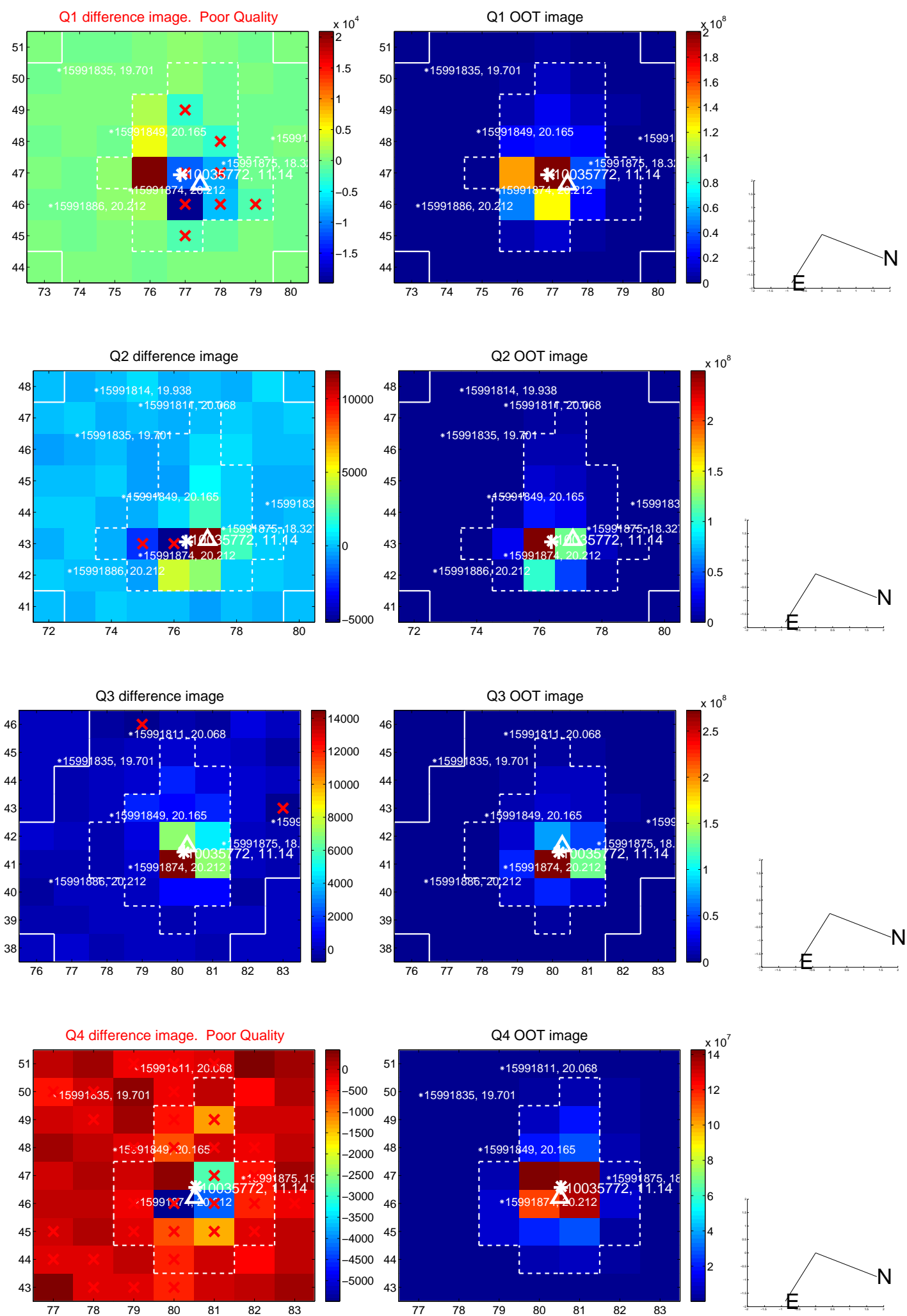
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.311 \pm 0.381$	0.82	$-0.097 \pm 0.969$	$0.296 \pm 0.630$
PRF-fit source offset from KIC position	$0.194 \pm 0.746$	0.26	$0.022 \pm 0.969$	$0.192 \pm 0.654$
photometric centroid source offset	$0.27 \pm 0.15$	1.76	$-0.27 \pm 0.15$	$-0.04 \pm 0.12$

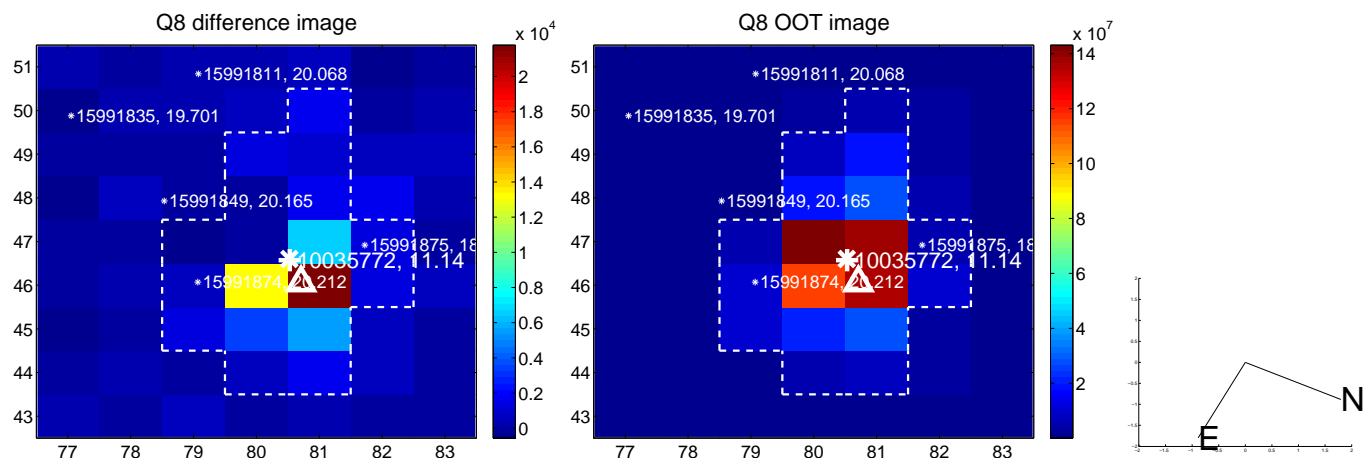
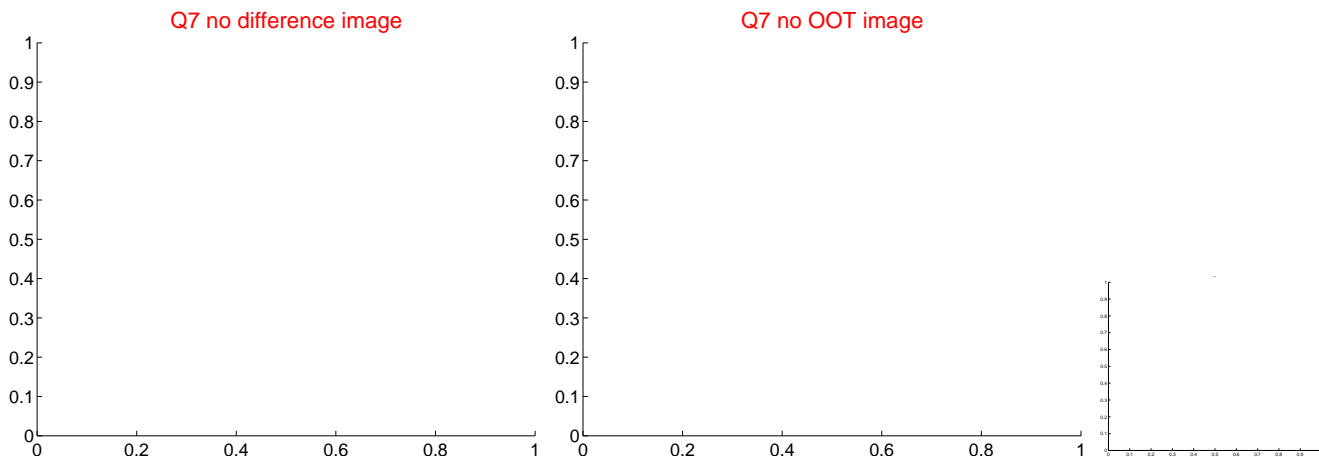
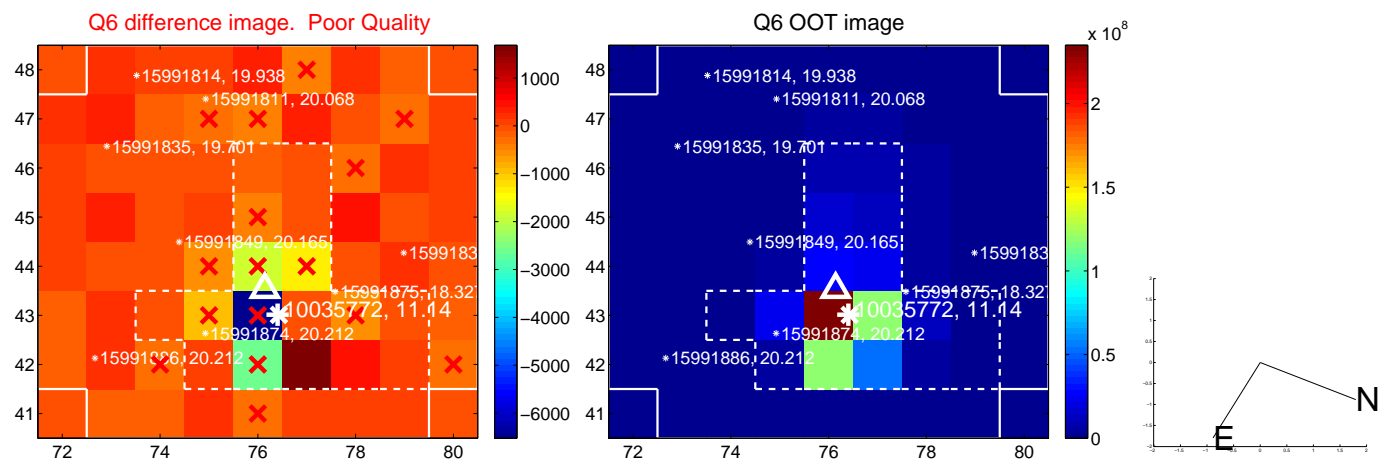
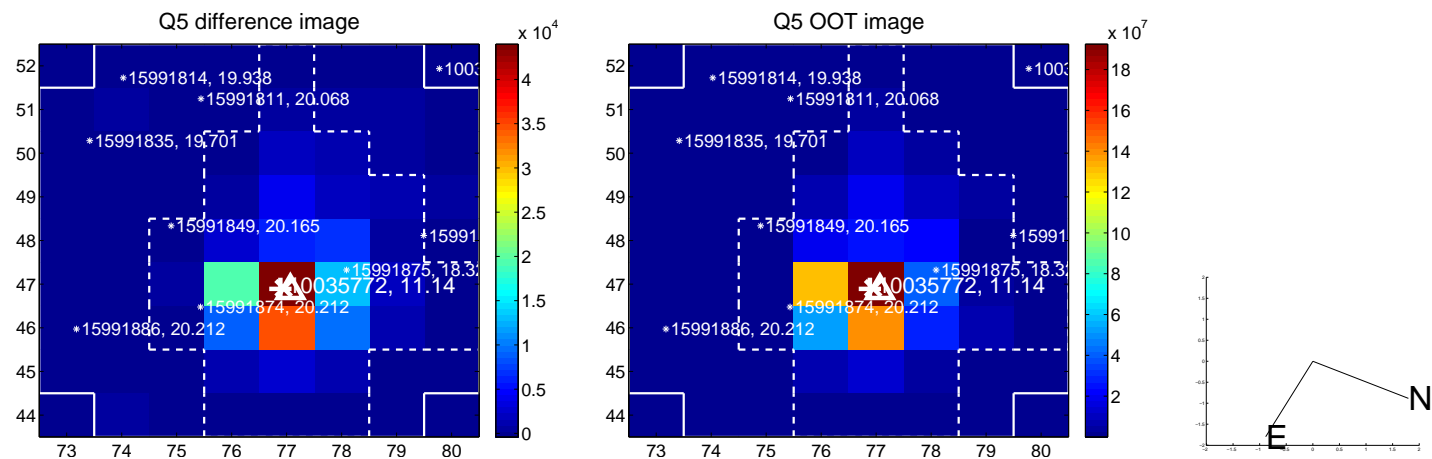


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

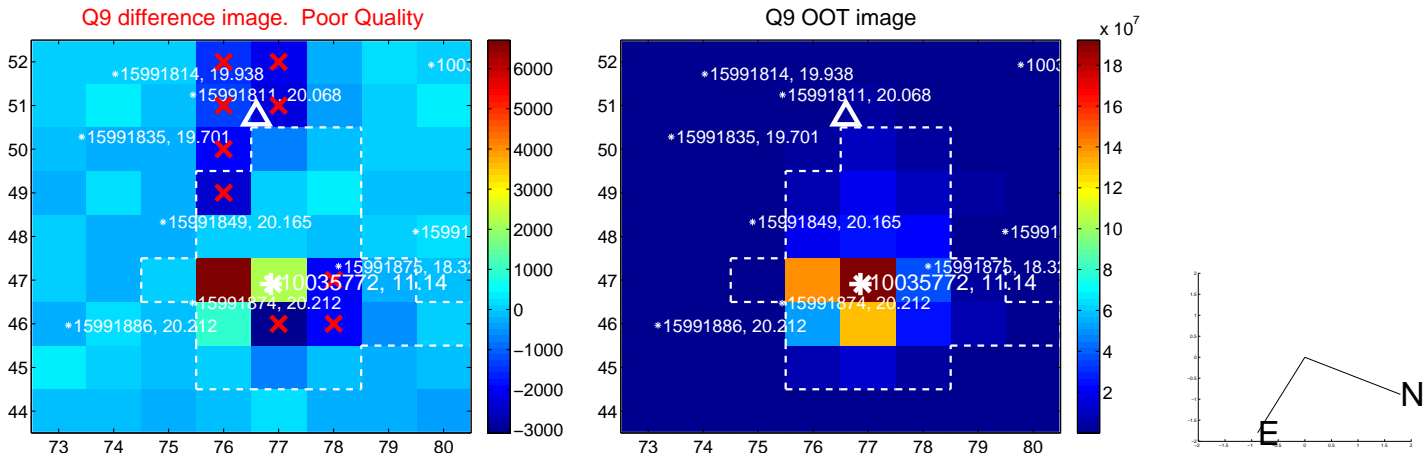


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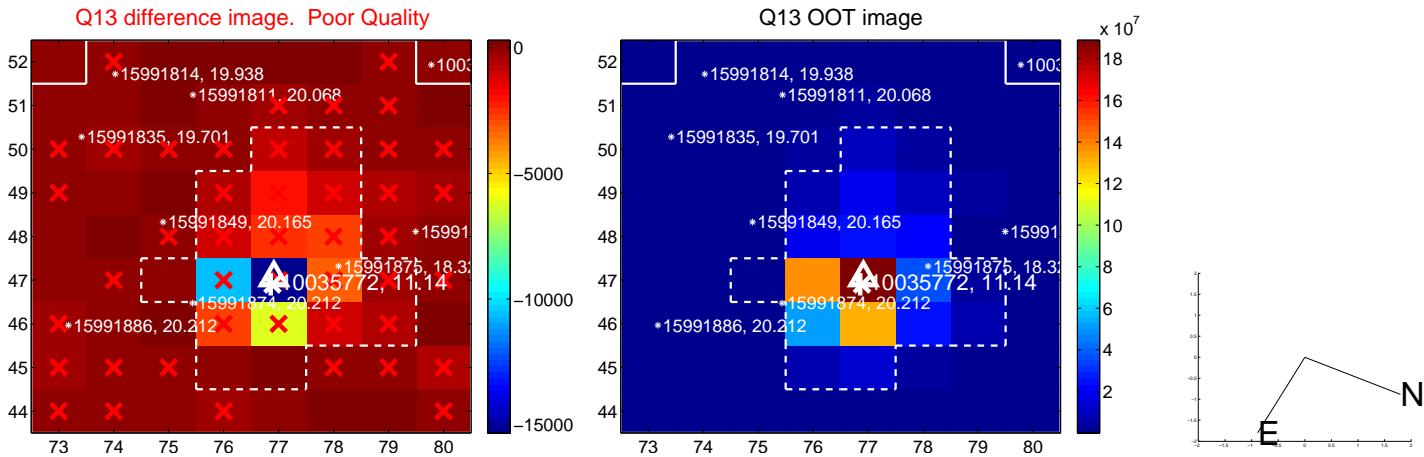




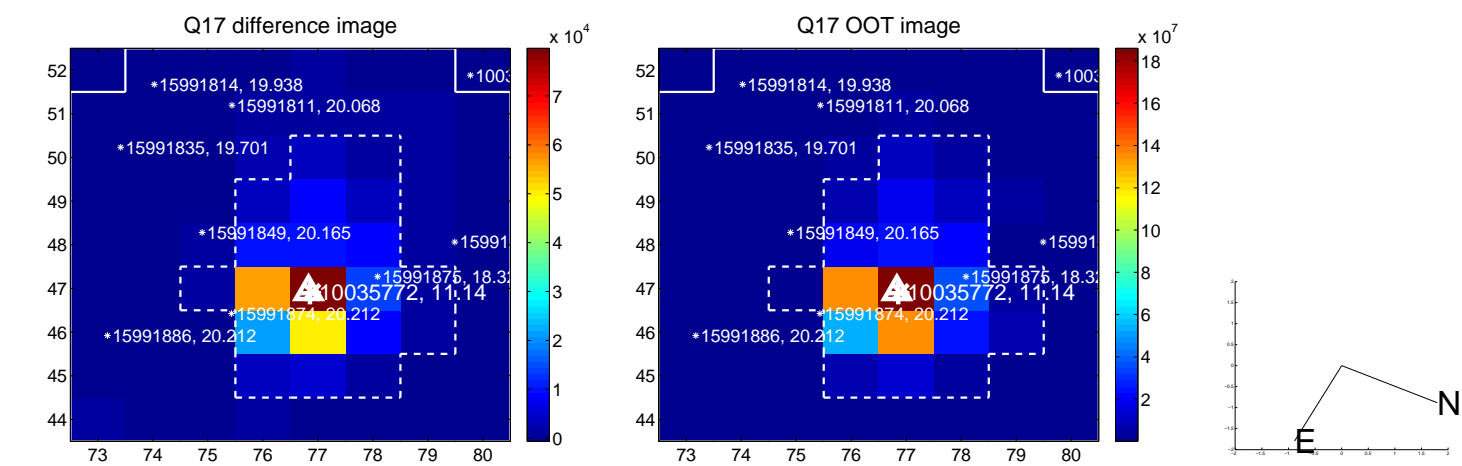
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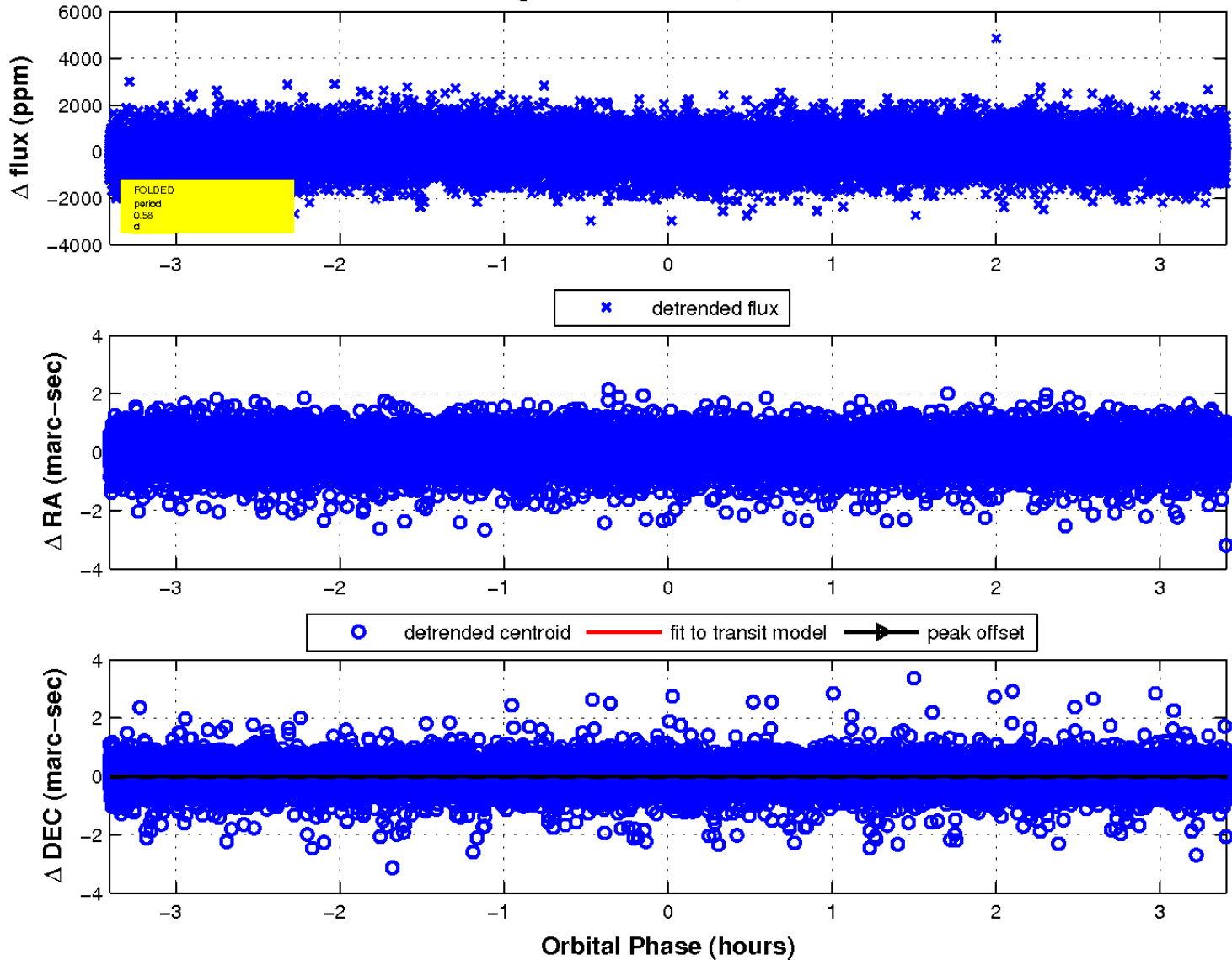
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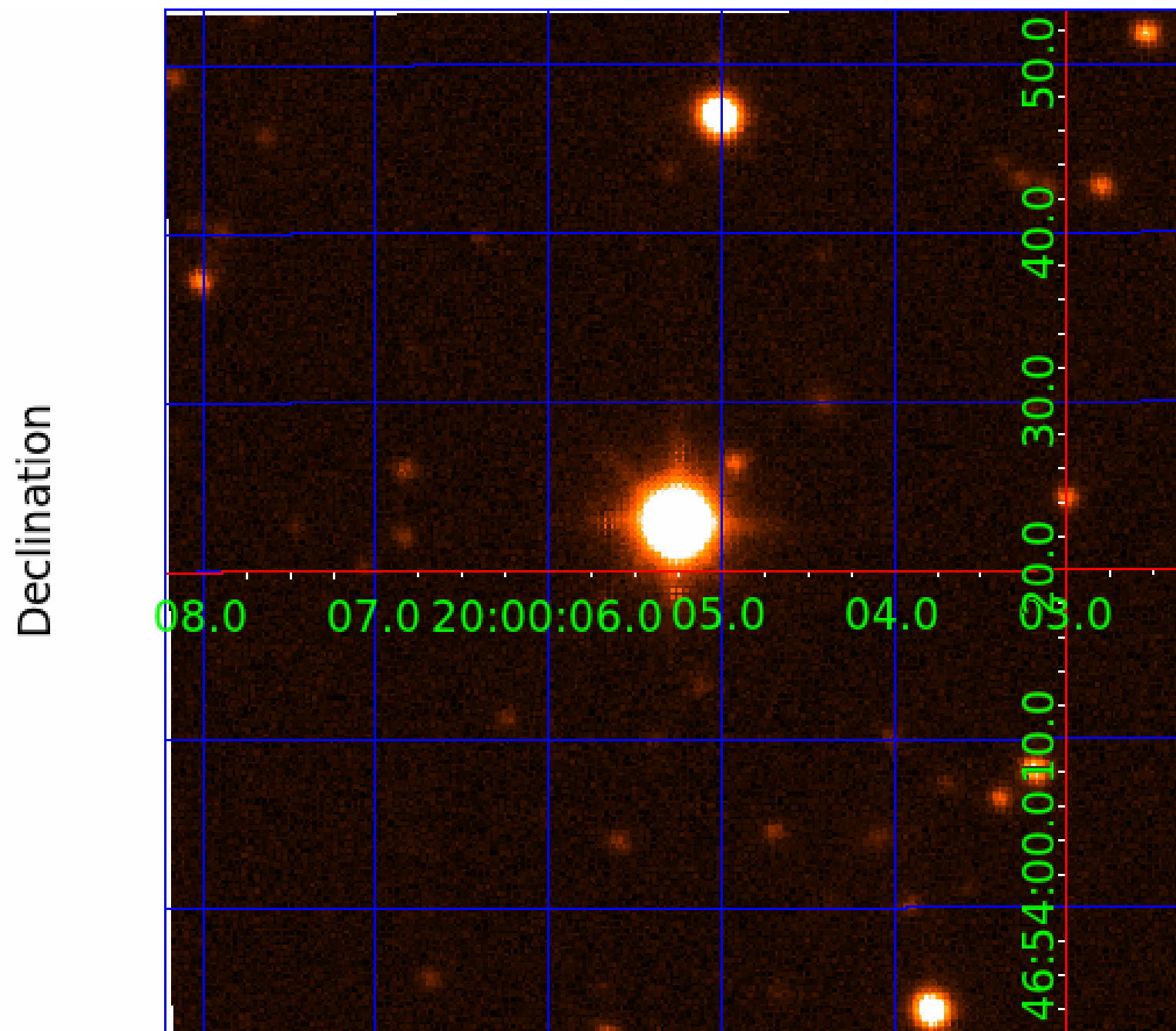
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fluxWeightedCentroids, Planet 1 of 6



UKIRT Image



# KIC 010035772

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010035772-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
010035772-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_SATURATED
010035772-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010035772-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010035772-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

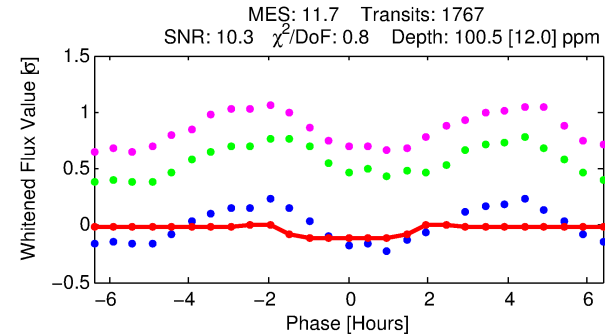
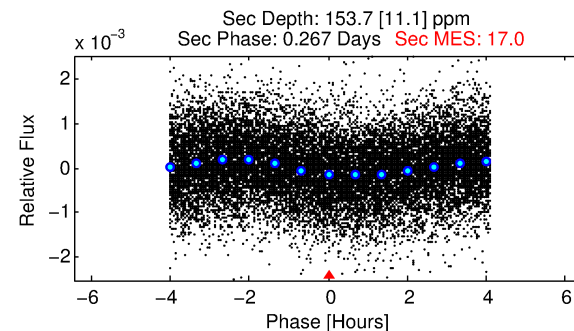
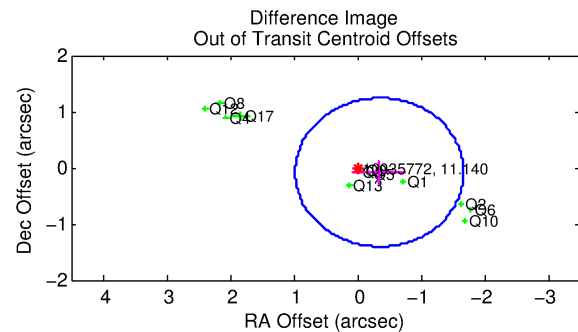
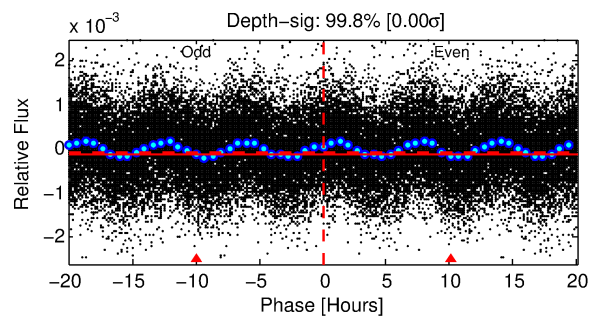
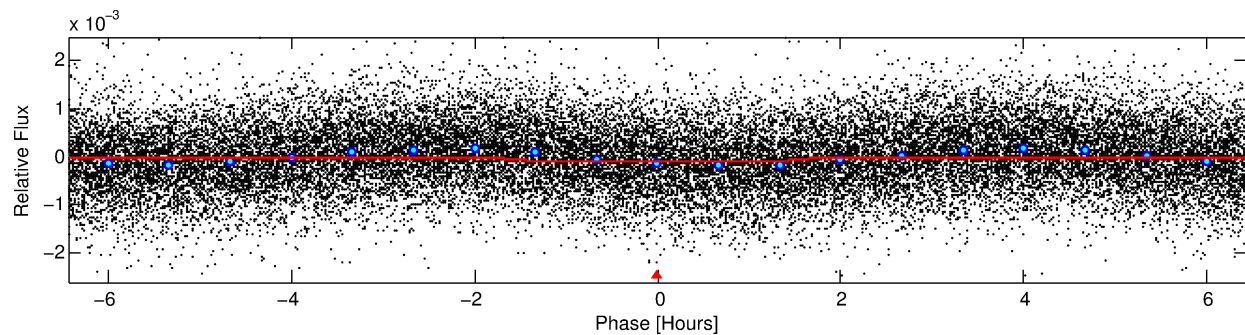
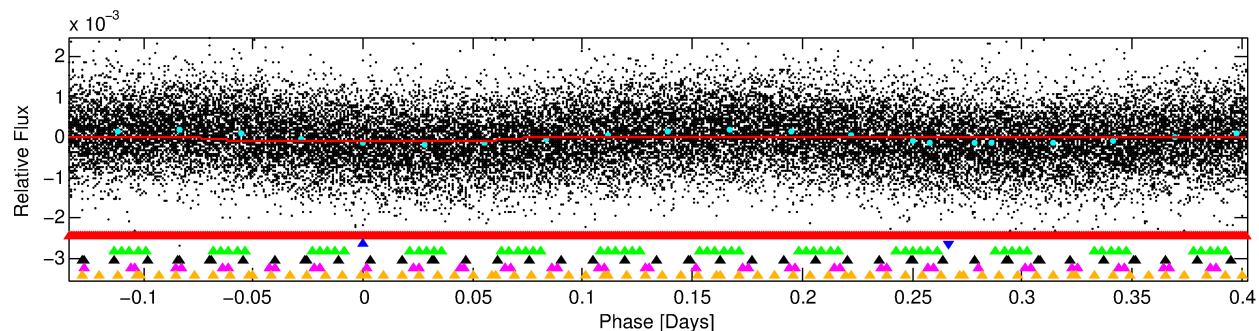
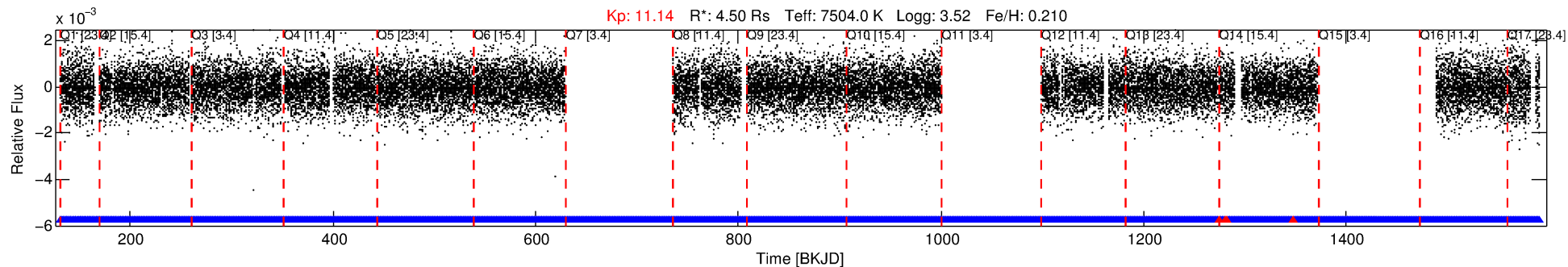
Ephemeris Match Information For 010035772-02

No Significant Match Found



# DV One-Page Summary

KIC: 10035772 Candidate: 2 of 6 Period: 0.536 d



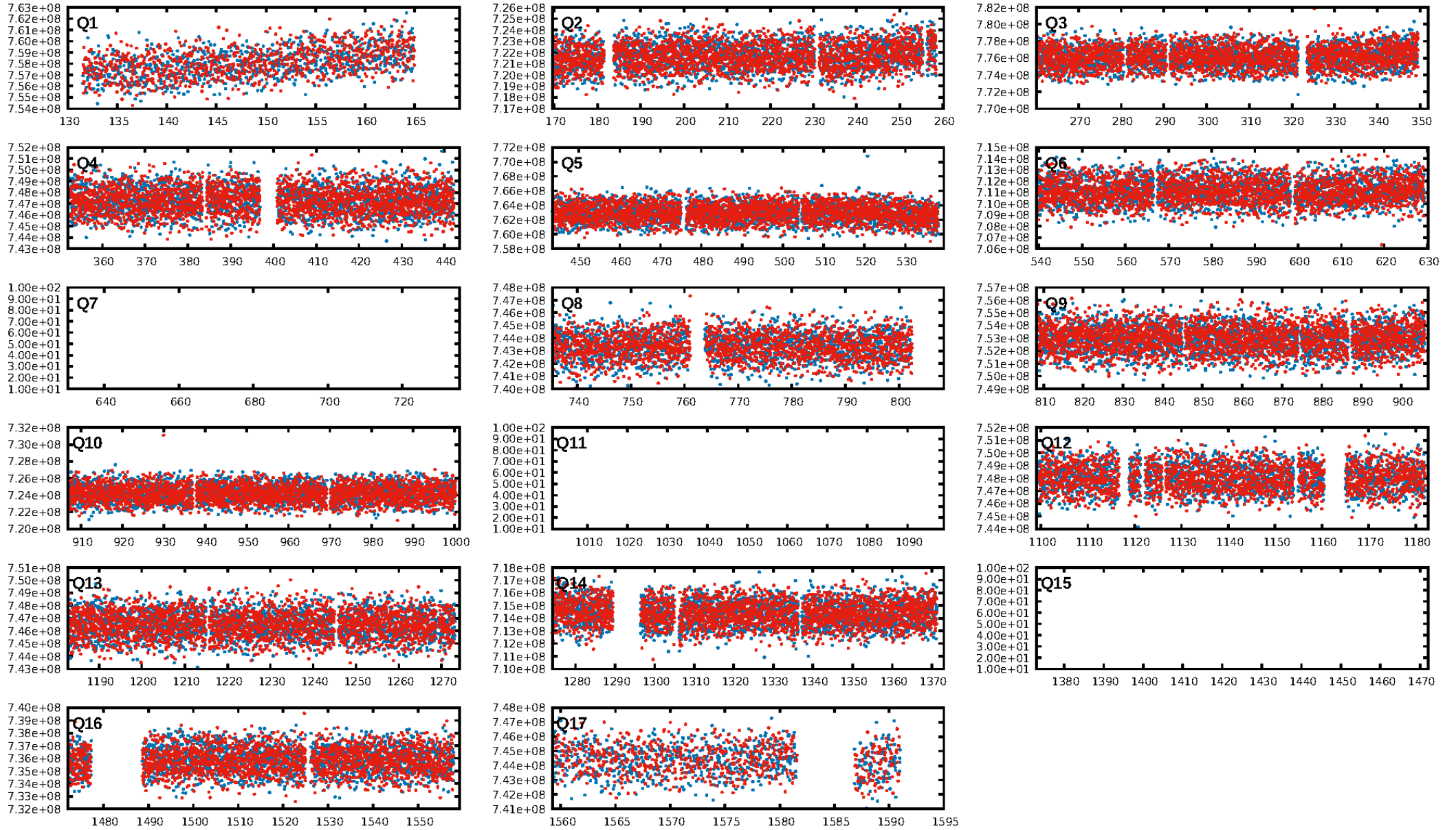
## DV Fit Results:

Period = 0.53643 [0.00001] d  
Epoch = 131.6845 [0.0031] BKJD  
Rp/R\* = 0.0096 [0.0068]  
a/R\* = 1.29 [2.04]  
b = 0.56 [5.06]  
Seff = N/A  
Teq = N/A  
Rp = 4.71 [4.25] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

## DV Diagnostic Results:

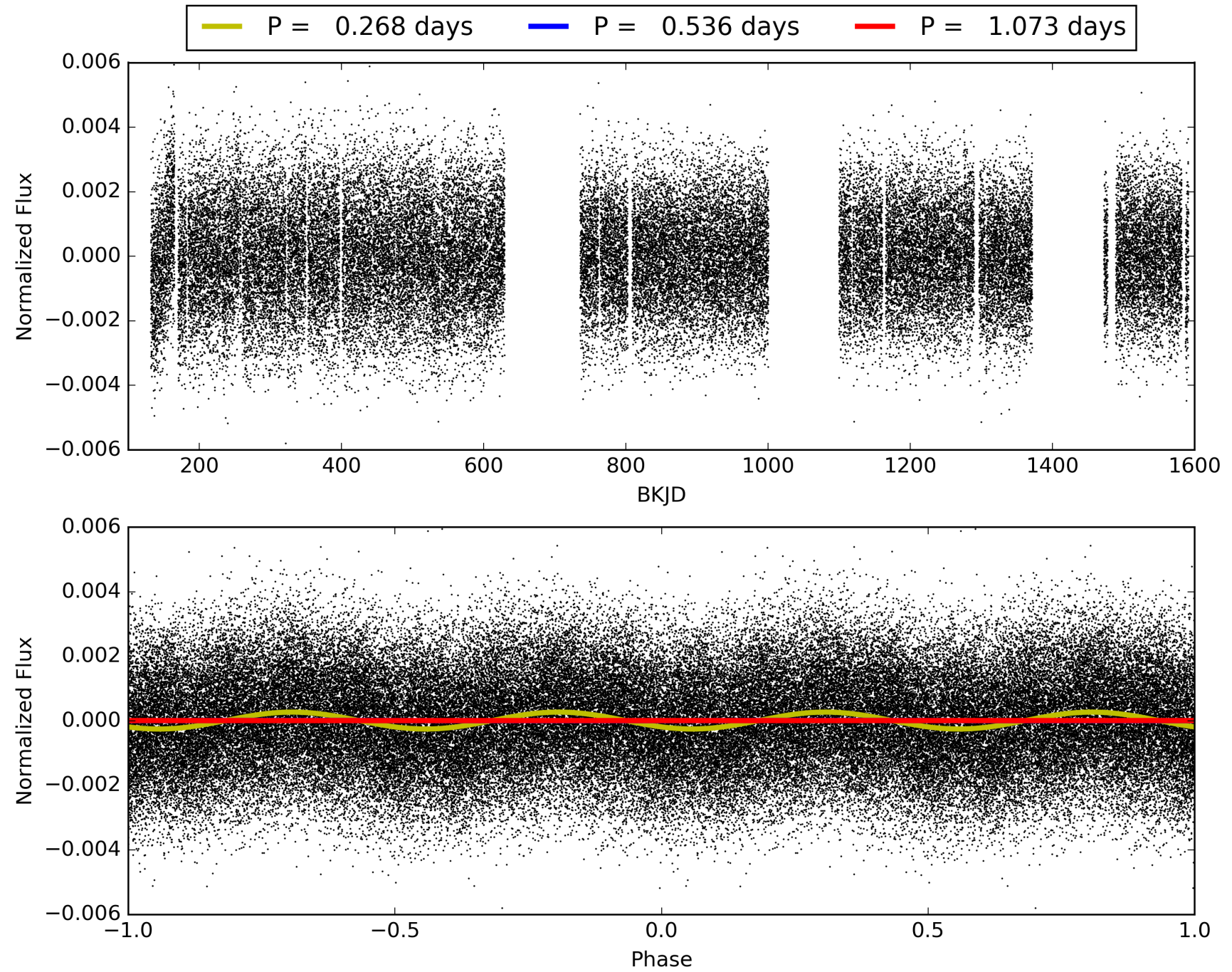
ShortPeriod-sig: N/A  
LongPeriod-sig: 21.5% [0.27 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1663/1667]  
GhostDiagnostic-chr: 8.893  
Centroid-sig: N/A  
**Centroid-so: 0.280 arcsec [3.14 $\sigma$ ]**  
OotOffset-rm: 0.356 arcsec [0.81 $\sigma$ ]  
KicOffset-rm: 0.311 arcsec [0.71 $\sigma$ ]  
OotOffset-st: 3/1/3/5 [12]  
KicOffset-st: 3/1/3/5 [12]  
DiffImageQuality-fgm: 1.00 [12/12]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 010035772-02, PDC Light Curves



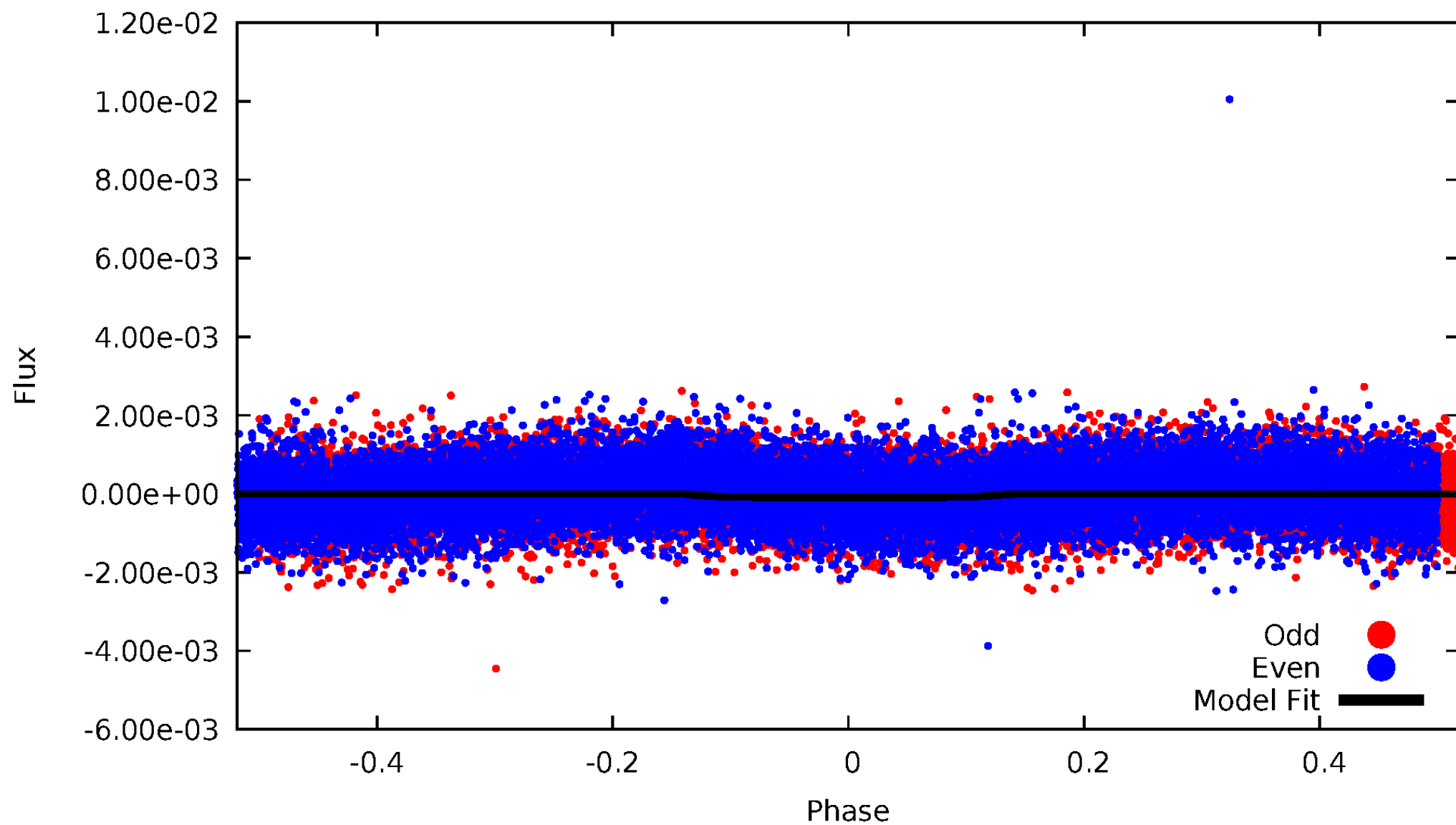


# TCE 010035772-02



# DV Odd/Even

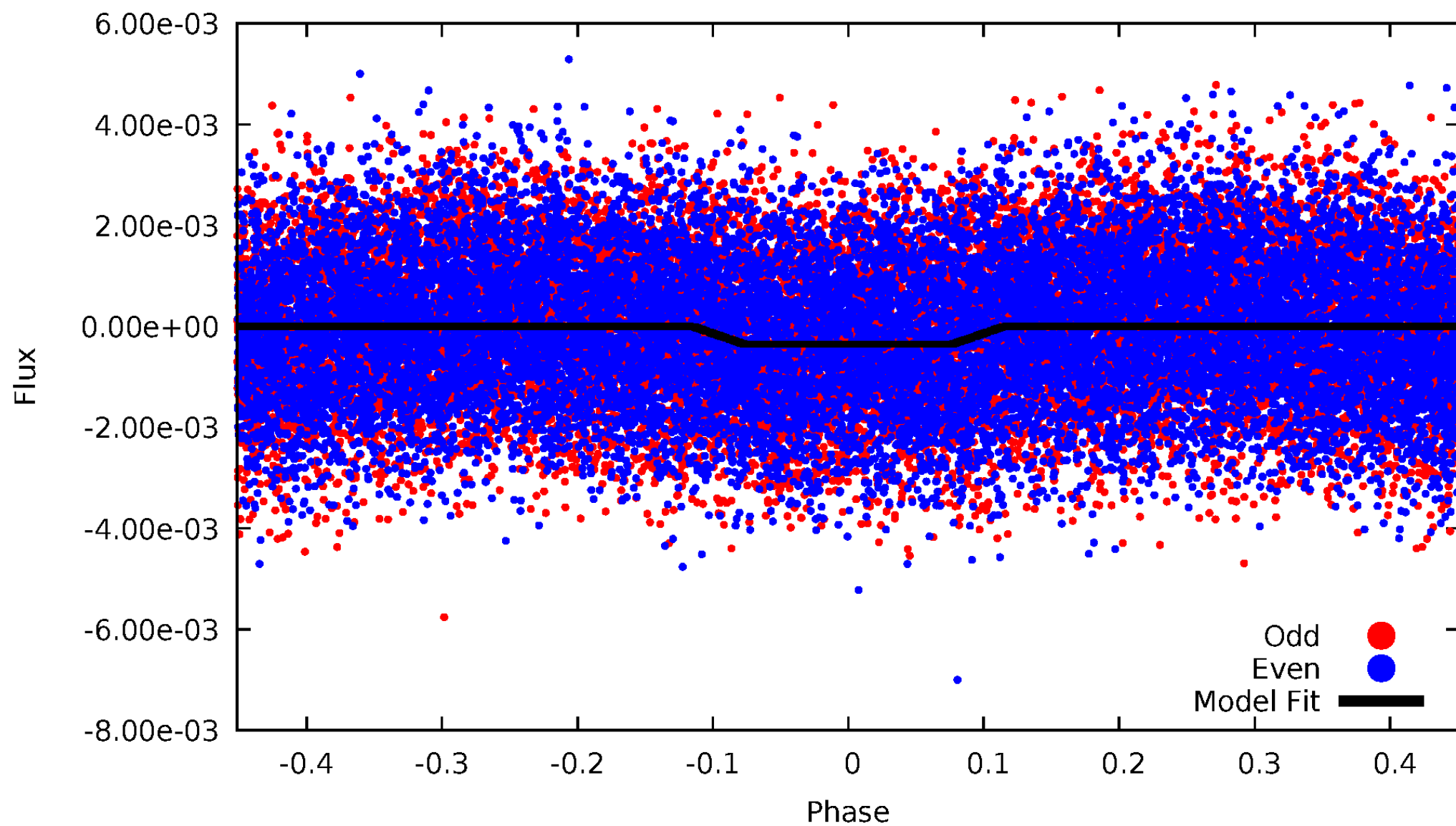
TCE 010035772-02





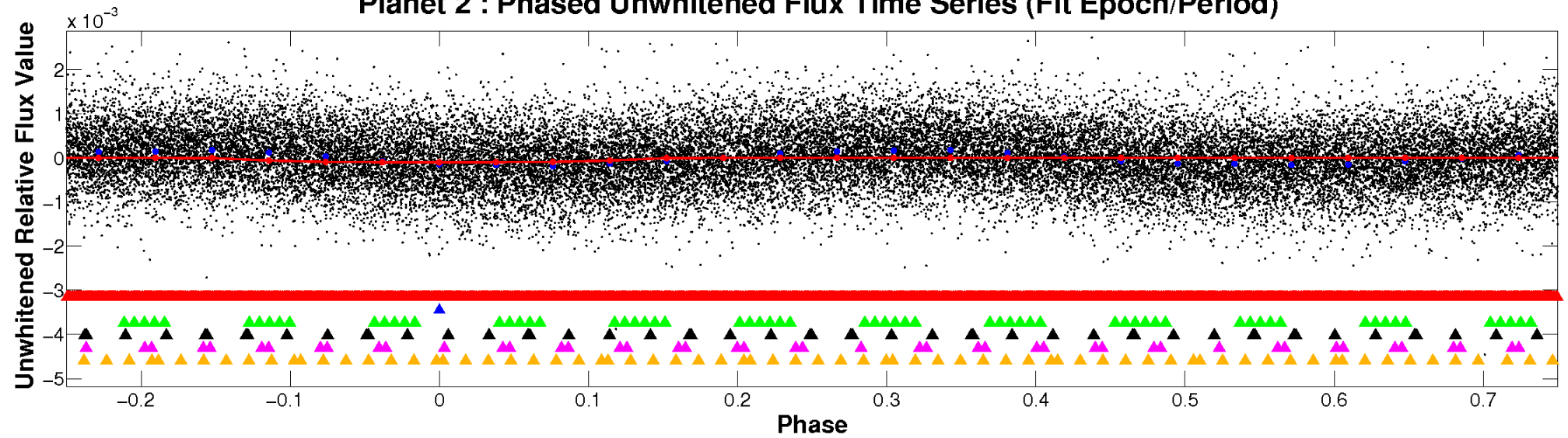
# ALT Odd/Even

TCE 010035772-02

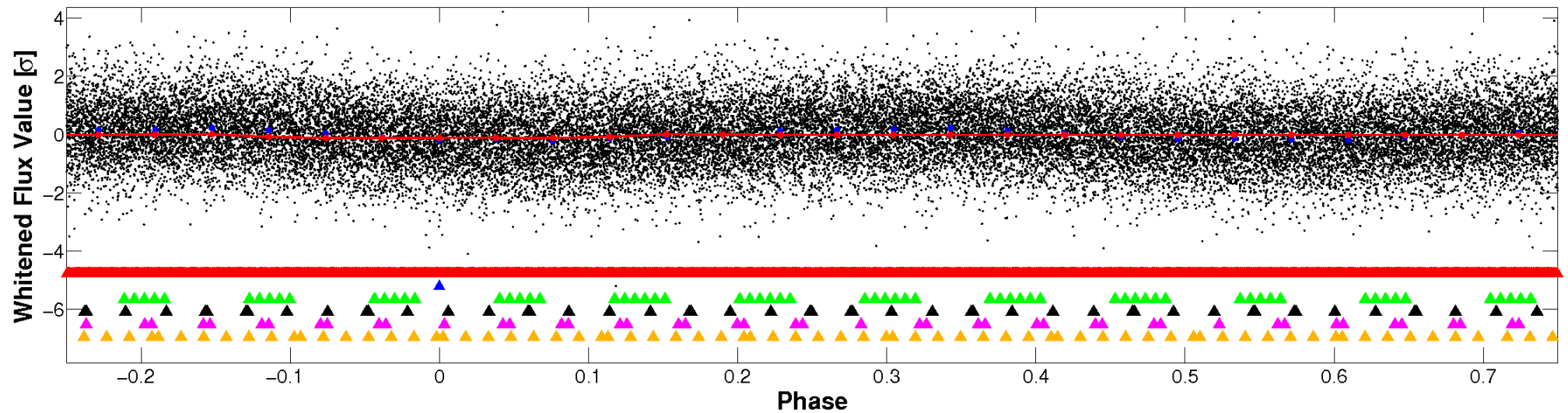


# Non-Whitened Vs. Whitened Light Curve

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

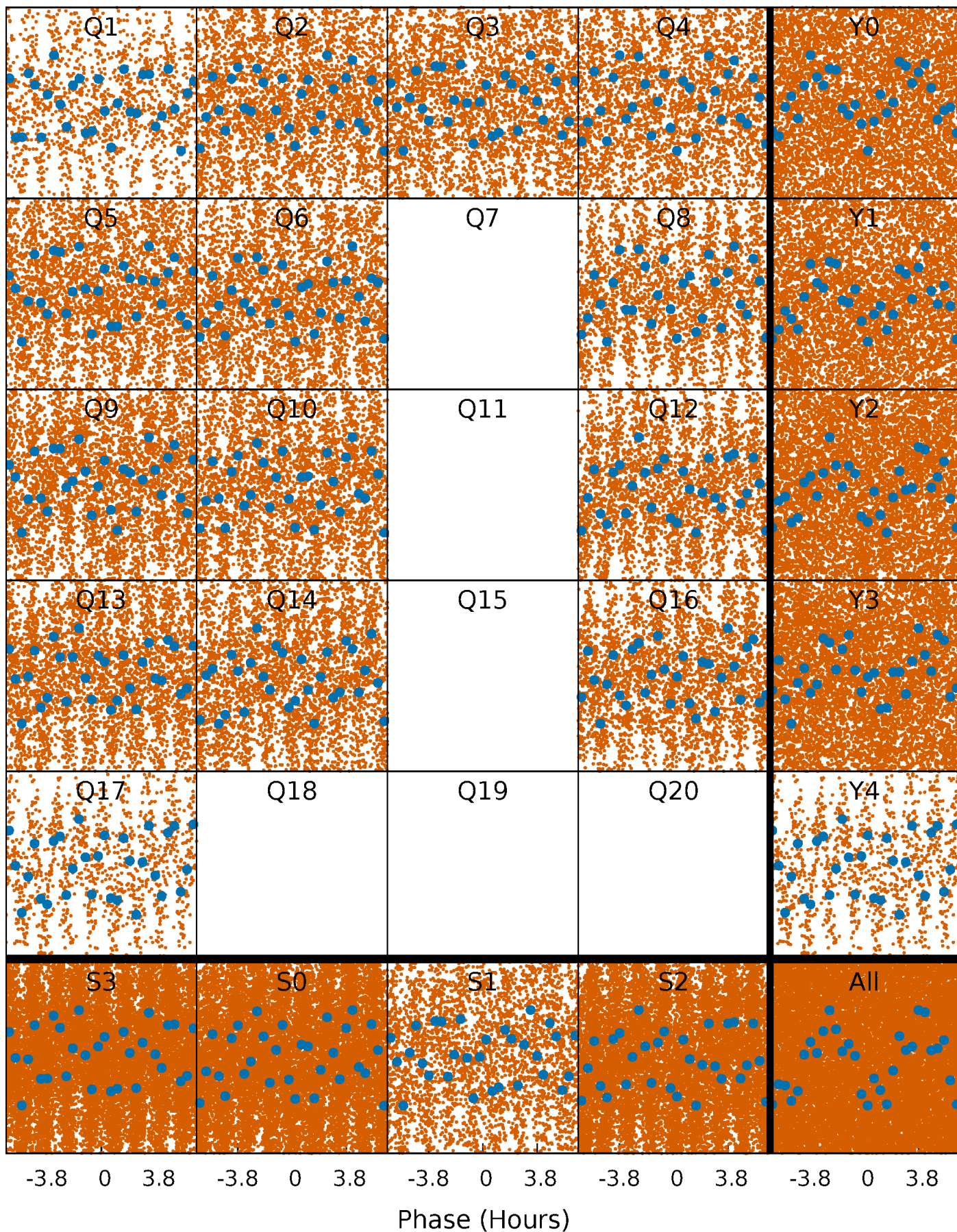


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

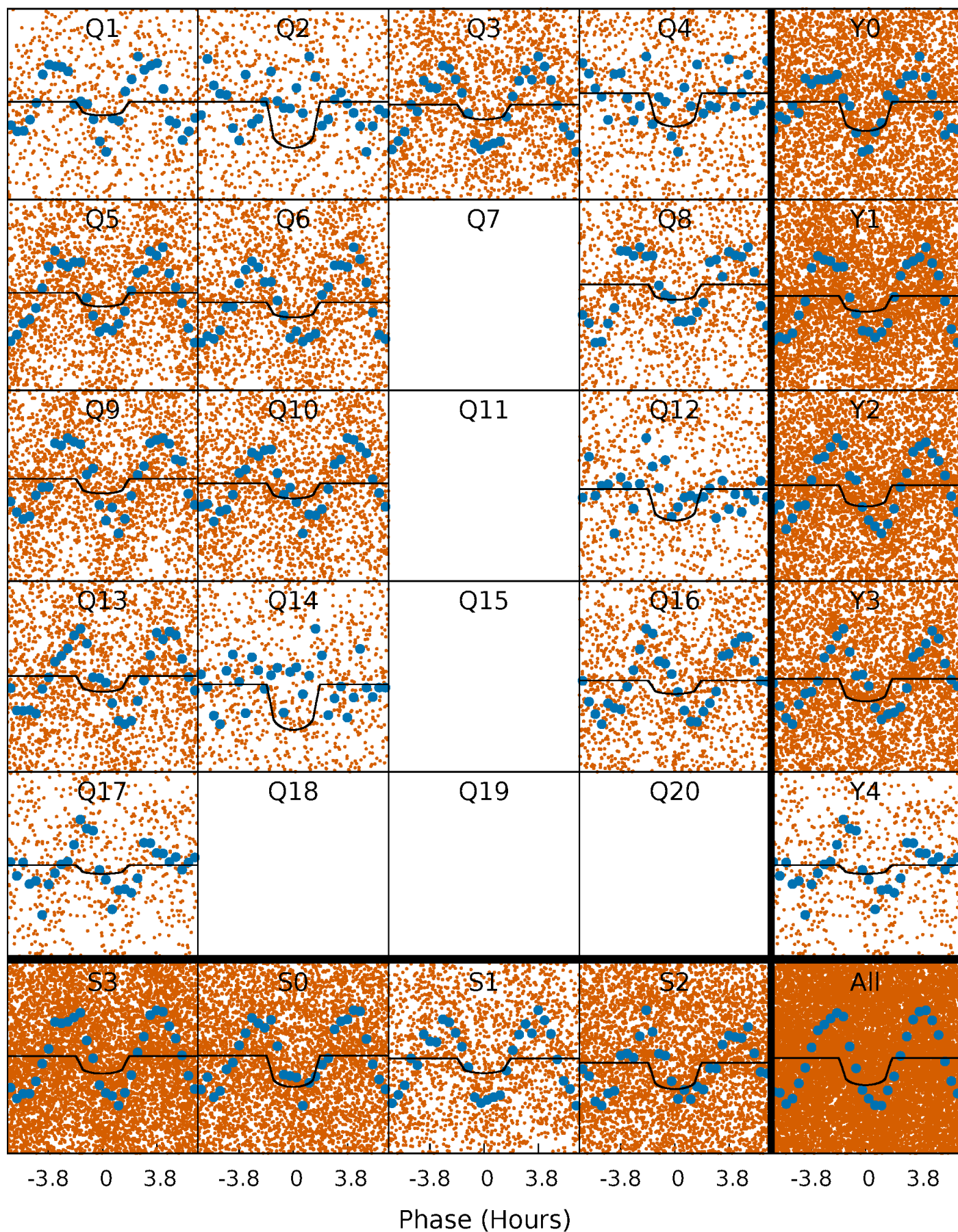
TCE 010035772-02 P= 0.536434 Days  $T_0=131.684486$  (BKJD)





# DV Quarter-Phased Transit Curves

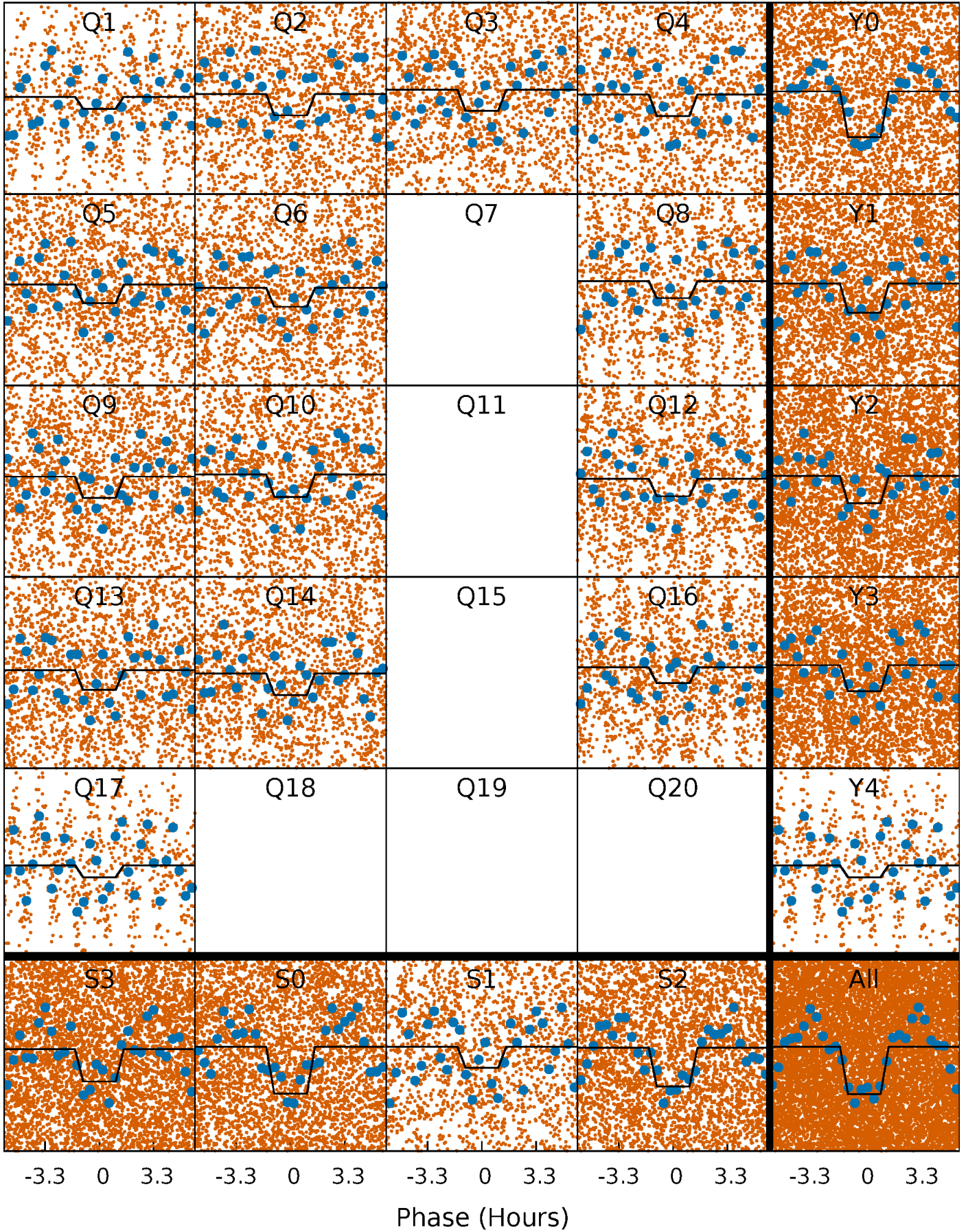
TCE 010035772-02     $P = 0.536434$  Days     $T_0 = 131.684486$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

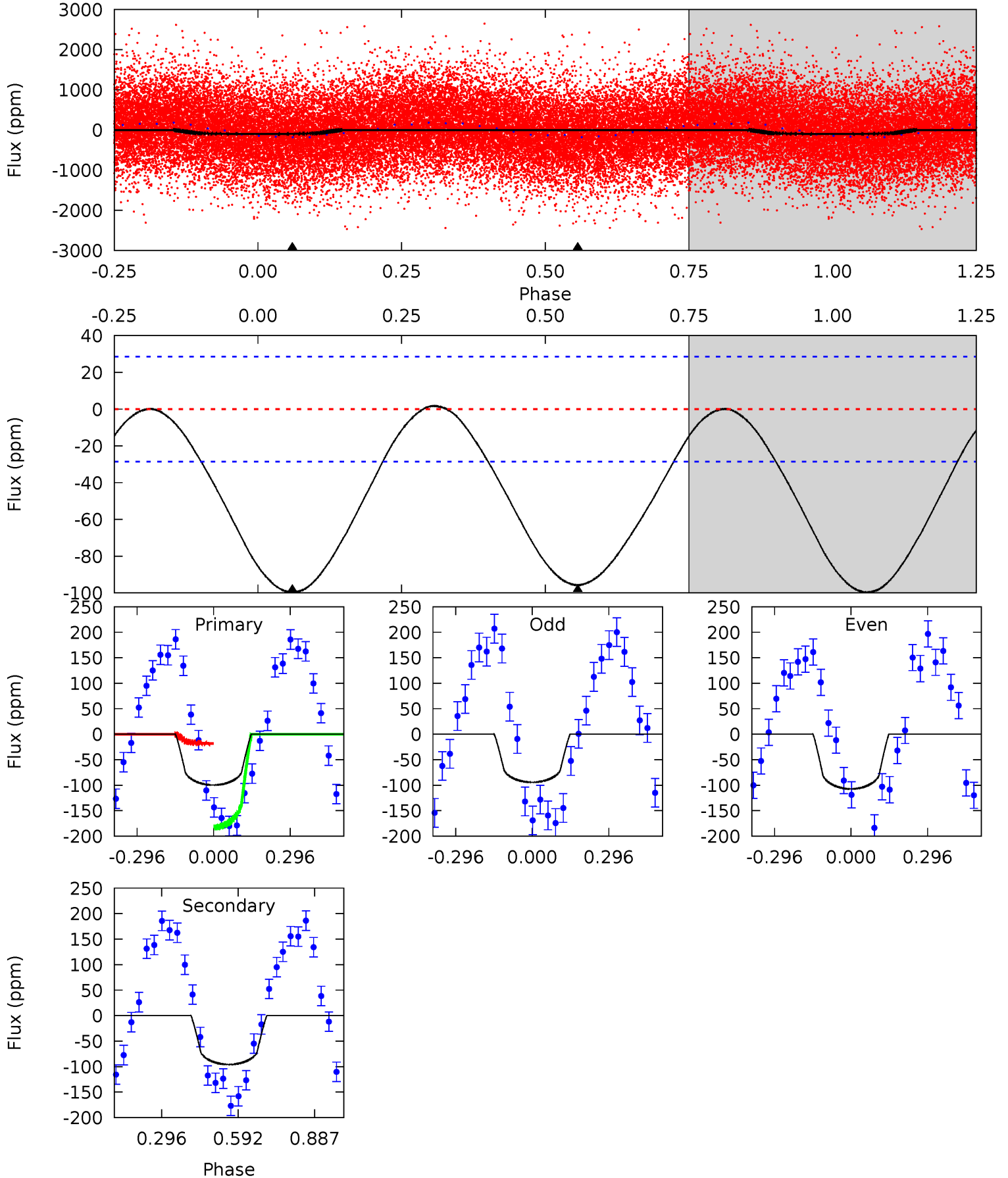
TCE 010035772-02 P= 0.536471 Days  $T_0=131.671078$  (BKJD)



# DV Model-Shift Uniqueness Test

010035772-02, P = 0.536434 Days, E = 131.148052 Days

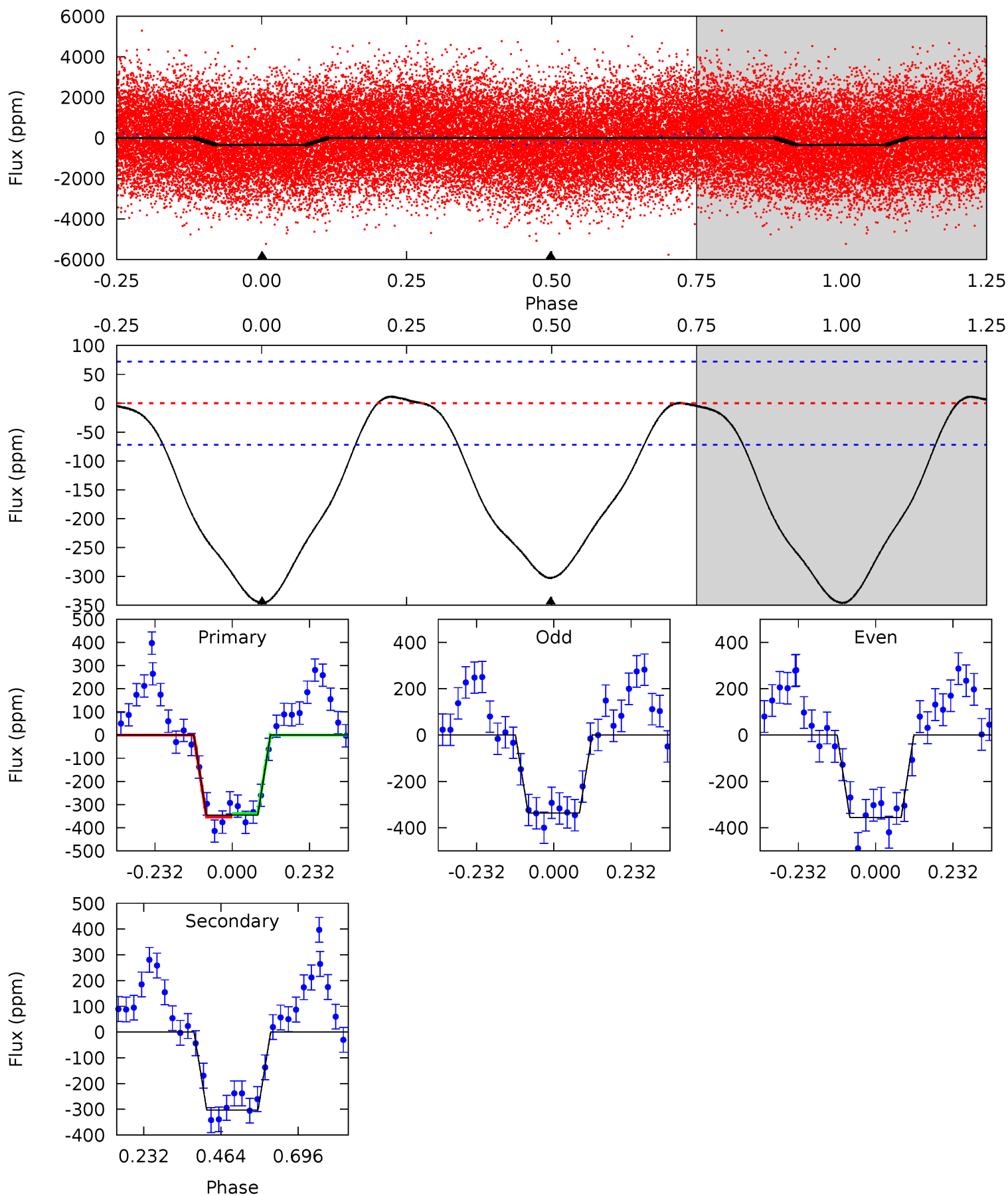
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.1	14.5	0	0	4.33	1.05	0.20	15.1	15.1	14.5	14.5	1.01	1.11	0.02	12.7



# Alt Model-Shift Uniqueness Test

010035772-02, P = 0.536471 Days, E = 131.134607 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
21.1	18.5	0	0	4.39	1.20	0.39	21.1	21.1	18.5	18.5	0.61	0.99	0.03	0.45



### Stellar Parameters For KIC 010035772

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7504^{+209}_{-328}$	$3.525^{+0.532}_{-0.028}$	$0.210^{+0.150}_{-0.350}$	$4.501^{+0.278}_{-2.499}$	$2.472^{+0.147}_{-0.832}$	$0.038^{+0.253}_{-0.004}$
	+3%/-4%	+15%/-1%	+71%/-167%	+6%/-56%	+6%/-34%	+663%/-10%
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 010035772-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-96 \pm 7$	$4.24^{+3.23}_{-2.61}$	$7022^{+528}_{-930}$	$6300^{+5996}_{-9399}$	$0.868^{+4.578}_{-0.579}$
Alt.	$-303 \pm 16$	$7.81^{+3.97}_{-3.29}$	$7052^{+488}_{-1006}$	$6240^{+2663}_{-1931}$	$0.815^{+1.448}_{-0.440}$

$T_{max}$  = 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

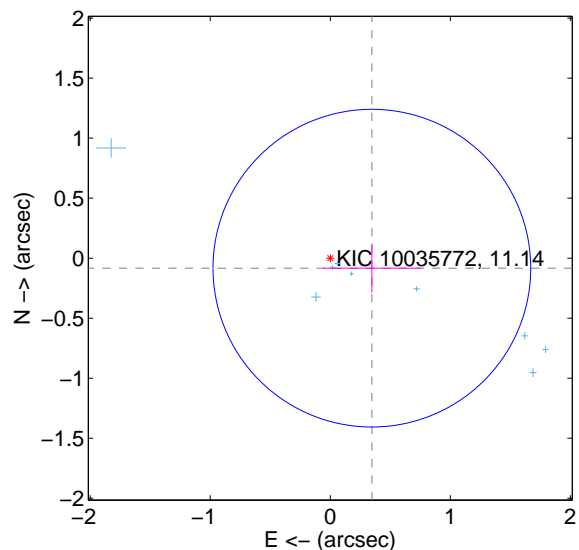
Supplemental centroid analysis for 010035772-02. **Kepler magnitude: 11.14**. Transit SNR 10.32

There are 12 quarters with good PRF difference image offsets

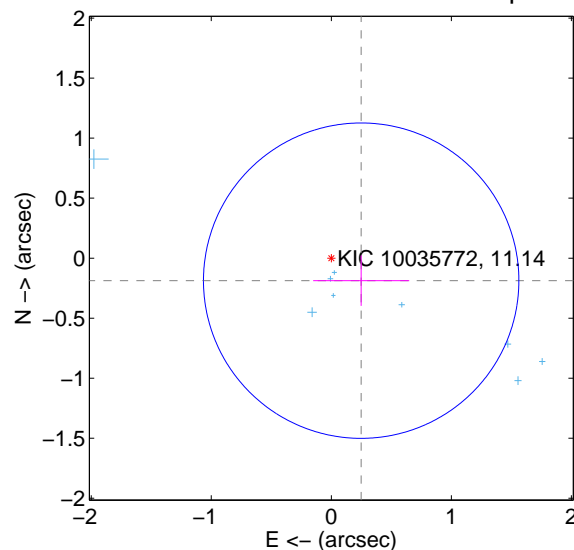
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.356 \pm 0.441$	0.81	$-0.347 \pm 0.408$	$-0.083 \pm 0.205$
PRF-fit source offset from KIC position	$0.311 \pm 0.438$	0.71	$-0.249 \pm 0.400$	$-0.187 \pm 0.210$
photometric centroid source offset	<b><math>0.28 \pm 0.09</math></b>	<b>3.14</b>	$-0.24 \pm 0.09$	$-0.15 \pm 0.08$

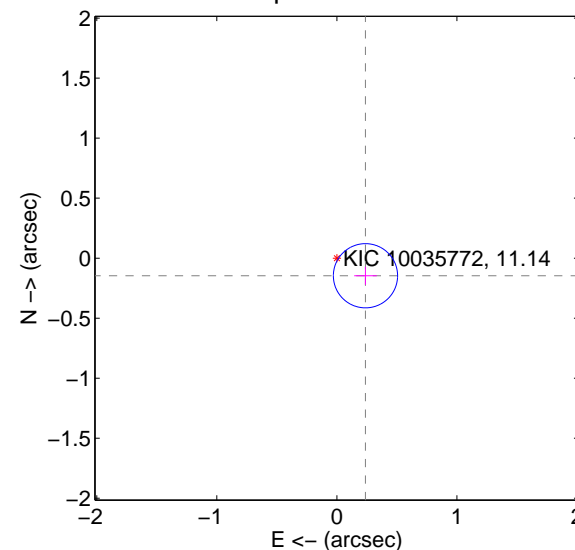
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

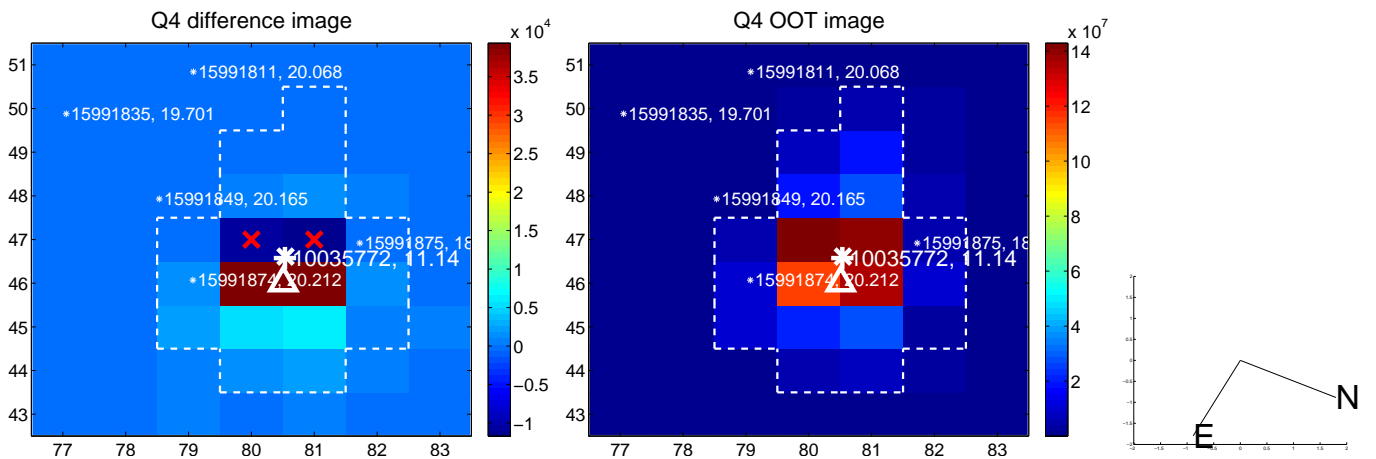
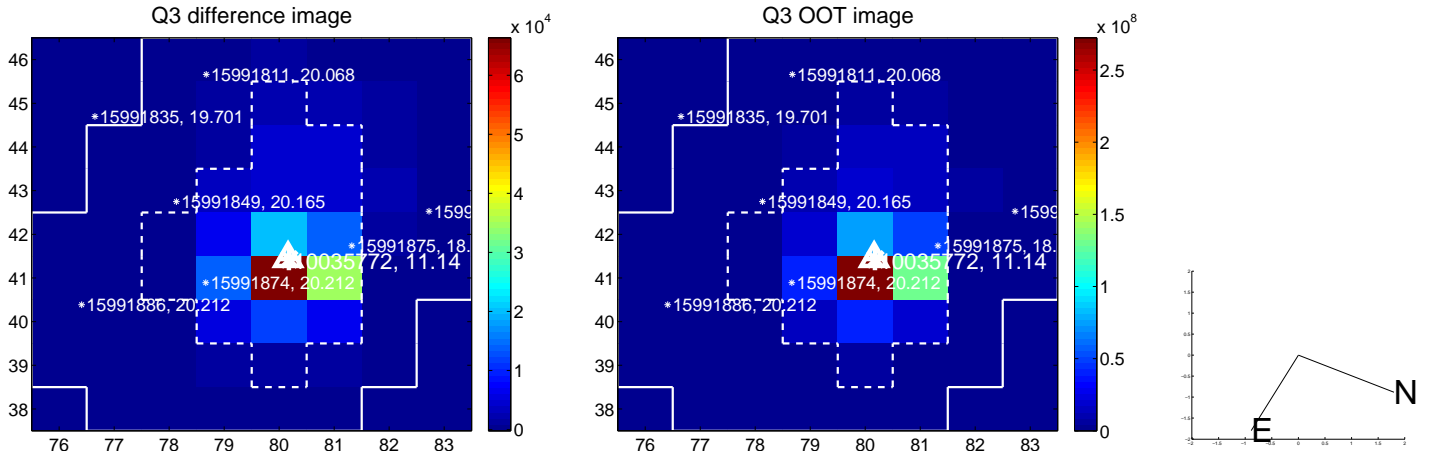
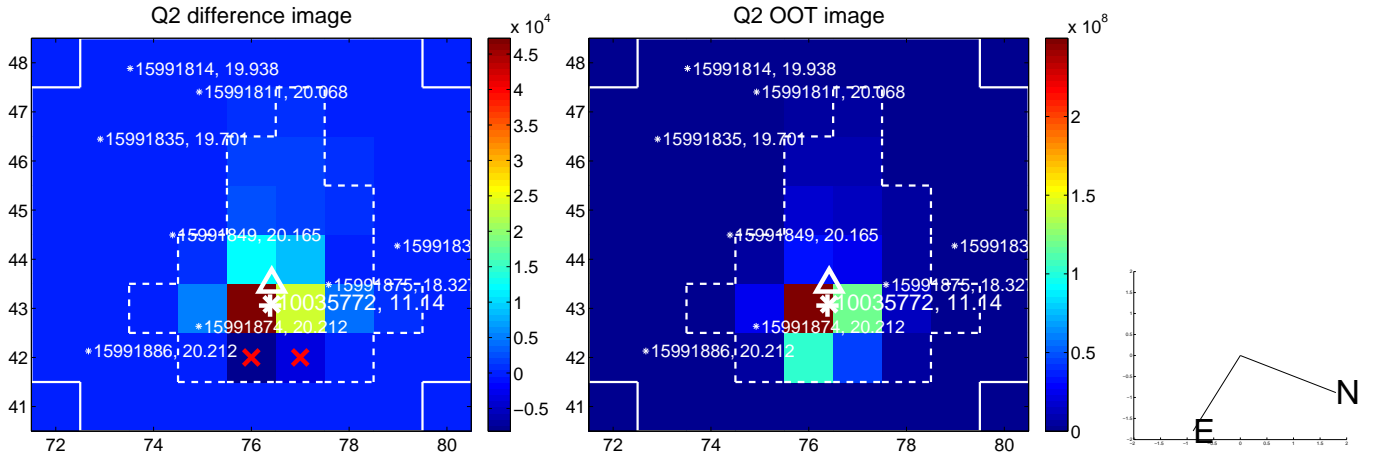
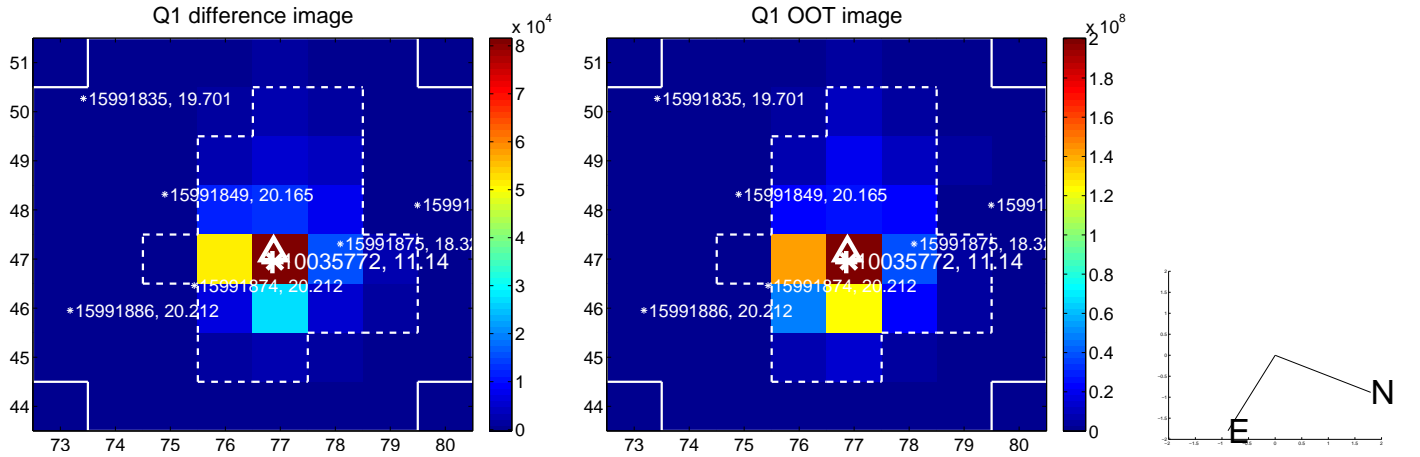


offset from photometric centroids

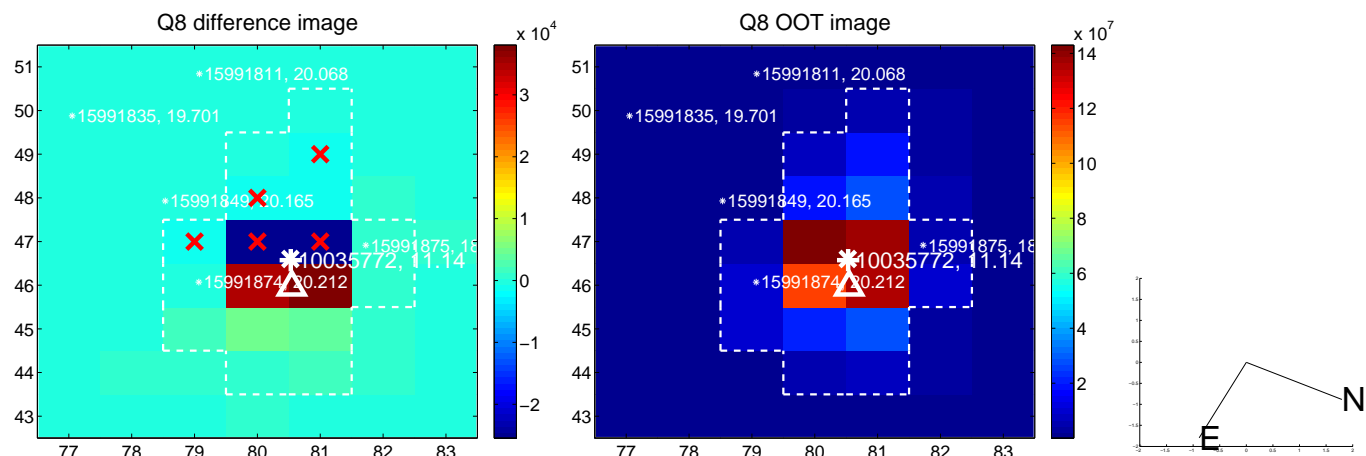
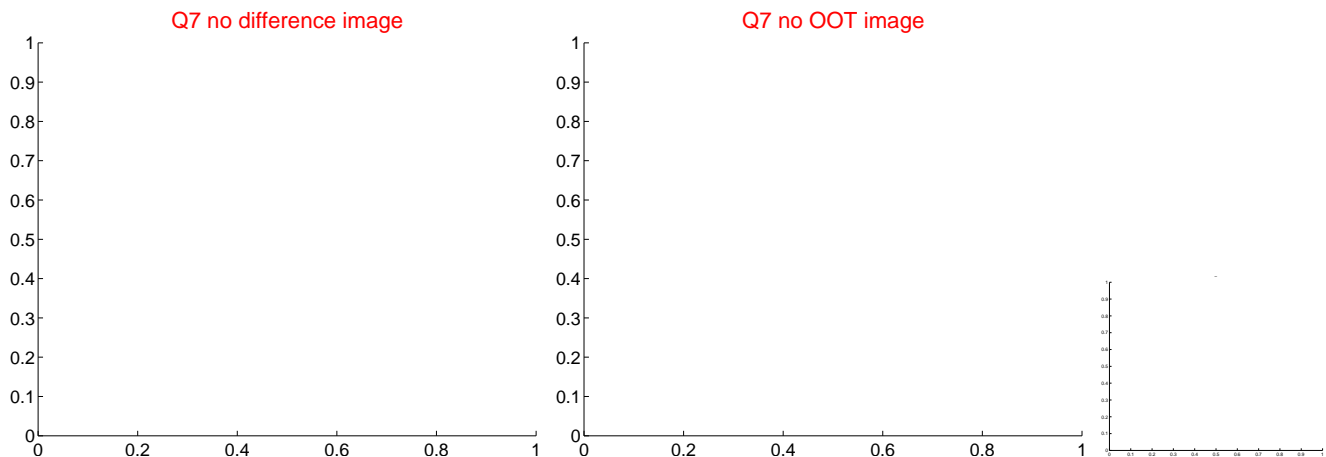
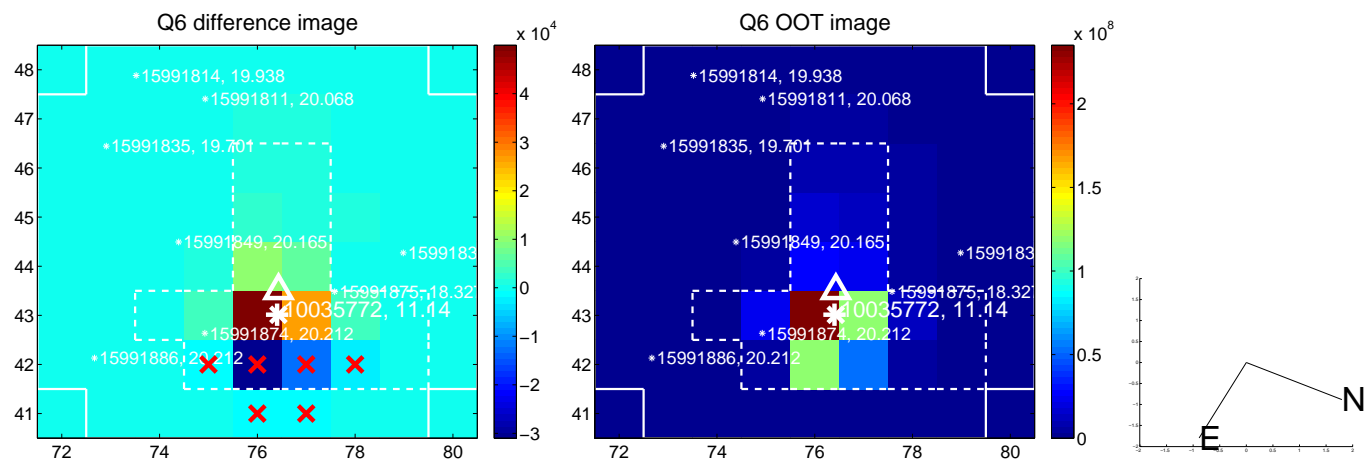
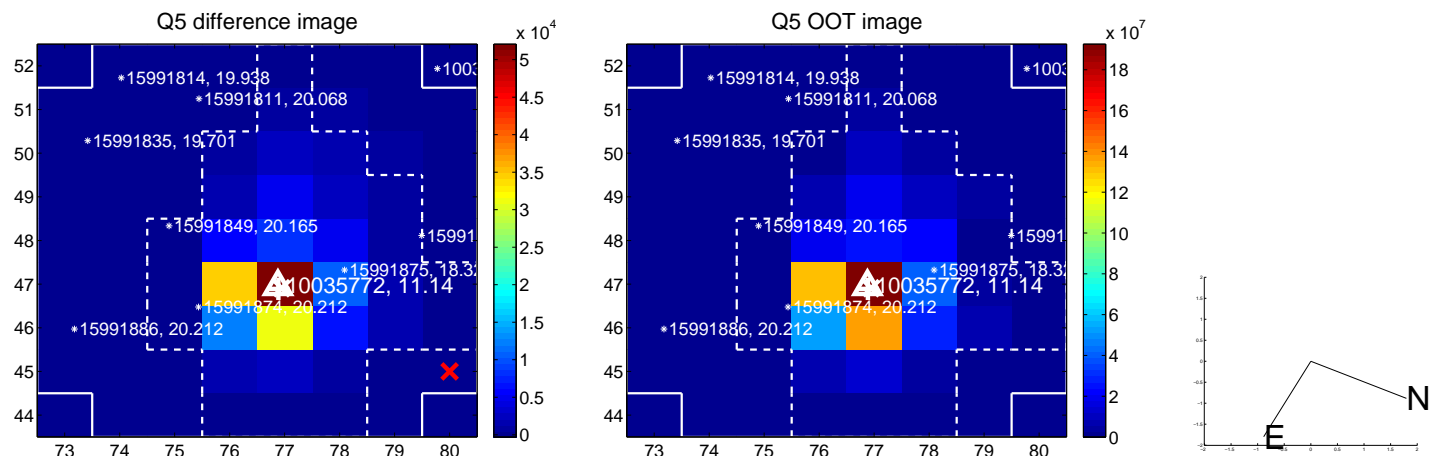


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

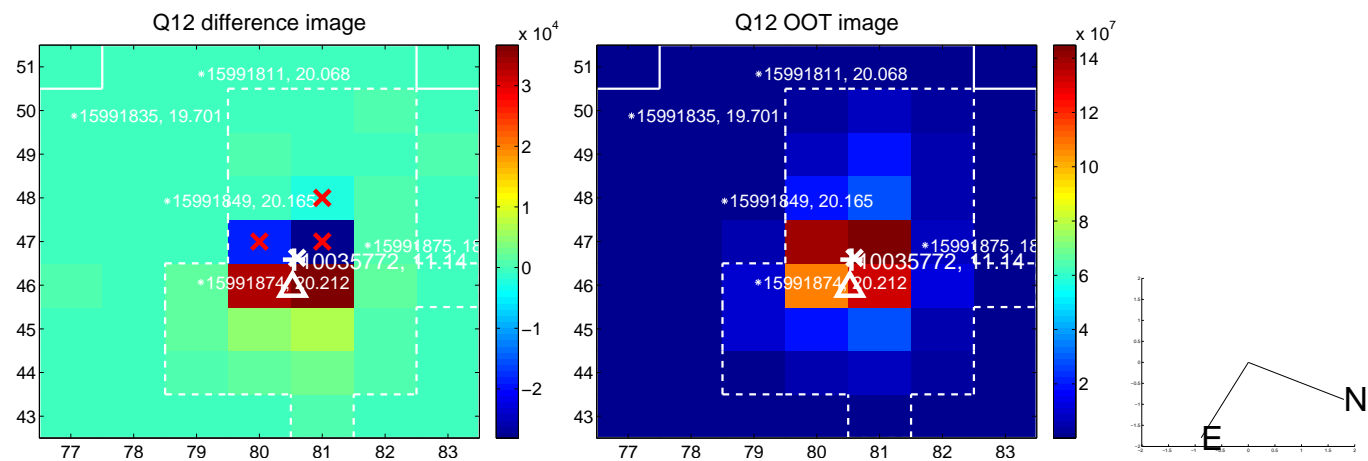
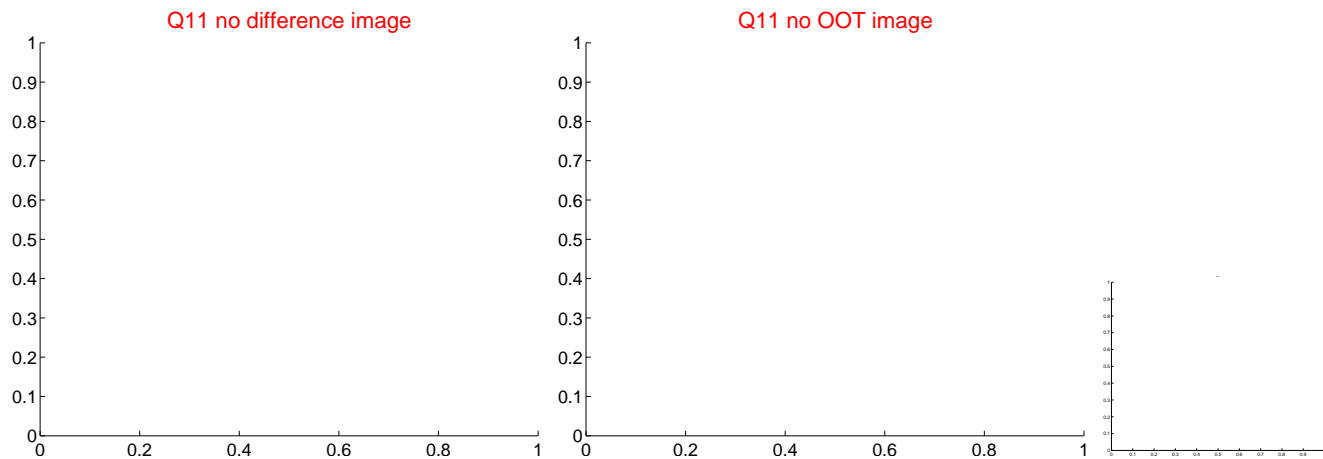
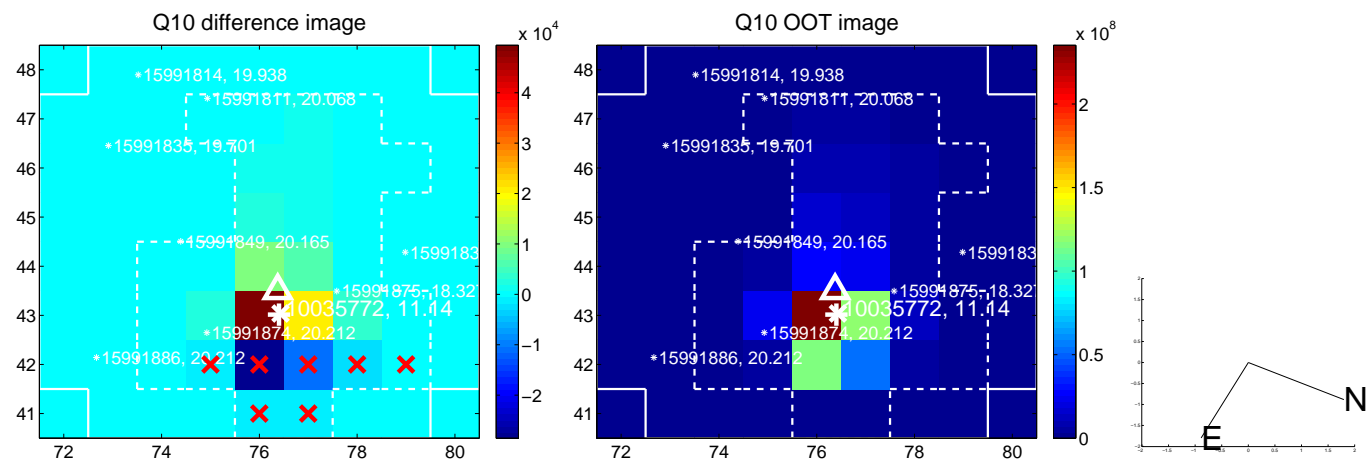
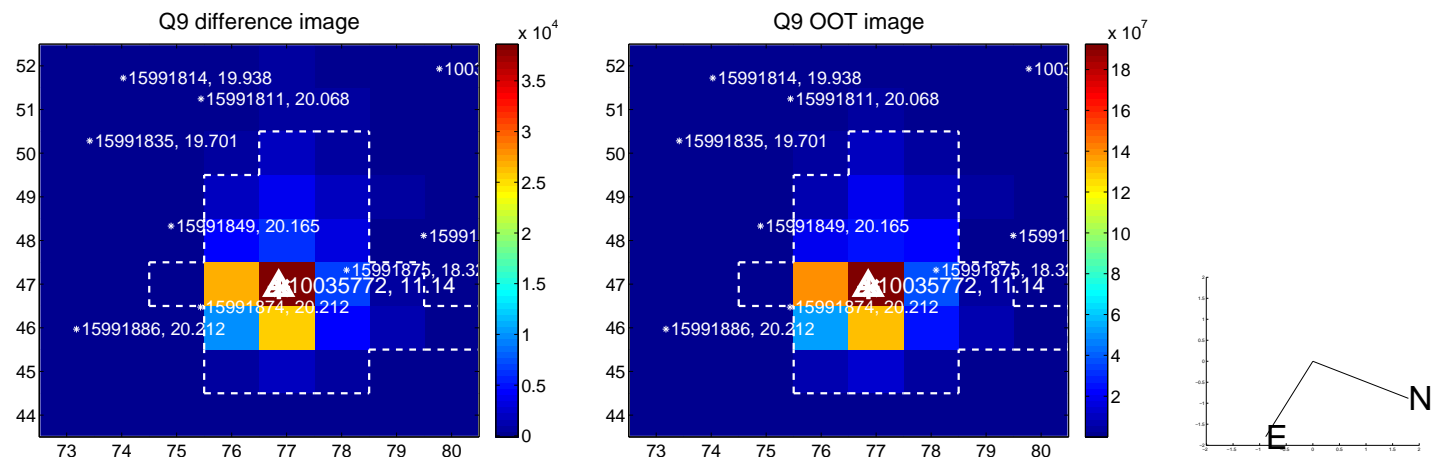
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



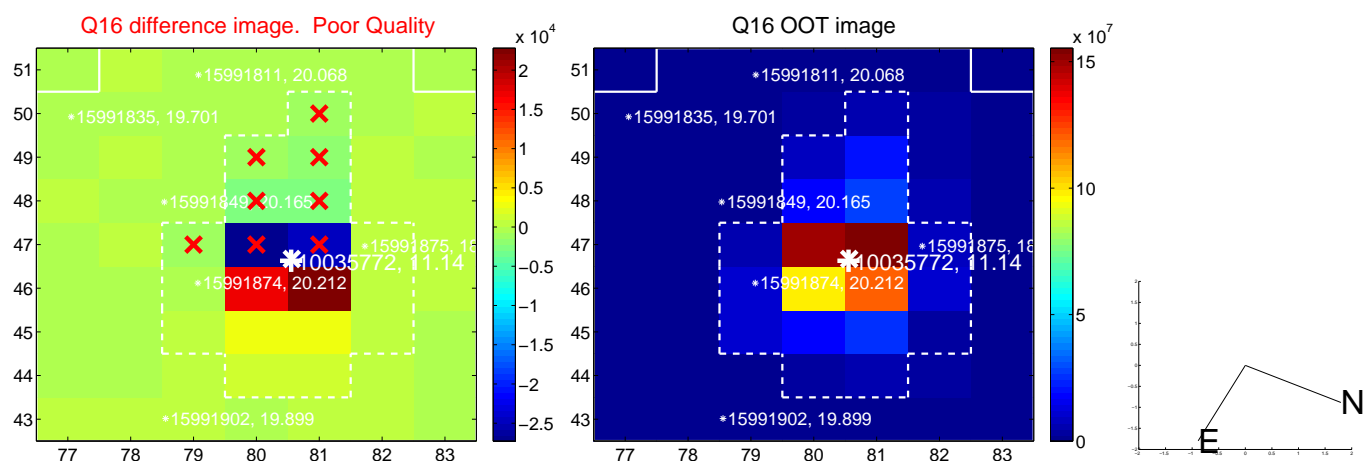
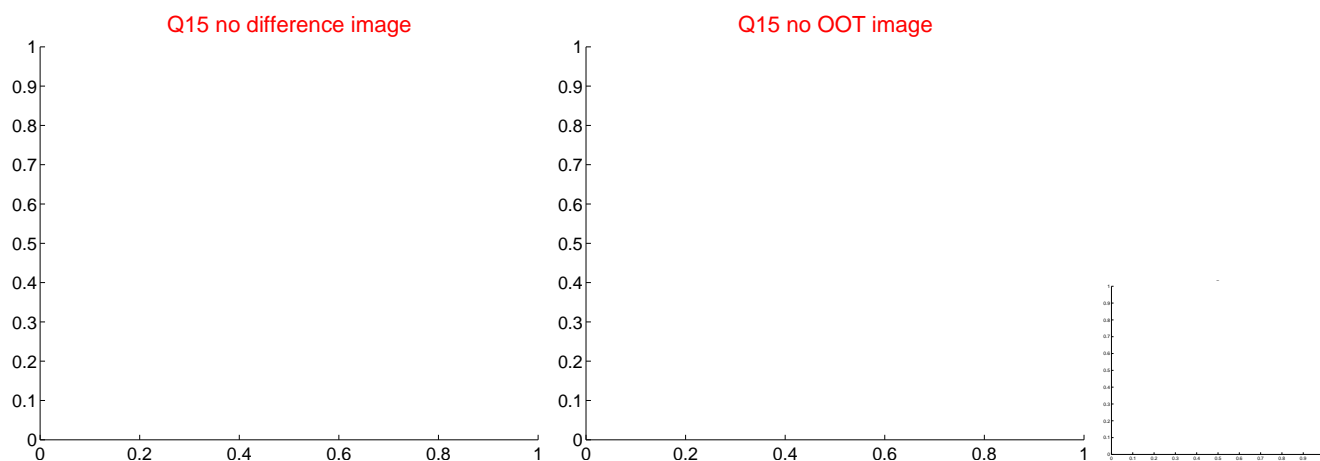
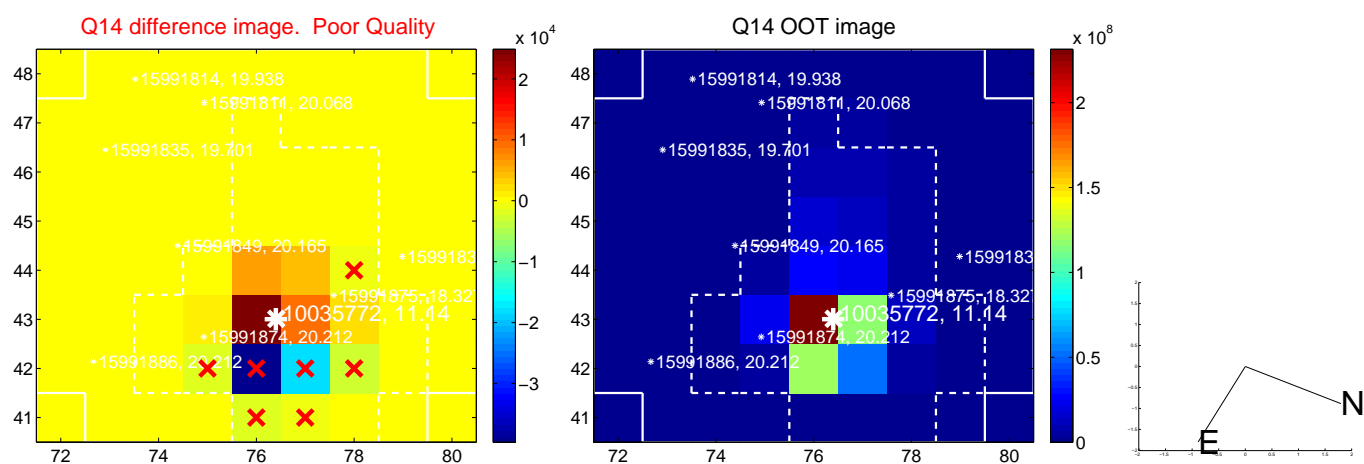
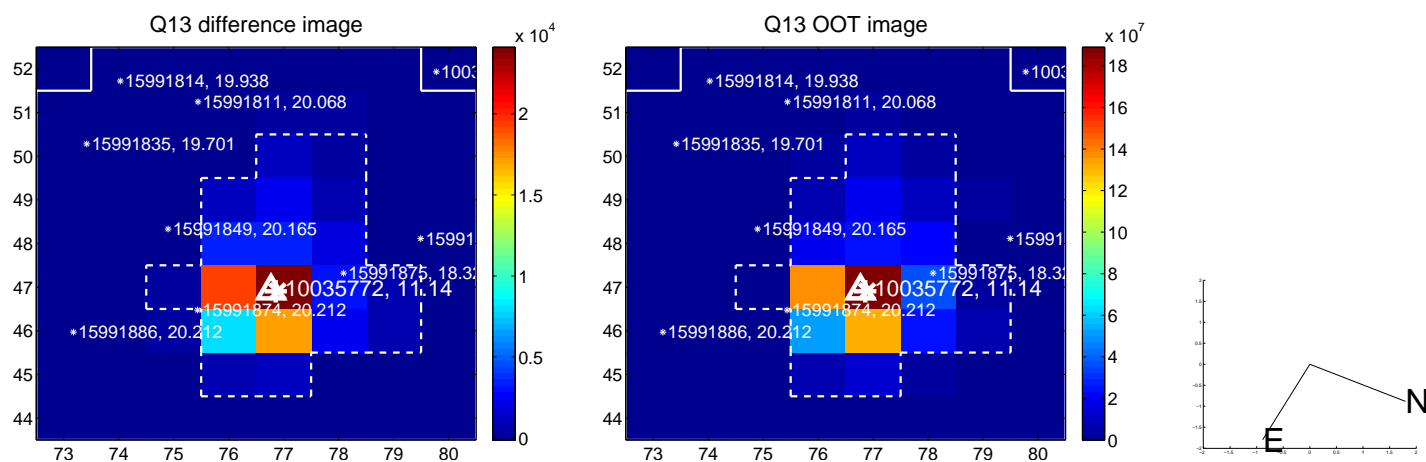
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

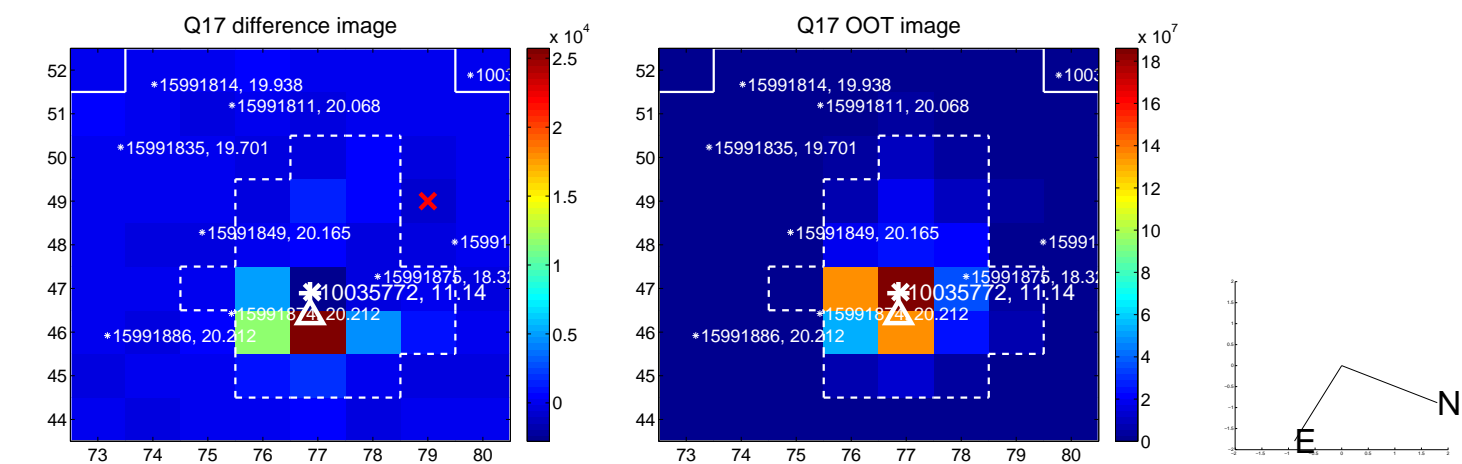


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

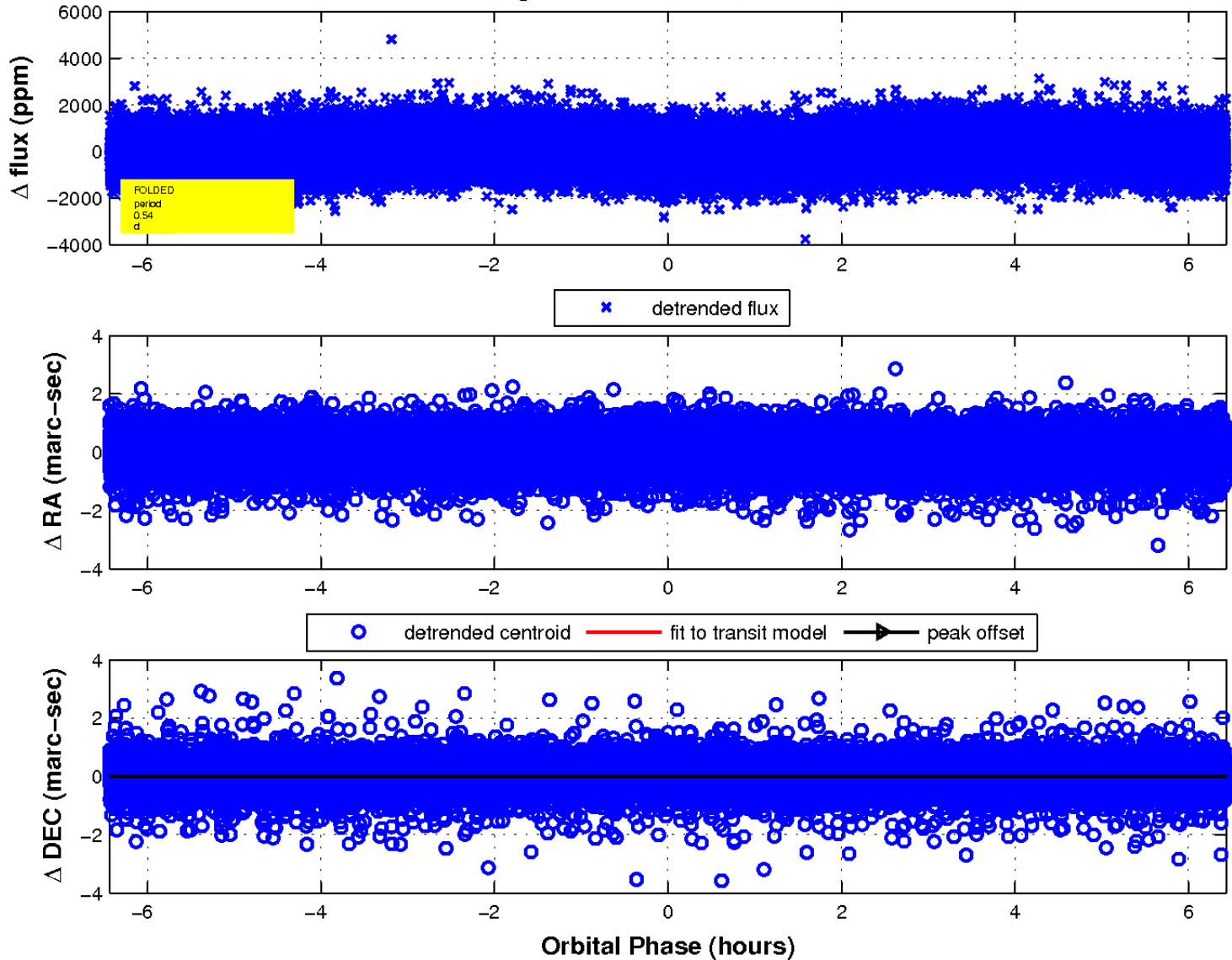




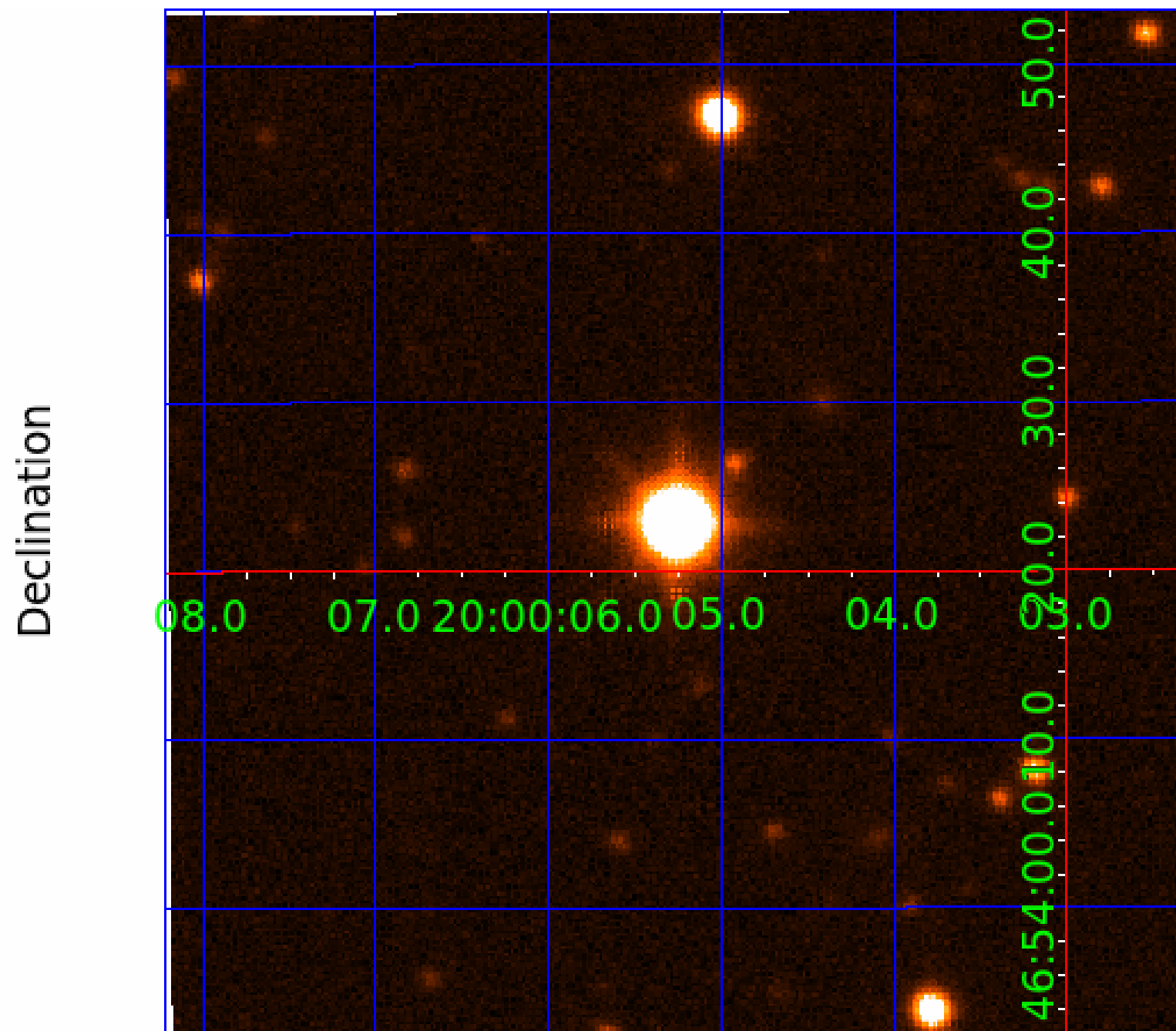
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 6



UKIRT Image



# KIC 010035772

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010035772-01	OBS	No	0.576548	131.975854	109.6	1.135	10.5	9.0	4.50	7504	5.51	0.00
010035772-02	OBS	No	0.536434	131.684486	100.5	3.337	11.7	10.3	4.50	7504	4.71	0.00
010035772-03	OBS	No	22.485213	150.720857	1161.7	2.067	13.2	9.7	4.50	7504	26.49	1293.43
010035772-04	OBS	No	29.344394	150.375488	970.5	3.975	11.0	10.5	4.50	7504	15.32	906.92
010035772-05	OBS	No	31.778434	143.614221	1344.3	1.242	10.6	9.2	4.50	7504	16.74	815.51
010035772-06	OBS	No	20.222738	147.997585	1439.9	1.574	10.5	11.3	4.50	7504	26.42	1489.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010035772-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
010035772-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
010035772-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_SATURATED
010035772-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010035772-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010035772-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

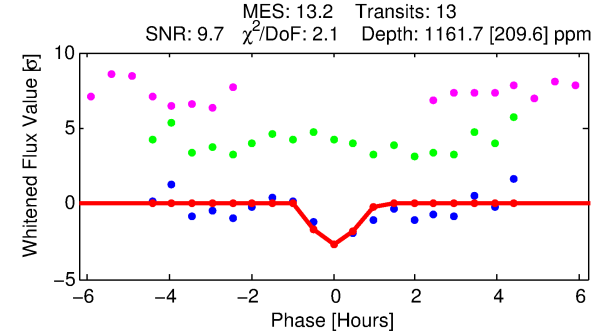
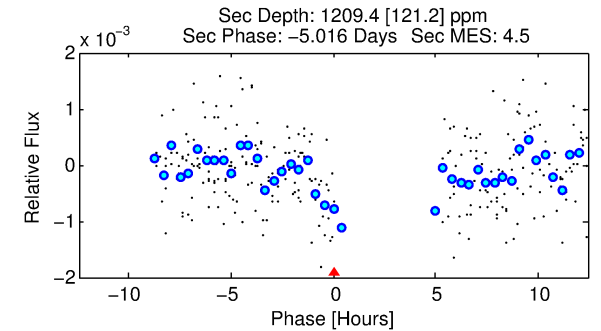
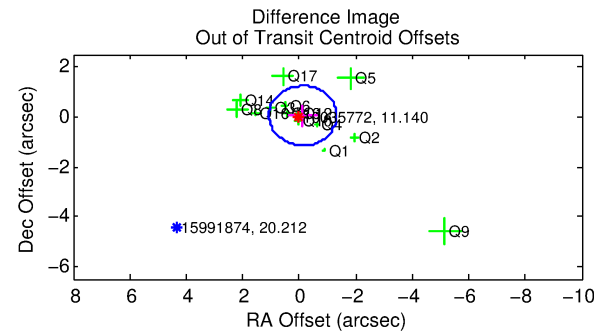
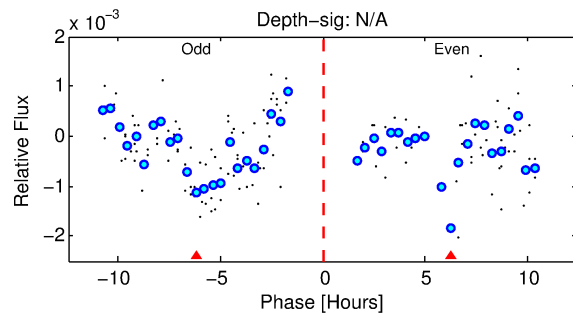
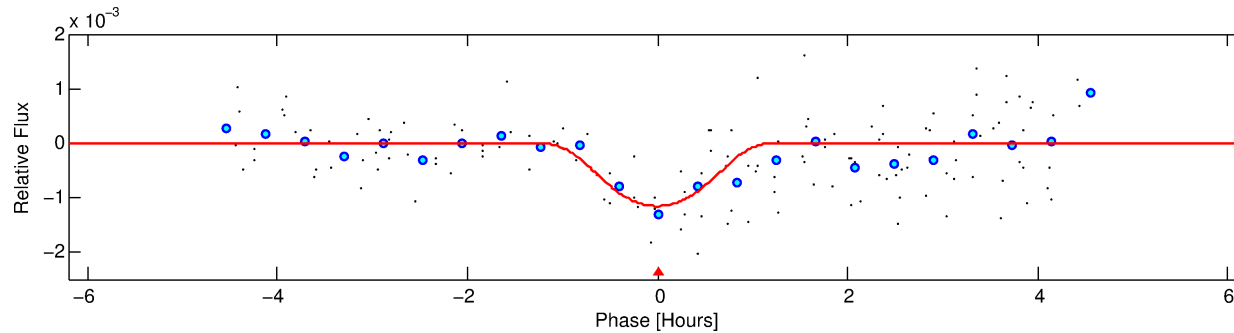
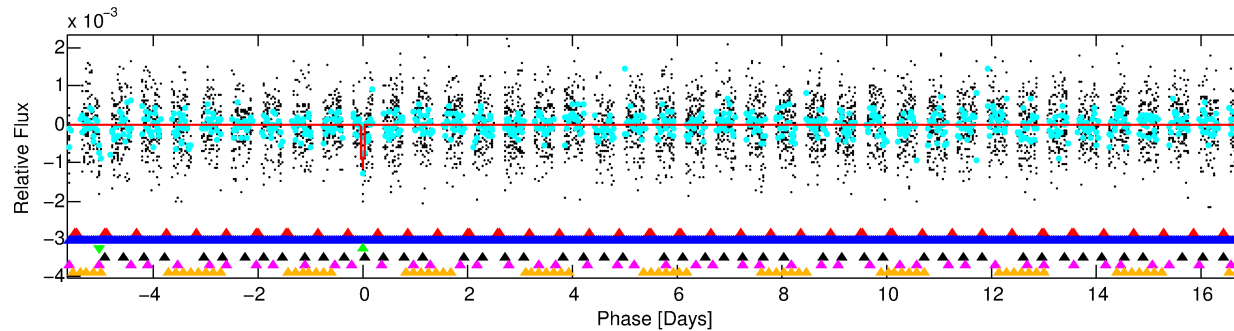
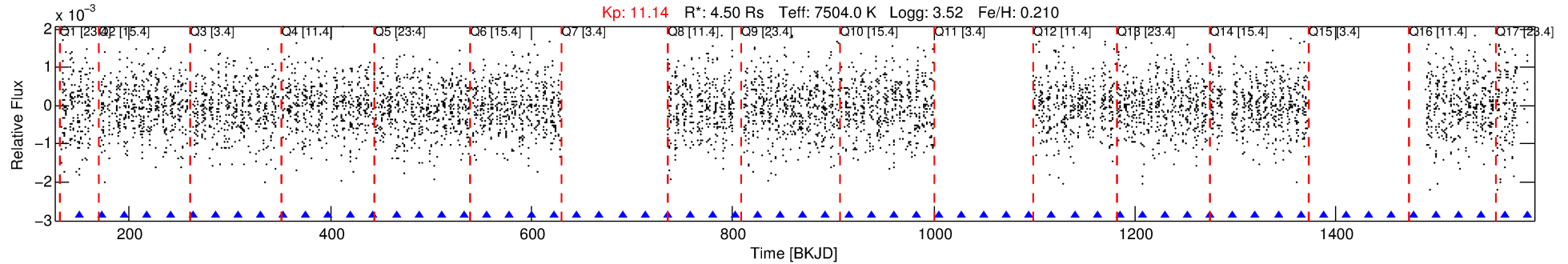
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010035772-03

No Significant Match Found

# DV One-Page Summary

KIC: 10035772 Candidate: 3 of 6 Period: 22.485 d



## DV Fit Results:

Period = 22.48521 [0.00018] d  
Epoch = 150.7209 [0.0066] BKJD  
Rp/R\* = 0.0539 [0.2547]  
a/R\* = 29.47 [39.96]  
b = 0.99 [0.40]  
Seff = 1293.43 [1181.55]  
Teq = 1529 [349] K  
Rp = 26.49 [125.95] Re  
a = 0.2109 [0.1163] AU  
Ag = 42.18 [400.10] [0.10σ]  
Teffp = 6025 [14227] K [0.32σ]

## DV Diagnostic Results:

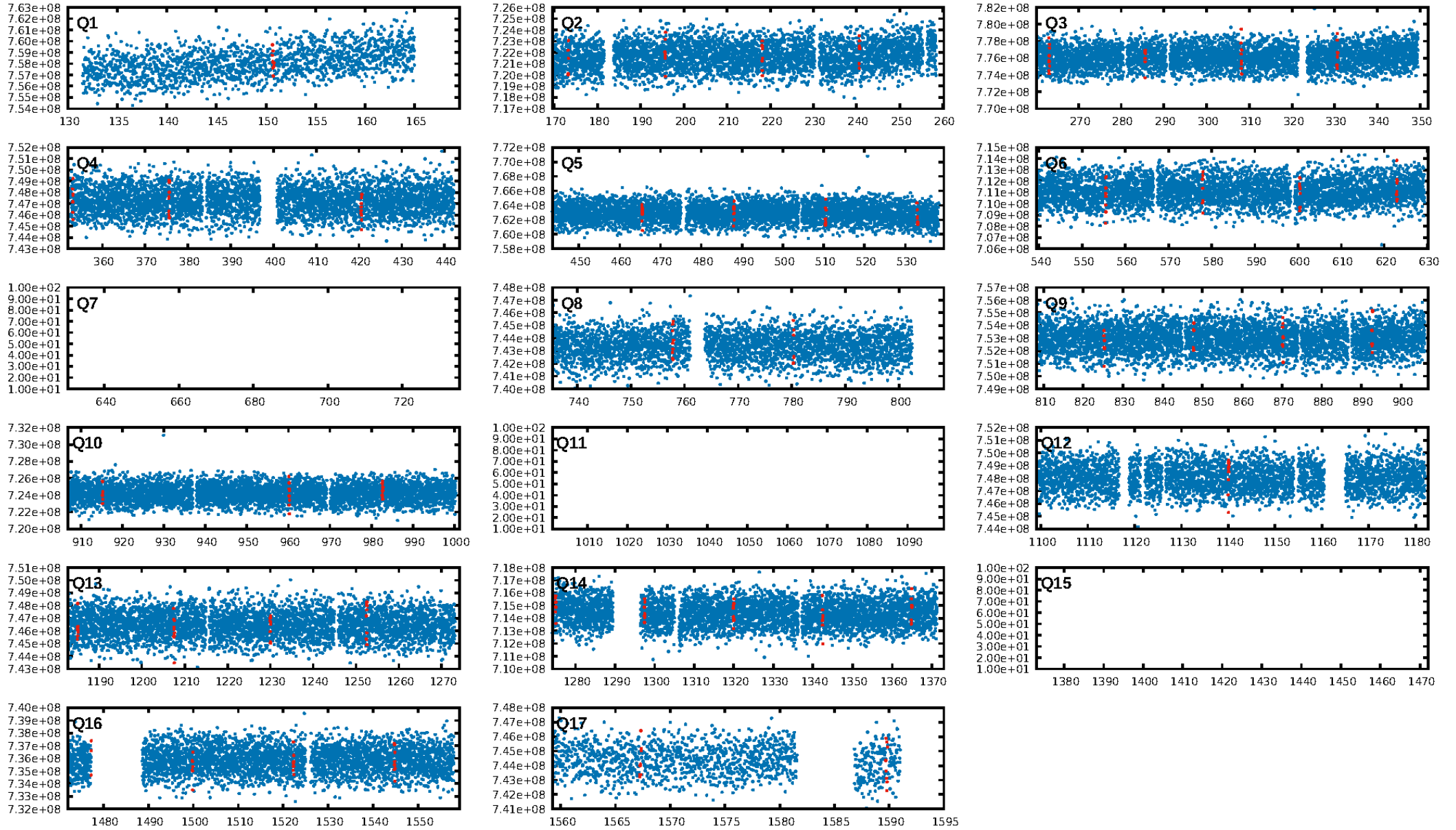
ShortPeriod-sig: 100.0% [20.90σ]  
LongPeriod-sig: 100.0% [36.74σ]  
ModelChiSquare2-sig: 4.4%  
ModelChiSquareGof-sig: 96.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [12/12]  
GhostDiagnostic-chr: 1.011  
Centroid-sig: N/A  
Centroid-so: 0.298 arcsec [4.03σ]  
OotOffset-rm: 0.127 arcsec [0.32σ]  
KicOffset-rm: 0.043 arcsec [0.17σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.50 [7/14]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:13:38 Z

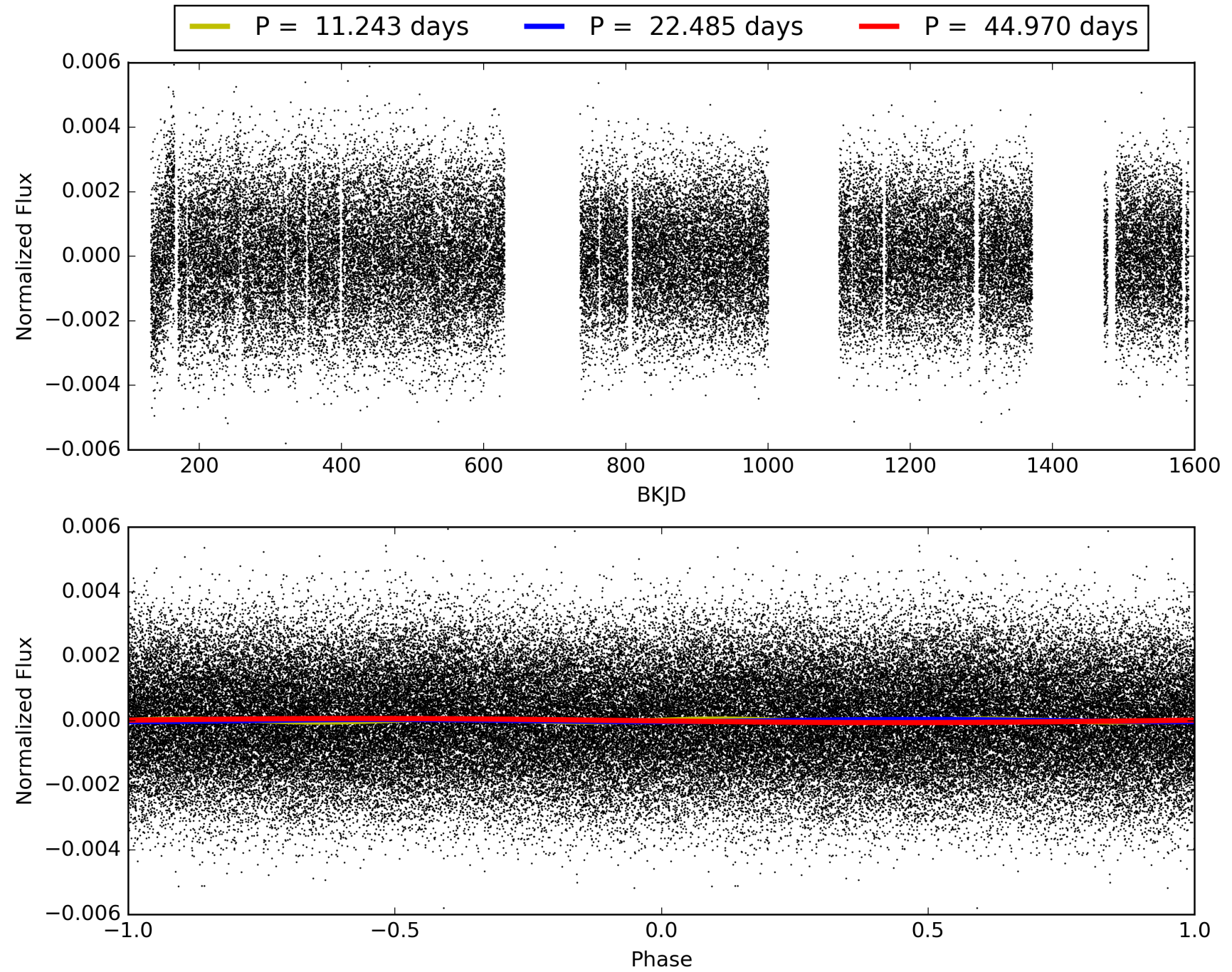
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 010035772-03, PDC Light Curves

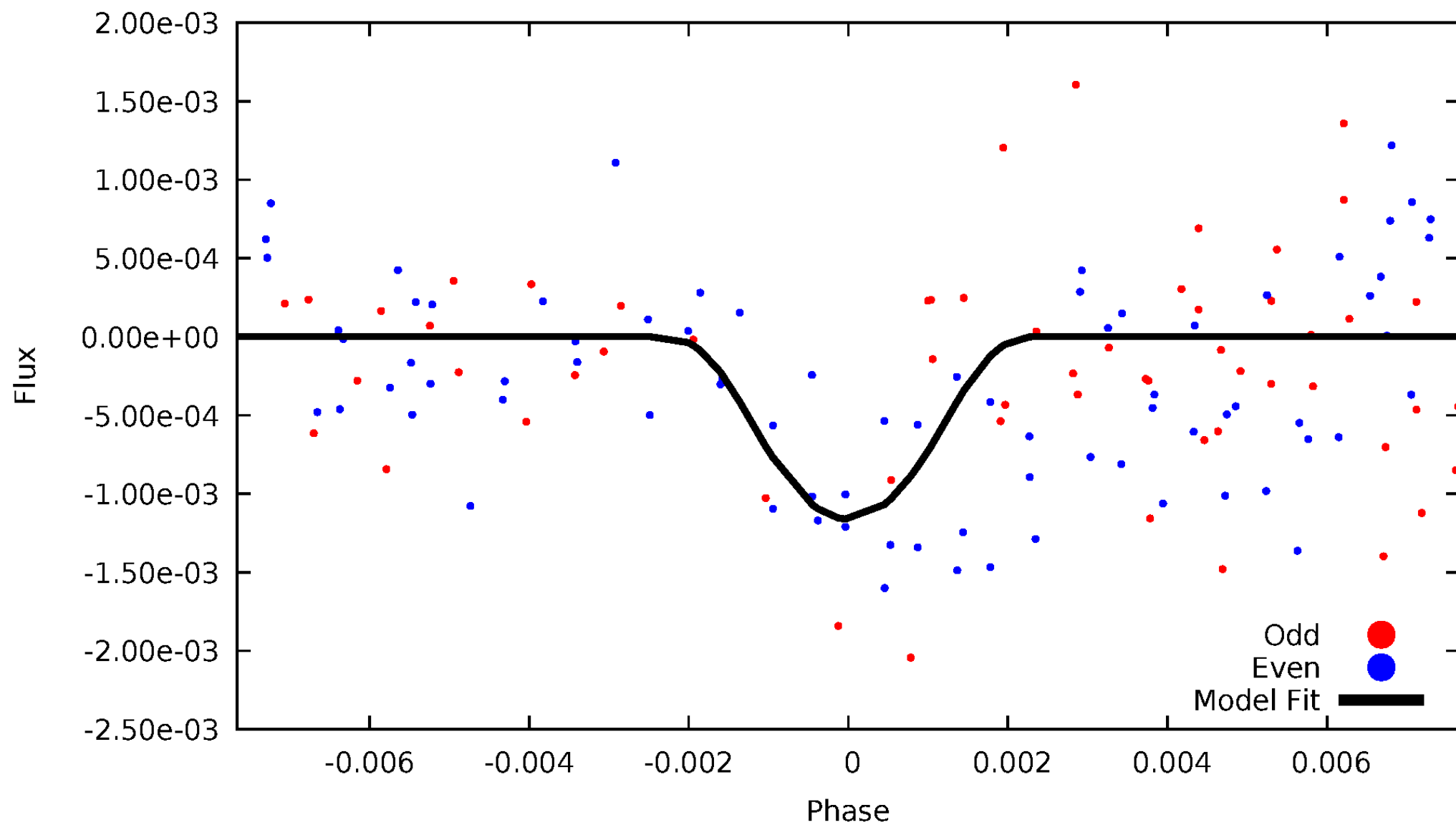


# TCE 010035772-03



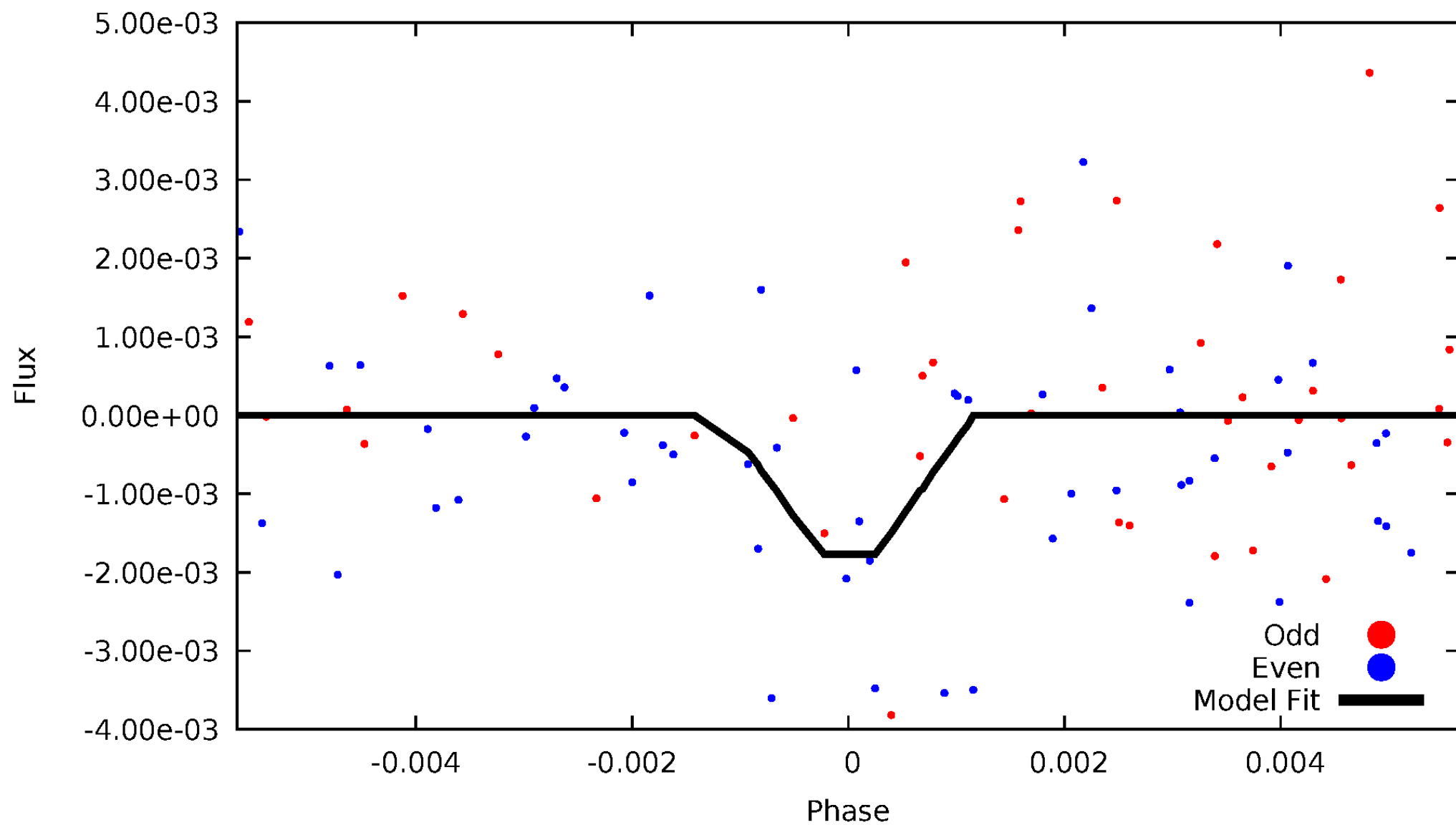
# DV Odd/Even

TCE 010035772-03



# ALT Odd/Even

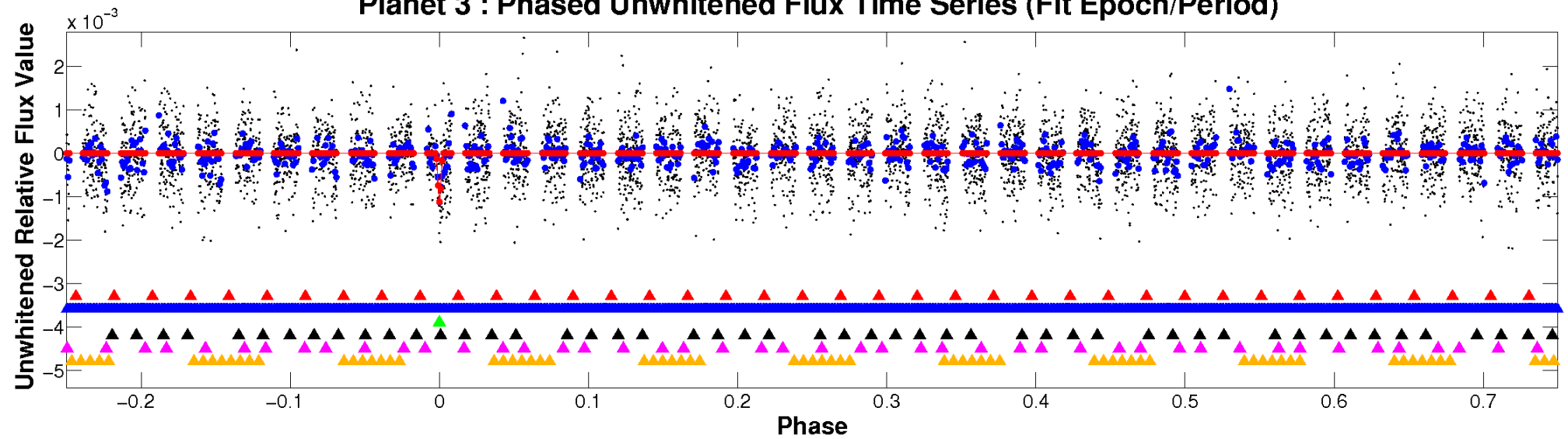
TCE 010035772-03



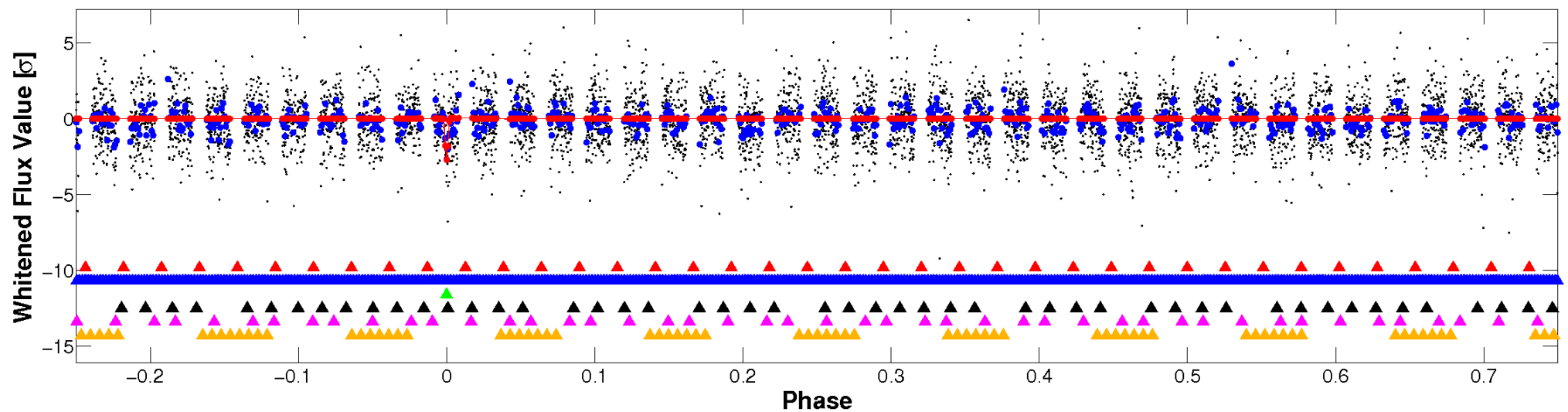


# Non-Whitened Vs. Whitened Light Curve

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

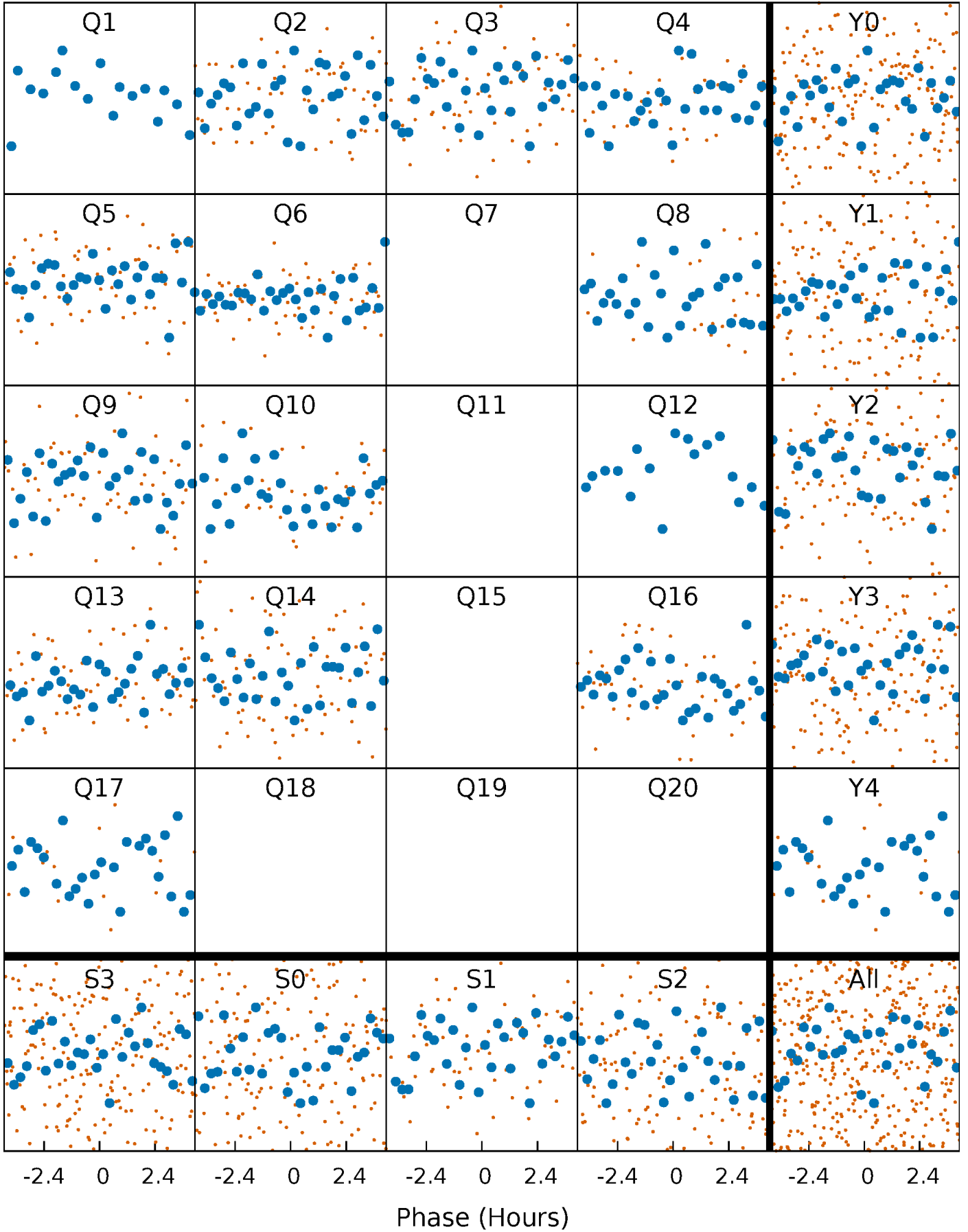


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



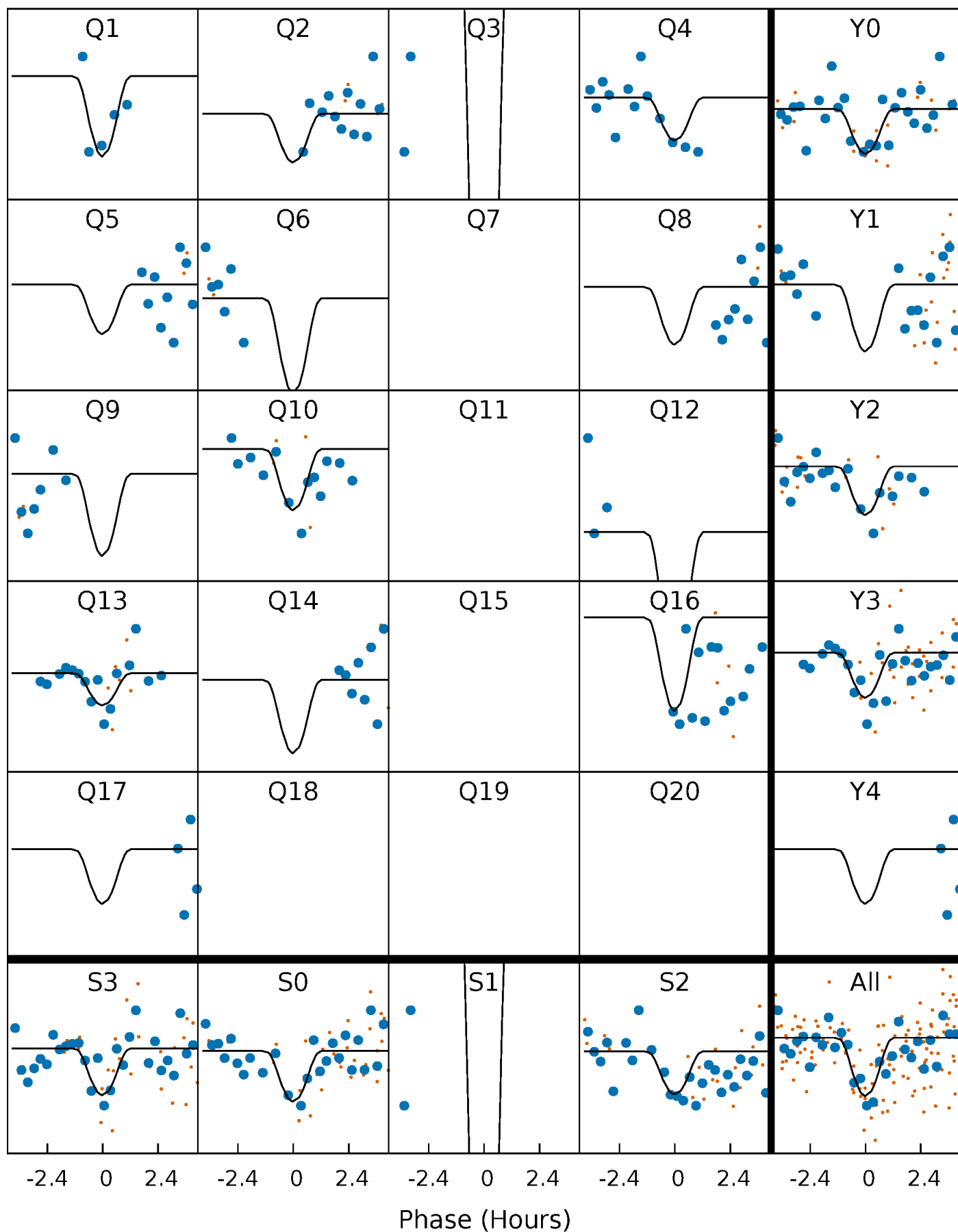
# PDC Quarter-Phased Transit Curves

TCE 010035772-03   P= 22.485213 Days    $T_0=150.720857$  (BKJD)



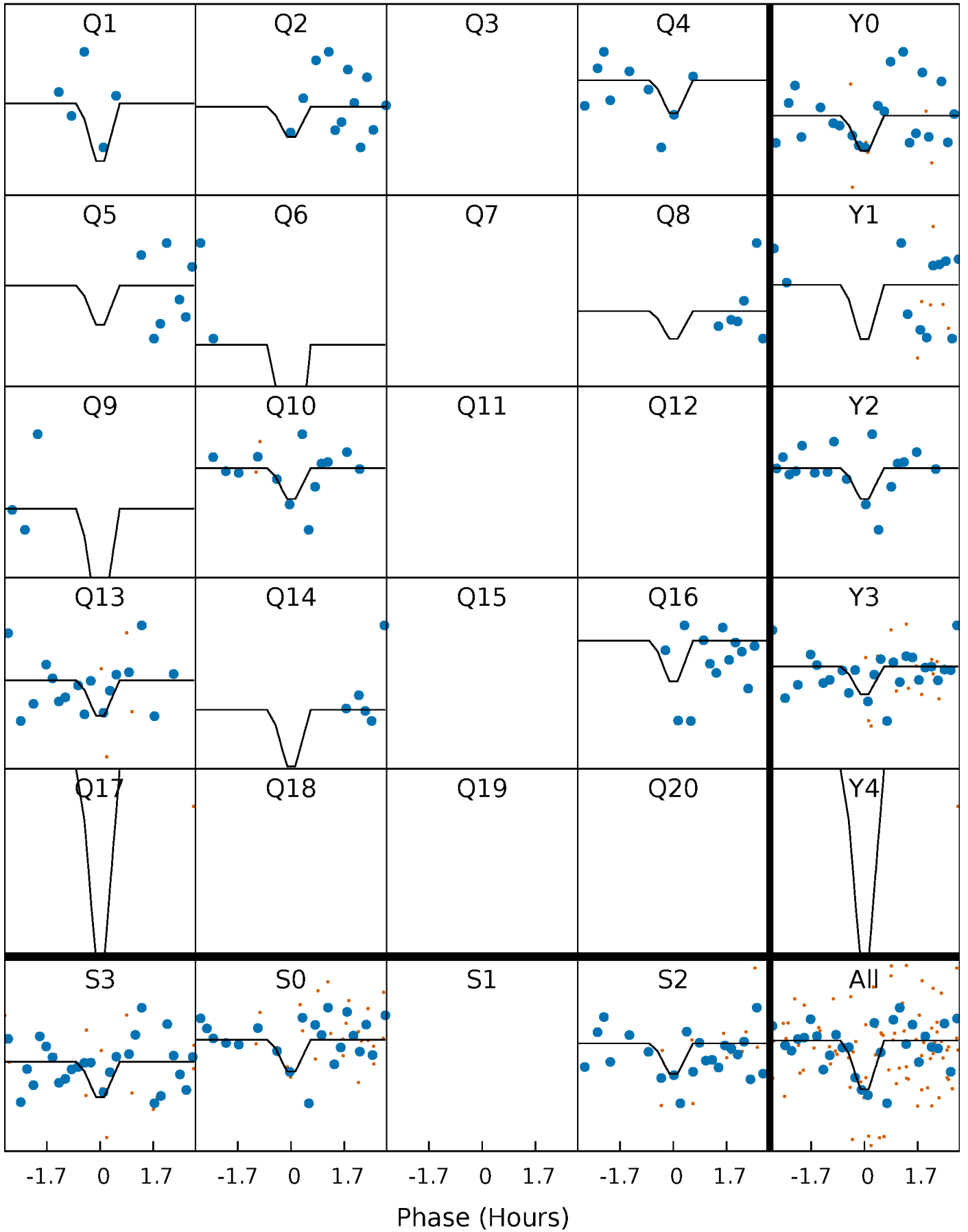
# DV Quarter-Phased Transit Curves

TCE 010035772-03 P= 22.485213 Days  $T_0=150.720857$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010035772-03 P= 22.485030 Days  $T_0=150.738156$  (BKJD)

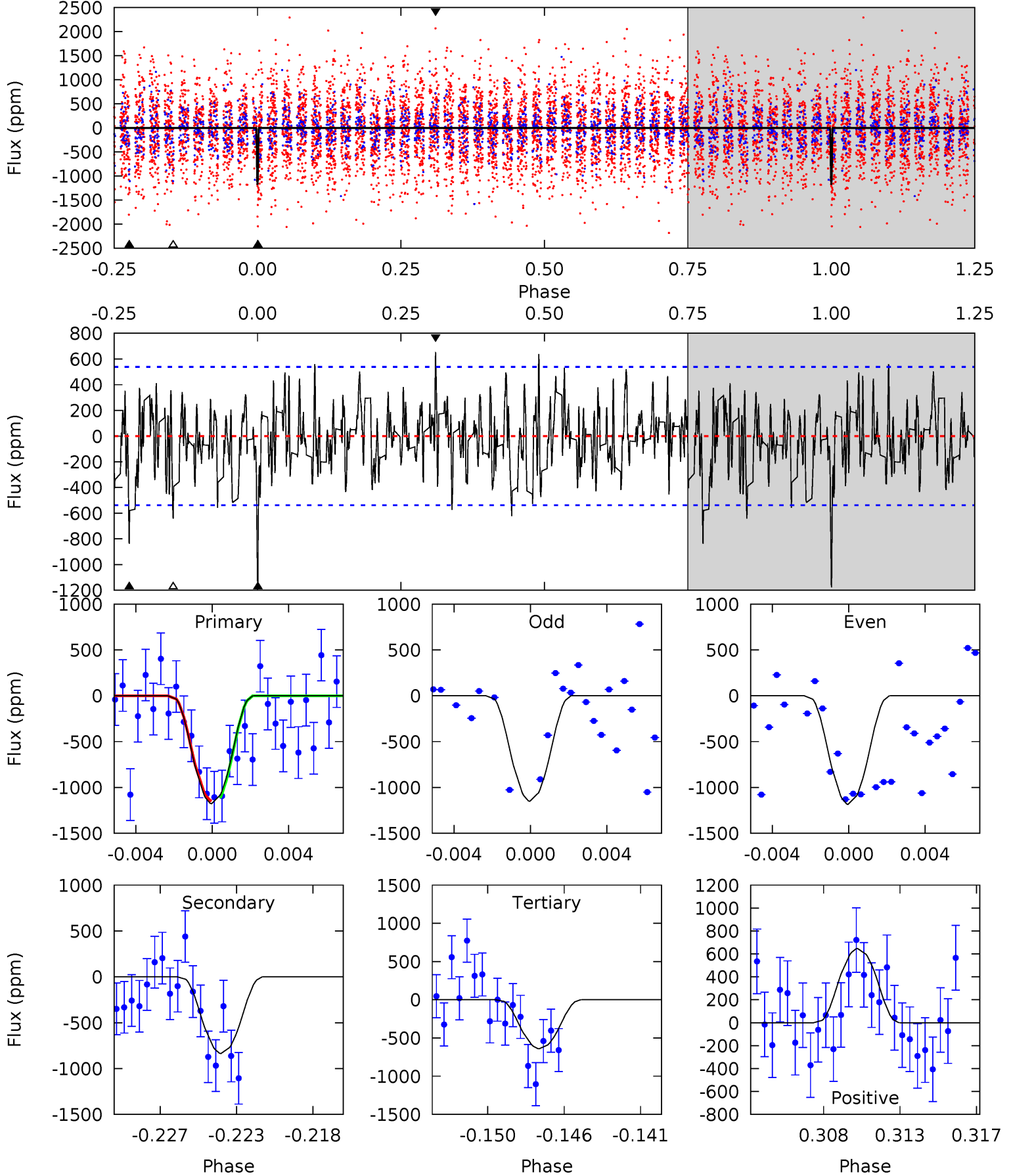




# DV Model-Shift Uniqueness Test

010035772-03, P = 22.485213 Days, E = 128.235644 Days

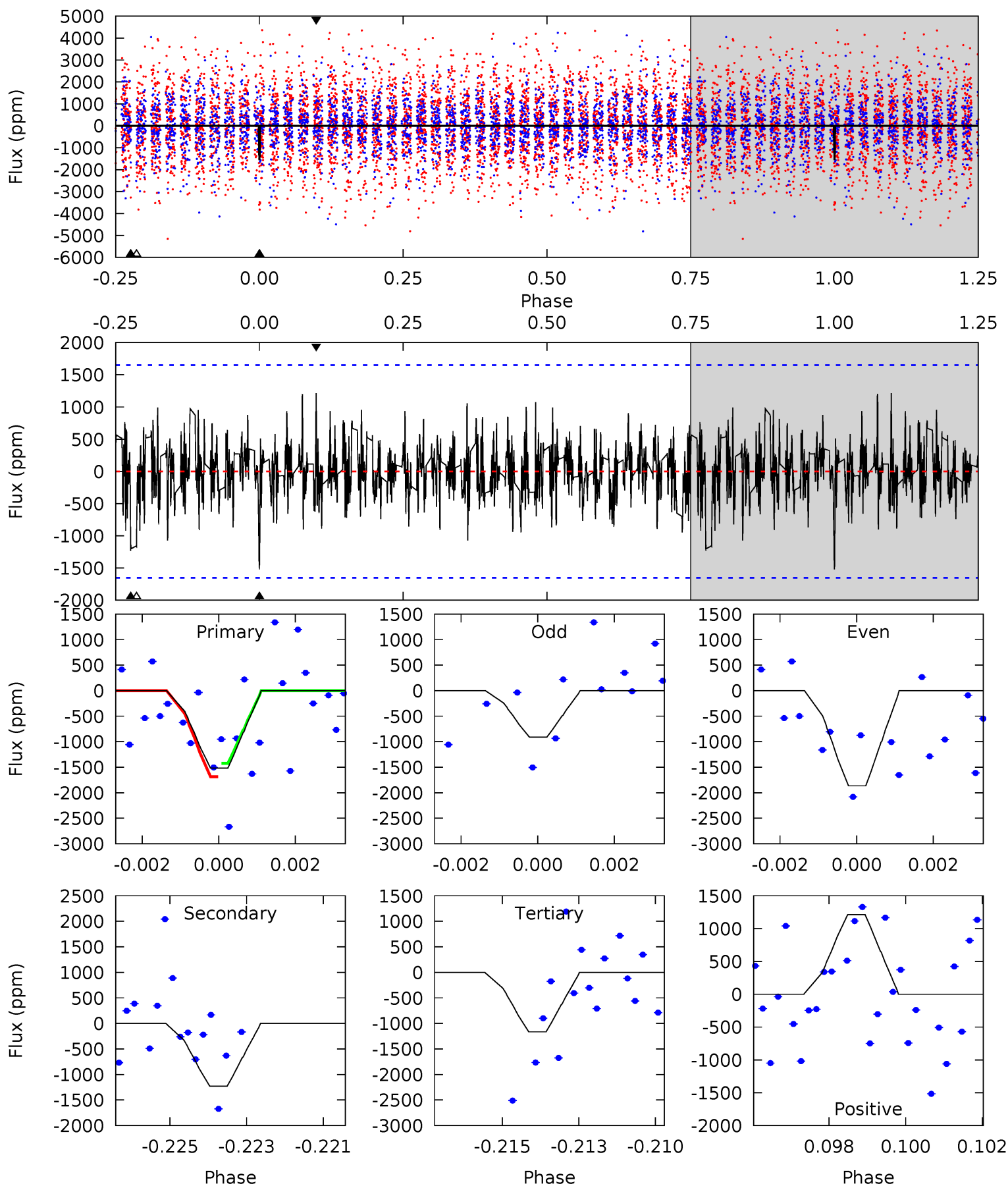
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	8.07	6.19	6.24	5.19	2.86	2.05	5.17	5.11	1.88	1.82	0.15	0.85	0.35	0.16



# Alt Model-Shift Uniqueness Test

010035772-03, P = 22.485030 Days, E = 128.253126 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.90	3.97	3.76	3.91	5.32	3.08	1.16	1.14	0.98	0.21	0.06	1.47	0.69	0.44	0.40



### Stellar Parameters For KIC 010035772

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7504^{+209}_{-328}$	$3.525^{+0.532}_{-0.028}$	$0.210^{+0.150}_{-0.350}$	$4.501^{+0.278}_{-2.499}$	$2.472^{+0.147}_{-0.832}$	$0.038^{+0.253}_{-0.004}$
	+3%/-4%	+15%/-1%	+71%/-167%	+6%/-56%	+6%/-34%	+663%/-10%
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 010035772-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-837 \pm 104$	$74.25^{+84.40}_{-52.53}$	$2025^{+141}_{-275}$	$3428^{+1856}_{-823}$	$3.567^{+35.025}_{-2.798}$
Alt.	$-1231 \pm 310$	$79.57^{+91.19}_{-57.68}$	$2025^{+151}_{-255}$	$3554^{+2432}_{-797}$	$4.596^{+61.278}_{-3.584}$

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

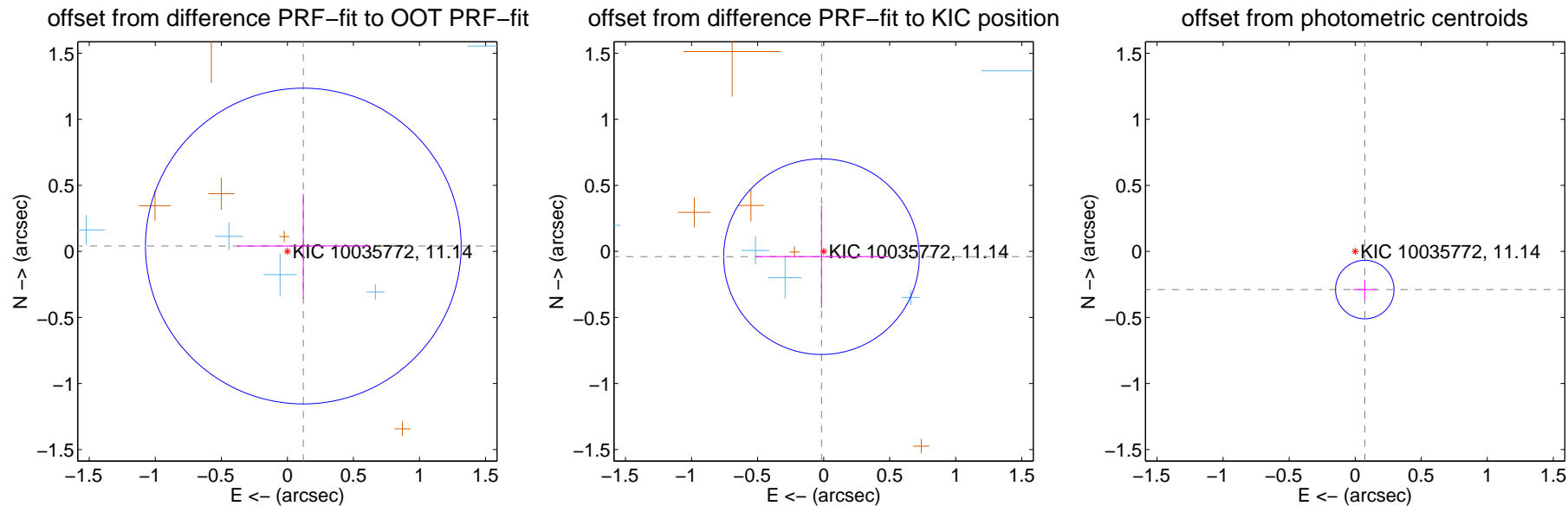
## DV Centroid Data

Supplemental centroid analysis for 010035772-03. **Kepler magnitude: 11.14.** Transit SNR 9.70

There are 7 quarters with good PRF difference image offsets

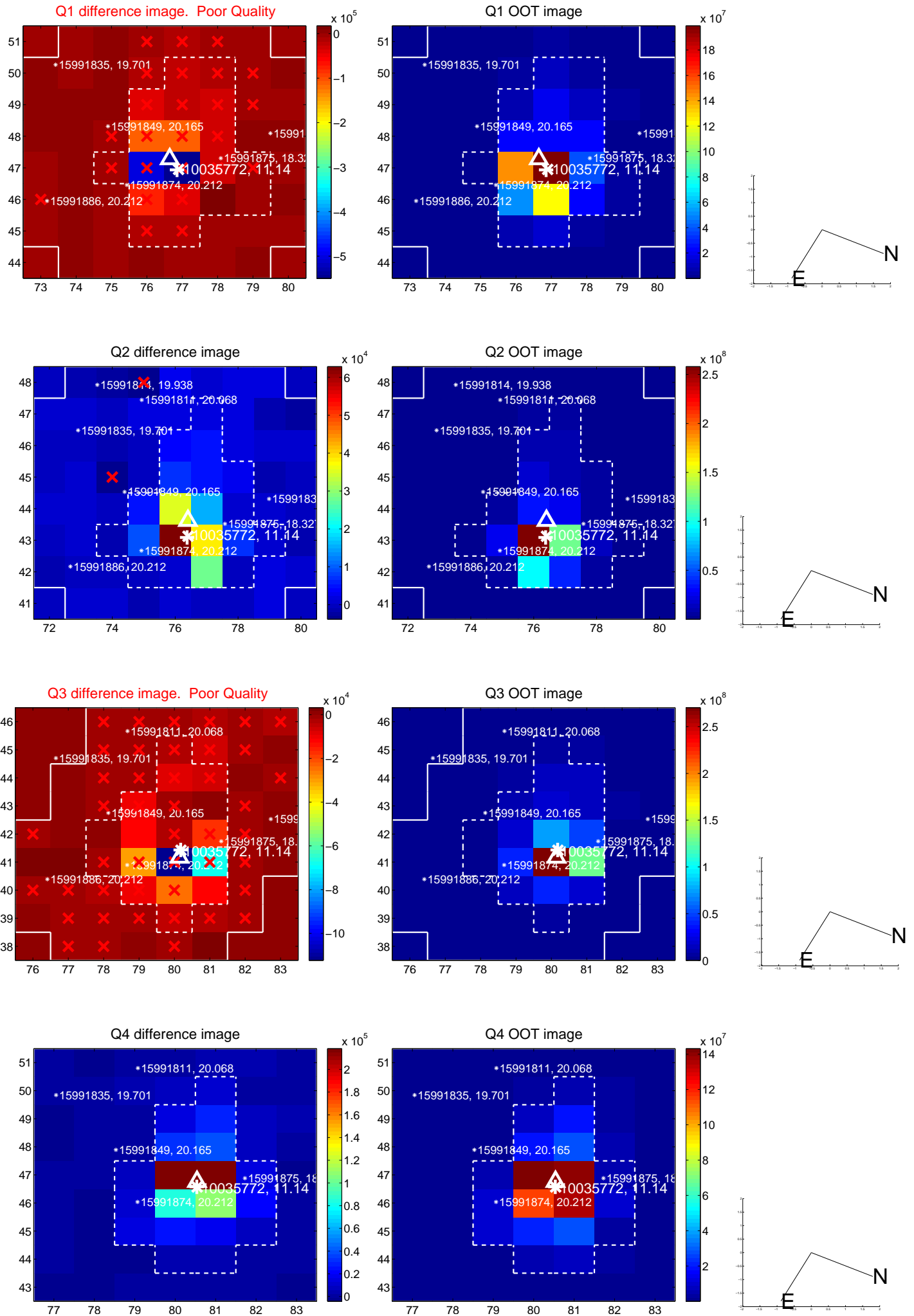
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.127 \pm 0.398$	0.32	$-0.121 \pm 0.500$	$0.041 \pm 0.395$
PRF-fit source offset from KIC position	$0.043 \pm 0.247$	0.17	$0.016 \pm 0.500$	$-0.040 \pm 0.387$
photometric centroid source offset	<b><math>0.30 \pm 0.07</math></b>	<b>4.03</b>	$-0.07 \pm 0.09$	$-0.29 \pm 0.07$



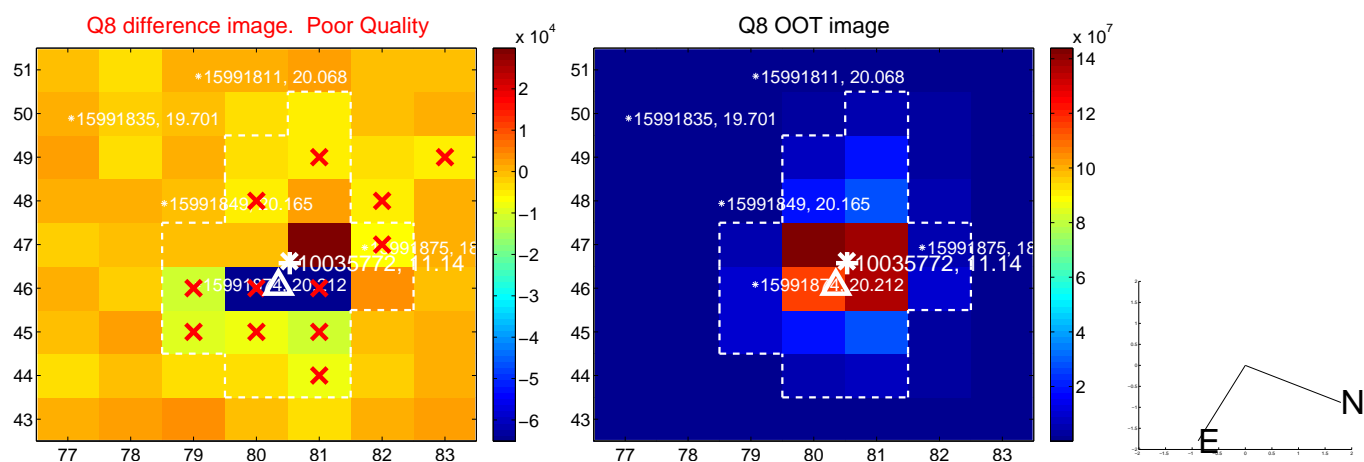
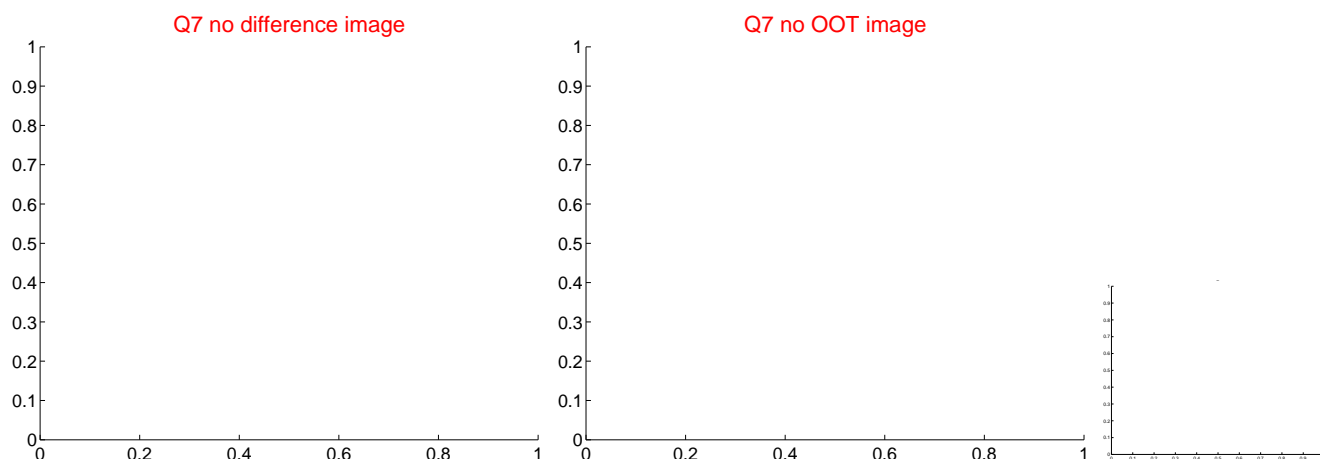
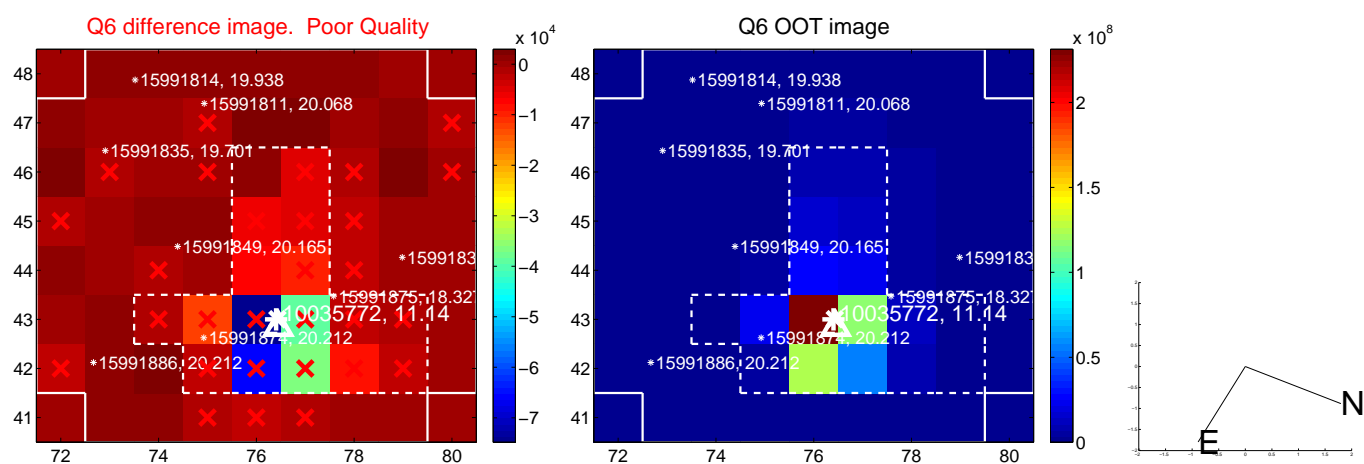
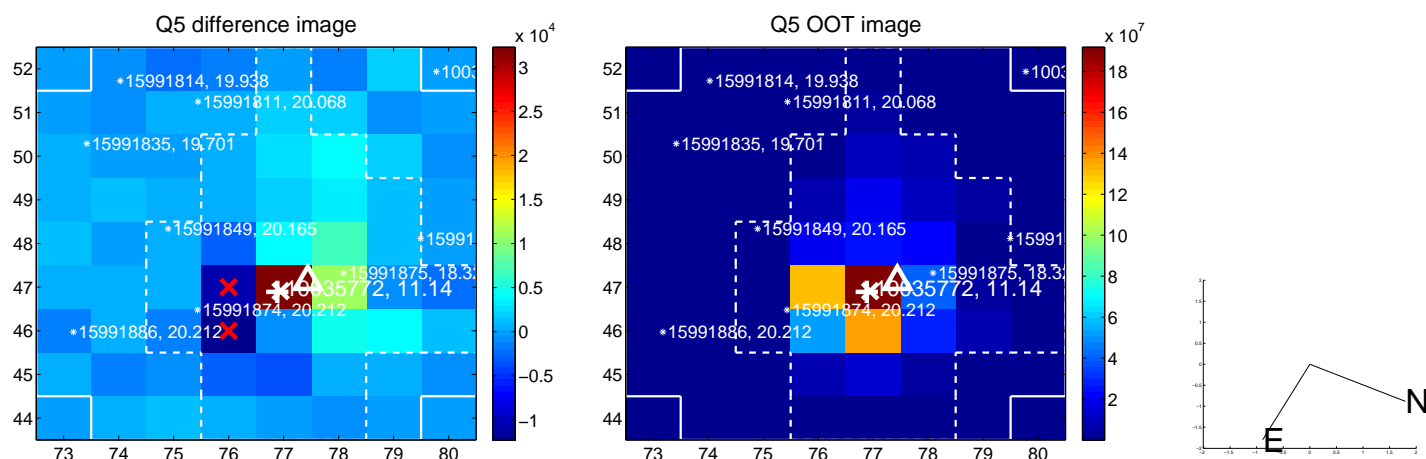
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

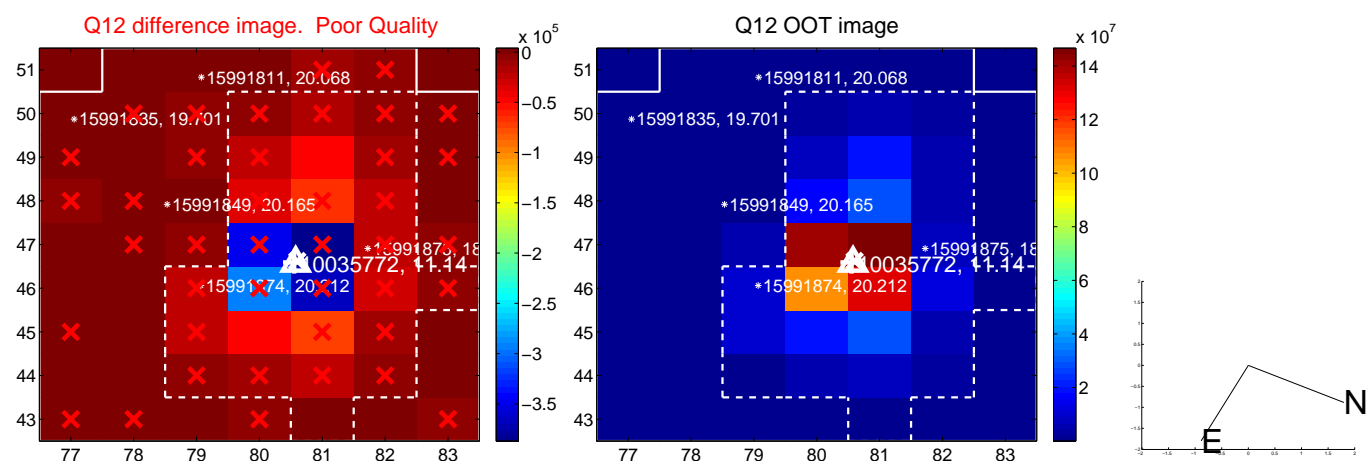
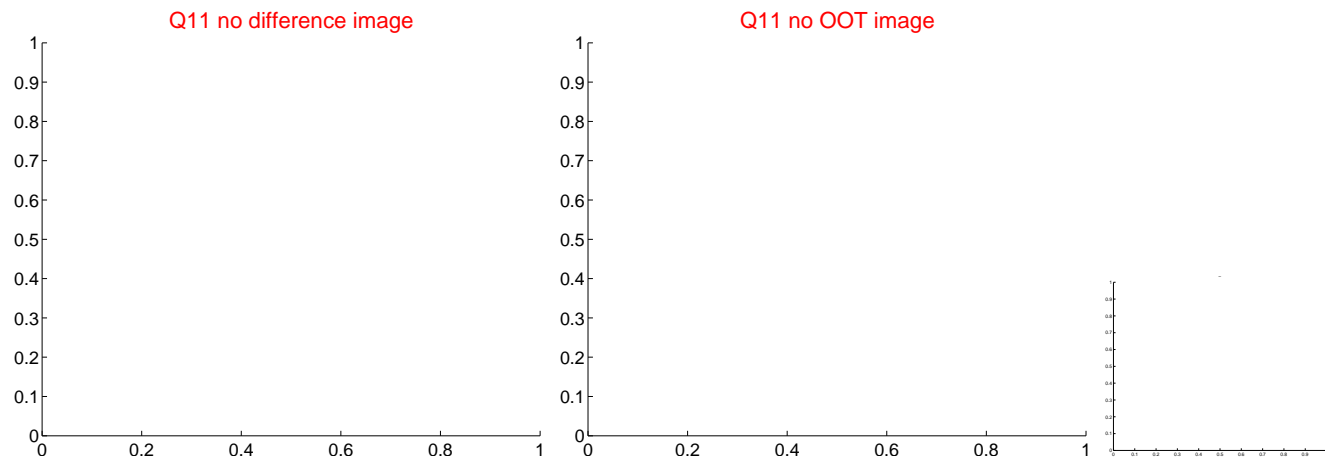
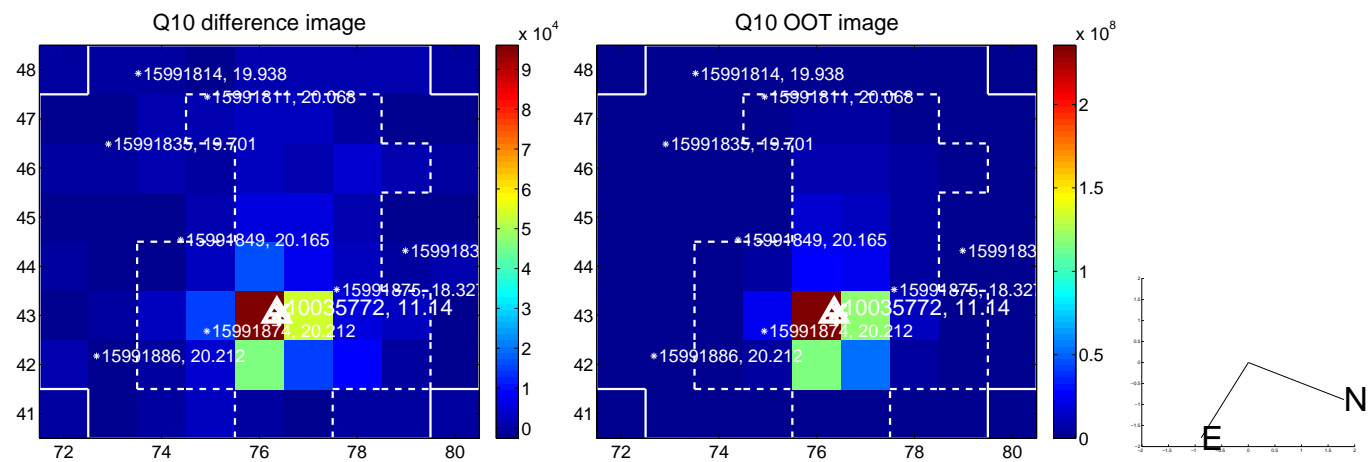
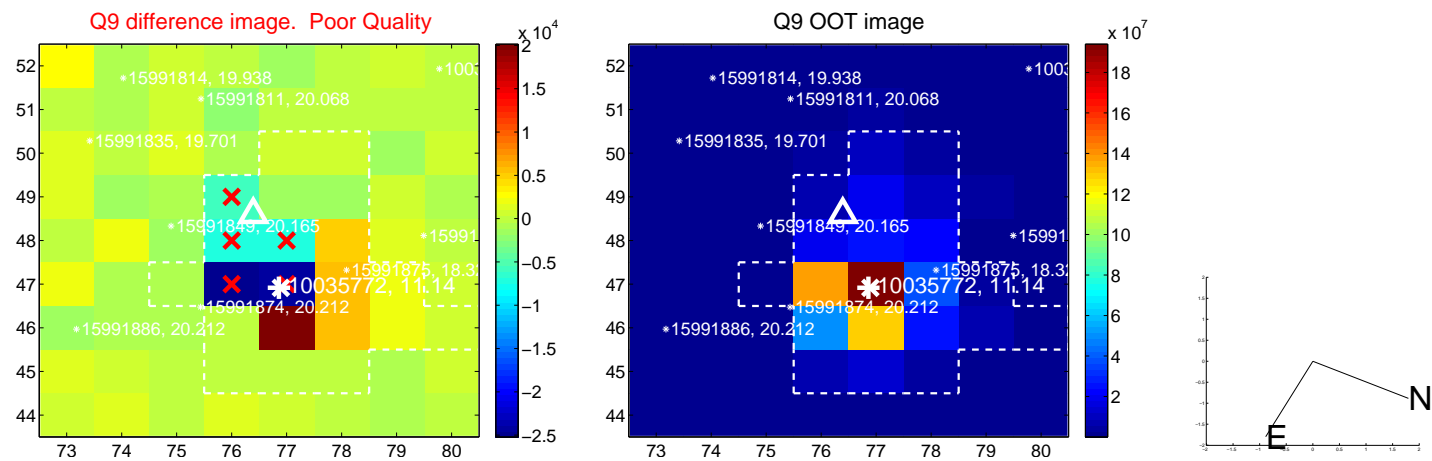




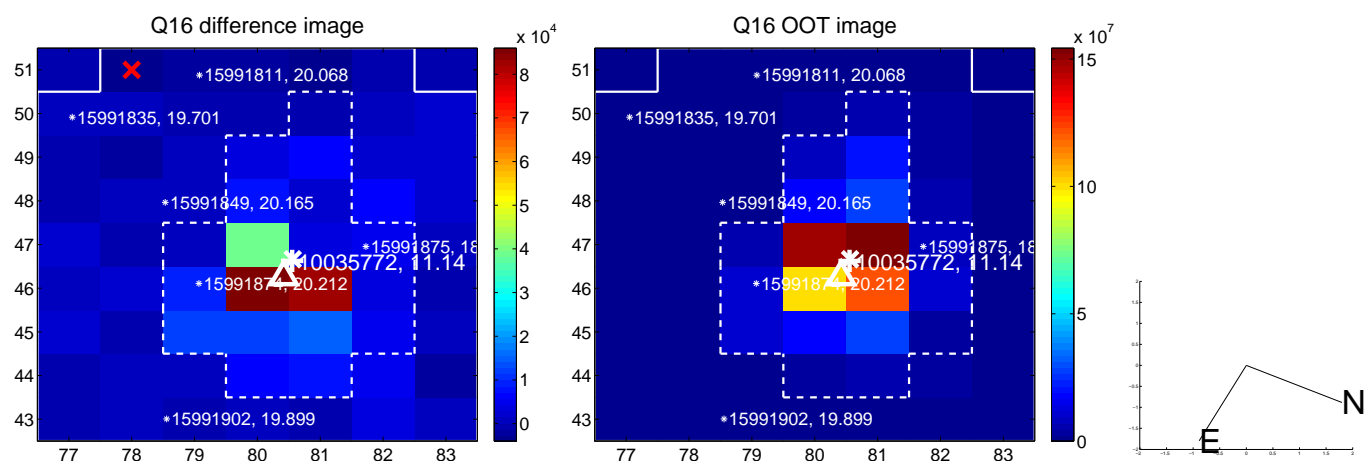
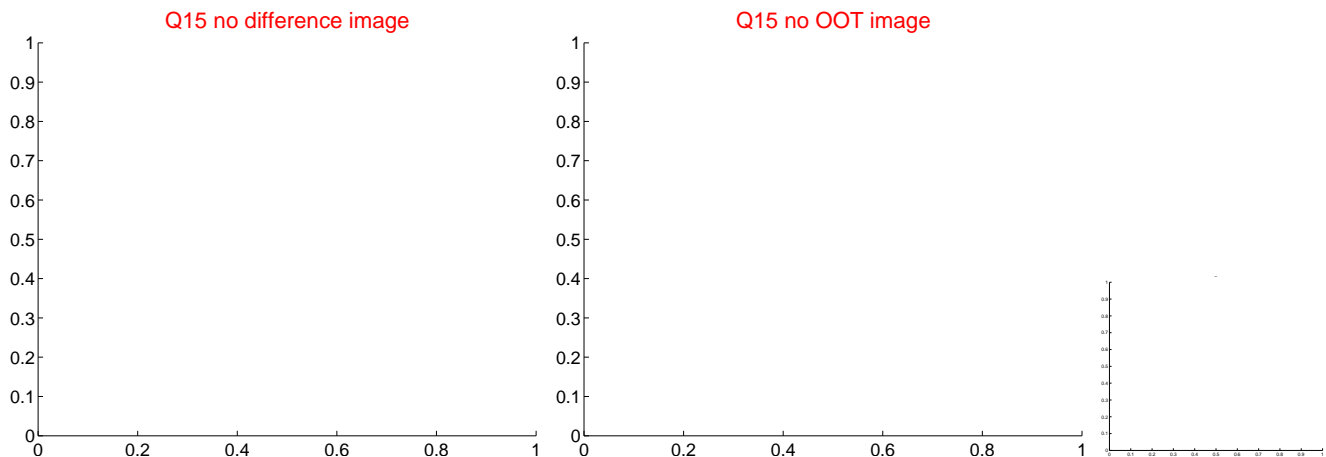
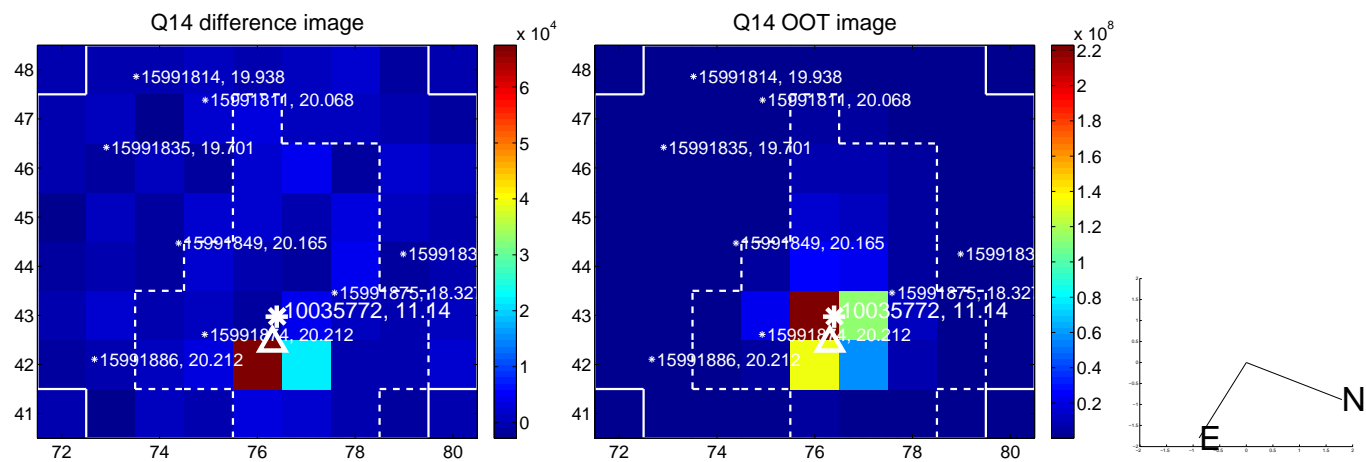
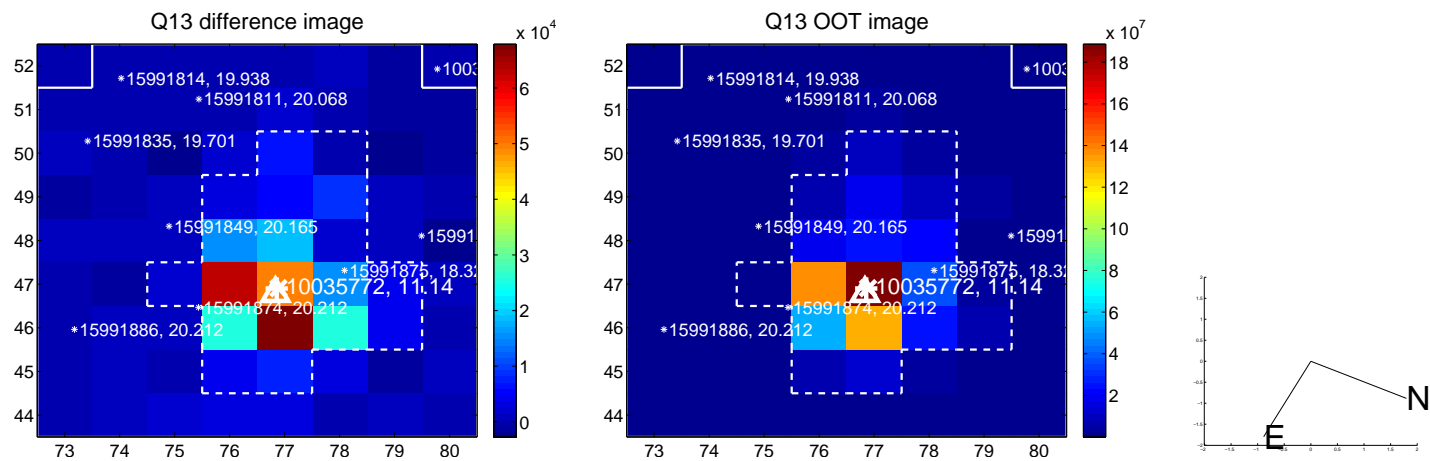
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



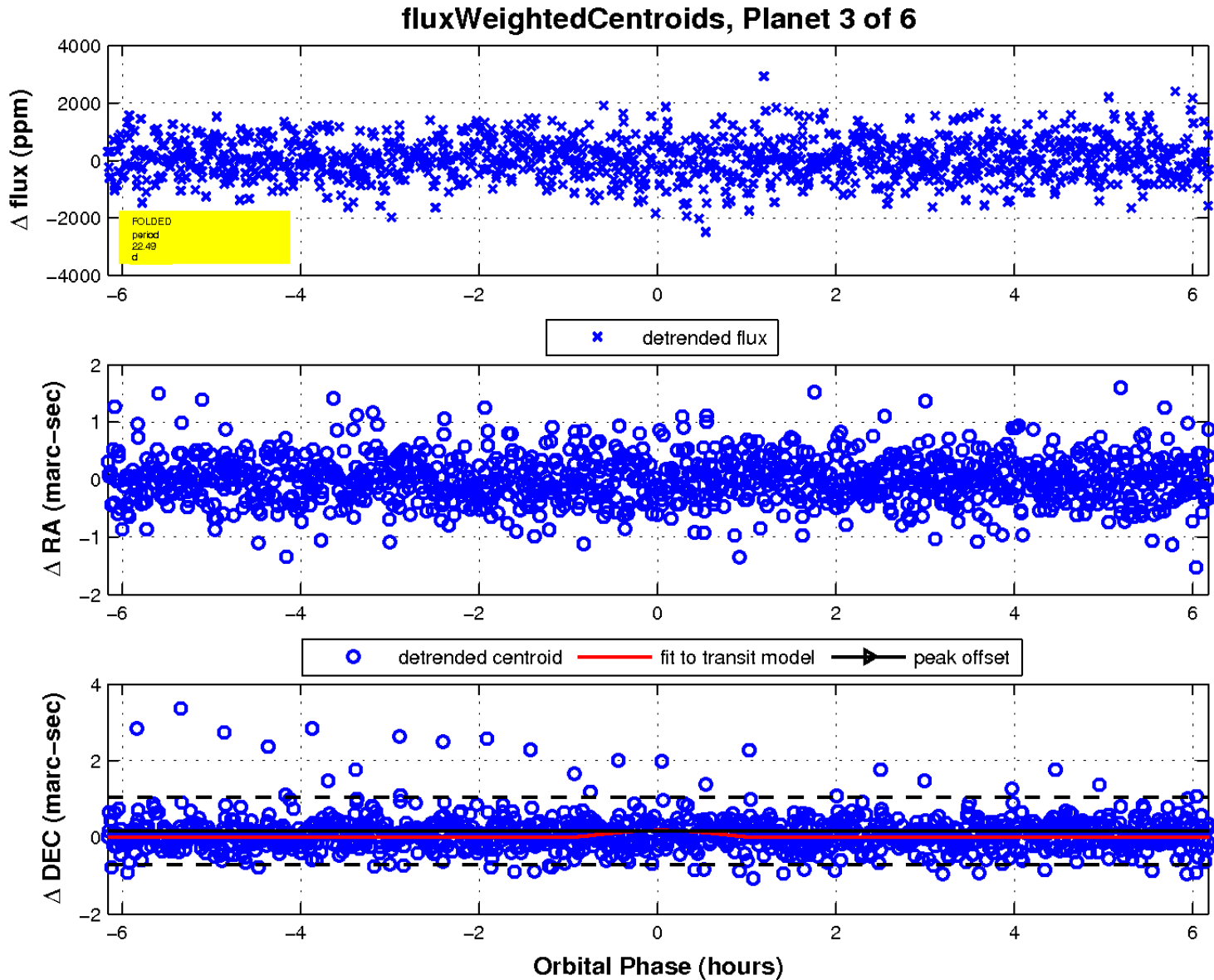
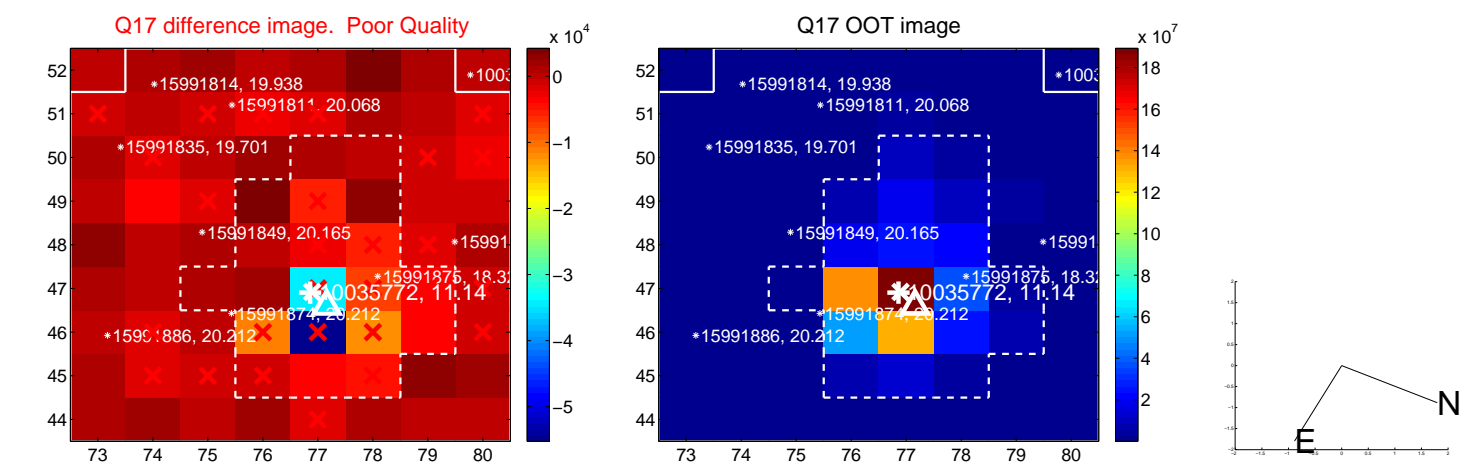
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



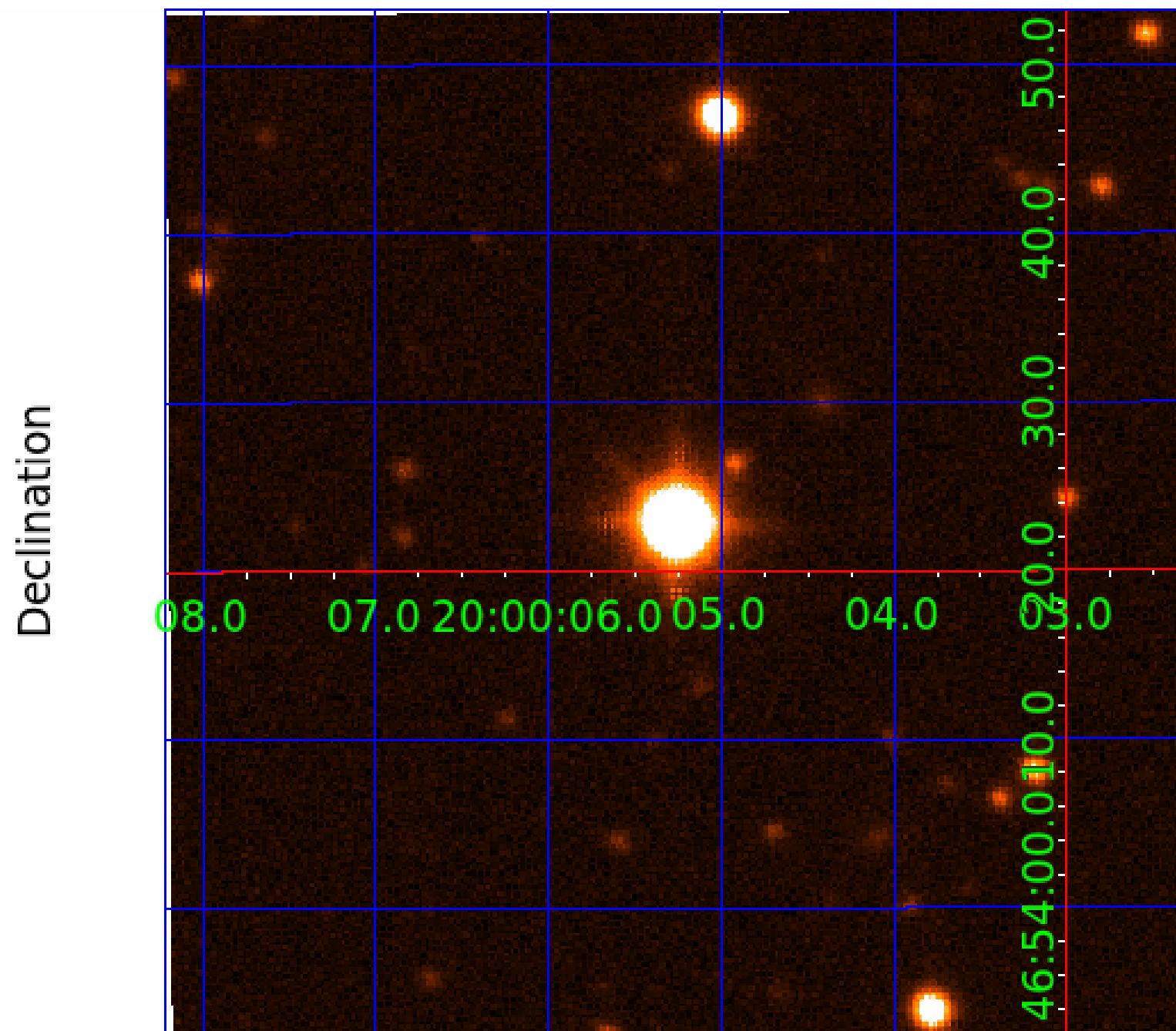
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 010035772

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010035772-01	OBS	No	0.576548	131.975854	109.6	1.135	10.5	9.0	4.50	7504	5.51	0.00
010035772-02	OBS	No	0.536434	131.684486	100.5	3.337	11.7	10.3	4.50	7504	4.71	0.00
010035772-03	OBS	No	22.485213	150.720857	1161.7	2.067	13.2	9.7	4.50	7504	26.49	1293.43
010035772-04	OBS	No	29.344394	150.375488	970.5	3.975	11.0	10.5	4.50	7504	15.32	906.92
010035772-05	OBS	No	31.778434	143.614221	1344.3	1.242	10.6	9.2	4.50	7504	16.74	815.51
010035772-06	OBS	No	20.222738	147.997585	1439.9	1.574	10.5	11.3	4.50	7504	26.42	1489.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010035772-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
010035772-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
010035772-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_SATURATED
010035772-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010035772-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010035772-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

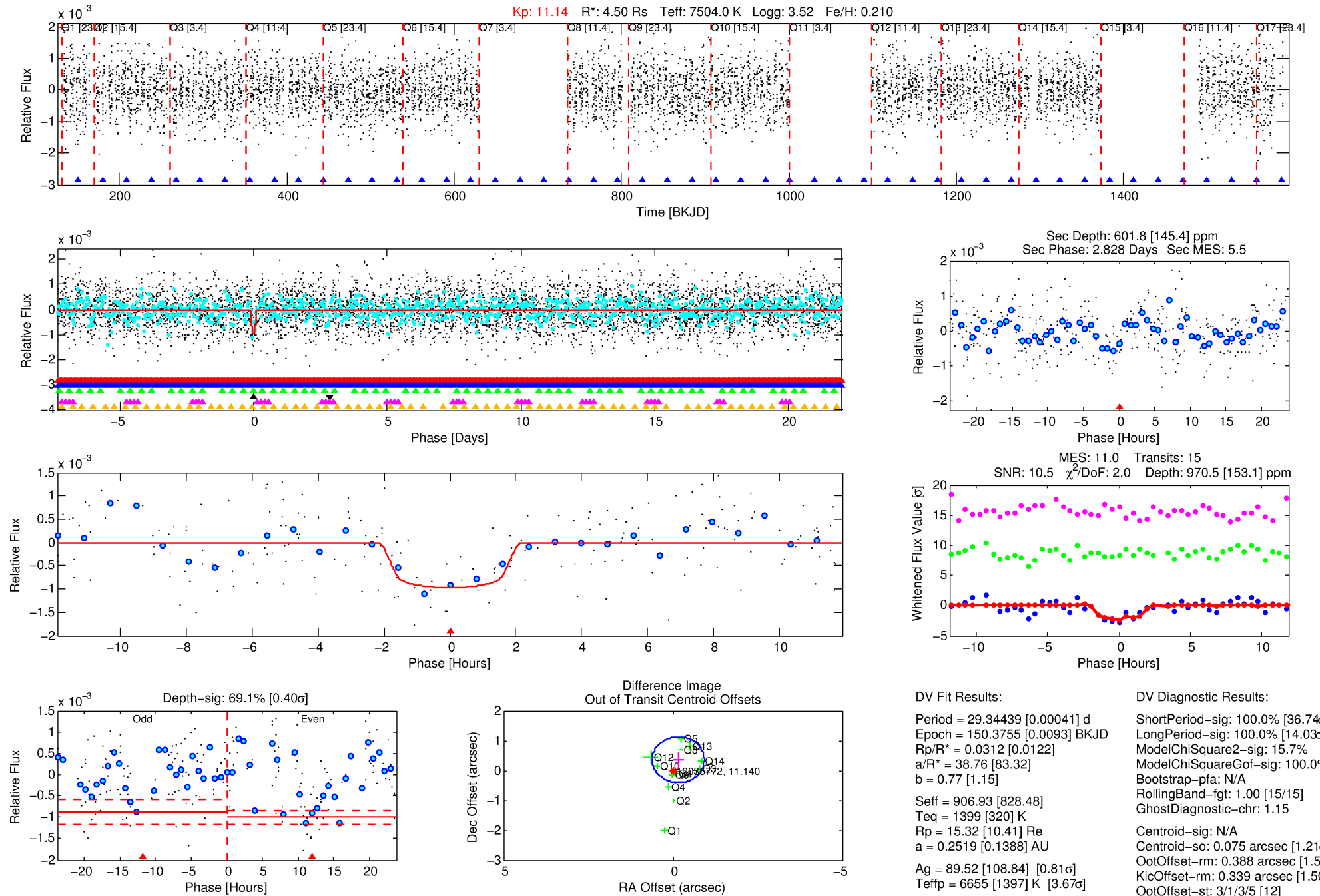
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010035772-04

No Significant Match Found

# DV One-Page Summary

KIC: 10035772 Candidate: 4 of 6 Period: 29.344 d



## DV Fit Results:

Period = 29.34439 [0.00041] d  
Epoch = 150.3755 [0.0093] BKJD  
Rp/R\* = 0.0312 [0.0122]  
a/R\* = 38.76 [83.32]  
b = 0.77 [1.15]  
Seff = 906.93 [828.48]  
Teq = 1399 [320] K  
Rp = 15.32 [10.41] Re  
a = 0.2519 [0.1388] AU  
Ag = 89.52 [108.84] [0.81 $\sigma$ ]  
Teff = 6655 [1397] K [3.67 $\sigma$ ]

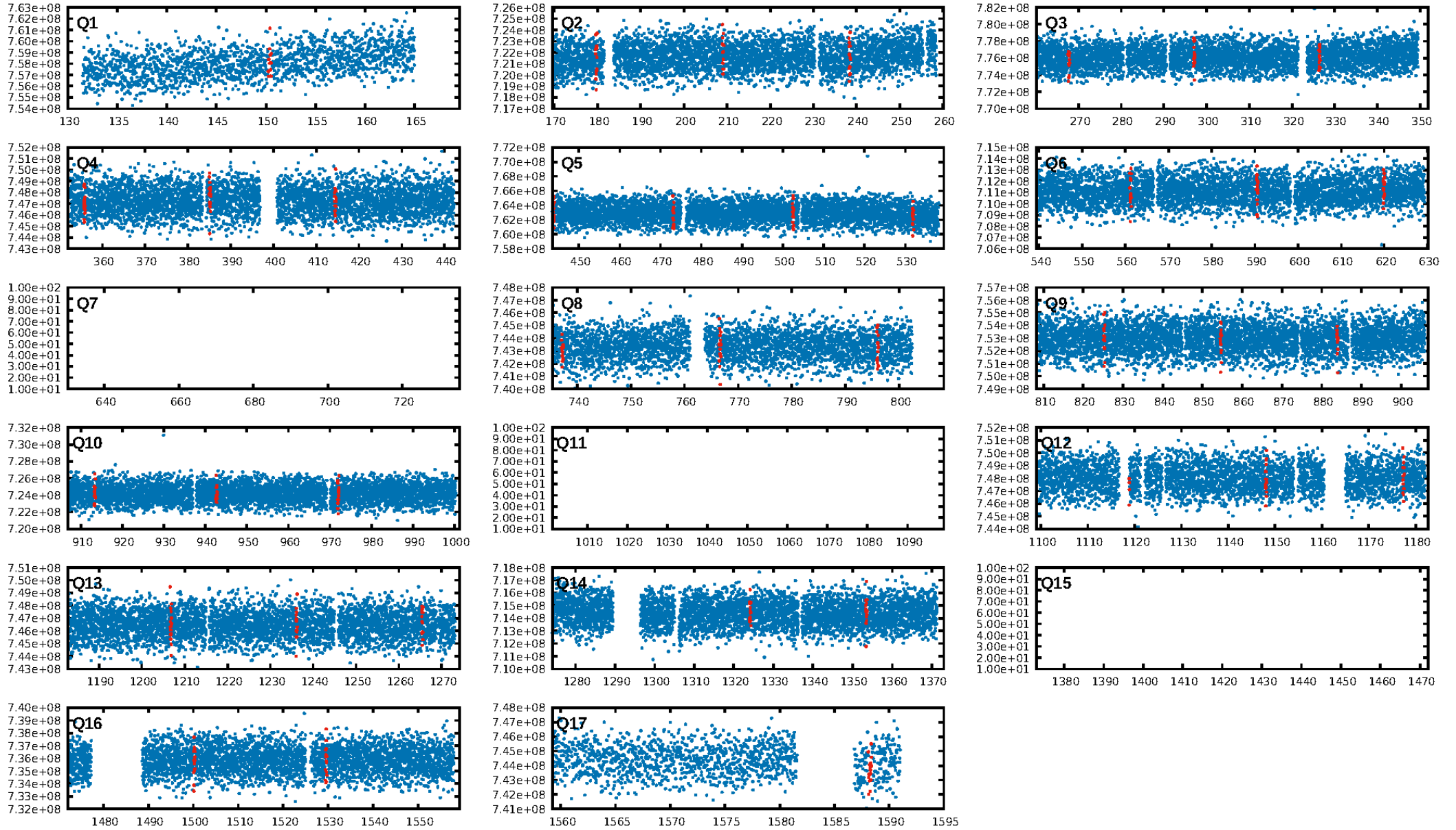
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [36.74 $\sigma$ ]  
LongPeriod-sig: 100.0% [14.03 $\sigma$ ]  
ModelChiSquare2-sig: 15.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [15/15]  
GhostDiagnostic-chr: 1.15  
Centroid-sig: N/A  
Centroid-so: 0.075 arcsec [1.21 $\sigma$ ]  
OotOffset-rm: 0.388 arcsec [1.52 $\sigma$ ]  
KicOffset-rm: 0.339 arcsec [1.50 $\sigma$ ]  
OotOffset-st: 3/1/3/5 [12]  
KicOffset-st: 3/1/3/5 [12]  
DiffImageQuality-fgm: 0.83 [10/12]  
DiffImageOverlap-fno: 0.00 [0/14]

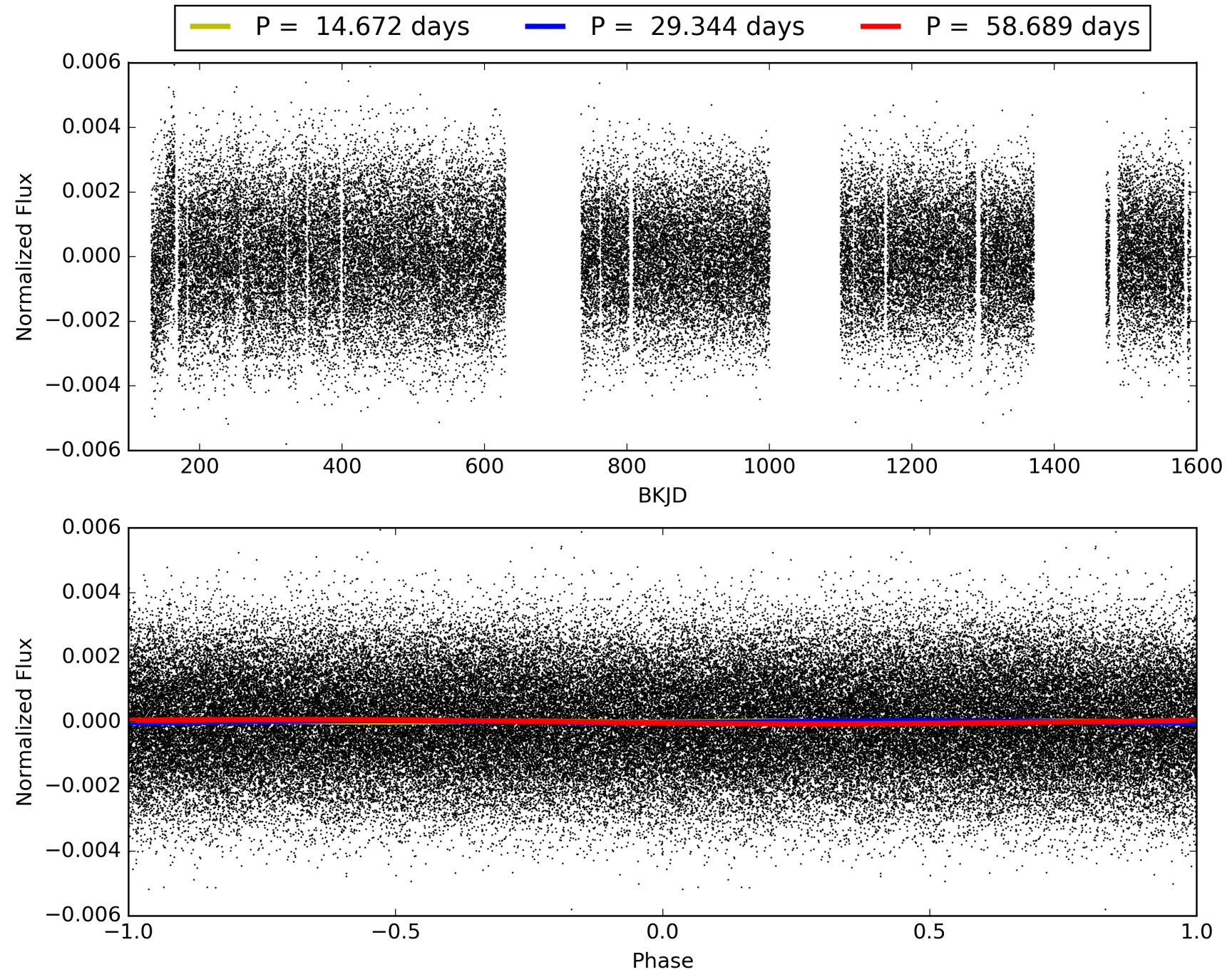
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:13:41 Z

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

# TCE 010035772-04, PDC Light Curves

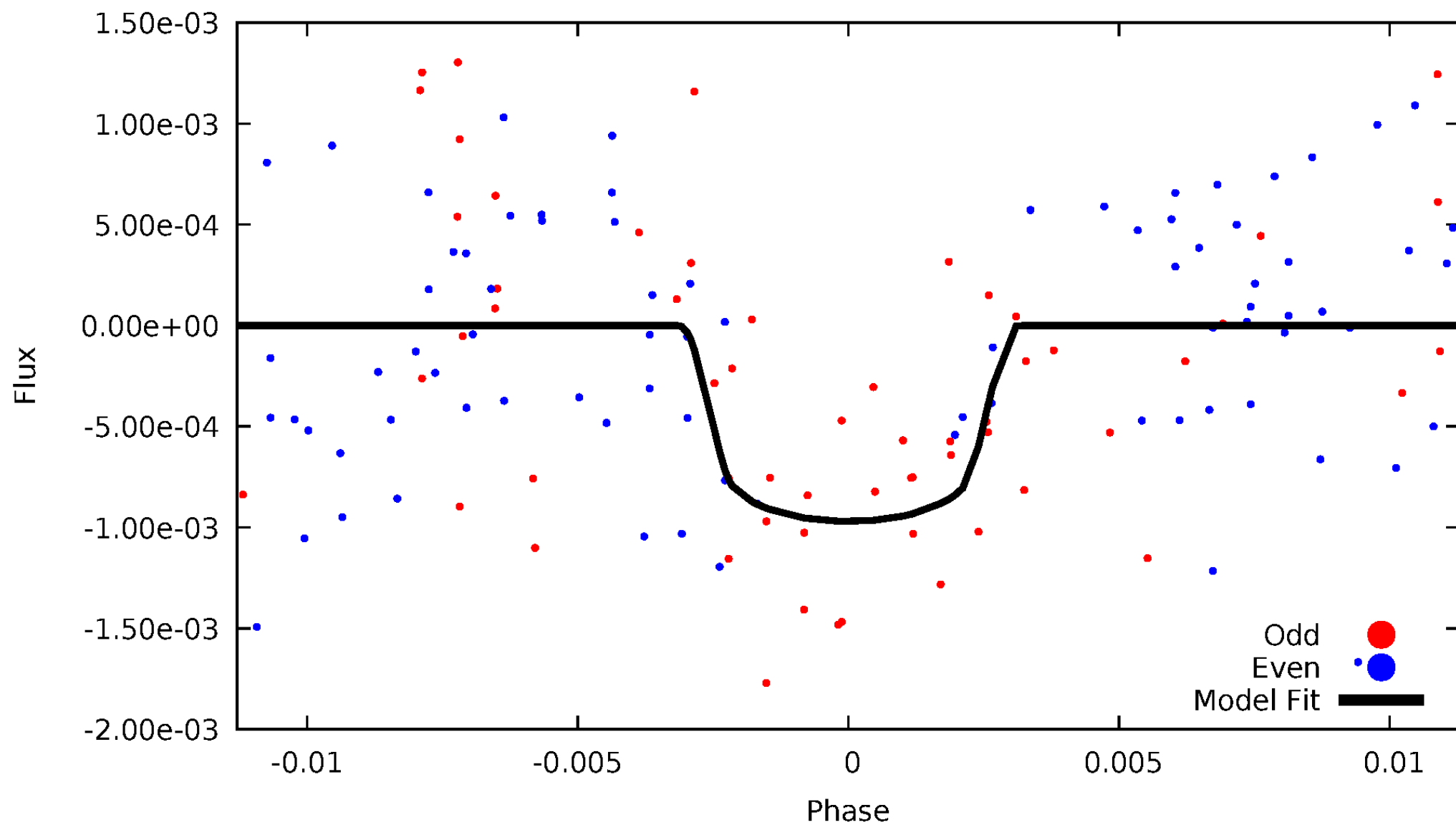


TCE 010035772-04



# DV Odd/Even

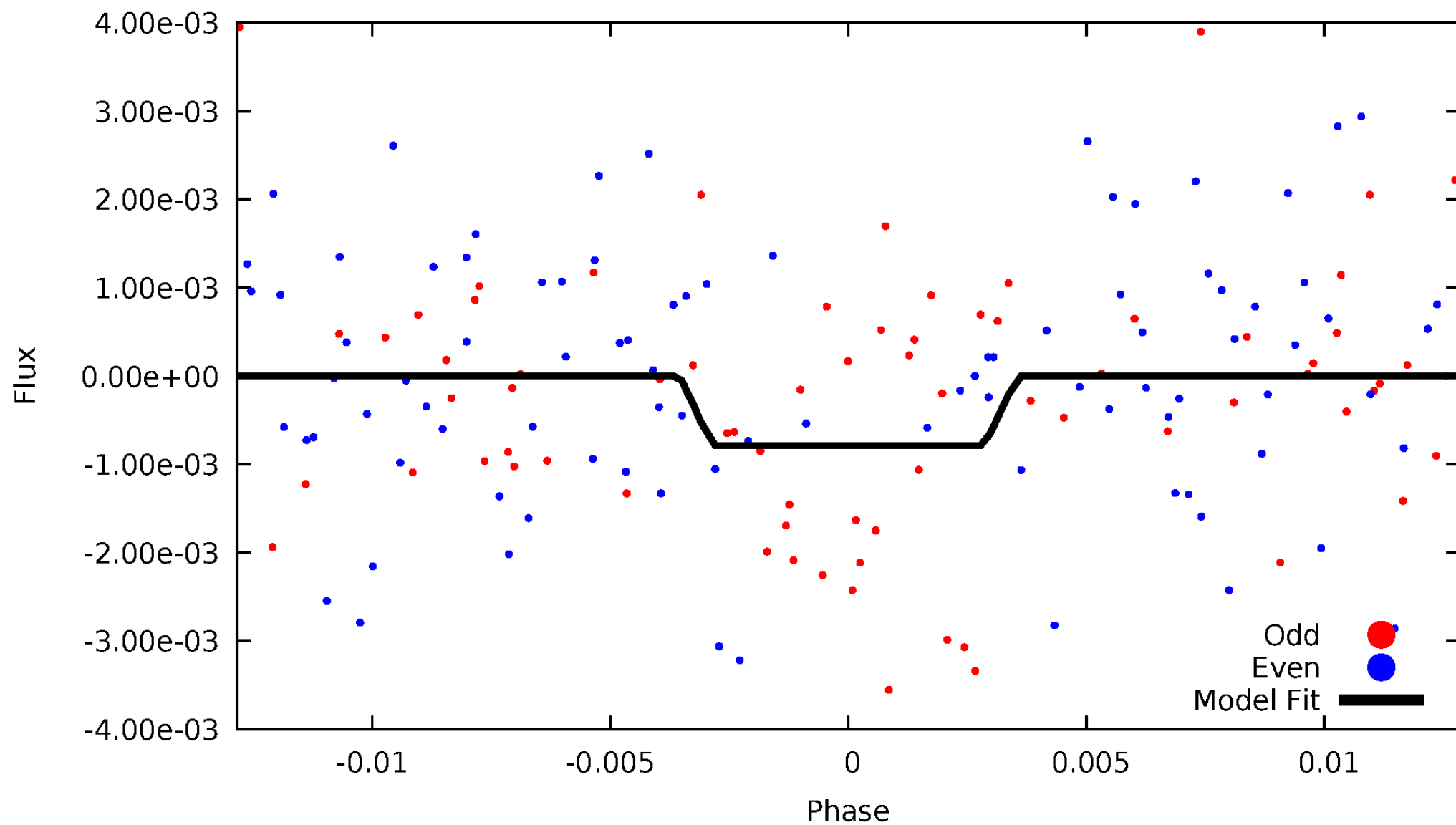
TCE 010035772-04





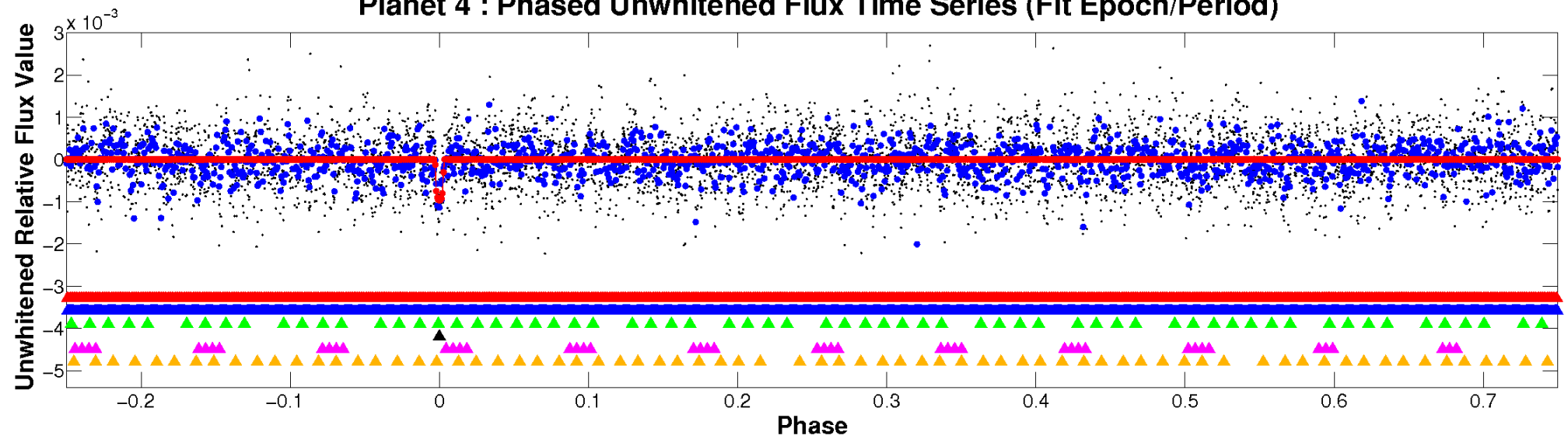
# ALT Odd/Even

TCE 010035772-04

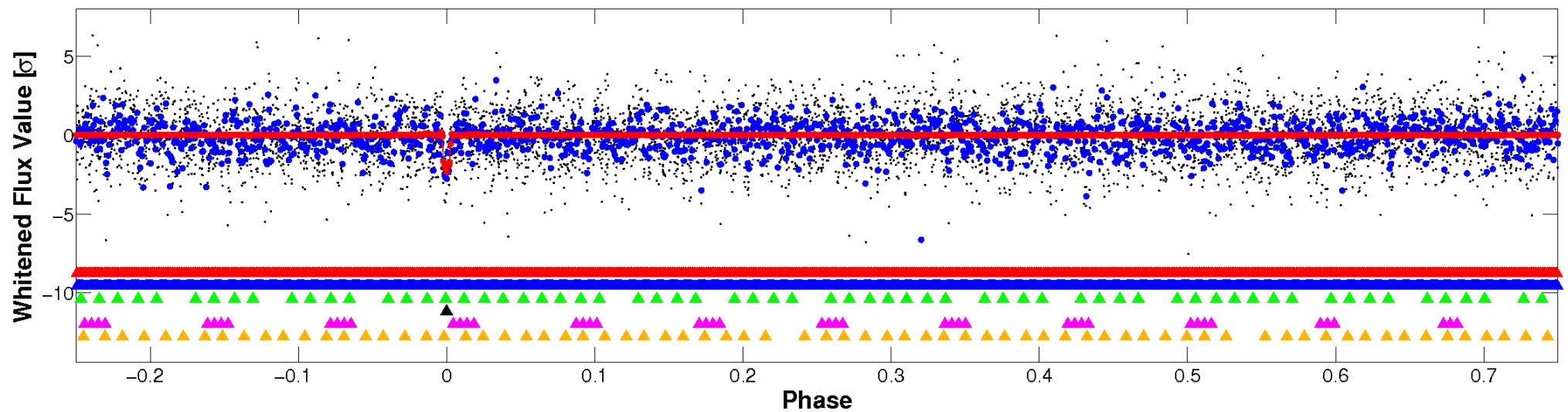


# Non-Whitened Vs. Whitened Light Curve

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

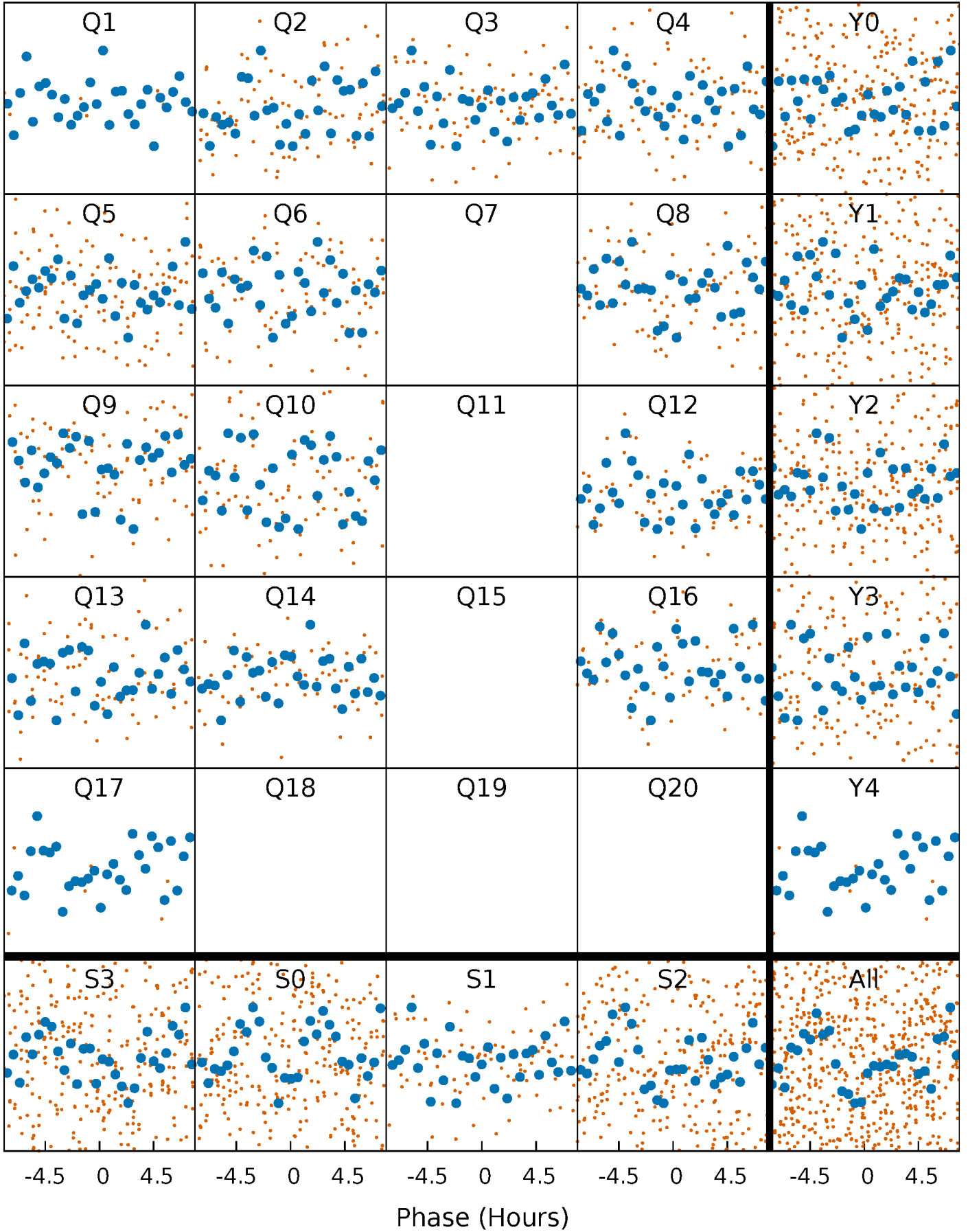


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



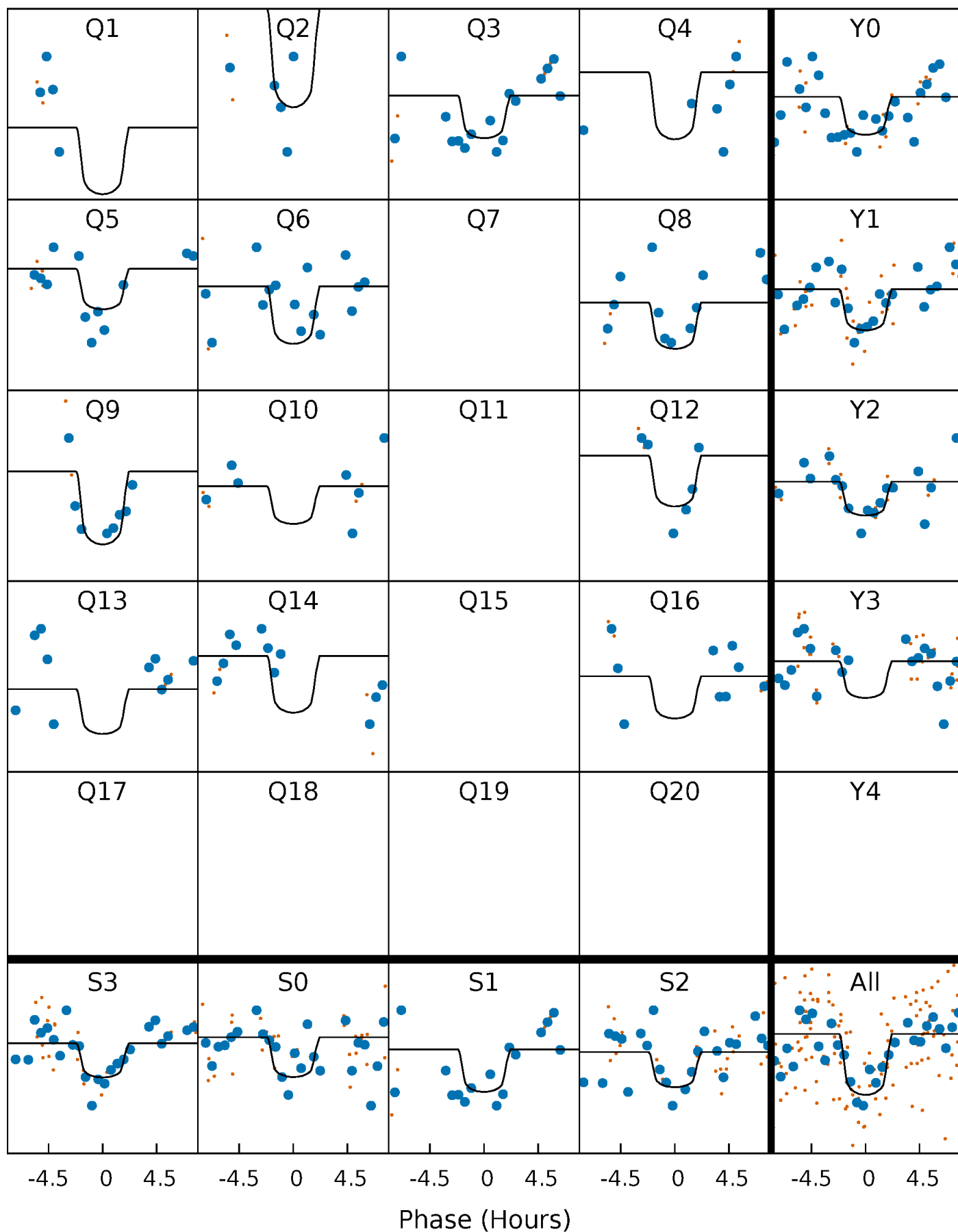
# PDC Quarter-Phased Transit Curves

TCE 010035772-04   P= 29.344394 Days    $T_0=150.375488$  (BKJD)



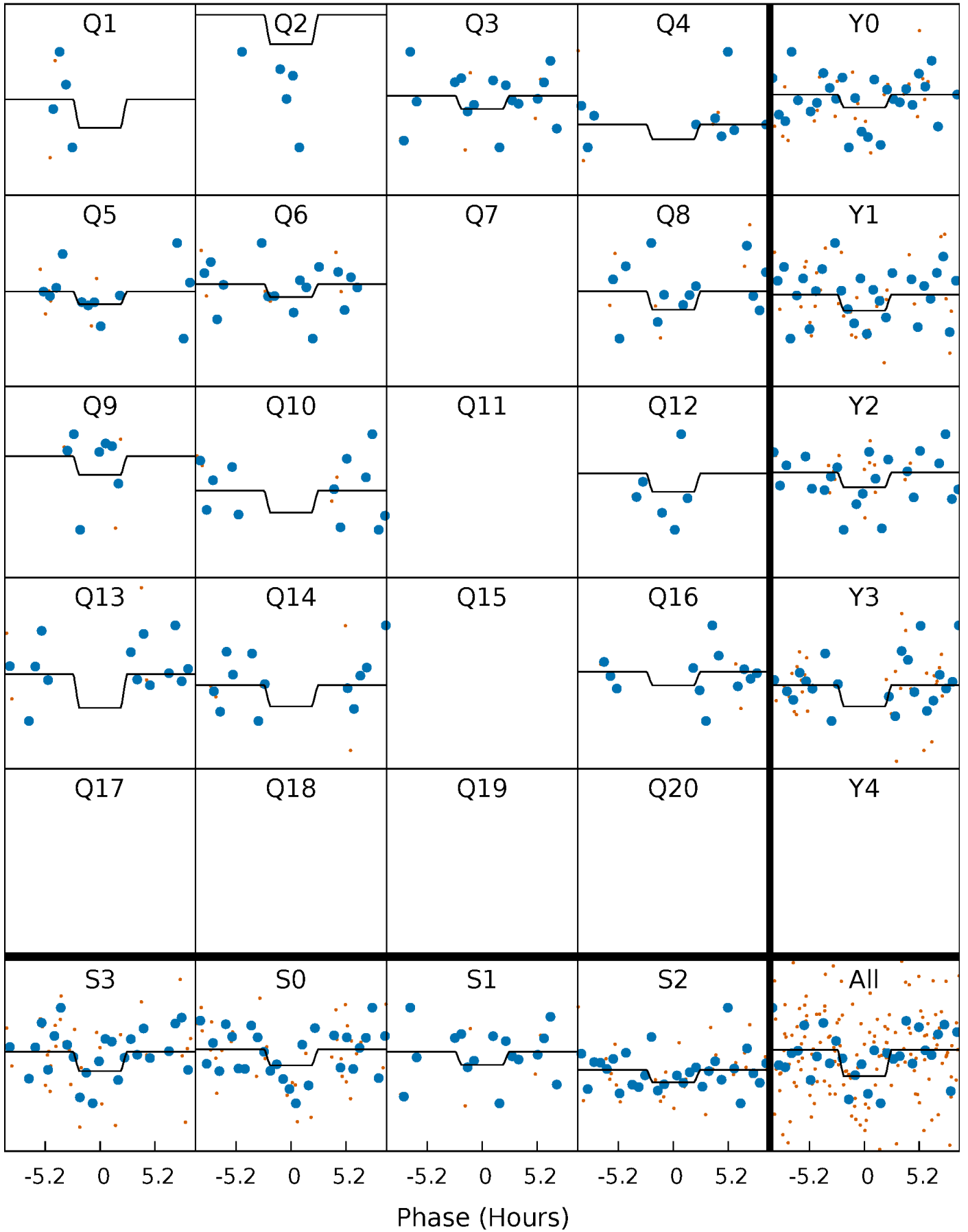
# DV Quarter-Phased Transit Curves

TCE 010035772-04   P= 29.344394 Days    $T_0=150.375488$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010035772-04   P= 29.346199 Days    $T_0=150.345010$  (BKJD)

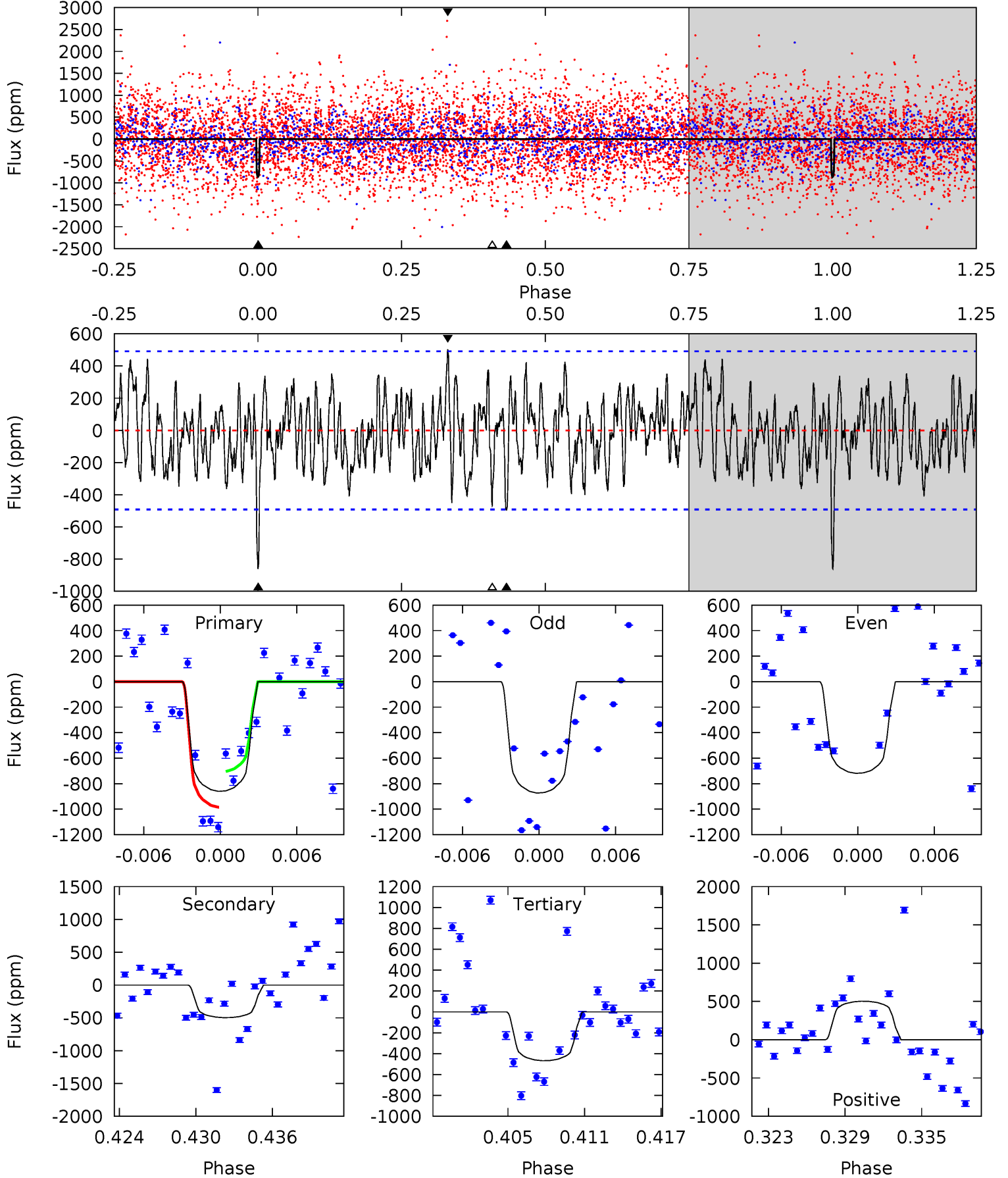




# DV Model-Shift Uniqueness Test

010035772-04, P = 29.344394 Days, E = 121.031094 Days

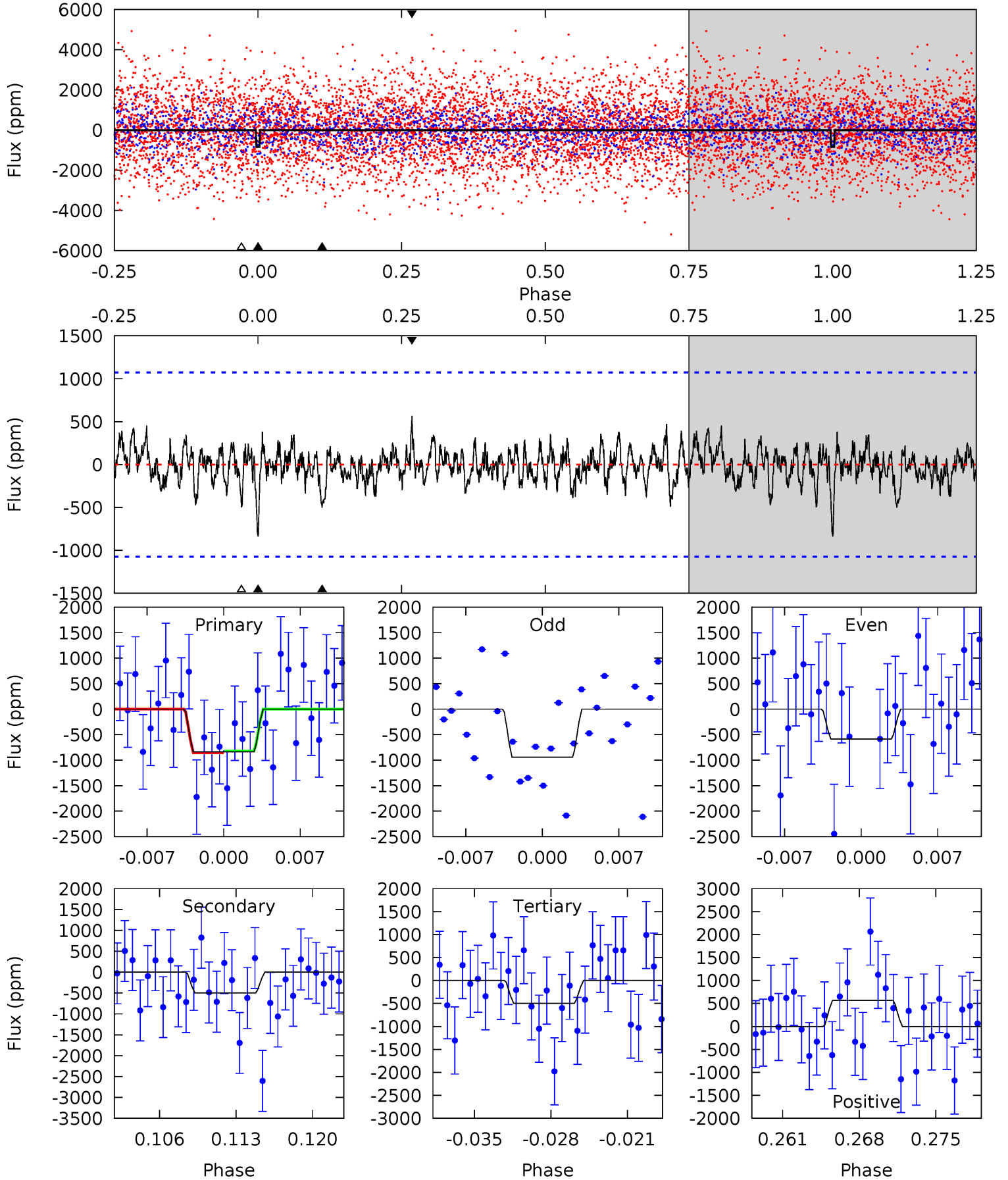
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.95	5.17	4.87	5.24	5.11	2.73	1.88	4.08	3.71	0.30	-0.07	0.71	0.88	0.37	1.46



# Alt Model-Shift Uniqueness Test

010035772-04, P = 29.346199 Days, E = 120.998811 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
3.97	2.38	2.37	2.69	5.09	2.69	0.77	1.61	1.28	0.01	-0.32	0.78	1.15	0.40	0.09



### Stellar Parameters For KIC 010035772

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7504^{+209}_{-328}$	$3.525^{+0.532}_{-0.028}$	$0.210^{+0.150}_{-0.350}$	$4.501^{+0.278}_{-2.499}$	$2.472^{+0.147}_{-0.832}$	$0.038^{+0.253}_{-0.004}$
	+3%/-4%	+15%/-1%	+71%/-167%	+6%/-56%	+6%/-34%	+663%/-10%
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 010035772-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-497 \pm 96$	$13.05^{+6.60}_{-5.54}$	$1852^{+131}_{-266}$	$6121^{+1992}_{-851}$	$101^{+191}_{-56}$
Alt.	$-501 \pm 211$	$11.79^{+6.37}_{-5.65}$	$1859^{+121}_{-239}$	$6559^{+2715}_{-1383}$	$118^{+315}_{-75}$

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

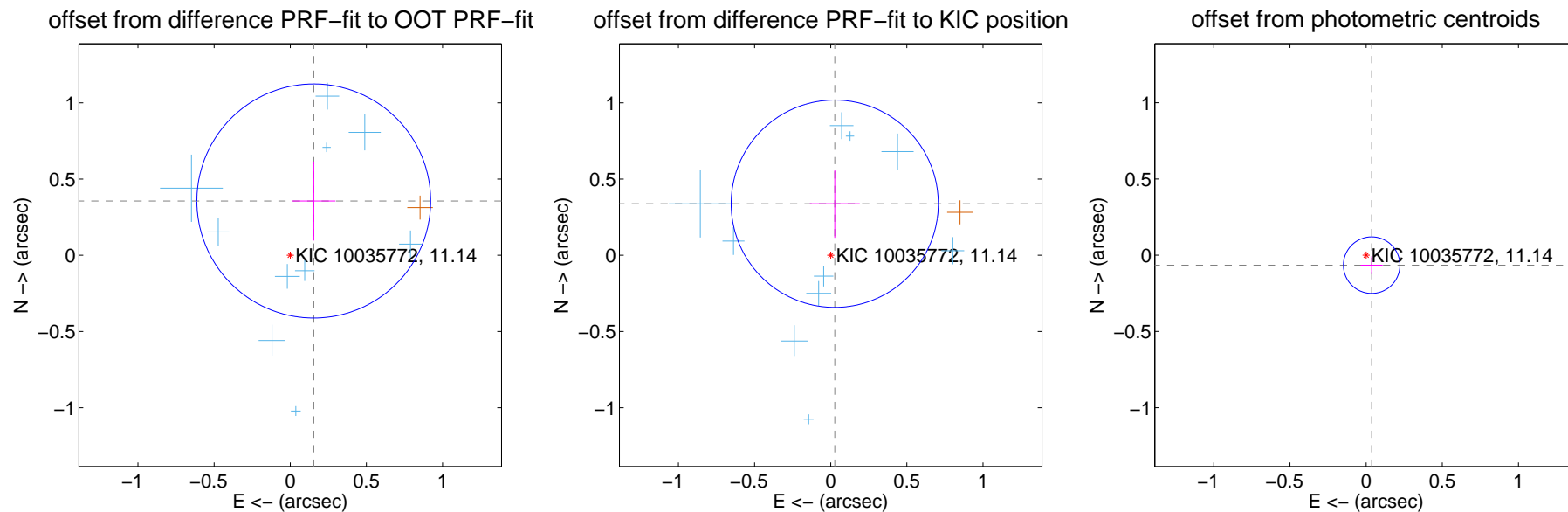
## DV Centroid Data

Supplemental centroid analysis for 010035772-04. **Kepler magnitude: 11.14.** Transit SNR 10.50

There are 10 quarters with good PRF difference image offsets

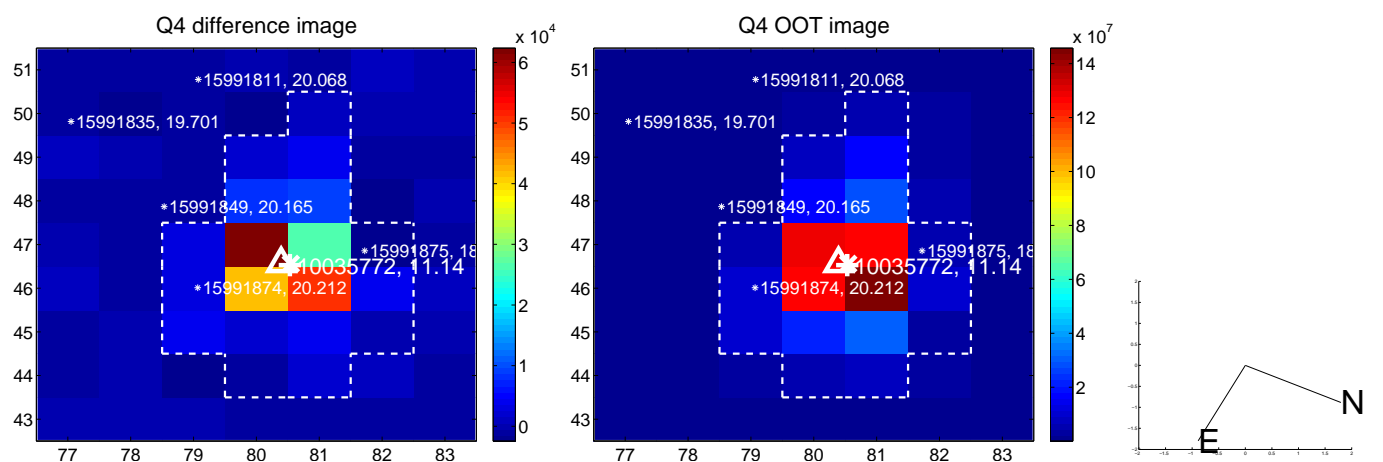
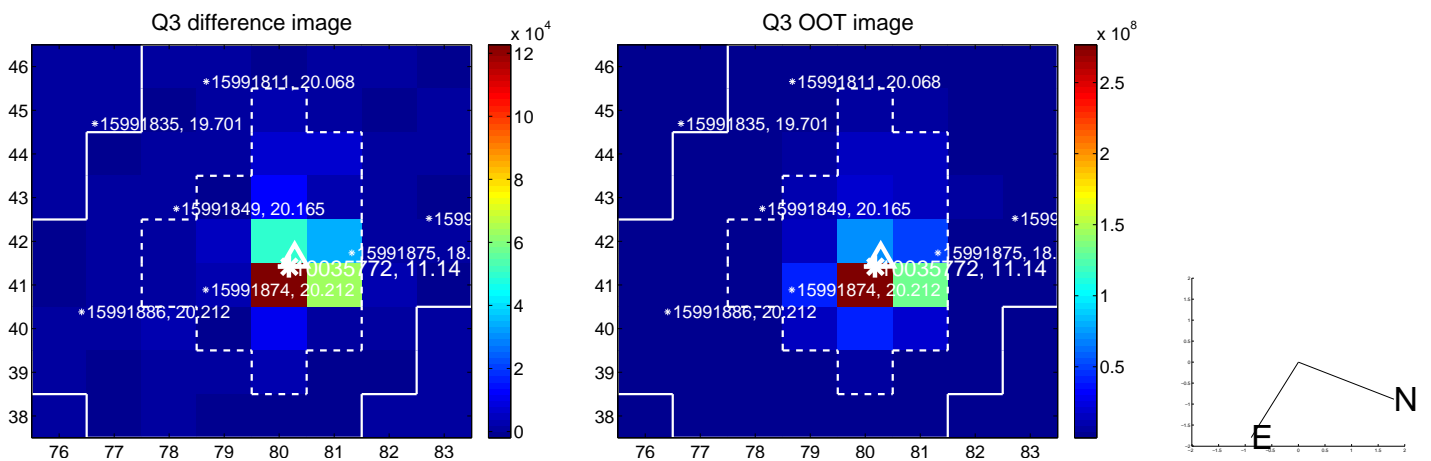
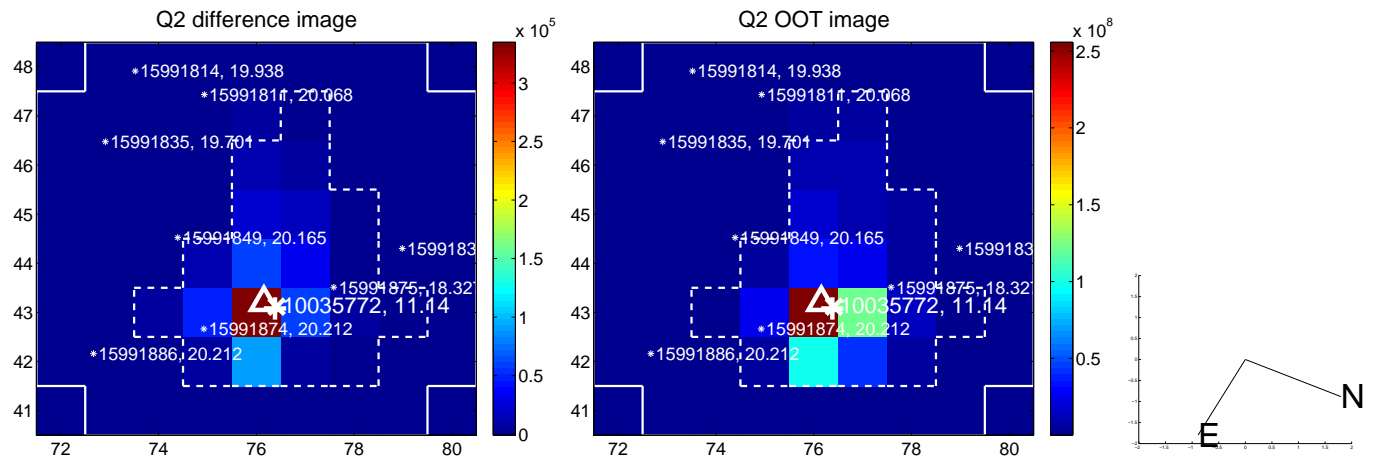
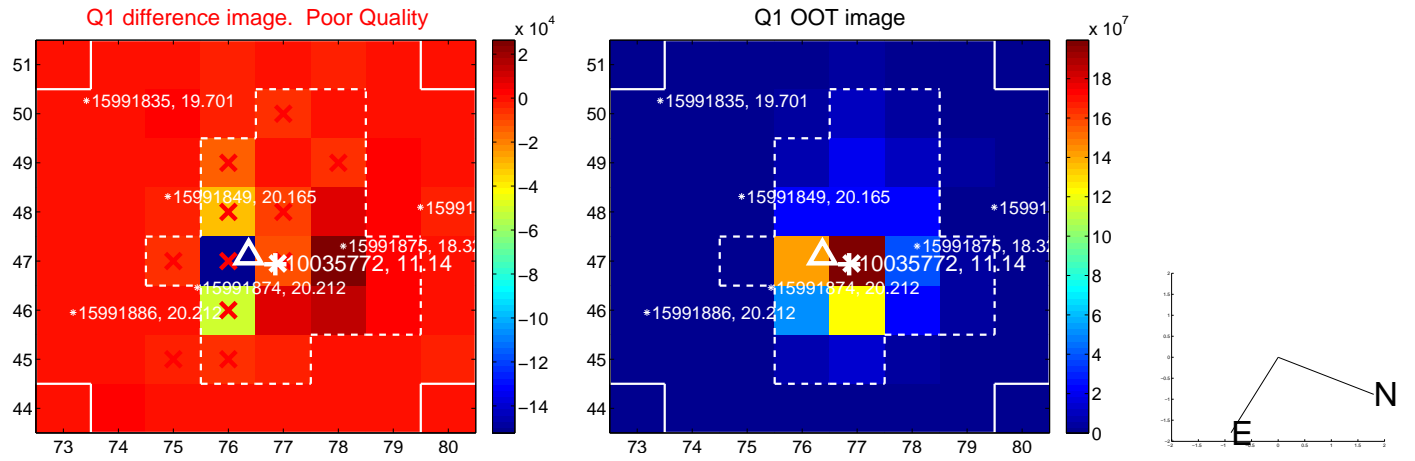
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.388 \pm 0.256$	1.52	$-0.154 \pm 0.142$	$0.356 \pm 0.259$
PRF-fit source offset from KIC position	$0.339 \pm 0.227$	1.50	$-0.026 \pm 0.164$	$0.338 \pm 0.224$
photometric centroid source offset	$0.07 \pm 0.06$	1.21	$-0.04 \pm 0.07$	$-0.07 \pm 0.06$



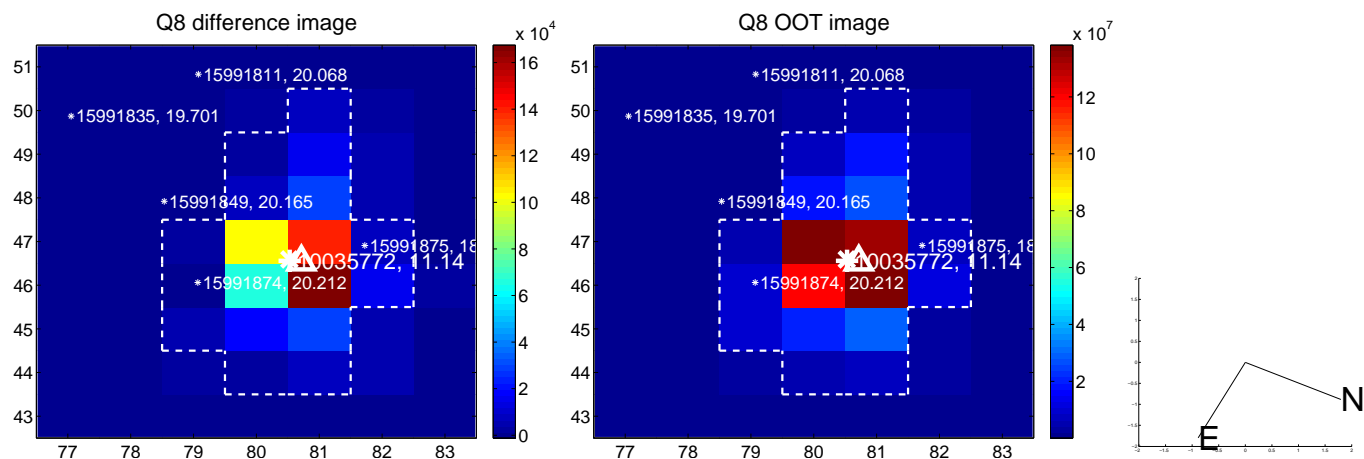
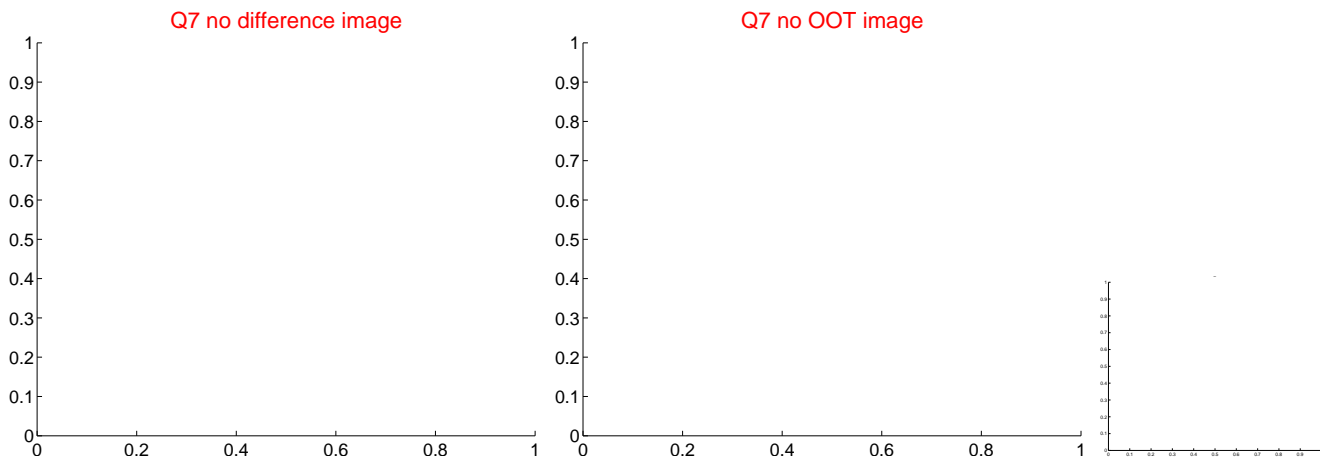
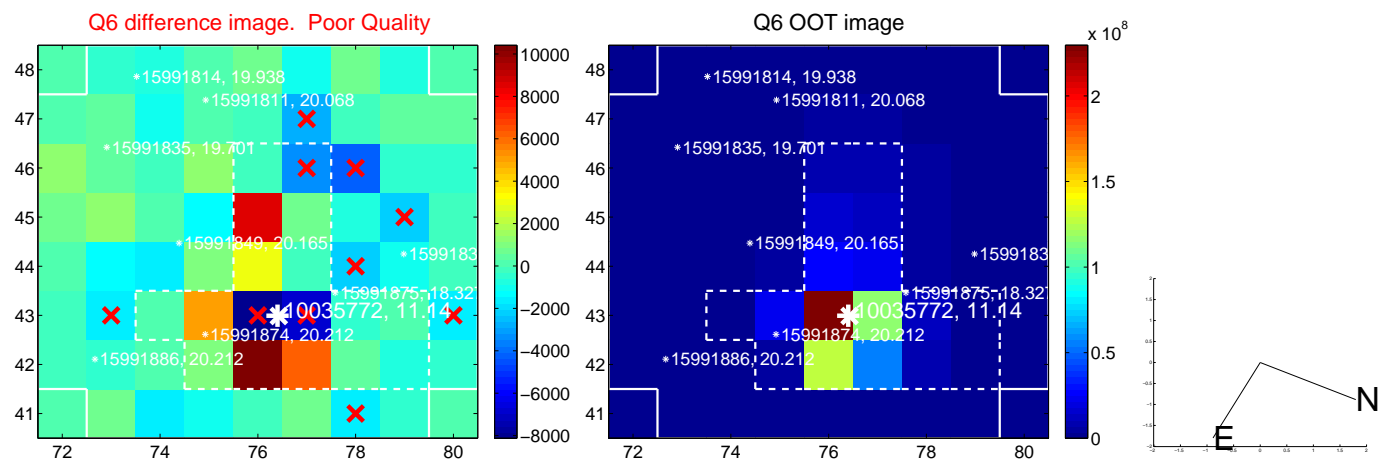
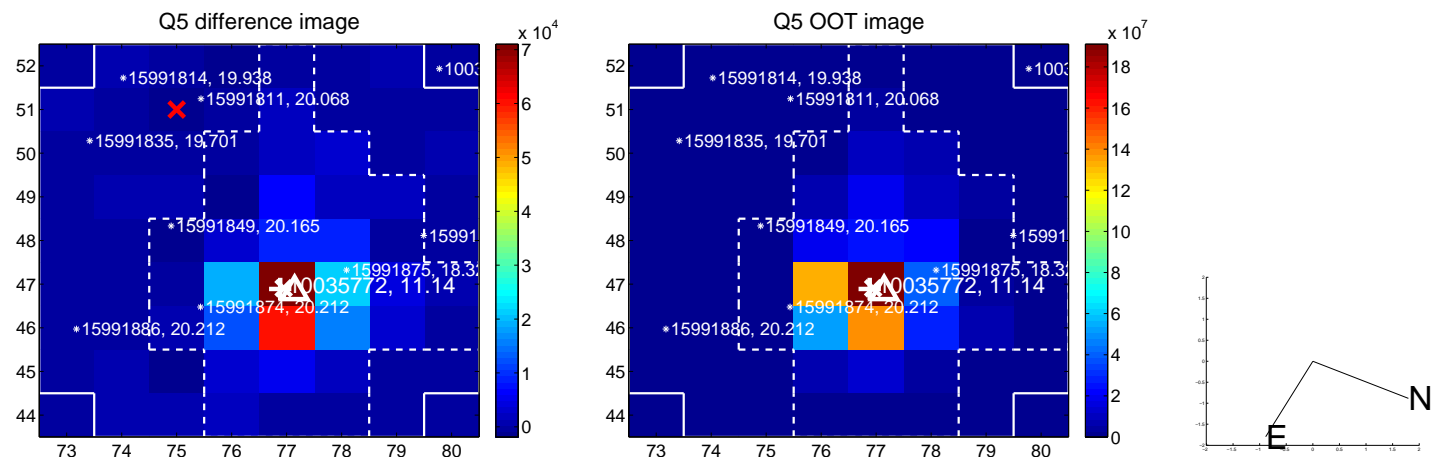
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

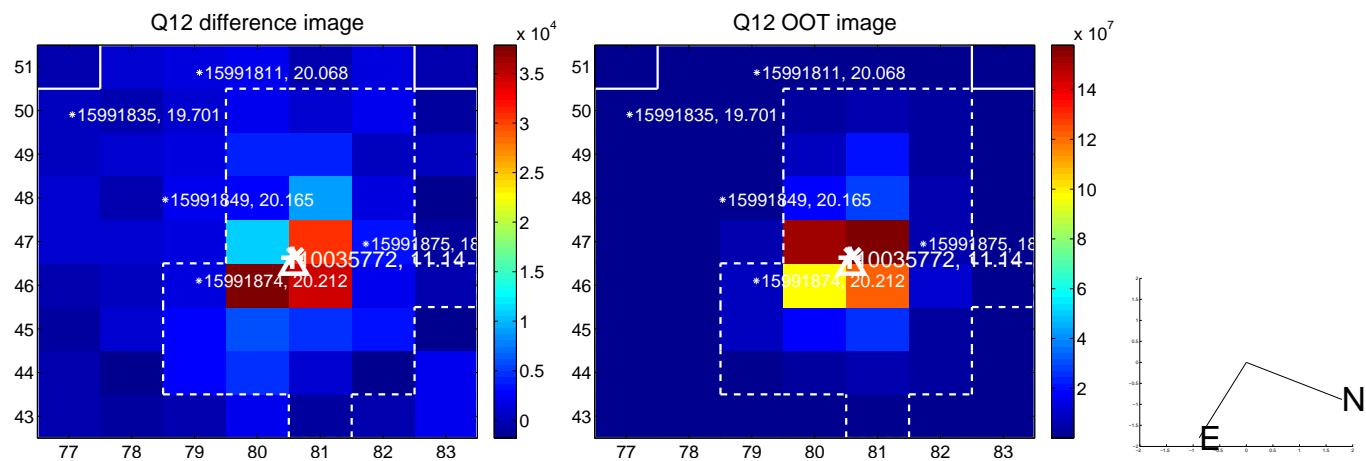
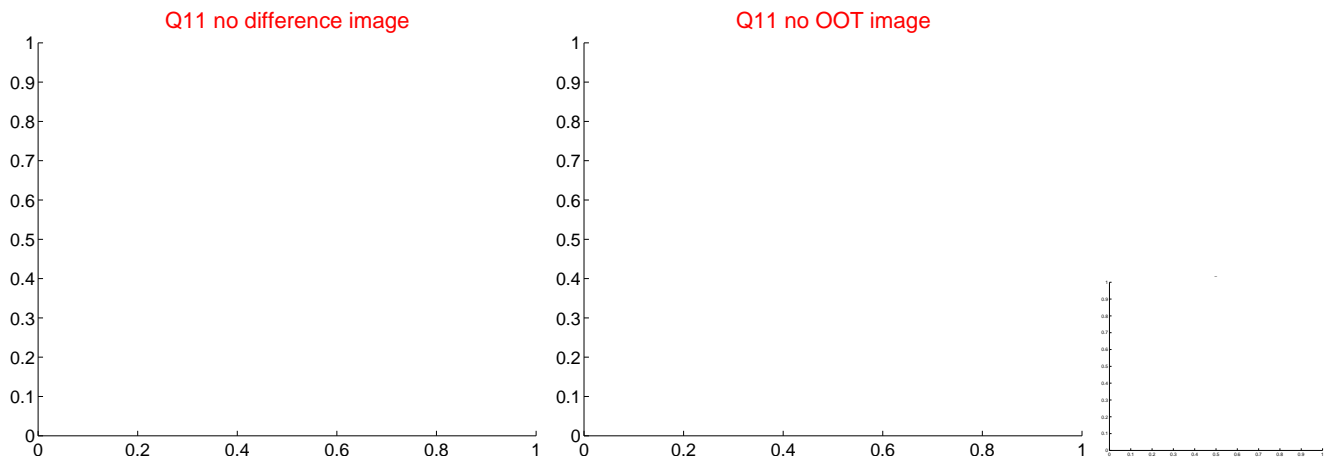
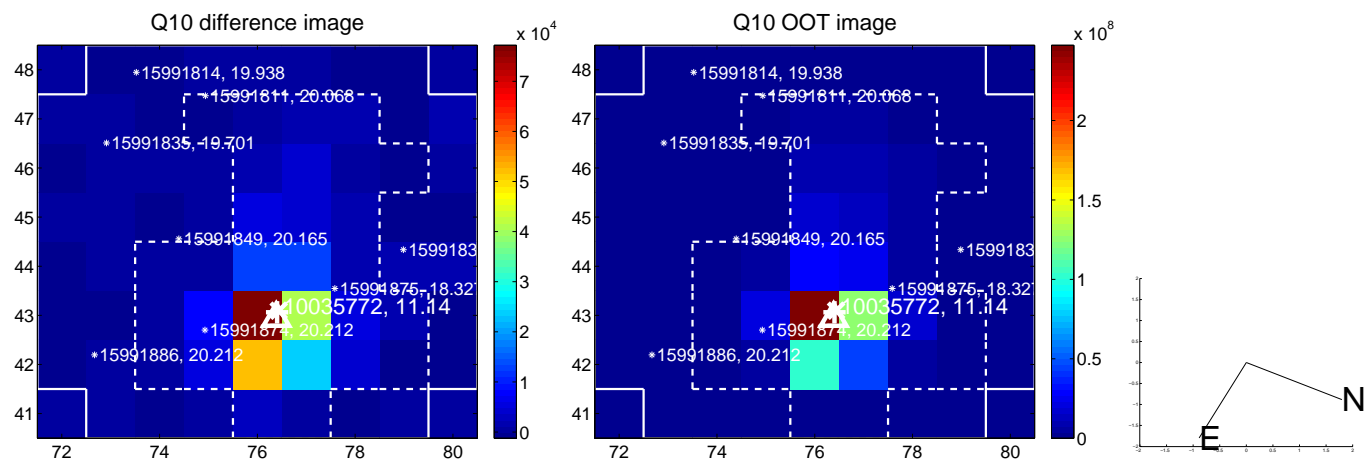
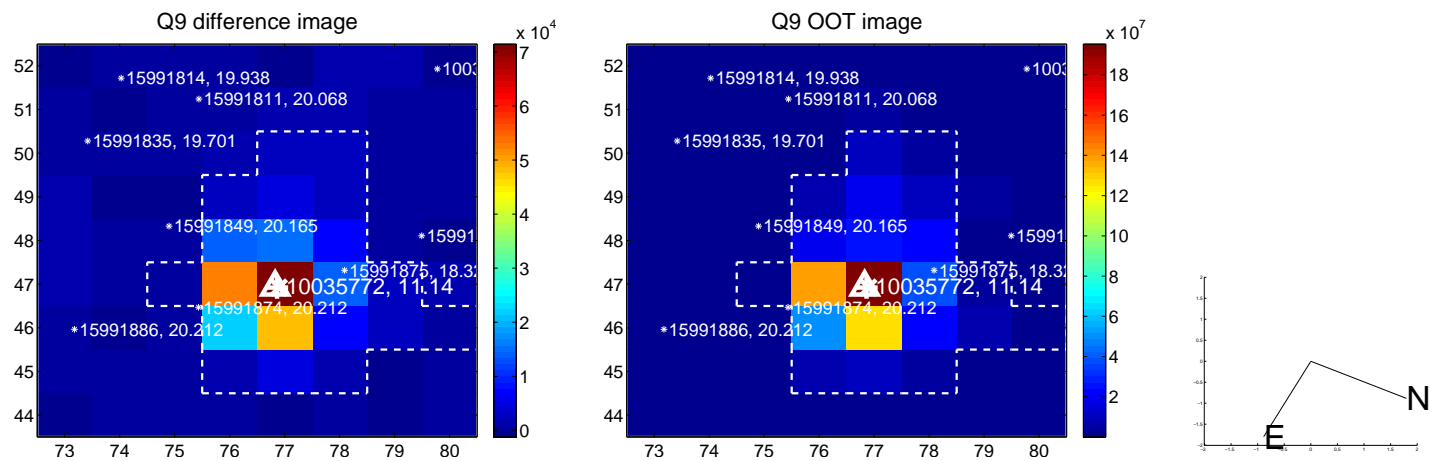




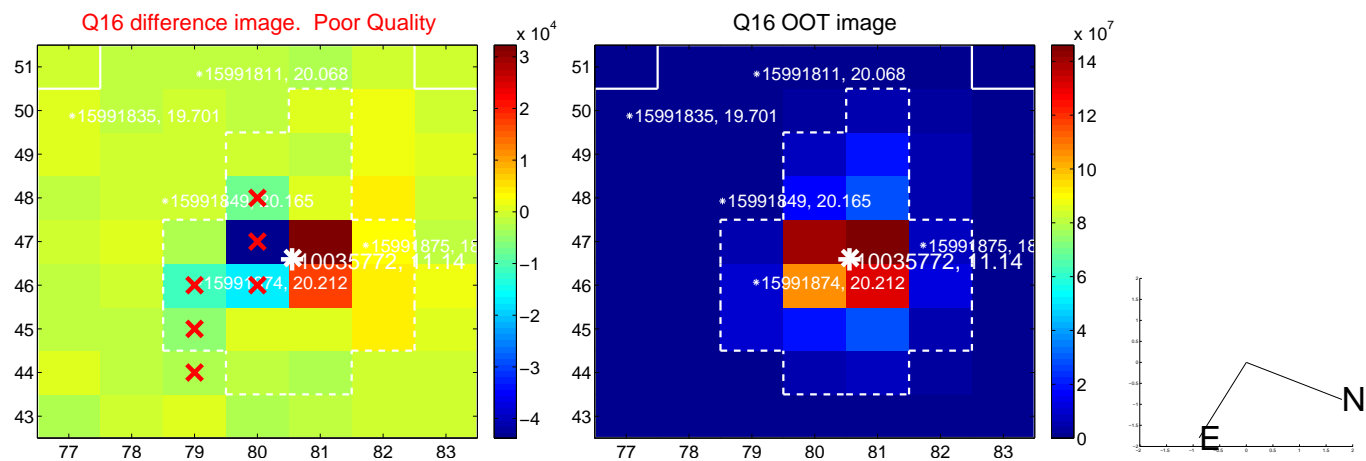
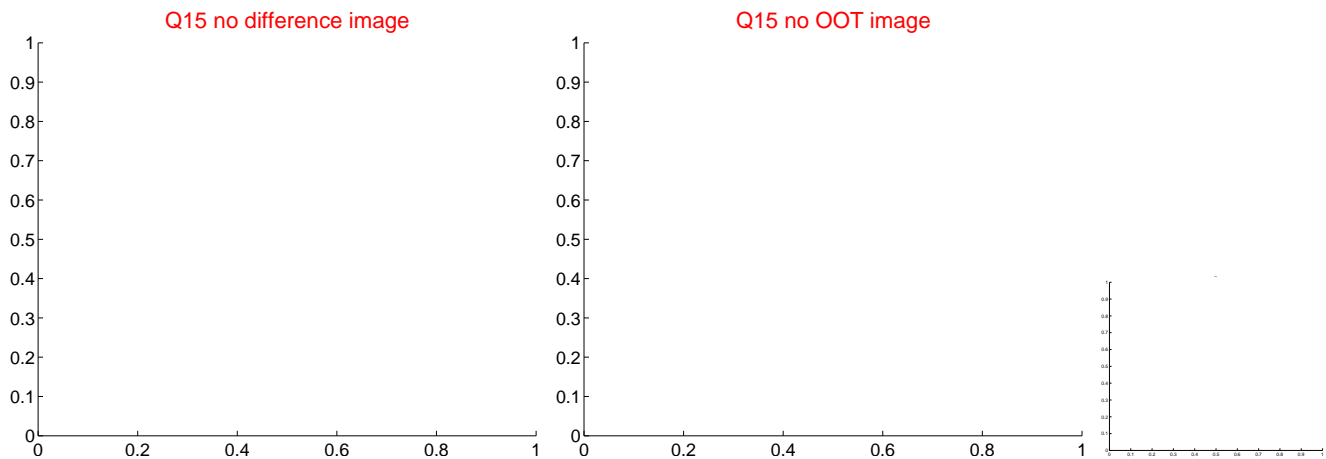
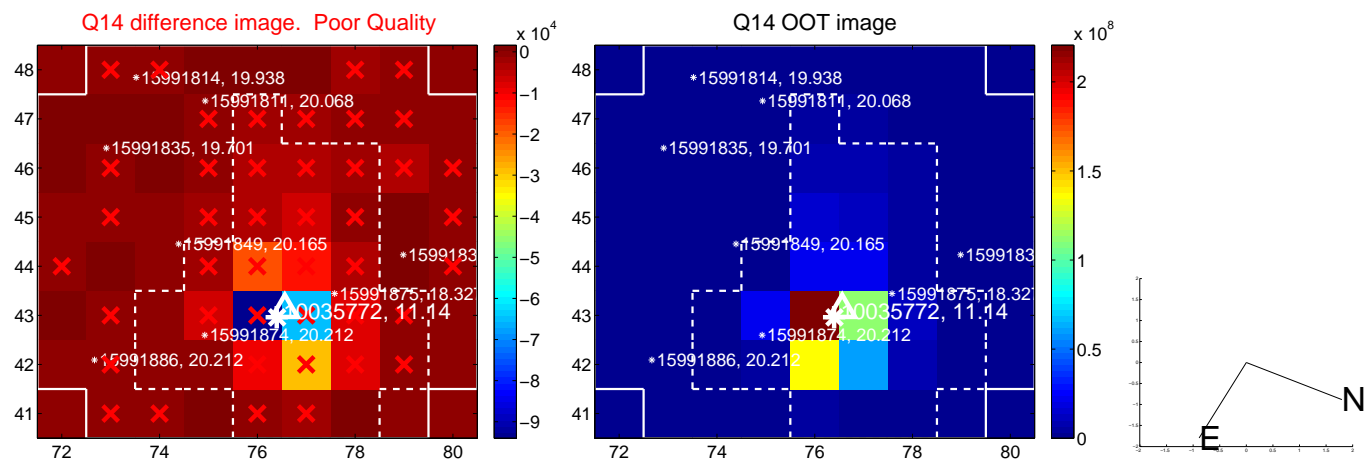
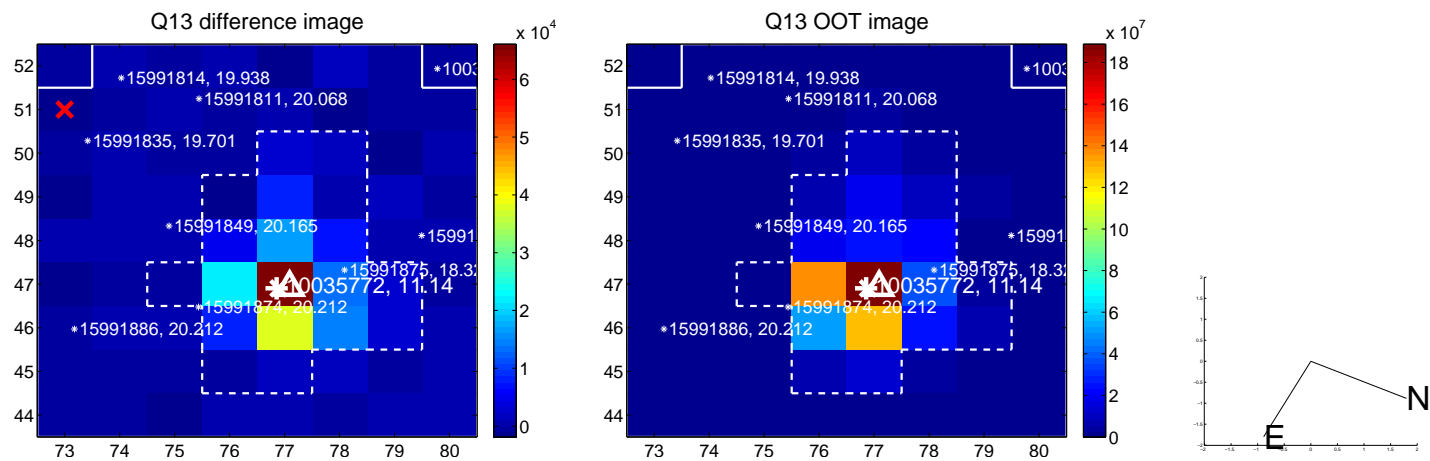
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



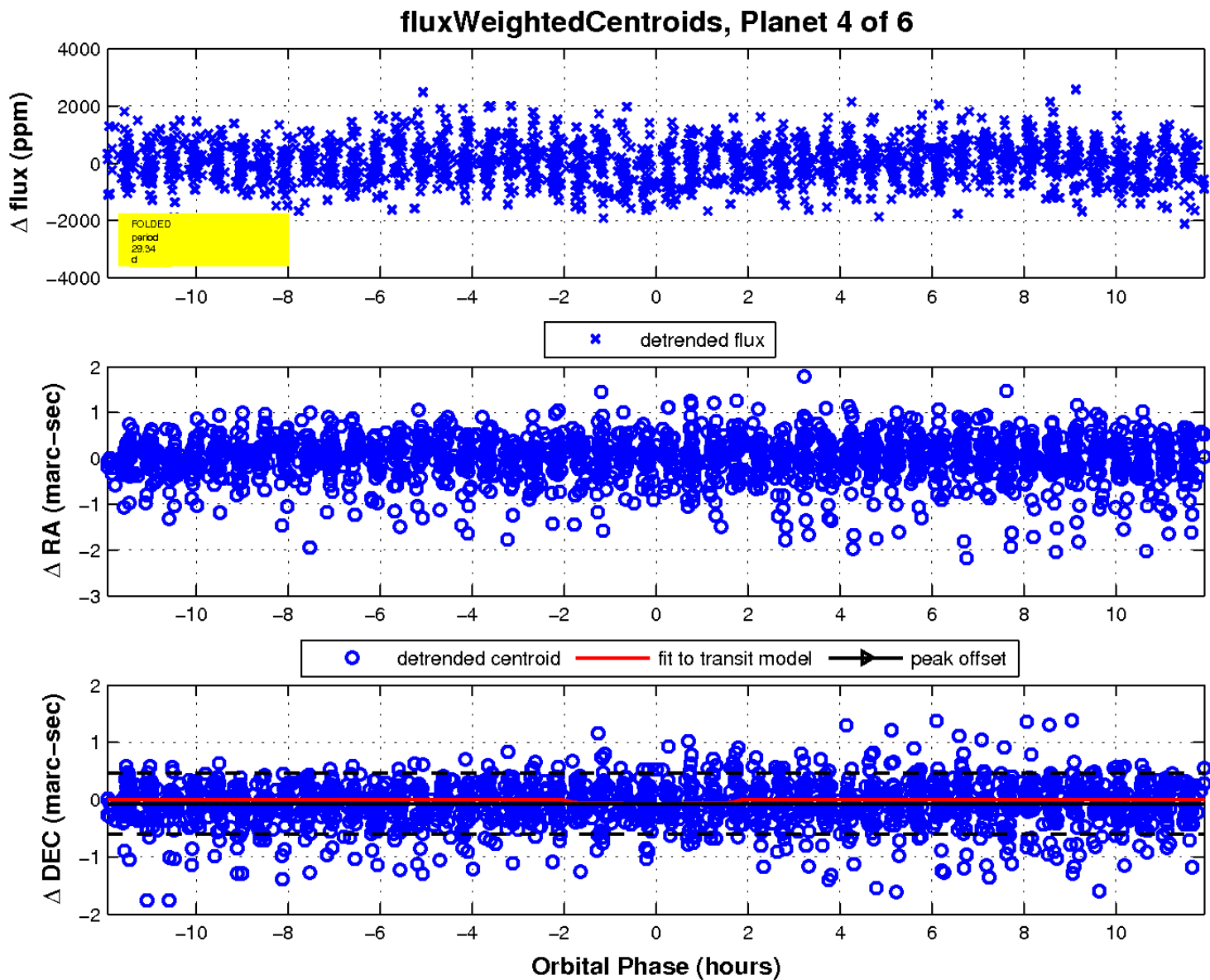
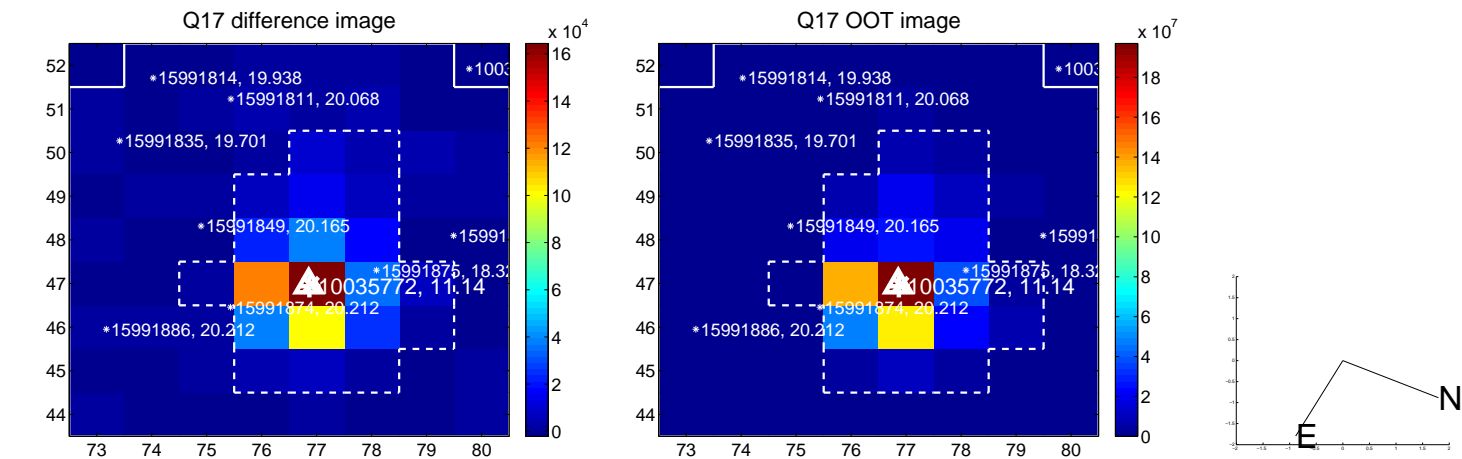
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



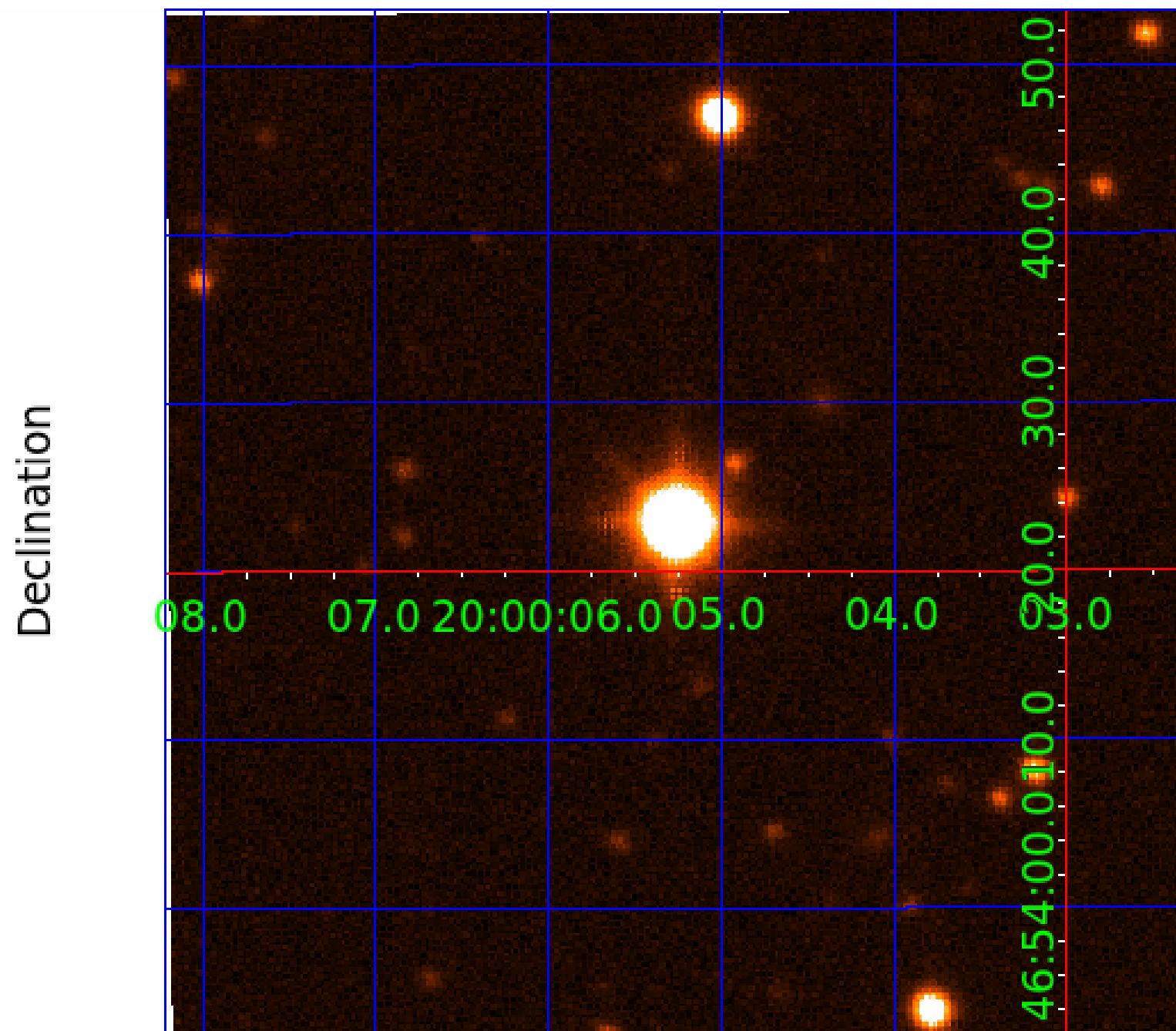
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 010035772

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010035772-01	OBS	No	0.576548	131.975854	109.6	1.135	10.5	9.0	4.50	7504	5.51	0.00
010035772-02	OBS	No	0.536434	131.684486	100.5	3.337	11.7	10.3	4.50	7504	4.71	0.00
010035772-03	OBS	No	22.485213	150.720857	1161.7	2.067	13.2	9.7	4.50	7504	26.49	1293.43
010035772-04	OBS	No	29.344394	150.375488	970.5	3.975	11.0	10.5	4.50	7504	15.32	906.92
010035772-05	OBS	No	31.778434	143.614221	1344.3	1.242	10.6	9.2	4.50	7504	16.74	815.51
010035772-06	OBS	No	20.222738	147.997585	1439.9	1.574	10.5	11.3	4.50	7504	26.42	1489.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010035772-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
010035772-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
010035772-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_SATURATED
010035772-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010035772-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010035772-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

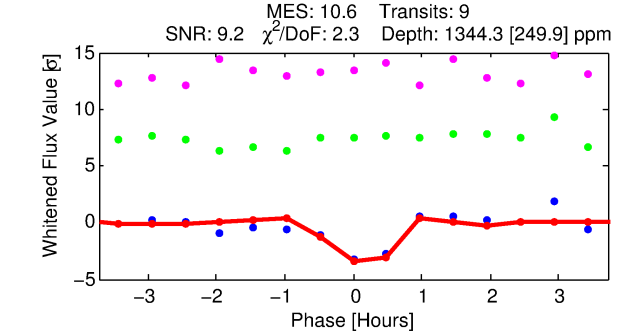
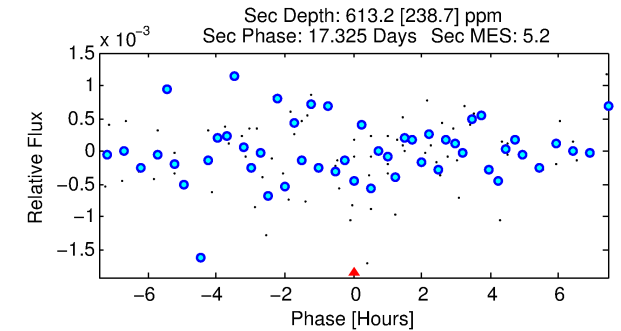
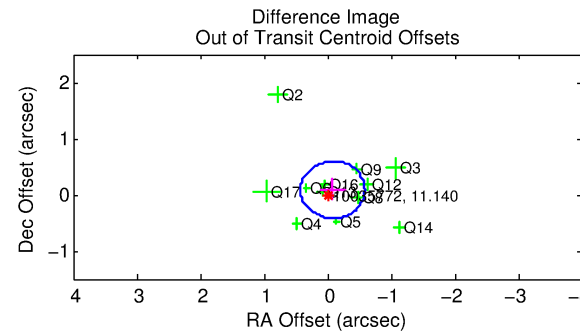
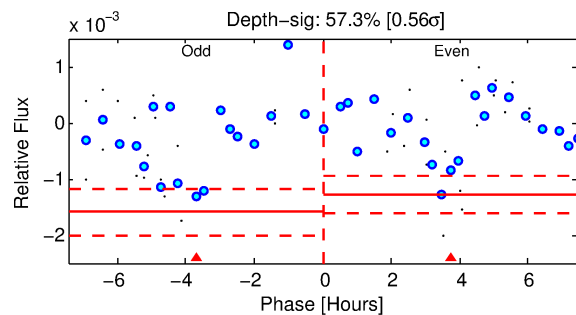
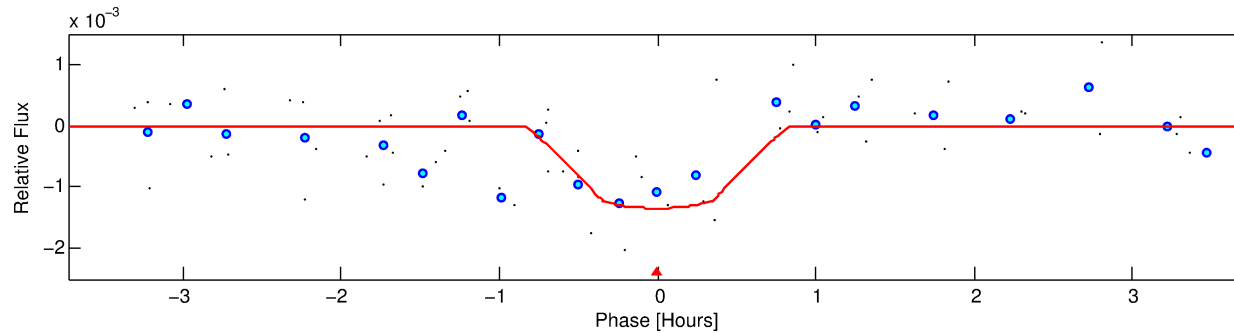
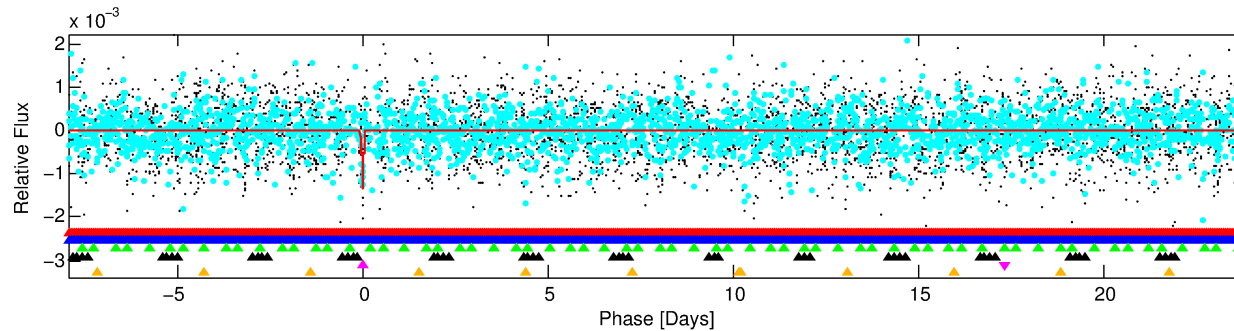
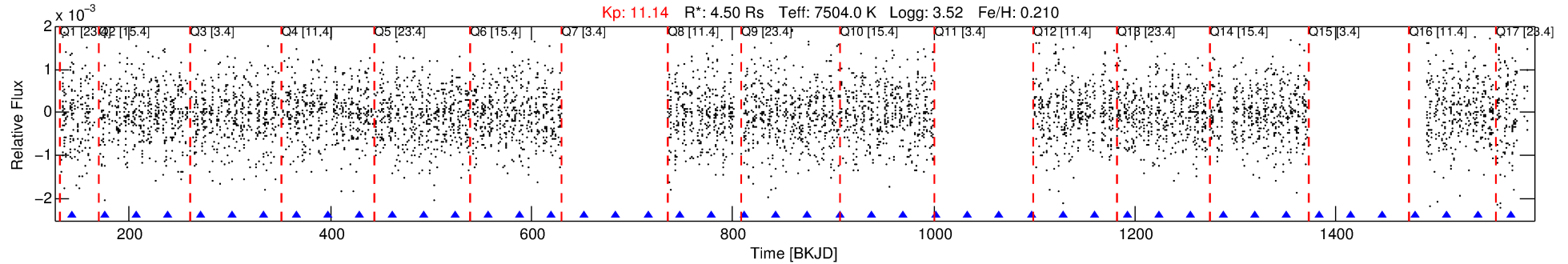
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010035772-05

No Significant Match Found

# DV One-Page Summary

KIC: 10035772 Candidate: 5 of 6 Period: 31.778 d



## DV Fit Results:

Period = 31.77843 [0.00024] d  
Epoch = 143.6142 [0.0056] BKJD  
Rp/R\* = 0.0341 [0.0535]  
a/R\* = 201.77 [1697.01]  
b = 0.07 [129.86]  
Seff = 815.51 [744.97]  
Teq = 1363 [311] K  
Rp = 16.74 [27.85] Re  
a = 0.2657 [0.1464] AU  
Ag = 85.01 [279.36] [0.30 $\sigma$ ]  
Teffp = 6397 [5064] K [0.99 $\sigma$ ]

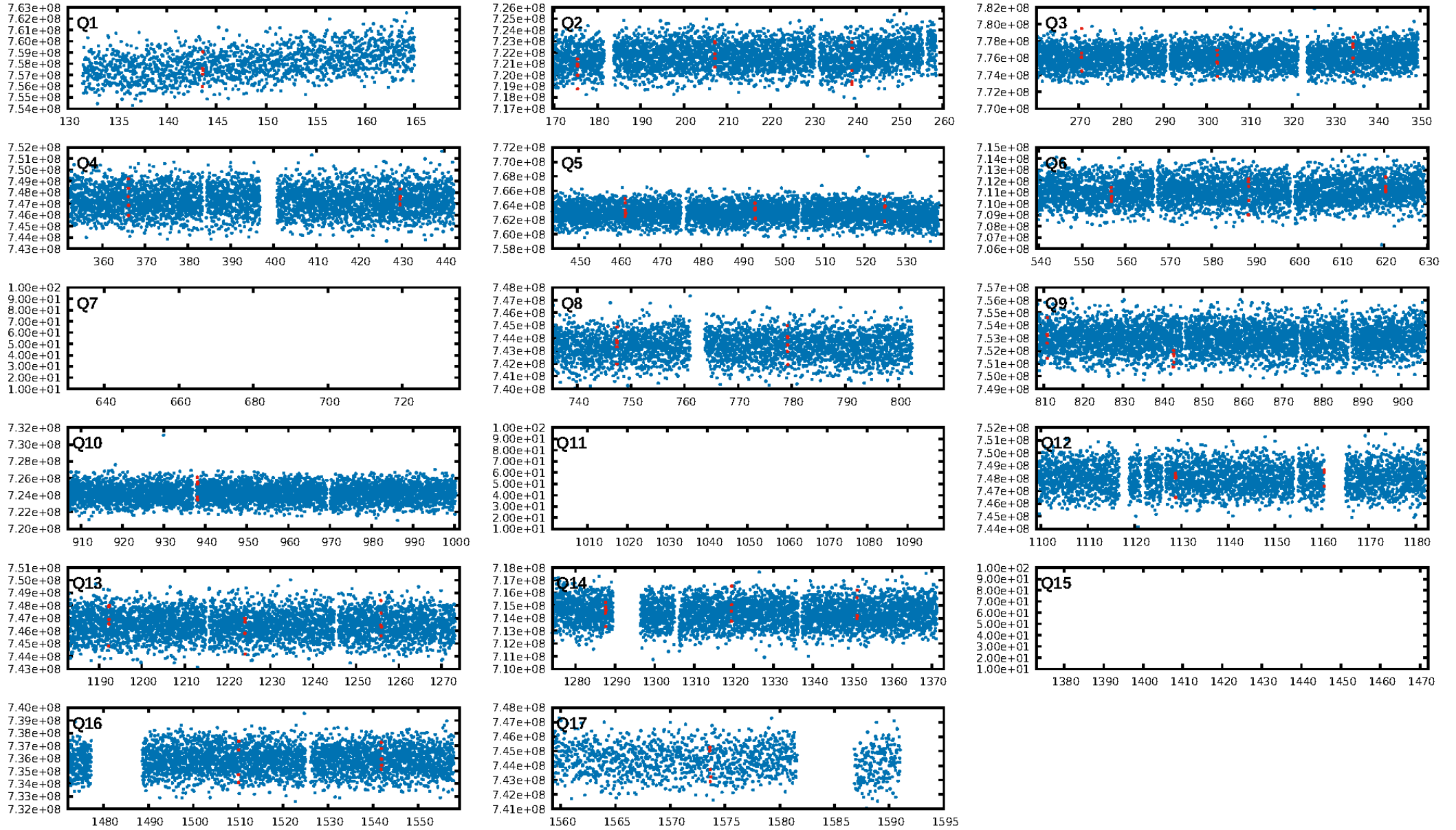
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [14.03 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.8%  
ModelChiSquareGof-sig: 79.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [9/9]  
**GhostDiagnostic-chr: 0.7223**  
Centroid-sig: N/A  
Centroid-so: 0.186 arcsec [2.04 $\sigma$ ]  
OotOffset-rm: 0.120 arcsec [0.71 $\sigma$ ]  
OotOffset-st: 3/1/4/4 [12]  
KicOffset-rm: 0.040 arcsec [0.20 $\sigma$ ]  
KicOffset-st: 3/1/4/4 [12]  
DiffImageQuality-fgm: 0.42 [5/12]  
DiffImageOverlap-fno: 0.00 [0/13]

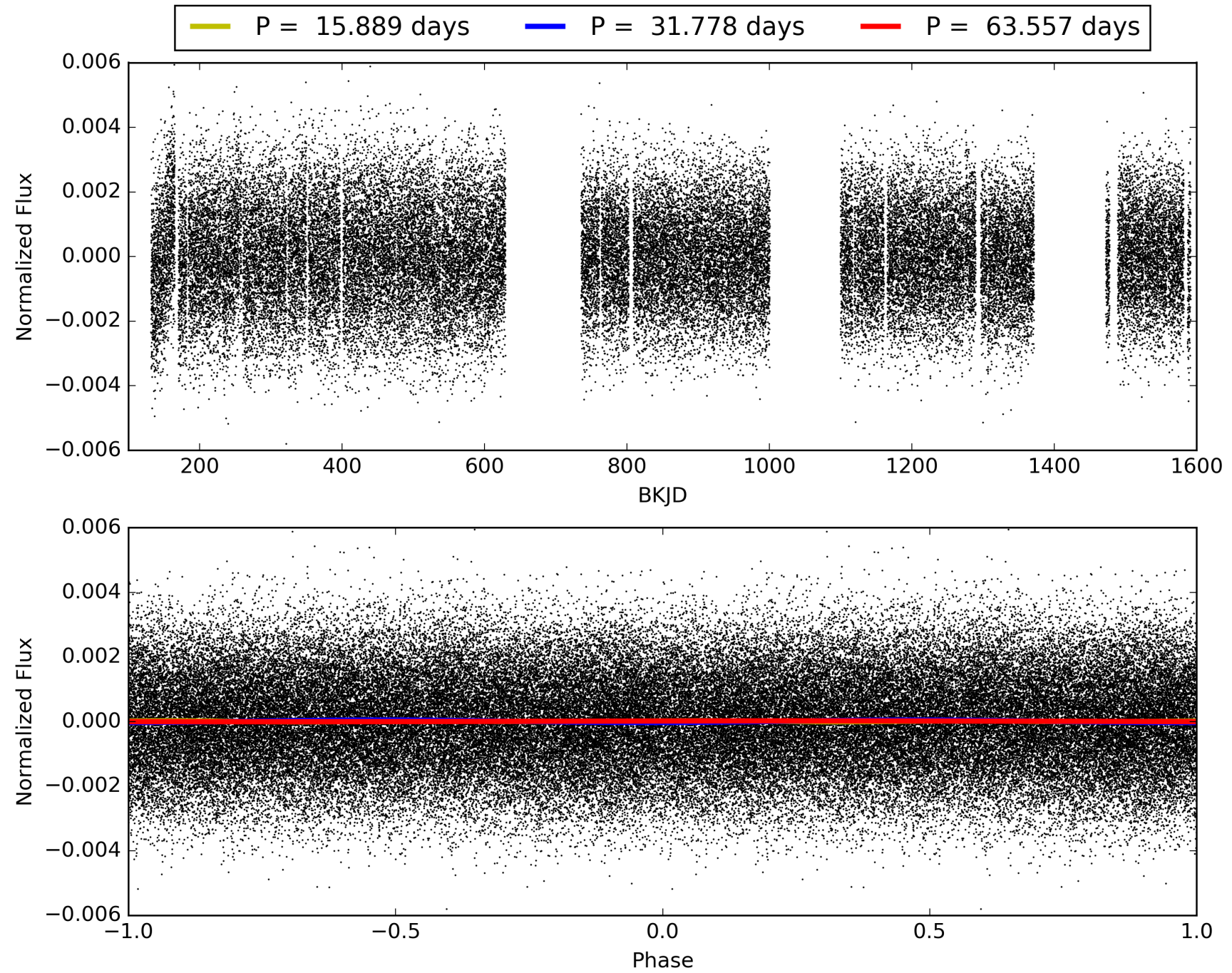
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:13:44 Z

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

# TCE 010035772-05, PDC Light Curves

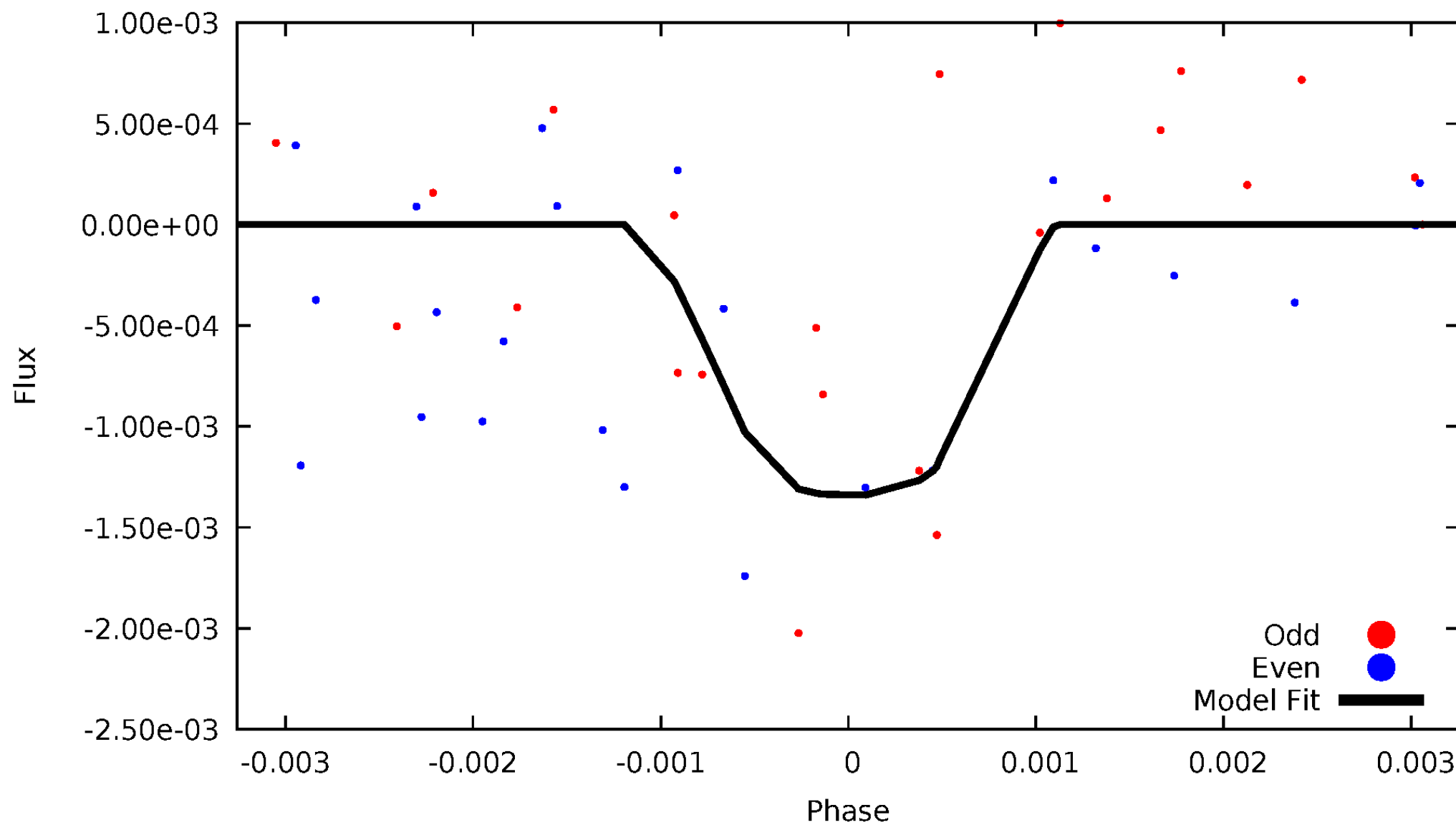


TCE 010035772-05



# DV Odd/Even

TCE 010035772-05





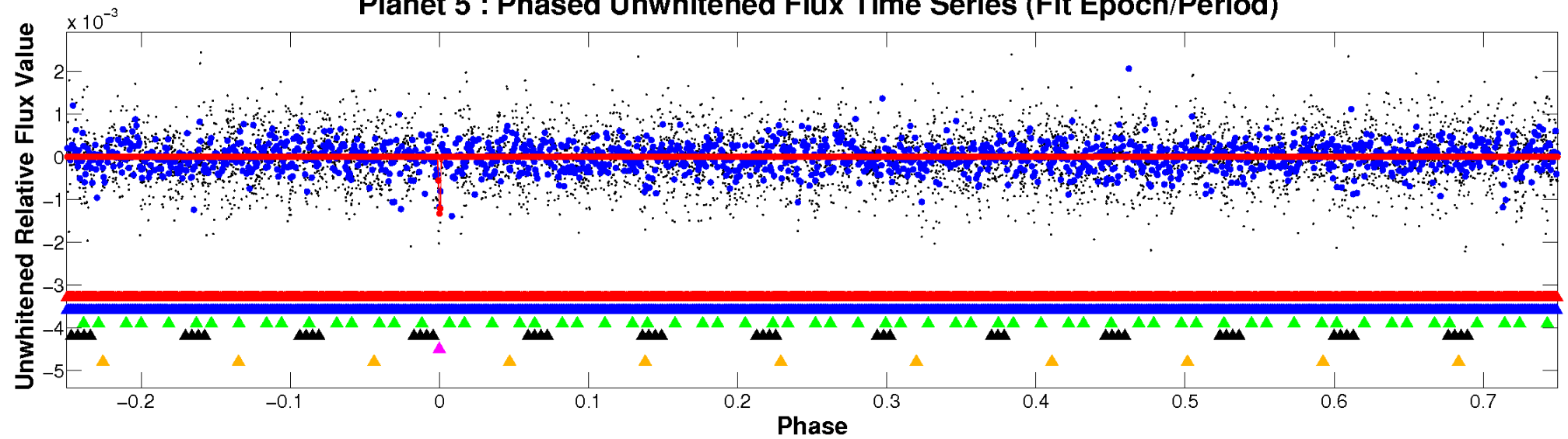


ALT Odd/Even

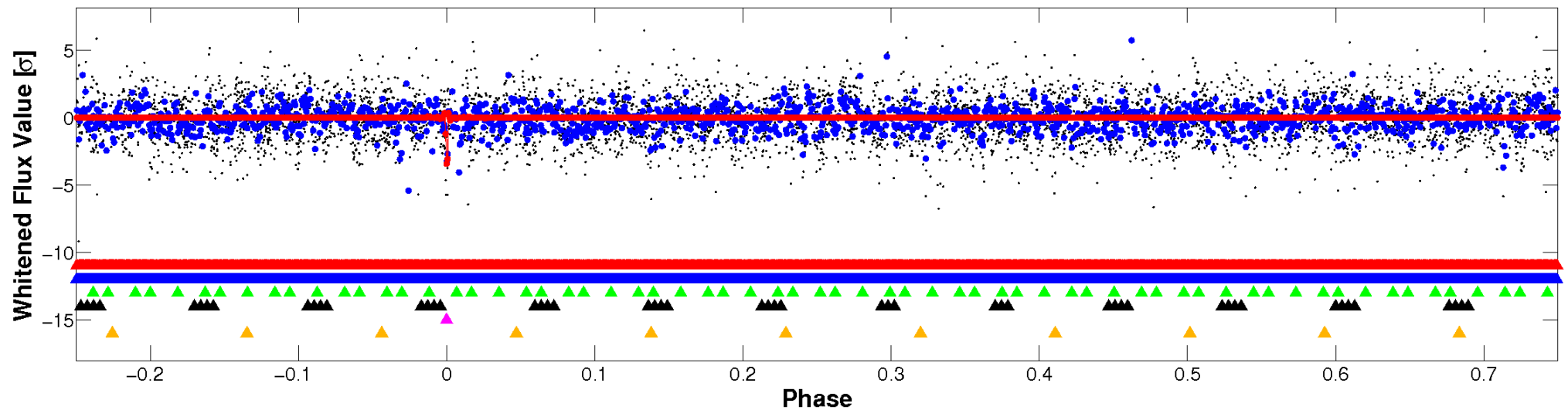
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

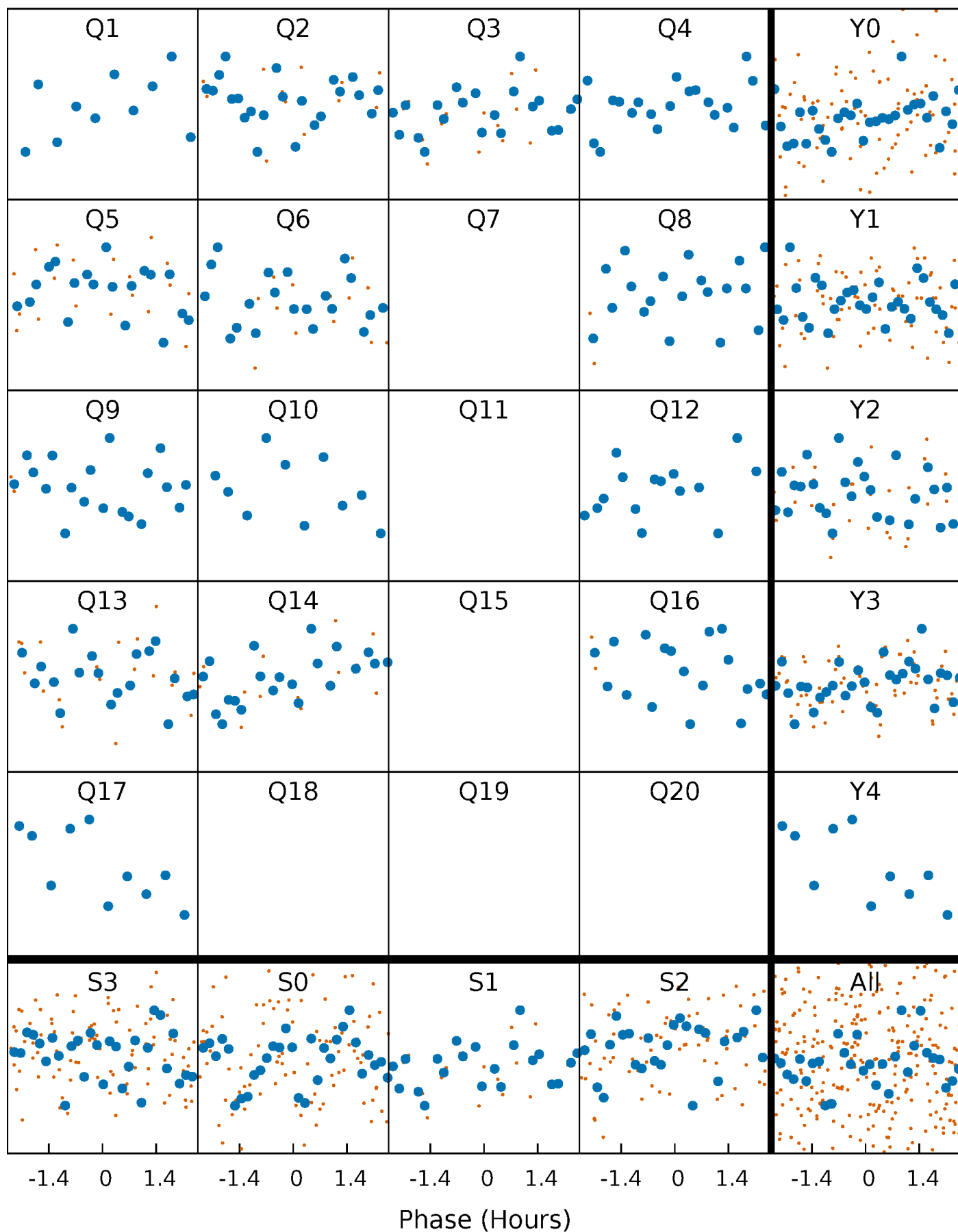


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



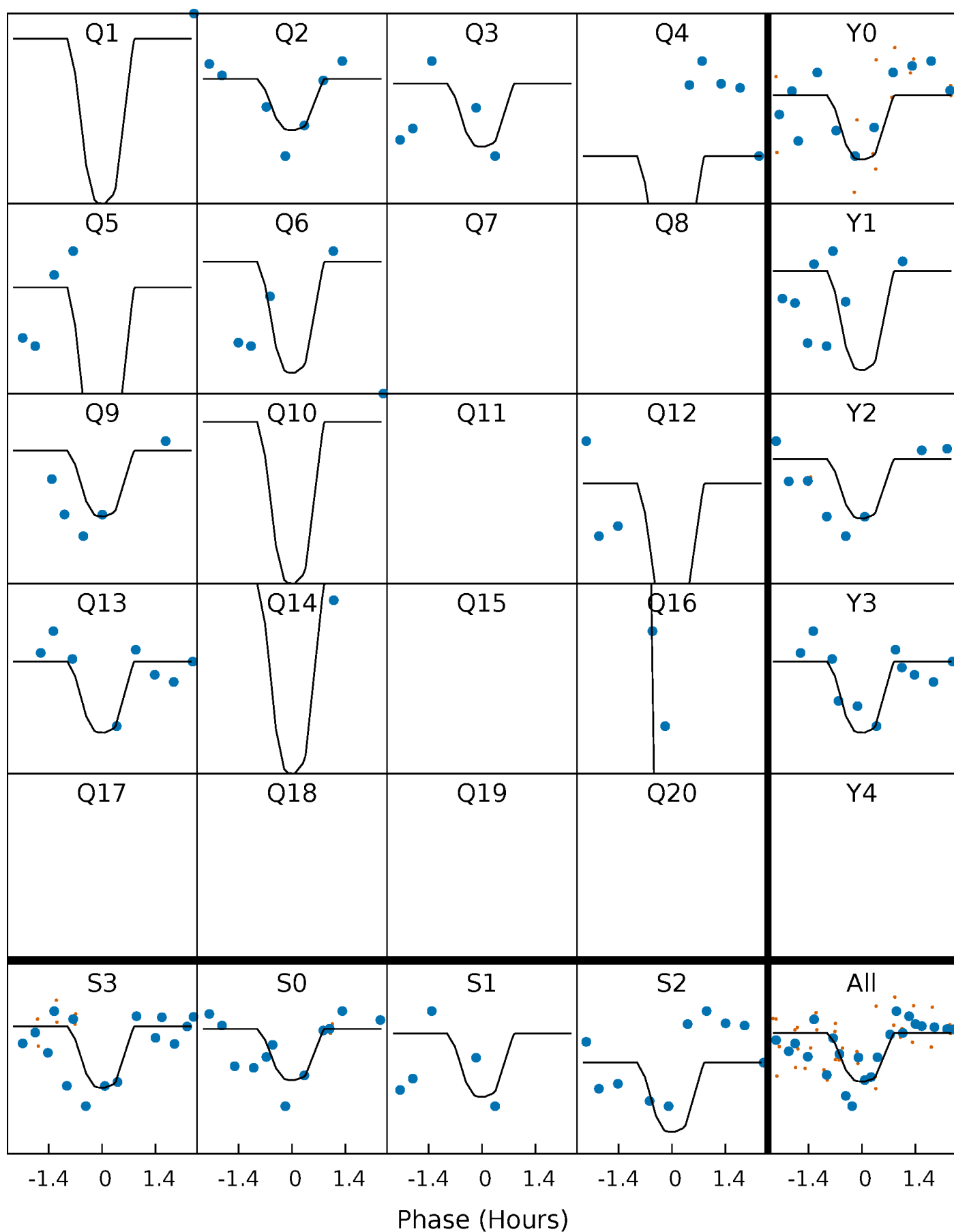
# PDC Quarter-Phased Transit Curves

TCE 010035772-05     $P = 31.778434$  Days     $T_0 = 143.614221$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 010035772-05 P= 31.778434 Days  $T_0=143.614221$  (BKJD)

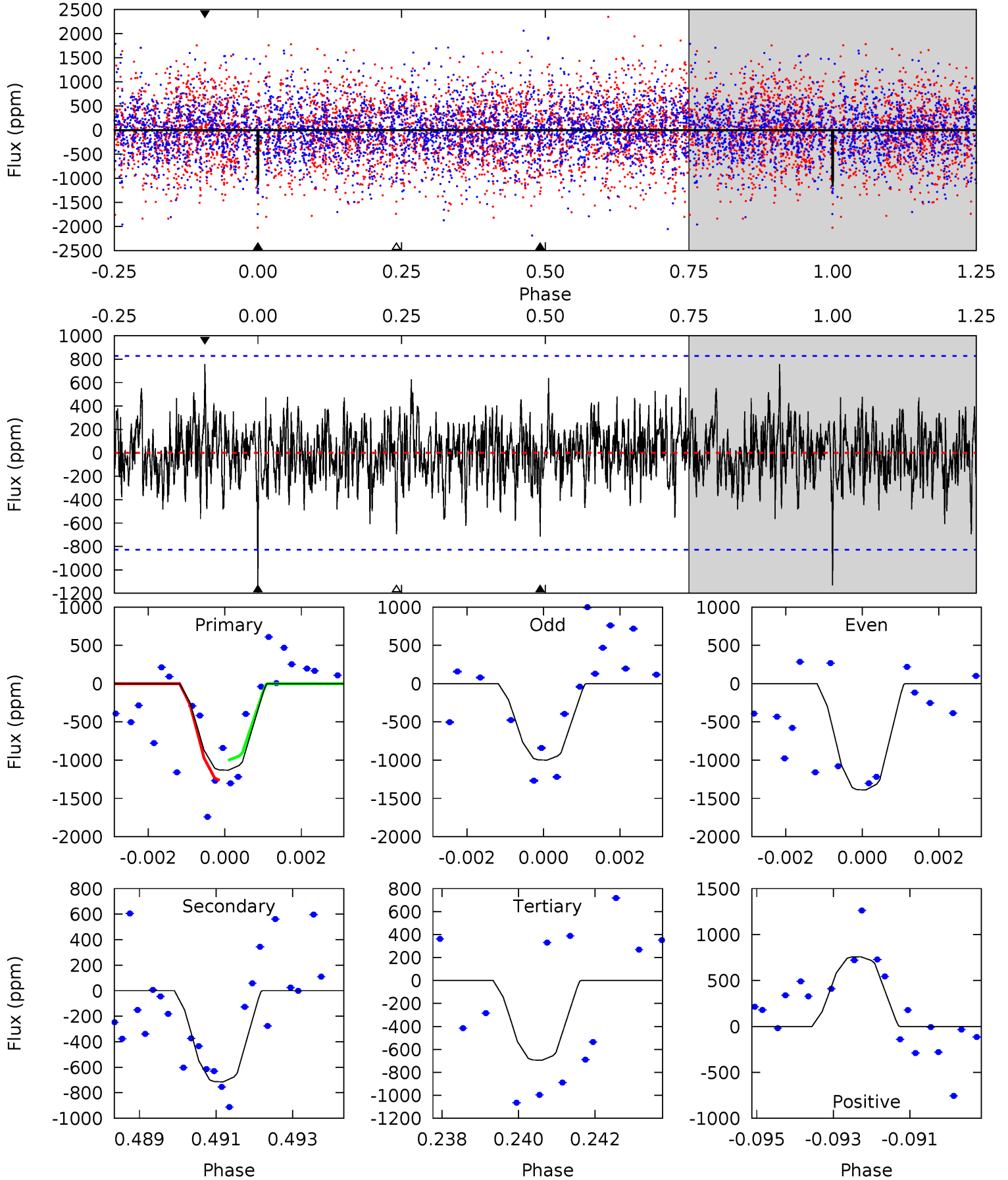


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

010035772-05, P = 31.778434 Days, E = 111.835787 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
7.28	4.60	4.47	4.88	5.32	3.09	1.27	2.81	2.40	0.13	-0.28	1.20	1.01	0.40	0.82





## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 010035772

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7504^{+209}_{-328}$	$3.525^{+0.532}_{-0.028}$	$0.210^{+0.150}_{-0.350}$	$4.501^{+0.278}_{-2.499}$	$2.472^{+0.147}_{-0.832}$	$0.038^{+0.253}_{-0.004}$
	+3%/-4%	+15%/-1%	+71%/-167%	+6%/-56%	+6%/-34%	+663%/-10%
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 010035772-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-715 \pm 156$	$21.48^{+19.64}_{-14.76}$	$1811^{+119}_{-235}$	$5379^{+4866}_{-1288}$	$58^{+568}_{-43}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

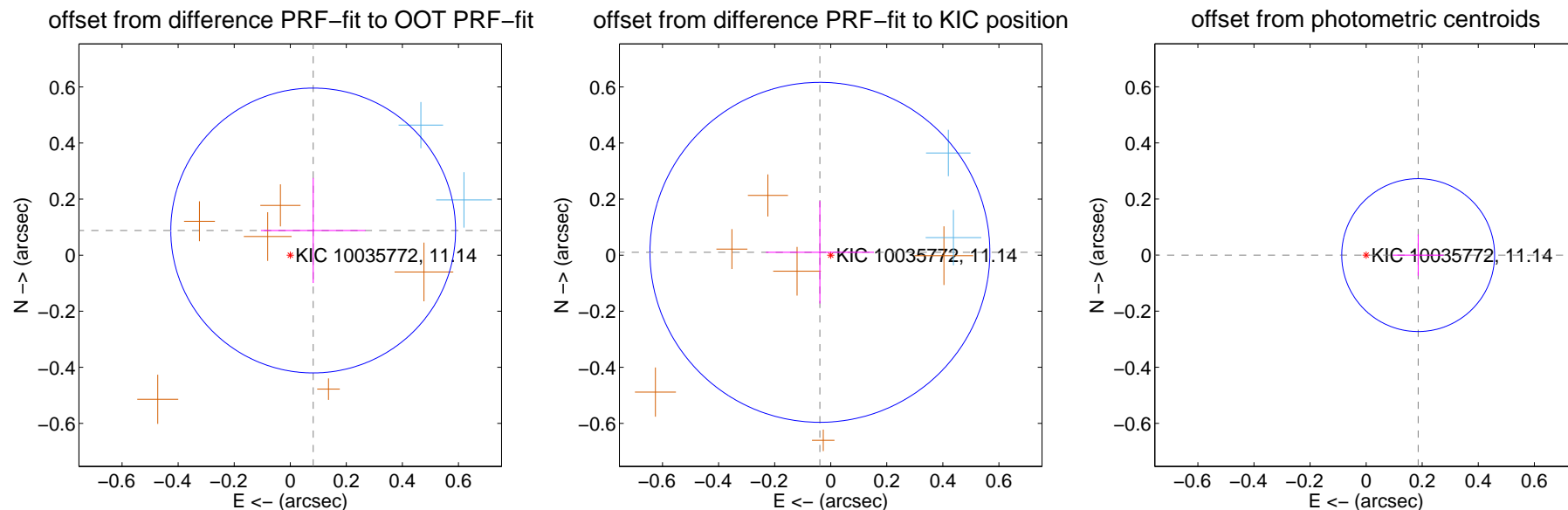
## DV Centroid Data

Supplemental centroid analysis for 010035772-05. **Kepler magnitude: 11.14.** Transit SNR 9.22

There are 5 quarters with good PRF difference image offsets

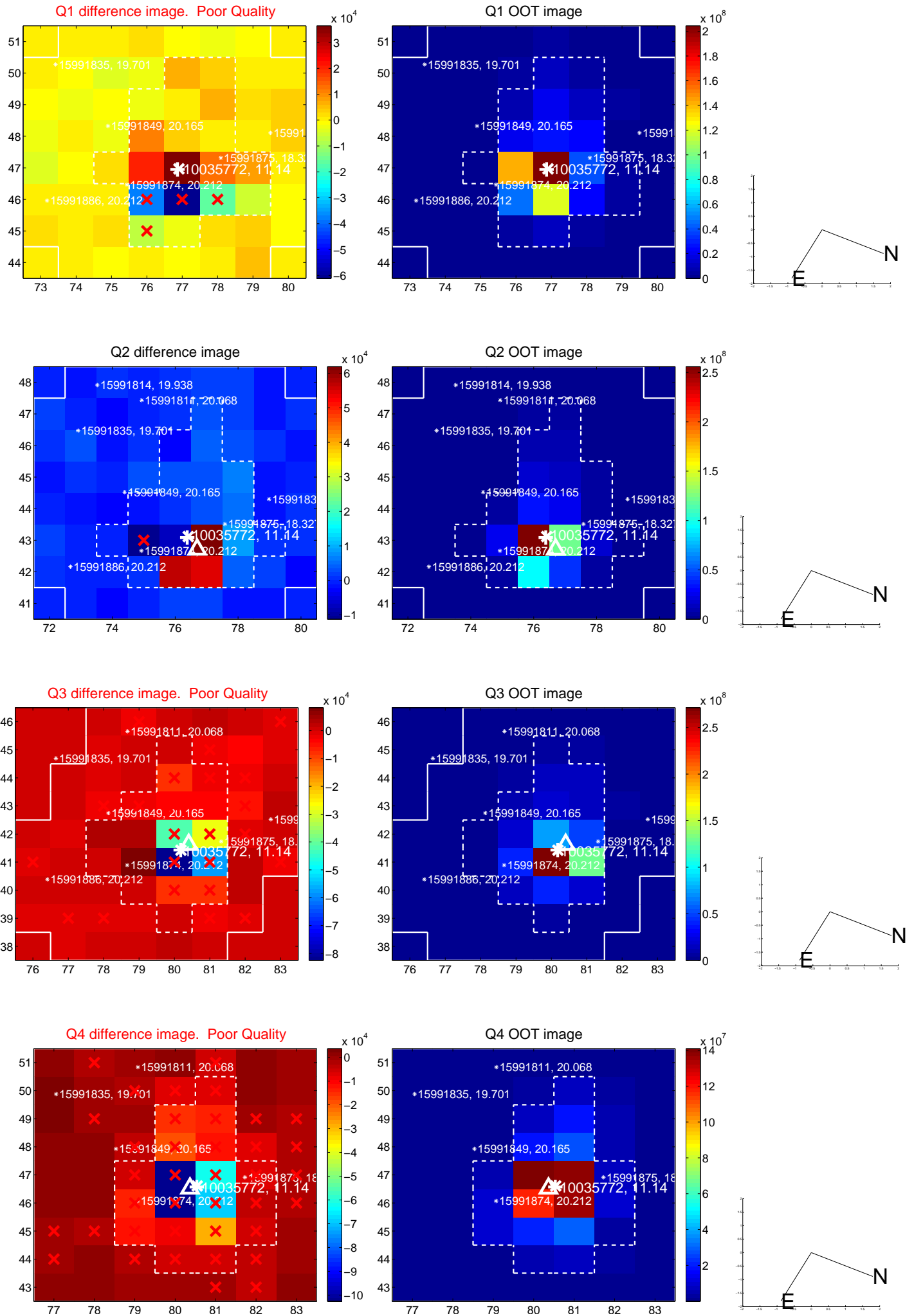
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.120 \pm 0.169$	0.71	$-0.082 \pm 0.187$	$0.088 \pm 0.187$
PRF-fit source offset from KIC position	$0.040 \pm 0.202$	0.20	$0.039 \pm 0.193$	$0.010 \pm 0.182$
photometric centroid source offset	$0.19 \pm 0.09$	2.04	$-0.19 \pm 0.09$	$-0.00 \pm 0.07$

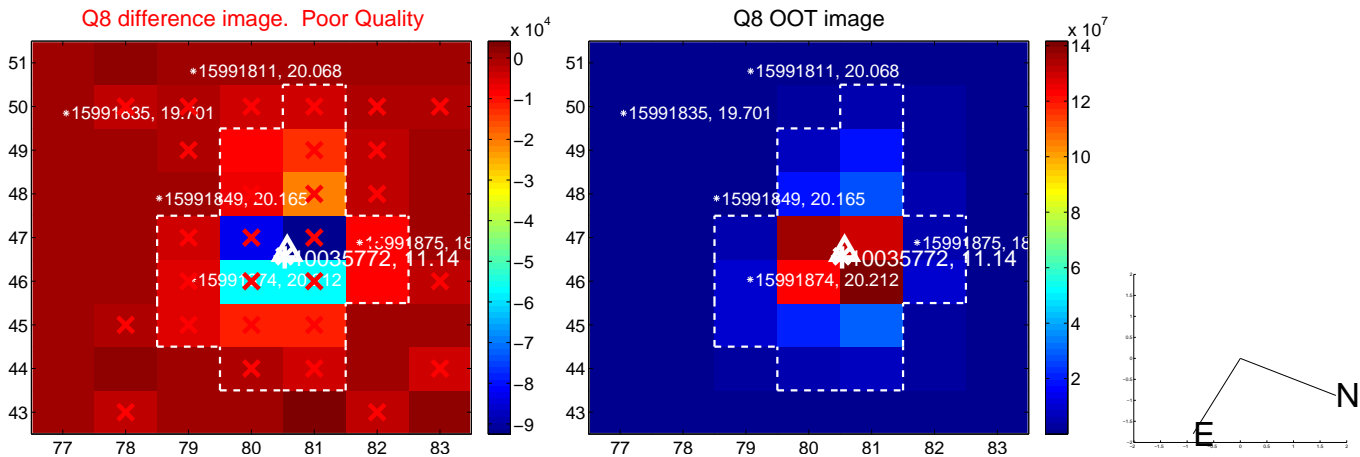
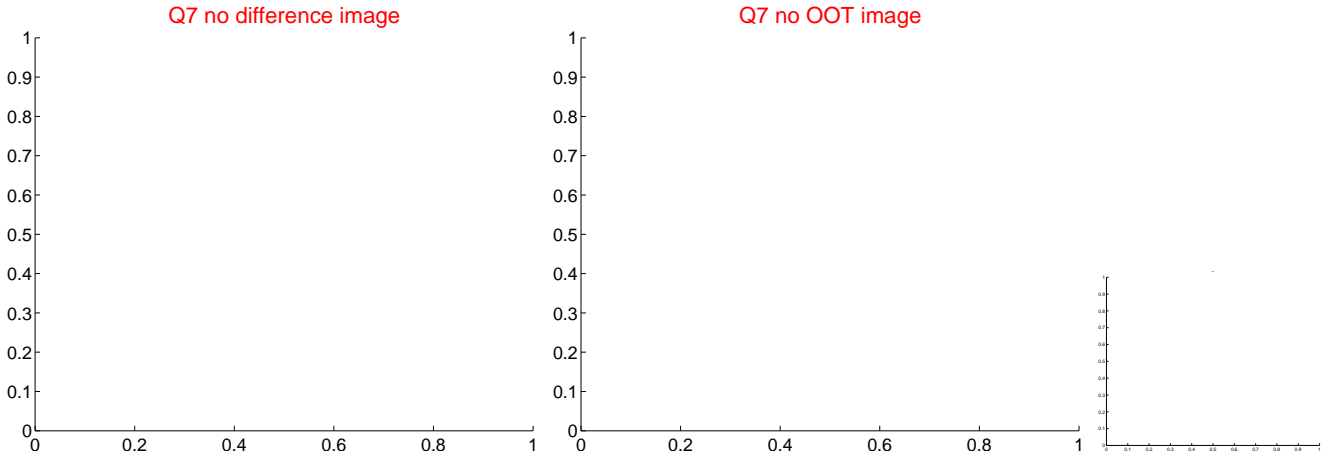
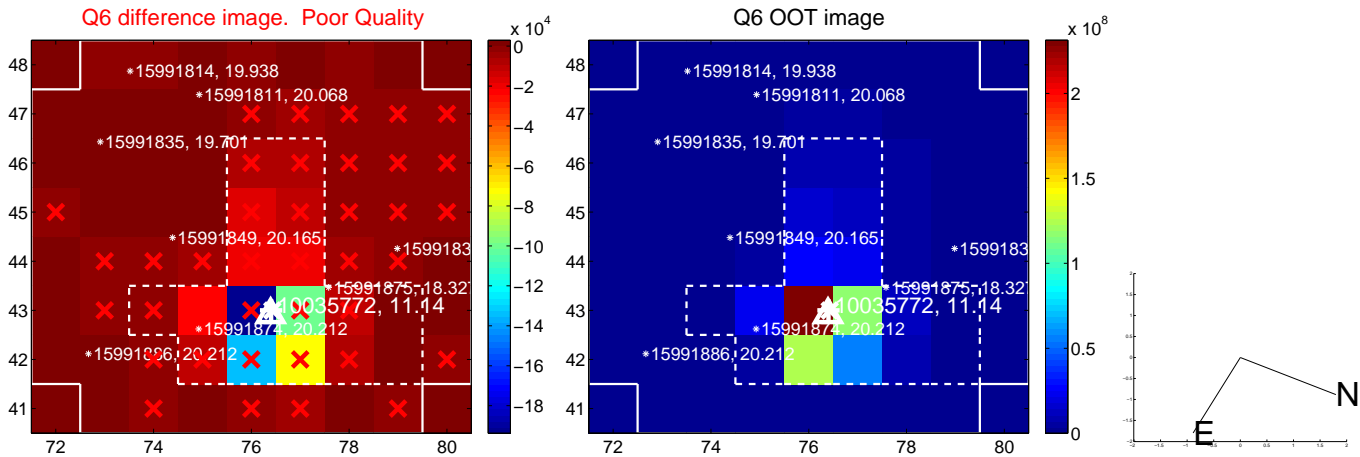
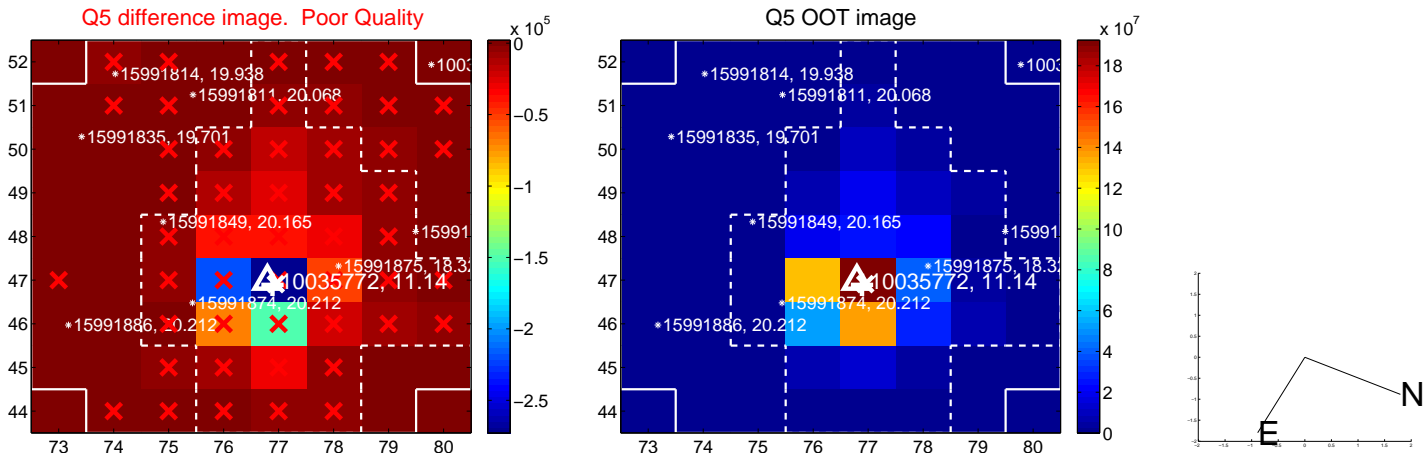


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

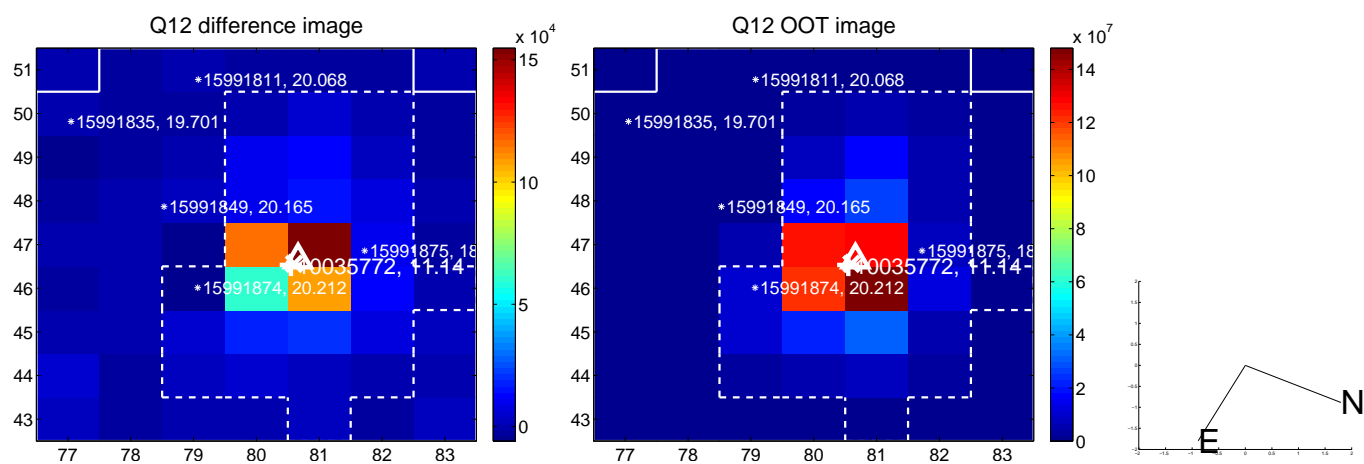
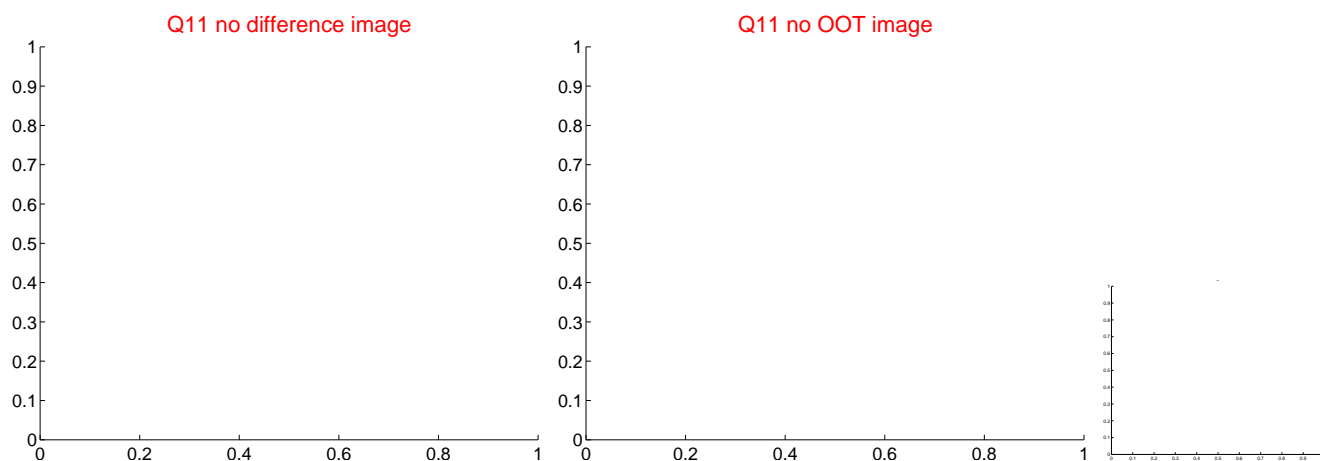
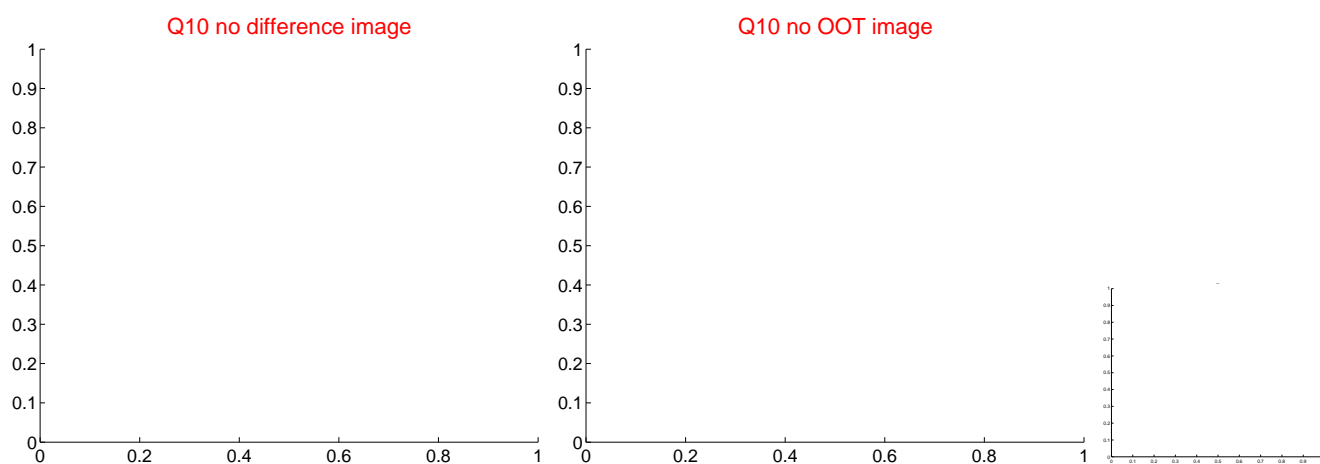
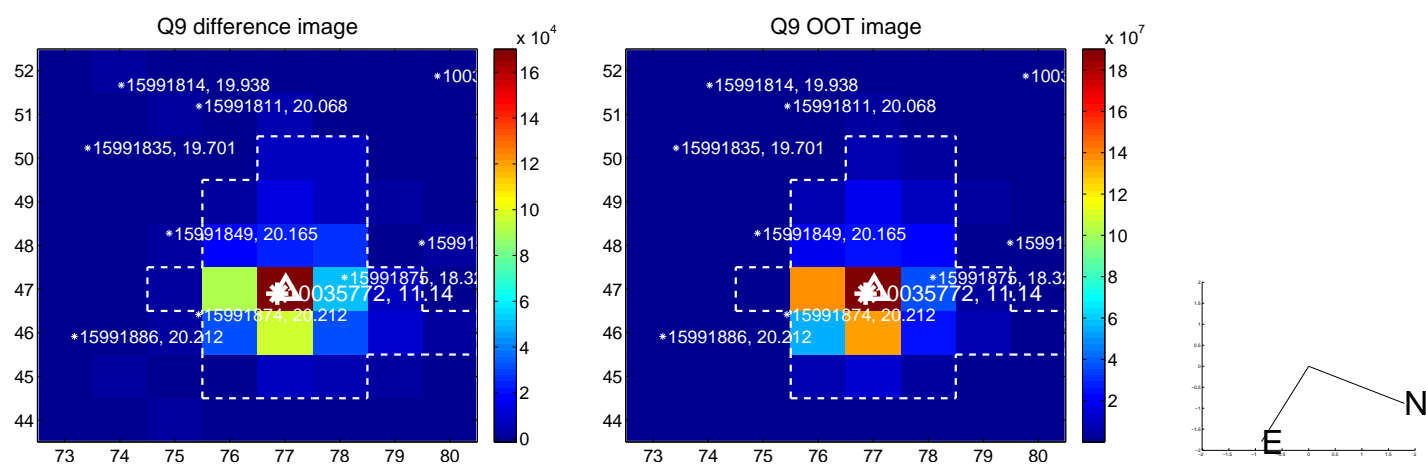
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

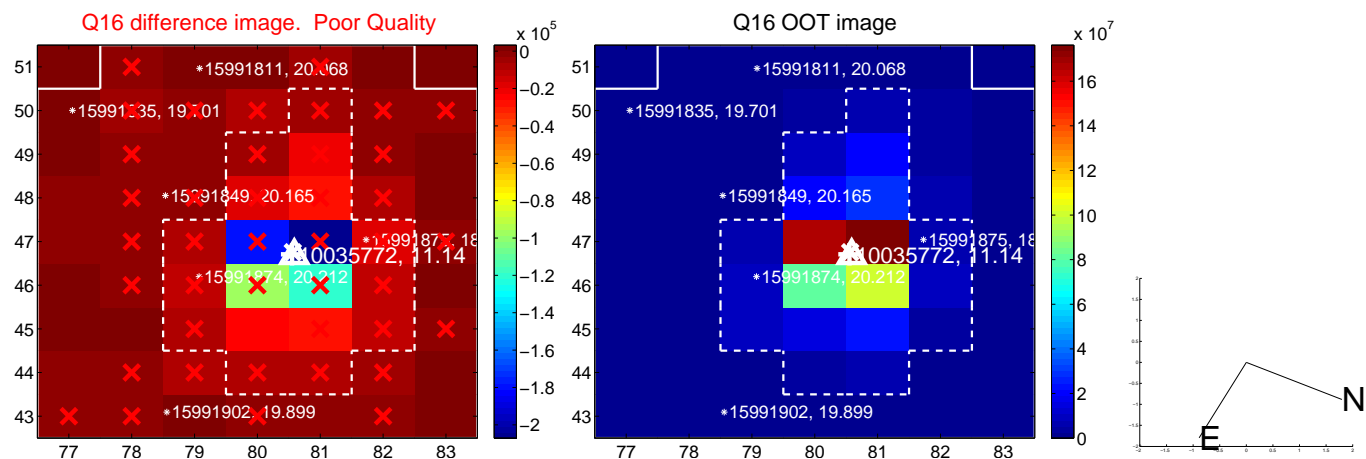
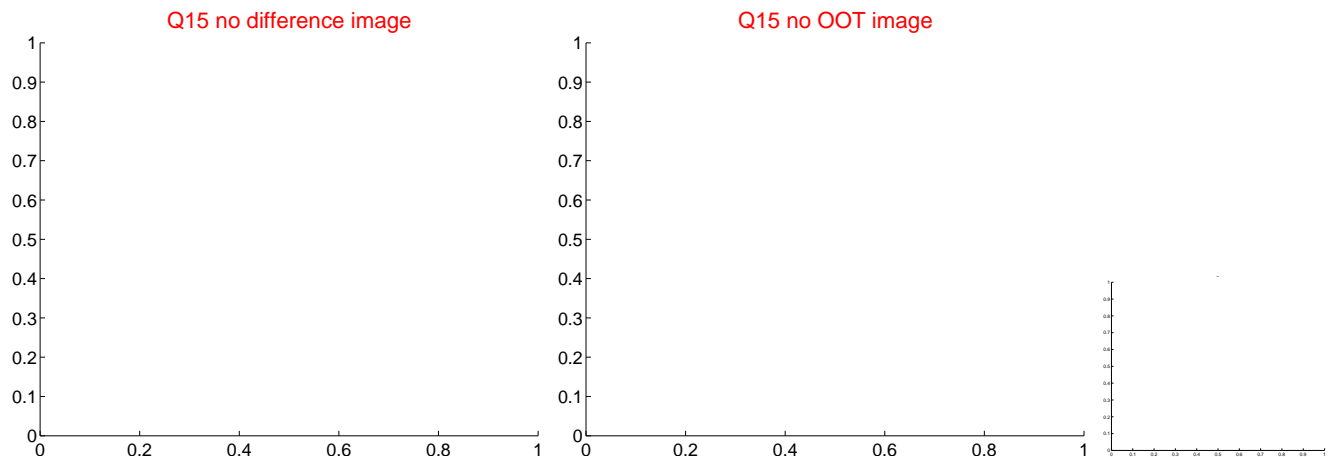
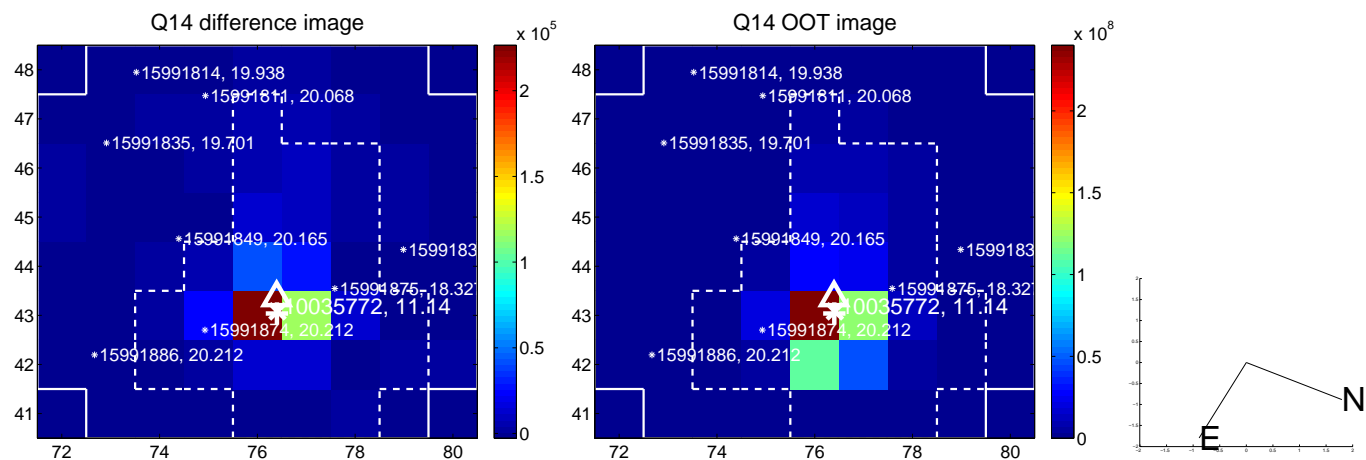
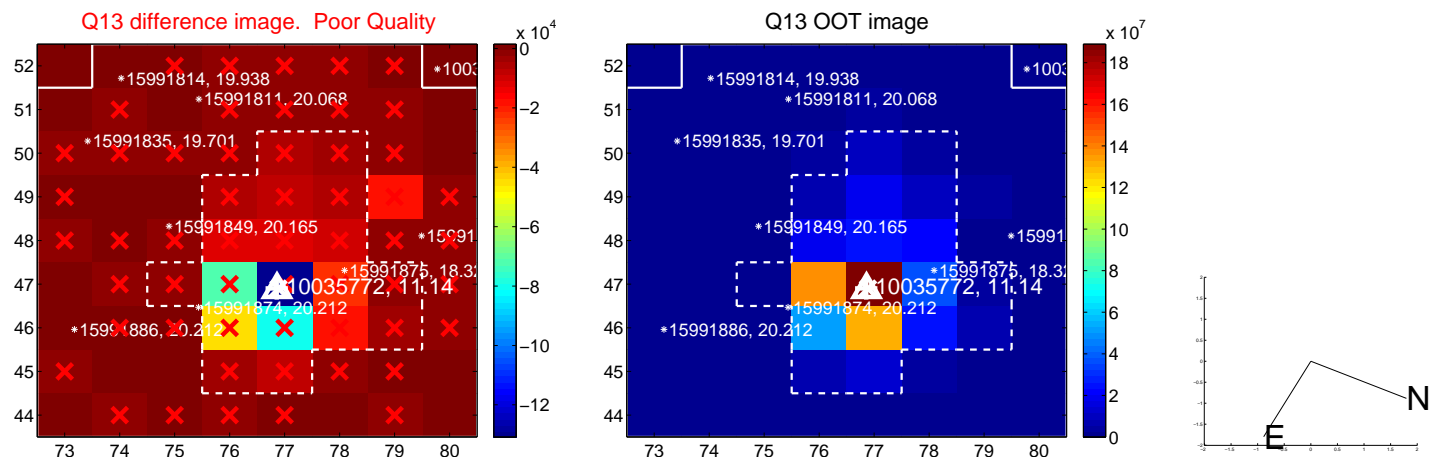


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

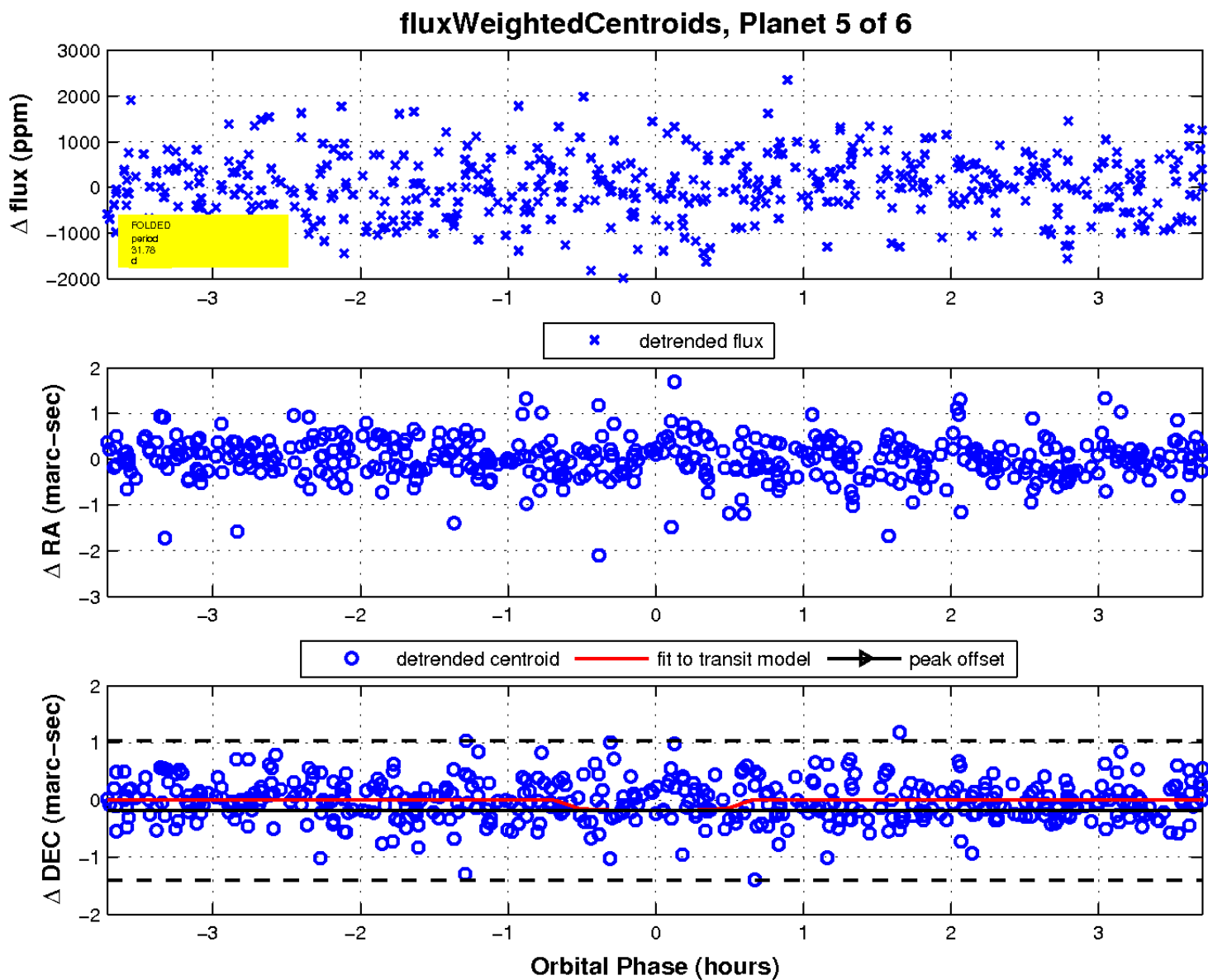
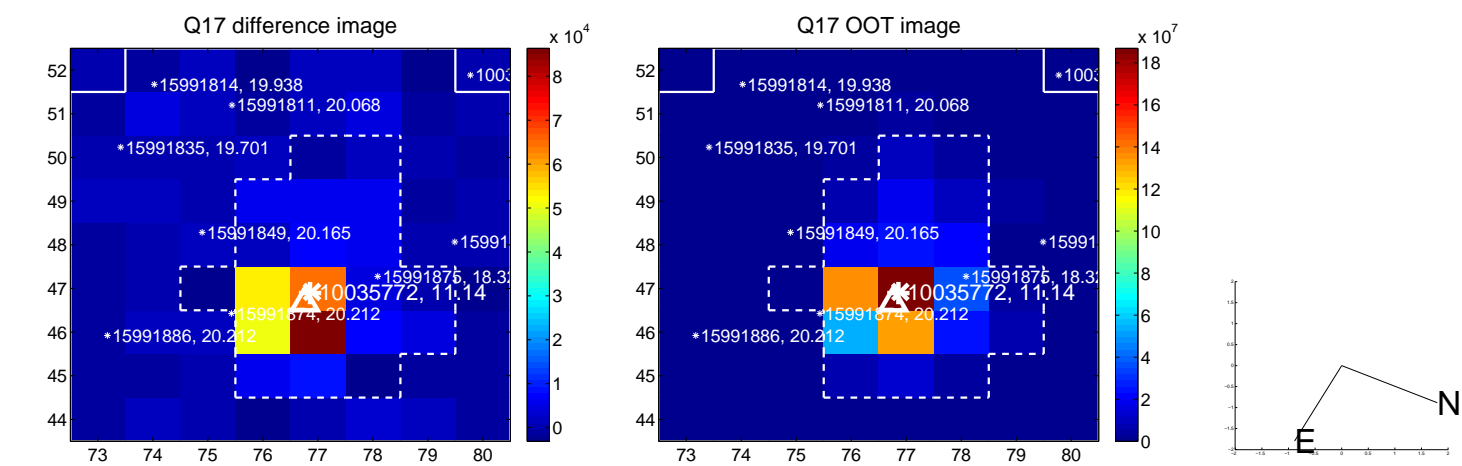




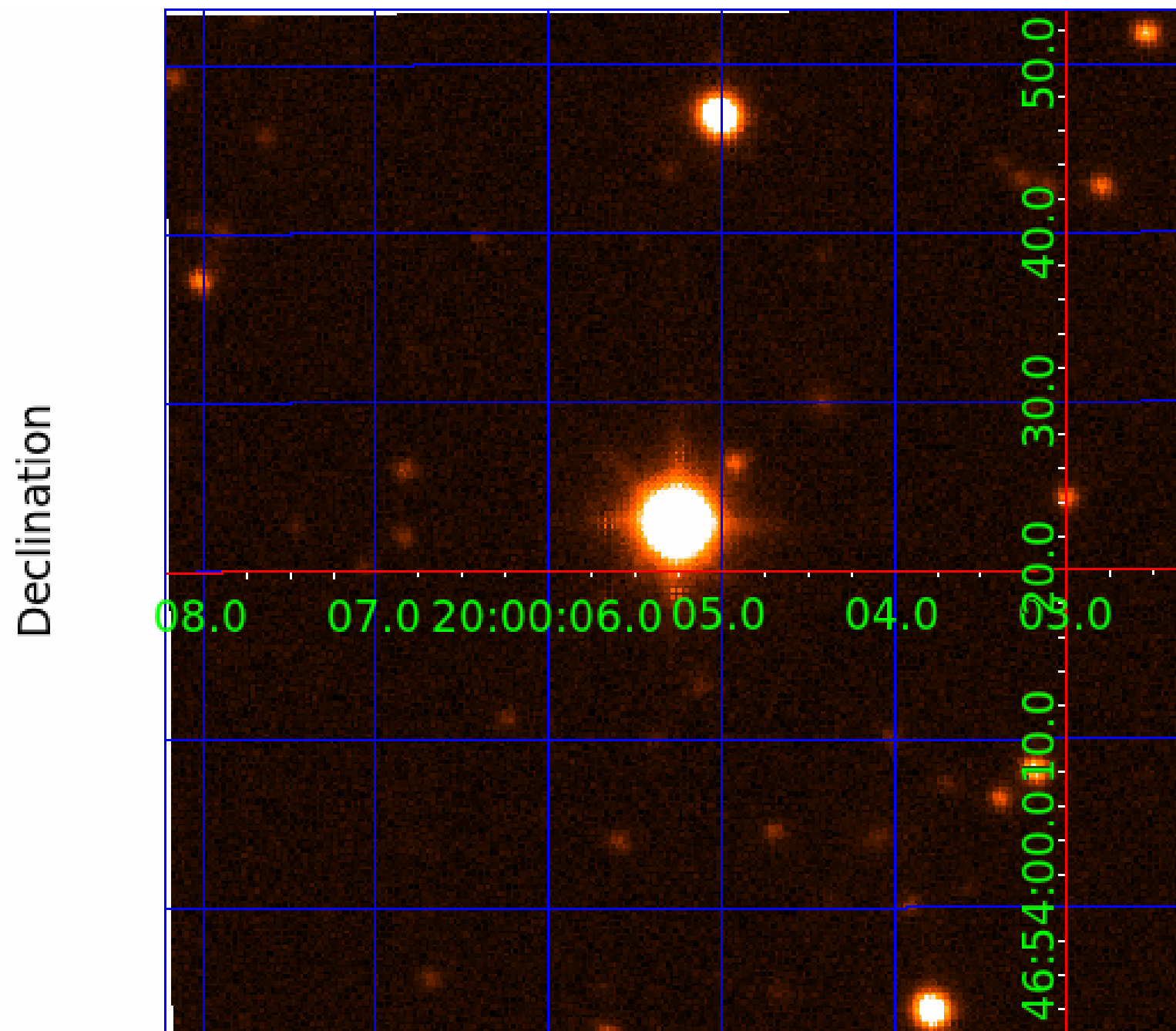
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 010035772

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010035772-01	OBS	No	0.576548	131.975854	109.6	1.135	10.5	9.0	4.50	7504	5.51	0.00
010035772-02	OBS	No	0.536434	131.684486	100.5	3.337	11.7	10.3	4.50	7504	4.71	0.00
010035772-03	OBS	No	22.485213	150.720857	1161.7	2.067	13.2	9.7	4.50	7504	26.49	1293.43
010035772-04	OBS	No	29.344394	150.375488	970.5	3.975	11.0	10.5	4.50	7504	15.32	906.92
010035772-05	OBS	No	31.778434	143.614221	1344.3	1.242	10.6	9.2	4.50	7504	16.74	815.51
010035772-06	OBS	No	20.222738	147.997585	1439.9	1.574	10.5	11.3	4.50	7504	26.42	1489.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010035772-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
010035772-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
010035772-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_SATURATED
010035772-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010035772-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010035772-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

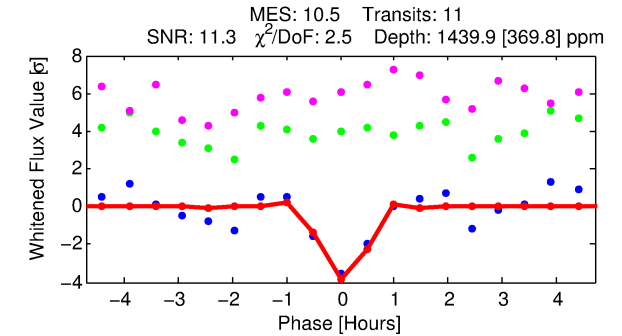
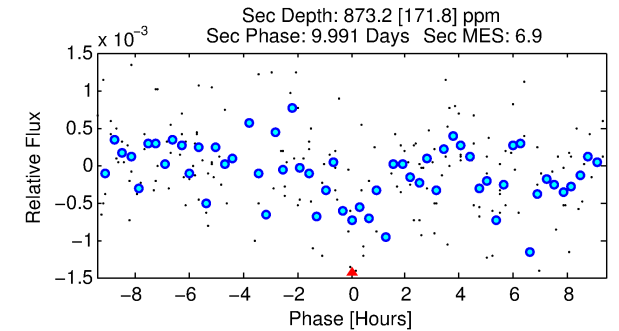
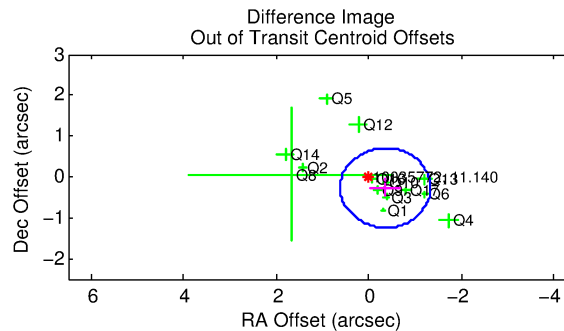
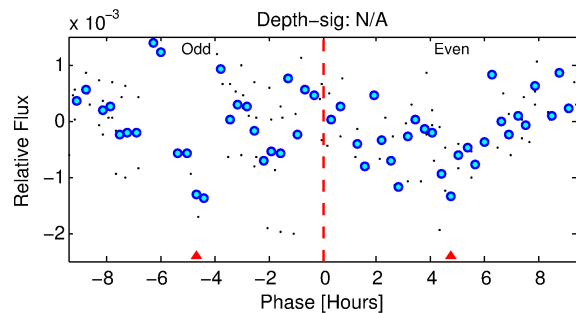
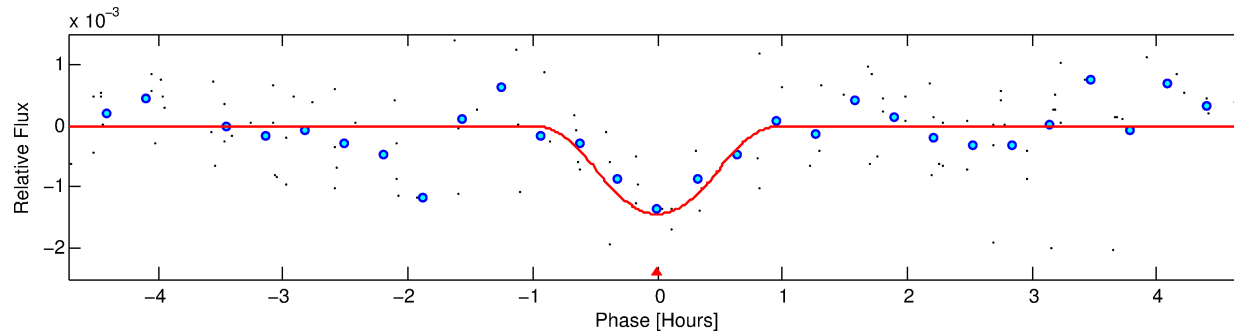
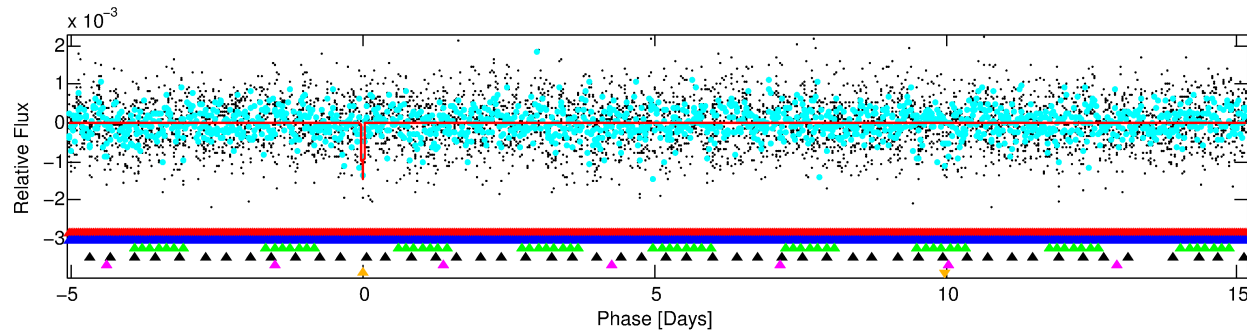
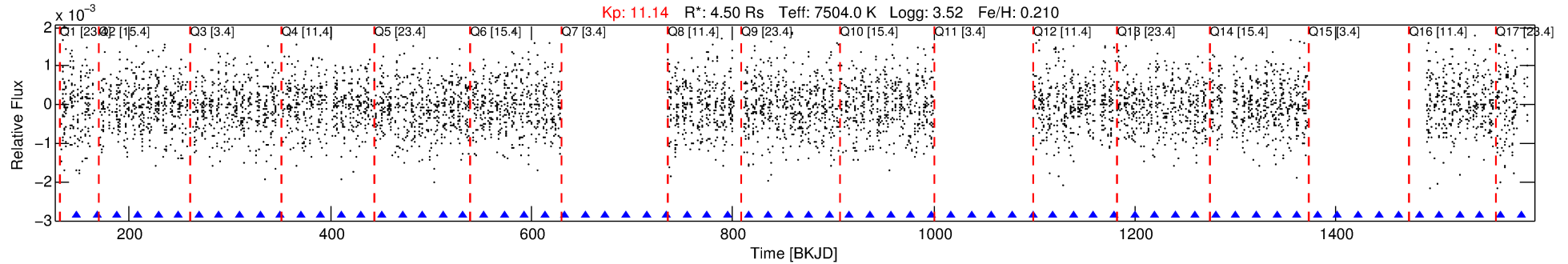
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010035772-06

No Significant Match Found

# DV One-Page Summary

KIC: 10035772 Candidate: 6 of 6 Period: 20.223 d



## DV Fit Results:

Period = 20.22274 [0.00021] d  
Epoch = 147.9976 [0.0071] BKJD  
Rp/R\* = 0.0538 [0.2948]  
a/R\* = 37.84 [73.50]  
b = 0.98 [0.54]  
Seff = 1489.88 [1361.01]  
Teq = 1584 [362] K  
Rp = 26.42 [145.55] Re  
a = 0.1965 [0.1083] AU  
Ag = 26.59 [292.57] [0.09σ]  
Teffp = 5562 [15250] K [0.2σ]

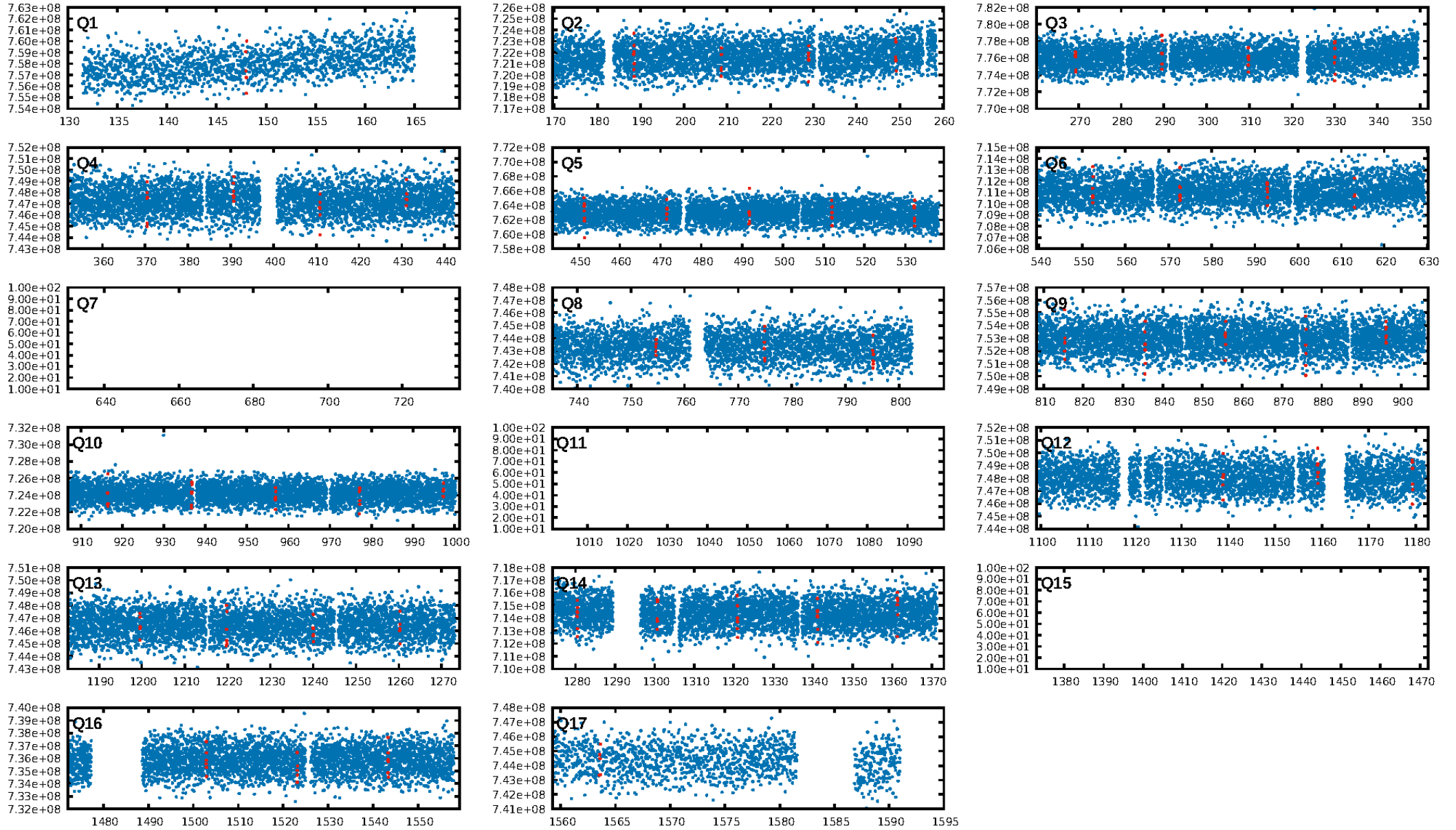
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [242.94σ]  
LongPeriod-sig: 100.0% [20.90σ]  
ModelChiSquare2-sig: 1.6%  
ModelChiSquareGof-sig: 86.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: 0.4618  
Centroid-sig: N/A  
Centroid-so: 0.075 arcsec [1.09σ]  
OotOffset-rm: 0.446 arcsec [1.37σ]  
KicOffset-rm: 0.410 arcsec [1.26σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.50 [7/14]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:13:47 Z

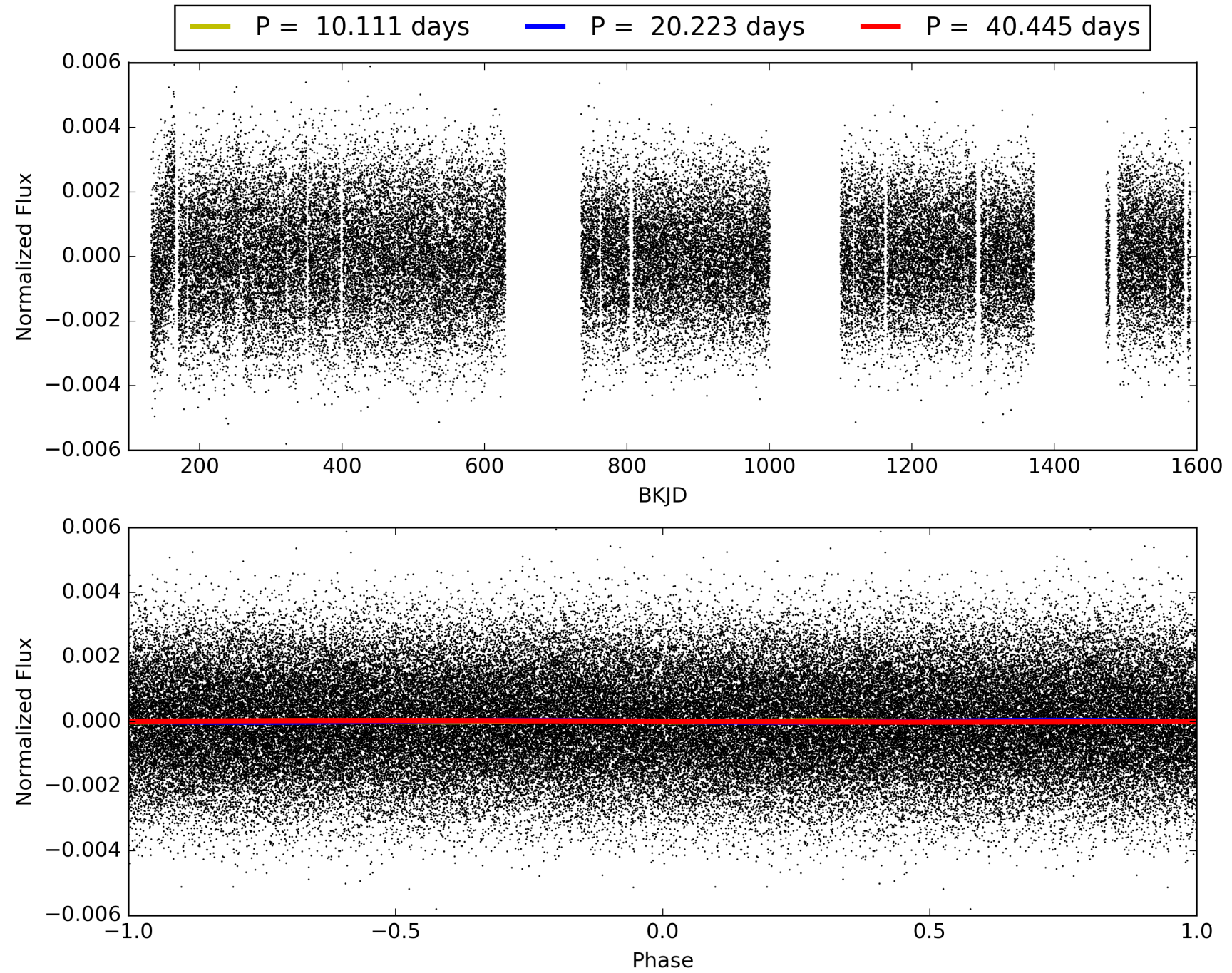
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010035772-06, PDC Light Curves



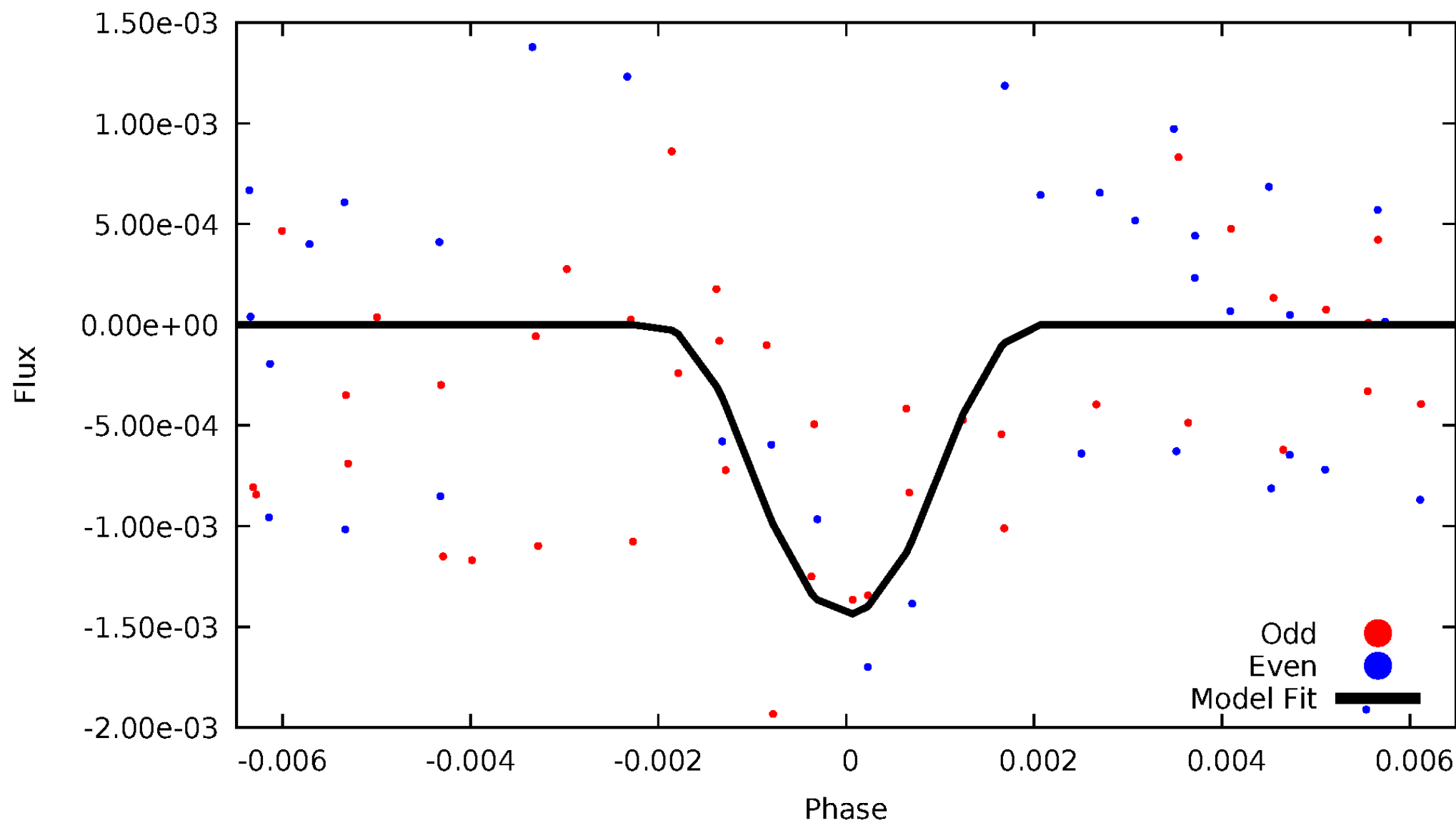


TCE 010035772-06



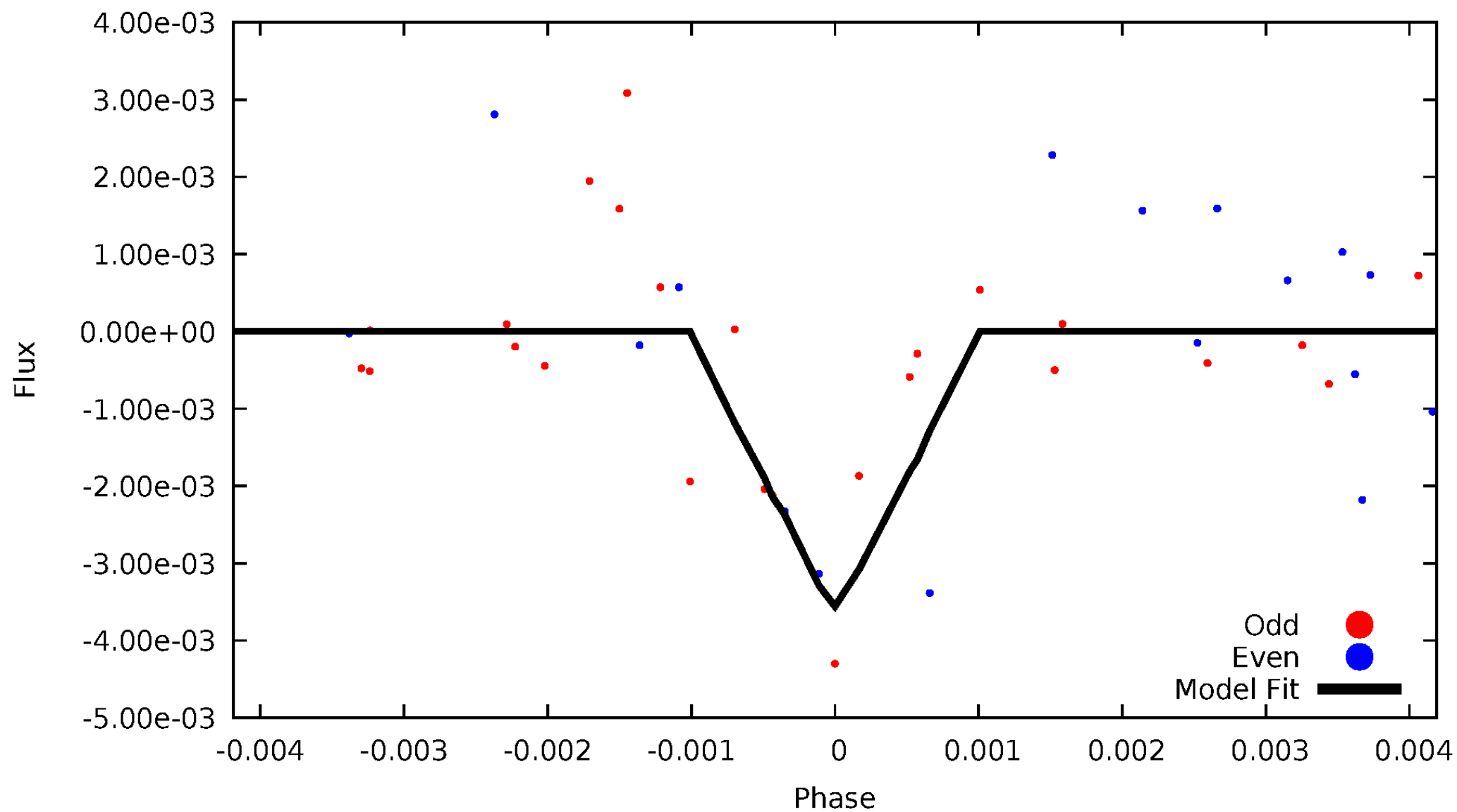
# DV Odd/Even

TCE 010035772-06



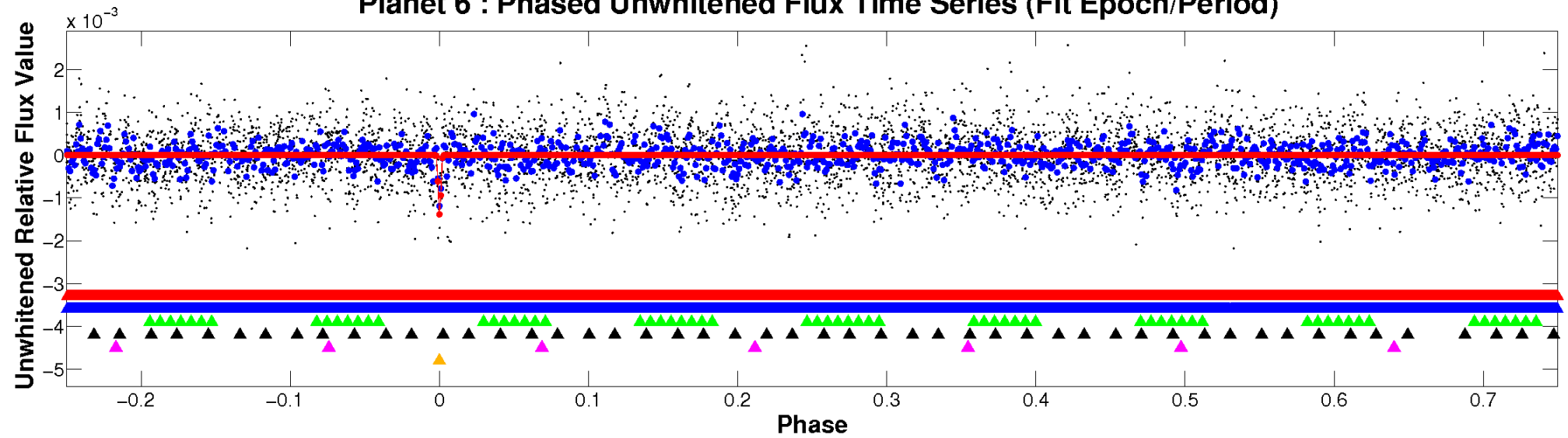
# ALT Odd/Even

TCE 010035772-06

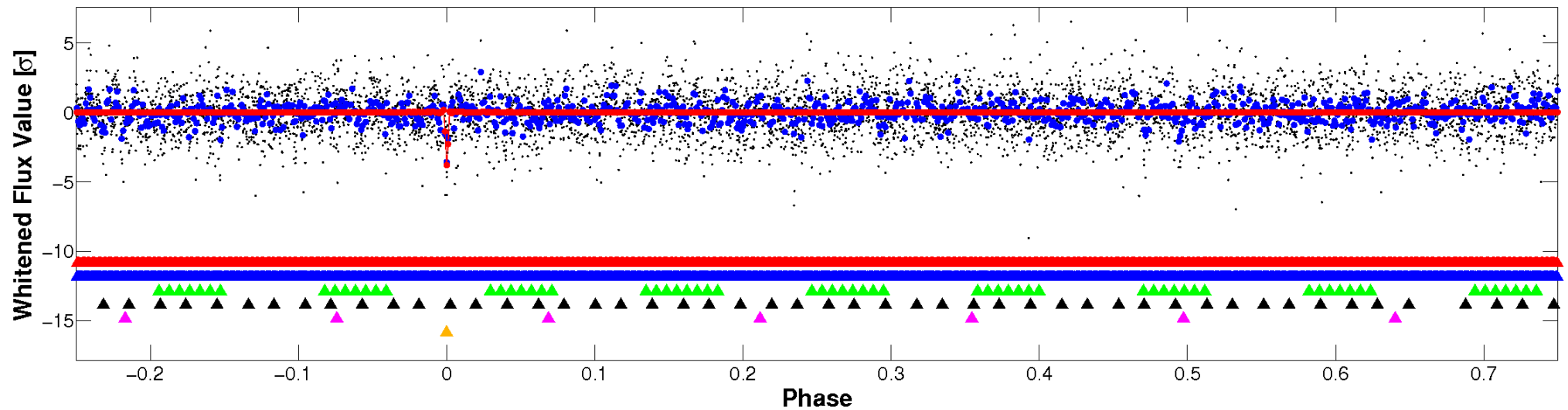


# Non-Whitened Vs. Whitened Light Curve

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

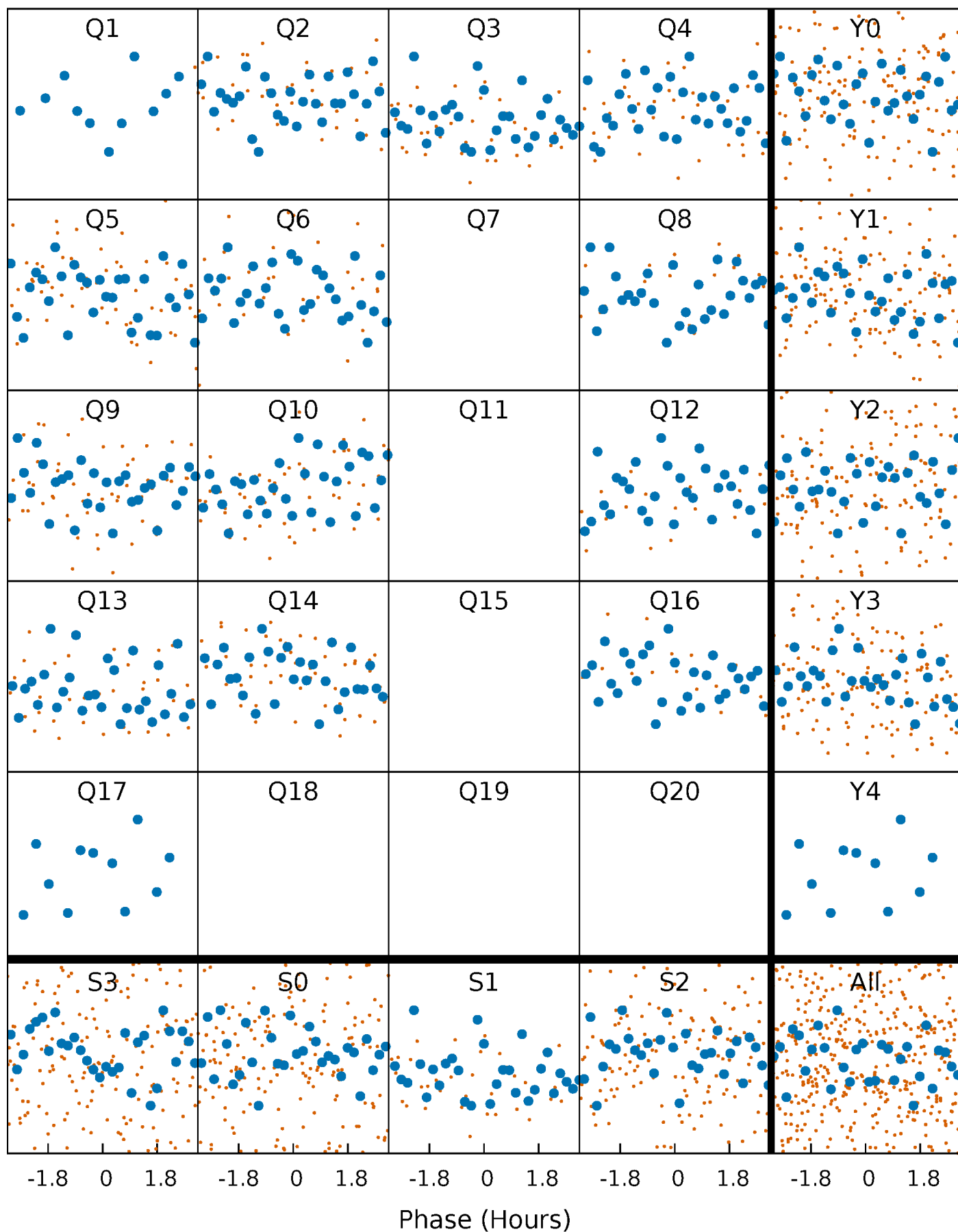


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



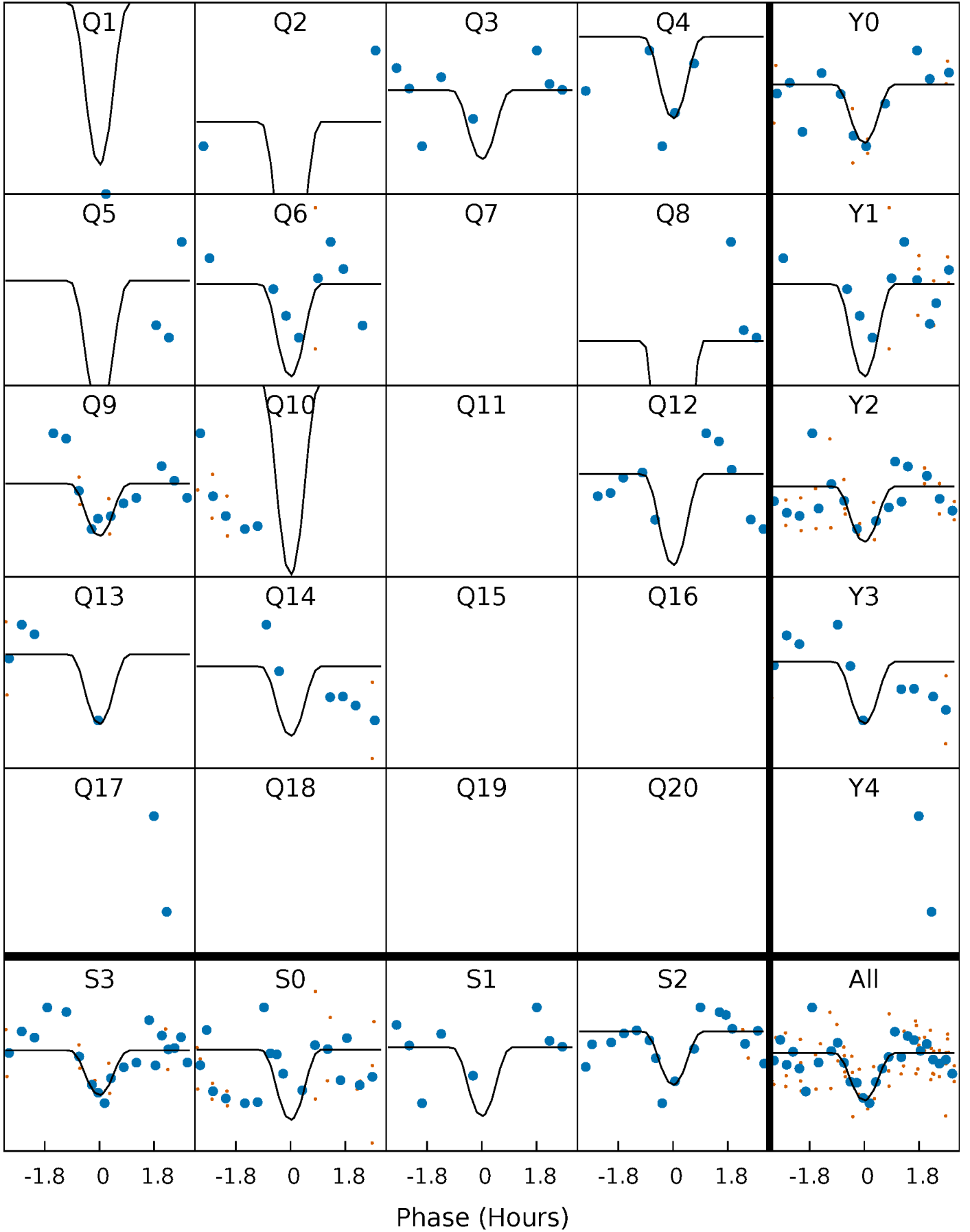
# PDC Quarter-Phased Transit Curves

TCE 010035772-06 P= 20.222738 Days  $T_0=147.997585$  (BKJD)



# DV Quarter-Phased Transit Curves

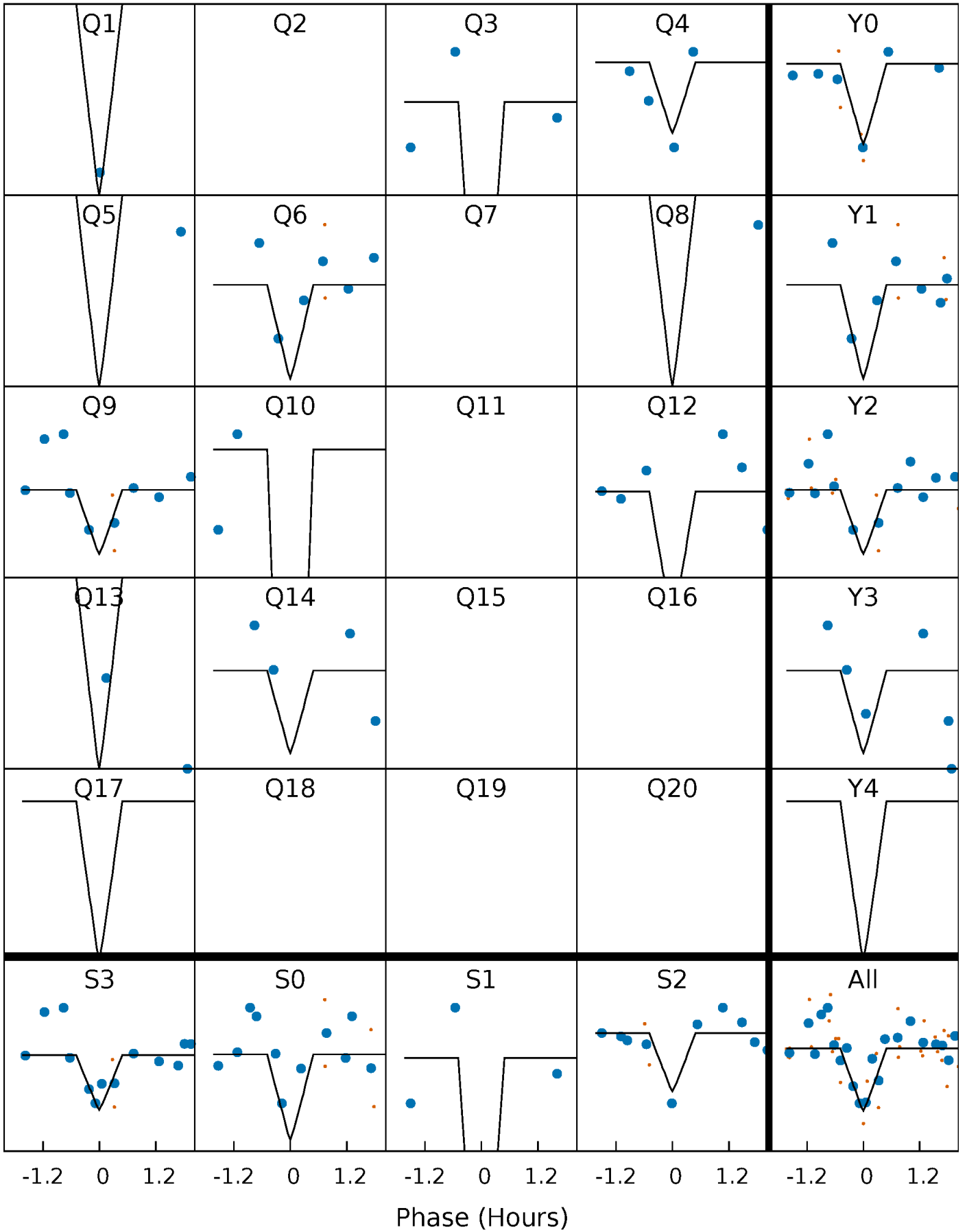
TCE 010035772-06 P= 20.222738 Days  $T_0=147.997585$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

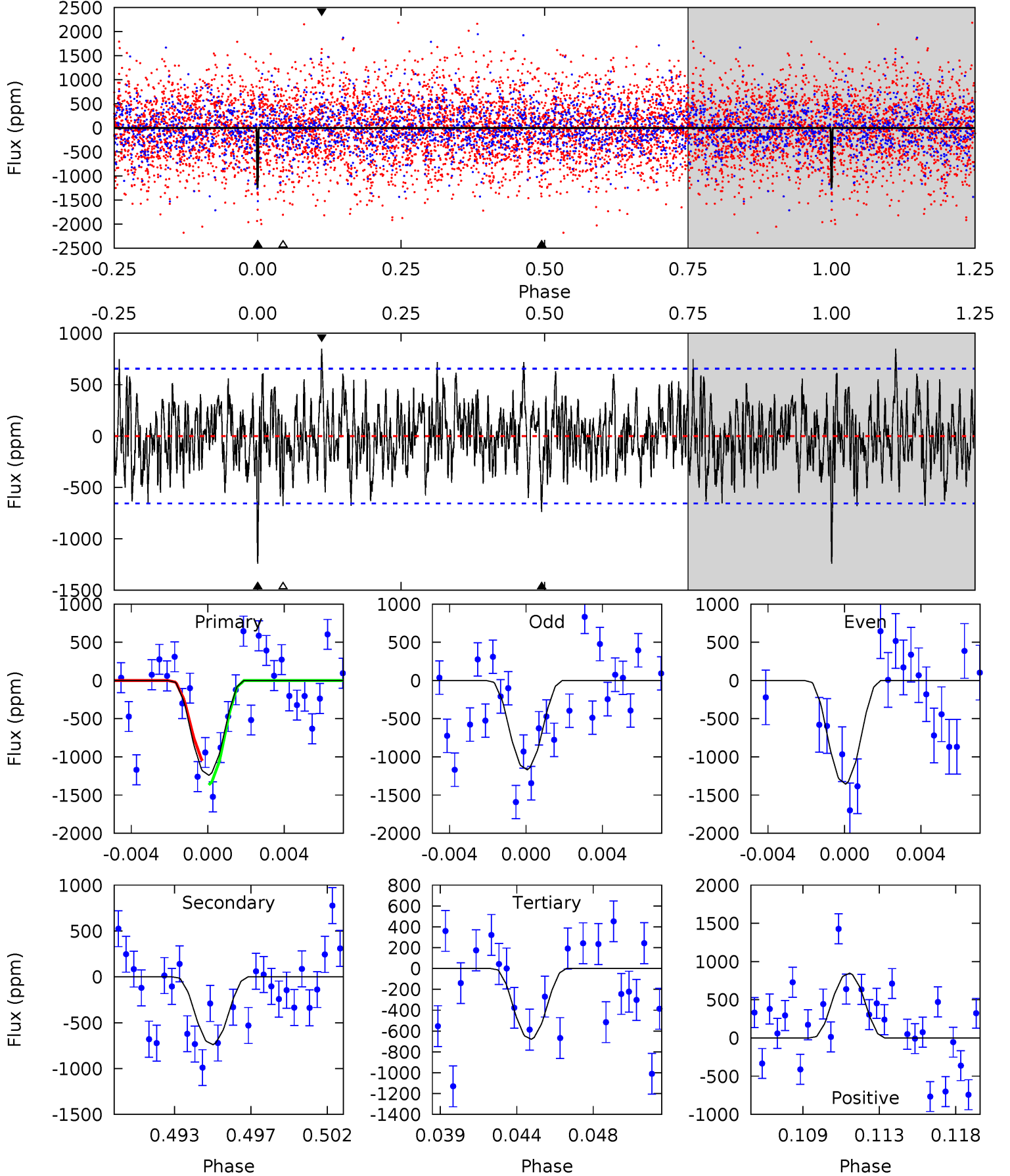
TCE 010035772-06 P= 20.222570 Days  $T_0=148.004471$  (BKJD)



# DV Model-Shift Uniqueness Test

010035772-06,  $P = 20.222738$  Days,  $E = 127.774847$  Days

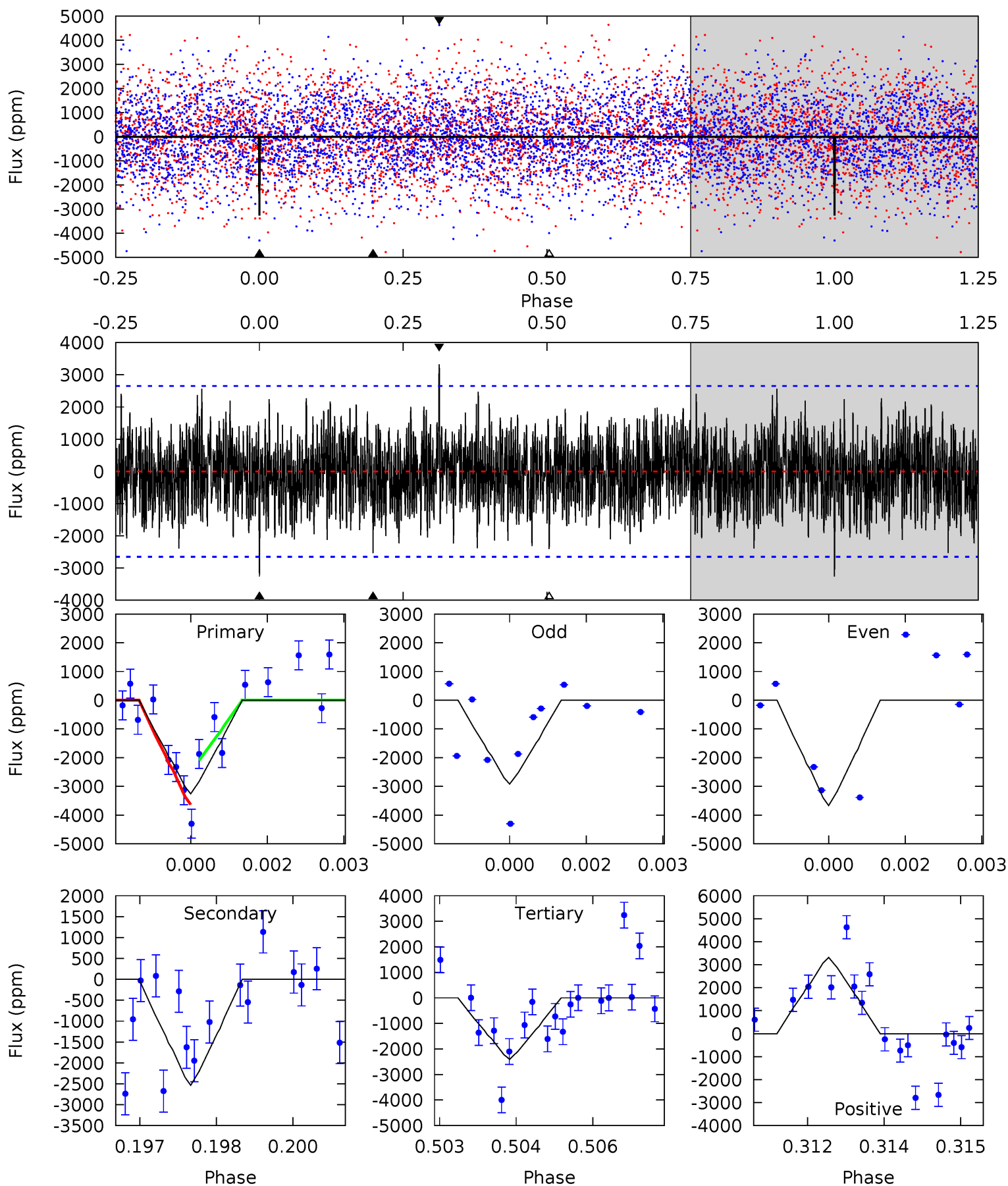
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.82	5.85	5.38	6.72	5.18	2.85	1.97	4.44	3.10	0.47	-0.87	0.72	1.05	0.41	1.25



# Alt Model-Shift Uniqueness Test

010035772-06, P = 20.222570 Days, E = 127.781901 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
6.61	5.15	4.88	6.73	5.38	3.17	1.91	1.73	-0.12	0.26	-1.59	0.74	1.28	0.50	1.57



### Stellar Parameters For KIC 010035772

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7504^{+209}_{-328}$	$3.525^{+0.532}_{-0.028}$	$0.210^{+0.150}_{-0.350}$	$4.501^{+0.278}_{-2.499}$	$2.472^{+0.147}_{-0.832}$	$0.038^{+0.253}_{-0.004}$
	+3%/-4%	+15%/-1%	+71%/-167%	+6%/-56%	+6%/-34%	+663%/-10%
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 010035772-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-739 \pm 126$	$81.66^{+114.19}_{-56.82}$	$2090^{+161}_{-278}$	$3185^{+1842}_{-1029}$	$2.285^{+22.639}_{-1.901}$
Alt.	$-2535 \pm 493$	$90.41^{+107.31}_{-64.06}$	$2116^{+145}_{-300}$	$3838^{+2808}_{-856}$	$6.202^{+75.684}_{-4.806}$

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

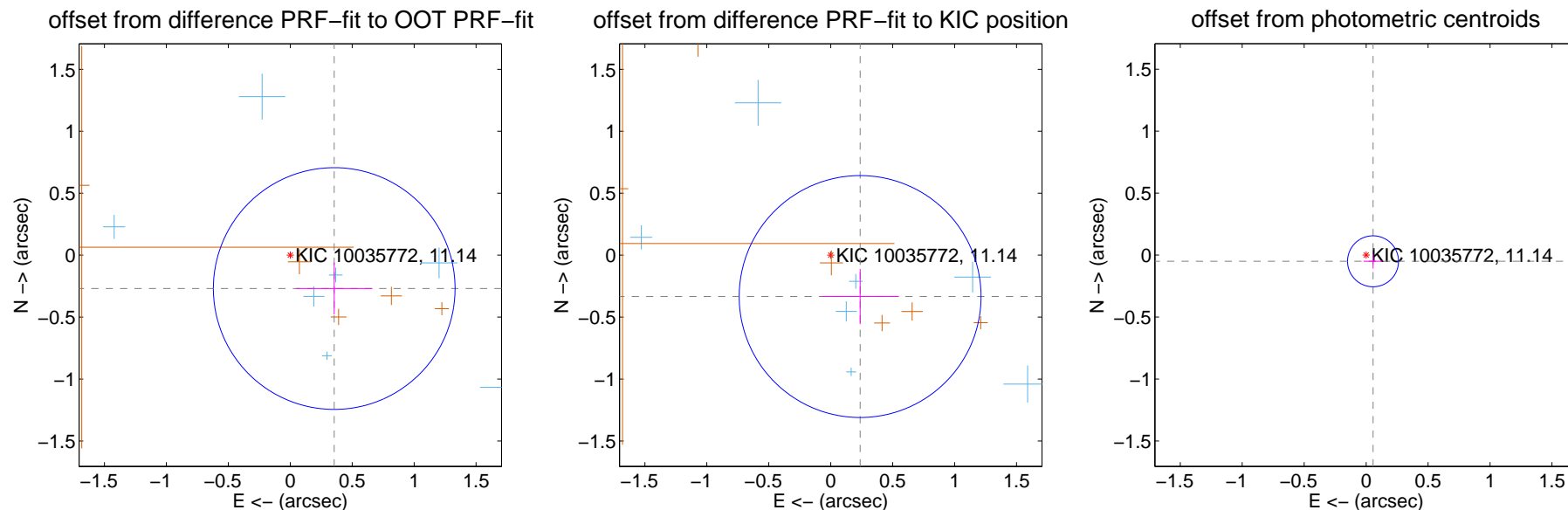
## DV Centroid Data

Supplemental centroid analysis for 010035772-06. **Kepler magnitude: 11.14.** Transit SNR 11.26

There are 7 quarters with good PRF difference image offsets

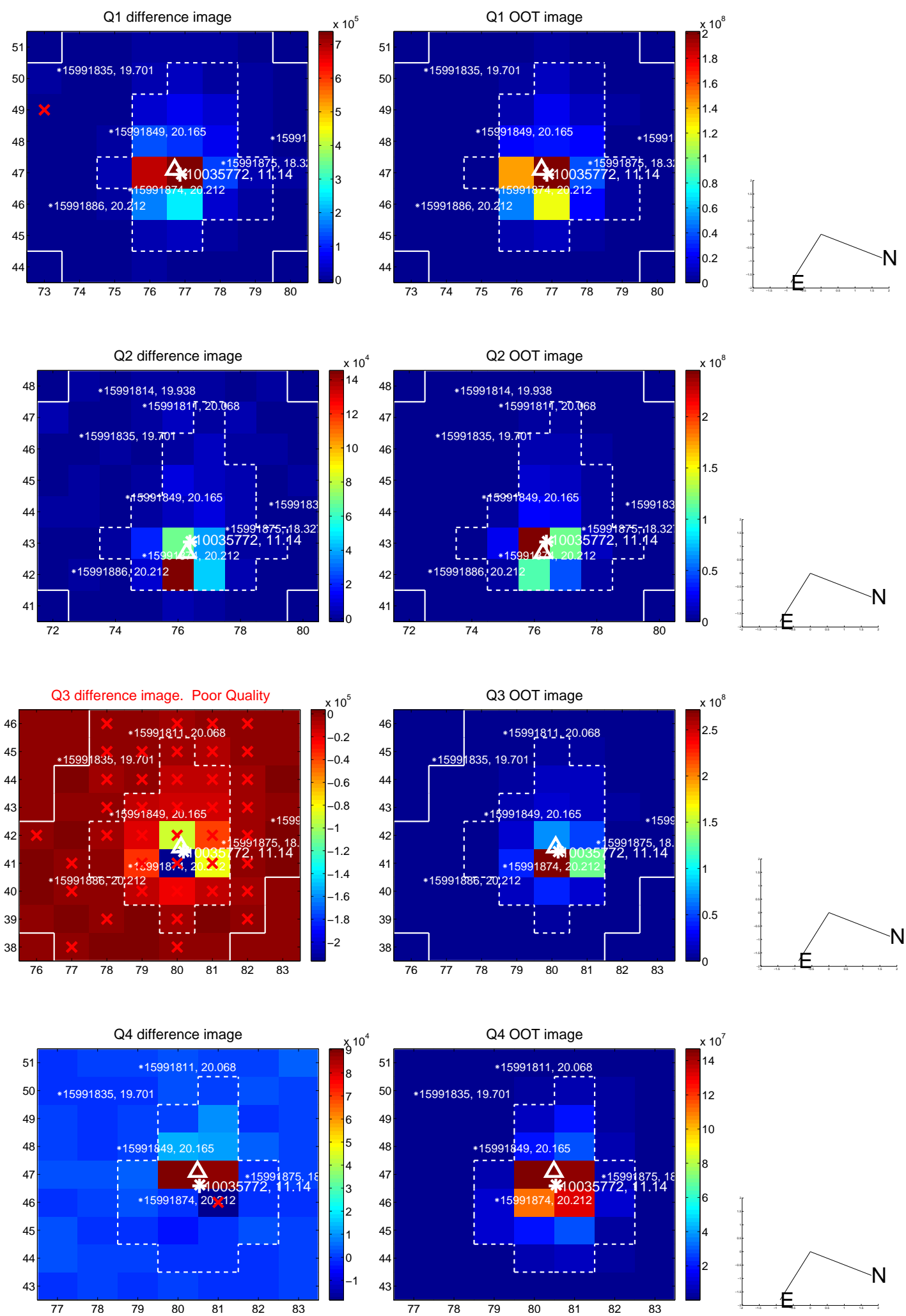
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.446 \pm 0.325$	1.37	$-0.355 \pm 0.307$	$-0.269 \pm 0.209$
PRF-fit source offset from KIC position	$0.410 \pm 0.325$	1.26	$-0.237 \pm 0.312$	$-0.334 \pm 0.223$
photometric centroid source offset	$0.07 \pm 0.07$	1.09	$-0.06 \pm 0.08$	$-0.05 \pm 0.06$



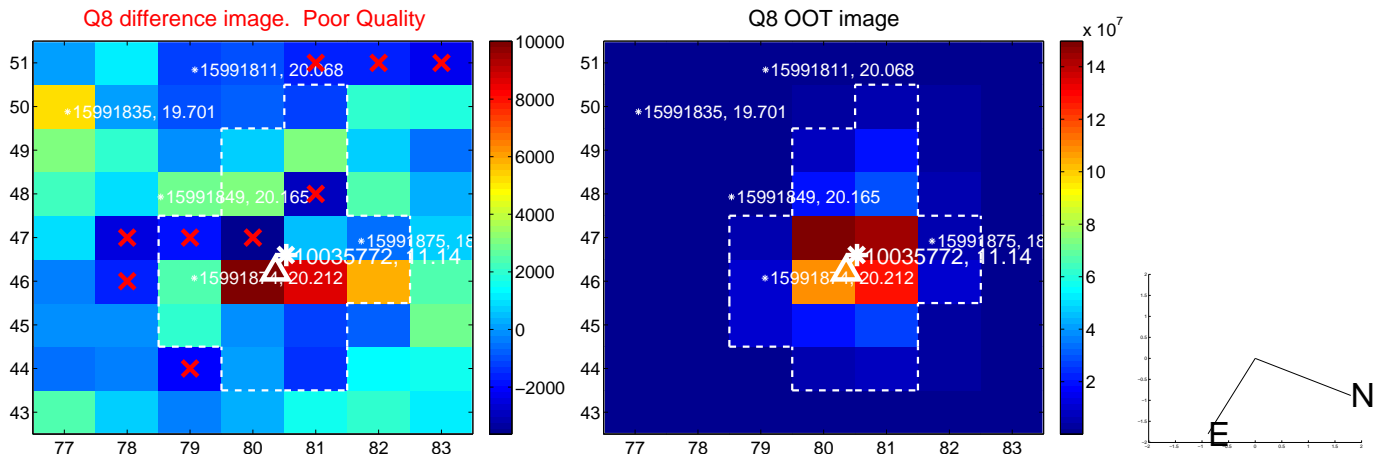
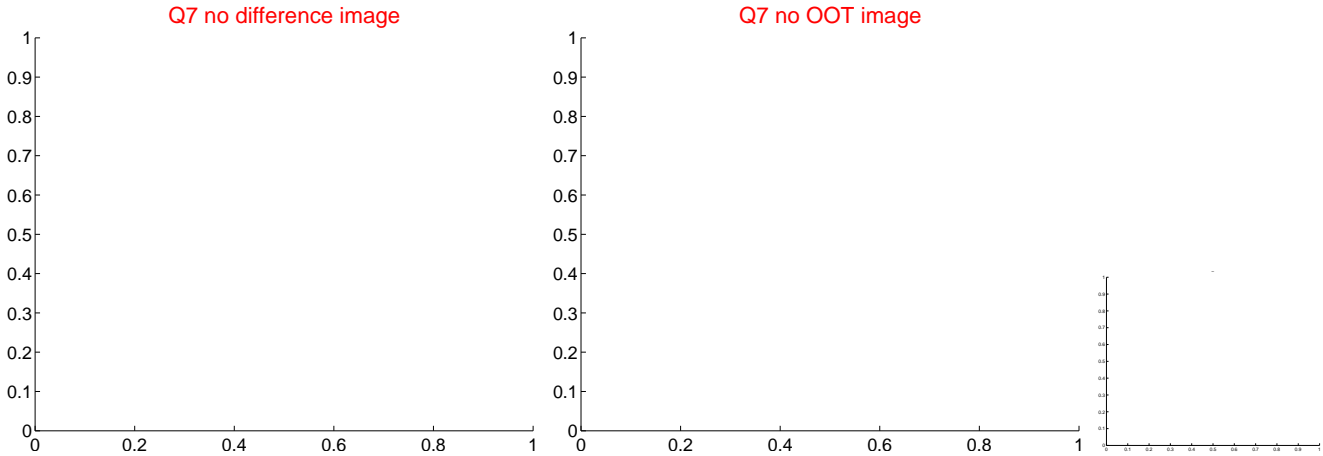
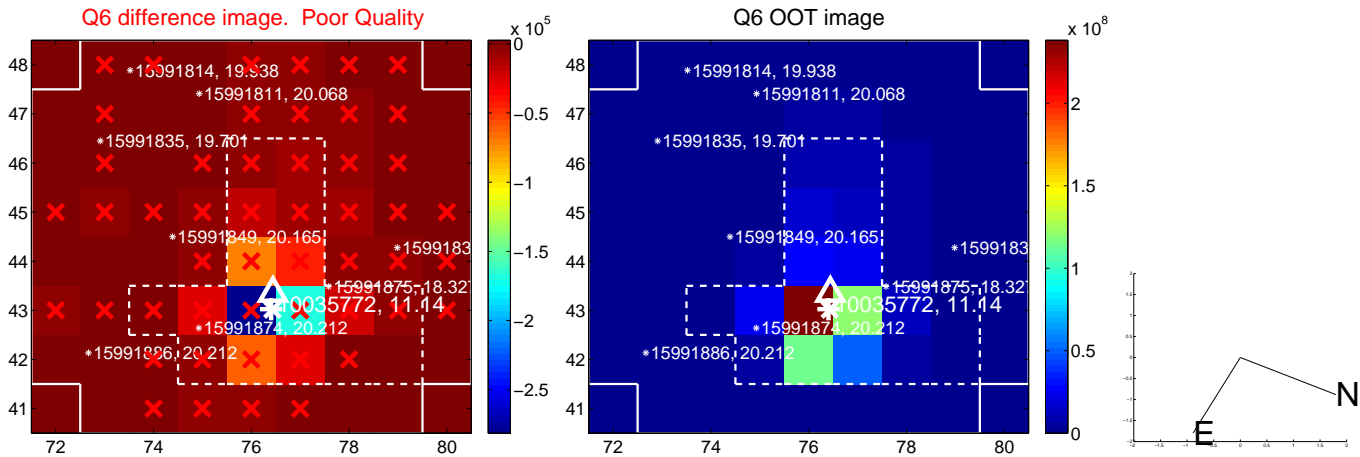
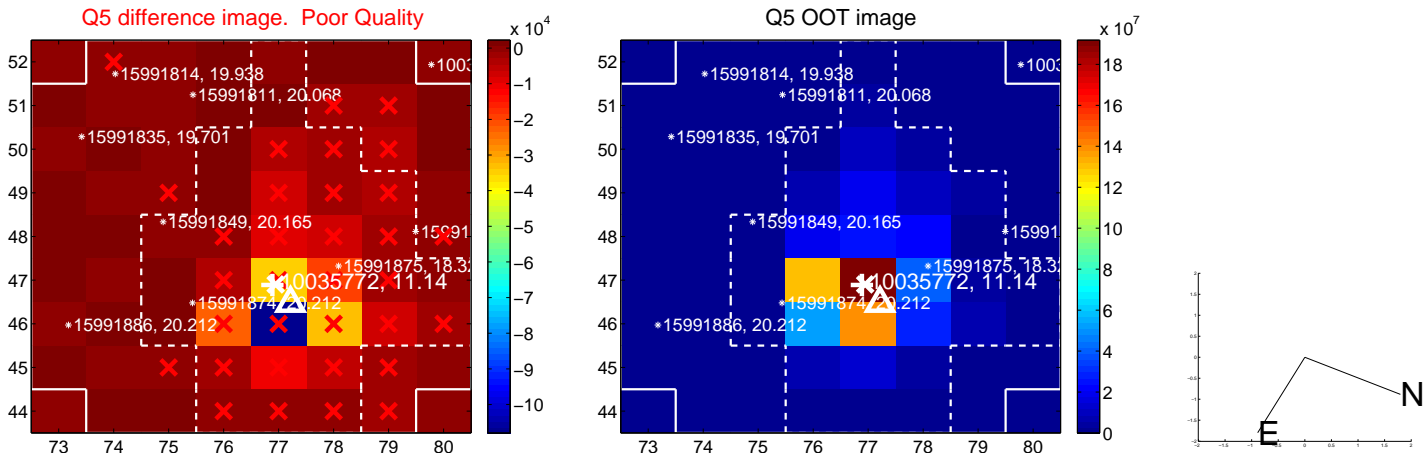
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

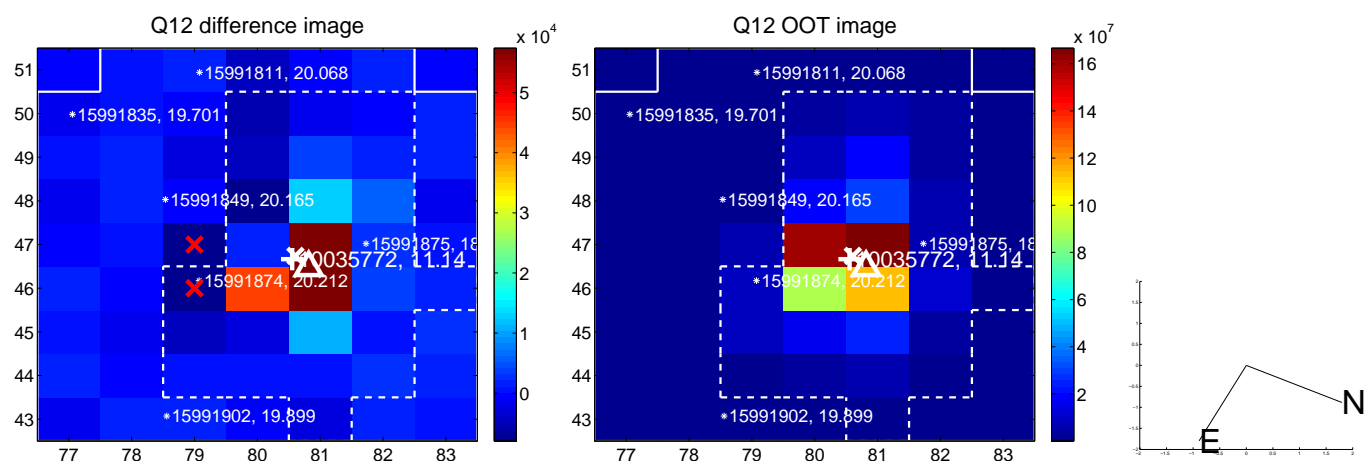
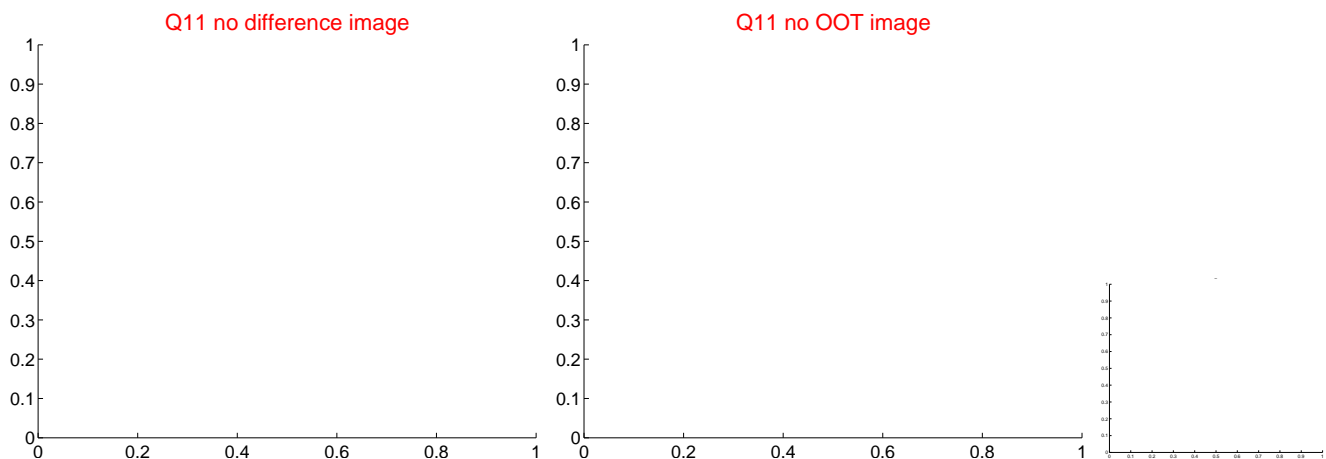
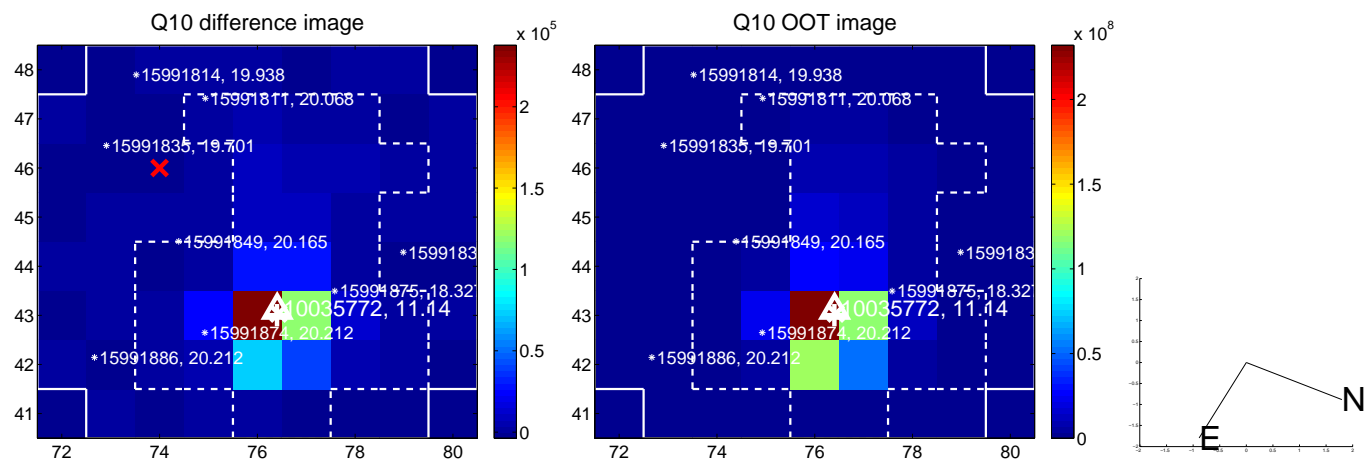
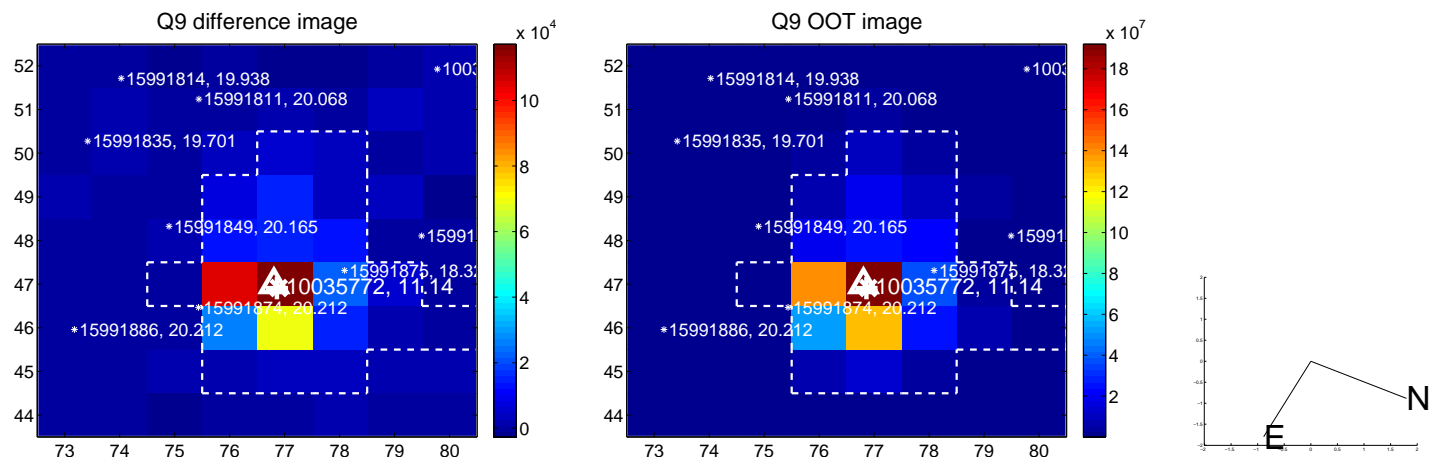




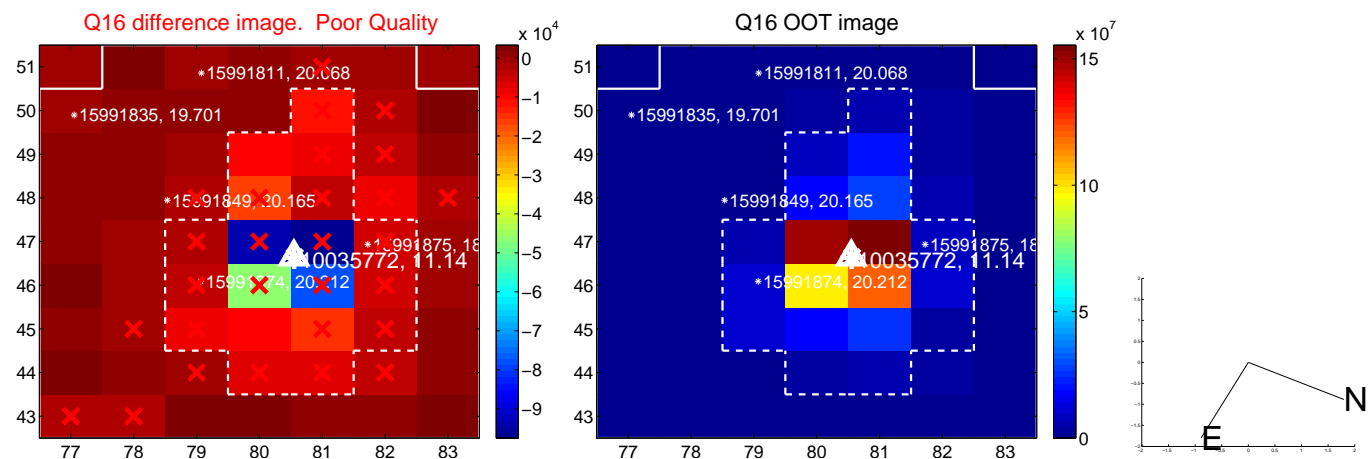
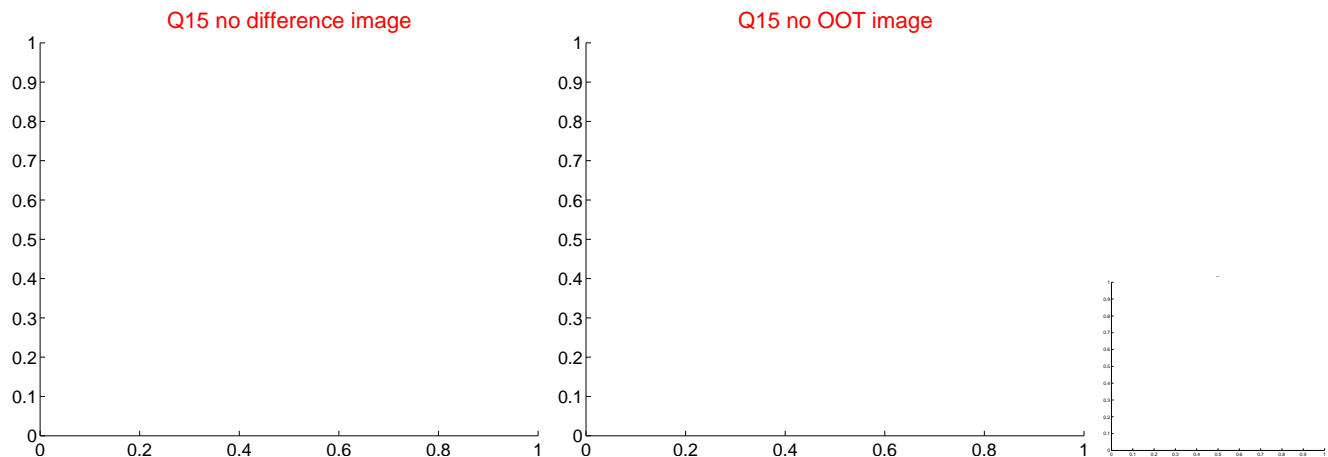
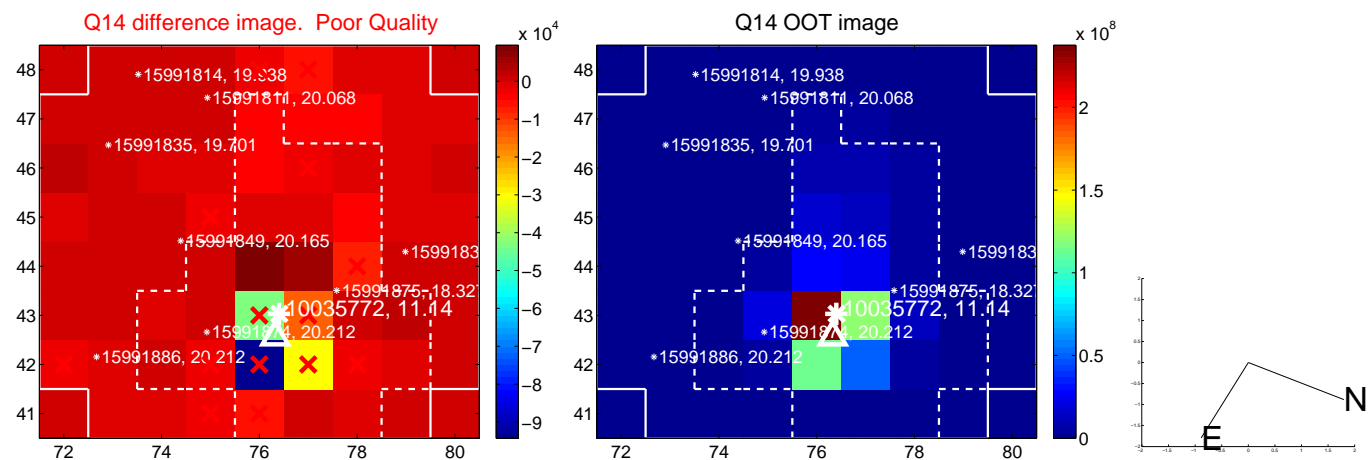
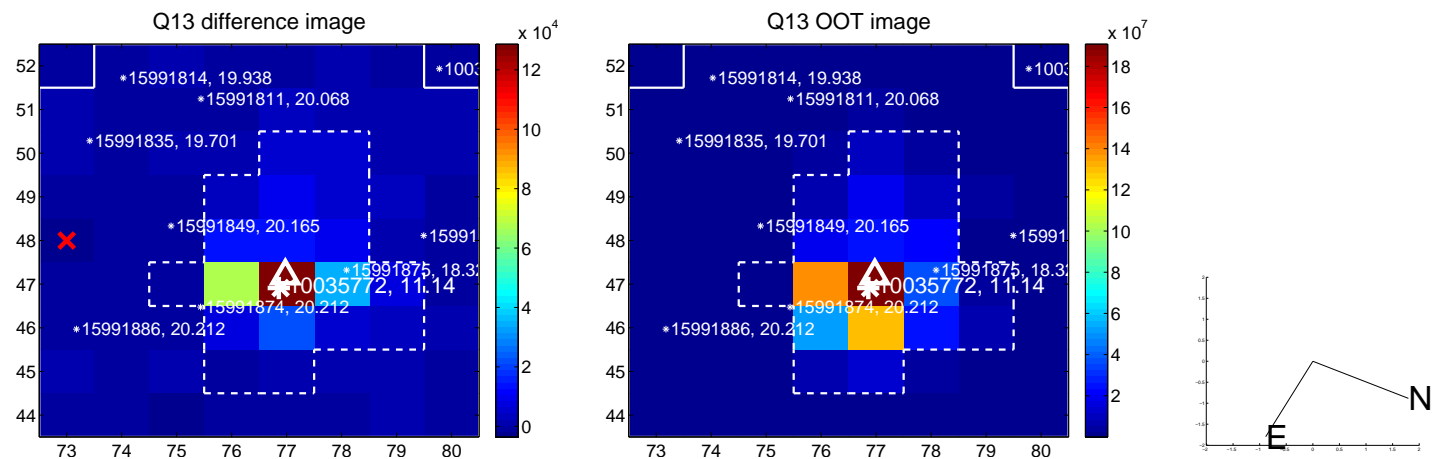
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



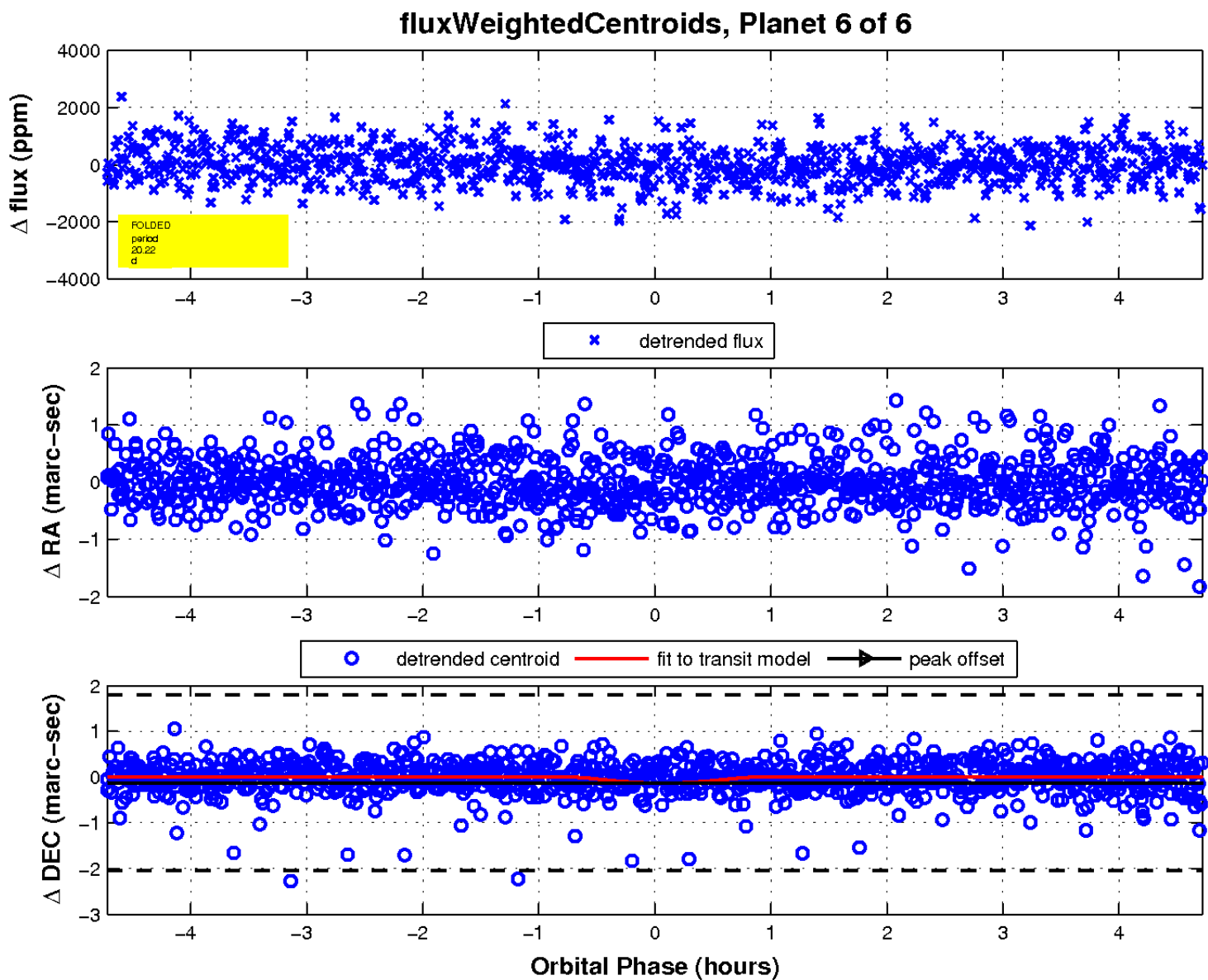
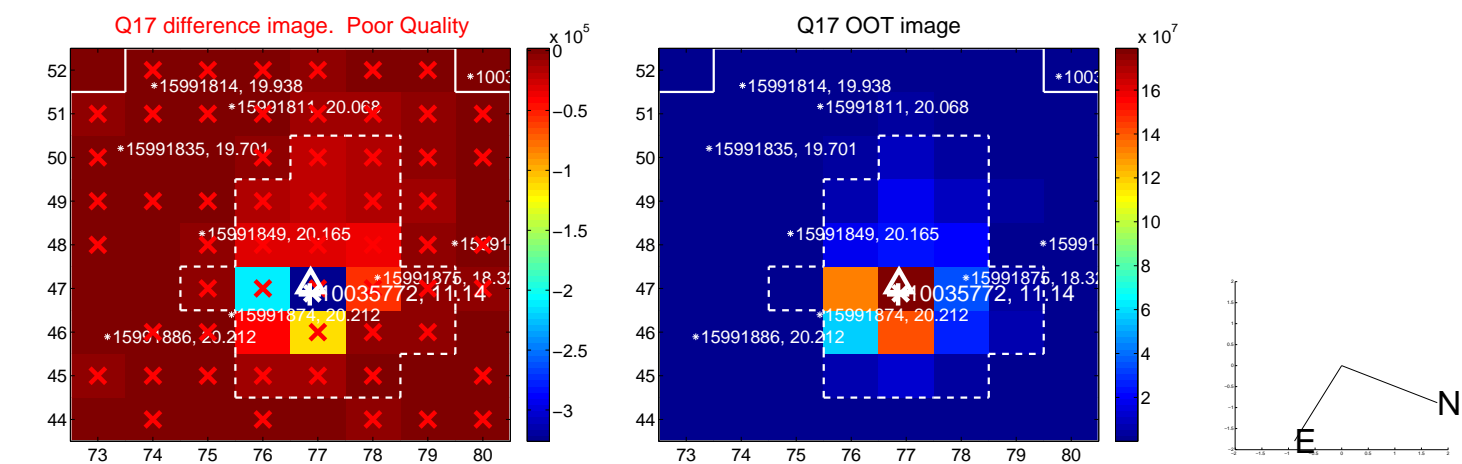
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

