

## KIC 010395312

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010395312-01	OBS	No	0.734969	131.818451	68.7	5.235	7.8	10.6	0.36	3553	0.30	138.09
010395312-02	OBS	No	43.338219	160.884184	1756.7	2.650	18.5	11.9	0.36	3553	1.49	0.60
010395312-03	OBS	No	22.617913	145.928423	0.0	14.208	12.1	0.0	0.36	3553	0.01	1.43
010395312-04	OBS	No	21.830529	141.862680	332.5	2.263	13.1	2.6	0.36	3553	0.77	1.50
010395312-05	OBS	No	62.134882	184.242550	0.1	3.631	13.2	0.0	0.36	3553	0.01	0.37
010395312-07	OBS	No	29.856582	155.990807	2220.3	1.681	13.8	11.7	0.36	3553	1.71	0.99
010395312-08	OBS	No	39.700029	148.941743	1333.3	2.348	11.7	10.1	0.36	3553	1.50	0.68
010395312-09	OBS	No	26.497868	133.642244	3844.7	1.500	14.1	-1.0	0.36	3553	2.21	1.16
010395312-10	OBS	No	38.975665	141.685996	5375.8	1.500	19.0	-1.0	0.36	3553	2.62	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010395312-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010395312-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010395312-08	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
010395312-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
010395312-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

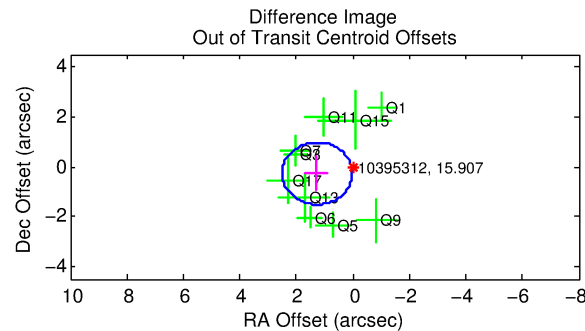
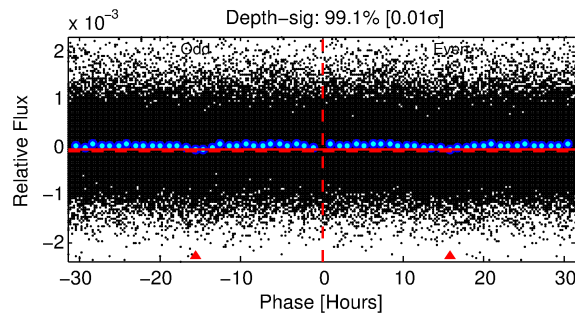
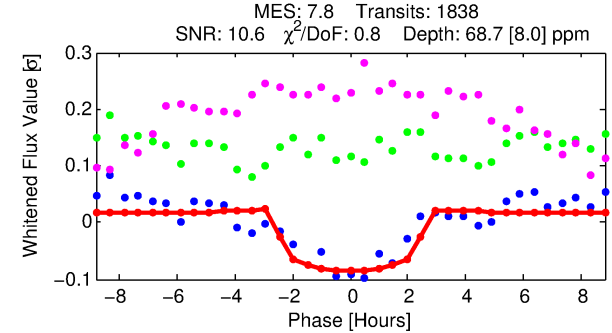
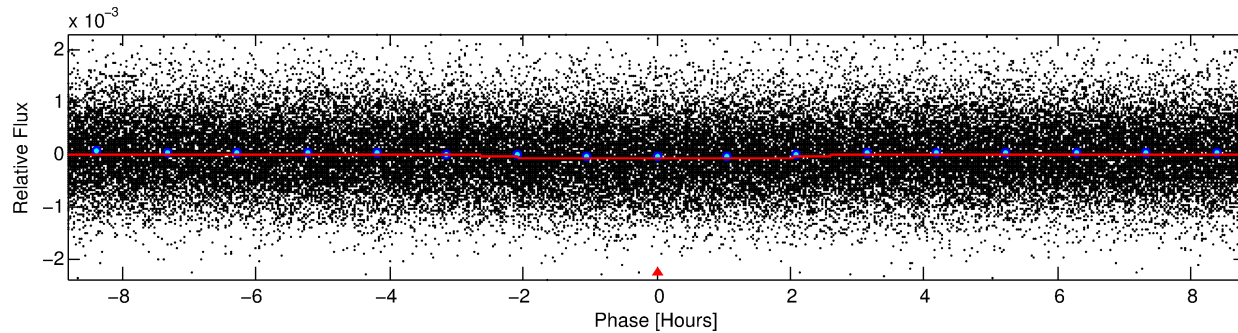
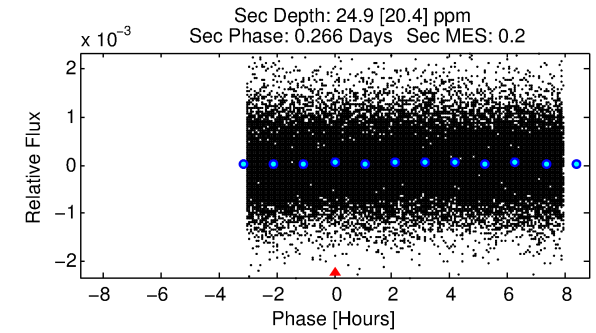
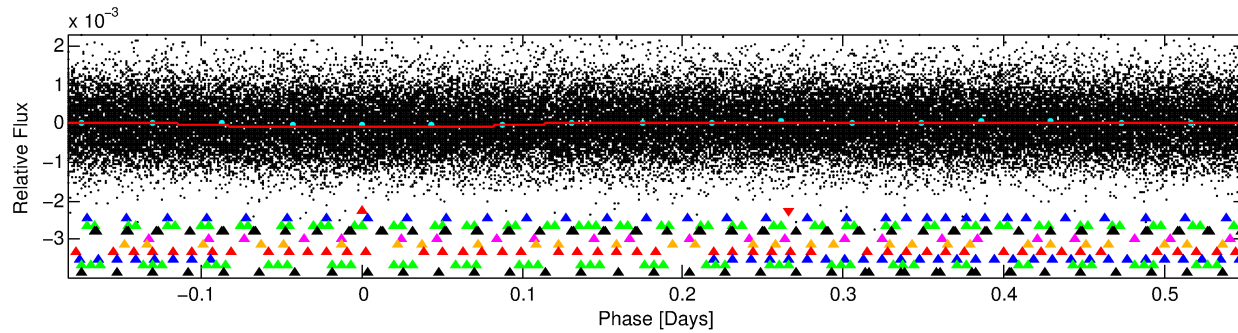
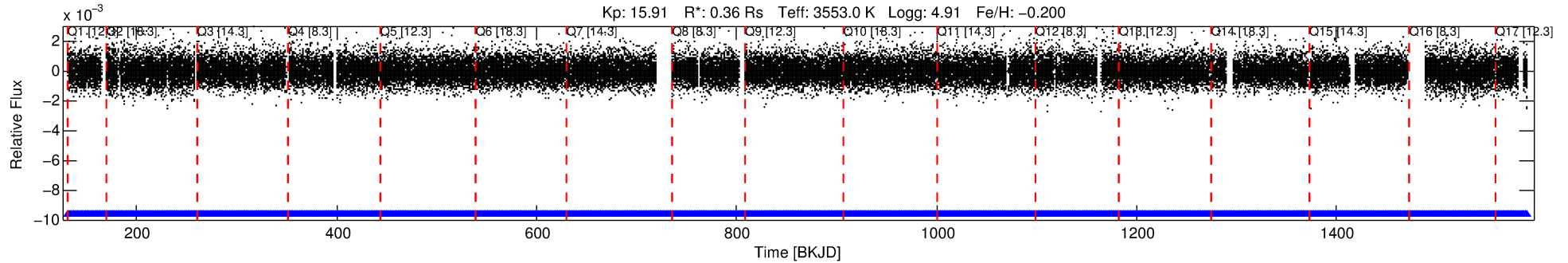
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010395312-01

No Significant Match Found

# DV One-Page Summary

KIC: 10395312 Candidate: 1 of 10 Period: 0.735 d



## DV Fit Results:

Period = 0.73497 [0.00001] d  
Epoch = 131.8185 [0.0048] BKJD  
Rp/R\* = 0.0078 [0.0162]  
a/R\* = 1.20 [3.43]  
b = 0.51 [13.75]  
Seff = 138.09 [15.26]  
Teq = 874 [24] K  
Rp = 0.30 [0.63] Re  
a = 0.0115 [0.0009] AU  
Ag = 19.60 [82.99] [0.22σ]  
Teffp = 2844 [3010] K [0.65σ]

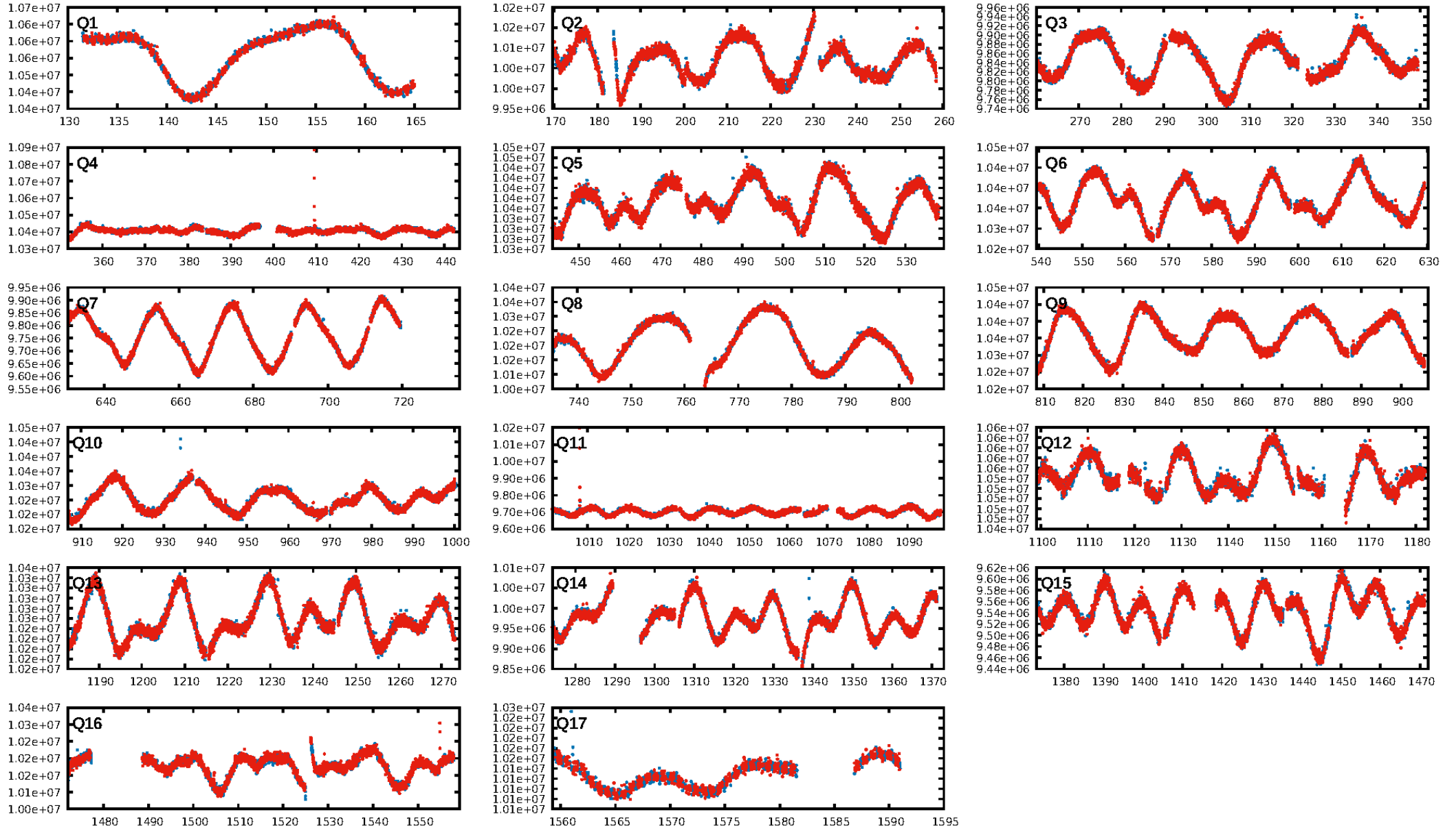
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [88.78σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1755/1755]  
GhostDiagnostic-chr: 1.836  
Centroid-sig: 3.6%  
Centroid-so: 2.059 arcsec [1.90σ]  
OotOffset-rm: 1.306 arcsec [3.15σ]  
KicOffset-rm: 1.445 arcsec [3.71σ]  
OotOffset-st: 1/4/0/5 [10]  
KicOffset-st: 1/4/0/5 [10]  
DiffImageQuality-fgm: 0.70 [7/10]  
DiffImageOverlap-fno: 1.00 [17/17]

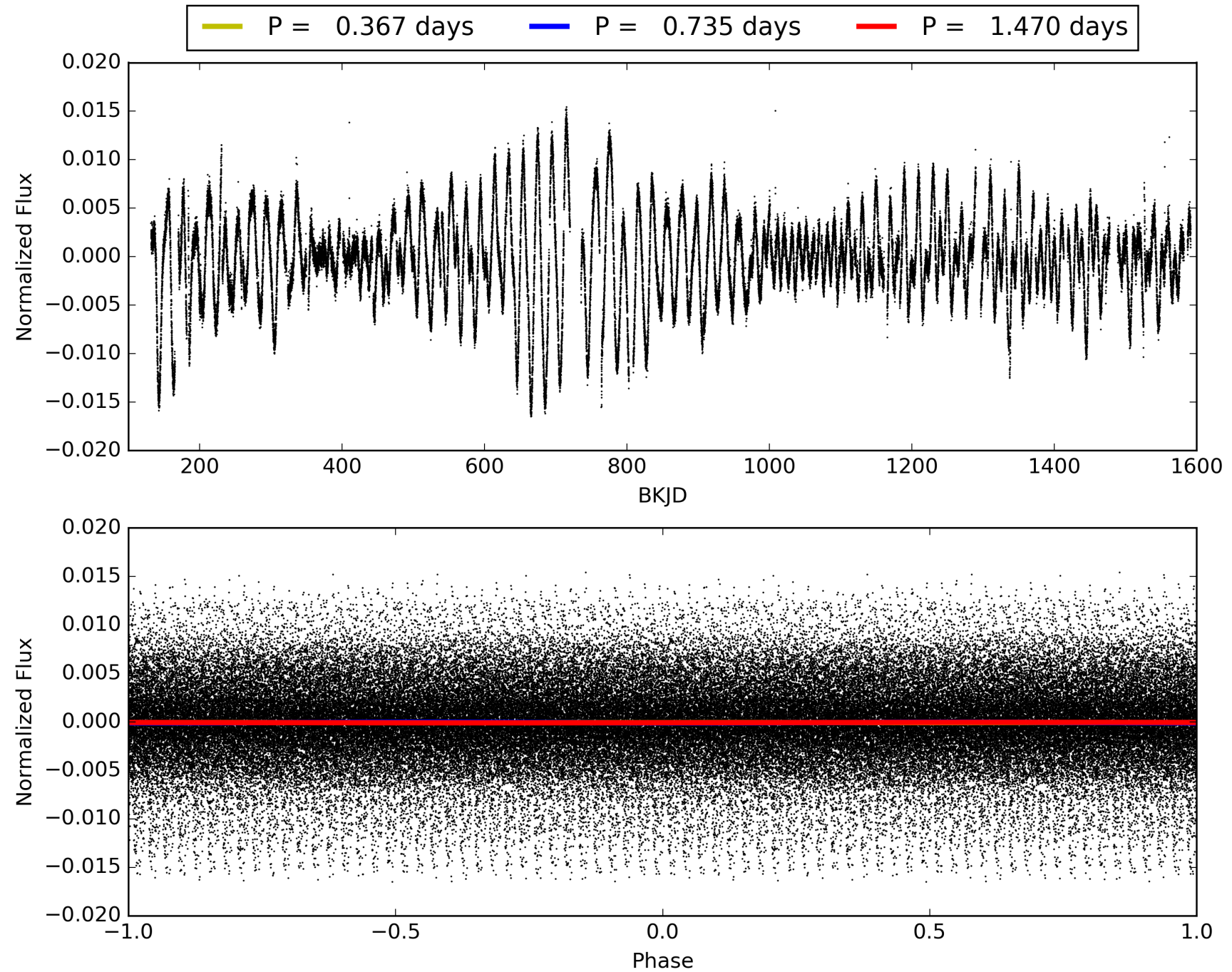
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:44:07 Z

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

# TCE 010395312-01, PDC Light Curves



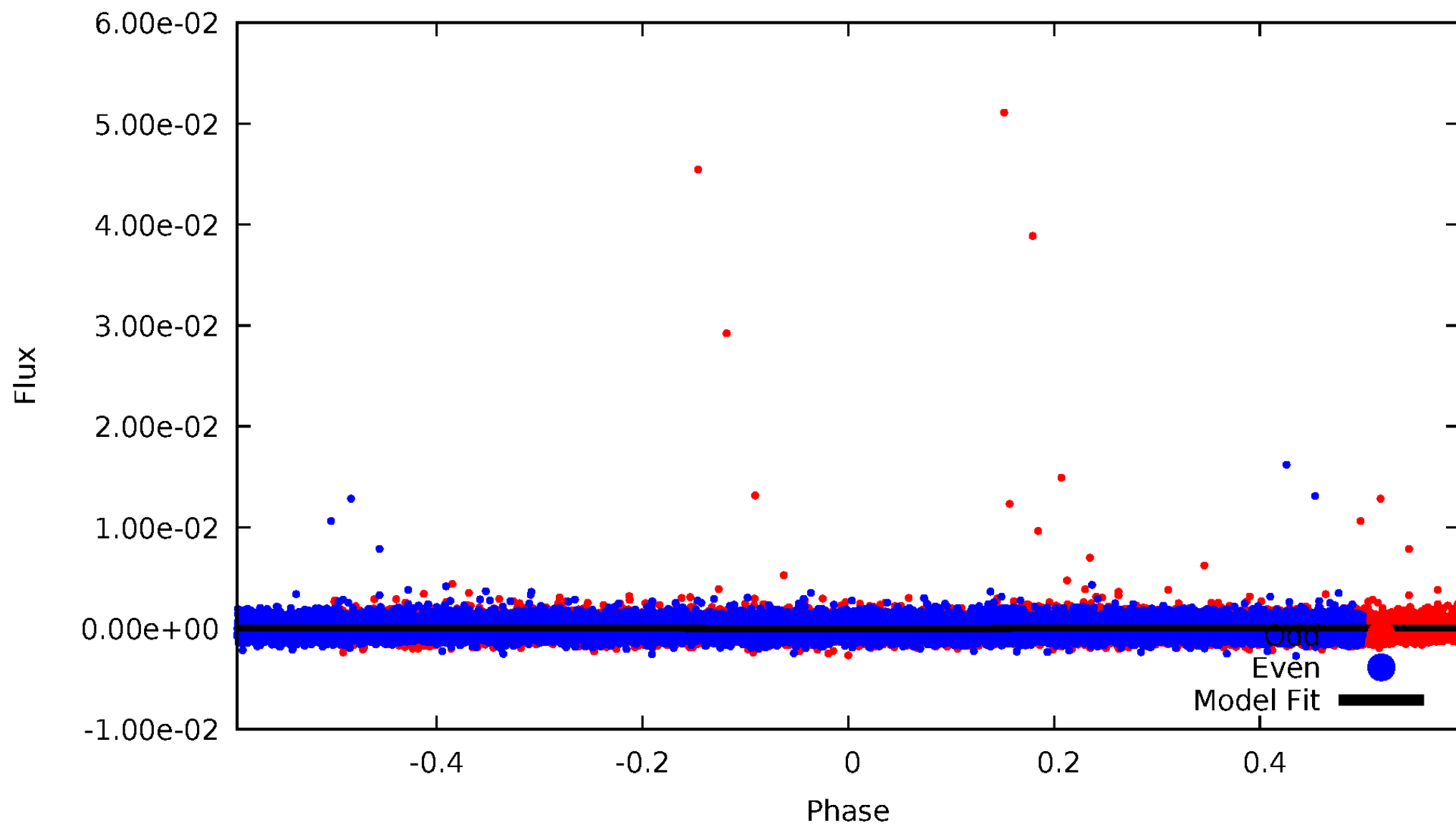
# TCE 010395312-01





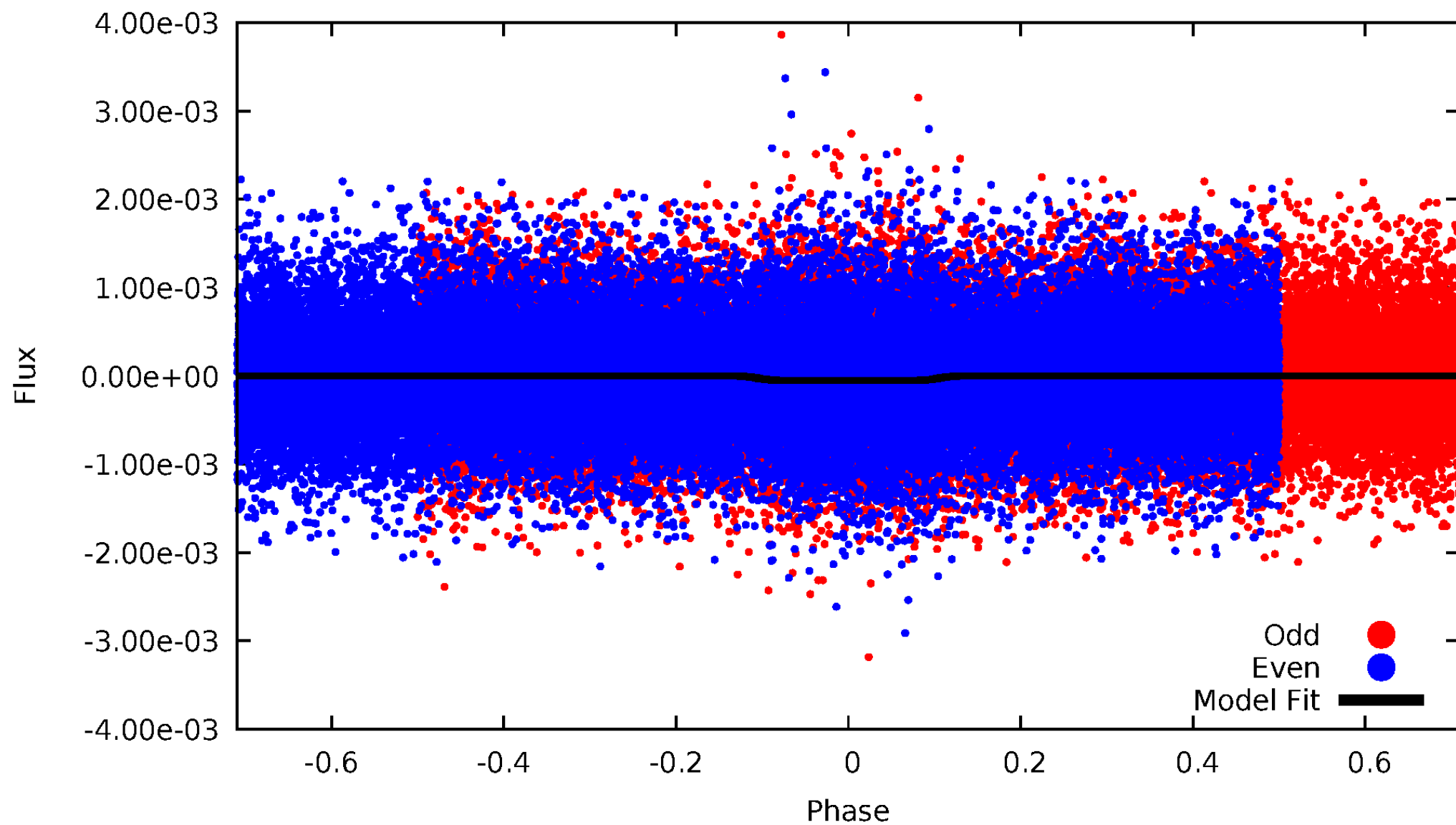
# DV Odd/Even

TCE 010395312-01

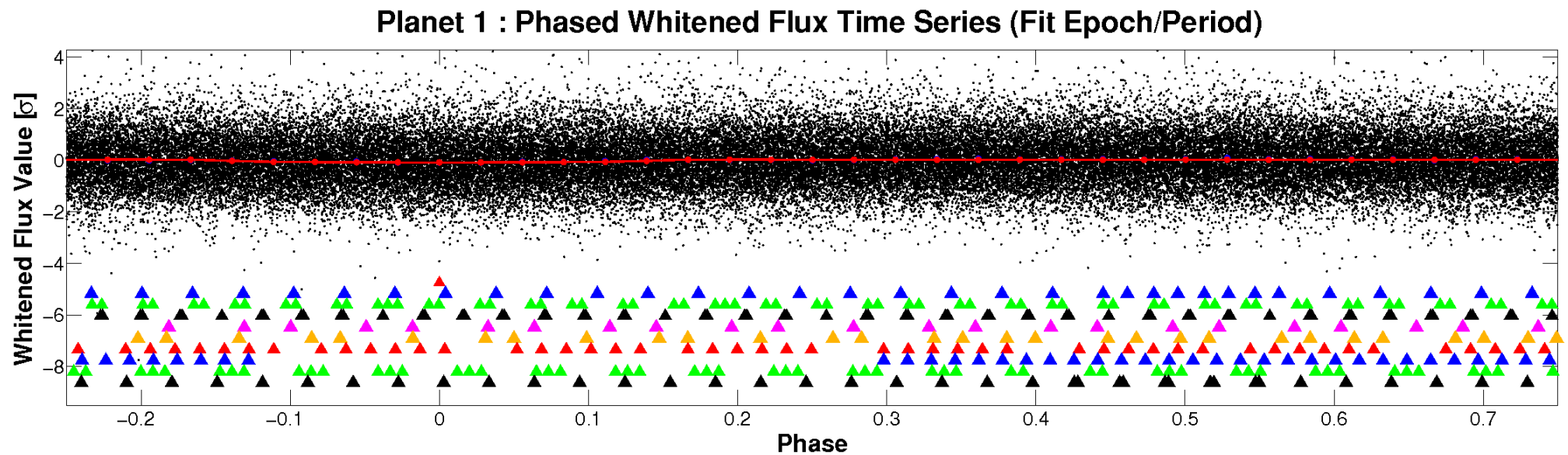
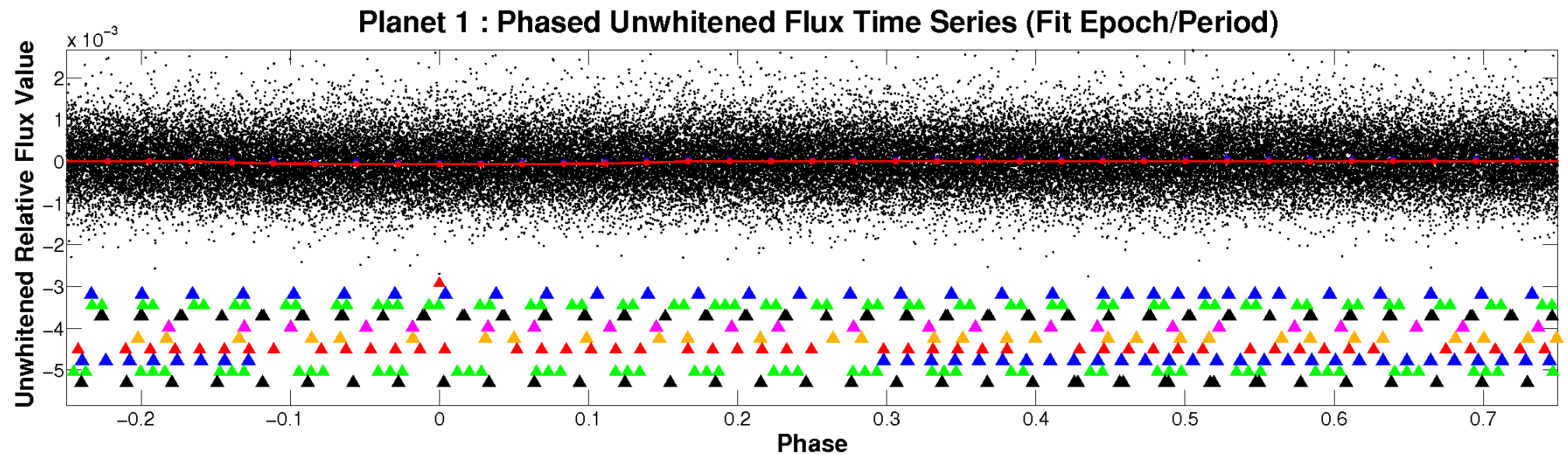


# ALT Odd/Even

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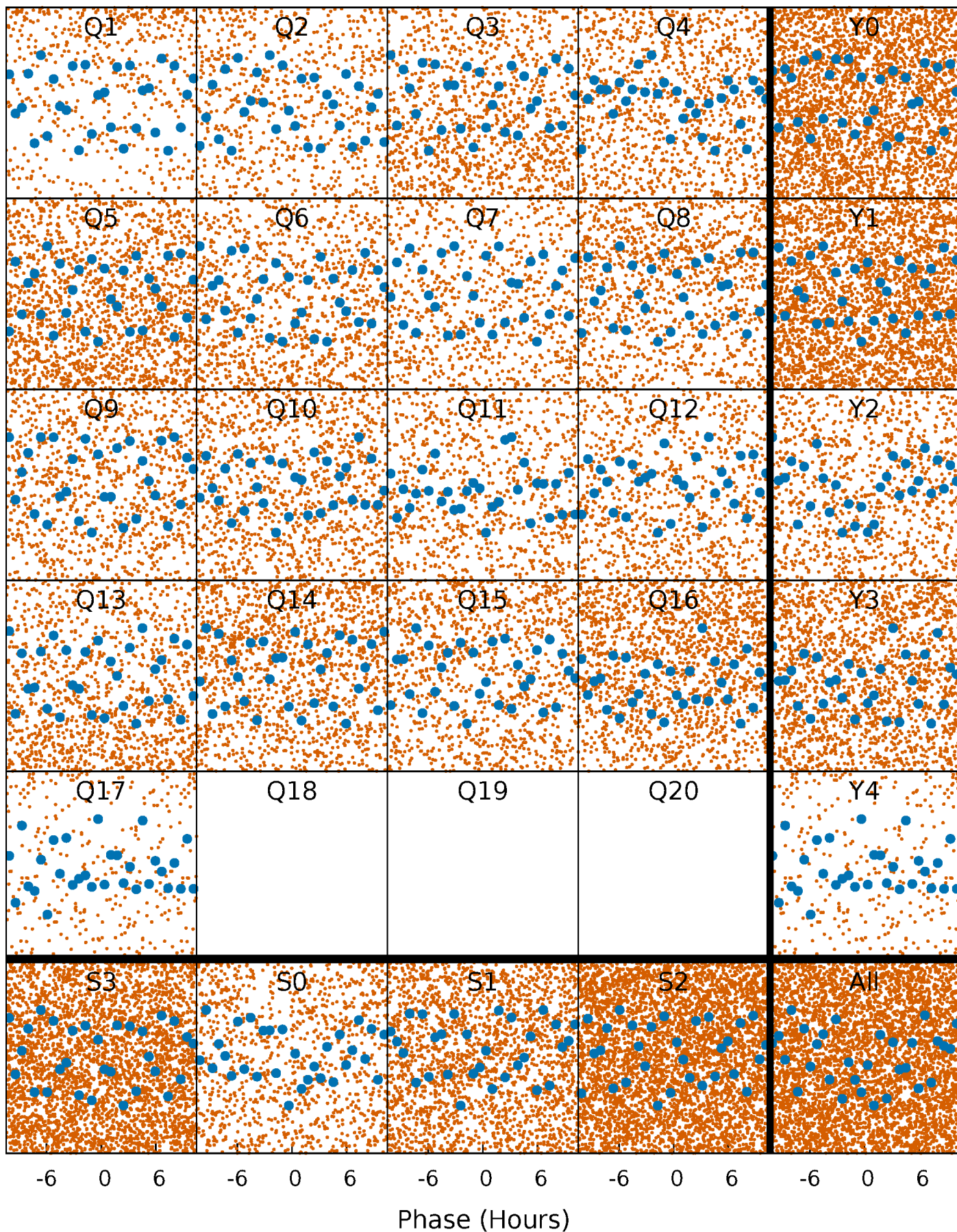


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

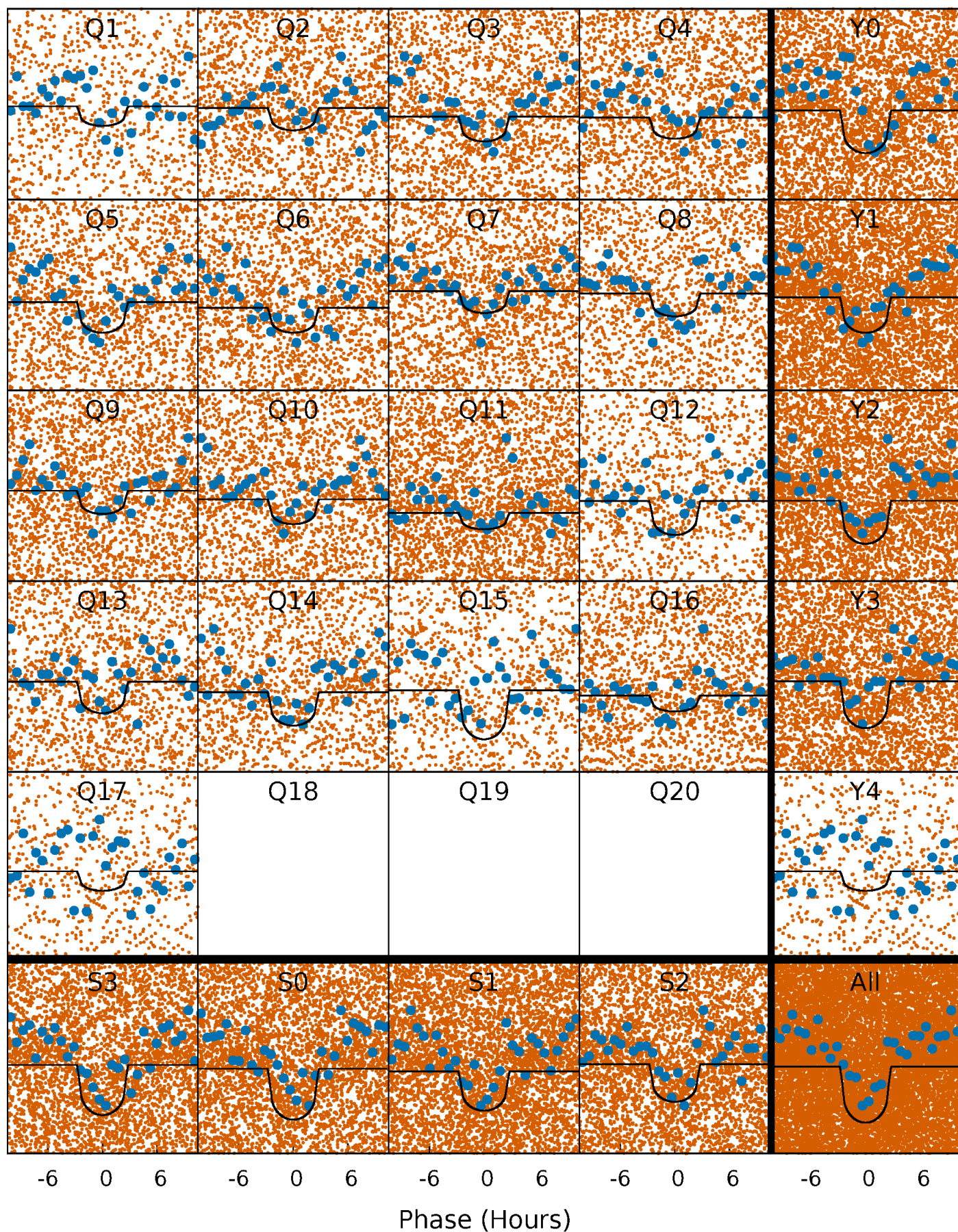
TCE 010395312-01 P= 0.734969 Days  $T_0=131.818451$  (BKJD)





# DV Quarter-Phased Transit Curves

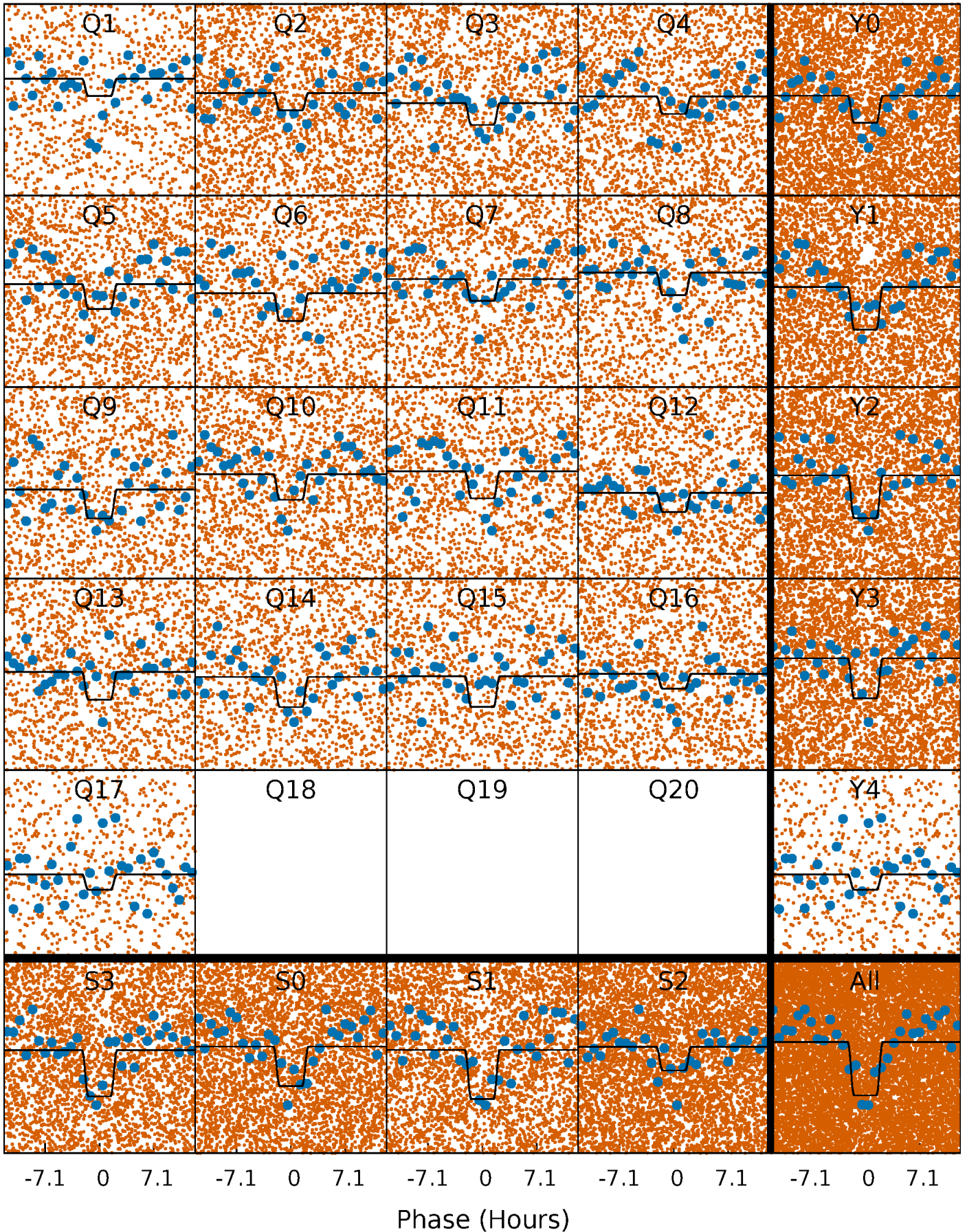
TCE 010395312-01 P= 0.734969 Days  $T_0=131.818451$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

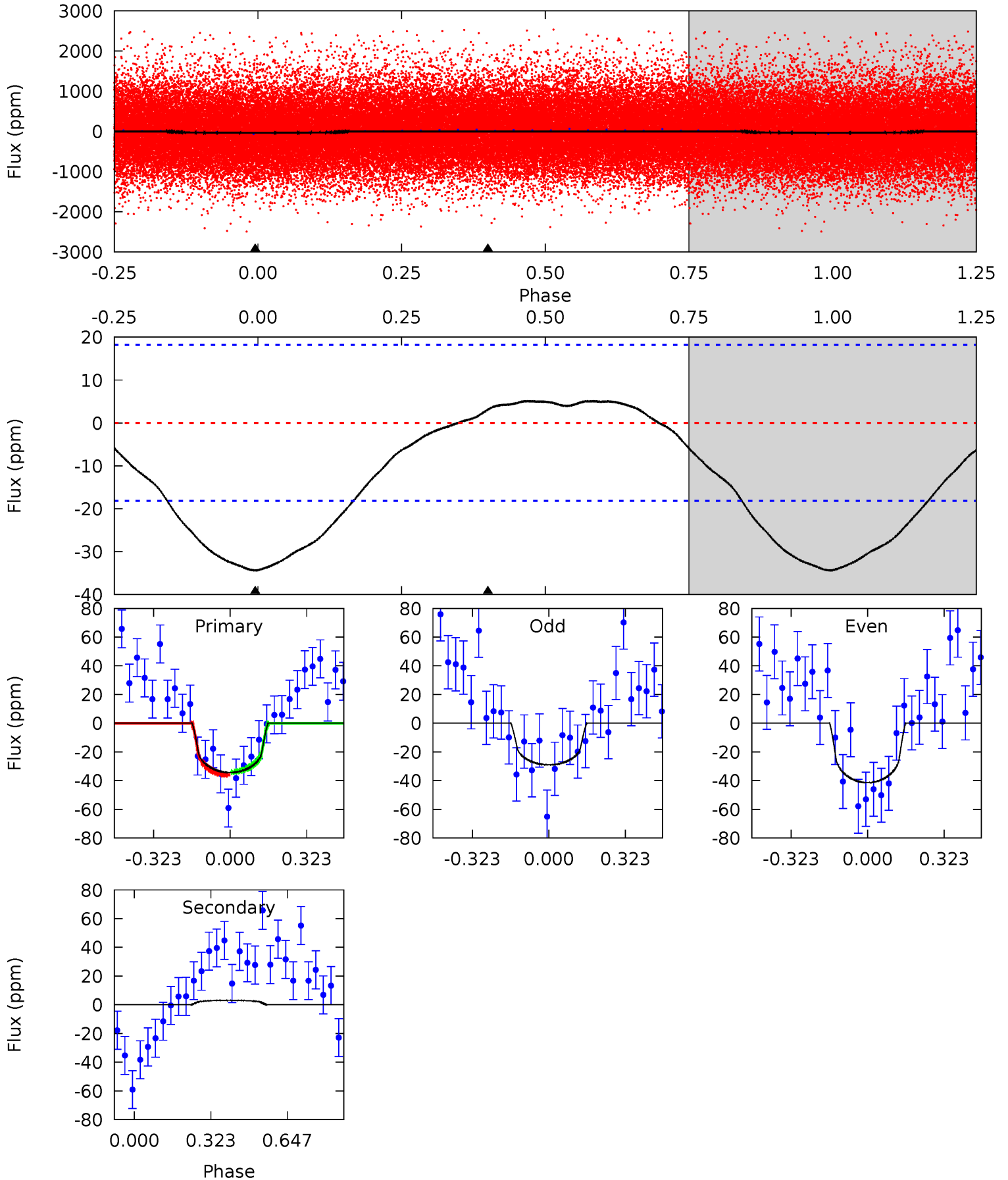
TCE 010395312-01 P= 0.734930 Days  $T_0=131.855517$  (BKJD)



# DV Model-Shift Uniqueness Test

010395312-01, P = 0.734969 Days, E = 131.083482 Days

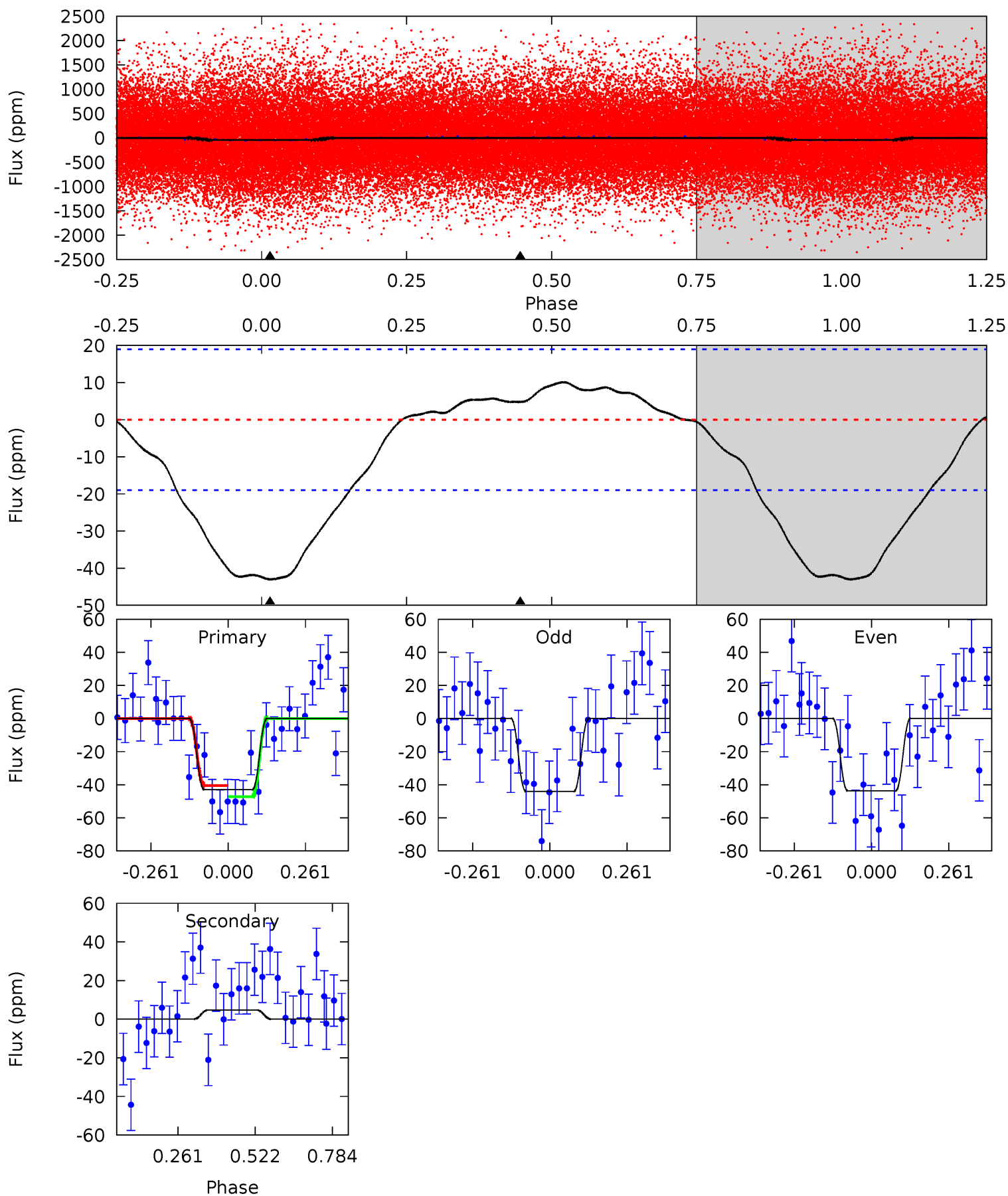
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.16	-0.73	0	0	4.31	0.99	0.64	8.16	8.16	-0.73	-0.73	1.47	0.95	0.13	0.24



# Alt Model-Shift Uniqueness Test

010395312-01, P = 0.734930 Days, E = 131.120587 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
9.89	-1.09	0	0	4.36	1.12	0.48	9.89	9.89	-1.09	-1.09	0.05	1.18	0.19	0.77





### Stellar Parameters For KIC 010395312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3553^{+48}_{-53}$	$4.906^{+0.035}_{-0.042}$	$-0.200^{+0.100}_{-0.100}$	$0.358^{+0.036}_{-0.036}$	$0.379^{+0.034}_{-0.046}$	$11.630^{+2.353}_{-1.957}$
	+1%/-1%	+1%/-1%	+50%/-50%	+10%/-10%	+9%/-12%	+20%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010395312-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$3\pm4$	$0.55^{+0.52}_{-0.41}$	$1222^{+28}_{-26}$	$-2082^{+347}_{-679}$	$-0.479^{+0.655}_{-8.098}$
Alt.	$5\pm4$	$0.53^{+0.50}_{-0.37}$	$1224^{+30}_{-26}$	$-2185^{+284}_{-636}$	$-0.853^{+0.835}_{-8.637}$

$T_{max}$  = 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

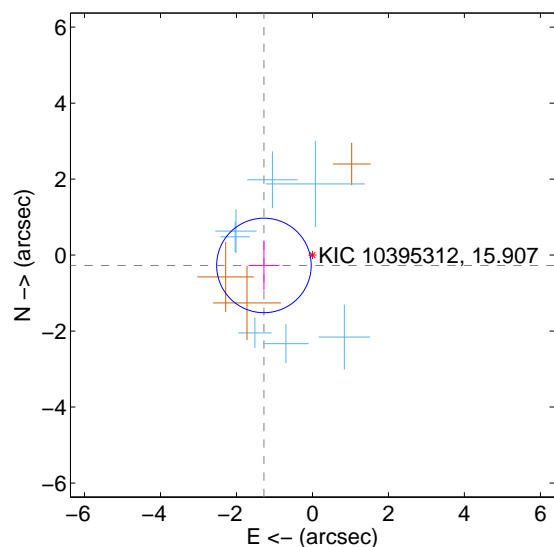
Supplemental centroid analysis for 010395312-01. Kepler magnitude: 15.91. Transit SNR 10.60

There are 7 quarters with good PRF difference image offsets

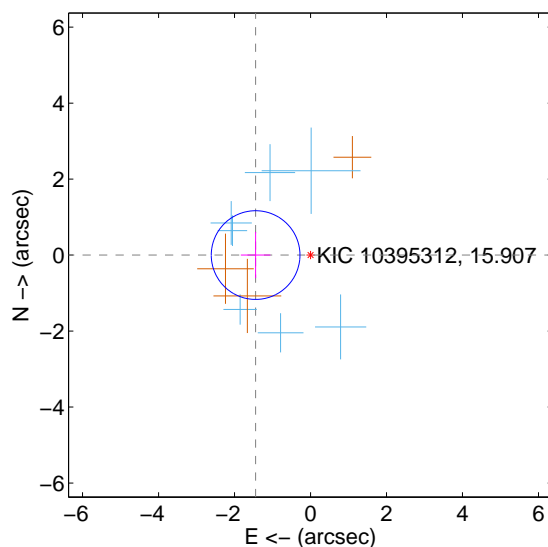
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.306 \pm 0.415$	<b>3.15</b>	$1.277 \pm 0.400$	$-0.272 \pm 0.654$
PRF-fit source offset from KIC position	$1.445 \pm 0.389$	<b>3.71</b>	$1.445 \pm 0.389$	$0.001 \pm 0.609$
photometric centroid source offset	$2.06 \pm 1.08$	1.90	$2.02 \pm 1.08$	$-0.38 \pm 1.06$

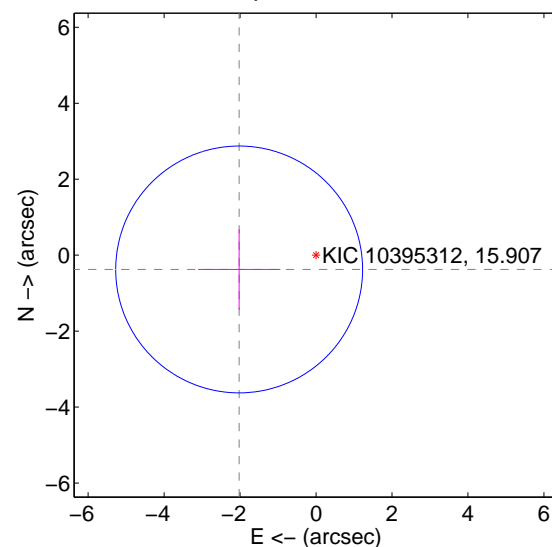
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

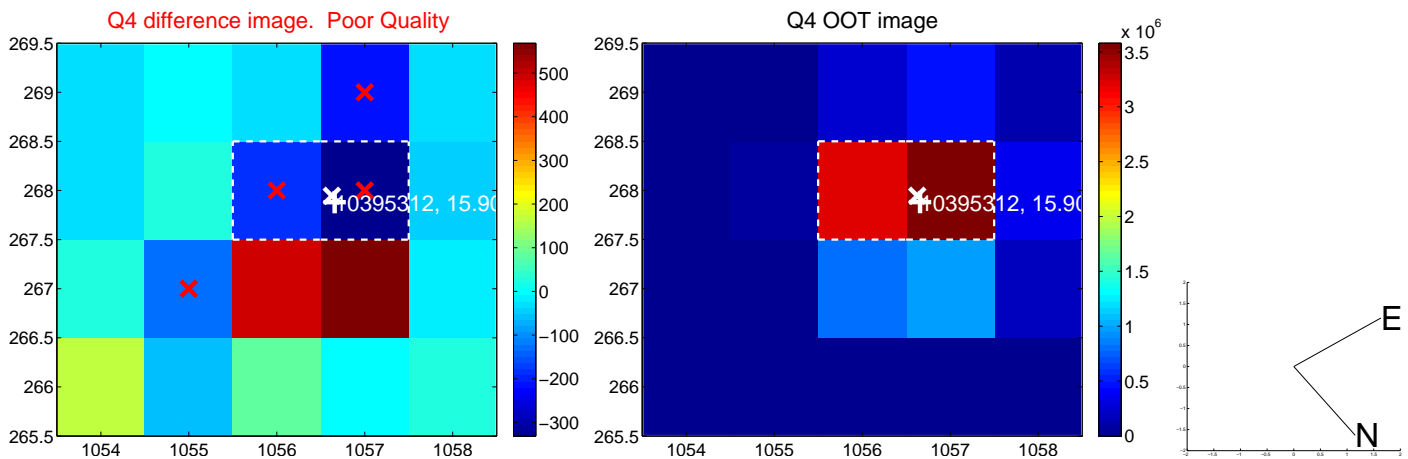
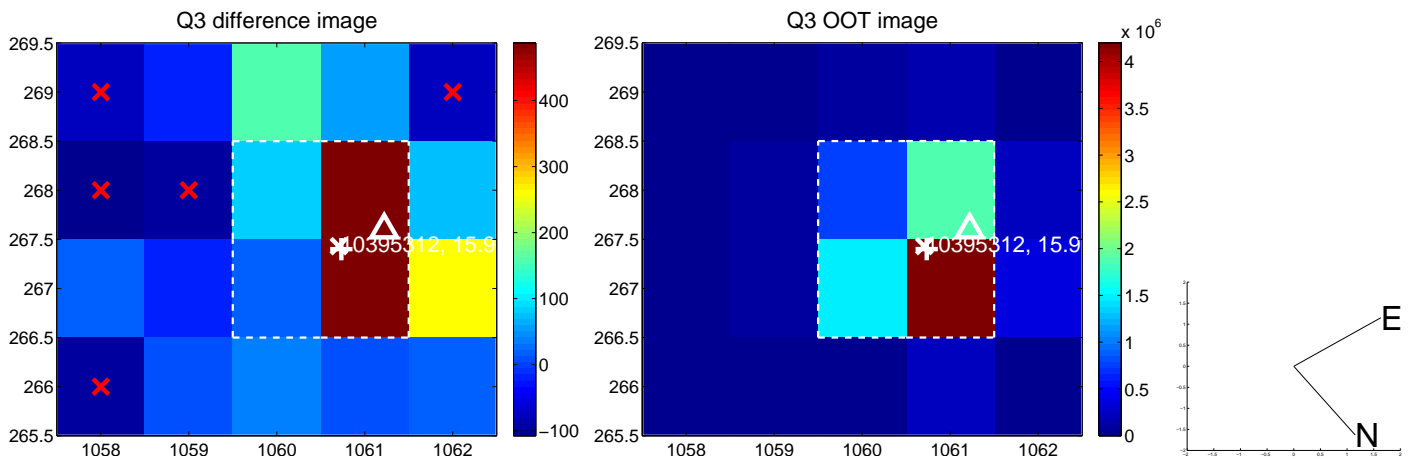
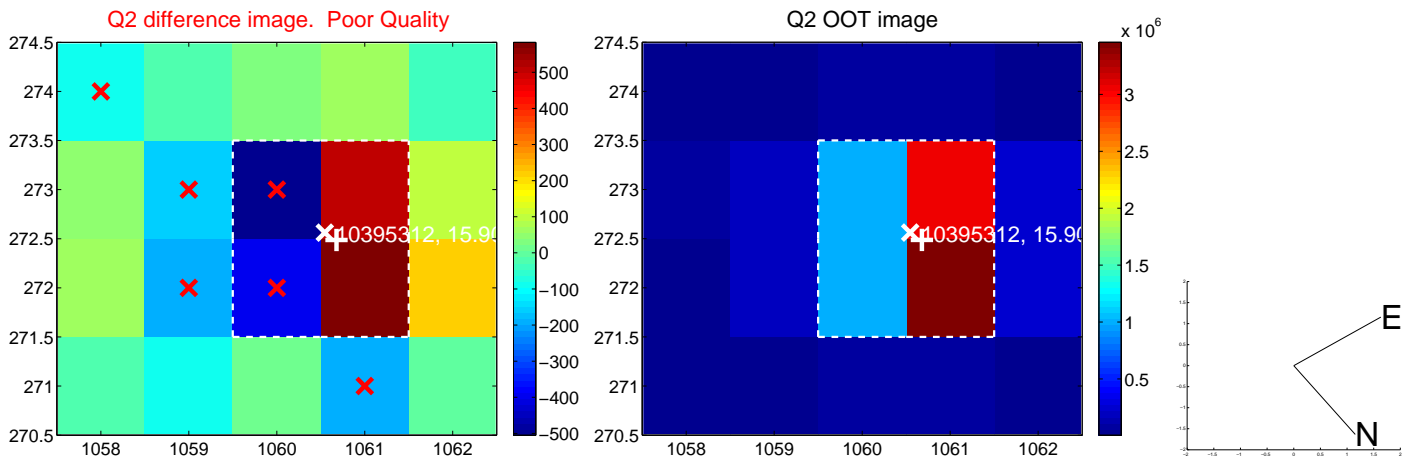
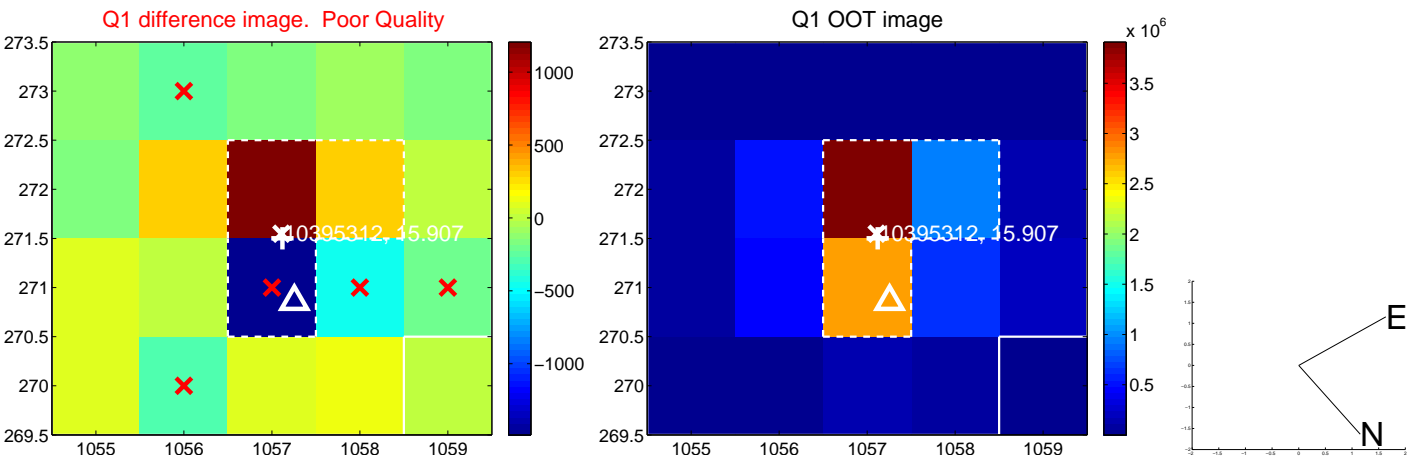


offset from photometric centroids

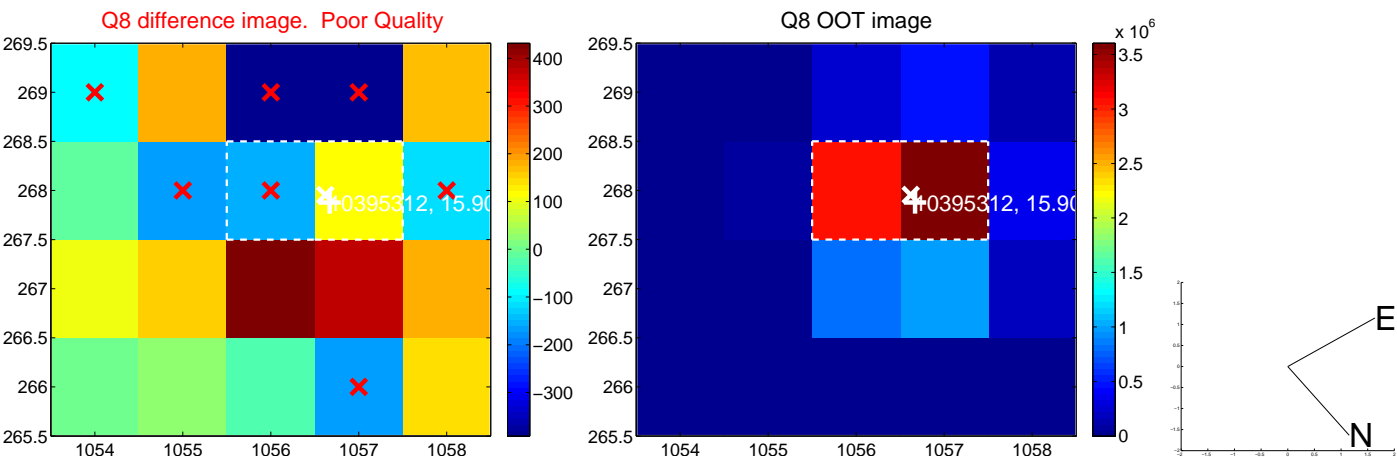
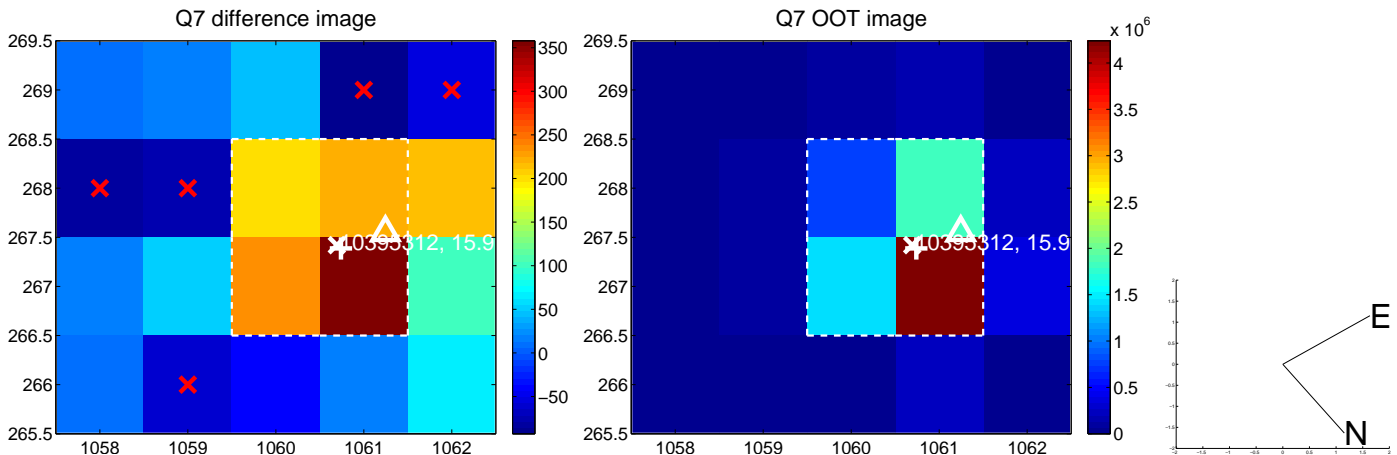
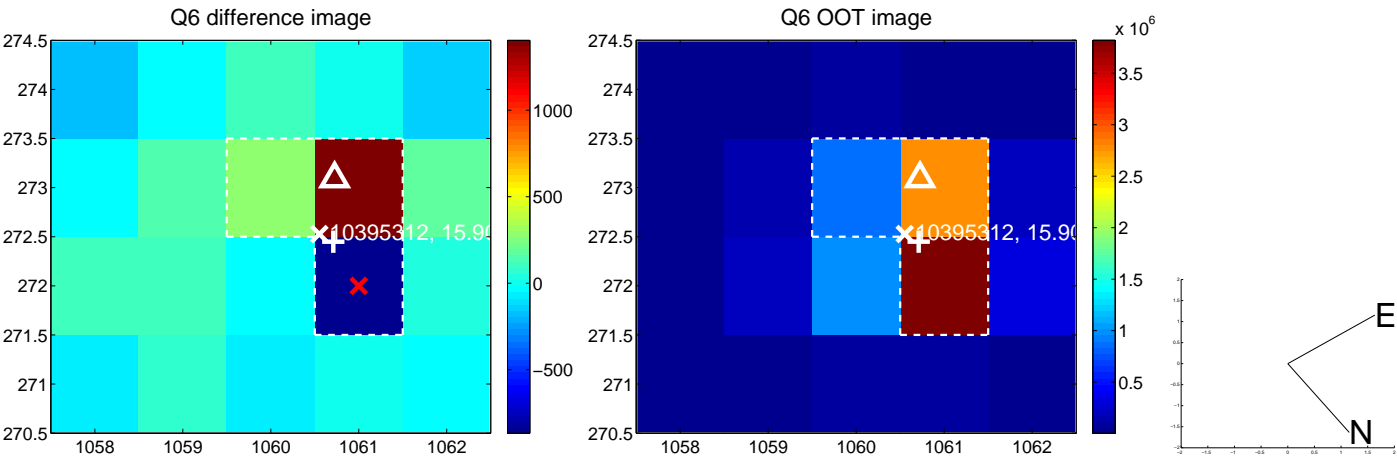
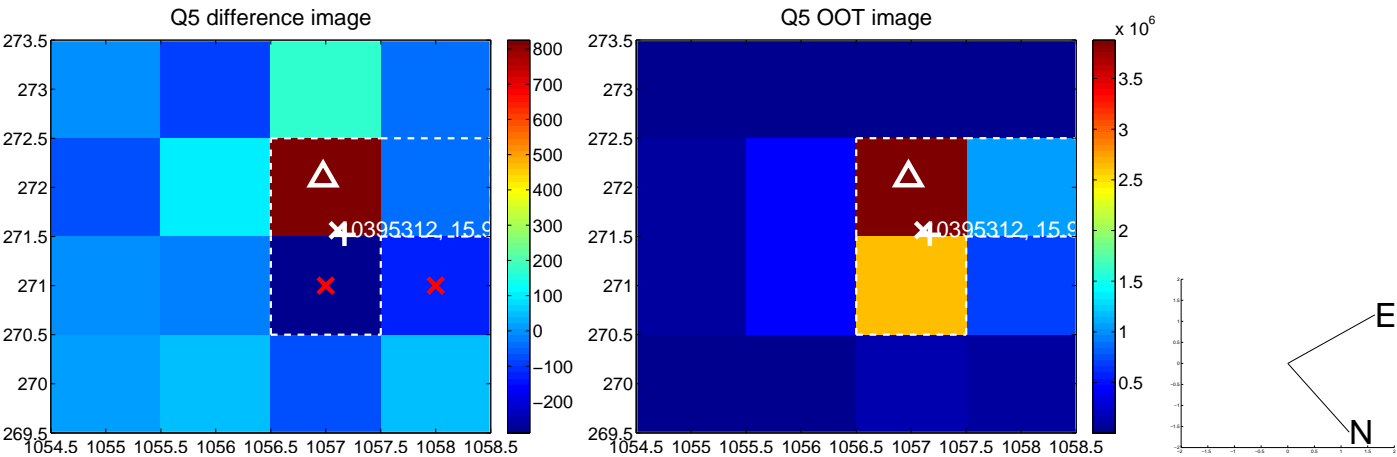


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

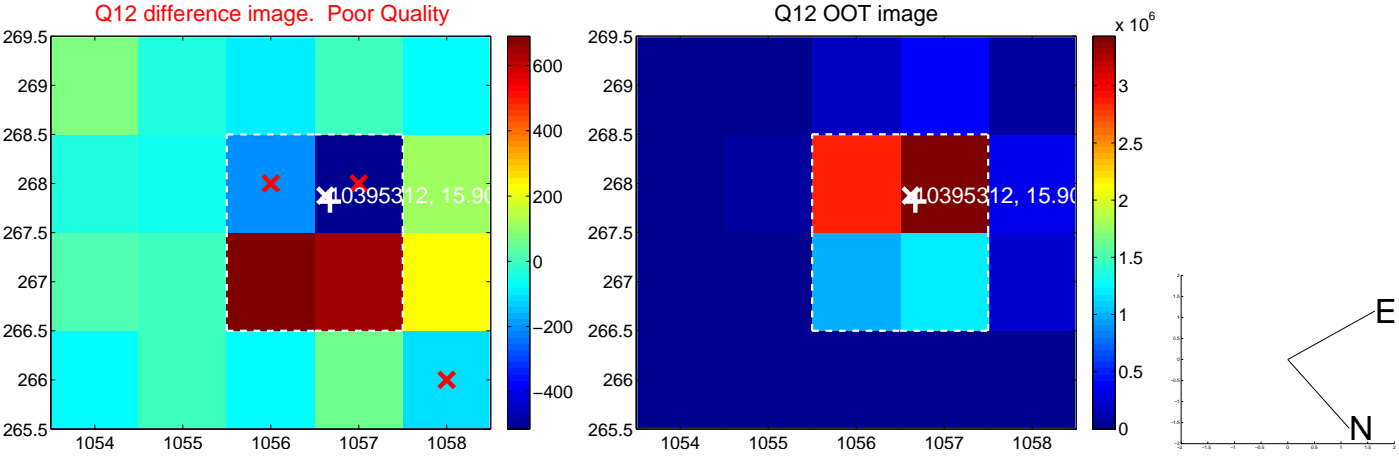
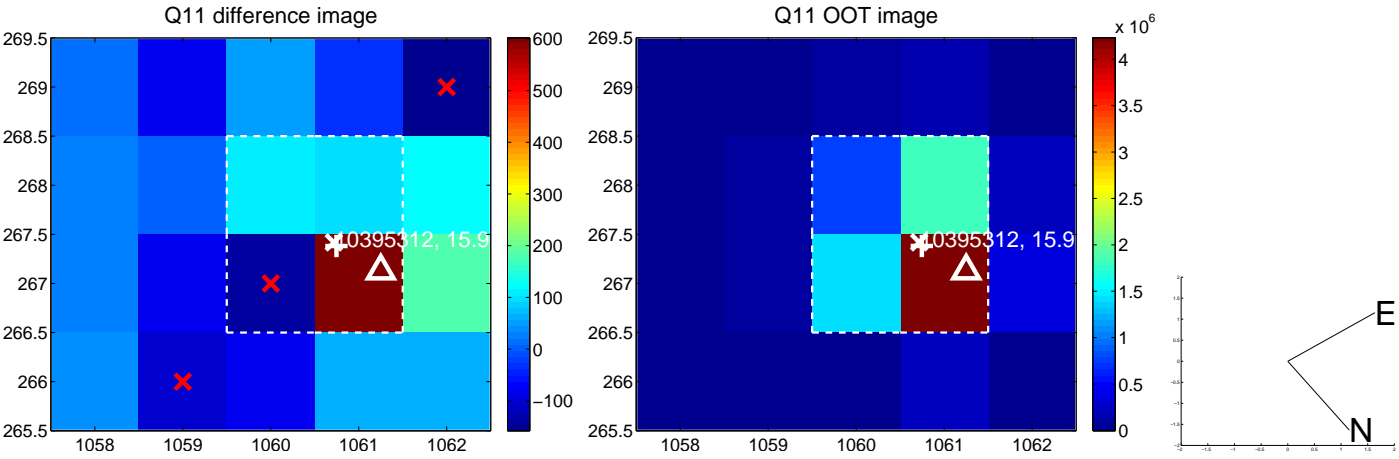
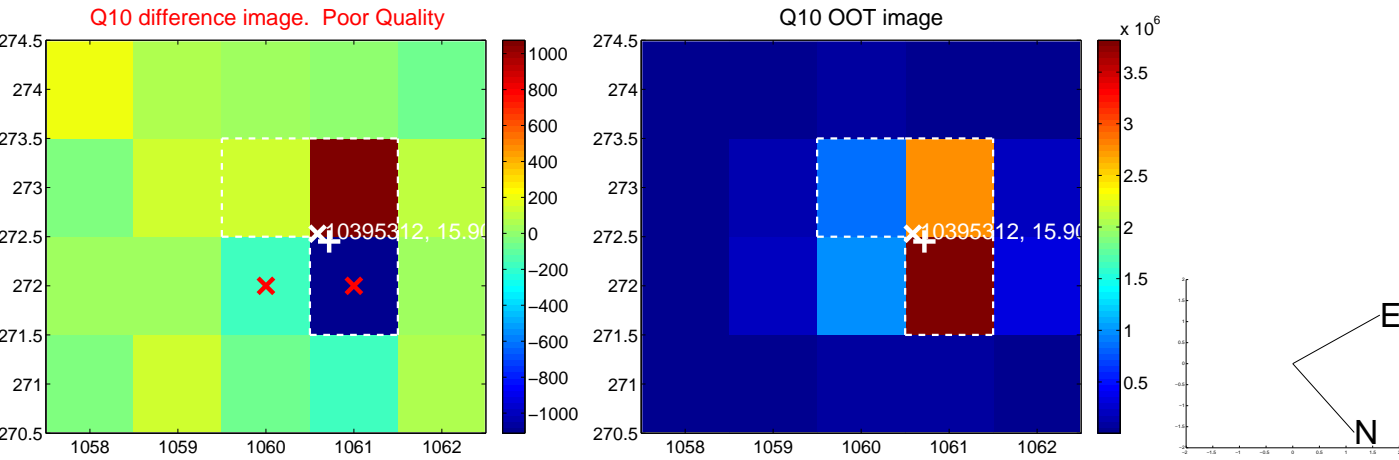
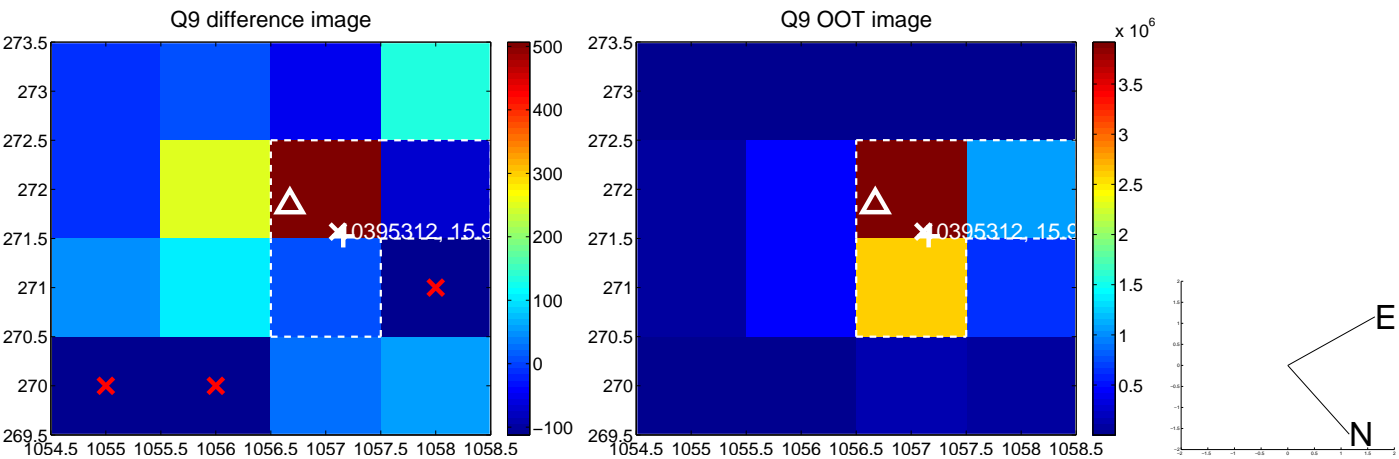


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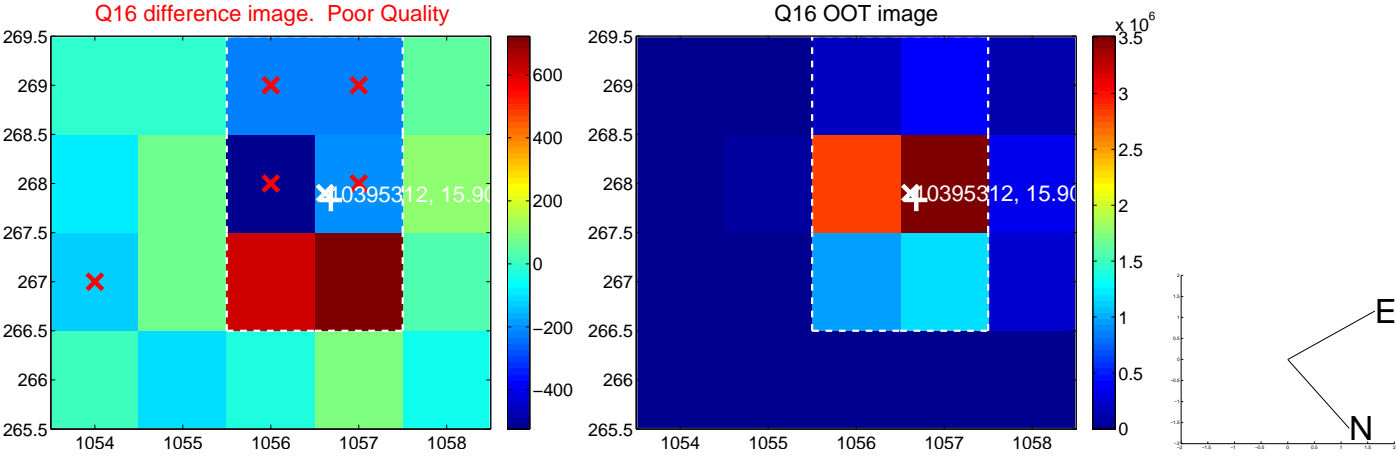
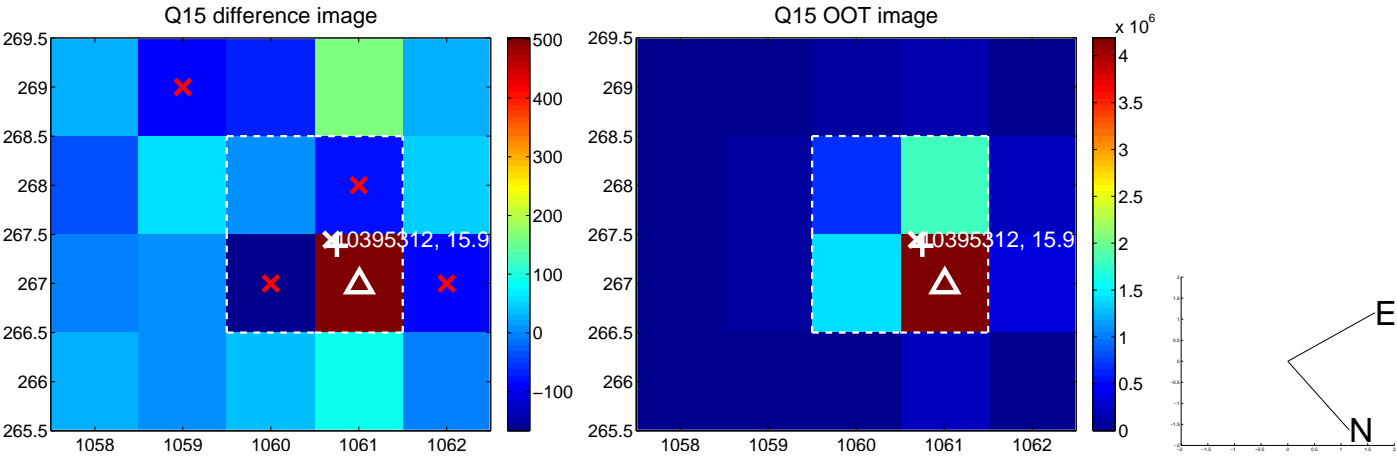
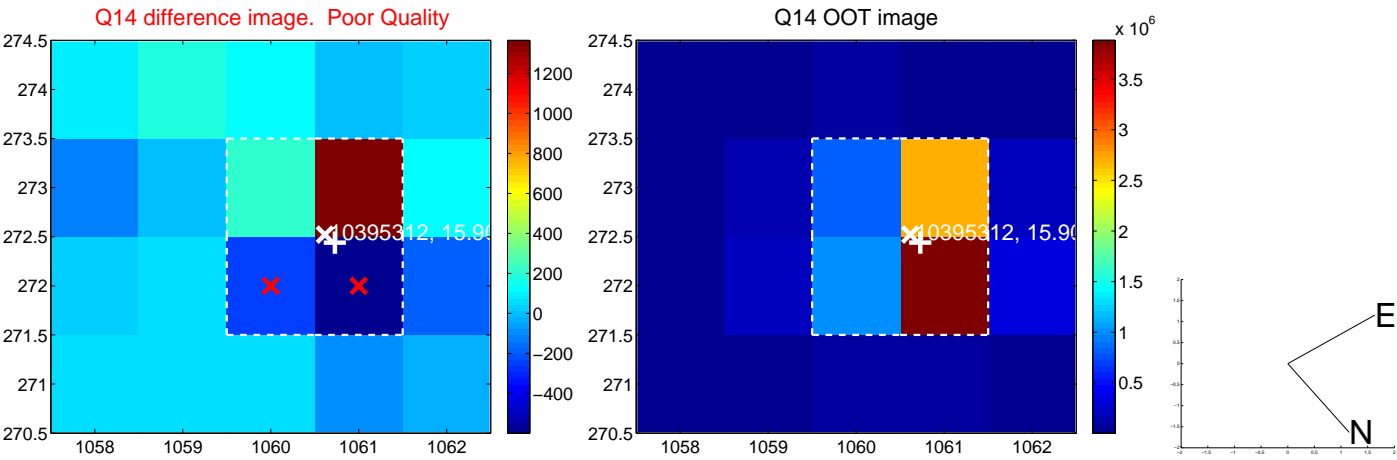
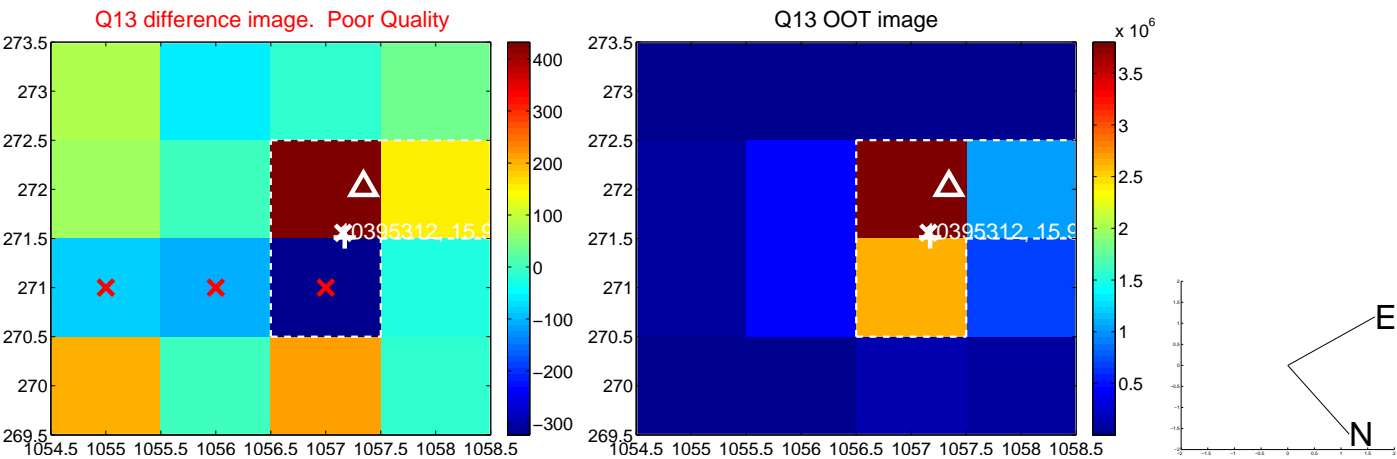




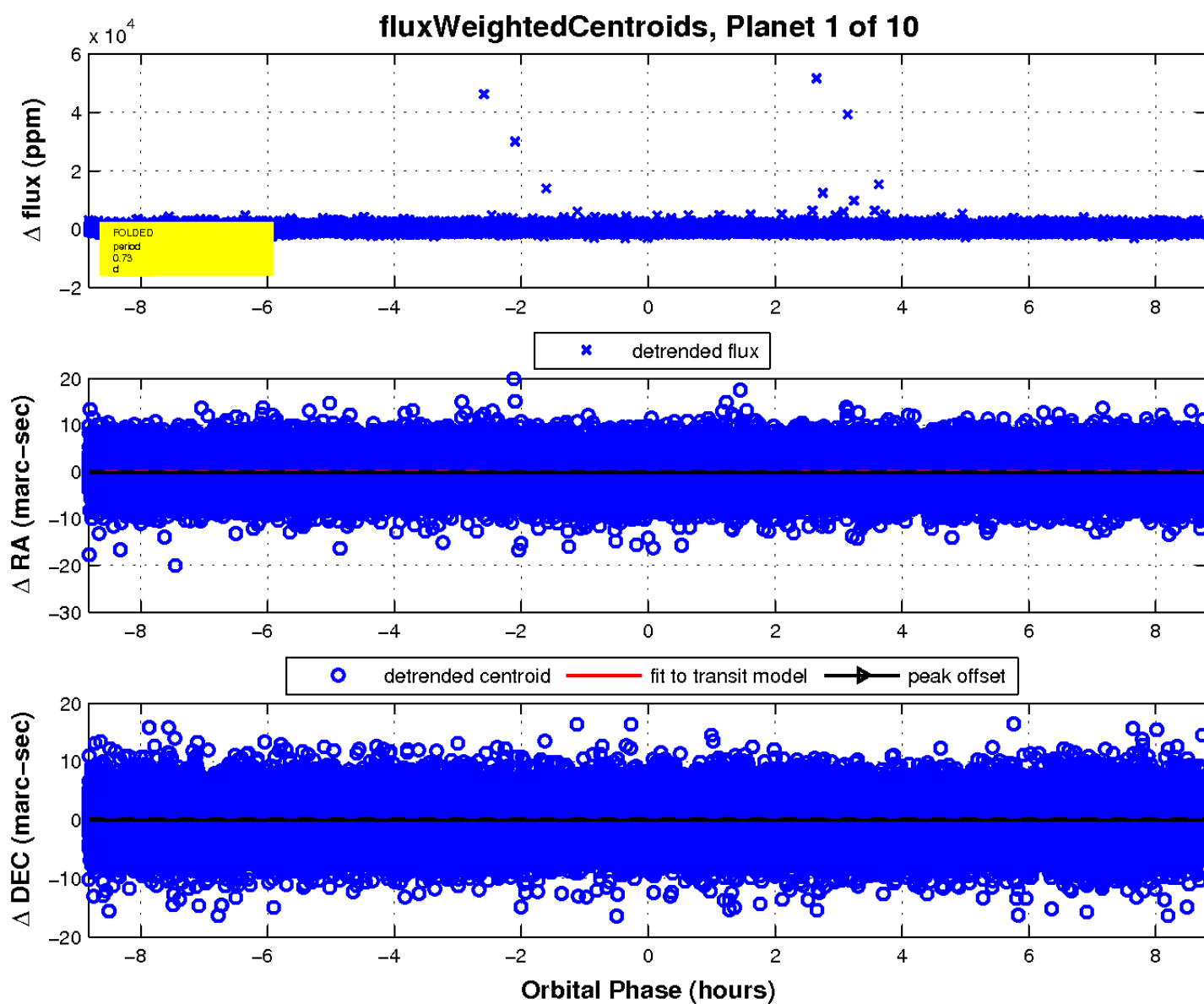
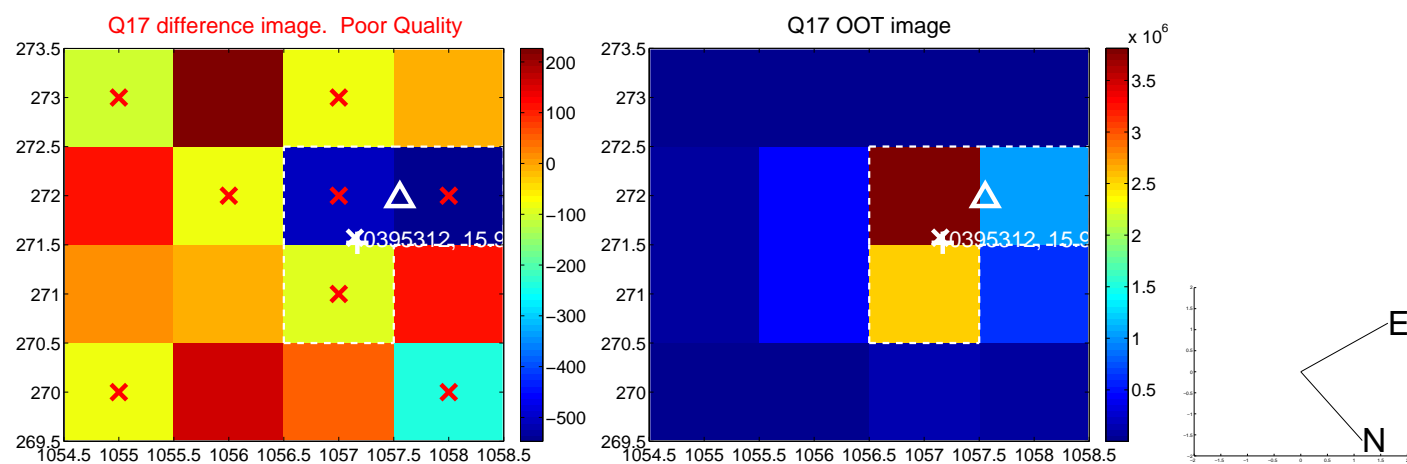
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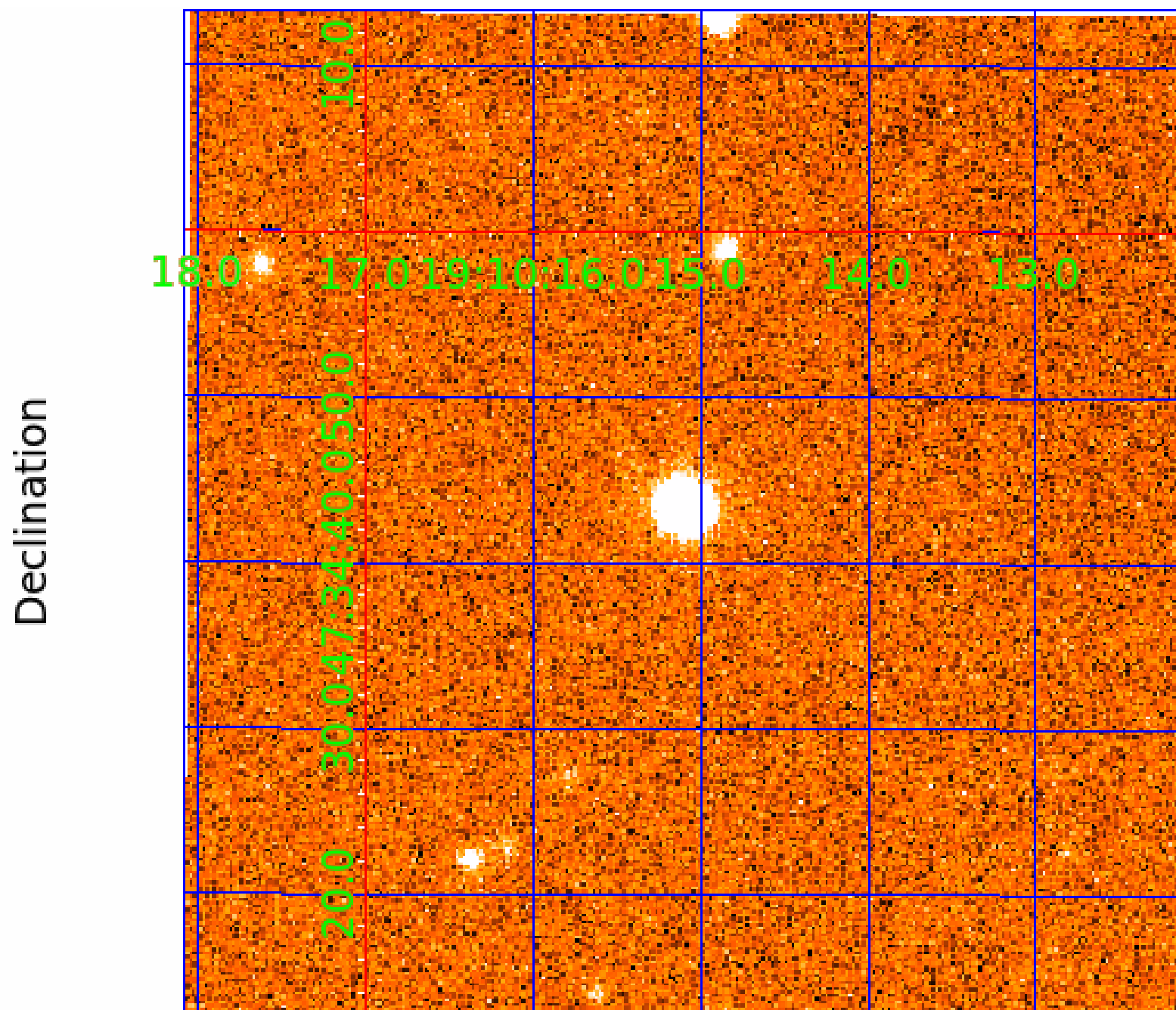
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UKIRT Image





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010395312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010395312-08	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
010395312-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
010395312-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

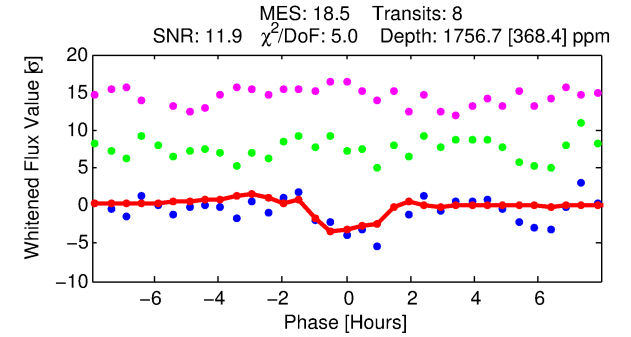
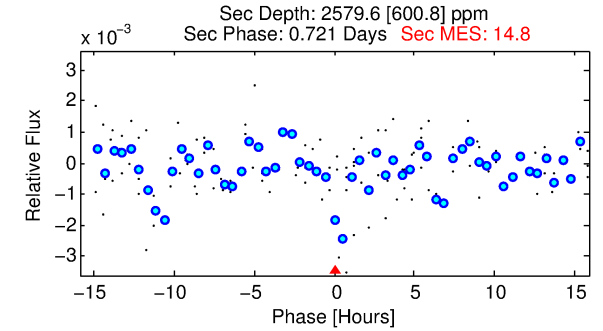
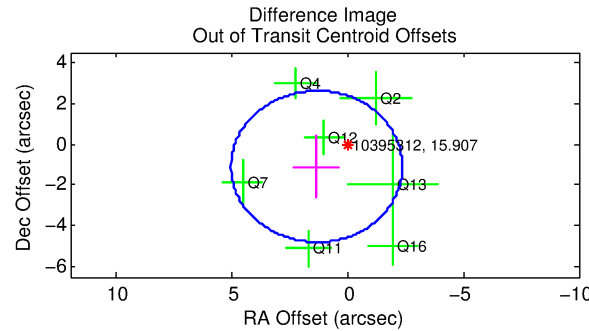
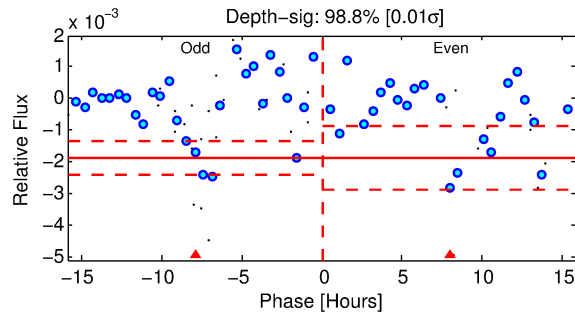
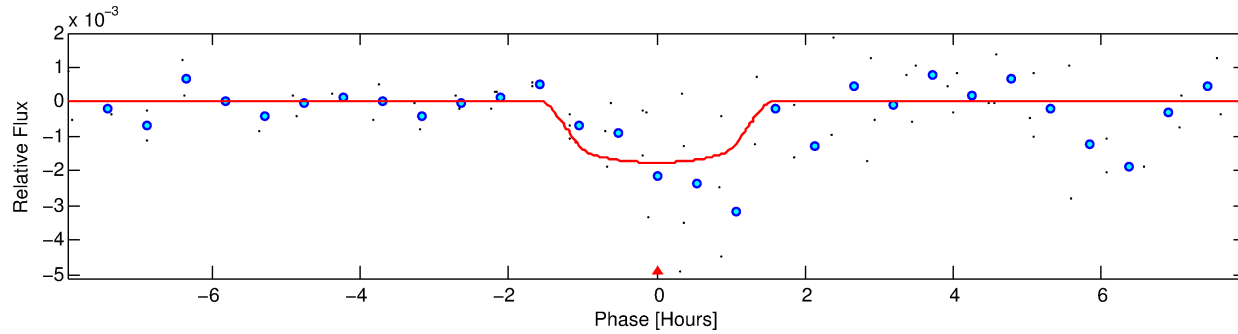
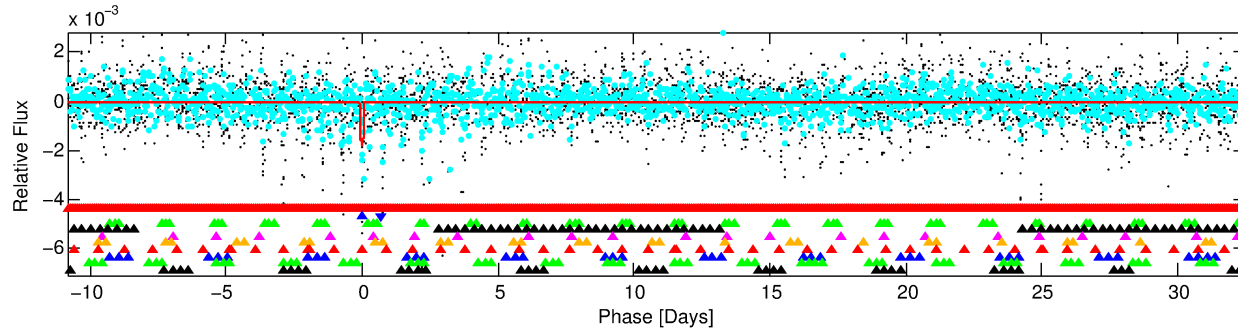
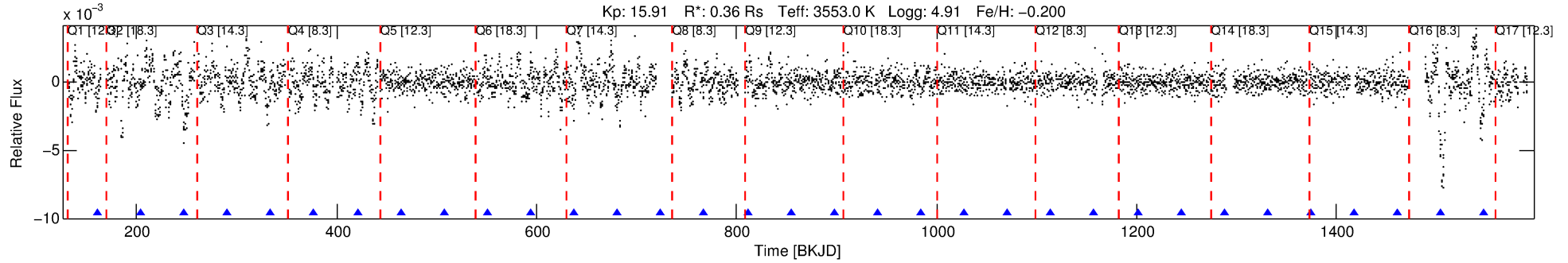
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010395312-02

No Significant Match Found

# DV One-Page Summary

KIC: 10395312 Candidate: 2 of 10 Period: 43.338 d



## DV Fit Results:

Period = 43.33822 [0.00053] d  
Epoch = 160.8842 [0.0108] BKJD  
Rp/R\* = 0.0381 [0.3681]  
a/R\* = 129.66 [5780.09]  
b = 0.03 [1712.23]  
Seff = 0.60 [0.07]  
Teq = 225 [6] K  
Rp = 1.49 [14.38] Re  
a = 0.1744 [0.0130] AU  
Ag = 19473.15 [376230.40] [0.05 $\sigma$ ]  
Teffp = 4102 [19812] K [0.20 $\sigma$ ]

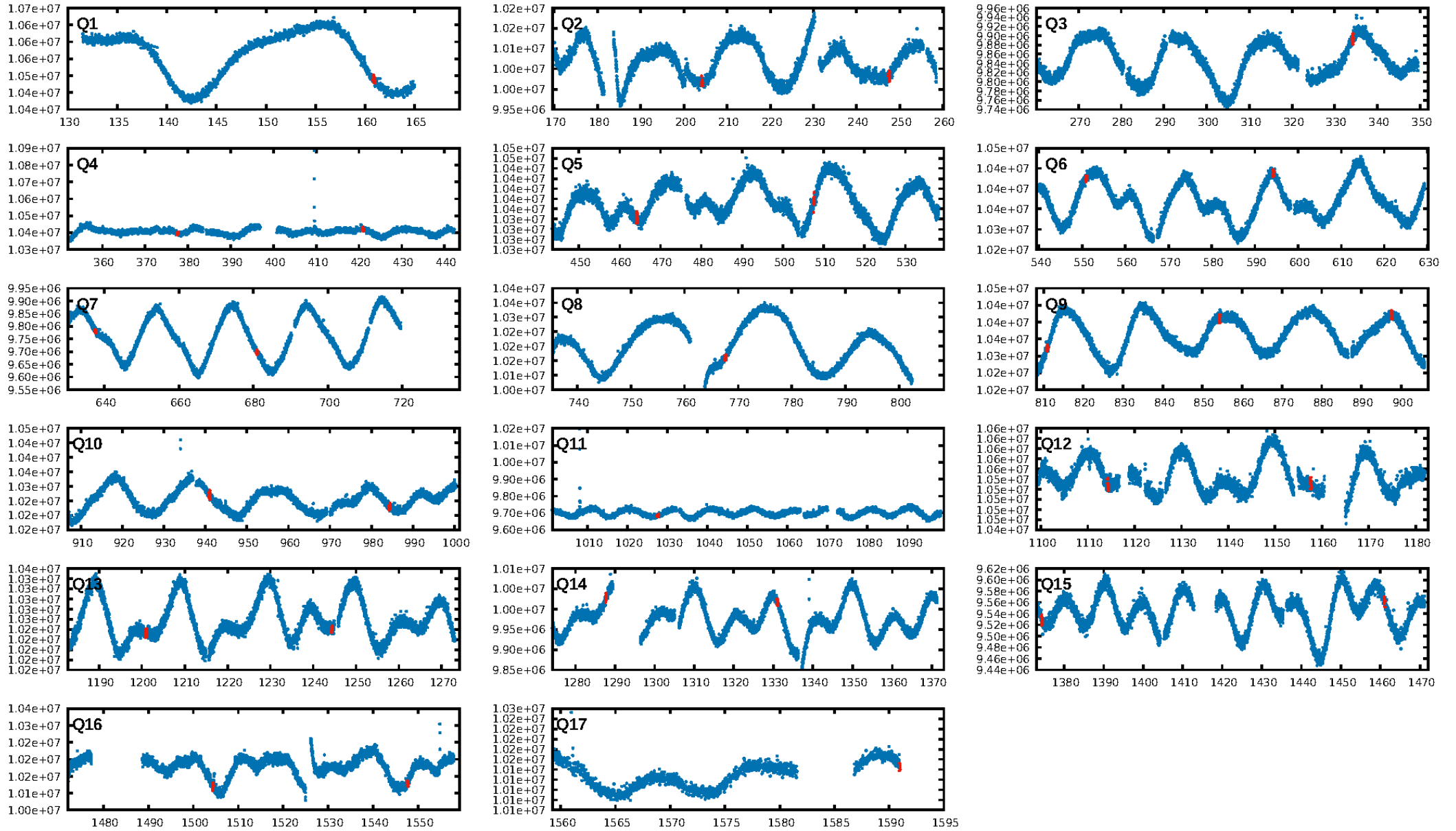
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [24.66 $\sigma$ ]  
LongPeriod-sig: 100.0% [40.86 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: 0.9755  
Centroid-sig: 5.3%  
Centroid-so: 0.619 arcsec [1.33 $\sigma$ ]  
OotOffset-rm: 1.733 arcsec [1.40 $\sigma$ ]  
OotOffset-st: 1/2/3/1 [7]  
KicOffset-rm: 1.567 arcsec [1.37 $\sigma$ ]  
KicOffset-st: 1/2/3/1 [7]  
DiffImageQuality-fgm: 0.00 [0/7]  
DiffImageOverlap-fno: 0.00 [0/16]

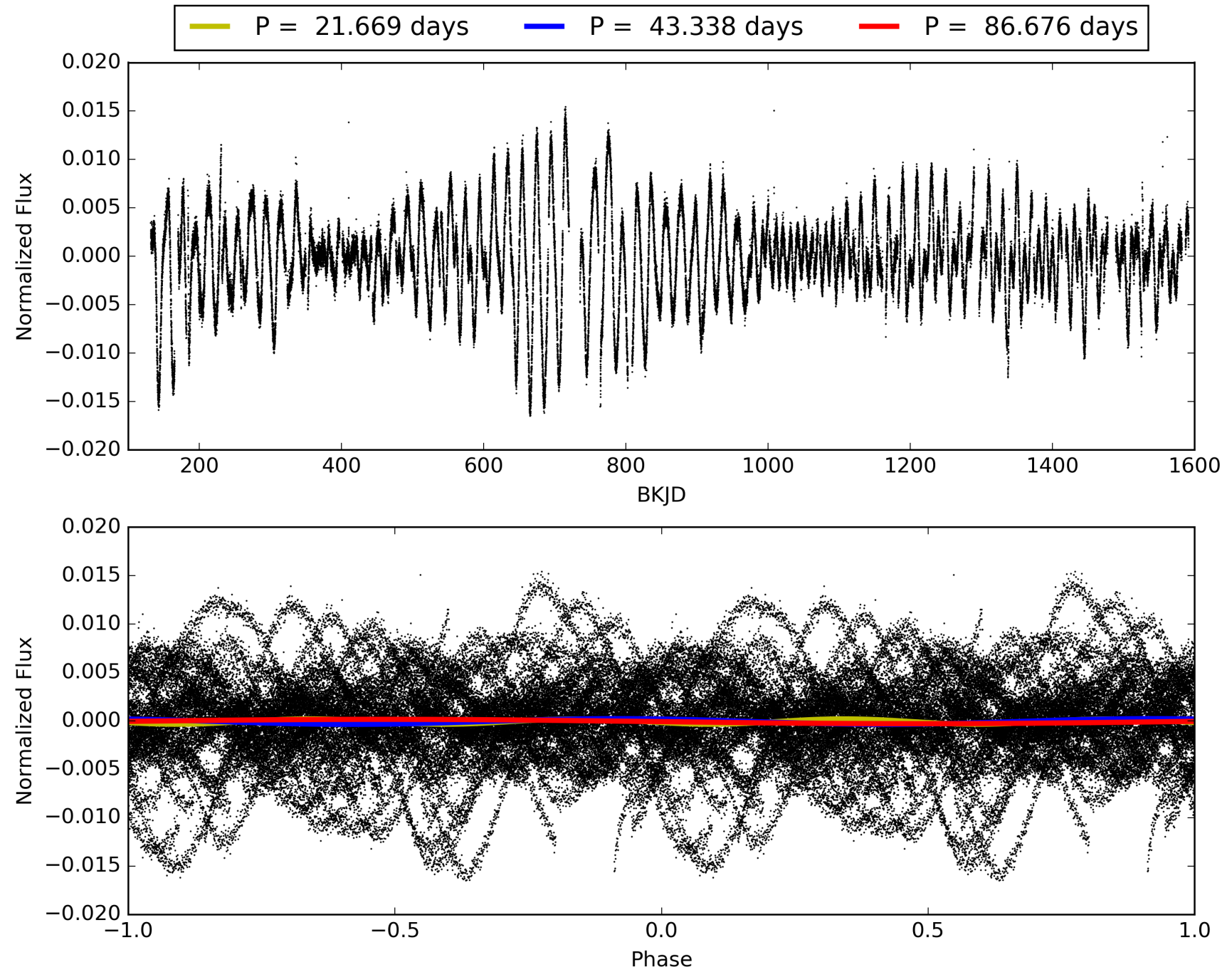
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:44:18 Z

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

# TCE 010395312-02, PDC Light Curves

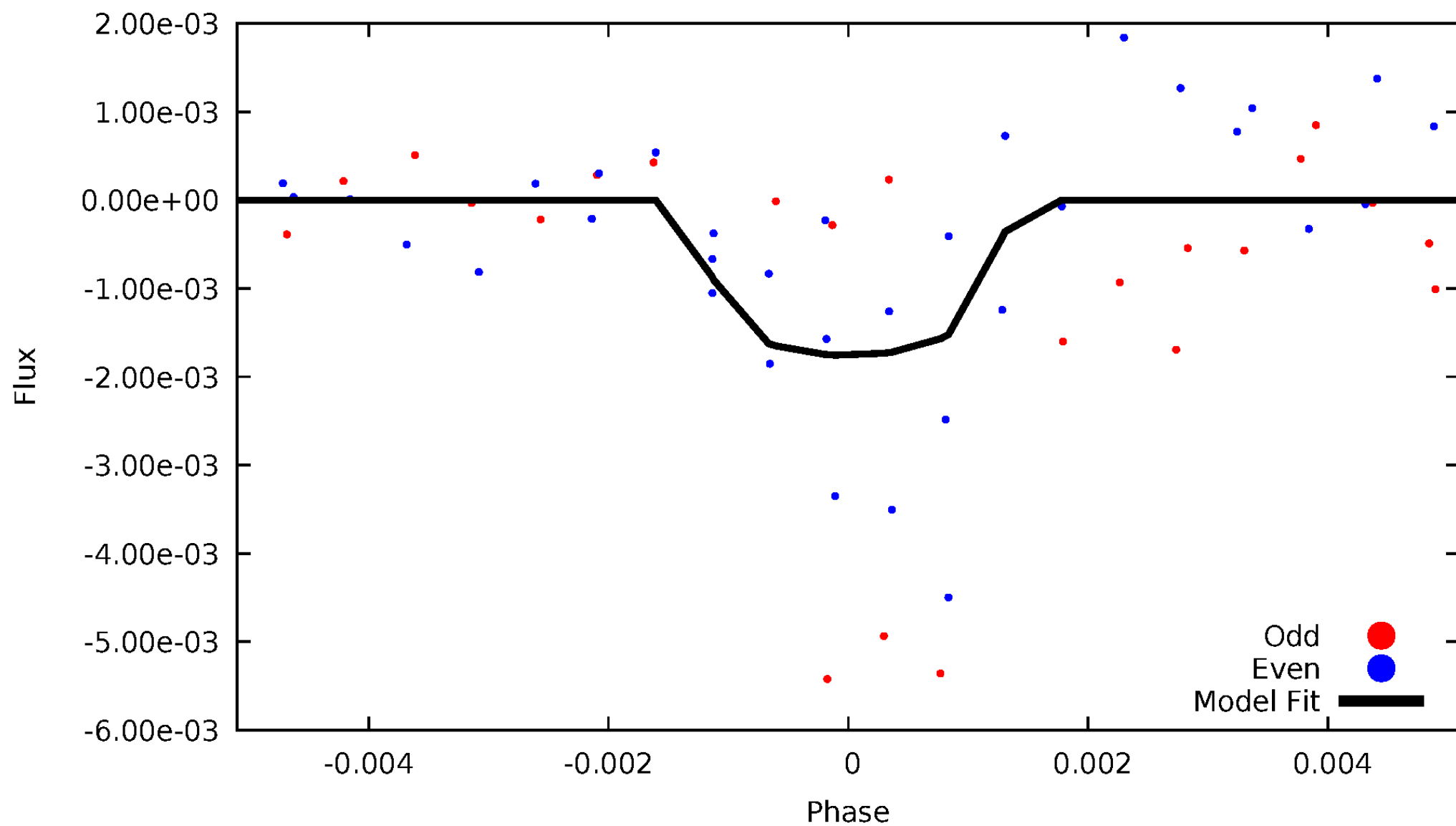


# TCE 010395312-02



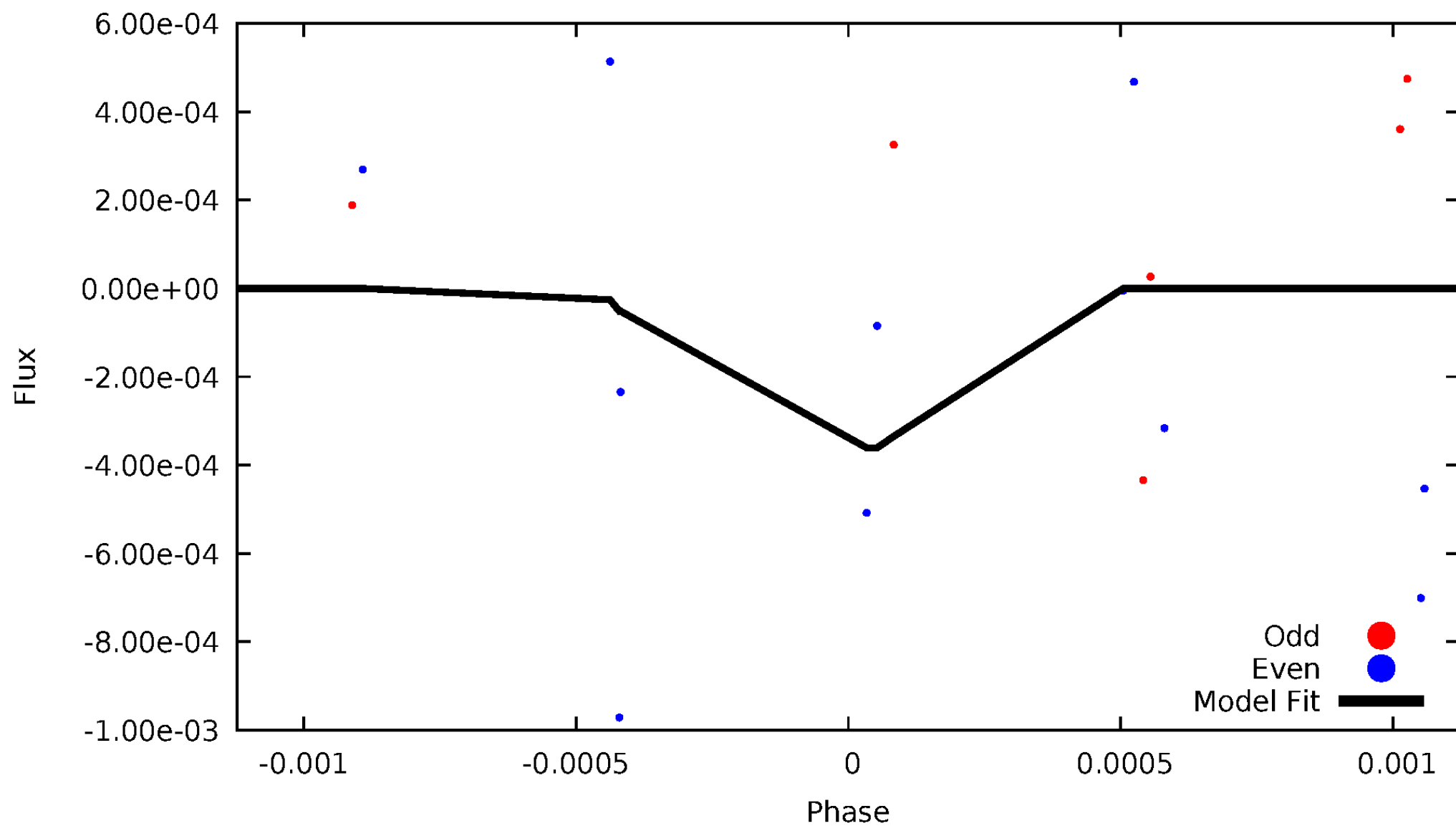
# DV Odd/Even

TCE 010395312-02



# ALT Odd/Even

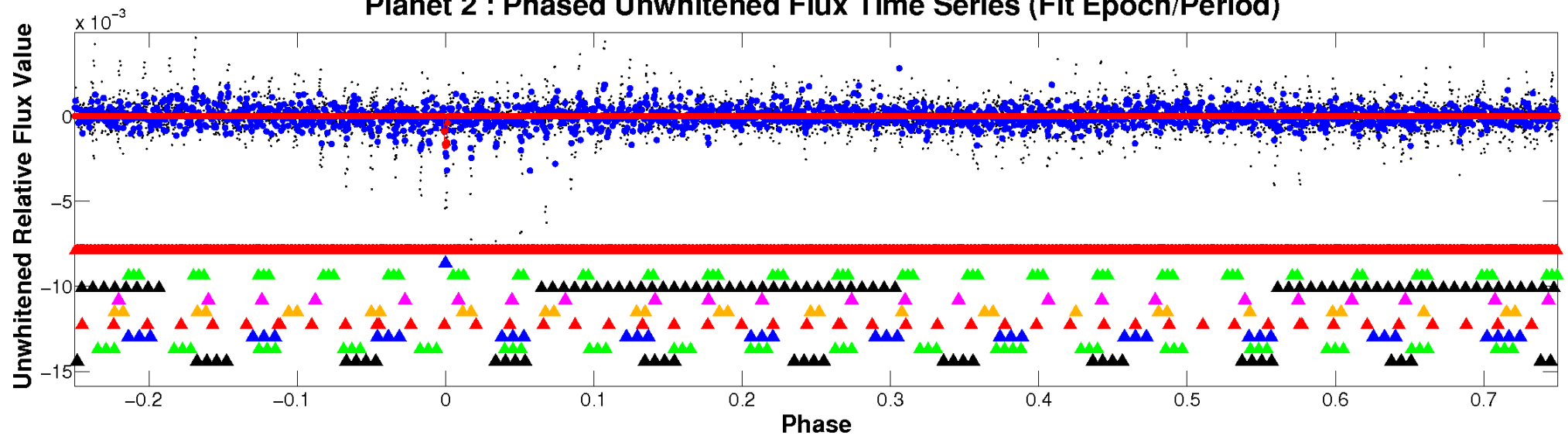
TCE 010395312-02



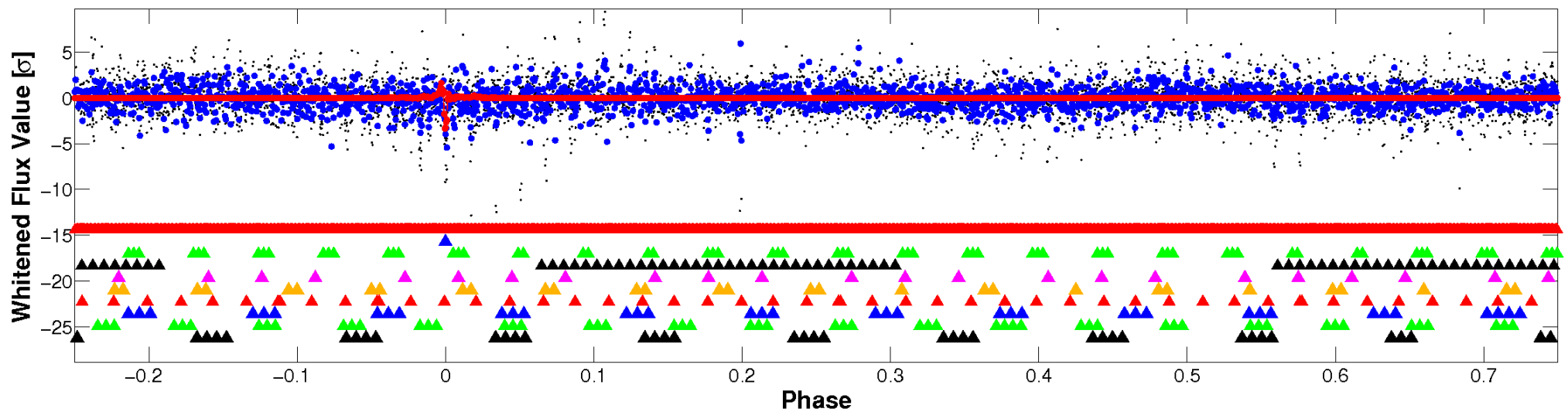


# Non-Whitened Vs. Whitened Light Curve

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

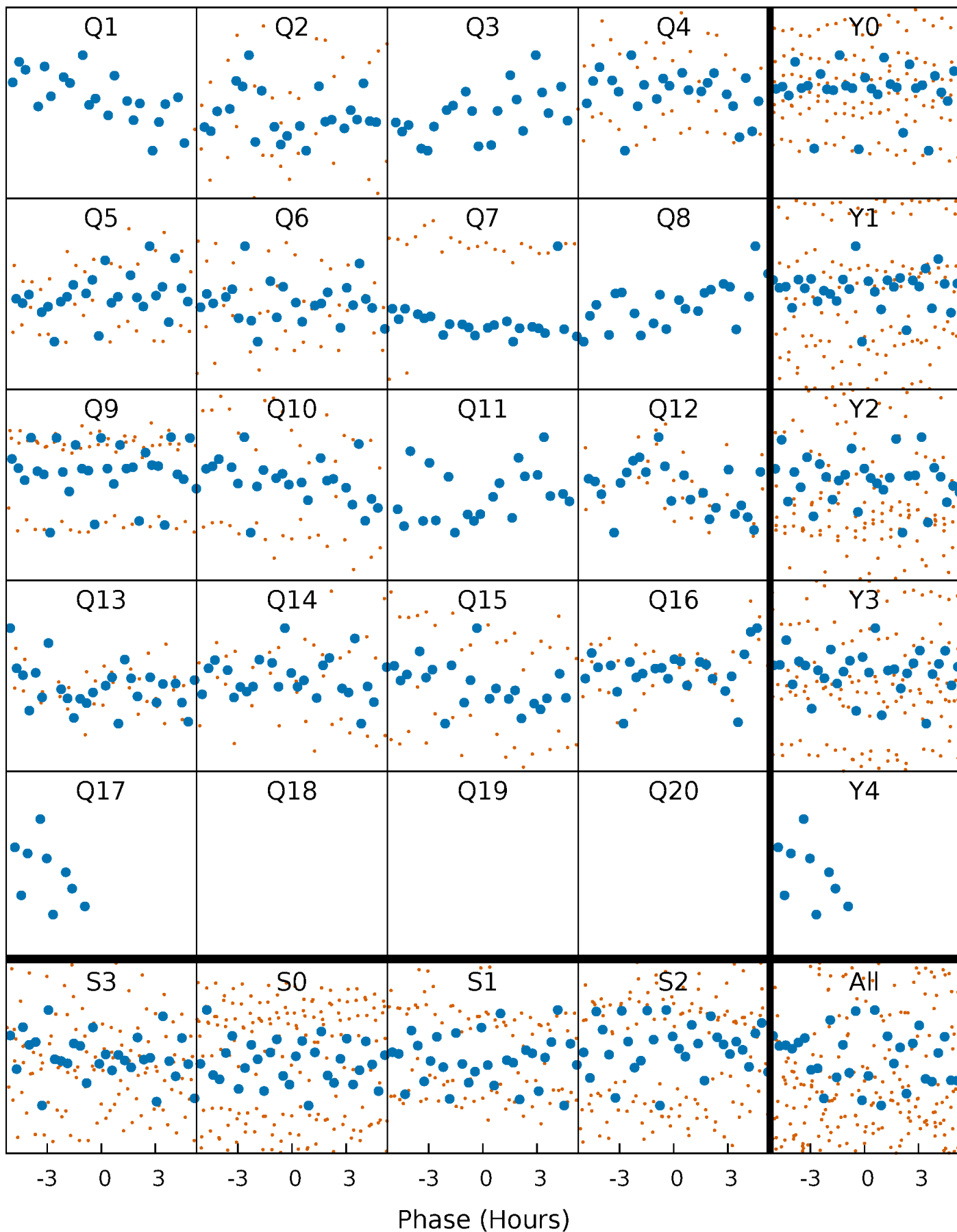


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



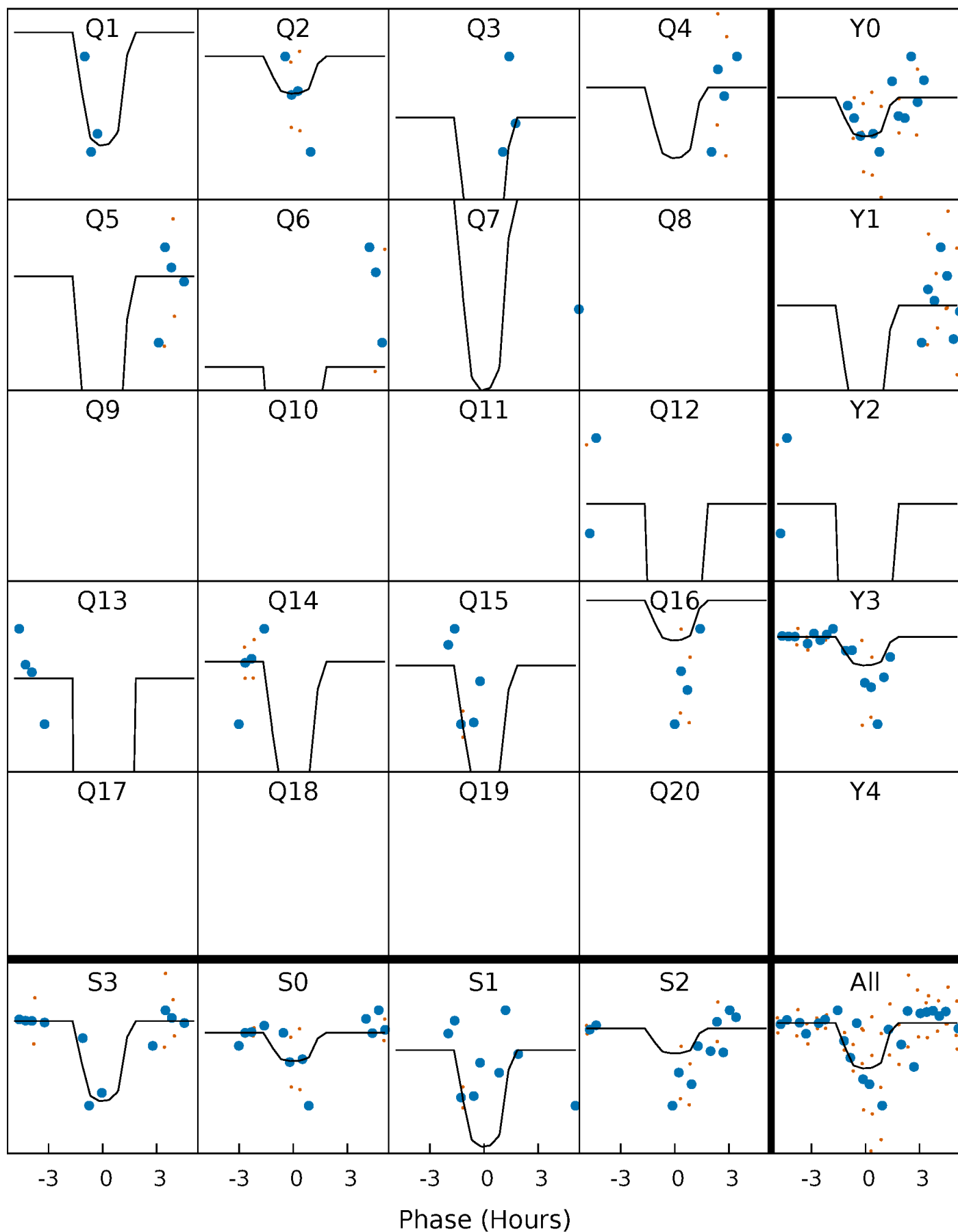
# PDC Quarter-Phased Transit Curves

TCE 010395312-02   P= 43.338219 Days    $T_0=160.884184$  (BKJD)



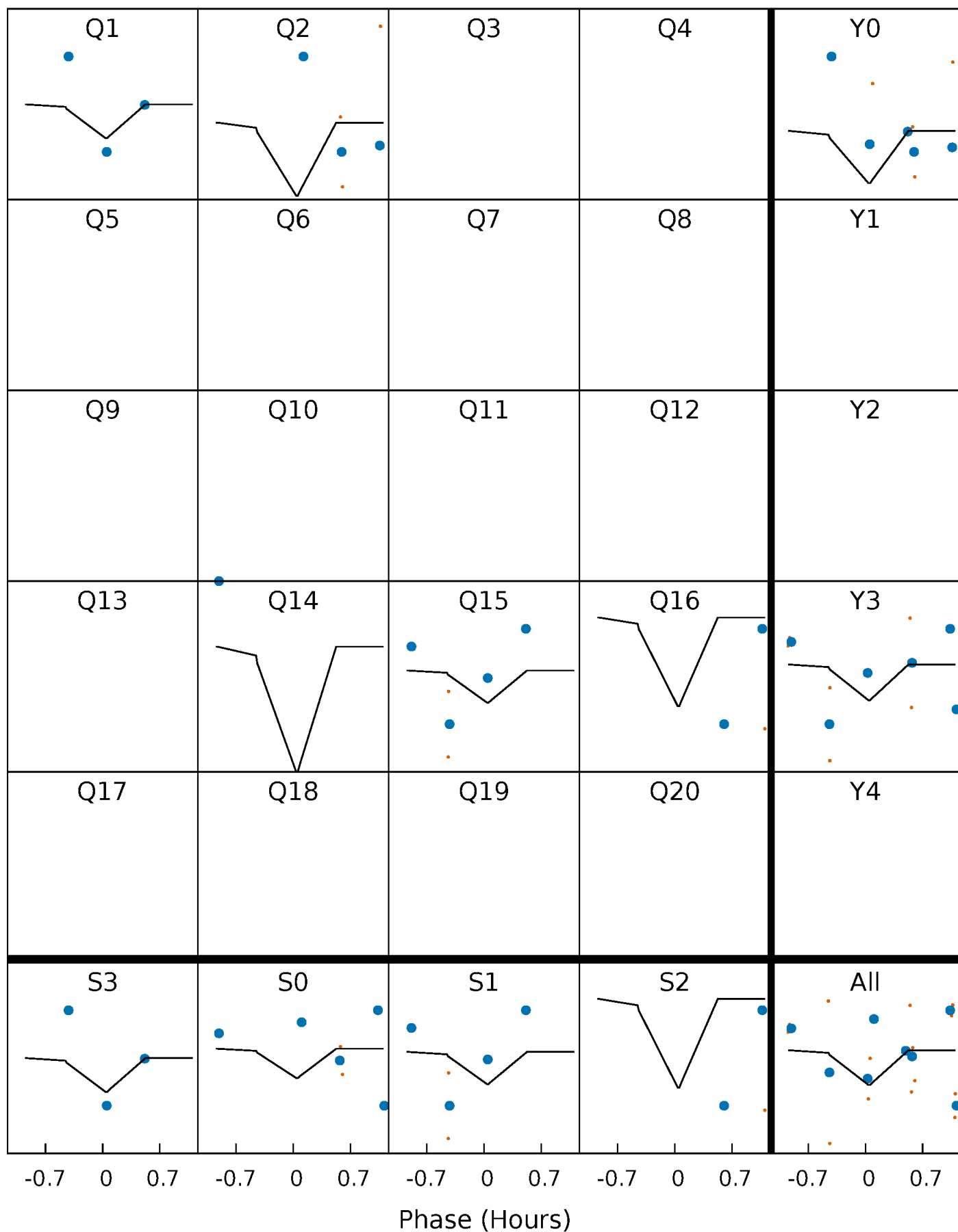
# DV Quarter-Phased Transit Curves

TCE 010395312-02     $P = 43.338219$  Days     $T_0 = 160.884184$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

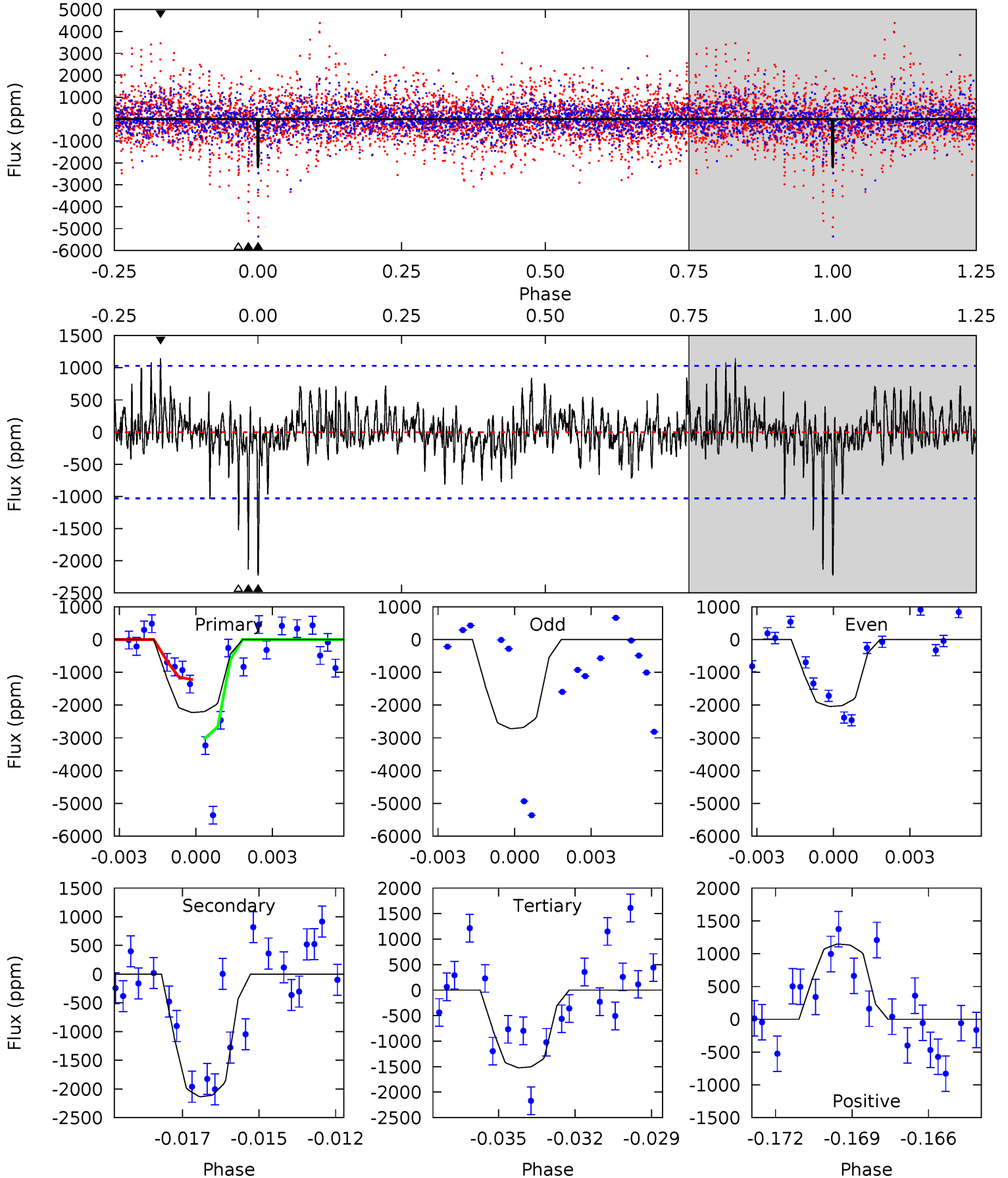
TCE 010395312-02 P= 43.338178 Days  $T_0=160.854408$  (BKJD)



# DV Model-Shift Uniqueness Test

010395312-02, P = 43.338219 Days, E = 117.545965 Days

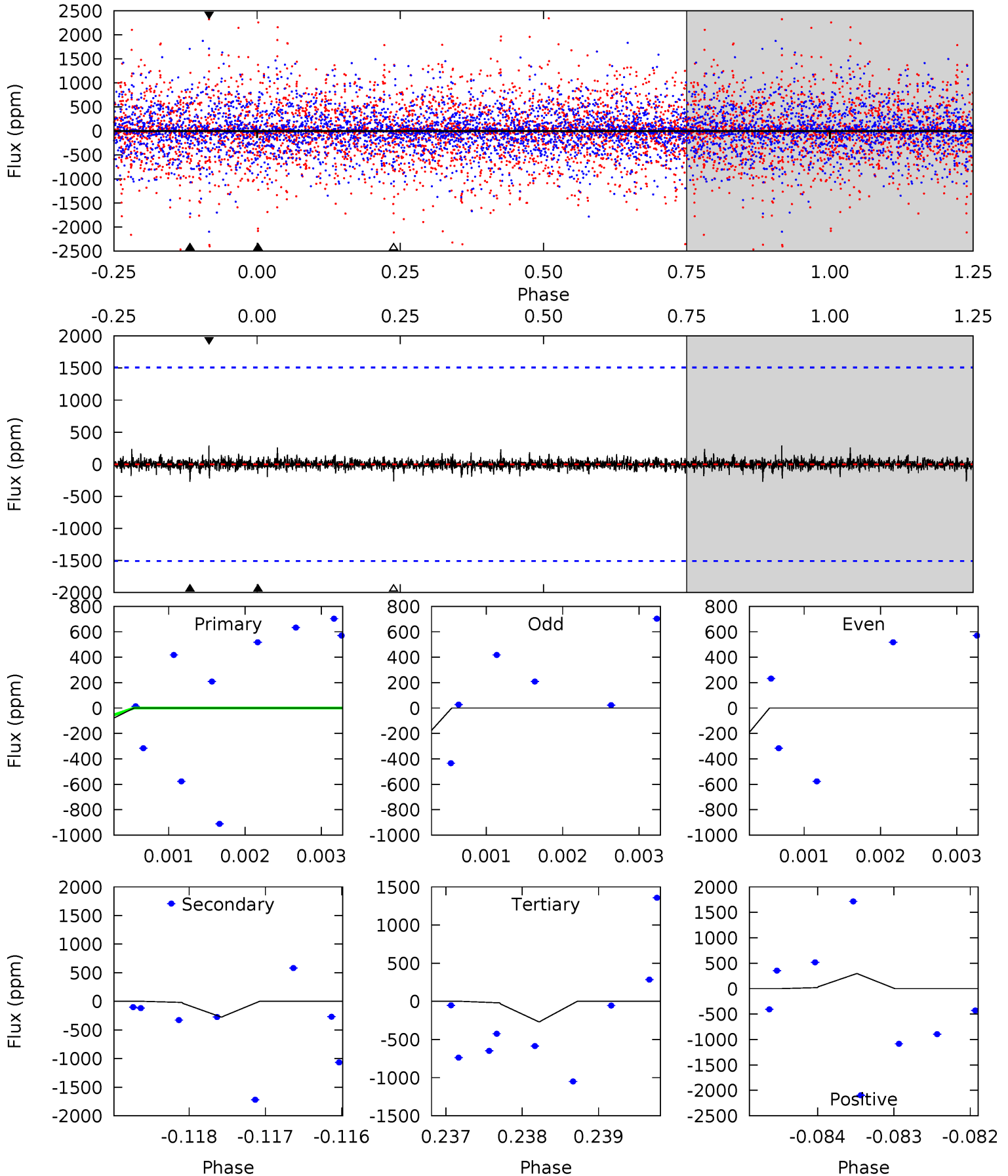
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	10.9	7.77	5.85	5.26	2.98	1.44	3.60	5.52	3.13	5.05	1.36	1.23	0.34	4.52



# Alt Model-Shift Uniqueness Test

010395312-02, P = 43.338178 Days, E = 117.516230 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.53	0.98	0.96	1.06	5.46	3.31	0.18	-0.43	-0.53	0.02	-0.08	0.05	1.00	0.52	0.51



### Stellar Parameters For KIC 010395312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3553^{+48}_{-53}$	$4.906^{+0.035}_{-0.042}$	$-0.200^{+0.100}_{-0.100}$	$0.358^{+0.036}_{-0.036}$	$0.379^{+0.034}_{-0.046}$	$11.630^{+2.353}_{-1.957}$
	+1%/-1%	+1%/-1%	+50%/-50%	+10%/-10%	+9%/-12%	+20%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010395312-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-2136 \pm 196$	$10.59^{+10.25}_{-7.83}$	$315^{+6}_{-7}$	$2223^{+895}_{-294}$	$319^{+4169}_{-237}$
Alt.	$-270 \pm 276$	$9.96^{+10.52}_{-7.11}$	$314^{+7}_{-7}$	$1747^{+541}_{-3159}$	$30^{+358}_{-32}$

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



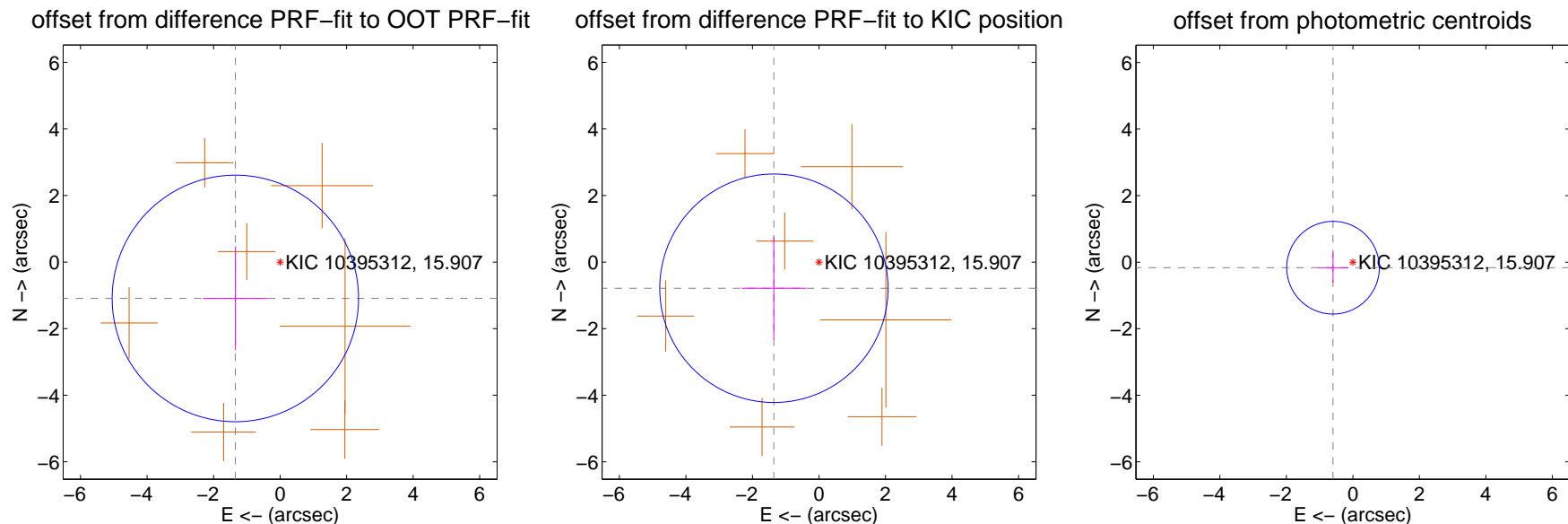
## DV Centroid Data

Supplemental centroid analysis for 010395312-02. Kepler magnitude: 15.91. Transit SNR 11.91

There are 0 quarters with good PRF difference image offsets

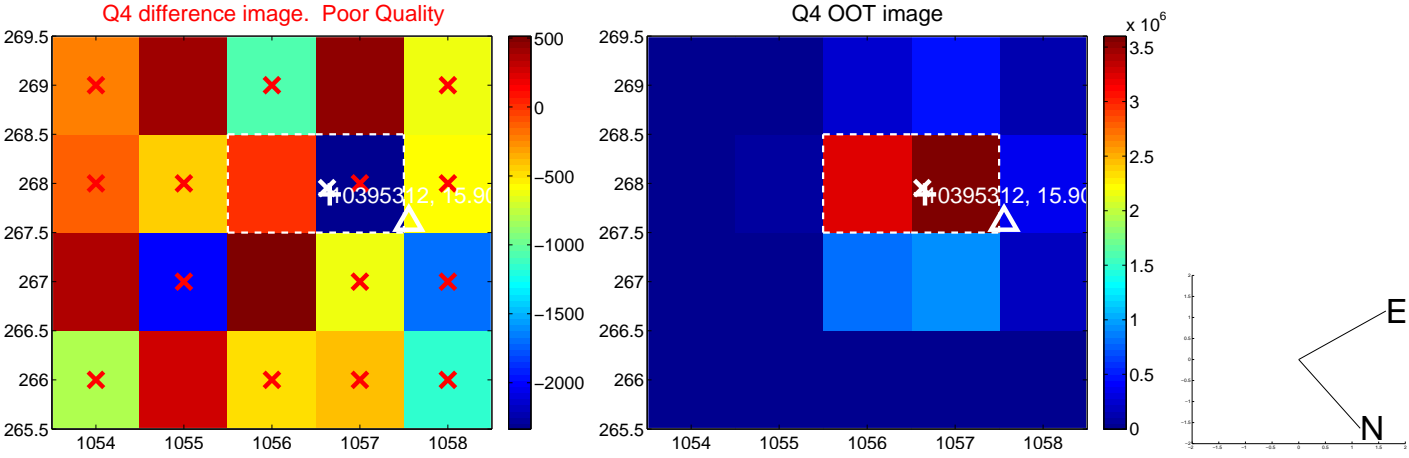
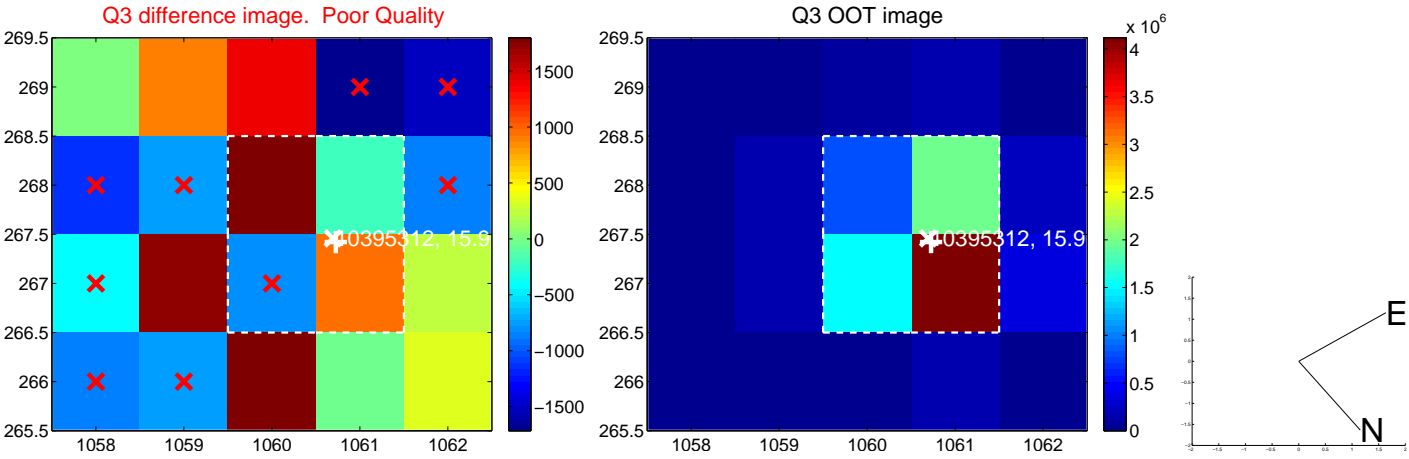
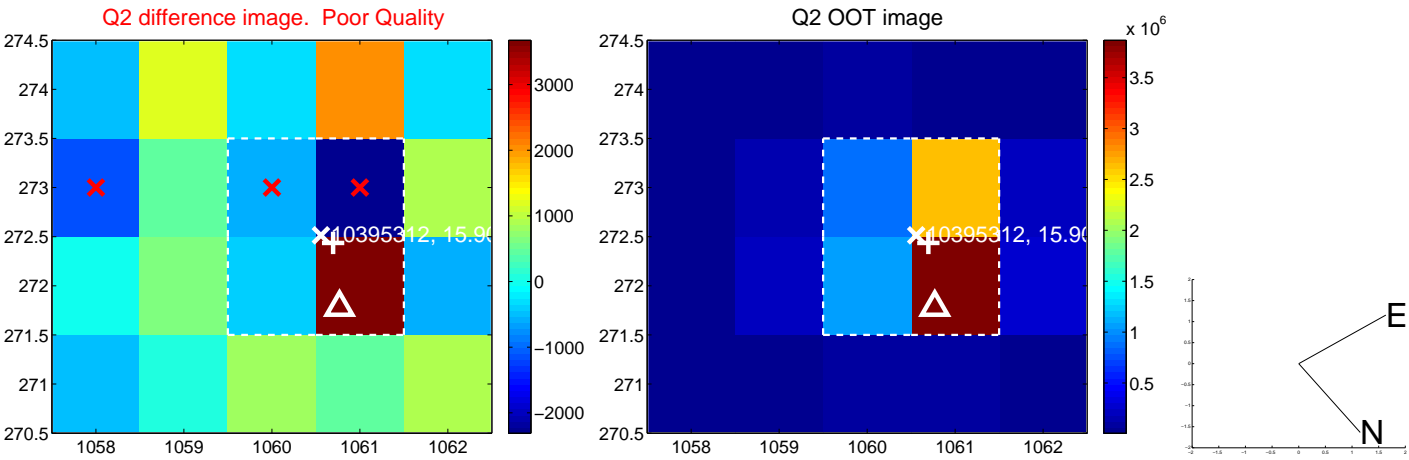
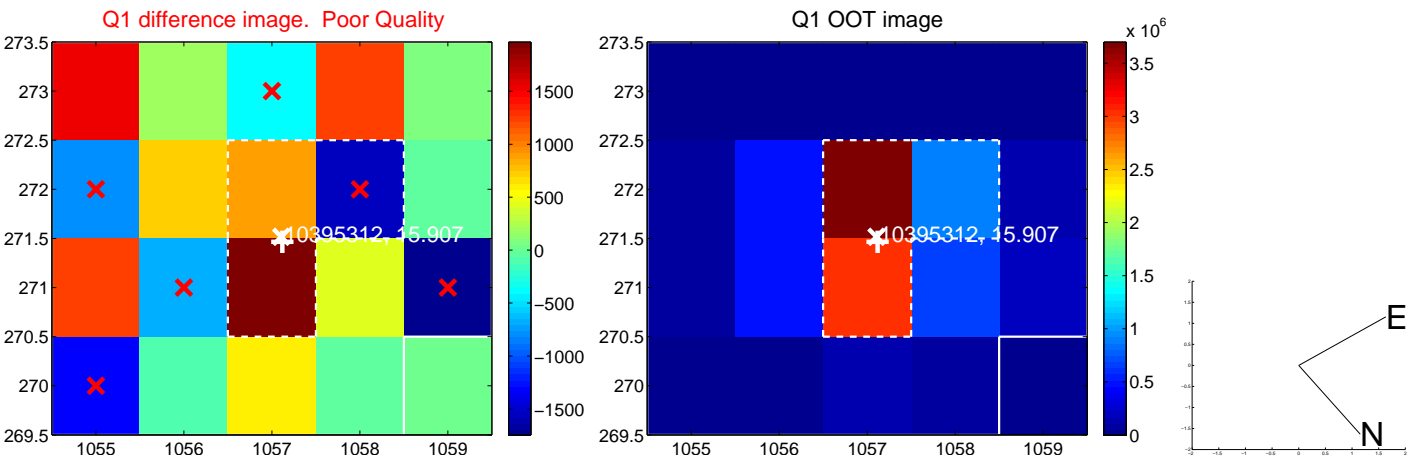
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.733 \pm 1.235$	1.40	$1.345 \pm 0.969$	$-1.092 \pm 1.553$
PRF-fit source offset from KIC position	$1.567 \pm 1.144$	1.37	$1.356 \pm 0.972$	$-0.786 \pm 1.546$
photometric centroid source offset	$0.62 \pm 0.46$	1.33	$0.60 \pm 0.47$	$-0.17 \pm 0.45$

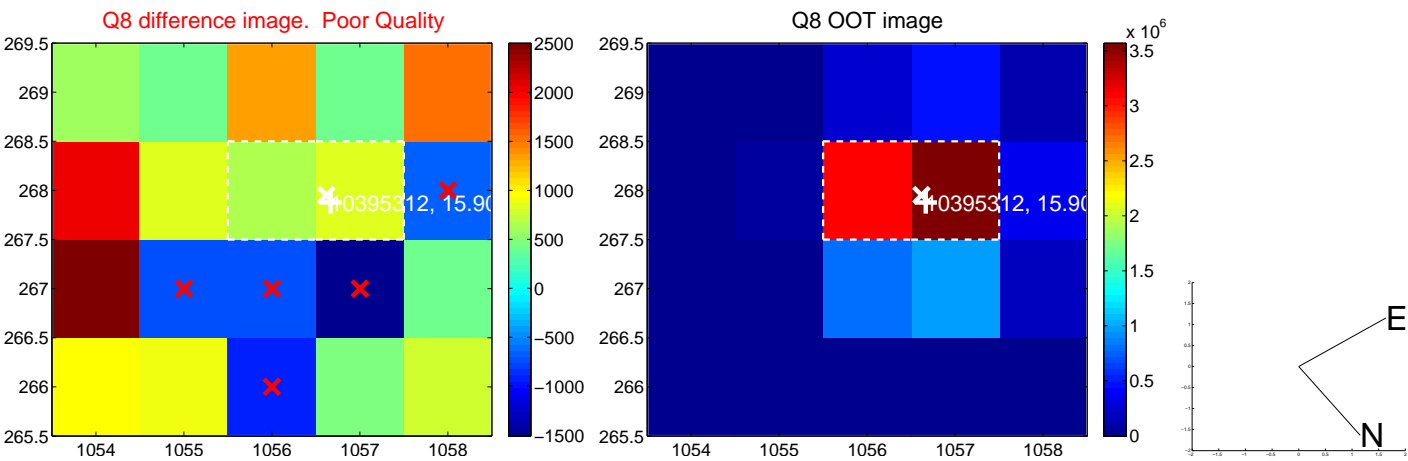
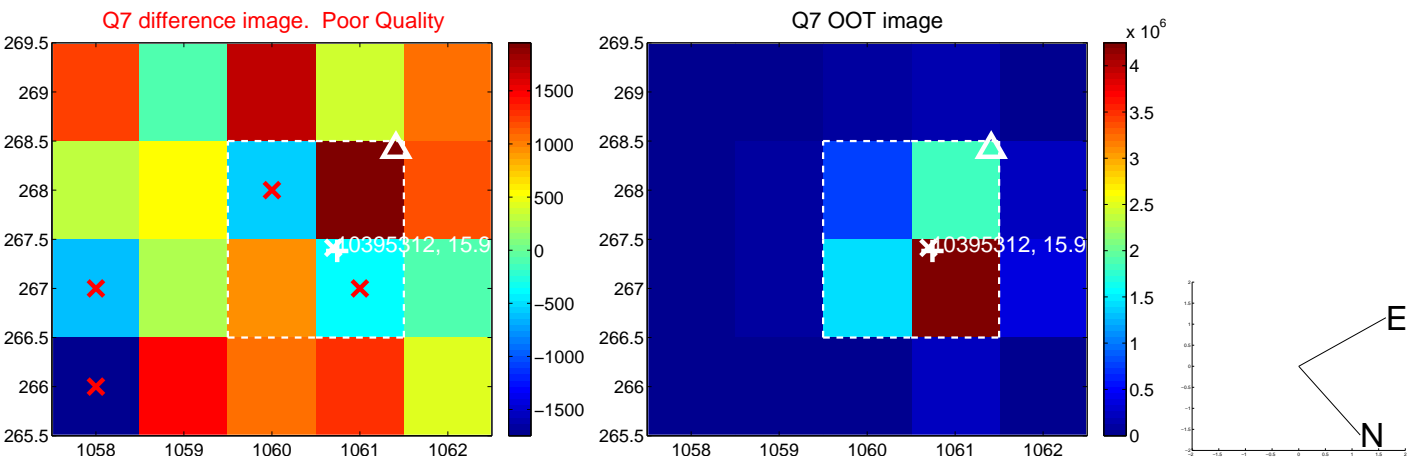
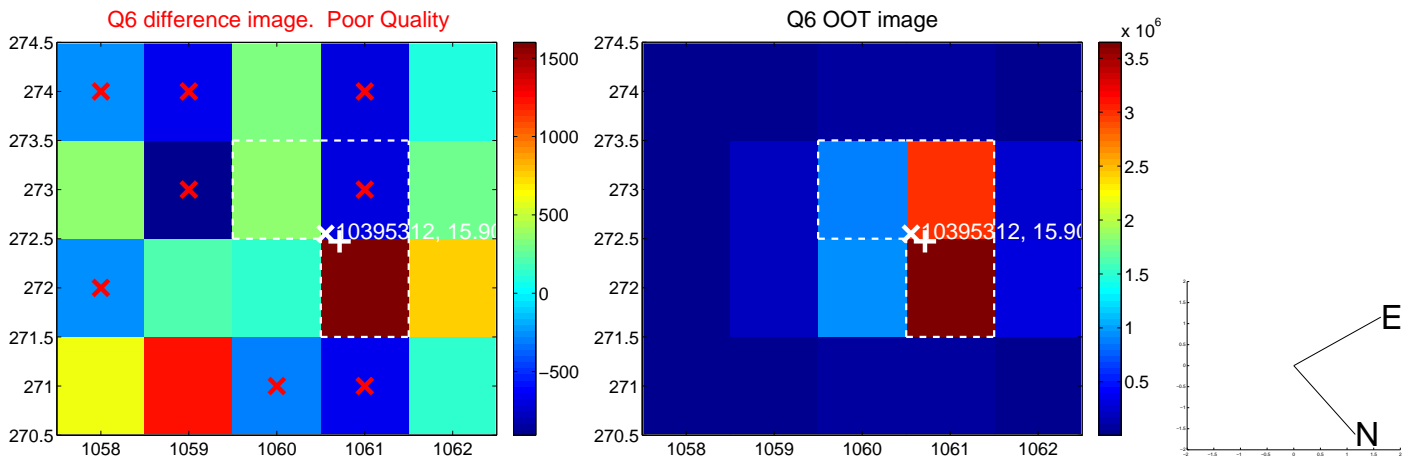
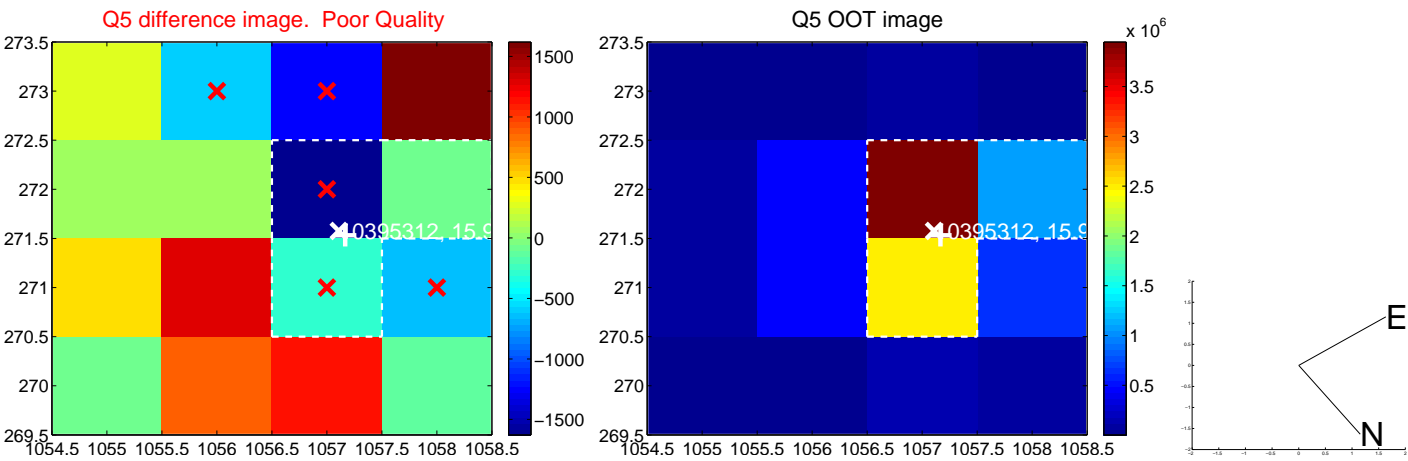


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

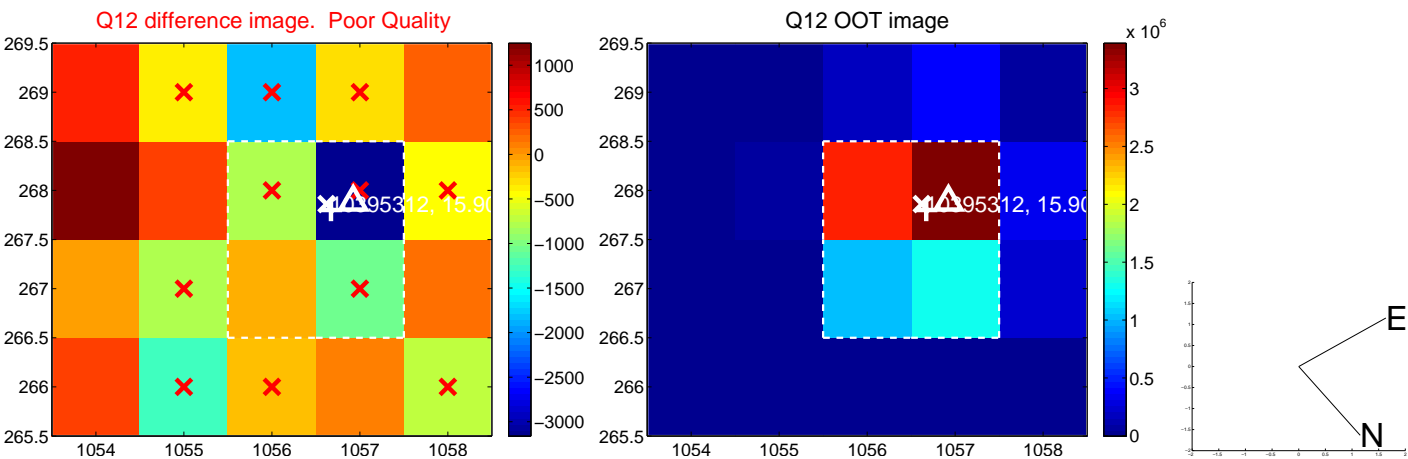
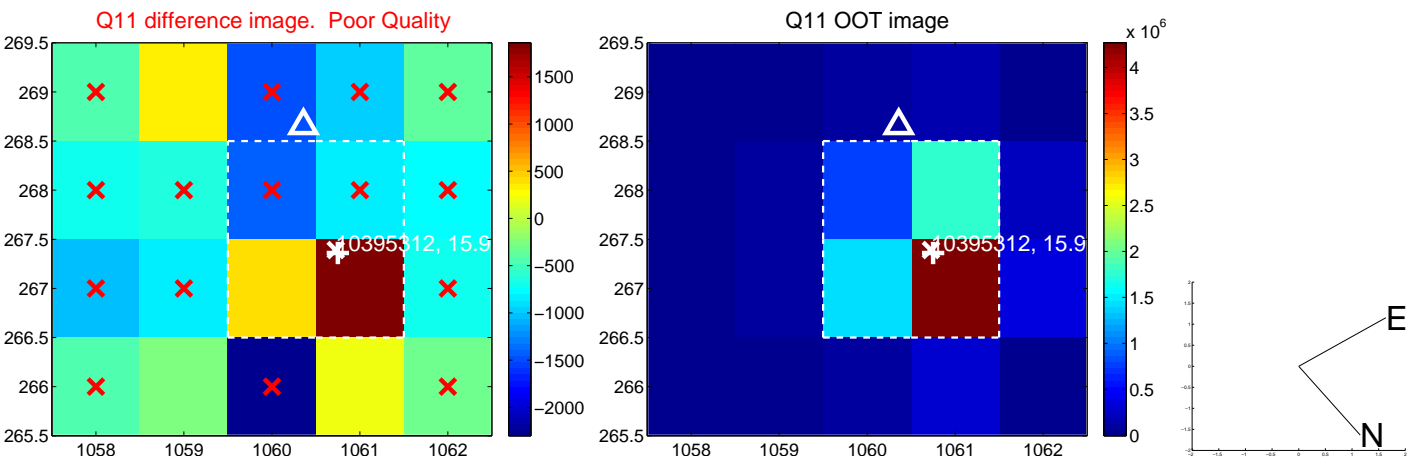
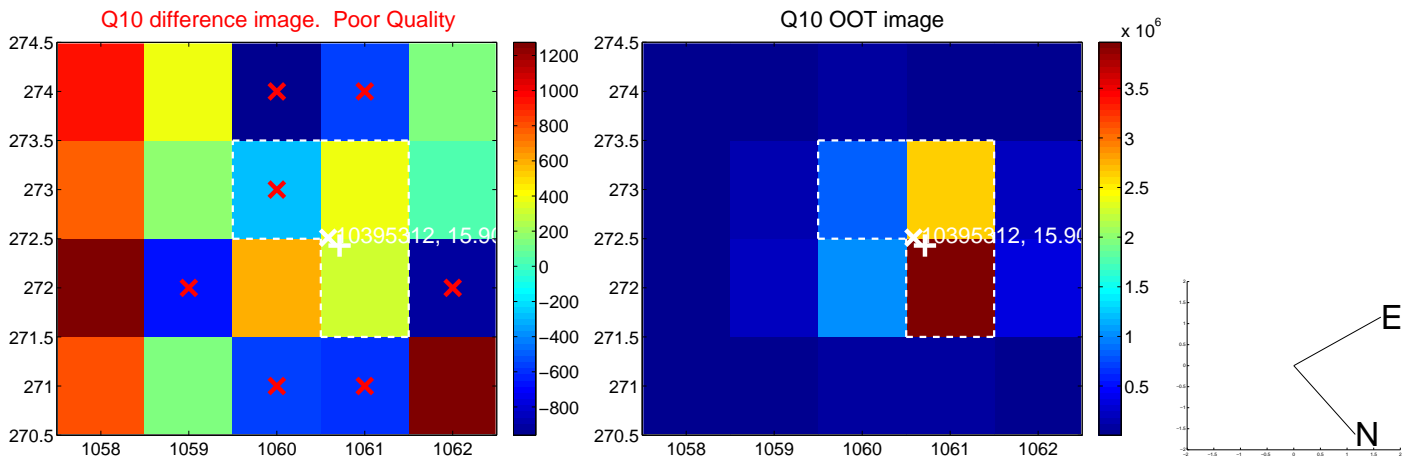
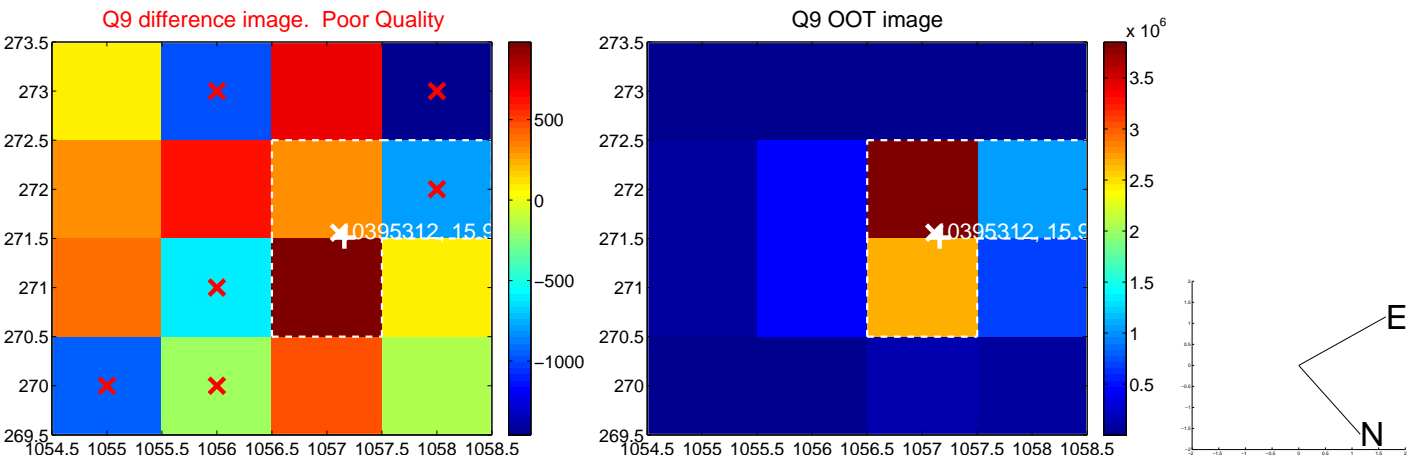
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

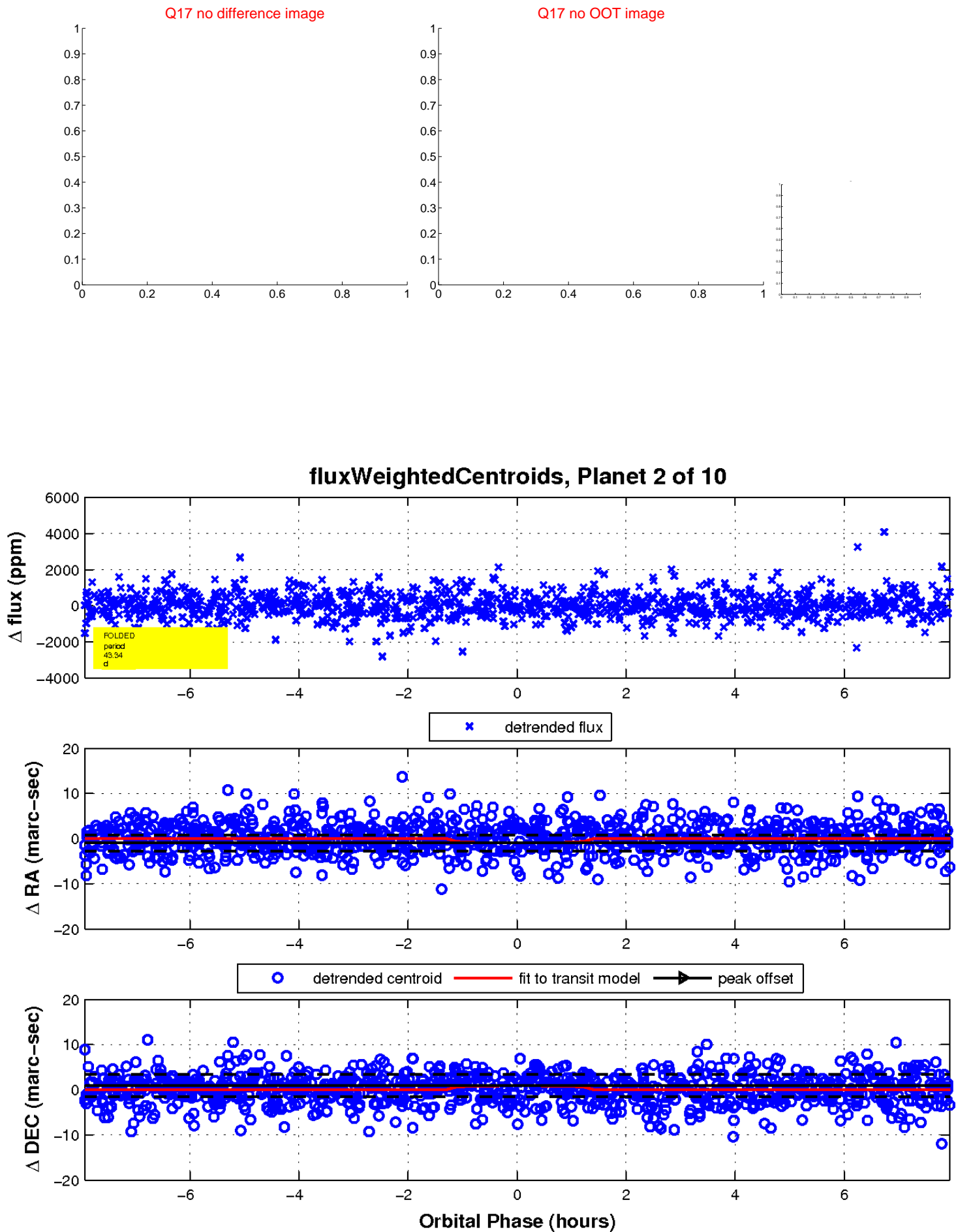


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

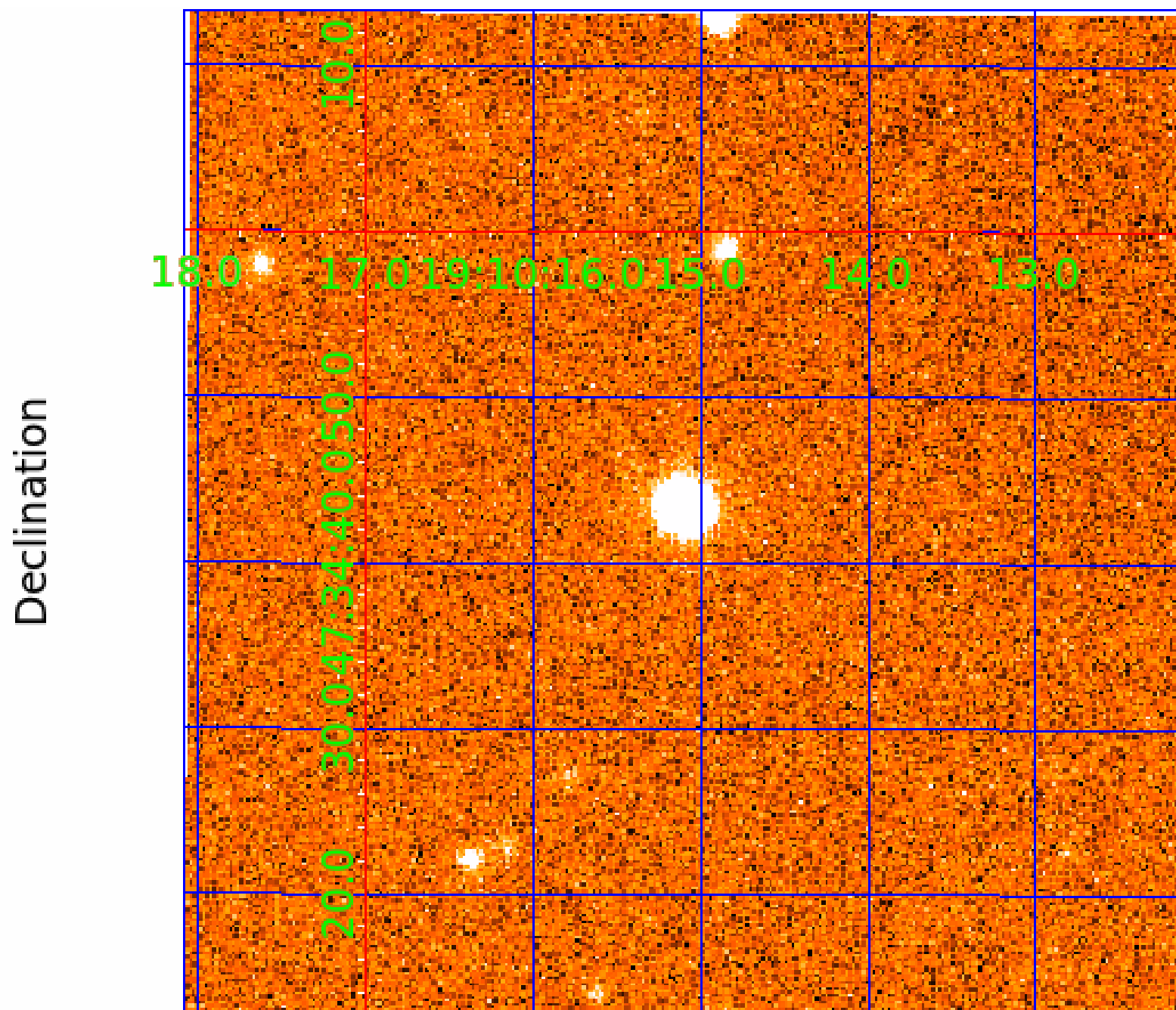




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image





## KIC 010395312

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010395312-01	OBS	No	0.734969	131.818451	68.7	5.235	7.8	10.6	0.36	3553	0.30	138.09
010395312-02	OBS	No	43.338219	160.884184	1756.7	2.650	18.5	11.9	0.36	3553	1.49	0.60
010395312-03	OBS	No	22.617913	145.928423	0.0	14.208	12.1	0.0	0.36	3553	0.01	1.43
010395312-04	OBS	No	21.830529	141.862680	332.5	2.263	13.1	2.6	0.36	3553	0.77	1.50
010395312-05	OBS	No	62.134882	184.242550	0.1	3.631	13.2	0.0	0.36	3553	0.01	0.37
010395312-07	OBS	No	29.856582	155.990807	2220.3	1.681	13.8	11.7	0.36	3553	1.71	0.99
010395312-08	OBS	No	39.700029	148.941743	1333.3	2.348	11.7	10.1	0.36	3553	1.50	0.68
010395312-09	OBS	No	26.497868	133.642244	3844.7	1.500	14.1	-1.0	0.36	3553	2.21	1.16
010395312-10	OBS	No	38.975665	141.685996	5375.8	1.500	19.0	-1.0	0.36	3553	2.62	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010395312-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010395312-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010395312-08	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
010395312-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
010395312-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

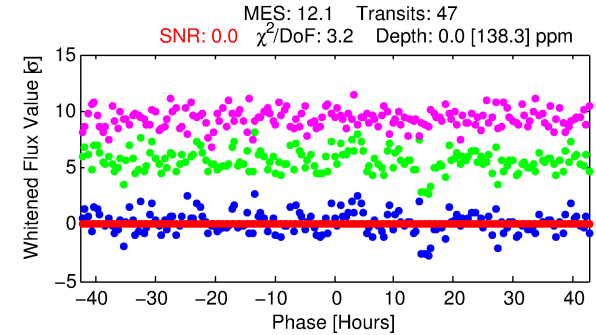
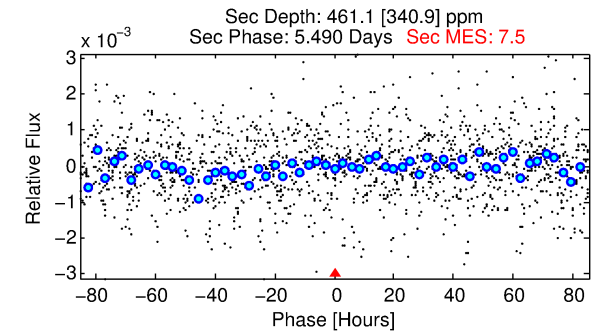
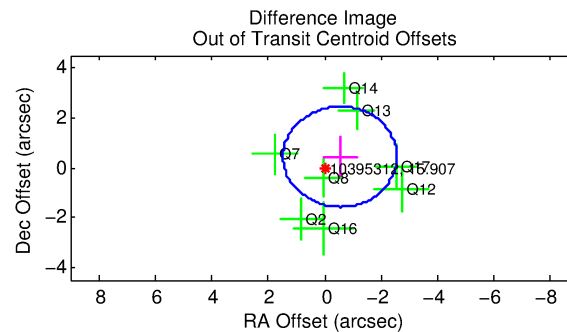
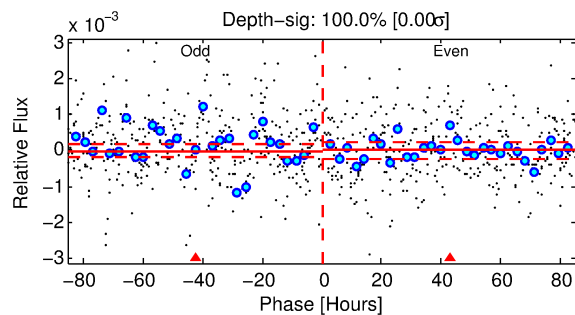
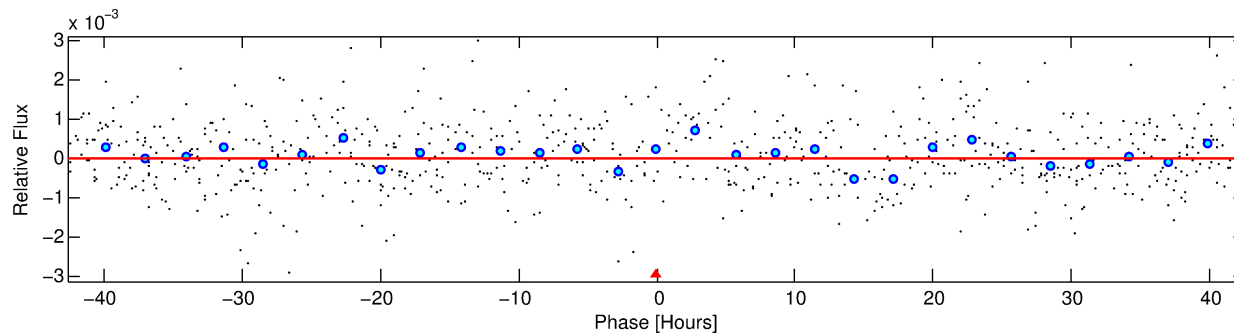
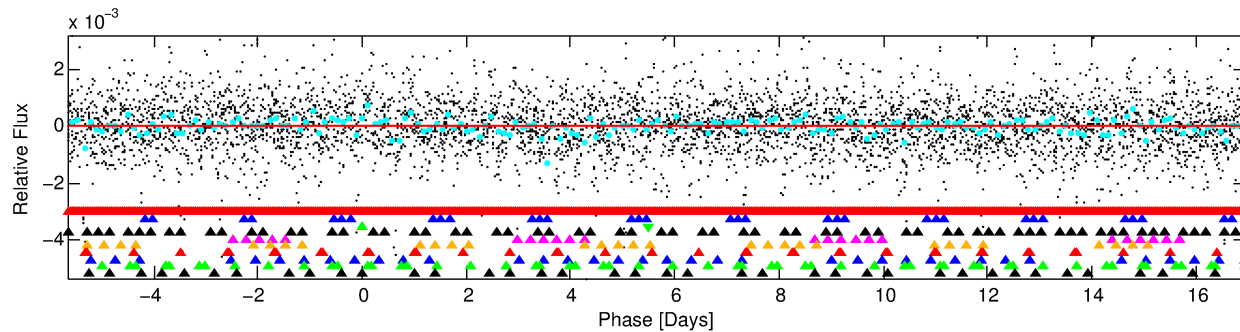
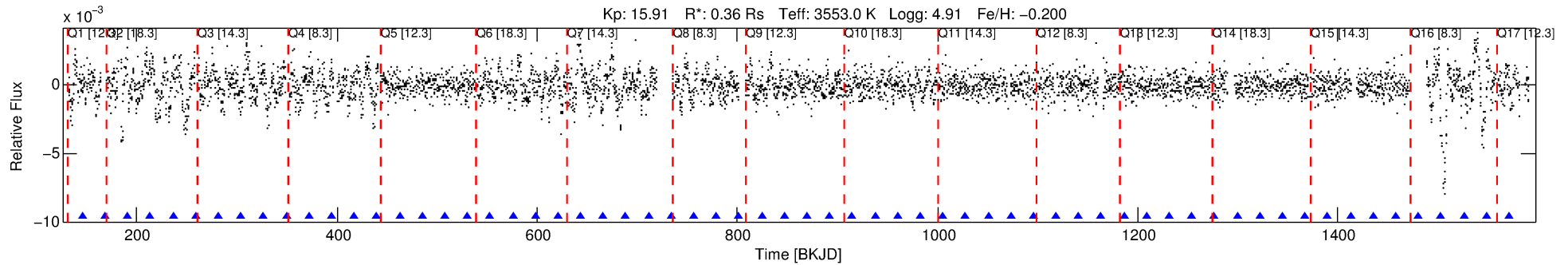
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010395312-03

No Significant Match Found

# DV One-Page Summary

KIC: 10395312 Candidate: 3 of 10 Period: 22.618 d



## DV Fit Results:

Period = 22.61791 [19.63251] d  
Epoch = 145.9284 [907.1432] BKJD  
Rp/R\* = 0.0002 [0.4009]  
a/R\* = 5.67 [10785.41]  
b = 0.89 [775.33]  
Seff = 1.43 [1.66]  
Teq = 279 [81] K  
Rp = 0.01 [15.66] Re  
a = 0.1130 [0.0660] AU  
Ag = 42795323.16 [153993171620.16] [10.00σ]  
Teffp = 34882 [31382380] K [0.00σ]

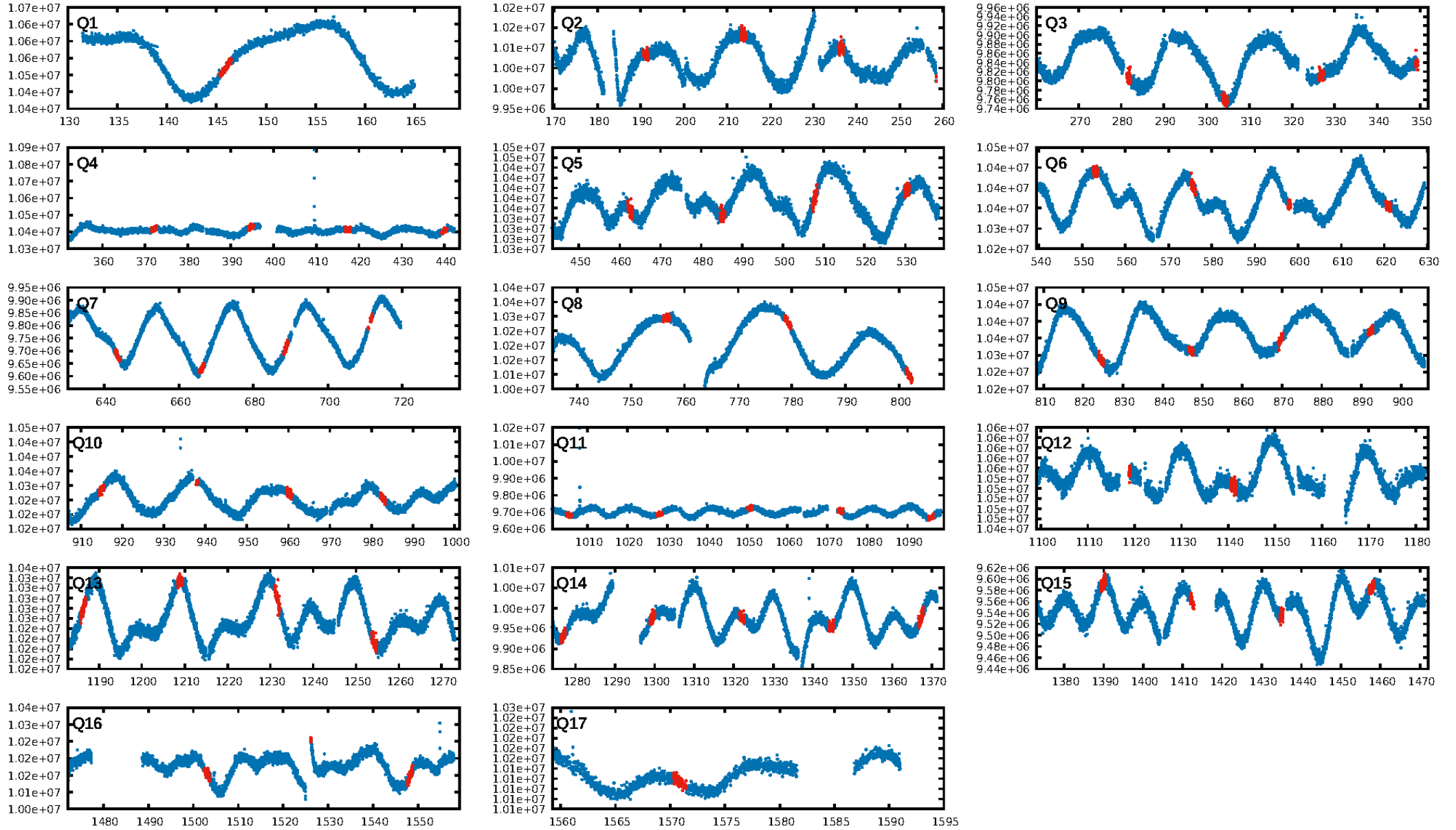
## DV Diagnostic Results:

ShortPeriod-sig: 81.1% [1.31σ]  
LongPeriod-sig: 100.0% [6.52σ]  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [46/46]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.696 arcsec [1.04σ]  
KicOffset-rm: 0.887 arcsec [1.22σ]  
OotOffset-st: 2/1/3/2 [8]  
KicOffset-st: 2/1/3/2 [8]  
DiffImageQuality-fgm: 0.12 [1/8]  
DiffImageOverlap-fno: 0.00 [0/17]

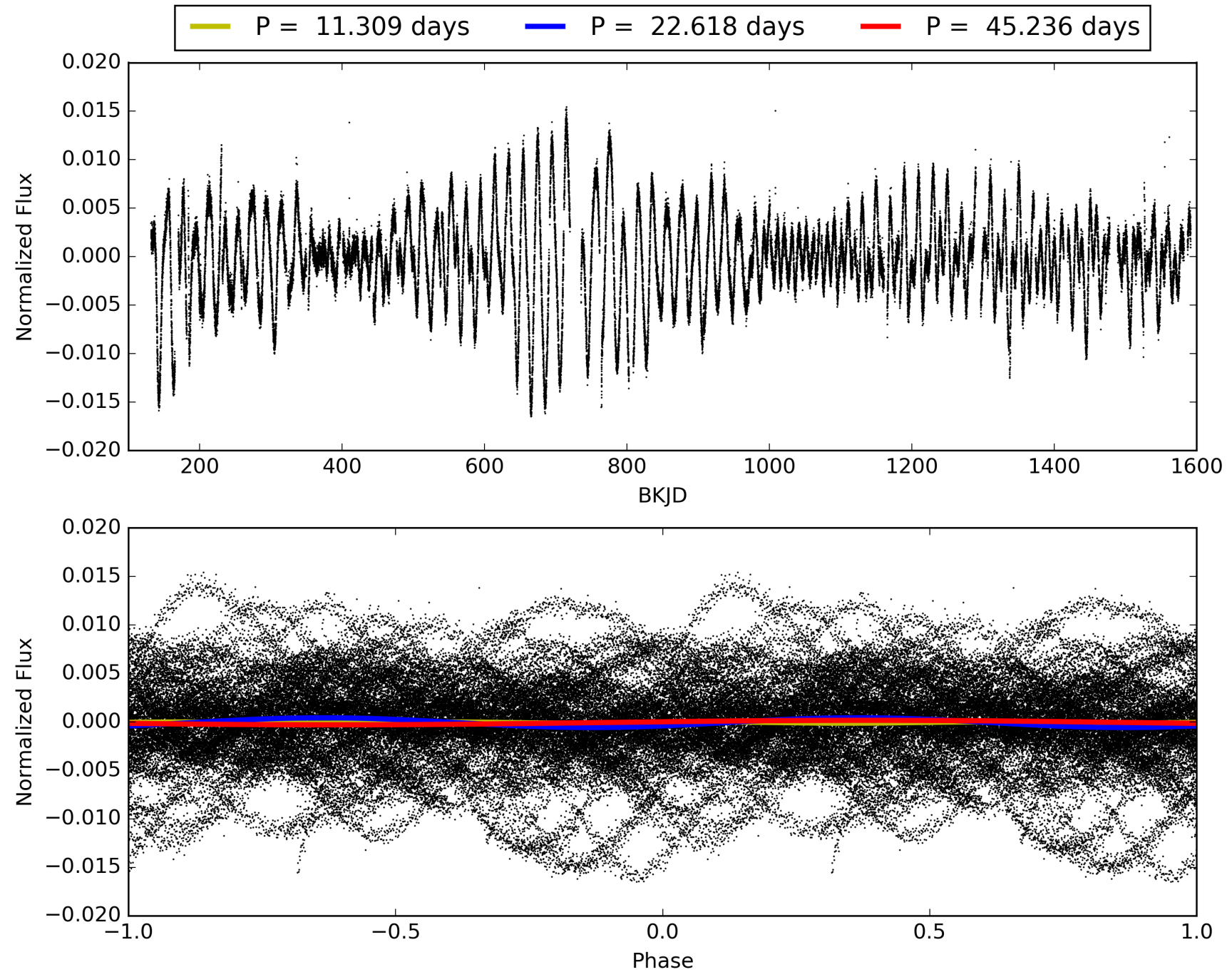
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:44:22 Z

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

# TCE 010395312-03, PDC Light Curves

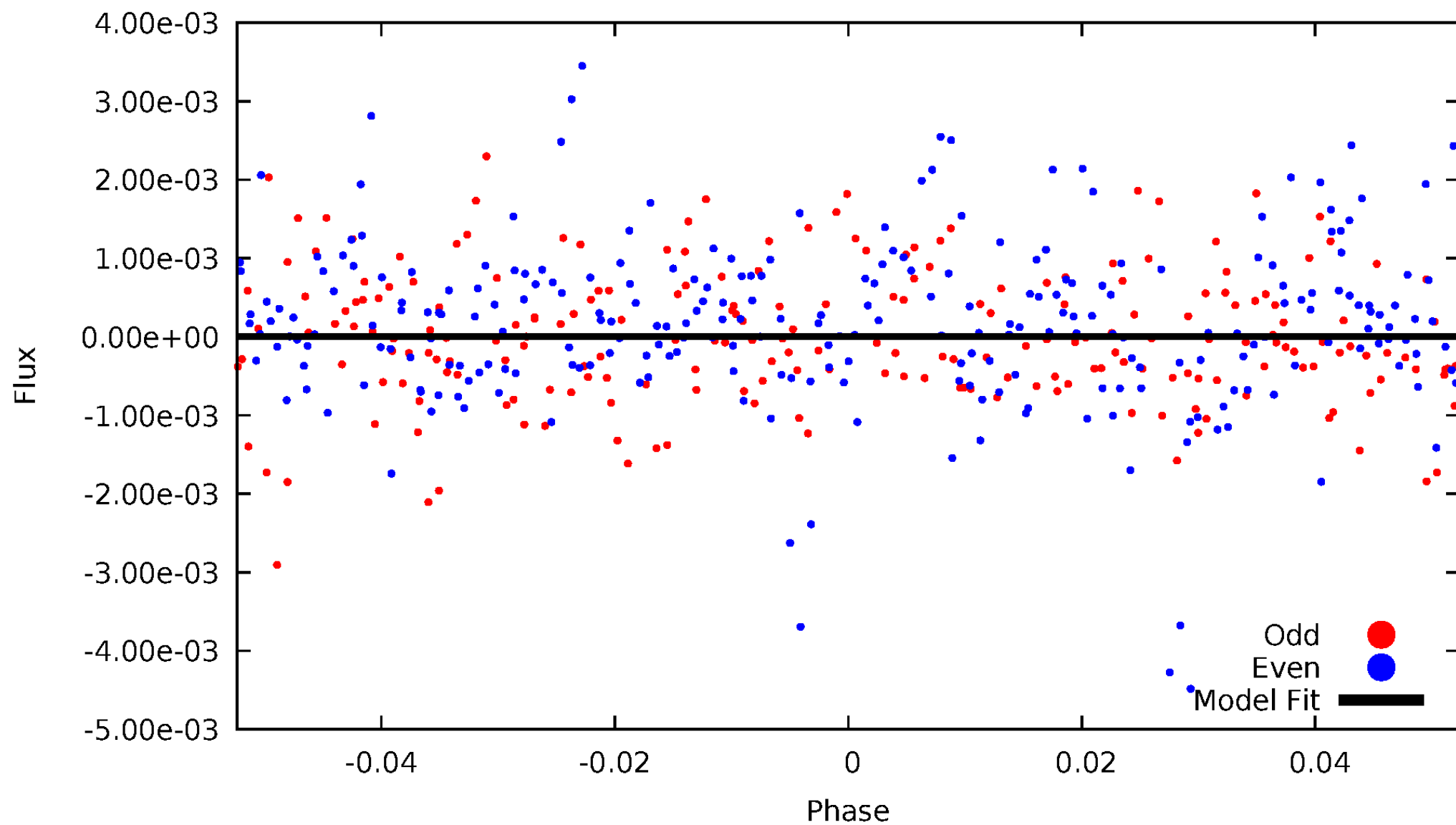


# TCE 010395312-03



# DV Odd/Even

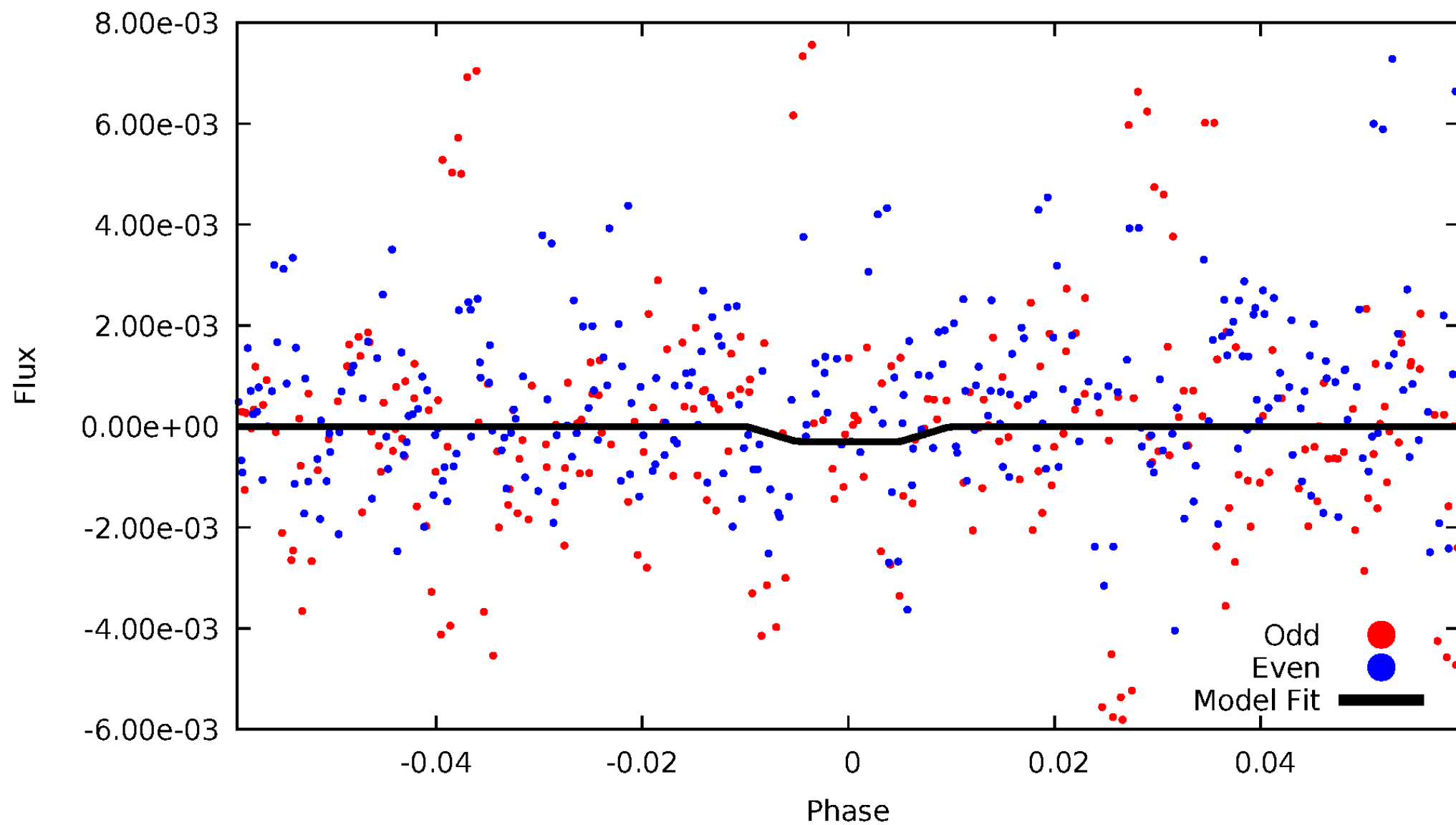
TCE 010395312-03



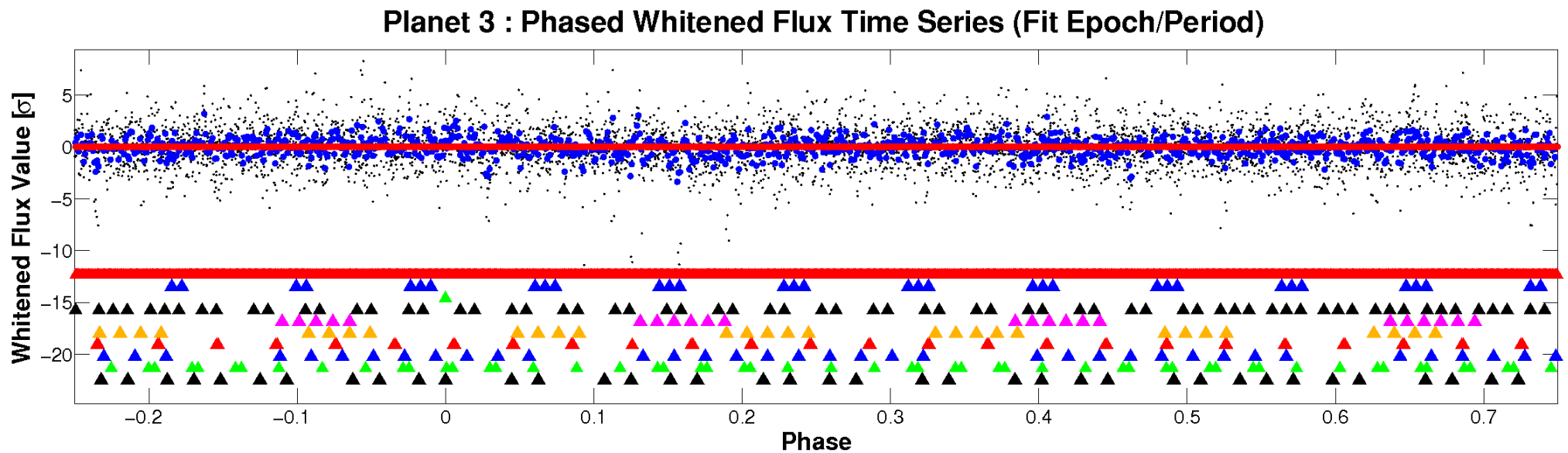
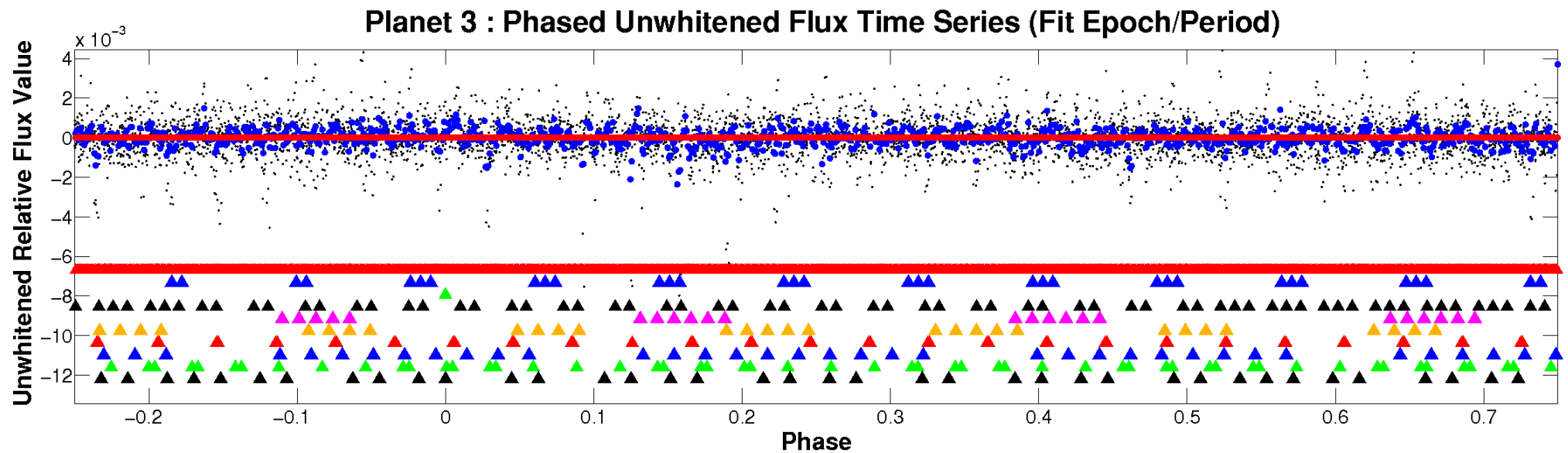


# ALT Odd/Even

TCE 010395312-03

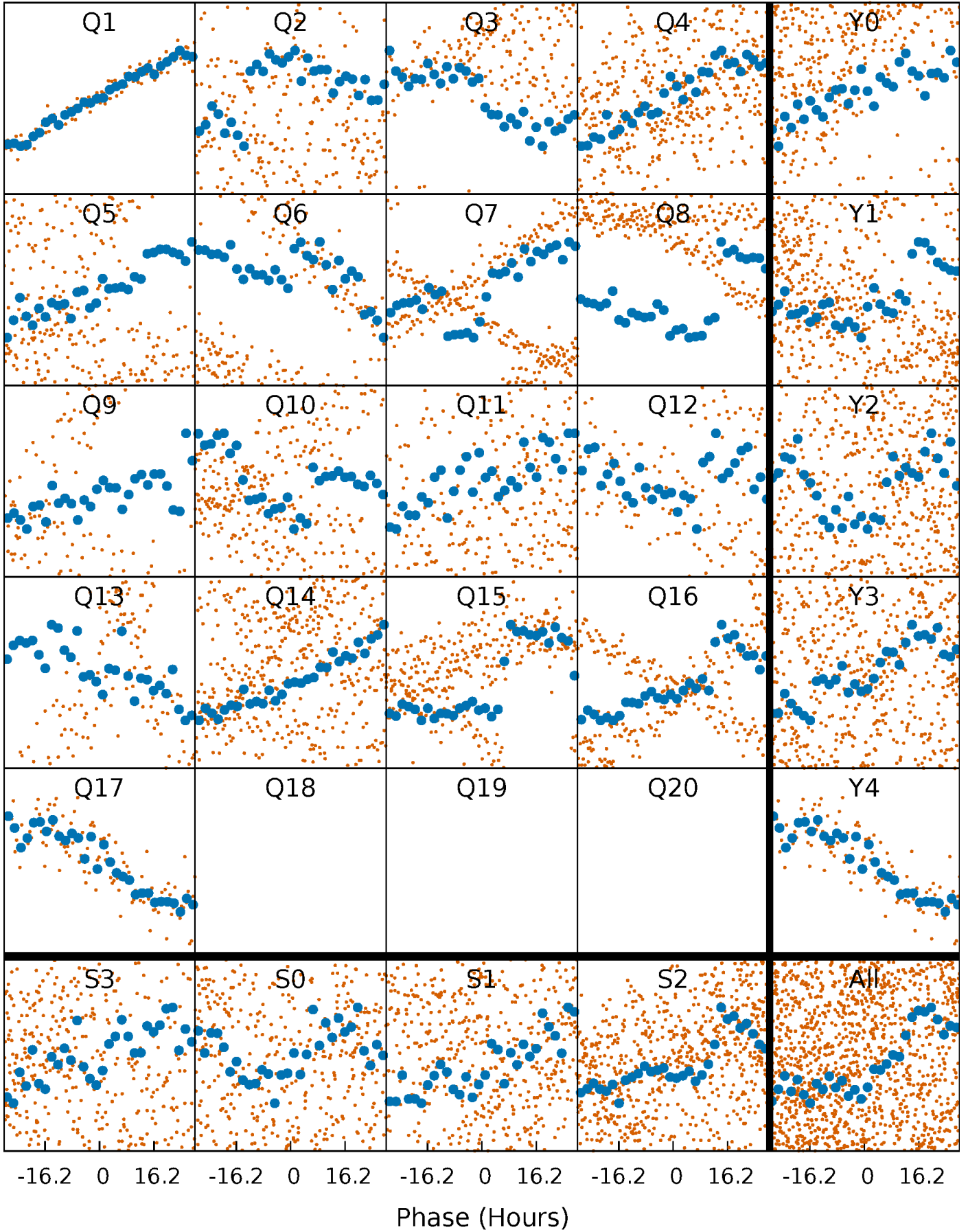


# Non-Whitened Vs. Whitened Light Curve



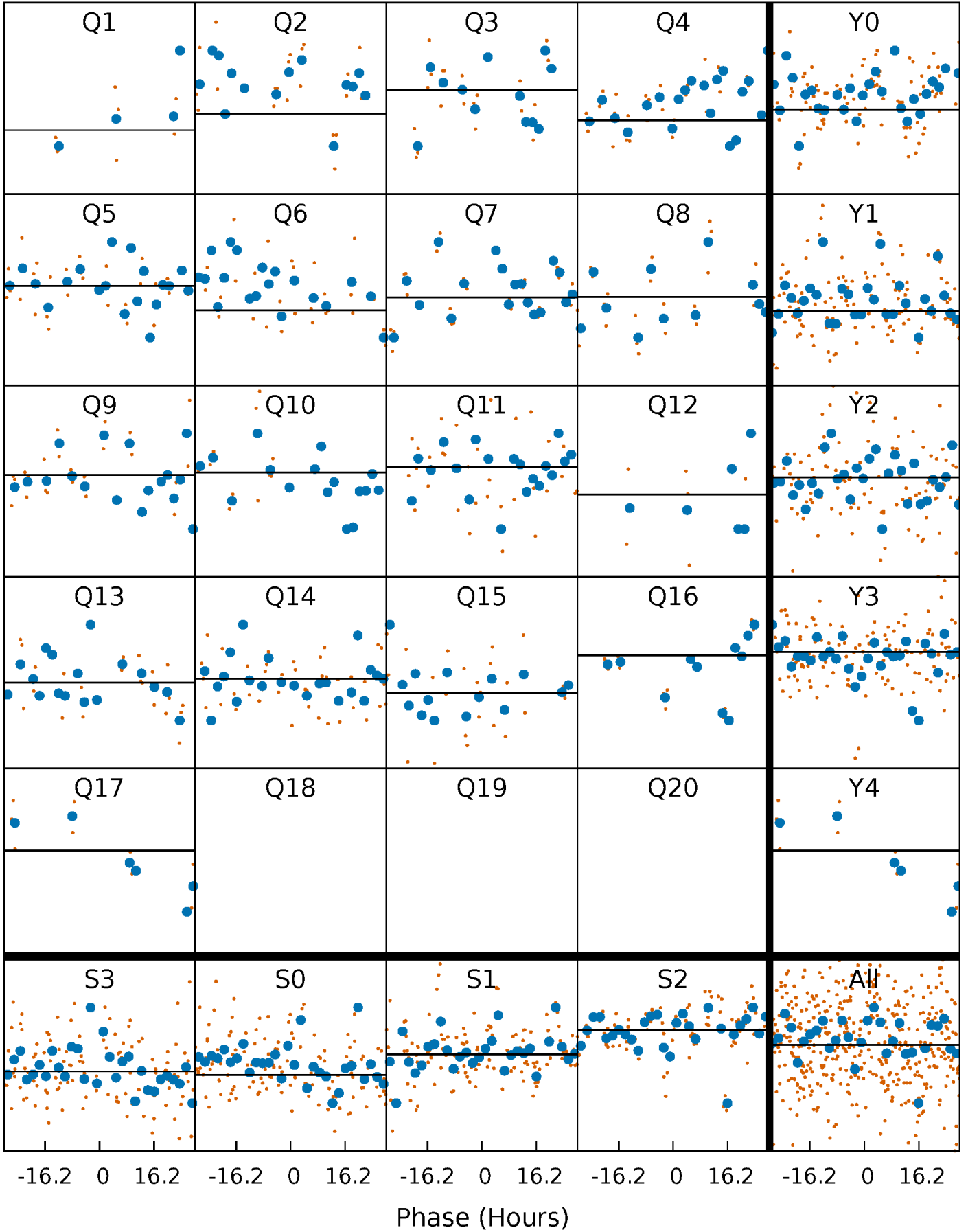
# PDC Quarter-Phased Transit Curves

TCE 010395312-03 P= 22.617913 Days  $T_0=145.928423$  (BKJD)



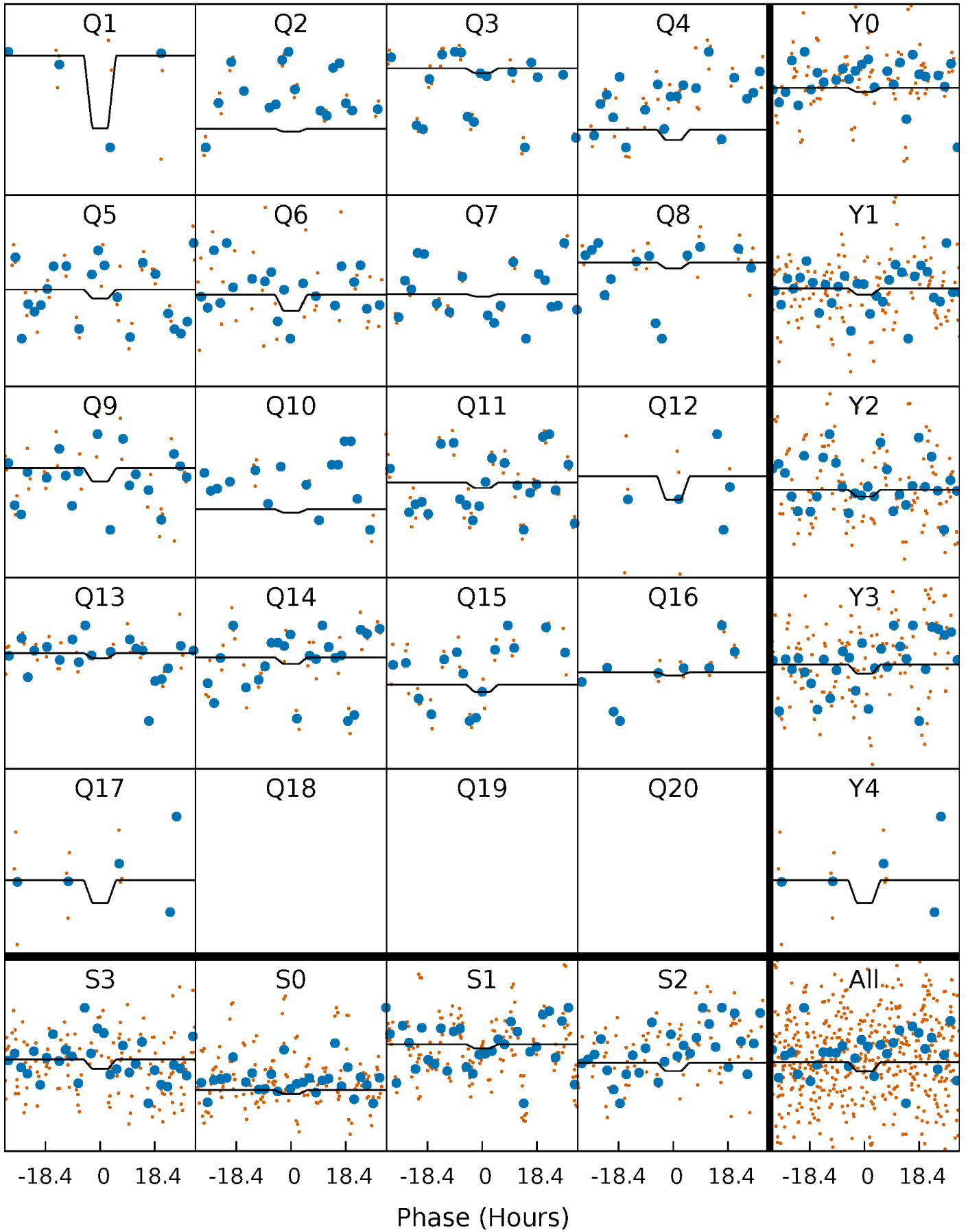
# DV Quarter-Phased Transit Curves

TCE 010395312-03   P= 22.617913 Days    $T_0=145.928423$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

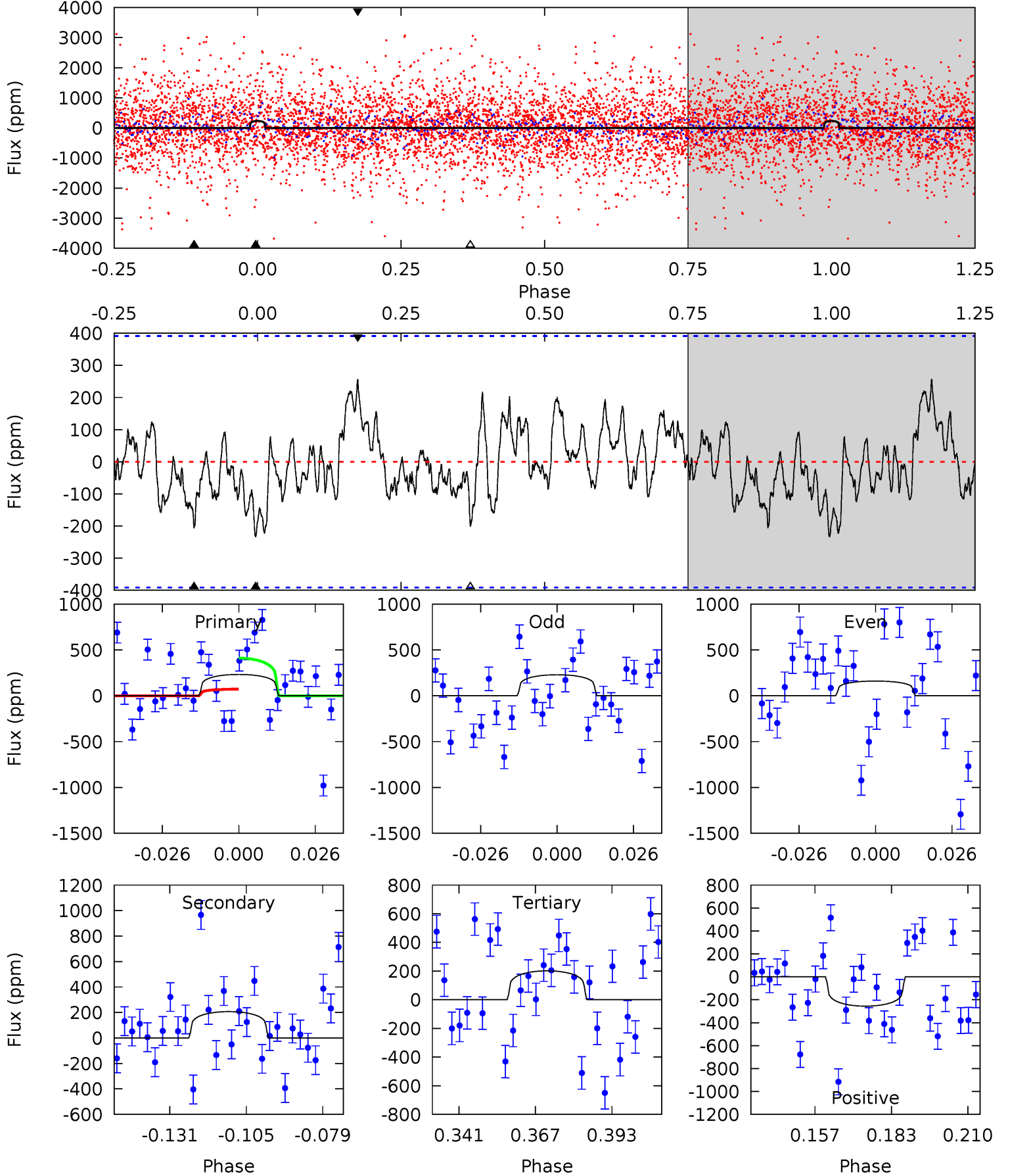
TCE 010395312-03 P= 22.618595 Days  $T_0=146.003655$  (BKJD)



# DV Model-Shift Uniqueness Test

010395312-03, P = 22.617913 Days, E = 123.310510 Days

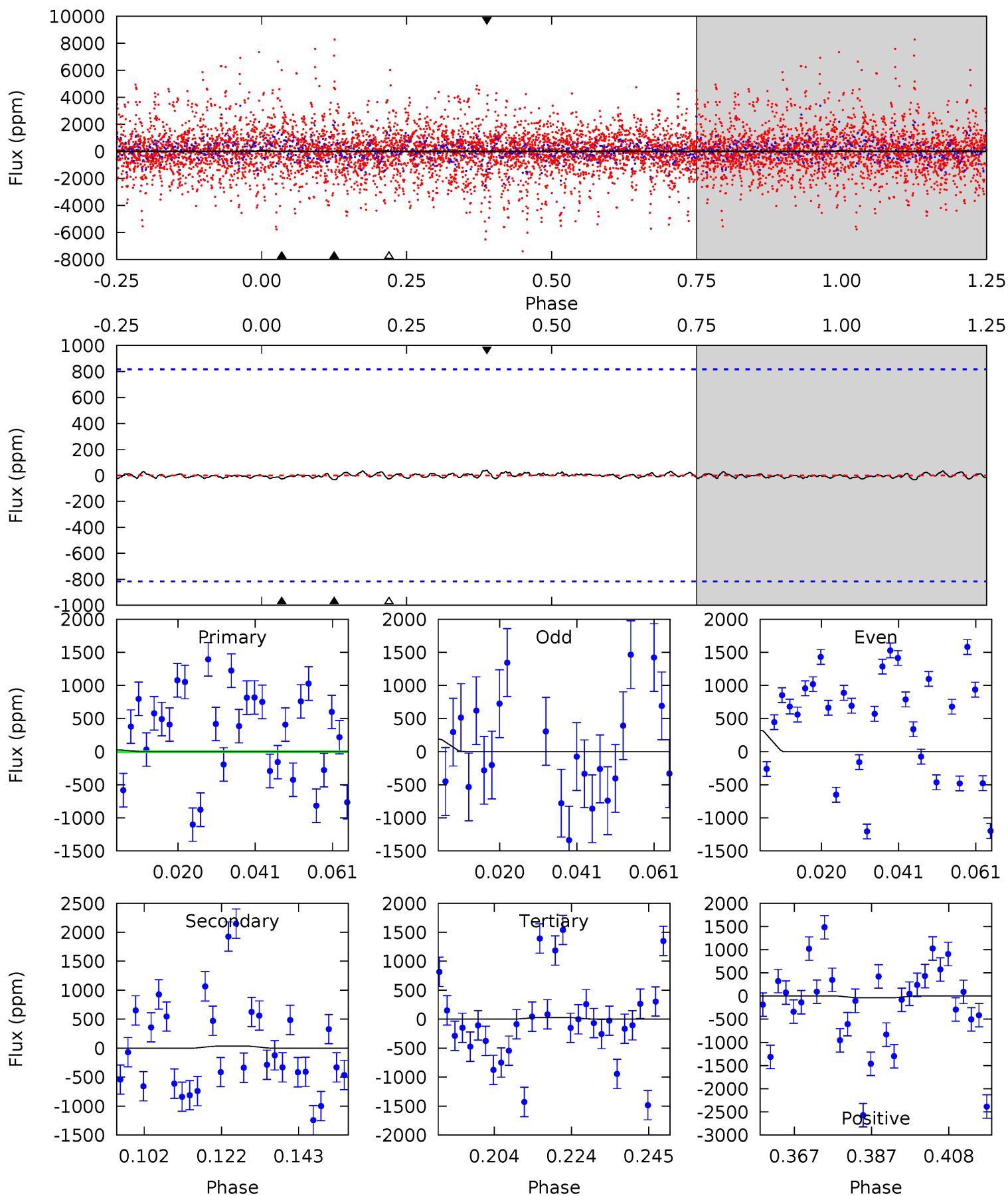
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.88	2.56	2.49	3.16	4.84	2.22	1.08	0.38	-0.29	0.06	-0.61	0.42	1.16	0.52	2.12



# Alt Model-Shift Uniqueness Test

010395312-03, P = 22.618595 Days, E = 123.385060 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.17	0.20	0.17	0.24	4.89	2.32	0.08	0.00	-0.07	0.04	-0.03	0.38	-1.00	0.54	0.21





### Stellar Parameters For KIC 010395312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3553^{+48}_{-53}$	$4.906^{+0.035}_{-0.042}$	$-0.200^{+0.100}_{-0.100}$	$0.358^{+0.036}_{-0.036}$	$0.379^{+0.034}_{-0.046}$	$11.630^{+2.353}_{-1.957}$
	+1%/-1%	+1%/-1%	+50%/-50%	+10%/-10%	+9%/-12%	+20%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010395312-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-207 \pm 81$	$10.39^{+11.96}_{-7.37}$	$378^{+144}_{-67}$	$1748^{+485}_{-264}$	$12^{+133}_{-10}$
Alt.	$-34 \pm 167$	$10.63^{+11.16}_{-7.42}$	$375^{+133}_{-66}$	$1326^{+507}_{-3128}$	$0.672^{+25.352}_{-16.367}$

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

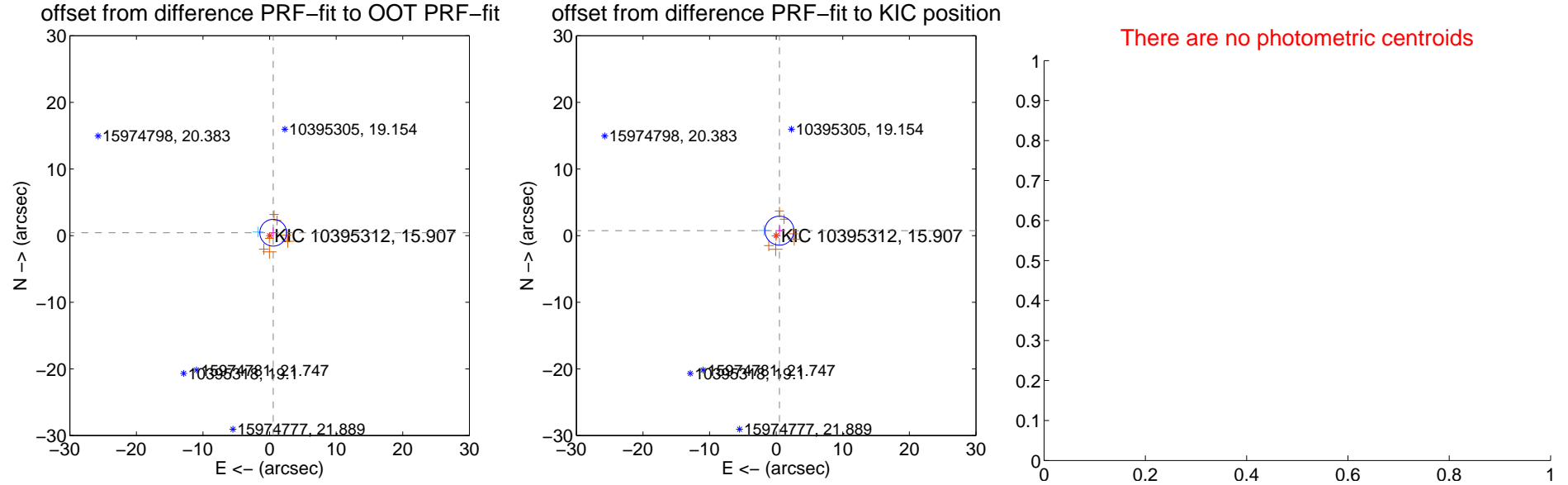
## DV Centroid Data

Supplemental centroid analysis for 010395312-03. Kepler magnitude: 15.91. Transit SNR 0.00

There are 1 quarters with good PRF difference image offsets

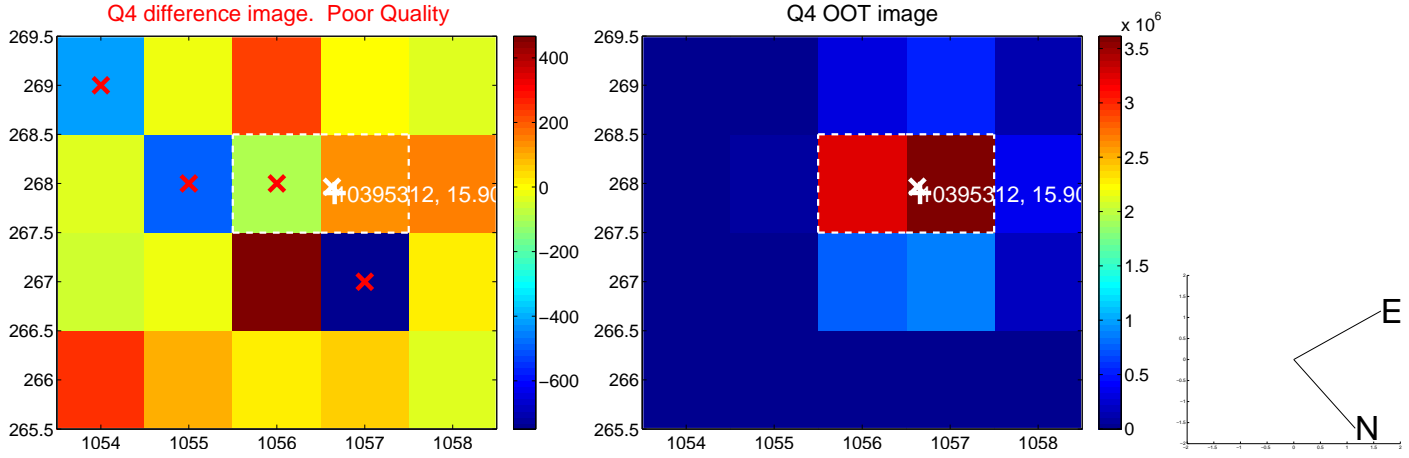
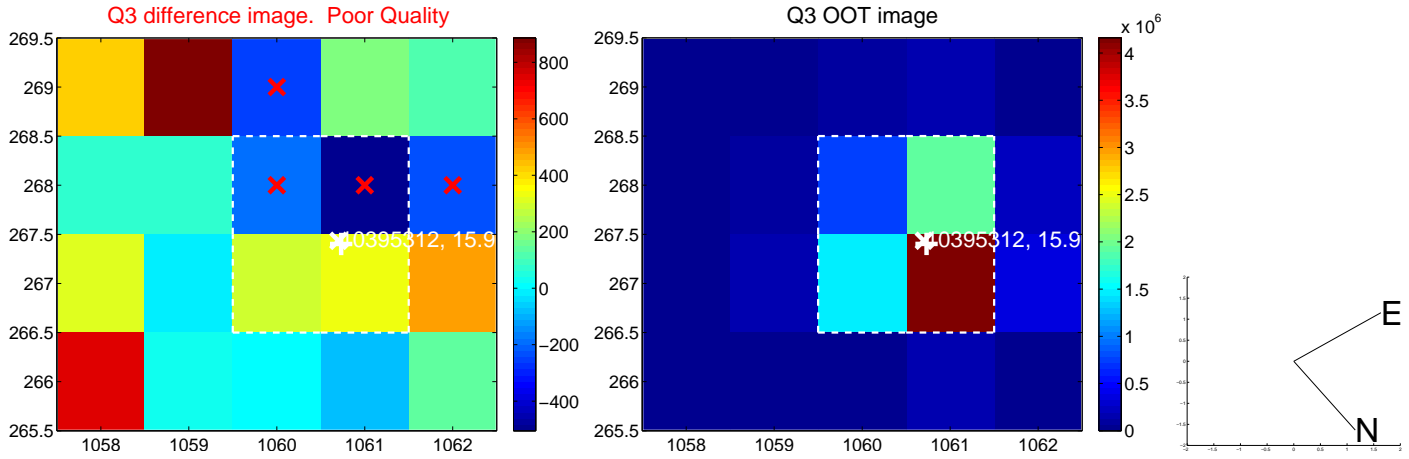
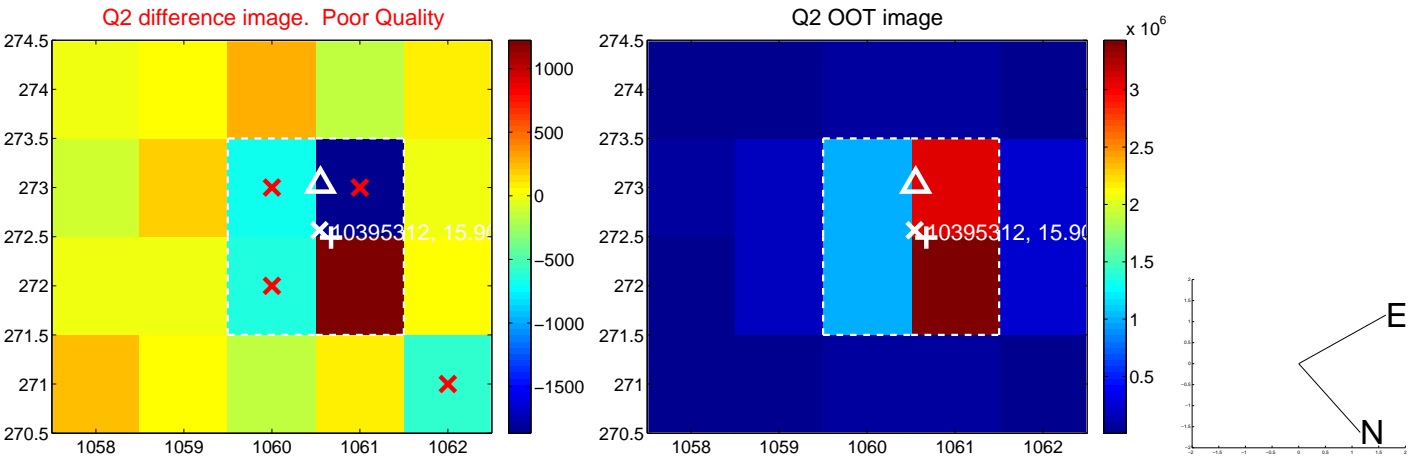
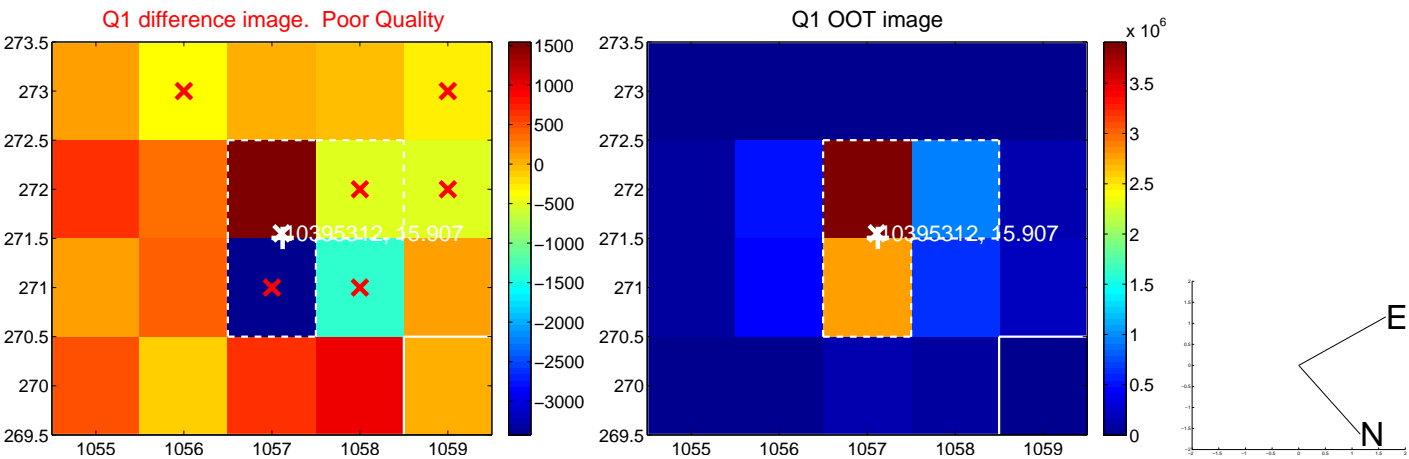
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.696 \pm 0.670$	1.04	$-0.543 \pm 0.586$	$0.436 \pm 0.784$
PRF-fit source offset from KIC position	$0.887 \pm 0.726$	1.22	$-0.487 \pm 0.598$	$0.741 \pm 0.775$
photometric centroid source offset	—	—	—	—

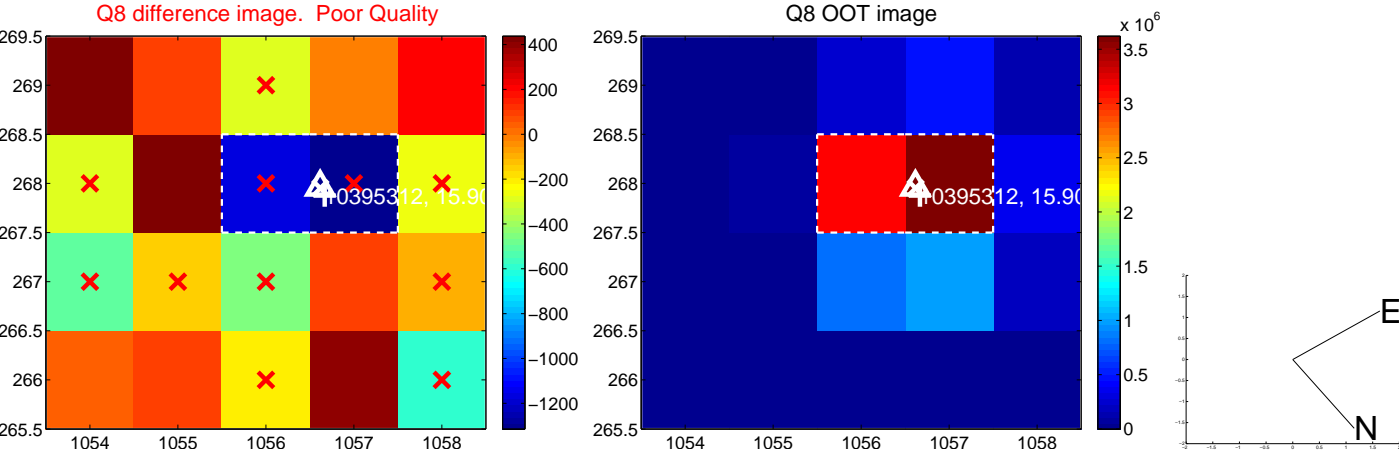
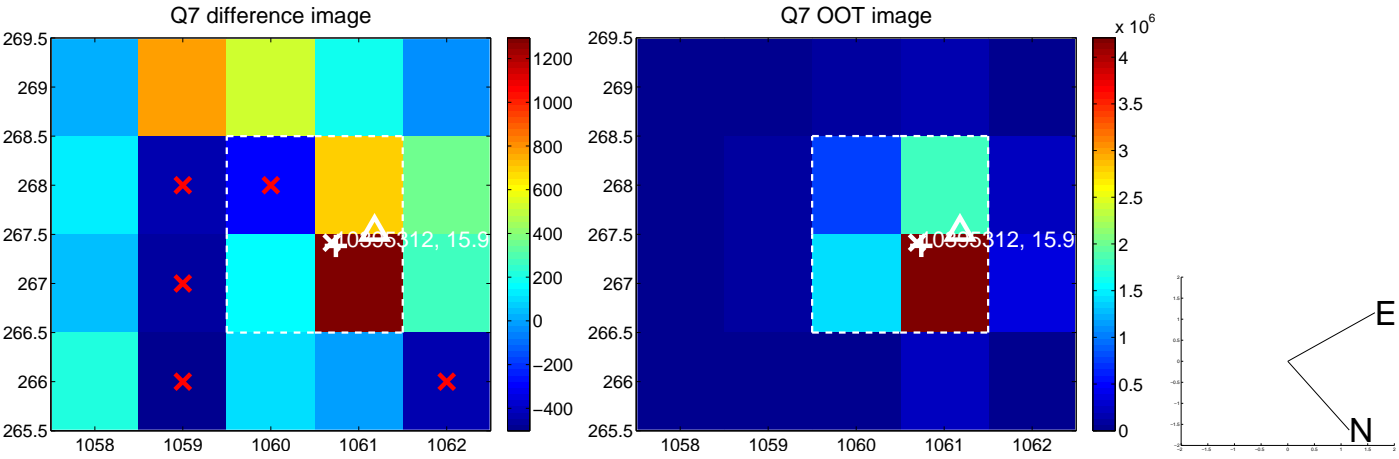
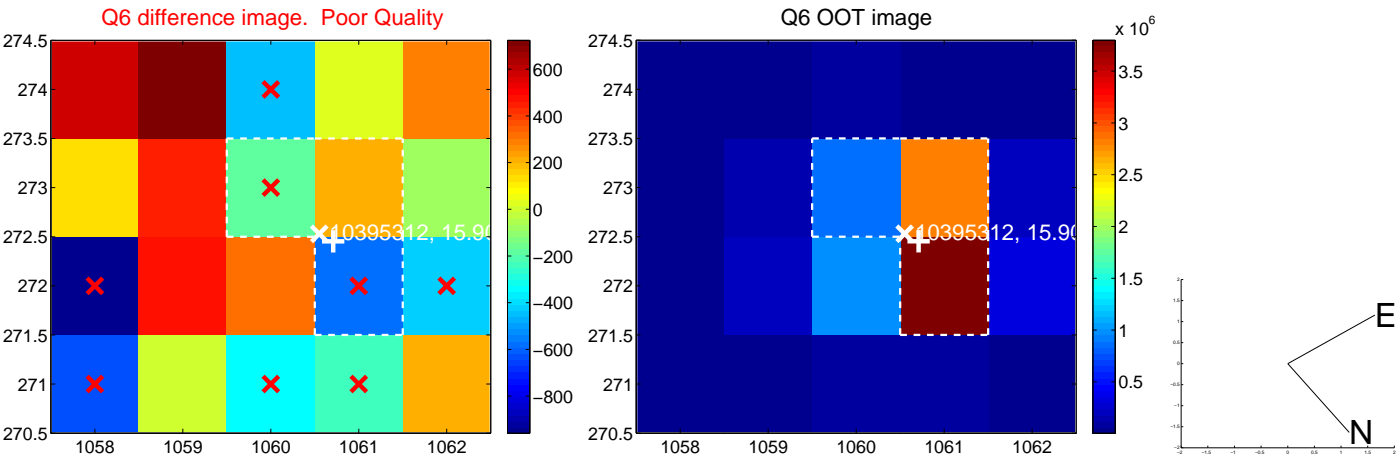
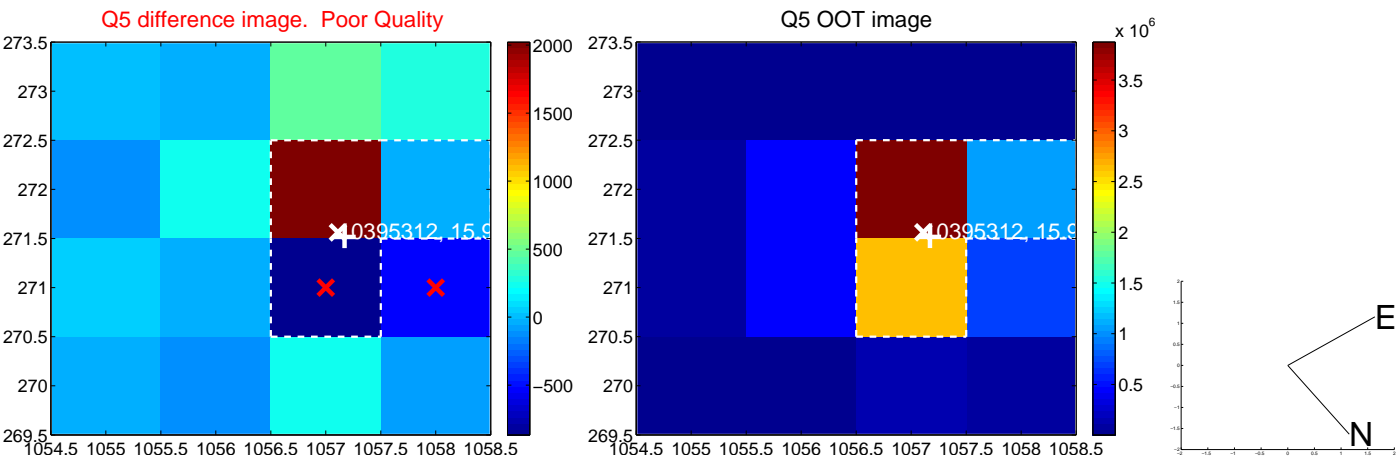


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

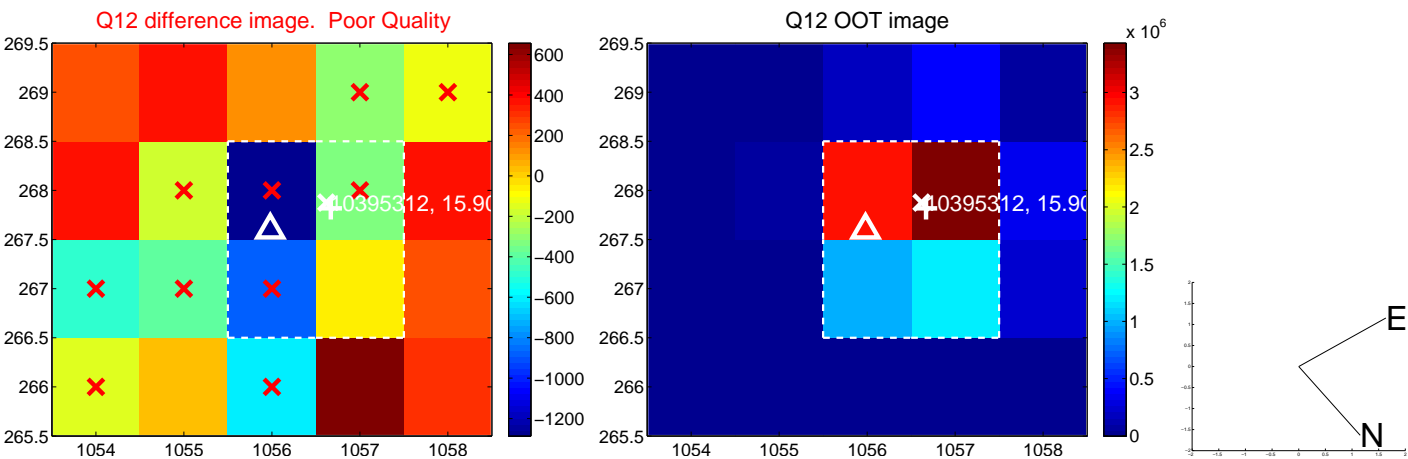
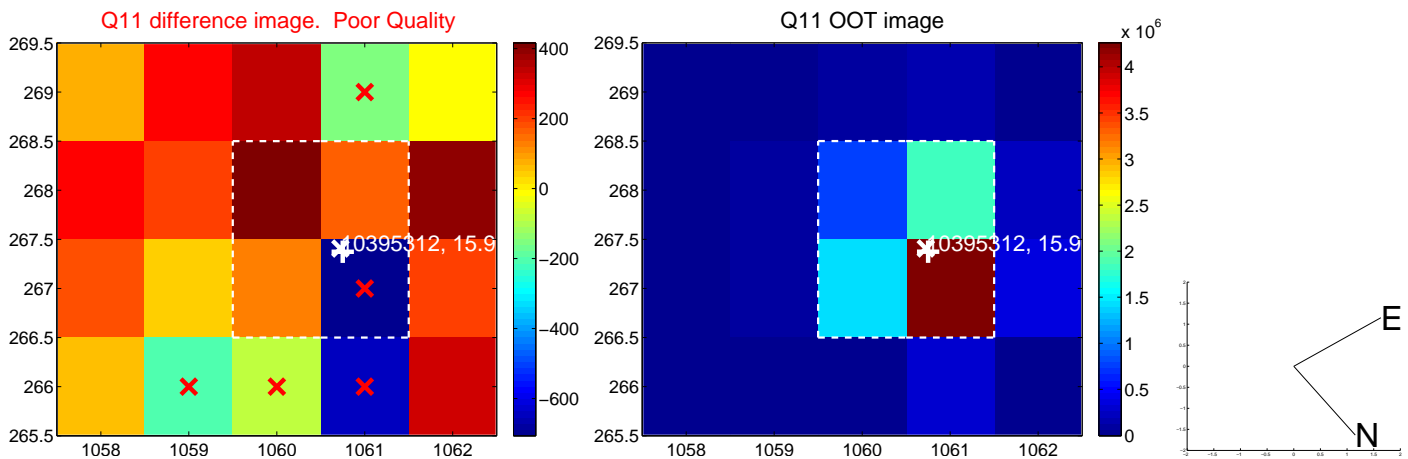
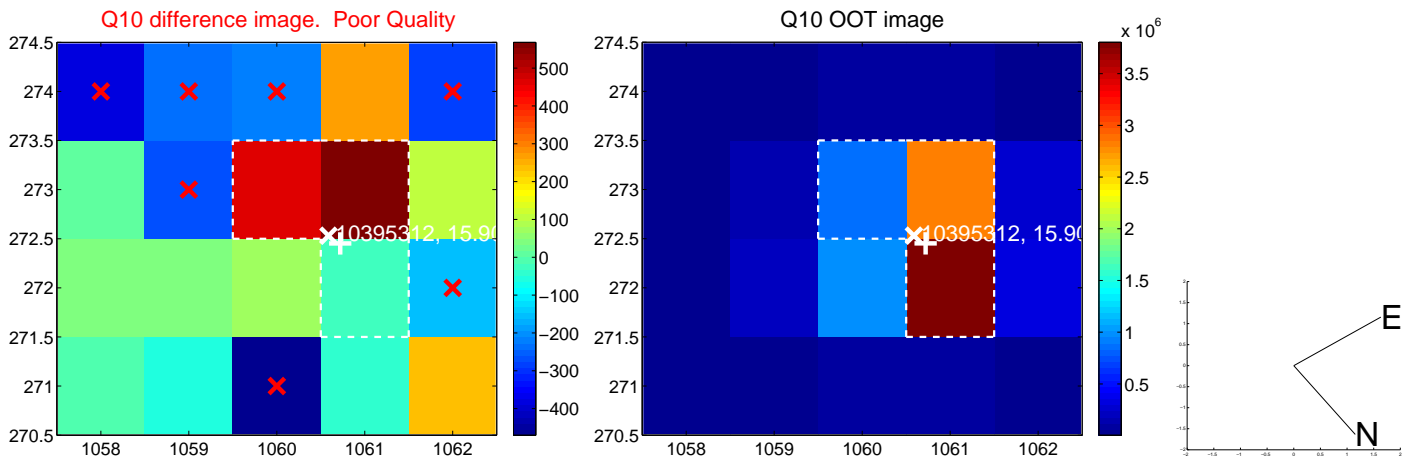
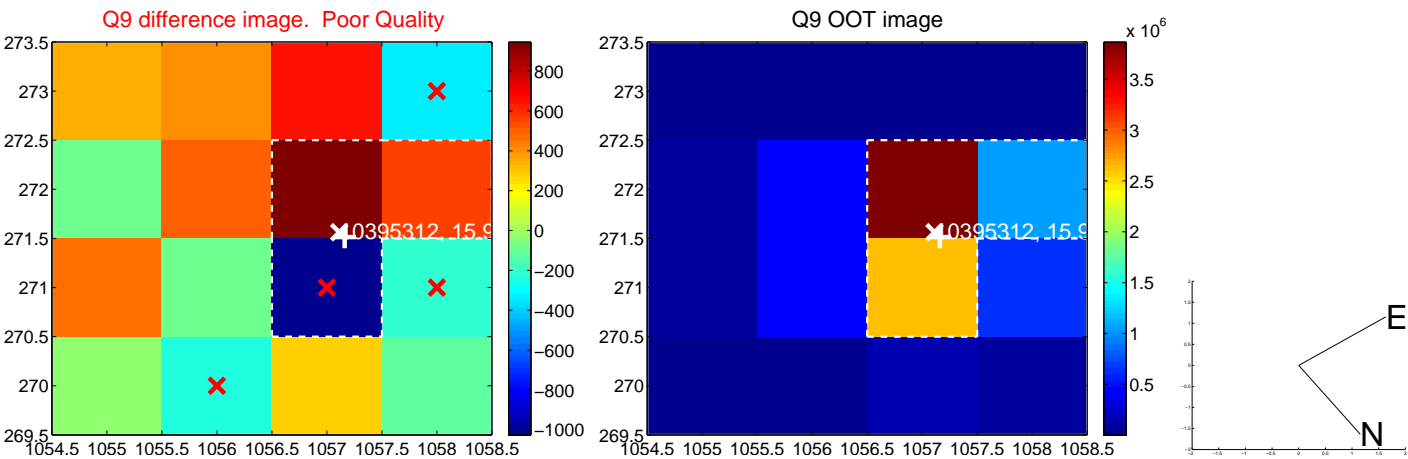
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



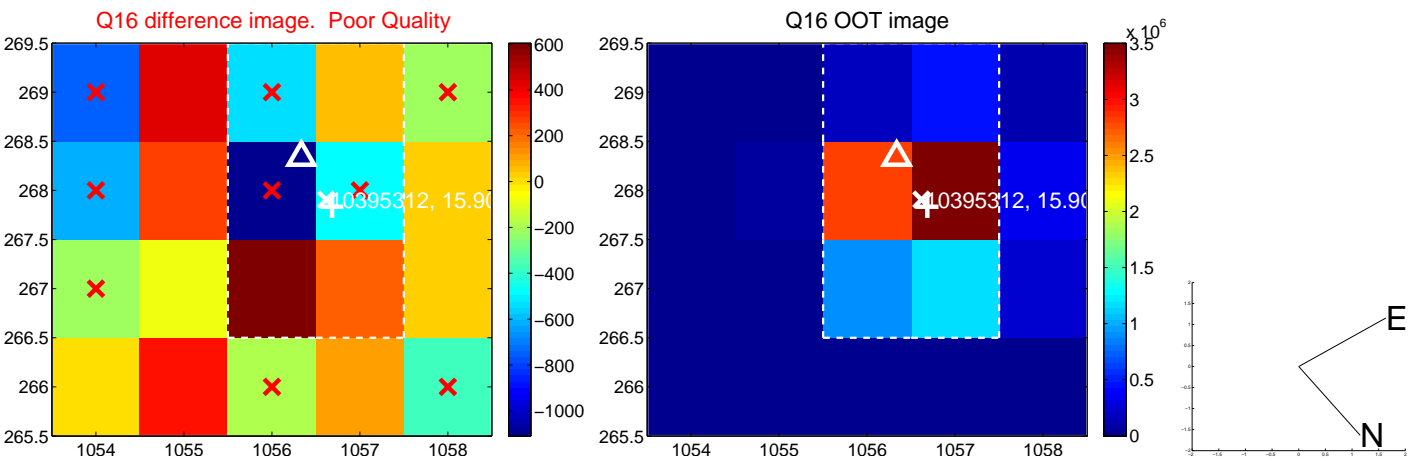
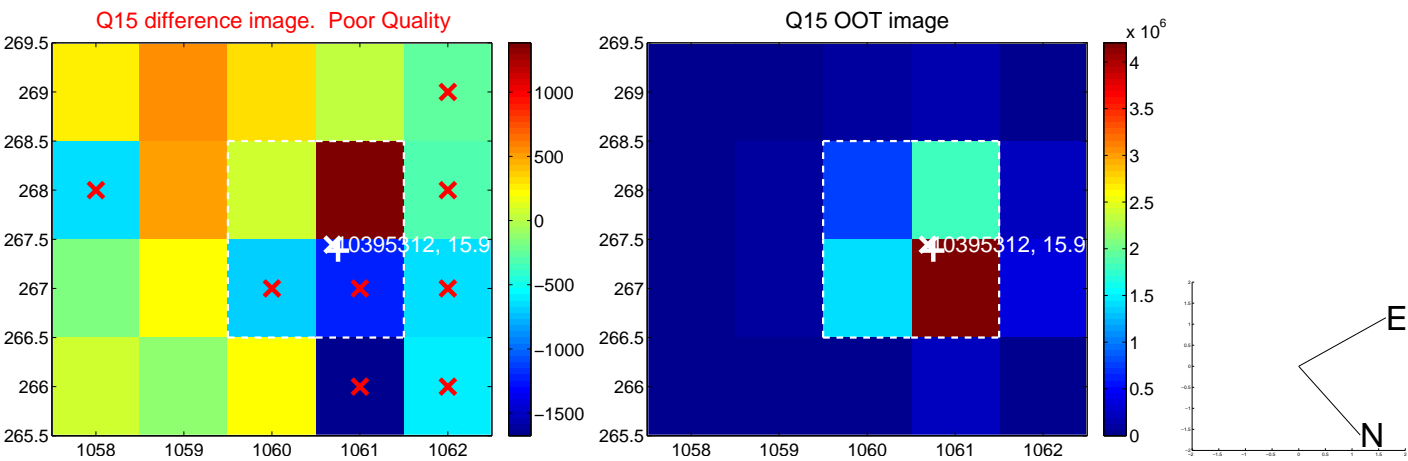
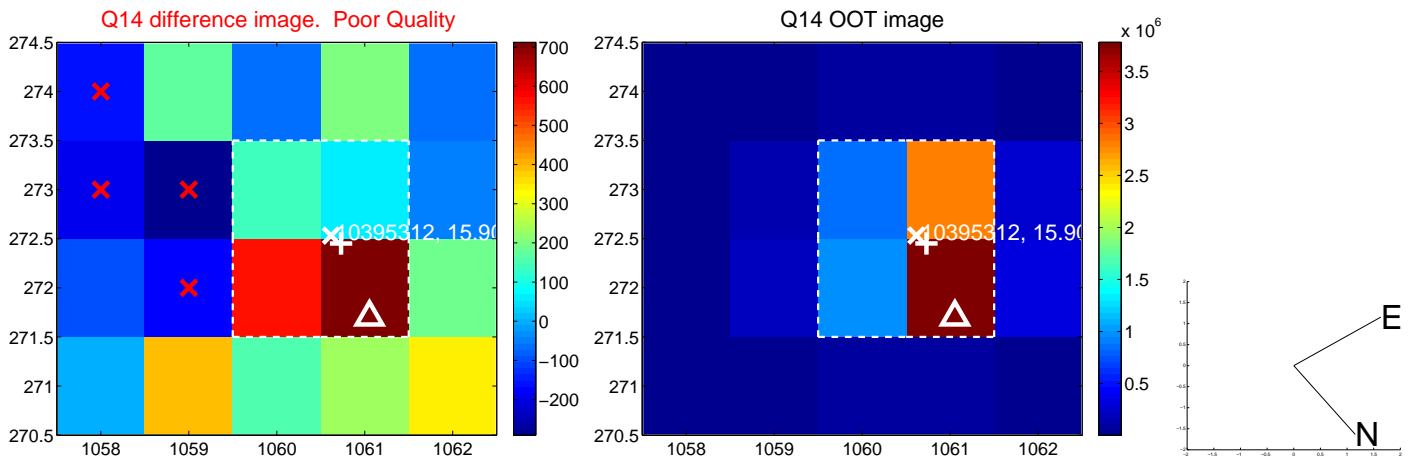
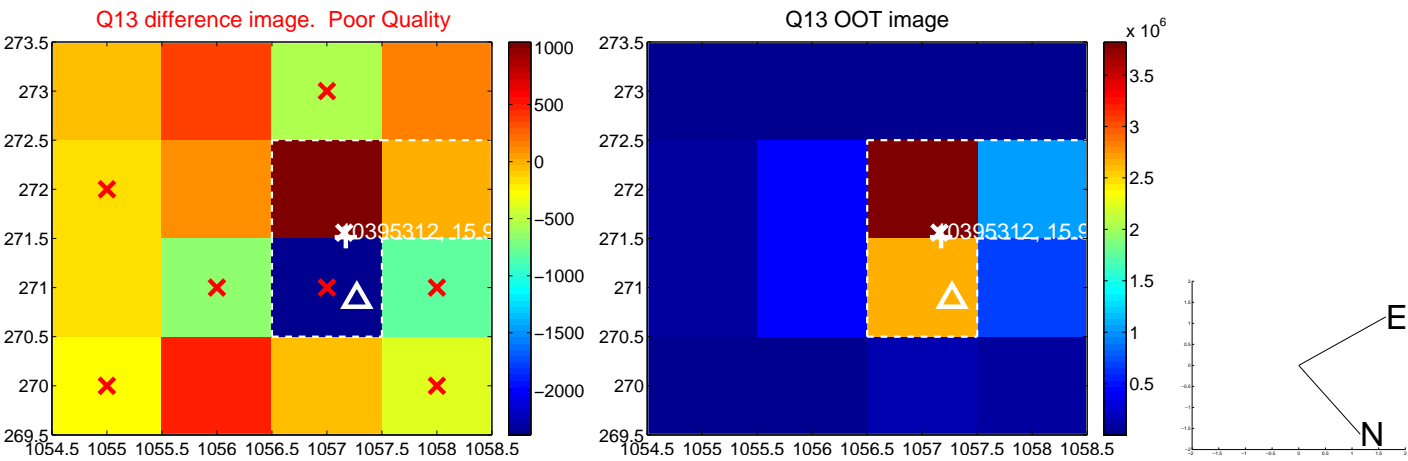
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



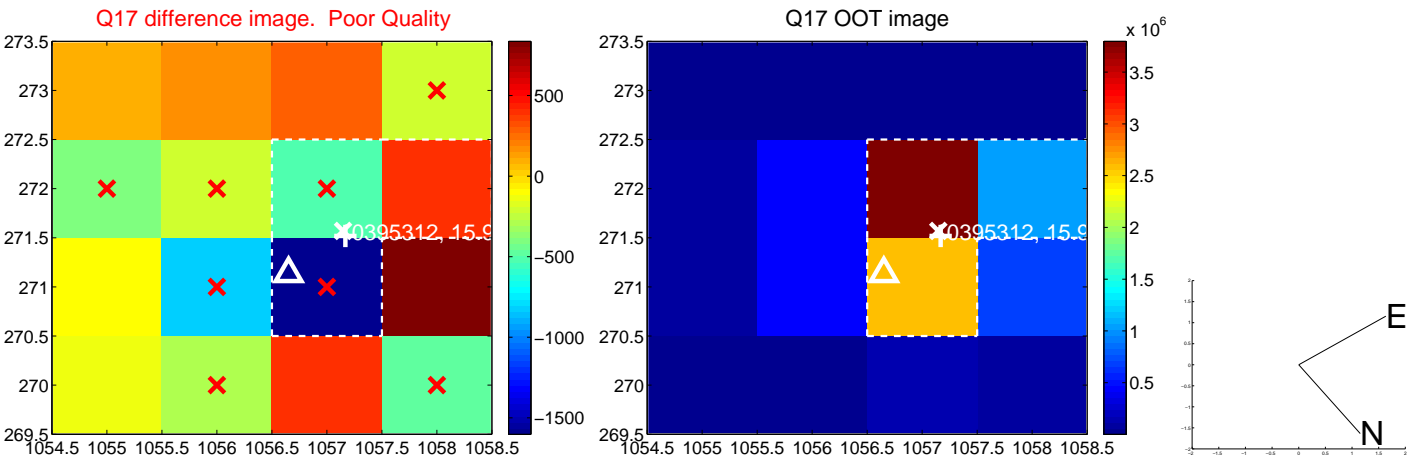
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



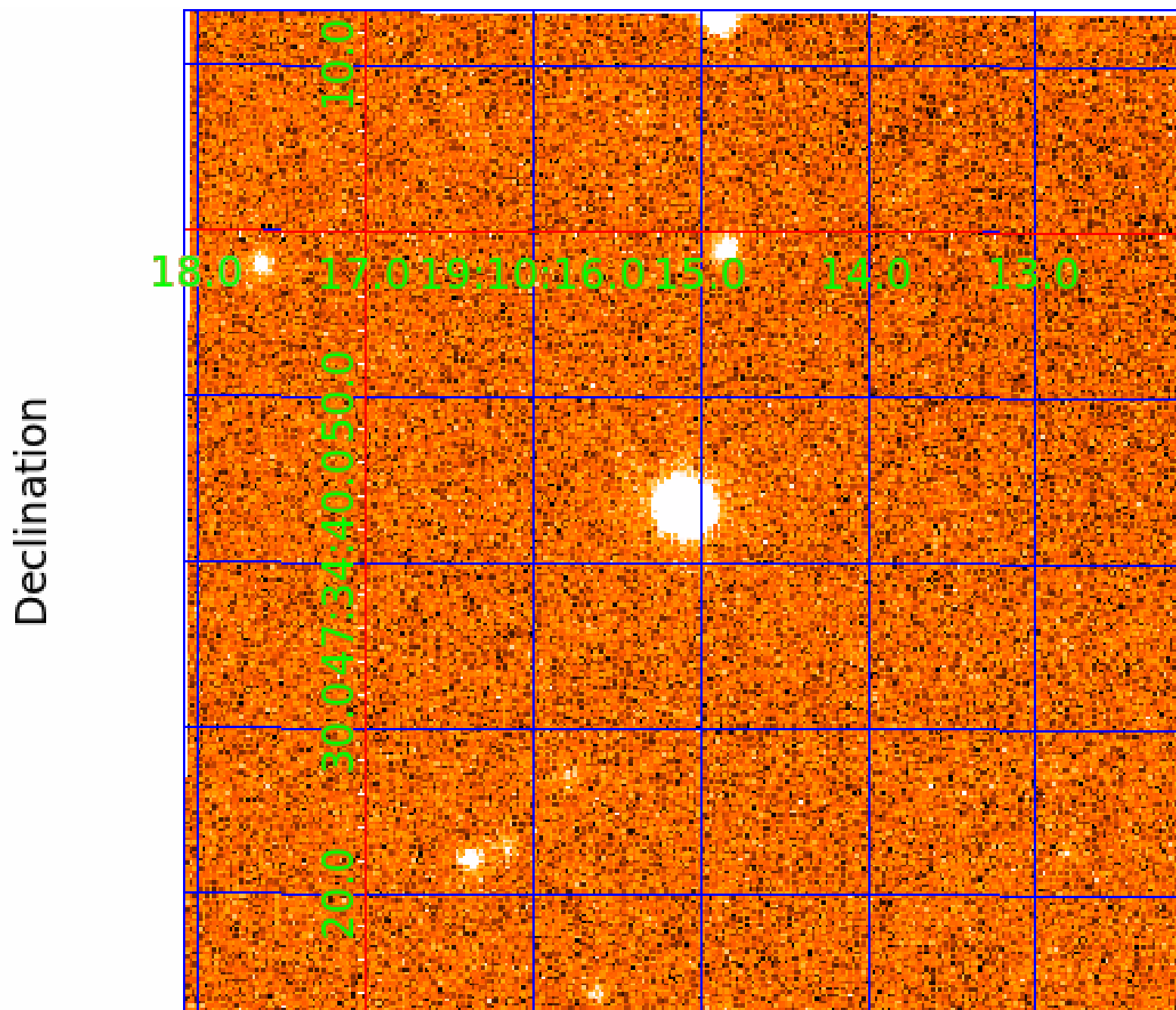
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.



UKIRT Image



## KIC 010395312

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010395312-01	OBS	No	0.734969	131.818451	68.7	5.235	7.8	10.6	0.36	3553	0.30	138.09
010395312-02	OBS	No	43.338219	160.884184	1756.7	2.650	18.5	11.9	0.36	3553	1.49	0.60
010395312-03	OBS	No	22.617913	145.928423	0.0	14.208	12.1	0.0	0.36	3553	0.01	1.43
010395312-04	OBS	No	21.830529	141.862680	332.5	2.263	13.1	2.6	0.36	3553	0.77	1.50
010395312-05	OBS	No	62.134882	184.242550	0.1	3.631	13.2	0.0	0.36	3553	0.01	0.37
010395312-07	OBS	No	29.856582	155.990807	2220.3	1.681	13.8	11.7	0.36	3553	1.71	0.99
010395312-08	OBS	No	39.700029	148.941743	1333.3	2.348	11.7	10.1	0.36	3553	1.50	0.68
010395312-09	OBS	No	26.497868	133.642244	3844.7	1.500	14.1	-1.0	0.36	3553	2.21	1.16
010395312-10	OBS	No	38.975665	141.685996	5375.8	1.500	19.0	-1.0	0.36	3553	2.62	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010395312-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010395312-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010395312-08	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
010395312-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
010395312-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

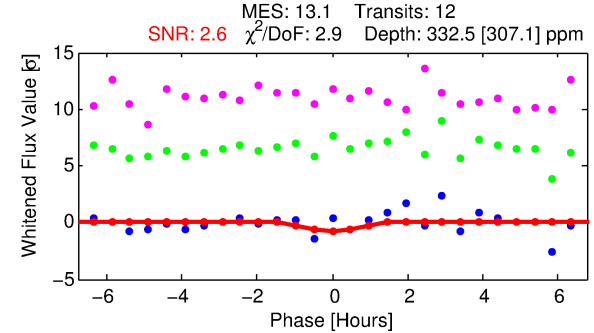
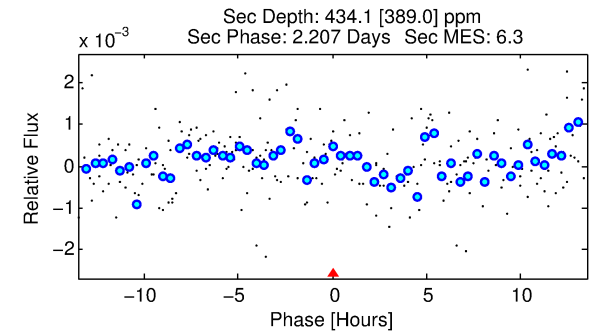
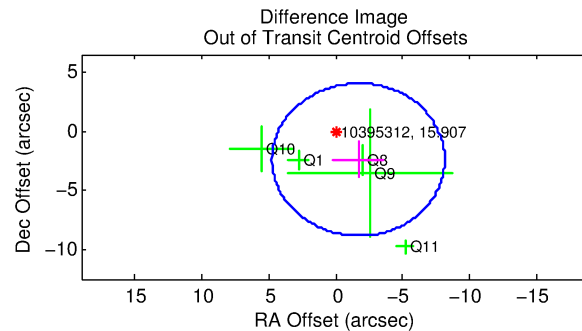
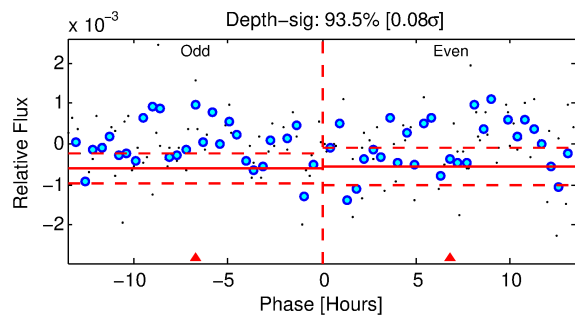
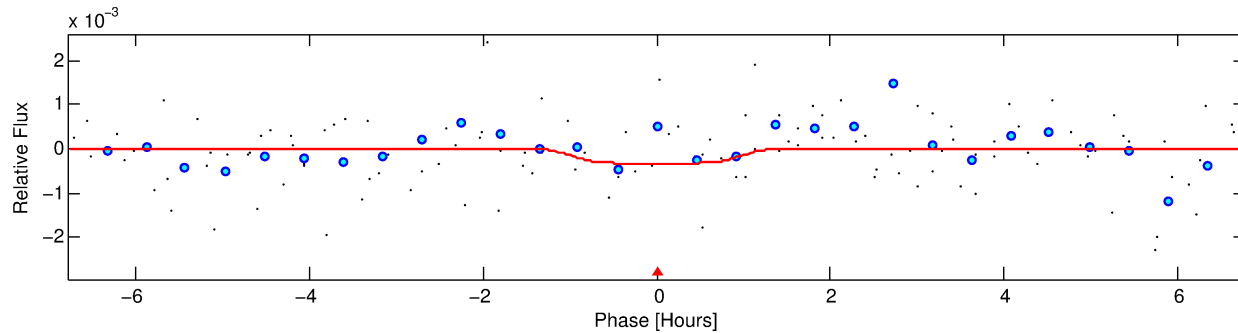
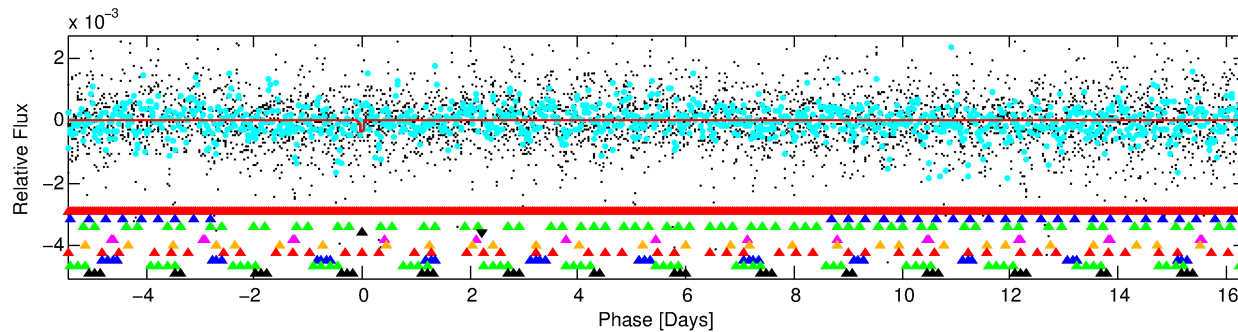
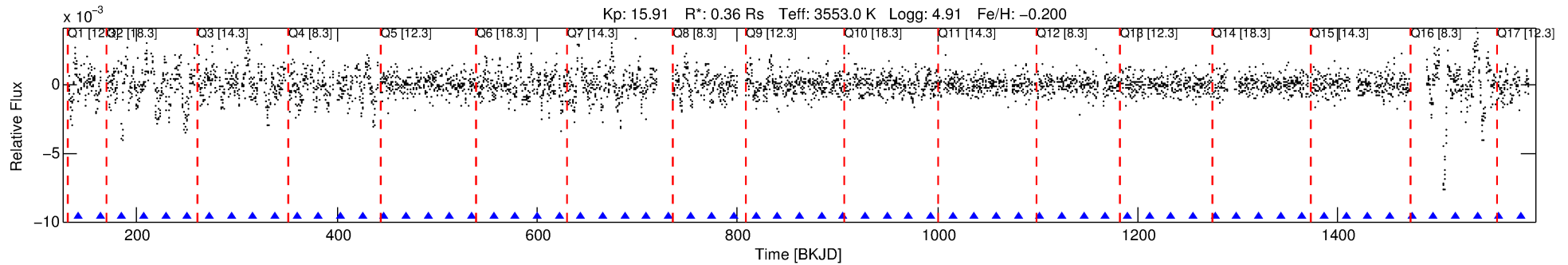
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010395312-04

No Significant Match Found

# DV One-Page Summary

KIC: 10395312 Candidate: 4 of 10 Period: 21.831 d



## DV Fit Results:

Period = 21.83053 [0.00107] d  
Epoch = 141.8627 [0.0406] BKJD  
Rp/R\* = 0.0198 [0.1092]  
a/R\* = 35.85 [897.86]  
b = 0.90 [5.54]  
Seff = 1.50 [0.17]  
Teq = 282 [8] K  
Rp = 0.77 [4.27] Re  
a = 0.1104 [0.0082] AU  
Ag = 4881.01 [54105.31] [0.09 $\sigma$ ]  
Teffp = 3648 [10108] K [0.33 $\sigma$ ]

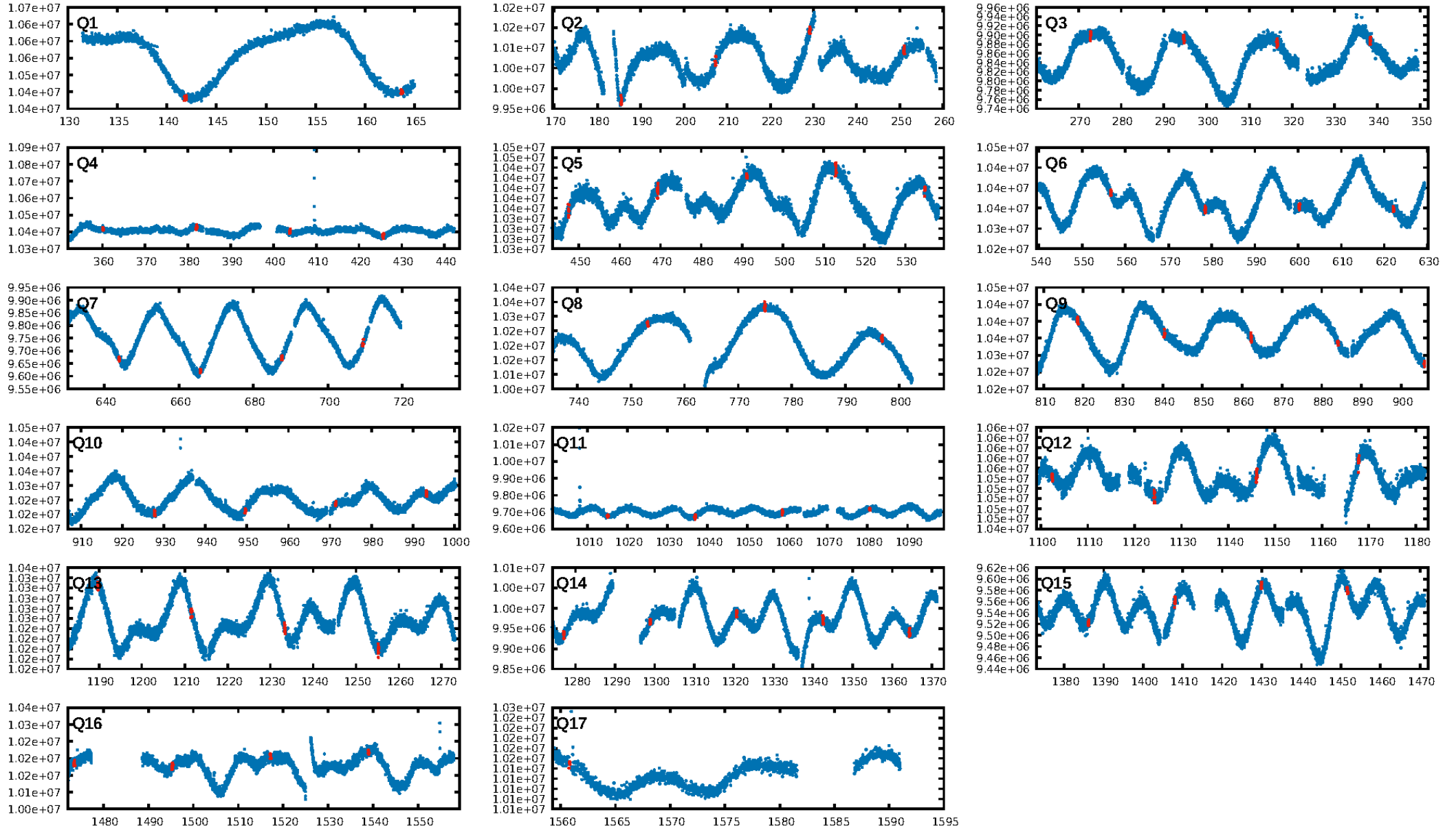
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [88.78 $\sigma$ ]  
LongPeriod-sig: 81.1% [1.31 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 96.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [12/12]  
GhostDiagnostic-chr: -0.4721  
Centroid-sig: 0.3%  
Centroid-so: 3.161 arcsec [1.71 $\sigma$ ]  
OotOffset-rm: 2.943 arcsec [1.37 $\sigma$ ]  
KicOffset-rm: 2.735 arcsec [1.26 $\sigma$ ]  
OotOffset-st: 1/1/1/2 [5]  
KicOffset-st: 1/1/1/2 [5]  
DiffImageQuality-fgm: 0.00 [0/5]  
DiffImageOverlap-fno: 0.00 [0/16]

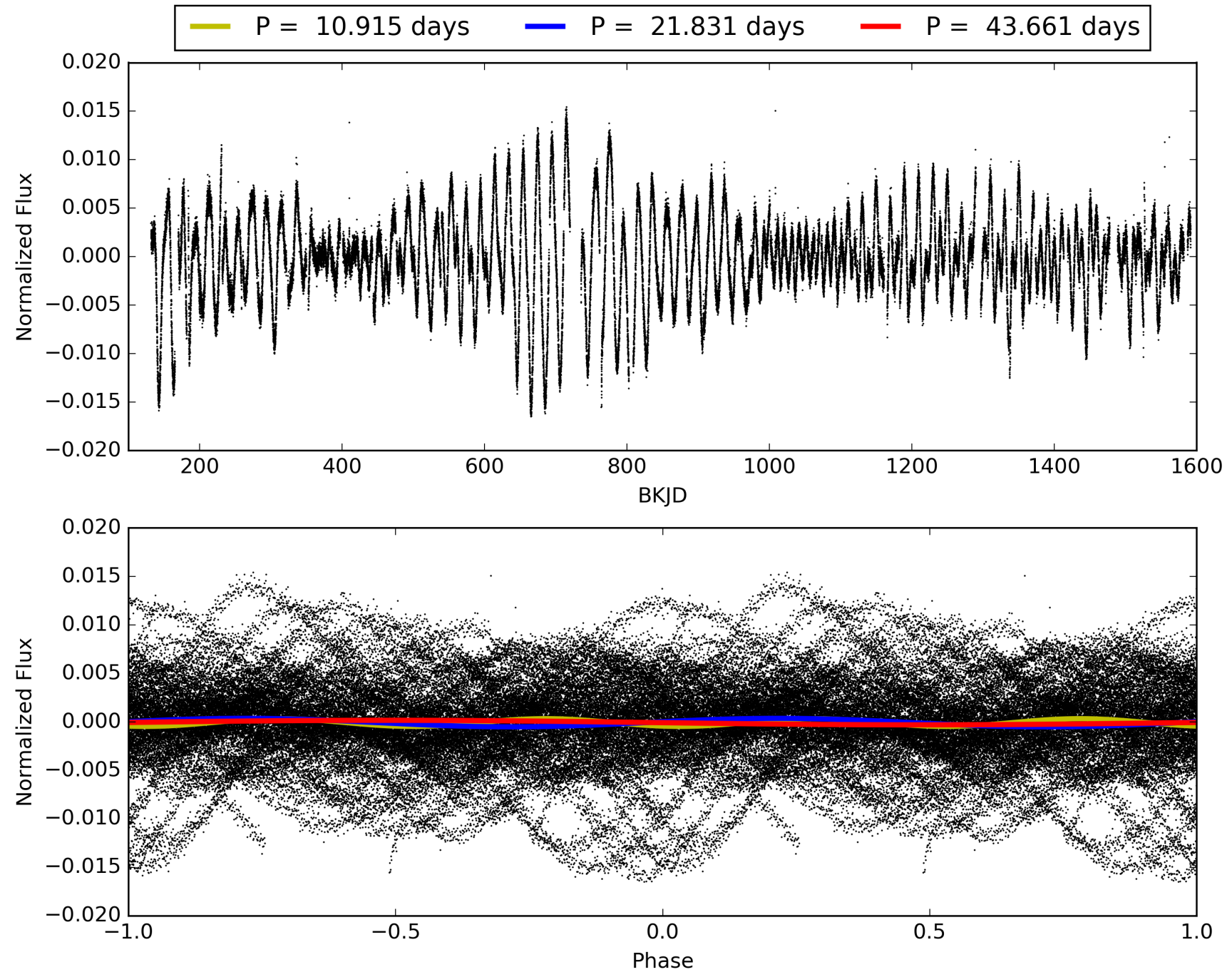
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:44:25 Z

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

# TCE 010395312-04, PDC Light Curves

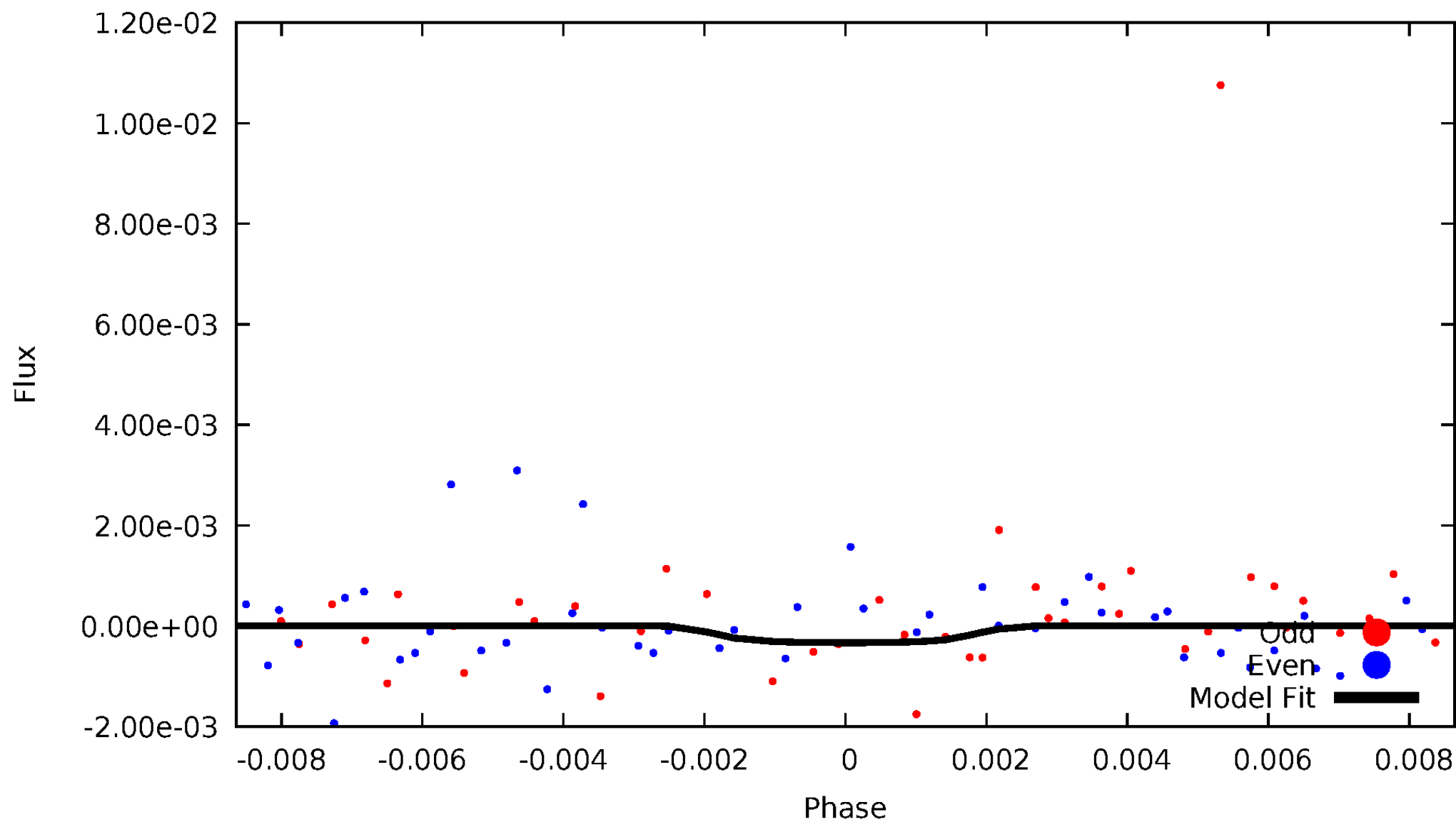


# TCE 010395312-04



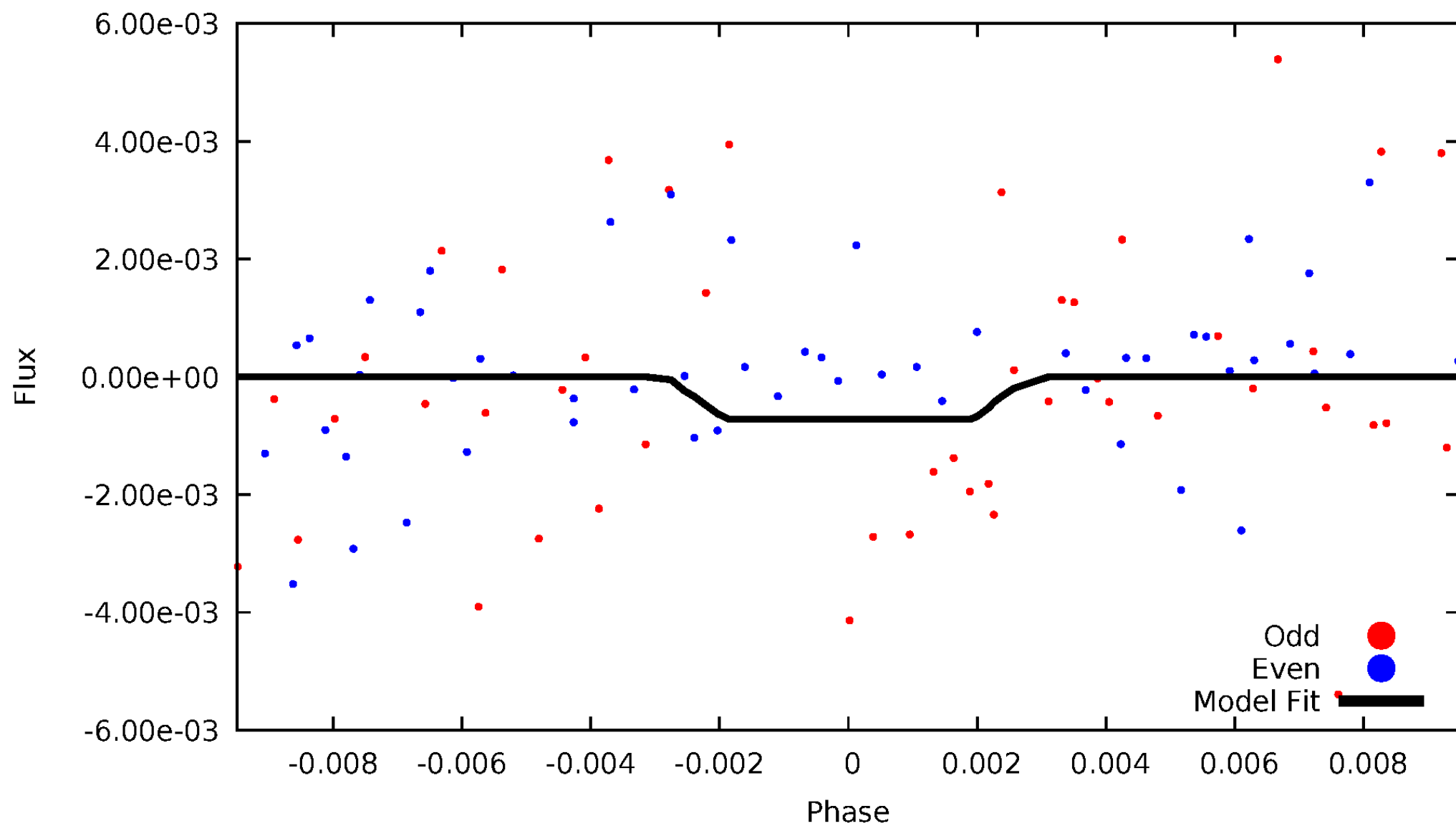
# DV Odd/Even

TCE 010395312-04



# ALT Odd/Even

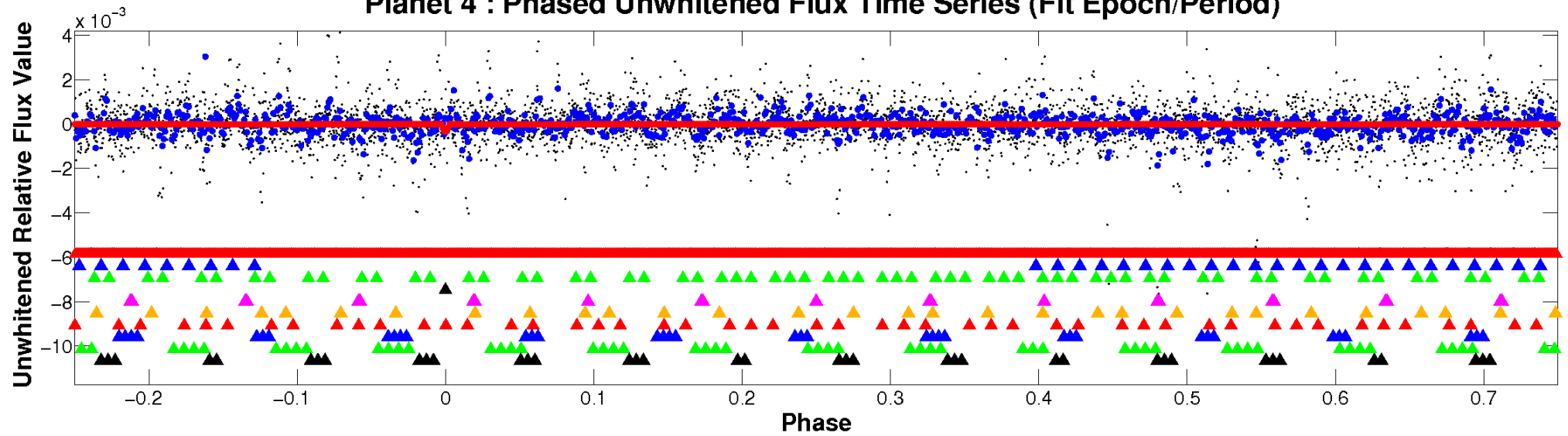
TCE 010395312-04



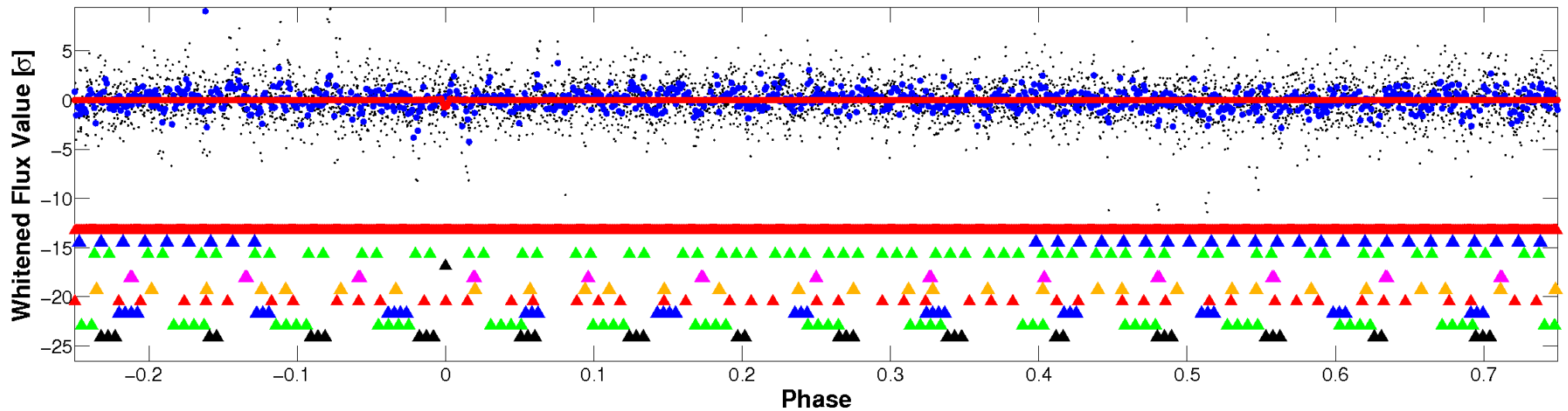


# Non-Whitened Vs. Whitened Light Curve

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

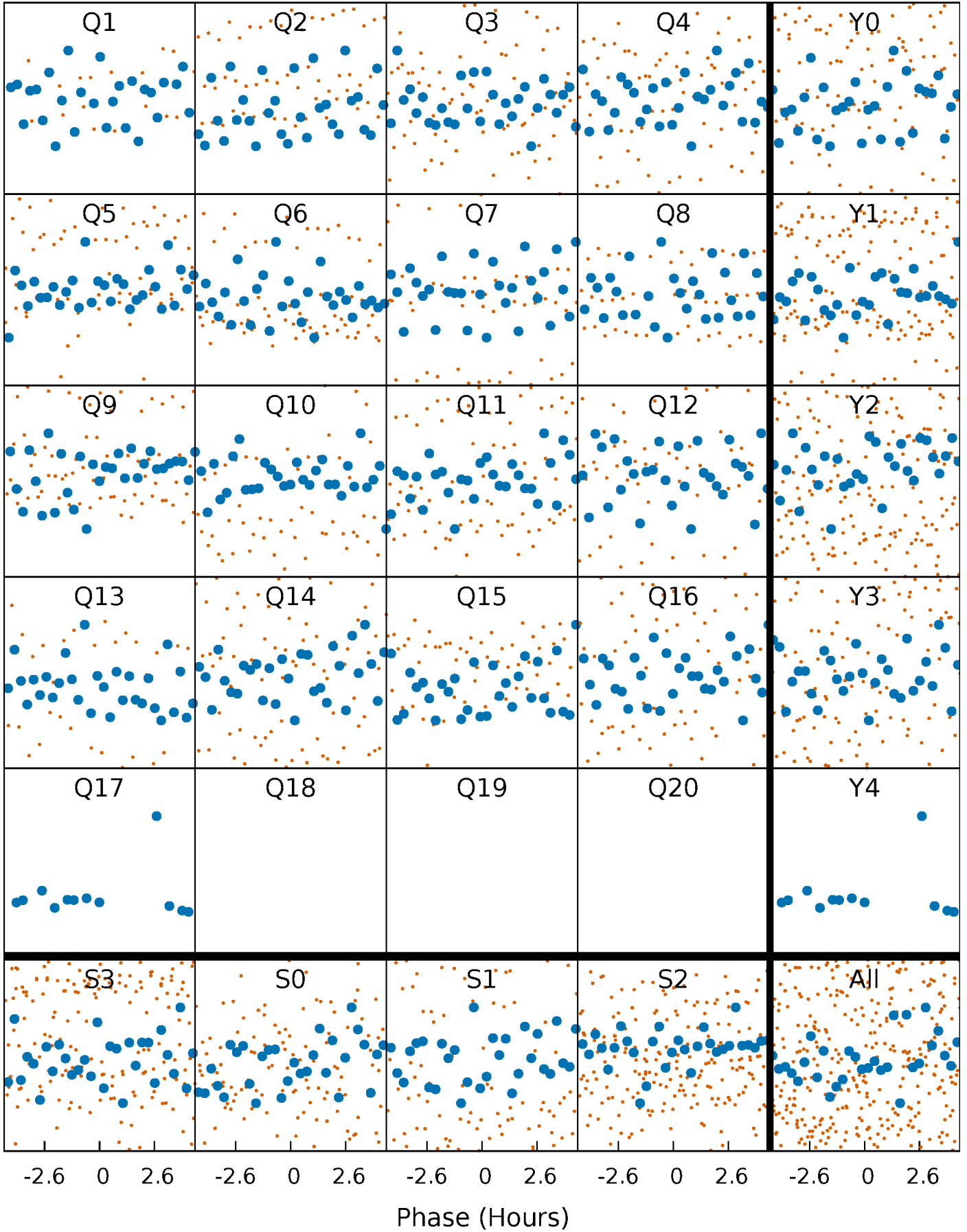


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



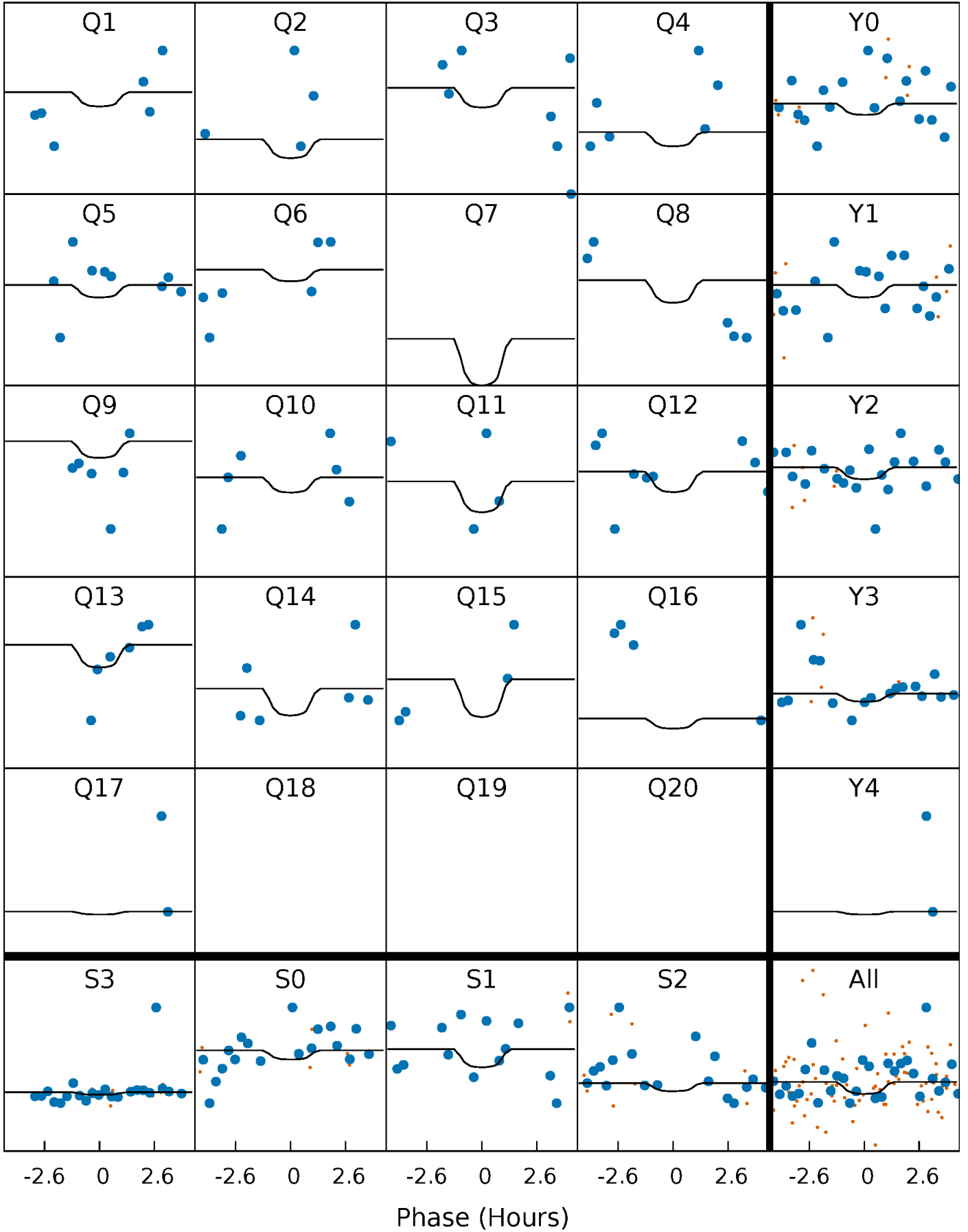
# PDC Quarter-Phased Transit Curves

TCE 010395312-04   P= 21.830529 Days    $T_0=141.862680$  (BKJD)



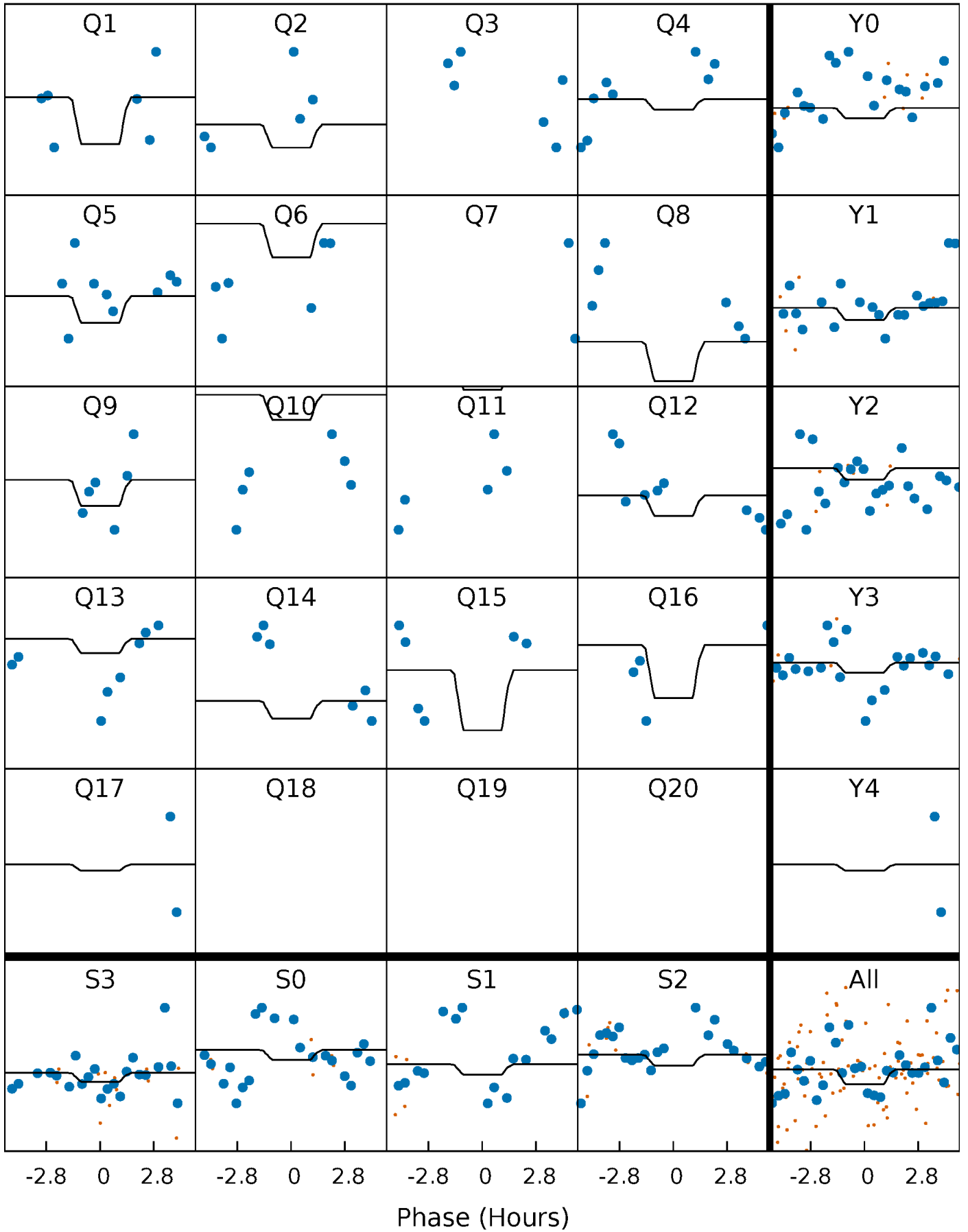
# DV Quarter-Phased Transit Curves

TCE 010395312-04   P= 21.830529 Days    $T_0=141.862680$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

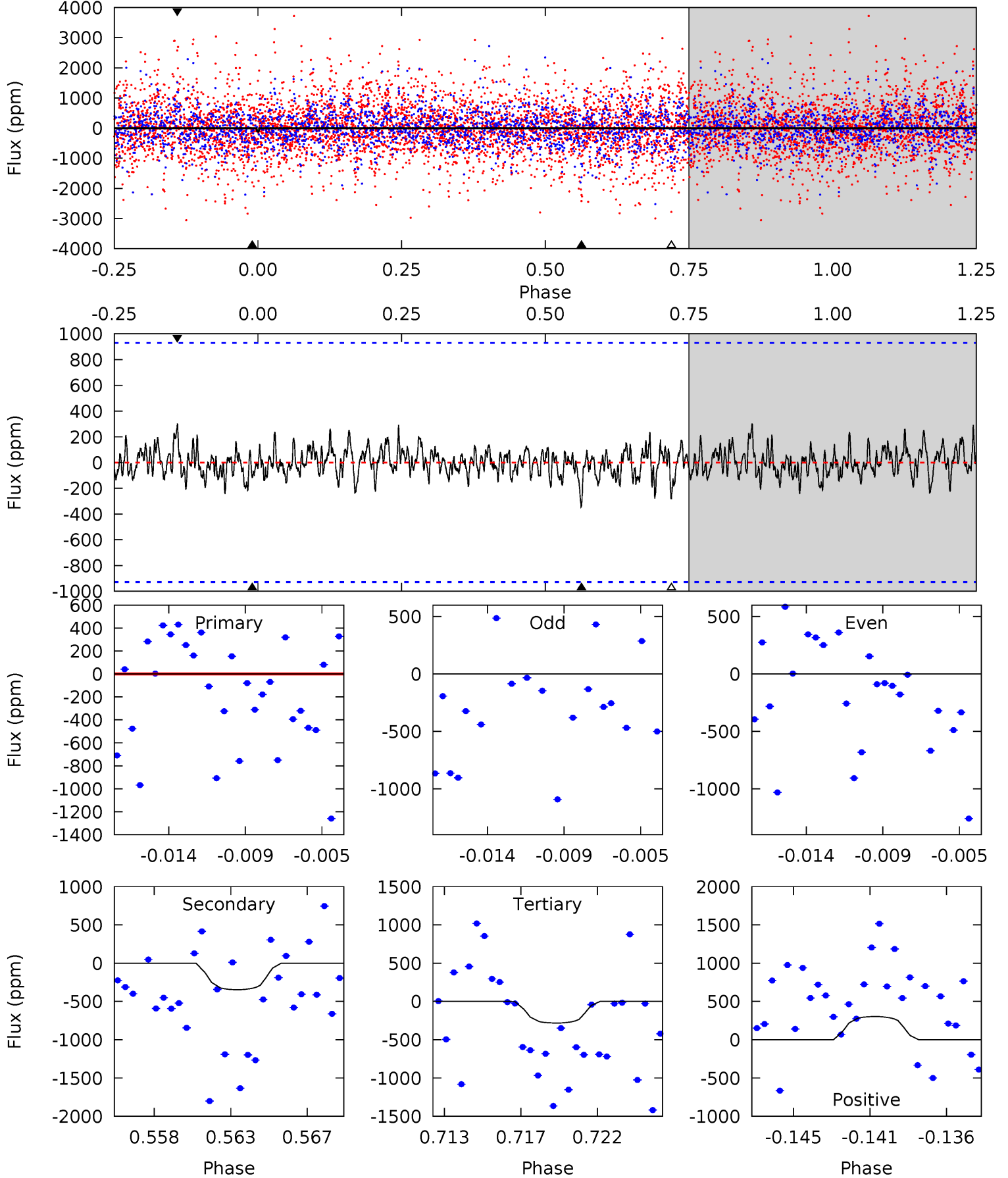
TCE 010395312-04   P= 21.830064 Days    $T_0=141.863424$  (BKJD)



# DV Model-Shift Uniqueness Test

010395312-04, P = 21.830529 Days, E = 120.032151 Days

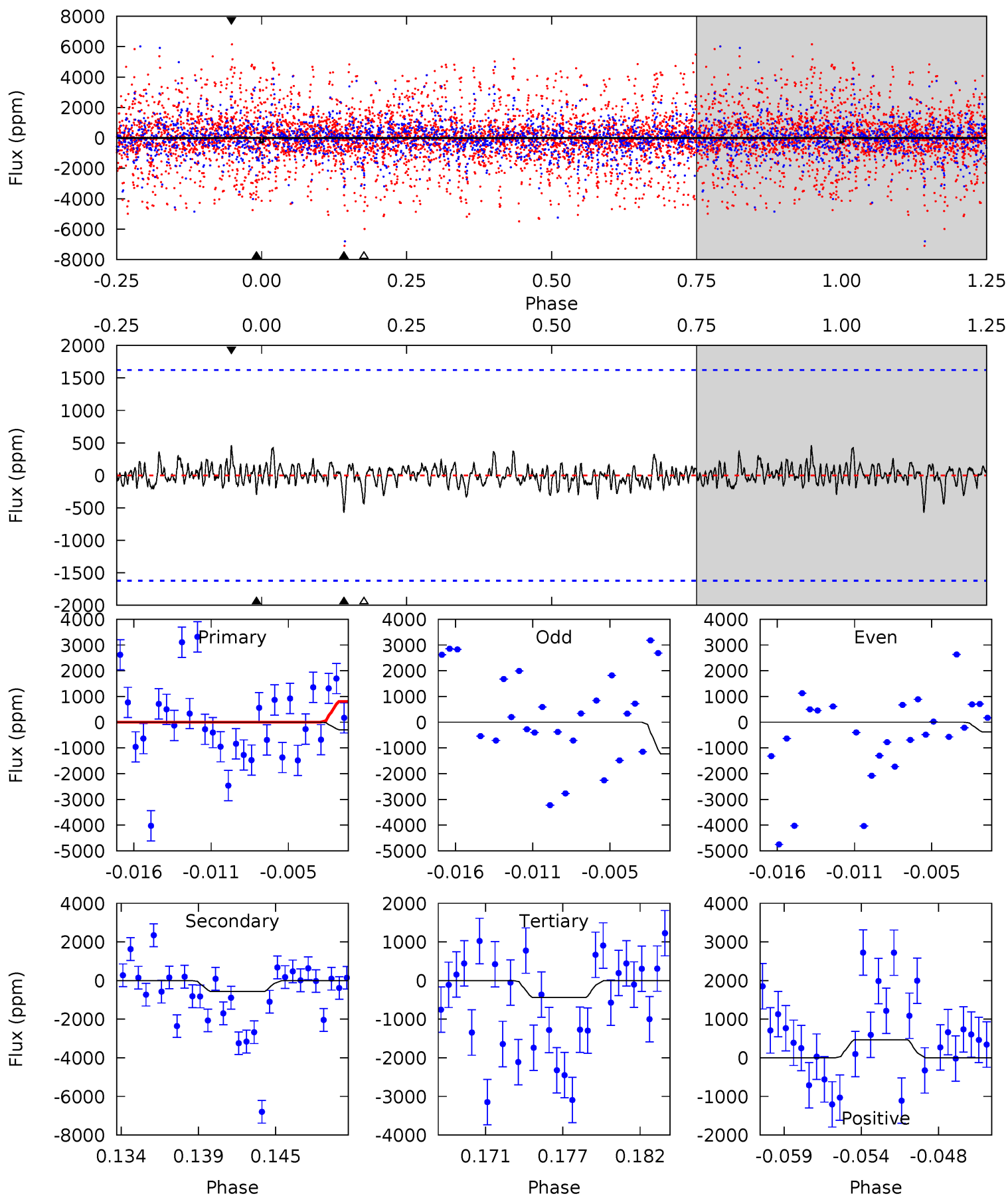
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.67	1.93	1.57	1.69	5.17	2.83	0.51	-0.91	-1.02	0.36	0.24	0.57	2.74	0.47	0.86



# Alt Model-Shift Uniqueness Test

010395312-04, P = 21.830064 Days, E = 120.033360 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.94	1.80	1.38	1.47	5.14	2.78	0.40	-0.44	-0.54	0.42	0.33	1.22	-7.83	0.45	0.43



### Stellar Parameters For KIC 010395312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3553^{+48}_{-53}$	$4.906^{+0.035}_{-0.042}$	$-0.200^{+0.100}_{-0.100}$	$0.358^{+0.036}_{-0.036}$	$0.379^{+0.034}_{-0.046}$	$11.630^{+2.353}_{-1.957}$
	+1%/-1%	+1%/-1%	+50%/-50%	+10%/-10%	+9%/-12%	+20%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010395312-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-347 \pm 180$	$3.35^{+3.29}_{-2.31}$	$395^{+9}_{-9}$	$2320^{+866}_{-369}$	$182^{+1928}_{-143}$
Alt.	$-567 \pm 315$	$3.29^{+3.59}_{-2.37}$	$395^{+9}_{-9}$	$2465^{+1035}_{-418}$	$322^{+3565}_{-263}$

$T_{max}$  = 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

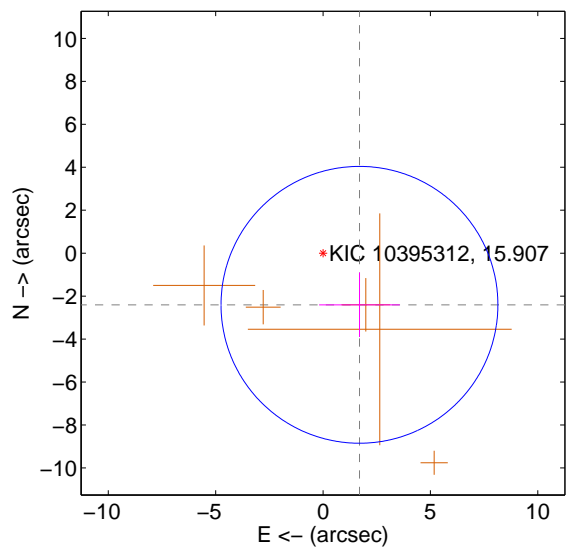
Supplemental centroid analysis for 010395312-04. Kepler magnitude: 15.91. Transit SNR 2.60

There are 0 quarters with good PRF difference image offsets

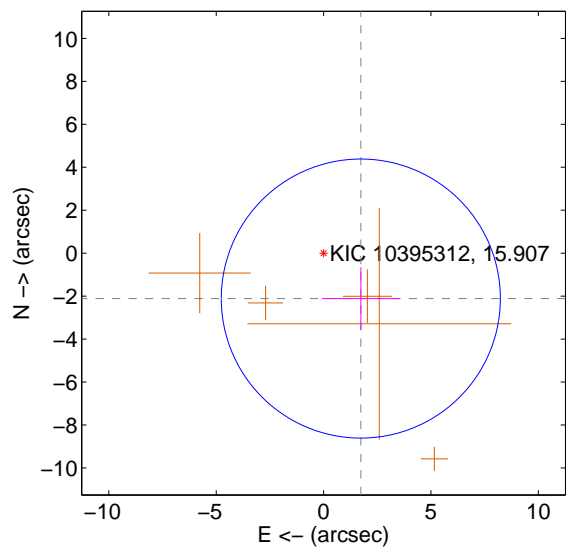
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.943 \pm 2.149$	1.37	$-1.696 \pm 1.881$	$-2.405 \pm 1.501$
PRF-fit source offset from KIC position	$2.735 \pm 2.166$	1.26	$-1.734 \pm 1.807$	$-2.114 \pm 1.461$
photometric centroid source offset	$3.16 \pm 1.84$	1.71	$0.99 \pm 1.88$	$-3.00 \pm 1.84$

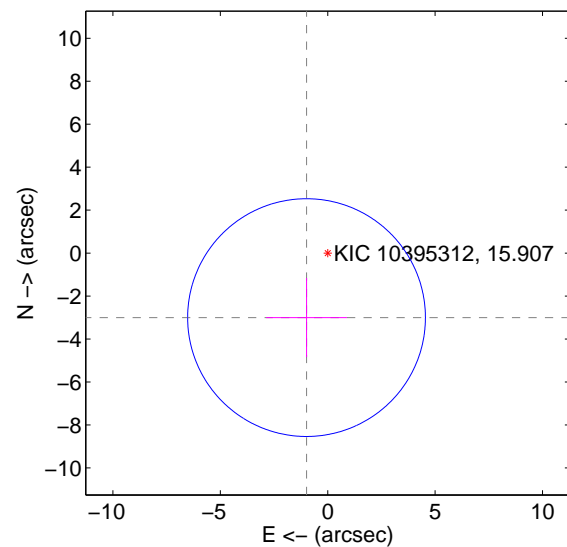
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

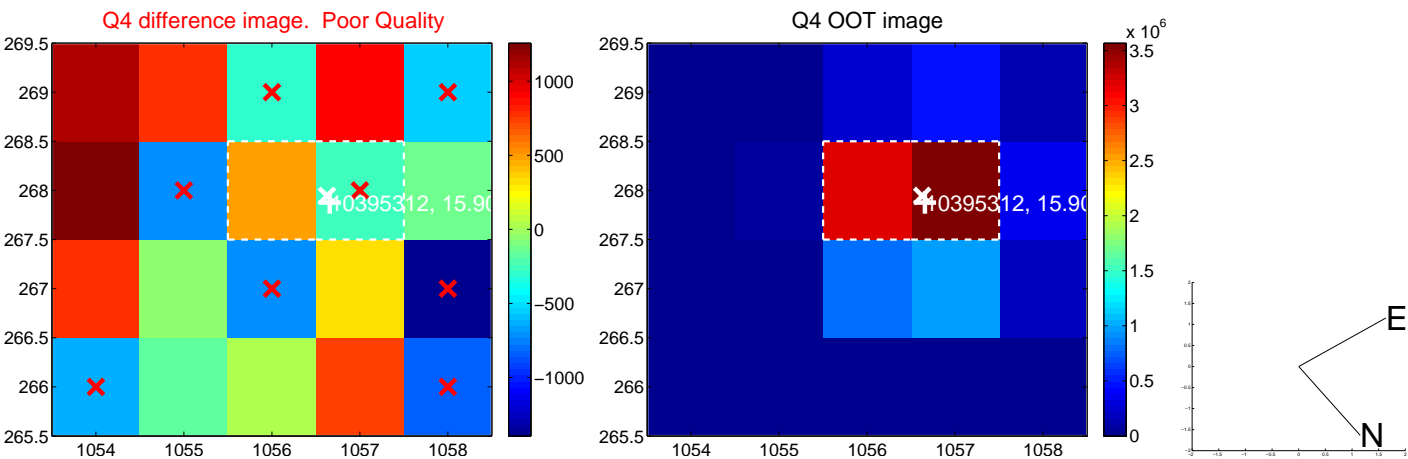
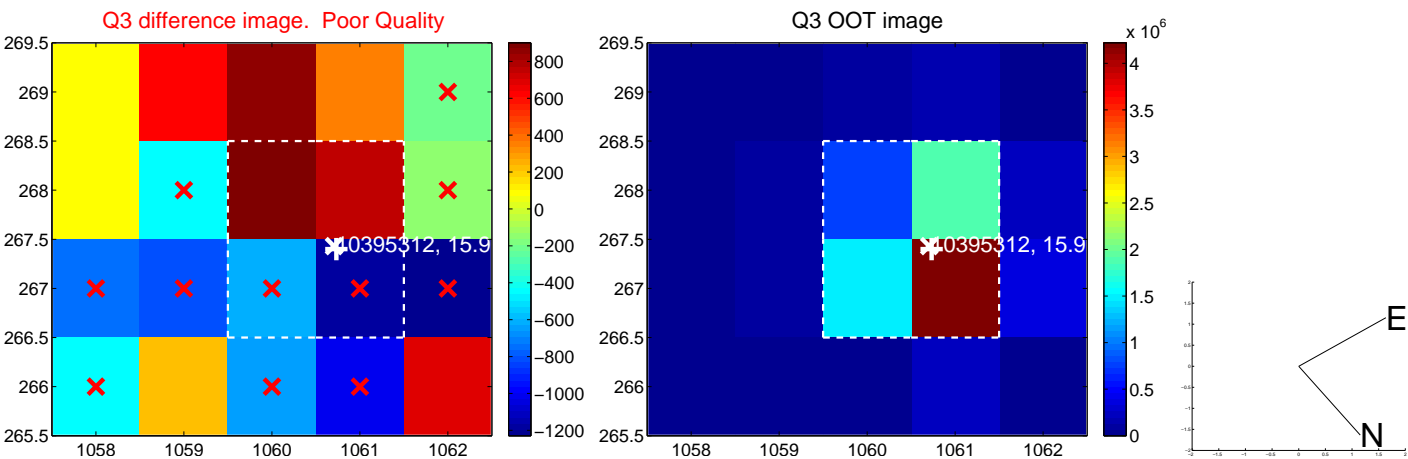
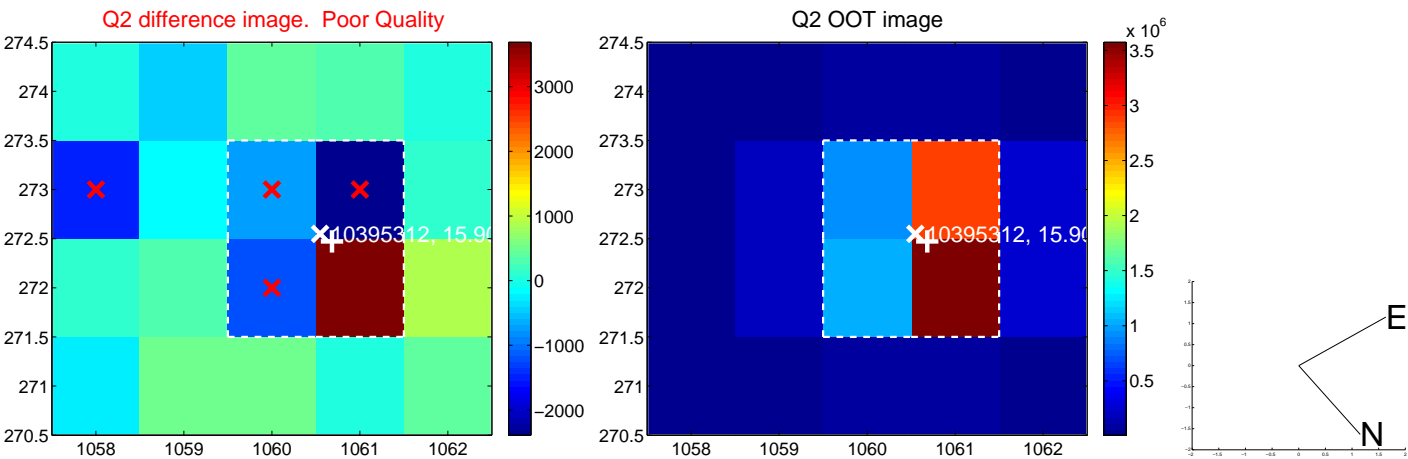
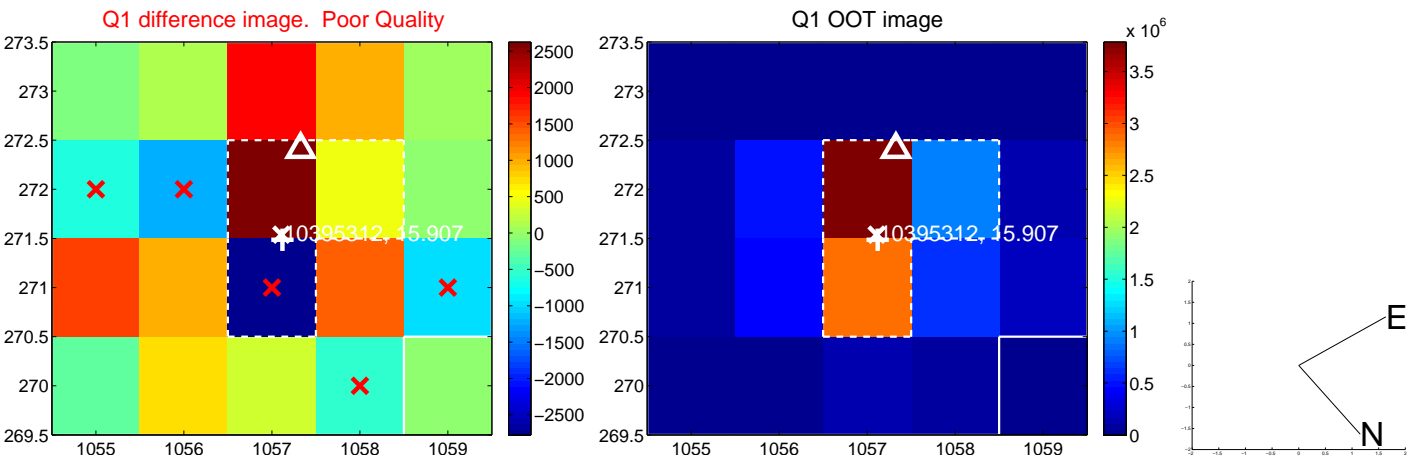


offset from photometric centroids

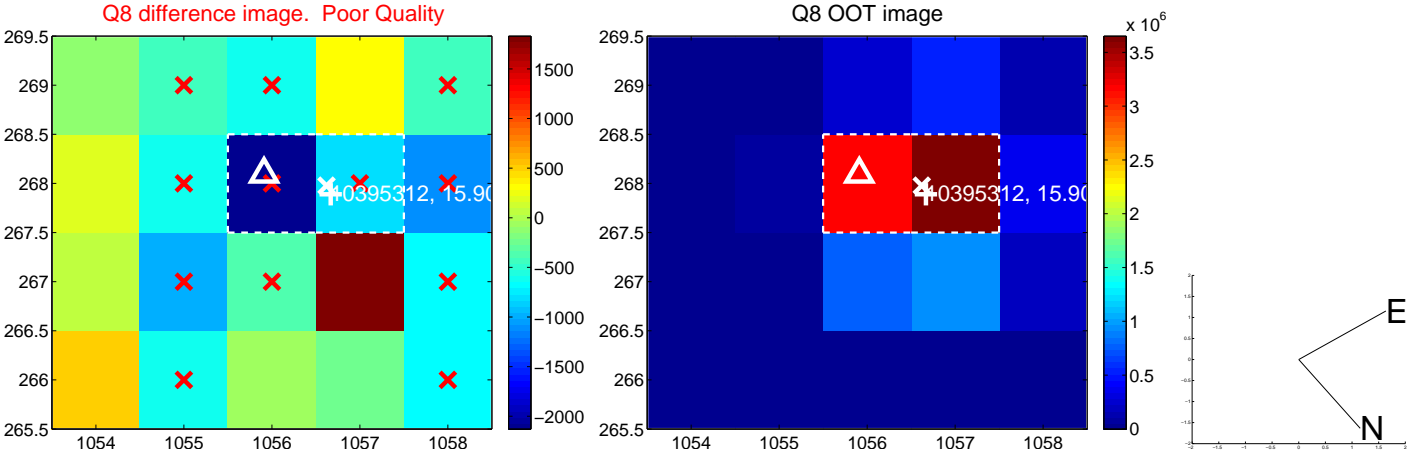
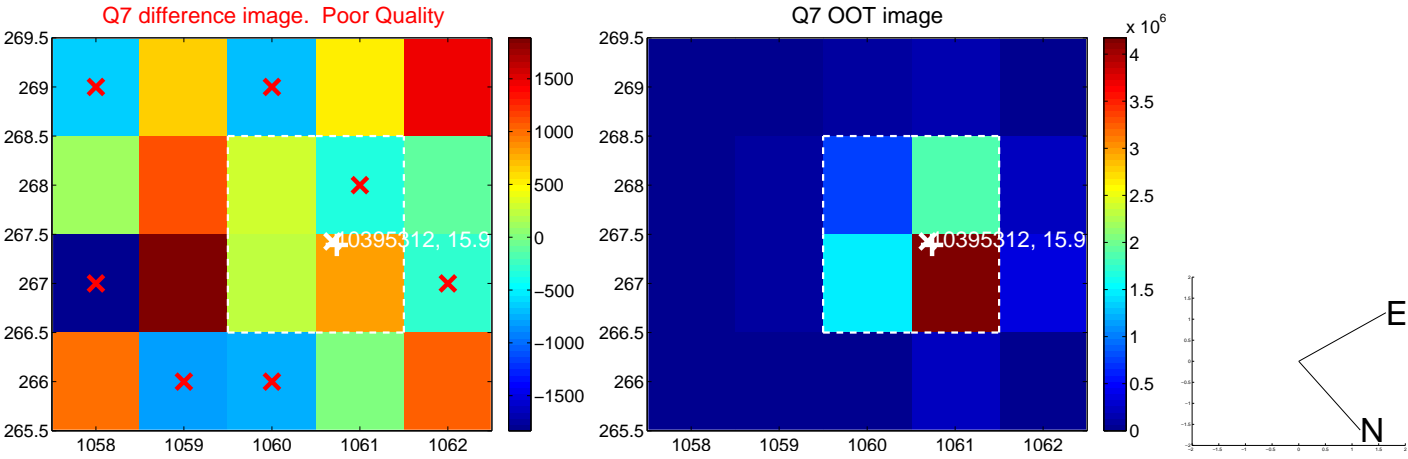
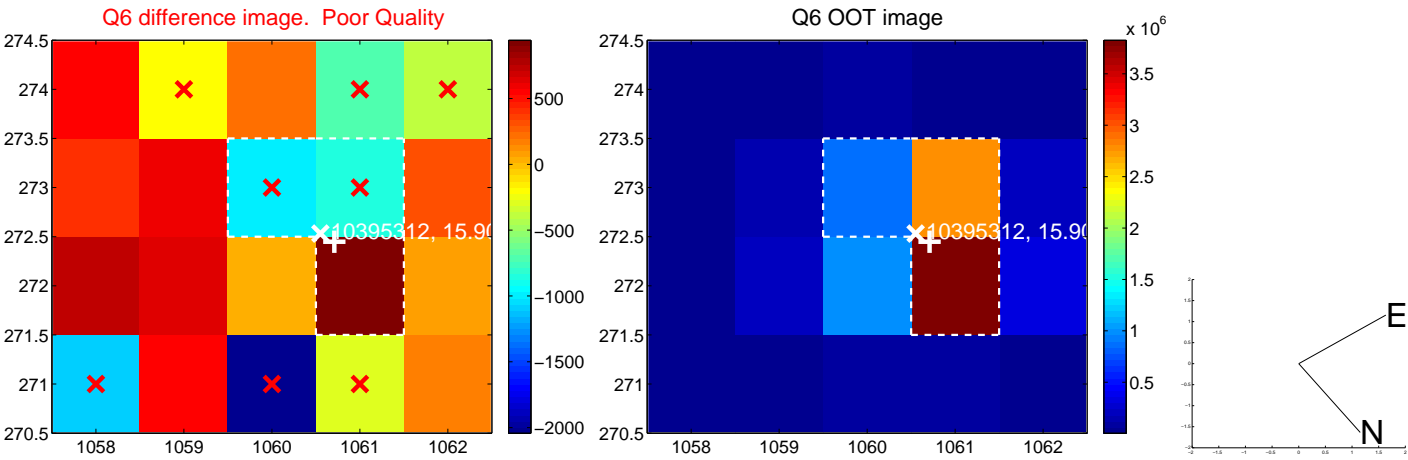
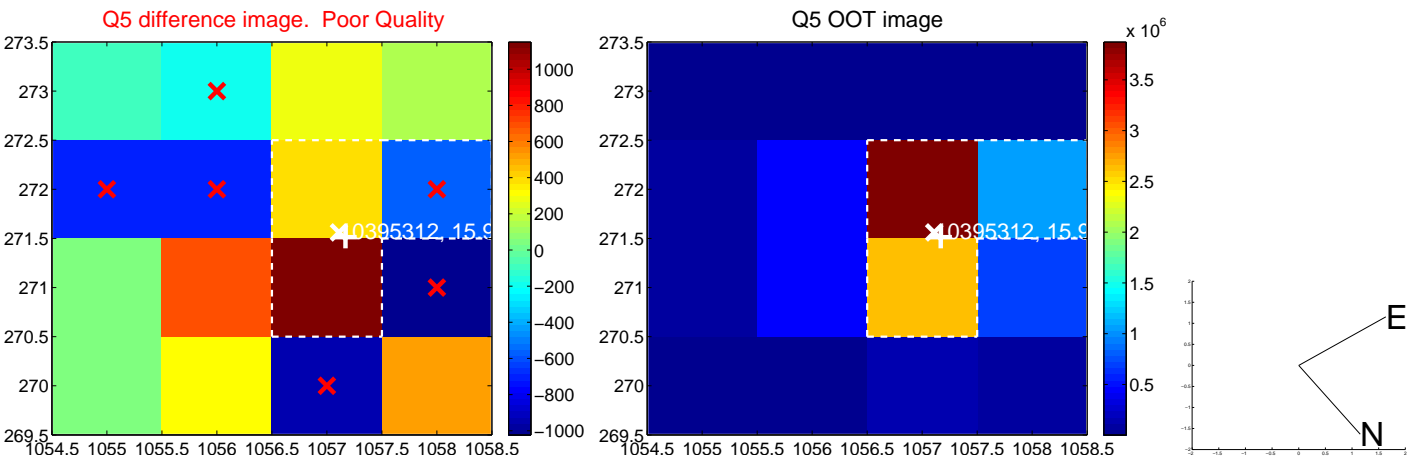


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

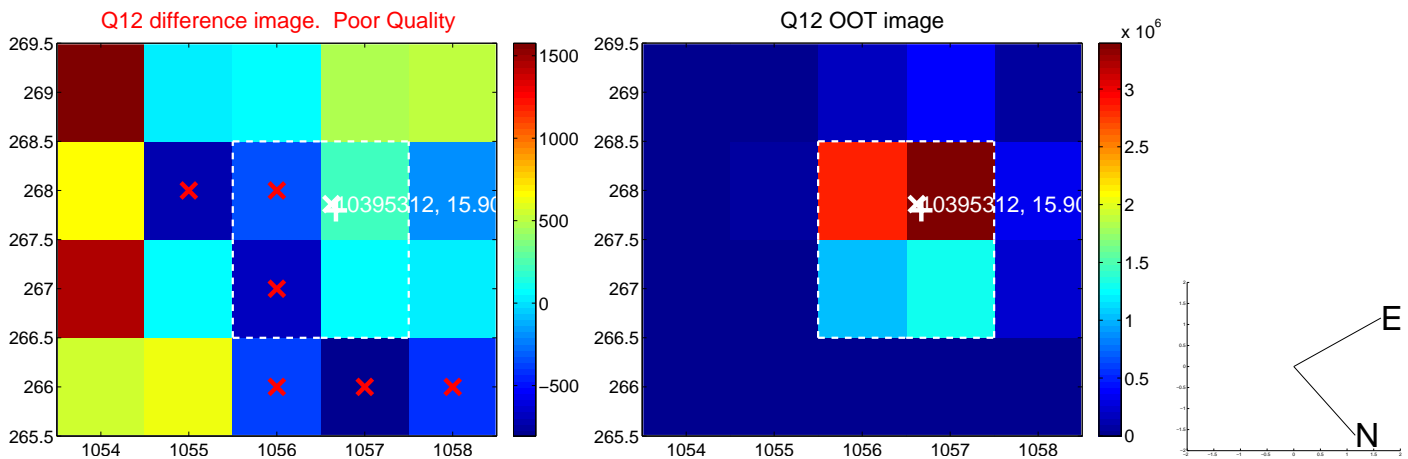
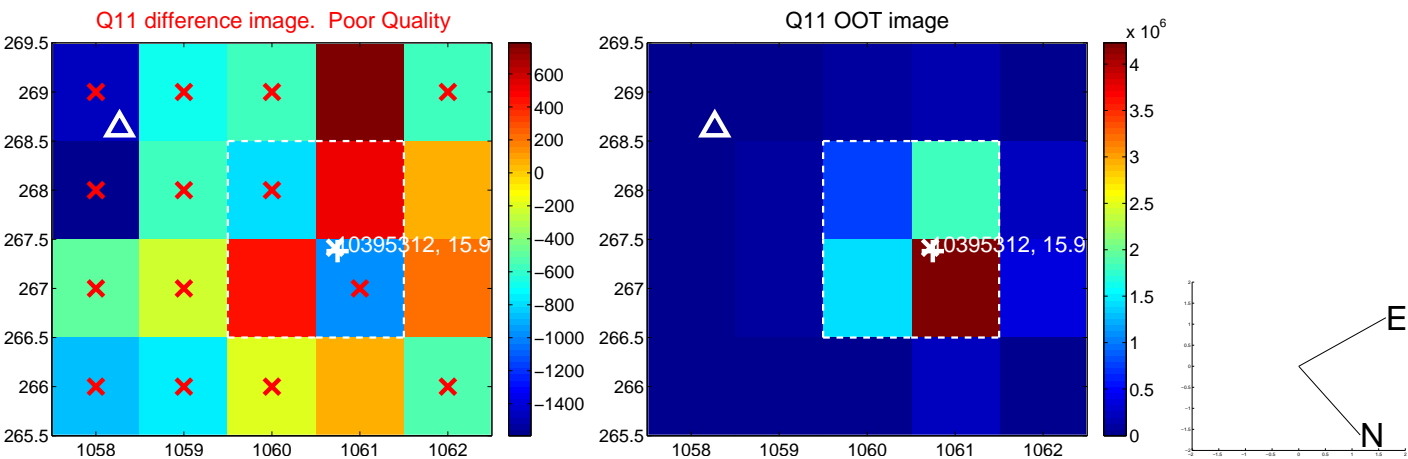
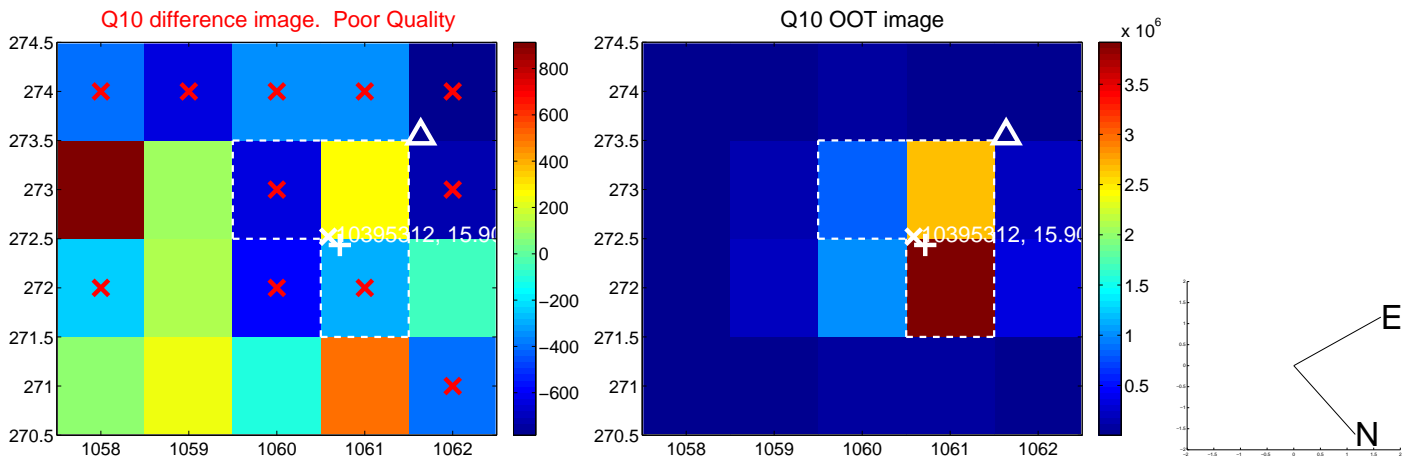
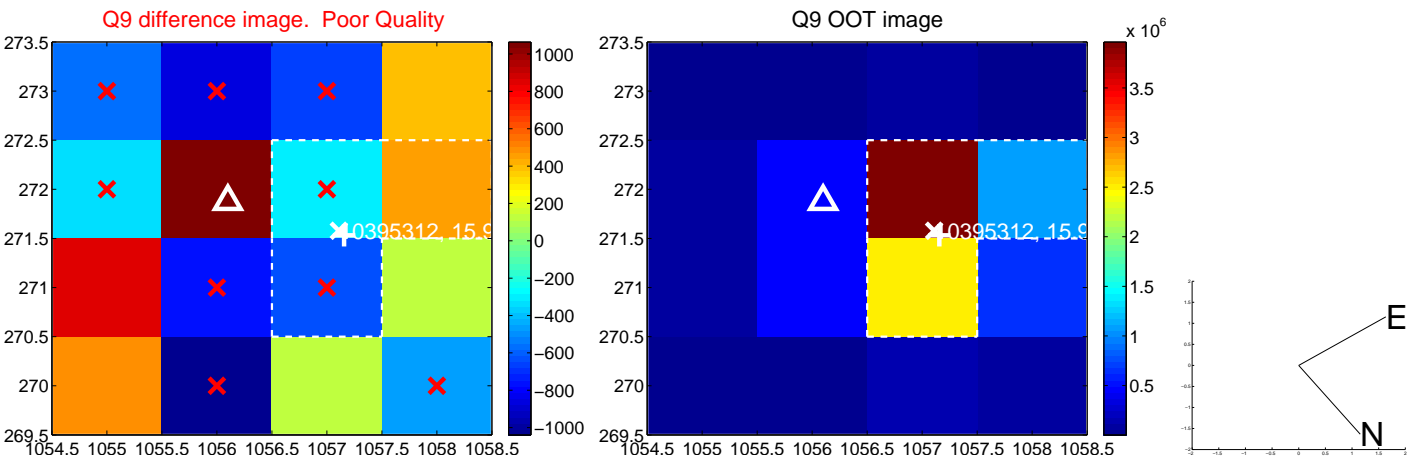
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



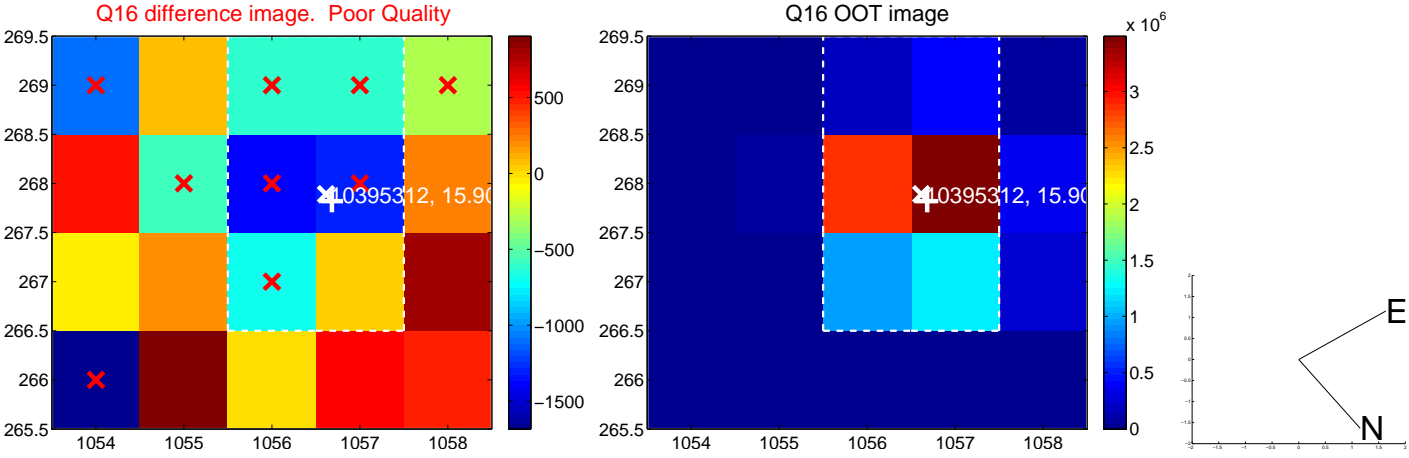
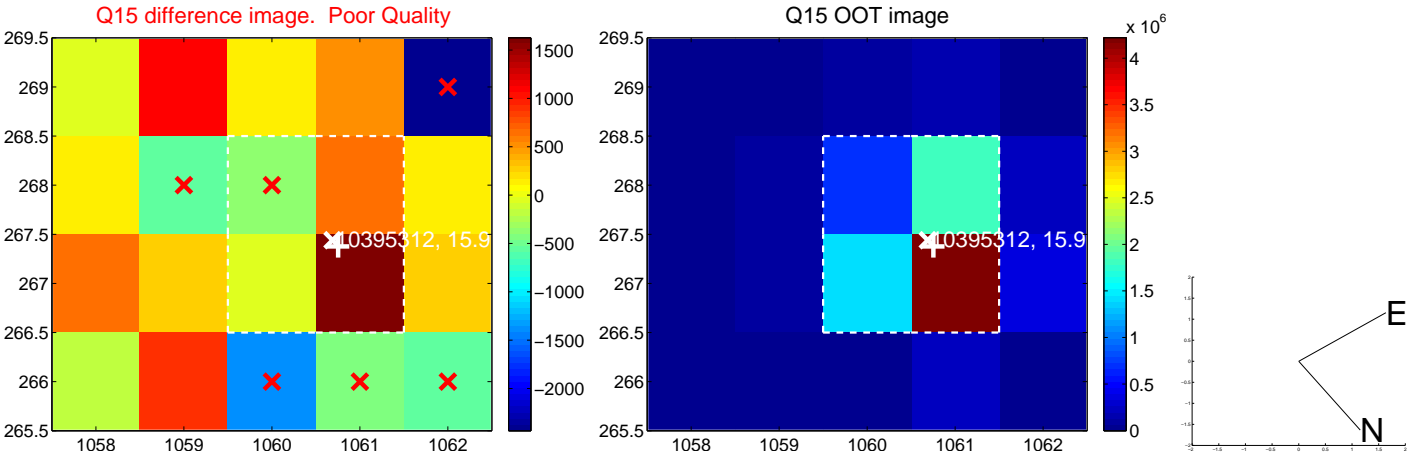
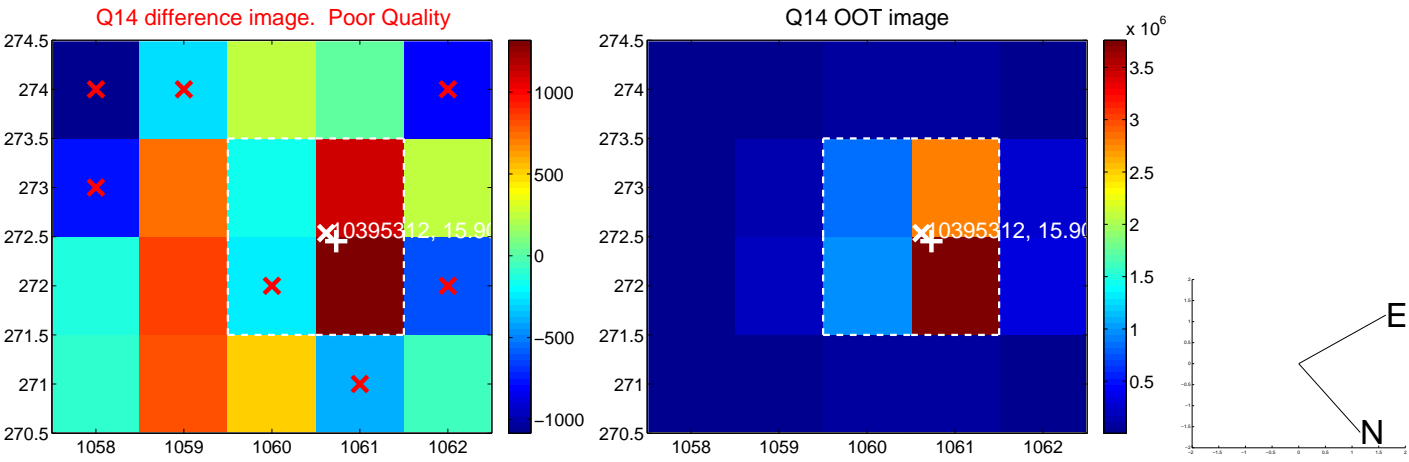
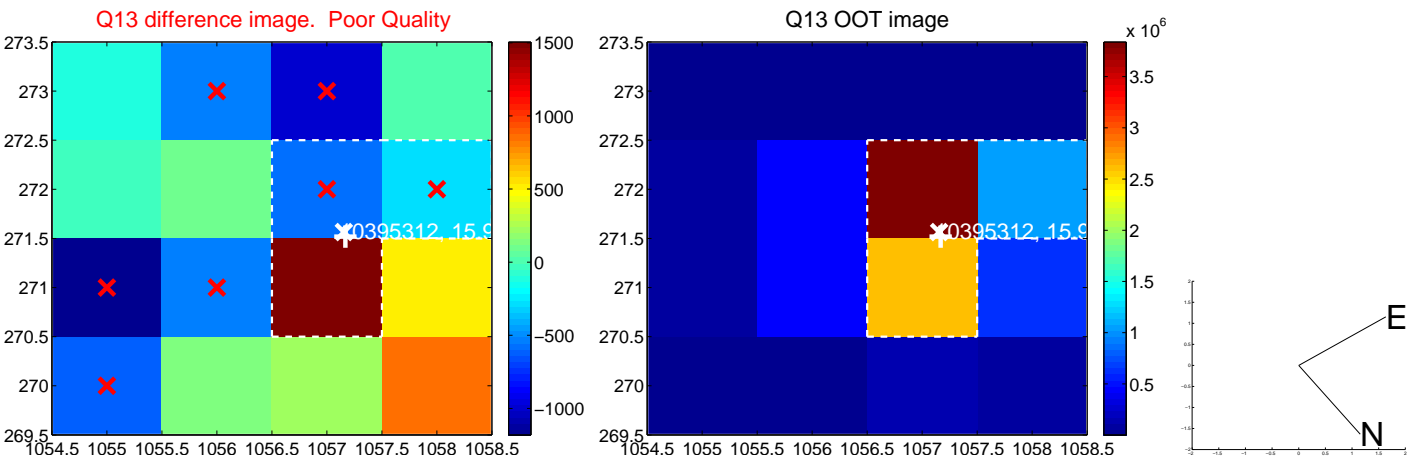
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



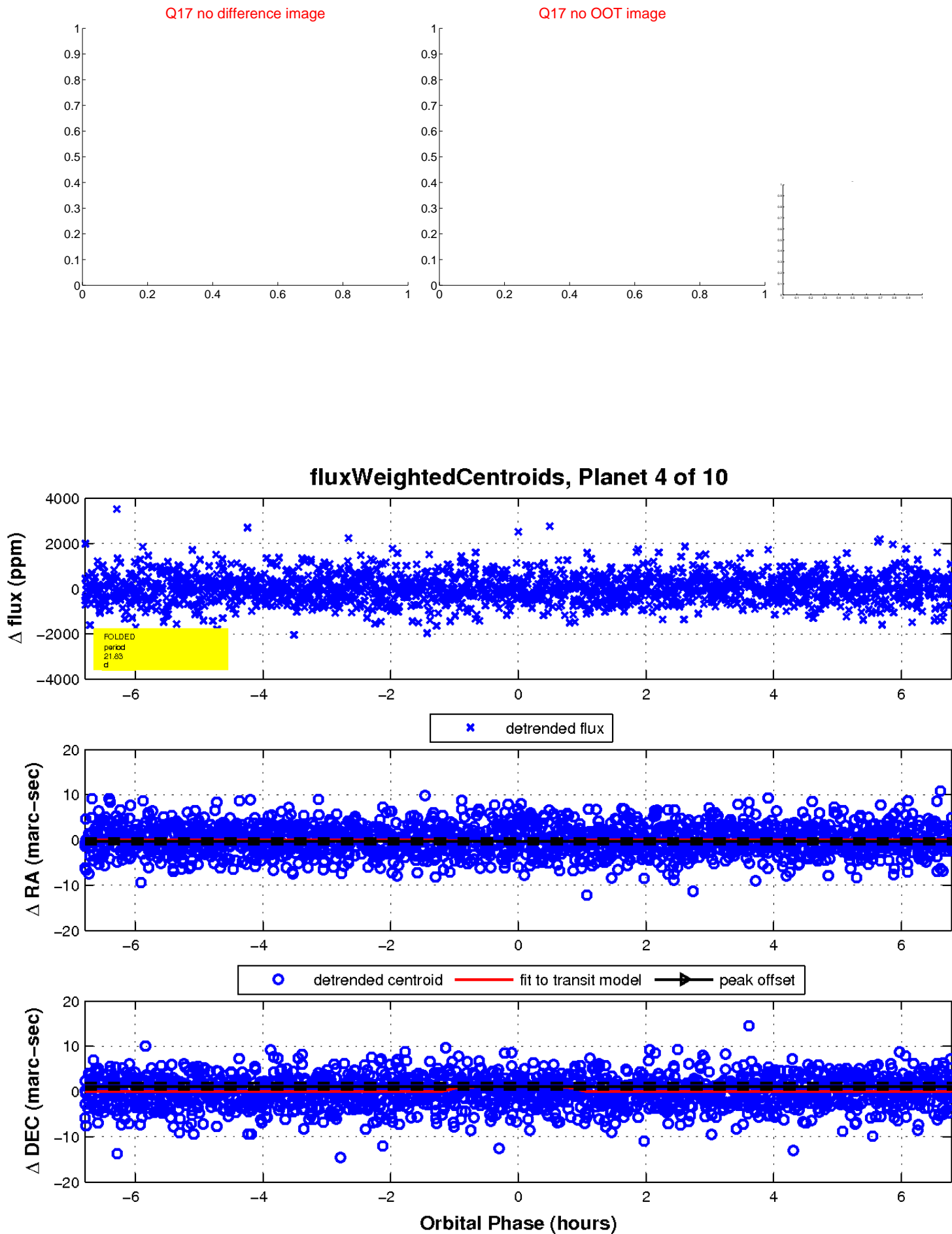
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



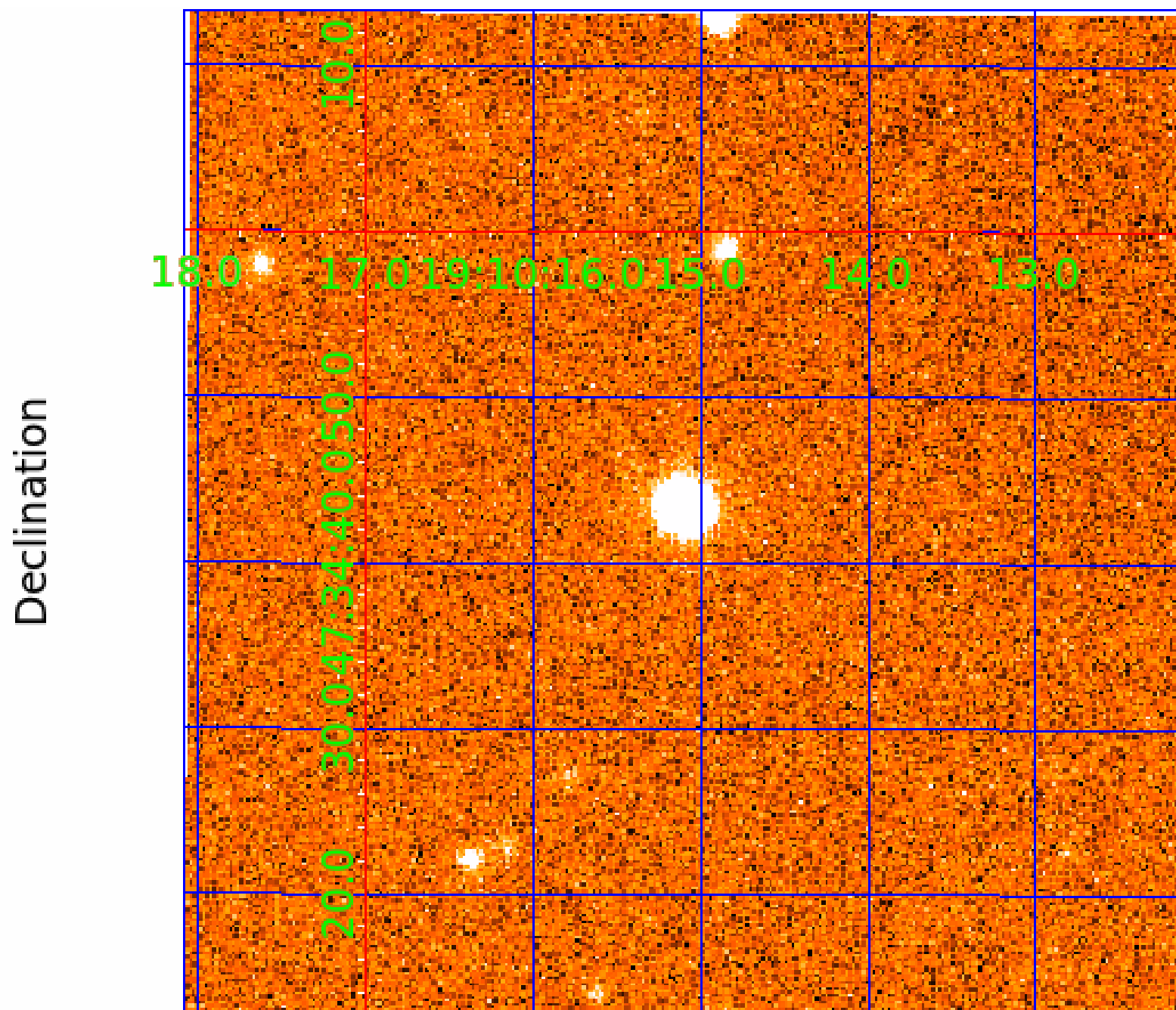
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





## KIC 010395312

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010395312-01	OBS	No	0.734969	131.818451	68.7	5.235	7.8	10.6	0.36	3553	0.30	138.09
010395312-02	OBS	No	43.338219	160.884184	1756.7	2.650	18.5	11.9	0.36	3553	1.49	0.60
010395312-03	OBS	No	22.617913	145.928423	0.0	14.208	12.1	0.0	0.36	3553	0.01	1.43
010395312-04	OBS	No	21.830529	141.862680	332.5	2.263	13.1	2.6	0.36	3553	0.77	1.50
010395312-05	OBS	No	62.134882	184.242550	0.1	3.631	13.2	0.0	0.36	3553	0.01	0.37
010395312-07	OBS	No	29.856582	155.990807	2220.3	1.681	13.8	11.7	0.36	3553	1.71	0.99
010395312-08	OBS	No	39.700029	148.941743	1333.3	2.348	11.7	10.1	0.36	3553	1.50	0.68
010395312-09	OBS	No	26.497868	133.642244	3844.7	1.500	14.1	-1.0	0.36	3553	2.21	1.16
010395312-10	OBS	No	38.975665	141.685996	5375.8	1.500	19.0	-1.0	0.36	3553	2.62	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010395312-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010395312-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010395312-08	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
010395312-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
010395312-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

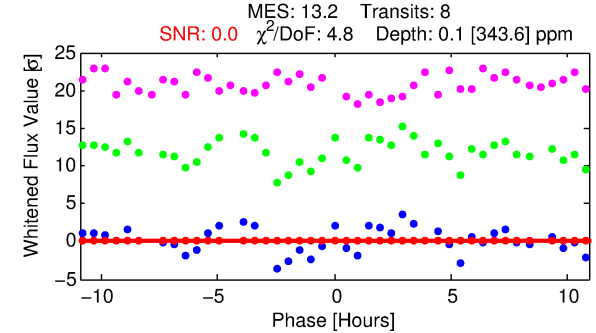
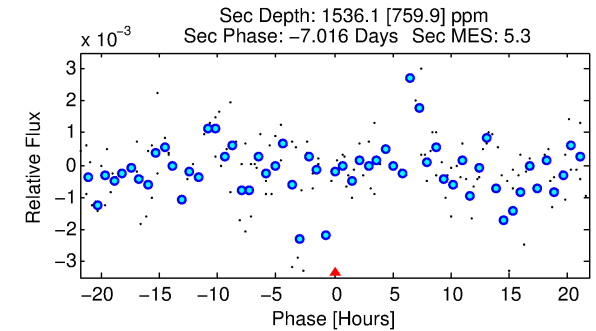
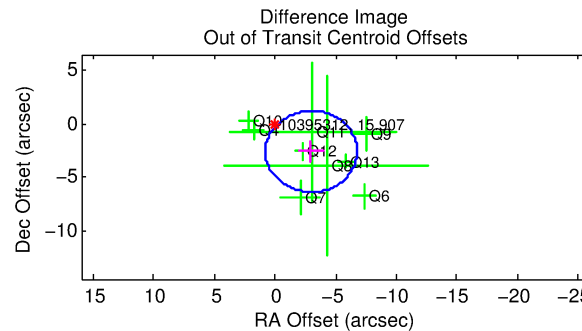
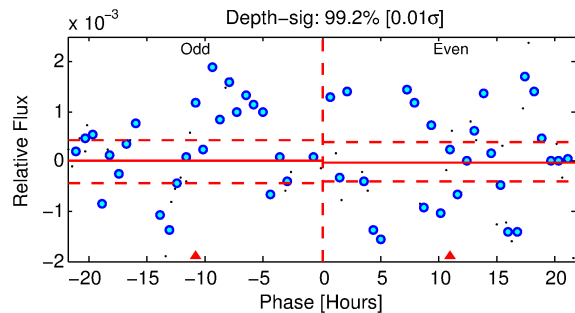
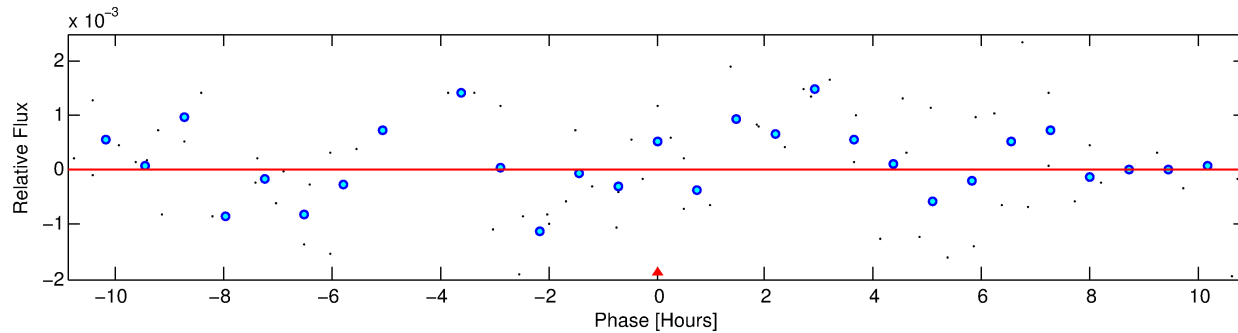
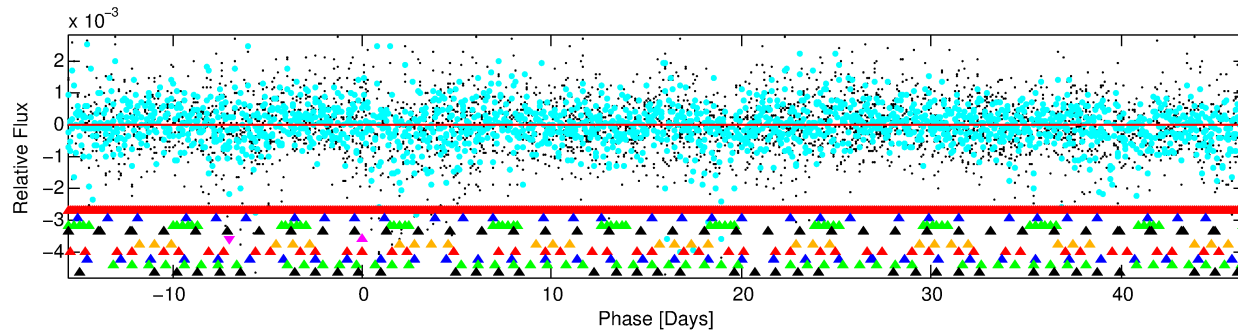
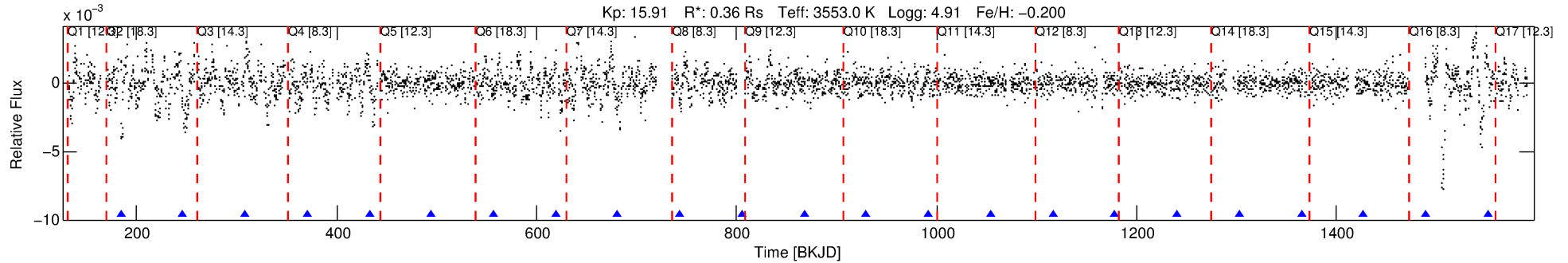
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010395312-05

No Significant Match Found

# DV One-Page Summary

KIC: 10395312 Candidate: 5 of 10 Period: 62.135 d



## DV Fit Results:

Period = 62.13488 [18.21393] d  
Epoch = 184.2425 [287.8230] BKJD  
Rp/R\* = 0.0004 [0.8332]  
a/R\* = 43.70 [333441.86]  
b = 0.94 [833.08]  
Seff = 0.37 [0.15]  
Teq = 199 [20] K  
Rp = 0.02 [32.55] Re  
a = 0.2217 [0.0464] AU  
Ag = 176328179.56 [747819726724.18] J0.0001  
Teffp = 35484 [37621162] K [0.00σ]

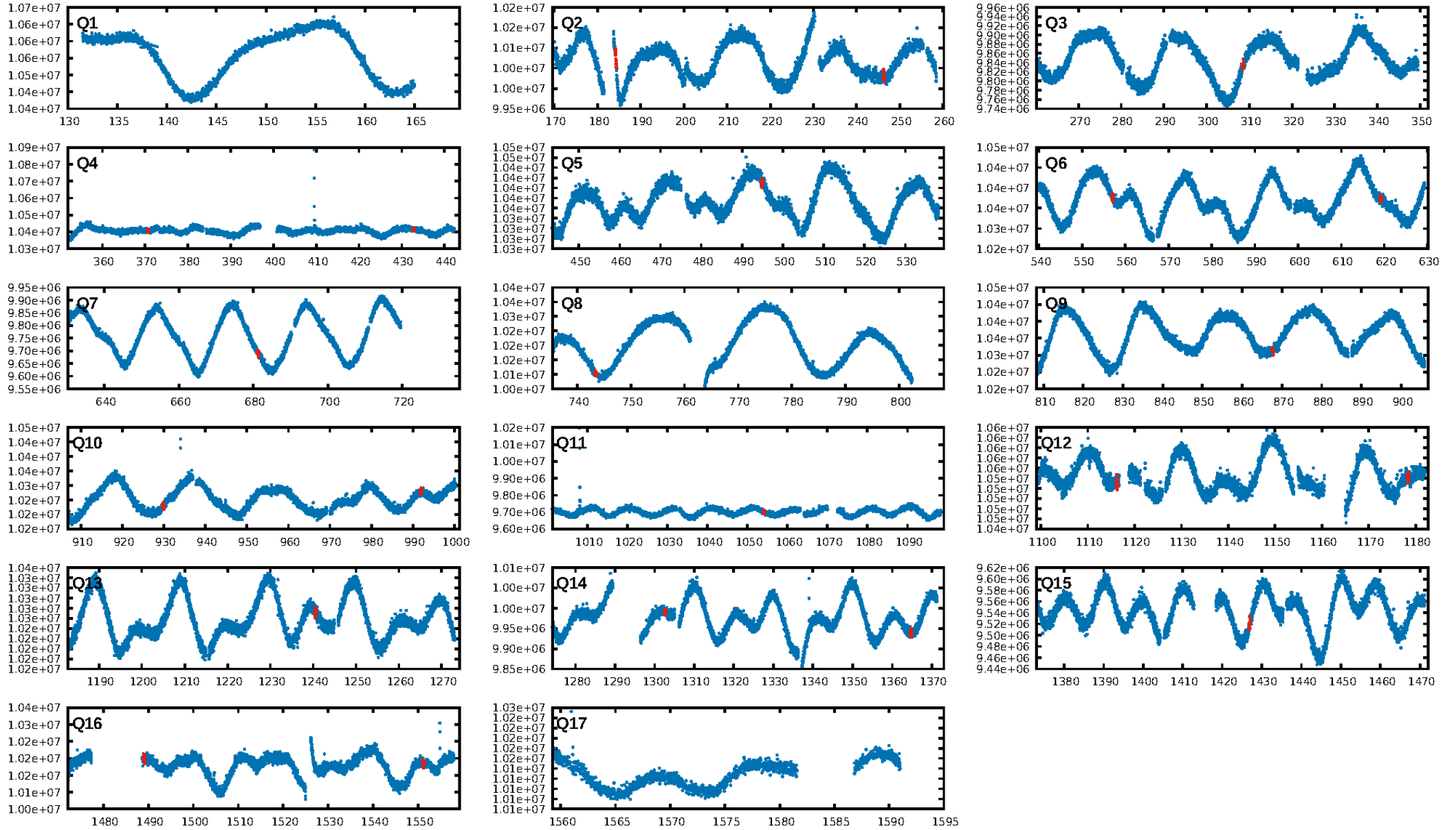
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [84.74σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 56.4%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
QotOffset-rm: 3.943 arcsec [3.12σ]  
KicOffset-rm: 3.705 arcsec [2.98σ]  
QotOffset-st: 2/2/3/2 [9]  
KicOffset-st: 2/2/3/2 [9]  
DiffImageQuality-fgm: 0.00 [0/9]  
DiffImageOverlap-fno: 0.00 [0/14]

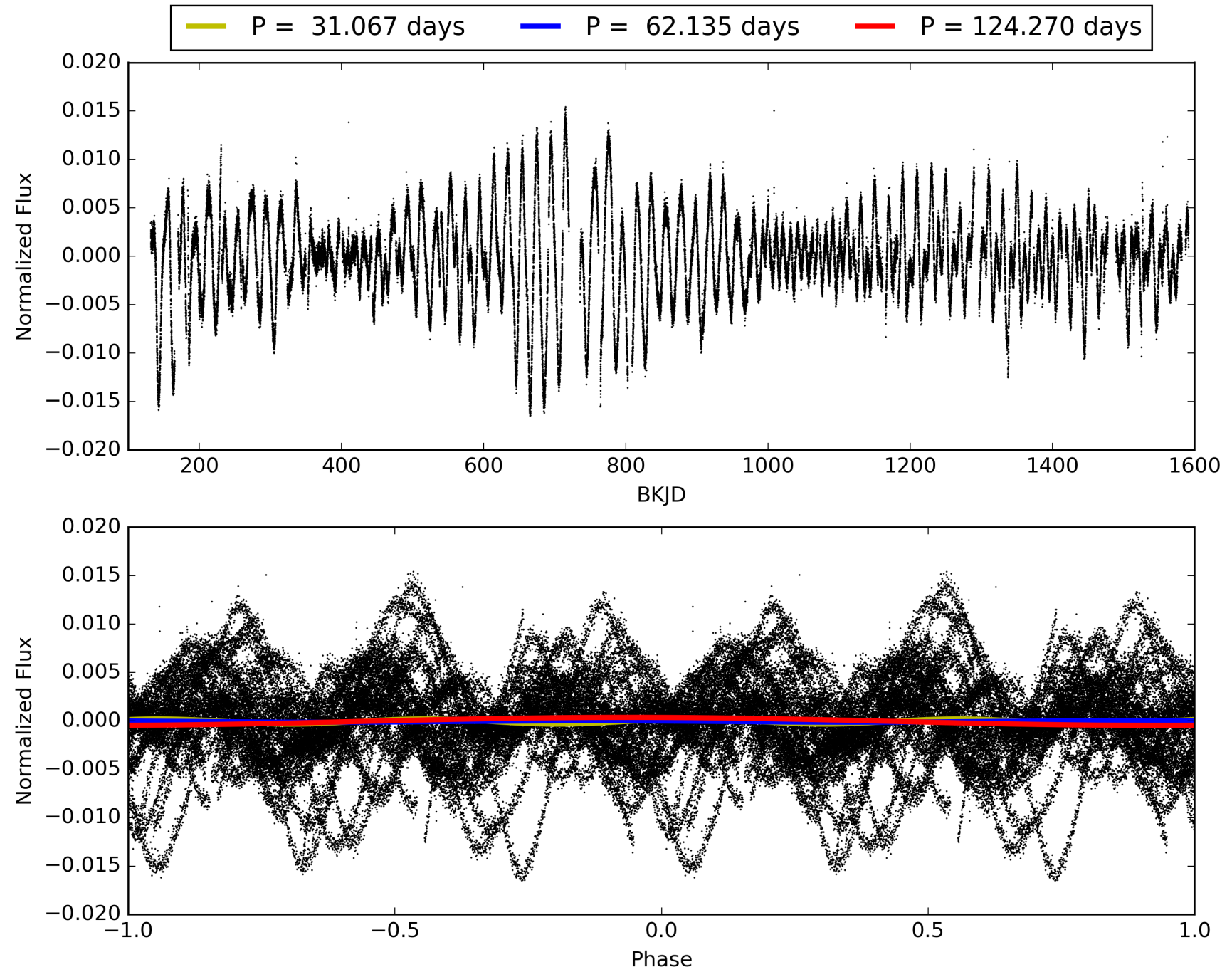
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:44:28 Z

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

# TCE 010395312-05, PDC Light Curves

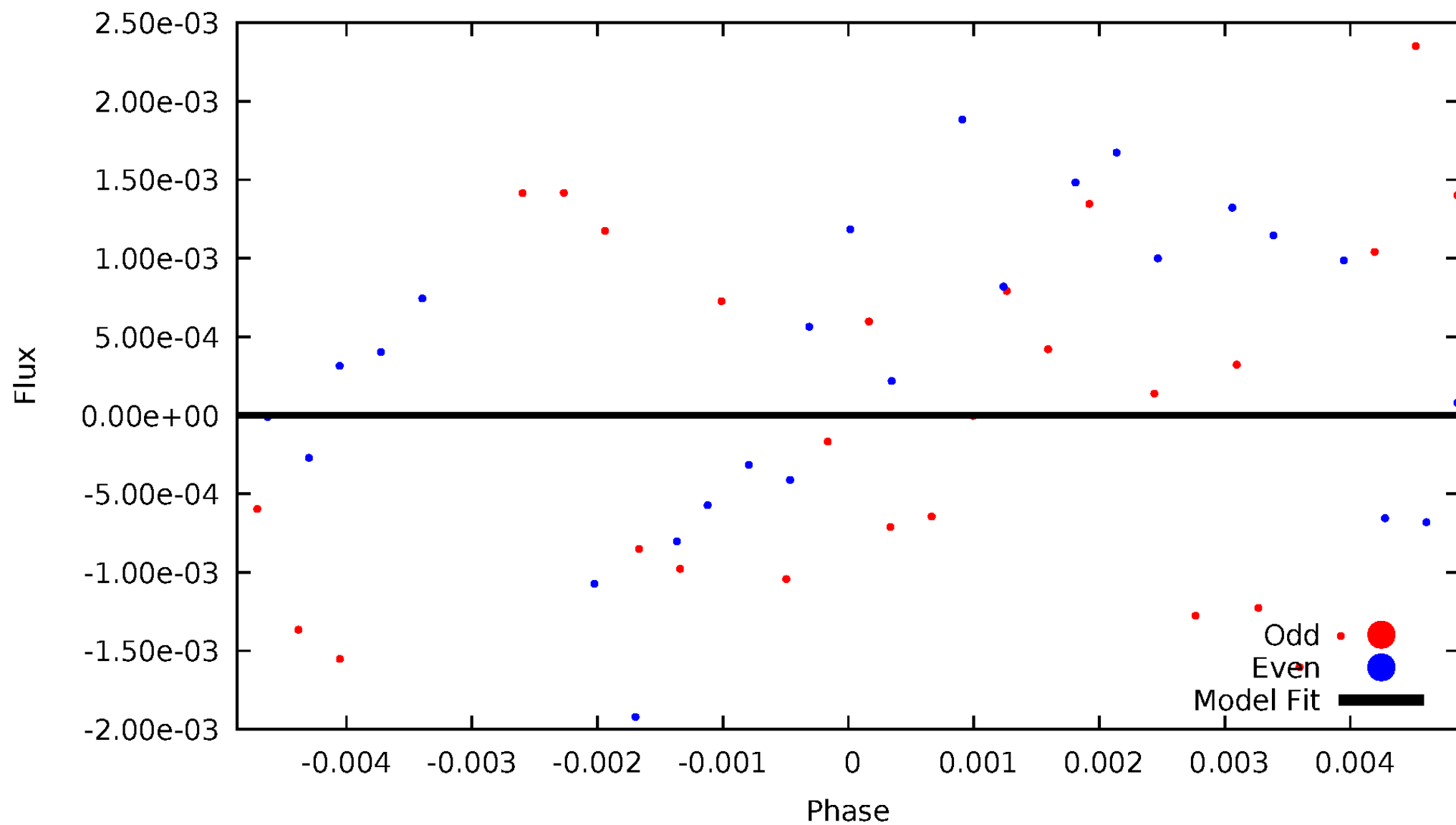


# TCE 010395312-05



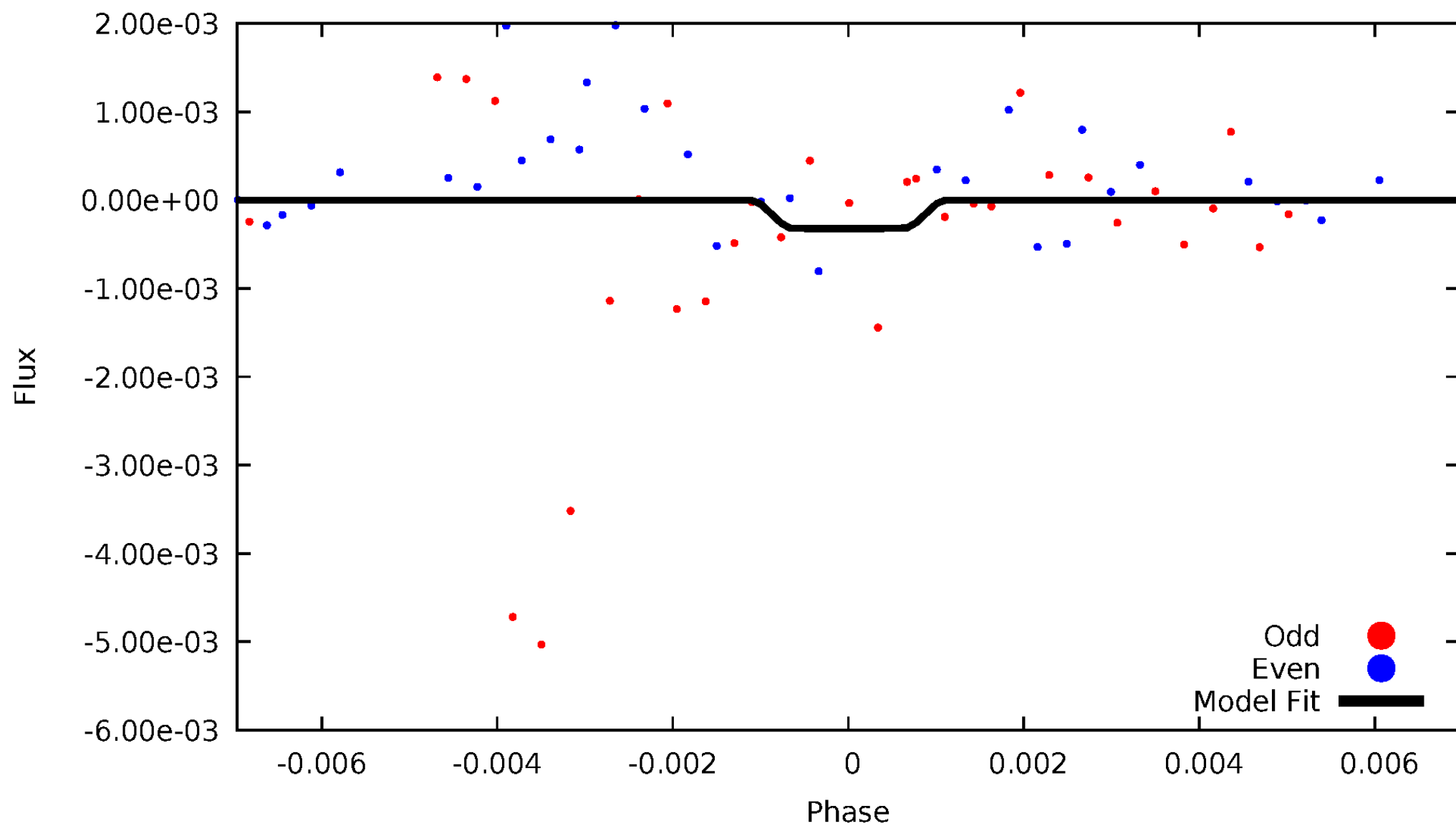
# DV Odd/Even

TCE 010395312-05



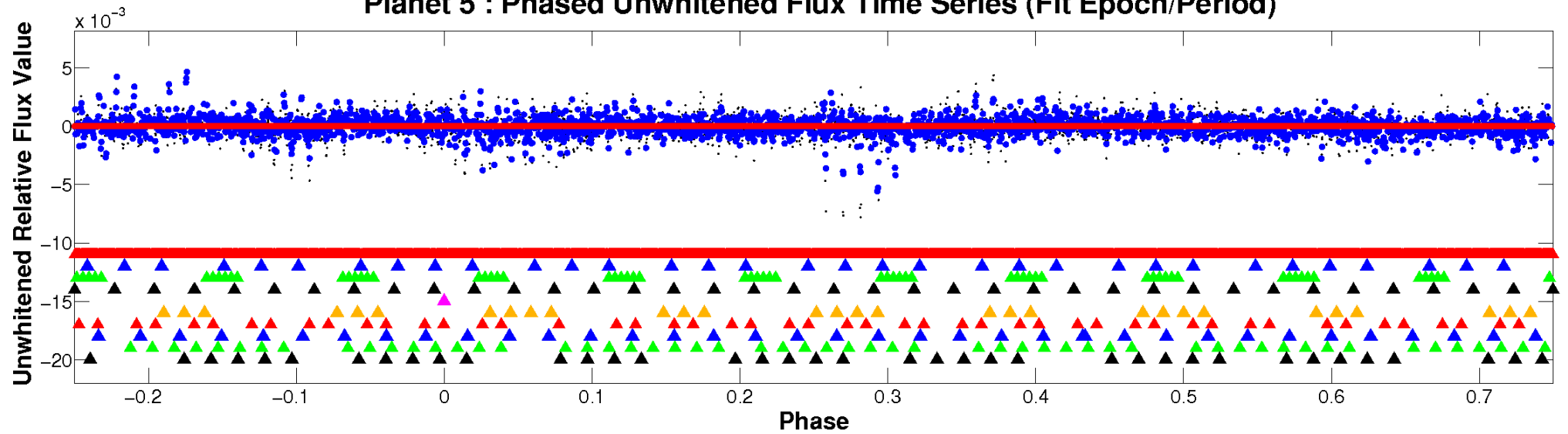
# ALT Odd/Even

TCE 010395312-05

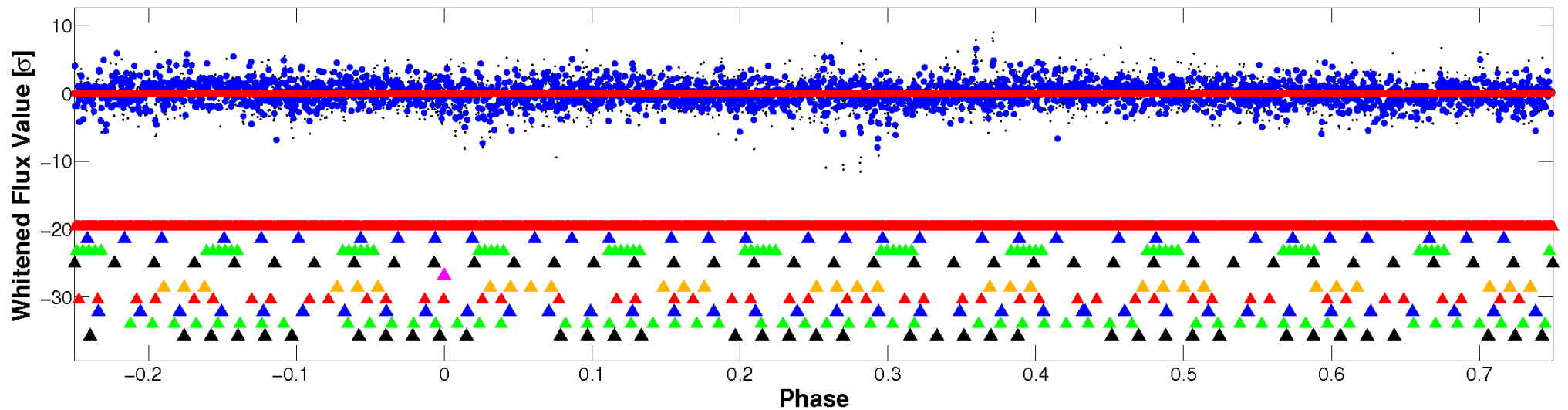


# Non-Whitened Vs. Whitened Light Curve

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



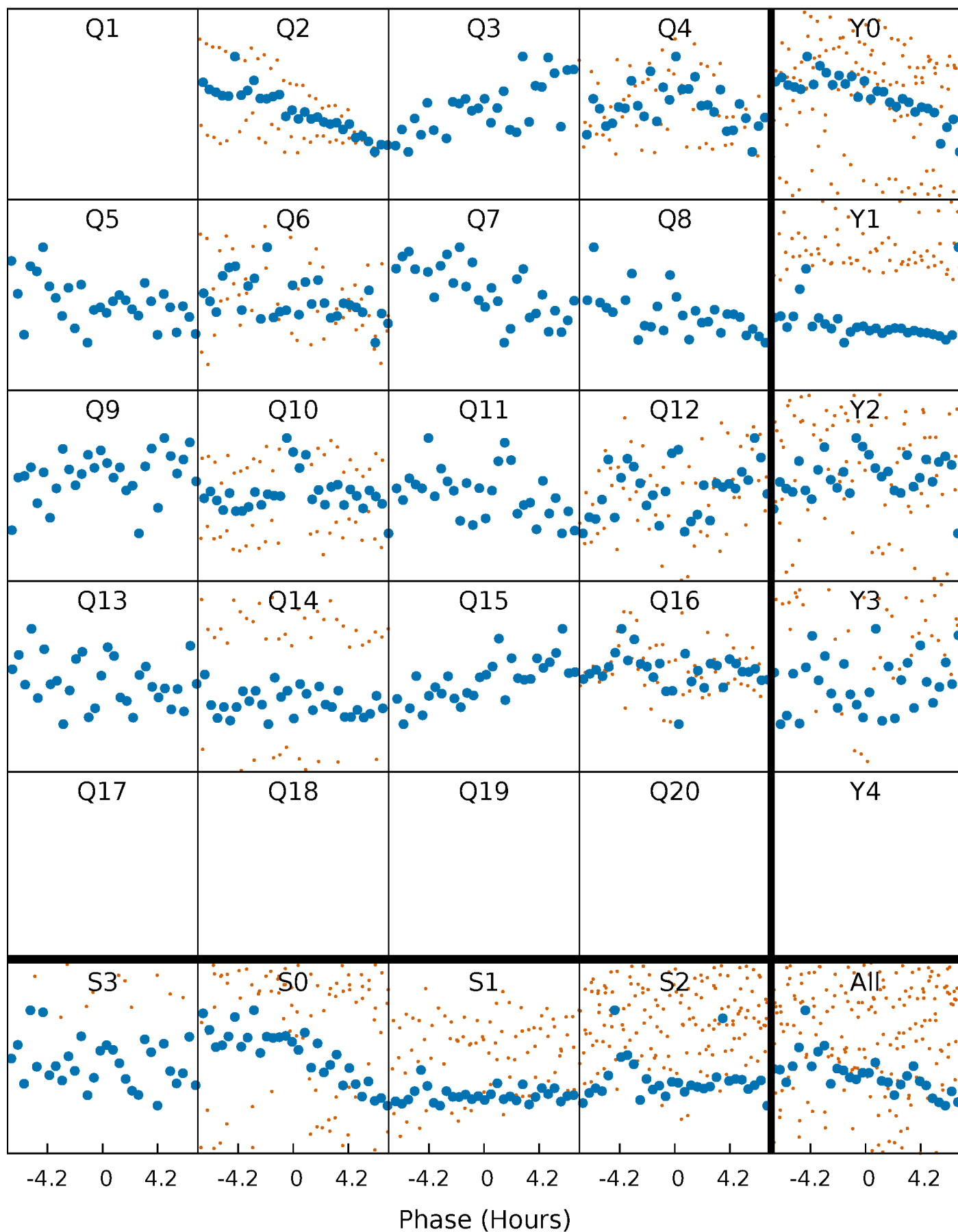
Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)





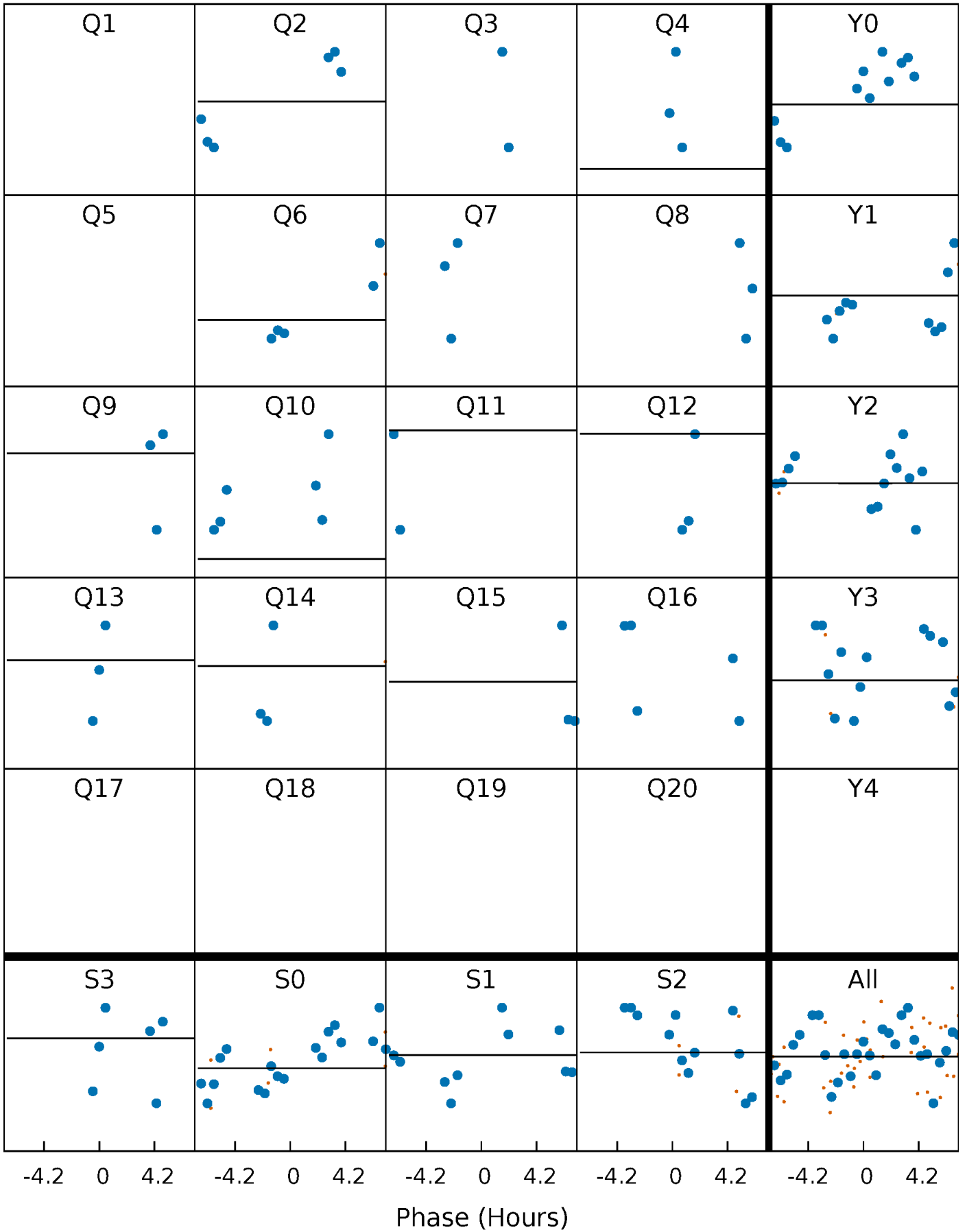
# PDC Quarter-Phased Transit Curves

TCE 010395312-05     $P = 62.134882$  Days     $T_0 = 184.242550$  (BKJD)



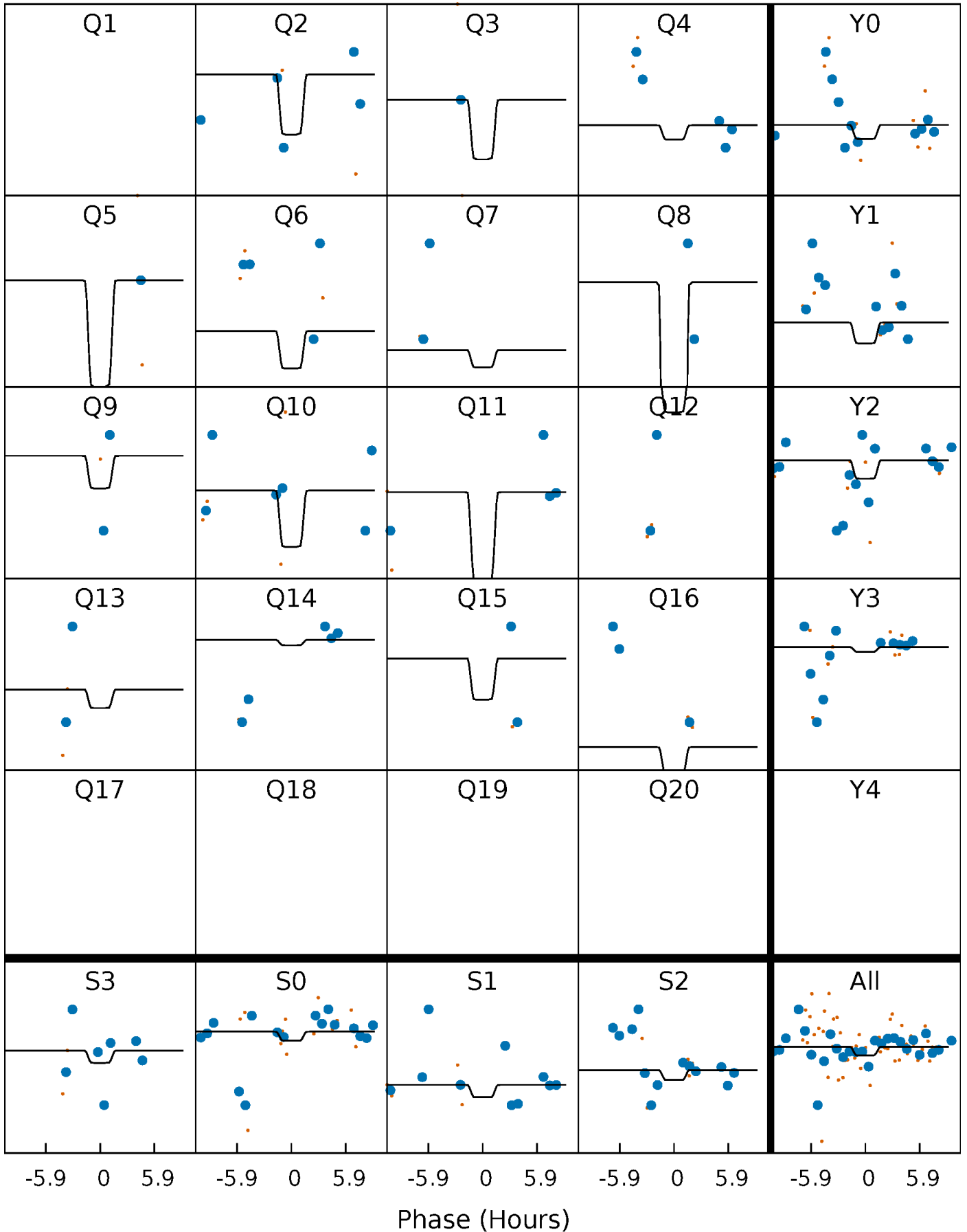
# DV Quarter-Phased Transit Curves

TCE 010395312-05     $P = 62.134882$  Days     $T_0 = 184.242550$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

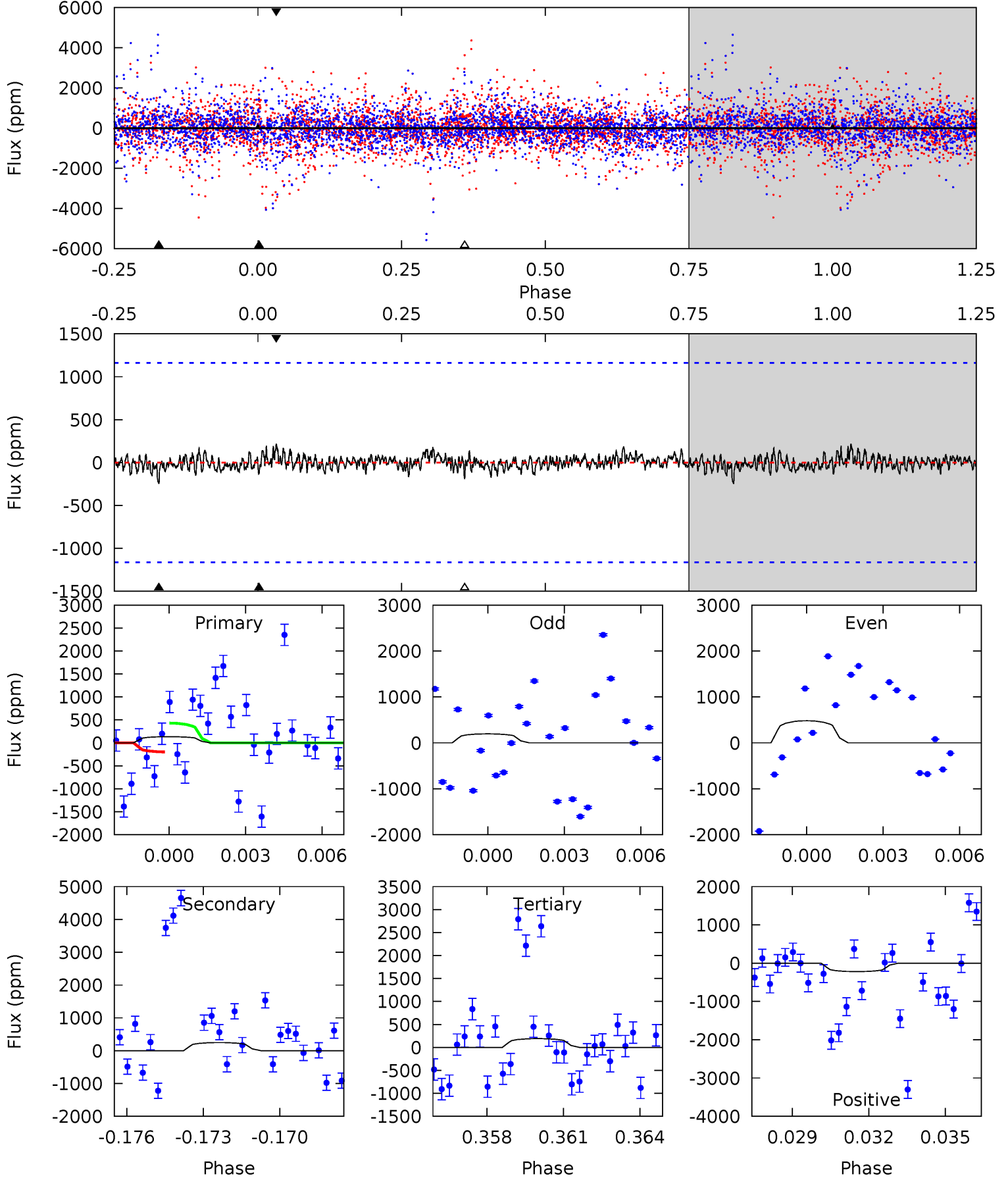
TCE 010395312-05     $P = 62.132757$  Days     $T_0 = 184.416801$  (BKJD)



# DV Model-Shift Uniqueness Test

010395312-05, P = 62.134882 Days, E = 122.107668 Days

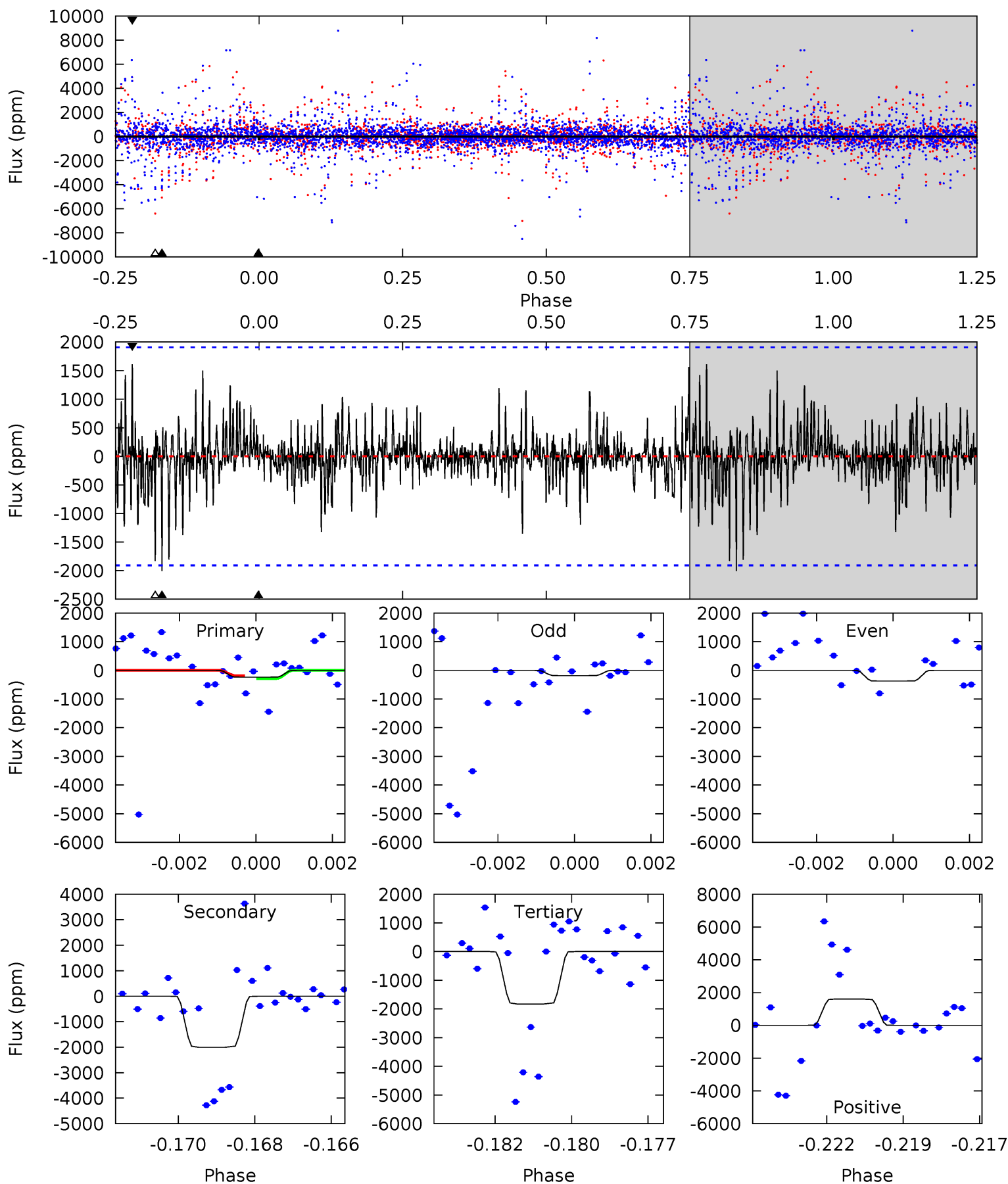
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.61	1.12	0.86	1.00	5.26	2.97	0.27	-0.25	-0.38	0.26	0.12	0.62	1.86	0.47	0.53



# Alt Model-Shift Uniqueness Test

010395312-05, P = 62.132757 Days, E = 122.284044 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.66	5.57	5.09	4.47	5.30	3.04	0.96	-4.43	-3.81	0.49	1.10	0.19	0.69	0.45	0.14



### Stellar Parameters For KIC 010395312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3553^{+48}_{-53}$	$4.906^{+0.035}_{-0.042}$	$-0.200^{+0.100}_{-0.100}$	$0.358^{+0.036}_{-0.036}$	$0.379^{+0.034}_{-0.046}$	$11.630^{+2.353}_{-1.957}$
	+1%/-1%	+1%/-1%	+50%/-50%	+10%/-10%	+9%/-12%	+20%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010395312-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-247 \pm 221$	$21.21^{+25.80}_{-15.34}$	$281^{+36}_{-27}$	$1547^{+415}_{-319}$	$12^{+127}_{-11}$
Alt.	$-2007 \pm 360$	$22.16^{+24.56}_{-15.26}$	$279^{+35}_{-24}$	$1888^{+555}_{-238}$	$110^{+1109}_{-89}$

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

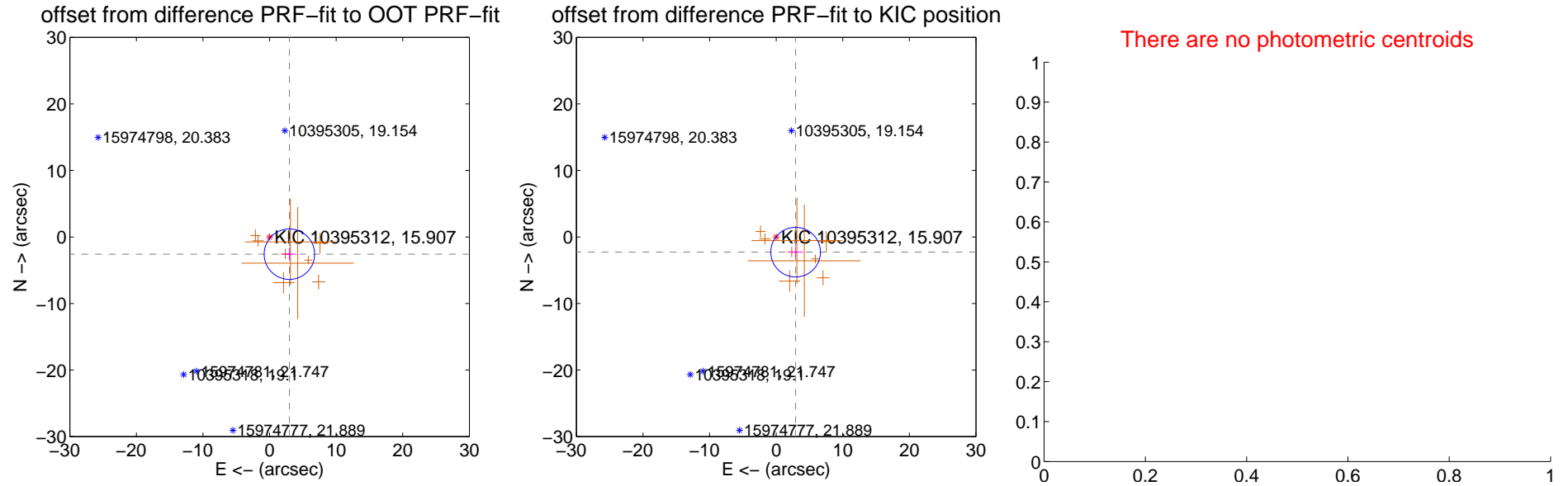
## DV Centroid Data

Supplemental centroid analysis for 010395312-05. Kepler magnitude: 15.91. Transit SNR 0.00

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

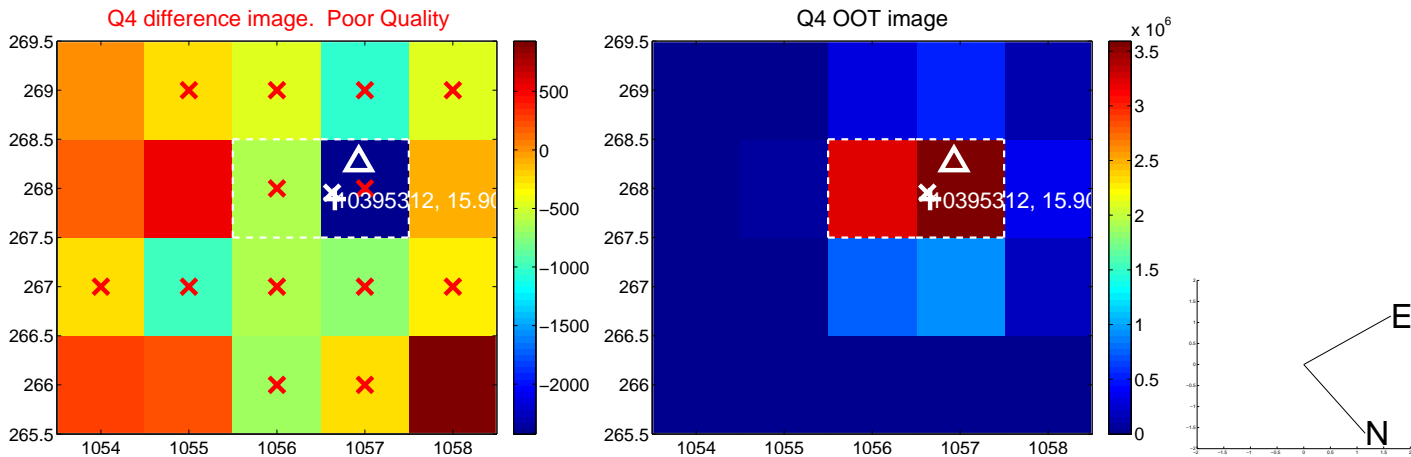
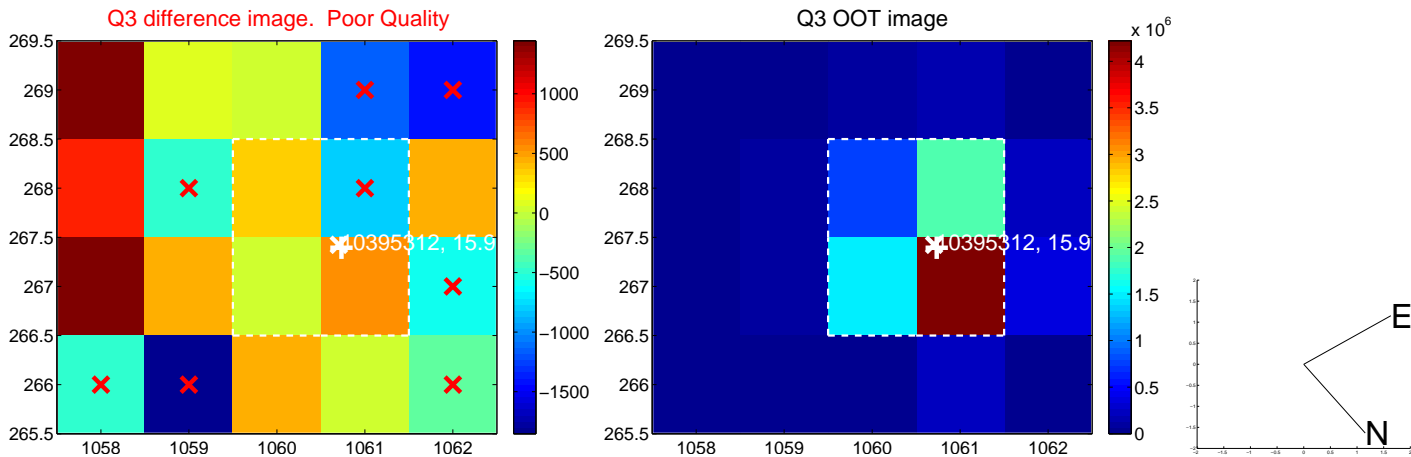
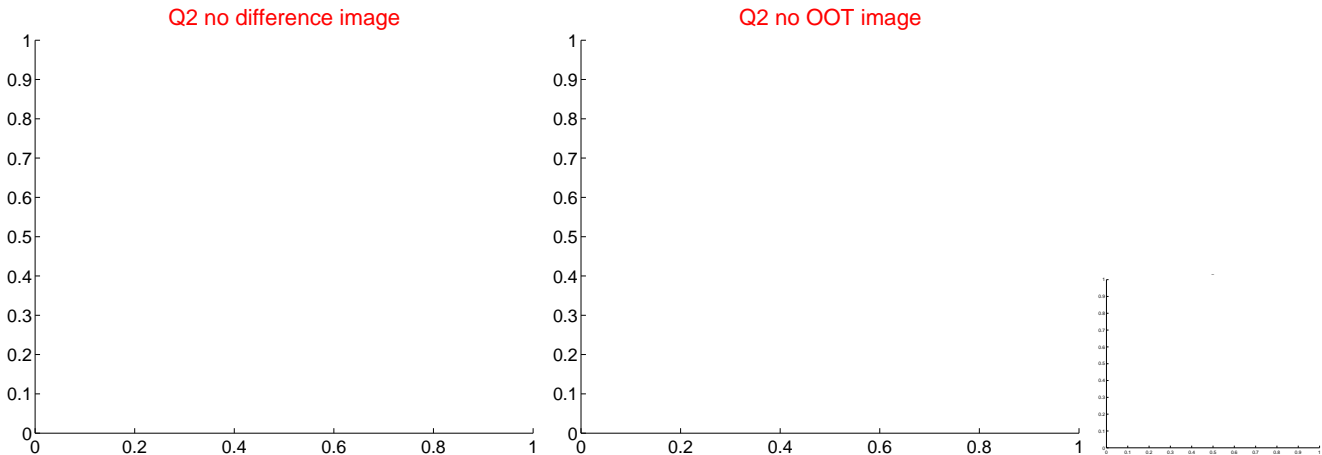
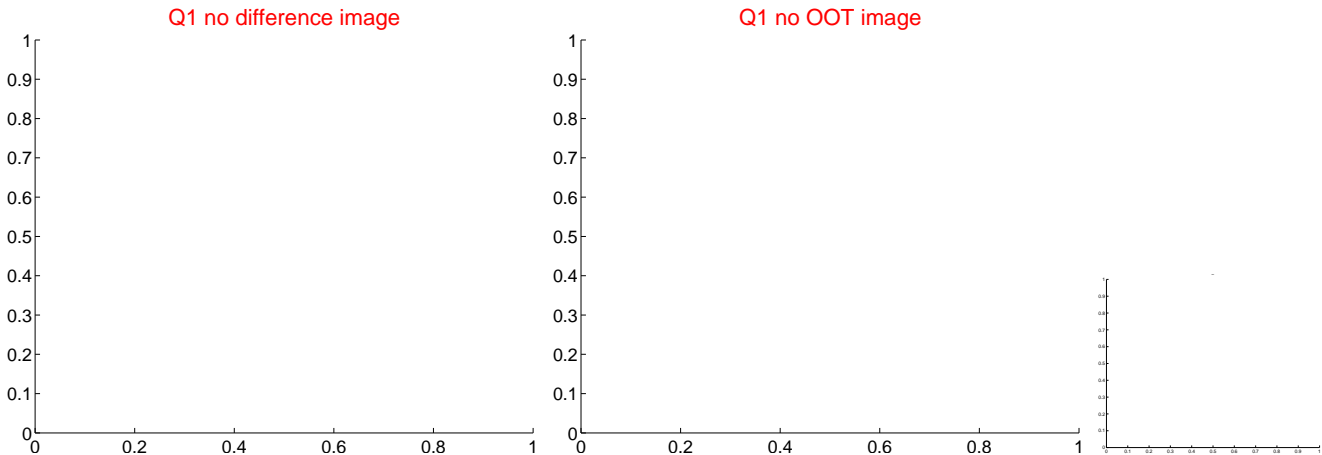
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.943 \pm 1.263$	3.12	$-2.974 \pm 1.046$	$-2.588 \pm 0.953$
PRF-fit source offset from KIC position	$3.705 \pm 1.242$	2.98	$-2.918 \pm 1.113$	$-2.283 \pm 0.845$
photometric centroid source offset	—	—	—	—



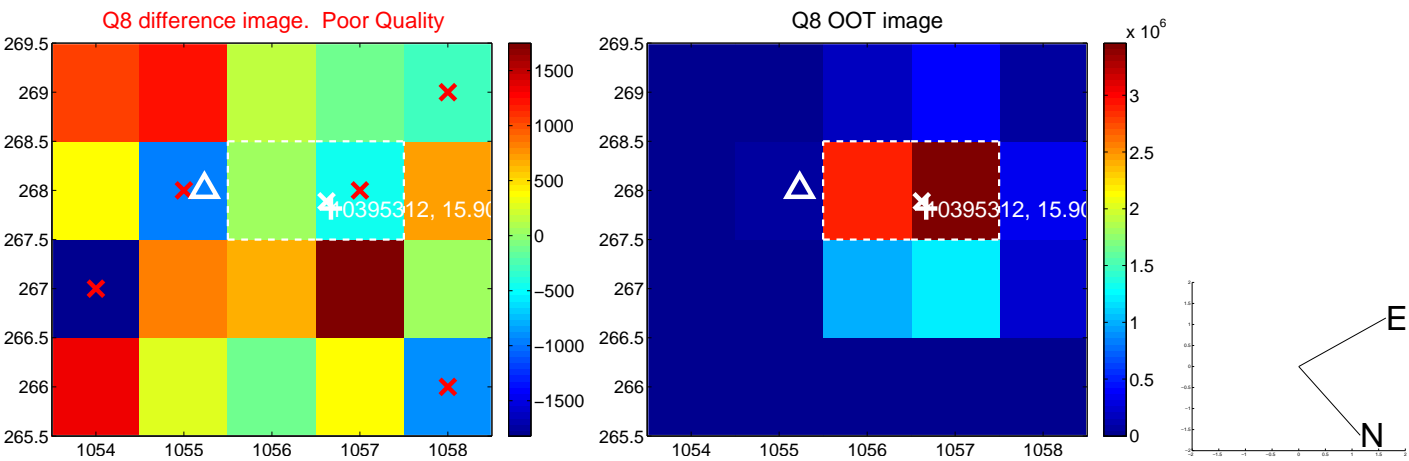
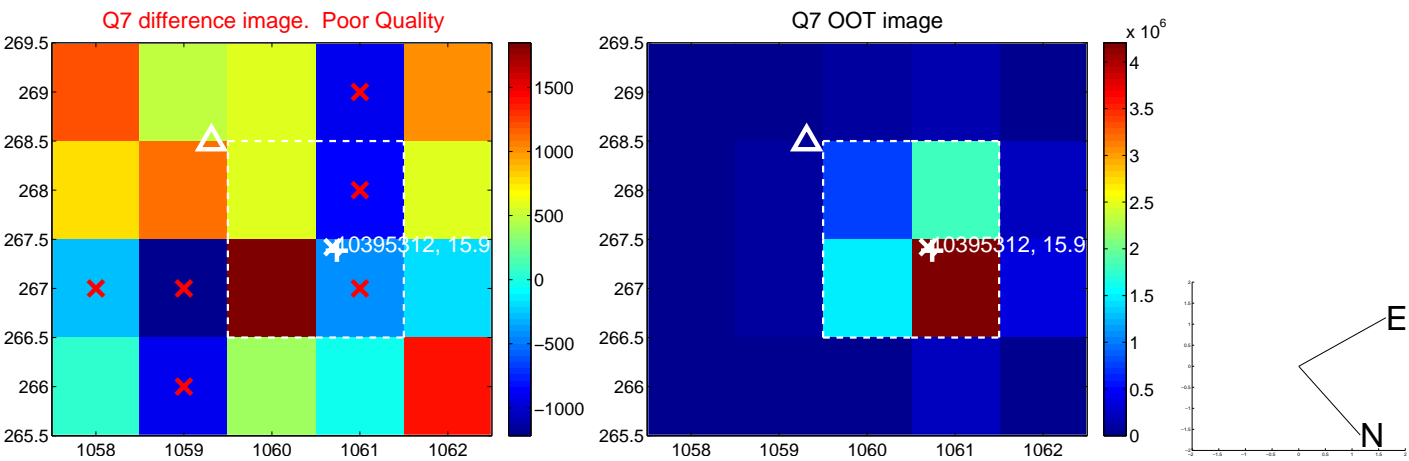
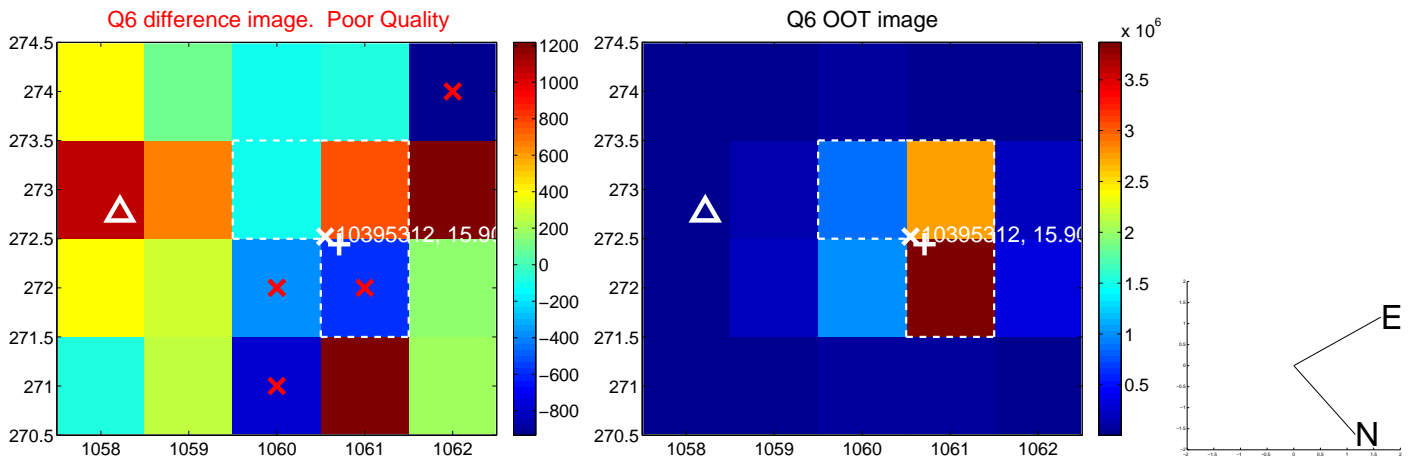
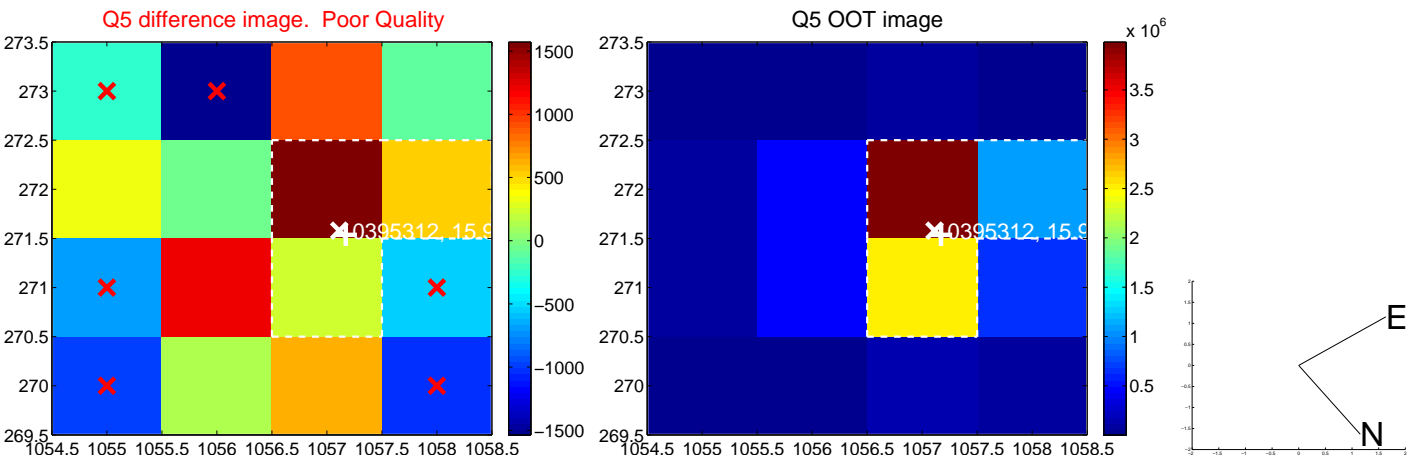
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



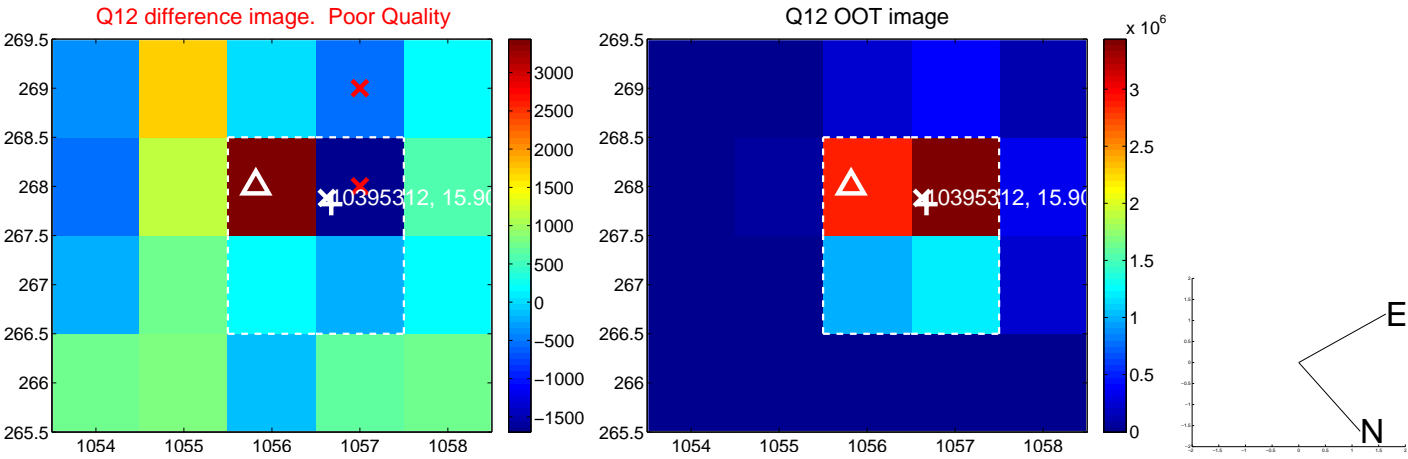
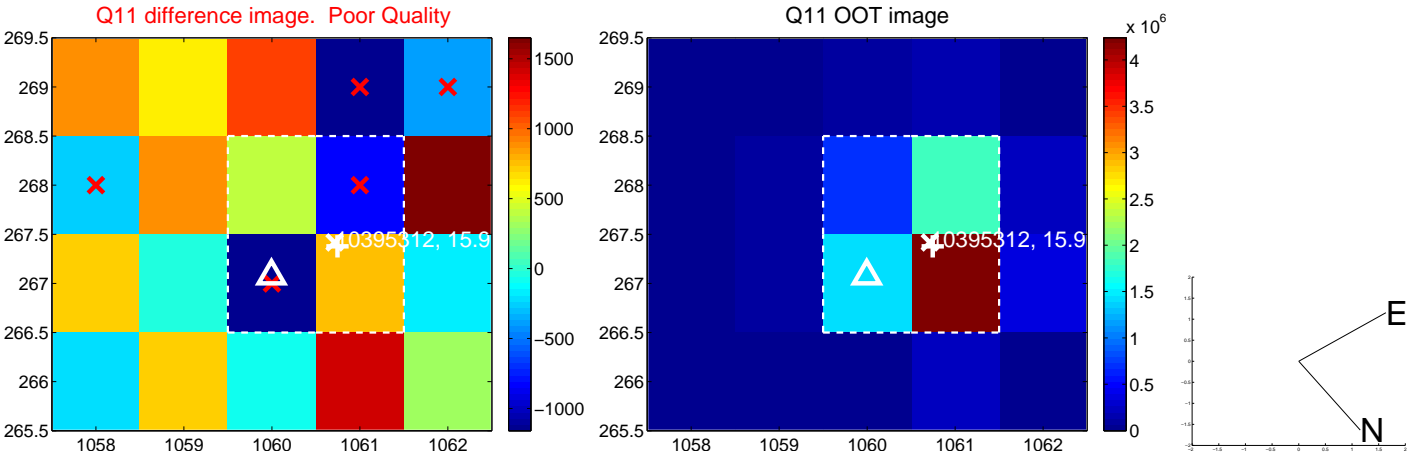
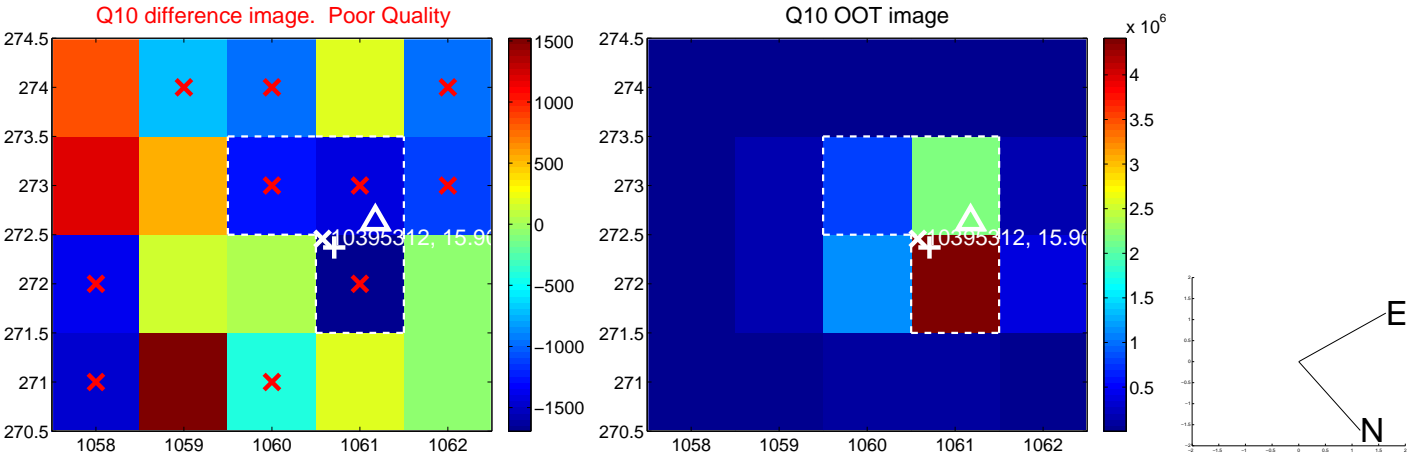
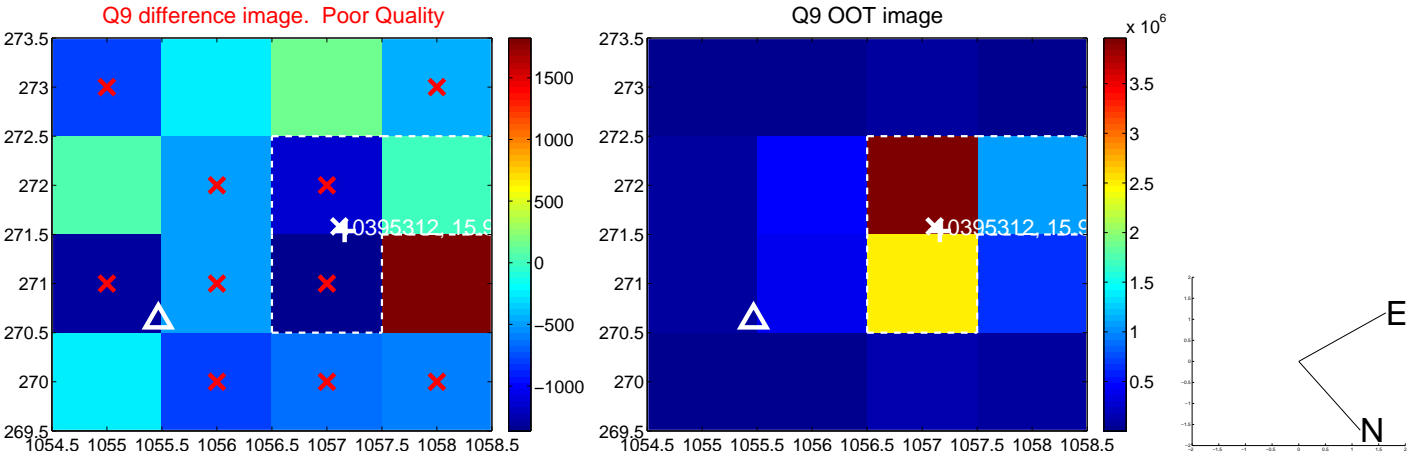
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



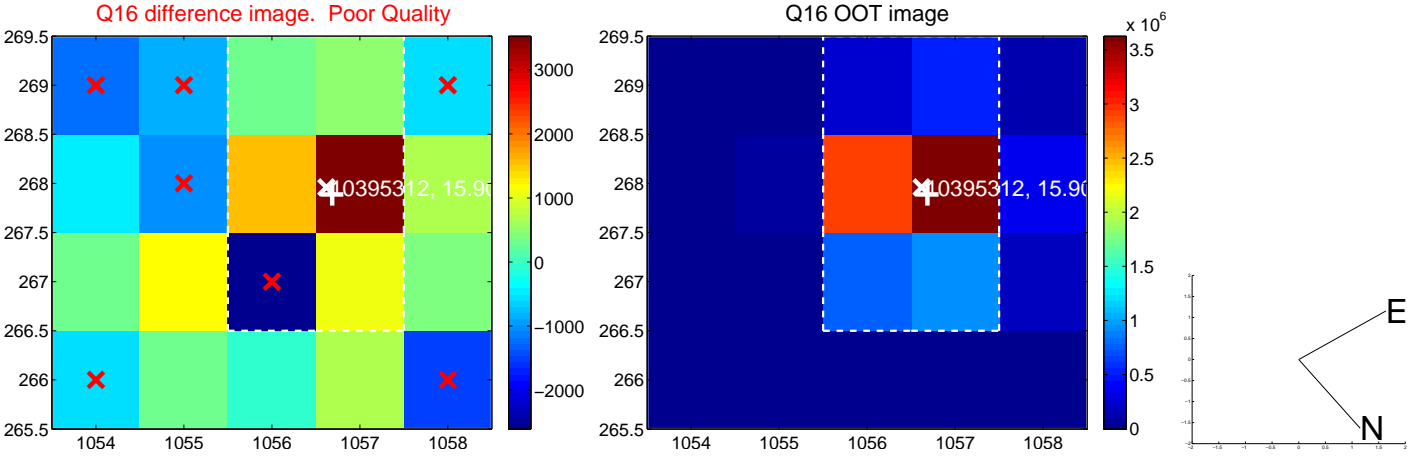
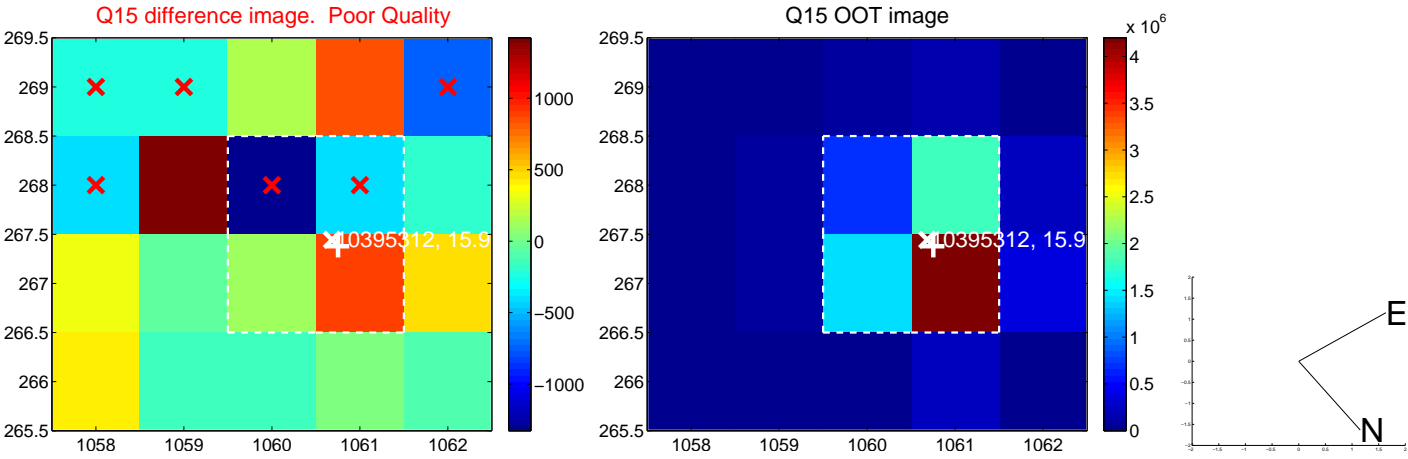
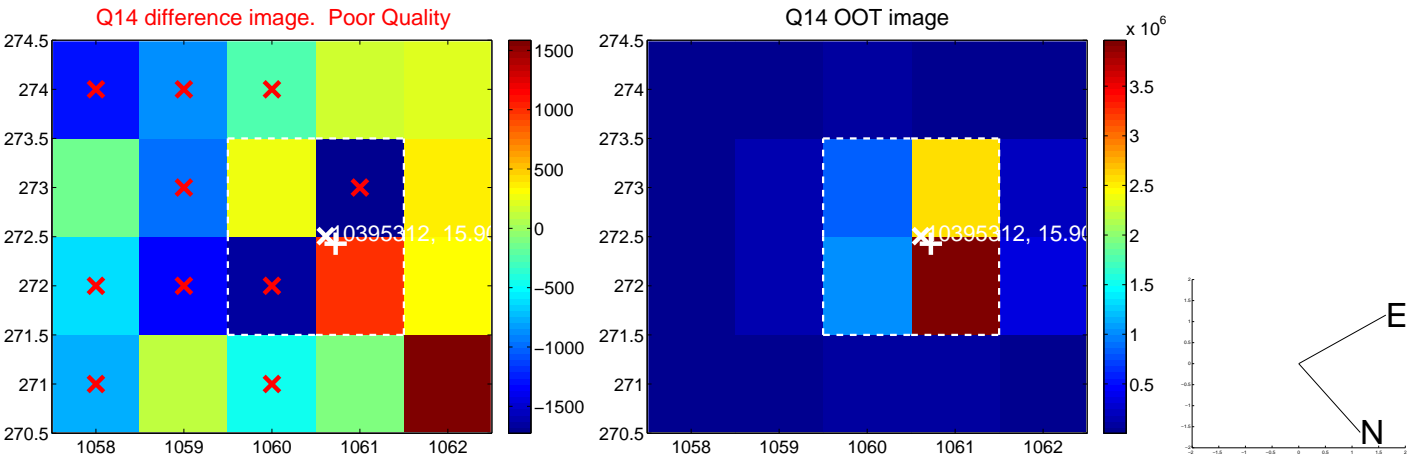
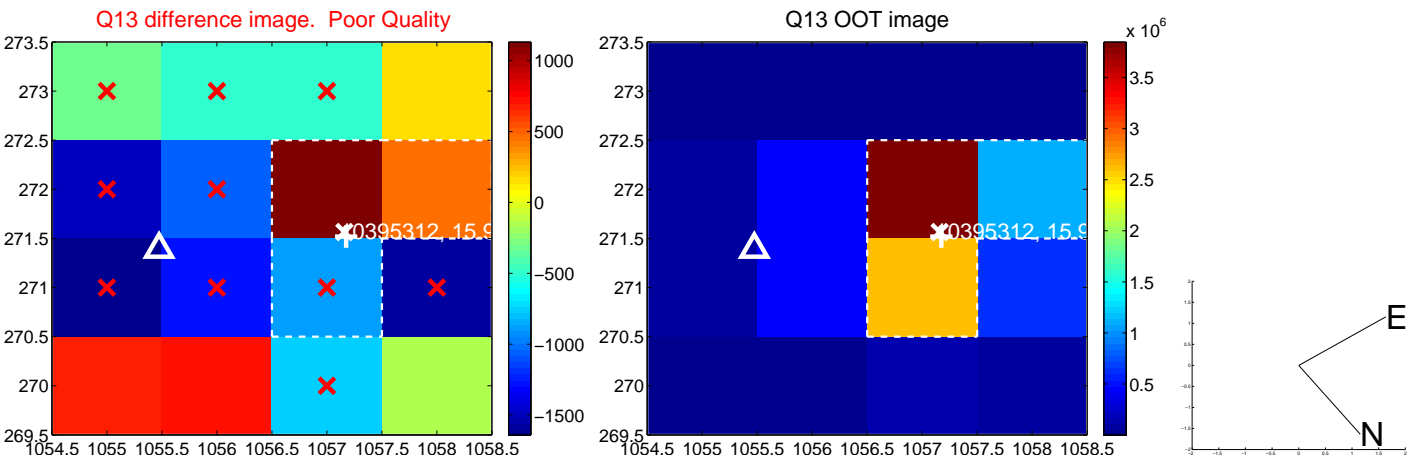
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

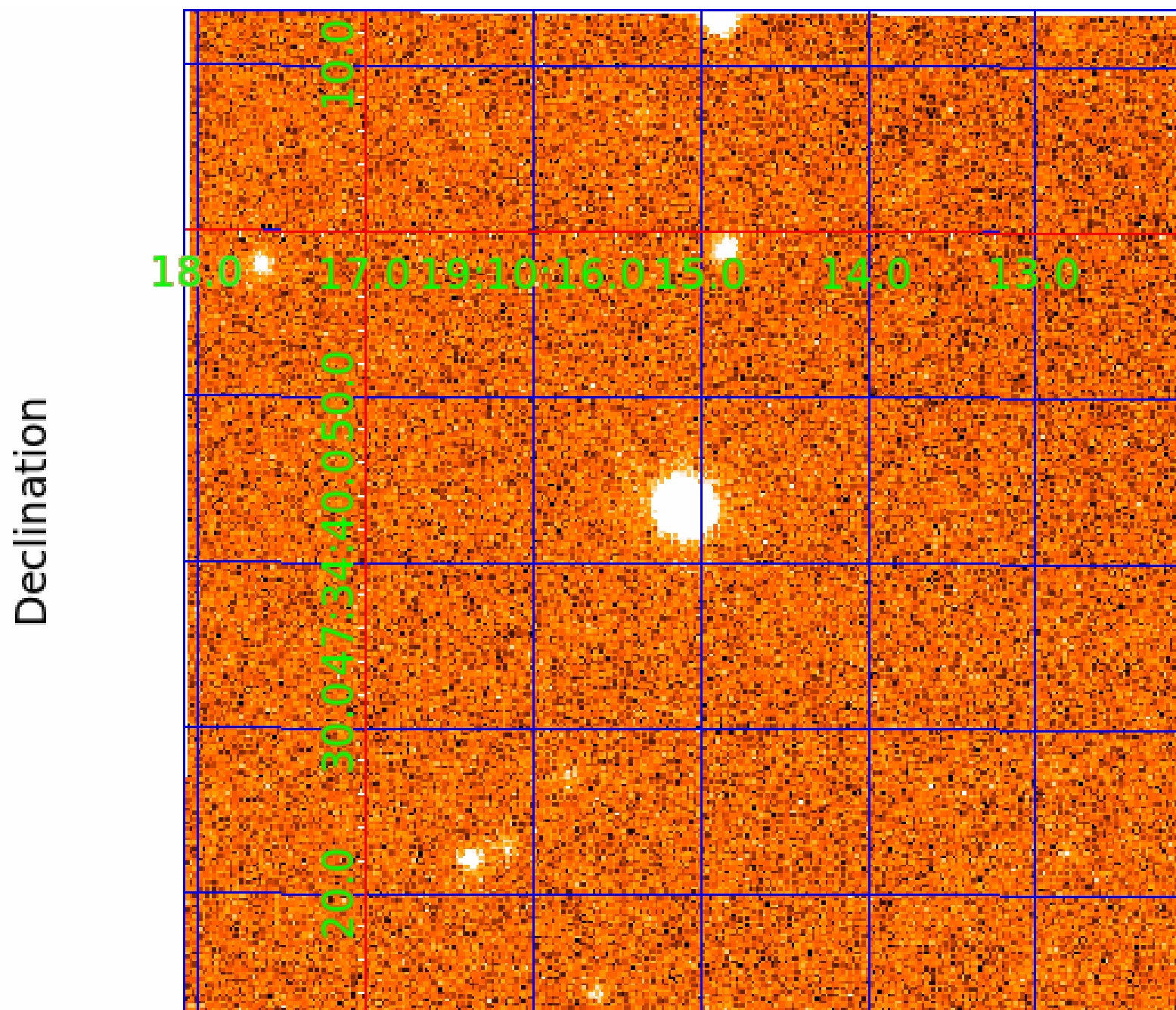


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image



## KIC 010395312

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010395312-01	OBS	No	0.734969	131.818451	68.7	5.235	7.8	10.6	0.36	3553	0.30	138.09
010395312-02	OBS	No	43.338219	160.884184	1756.7	2.650	18.5	11.9	0.36	3553	1.49	0.60
010395312-03	OBS	No	22.617913	145.928423	0.0	14.208	12.1	0.0	0.36	3553	0.01	1.43
010395312-04	OBS	No	21.830529	141.862680	332.5	2.263	13.1	2.6	0.36	3553	0.77	1.50
010395312-05	OBS	No	62.134882	184.242550	0.1	3.631	13.2	0.0	0.36	3553	0.01	0.37
010395312-07	OBS	No	29.856582	155.990807	2220.3	1.681	13.8	11.7	0.36	3553	1.71	0.99
010395312-08	OBS	No	39.700029	148.941743	1333.3	2.348	11.7	10.1	0.36	3553	1.50	0.68
010395312-09	OBS	No	26.497868	133.642244	3844.7	1.500	14.1	-1.0	0.36	3553	2.21	1.16
010395312-10	OBS	No	38.975665	141.685996	5375.8	1.500	19.0	-1.0	0.36	3553	2.62	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010395312-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010395312-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010395312-08	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
010395312-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
010395312-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

**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.

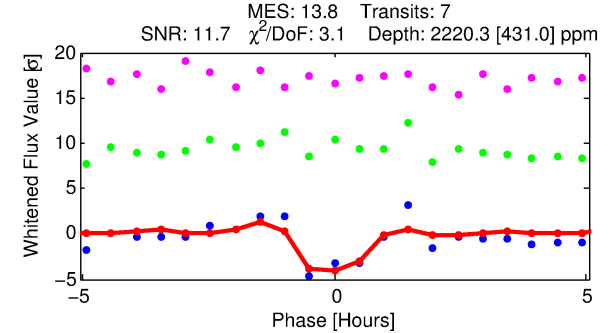
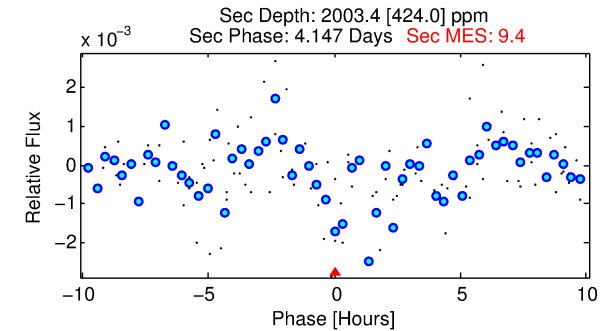
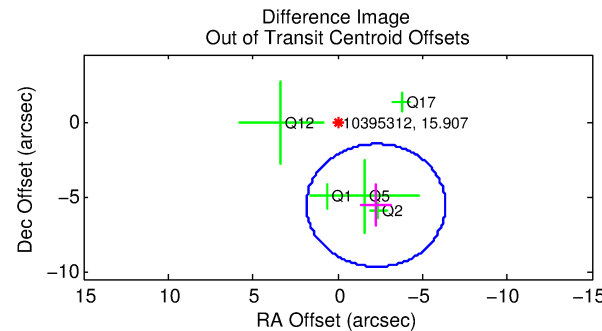
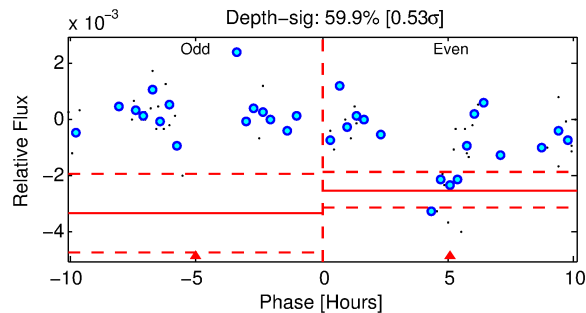
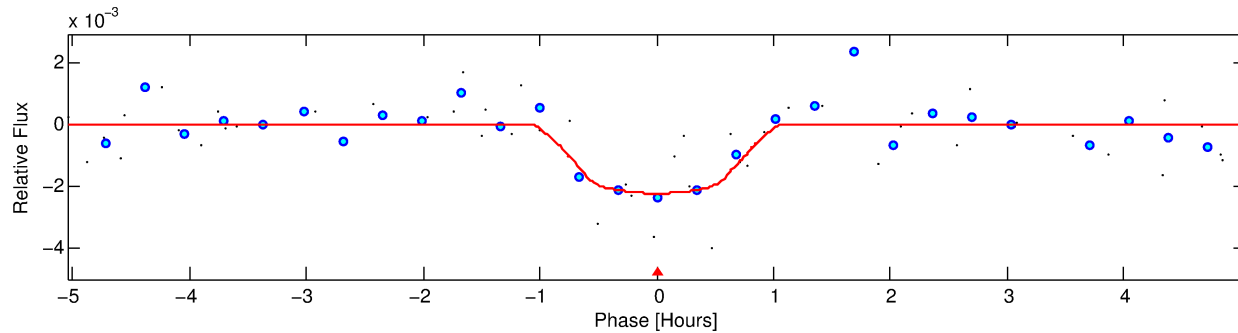
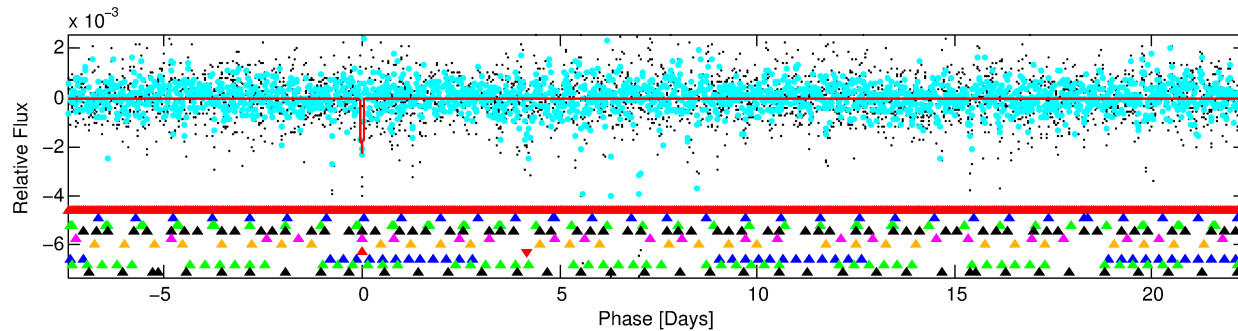
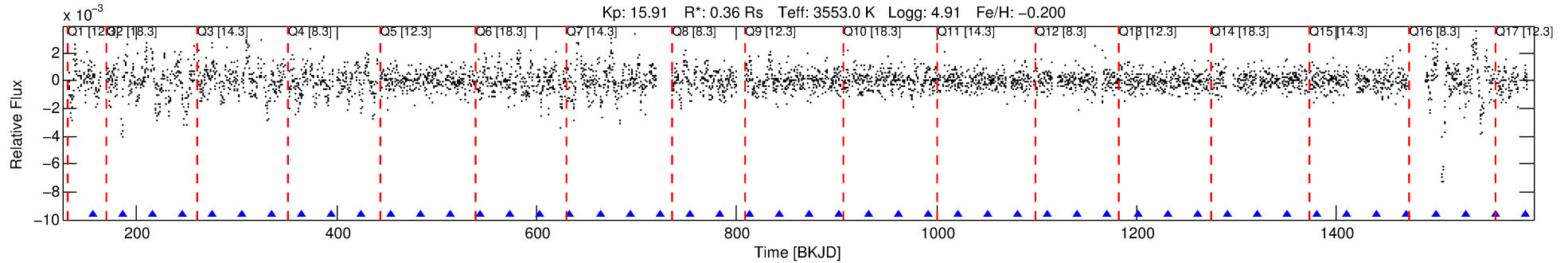
Ephemeris Match Information For 010395312-07

No Significant Match Found



# DV One-Page Summary

KIC: 10395312 Candidate: 7 of 10 Period: 29.857 d



## DV Fit Results:

Period = 29.85658 [0.00027] d  
Epoch = 155.9908 [0.0089] BKJD  
Rp/R\* = 0.0437 [0.1691]  
a/R\* = 131.33 [2321.96]  
b = 0.39 [38.56]  
Seff = 0.99 [0.11]  
Teq = 254 [7] K  
Rp = 1.71 [6.61] Re  
a = 0.1360 [0.0101] AU  
Ag = 6997.28 [54168.09] [0.13 $\sigma$ ]  
Teffp = 3596 [6959] K [0.48 $\sigma$ ]

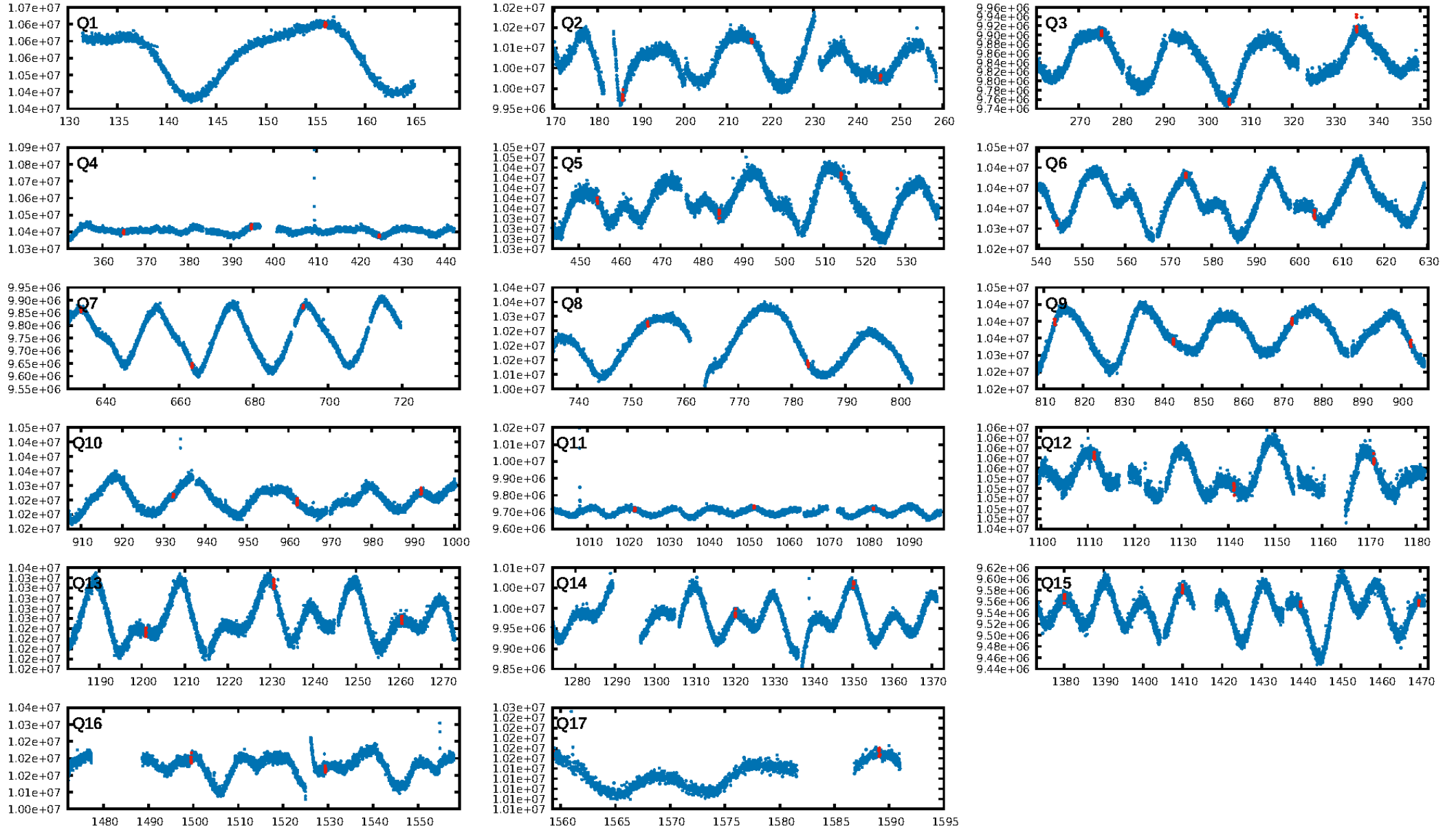
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [35.78 $\sigma$ ]  
LongPeriod-sig: 100.0% [97.14 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 60.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: 0.2929  
Centroid-sig: 3.6%  
Centroid-so: 0.870 arcsec [2.31 $\sigma$ ]  
OotOffset-rm: 6.024 arcsec [4.41 $\sigma$ ]  
KicOffset-rm: 5.583 arcsec [3.88 $\sigma$ ]  
OotOffset-st: 1/0/1/3 [5]  
KicOffset-st: 1/0/1/3 [5]  
DiffImageQuality-fgm: 0.00 [0/5]  
DiffImageOverlap-fno: 0.12 [2/17]

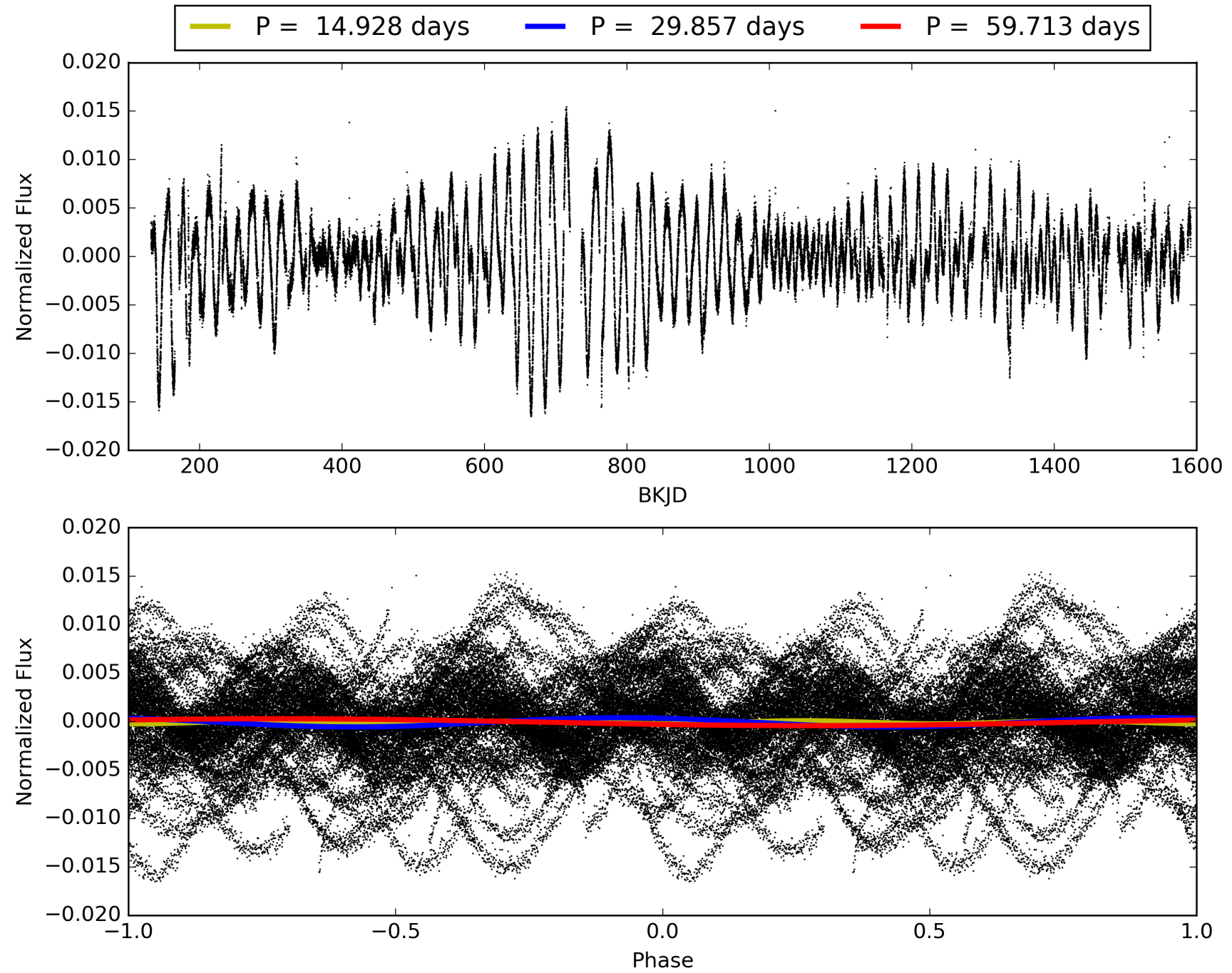
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:44:35 Z

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

# TCE 010395312-07, PDC Light Curves

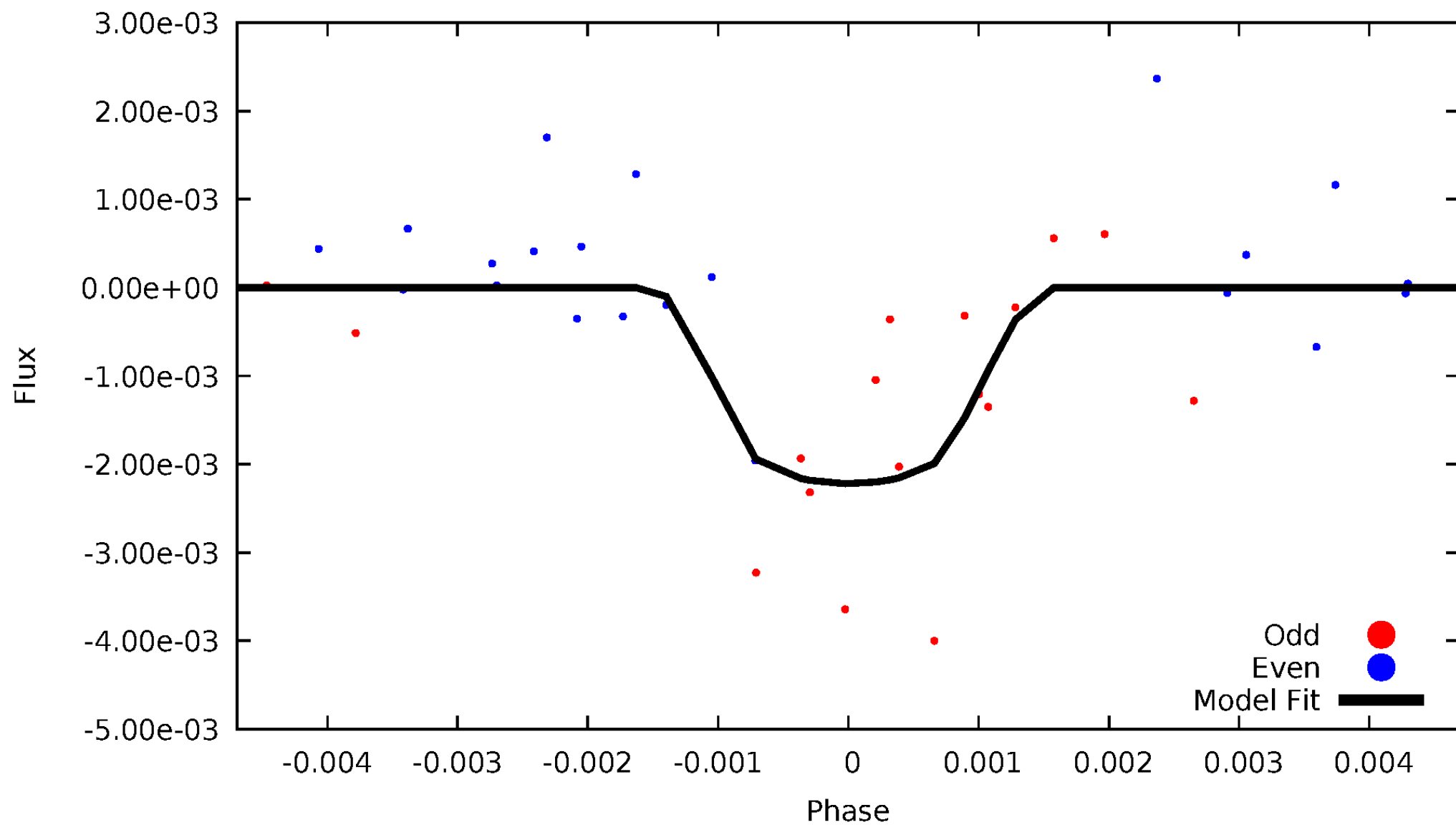


TCE 010395312-07



# DV Odd/Even

TCE 010395312-07

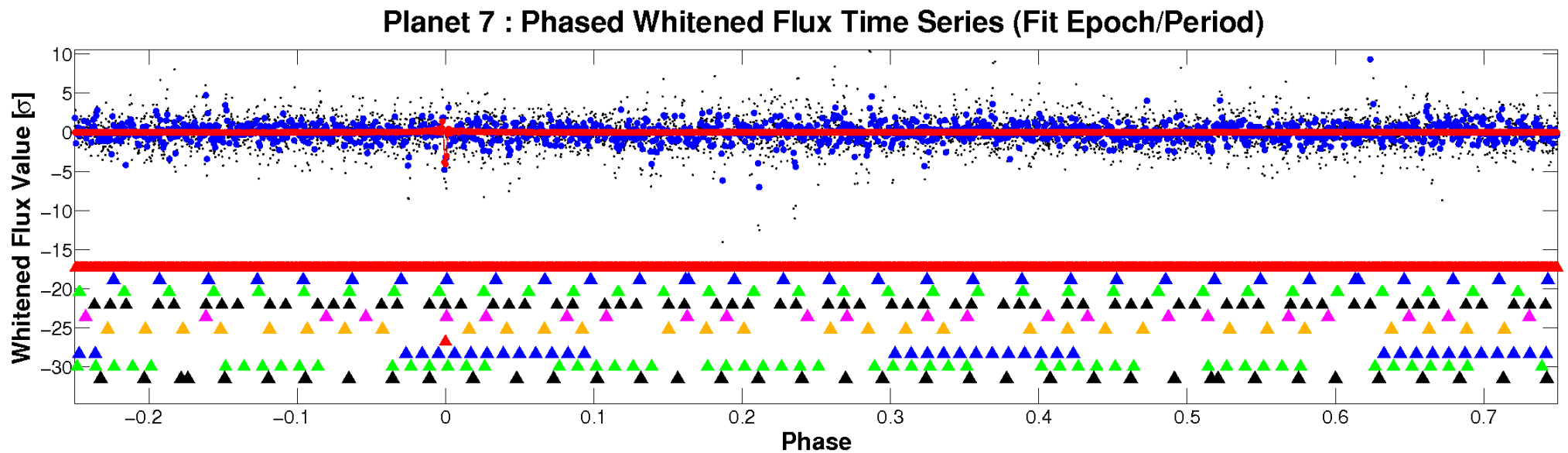
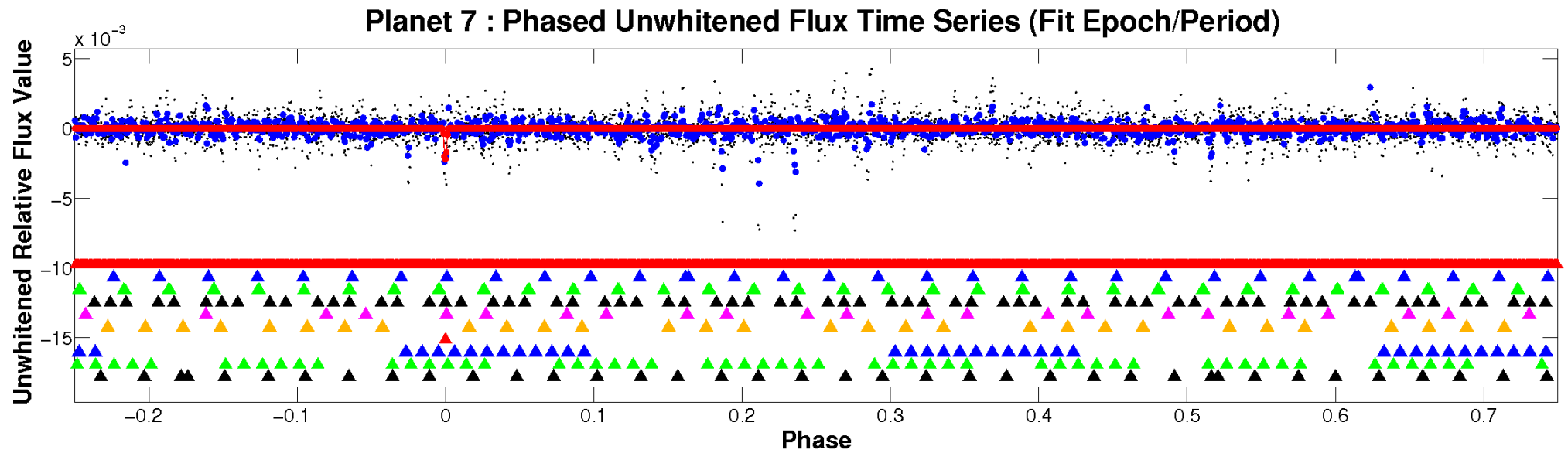




ALT Odd/Even

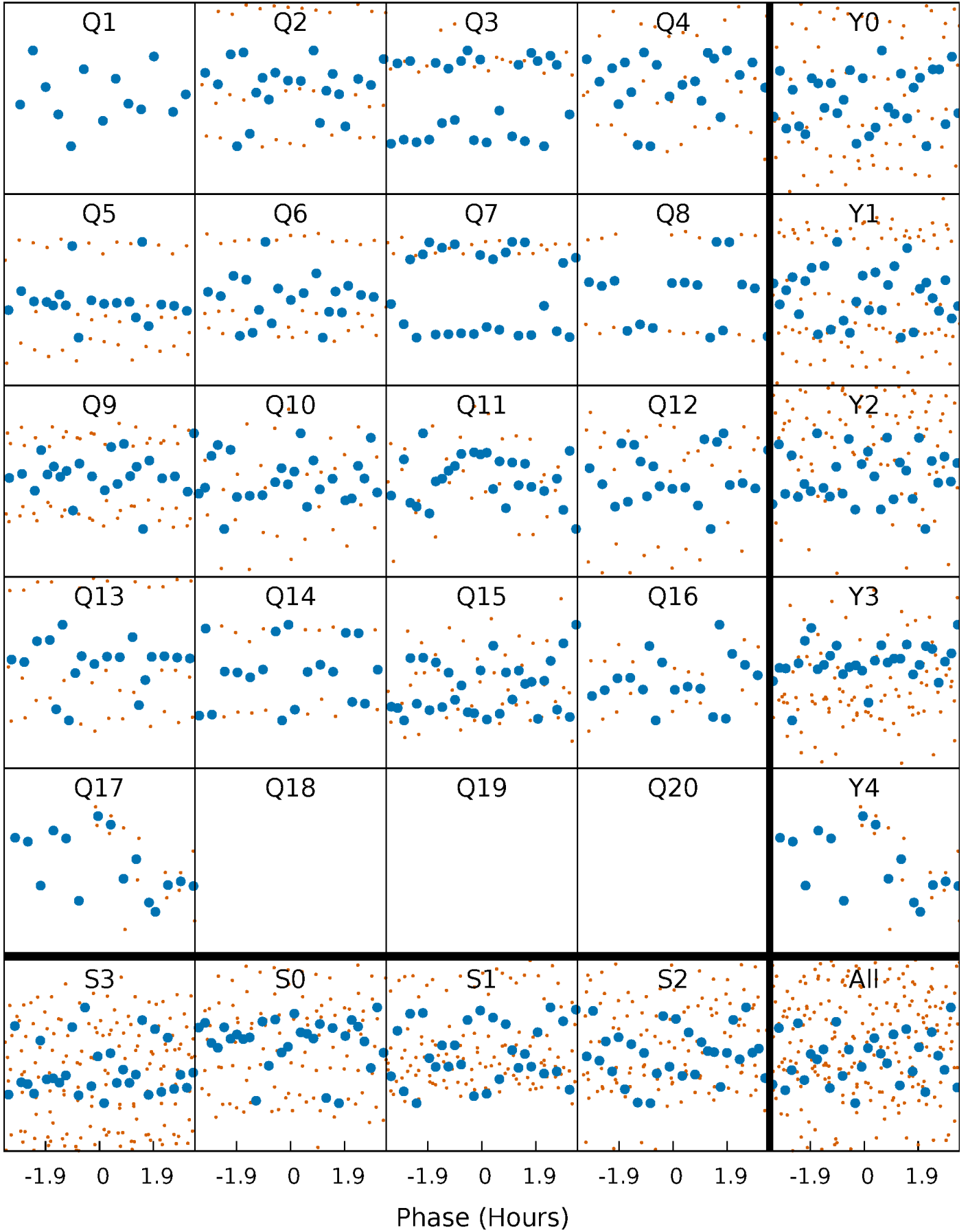
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

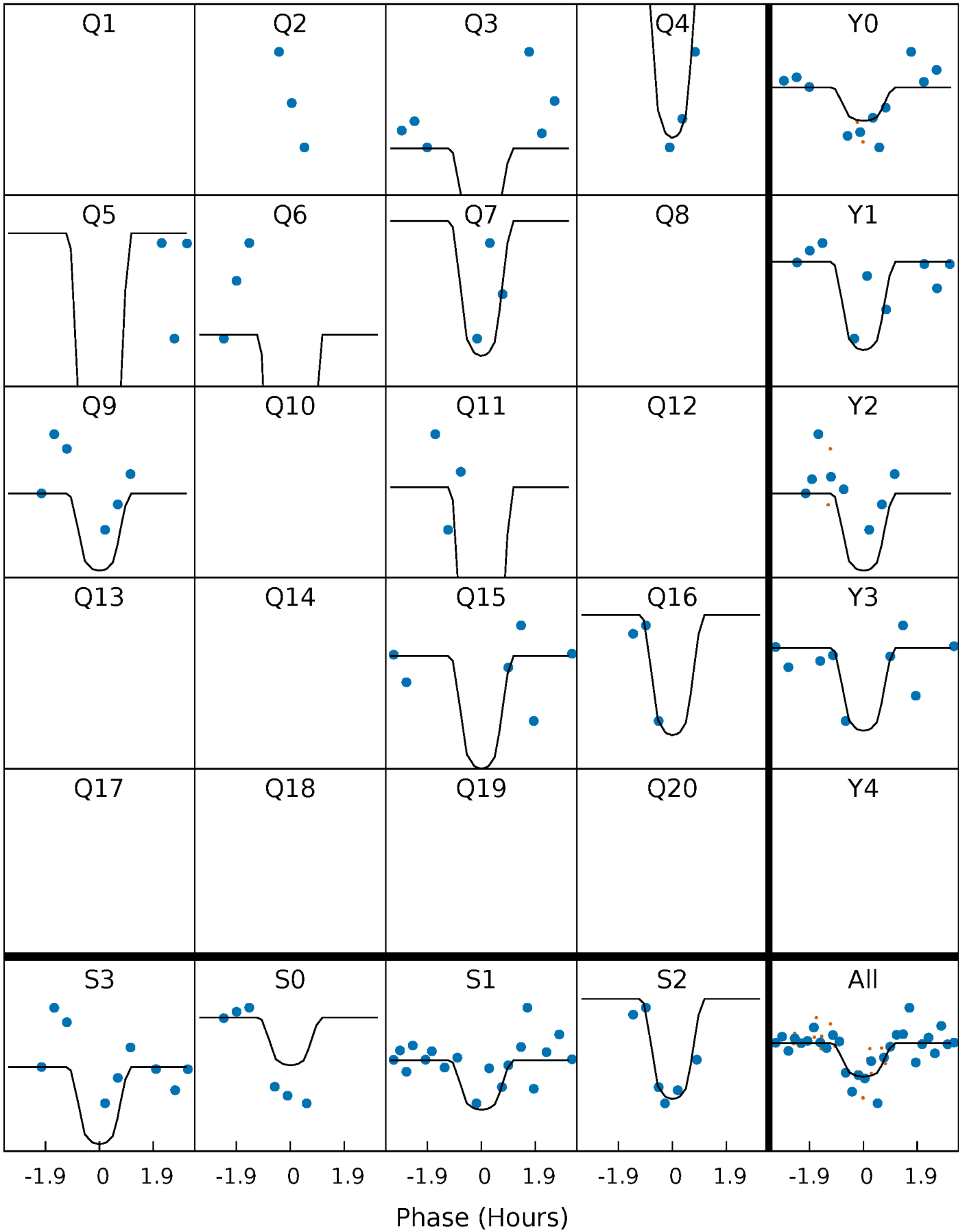
TCE 010395312-07   P= 29.856582 Days    $T_0=155.990807$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 010395312-07     $P = 29.856582$  Days     $T_0 = 155.990807$  (BKJD)

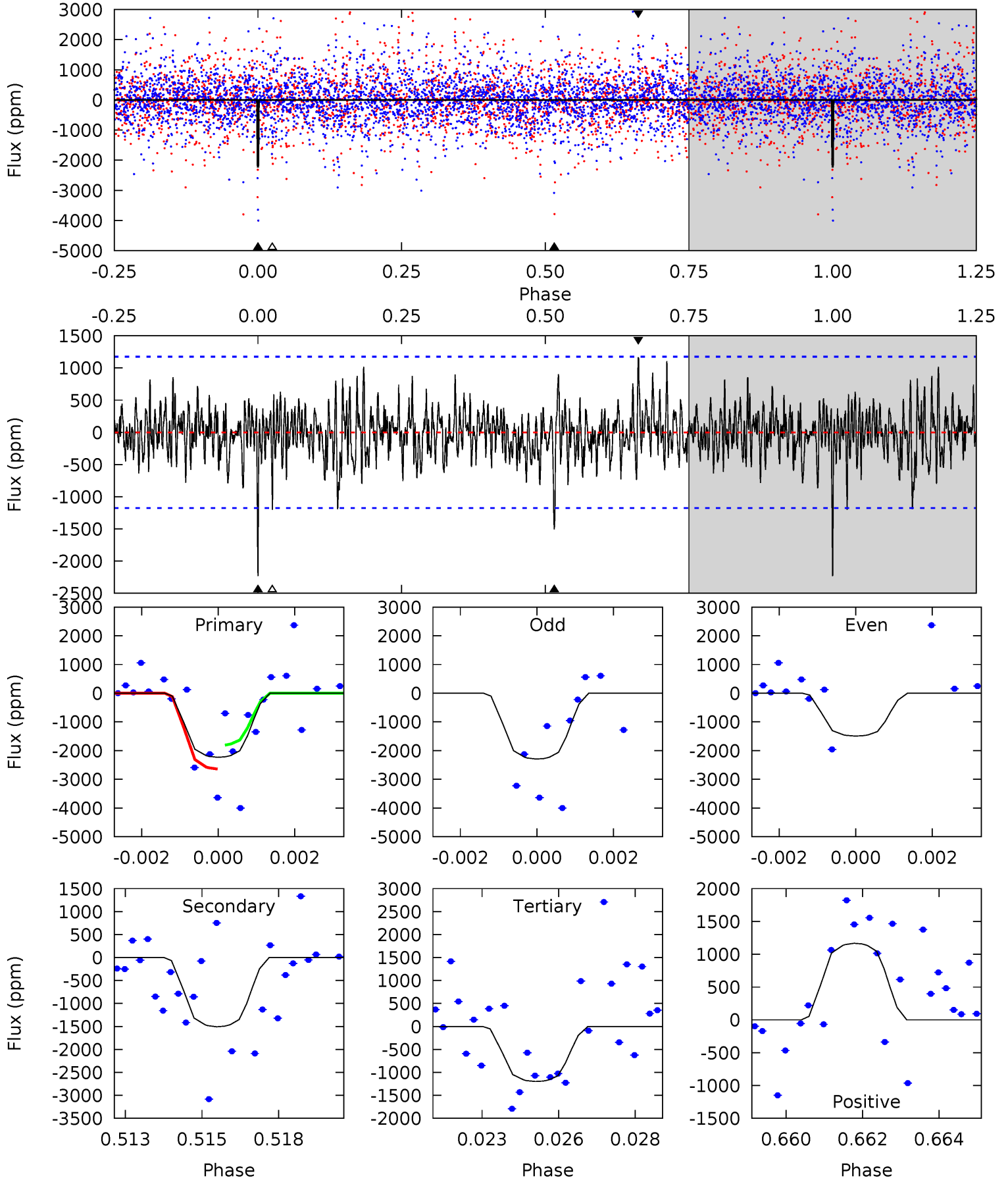


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

010395312-07, P = 29.856582 Days, E = 126.134225 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	6.79	5.40	5.25	5.30	3.04	1.42	4.66	4.81	1.39	1.54	1.00	0.95	0.34	1.88



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 010395312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3553^{+48}_{-53}$	$4.906^{+0.035}_{-0.042}$	$-0.200^{+0.100}_{-0.100}$	$0.358^{+0.036}_{-0.036}$	$0.379^{+0.034}_{-0.046}$	$11.630^{+2.353}_{-1.957}$
	+1%/-1%	+1%/-1%	+50%/-50%	+10%/-10%	+9%/-12%	+20%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010395312-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1507 \pm 222$	$5.18^{+5.31}_{-3.64}$	$356^{+7}_{-8}$	$2515^{+1030}_{-375}$	$553^{+6136}_{-415}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

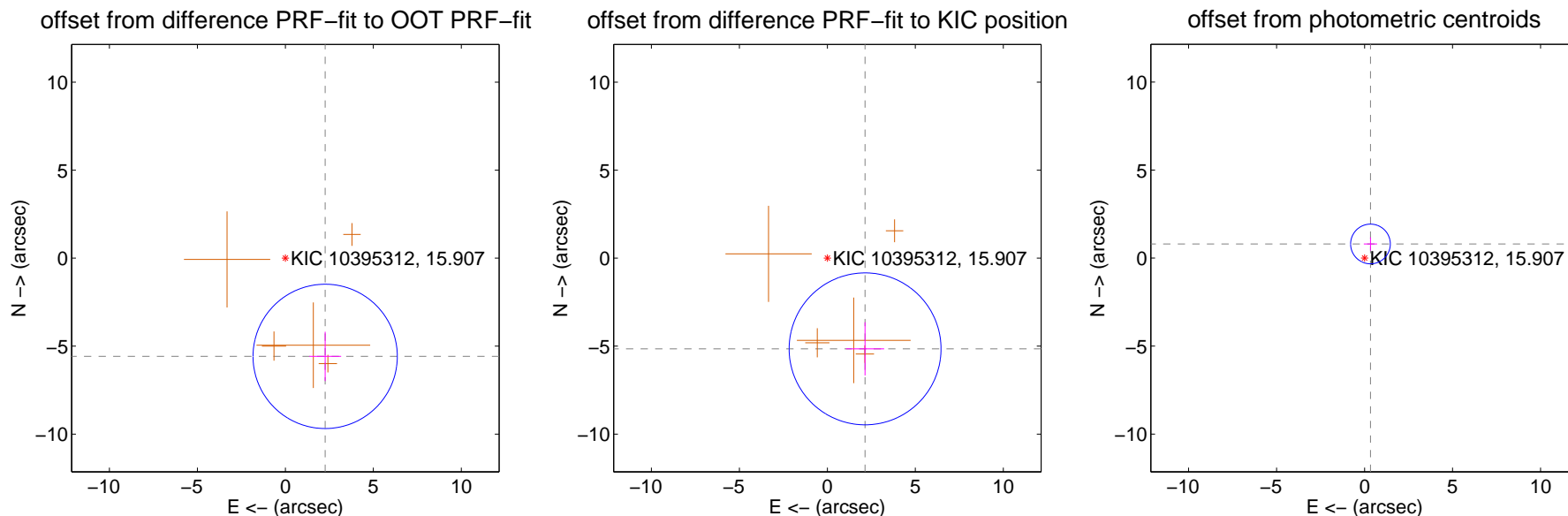
## DV Centroid Data

Supplemental centroid analysis for 010395312-07. Kepler magnitude: 15.91. Transit SNR 11.69

There are 0 quarters with good PRF difference image offsets

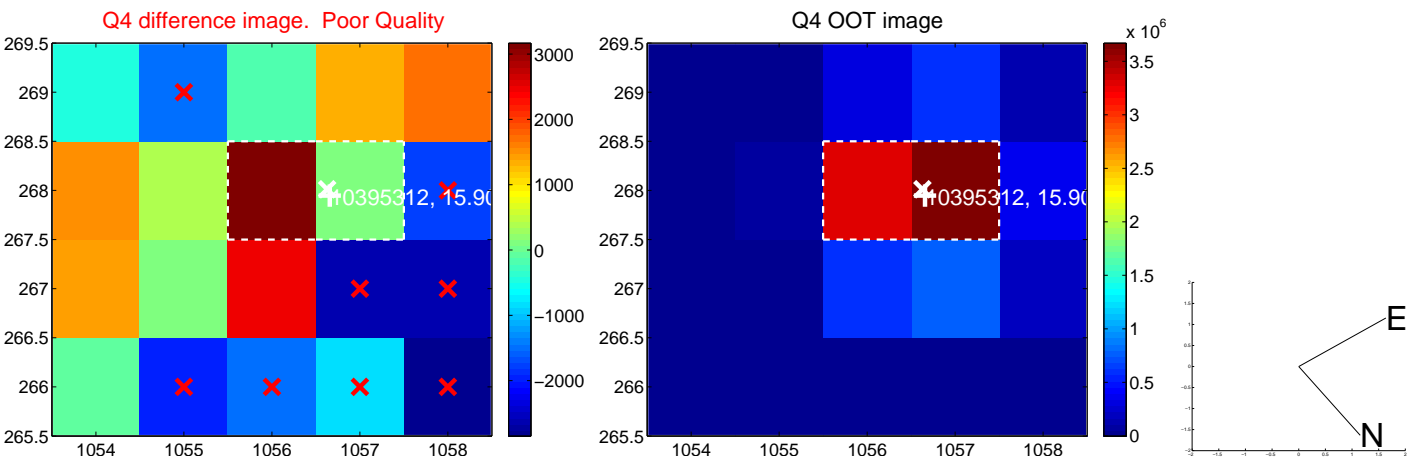
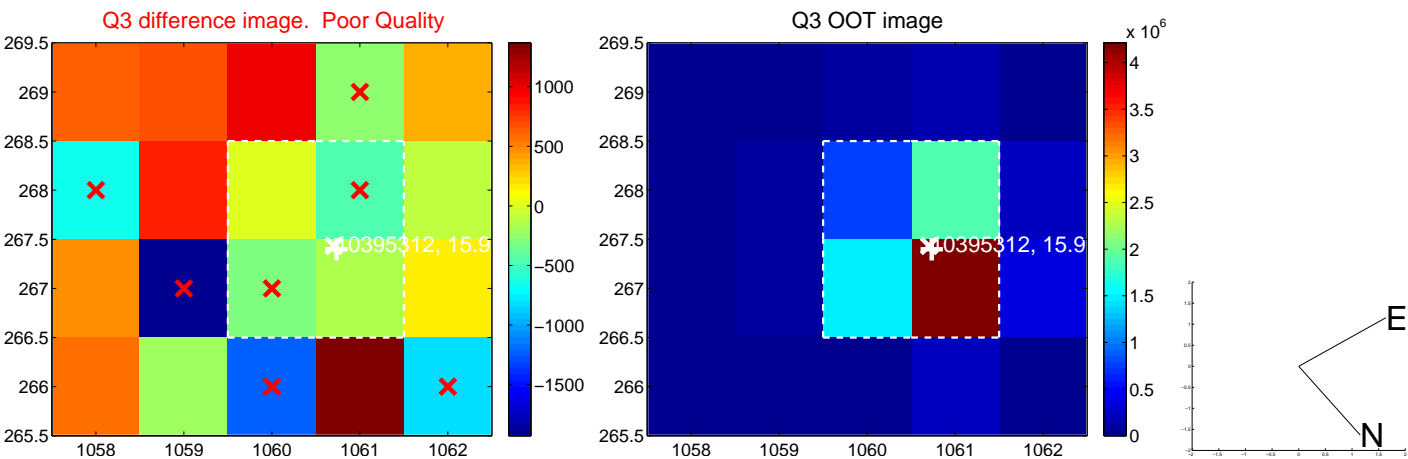
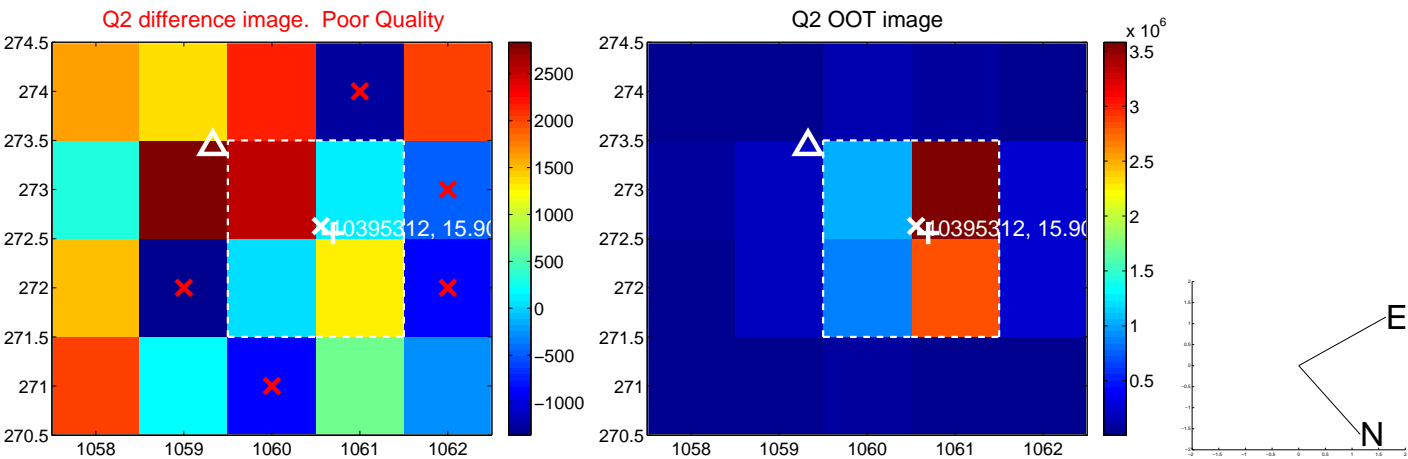
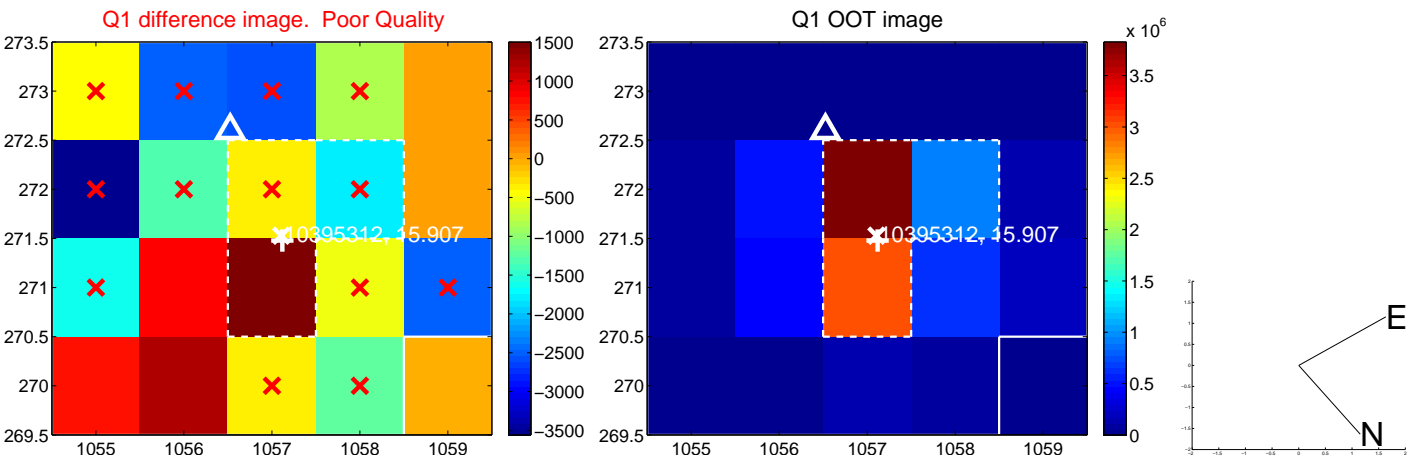
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.024 \pm 1.367$	4.41	$-2.263 \pm 0.906$	$-5.582 \pm 1.402$
PRF-fit source offset from KIC position	$5.583 \pm 1.439$	3.88	$-2.145 \pm 1.083$	$-5.155 \pm 1.513$
photometric centroid source offset	$0.87 \pm 0.38$	2.31	$-0.34 \pm 0.38$	$0.80 \pm 0.38$

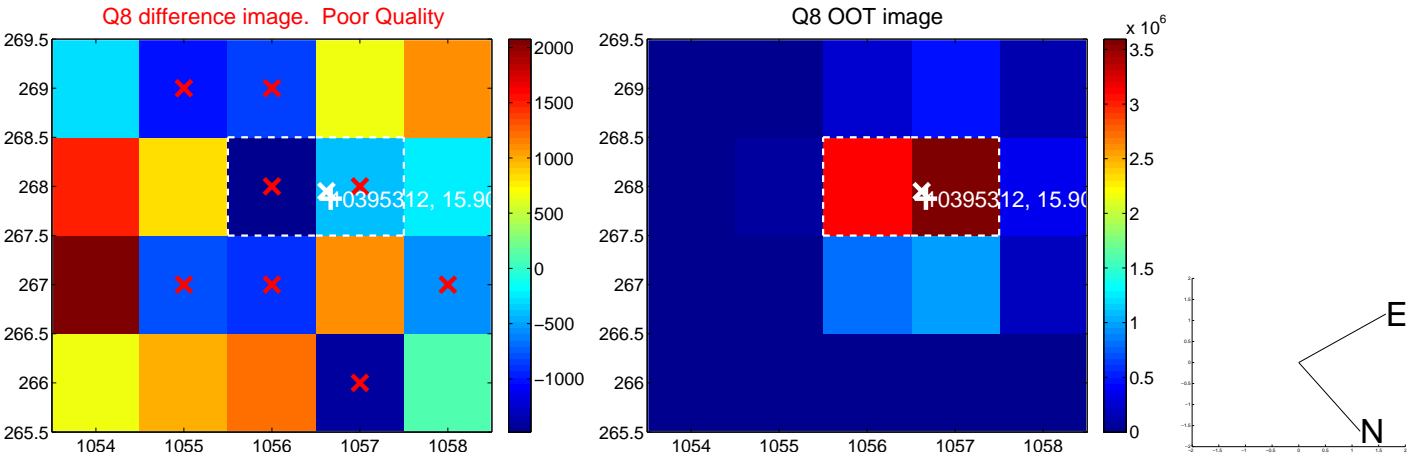
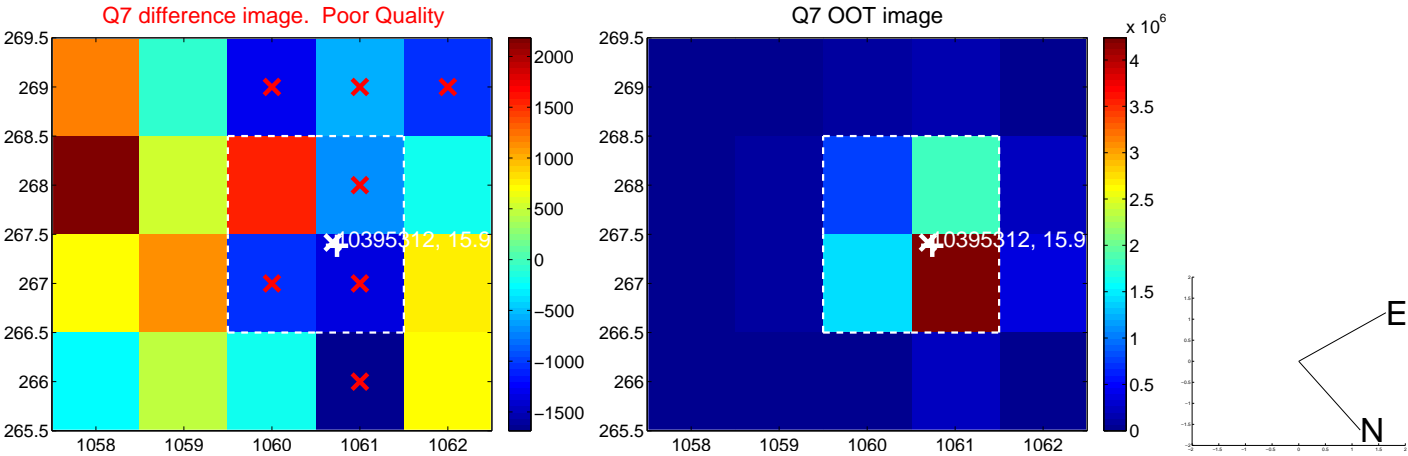
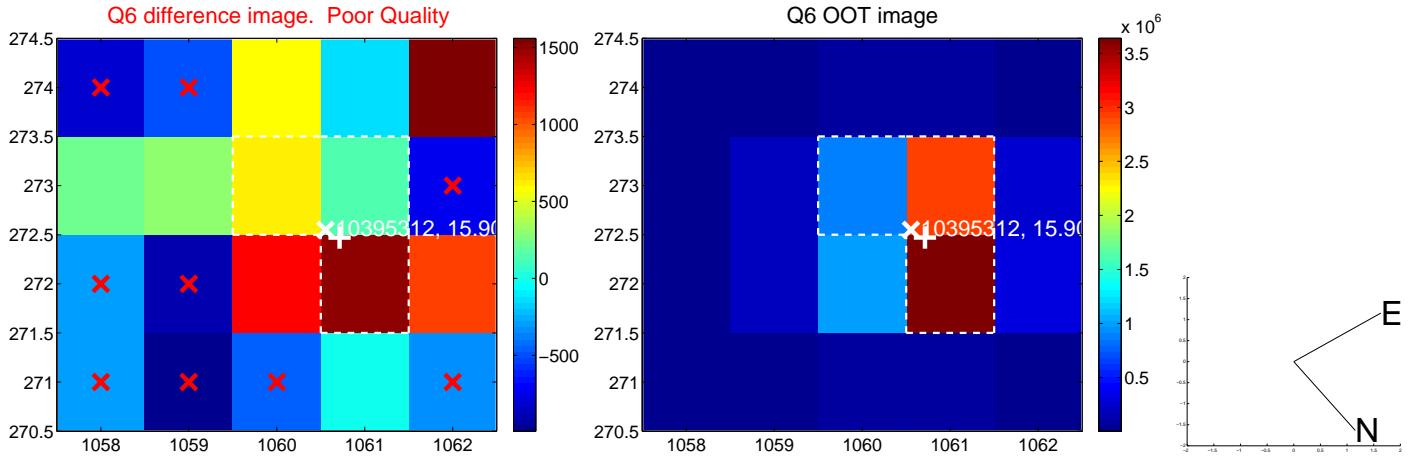
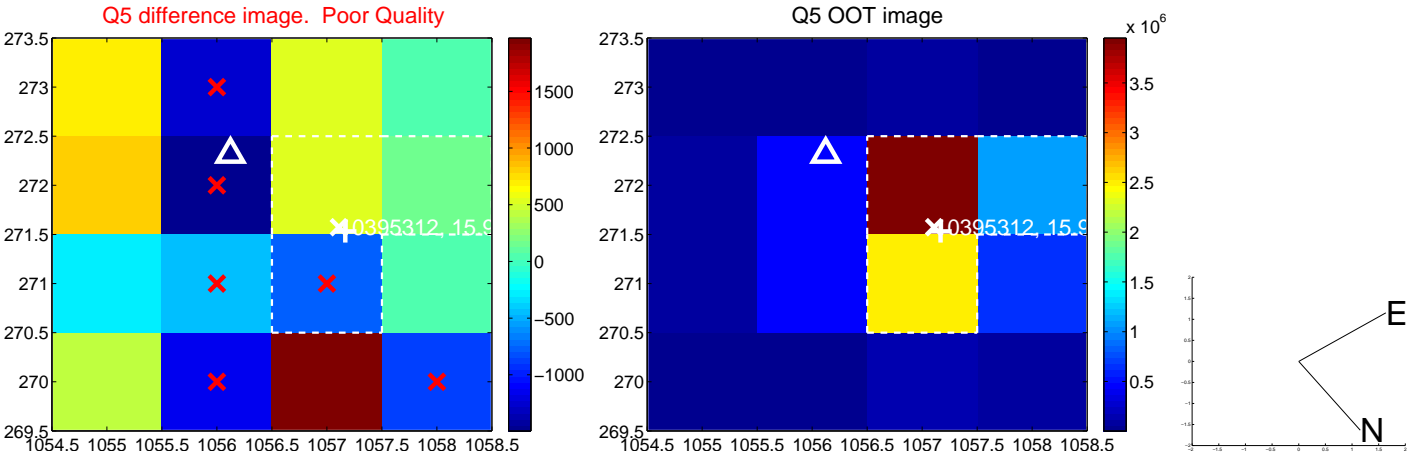


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



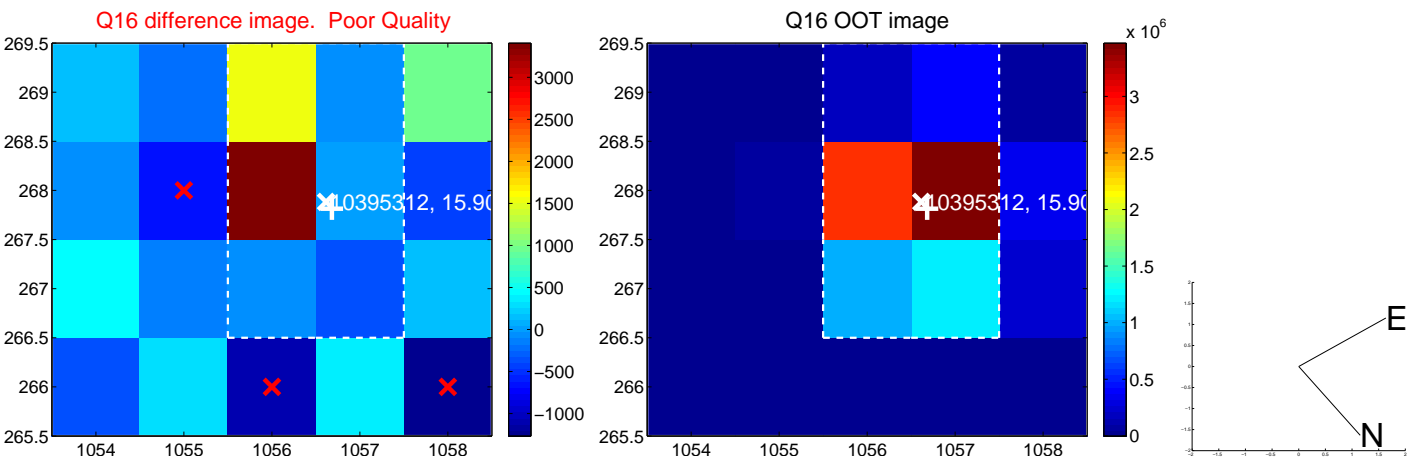
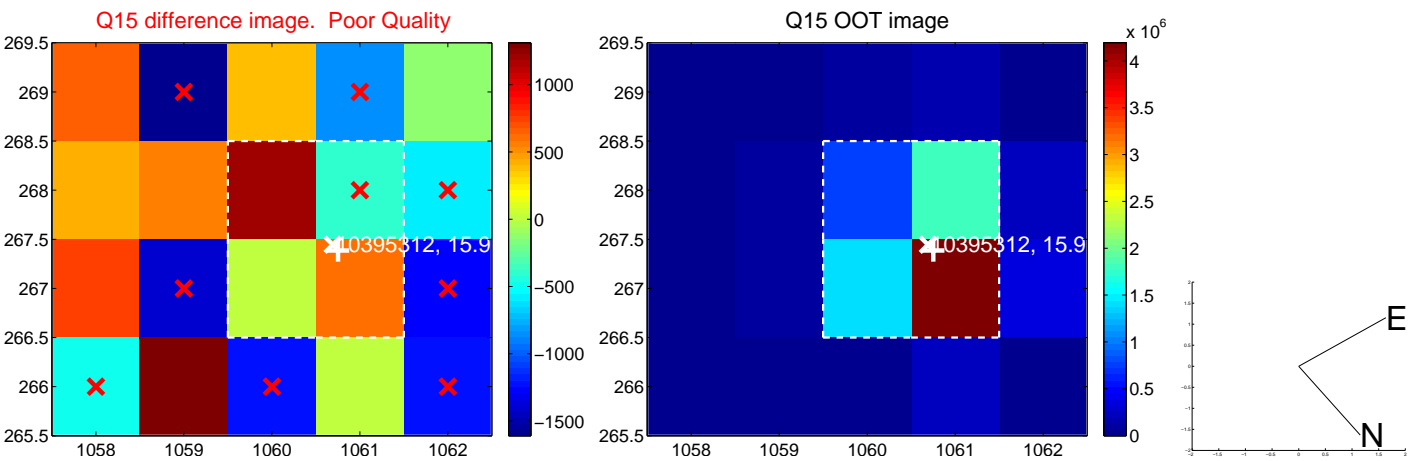
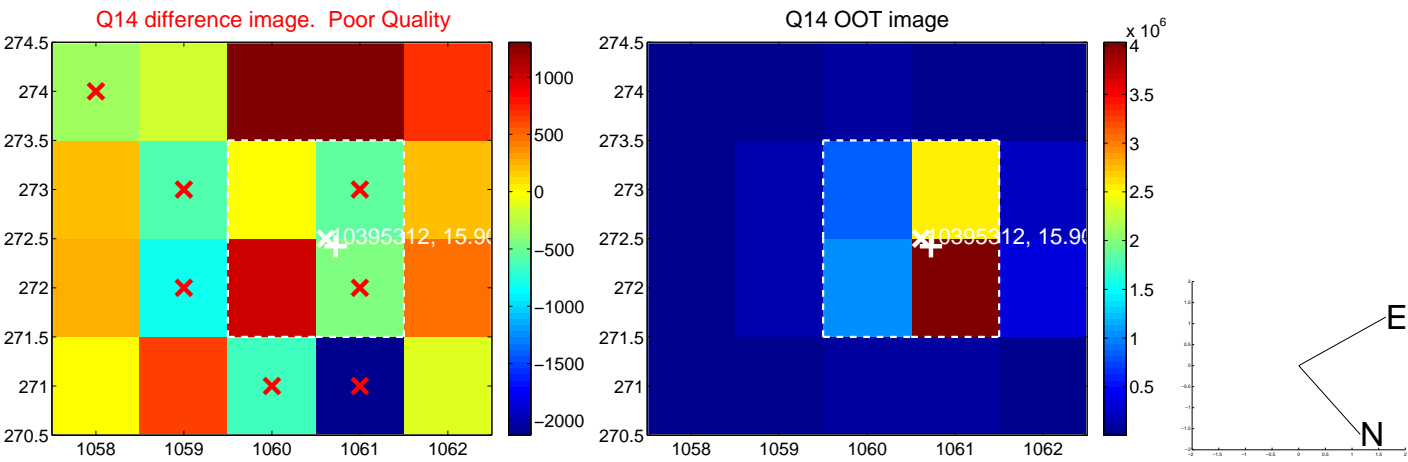
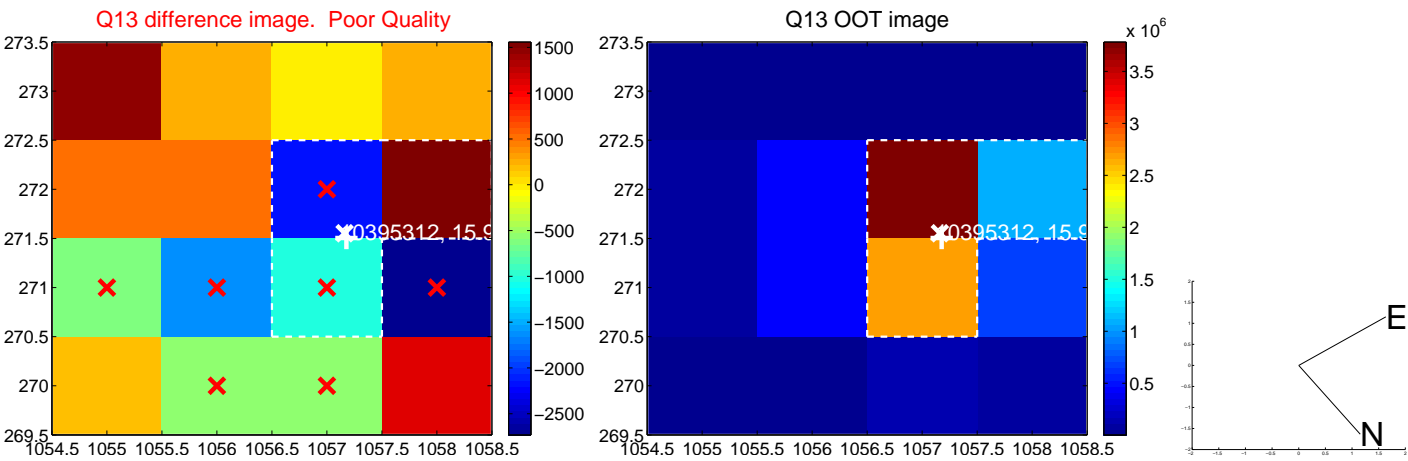
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



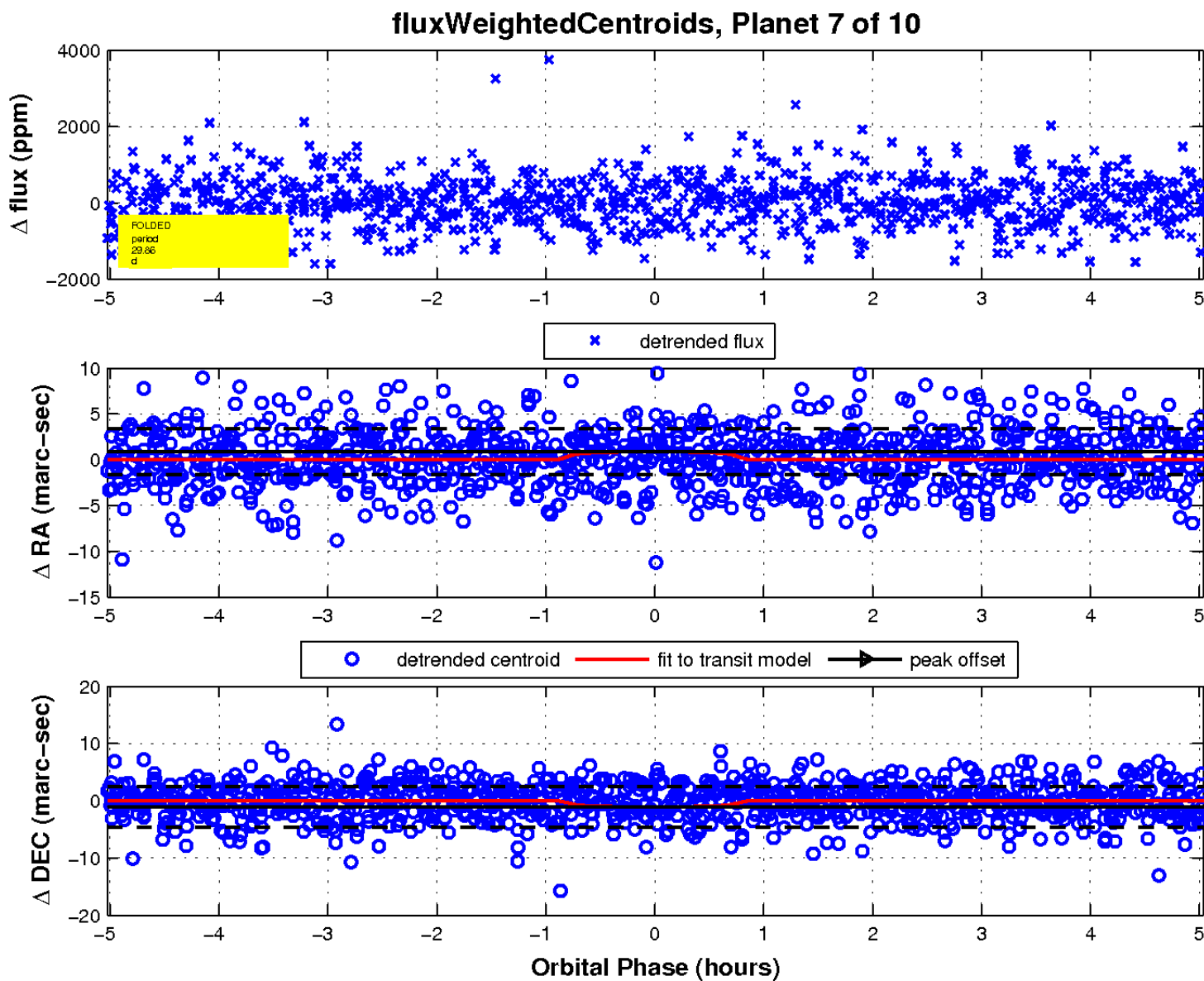
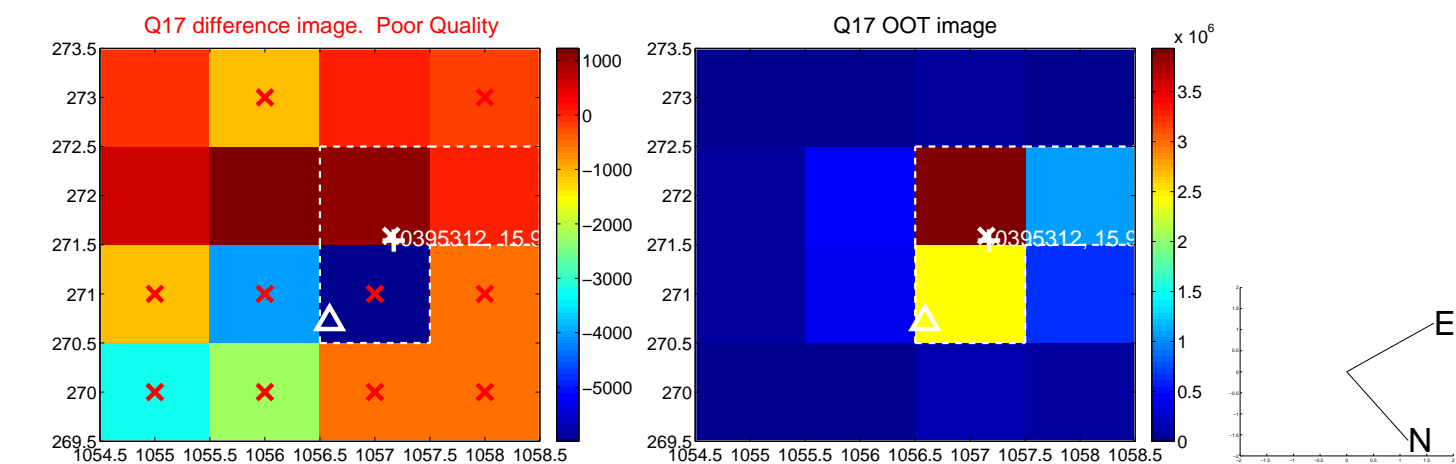




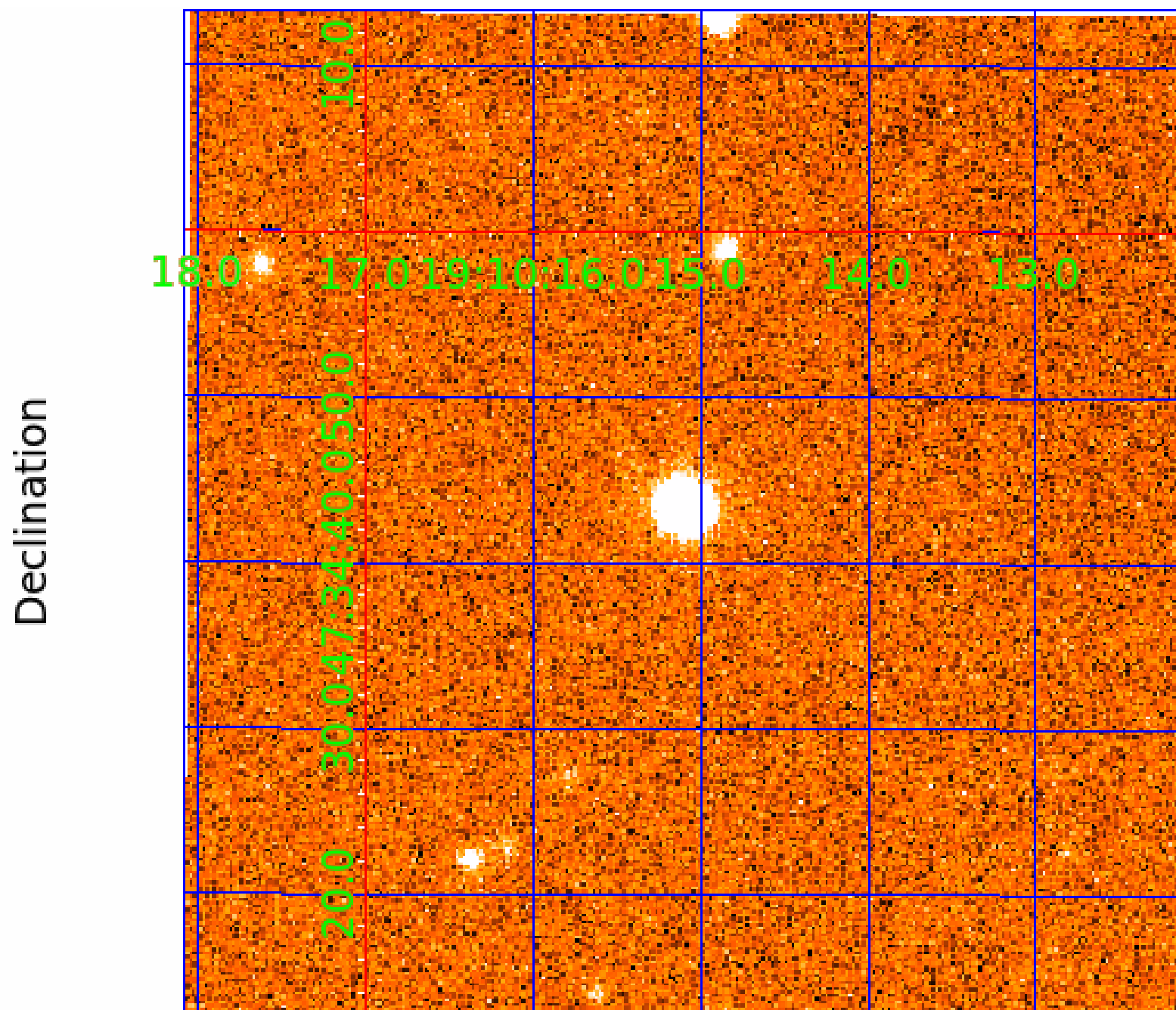
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



## KIC 010395312

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010395312-01	OBS	No	0.734969	131.818451	68.7	5.235	7.8	10.6	0.36	3553	0.30	138.09
010395312-02	OBS	No	43.338219	160.884184	1756.7	2.650	18.5	11.9	0.36	3553	1.49	0.60
010395312-03	OBS	No	22.617913	145.928423	0.0	14.208	12.1	0.0	0.36	3553	0.01	1.43
010395312-04	OBS	No	21.830529	141.862680	332.5	2.263	13.1	2.6	0.36	3553	0.77	1.50
010395312-05	OBS	No	62.134882	184.242550	0.1	3.631	13.2	0.0	0.36	3553	0.01	0.37
010395312-07	OBS	No	29.856582	155.990807	2220.3	1.681	13.8	11.7	0.36	3553	1.71	0.99
010395312-08	OBS	No	39.700029	148.941743	1333.3	2.348	11.7	10.1	0.36	3553	1.50	0.68
010395312-09	OBS	No	26.497868	133.642244	3844.7	1.500	14.1	-1.0	0.36	3553	2.21	1.16
010395312-10	OBS	No	38.975665	141.685996	5375.8	1.500	19.0	-1.0	0.36	3553	2.62	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010395312-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010395312-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010395312-08	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
010395312-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
010395312-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

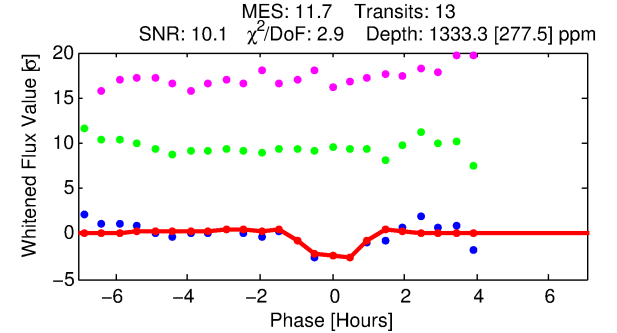
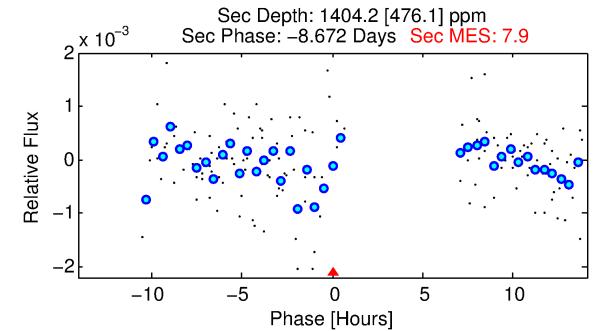
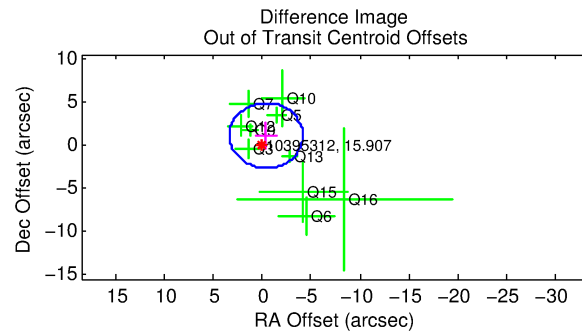
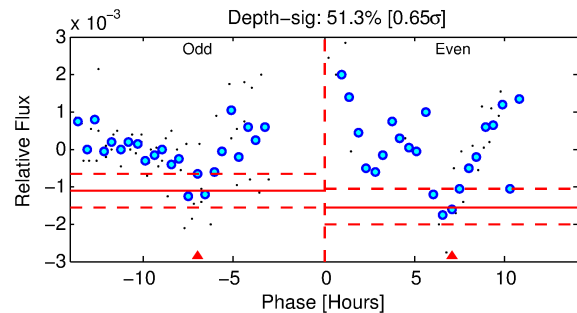
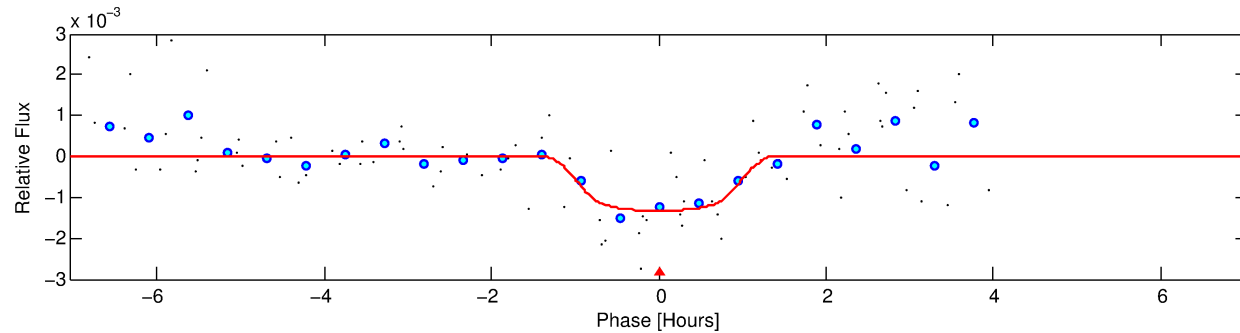
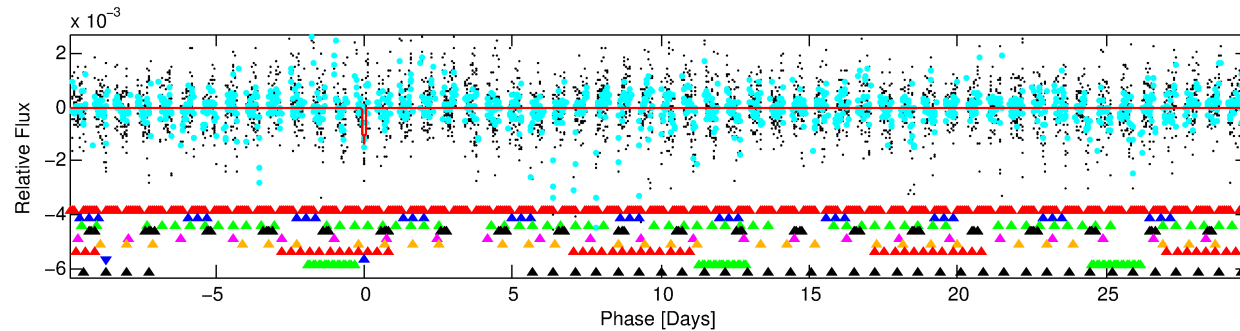
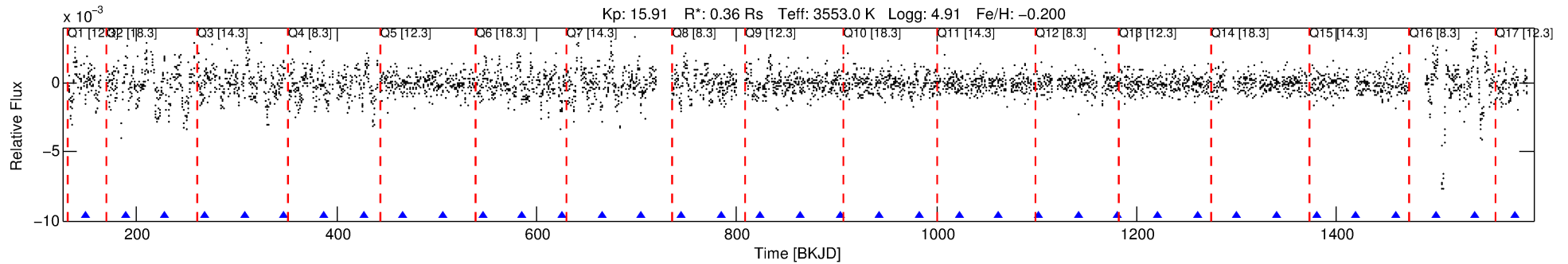
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010395312-08

No Significant Match Found

# DV One-Page Summary

KIC: 10395312 Candidate: 8 of 10 Period: 39.700 d



## DV Fit Results:

Period = 39.70003 [0.00316] d  
Epoch = 148.9417 [0.0408] BKJD  
Rp/R\* = 0.0383 [0.0310]  
a/R\* = 76.33 [282.61]  
b = 0.85 [1.13]  
Seff = 0.68 [0.07]  
Teq = 231 [6] K  
Rp = 1.49 [1.22] Re  
a = 0.1645 [0.0122] AU  
Ag = 9354.67 [15501.36] [0.60 $\sigma$ ]  
Teffp = 3516 [1455] K [2.26 $\sigma$ ]

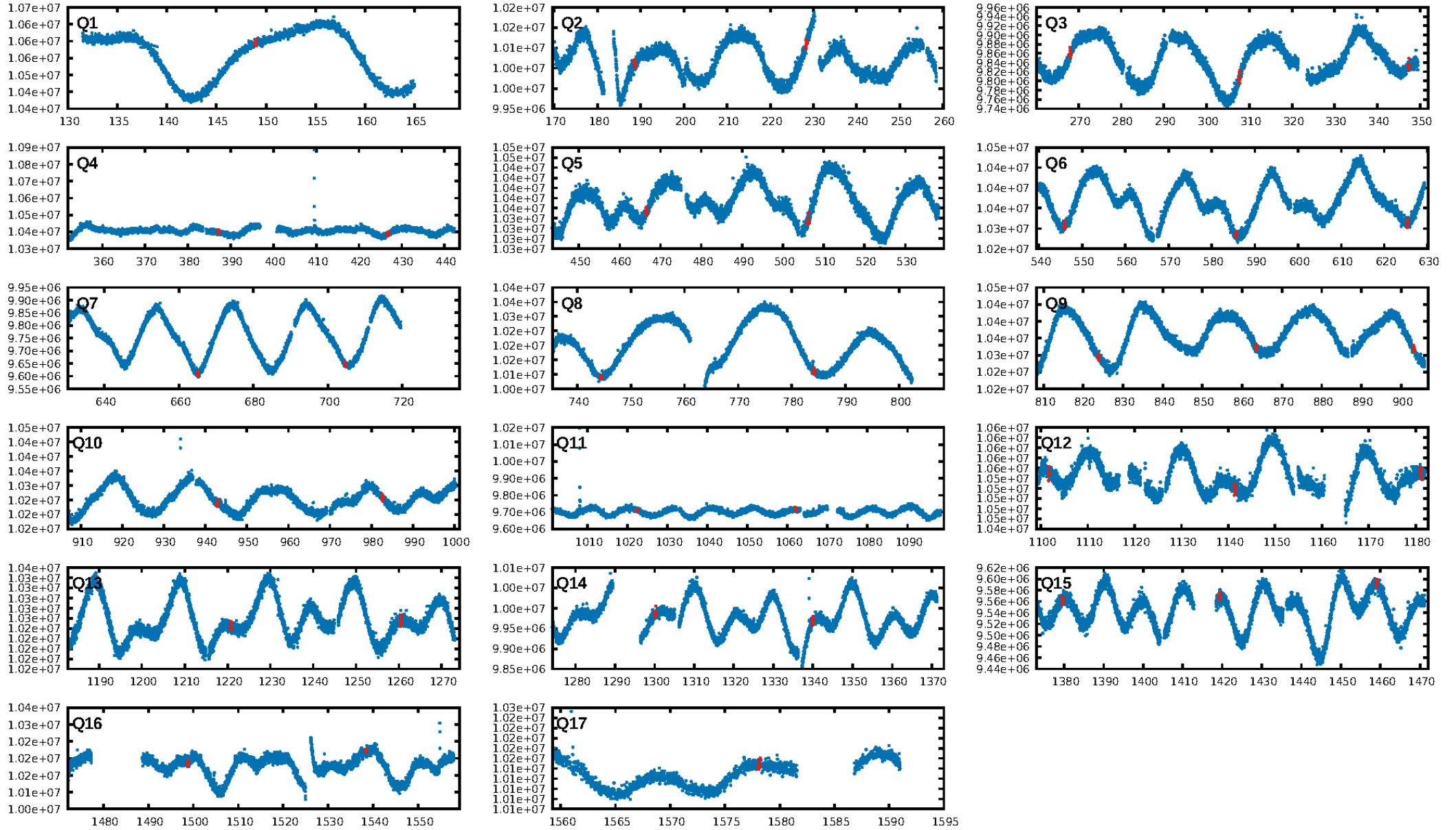
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.24 $\sigma$ ]  
LongPeriod-sig: 100.0% [24.66 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 96.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [13/13]  
GhostDiagnostic-chr: 0.00281  
Centroid-sig: 1.5%  
Centroid-so: 1.648 arcsec [2.68 $\sigma$ ]  
OotOffset-rm: 1.157 arcsec [0.92 $\sigma$ ]  
OotOffset-st: 2/3/2/3 [10]  
KicOffset-rm: 1.379 arcsec [1.01 $\sigma$ ]  
KicOffset-st: 2/3/2/3 [10]  
DiffImageQuality-fgm: 0.00 [0/10]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:44:38 Z

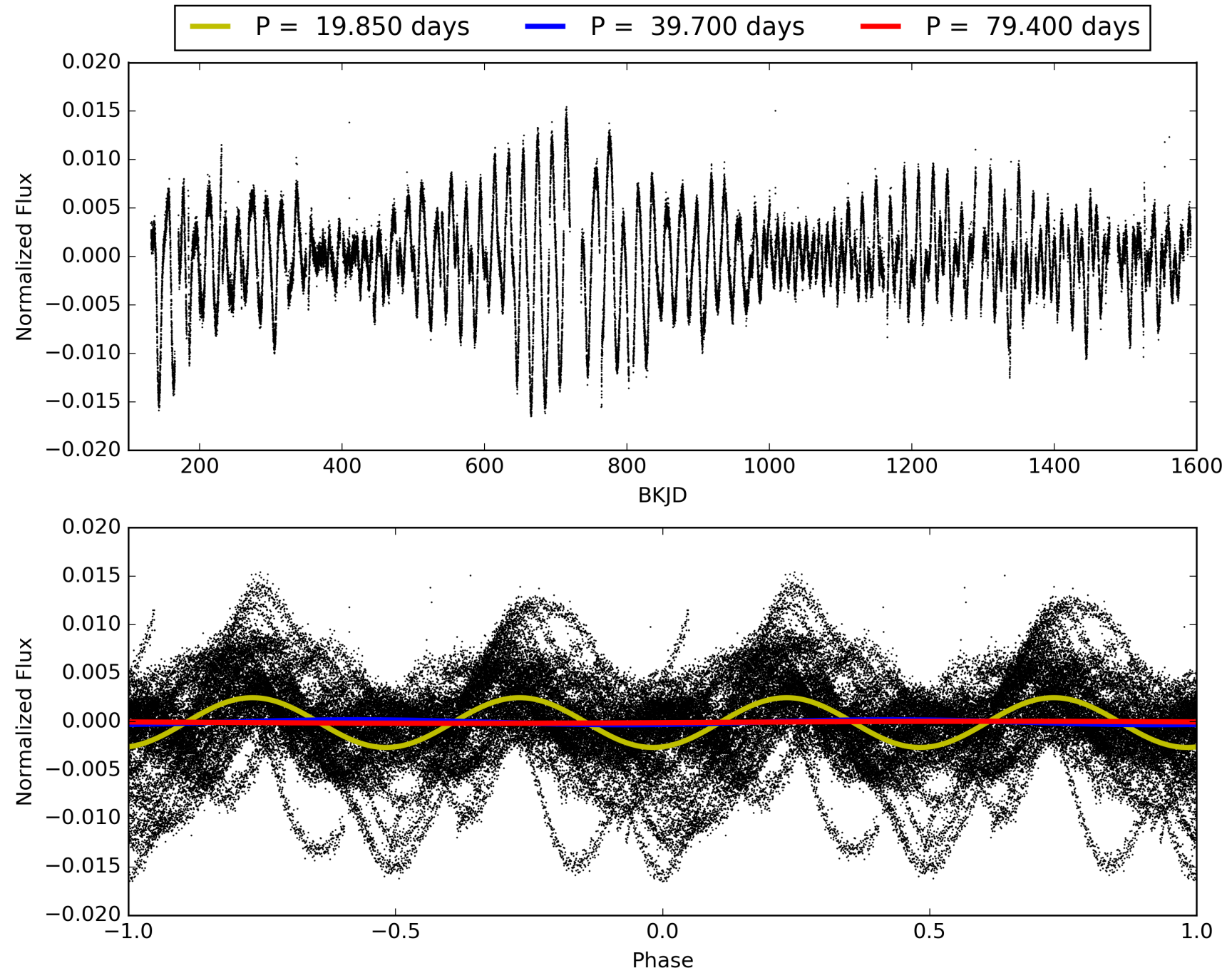
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010395312-08, PDC Light Curves





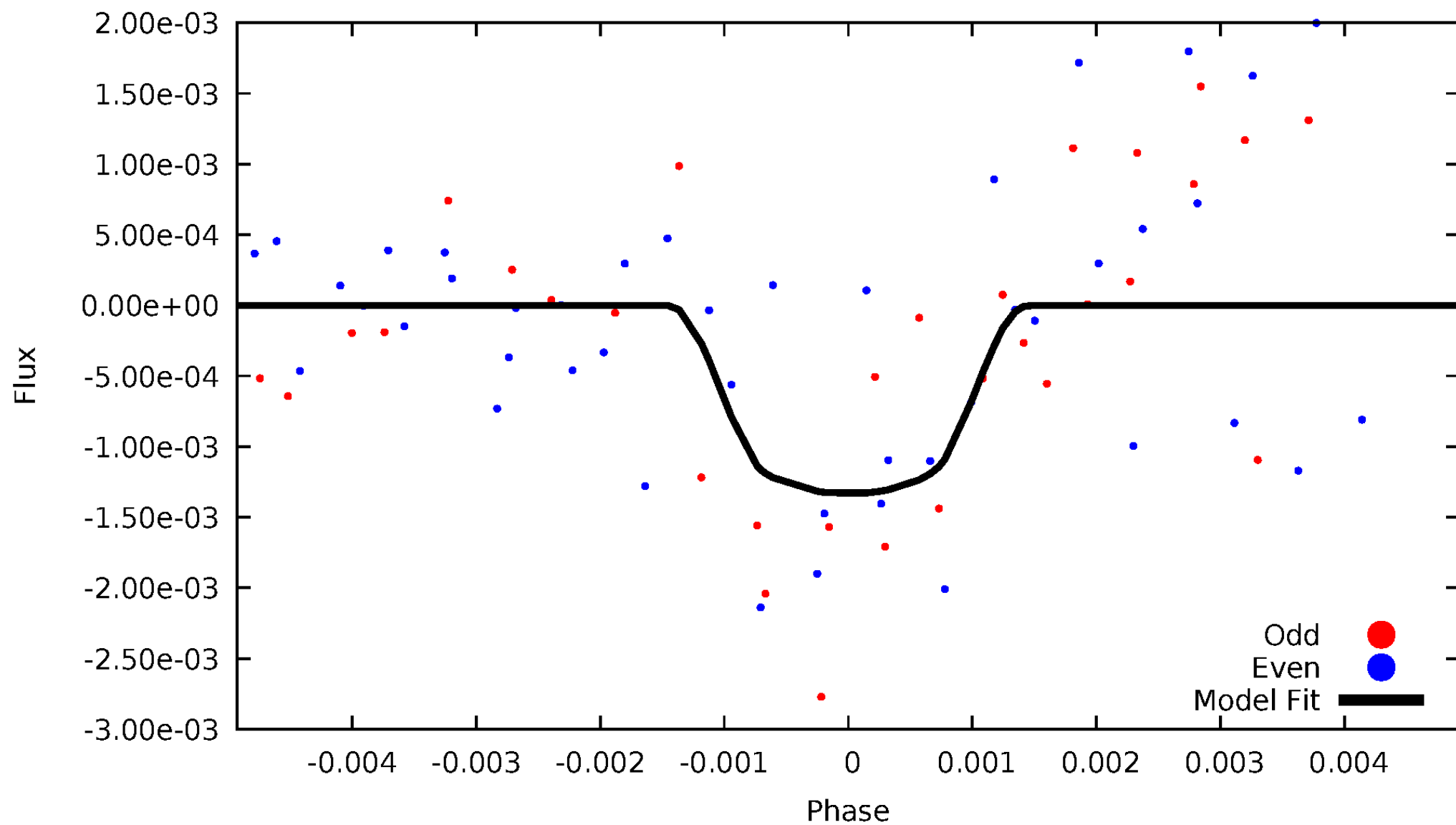
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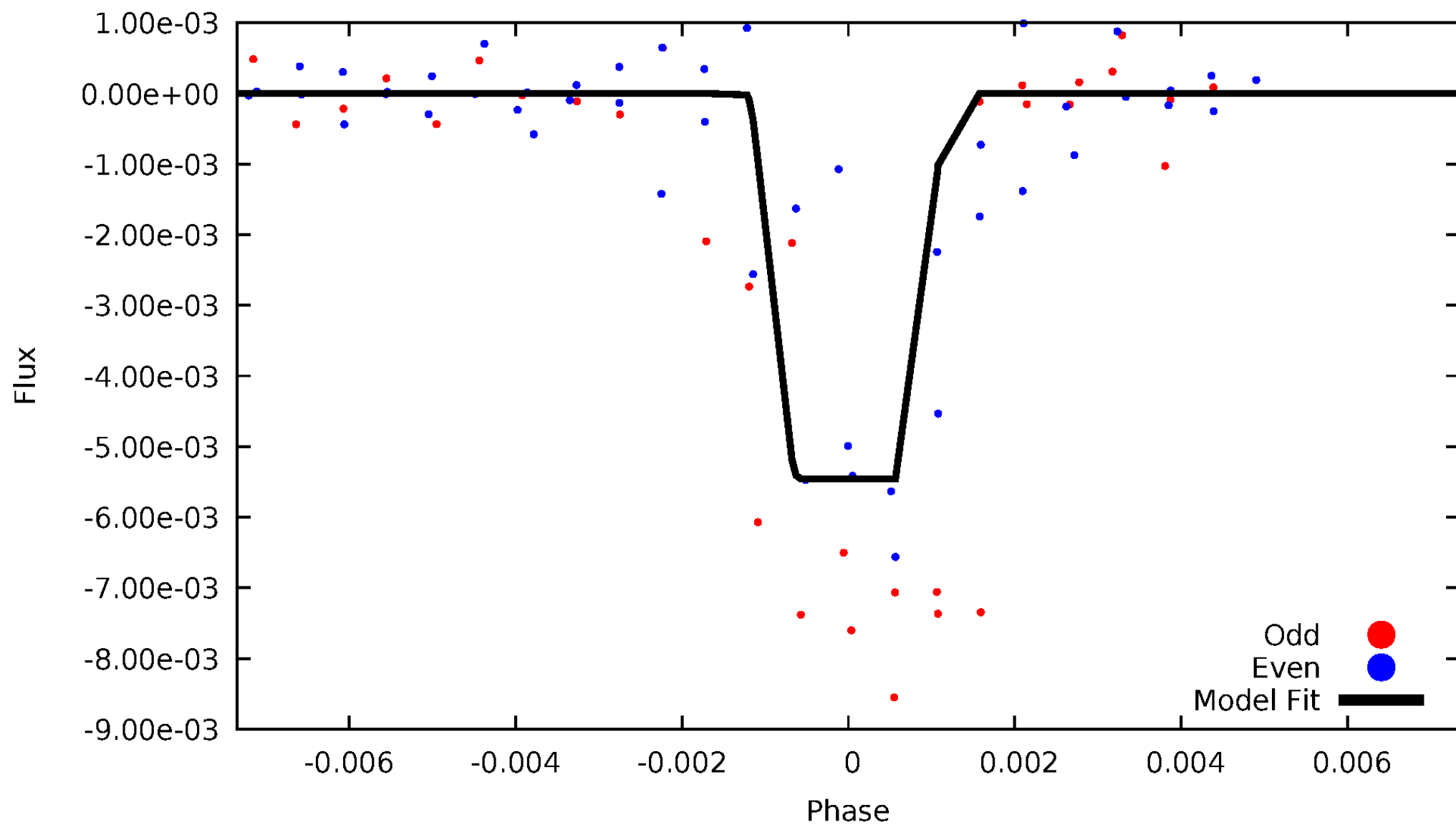
# DV Odd/Even

TCE 010395312-08



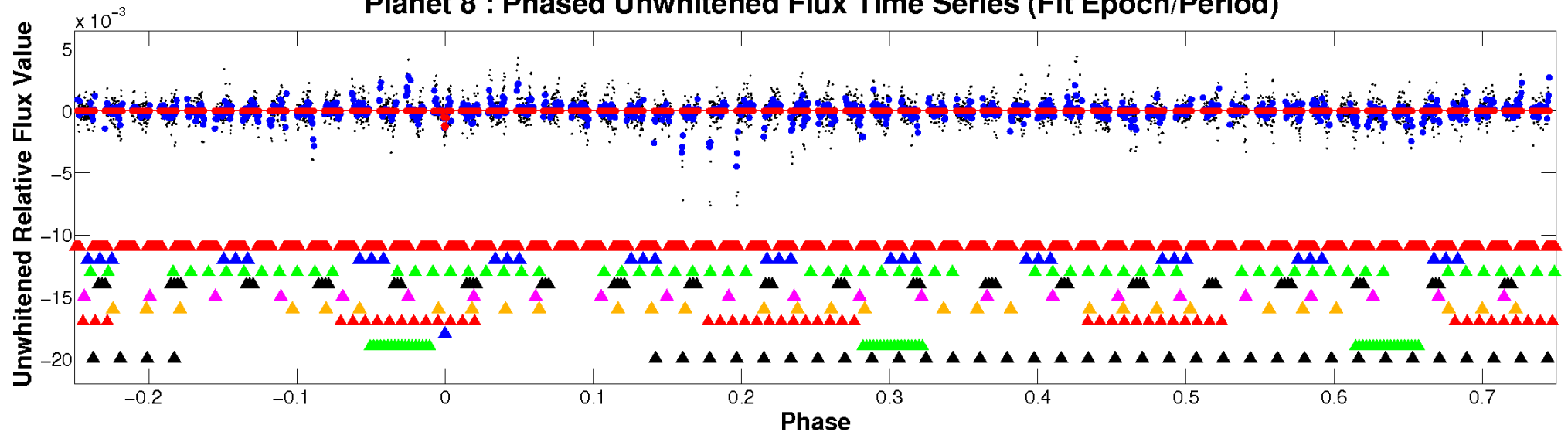
# ALT Odd/Even

TCE 010395312-08

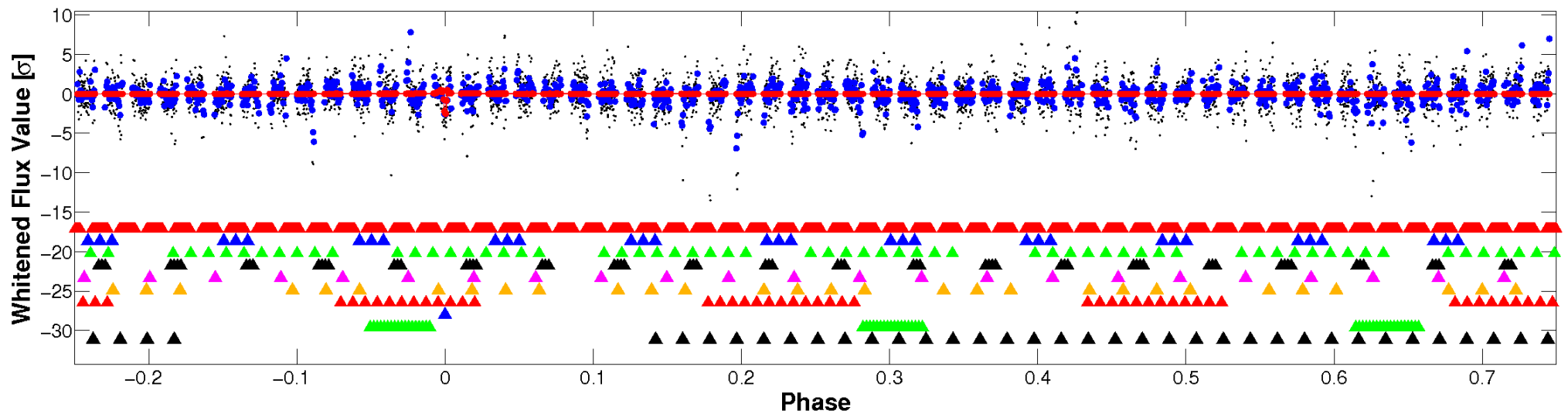


# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

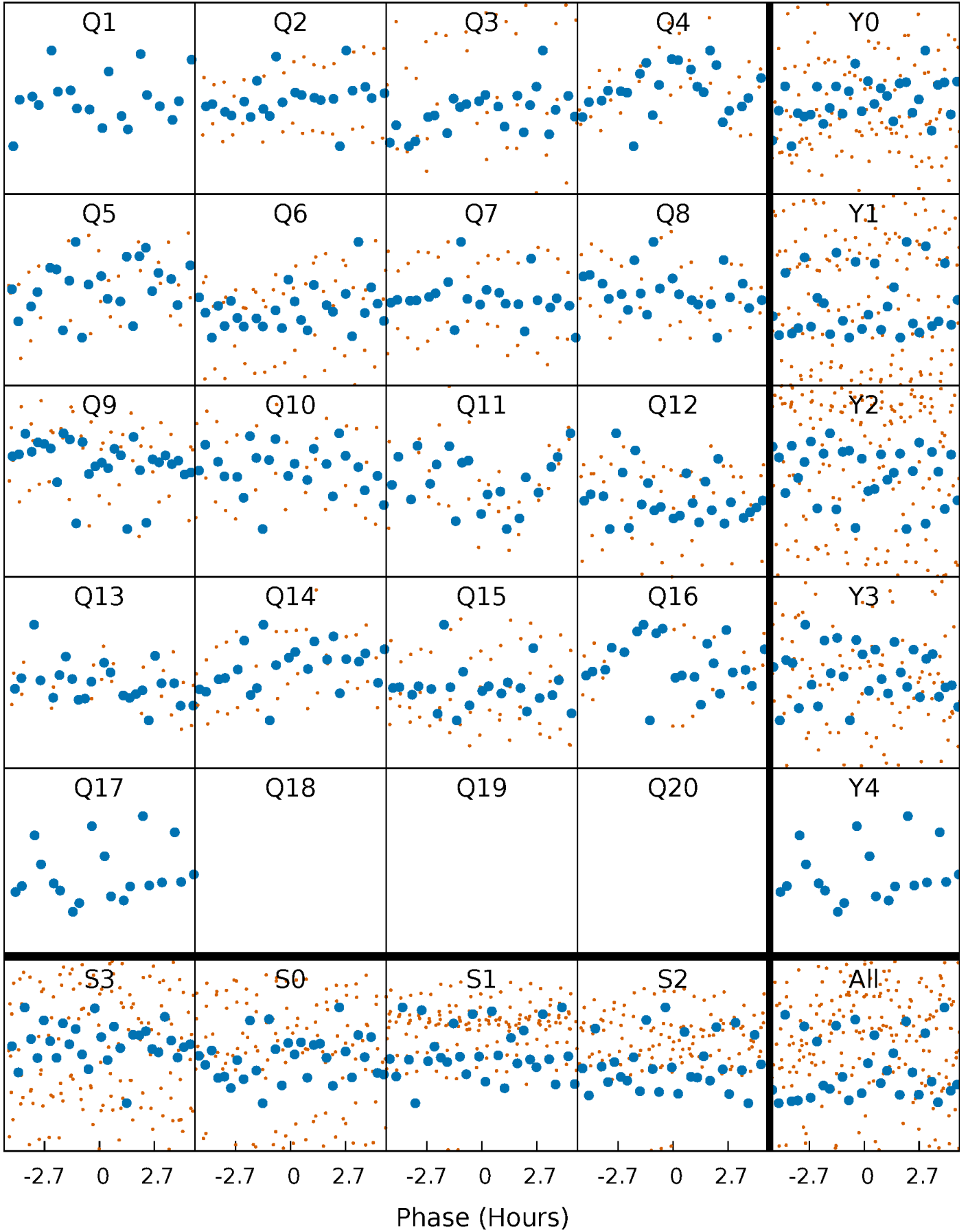


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



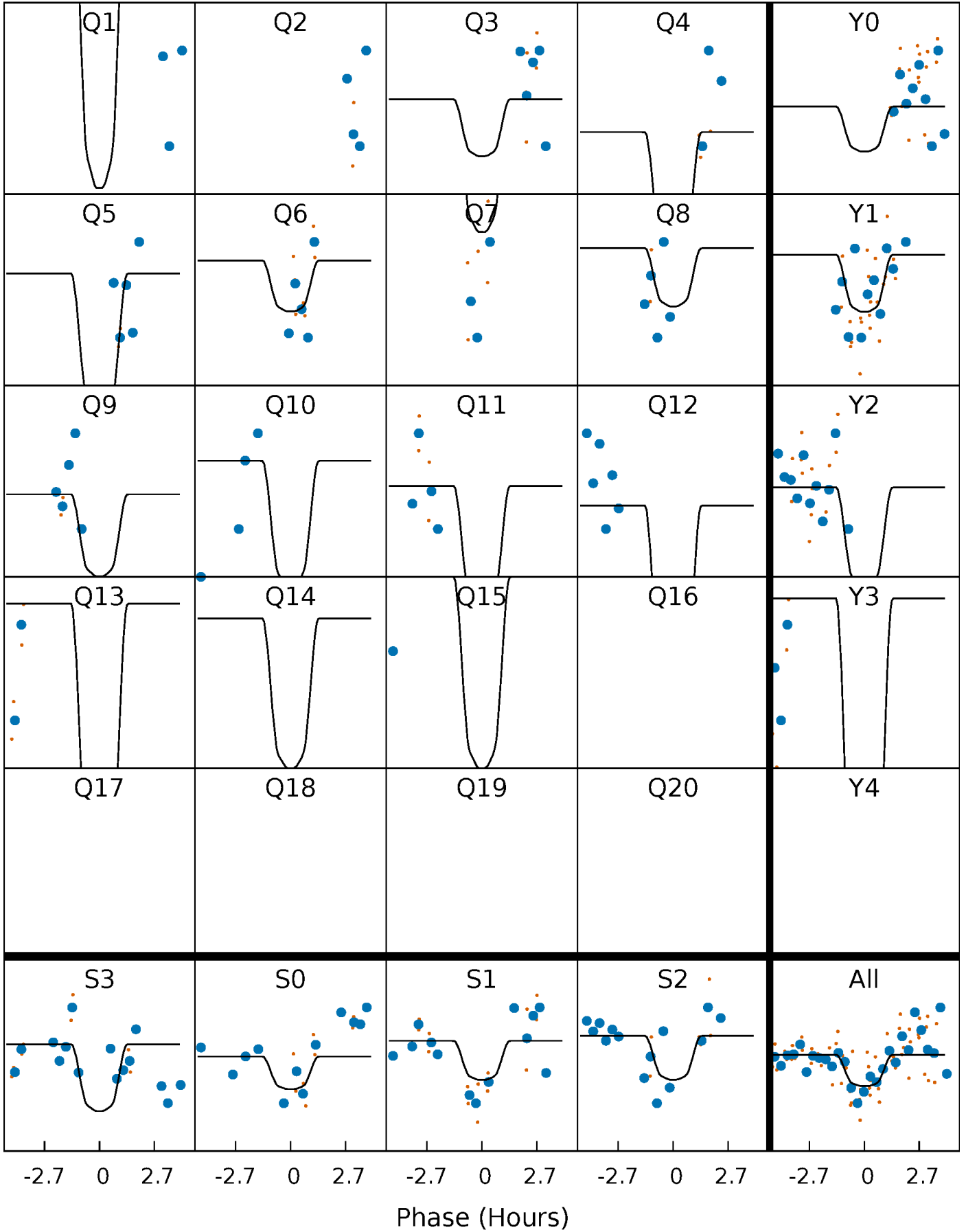
# PDC Quarter-Phased Transit Curves

TCE 010395312-08     $P = 39.700029$  Days     $T_0 = 148.941744$  (BKJD)



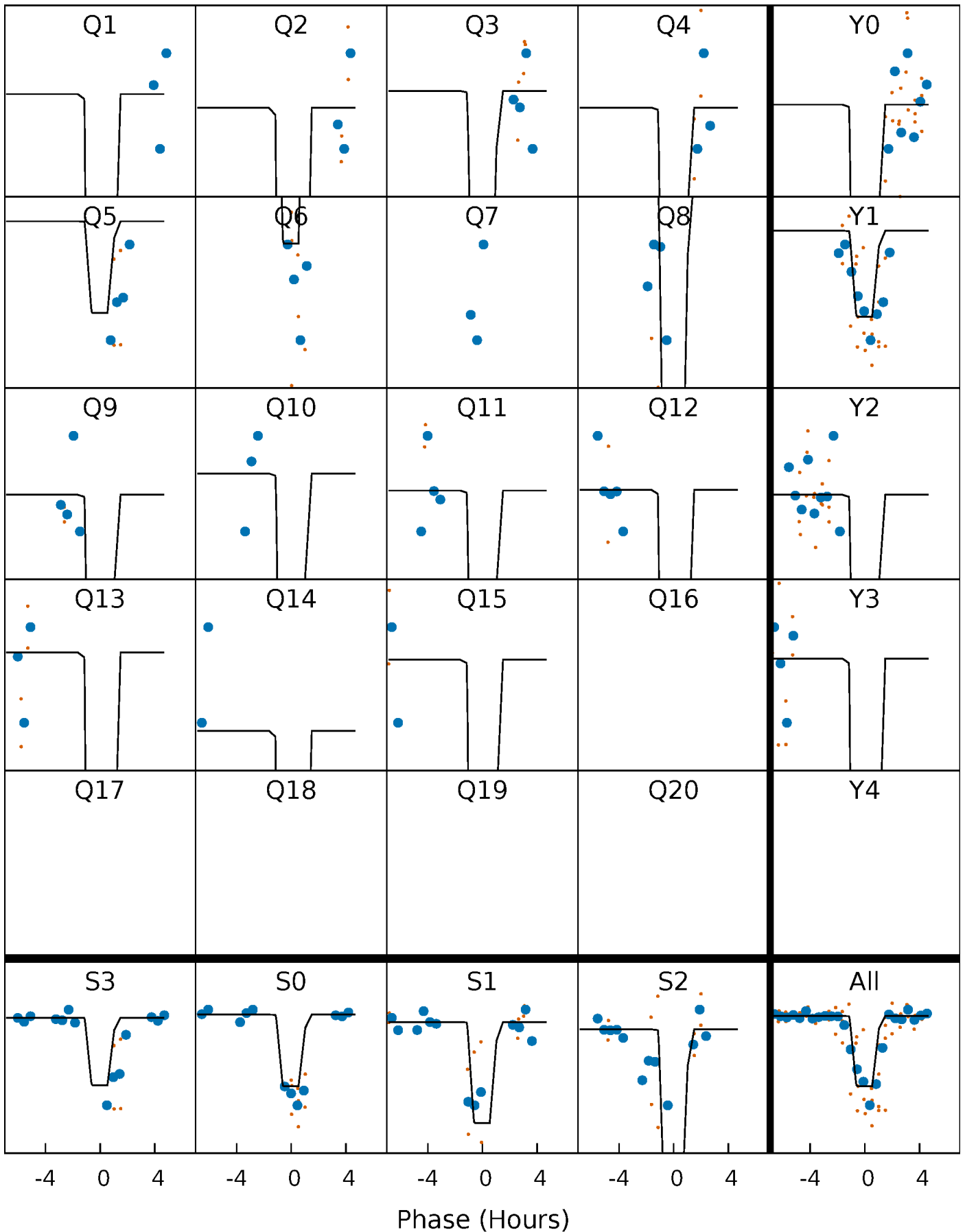
# DV Quarter-Phased Transit Curves

TCE 010395312-08     $P = 39.700029$  Days     $T_0 = 148.941744$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

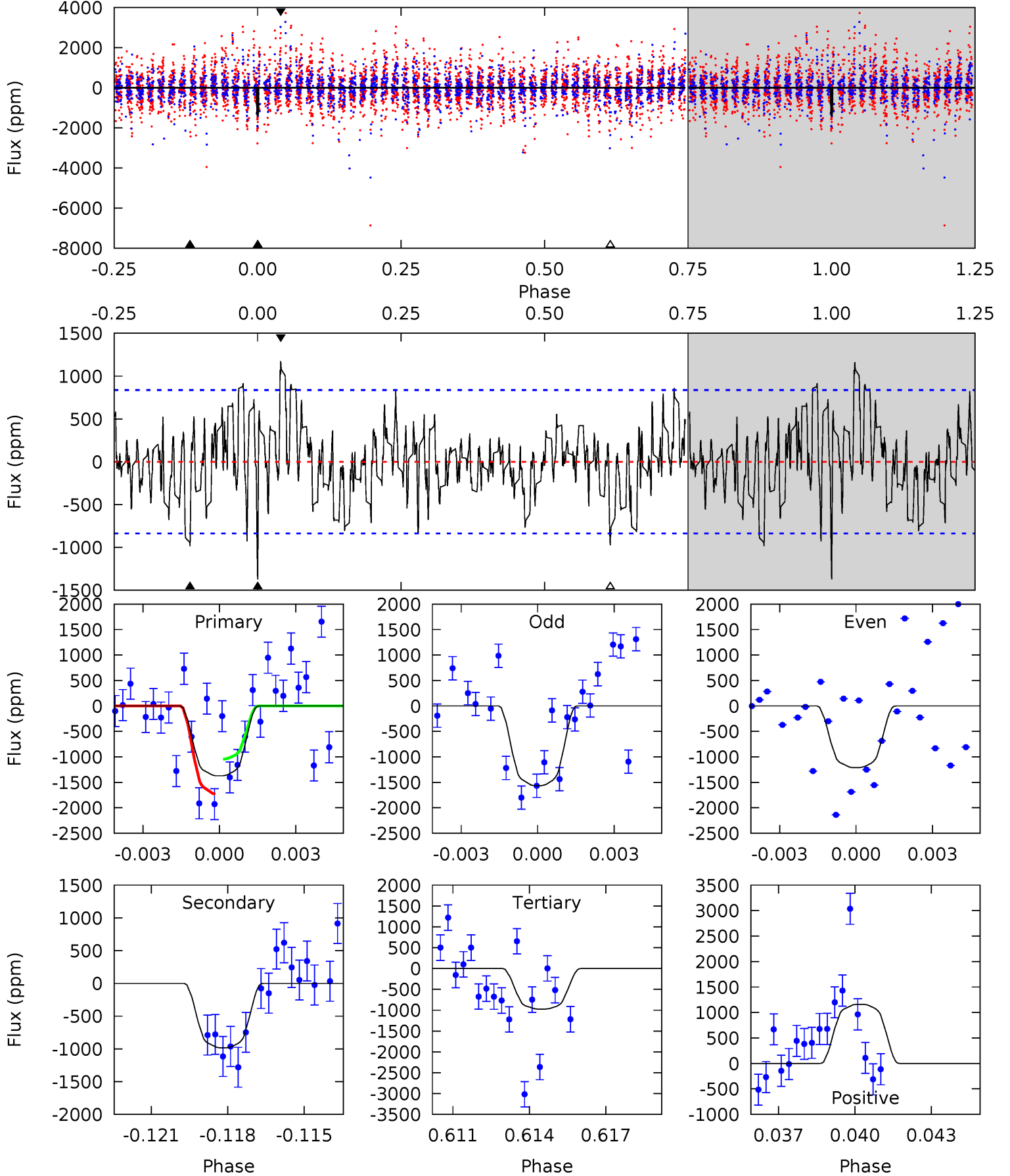
TCE 010395312-08   P= 39.703430 Days    $T_0=148.911500$  (BKJD)



# DV Model-Shift Uniqueness Test

010395312-08, P = 39.700029 Days, E = 109.241715 Days

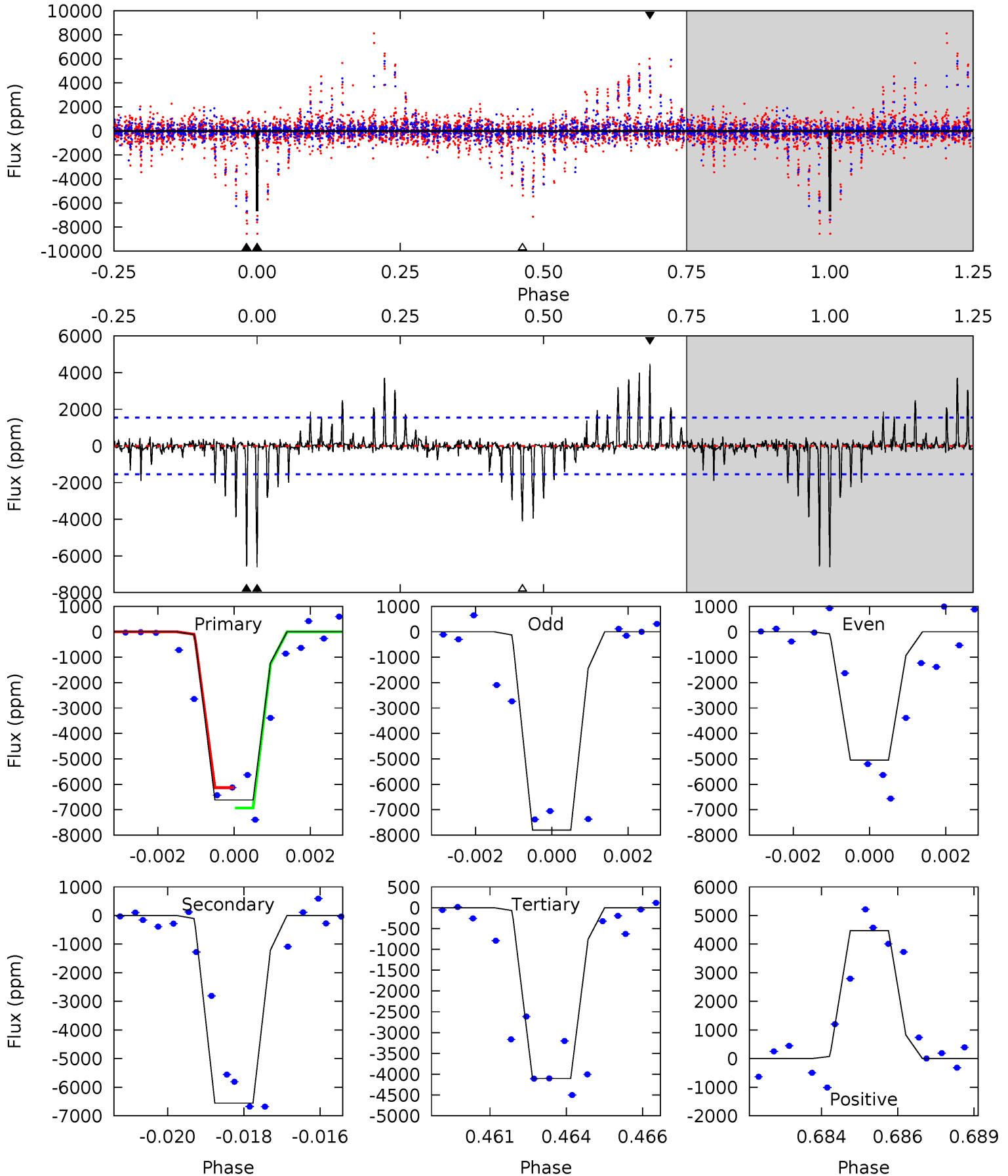
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.62	6.18	6.13	7.30	5.26	2.98	1.88	2.50	1.32	0.06	-1.12	1.08	1.13	0.46	2.15



# Alt Model-Shift Uniqueness Test

010395312-08, P = 39.703430 Days, E = 109.208070 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
22.6	22.4	14.0	15.3	5.30	3.05	2.31	8.59	7.33	8.39	7.13	3.86	0.90	0.40	1.36





### Stellar Parameters For KIC 010395312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3553^{+48}_{-53}$	$4.906^{+0.035}_{-0.042}$	$-0.200^{+0.100}_{-0.100}$	$0.358^{+0.036}_{-0.036}$	$0.379^{+0.034}_{-0.046}$	$11.630^{+2.353}_{-1.957}$
	+1%/-1%	+1%/-1%	+50%/-50%	+10%/-10%	+9%/-12%	+20%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010395312-08 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-983 \pm 159$	$1.68^{+1.20}_{-0.99}$	$324^{+7}_{-8}$	$3228^{+1156}_{-464}$	$5314^{+26332}_{-3598}$
Alt.	$-6556 \pm 292$	$2.92^{+1.21}_{-1.19}$	$324^{+7}_{-7}$	$3659^{+729}_{-378}$	$11622^{+21083}_{-5758}$

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

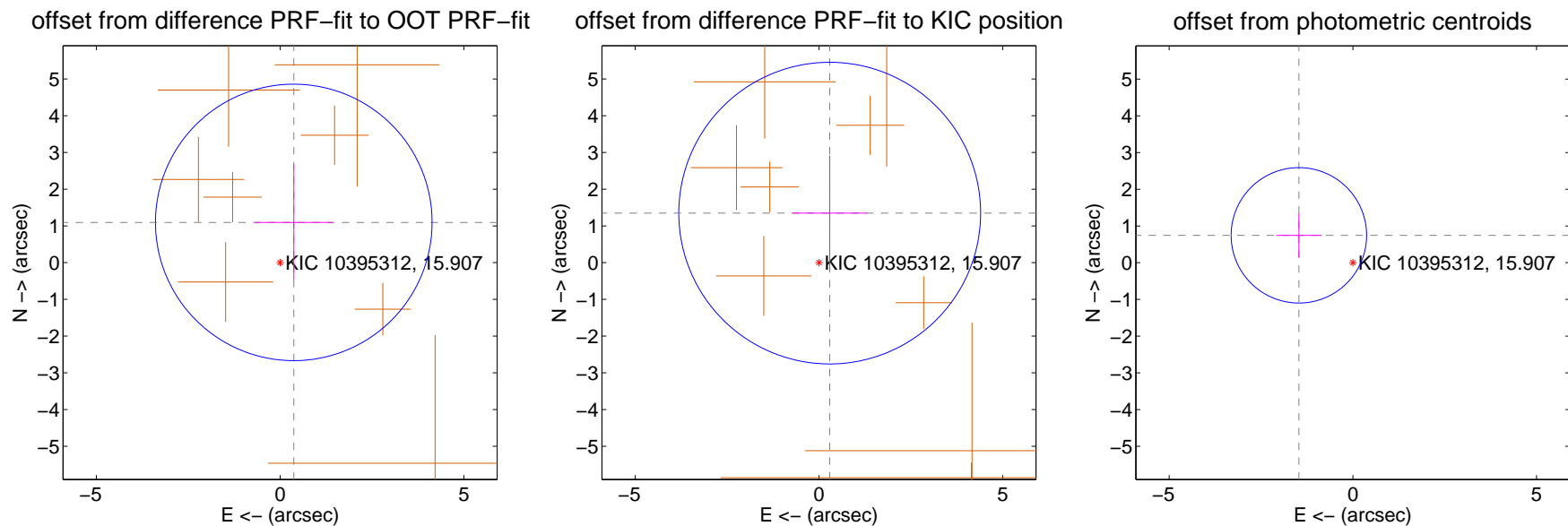
## DV Centroid Data

Supplemental centroid analysis for 010395312-08. Kepler magnitude: 15.91. Transit SNR 10.13

There are 0 quarters with good PRF difference image offsets

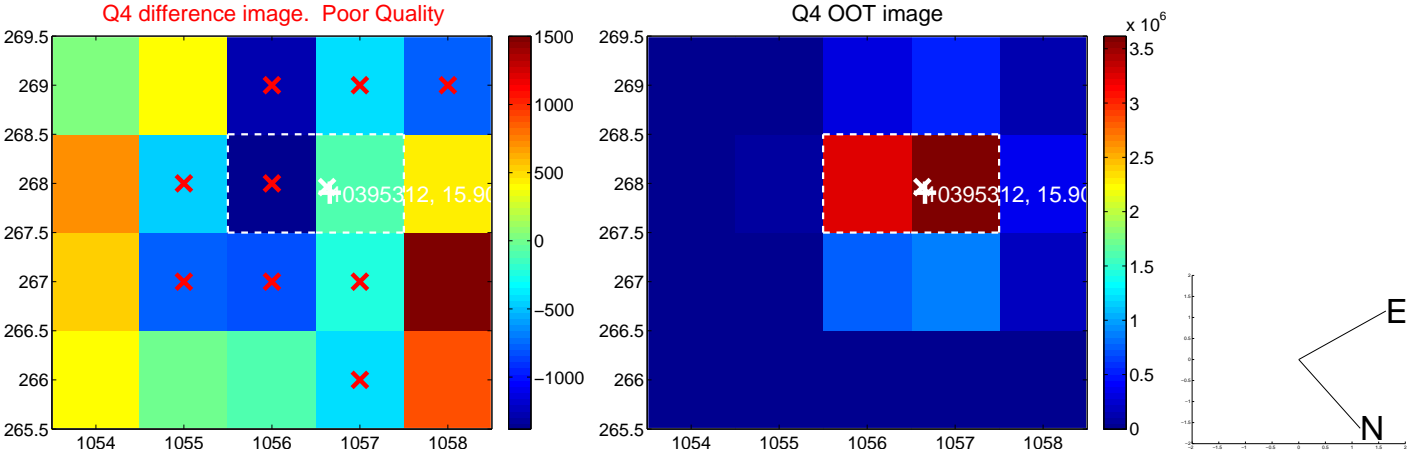
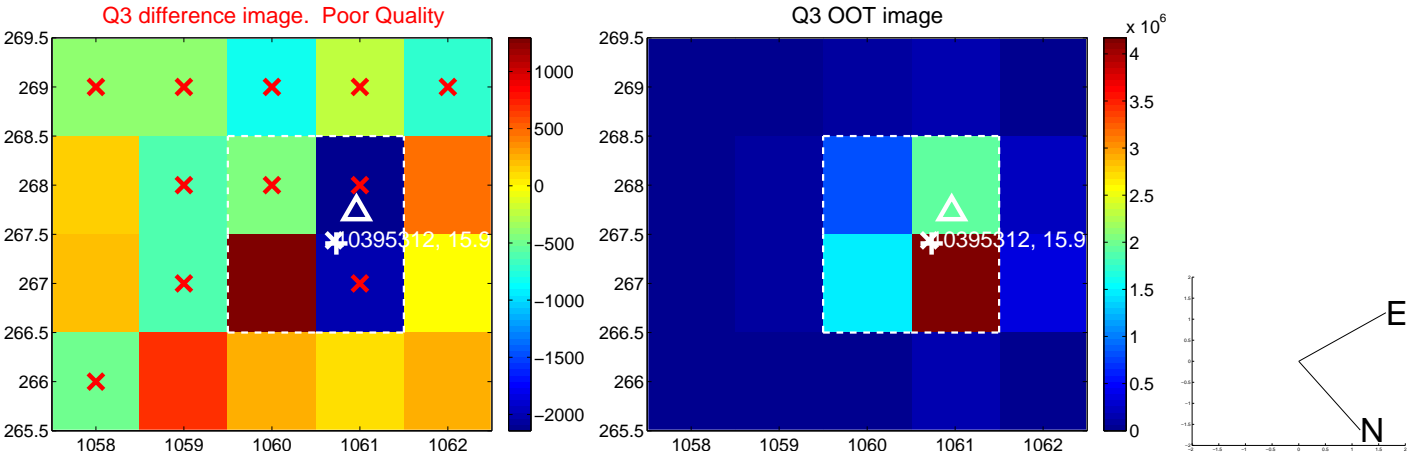
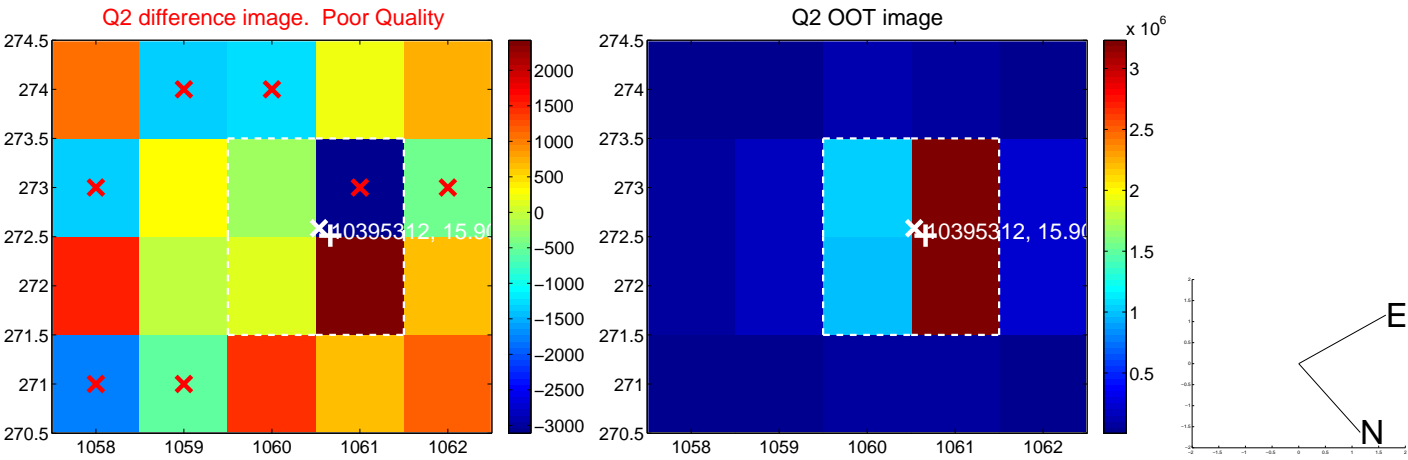
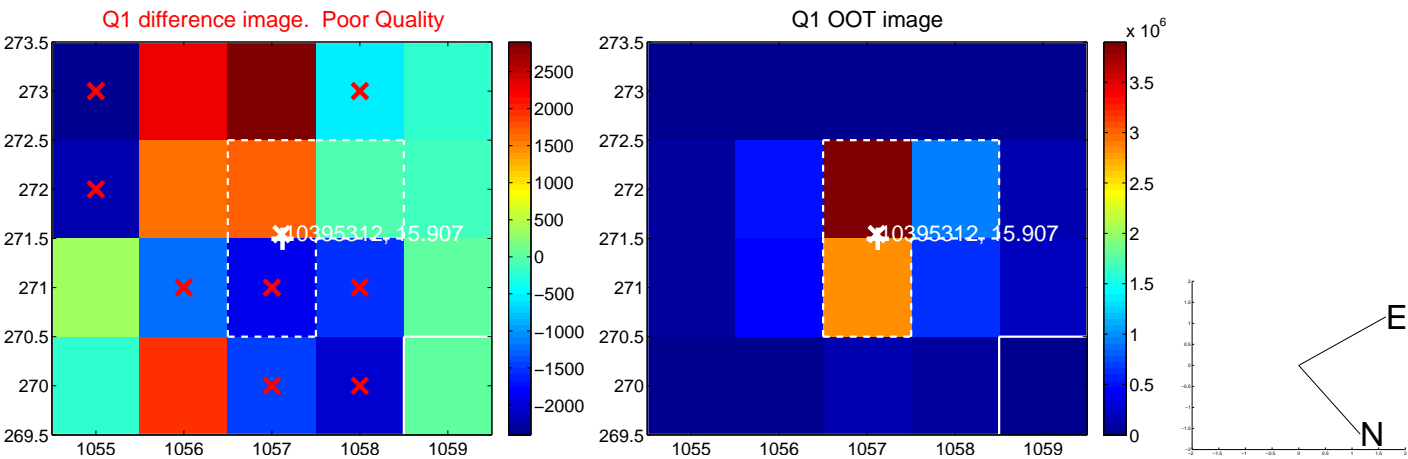
The direct PRF centroid is offset from the target star catalog position by about 0.38 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.157 \pm 1.254$	0.92	$-0.372 \pm 1.053$	$1.095 \pm 1.576$
PRF-fit source offset from KIC position	$1.379 \pm 1.369$	1.01	$-0.292 \pm 1.024$	$1.348 \pm 1.569$
photometric centroid source offset	$1.65 \pm 0.61$	2.68	$1.47 \pm 0.62$	$0.75 \pm 0.60$

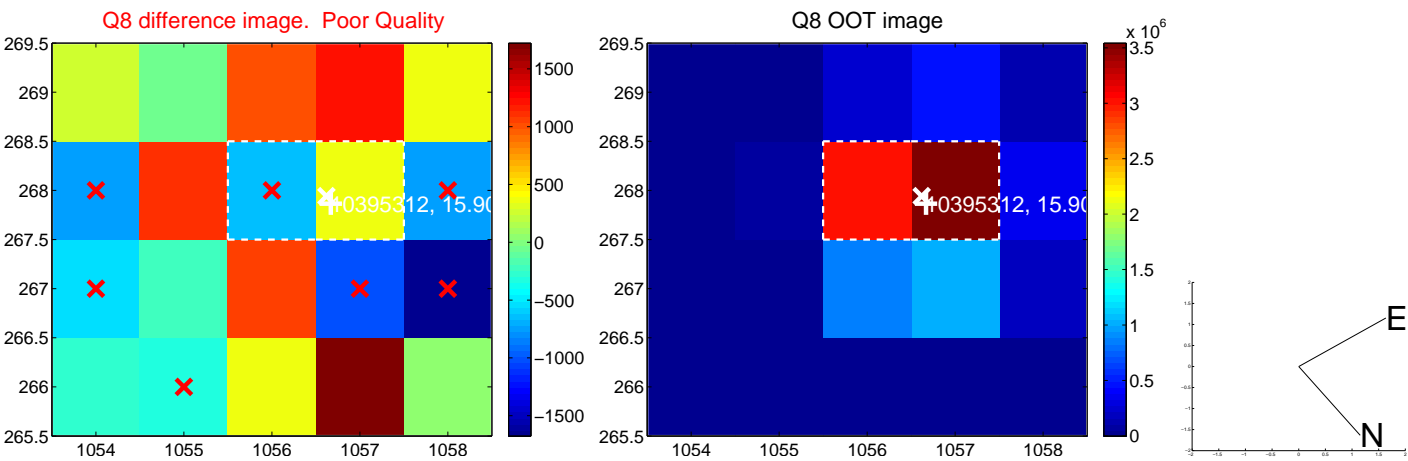
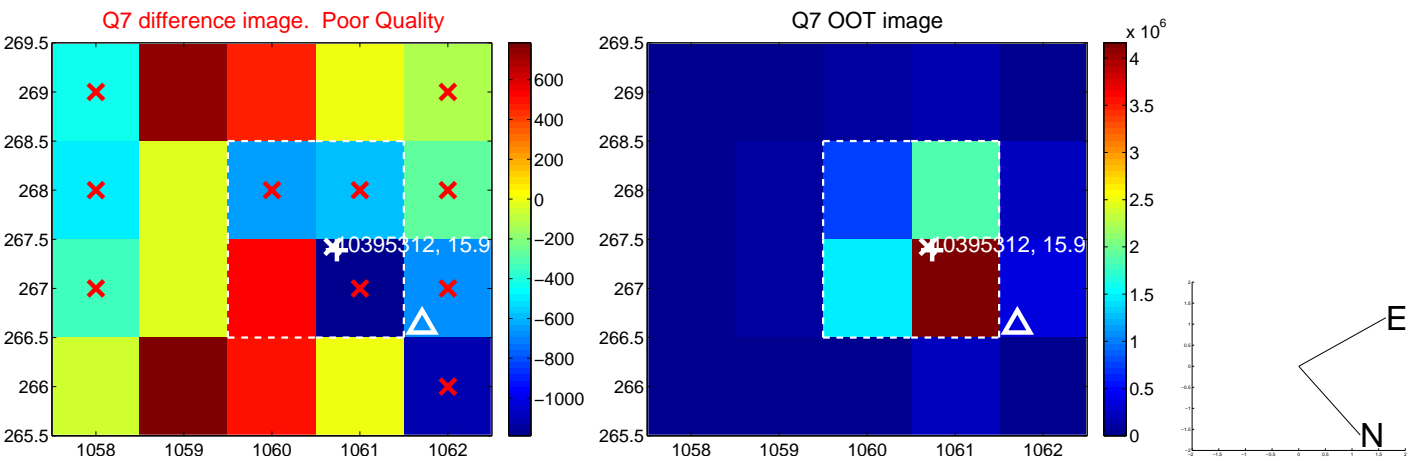
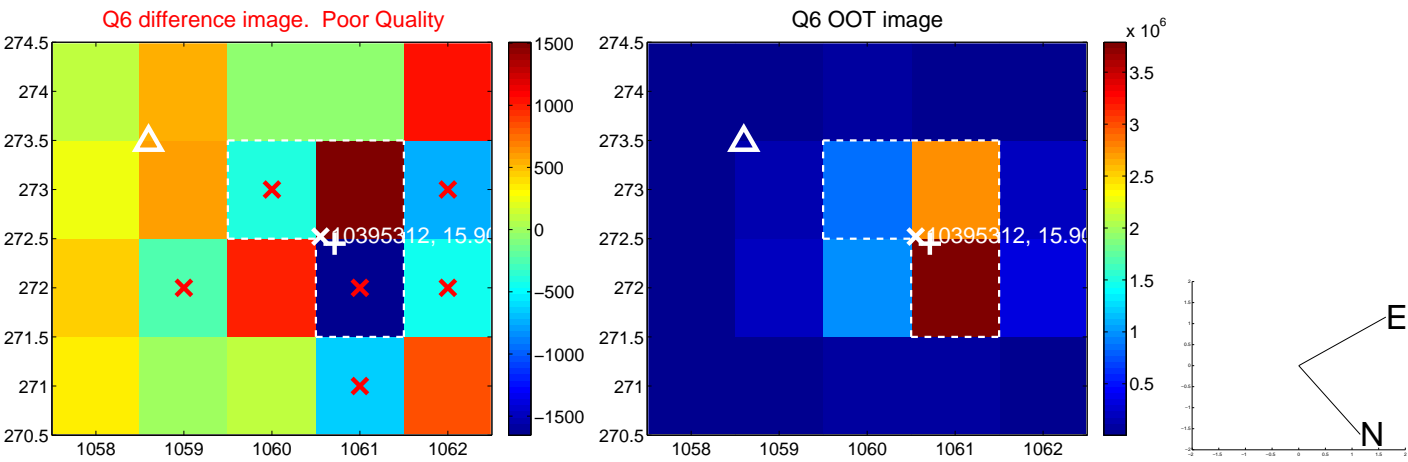
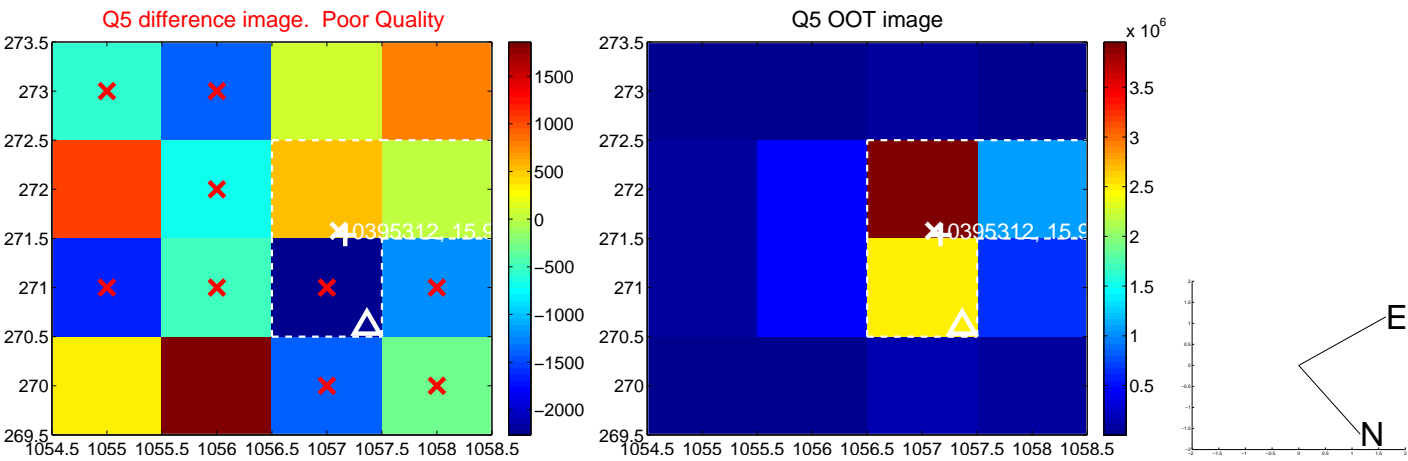


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

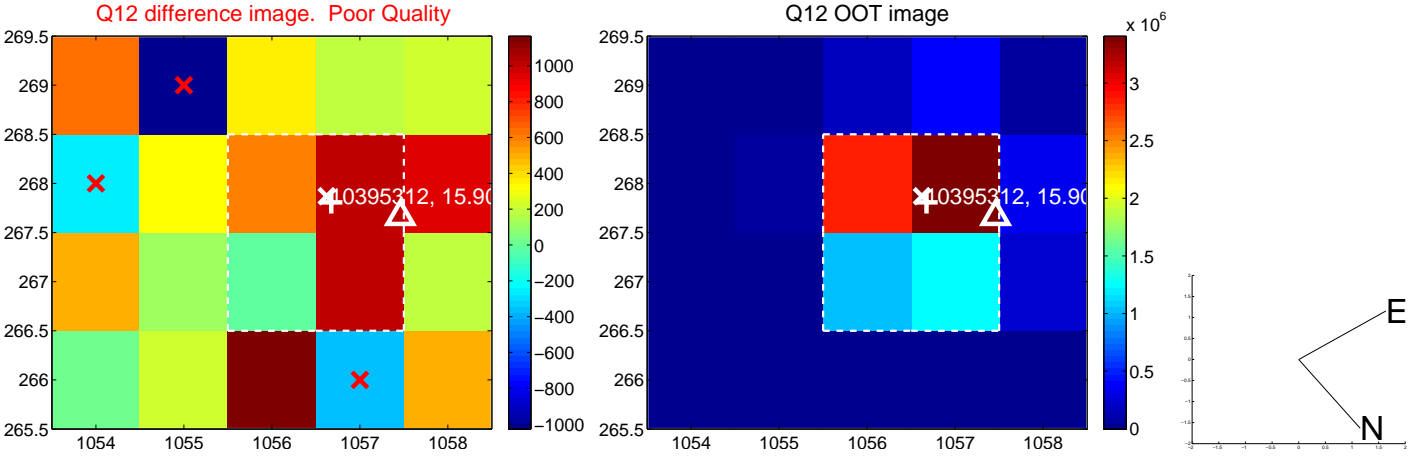
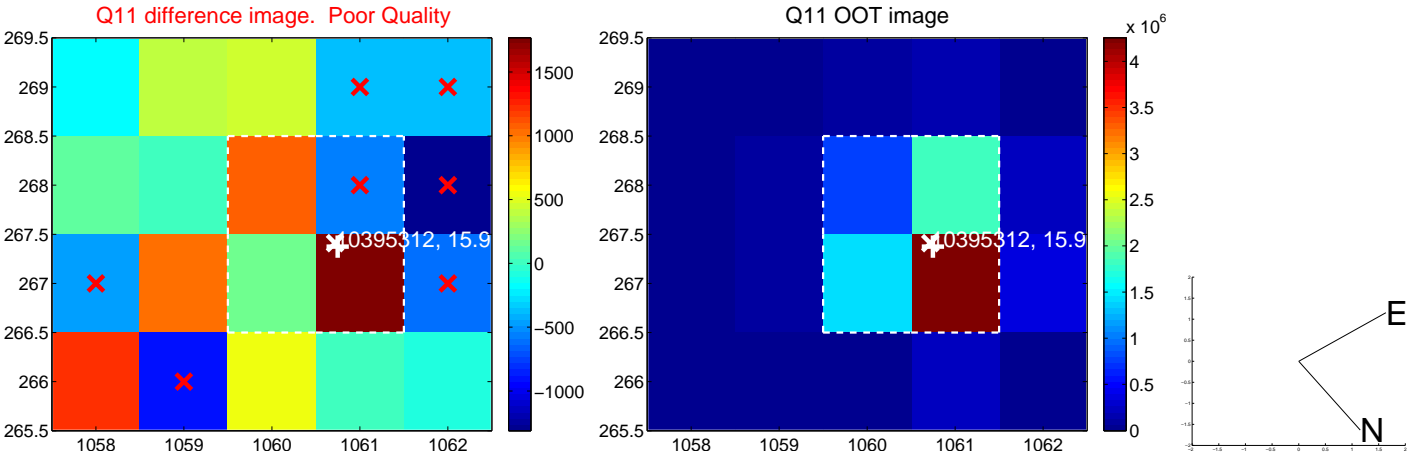
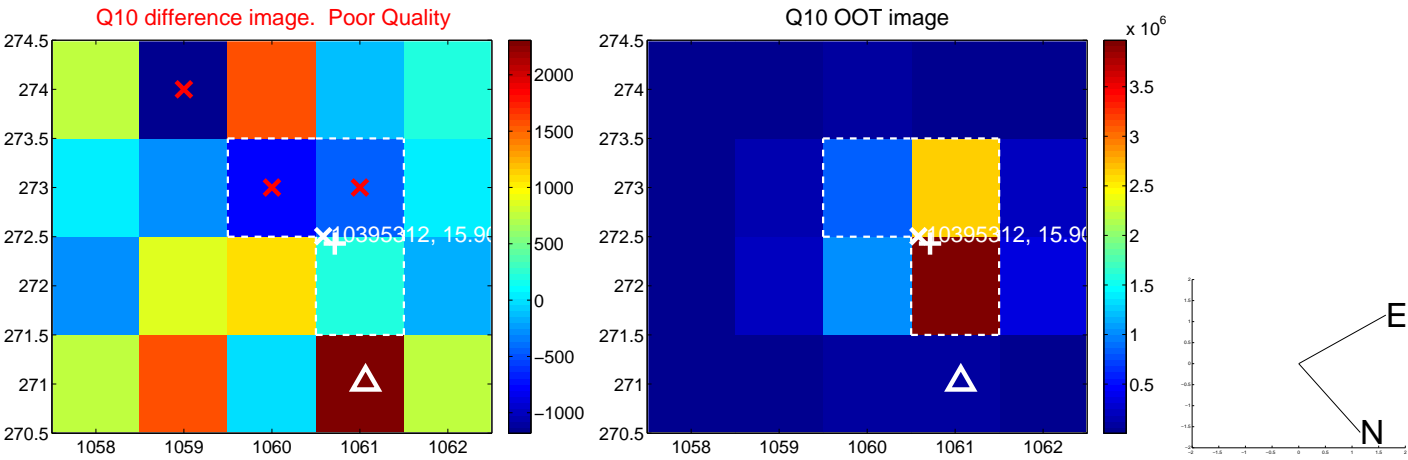
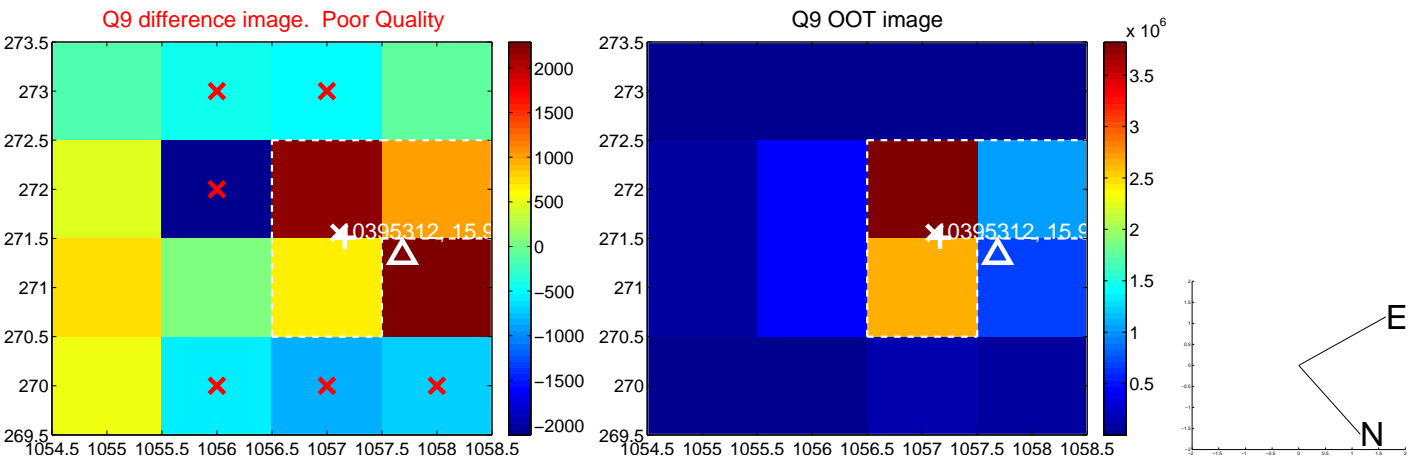
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



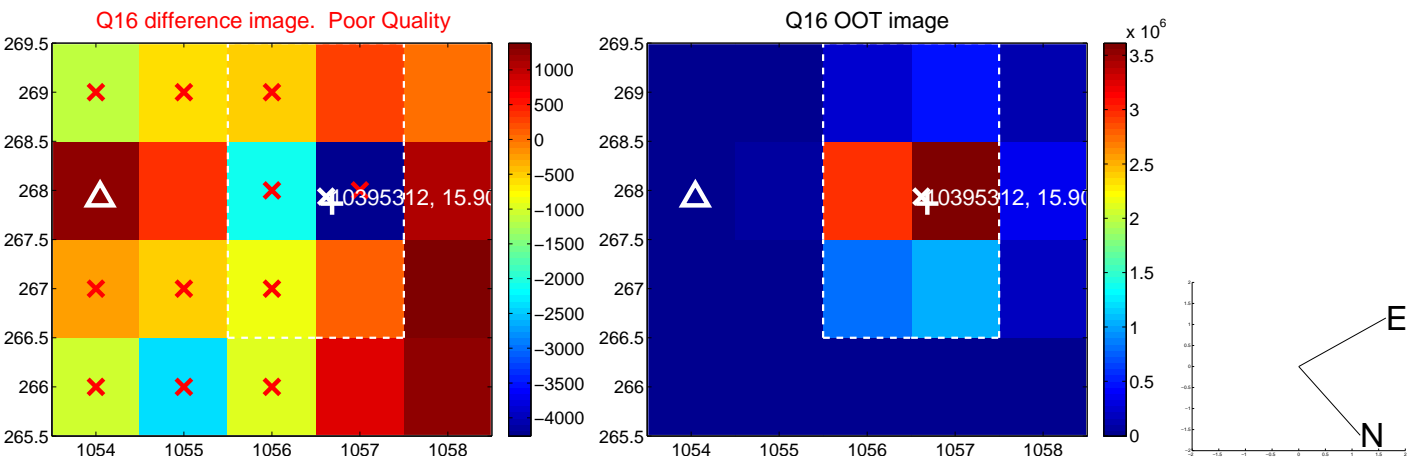
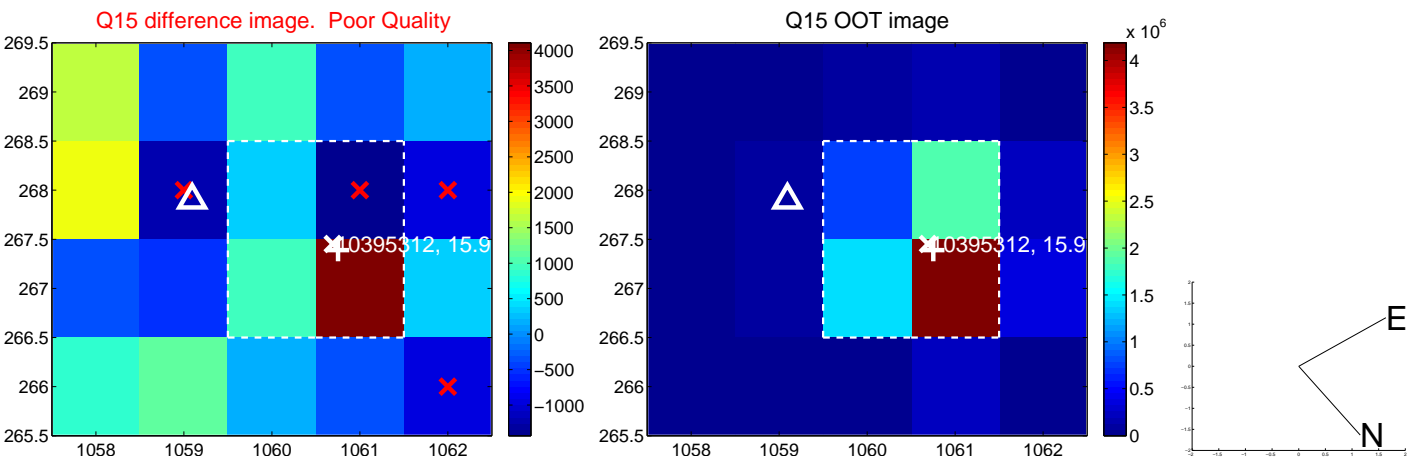
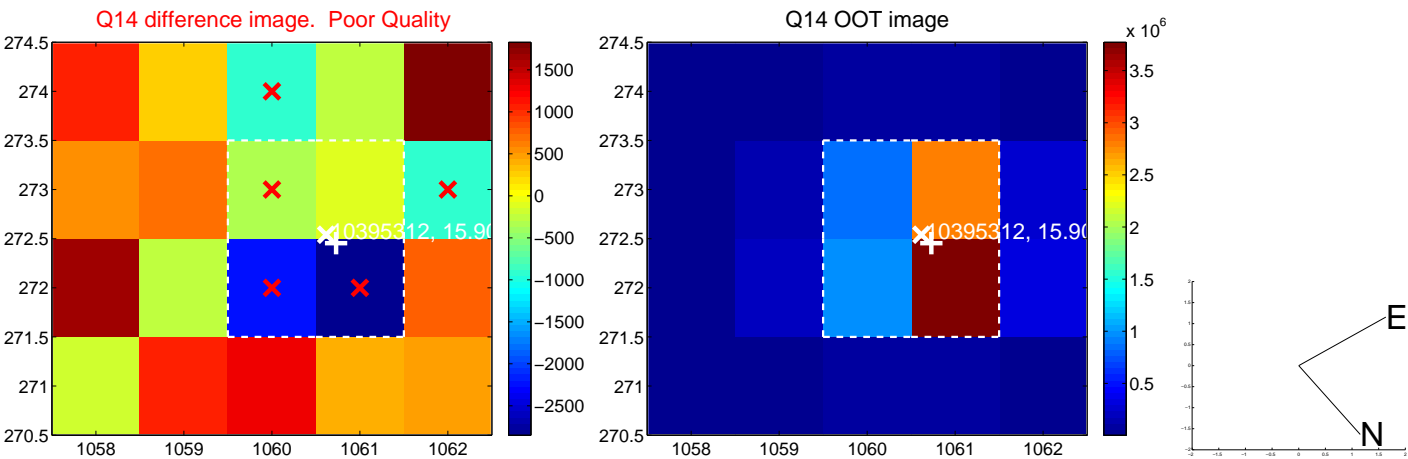
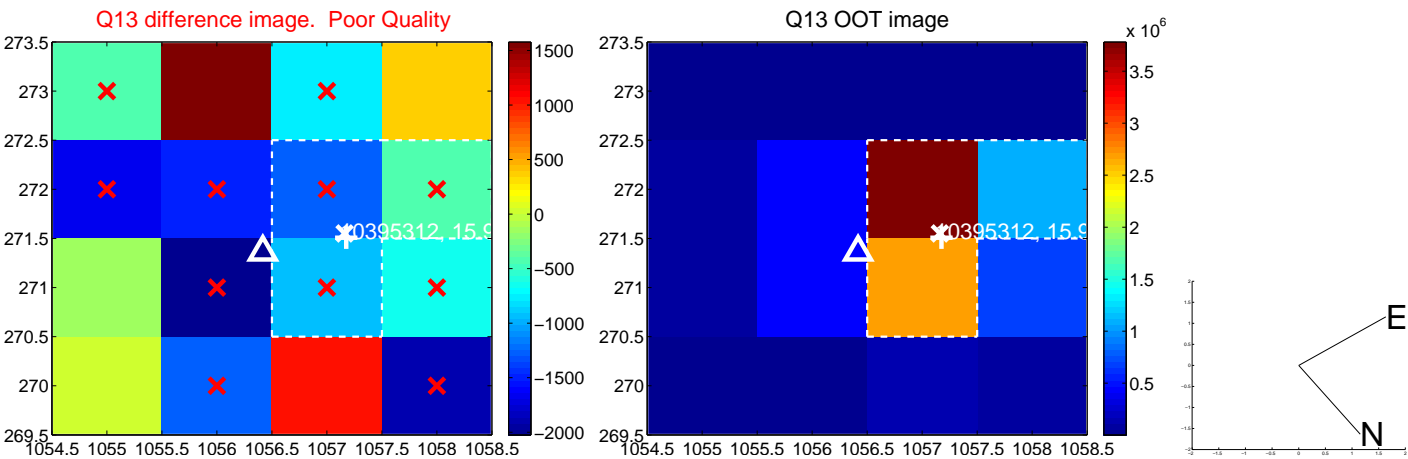
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



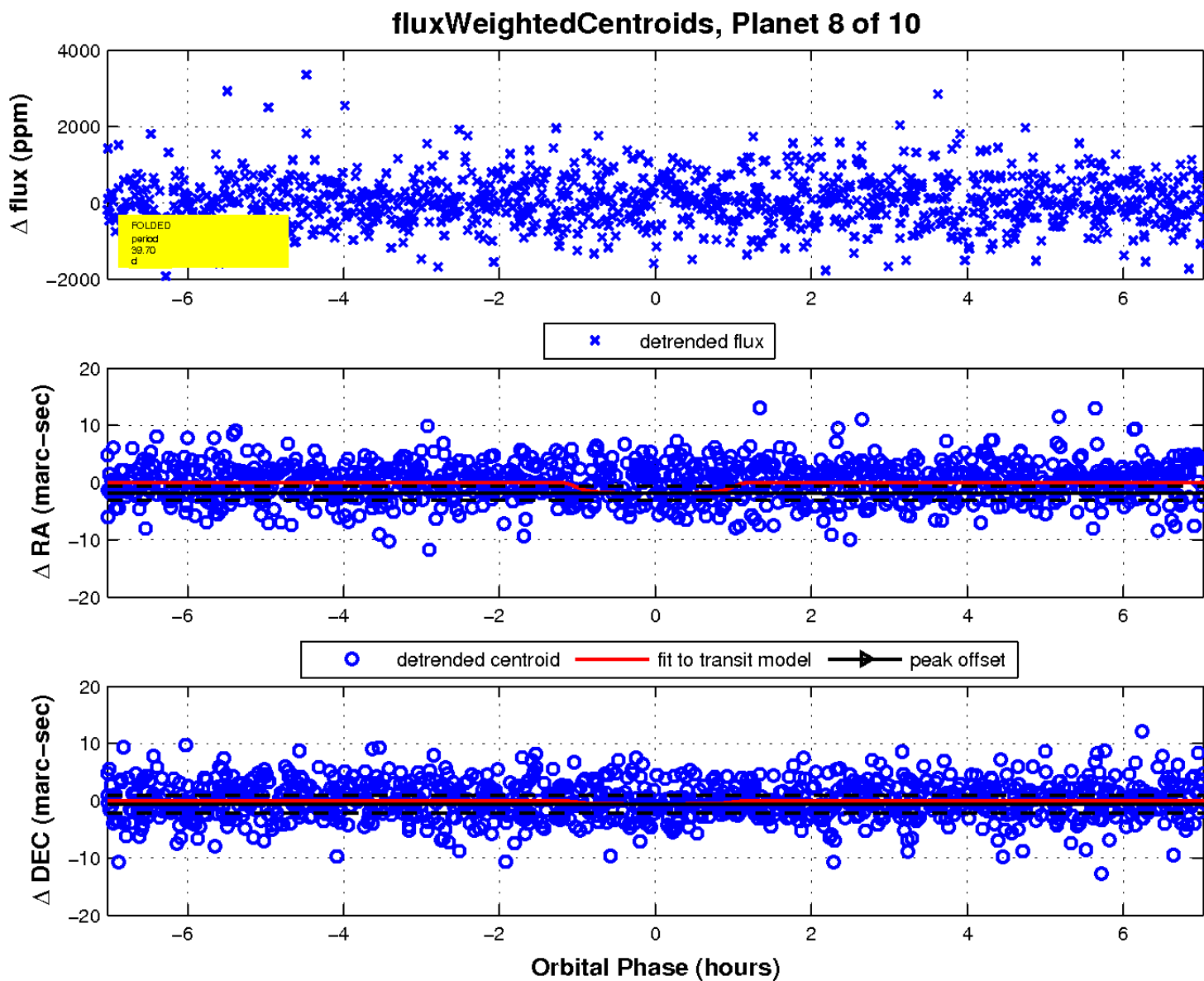
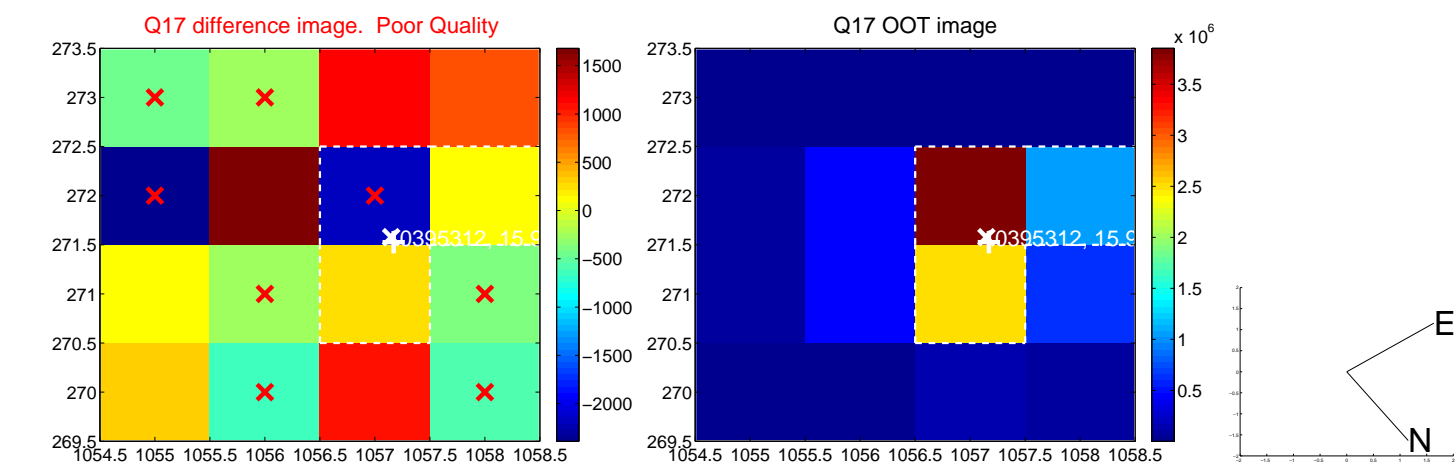
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



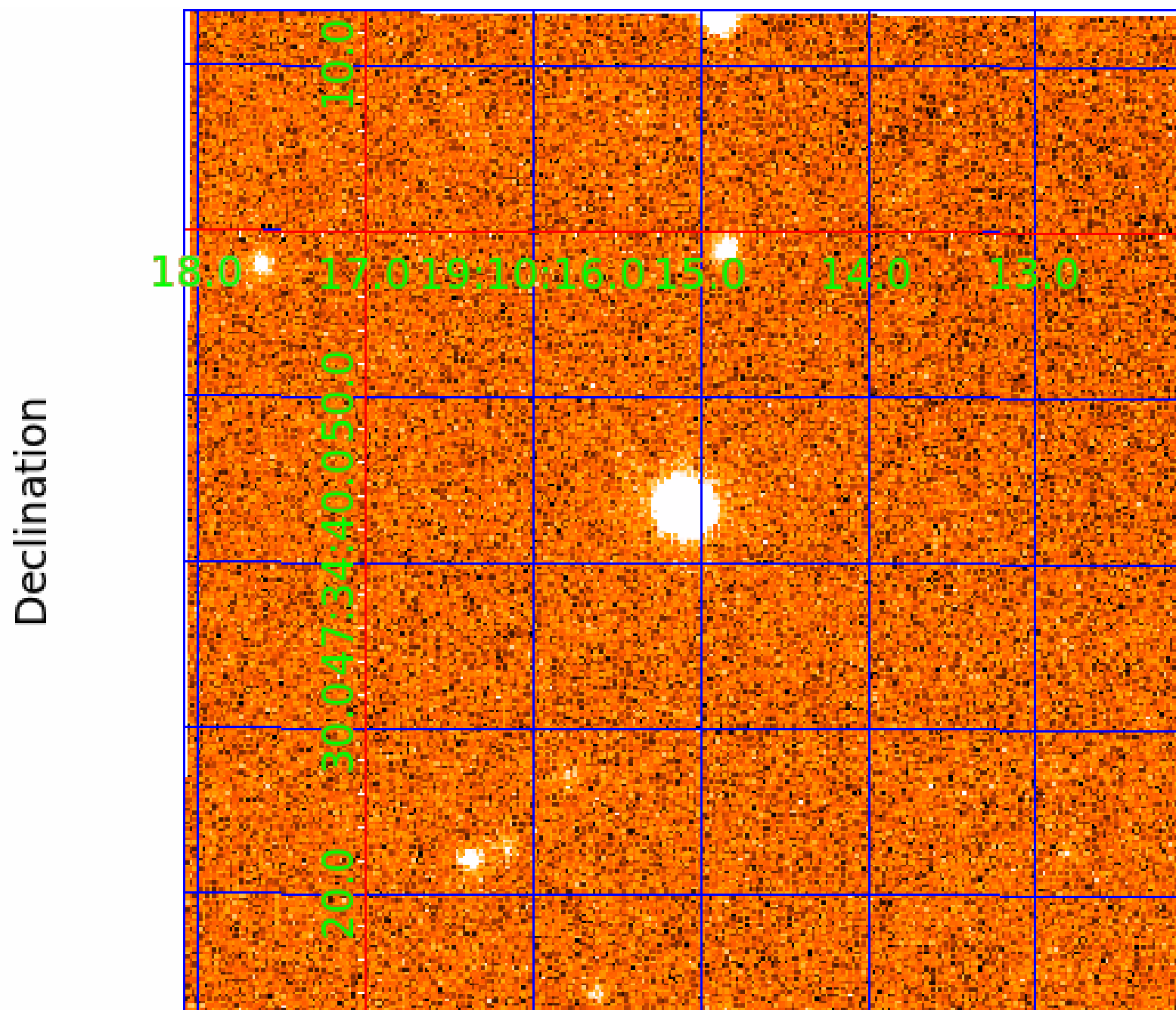
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





## KIC 010395312

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010395312-01	OBS	No	0.734969	131.818451	68.7	5.235	7.8	10.6	0.36	3553	0.30	138.09
010395312-02	OBS	No	43.338219	160.884184	1756.7	2.650	18.5	11.9	0.36	3553	1.49	0.60
010395312-03	OBS	No	22.617913	145.928423	0.0	14.208	12.1	0.0	0.36	3553	0.01	1.43
010395312-04	OBS	No	21.830529	141.862680	332.5	2.263	13.1	2.6	0.36	3553	0.77	1.50
010395312-05	OBS	No	62.134882	184.242550	0.1	3.631	13.2	0.0	0.36	3553	0.01	0.37
010395312-07	OBS	No	29.856582	155.990807	2220.3	1.681	13.8	11.7	0.36	3553	1.71	0.99
010395312-08	OBS	No	39.700029	148.941743	1333.3	2.348	11.7	10.1	0.36	3553	1.50	0.68
010395312-09	OBS	No	26.497868	133.642244	3844.7	1.500	14.1	-1.0	0.36	3553	2.21	1.16
010395312-10	OBS	No	38.975665	141.685996	5375.8	1.500	19.0	-1.0	0.36	3553	2.62	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010395312-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010395312-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010395312-08	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
010395312-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
010395312-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

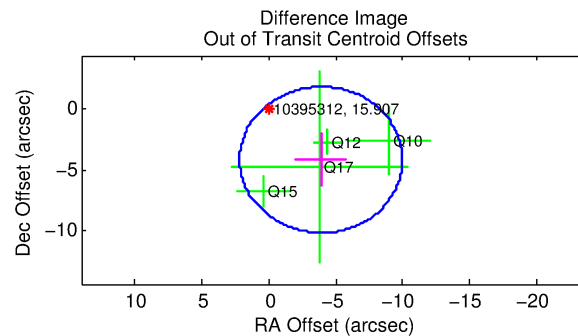
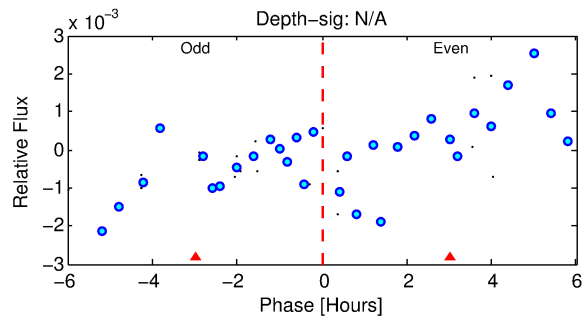
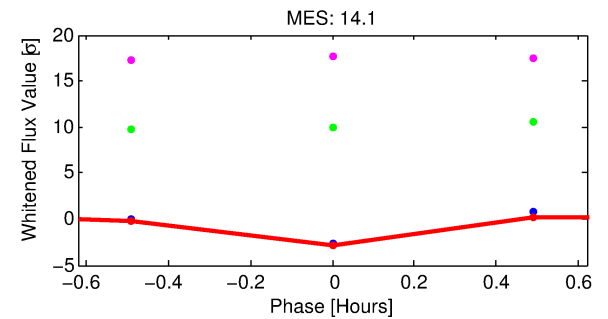
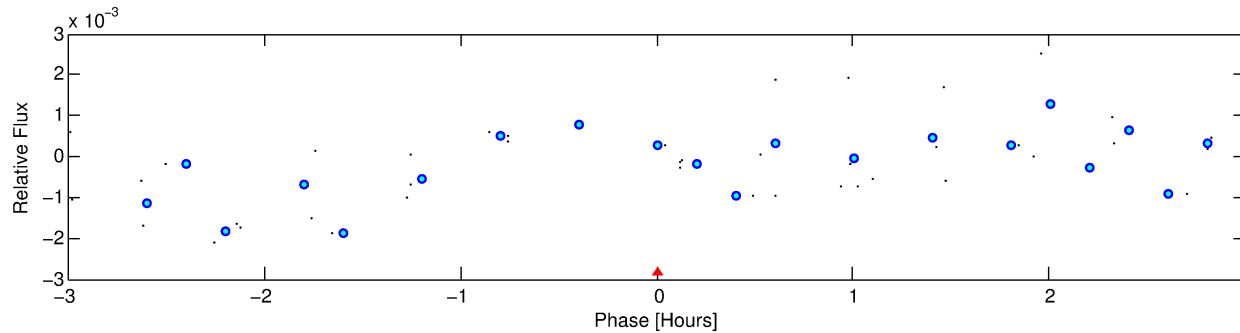
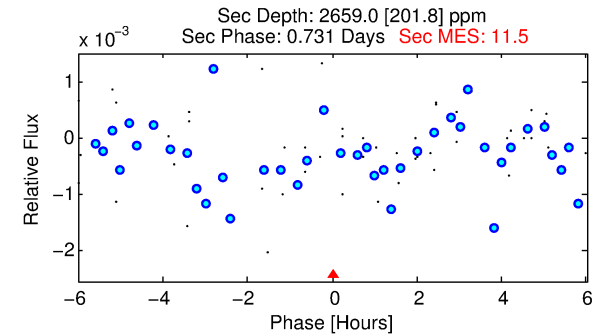
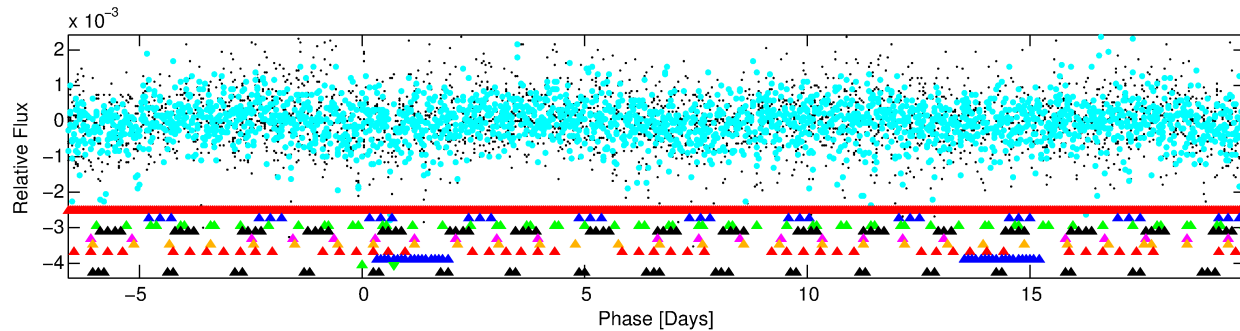
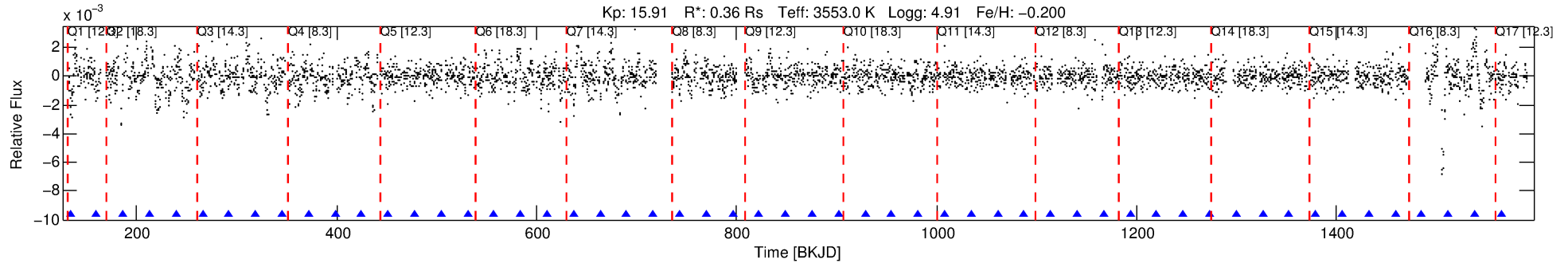
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010395312-09

No Significant Match Found

# DV One-Page Summary

KIC: 10395312 Candidate: 9 of 10 Period: 26.498 d



## TPS TCE Results:

Period = 26.49787 d  
Epoch = 133.6422 BKJD

DV fit results are unavailable

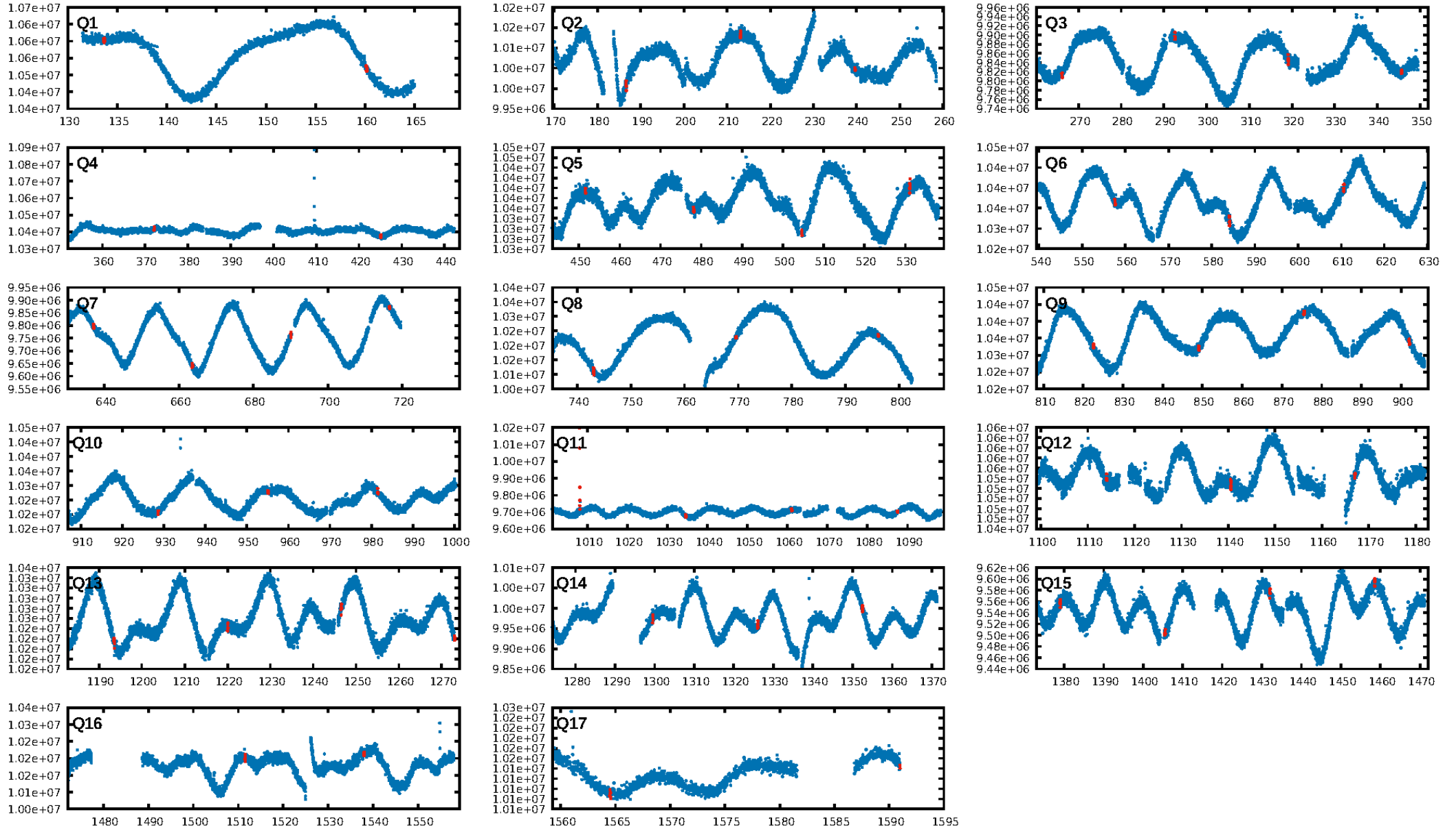
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.52 $\sigma$ ]  
LongPeriod-sig: 100.0% [35.78 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [8/8]  
**GhostDiagnostic-chr: -0.5841**  
Centroid-sig: 5.8%  
Centroid-so: 9.738 arcsec [1.48 $\sigma$ ]  
OotOffset-rm: 5.713 arcsec [2.82 $\sigma$ ]  
KicOffset-rm: 5.440 arcsec [2.70 $\sigma$ ]  
OotOffset-st: 1/1/1/1 [4]  
KicOffset-st: 1/1/1/1 [4]  
DiffImageQuality-fgm: 0.00 [0/4]  
DiffImageOverlap-fno: 0.14 [2/14]

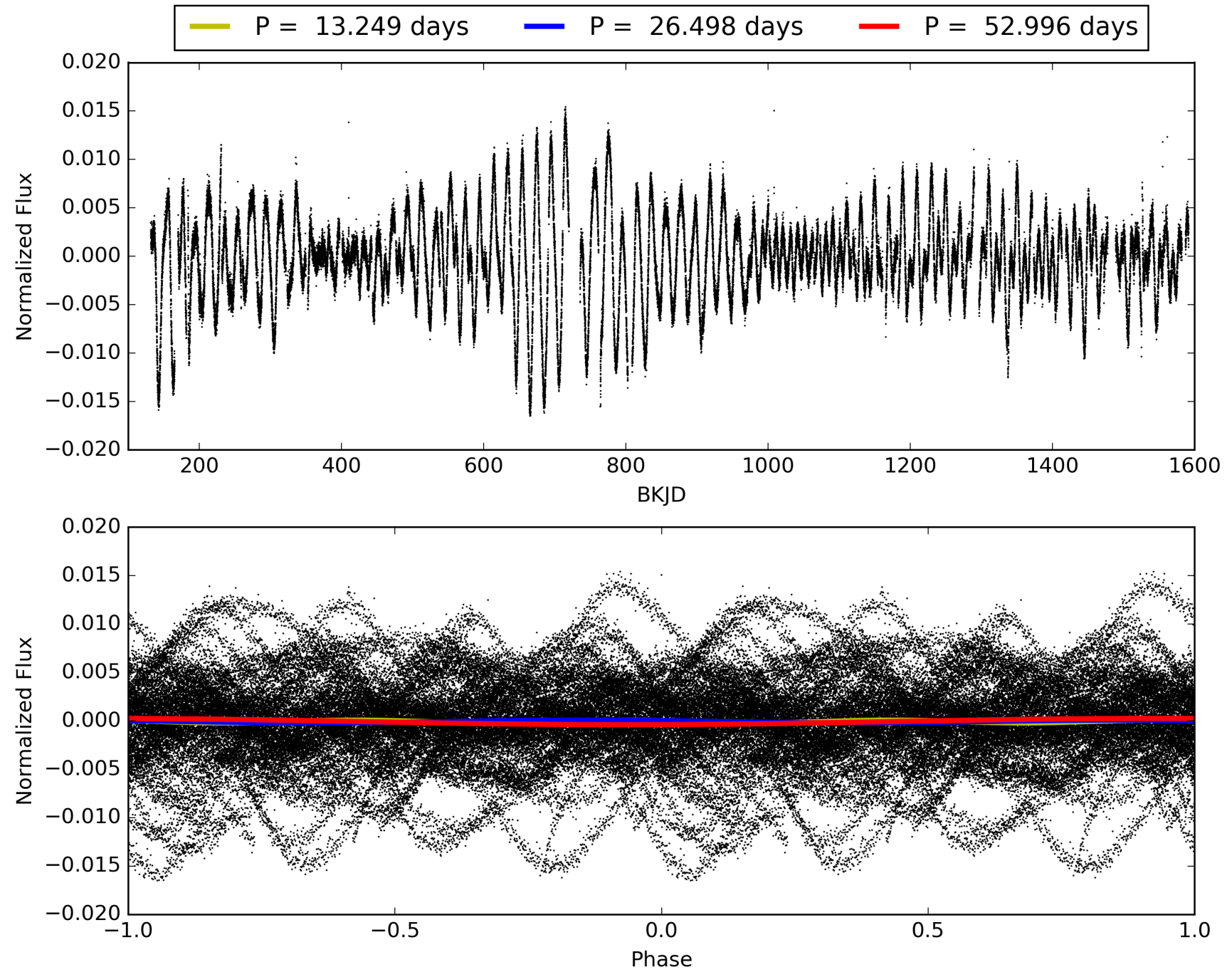
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:44:41 Z

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

# TCE 010395312-09, PDC Light Curves

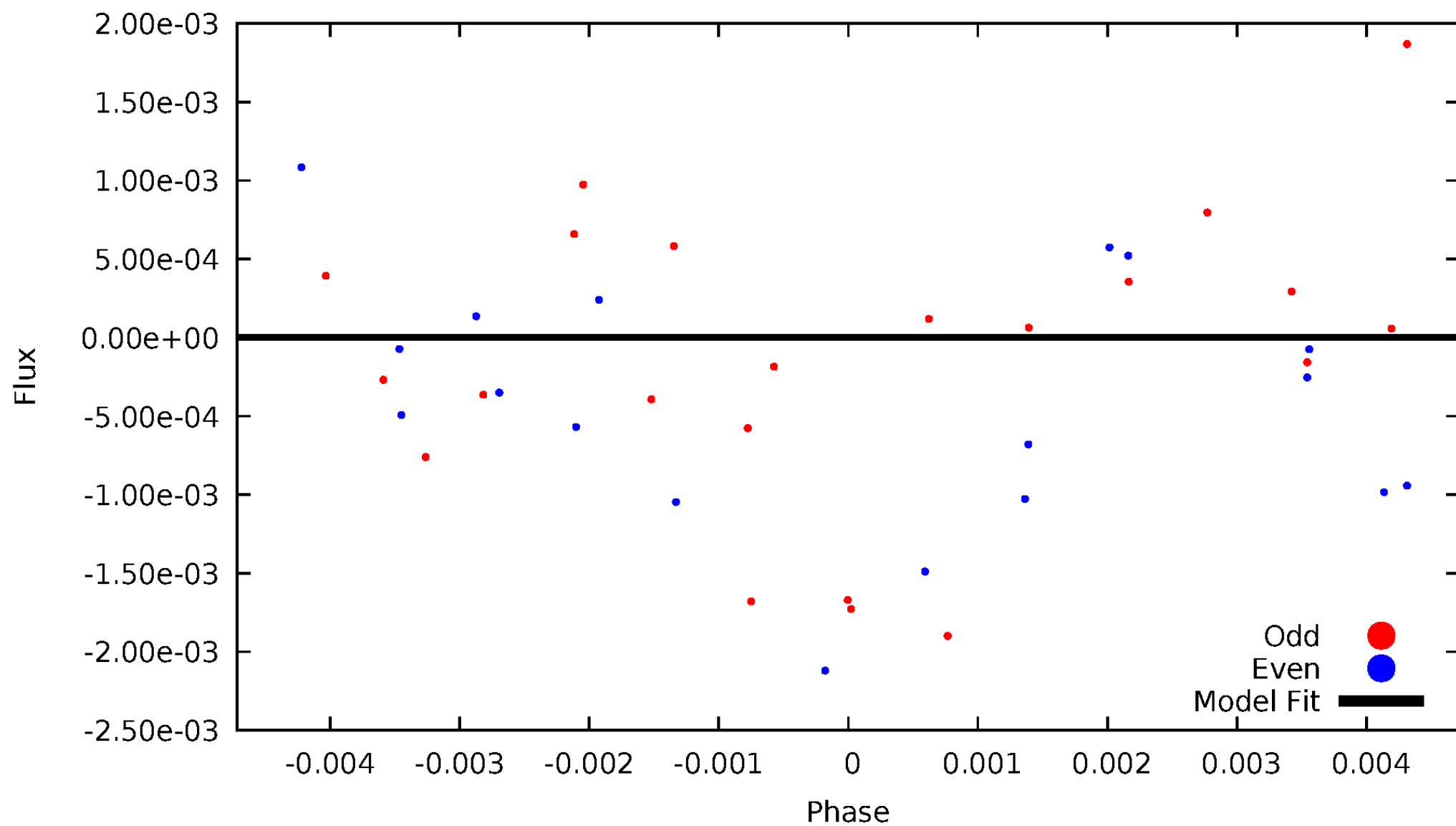


# TCE 010395312-09



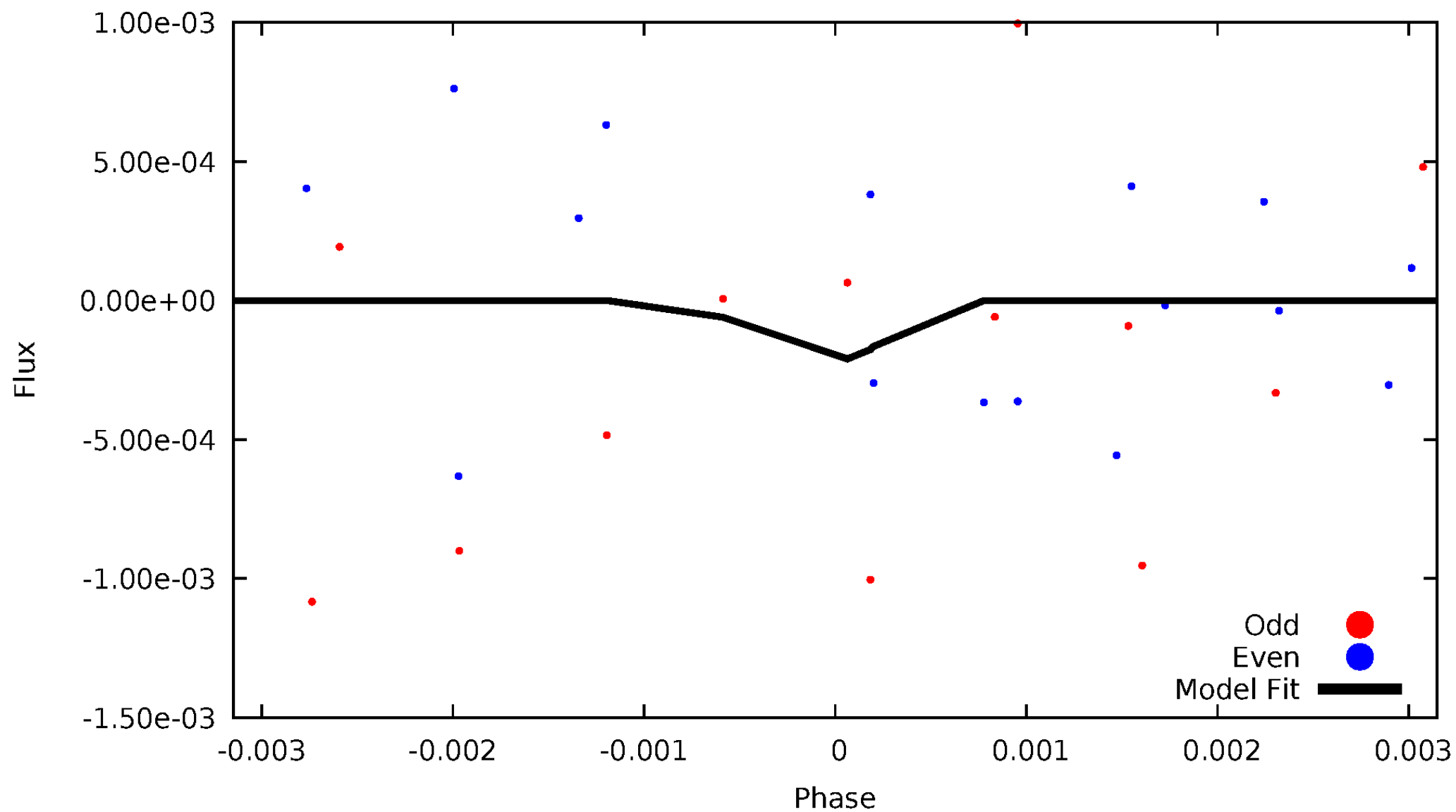
# DV Odd/Even

TCE 010395312-09



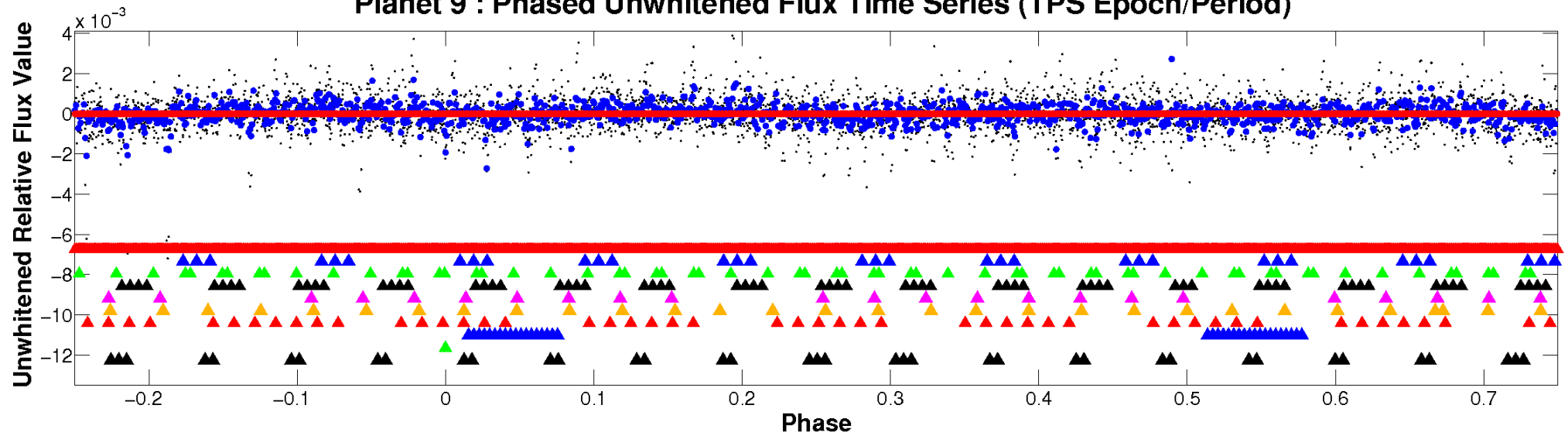
# ALT Odd/Even

TCE 010395312-09



# Non-Whitened Vs. Whitened Light Curve

**Planet 9 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

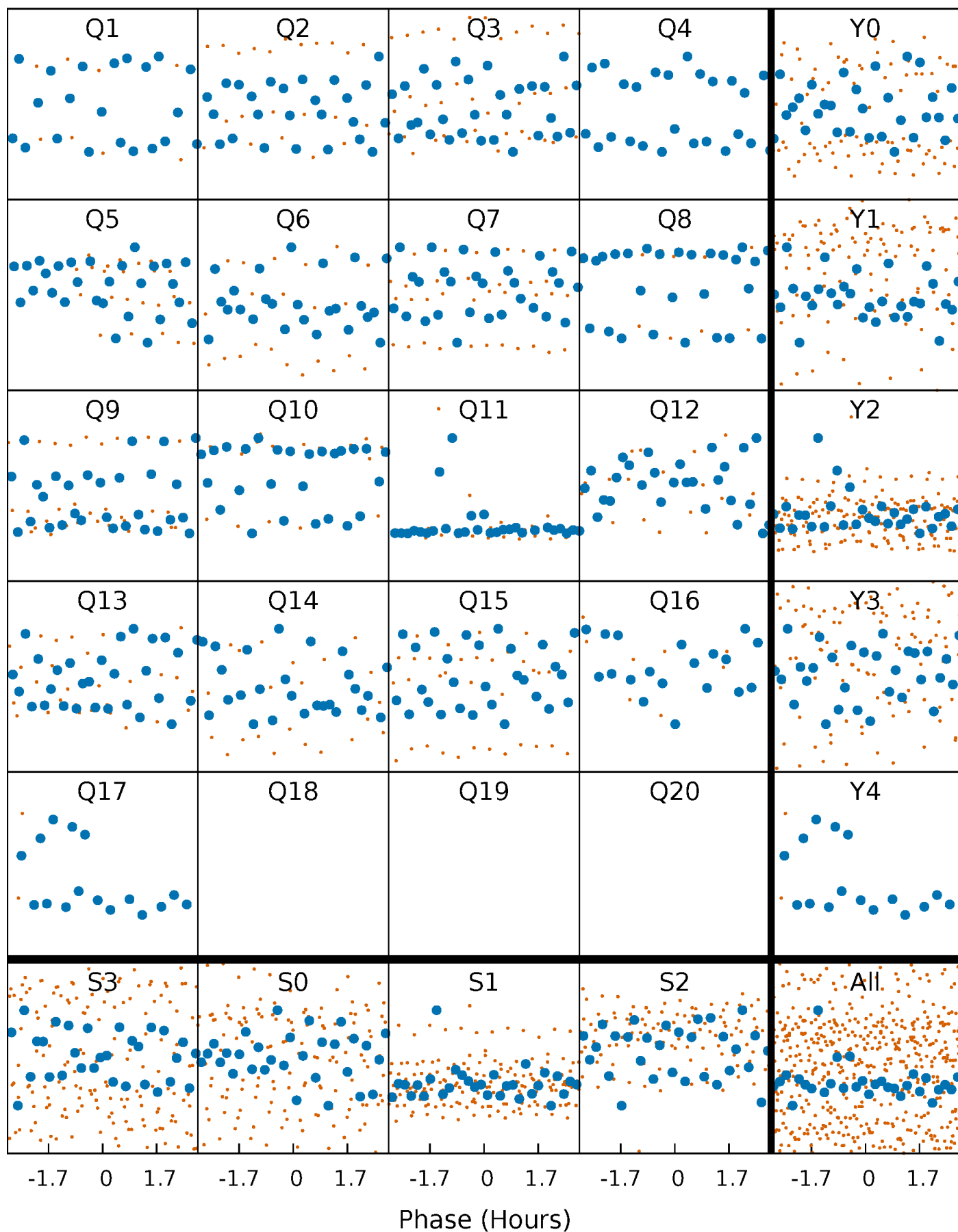


**Planet 9 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

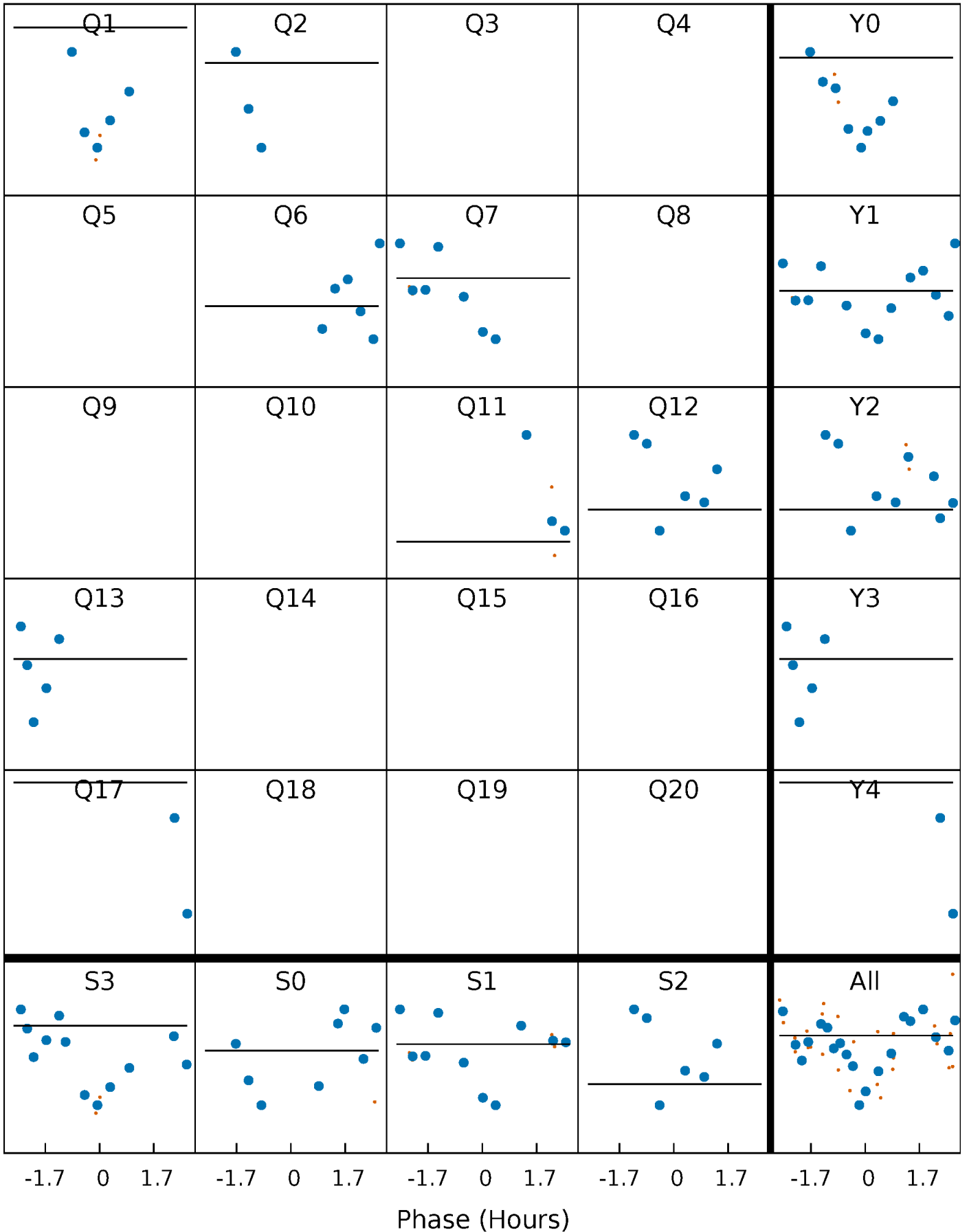
TCE 010395312-09     $P = 26.497868$  Days     $T_0 = 133.642244$  (BKJD)





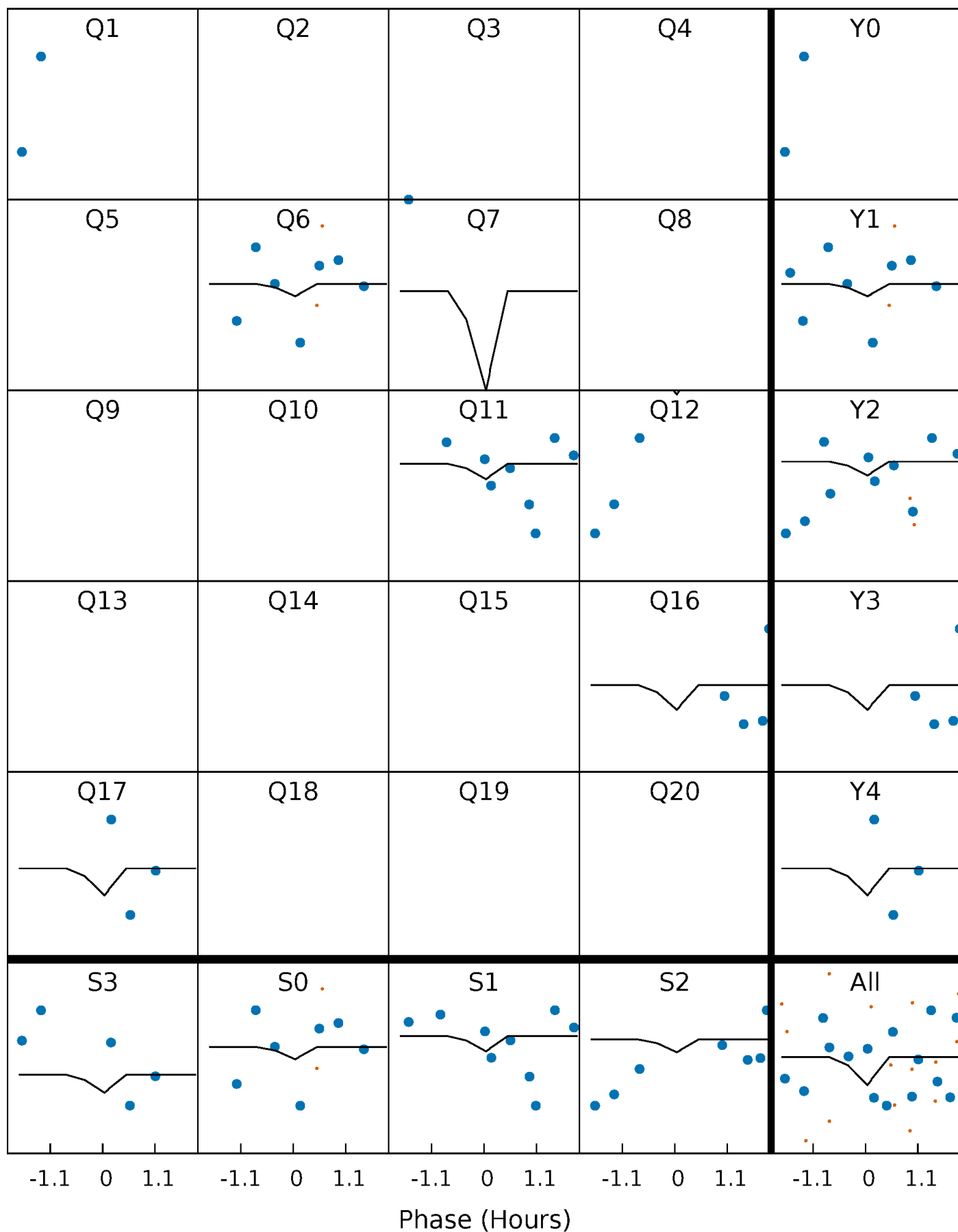
# DV Quarter-Phased Transit Curves

TCE 010395312-09   P= 26.497868 Days    $T_0=133.642244$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

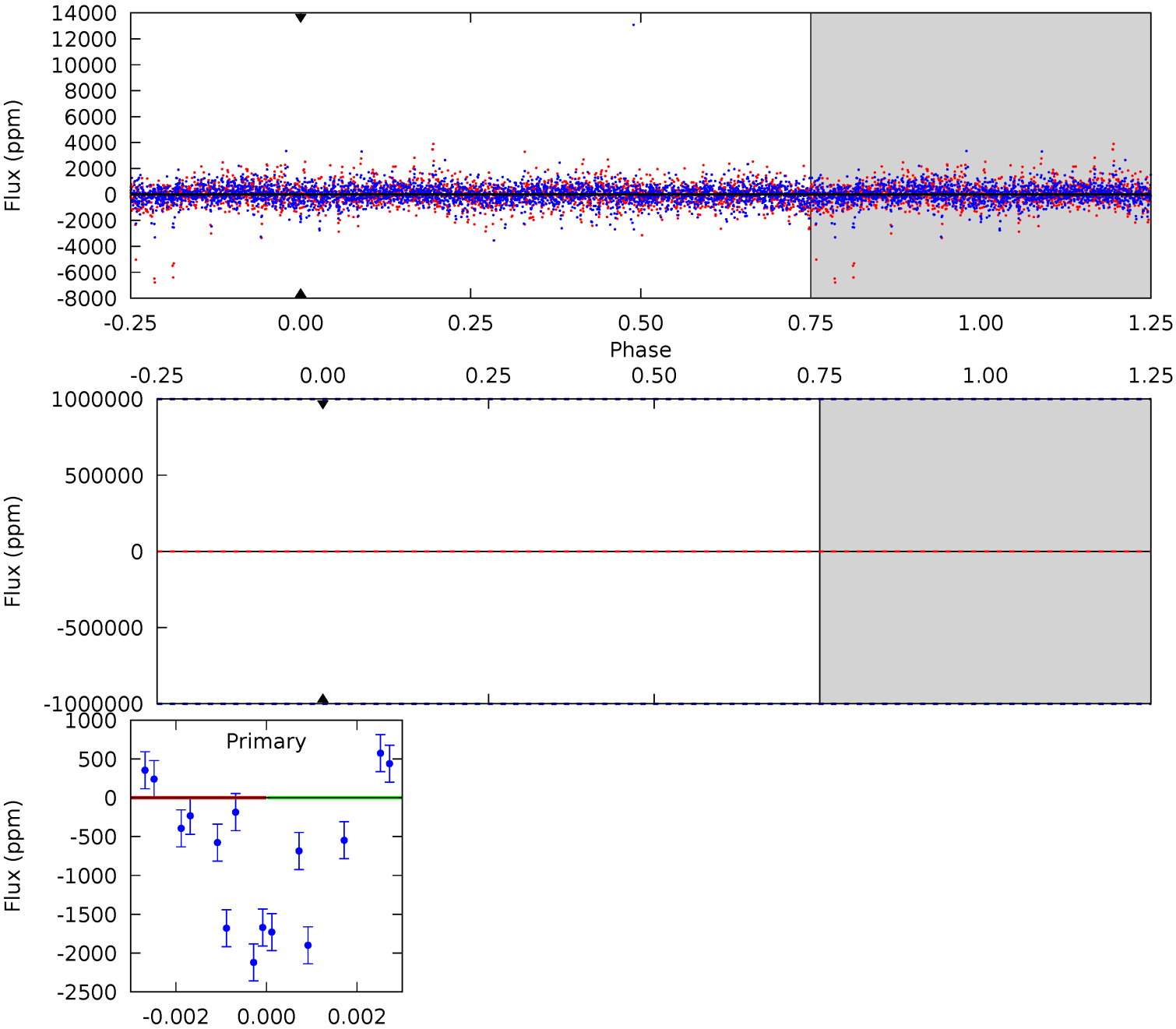
TCE 010395312-09 P= 26.497868 Days  $T_0=133.731228$  (BKJD)



# DV Model-Shift Uniqueness Test

010395312-09, P = 26.497868 Days, E = 107.144376 Days

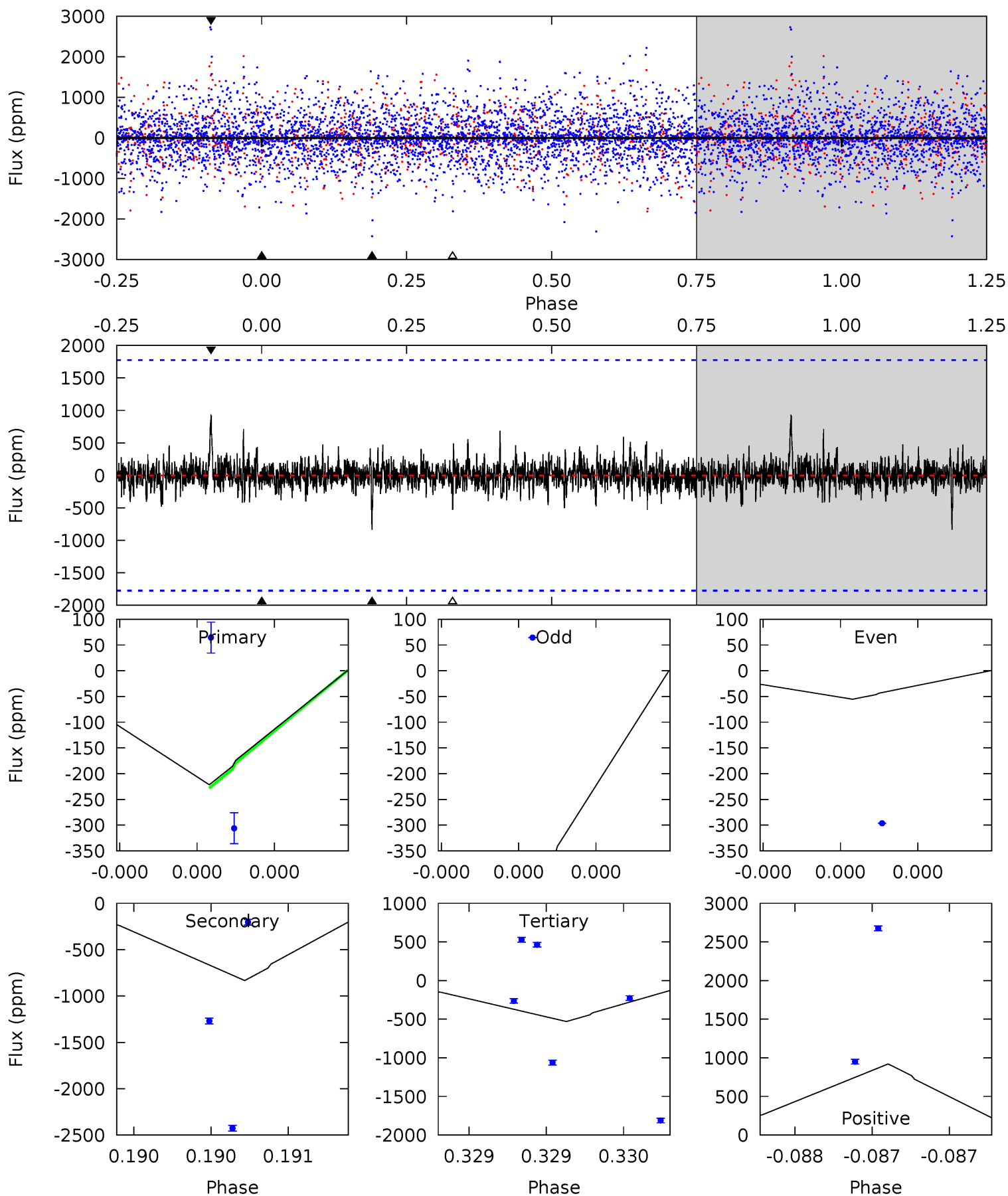
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010395312-09, P = 26.497868 Days, E = 107.233360 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.70	2.64	1.68	2.91	5.61	3.54	0.49	-0.98	-2.21	0.96	-0.28	0.64	1.00	0.52	0.00



### Stellar Parameters For KIC 010395312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3553^{+48}_{-53}$	$4.906^{+0.035}_{-0.042}$	$-0.200^{+0.100}_{-0.100}$	$0.358^{+0.036}_{-0.036}$	$0.379^{+0.034}_{-0.046}$	$11.630^{+2.353}_{-1.957}$
	+1%/-1%	+1%/-1%	+50%/-50%	+10%/-10%	+9%/-12%	+20%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010395312-09 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$3.80^{+3.09}_{-2.57}$	$370^{+9}_{-8}$	$-2918^{+9193}_{-3550}$	$-1437.912^{+100698.485}_{-110199.445}$
Alt.	$-833 \pm 316$	$2.88^{+2.94}_{-2.06}$	$370^{+8}_{-8}$	$2666^{+1204}_{-435}$	$751^{+8586}_{-580}$

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

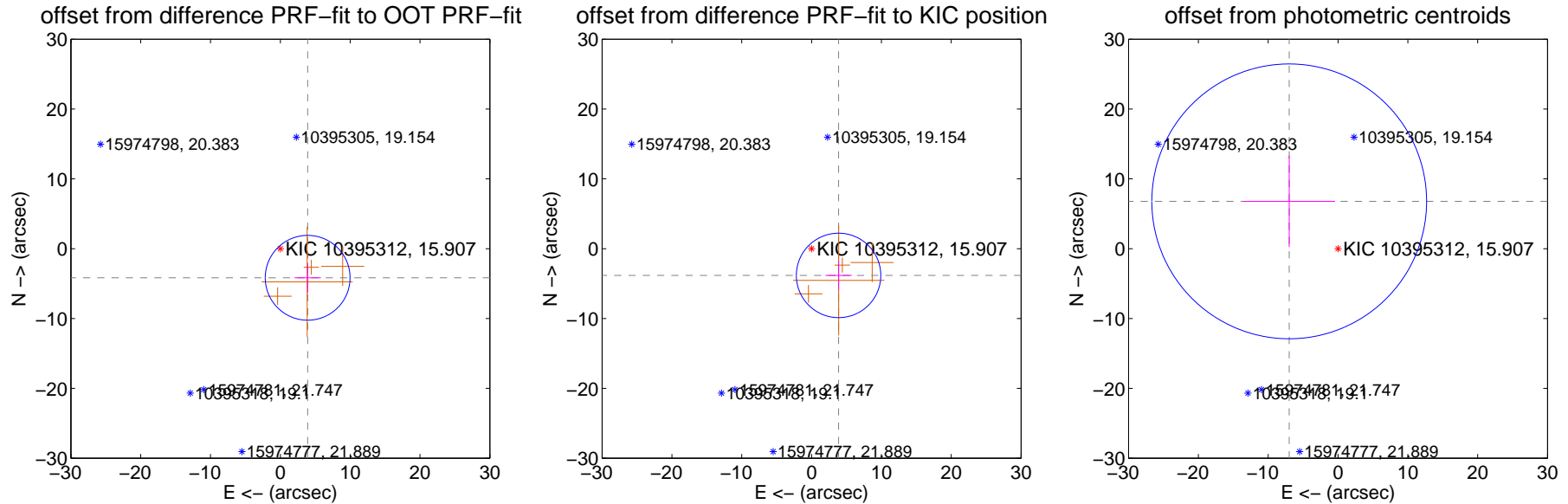
## DV Centroid Data

Supplemental centroid analysis for 010395312-09. Kepler magnitude: 15.91. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

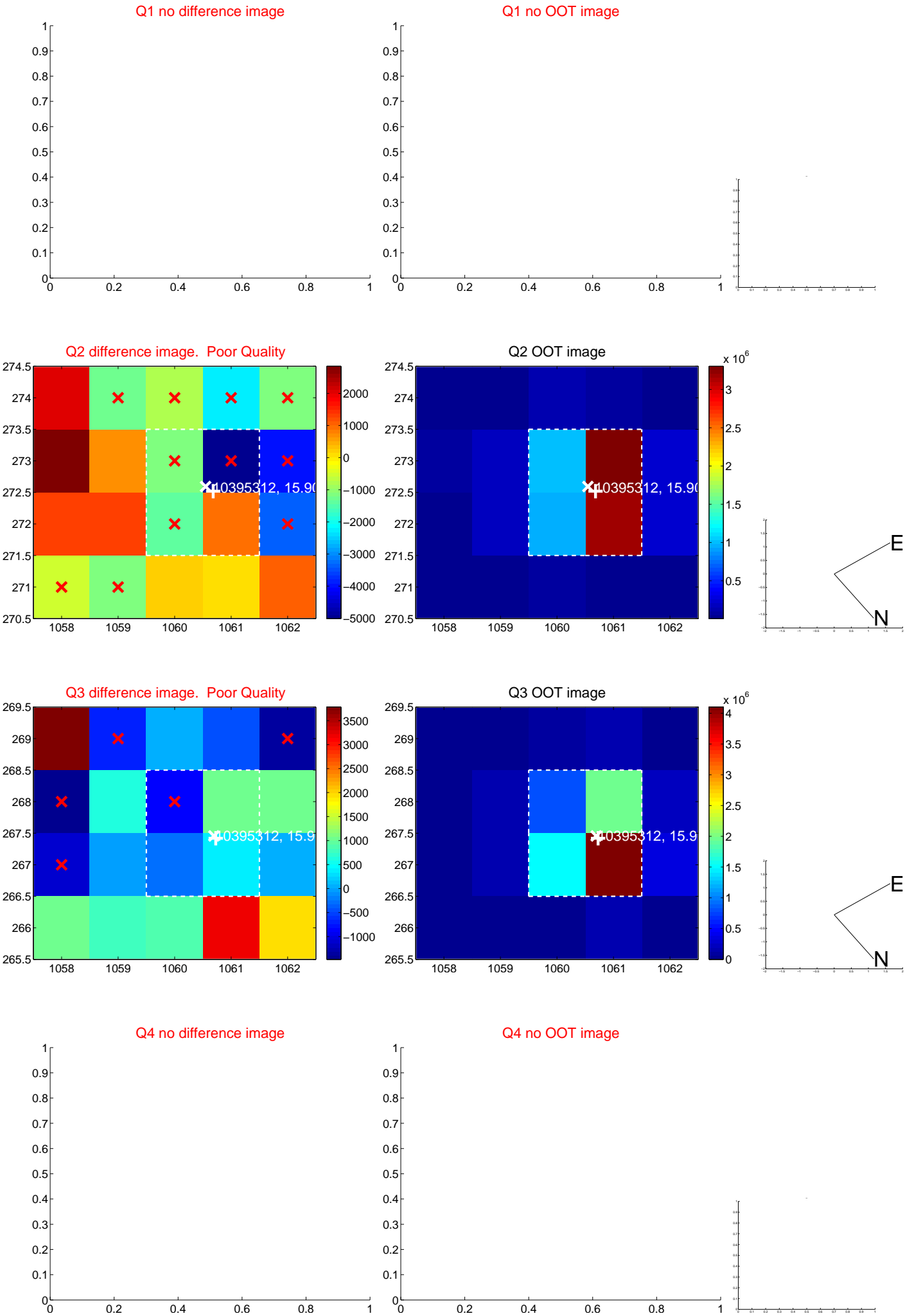
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.713 \pm 2.024$	2.82	$-3.908 \pm 1.892$	$-4.167 \pm 2.134$
PRF-fit source offset from KIC position	$5.440 \pm 2.015$	2.70	$-3.866 \pm 1.892$	$-3.827 \pm 2.134$
photometric centroid source offset	$9.74 \pm 6.56$	1.48	$6.99 \pm 6.58$	$6.78 \pm 6.54$

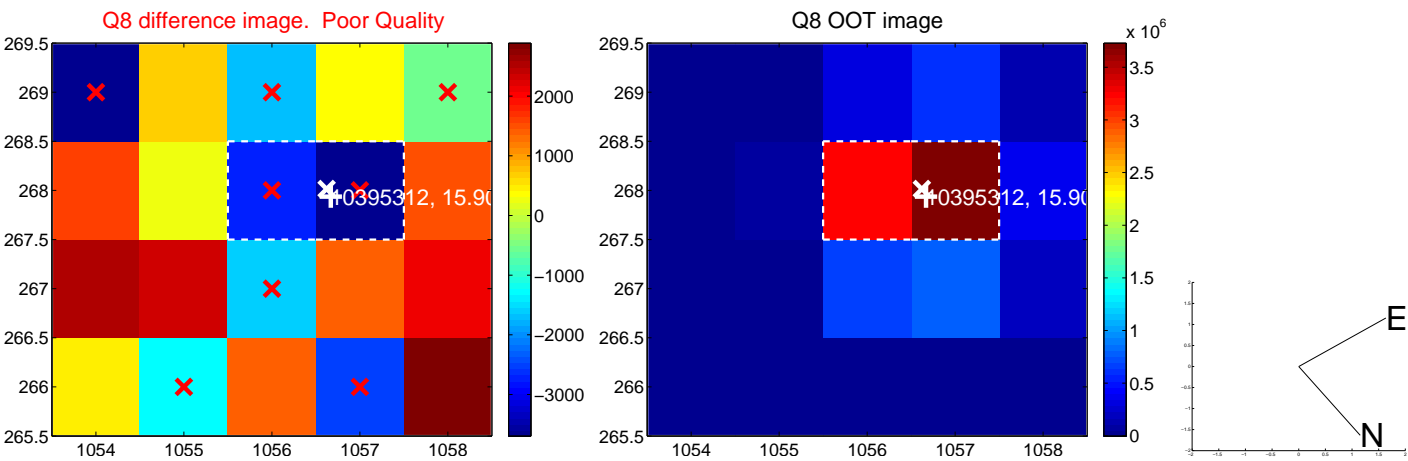
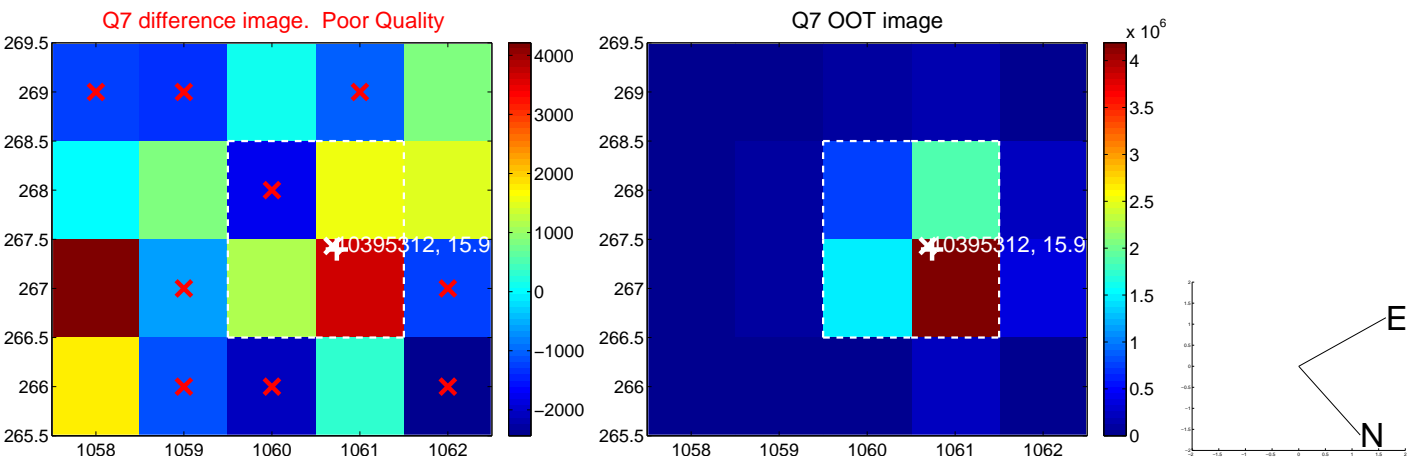
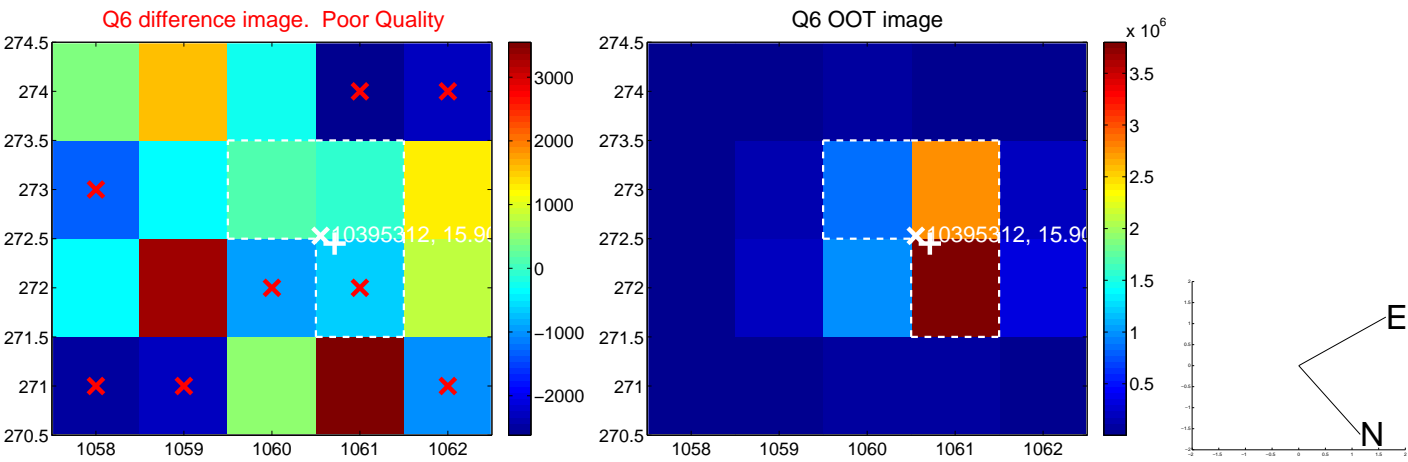
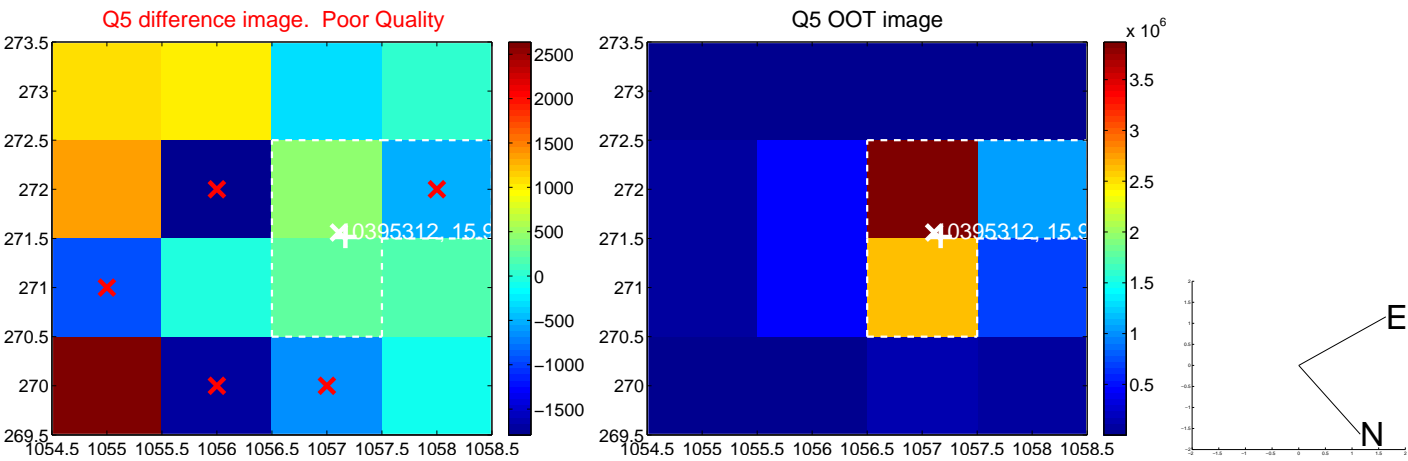


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

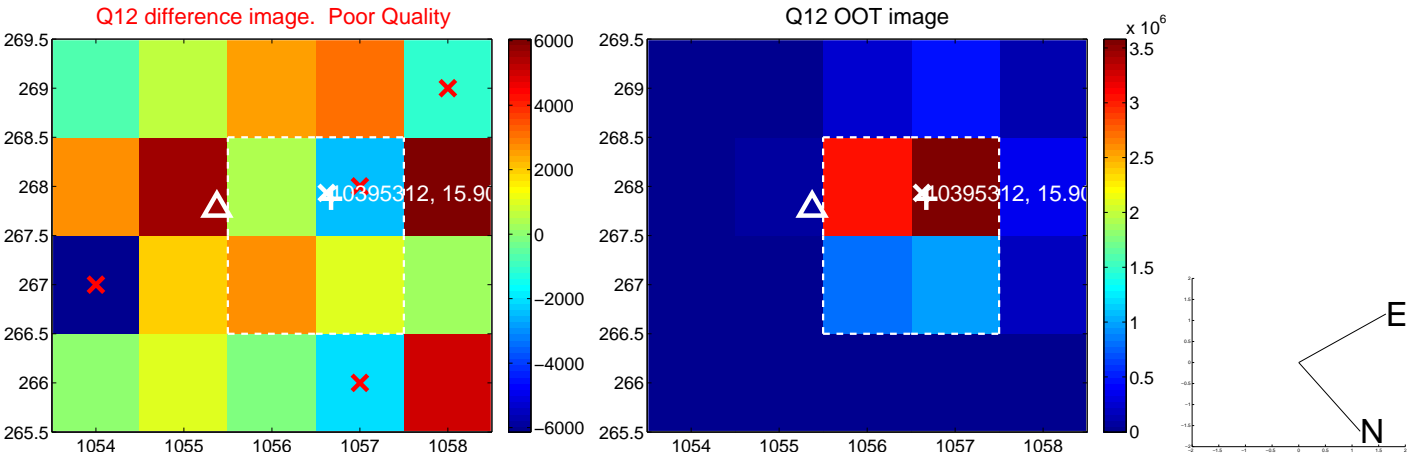
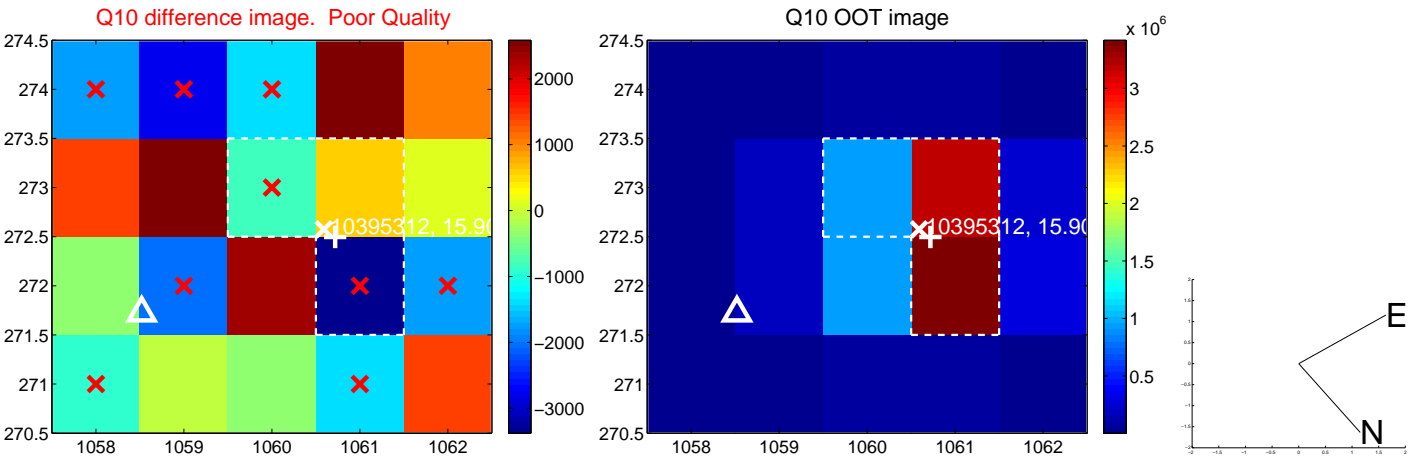
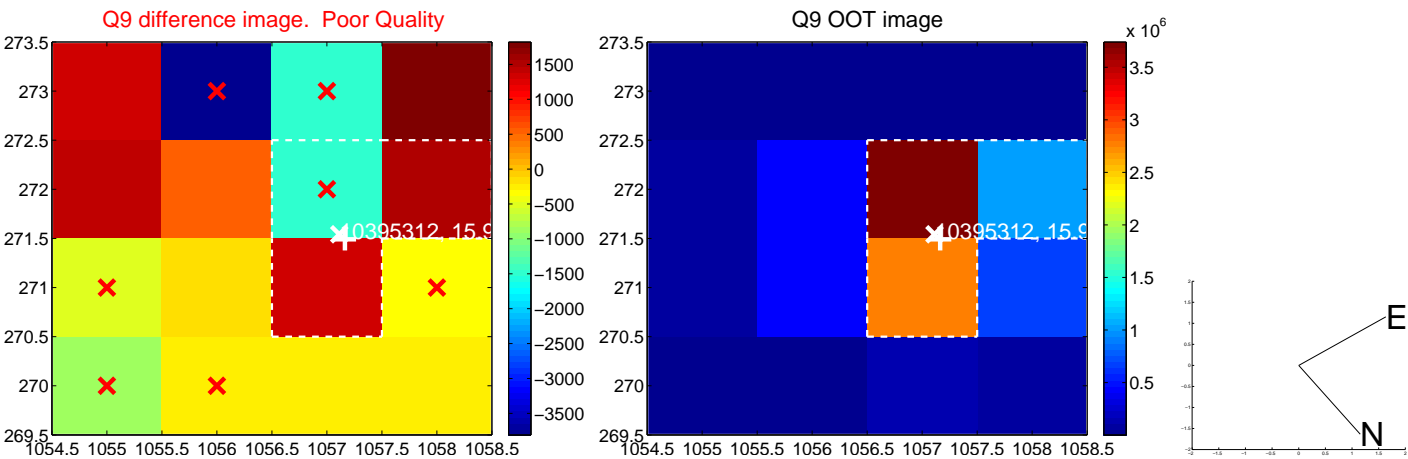


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

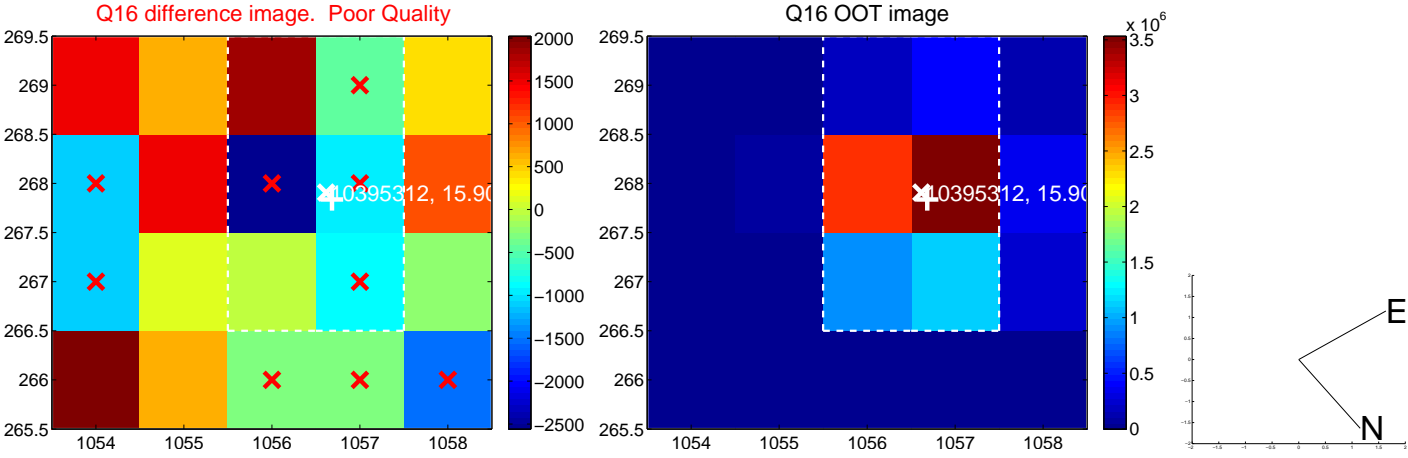
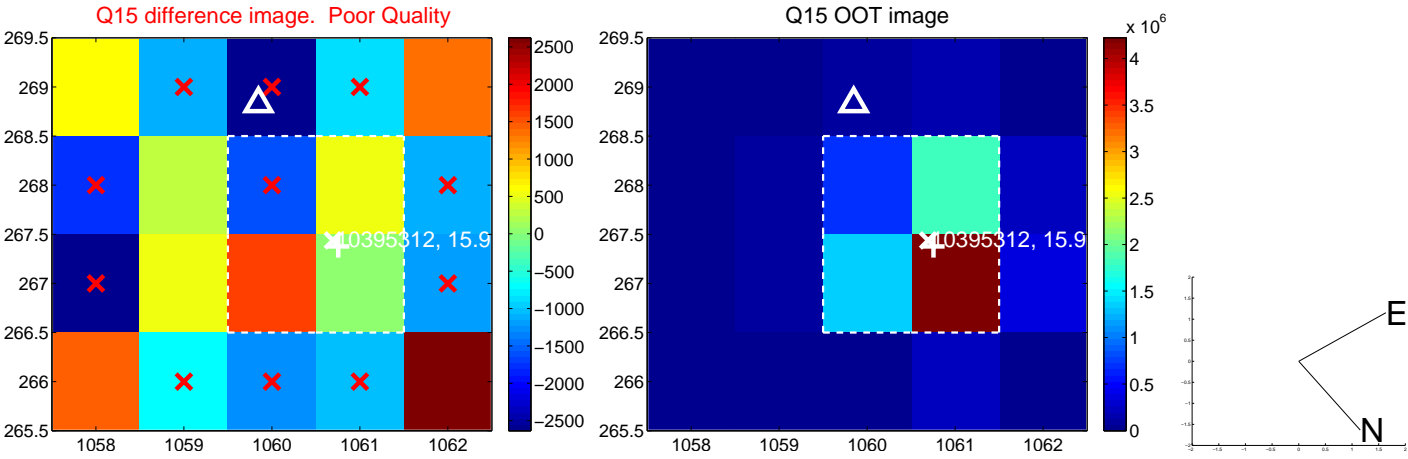
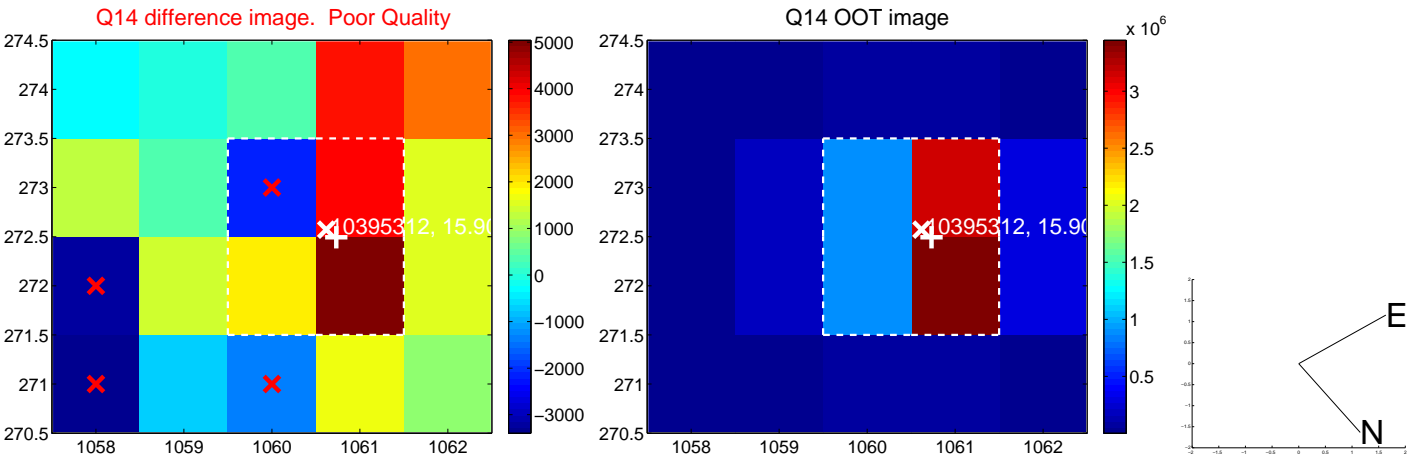
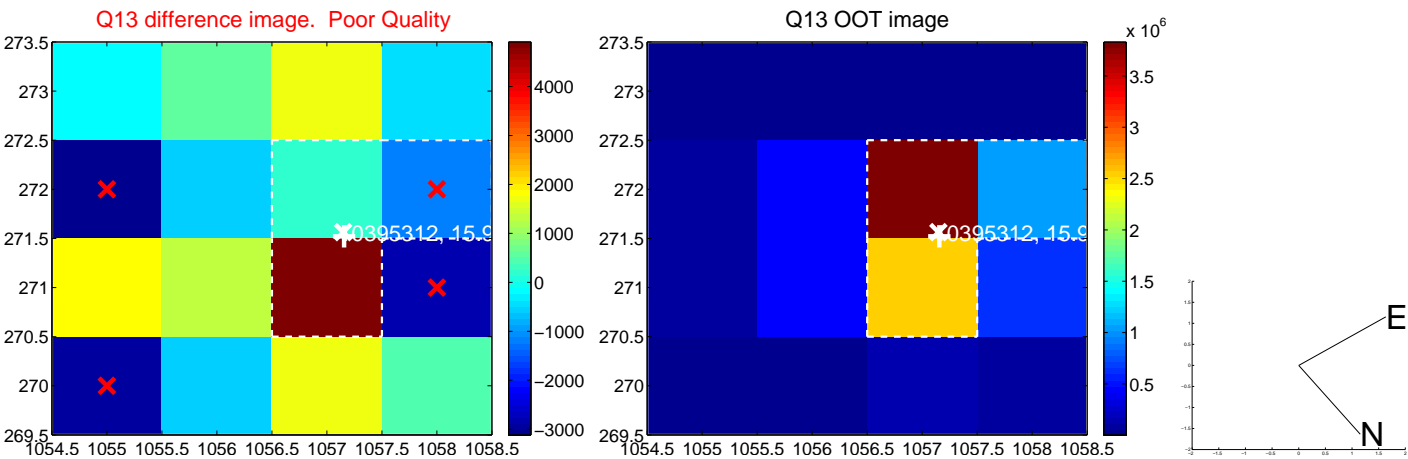




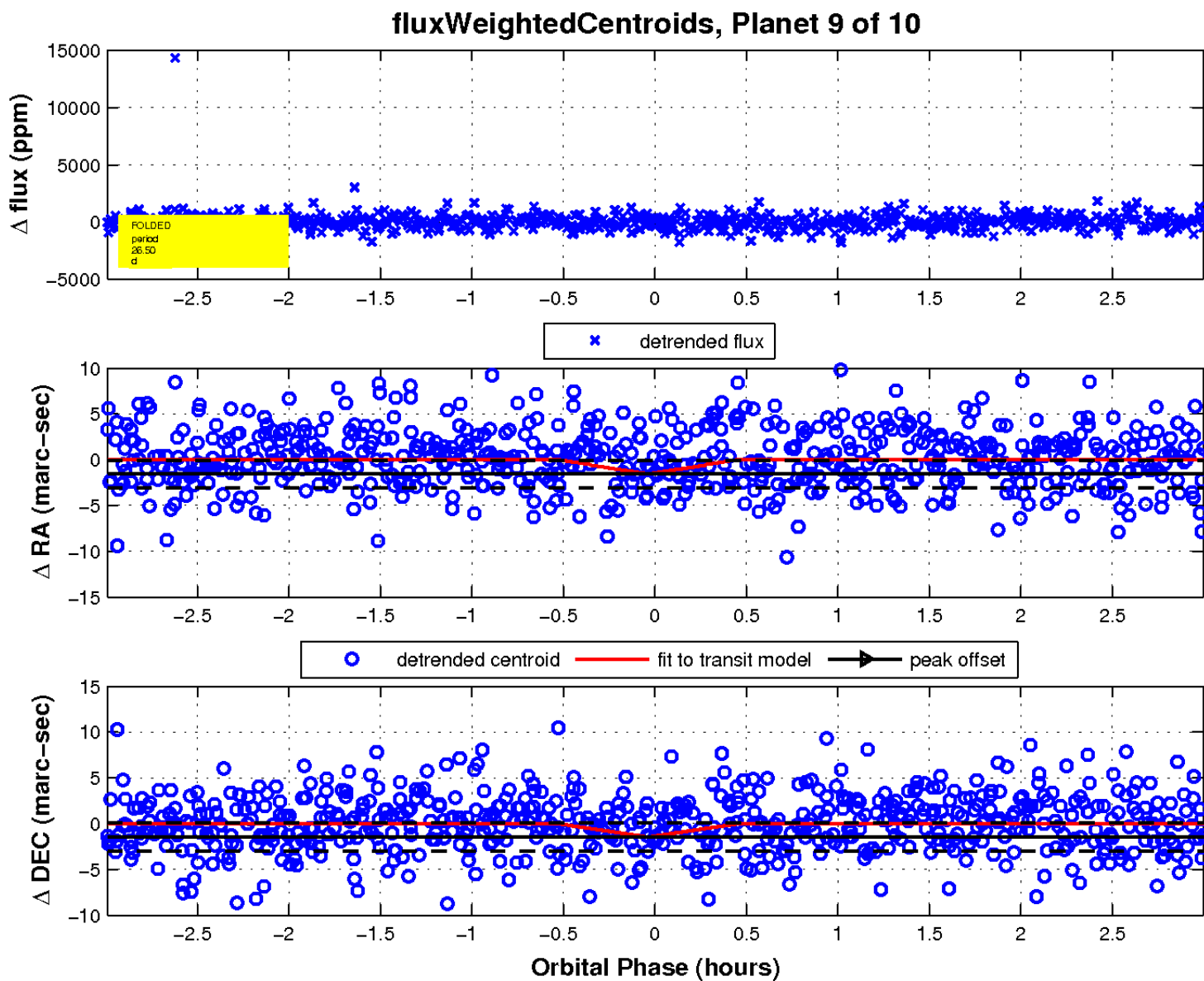
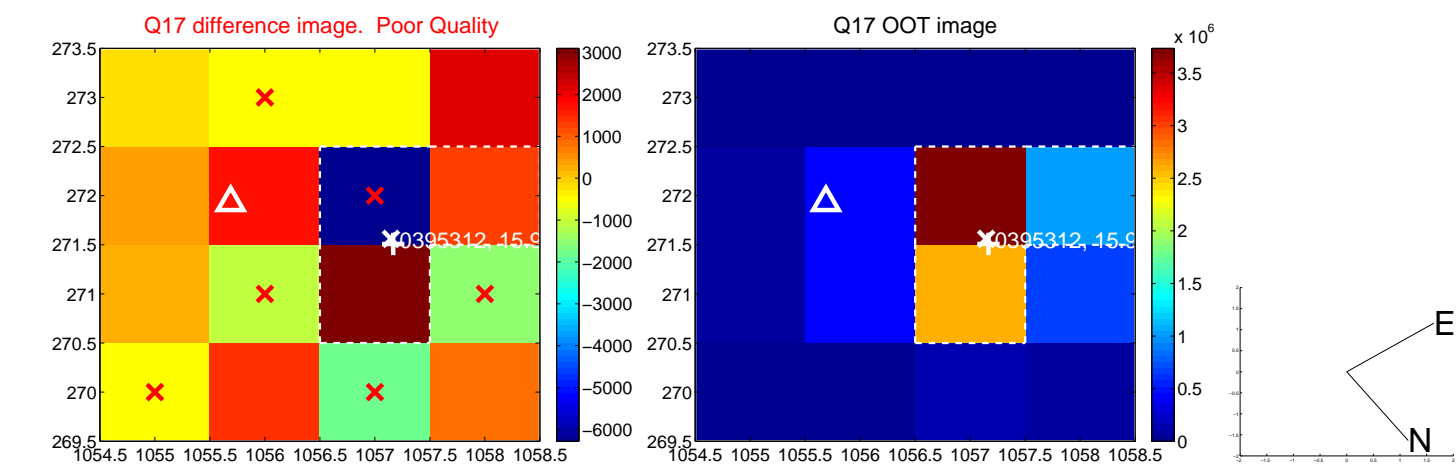
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



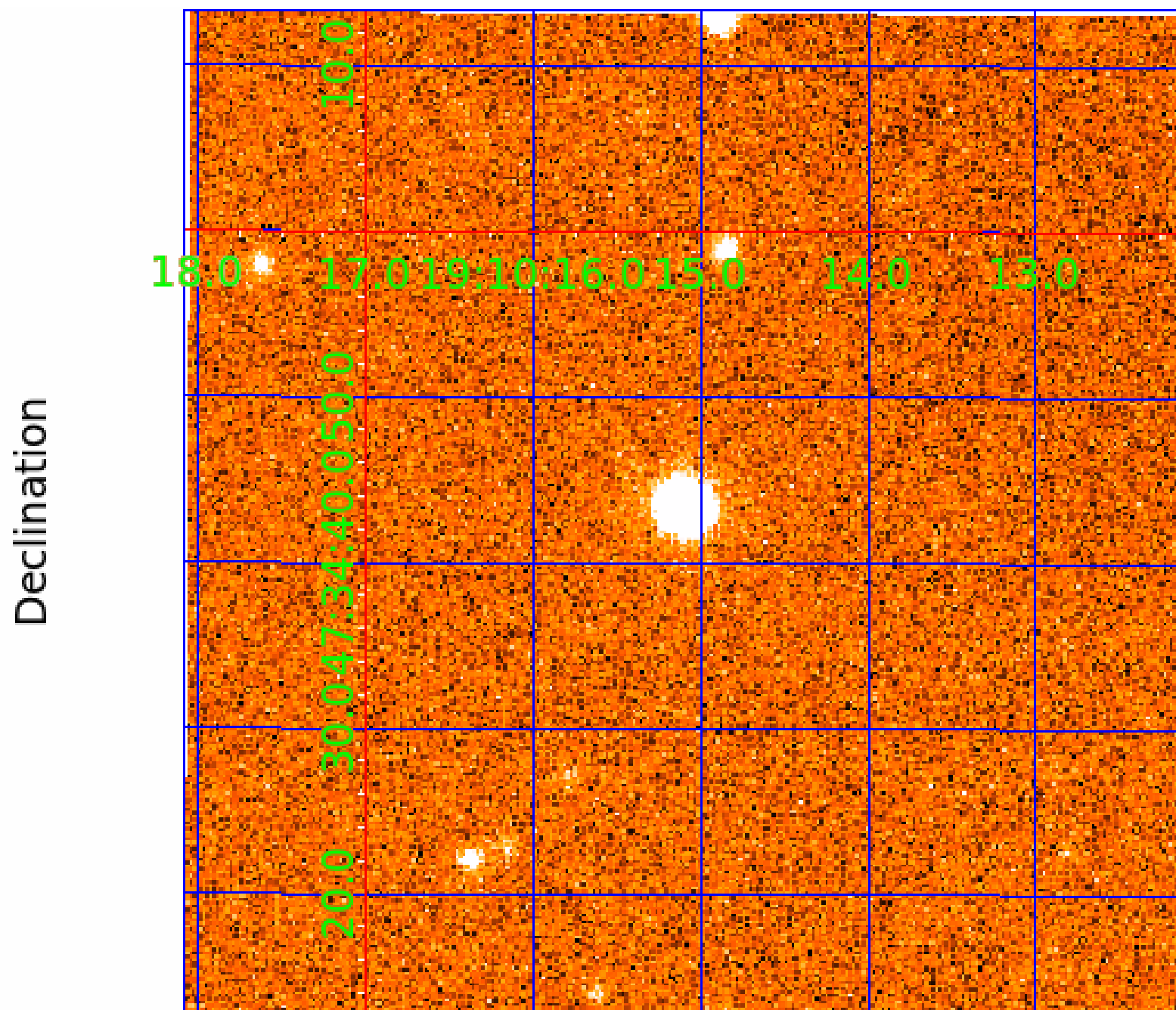
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



## KIC 010395312

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010395312-01	OBS	No	0.734969	131.818451	68.7	5.235	7.8	10.6	0.36	3553	0.30	138.09
010395312-02	OBS	No	43.338219	160.884184	1756.7	2.650	18.5	11.9	0.36	3553	1.49	0.60
010395312-03	OBS	No	22.617913	145.928423	0.0	14.208	12.1	0.0	0.36	3553	0.01	1.43
010395312-04	OBS	No	21.830529	141.862680	332.5	2.263	13.1	2.6	0.36	3553	0.77	1.50
010395312-05	OBS	No	62.134882	184.242550	0.1	3.631	13.2	0.0	0.36	3553	0.01	0.37
010395312-07	OBS	No	29.856582	155.990807	2220.3	1.681	13.8	11.7	0.36	3553	1.71	0.99
010395312-08	OBS	No	39.700029	148.941743	1333.3	2.348	11.7	10.1	0.36	3553	1.50	0.68
010395312-09	OBS	No	26.497868	133.642244	3844.7	1.500	14.1	-1.0	0.36	3553	2.21	1.16
010395312-10	OBS	No	38.975665	141.685996	5375.8	1.500	19.0	-1.0	0.36	3553	2.62	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010395312-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010395312-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010395312-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010395312-08	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
010395312-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
010395312-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

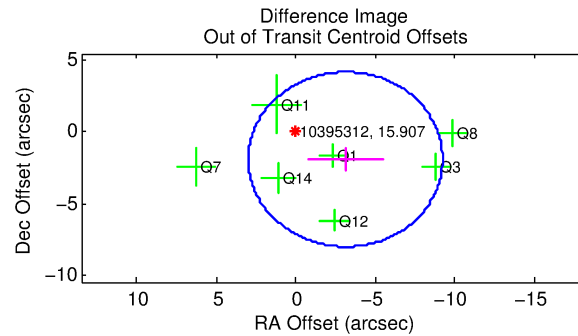
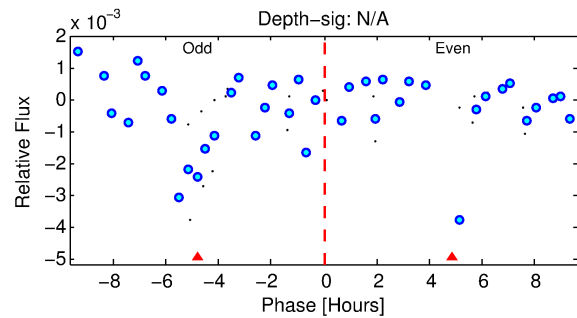
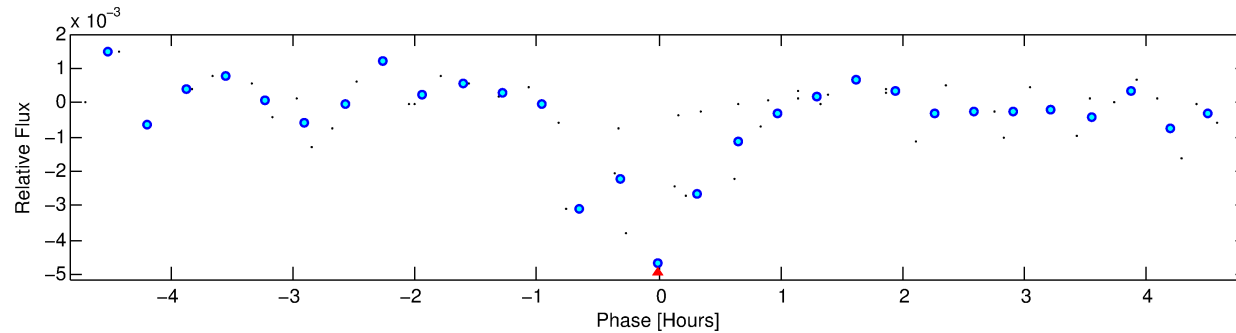
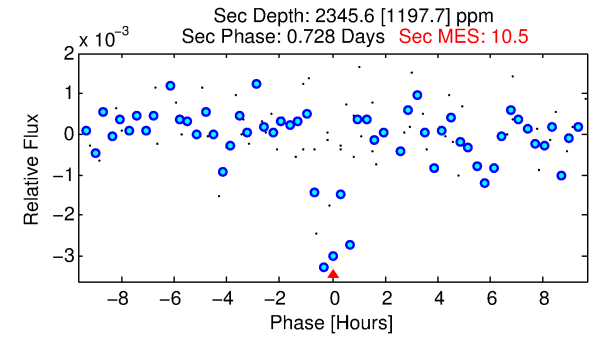
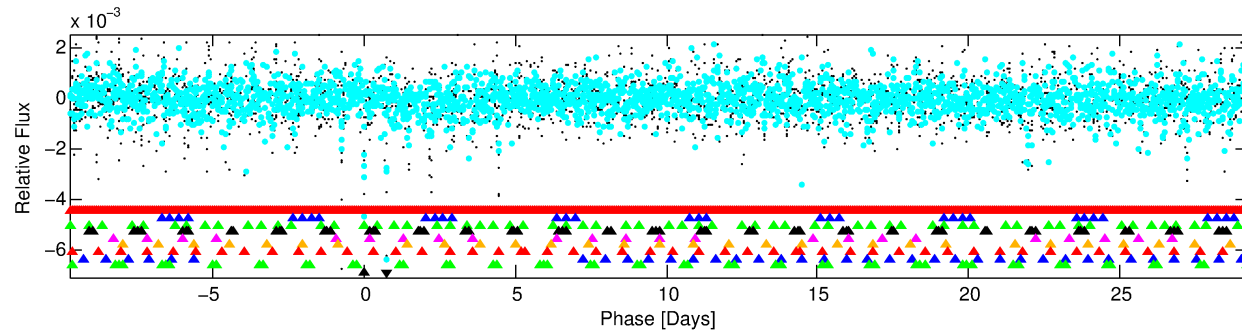
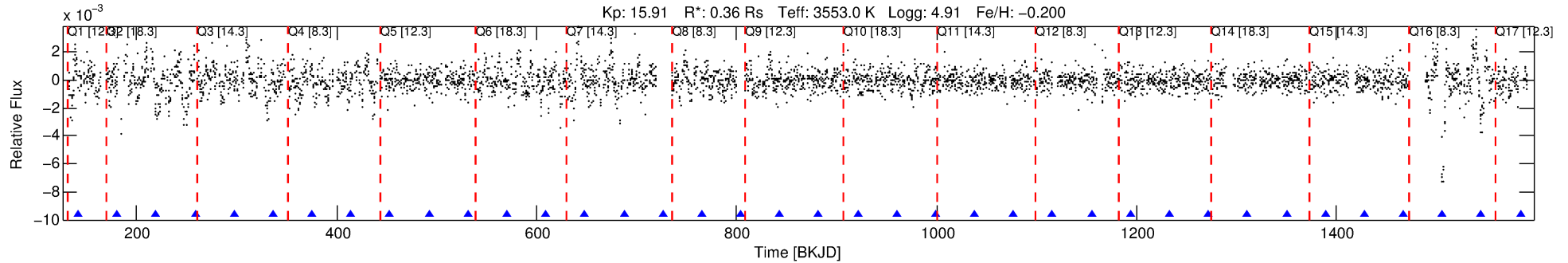
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010395312-10

No Significant Match Found

# DV One-Page Summary

KIC: 10395312 Candidate: 10 of 10 Period: 38.976 d



## TPS TCE Results:

Period = 38.97567 d  
Epoch = 141.6860 BKJD

**DV fit results are unavailable**

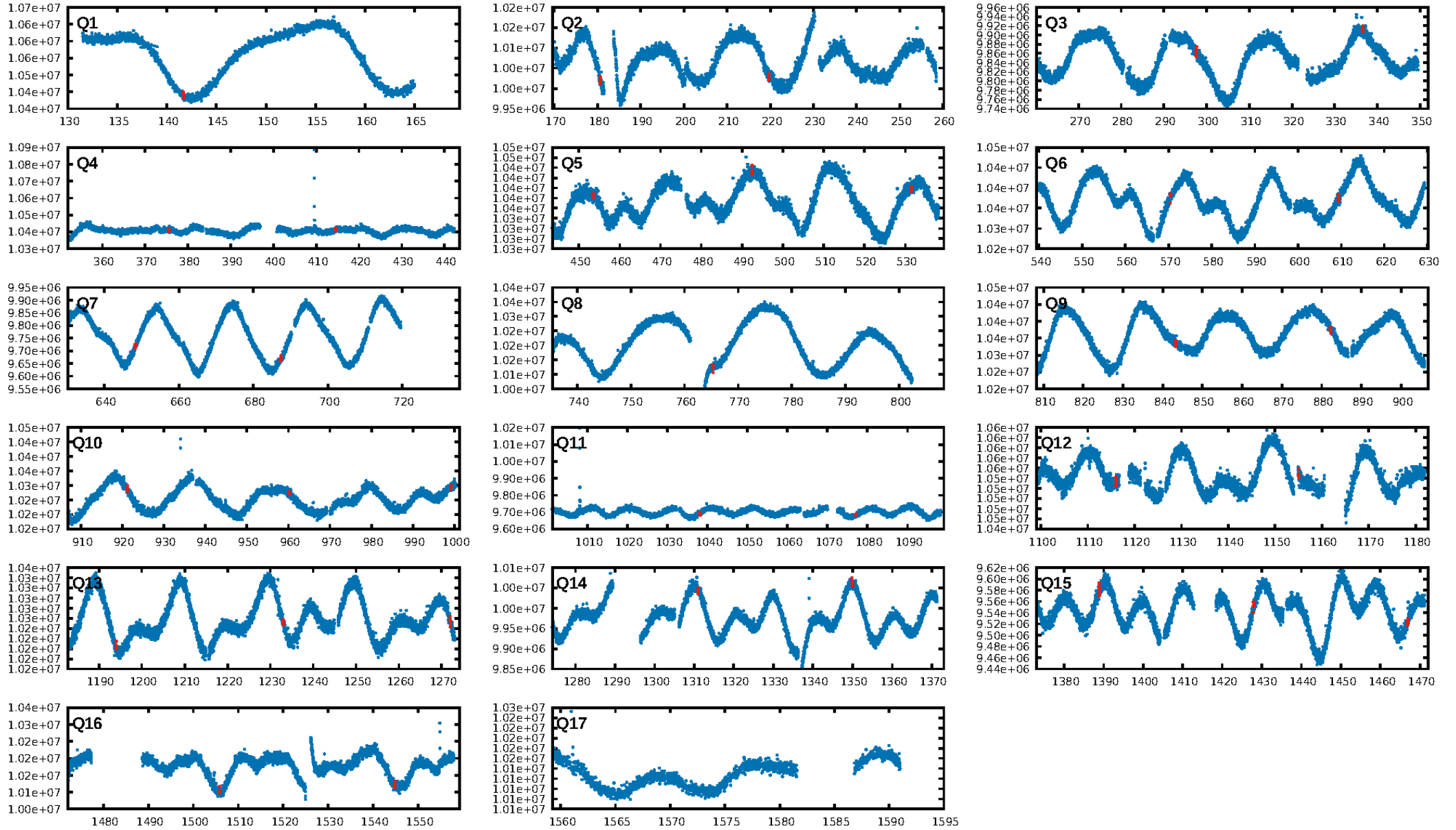
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [97.14σ]  
LongPeriod-sig: 100.0% [6.24σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
**GhostDiagnostic-chr: -0.06416**  
Centroid-sig: 0.9%  
Centroid-so: 0.453 arcsec [0.99σ]  
OotOffset-rm: 3.657 arcsec [1.79σ]  
KicOffset-rm: 3.442 arcsec [1.61σ]  
OotOffset-st: 1/3/2/1 [7]  
KicOffset-st: 1/3/2/1 [7]  
DiffImageQuality-fgm: 0.00 [0/7]  
DiffImageOverlap-fno: 0.19 [3/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:44:44 Z

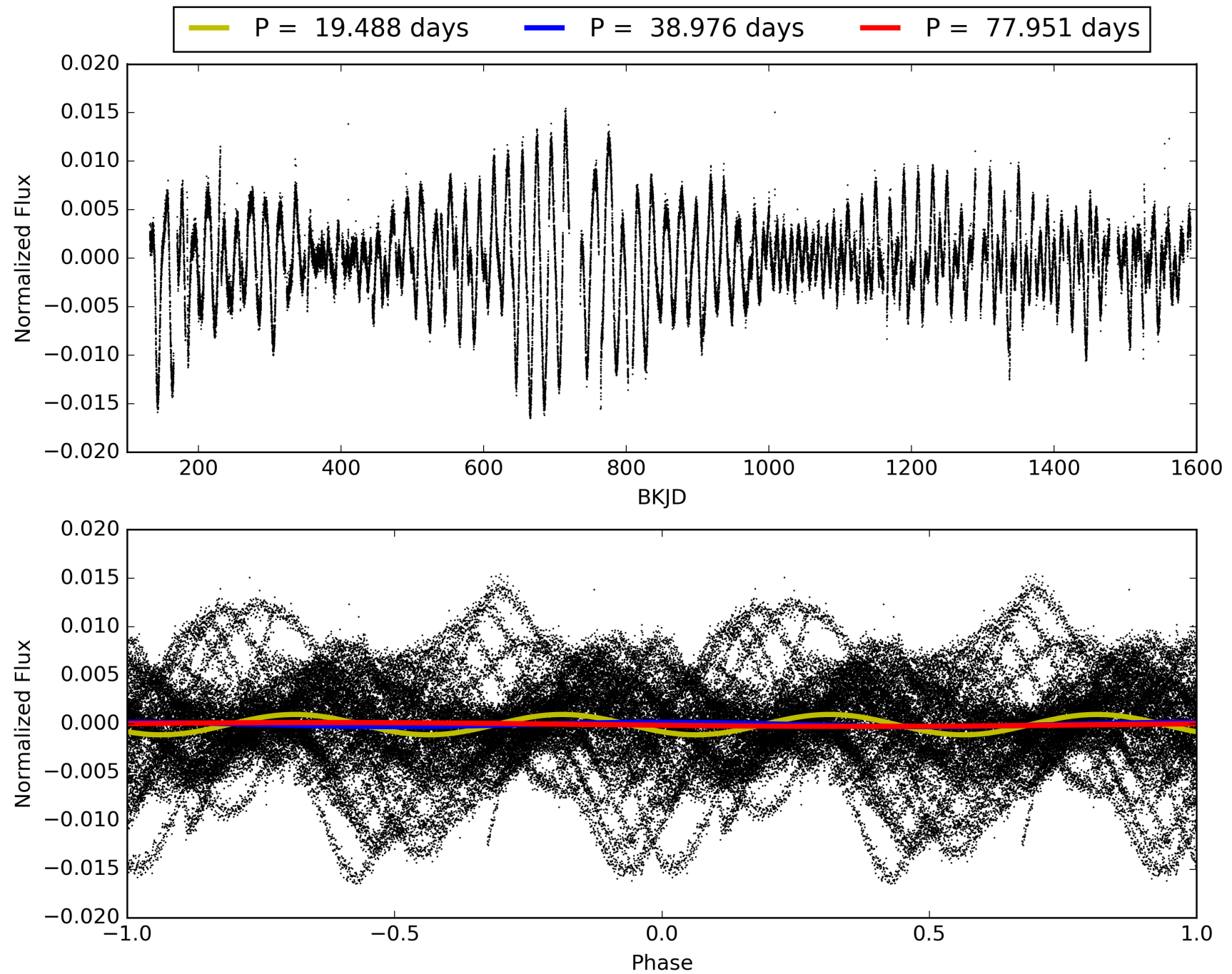
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010395312-10, PDC Light Curves





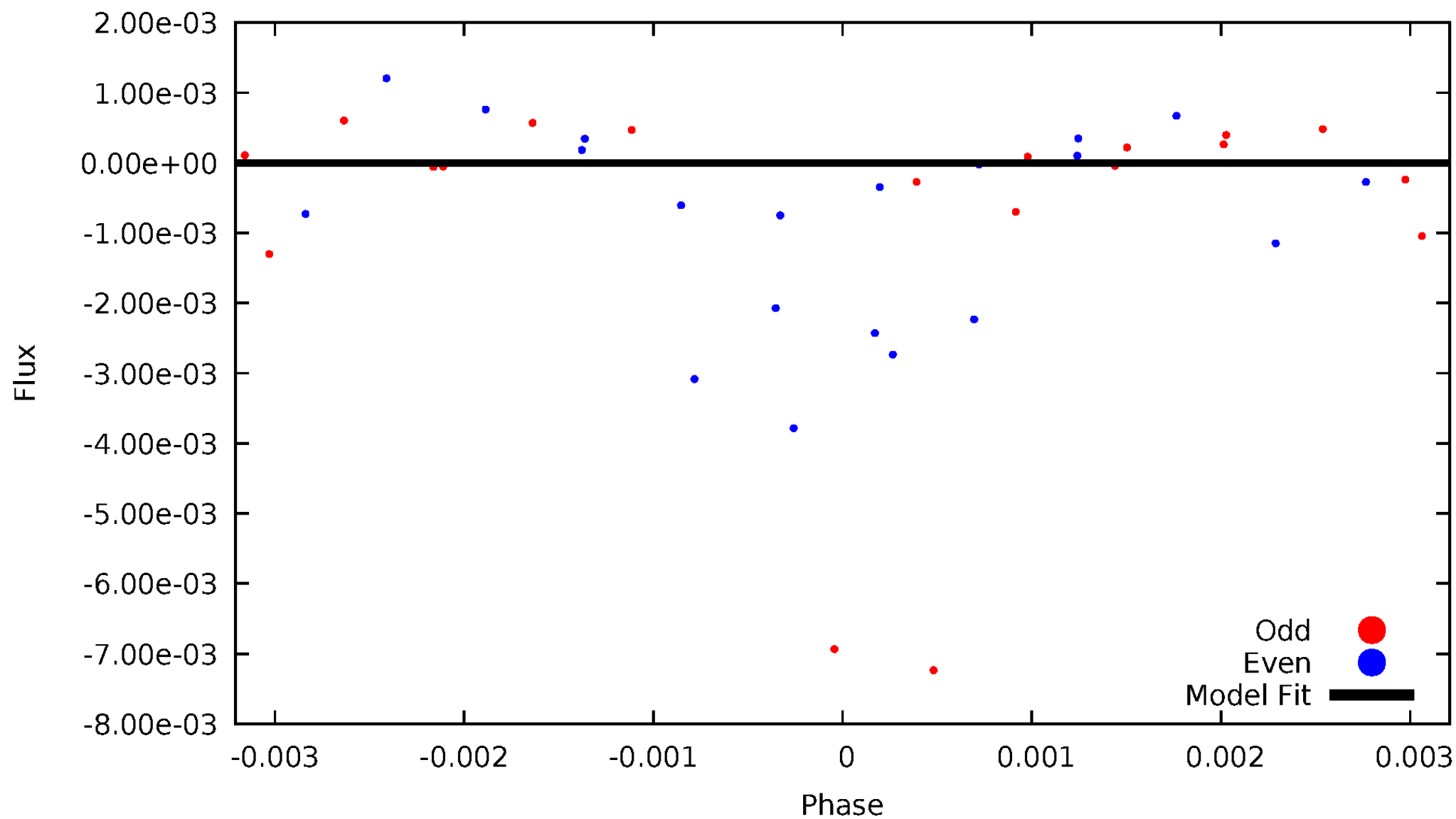
# TCE 010395312-10





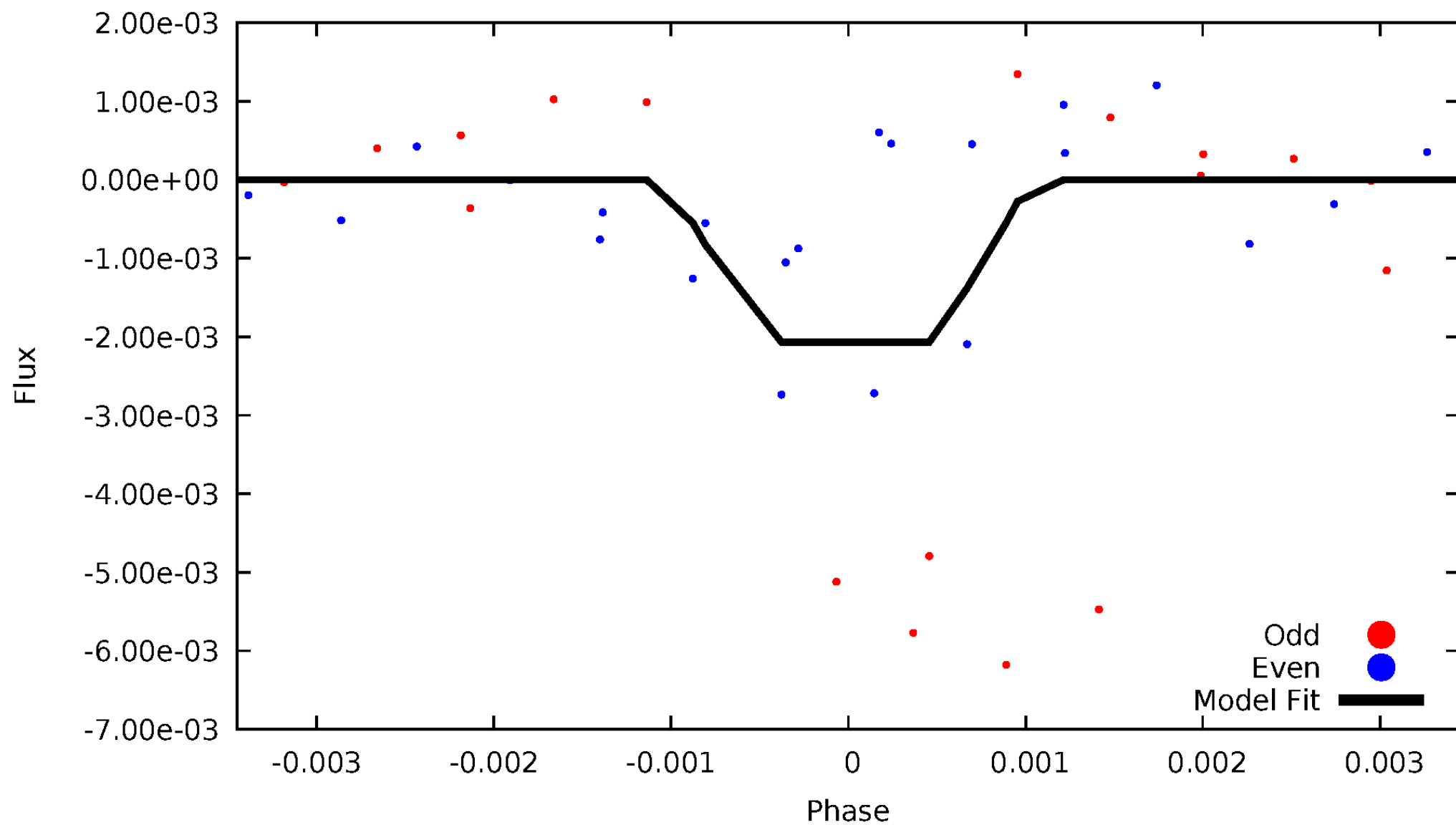
# DV Odd/Even

TCE 010395312-10



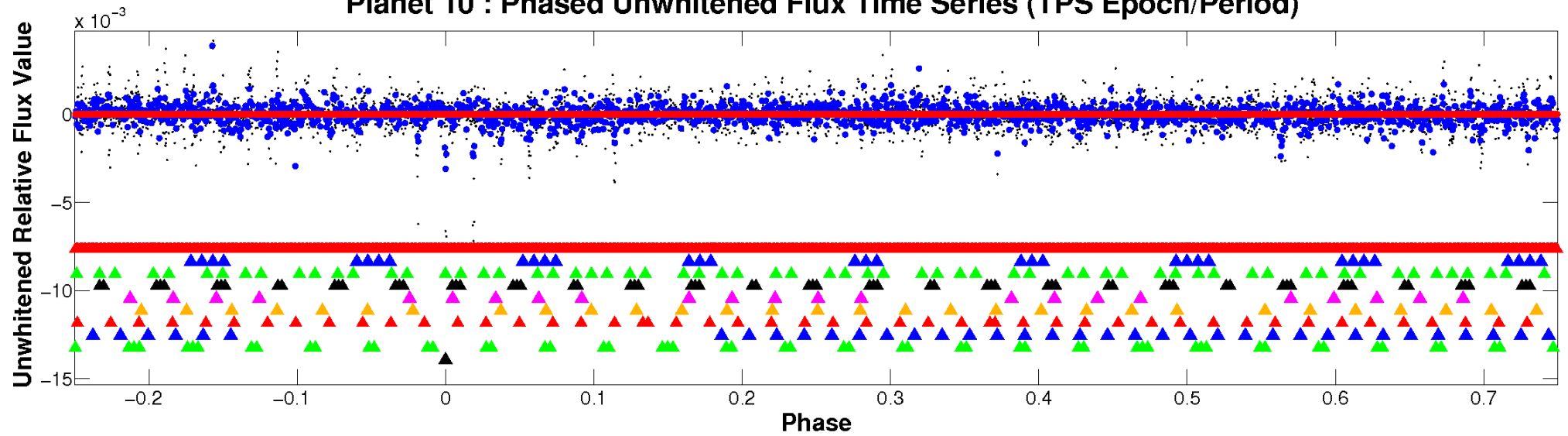
# ALT Odd/Even

TCE 010395312-10

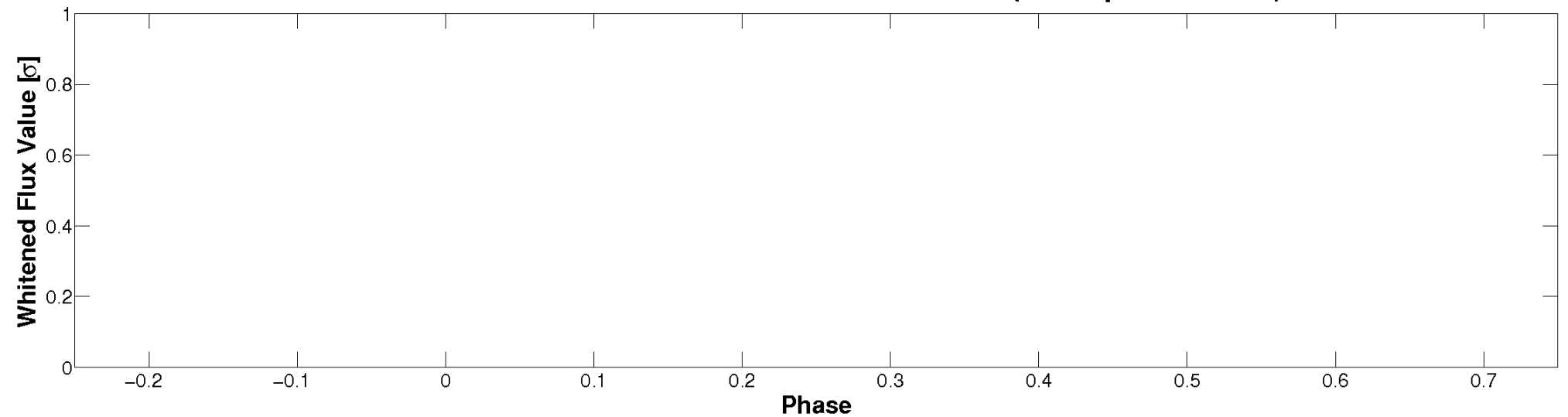


# Non-Whitened Vs. Whitened Light Curve

Planet 10 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)

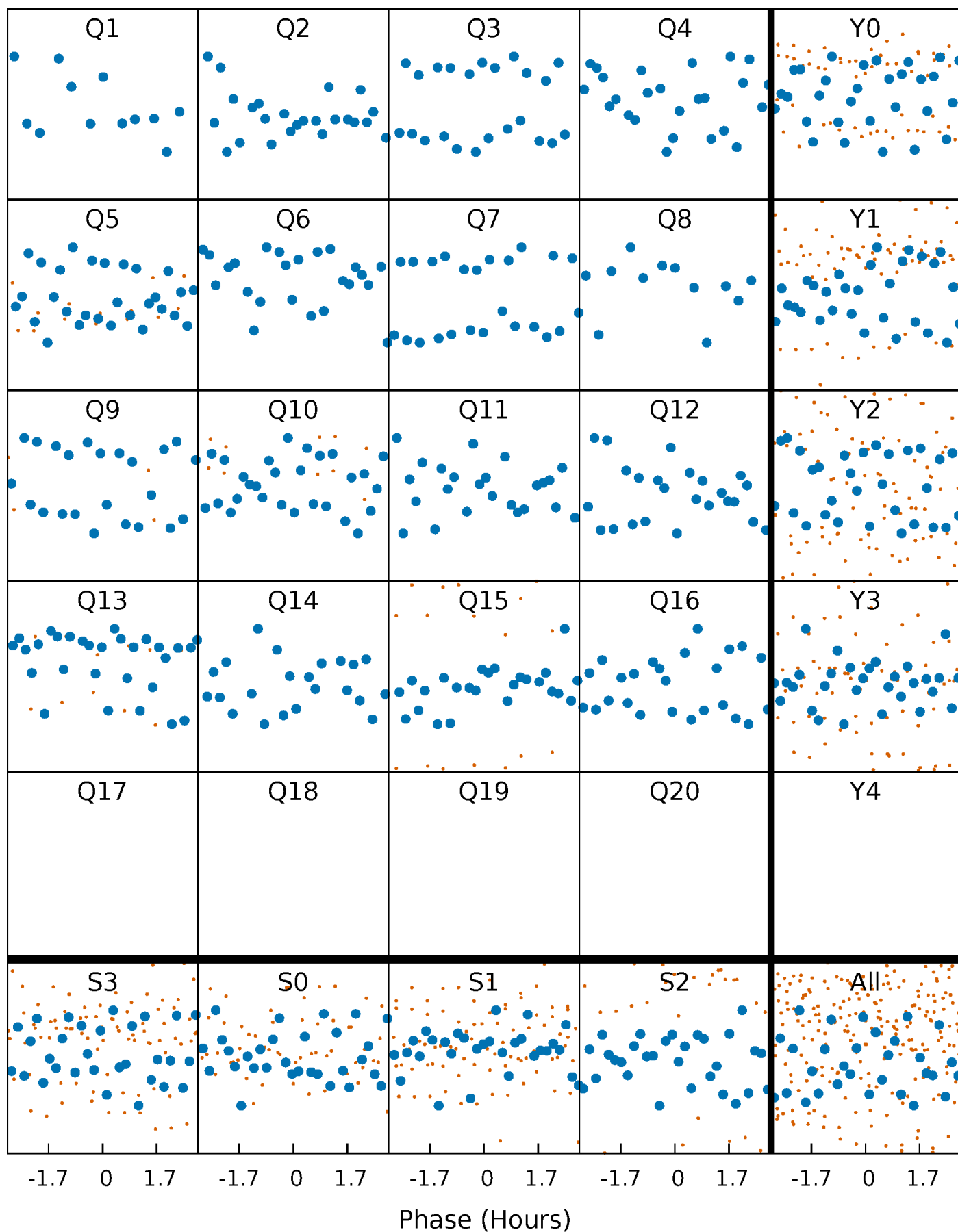


Planet 10 : Phased Whitened Flux Time Series (TPS Epoch/Period)



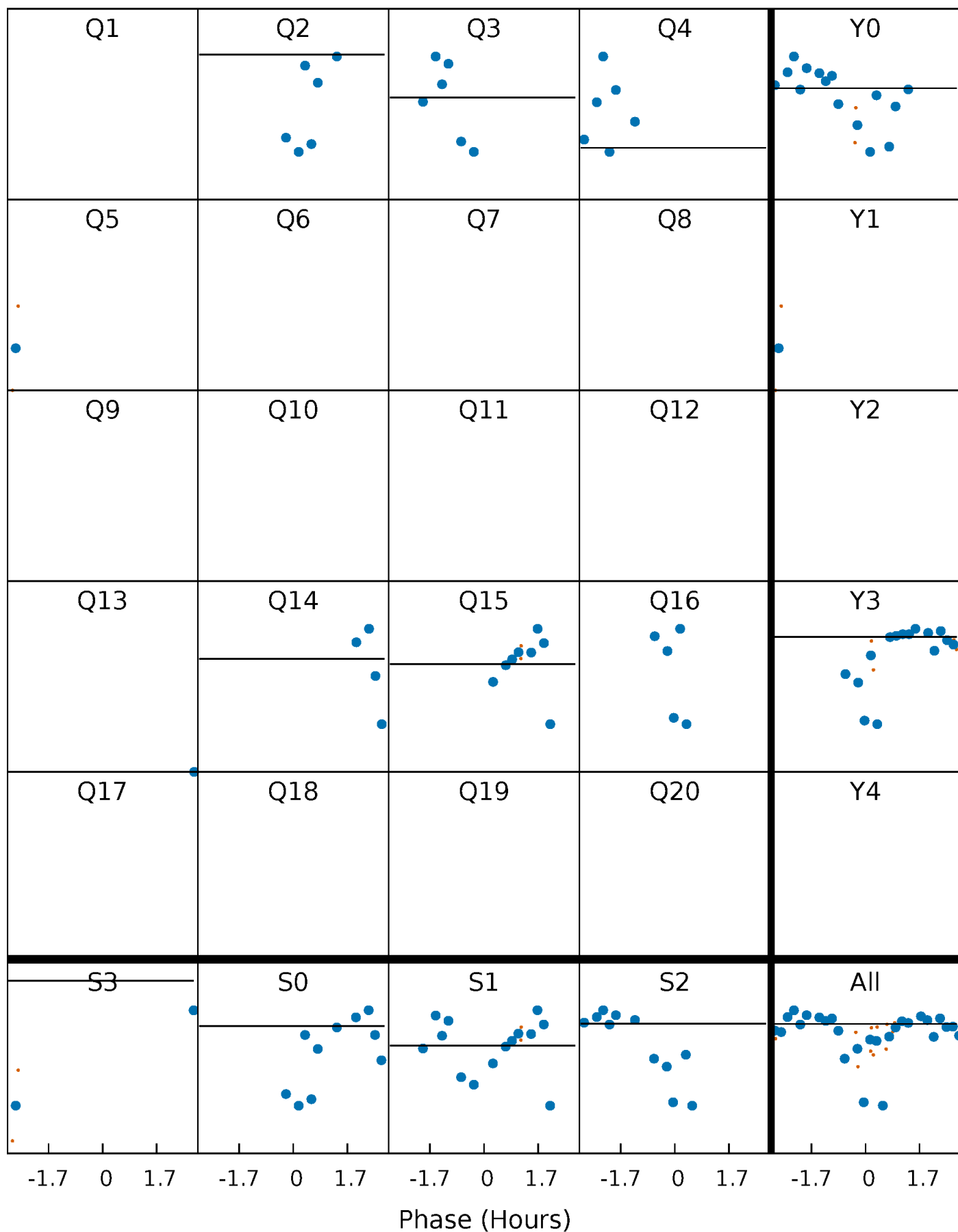
# PDC Quarter-Phased Transit Curves

TCE 010395312-10 P= 38.975665 Days  $T_0=141.685996$  (BKJD)



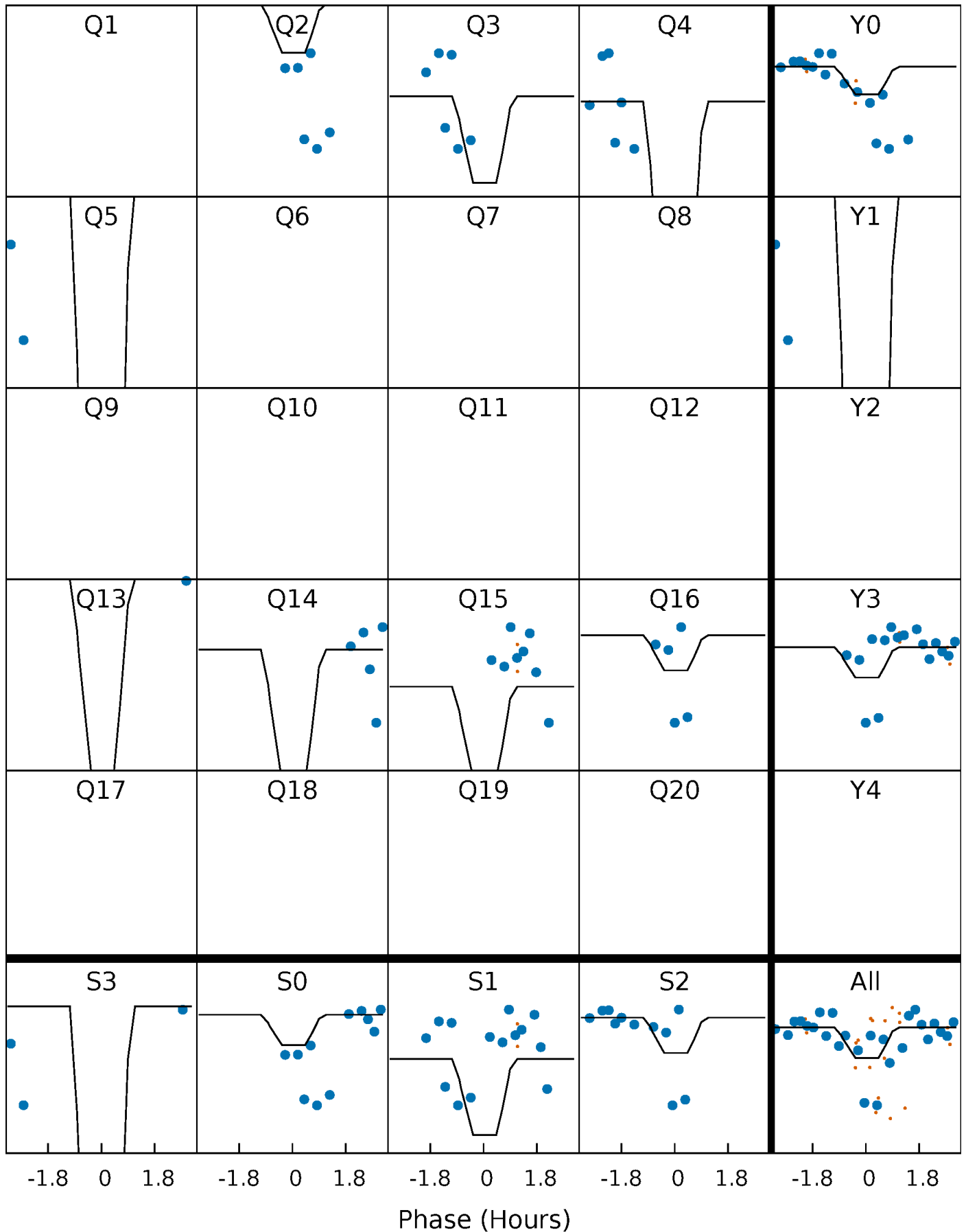
# DV Quarter-Phased Transit Curves

TCE 010395312-10   P= 38.975665 Days    $T_0=141.685996$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

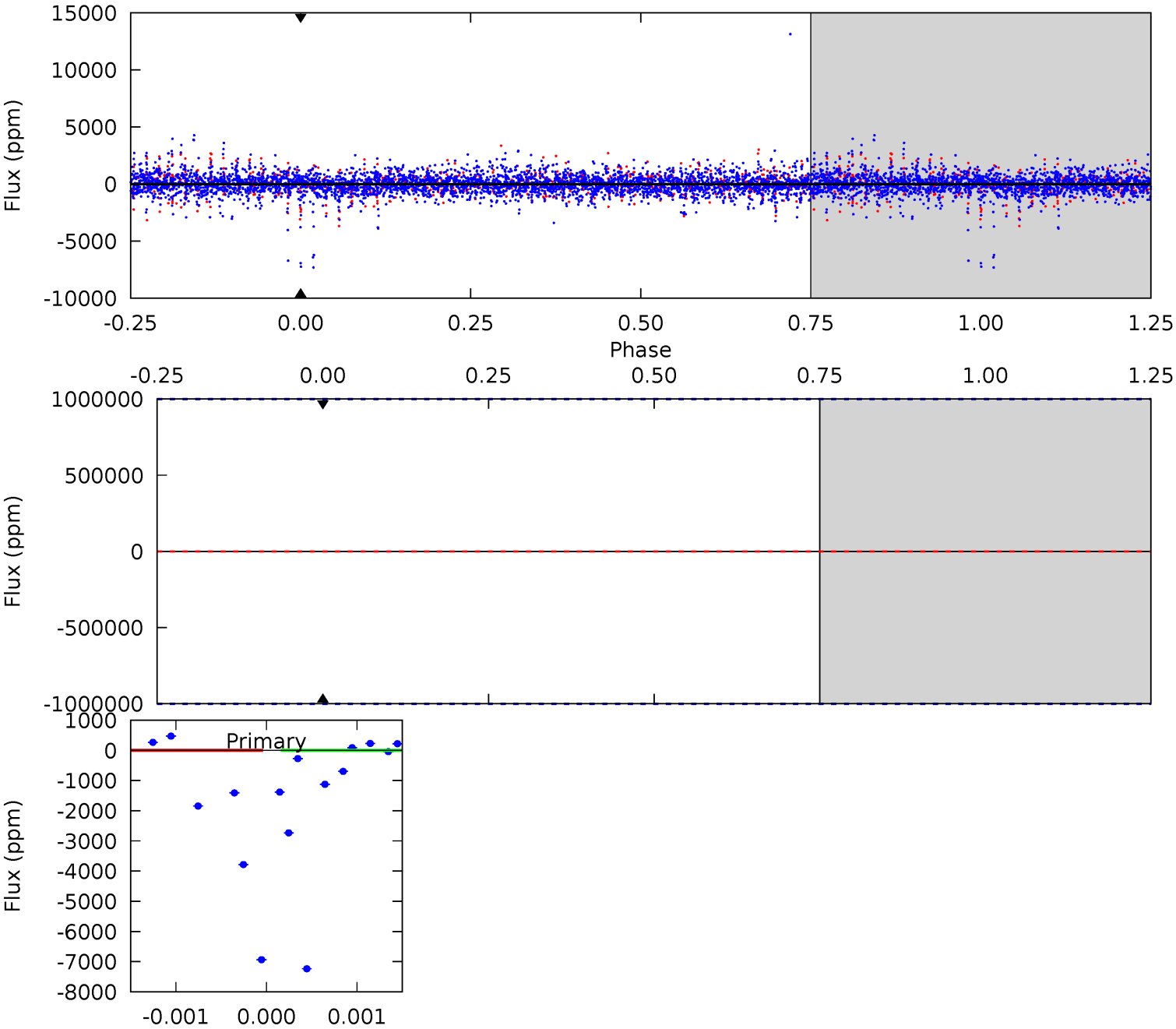
TCE 010395312-10   P= 38.975665 Days    $T_0=141.686950$  (BKJD)



# DV Model-Shift Uniqueness Test

010395312-10, P = 38.975665 Days, E = 102.710331 Days

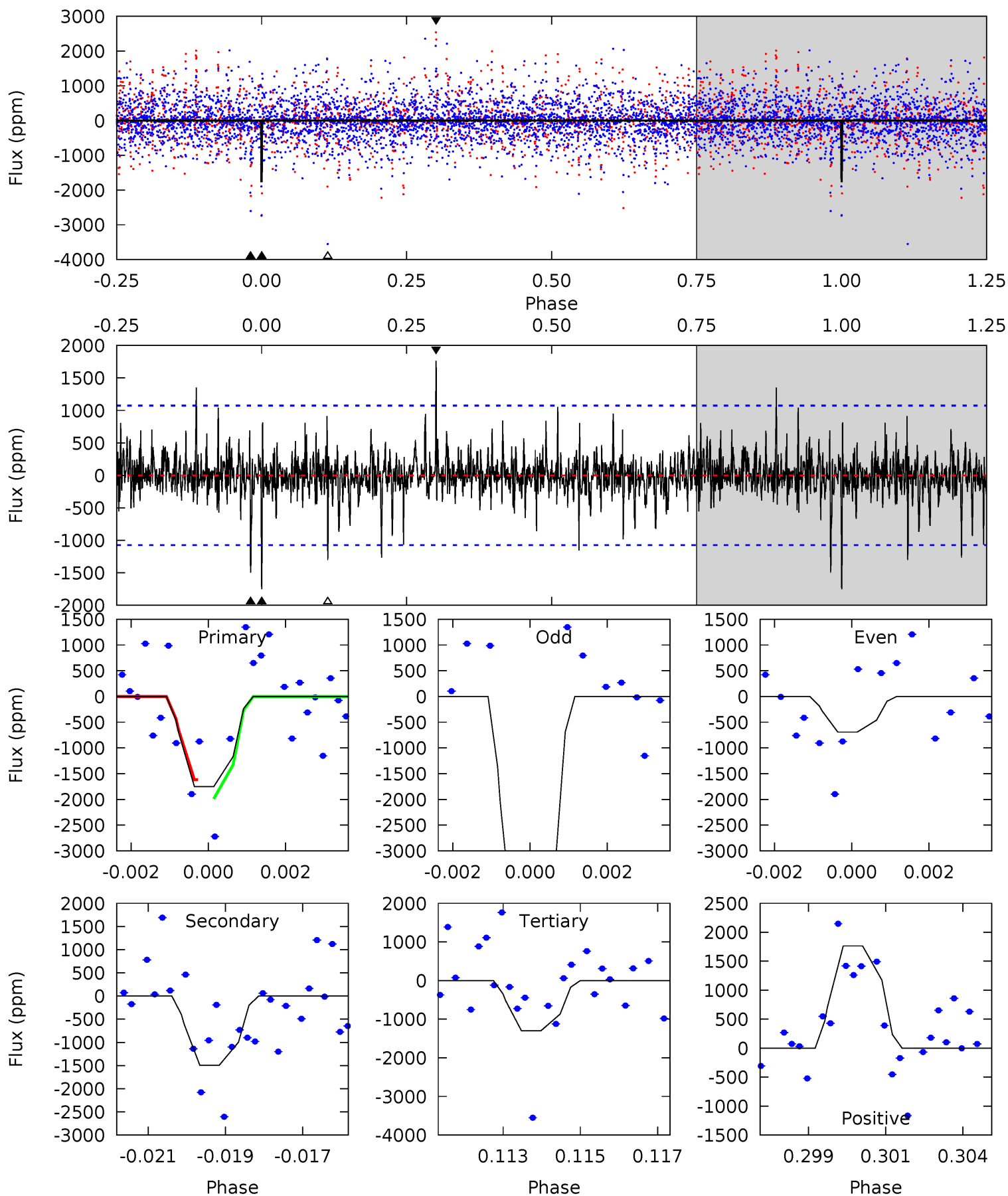
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010395312-10, P = 38.975665 Days, E = 102.711285 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
8.67	7.40	6.45	8.74	5.32	3.08	1.33	2.23	-0.06	0.95	-1.33	11.4	1.27	0.50	0





### Stellar Parameters For KIC 010395312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3553^{+48}_{-53}$	$4.906^{+0.035}_{-0.042}$	$-0.200^{+0.100}_{-0.100}$	$0.358^{+0.036}_{-0.036}$	$0.379^{+0.034}_{-0.046}$	$11.630^{+2.353}_{-1.957}$
	+1%/-1%	+1%/-1%	+50%/-50%	+10%/-10%	+9%/-12%	+20%/-17%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010395312-10 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$4.04^{+3.35}_{-2.69}$	$325^{+7}_{-7}$	$1870^{+4261}_{-7735}$	$56^{+150684}_{-127650}$
Alt.	$-1495 \pm 202$	$3.52^{+3.04}_{-2.40}$	$326^{+7}_{-8}$	$2786^{+1129}_{-417}$	$1777^{+14889}_{-1292}$

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

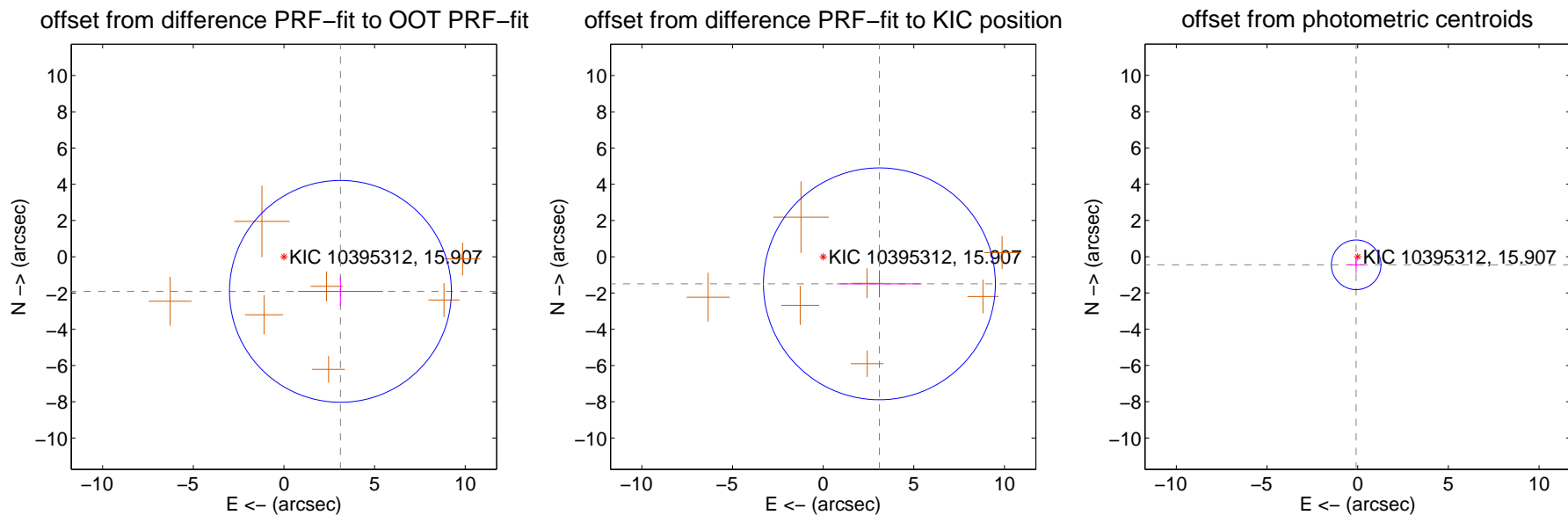
## DV Centroid Data

Supplemental centroid analysis for 010395312-10. Kepler magnitude: 15.91. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

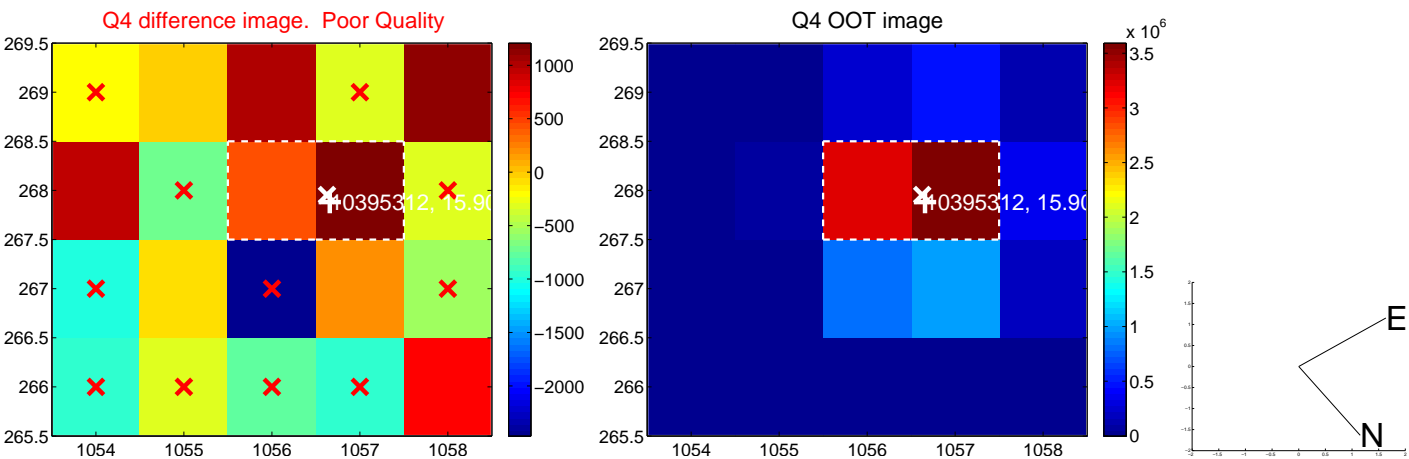
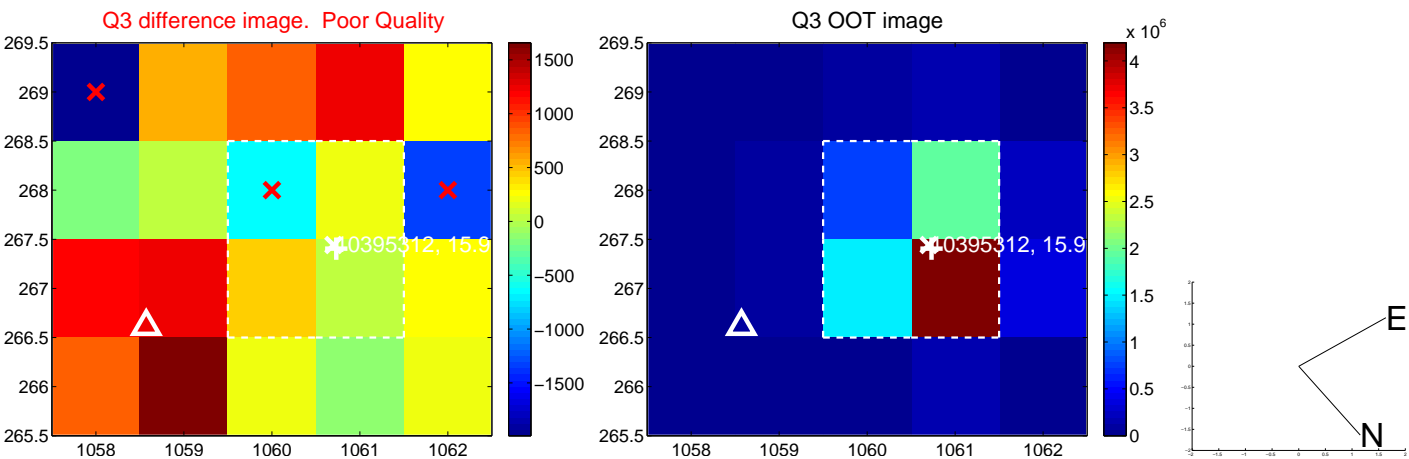
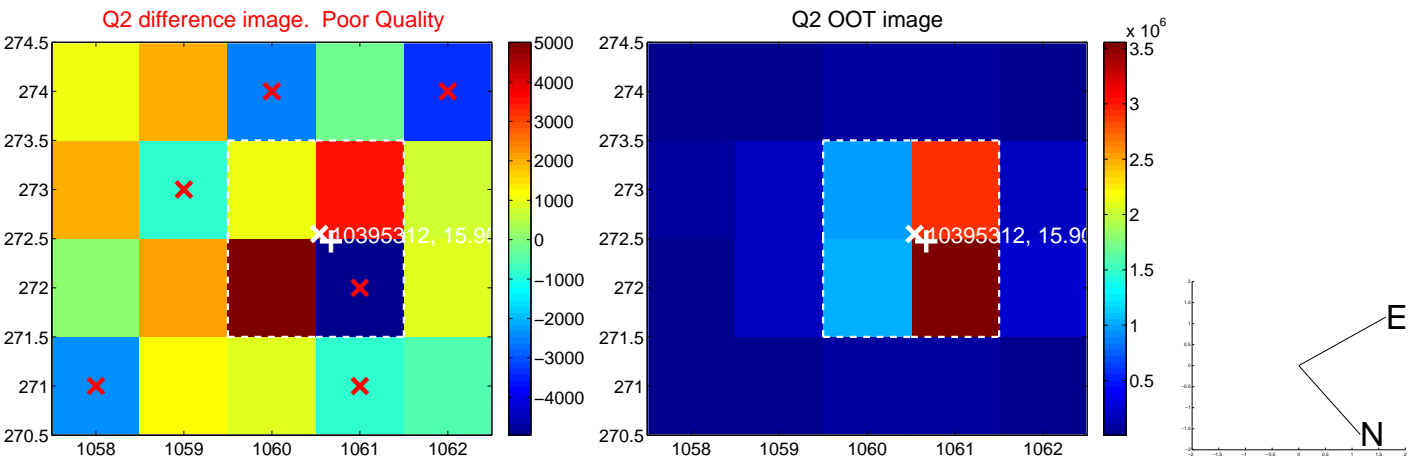
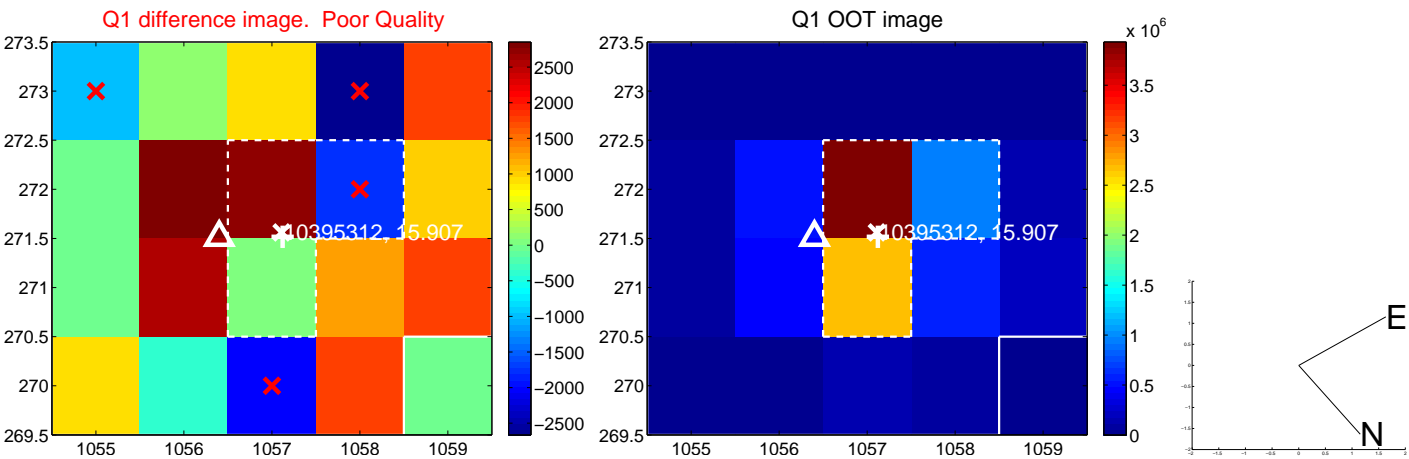
The direct PRF centroid is offset from the target star catalog position by about 0.55 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.657 \pm 2.040$	1.79	$-3.119 \pm 2.341$	$-1.909 \pm 0.798$
PRF-fit source offset from KIC position	$3.442 \pm 2.132$	1.61	$-3.101 \pm 2.339$	$-1.493 \pm 0.748$
photometric centroid source offset	$0.45 \pm 0.46$	0.99	$0.08 \pm 0.46$	$-0.44 \pm 0.46$

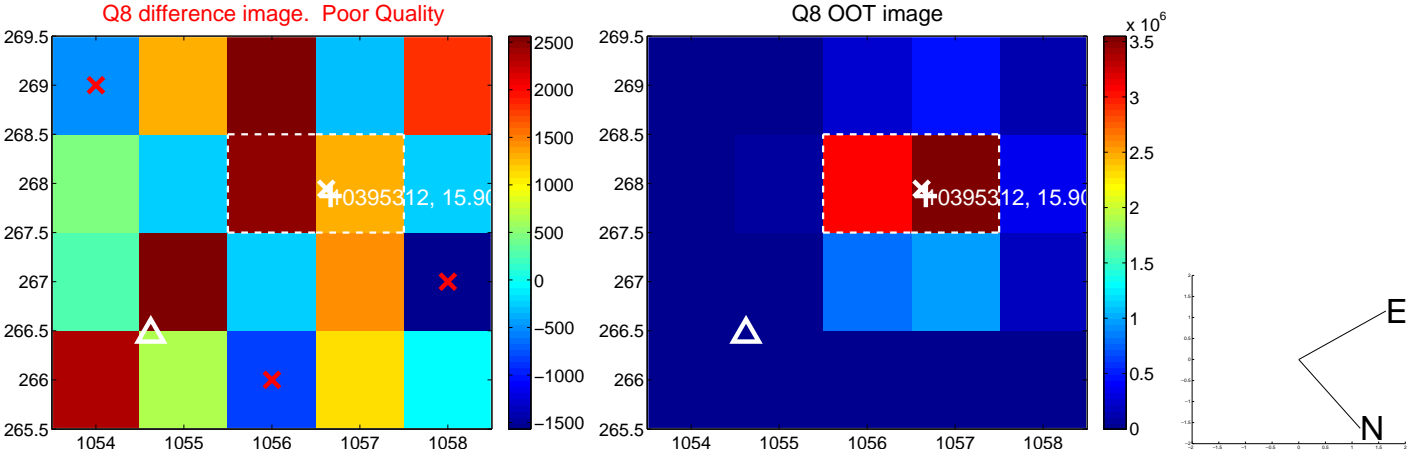
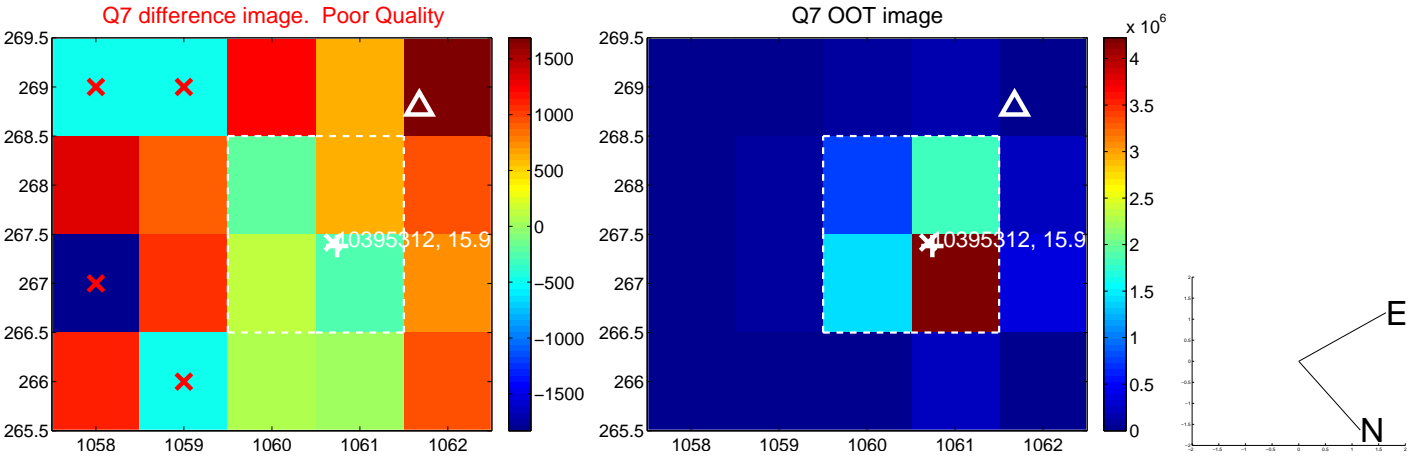
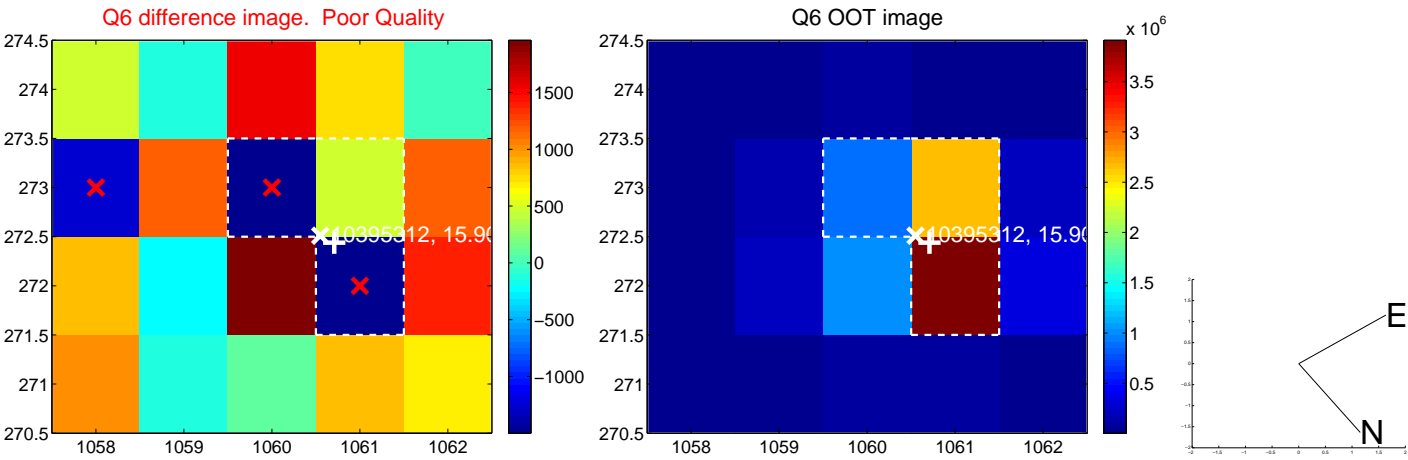
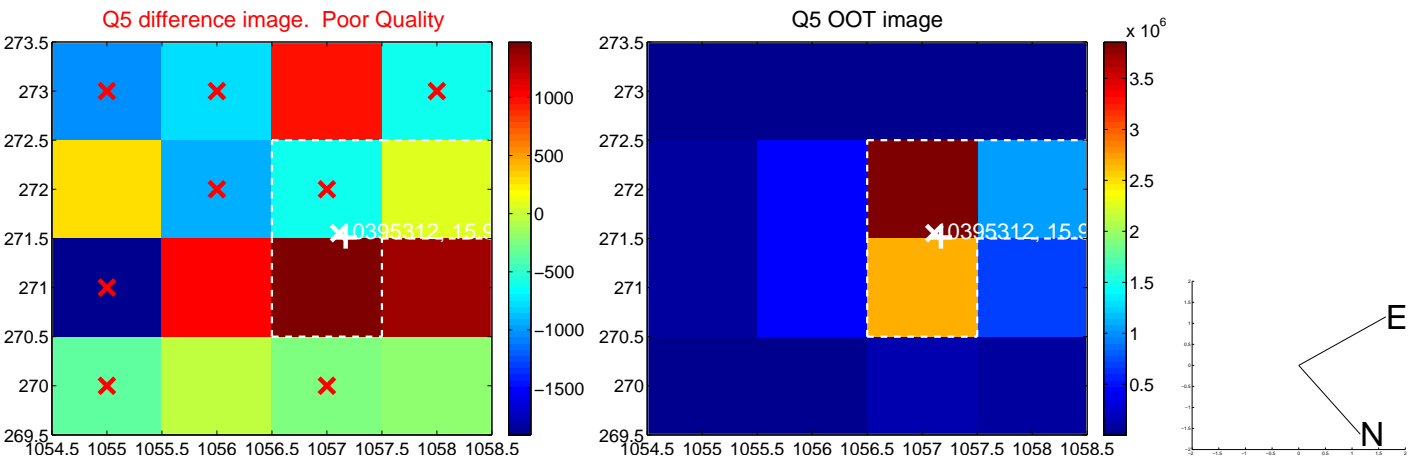


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

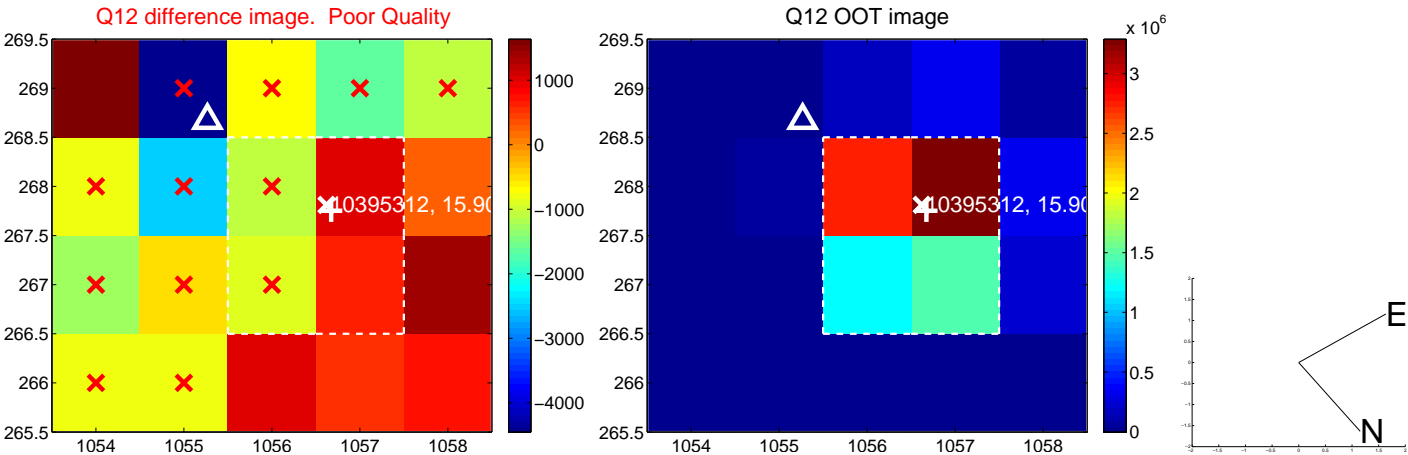
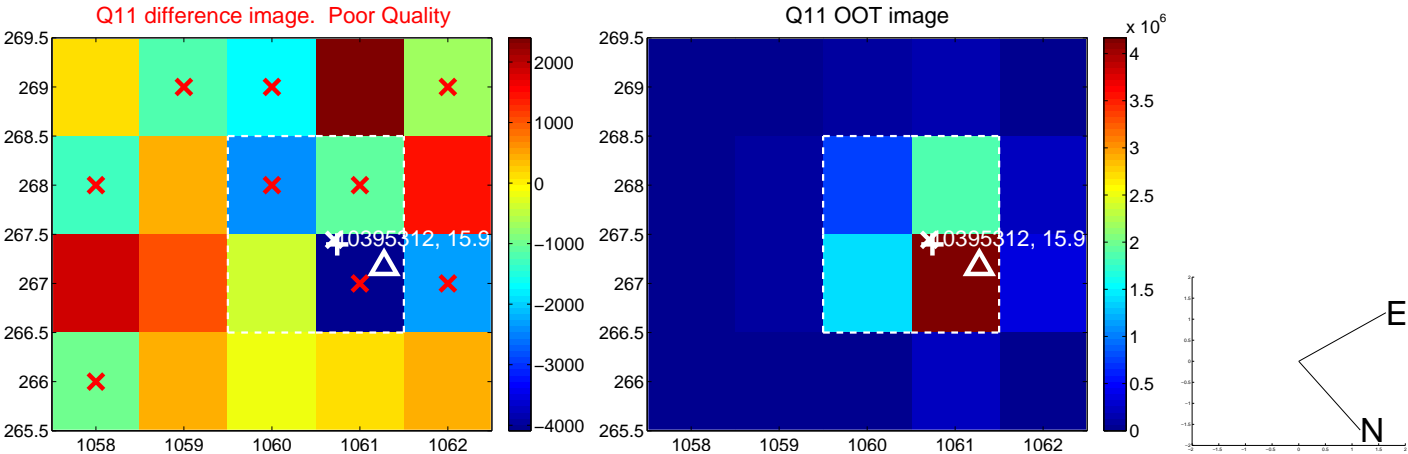
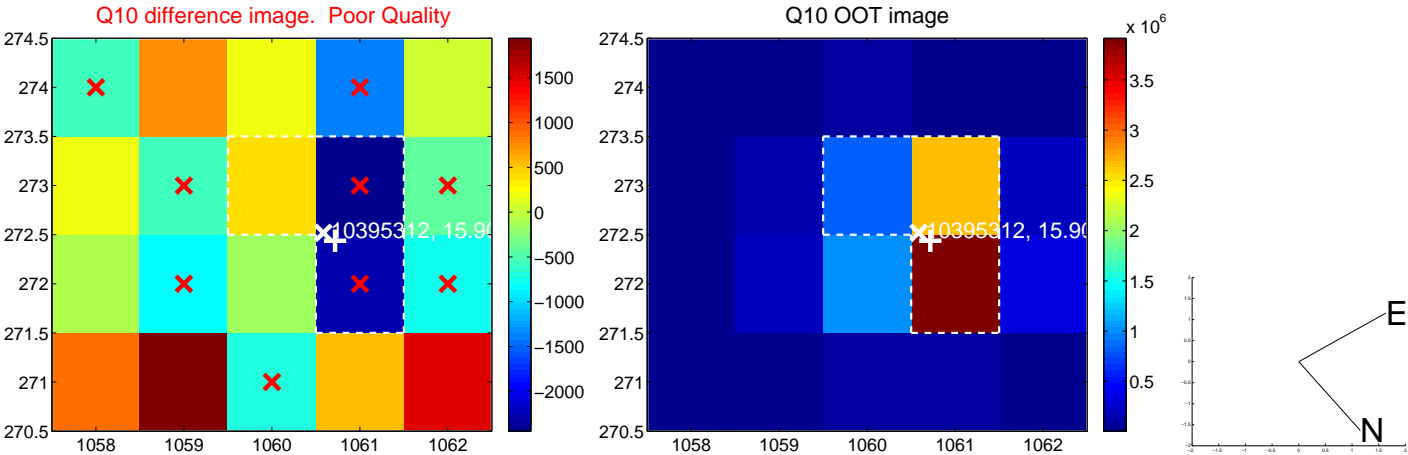
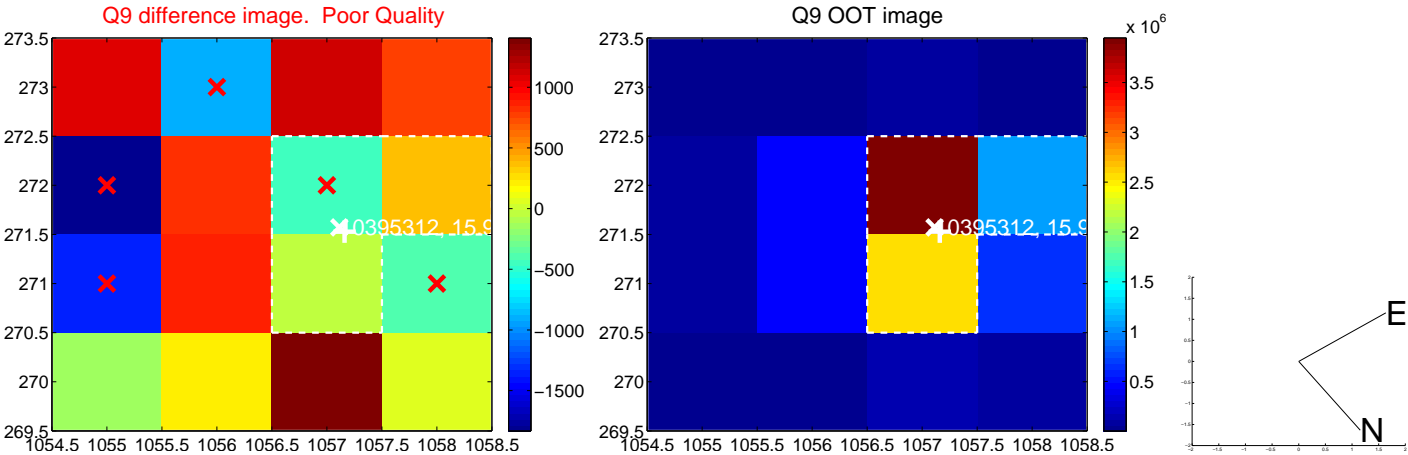
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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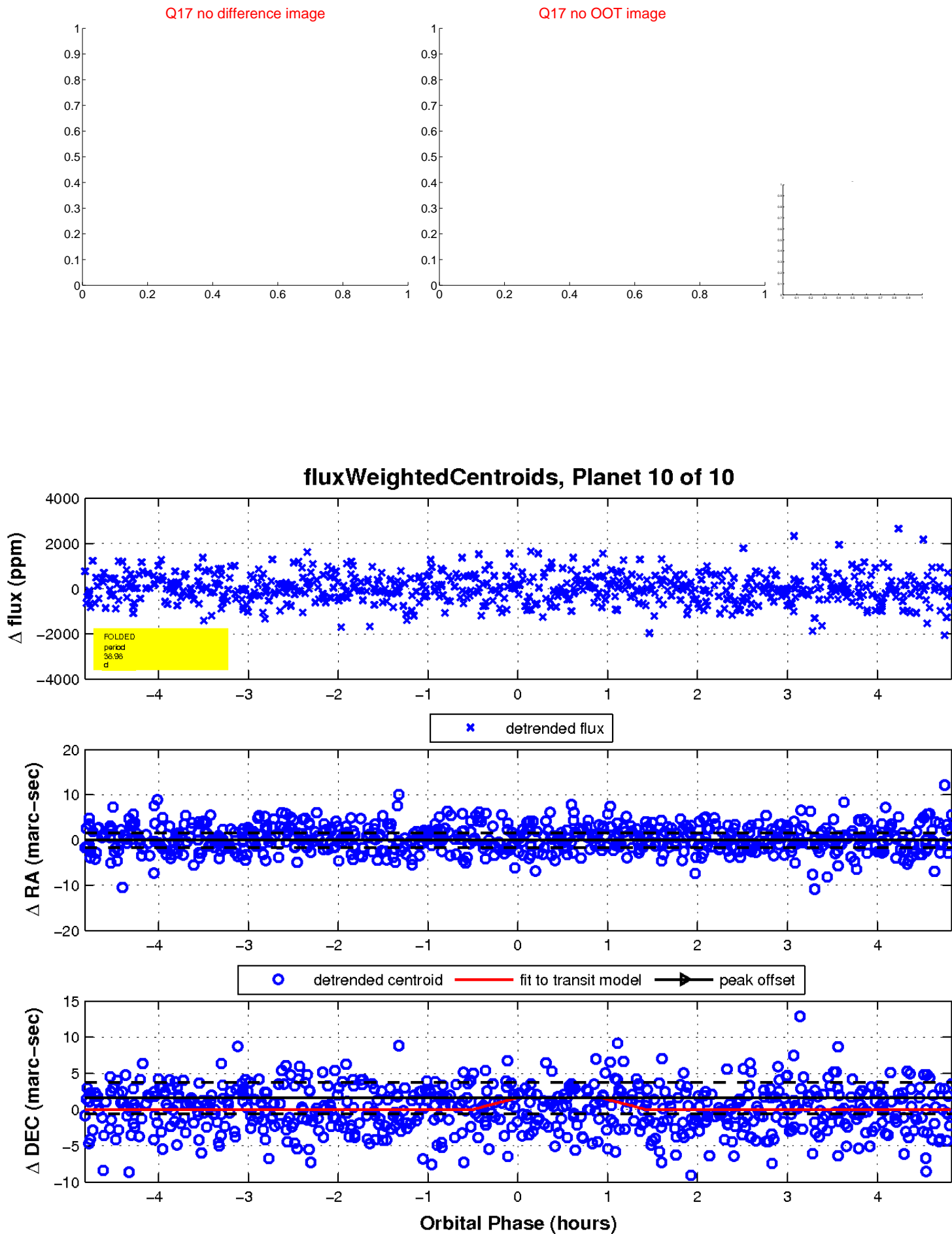


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

