

KIC 008453851

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})
008453851-01	OBS	4565.01	2.788039	132.489699	7.3	14.189	9.2	8.7	2.21	7523	0.61	6473.37
008453851-02	OBS	No	185.647757	276.009550	97.1	36.492	22.4	12.0	2.21	7523	2.27	23.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008453851-01	OBS	FP	0.00	1	0	0	0	LPP_DV
008453851-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_MEAS

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 for comment definitions.

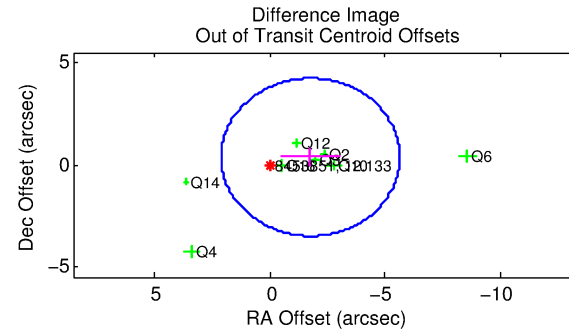
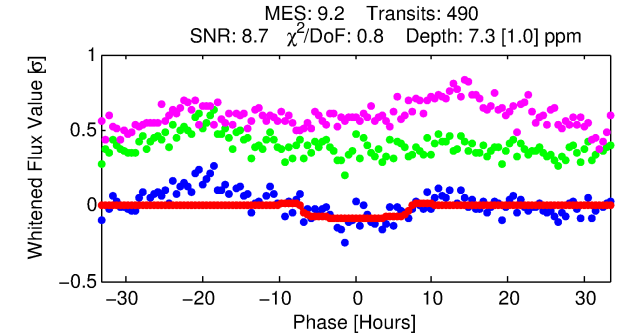
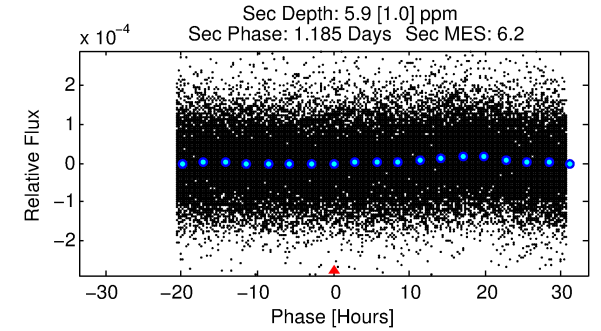
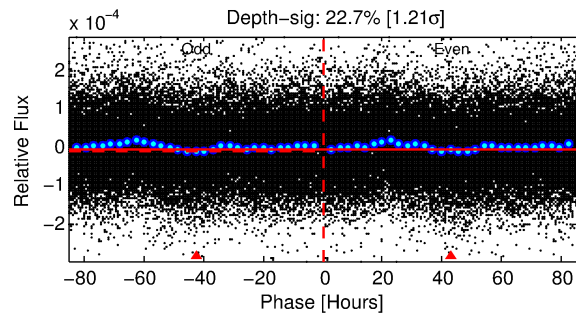
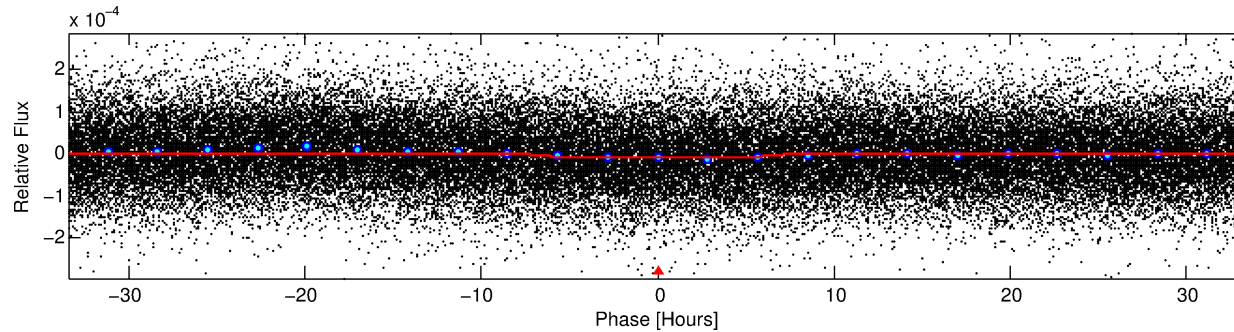
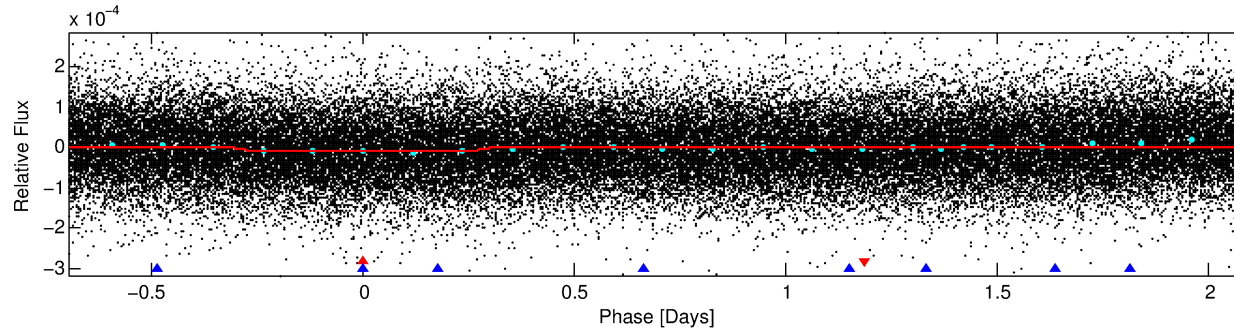
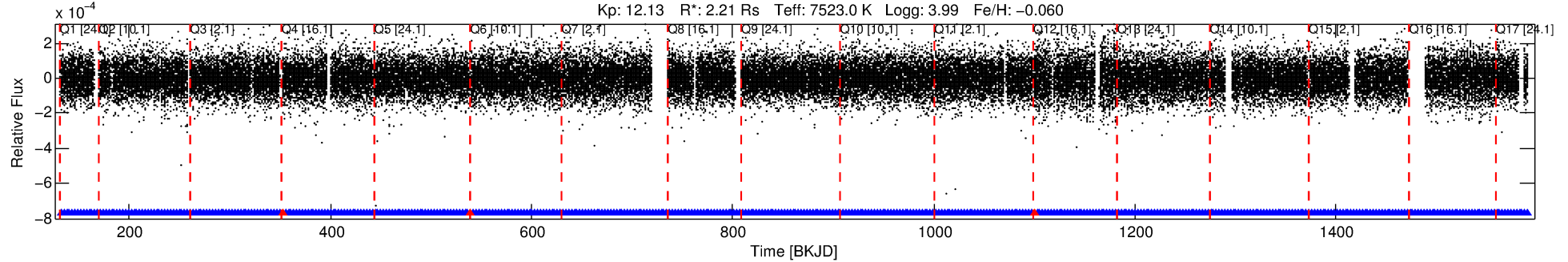
Ephemeris Match Information For 008453851-01

No Significant Match Found

DV One-Page Summary

KIC: 8453851 Candidate: 1 of 2 Period: 2.788 d
KOI: K04565.01 Corr: 0.832

Kp: 12.13 R*: 2.21 Rs Teff: 7523.0 K Logg: 3.99 Fe/H: -0.060



DV Fit Results:

Period = 2.78804 [0.00006] d
Epoch = 132.4897 [0.0129] BKJD
Rp/R* = 0.0025 [0.0026]
a/R* = 1.61 [6.10]
b = 0.17 [34.82]
Seff = 6473.37 [2758.97]
Teq = 2287 [244] K
Rp = 0.61 [0.64] Re
a = 0.0464 [0.0120] AU
Ag = 19.01 [39.45] [0.46σ]
Teffp = 7384 [3775] K [1.35σ]

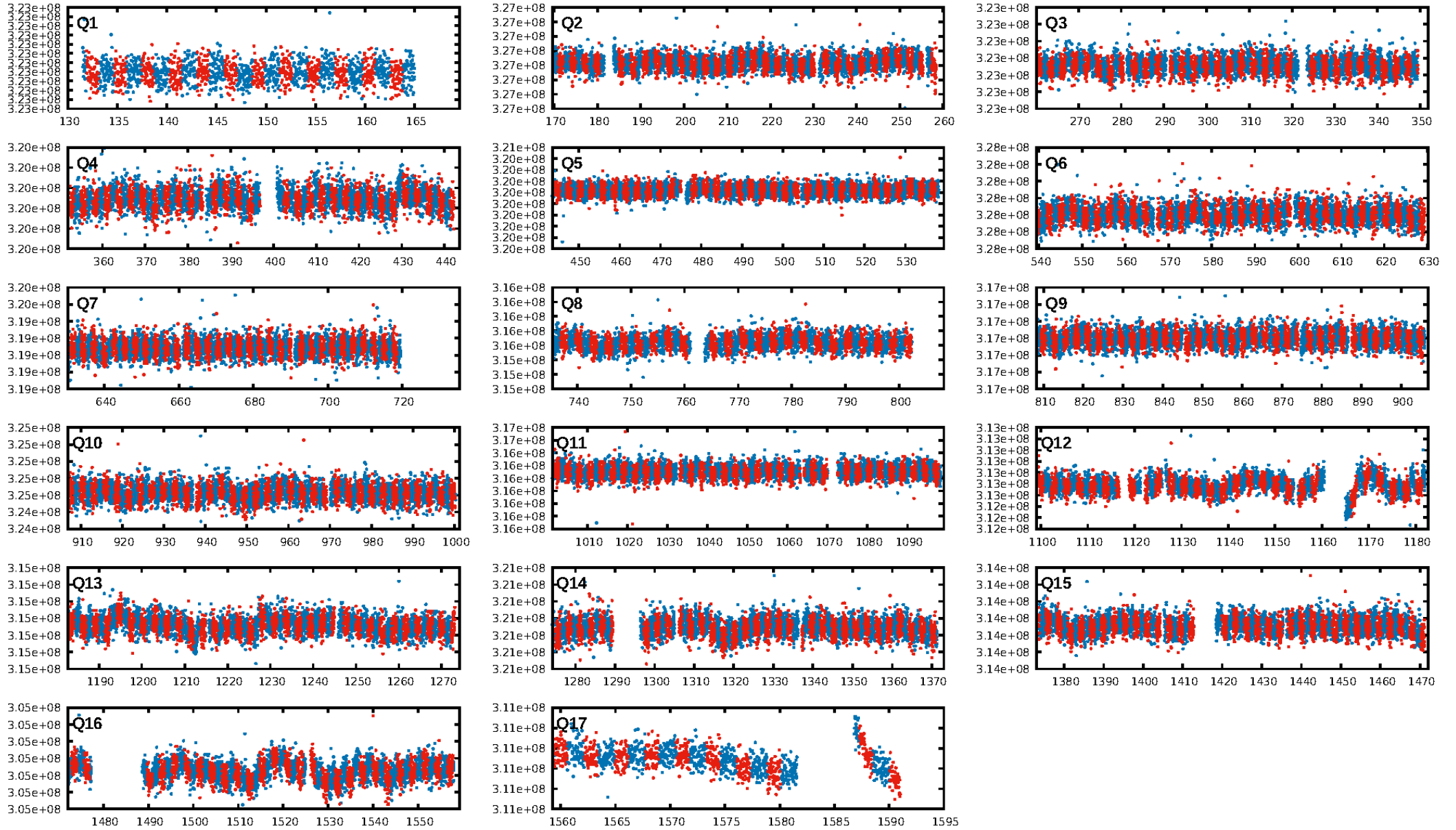
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [112.09σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.03e-14
RollingBand-fgt: 0.99 [465/468]
GhostDiagnostic-chr: 8.324
Centroid-sig: 0.5%
Centroid-so: 4.078 arcsec [2.16σ]
OotOffset-rm: 1.796 arcsec [1.39σ]
KicOffset-rm: 1.817 arcsec [1.43σ]
OotOffset-st: 4/1/3/0 [8]
KicOffset-st: 4/1/3/0 [8]
DiffImageQuality-fgm: 0.50 [4/8]
DiffImageOverlap-fno: 1.00 [17/17]

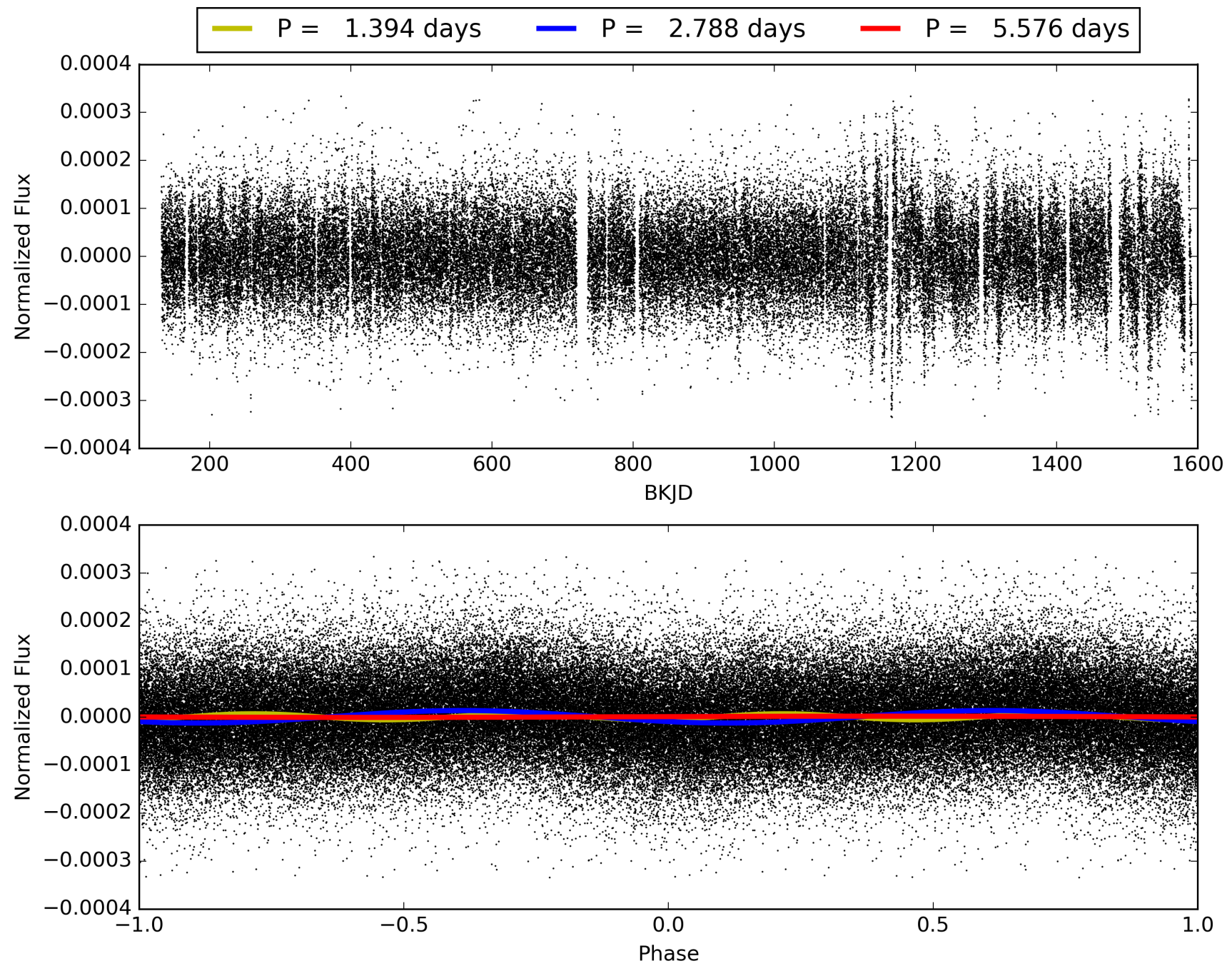
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:51:40 Z

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

TCE 008453851-01, PDC Light Curves

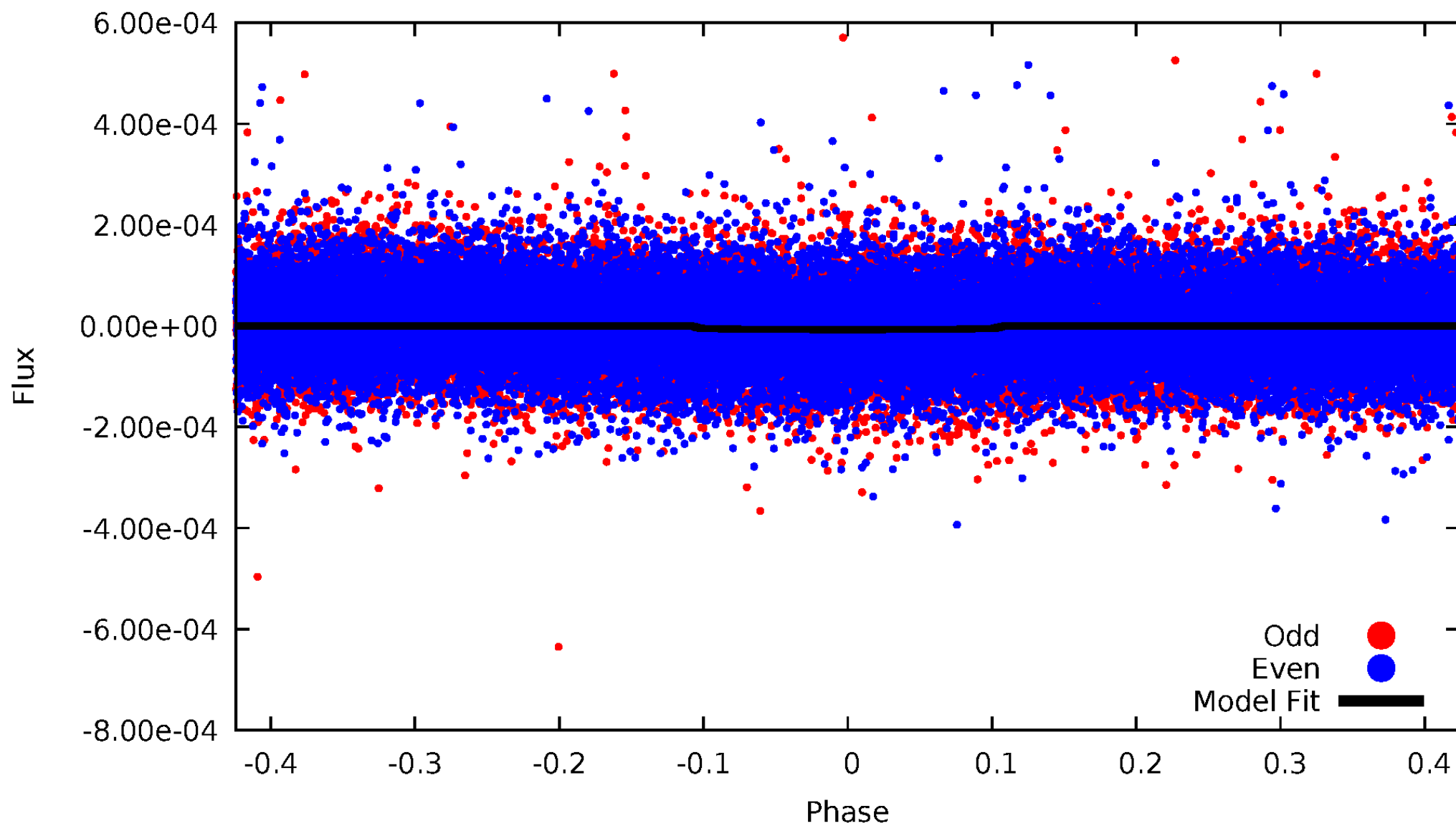


TCE 008453851-01



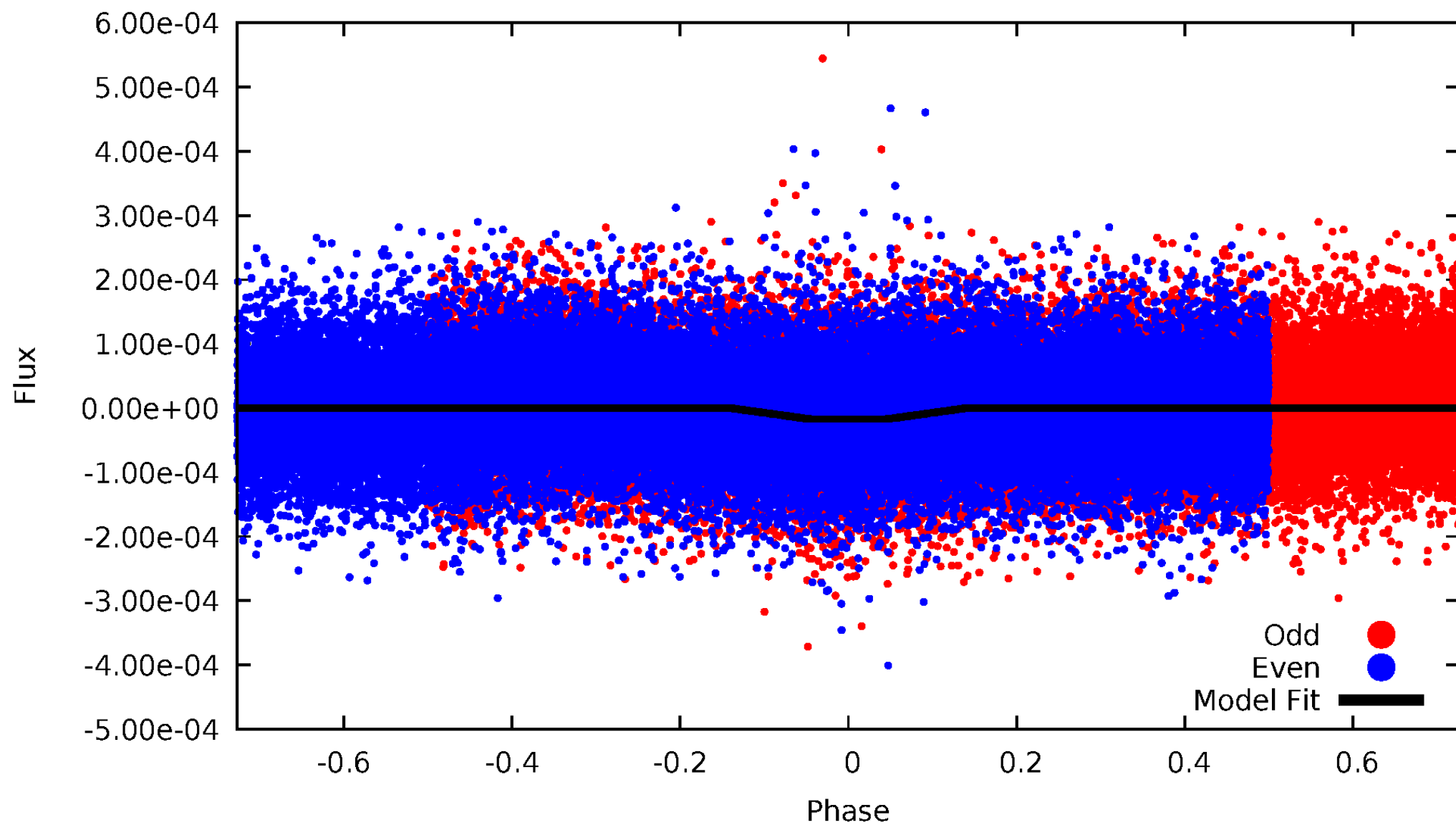
DV Odd/Even

TCE 008453851-01



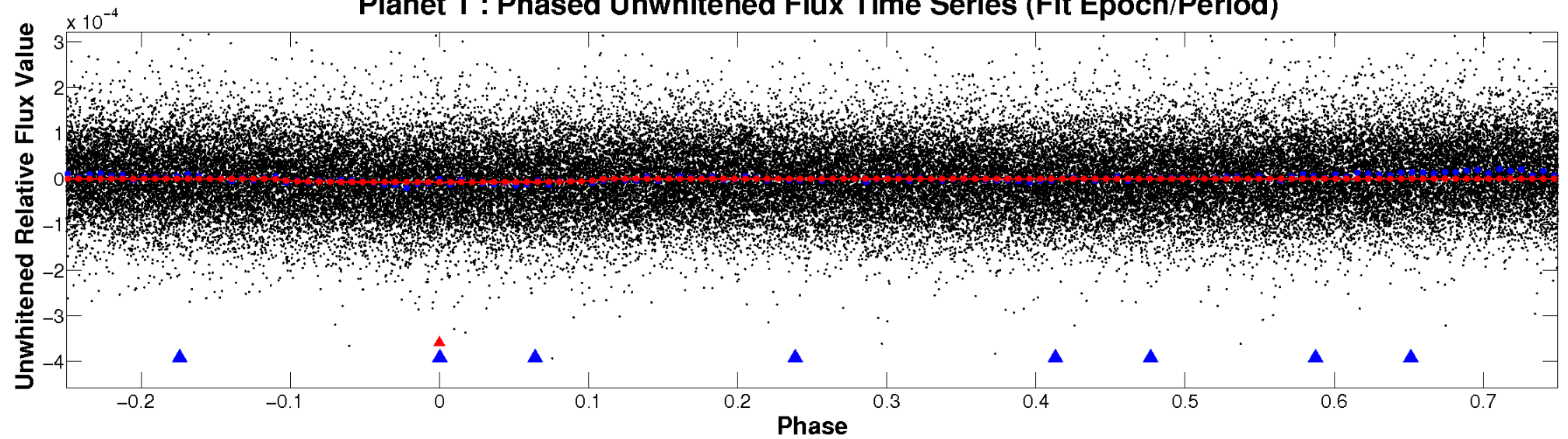
ALT Odd/Even

TCE 008453851-01

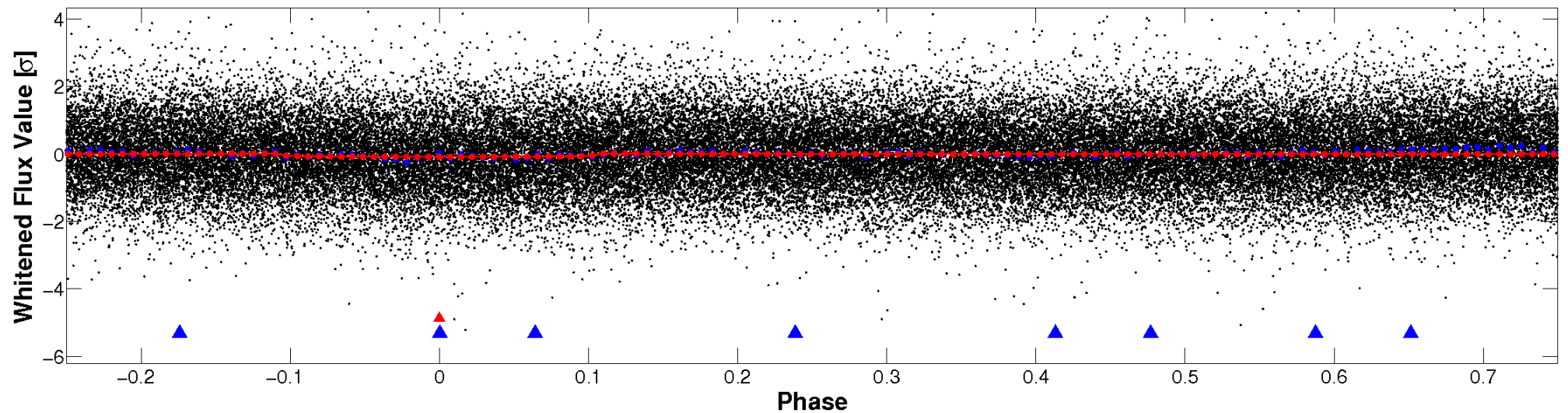


Non-Whitened Vs. Whitened Light Curve

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

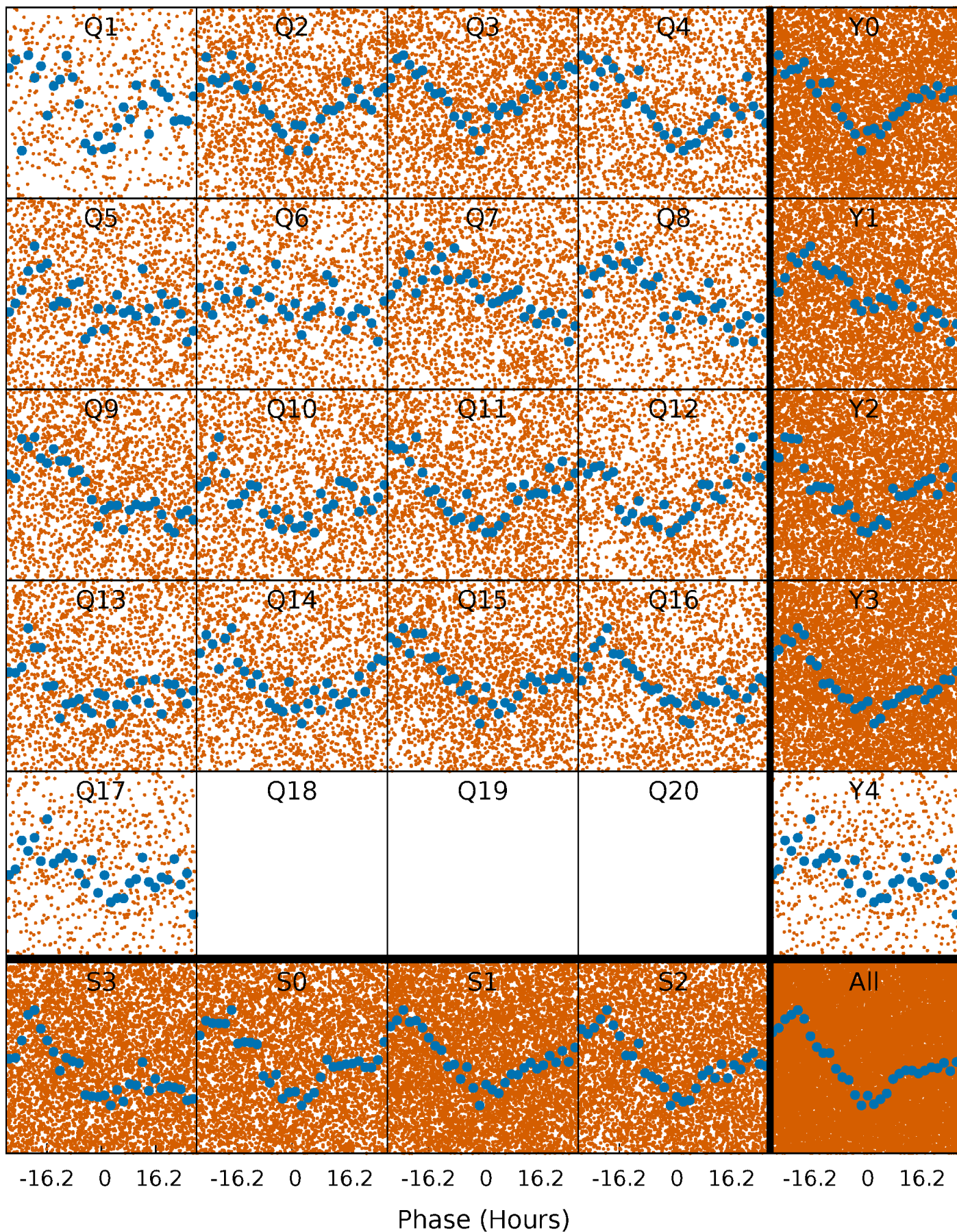


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



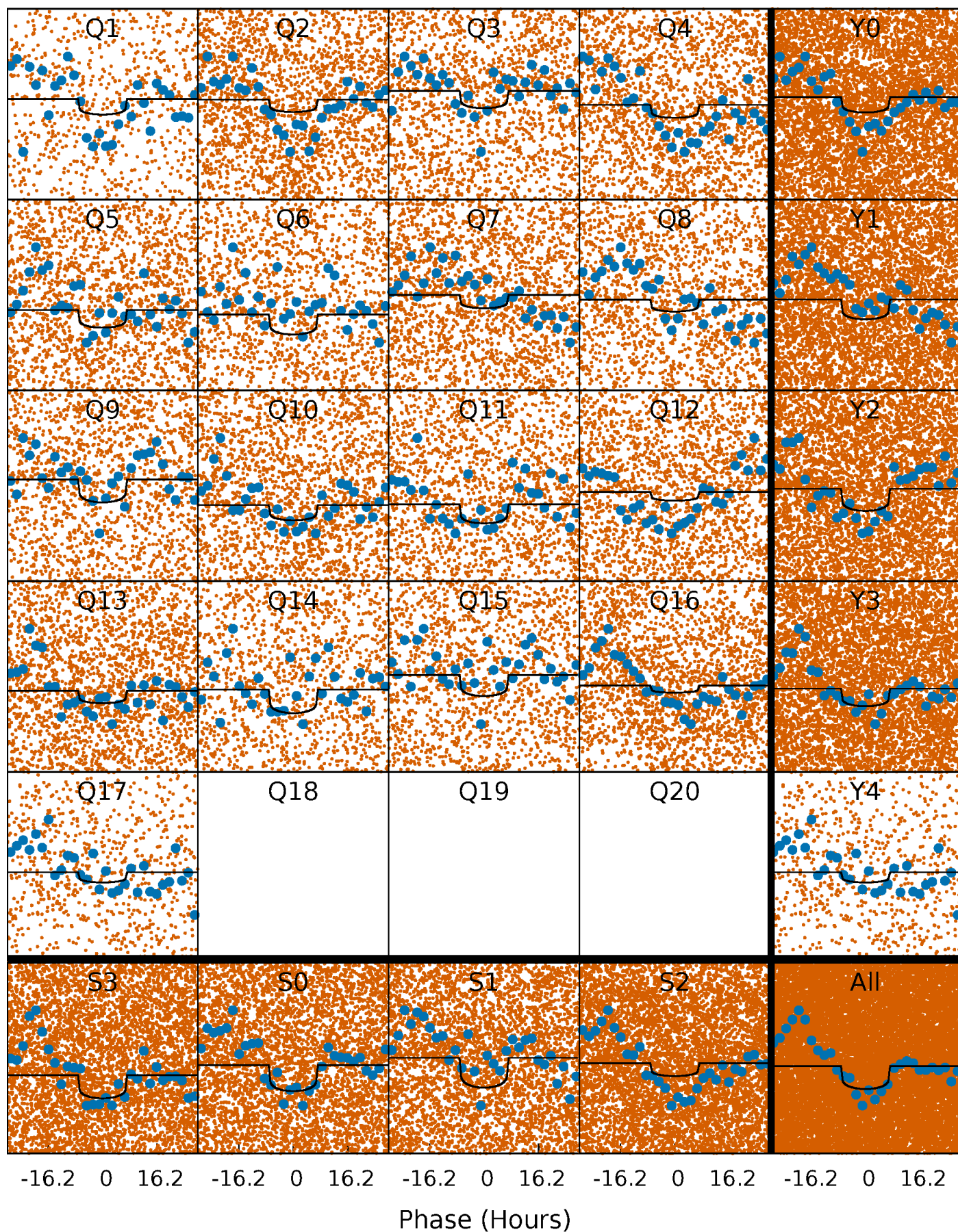
PDC Quarter-Phased Transit Curves

TCE 008453851-01 P= 2.788039 Days $T_0=132.489699$ (BKJD)



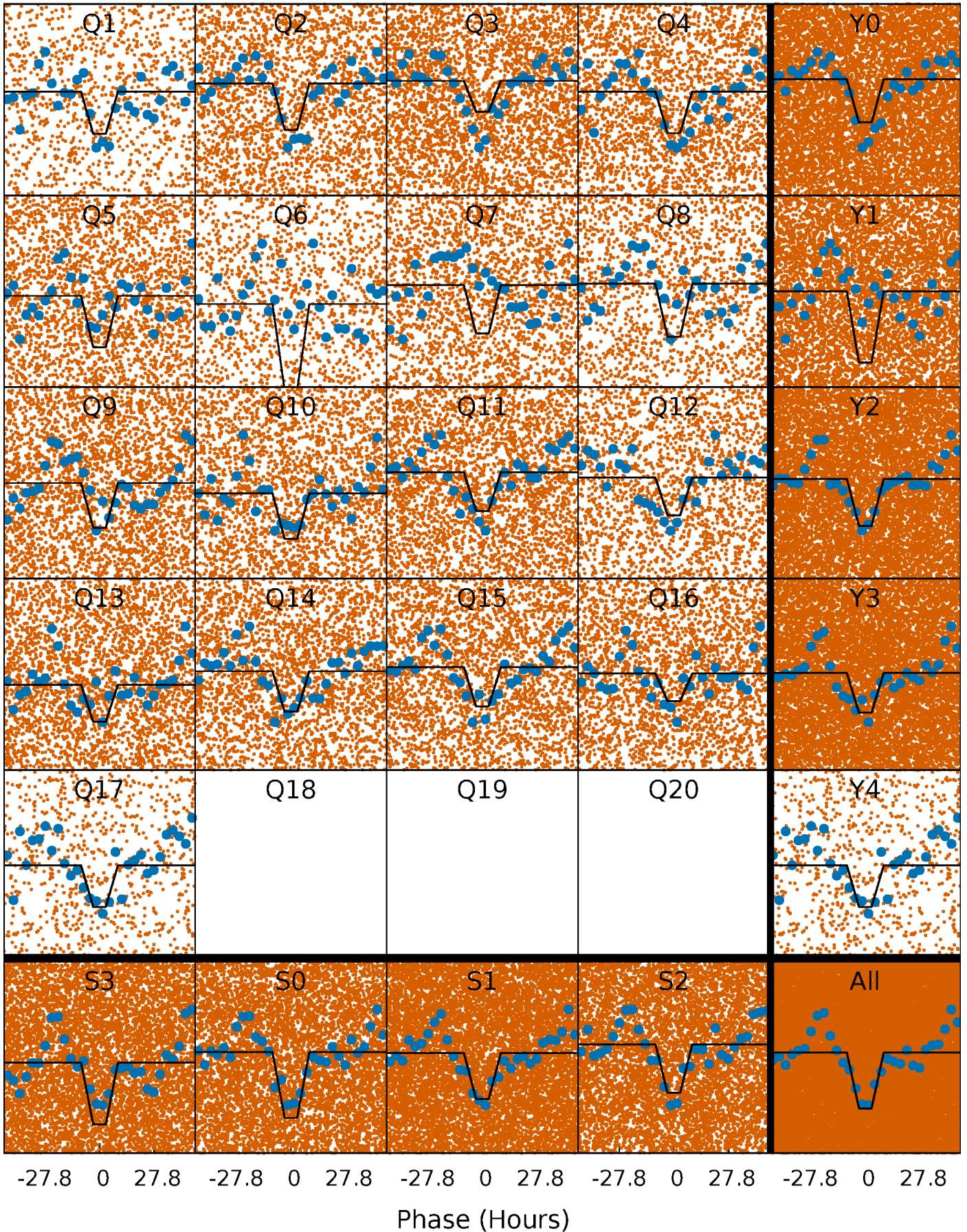
DV Quarter-Phased Transit Curves

TCE 008453851-01 P= 2.788039 Days $T_0=132.489699$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

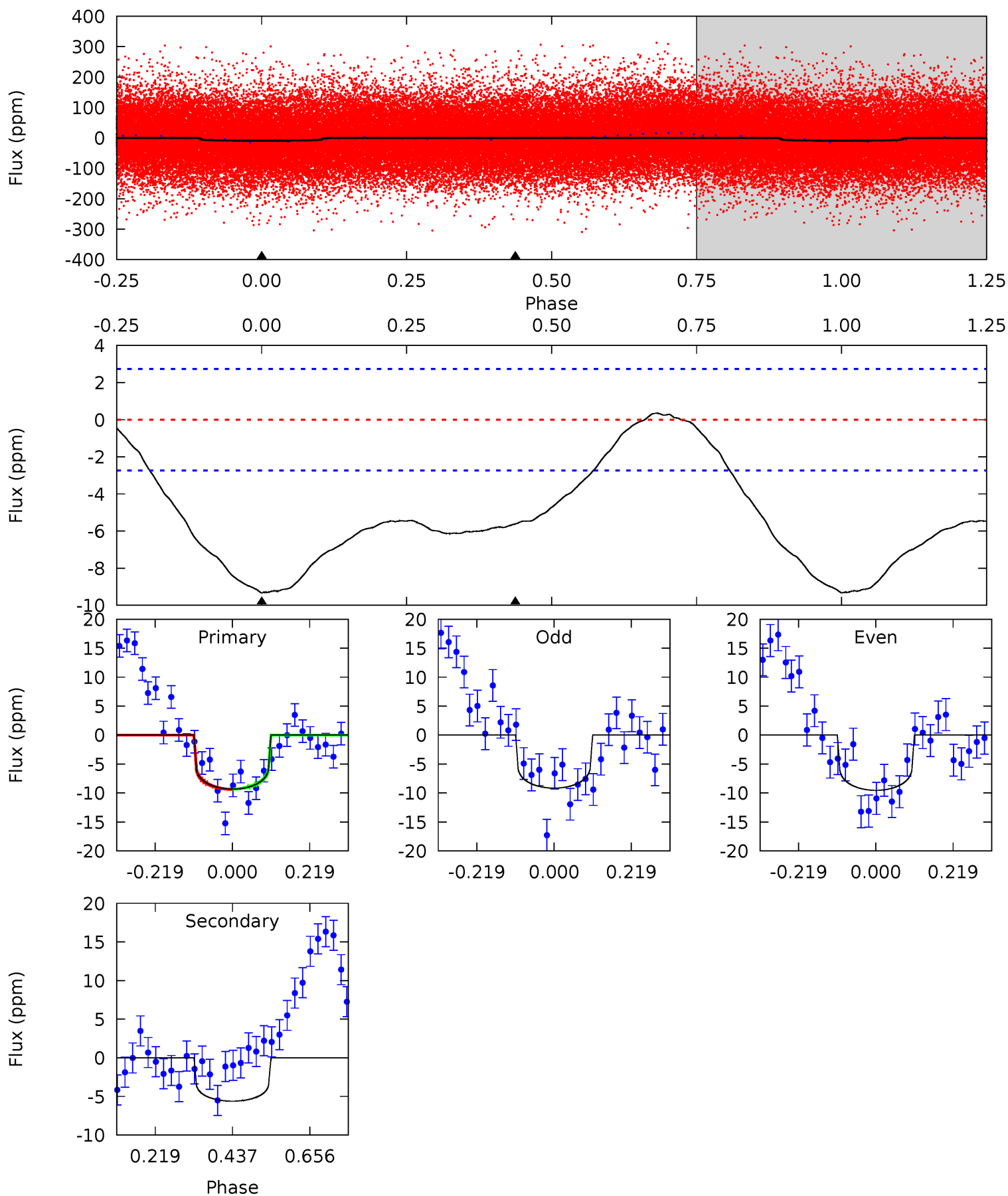
TCE 008453851-01 P= 2.788461 Days $T_0=132.415551$ (BKJD)



DV Model-Shift Uniqueness Test

008453851-01, P = 2.788039 Days, E = 129.701660 Days

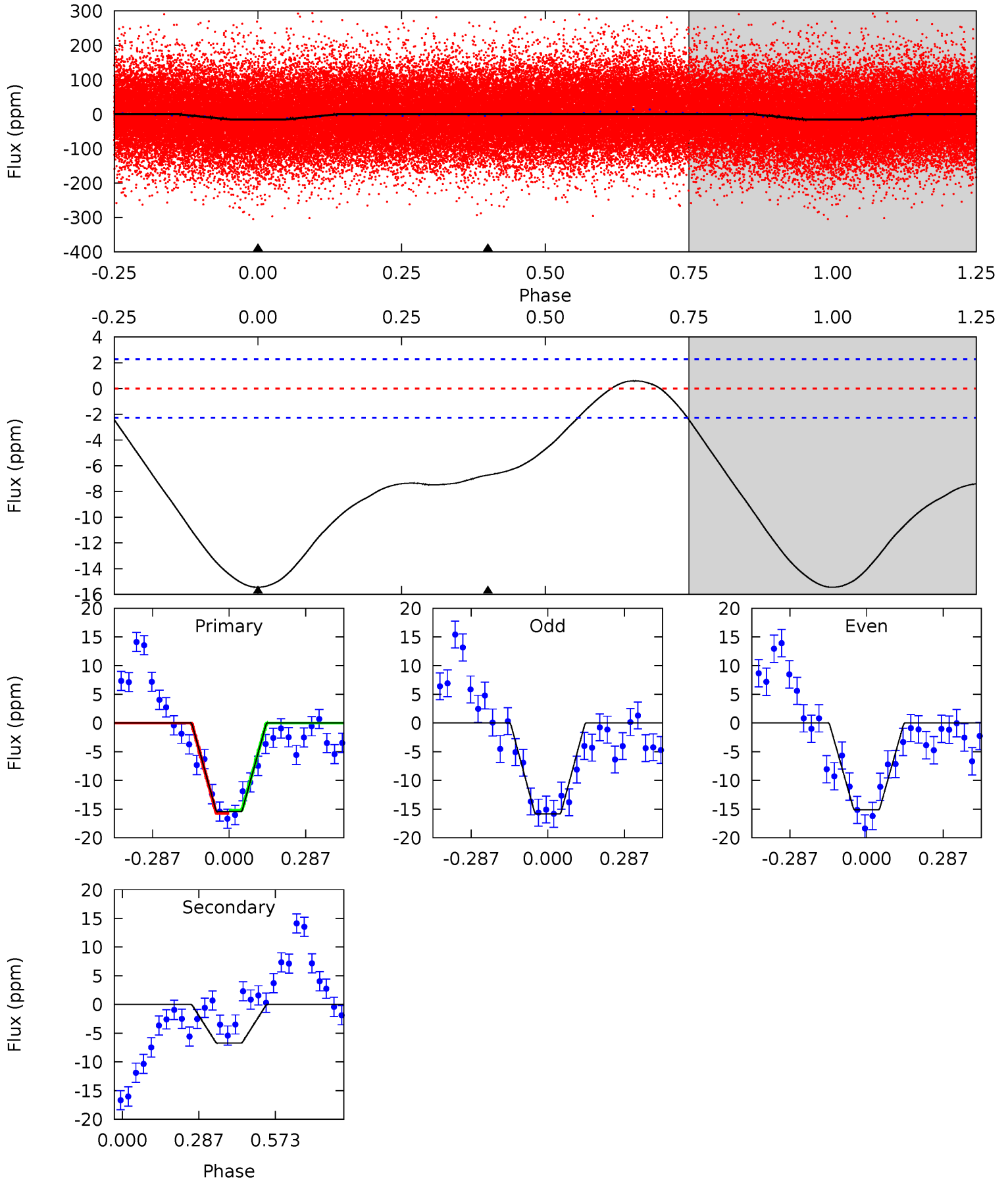
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	9.02	0	0	4.40	1.23	0.85	15.0	15.0	9.02	9.02	0.31	1.09	0.04	0.05



Alt Model-Shift Uniqueness Test

008453851-01, P = 2.788461 Days, E = 129.627090 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.4	12.8	0	0	4.34	1.07	1.77	29.4	29.4	12.8	12.8	0.71	1.06	0.04	0.50



Stellar Parameters For KIC 008453851

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7523^{+209}_{-314}	$3.986^{+0.222}_{-0.148}$	$-0.060^{+0.200}_{-0.350}$	$2.206^{+0.525}_{-0.642}$	$1.719^{+0.185}_{-0.317}$	$0.226^{+0.292}_{-0.096}$
	+3%/-4%	+6%/-4%	+333%/-583%	+24%/-29%	+11%/-18%	+129%/-43%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008453851-01 / KOI 4565.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-6 ± 1	$0.70^{+0.55}_{-0.43}$	3157^{+212}_{-238}	6516^{+6411}_{-1583}	13^{+84}_{-9}
Alt.	-7 ± 1	$0.99^{+0.61}_{-0.56}$	3159^{+217}_{-258}	5748^{+3498}_{-1143}	$8.229^{+33.566}_{-5.151}$

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

DV Centroid Data

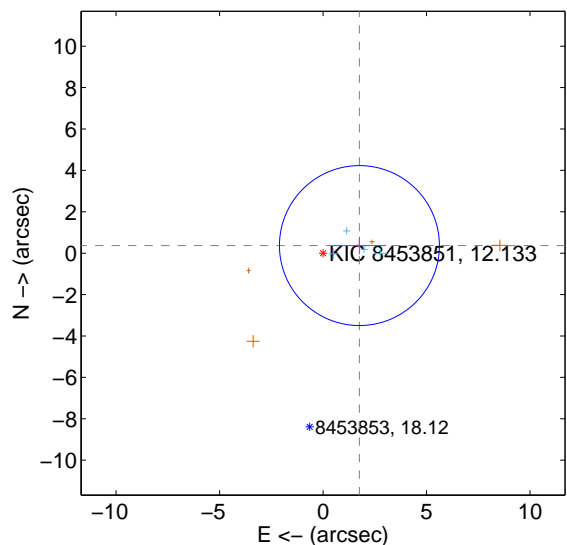
Supplemental centroid analysis for 008453851-01. Kepler magnitude: 12.13. Transit SNR 8.69

There are 4 quarters with good PRF difference image offsets

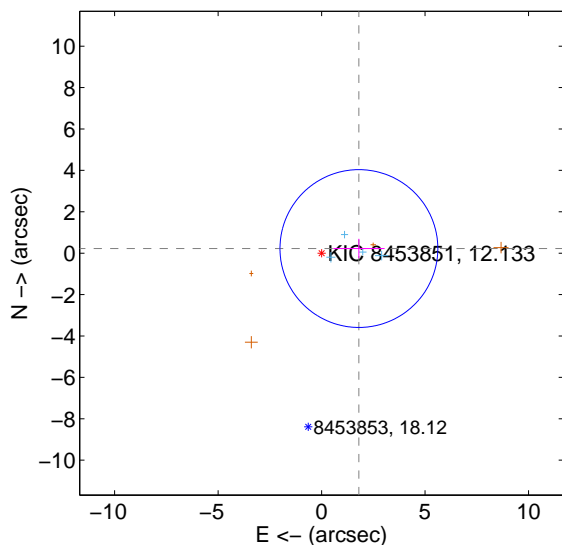
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.796 ± 1.288	1.39	-1.758 ± 1.274	0.368 ± 0.425
PRF-fit source offset from KIC position	1.817 ± 1.271	1.43	-1.803 ± 1.241	0.224 ± 0.473
photometric centroid source offset	4.08 ± 1.89	2.16	3.36 ± 1.95	-2.31 ± 1.76

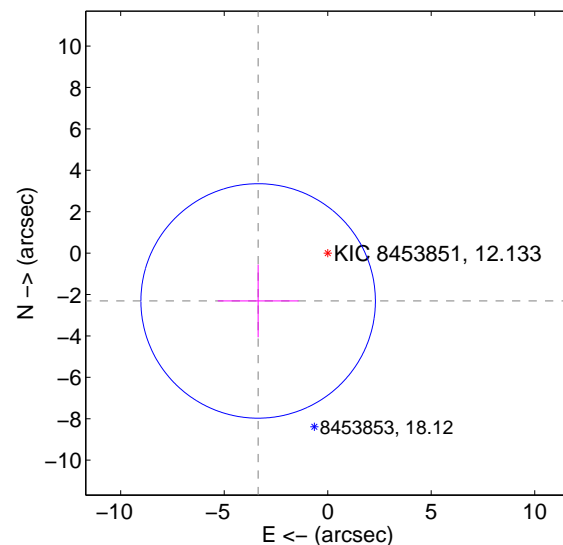
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

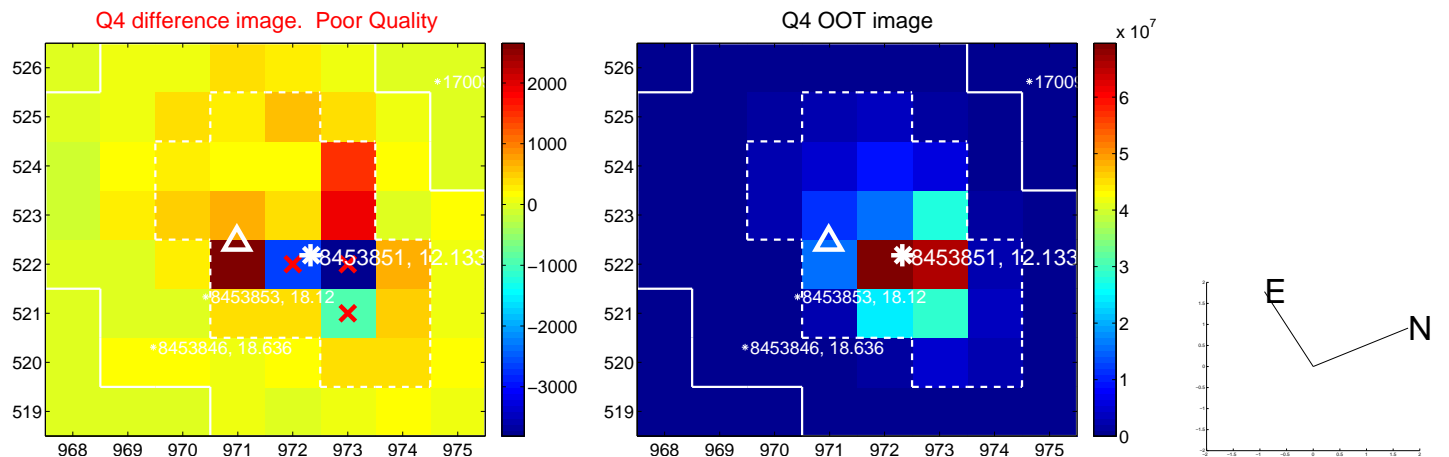
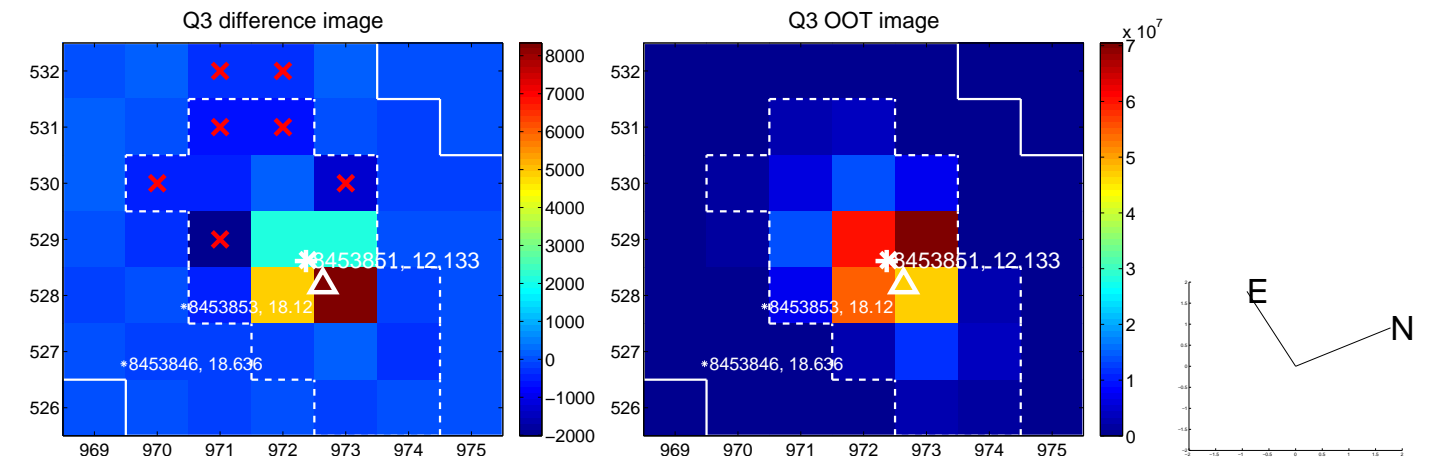
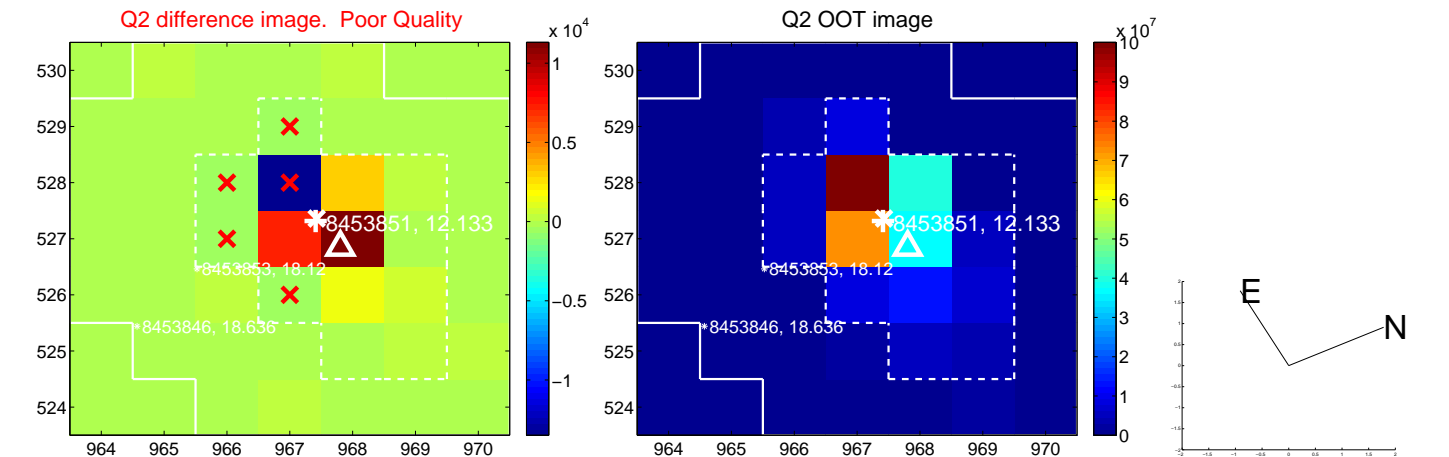
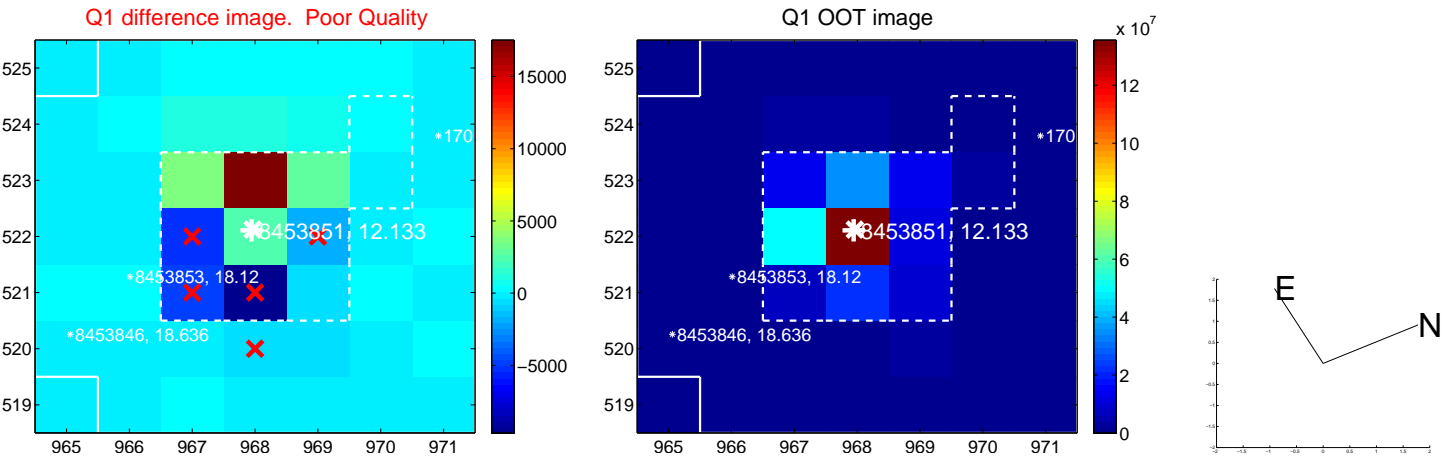


offset from photometric centroids

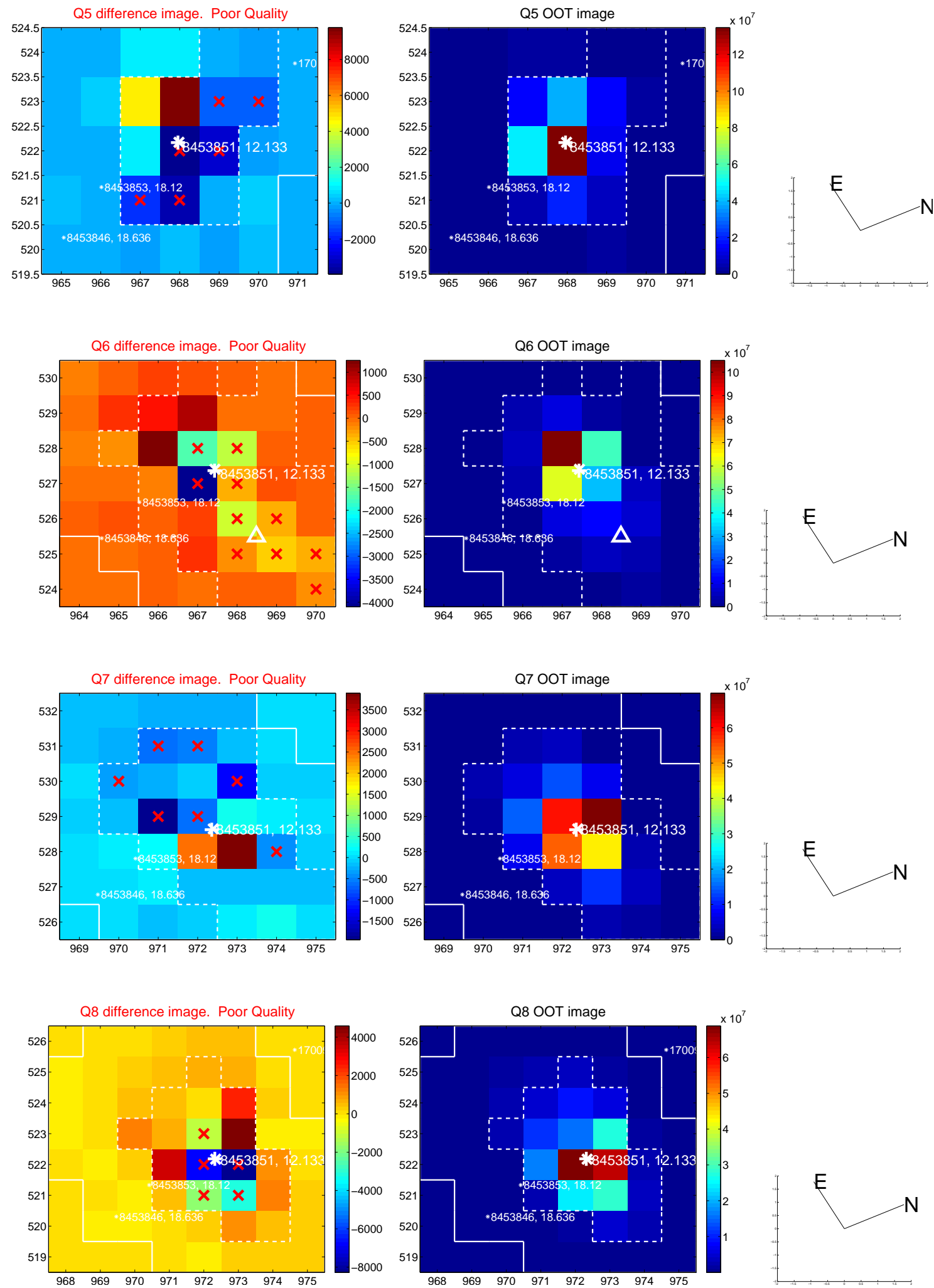


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

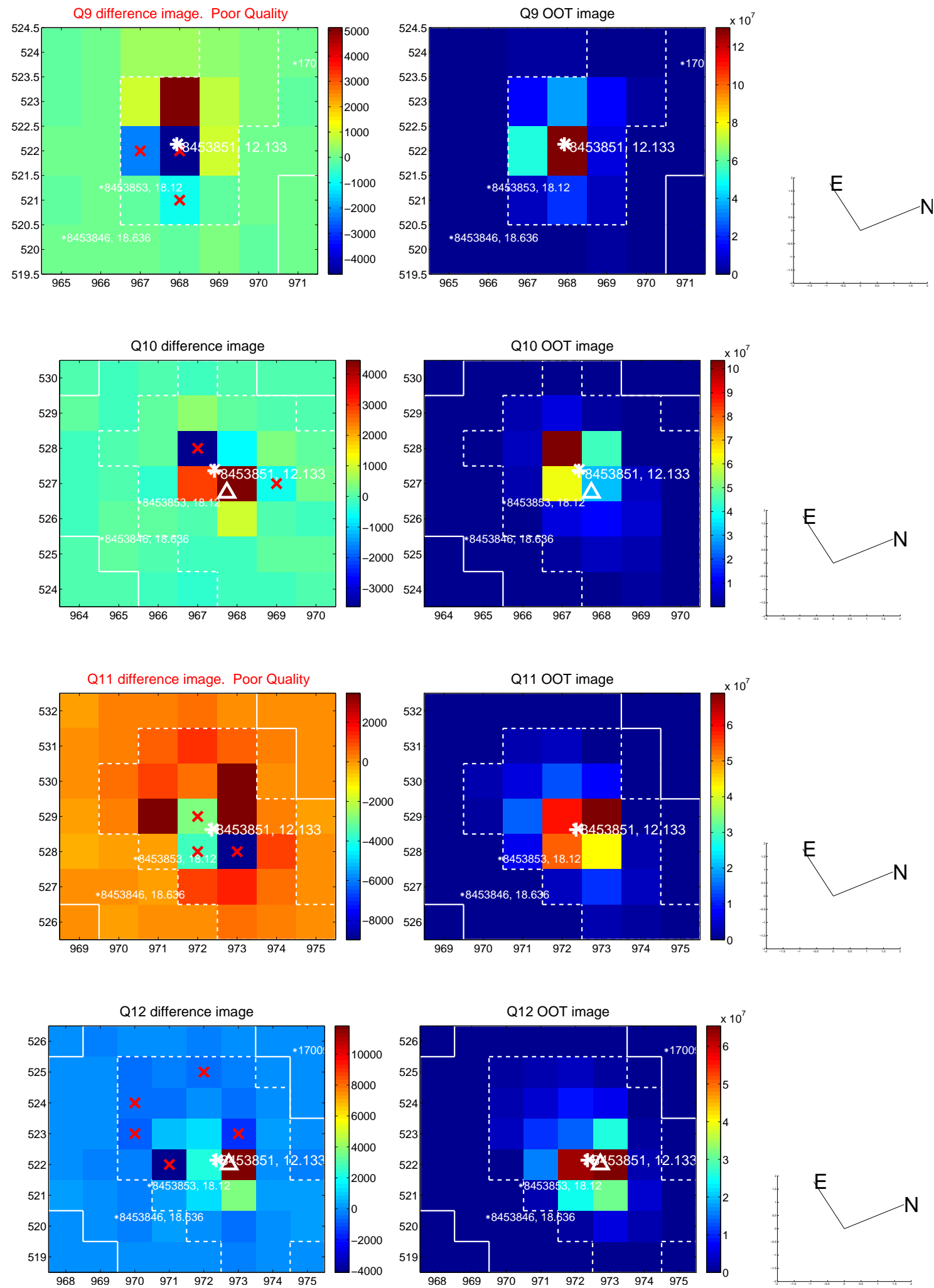
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



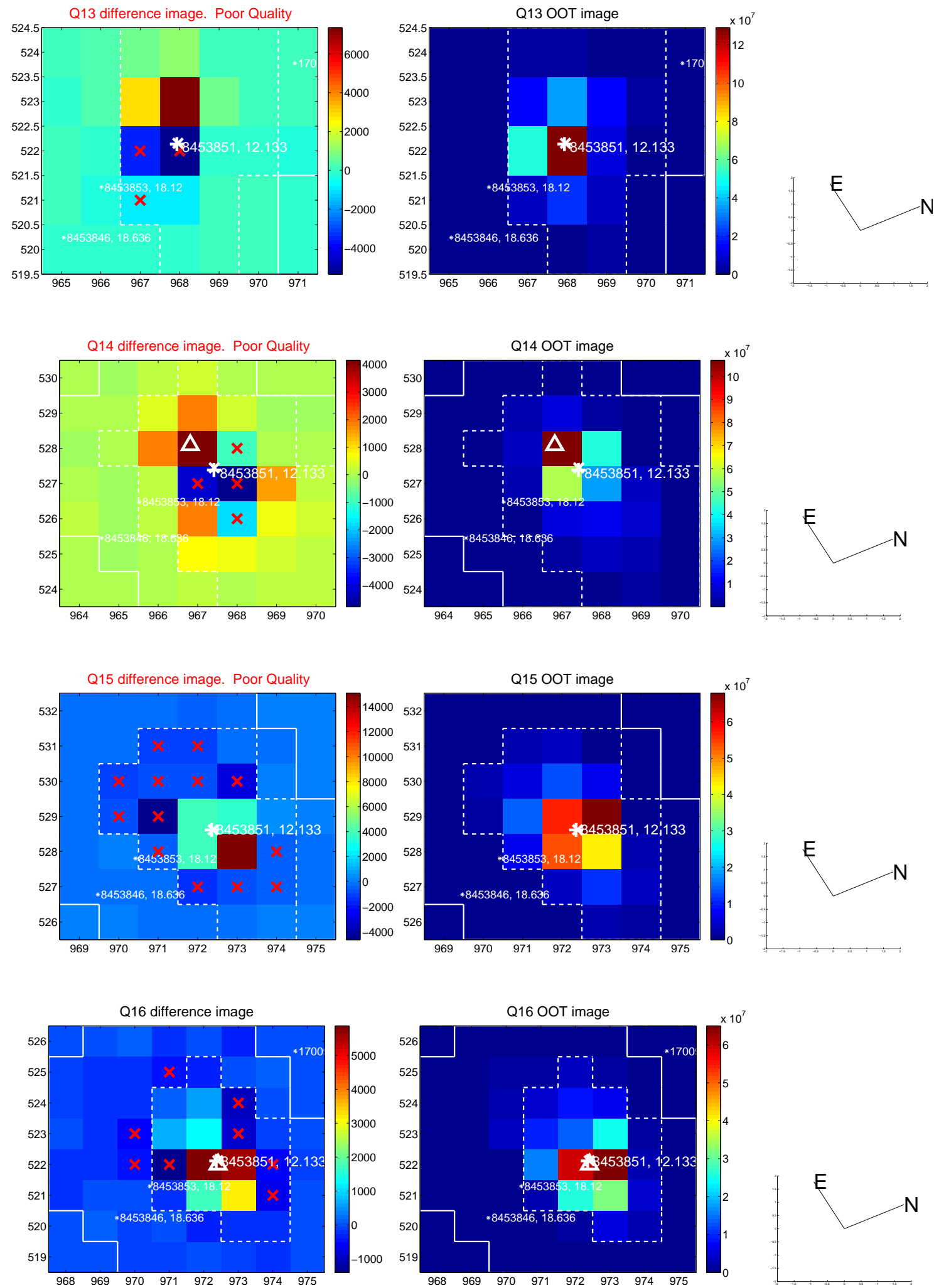
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



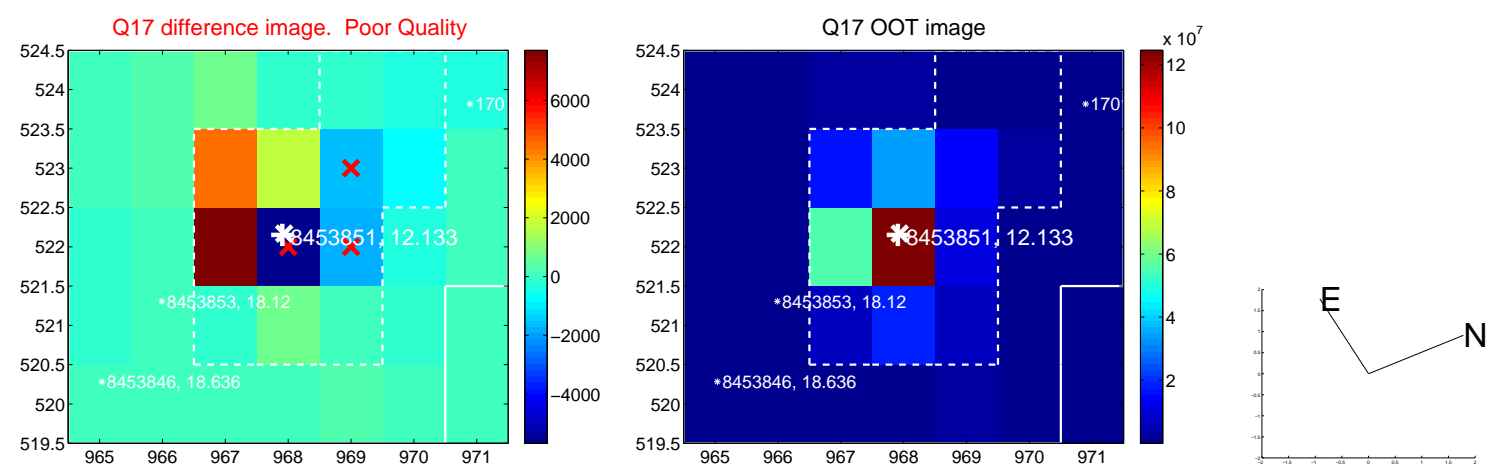
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



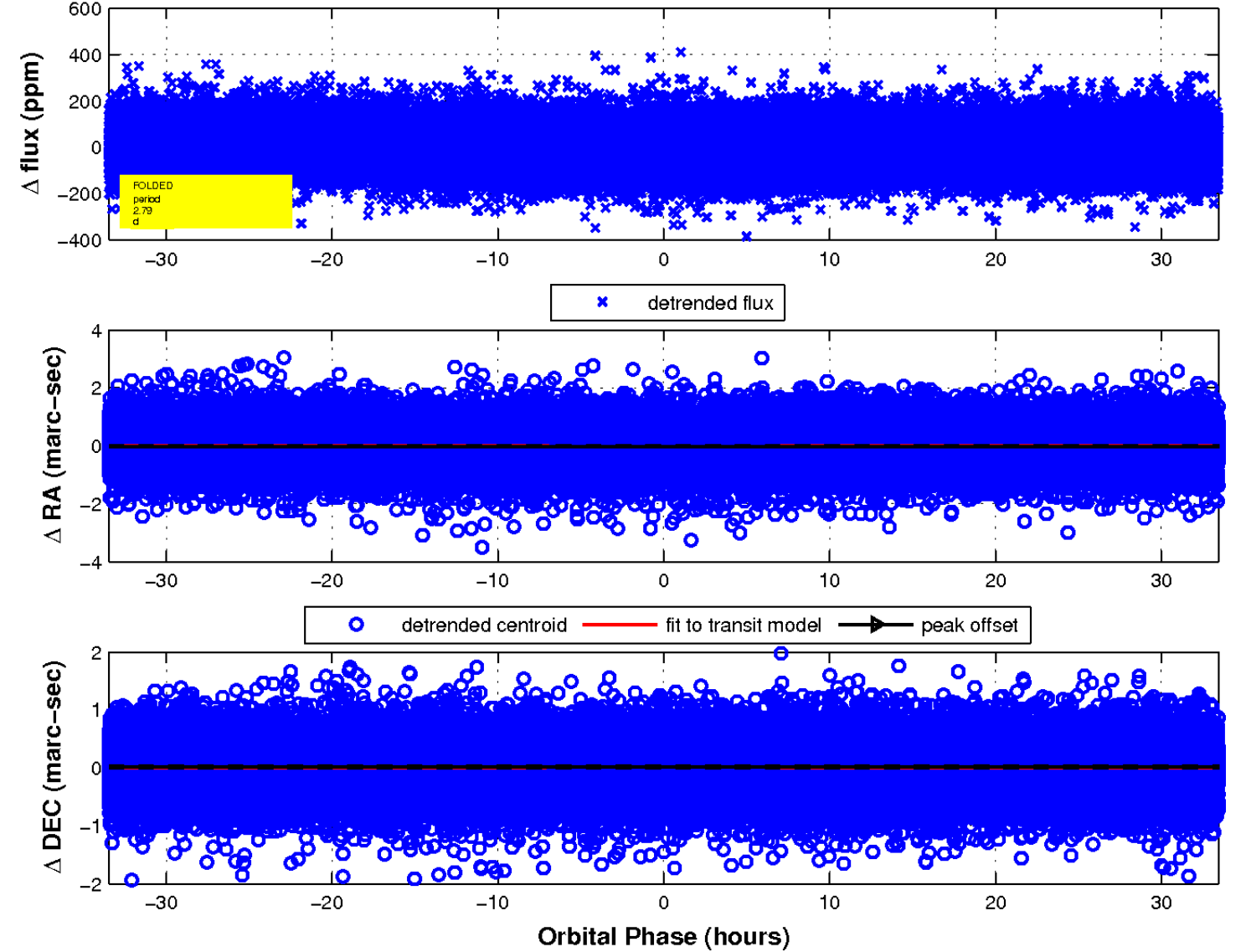
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 2



Declination

KIC 008453851

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})
008453851-01	OBS	4565.01	2.788039	132.489699	7.3	14.189	9.2	8.7	2.21	7523	0.61	6473.37
008453851-02	OBS	No	185.647757	276.009550	97.1	36.492	22.4	12.0	2.21	7523	2.27	23.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008453851-01	OBS	FP	0.00	1	0	0	0	LPP_DV
008453851-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_MEAS

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 for comment definitions.

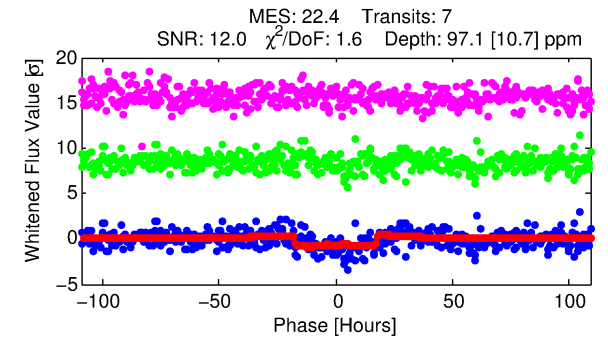
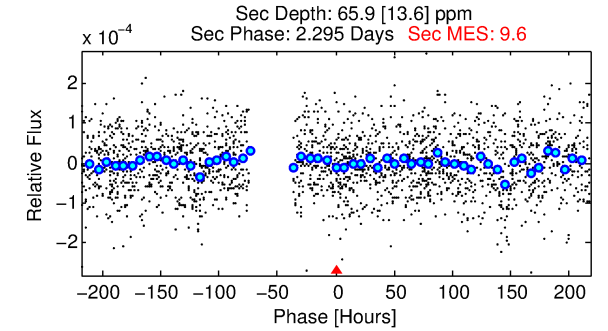
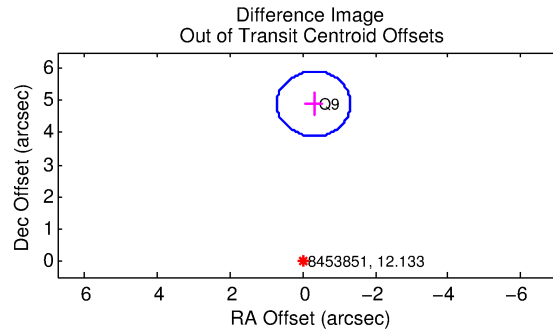
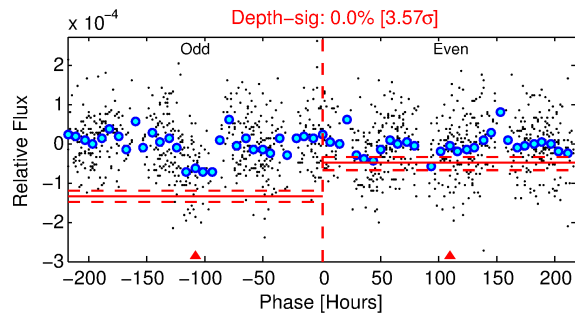
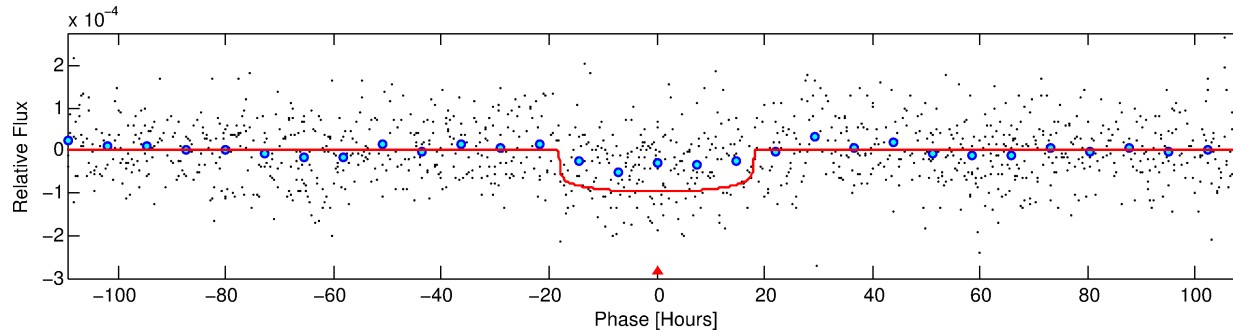
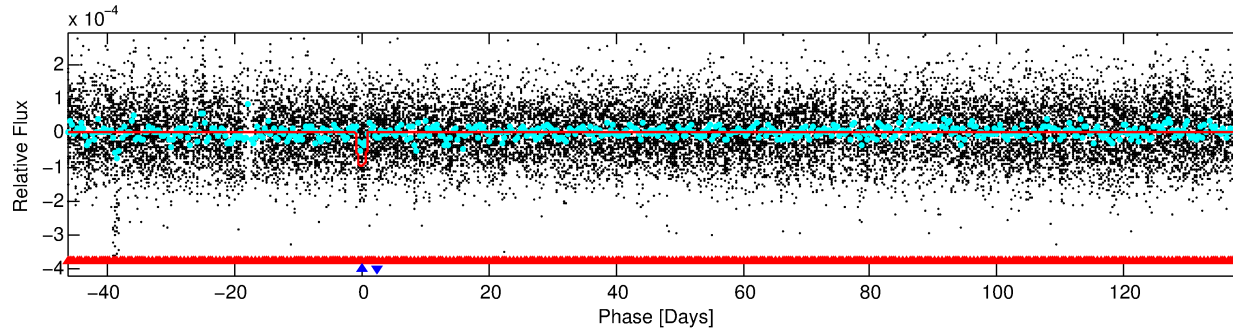
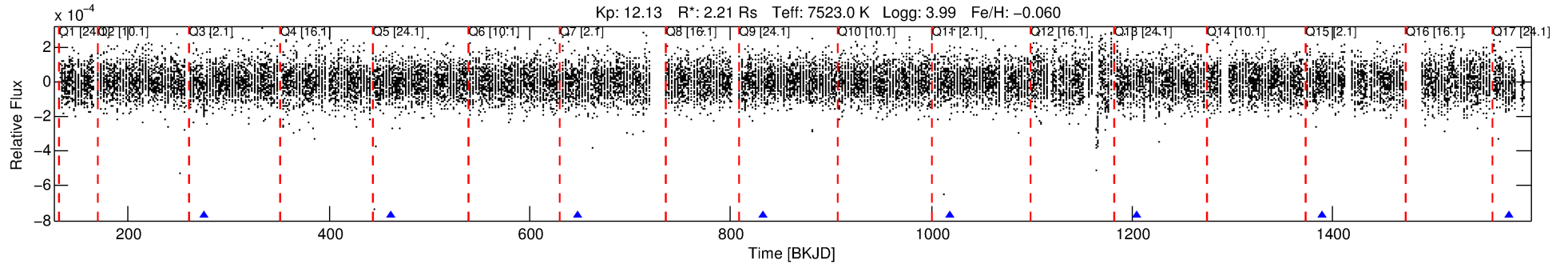
Ephemeris Match Information For 008453851-02

No Significant Match Found

DV One-Page Summary

KIC: 8453851 Candidate: 2 of 2 Period: 185.648 d
KOI: K04565 Corr: No Ephemeris Match

Kp: 12.13 R*: 2.21 Rs Teff: 7523.0 K Logg: 3.99 Fe/H: -0.060



DV Fit Results:

Period = 185.64776 [0.01542] d
Epoch = 276.0096 [0.0416] BKJD
Rp/R* = 0.0094 [0.0020]
a/R* = 33.29 [43.01]
b = 0.53 [1.73]
Seff = 23.99 [10.22]
Teq = 564 [60] K
Rp = 2.27 [0.82] Re
a = 0.7631 [0.1970] AU
Ag = 4103.57 [2541.46] [1.61σ]
Teff = 6983 [886] K [7.23σ]

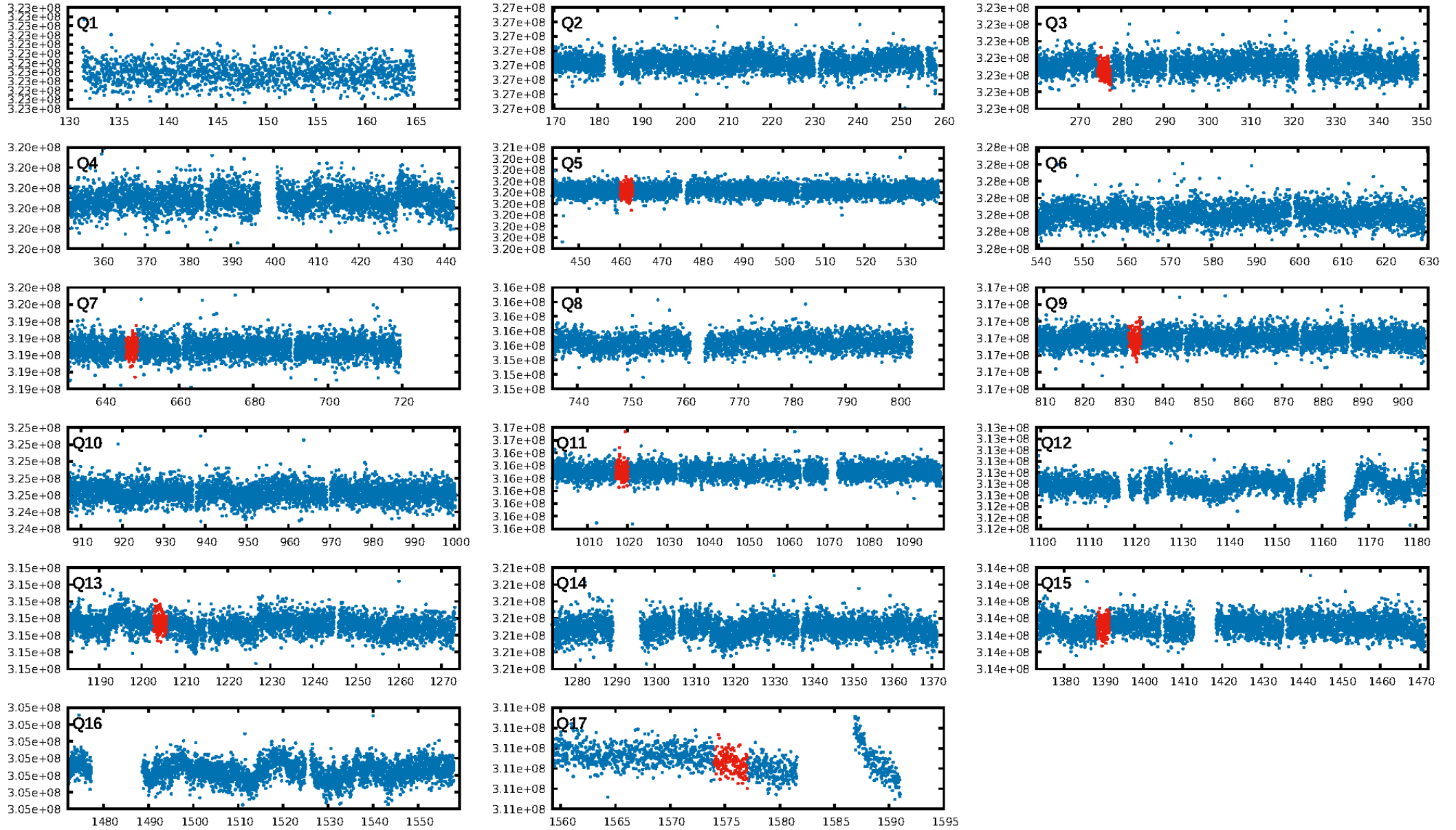
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [112.09σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 9.86e-65
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 2.58
Centroid-sig: 75.1%
Centroid-so: 0.349 arcsec [0.50σ]
OotOffset-rm: 4.904 arcsec [14.51σ]
KicOffset-rm: 4.816 arcsec [14.25σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.00 [0/7]

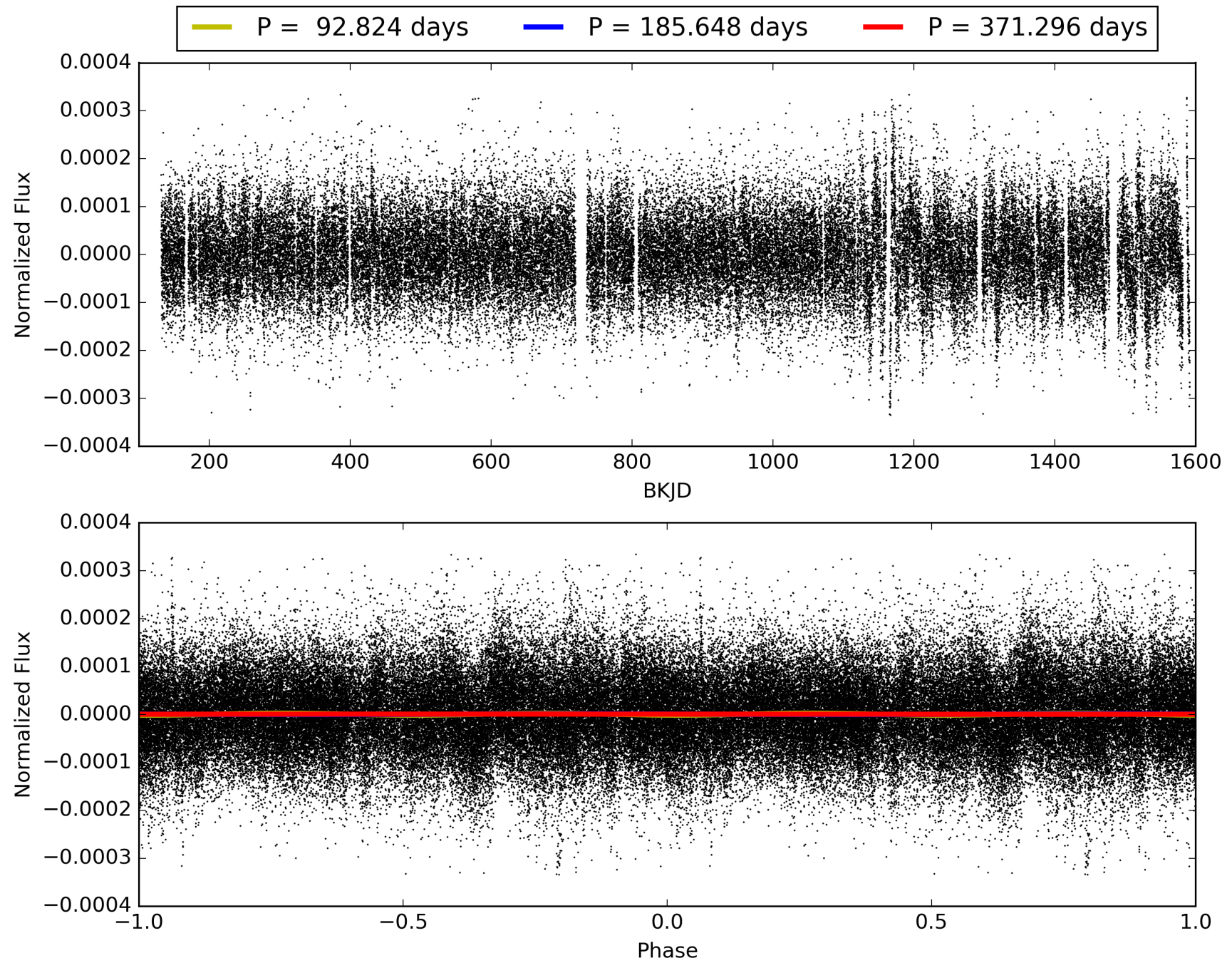
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:51:52 Z

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

TCE 008453851-02, PDC Light Curves

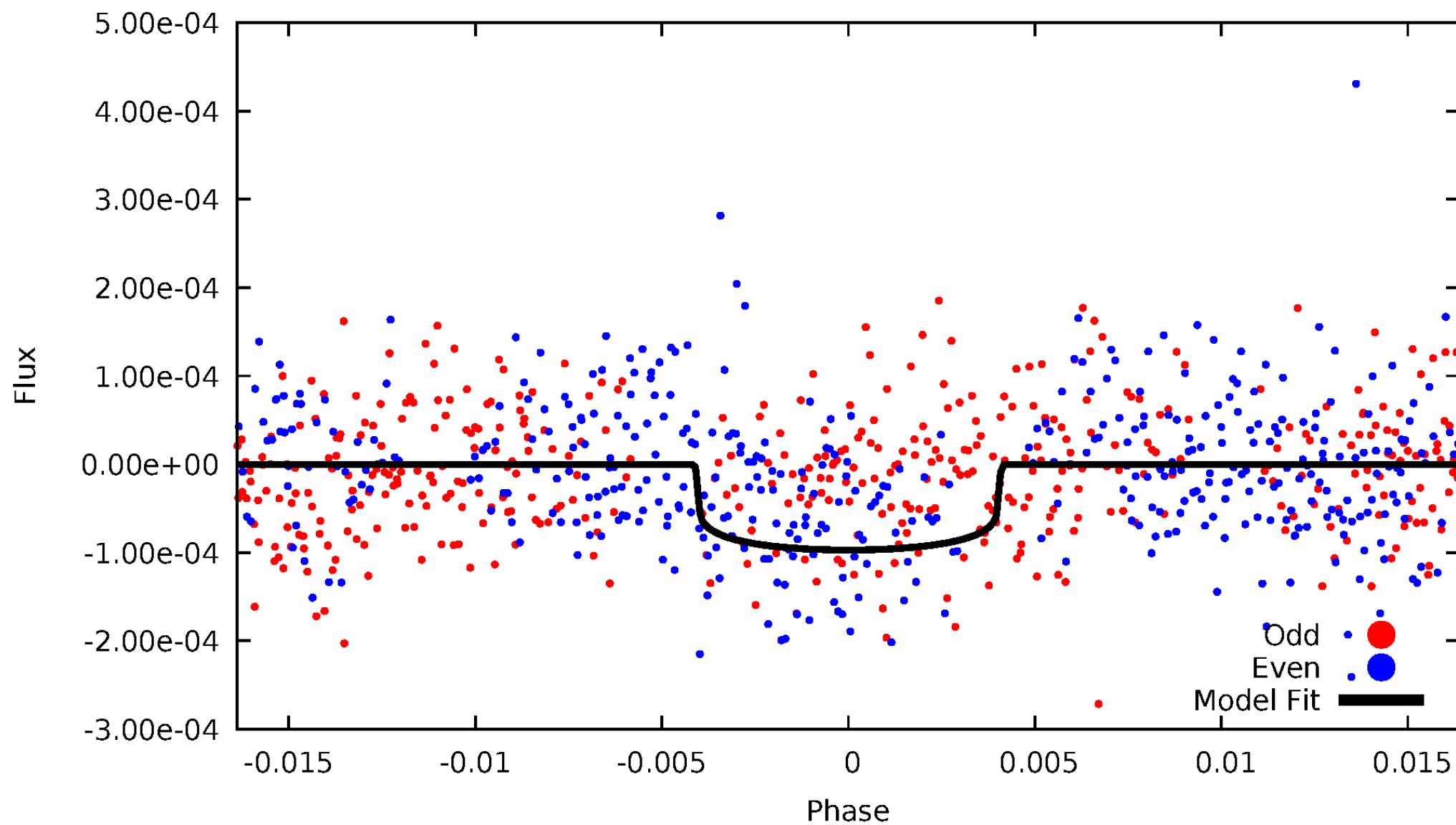


TCE 008453851-02



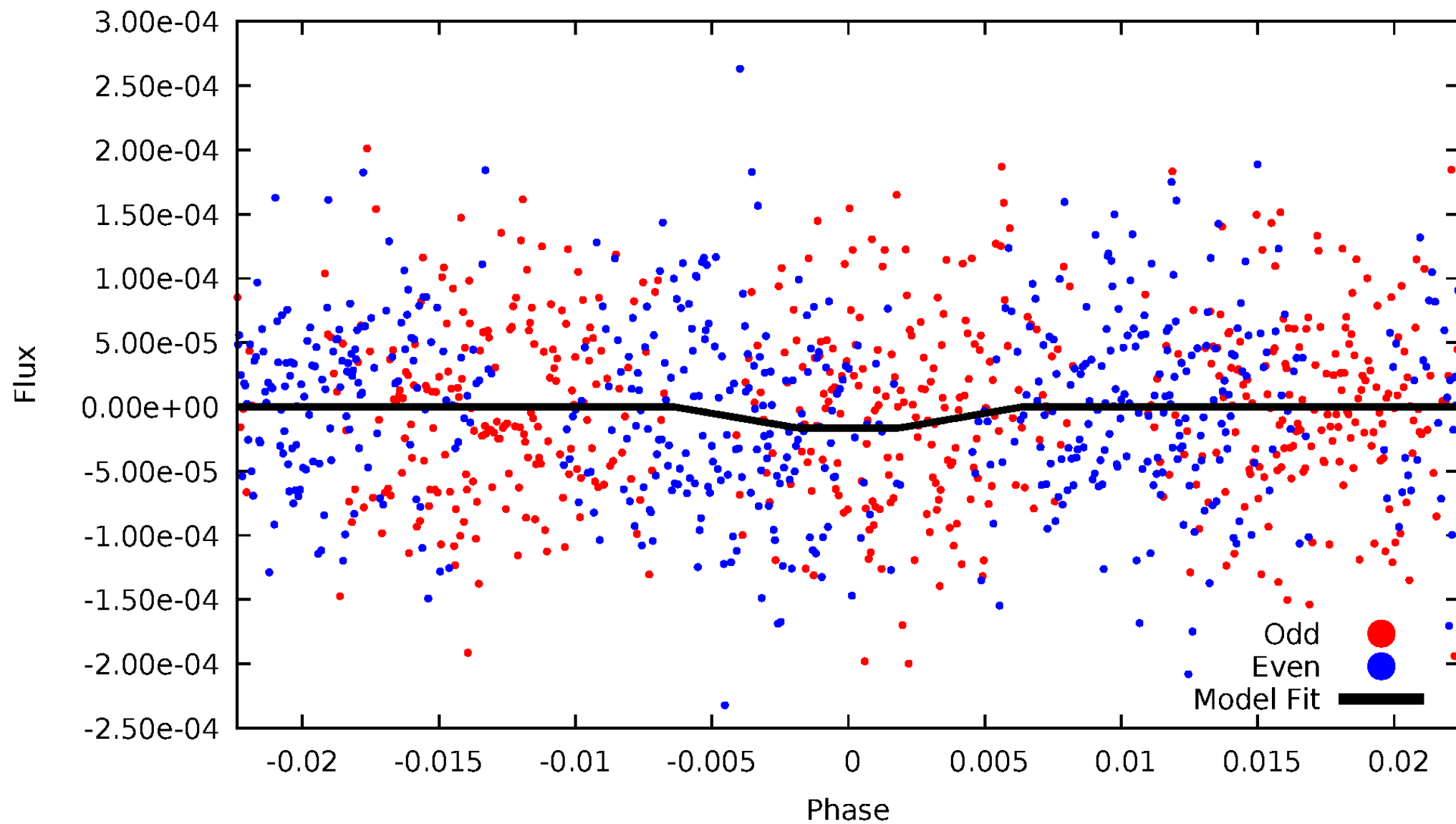
DV Odd/Even

TCE 008453851-02



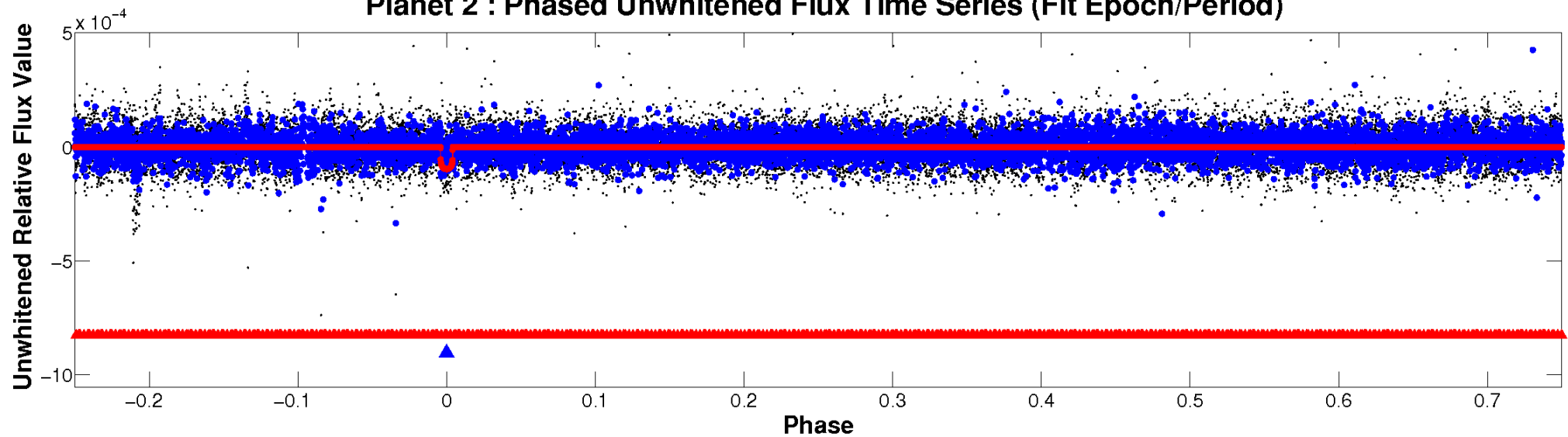
ALT Odd/Even

TCE 008453851-02

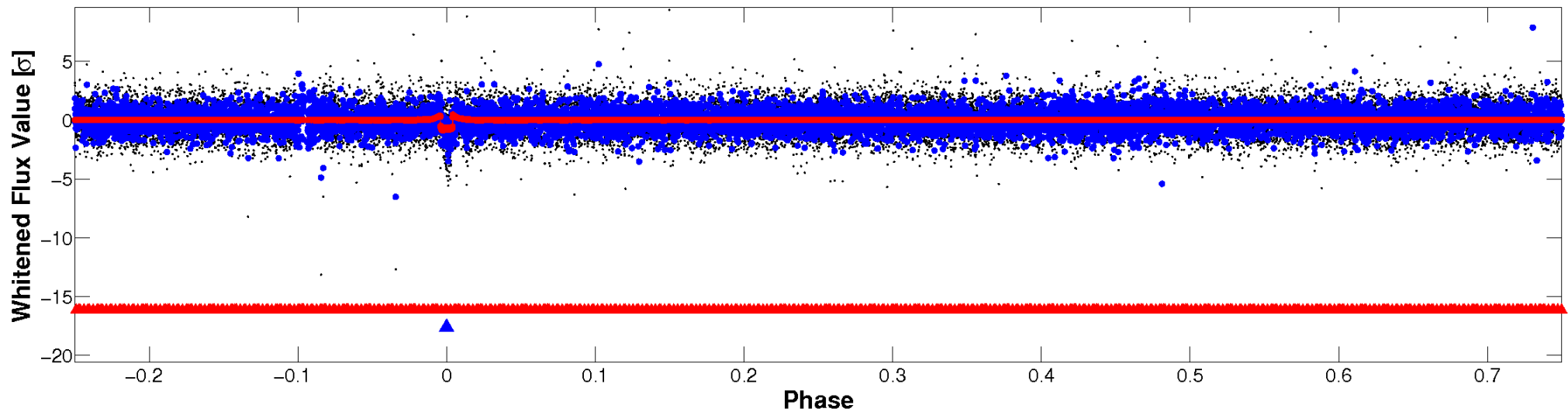


Non-Whitened Vs. Whitened Light Curve

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



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



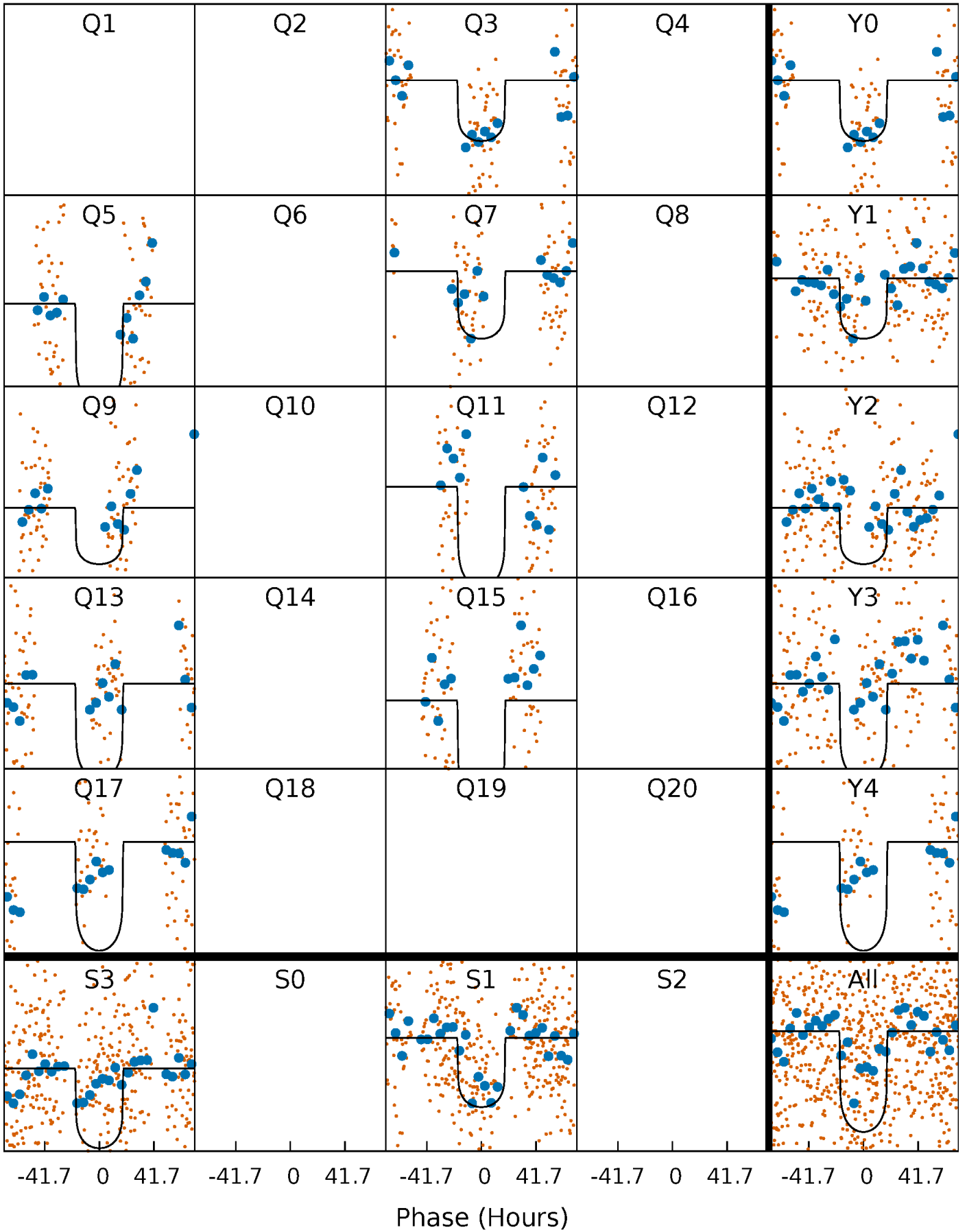
PDC Quarter-Phased Transit Curves

TCE 008453851-02 $P=185.647757$ Days $T_0=276.009550$ (BKJD)



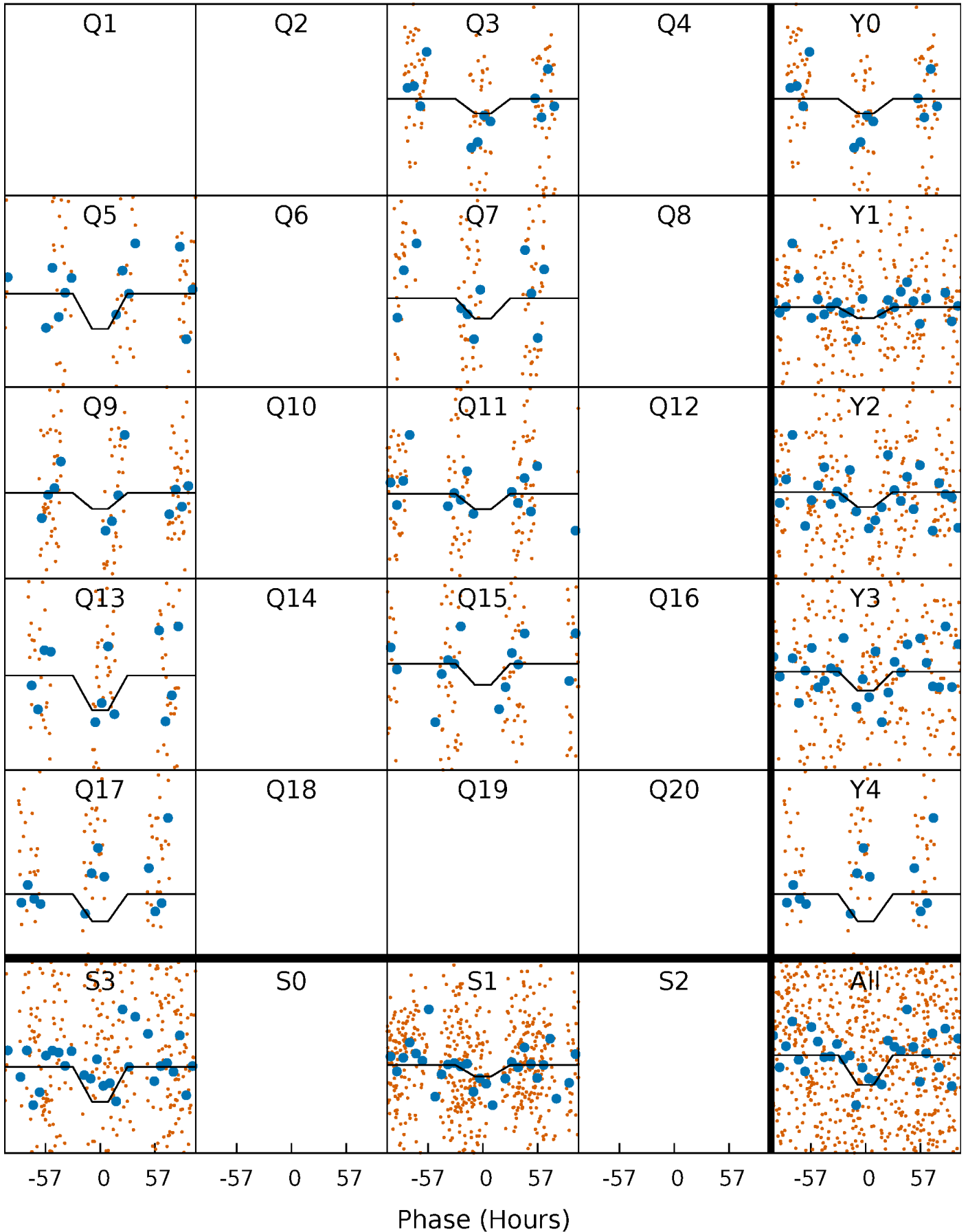
DV Quarter-Phased Transit Curves

TCE 008453851-02 $P=185.647757$ Days $T_0=276.009550$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

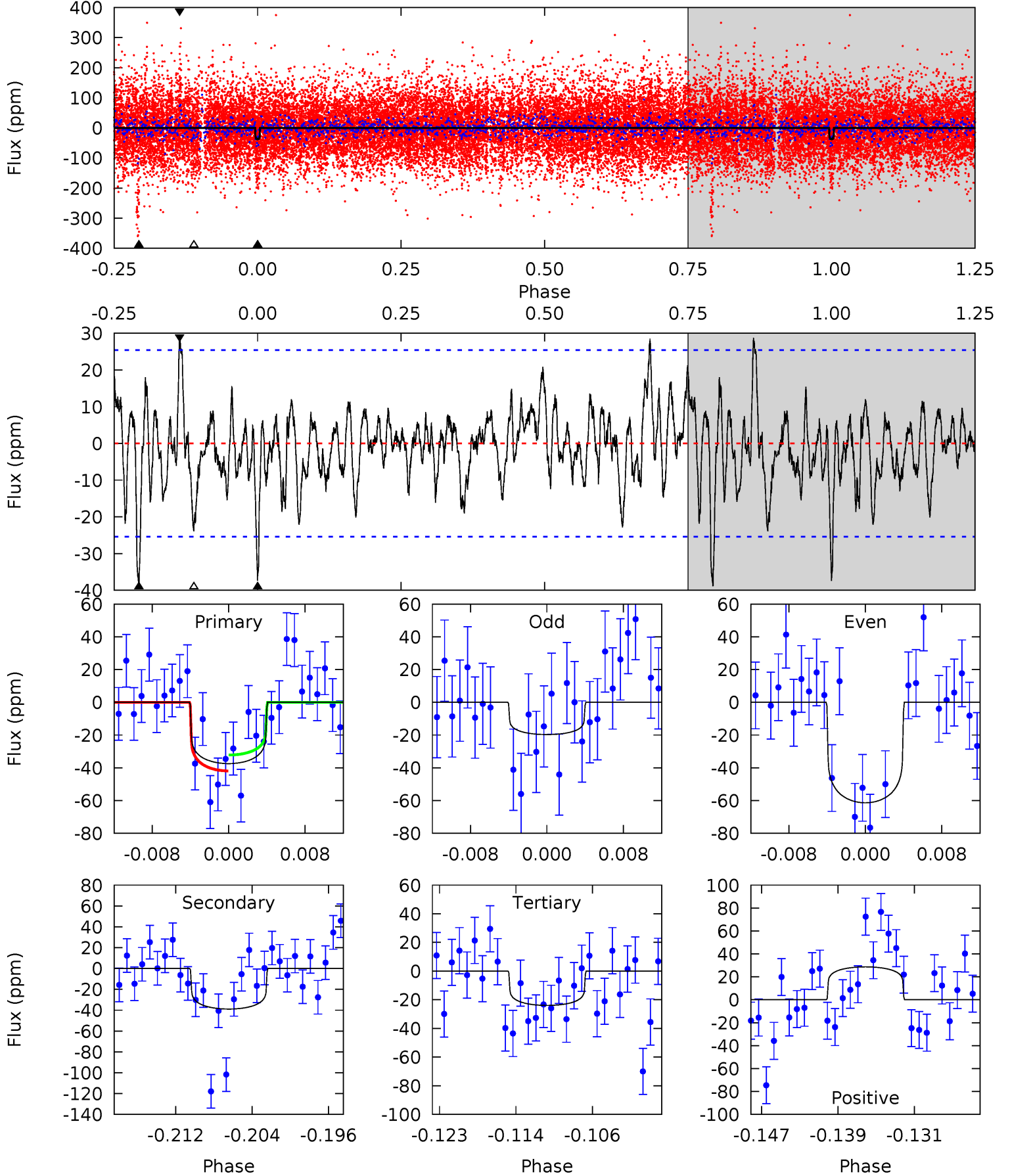
TCE 008453851-02 P=185.625270 Days $T_0=276.199975$ (BKJD)



DV Model-Shift Uniqueness Test

008453851-02, $P = 185.647757$ Days, $E = 90.361793$ Days

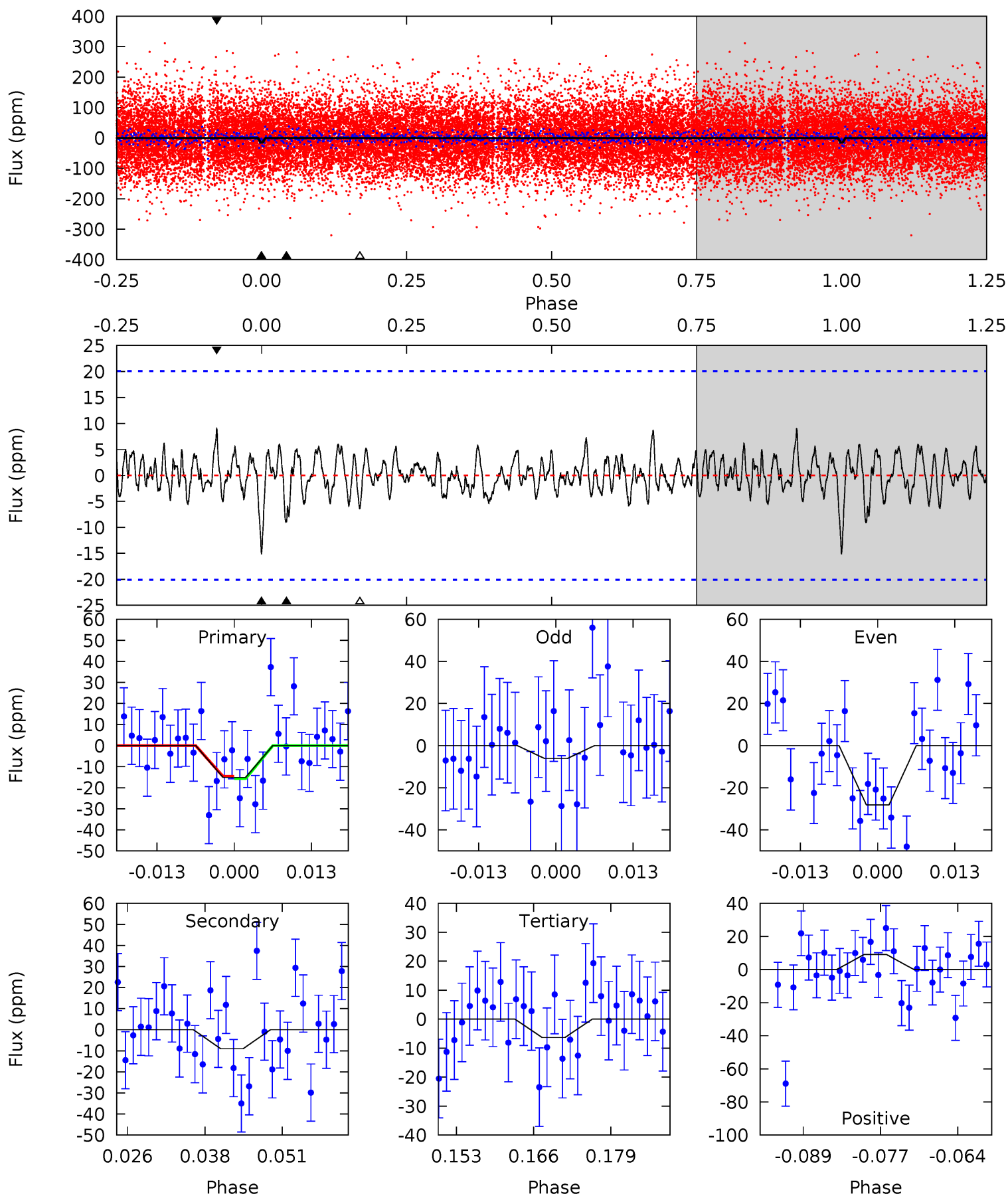
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.47	7.76	4.78	5.72	5.06	2.64	1.71	2.69	1.75	2.98	2.04	4.13	1.00	0.42	0.97



Alt Model-Shift Uniqueness Test

008453851-02, P = 185.625270 Days, E = 90.574705 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.74	2.23	1.57	2.24	4.98	2.49	0.68	2.17	1.50	0.65	-0.01	2.74	1.00	0.37	0.13



Stellar Parameters For KIC 008453851

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7523^{+209}_{-314}	$3.986^{+0.222}_{-0.148}$	$-0.060^{+0.200}_{-0.350}$	$2.206^{+0.525}_{-0.642}$	$1.719^{+0.185}_{-0.317}$	$0.226^{+0.292}_{-0.096}$
	+3%/-4%	+6%/-4%	+333%/-583%	+24%/-29%	+11%/-18%	+129%/-43%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008453851-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-39 ± 5	$2.20^{+0.58}_{-0.54}$	780^{+55}_{-63}	6000^{+778}_{-559}	2522^{+1844}_{-946}
Alt.	-9 ± 4	$0.93^{+0.47}_{-0.46}$	780^{+58}_{-62}	6351^{+3093}_{-1335}	3182^{+8741}_{-2083}

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

DV Centroid Data

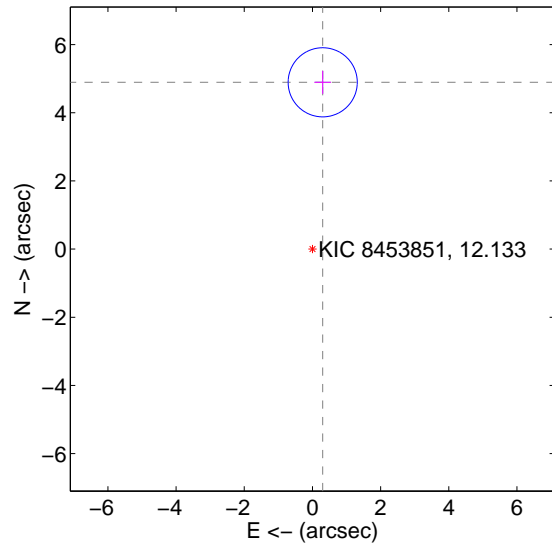
Supplemental centroid analysis for 008453851-02. Kepler magnitude: 12.13. Transit SNR 11.95

There are 1 quarters with good PRF difference image offsets

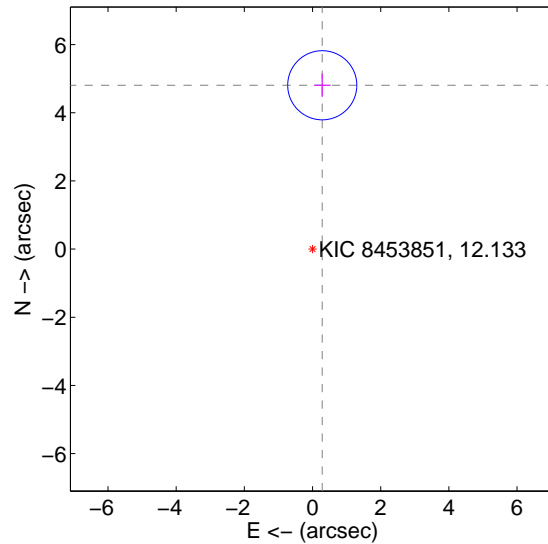
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.904 ± 0.338	14.51	-0.301 ± 0.245	4.895 ± 0.338
PRF-fit source offset from KIC position	4.816 ± 0.338	14.25	-0.286 ± 0.245	4.808 ± 0.338
photometric centroid source offset	0.35 ± 0.70	0.50	-0.34 ± 0.70	-0.08 ± 0.70

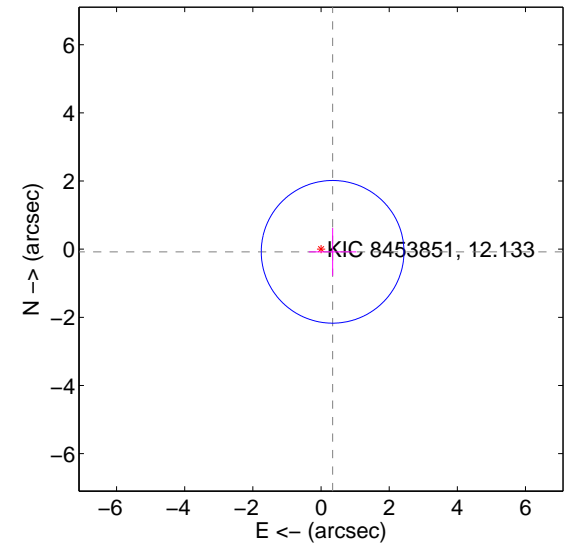
offset from difference PRF-fit to OOT PRF-fit



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- σ uncertainty. Blue circle: three- σ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

Q1 no difference image



Q1 no OOT image



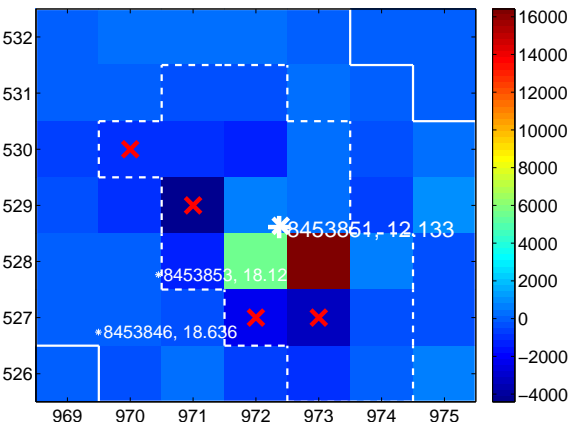
Q2 no difference image



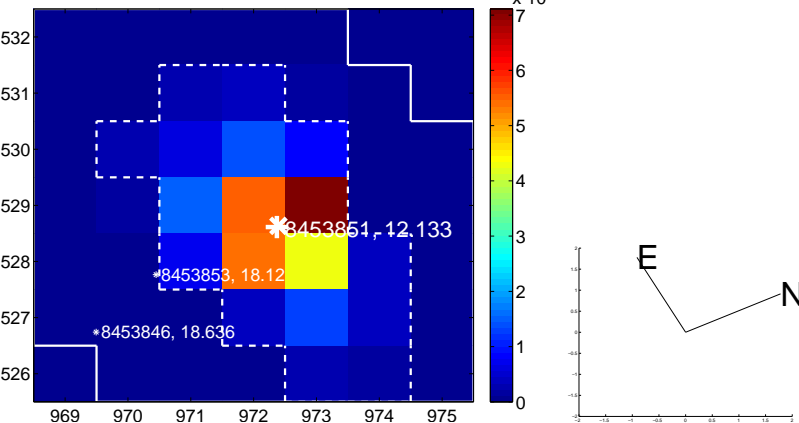
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



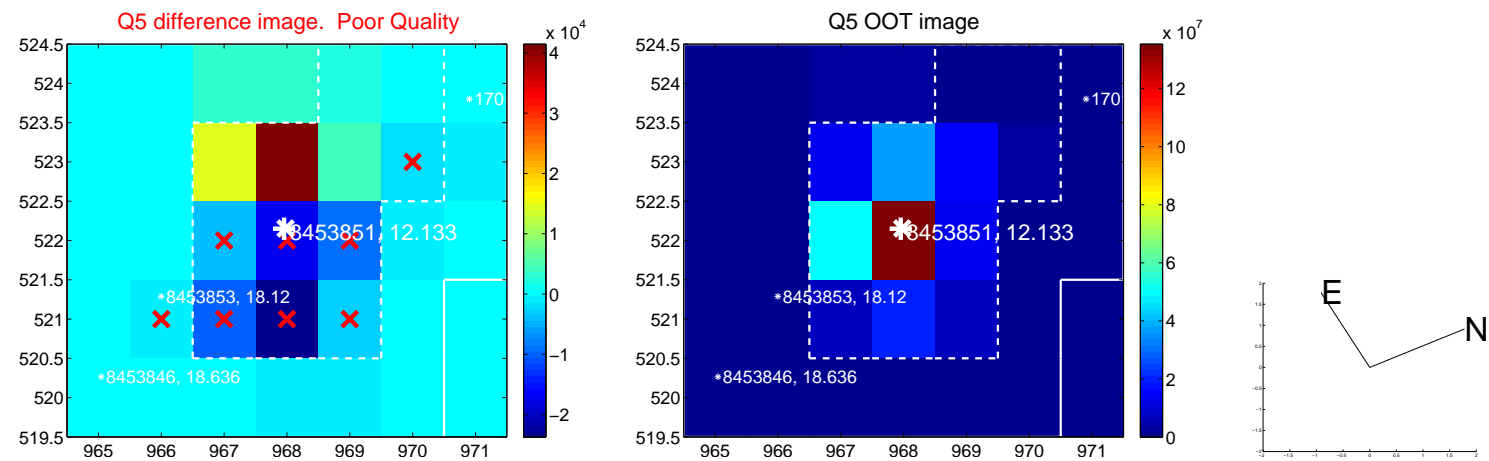
Q4 no difference image



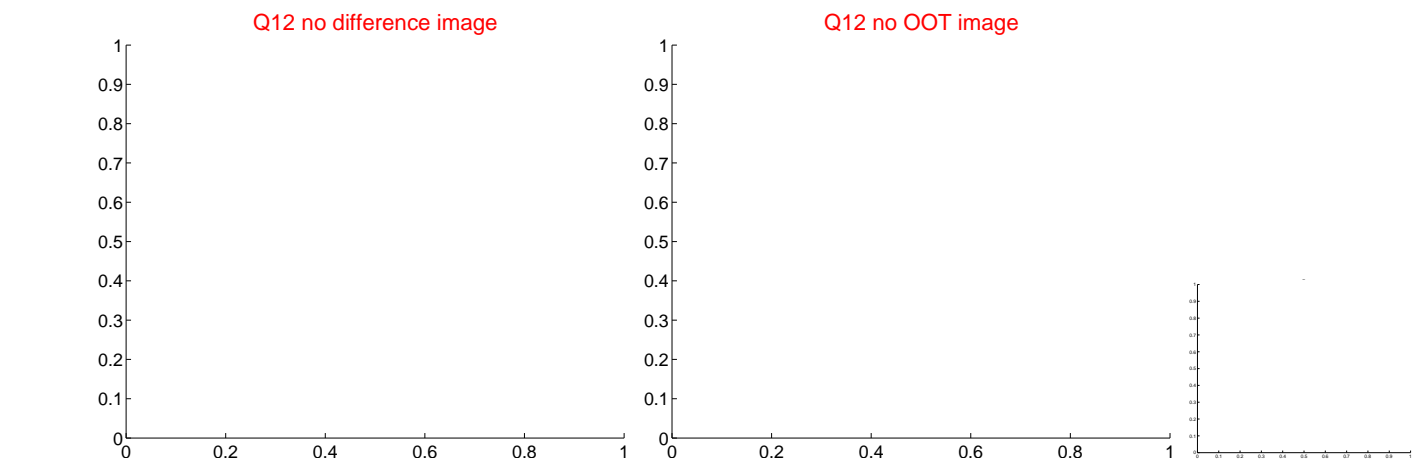
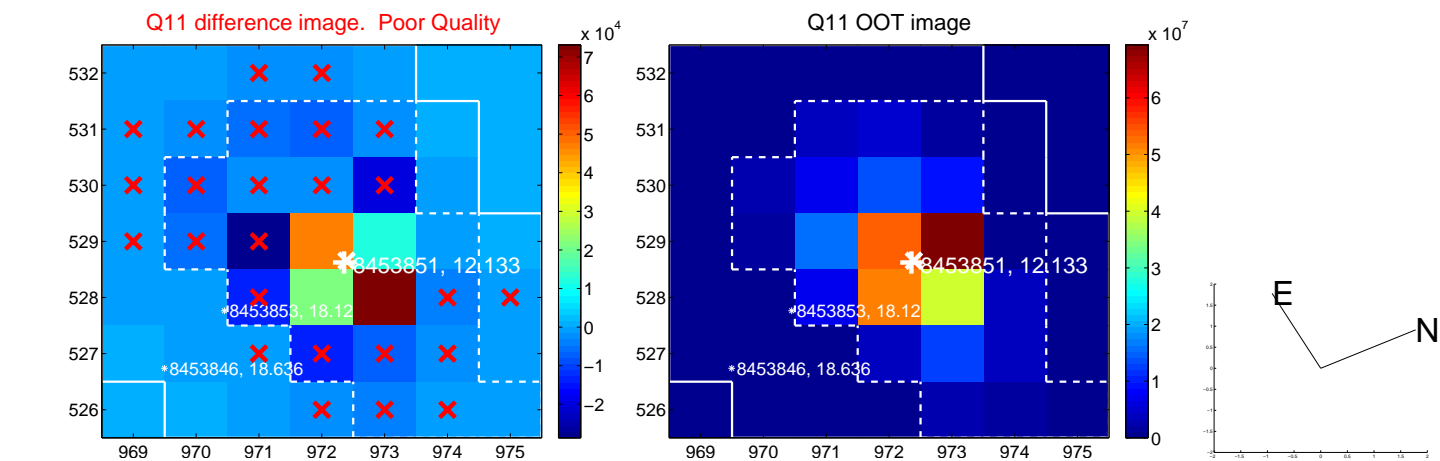
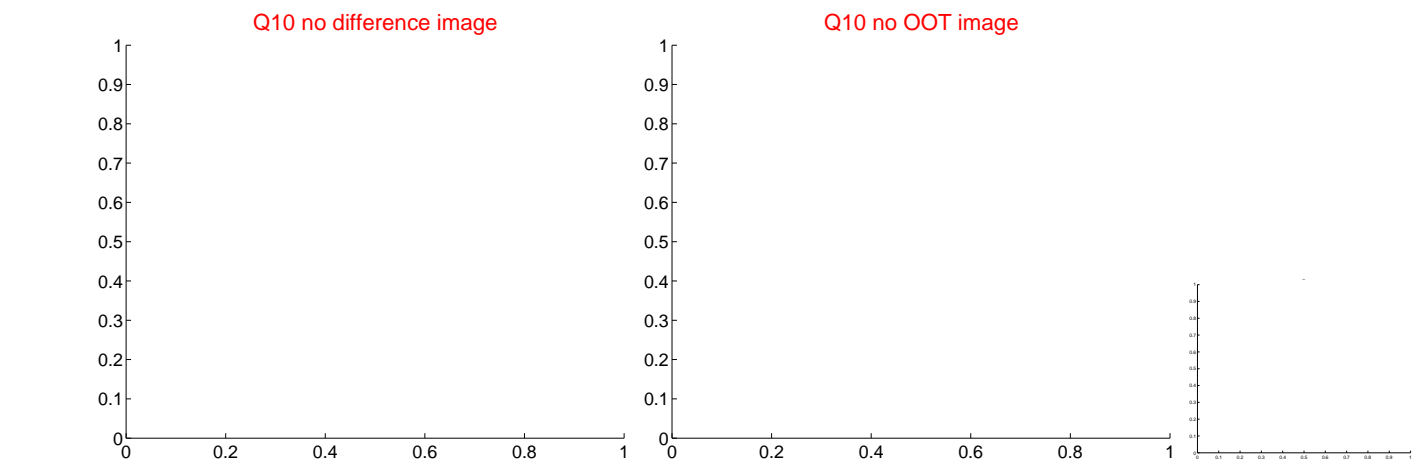
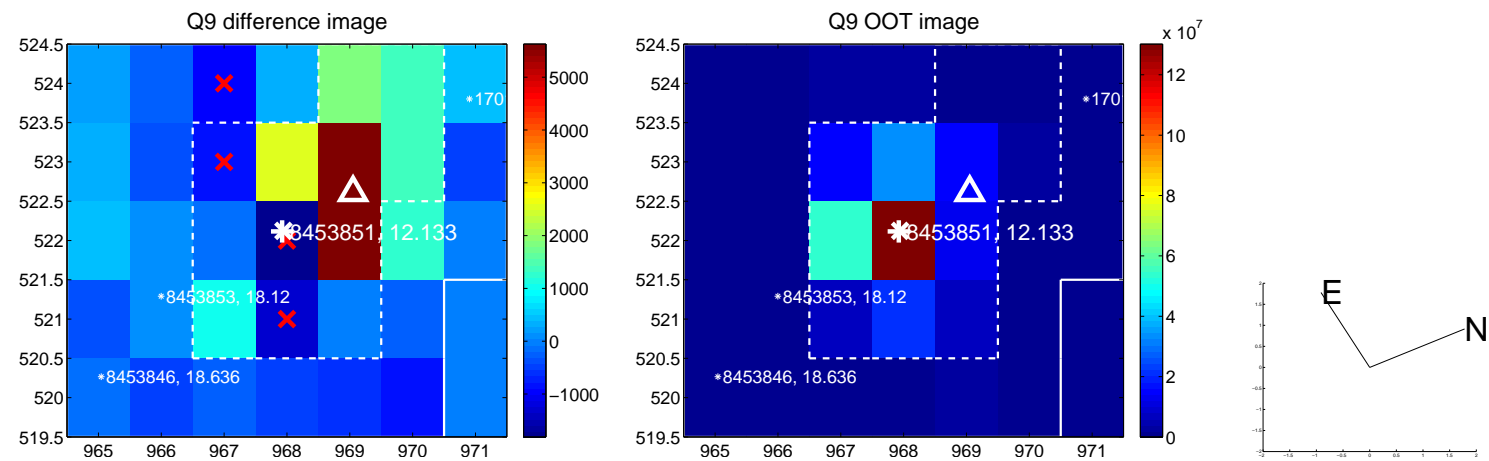
Q4 no OOT image



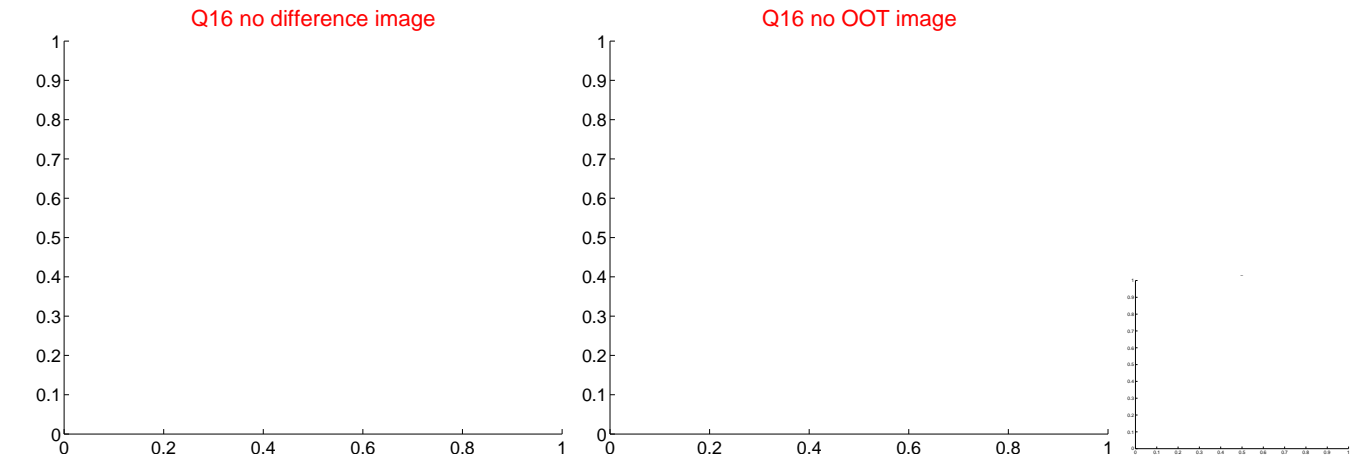
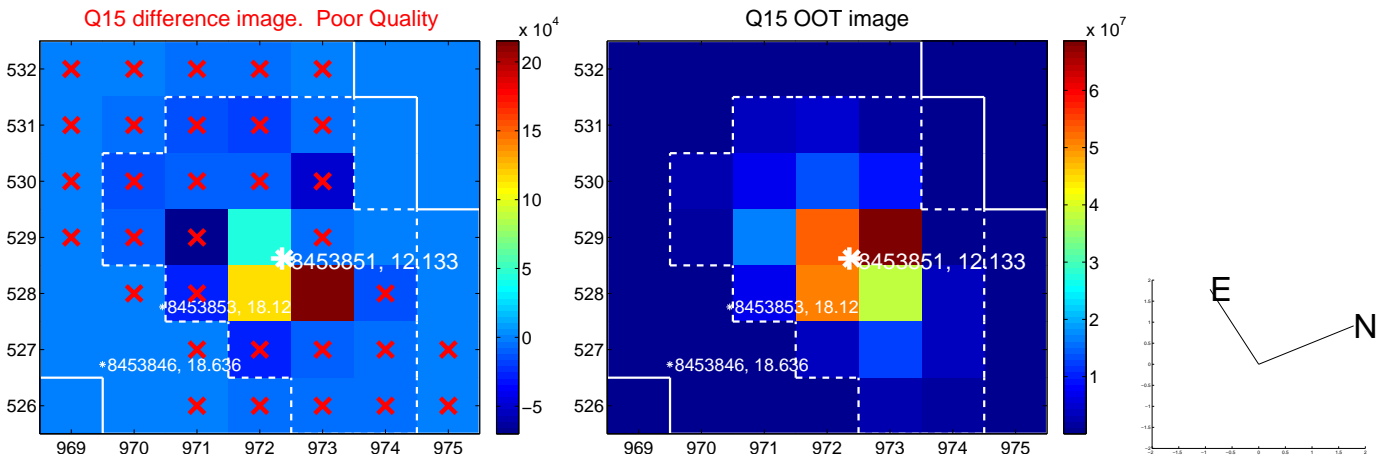
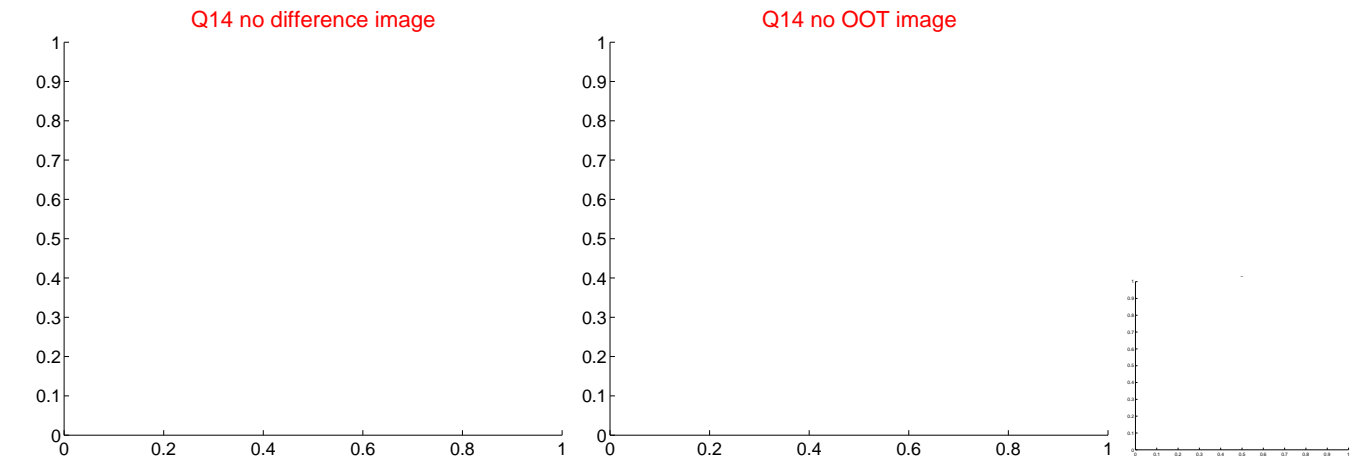
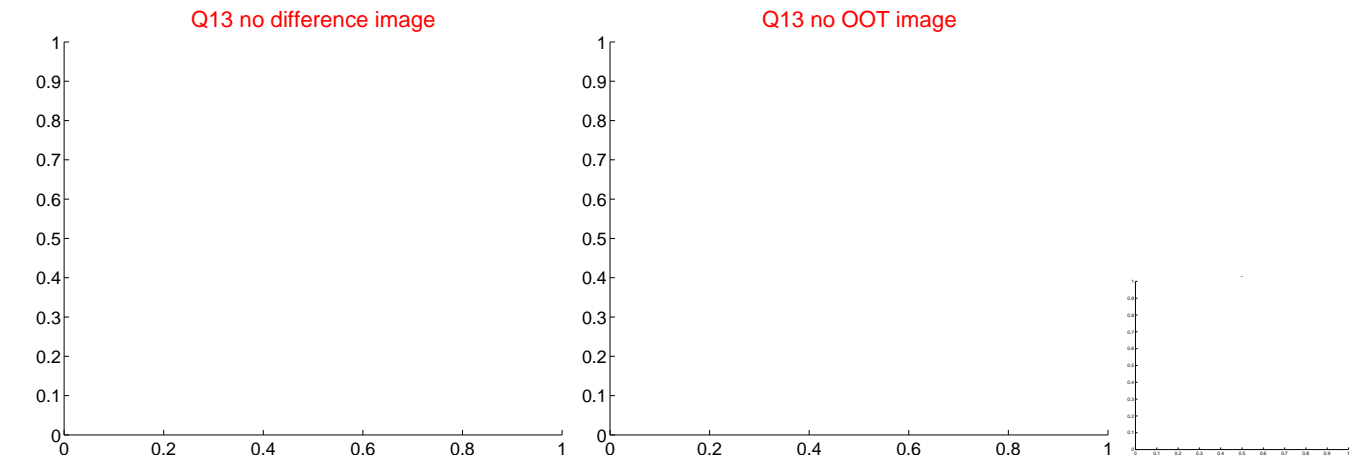
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



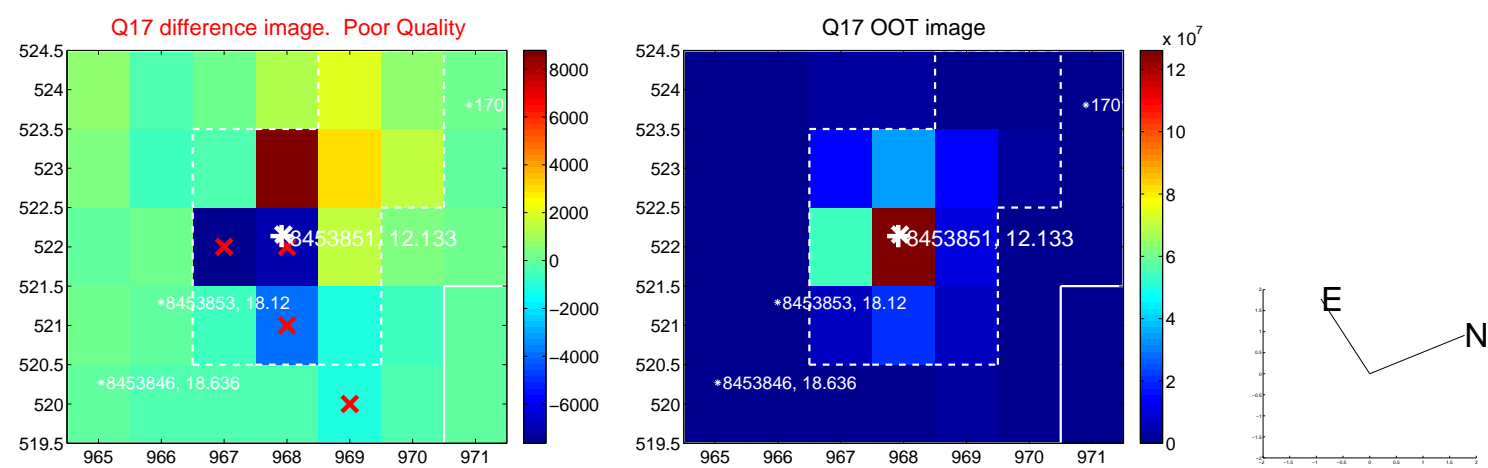
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



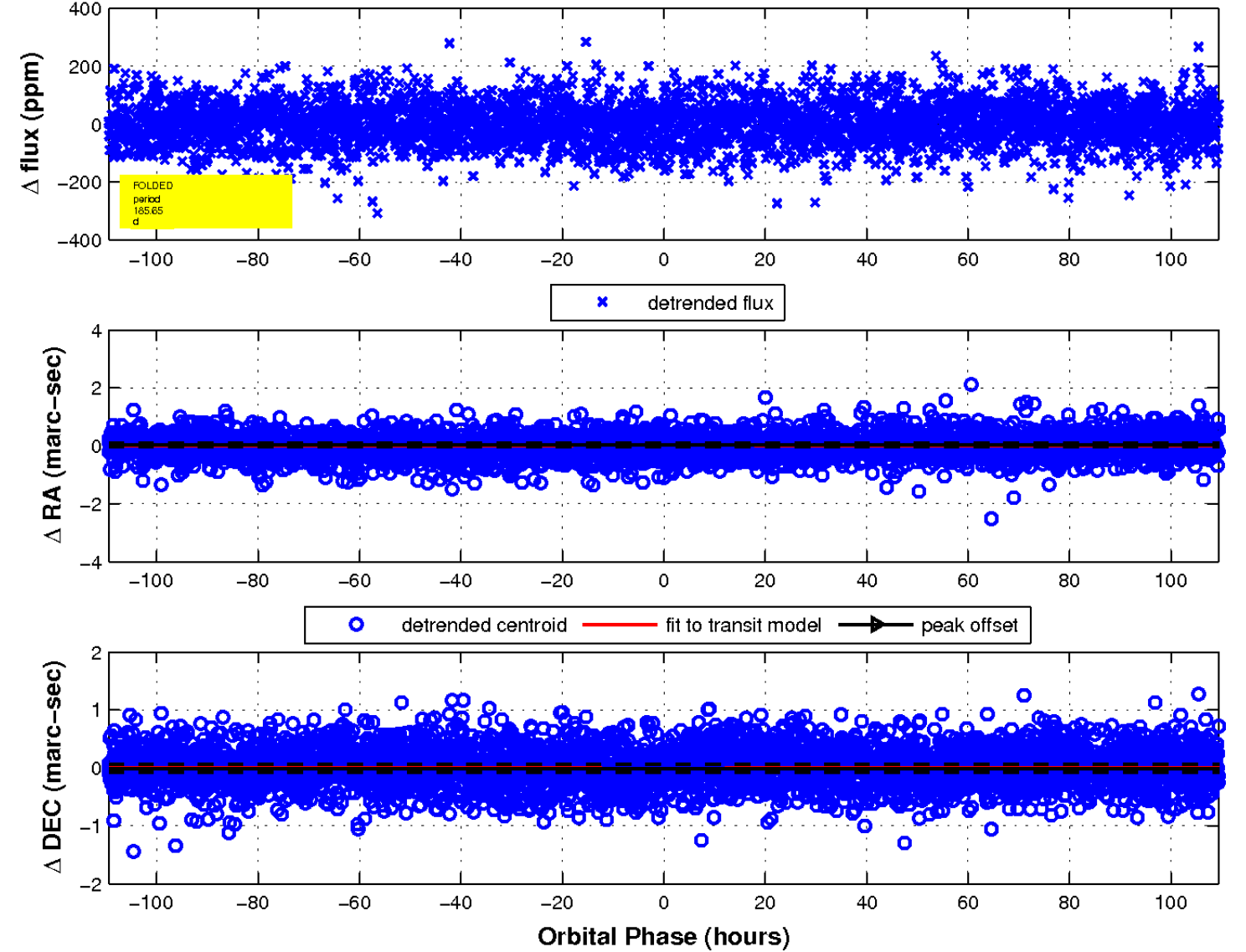
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

