

KIC 008559589

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})
008559589-01	OBS	3697.01	223.112119	140.949074	11396.9	8.988	276.0	248.5	1.06	6211	19.91	2.88
008559589-02	OBS	No	223.113117	229.263868	8682.2	11.834	278.7	254.9	1.06	6211	17.51	2.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008559589-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
008559589-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

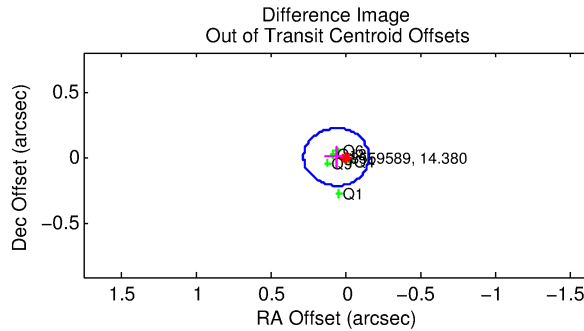
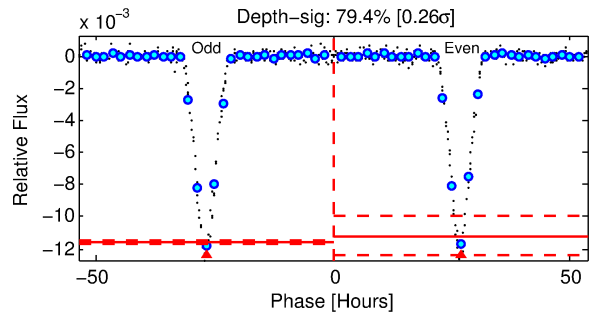
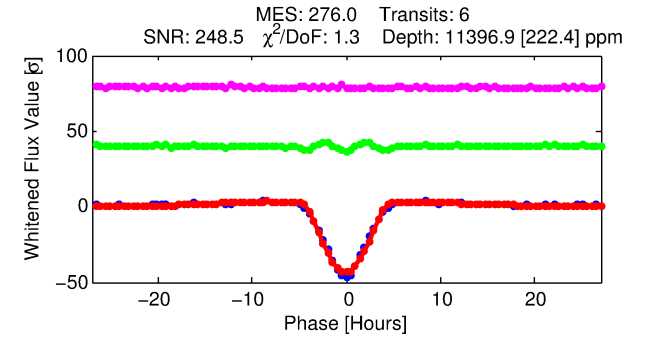
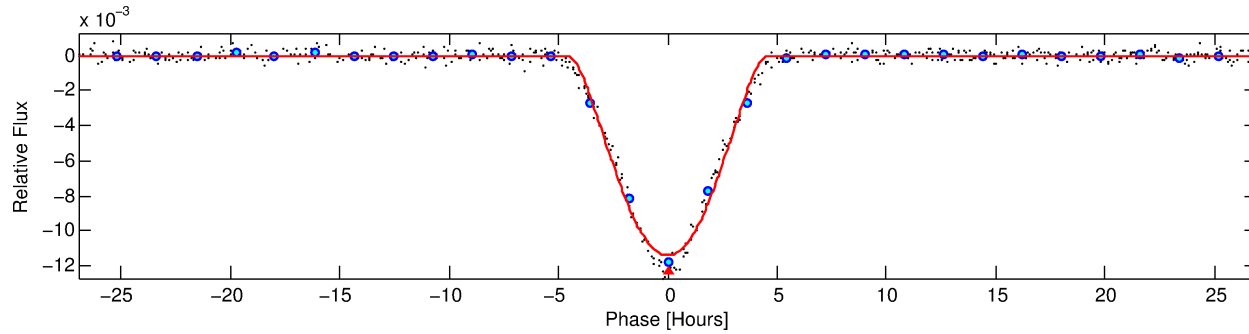
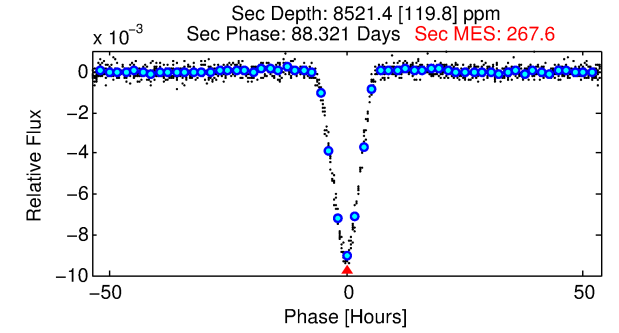
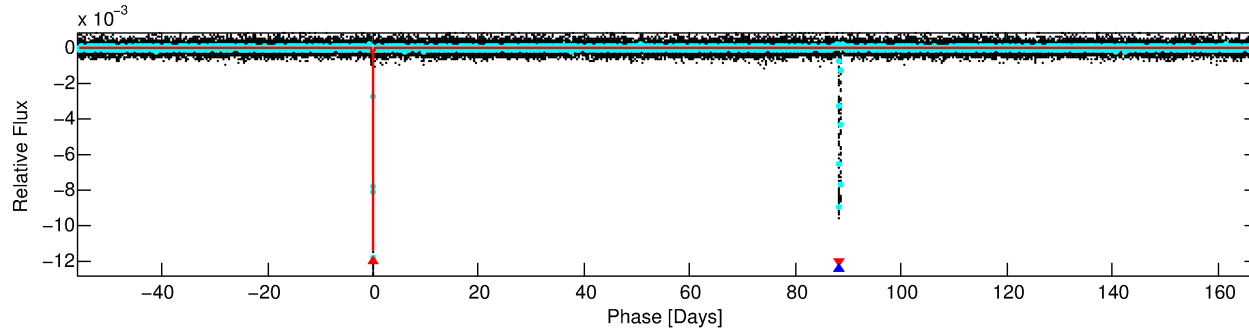
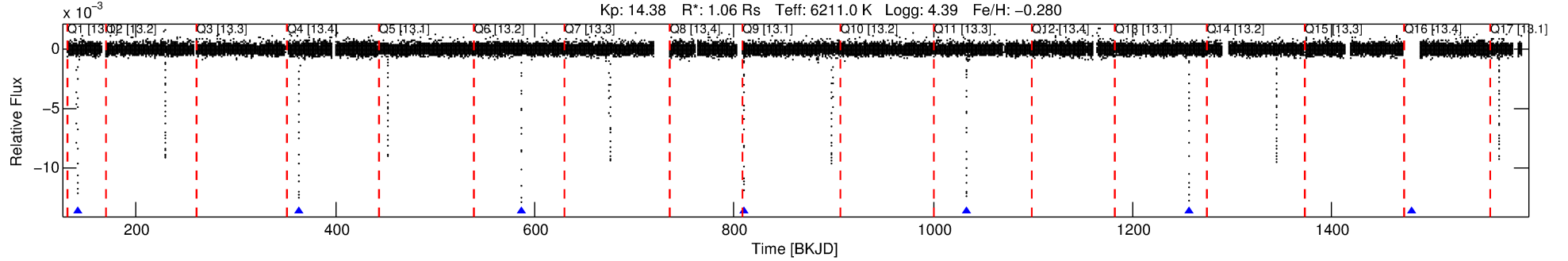
Ephemeris Match Information For 008559589-01

No Significant Match Found

DV One-Page Summary

KIC: 8559589 Candidate: 1 of 2 Period: 223.112 d
KOI: K03697.01 Corr: 0.997

Kp: 14.38 R*: 1.06 Rs Teff: 6211.0 K Logg: 4.39 Fe/H: -0.280



DV Fit Results:

Period = 223.11212 [0.00027] d
Epoch = 140.9491 [0.0008] BKJD
Rp/R* = 0.1728 [0.0420]
a/R* = 116.30 [4.03]
b = 1.00 [0.06]
Seff = 2.87 [1.10]
Teq = 332 [32] K
Rp = 19.91 [7.66] Re
a = 0.7192 [0.1790] AU
Ag = 6116.95 [3701.99] [1.65 sigma]
Teffp = 4540 [573] K [7.33 sigma]

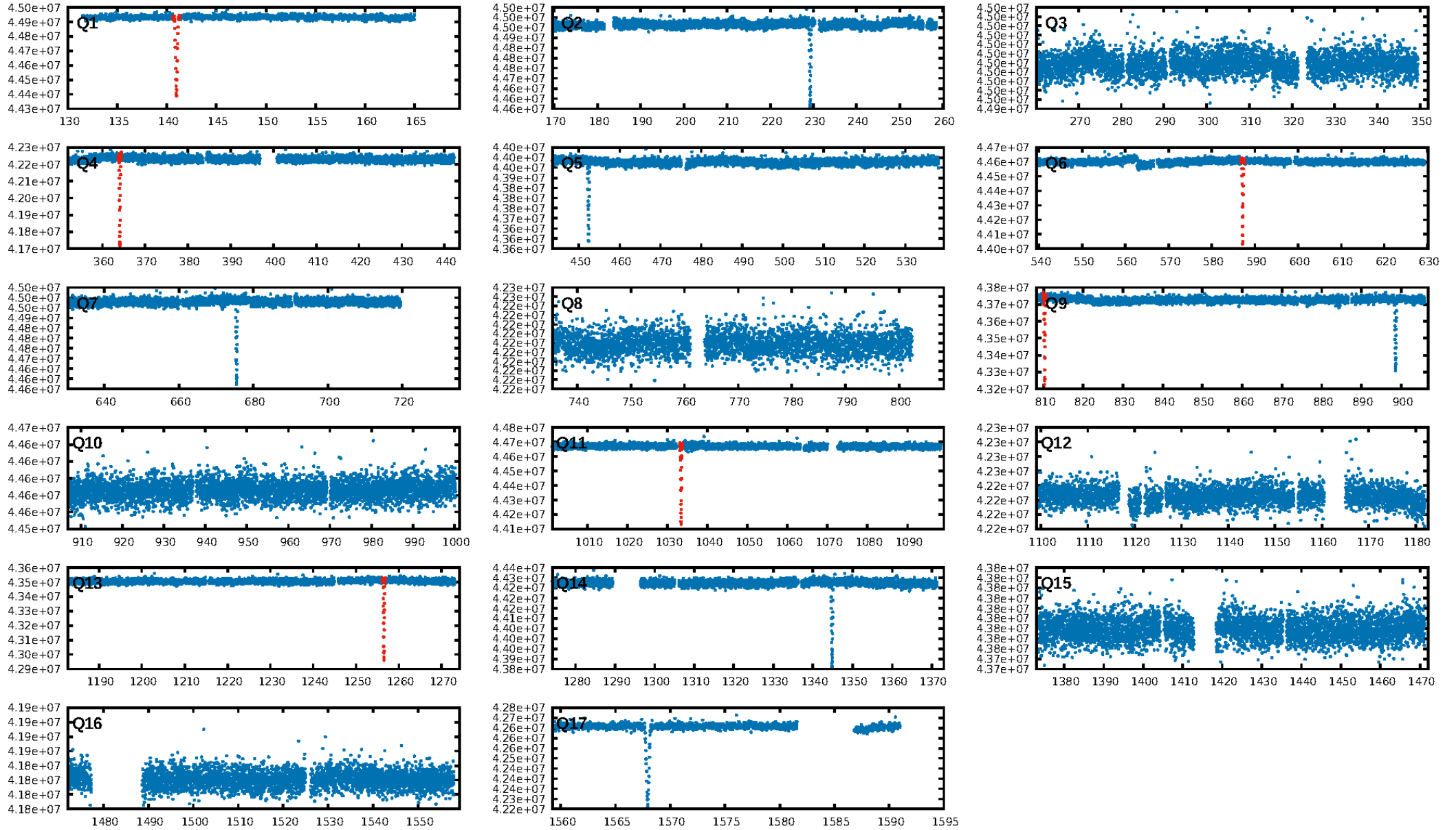
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.1% [0.00 sigma]
ModelChiSquare2-sig: 0.7%
ModelChiSquareGof-sig: 3.3%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 2.756
Centroid-sig: 5.2%
Centroid-so: 0.362 arcsec [9.22 sigma]
OotOffset-rm: 0.060 arcsec [0.82 sigma]
KicOffset-rm: 0.191 arcsec [2.20 sigma]
OotOffset-st: 1/0/1/3 [5]
KicOffset-st: 1/0/1/3 [5]
DiffImageQuality-fgm: 1.00 [5/5]
DiffImageOverlap-fno: 1.00 [5/5]

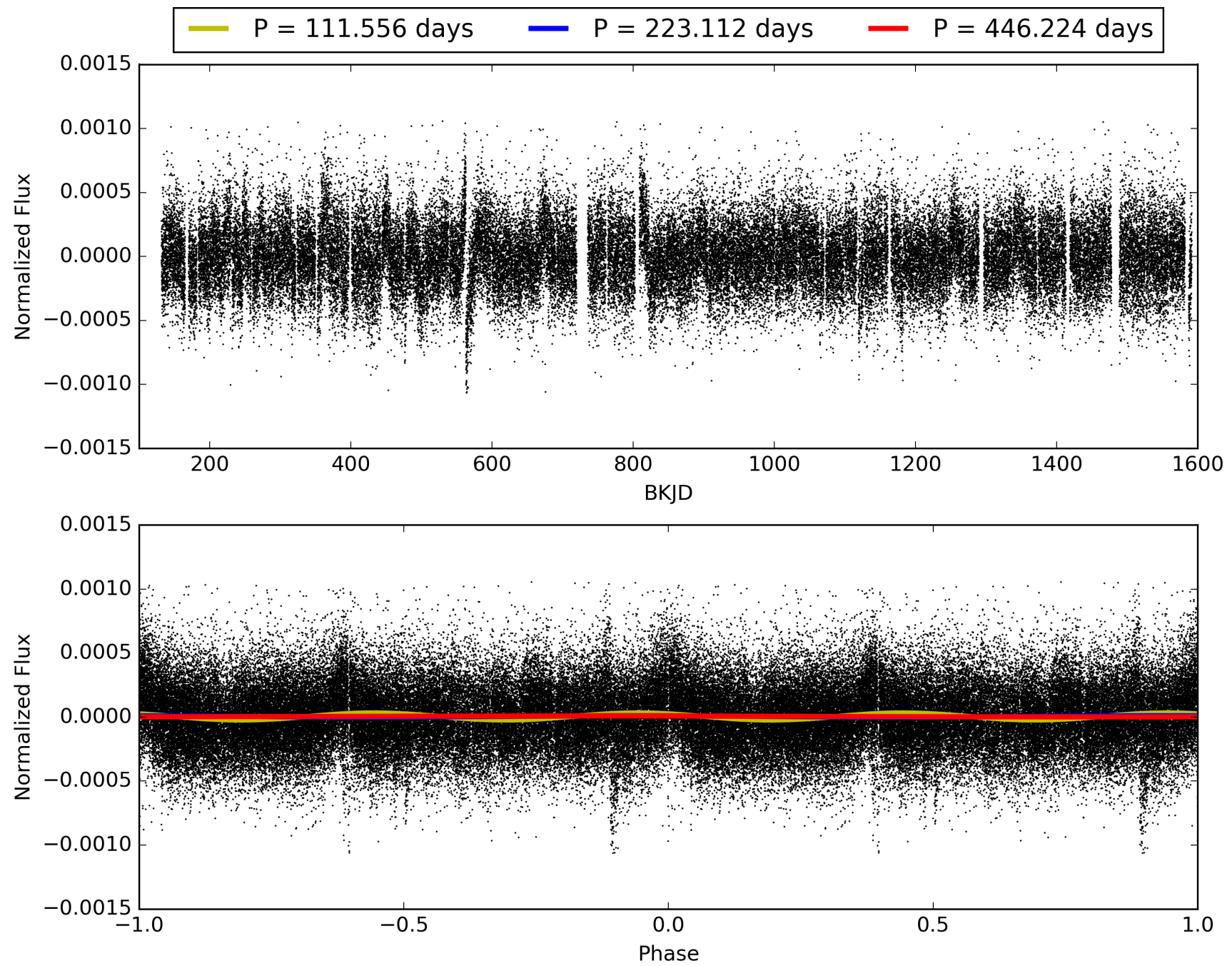
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:49:36 Z

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

TCE 008559589-01, PDC Light Curves

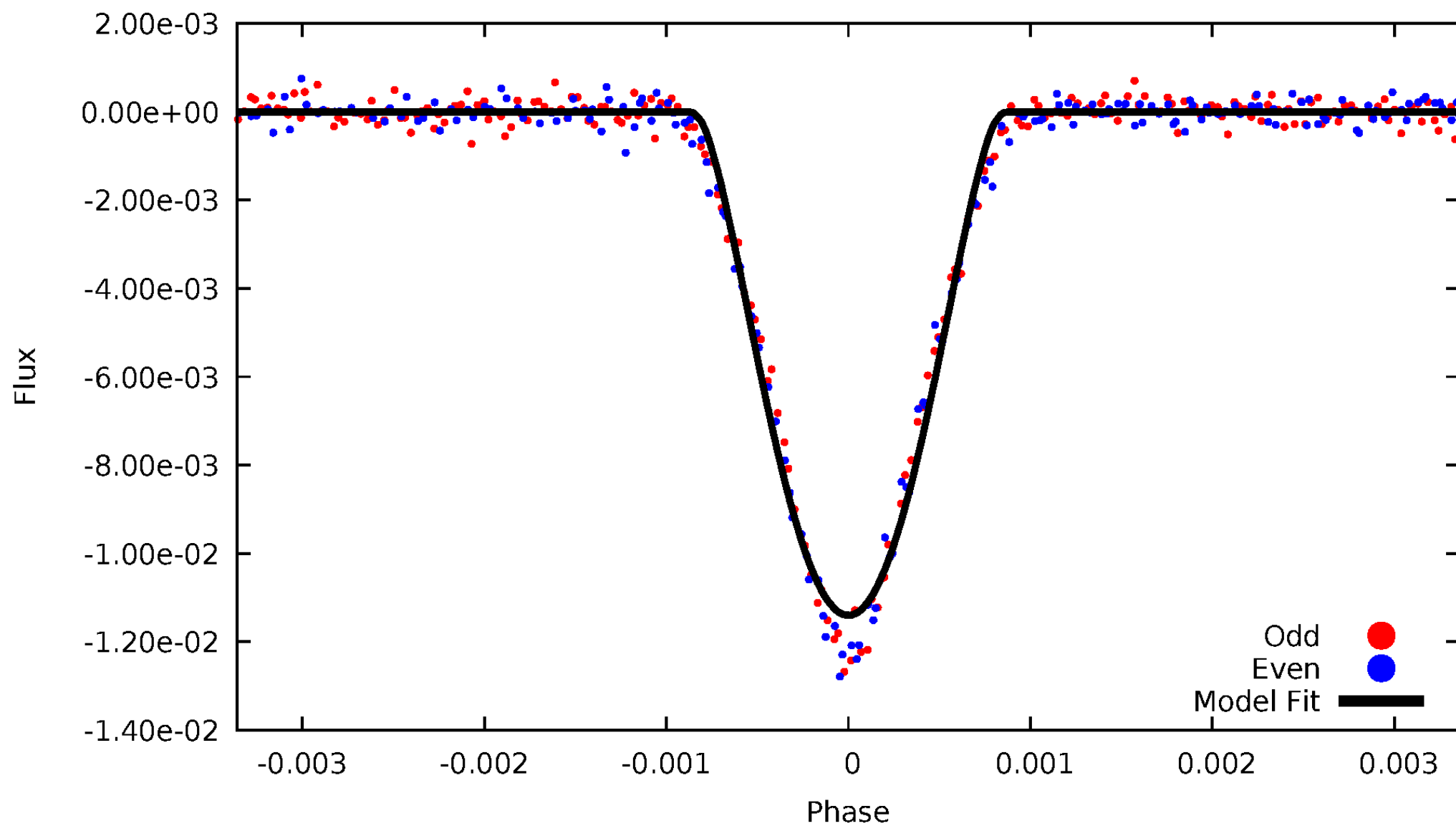


TCE 008559589-01



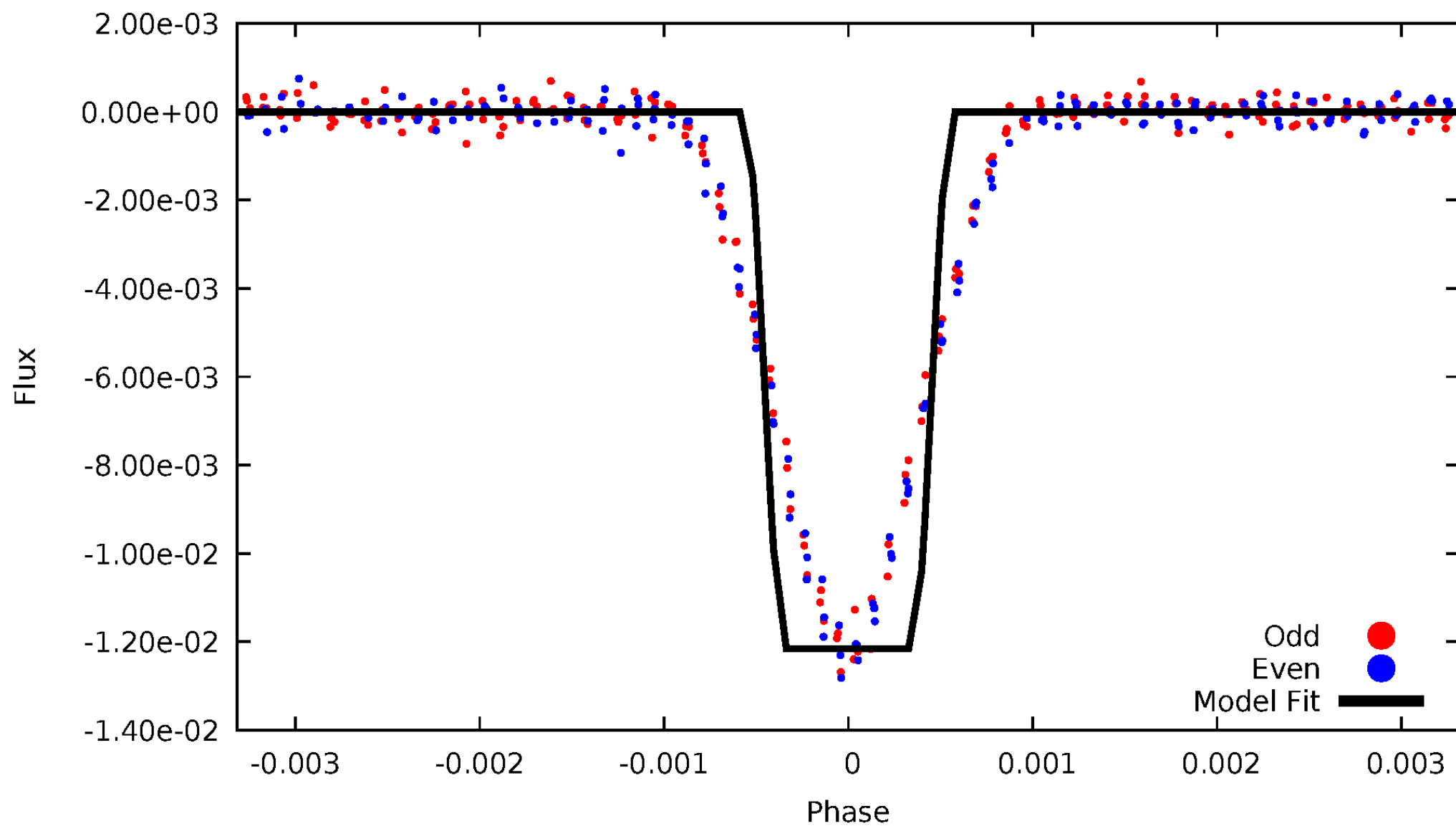
DV Odd/Even

TCE 008559589-01

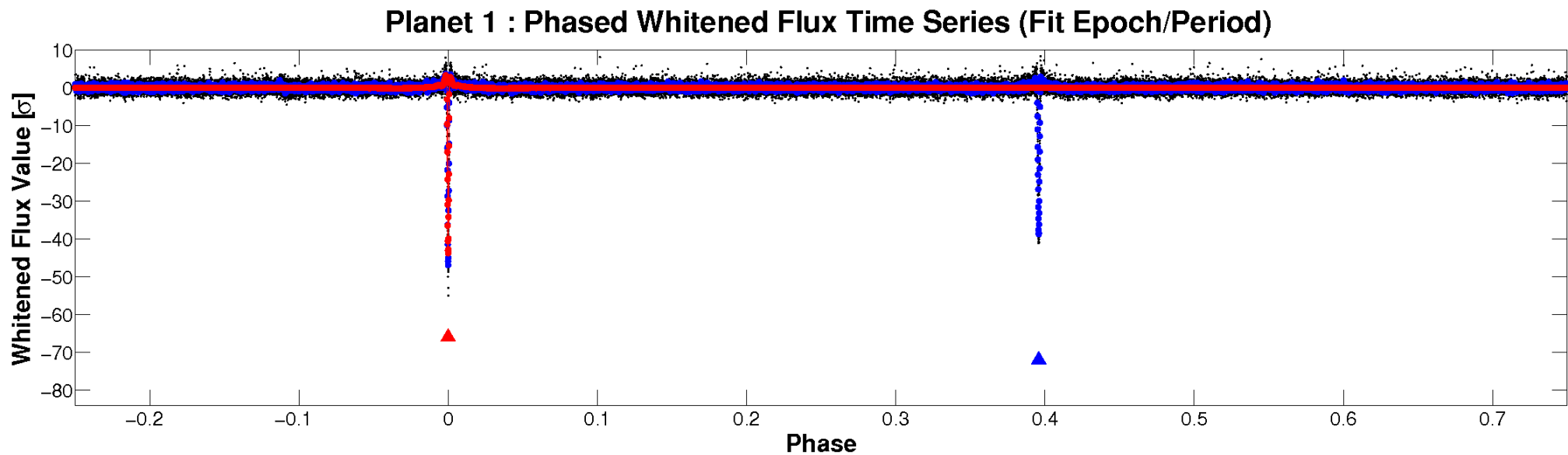
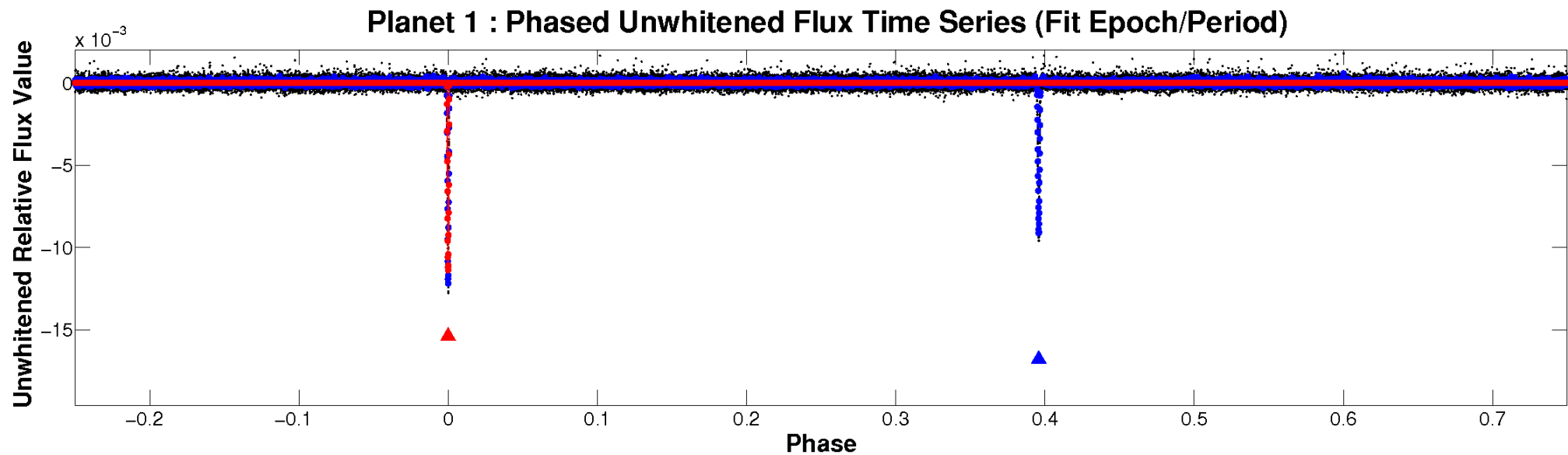


ALT Odd/Even

TCE 008559589-01

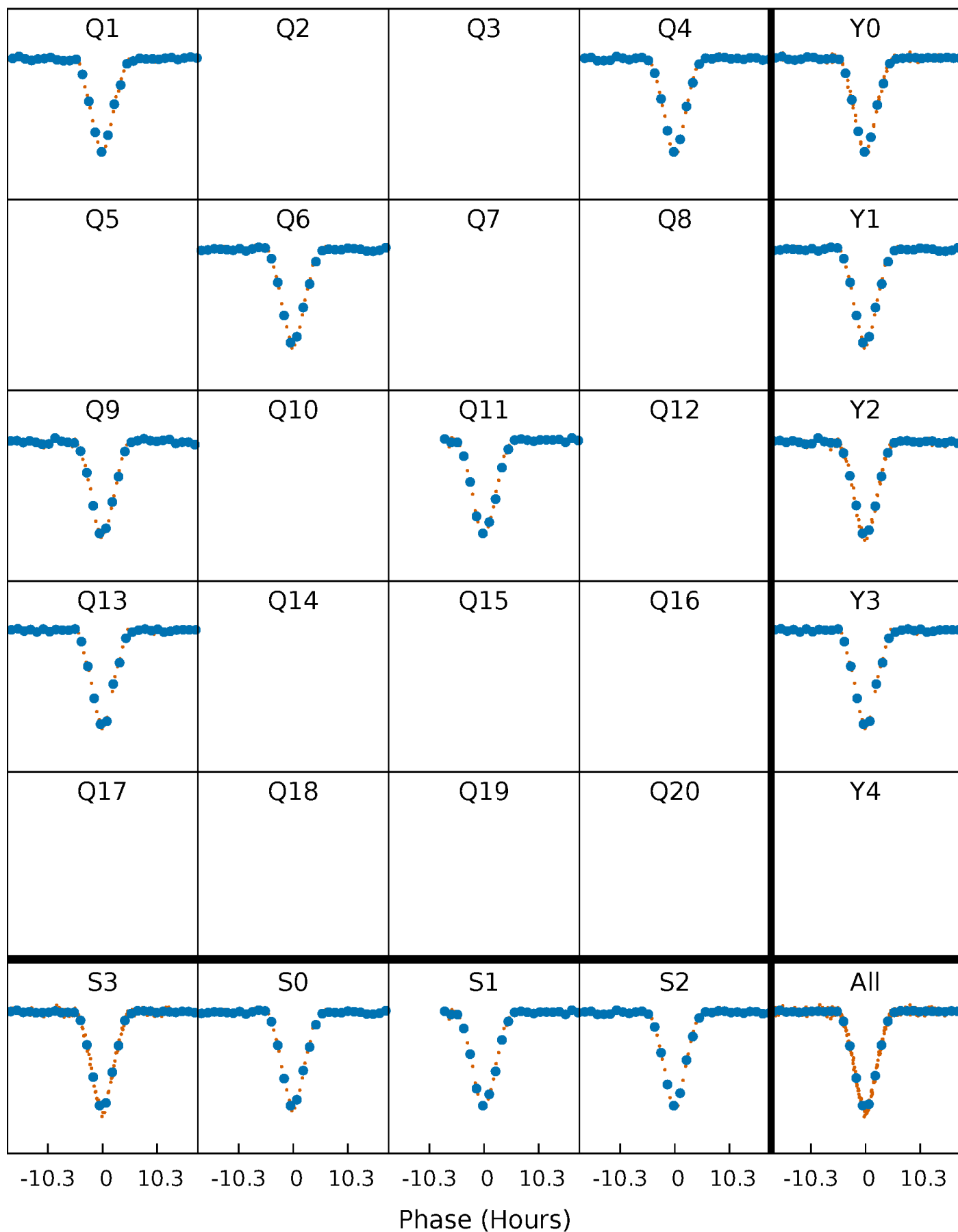


Non-Whitened Vs. Whitened Light Curve



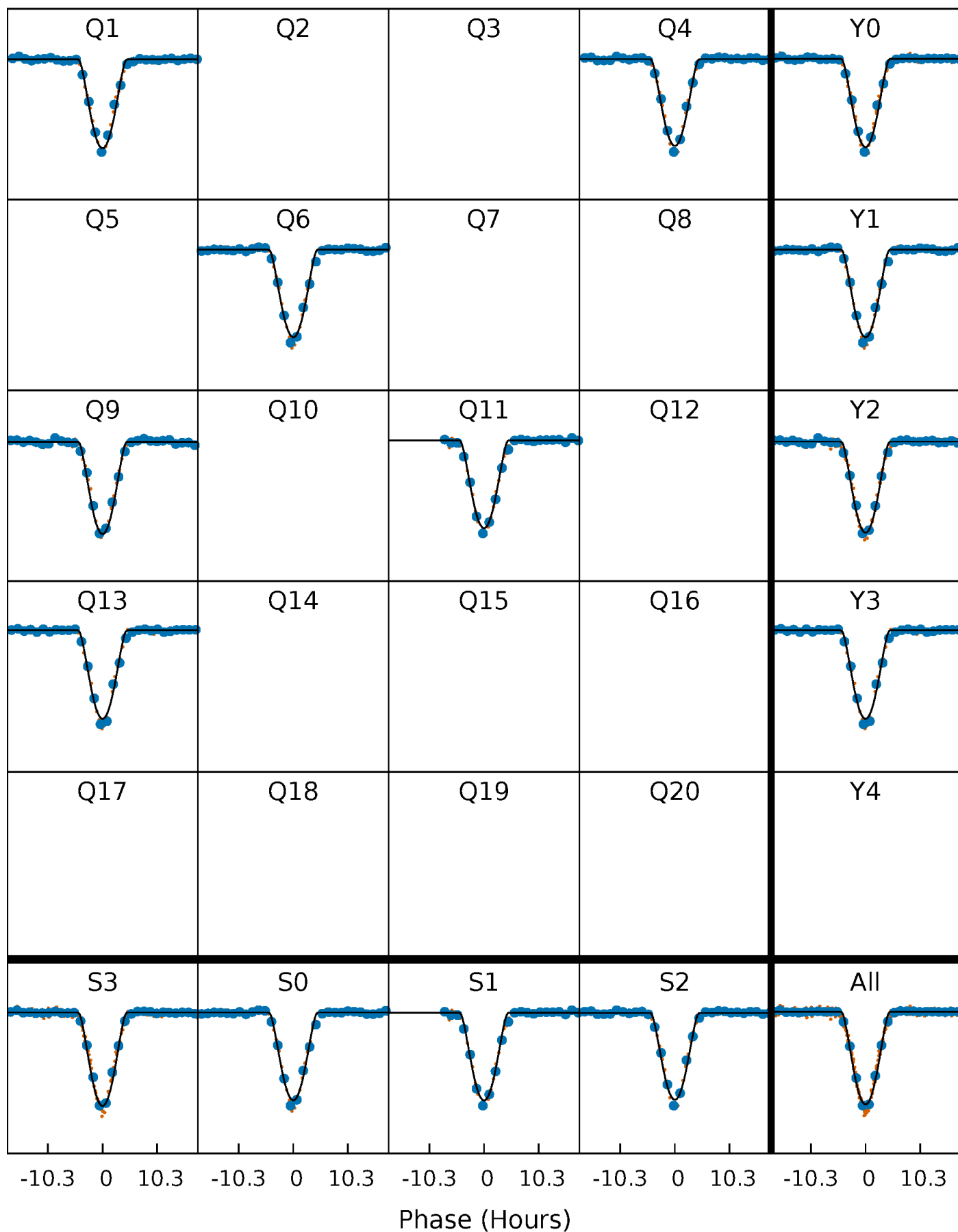
PDC Quarter-Phased Transit Curves

TCE 008559589-01 P=223.112119 Days $T_0=140.949073$ (BKJD)



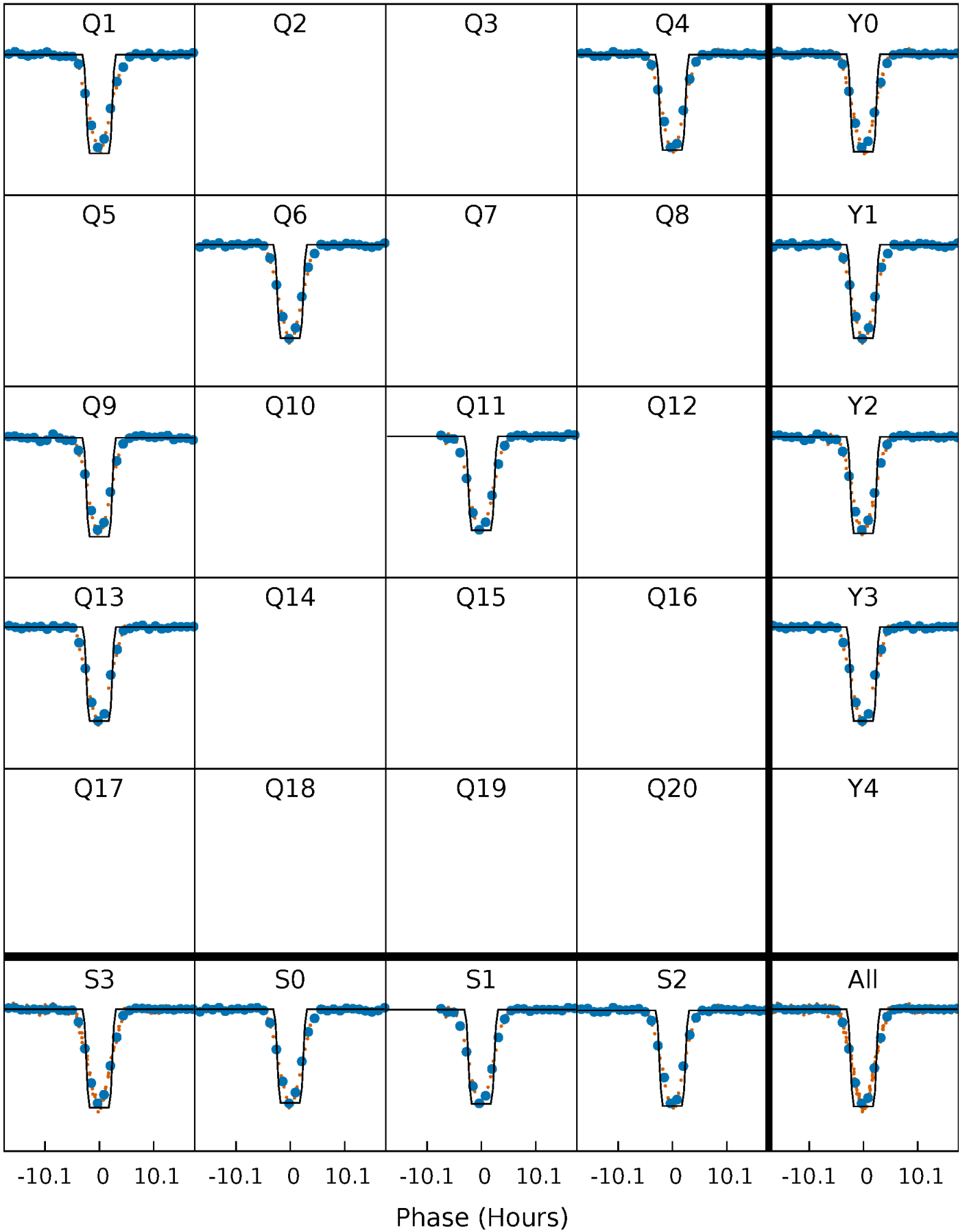
DV Quarter-Phased Transit Curves

TCE 008559589-01 P=223.112119 Days $T_0=140.949073$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

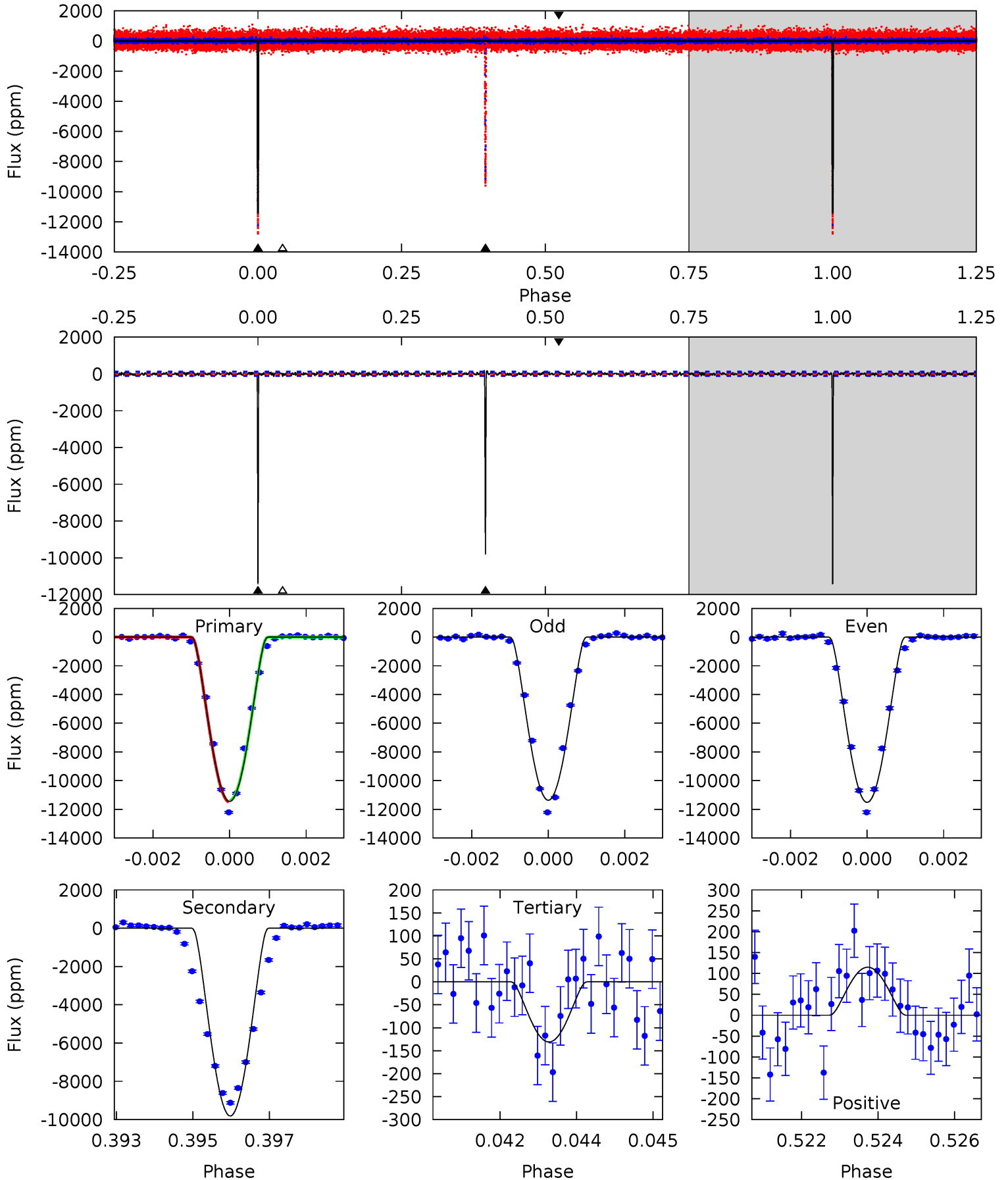
TCE 008559589-01 P=223.114042 Days $T_0=140.943731$ (BKJD)



DV Model-Shift Uniqueness Test

008559589-01, P = 223.112119 Days, E = 140.949073 Days

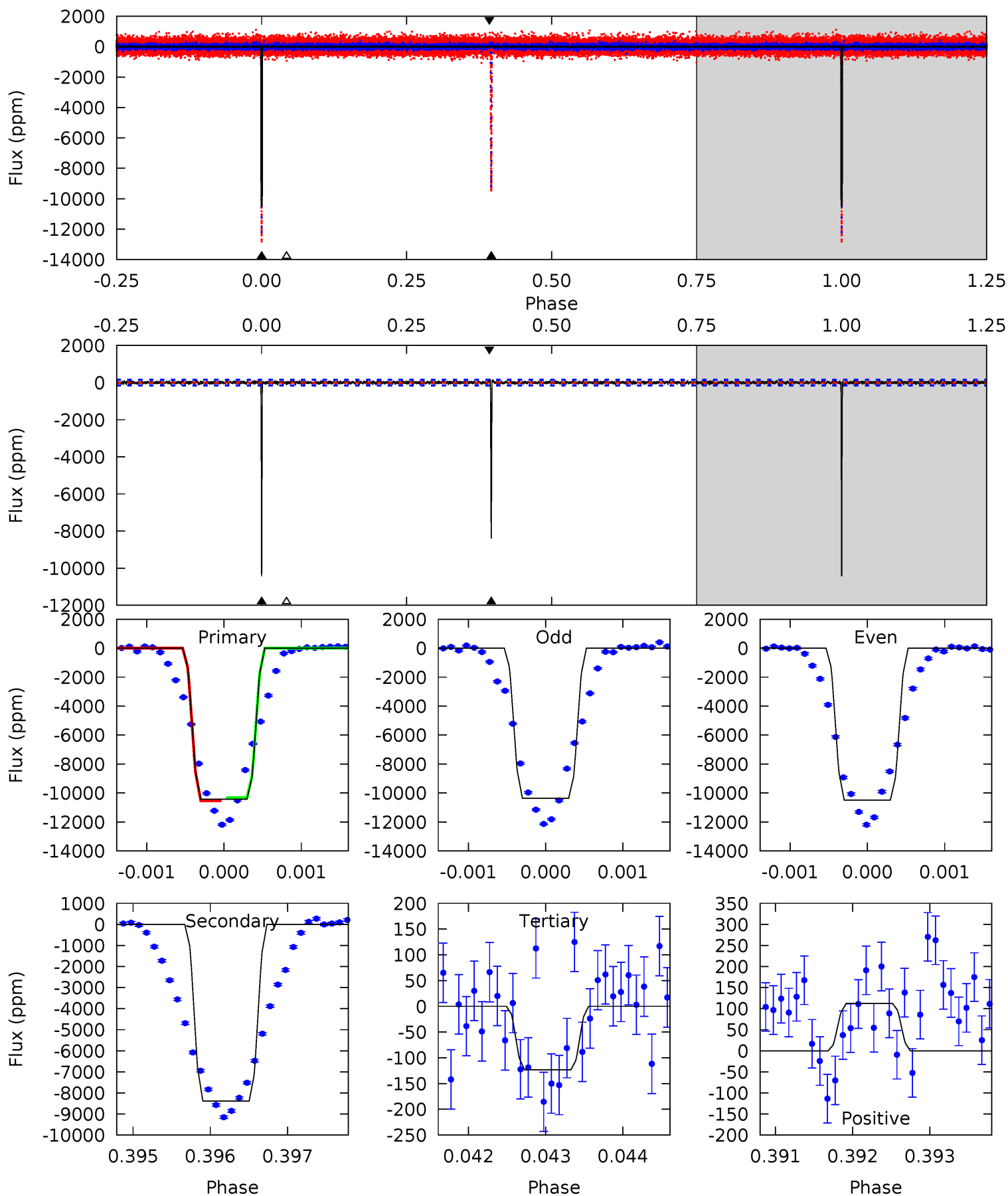
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
515.5	441.7	5.90	5.18	5.35	3.13	1.56	509.6	510.3	435.8	436.5	3.39	0.99	0.02	1.55



Alt Model-Shift Uniqueness Test

008559589-01, P = 223.114042 Days, E = 140.943731 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
370.1	297.6	4.38	3.99	5.43	3.26	1.25	365.7	366.1	293.2	293.6	2.12	0.99	0.02	2.61



Stellar Parameters For KIC 008559589

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6211^{+169}_{-206}	$4.389^{+0.105}_{-0.195}$	$-0.280^{+0.300}_{-0.300}$	$1.056^{+0.315}_{-0.145}$	$0.993^{+0.160}_{-0.120}$	$1.187^{+0.559}_{-0.613}$
	+3%/-3%	+2%/-4%	+107%/-107%	+30%/-14%	+16%/-12%	+47%/-52%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008559589-01 / KOI 3697.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-9806 ± 22	$20.52^{+6.00}_{-5.19}$	469^{+32}_{-27}	4829^{+588}_{-440}	6736^{+4870}_{-2668}
Alt.	-8385 ± 28	$12.65^{+5.43}_{-4.87}$	467^{+36}_{-25}	5752^{+1669}_{-844}	15197^{+25460}_{-7899}

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

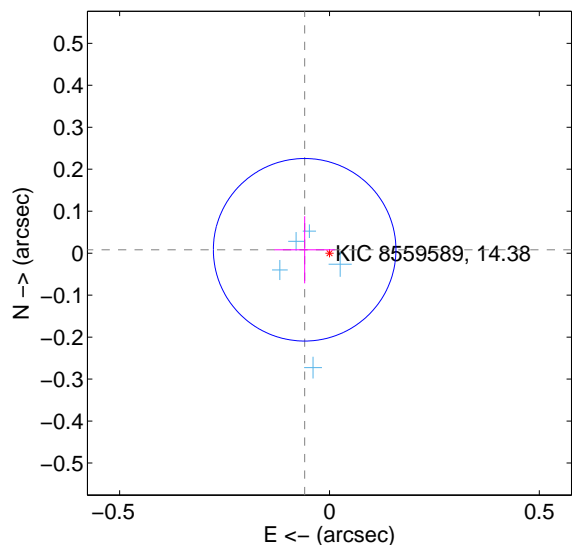
Supplemental centroid analysis for 008559589-01. Kepler magnitude: 14.38. Transit SNR 248.52

There are 5 quarters with good PRF difference image offsets

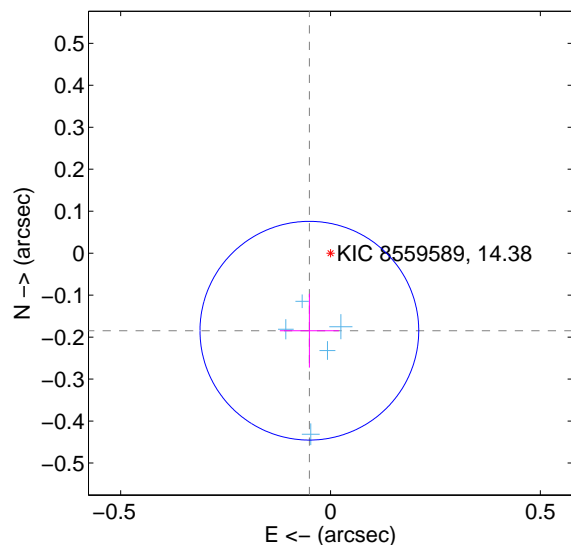
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.060 ± 0.072	0.82	0.059 ± 0.072	0.008 ± 0.080
PRF-fit source offset from KIC position	0.191 ± 0.087	2.20	0.050 ± 0.070	-0.185 ± 0.088
photometric centroid source offset	0.36 ± 0.04	9.22	0.10 ± 0.04	-0.35 ± 0.04

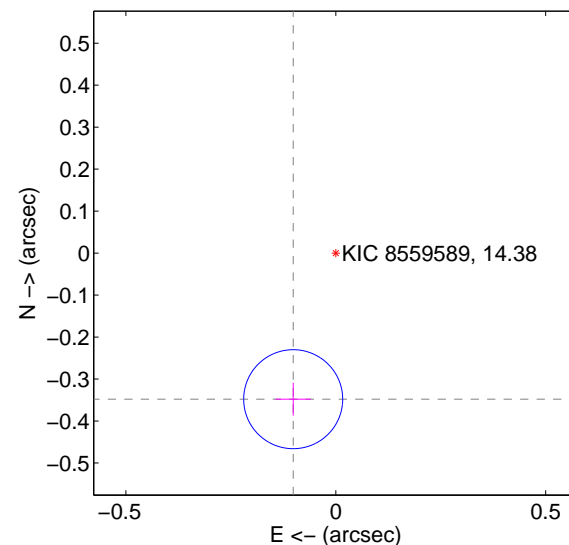
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

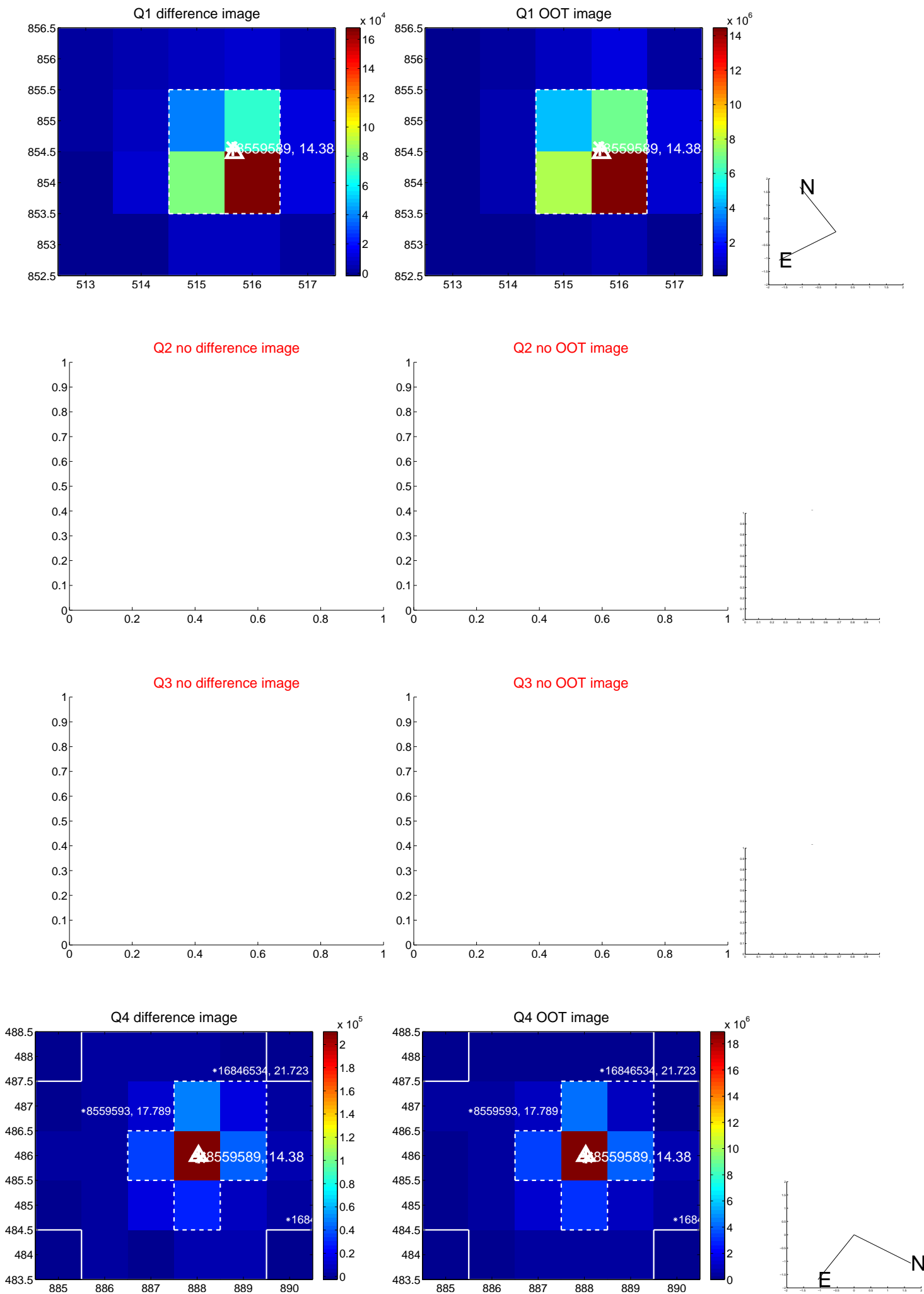


offset from photometric centroids



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.

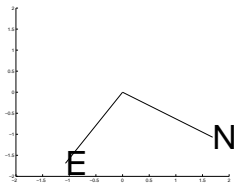
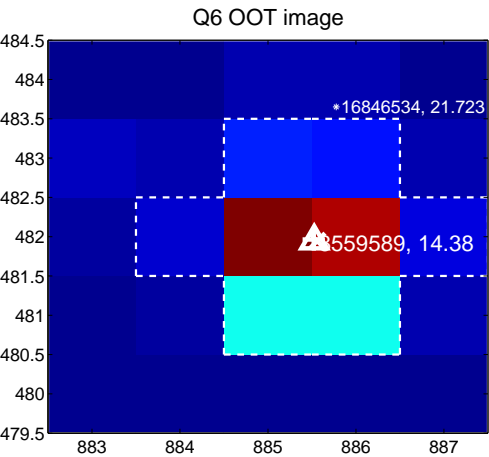
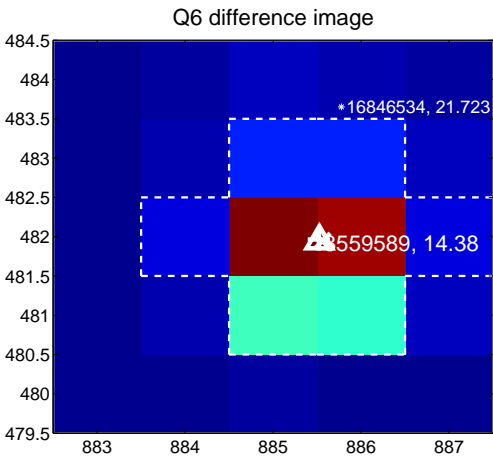


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

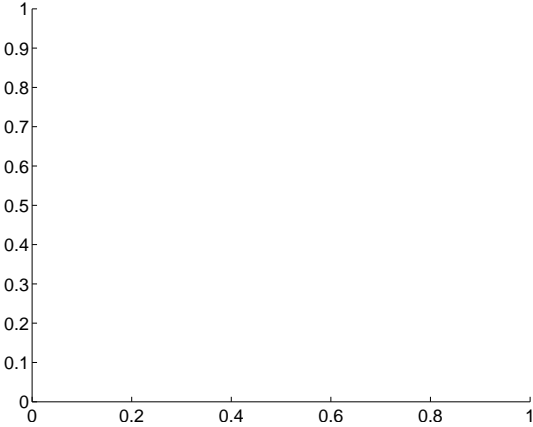
Q5 no difference image



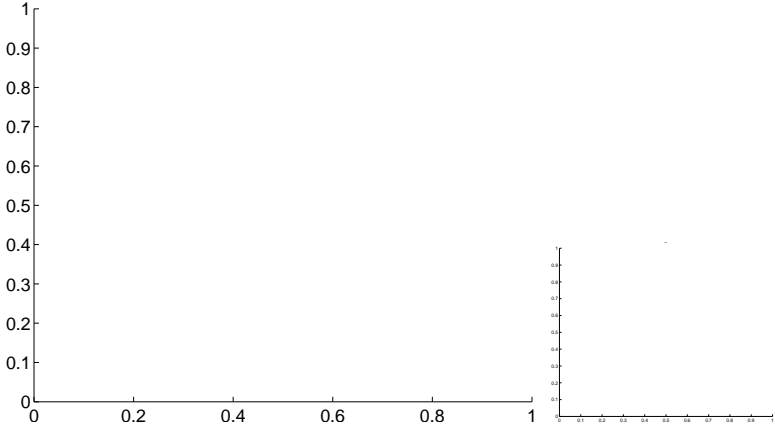
Q5 no OOT image



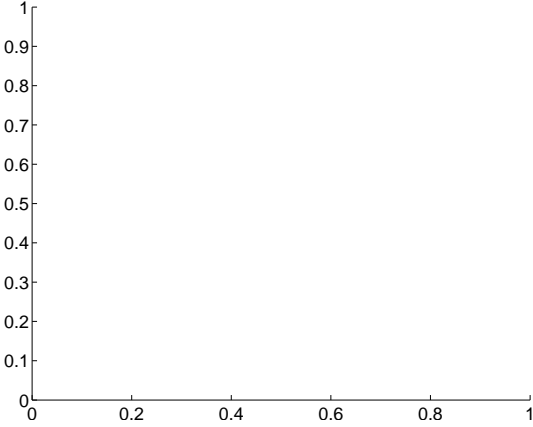
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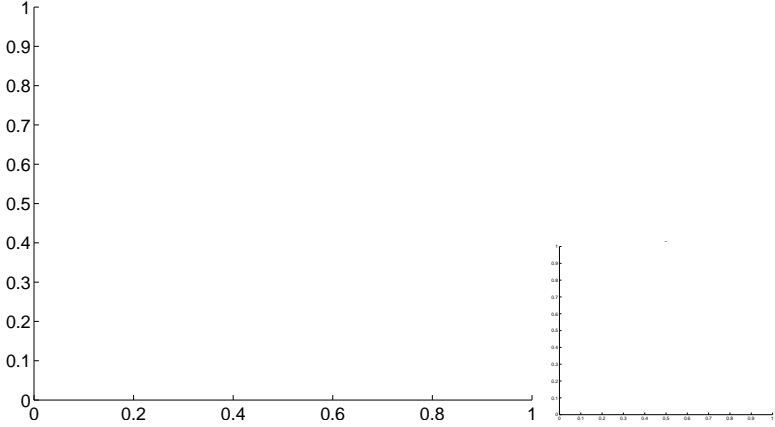
Q7 no OOT image



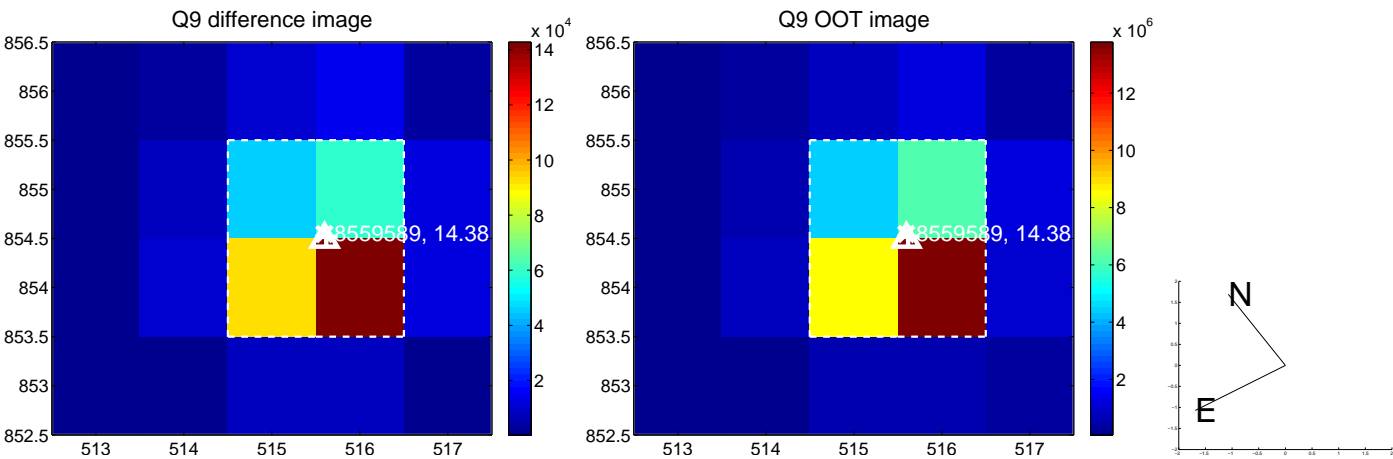
Q8 no difference image



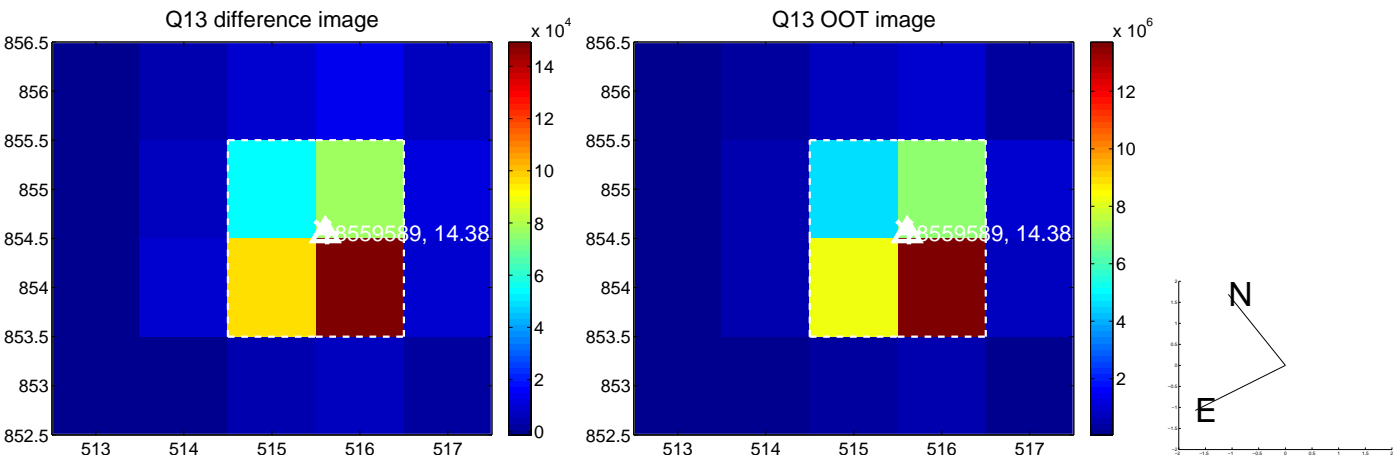
Q8 no OOT image



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



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



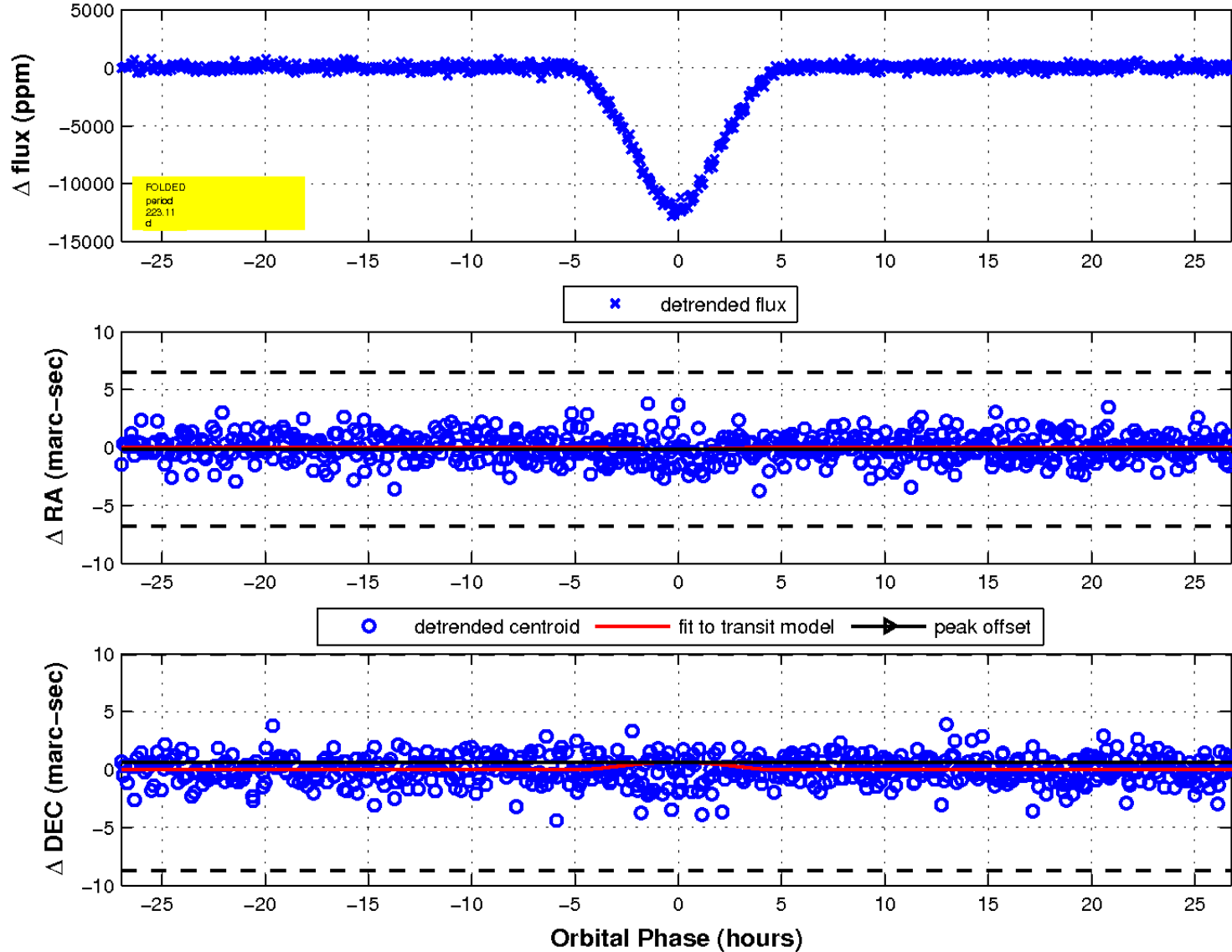
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q17 no difference image

Q17 no OOT image

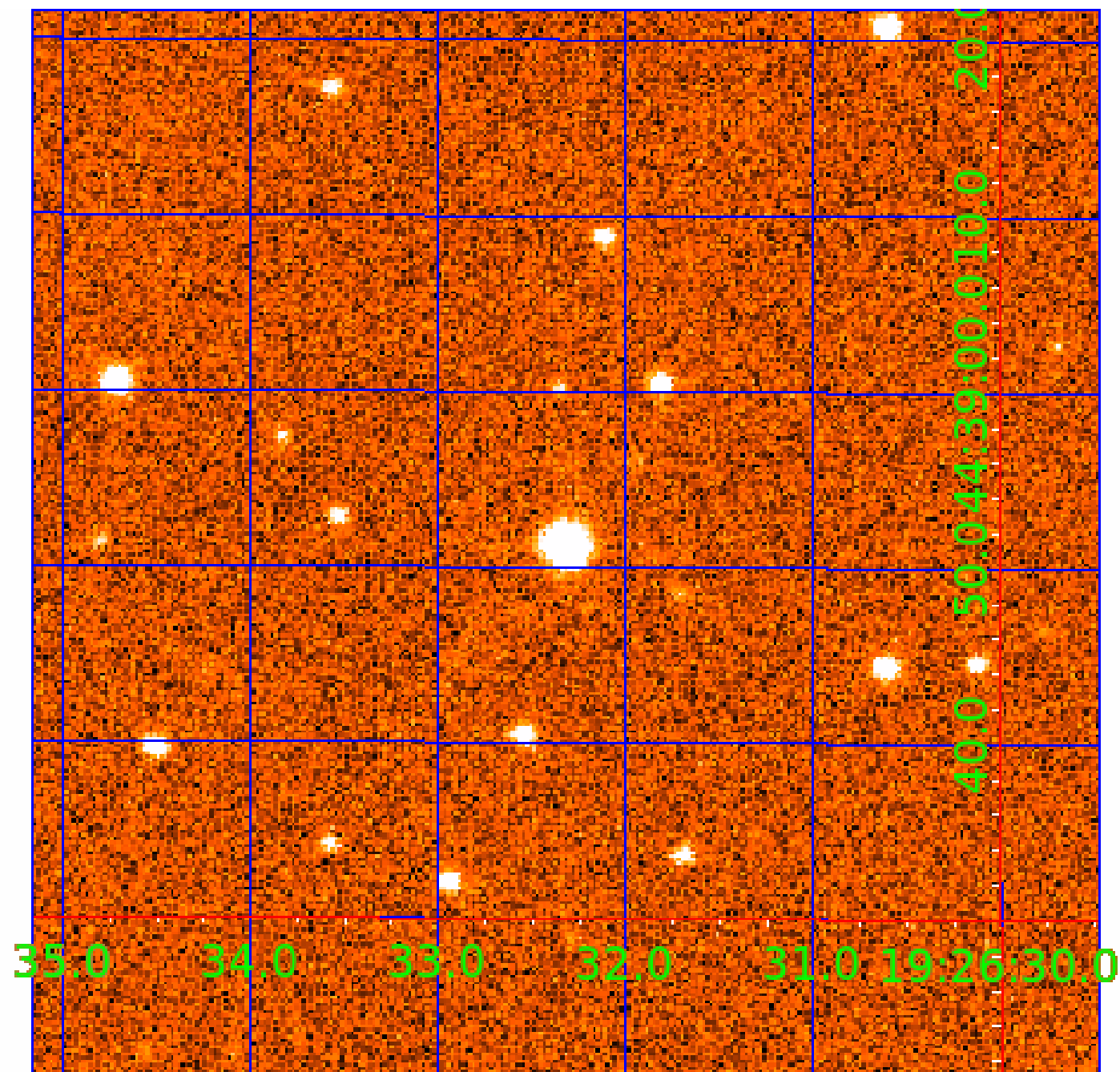


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 008559589

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})
008559589-01	OBS	3697.01	223.112119	140.949074	11396.9	8.988	276.0	248.5	1.06	6211	19.91	2.88
008559589-02	OBS	No	223.113117	229.263868	8682.2	11.834	278.7	254.9	1.06	6211	17.51	2.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008559589-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
008559589-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

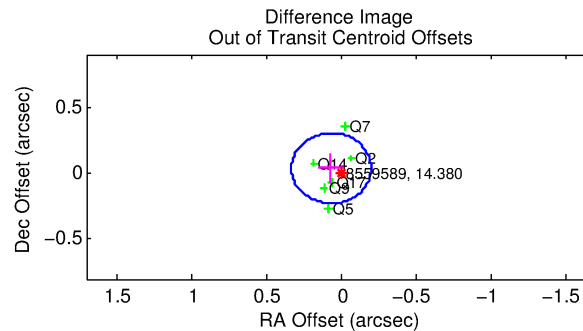
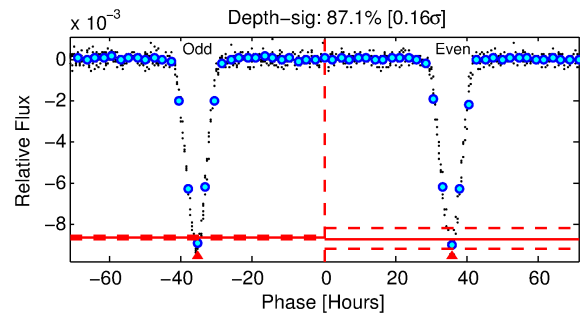
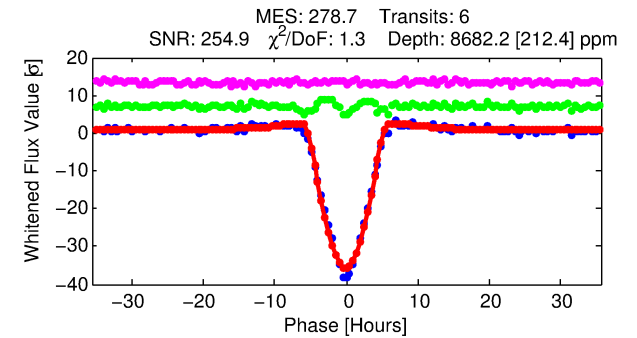
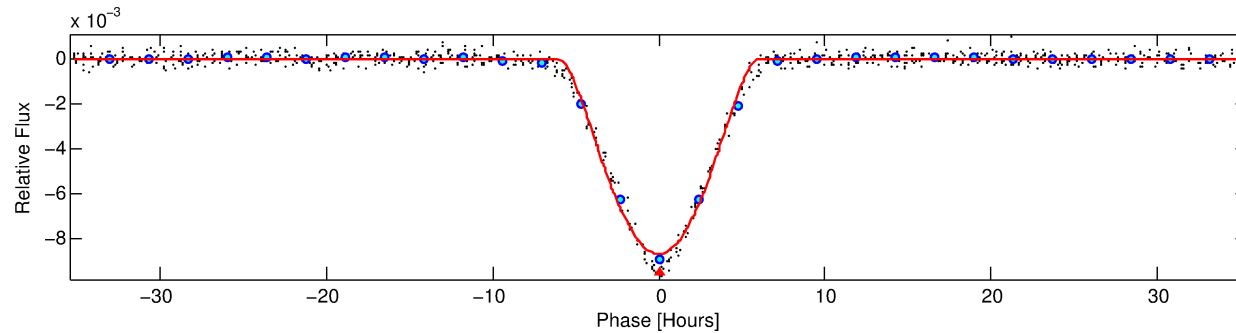
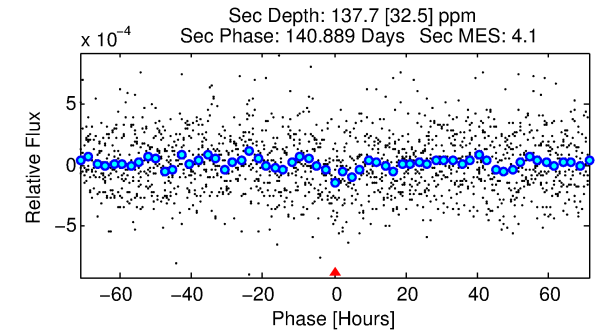
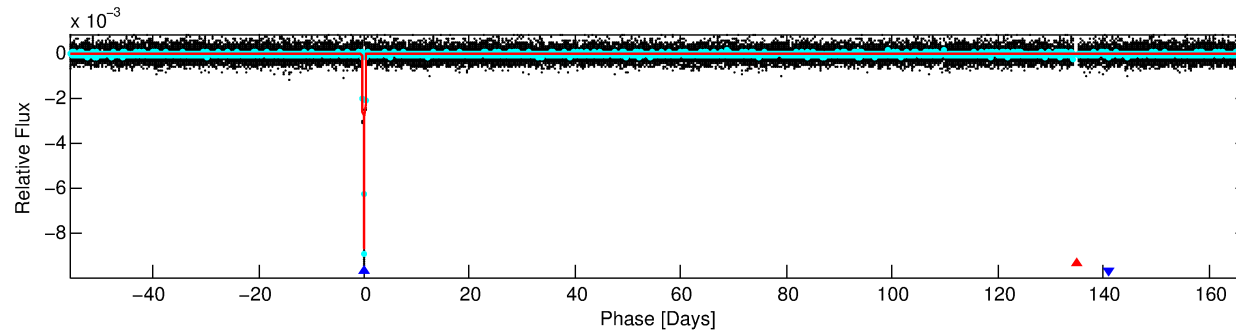
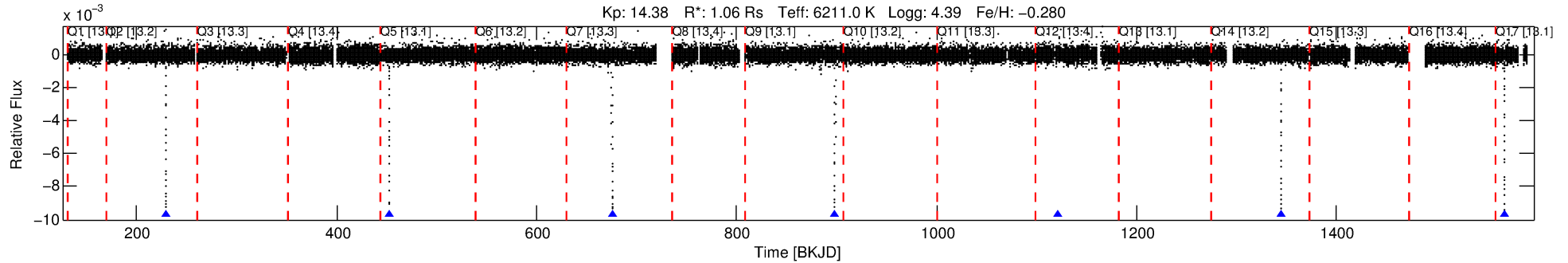
Ephemeris Match Information For 008559589-02

No Significant Match Found

DV One-Page Summary

KIC: 8559589 Candidate: 2 of 2 Period: 223.113 d

KOI: K03697 Corr: No Ephemeris Match



DV Fit Results:

Period = 223.11312 [0.00030] d
Epoch = 229.2639 [0.0010] BKJD
Rp/R* = 0.1520 [0.0357]
a/R* = 82.43 [3.06]
b = 1.00 [0.05]
Seff = 2.87 [1.10]
Teq = 332 [32] K
Rp = 17.51 [6.65] Re
a = 0.7192 [0.1790] AU
Ag = 127.73 [81.41] [1.56 σ]
Teffp = 1726 [234] K [5.90 σ]

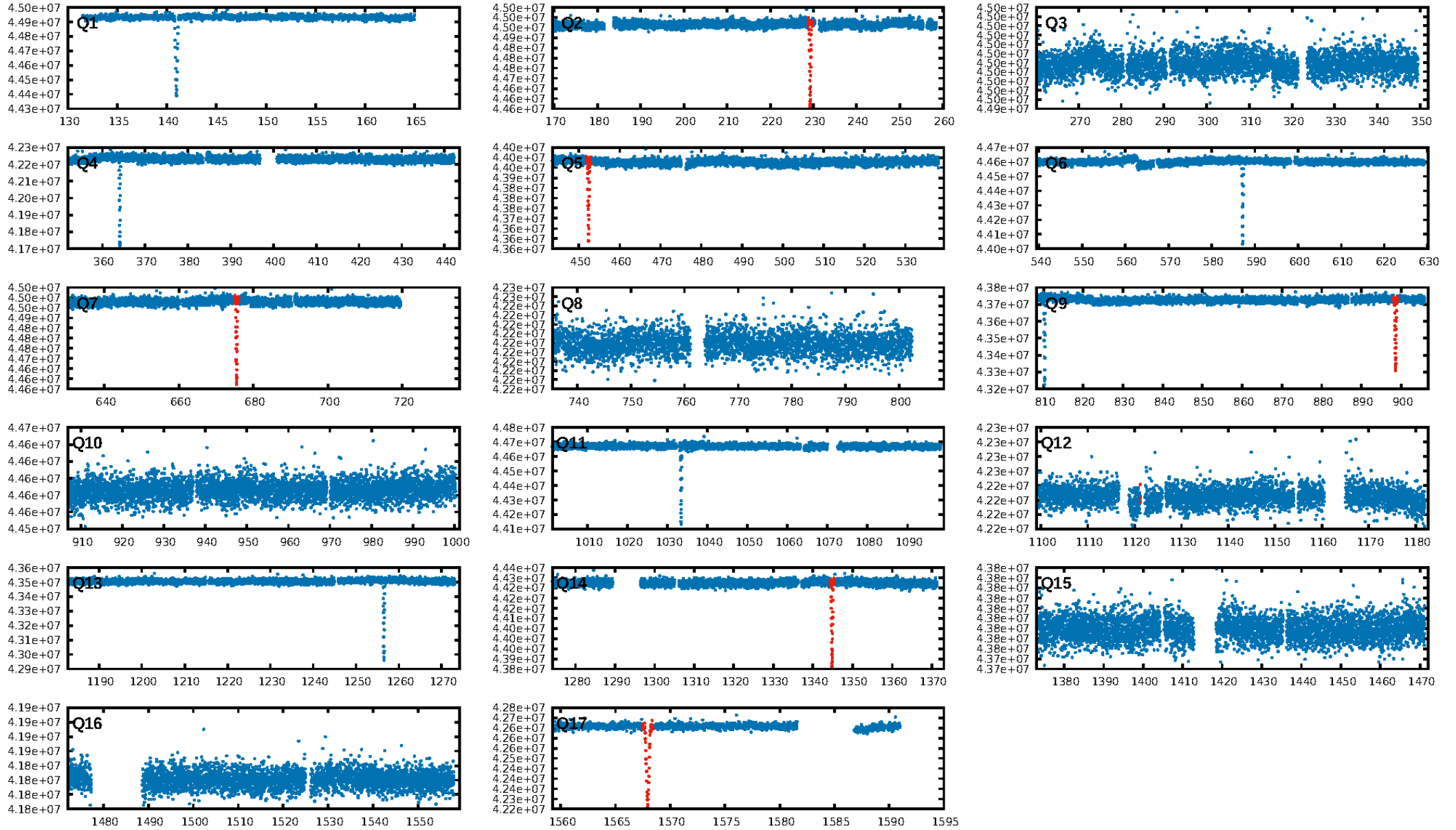
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 6.6%
ModelChiSquareGof-sig: 2.8%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 3.088
Centroid-sig: 27.4%
Centroid-so: 0.339 arcsec [8.26 σ]
OotOffset-rm: 0.074 arcsec [0.83 σ]
KicOffset-rm: 0.152 arcsec [1.32 σ]
OotOffset-st: 2/1/0/3 [6]
KicOffset-st: 2/1/0/3 [6]
DiffImageQuality-fgm: 1.00 [6/6]
DiffImageOverlap-fno: 1.00 [6/6]

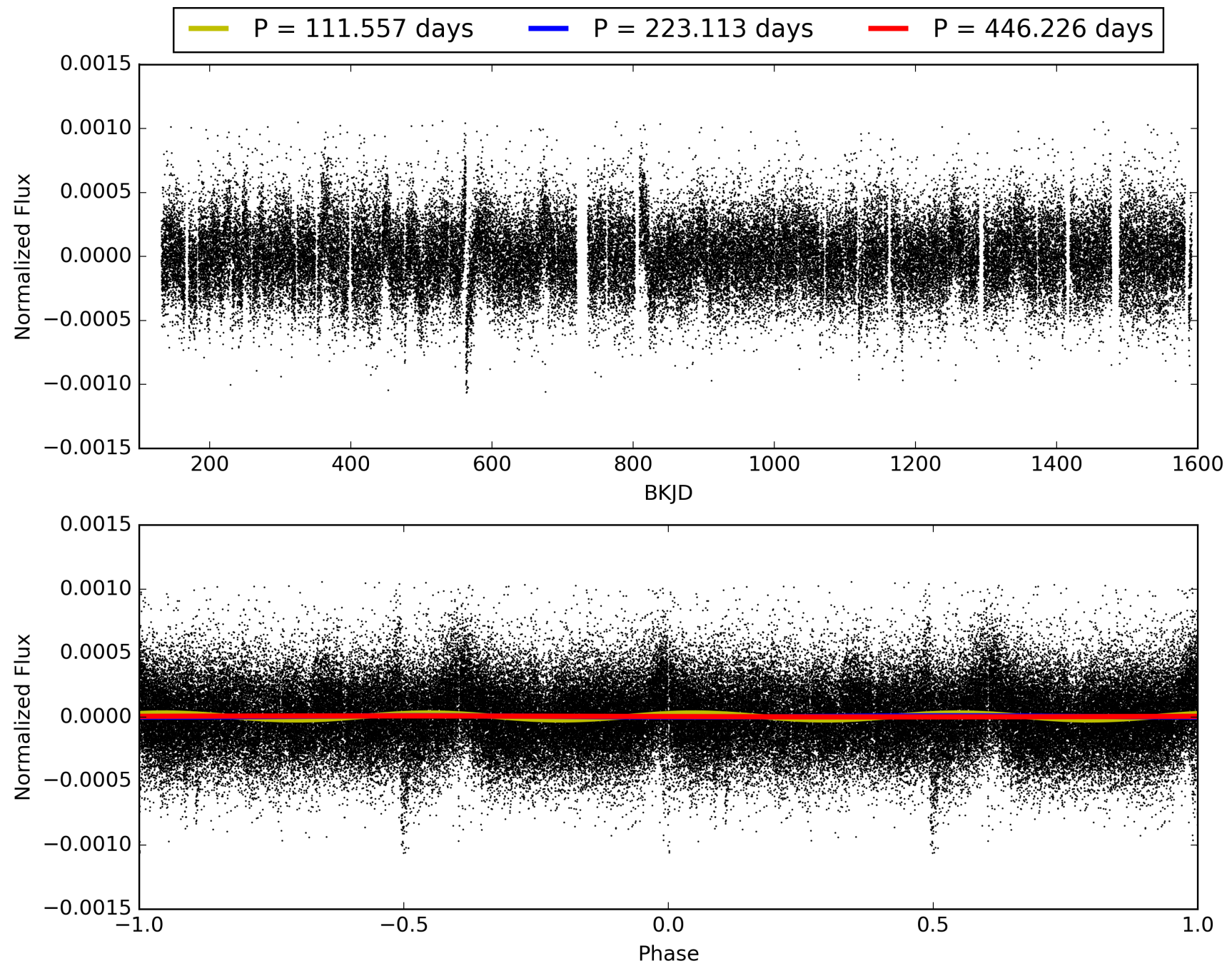
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:49:43 Z

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

TCE 008559589-02, PDC Light Curves

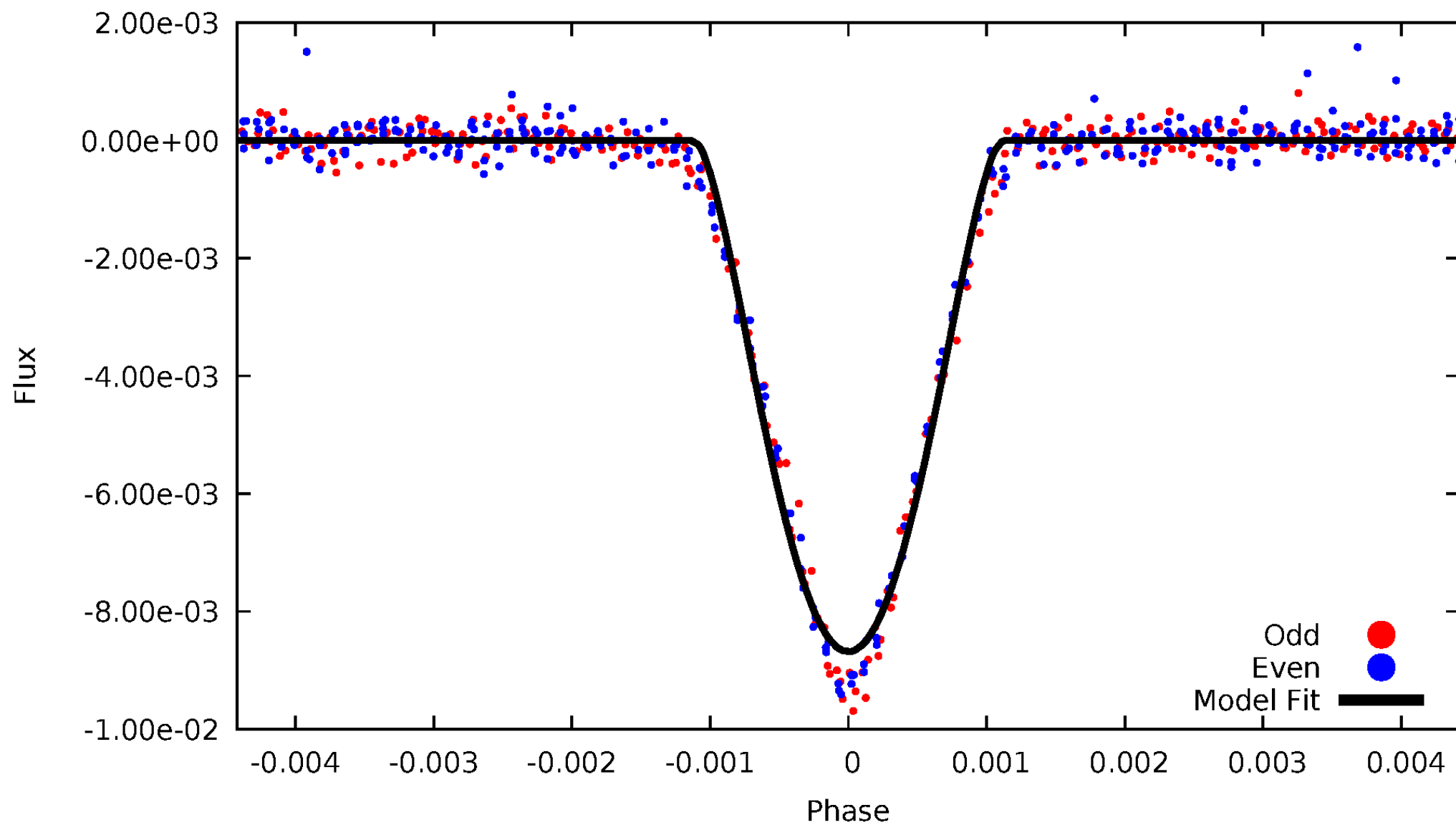


TCE 008559589-02



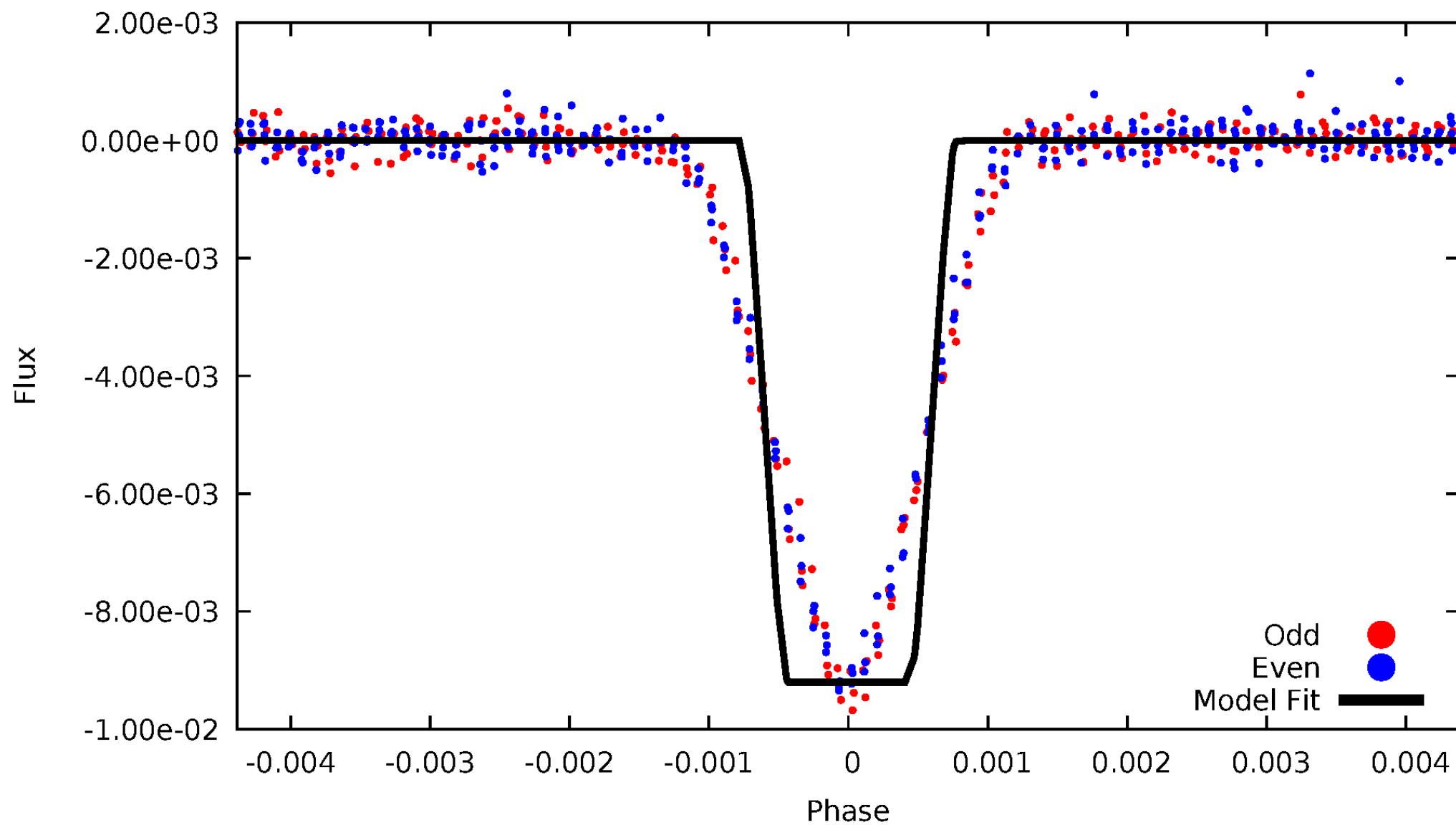
DV Odd/Even

TCE 008559589-02



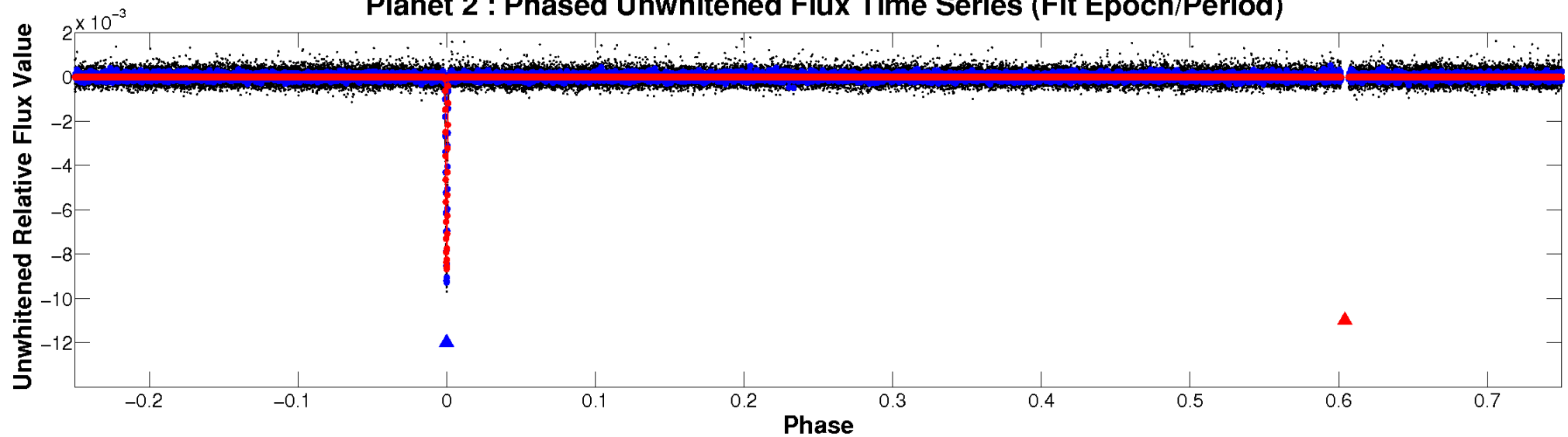
ALT Odd/Even

TCE 008559589-02

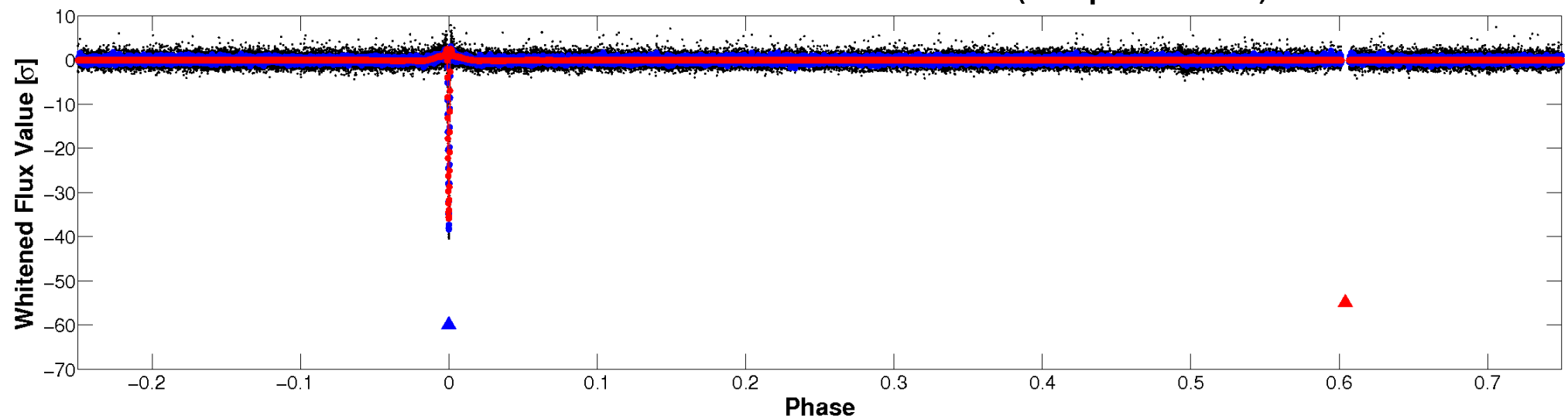


Non-Whitened Vs. Whitened Light Curve

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

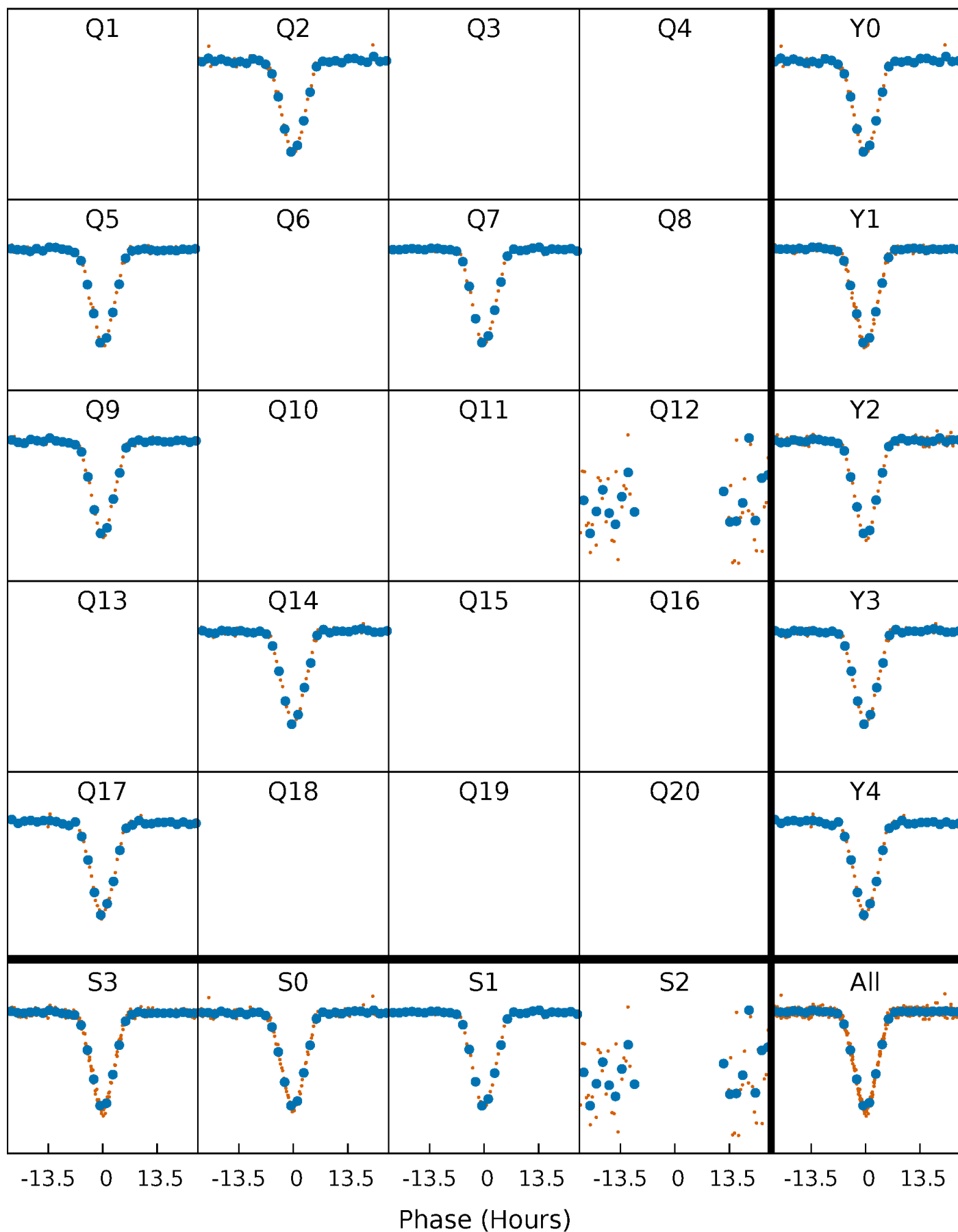


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



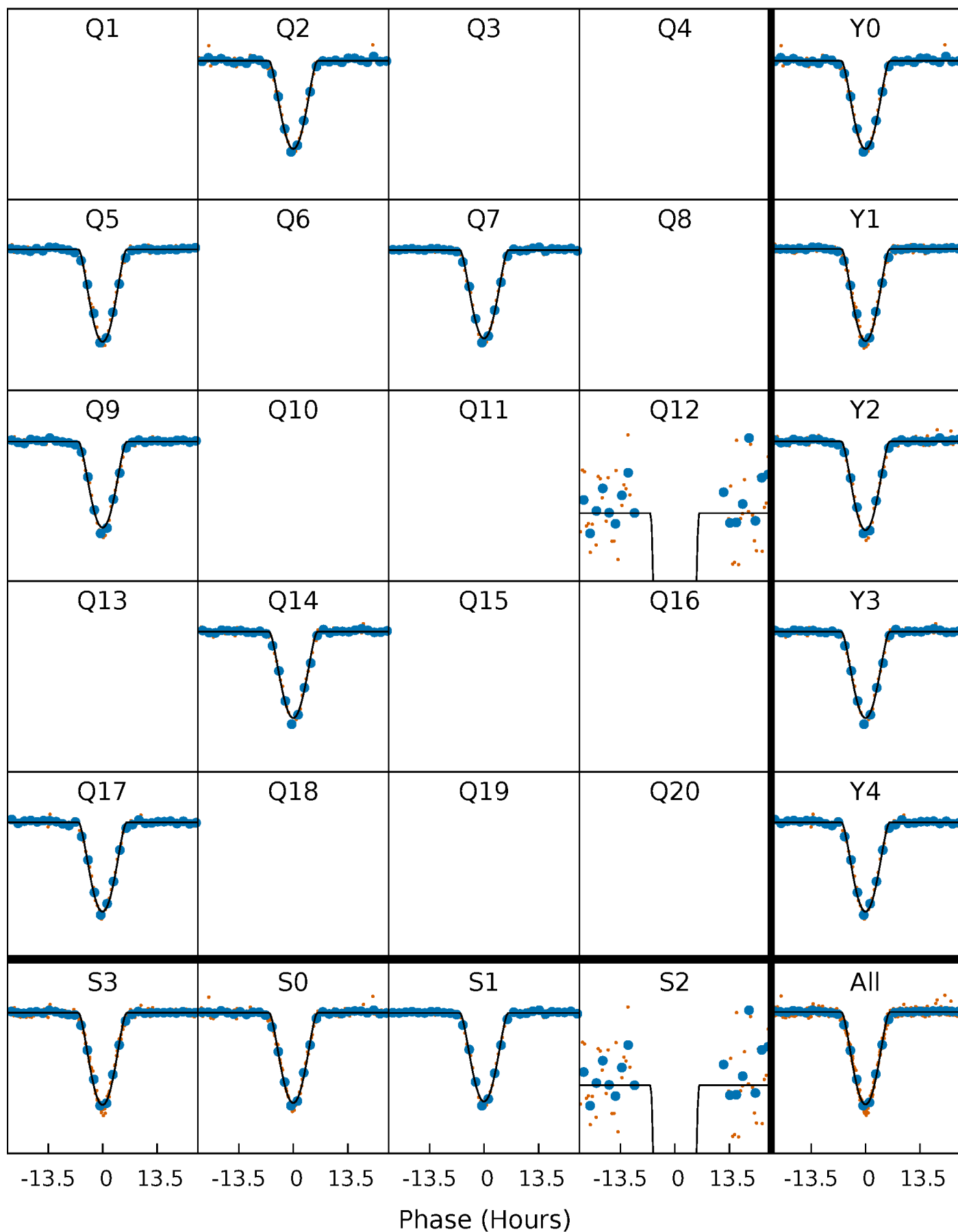
PDC Quarter-Phased Transit Curves

TCE 008559589-02 P=223.113117 Days $T_0=229.263868$ (BKJD)



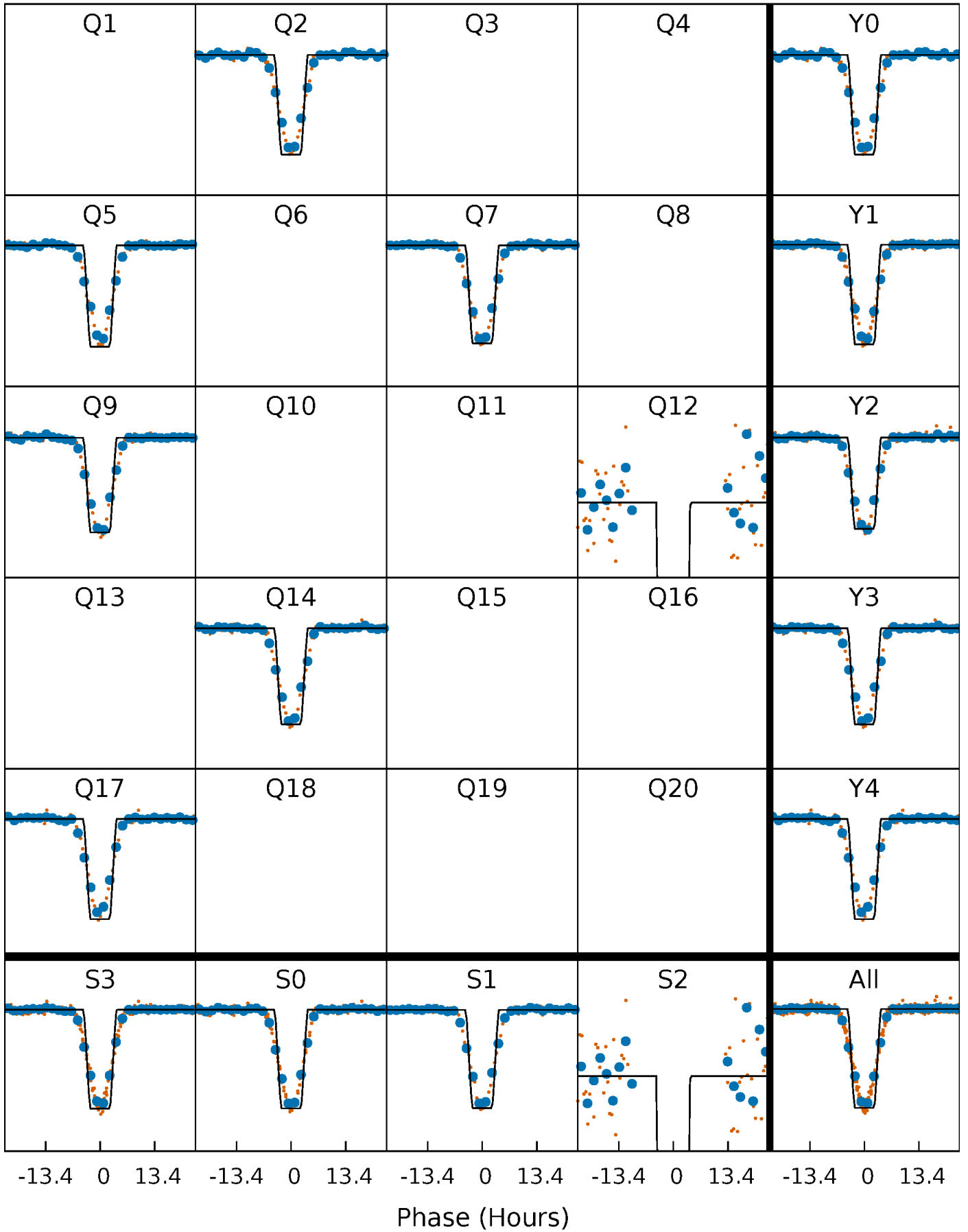
DV Quarter-Phased Transit Curves

TCE 008559589-02 P=223.113117 Days $T_0=229.263868$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

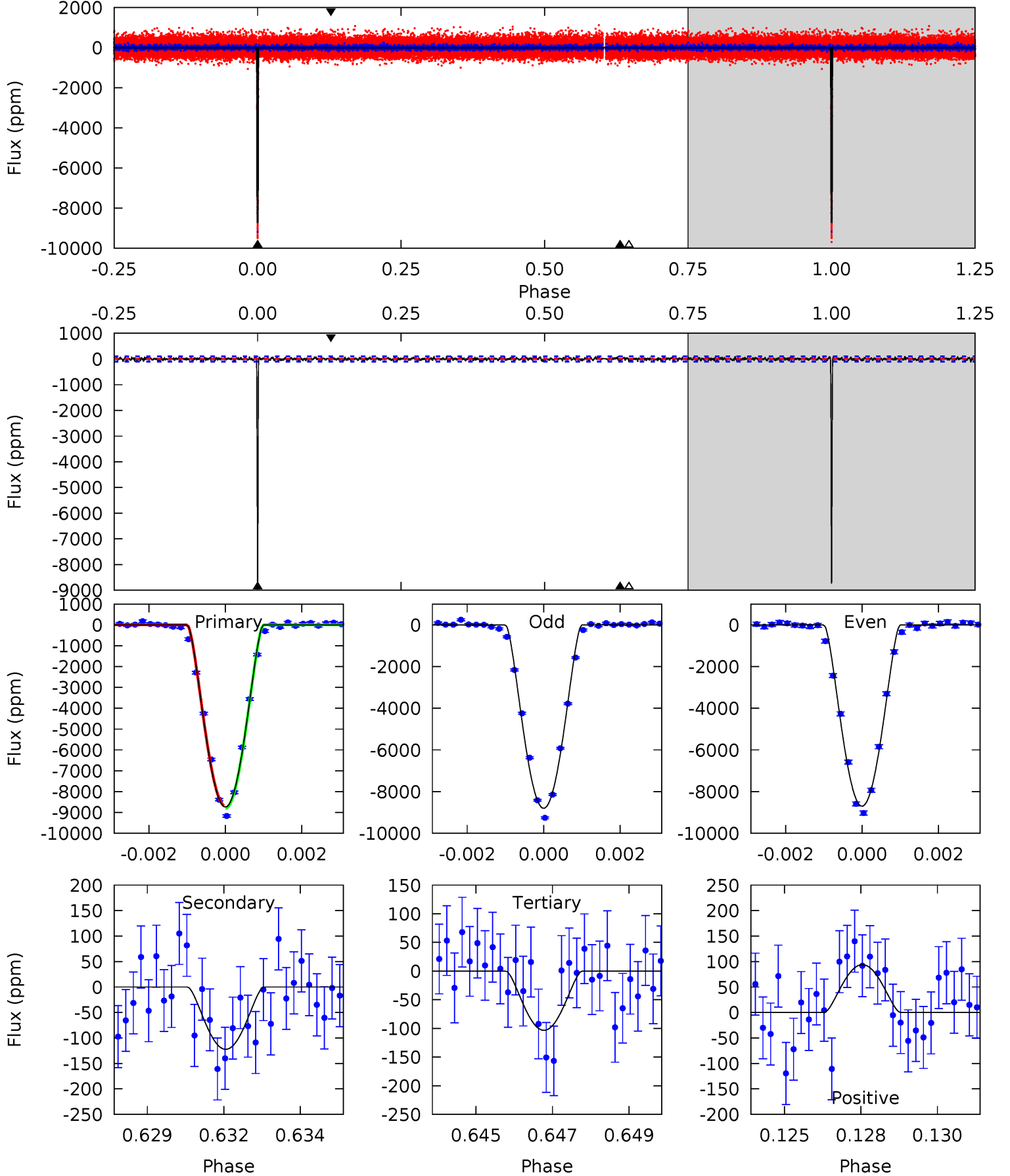
TCE 008559589-02 P=223.114042 Days $T_0=229.261883$ (BKJD)



DV Model-Shift Uniqueness Test

008559589-02, P = 223.113117 Days, E = 6.150751 Days

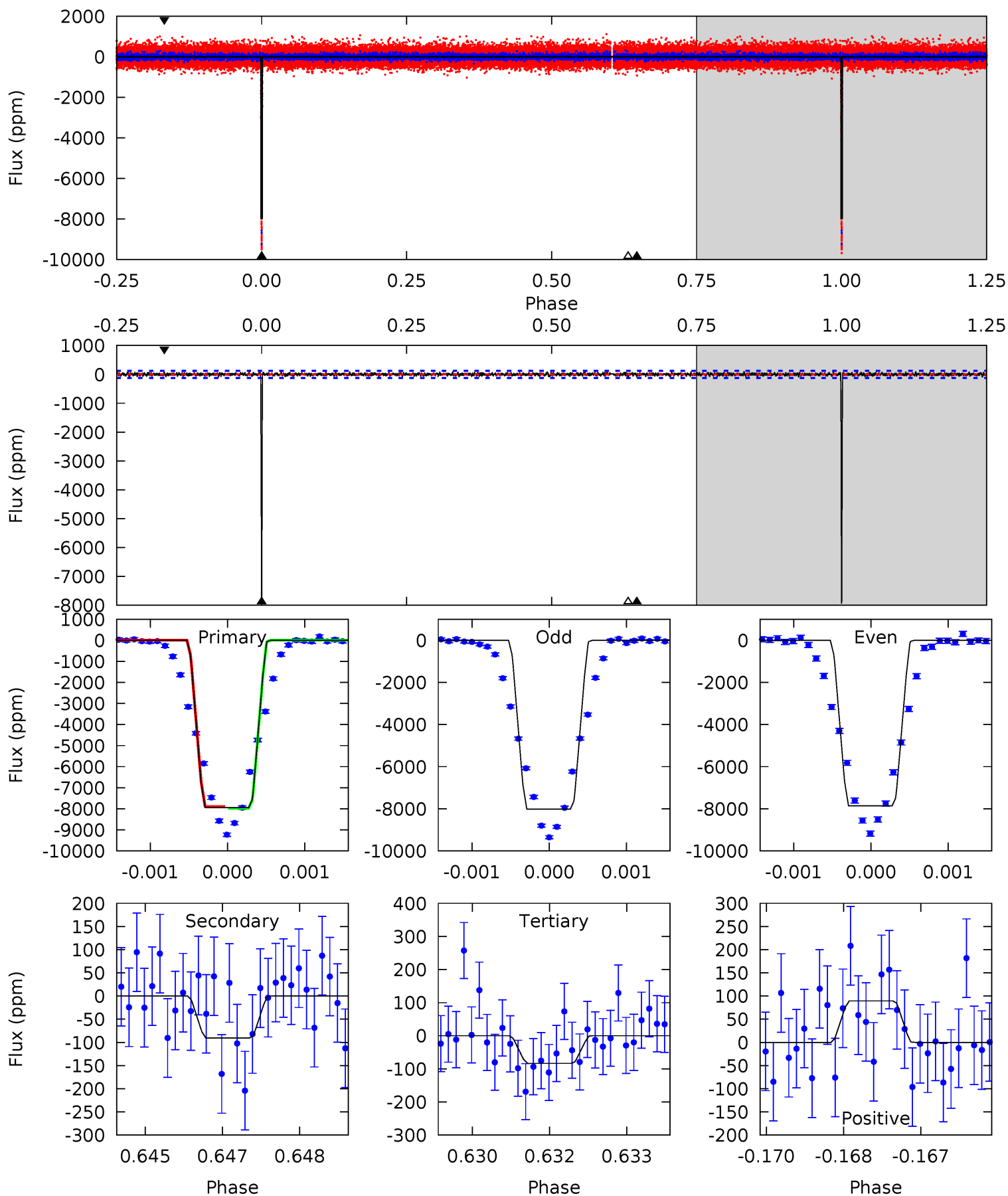
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
454.2	6.35	5.37	4.88	5.31	3.06	1.49	448.8	449.3	0.98	1.47	2.66	1.00	0.01	3.37



Alt Model-Shift Uniqueness Test

008559589-02, P = 223.114042 Days, E = 6.147841 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
340.5	3.89	3.58	3.83	5.38	3.18	1.06	336.9	336.6	0.31	0.06	3.28	1.00	0.01	1.78



Stellar Parameters For KIC 008559589

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6211^{+169}_{-206}	$4.389^{+0.105}_{-0.195}$	$-0.280^{+0.300}_{-0.300}$	$1.056^{+0.315}_{-0.145}$	$0.993^{+0.160}_{-0.120}$	$1.187^{+0.559}_{-0.613}$
	+3%/-3%	+2%/-4%	+107%/-107%	+30%/-14%	+16%/-12%	+47%/-52%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008559589-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-122 ± 19	$18.17^{+5.01}_{-4.86}$	468^{+36}_{-24}	2519^{+197}_{-148}	103^{+87}_{-41}
Alt.	-91 ± 23	$11.40^{+4.38}_{-4.19}$	467^{+33}_{-24}	2711^{+371}_{-224}	194^{+306}_{-100}

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 $A_{\text{obs}} \gg 1.0$

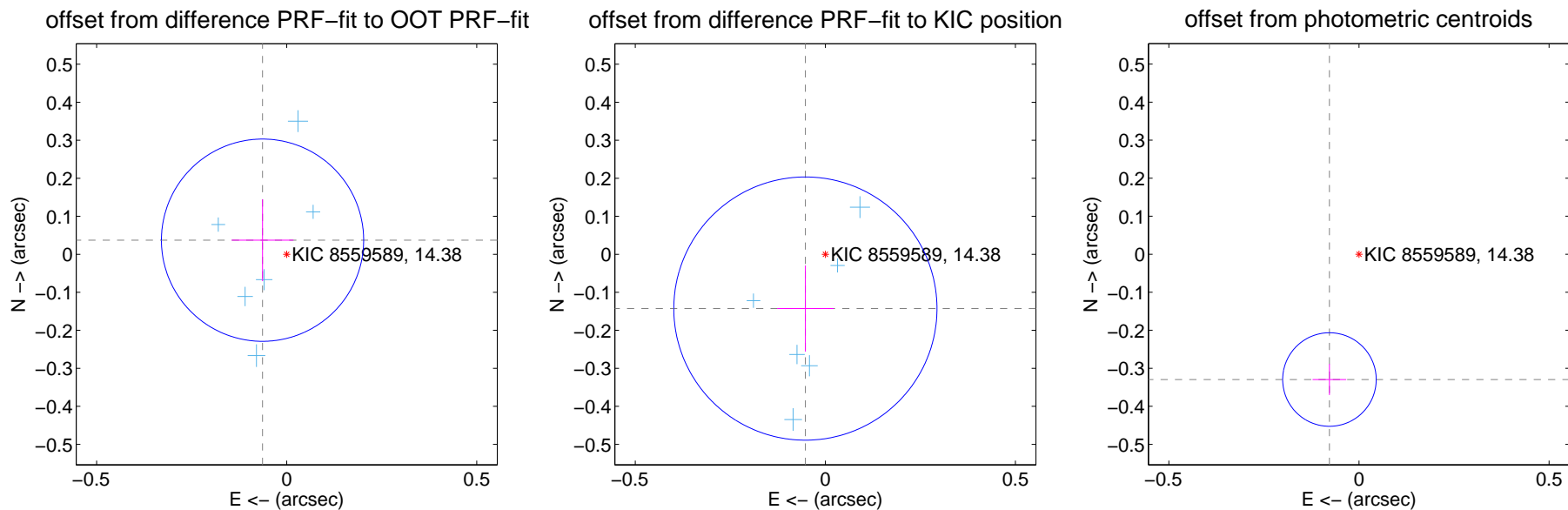
DV Centroid Data

Supplemental centroid analysis for 008559589-02. Kepler magnitude: 14.38. Transit SNR 254.95

There are 6 quarters with good PRF difference image offsets

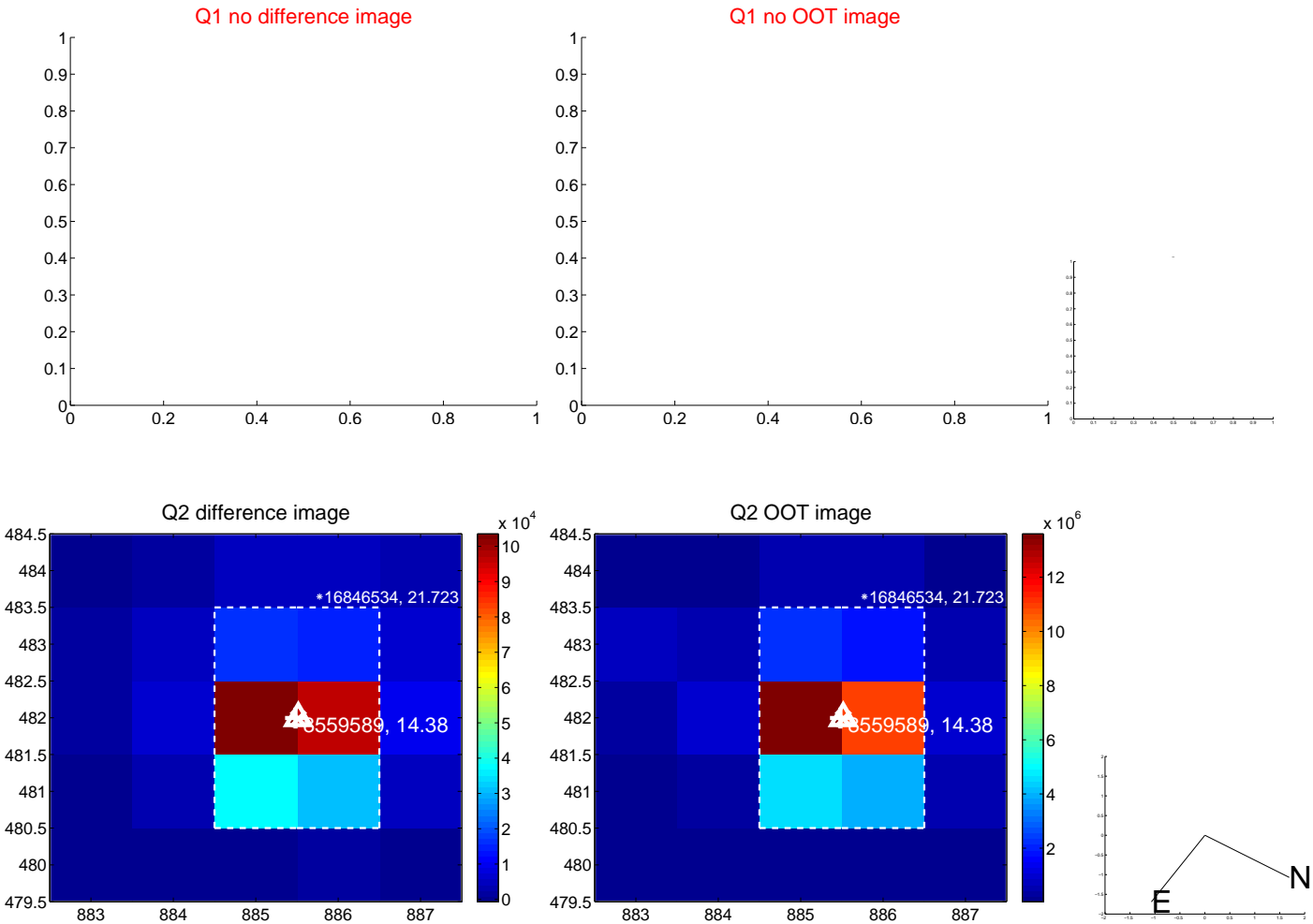
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.074 ± 0.089	0.83	0.064 ± 0.081	0.037 ± 0.108
PRF-fit source offset from KIC position	0.152 ± 0.115	1.32	0.052 ± 0.074	-0.143 ± 0.113
photometric centroid source offset	0.34 ± 0.04	8.26	0.08 ± 0.04	-0.33 ± 0.04

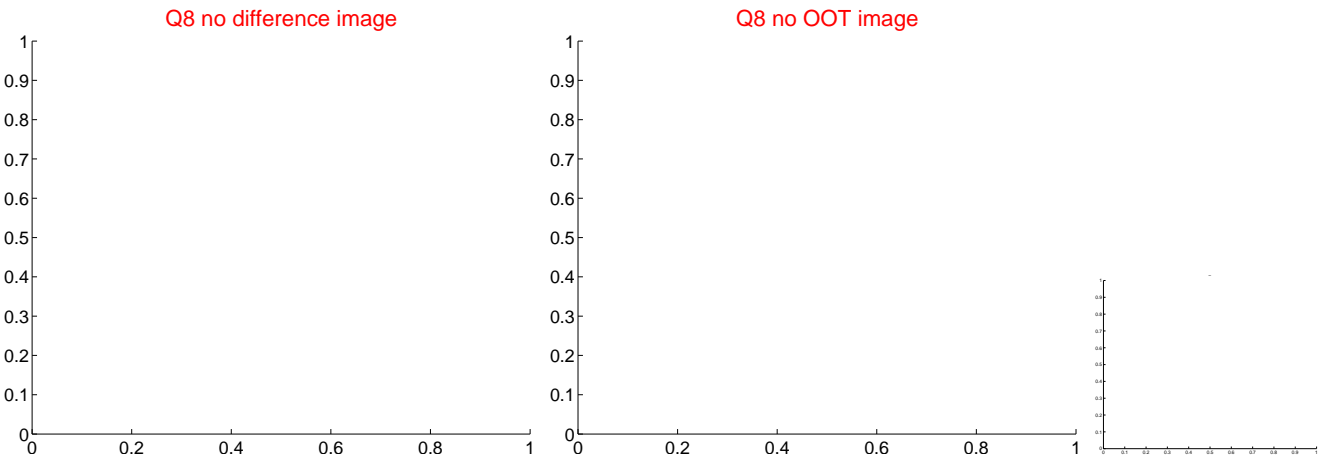
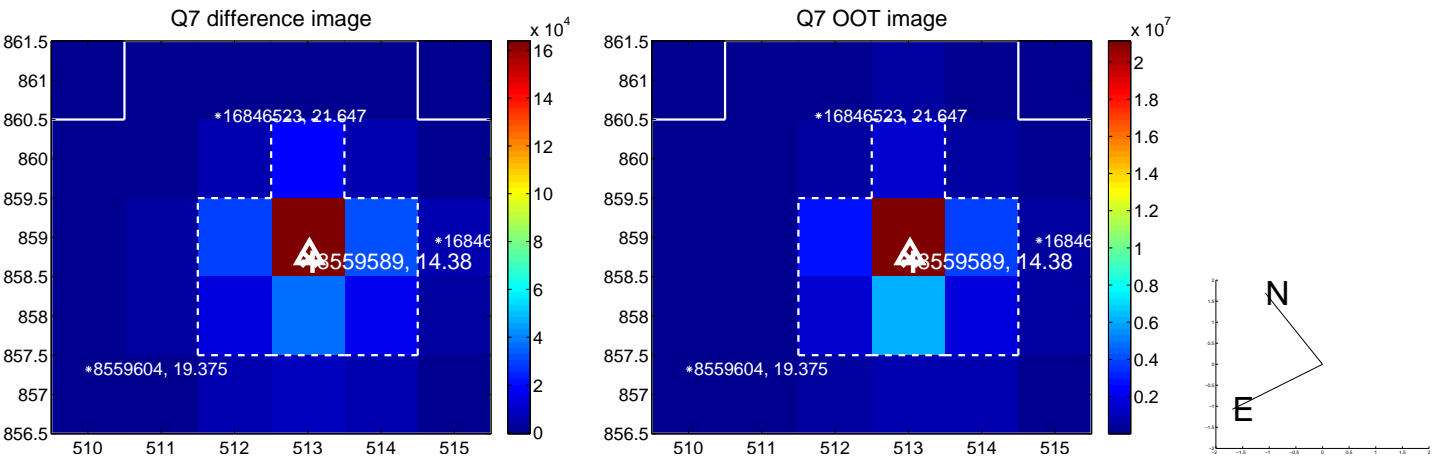
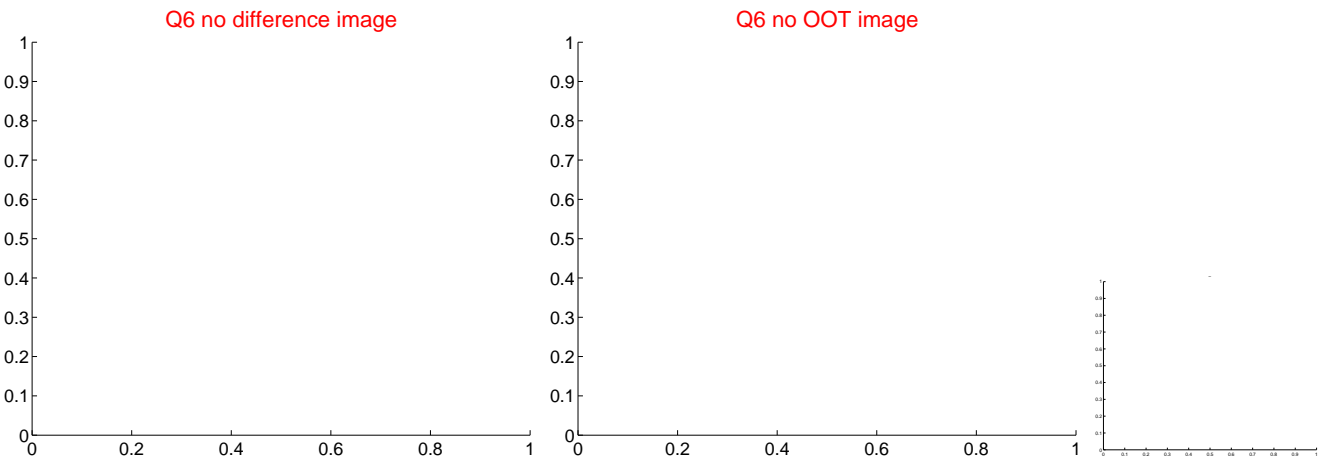
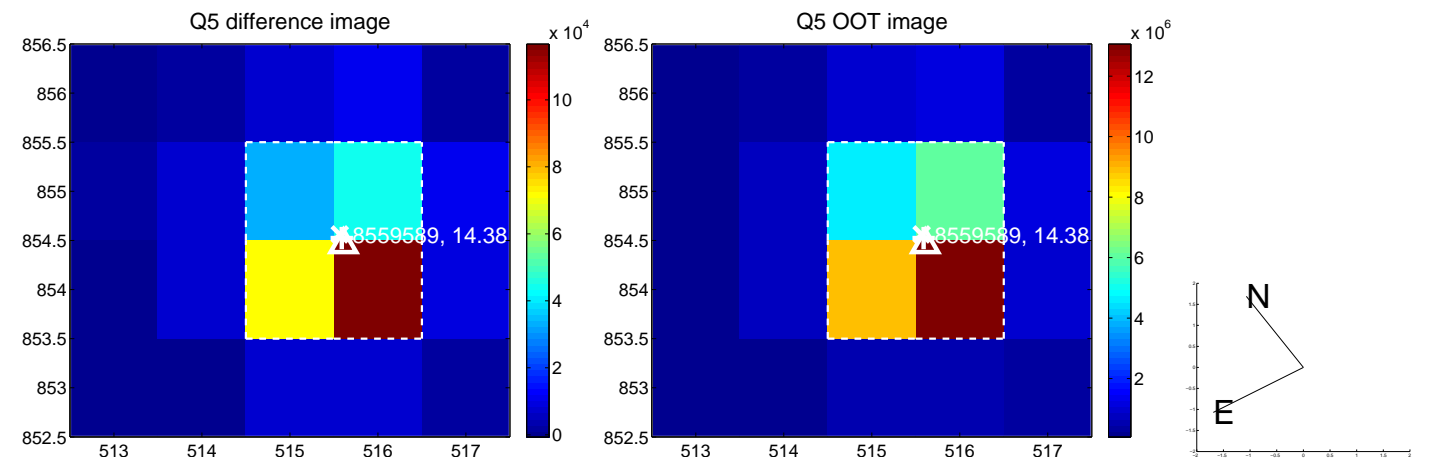


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

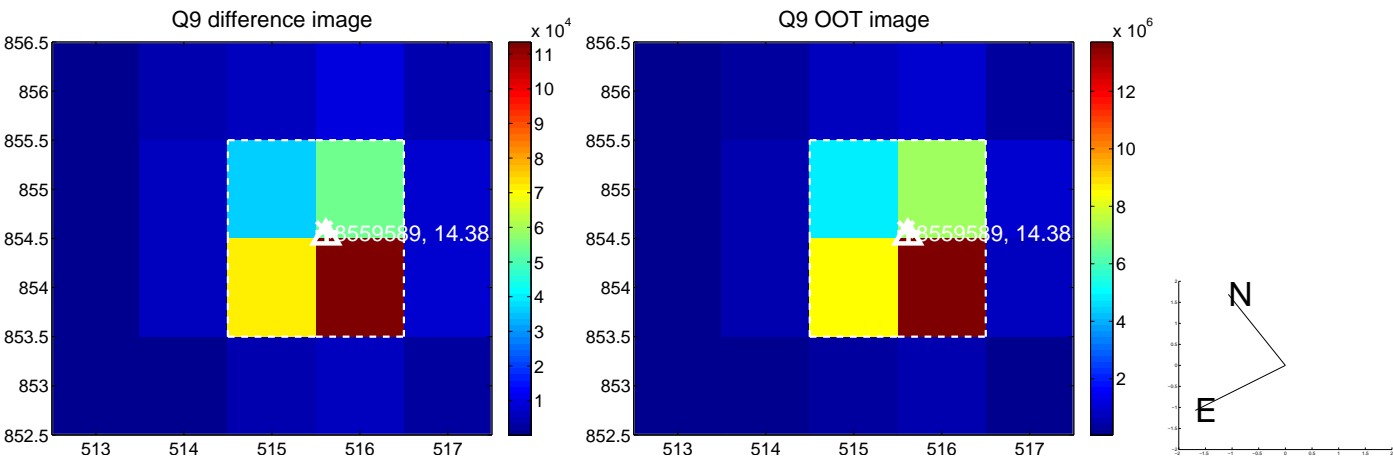
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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

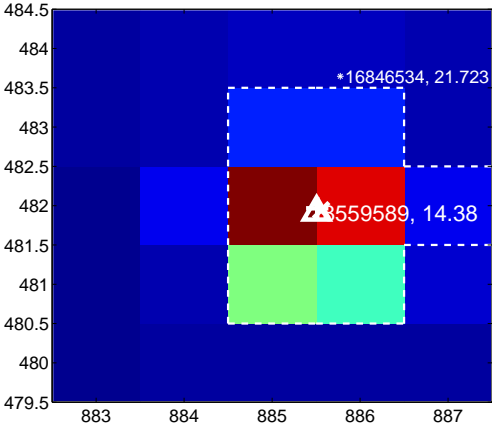
Q13 no difference image



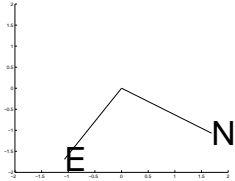
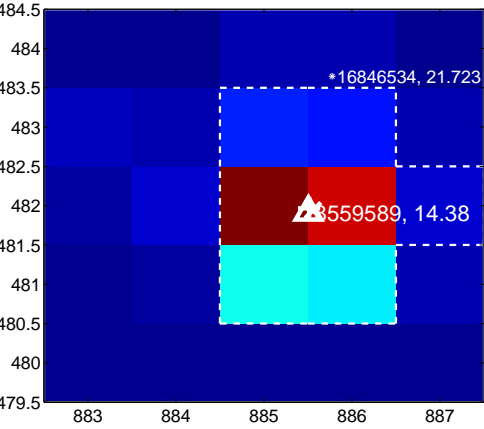
Q13 no OOT image



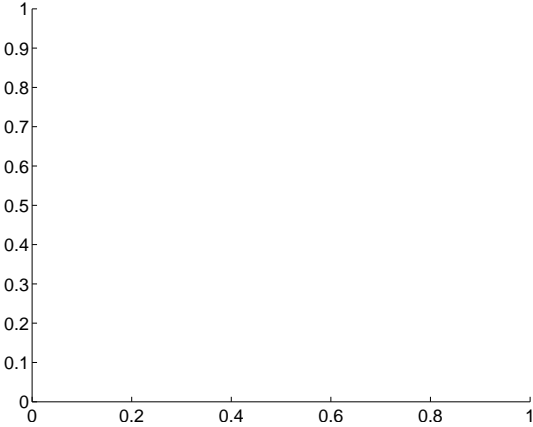
Q14 difference image



Q14 OOT image



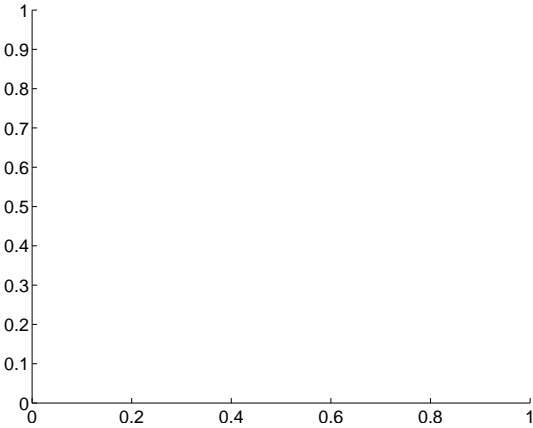
Q15 no difference image



Q15 no OOT image



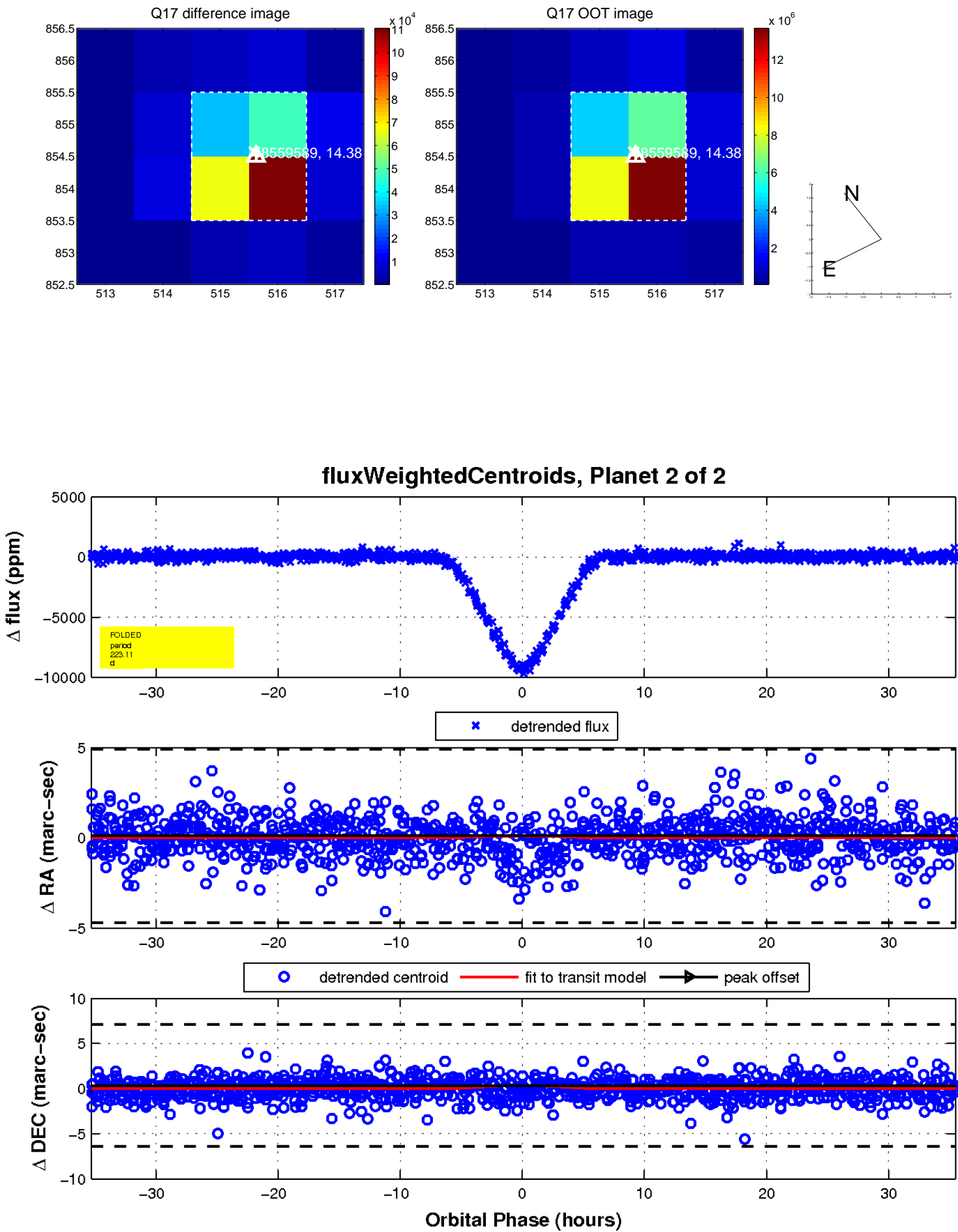
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

