

KIC 004472818

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})
004472818-01	OBS	3878.01	70.967394	182.666782	773.9	7.114	31.7	34.5	0.99	5818	2.96	8.68
004472818-02	OBS	3878.02	15.357244	132.607878	113.3	1.922	9.7	11.0	0.99	5818	1.20	66.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004472818-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
004472818-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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.

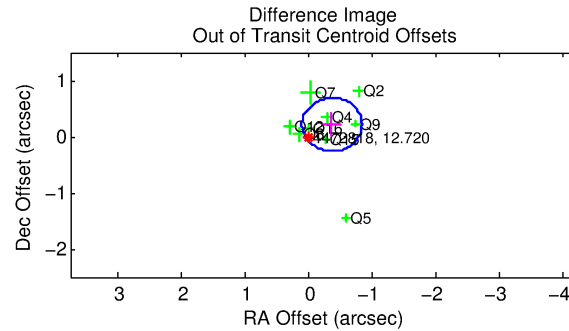
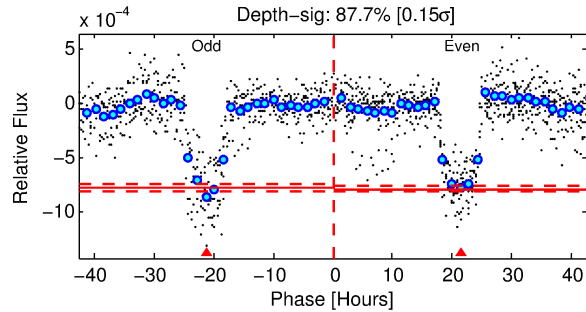
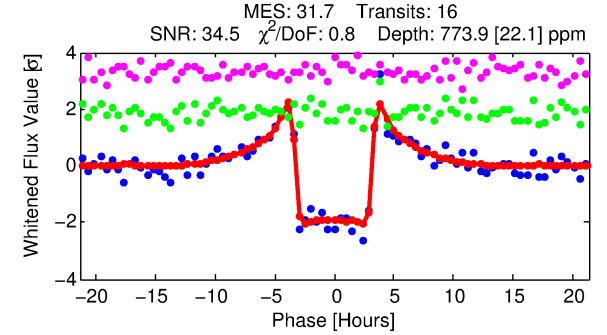
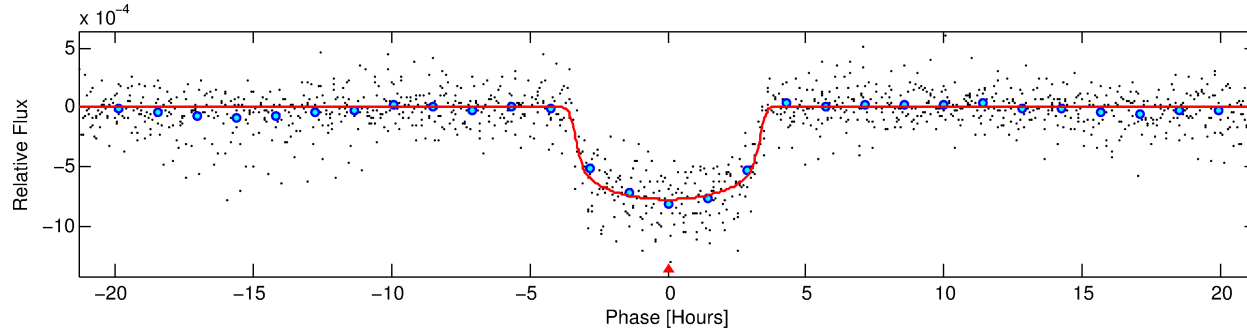
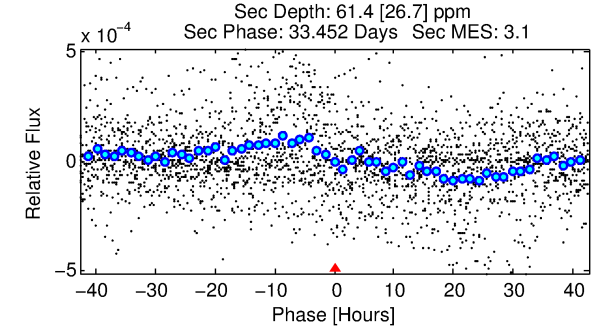
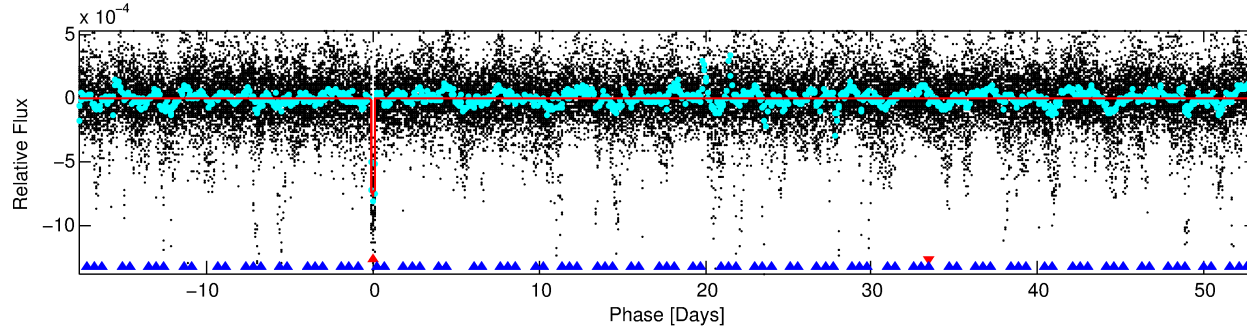
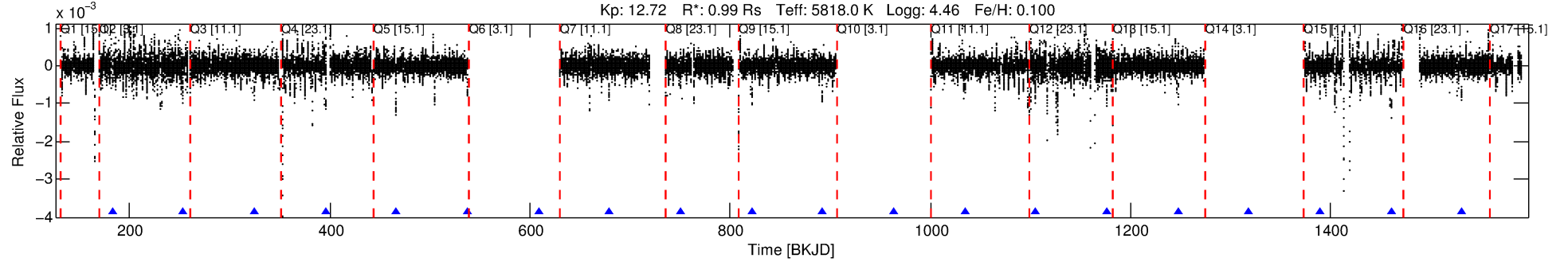
Ephemeris Match Information For 004472818-01

No Significant Match Found

DV One-Page Summary

KIC: 4472818 Candidate: 1 of 2 Period: 70.967 d
KOI: K03878.01 Corr: 0.985

Kp: 12.72 R*: 0.99 Rs Teff: 5818.0 K Logg: 4.46 Fe/H: 0.100



DV Fit Results:

Period = 70.96739 [0.00016] d
Epoch = 182.6668 [0.0019] BKJD
Rp/R* = 0.0275 [0.0017]
a/R* = 55.12 [14.48]
b = 0.73 [0.17]
Seff = 8.68 [1.88]
Teq = 438 [24] K
Rp = 2.96 [0.48] Re
a = 0.3391 [0.0461] AU
Ag = 443.77 [221.75] [2.00σ]
Teffp = 3106 [355] K [7.51σ]

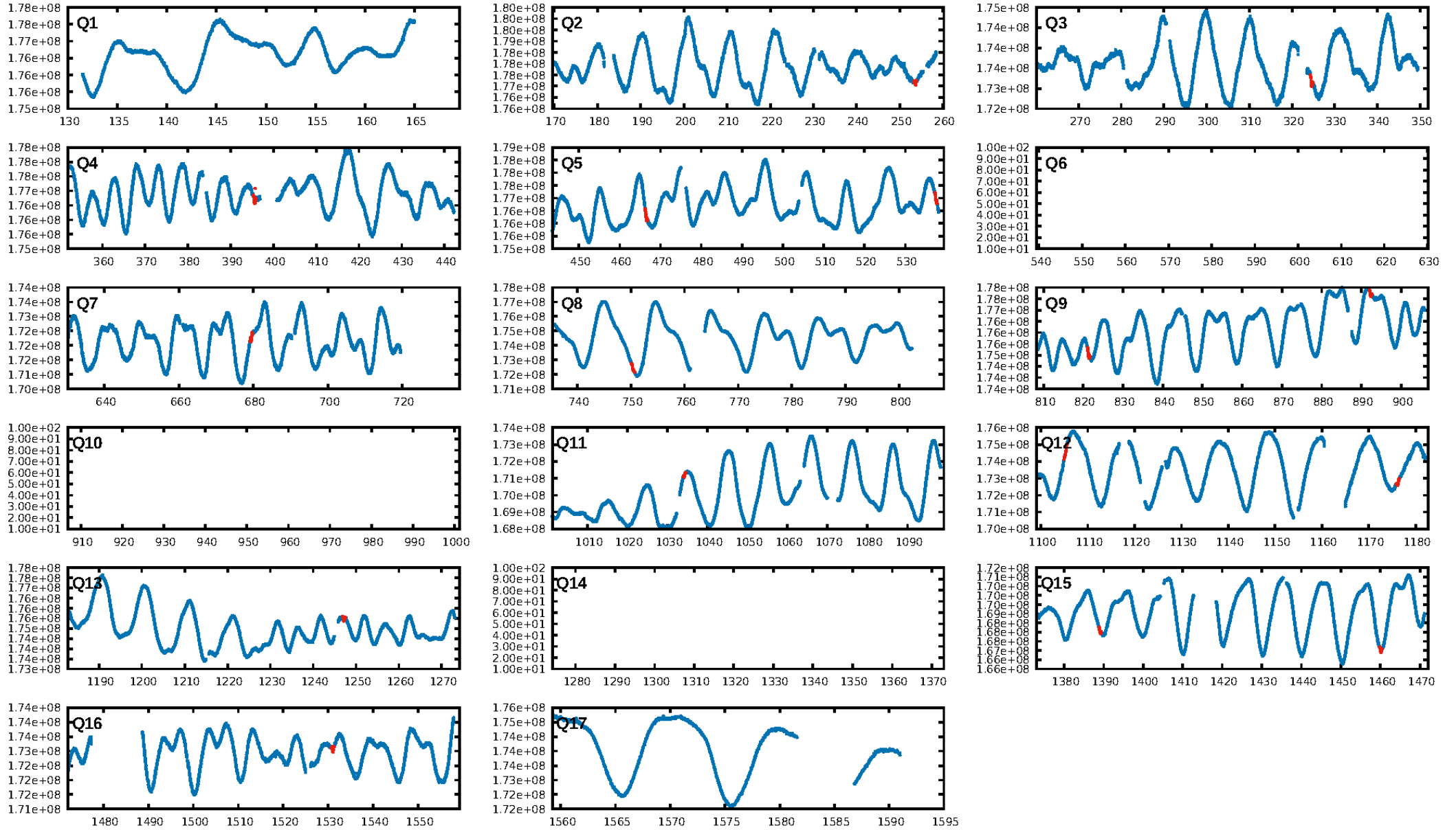
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [181.11σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 72.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.37e-93
RollingBand-fgt: 1.00 [16/16]
GhostDiagnostic-chr: 1.032
Centroid-sig: 1.9%
Centroid-so: 0.270 arcsec [1.54σ]
OotOffset-rm: 0.423 arcsec [2.68σ]
KicOffset-rm: 0.551 arcsec [3.27σ]
OotOffset-st: 1/2/4/2 [9]
KicOffset-st: 1/2/4/2 [9]
DiffImageQuality-fgm: 1.00 [9/9]
DiffImageOverlap-fno: 1.00 [9/9]

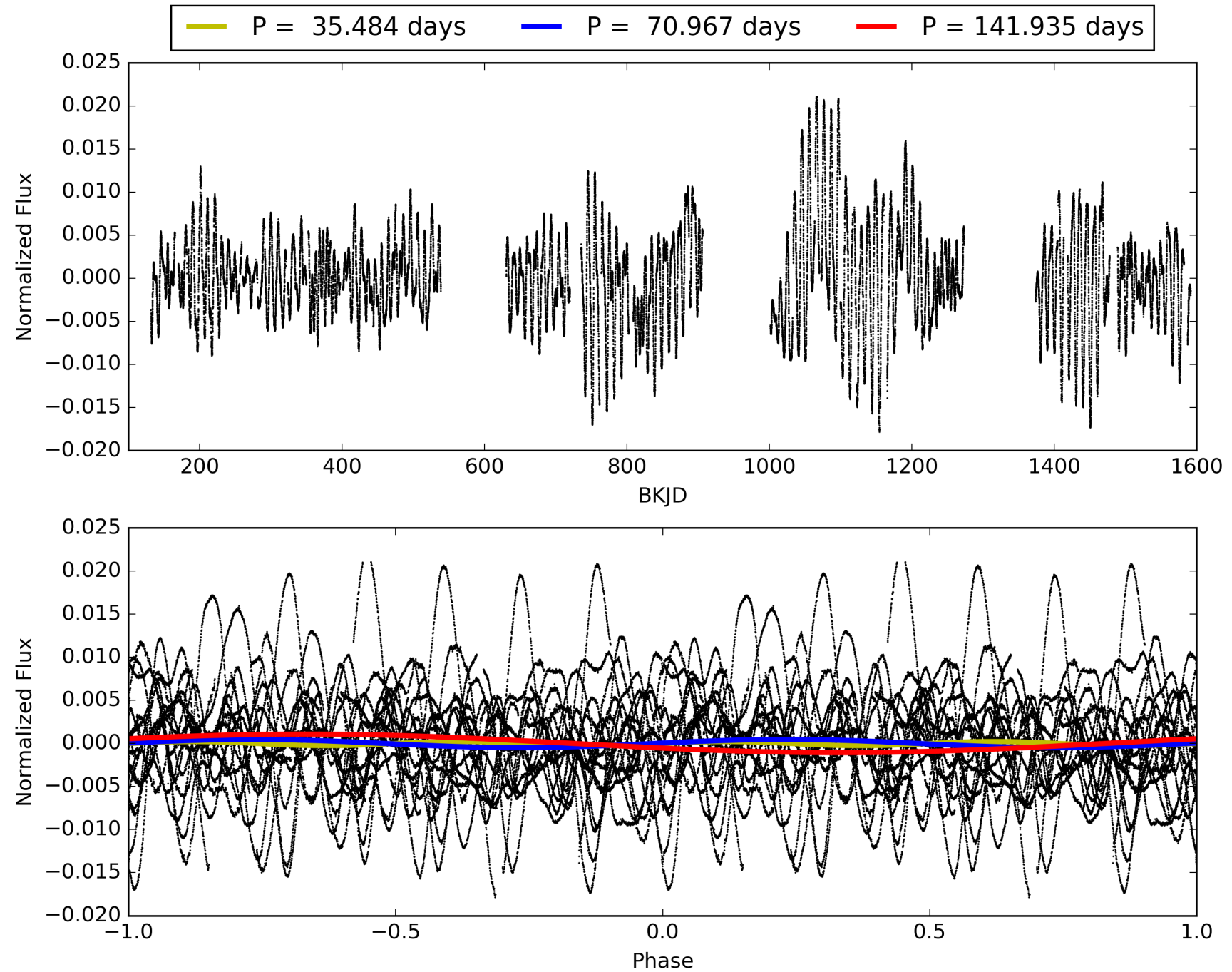
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:41:53 Z

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

TCE 004472818-01, PDC Light Curves

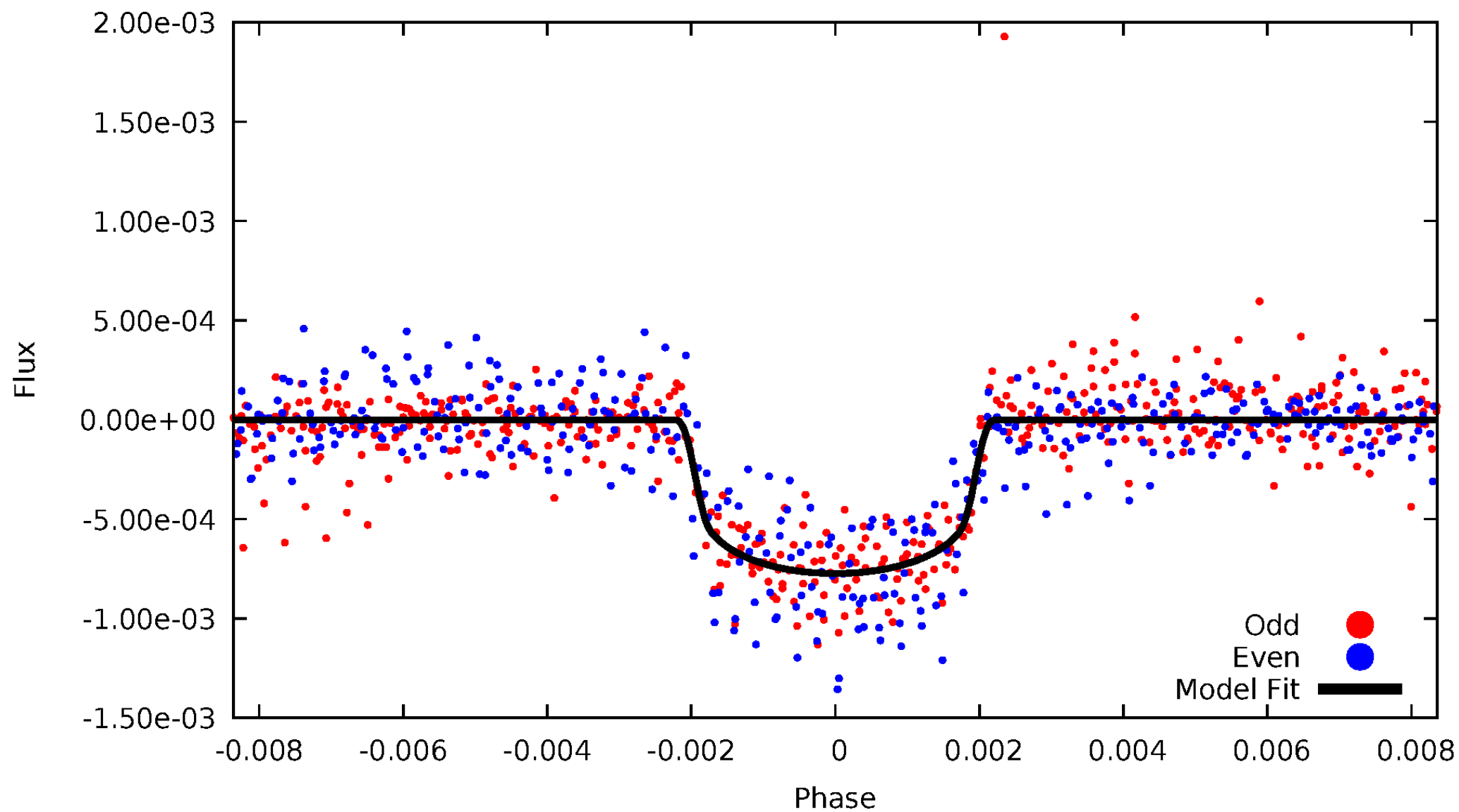


TCE 004472818-01



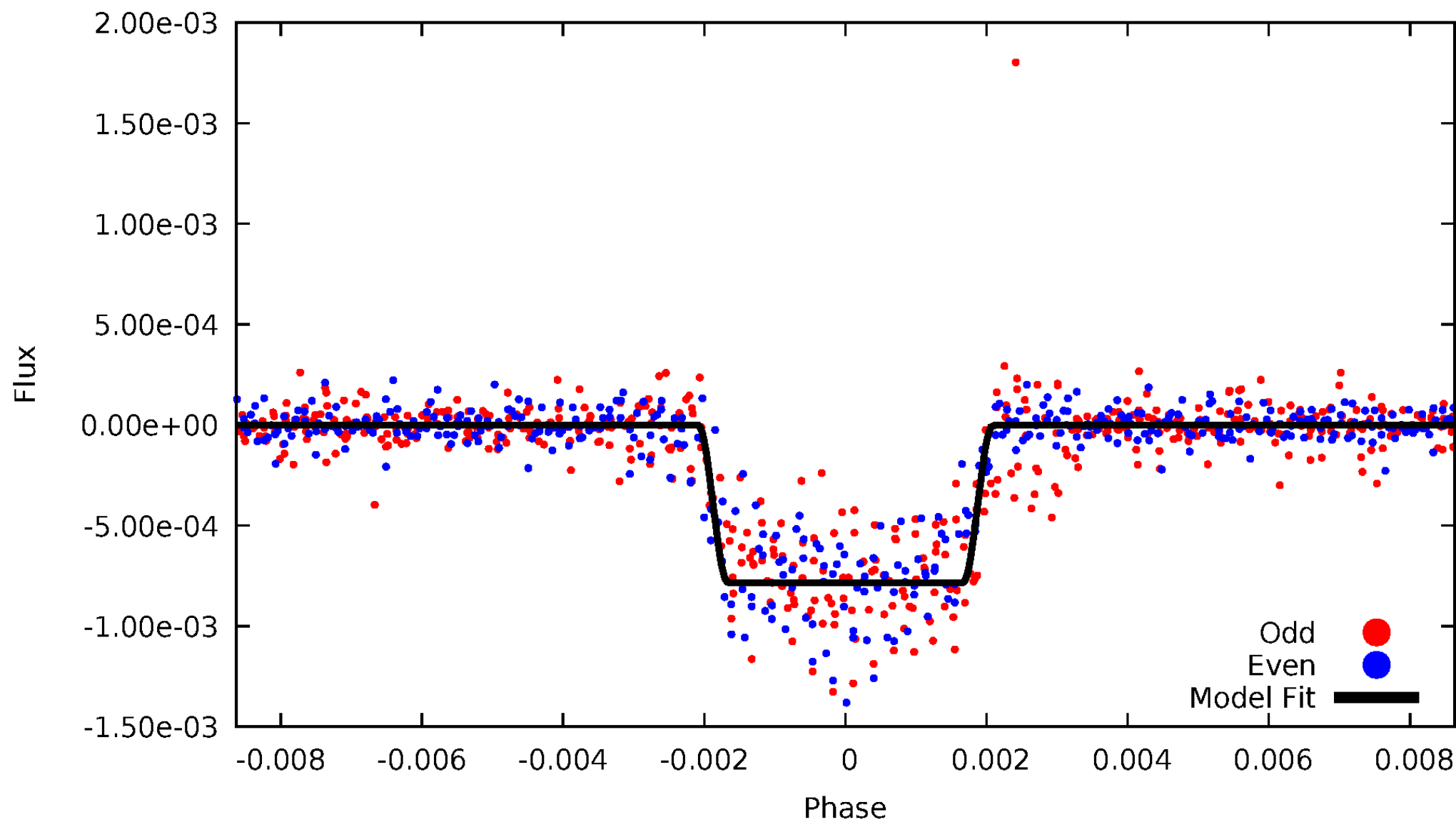
DV Odd/Even

TCE 004472818-01



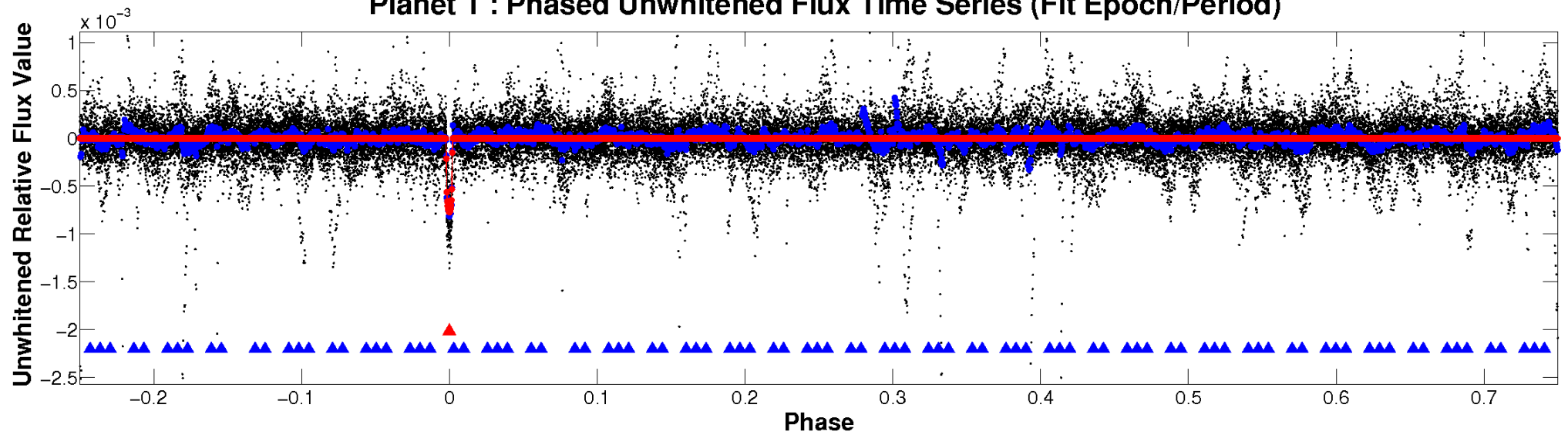
ALT Odd/Even

TCE 004472818-01

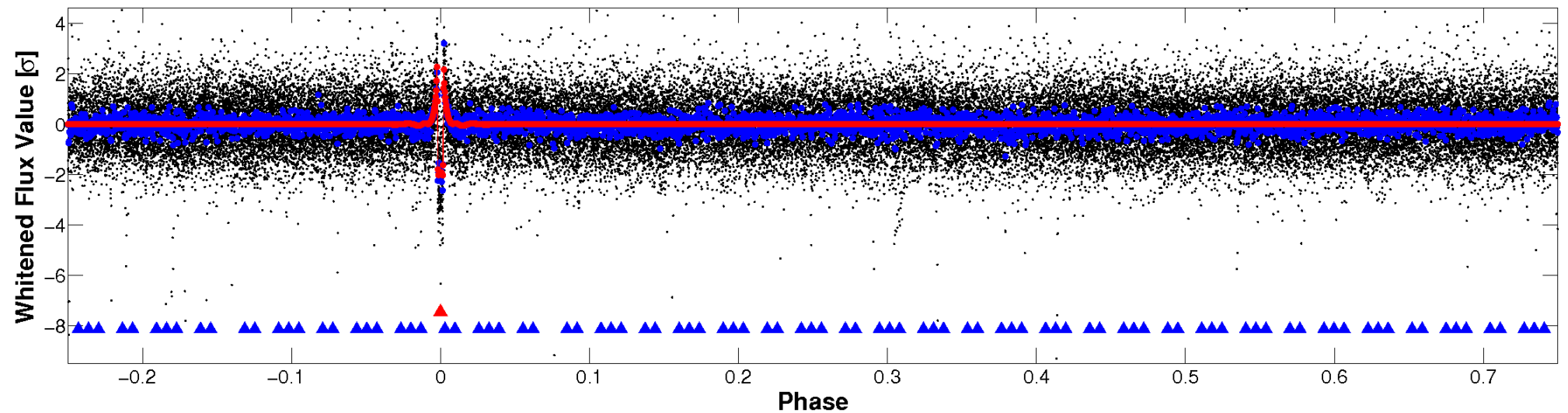


Non-Whitened Vs. Whitened Light Curve

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

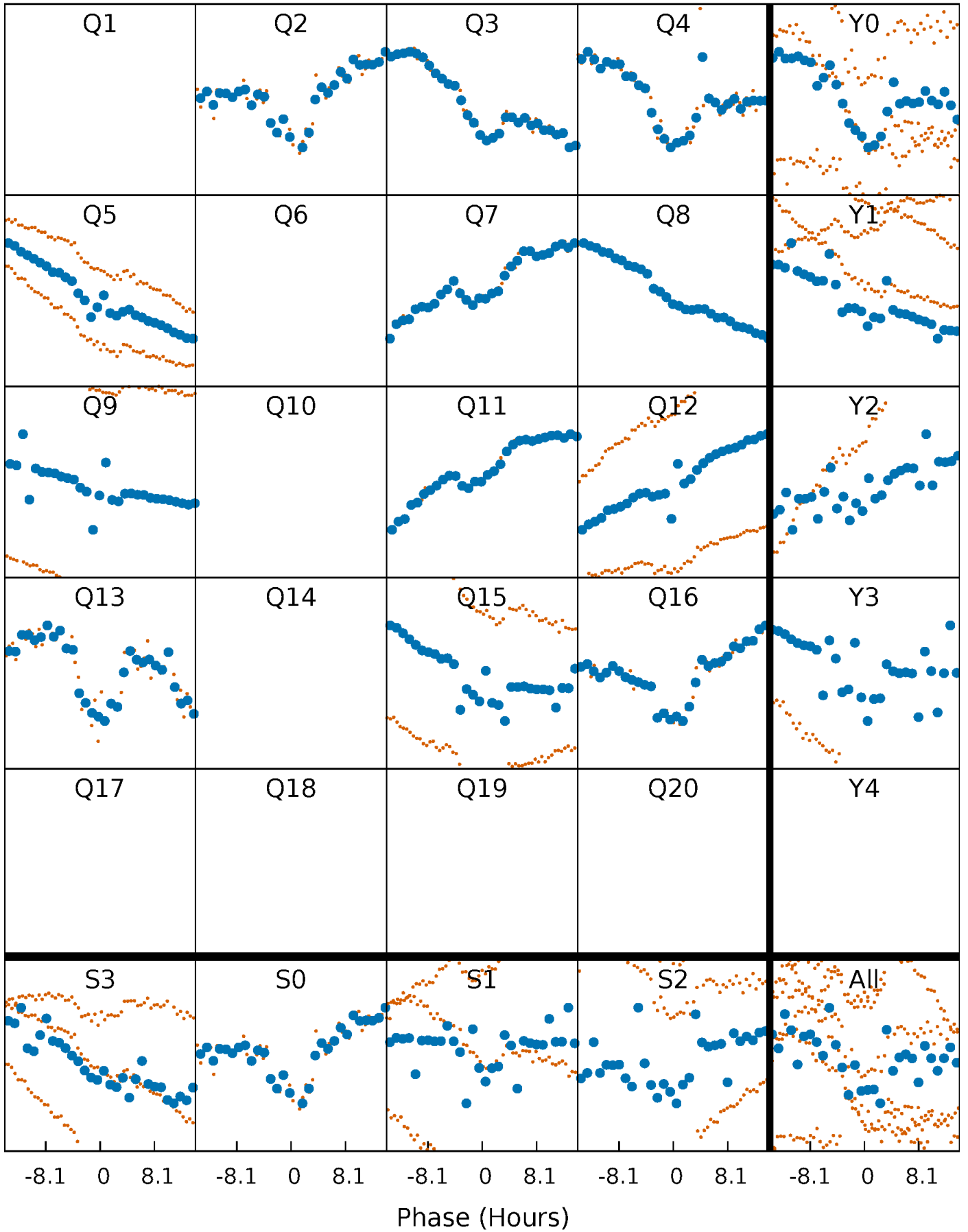


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



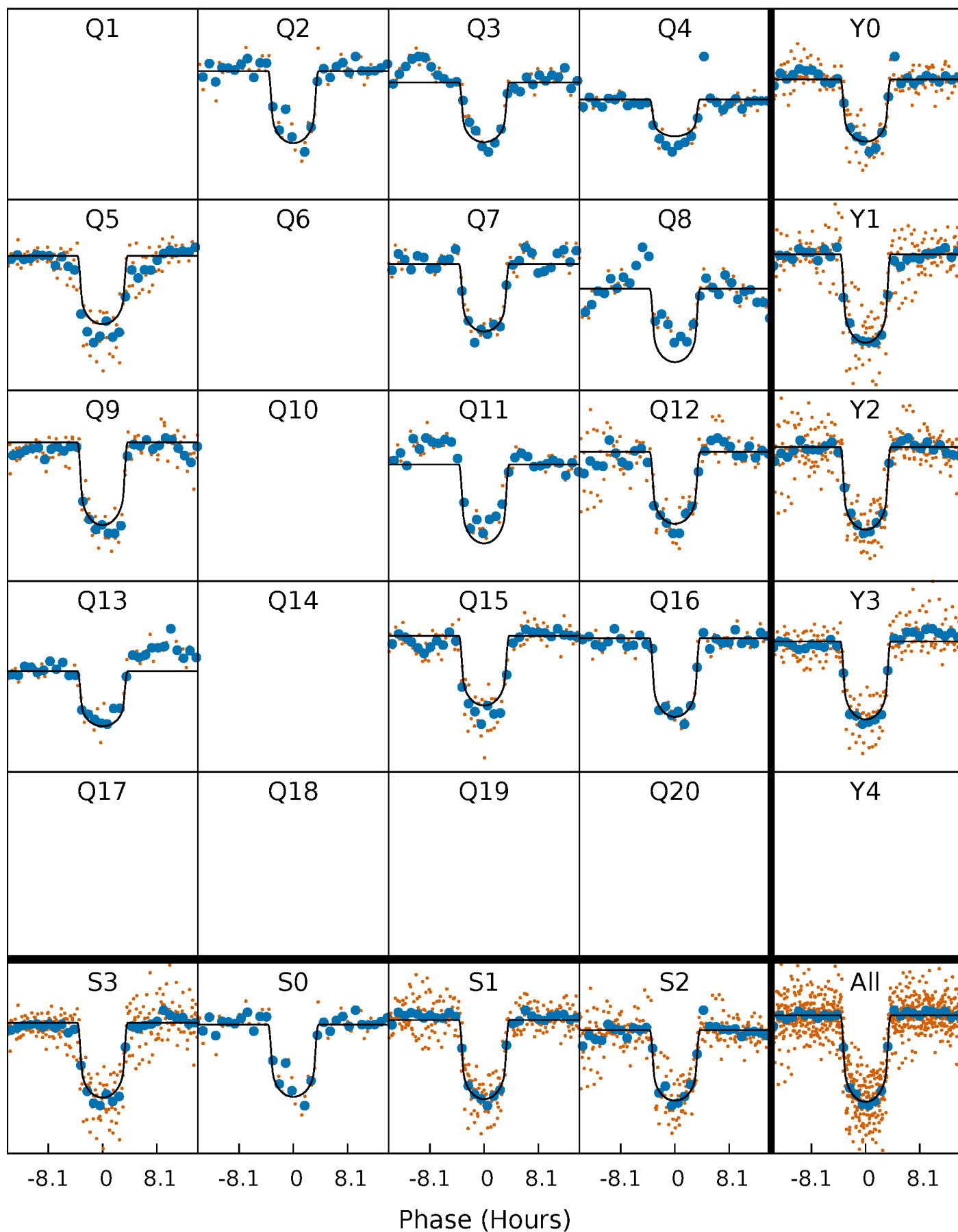
PDC Quarter-Phased Transit Curves

TCE 004472818-01 P= 70.967394 Days $T_0=182.666782$ (BKJD)



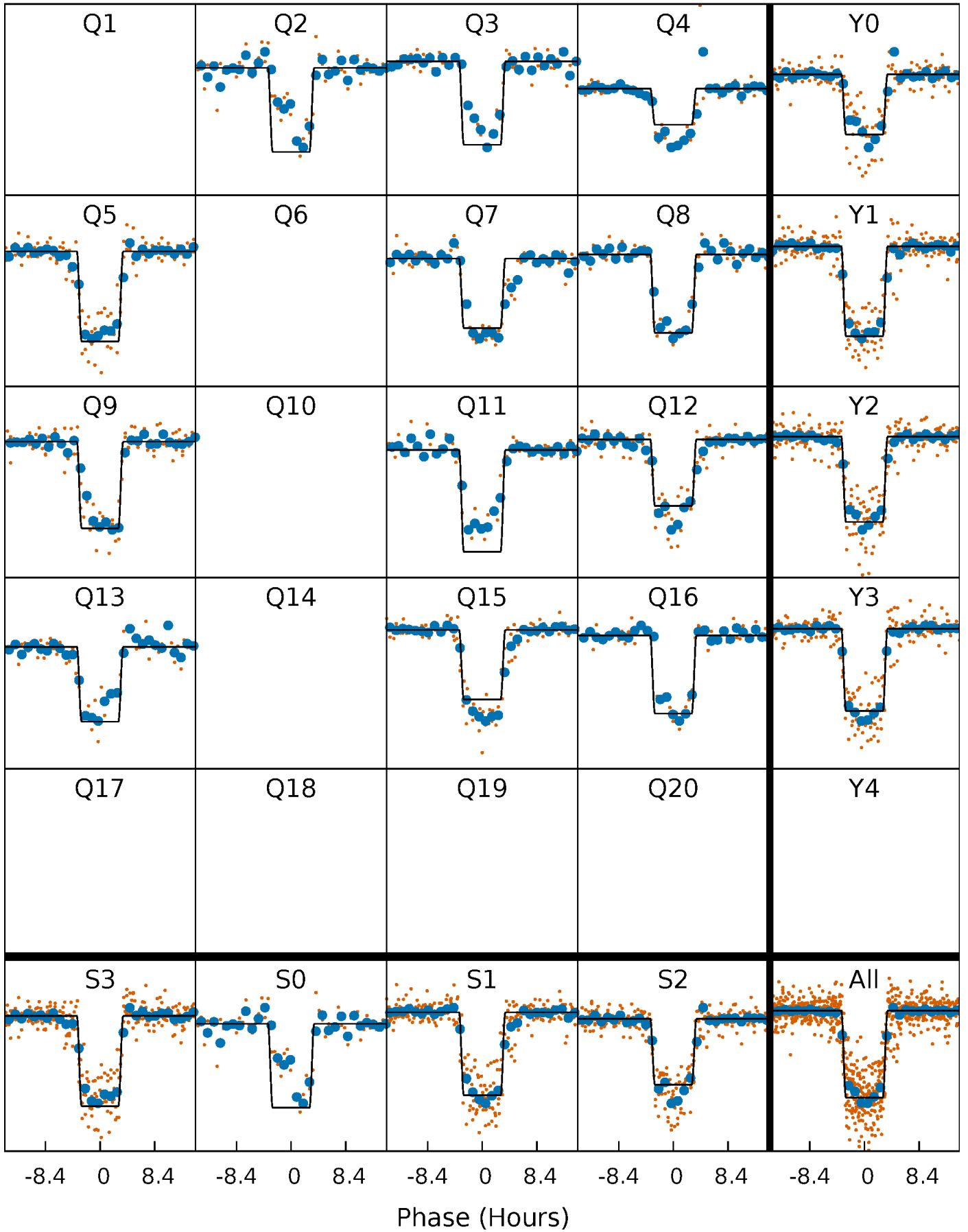
DV Quarter-Phased Transit Curves

TCE 004472818-01 P= 70.967394 Days $T_0=182.666782$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

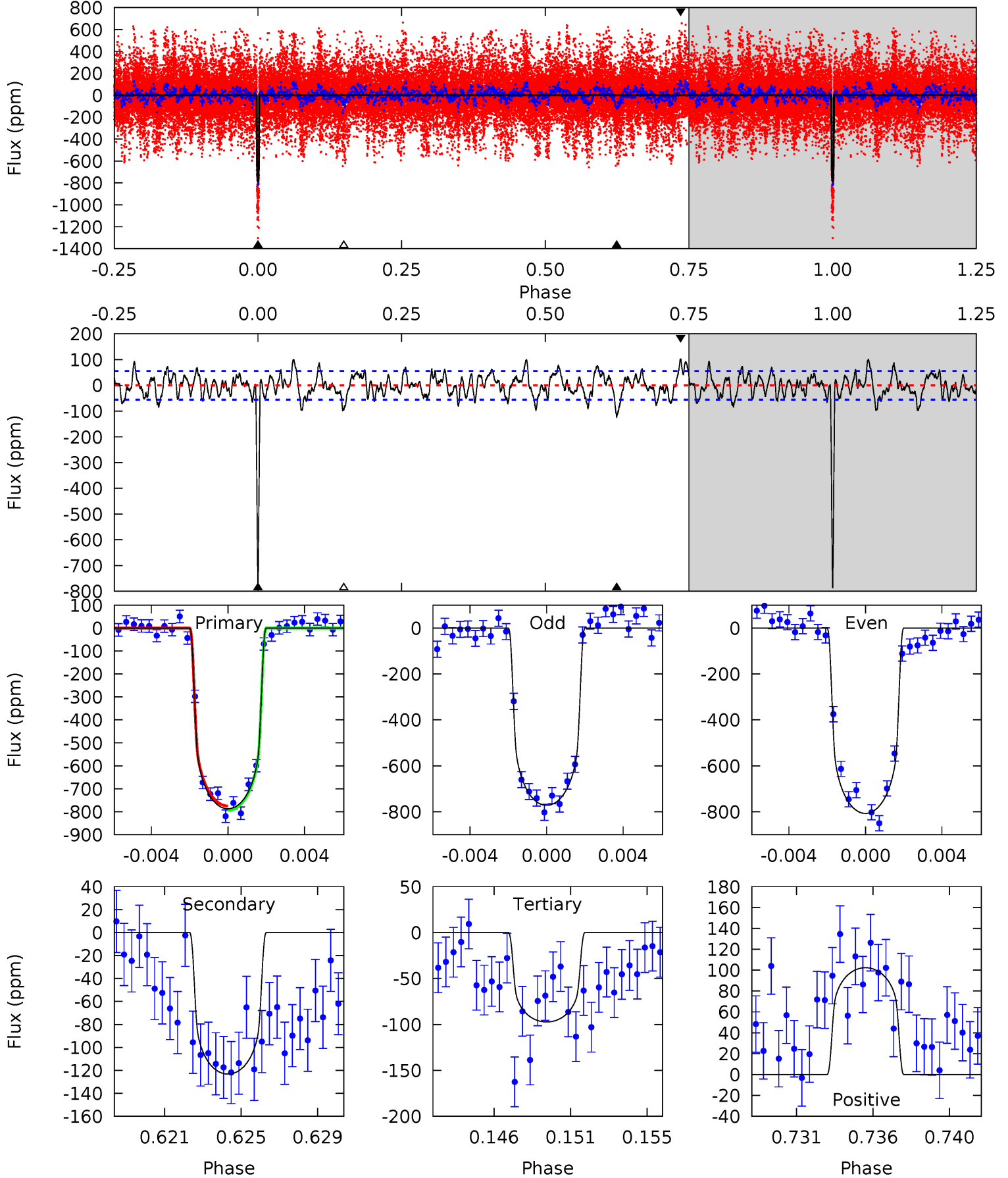
TCE 004472818-01 P= 70.967785 Days $T_0=182.660990$ (BKJD)



DV Model-Shift Uniqueness Test

004472818-01, P = 70.967394 Days, E = 111.699388 Days

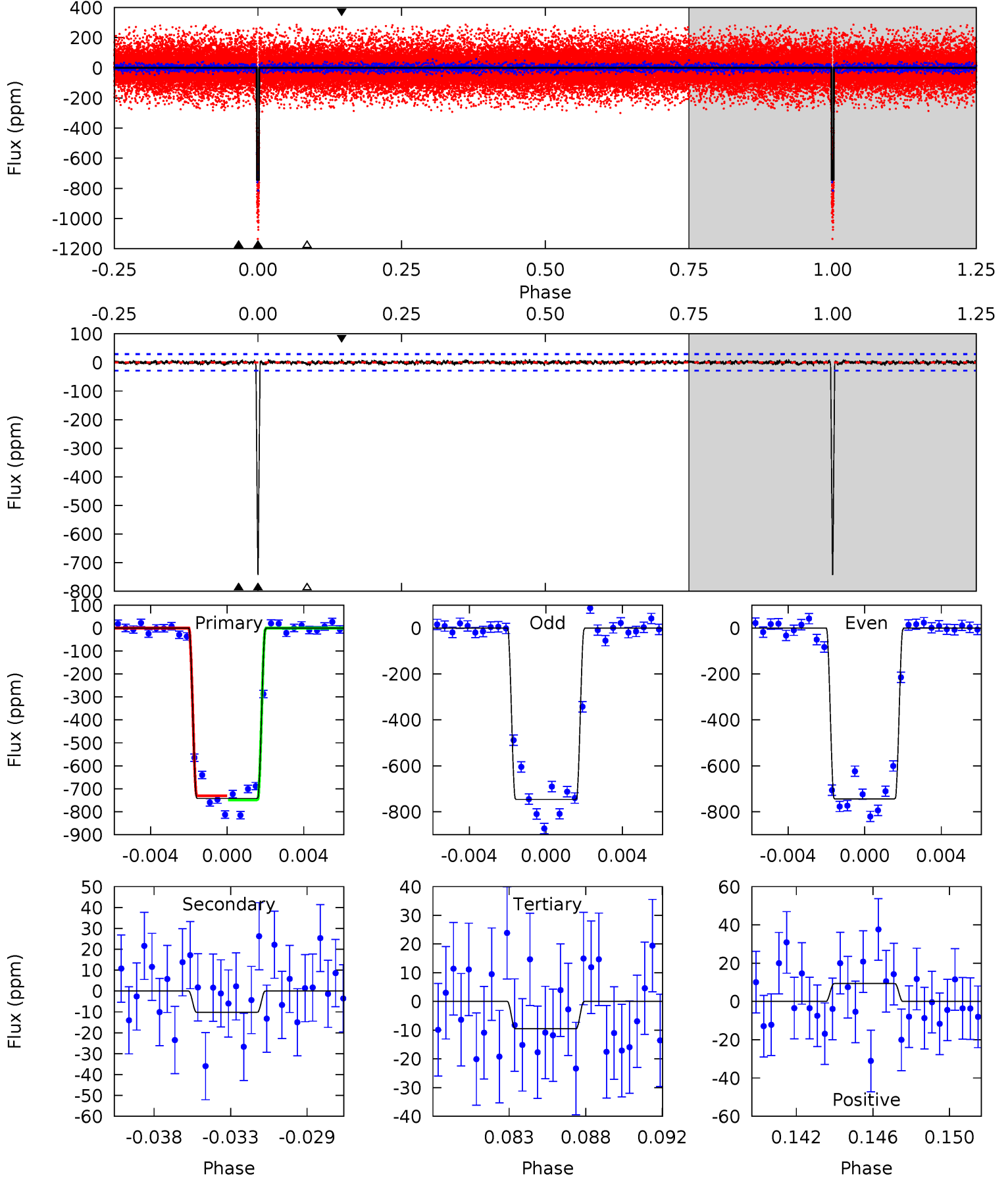
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
72.8	11.4	9.01	9.47	5.18	2.85	3.45	63.8	63.4	2.40	1.94	1.62	1.02	0.12	0.87



Alt Model-Shift Uniqueness Test

004472818-01, P = 70.967785 Days, E = 111.693205 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
134.0	1.84	1.72	1.68	5.19	2.86	0.50	132.3	132.3	0.12	0.16	0.15	1.00	0.01	1.53



Stellar Parameters For KIC 004472818

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5818^{+78}_{-78}	$4.464^{+0.040}_{-0.120}$	$0.100^{+0.150}_{-0.150}$	$0.986^{+0.148}_{-0.053}$	$1.032^{+0.057}_{-0.063}$	$1.518^{+0.226}_{-0.518}$
	+1%/-1%	+1%/-3%	+150%/-150%	+15%/-5%	+6%/-6%	+15%/-34%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 004472818-01 / KOI 3878.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-123 ± 11	$3.02^{+0.27}_{-0.24}$	617^{+24}_{-15}	4011^{+127}_{-122}	844^{+172}_{-148}
Alt.	-10 ± 6	$3.08^{+0.28}_{-0.24}$	616^{+23}_{-13}	2730^{+175}_{-259}	67^{+39}_{-36}

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 $A_{obs} \gg 1.0$

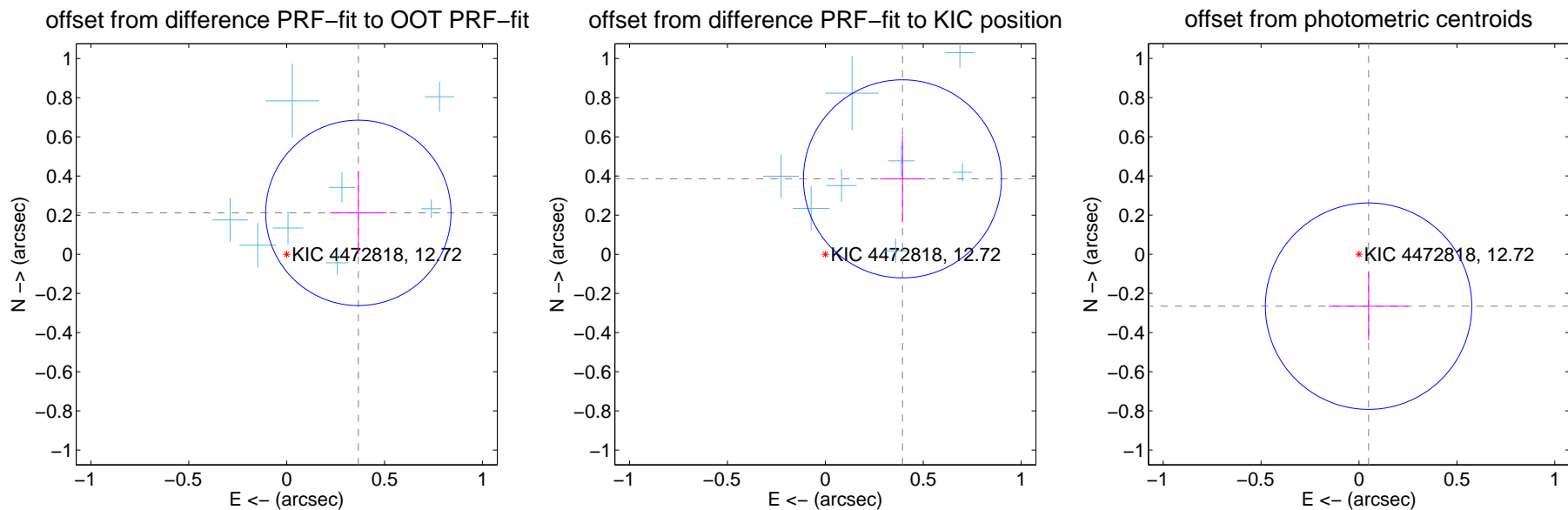
DV Centroid Data

Supplemental centroid analysis for 004472818-01. Kepler magnitude: 12.72. Transit SNR 34.54

There are 9 quarters with good PRF difference image offsets

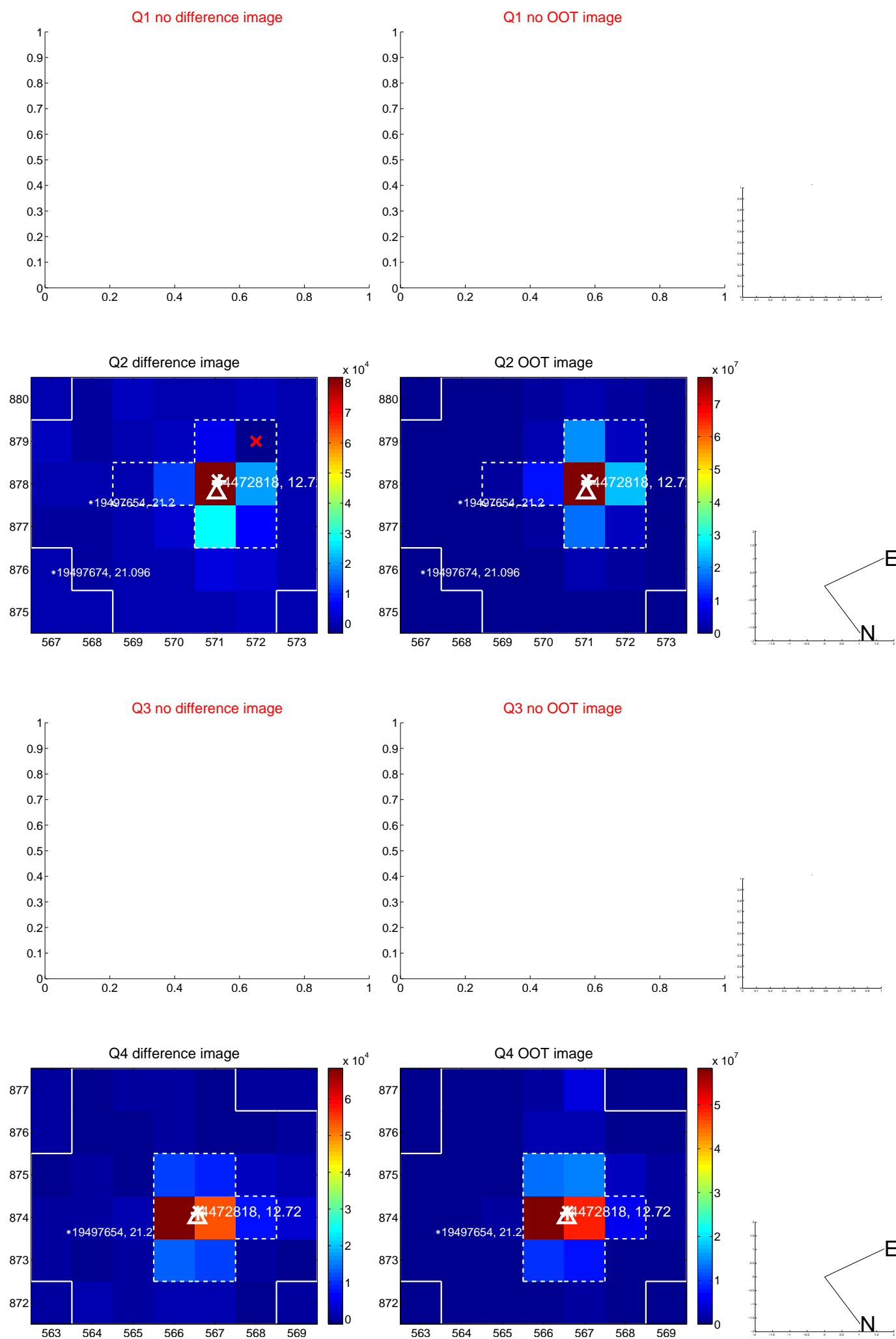
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.423 ± 0.158	2.68	-0.366 ± 0.145	0.211 ± 0.211
PRF-fit source offset from KIC position	0.551 ± 0.169	3.27	-0.394 ± 0.115	0.385 ± 0.222
photometric centroid source offset	0.27 ± 0.18	1.54	-0.05 ± 0.20	-0.27 ± 0.17

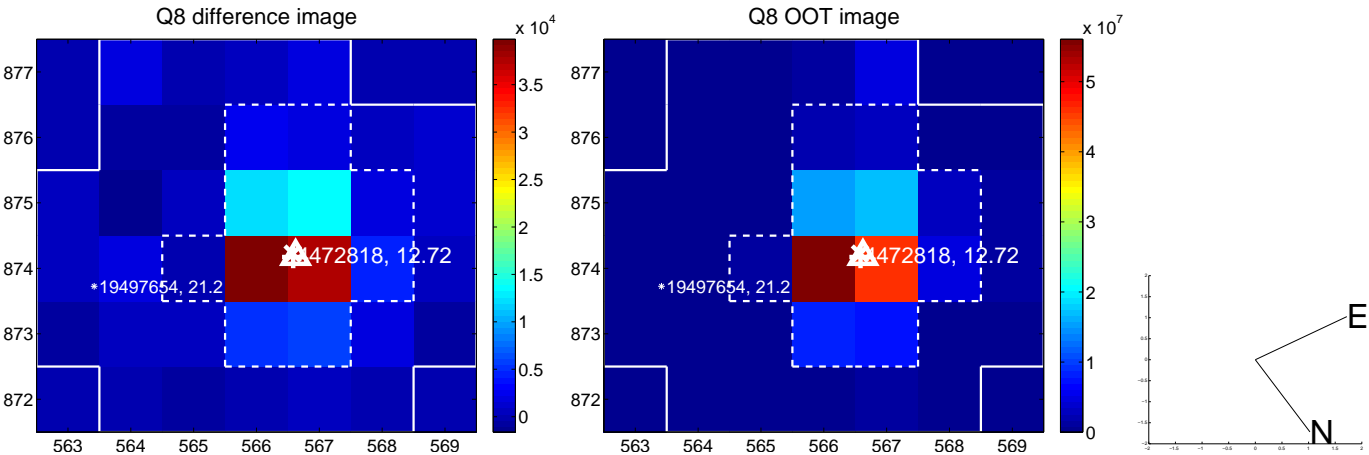
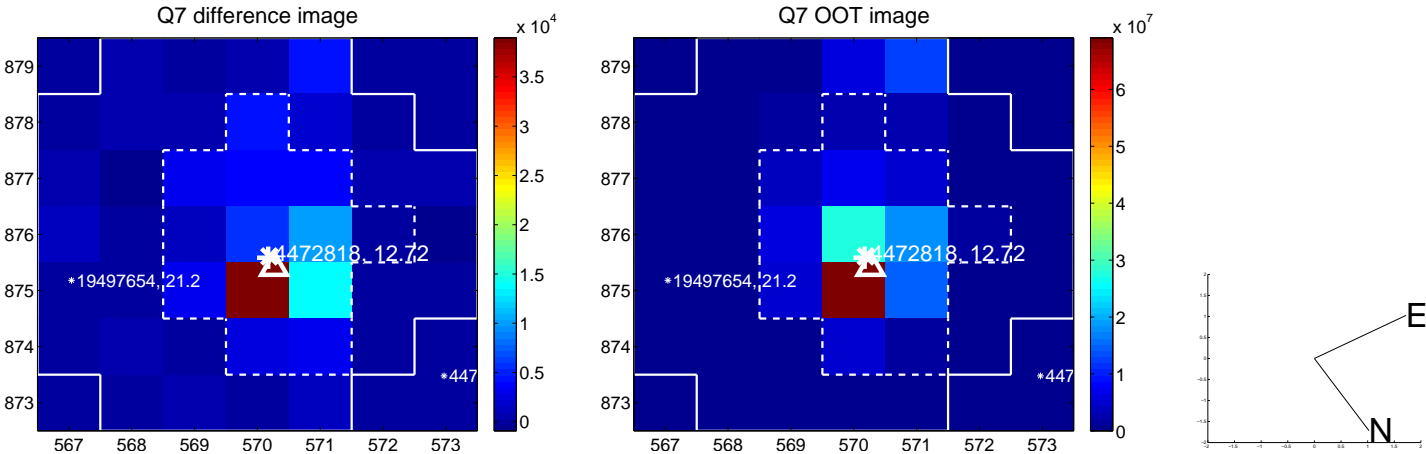
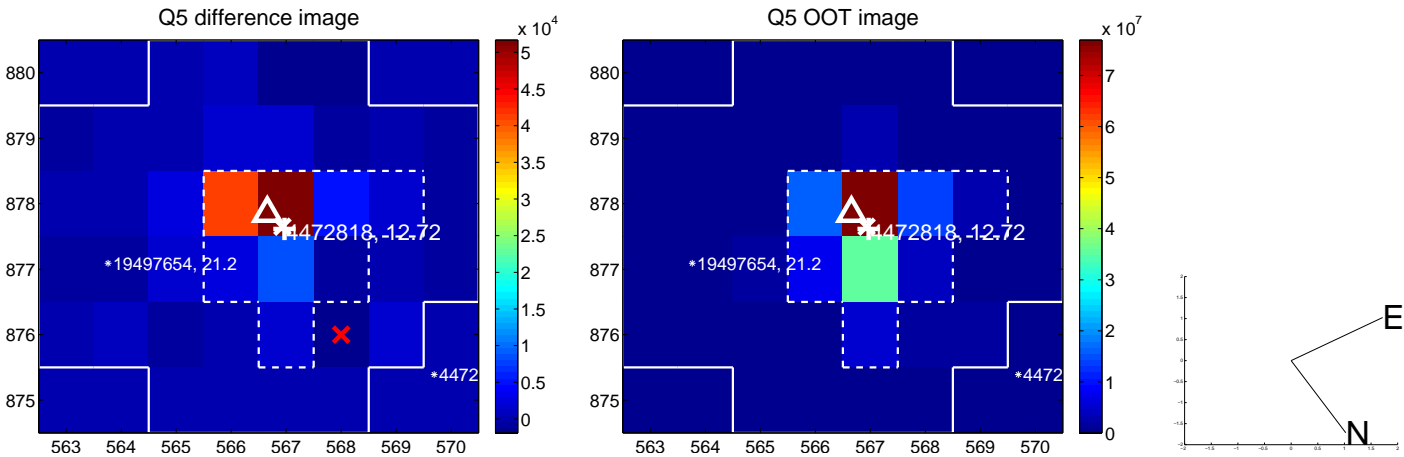


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

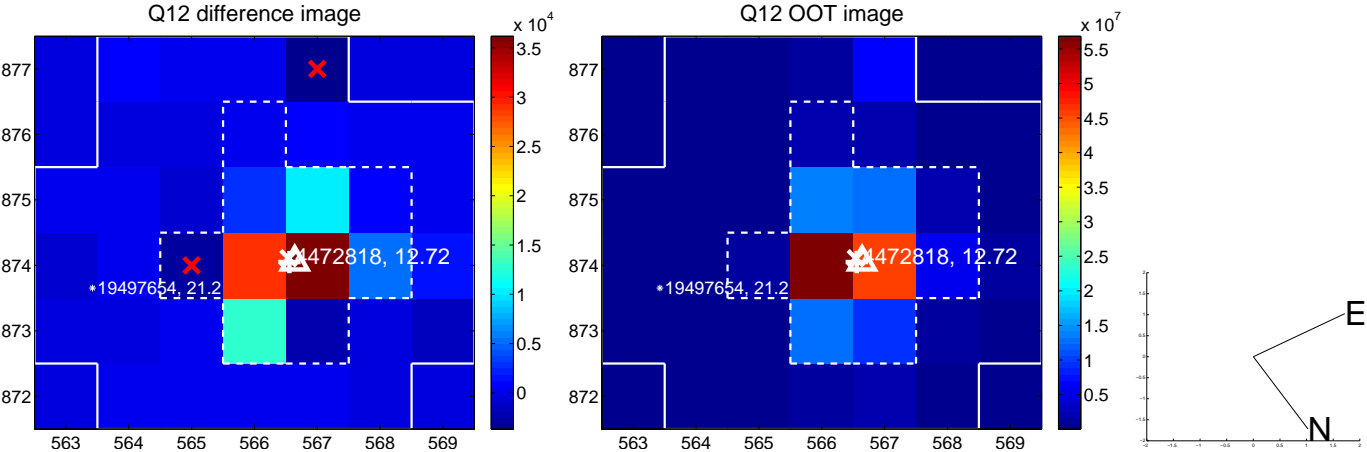
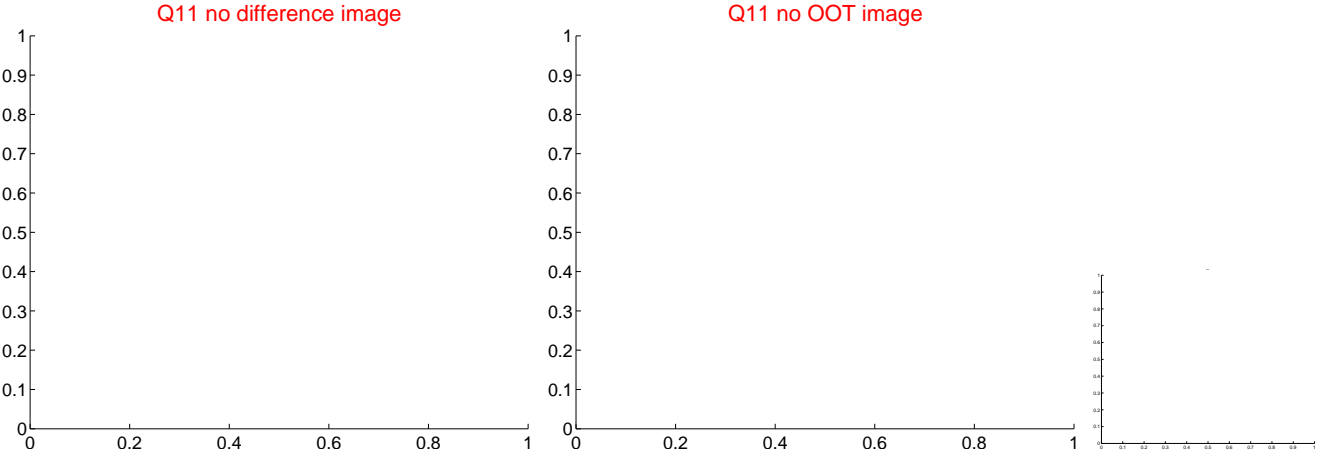
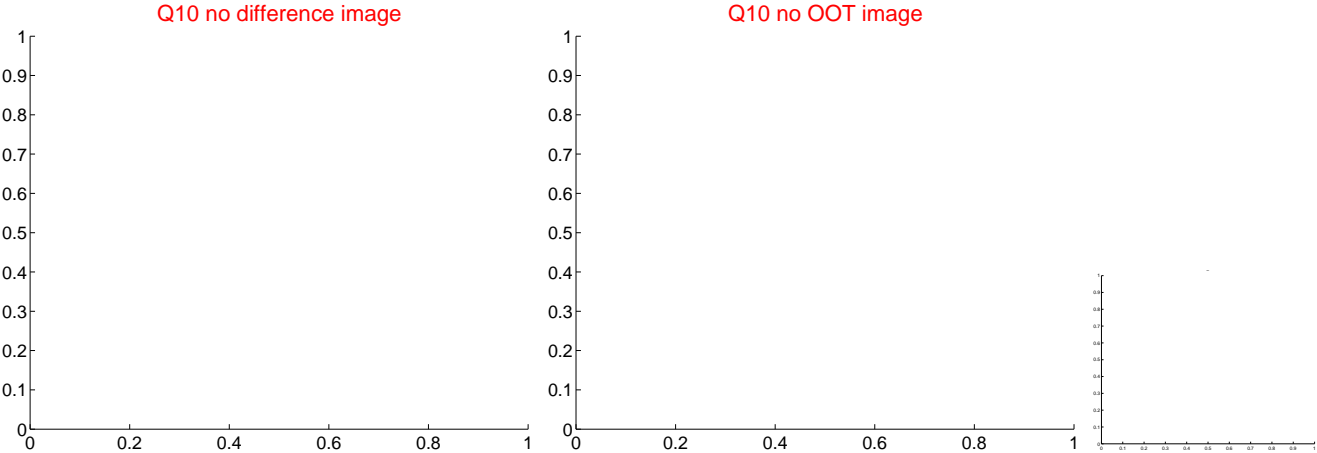
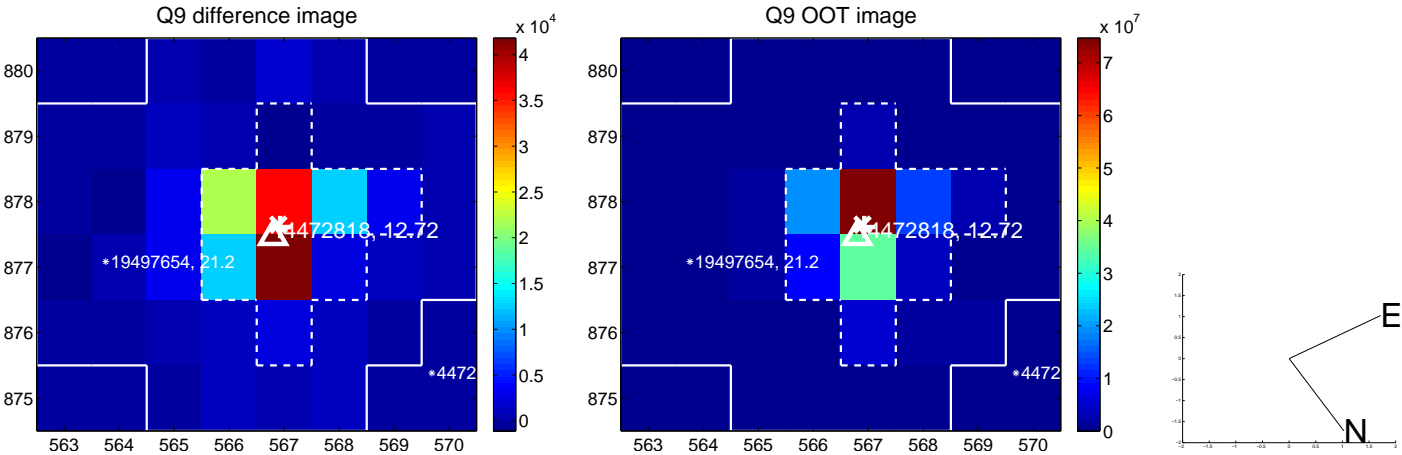
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

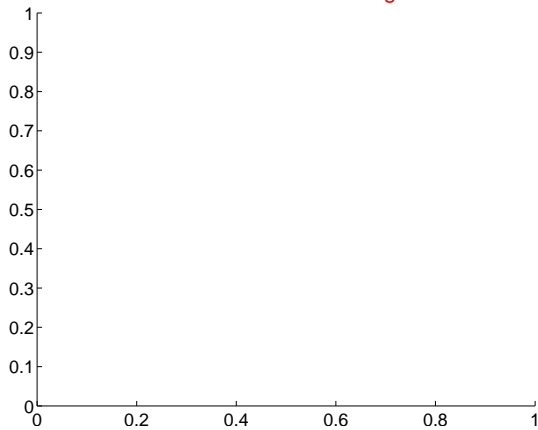


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

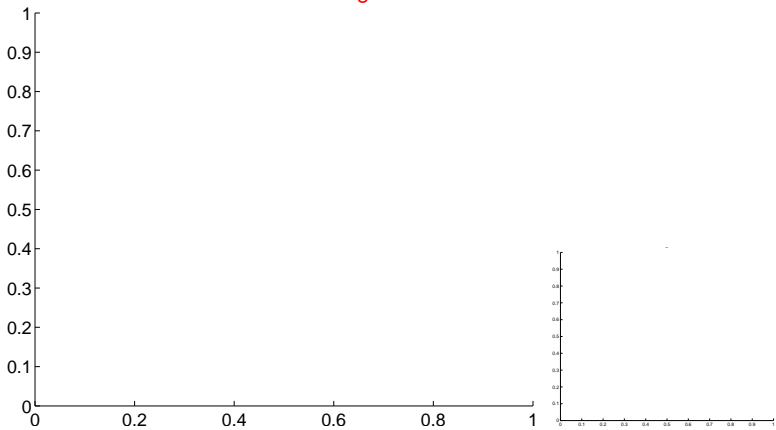


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

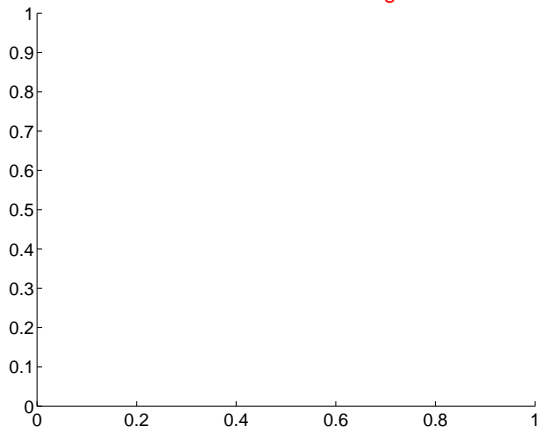
Q13 no difference image



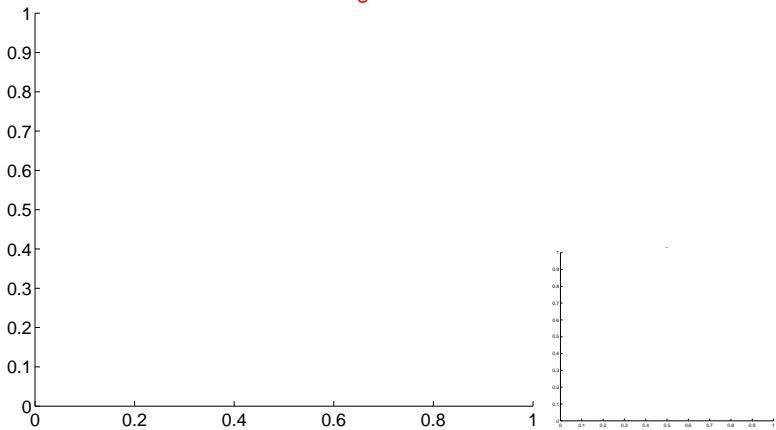
Q13 no OOT image



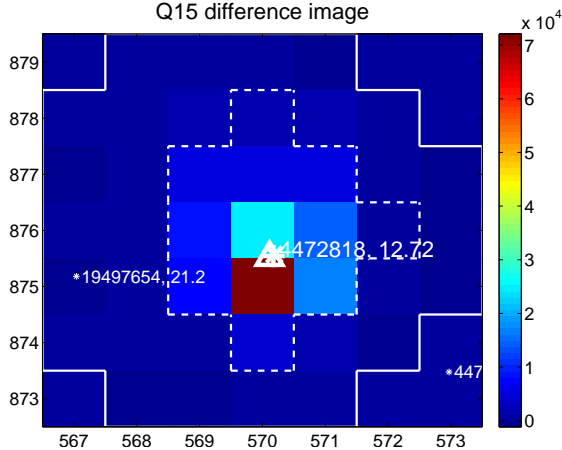
Q14 no difference image



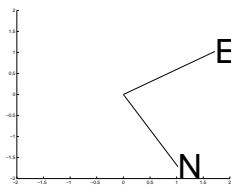
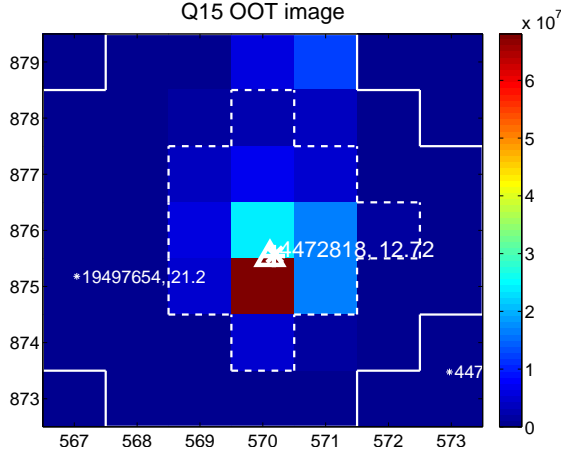
Q14 no OOT image



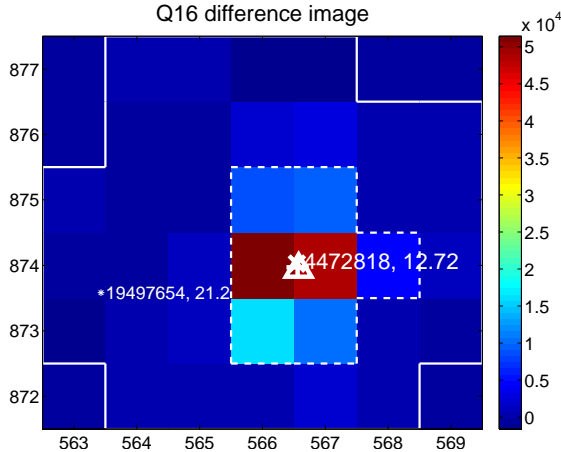
Q15 difference image



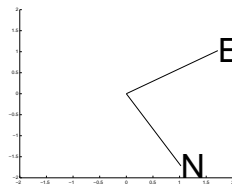
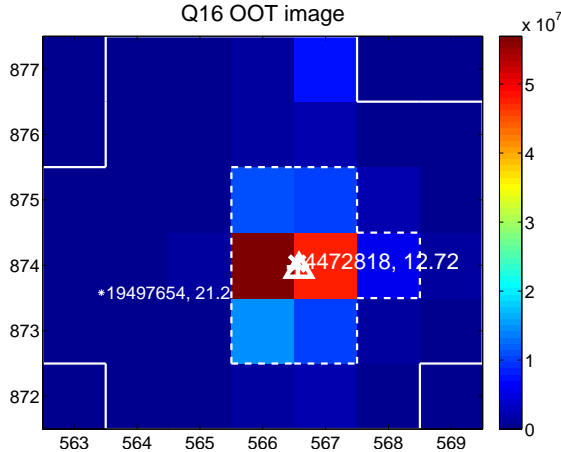
Q15 OOT image



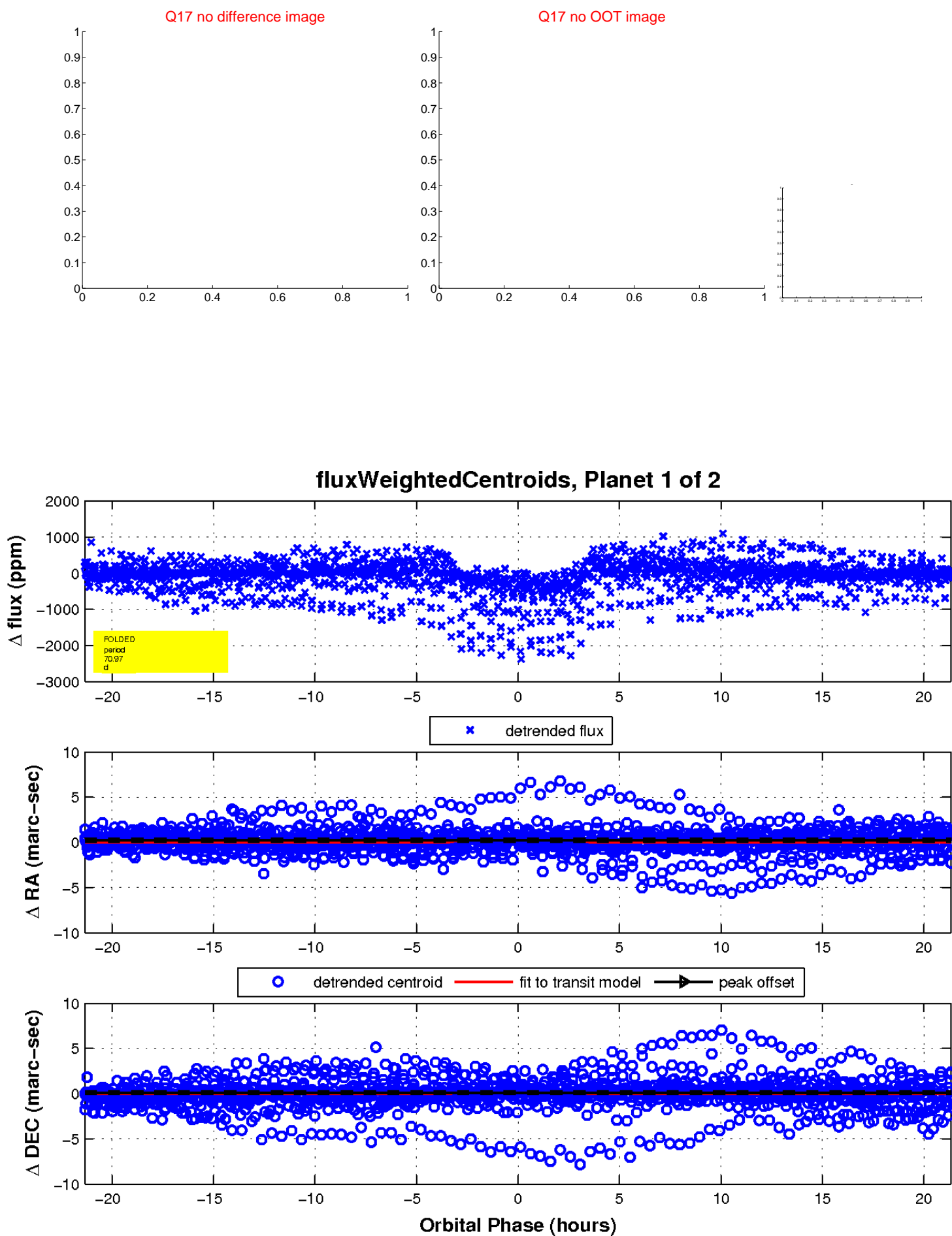
Q16 difference image



Q16 OOT image

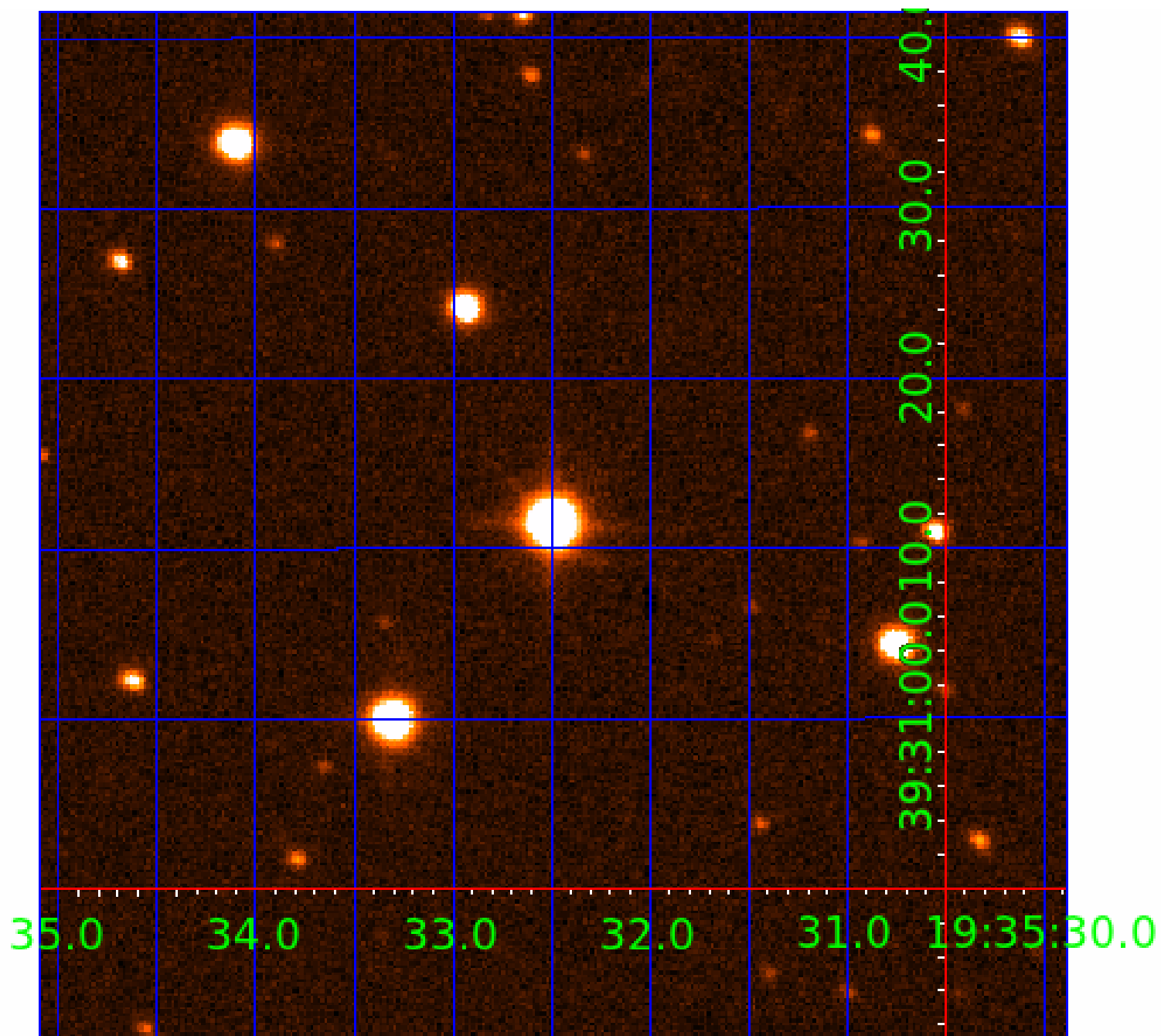


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004472818

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})
004472818-01	OBS	3878.01	70.967394	182.666782	773.9	7.114	31.7	34.5	0.99	5818	2.96	8.68
004472818-02	OBS	3878.02	15.357244	132.607878	113.3	1.922	9.7	11.0	0.99	5818	1.20	66.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004472818-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
004472818-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

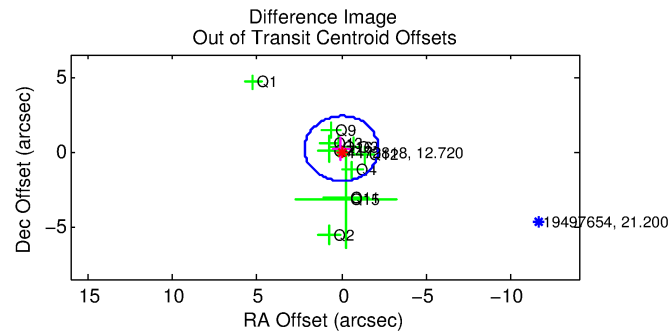
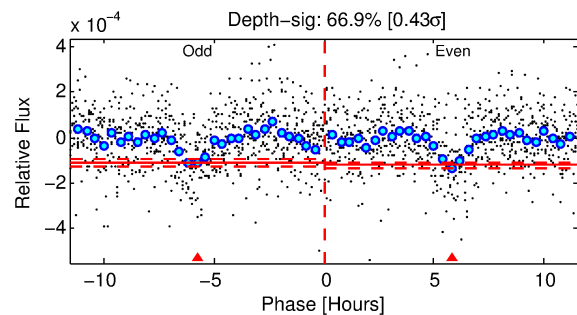
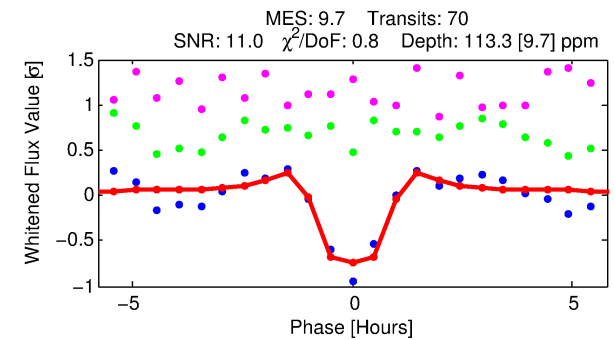
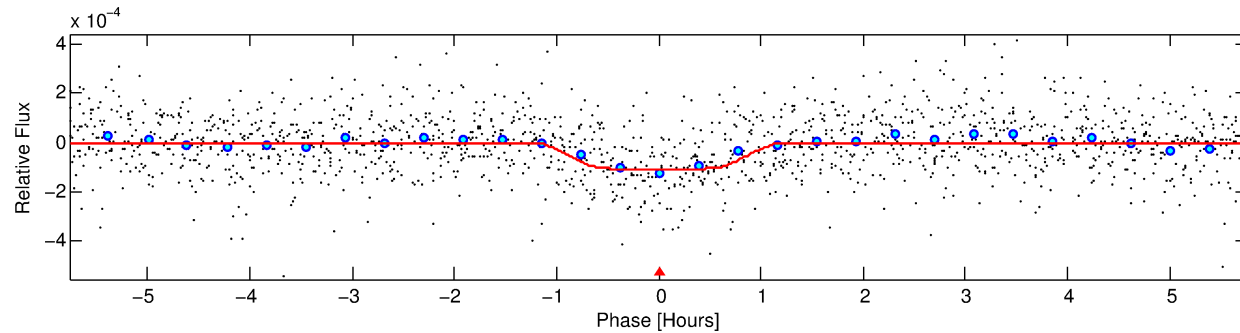
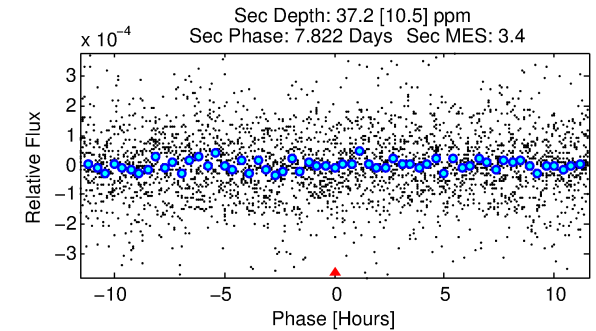
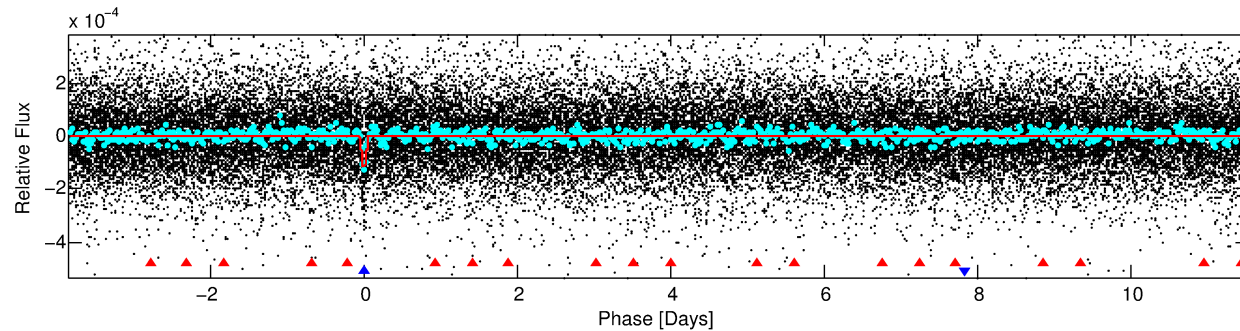
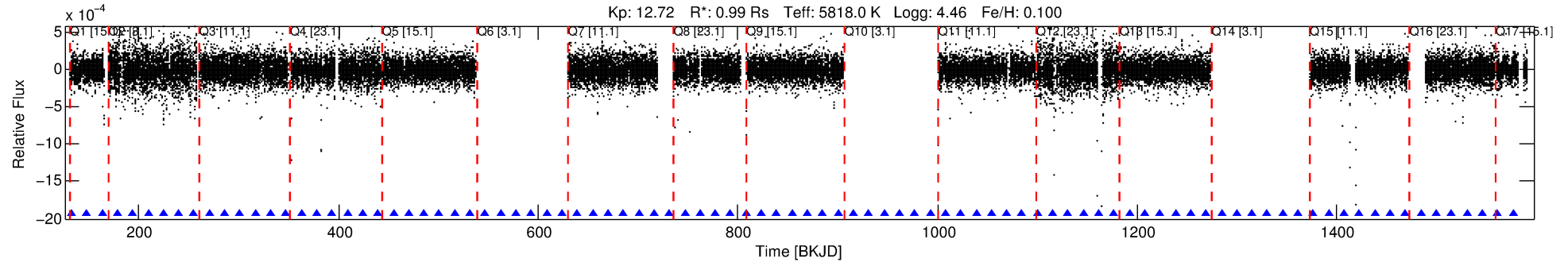
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004472818-02

No Significant Match Found

DV One-Page Summary

KIC: 4472818 Candidate: 2 of 2 Period: 15.357 d
KOI: K03878.02 Corr: 0.927



DV Fit Results:

Period = 15.35724 [0.00006] d
Epoch = 132.6079 [0.0033] BKJD
Rp/R* = 0.0111 [0.0065]
a/R* = 33.81 [90.05]
b = 0.85 [0.91]
Seff = 66.81 [14.46]
Teff = 729 [39] K
Rp = 1.20 [0.72] Re
a = 0.1222 [0.0166] AU
Ag = 213.04 [257.87] [0.82σ]
Teffp = 4306 [1285] K [2.78σ]

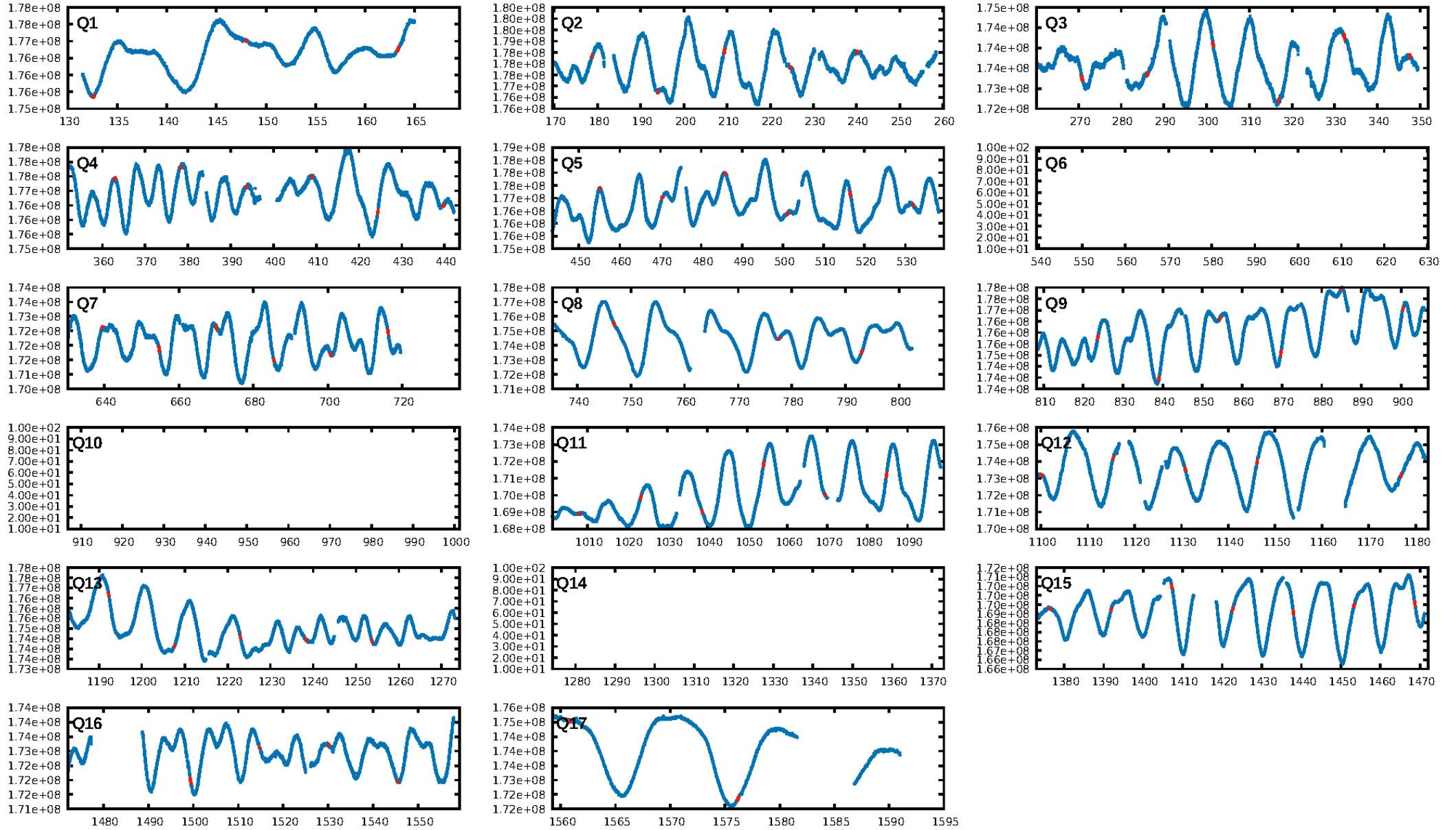
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [181.11σ]
ModelChiSquare2-sig: 95.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.58e-17
RollingBand-fgt: 1.00 [65/65]
GhostDiagnostic-chr: -0.9231
Centroid-sig: 46.3%
Centroid-so: 0.861 arcsec [0.97σ]
OotOffset-rm: 0.208 arcsec [0.29σ]
KicOffset-rm: 0.355 arcsec [0.50σ]
OotOffset-st: 1/4/3/3 [11]
KicOffset-st: 1/4/3/3 [11]
DiffImageQuality-fgm: 0.73 [8/11]
DiffImageOverlap-fno: 1.00 [14/14]

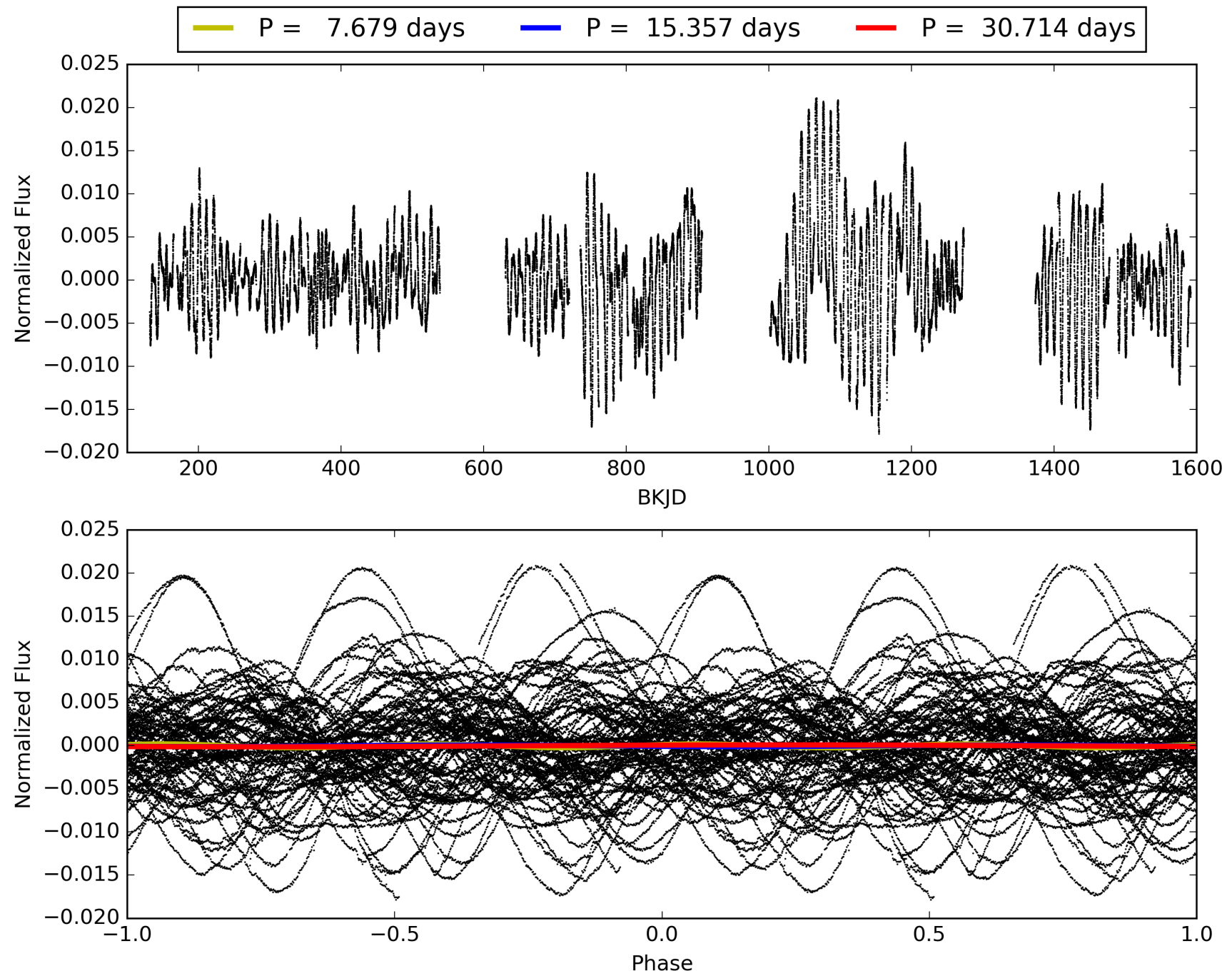
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:41:59 Z

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

TCE 004472818-02, PDC Light Curves

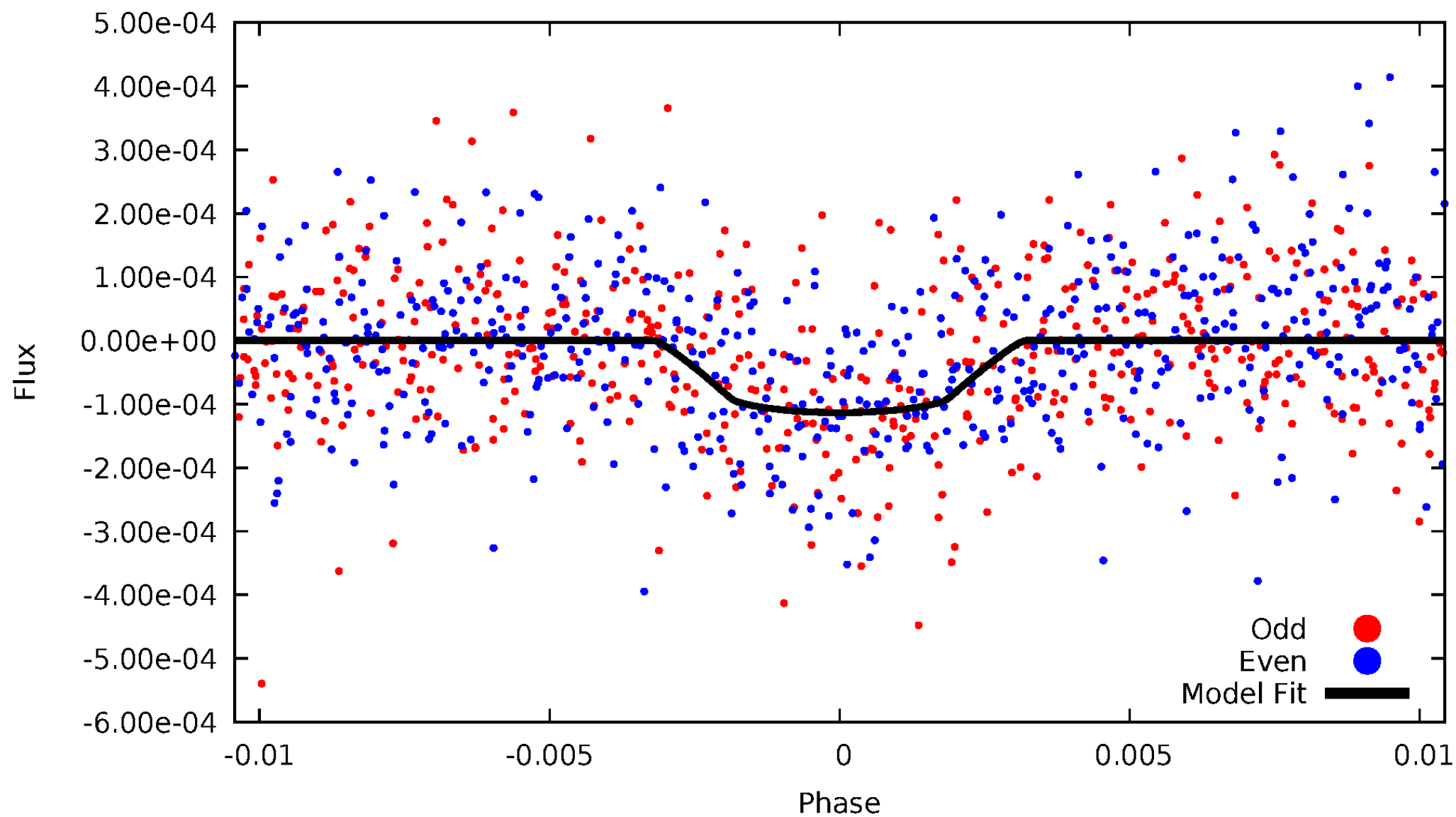


TCE 004472818-02



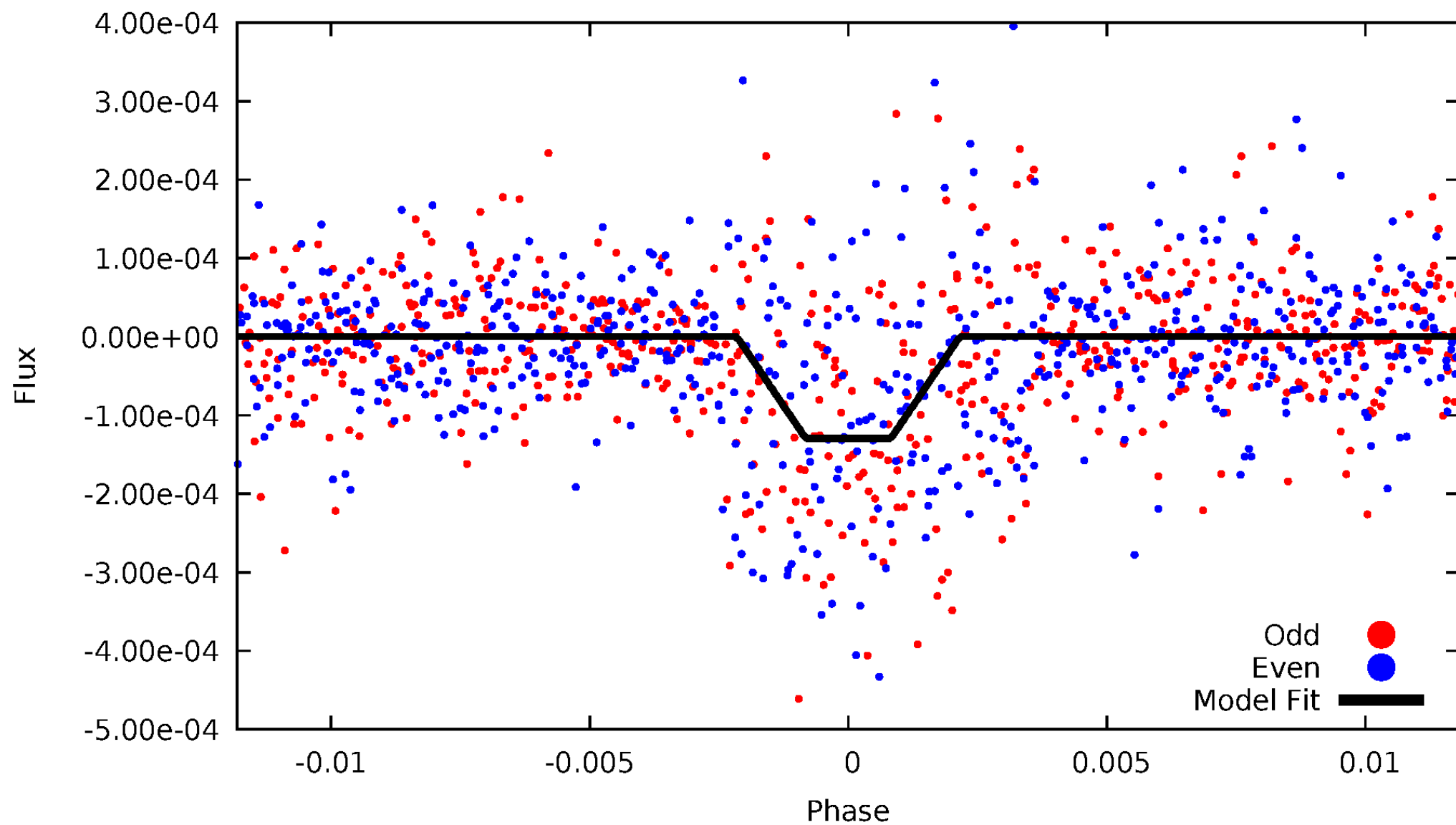
DV Odd/Even

TCE 004472818-02



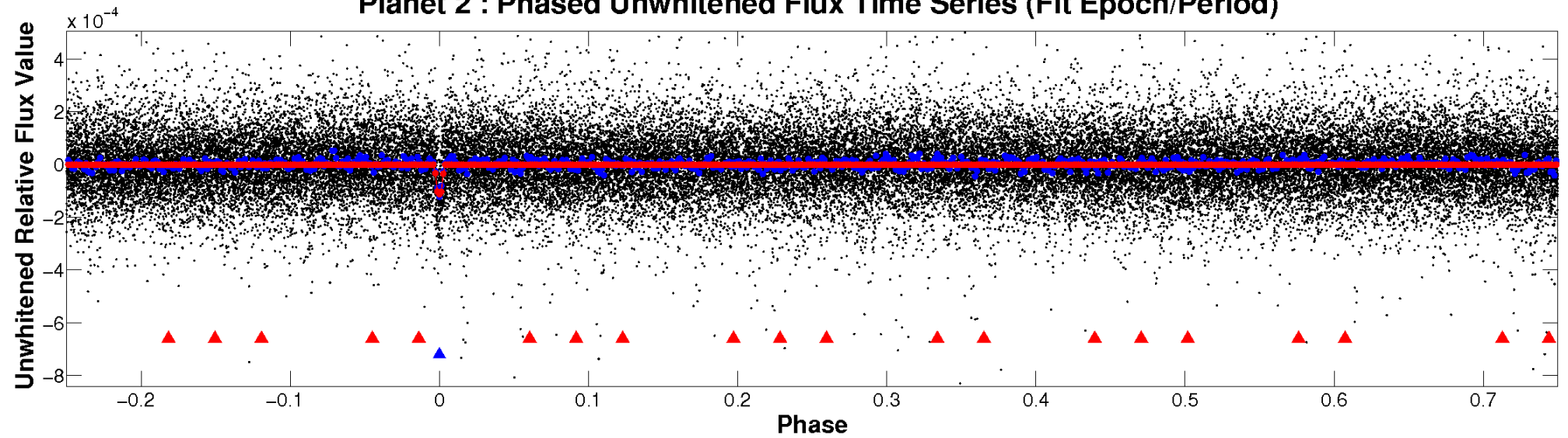
ALT Odd/Even

TCE 004472818-02

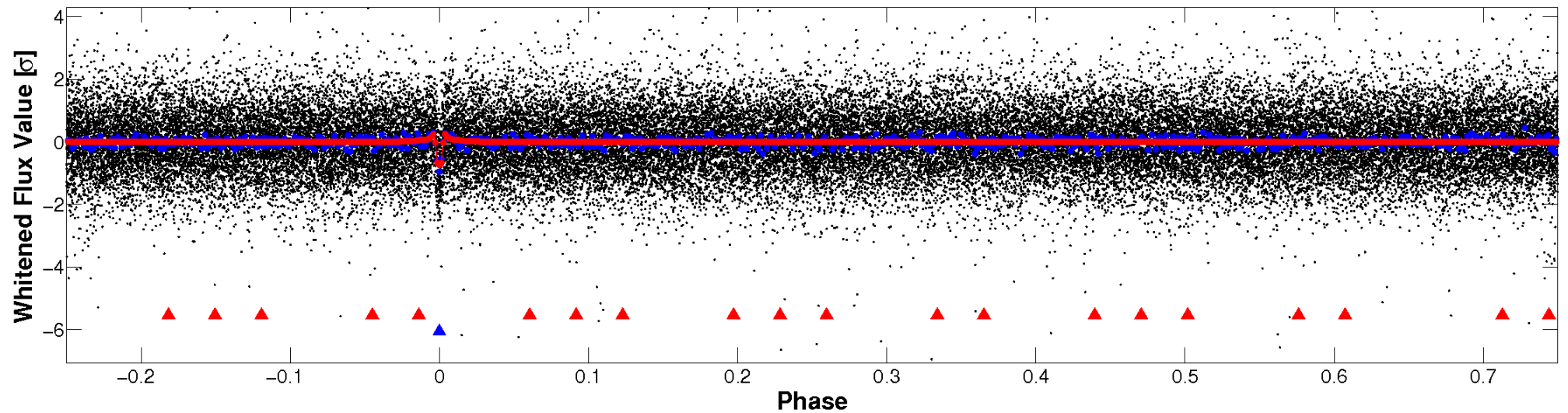


Non-Whitened Vs. Whitened Light Curve

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

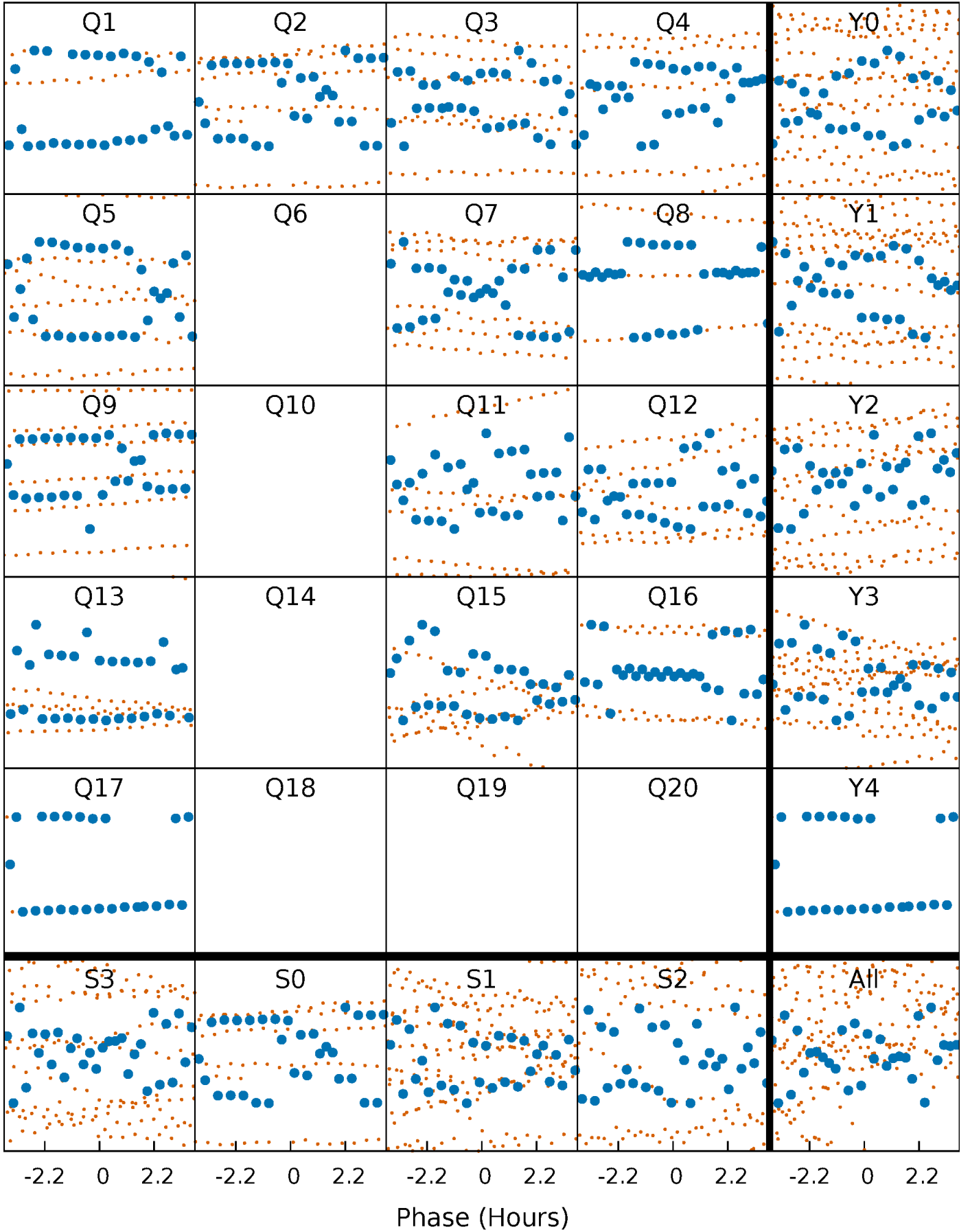


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



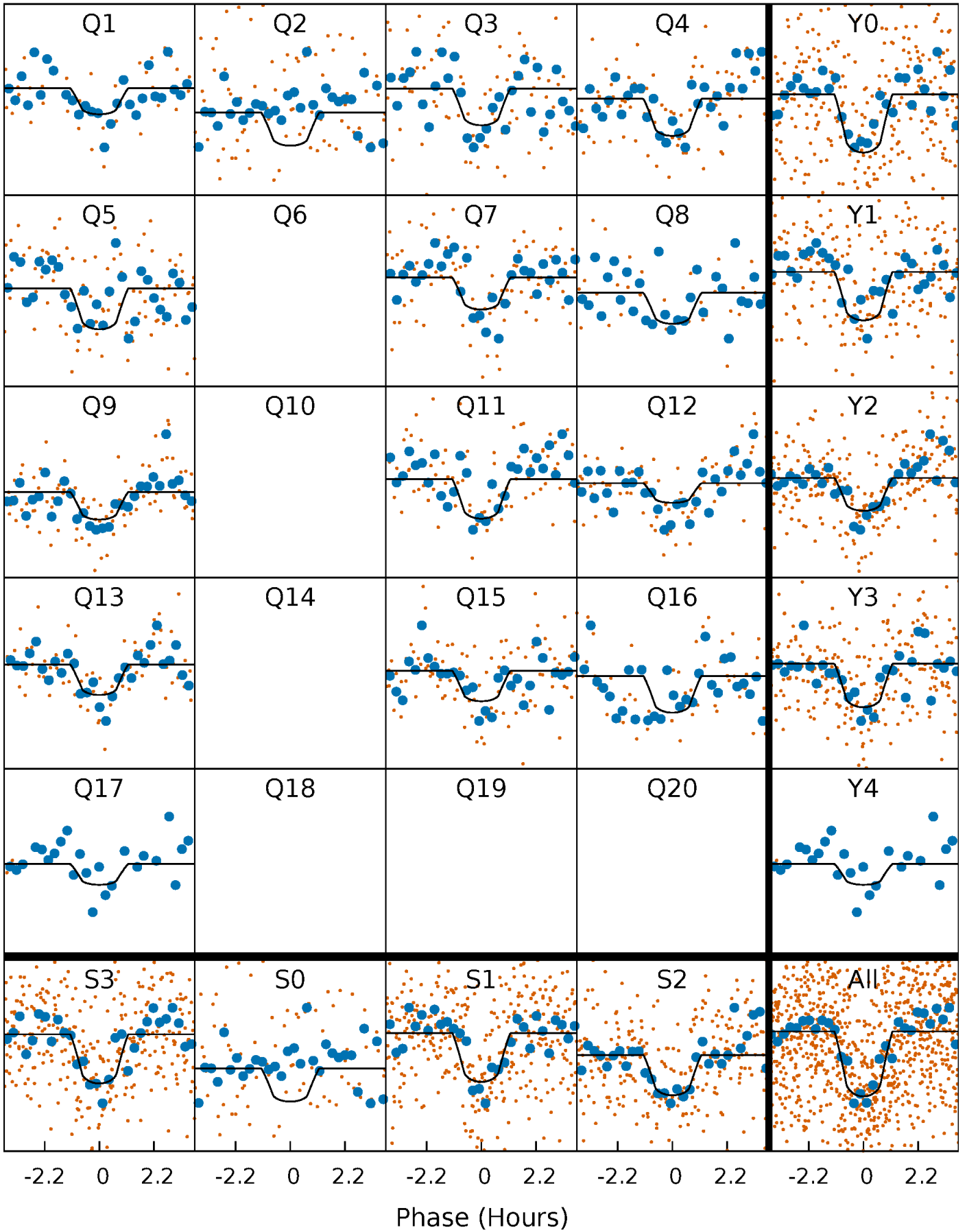
PDC Quarter-Phased Transit Curves

TCE 004472818-02 P= 15.357244 Days $T_0=132.607878$ (BKJD)



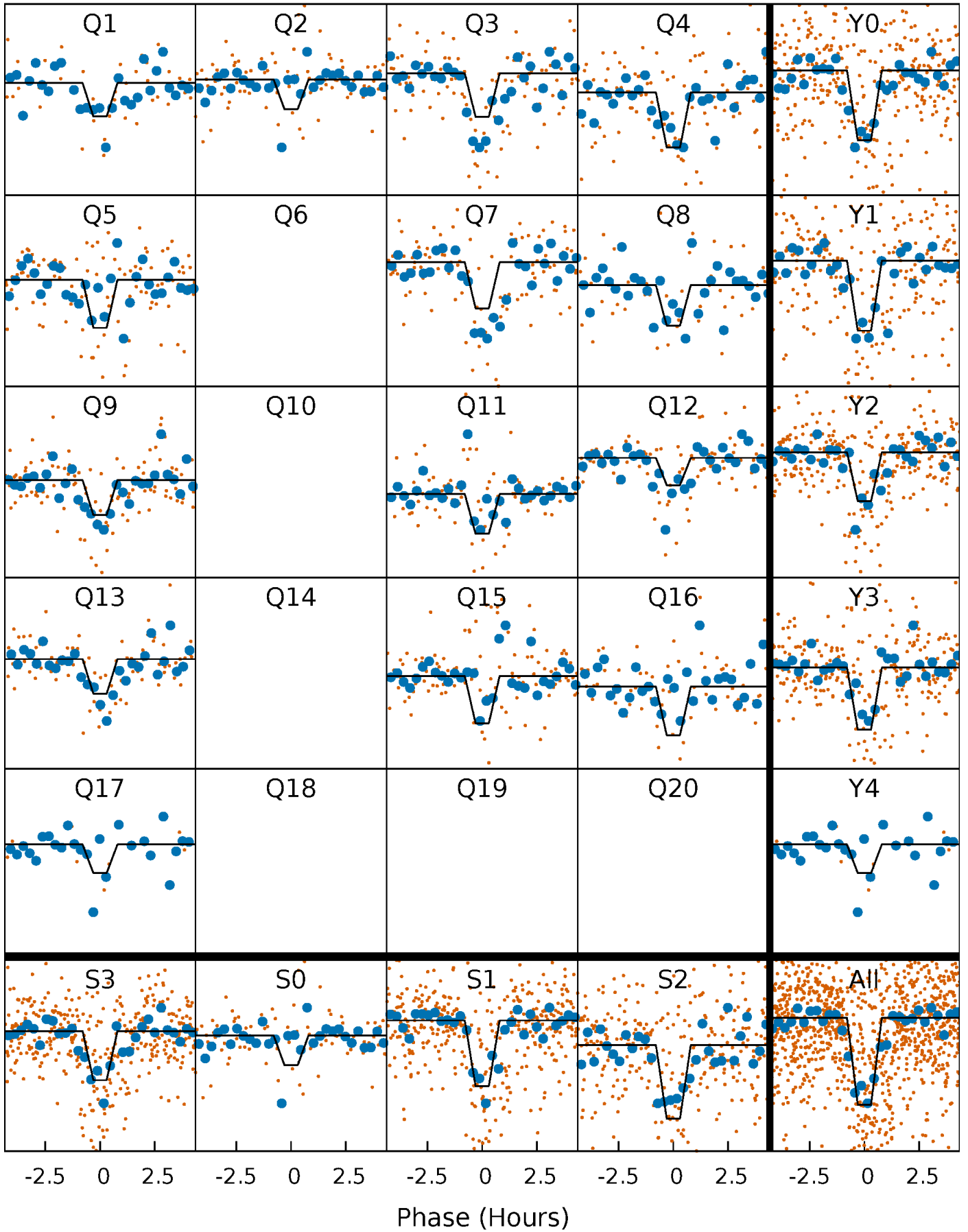
DV Quarter-Phased Transit Curves

TCE 004472818-02 P= 15.357244 Days $T_0=132.607878$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

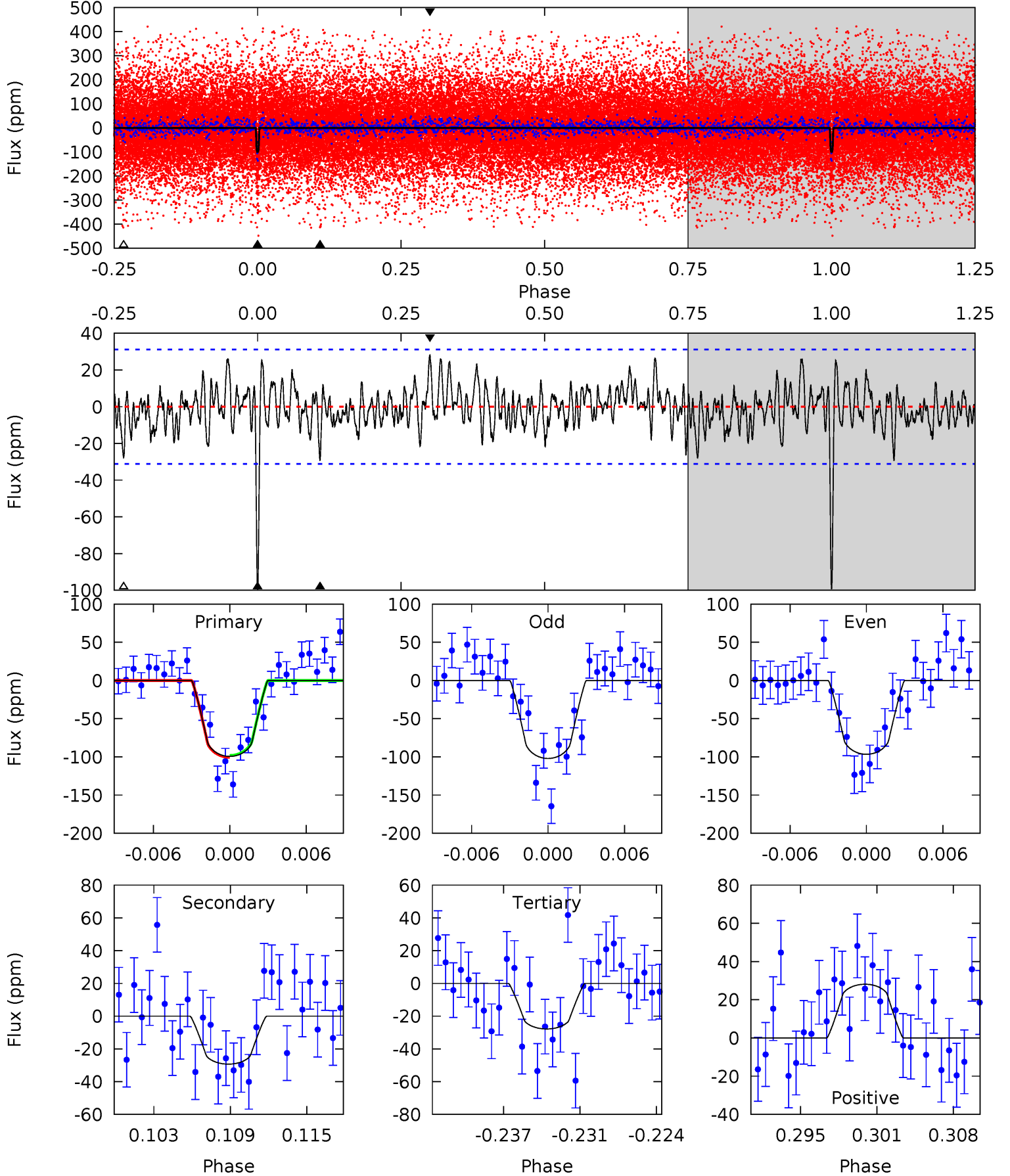
TCE 004472818-02 P= 15.357257 Days $T_0=132.607070$ (BKJD)



DV Model-Shift Uniqueness Test

004472818-02, P = 15.357244 Days, E = 117.250634 Days

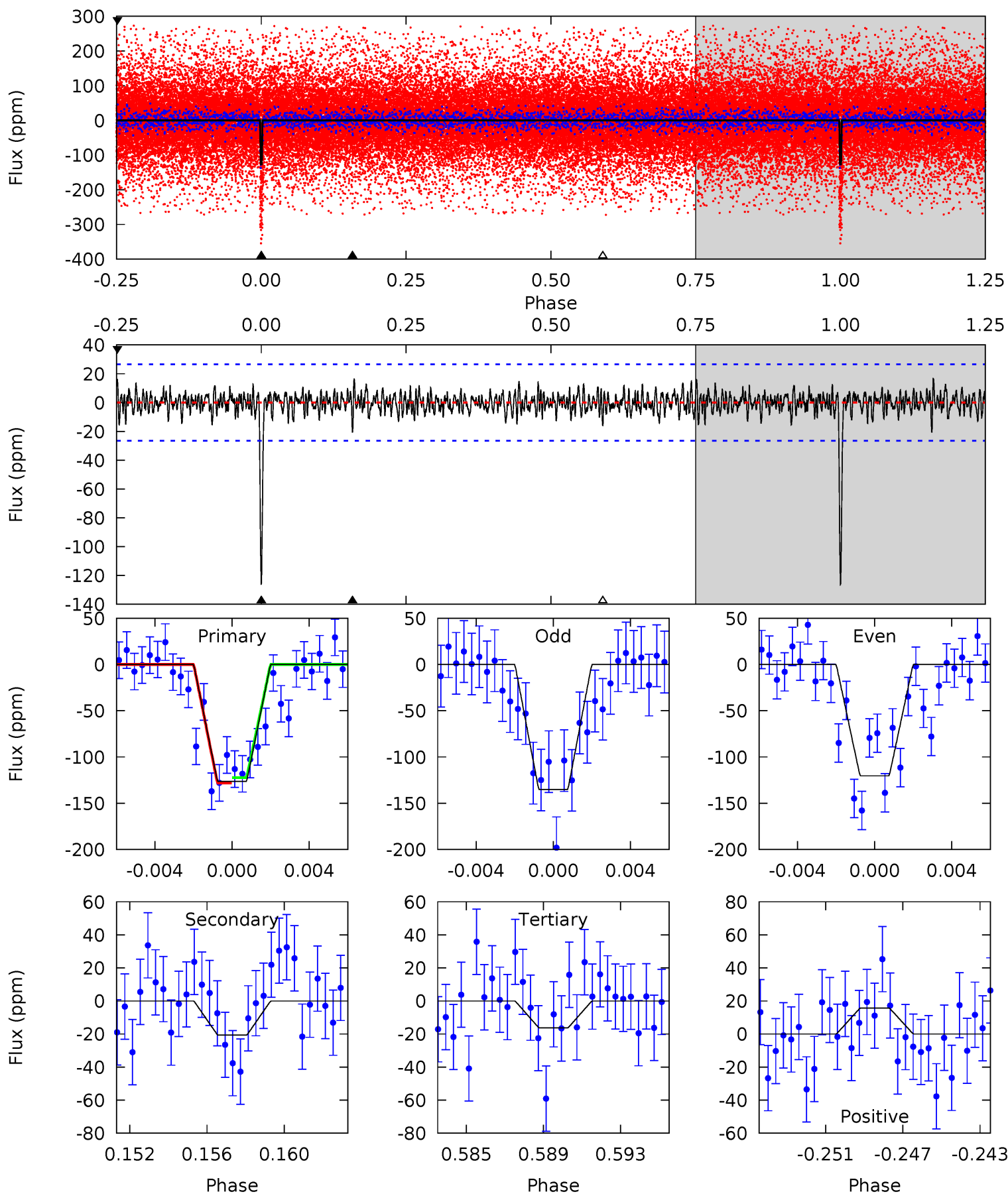
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	4.81	4.56	4.61	5.11	2.73	1.53	11.7	11.7	0.24	0.19	0.45	1.06	0.22	0.19



Alt Model-Shift Uniqueness Test

004472818-02, $P = 15.357257$ Days, $E = 117.249813$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.7	4.04	3.18	3.08	5.18	2.85	1.06	21.5	21.6	0.87	0.97	1.44	0.90	0.12	0.56



Stellar Parameters For KIC 004472818

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5818^{+78}_{-78}	$4.464^{+0.040}_{-0.120}$	$0.100^{+0.150}_{-0.150}$	$0.986^{+0.148}_{-0.053}$	$1.032^{+0.057}_{-0.063}$	$1.518^{+0.226}_{-0.518}$
	+1%/-1%	+1%/-3%	+150%/-150%	+15%/-5%	+6%/-6%	+15%/-34%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 004472818-02 / KOI 3878.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-29 ± 6	$1.26^{+0.72}_{-0.63}$	1027^{+37}_{-26}	4237^{+1501}_{-611}	149^{+490}_{-89}
Alt.	-21 ± 5	$1.35^{+0.68}_{-0.68}$	1028^{+40}_{-25}	3873^{+1209}_{-490}	90^{+302}_{-52}

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

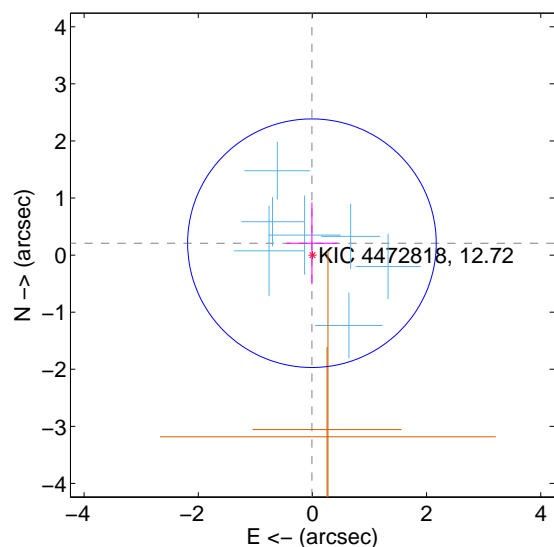
Supplemental centroid analysis for 004472818-02. Kepler magnitude: 12.72. Transit SNR 11.05

There are 8 quarters with good PRF difference image offsets

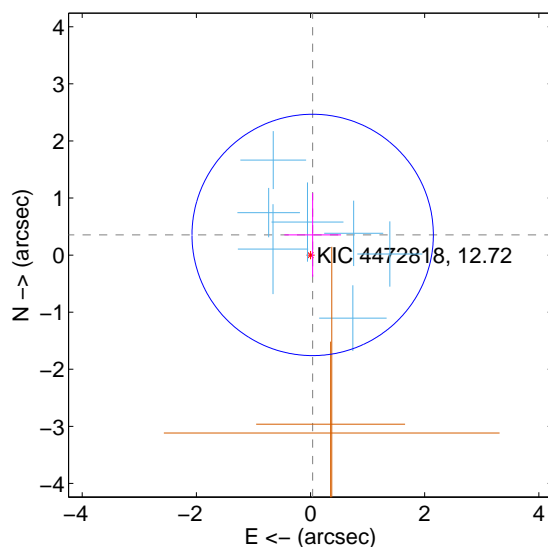
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.208 ± 0.726	0.29	0.009 ± 0.450	0.208 ± 0.718
PRF-fit source offset from KIC position	0.355 ± 0.705	0.50	-0.038 ± 0.496	0.353 ± 0.734
photometric centroid source offset	0.86 ± 0.89	0.97	0.54 ± 0.96	-0.67 ± 0.84

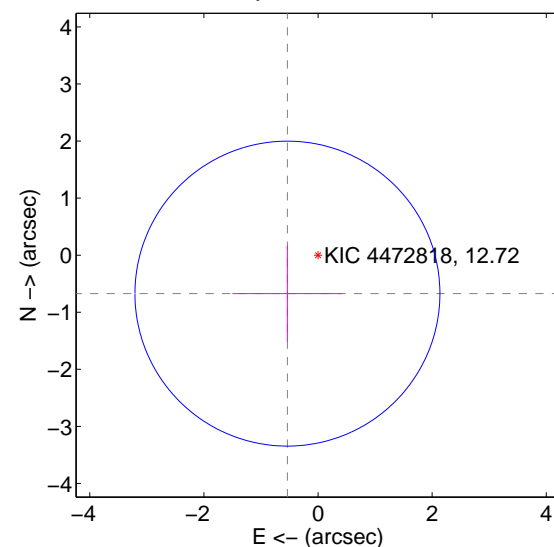
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

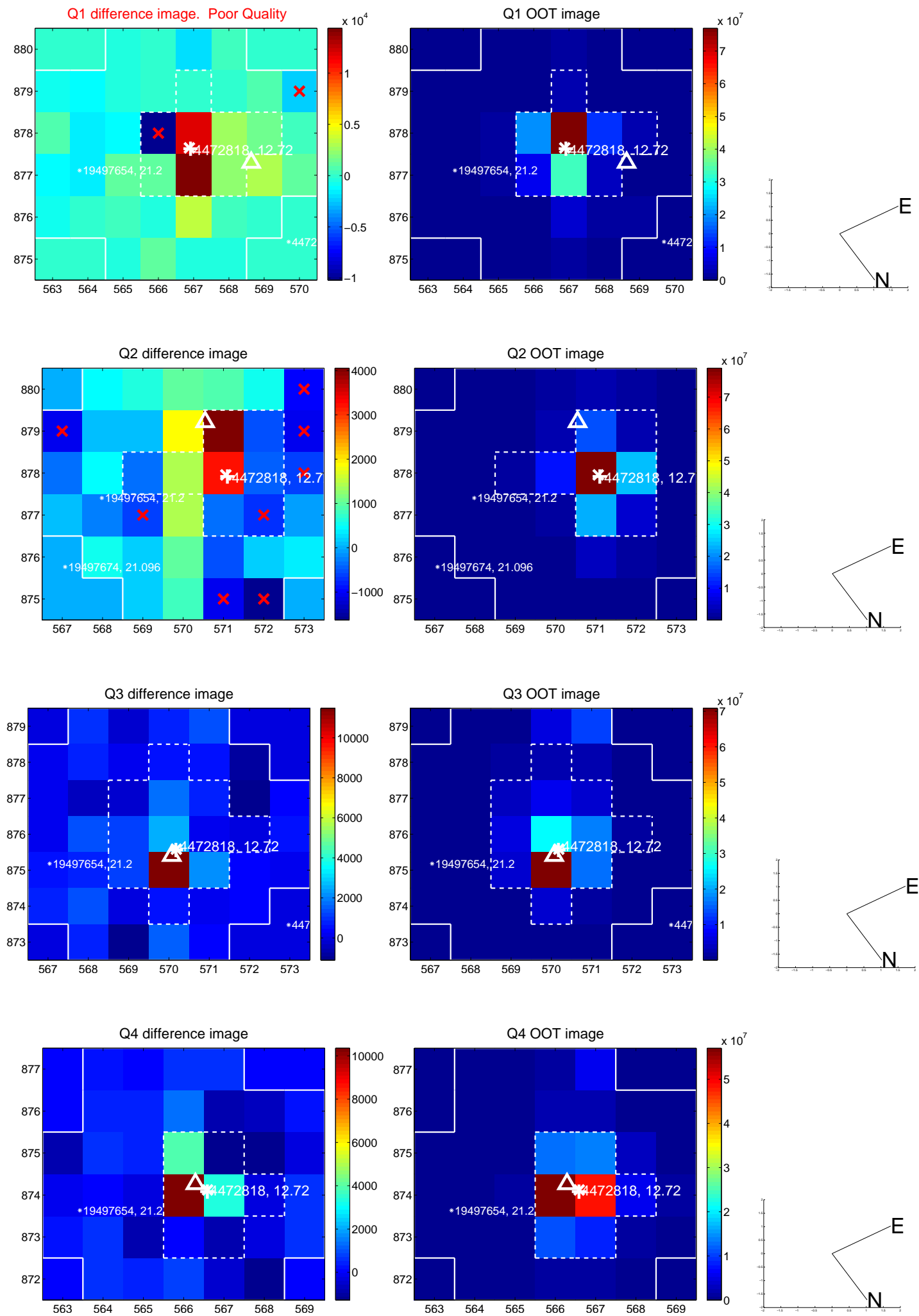


offset from photometric centroids

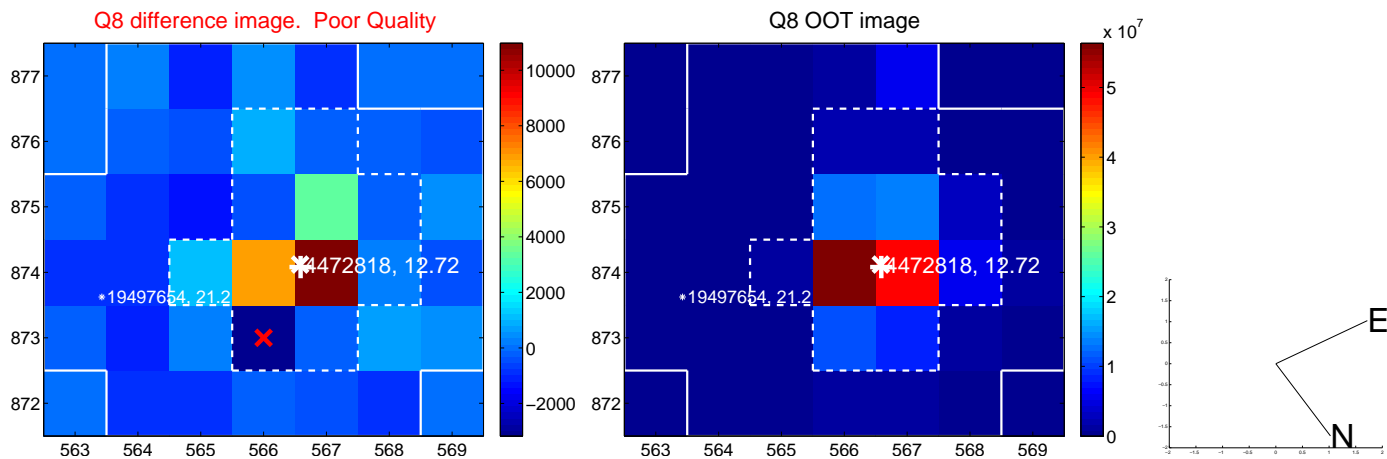
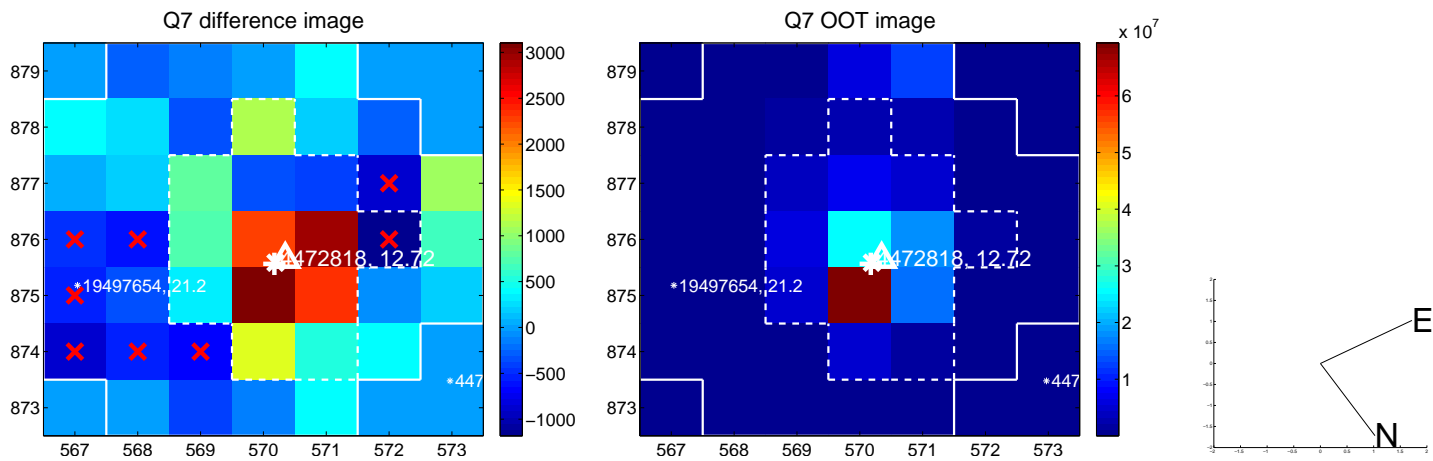
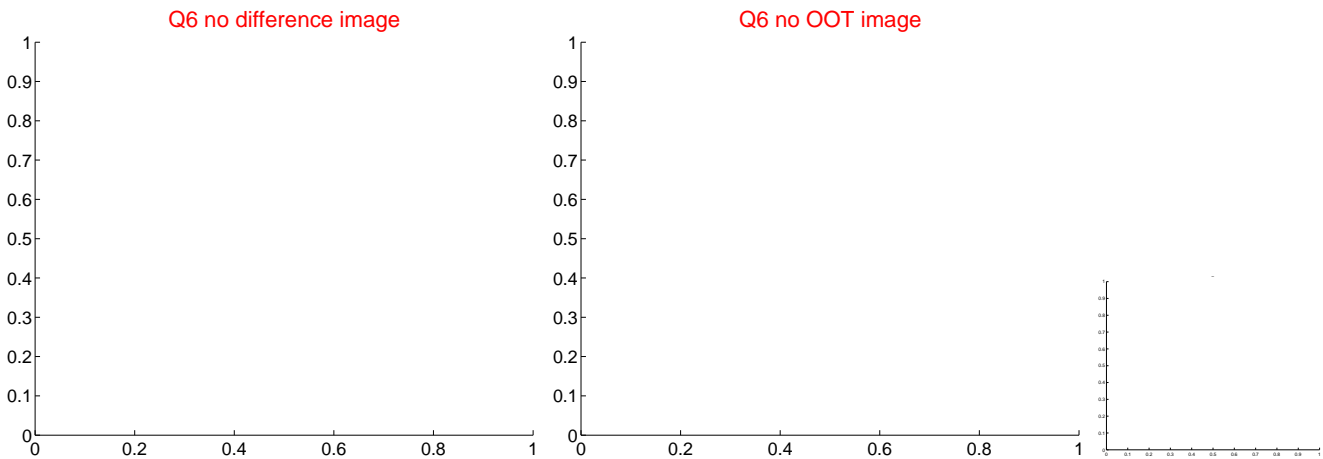
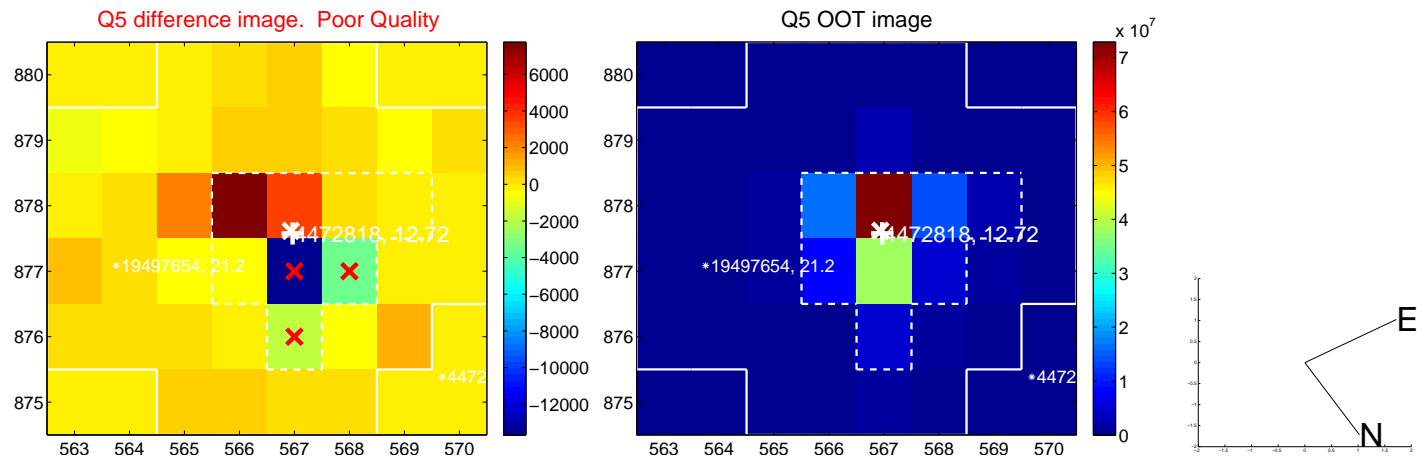


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

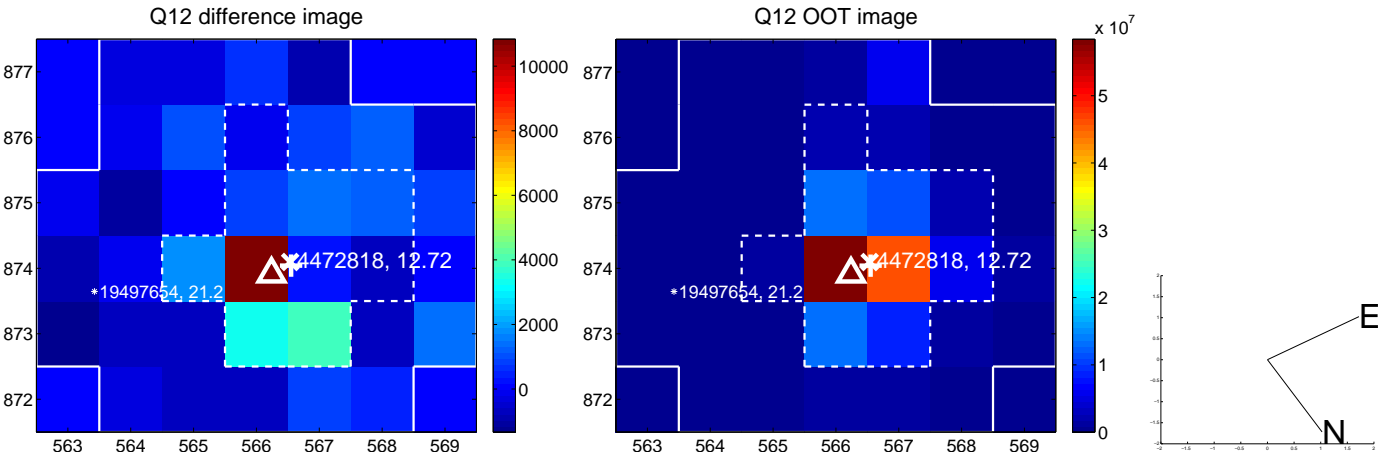
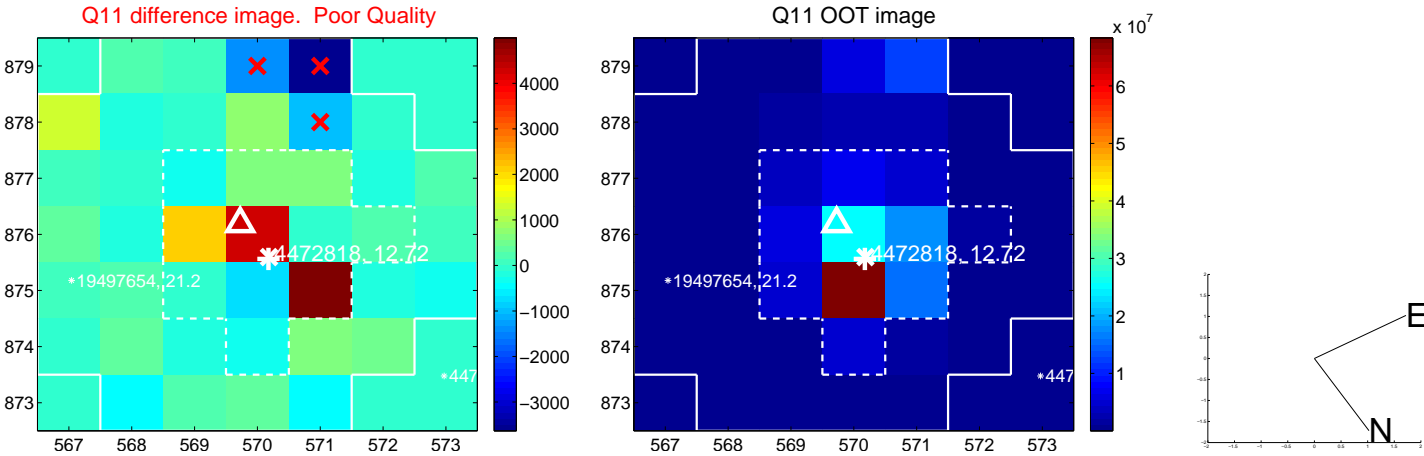
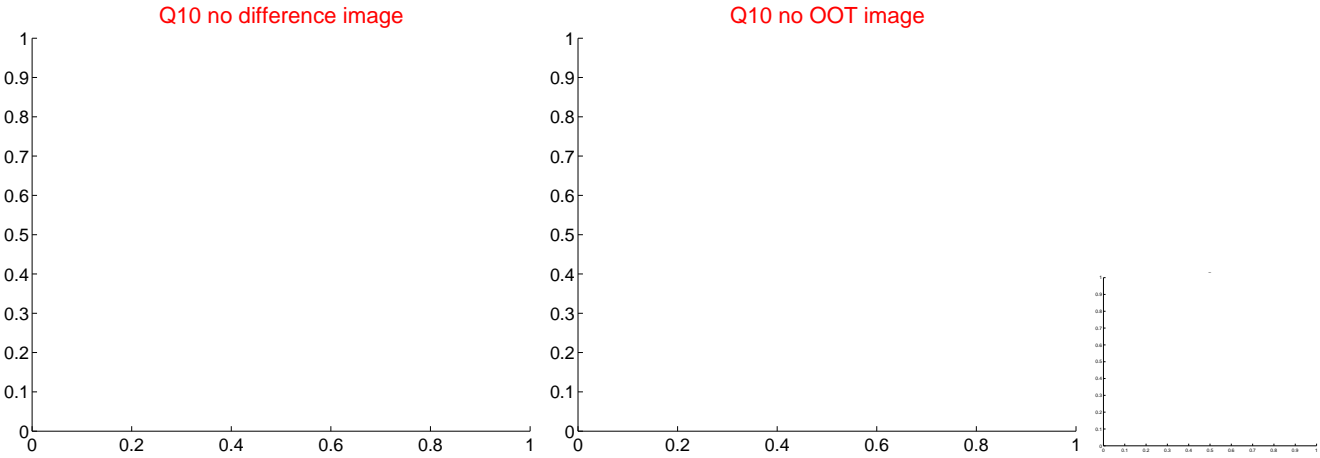
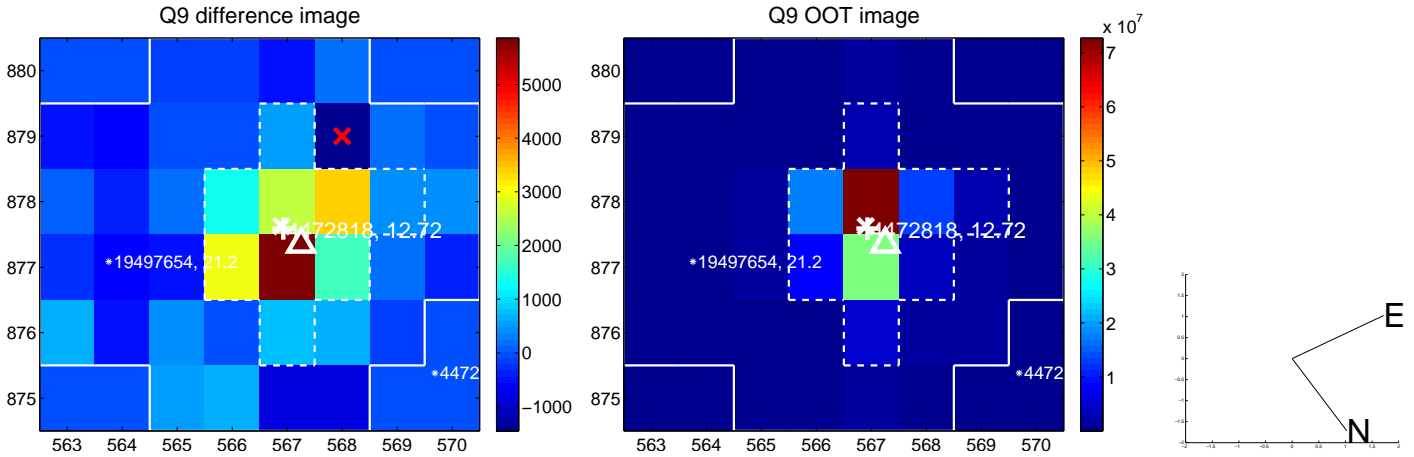
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



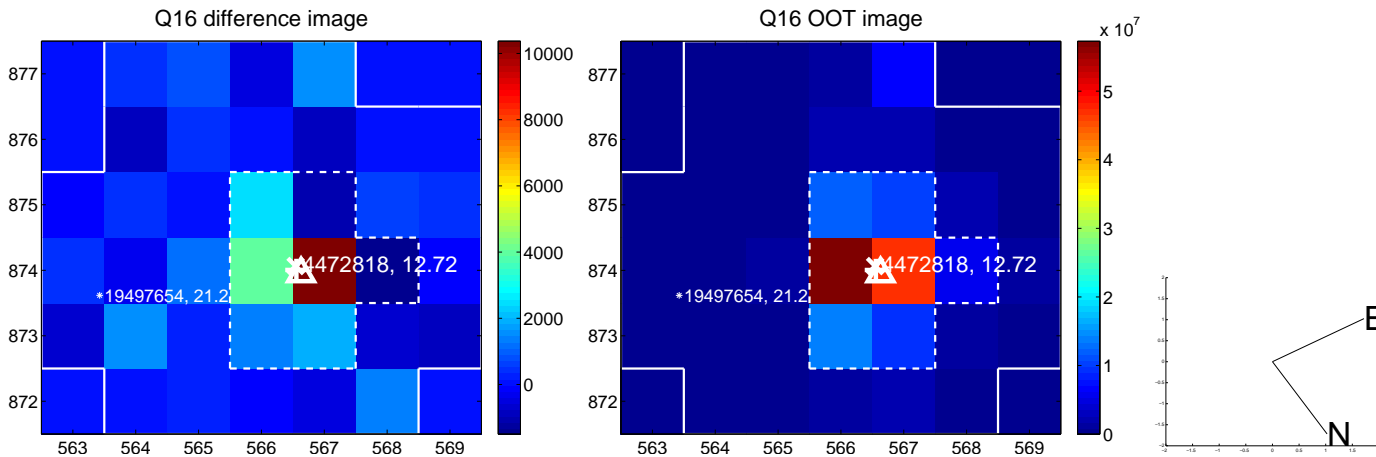
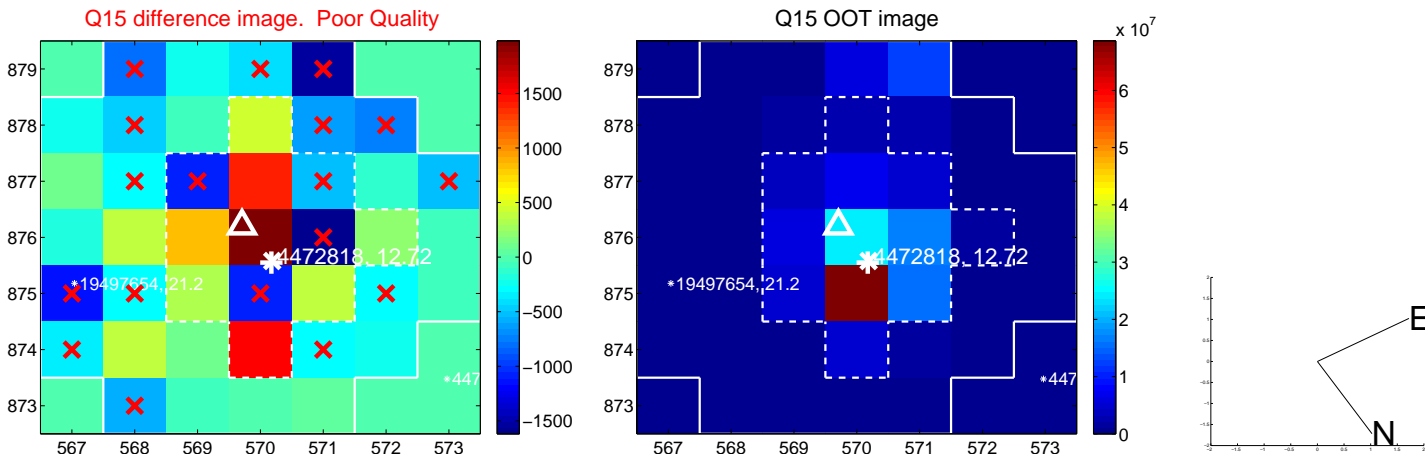
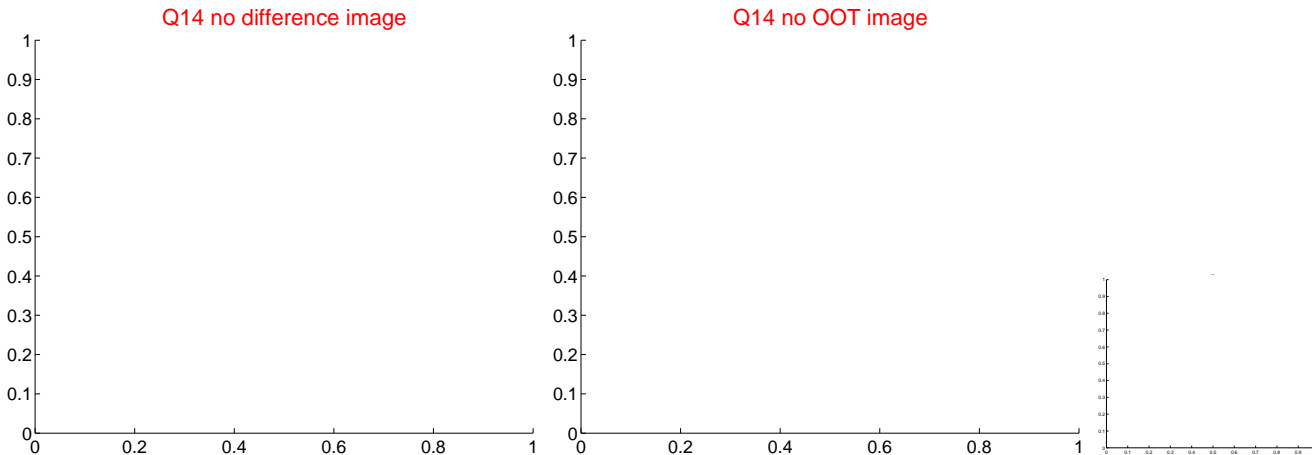
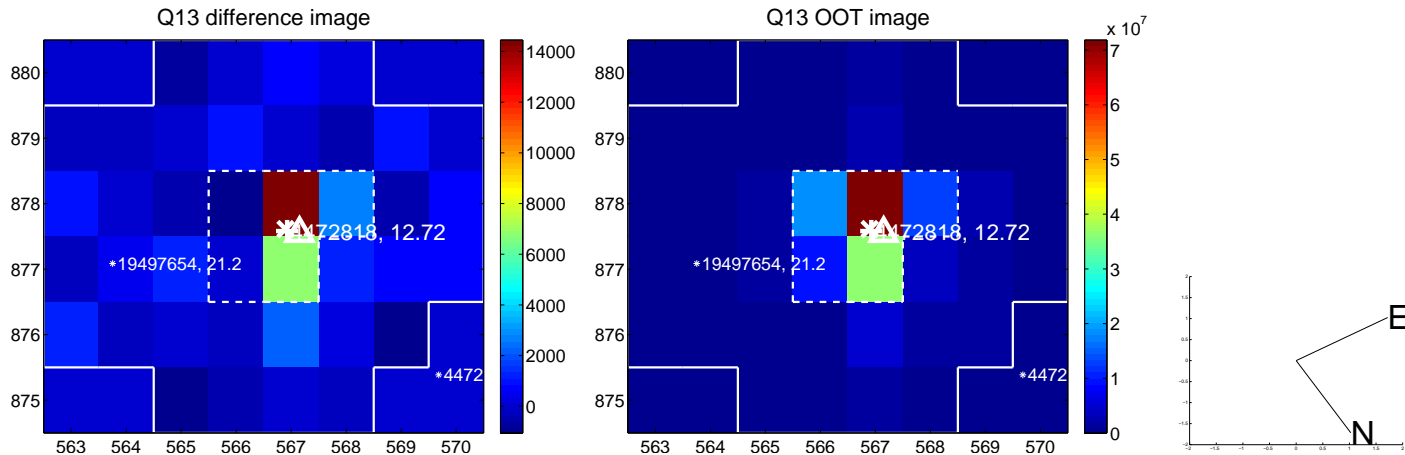
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



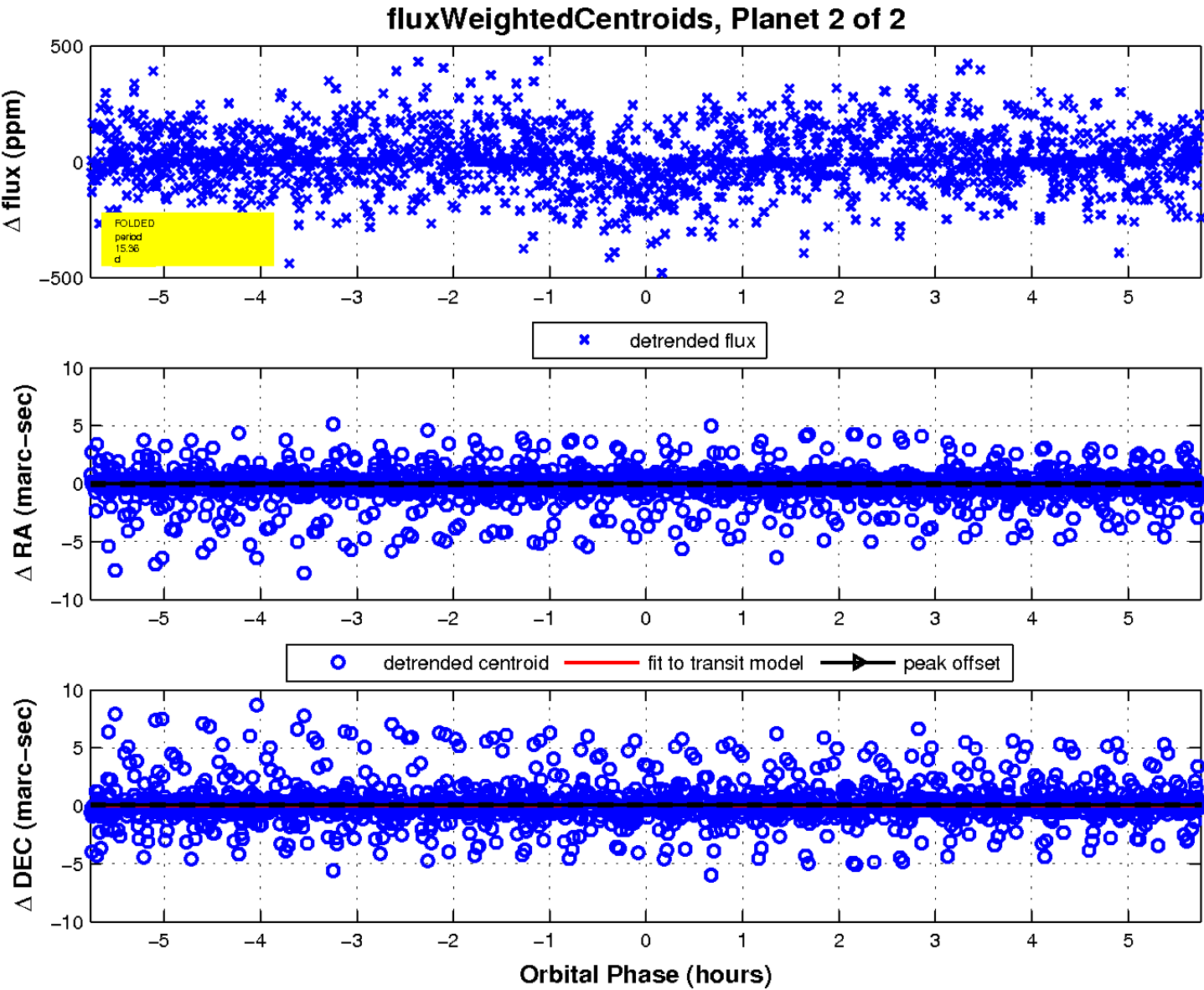
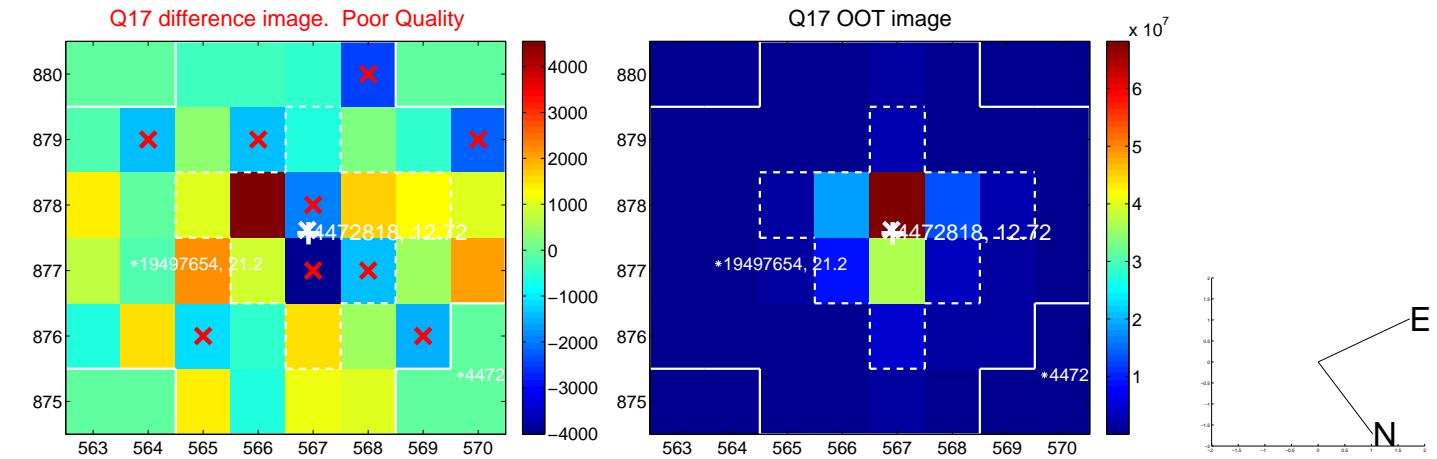
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

