

KIC 008782002

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})
008782002-01	OBS	No	2.909750	132.839418	15.8	7.640	9.9	8.4	2.78	6734	1.28	6413.95
008782002-02	OBS	No	2.909463	133.285035	22.0	16.042	9.4	9.0	2.78	6734	1.46	6414.79
008782002-03	OBS	No	87.568758	176.602310	90.2	13.906	38.0	6.4	2.78	6734	3.13	68.52
008782002-04	OBS	No	77.323537	132.783590	164.1	3.157	11.2	7.6	2.78	6734	3.92	80.88
008782002-05	OBS	No	169.954366	242.066644	220.0	2.916	10.3	9.9	2.78	6734	4.70	28.30
008782002-06	OBS	No	157.546368	183.225037	138.4	5.213	8.9	8.3	2.78	6734	3.86	31.31
008782002-07	OBS	No	219.897928	341.161649	241.6	2.342	10.3	8.8	2.78	6734	5.09	20.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008782002-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008782002-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
008782002-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

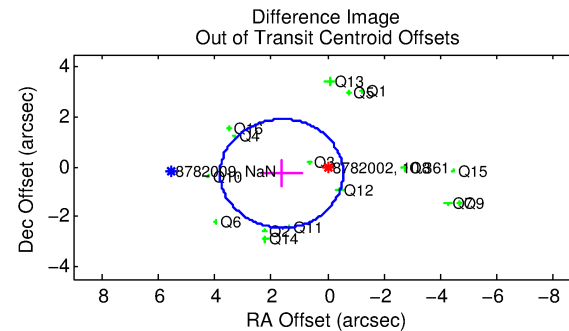
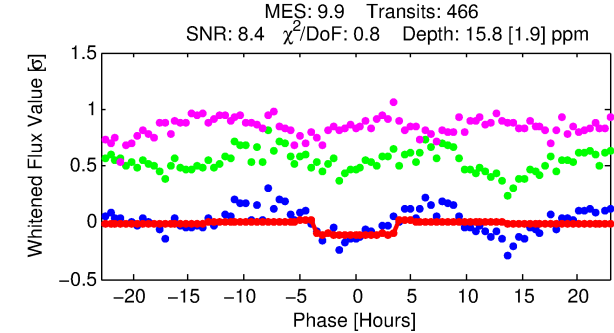
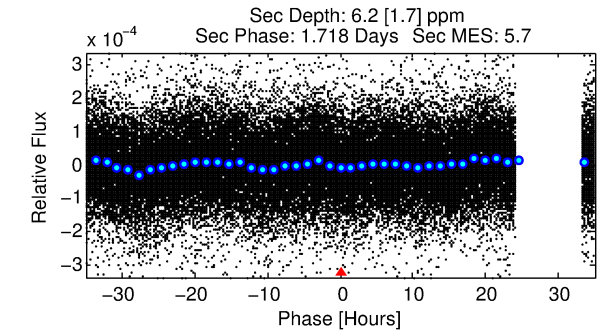
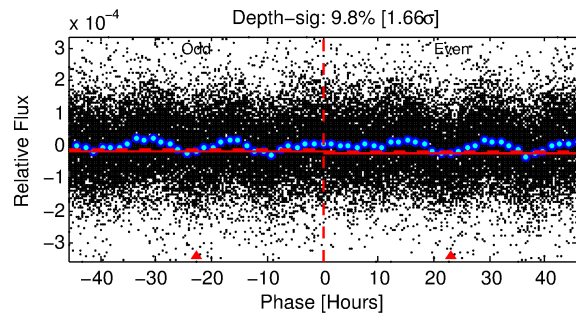
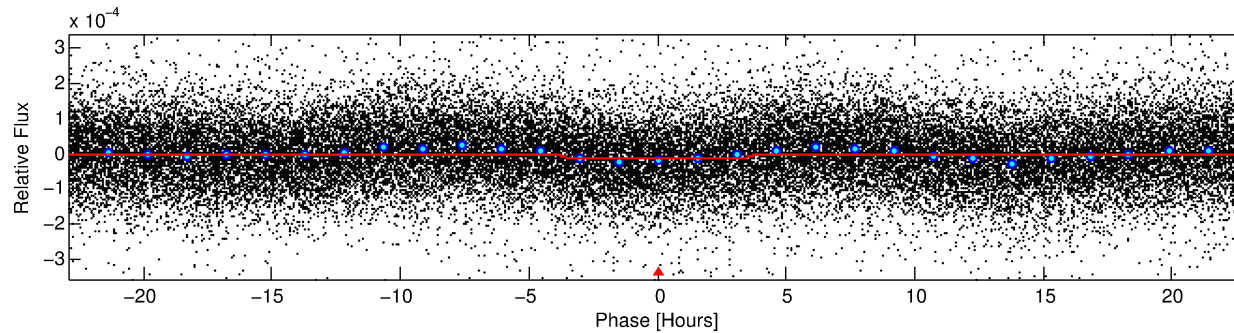
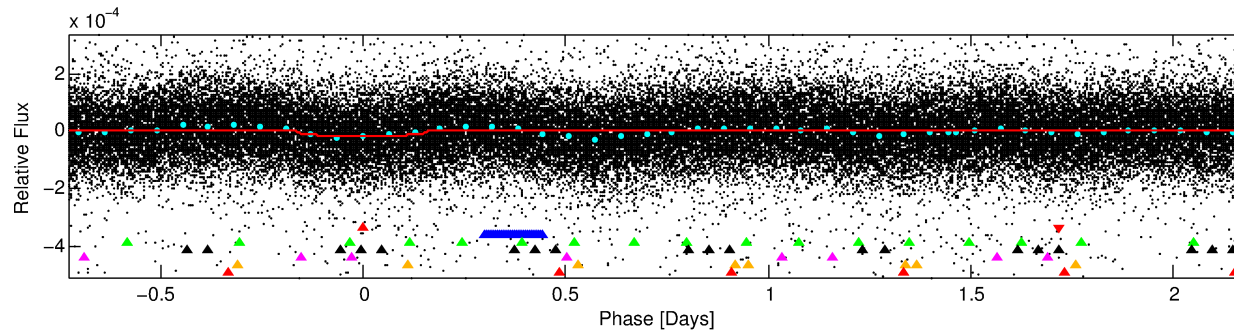
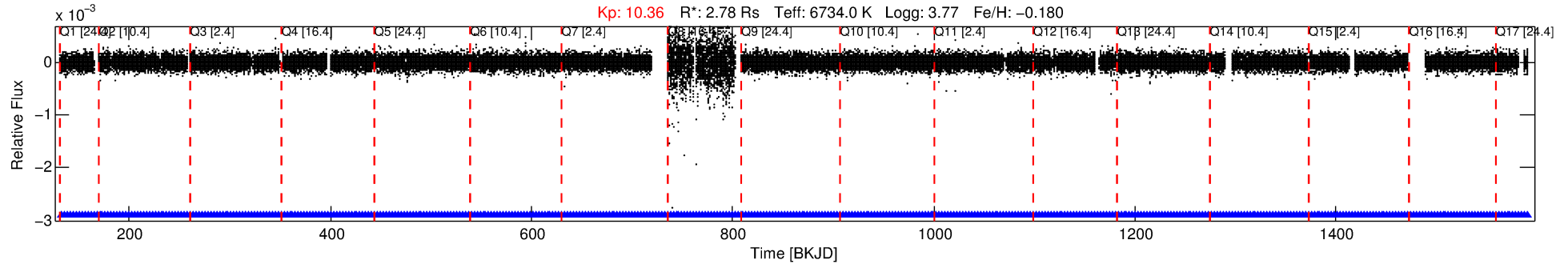
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008782002-01

No Significant Match Found

DV One-Page Summary

KIC: 8782002 Candidate: 1 of 7 Period: 2.910 d



DV Fit Results:

Period = 2.90975 [0.00003] d
Epoch = 132.8394 [0.0057] BKJD
 $R_p/R^* = 0.0042$ [0.0008]
 $a/R^* = 1.60$ [1.00]
 $b = 0.90$ [0.22]
 $\text{Seff} = 6413.95$ [3311.54]
 $T_{\text{eq}} = 2282$ [295] K
 $R_p = 1.28$ [0.50] R_e
 $a = 0.0470$ [0.0152] AU
 $A_g = 4.62$ [3.12] [1.16 σ]
 $T_{\text{eff}} = 5172$ [599] K [4.33 σ]

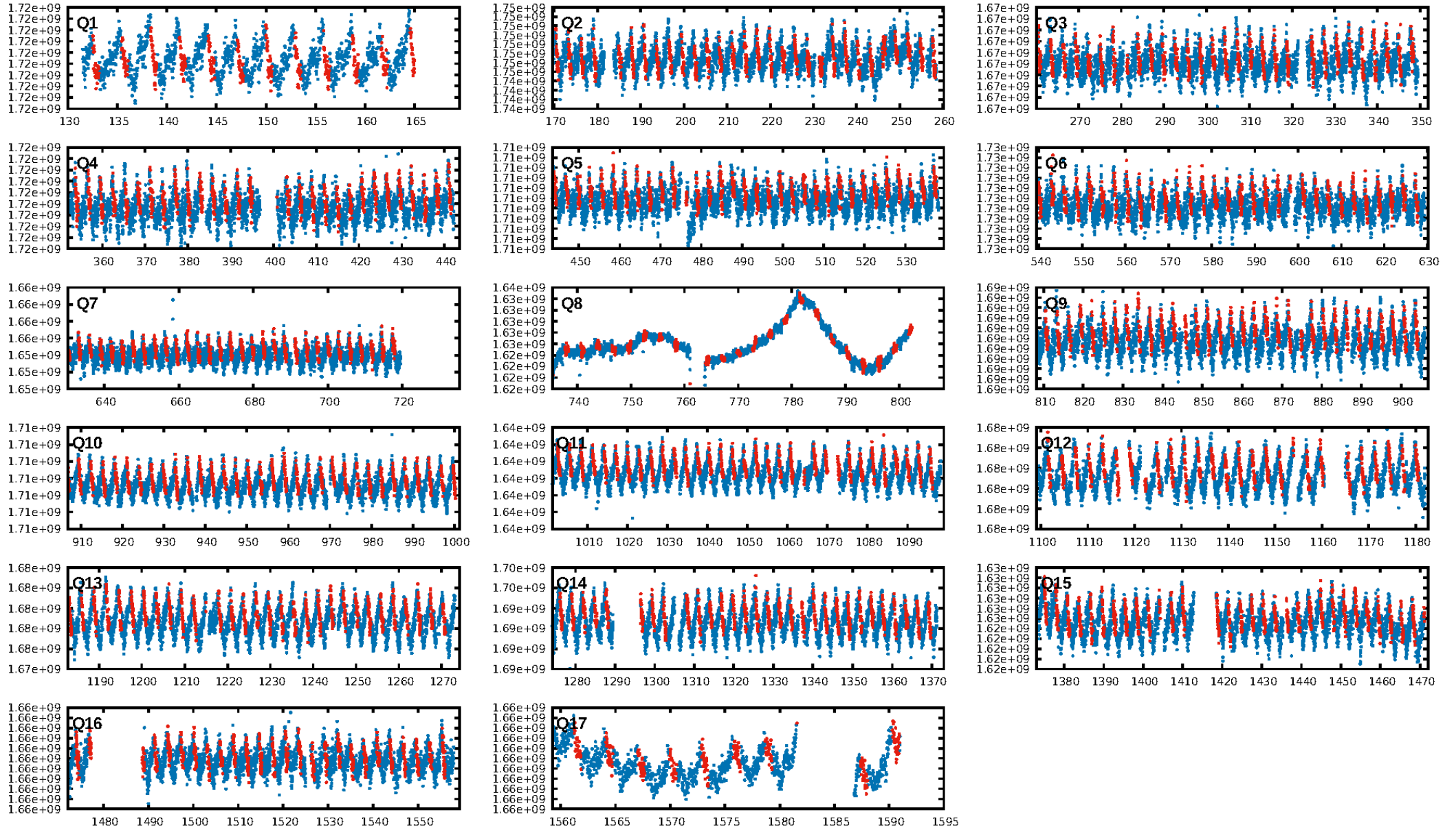
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: 100.0% [216.03 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.17e-10
RollingBand-fgt: 1.00 [445/445]
GhostDiagnostic-chr: N/A
Centroid-sig: 0.0%
Centroid-so: 3.644 arcsec [2.96 σ]
OotOffset-rm: 1.645 arcsec [2.27 σ]
KicOffset-rm: 1.260 arcsec [2.06 σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
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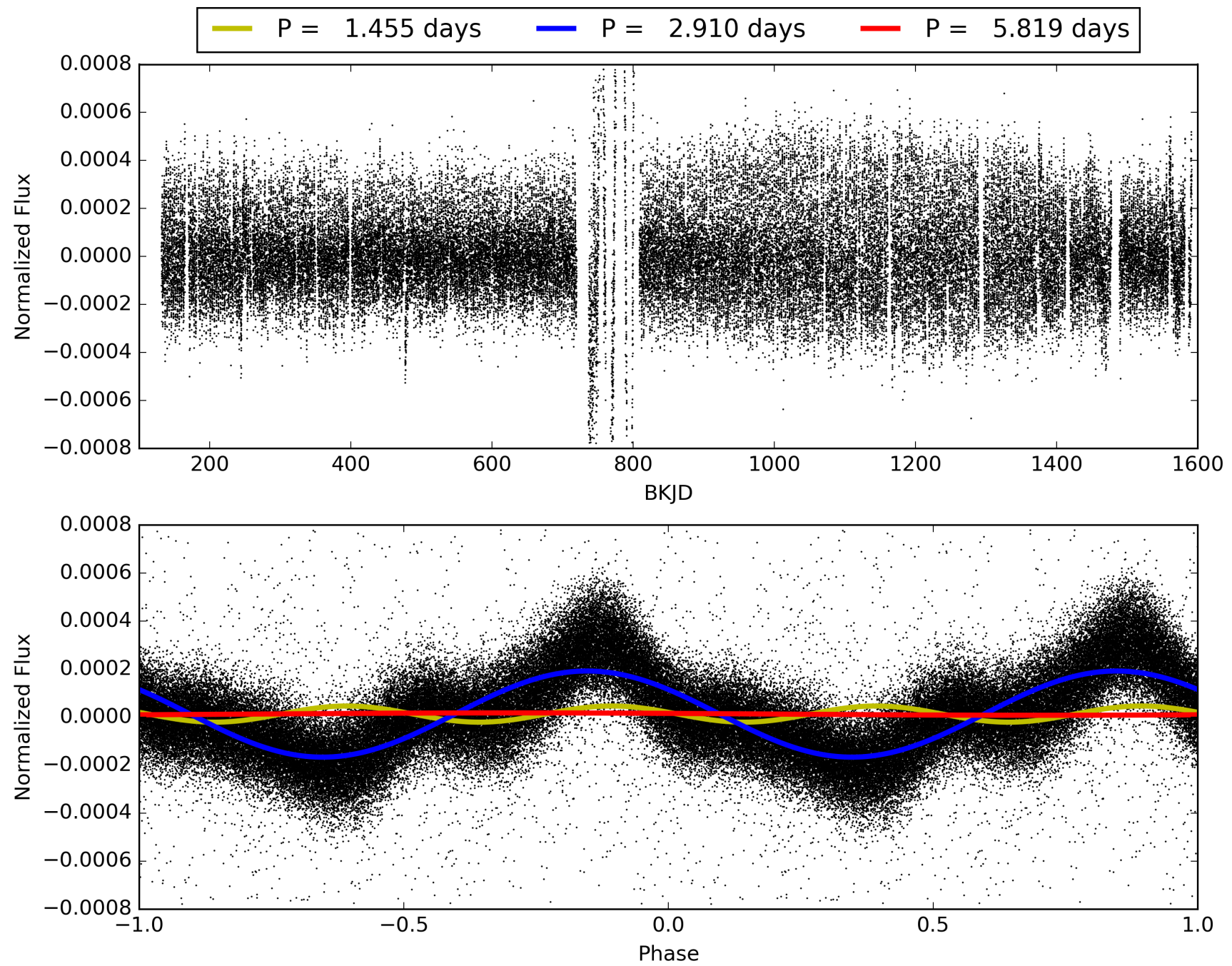
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008782002-01, PDC Light Curves

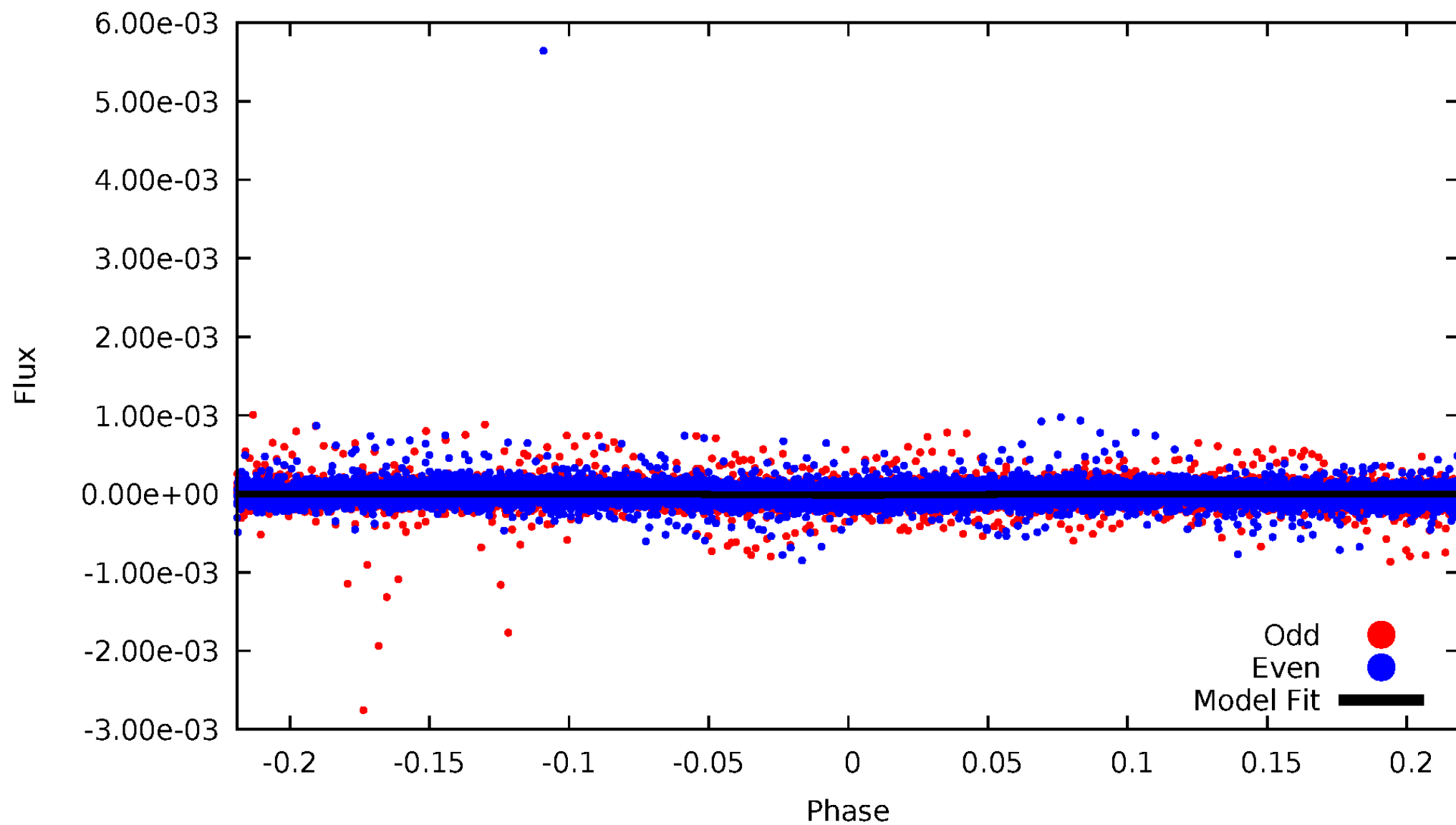


TCE 008782002-01



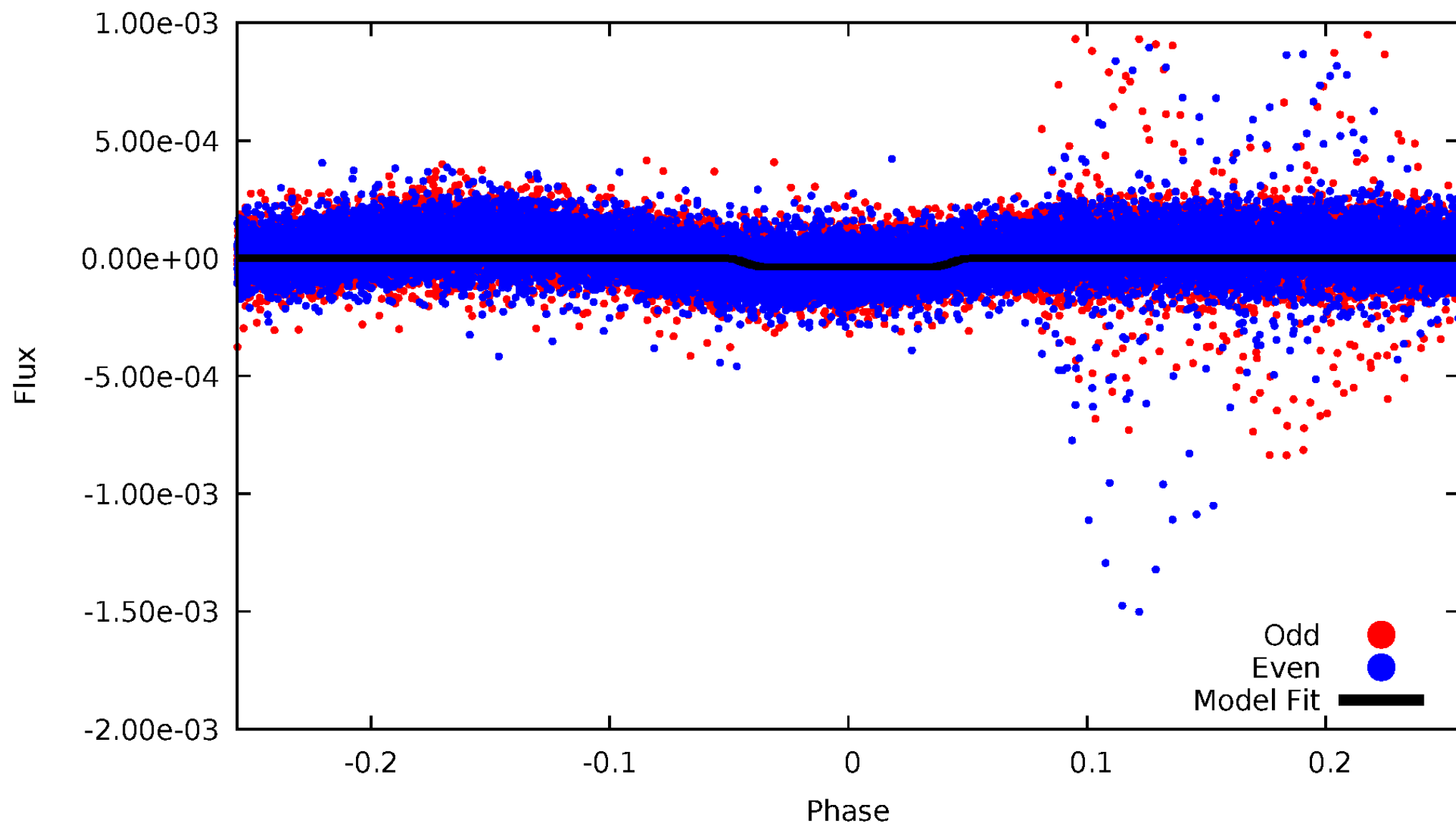
DV Odd/Even

TCE 008782002-01



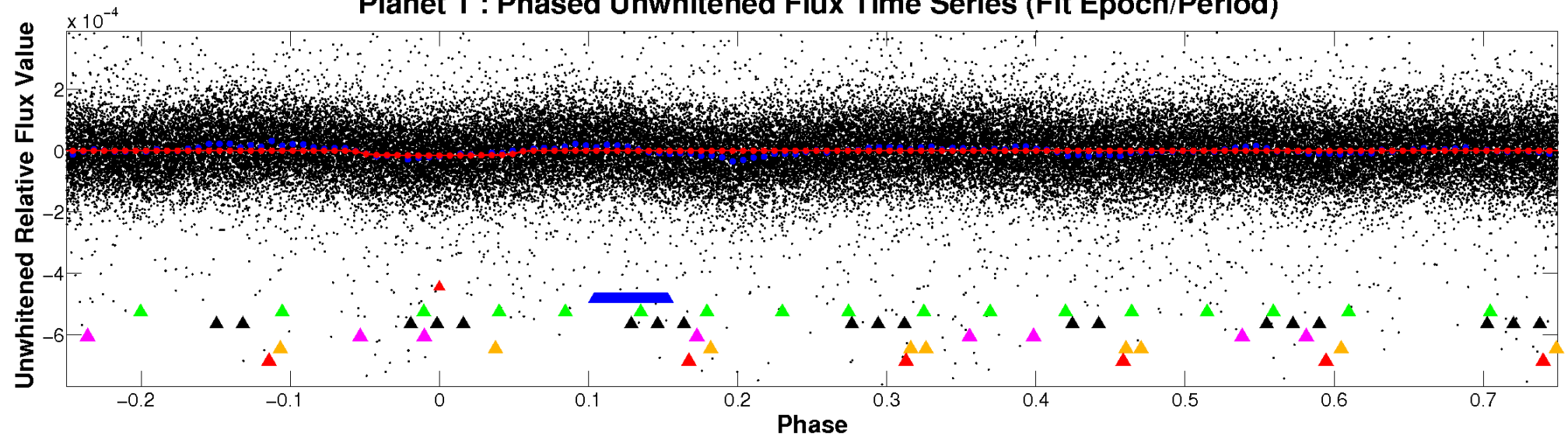
ALT Odd/Even

TCE 008782002-01

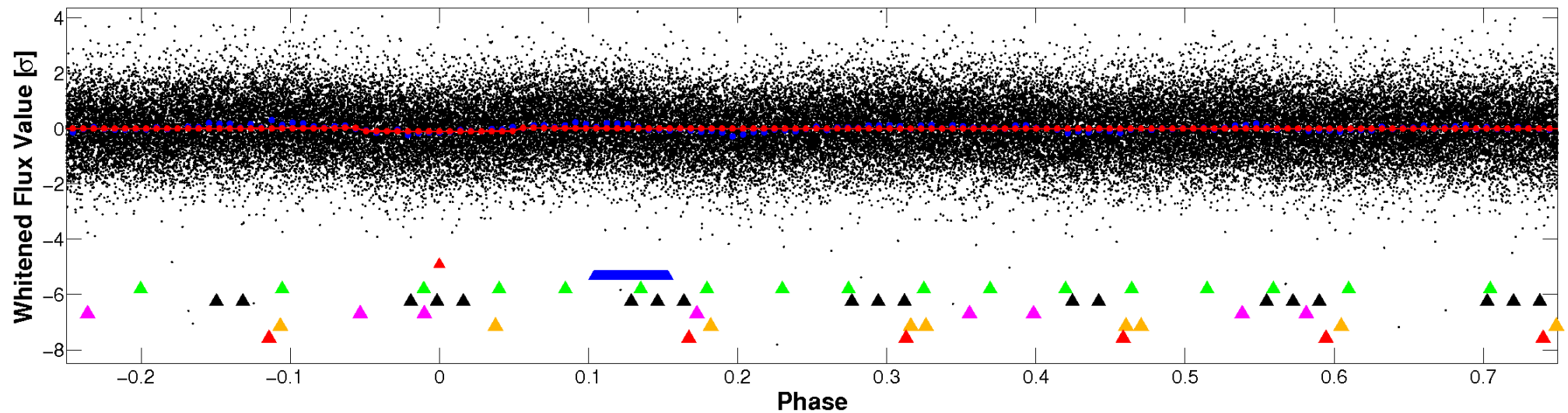


Non-Whitened Vs. Whitened Light Curve

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

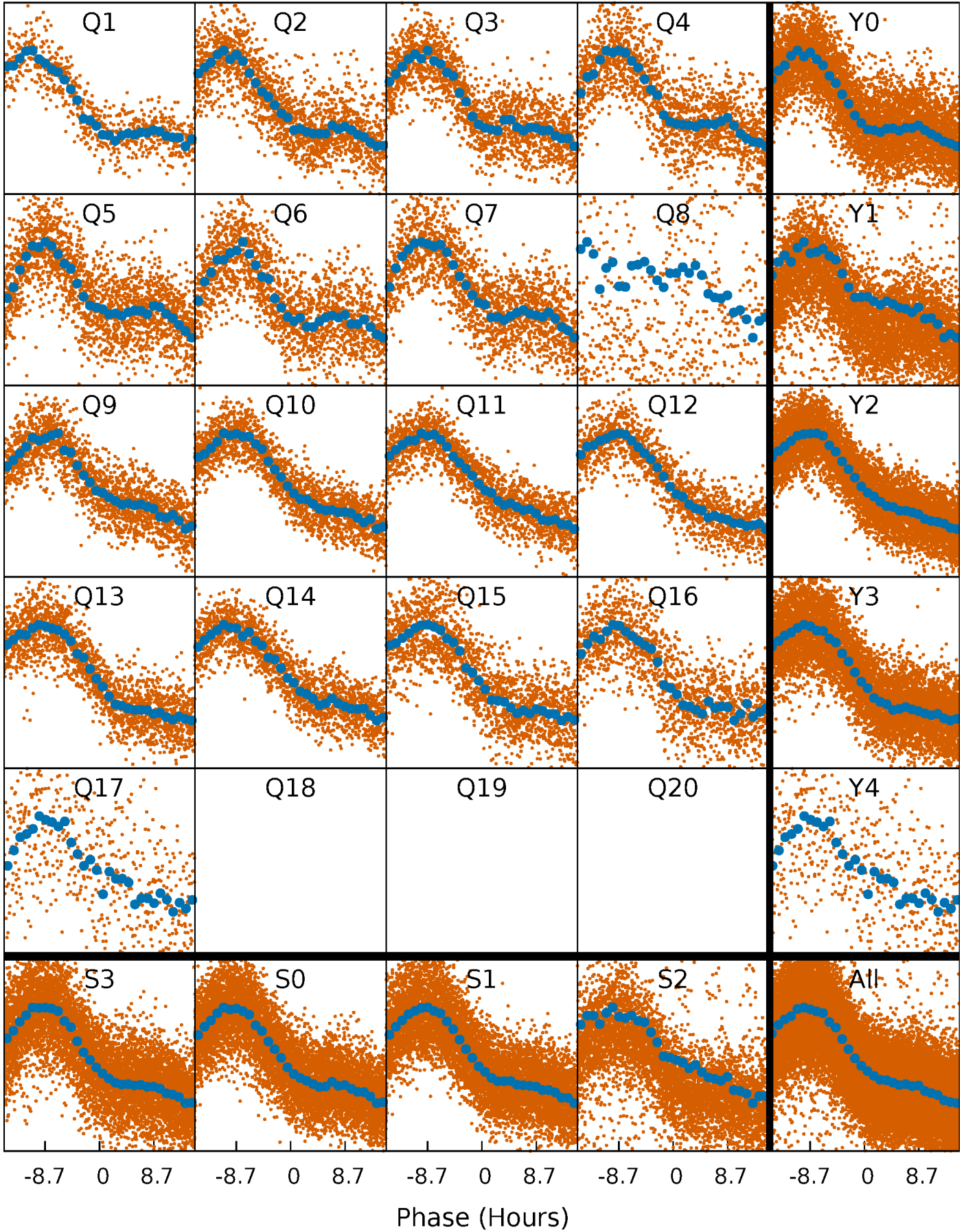


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



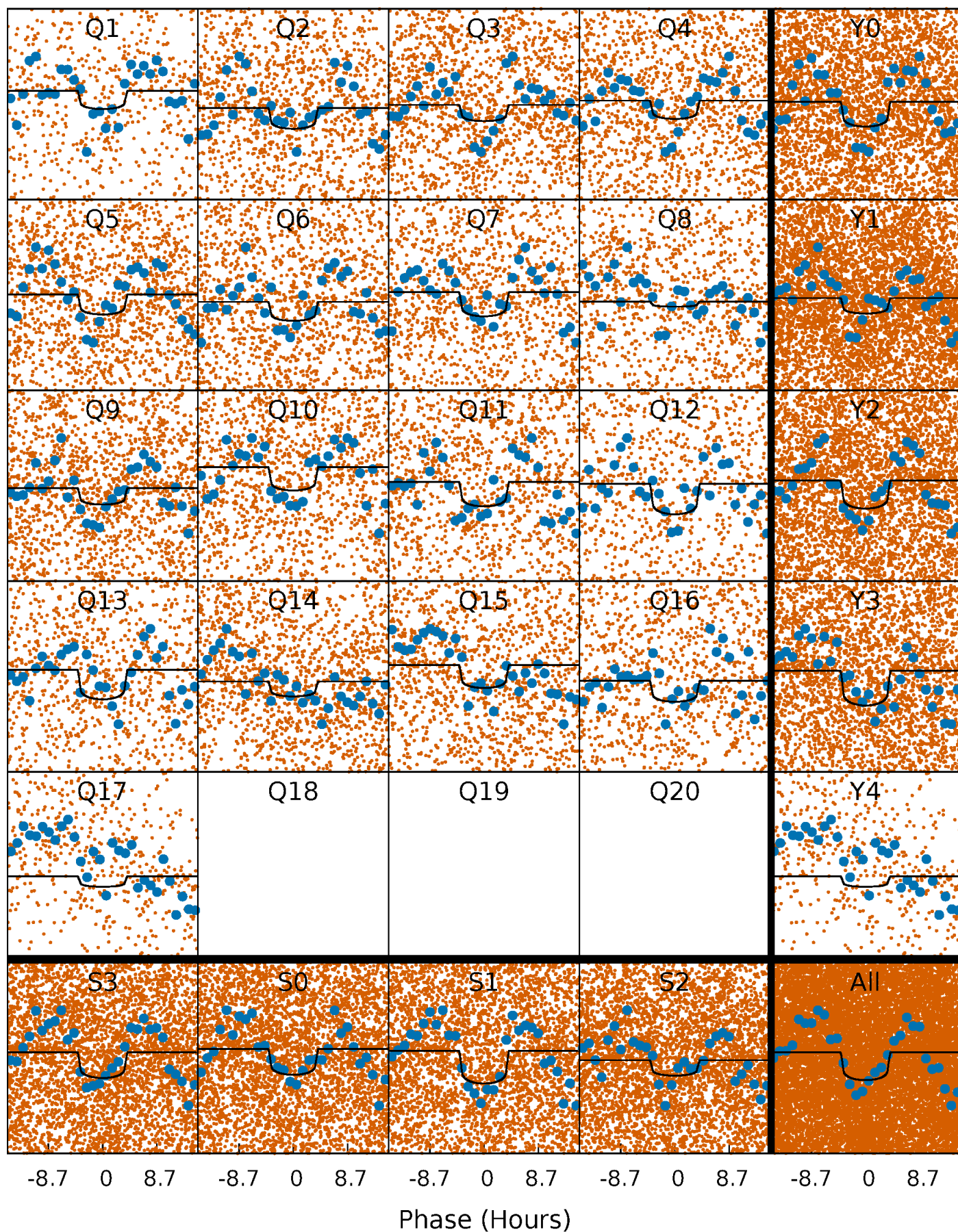
PDC Quarter-Phased Transit Curves

TCE 008782002-01 P= 2.909750 Days $T_0=132.839417$ (BKJD)



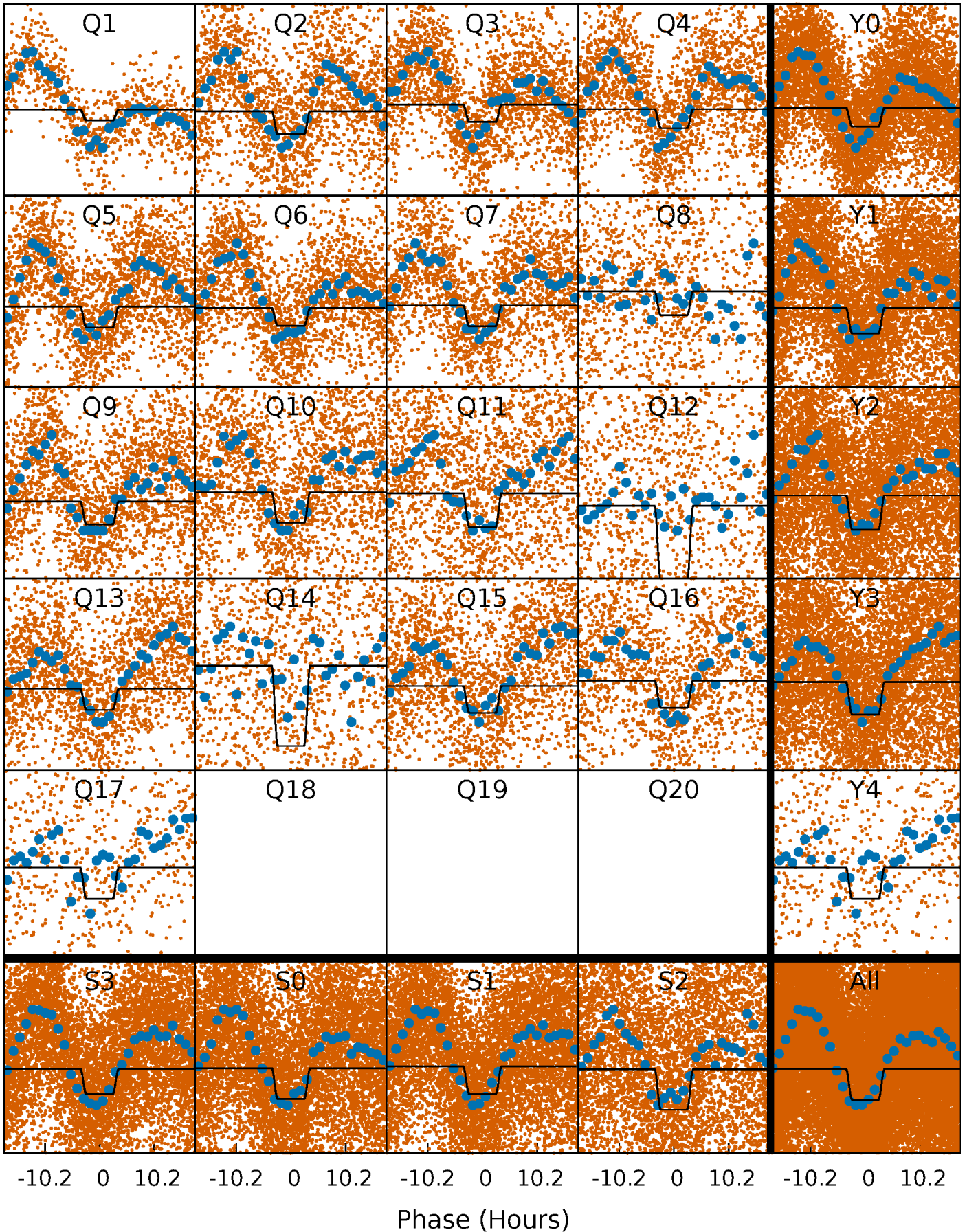
DV Quarter-Phased Transit Curves

TCE 008782002-01 P= 2.909750 Days $T_0=132.839417$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

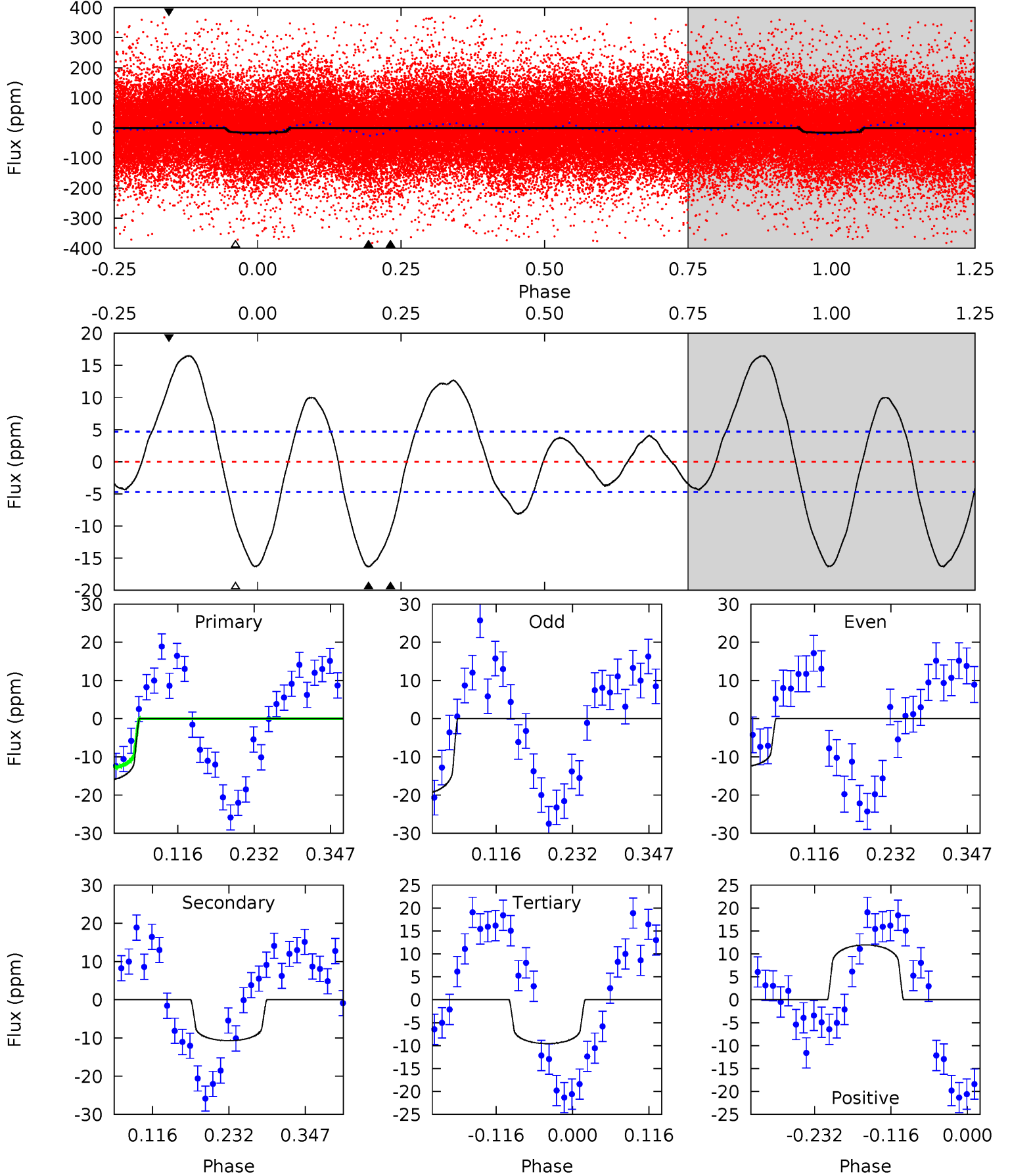
TCE 008782002-01 P= 2.909768 Days $T_0=132.922887$ (BKJD)



DV Model-Shift Uniqueness Test

008782002-01, P = 2.909750 Days, E = 129.929667 Days

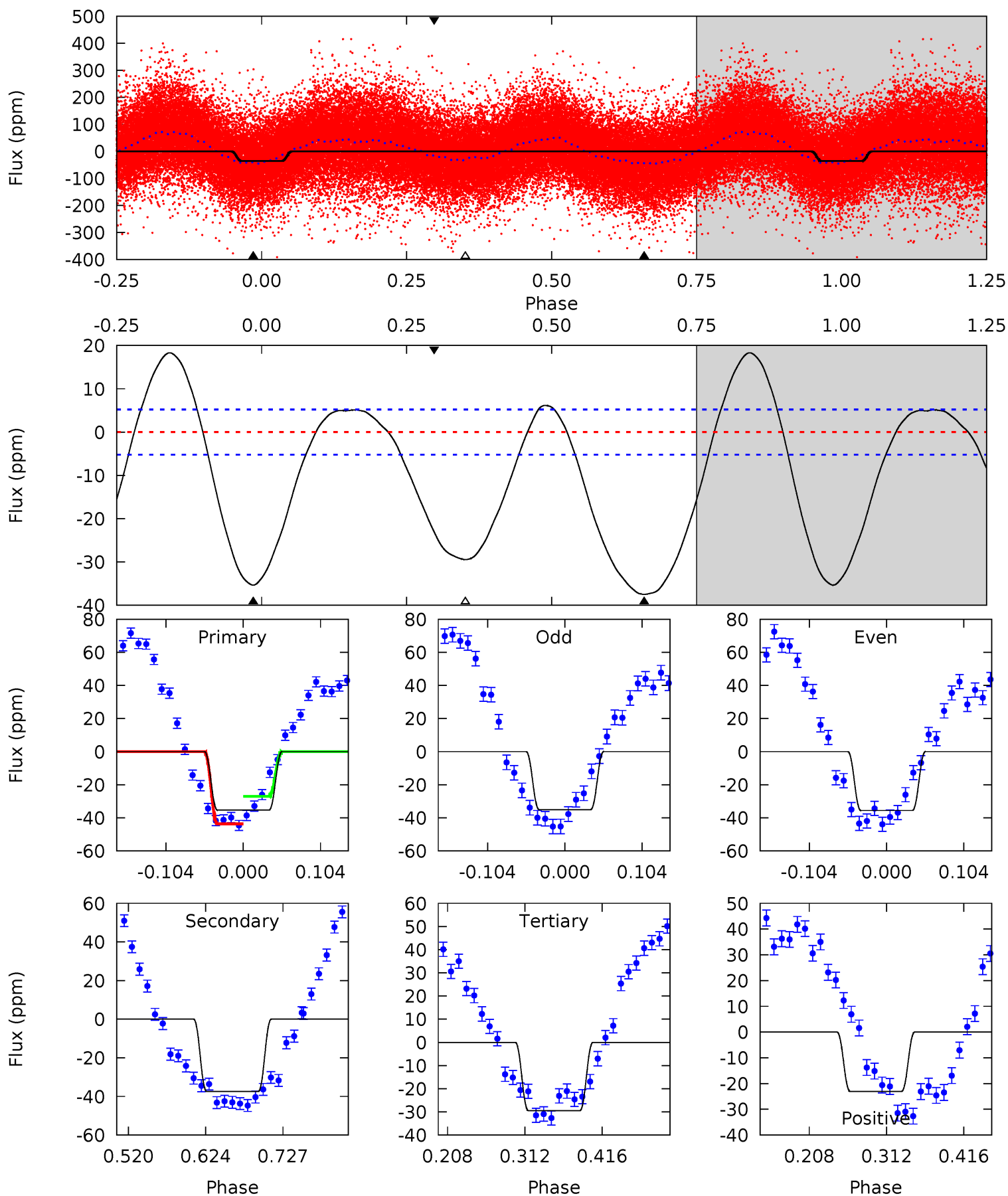
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.8	10.4	9.29	11.6	4.53	1.57	7.28	6.54	4.22	1.11	-1.21	3.43	1.11	0.50	2.99



Alt Model-Shift Uniqueness Test

008782002-01, P = 2.909768 Days, E = 130.013119 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.9	32.7	25.7	-20.1	4.56	1.63	12.1	5.15	51.0	7.00	52.9	0.23	1.01	0.33	7.06



Stellar Parameters For KIC 008782002

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6734^{+168}_{-184}	$3.766^{+0.292}_{-0.097}$	$-0.180^{+0.300}_{-0.250}$	$2.776^{+0.445}_{-0.965}$	$1.640^{+0.193}_{-0.358}$	$0.108^{+0.223}_{-0.034}$
	+2%/-3%	+8%/-3%	+167%/-139%	+16%/-35%	+12%/-22%	+207%/-31%
Source	PHO1	FLK73	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 008782002-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-11 ± 1	$1.22^{+0.29}_{-0.28}$	3150^{+173}_{-275}	5880^{+621}_{-485}	$8.717^{+5.564}_{-2.948}$
Alt.	-37 ± 1	$1.72^{+0.35}_{-0.37}$	3133^{+182}_{-281}	6778^{+532}_{-497}	15^{+9}_{-4}

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

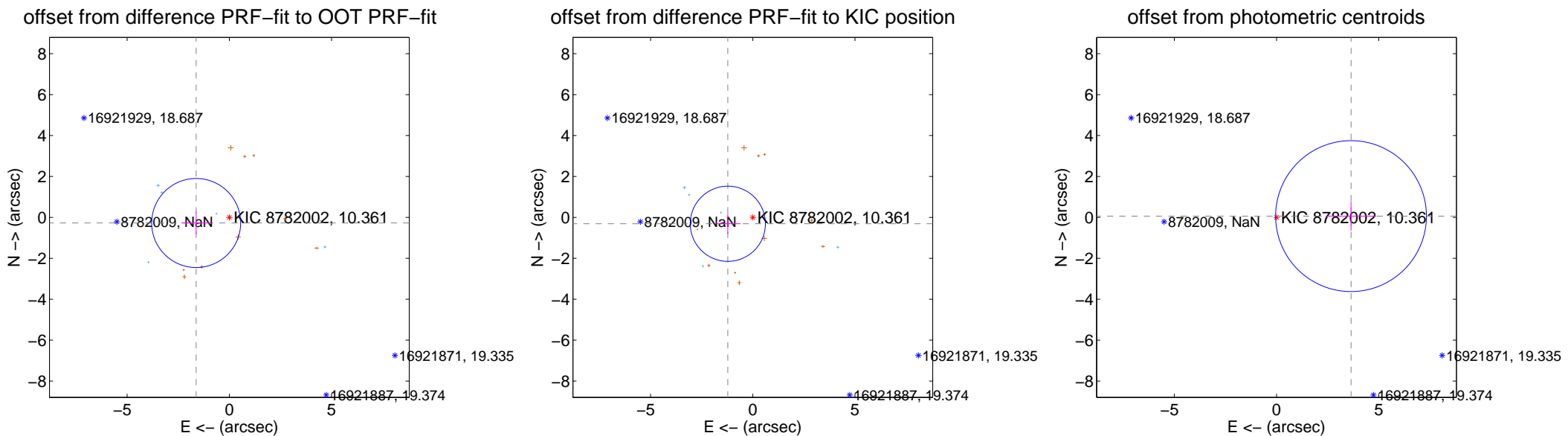
DV Centroid Data

Supplemental centroid analysis for 008782002-01. **Kepler magnitude: 10.36.** Transit SNR 8.37

There are 6 quarters with good PRF difference image offsets

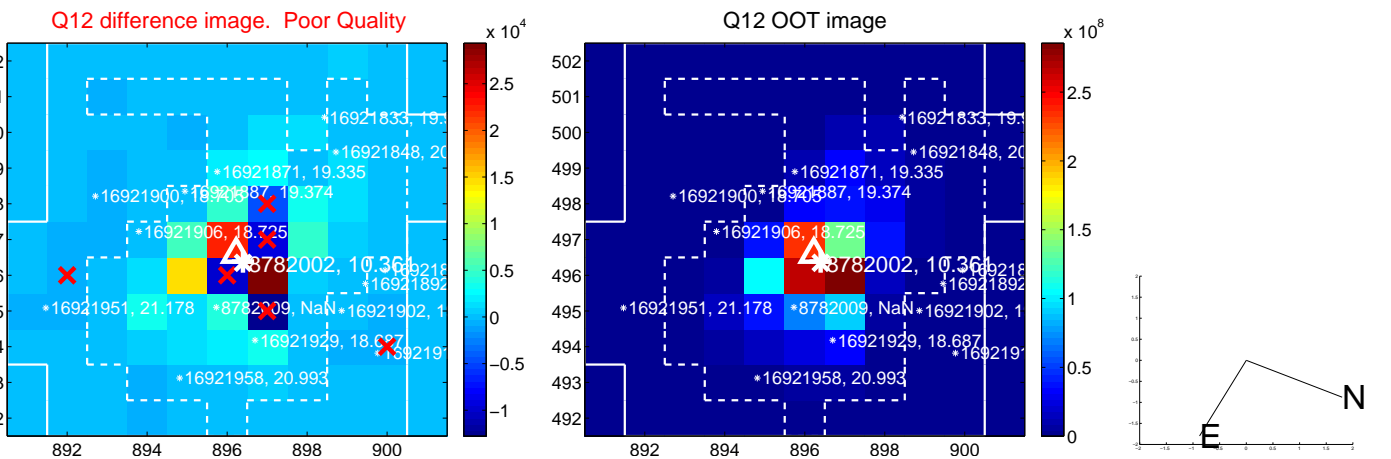
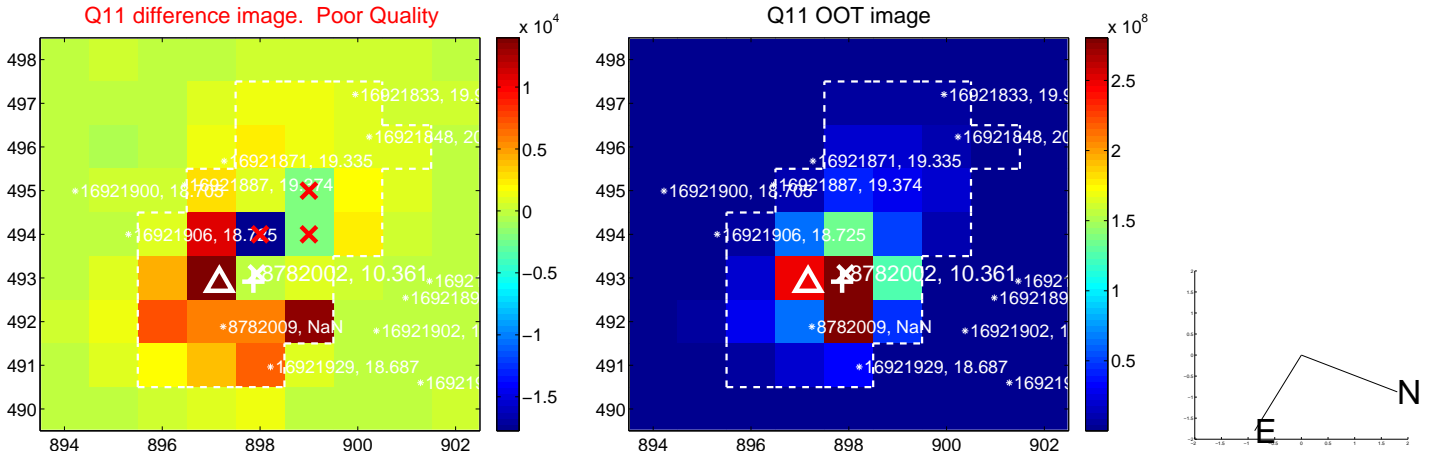
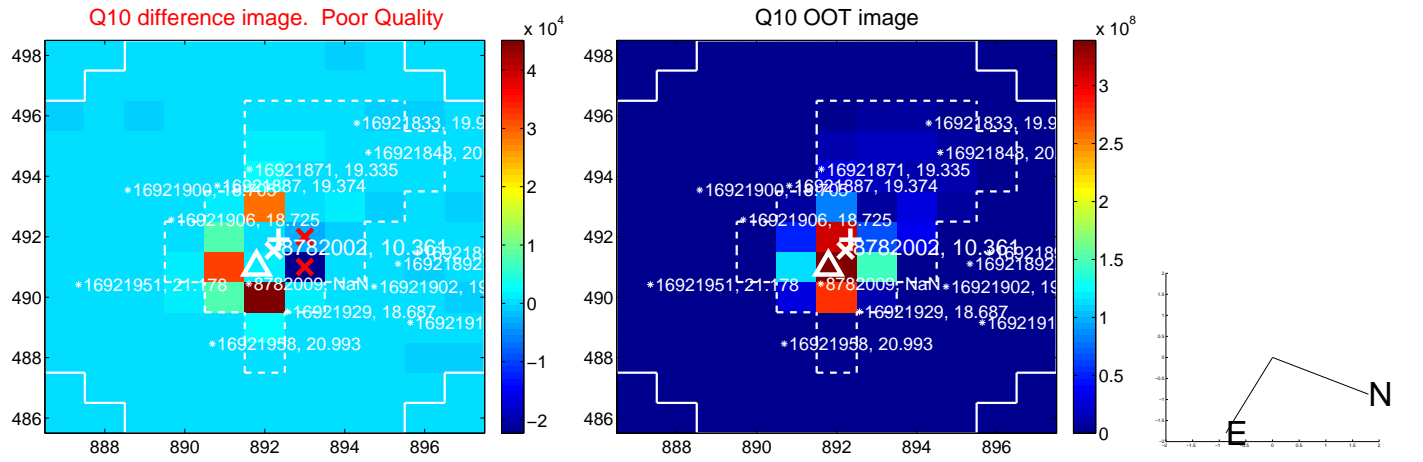
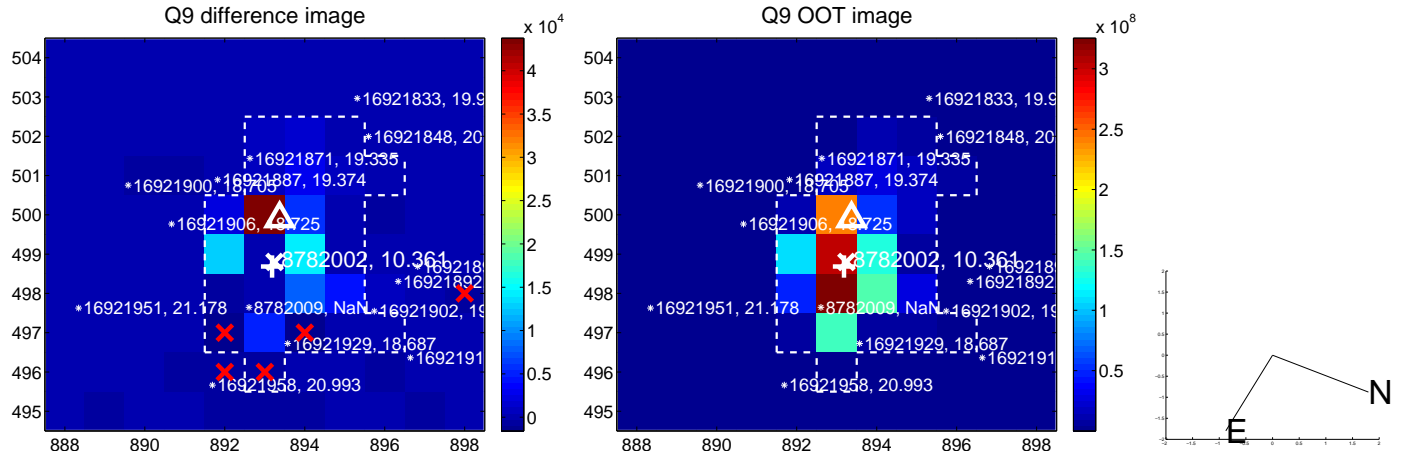
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.645 ± 0.725	2.27	1.622 ± 0.727	-0.275 ± 0.546
PRF-fit source offset from KIC position	1.260 ± 0.613	2.06	1.221 ± 0.629	-0.312 ± 0.492
photometric centroid source offset	3.64 ± 1.23	2.96	-3.64 ± 1.23	0.06 ± 0.71

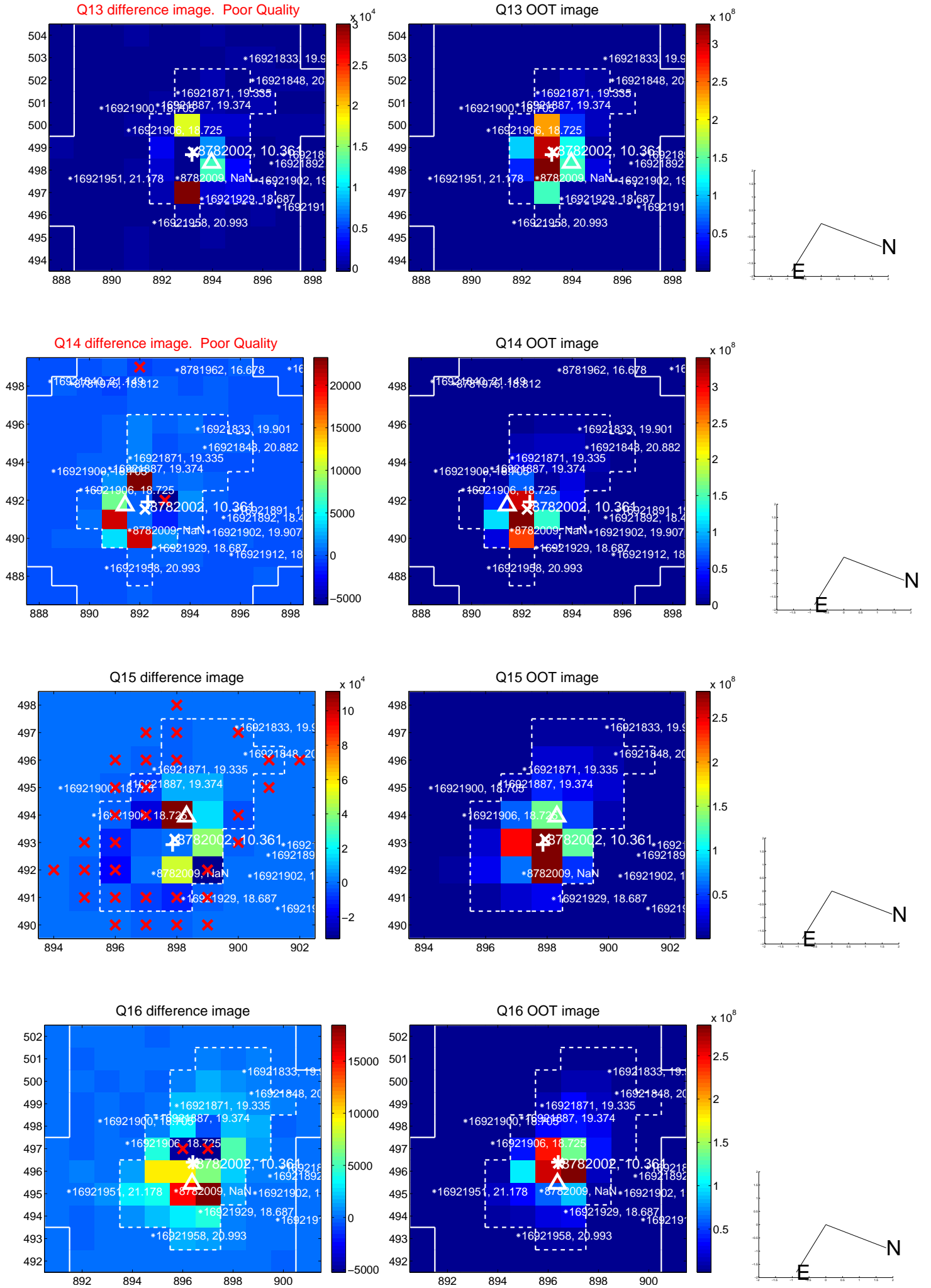


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

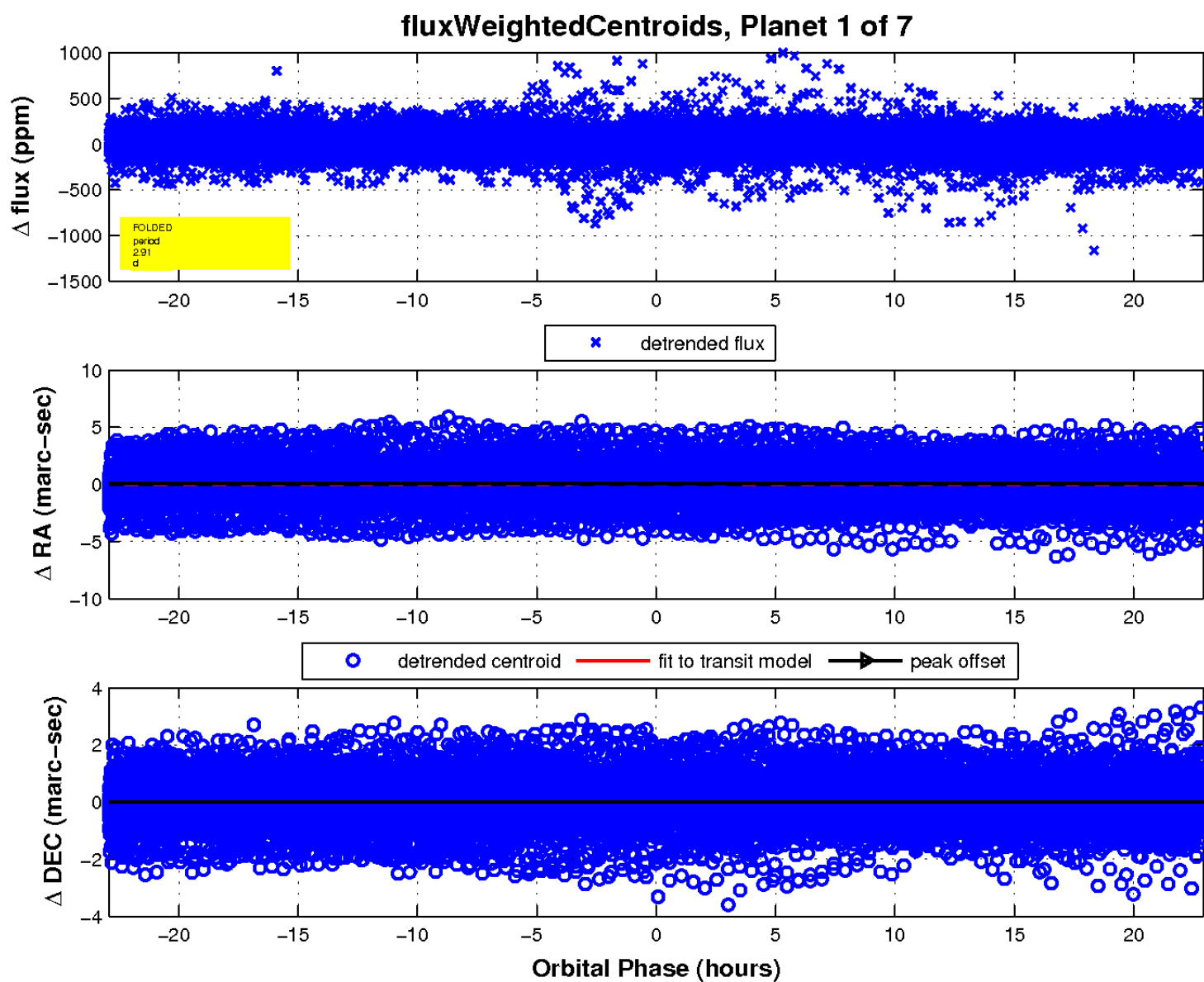
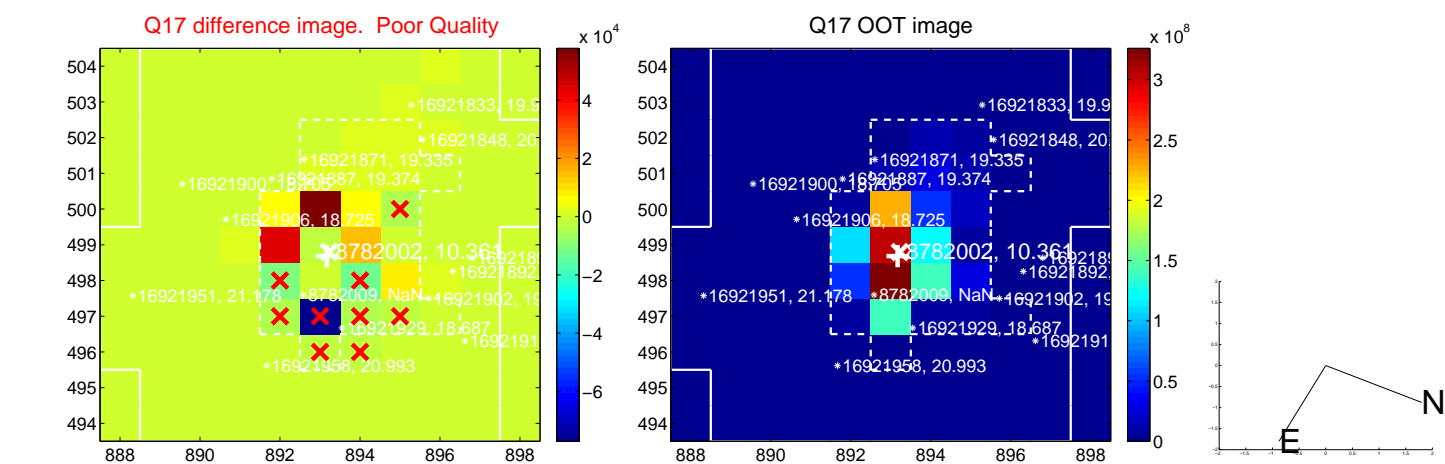
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



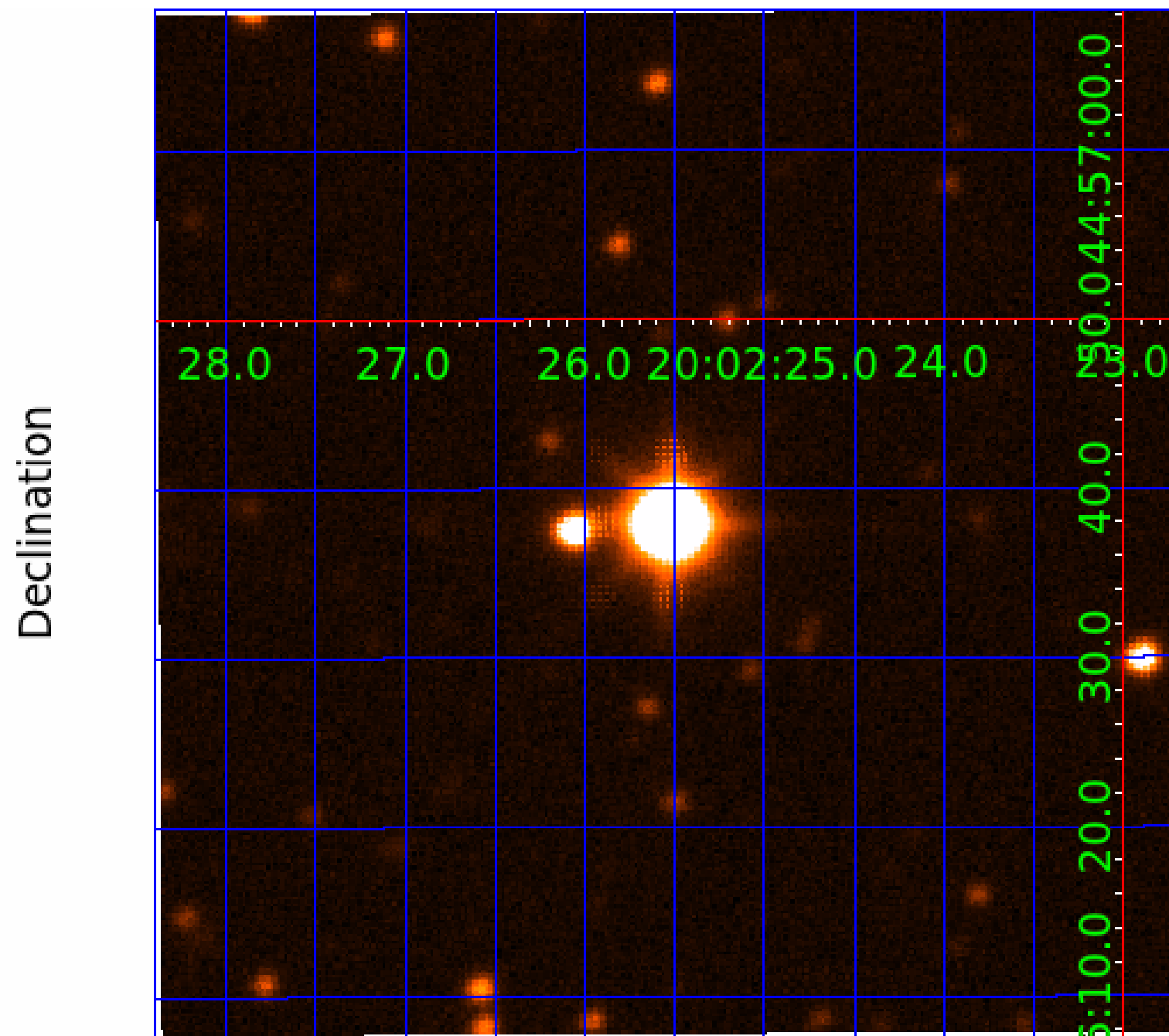
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 008782002

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})
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Robovetter Results

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008782002-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008782002-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
008782002-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

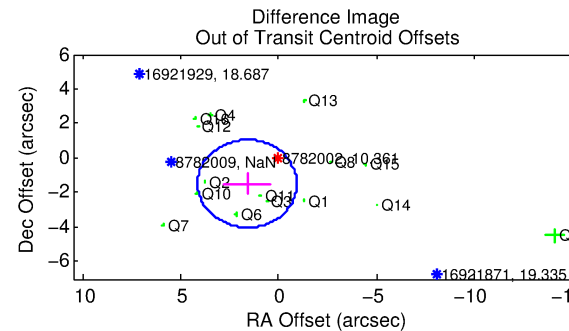
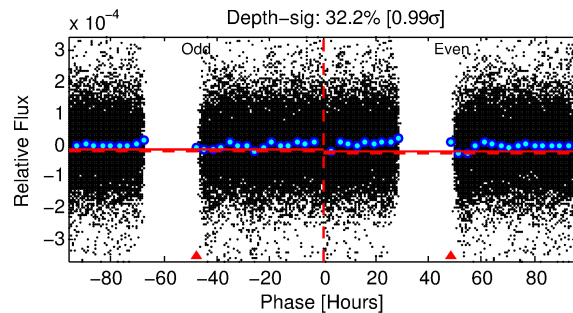
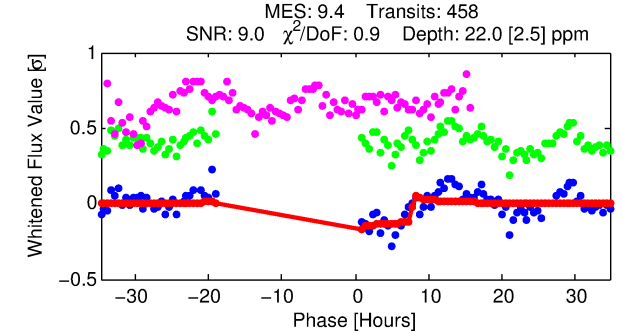
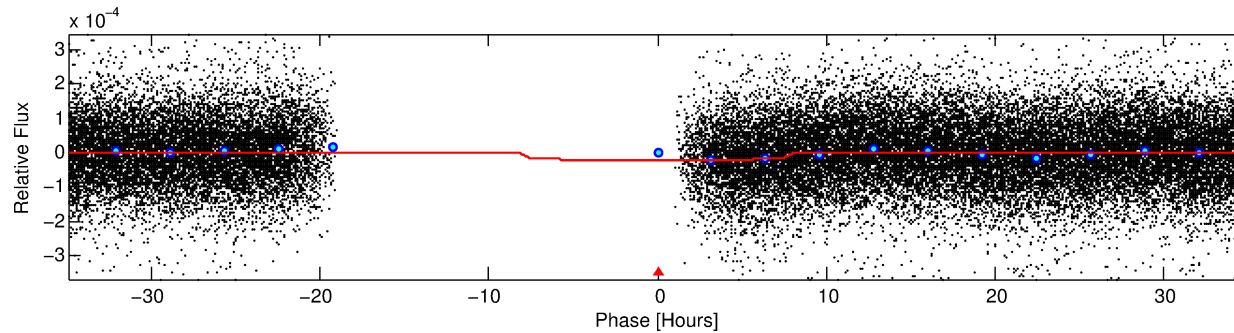
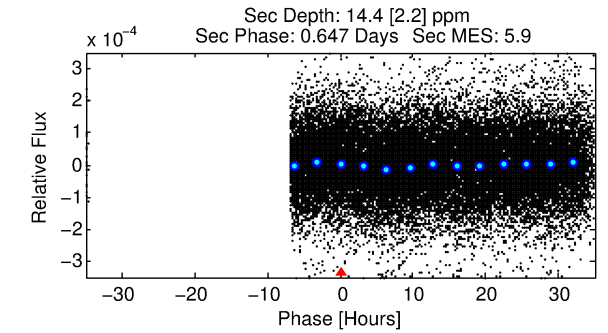
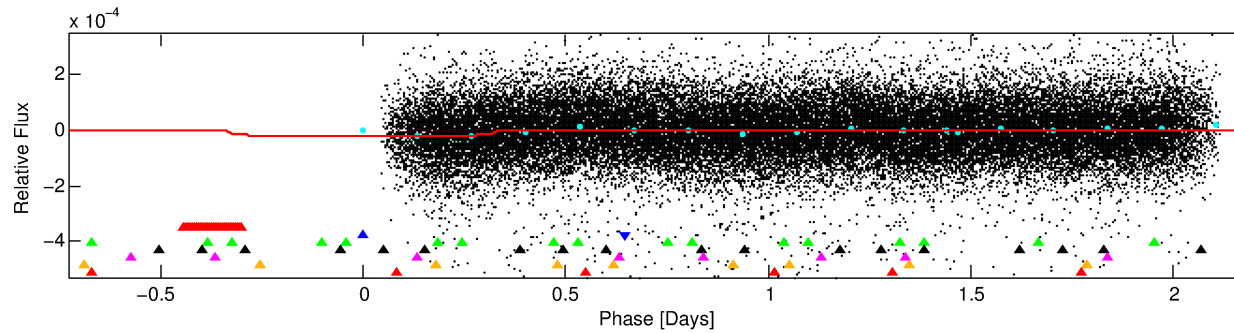
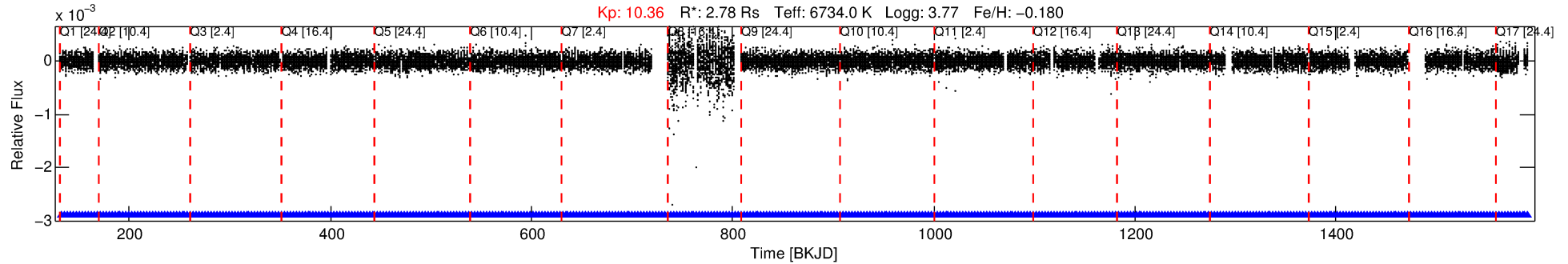
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008782002-02

No Significant Match Found

DV One-Page Summary

KIC: 8782002 Candidate: 2 of 7 Period: 2.909 d



DV Fit Results:

Period = 2.90946 [0.00004] d
Epoch = 133.2850 [0.0597] BKJD
Rp/R* = 0.0048 [0.0016]
a/R* = 1.19 [0.73]
b = 0.84 [0.69]
Seff = 6414.79 [3311.98]
Teq = 2282 [295] K
Rp = 1.46 [0.69] Re
a = 0.0470 [0.0152] AU
Ag = 8.27 [6.94] [1.05σ]
Teffp = 5984 [1016] K [3.50σ]

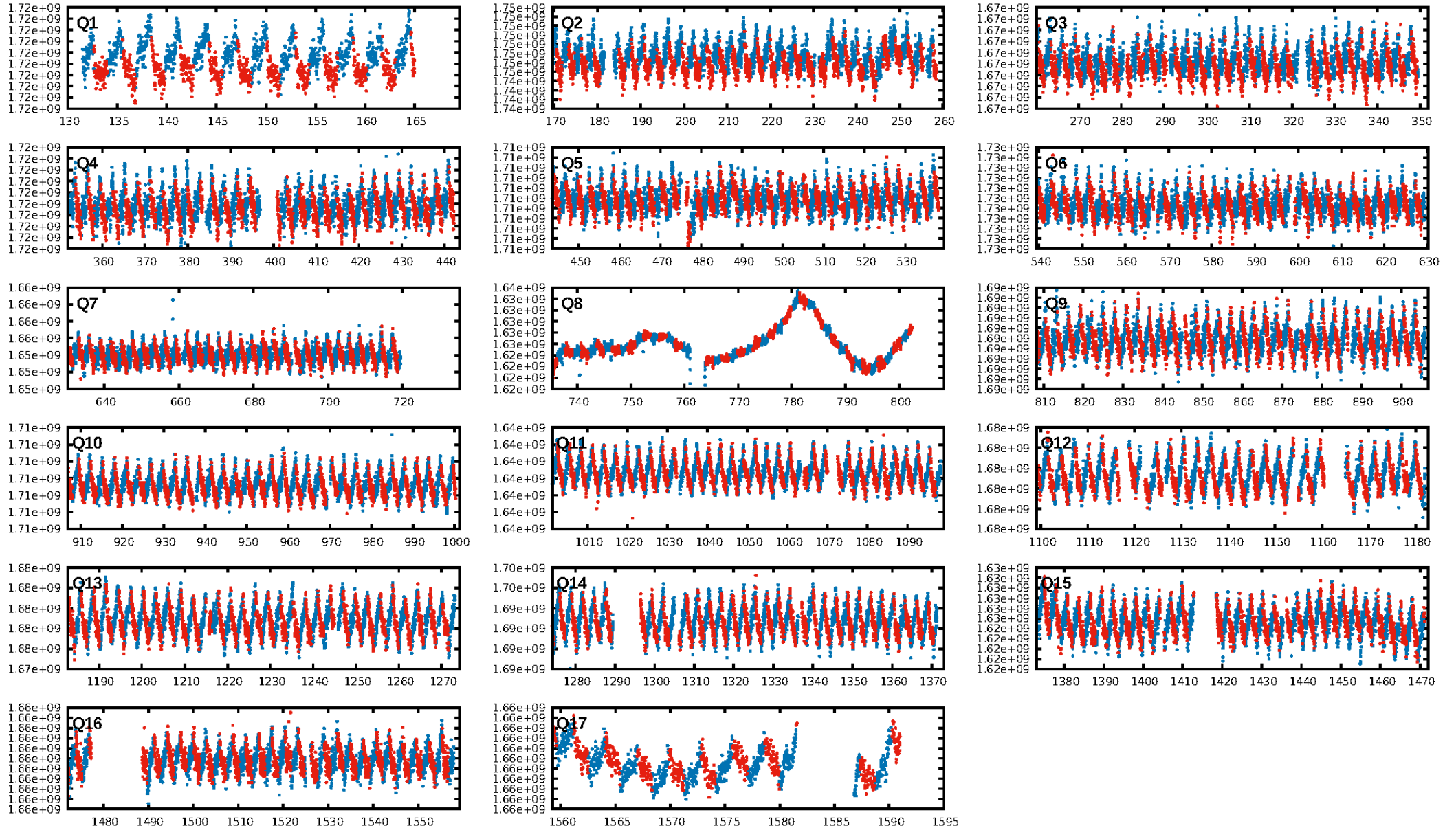
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.18e-09
RollingBand-fgt: 1.00 [438/438]
GhostDiagnostic-chr: N/A
Centroid-sig: 31.7%
Centroid-so: 1.014 arcsec [1.14σ]
OotOffset-rm: 2.190 arcsec [2.59σ]
KicOffset-rm: 1.899 arcsec [1.95σ]
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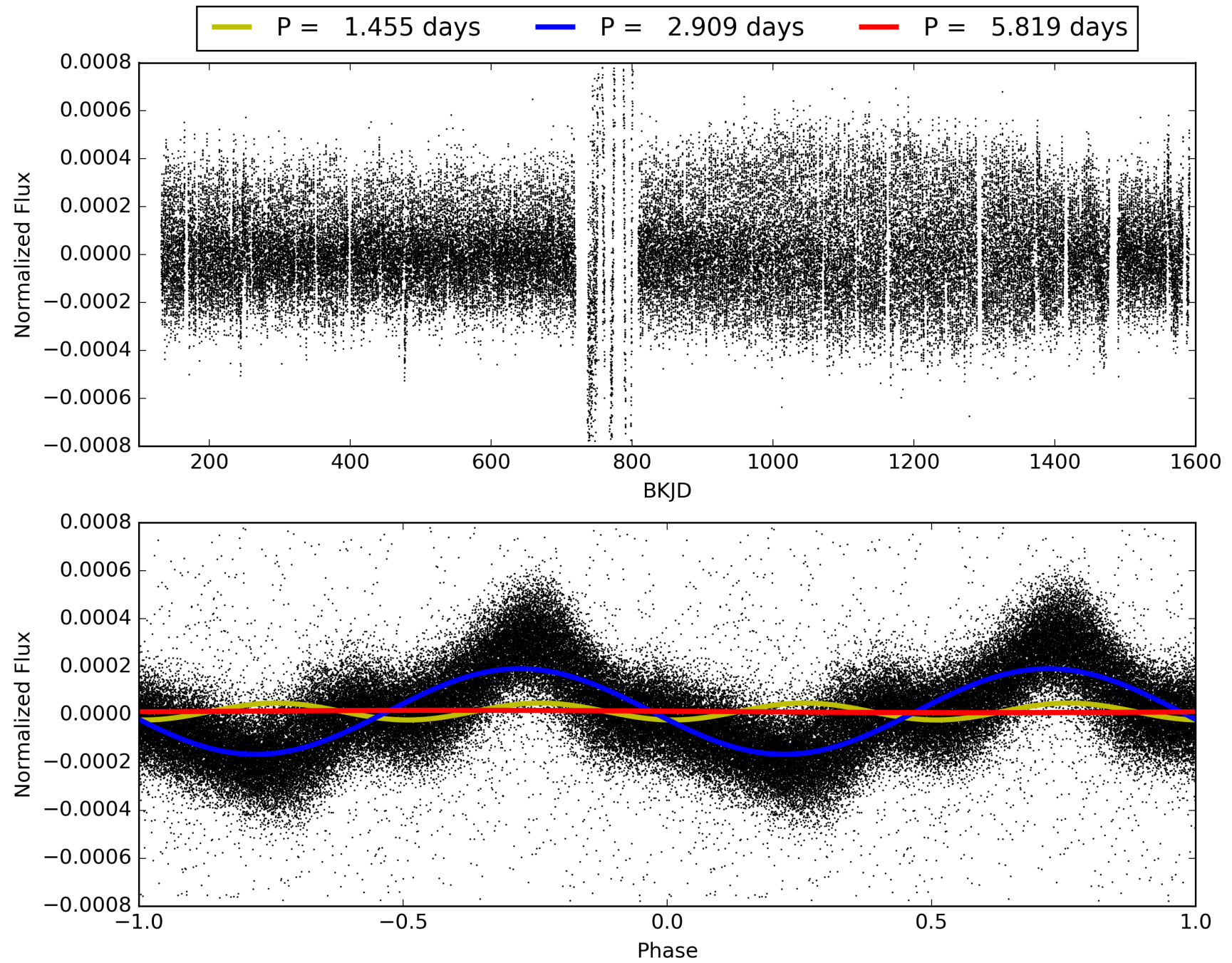
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008782002-02, PDC Light Curves

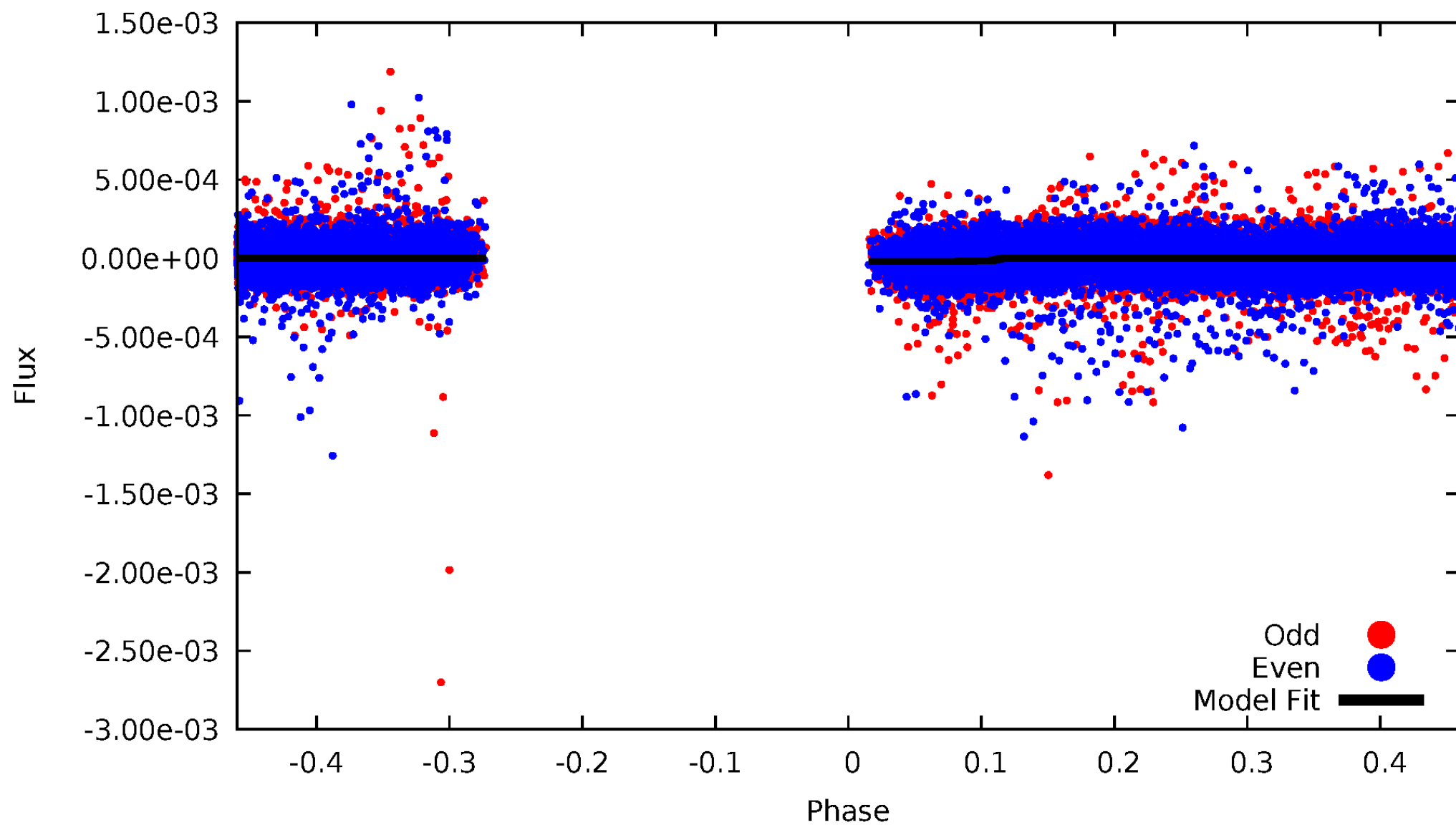


TCE 008782002-02



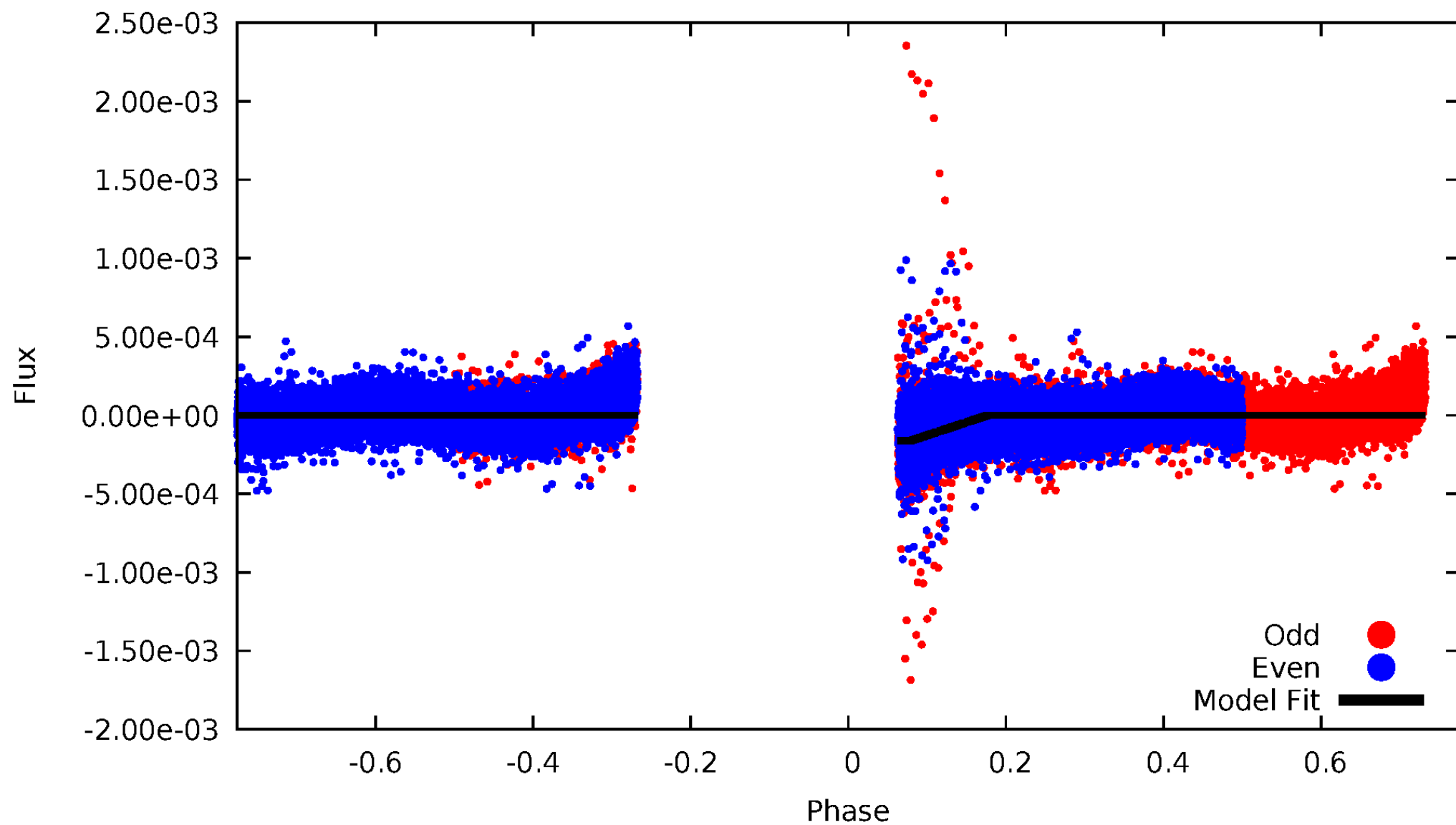
DV Odd/Even

TCE 008782002-02



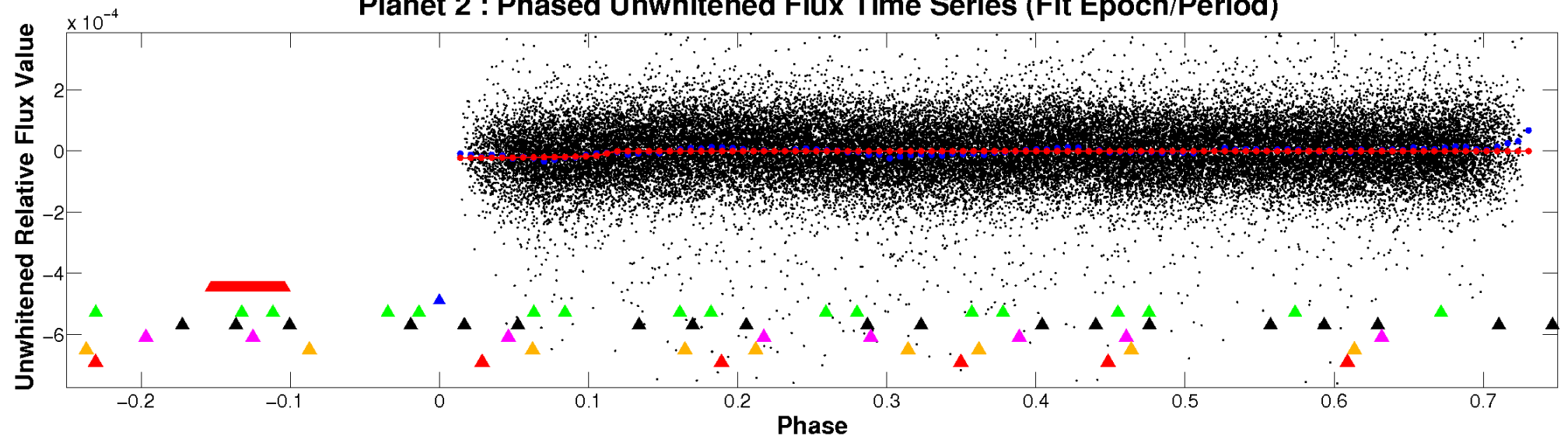
ALT Odd/Even

TCE 008782002-02

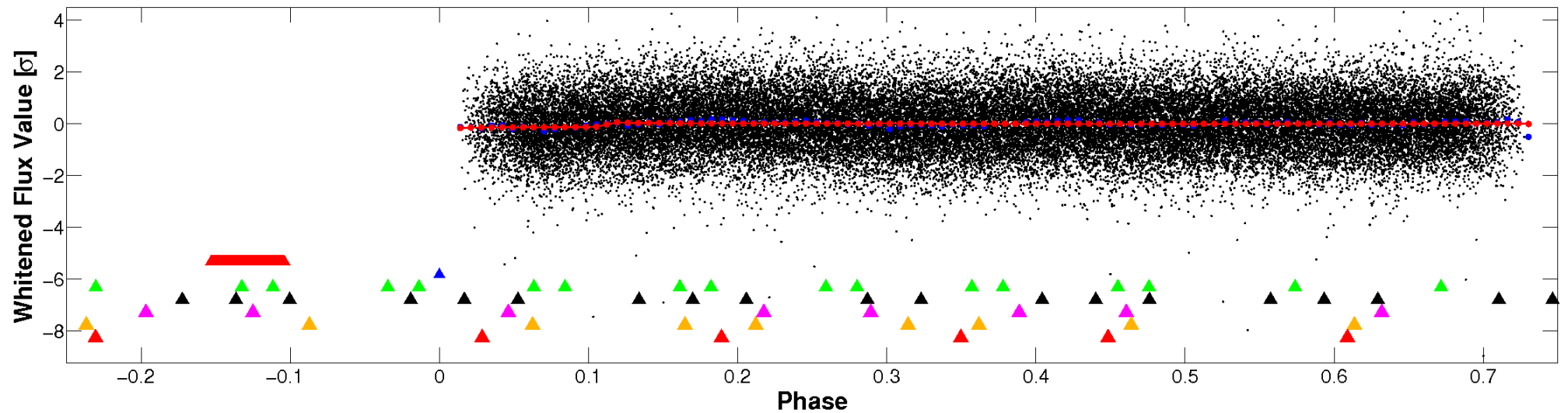


Non-Whitened Vs. Whitened Light Curve

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

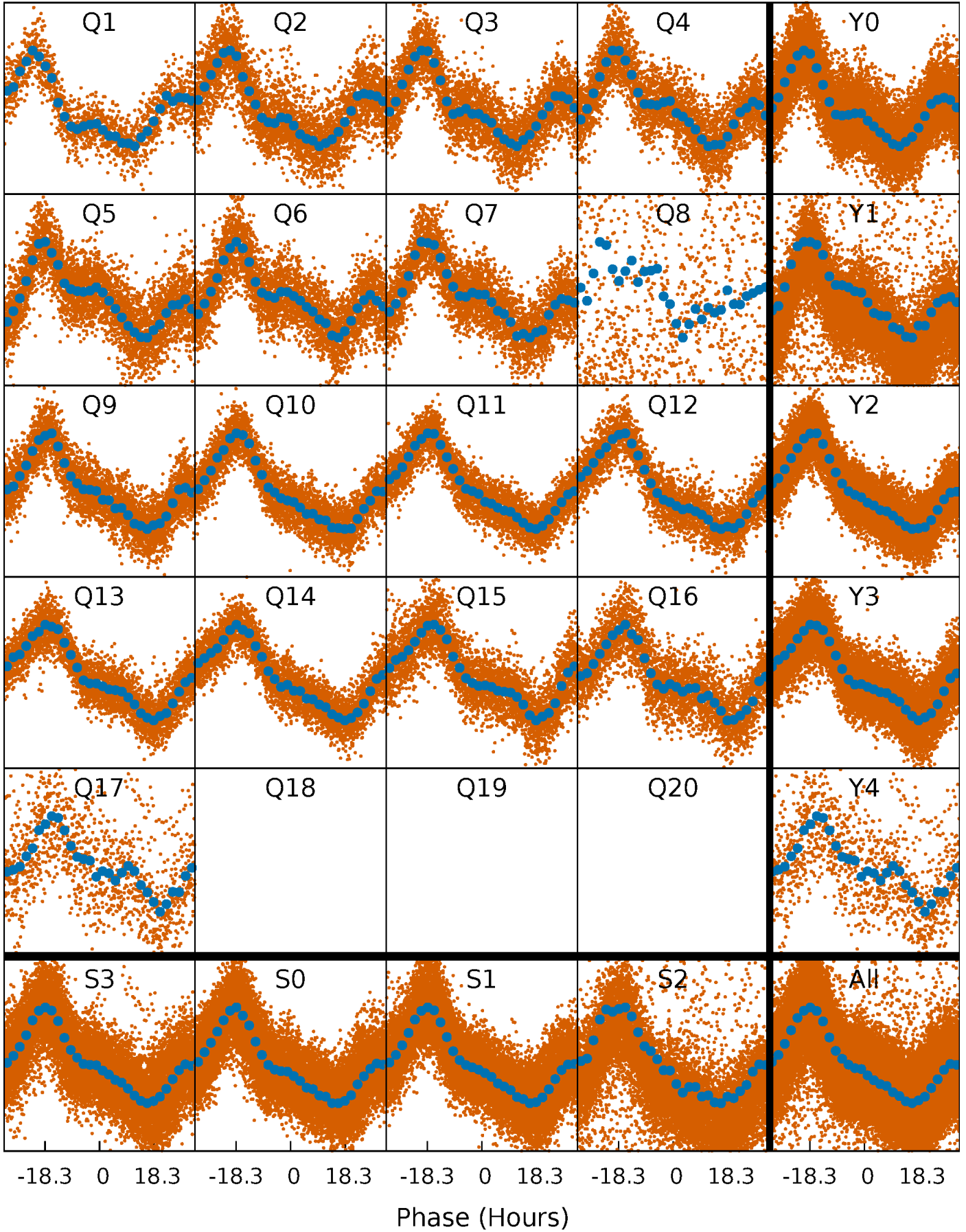


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



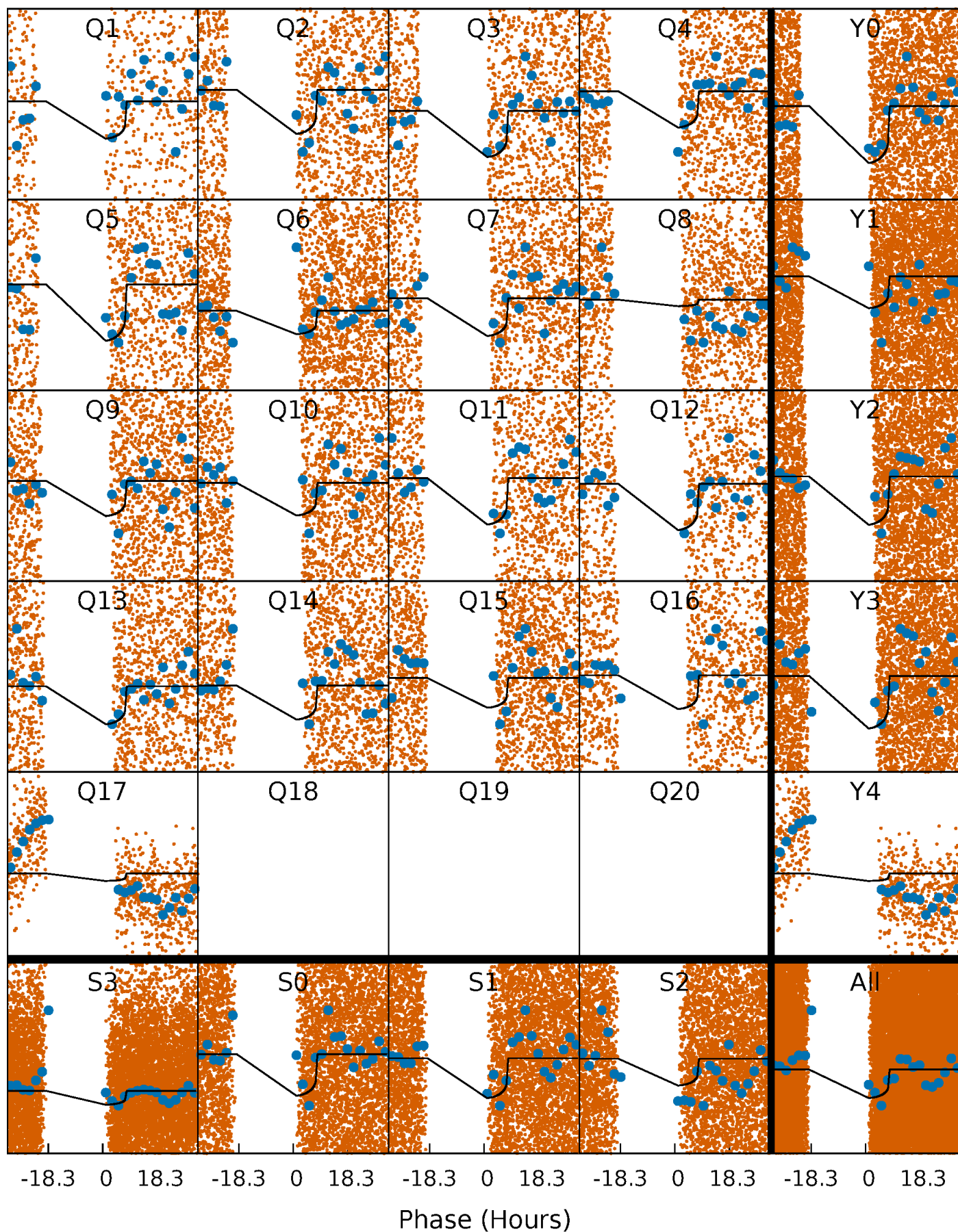
PDC Quarter-Phased Transit Curves

TCE 008782002-02 $P = 2.909463$ Days $T_0 = 133.285035$ (BKJD)



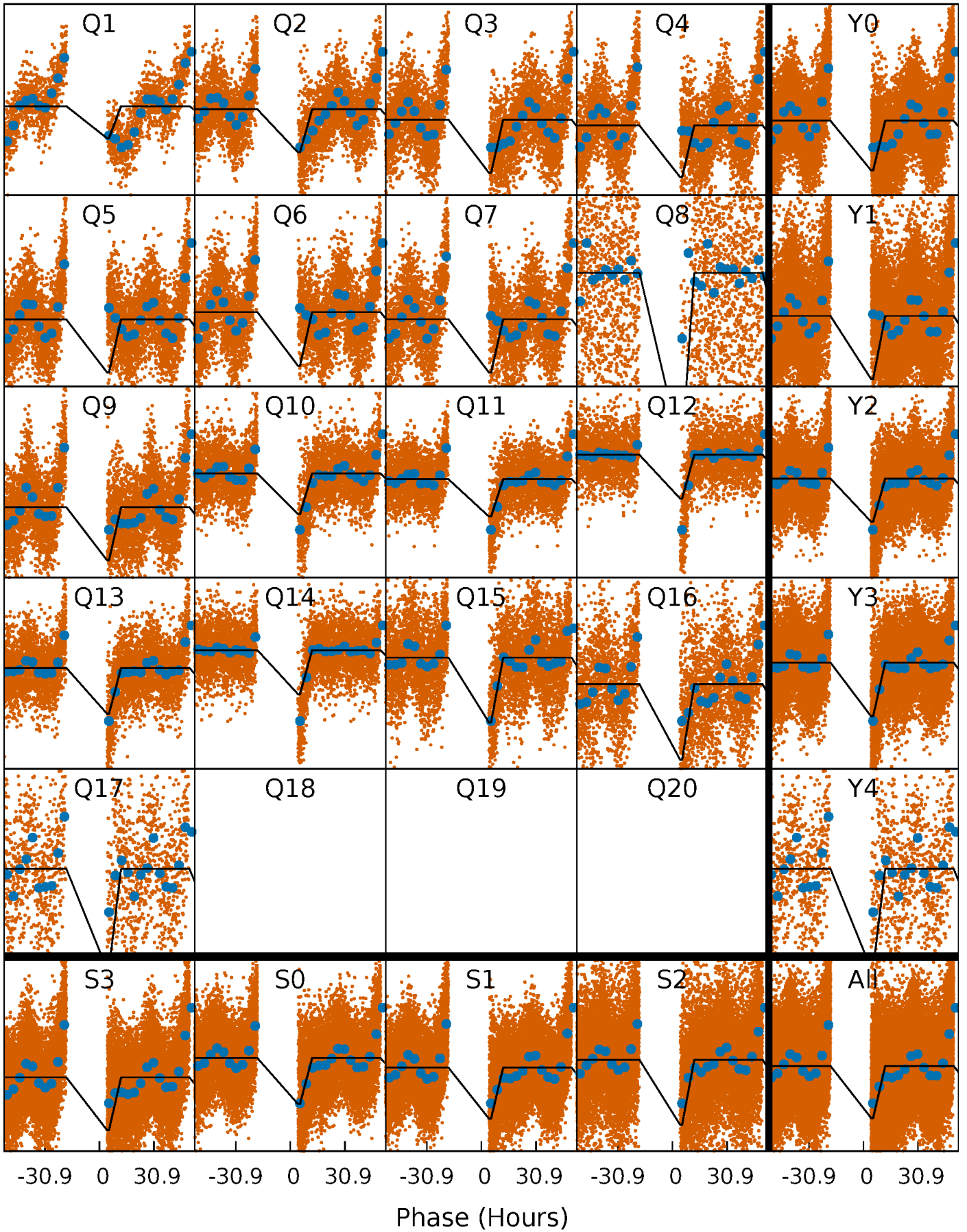
DV Quarter-Phased Transit Curves

TCE 008782002-02 P= 2.909463 Days $T_0=133.285035$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

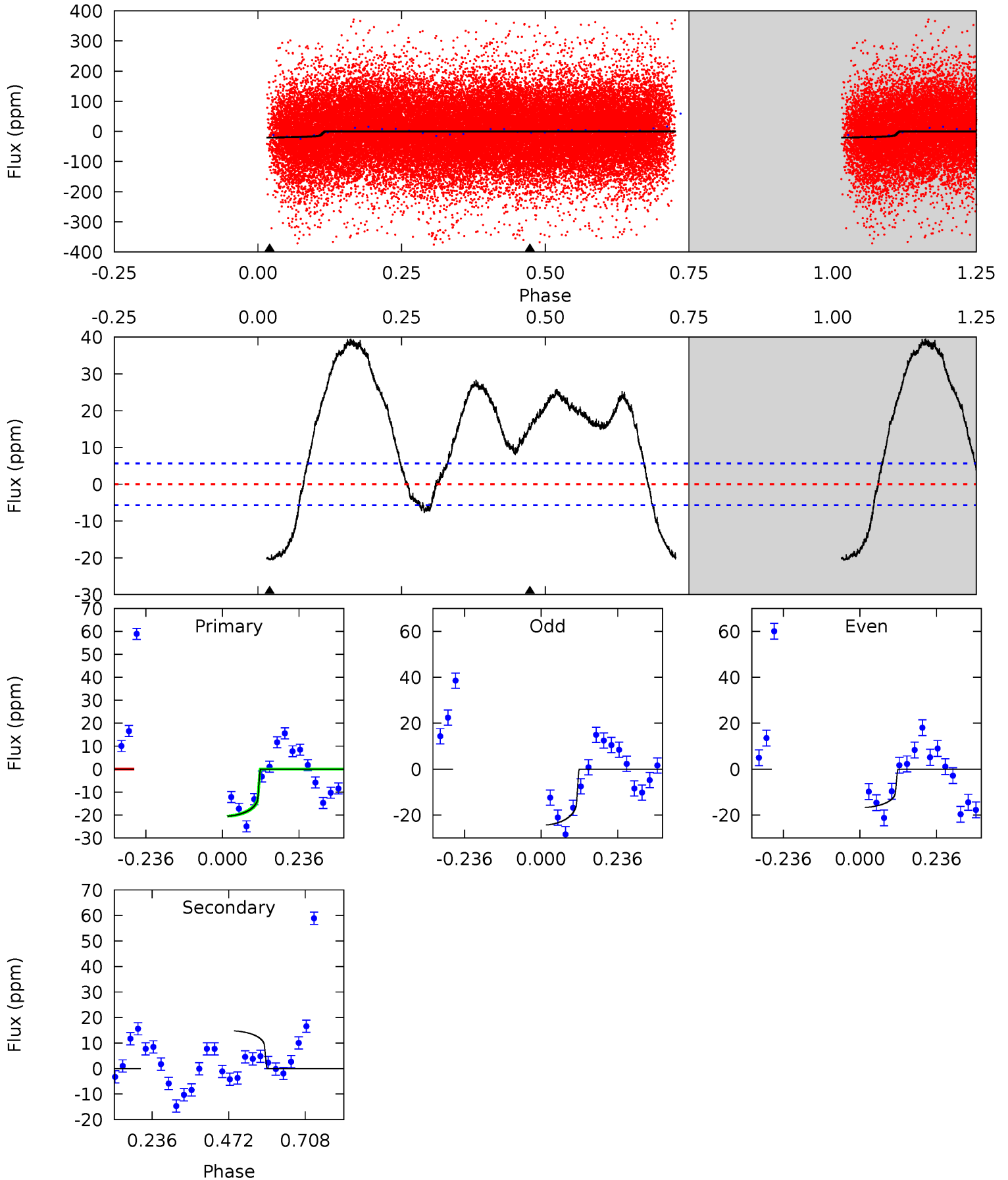
TCE 008782002-02 P= 2.909787 Days $T_0=133.128830$ (BKJD)



DV Model-Shift Uniqueness Test

008782002-02, P = 2.909463 Days, E = 130.375572 Days

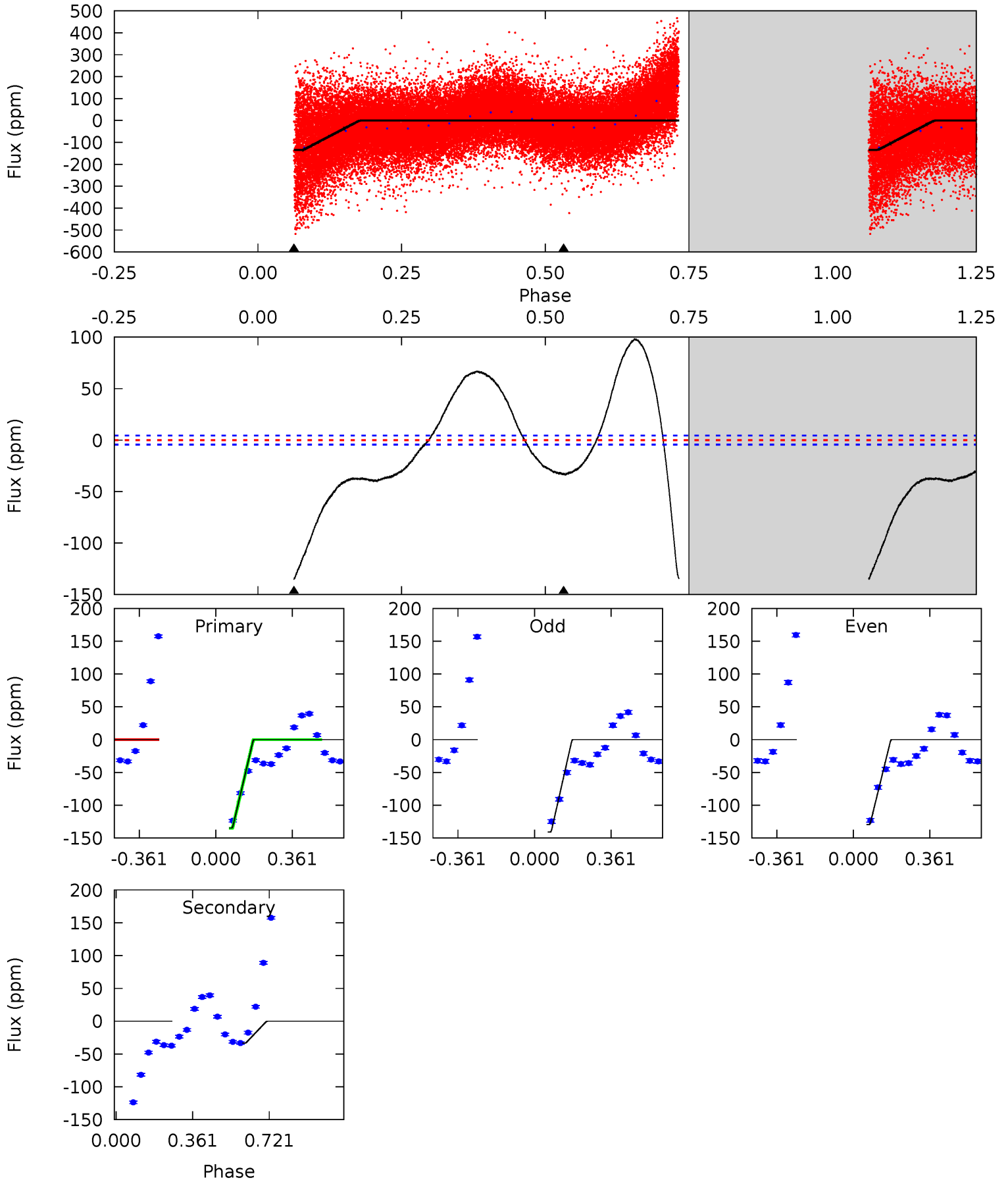
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.8	-11.4	0	0	4.38	1.18	7.99	15.8	15.8	-11.4	-11.4	2.94	1.08	0.66	0



Alt Model-Shift Uniqueness Test

008782002-02, P = 2.909787 Days, E = 130.219043 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
131.6	32.6	0	0	4.29	0.91	16.9	131.6	131.6	32.6	32.6	5.32	0.93	0.42	0



Stellar Parameters For KIC 008782002

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6734^{+168}_{-184}	$3.766^{+0.292}_{-0.097}$	$-0.180^{+0.300}_{-0.250}$	$2.776^{+0.445}_{-0.965}$	$1.640^{+0.193}_{-0.358}$	$0.108^{+0.223}_{-0.034}$
	+2%/-3%	+8%/-3%	+167%/-139%	+16%/-35%	+12%/-22%	+207%/-31%
Source	PHO1	FLK73	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 008782002-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	15 ± 1	$1.35^{+0.56}_{-0.45}$	3121^{+188}_{-252}	-6054^{+777}_{-1370}	$-9.790^{+4.702}_{-12.069}$
Alt.	-33 ± 1	$3.69^{+0.69}_{-0.76}$	3140^{+189}_{-269}	4584^{+293}_{-240}	$2.999^{+1.548}_{-0.821}$

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

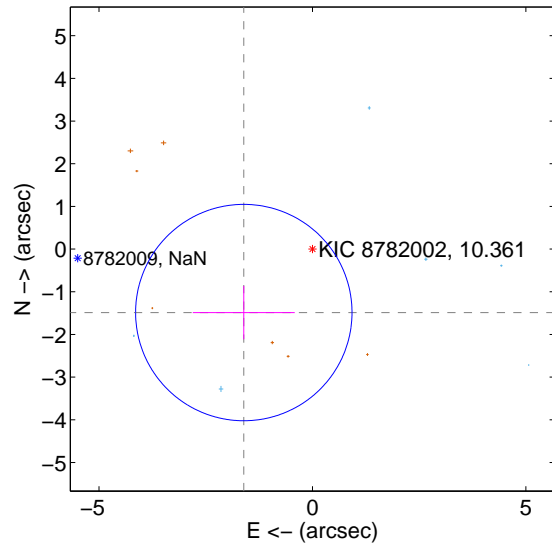
Supplemental centroid analysis for 008782002-02. **Kepler magnitude: 10.36.** Transit SNR 9.00

There are 6 quarters with good PRF difference image offsets

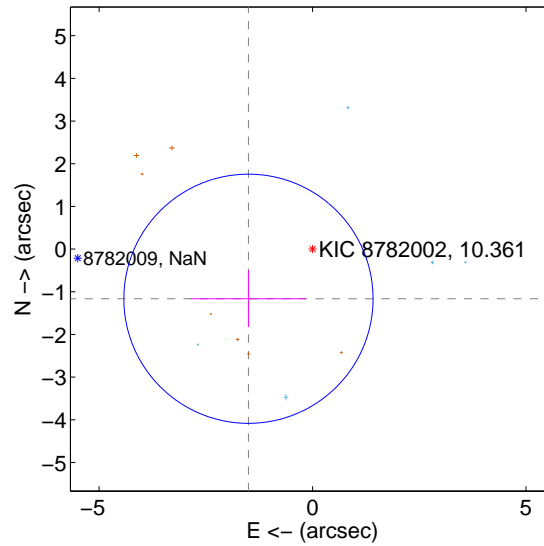
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.190 ± 0.845	2.59	1.608 ± 1.194	-1.487 ± 0.625
PRF-fit source offset from KIC position	1.899 ± 0.973	1.95	1.501 ± 1.349	-1.164 ± 0.664
photometric centroid source offset	1.01 ± 0.89	1.14	-1.01 ± 0.89	-0.07 ± 0.52

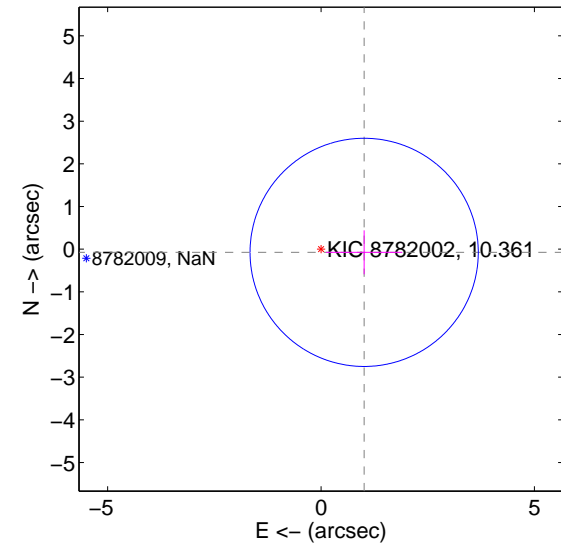
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

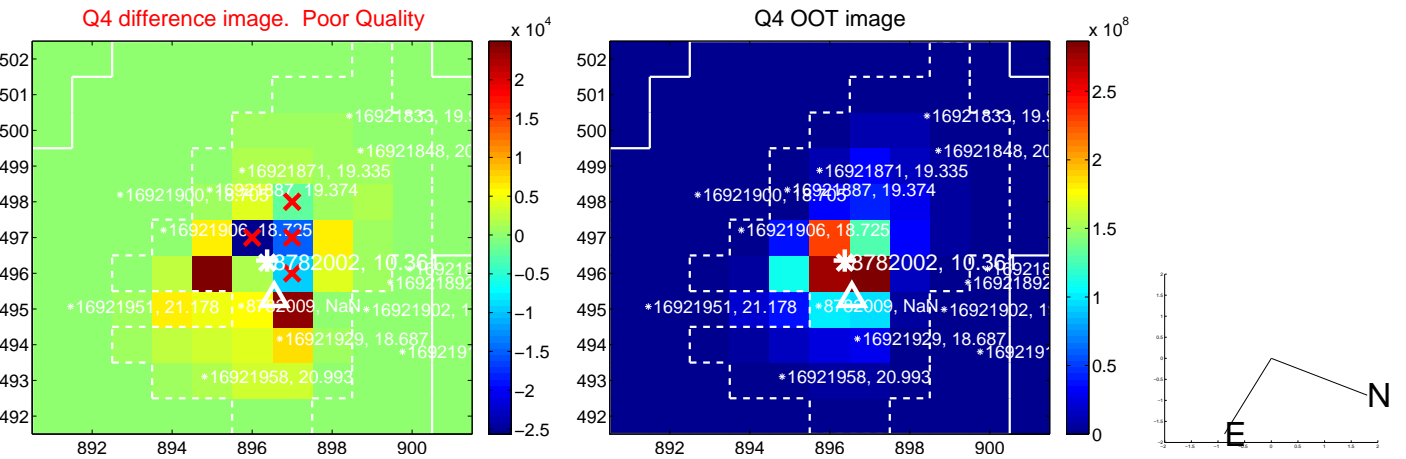
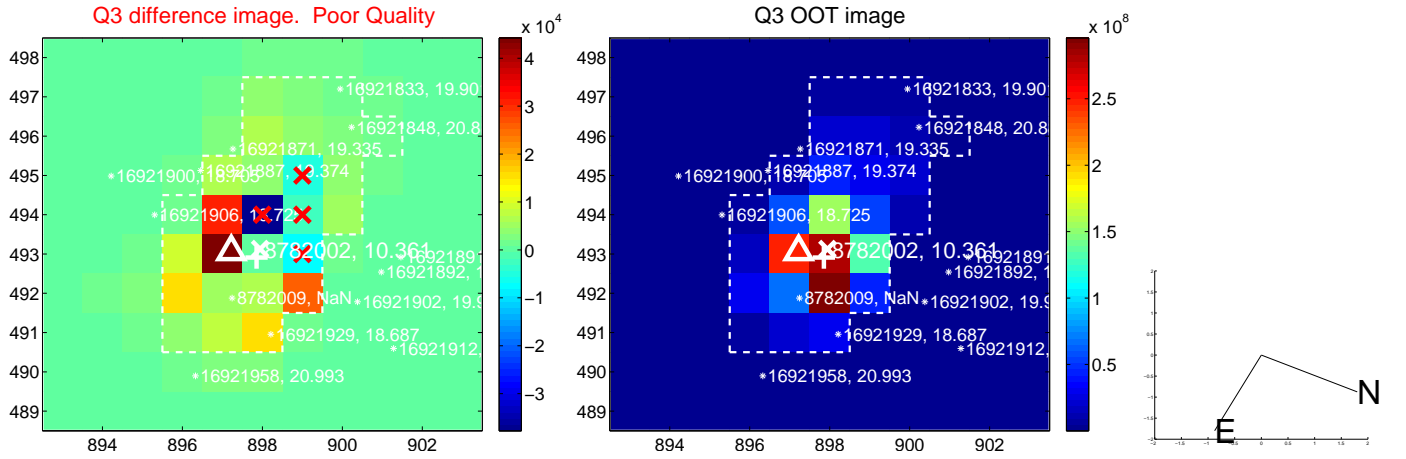
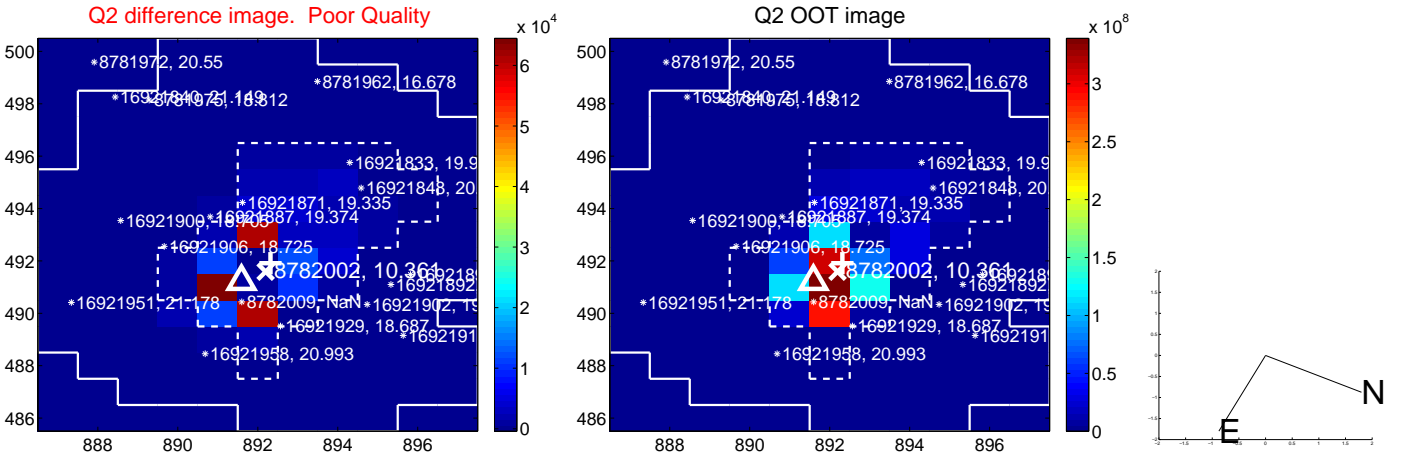
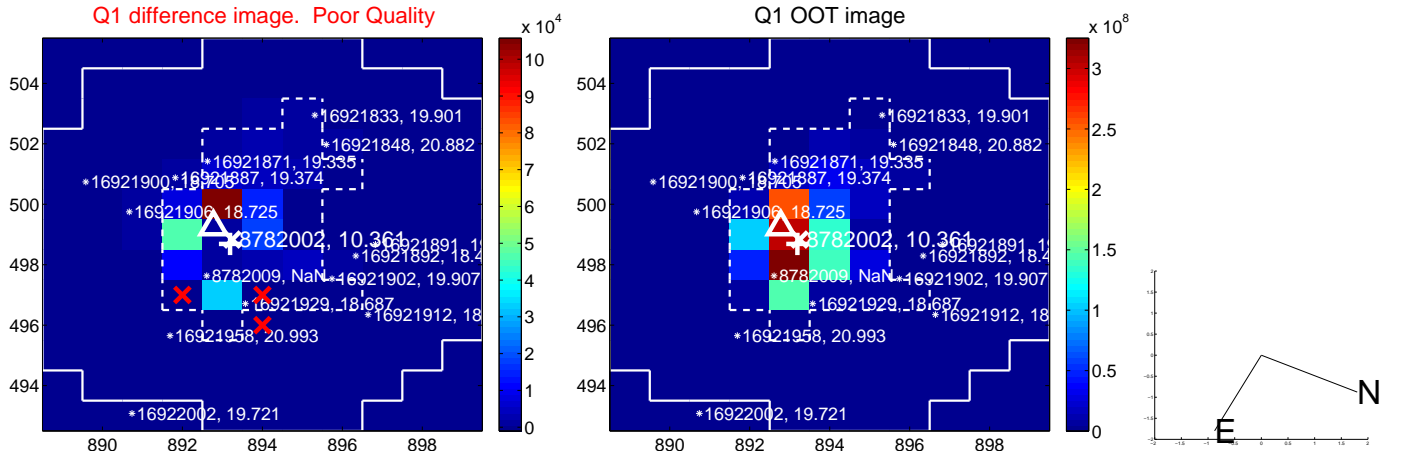


offset from photometric centroids

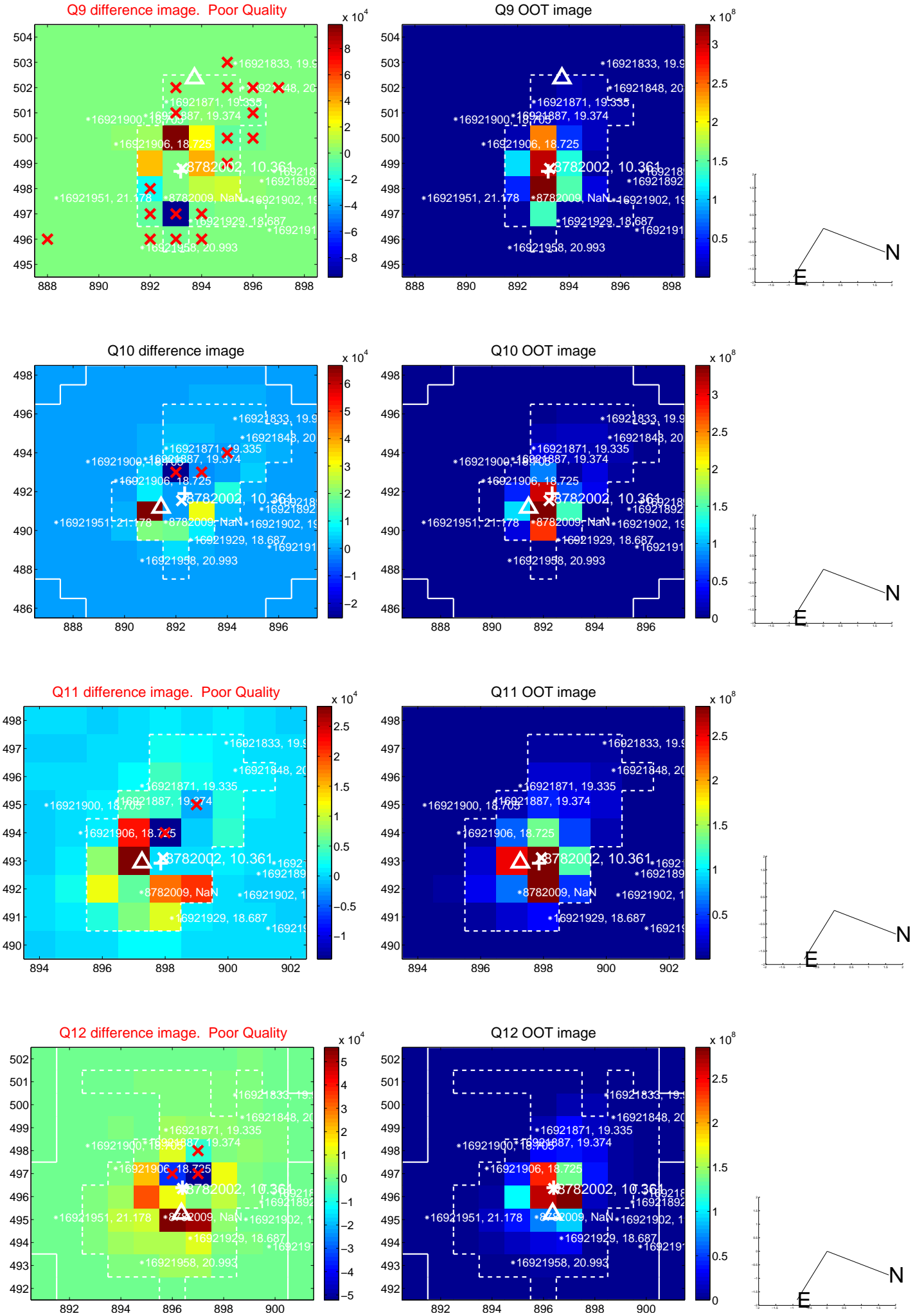


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

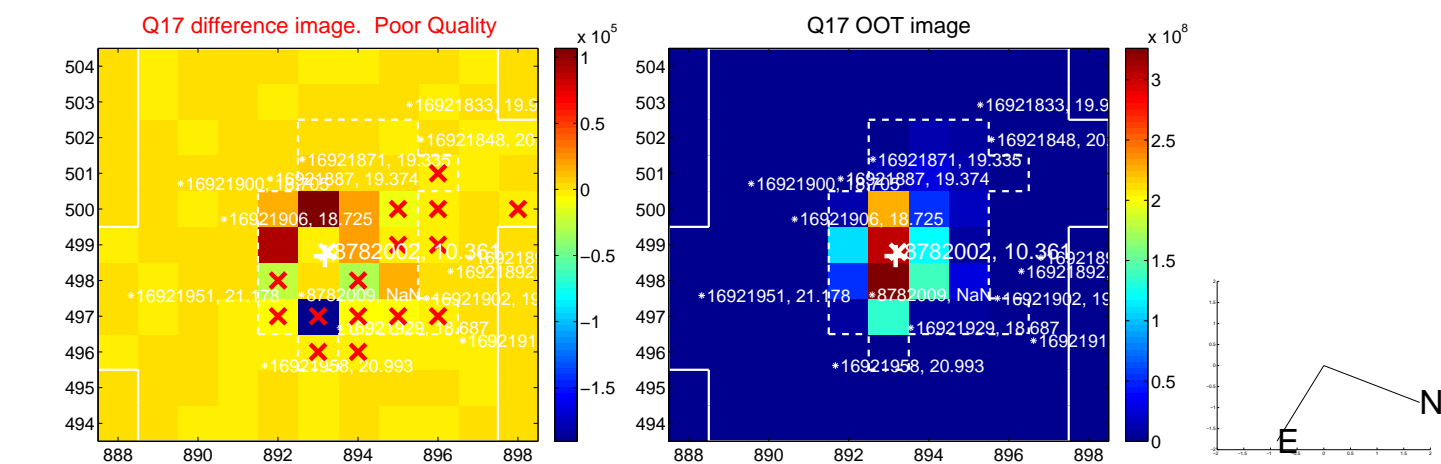
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



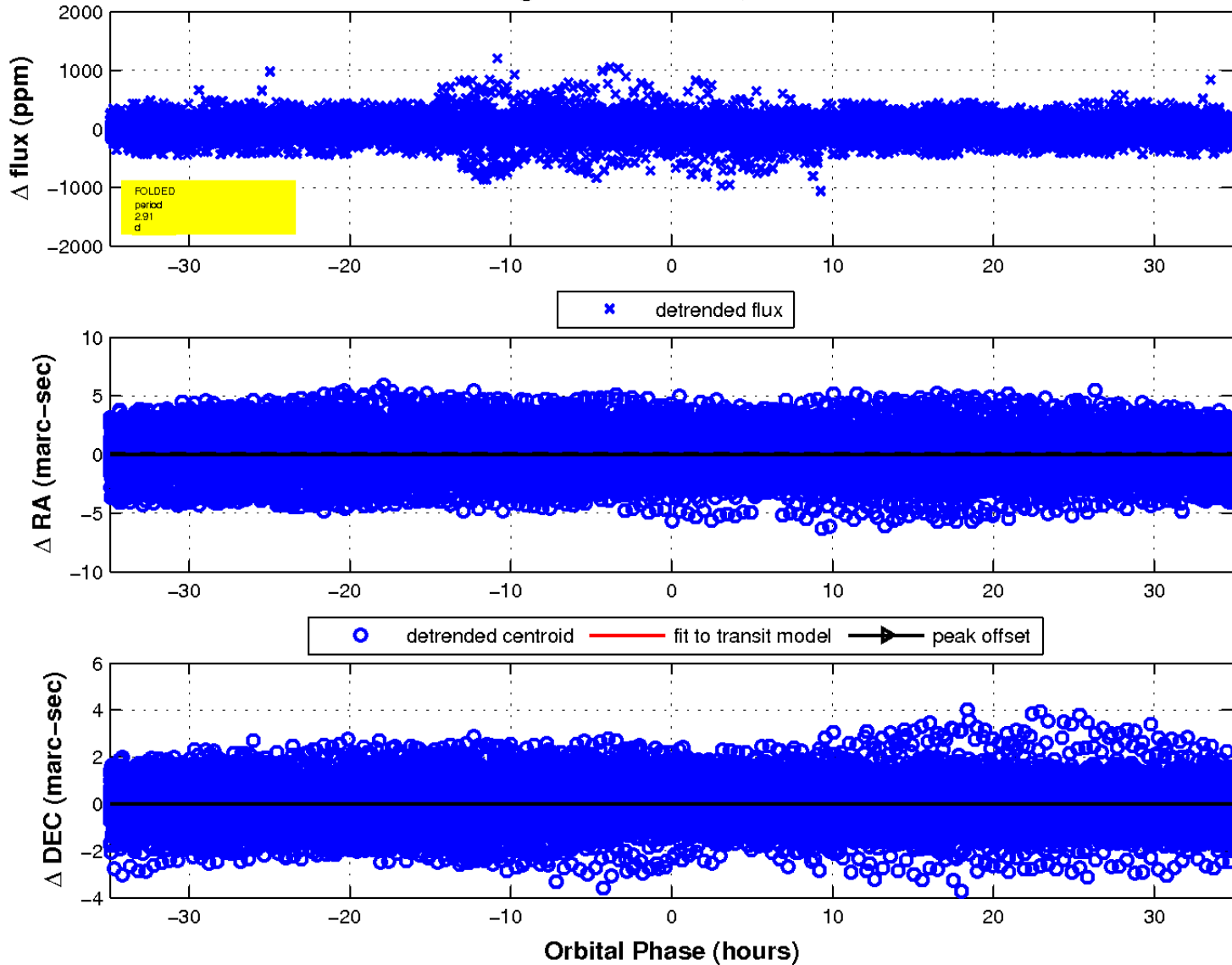
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



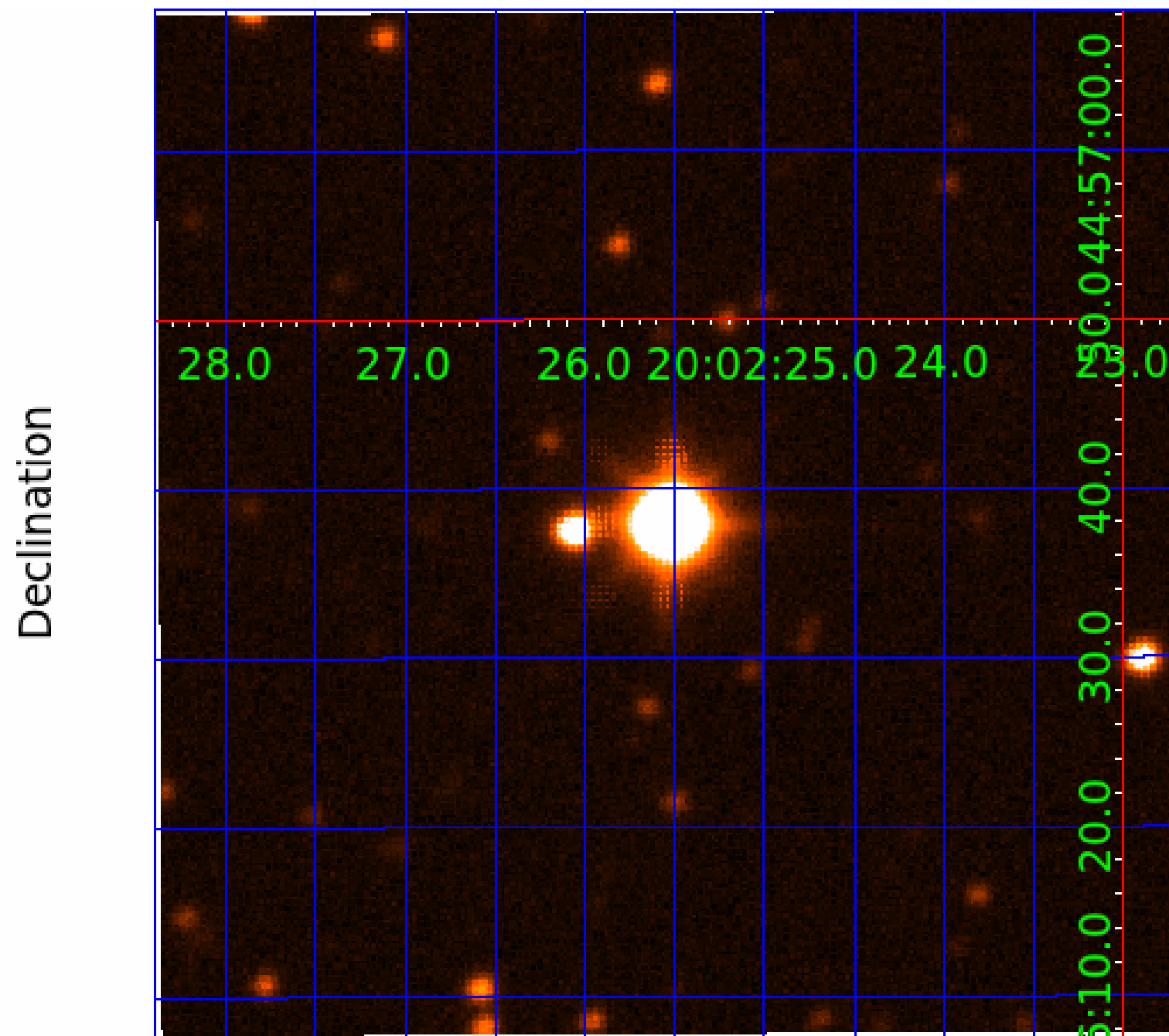
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 7



UKIRT Image



KIC 008782002

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})
008782002-01	OBS	No	2.909750	132.839418	15.8	7.640	9.9	8.4	2.78	6734	1.28	6413.95
008782002-02	OBS	No	2.909463	133.285035	22.0	16.042	9.4	9.0	2.78	6734	1.46	6414.79
008782002-03	OBS	No	87.568758	176.602310	90.2	13.906	38.0	6.4	2.78	6734	3.13	68.52
008782002-04	OBS	No	77.323537	132.783590	164.1	3.157	11.2	7.6	2.78	6734	3.92	80.88
008782002-05	OBS	No	169.954366	242.066644	220.0	2.916	10.3	9.9	2.78	6734	4.70	28.30
008782002-06	OBS	No	157.546368	183.225037	138.4	5.213	8.9	8.3	2.78	6734	3.86	31.31
008782002-07	OBS	No	219.897928	341.161649	241.6	2.342	10.3	8.8	2.78	6734	5.09	20.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008782002-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008782002-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
008782002-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

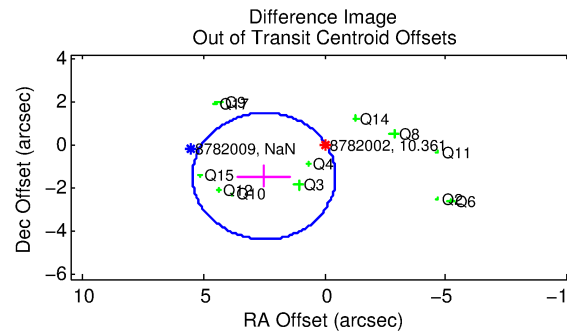
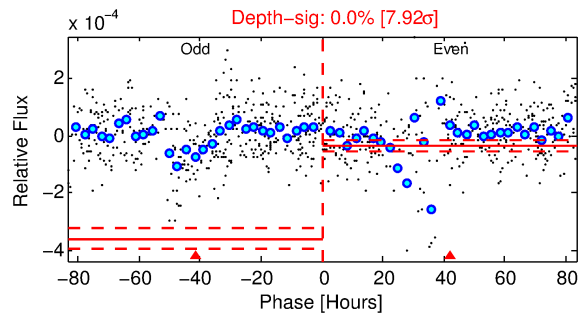
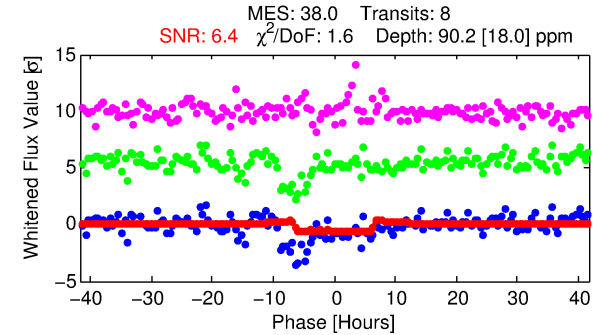
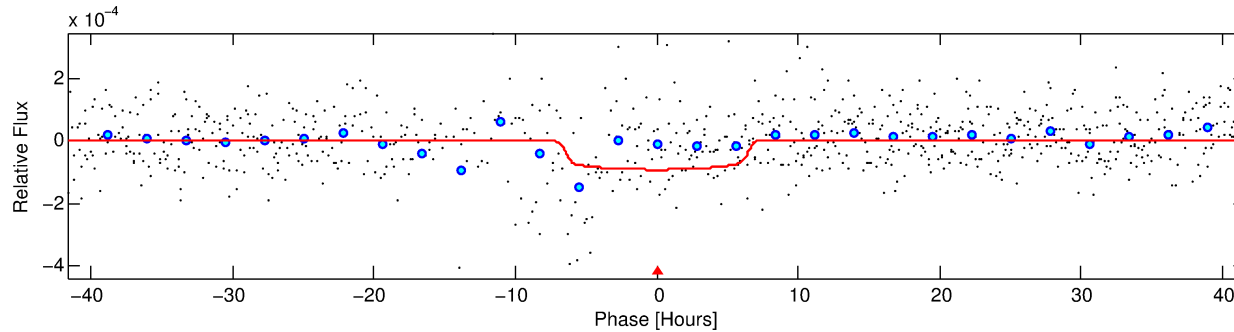
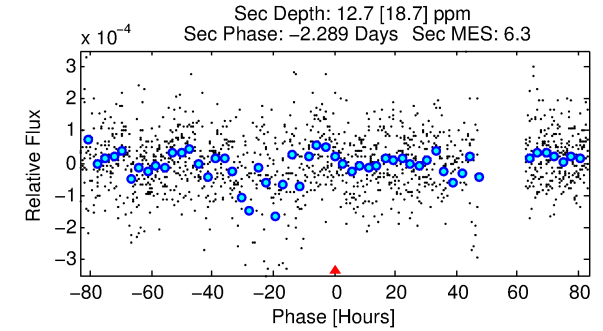
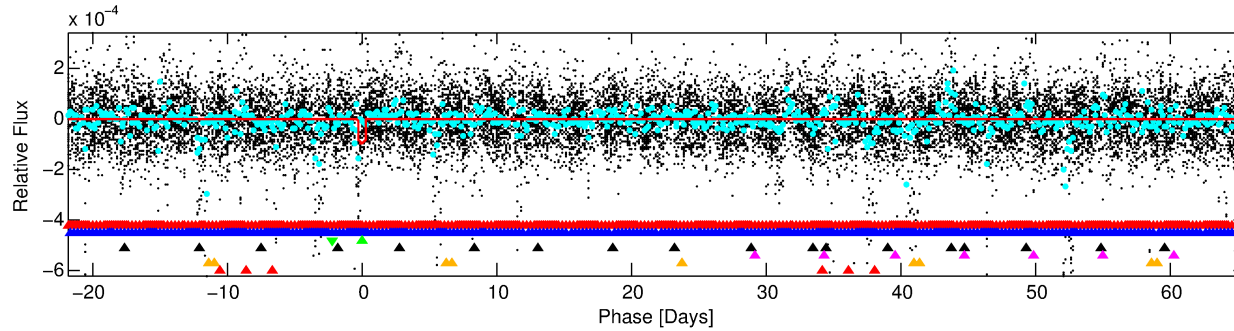
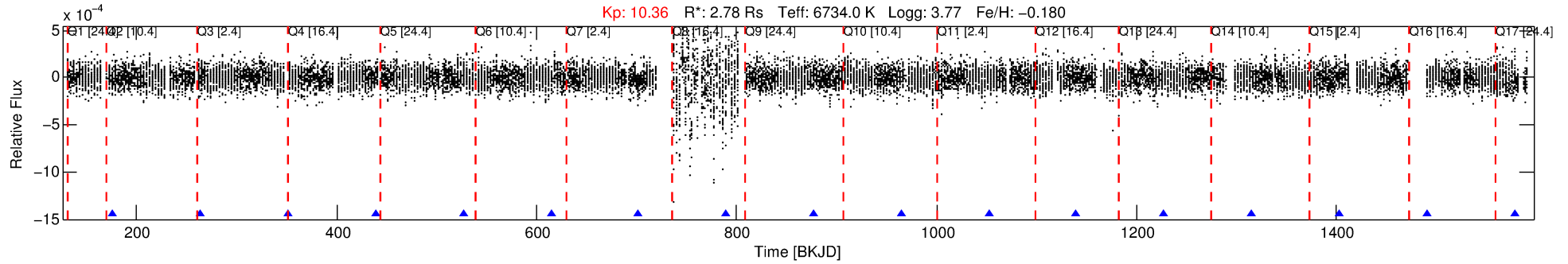
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008782002-03

No Significant Match Found

DV One-Page Summary

KIC: 8782002 Candidate: 3 of 7 Period: 87.569 d



DV Fit Results:

Period = 87.56876 [0.00267] d
Epoch = 176.6023 [0.0291] BKJD
 R_p/R^* = 0.0103 [0.0016]
 a/R^* = 19.79 [13.14]
 b = 0.92 [0.11]
 S_{eff} = 68.52 [35.38]
 T_{eq} = 734 [95] K
 R_p = 3.13 [1.19] R_e
 a = 0.4552 [0.1468] AU
 A_g = 147.16 [233.74] [0.63σ]
 T_{effp} = 3951 [1491] K [2.15σ]

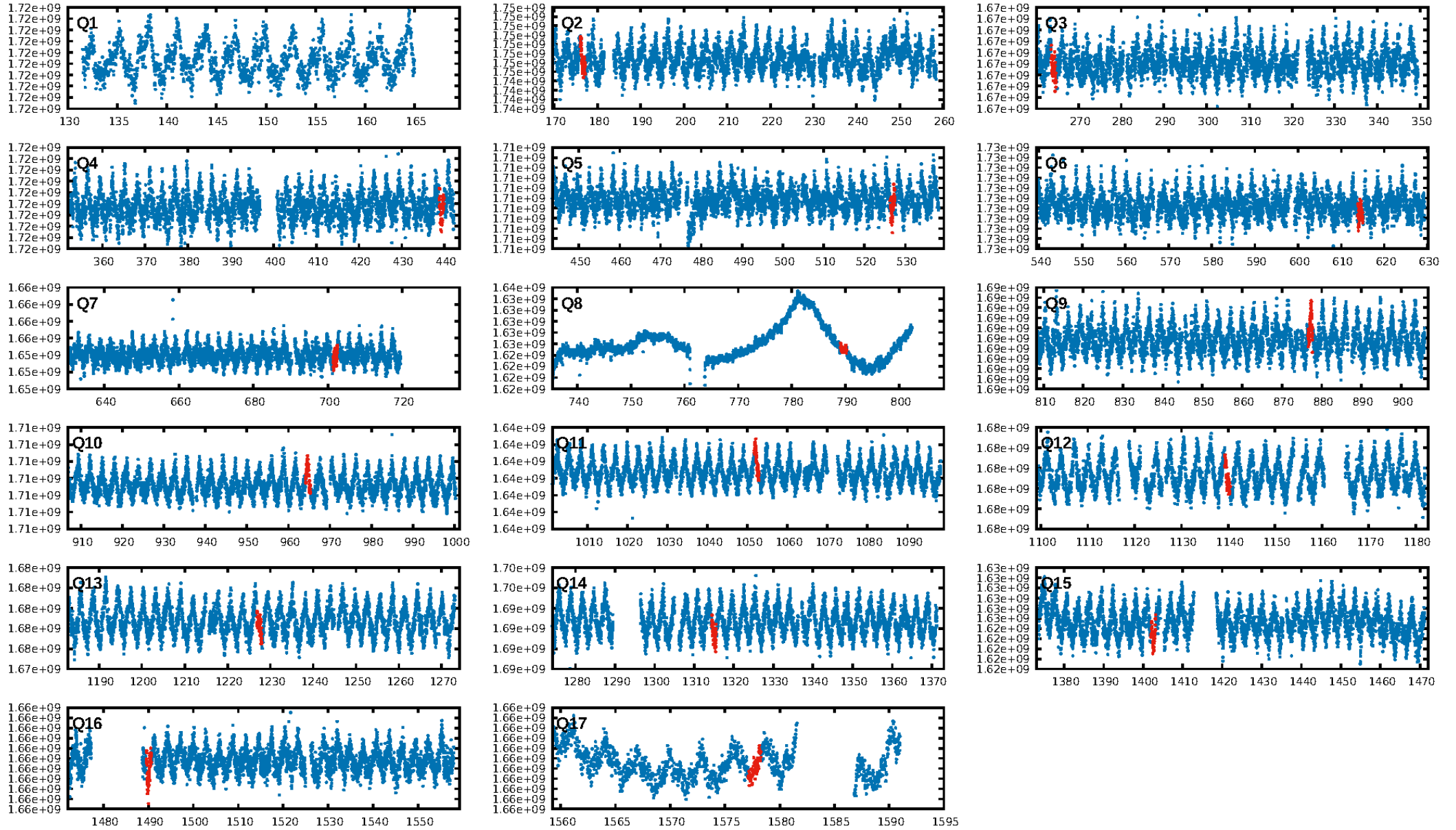
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.24σ]
LongPeriod-sig: 100.0% [113.09σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.32e-108
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: N/A
Centroid-sig: 8.0%
Centroid-so: 0.758 arcsec [1.08σ]
OotOffset-rm: 2.887 arcsec [2.93σ]
KicOffset-rm: 1.999 arcsec [2.03σ]
OotOffset-st: 4/3/3/2 [12]
KicOffset-st: 4/3/3/2 [12]
DiffImageQuality-fgm: 0.33 [4/12]
DiffImageOverlap-fno: 0.00 [0/14]

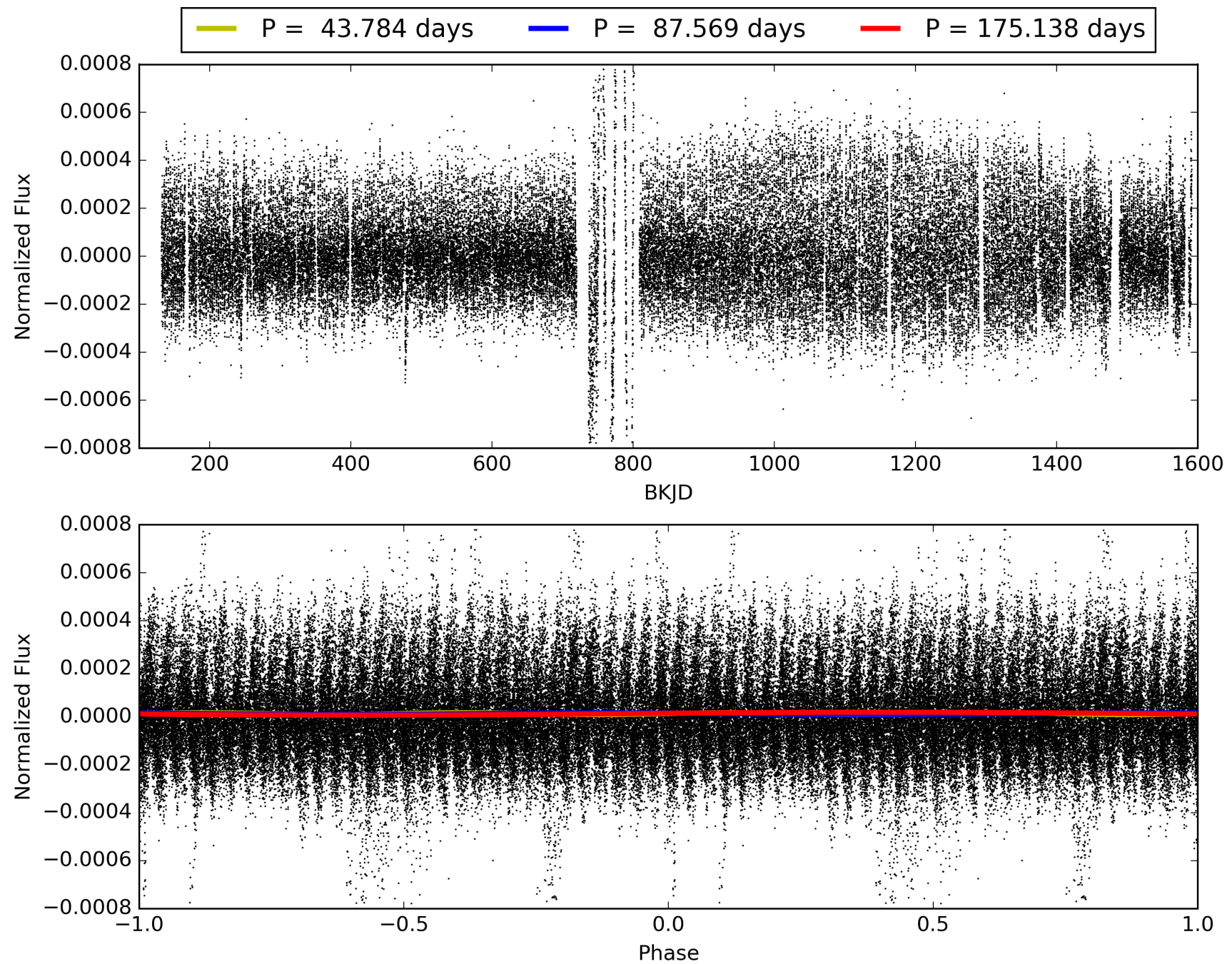
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:05:04 Z

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

TCE 008782002-03, PDC Light Curves

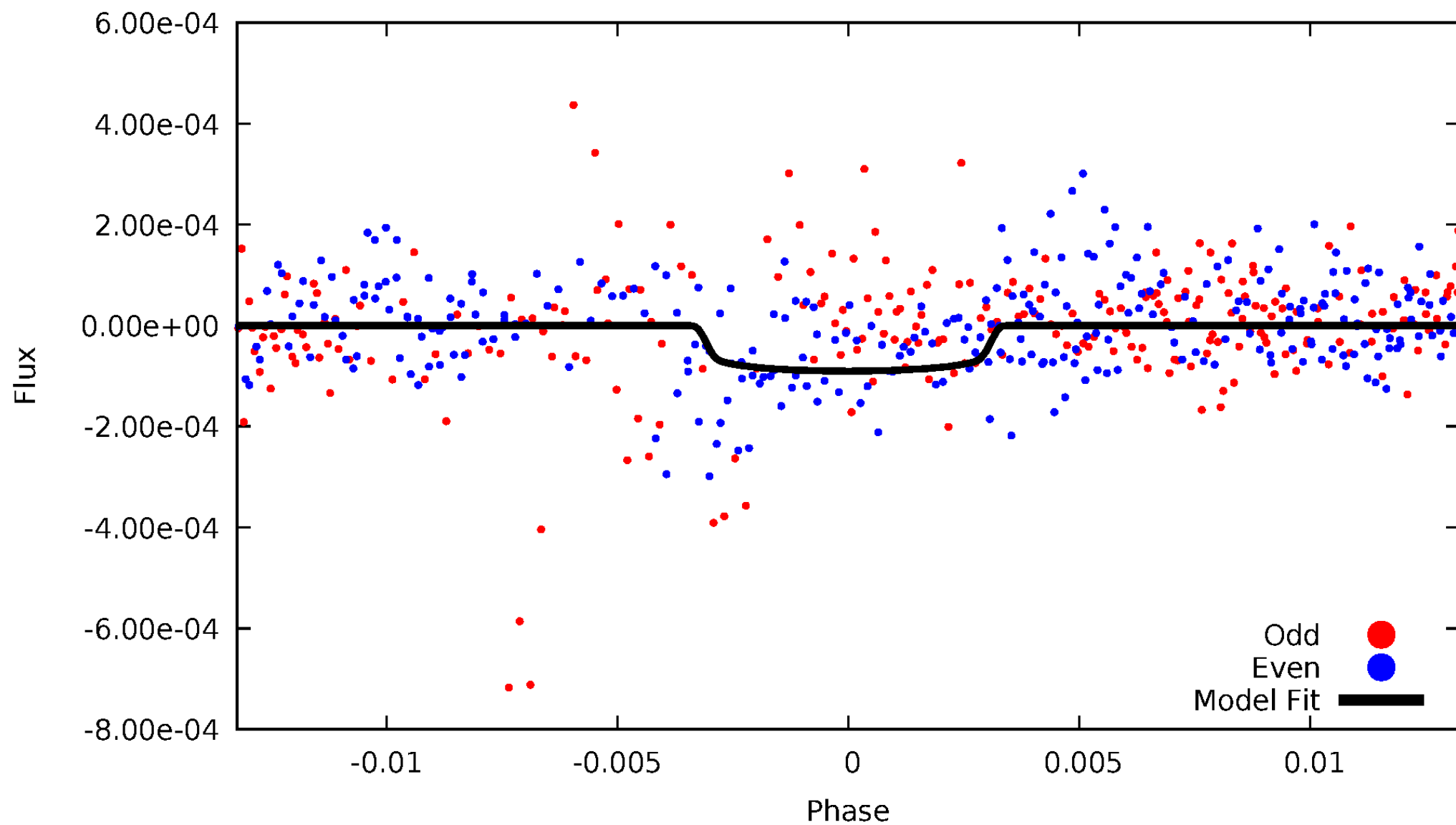


TCE 008782002-03



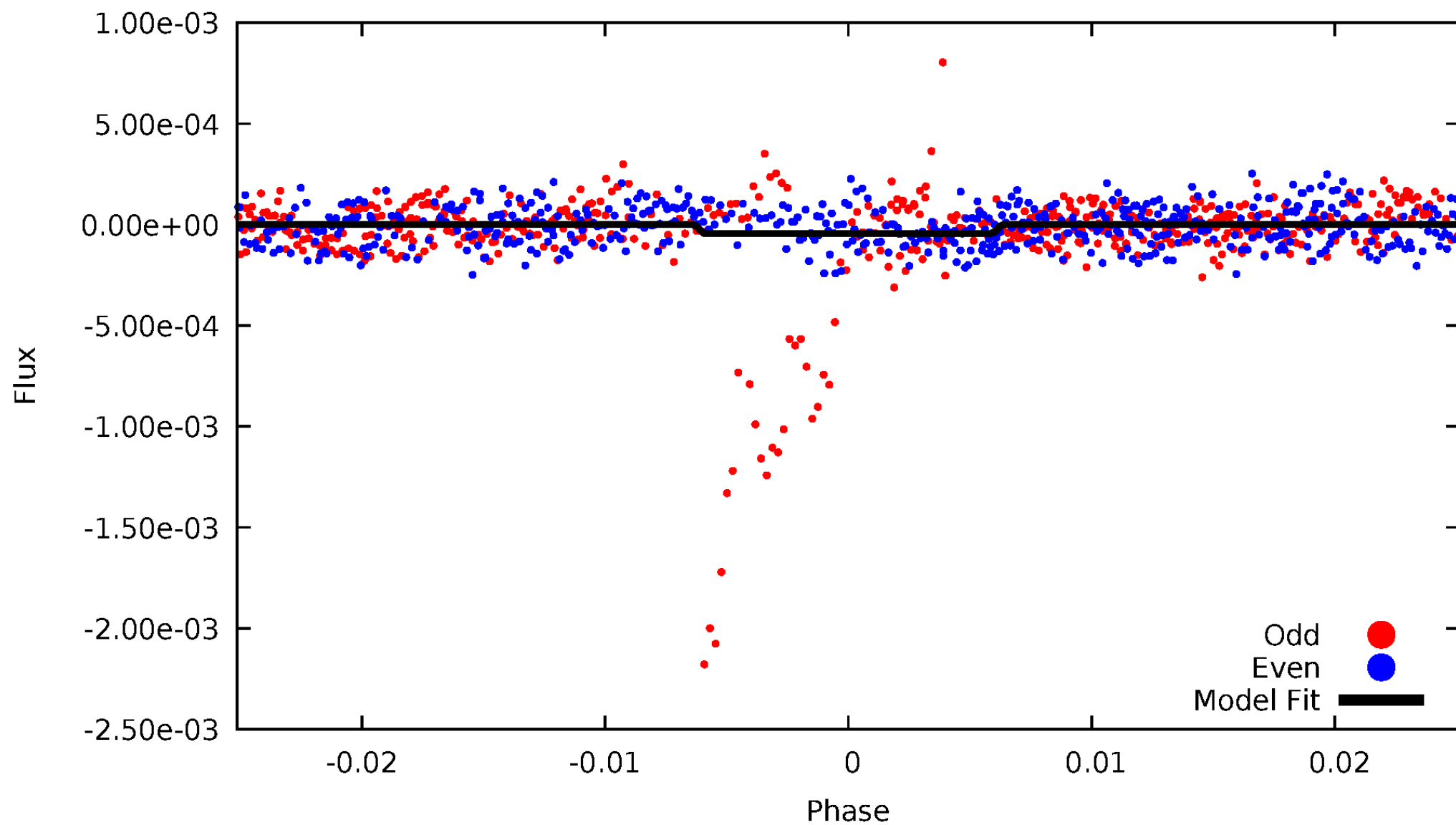
DV Odd/Even

TCE 008782002-03



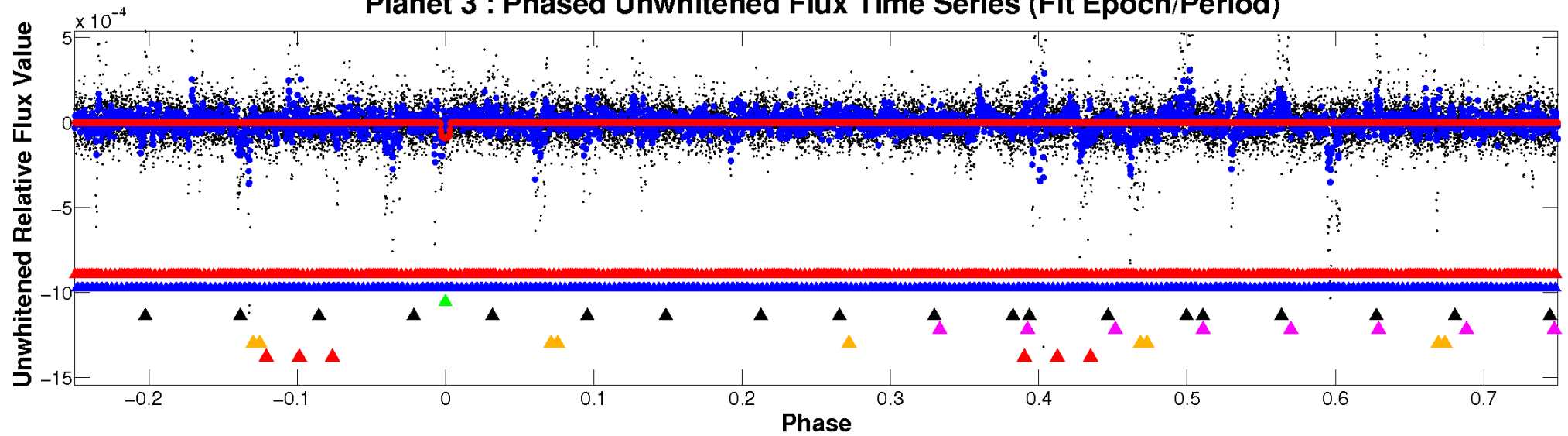
ALT Odd/Even

TCE 008782002-03

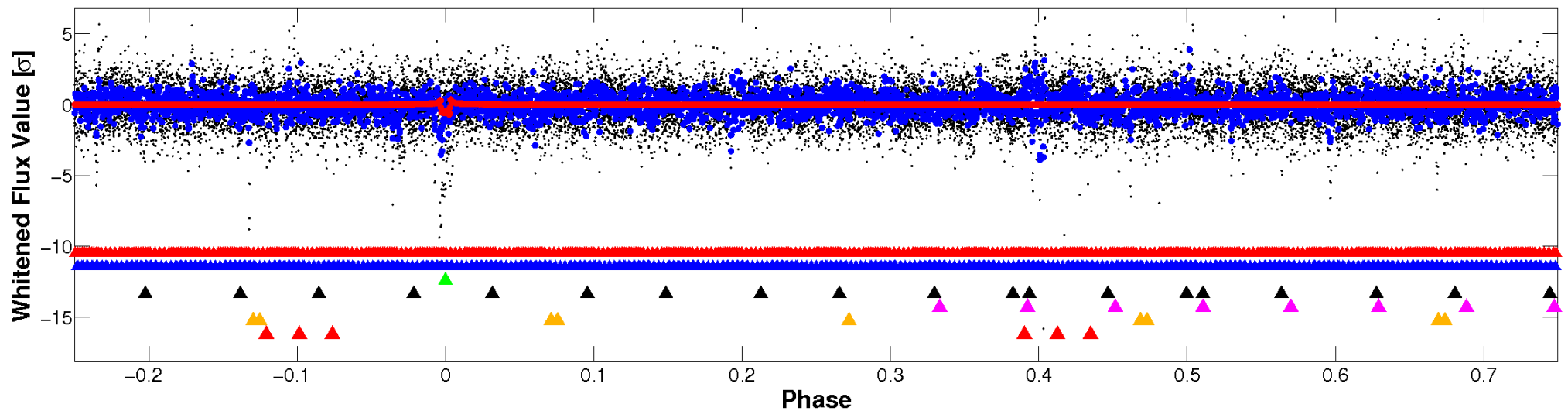


Non-Whitened Vs. Whitened Light Curve

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

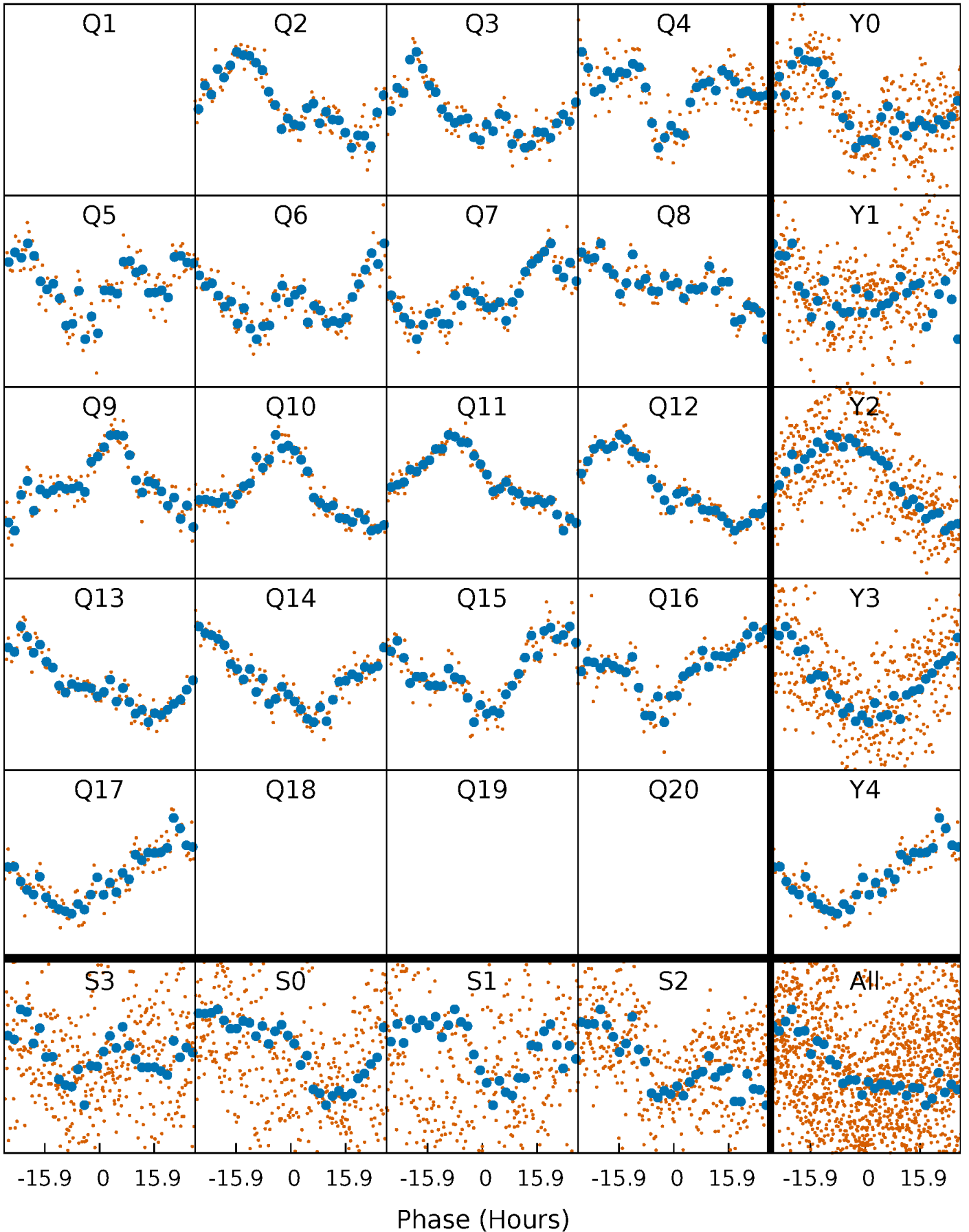


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



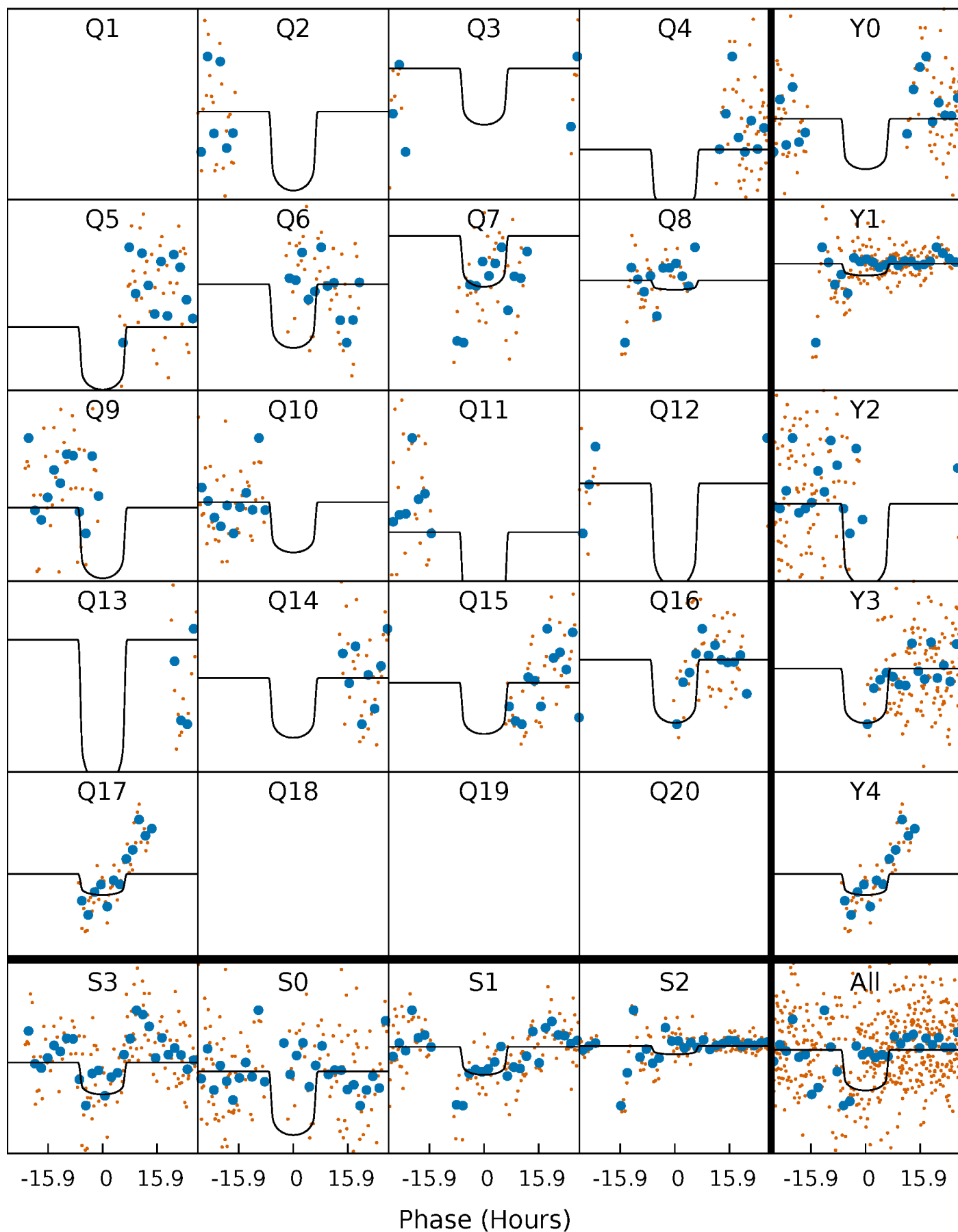
PDC Quarter-Phased Transit Curves

TCE 008782002-03 P= 87.568758 Days $T_0=176.602310$ (BKJD)



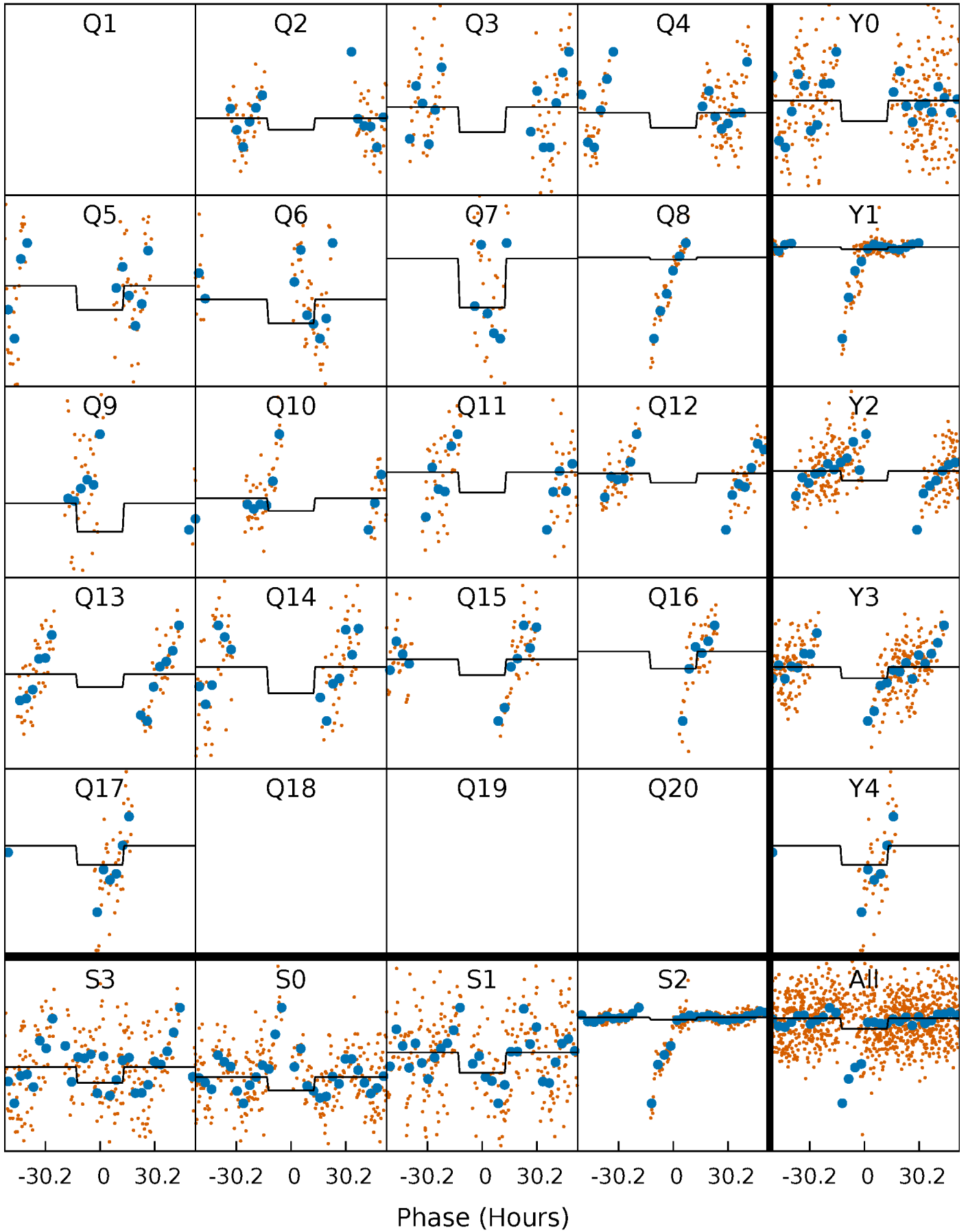
DV Quarter-Phased Transit Curves

TCE 008782002-03 $P = 87.568758$ Days $T_0 = 176.602310$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

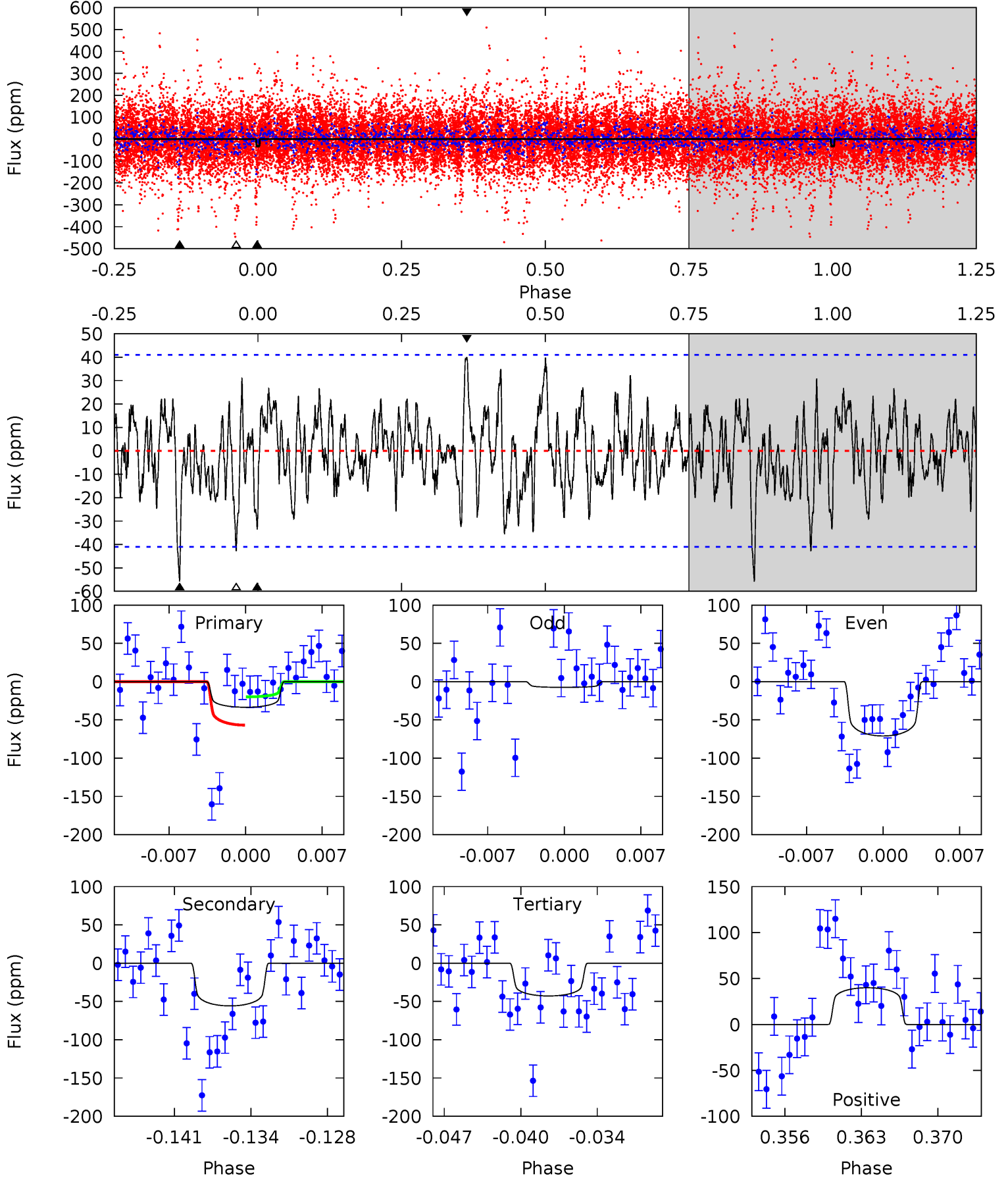
TCE 008782002-03 P= 87.564616 Days $T_0=176.505676$ (BKJD)



DV Model-Shift Uniqueness Test

008782002-03, P = 87.568758 Days, E = 89.033552 Days

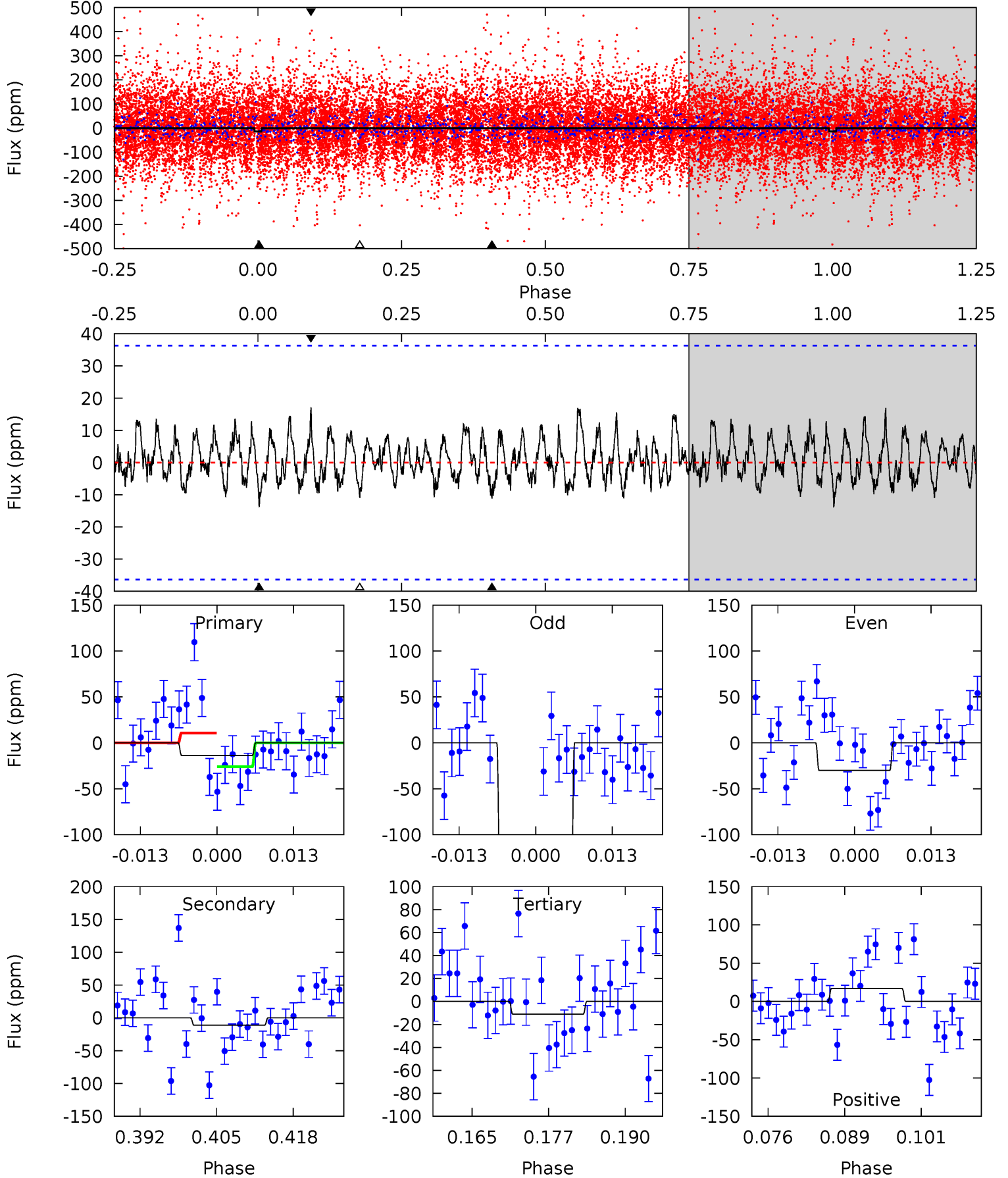
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.17	6.94	5.33	4.97	5.10	2.71	1.62	-1.16	-0.80	1.62	1.98	3.49	1.19	0.42	2.29



Alt Model-Shift Uniqueness Test

008782002-03, P = 87.564616 Days, E = 88.941060 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.87	1.53	1.50	2.33	4.98	2.49	0.76	0.37	-0.45	0.02	-0.80	11.1	4.28	0.55	0.98



Stellar Parameters For KIC 008782002

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6734^{+168}_{-184}	$3.766^{+0.292}_{-0.097}$	$-0.180^{+0.300}_{-0.250}$	$2.776^{+0.445}_{-0.965}$	$1.640^{+0.193}_{-0.358}$	$0.108^{+0.223}_{-0.034}$
	+2%/-3%	+8%/-3%	+167%/-139%	+16%/-35%	+12%/-22%	+207%/-31%
Source	PHO1	FLK73	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 008782002-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-56 ± 8	$2.97^{+0.69}_{-0.69}$	1008^{+56}_{-87}	5714^{+509}_{-436}	715^{+442}_{-241}
Alt.	-11 ± 7	$1.87^{+0.56}_{-0.54}$	1011^{+56}_{-95}	4829^{+886}_{-874}	335^{+426}_{-220}

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 $A_{obs} \gg 1.0$

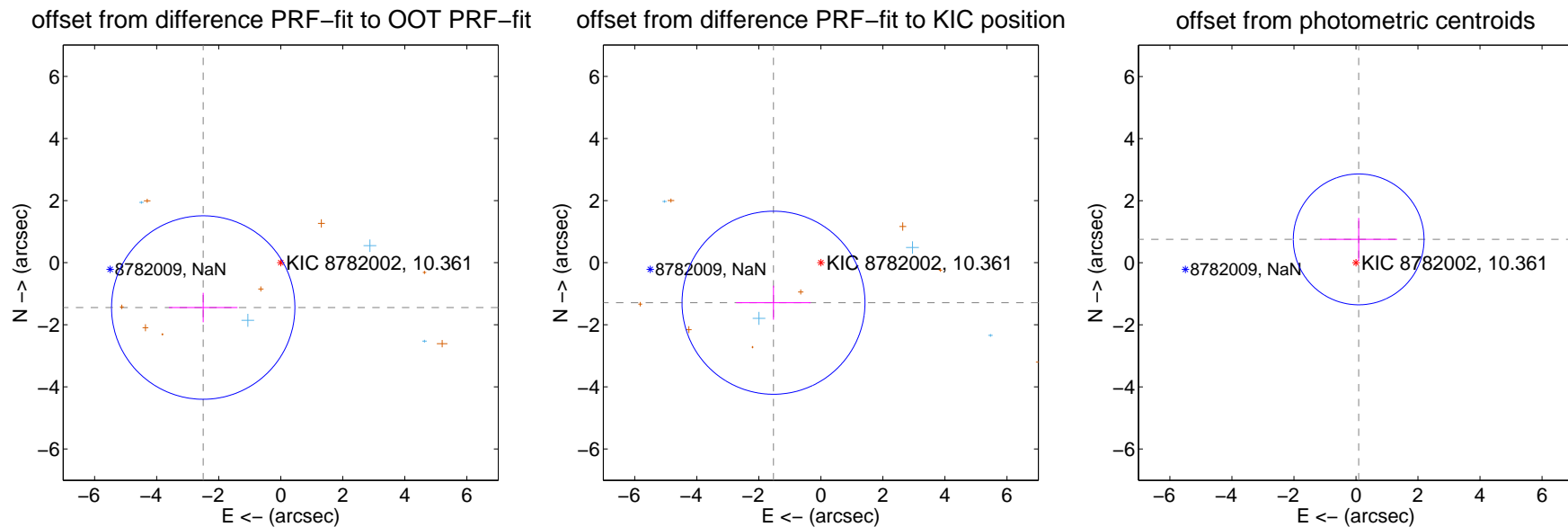
DV Centroid Data

Supplemental centroid analysis for 008782002-03. **Kepler magnitude: 10.36.** Transit SNR 6.36

There are 4 quarters with good PRF difference image offsets

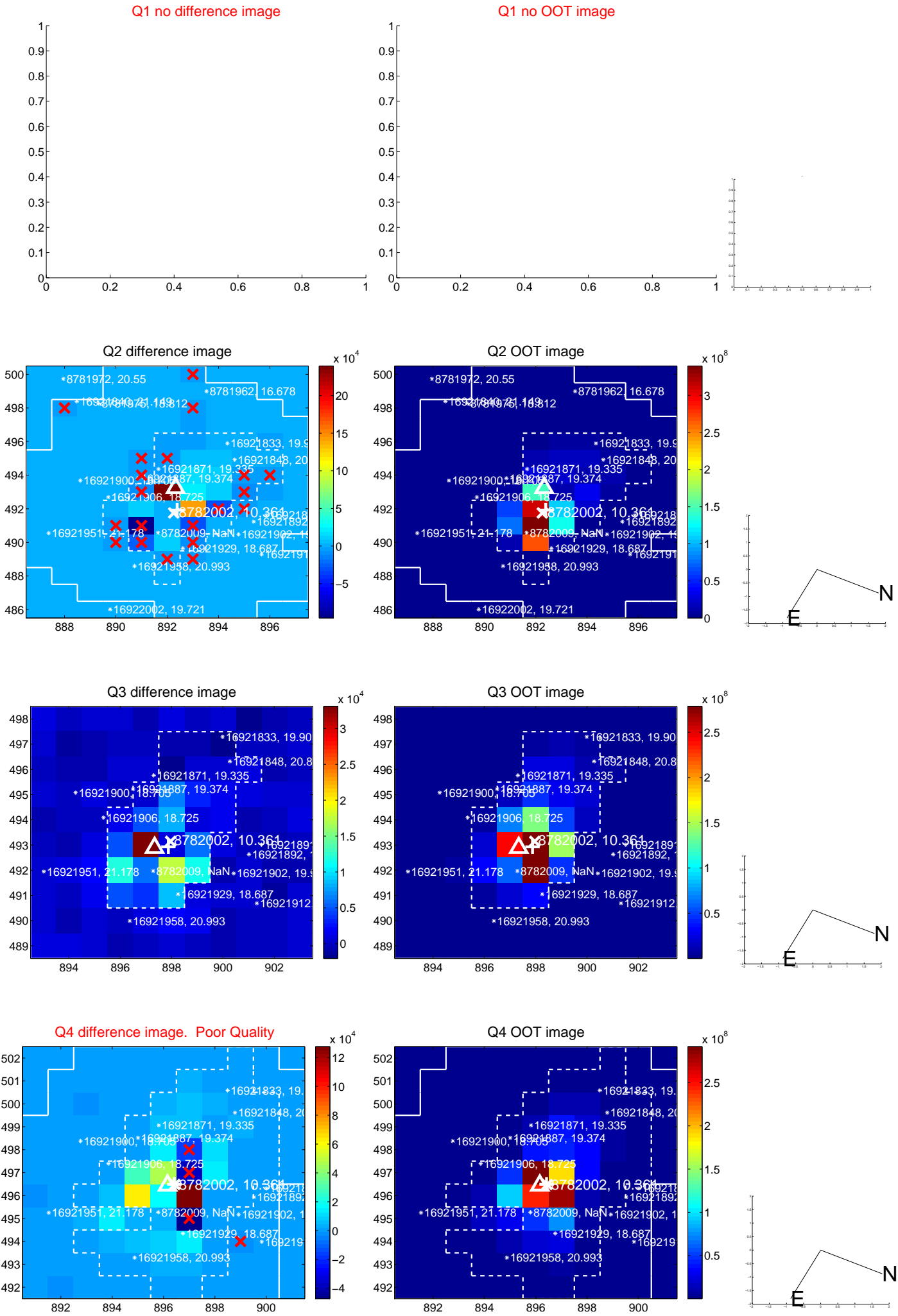
The direct PRF centroid is offset from the target star catalog position by about 0.55 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.887 ± 0.985	2.93	2.500 ± 1.104	-1.445 ± 0.474
PRF-fit source offset from KIC position	1.999 ± 0.983	2.03	1.527 ± 1.201	-1.290 ± 0.547
photometric centroid source offset	0.76 ± 0.70	1.08	-0.09 ± 1.24	0.75 ± 0.69

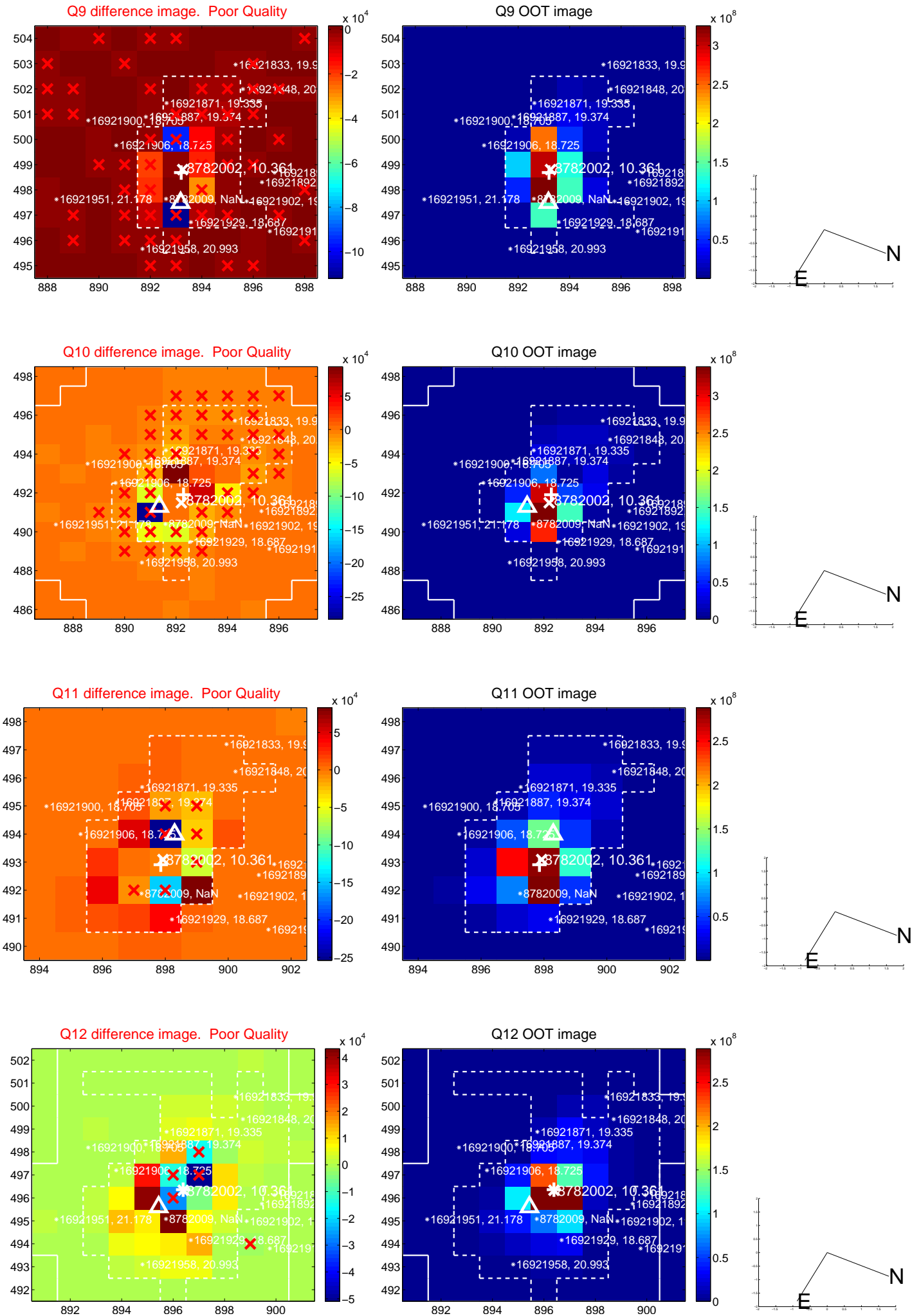


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

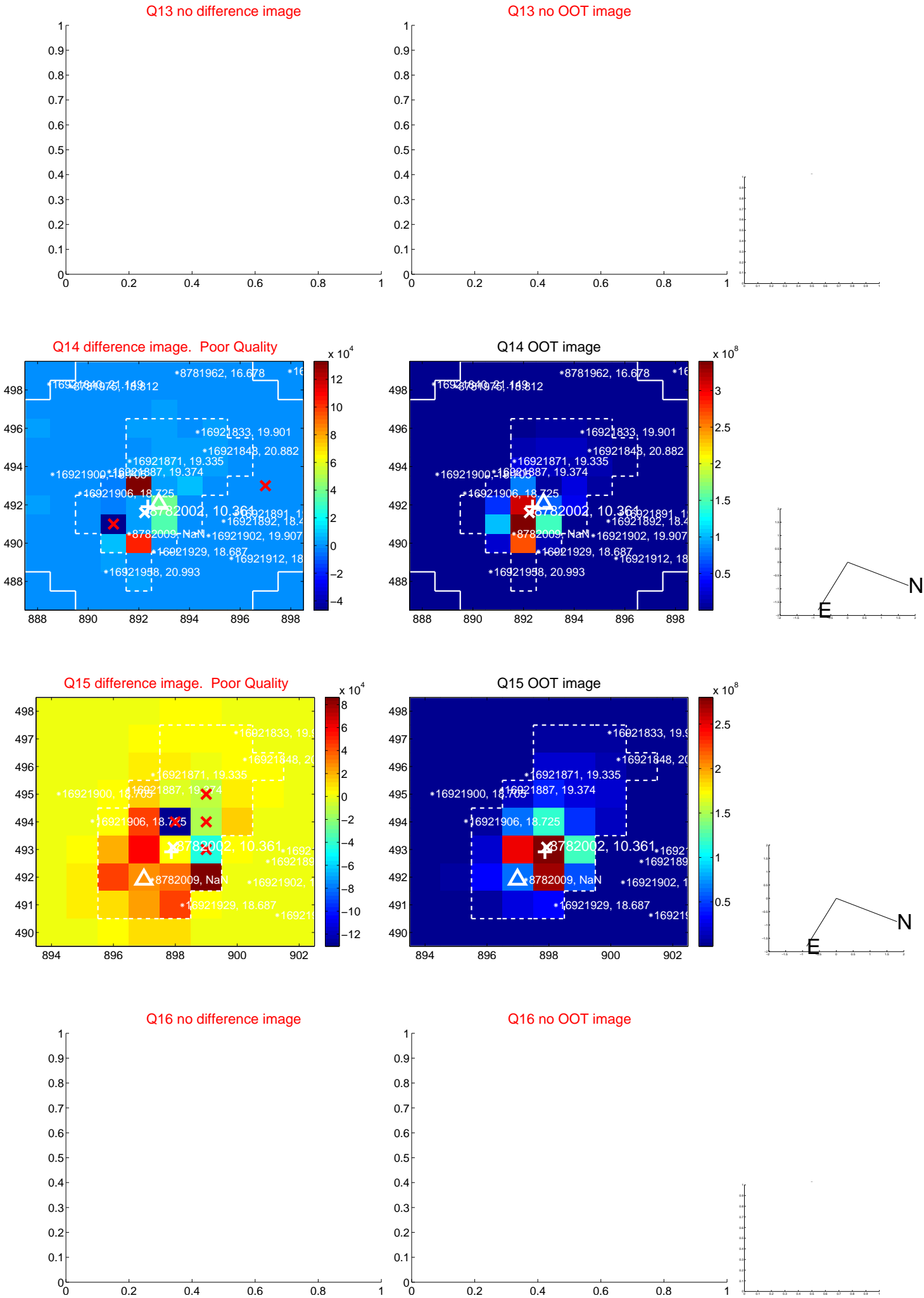
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



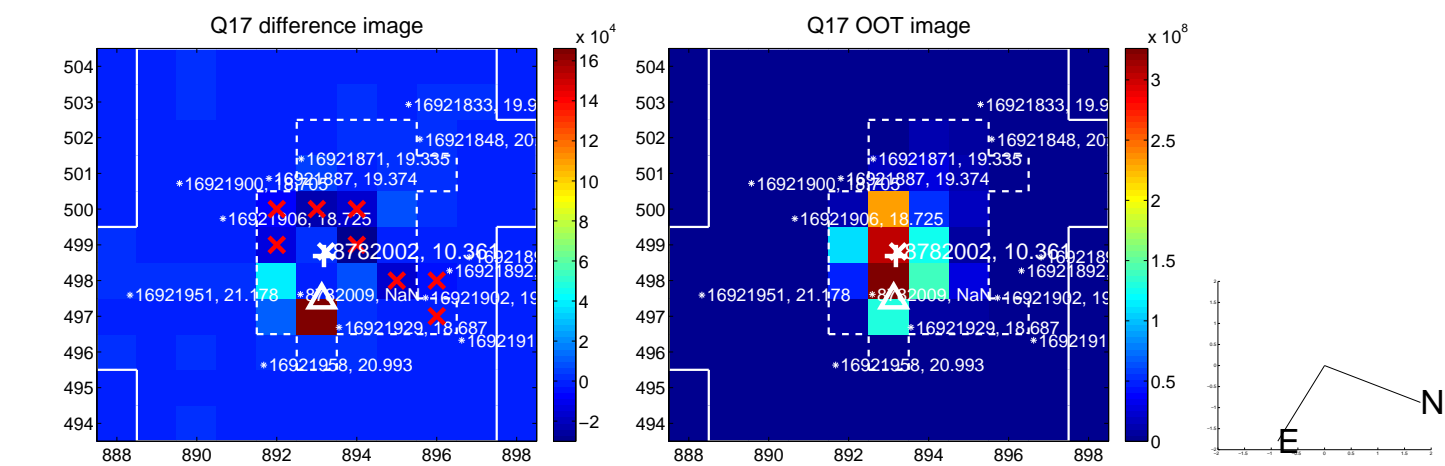
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



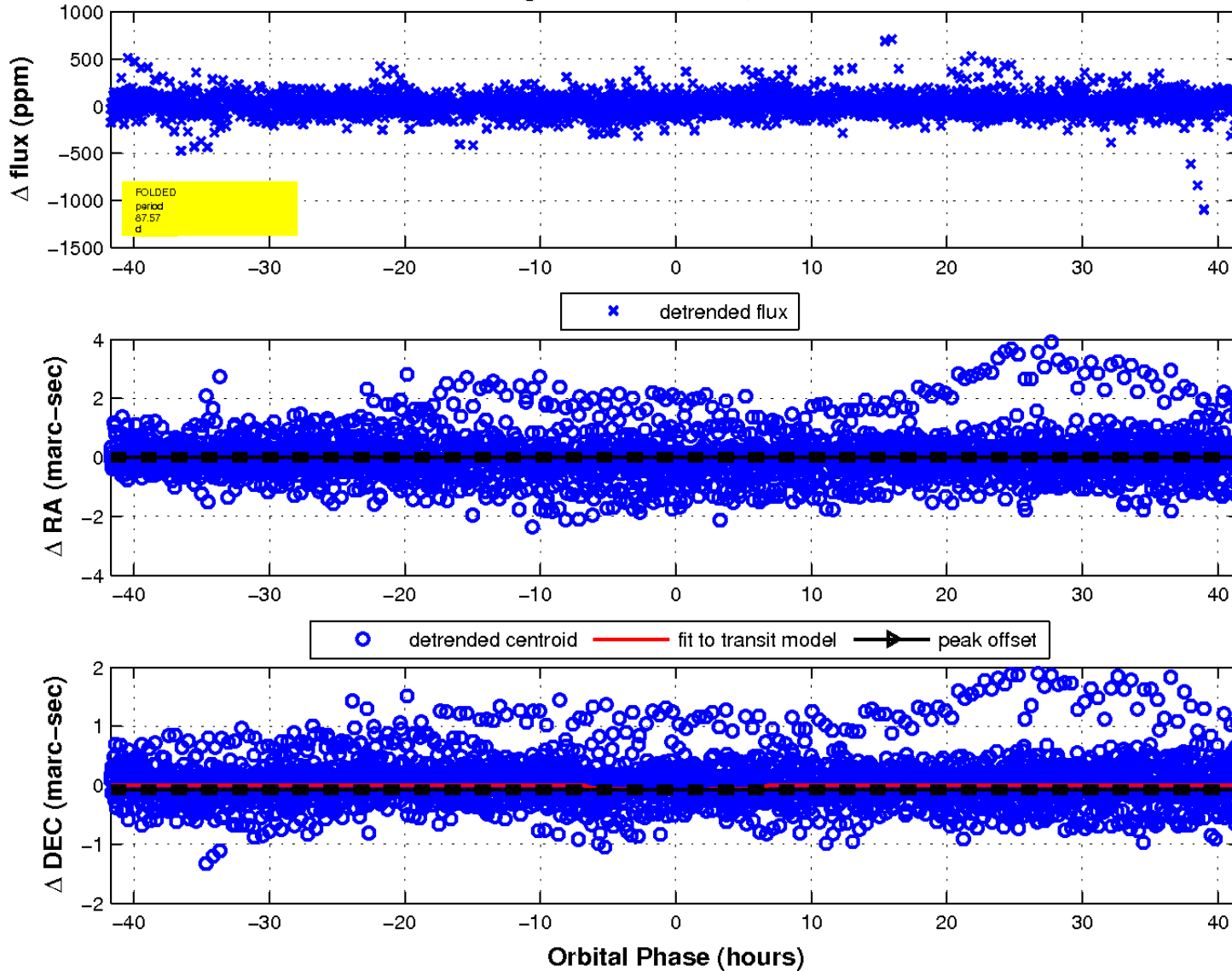
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



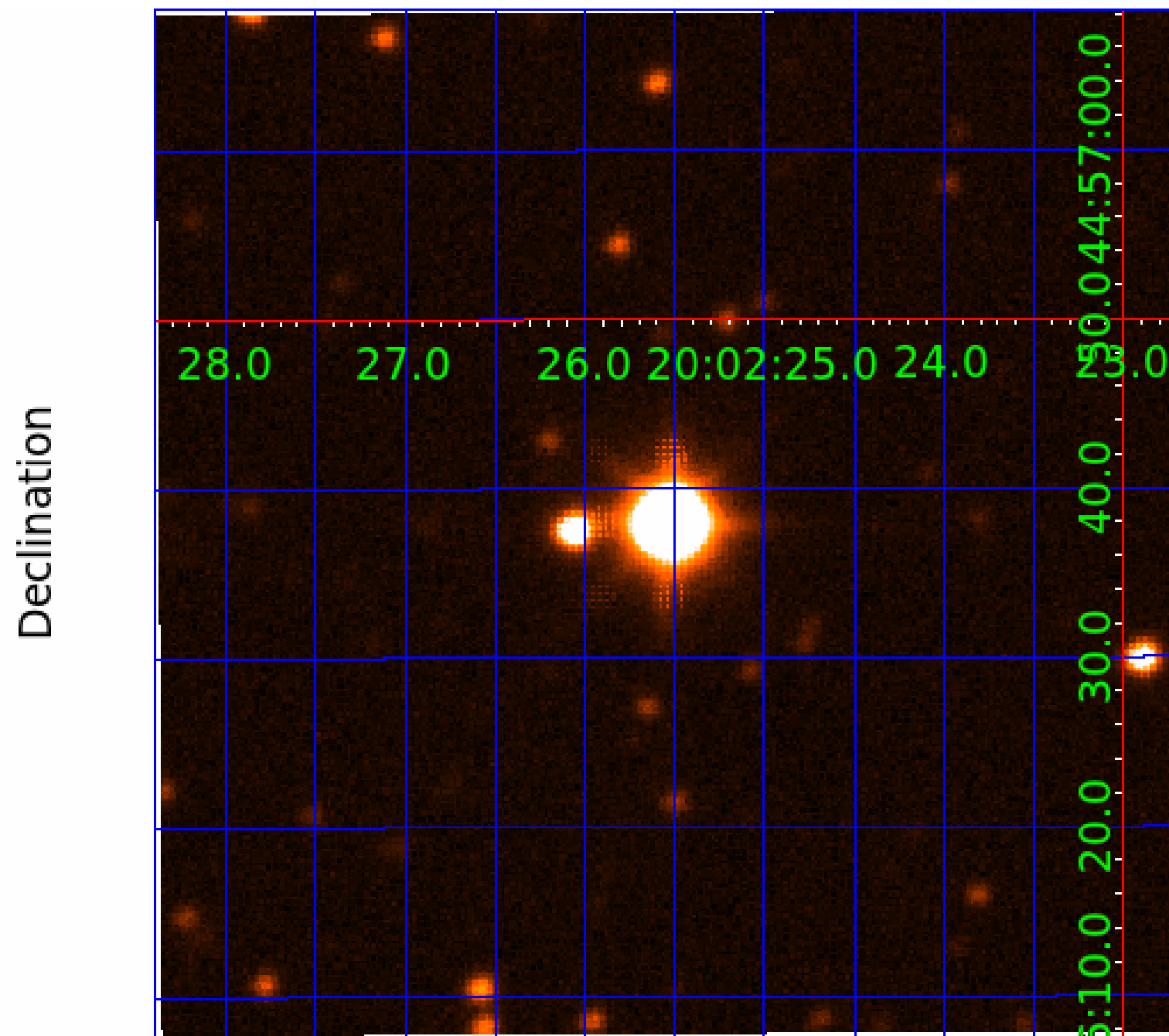
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 3 of 7



UKIRT Image



KIC 008782002

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})
008782002-01	OBS	No	2.909750	132.839418	15.8	7.640	9.9	8.4	2.78	6734	1.28	6413.95
008782002-02	OBS	No	2.909463	133.285035	22.0	16.042	9.4	9.0	2.78	6734	1.46	6414.79
008782002-03	OBS	No	87.568758	176.602310	90.2	13.906	38.0	6.4	2.78	6734	3.13	68.52
008782002-04	OBS	No	77.323537	132.783590	164.1	3.157	11.2	7.6	2.78	6734	3.92	80.88
008782002-05	OBS	No	169.954366	242.066644	220.0	2.916	10.3	9.9	2.78	6734	4.70	28.30
008782002-06	OBS	No	157.546368	183.225037	138.4	5.213	8.9	8.3	2.78	6734	3.86	31.31
008782002-07	OBS	No	219.897928	341.161649	241.6	2.342	10.3	8.8	2.78	6734	5.09	20.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008782002-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008782002-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
008782002-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

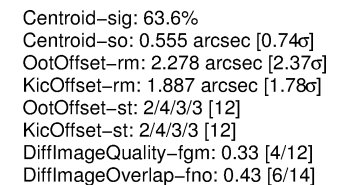
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

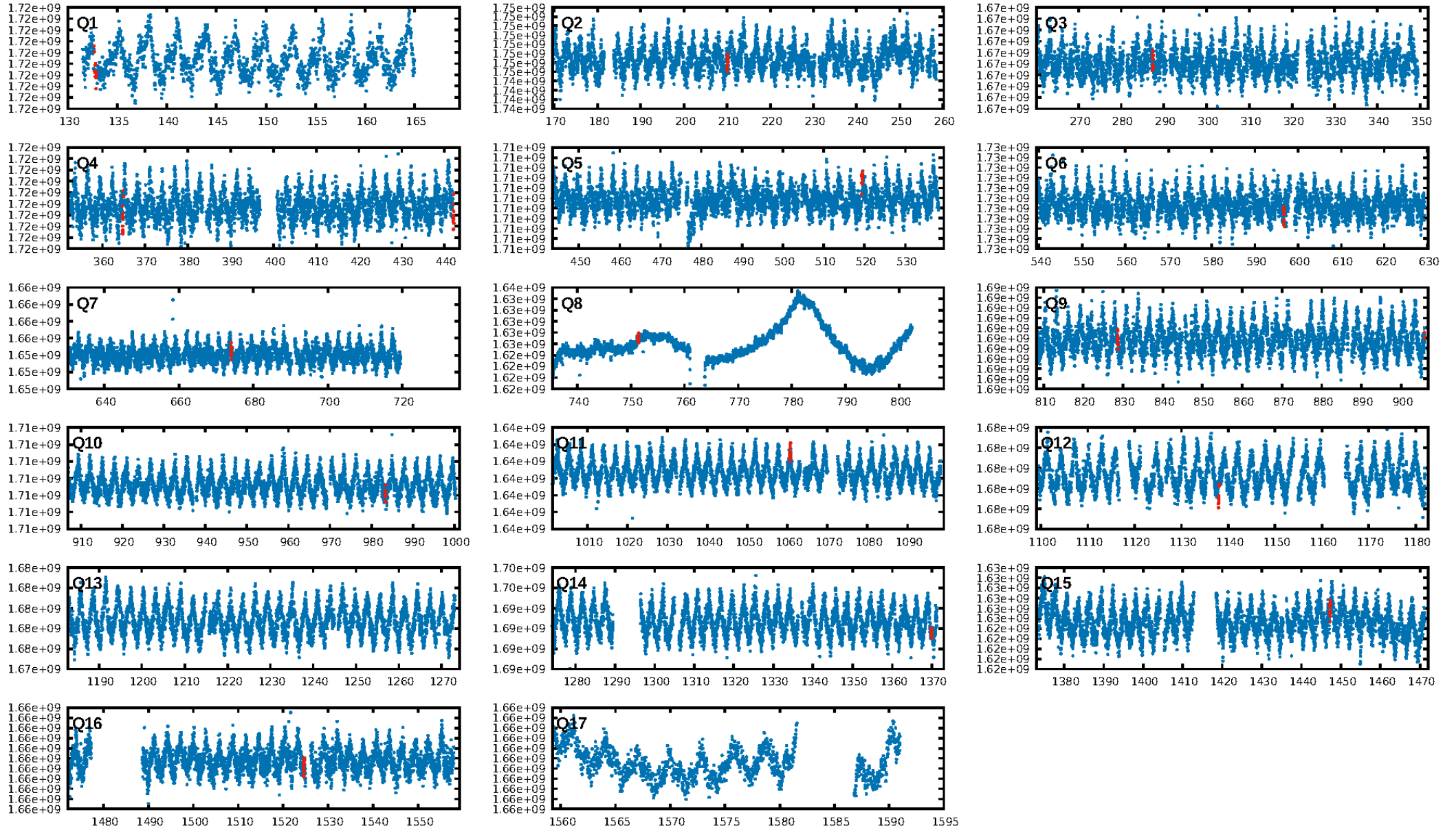
Ephemeris Match Information For 008782002-04

No Significant Match Found

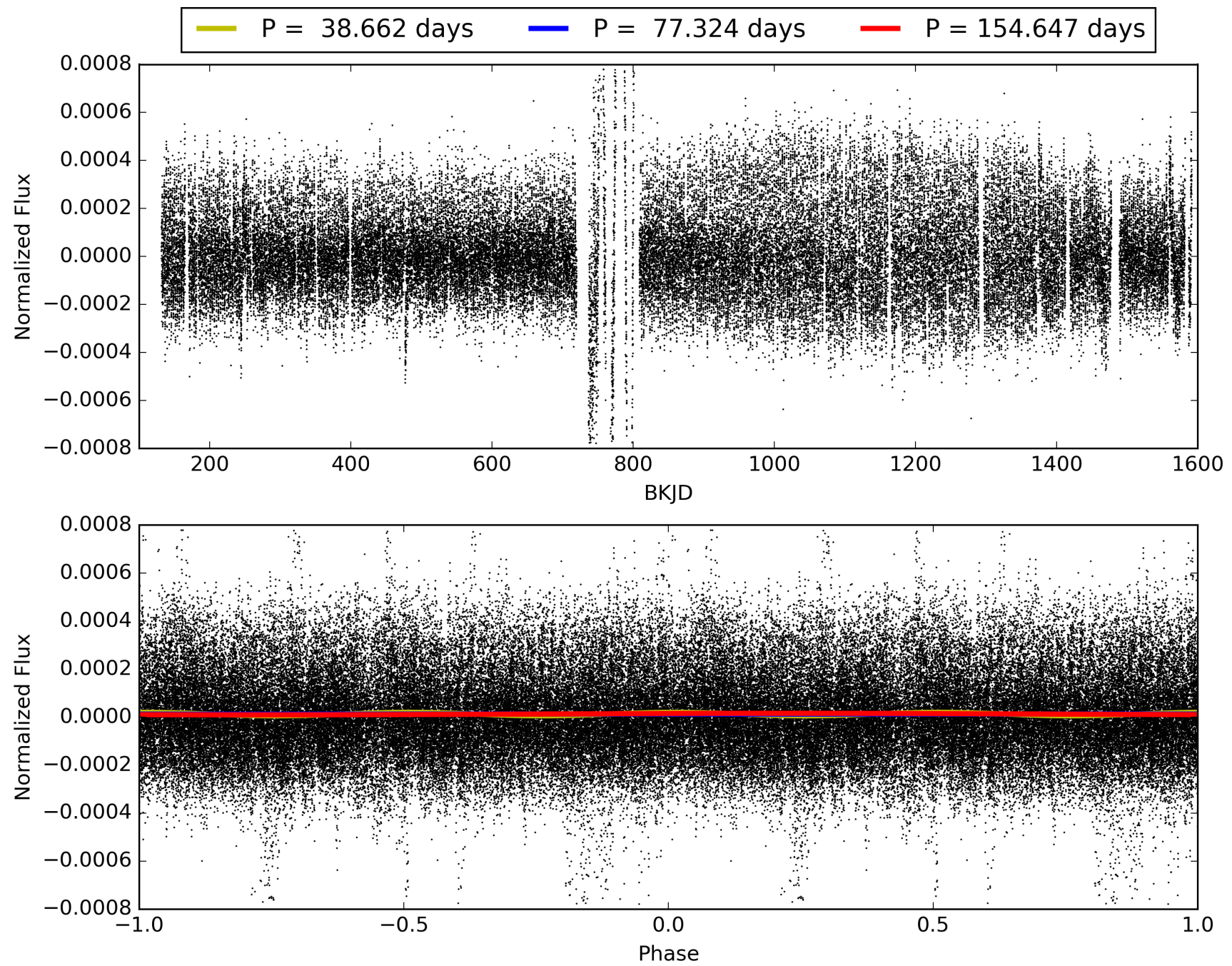
KIC: 8782002 Candidate: 4 of 7 Period: 77.324 d



TCE 008782002-04, PDC Light Curves

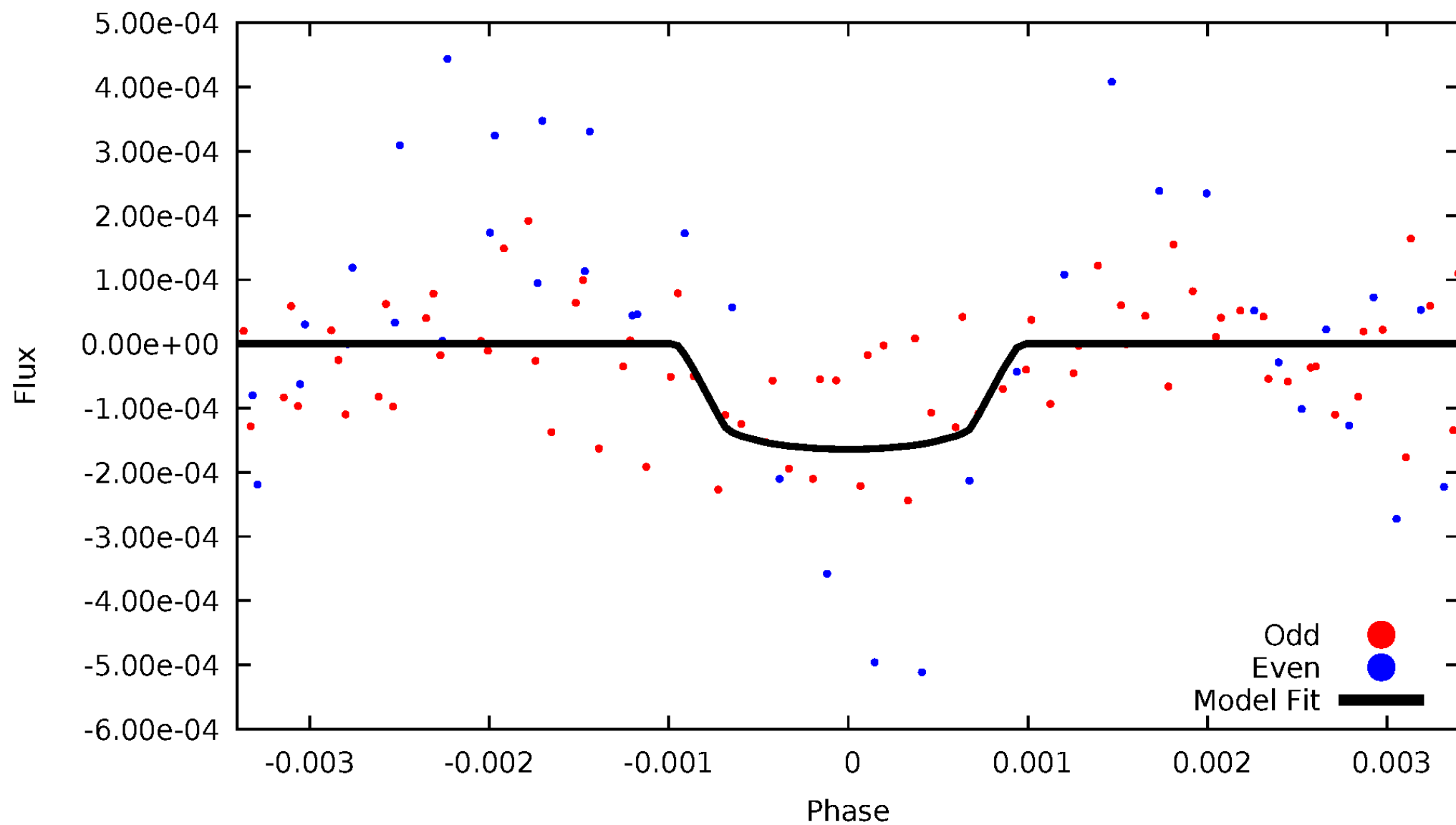


TCE 008782002-04



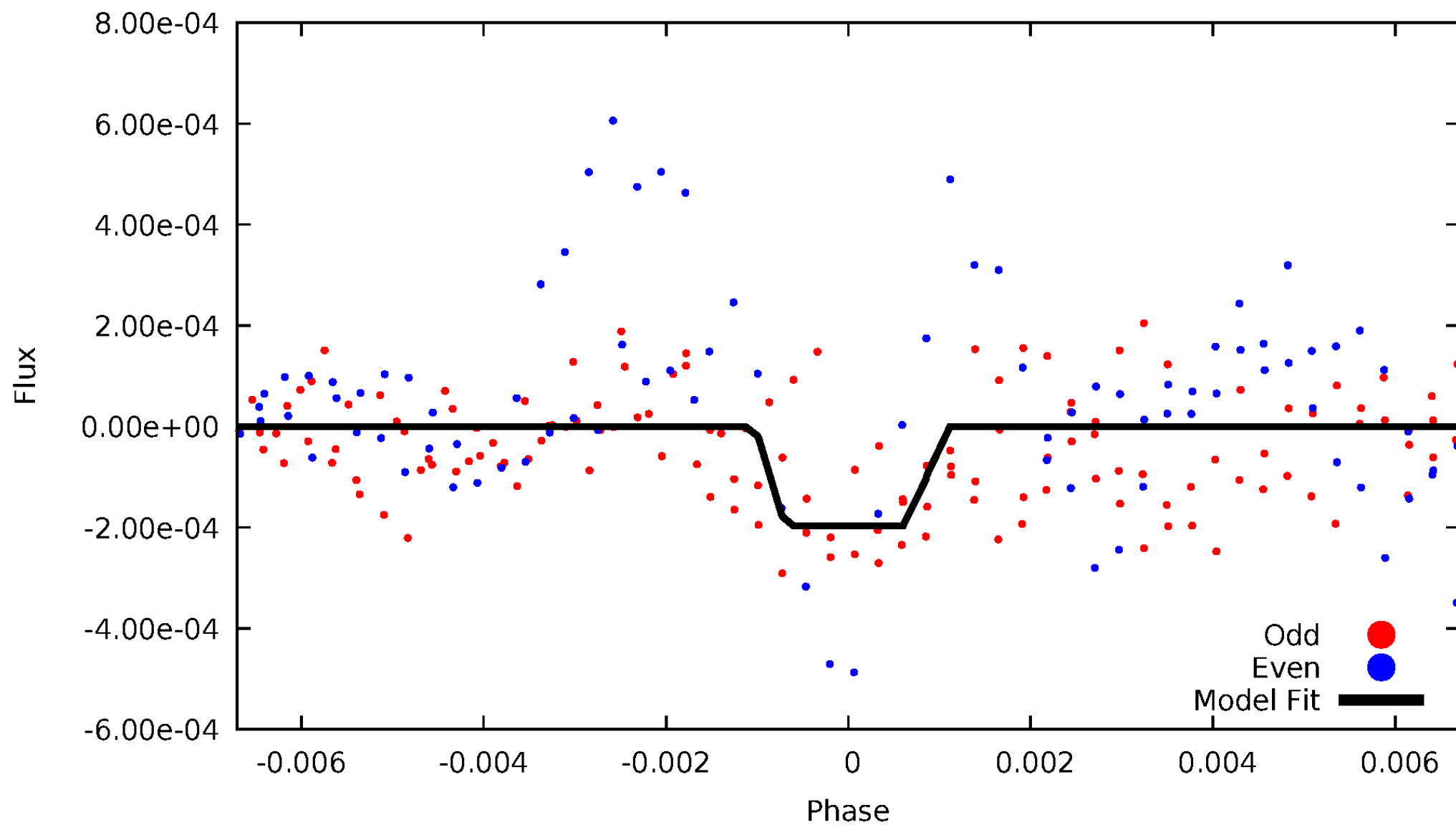
DV Odd/Even

TCE 008782002-04



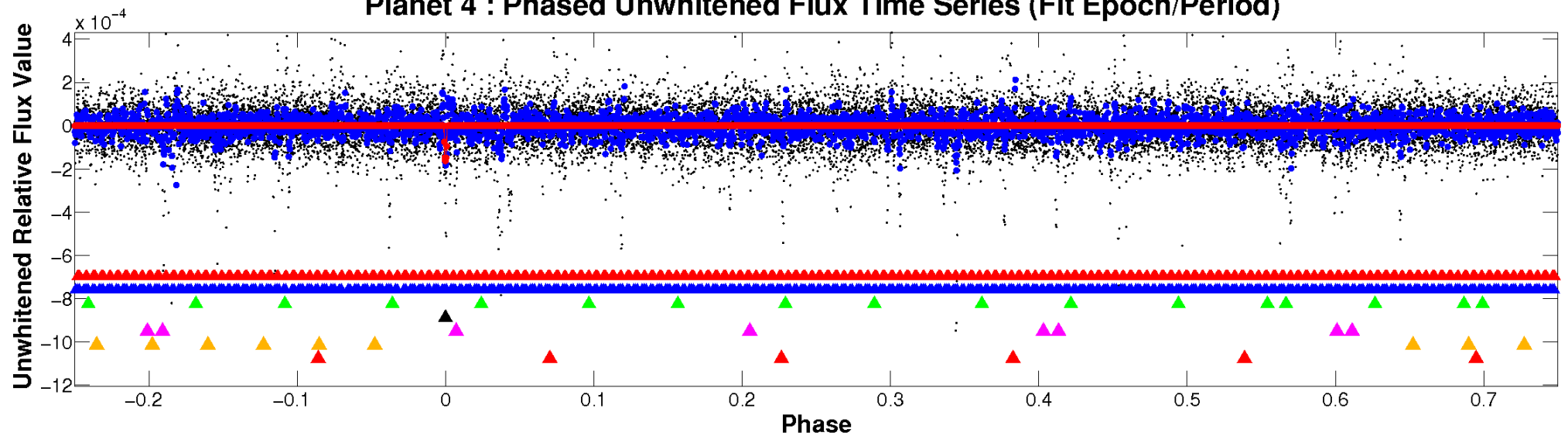
ALT Odd/Even

TCE 008782002-04

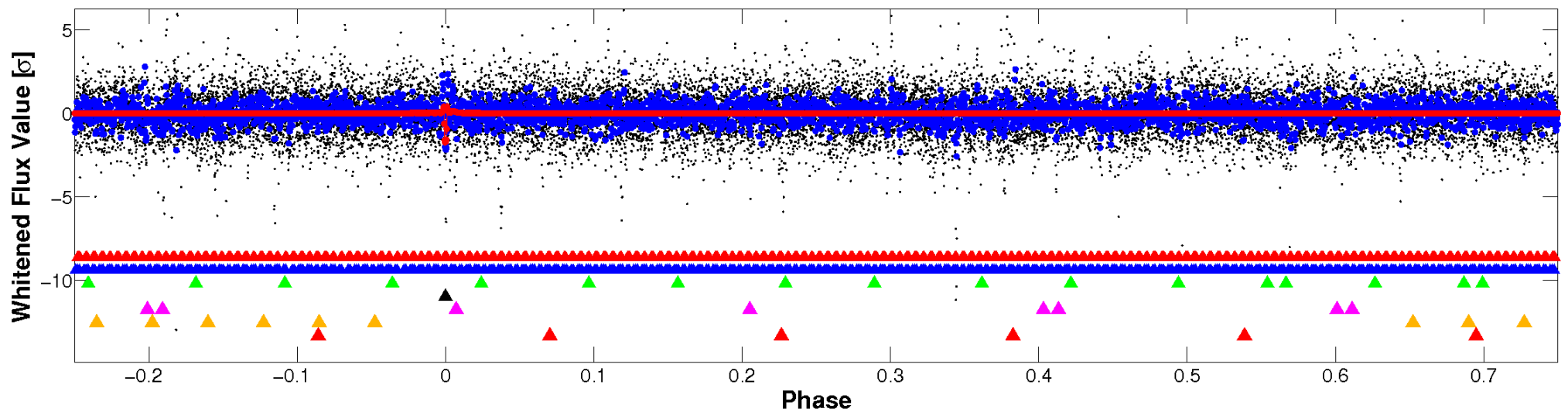


Non-Whitened Vs. Whitened Light Curve

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

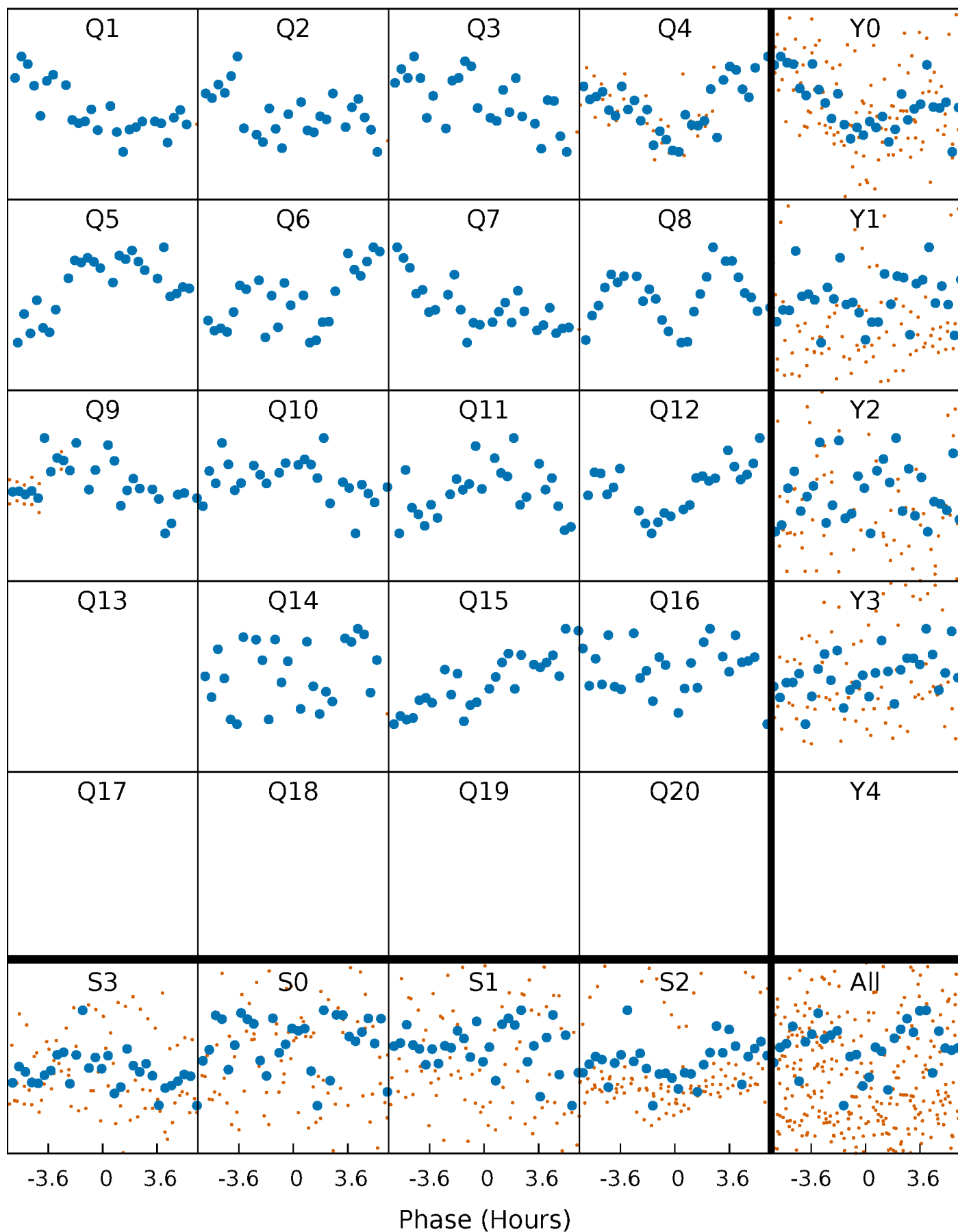


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



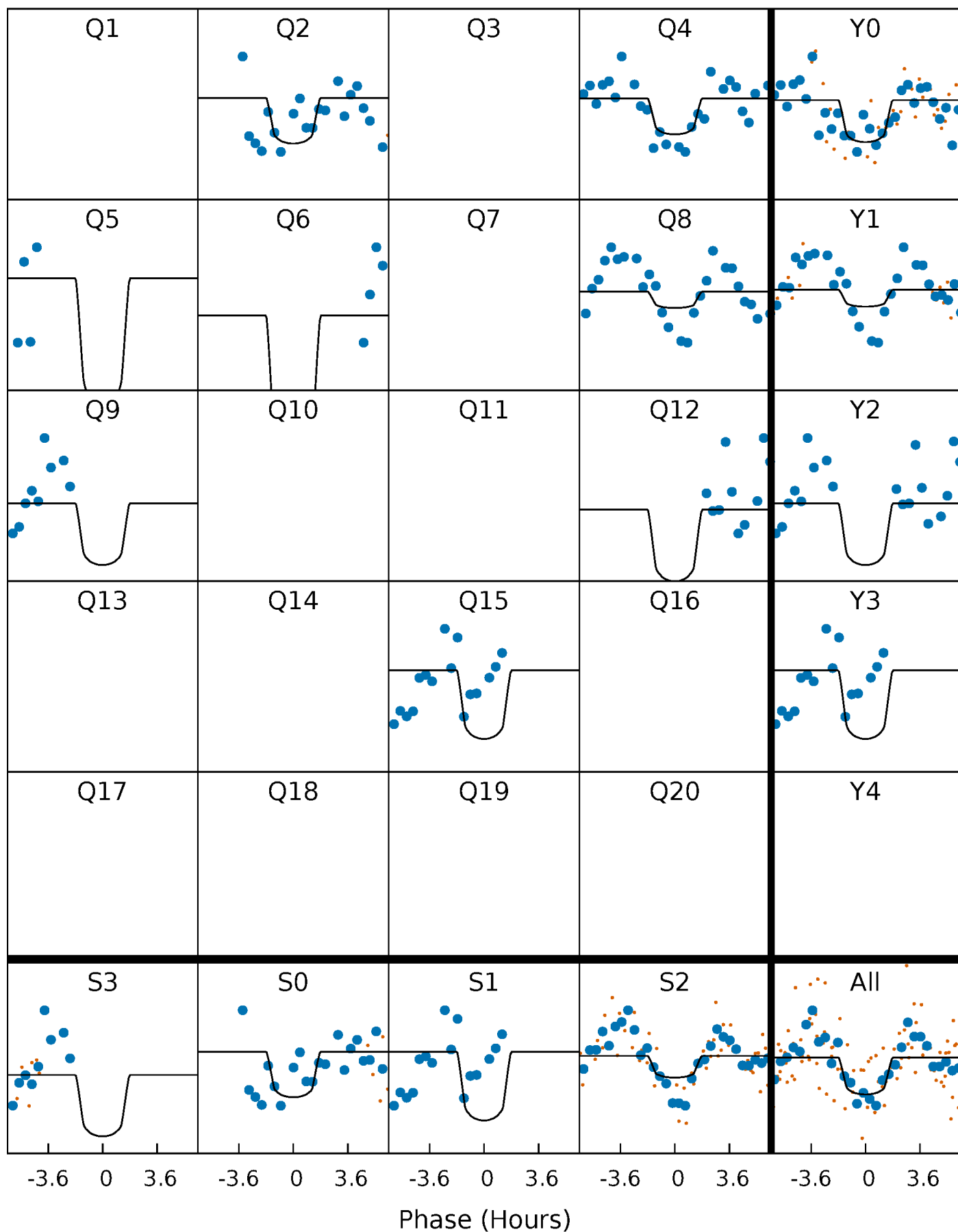
PDC Quarter-Phased Transit Curves

TCE 008782002-04 P= 77.323537 Days $T_0=132.783590$ (BKJD)



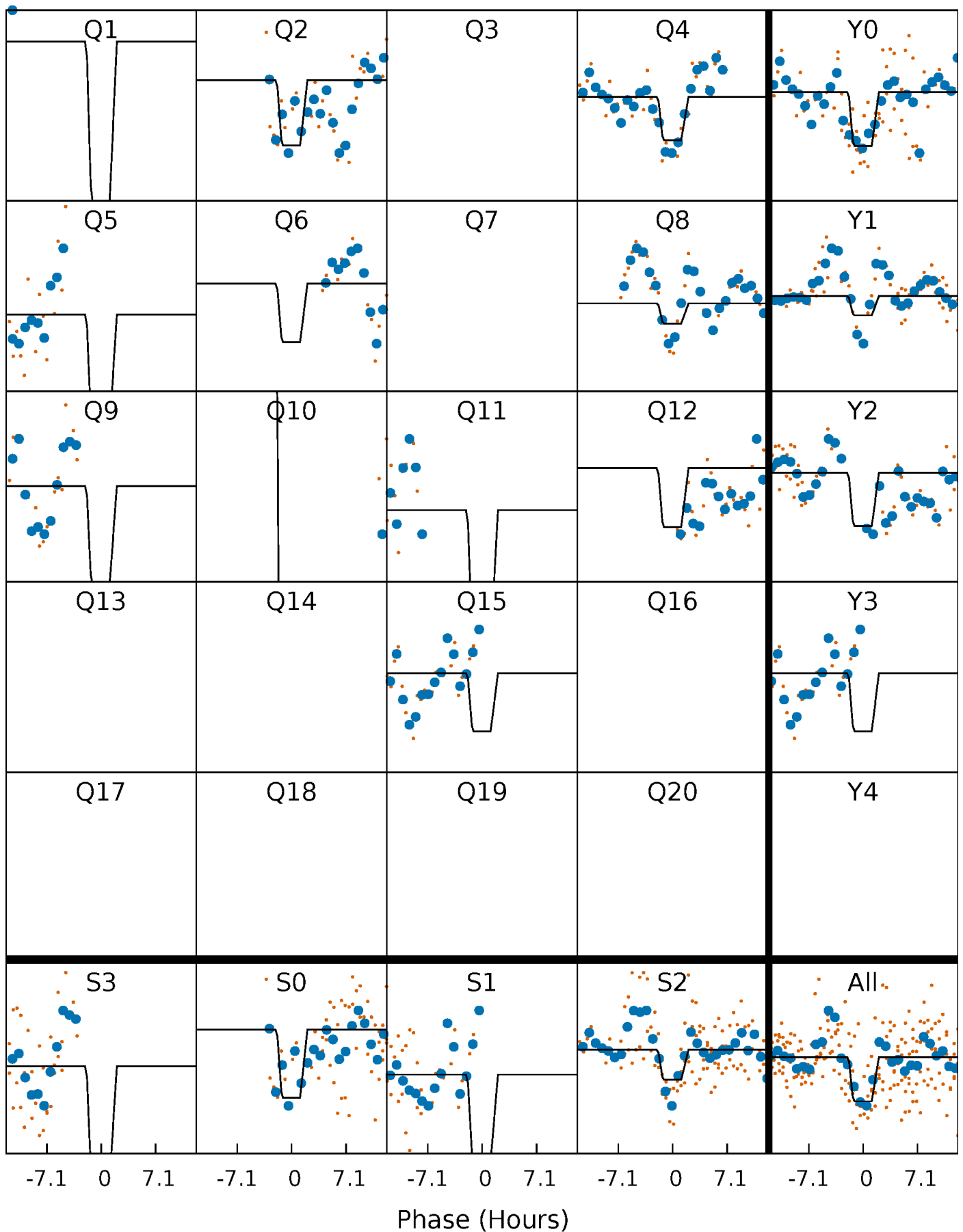
DV Quarter-Phased Transit Curves

TCE 008782002-04 P= 77.323537 Days $T_0=132.783590$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

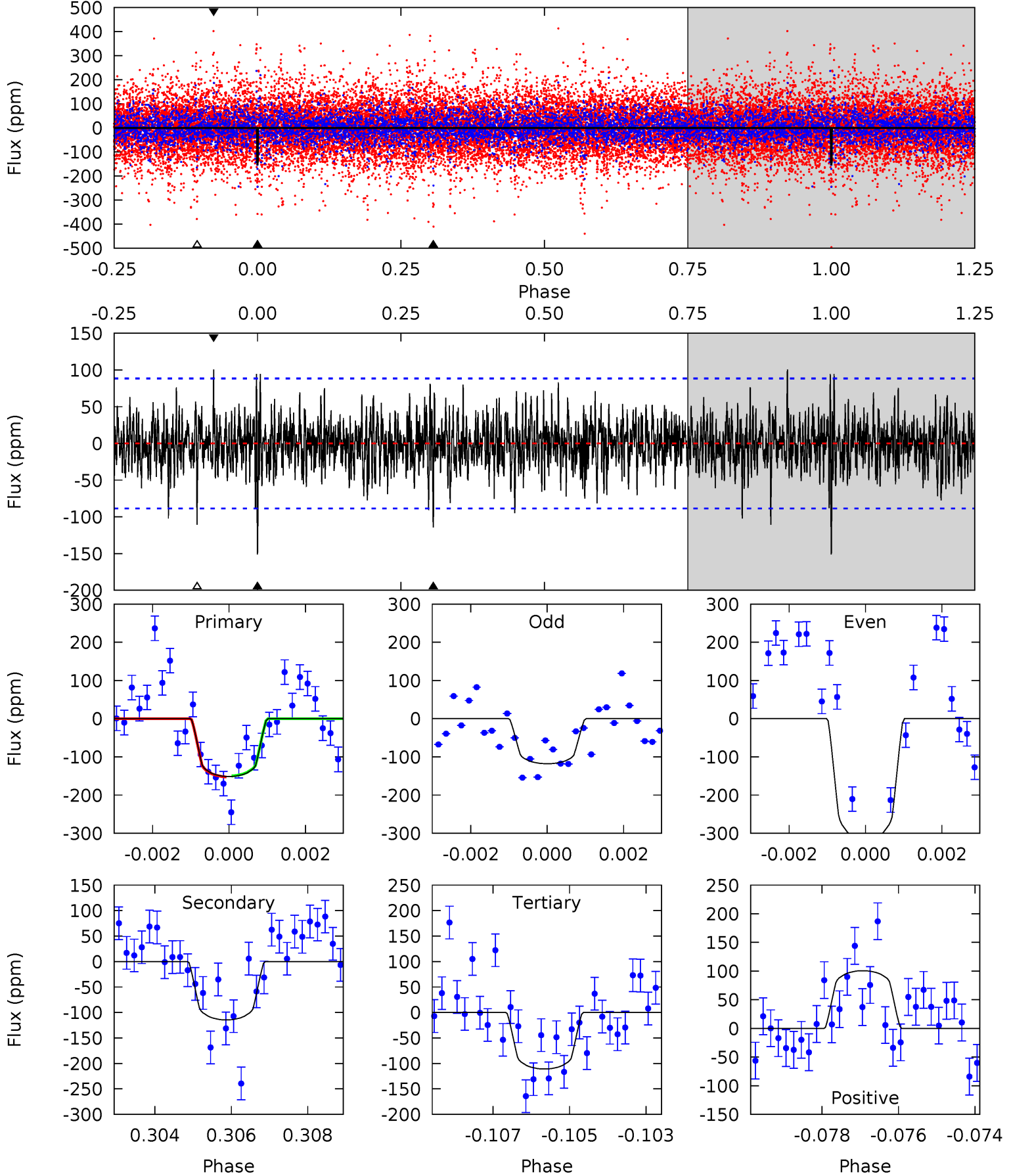
TCE 008782002-04 P= 77.328918 Days $T_0=132.767437$ (BKJD)



DV Model-Shift Uniqueness Test

008782002-04, P = 77.323537 Days, E = 55.460053 Days

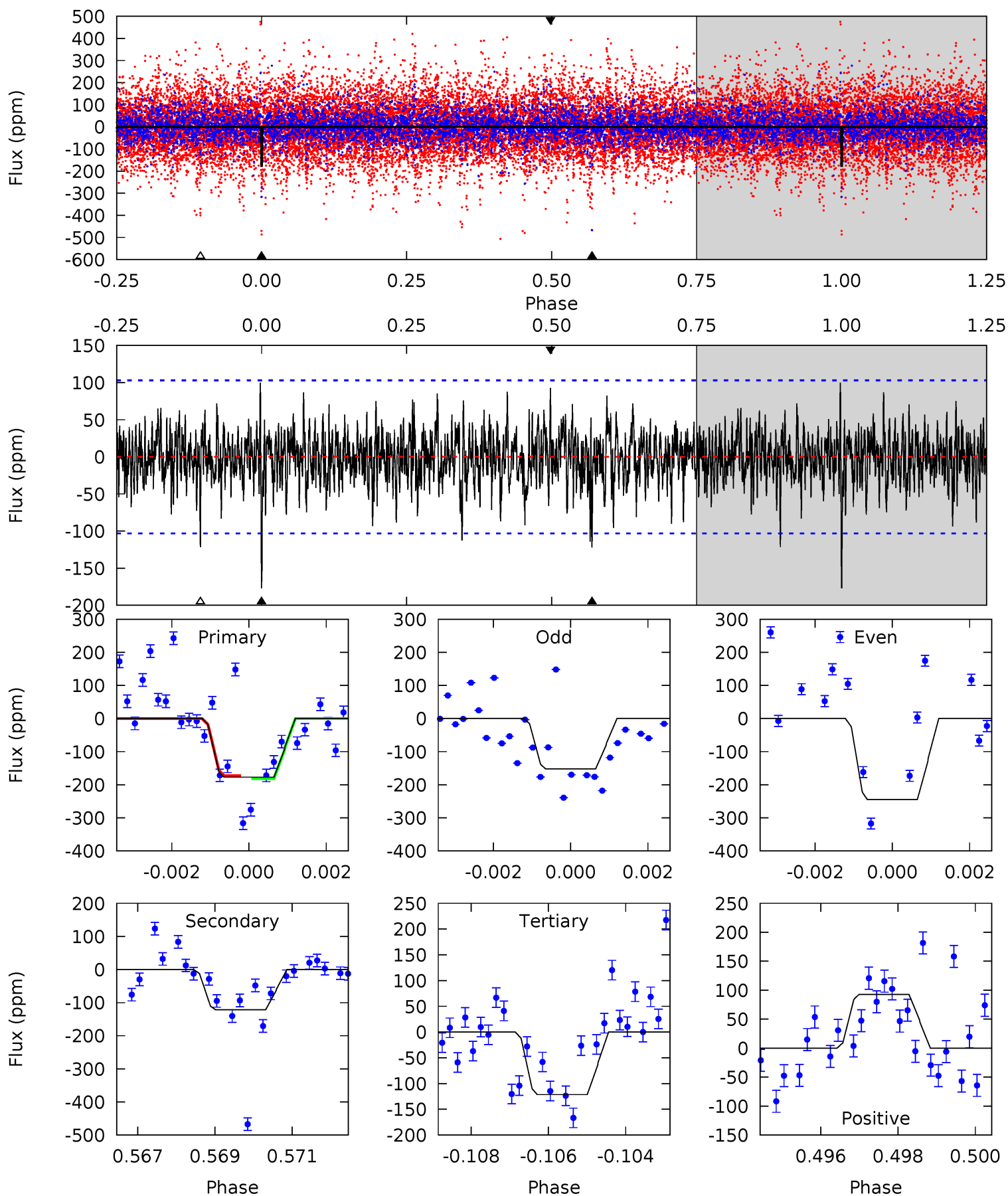
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.12	6.90	6.68	6.06	5.33	3.10	1.61	2.44	3.05	0.22	0.84	5.07	1.04	0.40	0.08



Alt Model-Shift Uniqueness Test

008782002-04, P = 77.328918 Days, E = 55.438519 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.18	6.31	6.29	4.81	5.34	3.11	1.50	2.88	4.37	0.02	1.50	2.03	0.62	0.36	0.23



Stellar Parameters For KIC 008782002

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6734^{+168}_{-184}	$3.766^{+0.292}_{-0.097}$	$-0.180^{+0.300}_{-0.250}$	$2.776^{+0.445}_{-0.965}$	$1.640^{+0.193}_{-0.358}$	$0.108^{+0.223}_{-0.034}$
	+2%/-3%	+8%/-3%	+167%/-139%	+16%/-35%	+12%/-22%	+207%/-31%
Source	PHO1	FLK73	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 008782002-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-114±17	$4.82^{+4.24}_{-3.29}$	1050^{+64}_{-84}	5391^{+4457}_{-1216}	475^{+4122}_{-343}
Alt.	-122±19	$5.41^{+4.05}_{-3.51}$	1051^{+58}_{-82}	5124^{+4033}_{-992}	391^{+2773}_{-259}

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

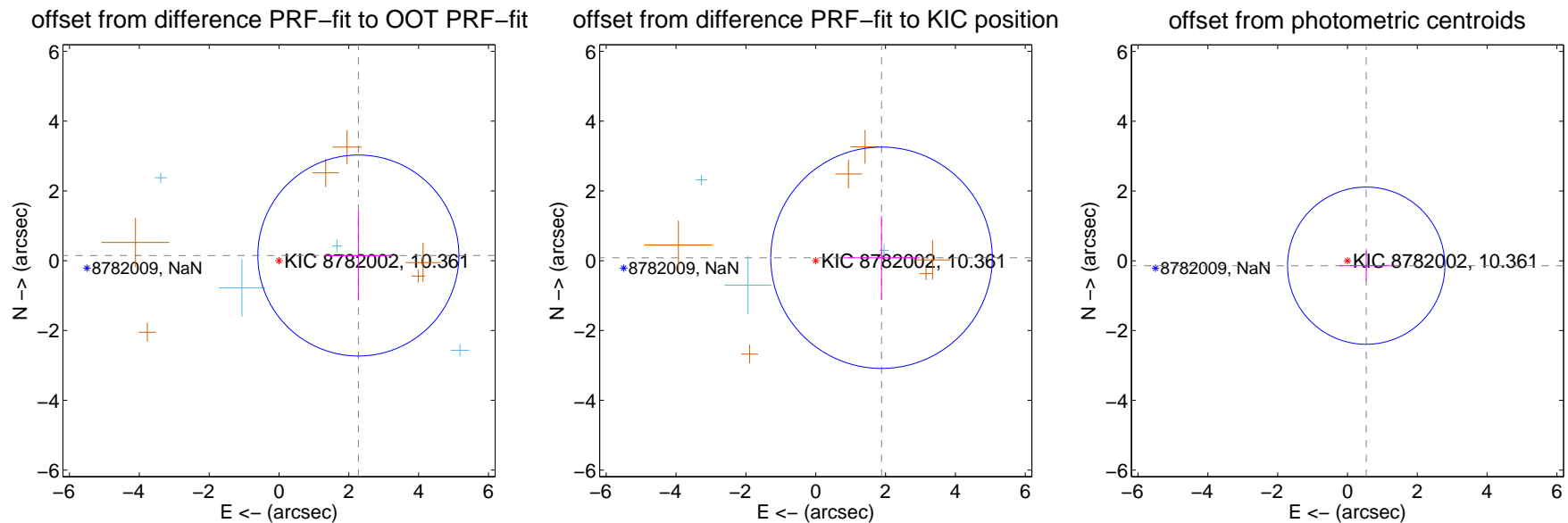
DV Centroid Data

Supplemental centroid analysis for 008782002-04. **Kepler magnitude: 10.36.** Transit SNR 7.62

There are 4 quarters with good PRF difference image offsets

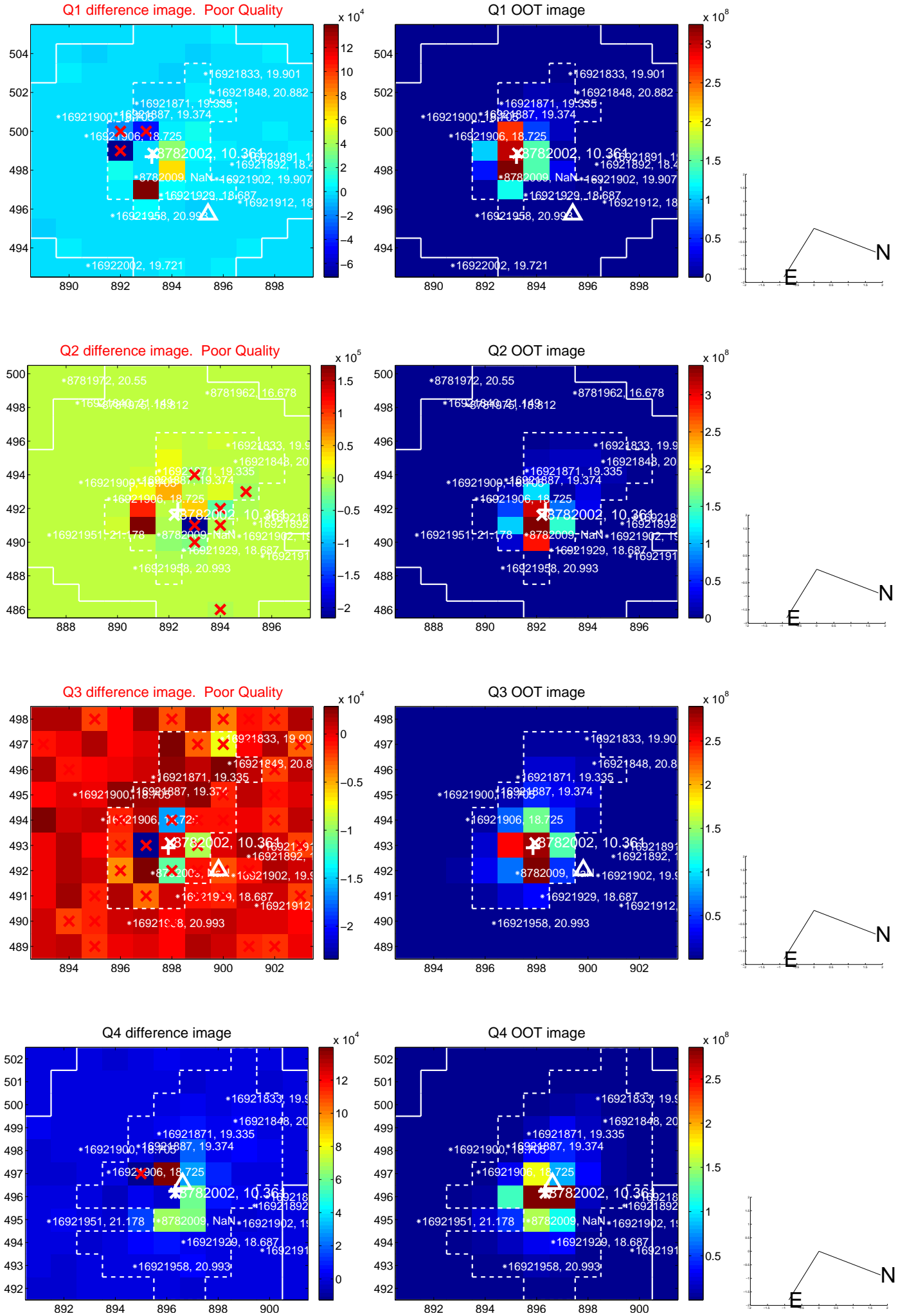
The direct PRF centroid is offset from the target star catalog position by about 0.88 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.278 ± 0.960	2.37	-2.274 ± 0.996	0.149 ± 1.283
PRF-fit source offset from KIC position	1.887 ± 1.057	1.78	-1.885 ± 1.091	0.084 ± 1.197
photometric centroid source offset	0.55 ± 0.75	0.74	-0.54 ± 0.77	-0.14 ± 0.43

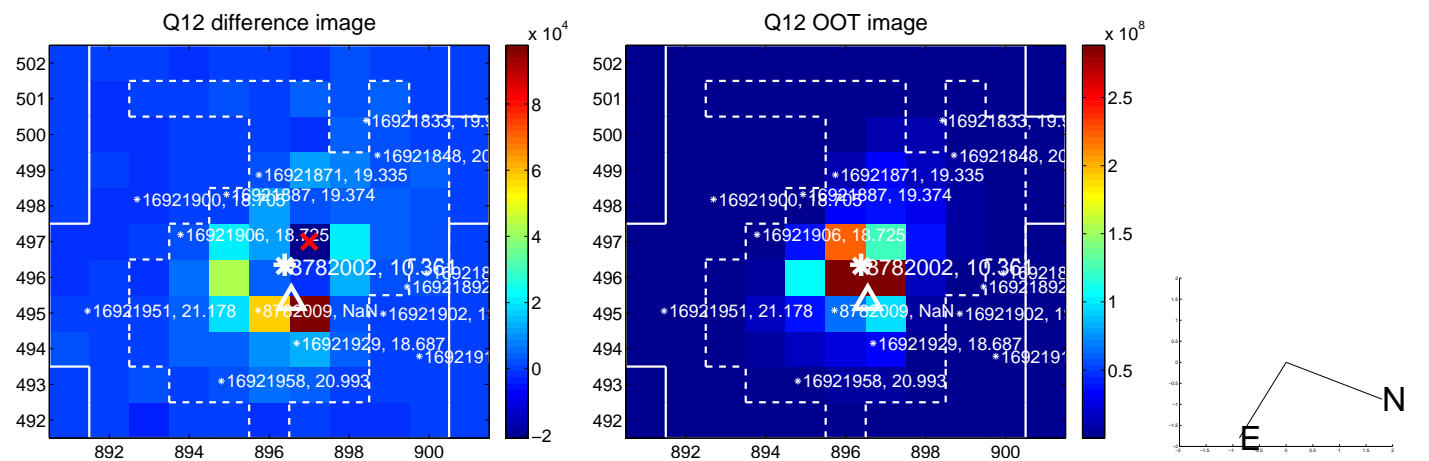
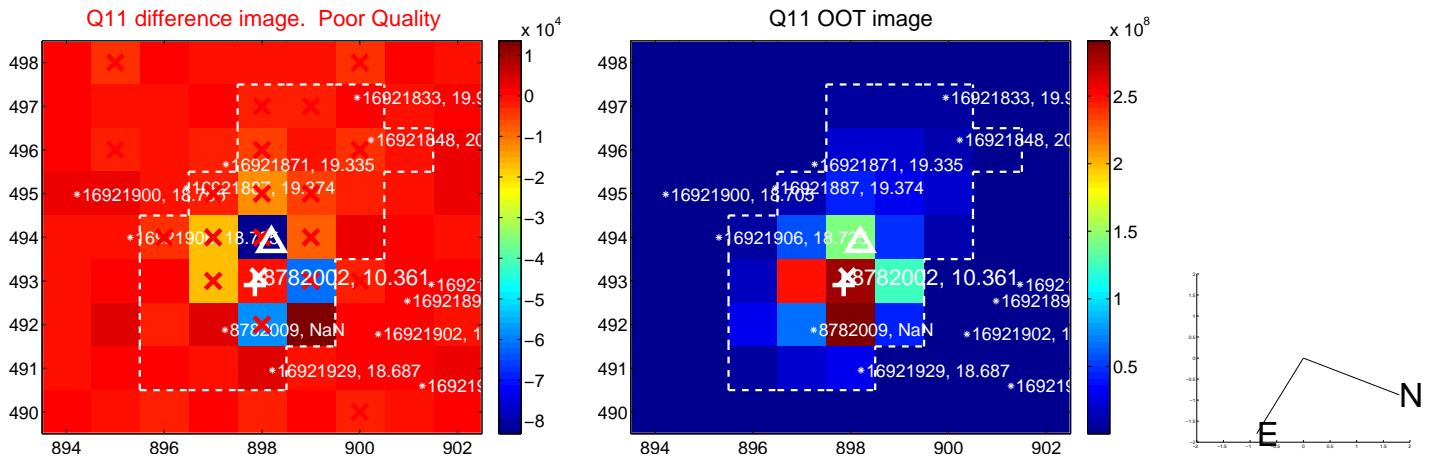
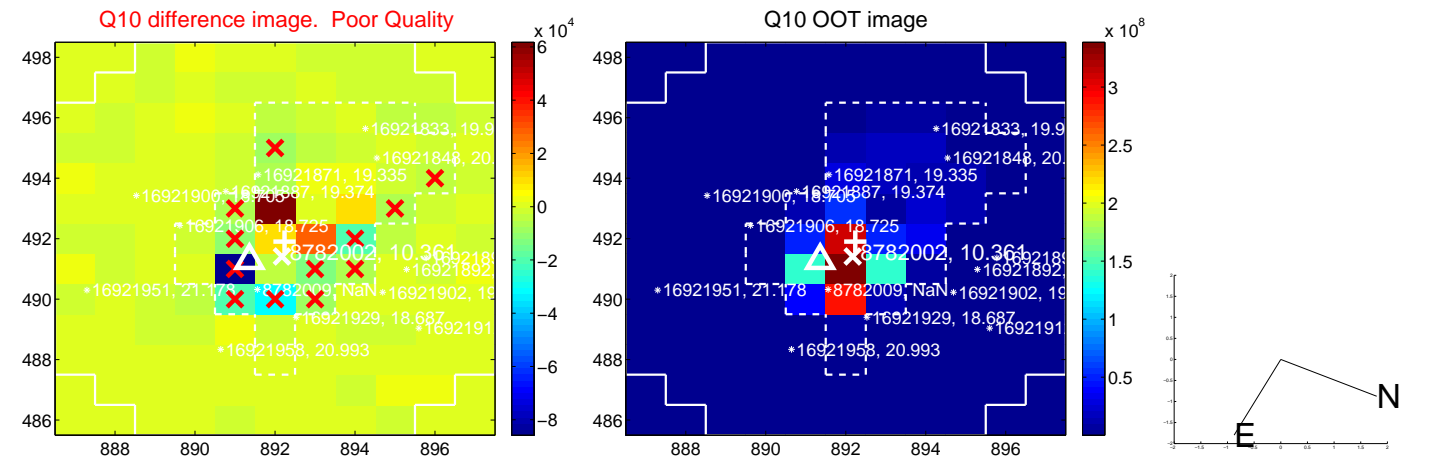
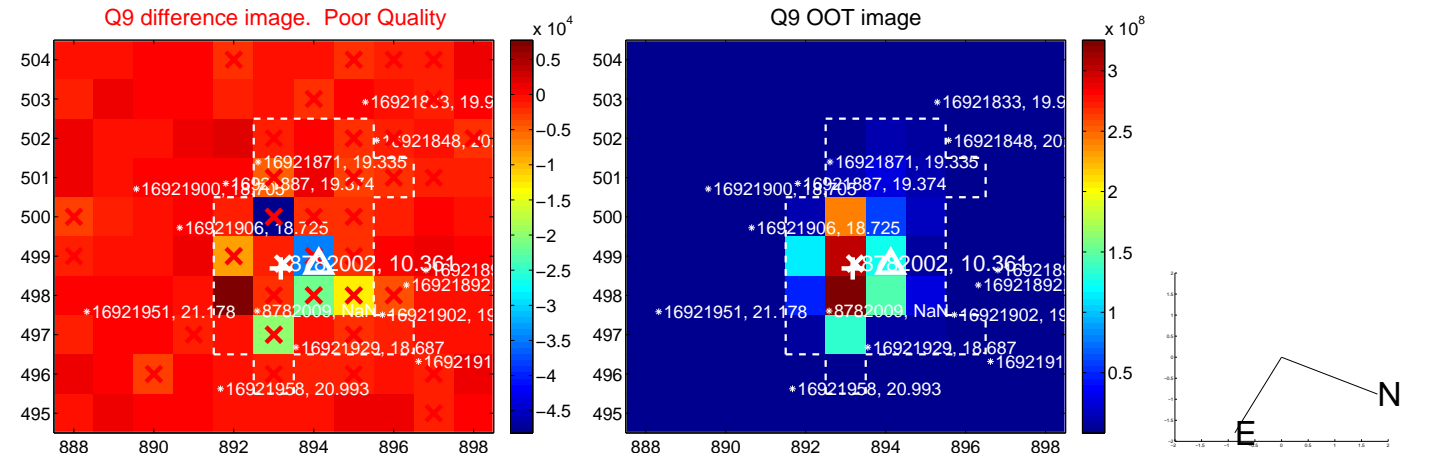


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

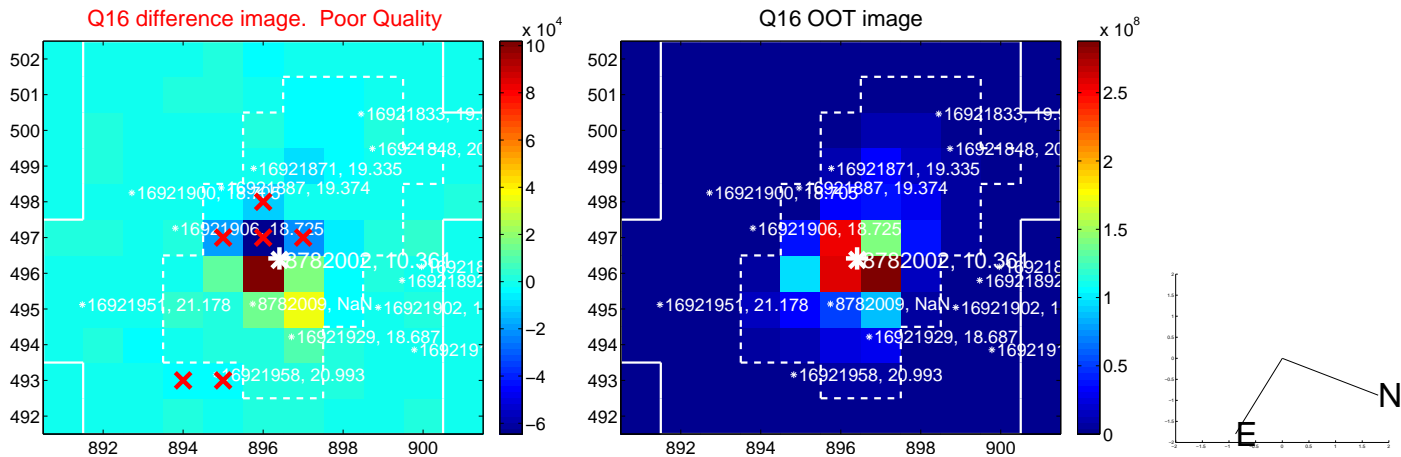
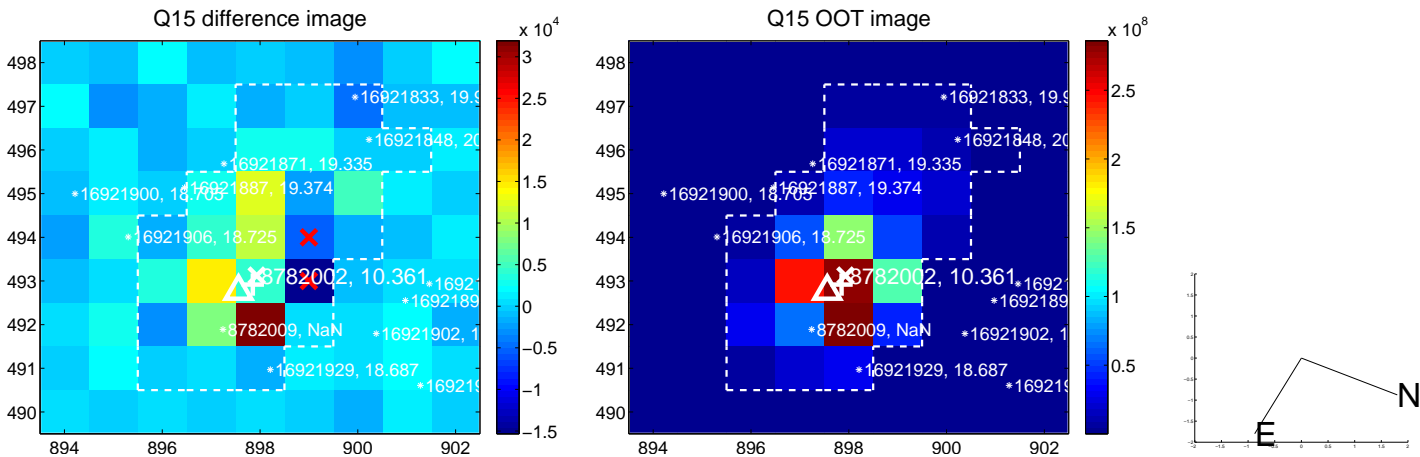
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



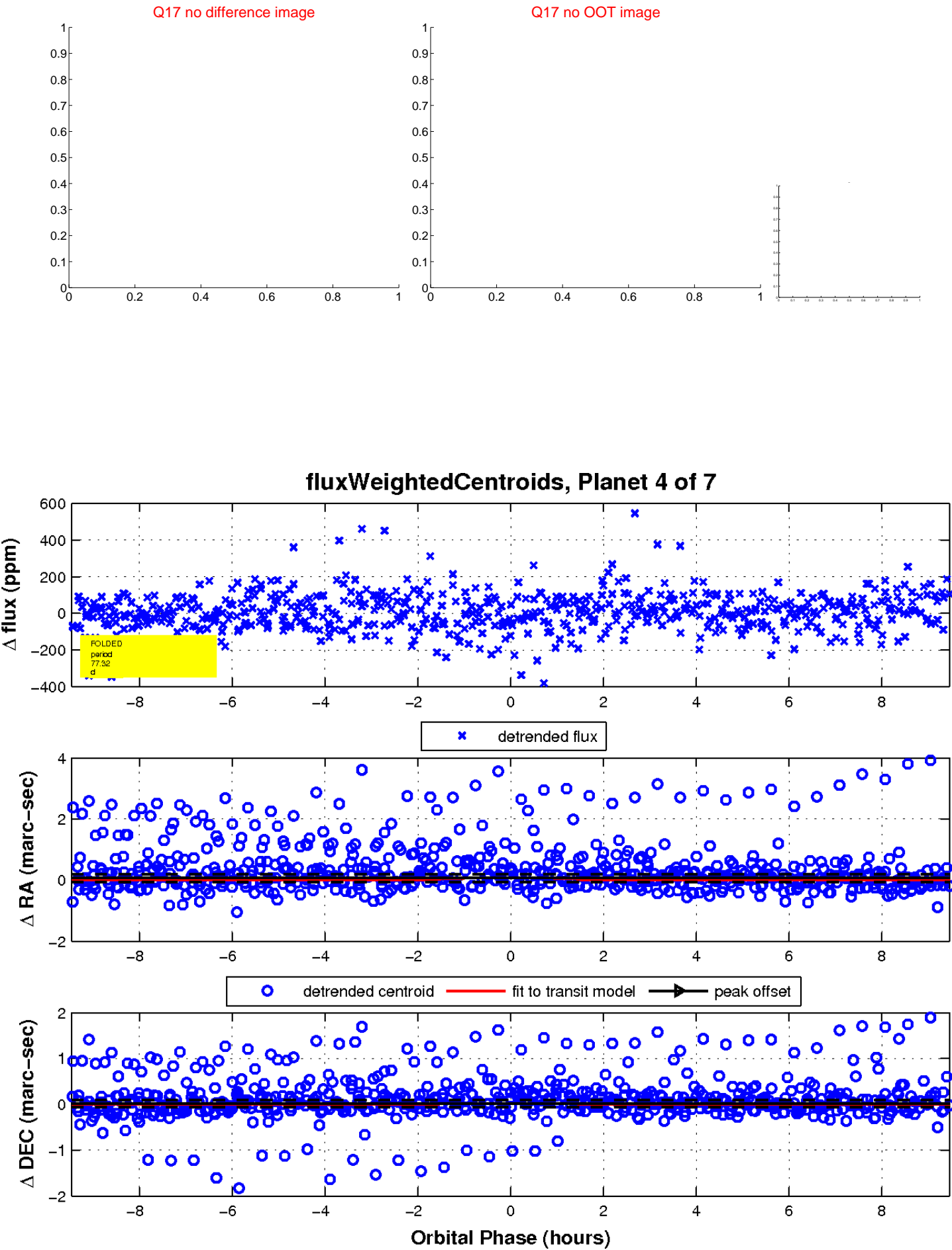
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



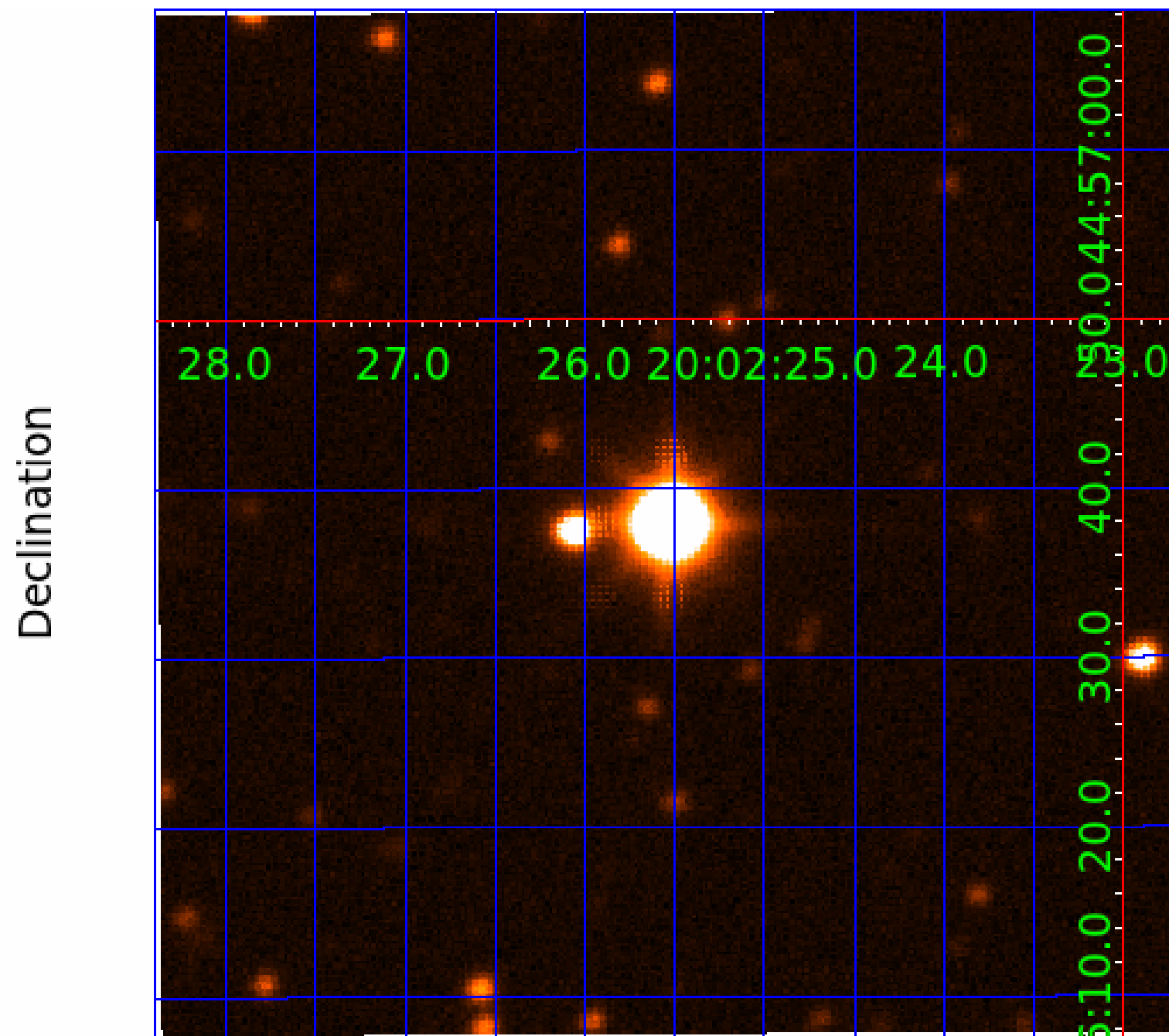
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 008782002

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})
008782002-01	OBS	No	2.909750	132.839418	15.8	7.640	9.9	8.4	2.78	6734	1.28	6413.95
008782002-02	OBS	No	2.909463	133.285035	22.0	16.042	9.4	9.0	2.78	6734	1.46	6414.79
008782002-03	OBS	No	87.568758	176.602310	90.2	13.906	38.0	6.4	2.78	6734	3.13	68.52
008782002-04	OBS	No	77.323537	132.783590	164.1	3.157	11.2	7.6	2.78	6734	3.92	80.88
008782002-05	OBS	No	169.954366	242.066644	220.0	2.916	10.3	9.9	2.78	6734	4.70	28.30
008782002-06	OBS	No	157.546368	183.225037	138.4	5.213	8.9	8.3	2.78	6734	3.86	31.31
008782002-07	OBS	No	219.897928	341.161649	241.6	2.342	10.3	8.8	2.78	6734	5.09	20.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008782002-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008782002-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
008782002-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

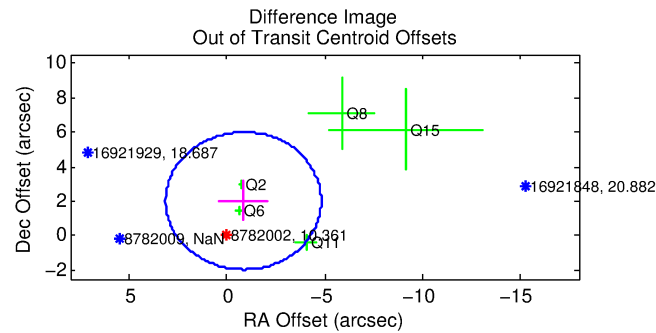
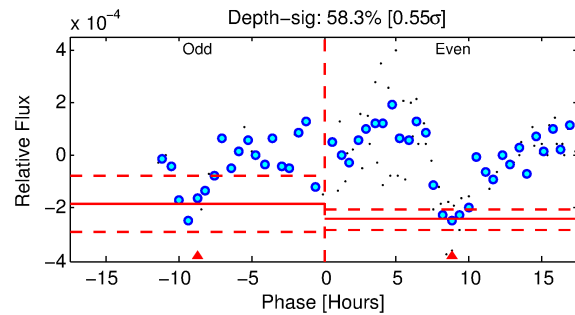
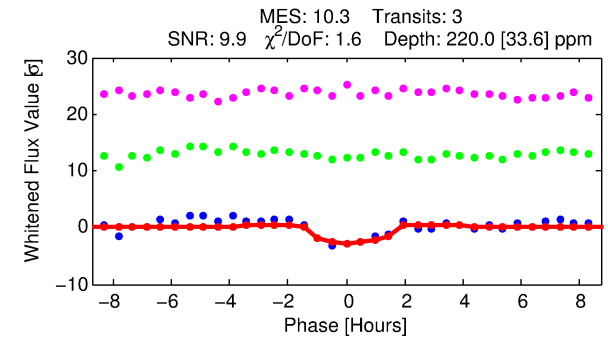
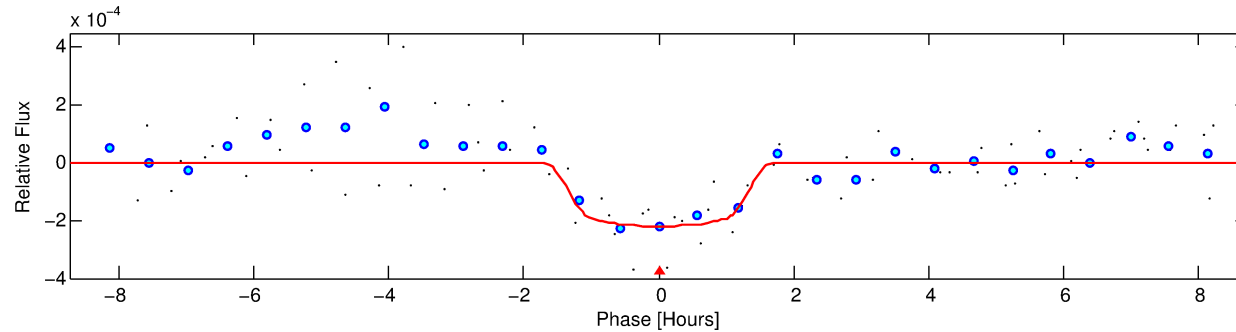
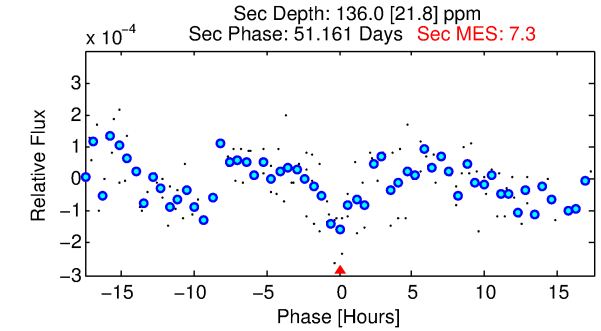
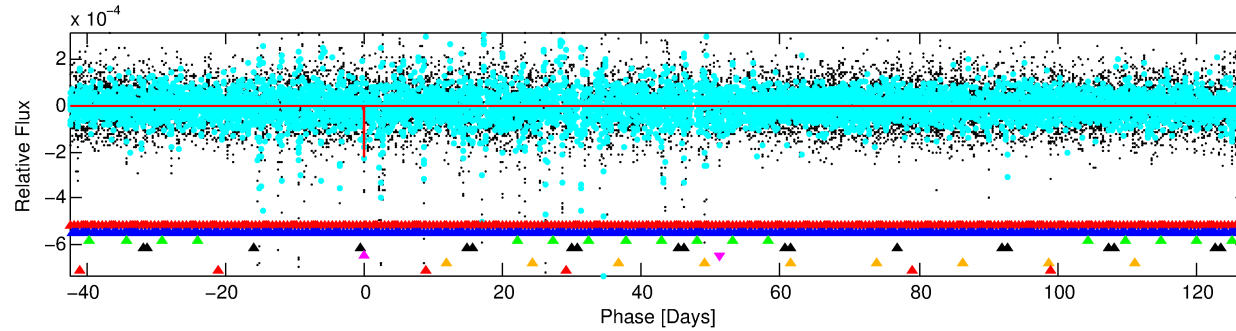
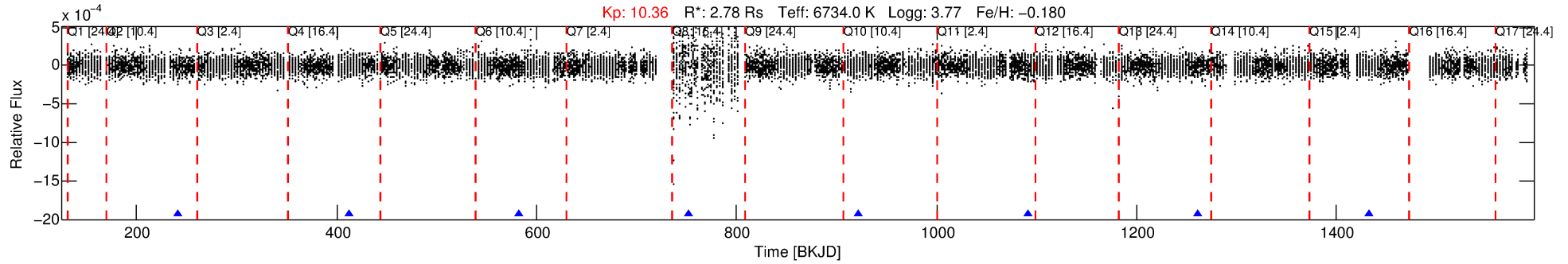
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008782002-05

No Significant Match Found

DV One-Page Summary

KIC: 8782002 Candidate: 5 of 7 Period: 169.954 d



DV Fit Results:

Period = 169.95437 [0.00202] d
Epoch = 242.0666 [0.0077] BKJD
Rp/R* = 0.0155 [0.0114]
a/R* = 233.98 [1001.66]
b = 0.87 [1.23]
Seff = 28.30 [14.61]
Teq = 588 [76] K
Rp = 4.70 [3.82] Re
a = 0.7083 [0.2283] AU
Ag = 1700.65 [2659.46] [0.64 σ]
Teffp = 5840 [2167] K [2.42 σ]

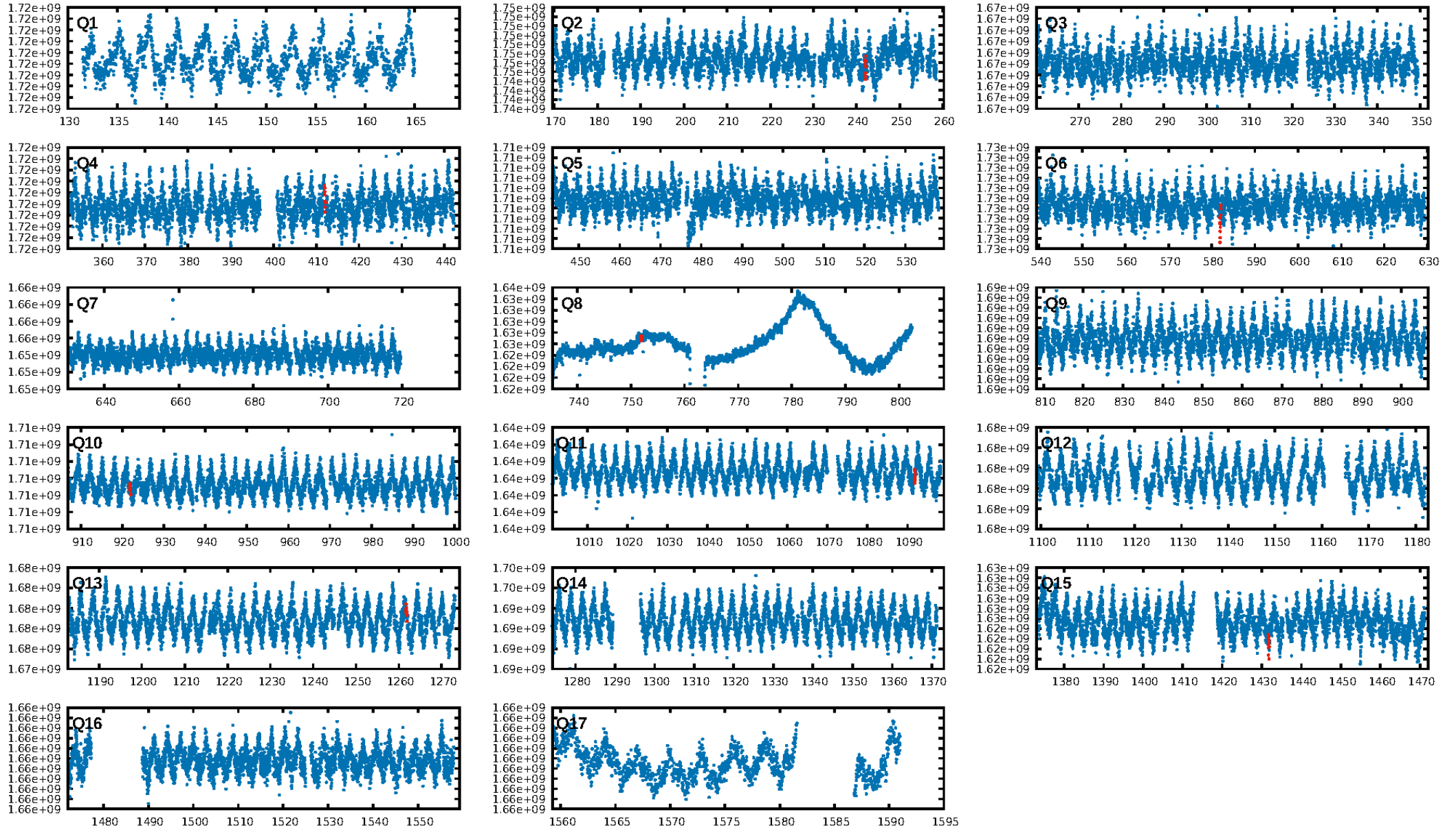
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [49.86 σ]
LongPeriod-sig: 100.0% [320.45 σ]
ModelChiSquare2-sig: 2.0%
ModelChiSquareGof-sig: 69.2%
Bootstrap-pfa: 5.46e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 8.9%
Centroid-so: 0.726 arcsec [1.02 σ]
OotOffset-rm: 2.189 arcsec [1.65 σ]
KicOffset-rm: 2.868 arcsec [1.56 σ]
OotOffset-st: 2/2/1/0 [5]
KicOffset-st: 2/2/1/0 [5]
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DiffImageOverlap-fno: 0.50 [4/8]

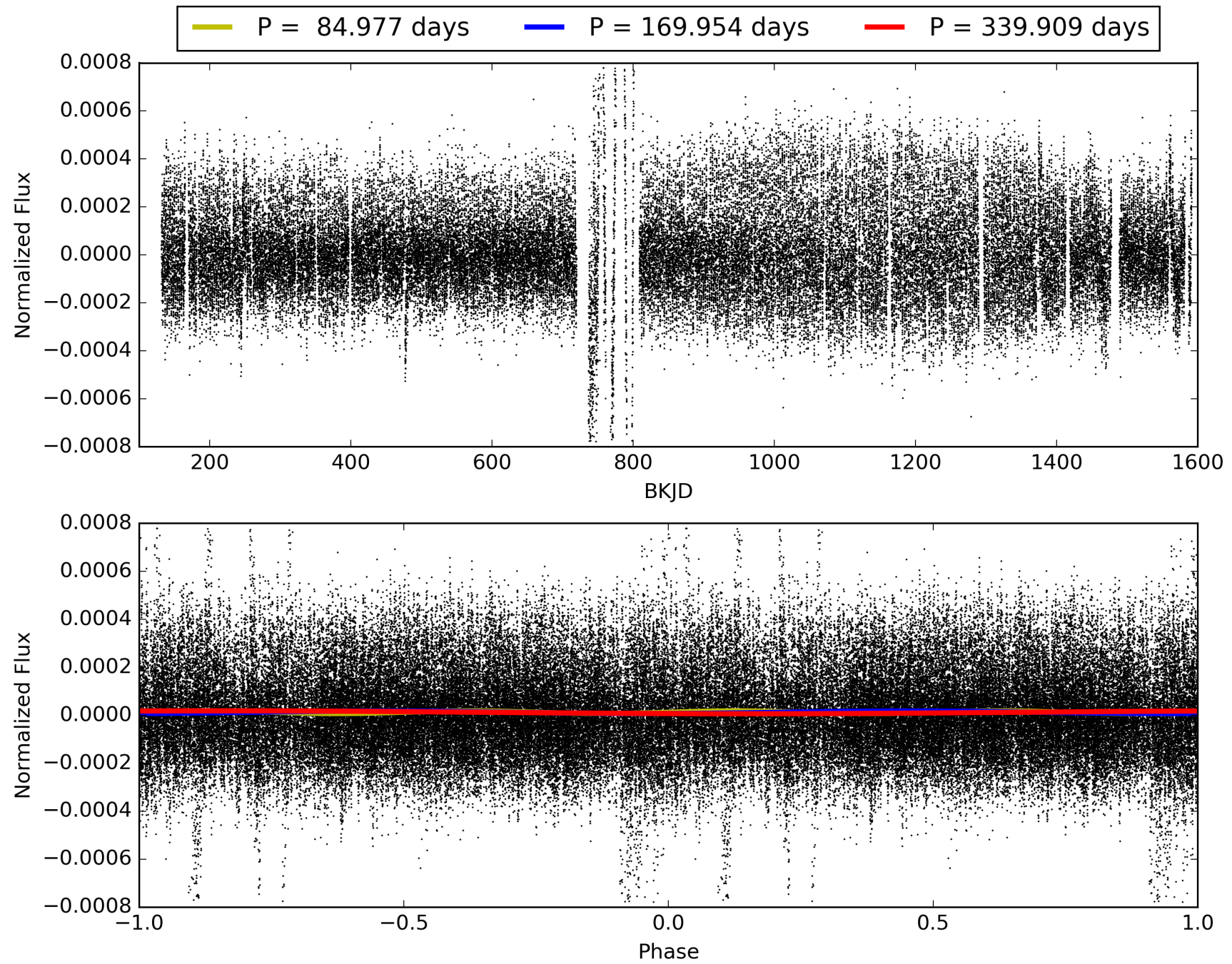
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008782002-05, PDC Light Curves

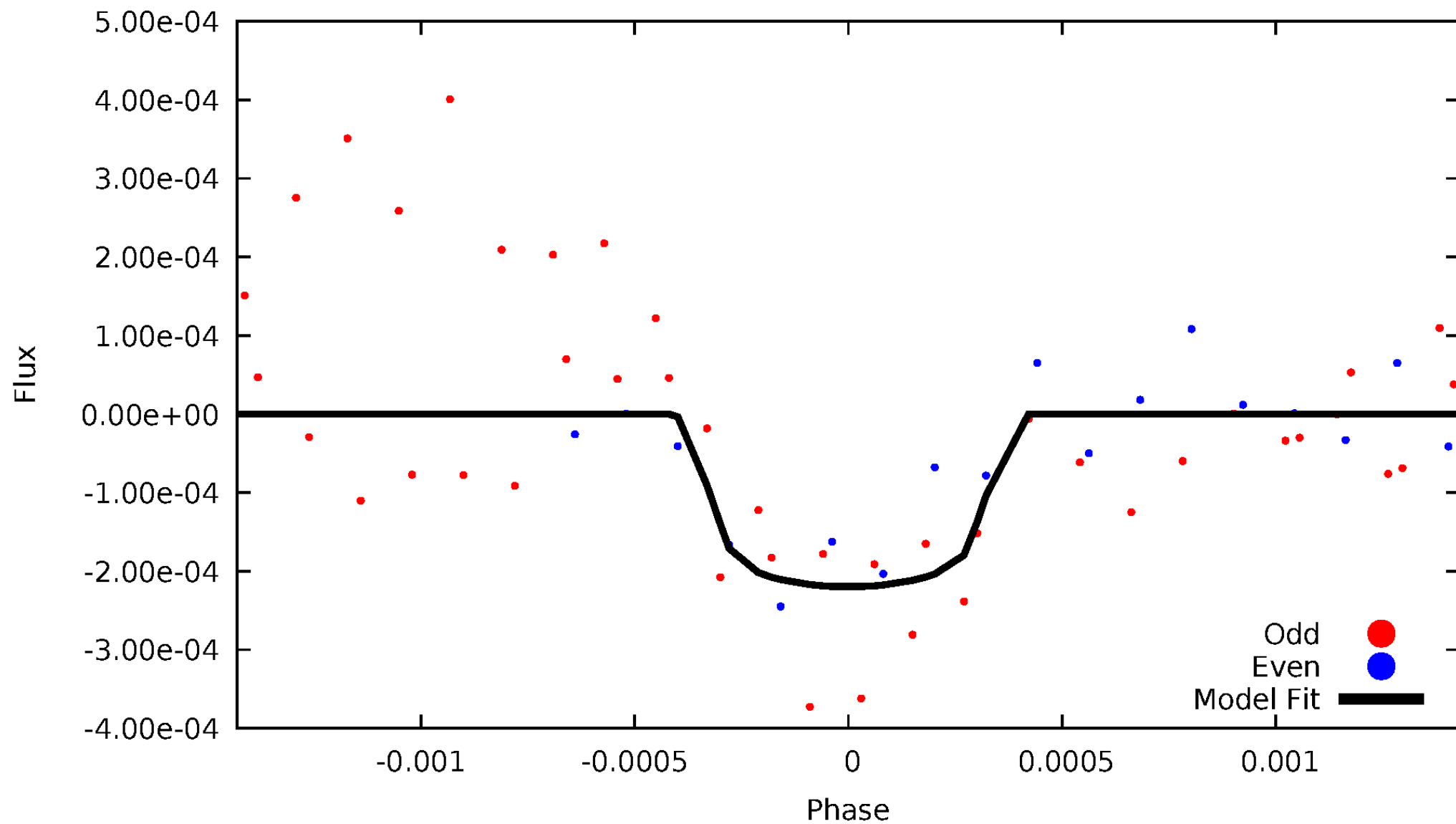


TCE 008782002-05



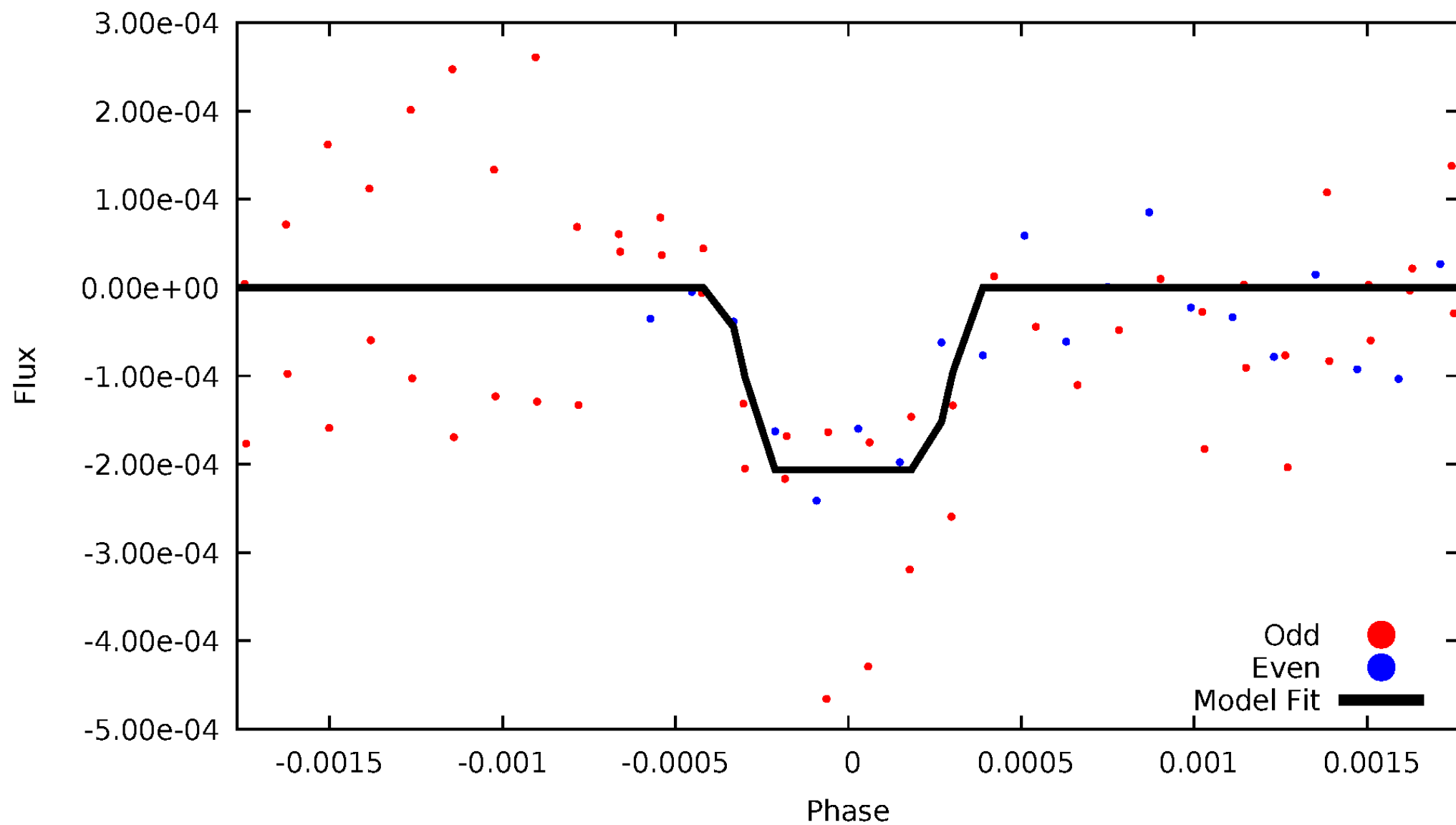
DV Odd/Even

TCE 008782002-05



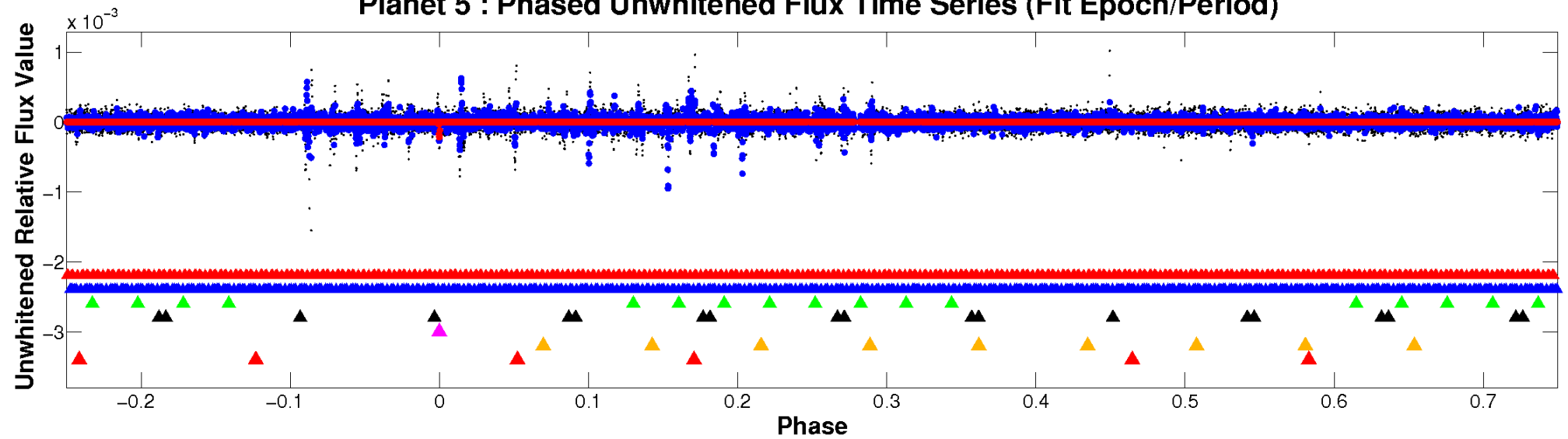
ALT Odd/Even

TCE 008782002-05

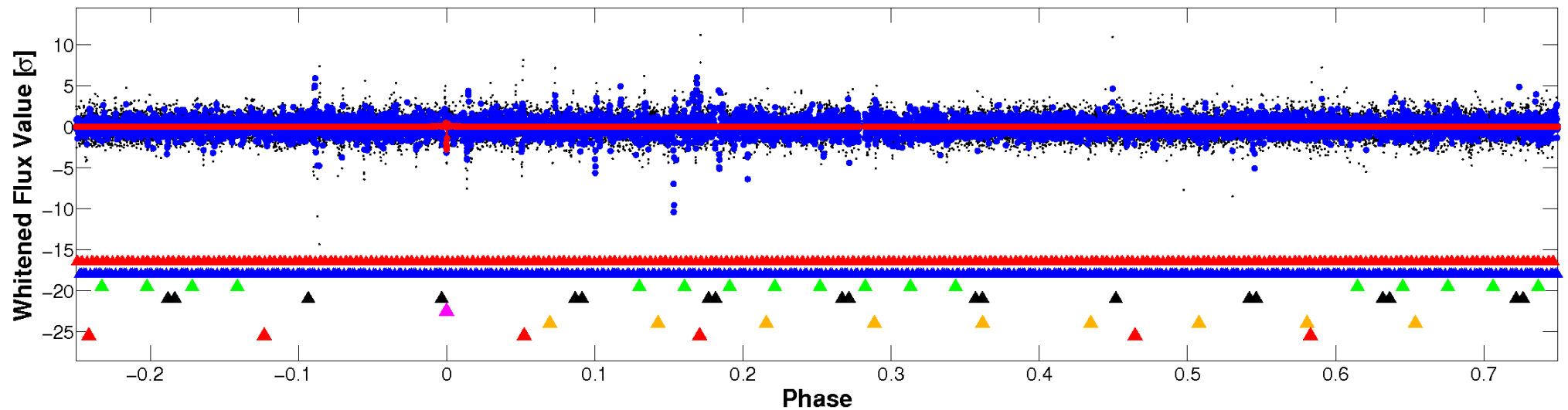


Non-Whitened Vs. Whitened Light Curve

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

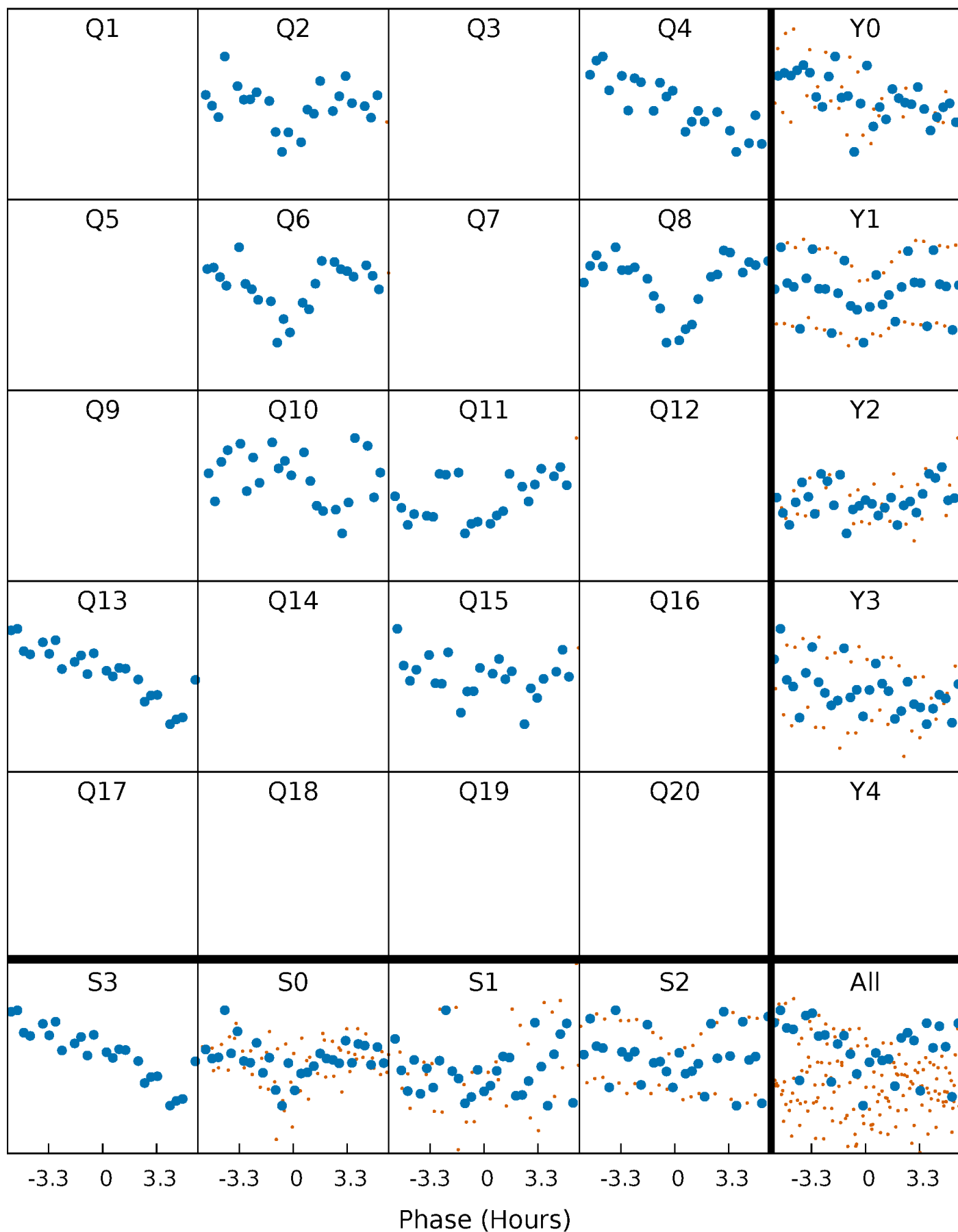


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



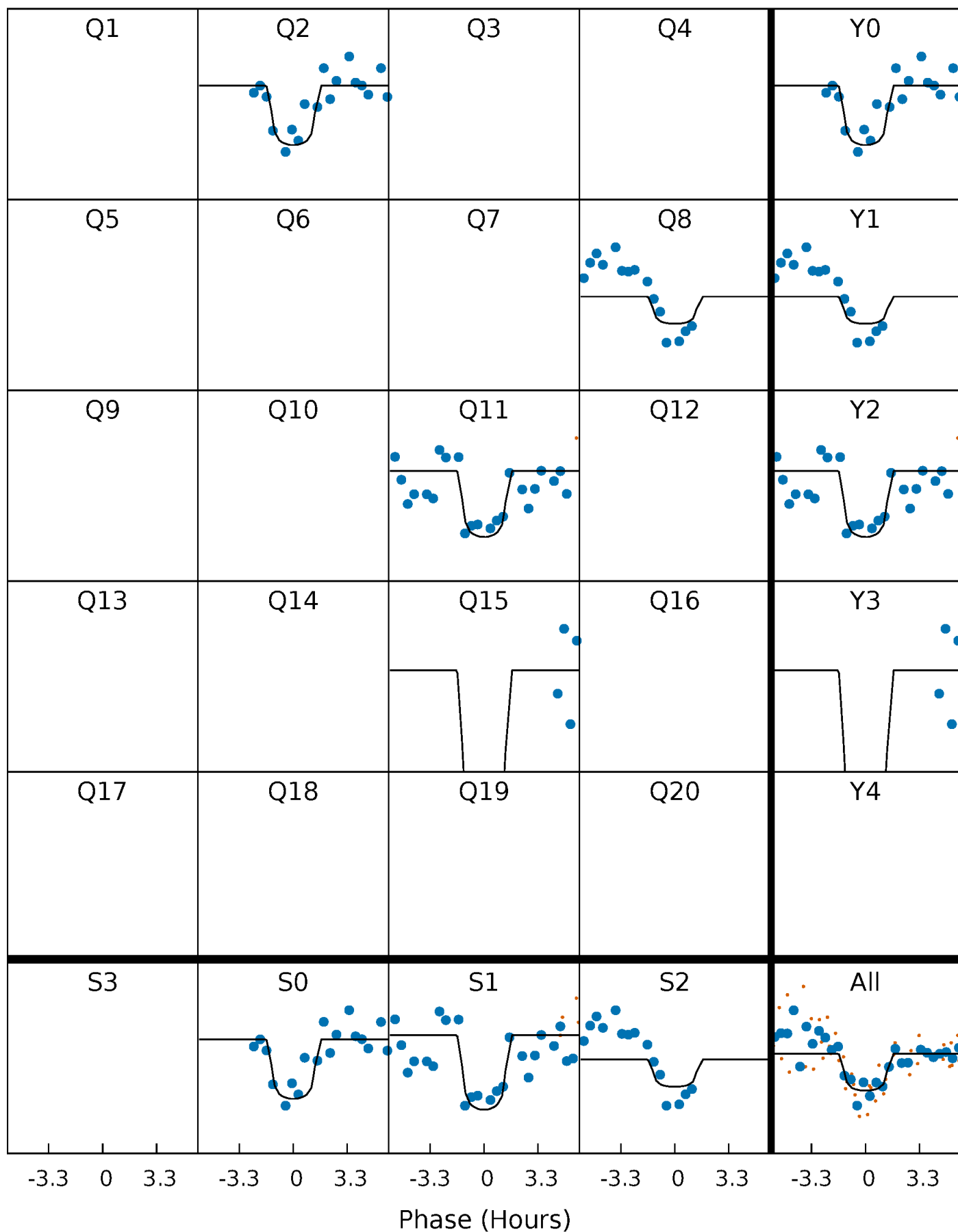
PDC Quarter-Phased Transit Curves

TCE 008782002-05 P=169.954366 Days $T_0=242.066644$ (BKJD)



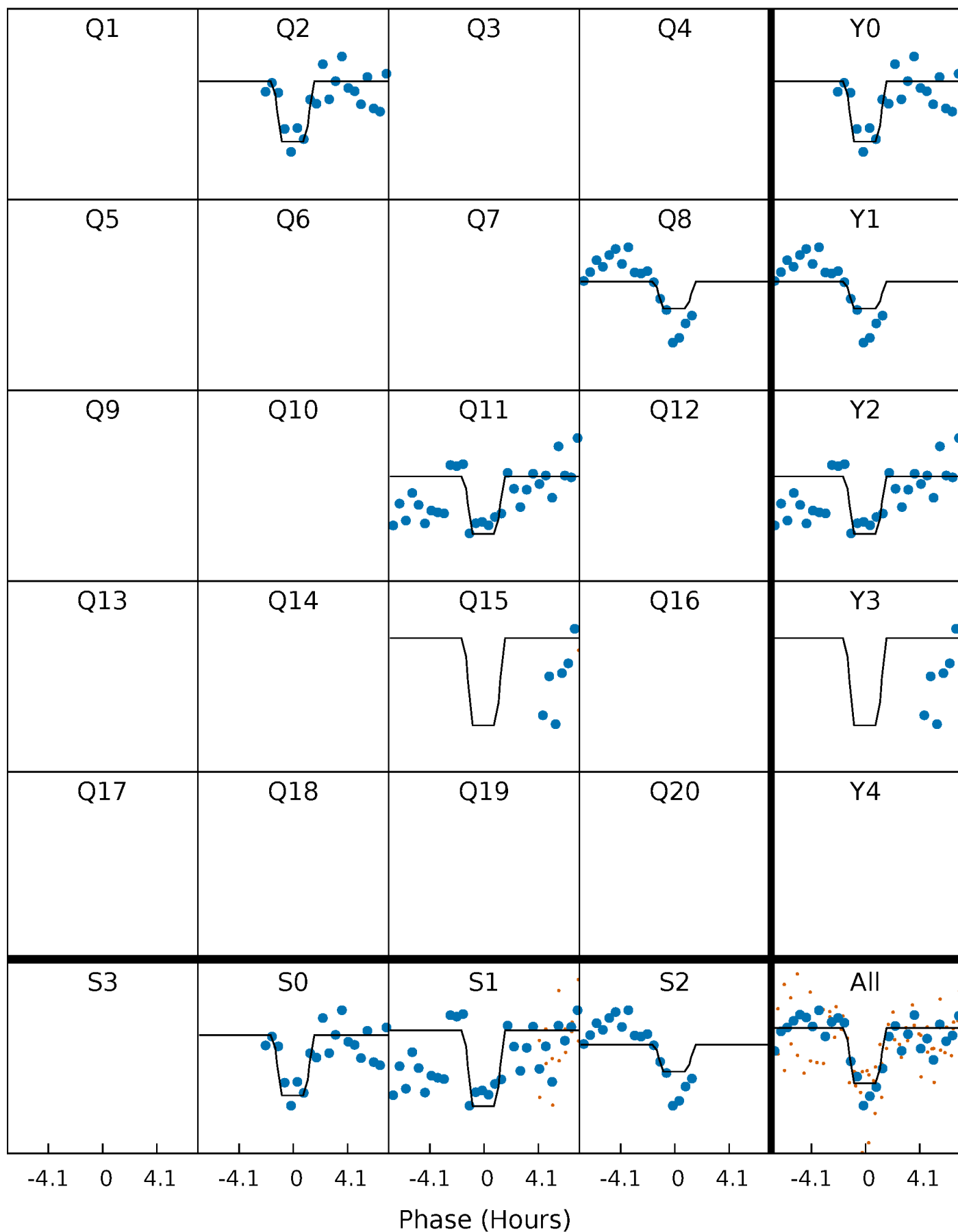
DV Quarter-Phased Transit Curves

TCE 008782002-05 $P=169.954366$ Days $T_0=242.066644$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

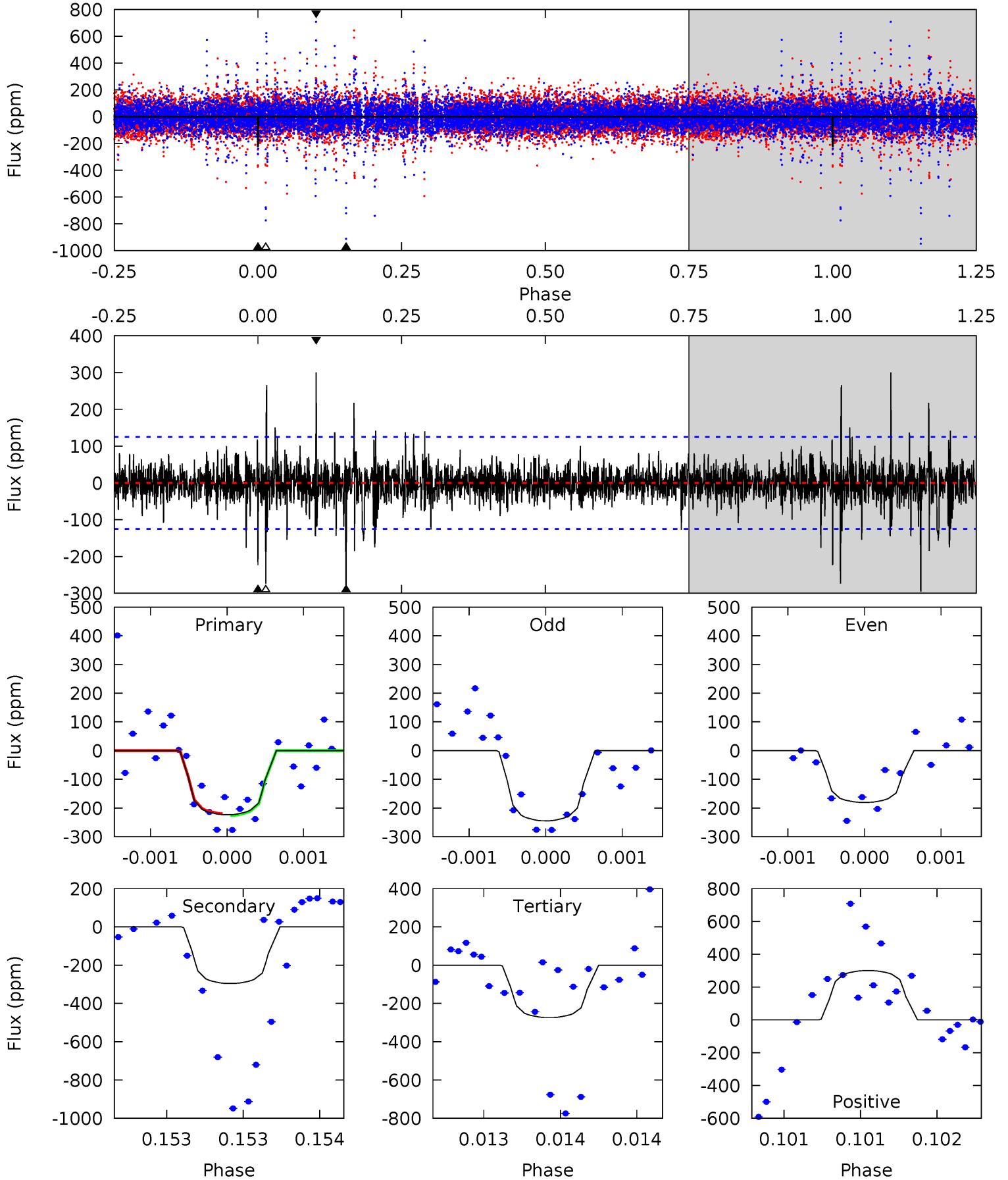
TCE 008782002-05 $P=169.956626$ Days $T_0=242.055245$ (BKJD)



DV Model-Shift Uniqueness Test

008782002-05, P = 169.954366 Days, E = 72.112278 Days

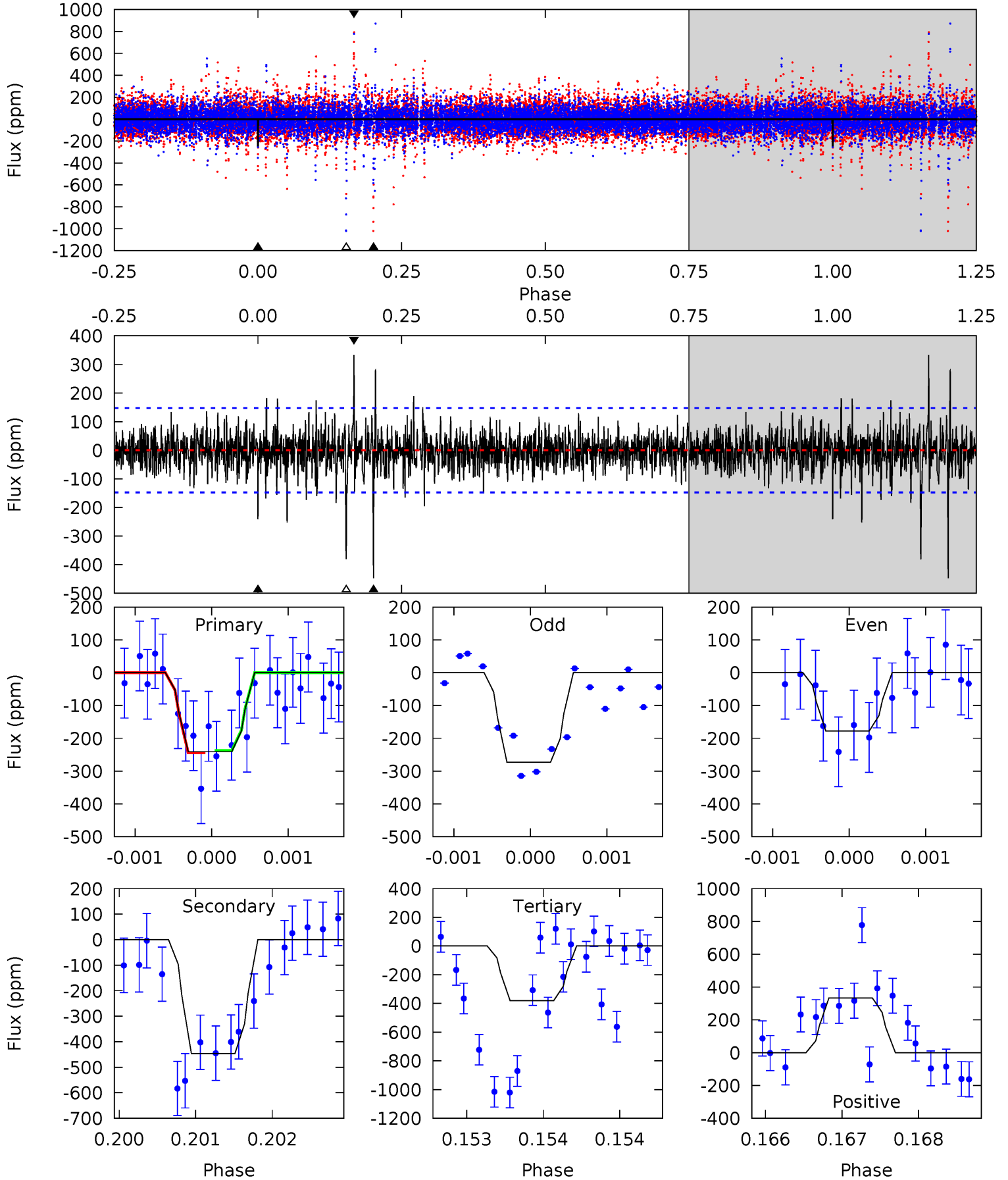
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.87	13.1	12.1	13.3	5.53	3.41	1.55	-2.22	-3.41	0.97	-0.21	1.41	1.10	0.50	0.15



Alt Model-Shift Uniqueness Test

008782002-05, $P = 169.956626$ Days, $E = 72.098619$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.00	16.7	14.2	12.5	5.52	3.39	1.77	-5.24	-3.45	2.47	4.26	1.67	1.32	0.43	0.13



Stellar Parameters For KIC 008782002

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	ρ_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6734^{+168}_{-184}	$3.766^{+0.292}_{-0.097}$	$-0.180^{+0.300}_{-0.250}$	$2.776^{+0.445}_{-0.965}$	$1.640^{+0.193}_{-0.358}$	$0.108^{+0.223}_{-0.034}$
	+2%/-3%	+8%/-3%	+167%/-139%	+16%/-35%	+12%/-22%	+207%/-31%
Source	PHO1	FLK73	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 008782002-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-296 ± 23	$4.80^{+3.31}_{-2.52}$	808^{+48}_{-70}	6853^{+3939}_{-1552}	3555^{+11989}_{-2307}
Alt.	-447 ± 27	$4.48^{+3.33}_{-2.67}$	809^{+45}_{-67}	7895^{+8044}_{-1878}	6063^{+31452}_{-4078}

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

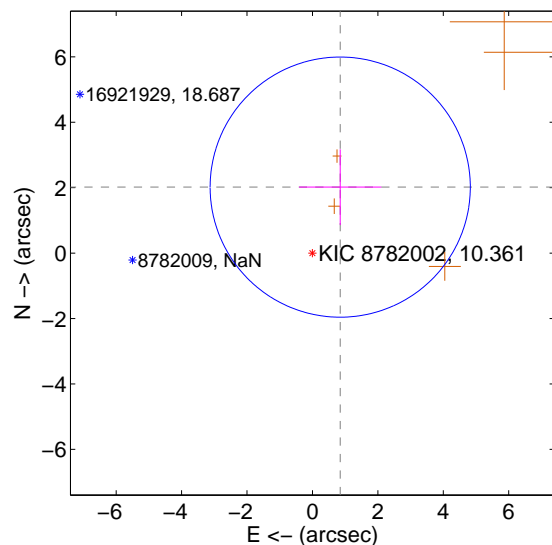
Supplemental centroid analysis for 008782002-05. **Kepler magnitude: 10.36.** Transit SNR 9.86

There are 0 quarters with good PRF difference image offsets

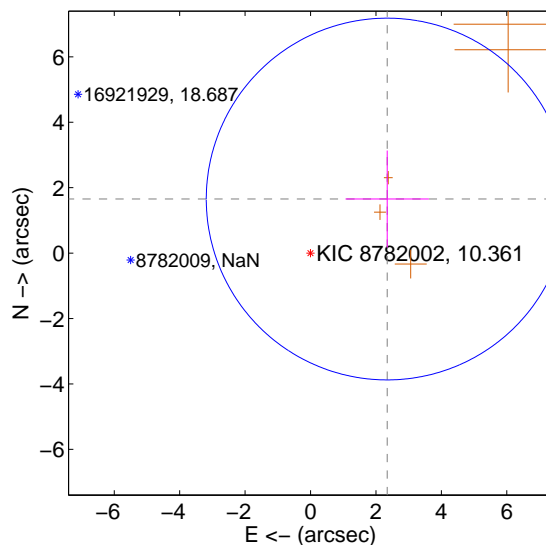
The direct PRF centroid is offset from the target star catalog position by about 0.84 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.189 ± 1.326	1.65	-0.850 ± 1.257	2.018 ± 1.156
PRF-fit source offset from KIC position	2.868 ± 1.844	1.56	-2.343 ± 1.273	1.653 ± 1.483
photometric centroid source offset	0.73 ± 0.71	1.02	-0.58 ± 0.82	0.44 ± 0.45

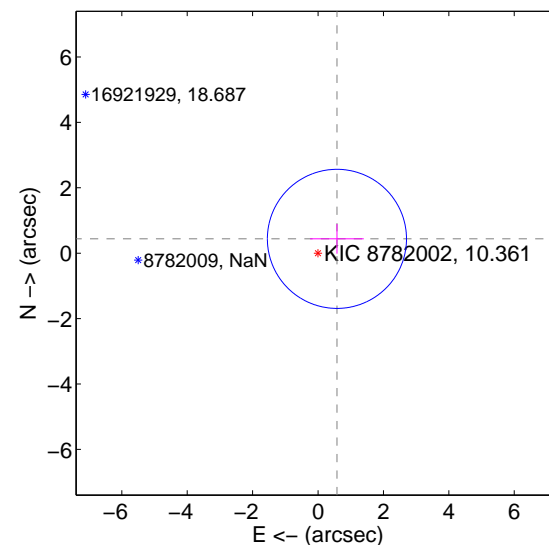
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

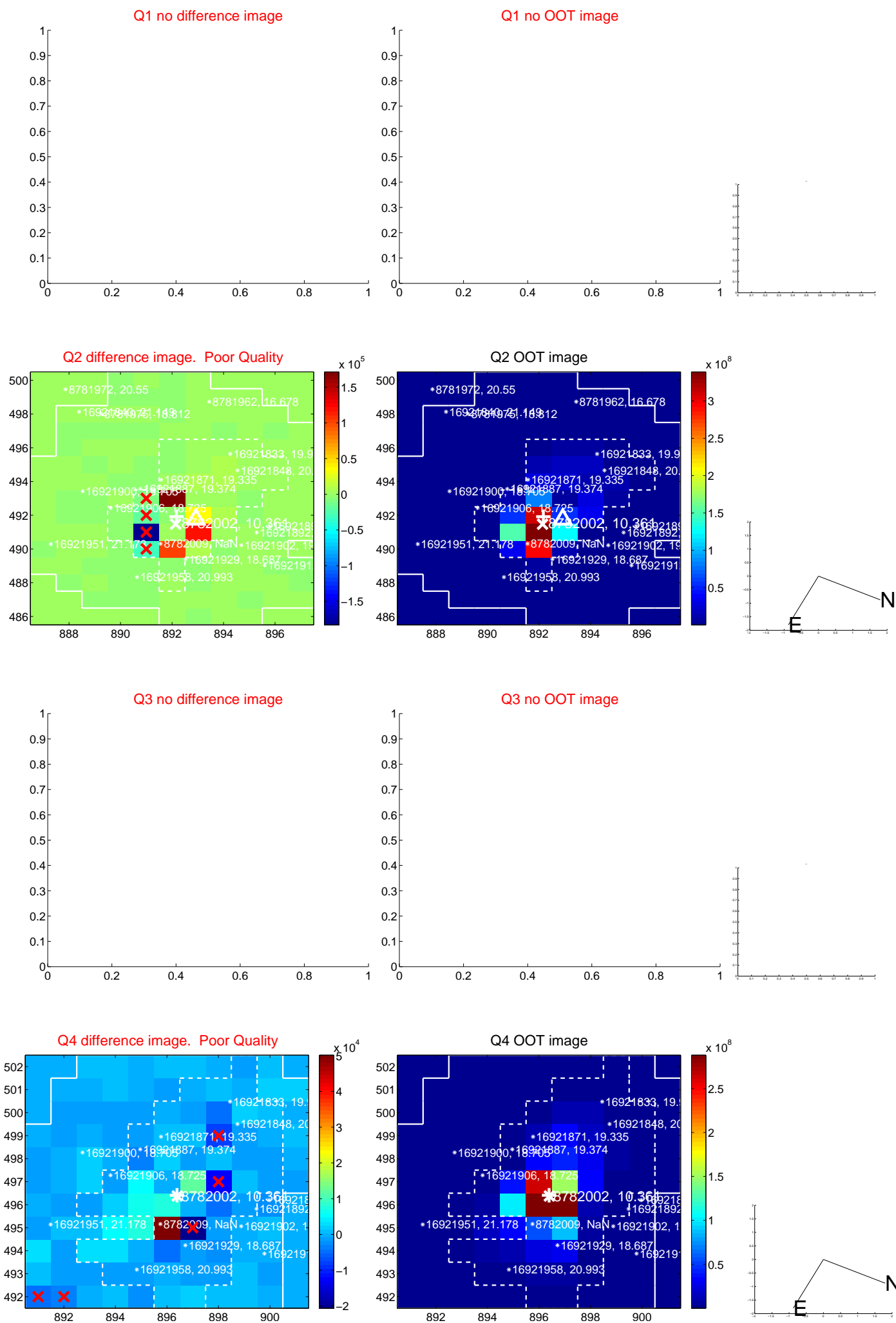


offset from photometric centroids



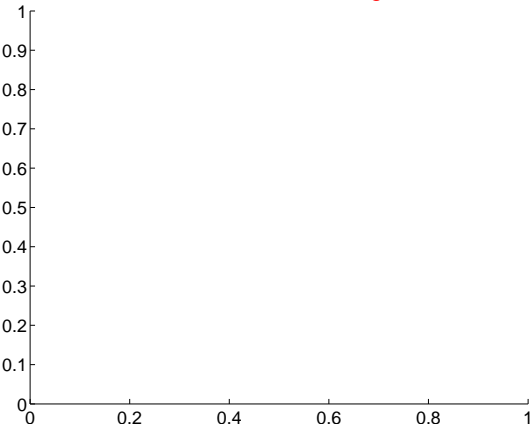
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

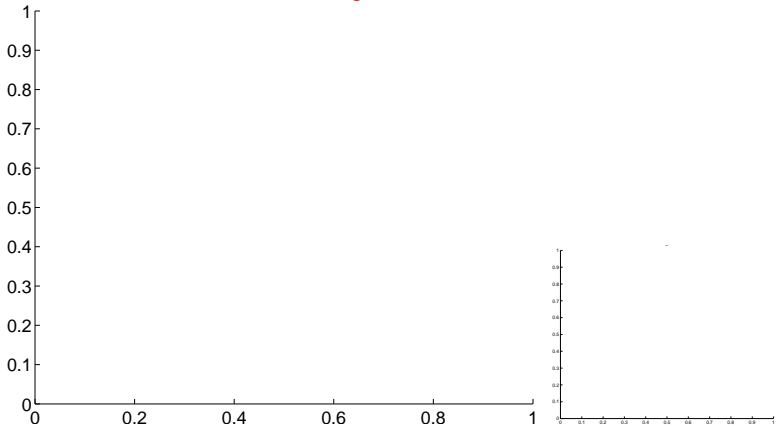


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

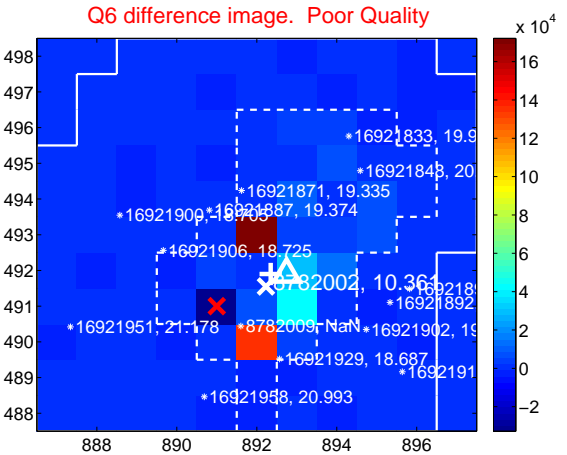
Q5 no difference image



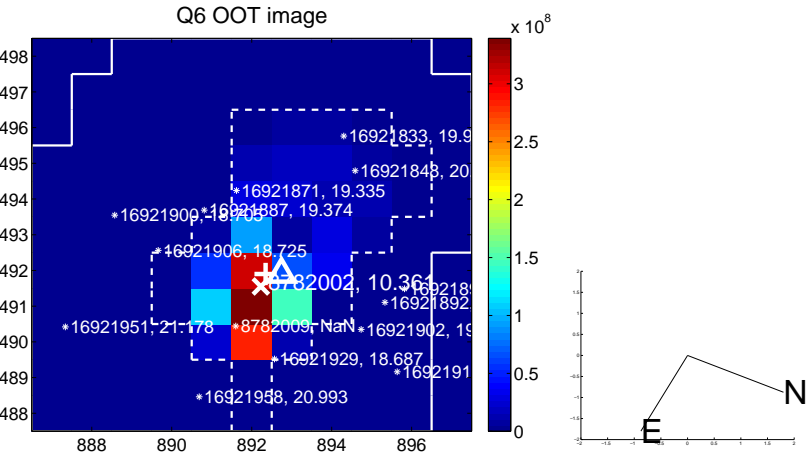
Q5 no OOT image



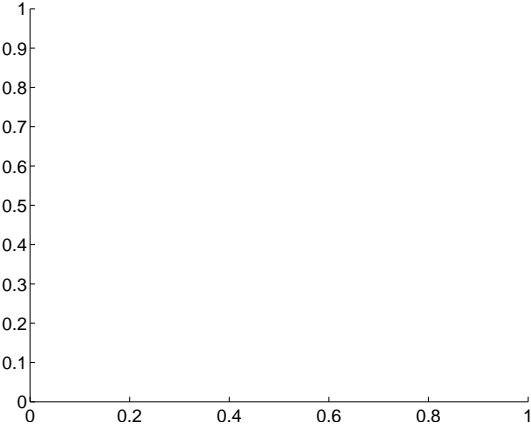
Q6 difference image. Poor Quality



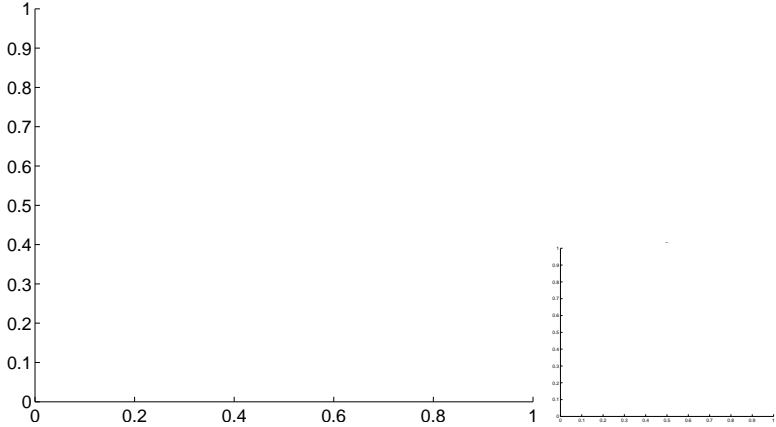
Q6 OOT image



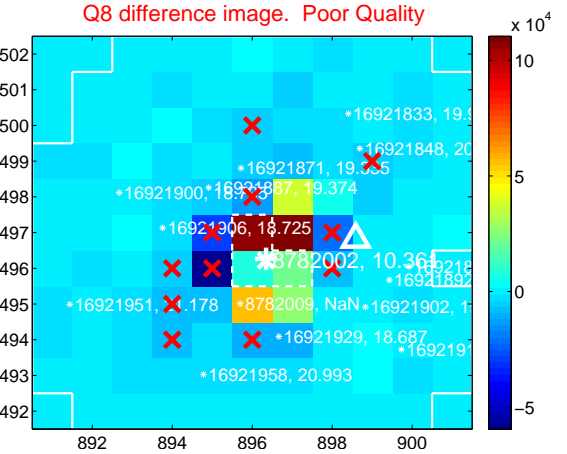
Q7 no difference image



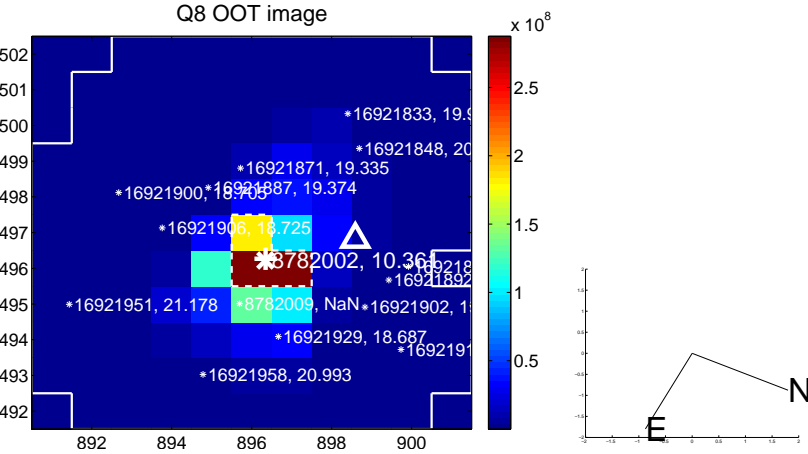
Q7 no OOT image



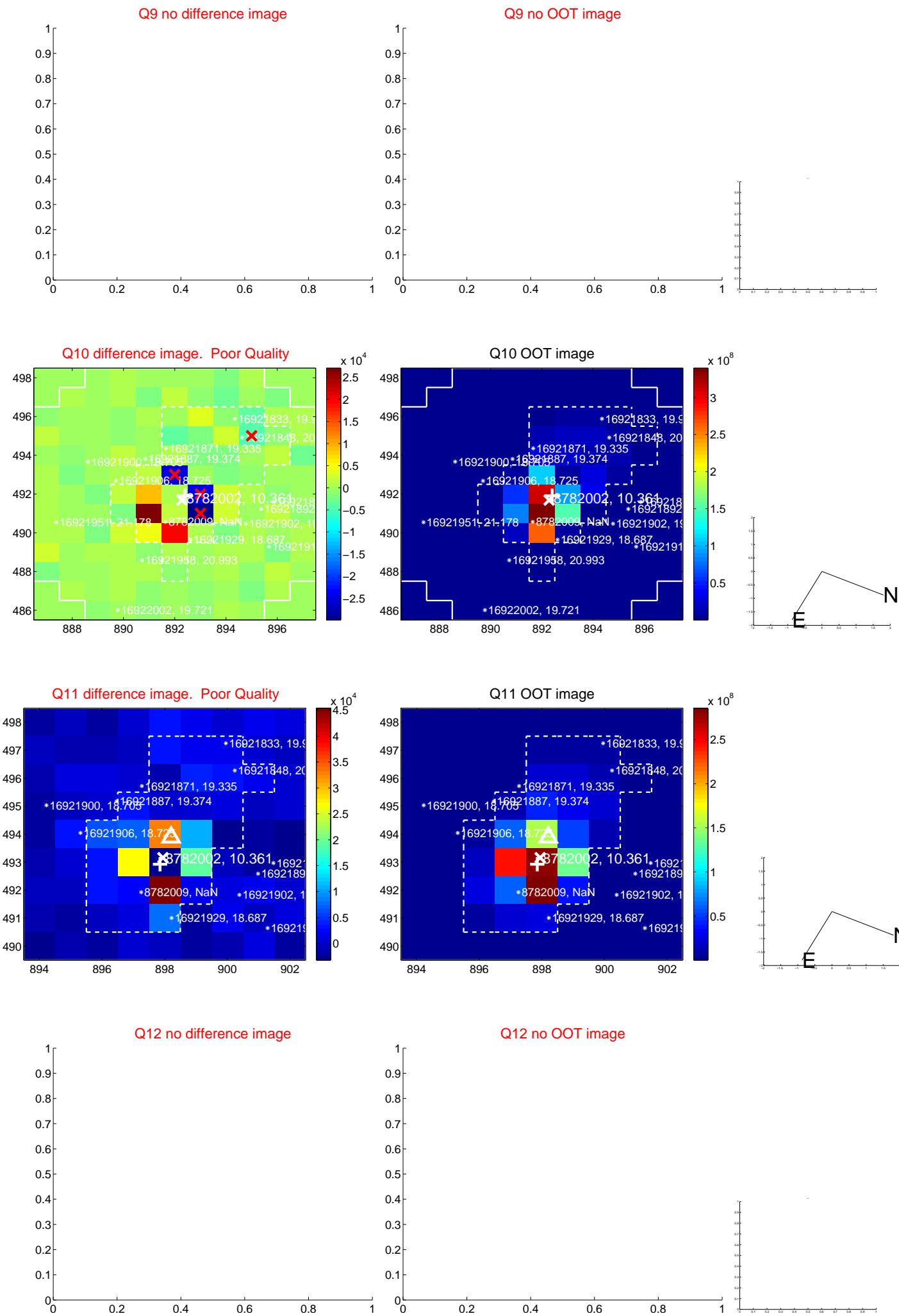
Q8 difference image. Poor Quality



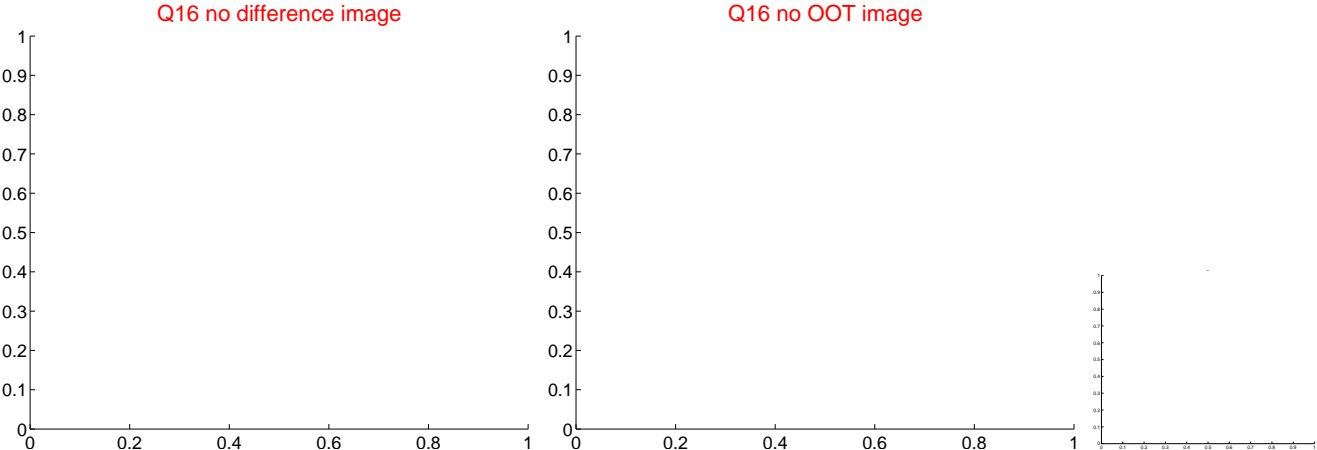
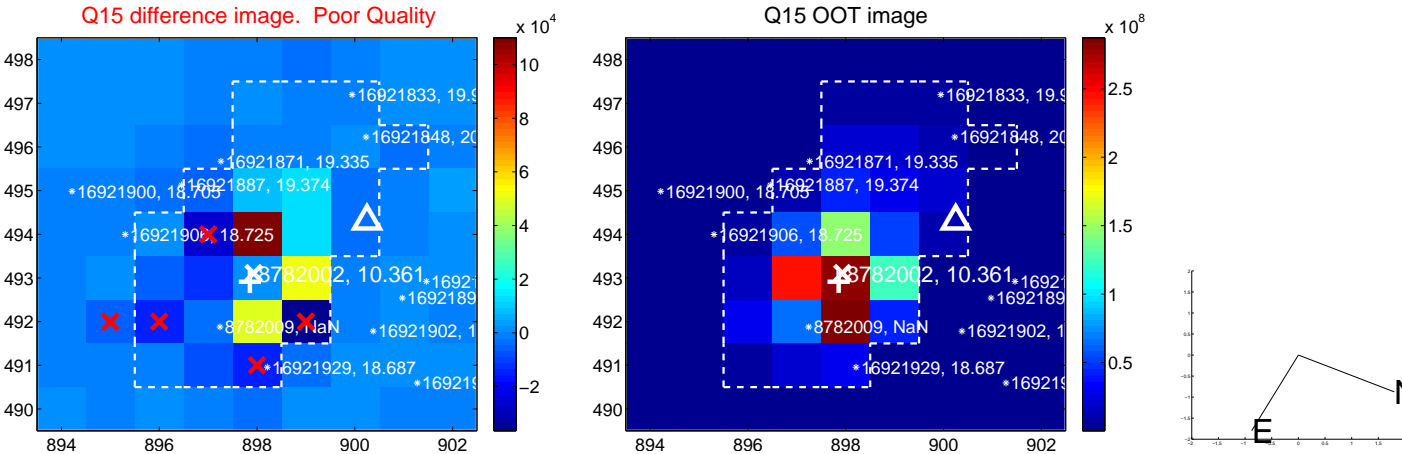
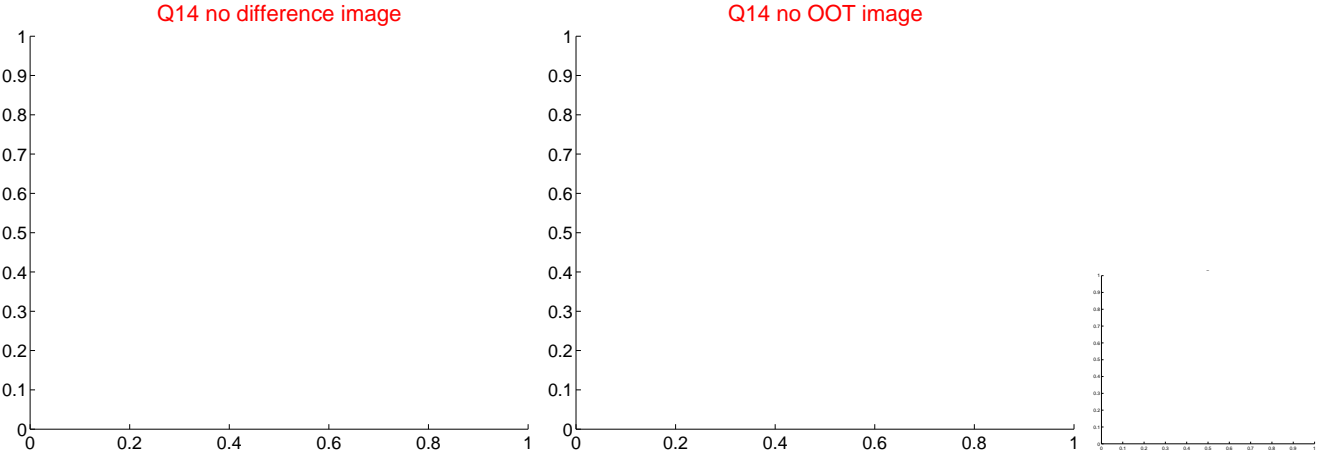
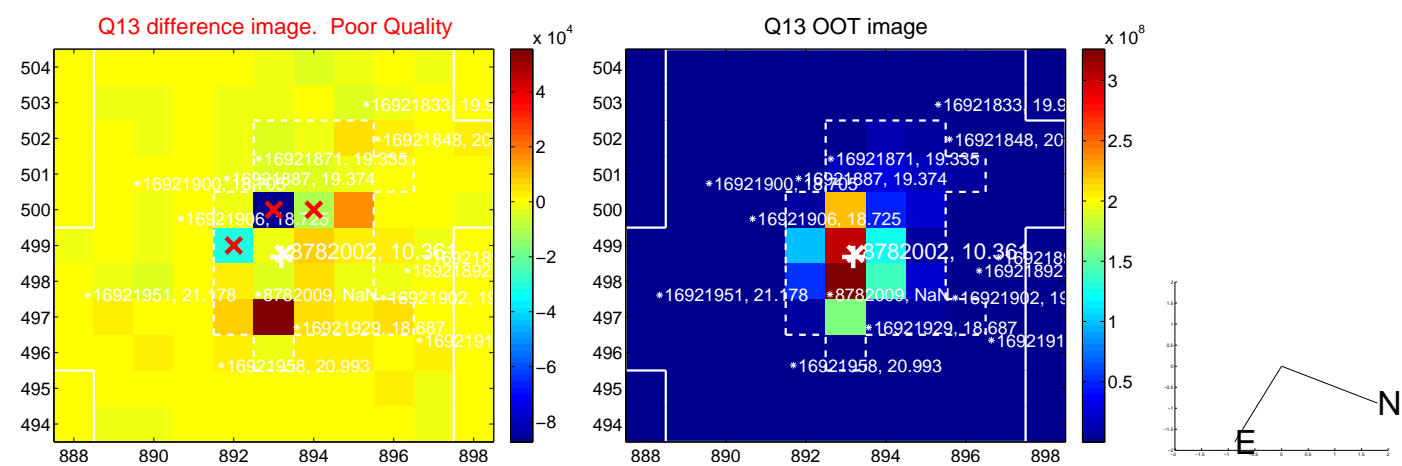
Q8 OOT image



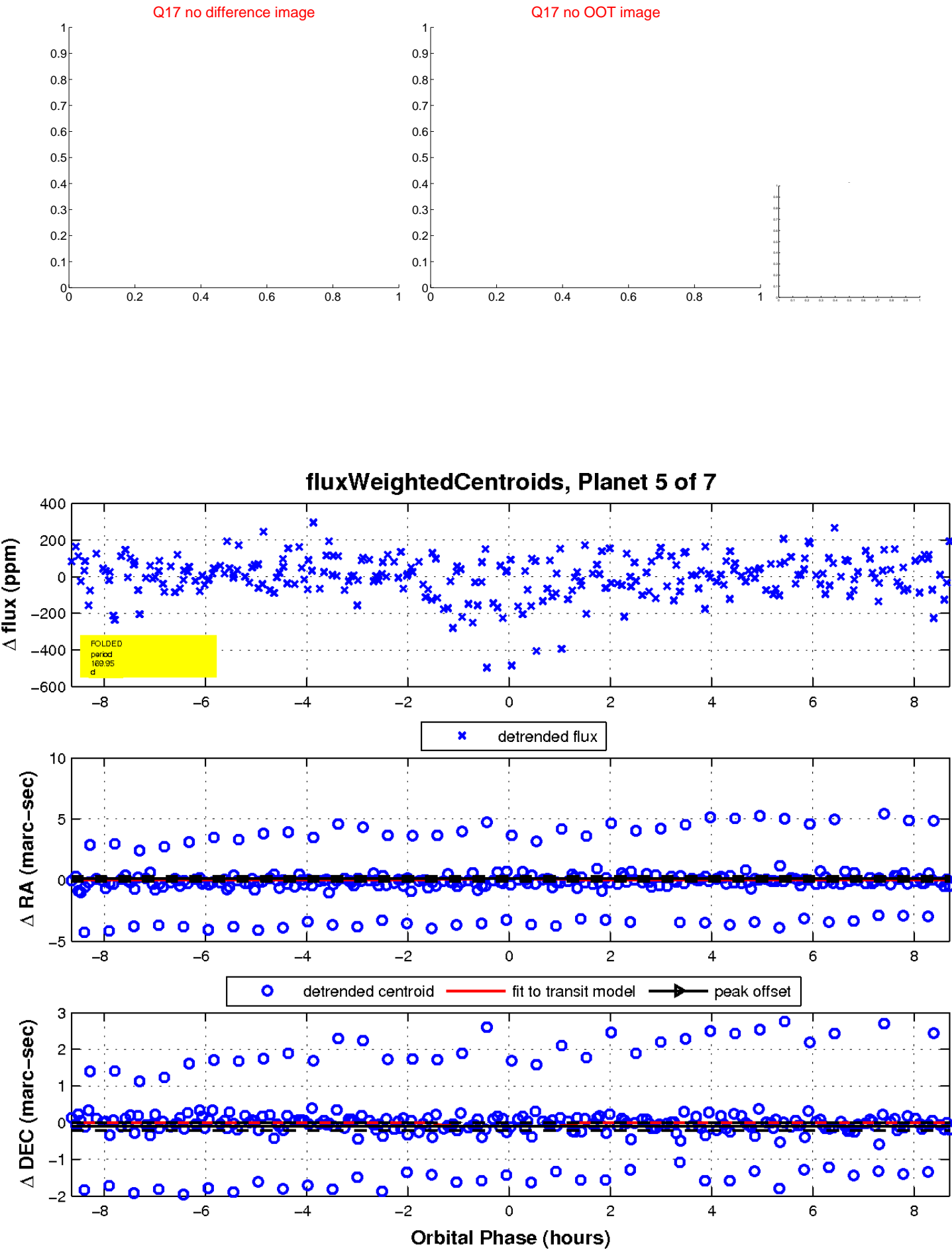
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



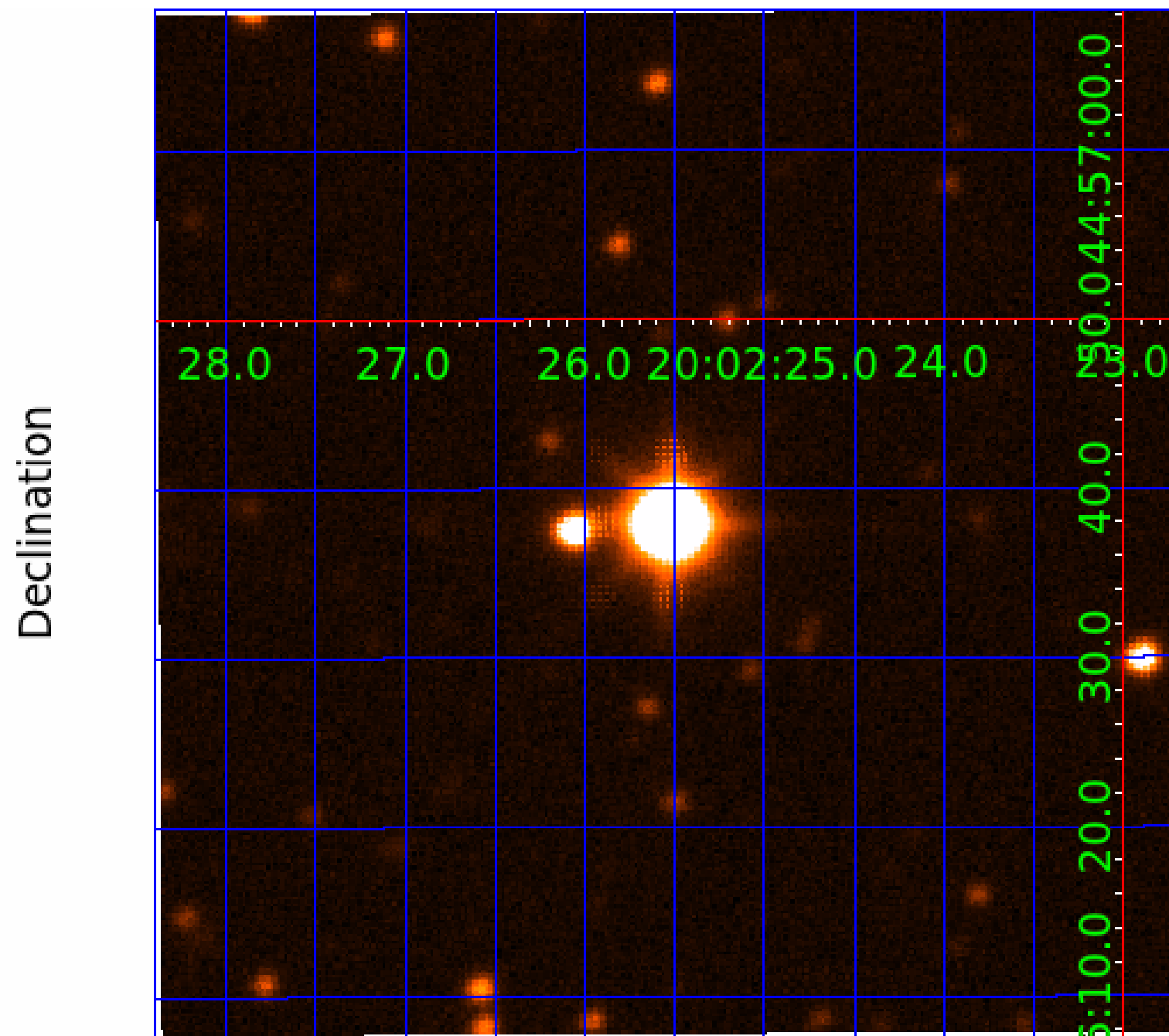
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 008782002

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})
008782002-01	OBS	No	2.909750	132.839418	15.8	7.640	9.9	8.4	2.78	6734	1.28	6413.95
008782002-02	OBS	No	2.909463	133.285035	22.0	16.042	9.4	9.0	2.78	6734	1.46	6414.79
008782002-03	OBS	No	87.568758	176.602310	90.2	13.906	38.0	6.4	2.78	6734	3.13	68.52
008782002-04	OBS	No	77.323537	132.783590	164.1	3.157	11.2	7.6	2.78	6734	3.92	80.88
008782002-05	OBS	No	169.954366	242.066644	220.0	2.916	10.3	9.9	2.78	6734	4.70	28.30
008782002-06	OBS	No	157.546368	183.225037	138.4	5.213	8.9	8.3	2.78	6734	3.86	31.31
008782002-07	OBS	No	219.897928	341.161649	241.6	2.342	10.3	8.8	2.78	6734	5.09	20.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008782002-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008782002-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
008782002-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

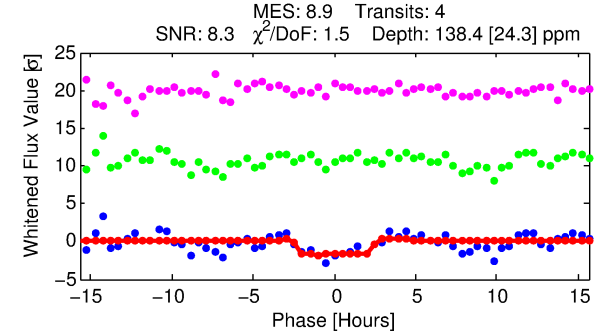
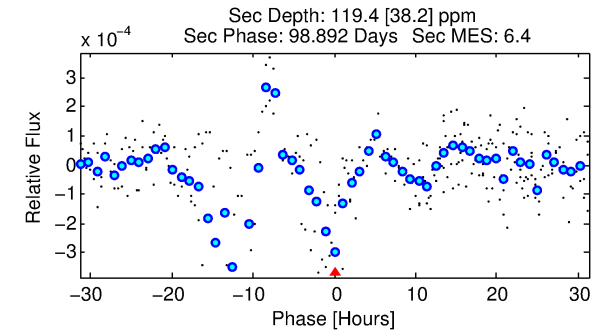
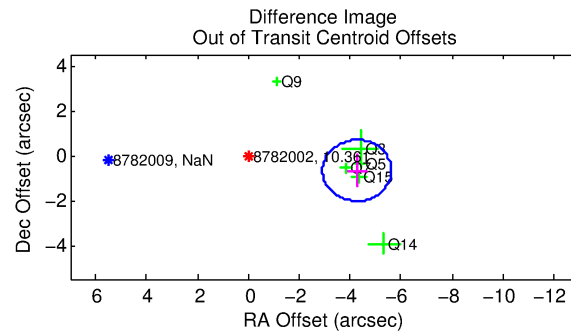
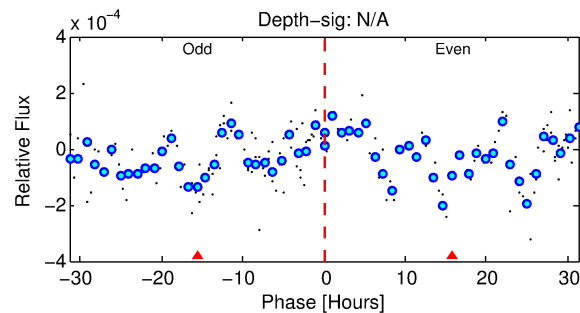
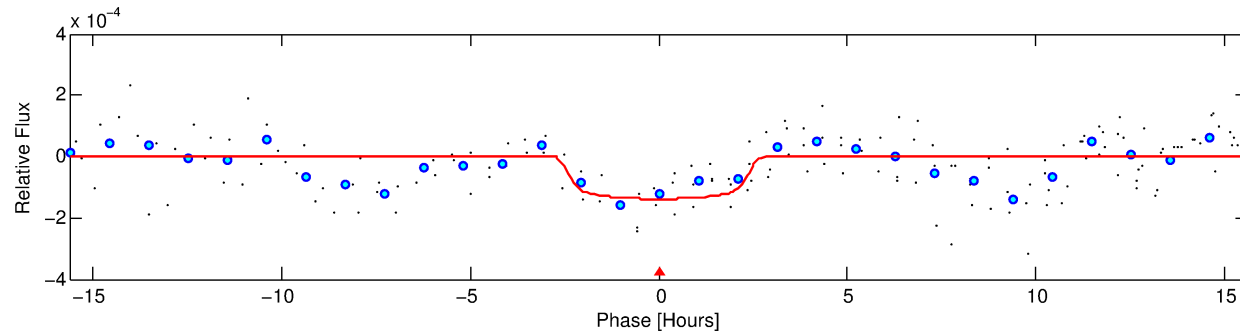
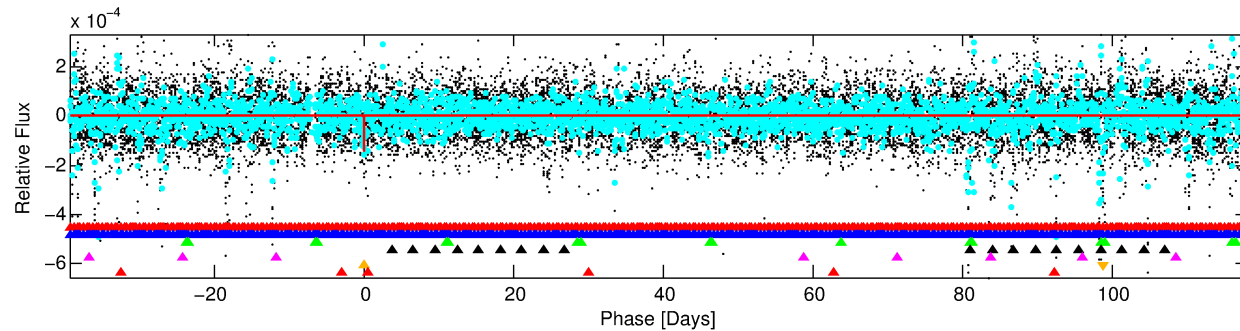
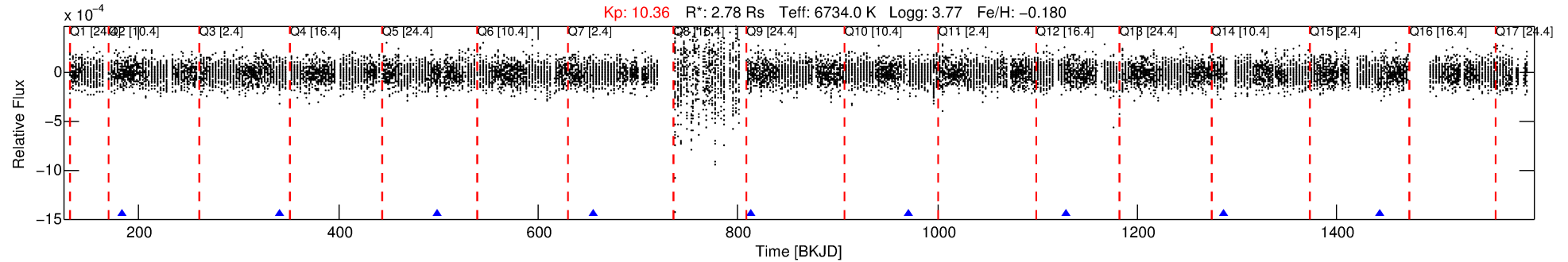
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008782002-06

No Significant Match Found

DV One-Page Summary

KIC: 8782002 Candidate: 6 of 7 Period: 157.546 d



DV Fit Results:

Period = 157.54637 [0.00304] d
Epoch = 183.2250 [0.0119] BKJD
Rp/R* = 0.0127 [0.0080]
a/R* = 98.78 [363.13]
b = 0.92 [0.64]
Seff = 31.31 [16.17]
Teq = 603 [78] K
Rp = 3.86 [2.76] Re
a = 0.6734 [0.2171] AU
Ag = 1996.39 [2763.87] [0.72σ]
Teffp = 6234 [2016] K [2.79σ]

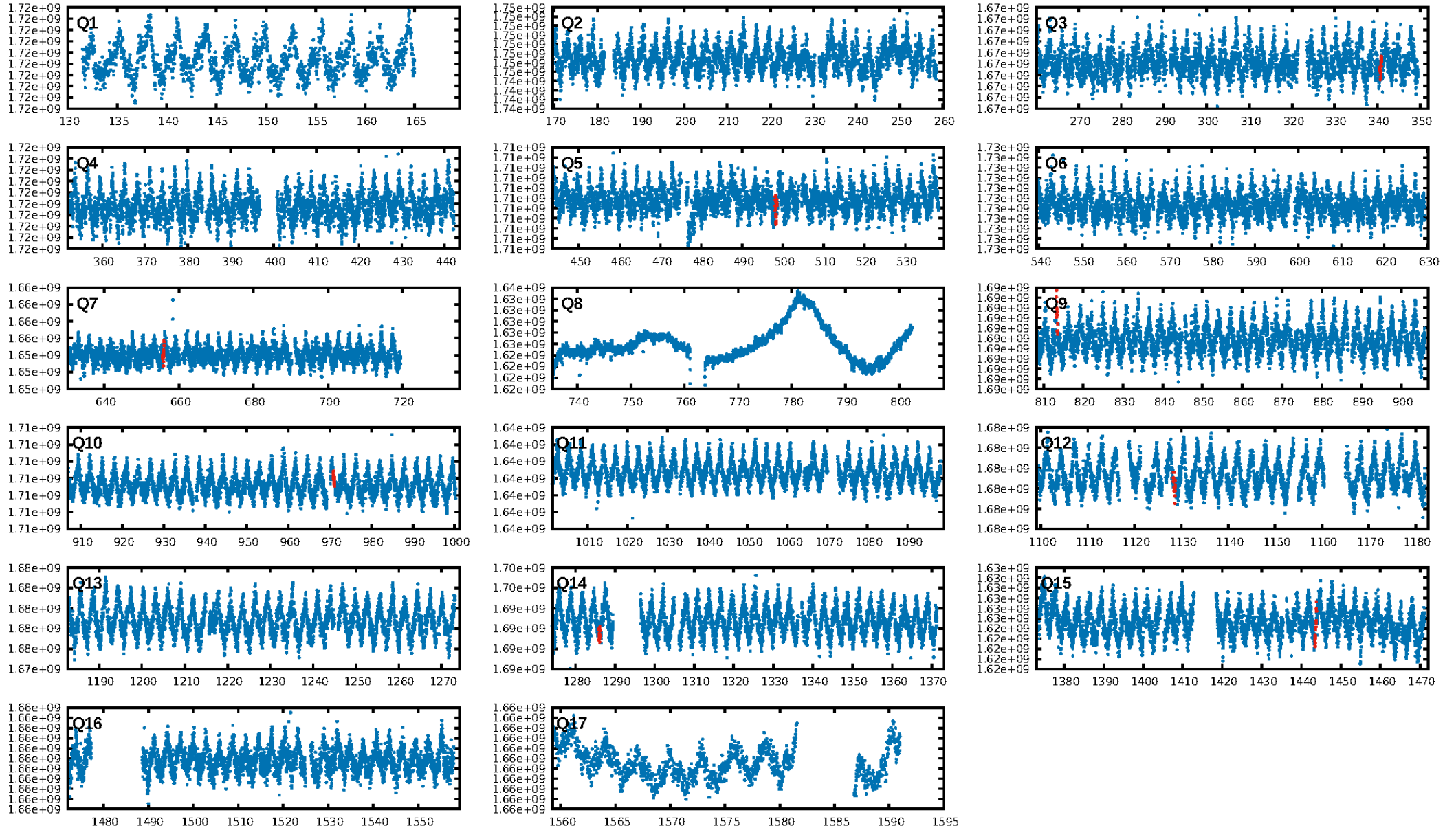
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [113.09σ]
LongPeriod-sig: 100.0% [49.86σ]
ModelChiSquare2-sig: 40.8%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: 1.84e-07
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: N/A
Centroid-sig: 88.6%
Centroid-so: 0.338 arcsec [0.35σ]
OotOffset-rm: 4.322 arcsec [9.53σ]
KicOffset-rm: 3.683 arcsec [4.05σ]
OotOffset-st: 1/3/0/2 [6]
KicOffset-st: 1/3/0/2 [6]
DiffImageQuality-fgm: 0.67 [4/6]
DiffImageOverlap-fno: 0.43 [3/7]

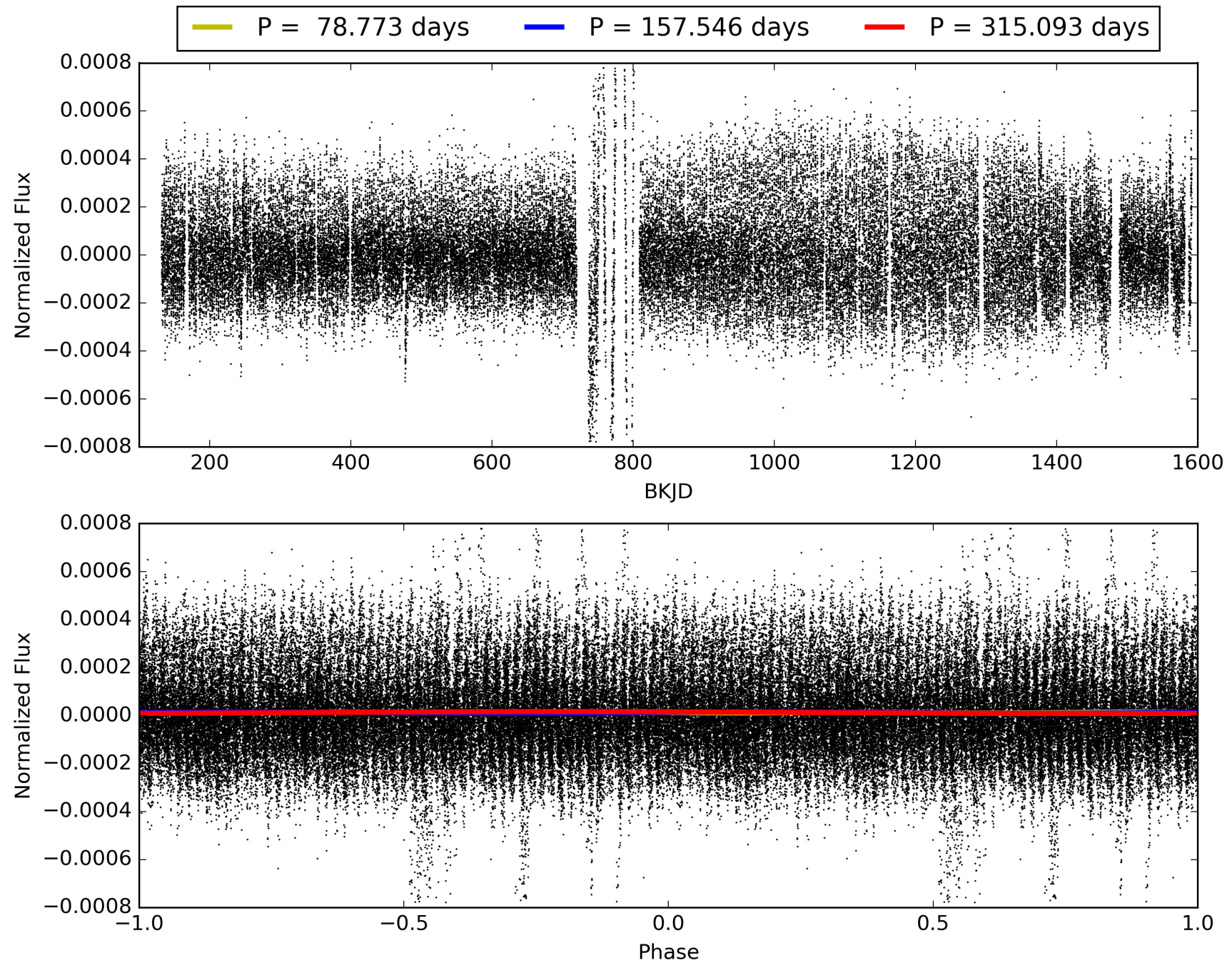
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:05:19 Z

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

TCE 008782002-06, PDC Light Curves

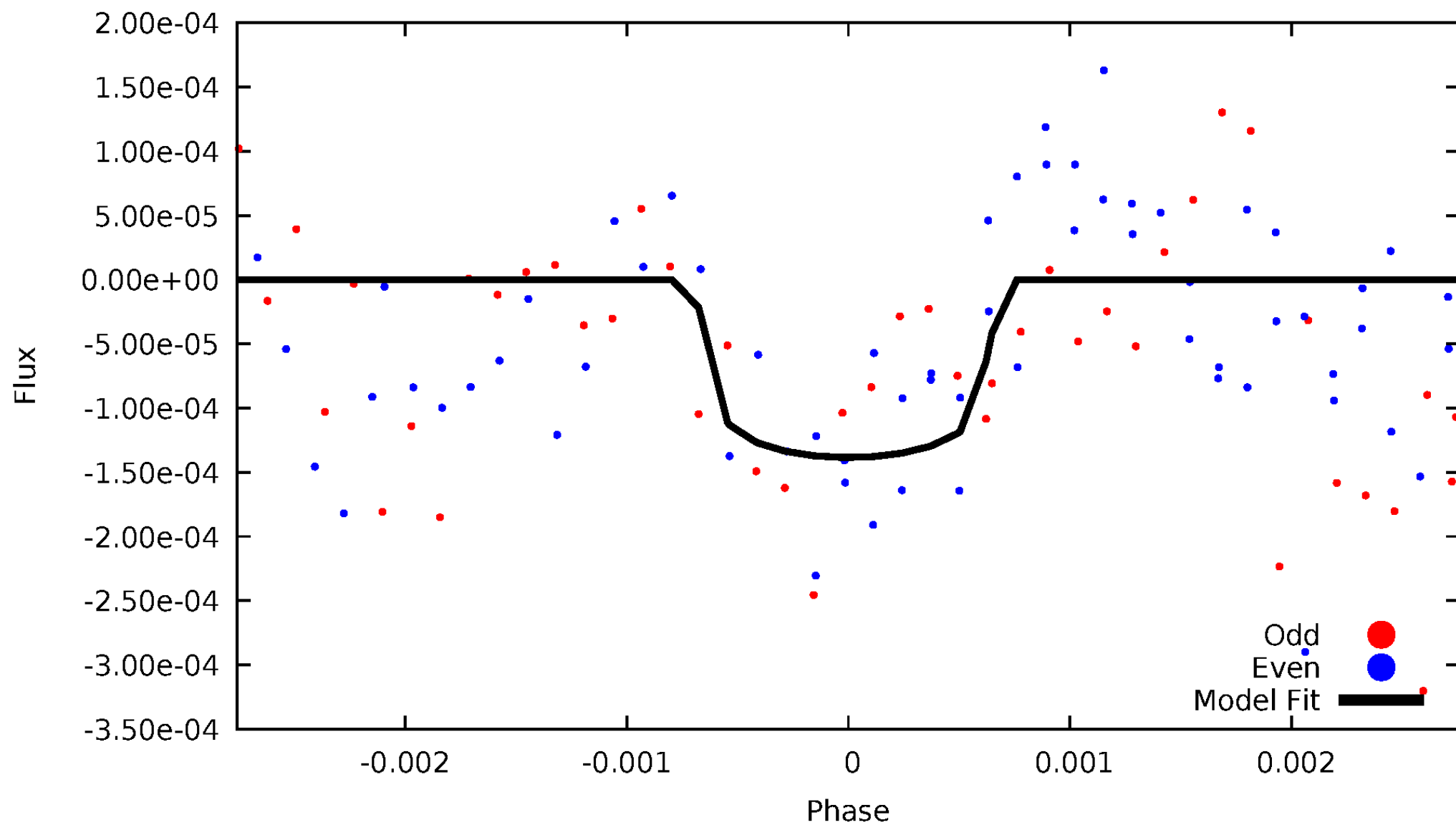


TCE 008782002-06



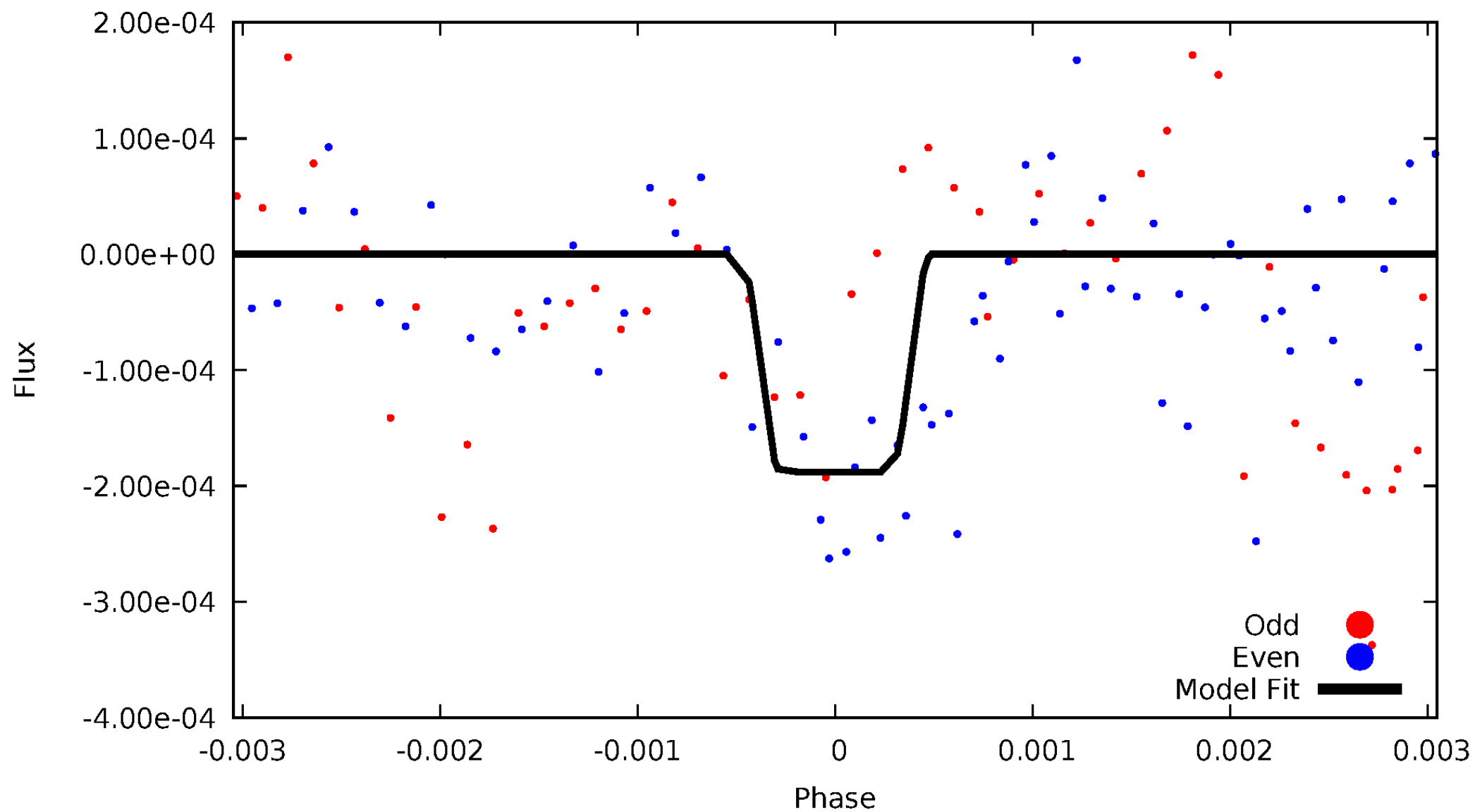
DV Odd/Even

TCE 008782002-06



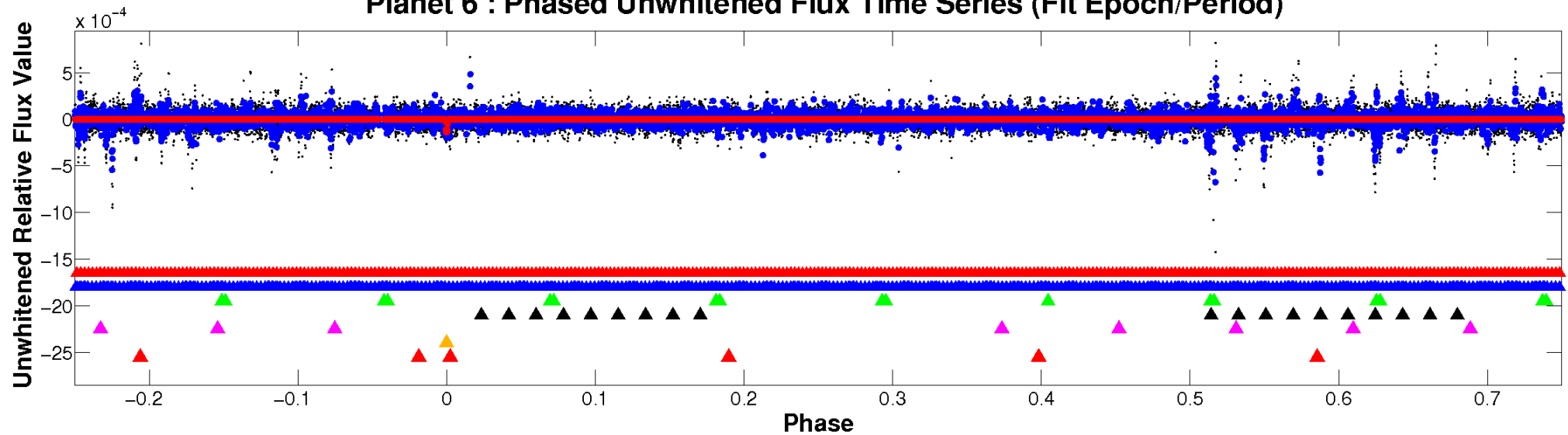
ALT Odd/Even

TCE 008782002-06

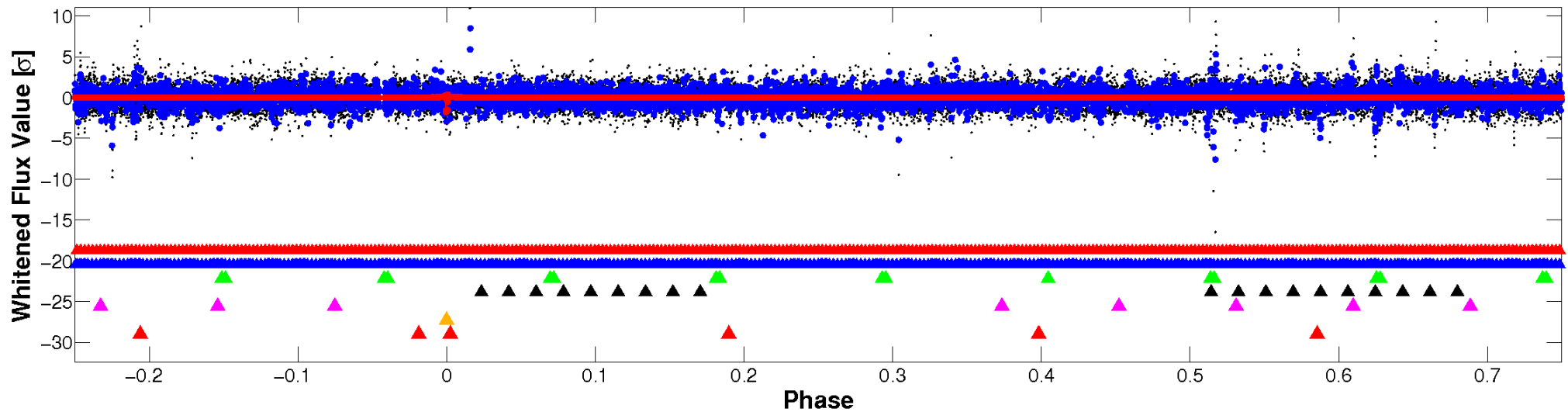


Non-Whitened Vs. Whitened Light Curve

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

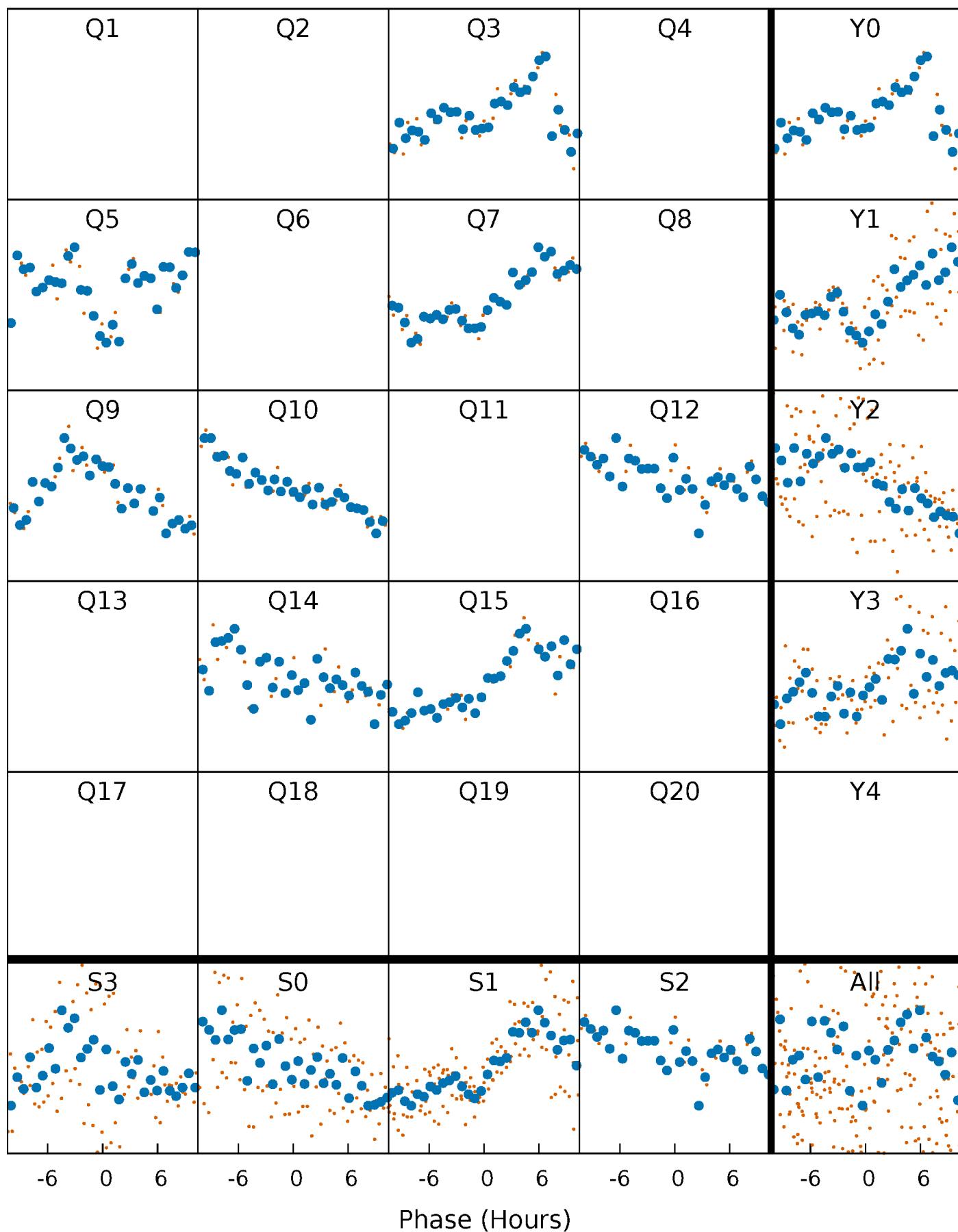


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



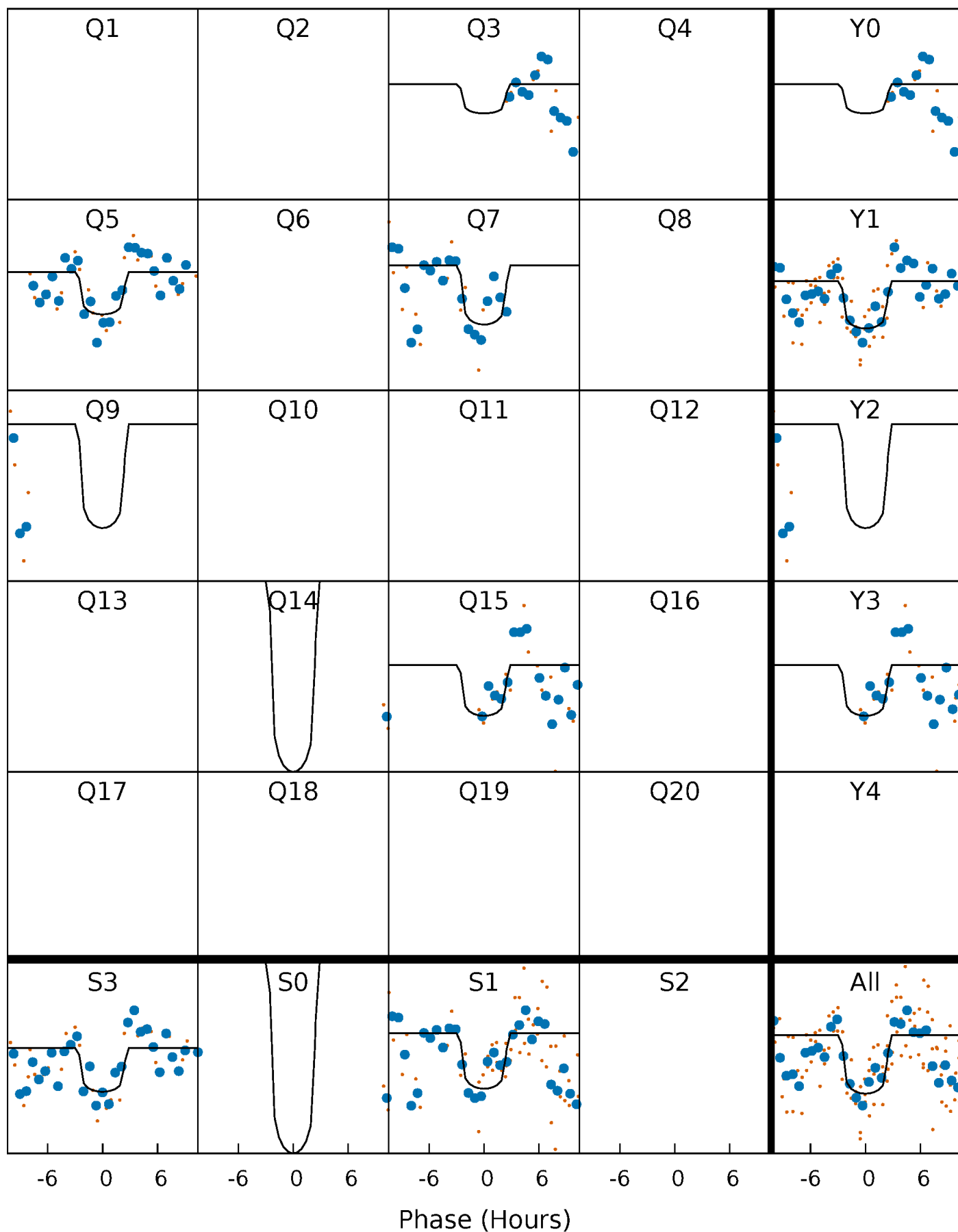
PDC Quarter-Phased Transit Curves

TCE 008782002-06 P=157.546368 Days $T_0=183.225037$ (BKJD)



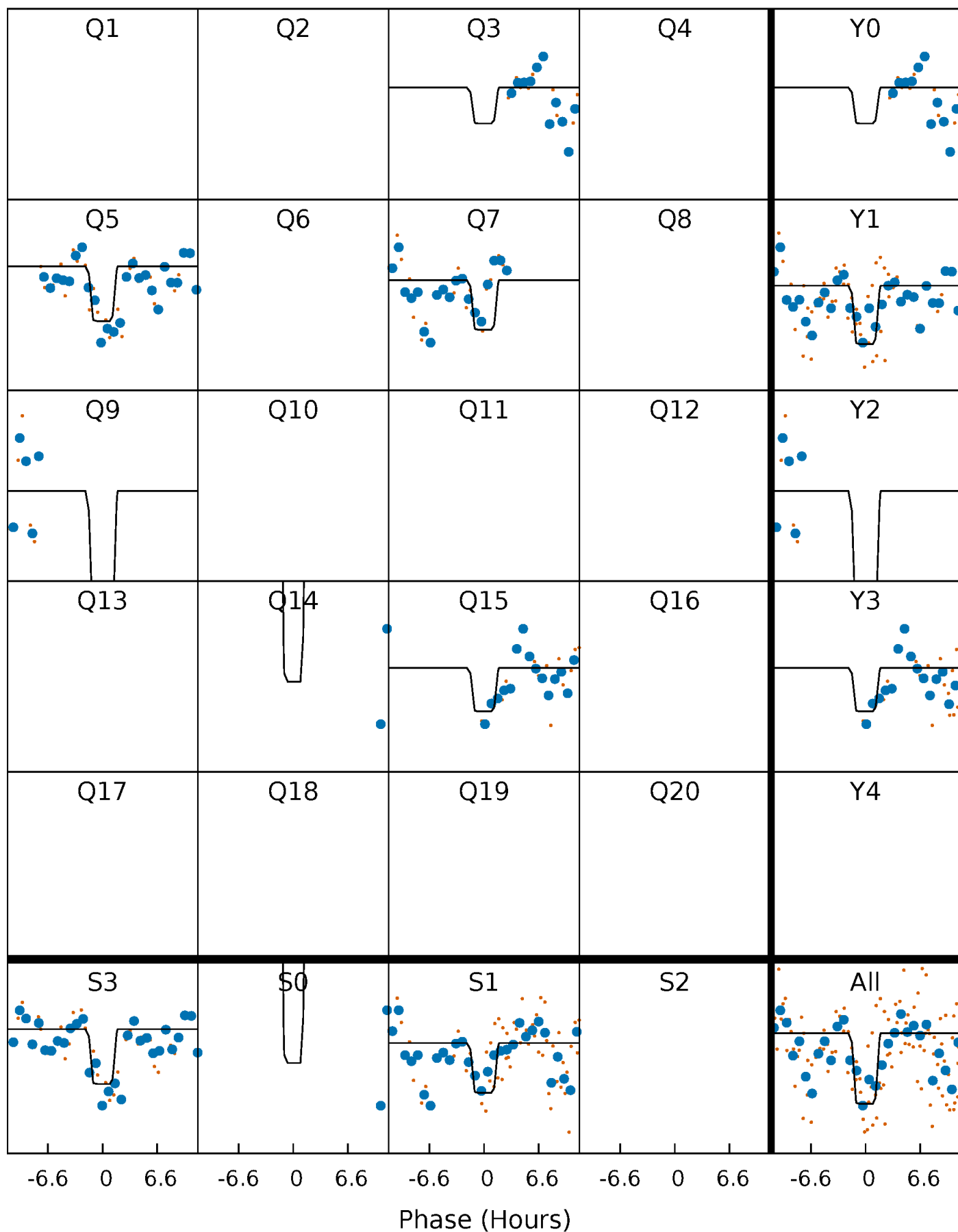
DV Quarter-Phased Transit Curves

TCE 008782002-06 P=157.546368 Days $T_0=183.225037$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

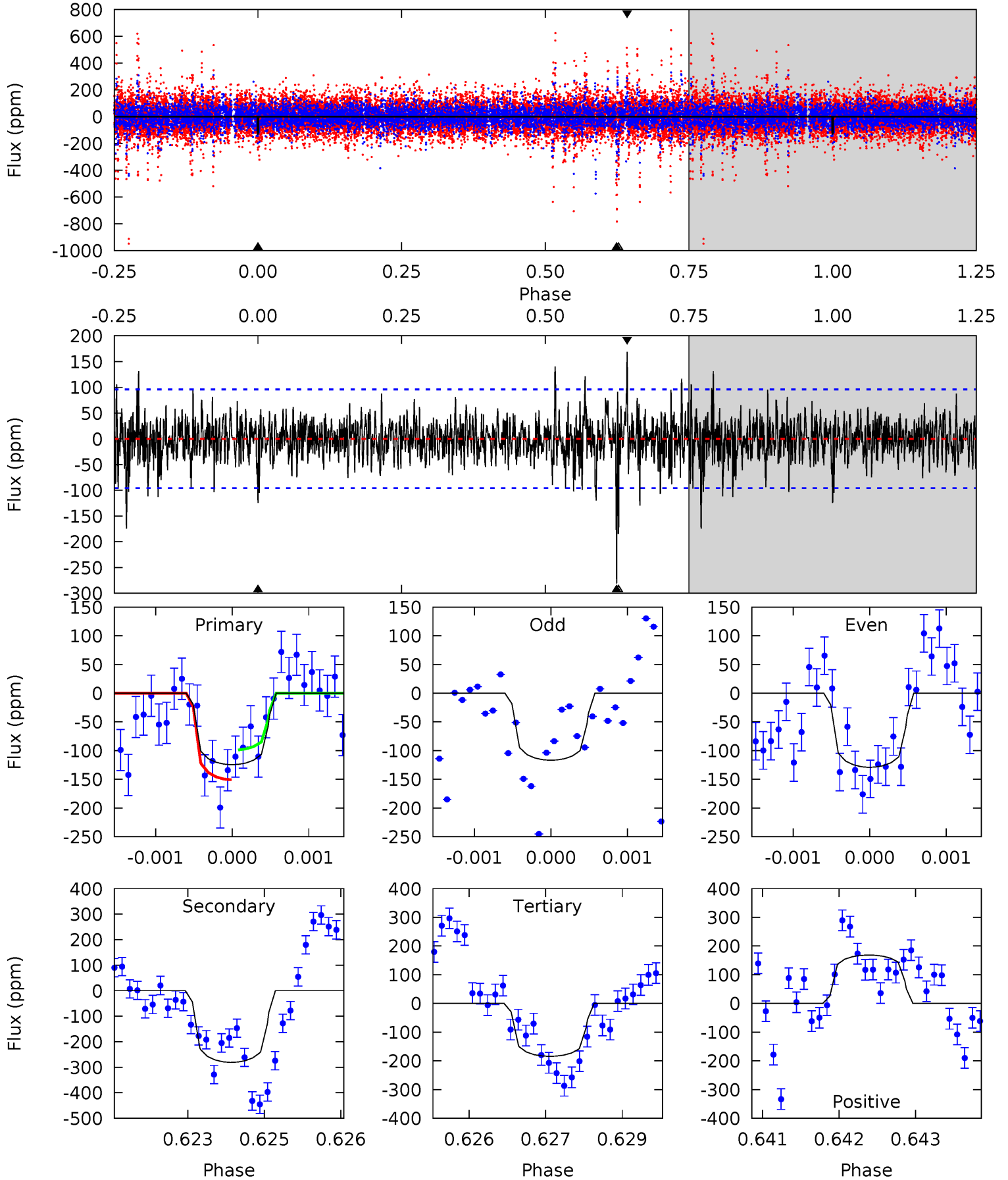
TCE 008782002-06 P=157.547578 Days $T_0=183.204214$ (BKJD)



DV Model-Shift Uniqueness Test

008782002-06, $P = 157.546368$ Days, $E = 25.678669$ Days

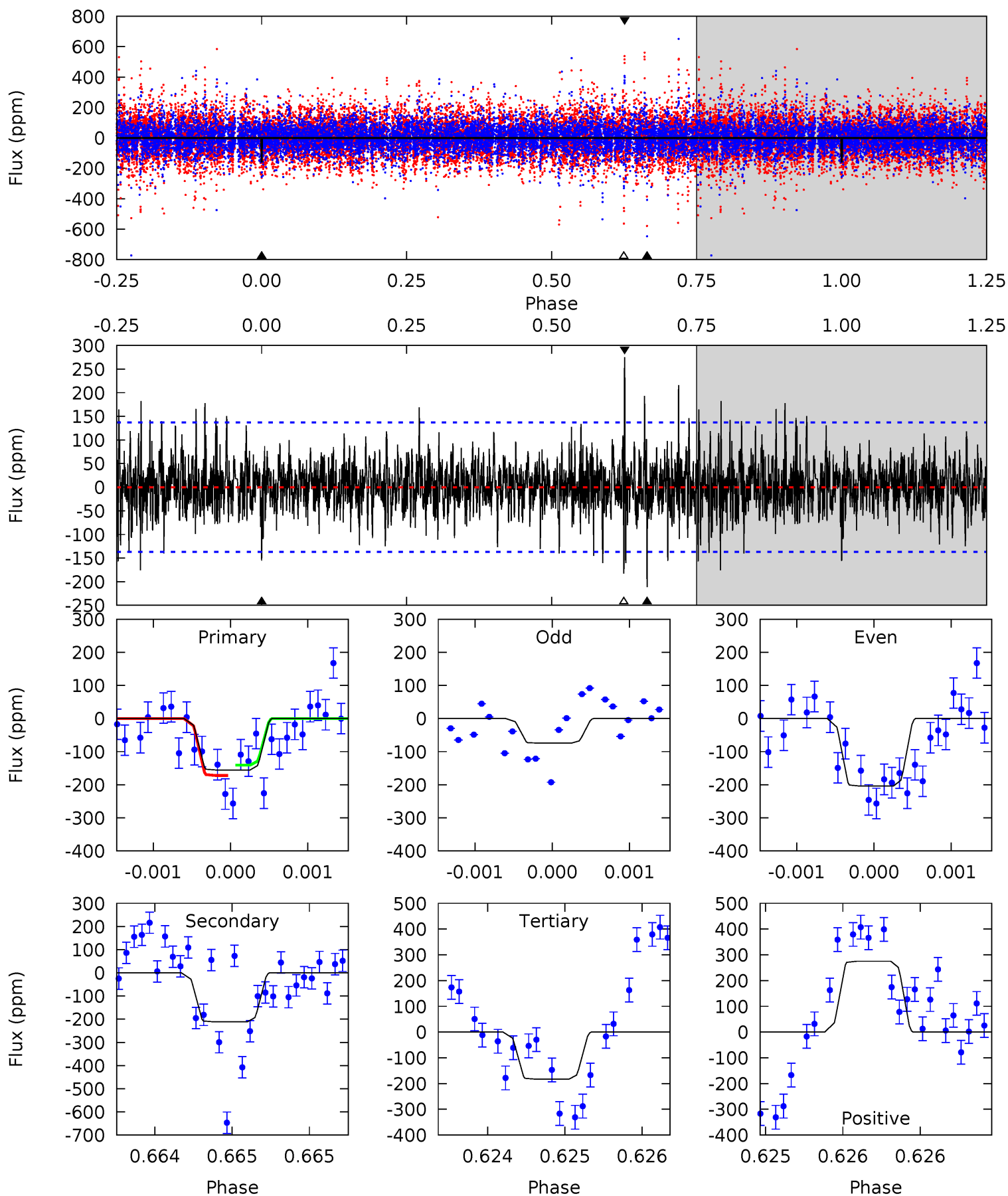
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.03	15.9	10.4	9.51	5.40	3.21	1.77	-3.37	-2.49	5.46	6.34	0.34	1.06	0.38	1.46



Alt Model-Shift Uniqueness Test

008782002-06, P = 157.547578 Days, E = 25.656636 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.21	8.42	7.29	11.0	5.47	3.32	1.66	-1.08	-4.76	1.13	-2.55	2.50	0.79	0.57	0.61



Stellar Parameters For KIC 008782002

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6734^{+168}_{-184}	$3.766^{+0.292}_{-0.097}$	$-0.180^{+0.300}_{-0.250}$	$2.776^{+0.445}_{-0.965}$	$1.640^{+0.193}_{-0.358}$	$0.108^{+0.223}_{-0.034}$
	+2%/-3%	+8%/-3%	+167%/-139%	+16%/-35%	+12%/-22%	+207%/-31%
Source	PHO1	FLK73	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 008782002-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-281±18	$3.54^{+2.41}_{-1.90}$	829^{+46}_{-71}	7964^{+5965}_{-1913}	5442^{+20264}_{-3444}
Alt.	-211±25	$3.90^{+2.35}_{-1.97}$	827^{+47}_{-64}	6825^{+3929}_{-1284}	3336^{+10685}_{-2037}

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

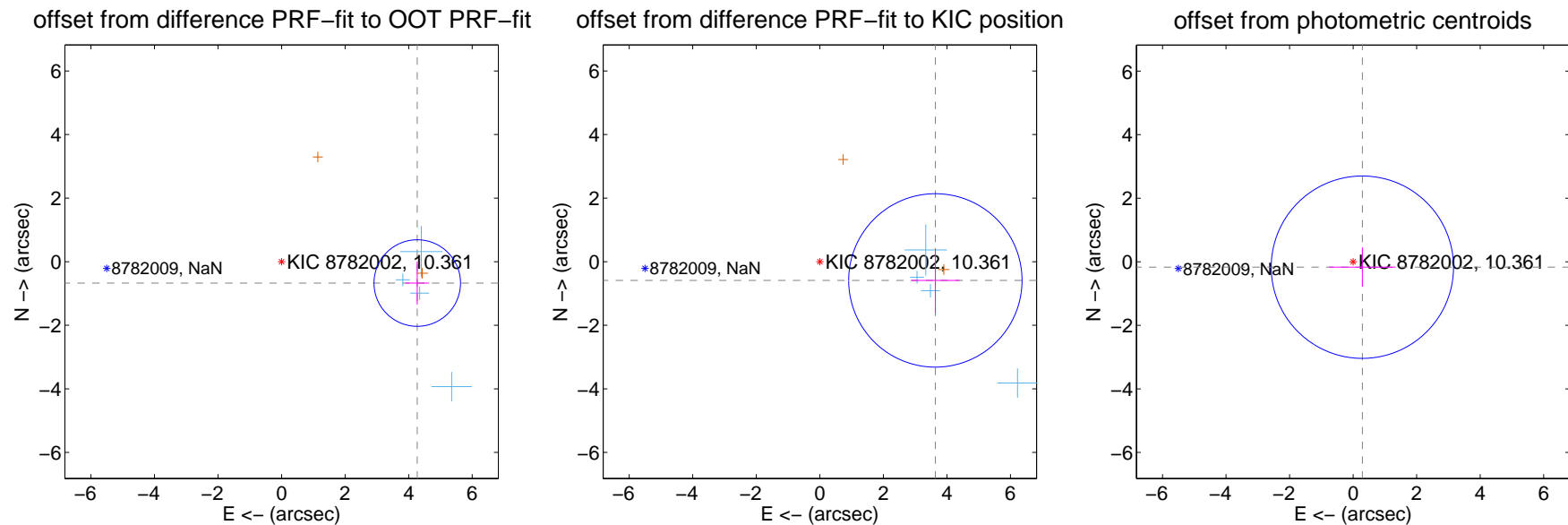
DV Centroid Data

Supplemental centroid analysis for 008782002-06. **Kepler magnitude: 10.36**. Transit SNR 8.33

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.87 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.322 ± 0.454	9.53	-4.270 ± 0.371	-0.672 ± 0.678
PRF-fit source offset from KIC position	3.683 ± 0.909	4.05	-3.635 ± 0.762	-0.589 ± 1.011
photometric centroid source offset	0.34 ± 0.96	0.35	-0.29 ± 1.05	-0.17 ± 0.62



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.

Q1 no difference image



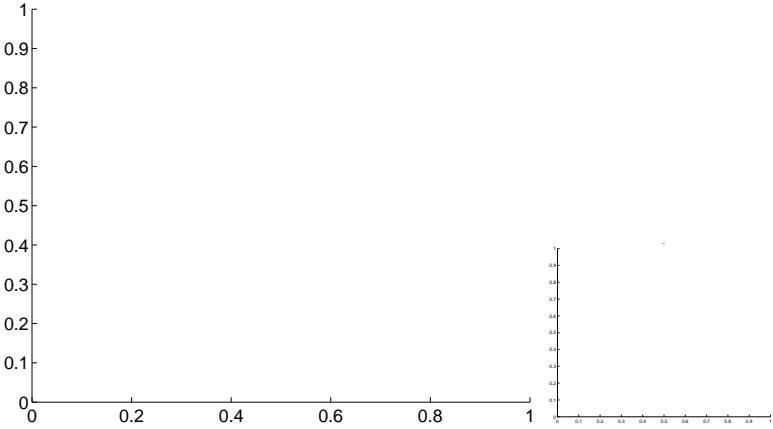
Q1 no OOT image



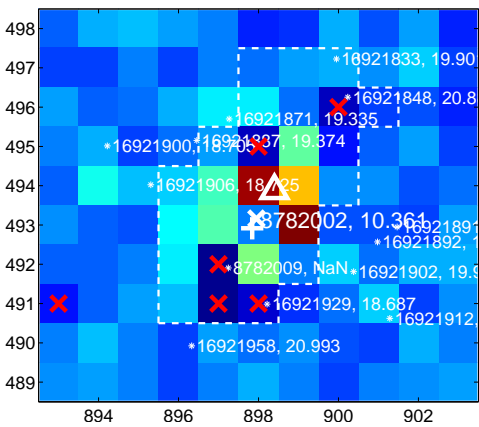
Q2 no difference image



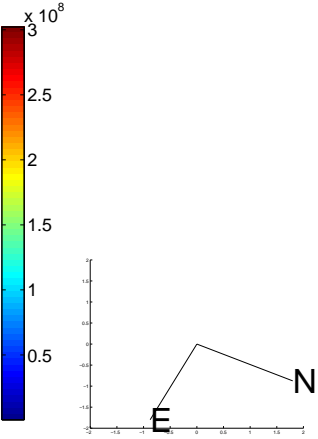
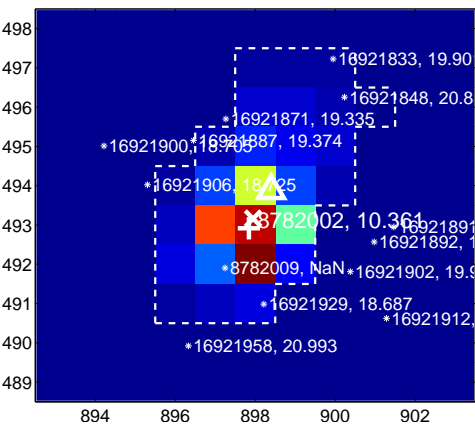
Q2 no OOT image



Q3 difference image



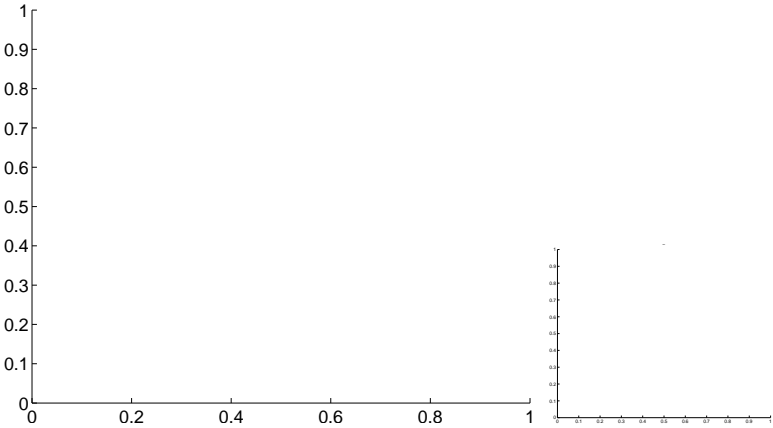
Q3 OOT image



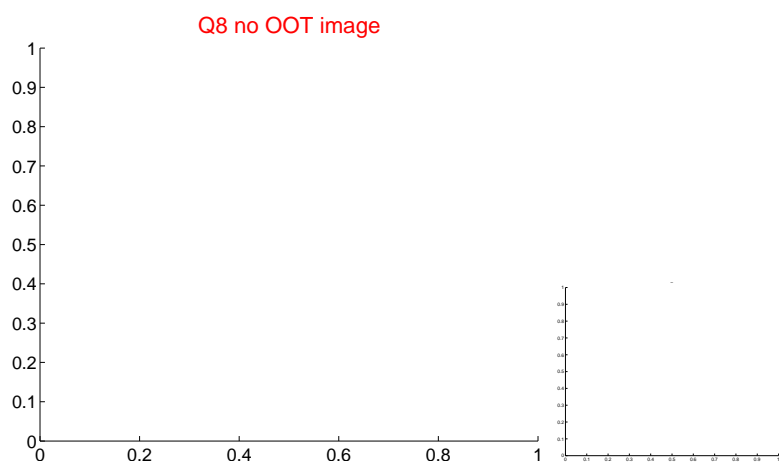
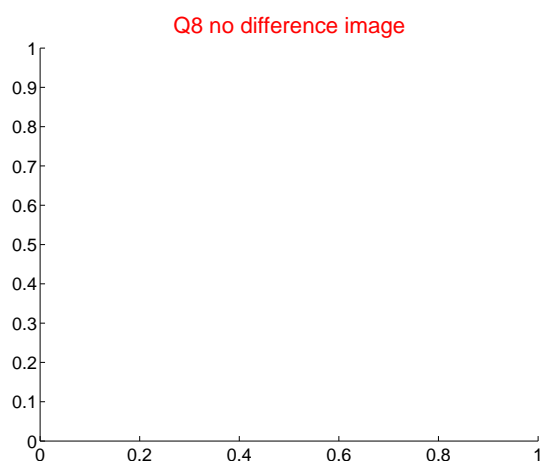
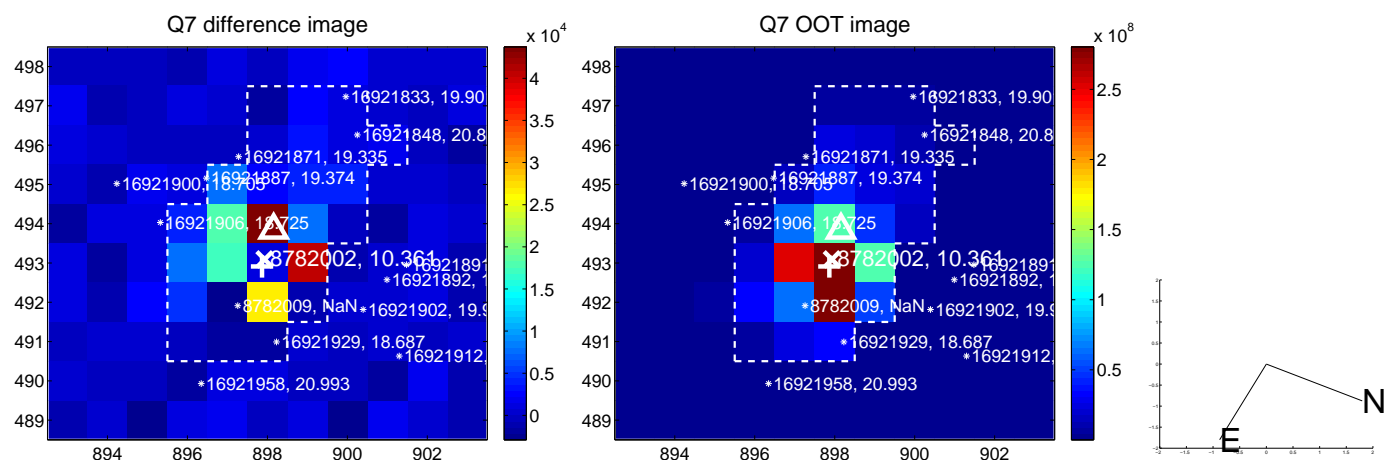
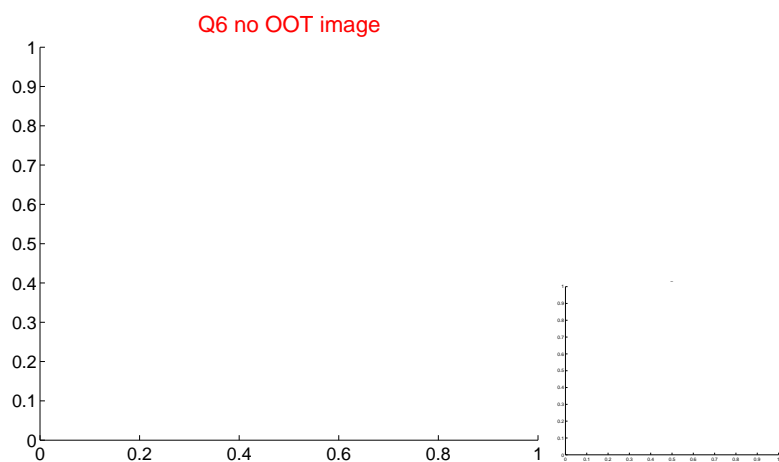
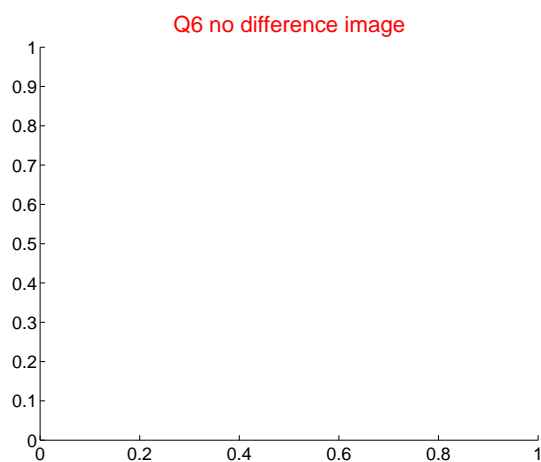
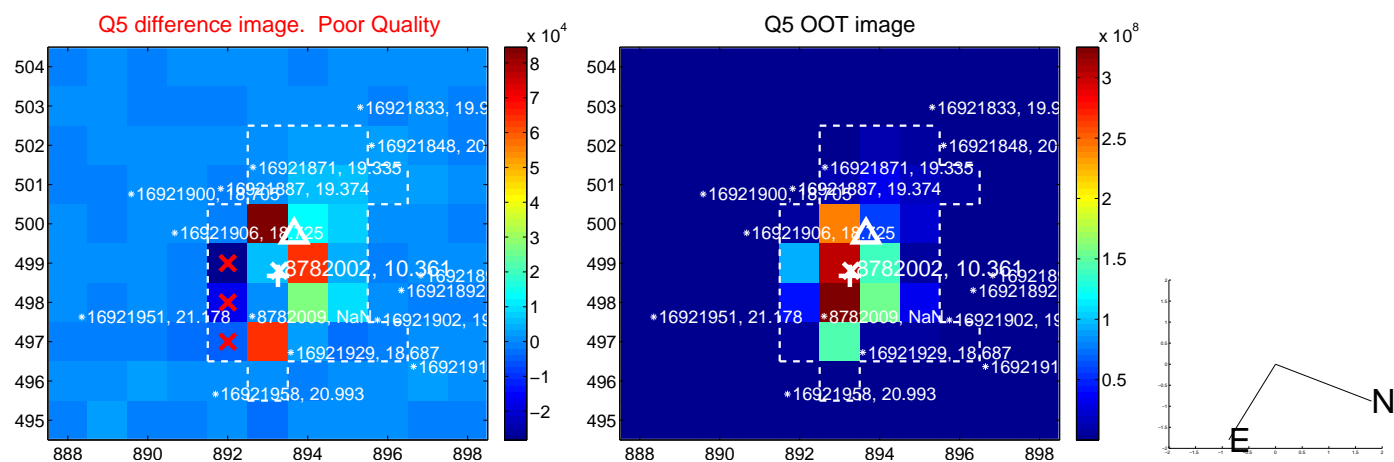
Q4 no difference image



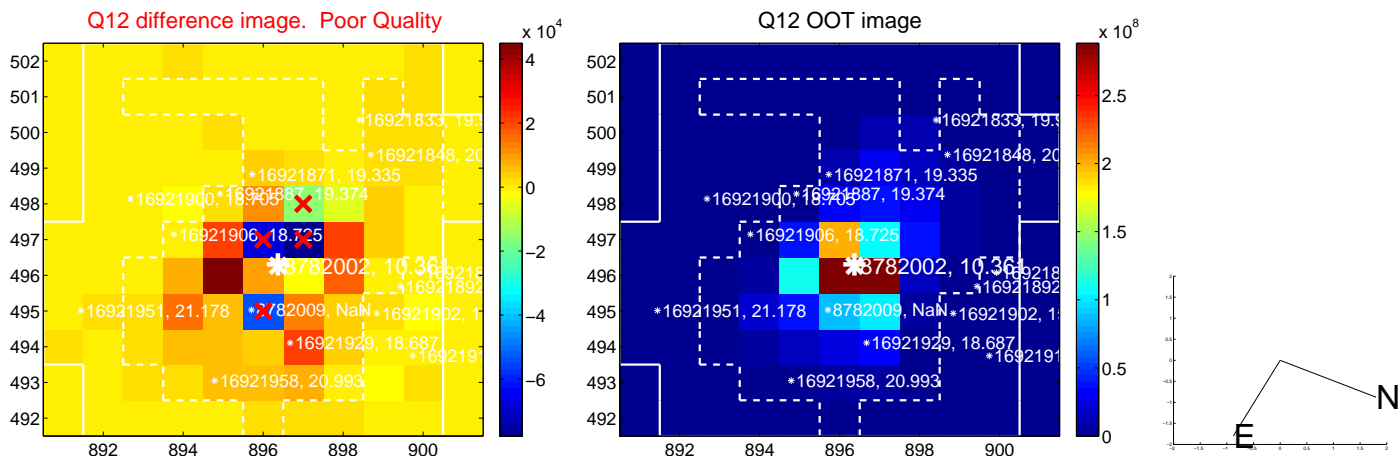
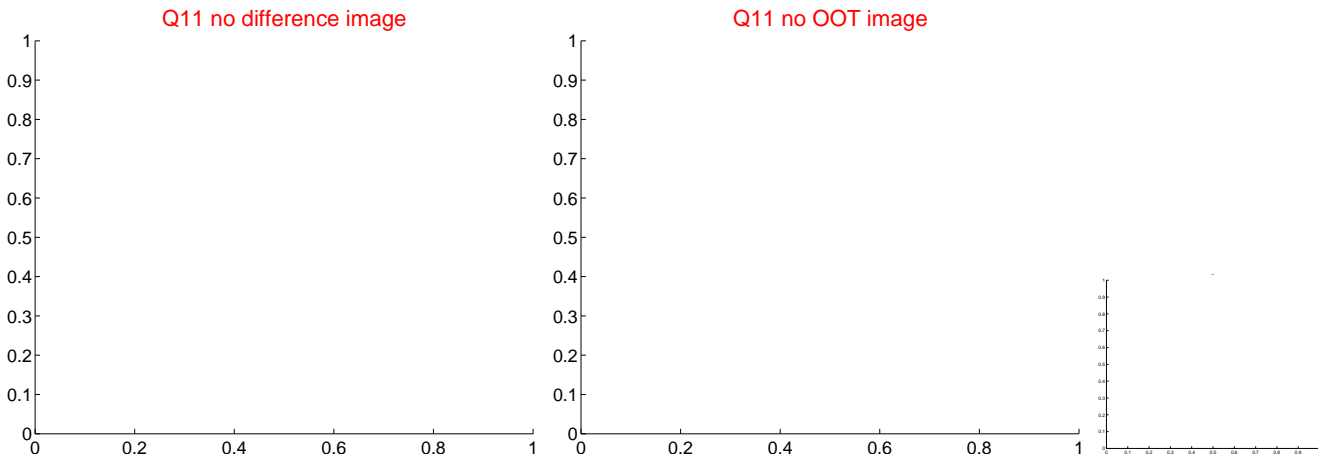
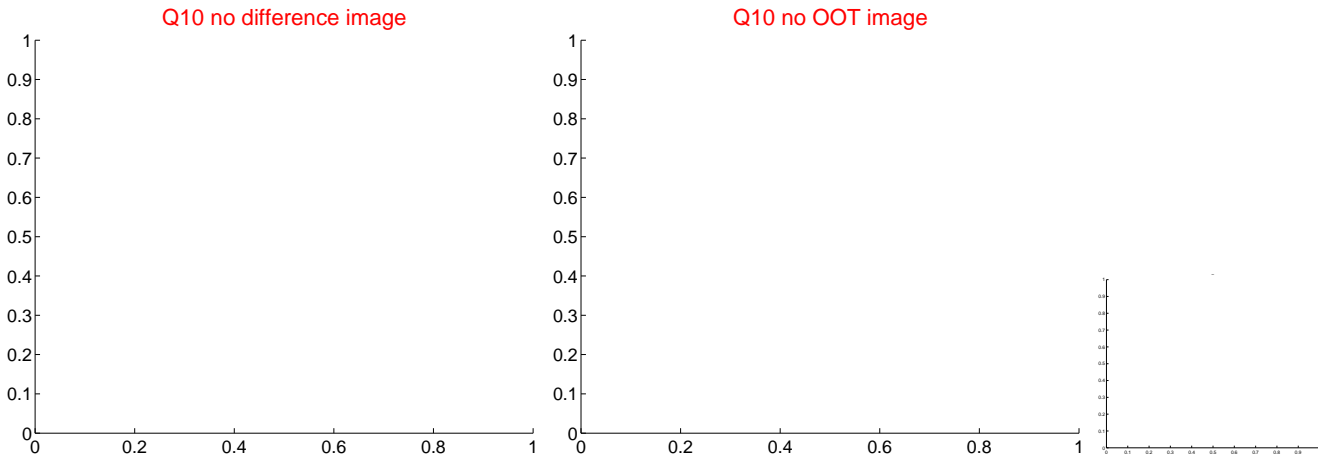
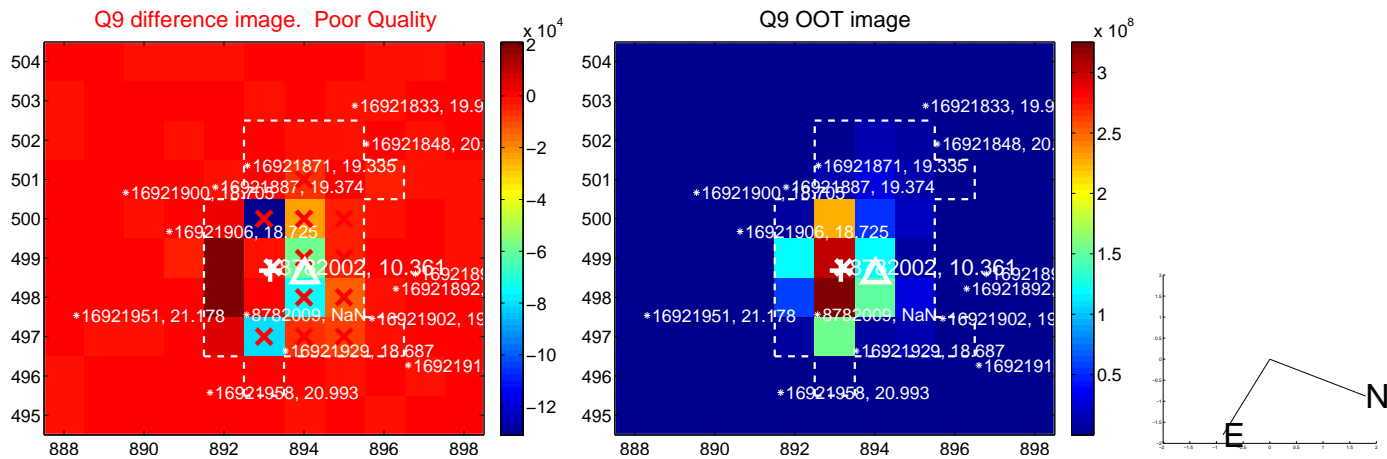
Q4 no OOT image



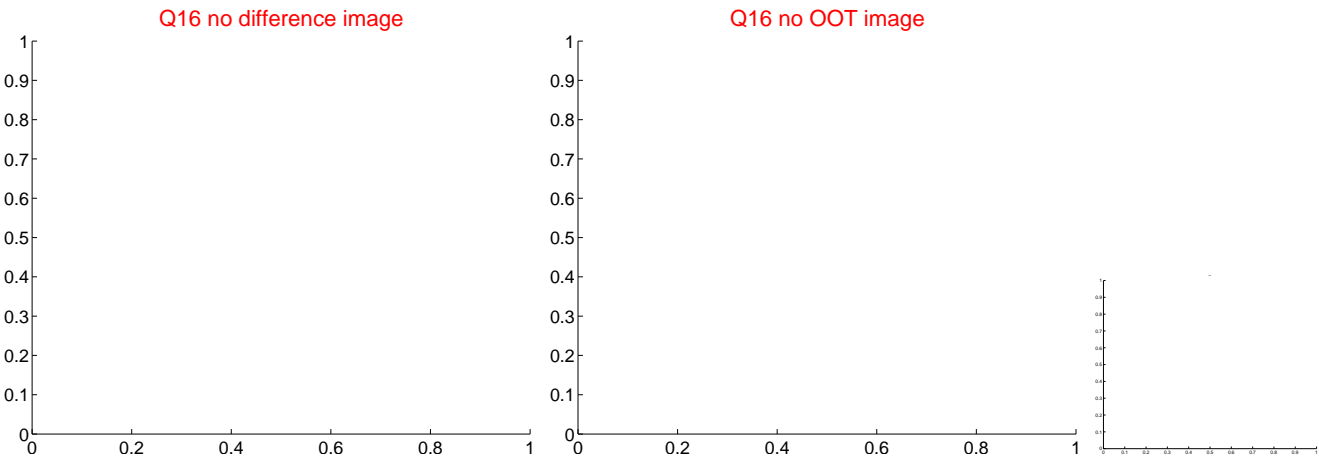
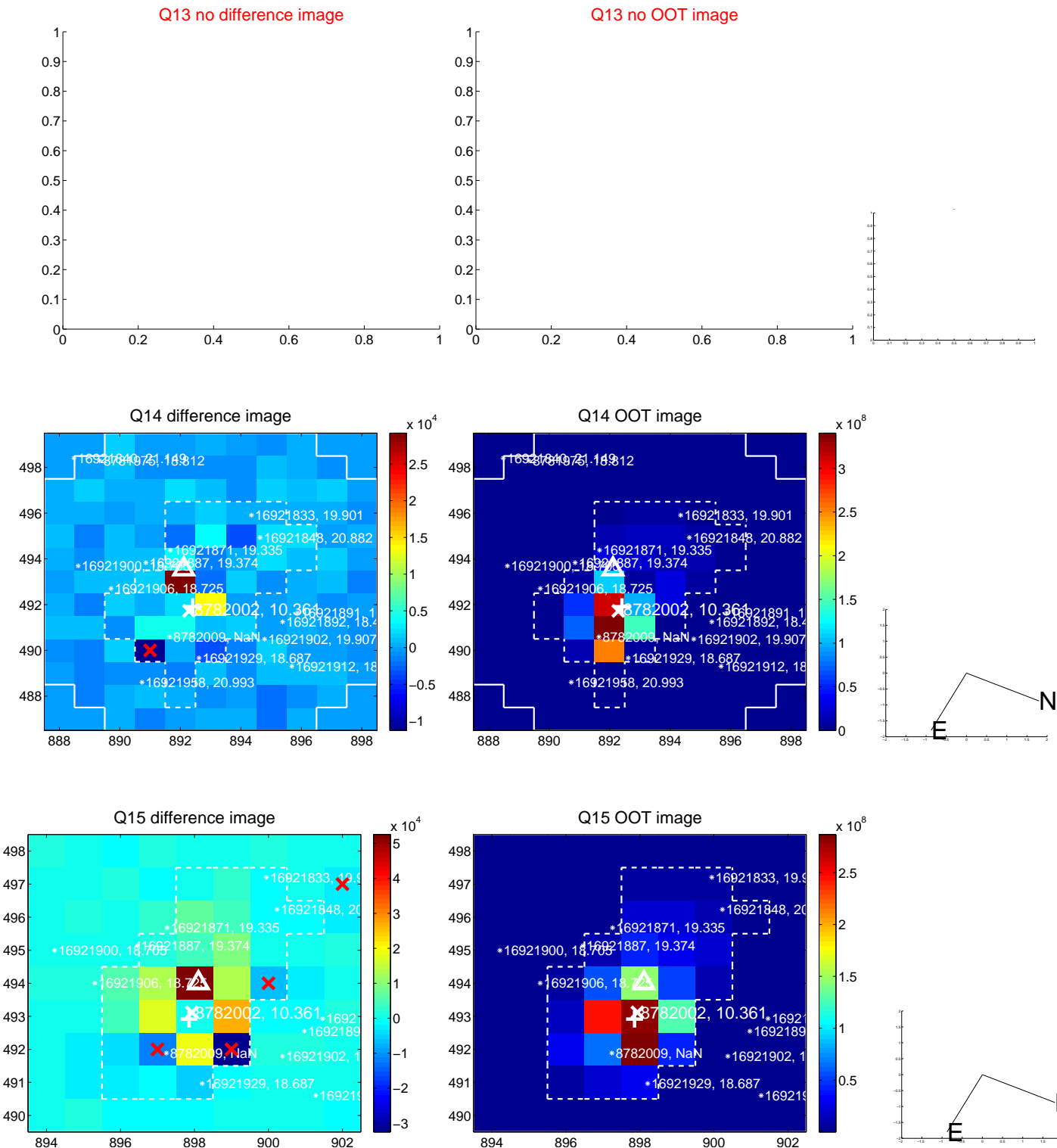
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



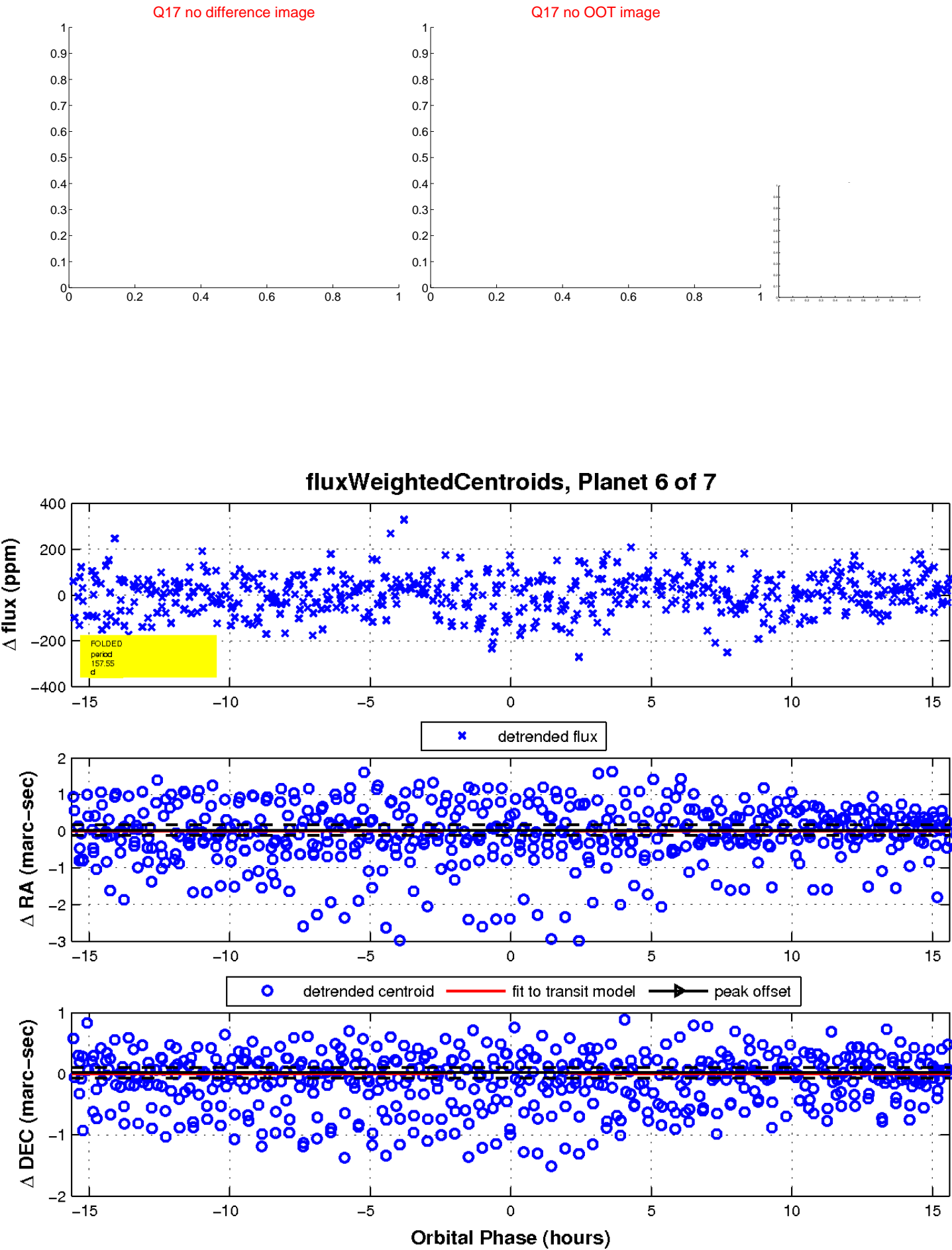
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



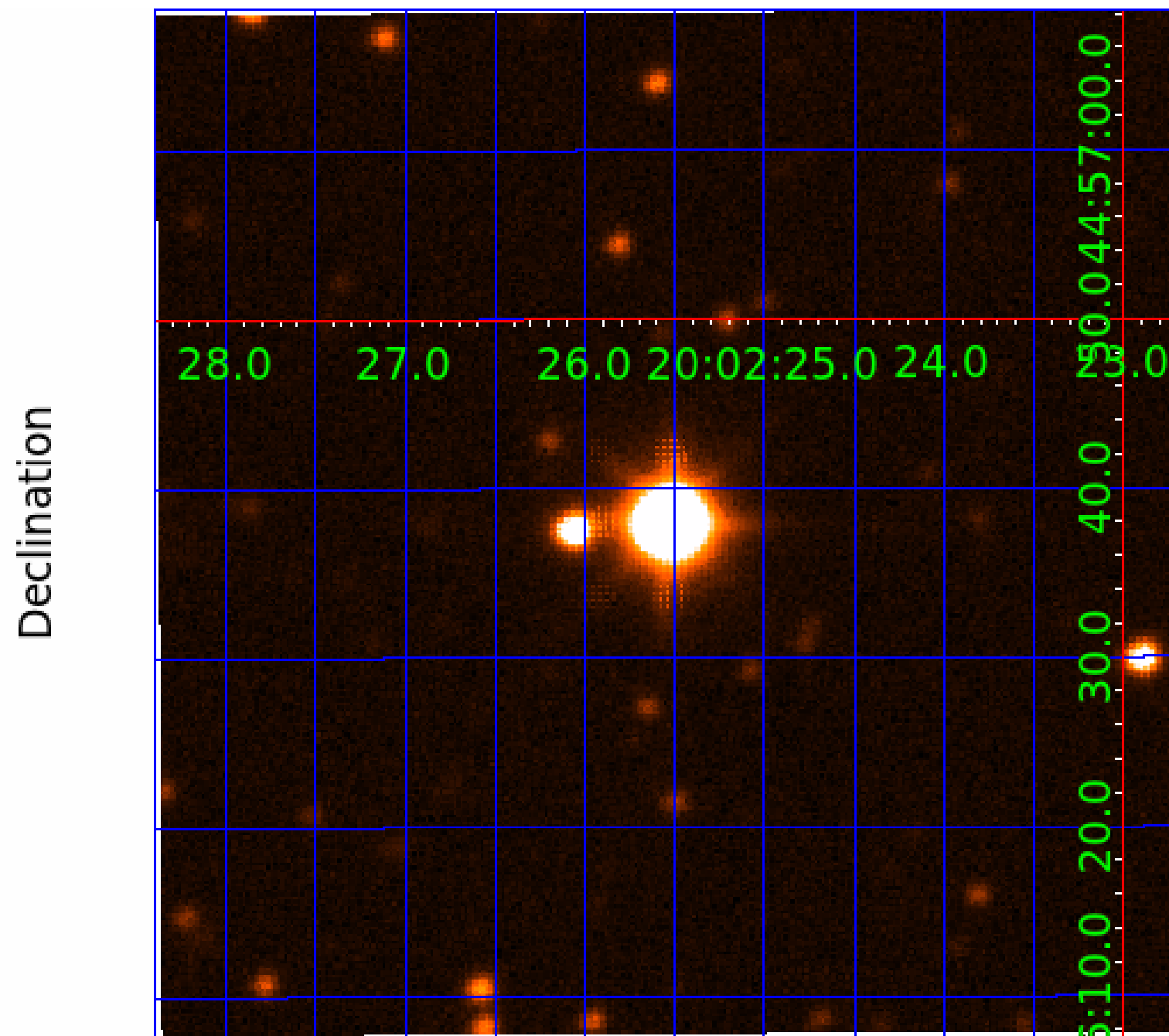
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



UKIRT Image



KIC 008782002

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})
008782002-01	OBS	No	2.909750	132.839418	15.8	7.640	9.9	8.4	2.78	6734	1.28	6413.95
008782002-02	OBS	No	2.909463	133.285035	22.0	16.042	9.4	9.0	2.78	6734	1.46	6414.79
008782002-03	OBS	No	87.568758	176.602310	90.2	13.906	38.0	6.4	2.78	6734	3.13	68.52
008782002-04	OBS	No	77.323537	132.783590	164.1	3.157	11.2	7.6	2.78	6734	3.92	80.88
008782002-05	OBS	No	169.954366	242.066644	220.0	2.916	10.3	9.9	2.78	6734	4.70	28.30
008782002-06	OBS	No	157.546368	183.225037	138.4	5.213	8.9	8.3	2.78	6734	3.86	31.31
008782002-07	OBS	No	219.897928	341.161649	241.6	2.342	10.3	8.8	2.78	6734	5.09	20.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008782002-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008782002-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
008782002-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008782002-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008782002-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

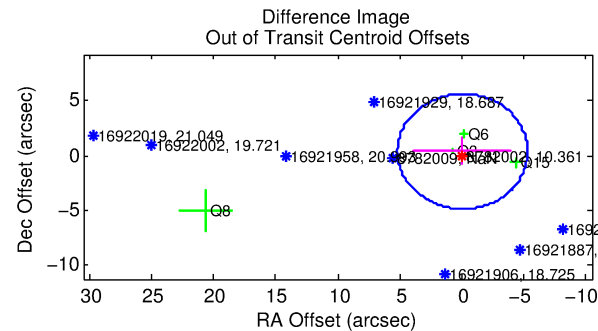
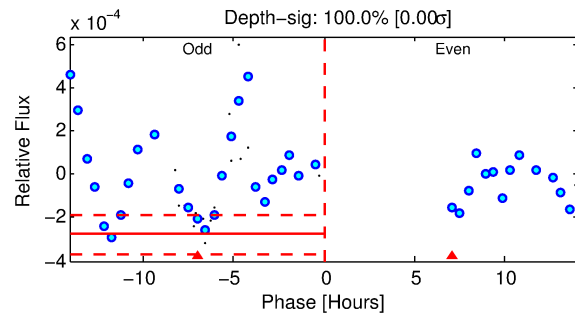
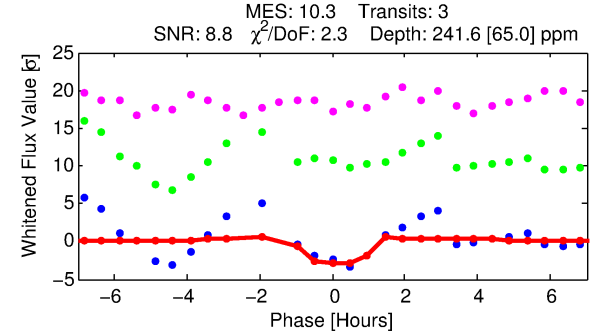
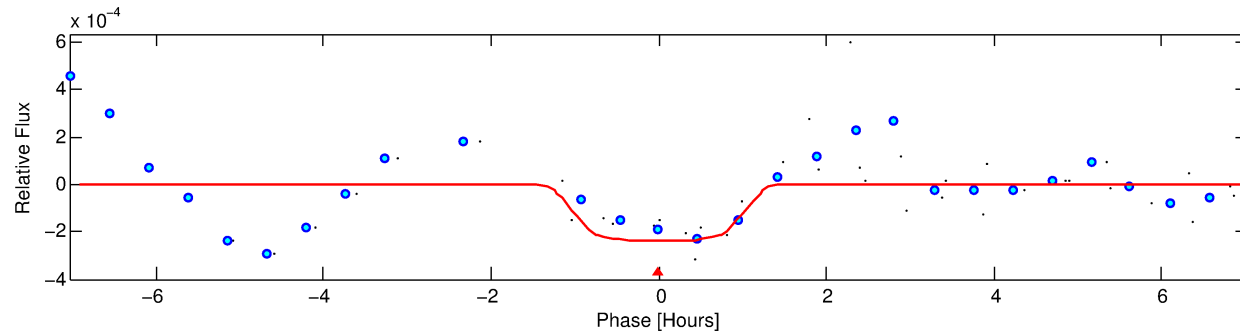
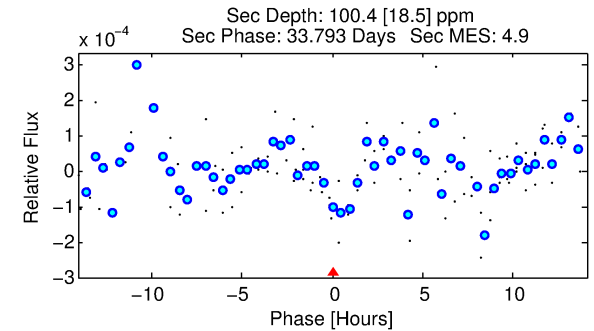
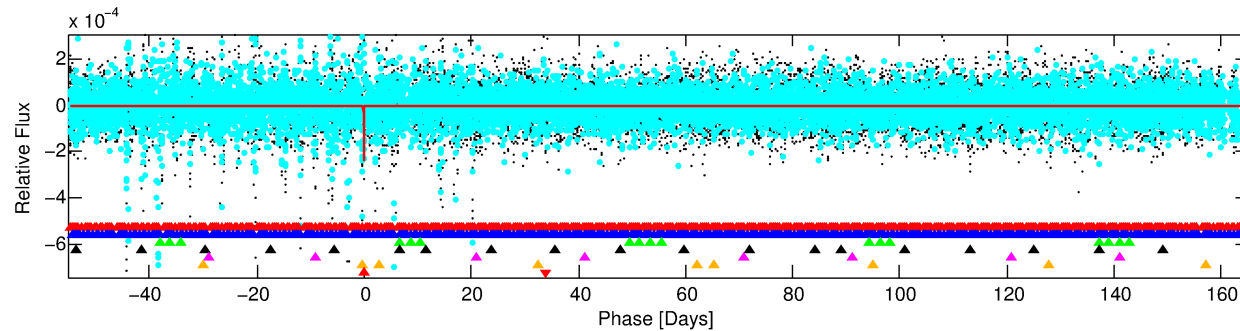
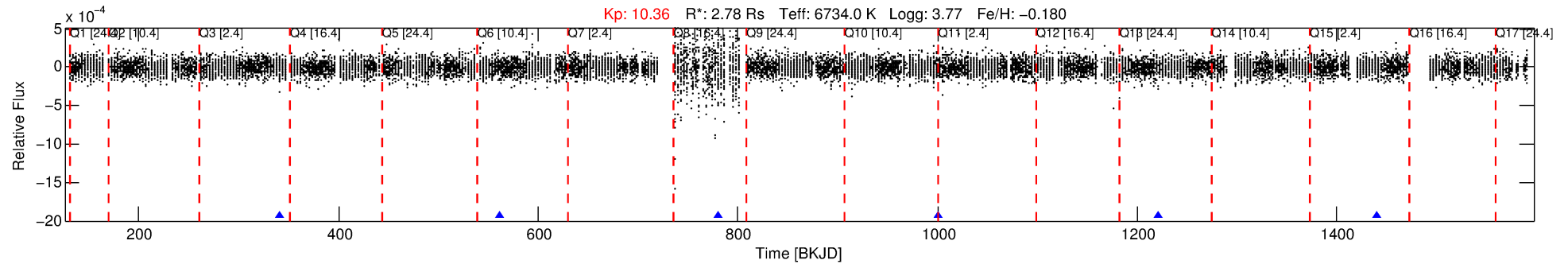
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008782002-07

No Significant Match Found

DV One-Page Summary

KIC: 8782002 Candidate: 7 of 7 Period: 219.898 d



DV Fit Results:

Period = 219.89793 [0.00322] d
Epoch = 341.1616 [0.0089] BKJD
Rp/R* = 0.0168 [0.0154]
a/R* = 320.09 [1701.21]
b = 0.91 [0.98]
Seff = 20.07 [10.36]
Teq = 540 [70] K
Rp = 5.09 [4.99] Re
a = 0.8410 [0.2711] AU
Ag = 1508.35 [2881.63] [0.52σ]
Teffp = 5201 [2400] K [1.94σ]

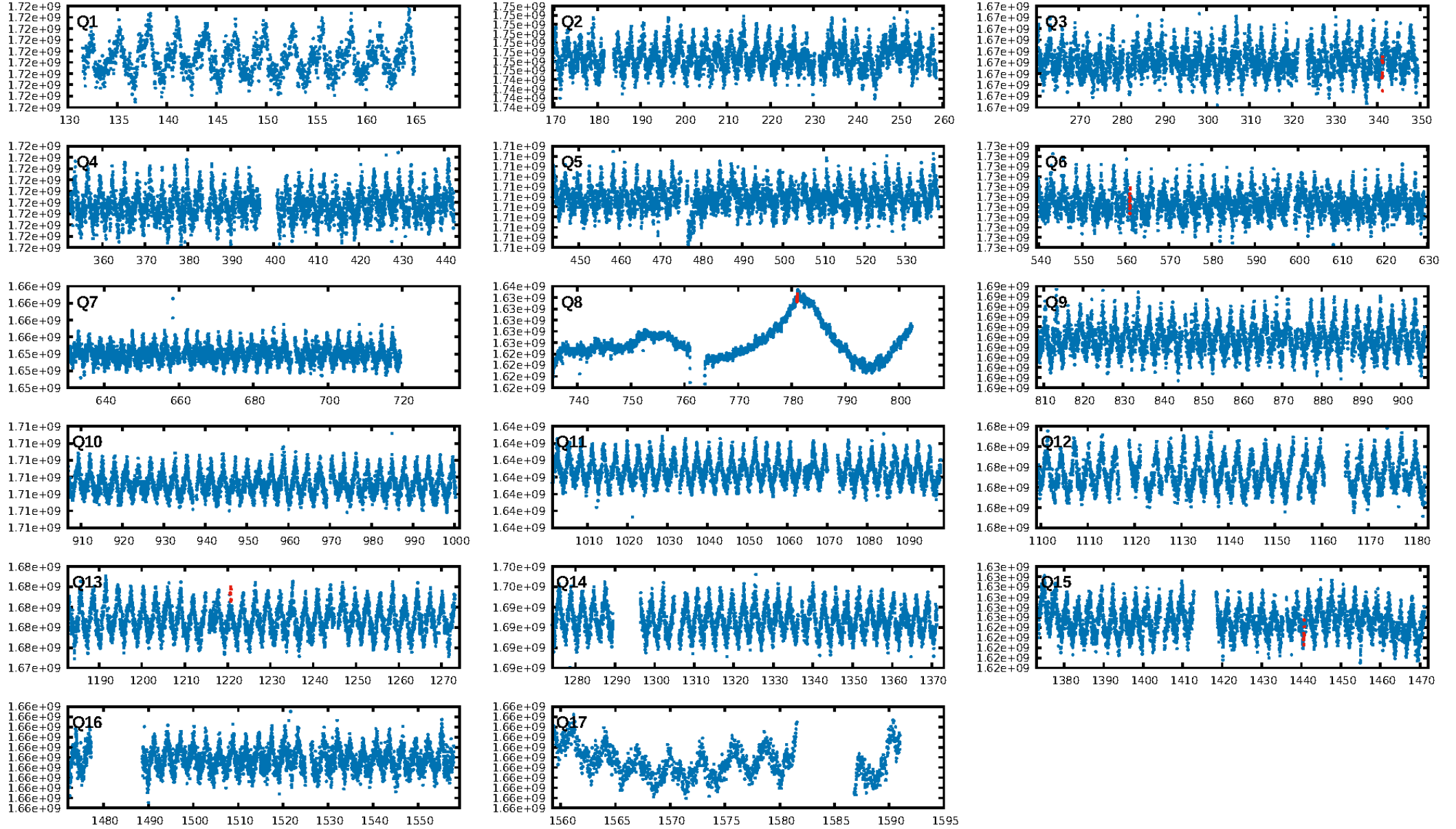
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [320.45σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 52.2%
ModelChiSquareGof-sig: 87.2%
Bootstrap-pfa: 3.24e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 18.1%
Centroid-so: 0.903 arcsec [0.96σ]
OotOffset-rm: 0.391 arcsec [0.22σ]
OotOffset-st: 1/2/1/0 [4]
KicOffset-rm: 0.613 arcsec [0.31σ]
KicOffset-st: 1/2/1/0 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 0.75 [3/4]

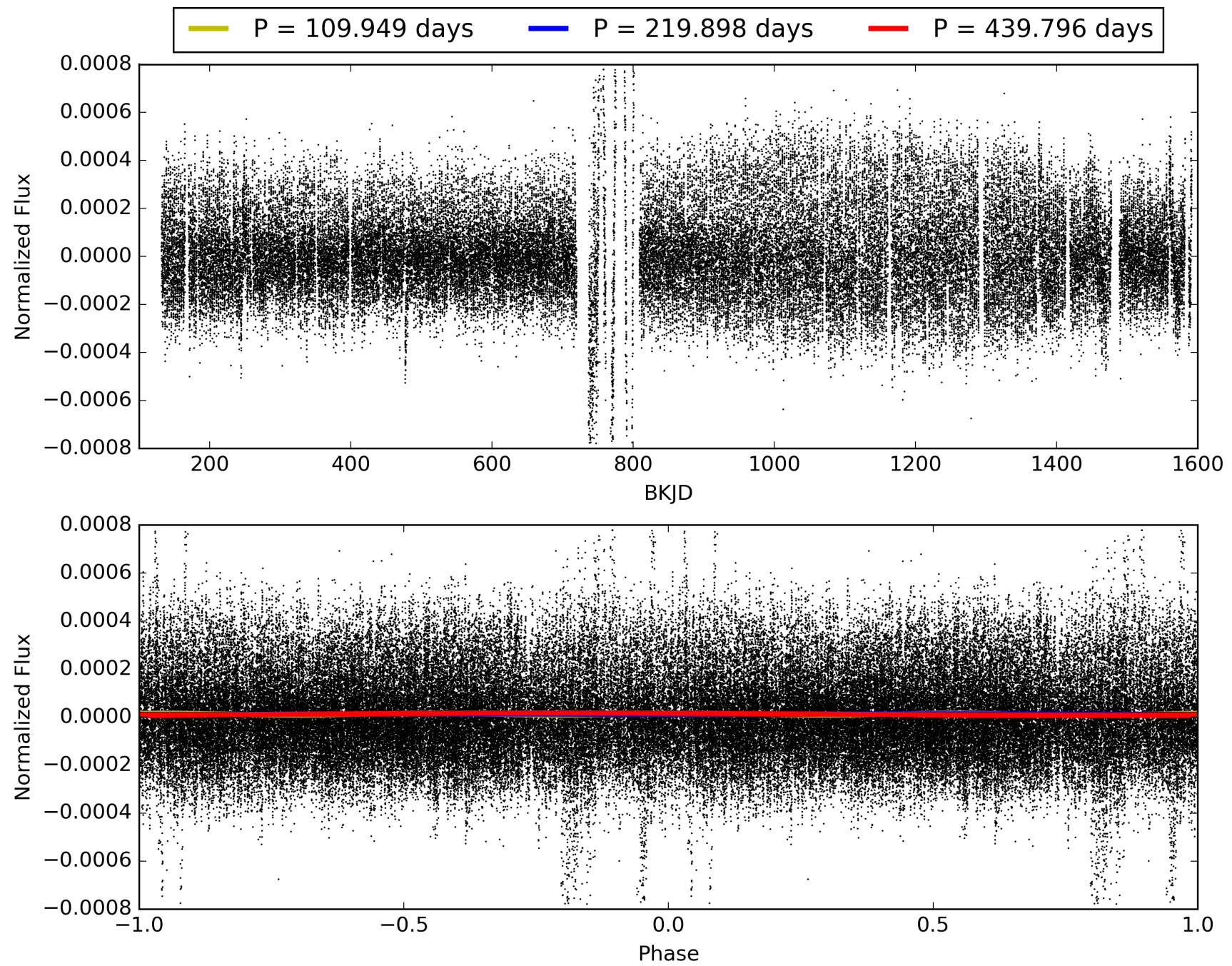
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:05:25 Z

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

TCE 008782002-07, PDC Light Curves

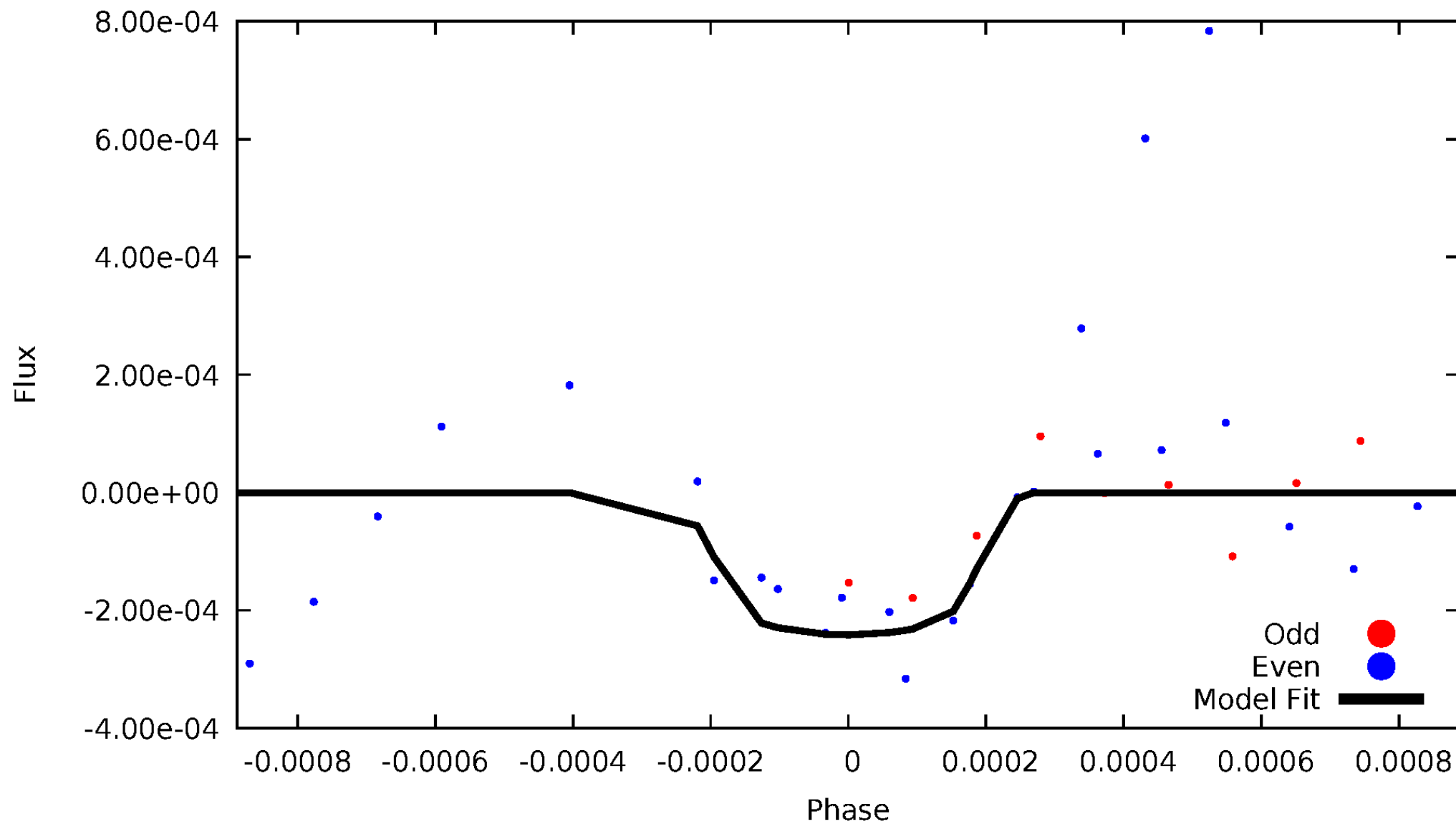


TCE 008782002-07



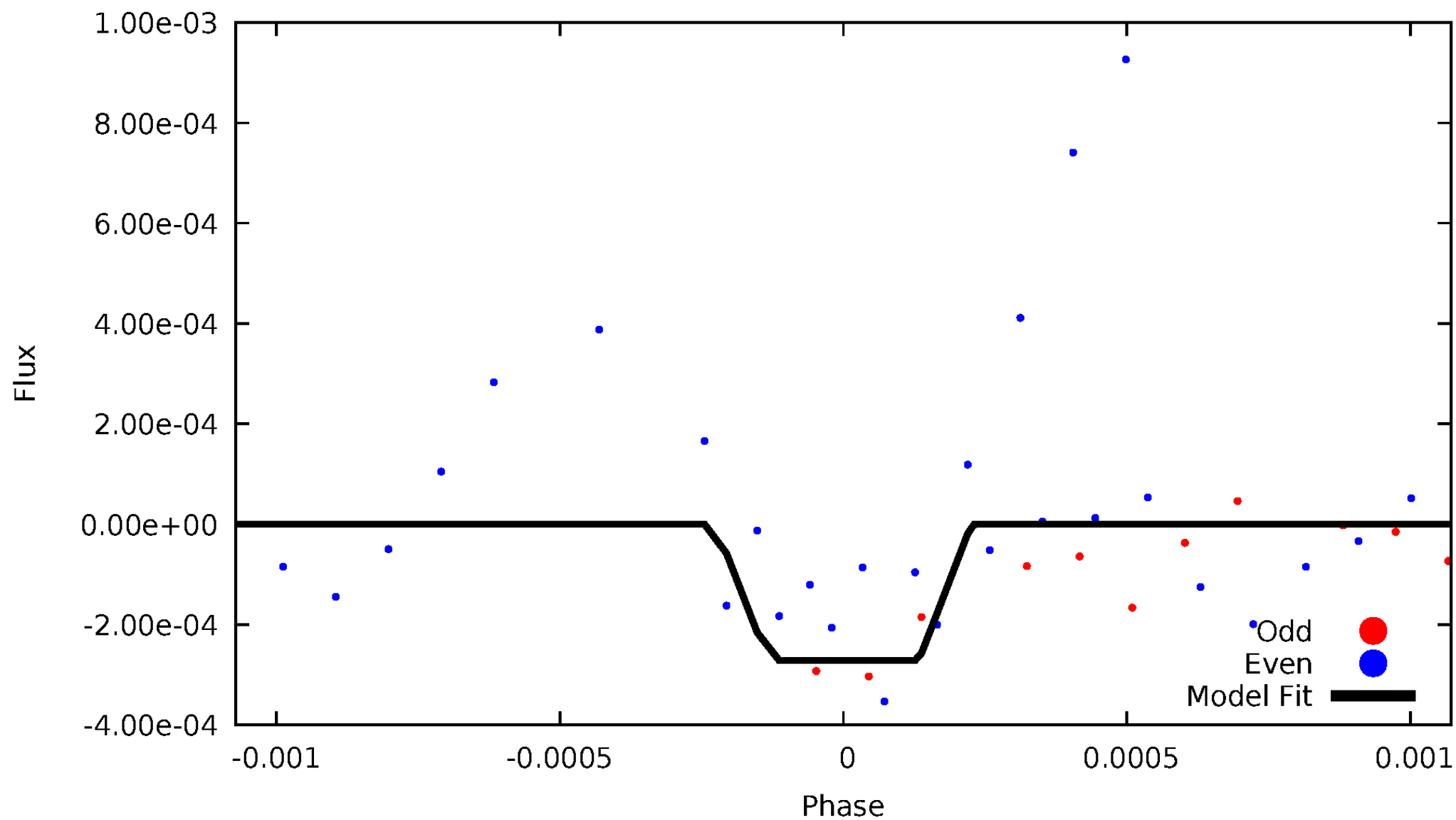
DV Odd/Even

TCE 008782002-07



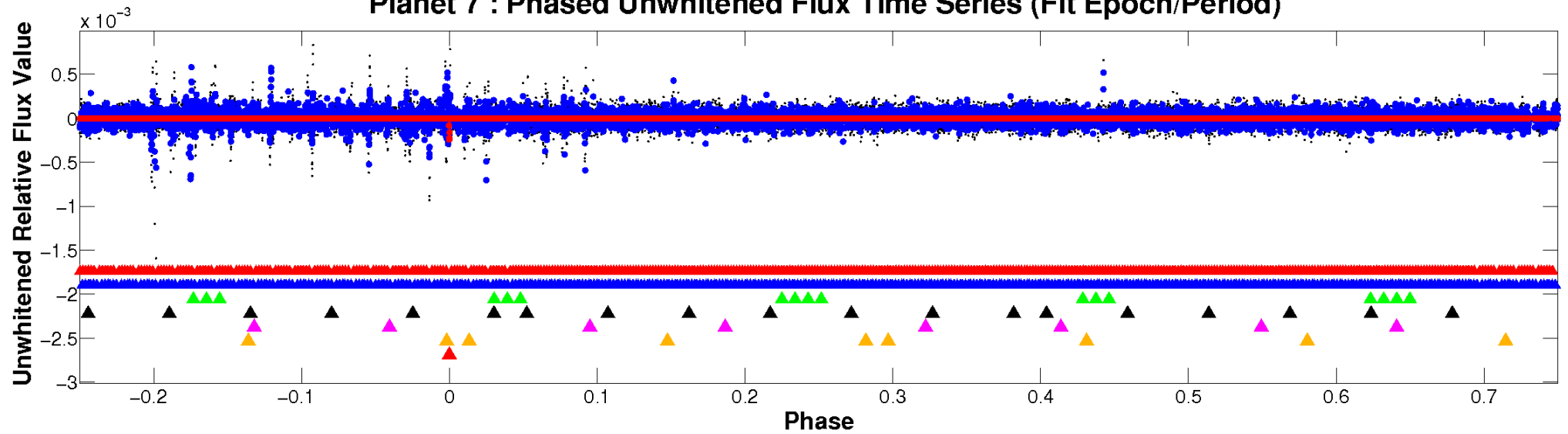
ALT Odd/Even

TCE 008782002-07

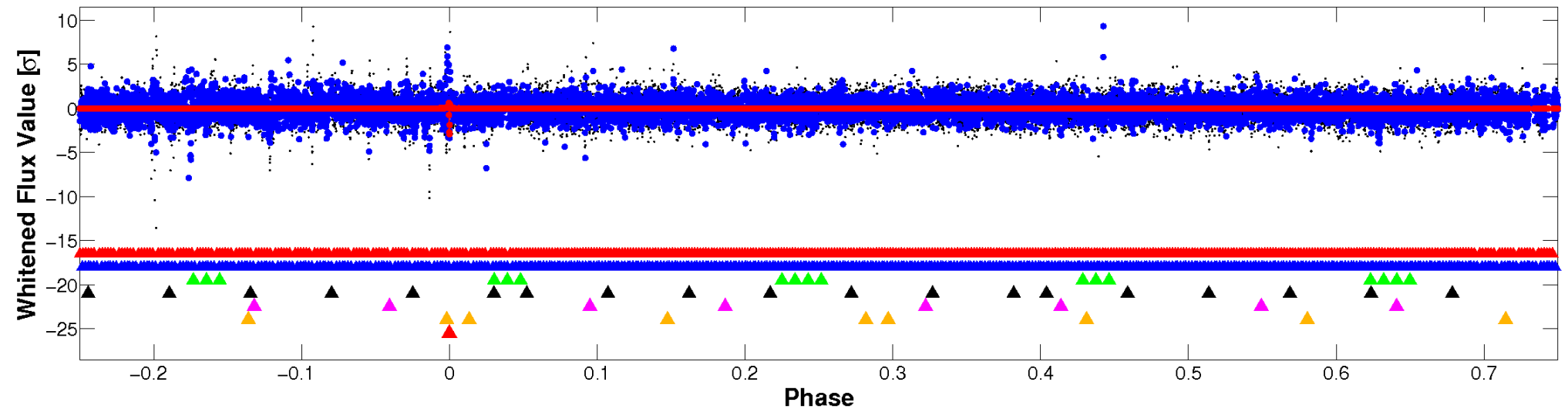


Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

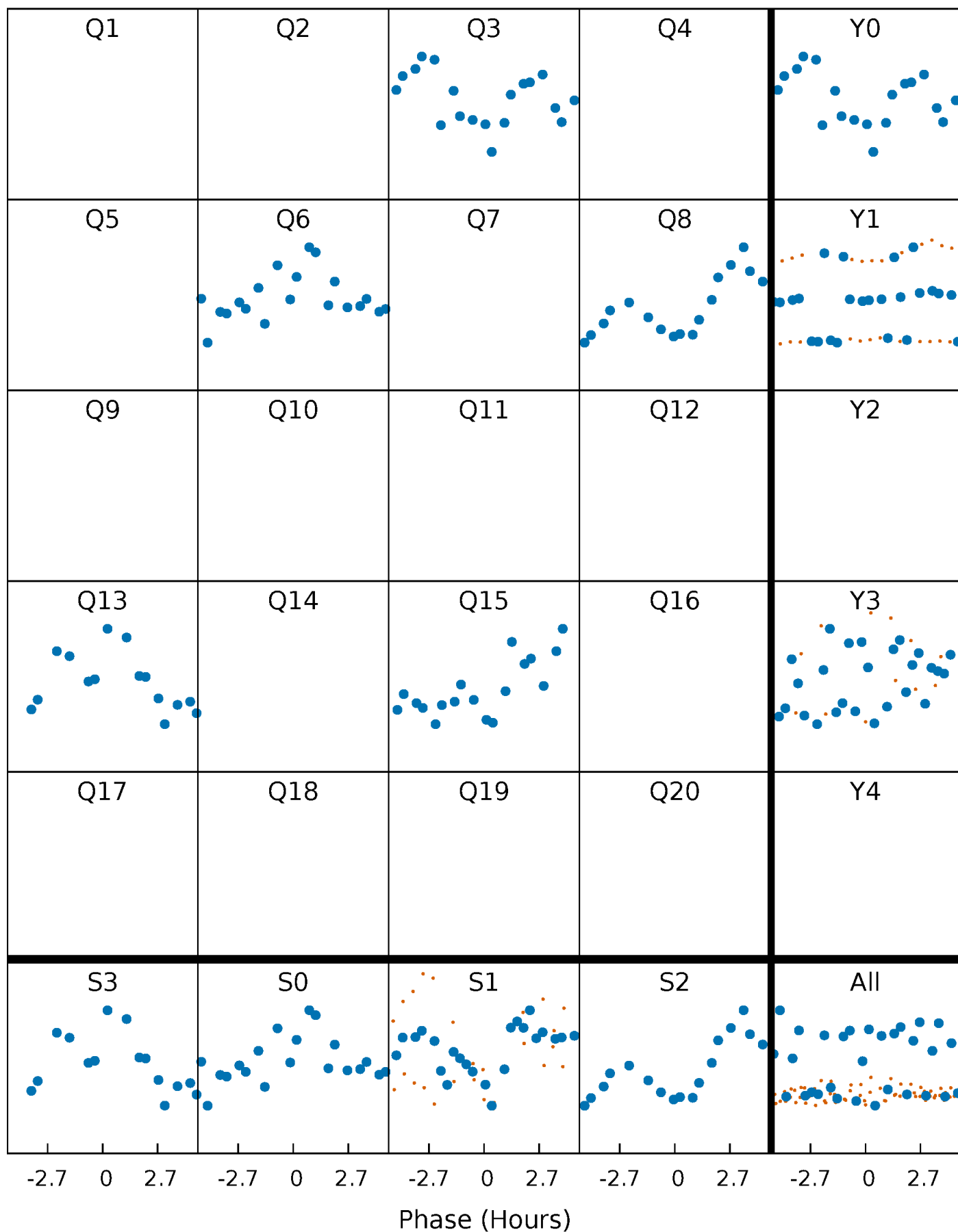


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



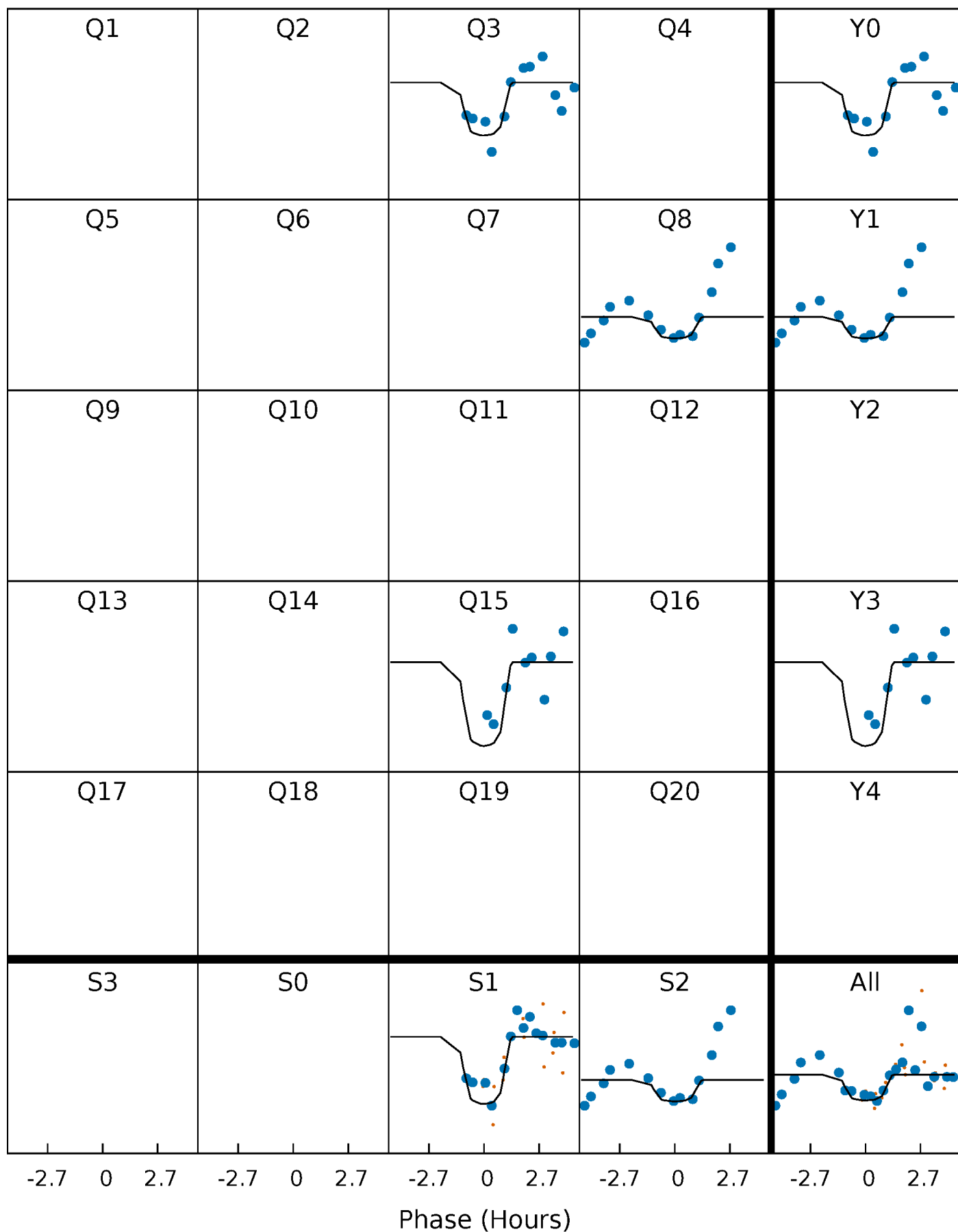
PDC Quarter-Phased Transit Curves

TCE 008782002-07 $P=219.897928$ Days $T_0=341.161649$ (BKJD)



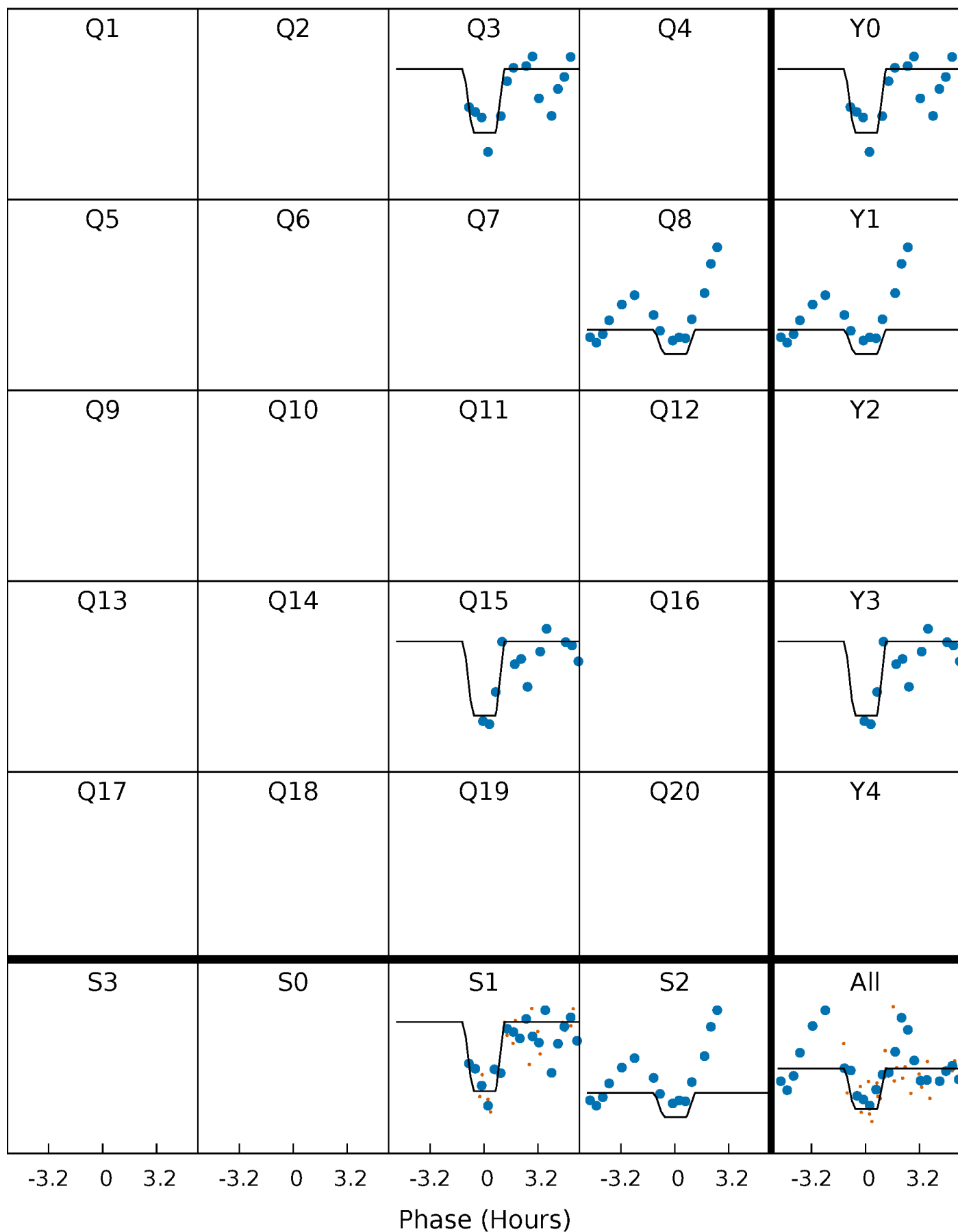
DV Quarter-Phased Transit Curves

TCE 008782002-07 $P=219.897928$ Days $T_0=341.161649$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

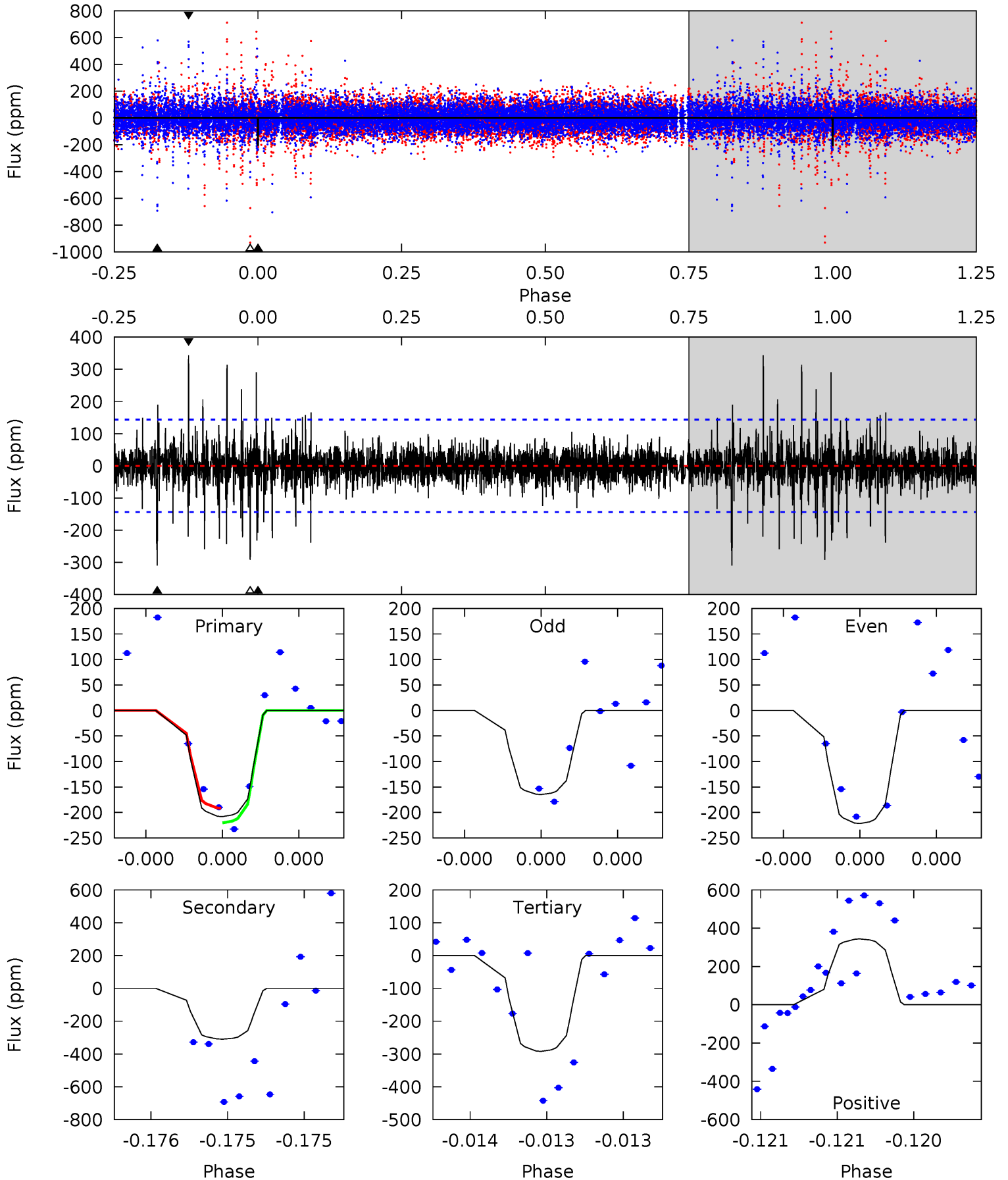
TCE 008782002-07 $P=219.899581$ Days $T_0=341.164033$ (BKJD)



DV Model-Shift Uniqueness Test

008782002-07, P = 219.897928 Days, E = 121.263721 Days

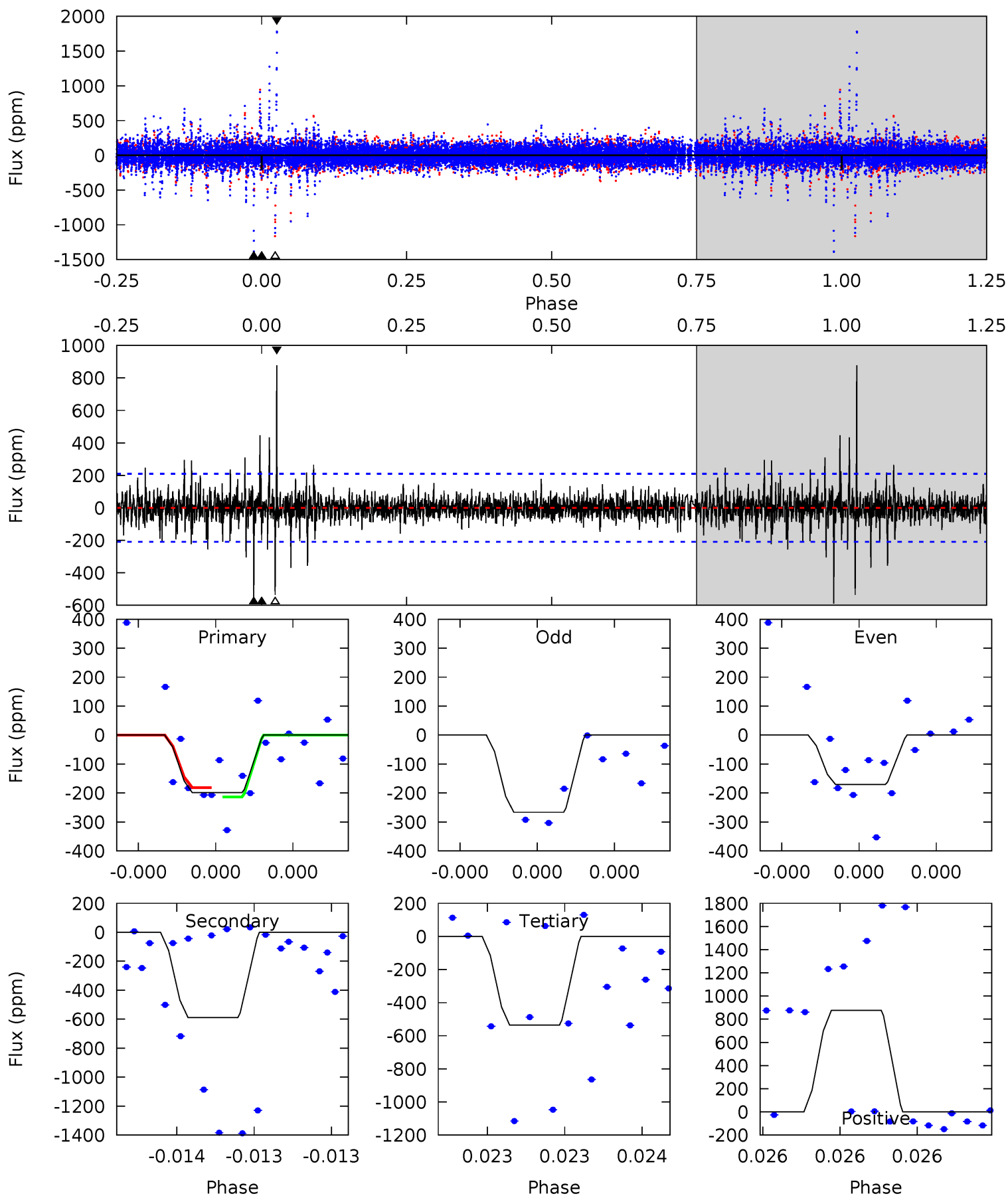
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.09	12.0	11.3	13.4	5.59	3.50	1.58	-3.26	-5.28	0.68	-1.34	1.00	0.97	0.53	0.54



Alt Model-Shift Uniqueness Test

008782002-07, P = 219.899581 Days, E = 121.264452 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.32	15.8	14.4	23.5	5.62	3.56	1.62	-9.04	-18.2	1.43	-7.72	1.20	0.78	0.60	0.43



Stellar Parameters For KIC 008782002

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6734^{+168}_{-184}	$3.766^{+0.292}_{-0.097}$	$-0.180^{+0.300}_{-0.250}$	$2.776^{+0.445}_{-0.965}$	$1.640^{+0.193}_{-0.358}$	$0.108^{+0.223}_{-0.034}$
	+2%/-3%	+8%/-3%	+167%/-139%	+16%/-35%	+12%/-22%	+207%/-31%
Source	PHO1	FLK73	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 008782002-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-309 ± 26	$5.59^{+3.93}_{-3.31}$	736^{+51}_{-64}	6295^{+5096}_{-1342}	3761^{+19309}_{-2448}
Alt.	-589 ± 37	$5.30^{+4.12}_{-3.33}$	746^{+43}_{-71}	7698^{+9609}_{-1911}	7798^{+52293}_{-5241}

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 $A_{obs} \gg 1.0$

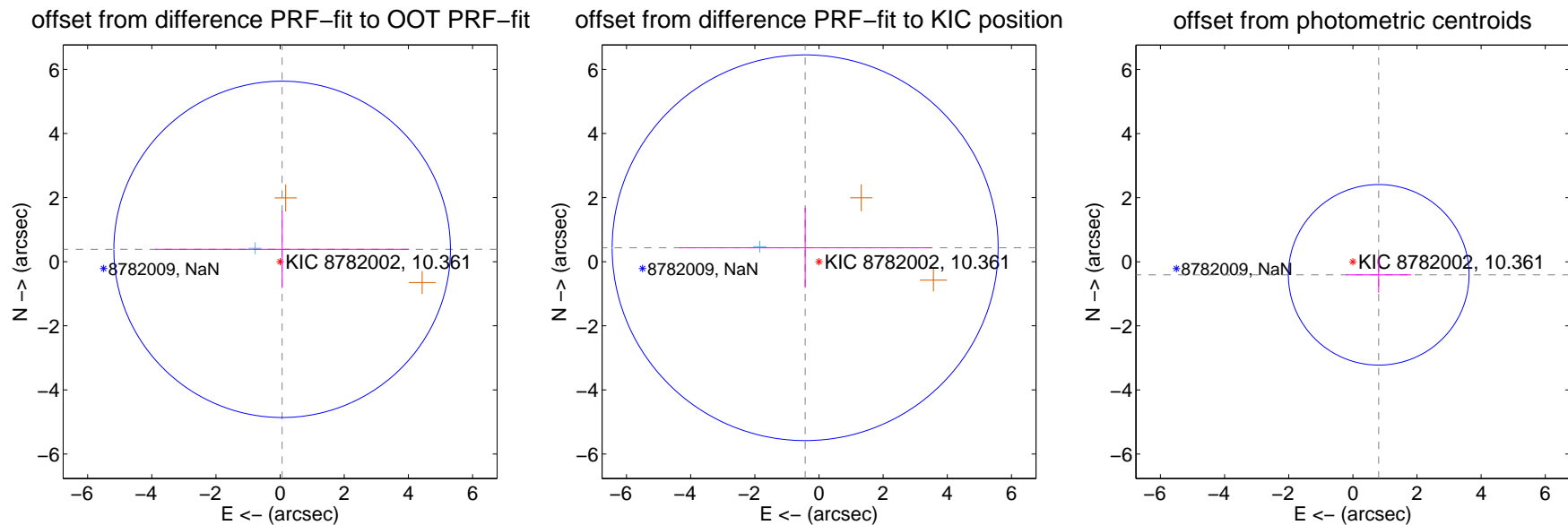
DV Centroid Data

Supplemental centroid analysis for 008782002-07. **Kepler magnitude: 10.36.** Transit SNR 8.84

There are 1 quarters with good PRF difference image offsets

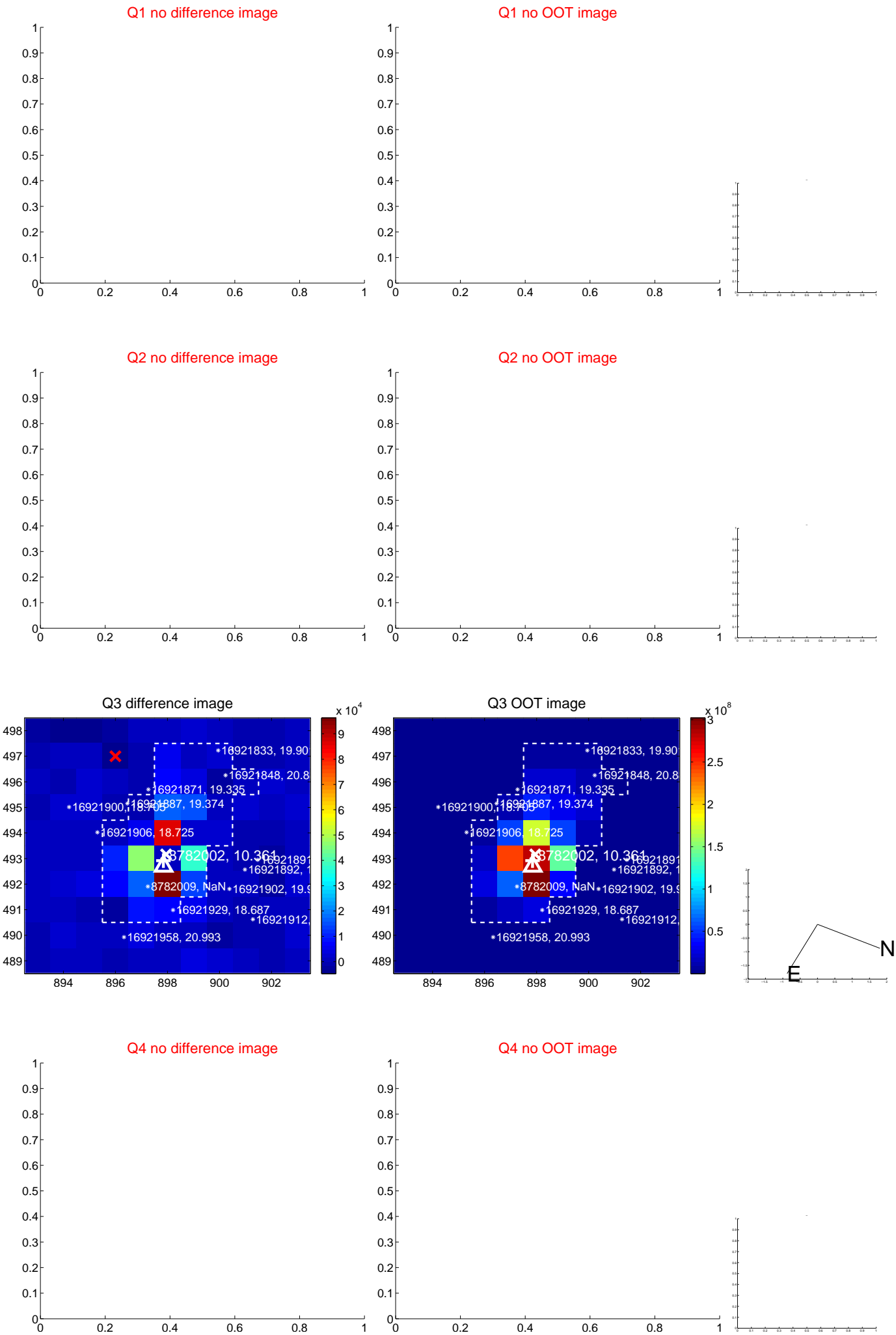
The direct PRF centroid is offset from the target star catalog position by about 0.86 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.391 ± 1.748	0.22	-0.064 ± 3.955	0.385 ± 1.203
PRF-fit source offset from KIC position	0.613 ± 2.005	0.31	0.431 ± 3.943	0.435 ± 1.249
photometric centroid source offset	0.90 ± 0.94	0.96	-0.81 ± 1.01	-0.41 ± 0.56

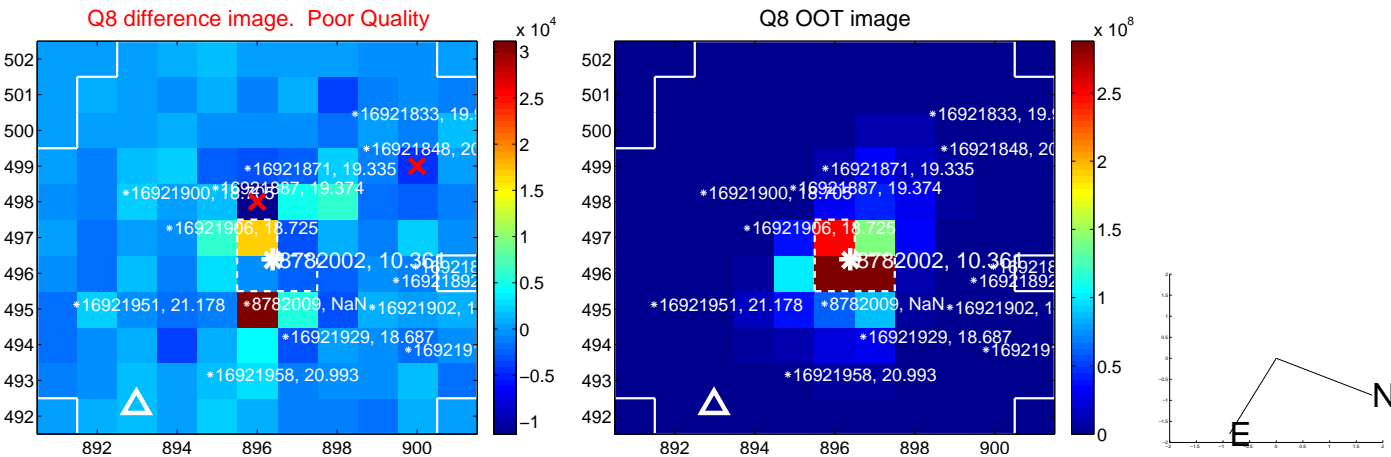
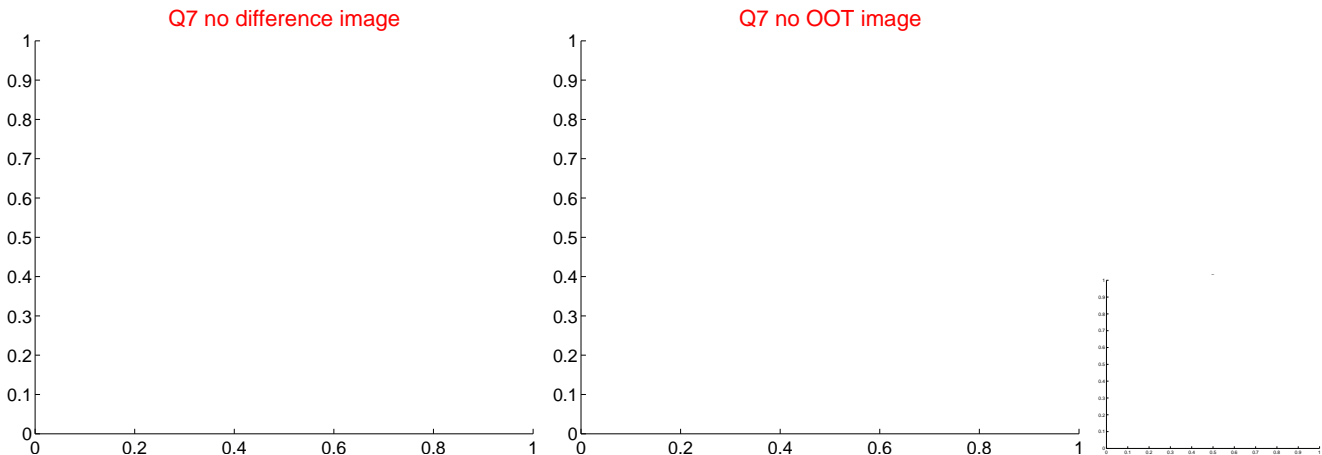
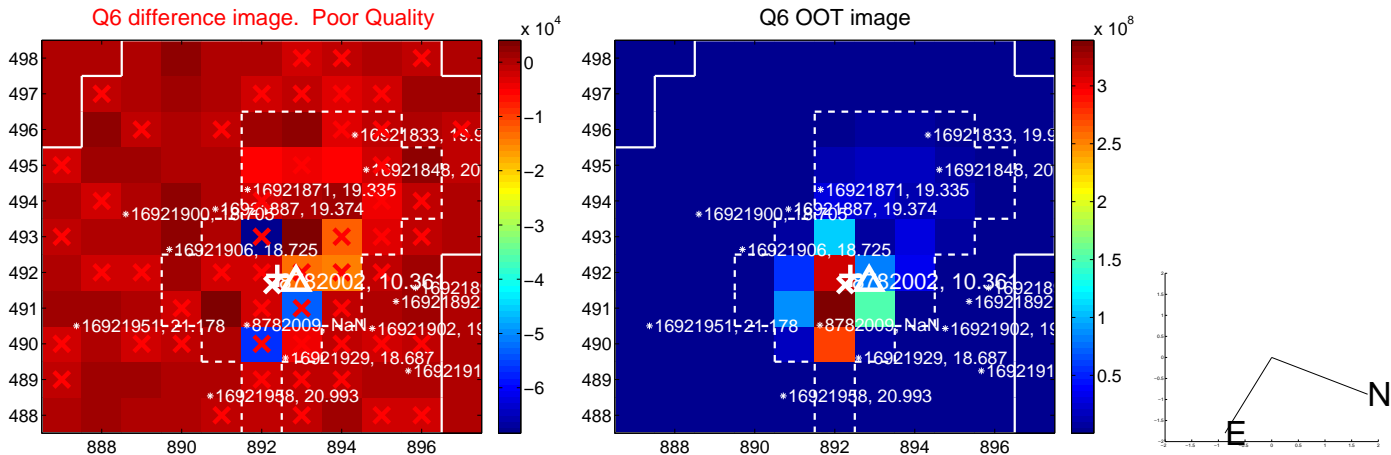
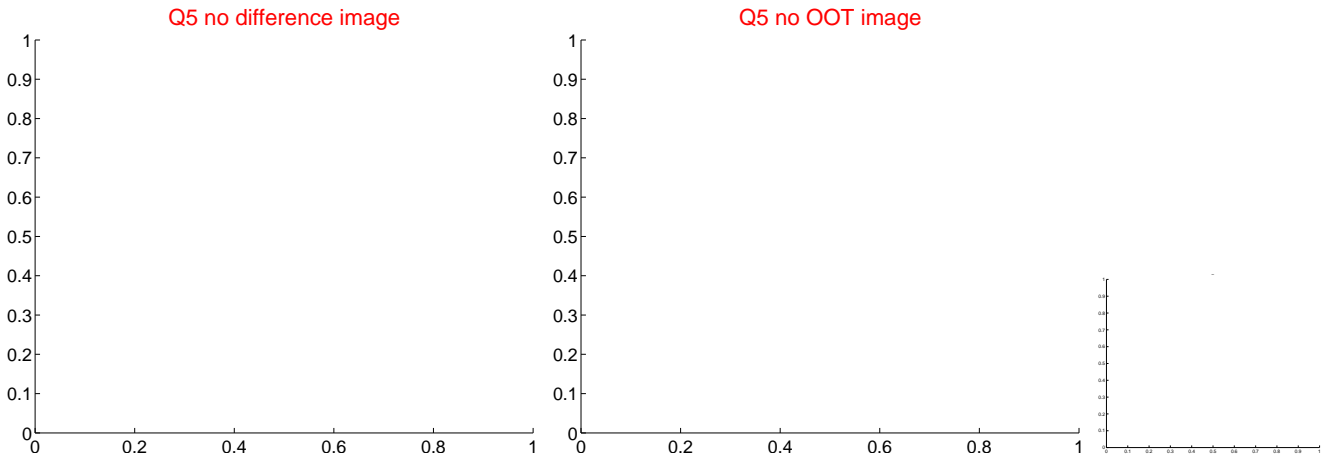


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



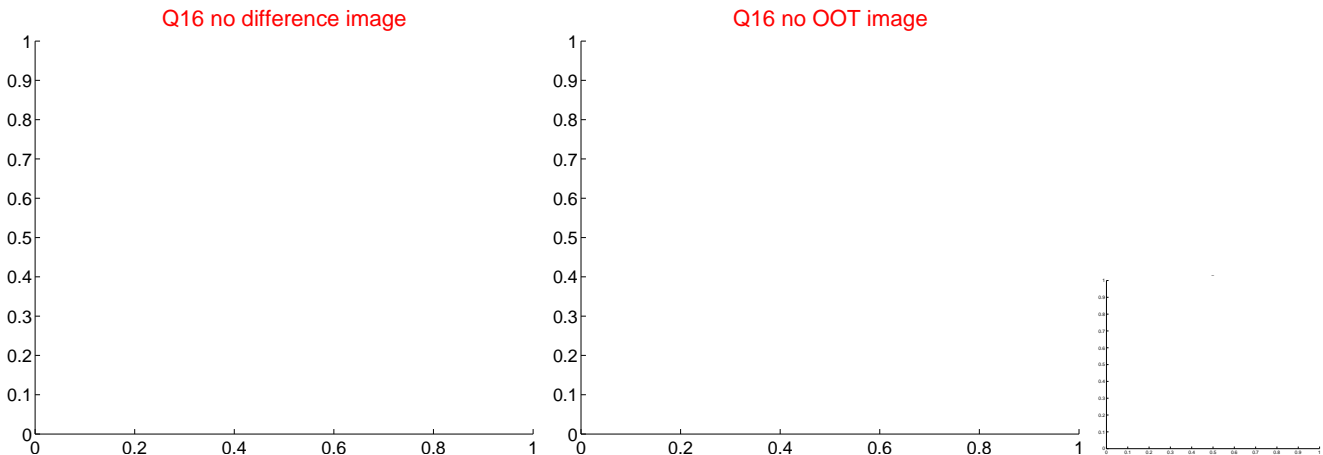
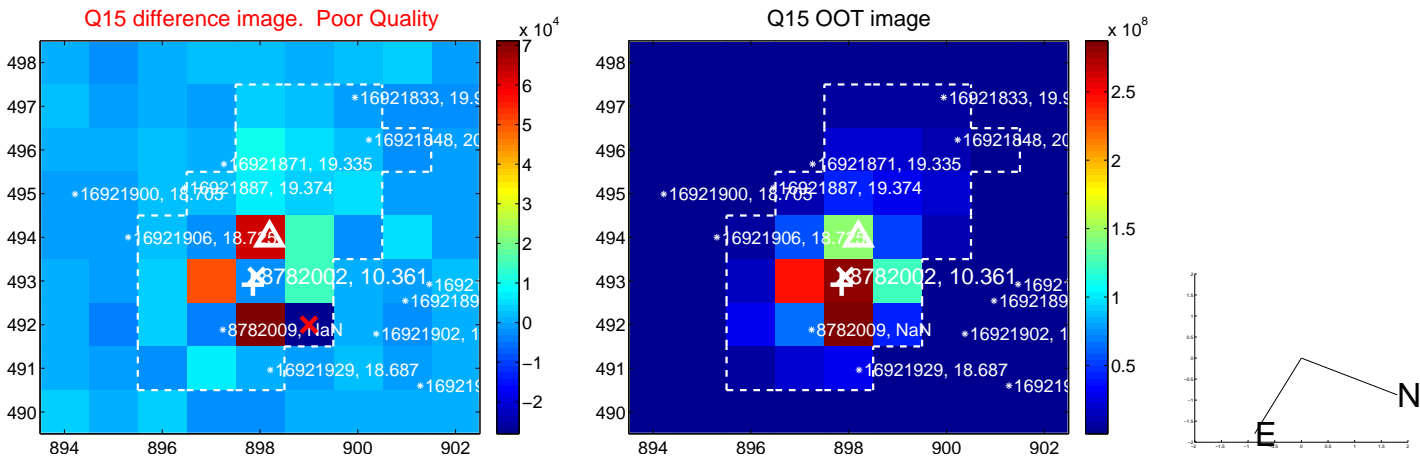
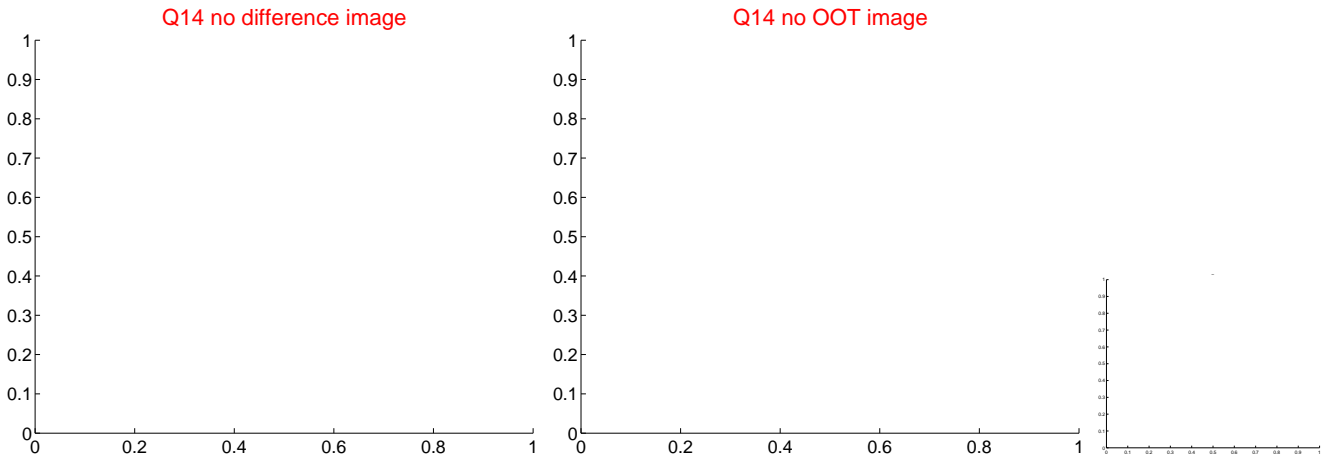
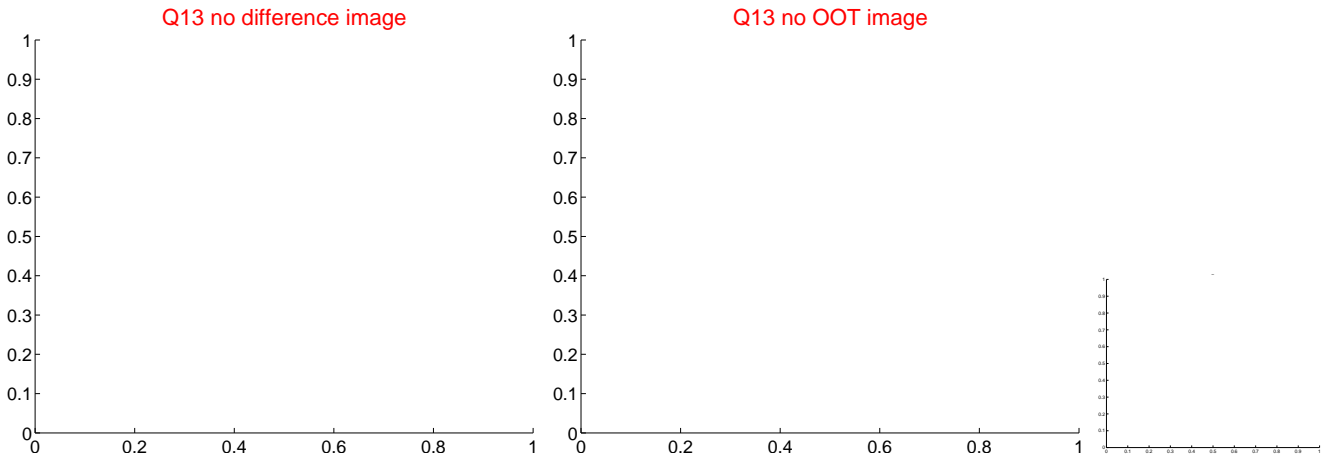
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



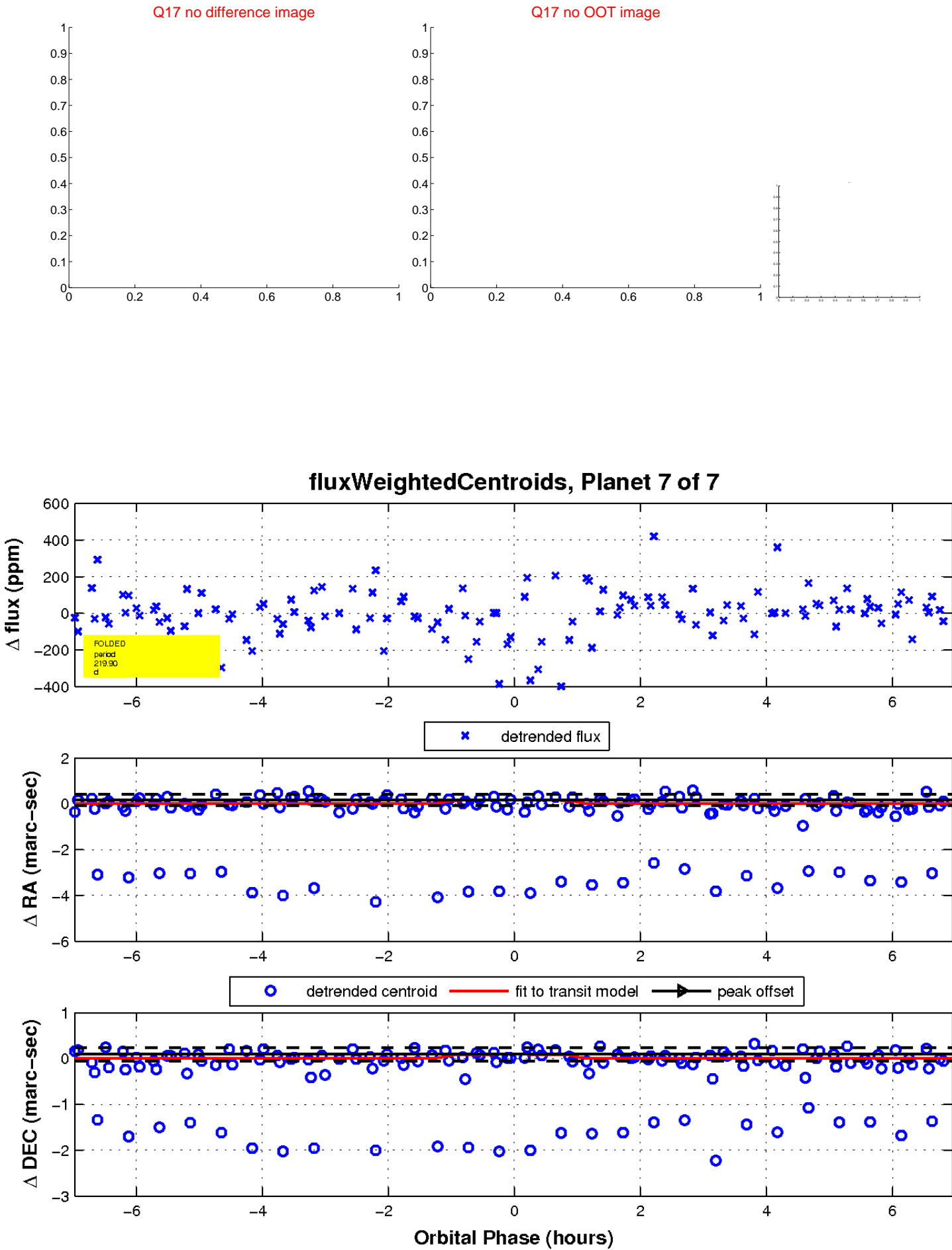
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

