

KIC 008716028

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})
008716028-01	OBS	No	1.752399	132.775555	73.5	6.540	10.8	11.7	2.13	6632	3.23	8050.20
008716028-02	OBS	No	1.752389	131.563135	68.6	4.734	9.9	12.3	2.13	6632	3.23	8050.26
008716028-03	OBS	No	532.874333	152.974204	576.3	7.403	9.4	9.8	2.13	6632	6.02	3.94
008716028-04	OBS	No	14.763042	142.008324	175.8	7.647	8.9	9.5	2.13	6632	2.98	469.62
008716028-05	OBS	No	98.427139	200.078630	536.0	4.065	7.9	8.3	2.13	6632	5.44	37.42
008716028-06	OBS	No	508.140391	316.308767	503.3	4.729	7.5	7.8	2.13	6632	4.80	4.19
008716028-07	OBS	No	72.851489	190.500130	273.6	0.594	7.8	2.9	2.13	6632	3.64	55.90
008716028-08	OBS	No	34.934758	163.806235	164.7	5.000	7.2	-1.0	2.13	6632	2.75	148.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008716028-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008716028-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
008716028-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008716028-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008716028-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

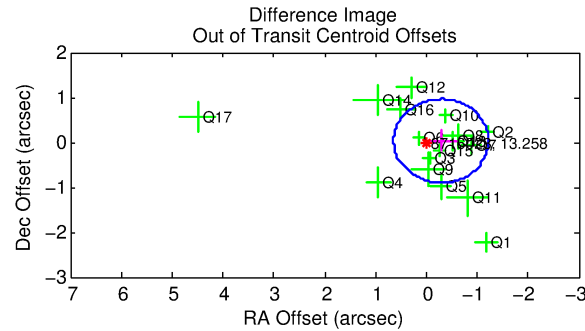
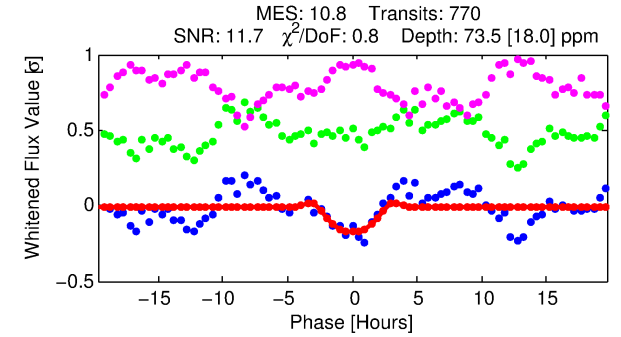
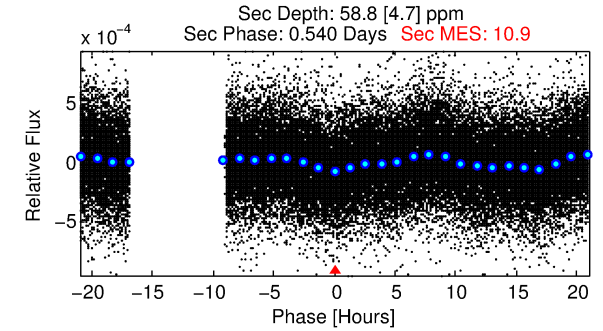
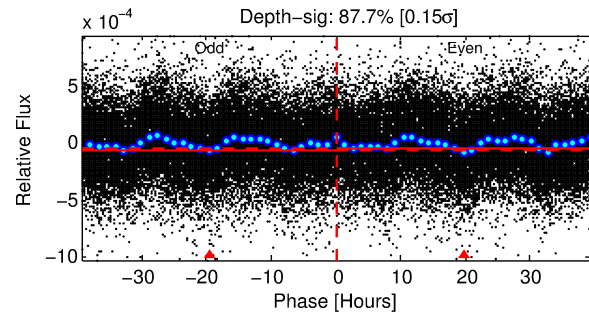
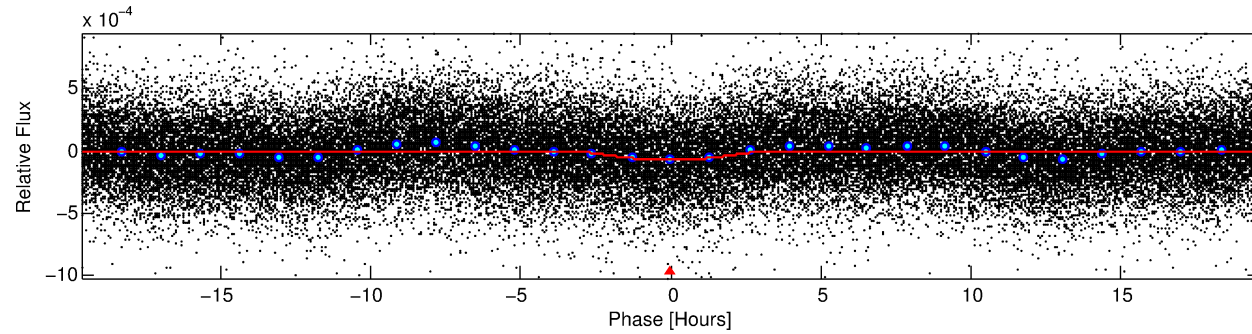
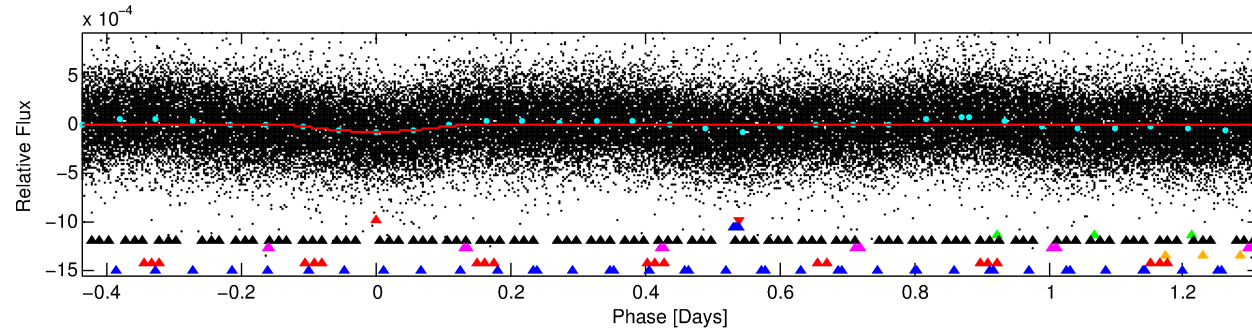
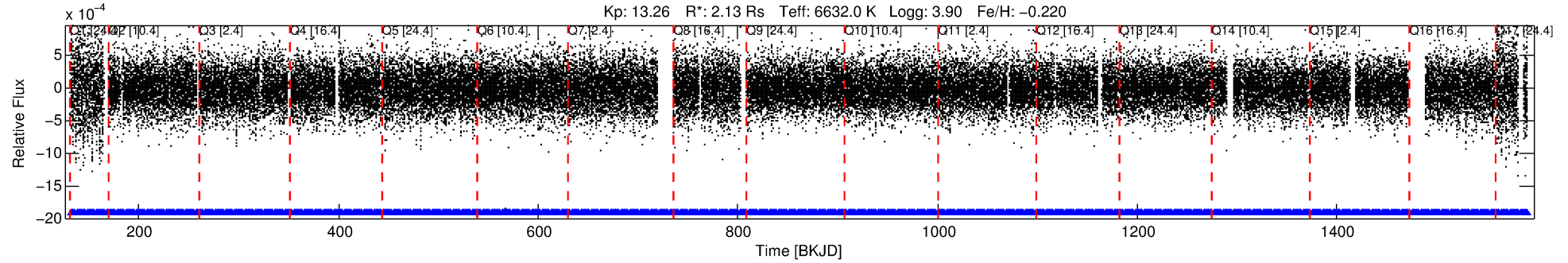
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008716028-01

No Significant Match Found

DV One-Page Summary

KIC: 8716028 Candidate: 1 of 8 Period: 1.752 d



DV Fit Results:

Period = 1.75240 [0.00002] d
Epoch = 132.7756 [0.0085] BKJD
Rp/R* = 0.0139 [0.0126]
a/R* = 1.07 [0.03]
b = 1.00 [0.02]
Seff = 8050.20 [5109.28]
Teq = 2415 [383] K
Rp = 3.23 [3.19] Re
a = 0.0312 [0.0120] AU
Ag = 3.01 [5.75] [0.35 σ]
Teffp = 4918 [2231] K [1.11 σ]

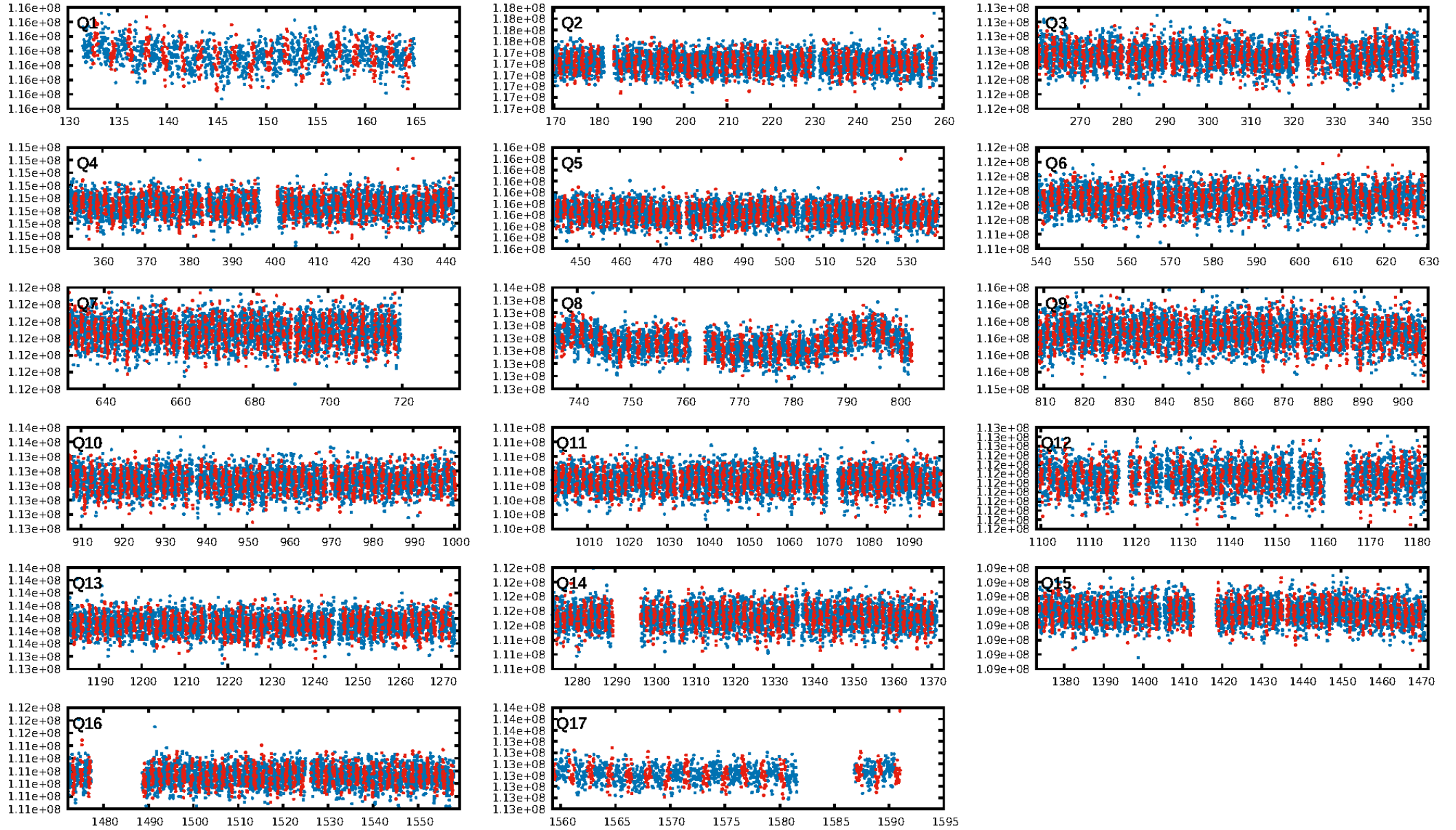
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: 100.0% [31.03 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [735/735]
GhostDiagnostic-chr: 1.686
Centroid-sig: N/A
Centroid-so: 0.701 arcsec [1.47 σ]
OotOffset-rm: 0.288 arcsec [0.93 σ]
KicOffset-rm: 0.325 arcsec [1.09 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.88 [15/17]
DiffImageOverlap-fno: 0.00 [0/17]

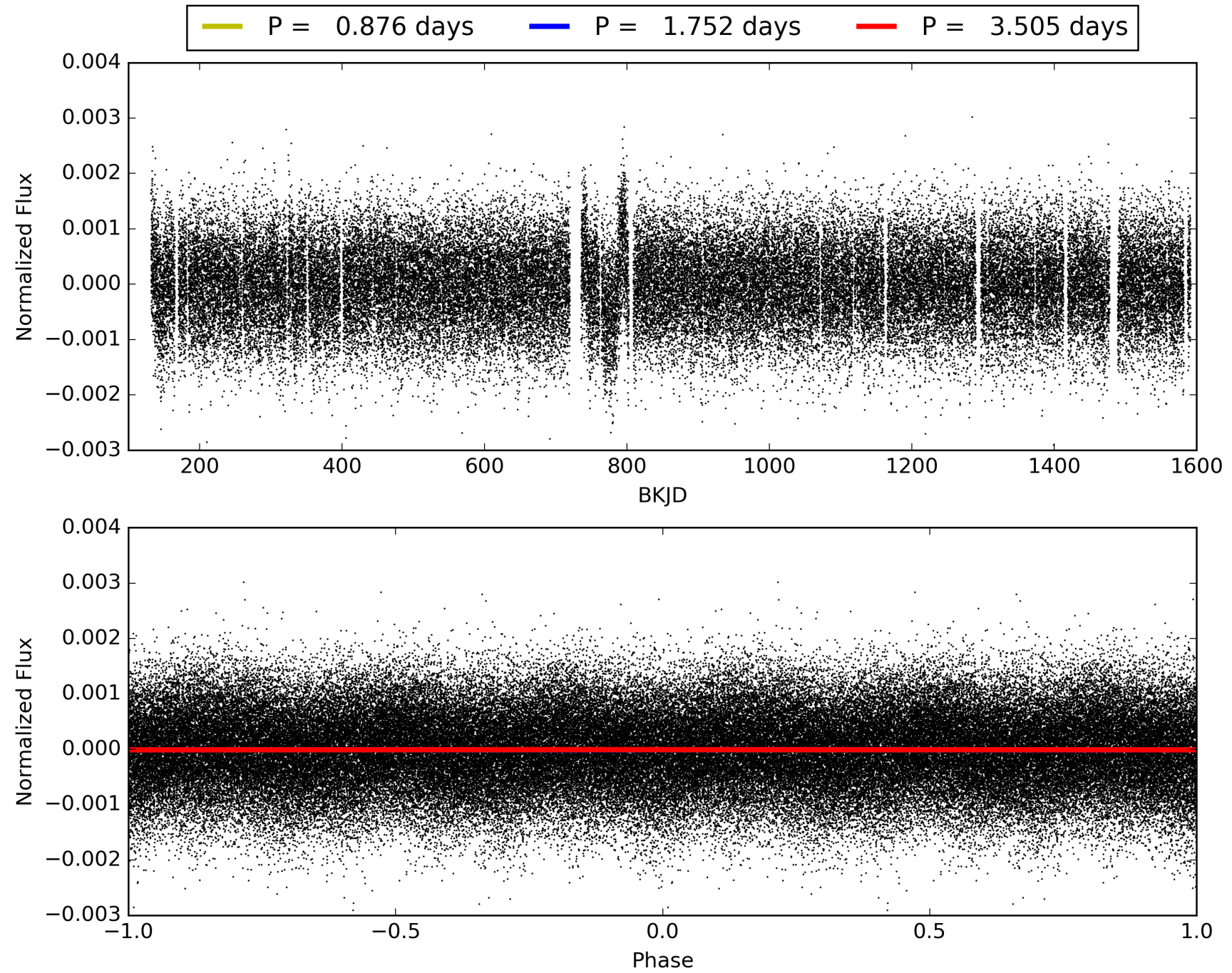
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:03:30 Z

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

TCE 008716028-01, PDC Light Curves

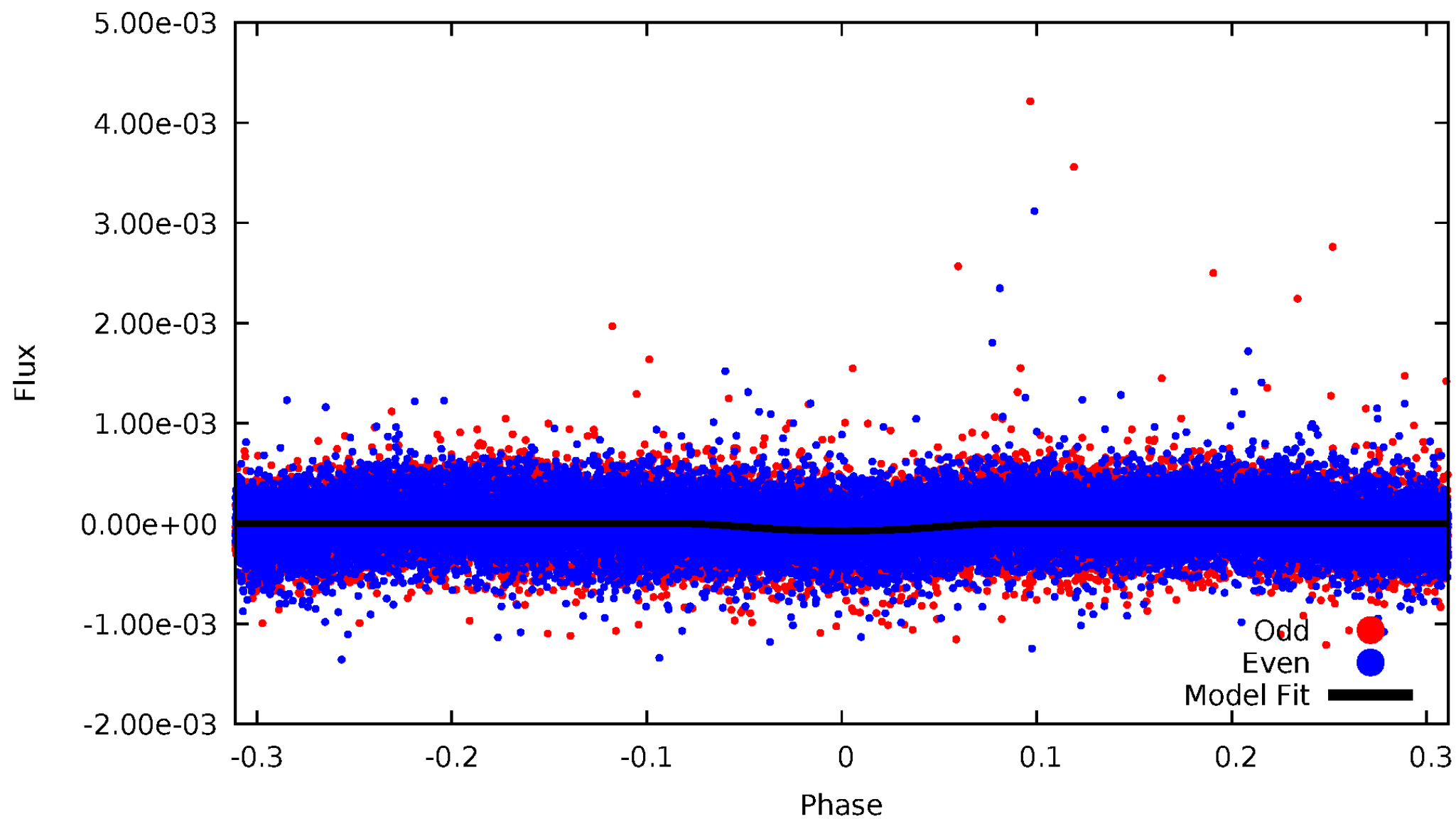


TCE 008716028-01



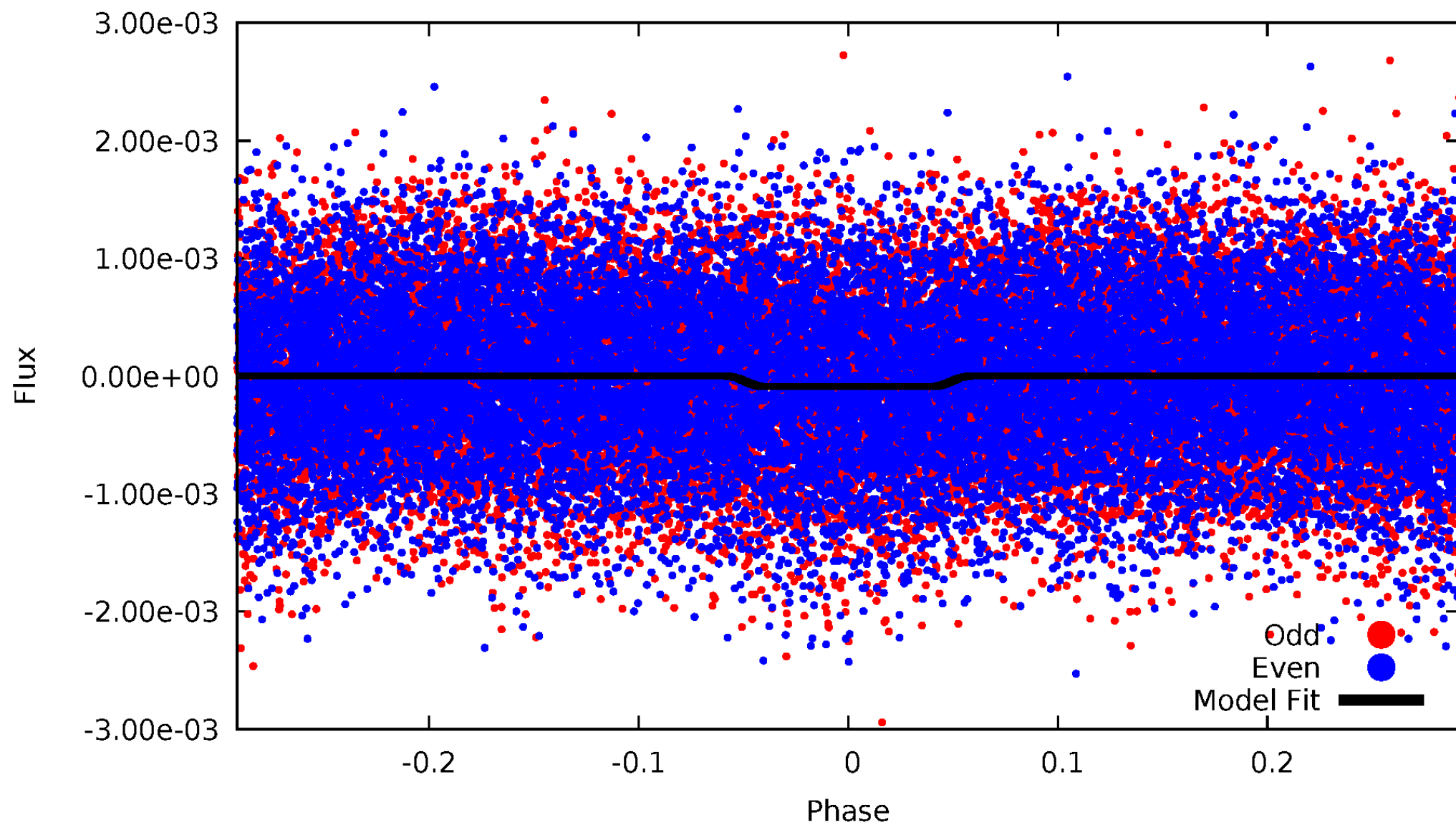
DV Odd/Even

TCE 008716028-01

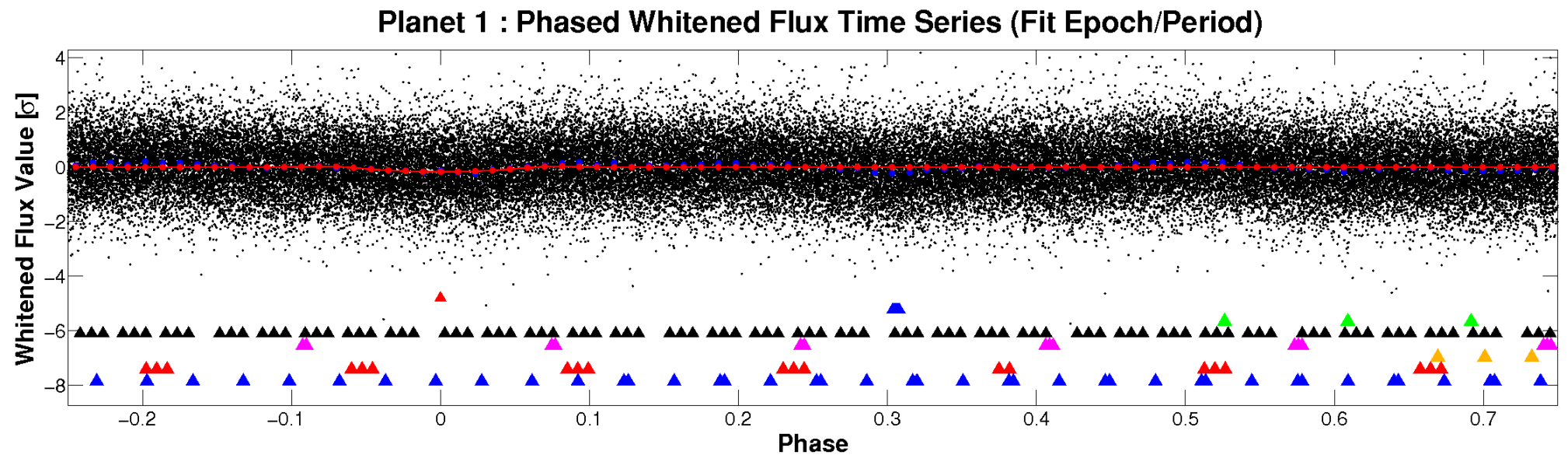
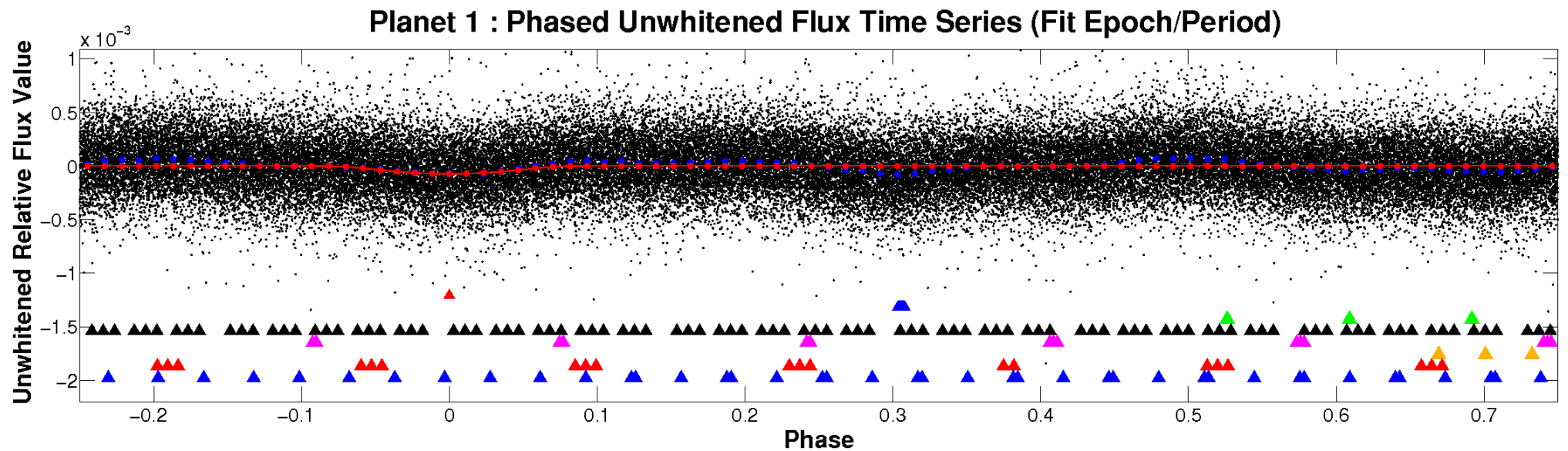


ALT Odd/Even

TCE 008716028-01

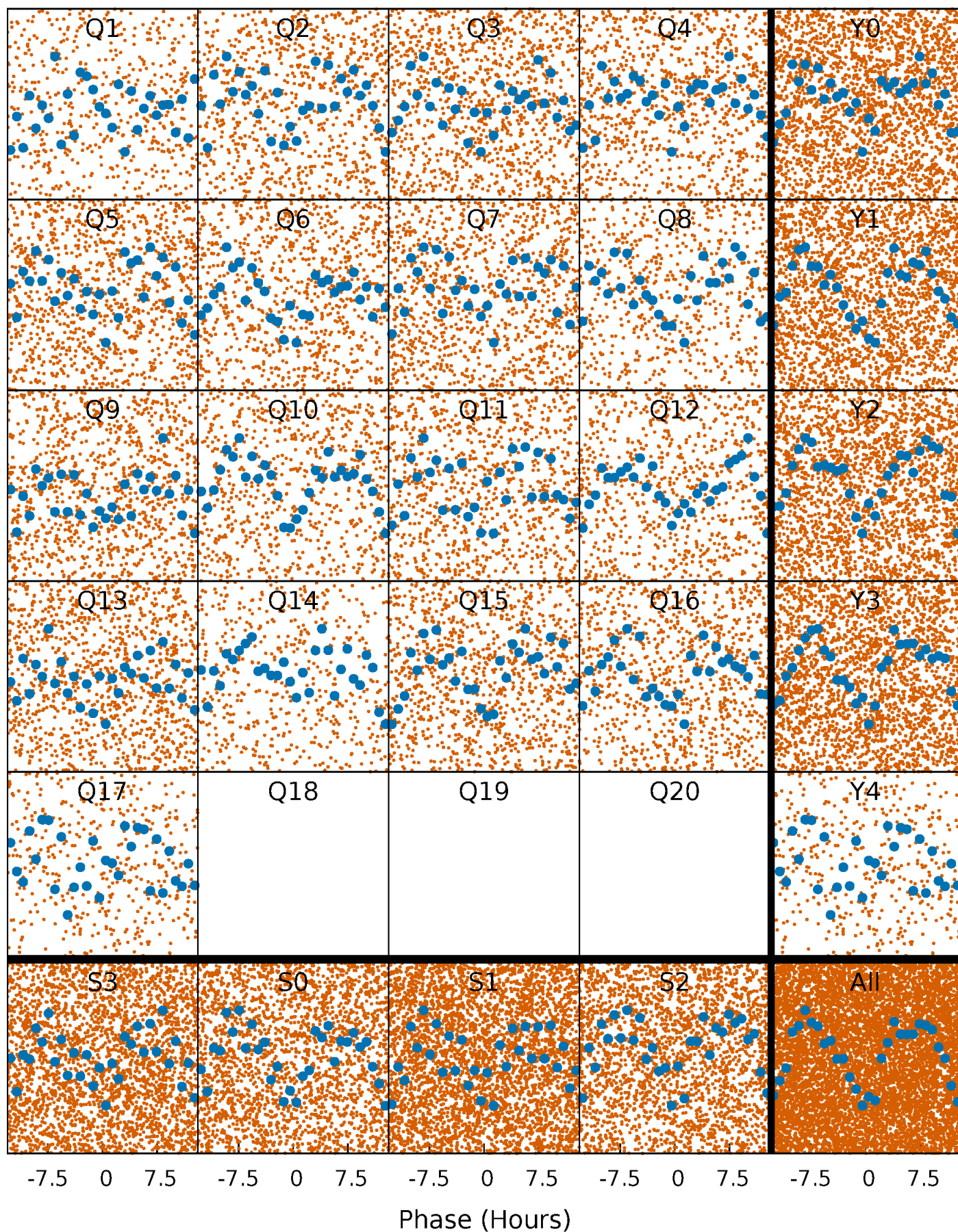


Non-Whitened Vs. Whitened Light Curve



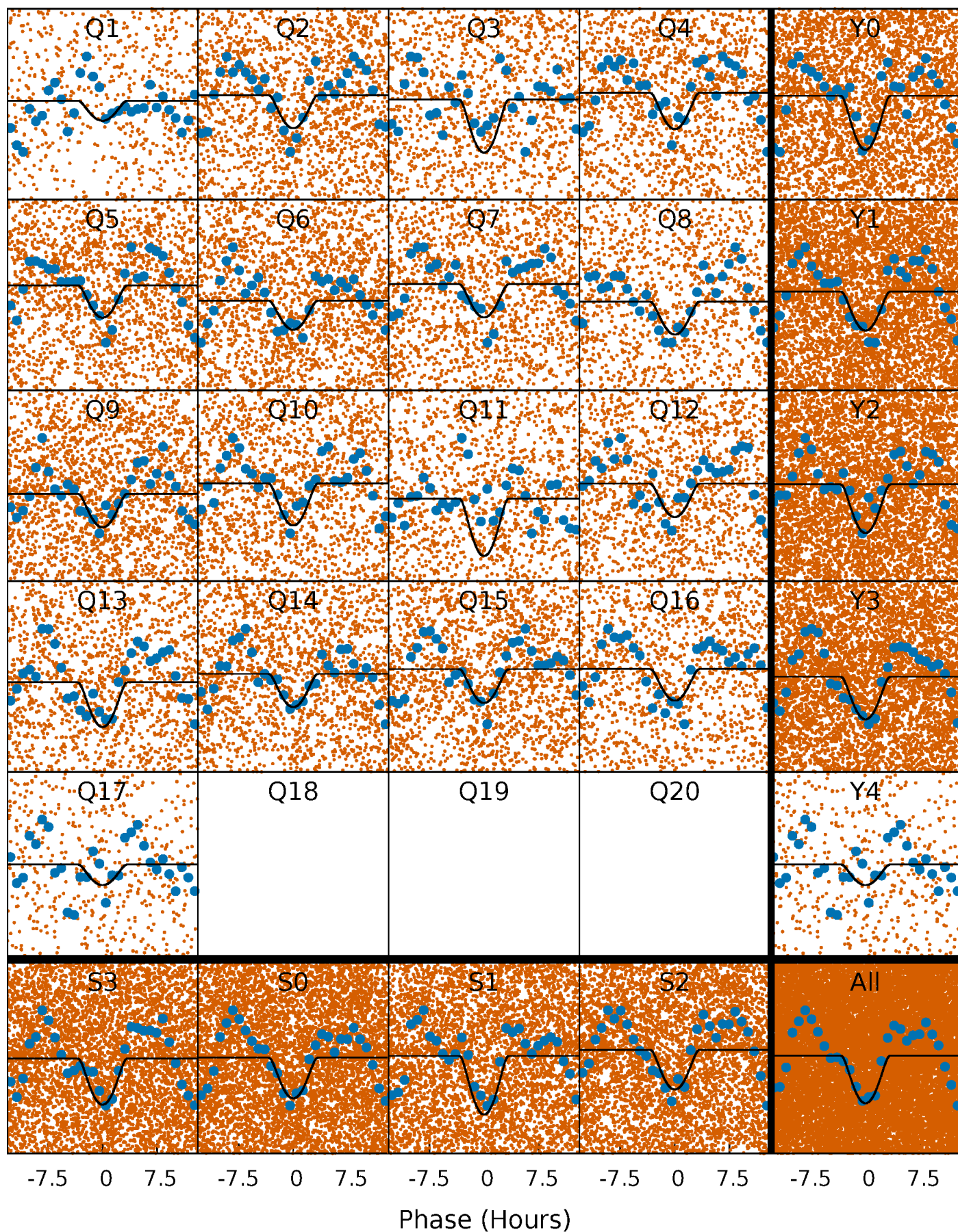
PDC Quarter-Phased Transit Curves

TCE 008716028-01 P= 1.752399 Days $T_0=132.775555$ (BKJD)



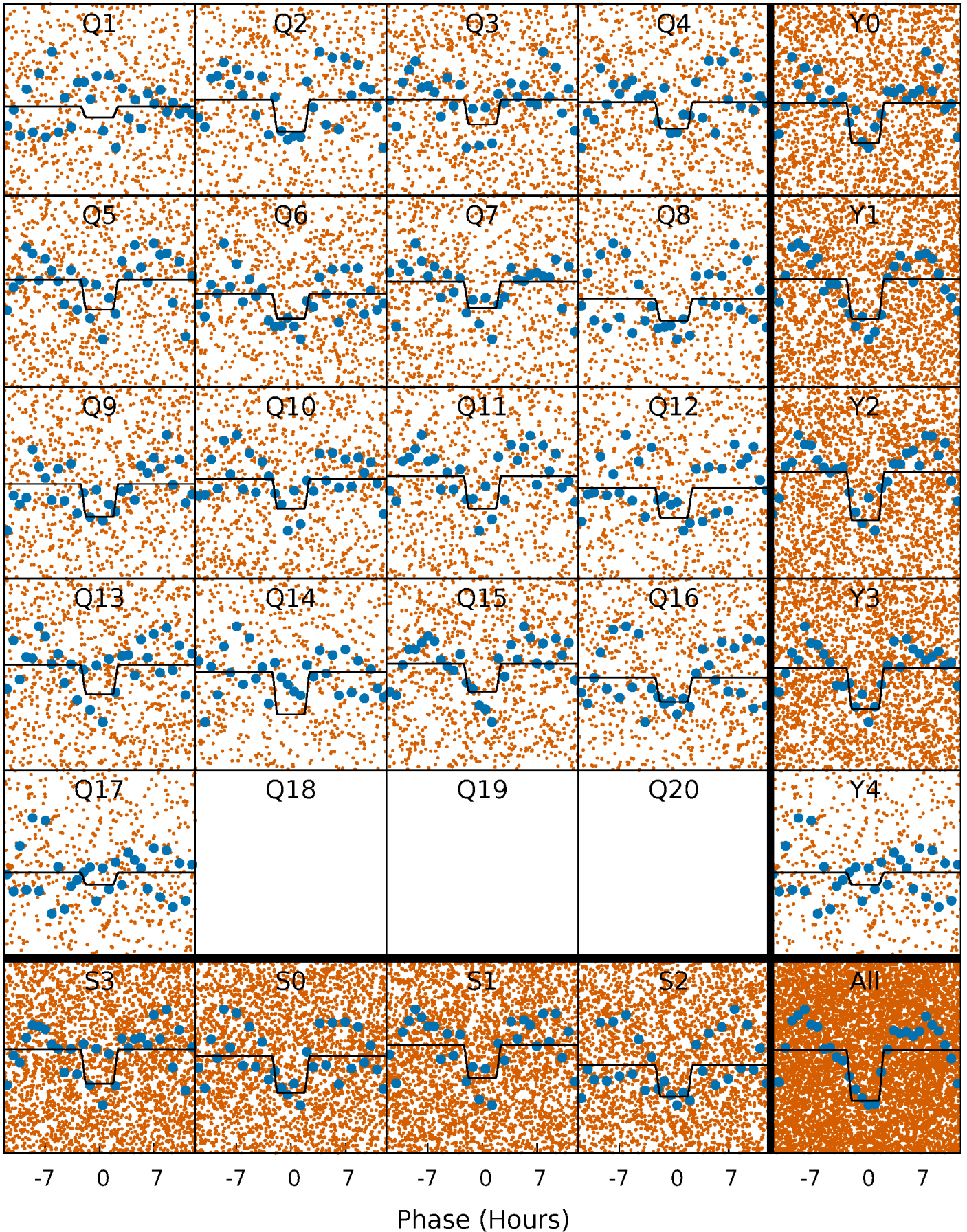
DV Quarter-Phased Transit Curves

TCE 008716028-01 P= 1.752399 Days $T_0=132.775555$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

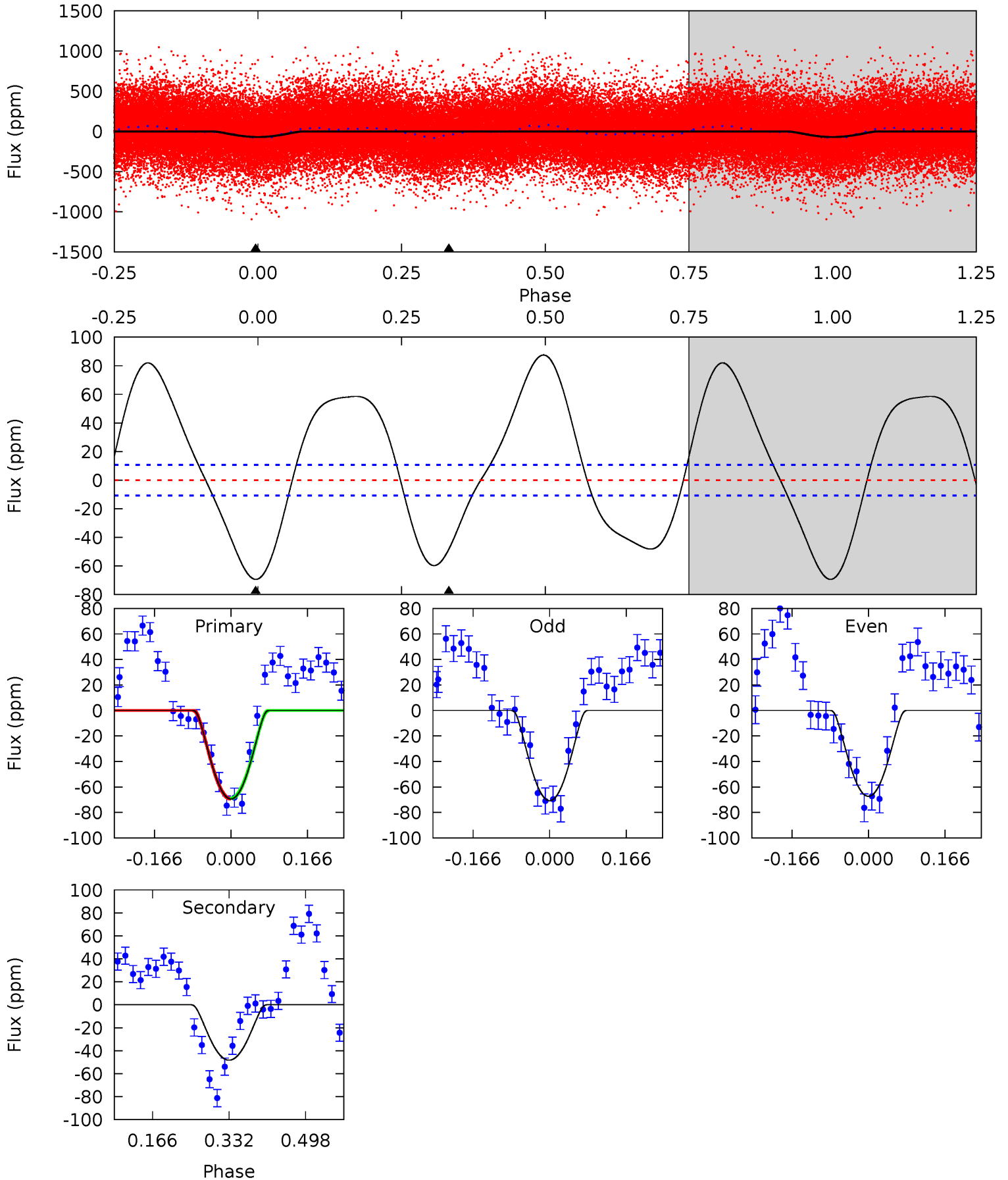
TCE 008716028-01 P= 1.752413 Days $T_0=132.763215$ (BKJD)



DV Model-Shift Uniqueness Test

008716028-01, P = 1.752399 Days, E = 131.023156 Days

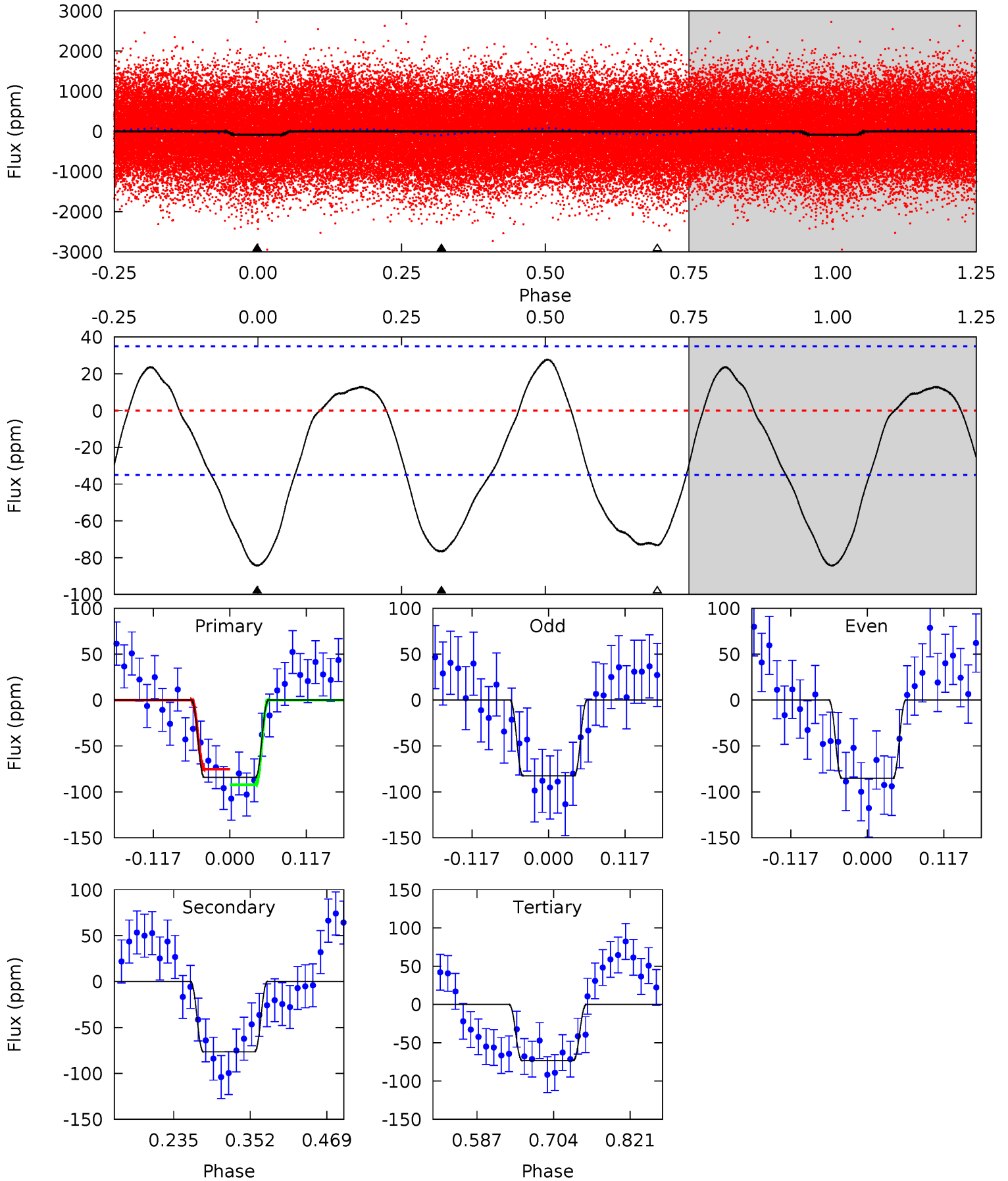
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.9	20.1	0	0	4.46	1.38	20.4	28.9	28.9	20.1	20.1	0.72	1.12	0.56	0.09



Alt Model-Shift Uniqueness Test

008716028-01, P = 1.752413 Days, E = 131.010802 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	9.92	9.50	0	4.53	1.57	4.48	1.42	10.9	0.42	9.92	0.17	1.27	0.25	1.10



Stellar Parameters For KIC 008716028

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6632^{+180}_{-240}	$3.903^{+0.364}_{-0.130}$	$-0.220^{+0.250}_{-0.300}$	$2.127^{+0.562}_{-0.842}$	$1.323^{+0.211}_{-0.234}$	$0.194^{+0.589}_{-0.070}$
	+3%/-4%	+9%/-3%	+114%/-136%	+26%/-40%	+16%/-18%	+304%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008716028-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-48 ± 2	$3.55^{+2.52}_{-2.06}$	3289^{+247}_{-332}	4331^{+2114}_{-916}	$2.092^{+9.757}_{-1.379}$
Alt.	-77 ± 8	$2.77^{+2.46}_{-1.76}$	3301^{+260}_{-347}	5326^{+4147}_{-1251}	$5.199^{+33.913}_{-3.686}$

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

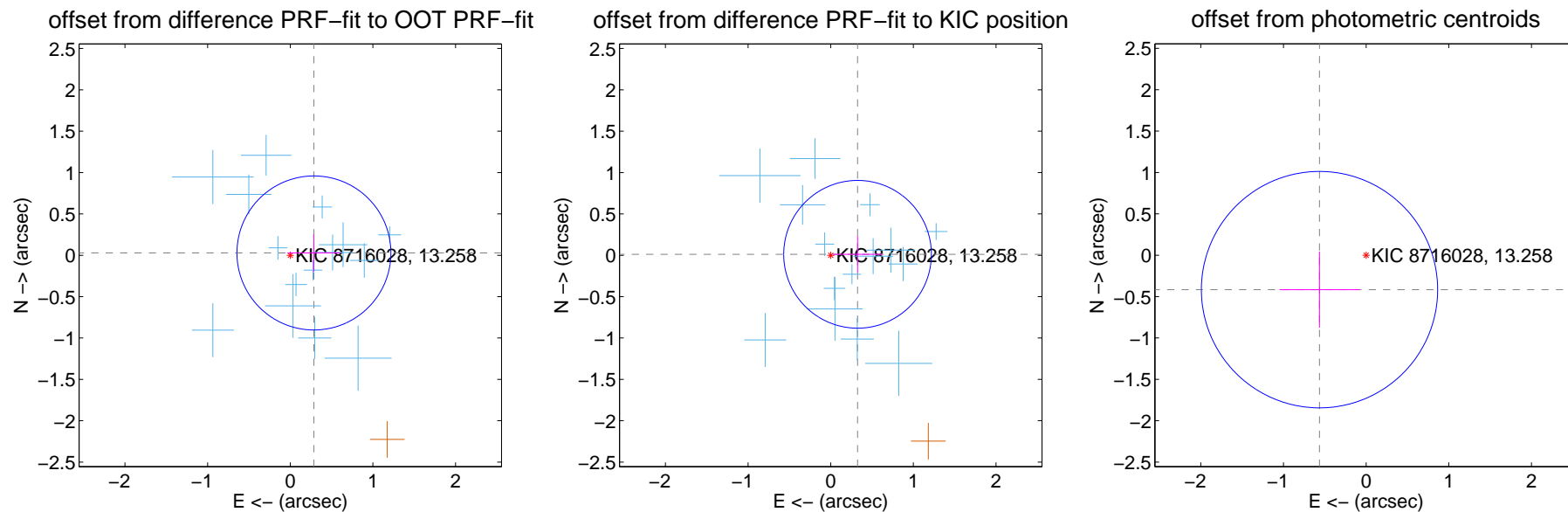
DV Centroid Data

Supplemental centroid analysis for 008716028-01. Kepler magnitude: 13.26. Transit SNR 11.72

There are 15 quarters with good PRF difference image offsets

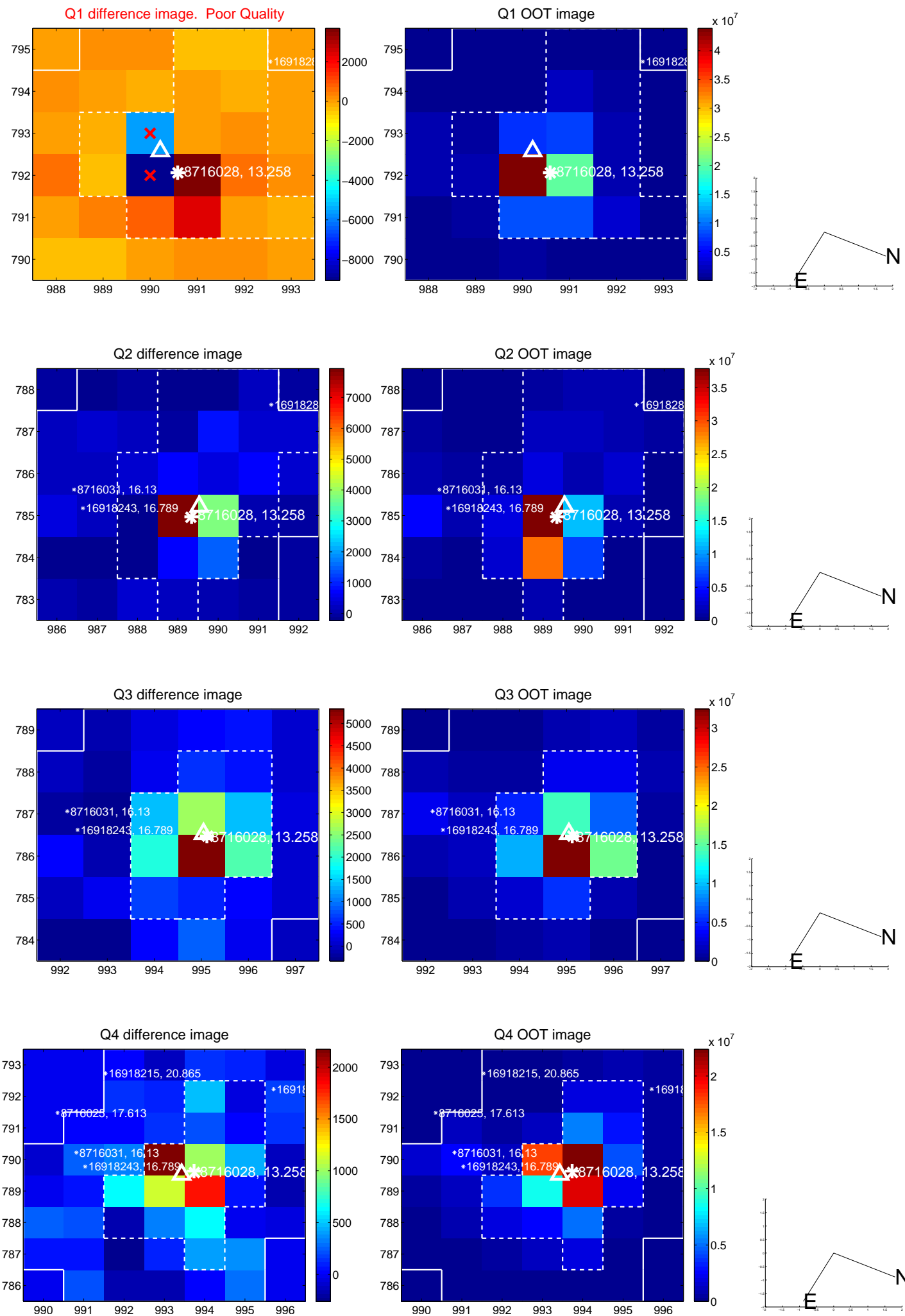
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.288 ± 0.310	0.93	-0.286 ± 0.319	0.028 ± 0.226
PRF-fit source offset from KIC position	0.325 ± 0.298	1.09	-0.324 ± 0.301	0.012 ± 0.220
photometric centroid source offset	0.70 ± 0.48	1.47	0.56 ± 0.49	-0.42 ± 0.46

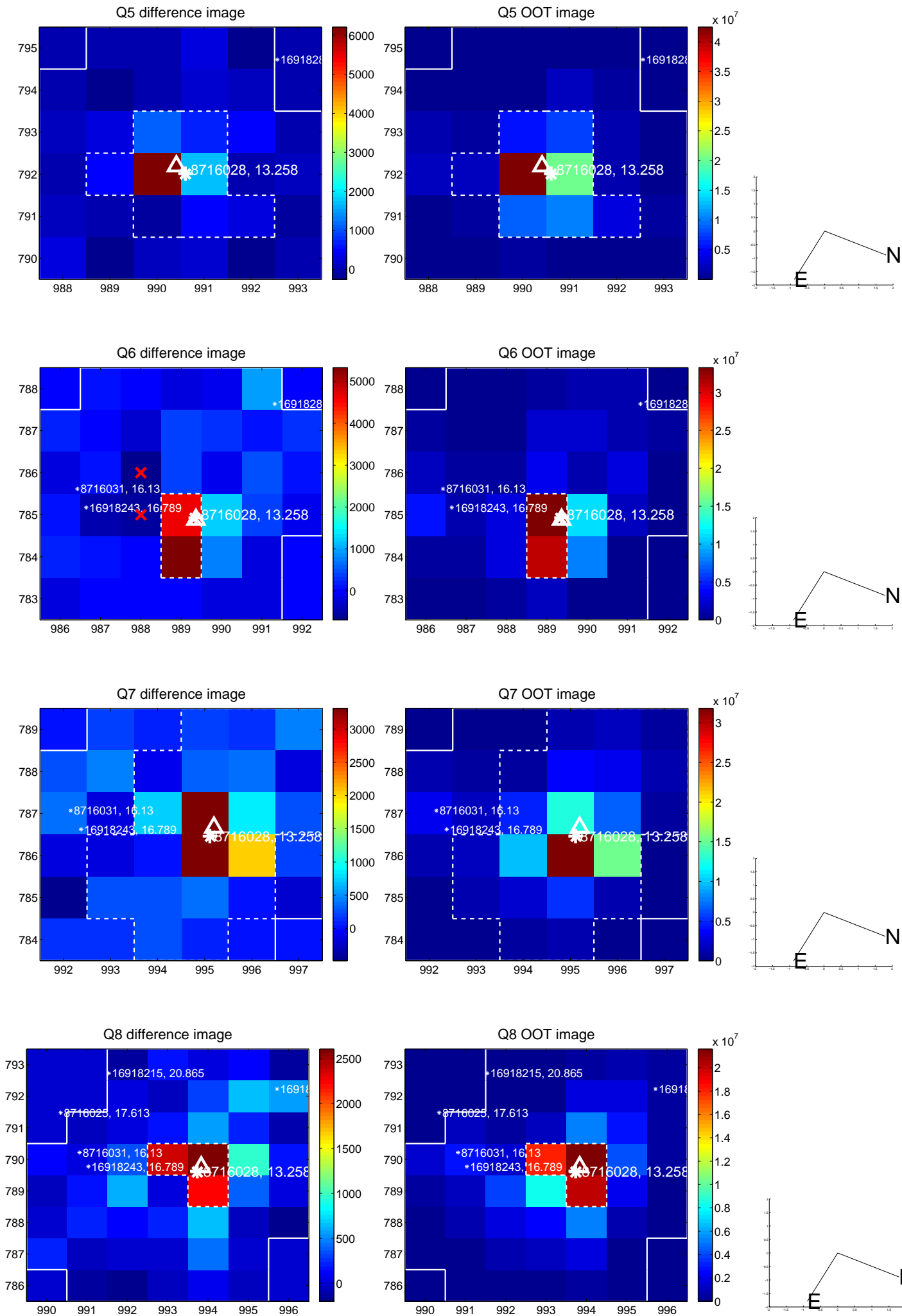


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

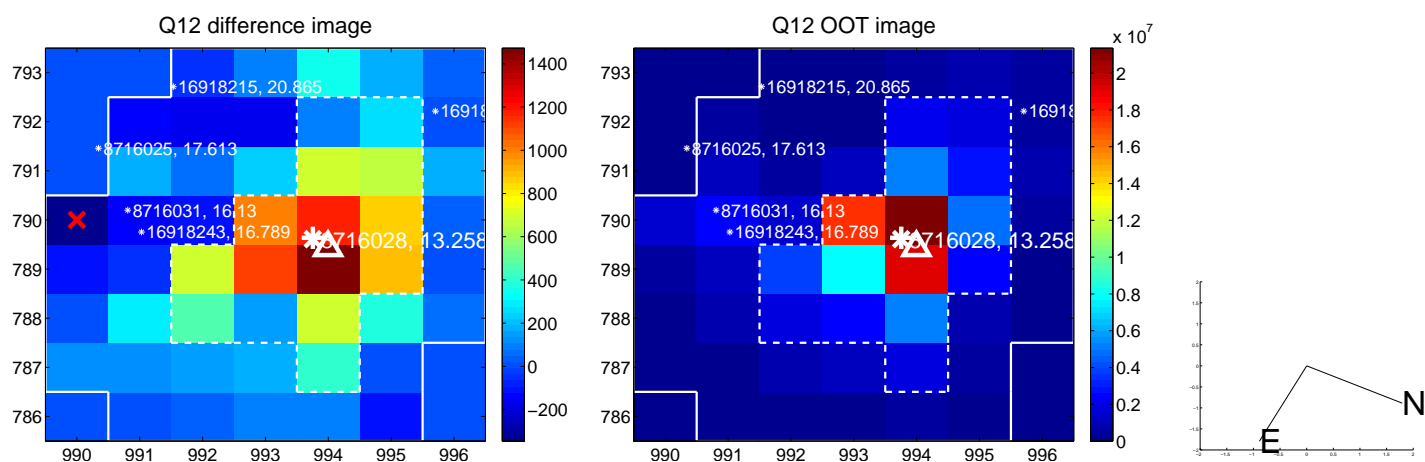
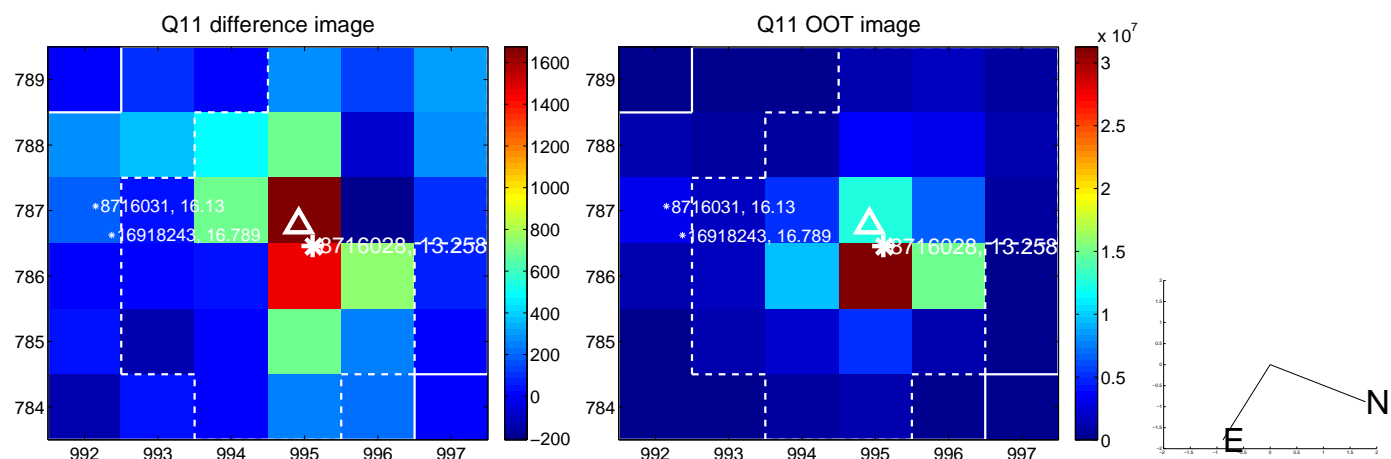
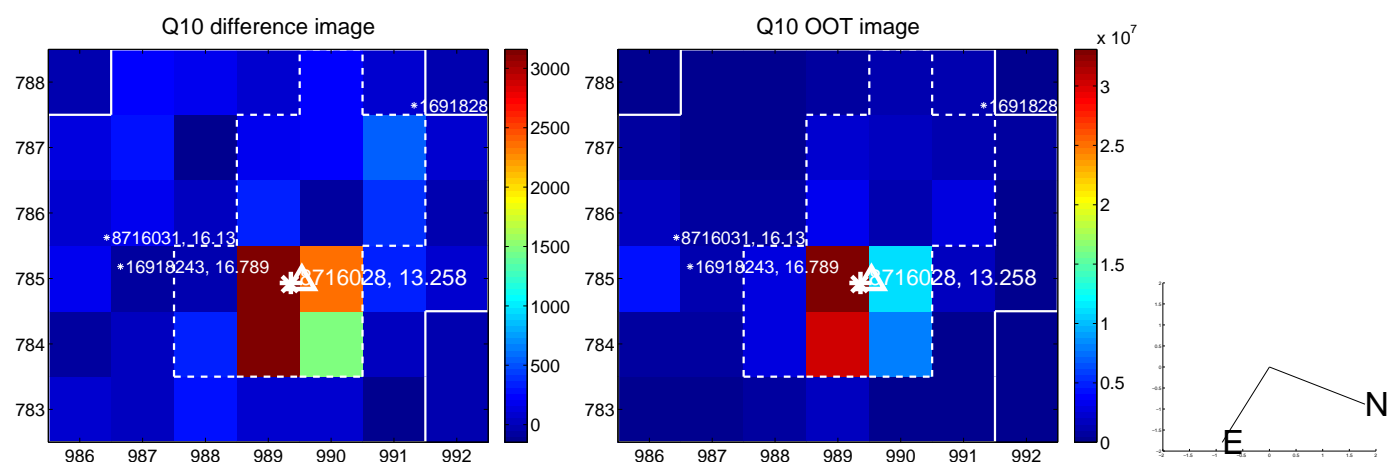
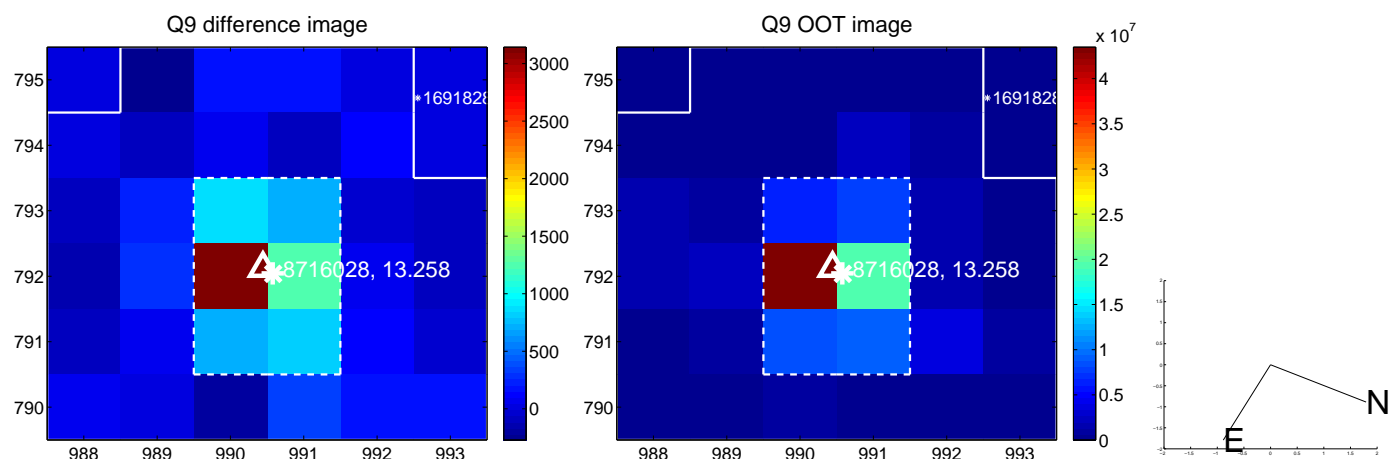
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



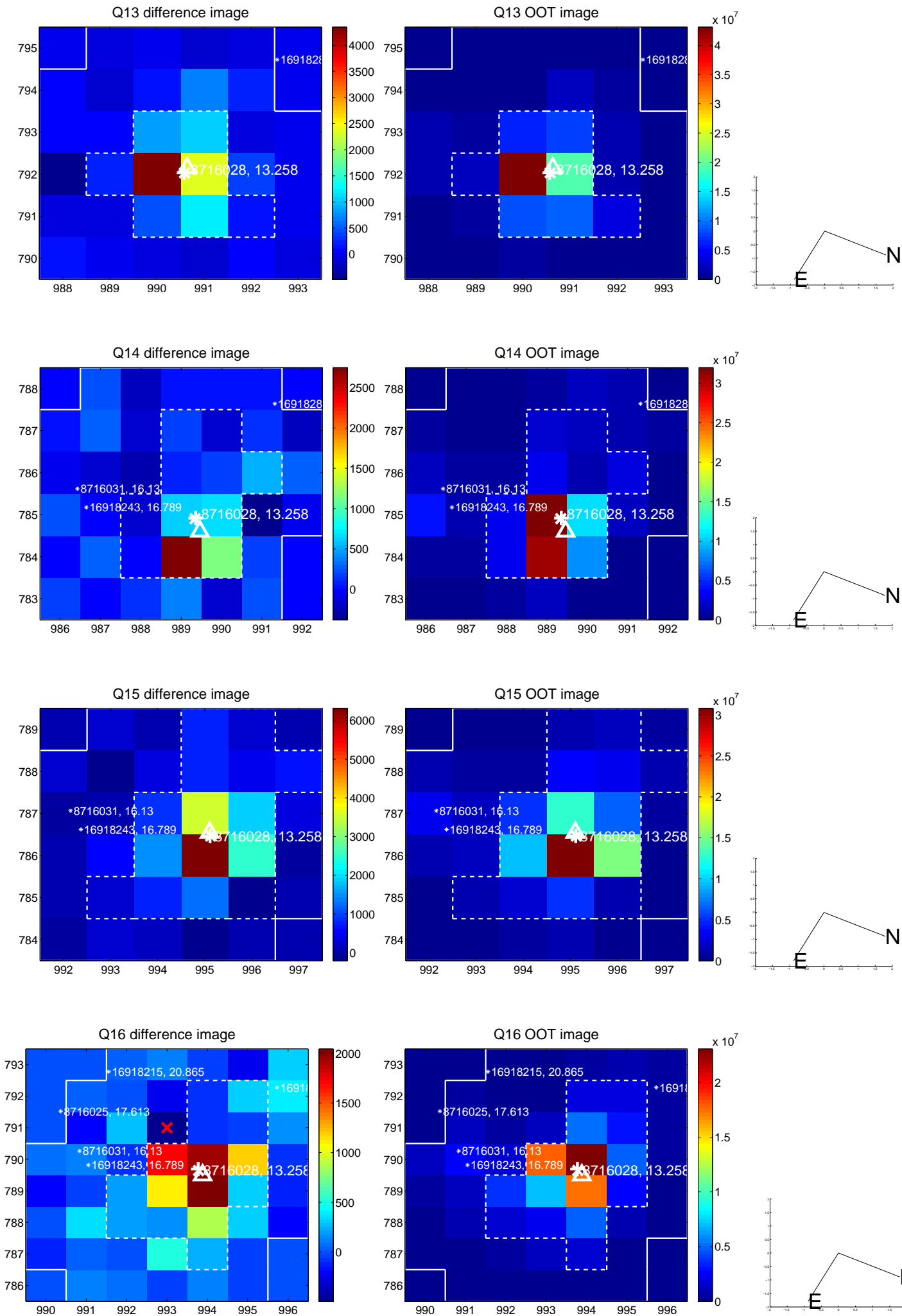
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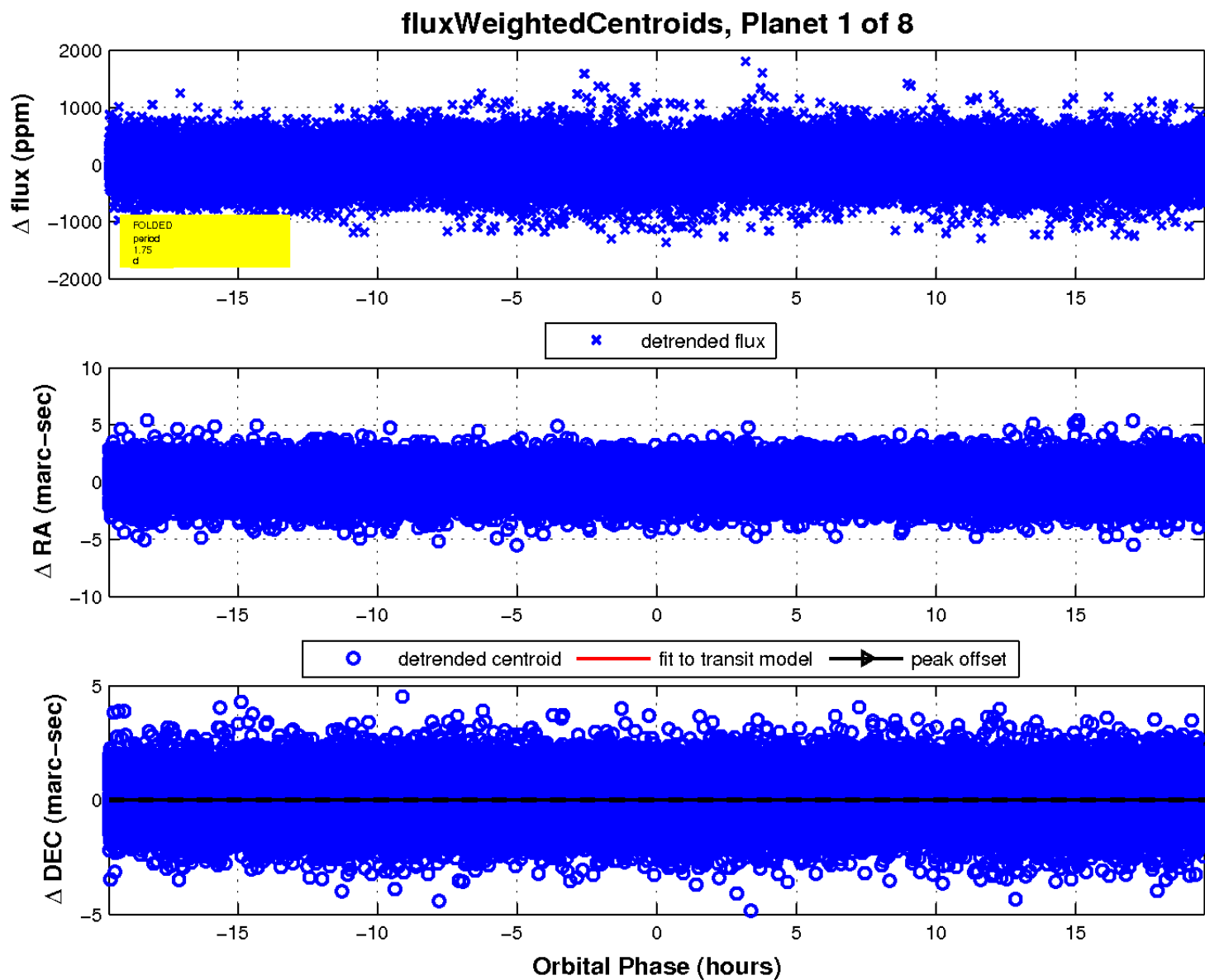
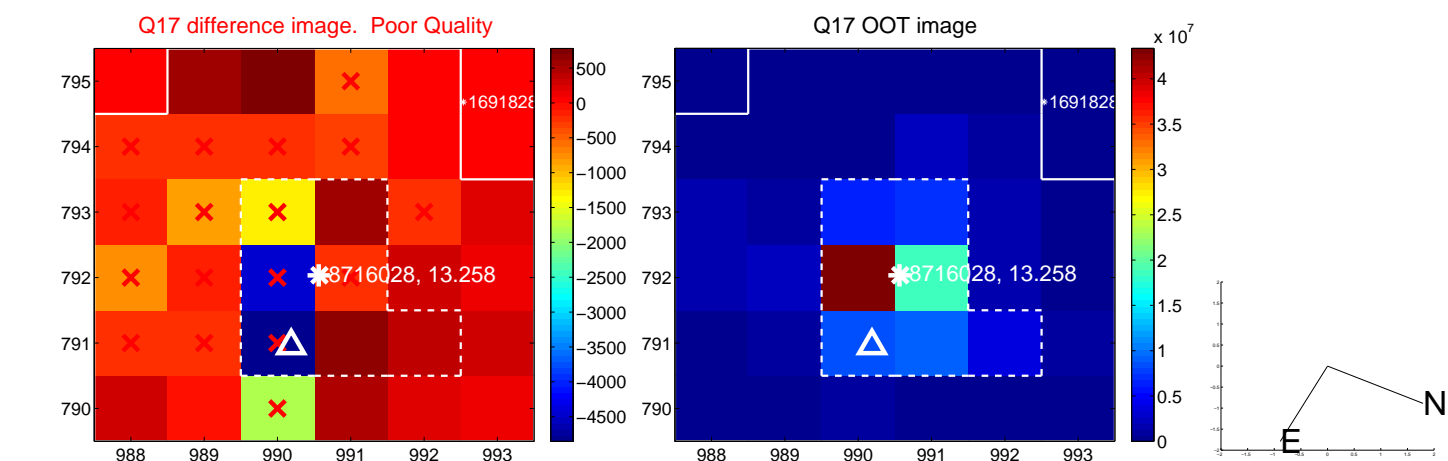
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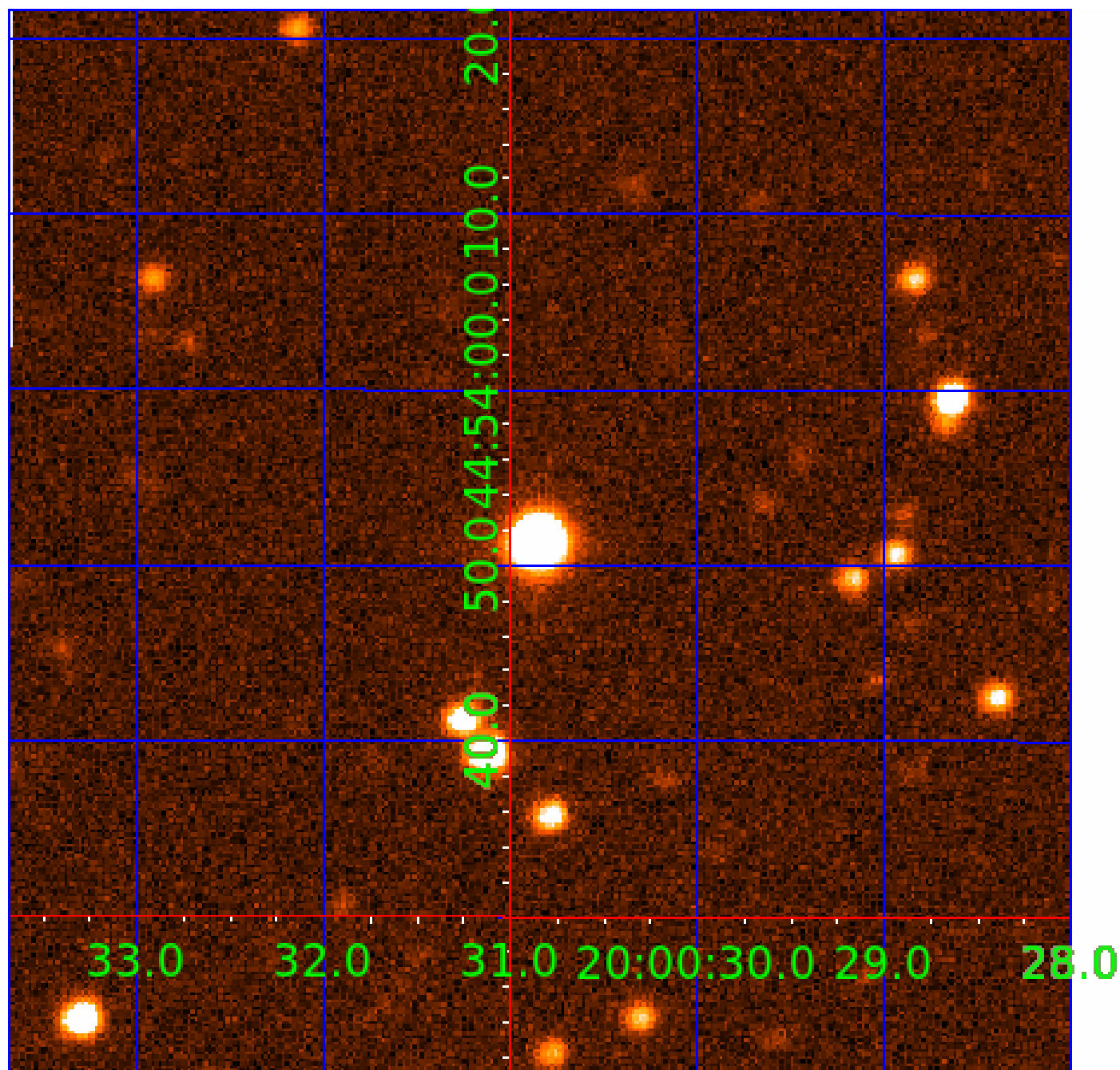


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008716028

Q1-17 DR25 TCE Parameters

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008716028-03	OBS	No	532.874333	152.974204	576.3	7.403	9.4	9.8	2.13	6632	6.02	3.94
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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008716028-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
008716028-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008716028-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008716028-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

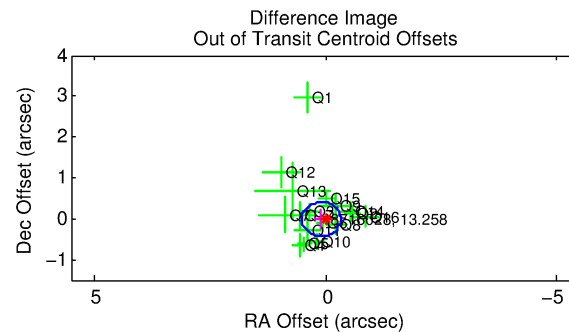
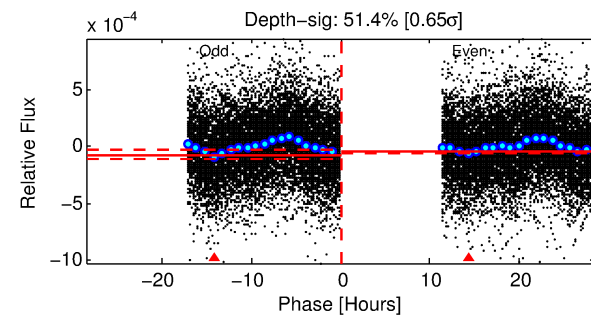
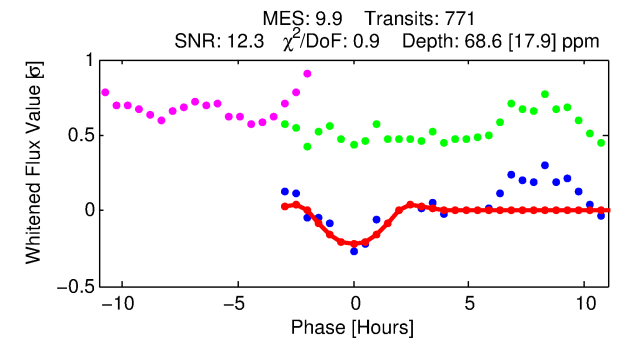
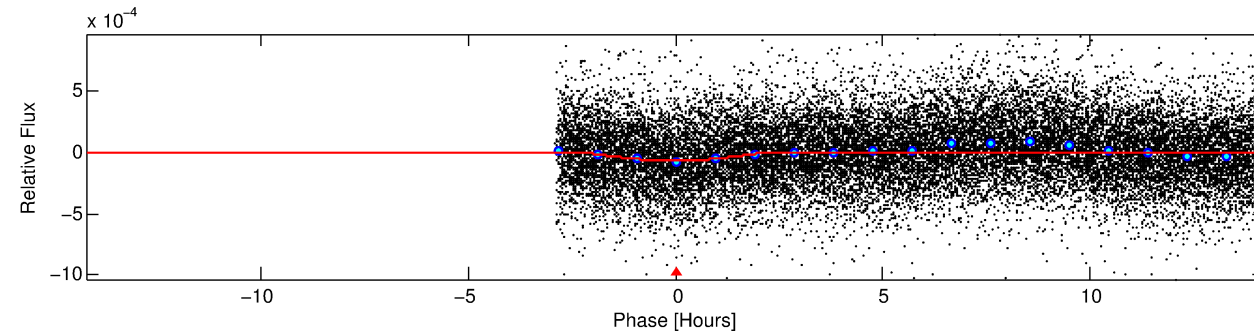
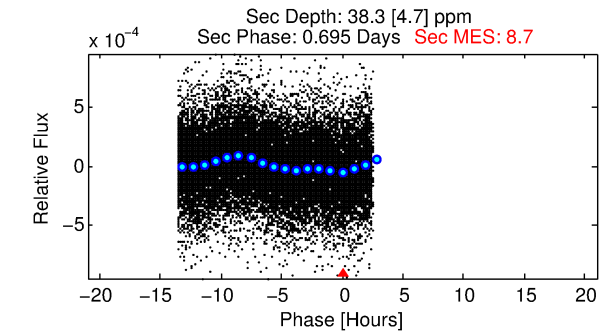
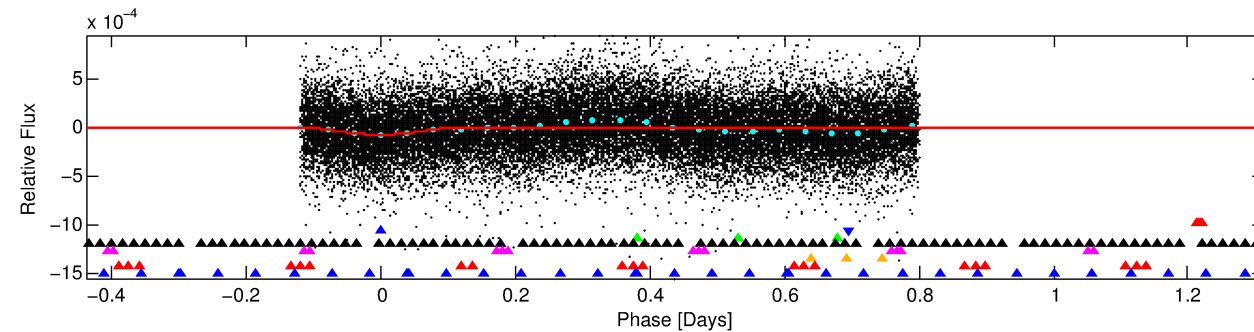
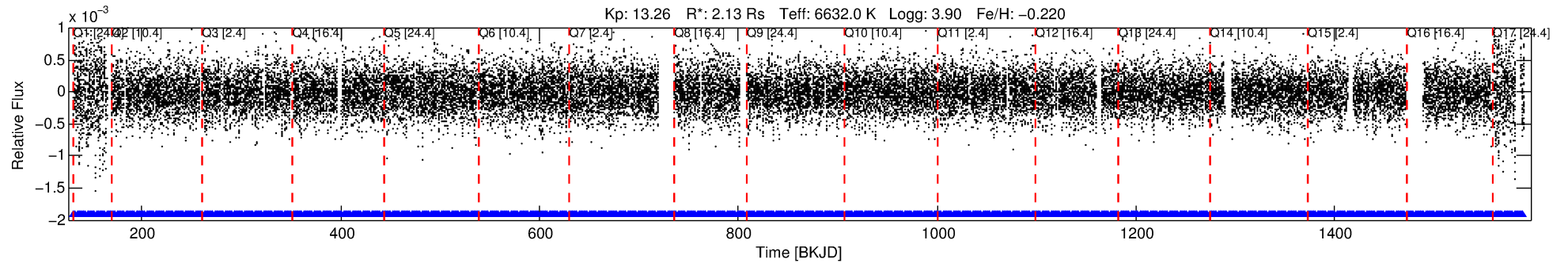
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008716028-02

No Significant Match Found

DV One-Page Summary

KIC: 8716028 Candidate: 2 of 8 Period: 1.752 d



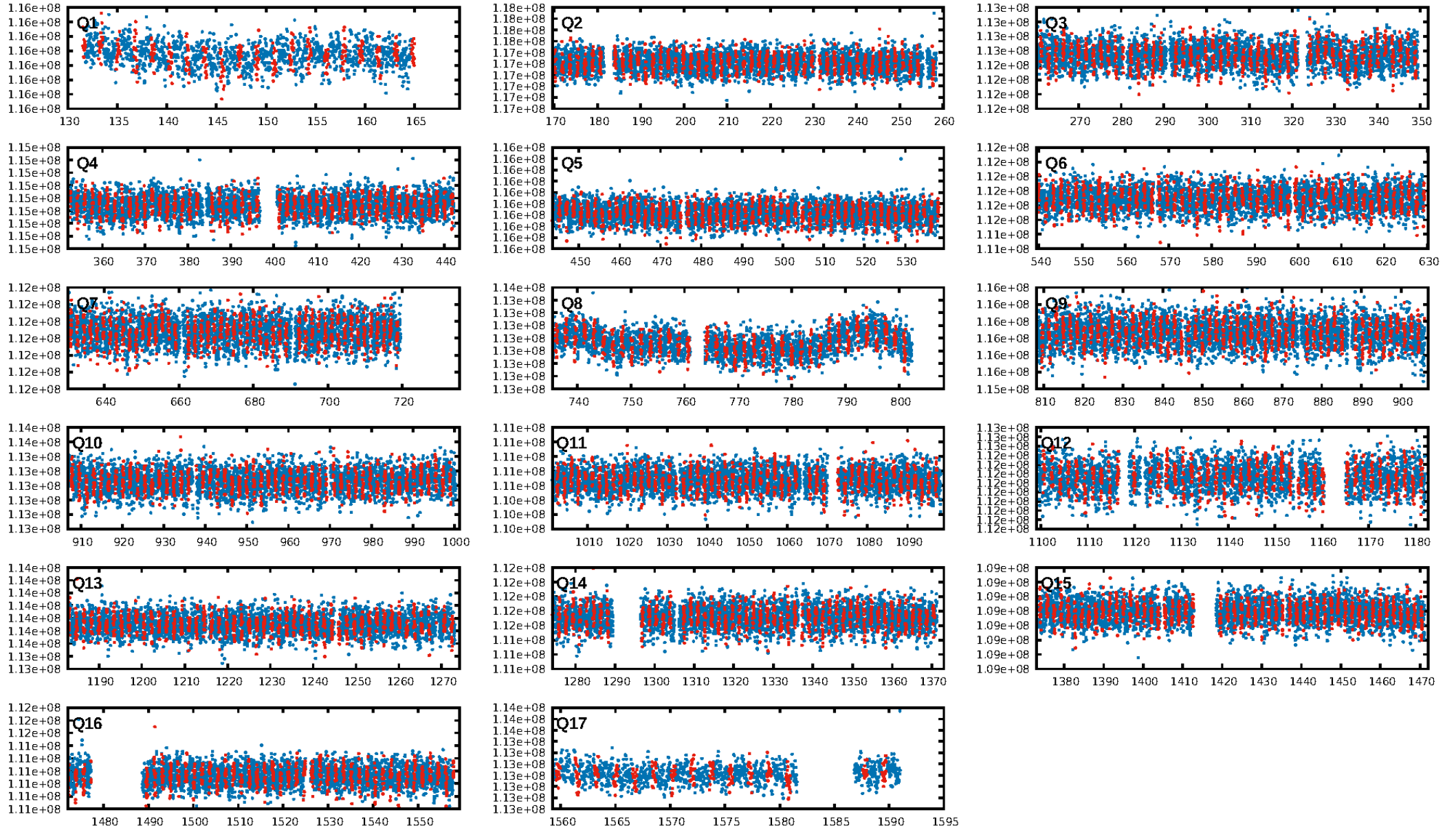
DV Fit Results:

Period = 1.75239 [0.00002] d
Epoch = 131.5631 [0.0057] BKJD
Rp/R* = 0.0139 [0.0179]
a/R* = 1.13 [0.08]
b = 1.00 [0.03]
Seff = 8050.26 [5109.31]
Teq = 2415 [383] K
Rp = 3.23 [4.34] Re
a = 0.0312 [0.0120] AU
Ag = 1.97 [5.21] [0.19σ]
Teffp = 4424 [2847] K [0.70σ]

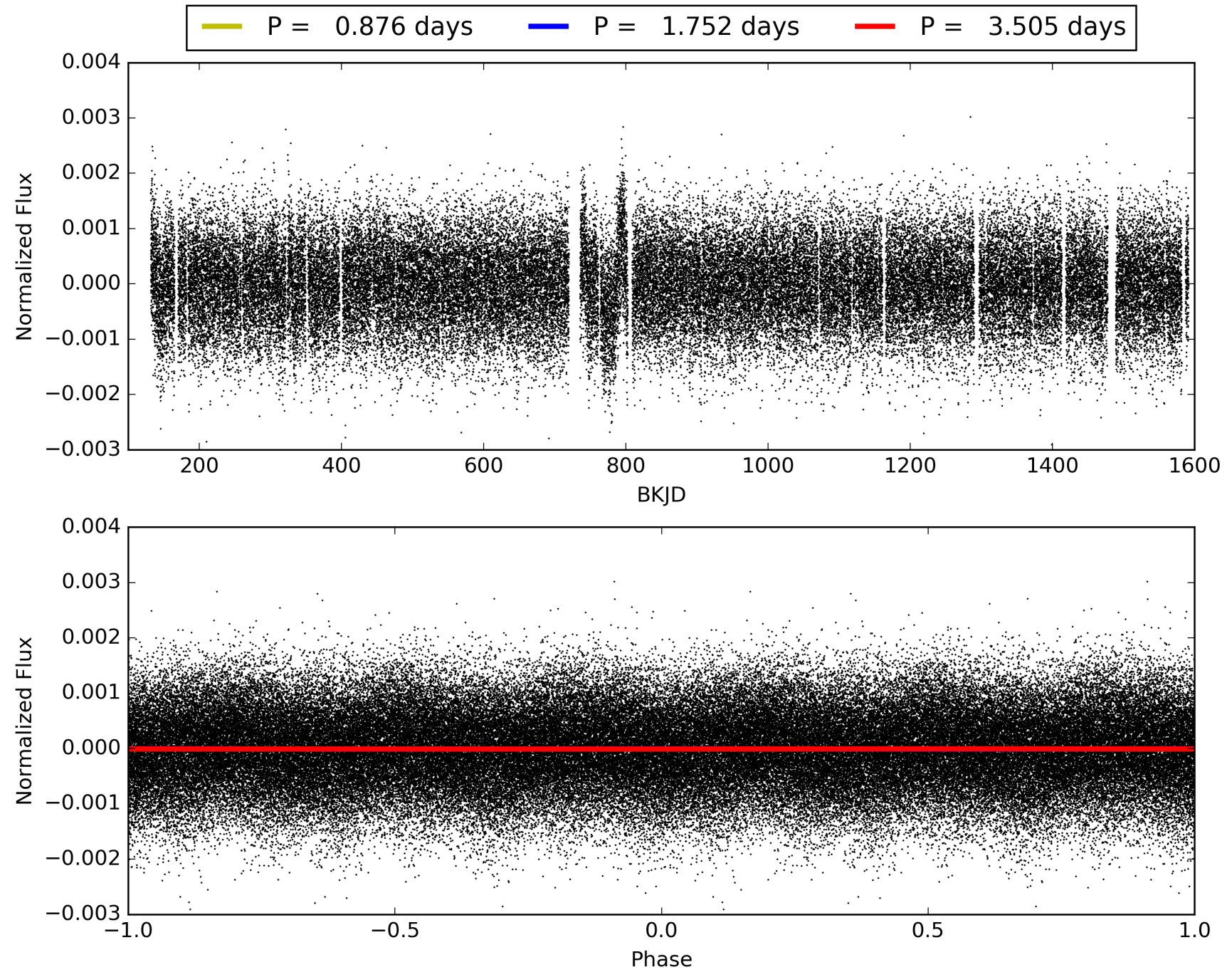
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [736/736]
GhostDiagnostic-chr: 1.985
Centroid-sig: N/A
Centroid-so: 0.239 arcsec [0.42σ]
OotOffset-rm: 0.091 arcsec [0.65σ]
KicOffset-rm: 0.046 arcsec [0.26σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 008716028-02, PDC Light Curves

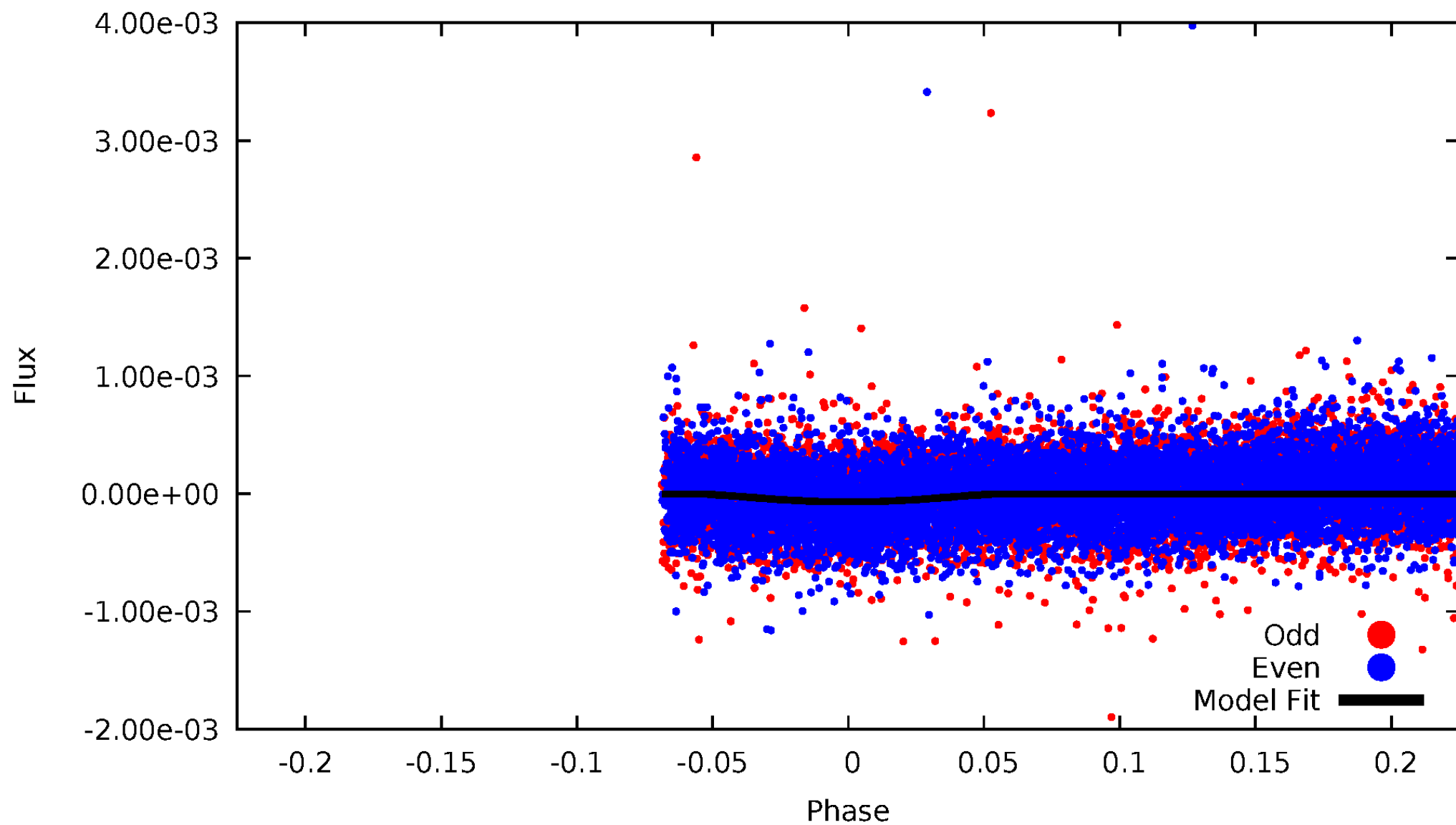


TCE 008716028-02



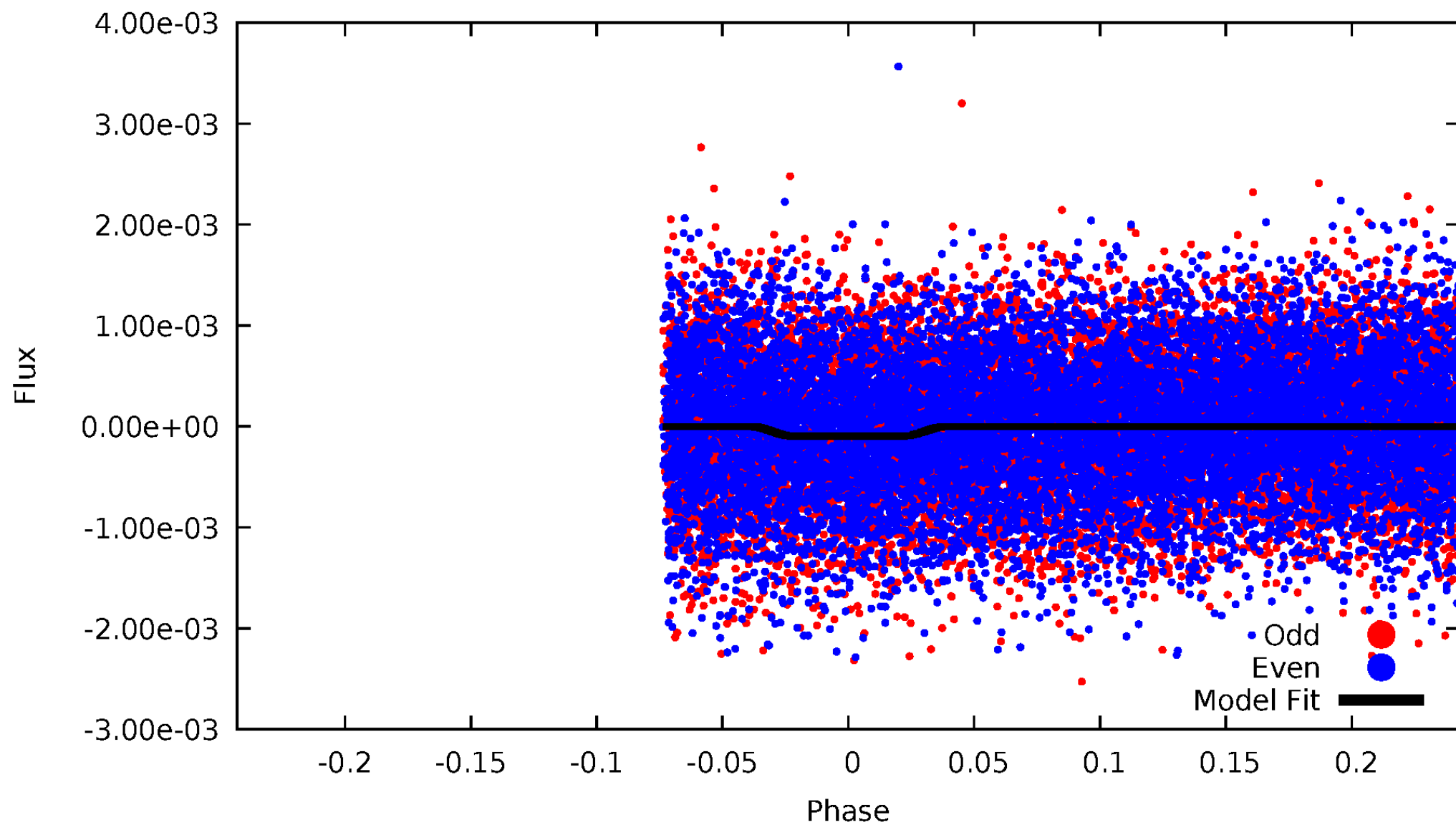
DV Odd/Even

TCE 008716028-02



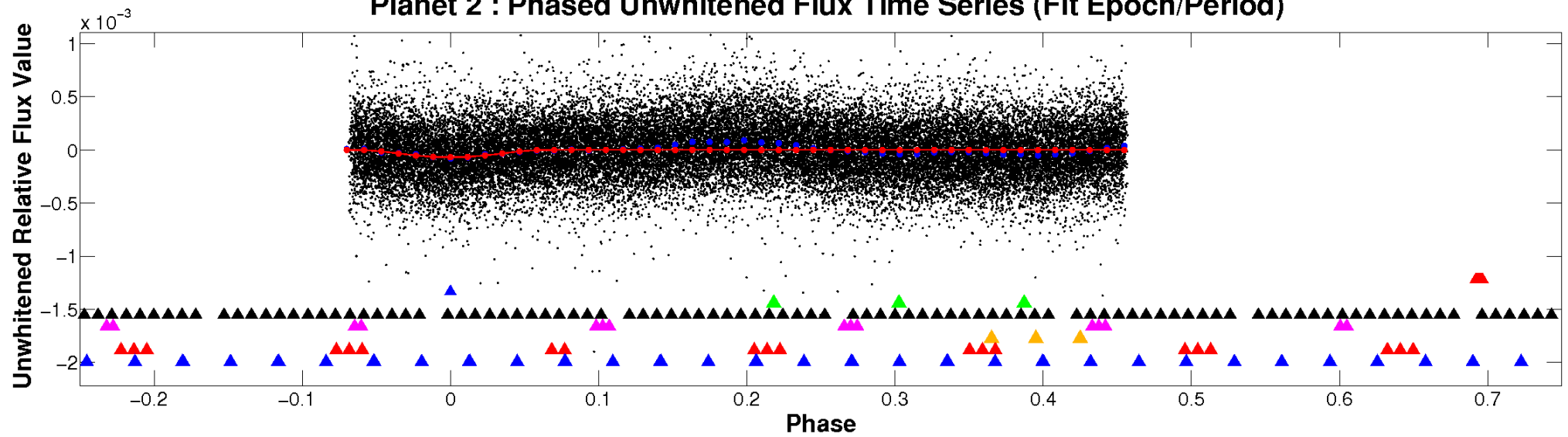
ALT Odd/Even

TCE 008716028-02

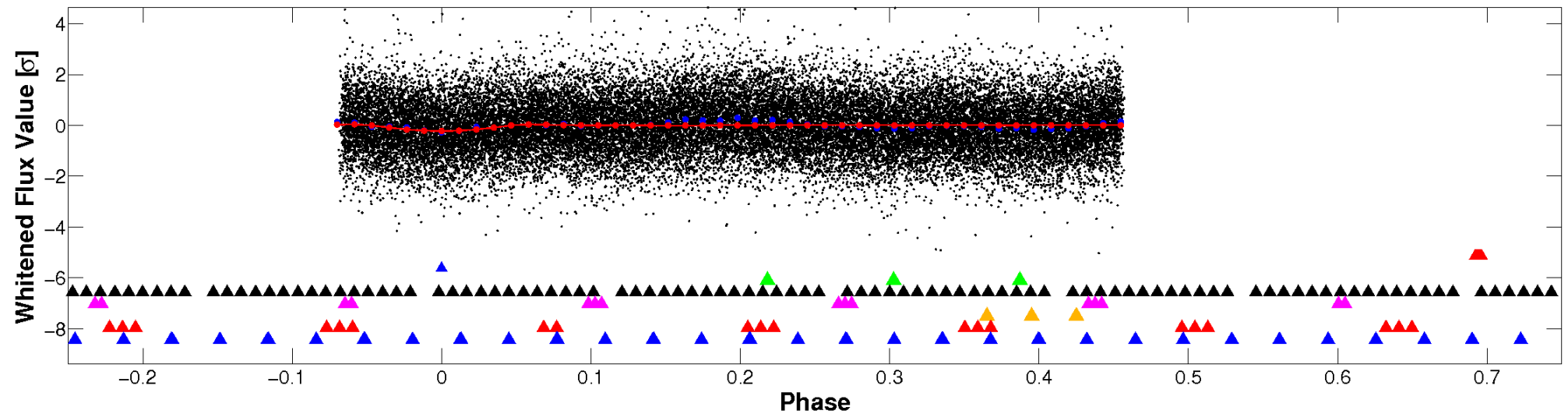


Non-Whitened Vs. Whitened Light Curve

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

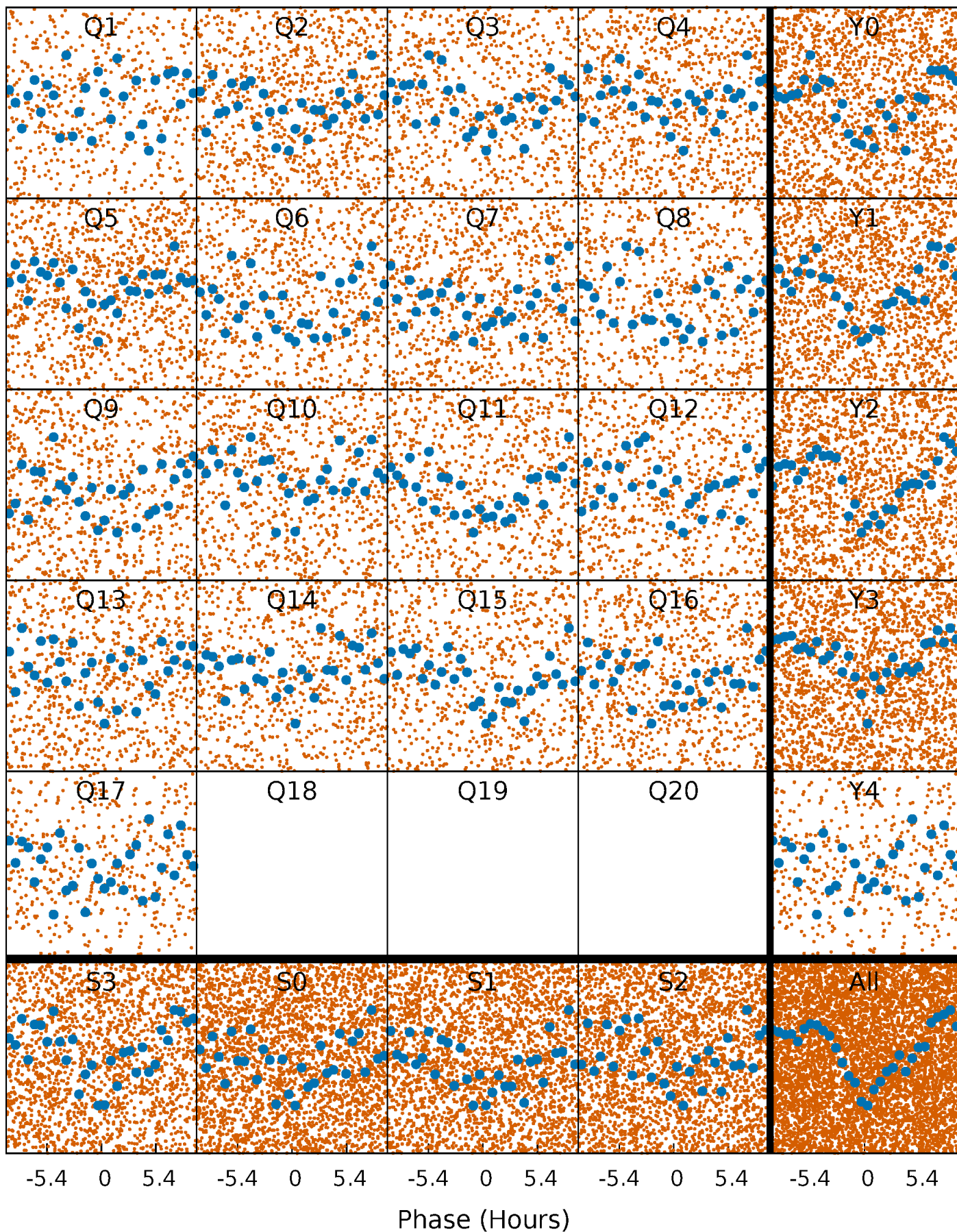


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



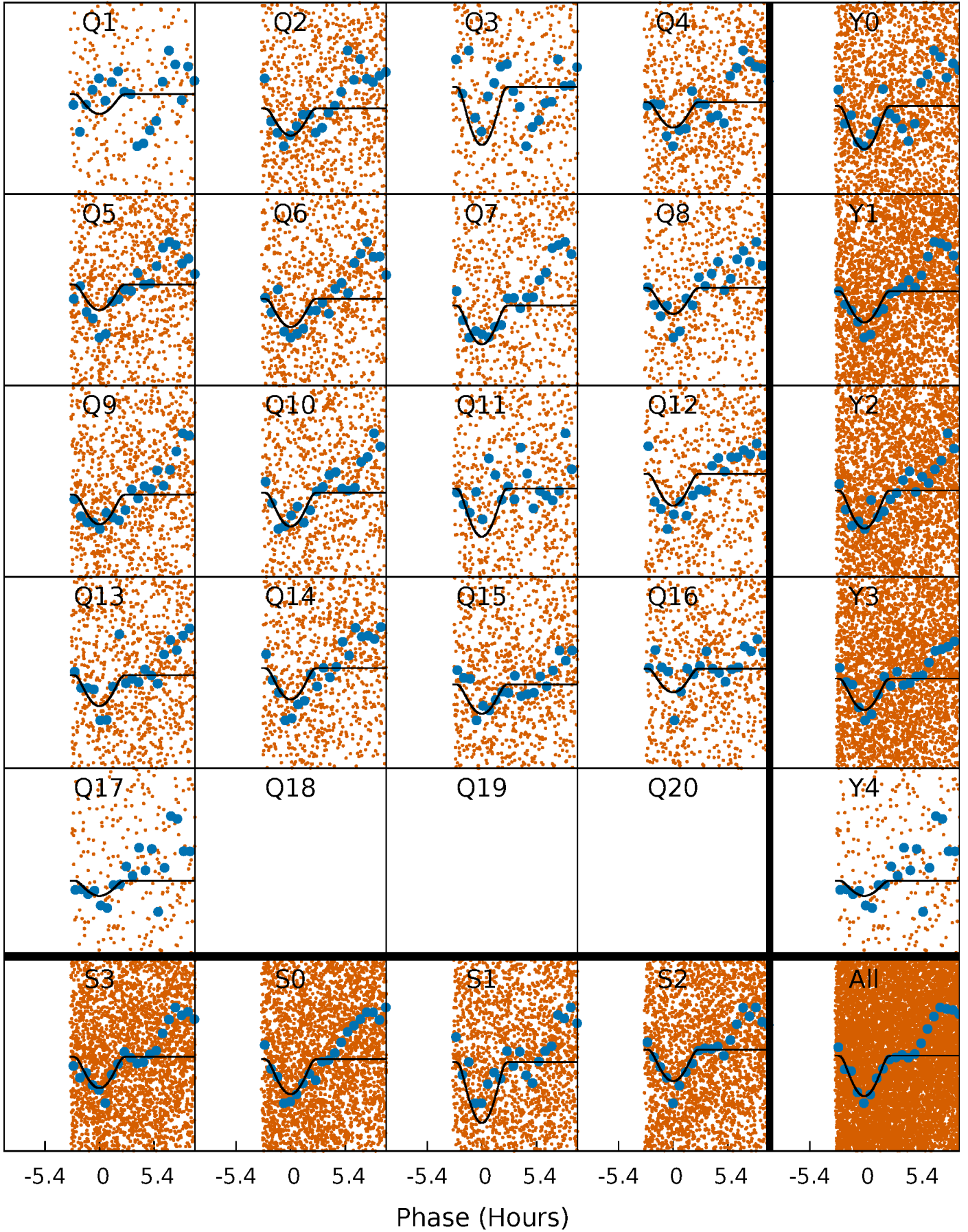
PDC Quarter-Phased Transit Curves

TCE 008716028-02 P= 1.752389 Days $T_0=131.563135$ (BKJD)



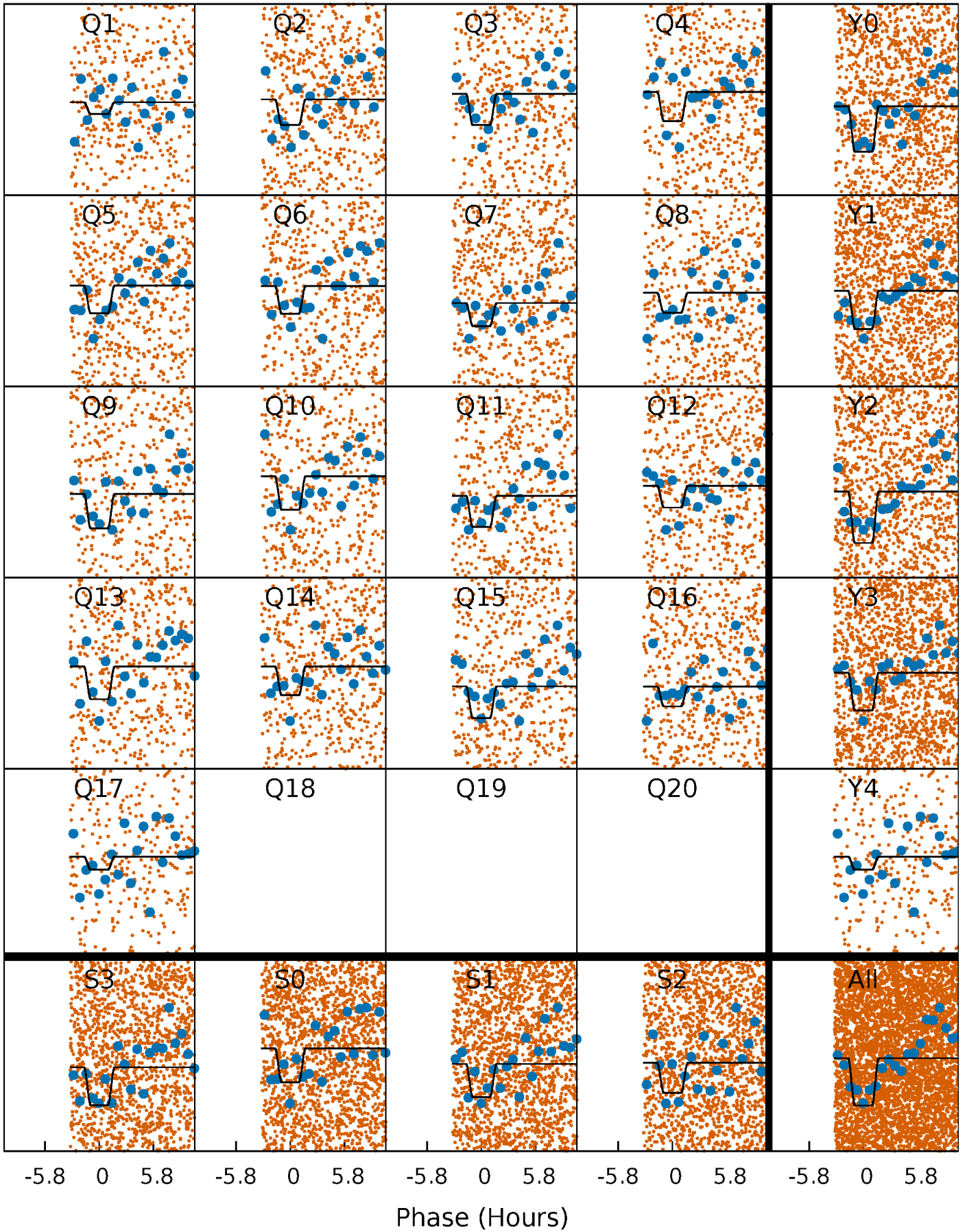
DV Quarter-Phased Transit Curves

TCE 008716028-02 P= 1.752389 Days $T_0=131.563135$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

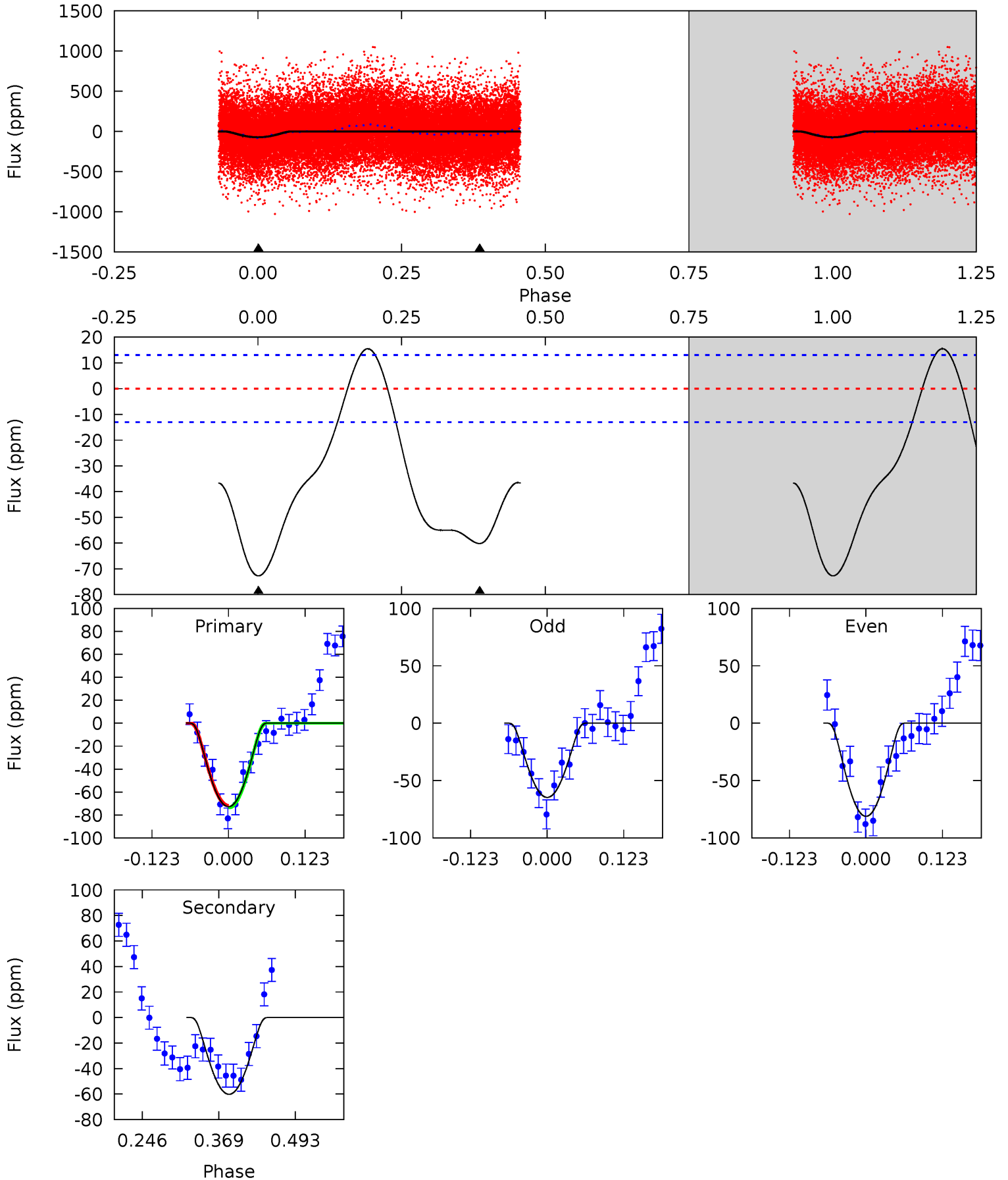
TCE 008716028-02 P= 1.752405 Days $T_0=131.566535$ (BKJD)



DV Model-Shift Uniqueness Test

008716028-02, P = 1.752389 Days, E = 129.810746 Days

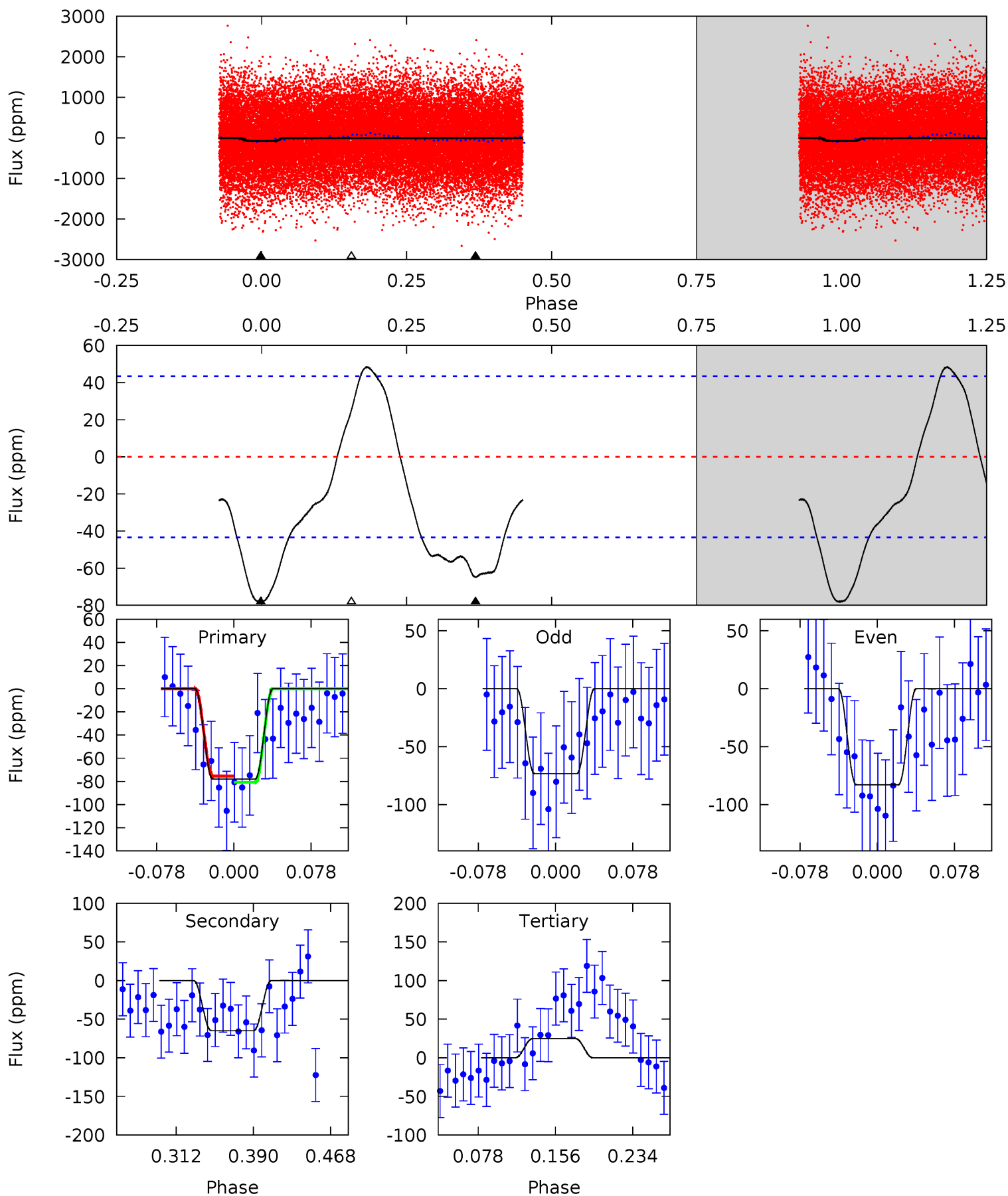
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.2	20.9	0	0	4.52	1.54	4.93	25.2	25.2	20.9	20.9	2.84	0.90	0.18	0.33



Alt Model-Shift Uniqueness Test

008716028-02, P = 1.752405 Days, E = 129.814130 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.30	6.89	-2.65	0	4.62	1.76	3.29	11.0	8.30	9.54	6.89	0.51	1.46	0.38	0.27



Stellar Parameters For KIC 008716028

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6632^{+180}_{-240}	$3.903^{+0.364}_{-0.130}$	$-0.220^{+0.250}_{-0.300}$	$2.127^{+0.562}_{-0.842}$	$1.323^{+0.211}_{-0.234}$	$0.194^{+0.589}_{-0.070}$
	+3%/-4%	+9%/-3%	+114%/-136%	+26%/-40%	+16%/-18%	+304%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008716028-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-60 ± 3	$3.98^{+3.58}_{-2.65}$	3305^{+263}_{-356}	4323^{+3112}_{-1101}	$2.067^{+15.542}_{-1.500}$
Alt.	-65 ± 9	$3.47^{+3.57}_{-2.30}$	3271^{+260}_{-322}	4688^{+3568}_{-1269}	$2.900^{+22.516}_{-2.192}$

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

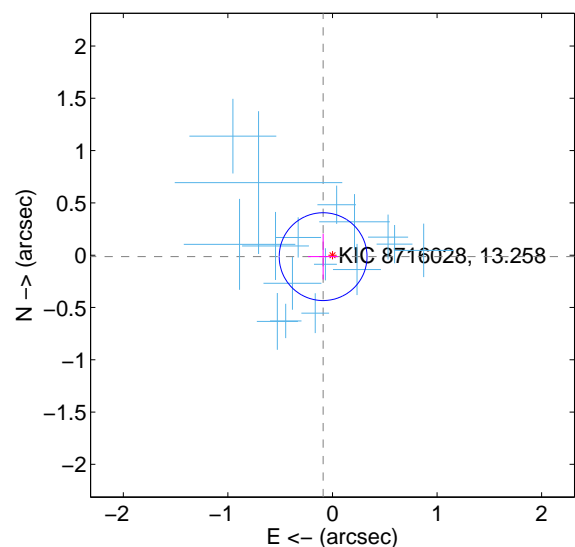
Supplemental centroid analysis for 008716028-02. Kepler magnitude: 13.26. Transit SNR 12.26

There are 16 quarters with good PRF difference image offsets

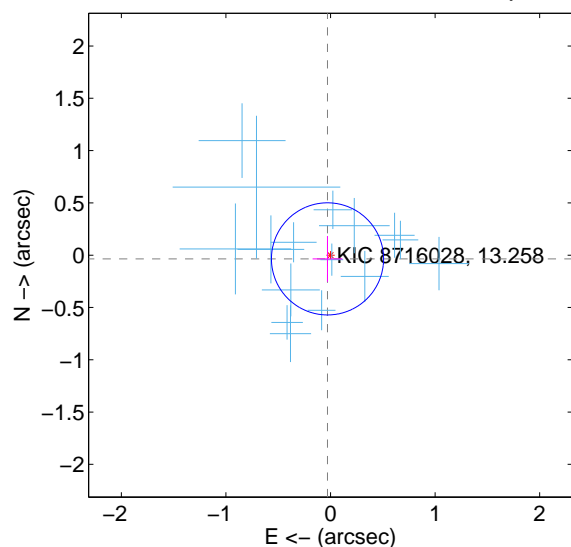
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.091 ± 0.140	0.65	0.089 ± 0.144	-0.014 ± 0.218
PRF-fit source offset from KIC position	0.046 ± 0.179	0.26	0.029 ± 0.143	-0.035 ± 0.219
photometric centroid source offset	0.24 ± 0.56	0.42	-0.13 ± 0.58	-0.20 ± 0.55

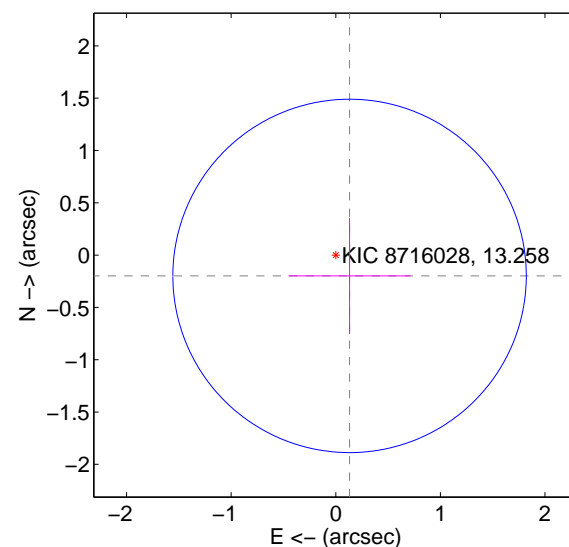
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

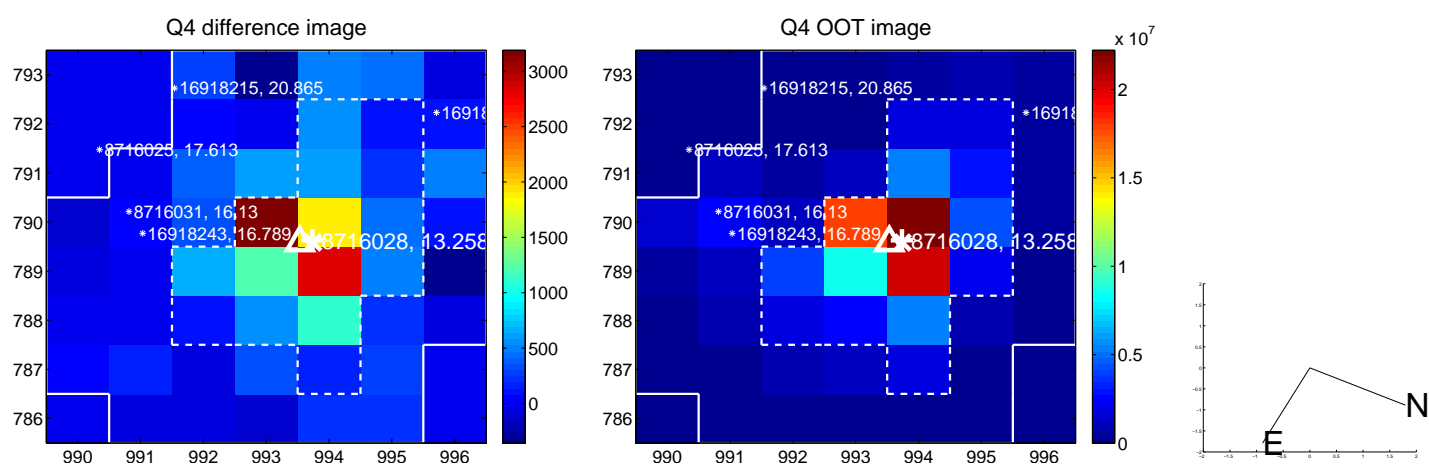
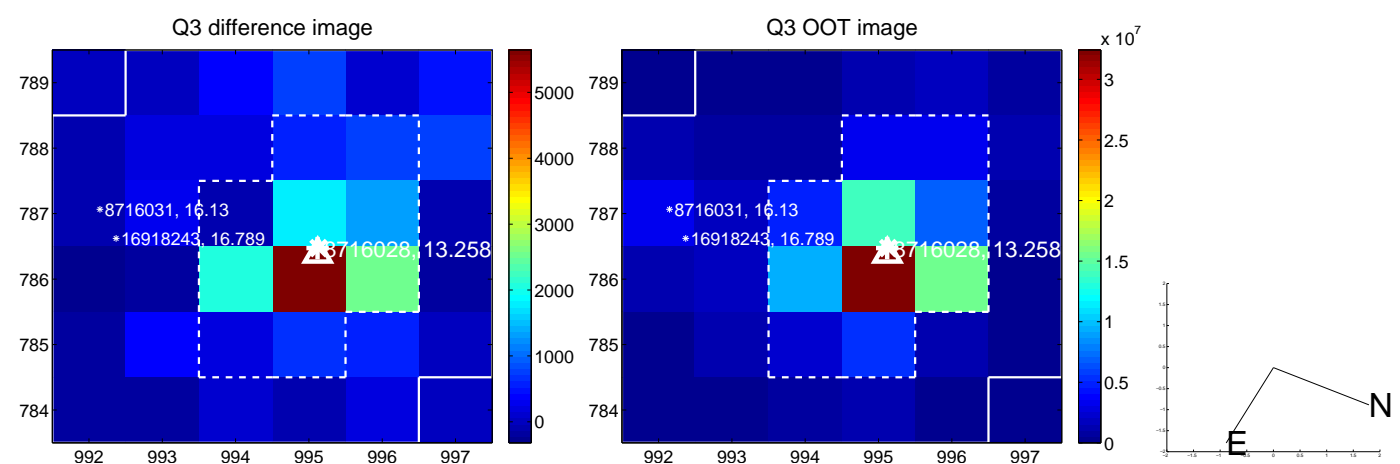
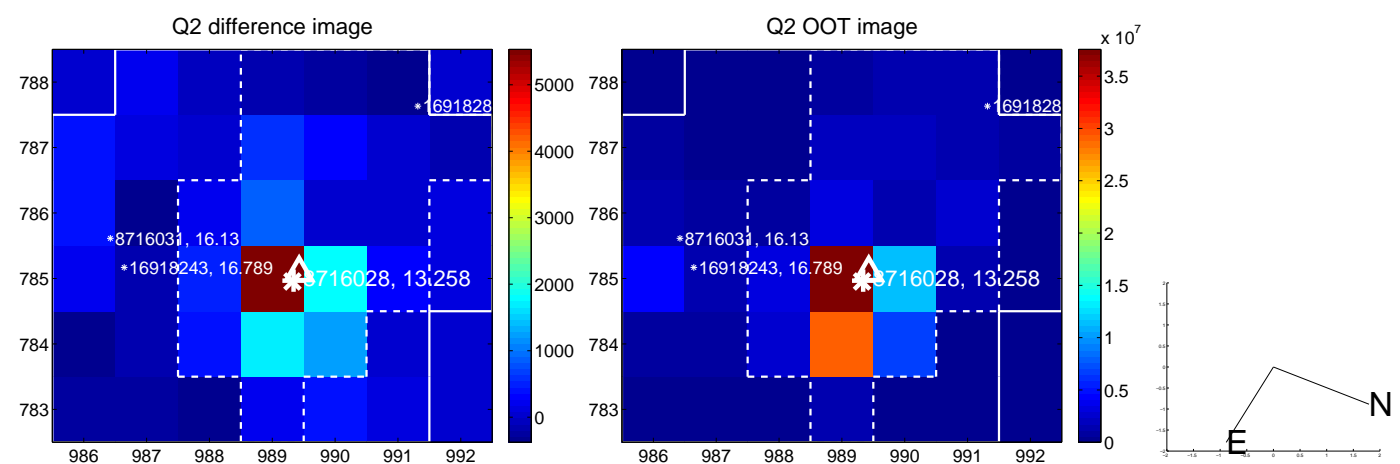
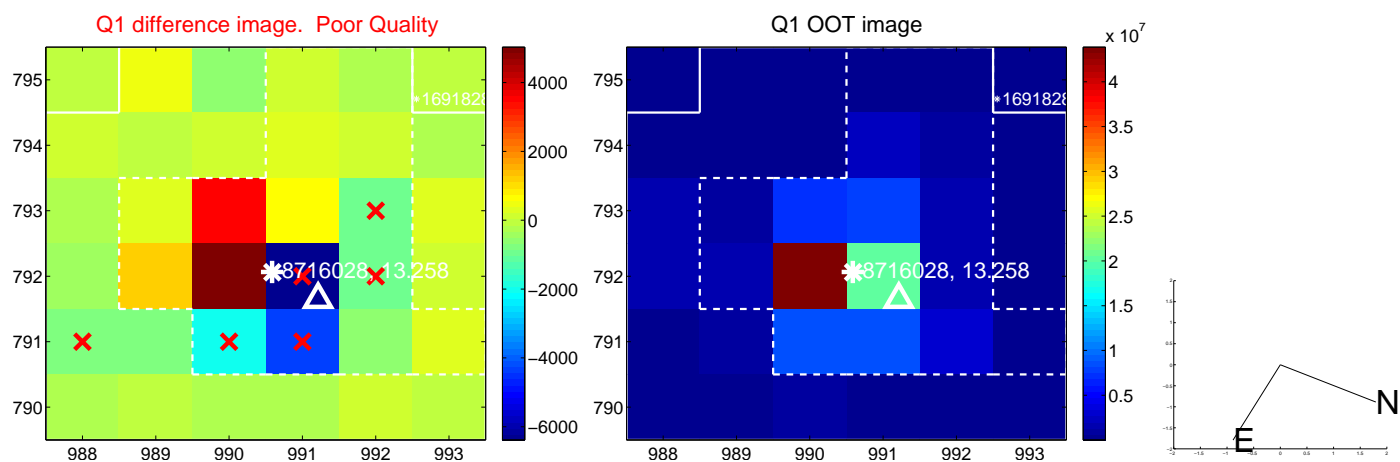


offset from photometric centroids

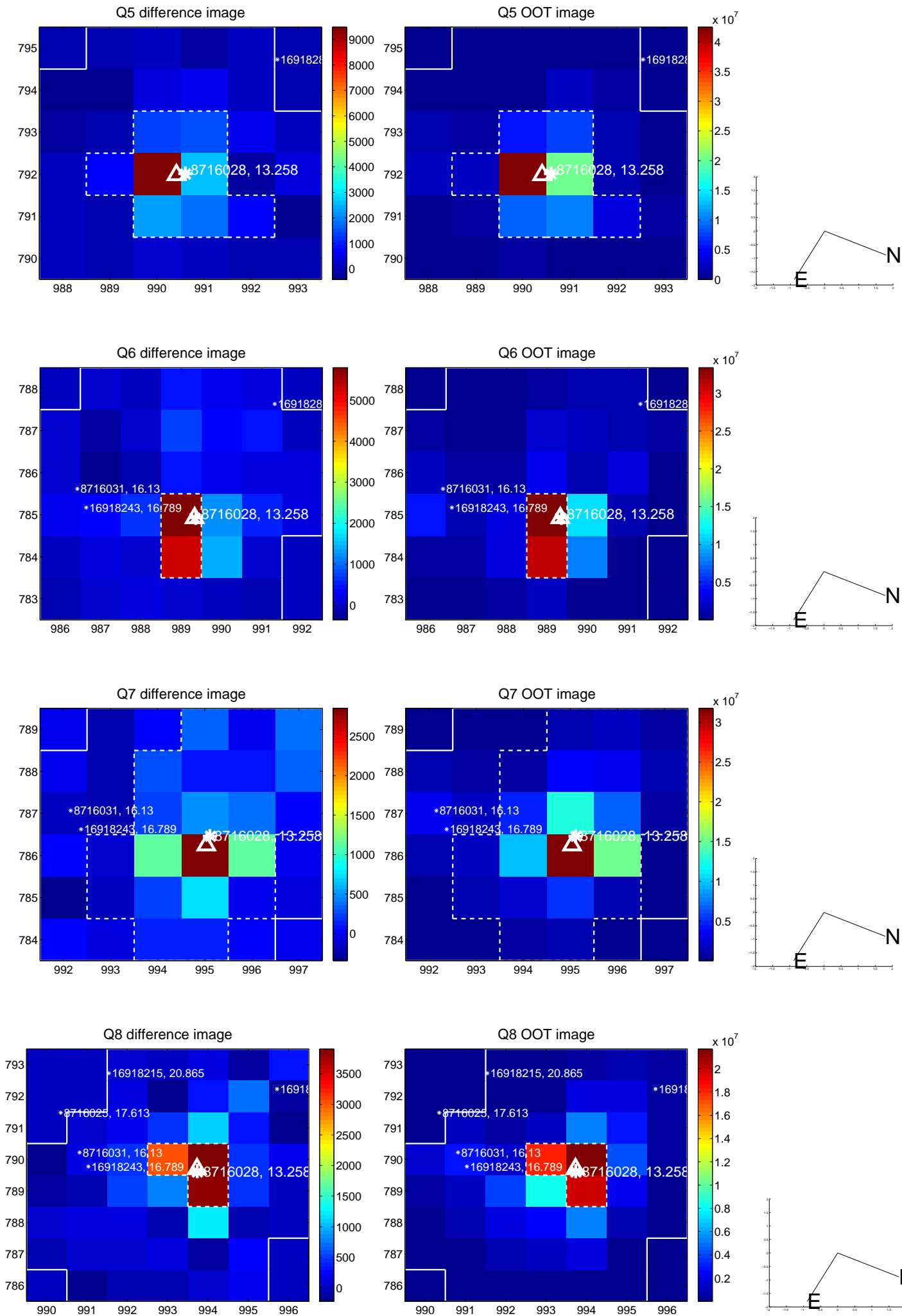


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

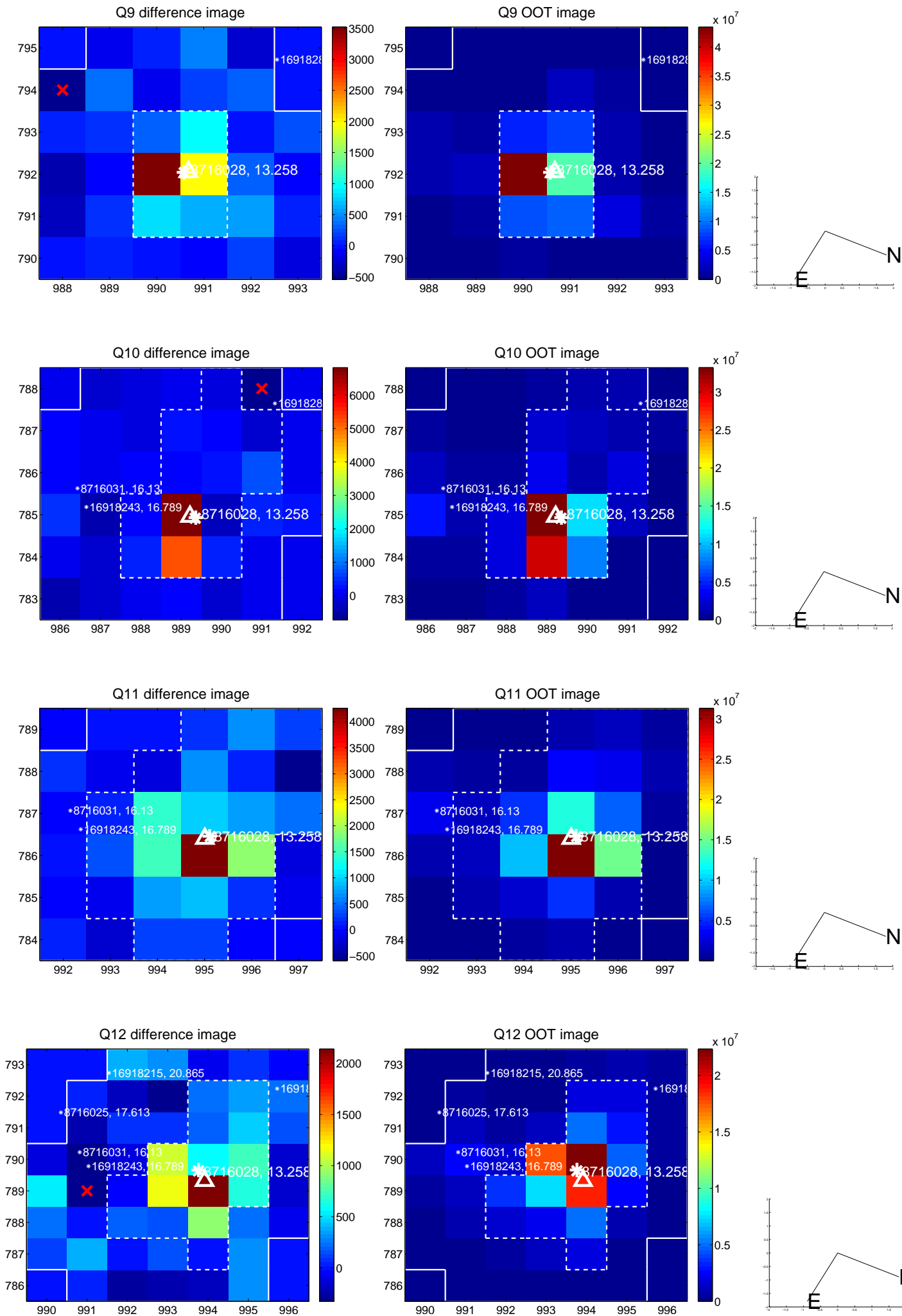
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



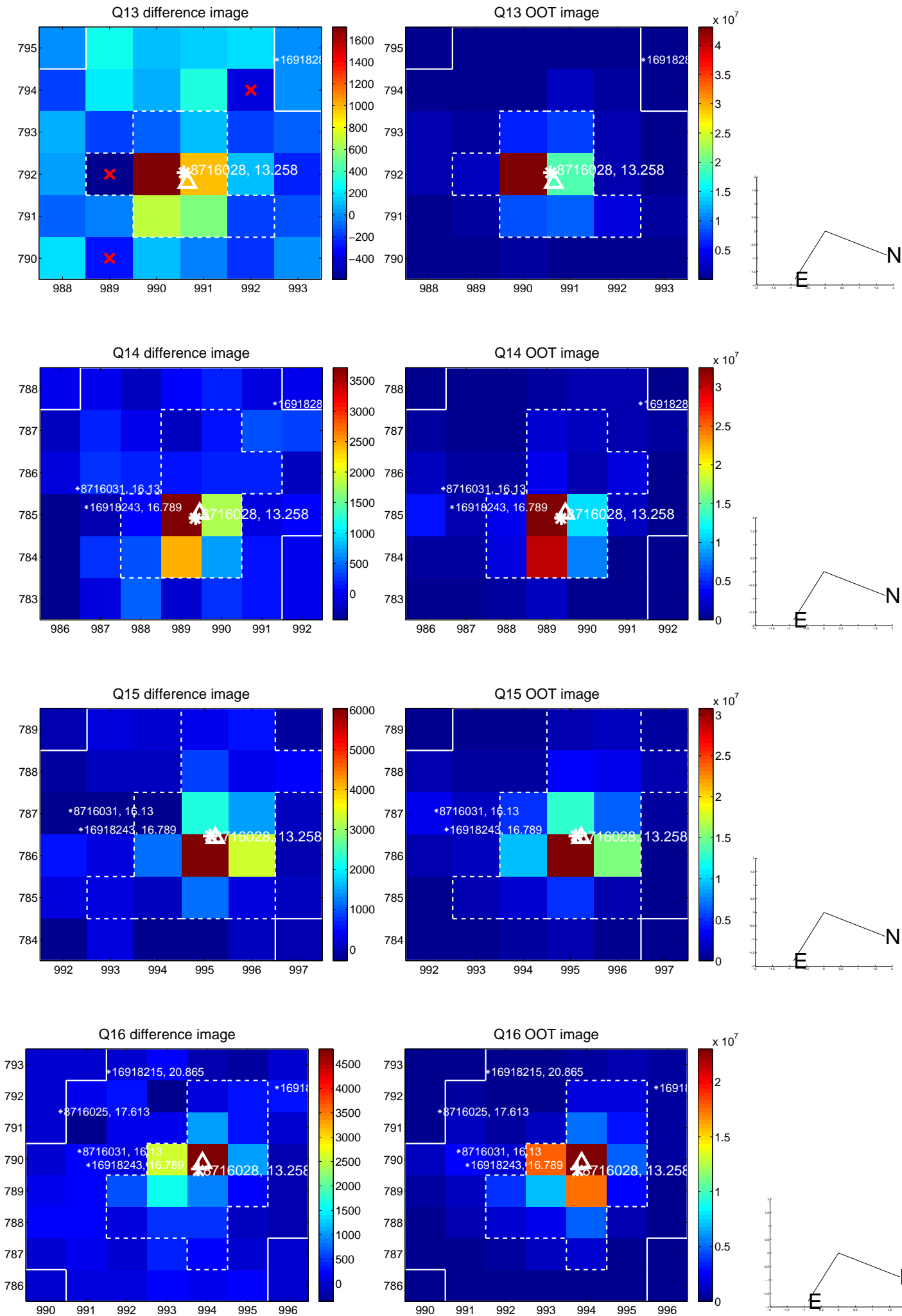
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



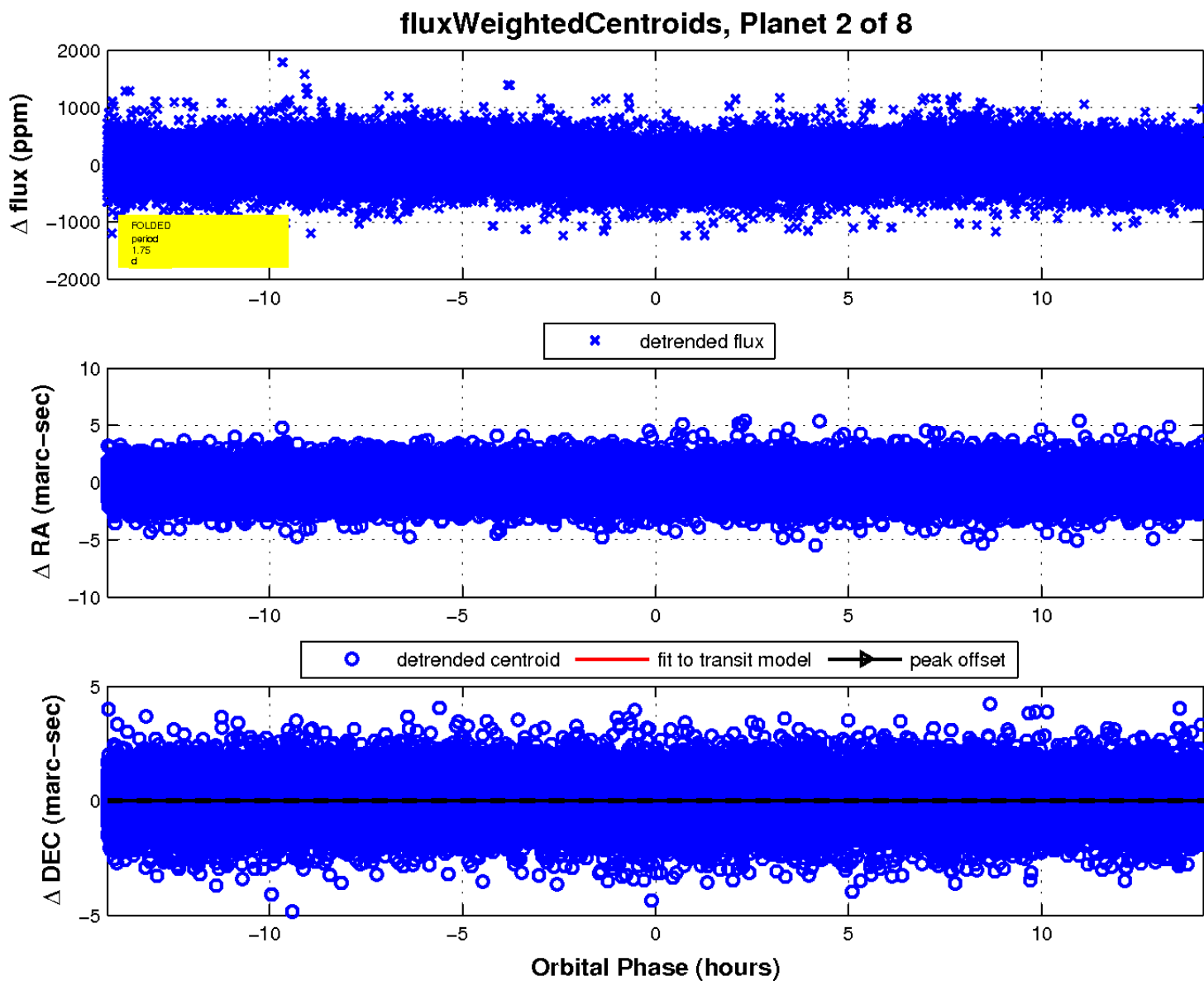
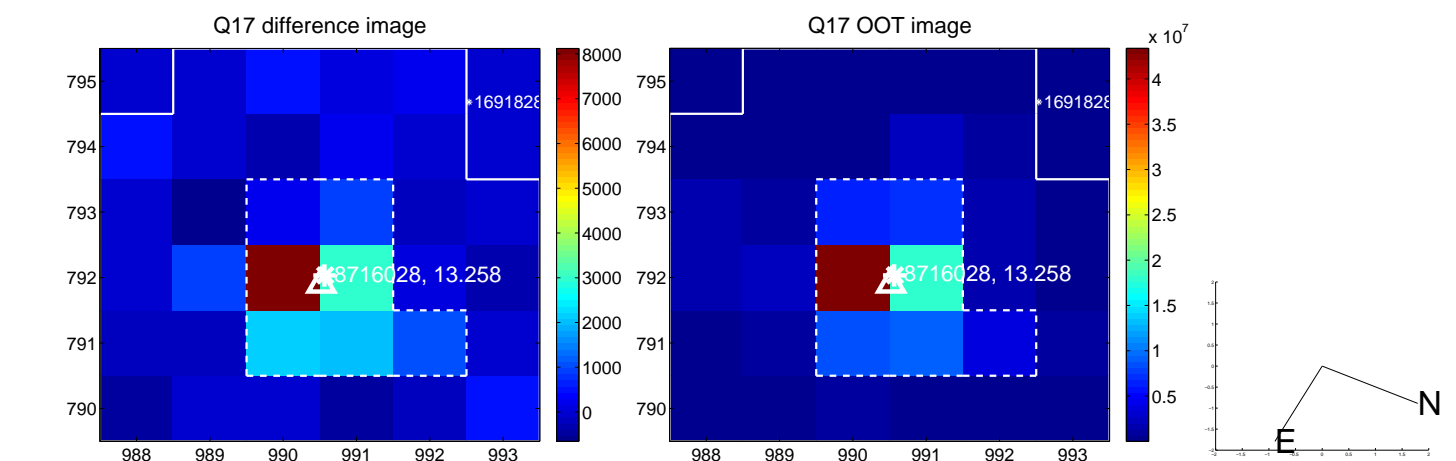
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

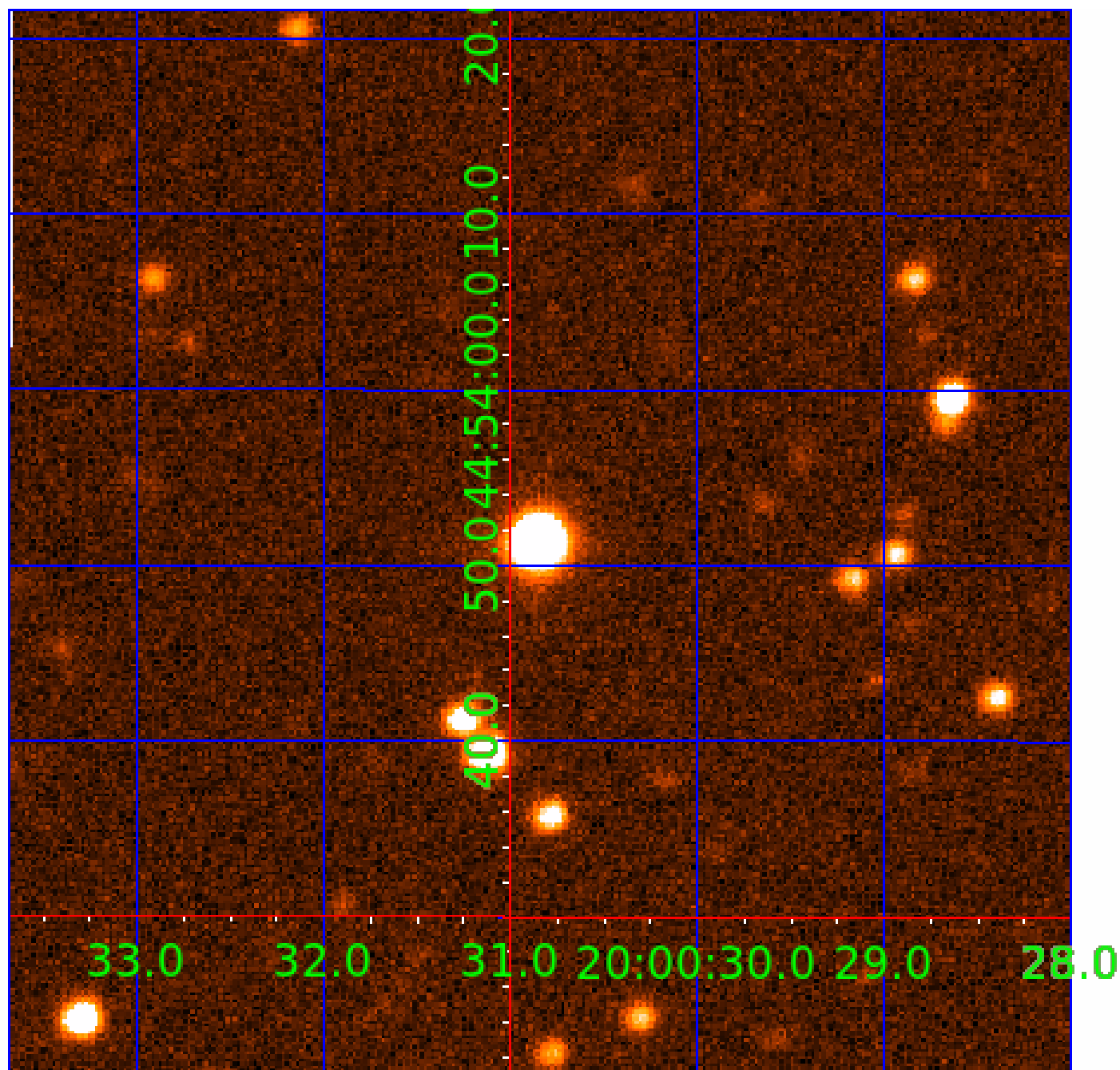


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008716028

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})
008716028-01	OBS	No	1.752399	132.775555	73.5	6.540	10.8	11.7	2.13	6632	3.23	8050.20
008716028-02	OBS	No	1.752389	131.563135	68.6	4.734	9.9	12.3	2.13	6632	3.23	8050.26
008716028-03	OBS	No	532.874333	152.974204	576.3	7.403	9.4	9.8	2.13	6632	6.02	3.94
008716028-04	OBS	No	14.763042	142.008324	175.8	7.647	8.9	9.5	2.13	6632	2.98	469.62
008716028-05	OBS	No	98.427139	200.078630	536.0	4.065	7.9	8.3	2.13	6632	5.44	37.42
008716028-06	OBS	No	508.140391	316.308767	503.3	4.729	7.5	7.8	2.13	6632	4.80	4.19
008716028-07	OBS	No	72.851489	190.500130	273.6	0.594	7.8	2.9	2.13	6632	3.64	55.90
008716028-08	OBS	No	34.934758	163.806235	164.7	5.000	7.2	-1.0	2.13	6632	2.75	148.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008716028-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008716028-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
008716028-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008716028-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008716028-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

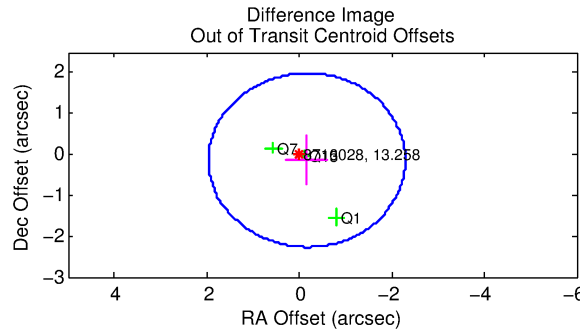
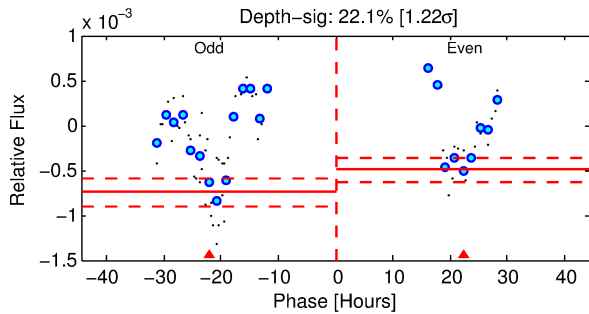
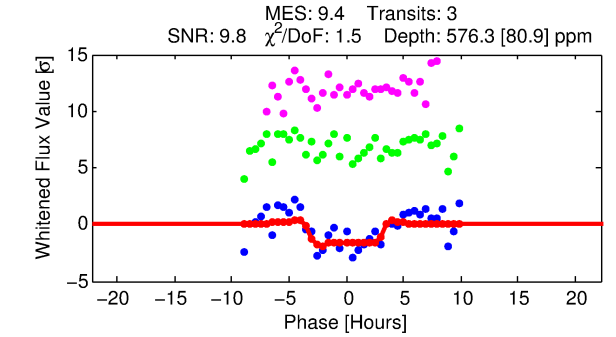
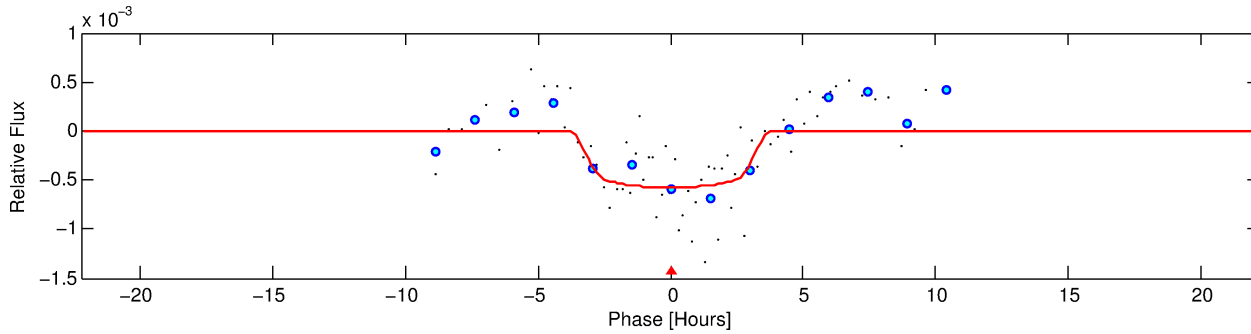
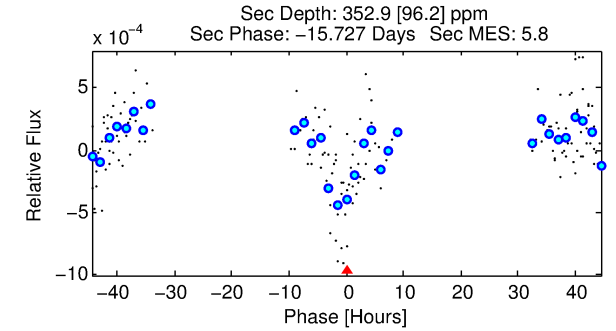
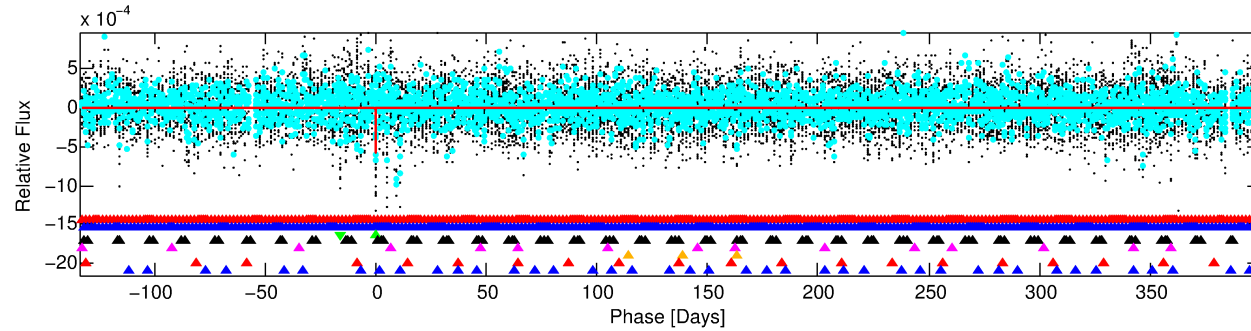
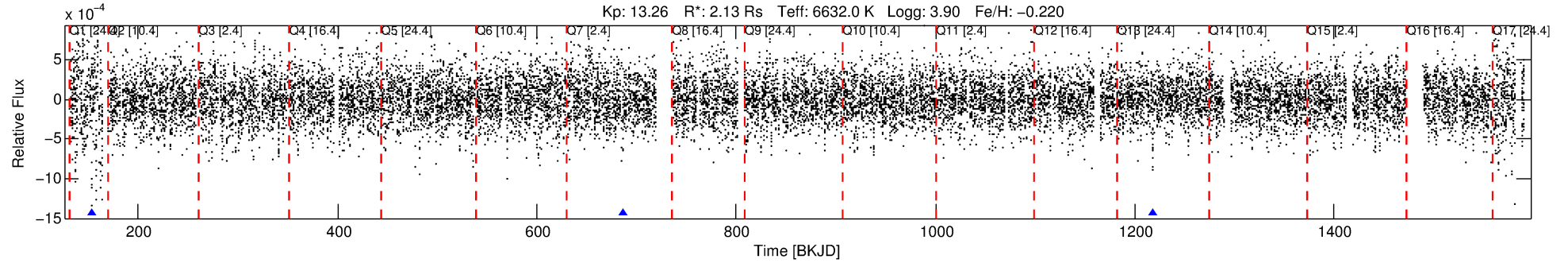
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008716028-03

No Significant Match Found

DV One-Page Summary

KIC: 8716028 Candidate: 3 of 8 Period: 532.874 d



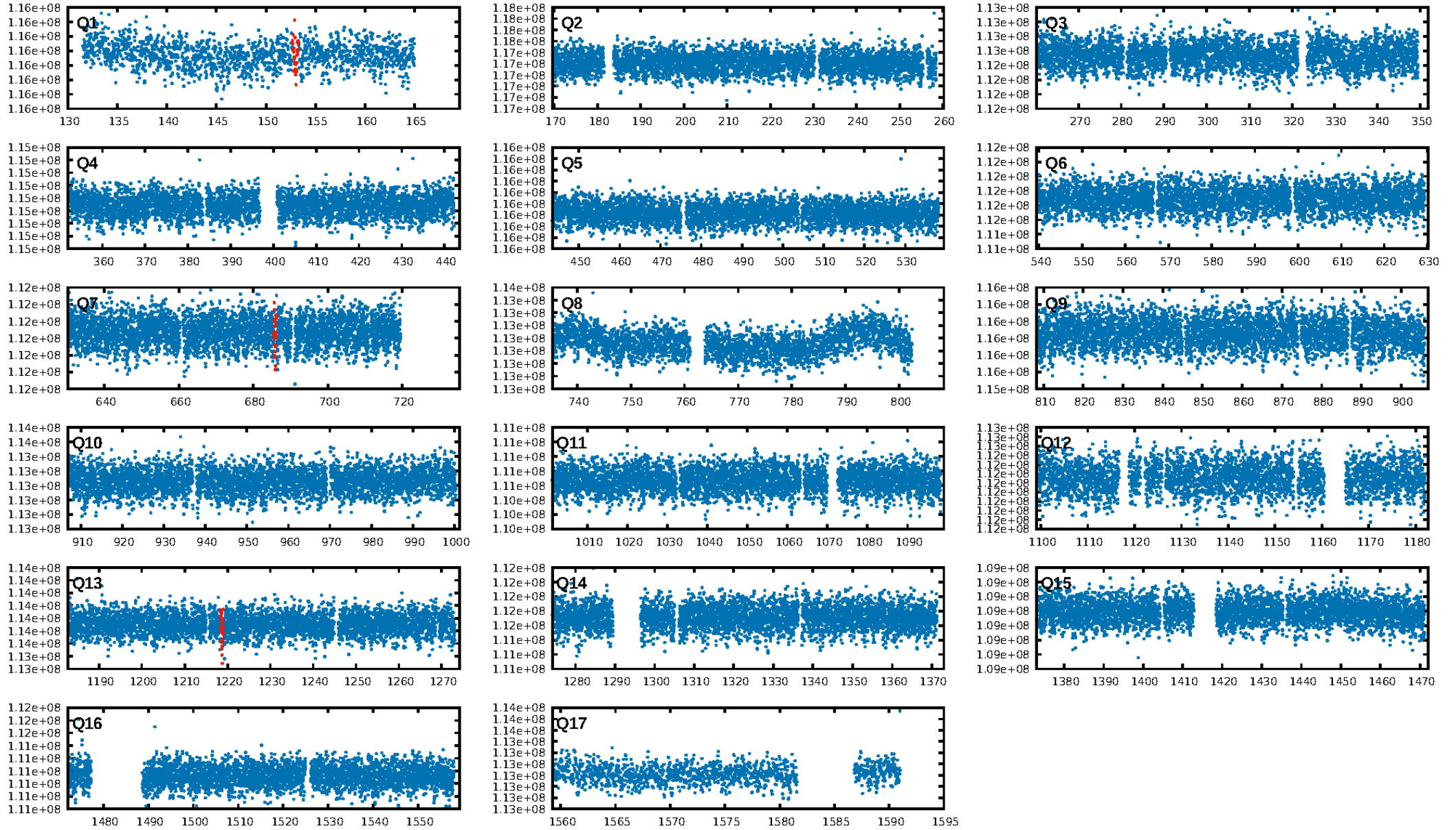
DV Fit Results:

Period = 532.87433 [0.01421] d
Epoch = 152.9742 [0.0203] BKJD
Rp/R* = 0.0259 [0.0033]
a/R* = 258.10 [152.49]
b = 0.91 [0.11]
Seff = 3.94 [2.50]
Teq = 359 [57] K
Rp = 6.02 [2.50] Re
a = 1.4113 [0.5424] AU
Ag = 10677.35 [7710.55] [1.38 σ]
Teffp = 5645 [566] K [9.30 σ]

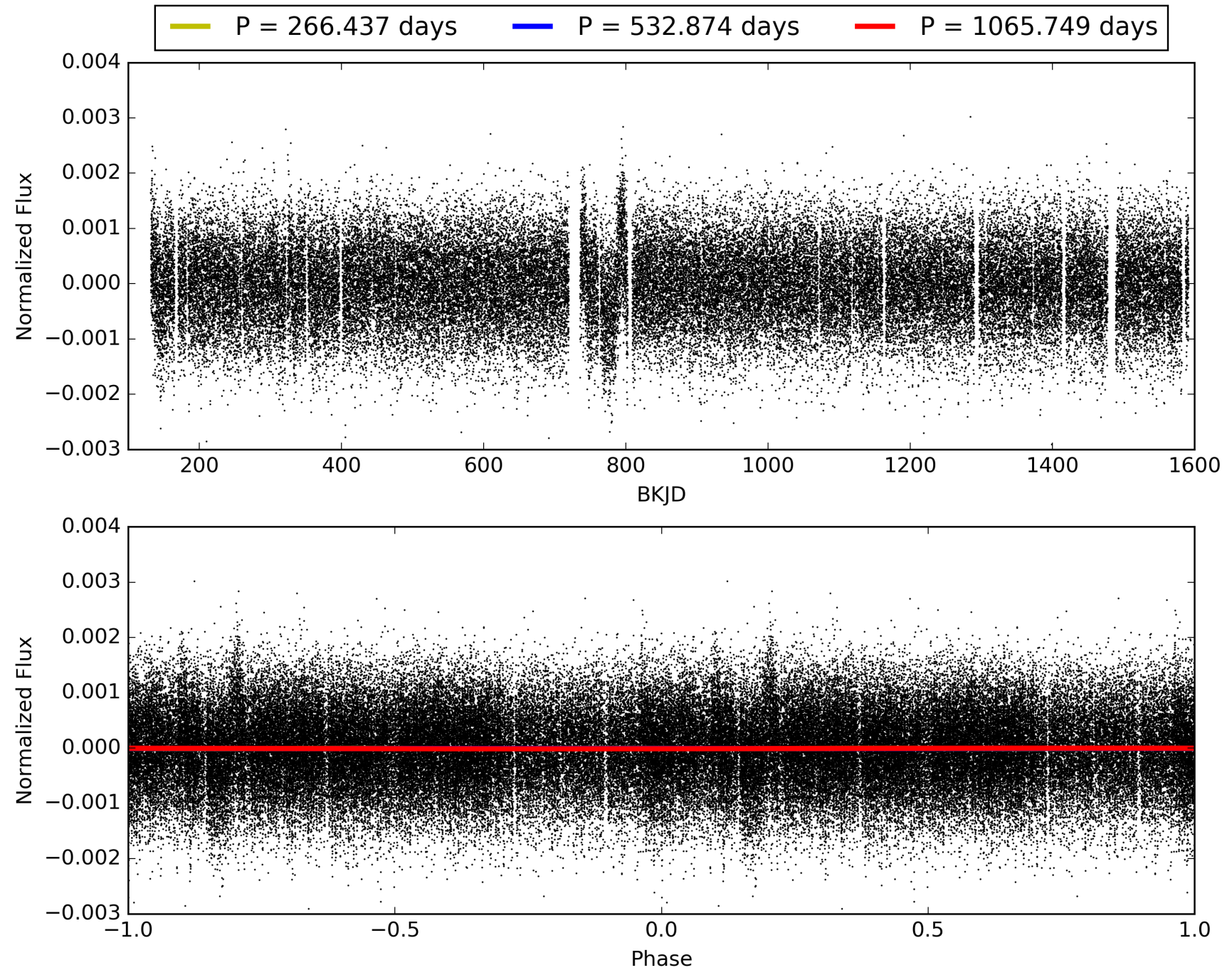
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.57 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 17.6%
ModelChiSquareGof-sig: 60.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.968
Centroid-sig: N/A
Centroid-so: 0.912 arcsec [1.11 σ]
OotOffset-rm: 0.217 arcsec [0.31 σ]
OotOffset-st: 0/1/0/2 [3]
KicOffset-rm: 0.242 arcsec [0.52 σ]
KicOffset-st: 0/1/0/2 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 0.00 [0/3]

TCE 008716028-03, PDC Light Curves

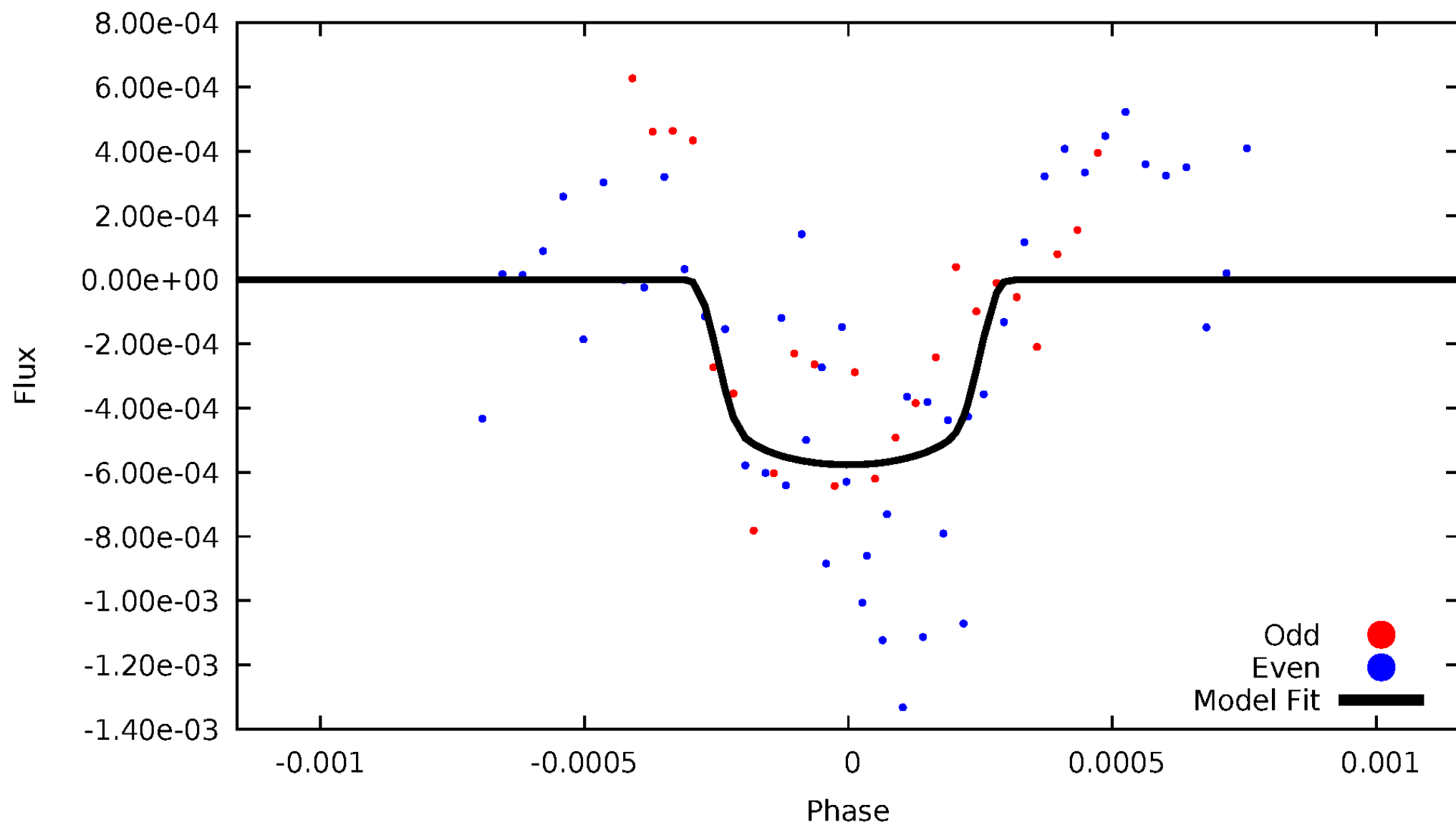


TCE 008716028-03



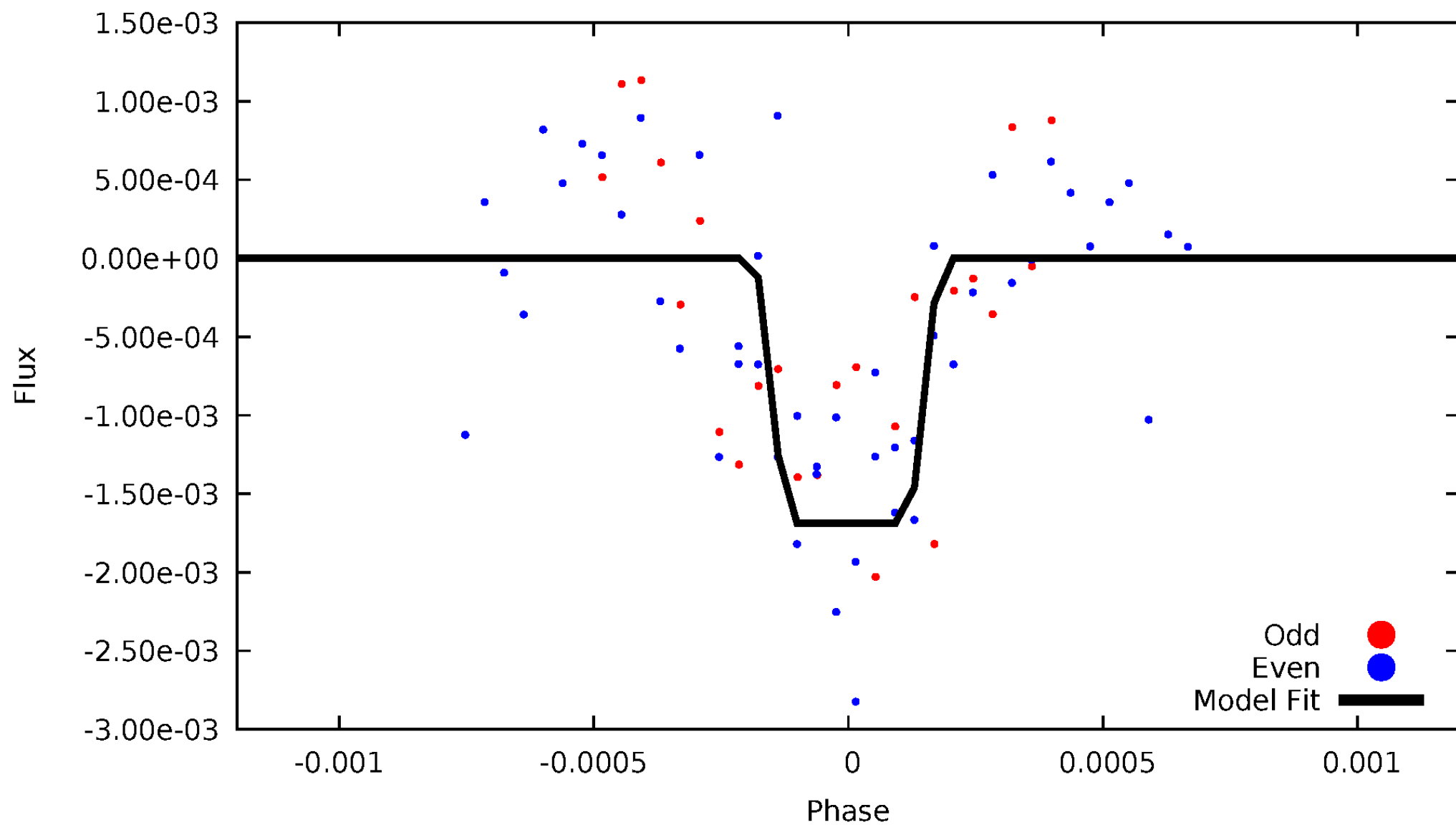
DV Odd/Even

TCE 008716028-03



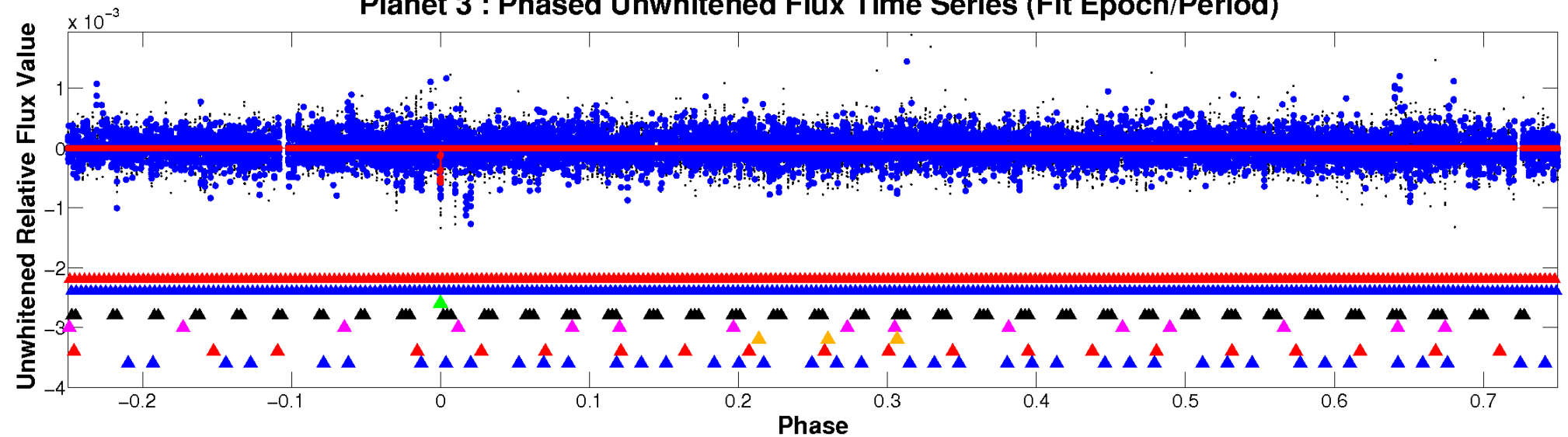
ALT Odd/Even

TCE 008716028-03

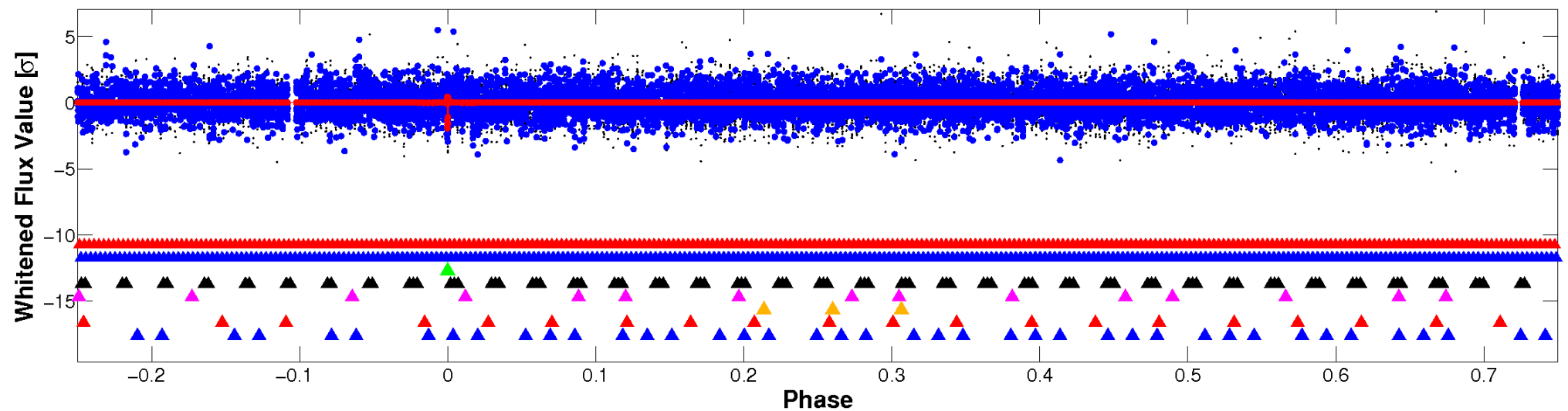


Non-Whitened Vs. Whitened Light Curve

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

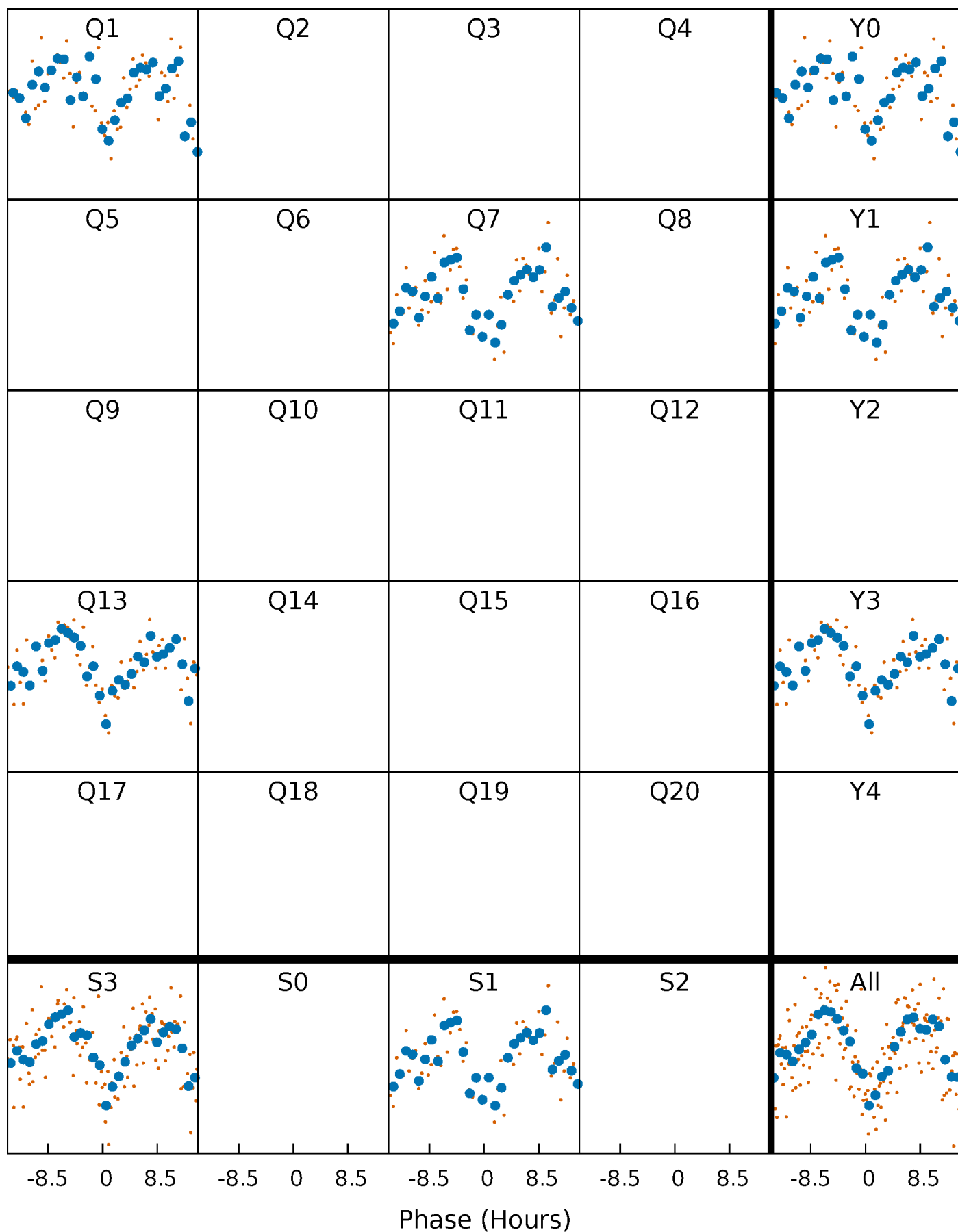


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



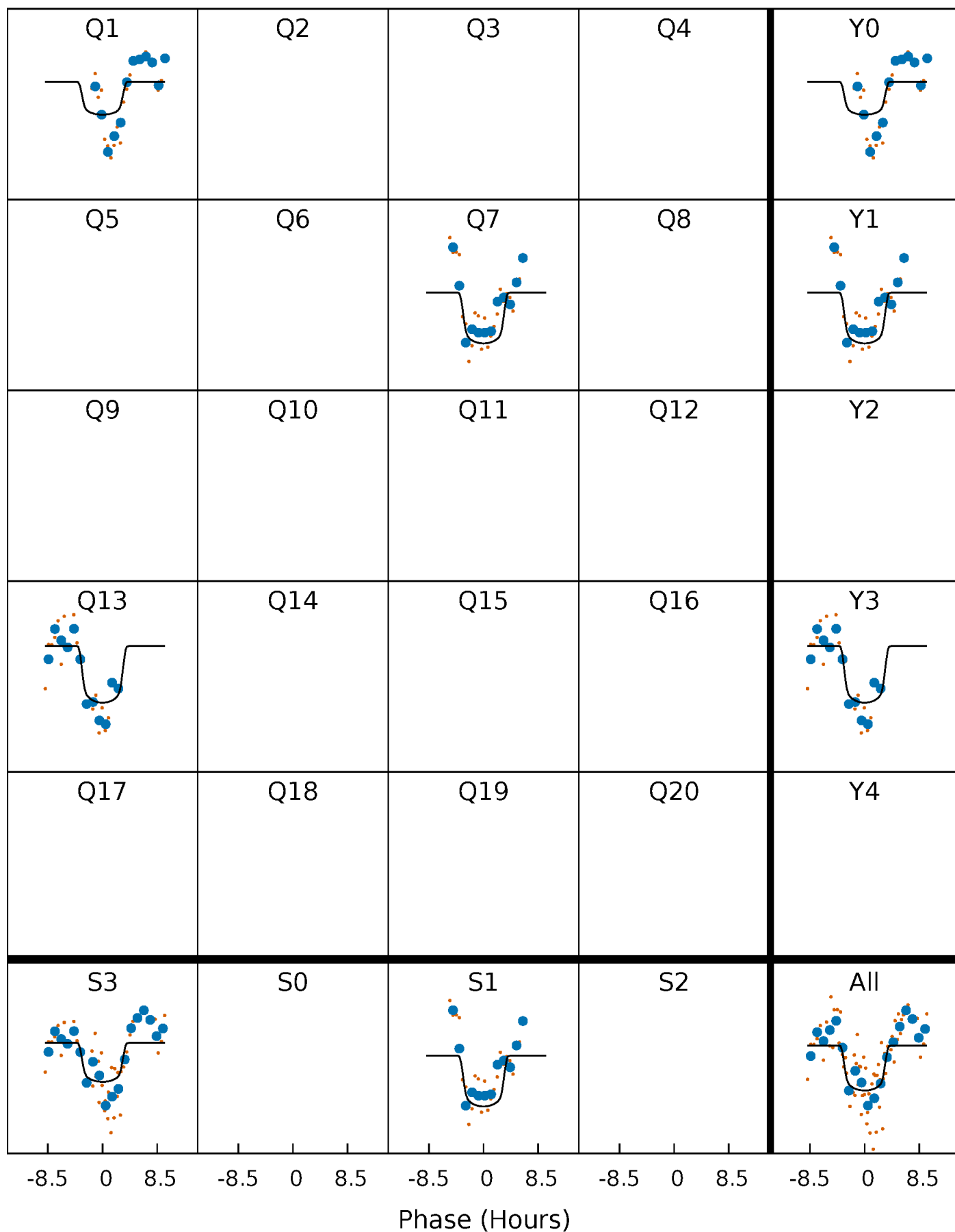
PDC Quarter-Phased Transit Curves

TCE 008716028-03 $P=532.874334$ Days $T_0=152.974204$ (BKJD)



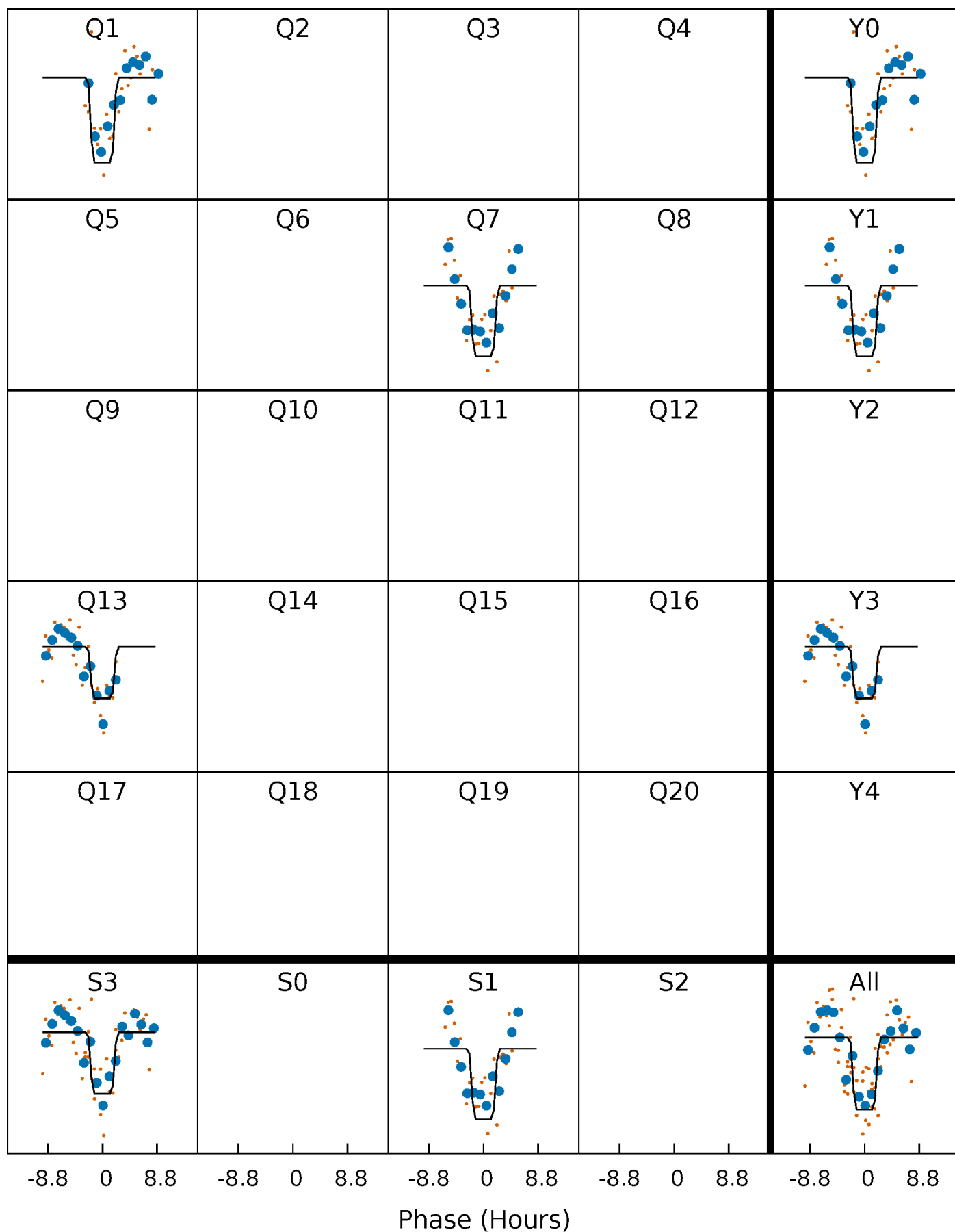
DV Quarter-Phased Transit Curves

TCE 008716028-03 P=532.874334 Days $T_0=152.974204$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

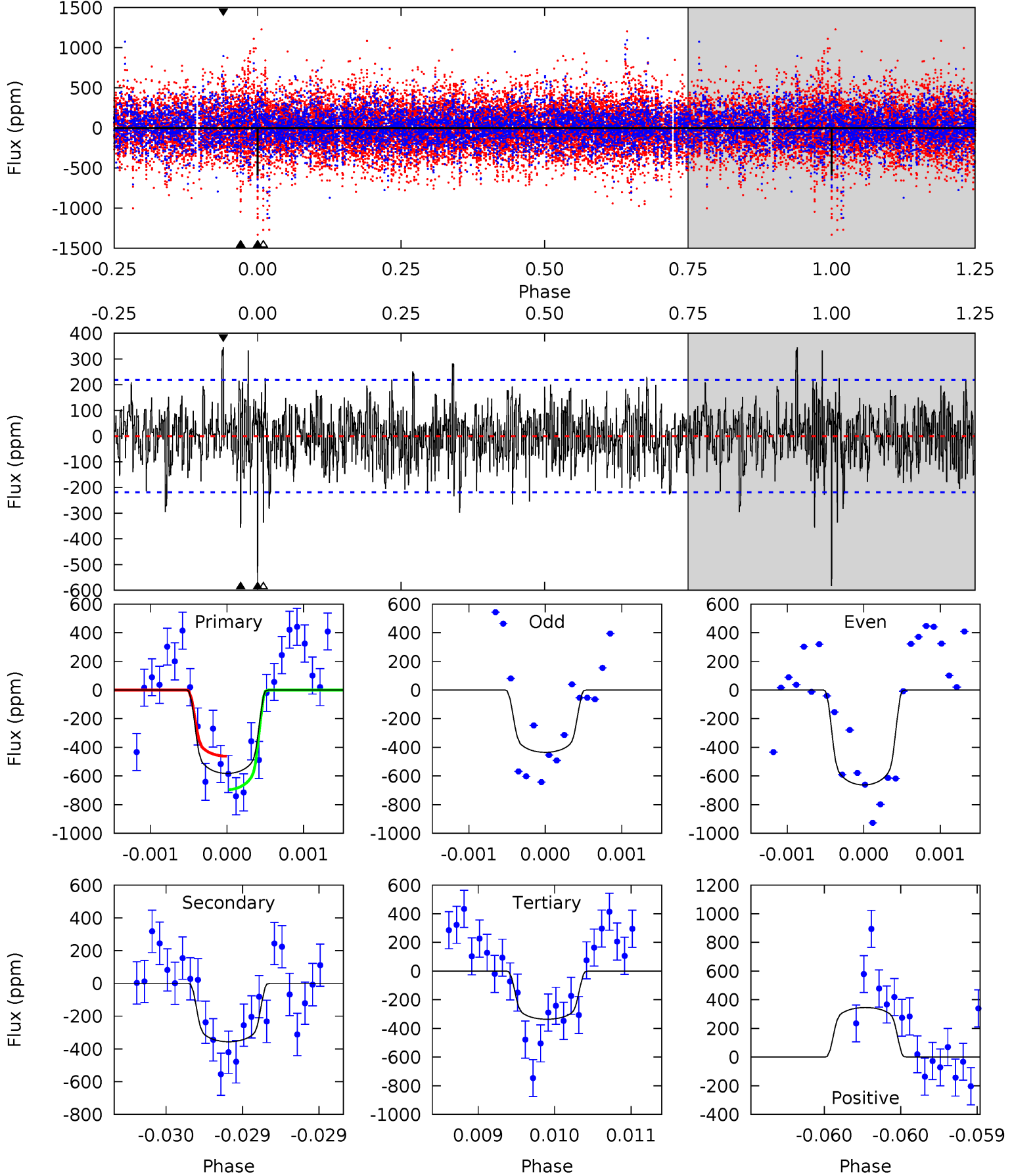
TCE 008716028-03 P=532.866378 Days $T_0=153.021443$ (BKJD)



DV Model-Shift Uniqueness Test

008716028-03, P = 532.874334 Days, E = 152.974204 Days

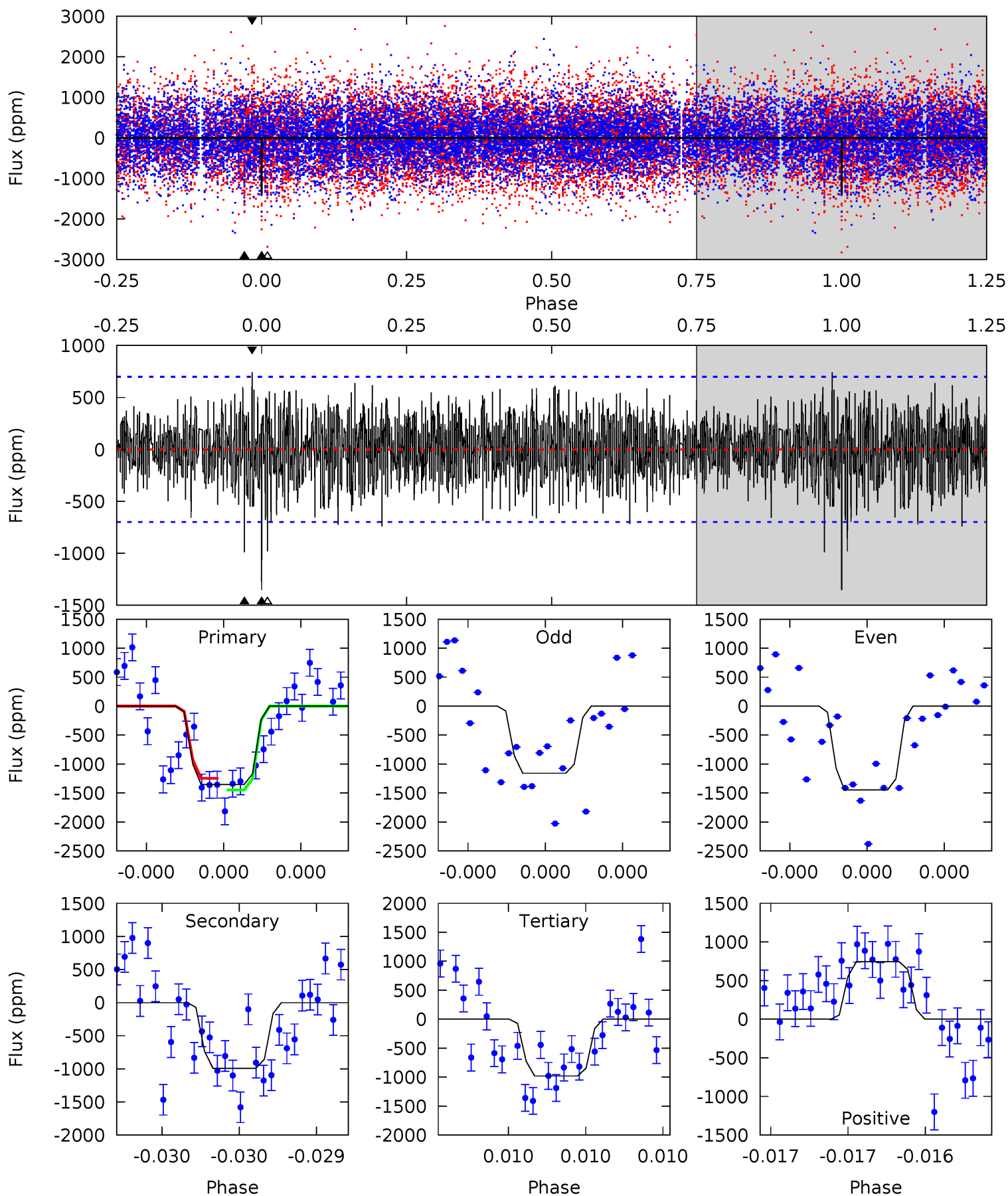
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.8	9.05	8.53	8.78	5.54	3.44	2.14	6.26	6.01	0.52	0.27	2.80	0.95	0.37	2.96



Alt Model-Shift Uniqueness Test

008716028-03, P = 532.866378 Days, E = 153.021443 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	7.99	7.90	6.00	5.64	3.58	1.92	3.01	4.91	0.09	1.99	1.09	1.17	0.35	0.81



Stellar Parameters For KIC 008716028

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6632^{+180}_{-240}	$3.903^{+0.364}_{-0.130}$	$-0.220^{+0.250}_{-0.300}$	$2.127^{+0.562}_{-0.842}$	$1.323^{+0.211}_{-0.234}$	$0.194^{+0.589}_{-0.070}$
	+3%/-4%	+9%/-3%	+114%/-136%	+26%/-40%	+16%/-18%	+304%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008716028-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-356 ± 39	$5.62^{+1.37}_{-1.27}$	486^{+39}_{-50}	5644^{+474}_{-395}	12287^{+7958}_{-4139}
Alt.	-990 ± 124	$9.16^{+1.85}_{-1.93}$	491^{+39}_{-54}	5745^{+358}_{-304}	12788^{+7509}_{-3851}

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

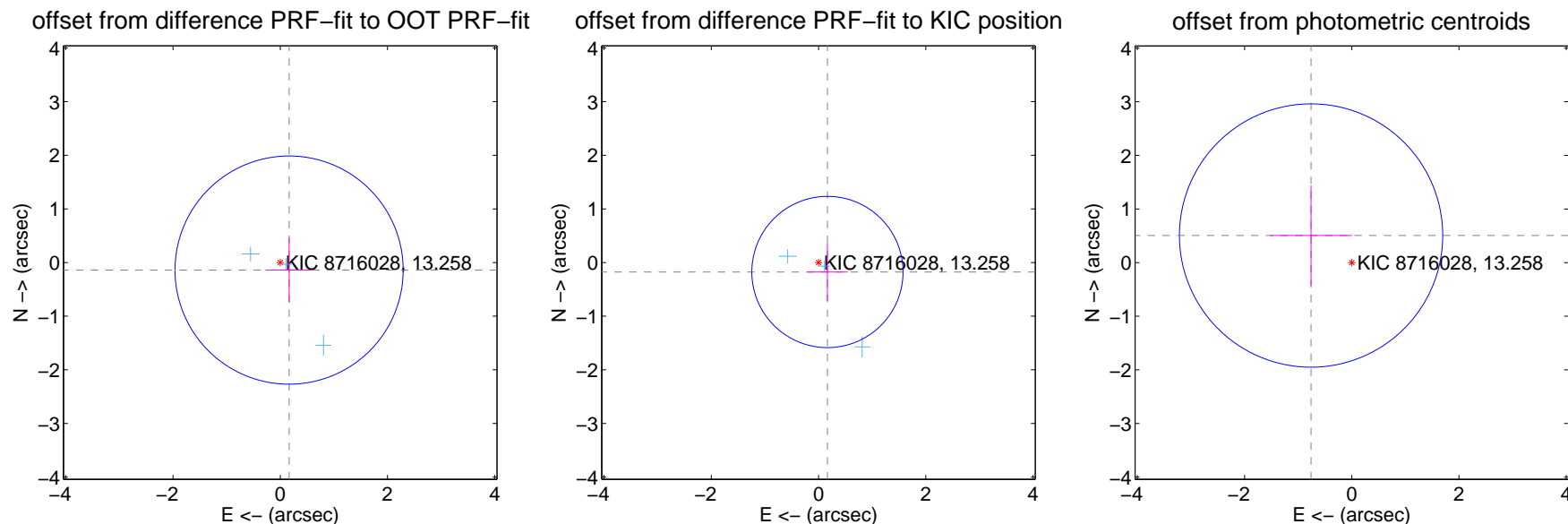
DV Centroid Data

Supplemental centroid analysis for 008716028-03. Kepler magnitude: 13.26. Transit SNR 9.80

There are 3 quarters with good PRF difference image offsets

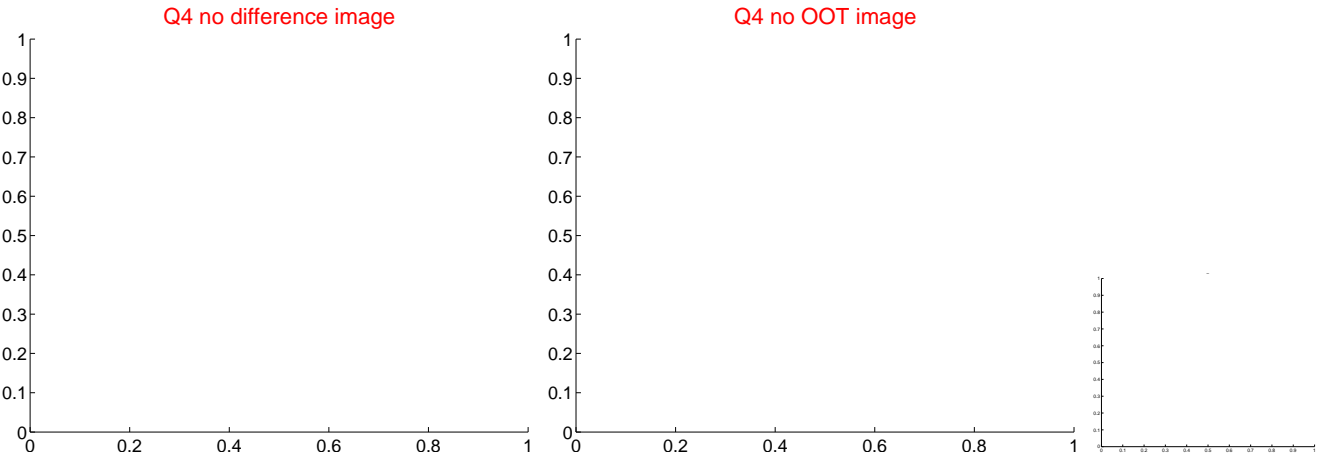
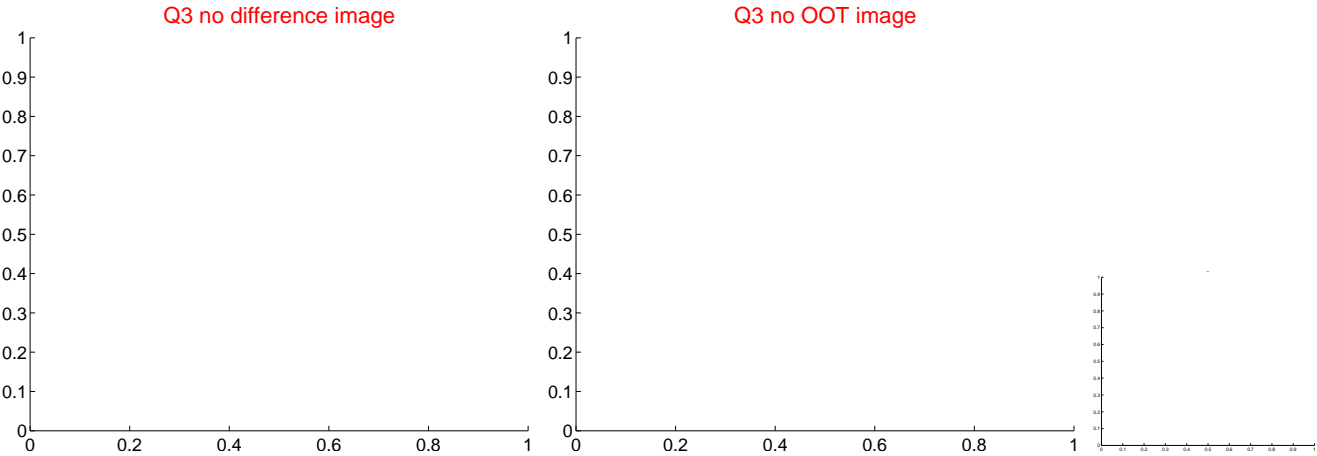
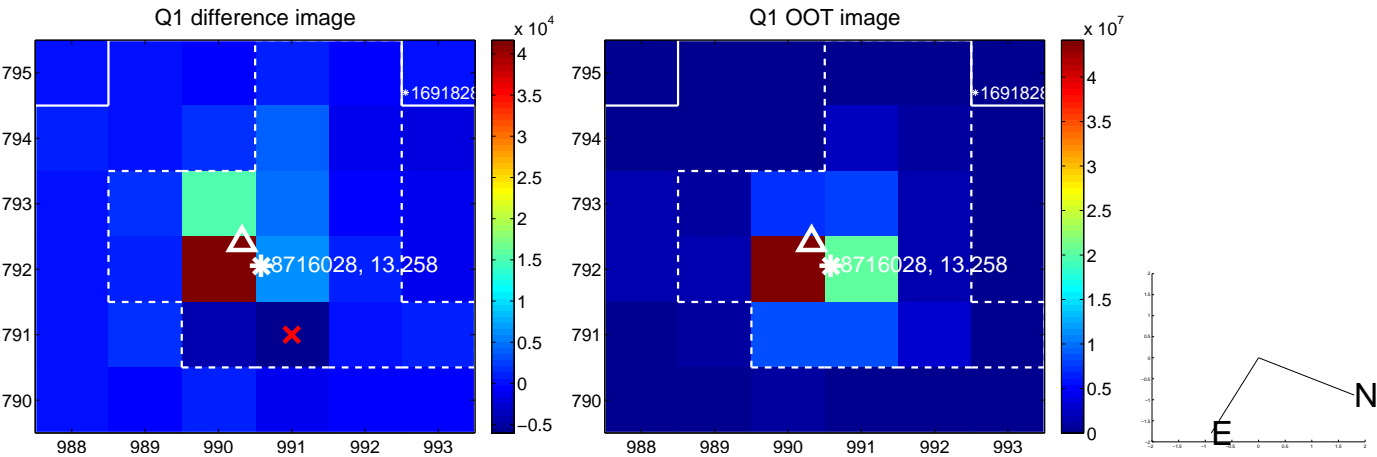
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.217 ± 0.709	0.31	-0.165 ± 0.436	-0.141 ± 0.605
PRF-fit source offset from KIC position	0.242 ± 0.470	0.52	-0.166 ± 0.380	-0.176 ± 0.537
photometric centroid source offset	0.91 ± 0.82	1.11	0.76 ± 0.76	0.51 ± 0.93

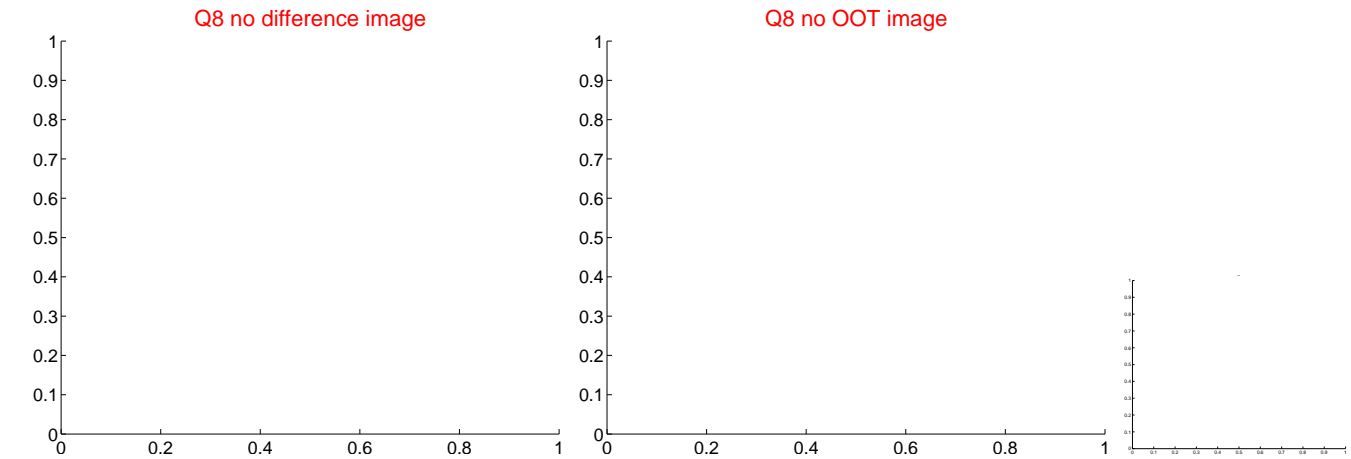
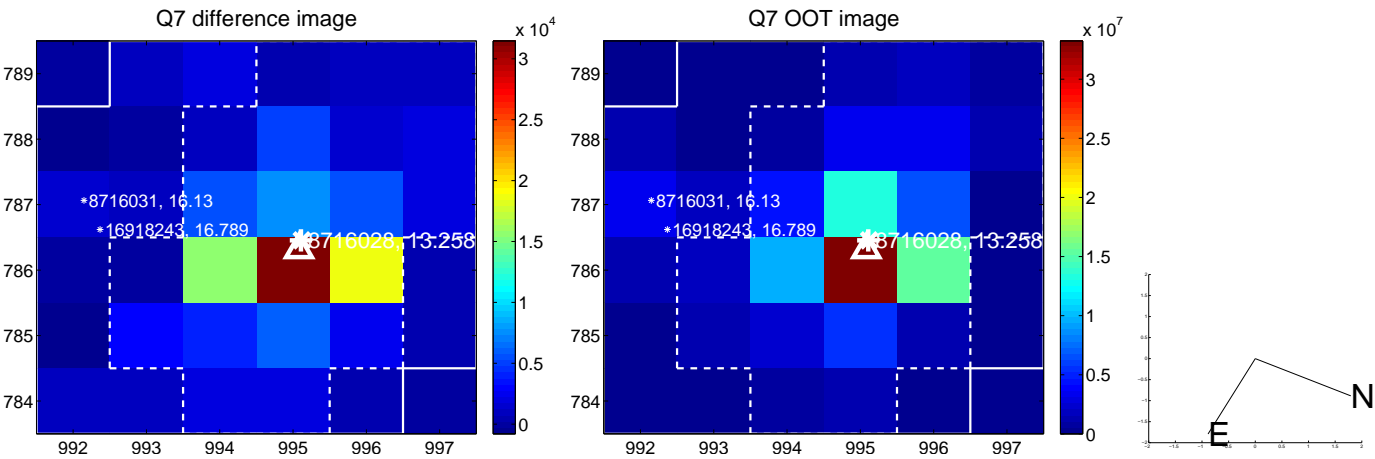
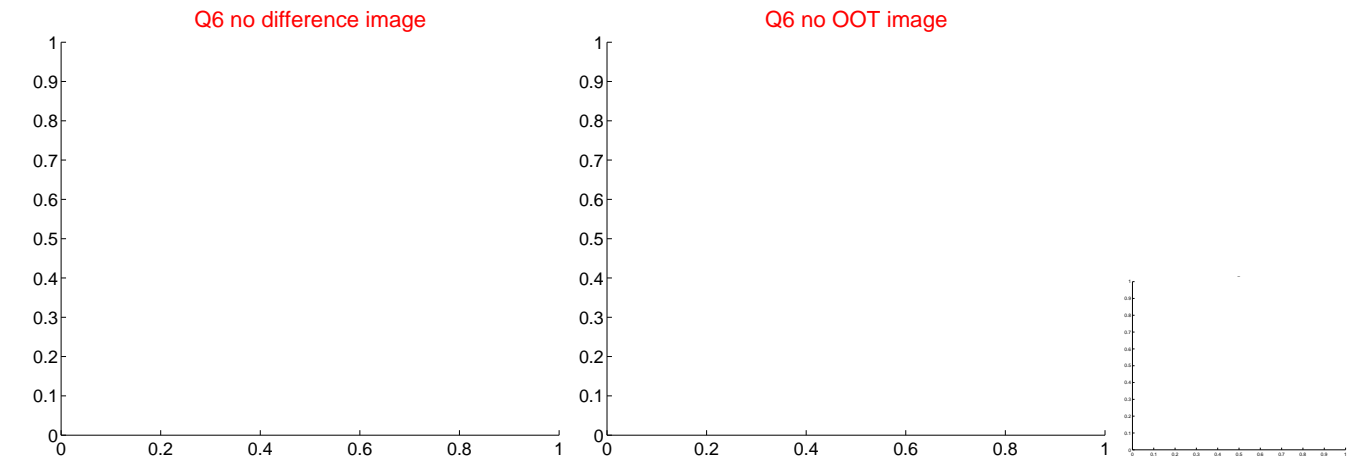
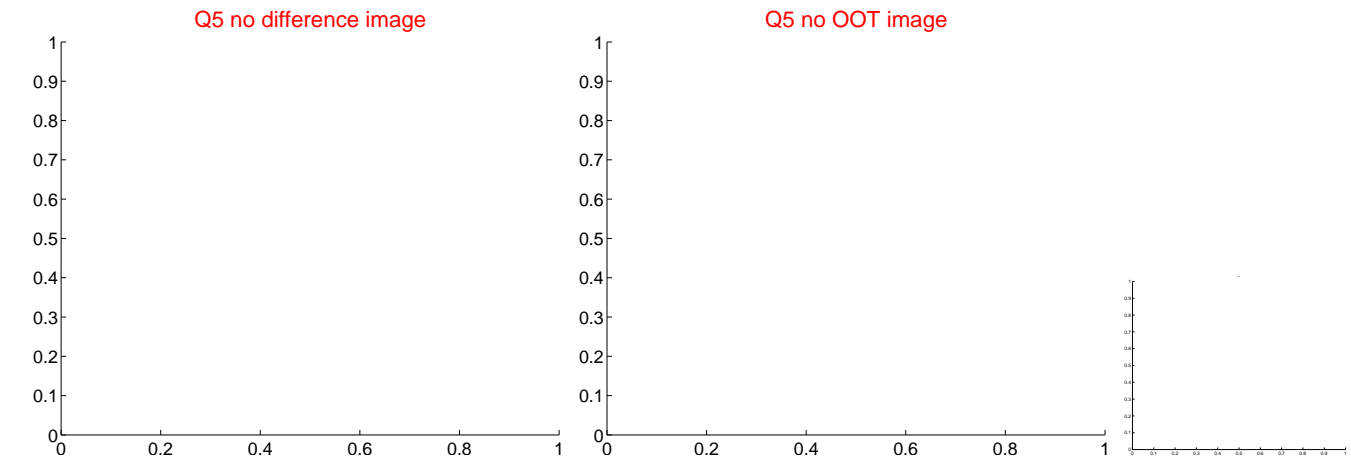


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



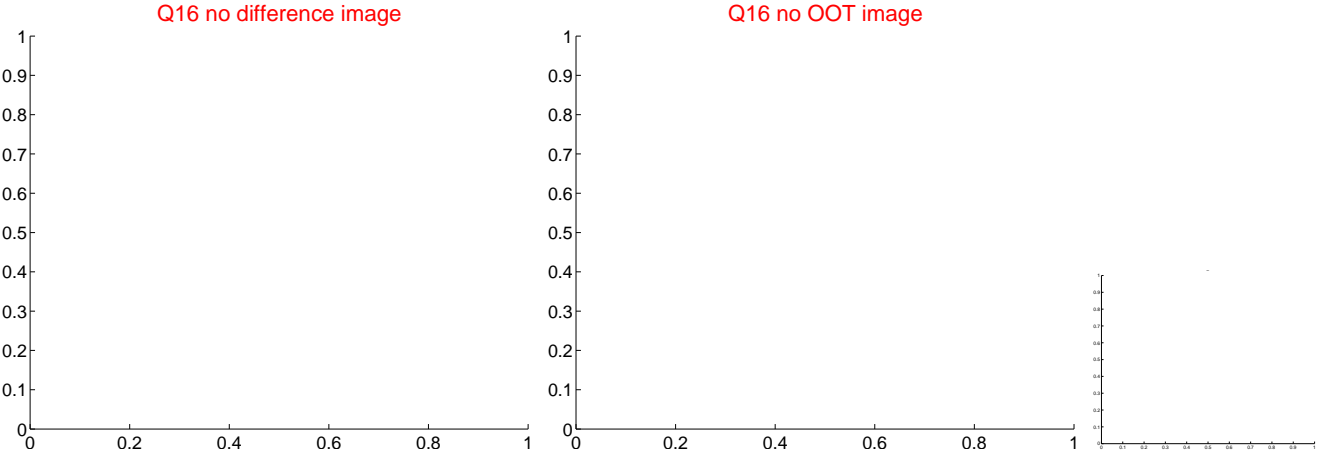
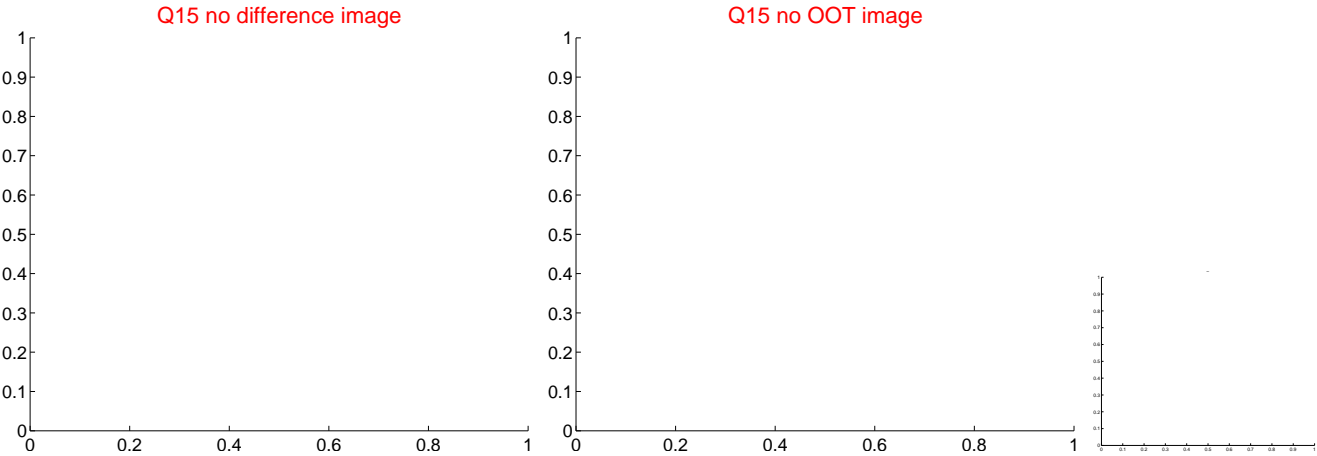
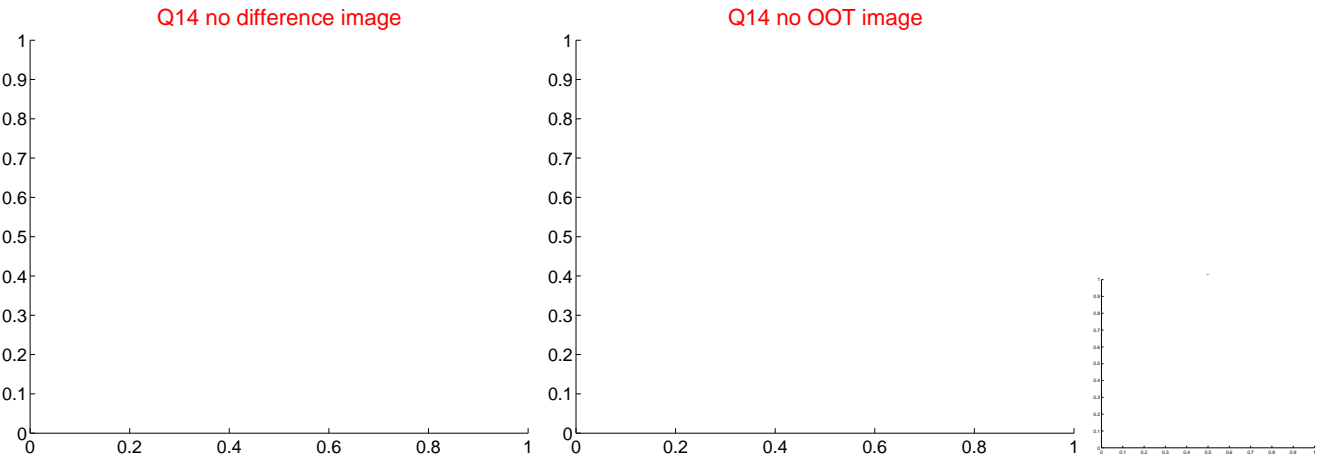
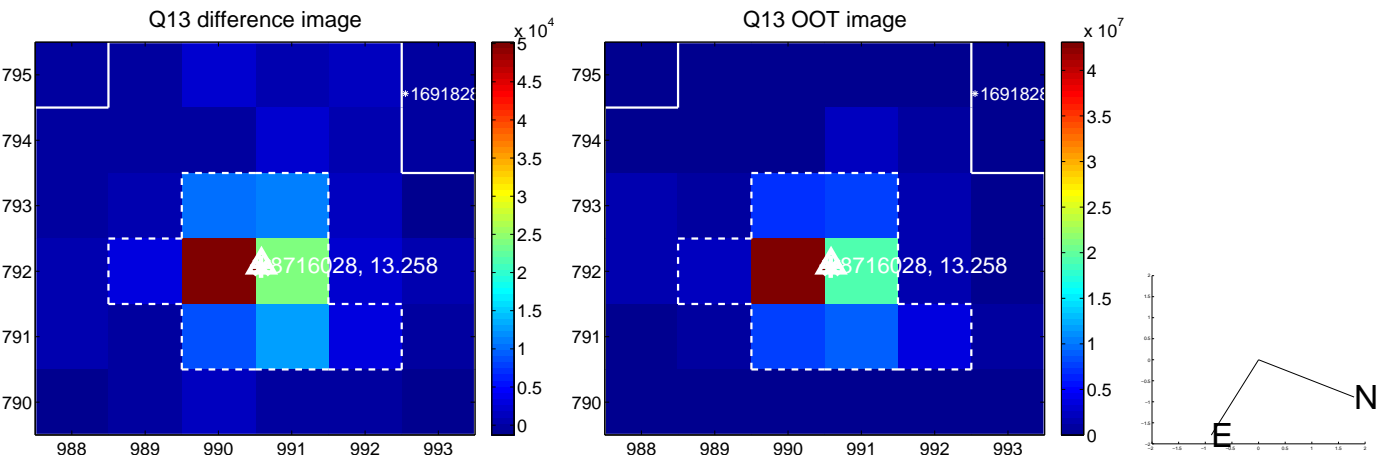
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



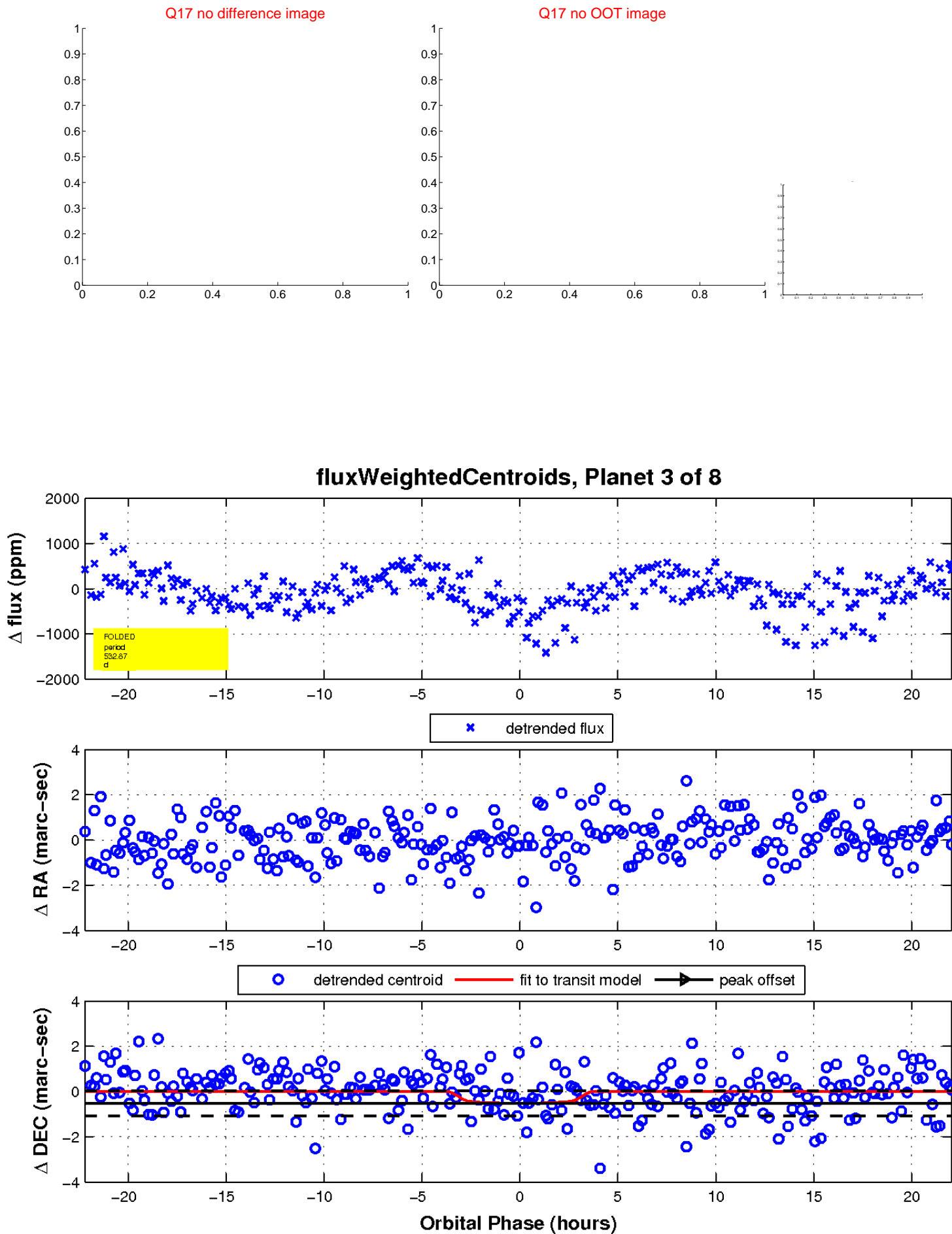
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

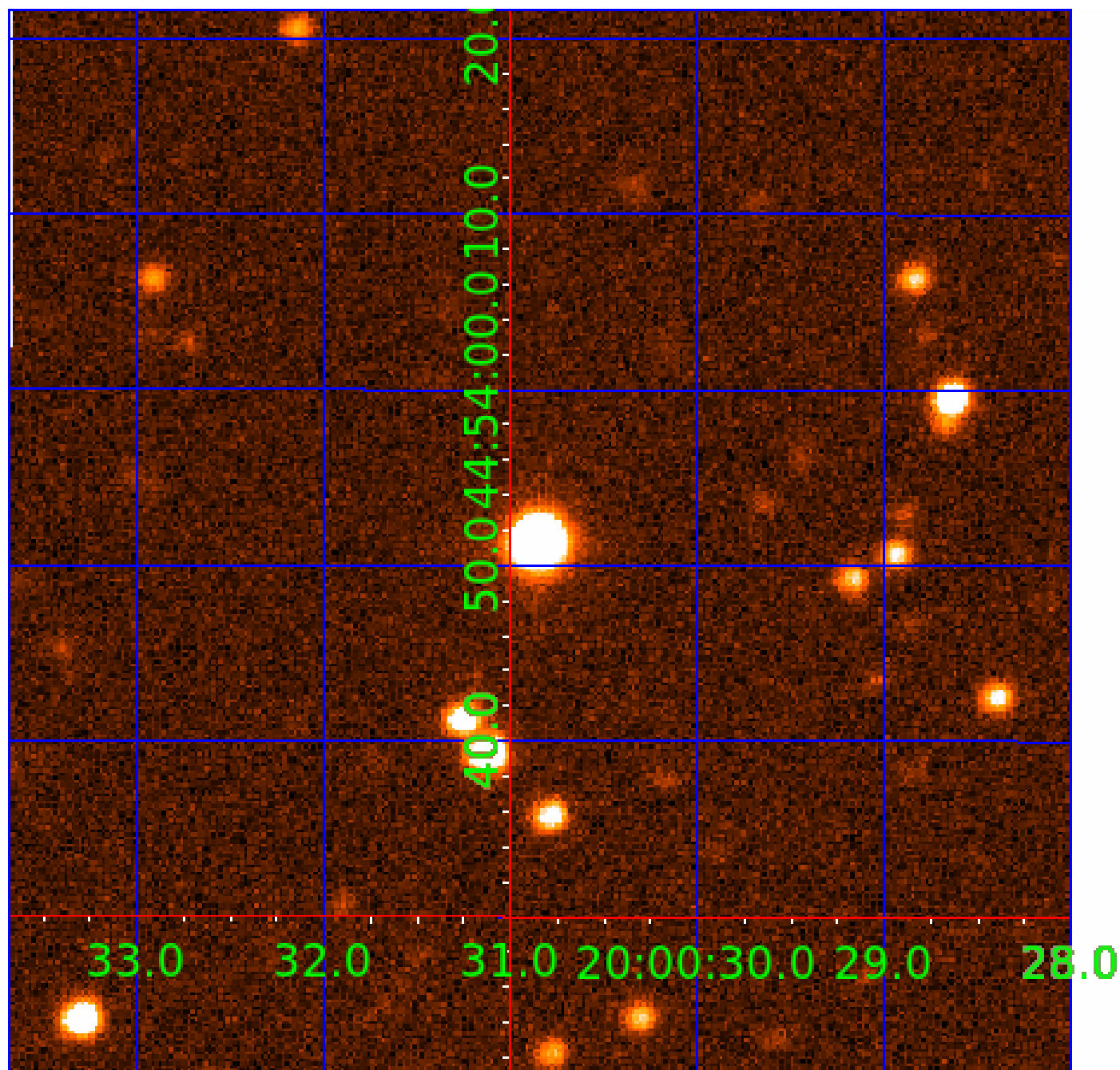


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008716028

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})
008716028-01	OBS	No	1.752399	132.775555	73.5	6.540	10.8	11.7	2.13	6632	3.23	8050.20
008716028-02	OBS	No	1.752389	131.563135	68.6	4.734	9.9	12.3	2.13	6632	3.23	8050.26
008716028-03	OBS	No	532.874333	152.974204	576.3	7.403	9.4	9.8	2.13	6632	6.02	3.94
008716028-04	OBS	No	14.763042	142.008324	175.8	7.647	8.9	9.5	2.13	6632	2.98	469.62
008716028-05	OBS	No	98.427139	200.078630	536.0	4.065	7.9	8.3	2.13	6632	5.44	37.42
008716028-06	OBS	No	508.140391	316.308767	503.3	4.729	7.5	7.8	2.13	6632	4.80	4.19
008716028-07	OBS	No	72.851489	190.500130	273.6	0.594	7.8	2.9	2.13	6632	3.64	55.90
008716028-08	OBS	No	34.934758	163.806235	164.7	5.000	7.2	-1.0	2.13	6632	2.75	148.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008716028-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008716028-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
008716028-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008716028-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008716028-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

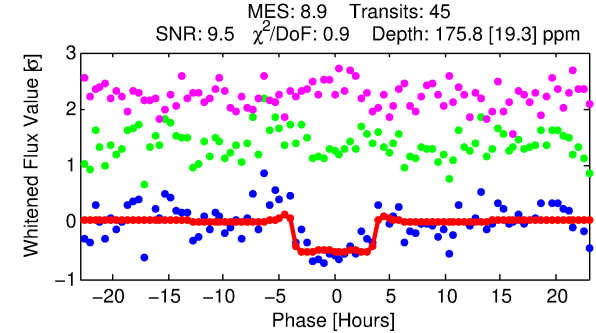
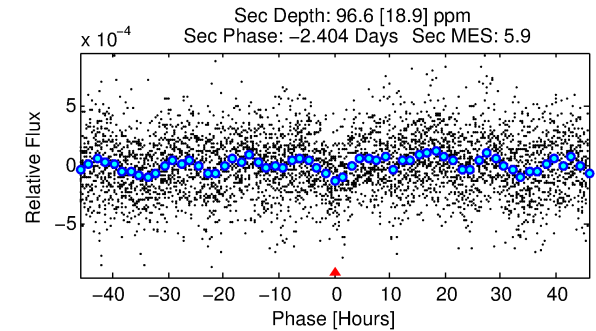
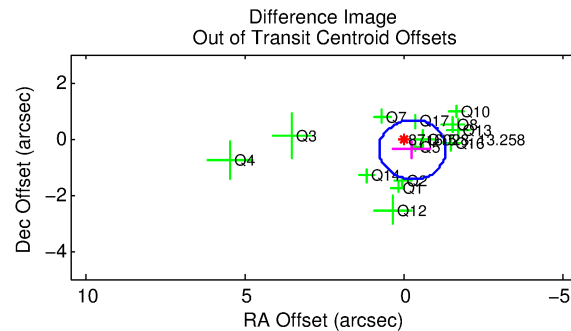
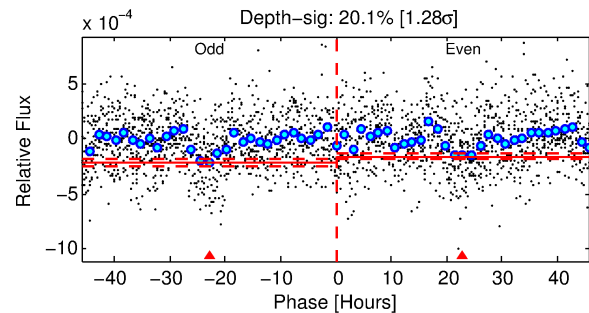
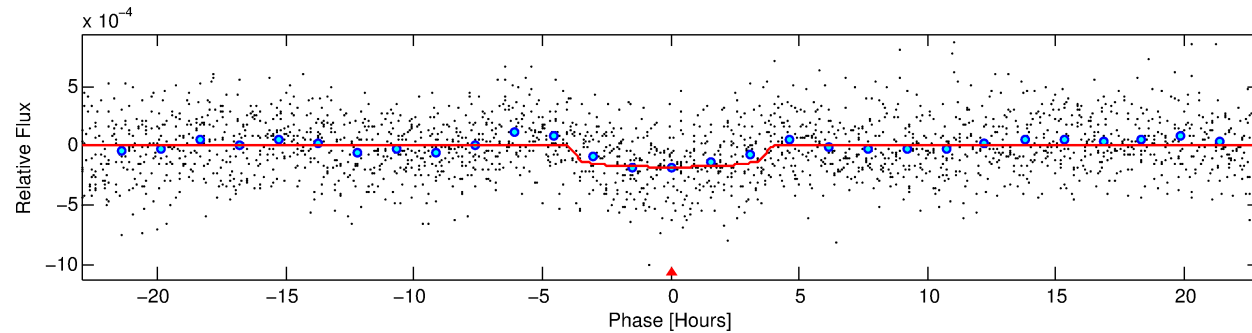
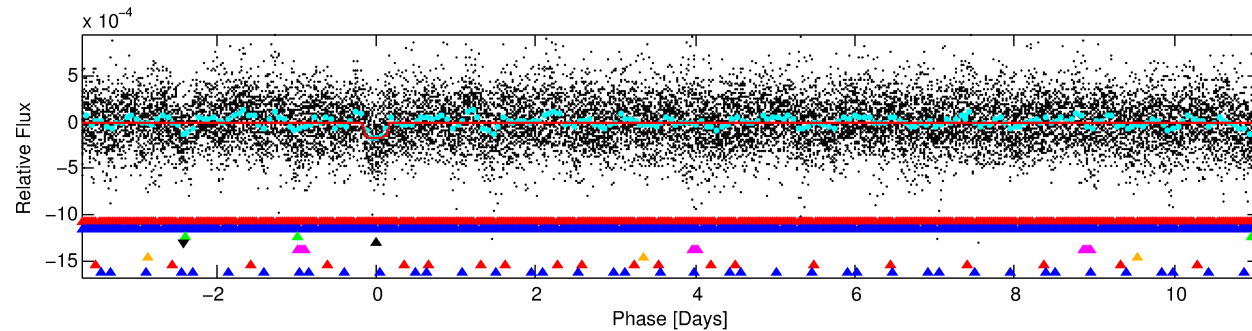
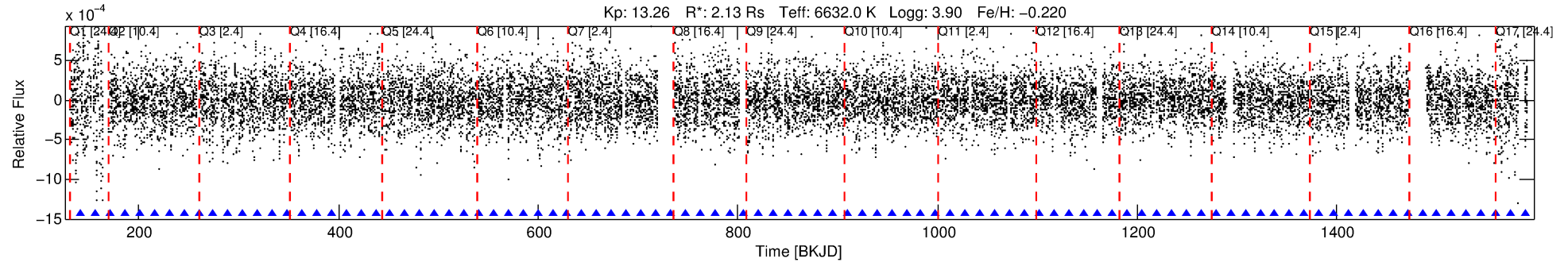
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008716028-04

No Significant Match Found

DV One-Page Summary

KIC: 8716028 Candidate: 4 of 8 Period: 14.763 d



DV Fit Results:

Period = 14.76304 [0.00018] d
Epoch = 142.0083 [0.0102] BKJD
Rp/R* = 0.0128 [0.0074]
a/R* = 11.58 [37.04]
b = 0.64 [2.96]
Seff = 469.62 [298.06]
Teq = 1187 [188] K
Rp = 2.98 [2.09] Re
a = 0.1292 [0.0497] AU
Ag = 99.84 [132.11] [0.75 σ]
Teffp = 5801 [1710] K [2.68 σ]

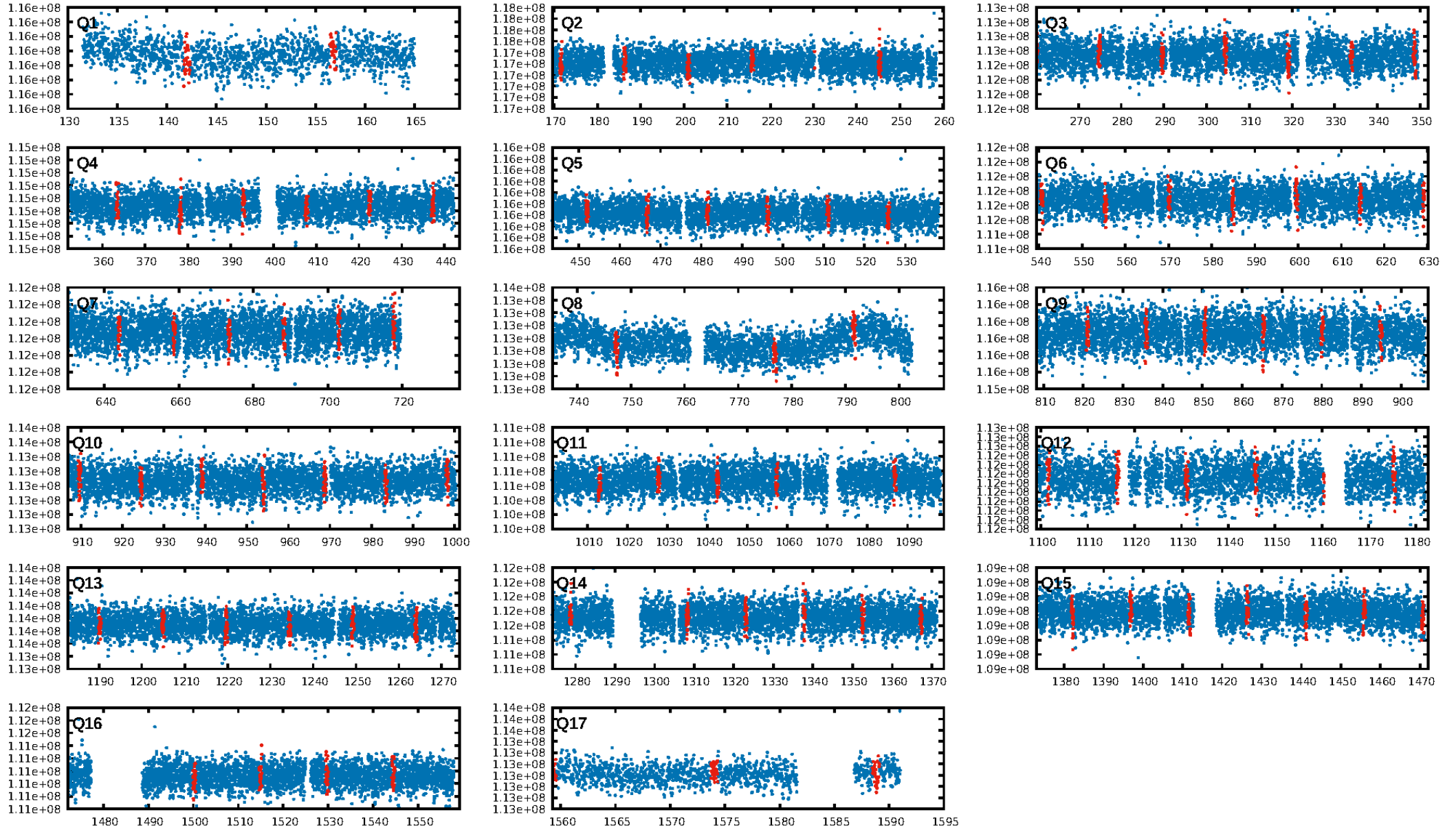
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [31.03 σ]
LongPeriod-sig: 100.0% [52.99 σ]
ModelChiSquare2-sig: 8.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [43/43]
GhostDiagnostic-chr: -0.7961
Centroid-sig: N/A
Centroid-so: 1.212 arcsec [2.70 σ]
OotOffset-rm: 0.471 arcsec [1.34 σ]
KicOffset-rm: 0.511 arcsec [1.56 σ]
OotOffset-st: 3/3/4/4 [14]
KicOffset-st: 3/3/4/4 [14]
DiffImageQuality-fgm: 0.43 [6/14]
DiffImageOverlap-fno: 0.00 [0/17]

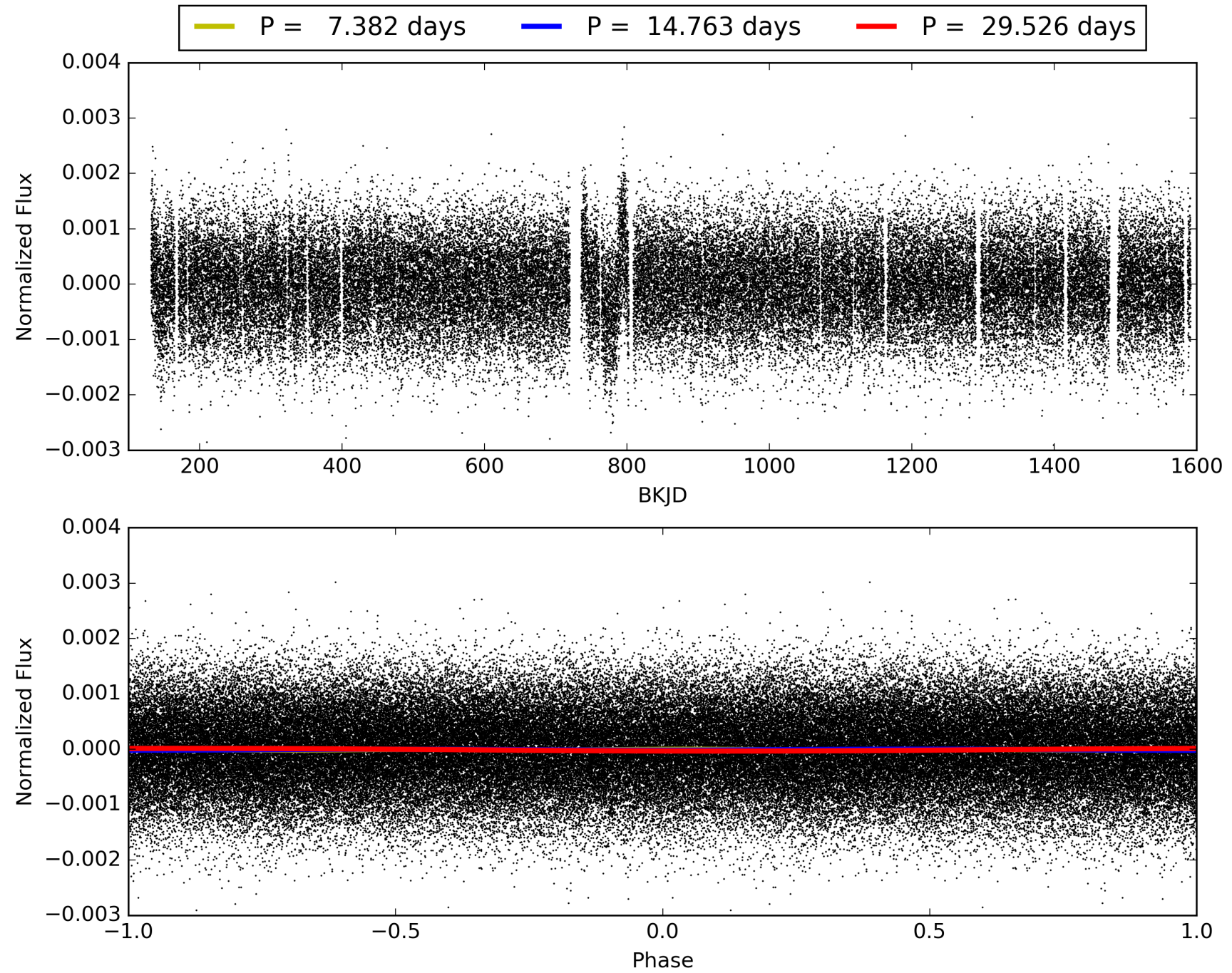
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:03:55 Z

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

TCE 008716028-04, PDC Light Curves

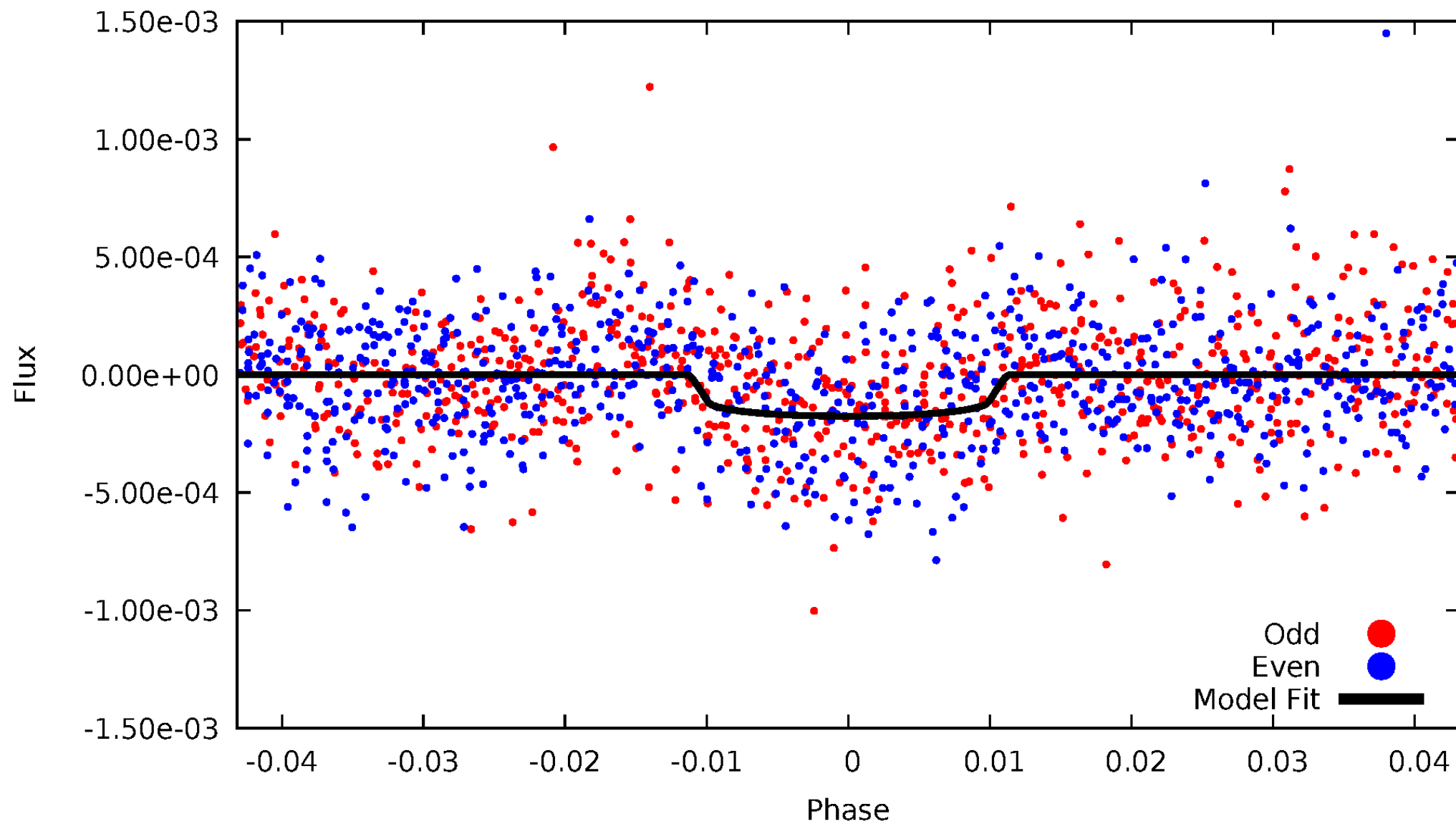


TCE 008716028-04



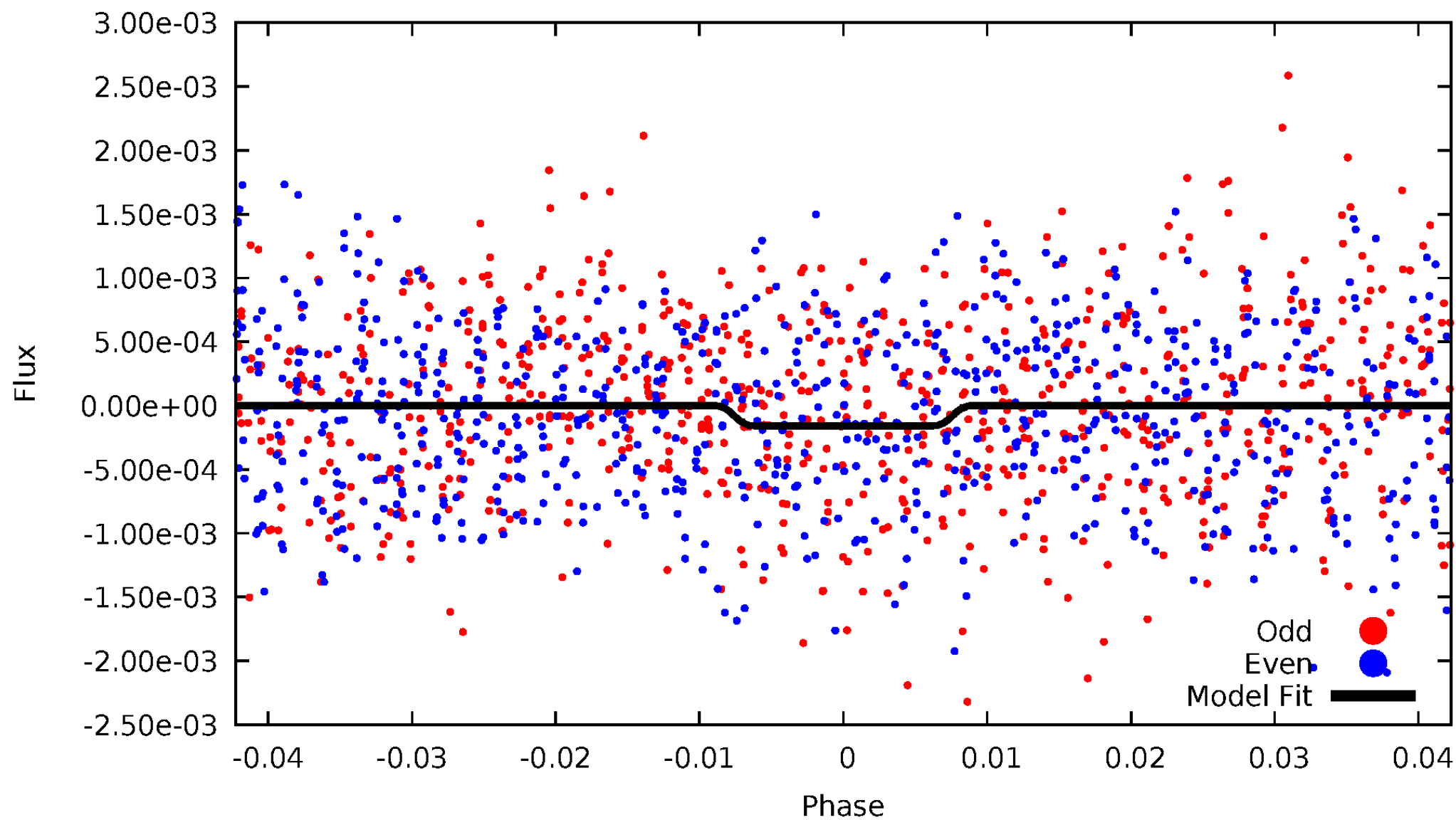
DV Odd/Even

TCE 008716028-04



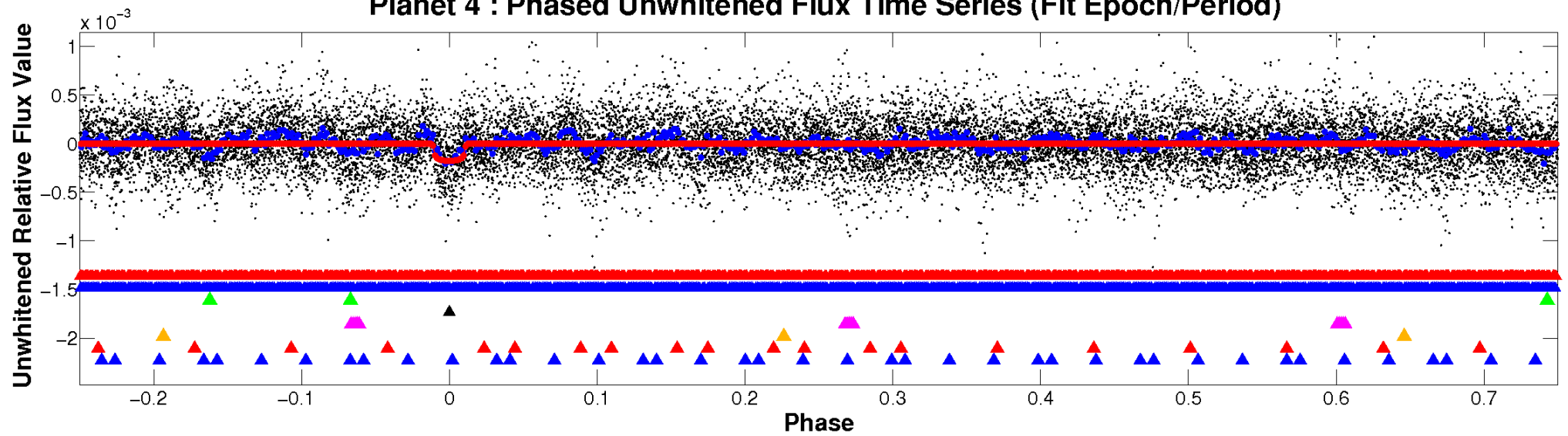
ALT Odd/Even

TCE 008716028-04

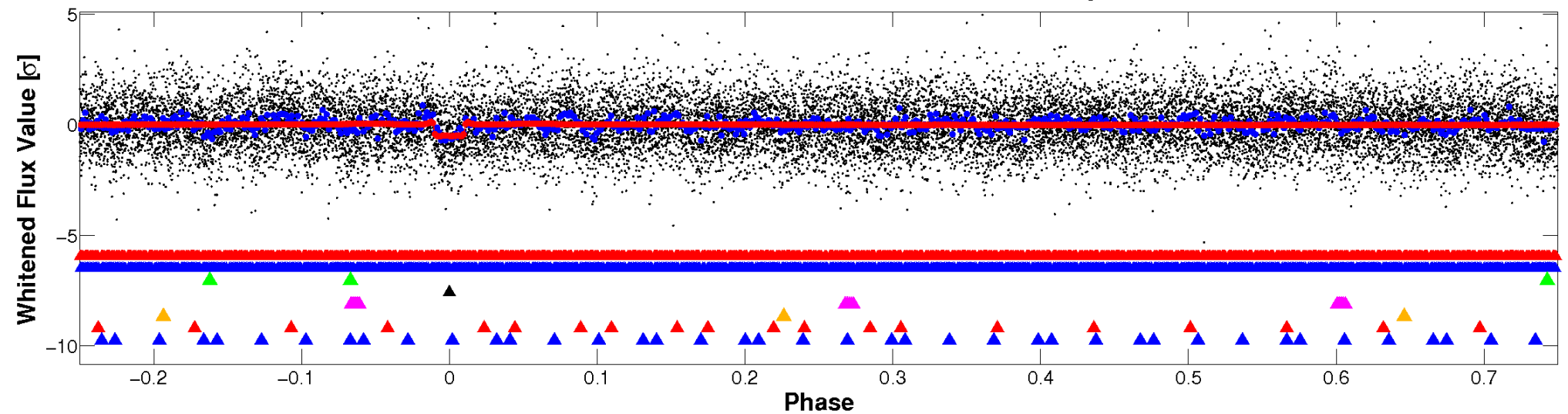


Non-Whitened Vs. Whitened Light Curve

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

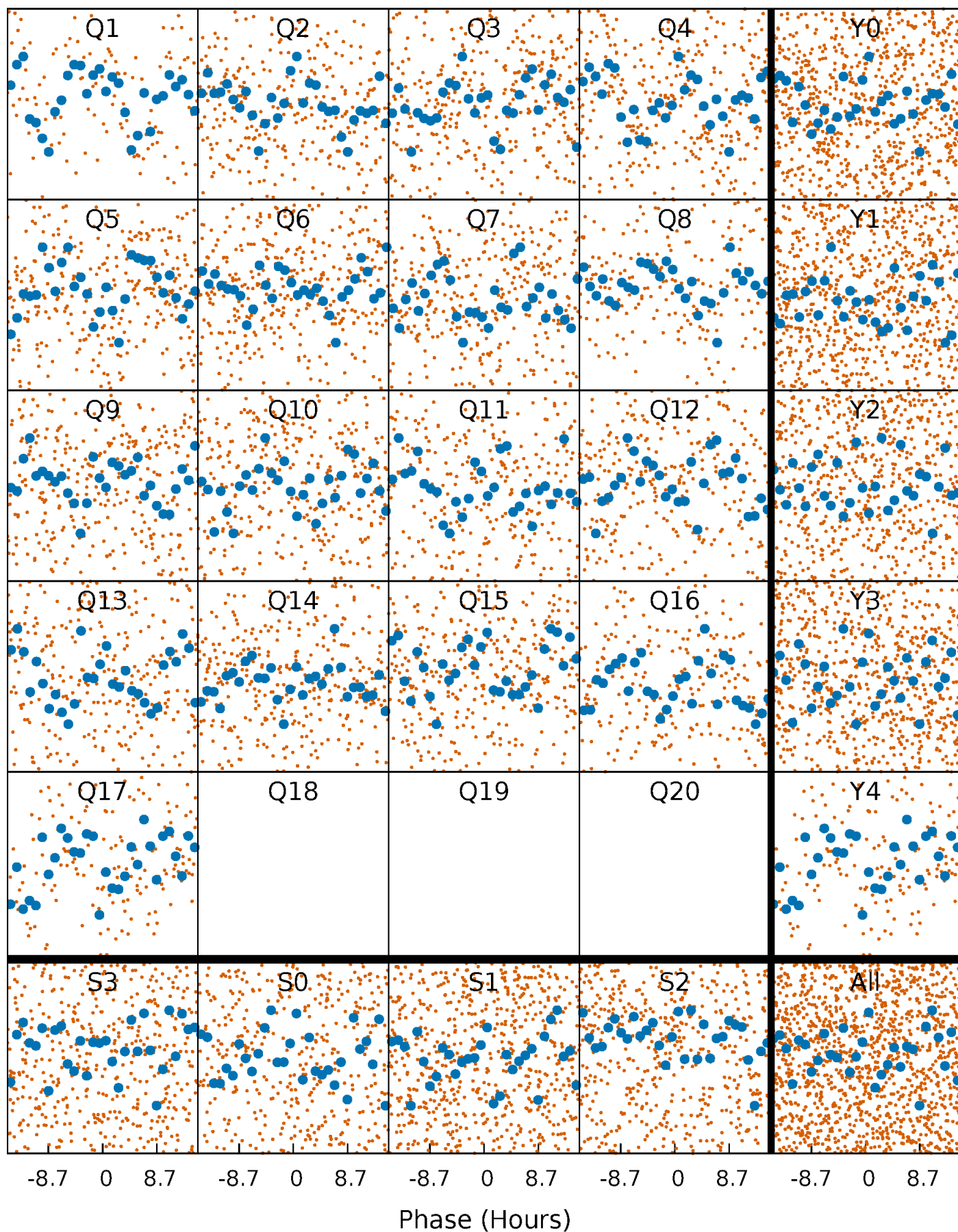


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



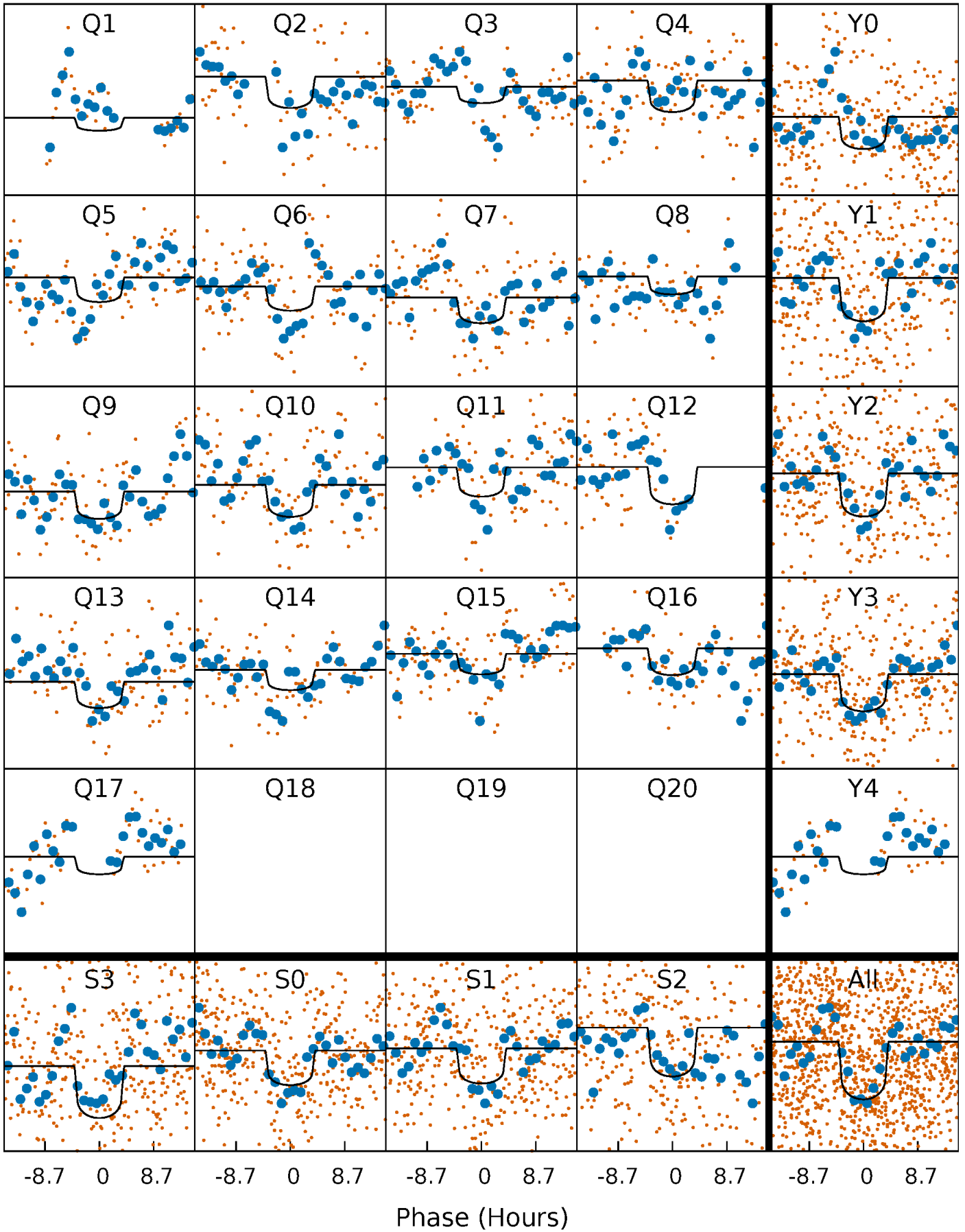
PDC Quarter-Phased Transit Curves

TCE 008716028-04 P= 14.763042 Days $T_0=142.008324$ (BKJD)



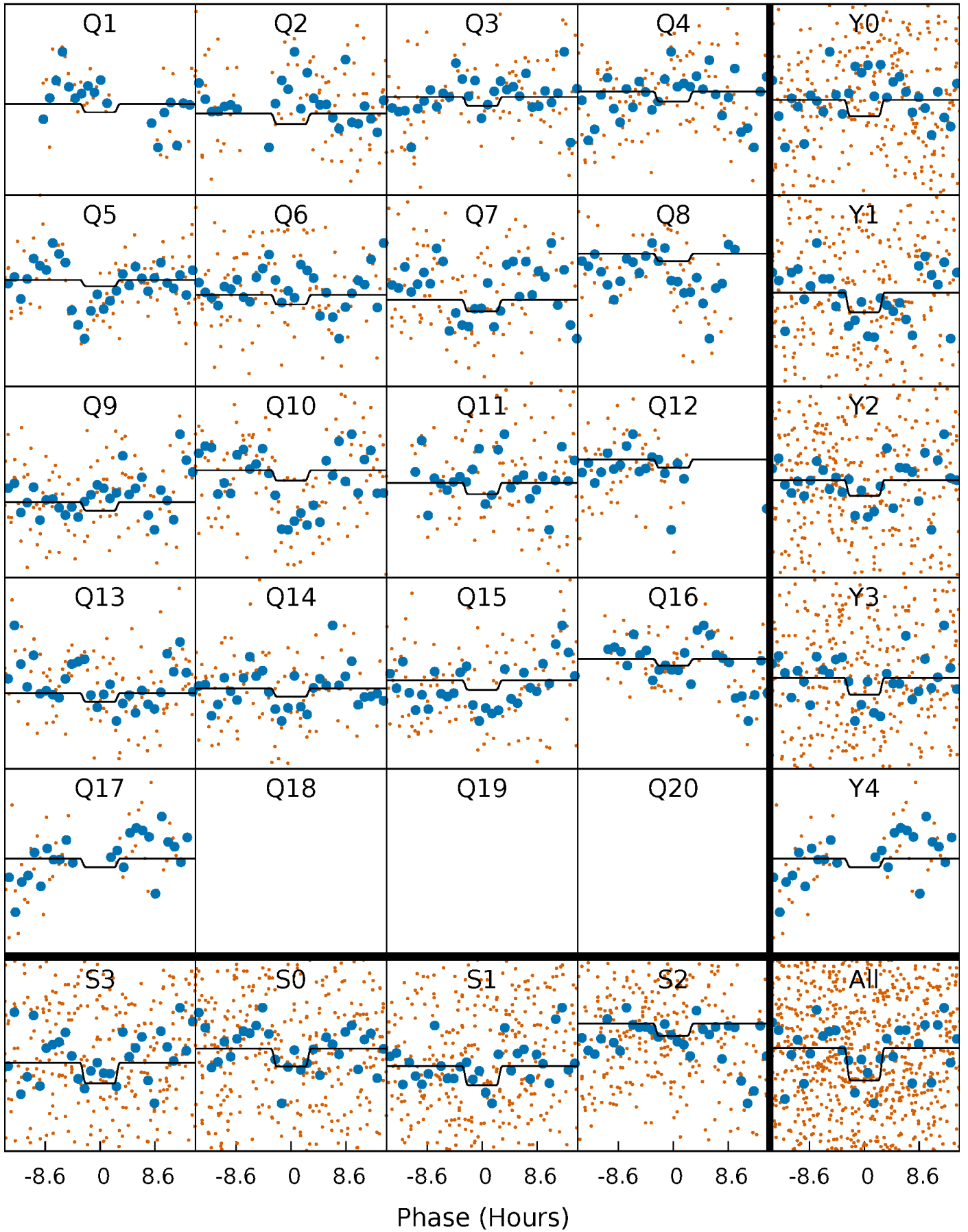
DV Quarter-Phased Transit Curves

TCE 008716028-04 P= 14.763042 Days $T_0=142.008324$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

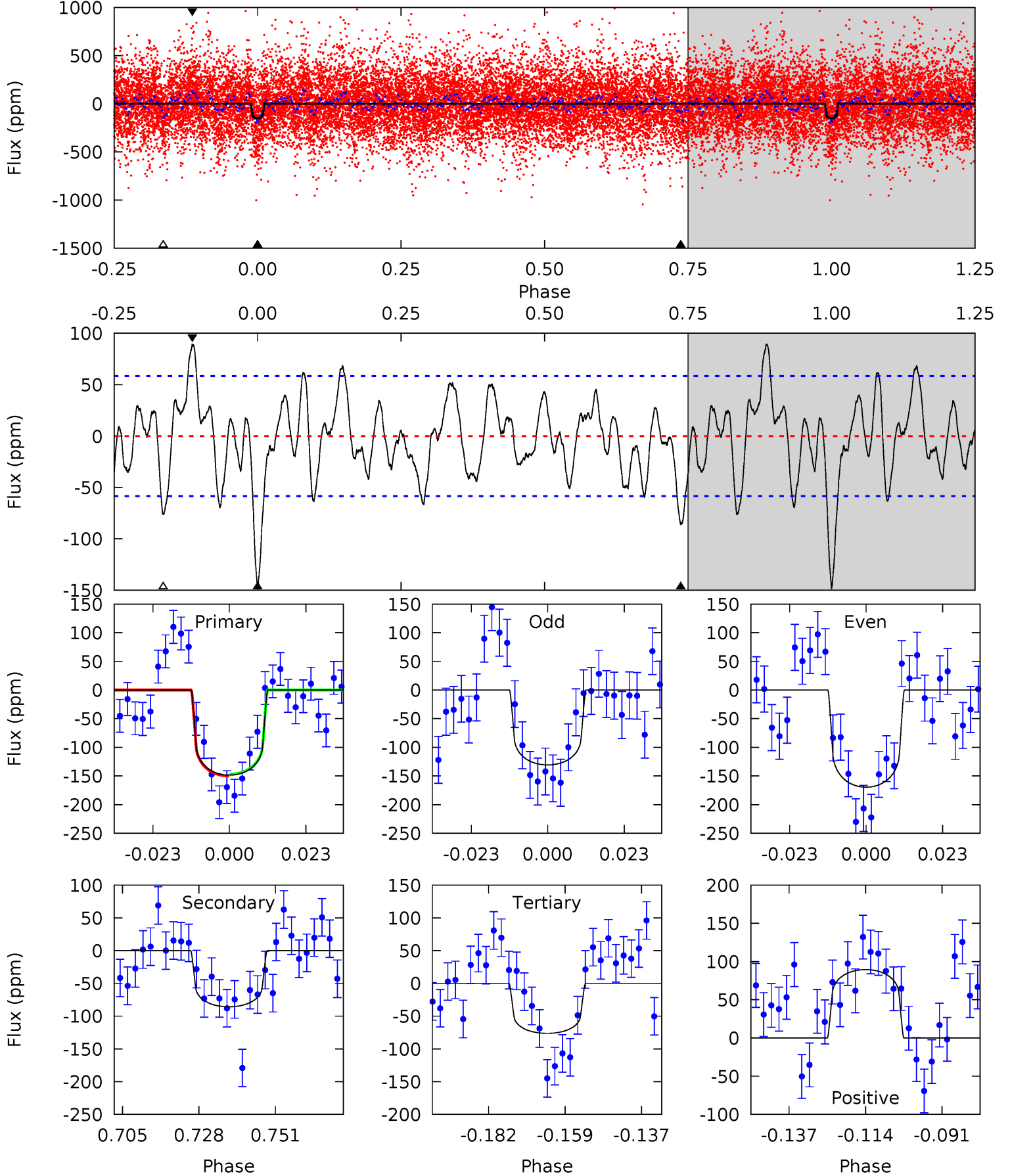
TCE 008716028-04 P= 14.762509 Days $T_0=142.049441$ (BKJD)



DV Model-Shift Uniqueness Test

008716028-04, P = 14.763042 Days, E = 127.245282 Days

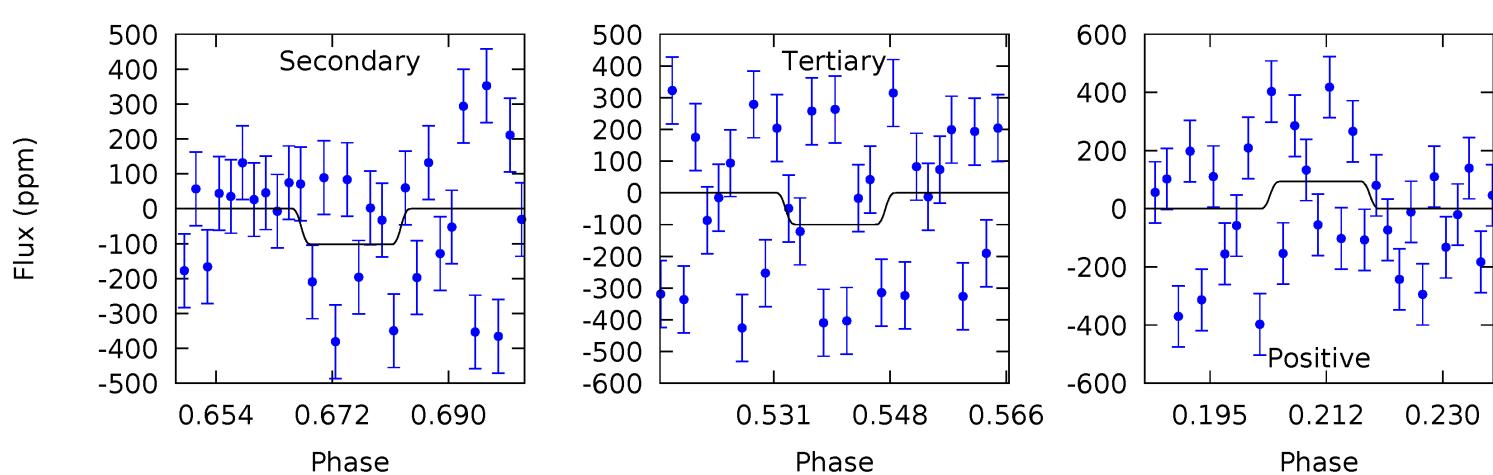
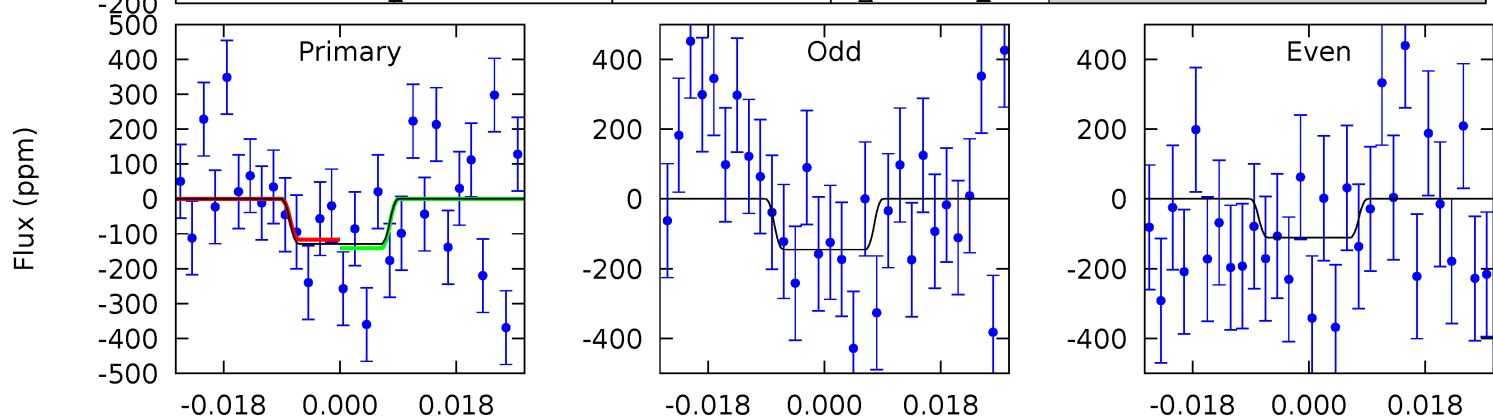
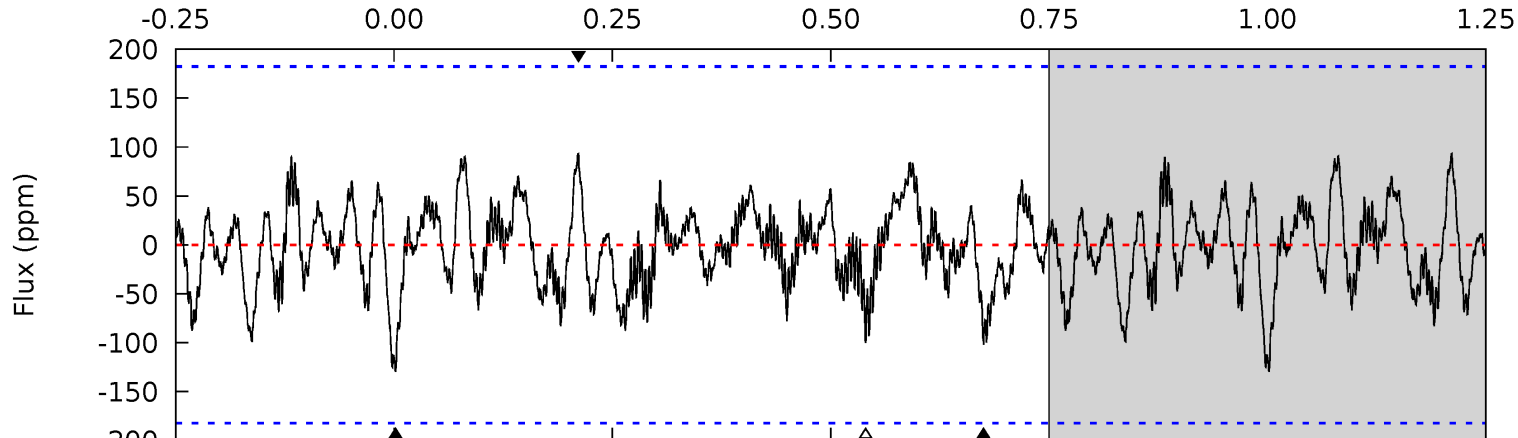
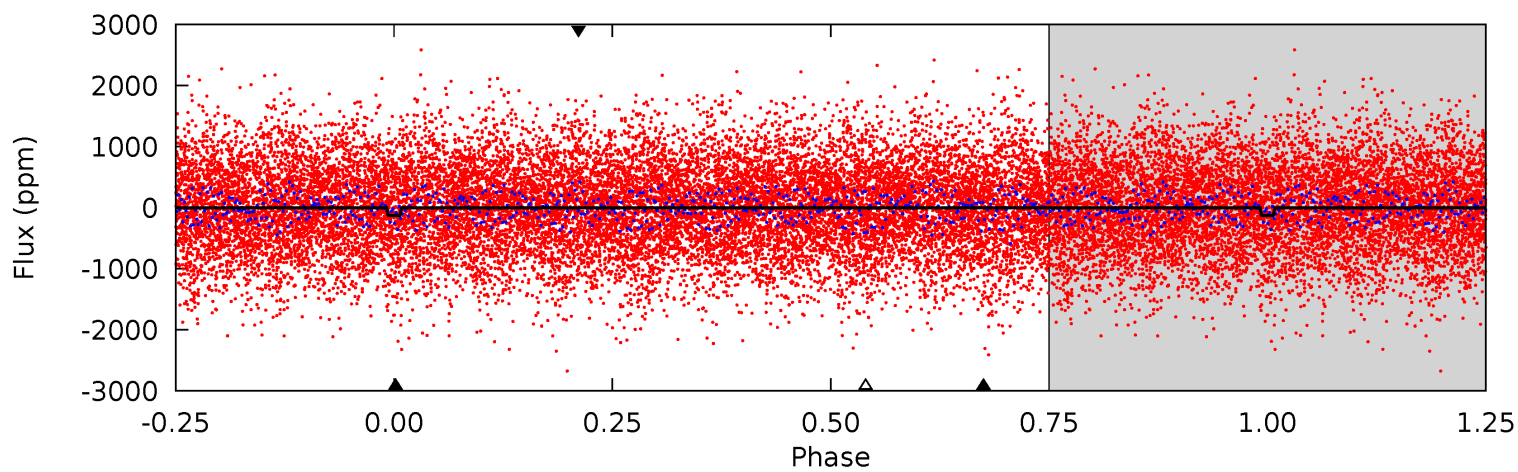
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	7.14	6.35	7.45	4.87	2.28	2.60	6.01	4.92	0.79	-0.31	1.62	0.82	0.38	0.14



Alt Model-Shift Uniqueness Test

008716028-04, P = 14.762509 Days, E = 127.286932 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.50	2.75	2.70	2.53	4.92	2.37	0.99	0.80	0.97	0.06	0.22	0.46	9.56	0.42	0.34



Stellar Parameters For KIC 008716028

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6632^{+180}_{-240}	$3.903^{+0.364}_{-0.130}$	$-0.220^{+0.250}_{-0.300}$	$2.127^{+0.562}_{-0.842}$	$1.323^{+0.211}_{-0.234}$	$0.194^{+0.589}_{-0.070}$
	+3%/-4%	+9%/-3%	+114%/-136%	+26%/-40%	+16%/-18%	+304%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008716028-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-86 ± 12	$2.75^{+1.92}_{-1.45}$	1626^{+122}_{-181}	5632^{+2744}_{-1049}	106^{+354}_{-70}
Alt.	-102 ± 37	$2.81^{+1.74}_{-1.48}$	1615^{+130}_{-164}	5699^{+2896}_{-1074}	111^{+433}_{-73}

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

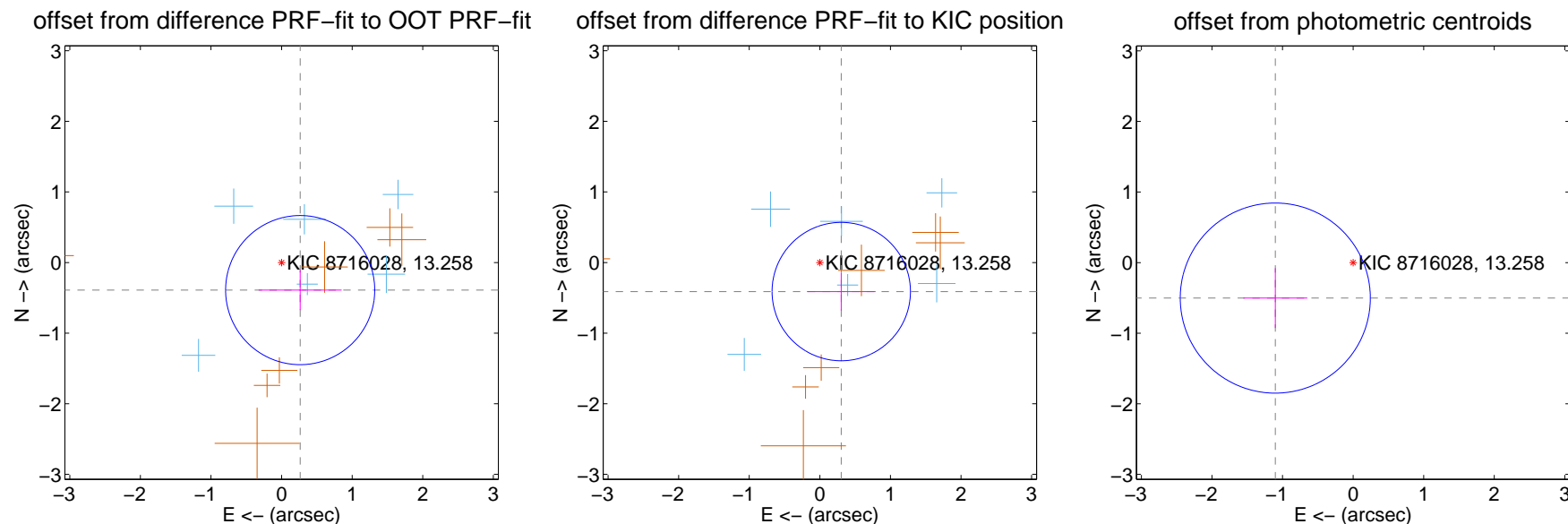
DV Centroid Data

Supplemental centroid analysis for 008716028-04. Kepler magnitude: 13.26. Transit SNR 9.52

There are 6 quarters with good PRF difference image offsets

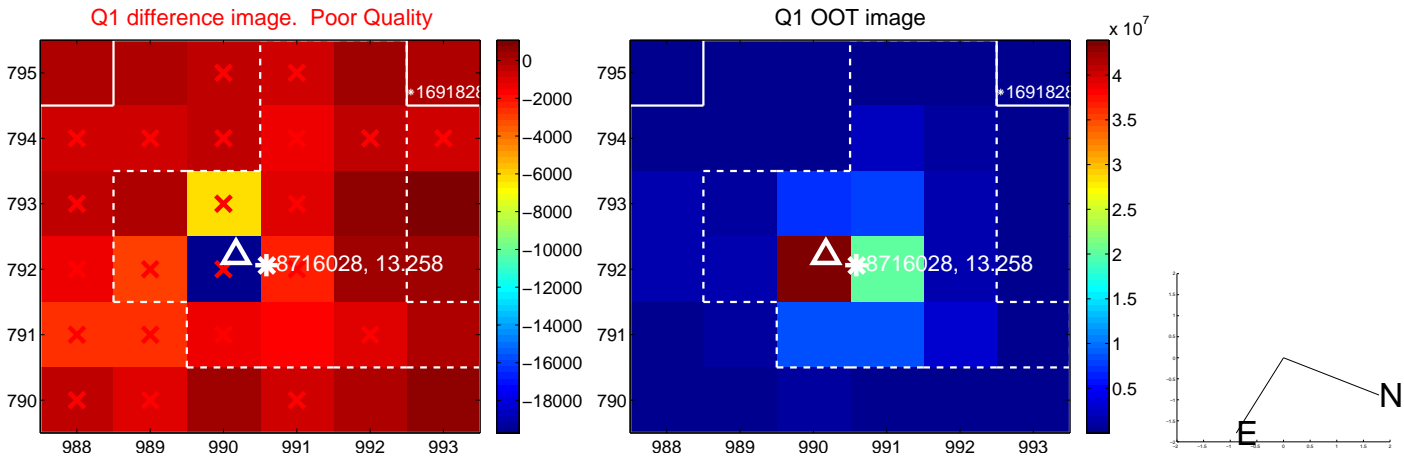
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.471 ± 0.352	1.34	-0.263 ± 0.588	-0.390 ± 0.284
PRF-fit source offset from KIC position	0.511 ± 0.327	1.56	-0.303 ± 0.486	-0.411 ± 0.270
photometric centroid source offset	1.21 ± 0.45	2.70	1.10 ± 0.45	-0.50 ± 0.42

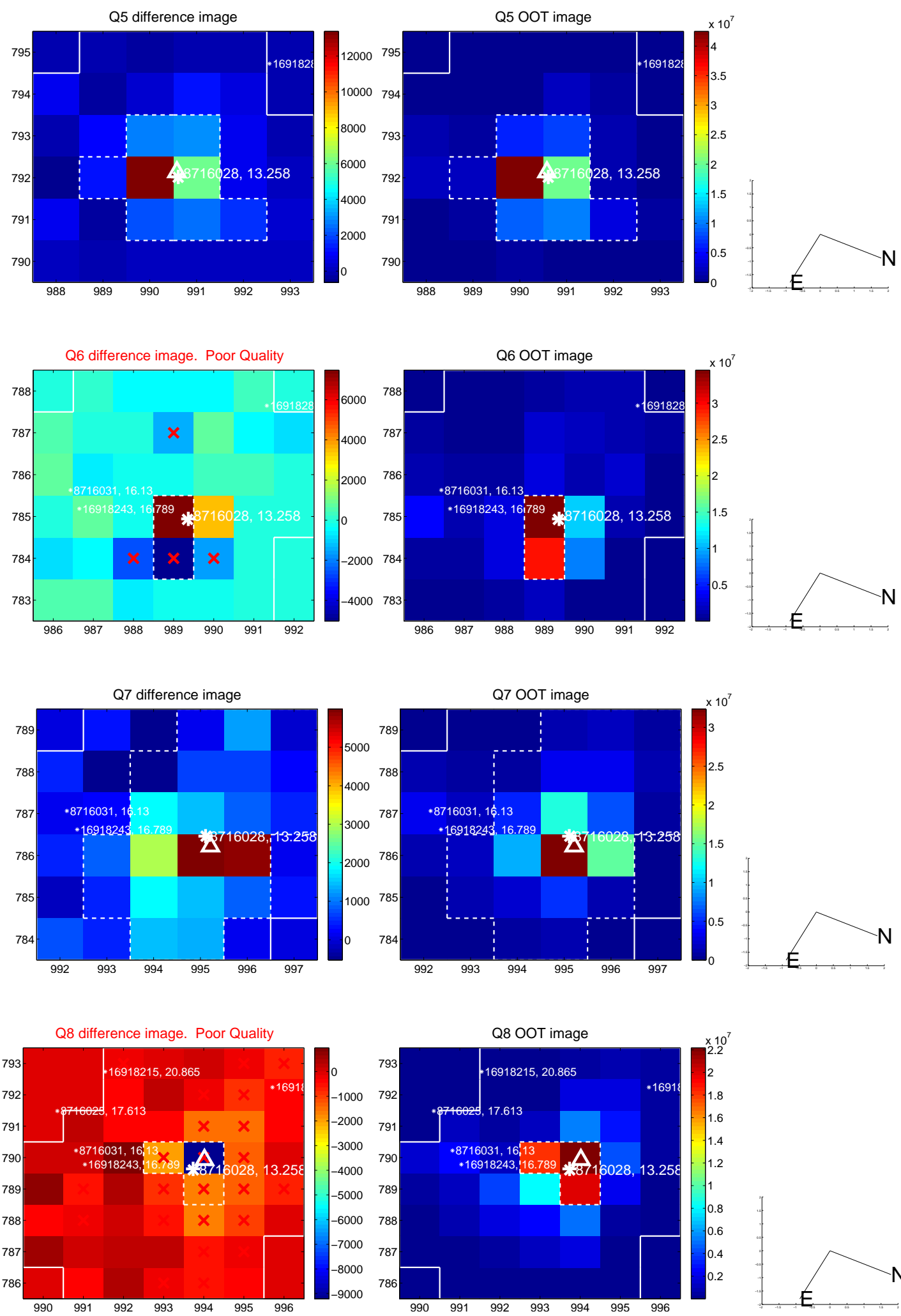


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

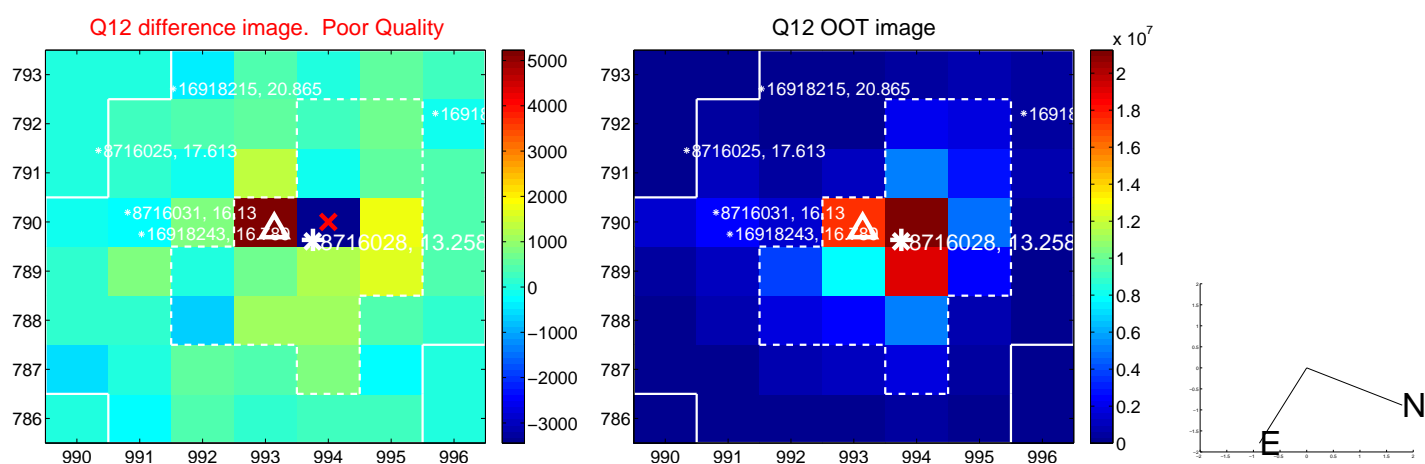
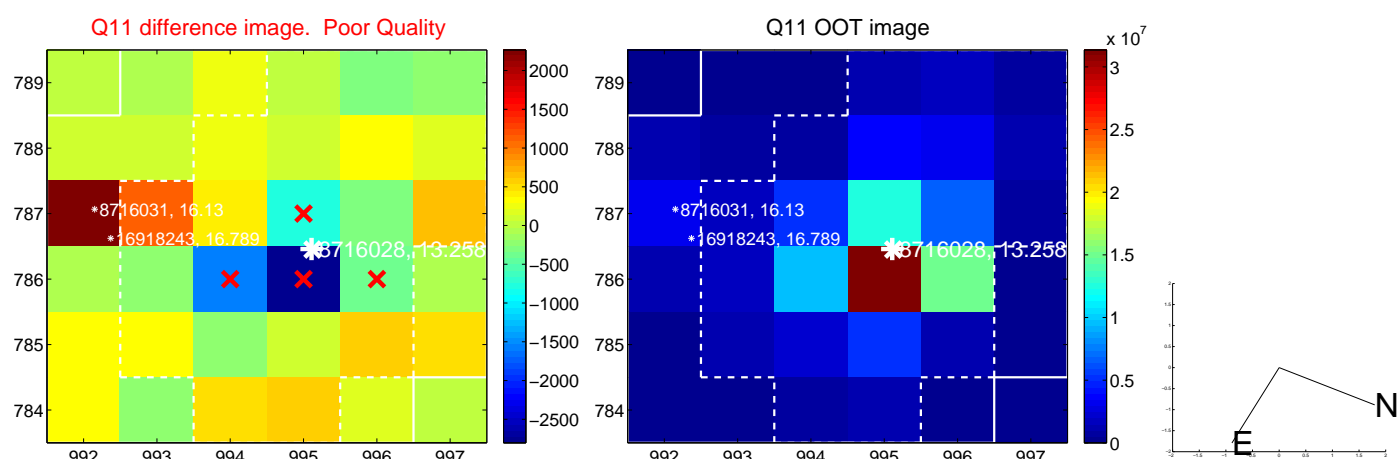
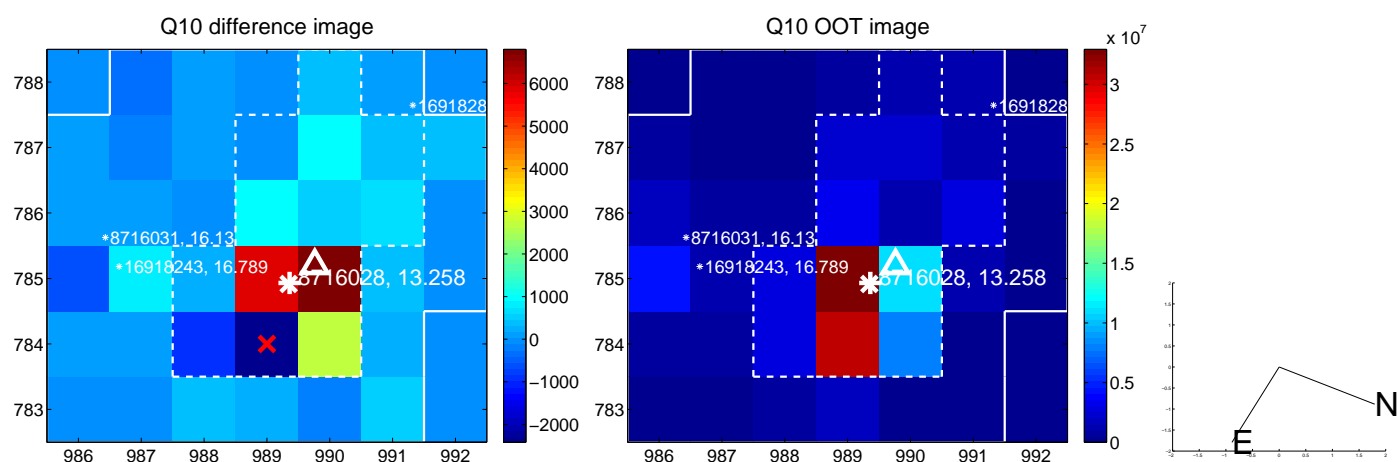
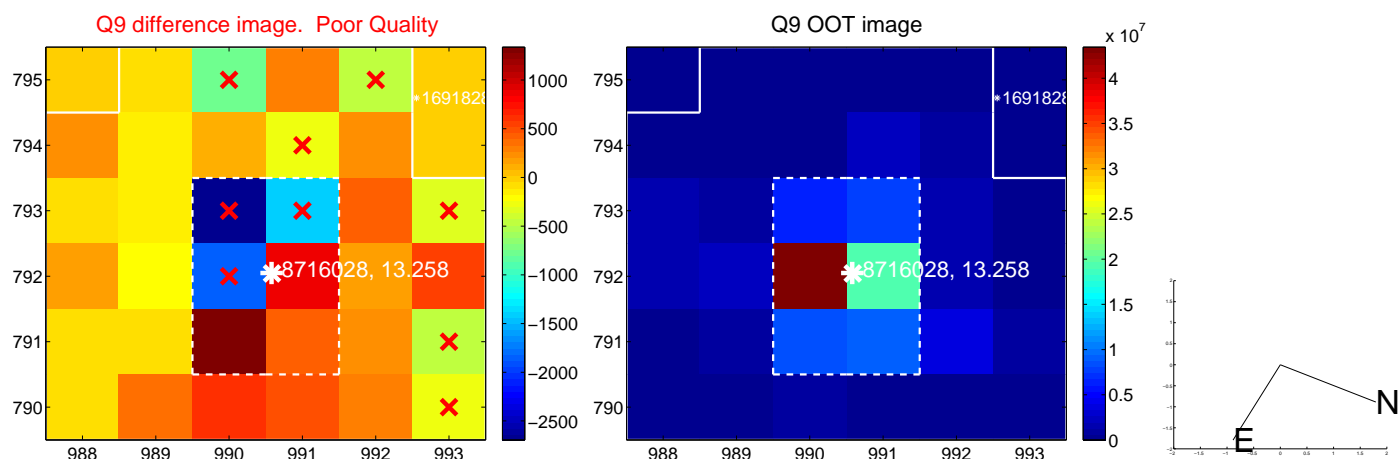
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



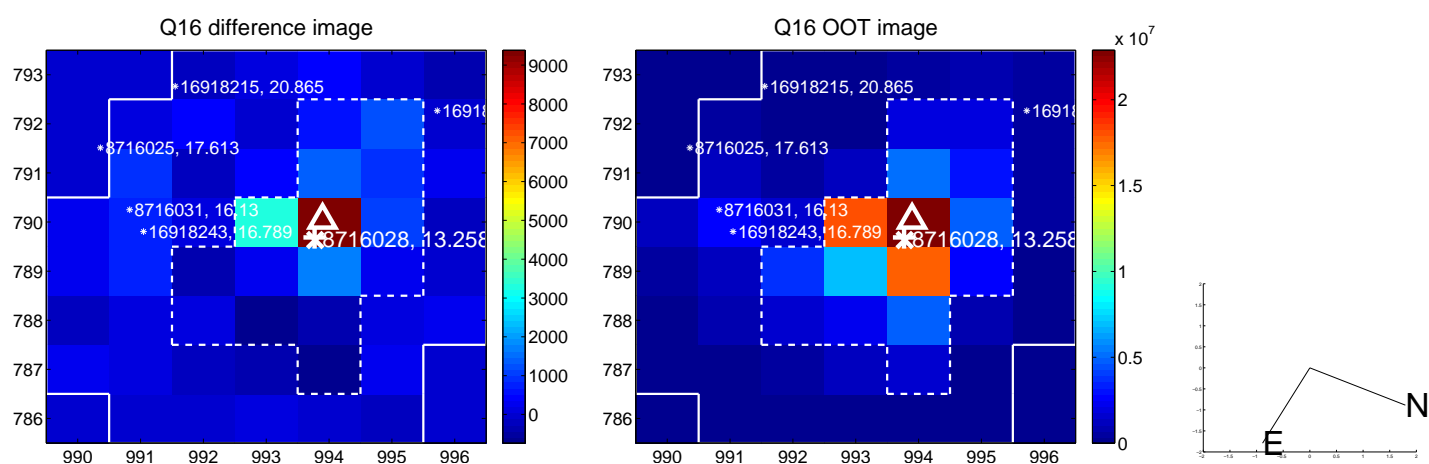
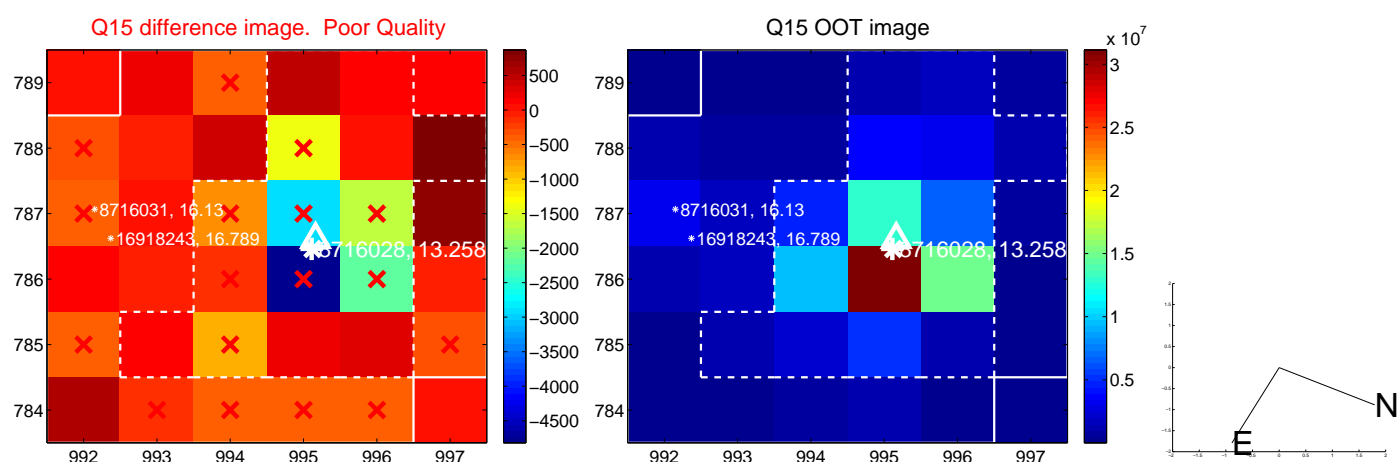
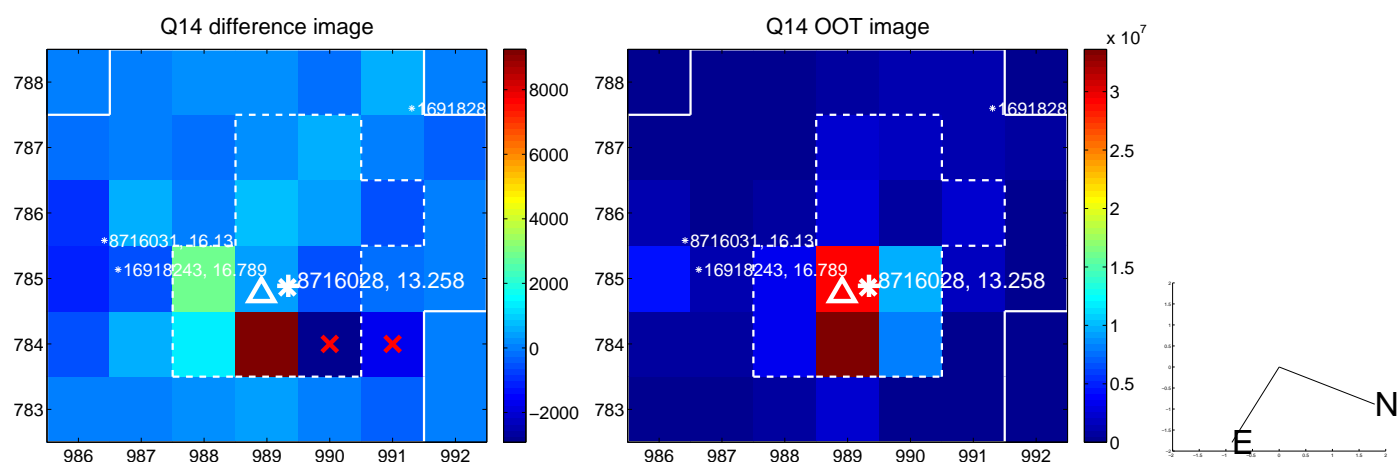
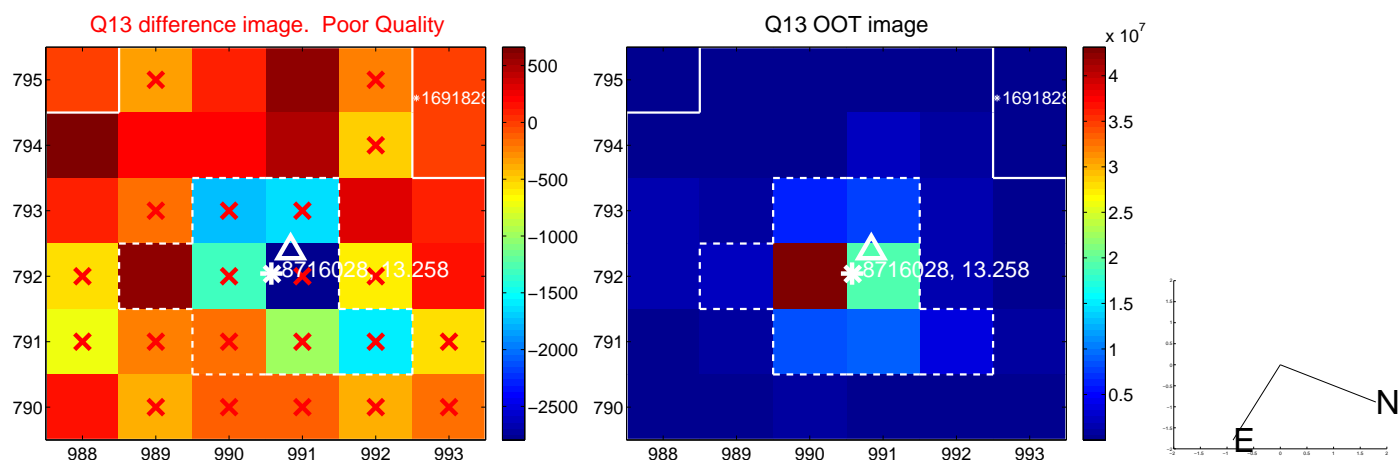
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



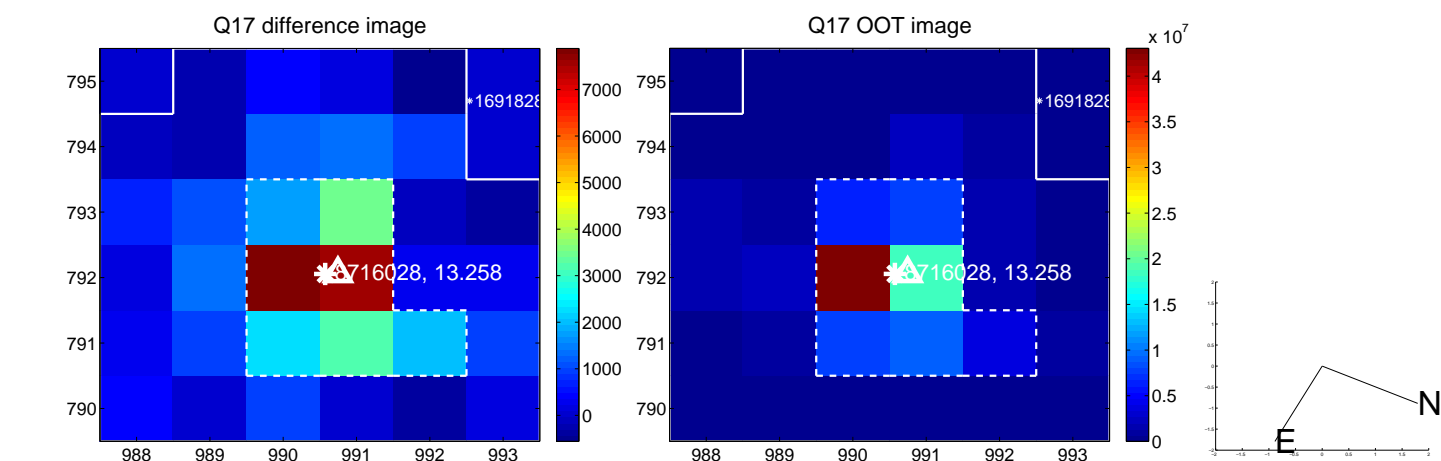
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



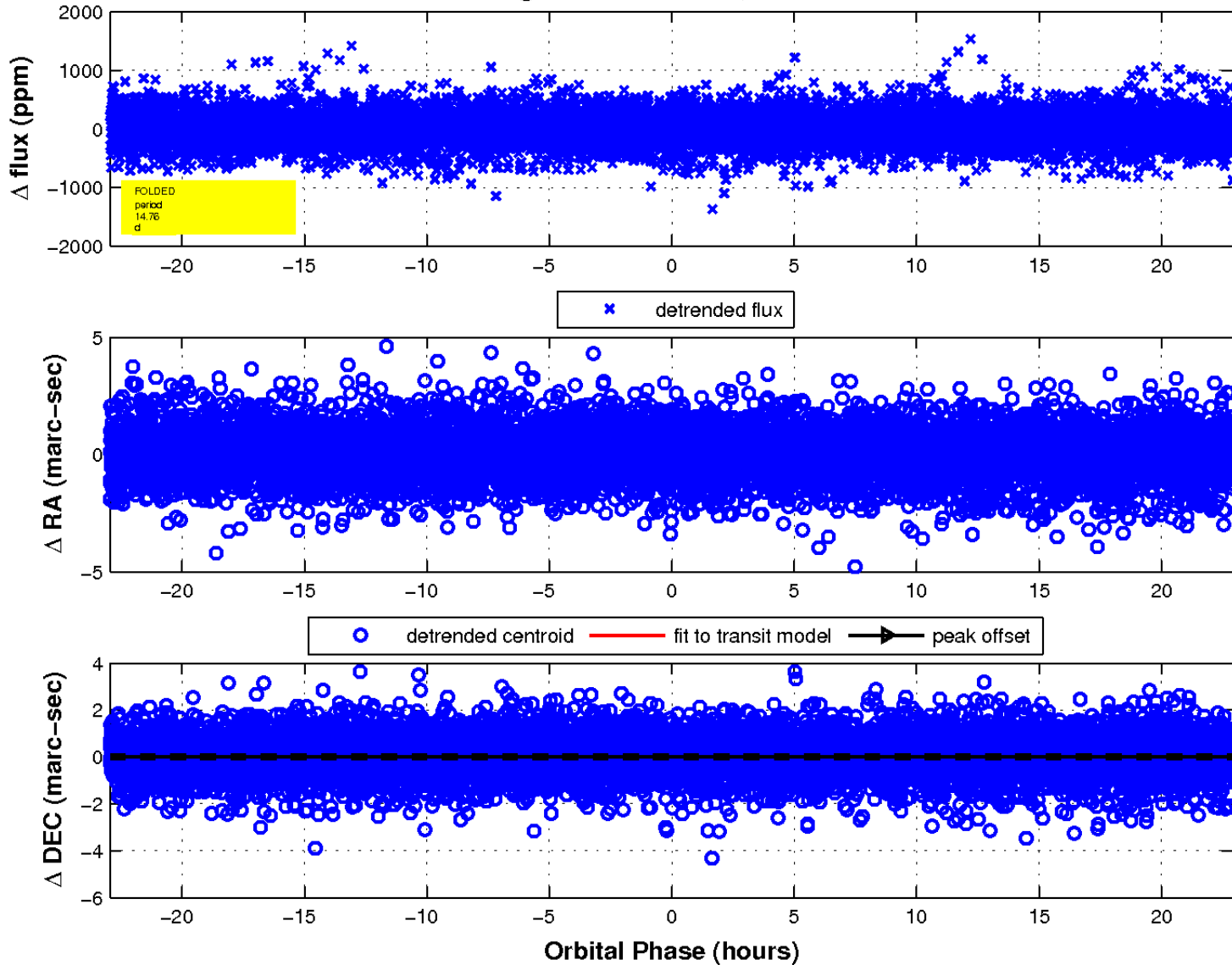
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

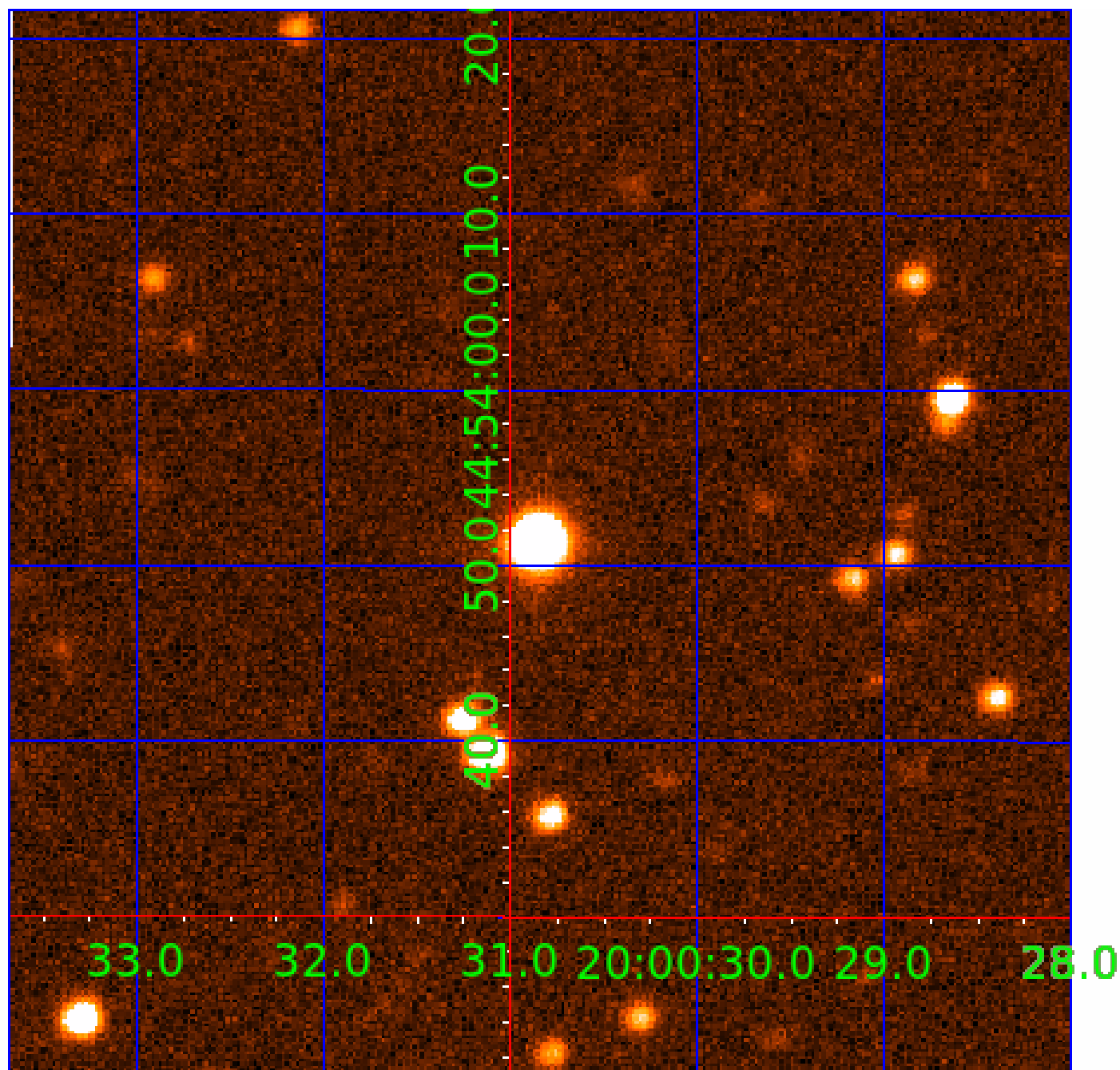


fluxWeightedCentroids, Planet 4 of 8



UKIRT Image

Declination



KIC 008716028

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})
008716028-01	OBS	No	1.752399	132.775555	73.5	6.540	10.8	11.7	2.13	6632	3.23	8050.20
008716028-02	OBS	No	1.752389	131.563135	68.6	4.734	9.9	12.3	2.13	6632	3.23	8050.26
008716028-03	OBS	No	532.874333	152.974204	576.3	7.403	9.4	9.8	2.13	6632	6.02	3.94
008716028-04	OBS	No	14.763042	142.008324	175.8	7.647	8.9	9.5	2.13	6632	2.98	469.62
008716028-05	OBS	No	98.427139	200.078630	536.0	4.065	7.9	8.3	2.13	6632	5.44	37.42
008716028-06	OBS	No	508.140391	316.308767	503.3	4.729	7.5	7.8	2.13	6632	4.80	4.19
008716028-07	OBS	No	72.851489	190.500130	273.6	0.594	7.8	2.9	2.13	6632	3.64	55.90
008716028-08	OBS	No	34.934758	163.806235	164.7	5.000	7.2	-1.0	2.13	6632	2.75	148.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008716028-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008716028-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
008716028-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008716028-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008716028-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

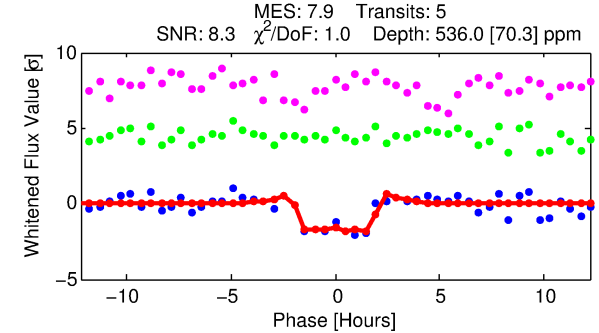
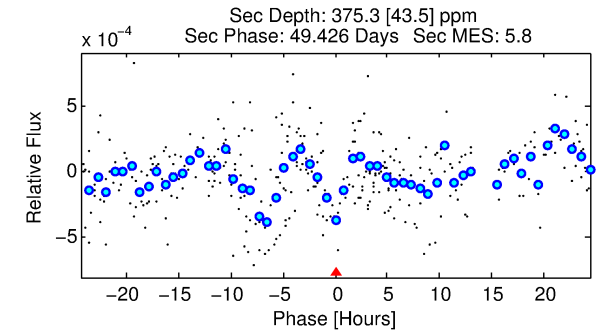
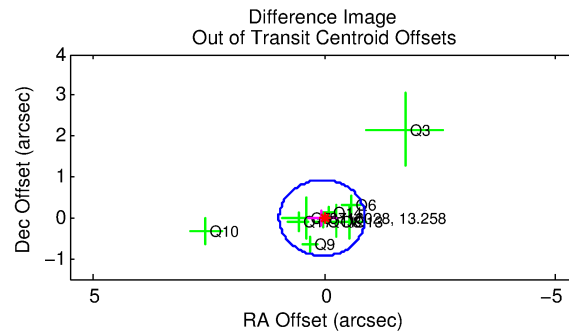
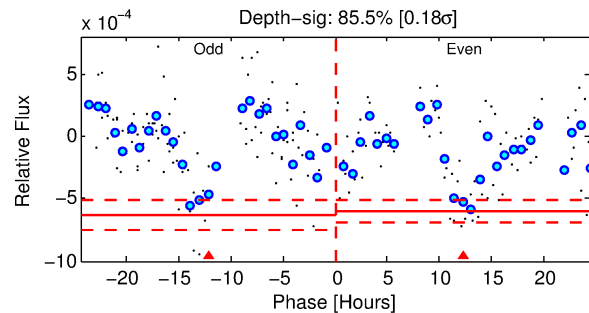
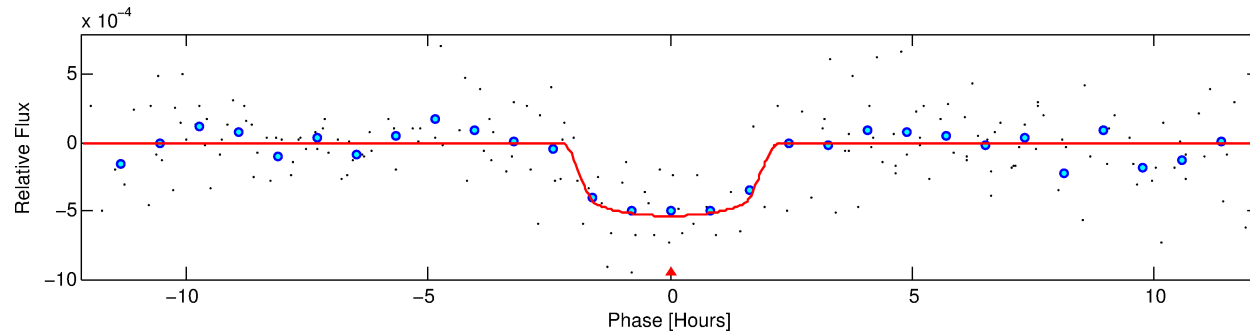
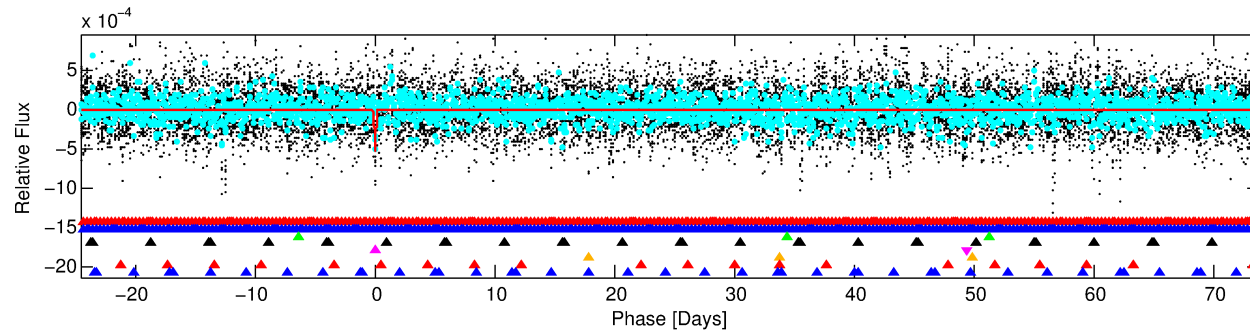
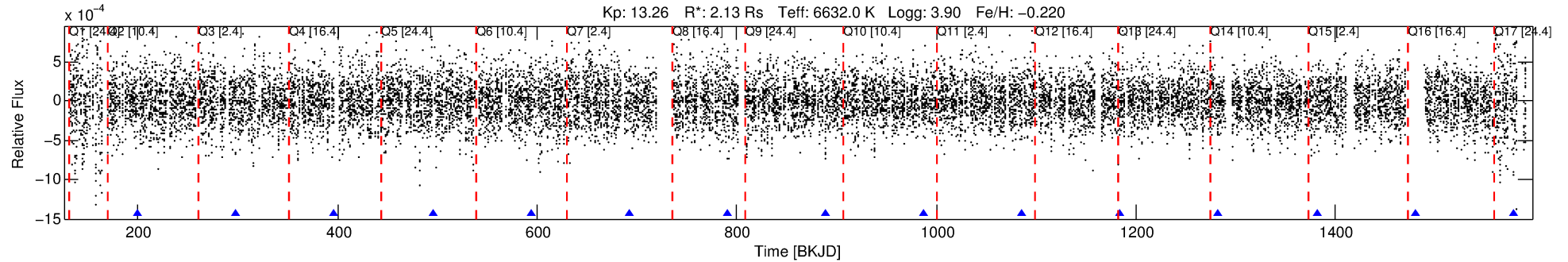
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008716028-05

No Significant Match Found

DV One-Page Summary

KIC: 8716028 Candidate: 5 of 8 Period: 98.427 d



DV Fit Results:

Period = 98.42714 [0.00105] d
Epoch = 200.0786 [0.0080] BKJD
Rp/R* = 0.0234 [0.0123]
a/R* = 117.94 [345.53]
b = 0.80 [1.32]
Seff = 37.43 [23.75]
Teq = 631 [100] K
Rp = 5.44 [3.57] Re
a = 0.4577 [0.1759] AU
Ag = 1462.15 [1785.71] [0.82 σ]
Teffp = 6030 [1603] K [3.36 σ]

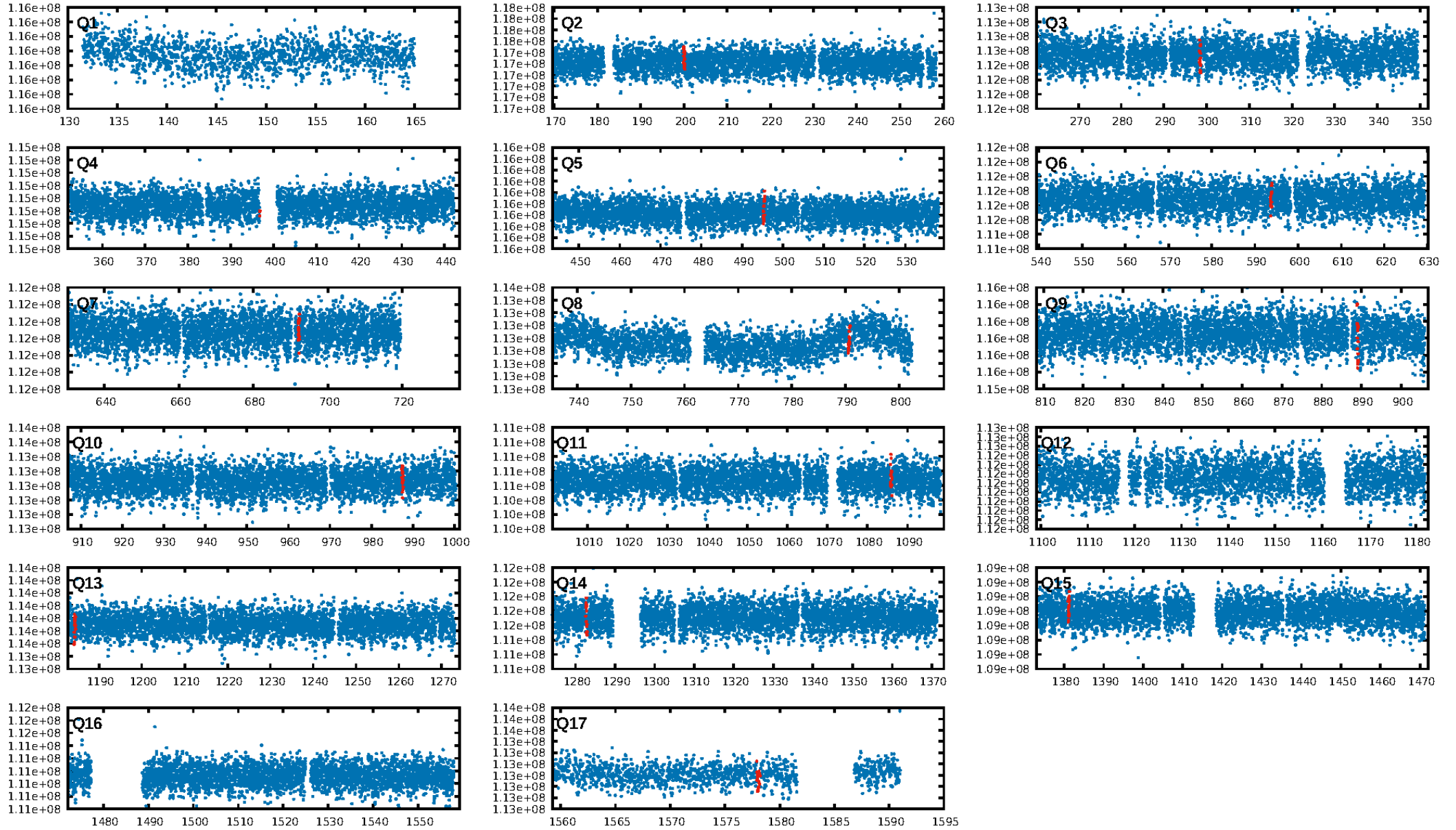
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [149.43 σ]
LongPeriod-sig: 100.0% [1576.80 σ]
ModelChiSquare2-sig: 11.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 3.73
Centroid-sig: N/A
Centroid-so: 0.373 arcsec [0.84 σ]
OotOffset-rm: 0.043 arcsec [0.14 σ]
KicOffset-rm: 0.050 arcsec [0.15 σ]
OotOffset-st: 3/2/1/4 [10]
KicOffset-st: 3/2/1/4 [10]
DiffImageQuality-fgm: 0.60 [6/10]
DiffImageOverlap-fno: 0.00 [0/11]

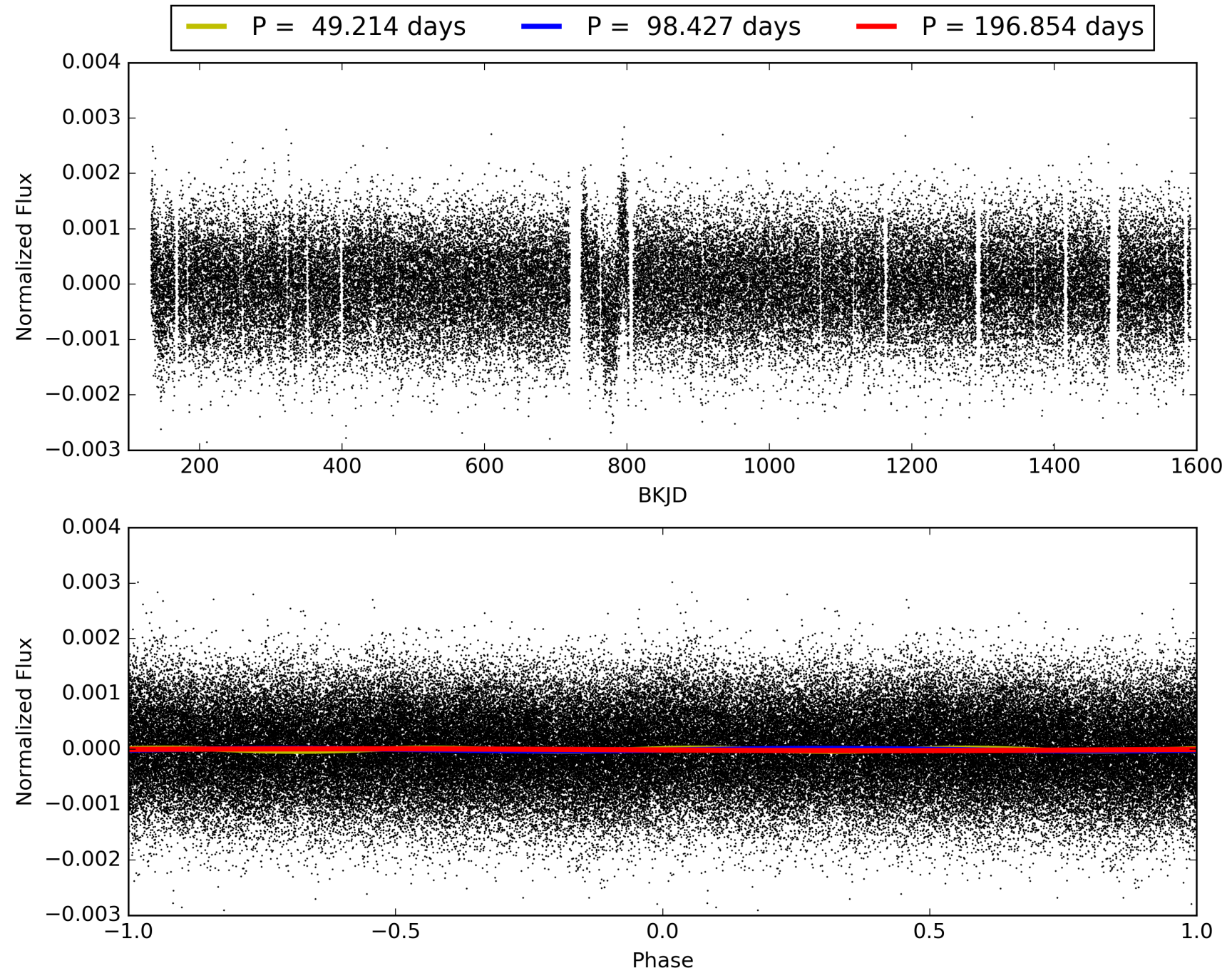
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:03:59 Z

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

TCE 008716028-05, PDC Light Curves

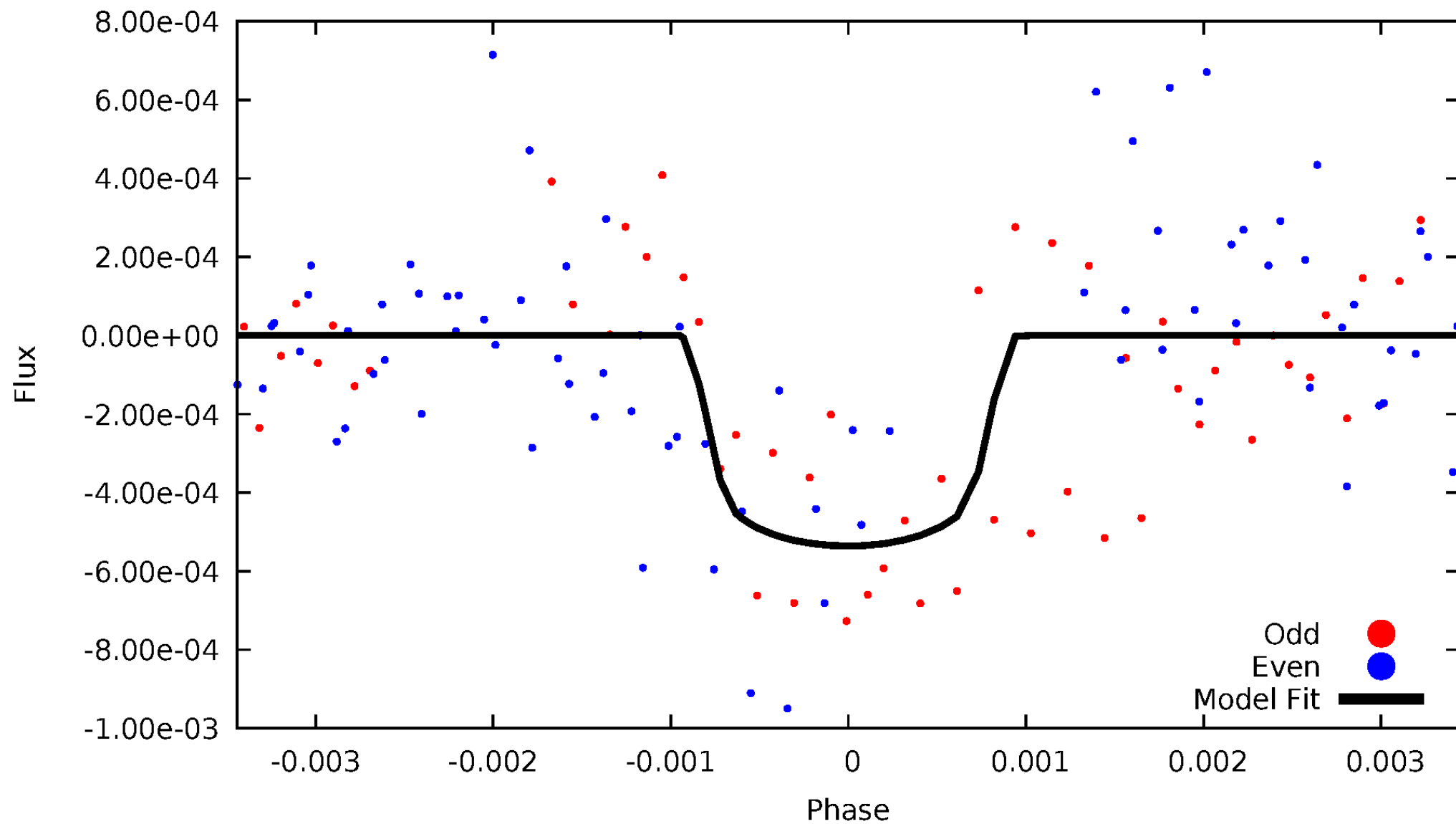


TCE 008716028-05



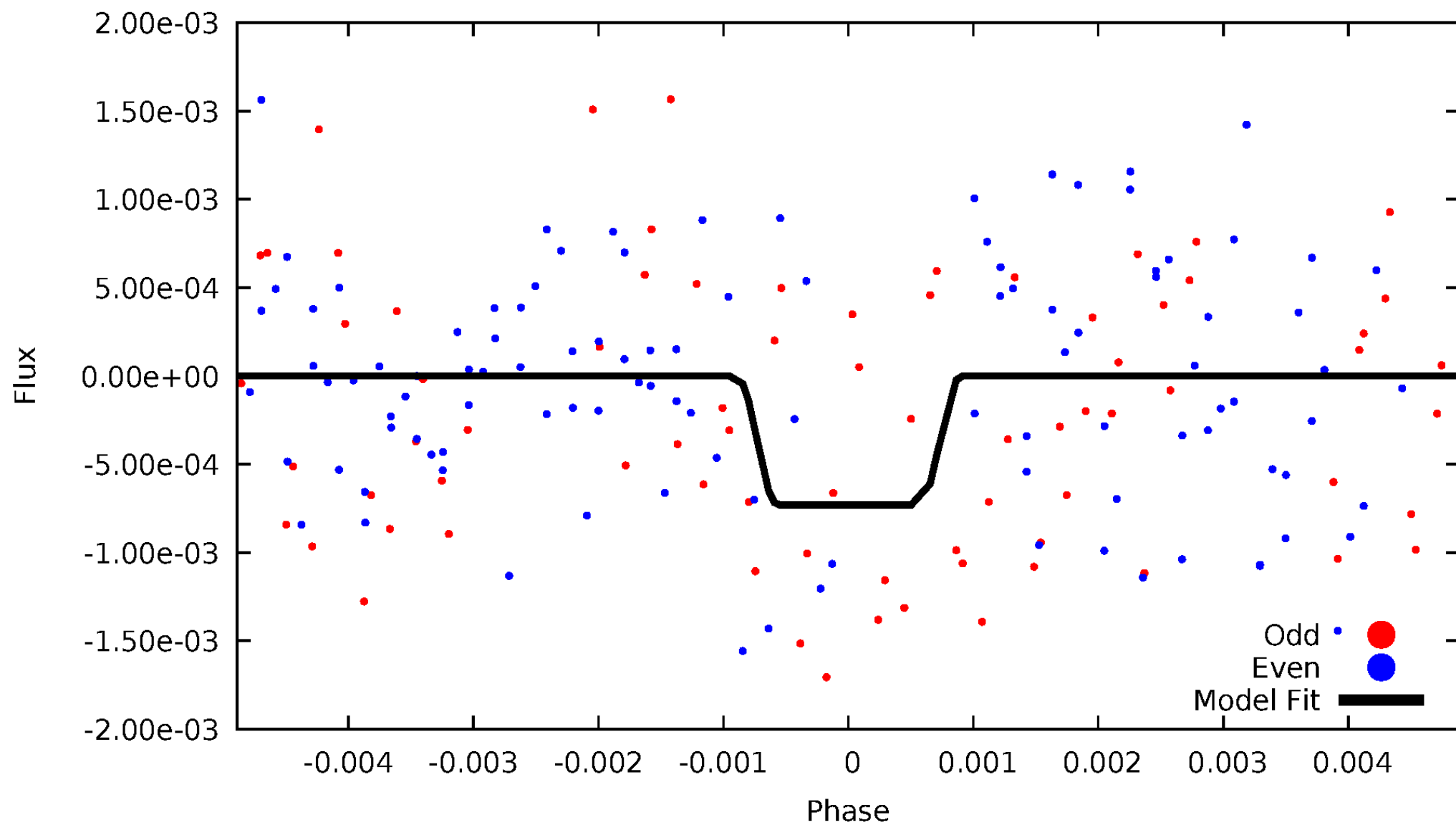
DV Odd/Even

TCE 008716028-05



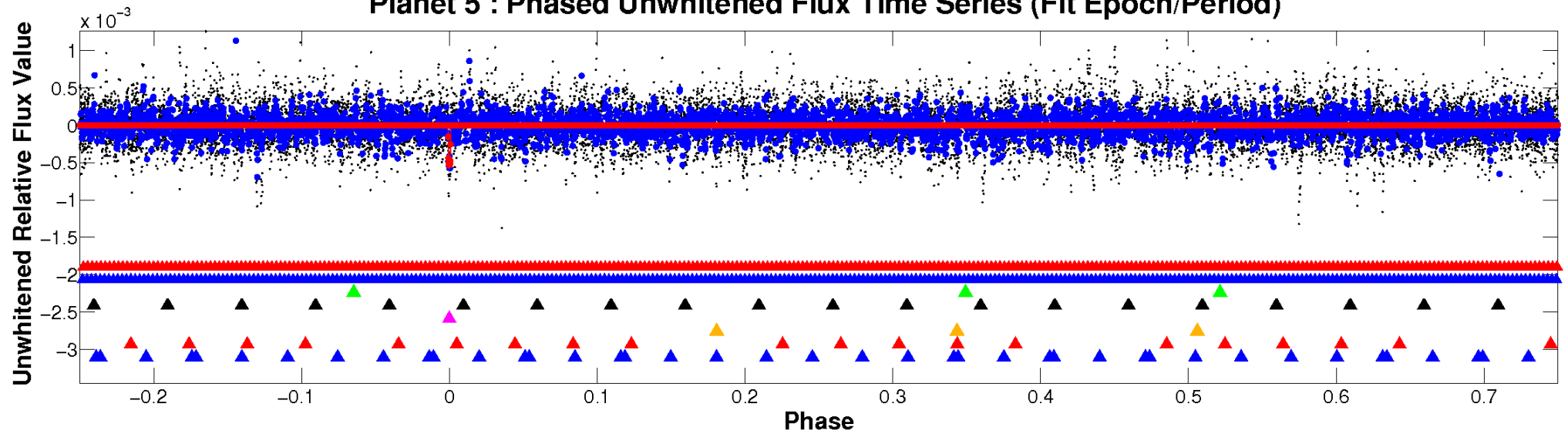
ALT Odd/Even

TCE 008716028-05

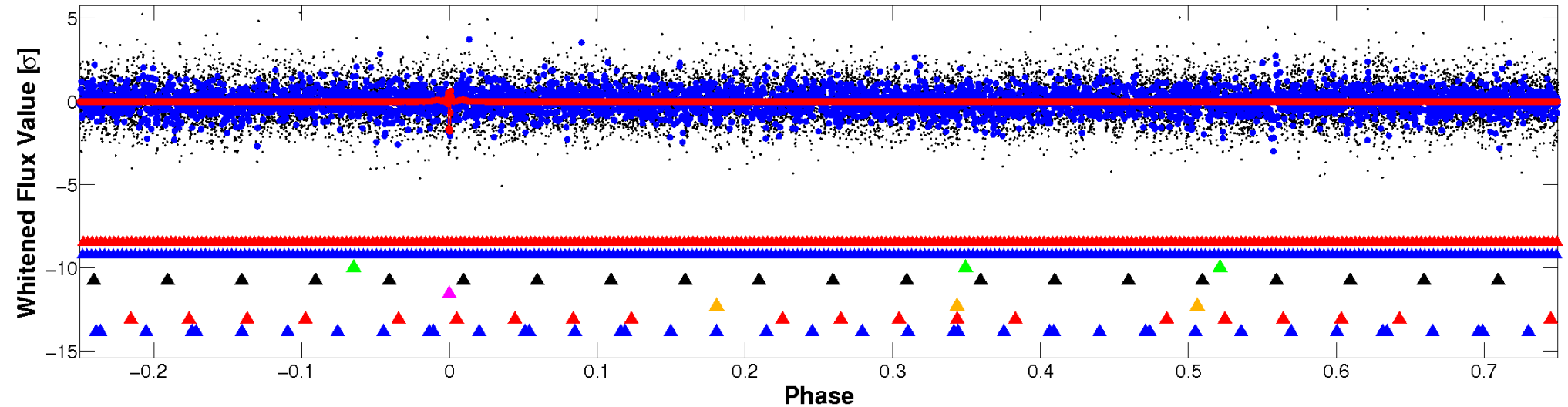


Non-Whitened Vs. Whitened Light Curve

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

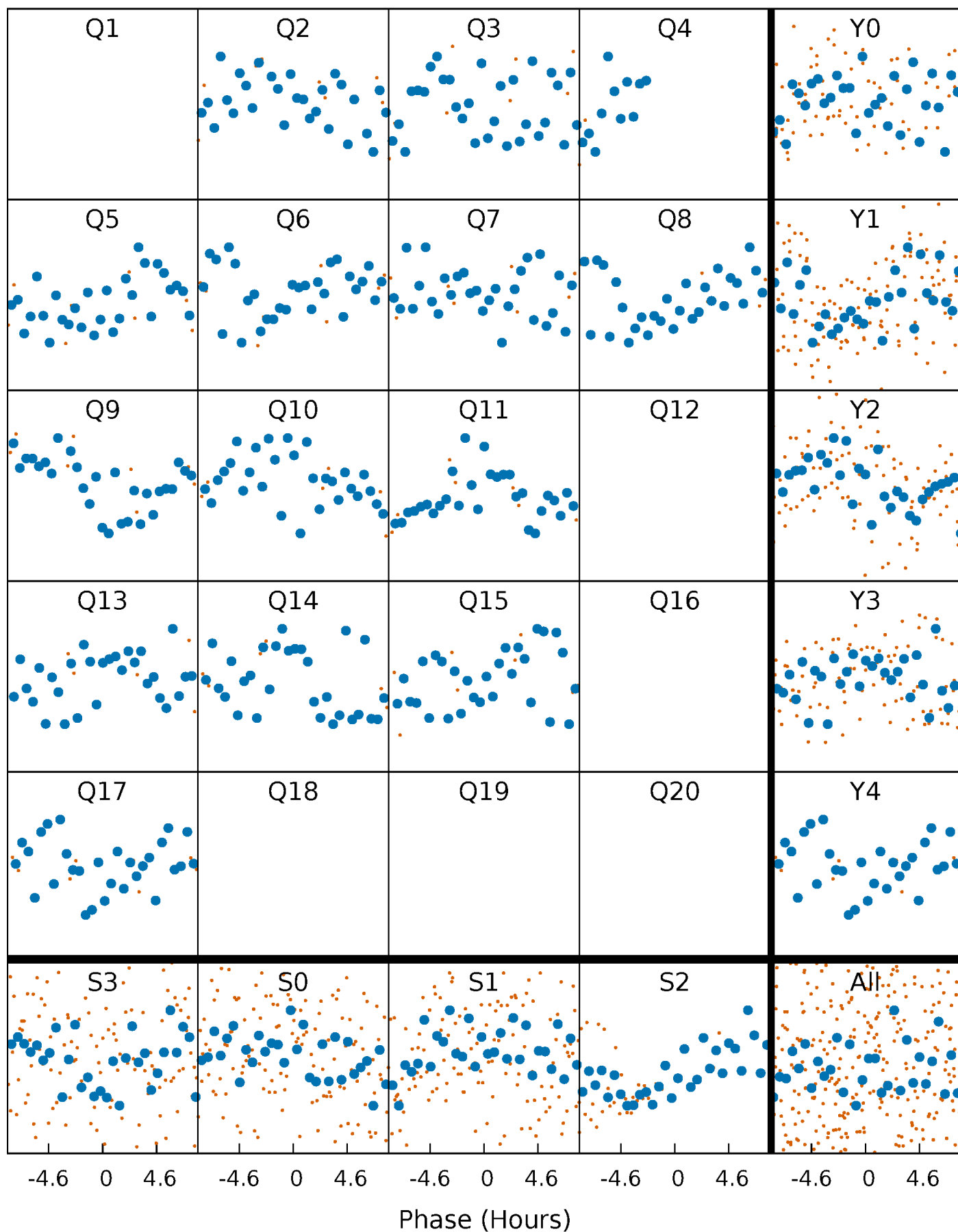


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



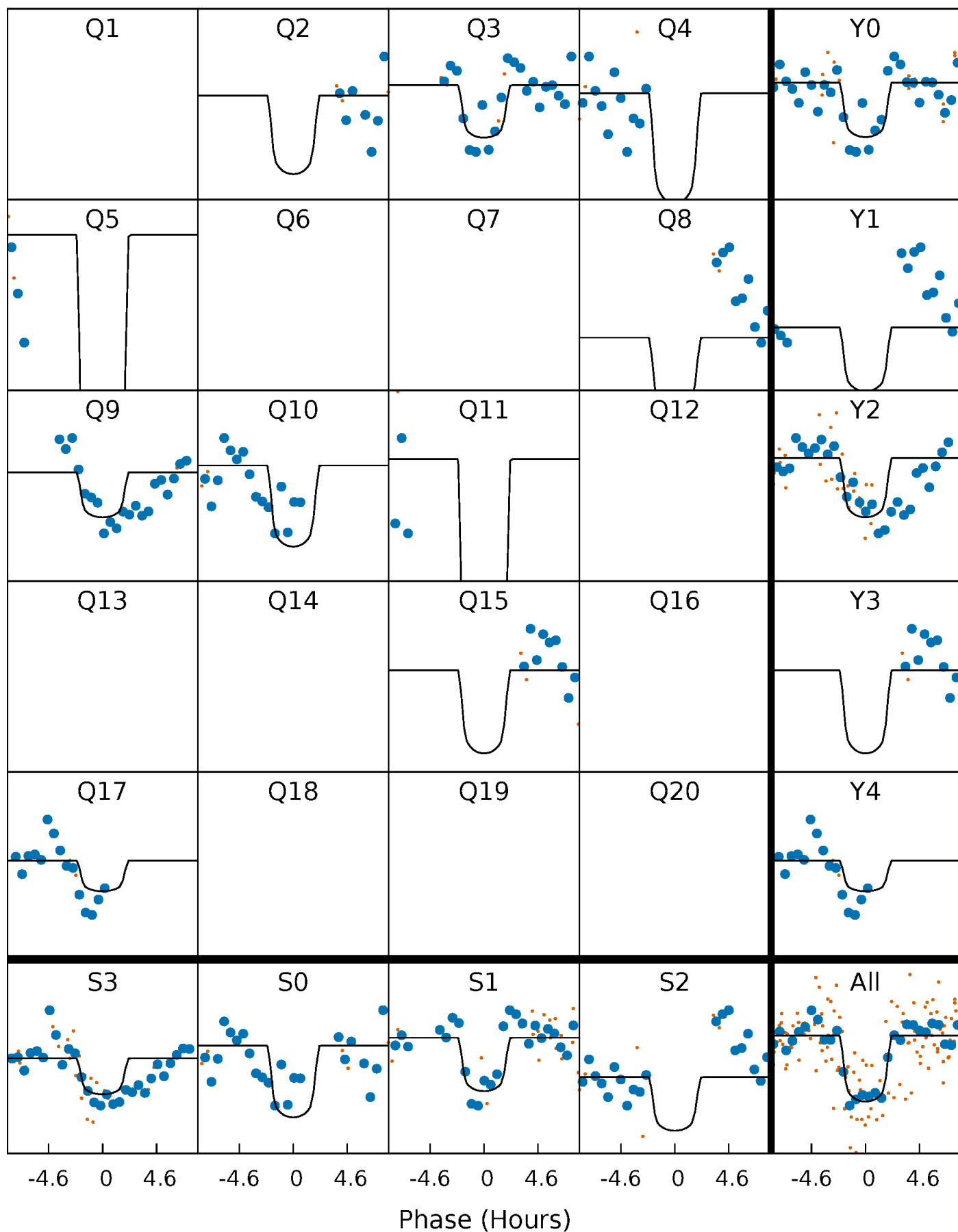
PDC Quarter-Phased Transit Curves

TCE 008716028-05 $P = 98.427139$ Days $T_0 = 200.078630$ (BKJD)



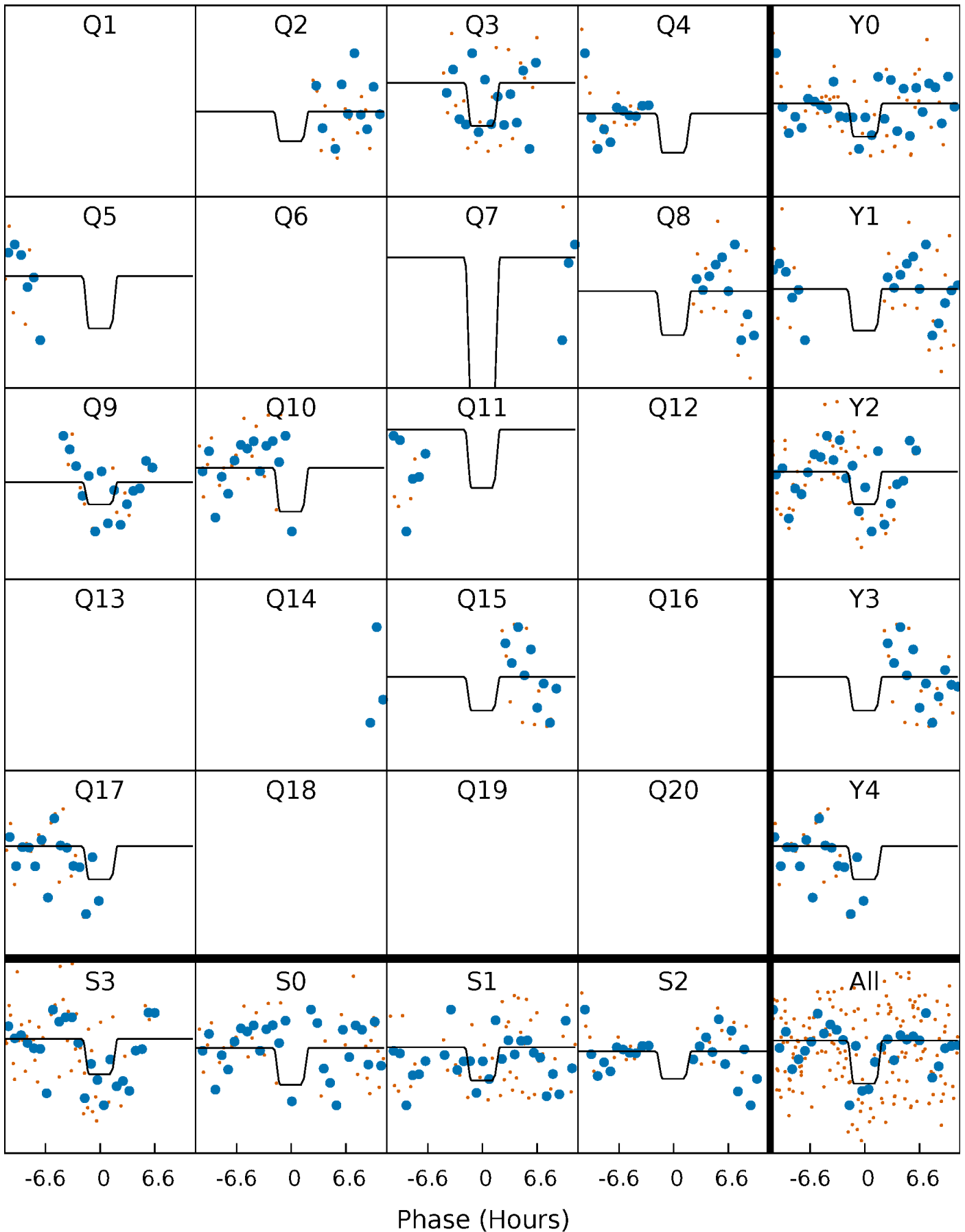
DV Quarter-Phased Transit Curves

TCE 008716028-05 $P = 98.427139$ Days $T_0 = 200.078630$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

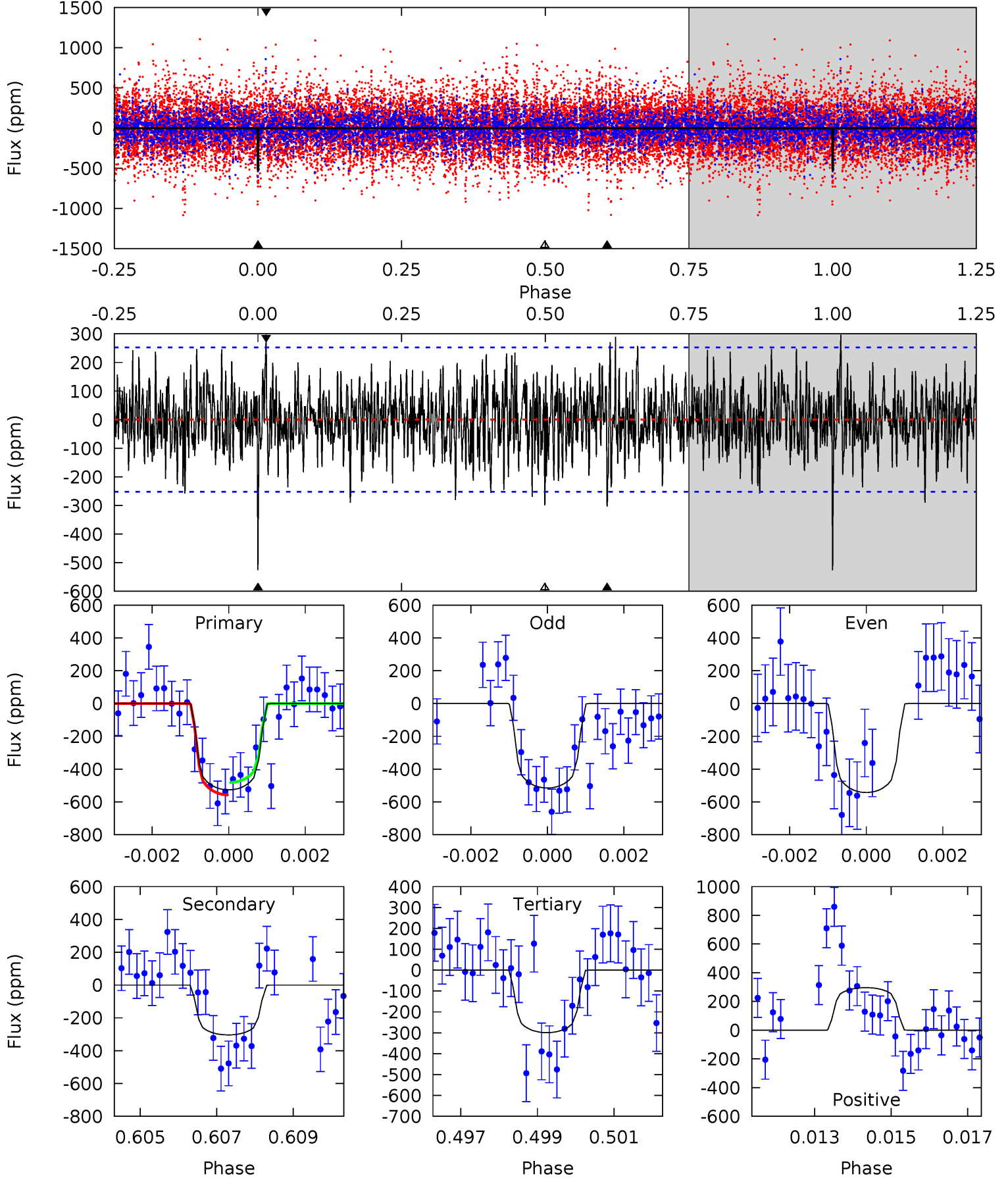
TCE 008716028-05 P= 98.426057 Days $T_0=200.122921$ (BKJD)



DV Model-Shift Uniqueness Test

008716028-05, P = 98.427139 Days, E = 101.651491 Days

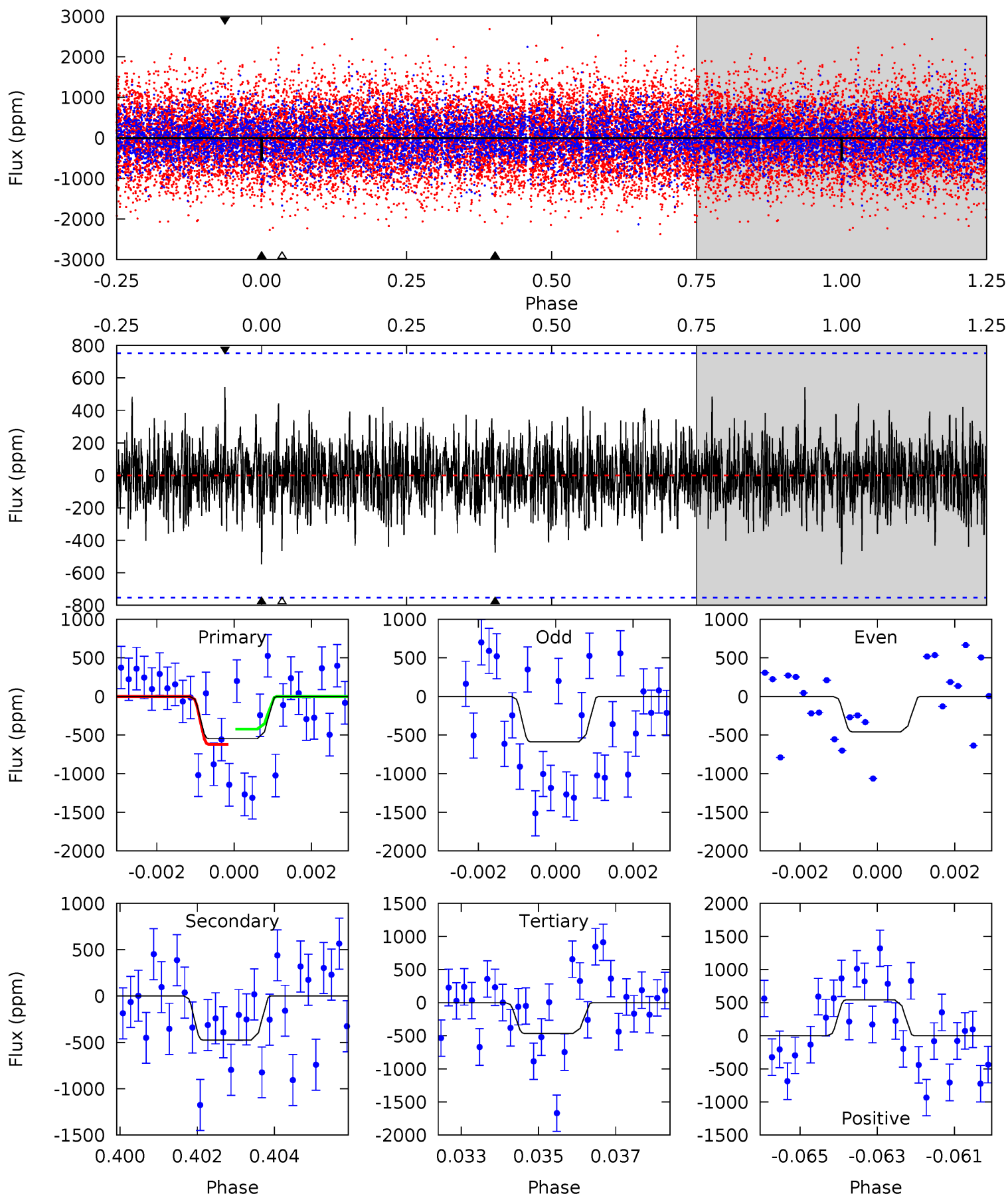
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.1	6.43	6.34	6.27	5.34	3.11	1.87	4.80	4.87	0.10	0.17	0.28	1.05	0.36	0.78



Alt Model-Shift Uniqueness Test

008716028-05, P = 98.426057 Days, E = 101.696864 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.90	3.38	3.31	3.87	5.36	3.14	0.98	0.59	0.03	0.07	-0.48	0.43	0.92	0.50	0.68



Stellar Parameters For KIC 008716028

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6632^{+180}_{-240}	$3.903^{+0.364}_{-0.130}$	$-0.220^{+0.250}_{-0.300}$	$2.127^{+0.562}_{-0.842}$	$1.323^{+0.211}_{-0.234}$	$0.194^{+0.589}_{-0.070}$
	+3%/-4%	+9%/-3%	+114%/-136%	+26%/-40%	+16%/-18%	+304%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008716028-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-304 ± 47	$5.22^{+2.88}_{-2.52}$	862^{+68}_{-87}	5637^{+2190}_{-963}	1272^{+3626}_{-762}
Alt.	-475 ± 140	$5.73^{+3.11}_{-2.63}$	867^{+67}_{-86}	5932^{+2543}_{-1019}	1666^{+4124}_{-1026}

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

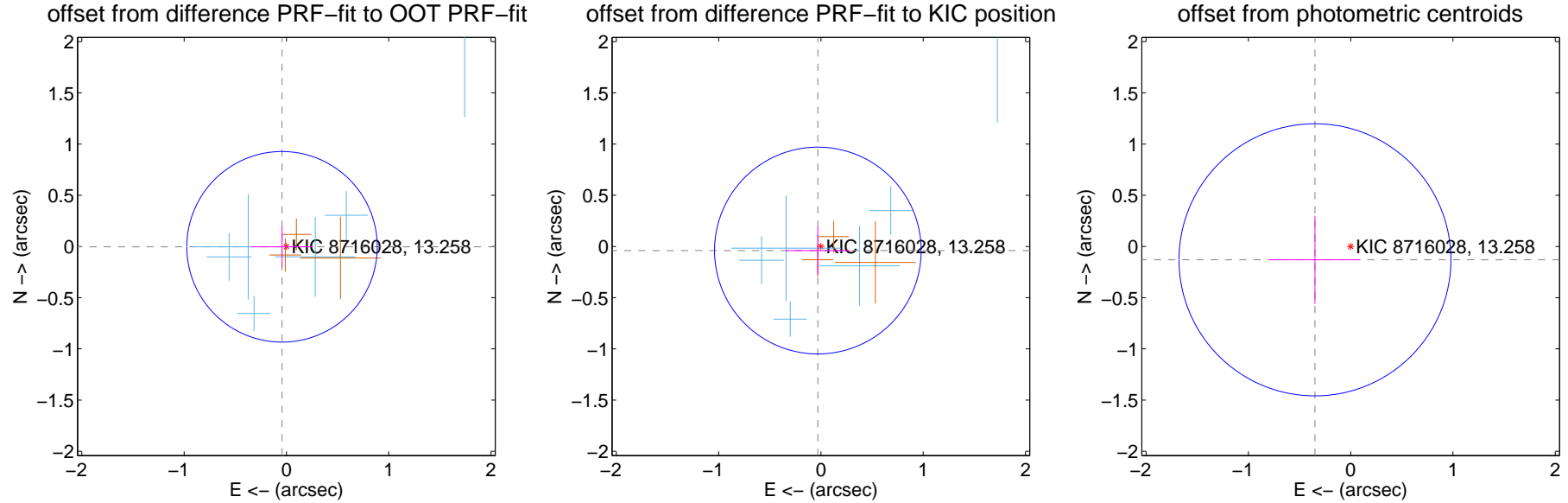
DV Centroid Data

Supplemental centroid analysis for 008716028-05. Kepler magnitude: 13.26. Transit SNR 8.33

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.043 ± 0.310	0.14	0.043 ± 0.301	-0.003 ± 0.199
PRF-fit source offset from KIC position	0.050 ± 0.337	0.15	0.030 ± 0.314	-0.040 ± 0.230
photometric centroid source offset	0.37 ± 0.44	0.84	0.35 ± 0.44	-0.13 ± 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.

Q1 no difference image



Q1 no OOT image



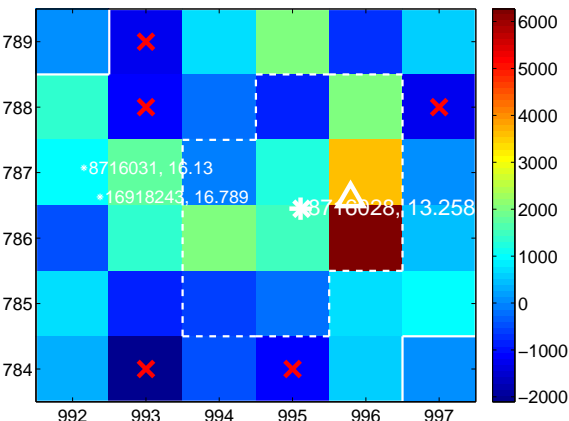
Q2 no difference image



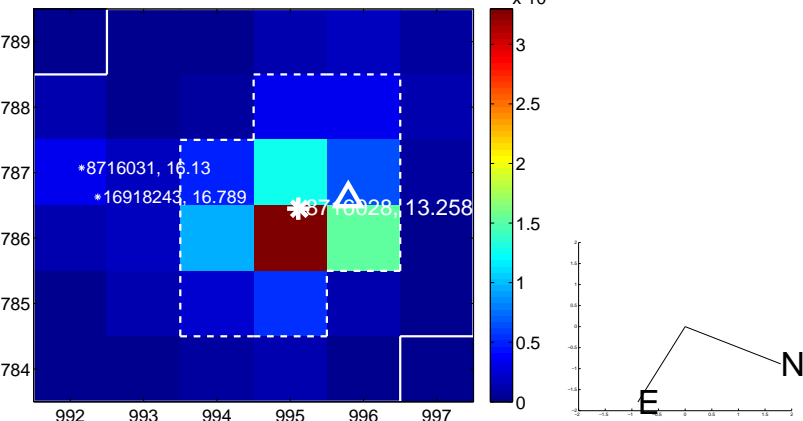
Q2 no OOT image



Q3 difference image



Q3 OOT image



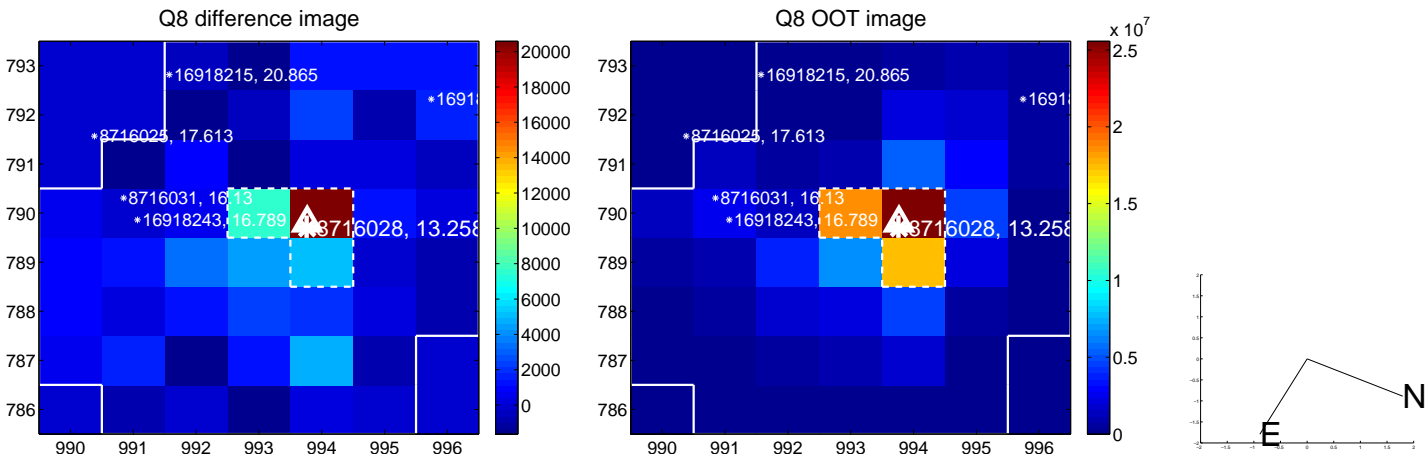
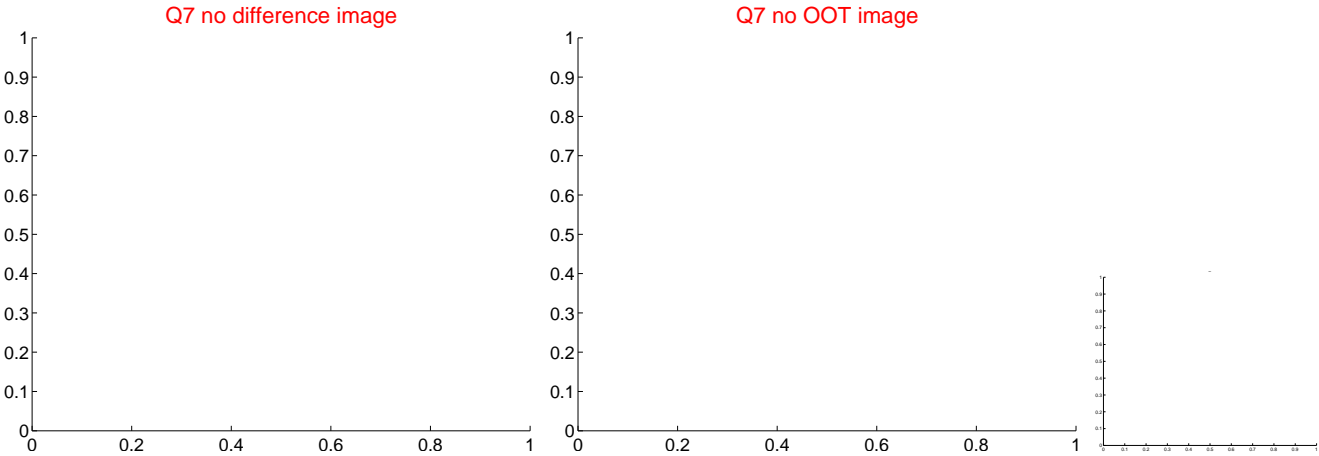
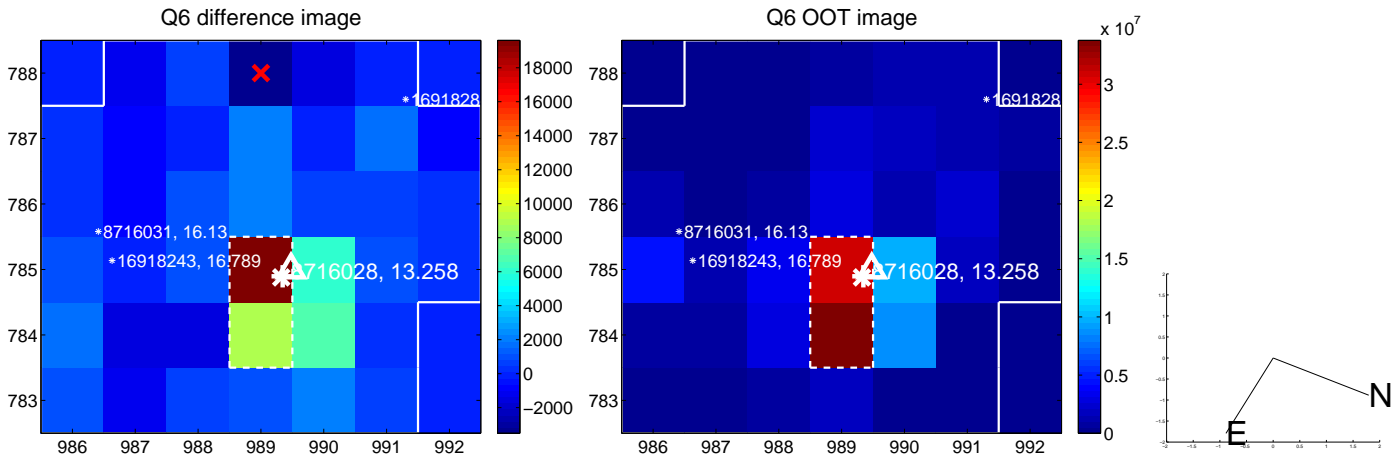
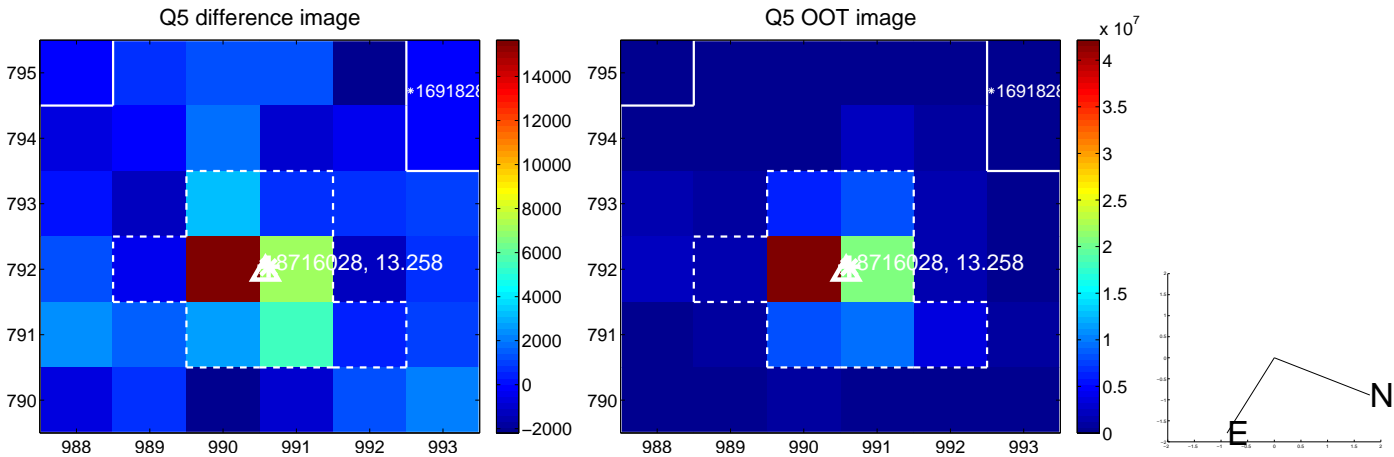
Q4 no difference image



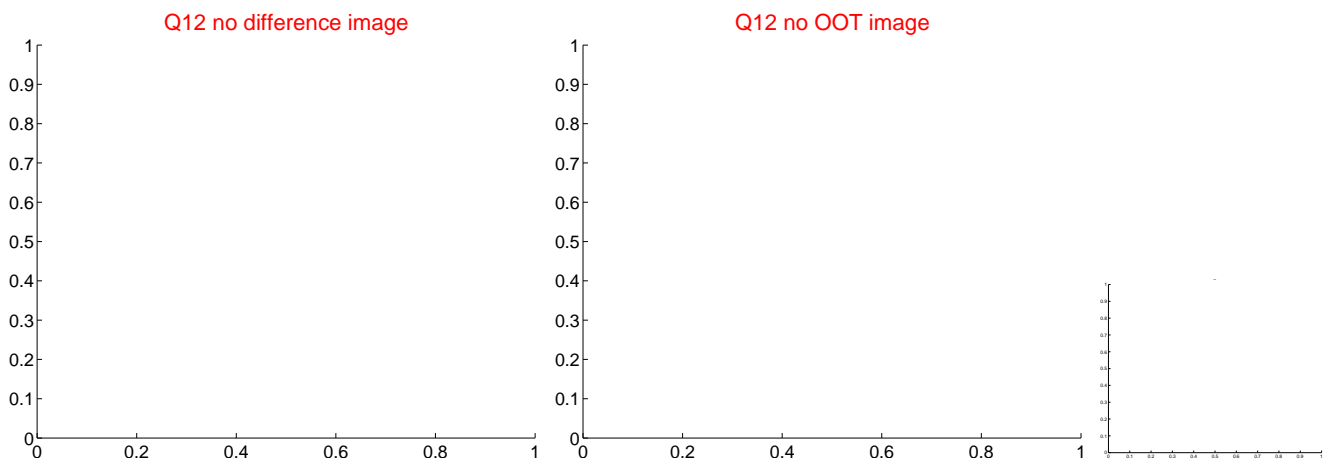
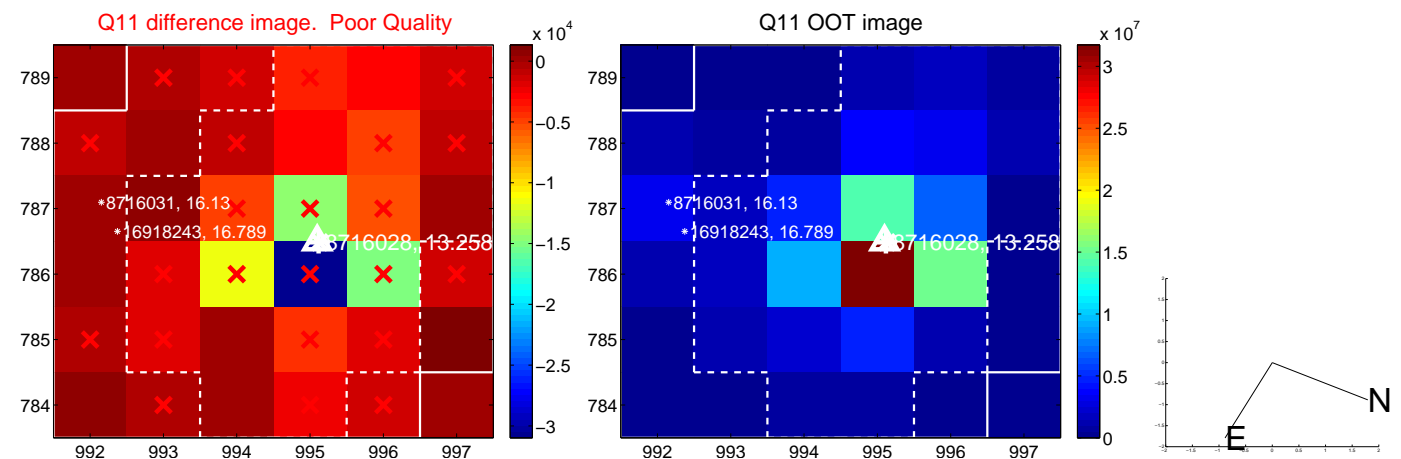
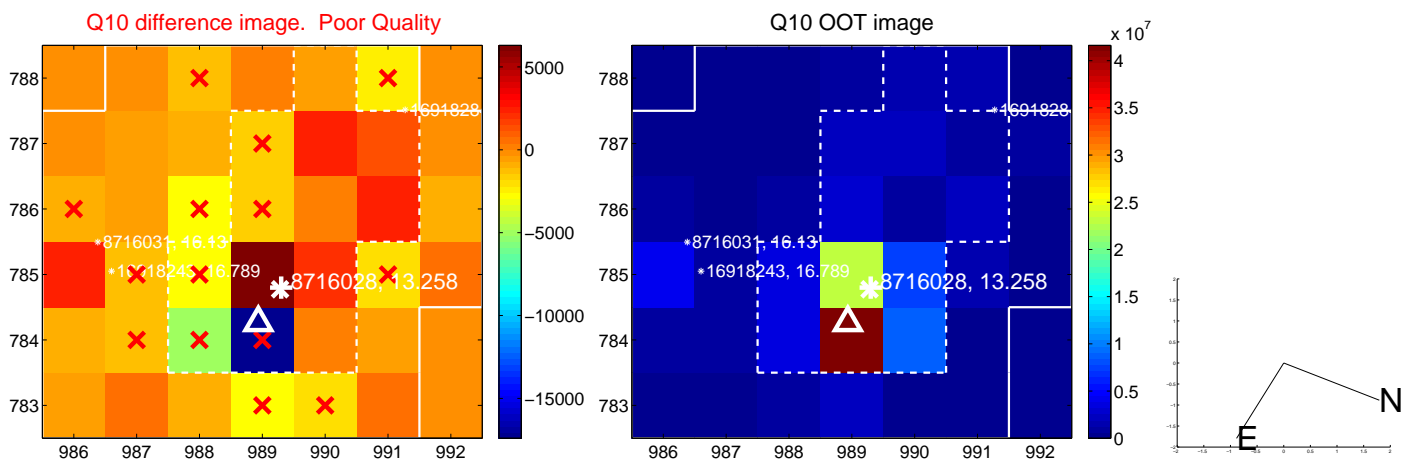
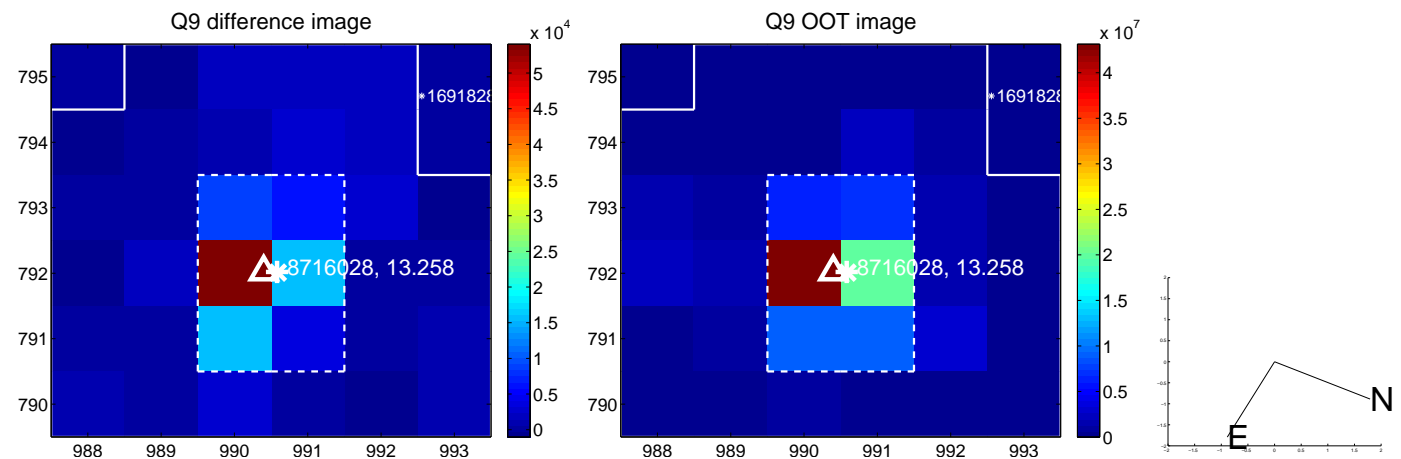
Q4 no OOT image



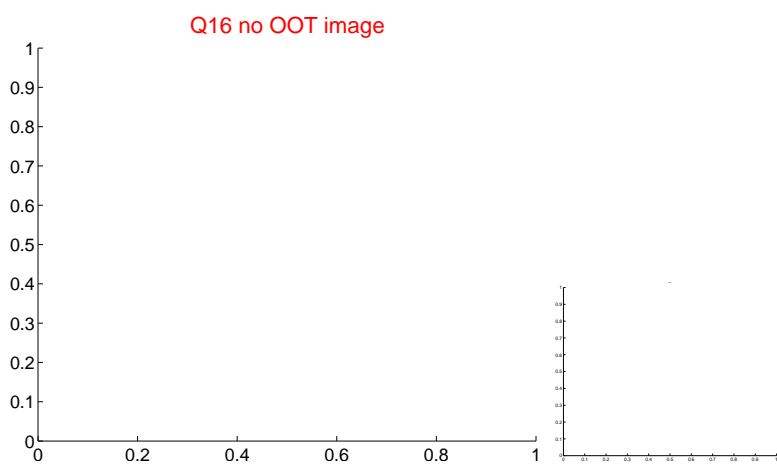
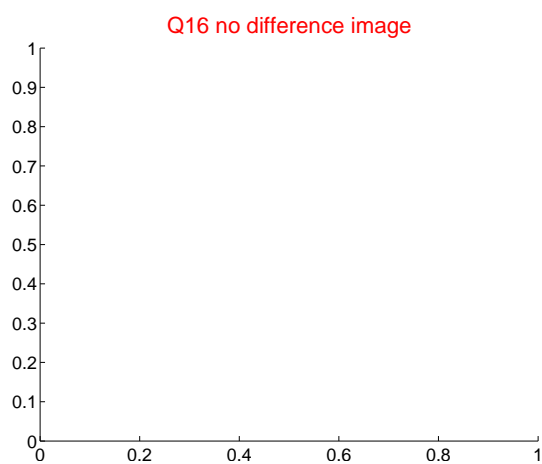
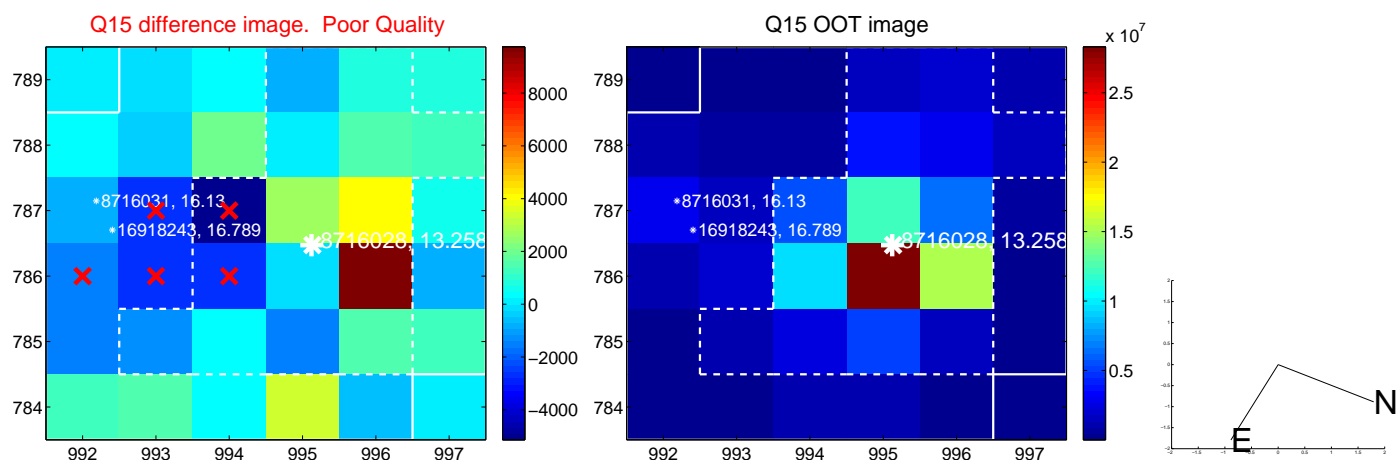
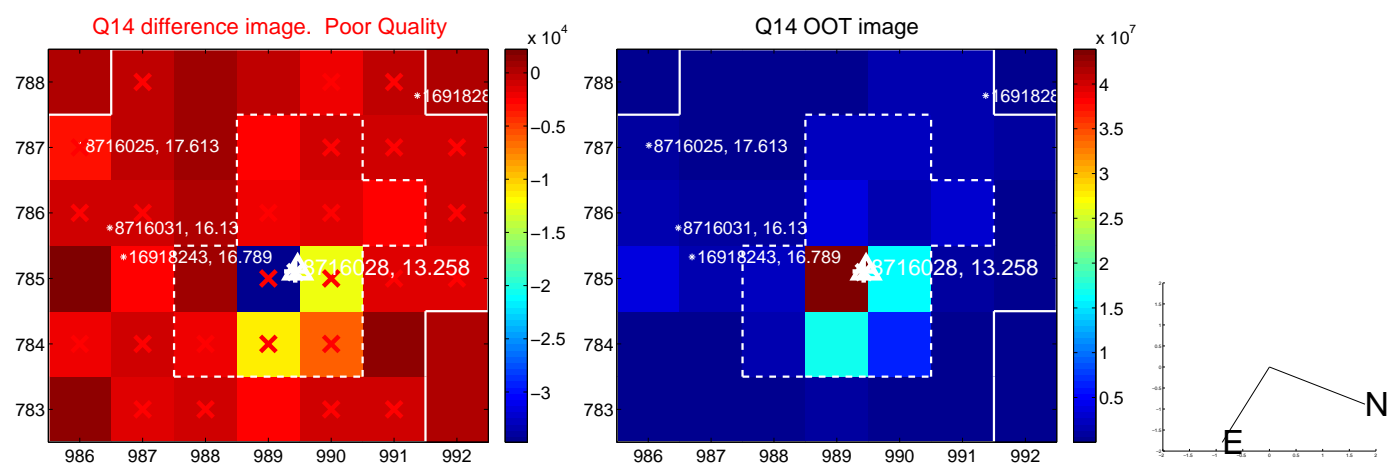
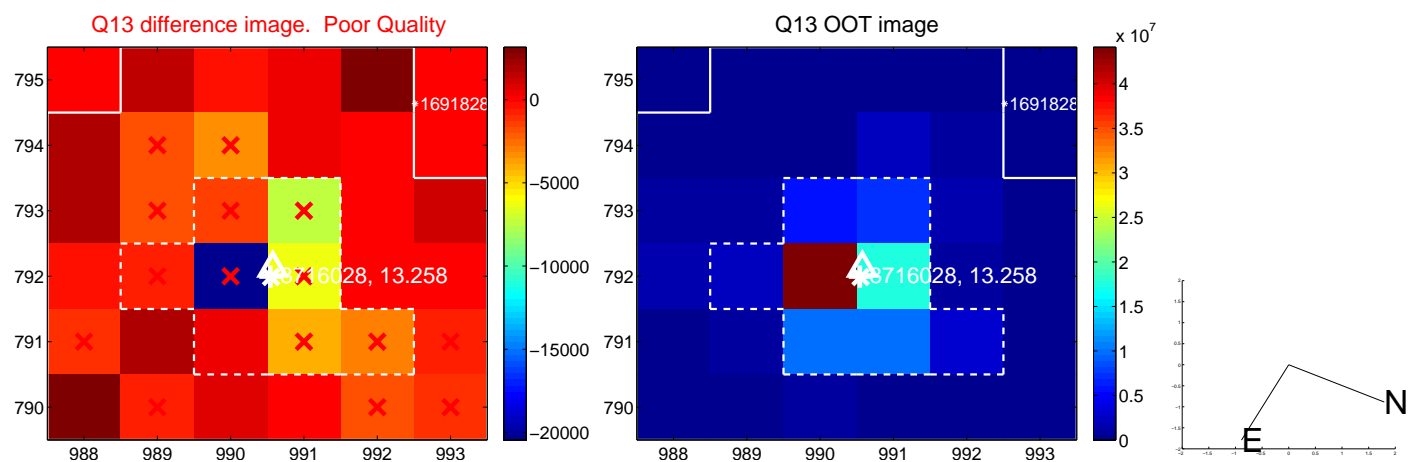
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



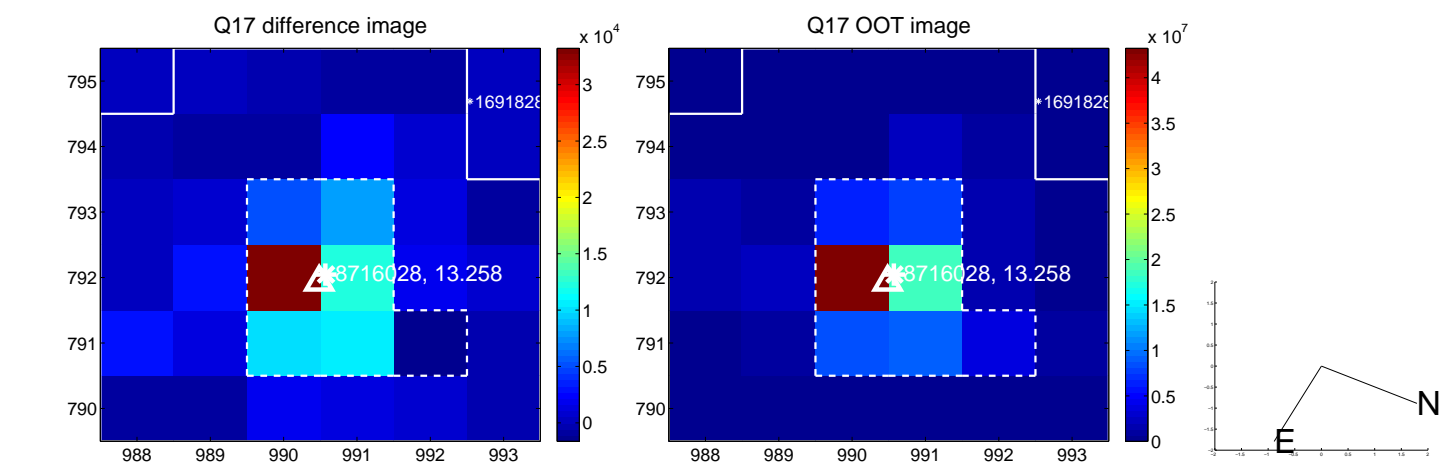
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



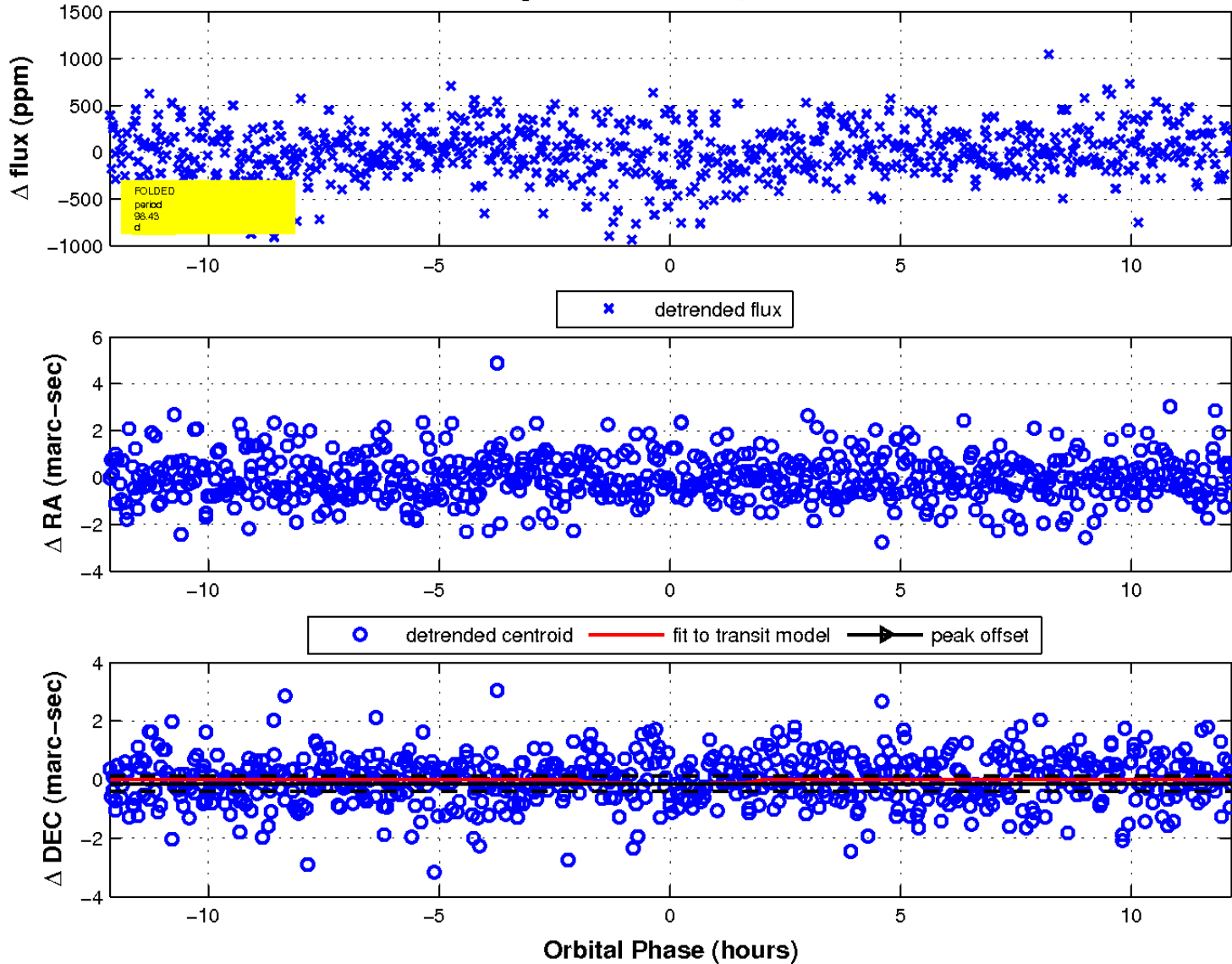
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

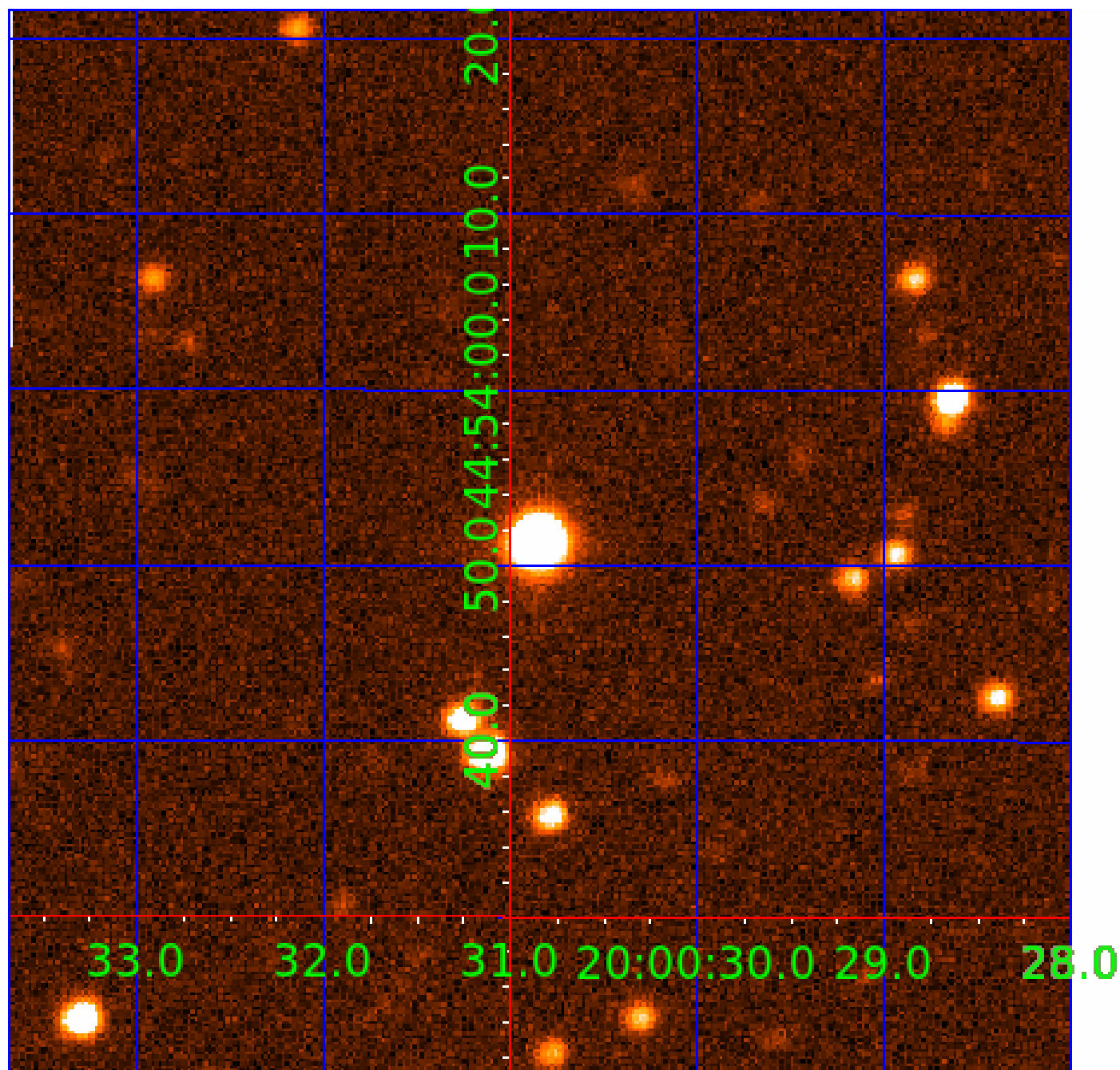


fluxWeightedCentroids, Planet 5 of 8



UKIRT Image

Declination



KIC 008716028

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})
008716028-01	OBS	No	1.752399	132.775555	73.5	6.540	10.8	11.7	2.13	6632	3.23	8050.20
008716028-02	OBS	No	1.752389	131.563135	68.6	4.734	9.9	12.3	2.13	6632	3.23	8050.26
008716028-03	OBS	No	532.874333	152.974204	576.3	7.403	9.4	9.8	2.13	6632	6.02	3.94
008716028-04	OBS	No	14.763042	142.008324	175.8	7.647	8.9	9.5	2.13	6632	2.98	469.62
008716028-05	OBS	No	98.427139	200.078630	536.0	4.065	7.9	8.3	2.13	6632	5.44	37.42
008716028-06	OBS	No	508.140391	316.308767	503.3	4.729	7.5	7.8	2.13	6632	4.80	4.19
008716028-07	OBS	No	72.851489	190.500130	273.6	0.594	7.8	2.9	2.13	6632	3.64	55.90
008716028-08	OBS	No	34.934758	163.806235	164.7	5.000	7.2	-1.0	2.13	6632	2.75	148.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008716028-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008716028-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
008716028-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008716028-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008716028-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

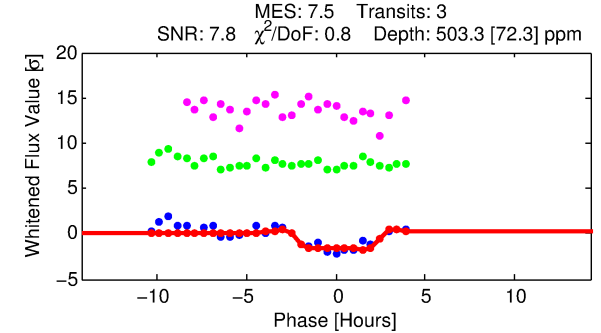
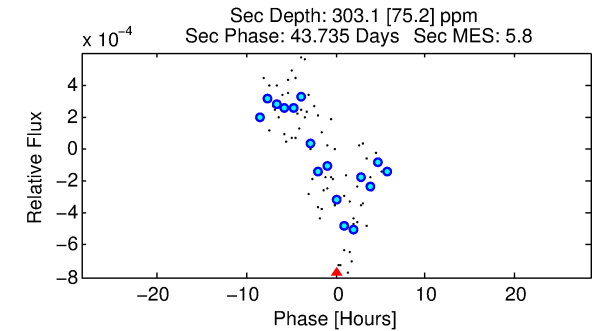
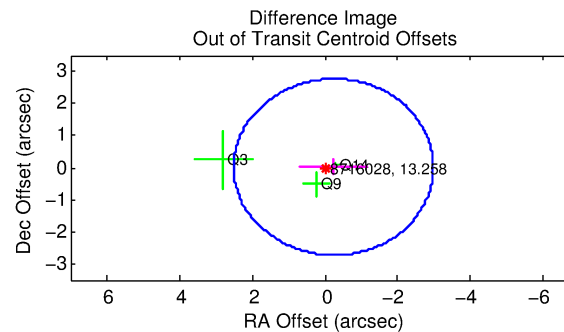
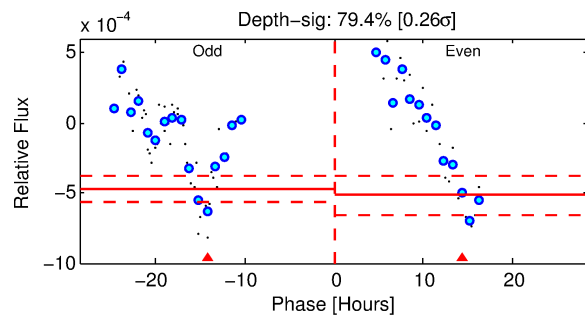
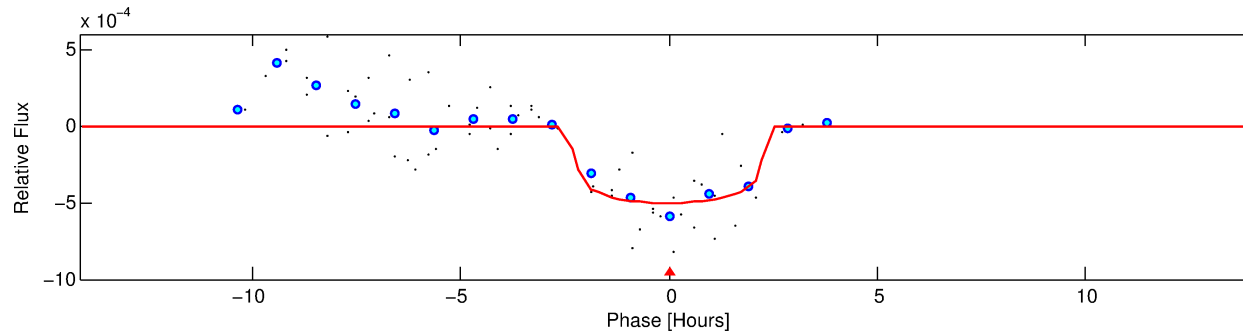
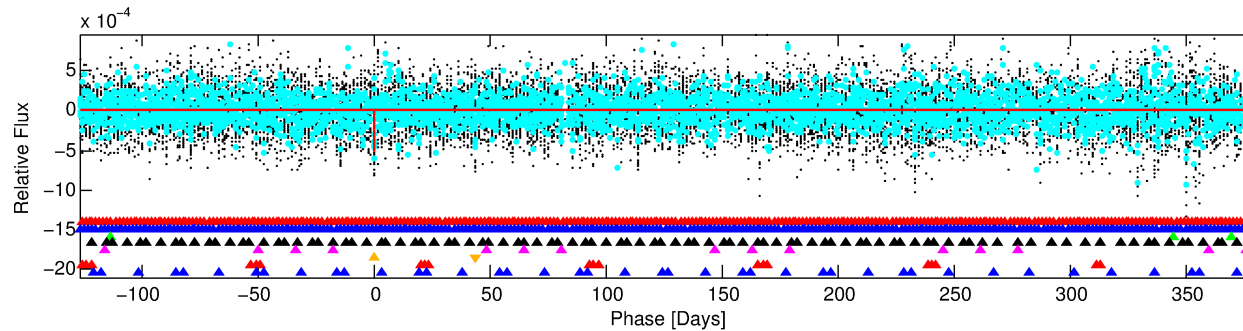
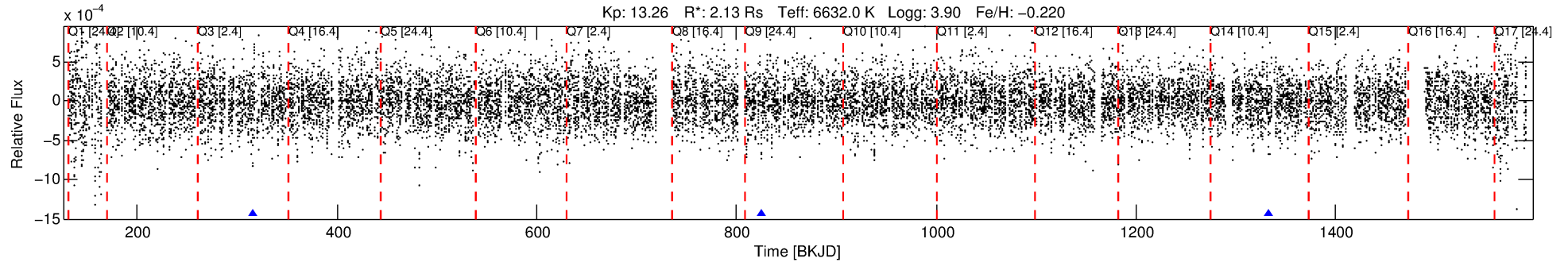
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008716028-06

No Significant Match Found

DV One-Page Summary

KIC: 8716028 Candidate: 6 of 8 Period: 508.140 d



DV Fit Results:

Period = 508.14039 [0.00694] d
Epoch = 316.3088 [0.0119] BKJD
Rp/R* = 0.0207 [0.0313]
a/R* = 836.65 [6743.35]
b = 0.05 [153.04]
Seff = 4.19 [2.66]
Teq = 365 [58] K
Rp = 4.80 [7.50] Re
a = 1.3673 [0.5255] AU
Ag = 13505.23 [41789.11] [0.32 σ]
Teffp = 6082 [4615] K [1.24 σ]

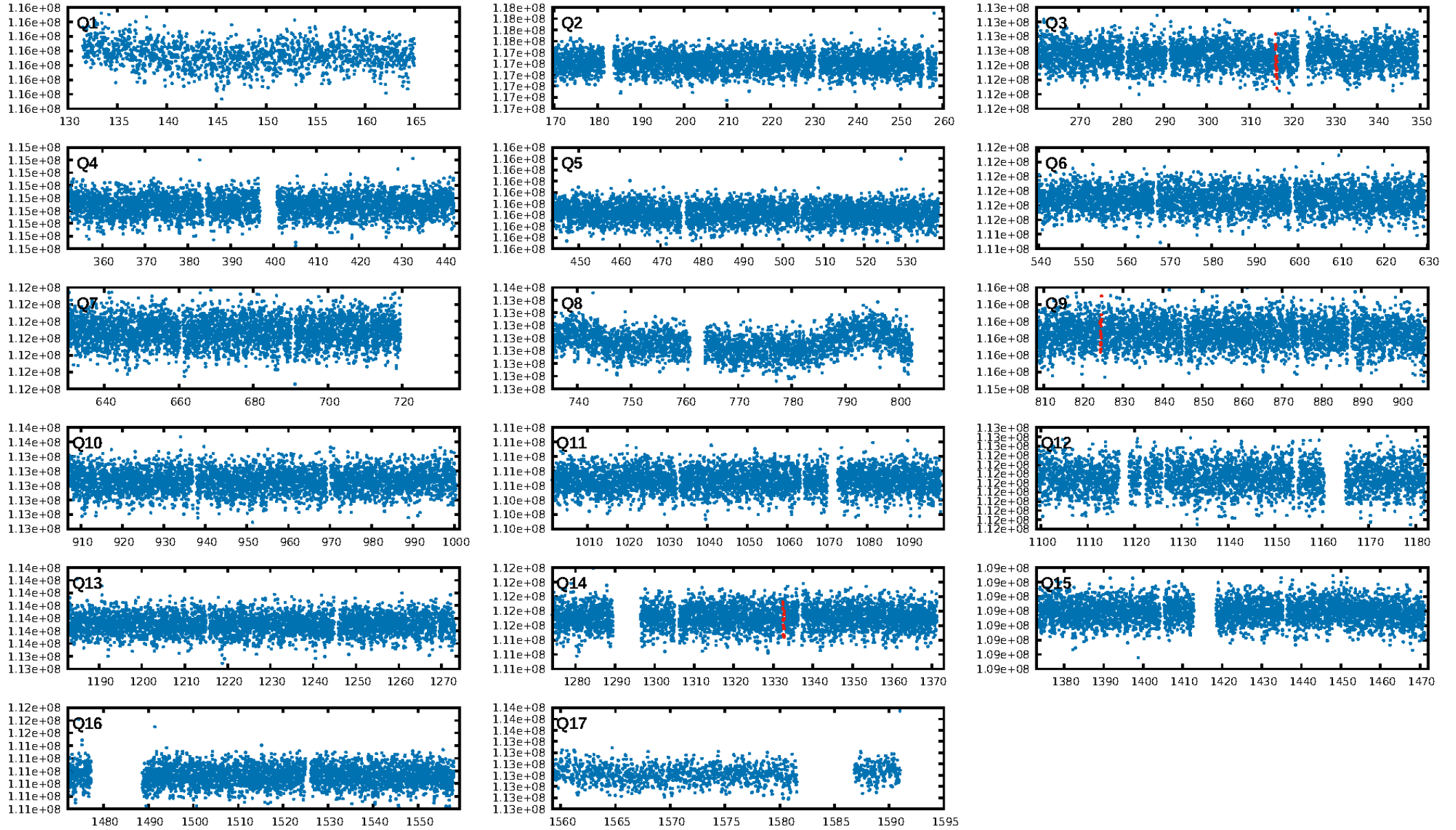
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1576.80 σ]
LongPeriod-sig: 100.0% [67.57 σ]
ModelChiSquare2-sig: 65.3%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.636
Centroid-sig: N/A
Centroid-so: 0.388 arcsec [0.42 σ]
OotOffset-rm: 0.238 arcsec [0.26 σ]
KicOffset-rm: 0.339 arcsec [0.48 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.33 [1/3]

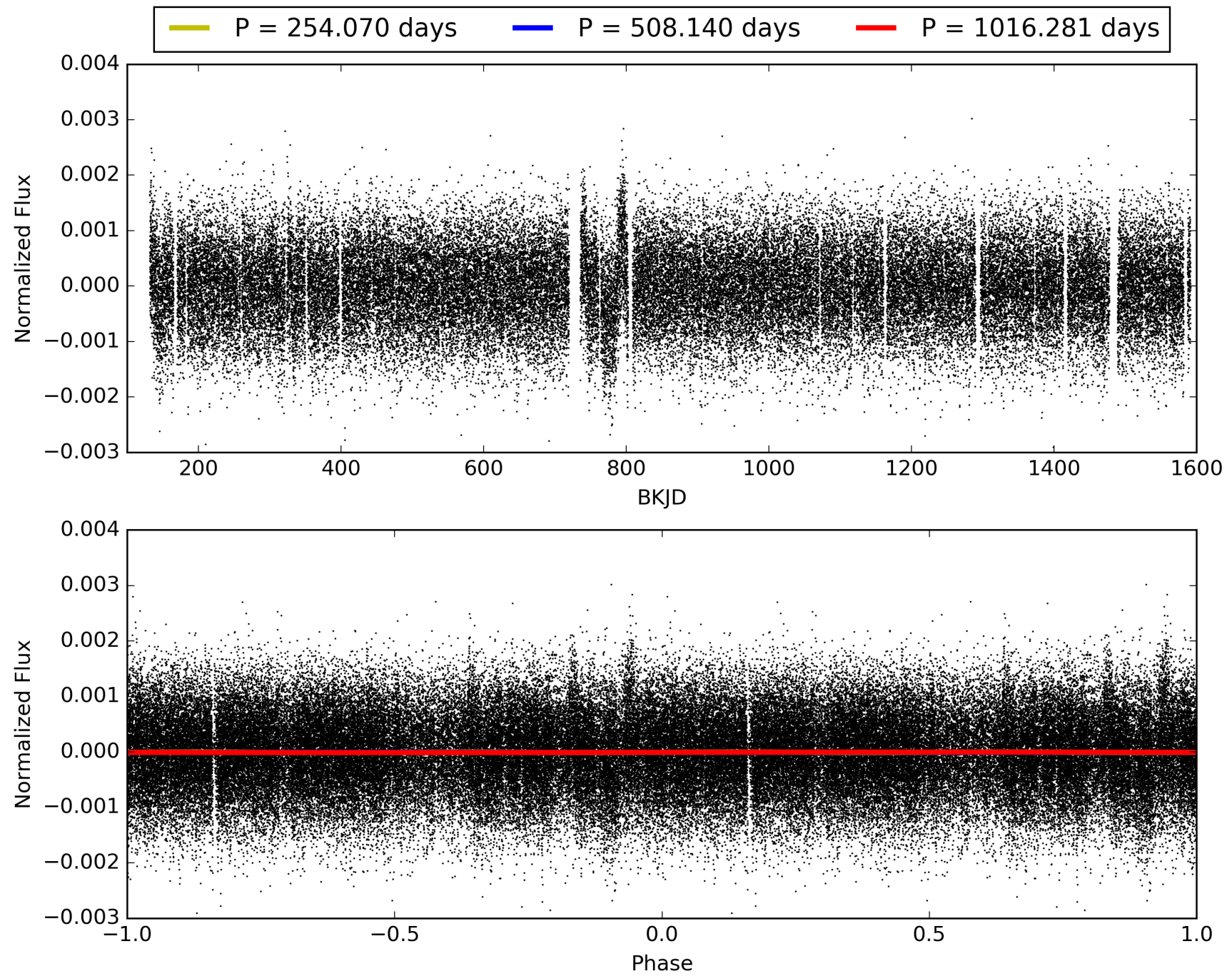
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:04:06 Z

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

TCE 008716028-06, PDC Light Curves

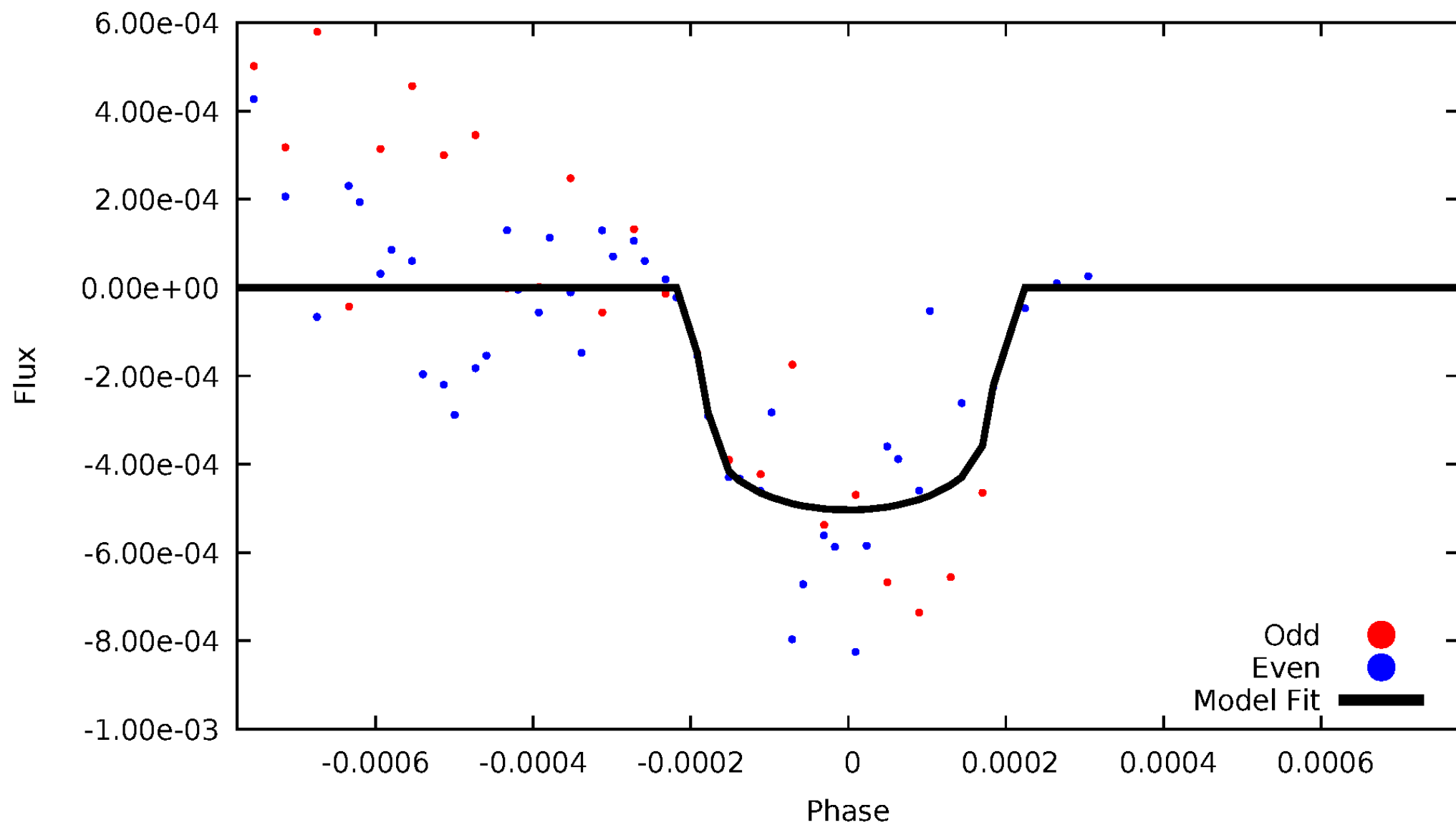


TCE 008716028-06



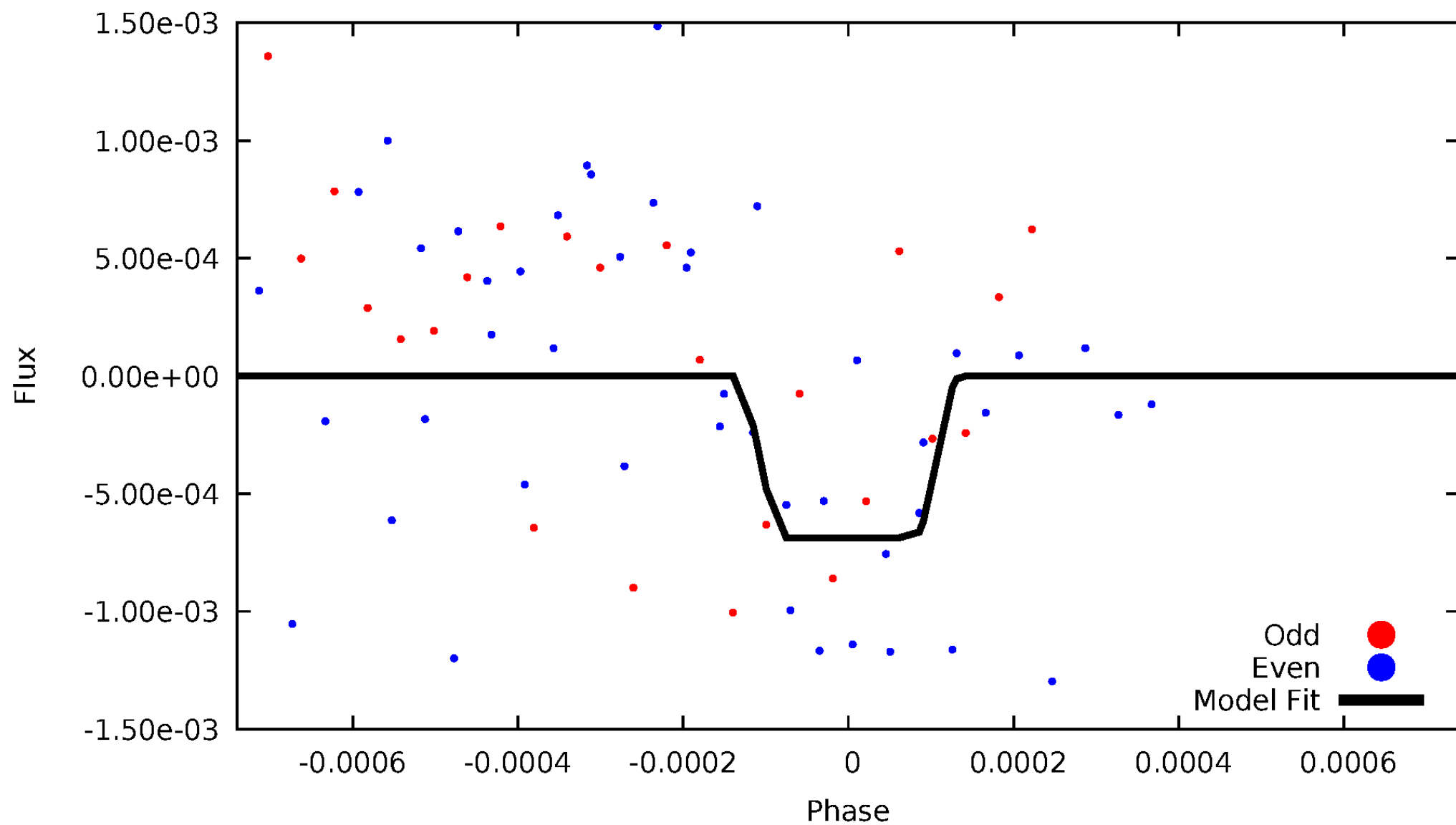
DV Odd/Even

TCE 008716028-06



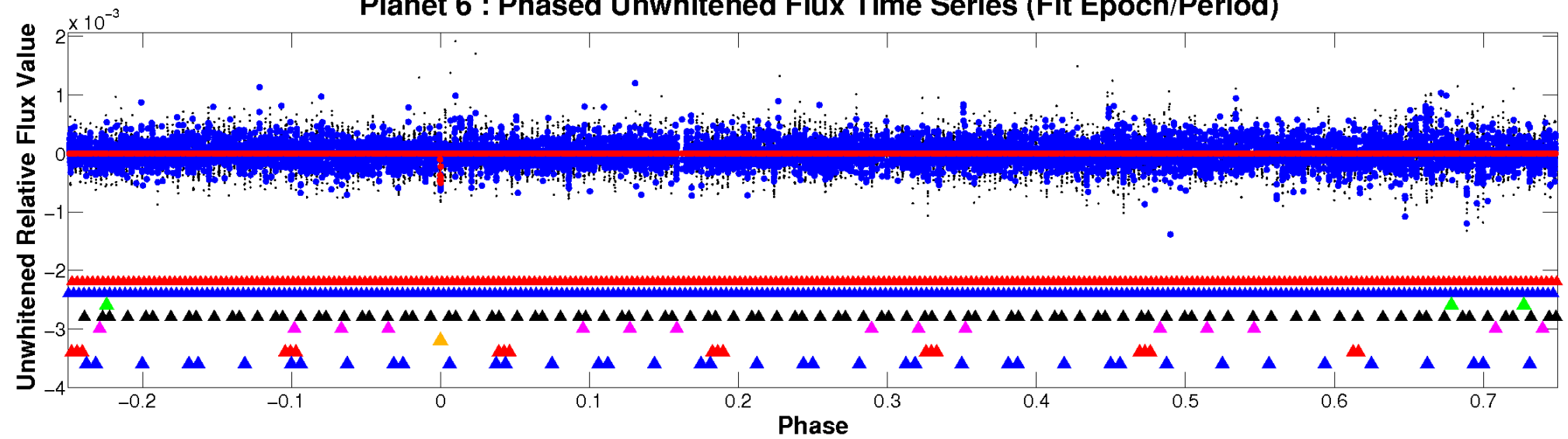
ALT Odd/Even

TCE 008716028-06

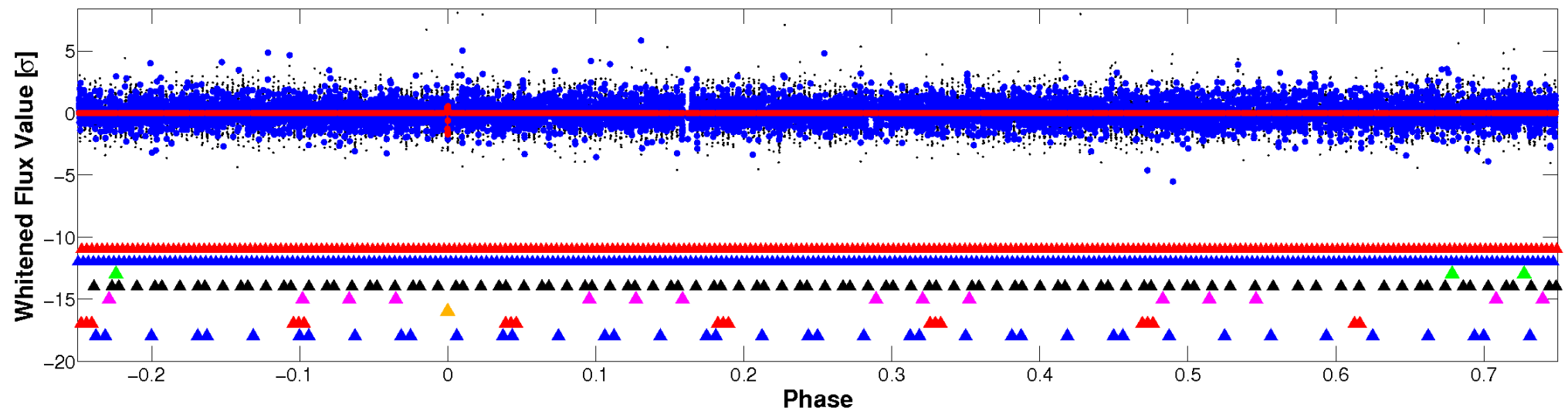


Non-Whitened Vs. Whitened Light Curve

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

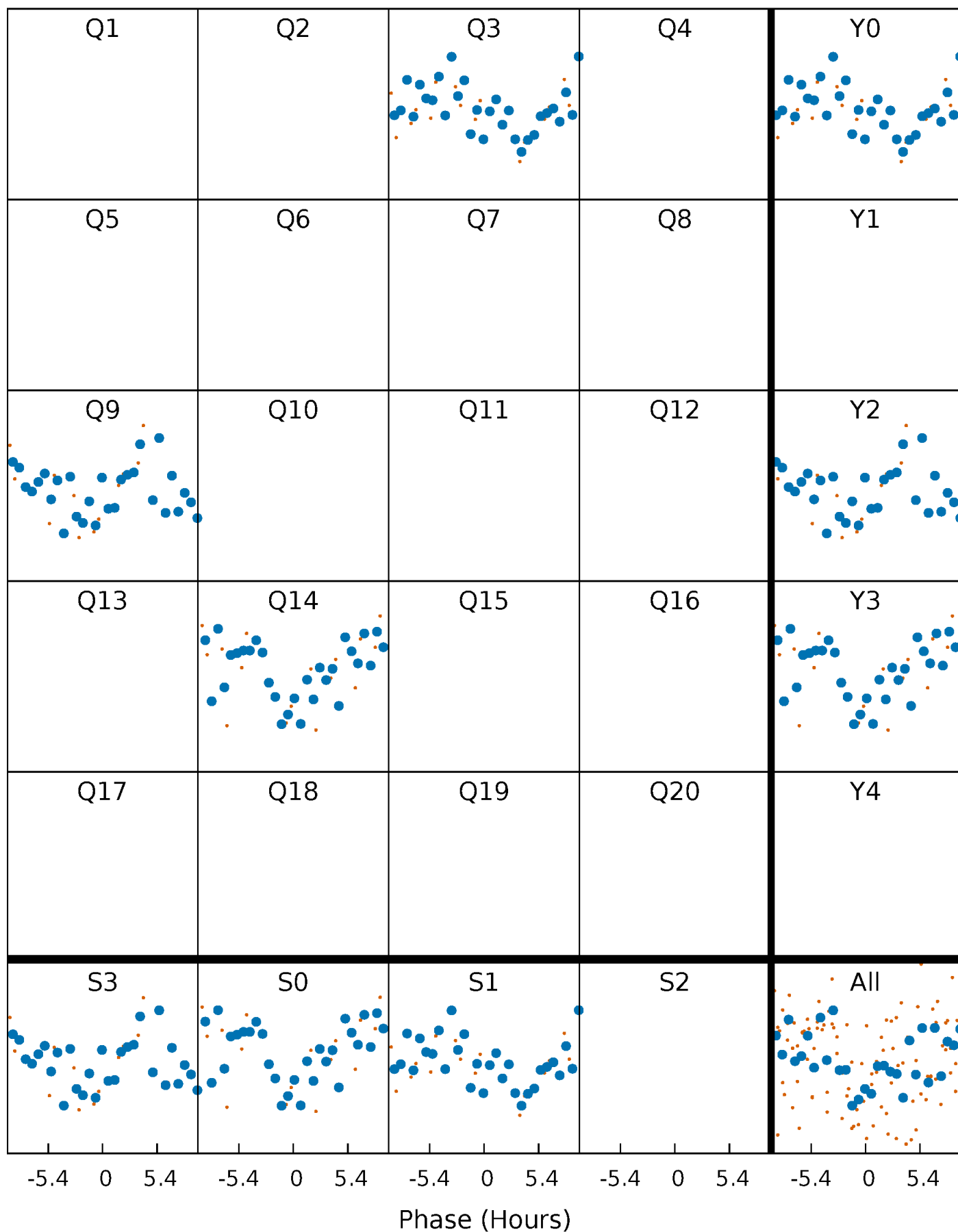


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



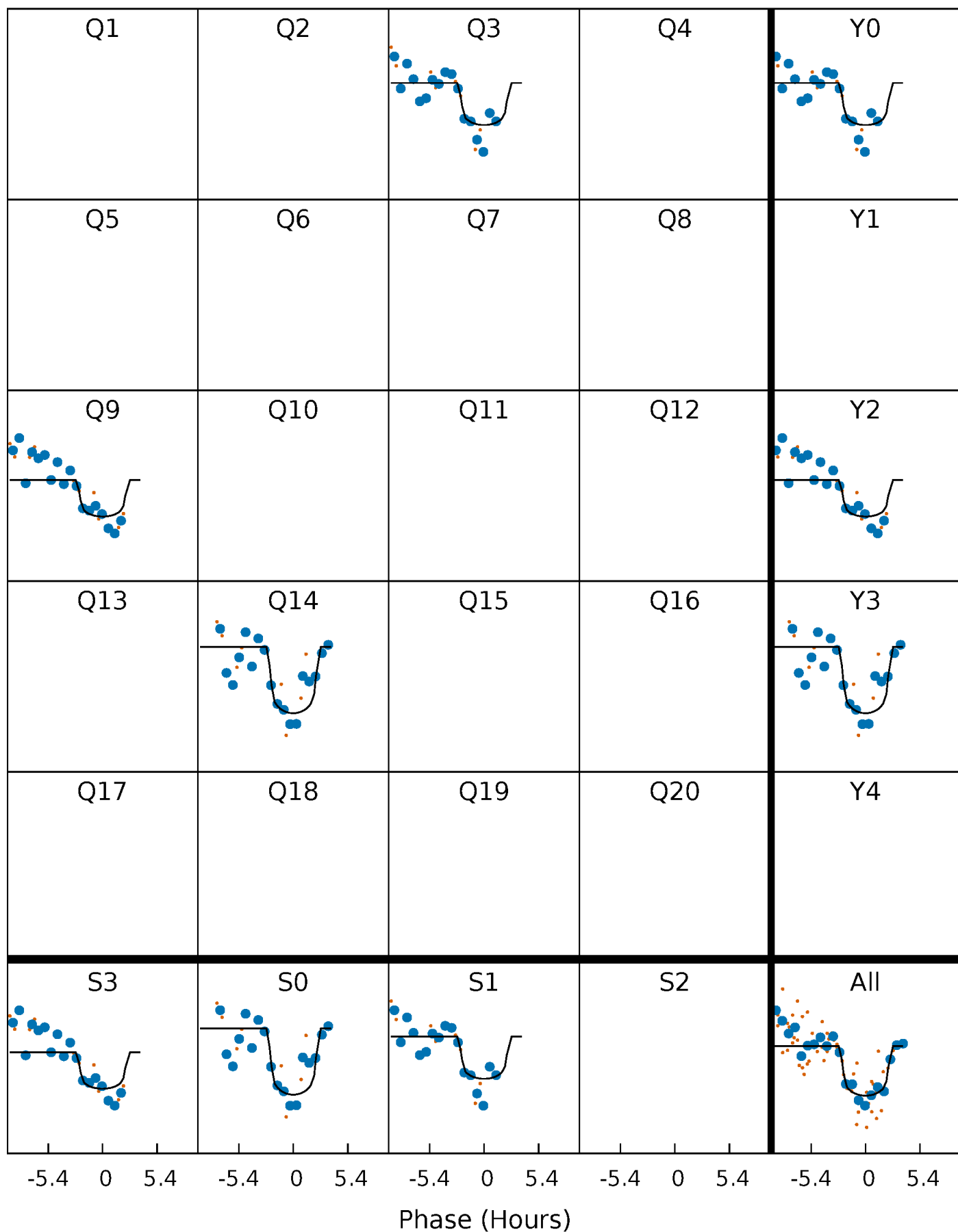
PDC Quarter-Phased Transit Curves

TCE 008716028-06 P=508.140391 Days $T_0=316.308767$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 008716028-06 P=508.140391 Days $T_0=316.308767$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

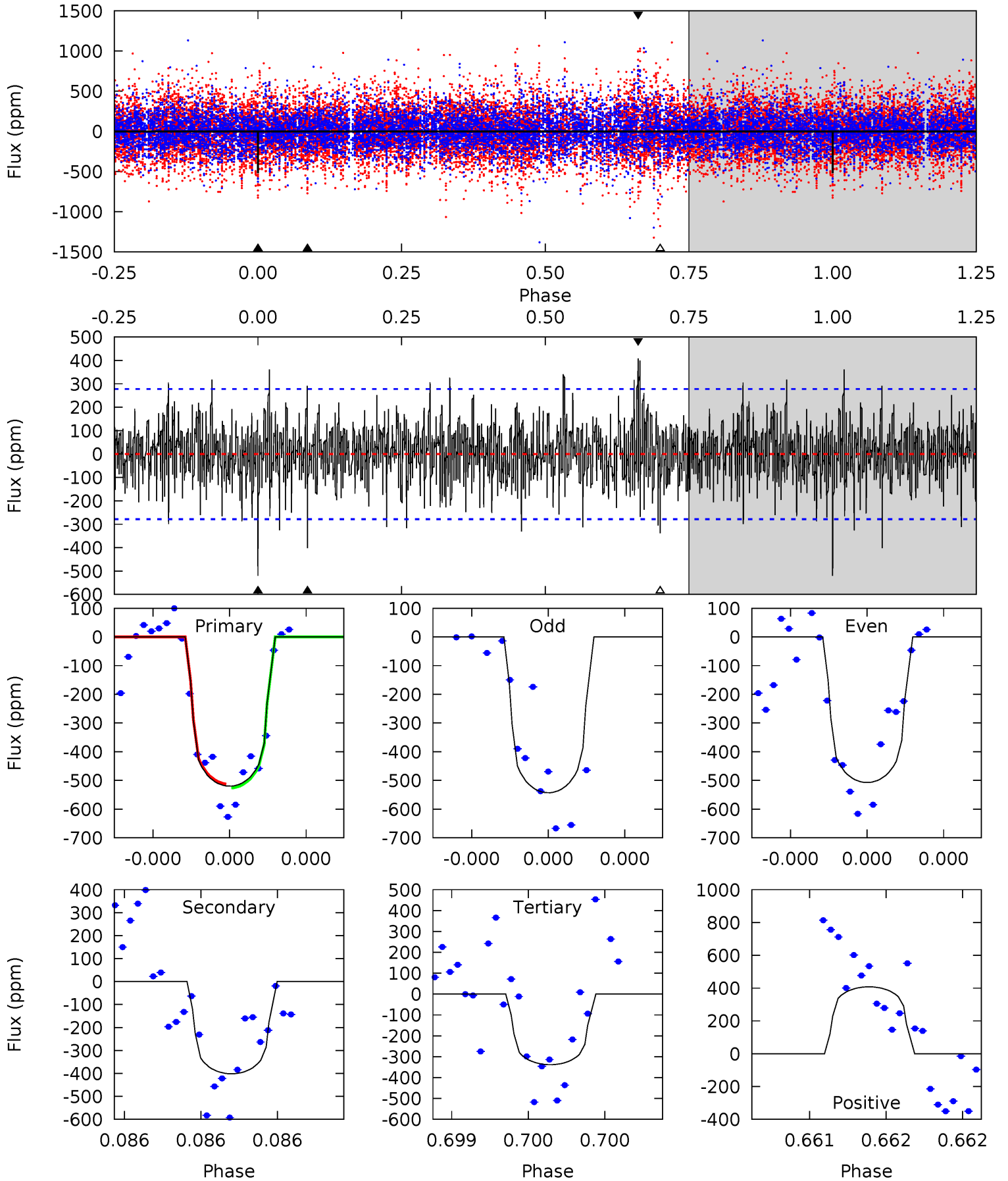
TCE 008716028-06 P=508.134959 Days $T_0=316.287757$ (BKJD)



DV Model-Shift Uniqueness Test

008716028-06, P = 508.140391 Days, E = 316.308767 Days

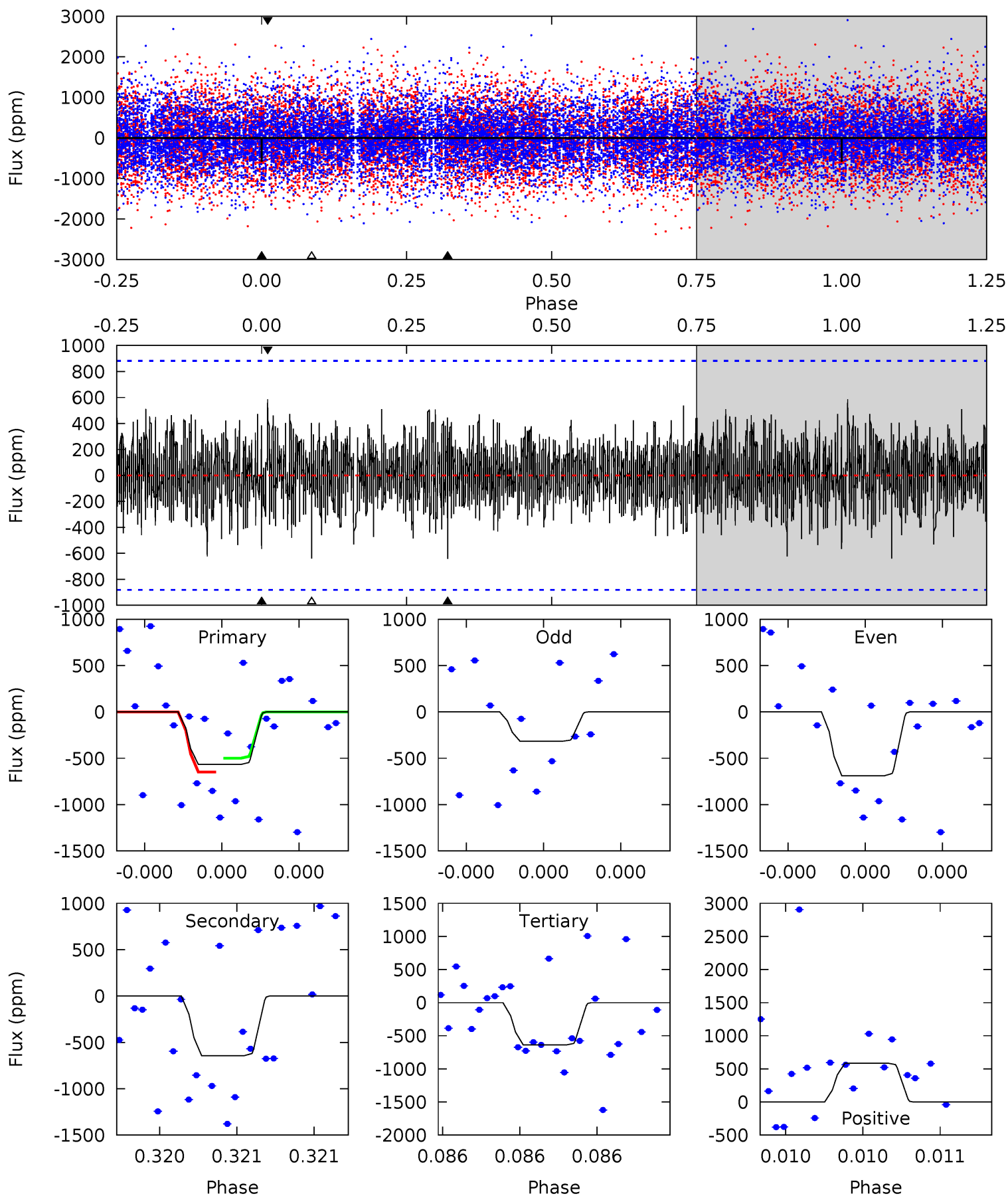
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	8.12	6.84	8.24	5.62	3.56	2.01	3.67	2.27	1.28	-0.12	0.36	0.96	0.44	0.14



Alt Model-Shift Uniqueness Test

008716028-06, P = 508.134959 Days, E = 316.287757 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.66	4.16	4.14	3.79	5.70	3.67	1.07	-0.47	-0.13	0.02	0.37	1.14	1.09	0.48	0.48



Stellar Parameters For KIC 008716028

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6632^{+180}_{-240}	$3.903^{+0.364}_{-0.130}$	$-0.220^{+0.250}_{-0.300}$	$2.127^{+0.562}_{-0.842}$	$1.323^{+0.211}_{-0.234}$	$0.194^{+0.589}_{-0.070}$
	+3%/-4%	+9%/-3%	+114%/-136%	+26%/-40%	+16%/-18%	+304%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008716028-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-402 ± 49	$6.70^{+6.34}_{-4.44}$	498^{+39}_{-50}	5390^{+4359}_{-1271}	9667^{+68228}_{-7222}
Alt.	-643 ± 155	$7.78^{+6.00}_{-5.12}$	498^{+39}_{-54}	5498^{+4538}_{-1129}	10909^{+74895}_{-7490}

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

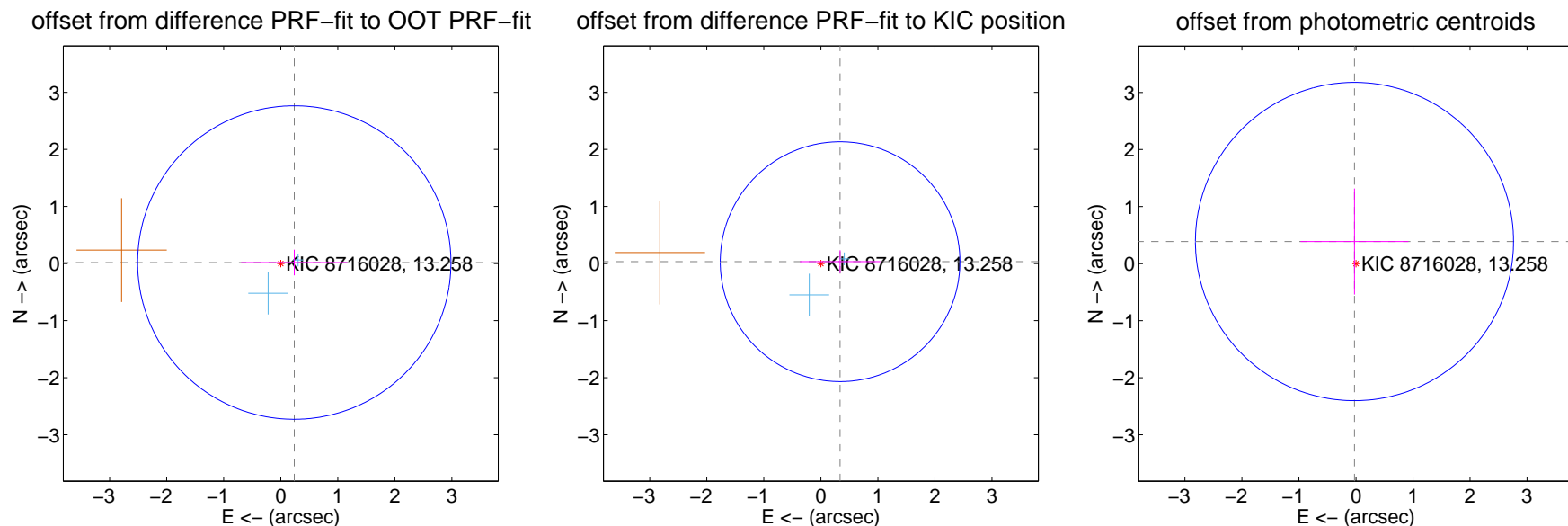
DV Centroid Data

Supplemental centroid analysis for 008716028-06. Kepler magnitude: 13.26. Transit SNR 7.84

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.238 ± 0.915	0.26	-0.237 ± 0.930	0.018 ± 0.224
PRF-fit source offset from KIC position	0.339 ± 0.700	0.48	-0.337 ± 0.705	0.033 ± 0.200
photometric centroid source offset	0.39 ± 0.93	0.42	0.03 ± 0.95	0.39 ± 0.93



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.

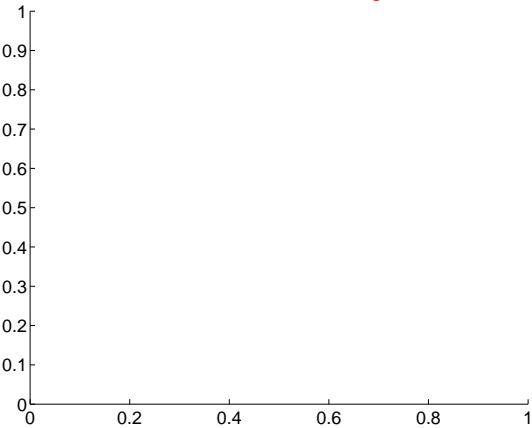
Q1 no difference image



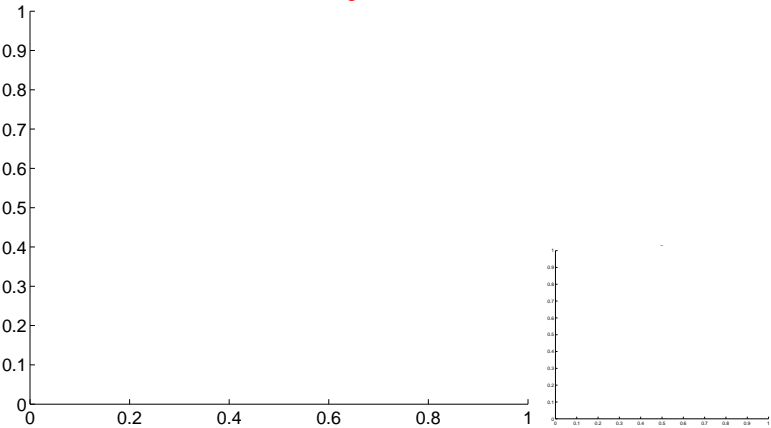
Q1 no OOT image



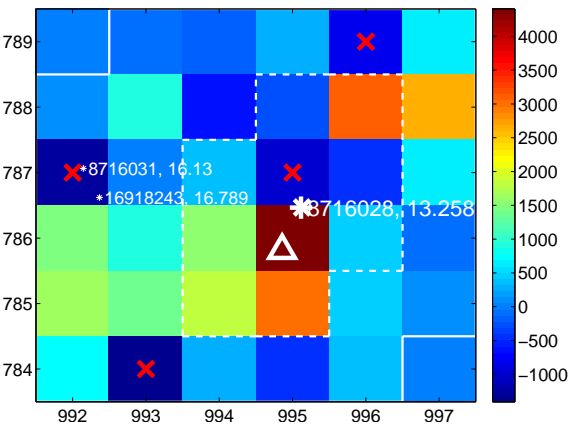
Q2 no difference image



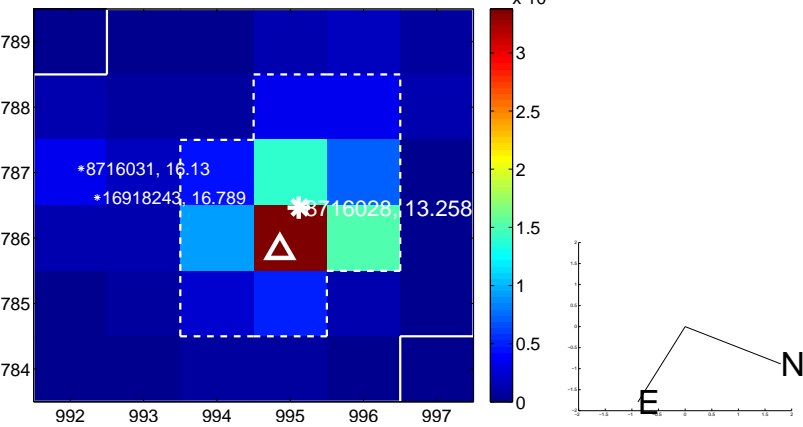
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



Q4 no difference image



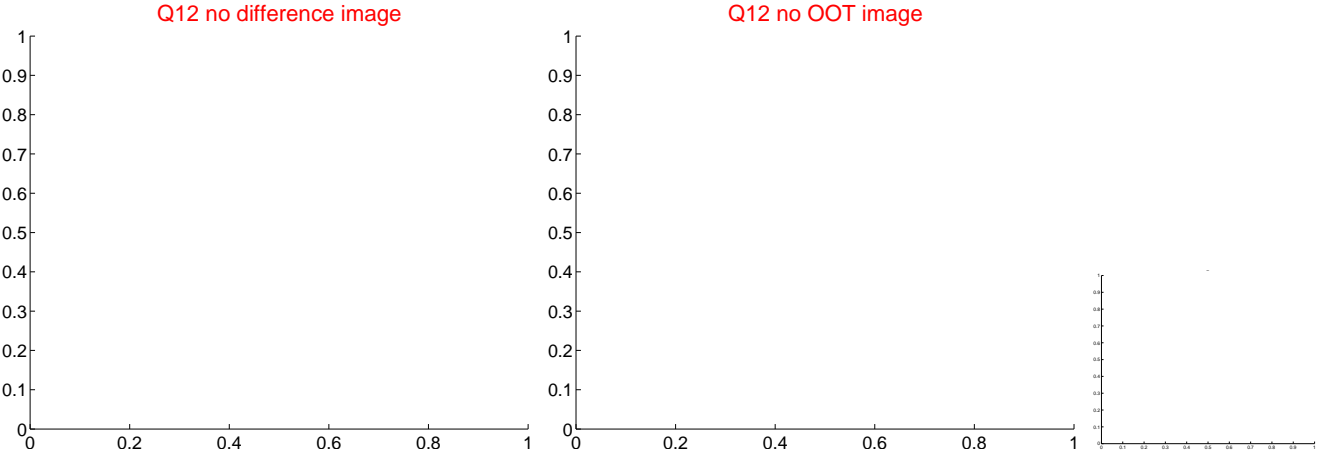
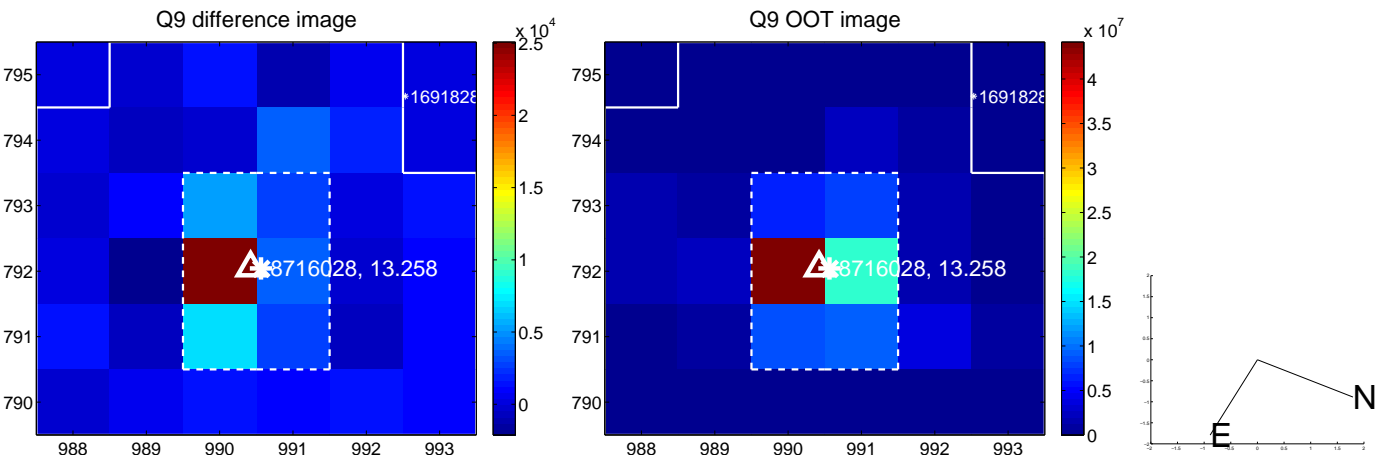
Q4 no OOT image



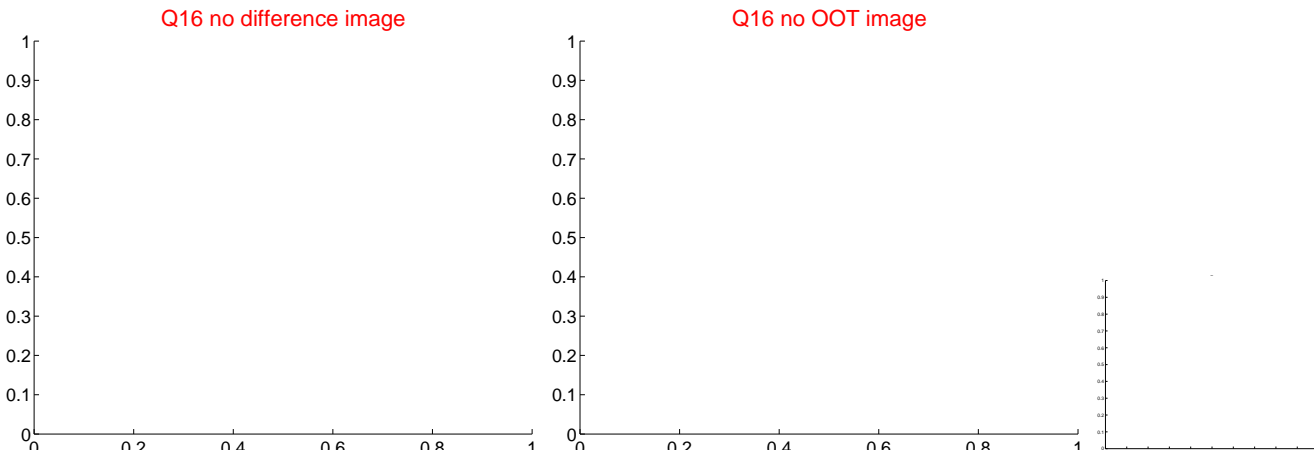
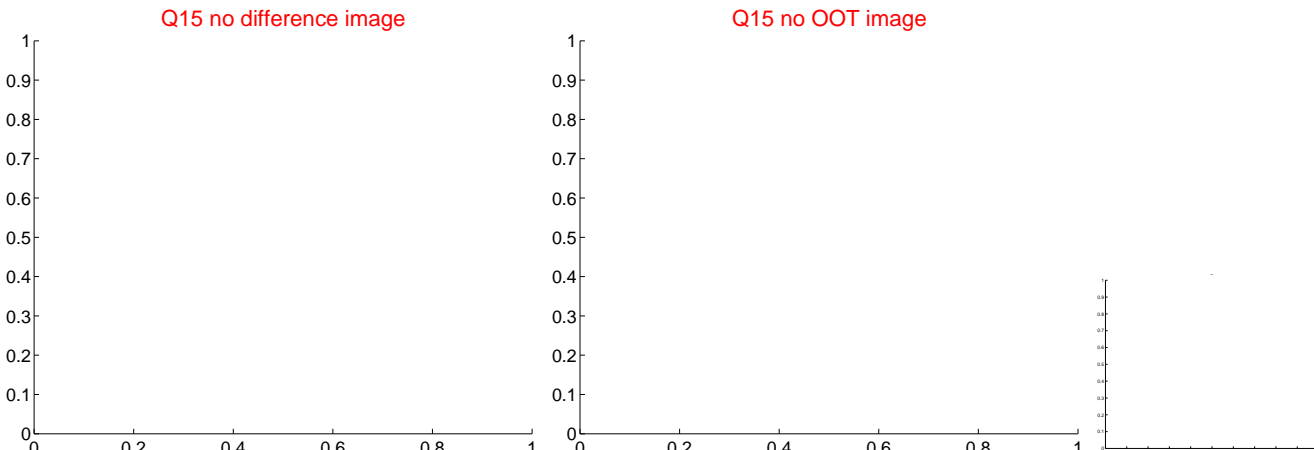
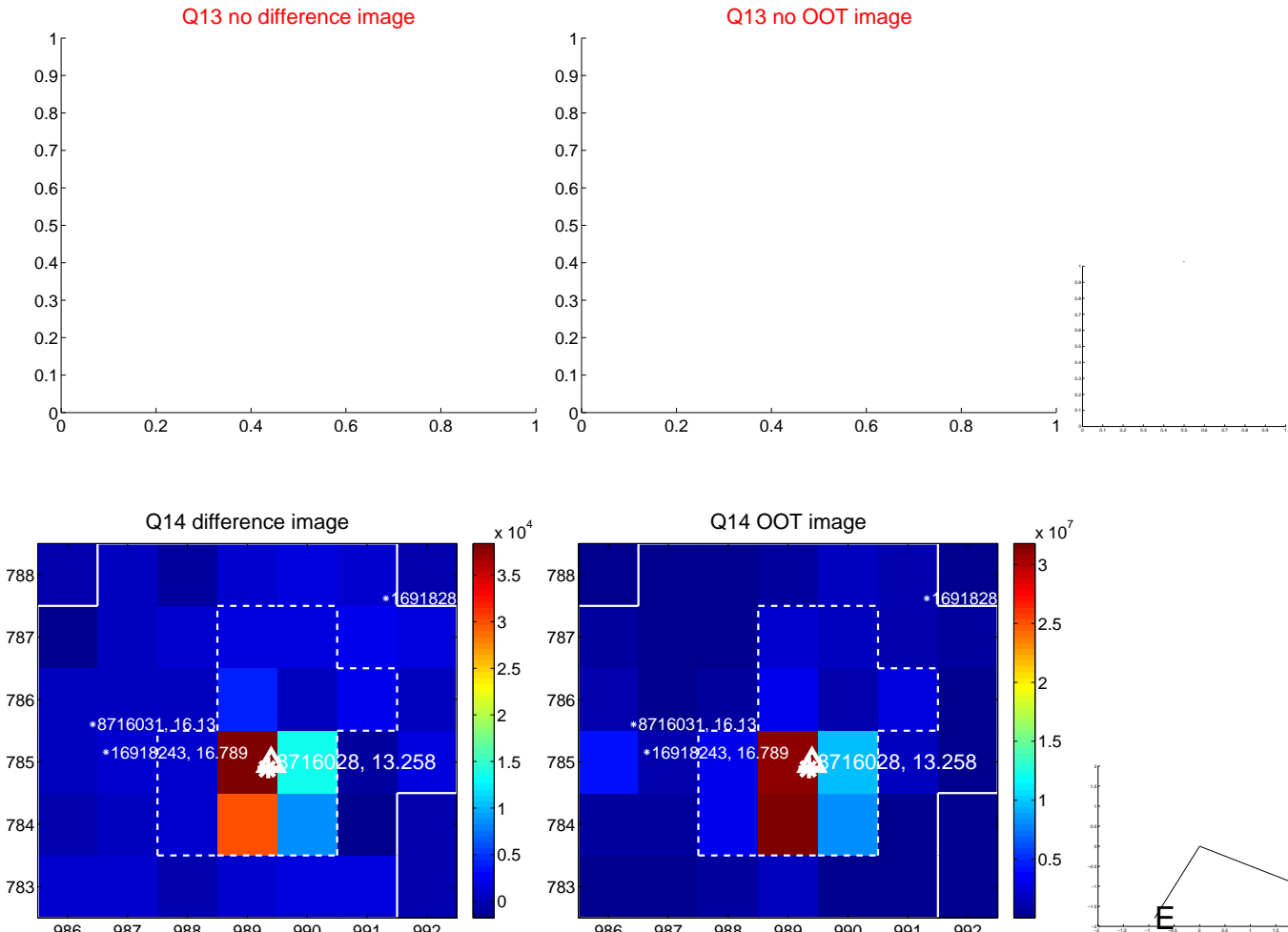
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



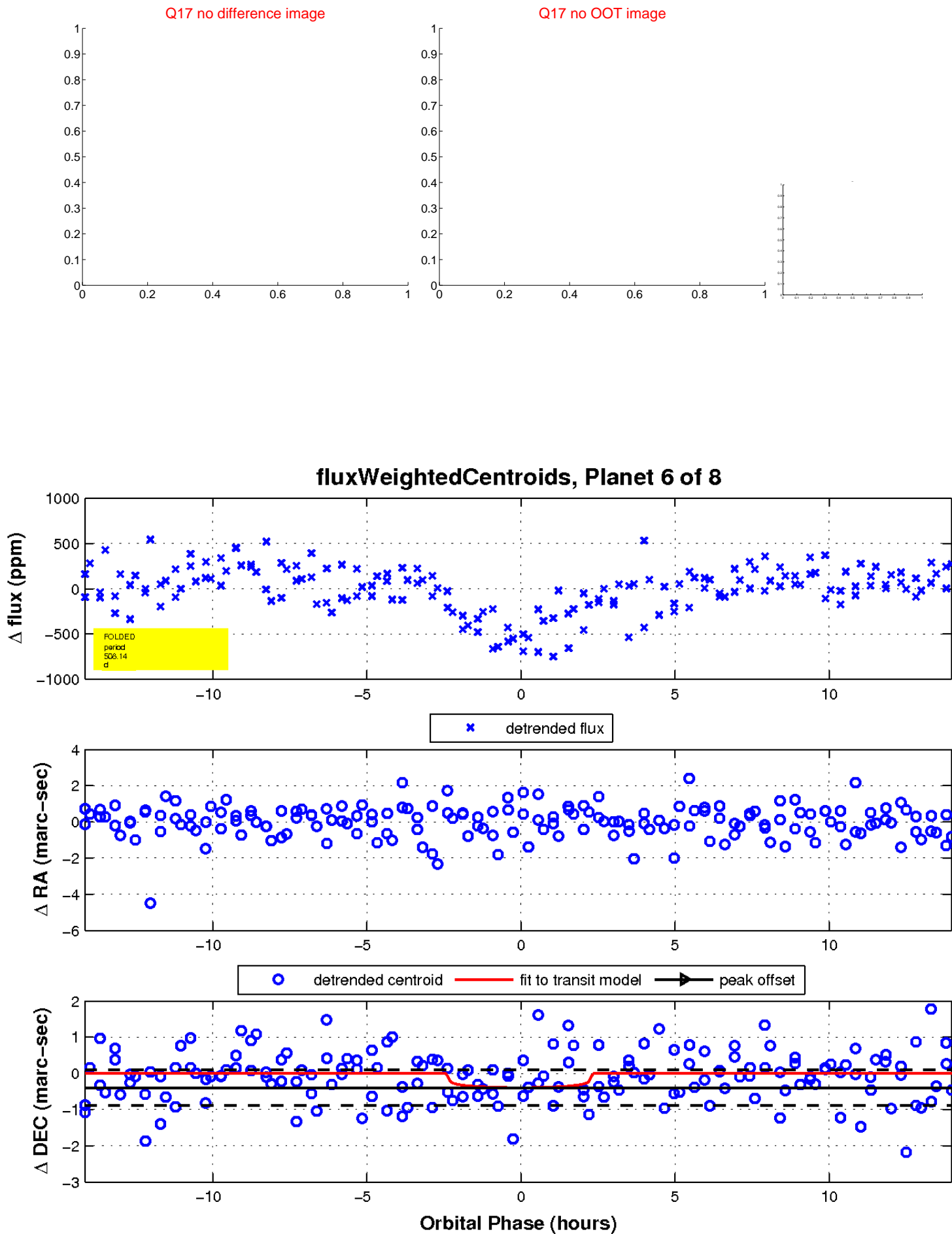
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

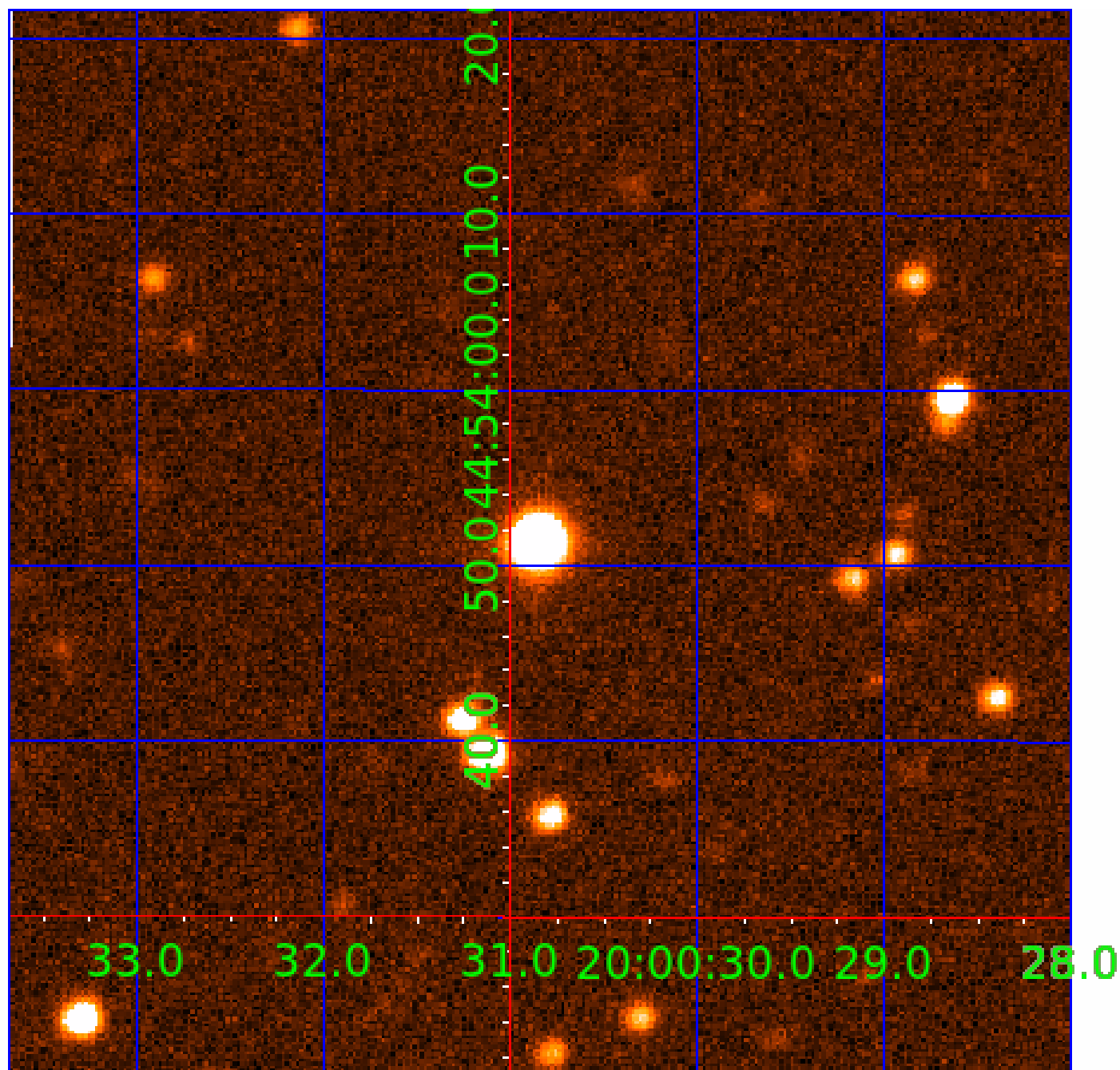


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008716028

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})
008716028-01	OBS	No	1.752399	132.775555	73.5	6.540	10.8	11.7	2.13	6632	3.23	8050.20
008716028-02	OBS	No	1.752389	131.563135	68.6	4.734	9.9	12.3	2.13	6632	3.23	8050.26
008716028-03	OBS	No	532.874333	152.974204	576.3	7.403	9.4	9.8	2.13	6632	6.02	3.94
008716028-04	OBS	No	14.763042	142.008324	175.8	7.647	8.9	9.5	2.13	6632	2.98	469.62
008716028-05	OBS	No	98.427139	200.078630	536.0	4.065	7.9	8.3	2.13	6632	5.44	37.42
008716028-06	OBS	No	508.140391	316.308767	503.3	4.729	7.5	7.8	2.13	6632	4.80	4.19
008716028-07	OBS	No	72.851489	190.500130	273.6	0.594	7.8	2.9	2.13	6632	3.64	55.90
008716028-08	OBS	No	34.934758	163.806235	164.7	5.000	7.2	-1.0	2.13	6632	2.75	148.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008716028-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008716028-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
008716028-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008716028-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008716028-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

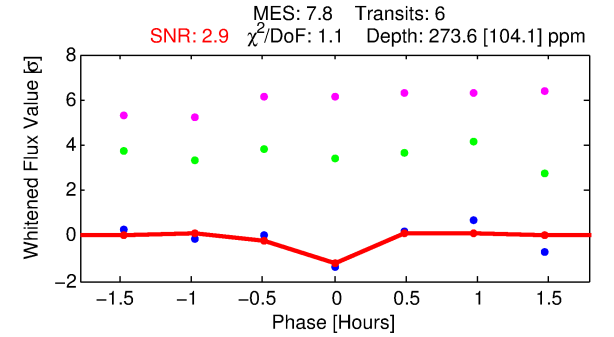
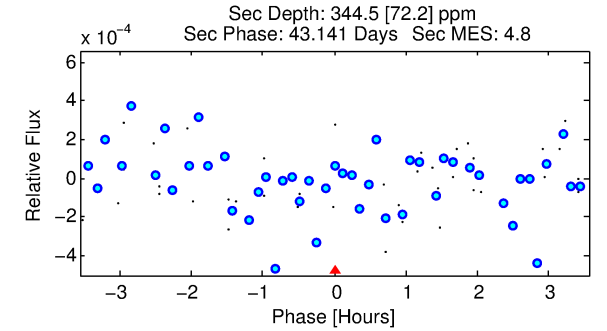
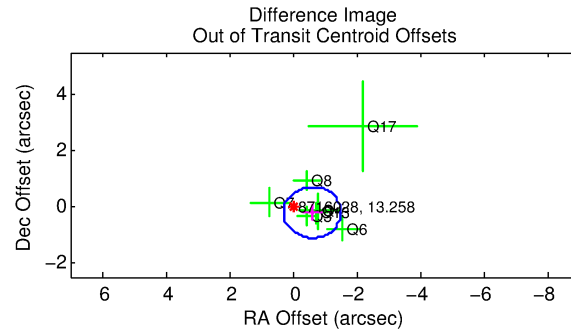
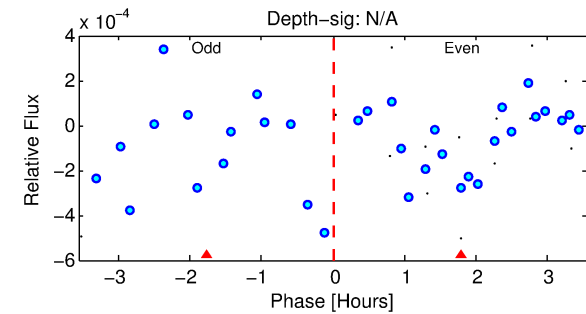
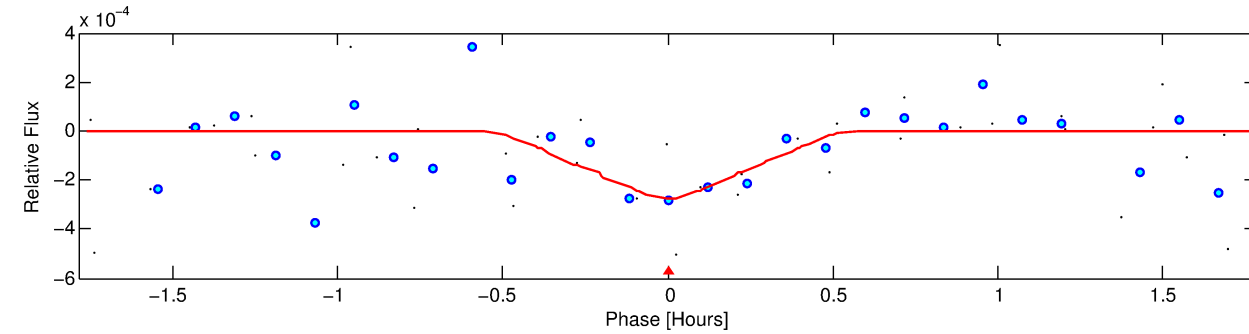
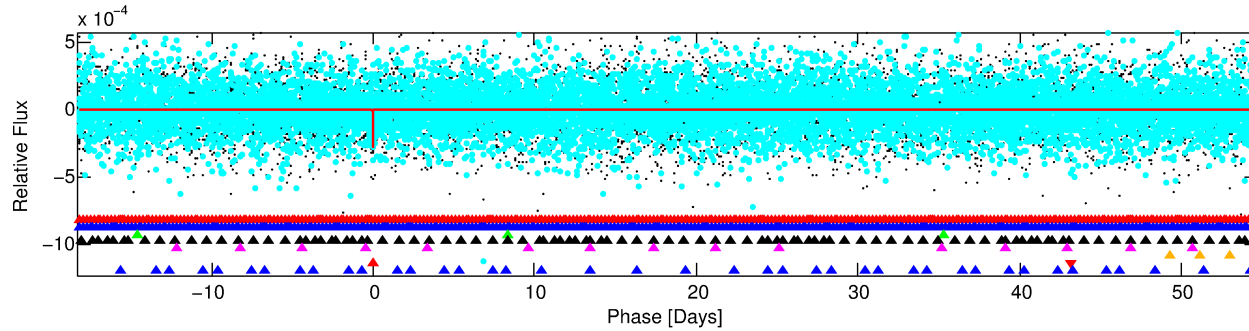
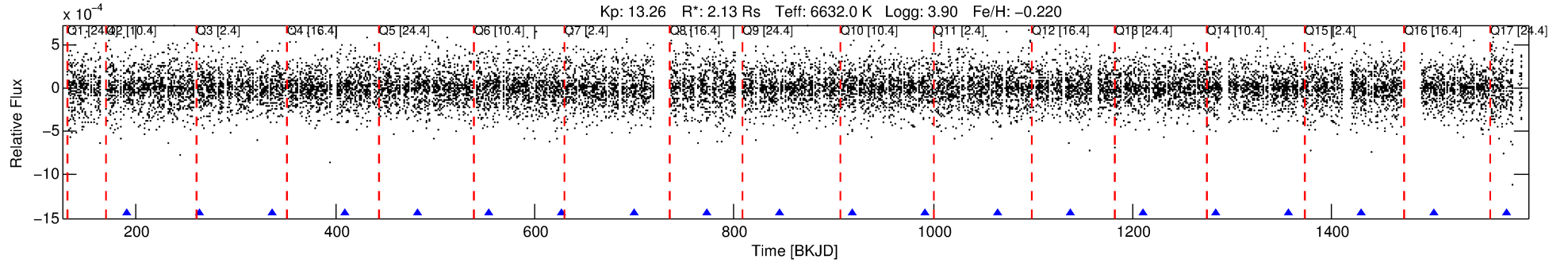
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008716028-07

No Significant Match Found

DV One-Page Summary

KIC: 8716028 Candidate: 7 of 8 Period: 72.851 d



DV Fit Results:

Period = 72.85149 [0.00070] d
Epoch = 190.5001 [0.0093] BKJD
Rp/R* = 0.0157 [0.1453]
a/R* = 946.22 [48269.09]
b = 0.10 [491.86]
Seff = 55.90 [35.48]
Teq = 697 [111] K
Rp = 3.64 [33.75] Re
a = 0.3745 [0.1439] AU
Ag = 2004.53 [37143.76] [0.05σ]
Teffp = 7213 [33397] K [0.20σ]

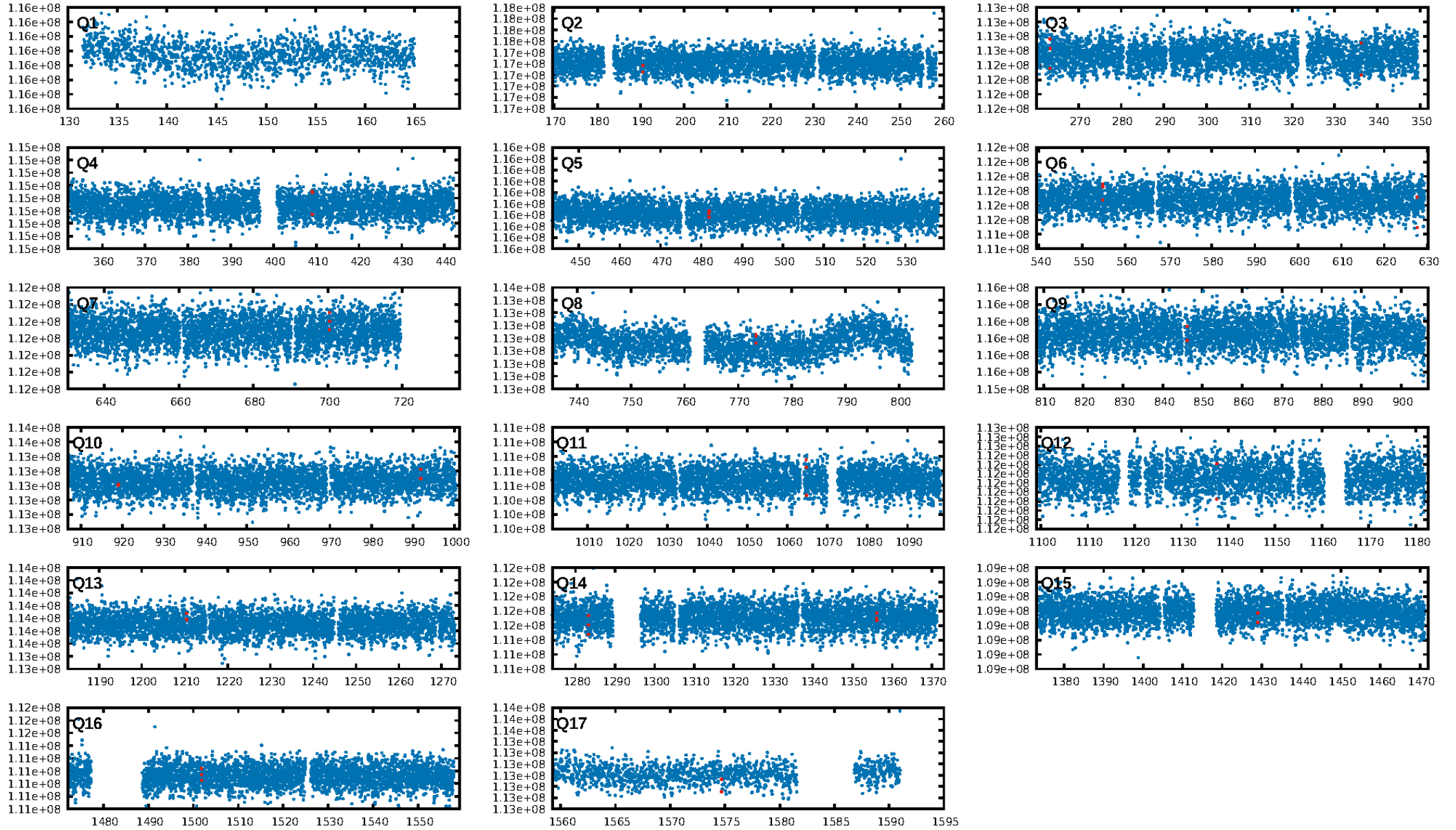
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [180.73σ]
LongPeriod-sig: 100.0% [149.43σ]
ModelChiSquare2-sig: 22.6%
ModelChiSquareGof-sig: 78.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 0.4202
Centroid-sig: N/A
Centroid-so: 0.704 arcsec [0.41σ]
OotOffset-rm: 0.645 arcsec [2.14σ]
KicOffset-rm: 0.688 arcsec [2.28σ]
OotOffset-st: 1/2/2/2 [7]
KicOffset-st: 1/2/2/2 [7]
DiffImageQuality-fgm: 0.14 [1/7]
DiffImageOverlap-fno: 0.27 [3/11]

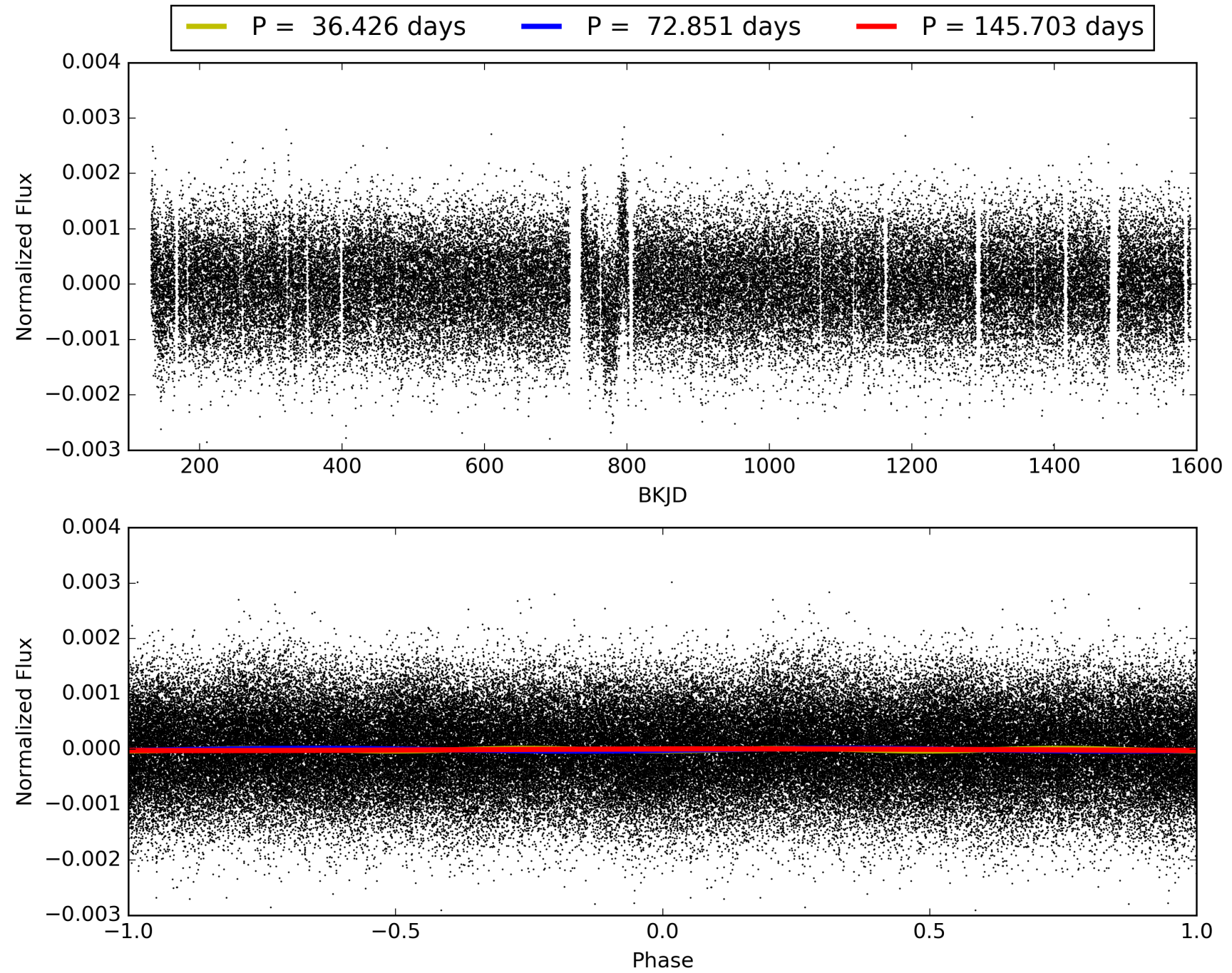
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:04:13 Z

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

TCE 008716028-07, PDC Light Curves

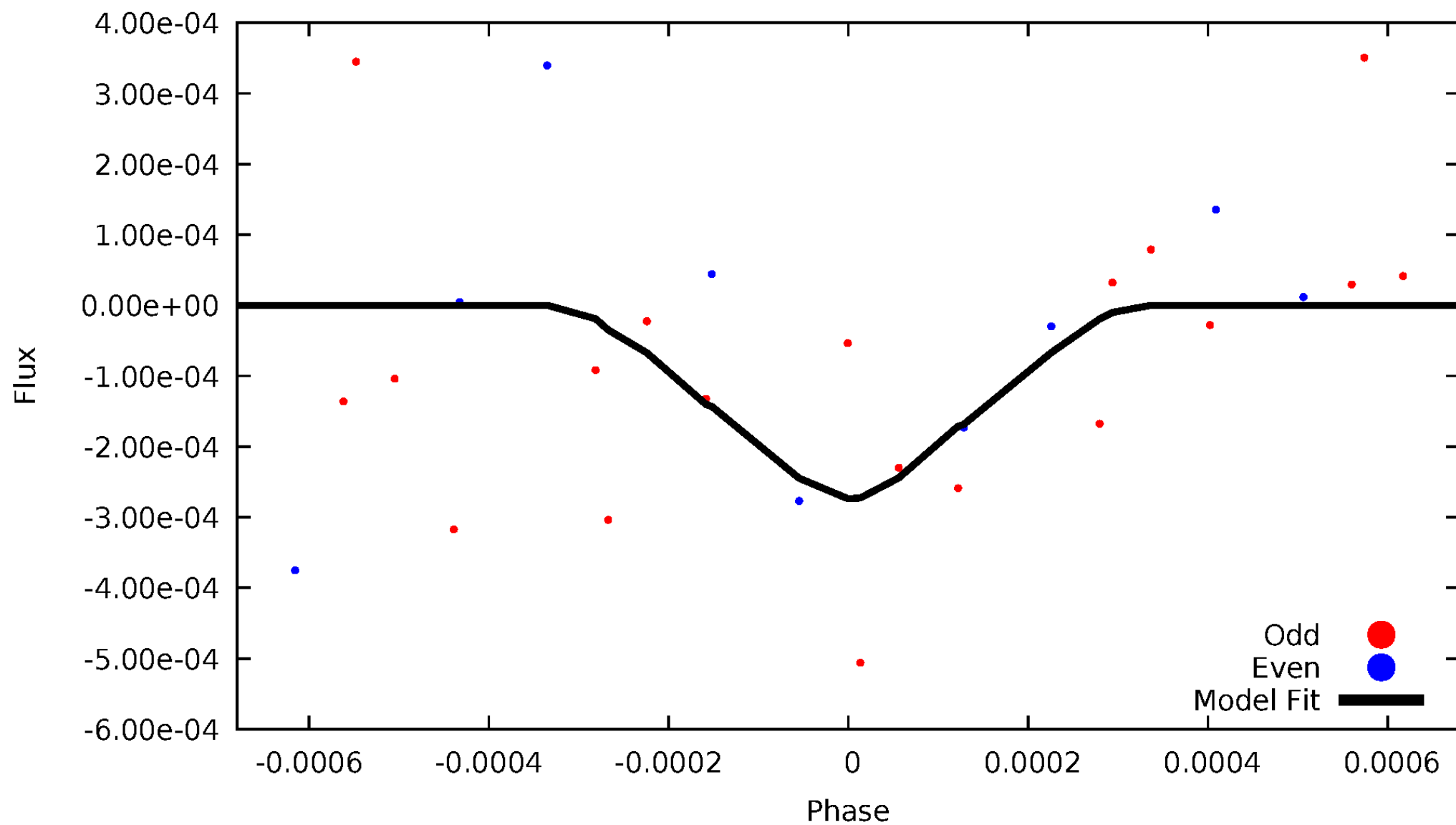


TCE 008716028-07



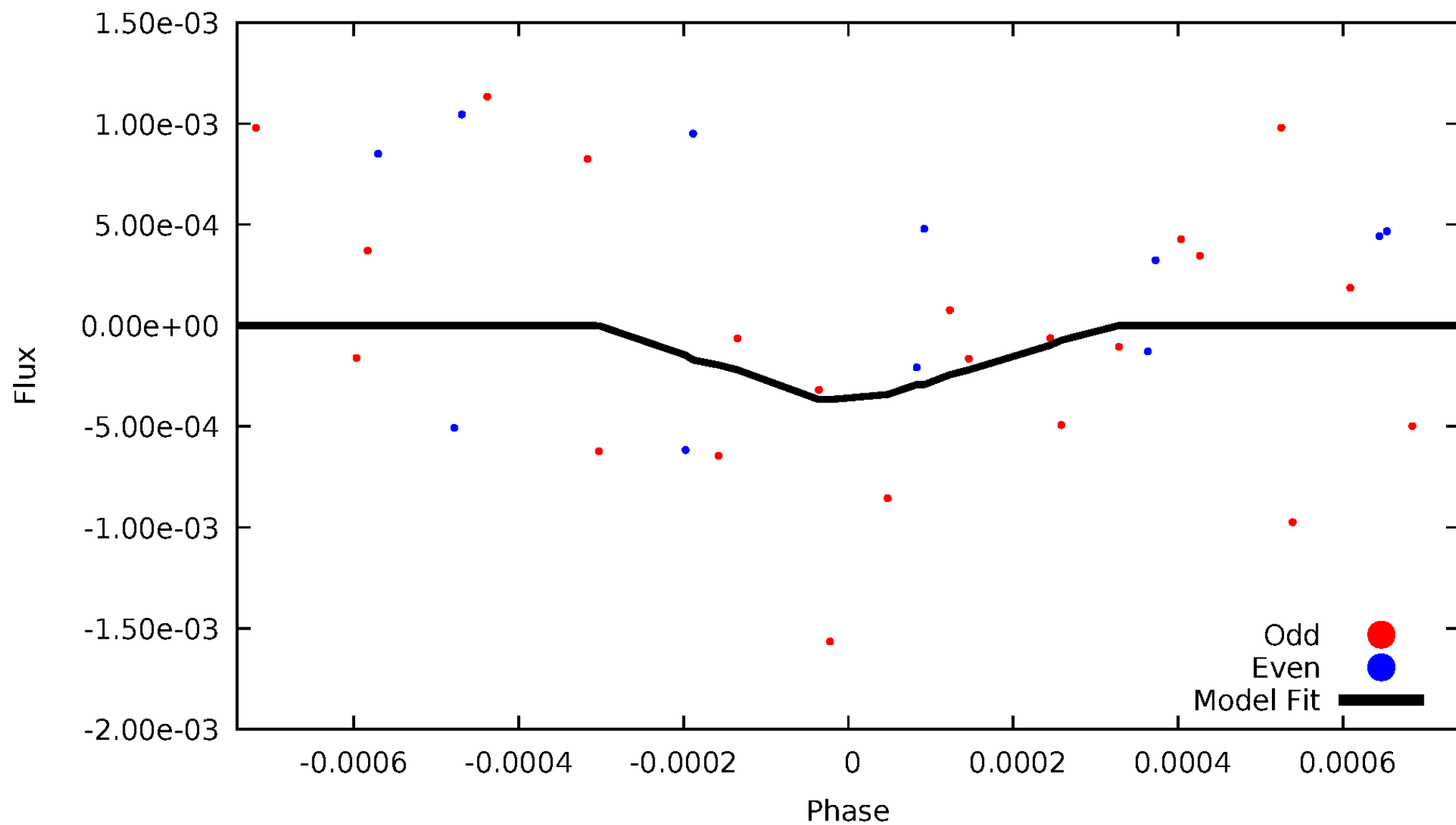
DV Odd/Even

TCE 008716028-07



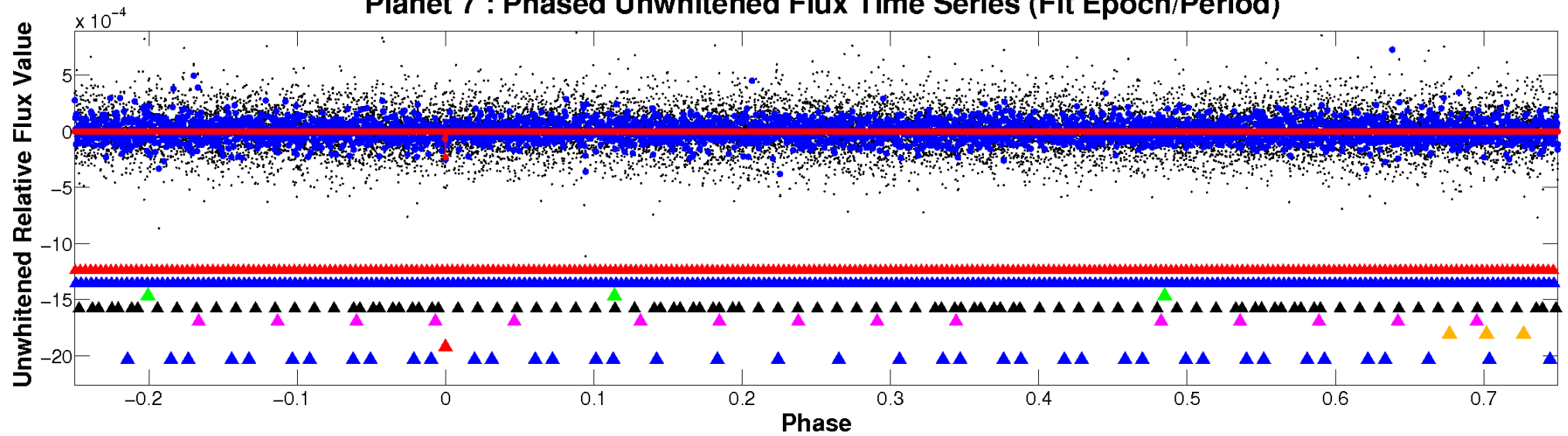
ALT Odd/Even

TCE 008716028-07

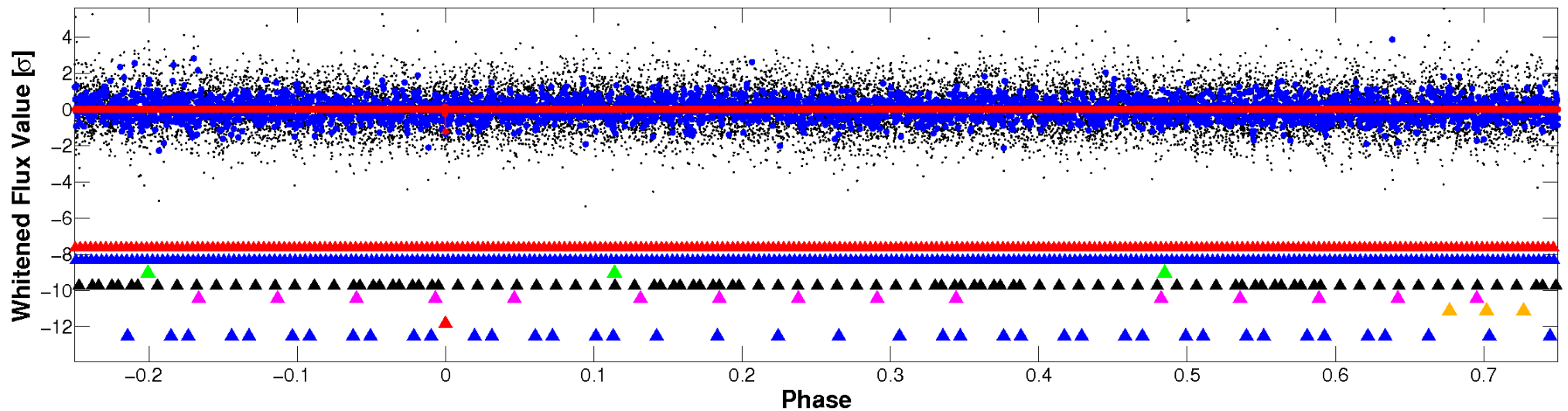


Non-Whitened Vs. Whitened Light Curve

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

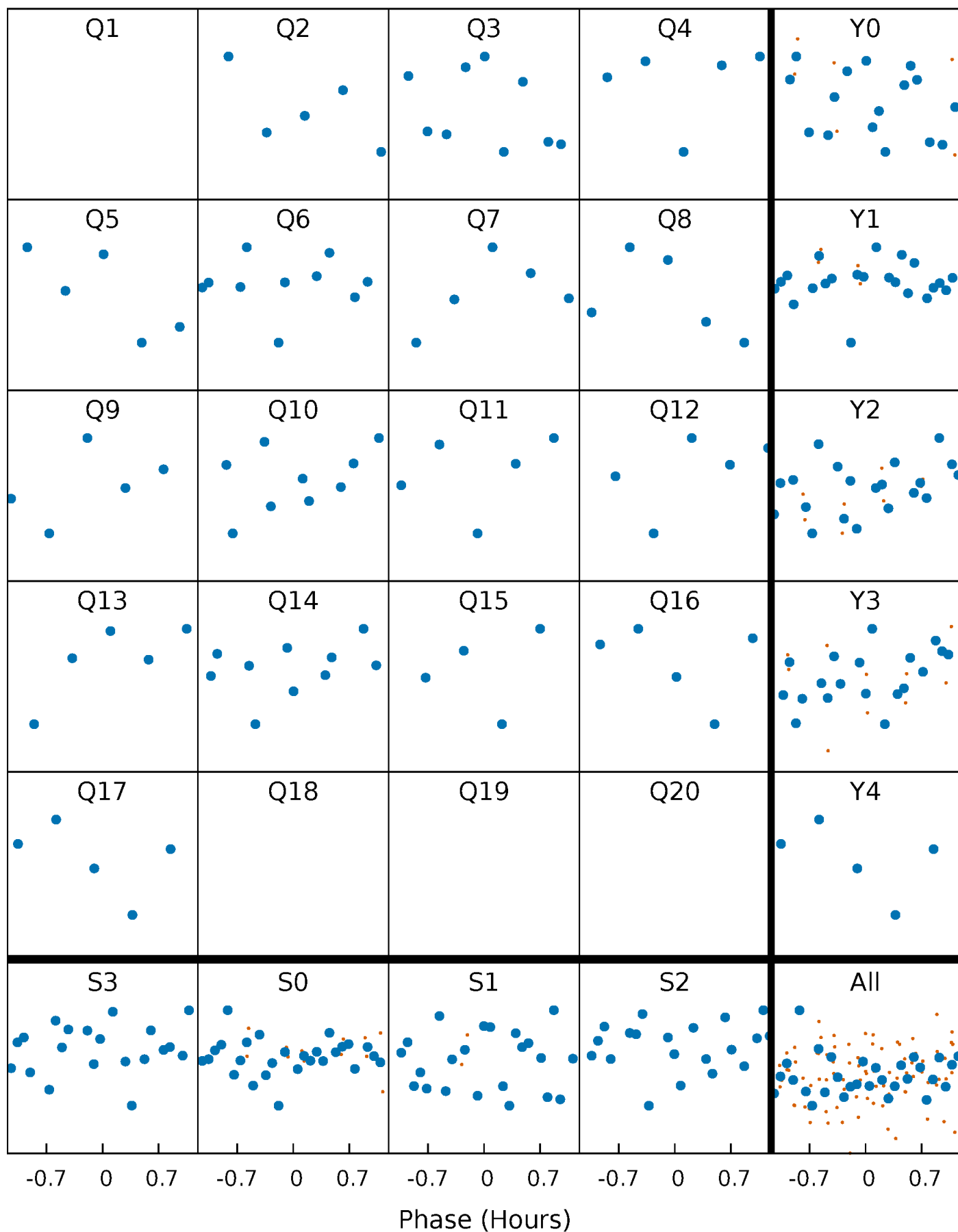


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



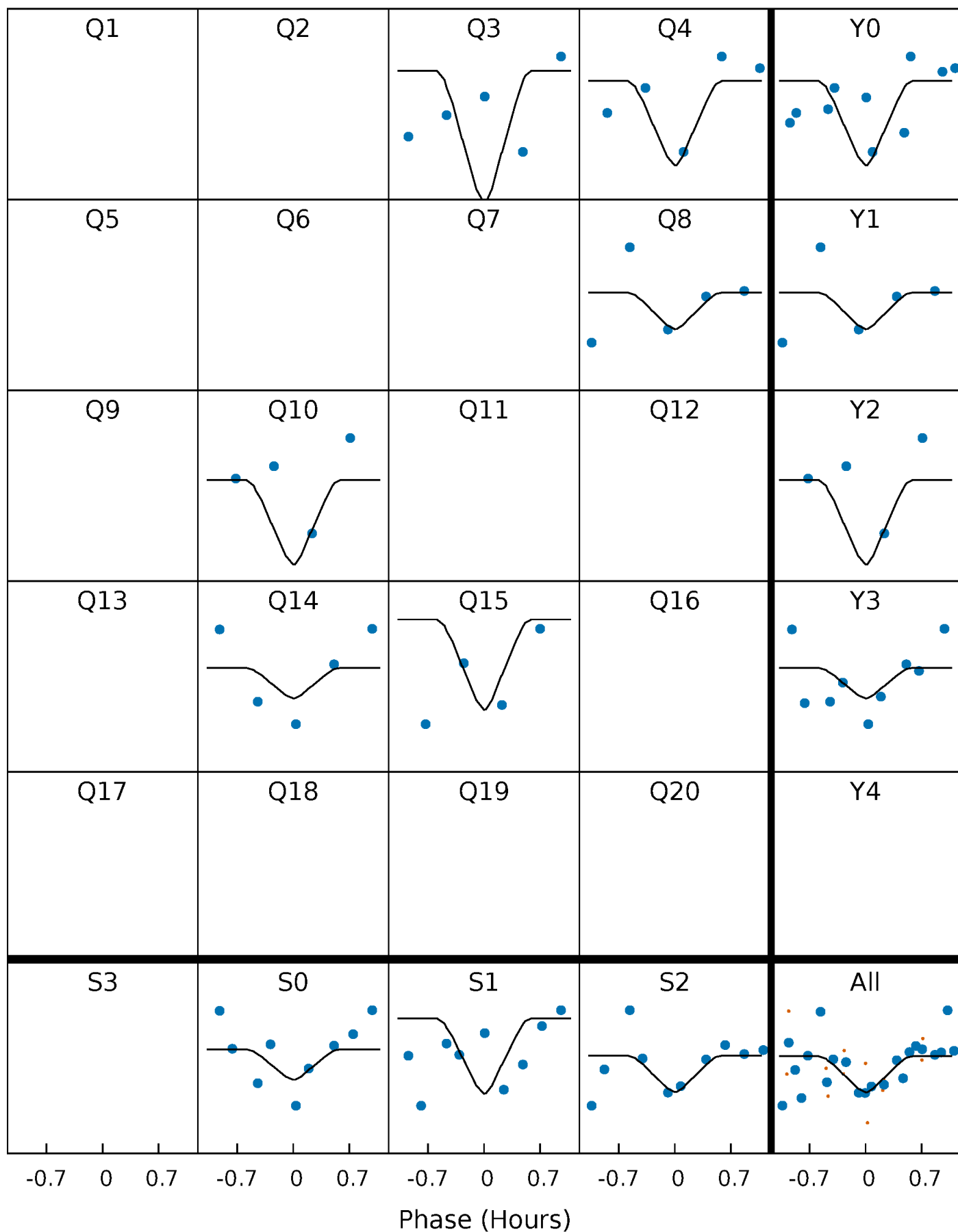
PDC Quarter-Phased Transit Curves

TCE 008716028-07 $P = 72.851489$ Days $T_0 = 190.500130$ (BKJD)



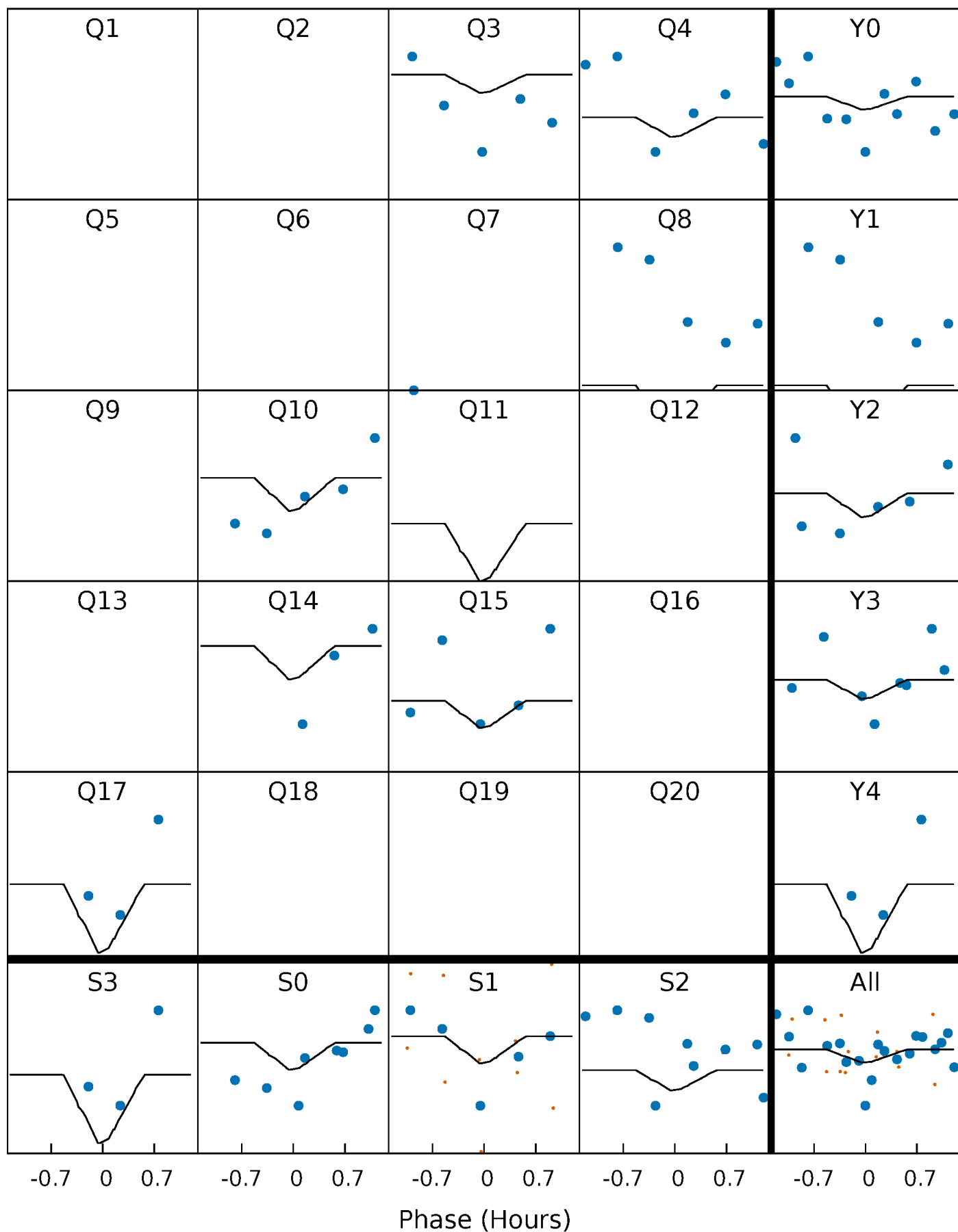
DV Quarter-Phased Transit Curves

TCE 008716028-07 $P = 72.851489$ Days $T_0 = 190.500130$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

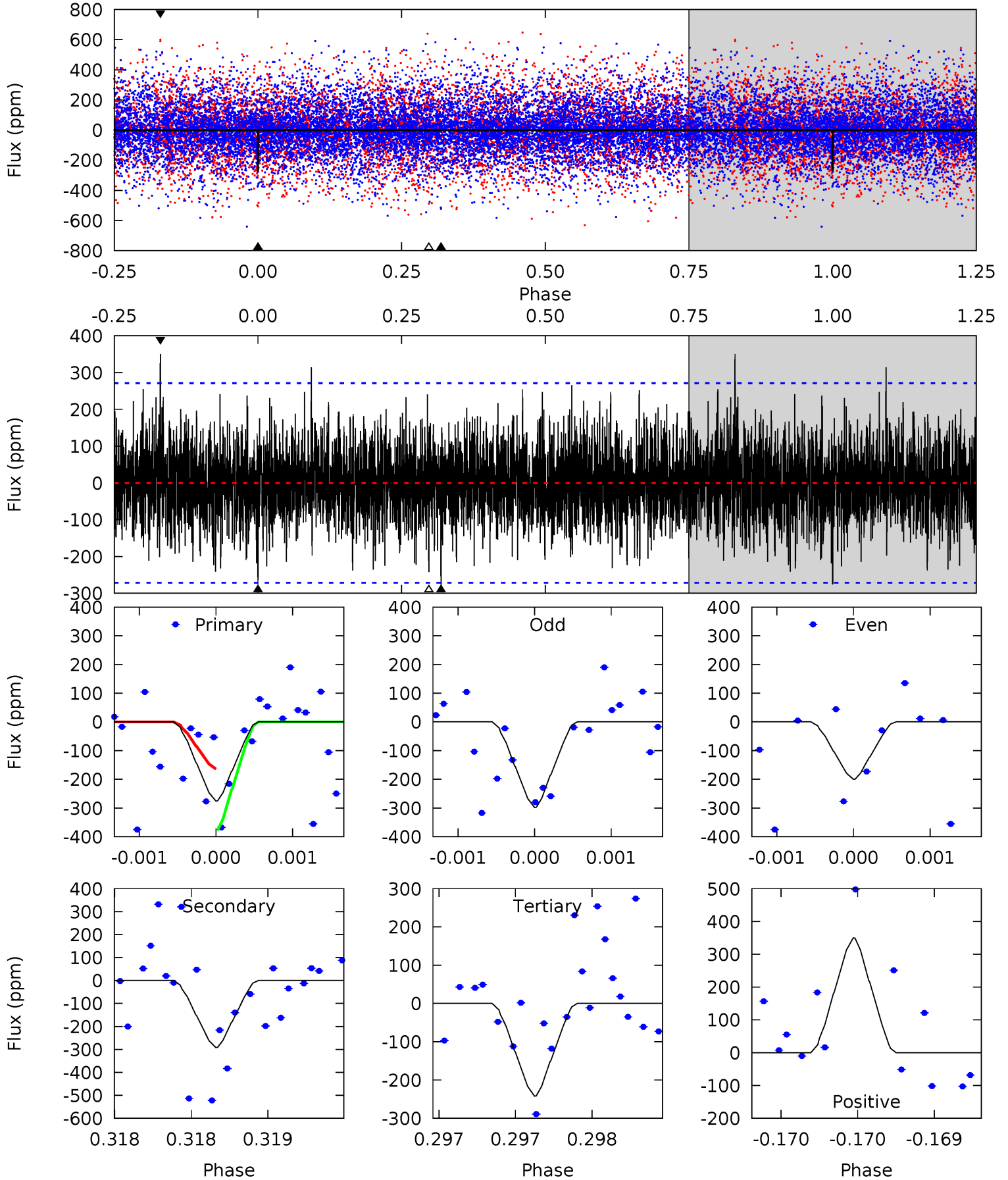
TCE 008716028-07 P= 72.838062 Days $T_0=190.617276$ (BKJD)



DV Model-Shift Uniqueness Test

008716028-07, P = 72.851489 Days, E = 117.648641 Days

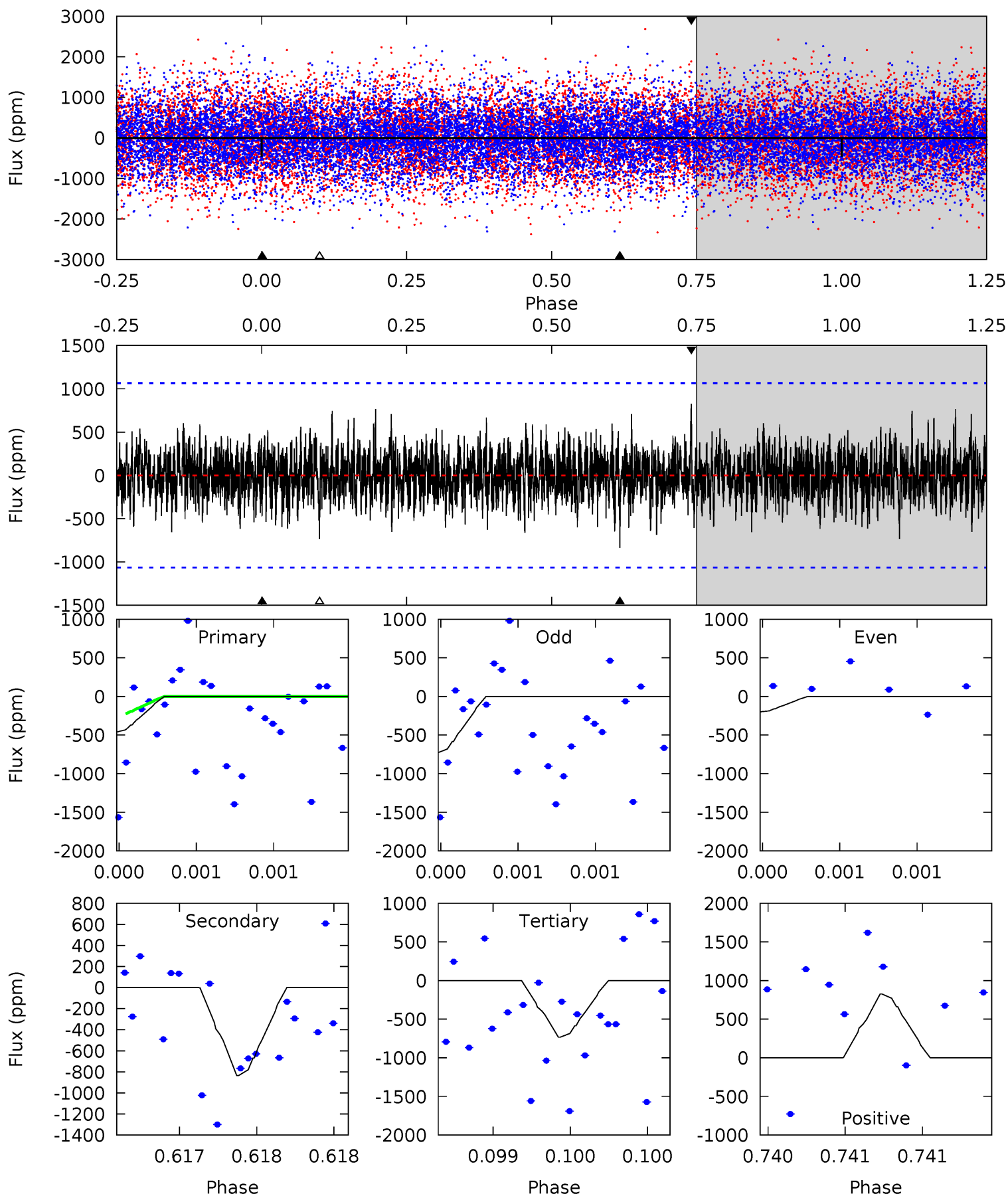
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.63	5.96	4.94	7.15	5.54	3.43	1.60	0.69	-1.51	1.02	-1.18	0.96	1.00	0.55	2.17



Alt Model-Shift Uniqueness Test

008716028-07, P = 72.838062 Days, E = 117.779214 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.41	4.35	3.82	4.30	5.55	3.45	1.08	-1.41	-1.89	0.53	0.05	1.30	0.96	0.50	1.20



Stellar Parameters For KIC 008716028

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6632^{+180}_{-240}	$3.903^{+0.364}_{-0.130}$	$-0.220^{+0.250}_{-0.300}$	$2.127^{+0.562}_{-0.842}$	$1.323^{+0.211}_{-0.234}$	$0.194^{+0.589}_{-0.070}$
	+3%/-4%	+9%/-3%	+114%/-136%	+26%/-40%	+16%/-18%	+304%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008716028-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-292 ± 49	$23.51^{+23.84}_{-16.55}$	949^{+71}_{-106}	3180^{+1700}_{-538}	43^{+422}_{-33}
Alt.	-836 ± 192	$24.14^{+25.34}_{-17.75}$	949^{+74}_{-93}	3762^{+2611}_{-762}	108^{+1394}_{-82}

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

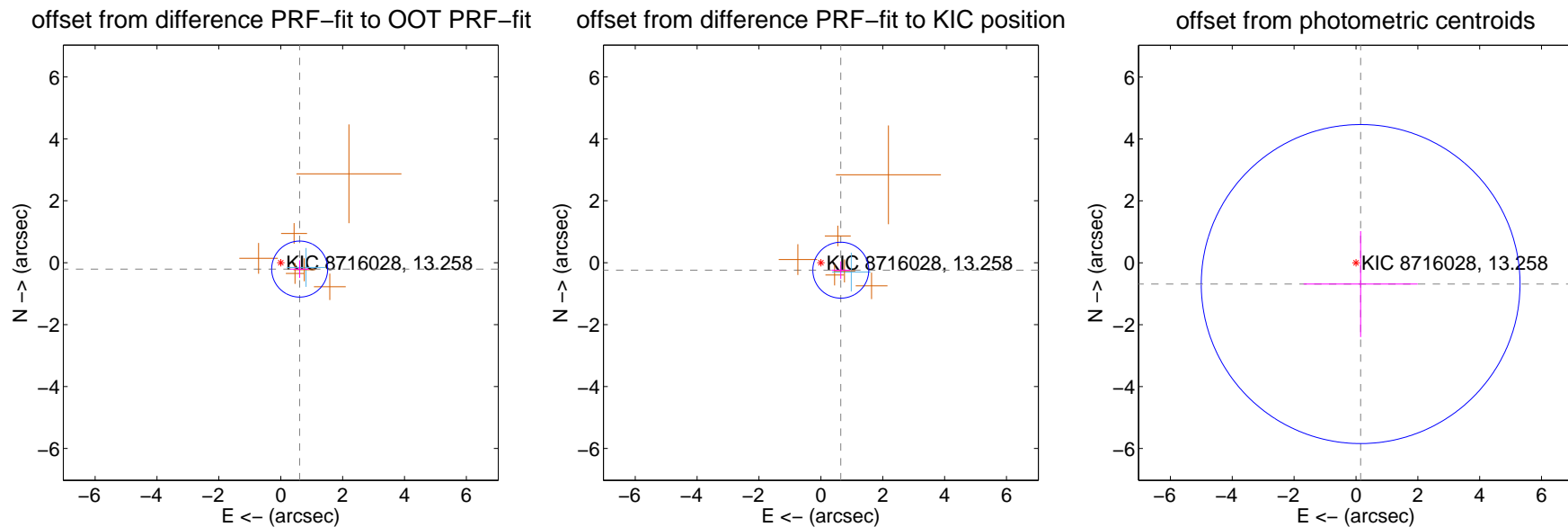
DV Centroid Data

Supplemental centroid analysis for 008716028-07. Kepler magnitude: 13.26. Transit SNR 2.93

There are 1 quarters with good PRF difference image offsets

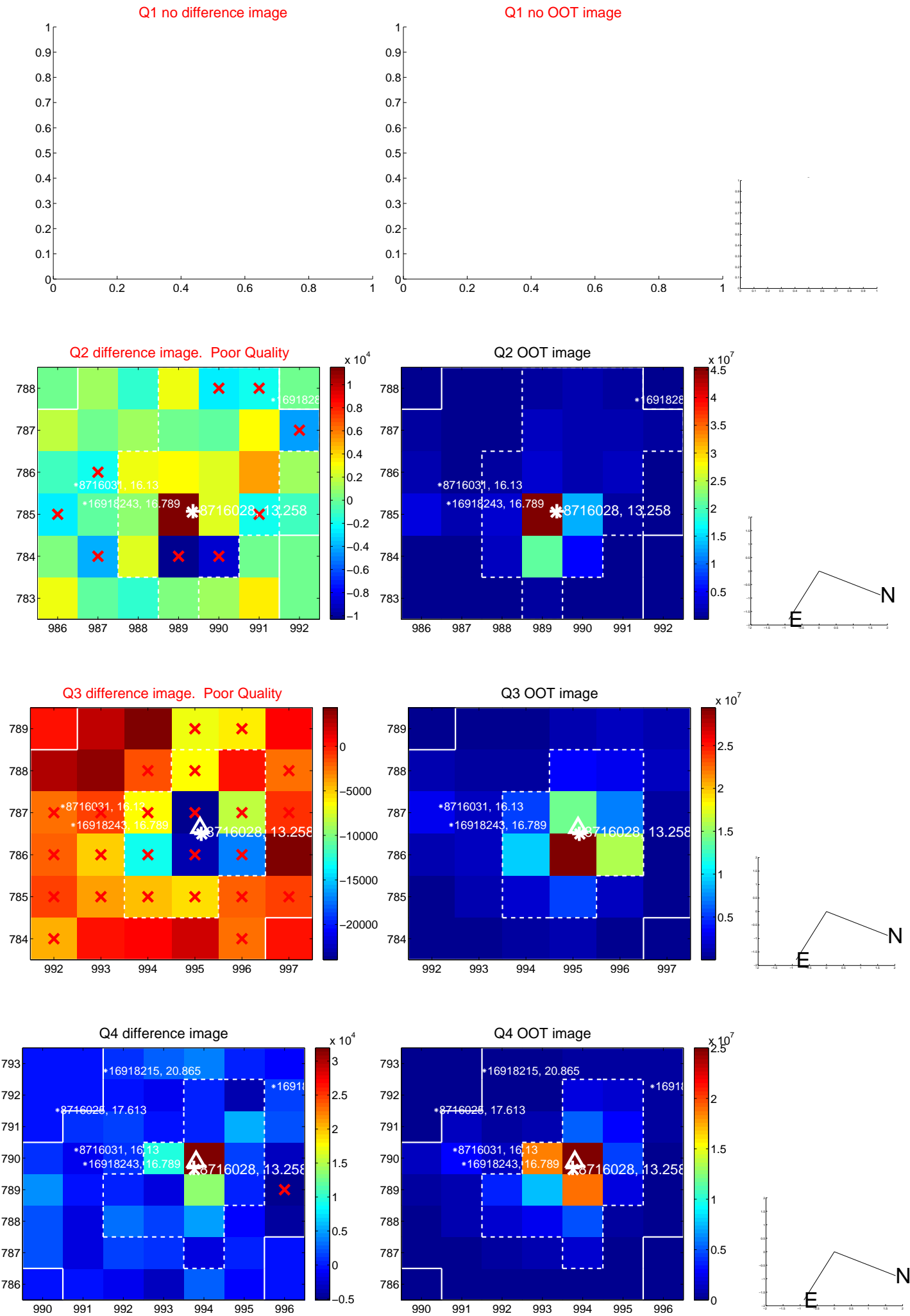
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.645 ± 0.302	2.14	-0.611 ± 0.304	-0.206 ± 0.284
PRF-fit source offset from KIC position	0.688 ± 0.301	2.28	-0.644 ± 0.304	-0.242 ± 0.284
photometric centroid source offset	0.70 ± 1.72	0.41	-0.15 ± 1.84	-0.69 ± 1.71

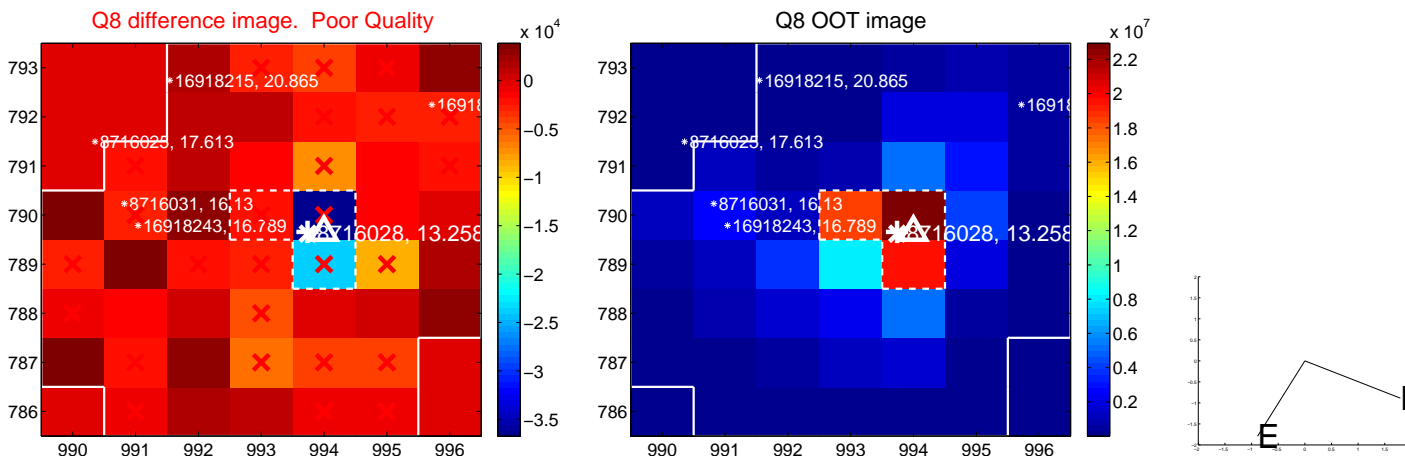
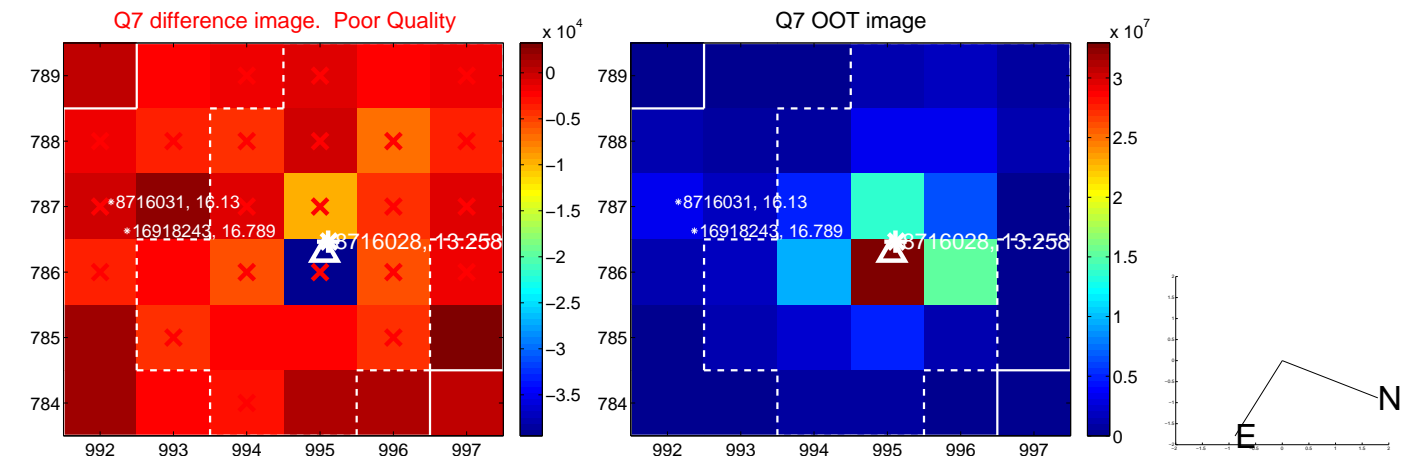
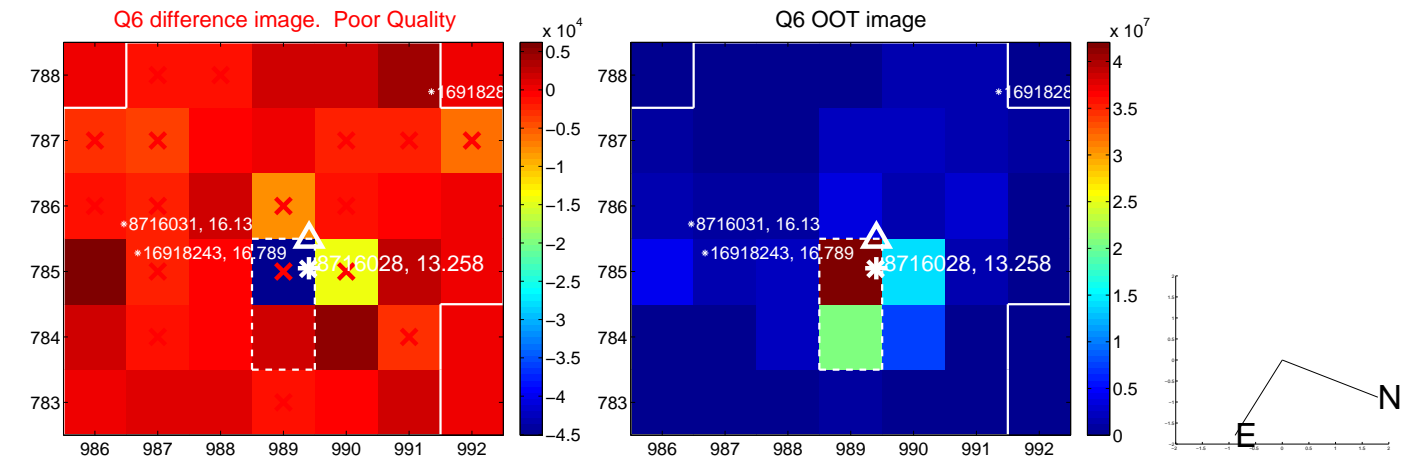
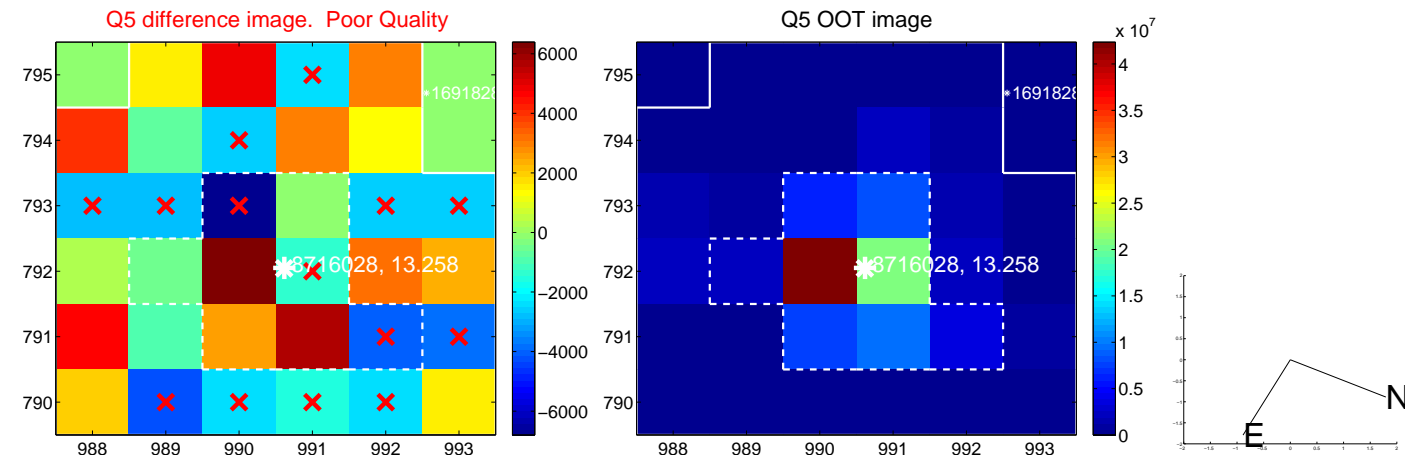


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

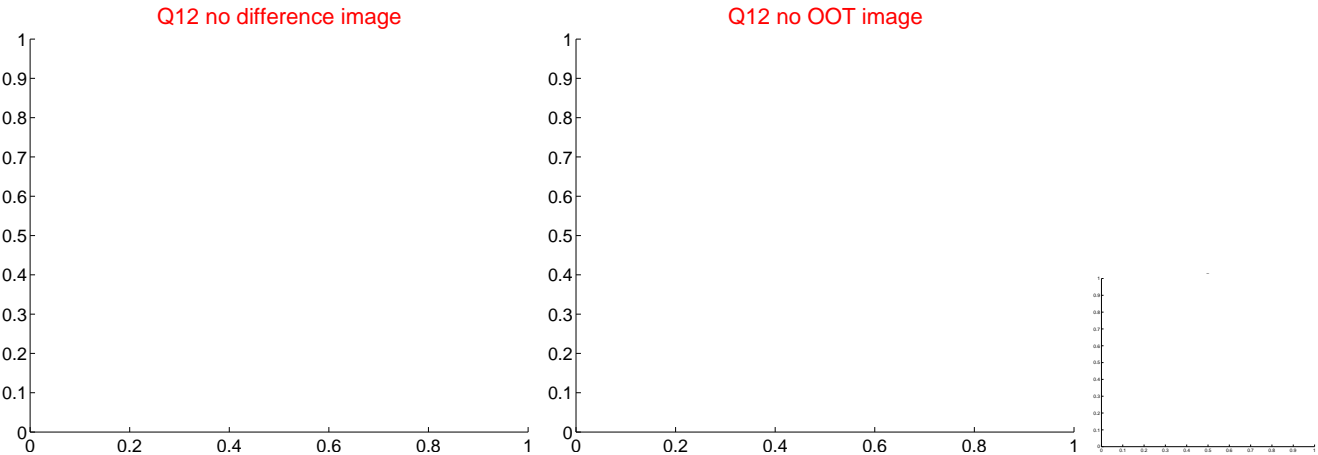
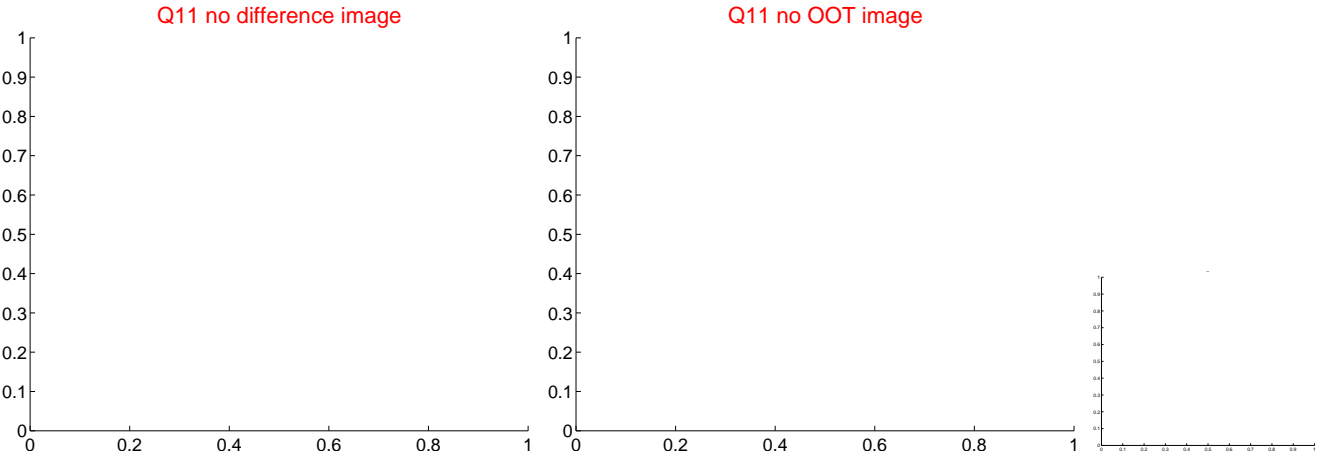
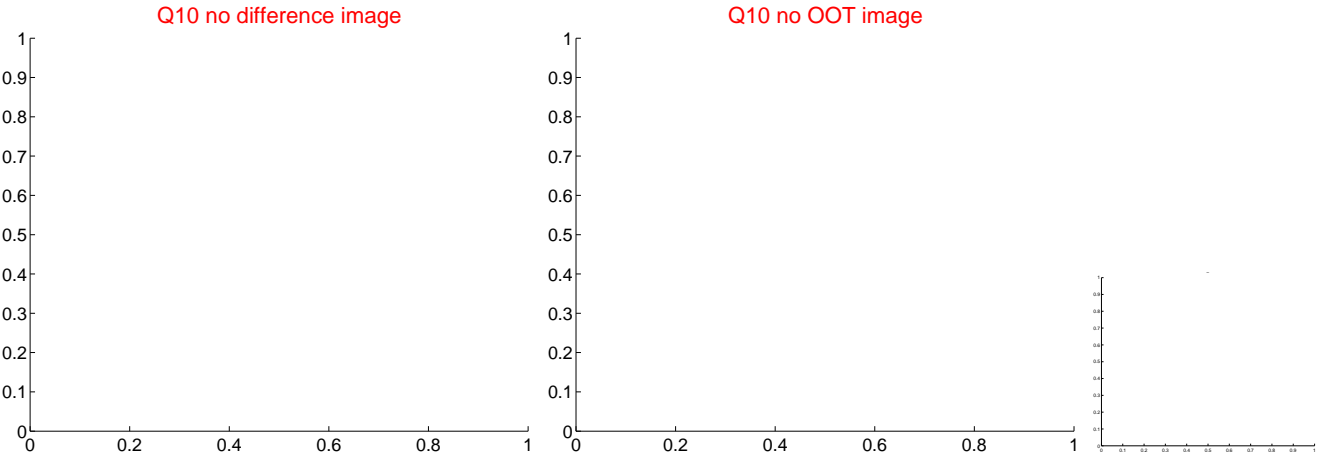
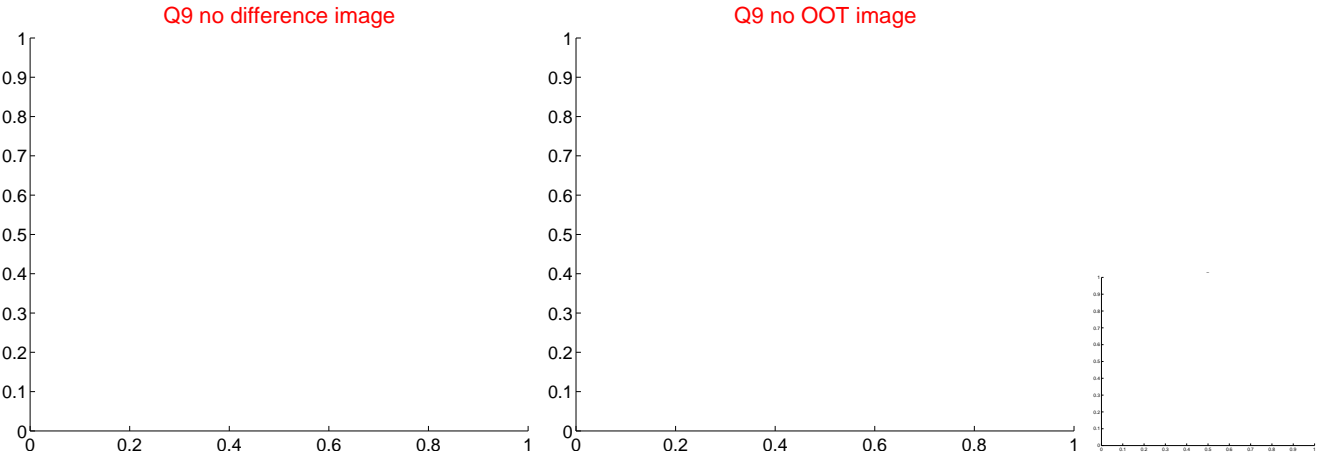
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



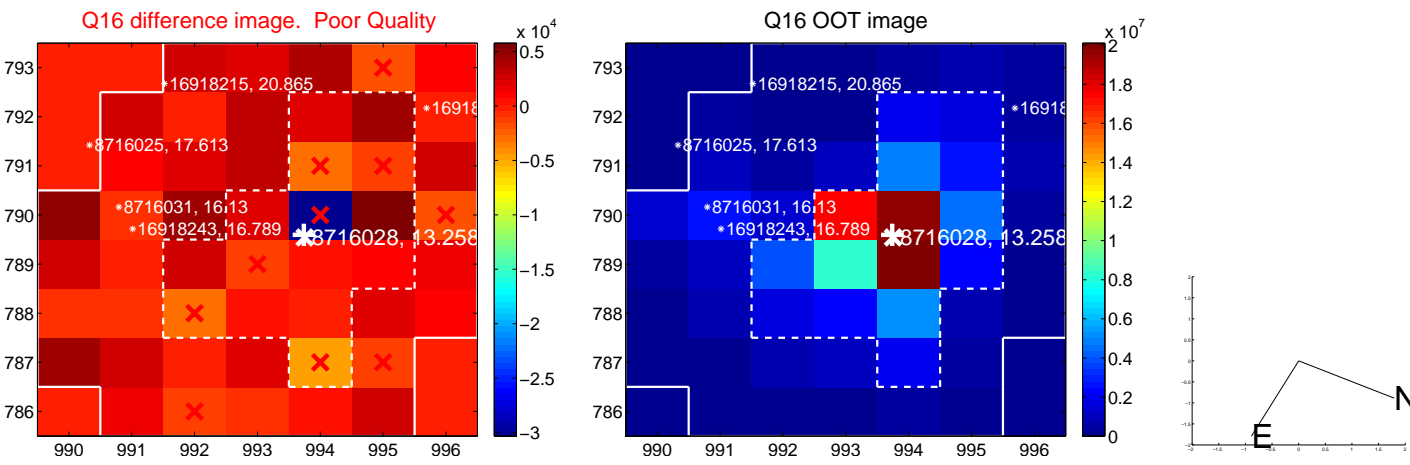
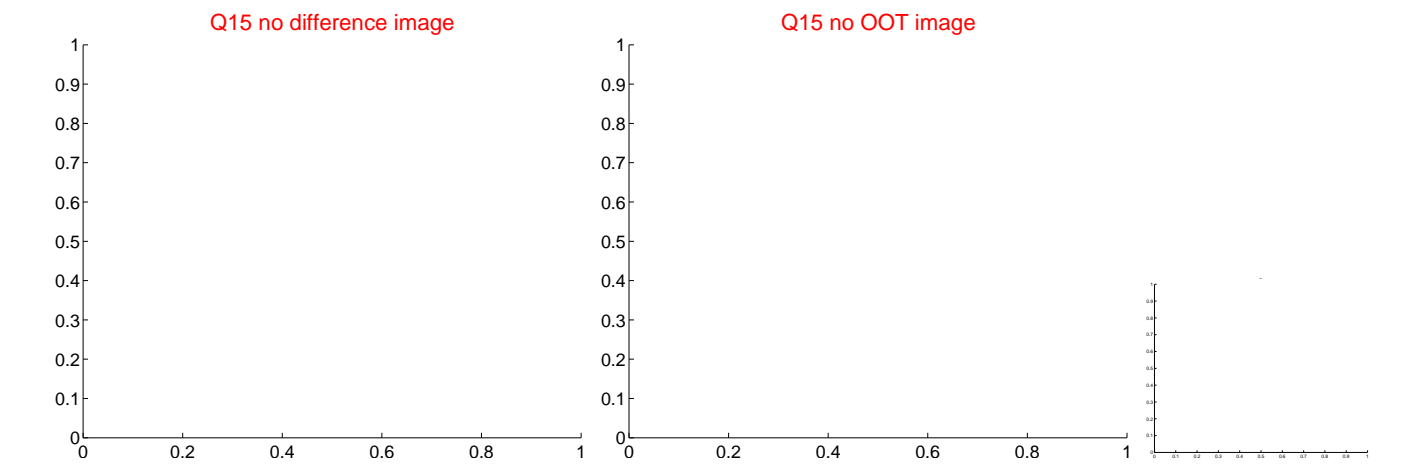
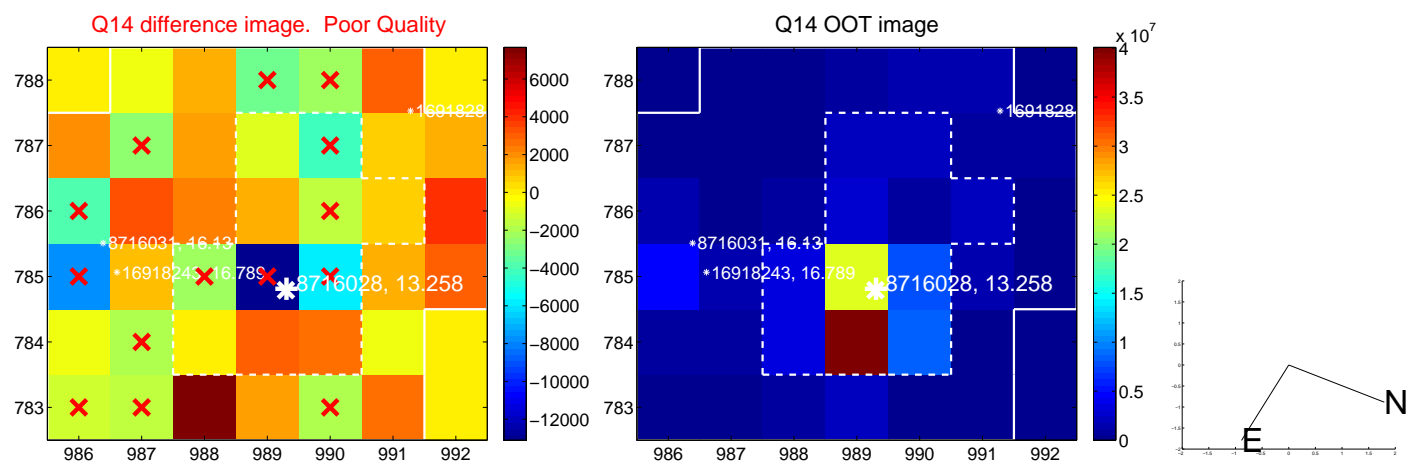
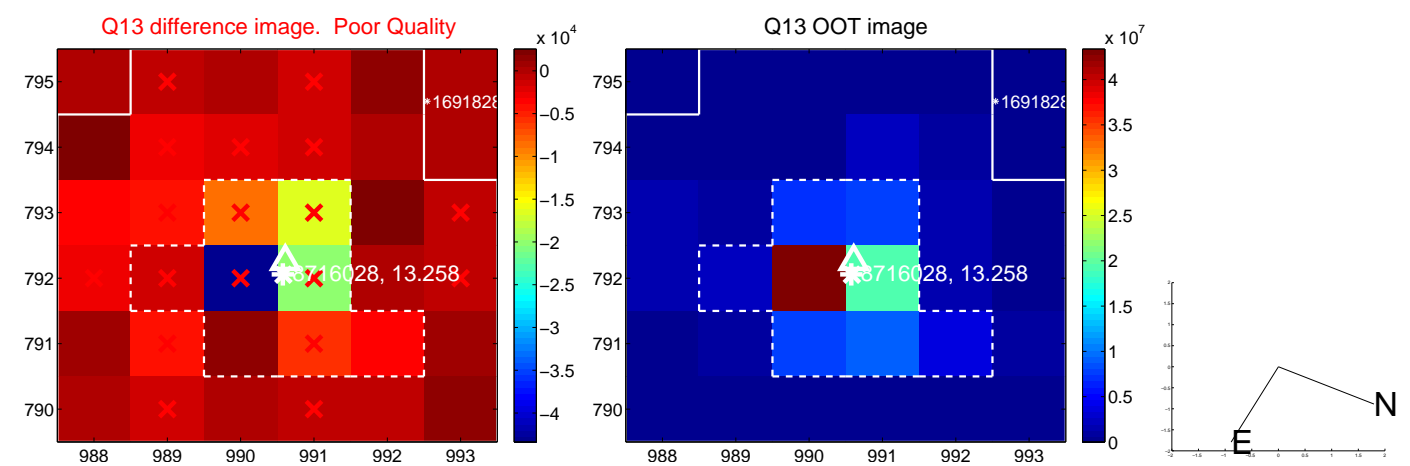
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



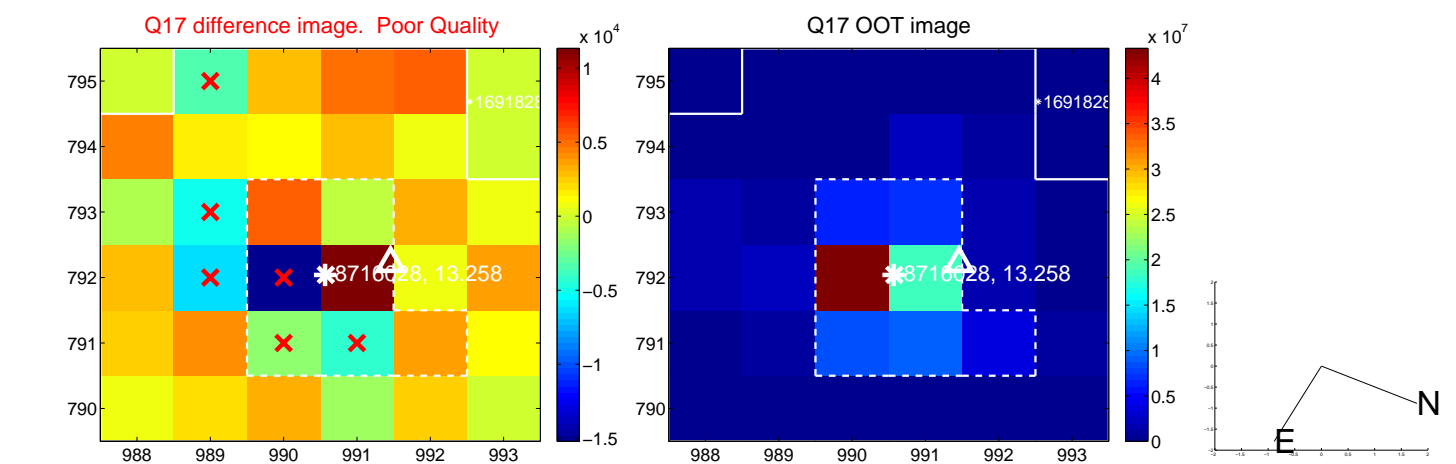
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



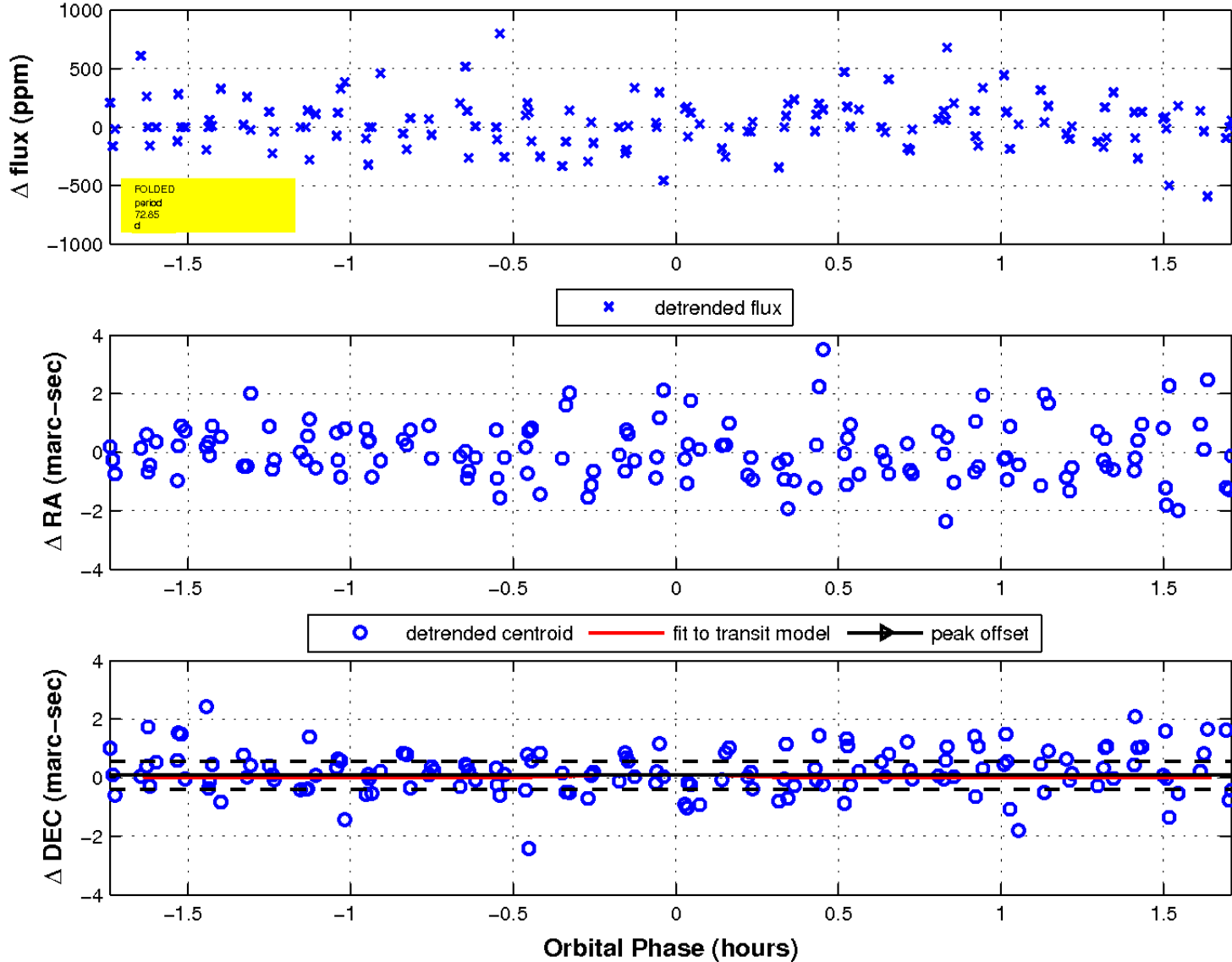
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

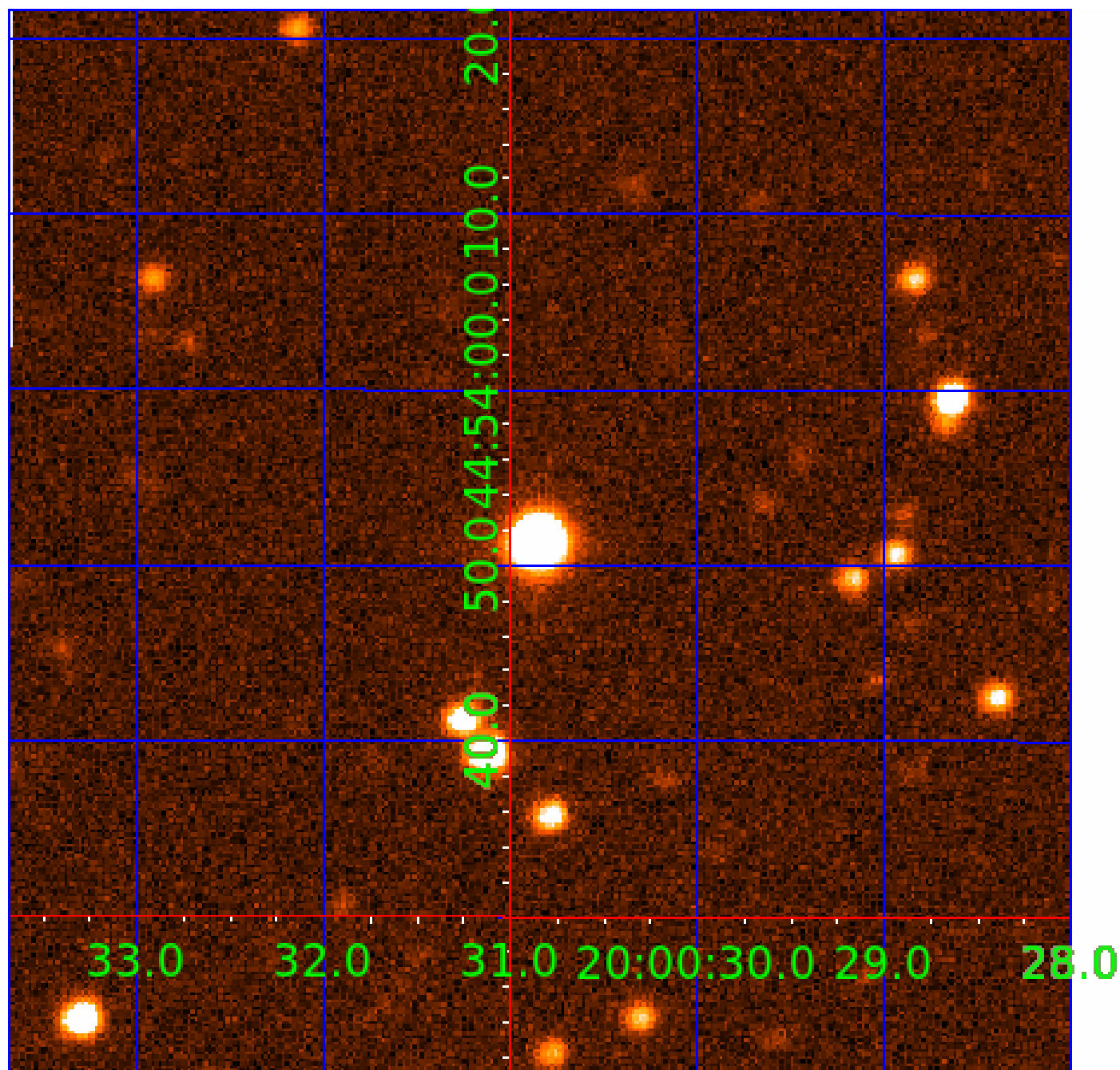


fluxWeightedCentroids, Planet 7 of 8



UKIRT Image

Declination



KIC 008716028

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})
008716028-01	OBS	No	1.752399	132.775555	73.5	6.540	10.8	11.7	2.13	6632	3.23	8050.20
008716028-02	OBS	No	1.752389	131.563135	68.6	4.734	9.9	12.3	2.13	6632	3.23	8050.26
008716028-03	OBS	No	532.874333	152.974204	576.3	7.403	9.4	9.8	2.13	6632	6.02	3.94
008716028-04	OBS	No	14.763042	142.008324	175.8	7.647	8.9	9.5	2.13	6632	2.98	469.62
008716028-05	OBS	No	98.427139	200.078630	536.0	4.065	7.9	8.3	2.13	6632	5.44	37.42
008716028-06	OBS	No	508.140391	316.308767	503.3	4.729	7.5	7.8	2.13	6632	4.80	4.19
008716028-07	OBS	No	72.851489	190.500130	273.6	0.594	7.8	2.9	2.13	6632	3.64	55.90
008716028-08	OBS	No	34.934758	163.806235	164.7	5.000	7.2	-1.0	2.13	6632	2.75	148.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008716028-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008716028-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
008716028-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008716028-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008716028-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008716028-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

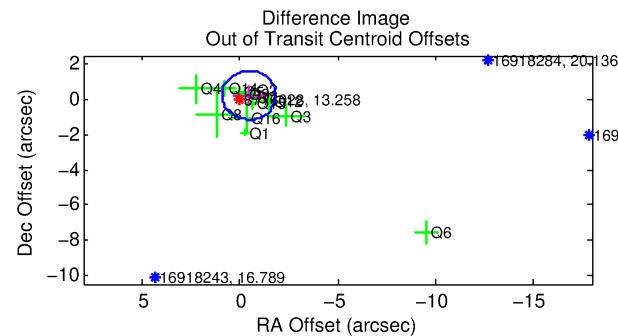
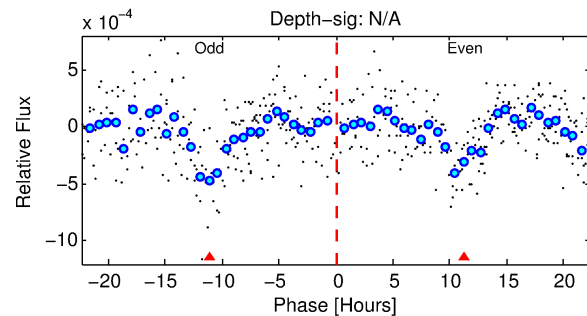
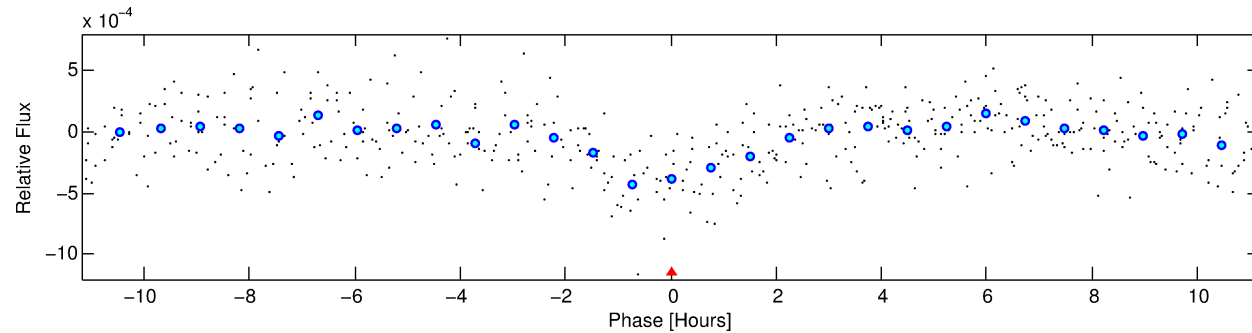
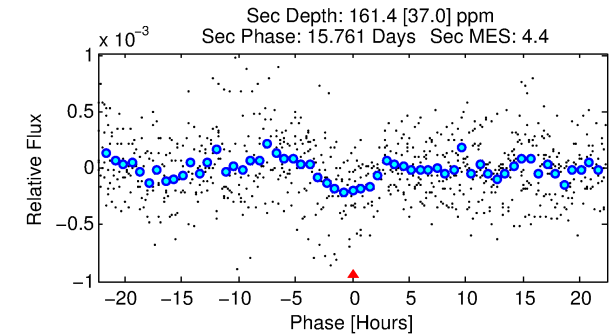
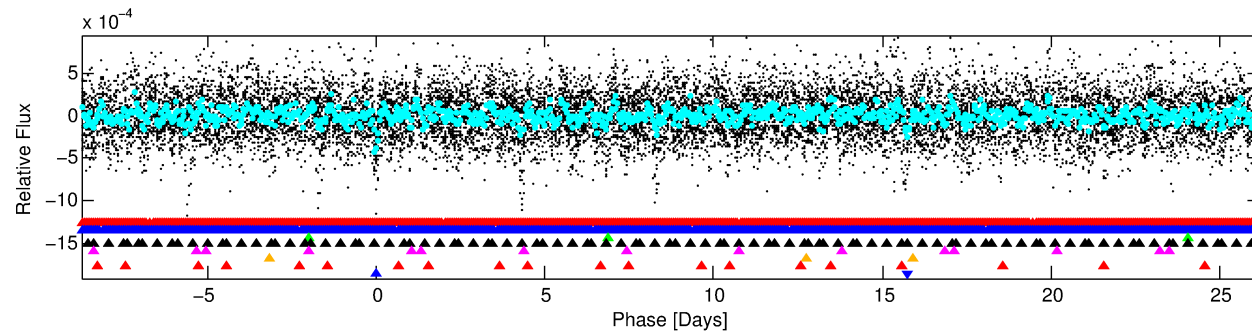
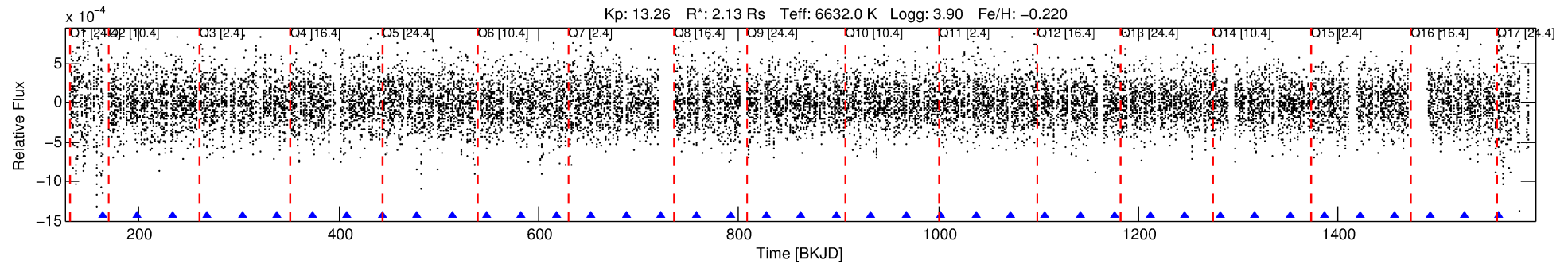
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008716028-08

No Significant Match Found

DV One-Page Summary

KIC: 8716028 Candidate: 8 of 8 Period: 34.935 d



TPS TCE Results:

Period = 34.93476 d
Epoch = 163.8062 BKJD

DV fit results are unavailable

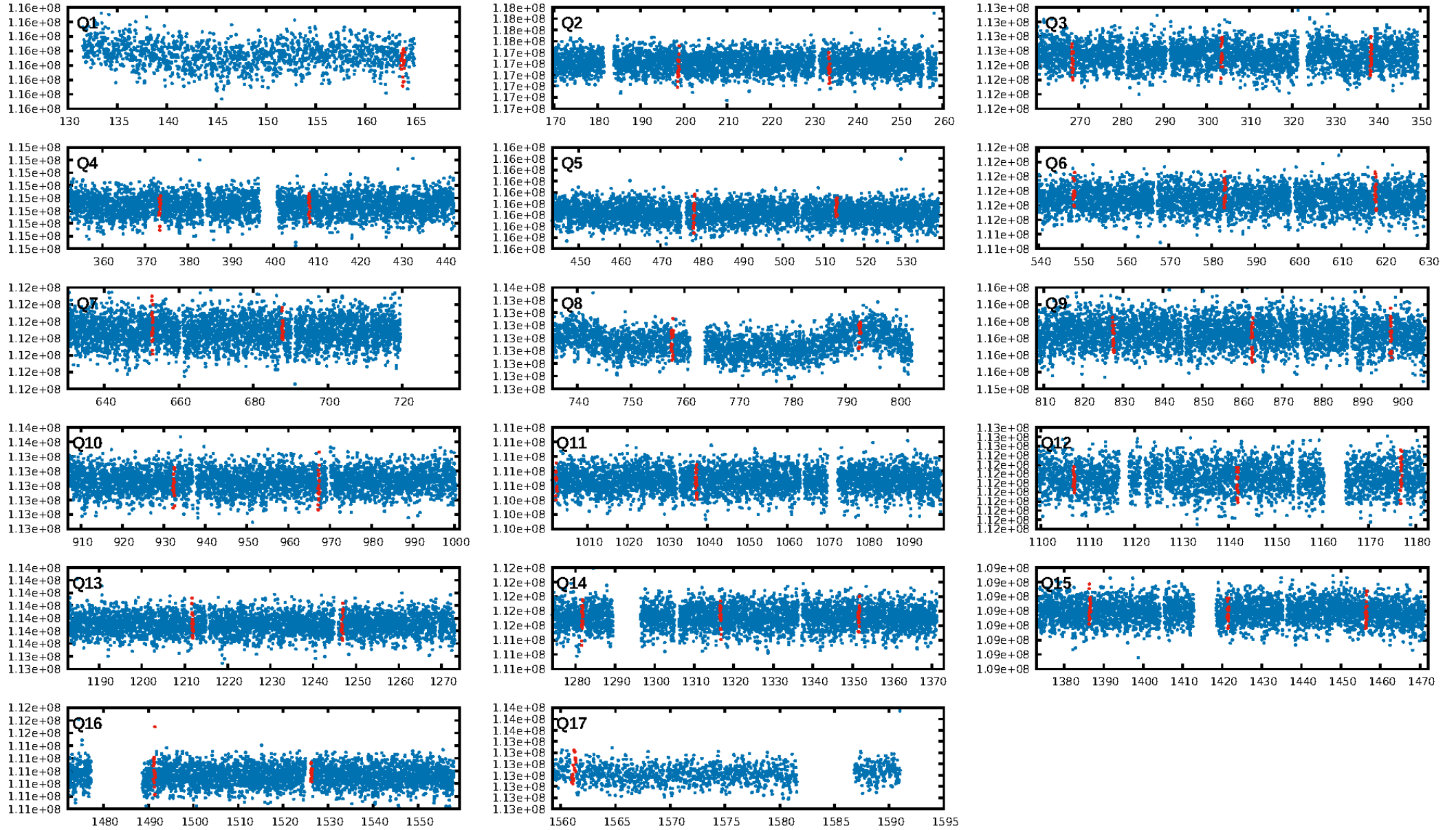
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [52.99σ]
LongPeriod-sig: 100.0% [180.73σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [13/13]
GhostDiagnostic-chr: -1.229
Centroid-sig: N/A
Centroid-so: 0.084 arcsec [0.20σ]
OotOffset-rm: 0.521 arcsec [1.13σ]
KicOffset-rm: 0.528 arcsec [1.16σ]
OotOffset-st: 3/3/4/3 [13]
KicOffset-st: 3/3/4/3 [13]
DiffImageQuality-fgm: 0.54 [7/13]
DiffImageOverlap-fno: 0.19 [3/16]

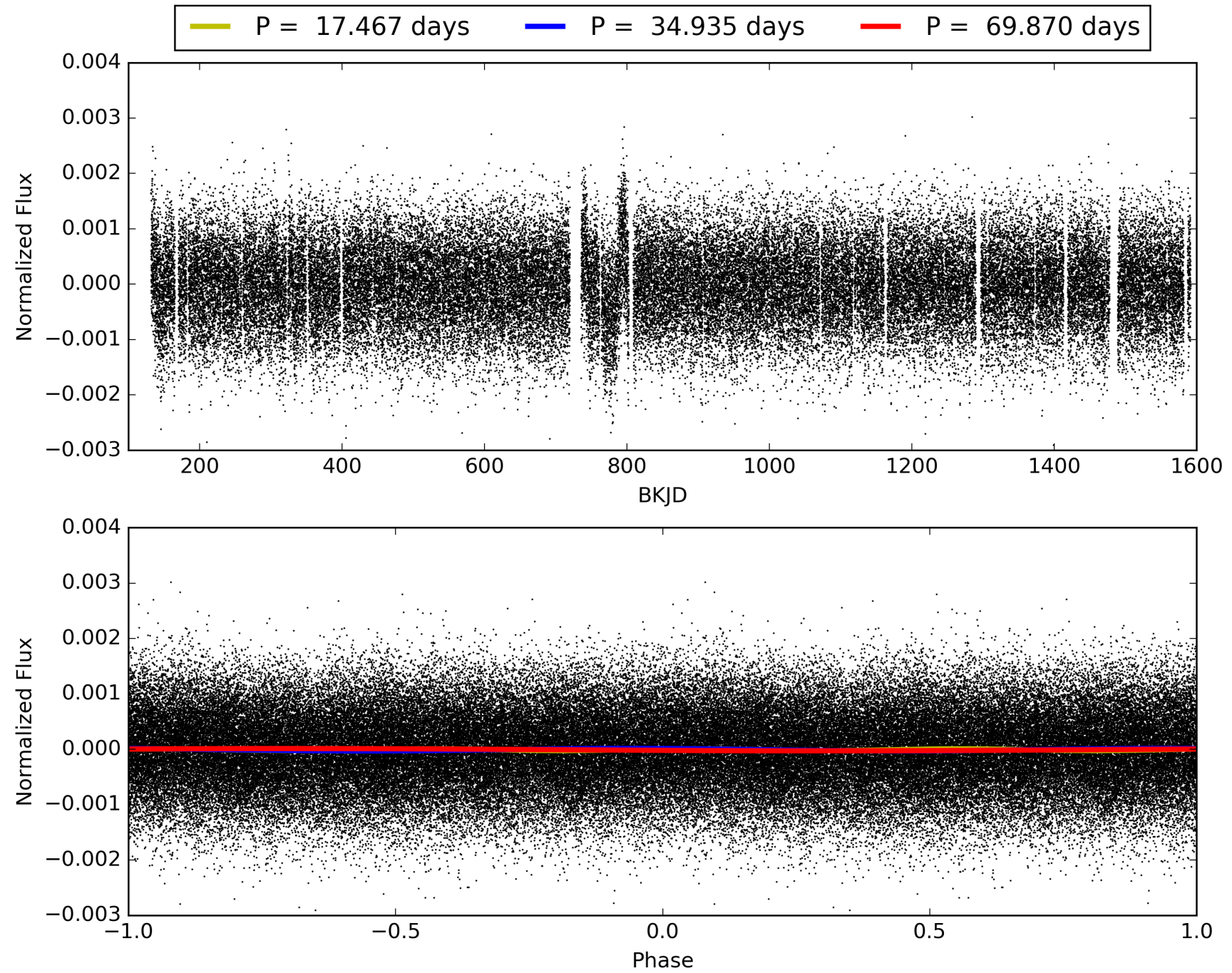
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:04:18 Z

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

TCE 008716028-08, PDC Light Curves

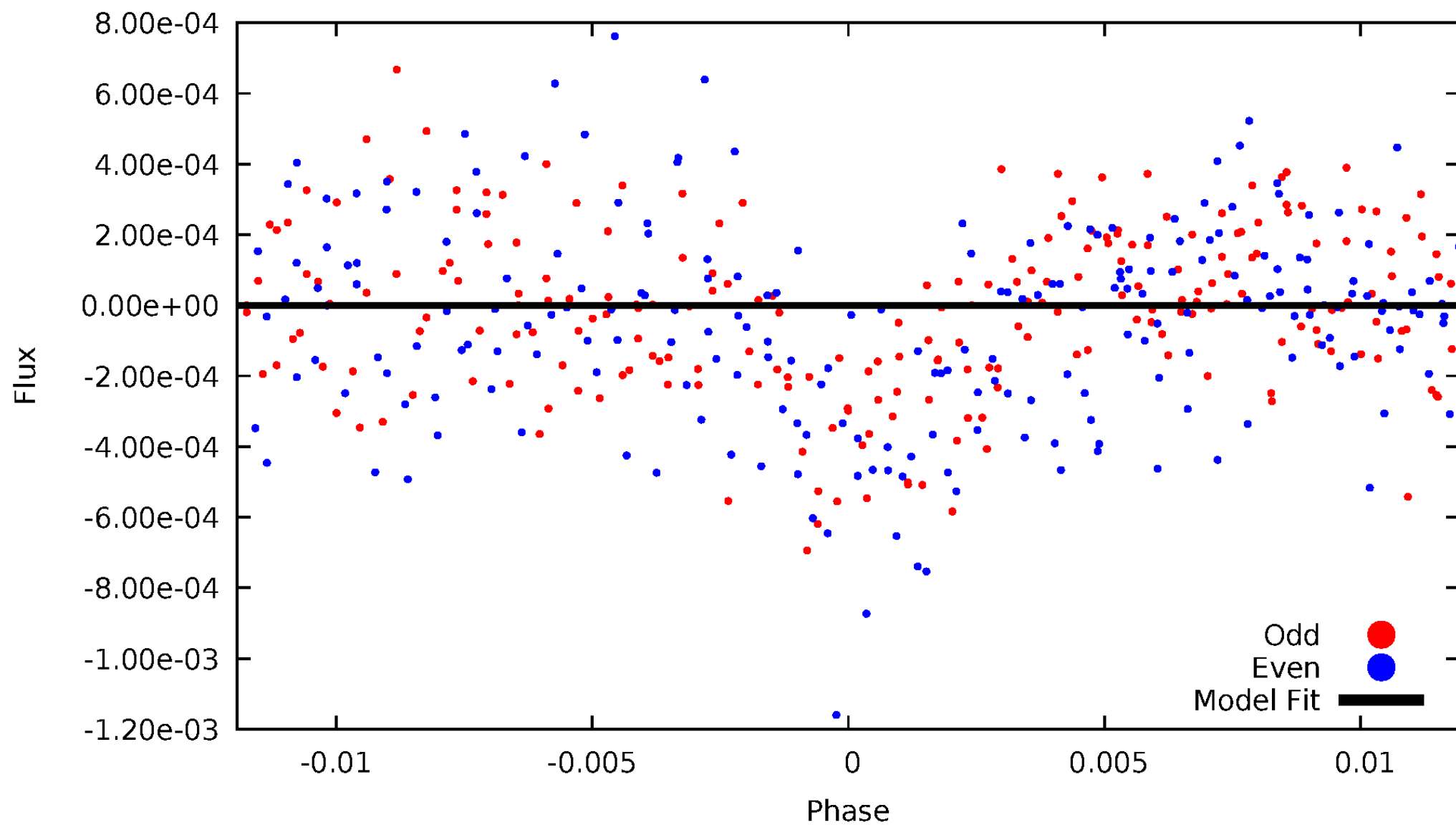


TCE 008716028-08



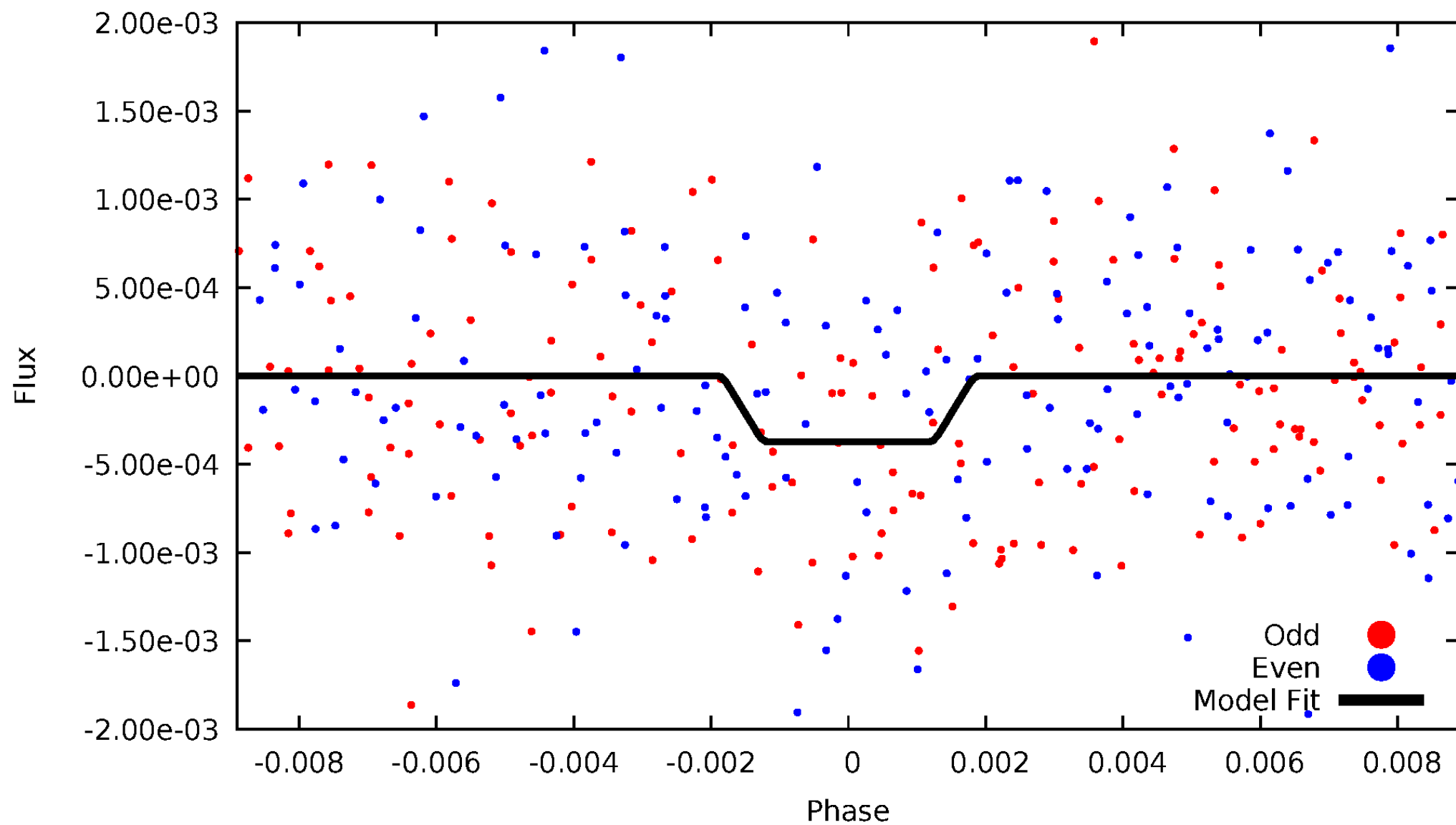
DV Odd/Even

TCE 008716028-08



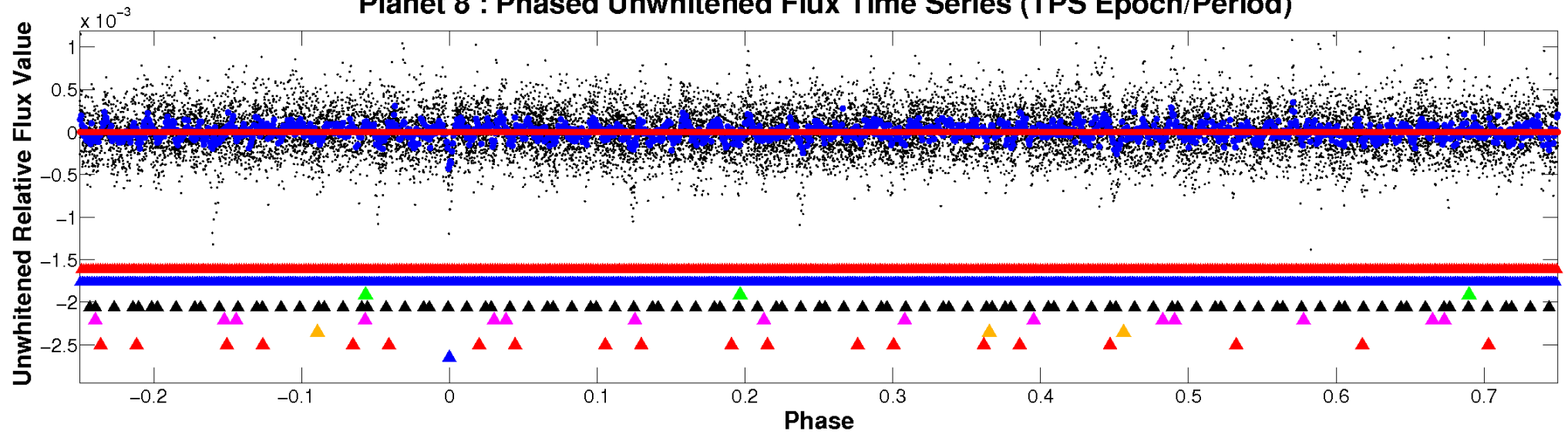
ALT Odd/Even

TCE 008716028-08



Non-Whitened Vs. Whitened Light Curve

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

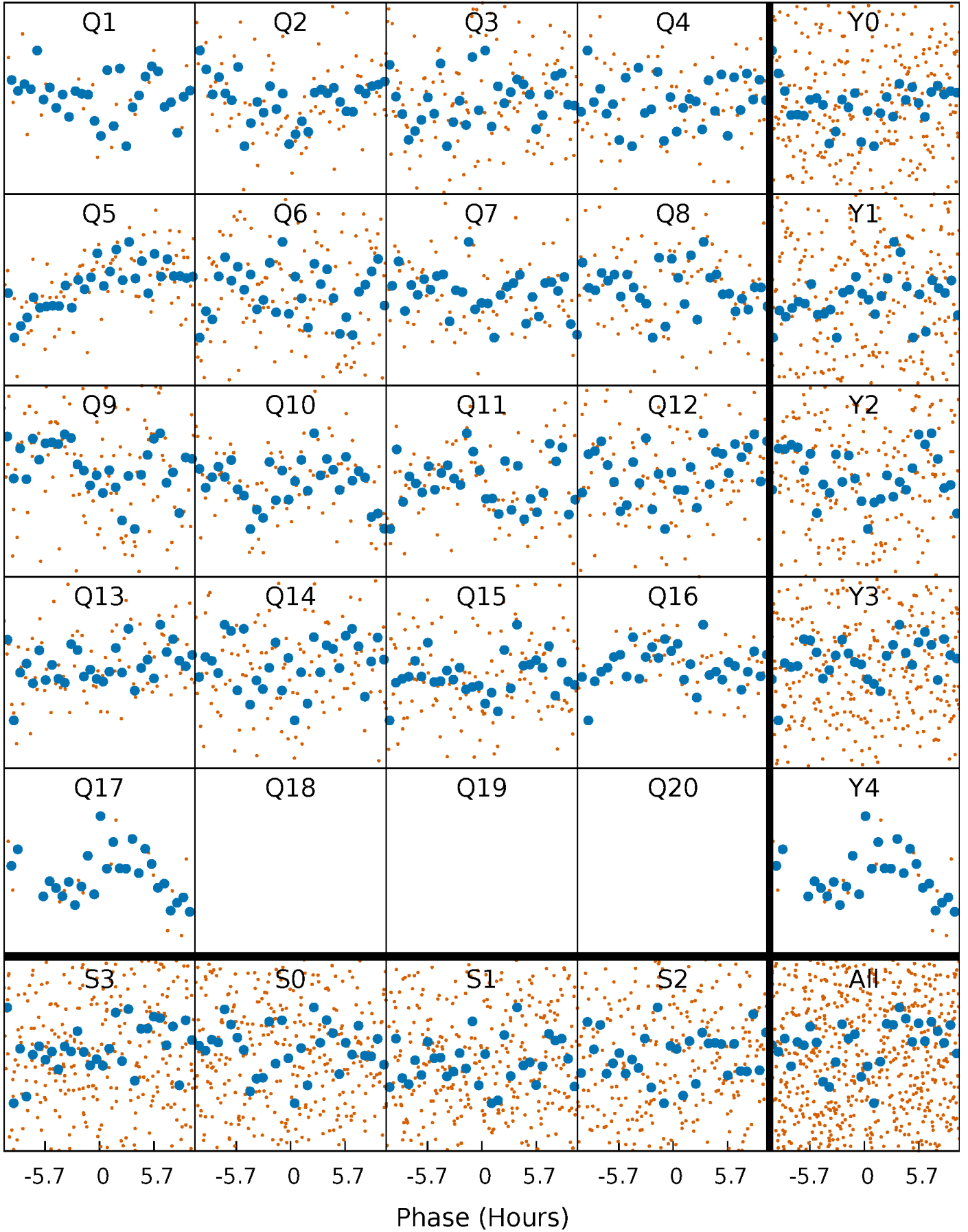


Planet 8 : Phased Whitened Flux Time Series (TPS Epoch/Period)



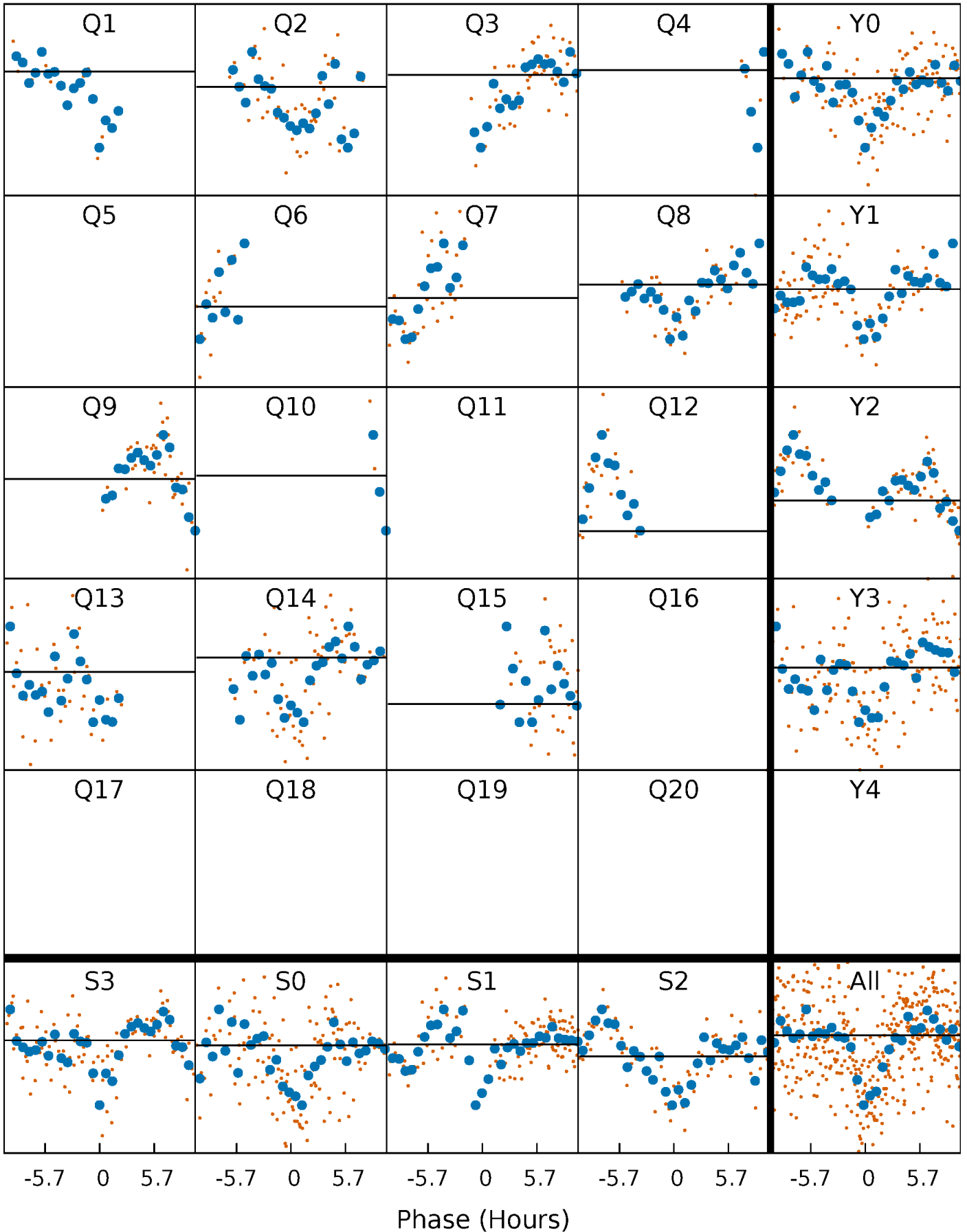
PDC Quarter-Phased Transit Curves

TCE 008716028-08 P= 34.934758 Days $T_0=163.806235$ (BKJD)



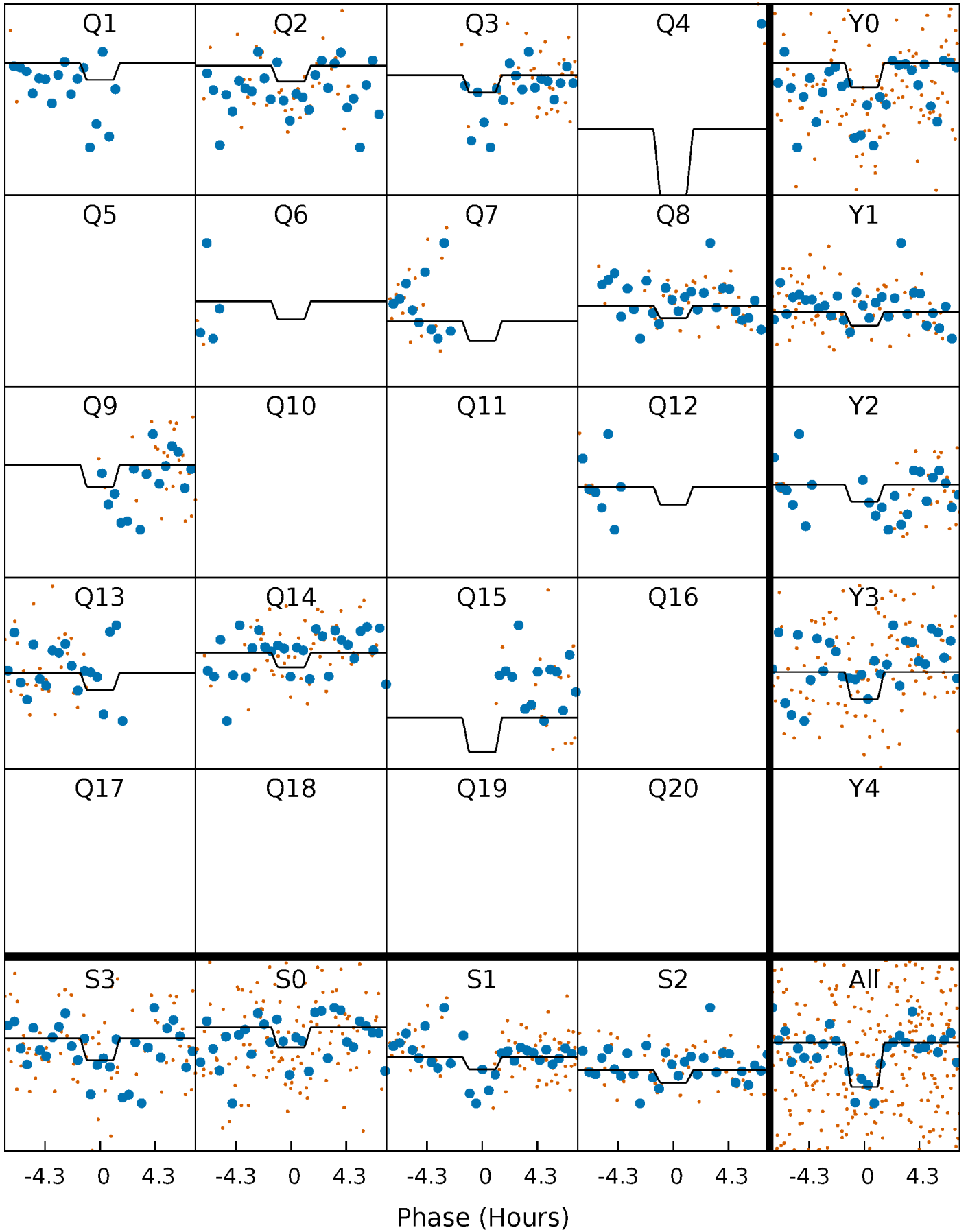
DV Quarter-Phased Transit Curves

TCE 008716028-08 $P = 34.934758$ Days $T_0 = 163.806235$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

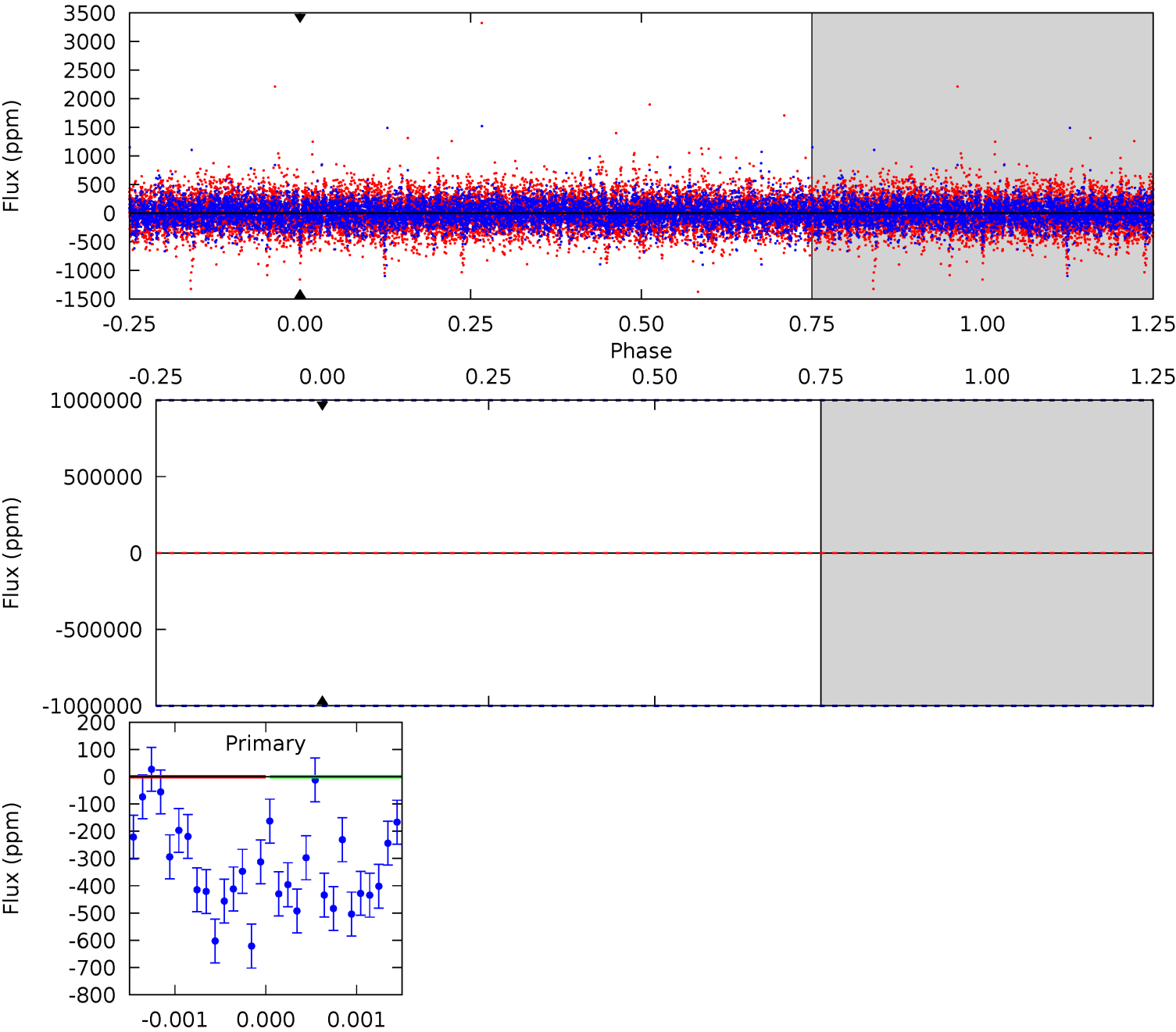
TCE 008716028-08 P= 34.934758 Days $T_0=163.824067$ (BKJD)



DV Model-Shift Uniqueness Test

008716028-08, P = 34.934758 Days, E = 128.871477 Days

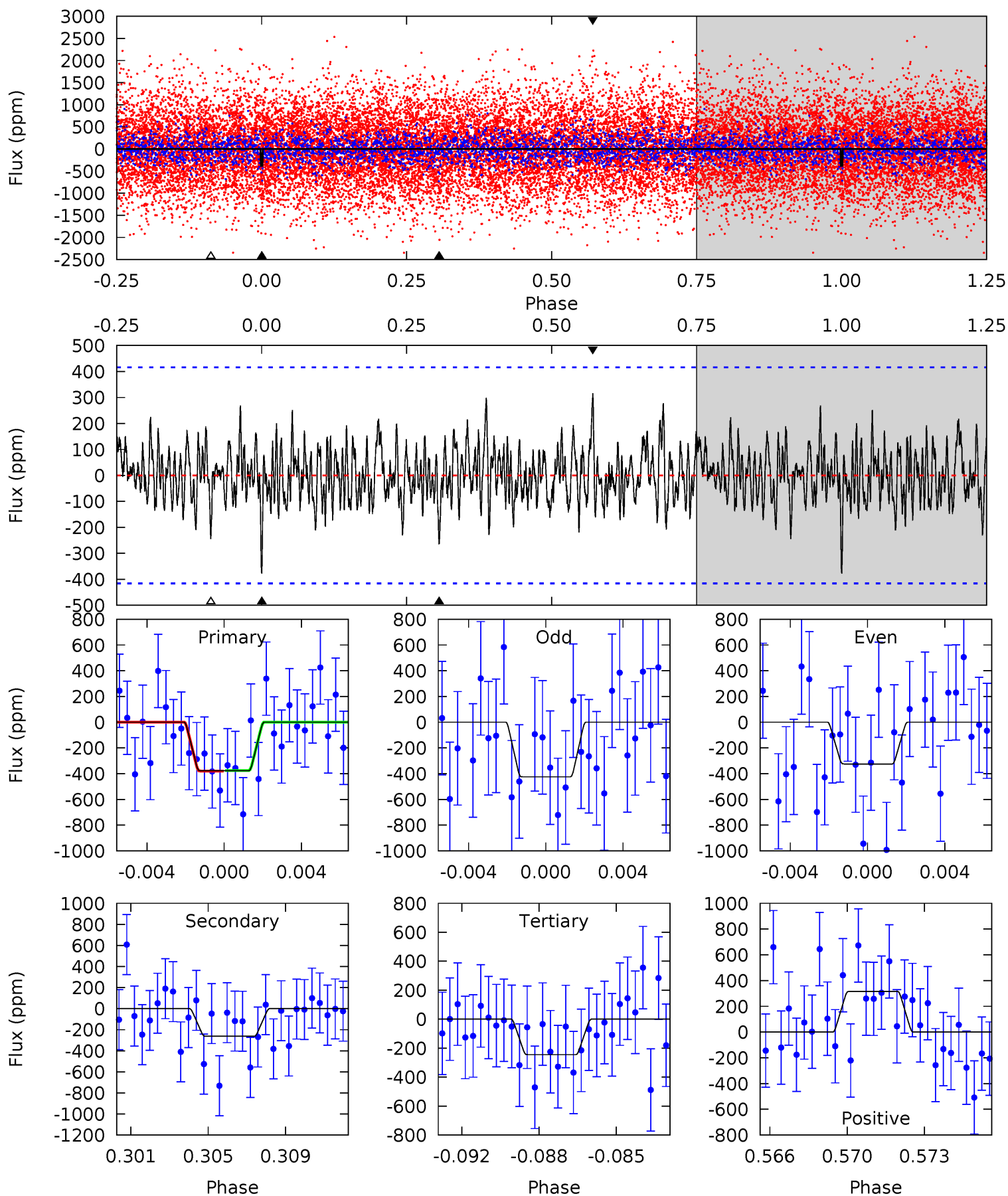
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

008716028-08, P = 34.934758 Days, E = 128.889309 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.73	3.29	3.07	3.96	5.22	2.90	1.12	1.66	0.77	0.22	-0.67	0.63	1.13	0.46	0.03



Stellar Parameters For KIC 008716028

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6632^{+180}_{-240}	$3.903^{+0.364}_{-0.130}$	$-0.220^{+0.250}_{-0.300}$	$2.127^{+0.562}_{-0.842}$	$1.323^{+0.211}_{-0.234}$	$0.194^{+0.589}_{-0.070}$
	+3%/-4%	+9%/-3%	+114%/-136%	+26%/-40%	+16%/-18%	+304%/-36%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008716028-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$15.15^{+17.92}_{-10.47}$	1215^{+95}_{-128}	6012^{+33933}_{-33877}	403^{+32269}_{-19450}
Alt.	-262 ± 80	$15.97^{+17.29}_{-11.30}$	1209^{+97}_{-119}	3508^{+2107}_{-704}	29^{+330}_{-23}

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

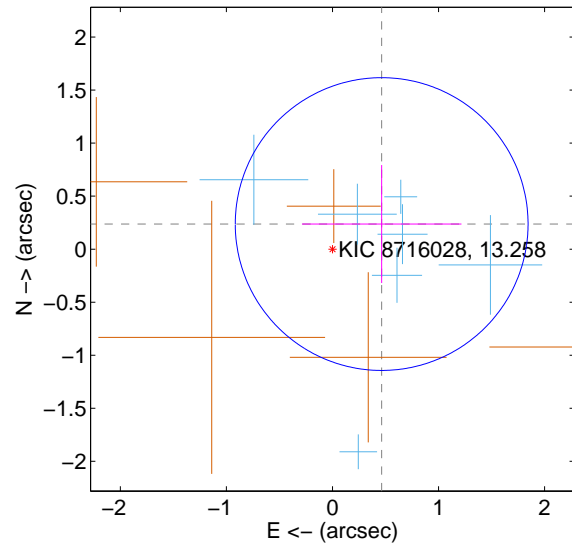
Supplemental centroid analysis for 008716028-08. Kepler magnitude: 13.26. Transit SNR -1.00

There are 7 quarters with good PRF difference image offsets

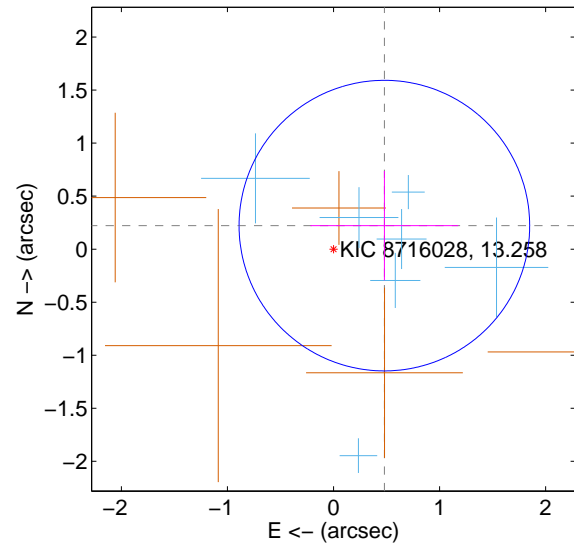
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.521 ± 0.460	1.13	-0.464 ± 0.752	0.237 ± 0.556
PRF-fit source offset from KIC position	0.528 ± 0.457	1.16	-0.480 ± 0.697	0.222 ± 0.515
photometric centroid source offset	0.08 ± 0.43	0.20	0.04 ± 0.44	-0.07 ± 0.42

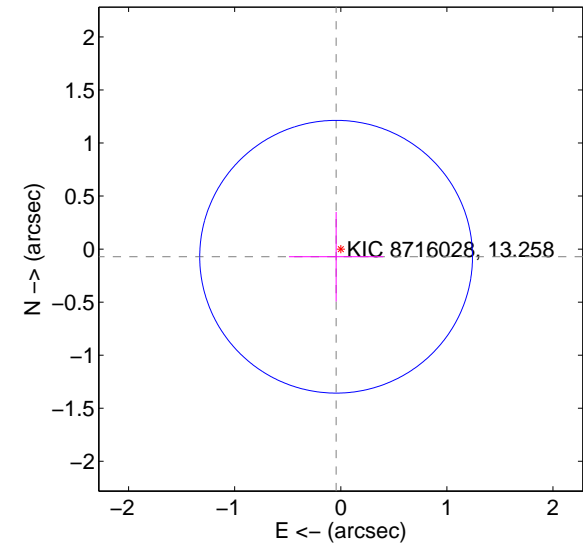
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

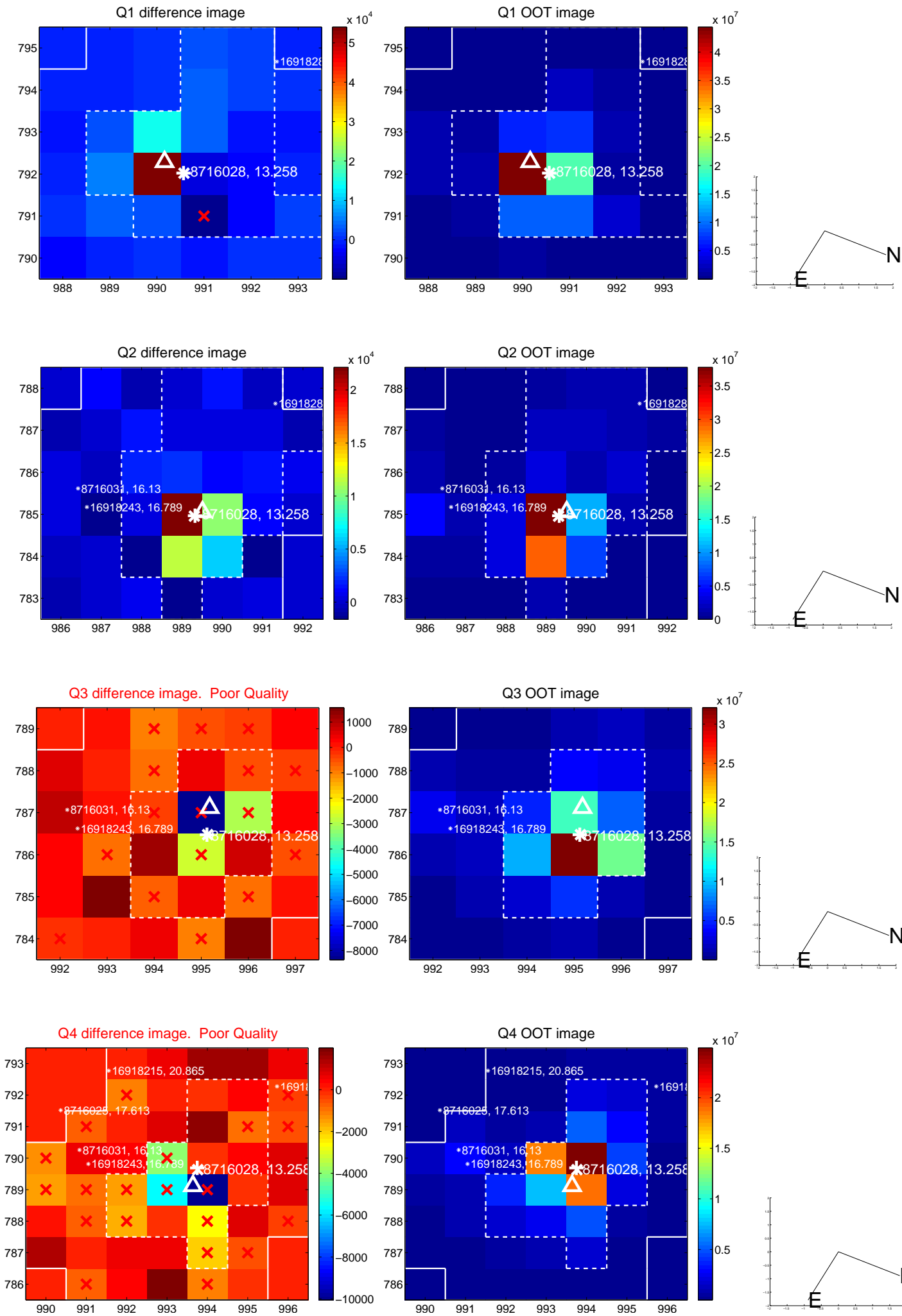


offset from photometric centroids

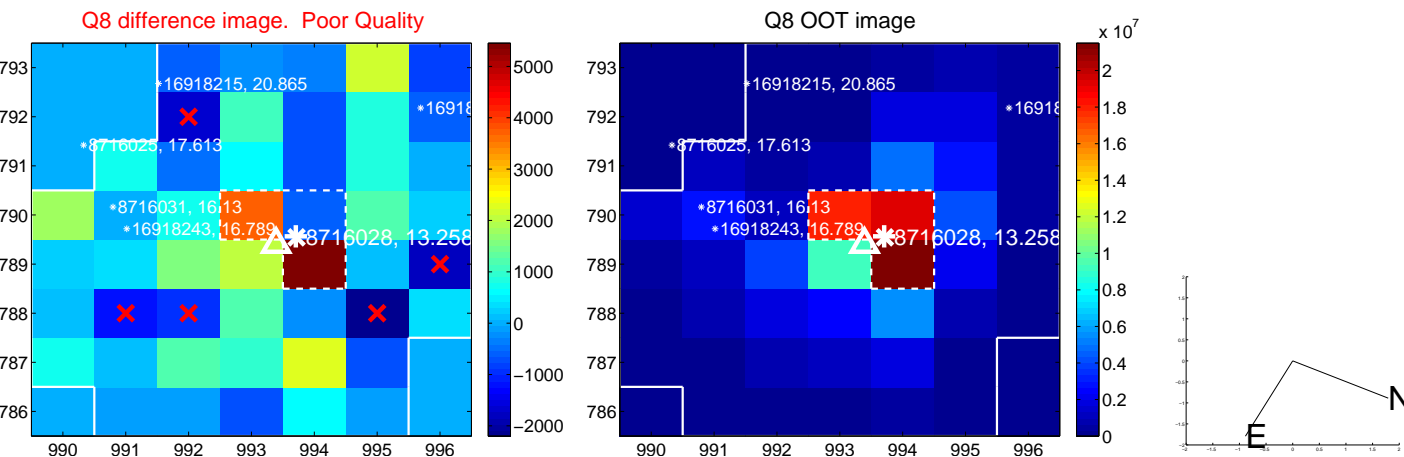
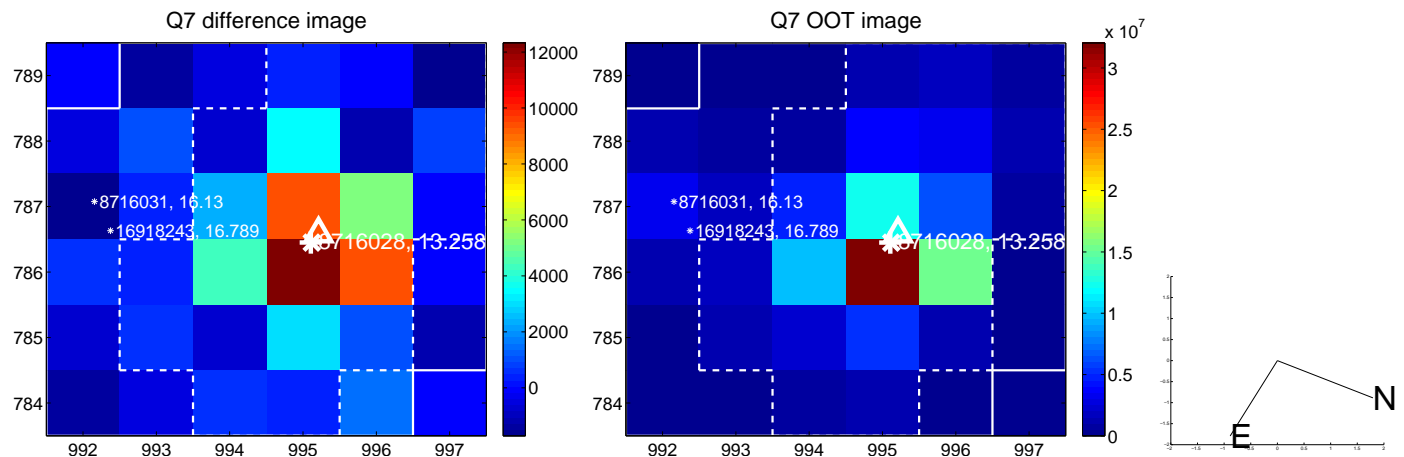
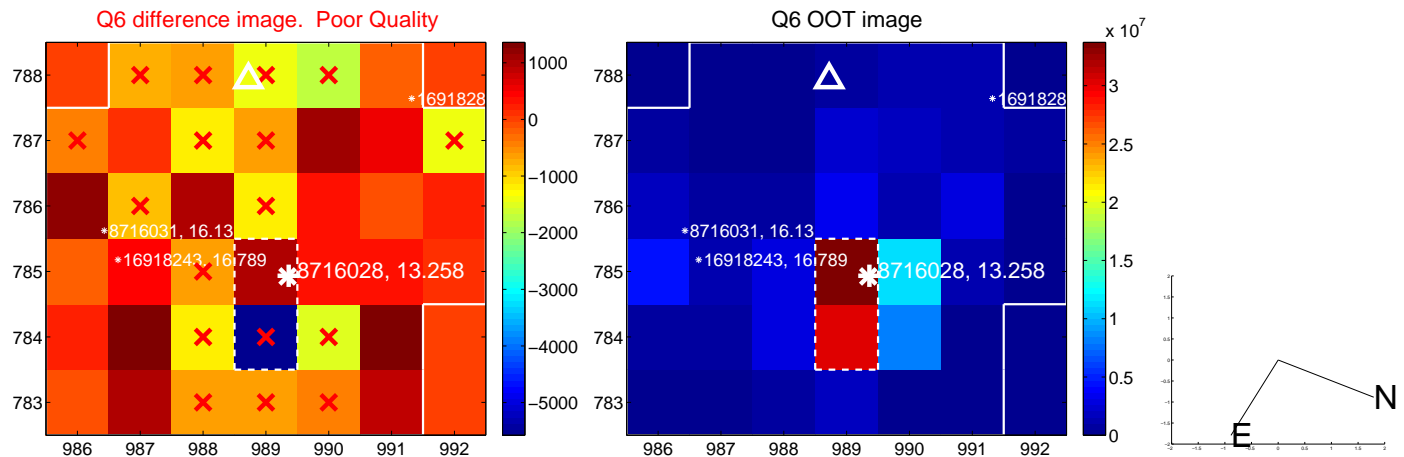
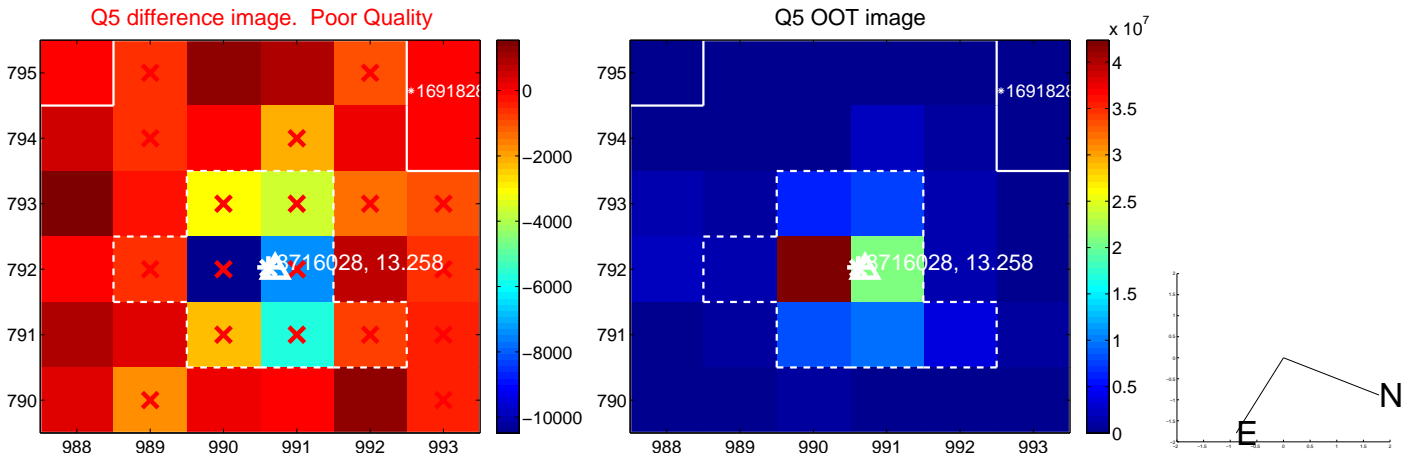


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

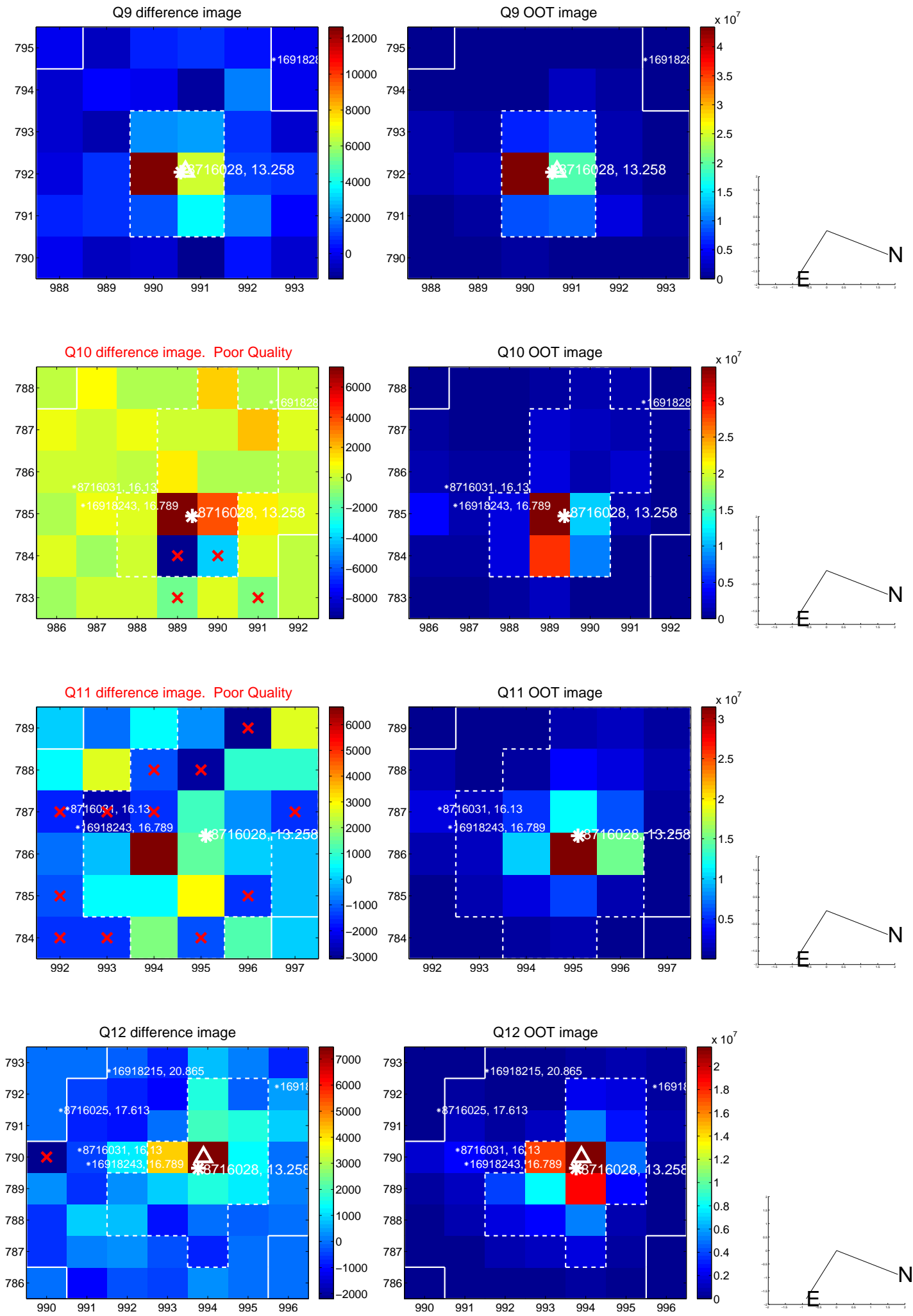
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



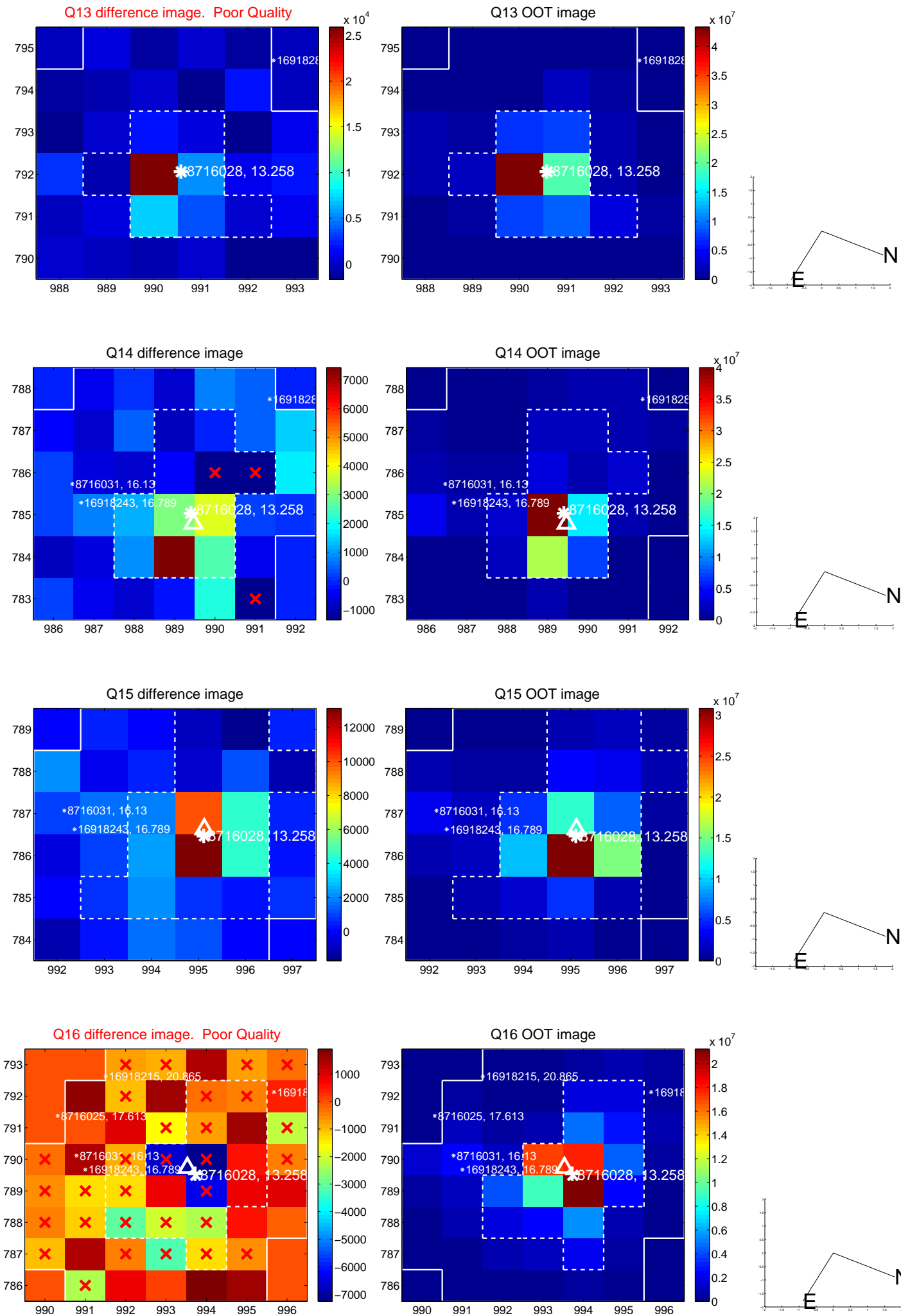
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



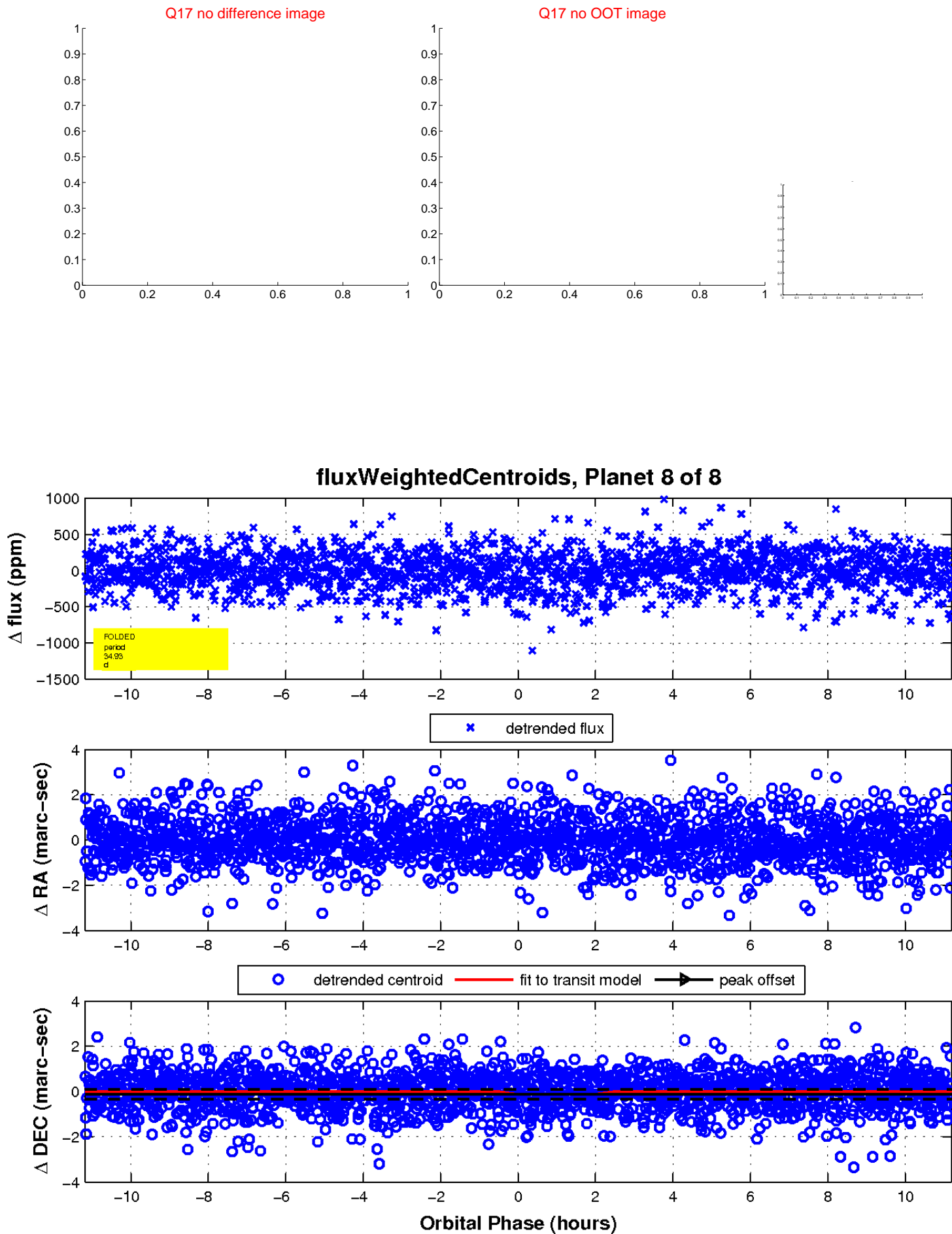
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

