

KIC 010646620

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})
010646620-01	OBS	7352.01	2.413745	133.562364	30.4	13.034	8.8	9.9	2.60	6628	1.53	7193.29
010646620-02	OBS	No	439.264571	518.484387	347.9	20.978	9.7	8.3	2.60	6628	5.98	6.97
010646620-03	OBS	No	111.063930	154.308140	173.3	8.319	9.7	7.2	2.60	6628	3.92	43.63
010646620-05	OBS	No	166.284333	180.111872	257.2	7.447	9.3	8.6	2.60	6628	4.77	25.47
010646620-06	OBS	No	74.102175	201.659120	171.5	10.789	8.3	6.9	2.60	6628	3.82	74.83
010646620-08	OBS	No	111.645419	207.499050	224.2	2.810	7.3	7.6	2.60	6628	4.60	43.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010646620-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010646620-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010646620-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
010646620-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010646620-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010646620-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT

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.

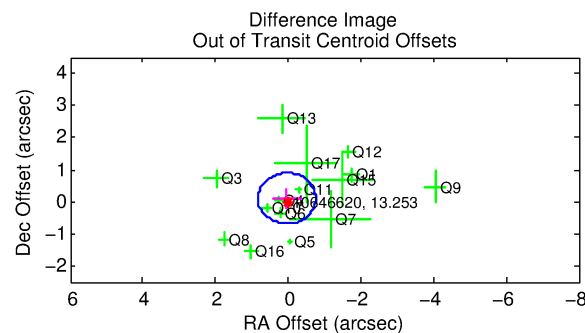
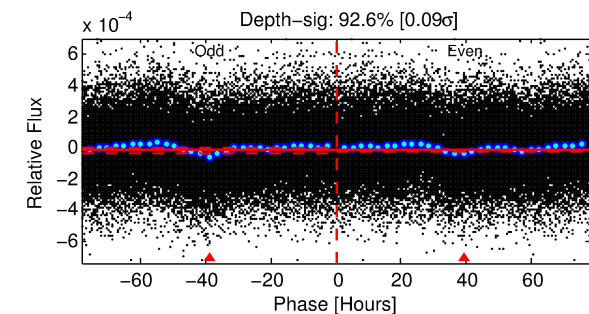
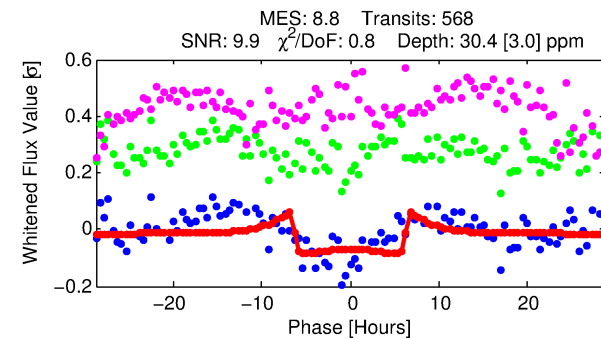
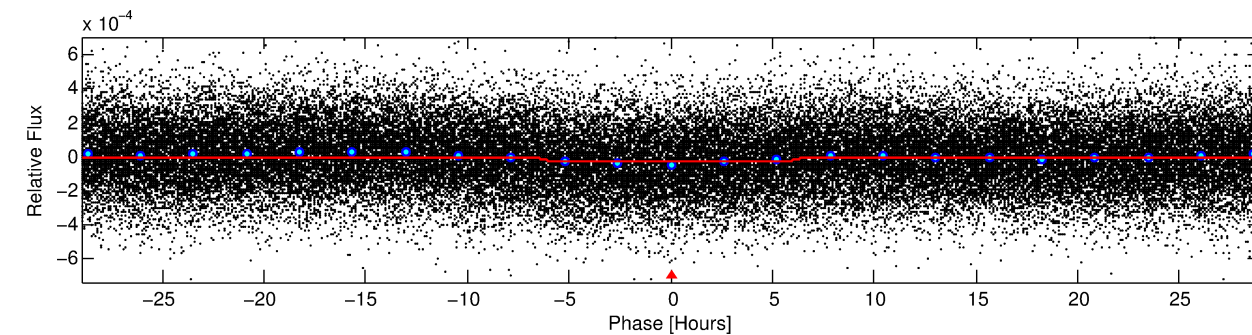
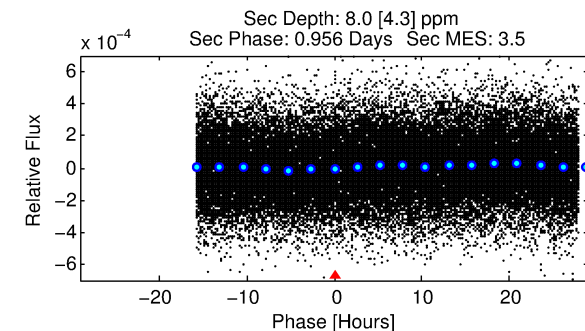
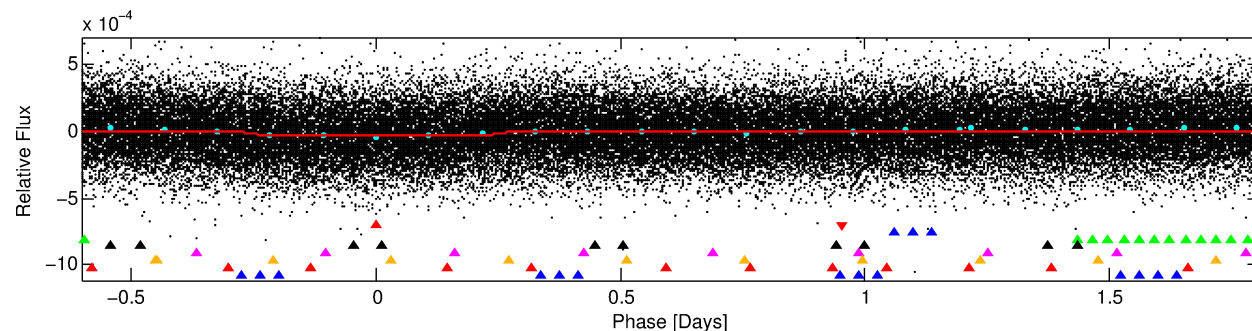
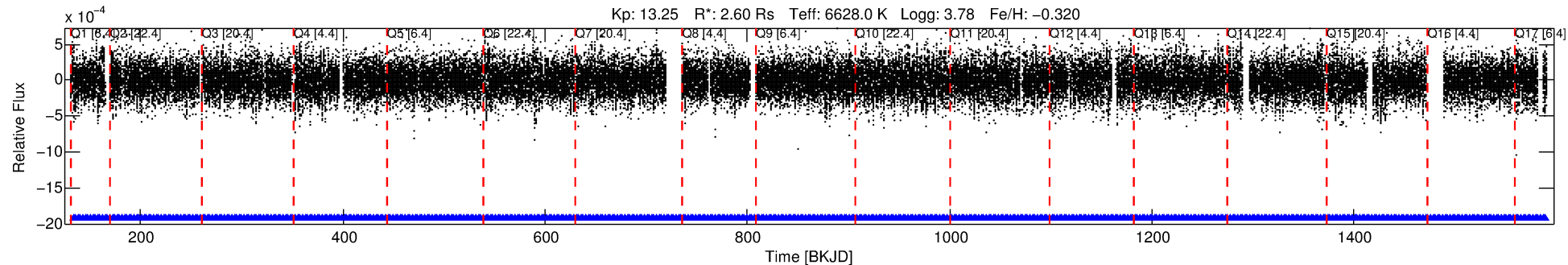
Ephemeris Match Information For 010646620-01

No Significant Match Found

DV One-Page Summary

KIC: 10646620 Candidate: 1 of 8 Period: 2.414 d
KOI: K07352 Corr: No Ephemeris Match

Kp: 13.25 R*: 2.60 Rs Teff: 6628.0 K Logg: 3.78 Fe/H: -0.320



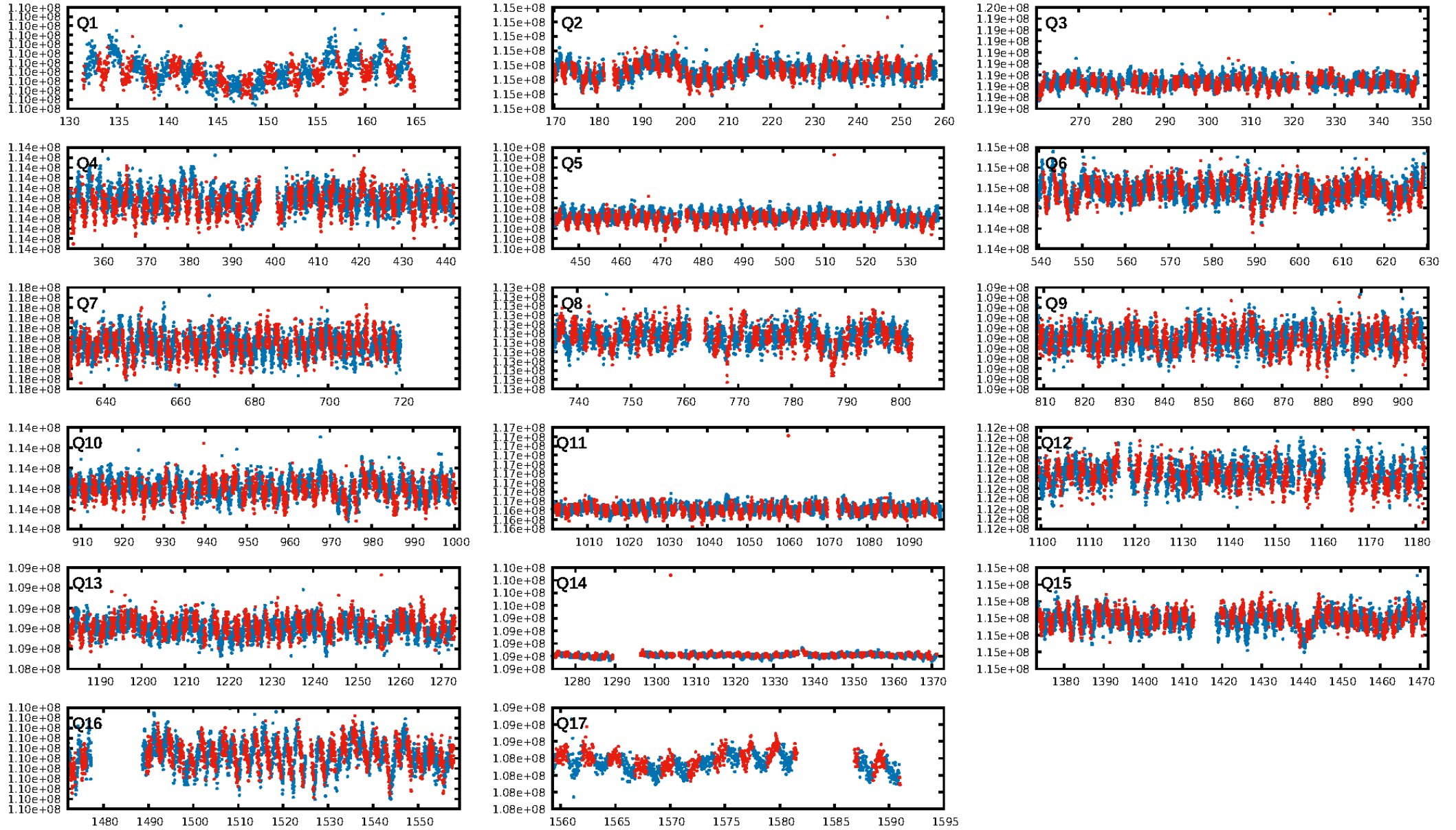
DV Fit Results:

Period = 2.41375 [0.00002] d
Epoch = 133.5624 [0.0056] BKJD
Rp/R* = 0.0054 [0.0014]
a/R* = 1.31 [0.81]
b = 0.71 [1.05]
Seff = 7193.29 [3968.12]
Teq = 2348 [324] K
Rp = 1.53 [0.71] Re
a = 0.0402 [0.0140] AU
Ag = 3.02 [2.81] [0.72σ]
Teffp = 4788 [912] K [2.52σ]

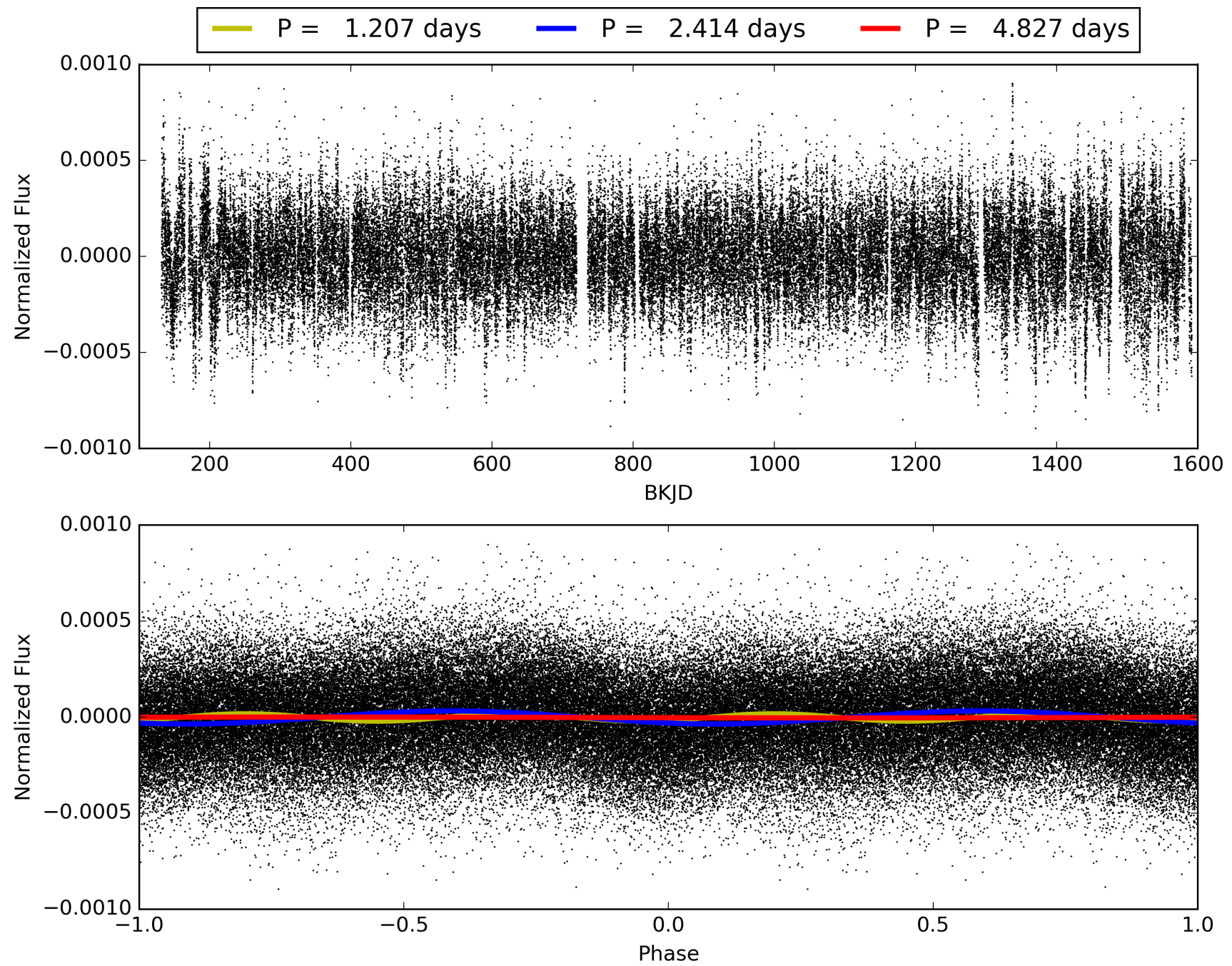
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [101.69σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.38e-10
RollingBand-fgt: 1.00 [542/542]
GhostDiagnostic-chr: 3.605
Centroid-sig: 0.0%
Centroid-so: 1.163 arcsec [2.04σ]
OotOffset-rm: 0.113 arcsec [0.43σ]
KicOffset-rm: 0.227 arcsec [0.85σ]
OotOffset-st: 2/4/4/5 [15]
KicOffset-st: 2/4/4/5 [15]
DiffImageQuality-fgm: 0.67 [10/15]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 010646620-01, PDC Light Curves

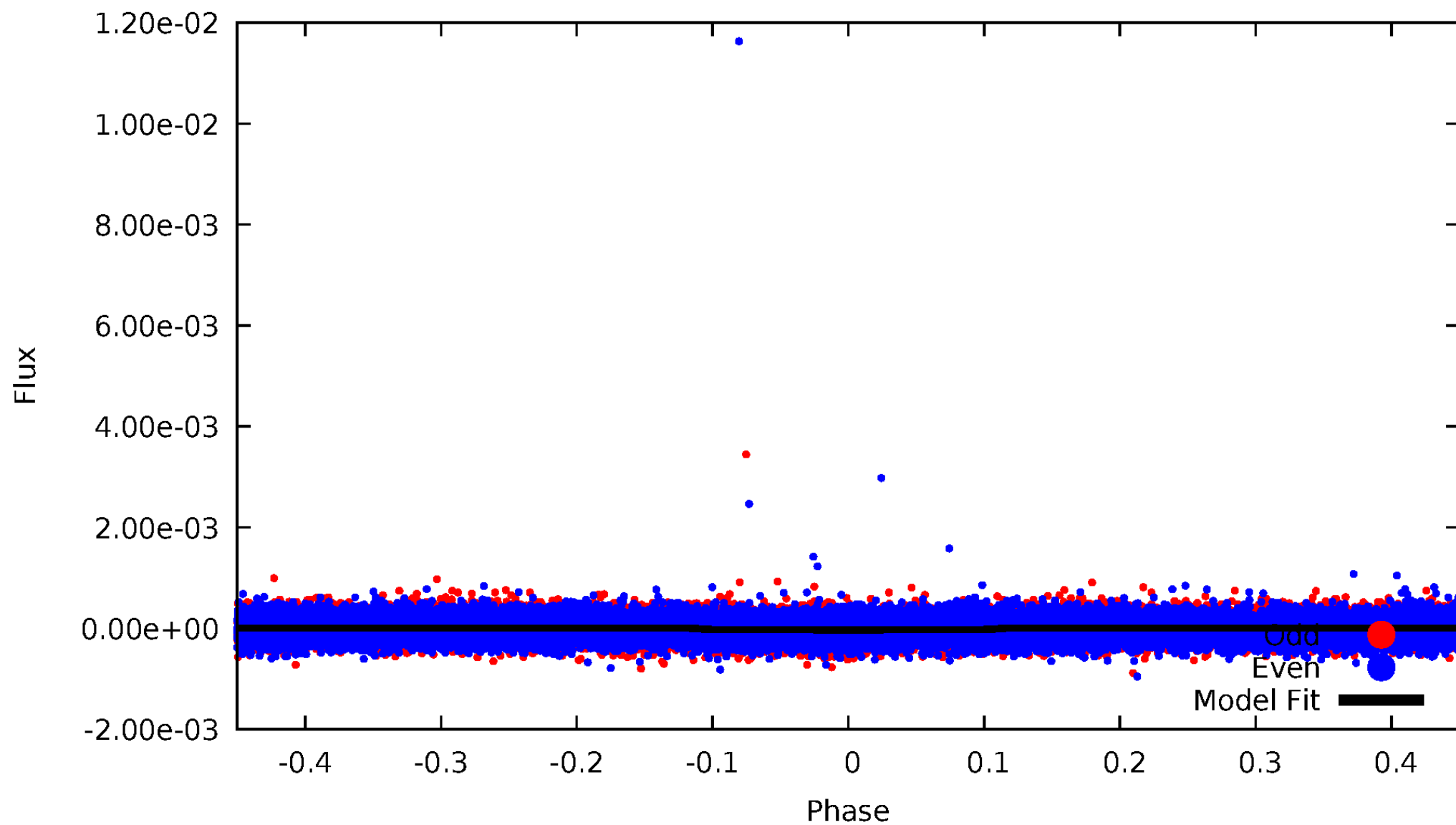


TCE 010646620-01



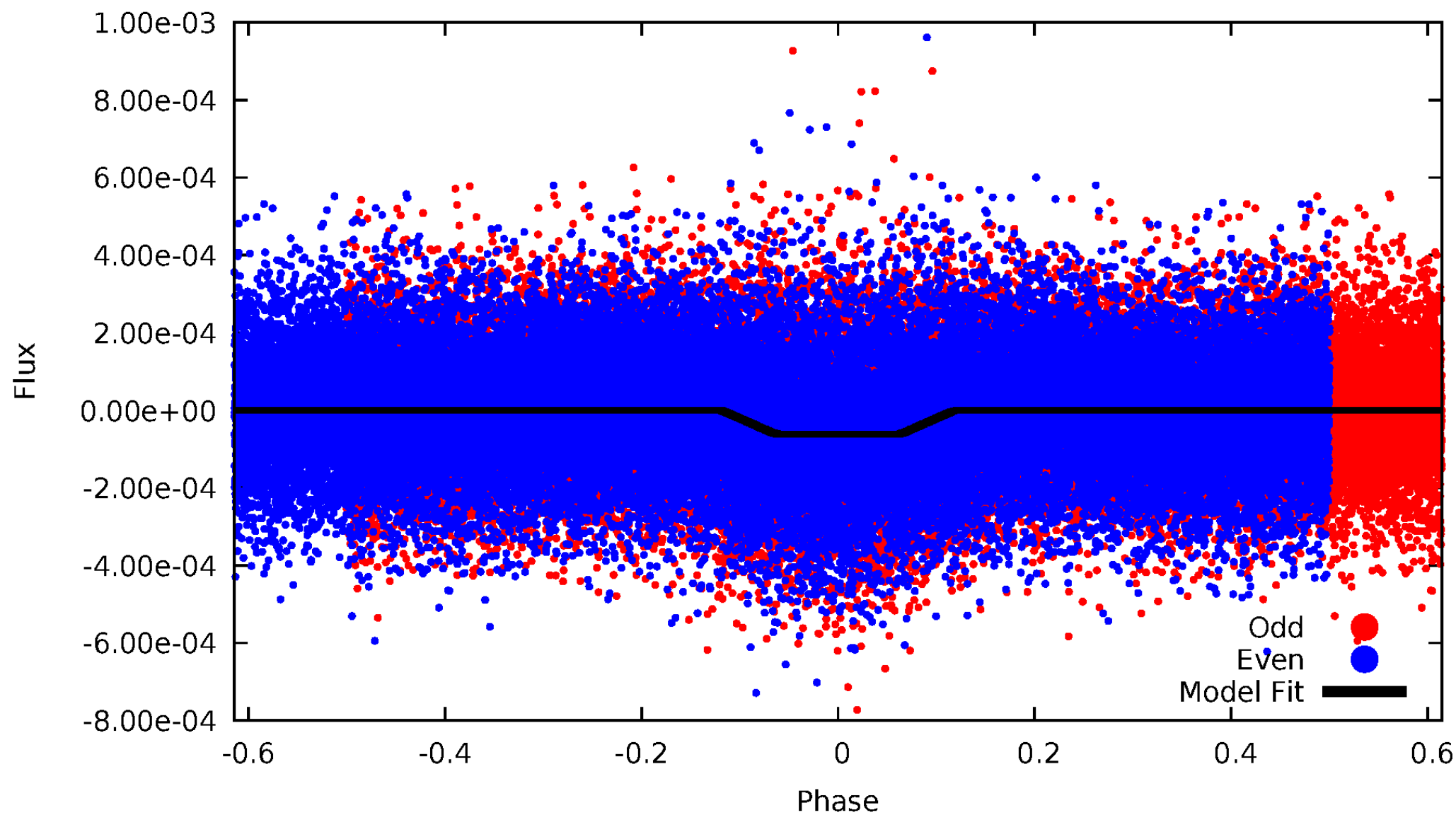
DV Odd/Even

TCE 010646620-01

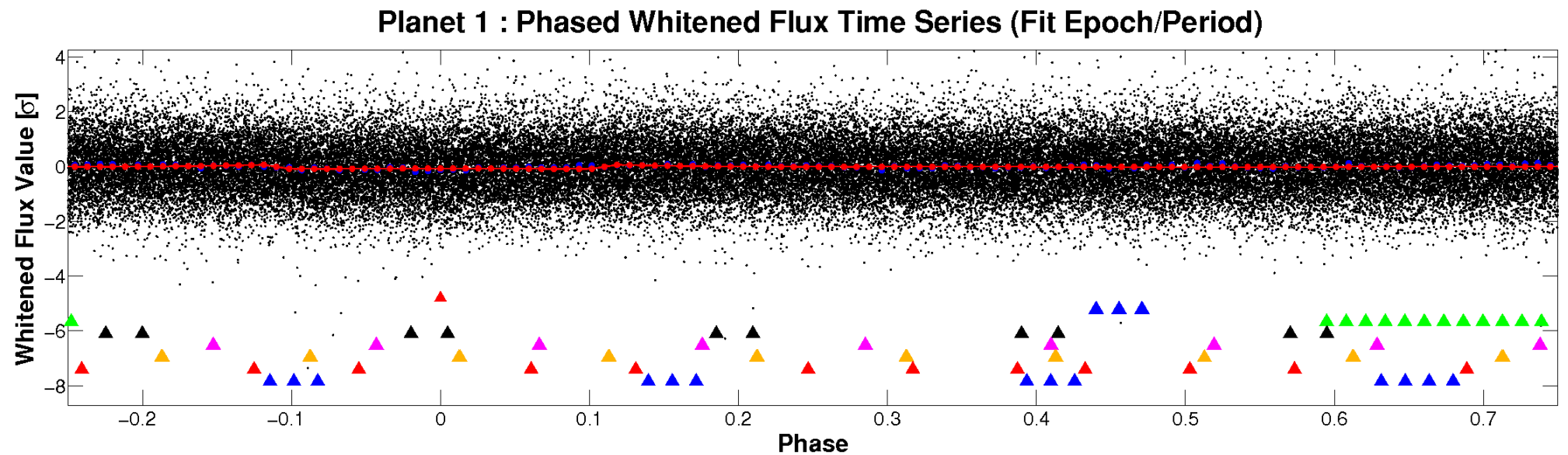
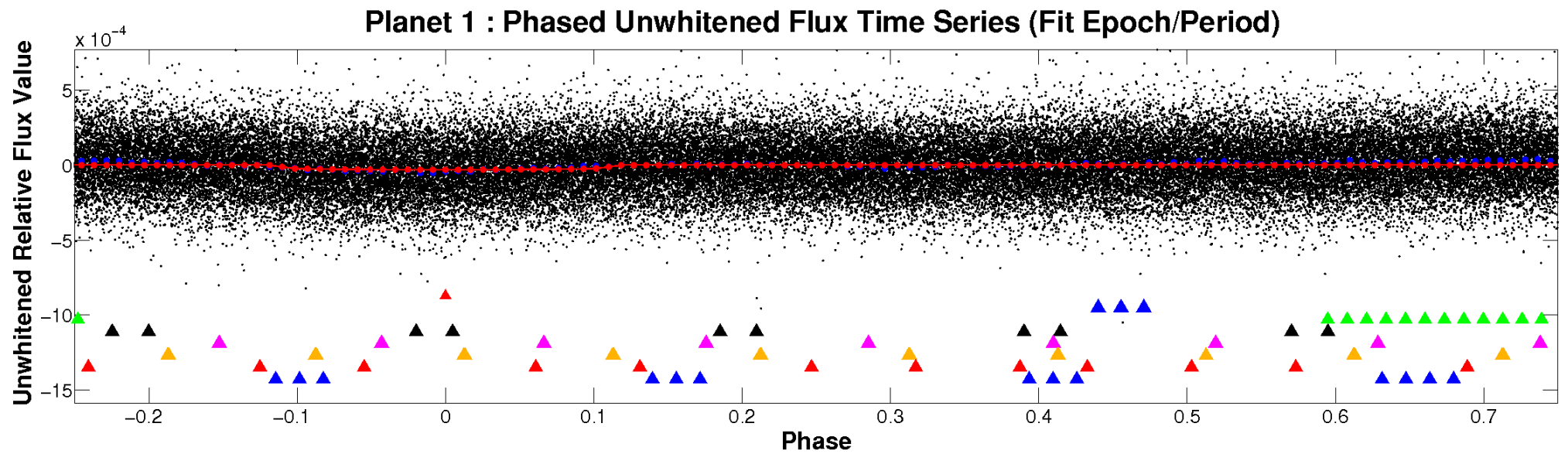


ALT Odd/Even

TCE 010646620-01

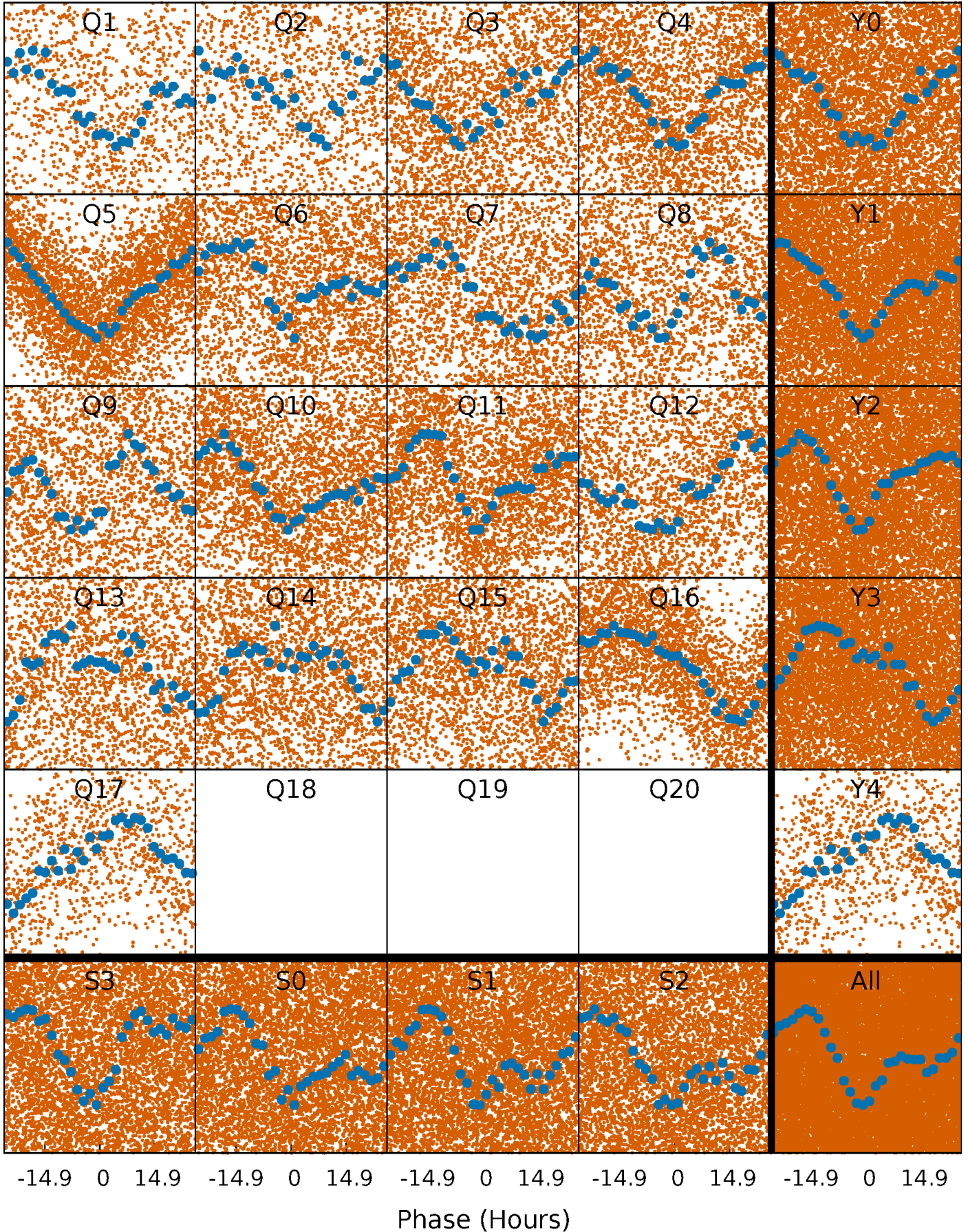


Non-Whitened Vs. Whitened Light Curve



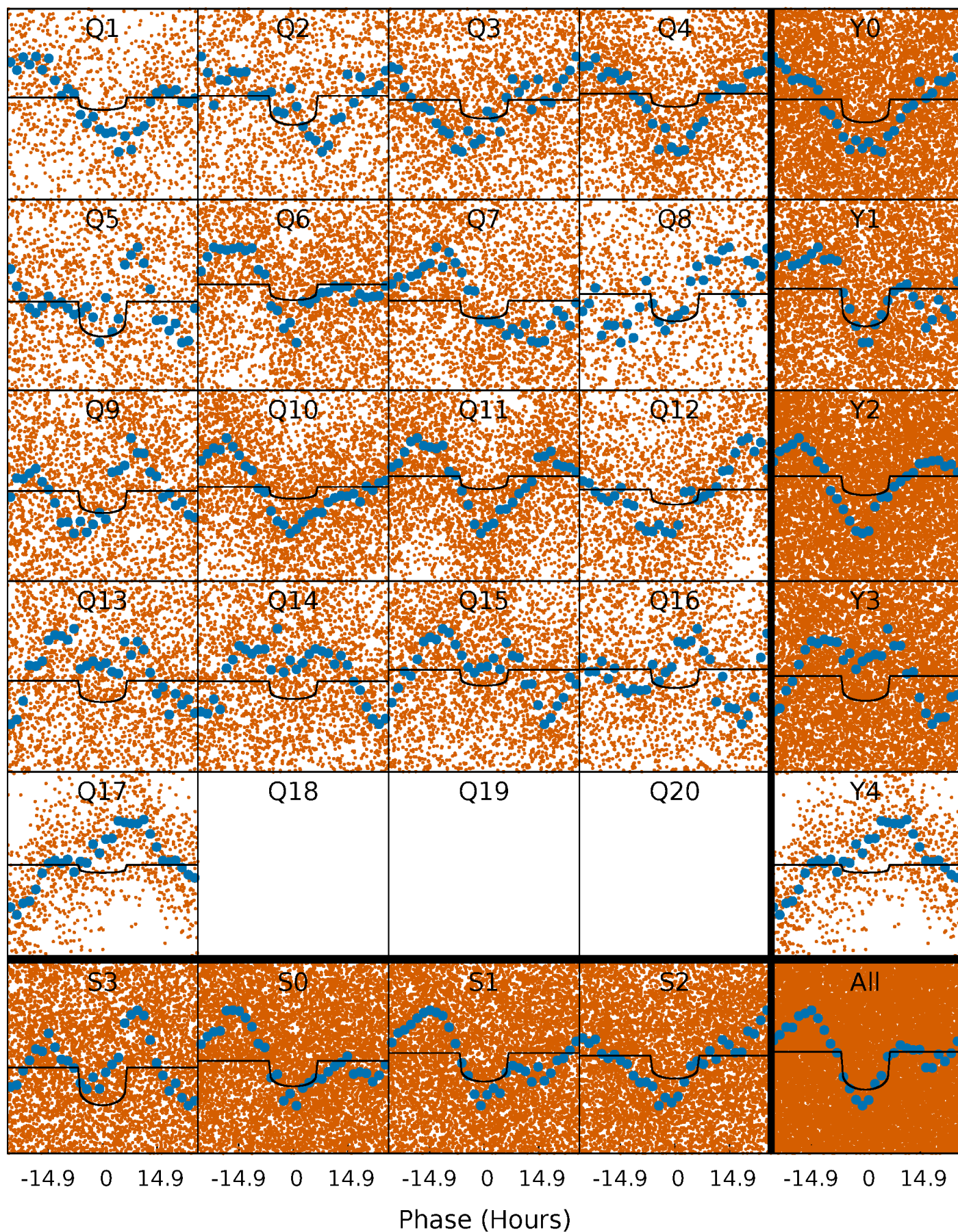
PDC Quarter-Phased Transit Curves

TCE 010646620-01 P= 2.413745 Days $T_0=133.562364$ (BKJD)



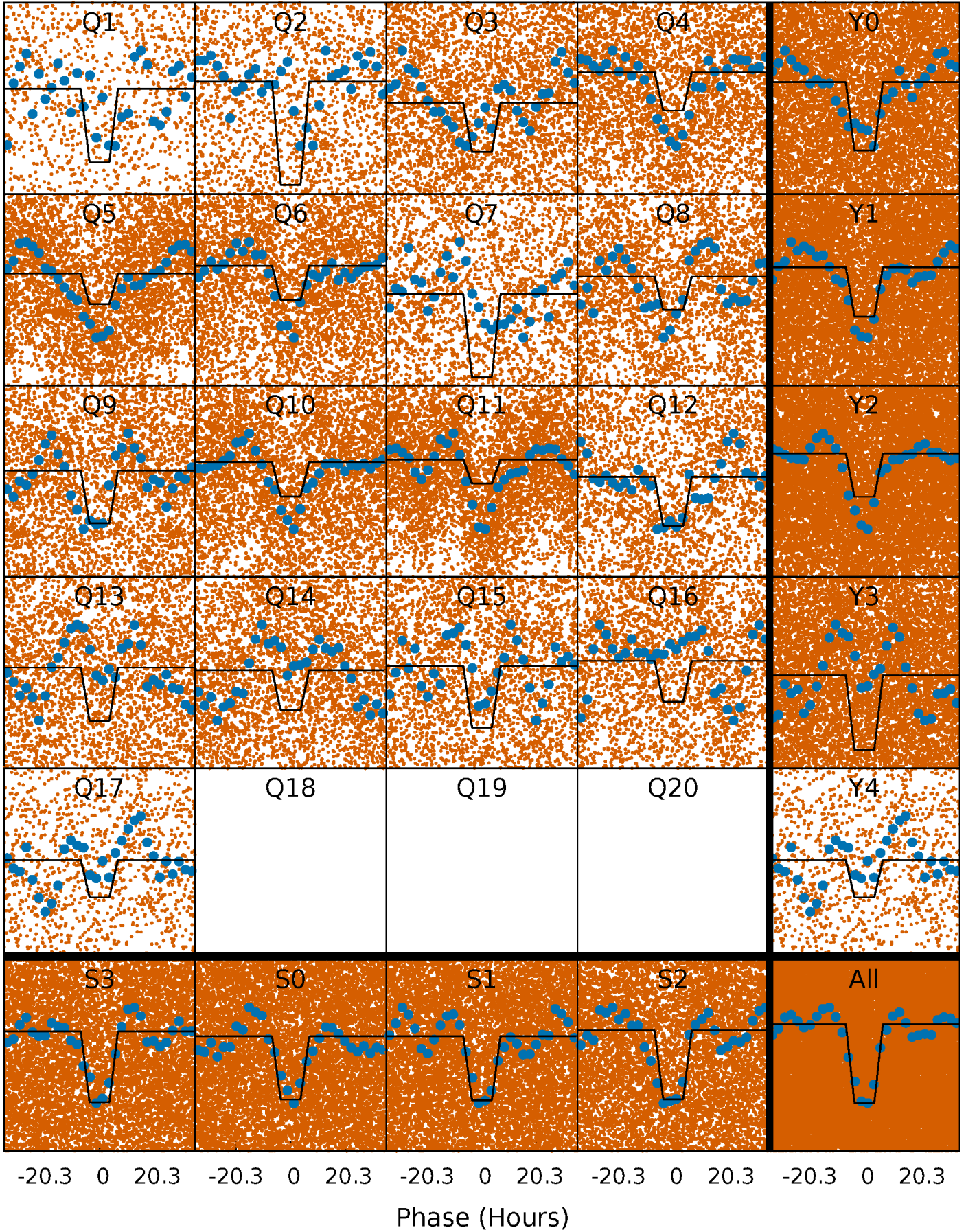
DV Quarter-Phased Transit Curves

TCE 010646620-01 P= 2.413745 Days $T_0=133.562364$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

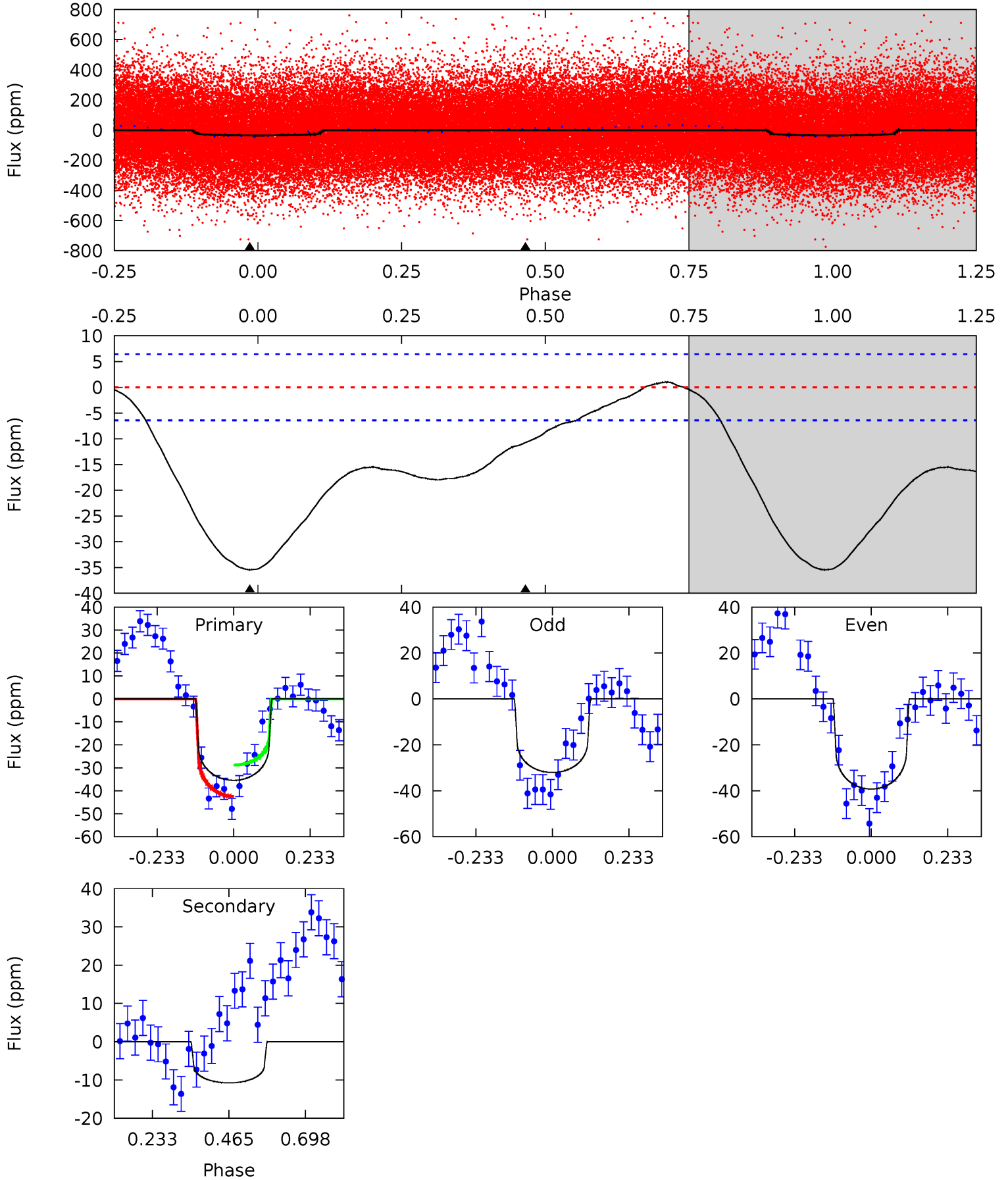
TCE 010646620-01 P= 2.413356 Days $T_0=133.610165$ (BKJD)



DV Model-Shift Uniqueness Test

010646620-01, P = 2.413745 Days, E = 131.148619 Days

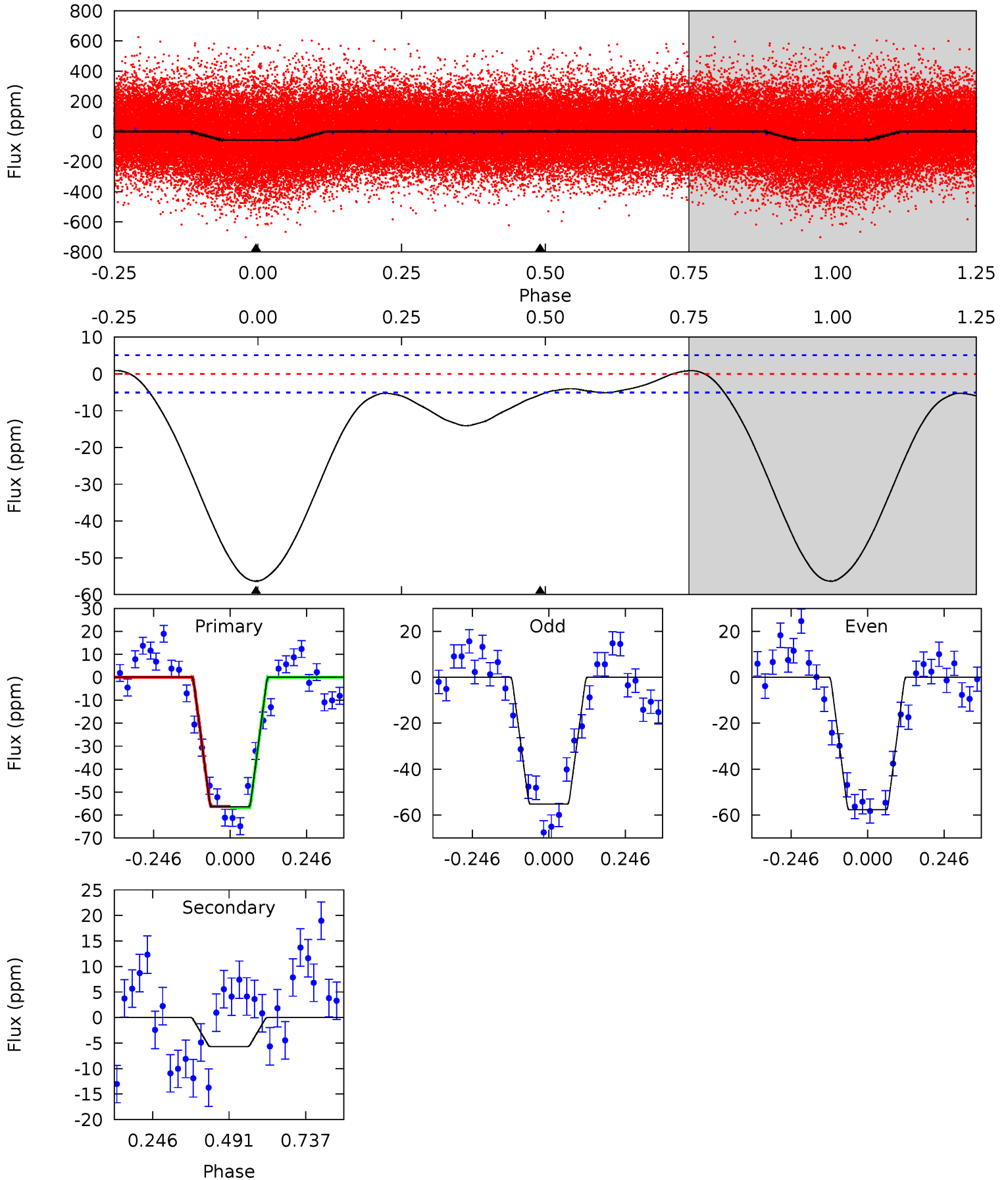
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.1	7.31	0	0	4.38	1.19	5.09	24.1	24.1	7.31	7.31	2.46	0.96	0.03	4.73



Alt Model-Shift Uniqueness Test

010646620-01, P = 2.413356 Days, E = 131.196809 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
48.5	4.90	0	0	4.37	1.16	2.78	48.5	48.5	4.90	4.90	1.07	1.20	0.02	0.21



Stellar Parameters For KIC 010646620

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6628^{+160}_{-180}	$3.783^{+0.312}_{-0.098}$	$-0.320^{+0.300}_{-0.250}$	$2.595^{+0.419}_{-0.978}$	$1.489^{+0.212}_{-0.344}$	$0.120^{+0.253}_{-0.038}$
	+2%/-3%	+8%/-3%	+94%/-78%	+16%/-38%	+14%/-23%	+211%/-31%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010646620-01 / KOI 7352.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-11 ± 1	$1.43^{+0.48}_{-0.42}$	3224^{+200}_{-278}	5142^{+791}_{-545}	$4.696^{+4.628}_{-2.045}$
Alt.	-6 ± 1	$2.06^{+0.56}_{-0.50}$	3222^{+191}_{-289}	3779^{+391}_{-362}	$1.160^{+0.827}_{-0.448}$

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

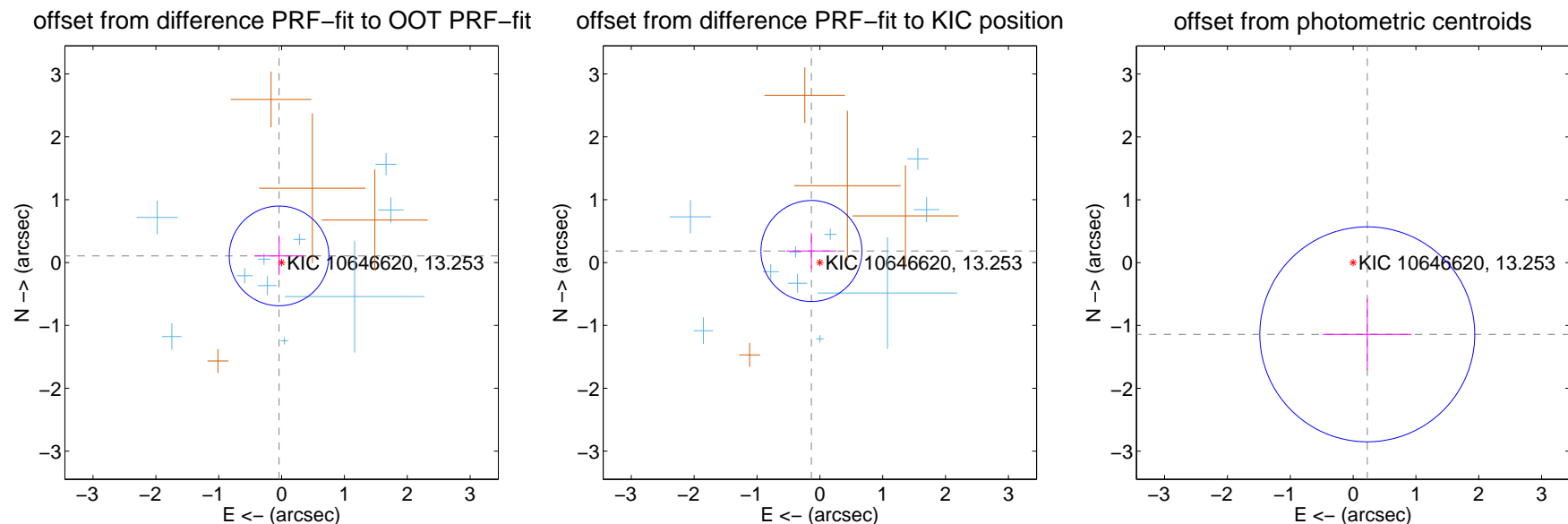
DV Centroid Data

Supplemental centroid analysis for 010646620-01. Kepler magnitude: 13.25. Transit SNR 9.93

There are 10 quarters with good PRF difference image offsets

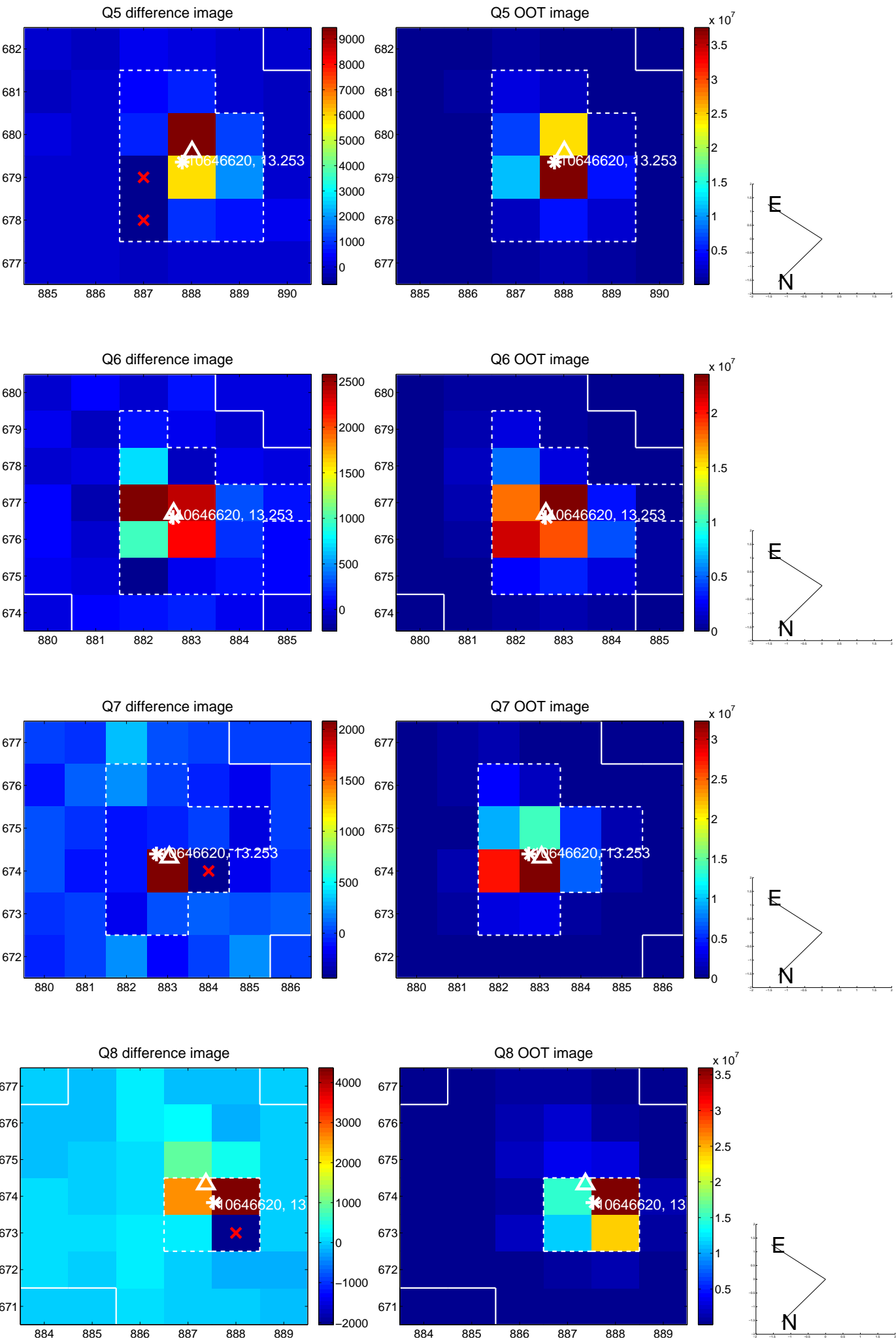
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.113 ± 0.264	0.43	0.040 ± 0.392	0.106 ± 0.306
PRF-fit source offset from KIC position	0.227 ± 0.268	0.85	0.134 ± 0.395	0.183 ± 0.285
photometric centroid source offset	1.16 ± 0.57	2.04	-0.23 ± 0.70	-1.14 ± 0.56

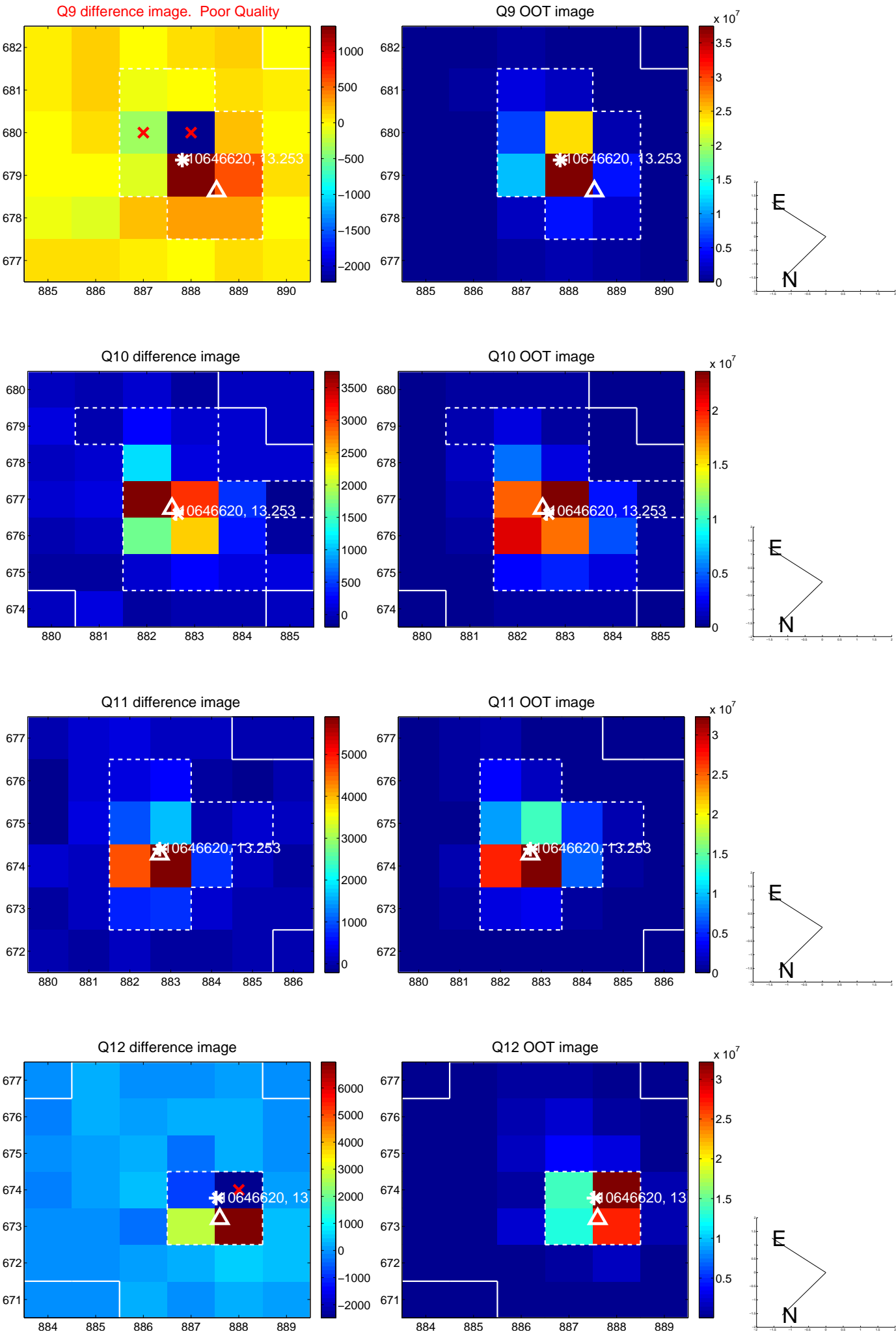


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

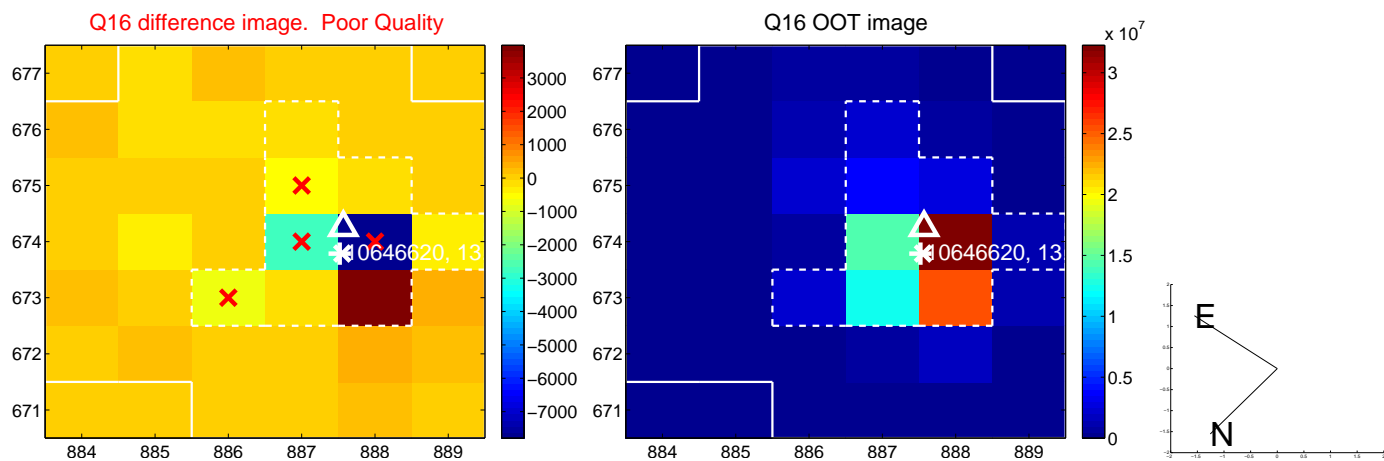
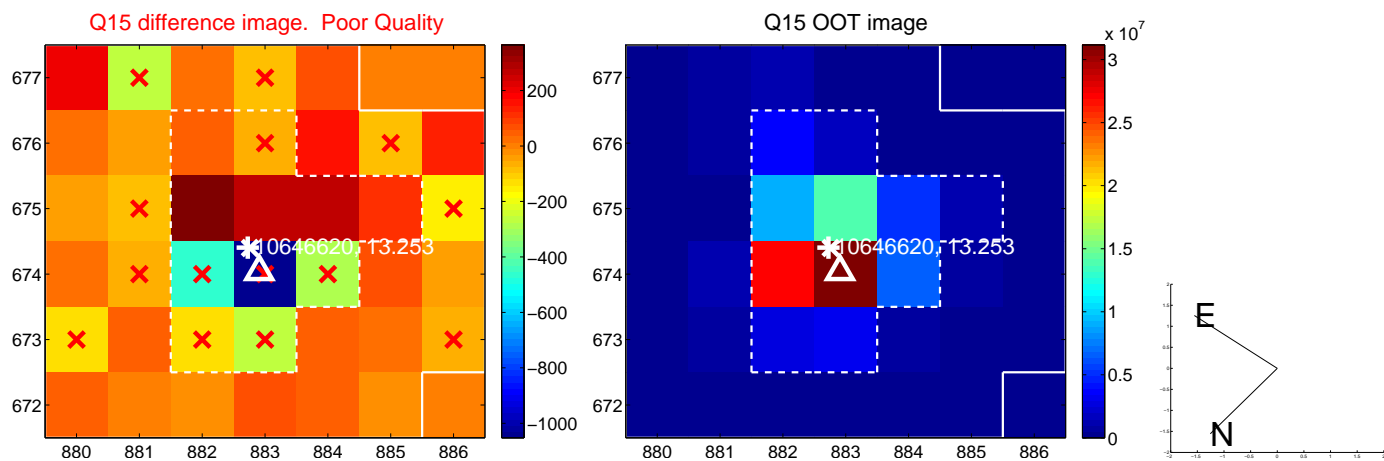
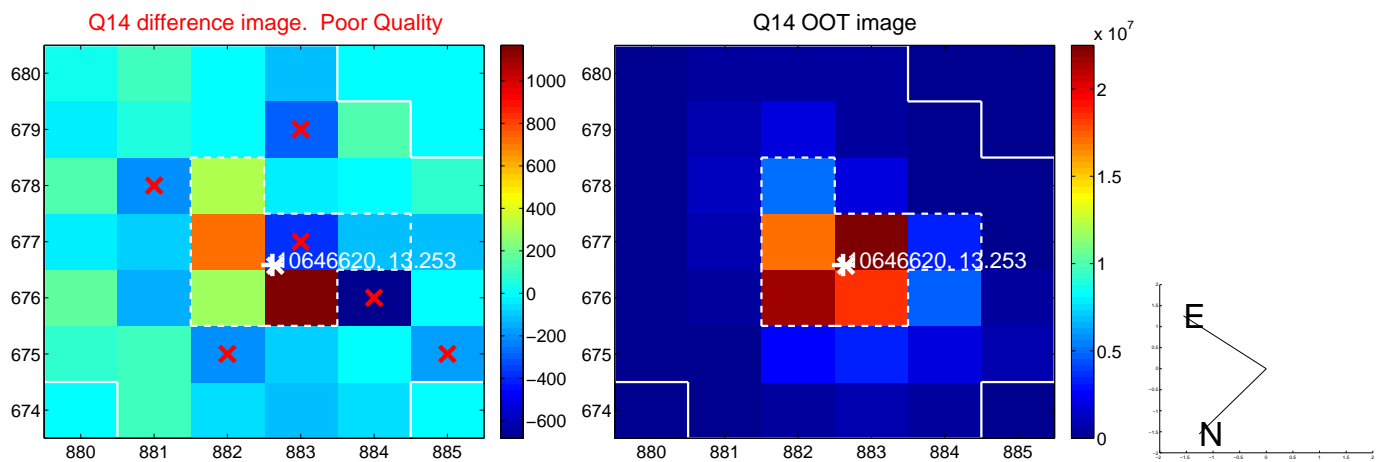
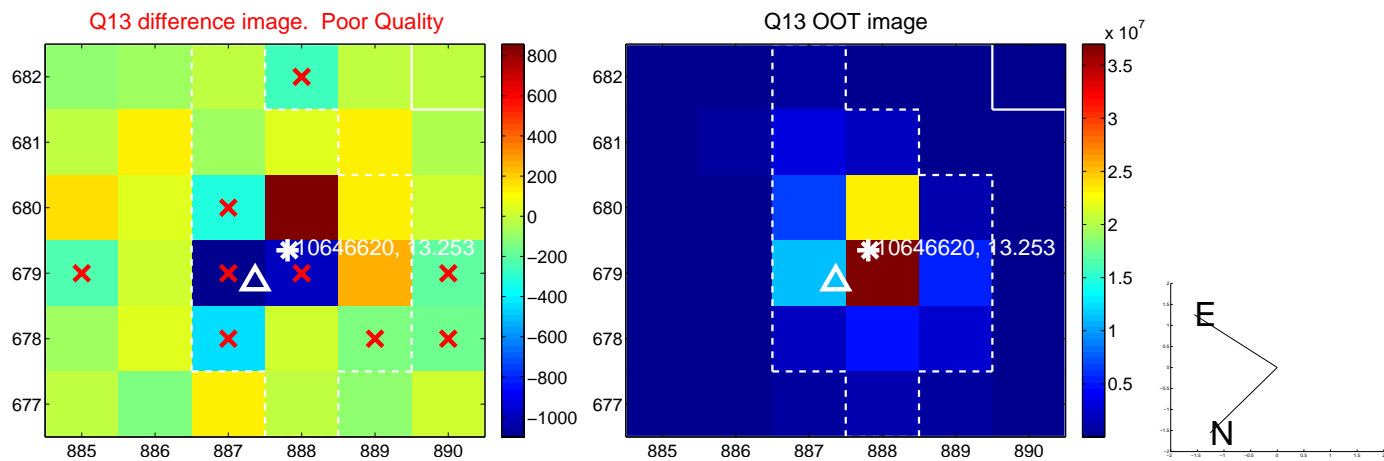
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



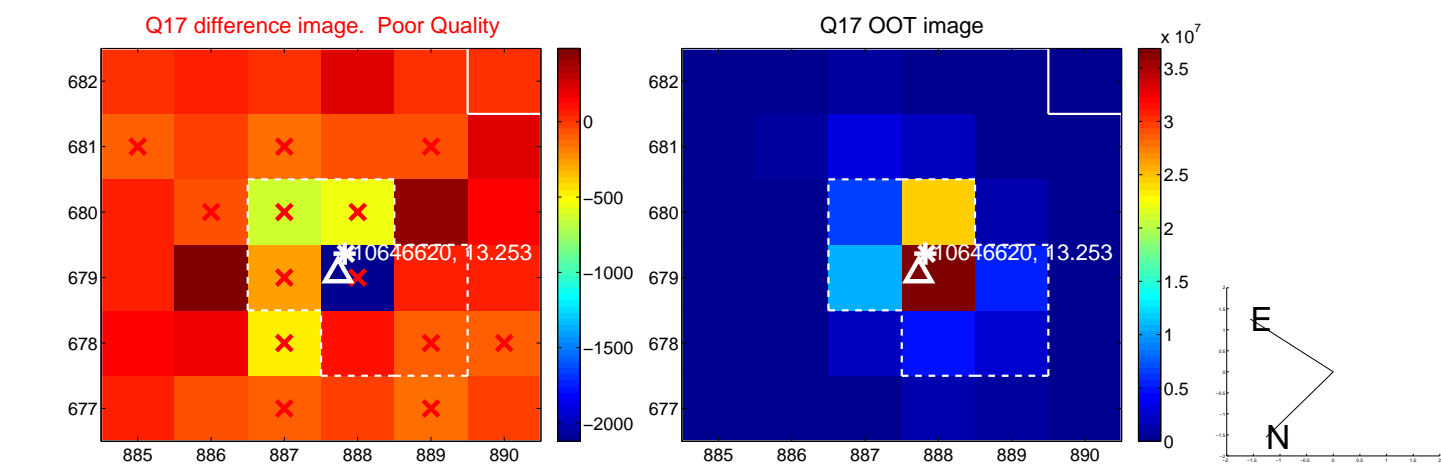
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



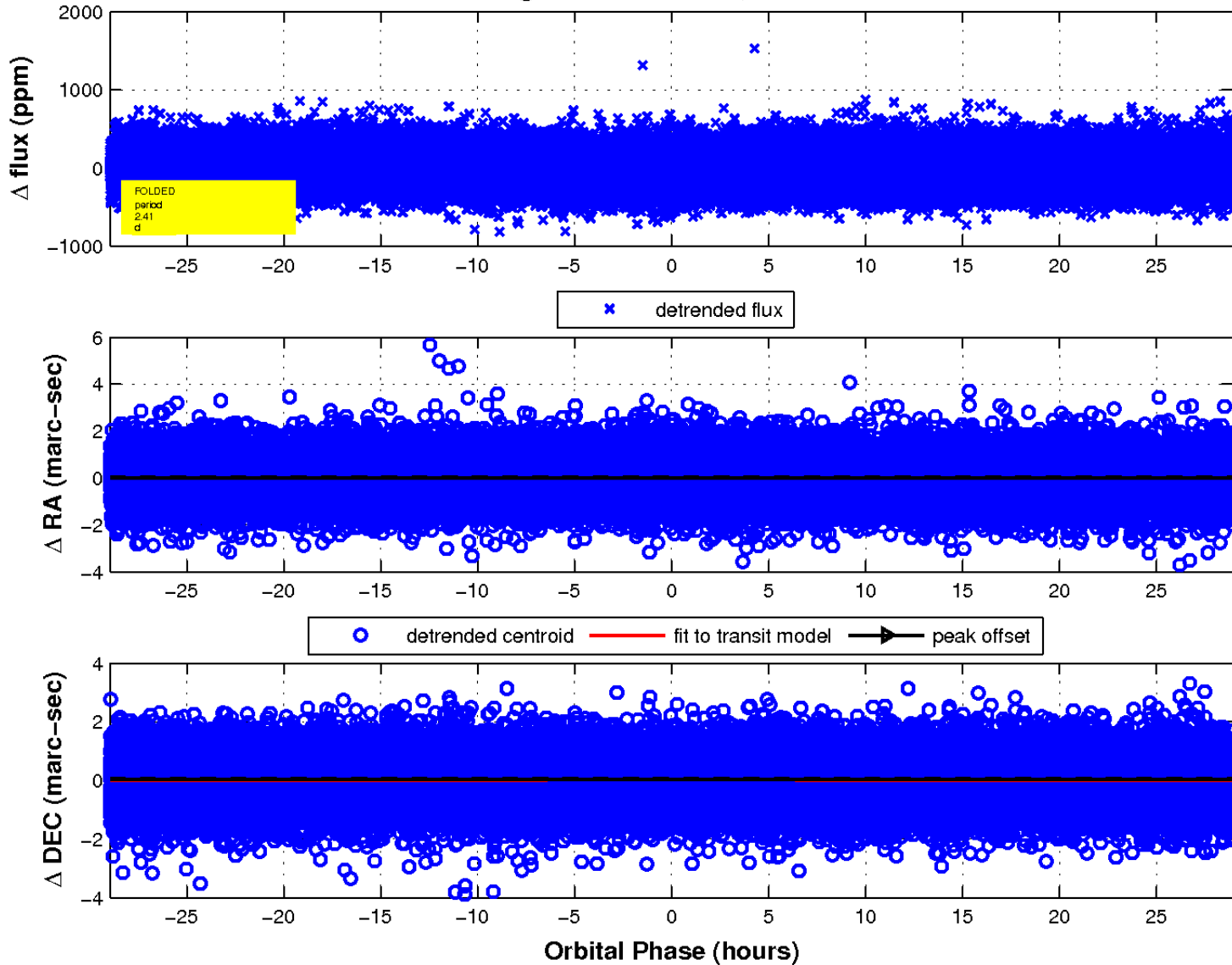
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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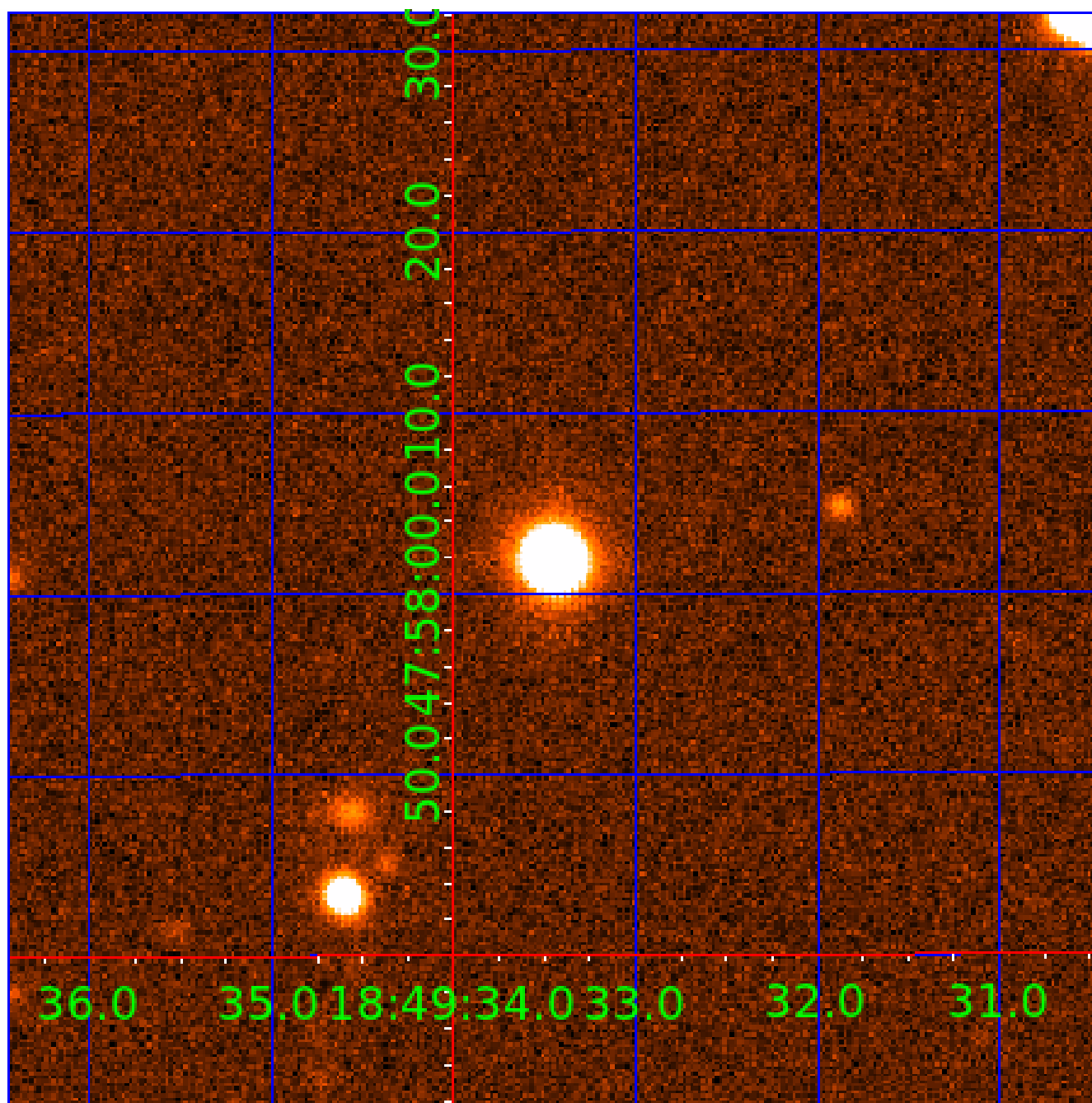


fluxWeightedCentroids, Planet 1 of 8



UKIRT Image

Declination



KIC 010646620

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})
010646620-01	OBS	7352.01	2.413745	133.562364	30.4	13.034	8.8	9.9	2.60	6628	1.53	7193.29
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010646620-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010646620-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010646620-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
010646620-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010646620-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010646620-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT

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.

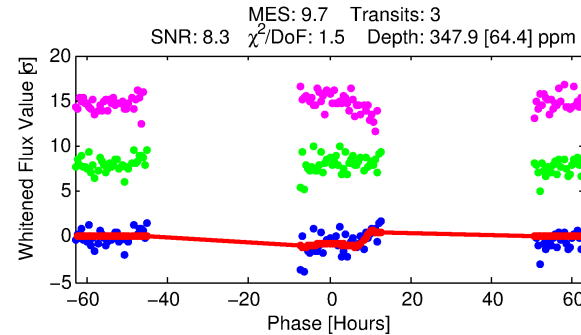
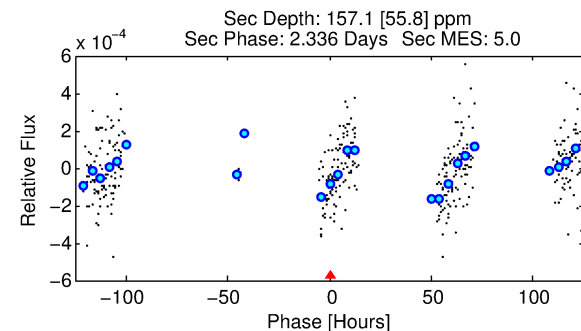
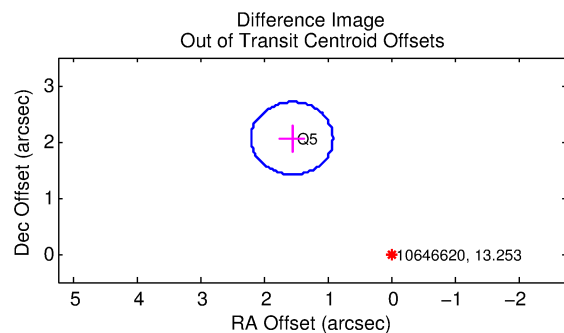
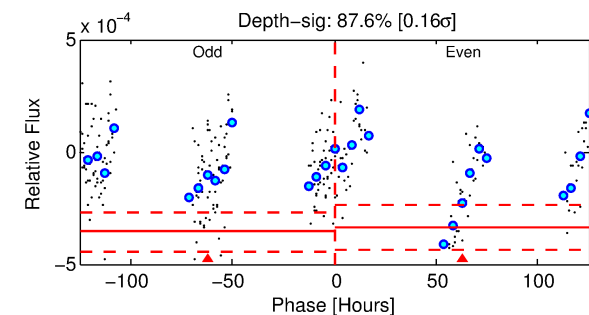
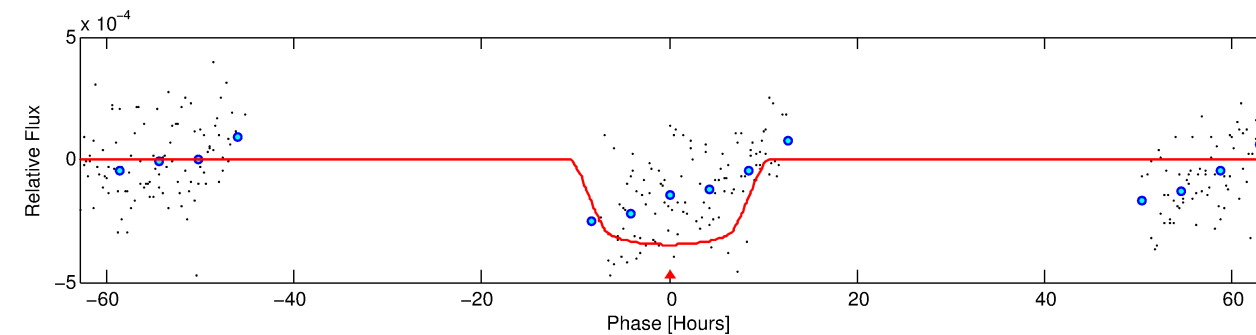
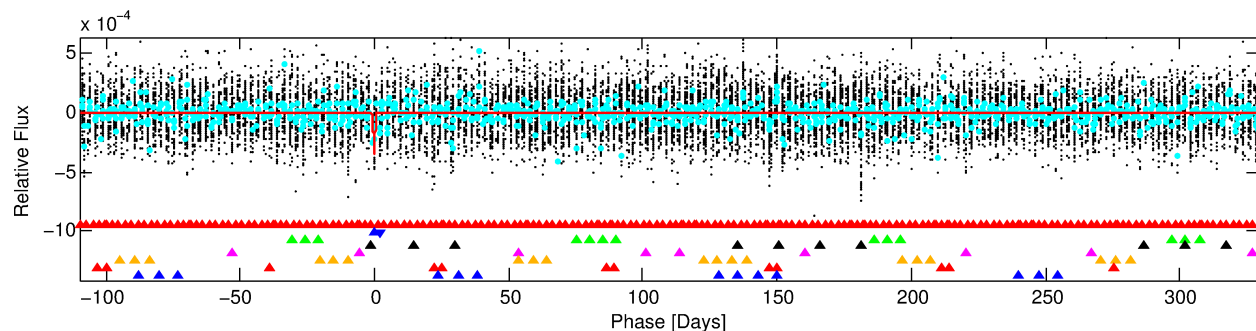
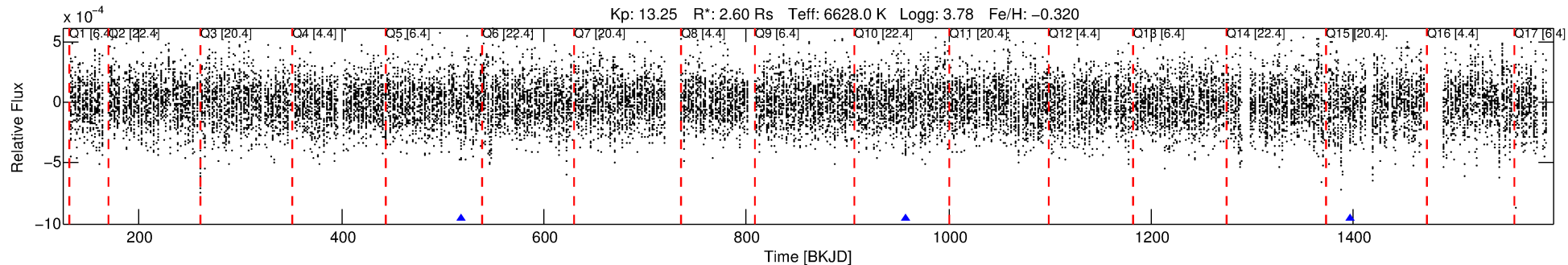
Ephemeris Match Information For 010646620-02

No Significant Match Found

DV One-Page Summary

KIC: 10646620 Candidate: 2 of 8 Period: 439.265 d
KOI: K07352 Corr: No Ephemeris Match

Kp: 13.25 R*: 2.60 Rs Teff: 6628.0 K Logg: 3.78 Fe/H: -0.320



DV Fit Results:

Period = 439.26457 [0.02814] d
Epoch = 518.4844 [0.0552] BKJD
Rp/R* = 0.0211 [0.0023]
a/R* = 59.05 [16.93]
b = 0.95 [0.02]
Seff = 6.98 [3.85]
Teq = 414 [57] K
Rp = 5.98 [2.34] Re
a = 1.2920 [0.4485] AU
Ag = 4037.71 [2750.50] [1.47σ]
Teffp = 5107 [547] K [8.54σ]

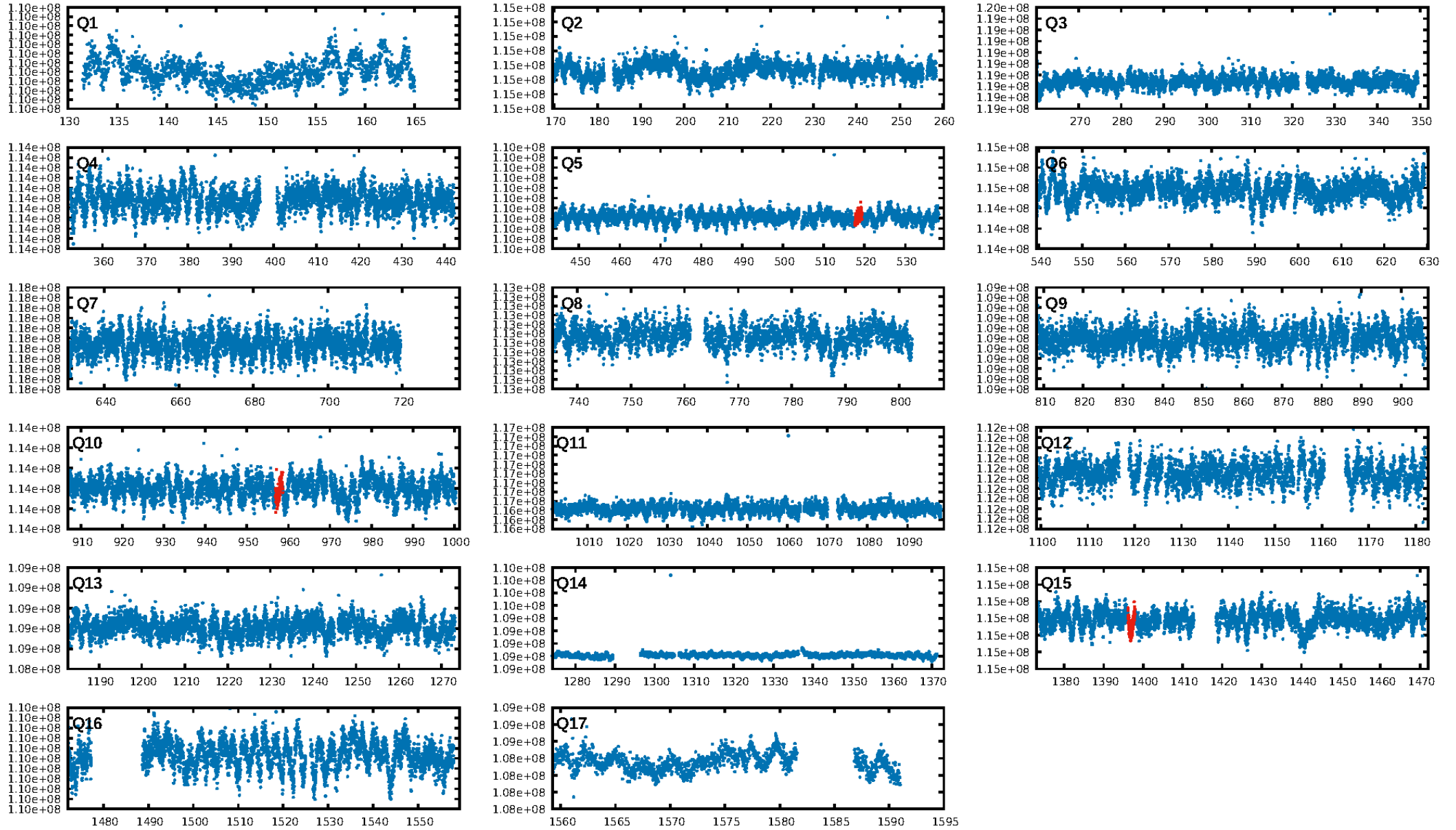
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [294.31σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 48.2%
ModelChiSquareGof-sig: 81.3%
Bootstrap-pfa: 1.25e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -10.61
Centroid-sig: 79.1%
Centroid-so: 0.292 arcsec [0.32σ]
OotOffset-rm: 2.589 arcsec [12.04σ]
KicOffset-rm: 2.652 arcsec [12.36σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
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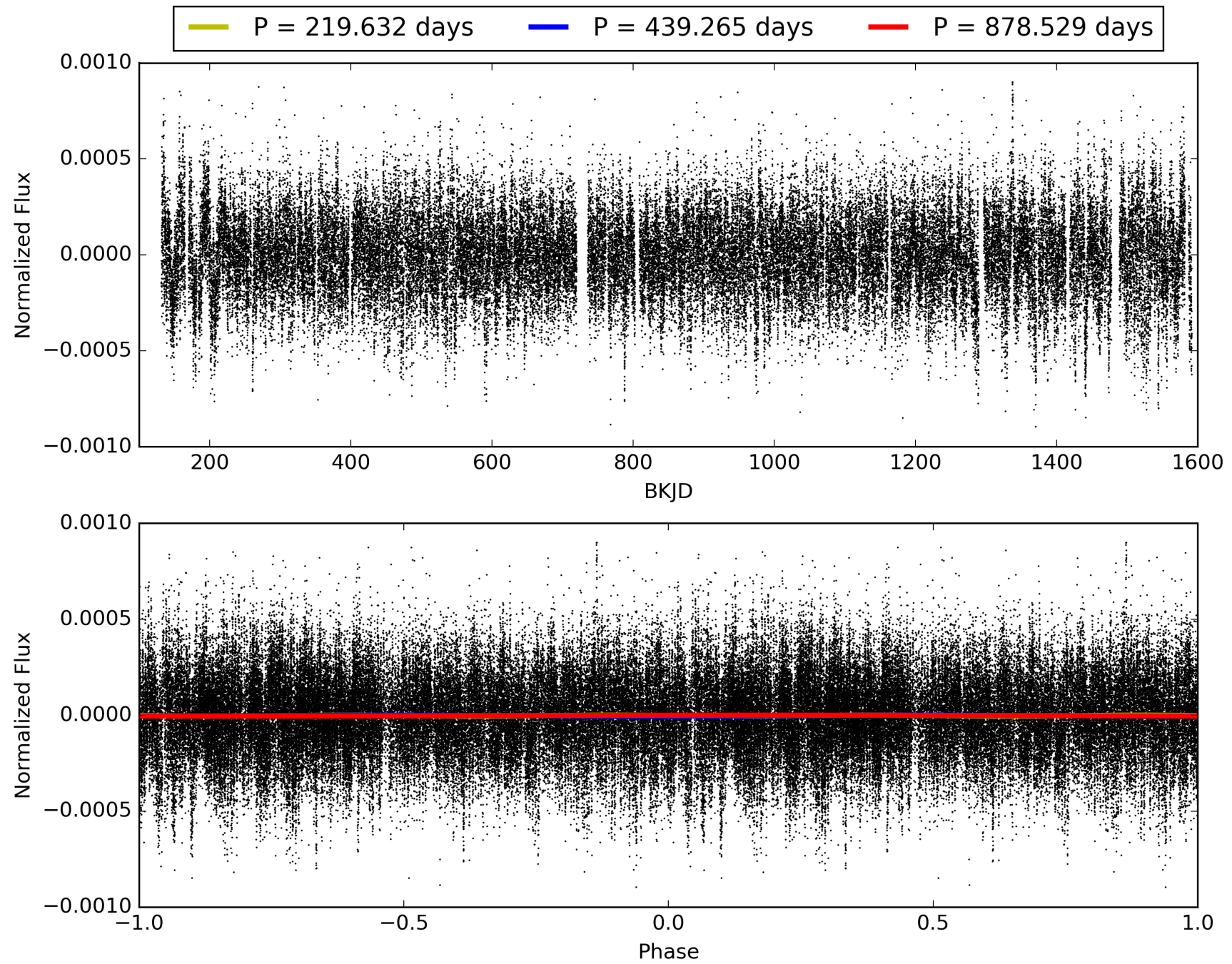
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:09:22 Z

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

TCE 010646620-02, PDC Light Curves

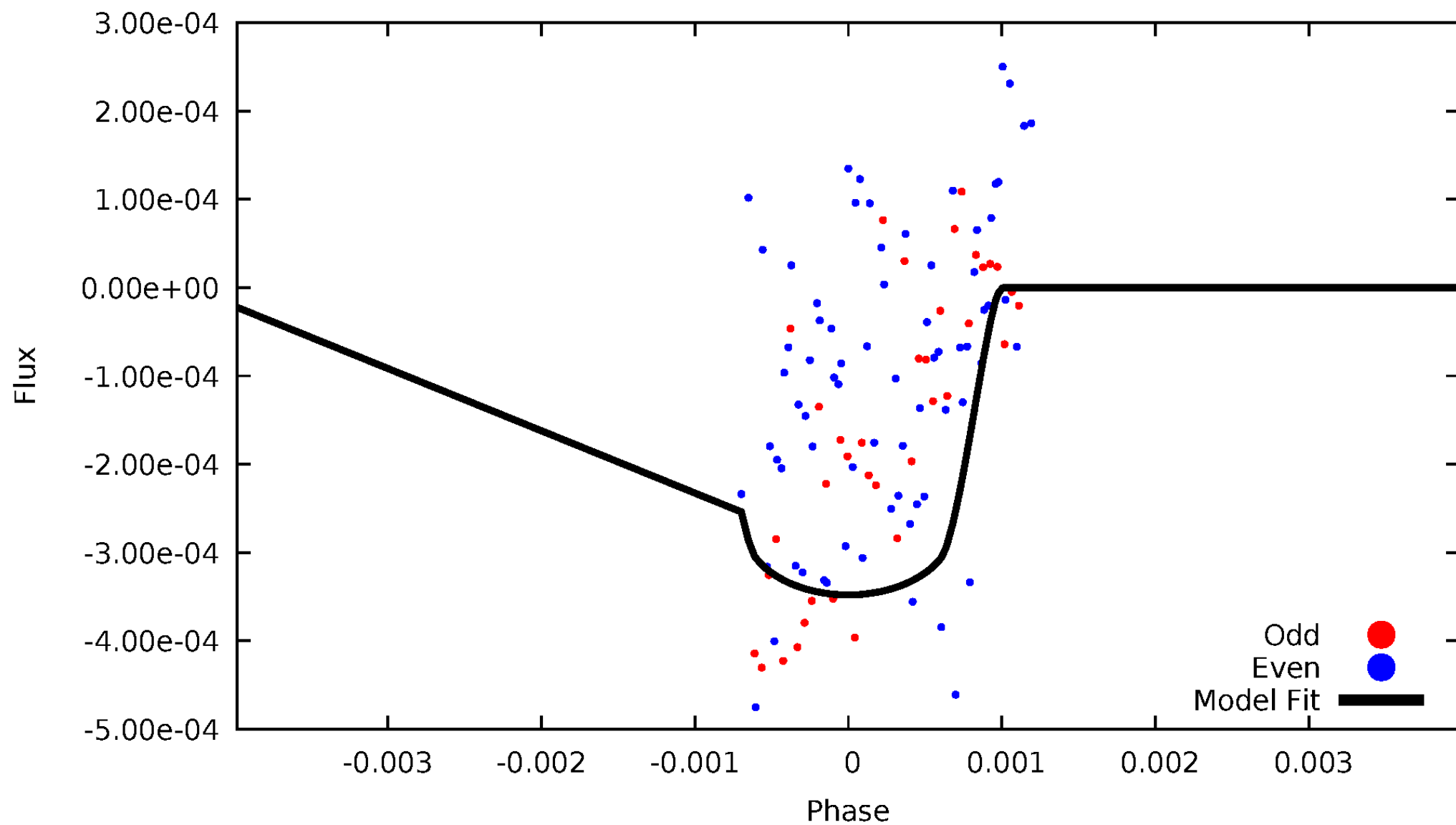


TCE 010646620-02



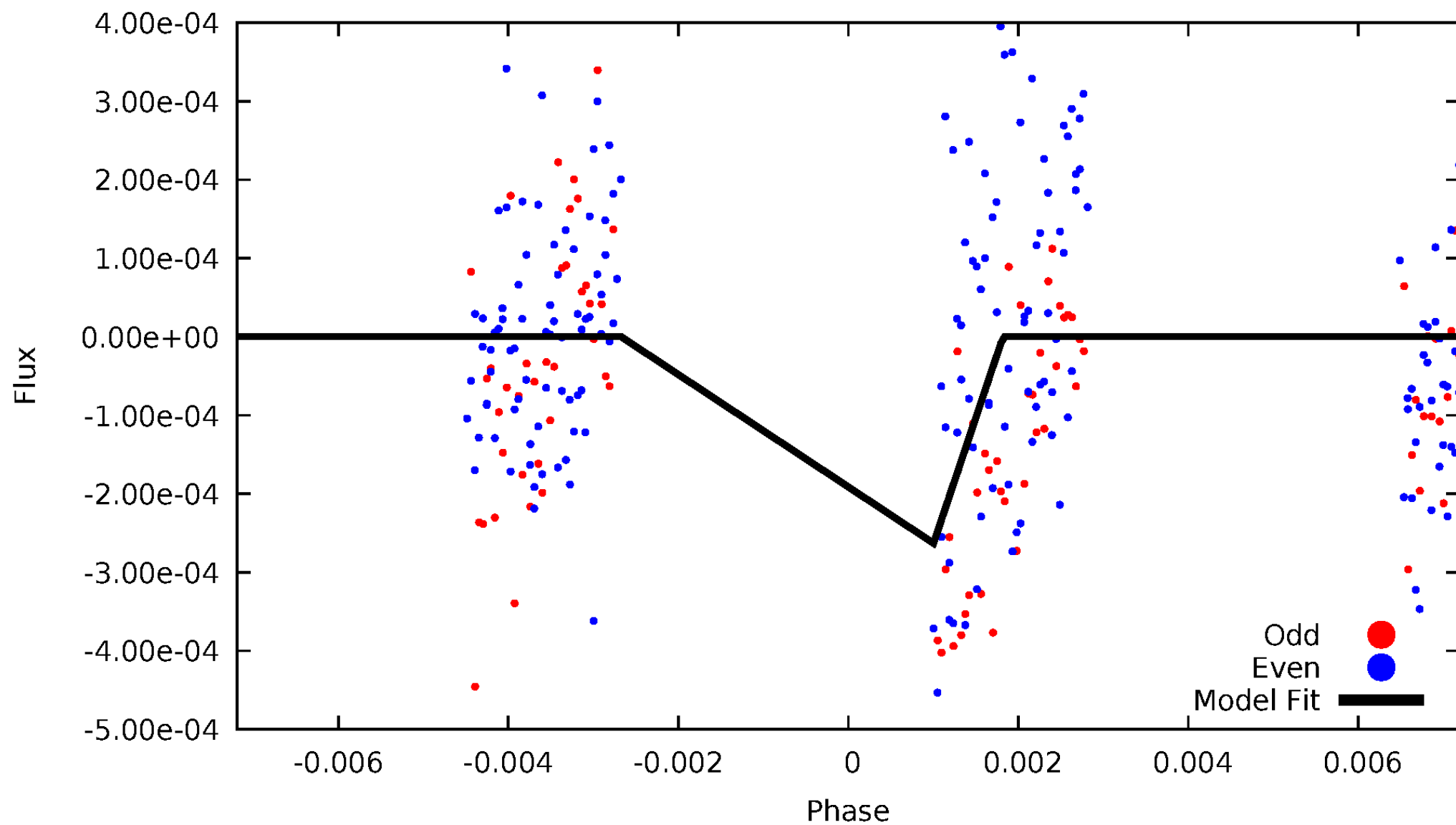
DV Odd/Even

TCE 010646620-02



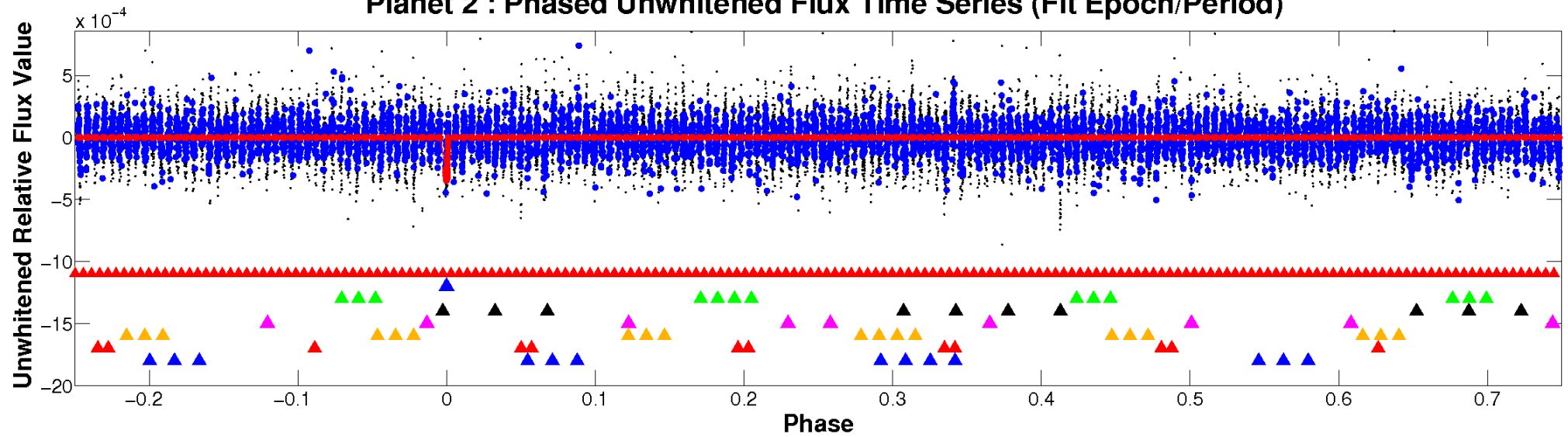
ALT Odd/Even

TCE 010646620-02

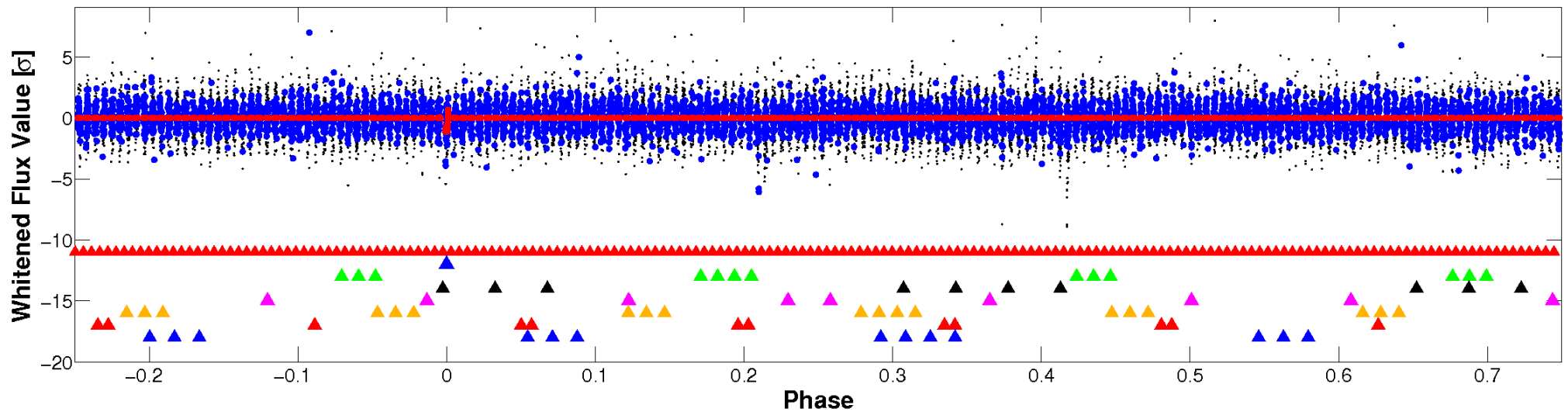


Non-Whitened Vs. Whitened Light Curve

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

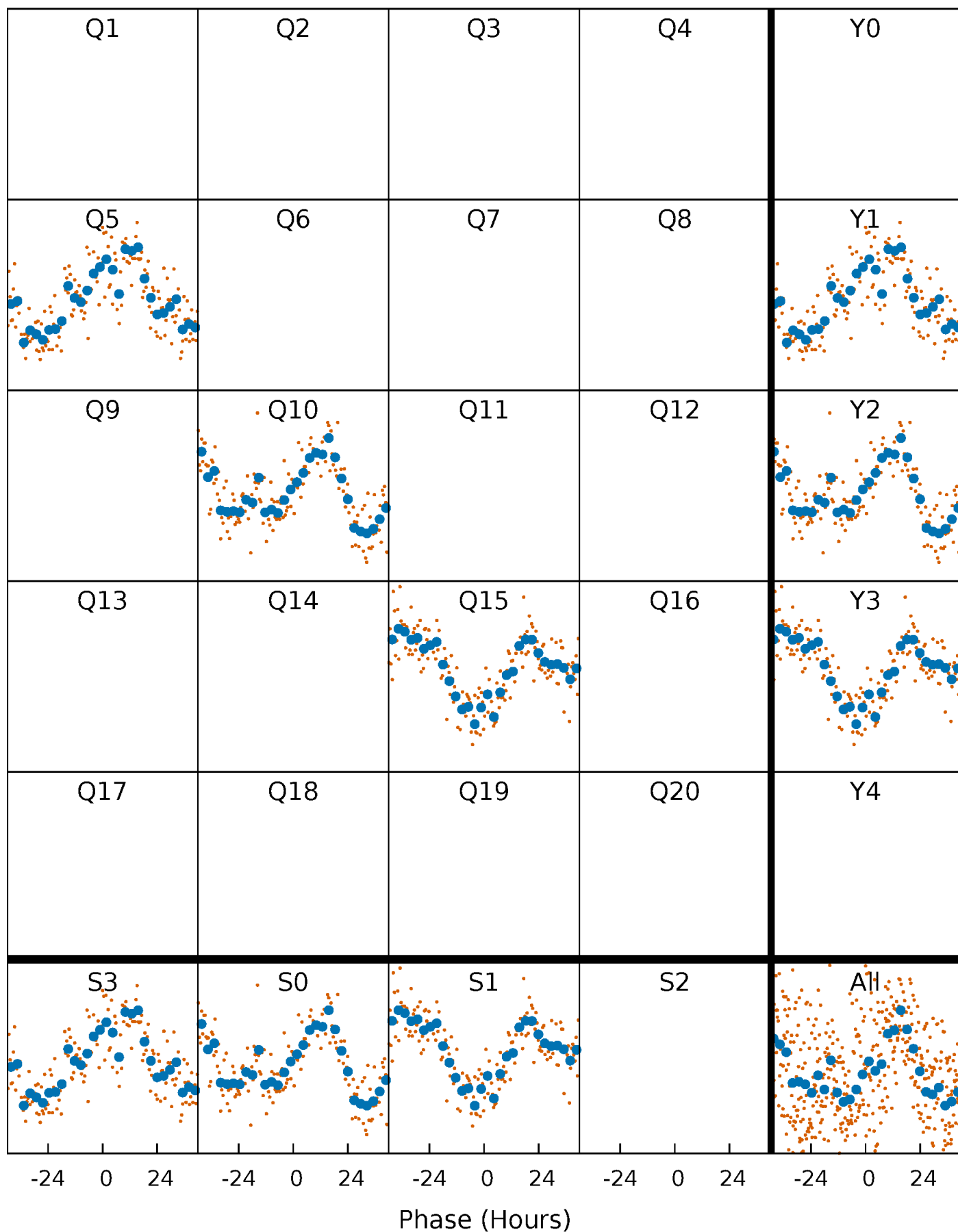


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



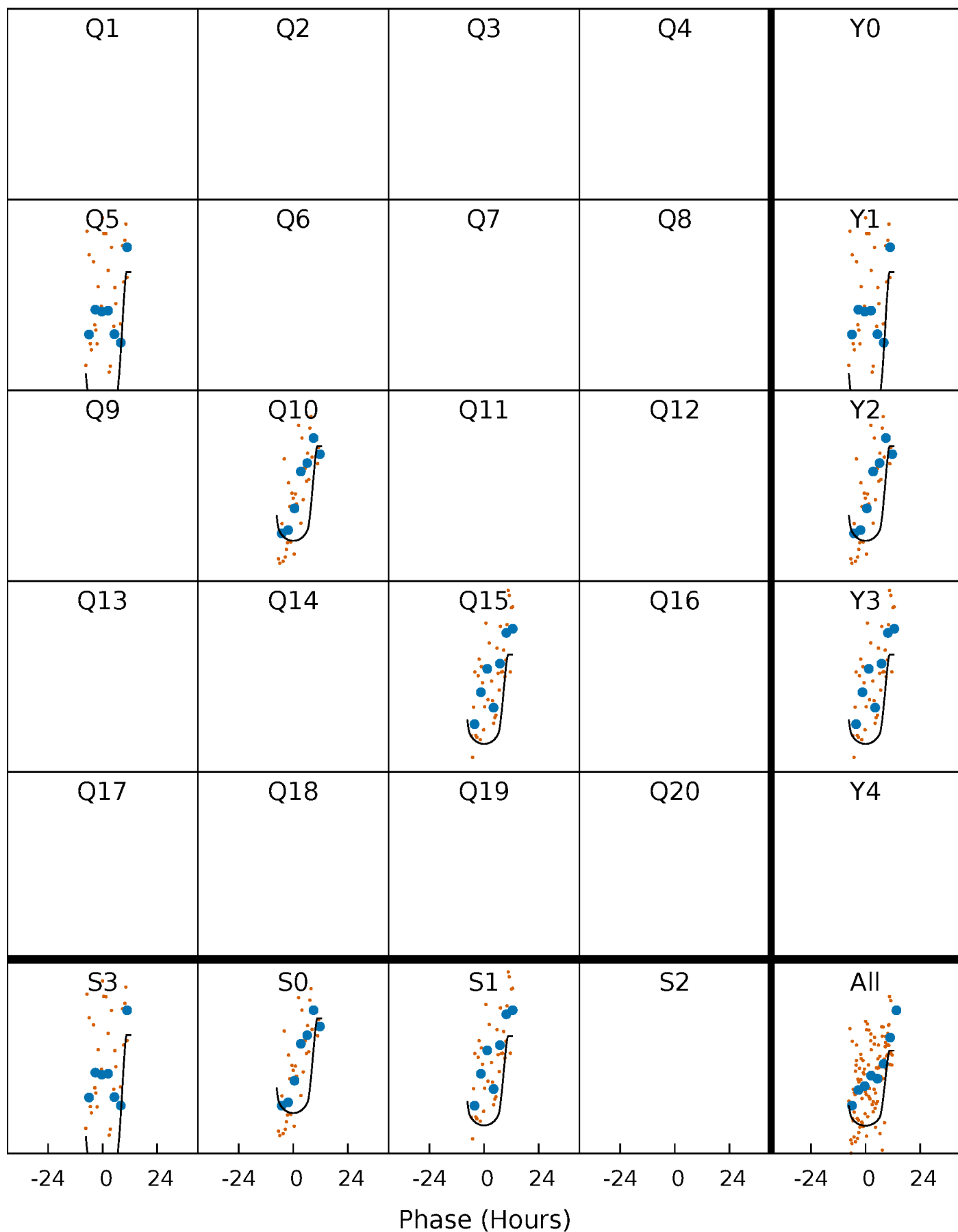
PDC Quarter-Phased Transit Curves

TCE 010646620-02 P=439.264570 Days $T_0=518.484387$ (BKJD)



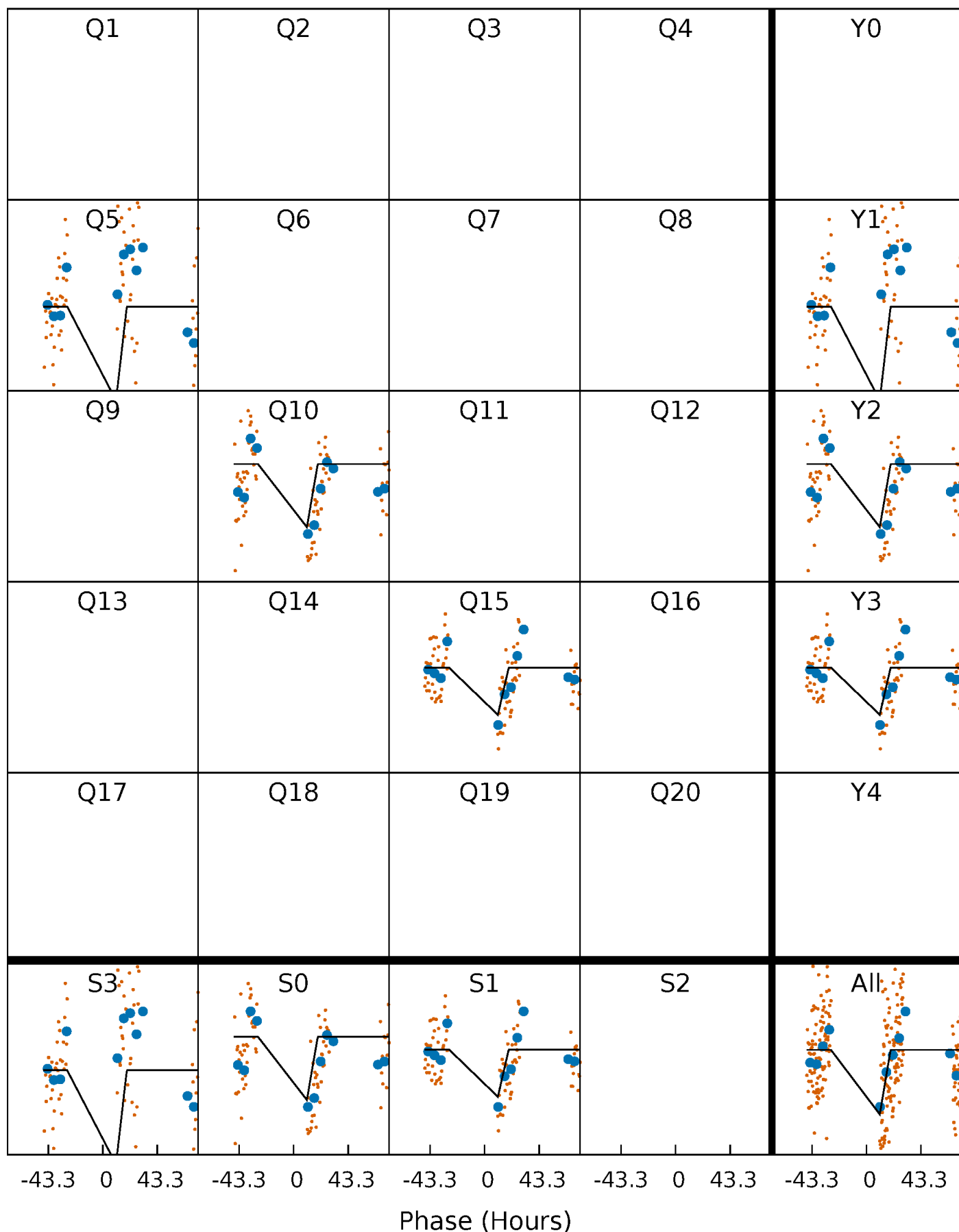
DV Quarter-Phased Transit Curves

TCE 010646620-02 P=439.264570 Days $T_0=518.484387$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

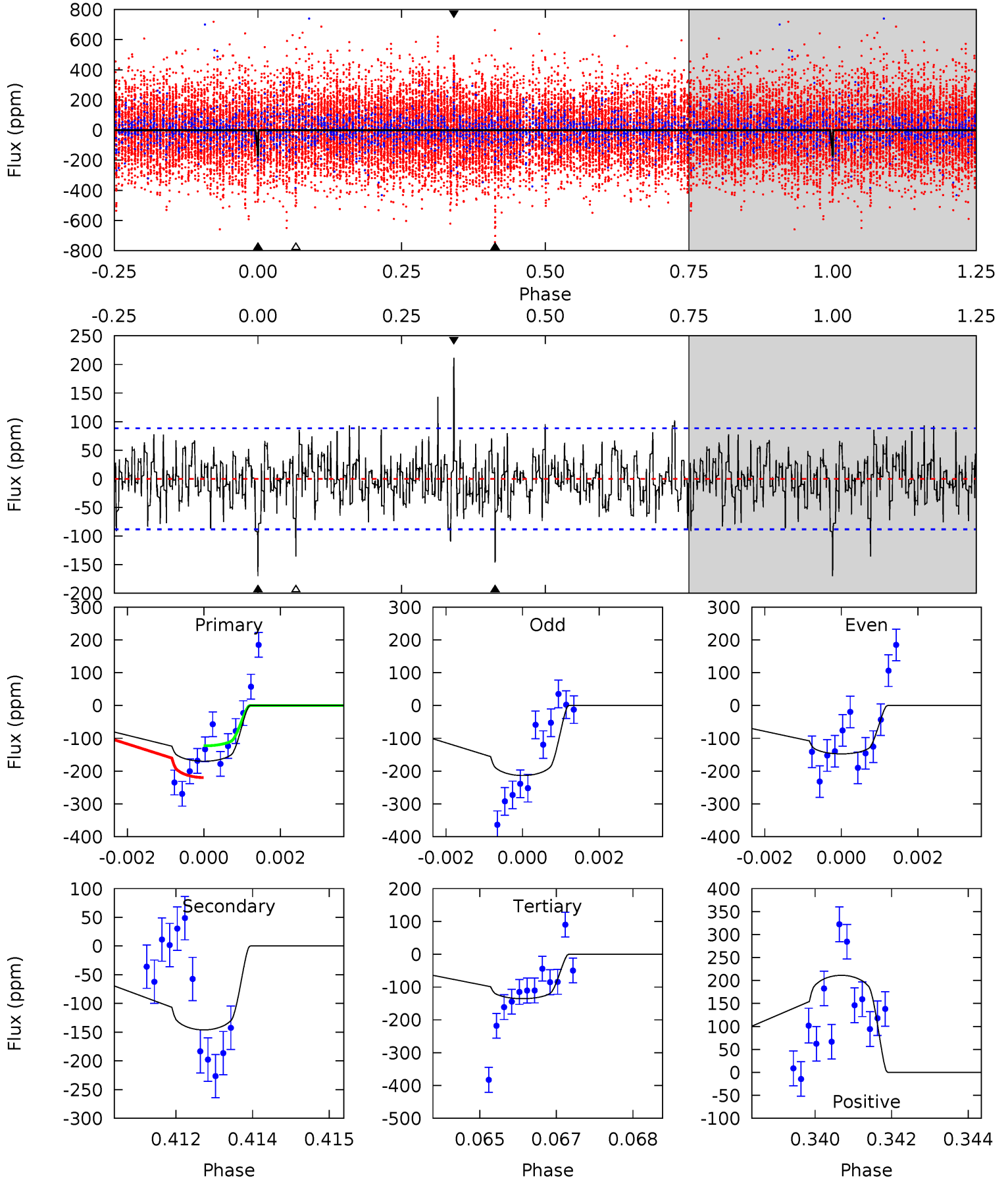
TCE 010646620-02 P=439.321540 Days $T_0=517.697602$ (BKJD)



DV Model-Shift Uniqueness Test

010646620-02, P = 439.264570 Days, E = 79.219817 Days

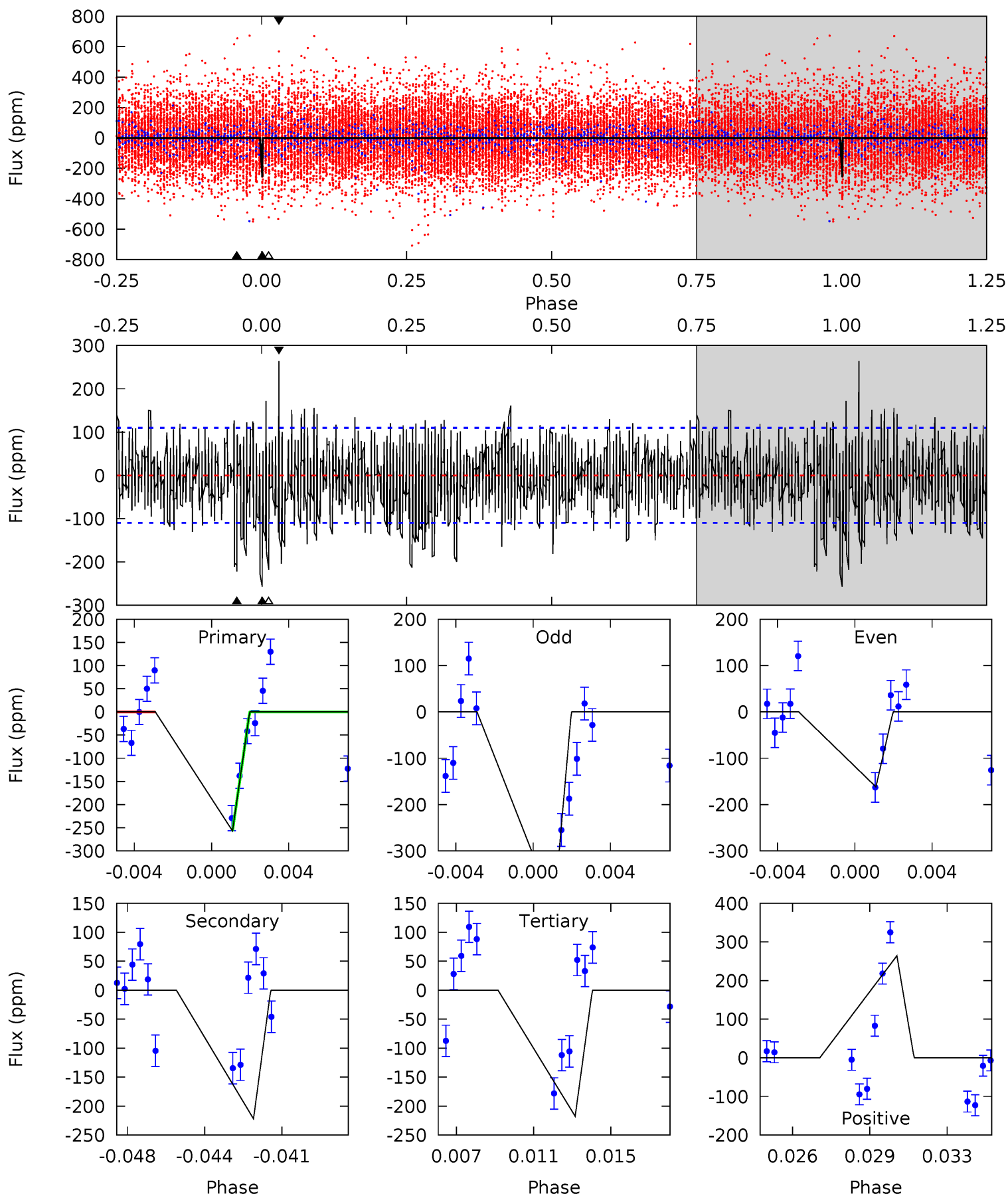
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	8.87	8.22	12.8	5.36	3.14	2.23	2.09	-2.51	0.64	-3.96	1.92	1.09	0.55	2.89



Alt Model-Shift Uniqueness Test

010646620-02, P = 439.321540 Days, E = 78.376062 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	10.5	10.3	12.5	5.21	2.90	2.62	1.87	-0.35	0.21	-2.01	5.90	0.65	0.51	0



Stellar Parameters For KIC 010646620

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6628^{+160}_{-180}	$3.783^{+0.312}_{-0.098}$	$-0.320^{+0.300}_{-0.250}$	$2.595^{+0.419}_{-0.978}$	$1.489^{+0.212}_{-0.344}$	$0.120^{+0.253}_{-0.038}$
	+2%/-3%	+8%/-3%	+94%/-78%	+16%/-38%	+14%/-23%	+211%/-31%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010646620-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-146 ± 16	$5.69^{+0.99}_{-1.12}$	567^{+35}_{-49}	5093^{+288}_{-275}	4214^{+1931}_{-1247}
Alt.	-222 ± 21	$5.56^{+0.93}_{-1.17}$	569^{+36}_{-51}	5700^{+372}_{-329}	6882^{+3363}_{-2063}

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

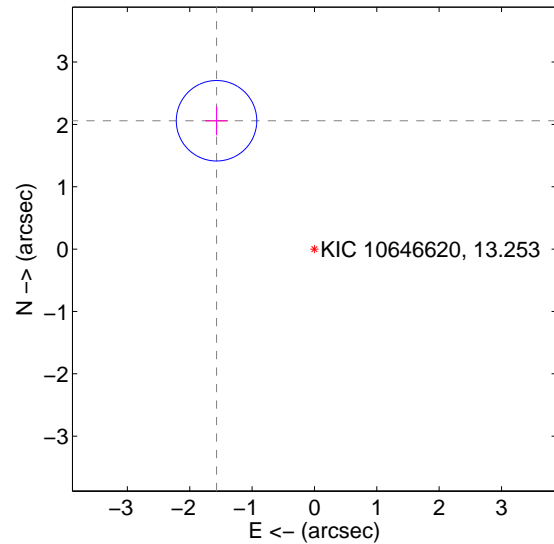
Supplemental centroid analysis for 010646620-02. Kepler magnitude: 13.25. Transit SNR 8.33

There are 0 quarters with good PRF difference image offsets

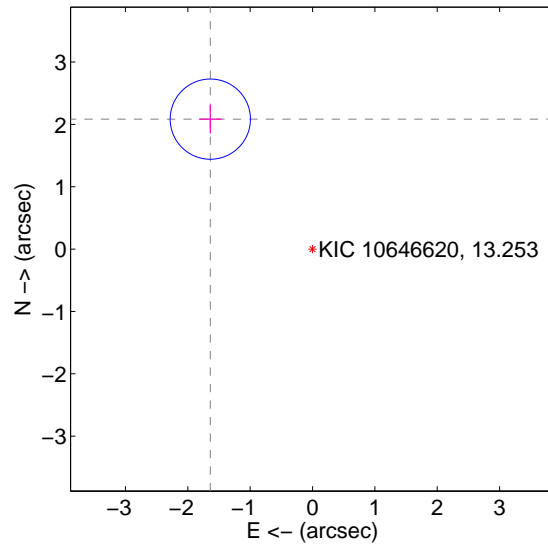
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.589 ± 0.215	12.04	1.570 ± 0.184	2.059 ± 0.232
PRF-fit source offset from KIC position	2.652 ± 0.214	12.36	1.639 ± 0.184	2.084 ± 0.232
photometric centroid source offset	0.29 ± 0.92	0.32	0.29 ± 0.92	-0.03 ± 0.80

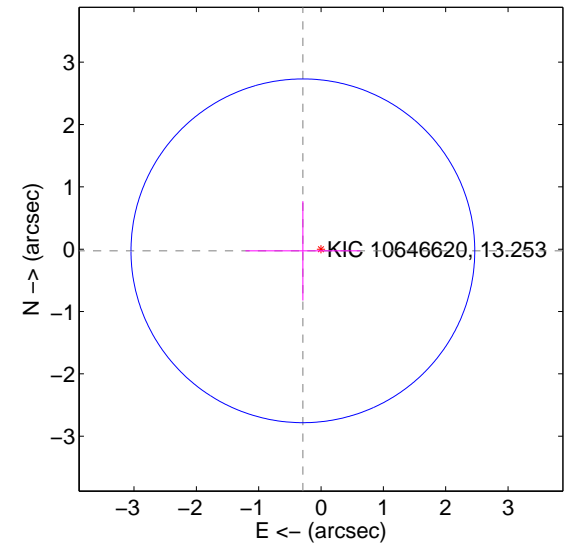
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

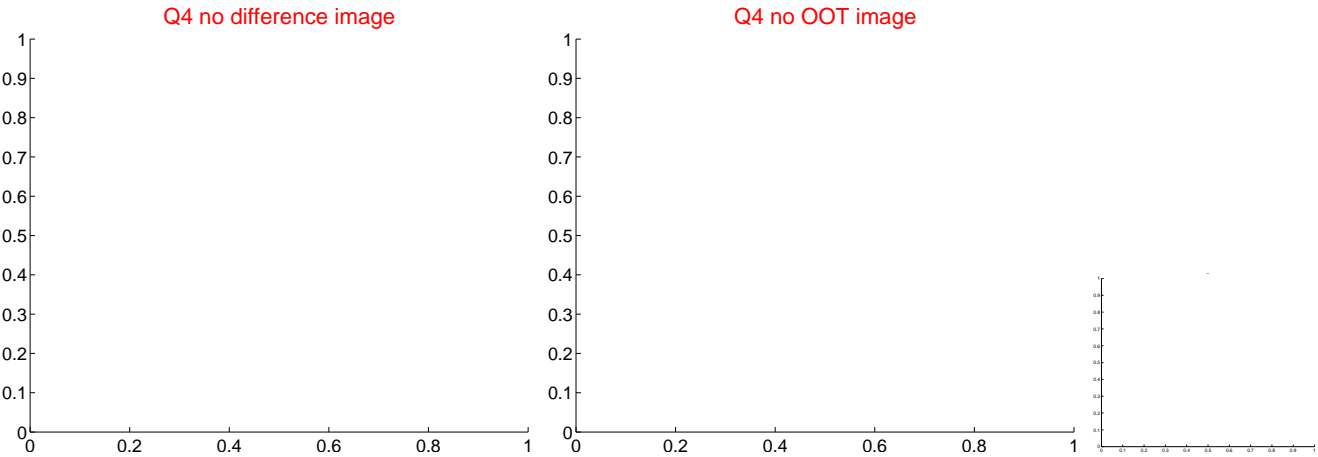
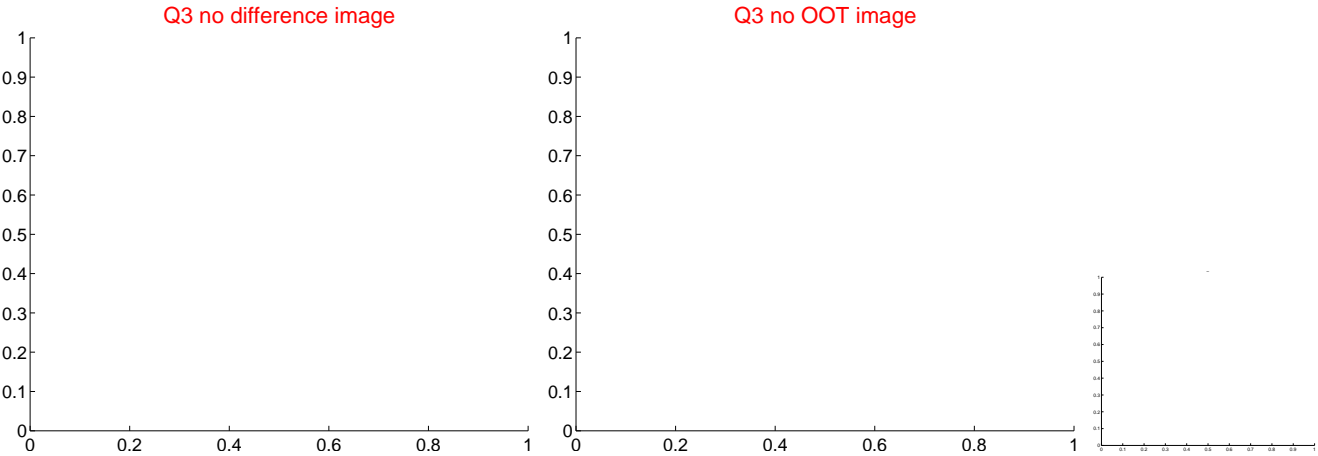
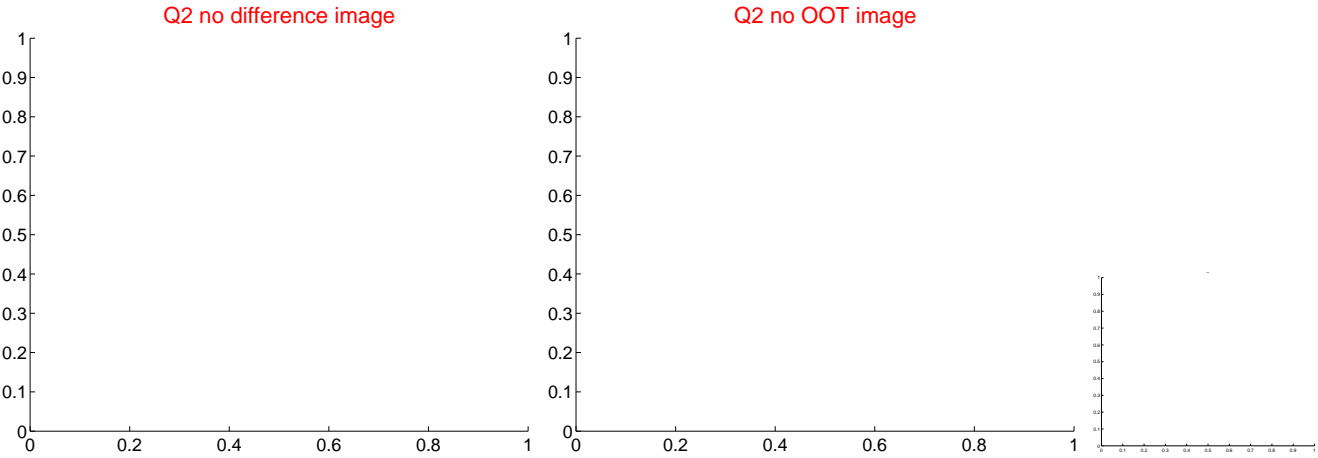
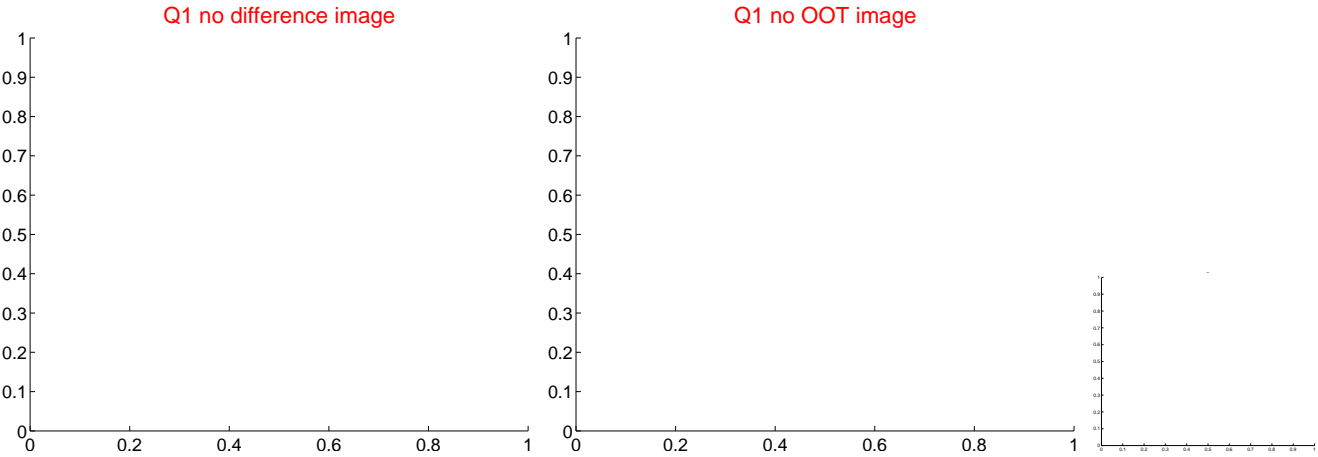


offset from photometric centroids

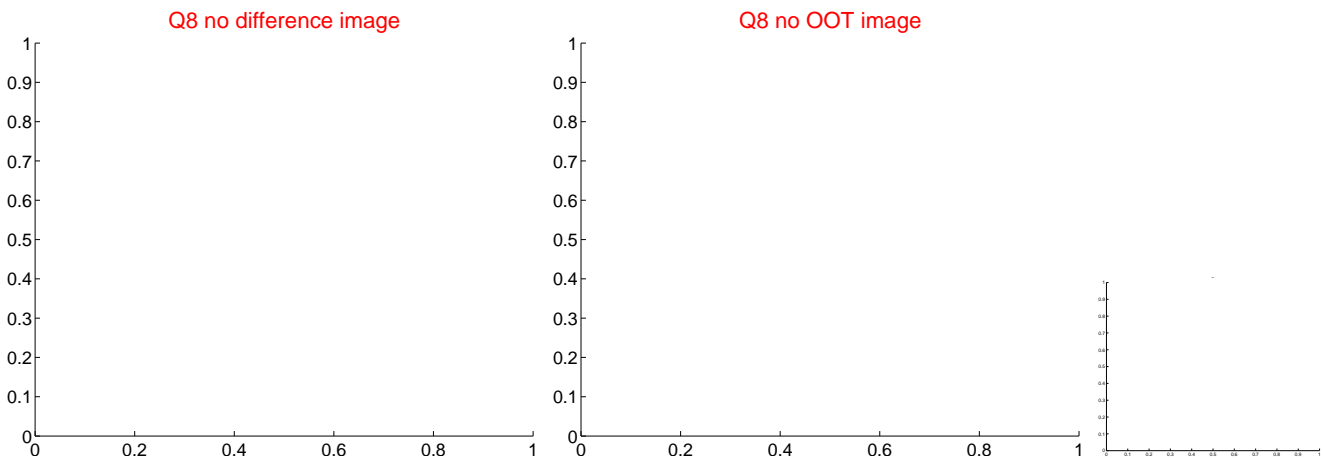
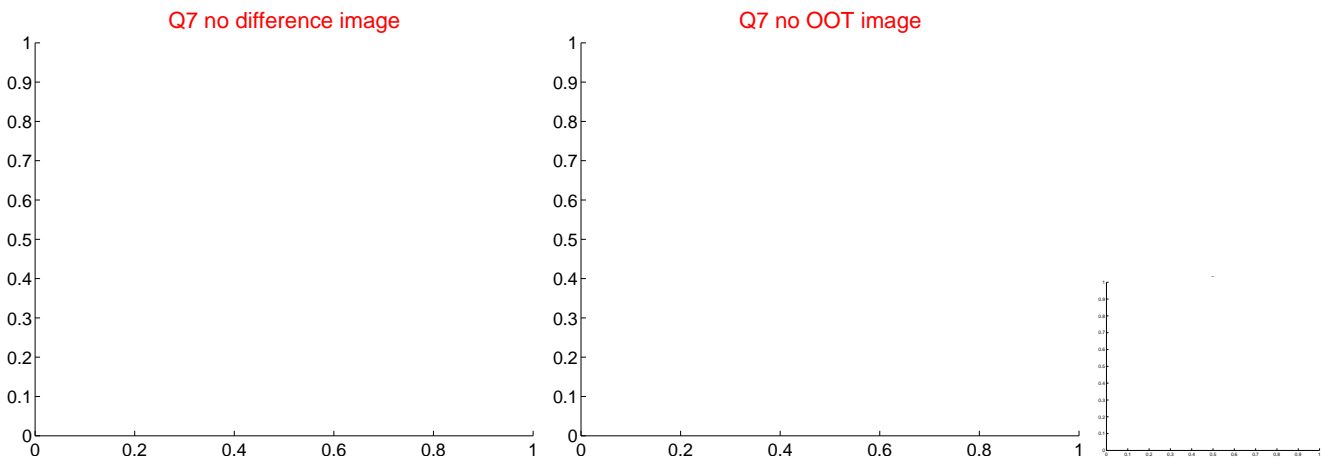
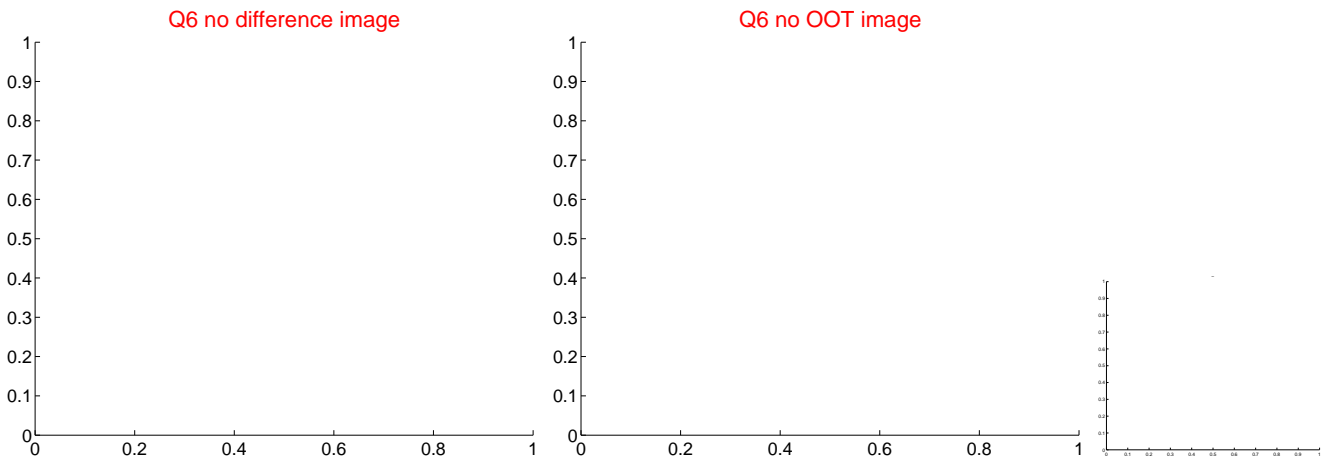
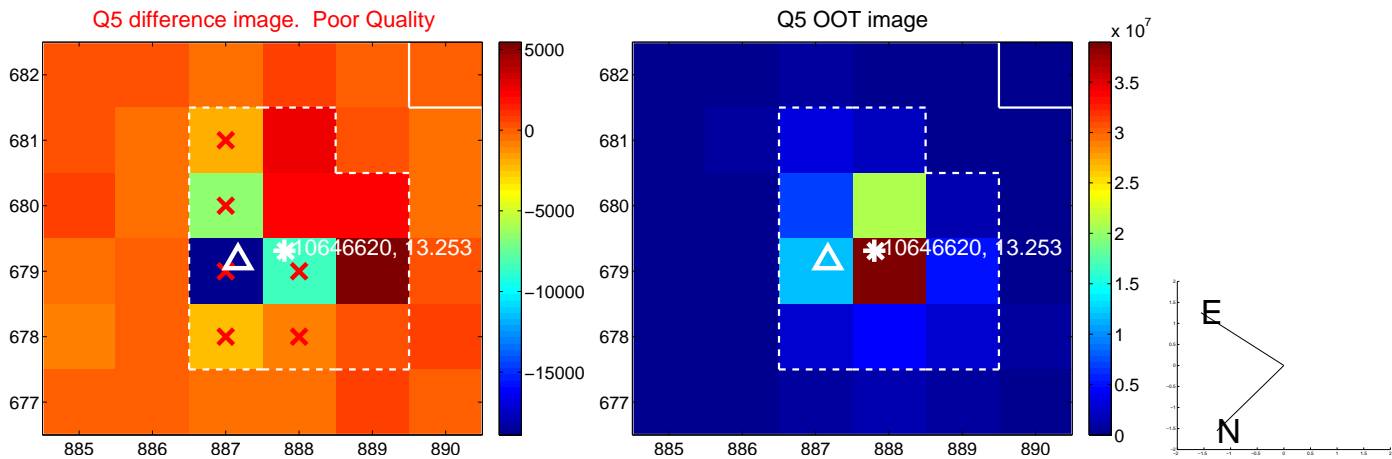


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

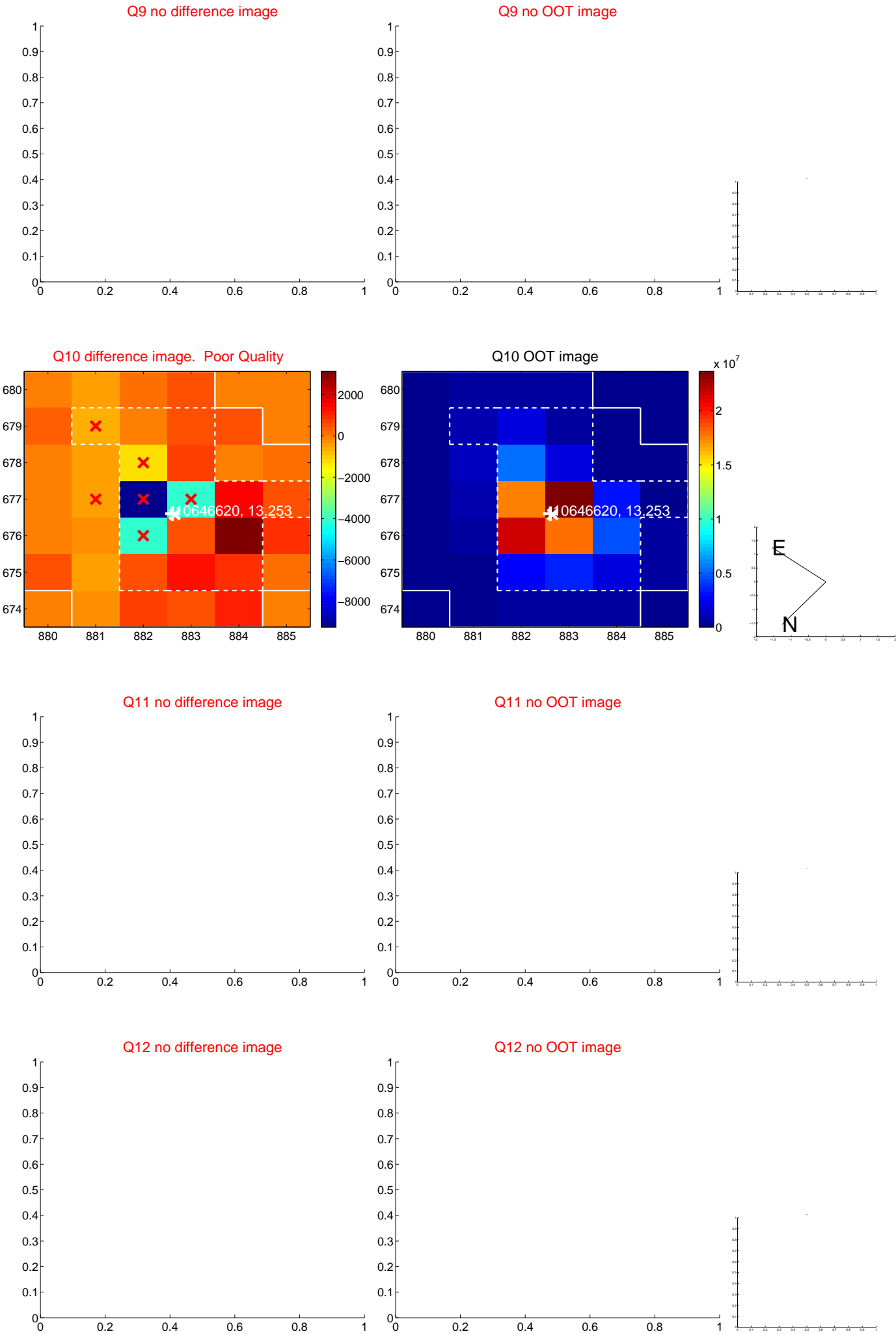
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



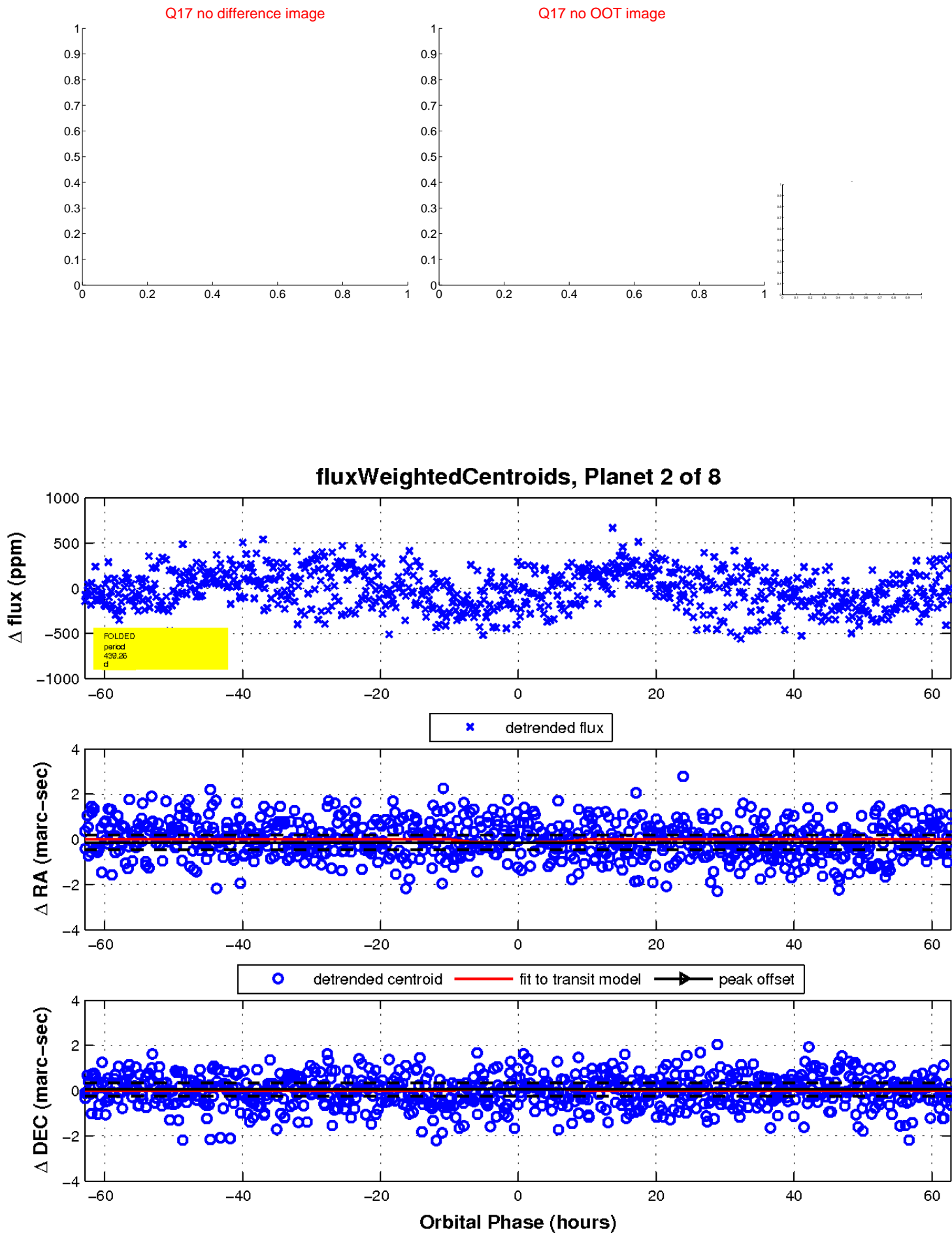
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

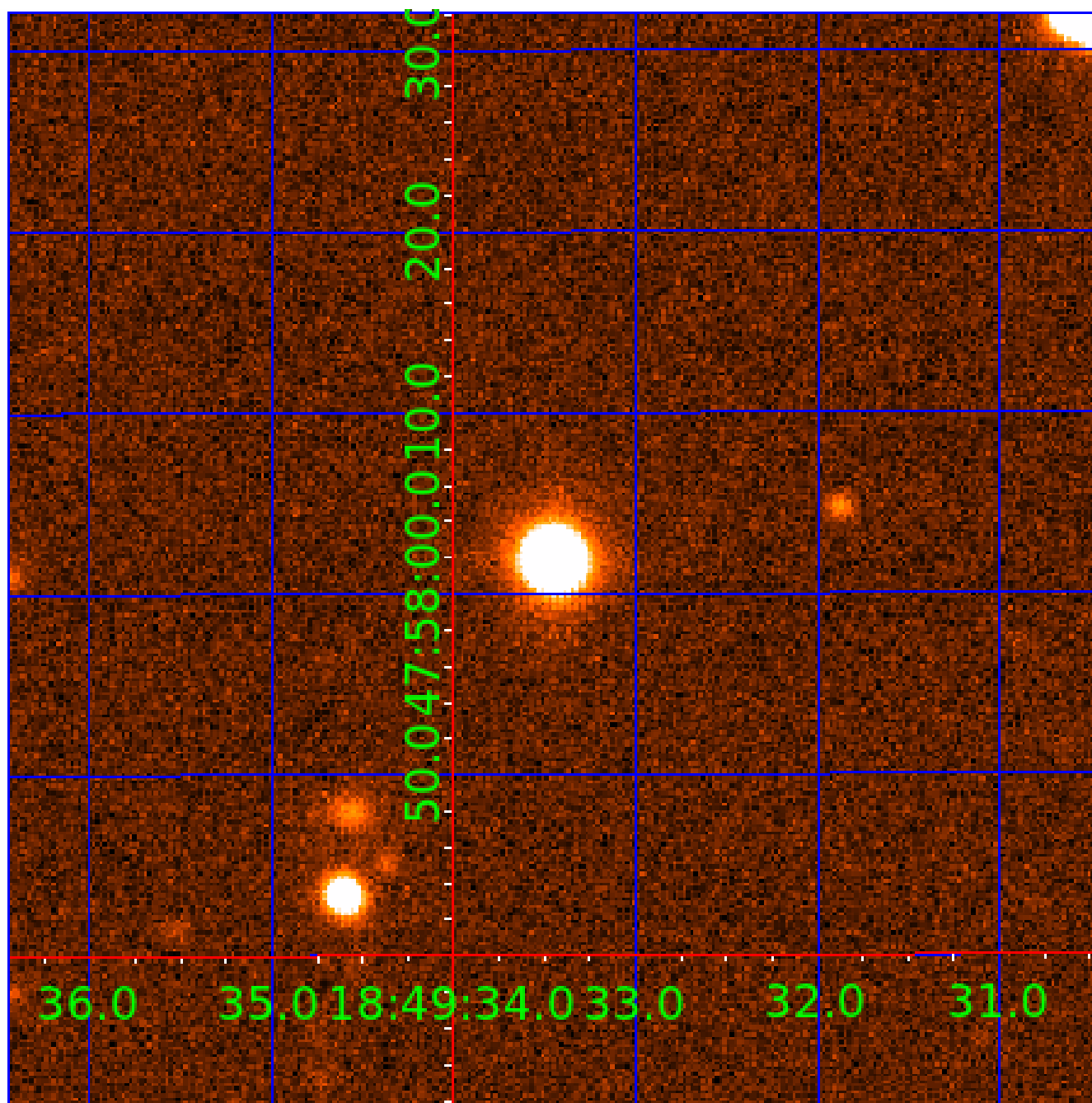


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010646620

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})
010646620-01	OBS	7352.01	2.413745	133.562364	30.4	13.034	8.8	9.9	2.60	6628	1.53	7193.29
010646620-02	OBS	No	439.264571	518.484387	347.9	20.978	9.7	8.3	2.60	6628	5.98	6.97
010646620-03	OBS	No	111.063930	154.308140	173.3	8.319	9.7	7.2	2.60	6628	3.92	43.63
010646620-05	OBS	No	166.284333	180.111872	257.2	7.447	9.3	8.6	2.60	6628	4.77	25.47
010646620-06	OBS	No	74.102175	201.659120	171.5	10.789	8.3	6.9	2.60	6628	3.82	74.83
010646620-08	OBS	No	111.645419	207.499050	224.2	2.810	7.3	7.6	2.60	6628	4.60	43.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010646620-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010646620-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010646620-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
010646620-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010646620-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010646620-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT

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.

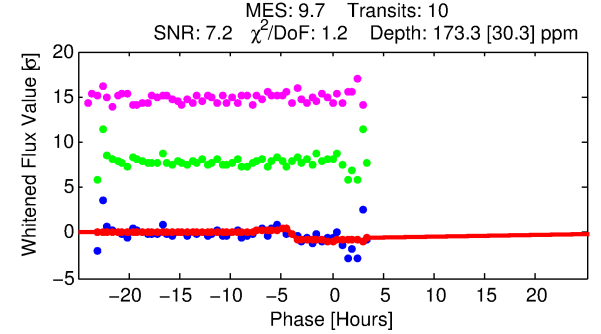
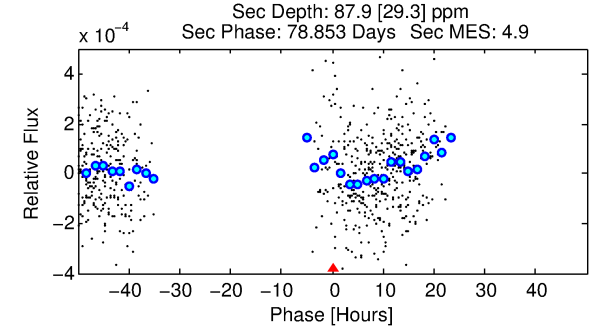
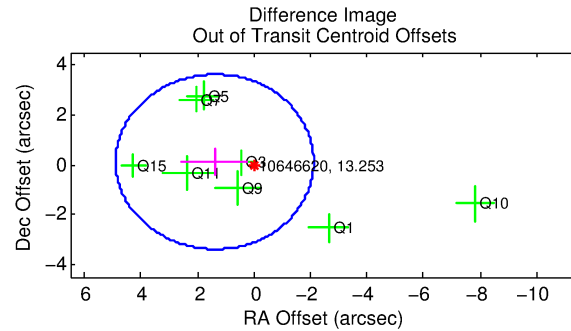
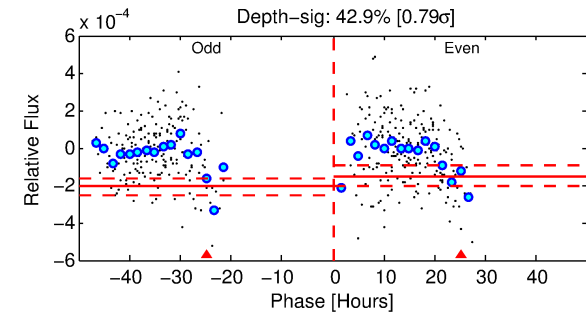
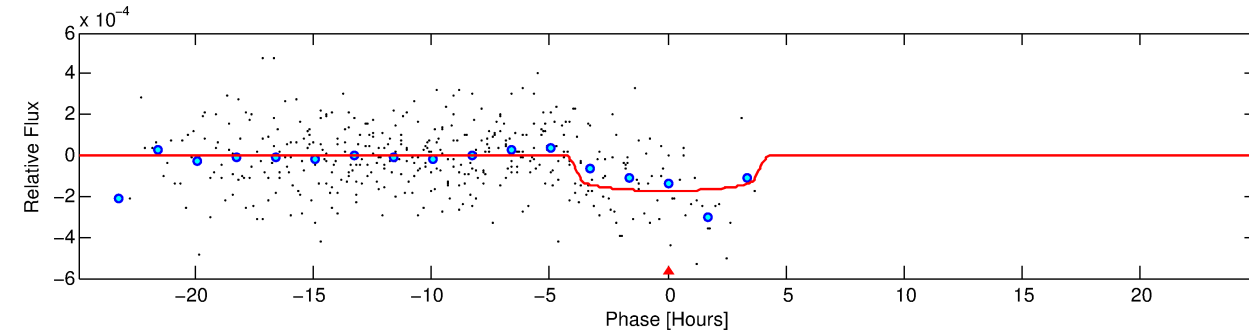
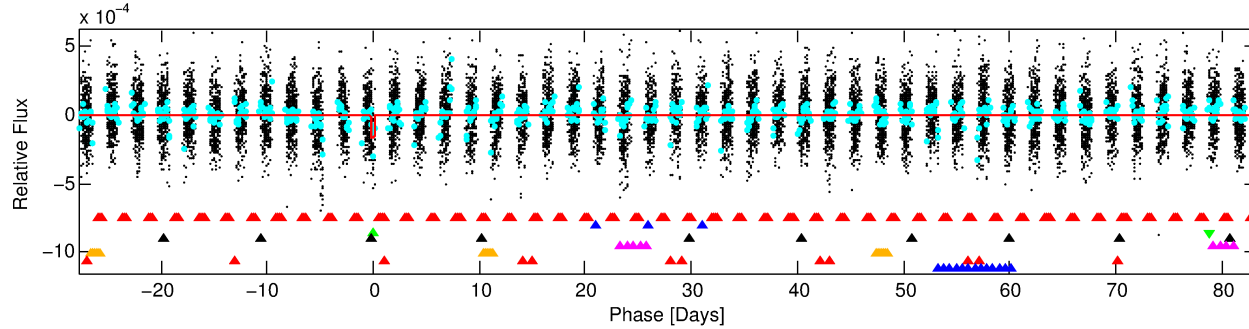
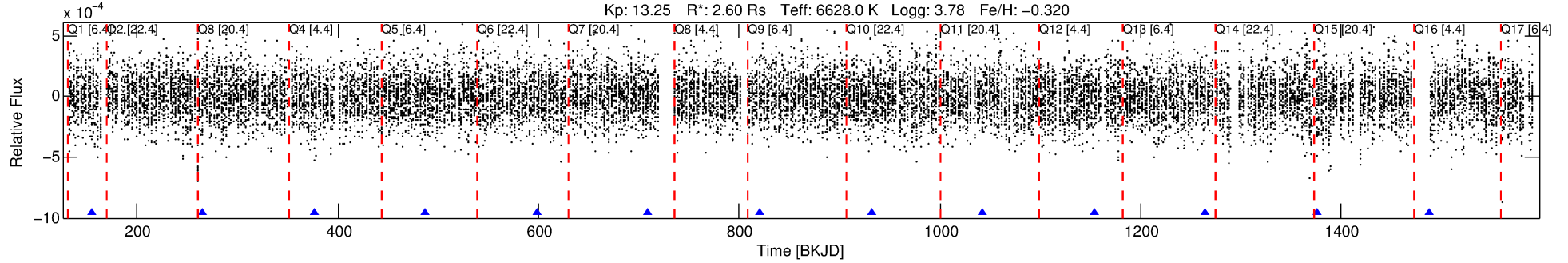
Ephemeris Match Information For 010646620-03

No Significant Match Found

DV One-Page Summary

KIC: 10646620 Candidate: 3 of 8 Period: 111.064 d
KOI: K07352 Corr: No Ephemeris Match

Kp: 13.25 R*: 2.60 Rs Teff: 6628.0 K Logg: 3.78 Fe/H: -0.320



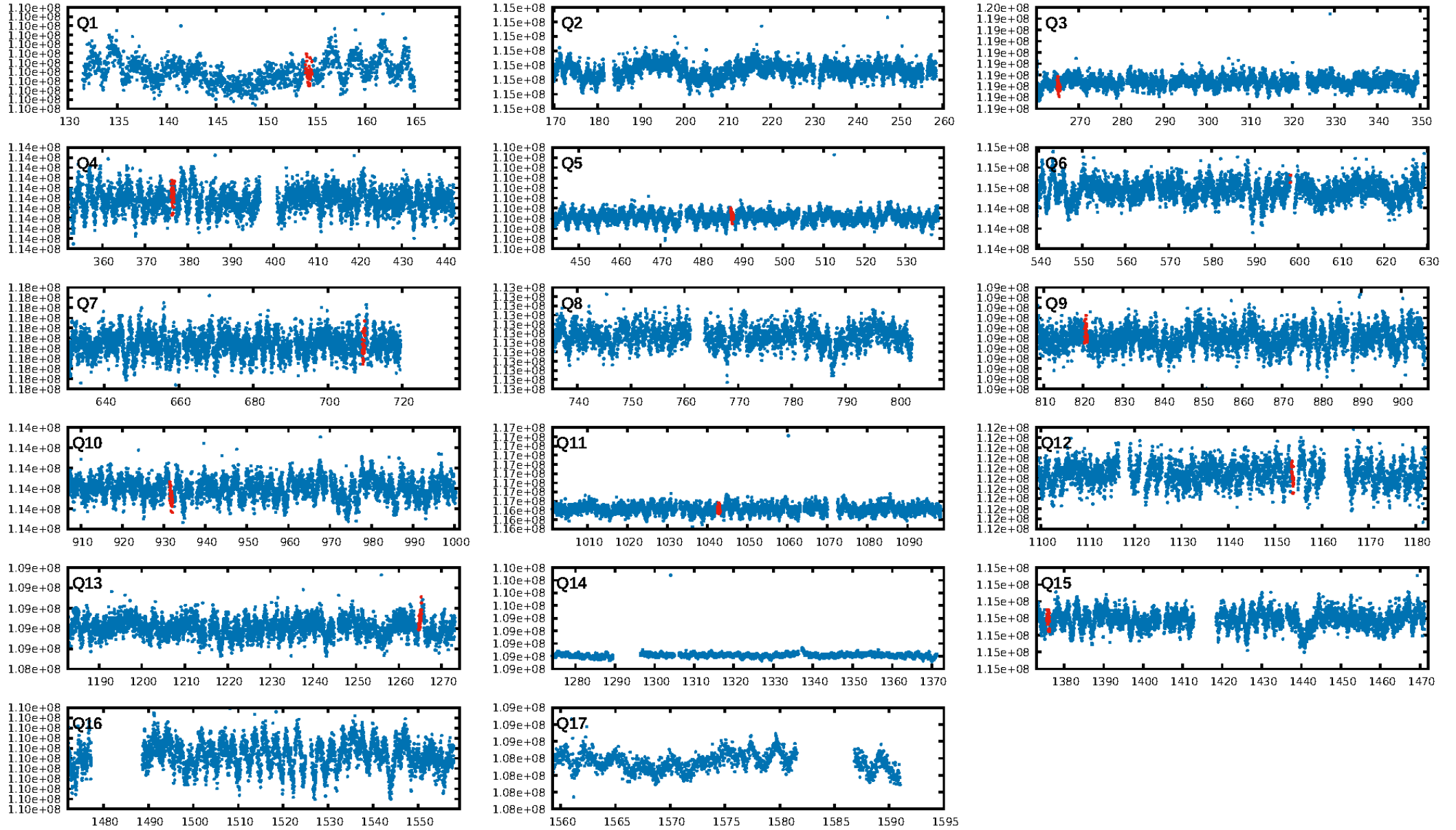
DV Fit Results:

Period = 111.06393 [0.00245] d
Epoch = 154.3081 [0.0203] BKJD
Rp/R* = 0.0138 [0.0036]
a/R* = 51.77 [72.14]
b = 0.88 [0.36]
Seff = 43.63 [24.07]
Teq = 655 [90] K
Rp = 3.92 [1.80] Re
a = 0.5166 [0.1793] AU
Ag = 840.54 [690.93] [1.22σ]
Teffp = 5456 [857] K [5.57σ]

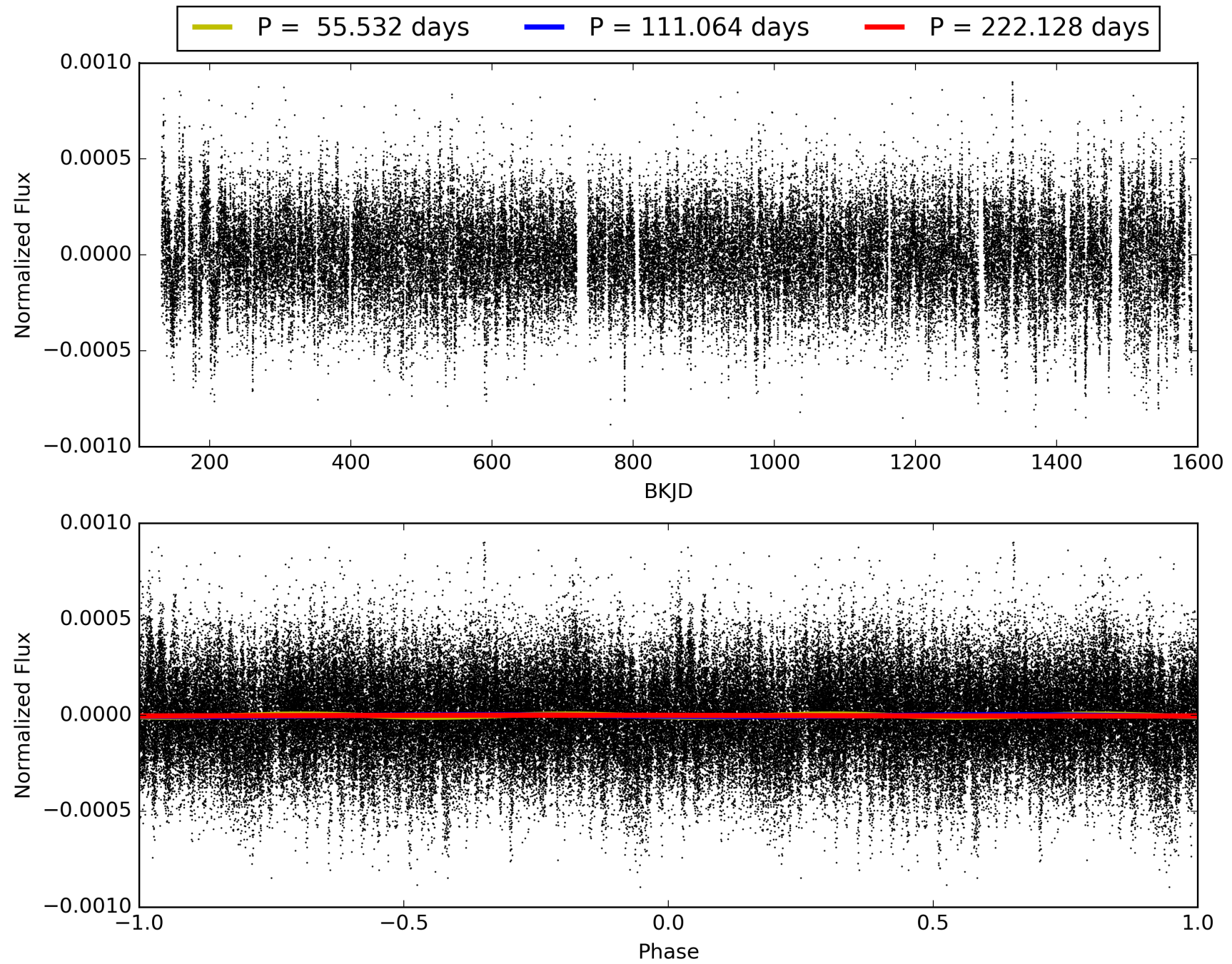
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [65.12σ]
LongPeriod-sig: 88.8% [1.59σ]
ModelChiSquare2-sig: 7.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.98e-10
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: 4.209
Centroid-sig: 2.0%
Centroid-so: 2.059 arcsec [1.93σ]
OotOffset-rm: 1.393 arcsec [1.19σ]
OotOffset-st: 1/4/0/3 [8]
KicOffset-rm: 1.481 arcsec [1.10σ]
KicOffset-st: 1/4/0/3 [8]
DiffImageQuality-fgm: 0.50 [4/8]
DiffImageOverlap-fno: 0.20 [2/10]

TCE 010646620-03, PDC Light Curves

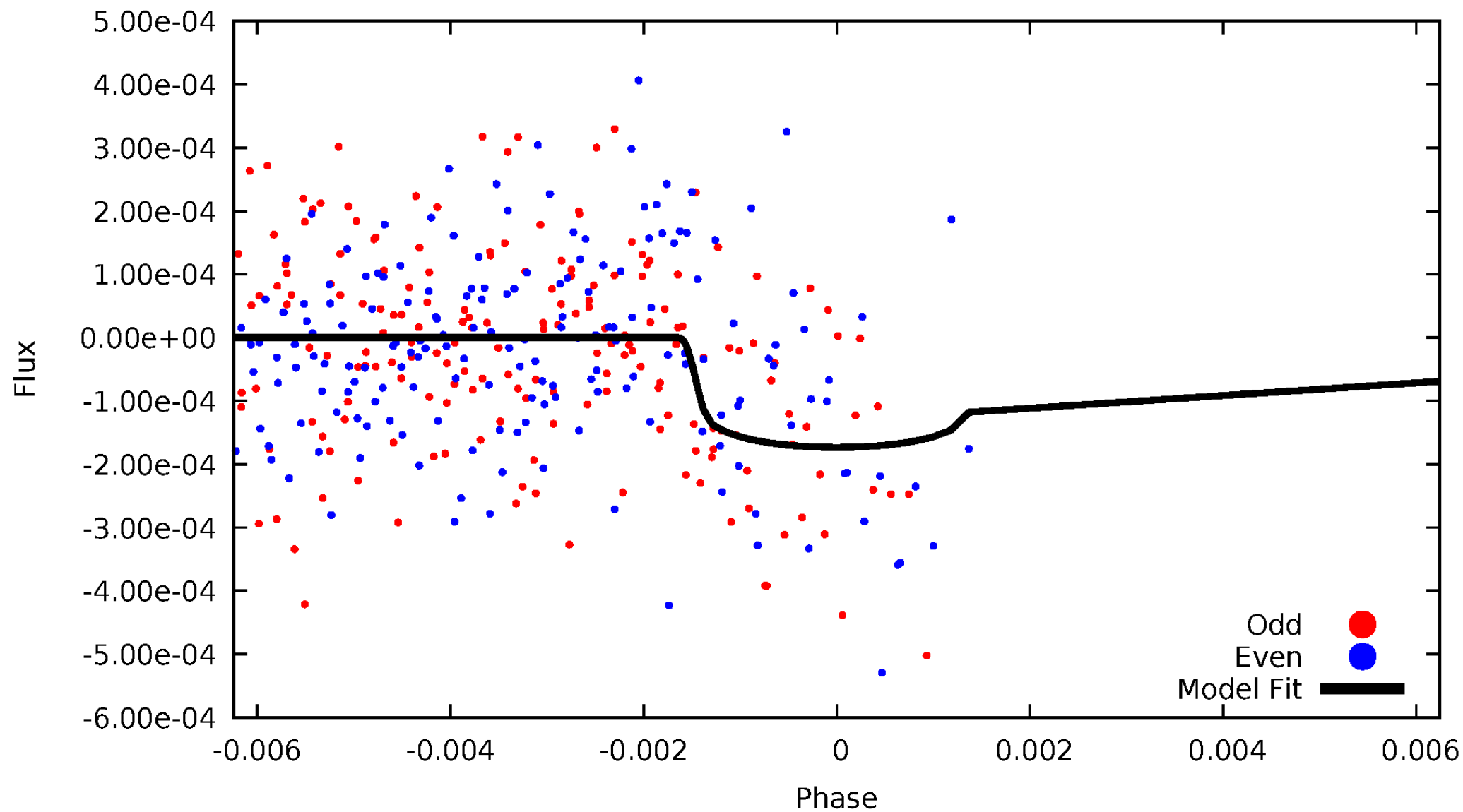


TCE 010646620-03



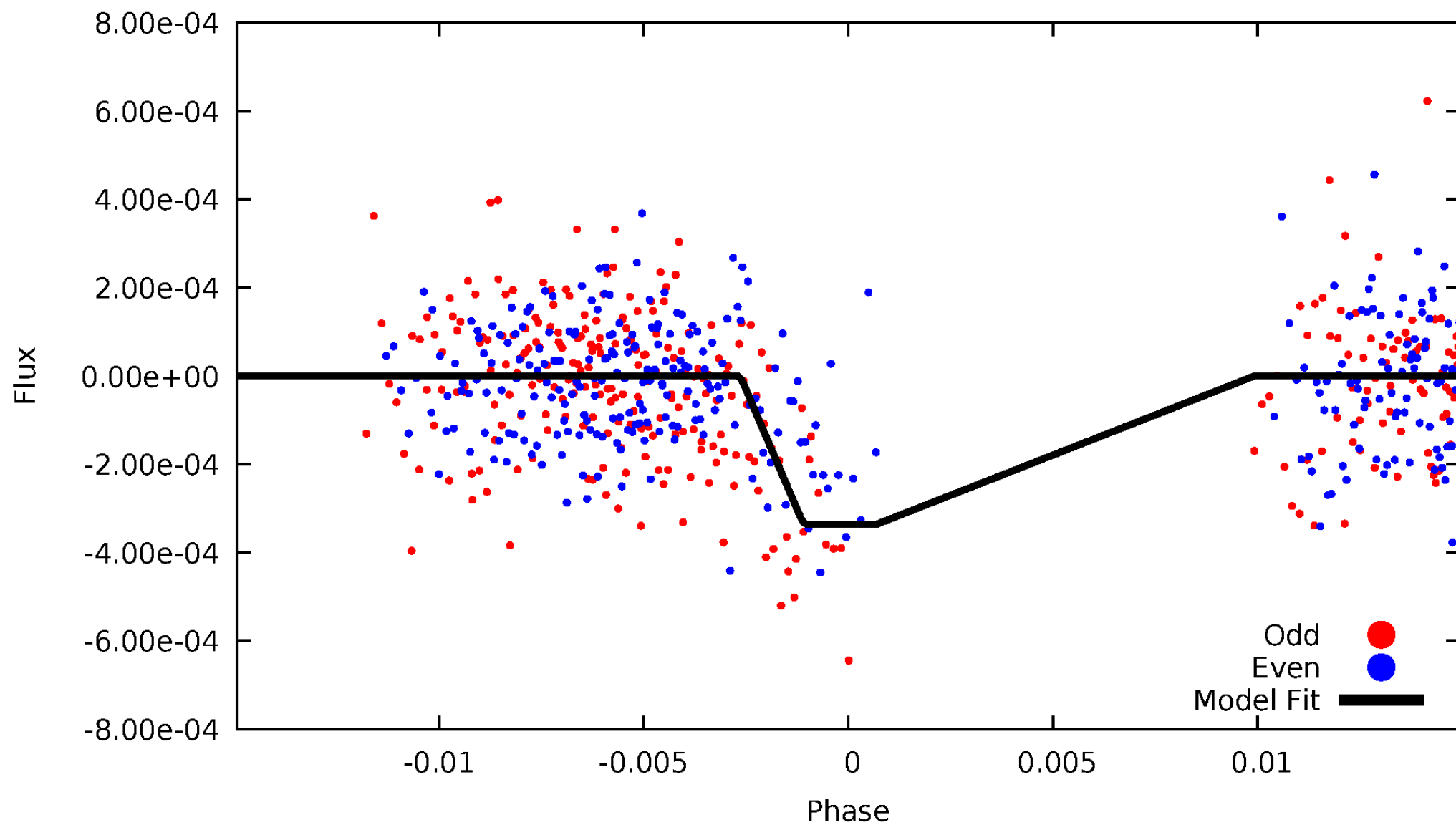
DV Odd/Even

TCE 010646620-03

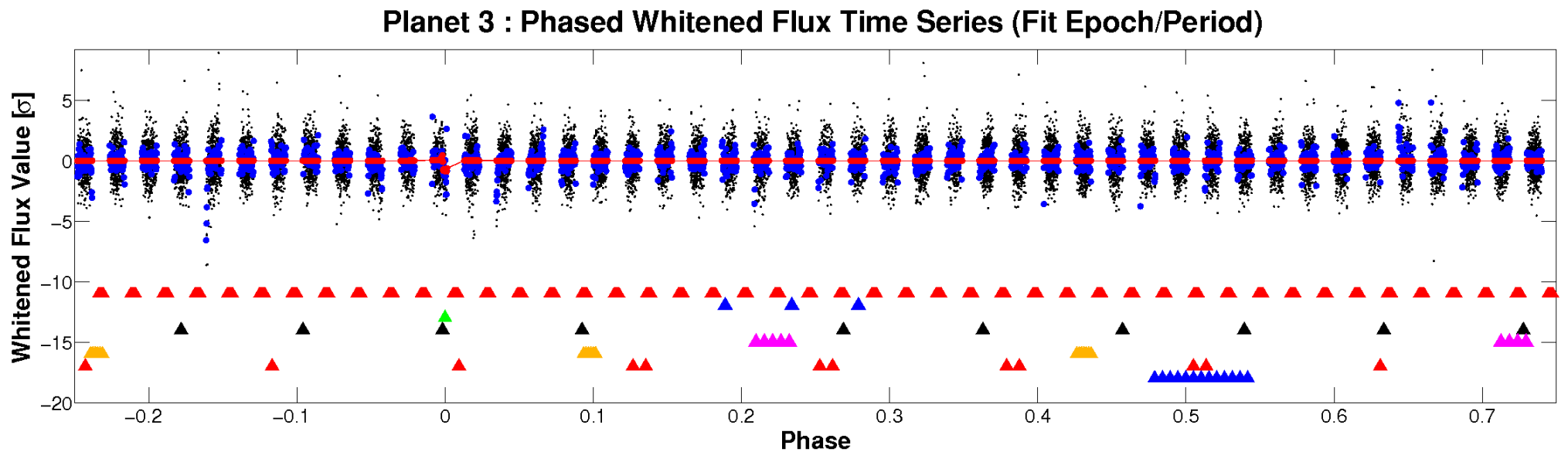
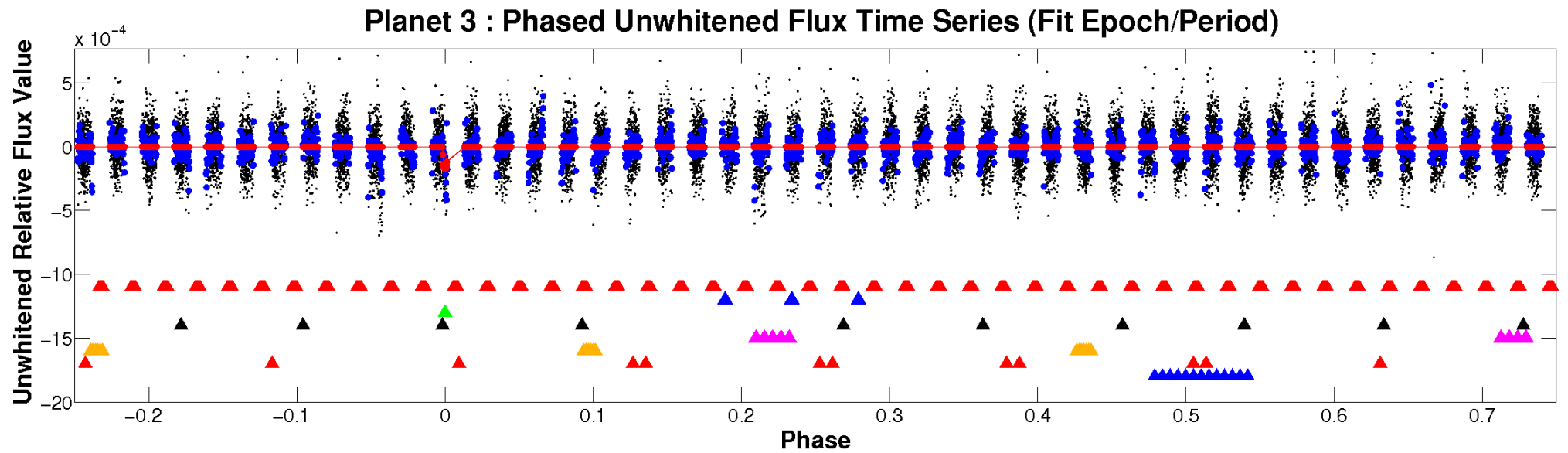


ALT Odd/Even

TCE 010646620-03

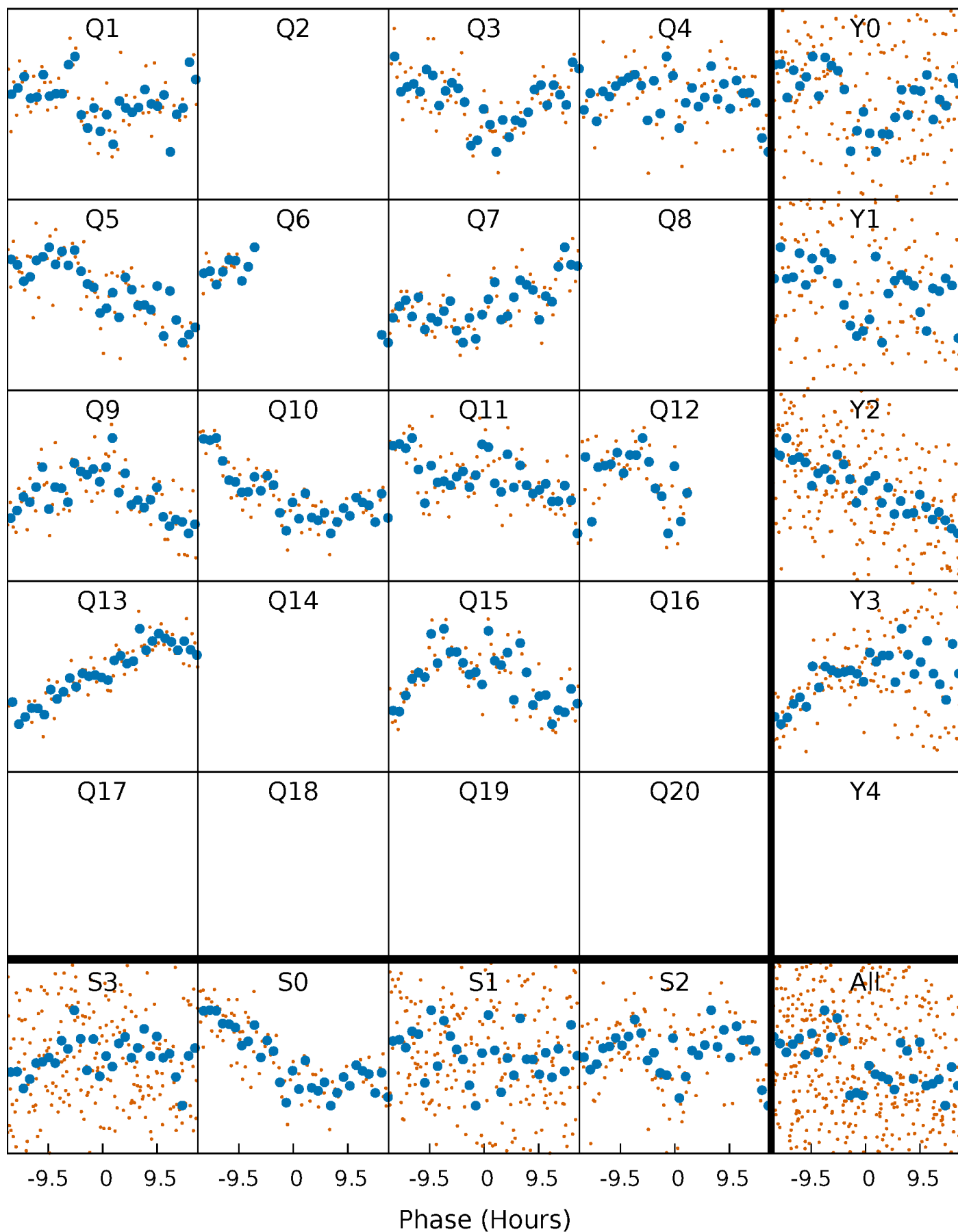


Non-Whitened Vs. Whitened Light Curve



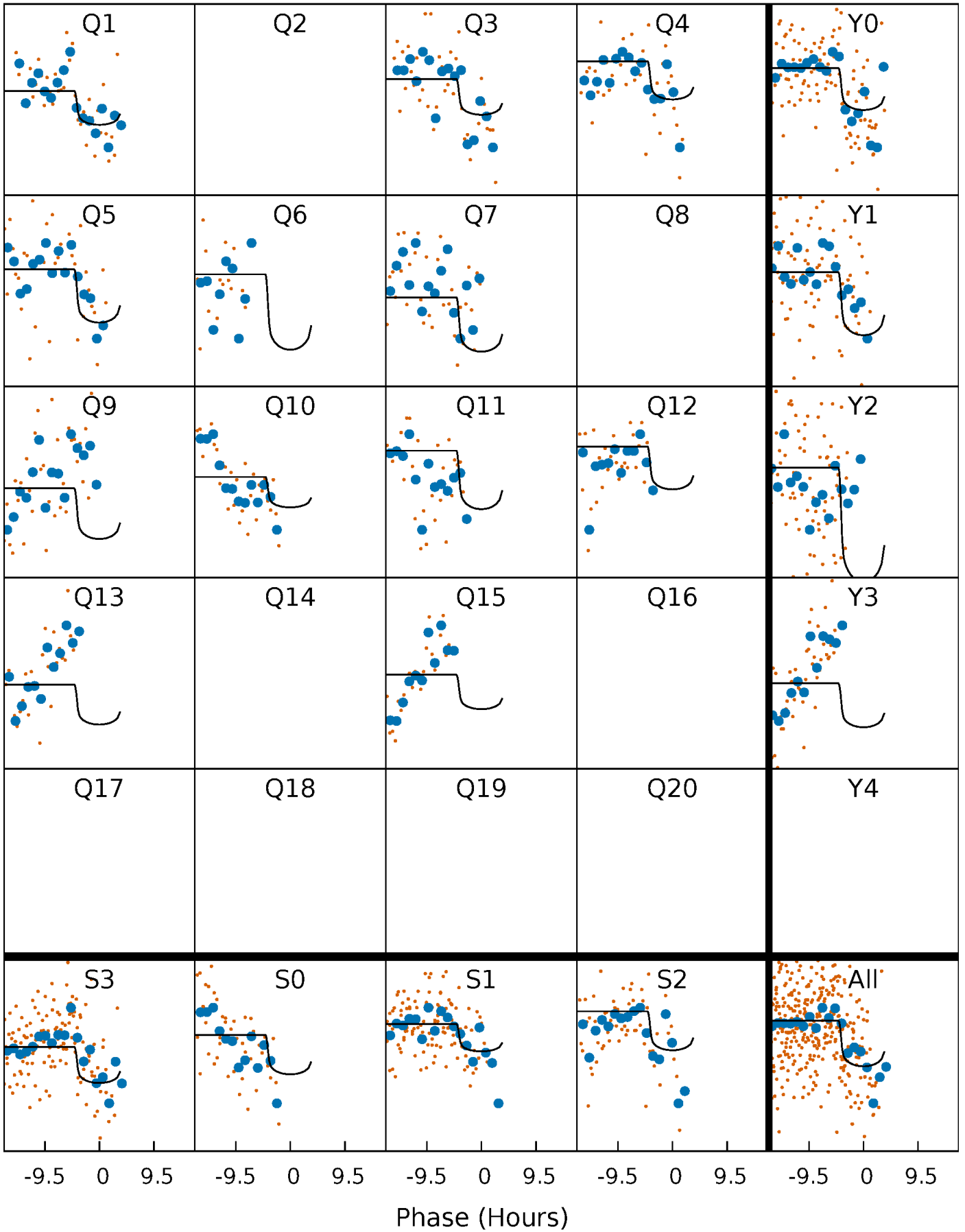
PDC Quarter-Phased Transit Curves

TCE 010646620-03 P=111.063930 Days $T_0=154.308140$ (BKJD)



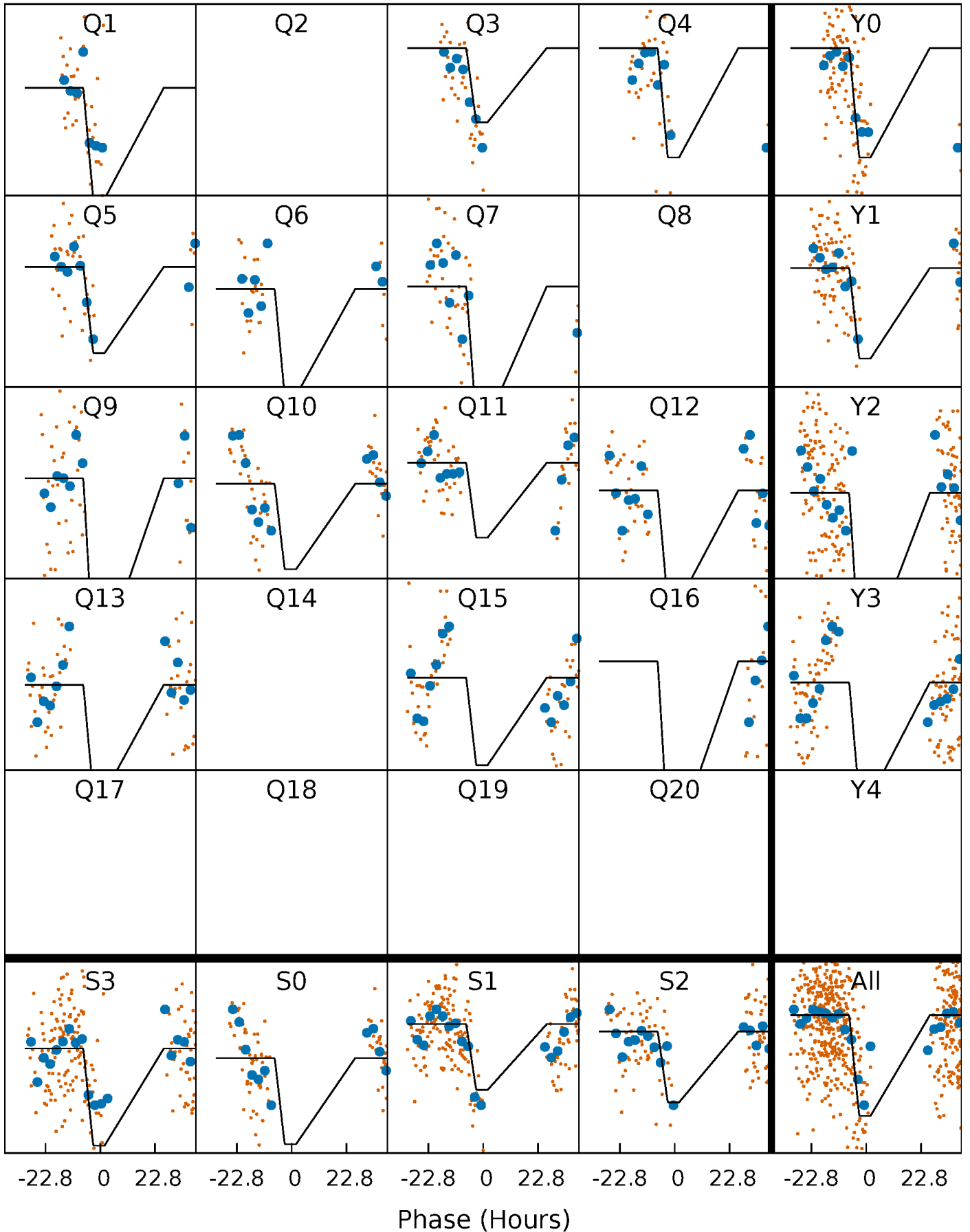
DV Quarter-Phased Transit Curves

TCE 010646620-03 $P=111.063930$ Days $T_0=154.308140$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

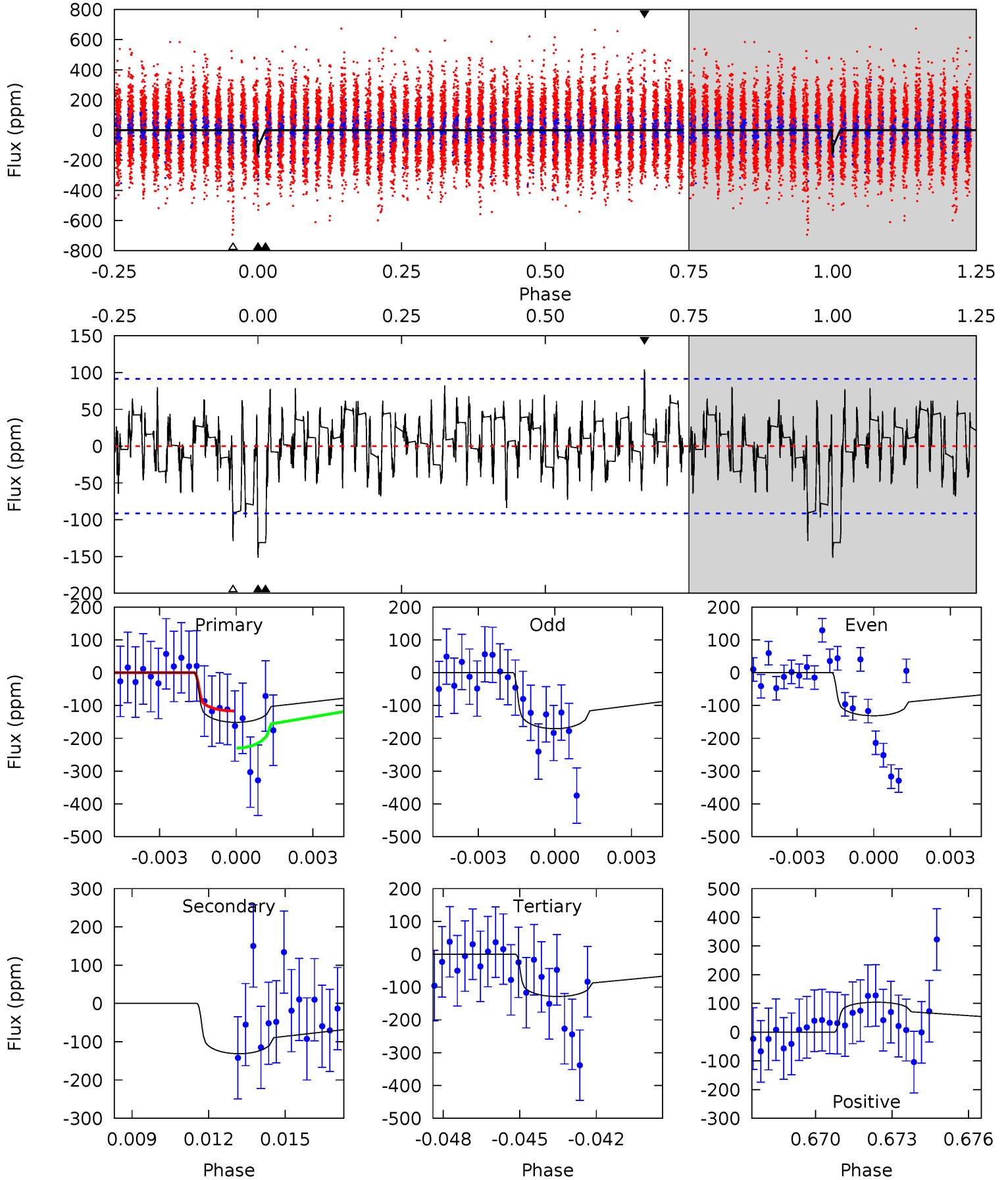
TCE 010646620-03 P=111.089493 Days $T_0=154.384963$ (BKJD)



DV Model-Shift Uniqueness Test

010646620-03, P = 111.063930 Days, E = 43.244210 Days

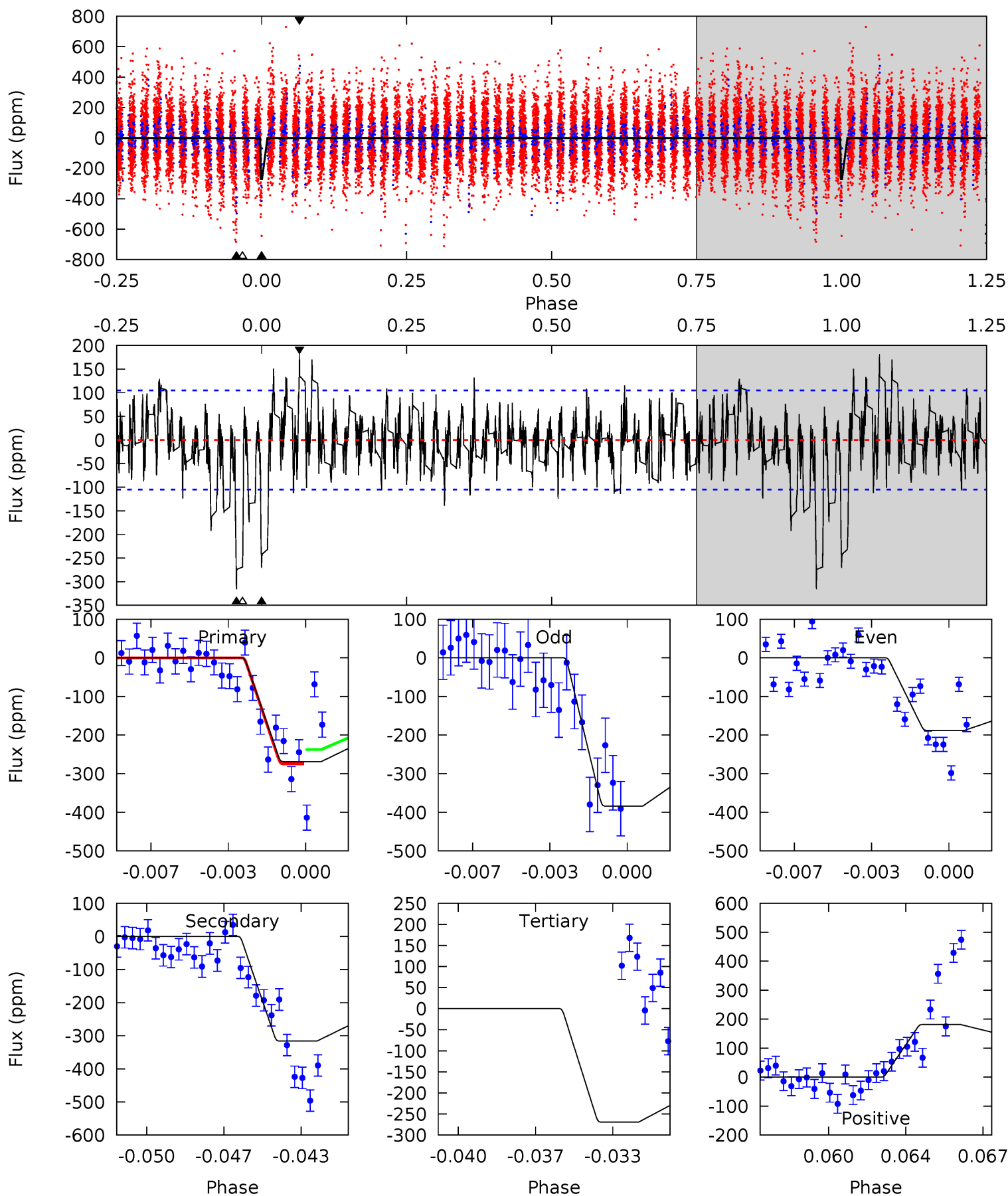
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.69	7.53	7.40	5.99	5.25	2.97	1.78	1.30	2.70	0.14	1.54	1.15	0.82	0.41	2.80



Alt Model-Shift Uniqueness Test

010646620-03, P = 111.089493 Days, E = 43.295470 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.4	15.8	13.4	9.06	5.23	2.93	2.09	-0.01	4.35	2.33	6.69	4.87	1.07	0.37	0.46



Stellar Parameters For KIC 010646620

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6628^{+160}_{-180}	$3.783^{+0.312}_{-0.098}$	$-0.320^{+0.300}_{-0.250}$	$2.595^{+0.419}_{-0.978}$	$1.489^{+0.212}_{-0.344}$	$0.120^{+0.253}_{-0.038}$
	+2%/-3%	+8%/-3%	+94%/-78%	+16%/-38%	+14%/-23%	+211%/-31%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010646620-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-131 ± 17	$3.67^{+1.21}_{-1.10}$	901^{+54}_{-80}	6045^{+1067}_{-709}	1434^{+1396}_{-647}
Alt.	-316 ± 20	$4.92^{+1.24}_{-1.28}$	898^{+52}_{-80}	6503^{+854}_{-590}	1958^{+1462}_{-716}

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

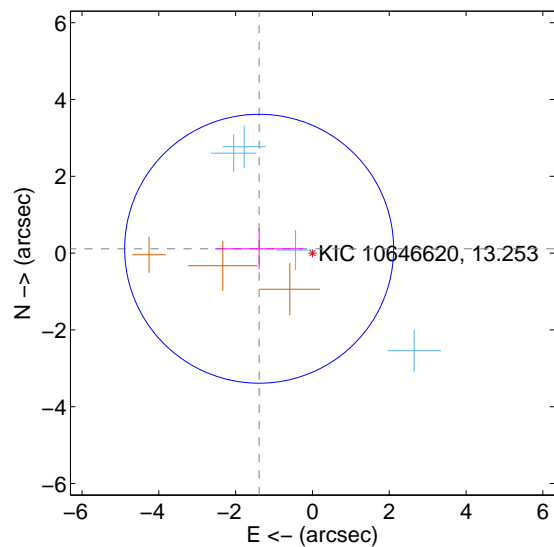
Supplemental centroid analysis for 010646620-03. Kepler magnitude: 13.25. Transit SNR 7.24

There are 4 quarters with good PRF difference image offsets

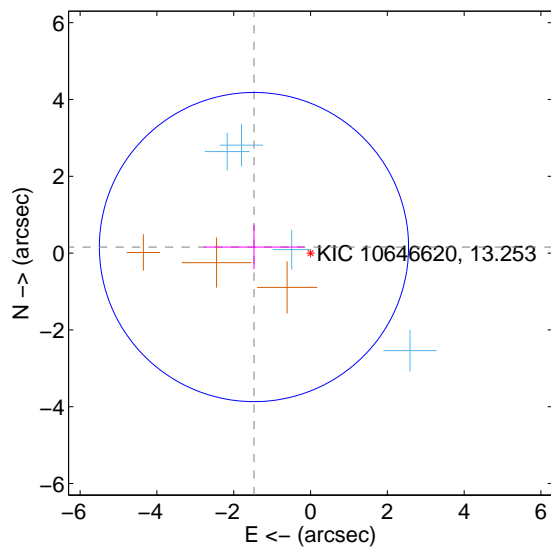
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.393 ± 1.167	1.19	1.388 ± 1.145	0.113 ± 0.532
PRF-fit source offset from KIC position	1.481 ± 1.342	1.10	1.473 ± 1.313	0.158 ± 0.577
photometric centroid source offset	2.06 ± 1.06	1.93	-1.86 ± 1.09	-0.88 ± 0.92

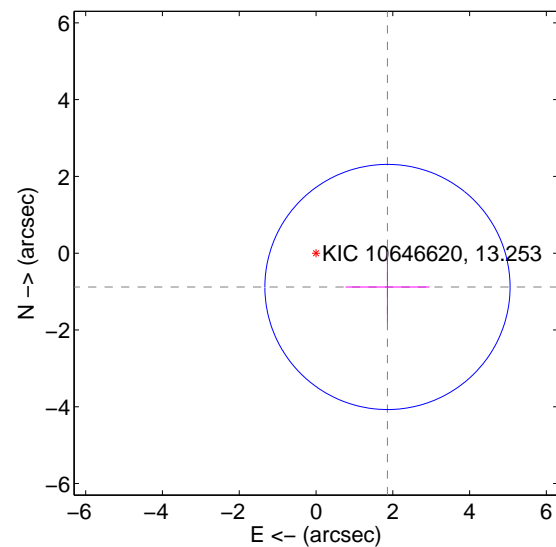
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

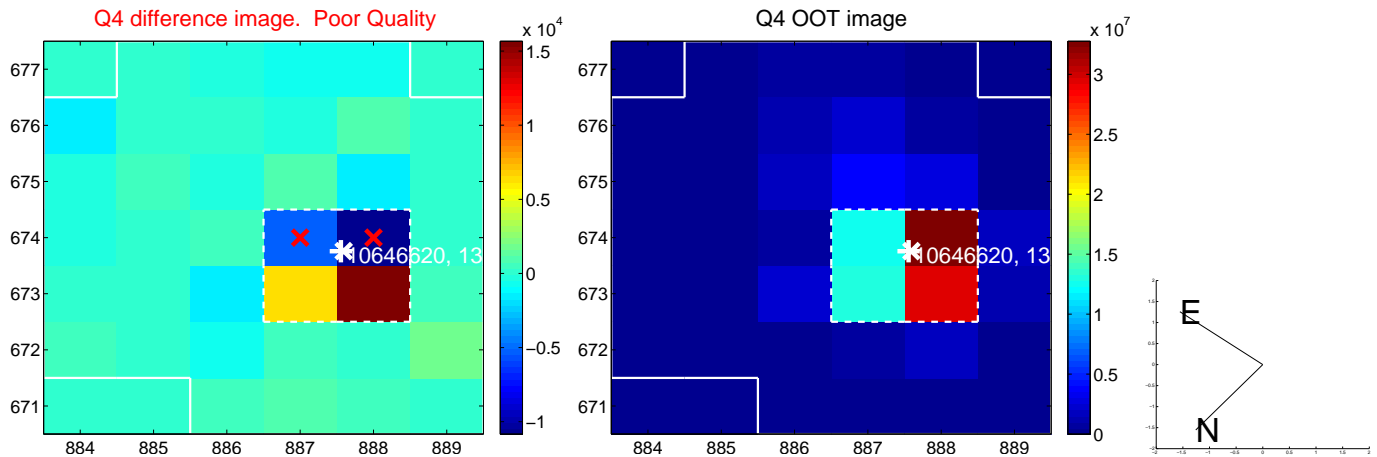
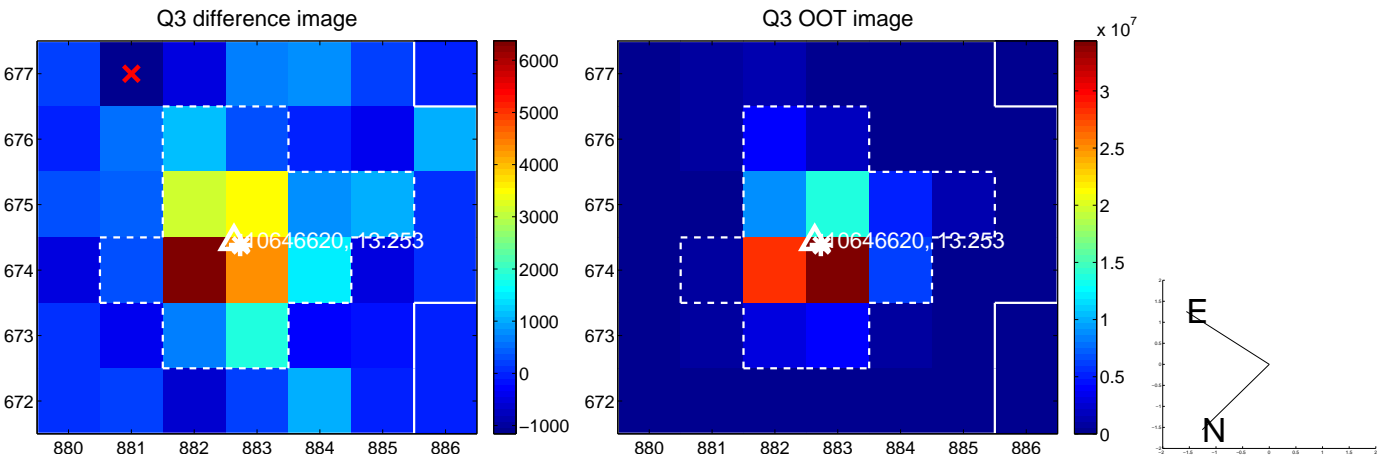
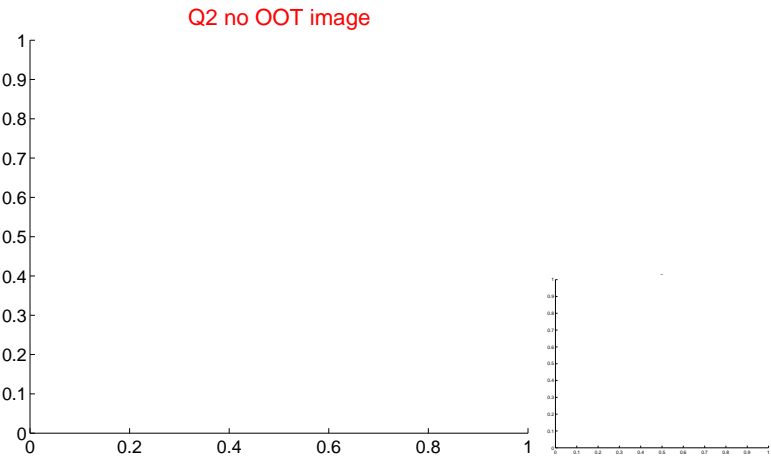
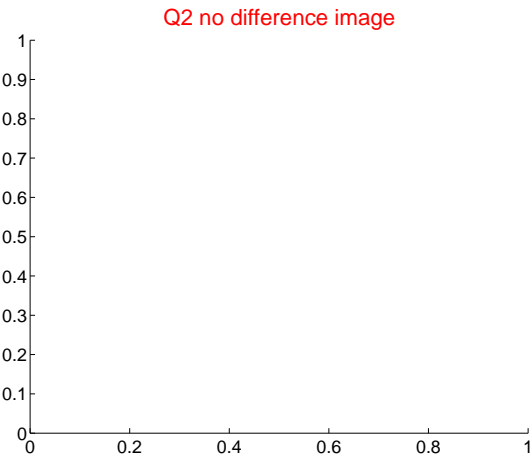
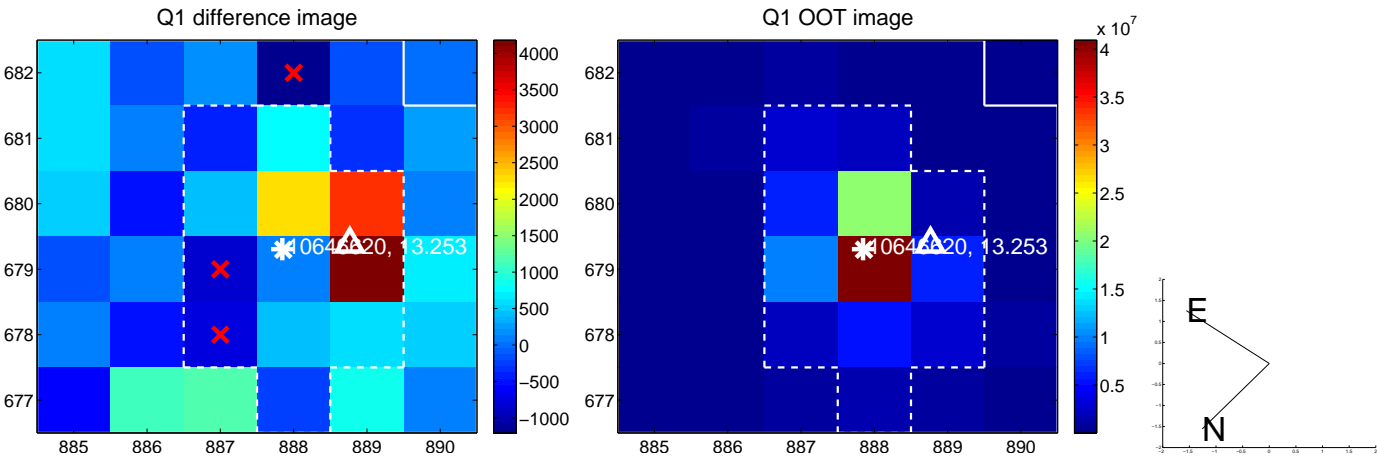


offset from photometric centroids

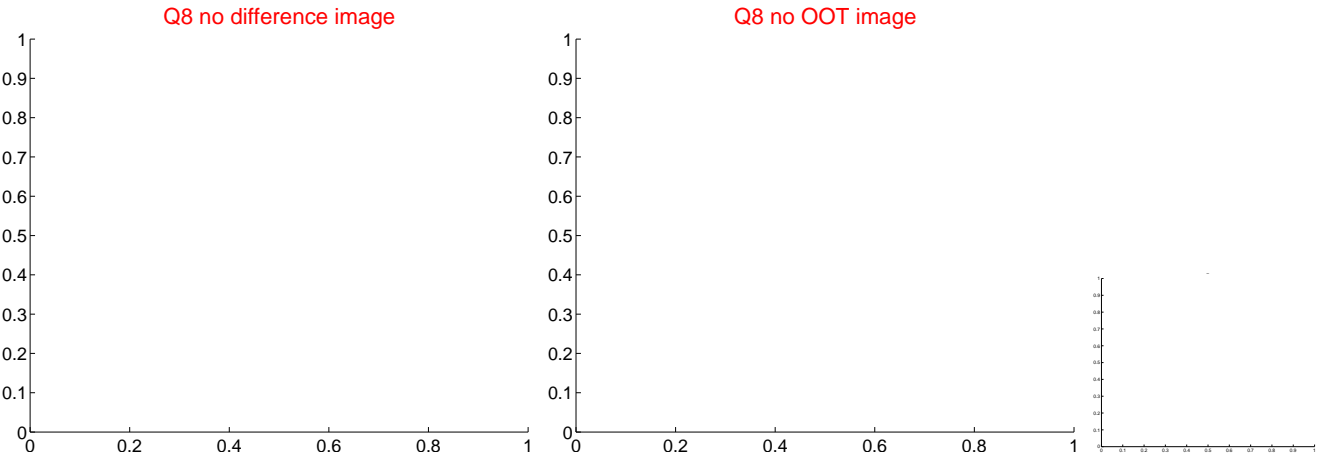
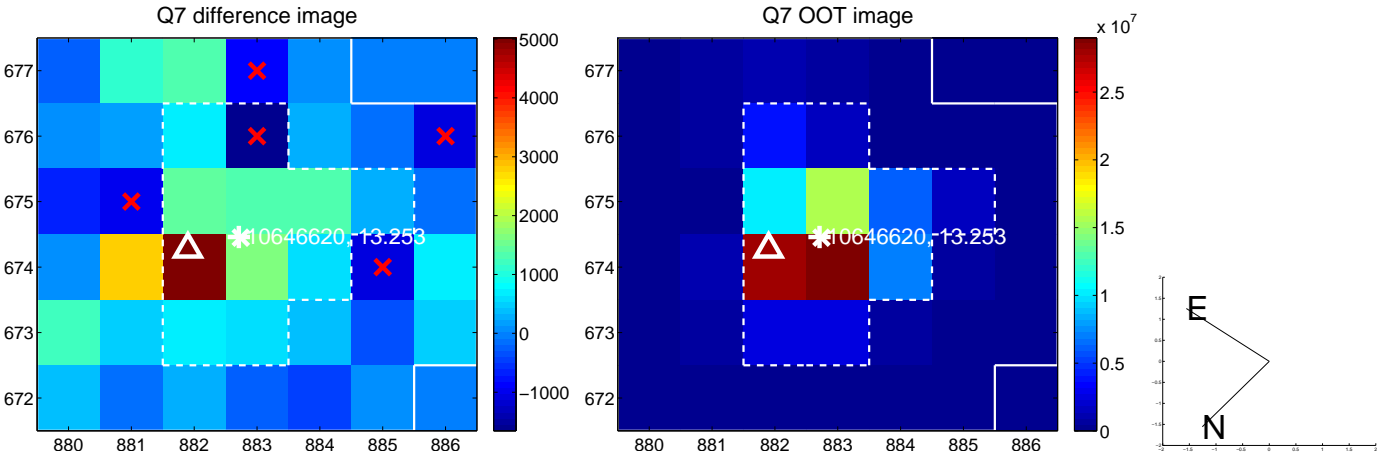
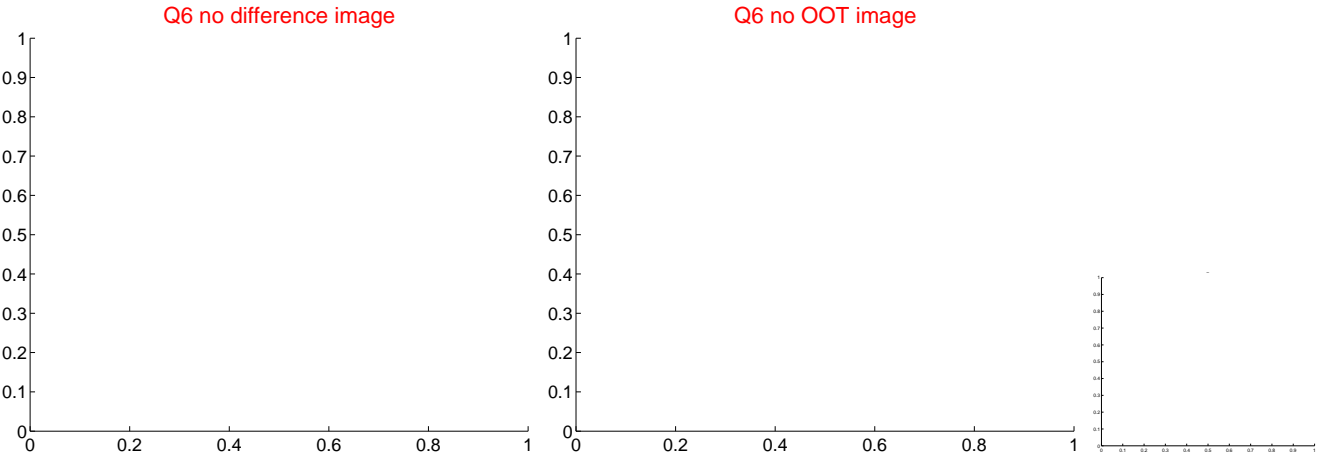
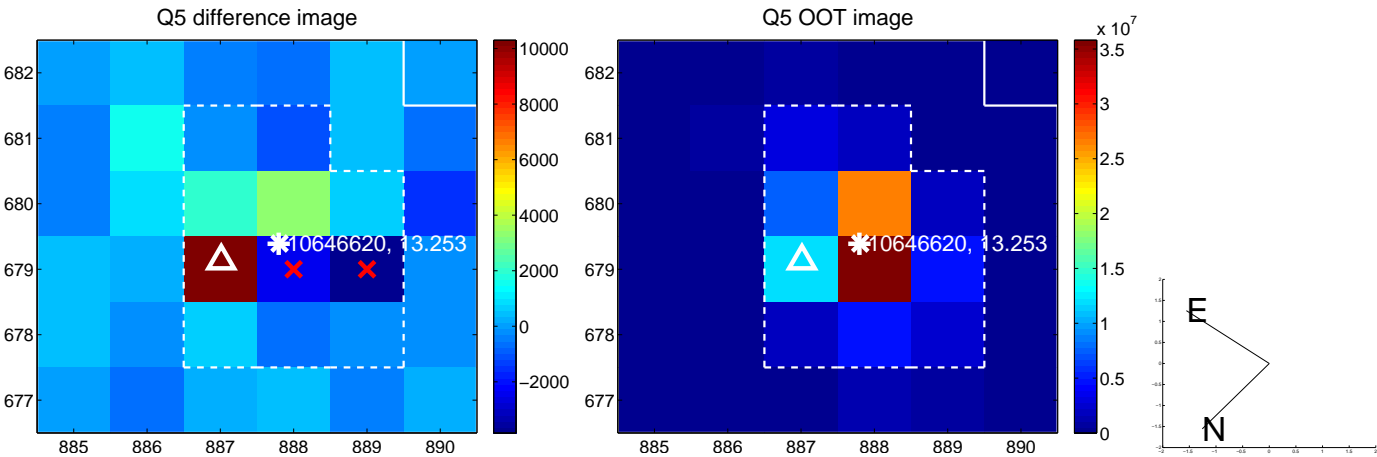


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

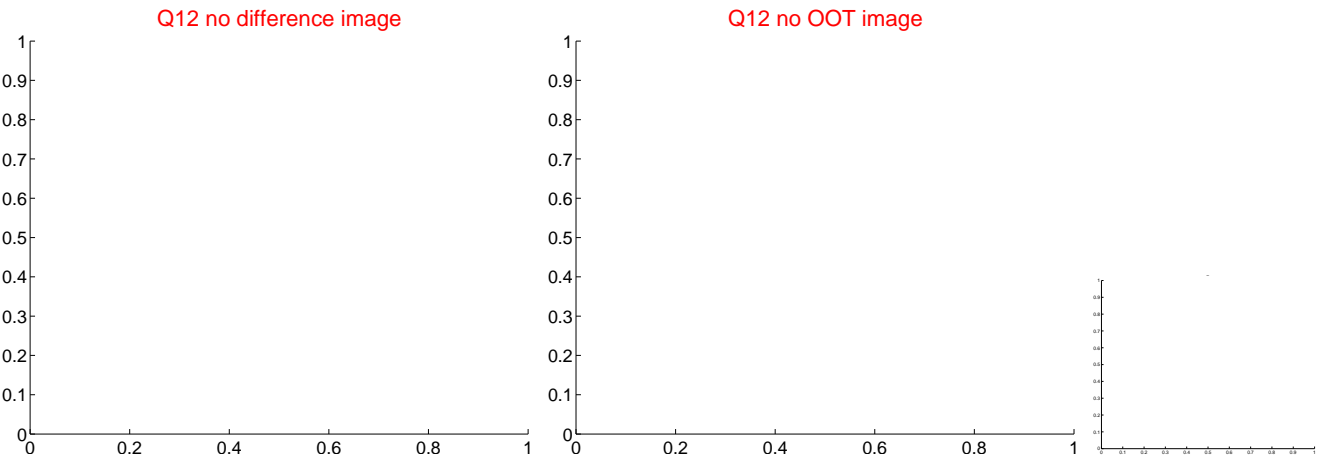
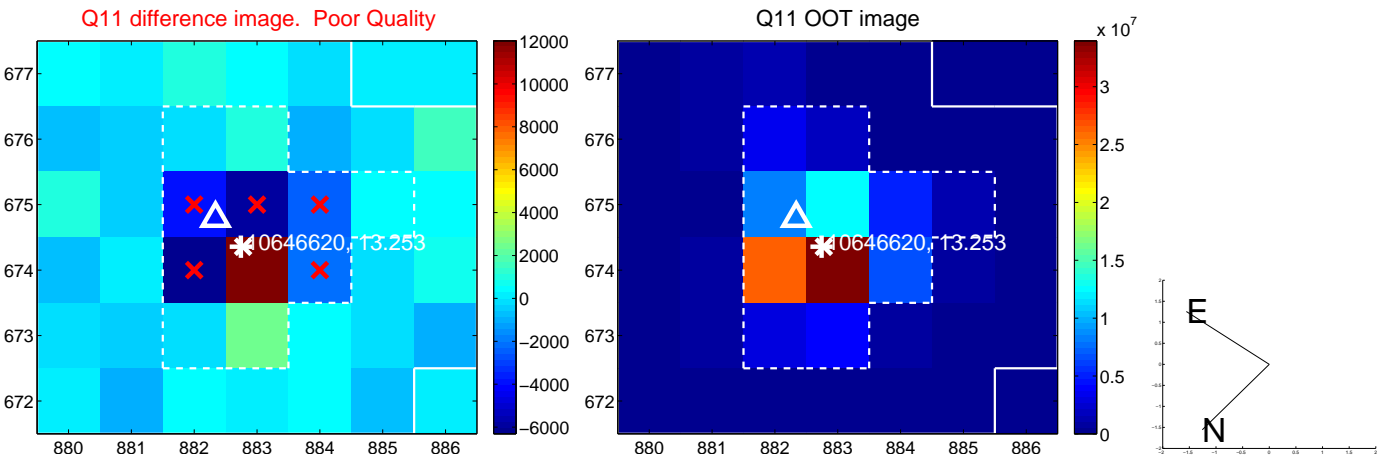
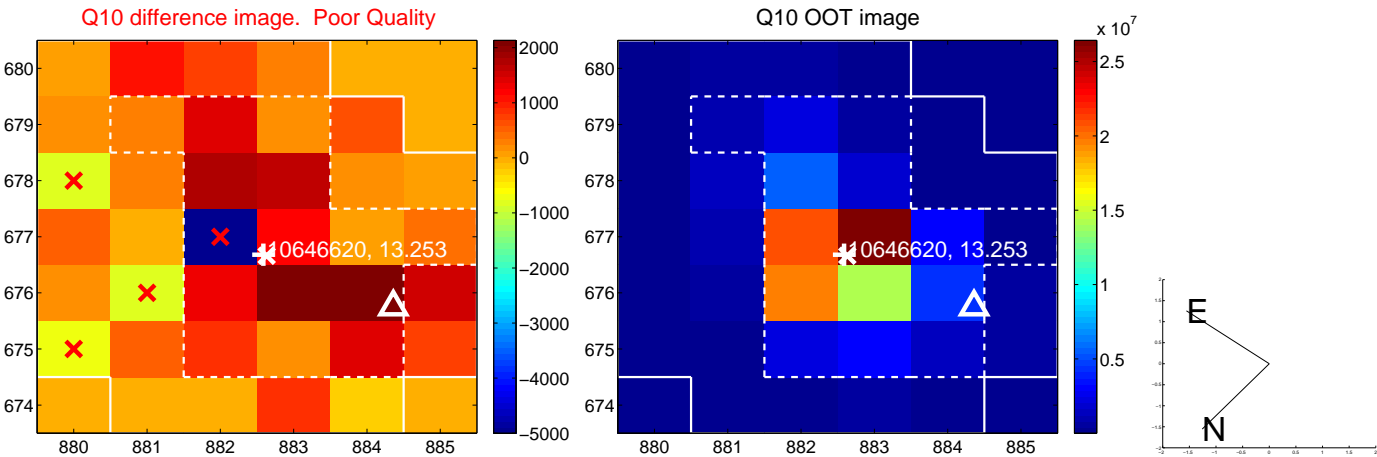
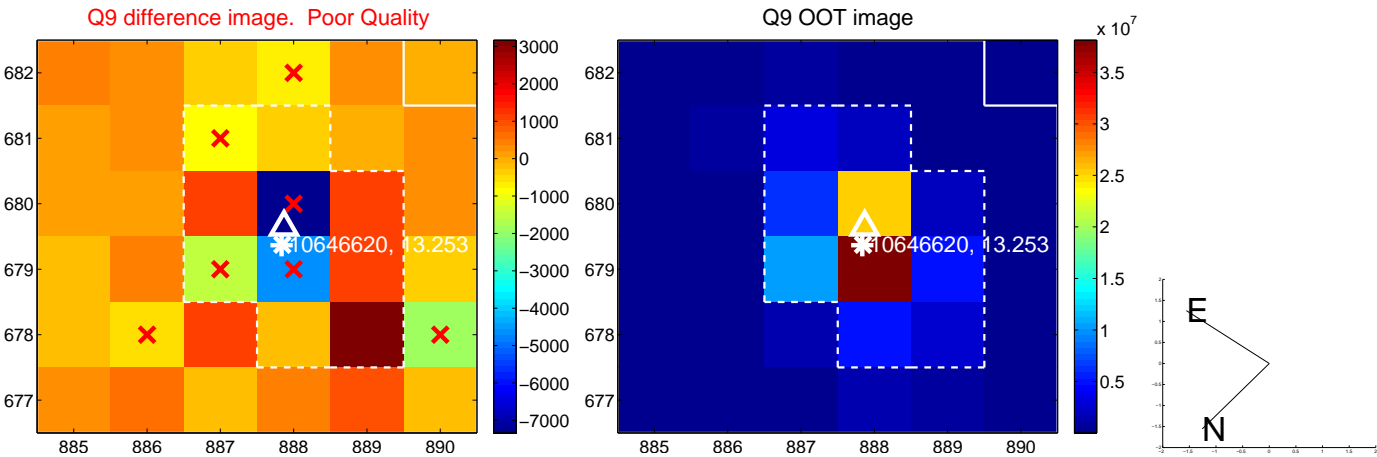
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



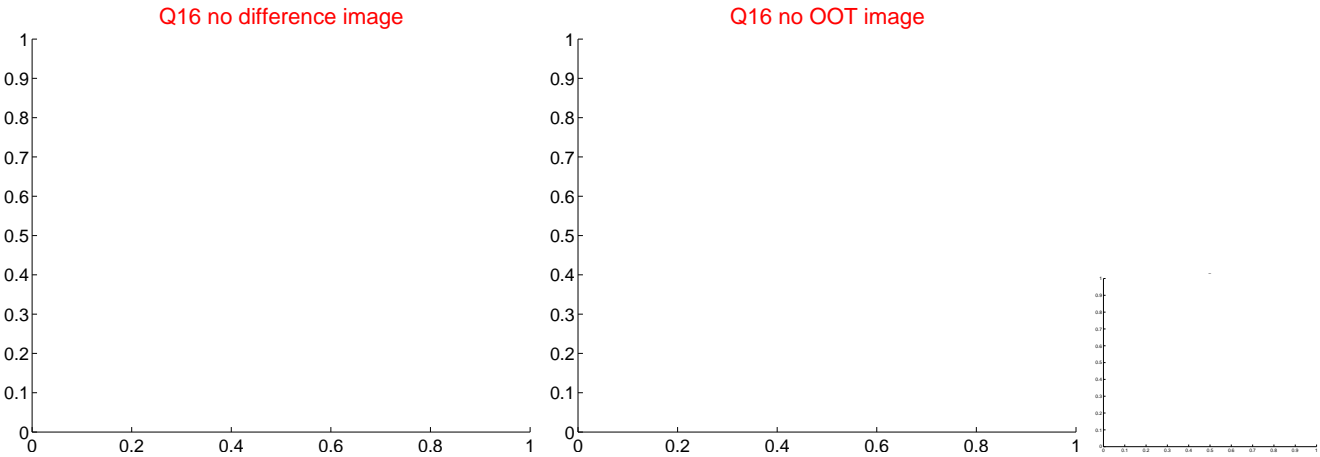
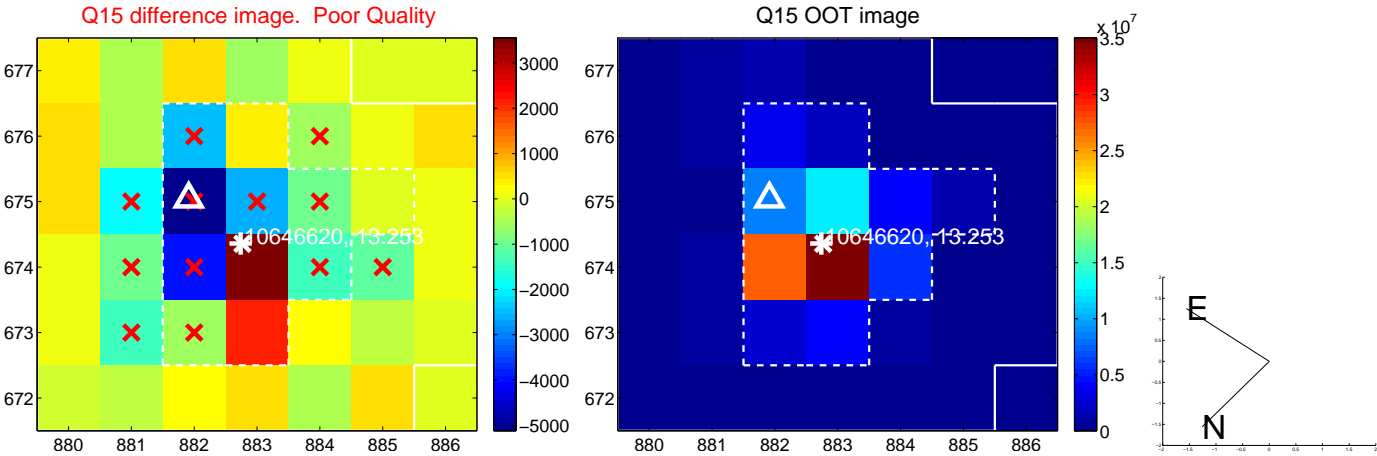
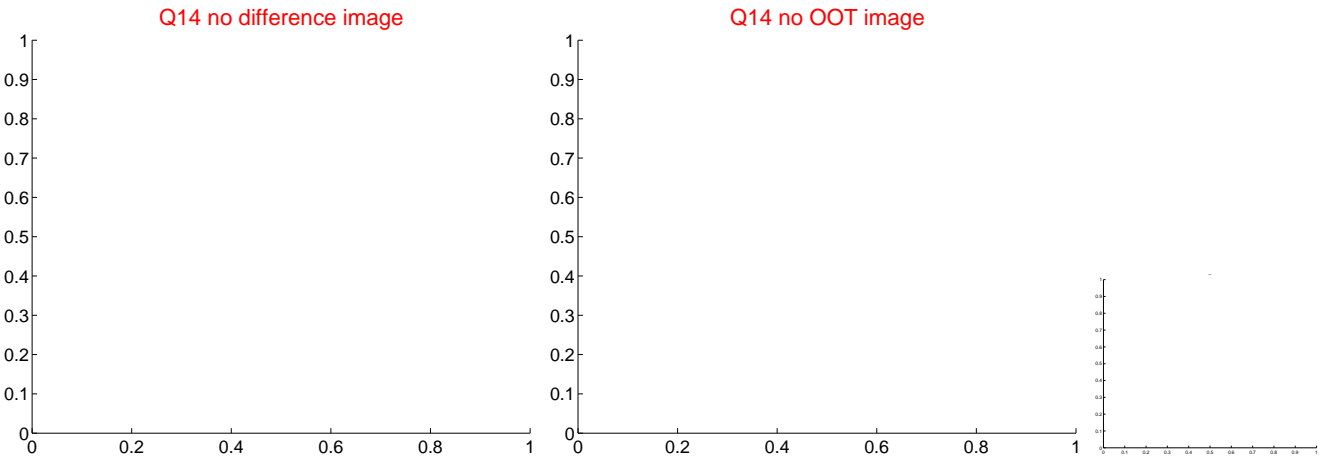
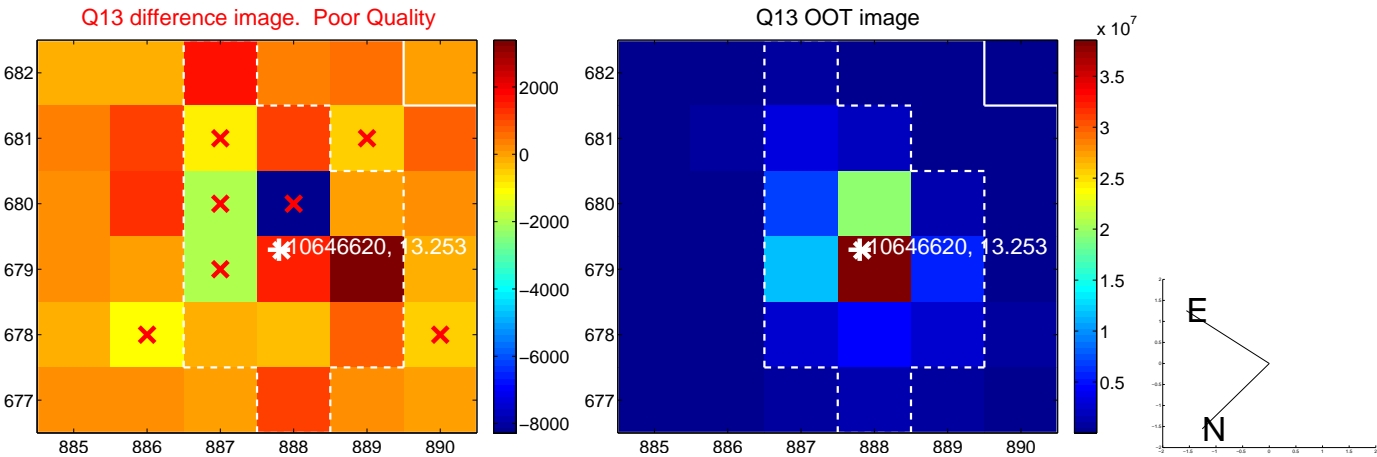
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



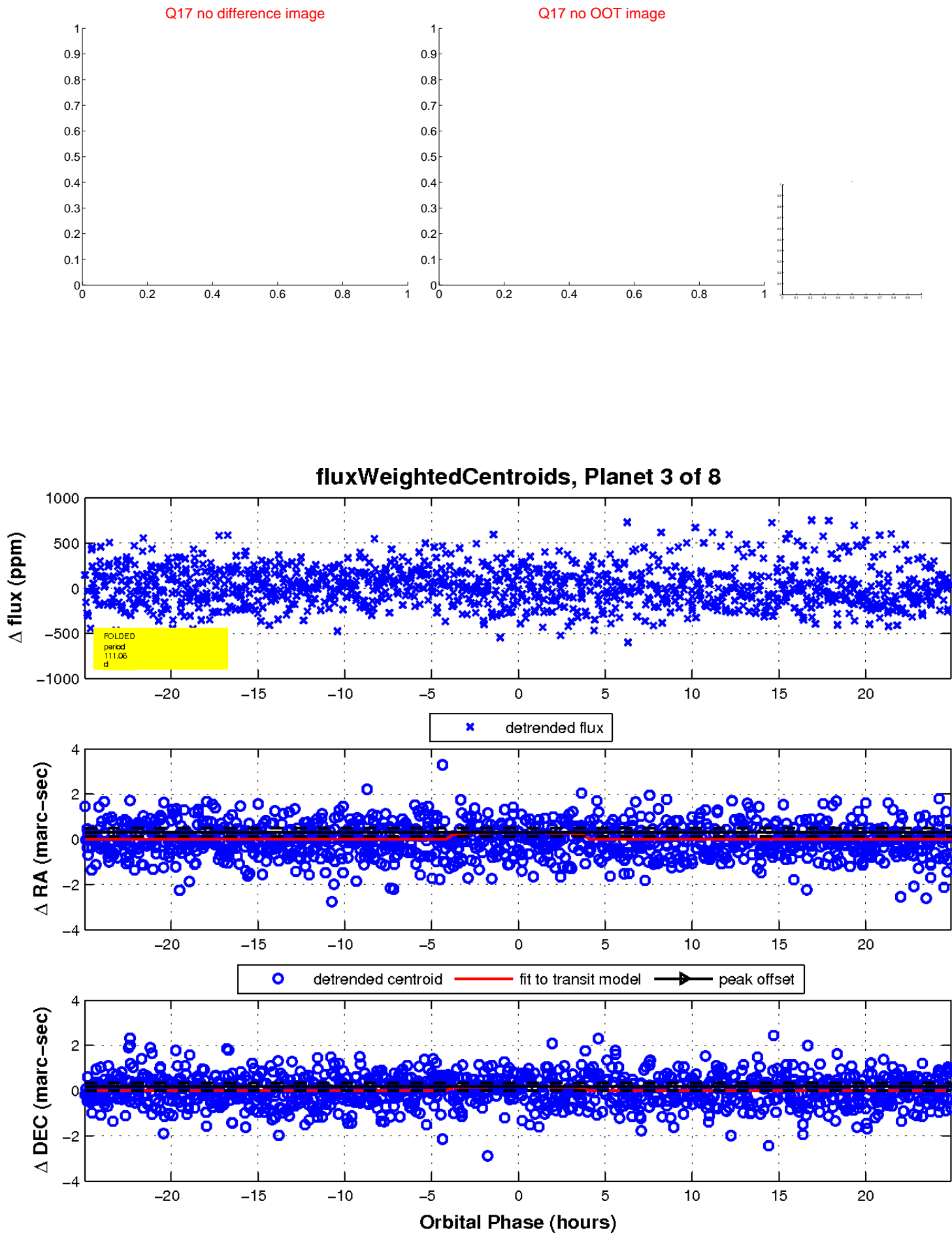
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

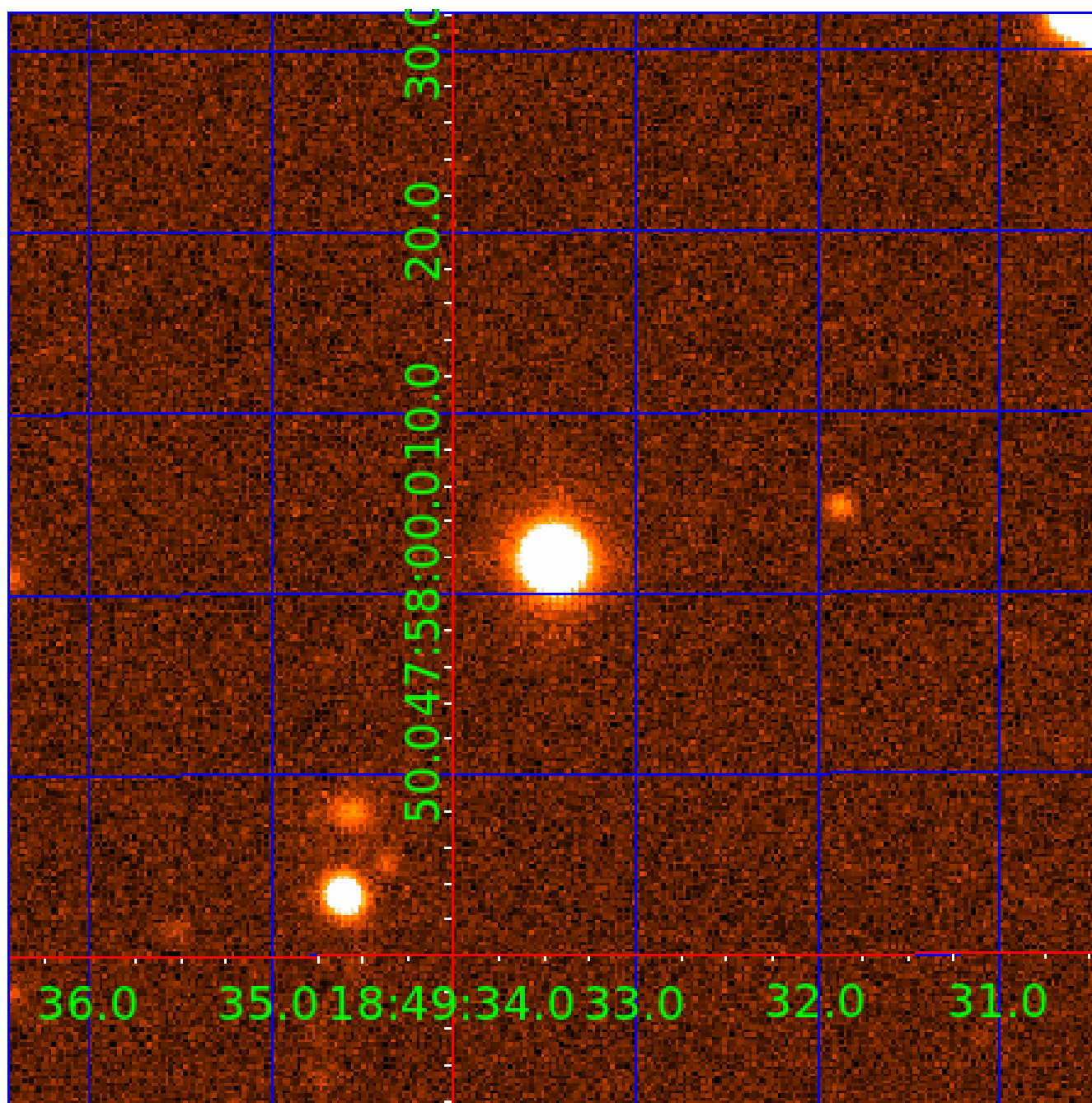


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010646620

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})
010646620-01	OBS	7352.01	2.413745	133.562364	30.4	13.034	8.8	9.9	2.60	6628	1.53	7193.29
010646620-02	OBS	No	439.264571	518.484387	347.9	20.978	9.7	8.3	2.60	6628	5.98	6.97
010646620-03	OBS	No	111.063930	154.308140	173.3	8.319	9.7	7.2	2.60	6628	3.92	43.63
010646620-05	OBS	No	166.284333	180.111872	257.2	7.447	9.3	8.6	2.60	6628	4.77	25.47
010646620-06	OBS	No	74.102175	201.659120	171.5	10.789	8.3	6.9	2.60	6628	3.82	74.83
010646620-08	OBS	No	111.645419	207.499050	224.2	2.810	7.3	7.6	2.60	6628	4.60	43.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010646620-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010646620-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010646620-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
010646620-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010646620-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010646620-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT

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 010646620-05

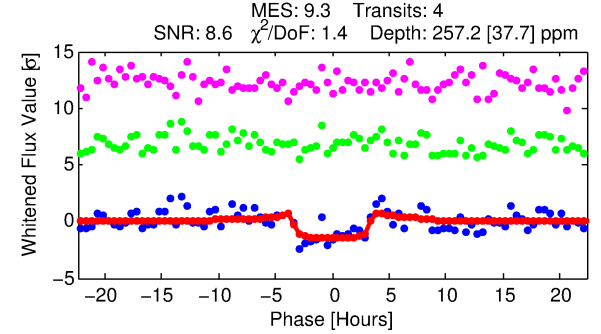
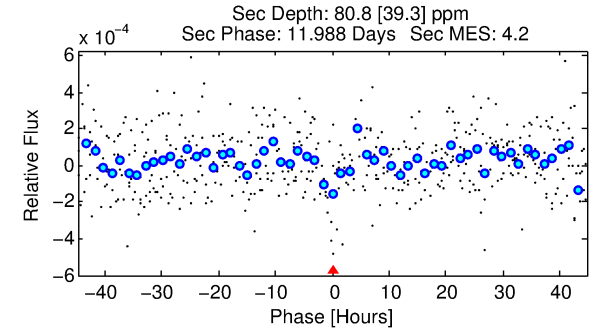
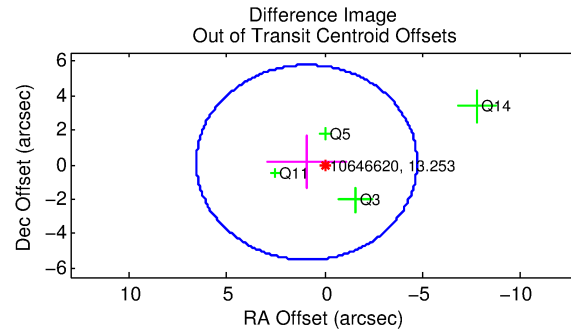
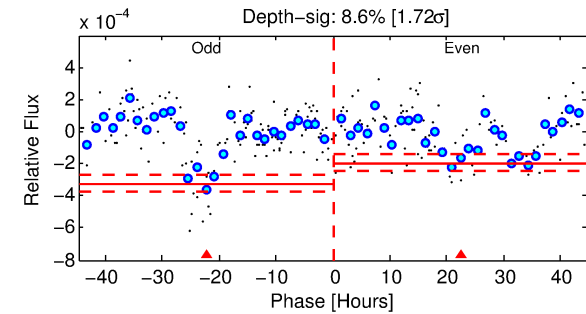
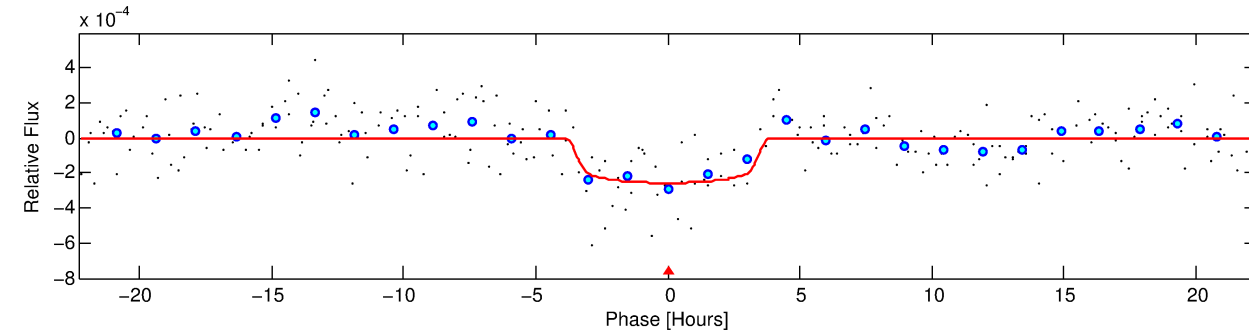
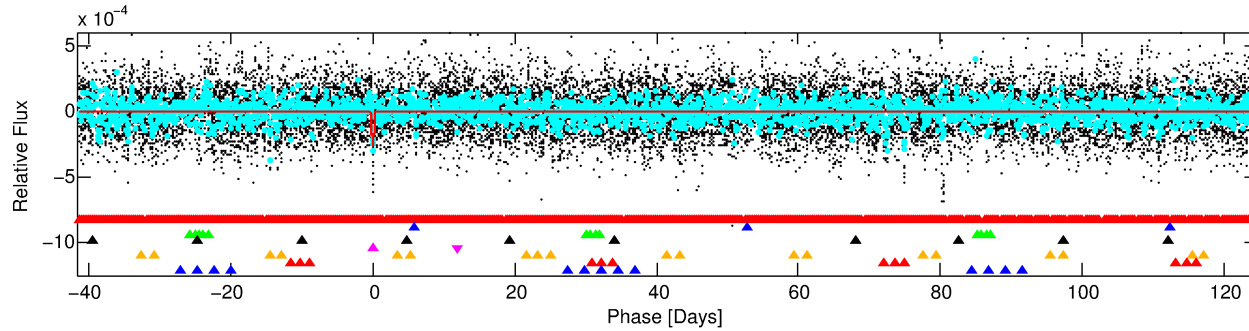
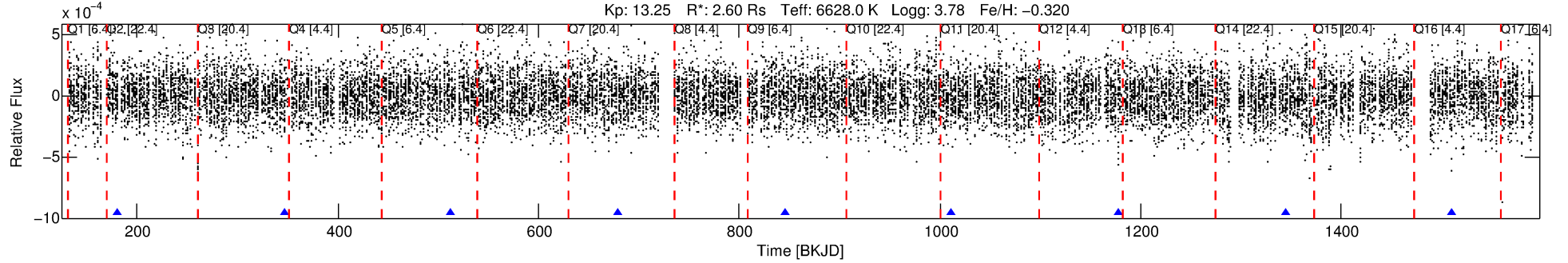
No Significant Match Found

DV One-Page Summary

KIC: 10646620 Candidate: 5 of 8 Period: 166.284 d

KOI: K07352 Corr: No Ephemeris Match

Kp: 13.25 R*: 2.60 Rs Teff: 6628.0 K Logg: 3.78 Fe/H: -0.320

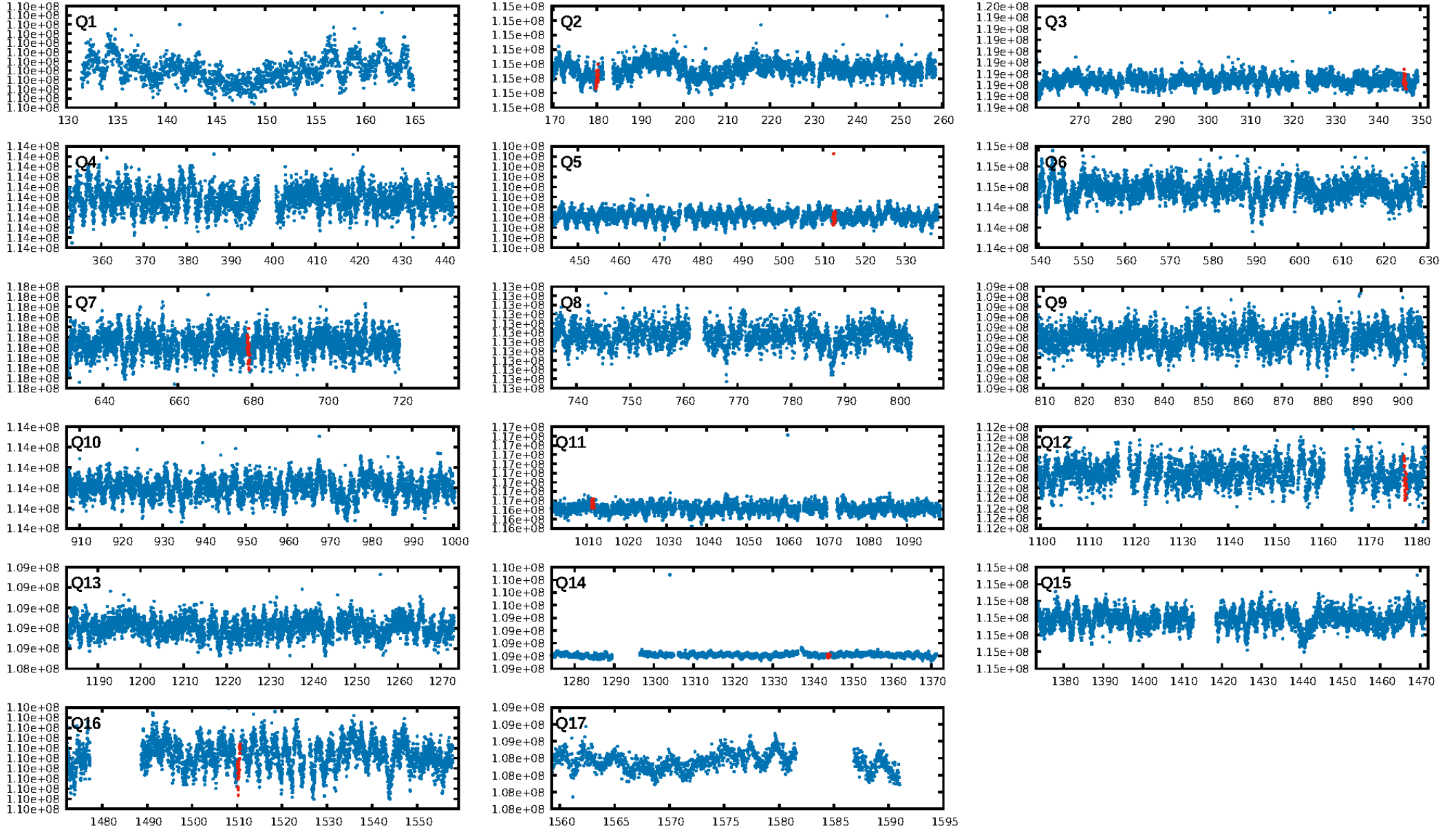


DV Fit Results:	DV Diagnostic Results:
Period = 166.28433 [0.00498] d	ShortPeriod-sig: 100.0% [28.16σ]
Epoch = 180.1119 [0.0379] BKJD	LongPeriod-sig: 100.0% [294.31σ]
Rp/R* = 0.0169 [0.0063]	ModelChiSquare2-sig: 39.7%
a/R* = 87.53 [185.58]	ModelChiSquareGof-sig: 97.8%
b = 0.88 [0.56]	Bootstrap-pfa: 5.81e-10
Seff = 25.47 [14.05]	RollingBand-fgt: 1.00 [4/4]
Teq = 573 [79] K	GhostDiagnostic-chr: -2.74
Rp = 4.77 [2.54] Re	Centroid-sig: 57.9%
a = 0.6761 [0.2347] AU	Centroid-so: 0.623 arcsec [0.80σ]
Ag = 891.68 [930.73] [0.96σ]	OotOffset-rm: 0.922 arcsec [0.49σ]
Teffp = 4840 [1088] K [3.91σ]	OotOffset-st: 1/2/0/1 [4]
	KicOffset-rm: 1.011 arcsec [0.56σ]
	OotOffset-st: 1/2/0/1 [4]
	KicOffset-st: 1/2/0/1 [4]
	DiffImageQuality-fgm: 0.00 [0/4]
	DiffImageOverlap-fno: 0.17 [1/6]

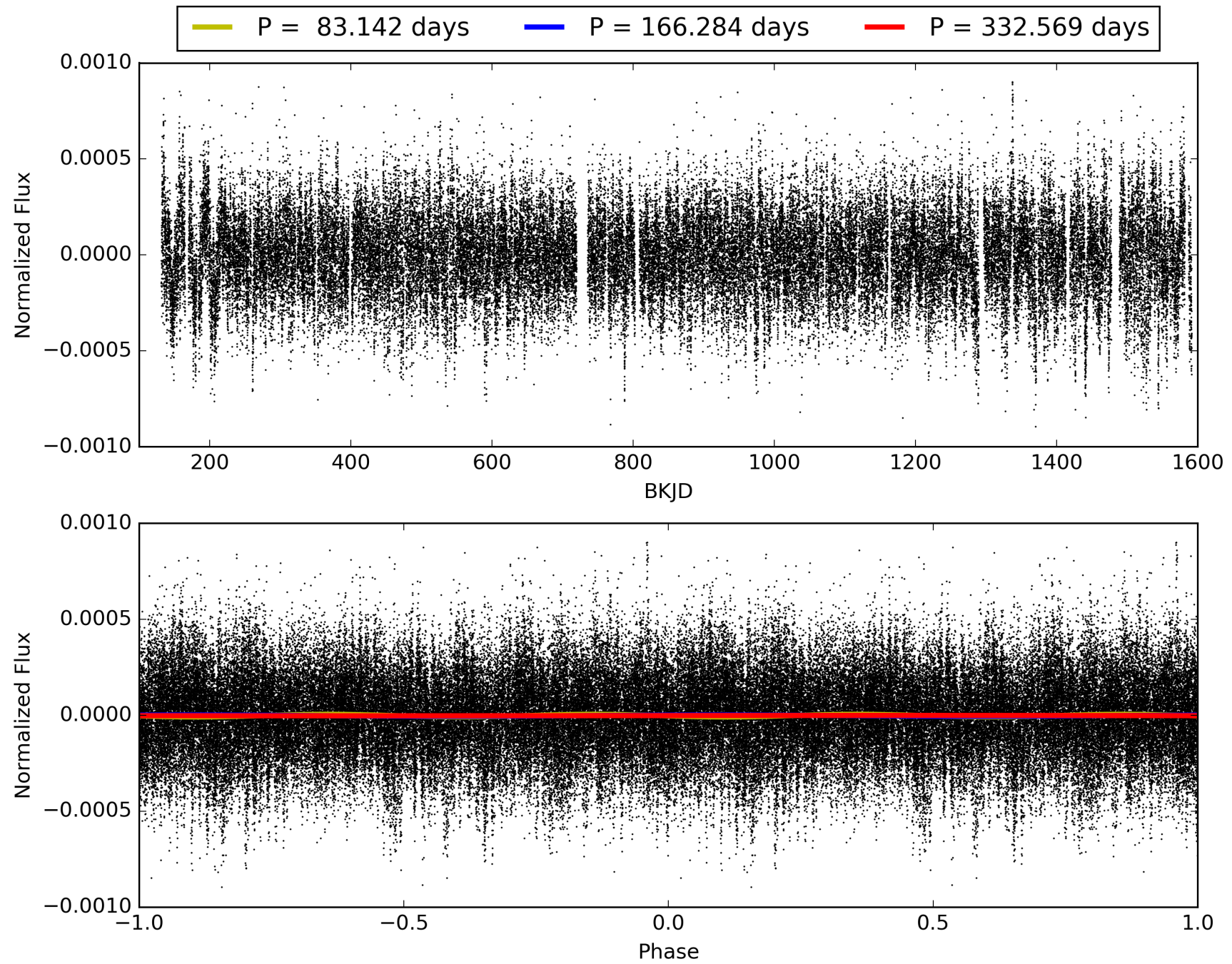
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:09:42 Z

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

TCE 010646620-05, PDC Light Curves

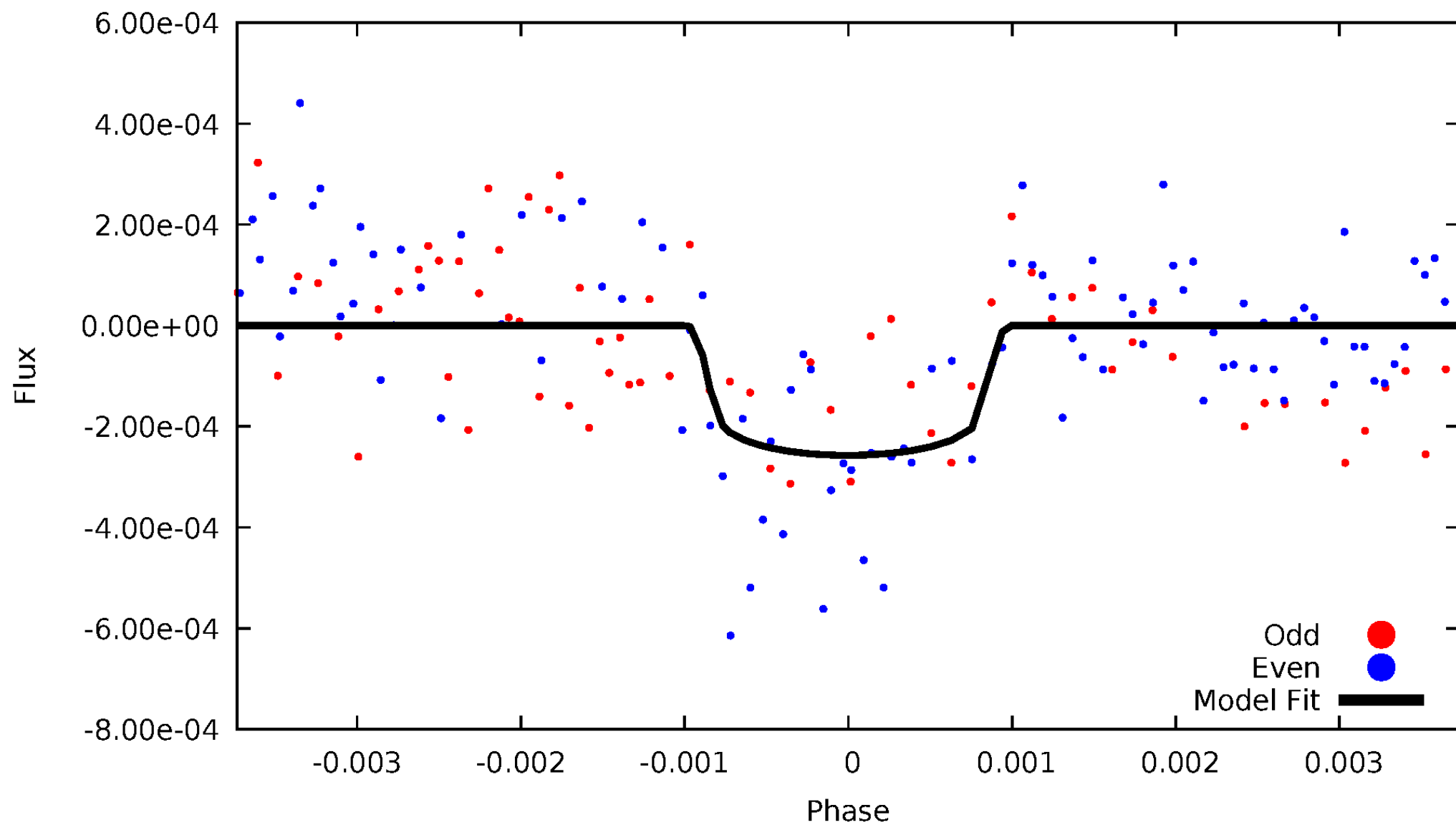


TCE 010646620-05



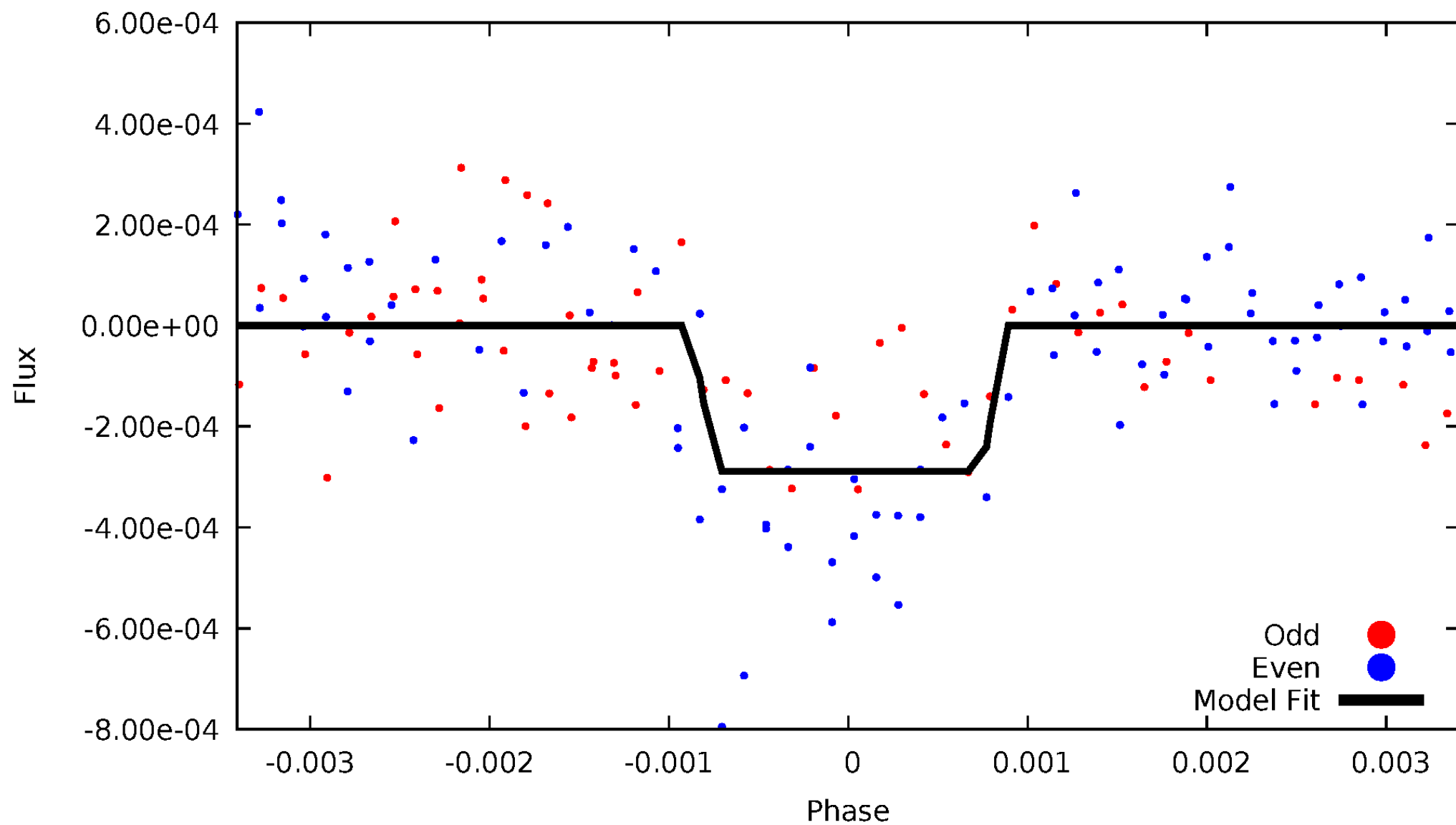
DV Odd/Even

TCE 010646620-05



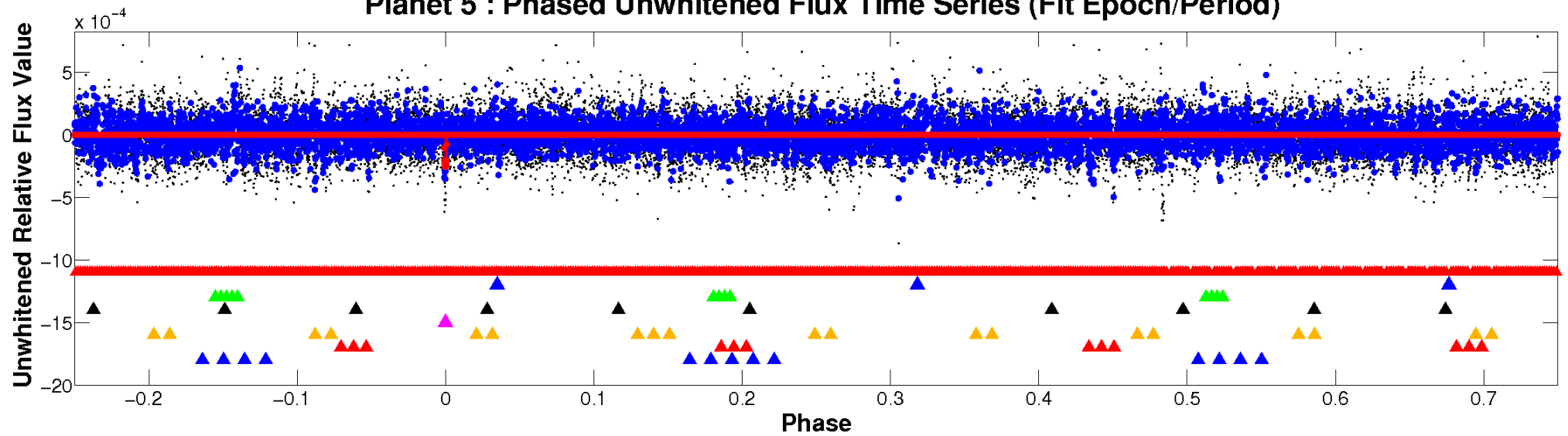
ALT Odd/Even

TCE 010646620-05

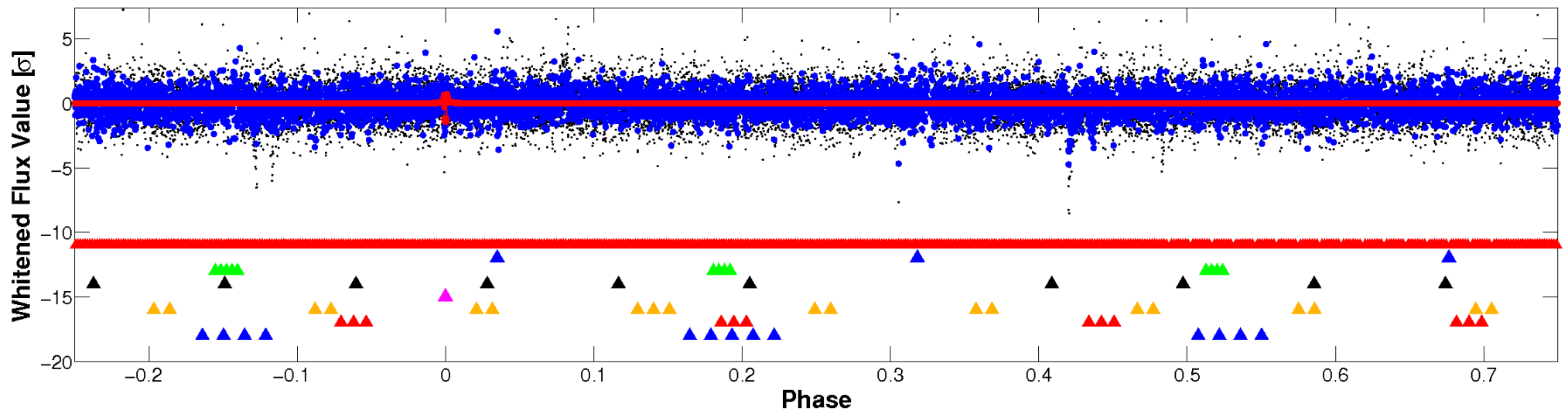


Non-Whitened Vs. Whitened Light Curve

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

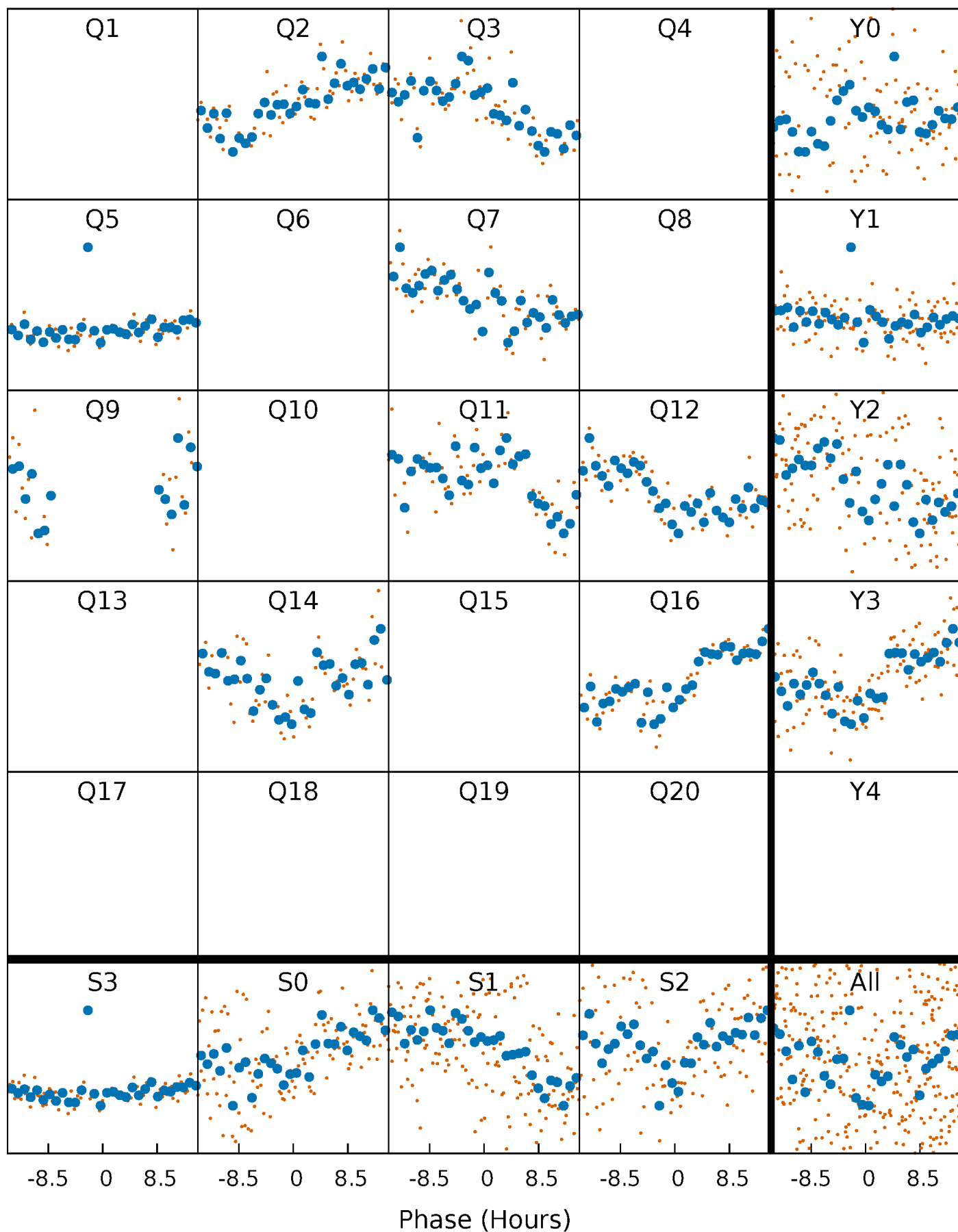


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



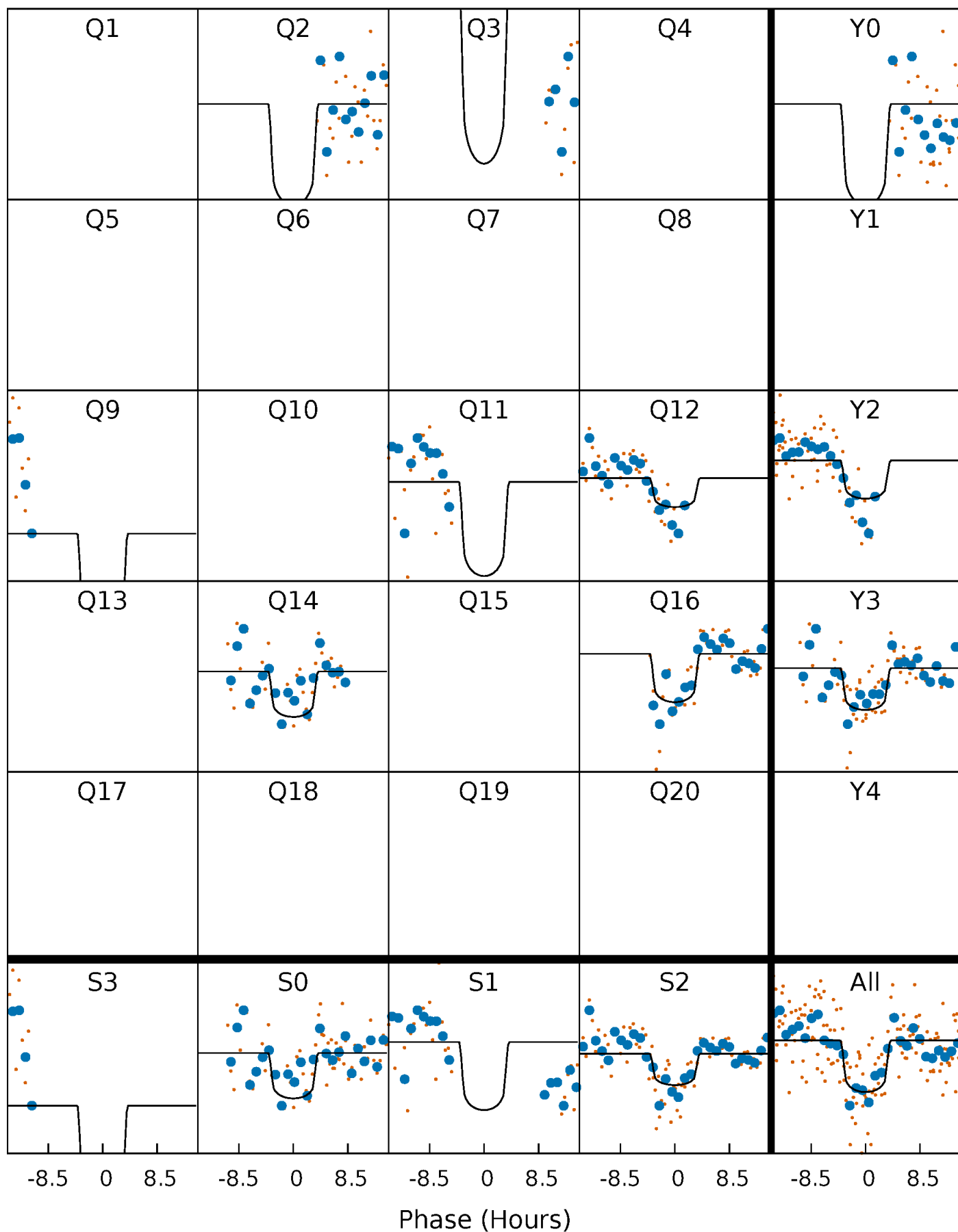
PDC Quarter-Phased Transit Curves

TCE 010646620-05 $P=166.284333$ Days $T_0=180.111872$ (BKJD)



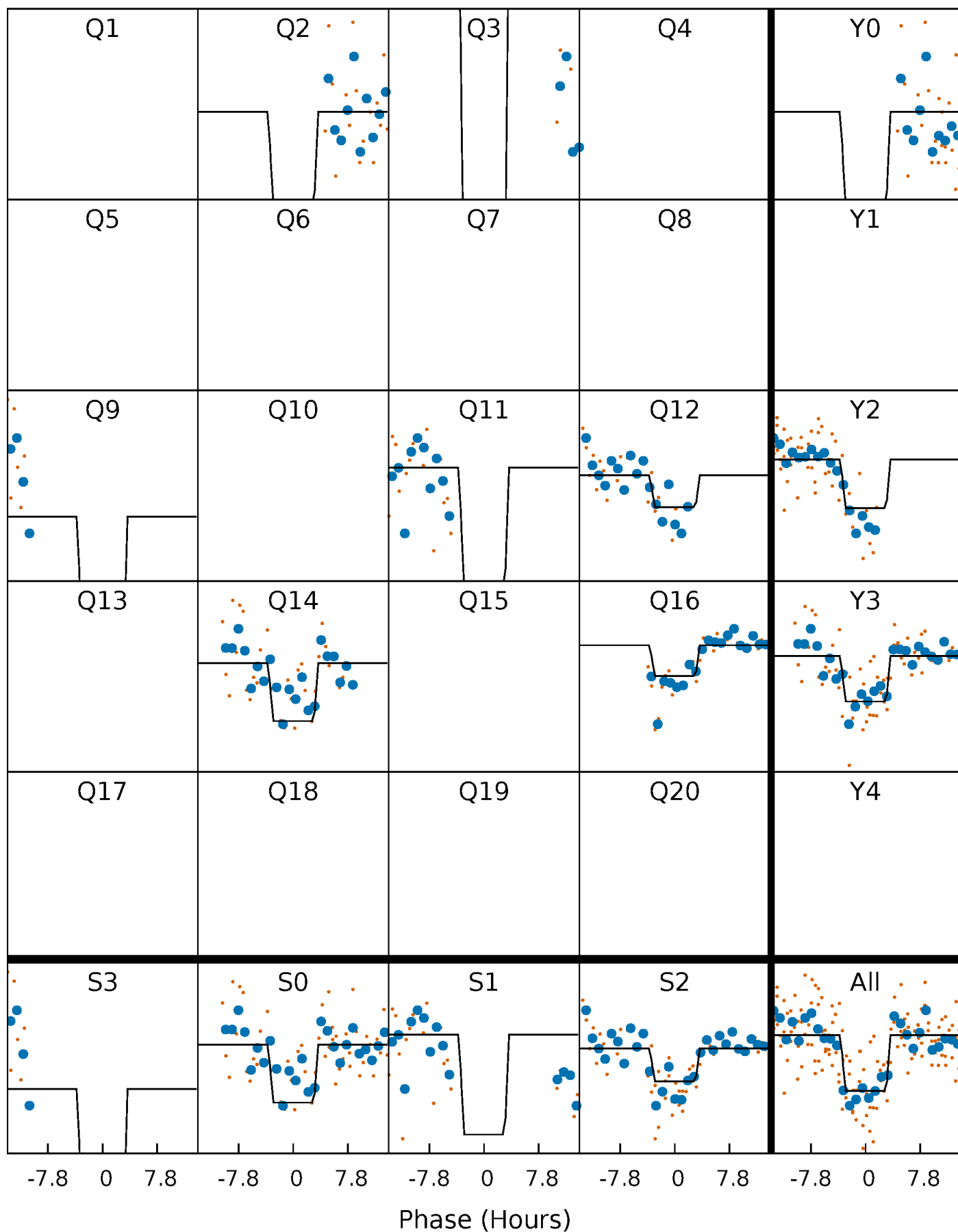
DV Quarter-Phased Transit Curves

TCE 010646620-05 $P=166.284333$ Days $T_0=180.111872$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

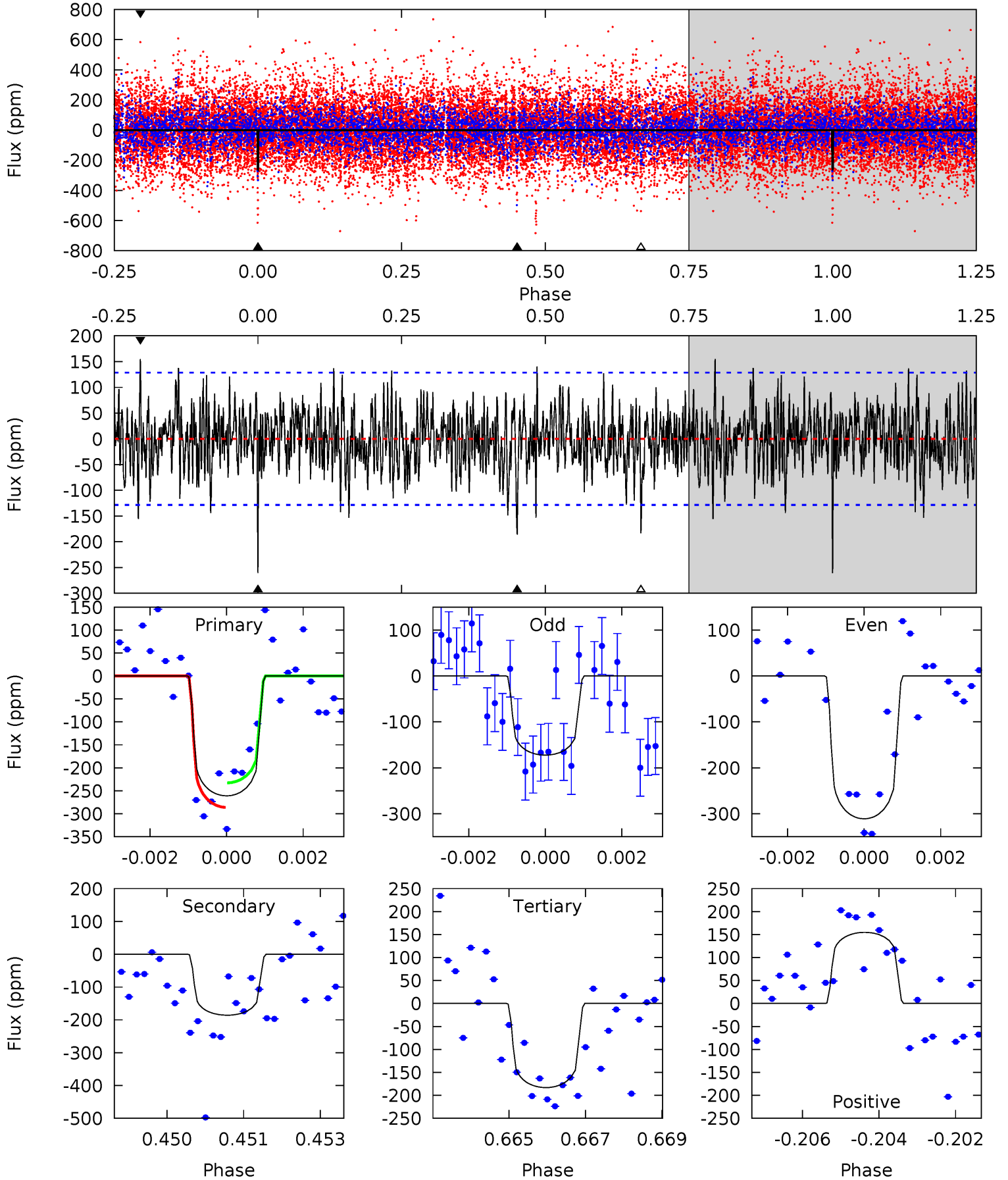
TCE 010646620-05 $P=166.288311$ Days $T_0=180.077562$ (BKJD)



DV Model-Shift Uniqueness Test

010646620-05, $P = 166.284333$ Days, $E = 13.827539$ Days

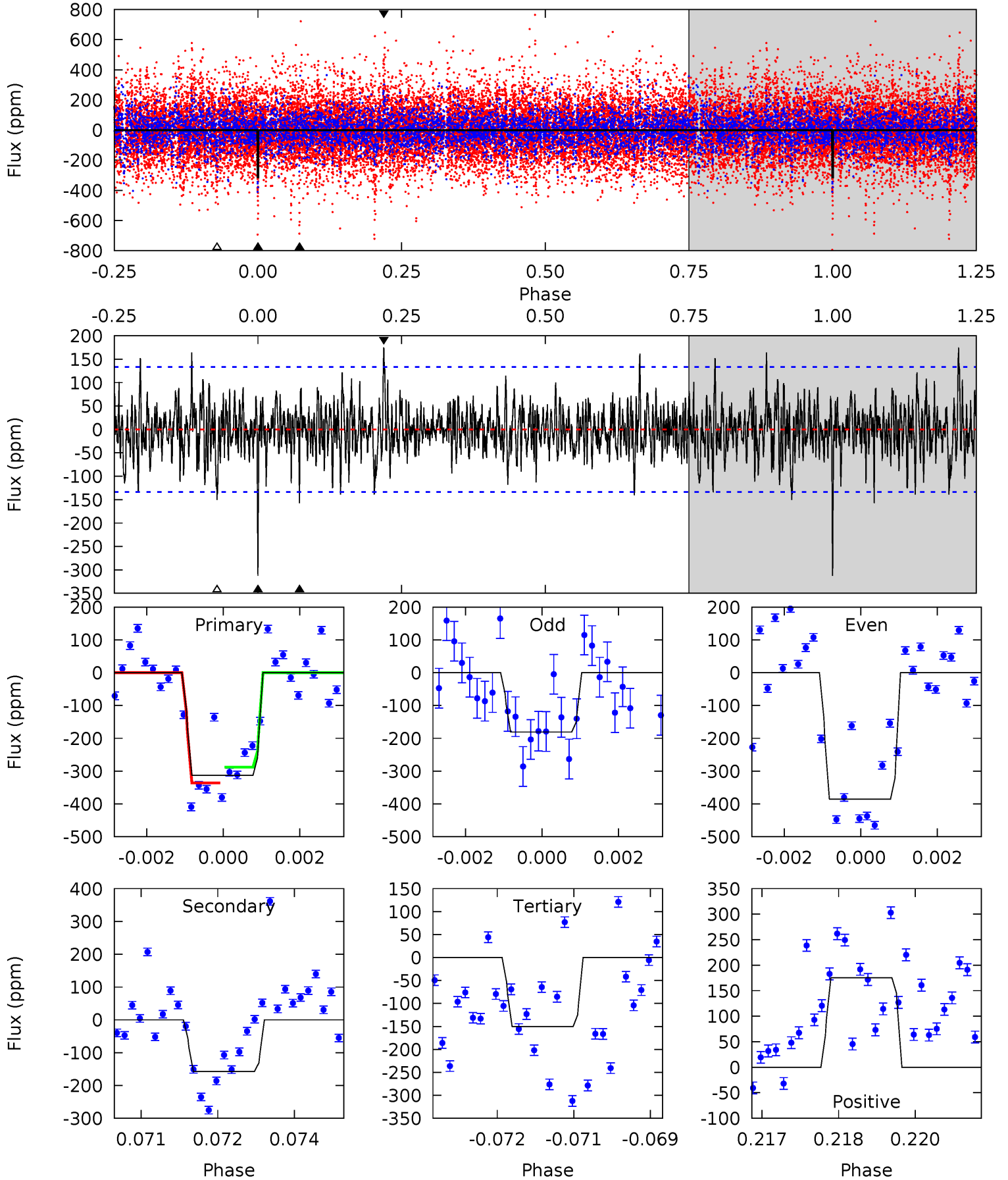
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	7.71	7.60	6.42	5.33	3.10	1.92	3.23	4.41	0.11	1.29	2.75	0.97	0.37	1.11



Alt Model-Shift Uniqueness Test

010646620-05, $P = 166.288311$ Days, $E = 13.789251$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.6	6.31	6.03	7.03	5.35	3.13	1.69	6.52	5.52	0.28	-0.72	4.05	0.87	0.36	0.96



Stellar Parameters For KIC 010646620

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6628^{+160}_{-180}	$3.783^{+0.312}_{-0.098}$	$-0.320^{+0.300}_{-0.250}$	$2.595^{+0.419}_{-0.978}$	$1.489^{+0.212}_{-0.344}$	$0.120^{+0.253}_{-0.038}$
	+2%/-3%	+8%/-3%	+94%/-78%	+16%/-38%	+14%/-23%	+211%/-31%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010646620-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-186 ± 24	$4.44^{+1.96}_{-1.67}$	787^{+49}_{-69}	5943^{+1628}_{-812}	2360^{+3564}_{-1188}
Alt.	-157 ± 25	$4.64^{+1.96}_{-1.71}$	790^{+47}_{-70}	5658^{+1397}_{-801}	1853^{+2740}_{-953}

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

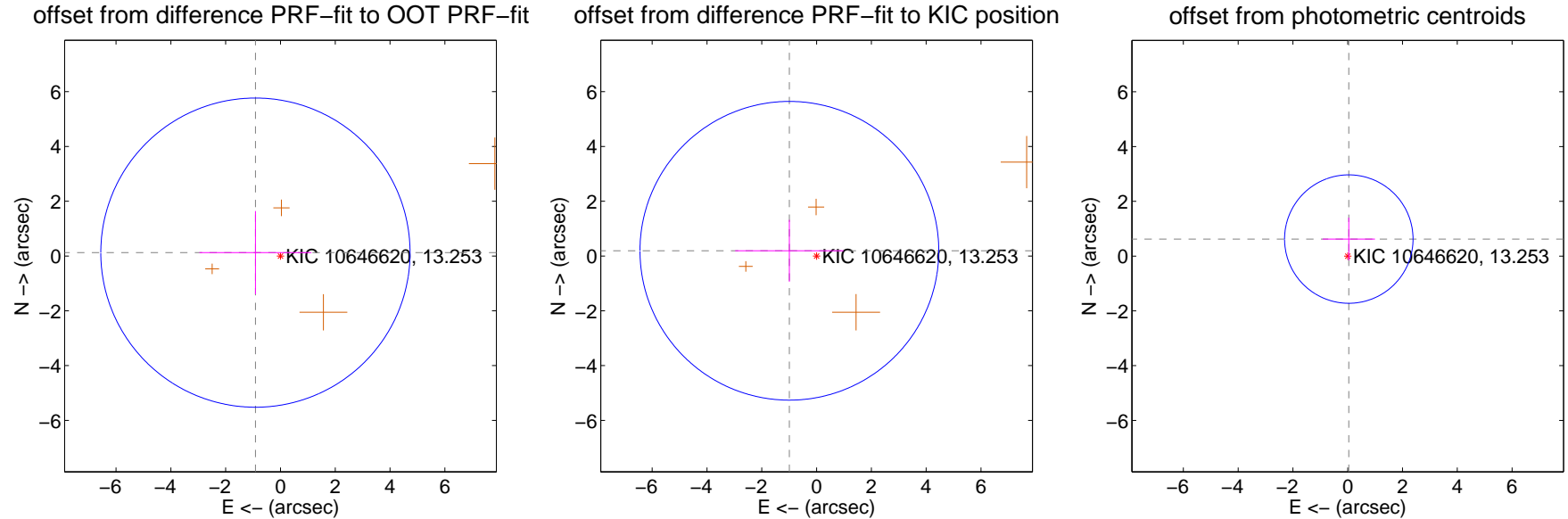
DV Centroid Data

Supplemental centroid analysis for 010646620-05. Kepler magnitude: 13.25. Transit SNR 8.63

There are 0 quarters with good PRF difference image offsets

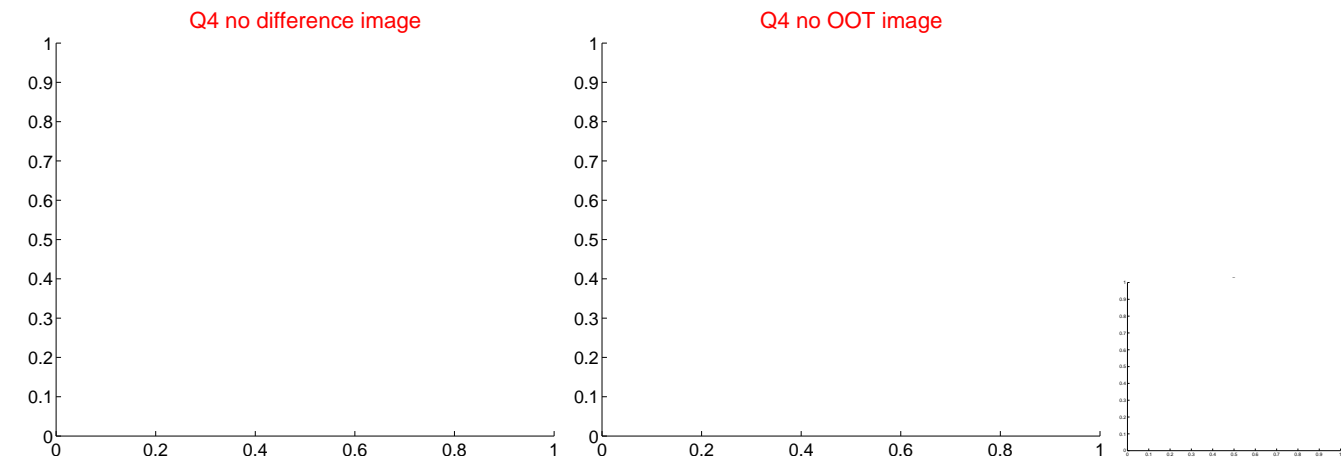
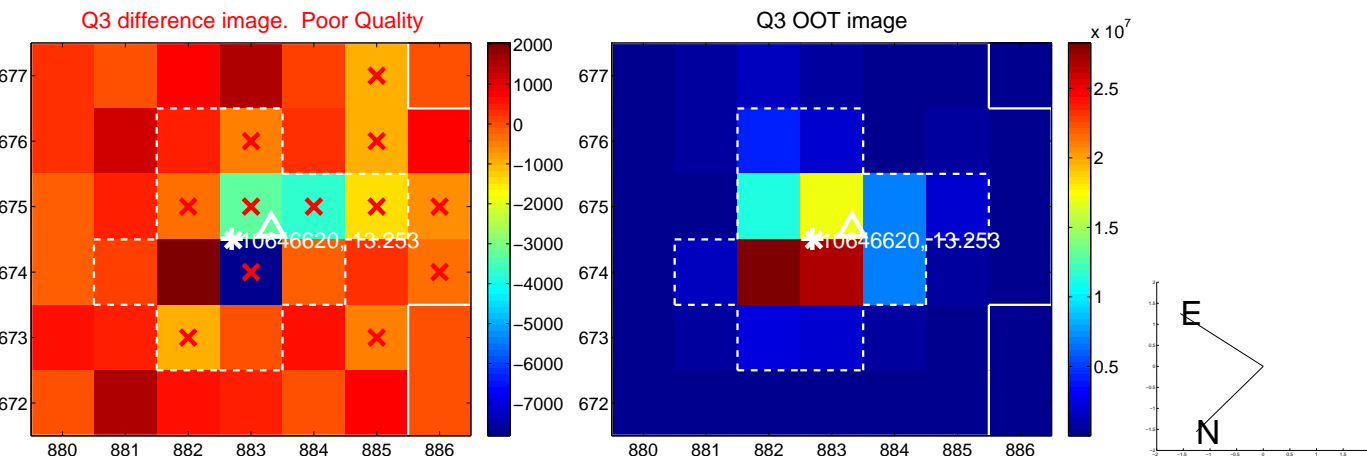
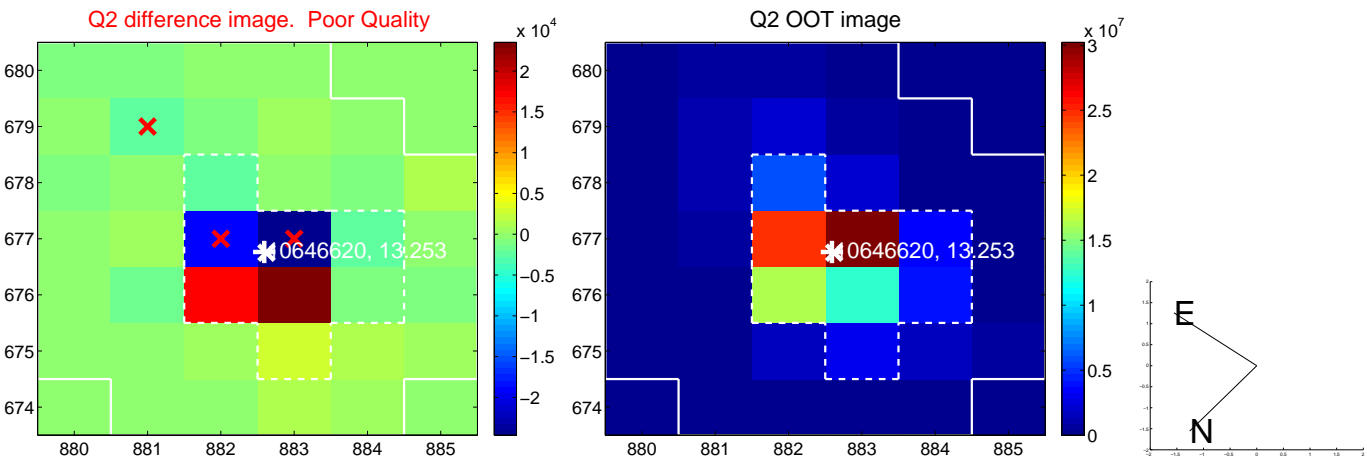
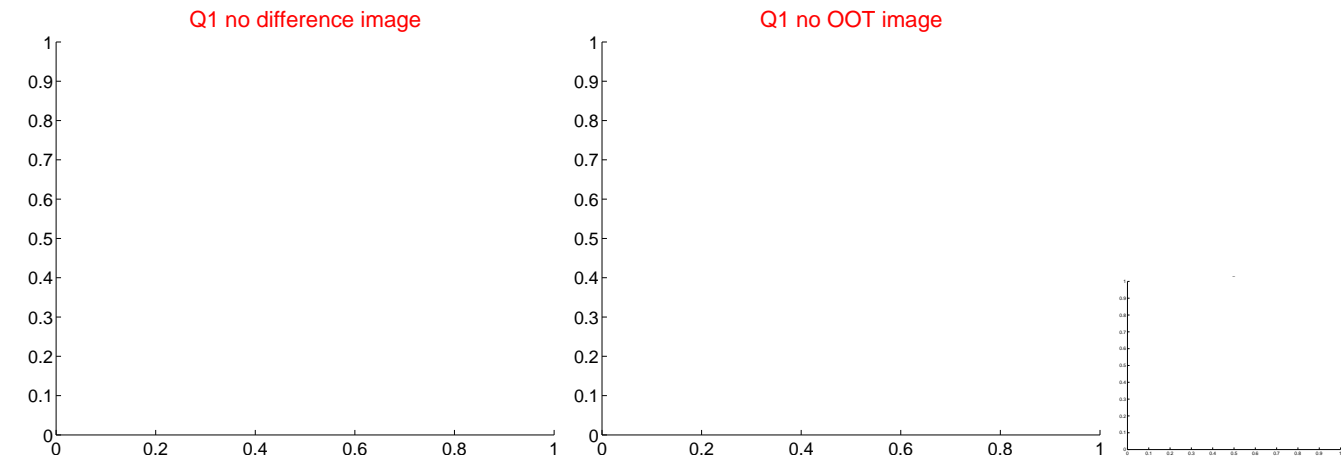
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.922 ± 1.881	0.49	0.913 ± 2.045	0.124 ± 1.518
PRF-fit source offset from KIC position	1.011 ± 1.817	0.56	0.993 ± 1.976	0.191 ± 1.129
photometric centroid source offset	0.62 ± 0.78	0.80	-0.04 ± 0.95	0.62 ± 0.78

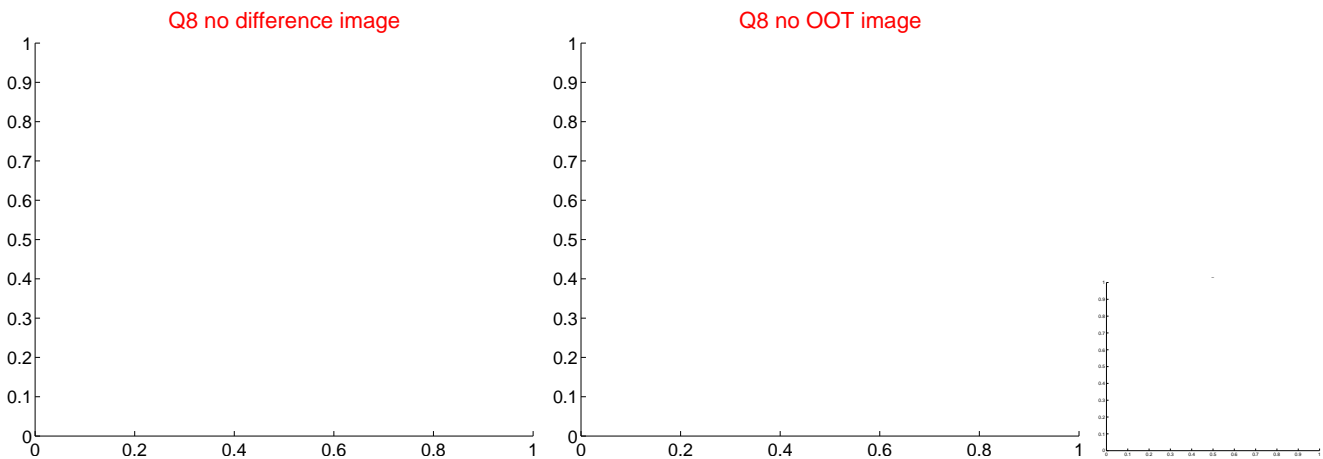
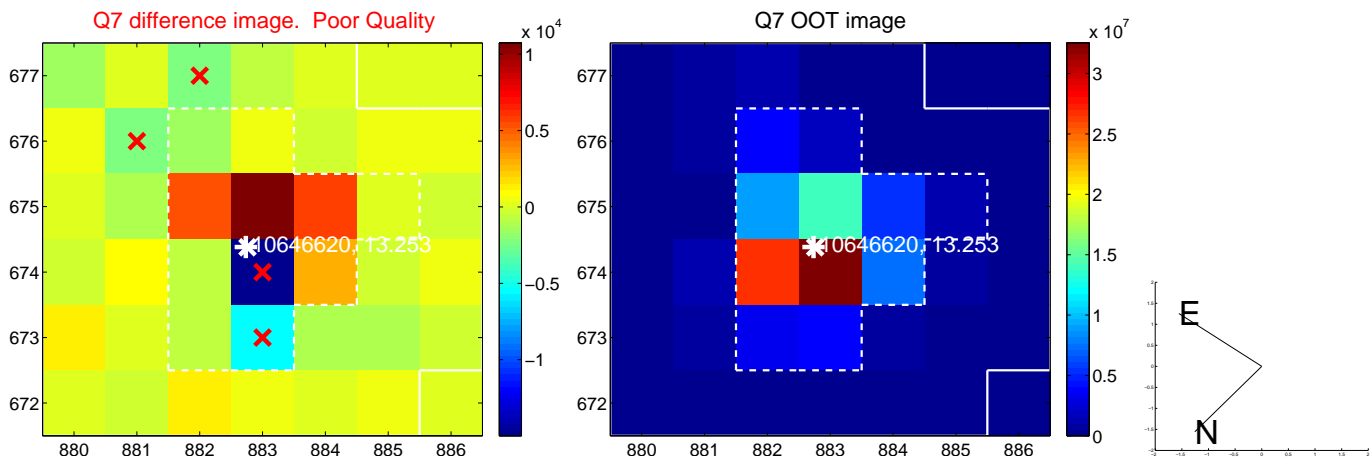
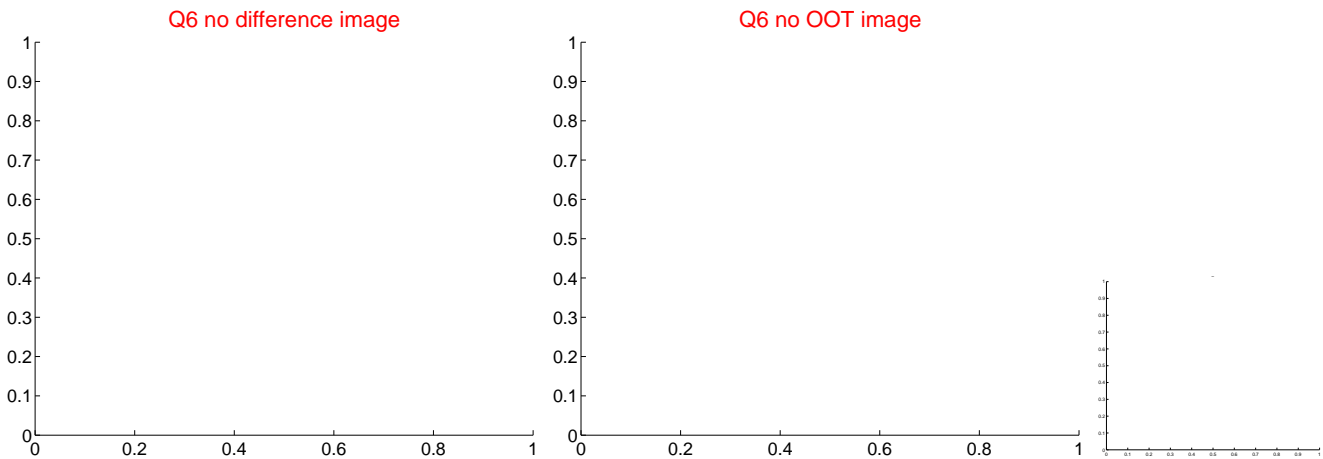
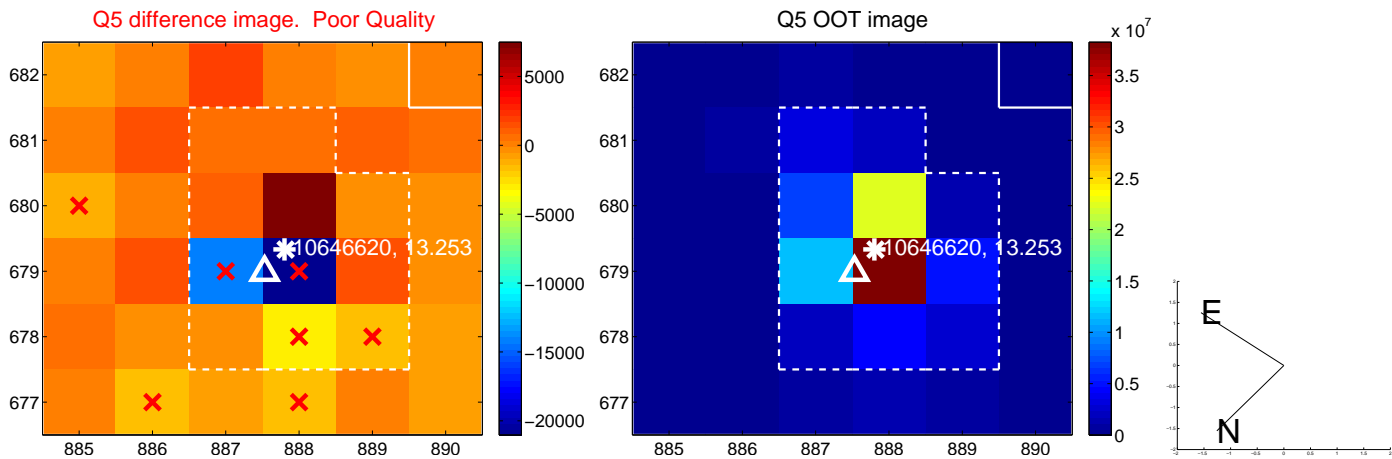


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

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

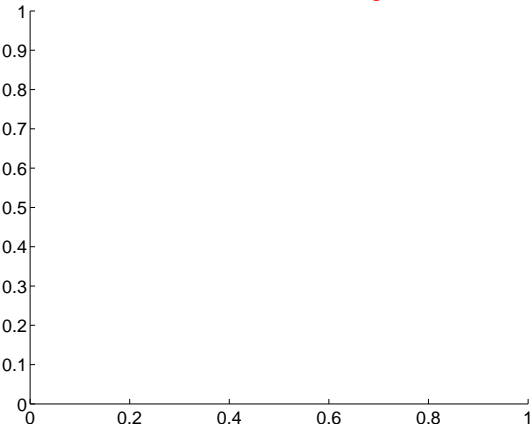


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

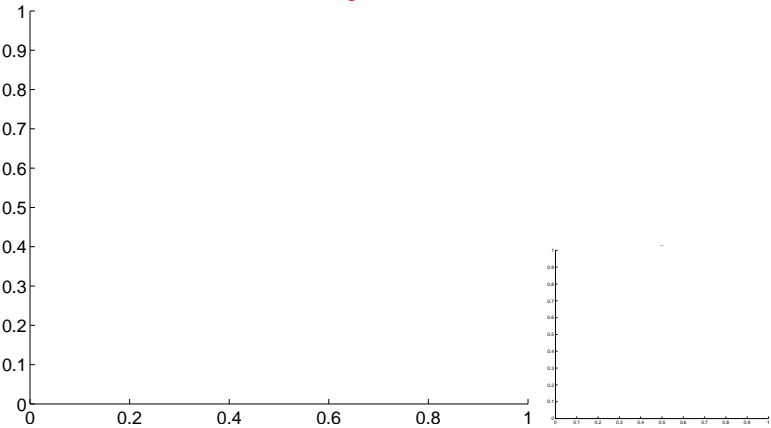


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

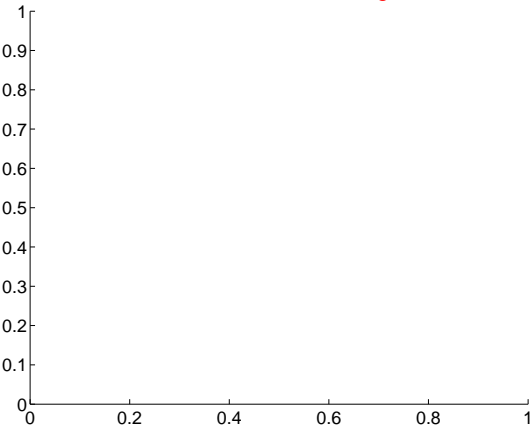
Q9 no difference image



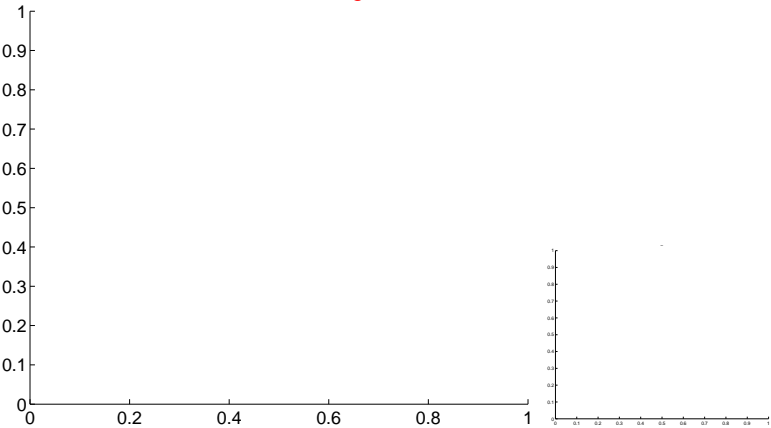
Q9 no OOT image



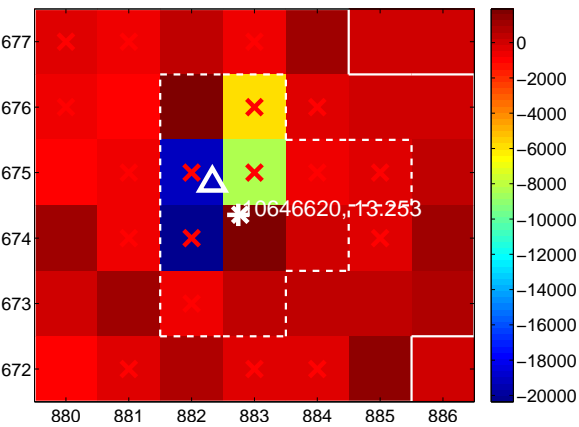
Q10 no difference image



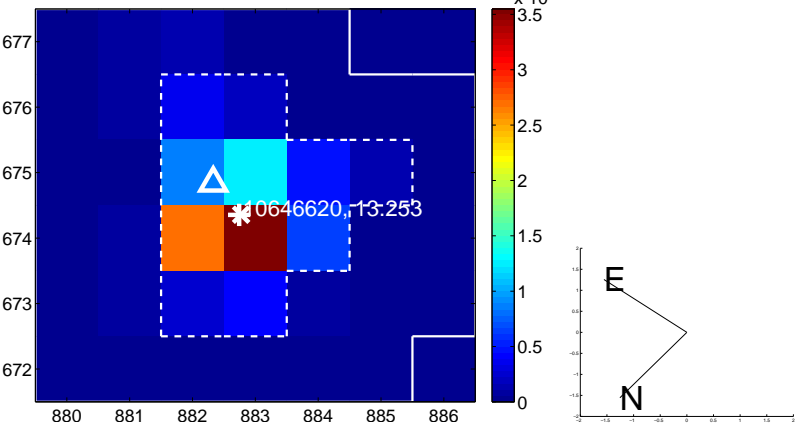
Q10 no OOT image



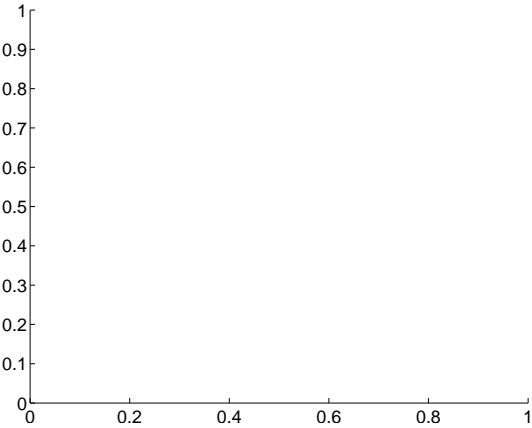
Q11 difference image. Poor Quality



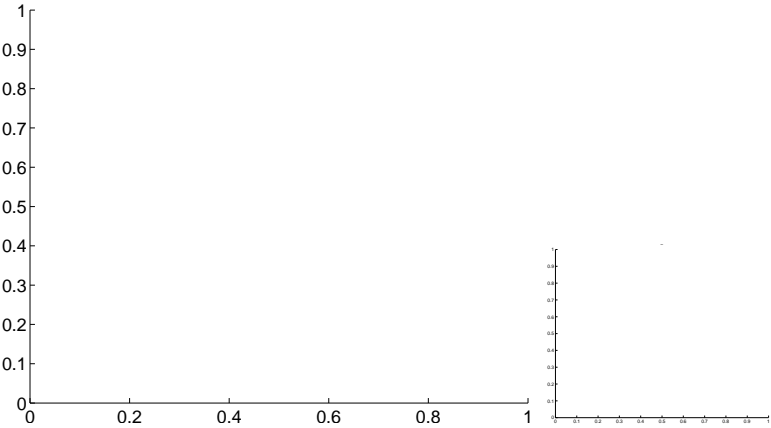
Q11 OOT image



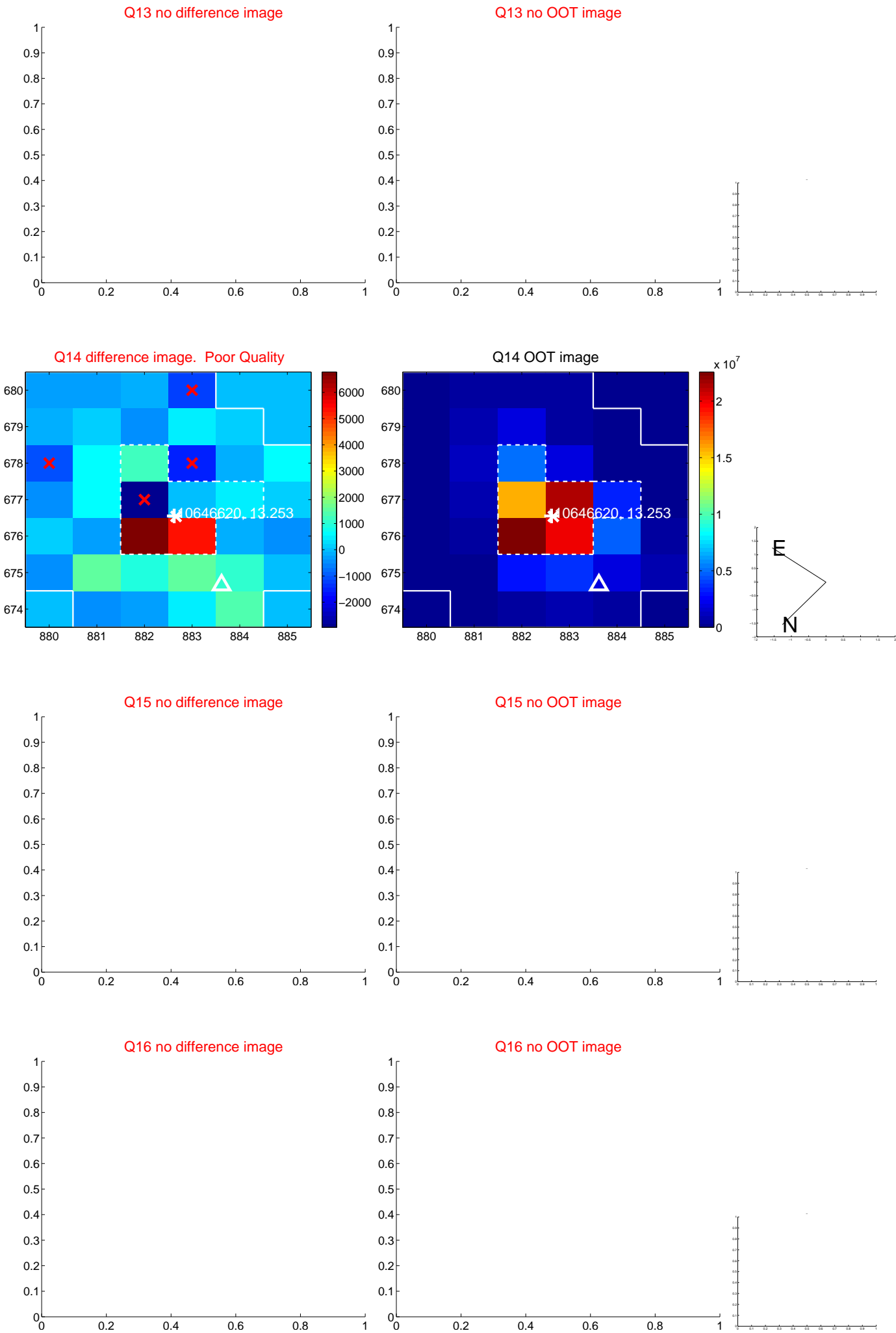
Q12 no difference image



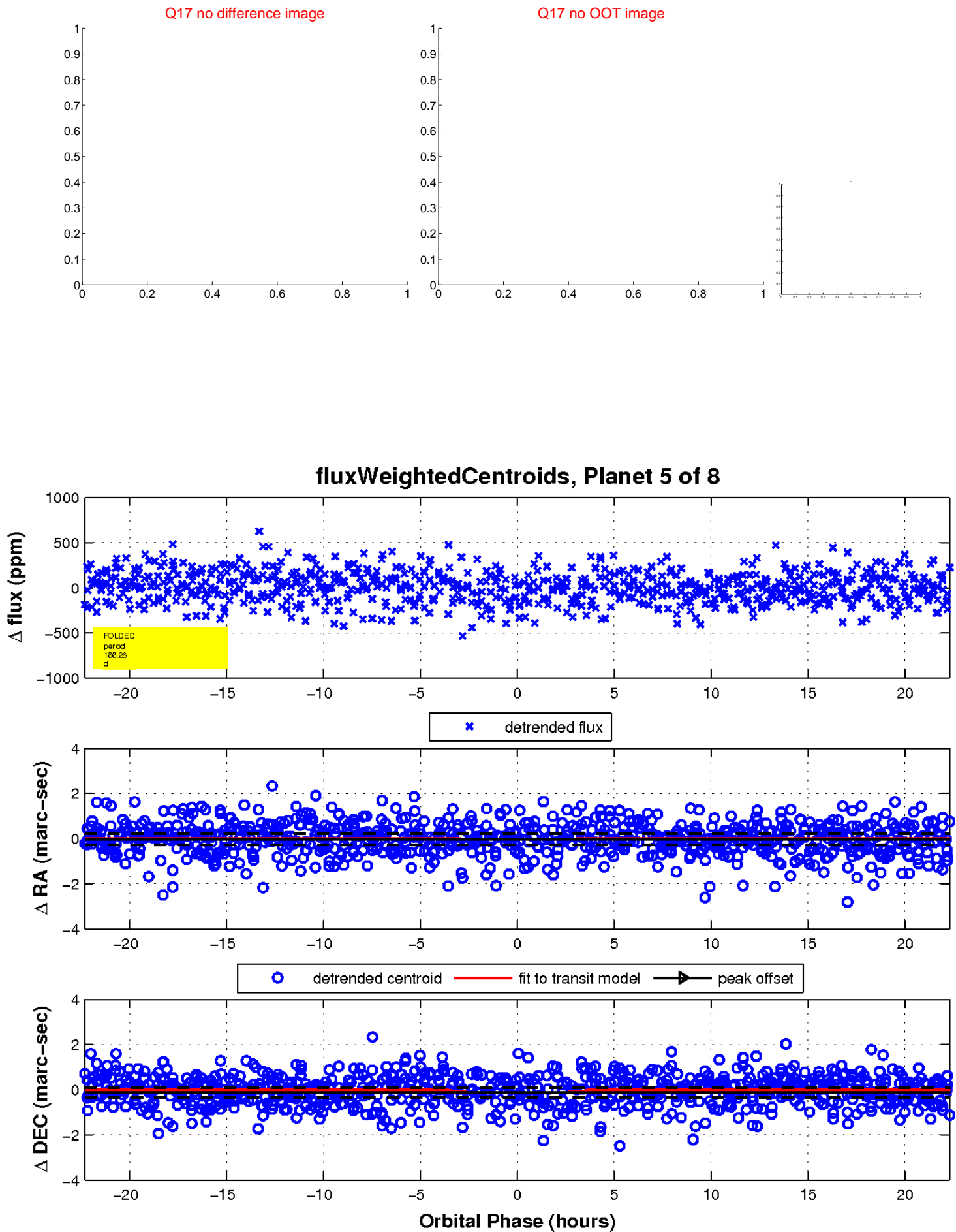
Q12 no OOT image



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

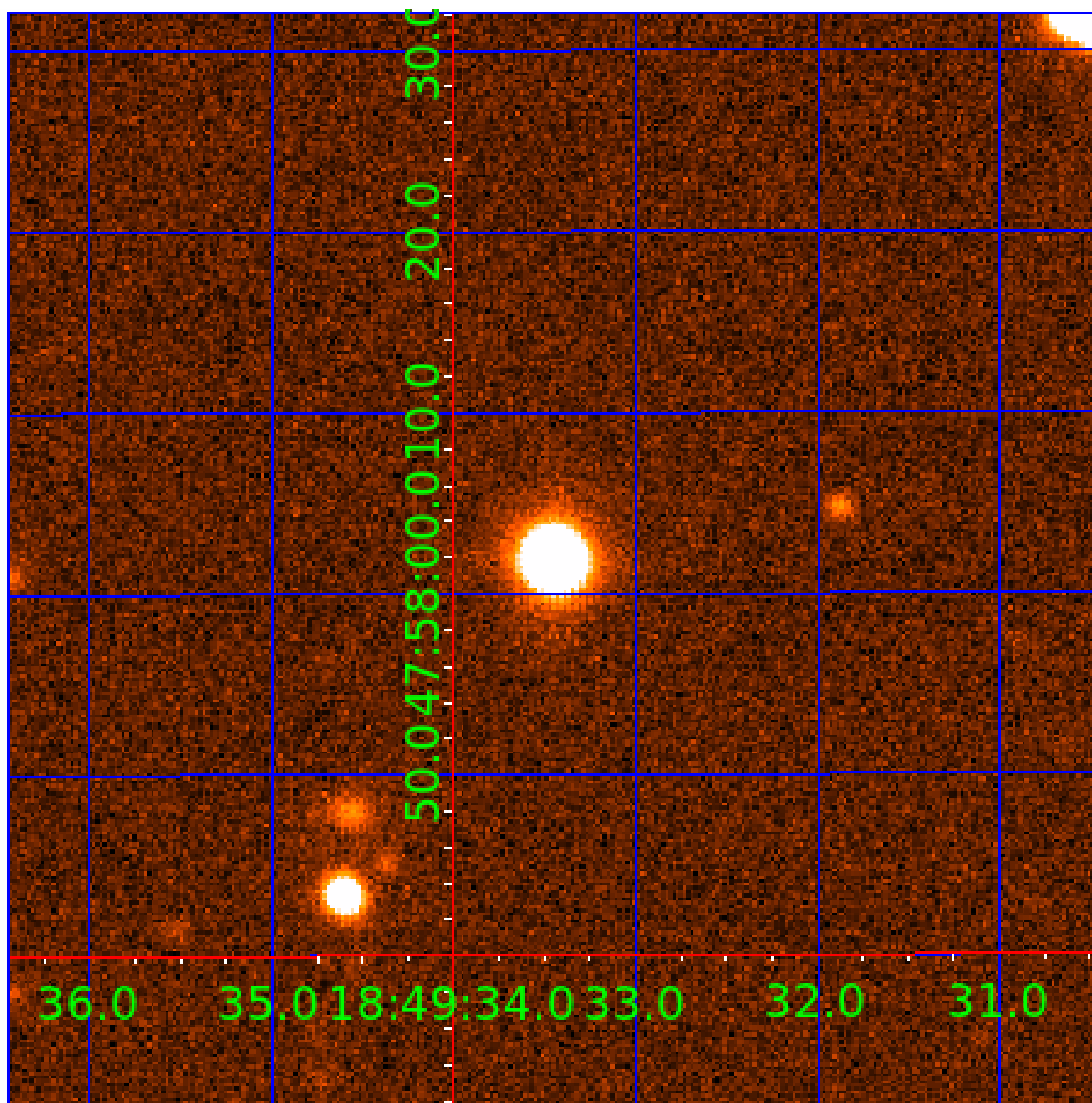


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010646620

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})
010646620-01	OBS	7352.01	2.413745	133.562364	30.4	13.034	8.8	9.9	2.60	6628	1.53	7193.29
010646620-02	OBS	No	439.264571	518.484387	347.9	20.978	9.7	8.3	2.60	6628	5.98	6.97
010646620-03	OBS	No	111.063930	154.308140	173.3	8.319	9.7	7.2	2.60	6628	3.92	43.63
010646620-05	OBS	No	166.284333	180.111872	257.2	7.447	9.3	8.6	2.60	6628	4.77	25.47
010646620-06	OBS	No	74.102175	201.659120	171.5	10.789	8.3	6.9	2.60	6628	3.82	74.83
010646620-08	OBS	No	111.645419	207.499050	224.2	2.810	7.3	7.6	2.60	6628	4.60	43.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010646620-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010646620-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010646620-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
010646620-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010646620-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010646620-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT

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 010646620-06

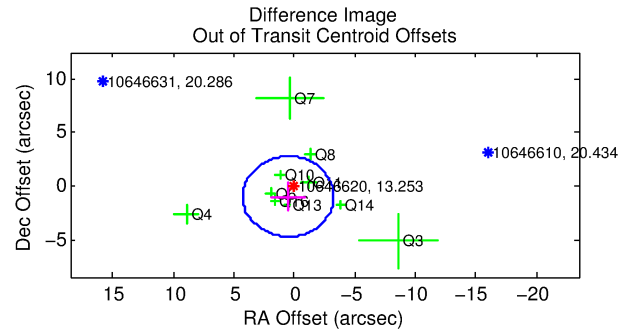
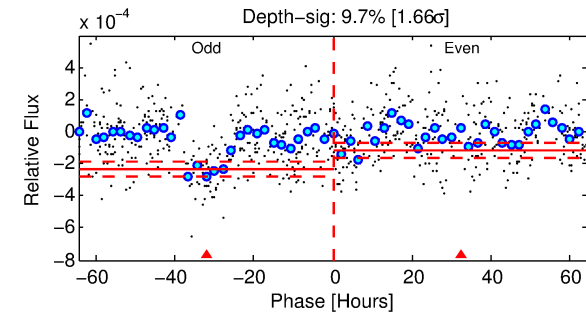
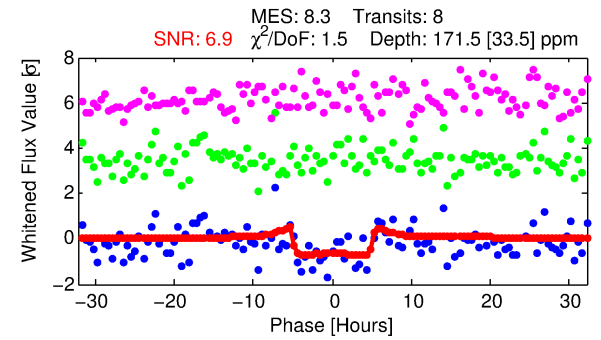
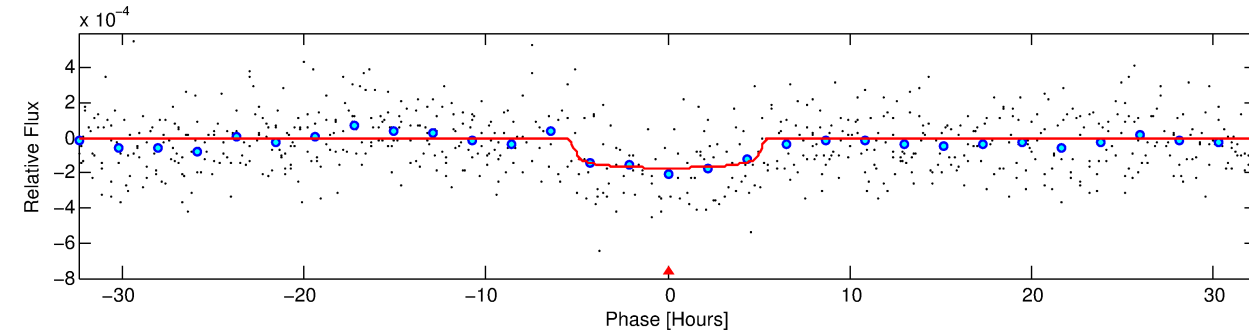
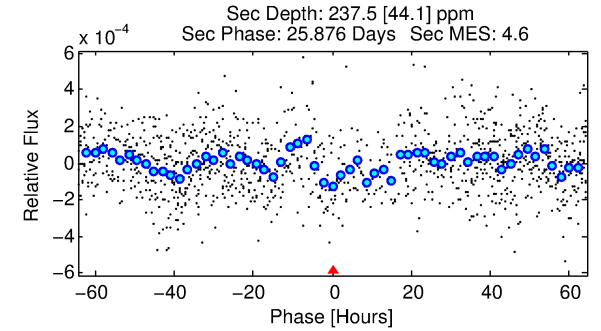
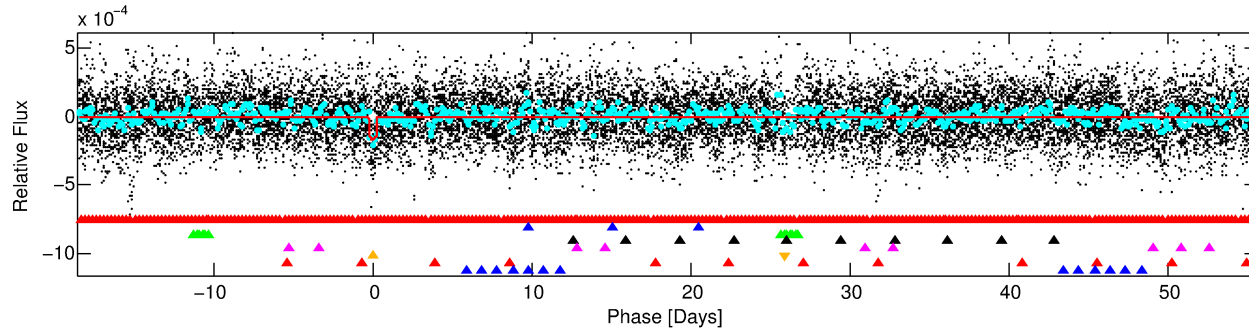
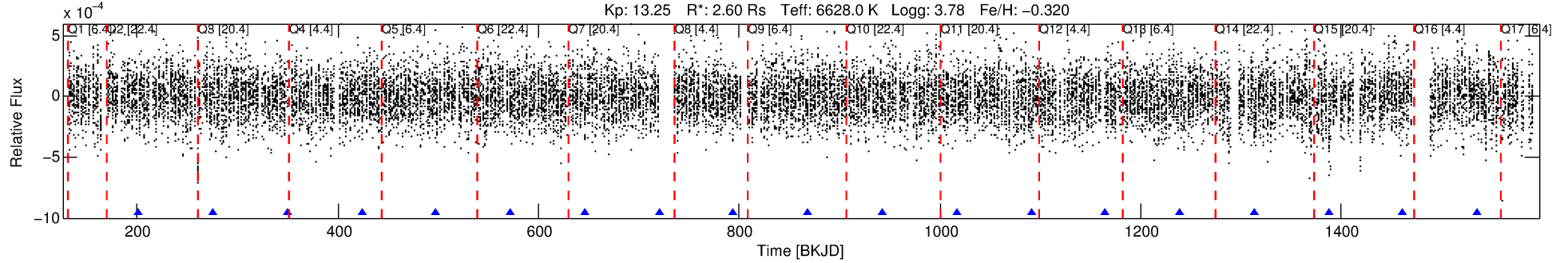
No Significant Match Found

DV One-Page Summary

KIC: 10646620 Candidate: 6 of 8 Period: 74.102 d

KOI: K07352 Corr: No Ephemeris Match

Kp: 13.25 R*: 2.60 Rs Teff: 6628.0 K Logg: 3.78 Fe/H: -0.320



DV Fit Results:

Period = 74.10218 [0.00229] d
Epoch = 201.6591 [0.0238] BKJD
Rp/R* = 0.0135 [0.0041]
a/R* = 29.53 [47.36]
b = 0.84 [0.55]
Seff = 74.83 [41.28]
Teq = 750 [103] K
Rp = 3.82 [1.85] Re
a = 0.3945 [0.1369] AU
Ag = 1392.62 [1159.42] [1.20σ]
Teffp = 7083 [1137] K [5.55σ]

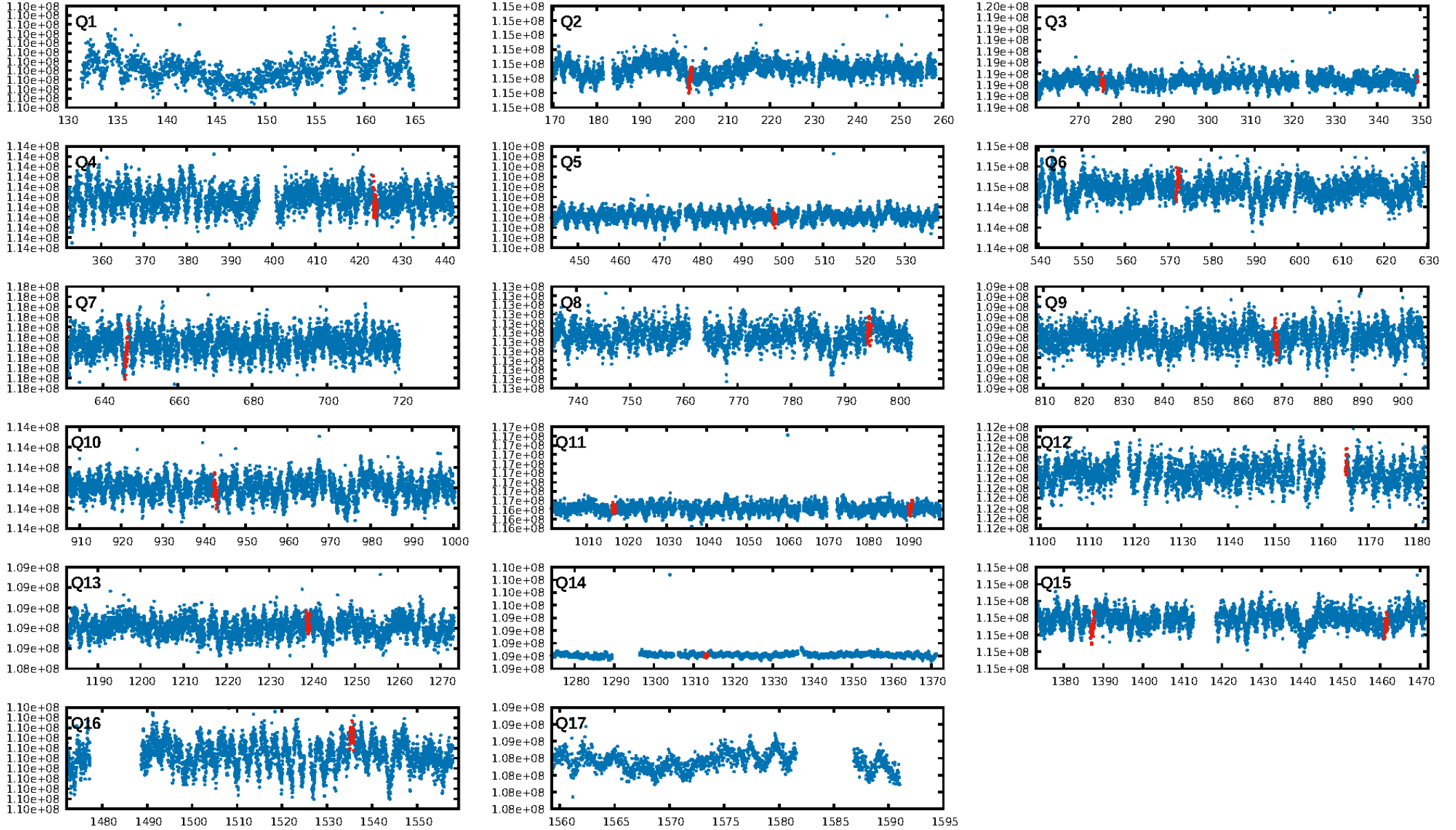
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [101.69σ]
LongPeriod-sig: 100.0% [65.12σ]
ModelChiSquare2-sig: 1.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.77e-08
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: 1.15
Centroid-sig: 63.4%
Centroid-so: 0.583 arcsec [0.81σ]
OotOffset-rm: 1.107 arcsec [0.89σ]
KicOffset-rm: 1.101 arcsec [1.04σ]
OotOffset-st: 3/3/3/1 [10]
KicOffset-st: 3/3/3/1 [10]
DiffImageQuality-fgm: 0.30 [3/10]
DiffImageOverlap-fno: 0.07 [1/14]

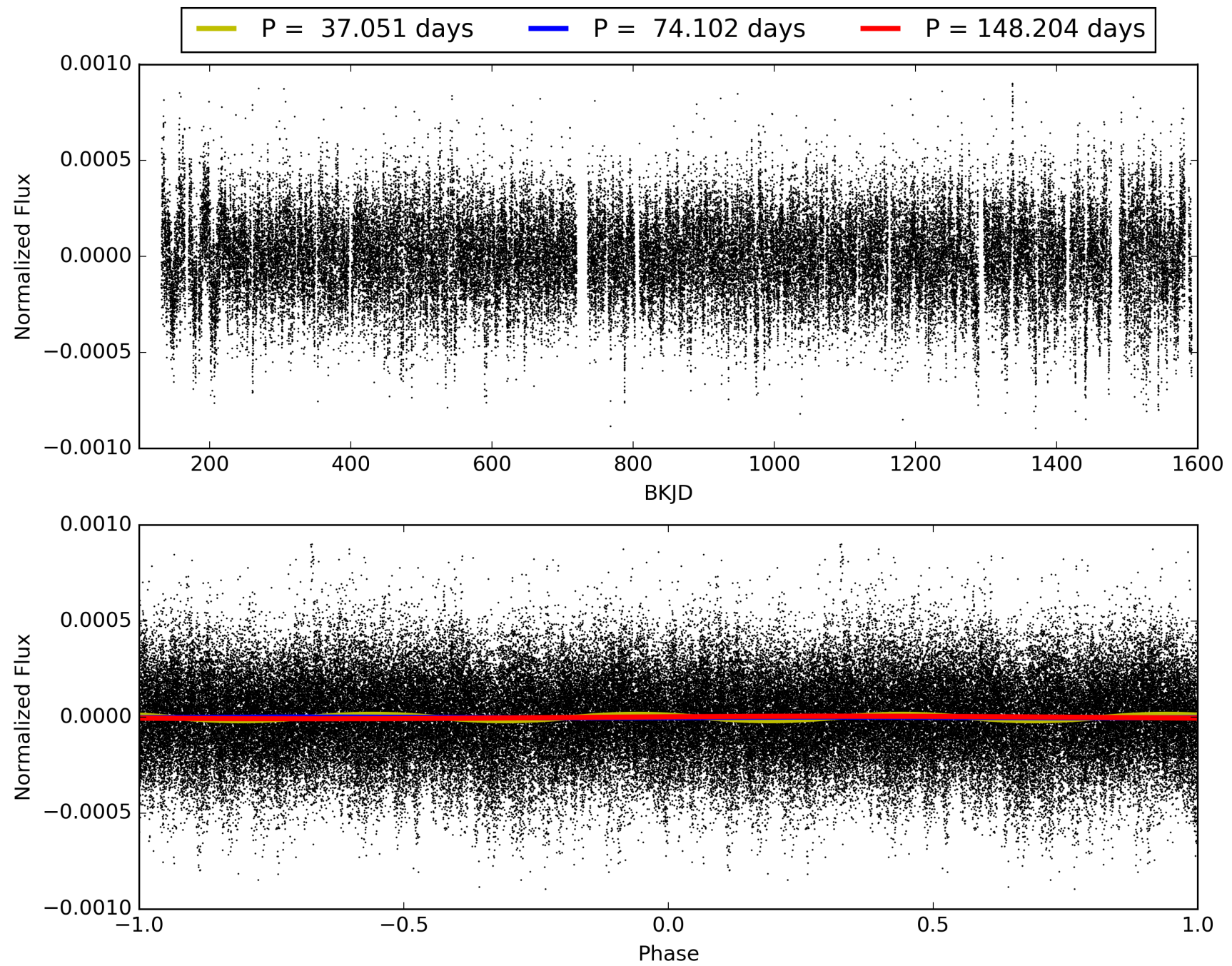
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:09:46 Z

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

TCE 010646620-06, PDC Light Curves

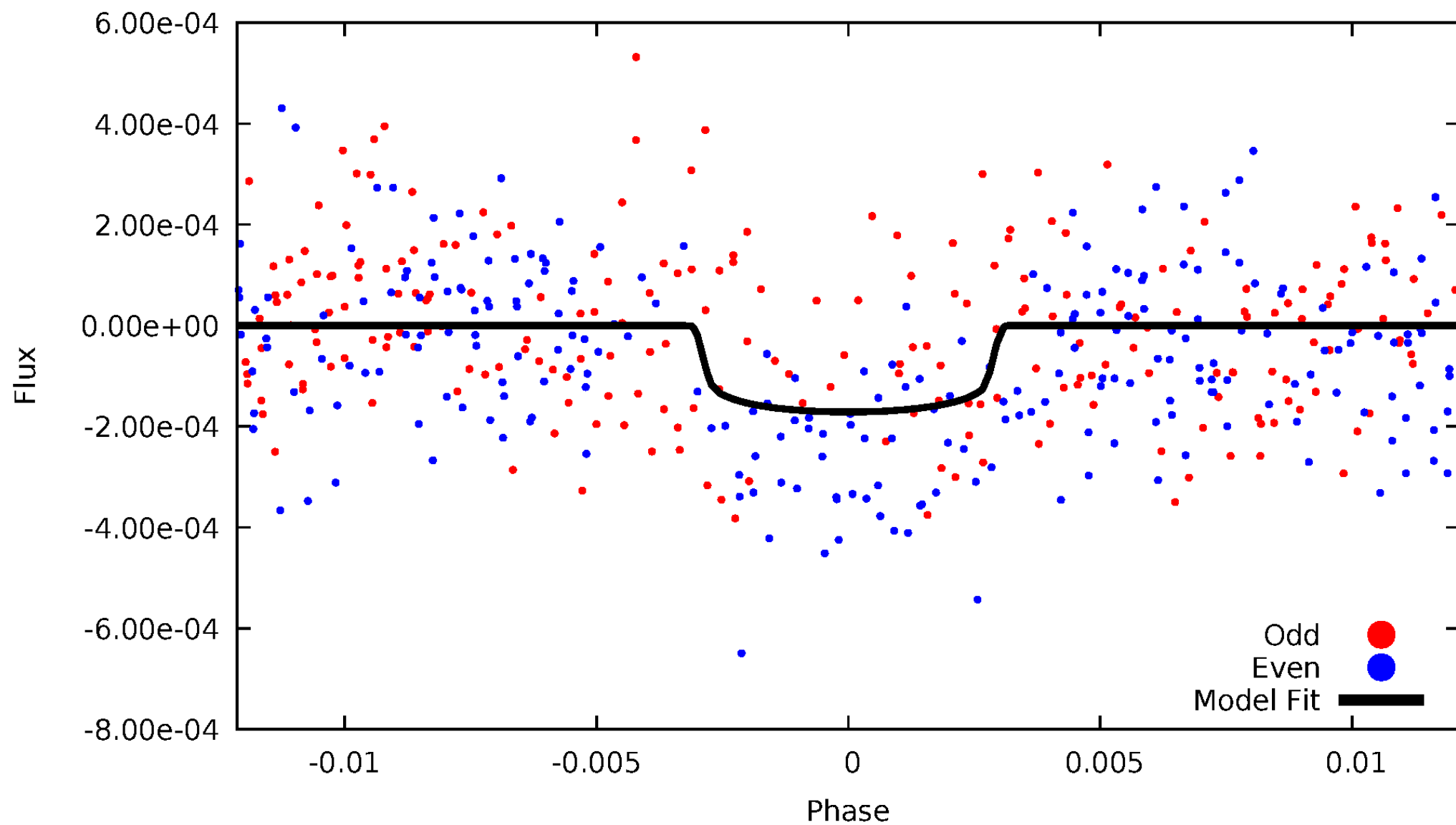


TCE 010646620-06



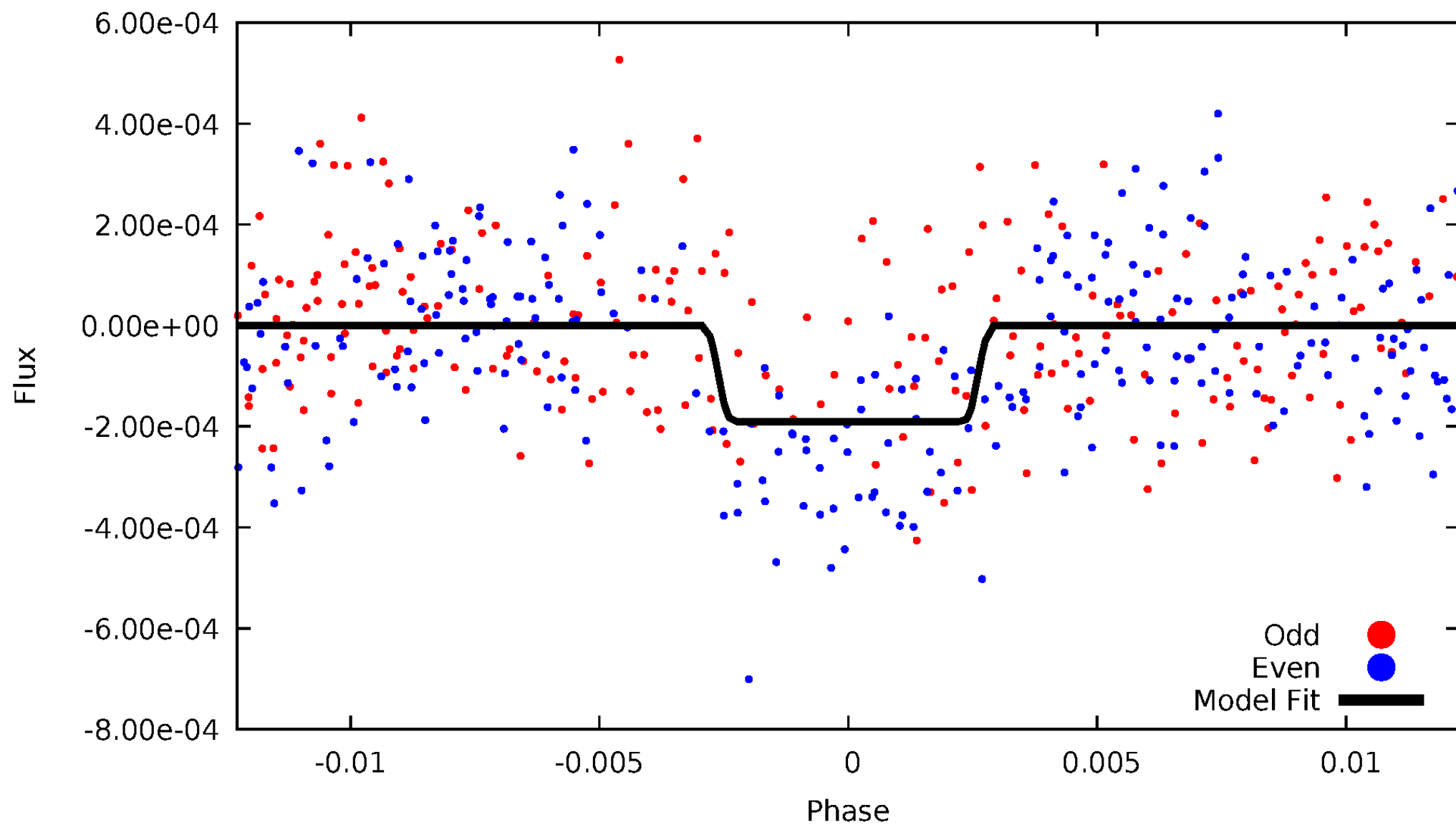
DV Odd/Even

TCE 010646620-06



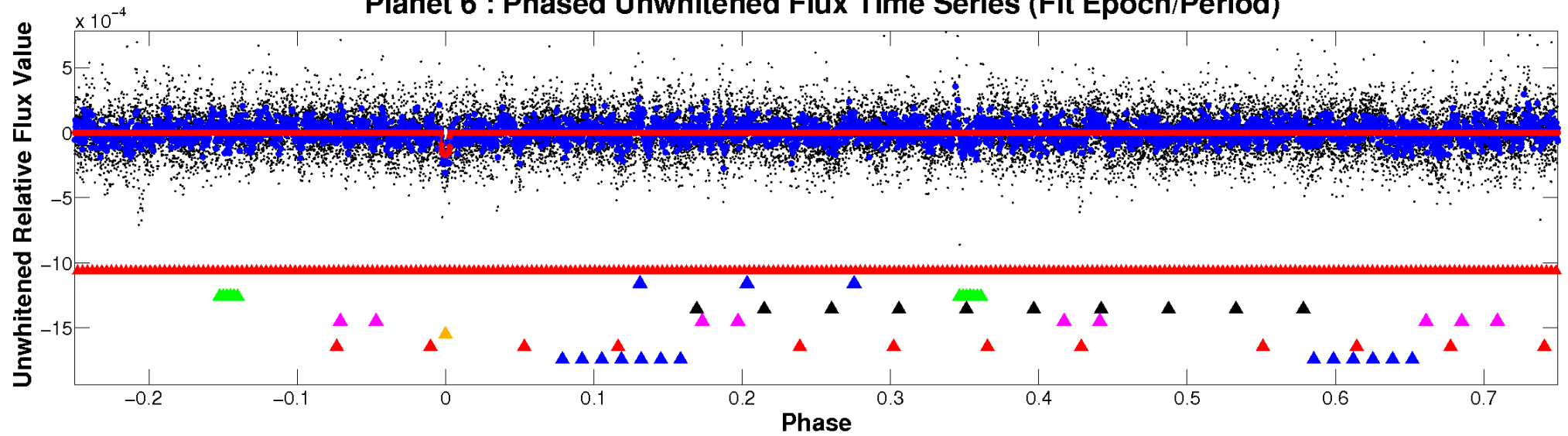
ALT Odd/Even

TCE 010646620-06

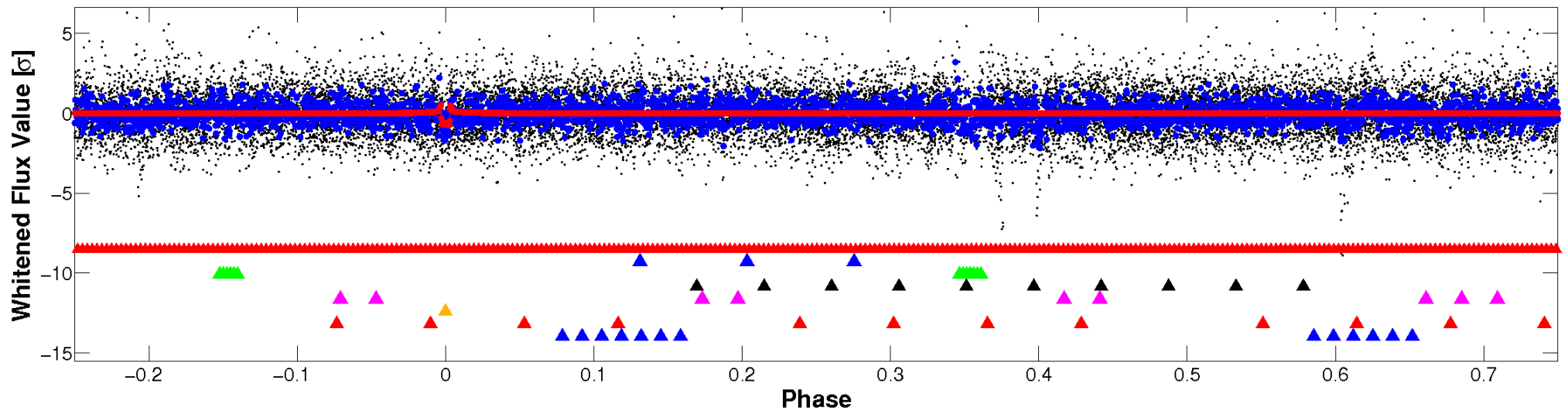


Non-Whitened Vs. Whitened Light Curve

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

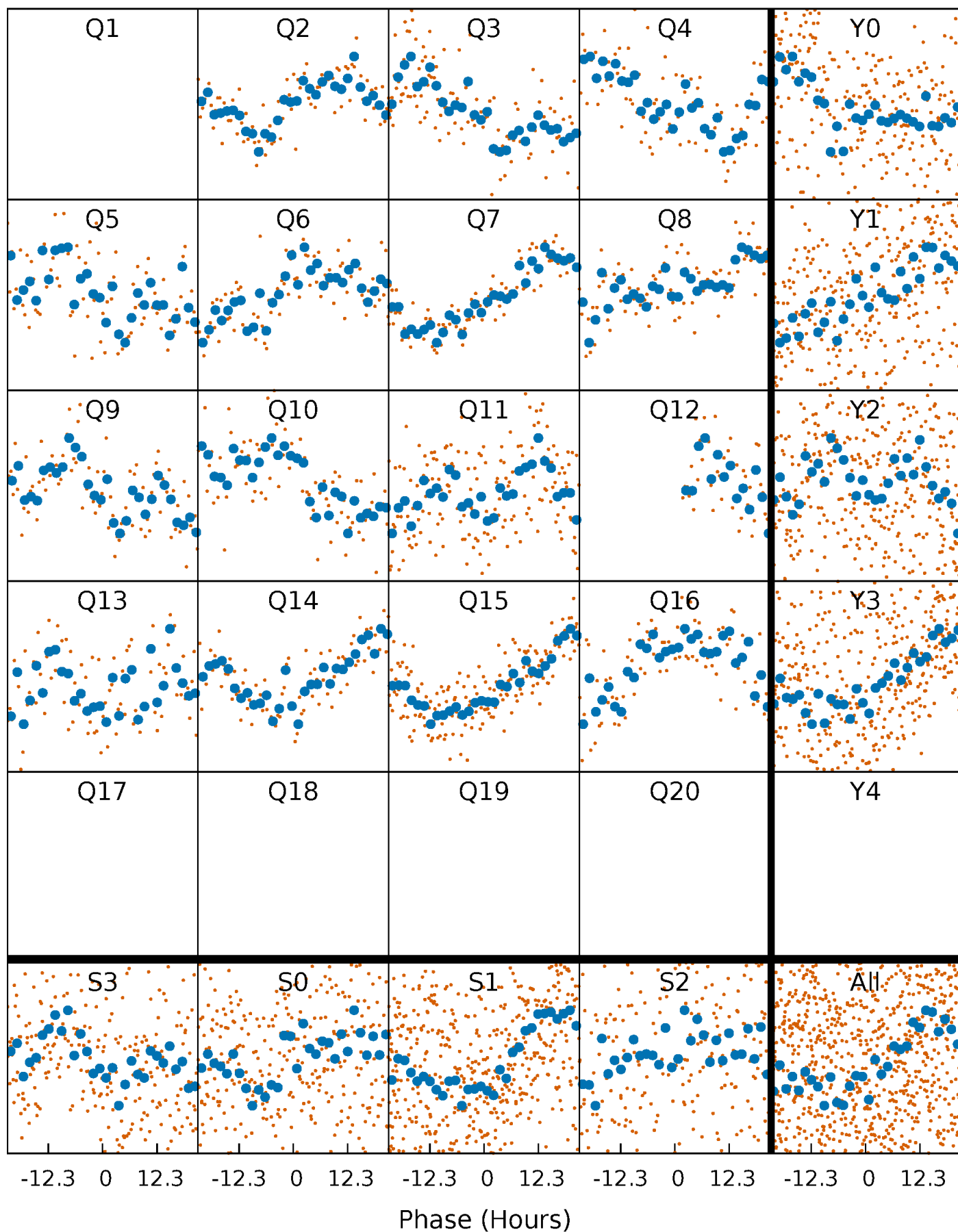


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



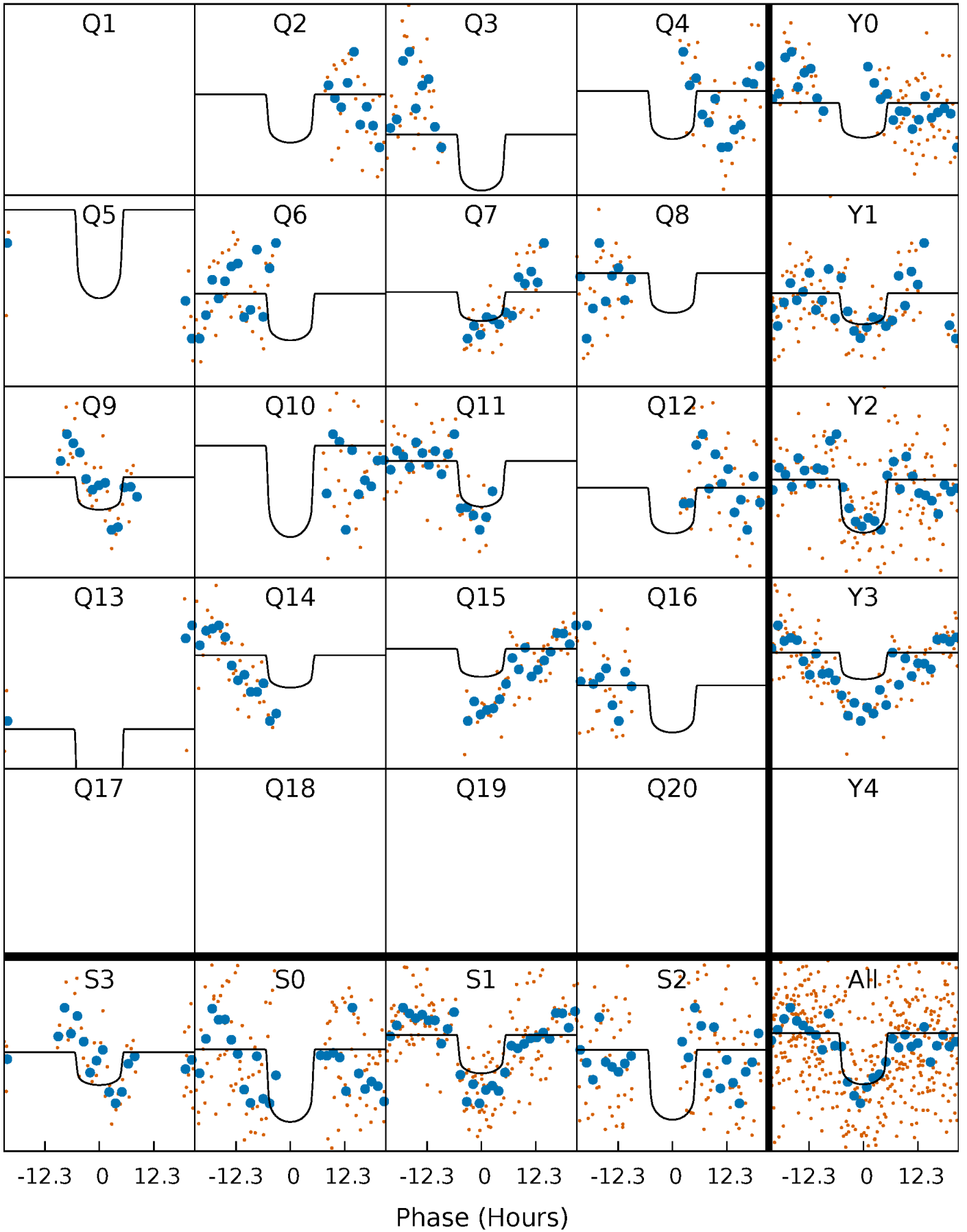
PDC Quarter-Phased Transit Curves

TCE 010646620-06 P= 74.102175 Days $T_0=201.659120$ (BKJD)



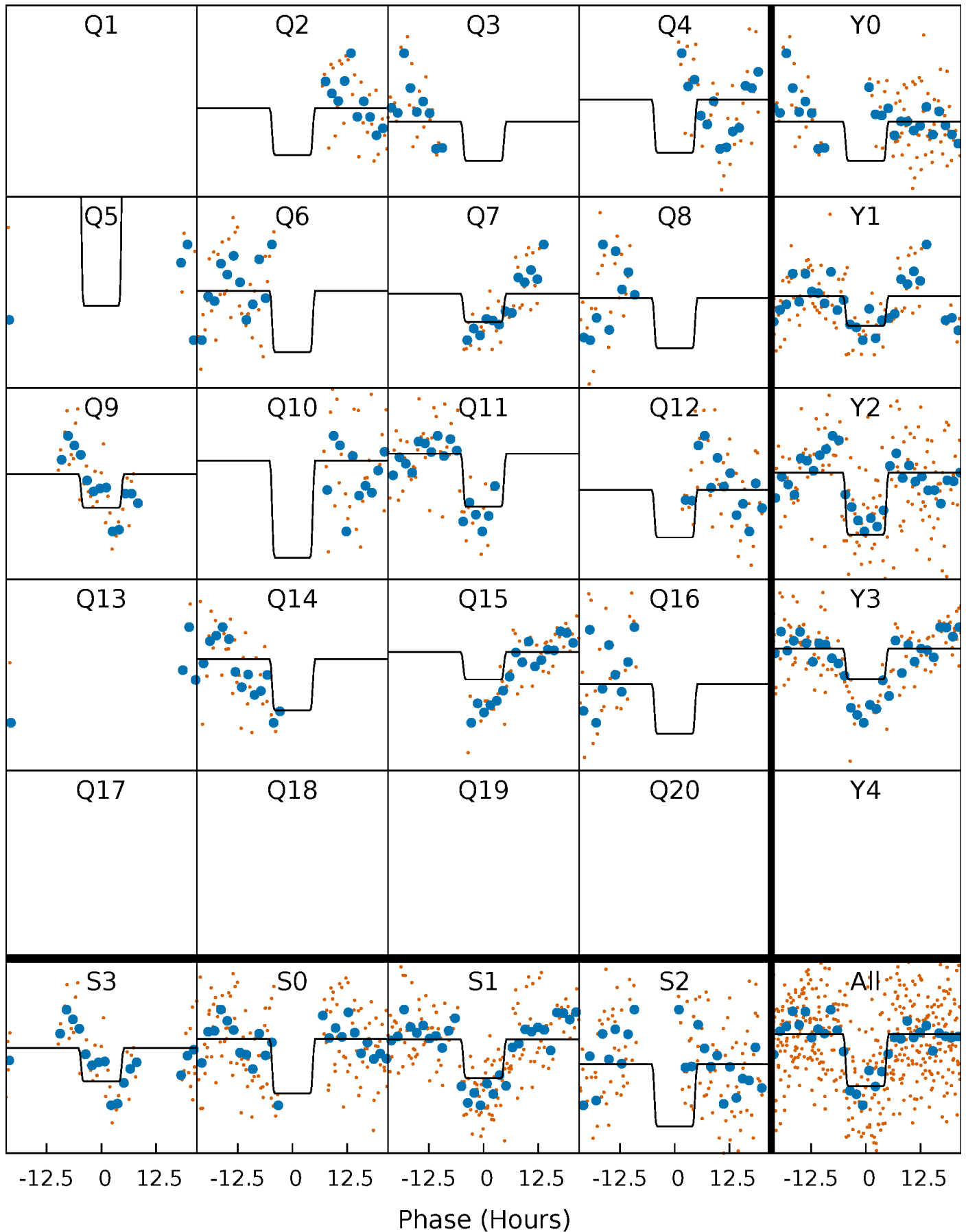
DV Quarter-Phased Transit Curves

TCE 010646620-06 P= 74.102175 Days $T_0=201.659120$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

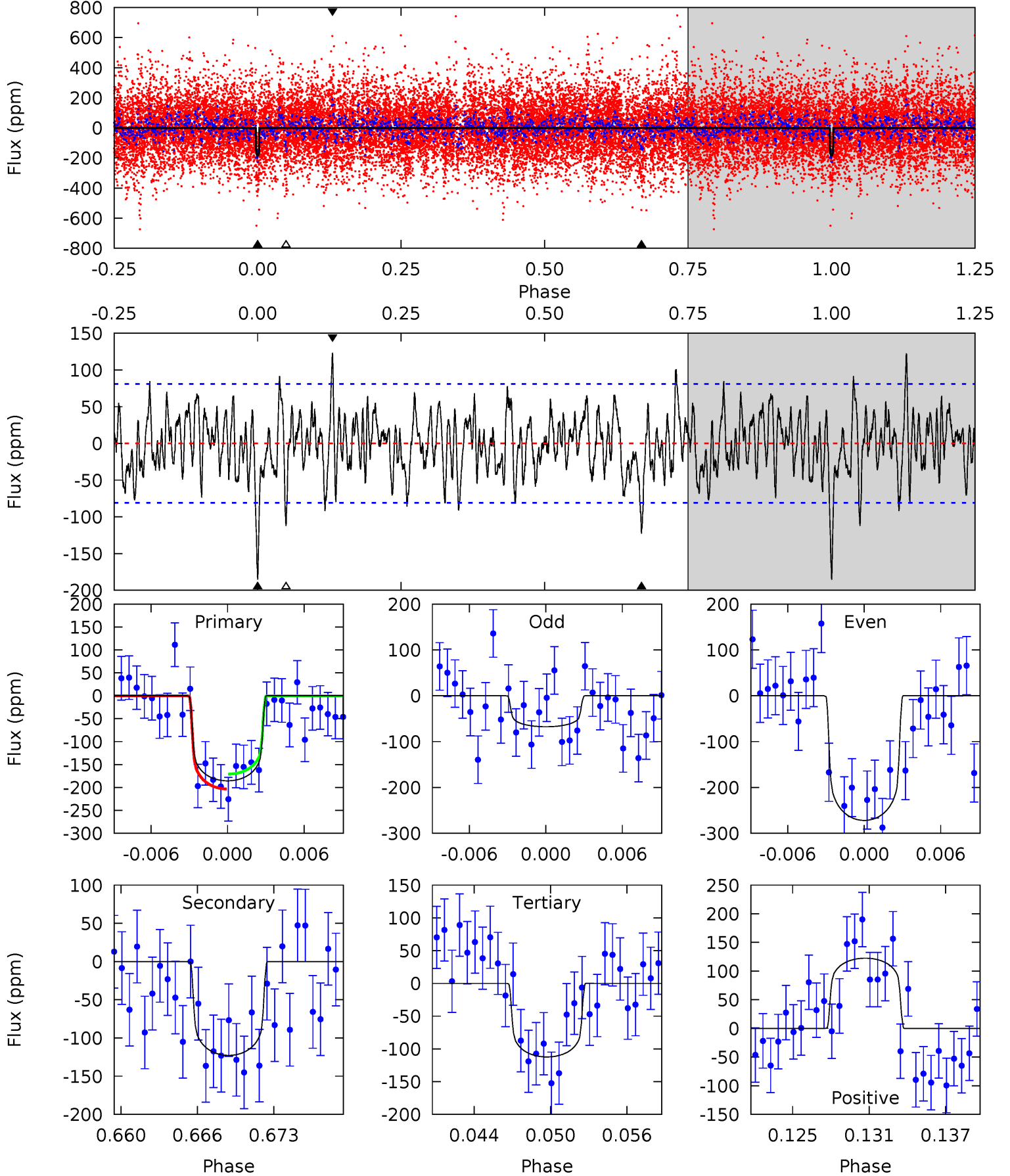
TCE 010646620-06 P= 74.098769 Days $T_0=201.704672$ (BKJD)



DV Model-Shift Uniqueness Test

010646620-06, P = 74.102175 Days, E = 127.556945 Days

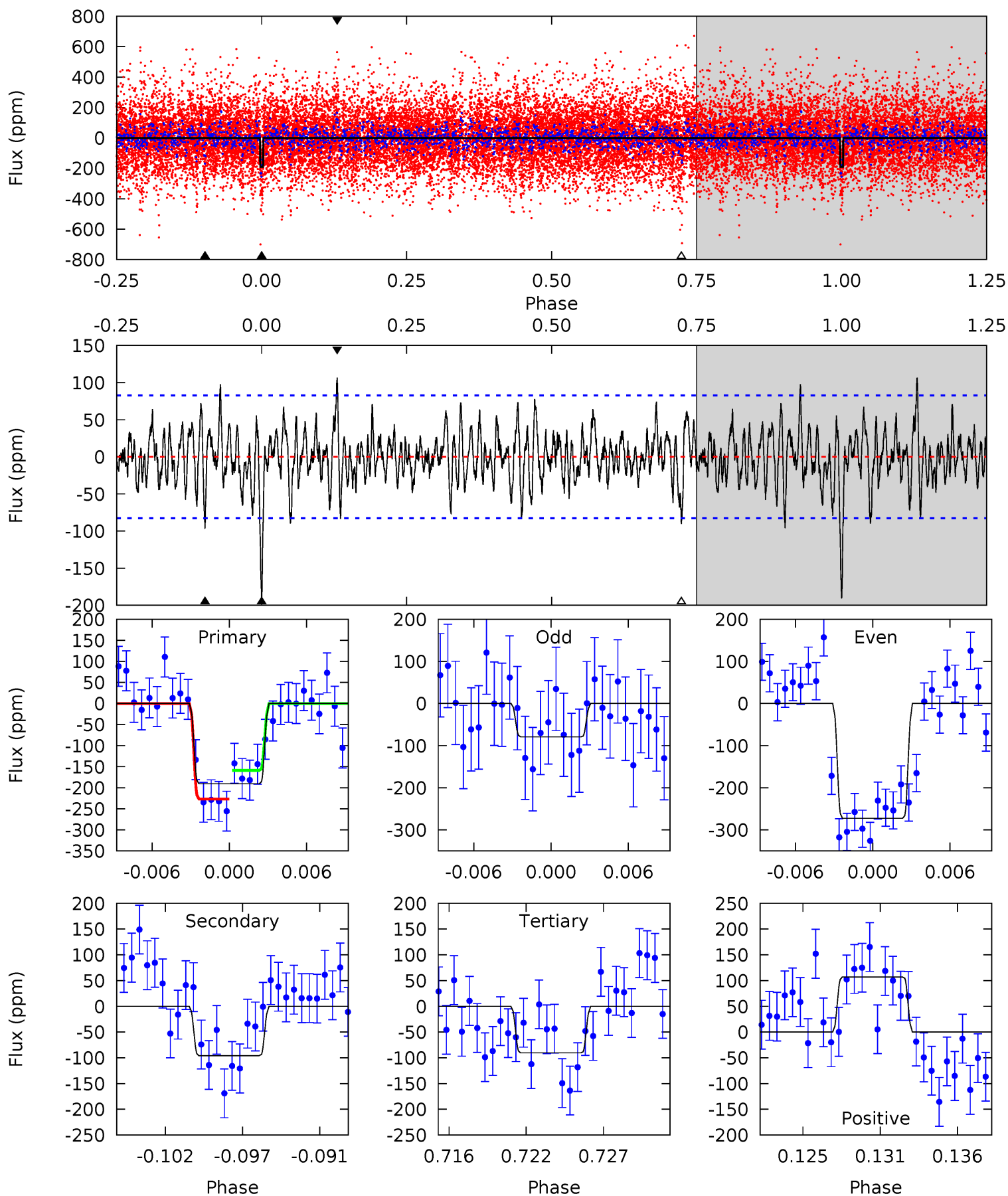
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	7.77	7.11	7.75	5.12	2.74	2.18	4.64	3.99	0.66	0.02	6.44	0.94	0.40	1.02



Alt Model-Shift Uniqueness Test

010646620-06, $P = 74.098769$ Days, $E = 127.605903$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	5.95	5.61	6.63	5.13	2.77	1.82	6.22	5.20	0.34	-0.68	5.97	0.65	0.36	2.10



Stellar Parameters For KIC 010646620

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6628^{+160}_{-180}	$3.783^{+0.312}_{-0.098}$	$-0.320^{+0.300}_{-0.250}$	$2.595^{+0.419}_{-0.978}$	$1.489^{+0.212}_{-0.344}$	$0.120^{+0.253}_{-0.038}$
	+2%/-3%	+8%/-3%	+94%/-78%	+16%/-38%	+14%/-23%	+211%/-31%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010646620-06 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-123 ± 16	$3.59^{+1.28}_{-1.22}$	1031^{+59}_{-89}	5998^{+1203}_{-755}	802^{+1034}_{-375}
Alt.	-96 ± 16	$3.62^{+1.31}_{-1.28}$	1030^{+62}_{-90}	5615^{+1140}_{-677}	610^{+854}_{-275}

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 $A_{obs} \gg 1.0$

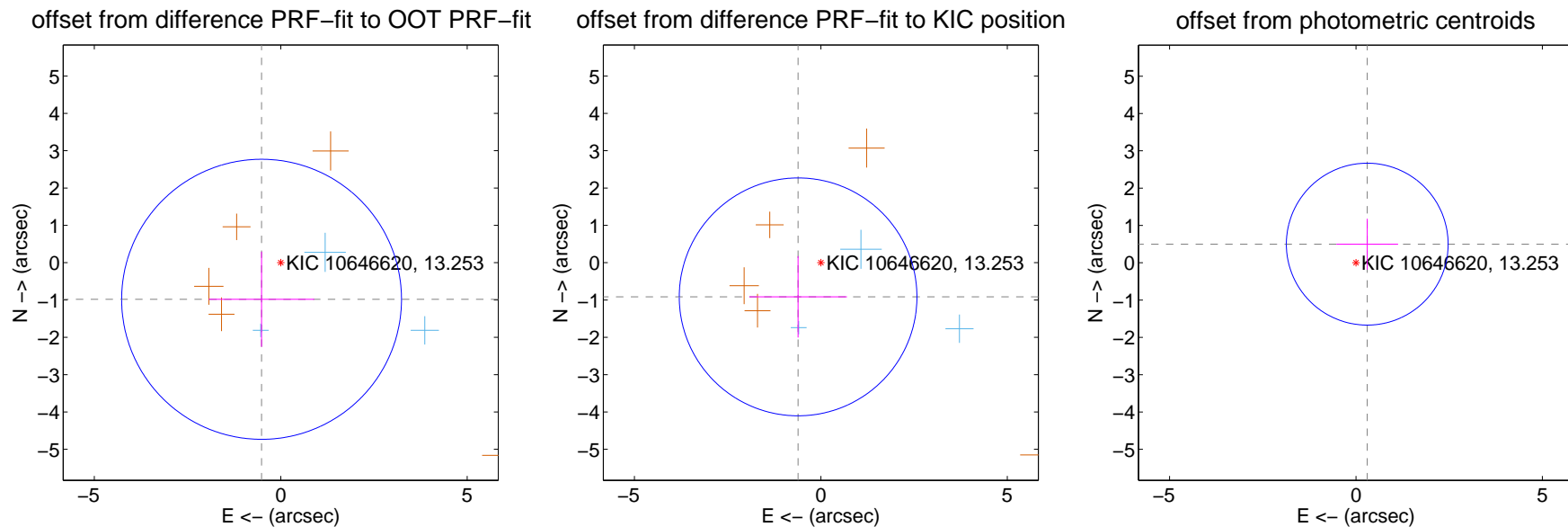
DV Centroid Data

Supplemental centroid analysis for 010646620-06. Kepler magnitude: 13.25. Transit SNR 6.94

There are 3 quarters with good PRF difference image offsets

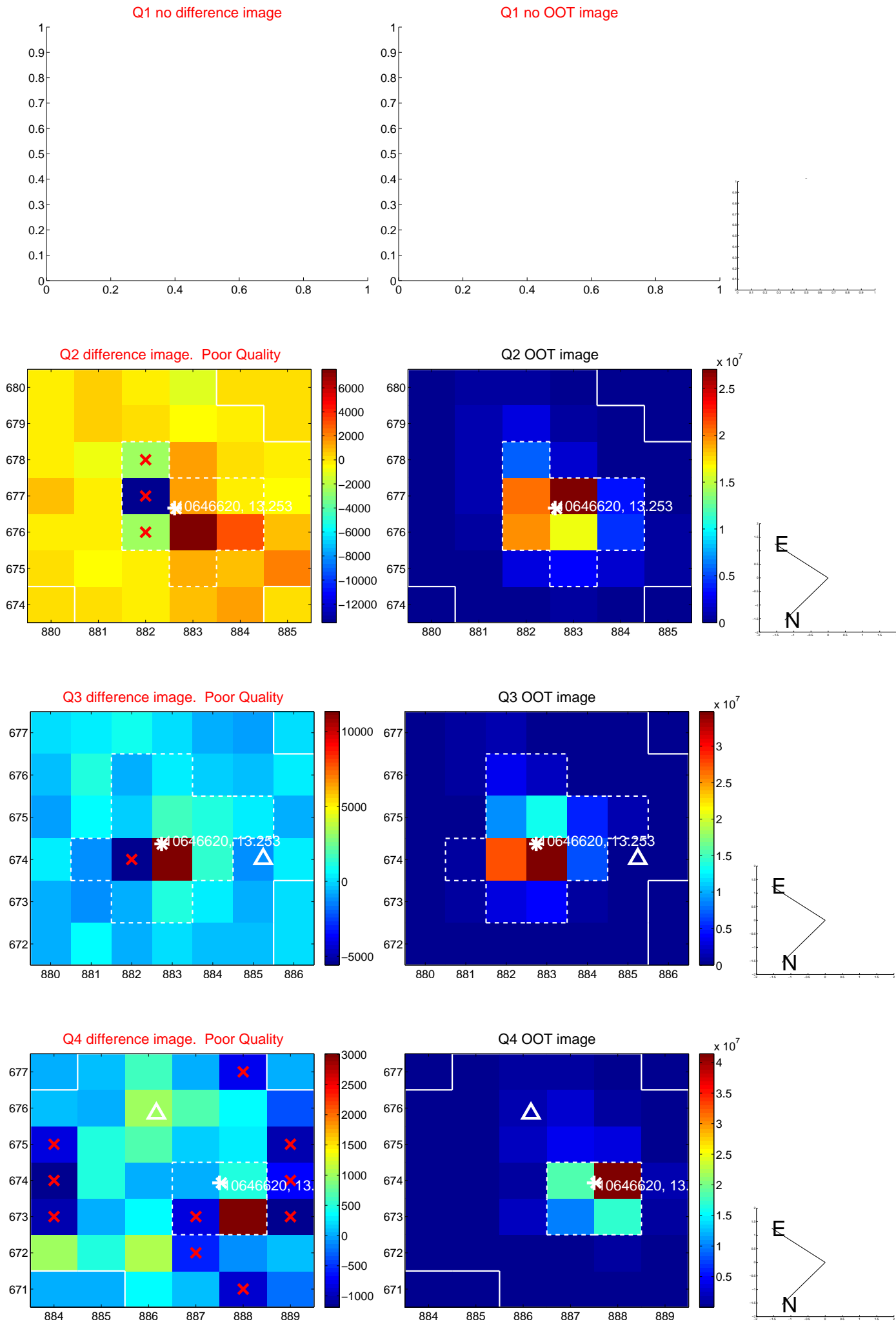
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.107 ± 1.251	0.89	0.514 ± 1.413	-0.981 ± 1.274
PRF-fit source offset from KIC position	1.101 ± 1.062	1.04	0.610 ± 1.310	-0.916 ± 1.090
photometric centroid source offset	0.58 ± 0.72	0.81	-0.30 ± 0.83	0.50 ± 0.68

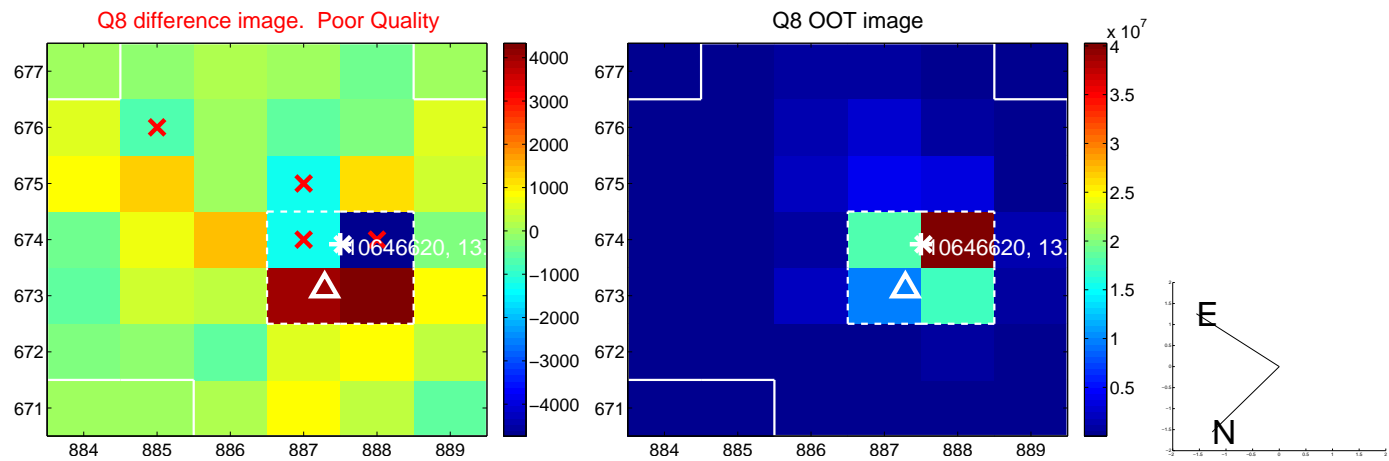
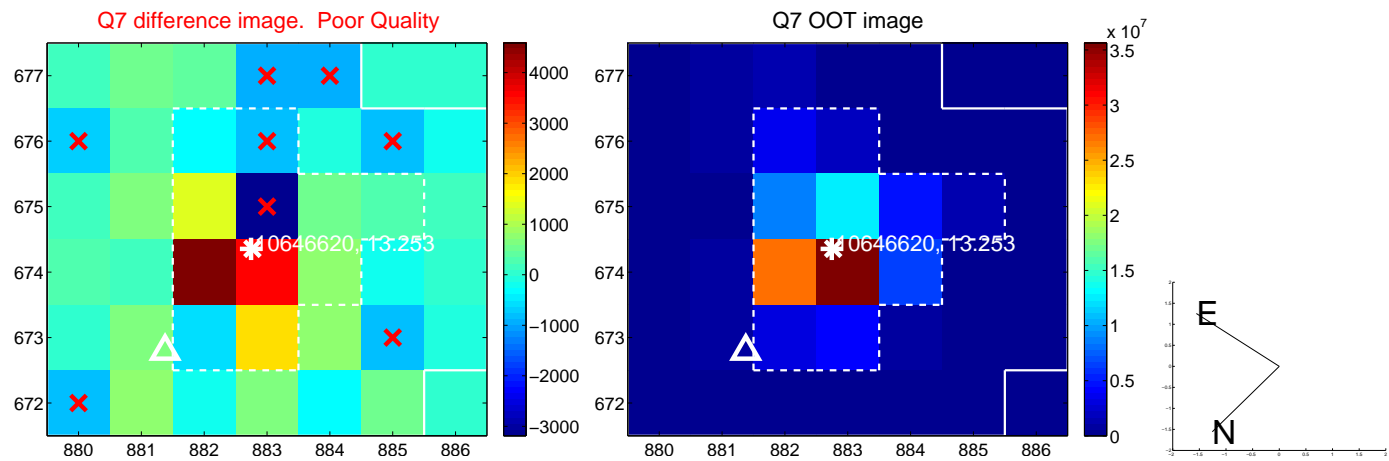
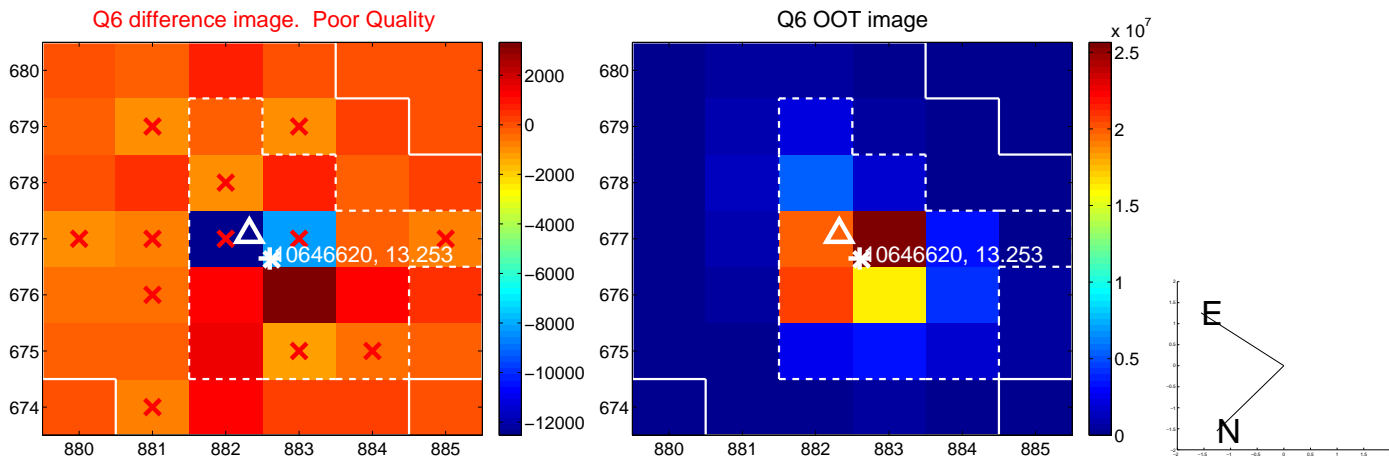
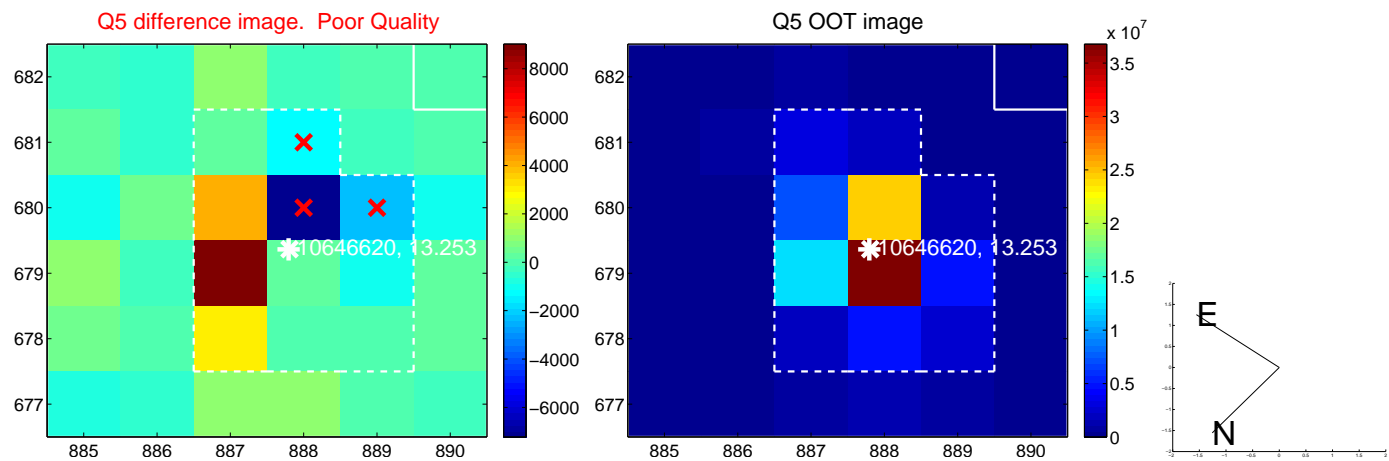


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

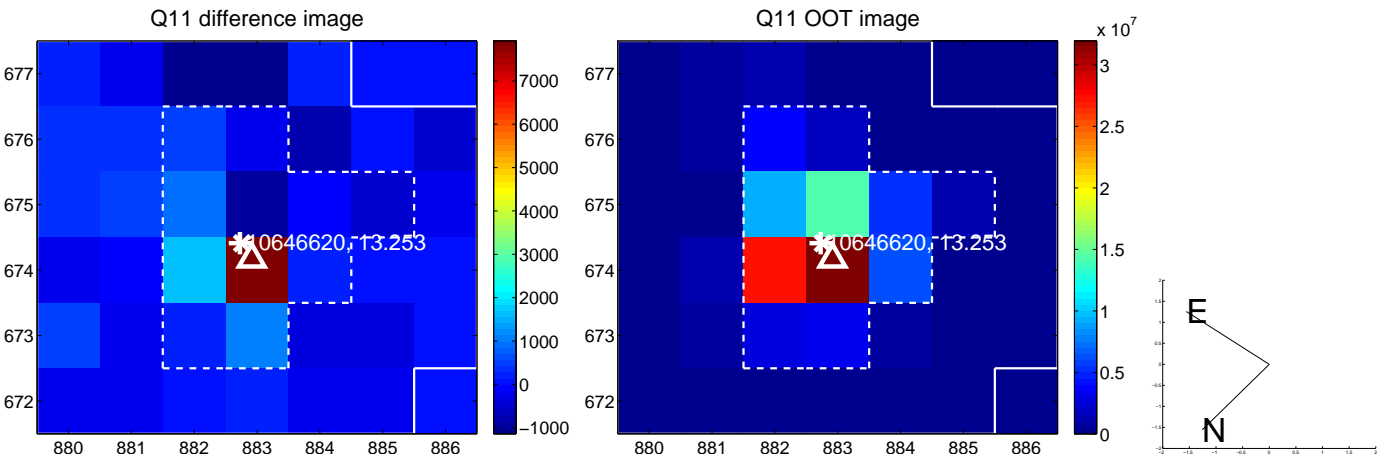
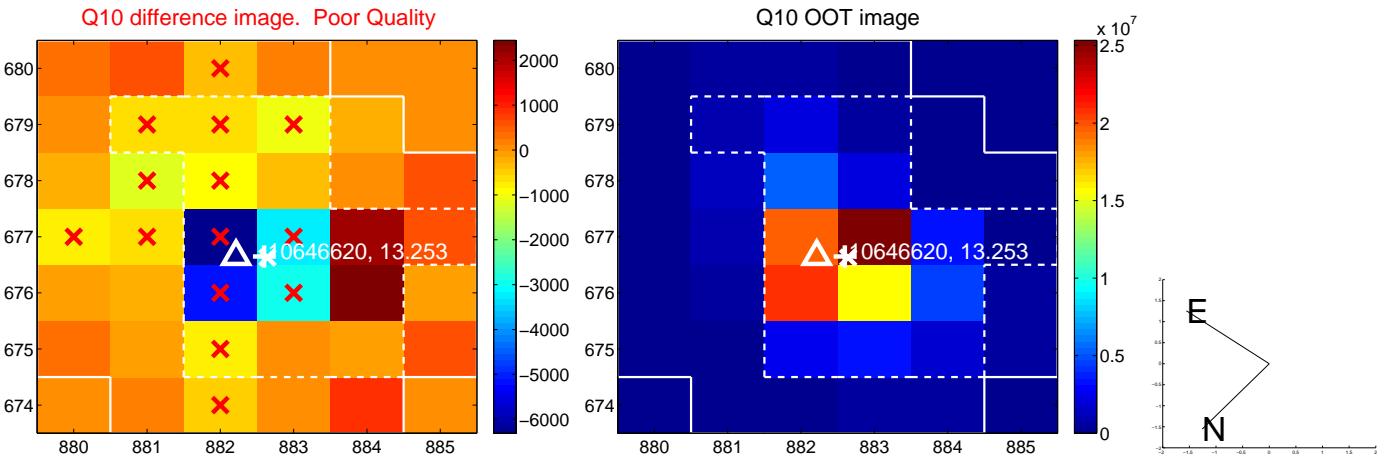
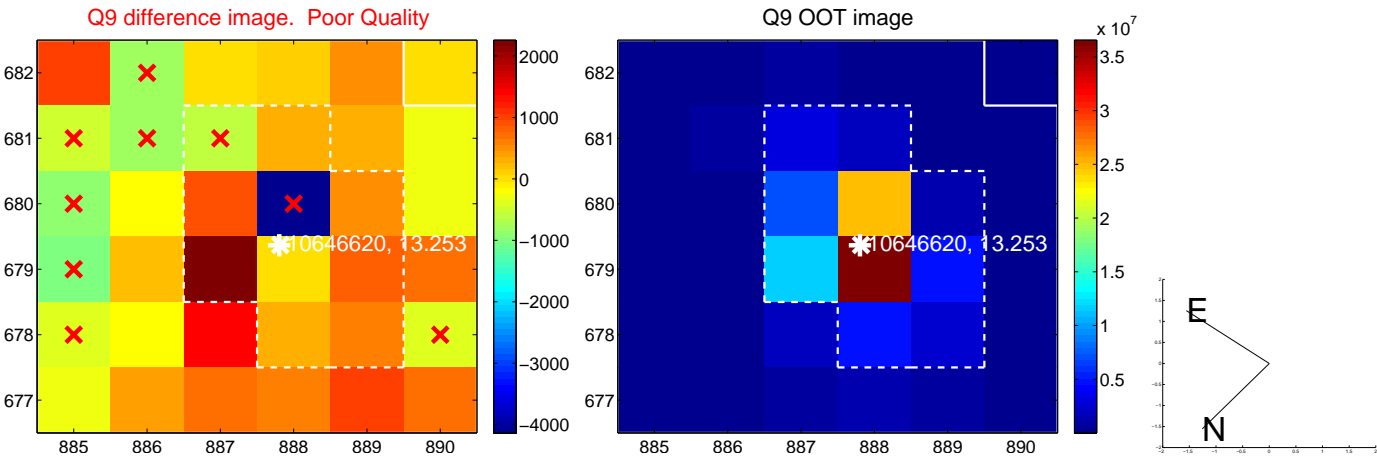
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



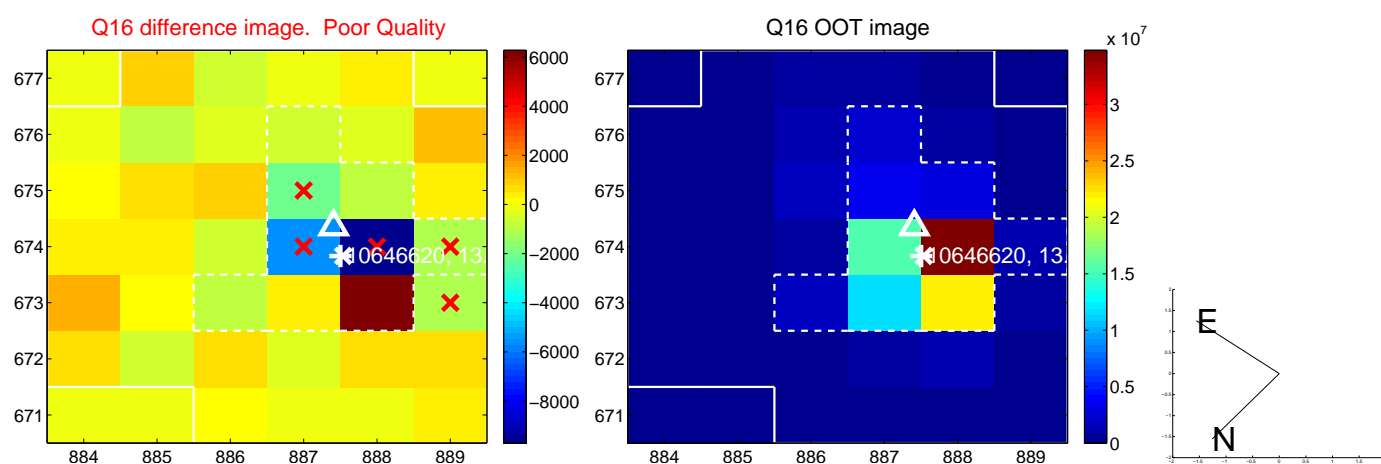
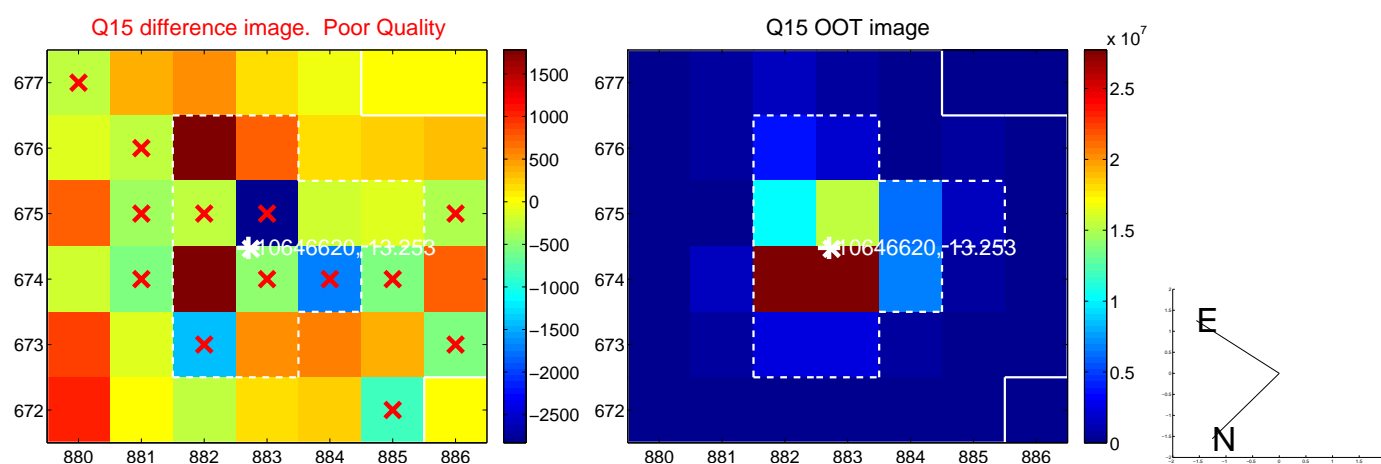
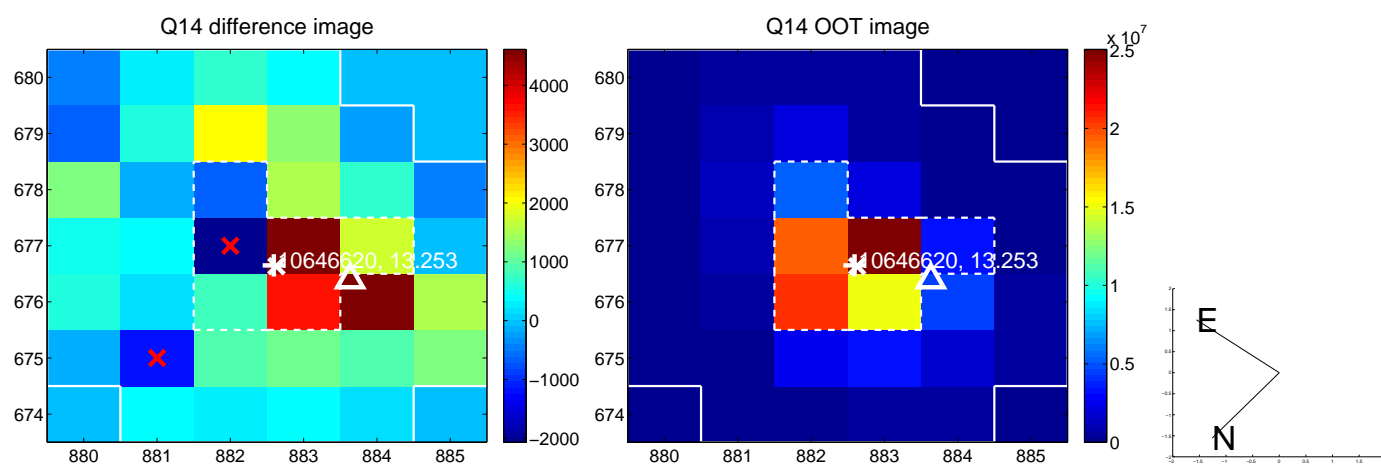
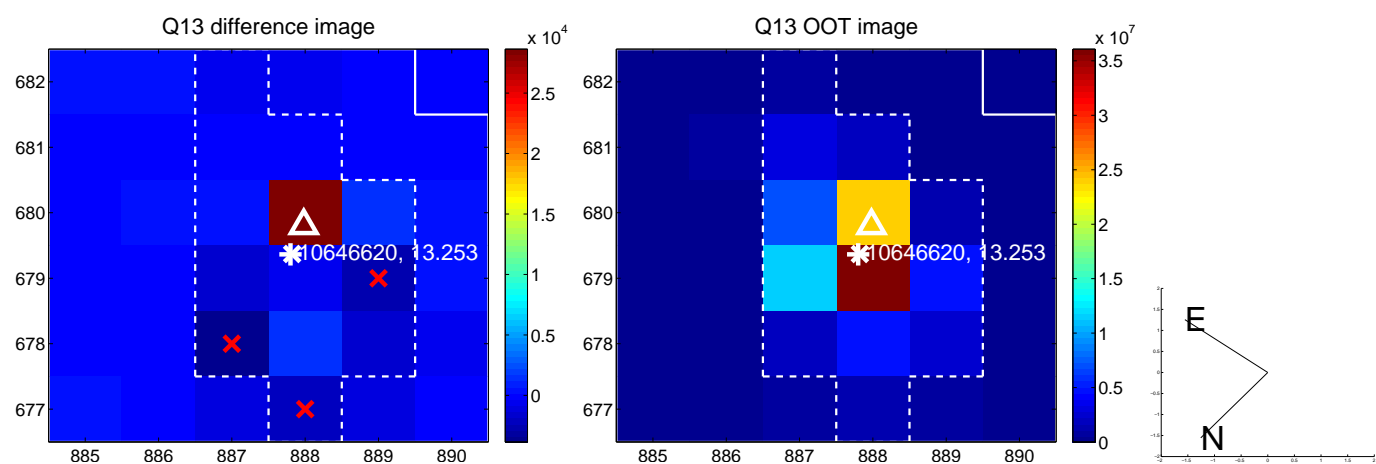
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



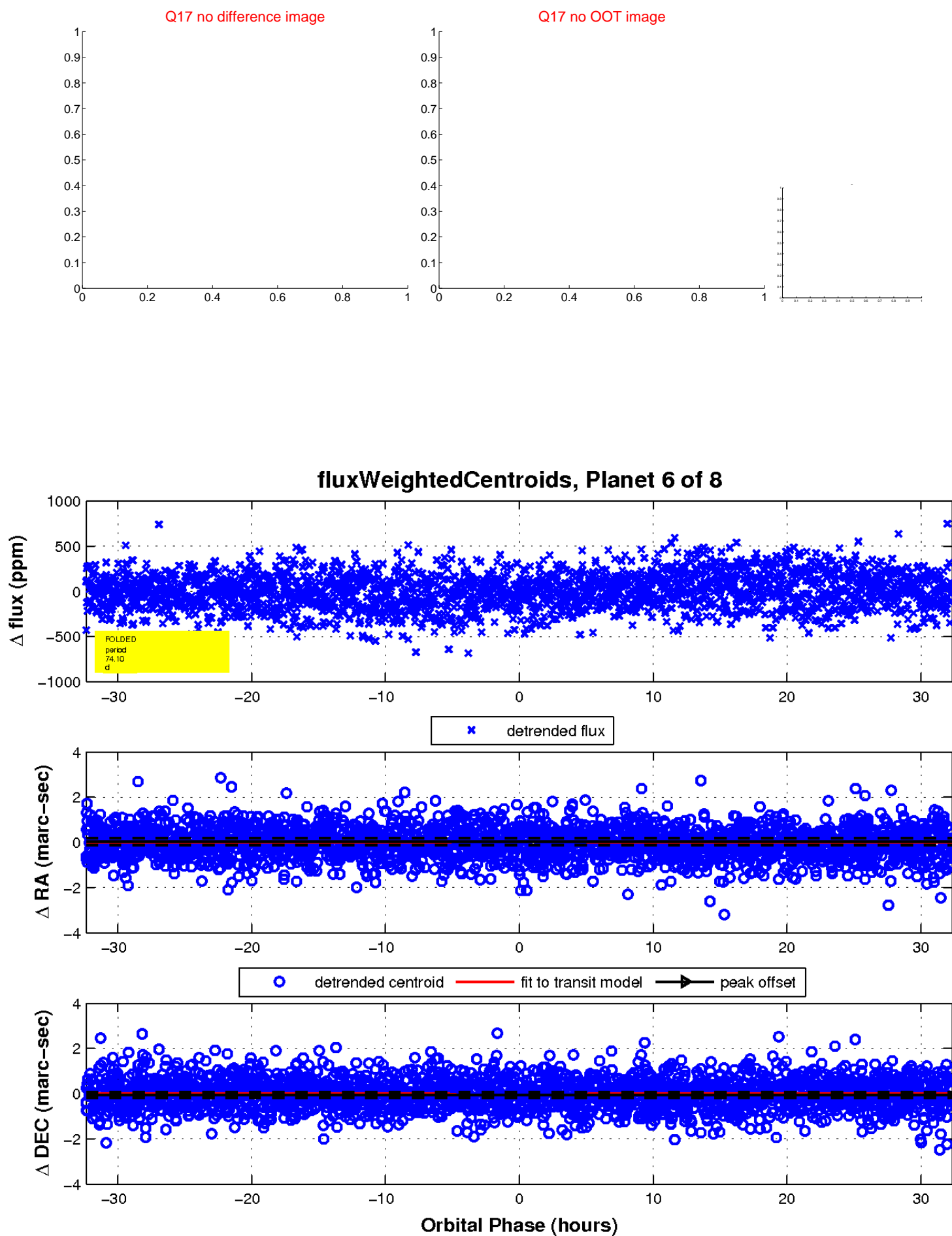
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

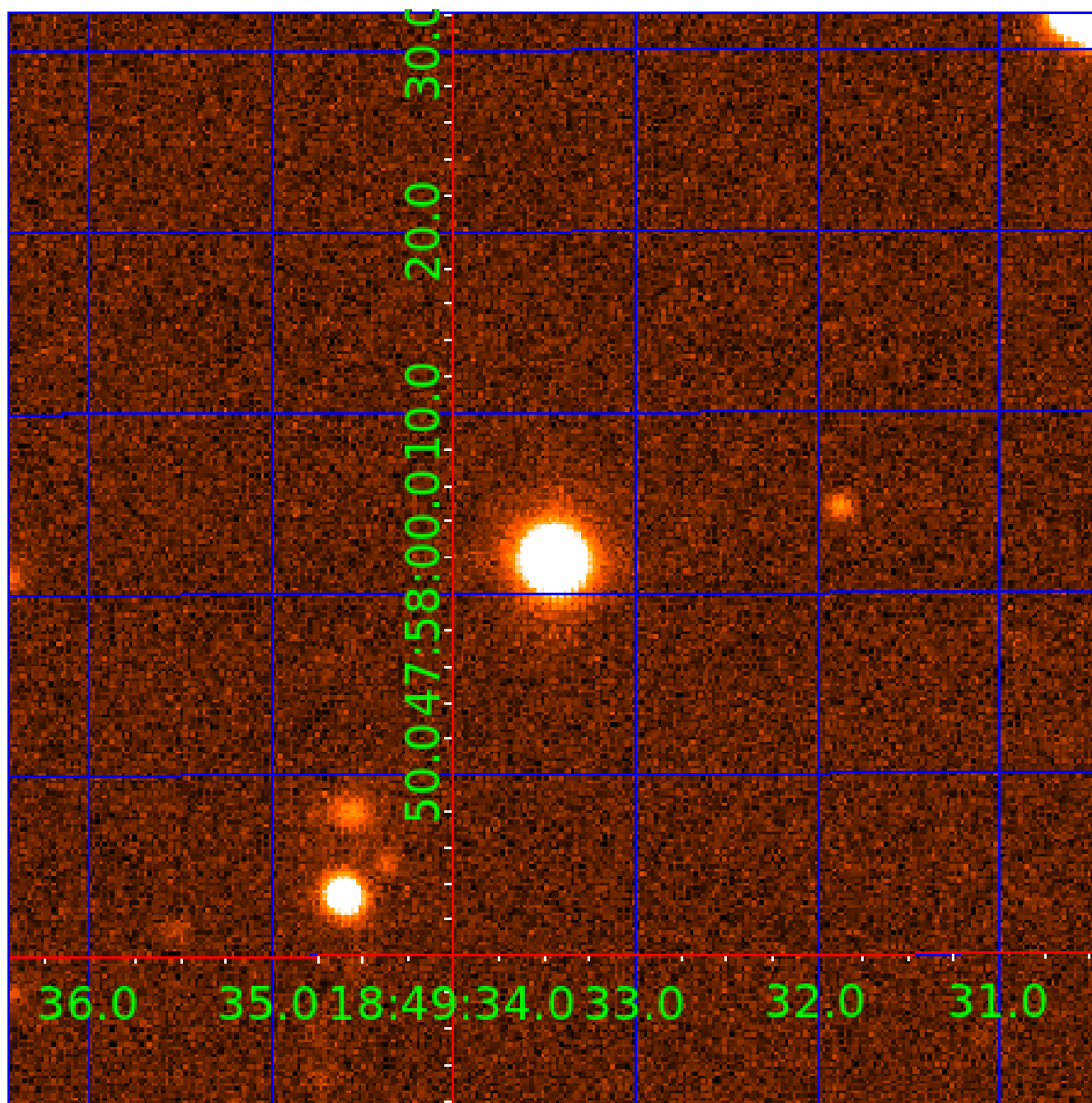


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010646620

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})
010646620-01	OBS	7352.01	2.413745	133.562364	30.4	13.034	8.8	9.9	2.60	6628	1.53	7193.29
010646620-02	OBS	No	439.264571	518.484387	347.9	20.978	9.7	8.3	2.60	6628	5.98	6.97
010646620-03	OBS	No	111.063930	154.308140	173.3	8.319	9.7	7.2	2.60	6628	3.92	43.63
010646620-05	OBS	No	166.284333	180.111872	257.2	7.447	9.3	8.6	2.60	6628	4.77	25.47
010646620-06	OBS	No	74.102175	201.659120	171.5	10.789	8.3	6.9	2.60	6628	3.82	74.83
010646620-08	OBS	No	111.645419	207.499050	224.2	2.810	7.3	7.6	2.60	6628	4.60	43.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010646620-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010646620-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010646620-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
010646620-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010646620-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010646620-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT

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.

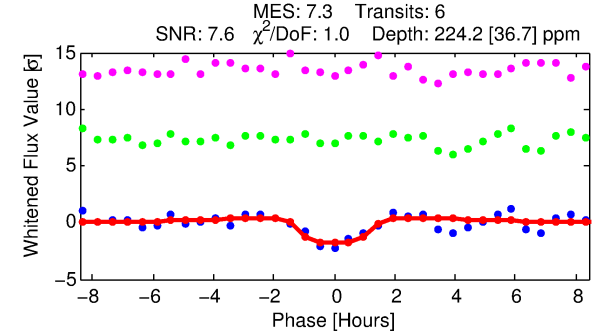
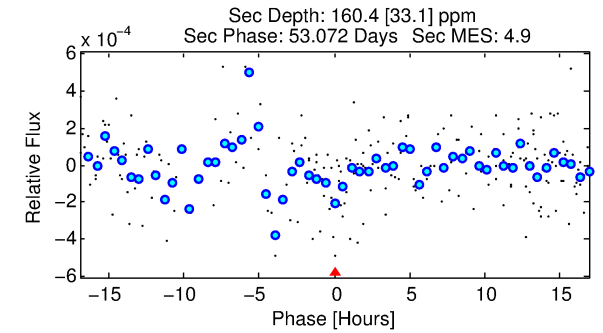
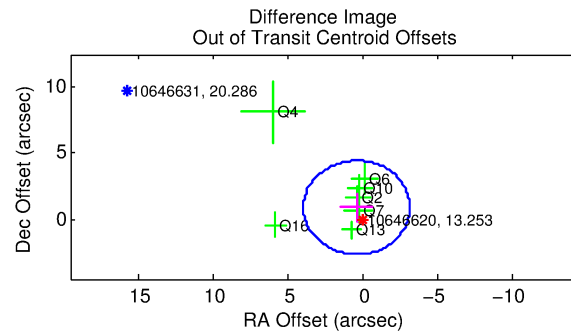
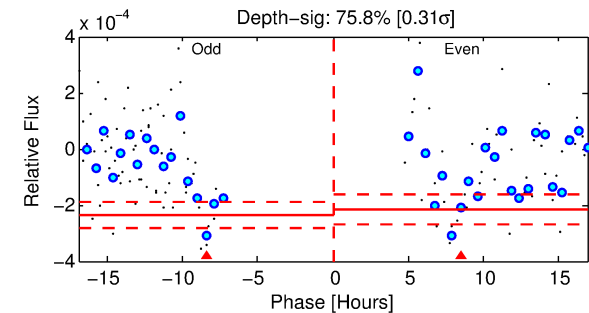
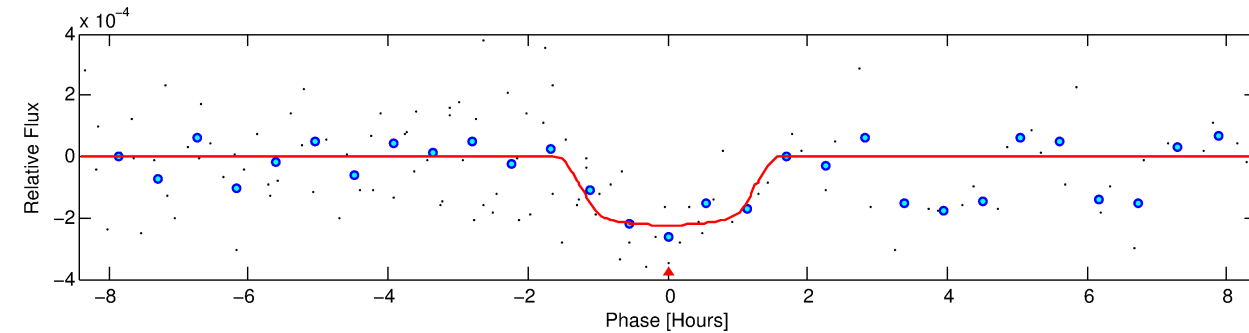
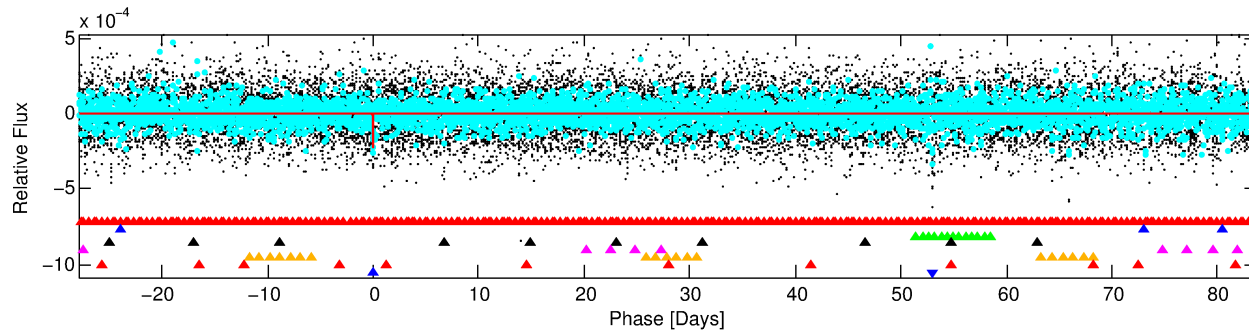
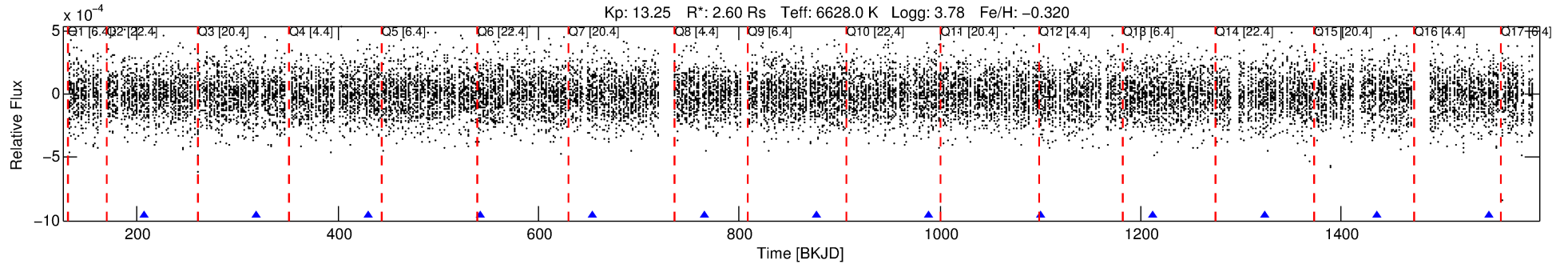
Ephemeris Match Information For 010646620-08

No Significant Match Found

DV One-Page Summary

KIC: 10646620 Candidate: 8 of 8 Period: 111.645 d
KOI: K07352 Corr: No Ephemeris Match

Kp: 13.25 R*: 2.60 Rs Teff: 6628.0 K Logg: 3.78 Fe/H: -0.320



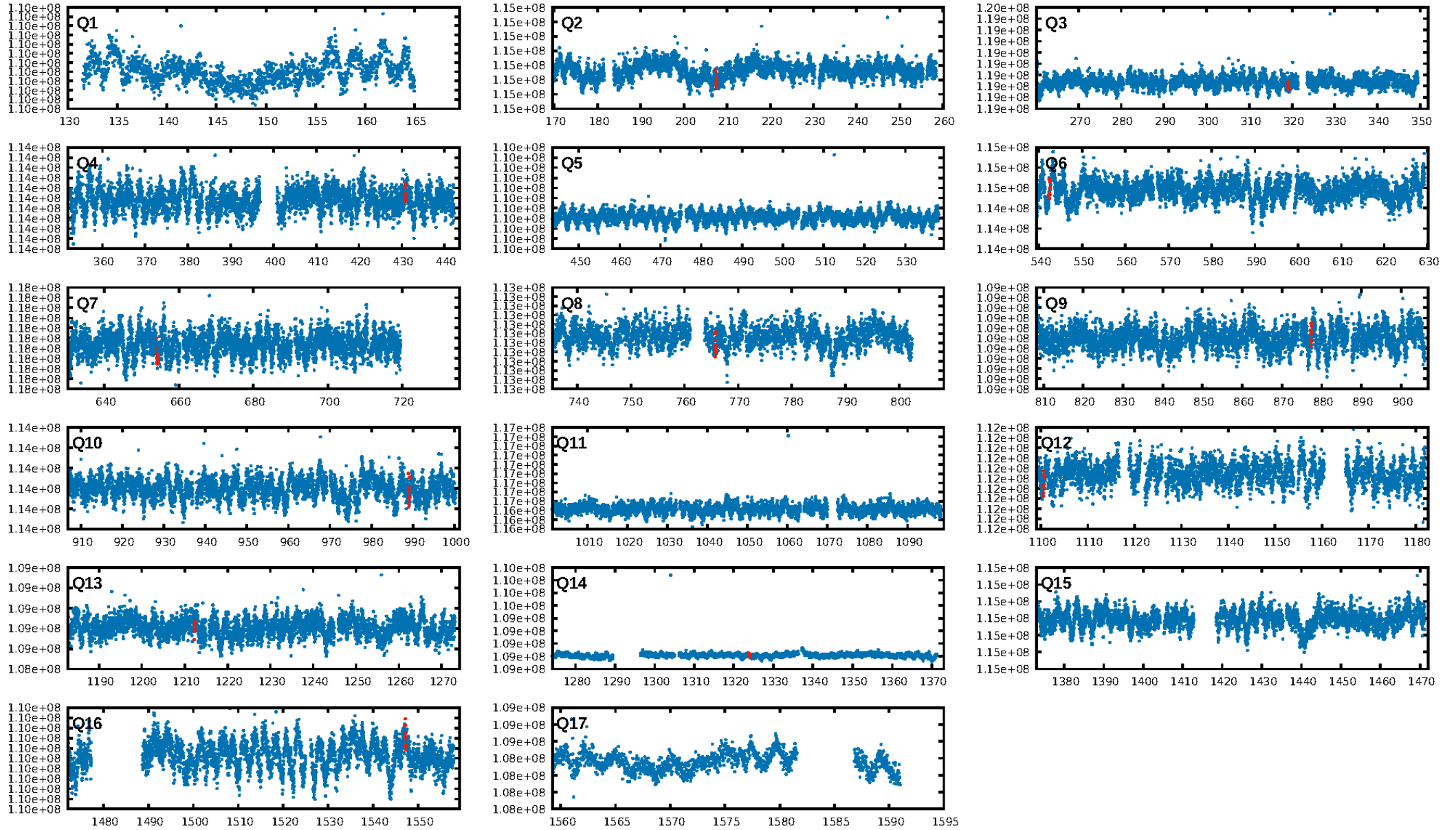
DV Fit Results:

Period = 111.64542 [0.00131] d
Epoch = 207.4990 [0.0065] BKJD
Rp/R* = 0.0162 [0.0089]
a/R* = 133.12 [417.13]
b = 0.92 [0.55]
Seff = 43.32 [23.90]
Teq = 654 [90] K
Rp = 4.60 [3.05] Re
a = 0.5184 [0.1799] AU
Ag = 1122.47 [1386.64] [0.81σ]
Teffp = 5855 [1633] K [3.18σ]

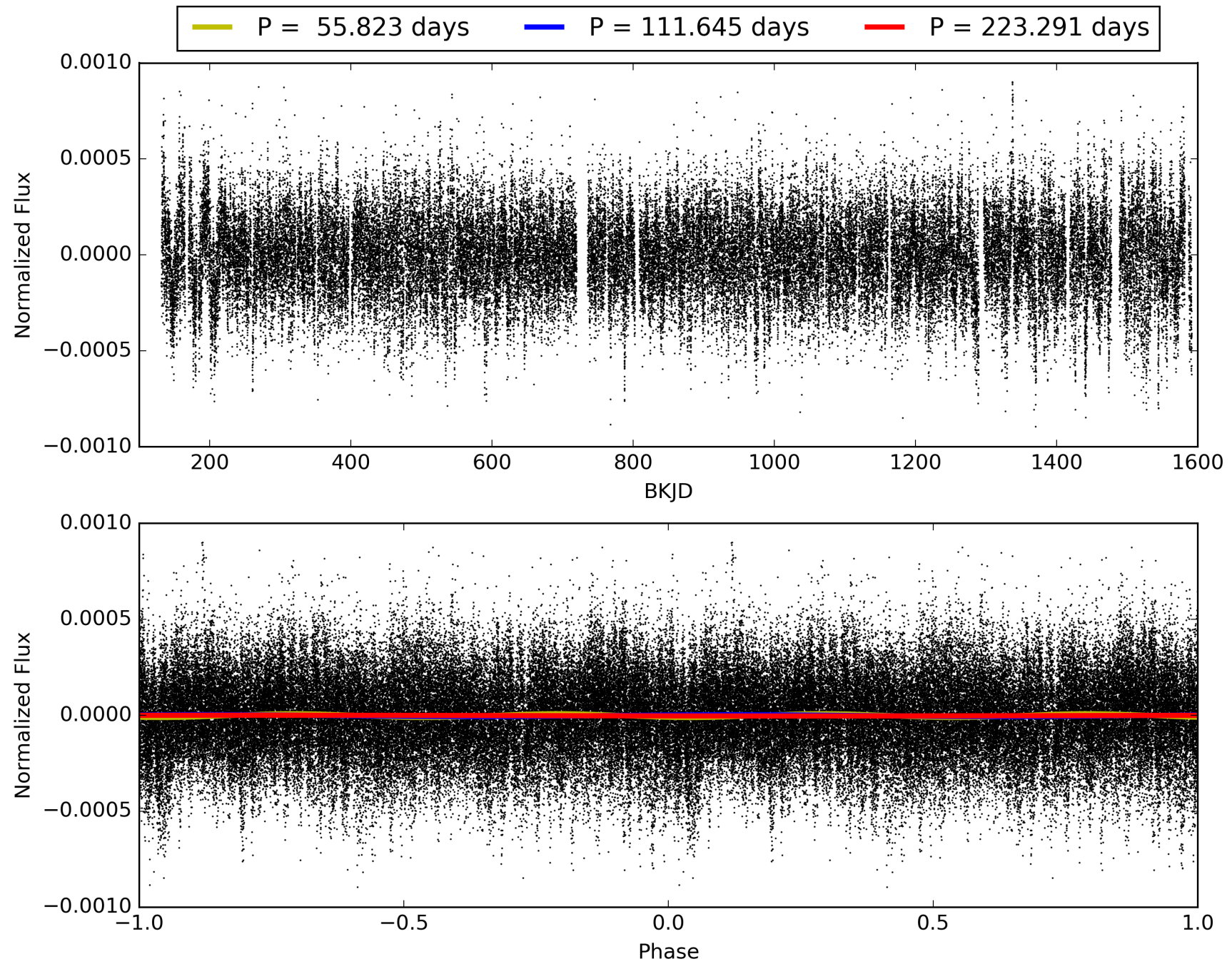
DV Diagnostic Results:

ShortPeriod-sig: 88.8% [1.59σ]
LongPeriod-sig: 100.0% [43.71σ]
ModelChiSquare2-sig: 94.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.41e-08
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: -7.92
Centroid-sig: 38.5%
Centroid-so: 0.668 arcsec [0.66σ]
OotOffset-rm: 0.977 arcsec [0.82σ]
KicOffset-rm: 1.065 arcsec [0.78σ]
OotOffset-st: 3/1/2/1 [7]
KicOffset-st: 3/1/2/1 [7]
DiffImageQuality-fgm: 0.71 [5/7]
DiffImageOverlap-fno: 0.50 [6/12]

TCE 010646620-08, PDC Light Curves

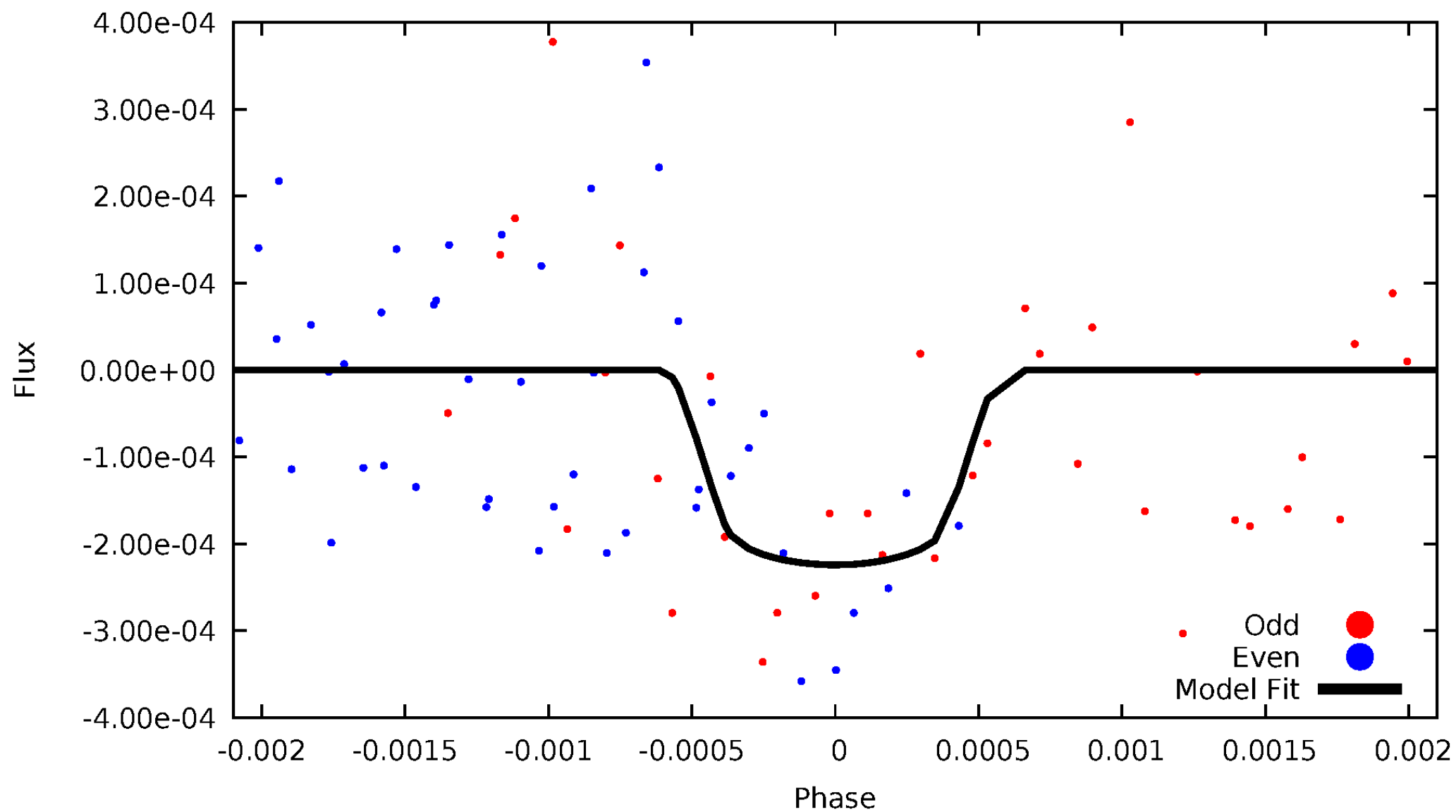


TCE 010646620-08



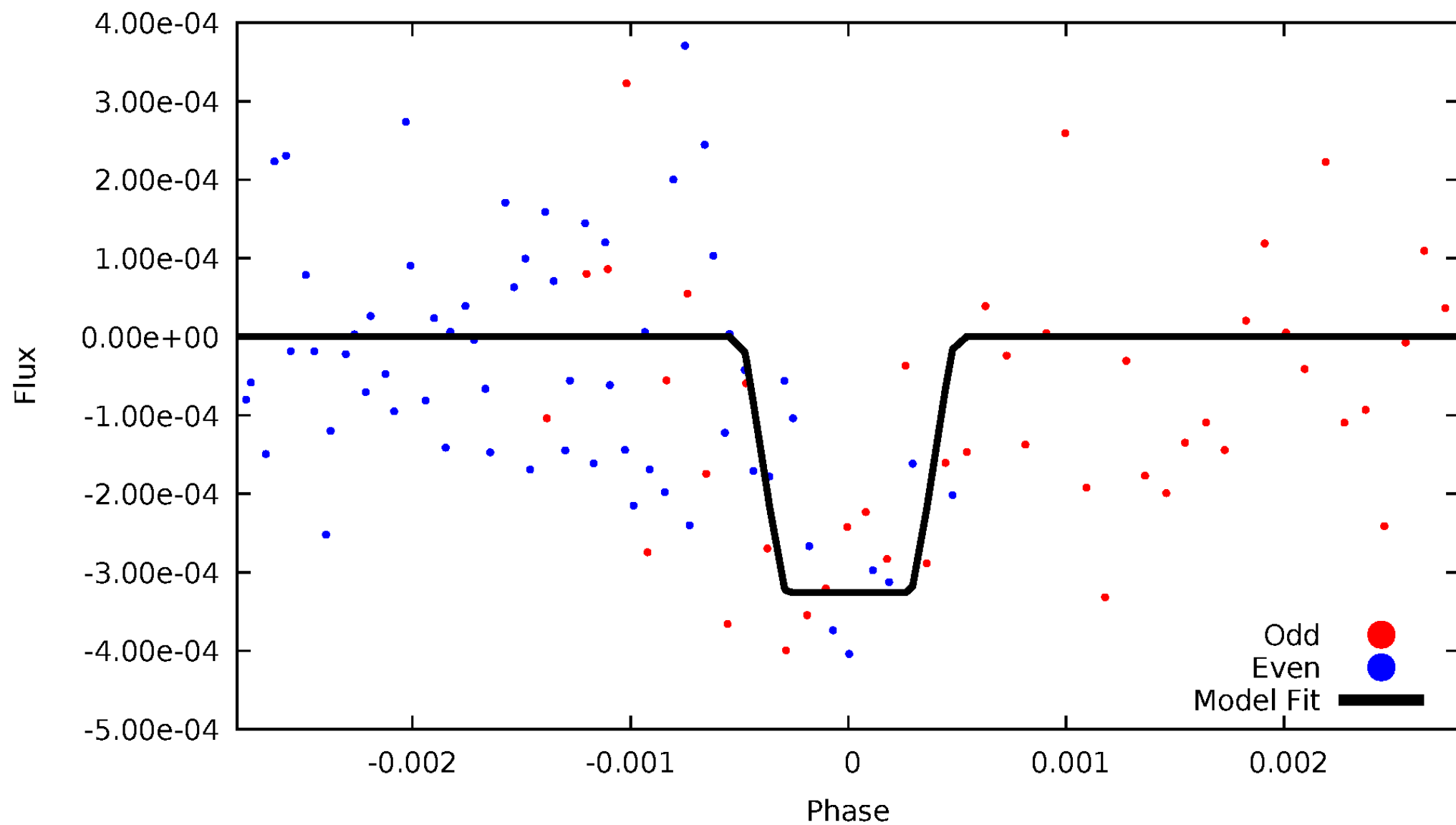
DV Odd/Even

TCE 010646620-08



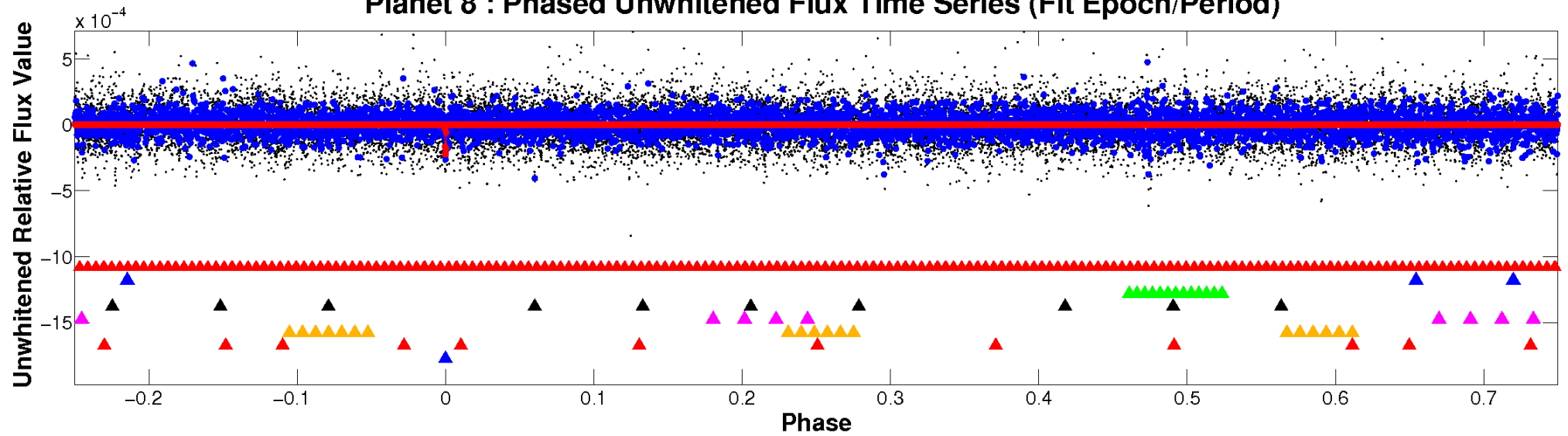
ALT Odd/Even

TCE 010646620-08

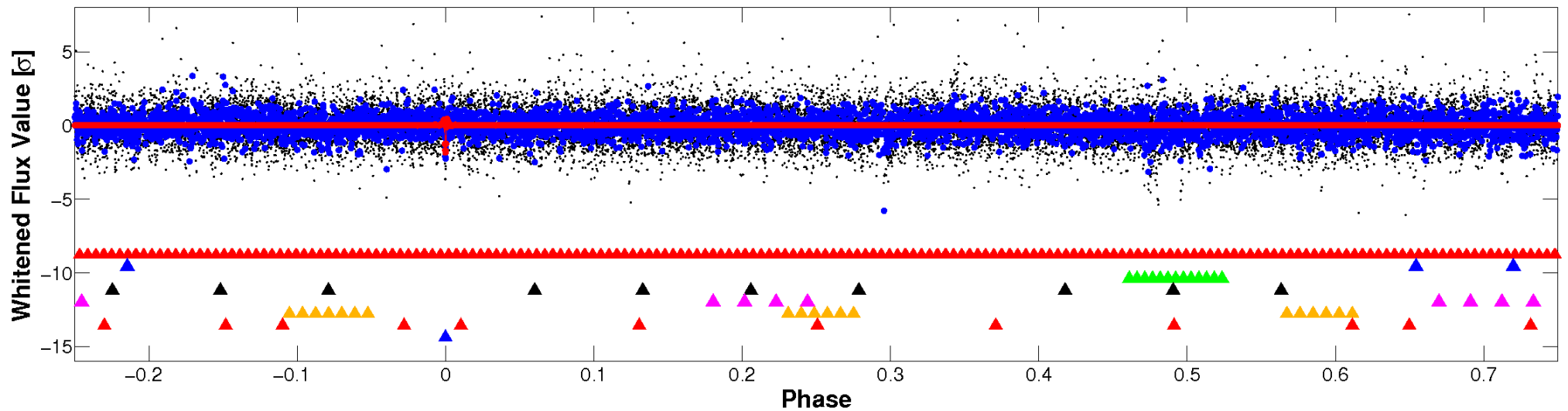


Non-Whitened Vs. Whitened Light Curve

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

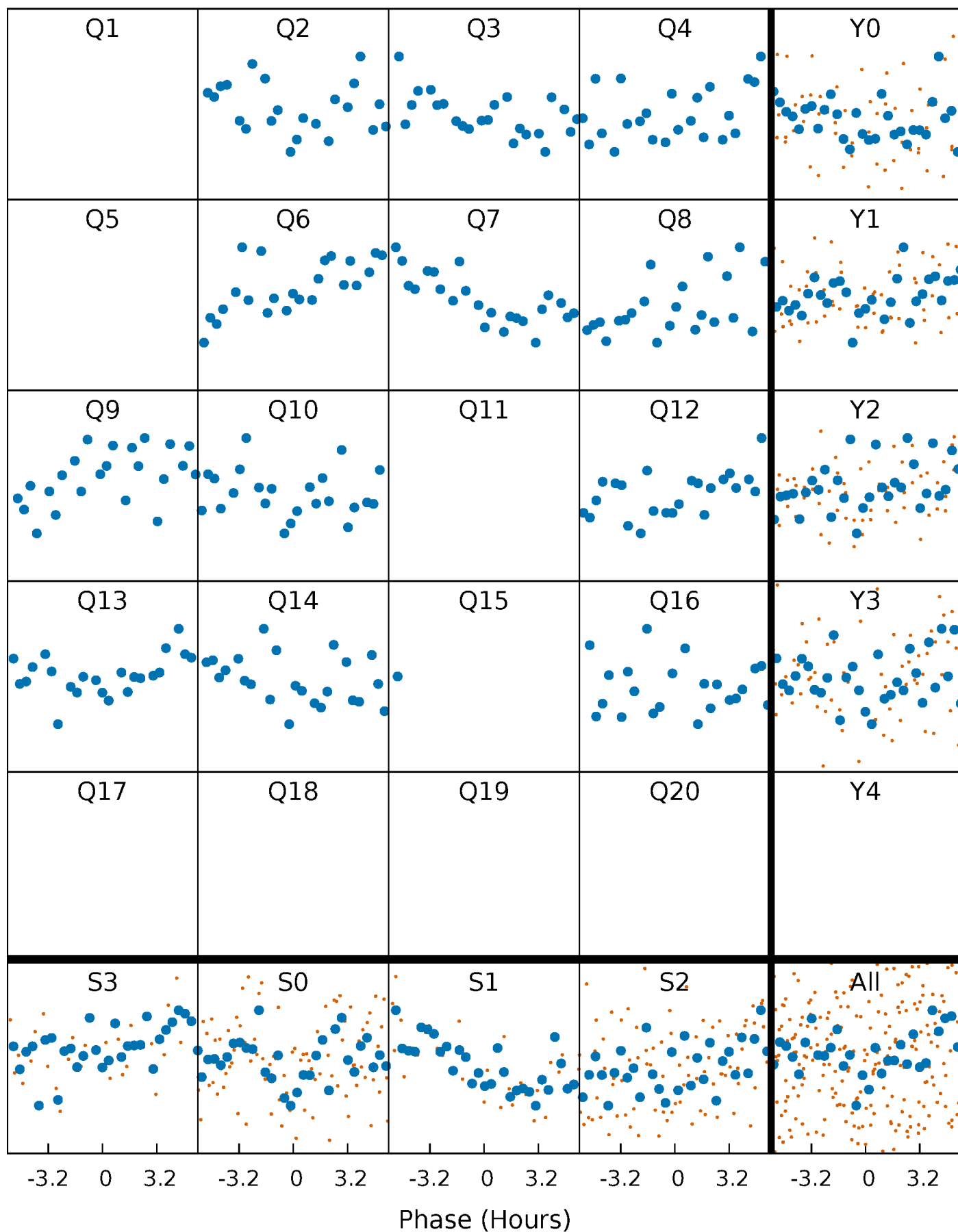


Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



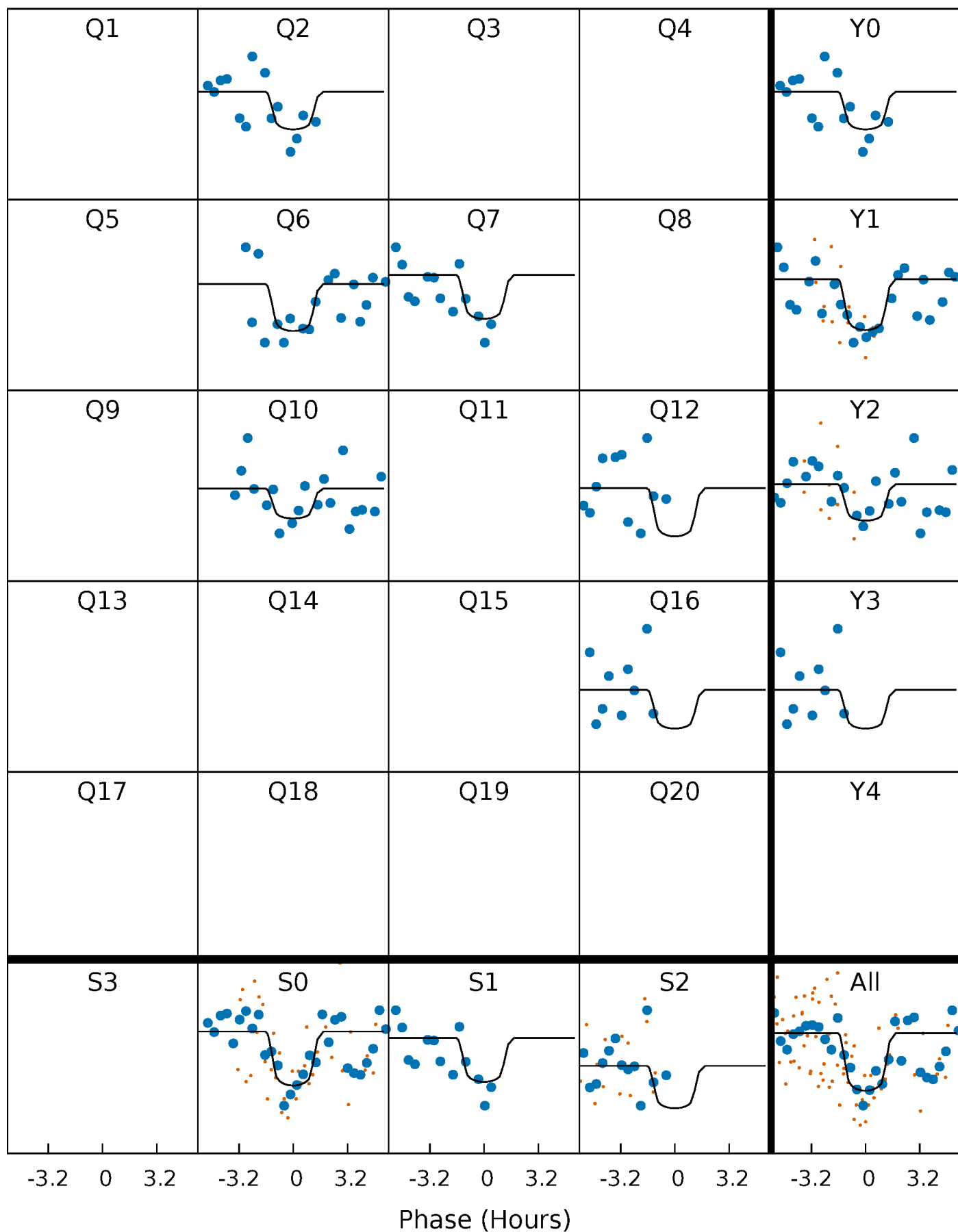
PDC Quarter-Phased Transit Curves

TCE 010646620-08 P=111.645419 Days $T_0=207.499050$ (BKJD)



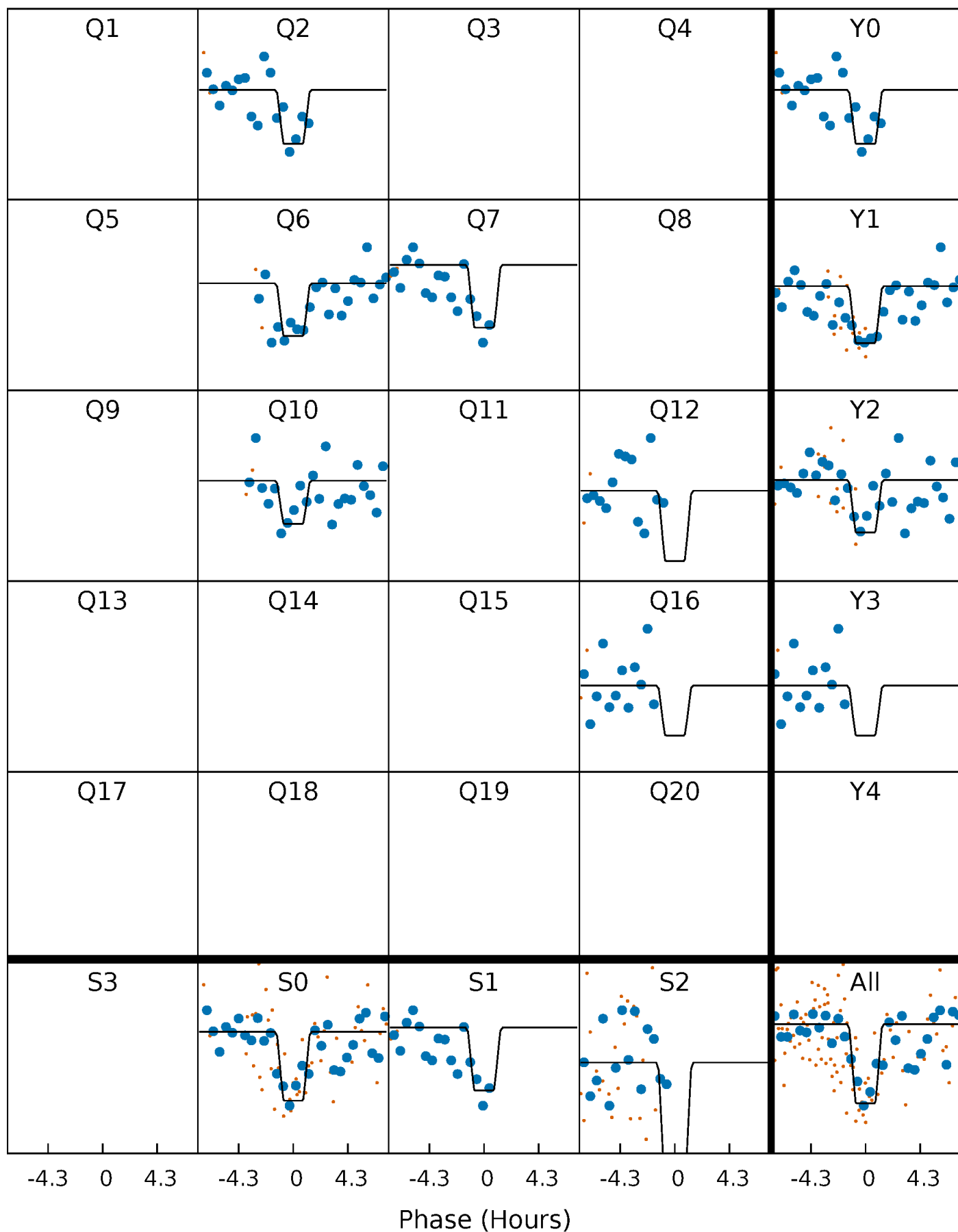
DV Quarter-Phased Transit Curves

TCE 010646620-08 P=111.645419 Days $T_0=207.499050$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

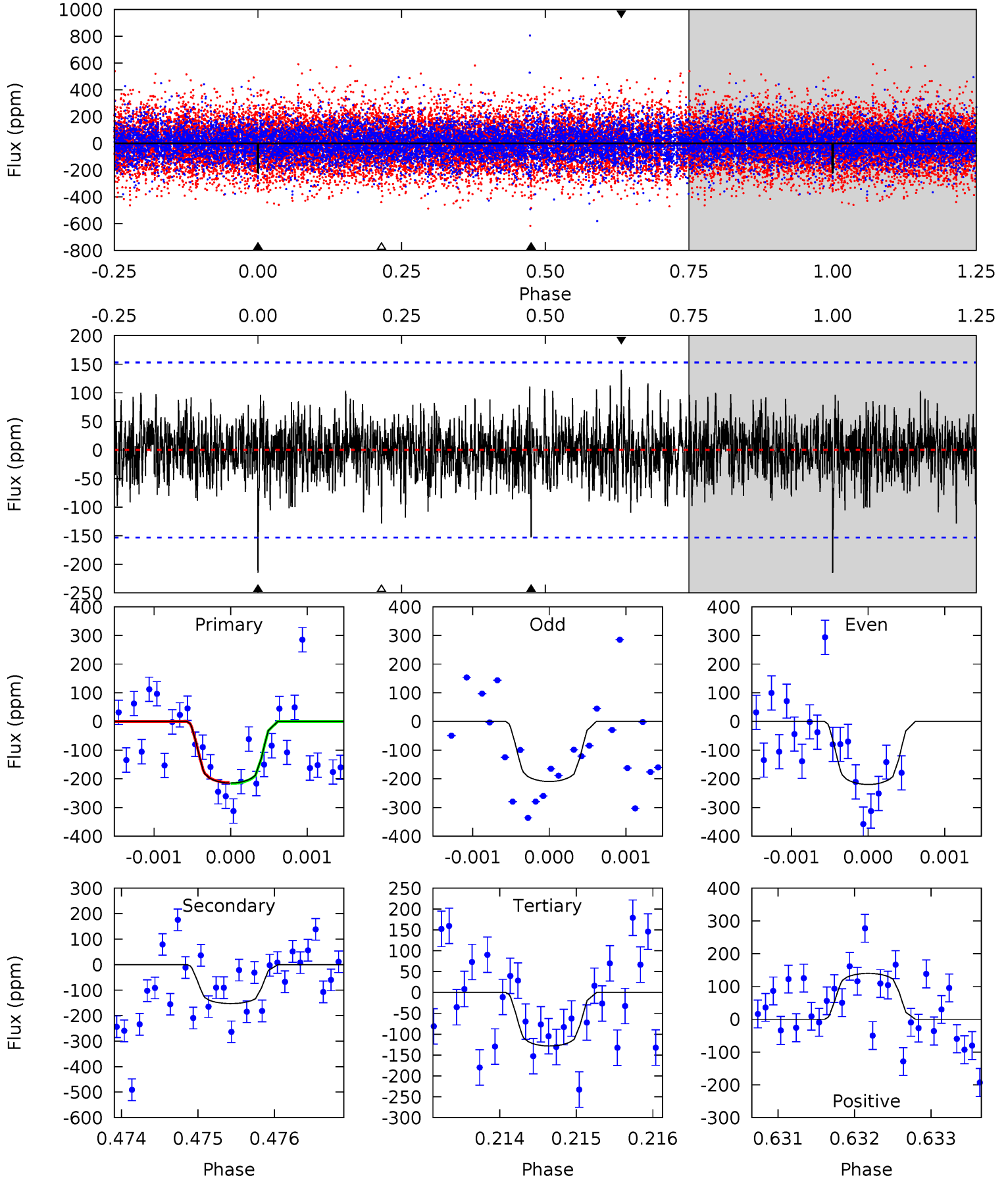
TCE 010646620-08 P=111.646711 Days $T_0=207.493731$ (BKJD)



DV Model-Shift Uniqueness Test

010646620-08, P = 111.645419 Days, E = 95.853631 Days

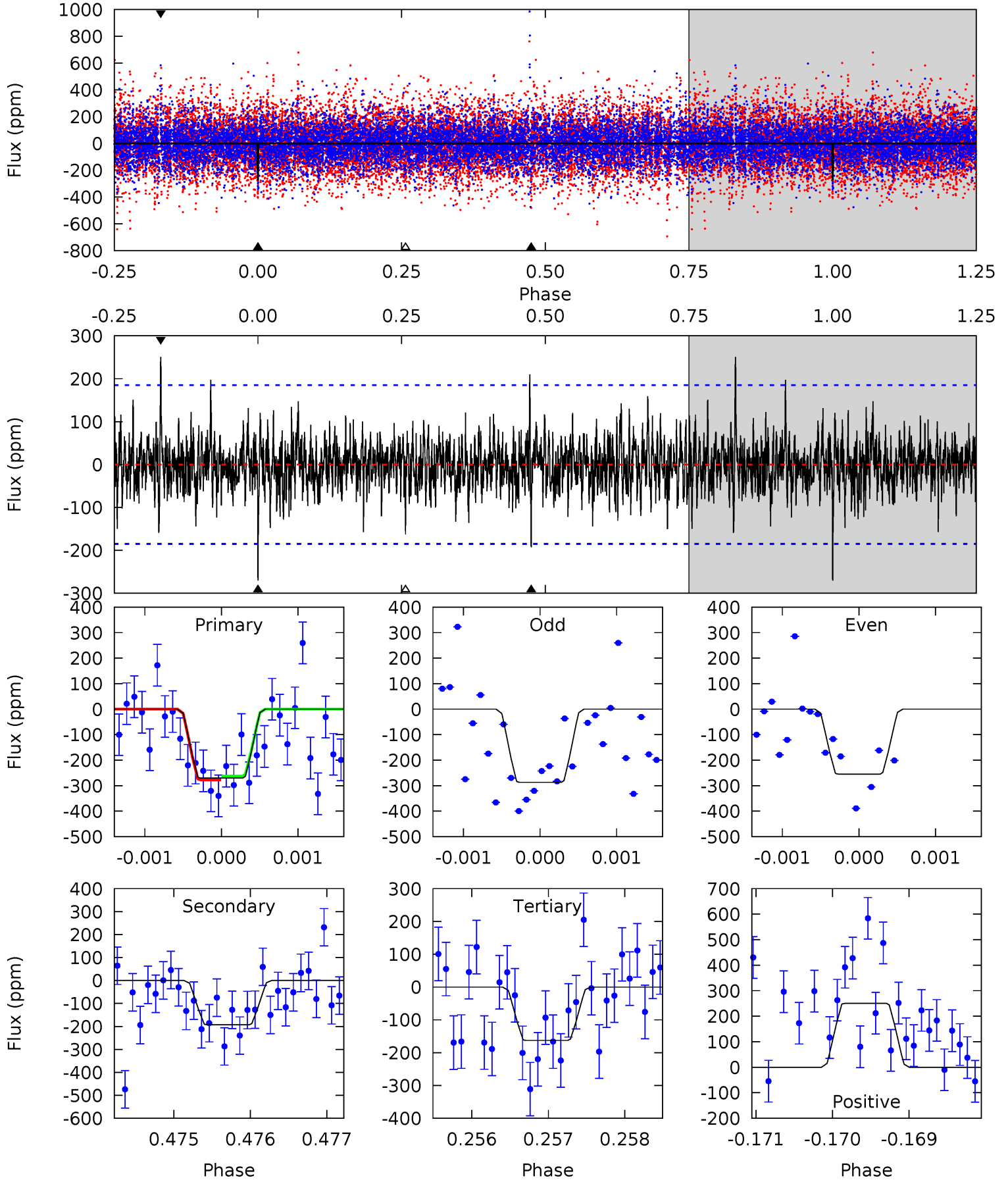
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.62	5.42	4.56	4.97	5.44	3.27	1.28	3.06	2.66	0.86	0.46	0.18	0.82	0.39	0.05



Alt Model-Shift Uniqueness Test

010646620-08, P = 111.646711 Days, E = 95.847020 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.98	5.69	4.80	7.40	5.46	3.31	1.38	3.18	0.59	0.89	-1.70	0.49	0.95	0.48	0.22



Stellar Parameters For KIC 010646620

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6628^{+160}_{-180}	$3.783^{+0.312}_{-0.098}$	$-0.320^{+0.300}_{-0.250}$	$2.595^{+0.419}_{-0.978}$	$1.489^{+0.212}_{-0.344}$	$0.120^{+0.253}_{-0.038}$
	+2%/-3%	+8%/-3%	+94%/-78%	+16%/-38%	+14%/-23%	+211%/-31%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010646620-08 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-153 ± 28	$4.34^{+2.60}_{-2.15}$	900^{+50}_{-78}	5755^{+2512}_{-1020}	1230^{+3448}_{-792}
Alt.	-193 ± 34	$4.80^{+2.71}_{-2.28}$	902^{+54}_{-91}	5780^{+2381}_{-976}	1223^{+3345}_{-729}

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 $A_{obs} \gg 1.0$

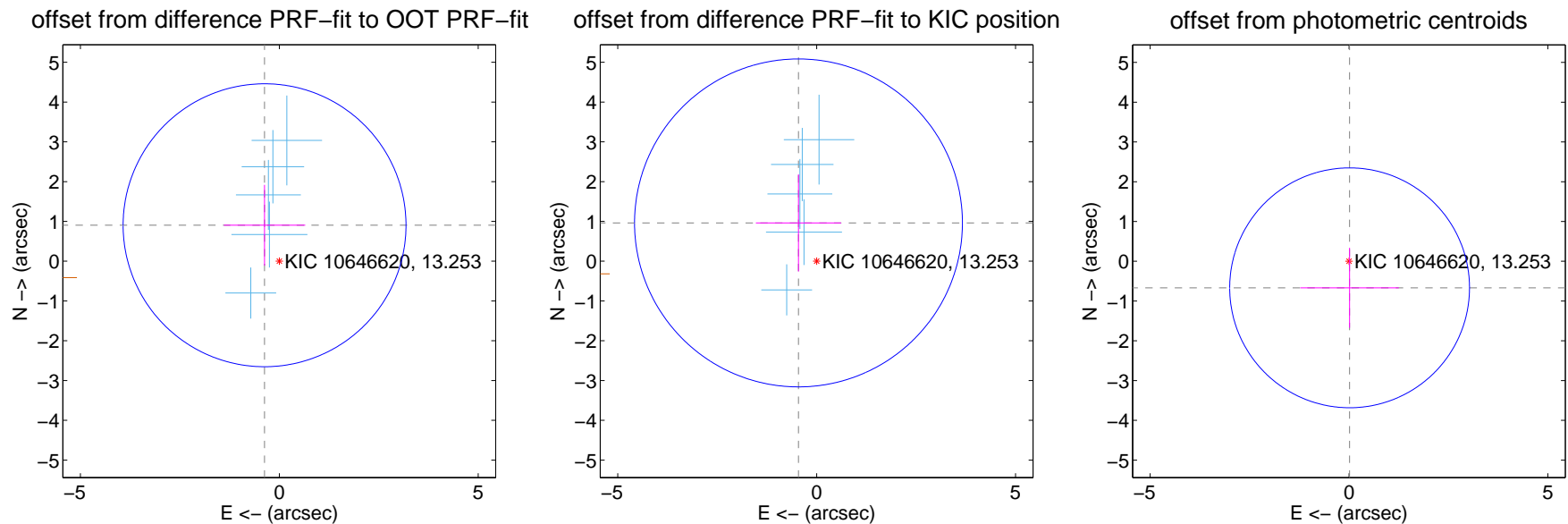
DV Centroid Data

Supplemental centroid analysis for 010646620-08. Kepler magnitude: 13.25. Transit SNR 7.62

There are 5 quarters with good PRF difference image offsets

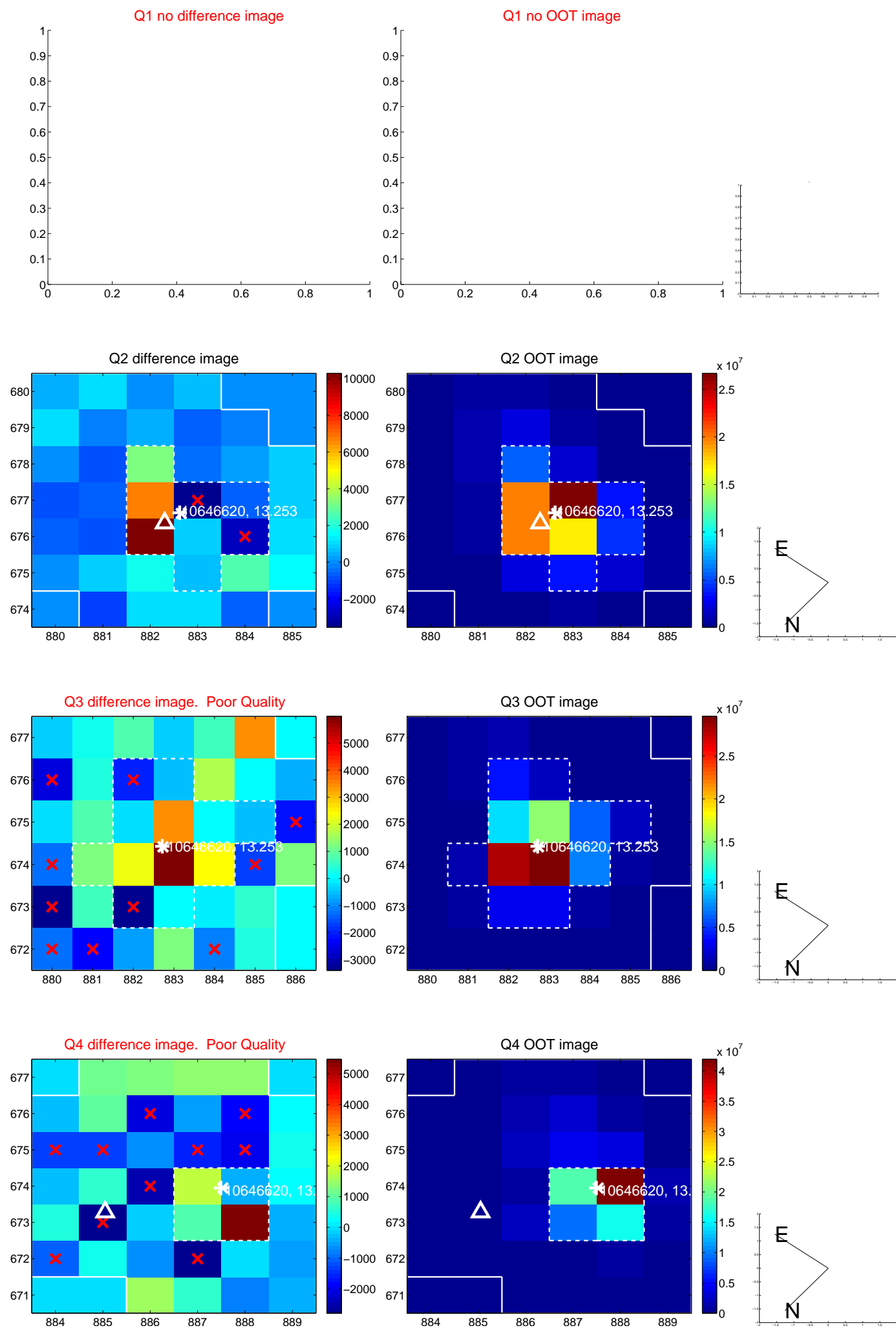
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.977 ± 1.186	0.82	0.371 ± 1.024	0.904 ± 1.016
PRF-fit source offset from KIC position	1.065 ± 1.374	0.78	0.457 ± 1.072	0.962 ± 1.222
photometric centroid source offset	0.67 ± 1.01	0.66	-0.02 ± 1.24	-0.67 ± 1.01

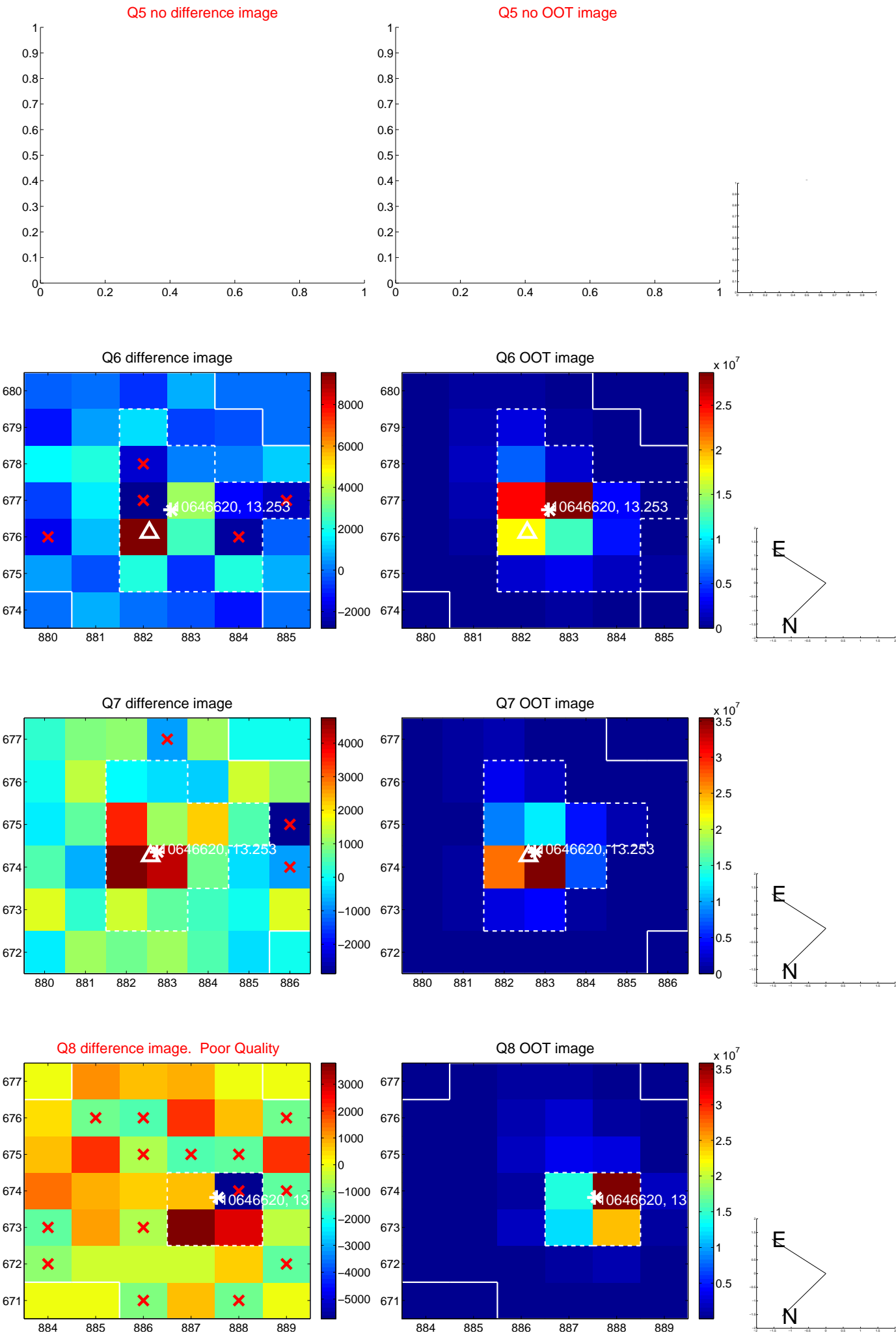


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

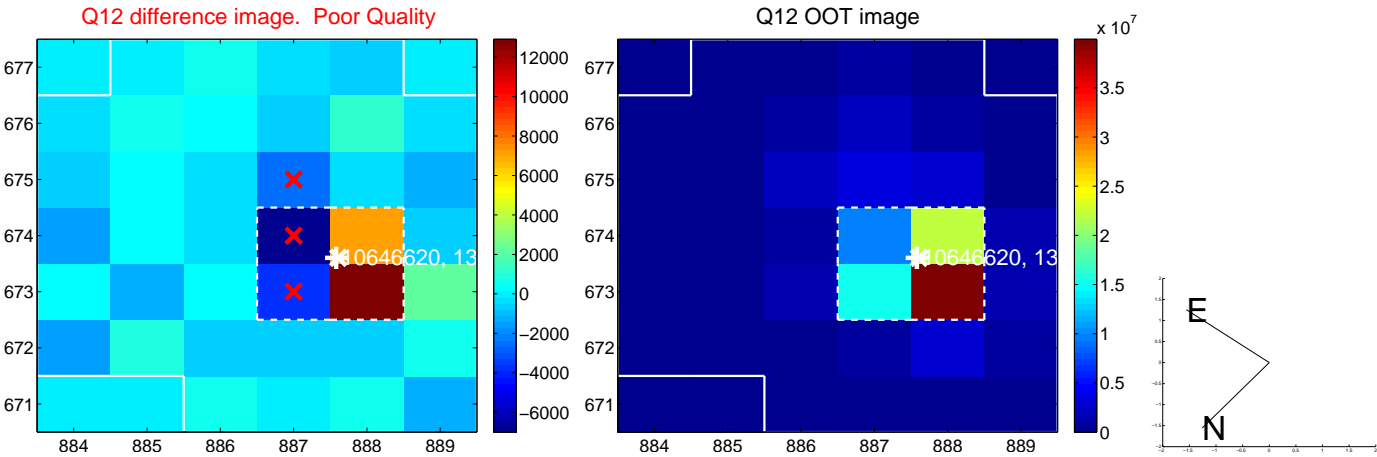
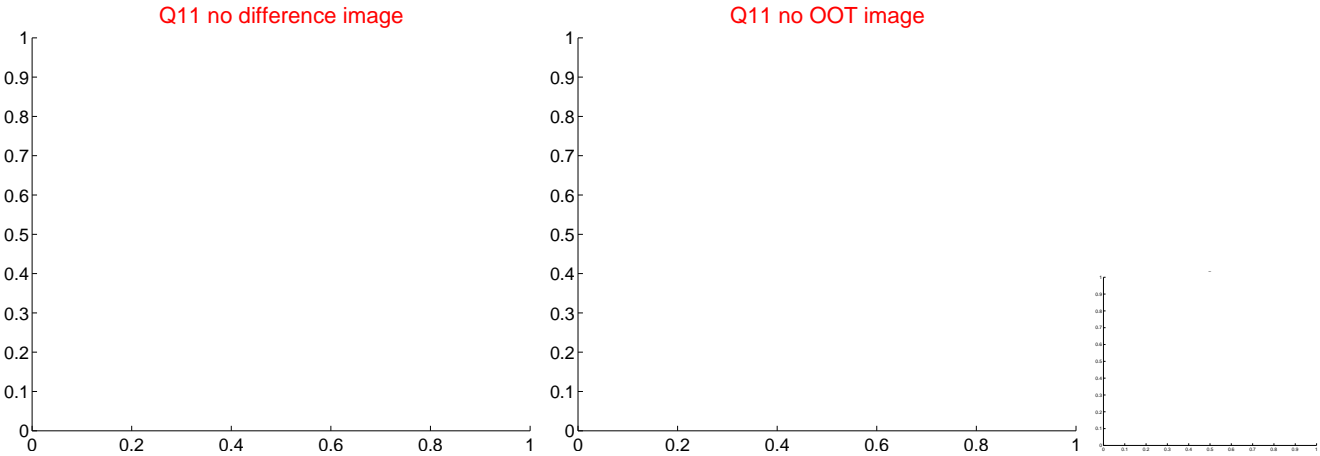
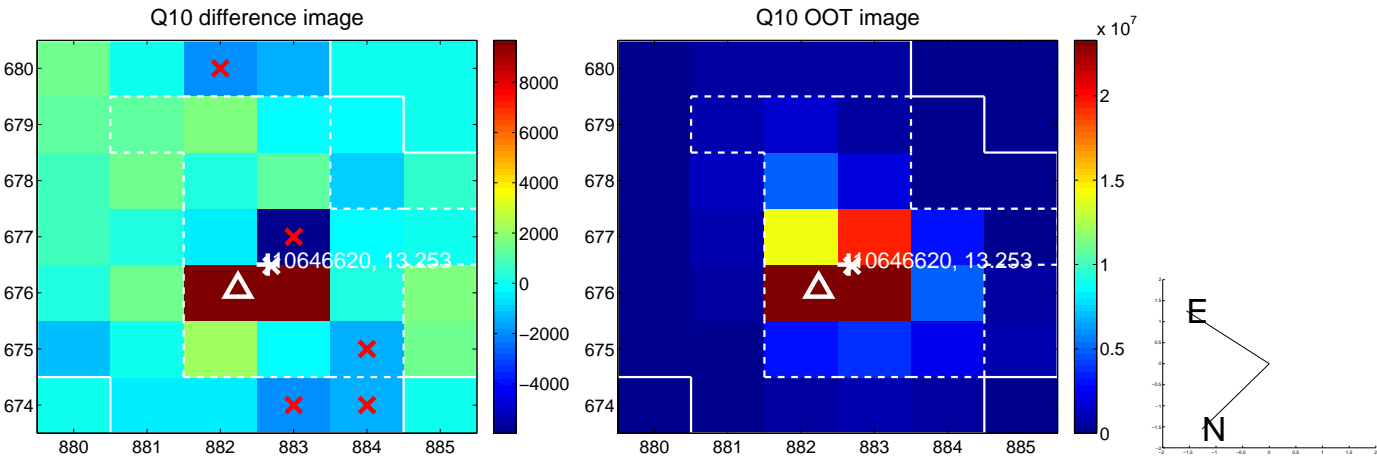
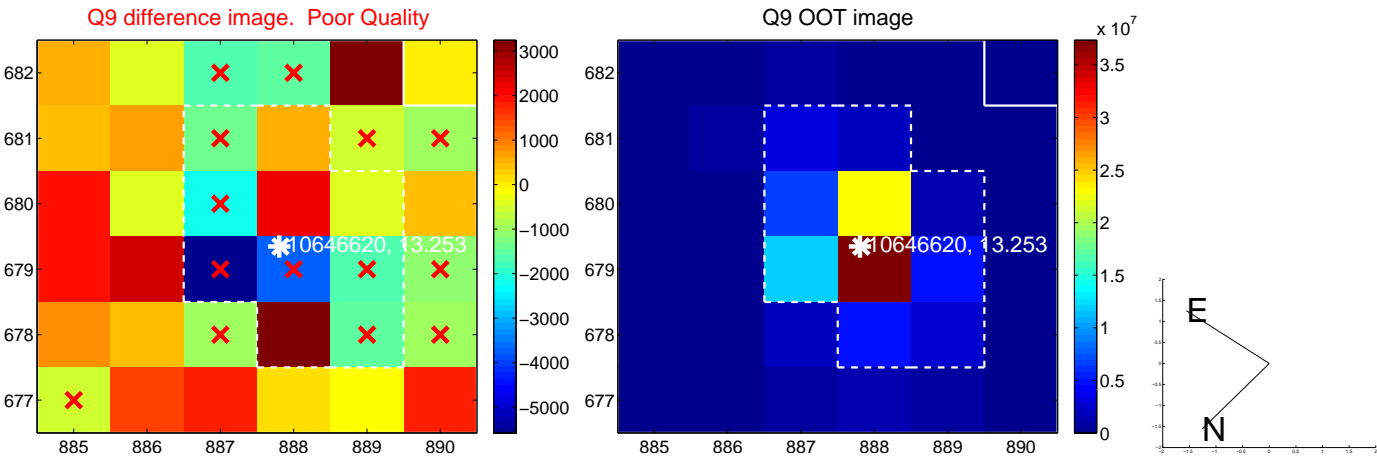
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



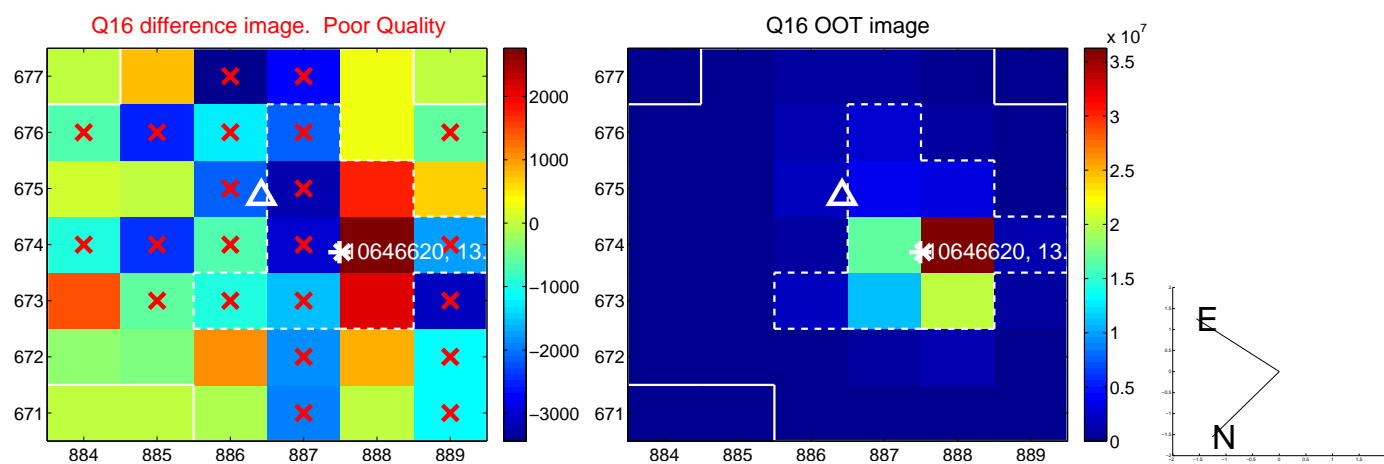
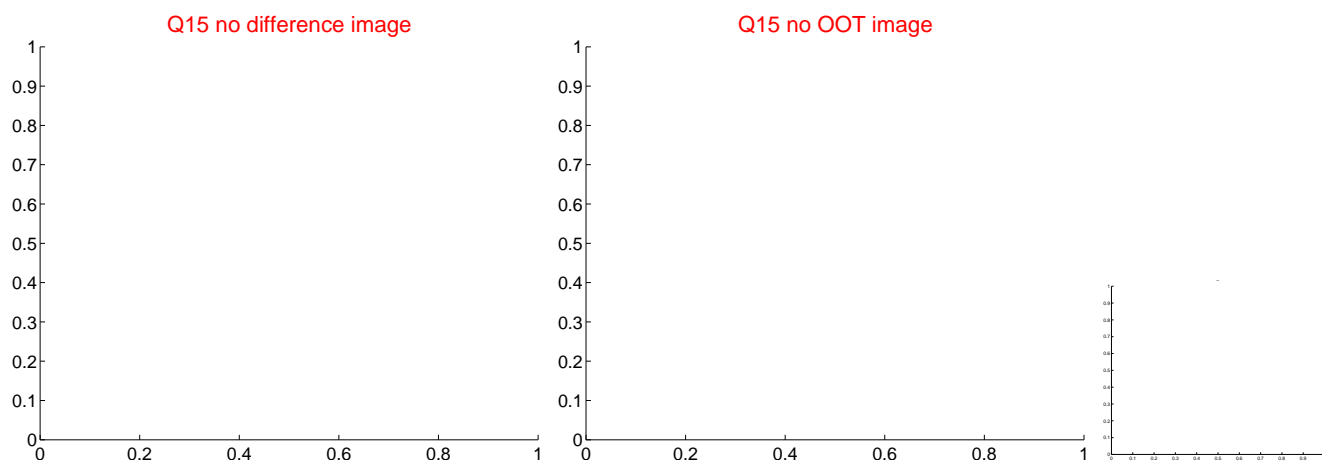
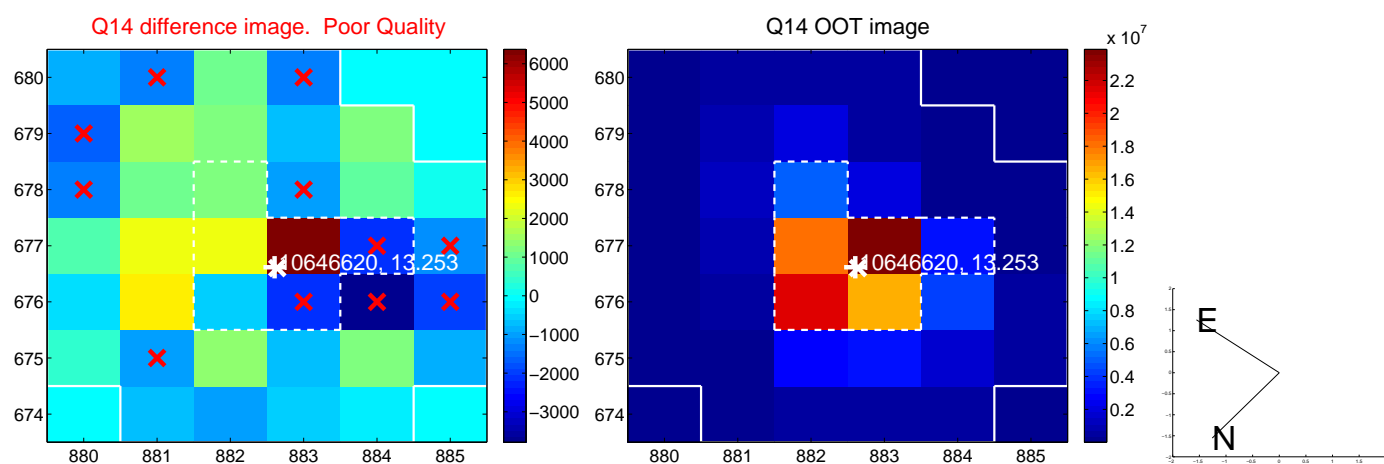
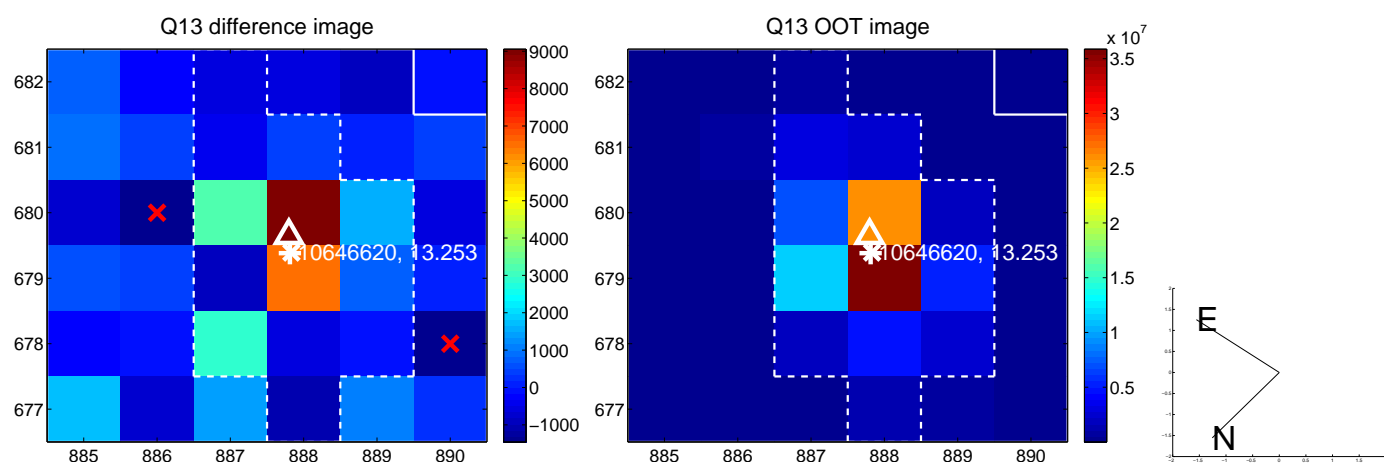
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



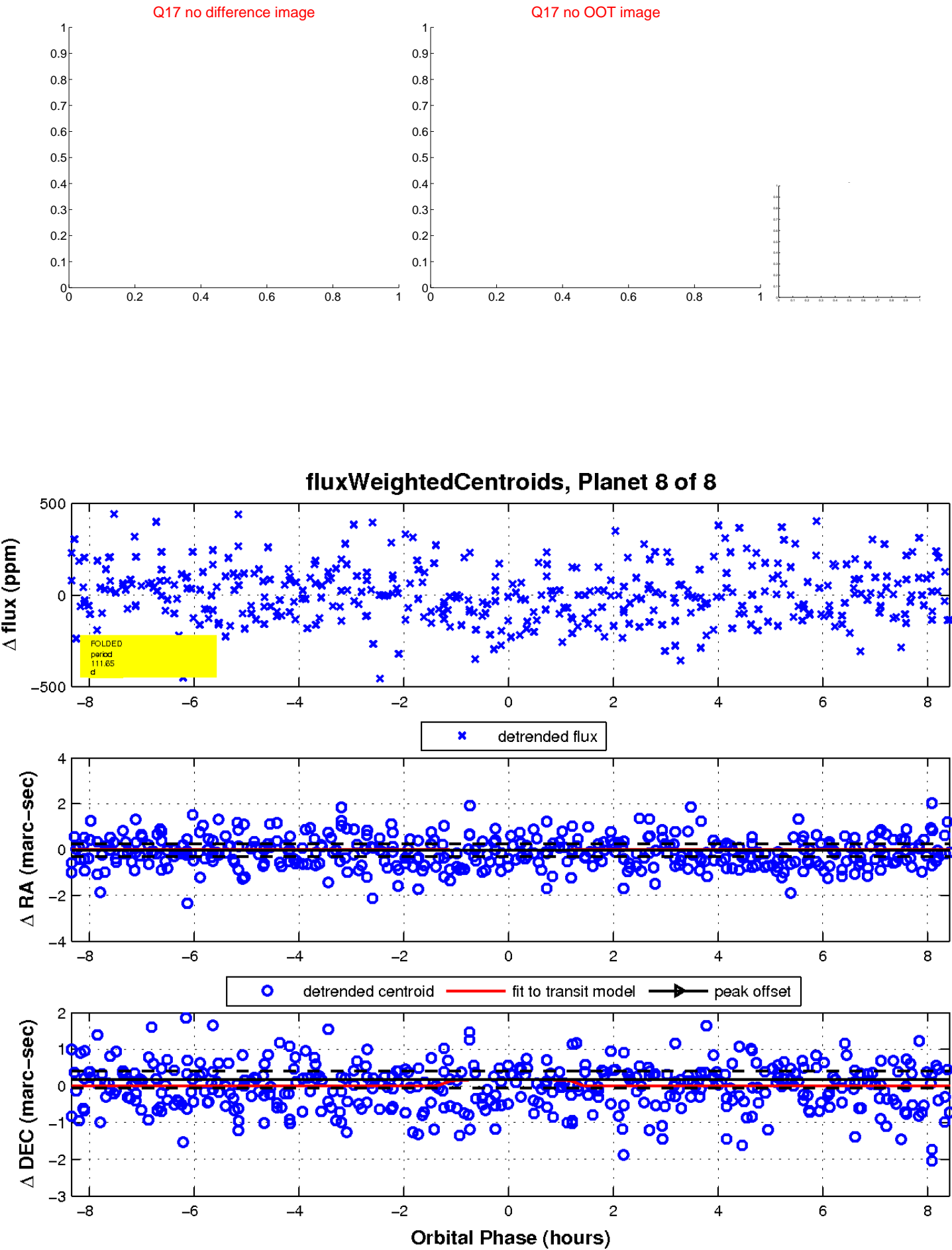
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

