

KIC 008222813

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})
008222813-01	OBS	1069.01	8.704201	139.954539	1064.4	2.974	60.6	68.1	0.86	5074	3.02	74.25
008222813-02	OBS	1069.02	2.466973	132.902738	292.0	1.776	24.8	27.7	0.86	5074	1.80	398.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008222813-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008222813-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

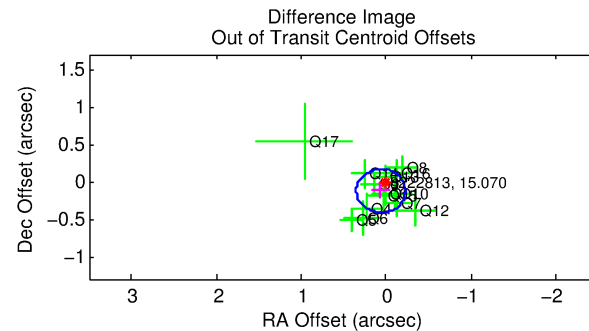
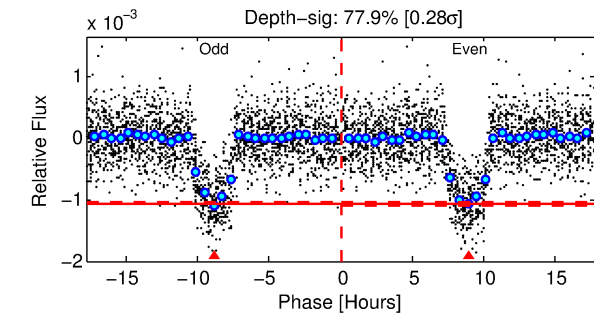
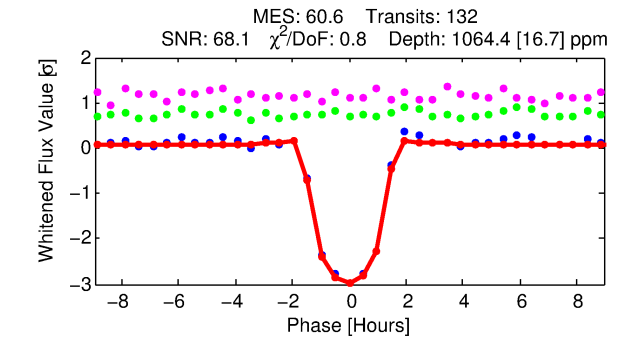
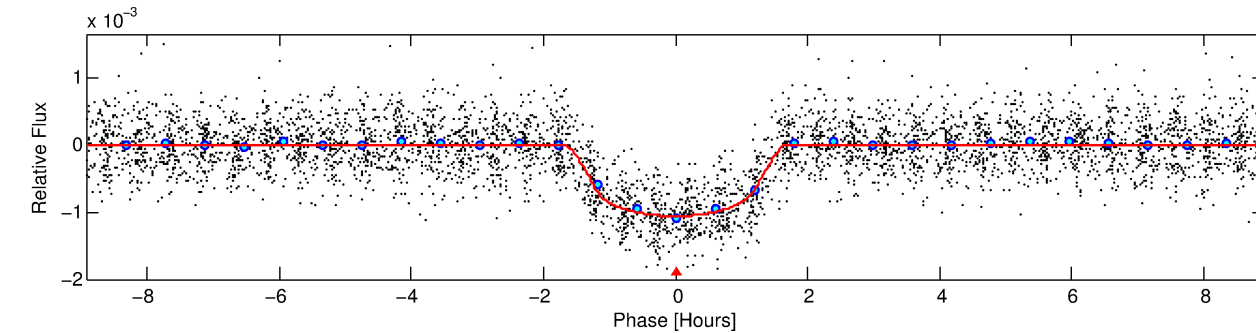
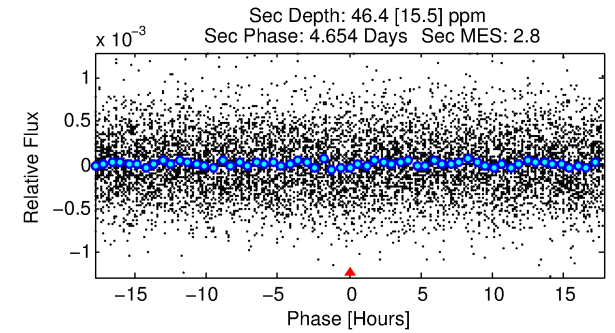
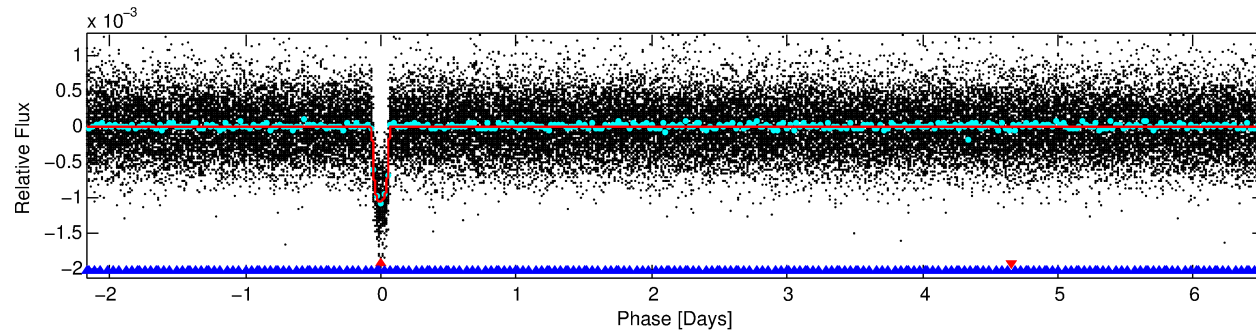
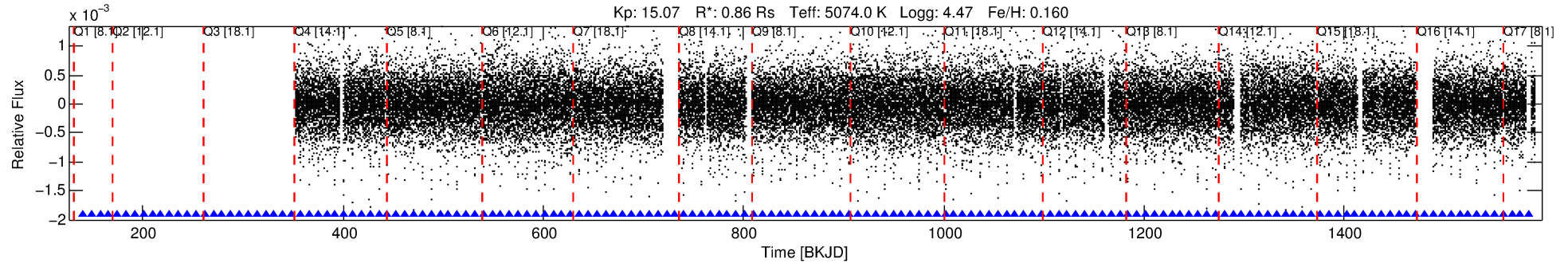
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008222813-01

No Significant Match Found

DV One-Page Summary

KIC: 8222813 Candidate: 1 of 2 Period: 8.704 d
KOI: K01069.01 Corr: 0.998



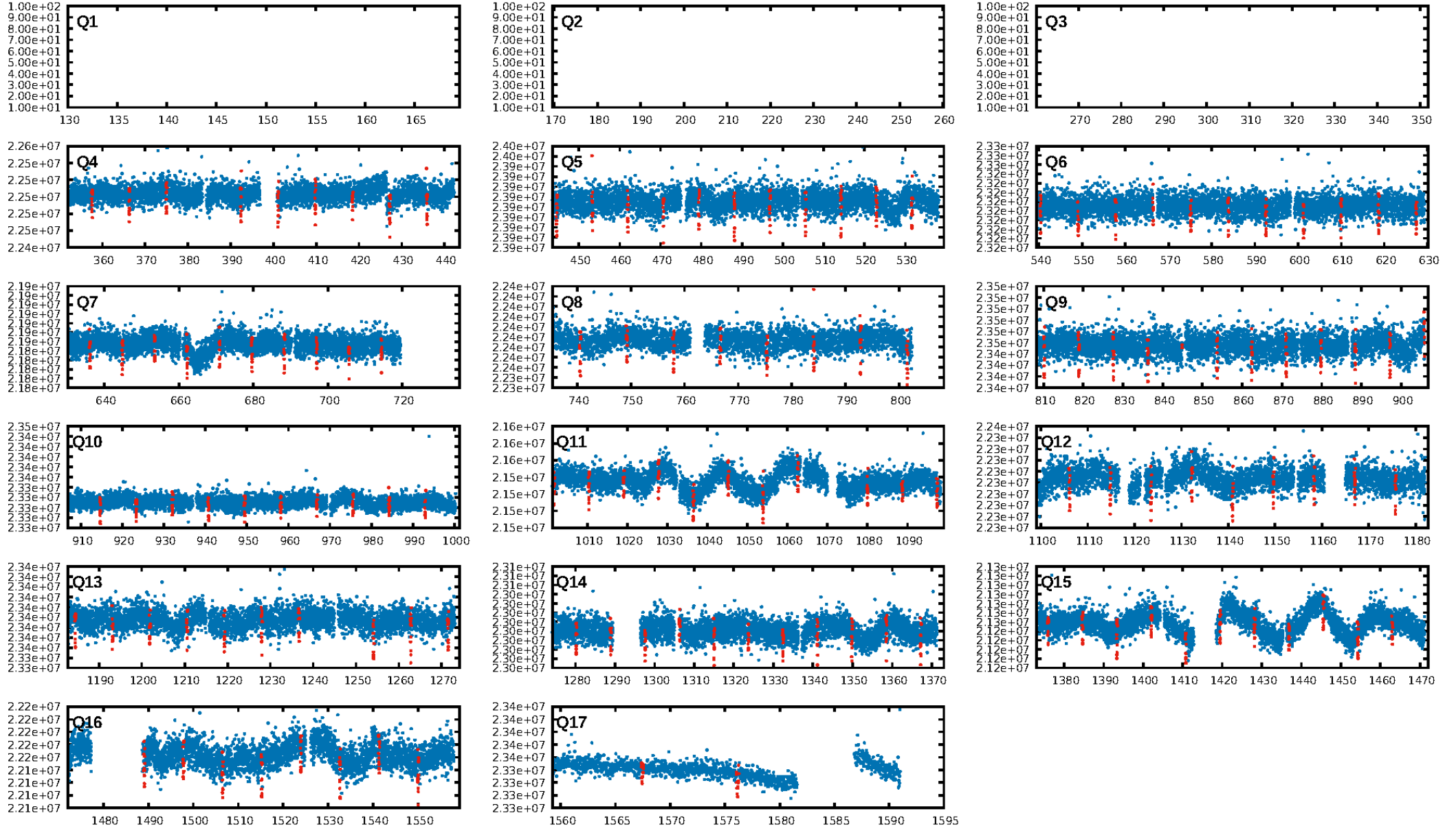
DV Fit Results:

Period = 8.70420 [0.00001] d
Epoch = 139.9545 [0.0011] BKJD
Rp/R* = 0.0321 [0.0060]
a/R* = 16.66 [10.71]
b = 0.72 [0.45]
Seff = 74.24 [11.50]
Teff = 749 [29] K
Rp = 3.02 [0.62] Re
a = 0.0772 [0.0066] AU
Ag = 16.62 [8.64] [1.81 σ]
Teffp = 2337 [295] K [5.36 σ]

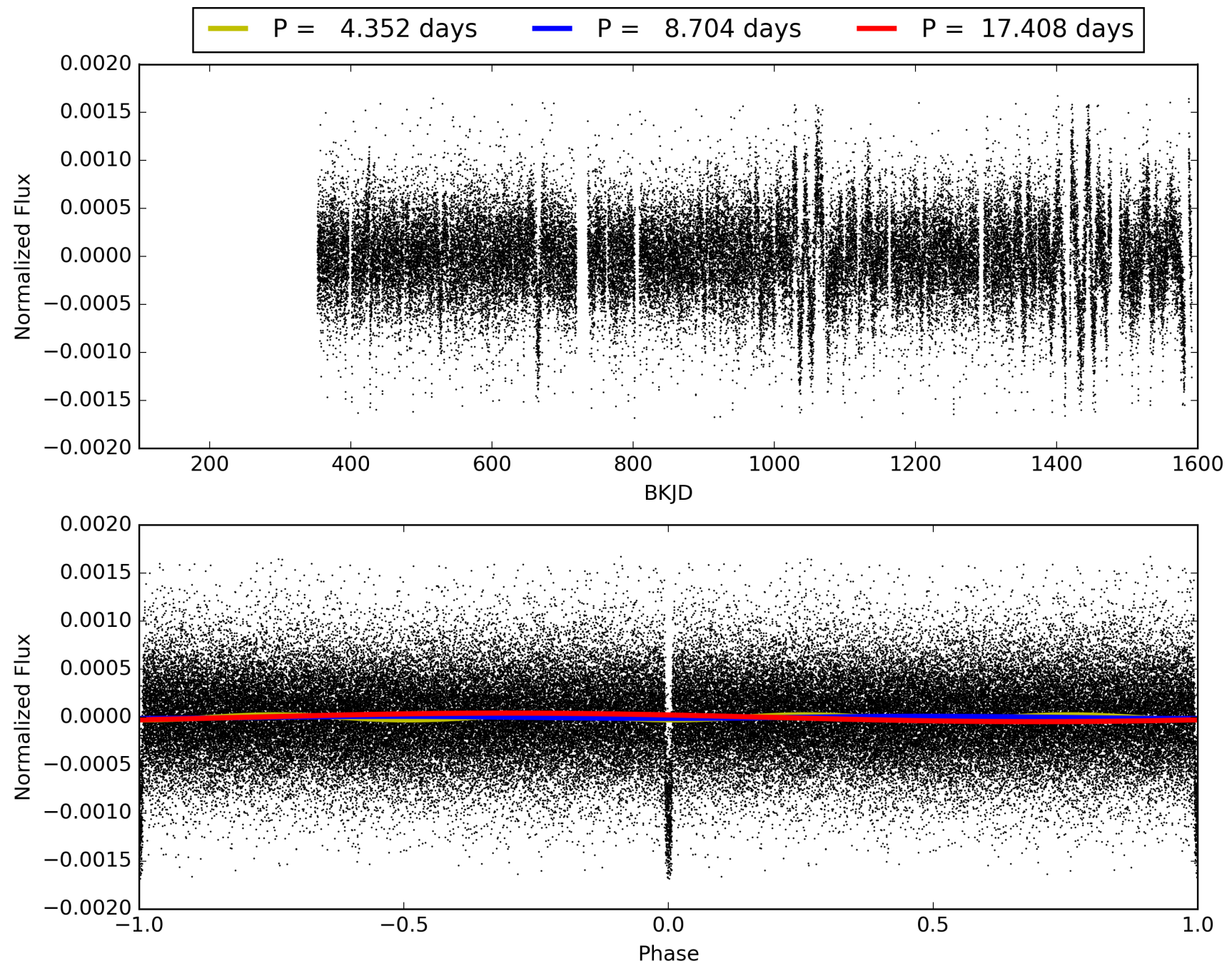
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [43.22 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 97.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [130/130]
GhostDiagnostic-chr: 10.29
Centroid-sig: 0.0%
Centroid-so: 0.296 arcsec [1.65 σ]
OotOffset-rm: 0.136 arcsec [1.41 σ]
KicOffset-rm: 0.080 arcsec [0.80 σ]
OotOffset-st: 3/3/4/4 [14]
KicOffset-st: 3/3/4/4 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 008222813-01, PDC Light Curves

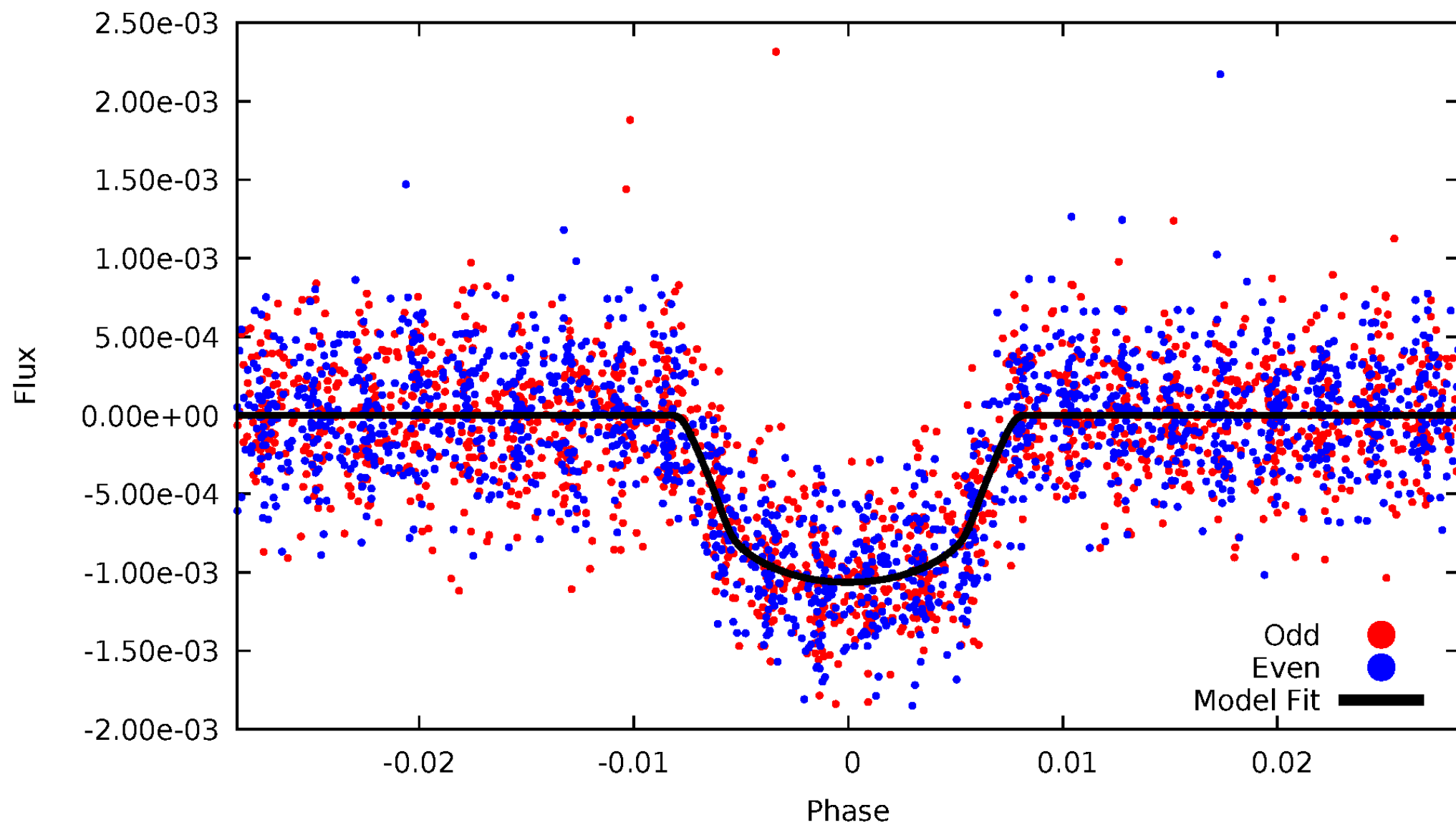


TCE 008222813-01



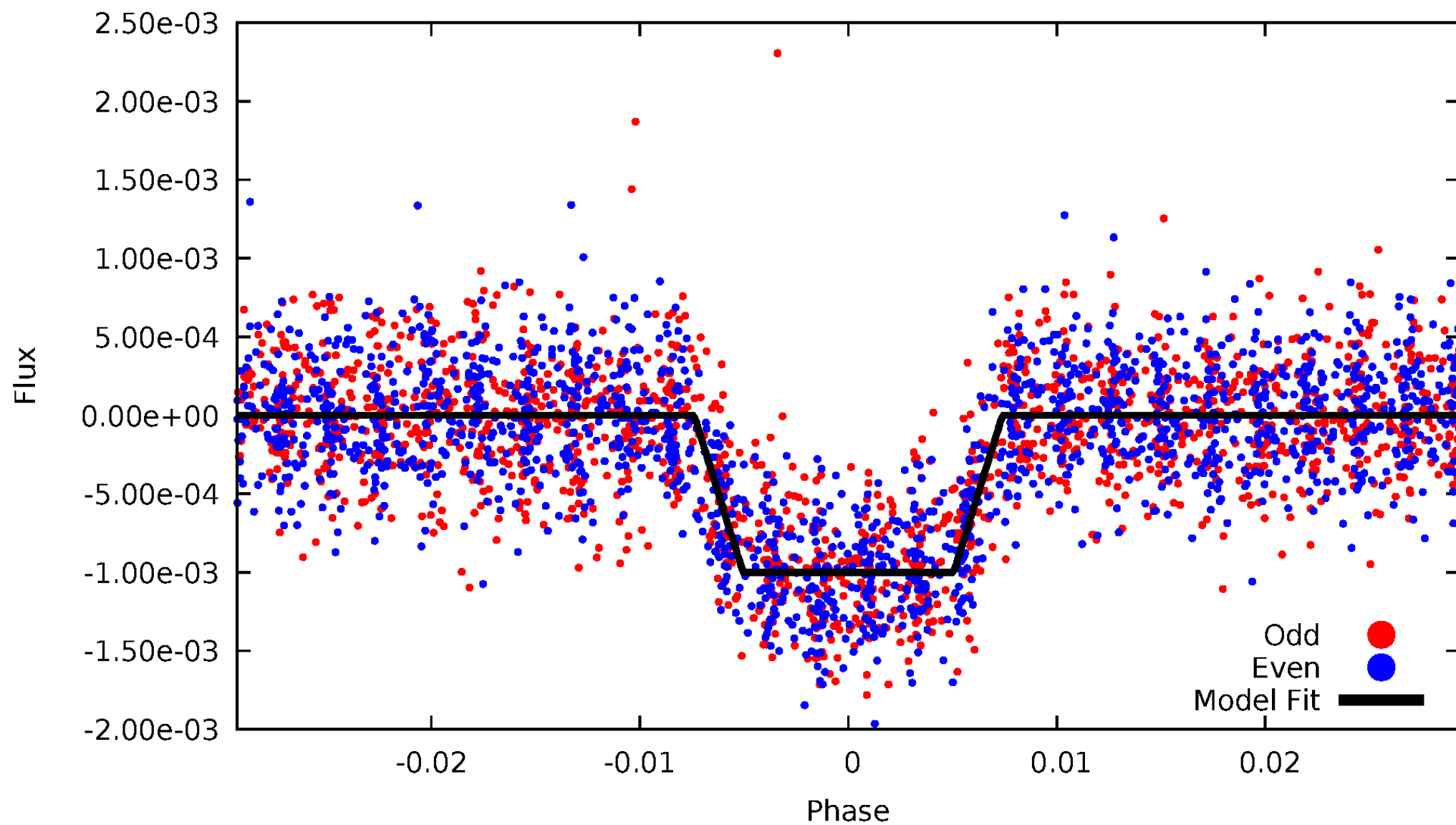
DV Odd/Even

TCE 008222813-01

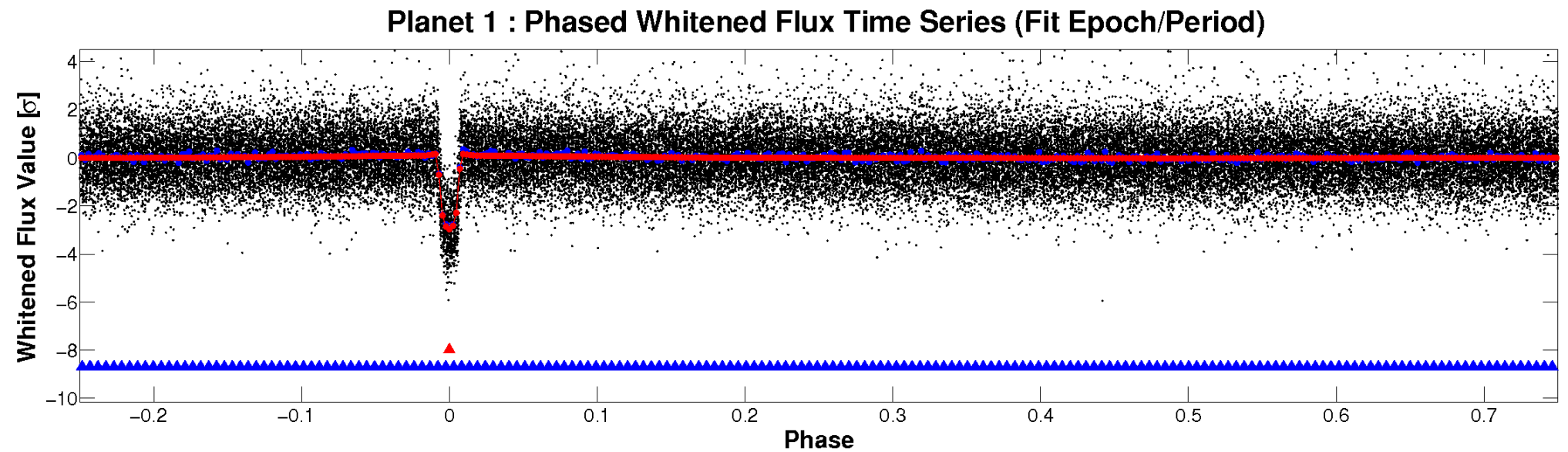
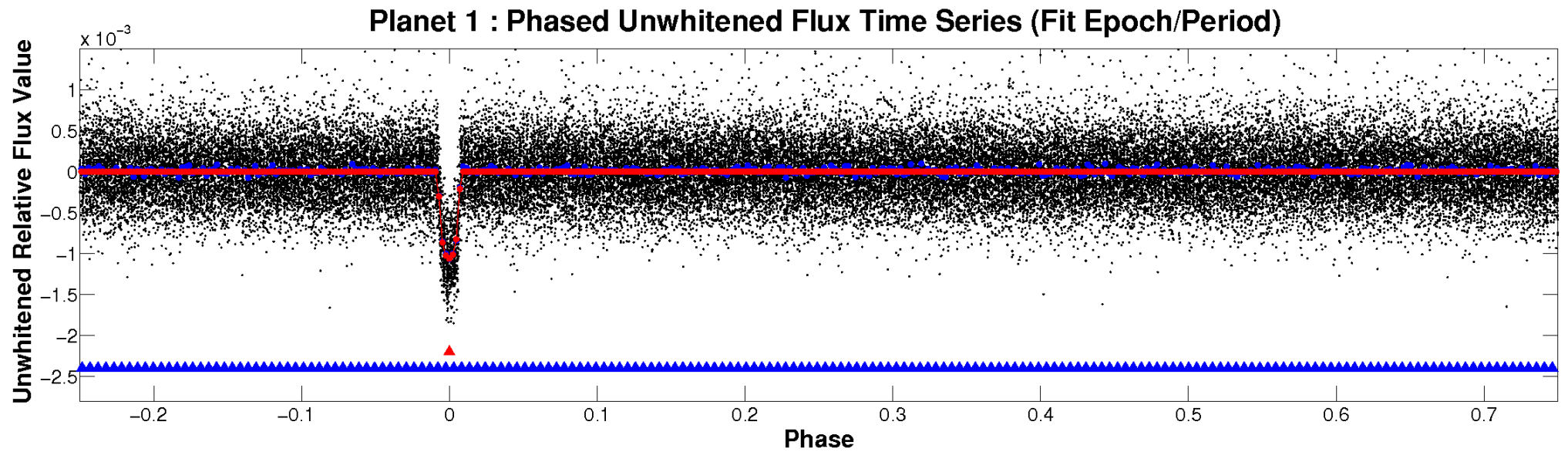


ALT Odd/Even

TCE 008222813-01

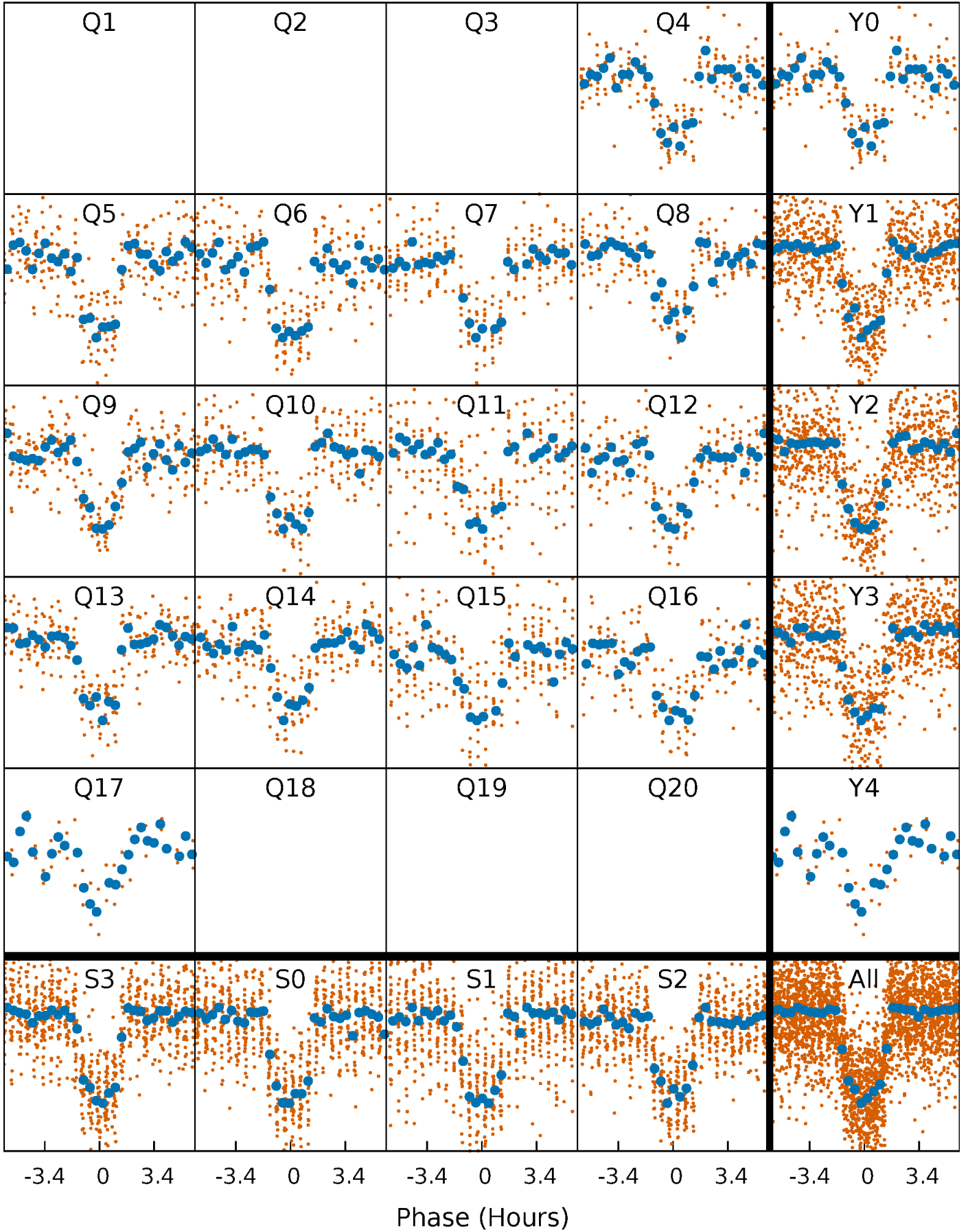


Non-Whitened Vs. Whitened Light Curve



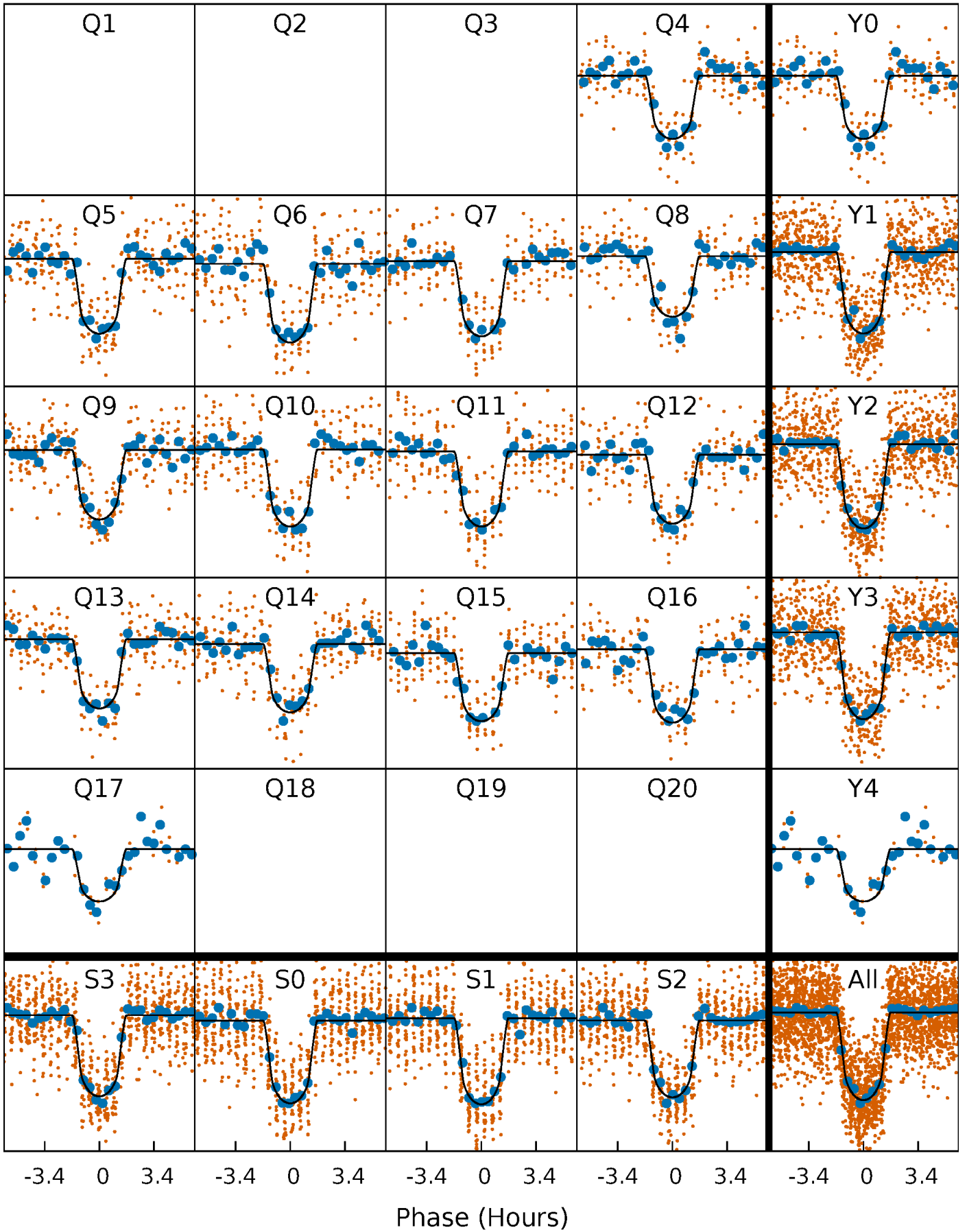
PDC Quarter-Phased Transit Curves

TCE 008222813-01 P= 8.704201 Days $T_0=139.954539$ (BKJD)



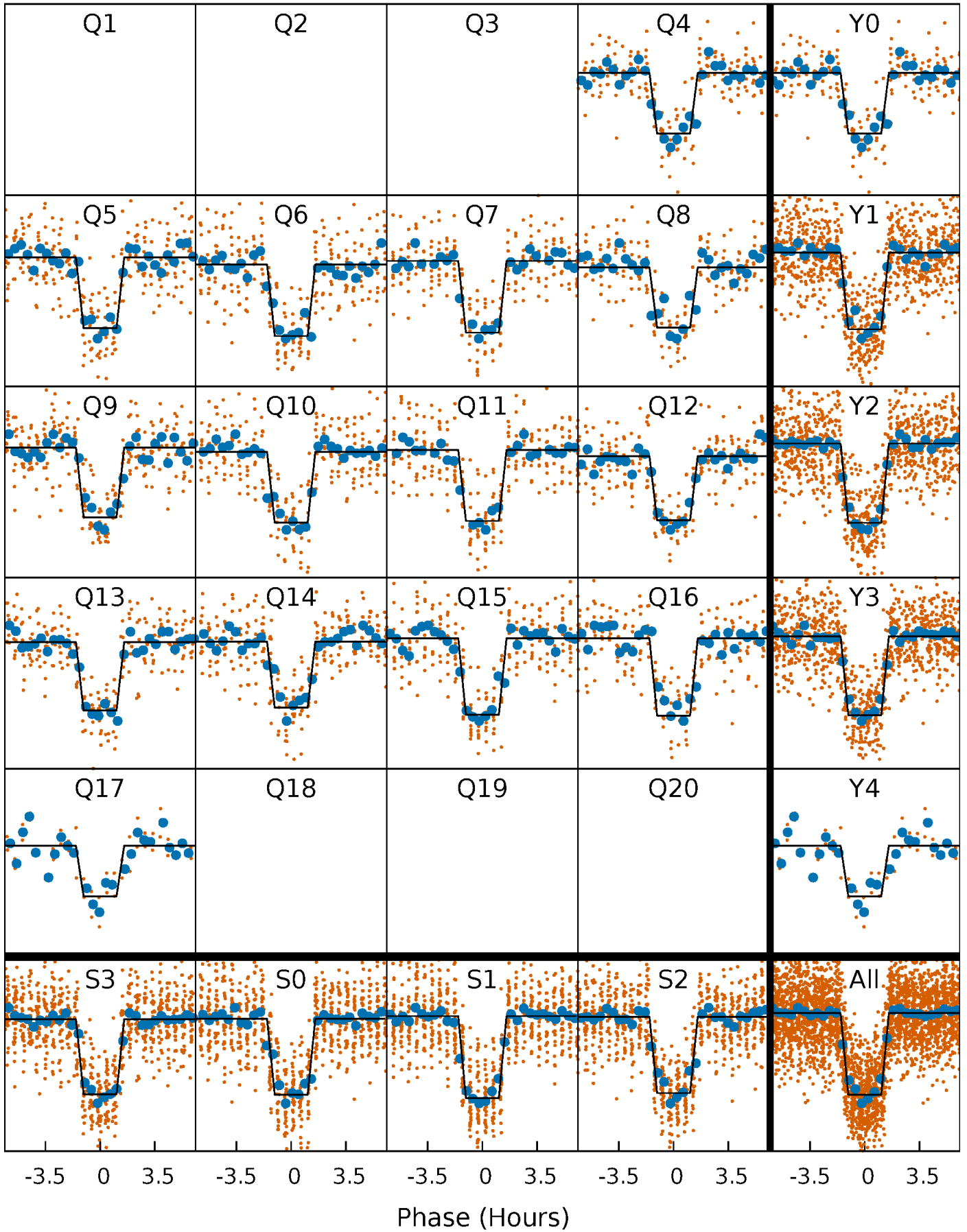
DV Quarter-Phased Transit Curves

TCE 008222813-01 P= 8.704201 Days $T_0=139.954539$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

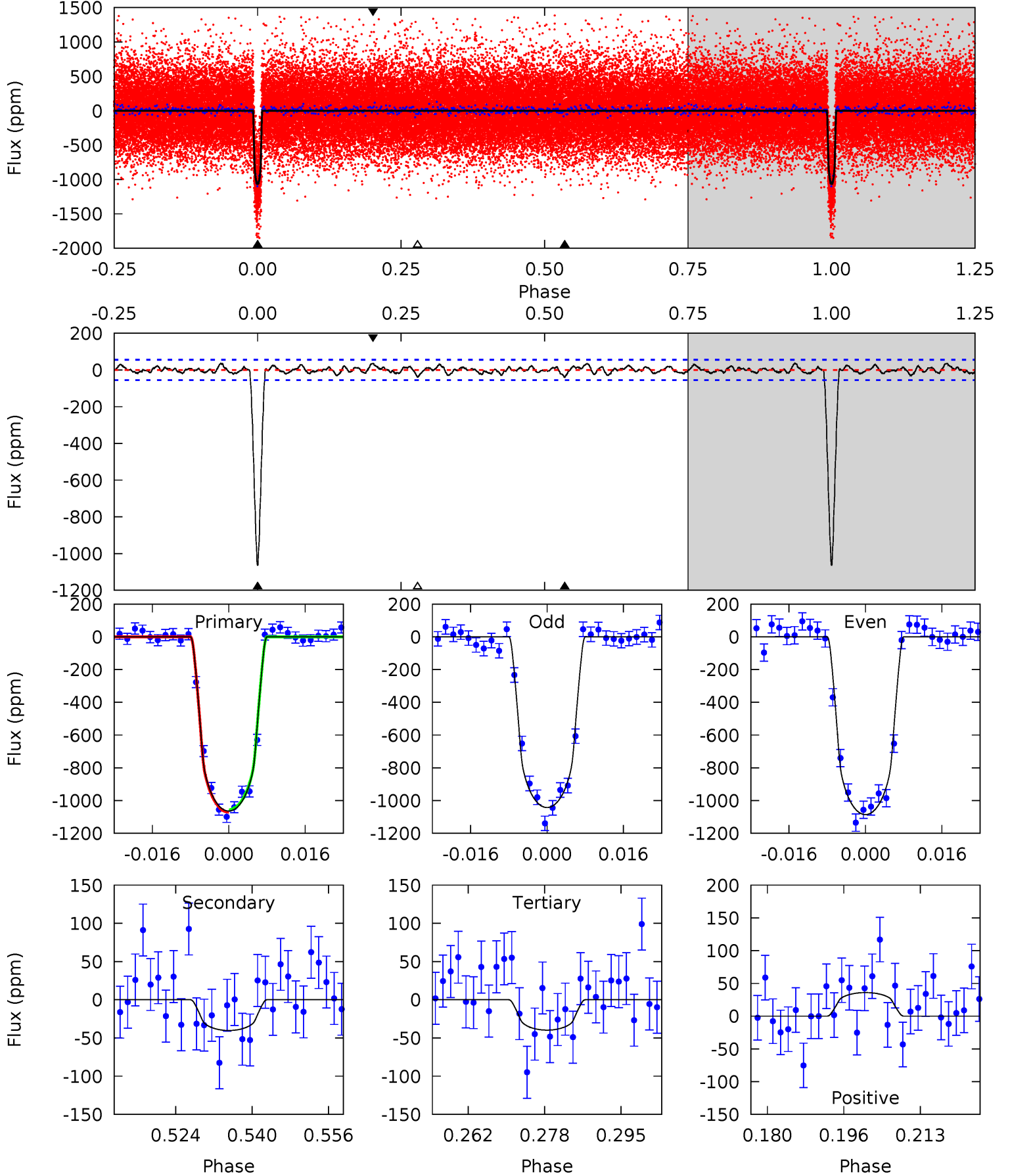
TCE 008222813-01 P= 8.704201 Days $T_0=139.954750$ (BKJD)



DV Model-Shift Uniqueness Test

008222813-01, P = 8.704201 Days, E = 139.954539 Days

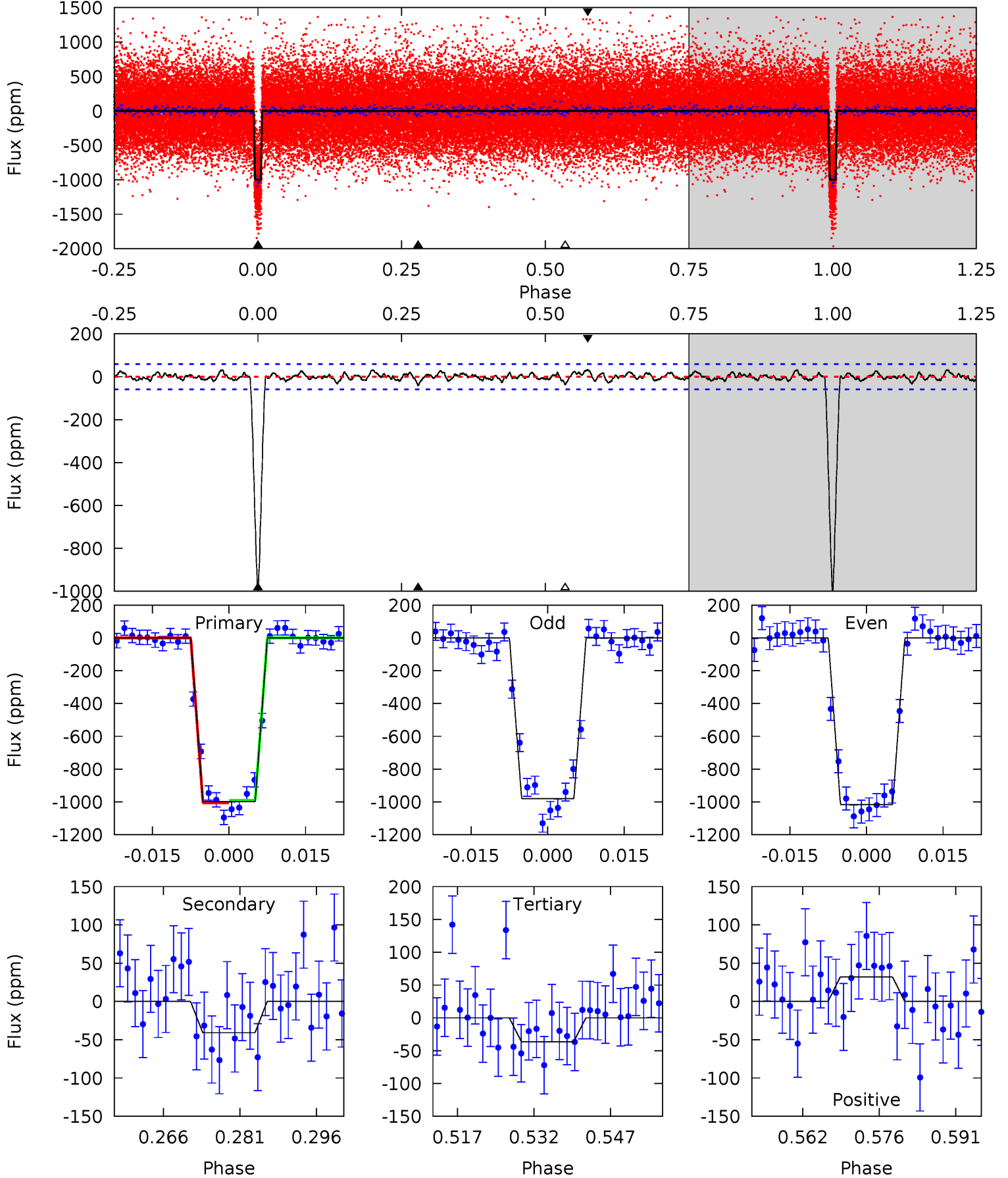
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
94.4	3.57	3.53	3.19	4.93	2.40	1.20	90.9	91.2	0.04	0.38	1.92	0.99	0.03	0.61



Alt Model-Shift Uniqueness Test

008222813-01, P = 8.704201 Days, E = 139.954750 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
83.7	3.42	3.05	2.69	4.95	2.44	1.04	80.6	81.0	0.37	0.74	1.50	0.97	0.03	0.61



Stellar Parameters For KIC 008222813

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5074^{+83}_{-76}	$4.474^{+0.084}_{-0.030}$	$0.160^{+0.150}_{-0.150}$	$0.863^{+0.039}_{-0.072}$	$0.809^{+0.060}_{-0.026}$	$1.775^{+0.565}_{-0.199}$
	+2%/-1%	+2%/-1%	+94%/-94%	+5%/-8%	+7%/-3%	+32%/-11%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 008222813-01 / KOI 1069.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-40 ± 11	$2.98^{+0.58}_{-0.55}$	1038^{+25}_{-27}	2911^{+216}_{-183}	15^{+10}_{-5}
Alt.	-41 ± 12	$2.94^{+0.57}_{-0.58}$	1040^{+23}_{-26}	2931^{+228}_{-180}	15^{+11}_{-6}

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

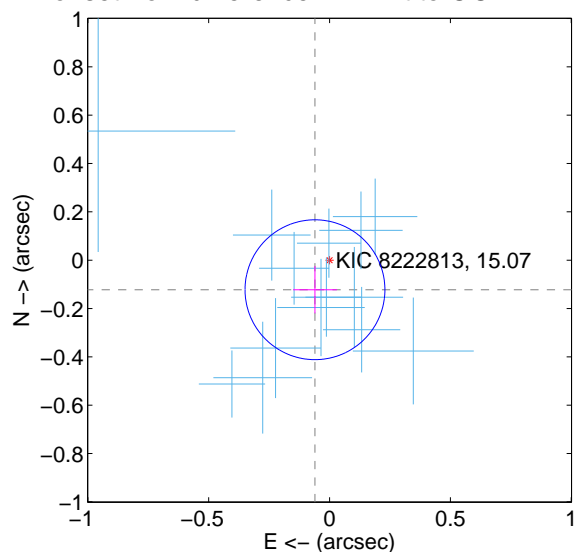
Supplemental centroid analysis for 008222813-01. Kepler magnitude: 15.07. Transit SNR 68.05

There are 14 quarters with good PRF difference image offsets

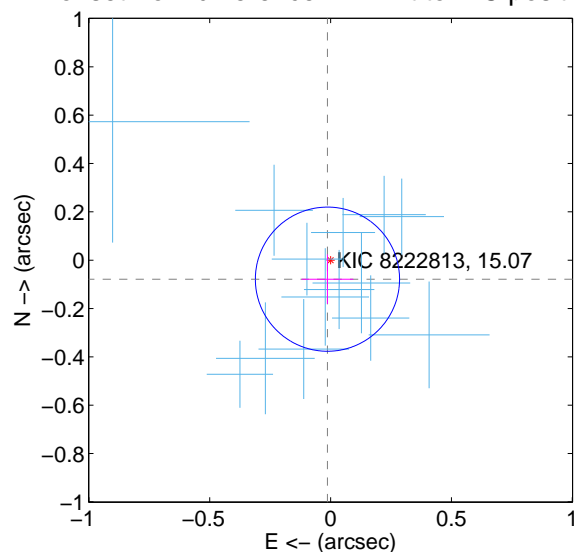
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.136 ± 0.096	1.41	0.060 ± 0.091	-0.122 ± 0.098
PRF-fit source offset from KIC position	0.080 ± 0.099	0.80	0.013 ± 0.107	-0.079 ± 0.102
photometric centroid source offset	0.30 ± 0.18	1.65	0.28 ± 0.18	0.09 ± 0.20

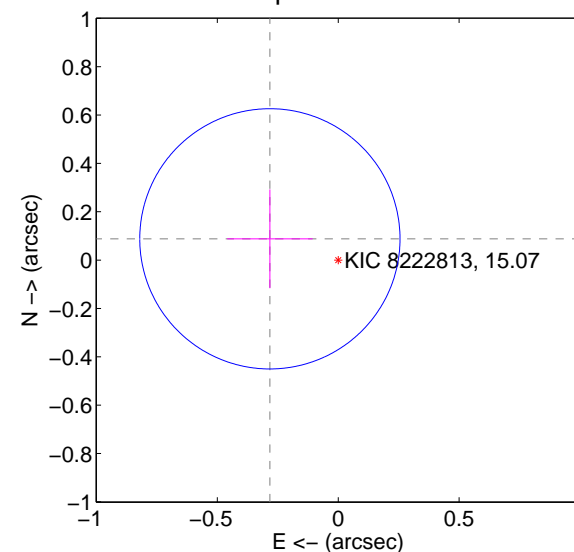
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

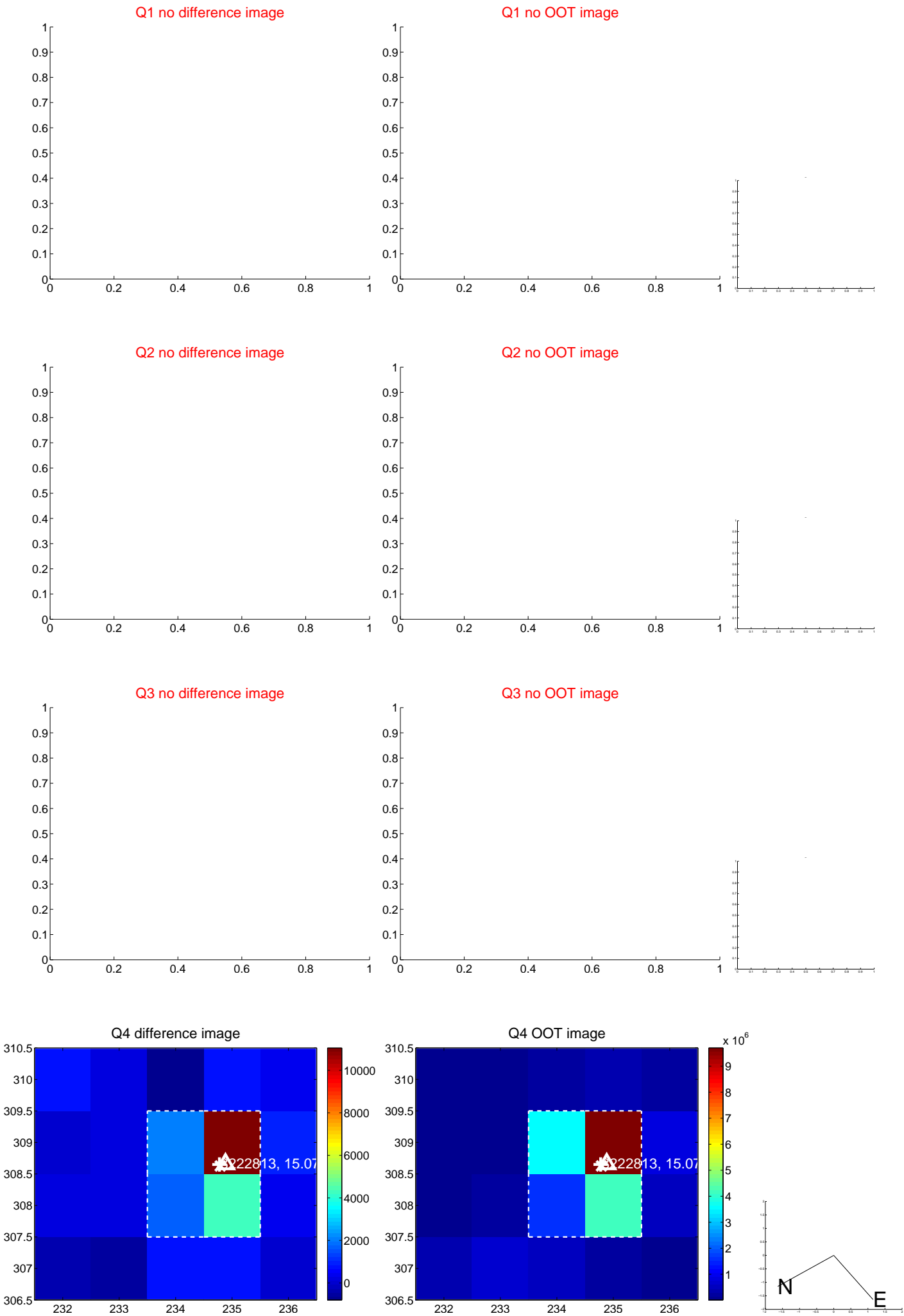


offset from photometric centroids

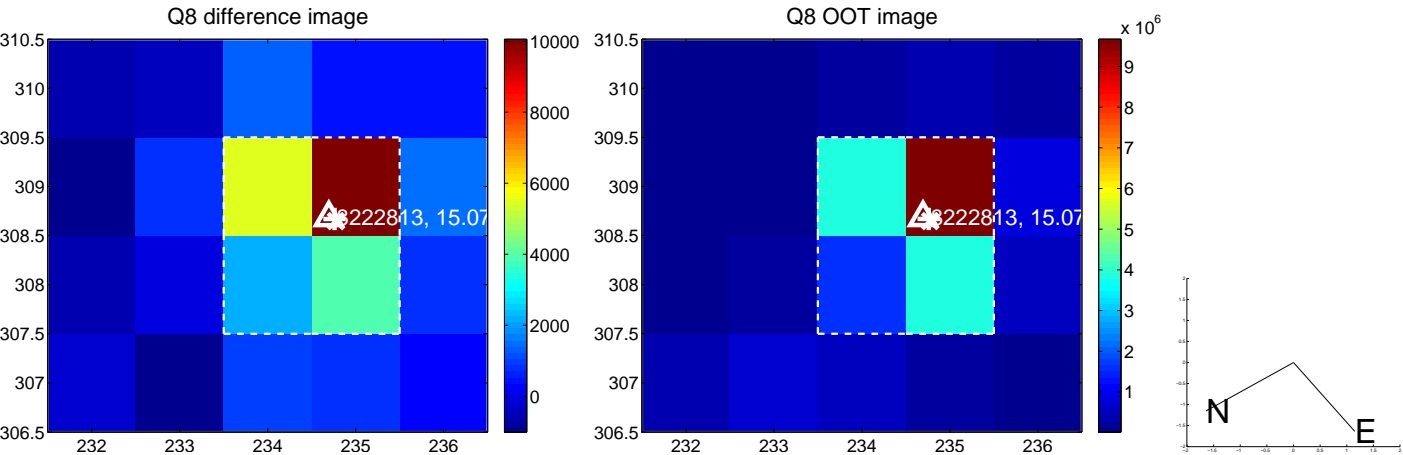
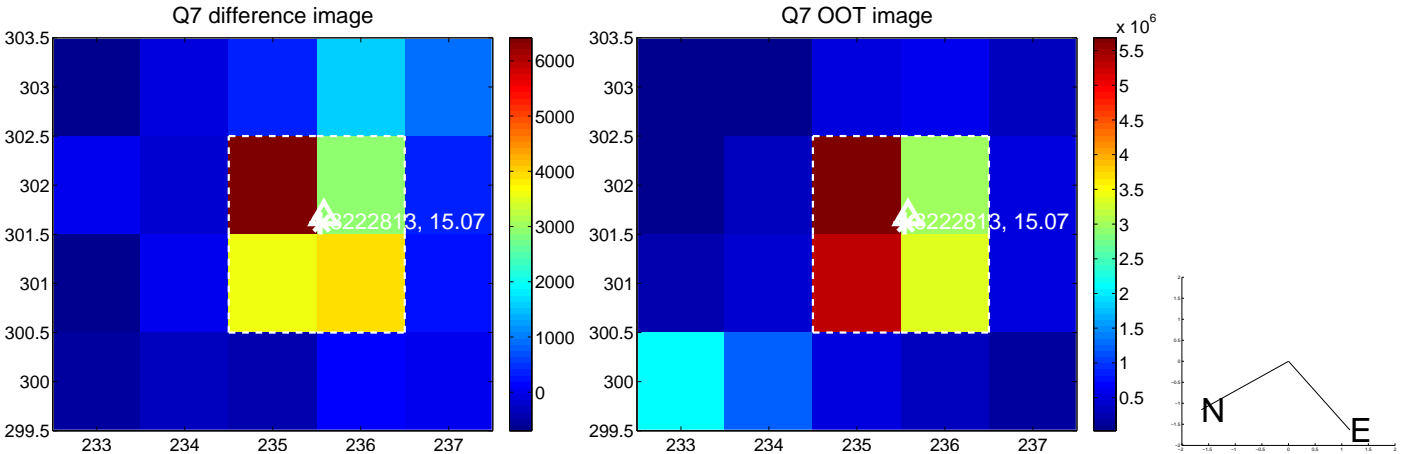
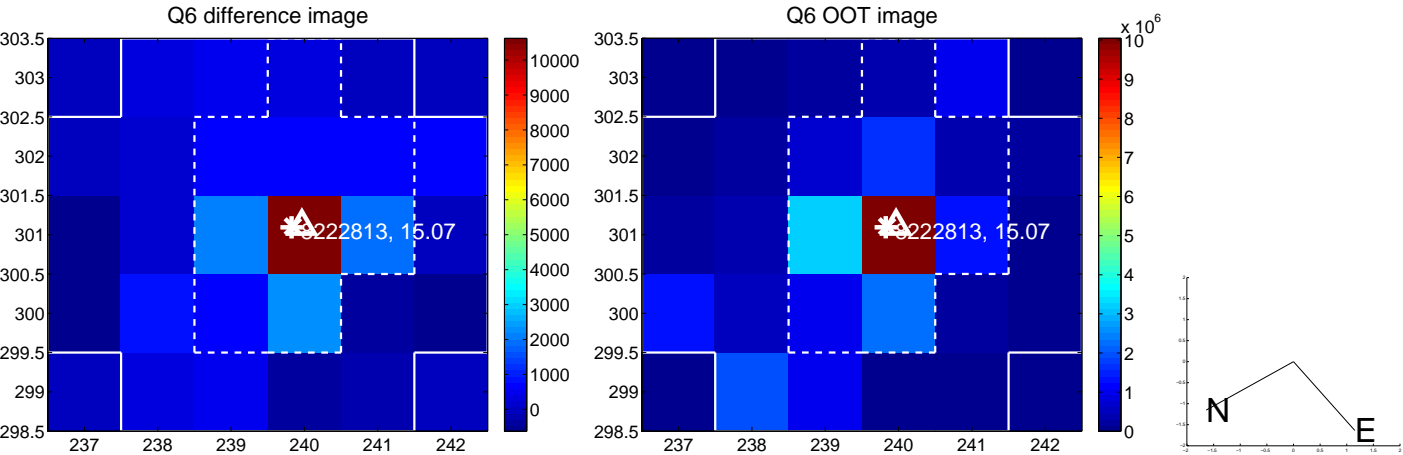
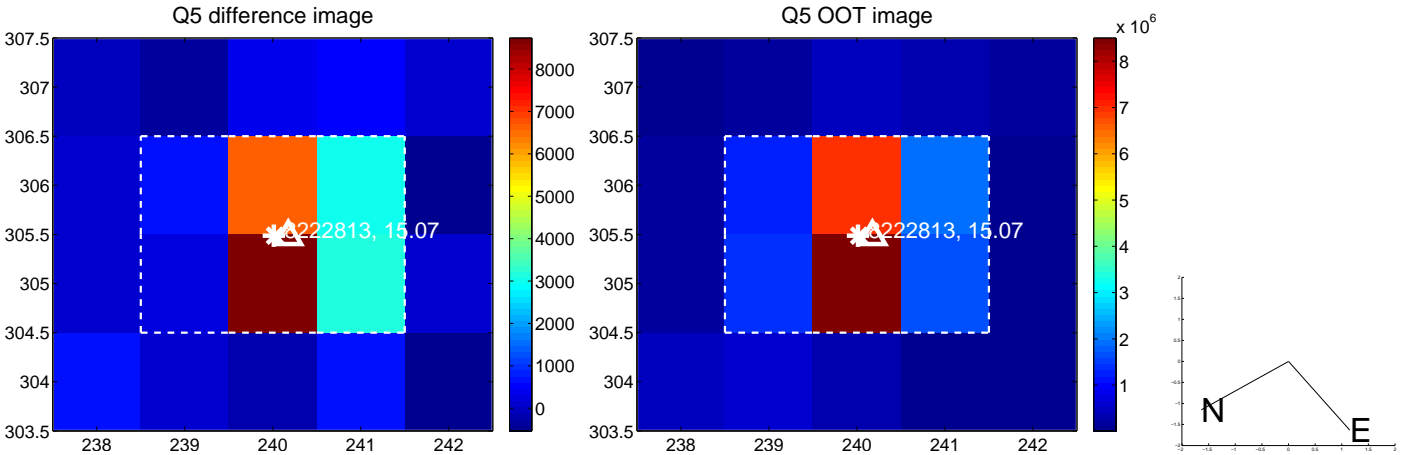


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

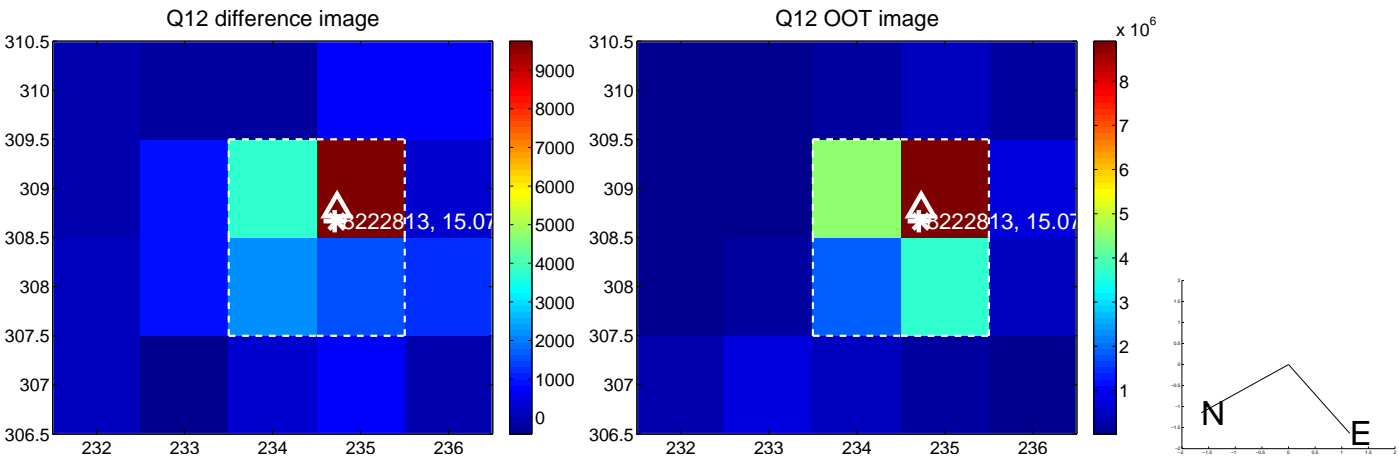
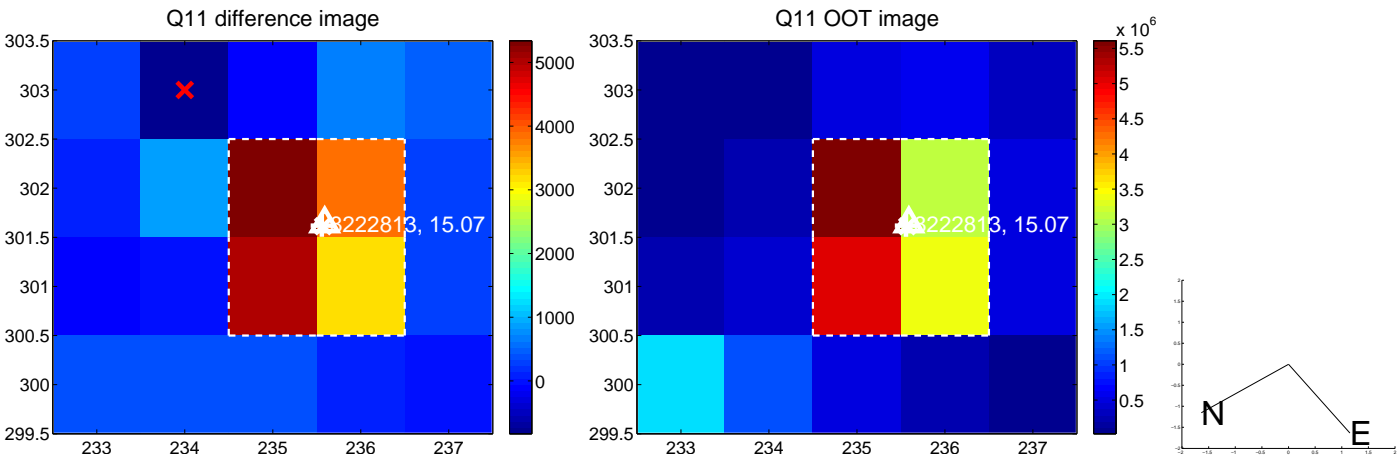
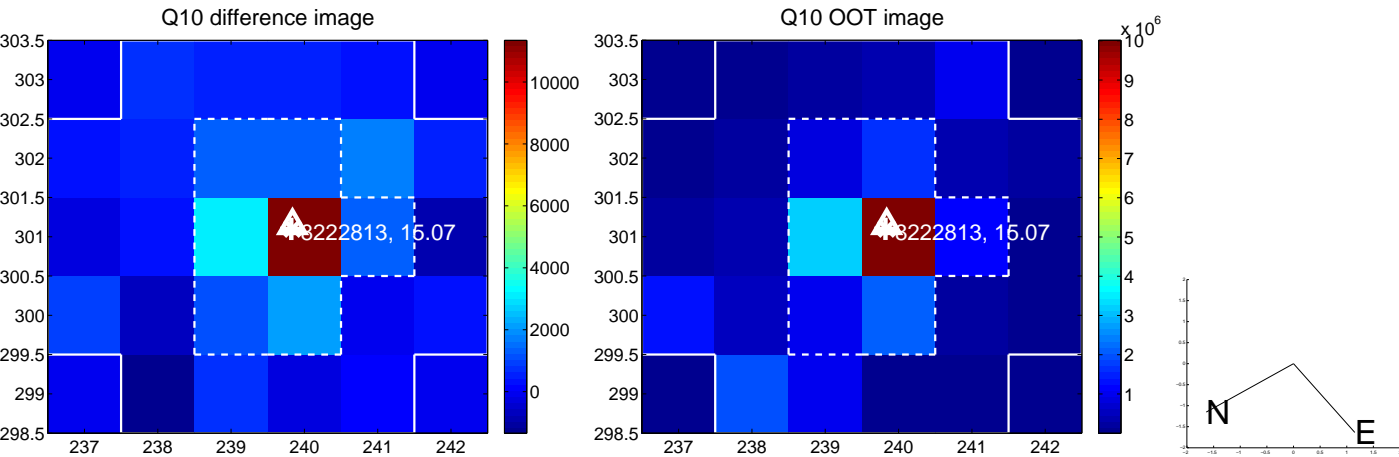
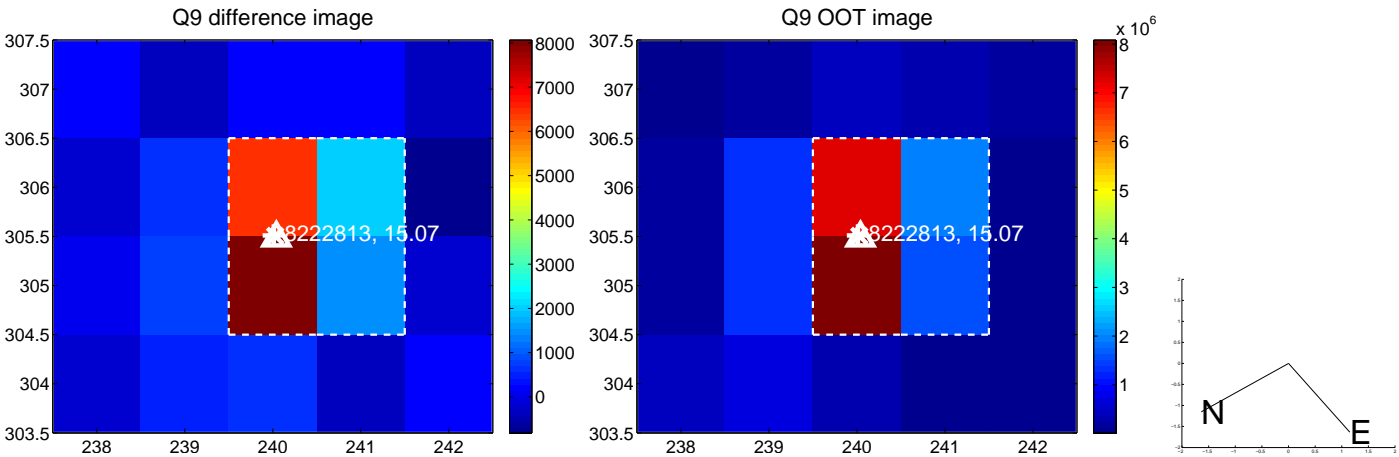
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



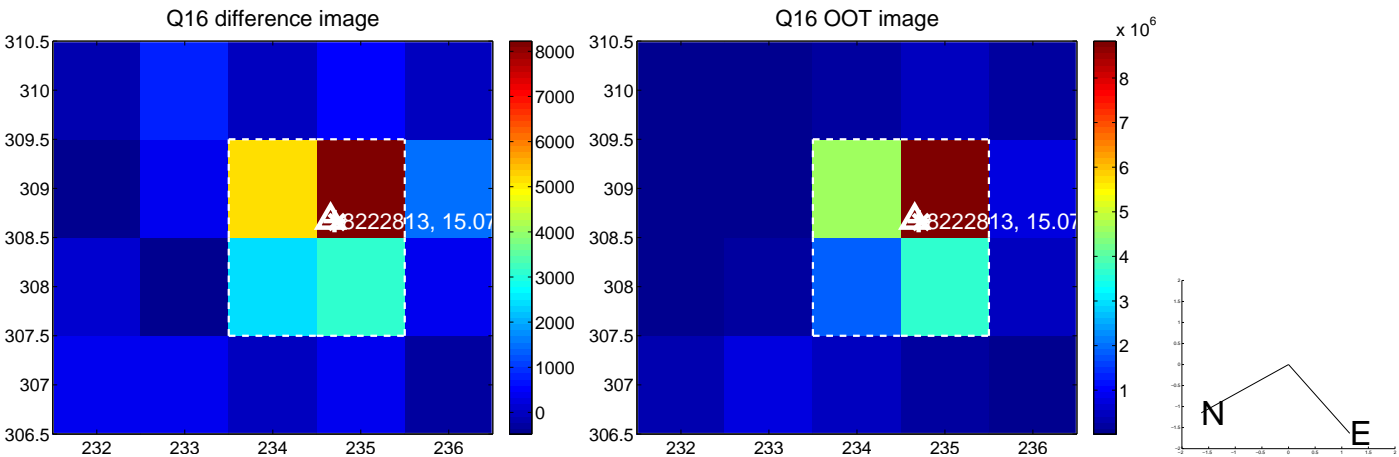
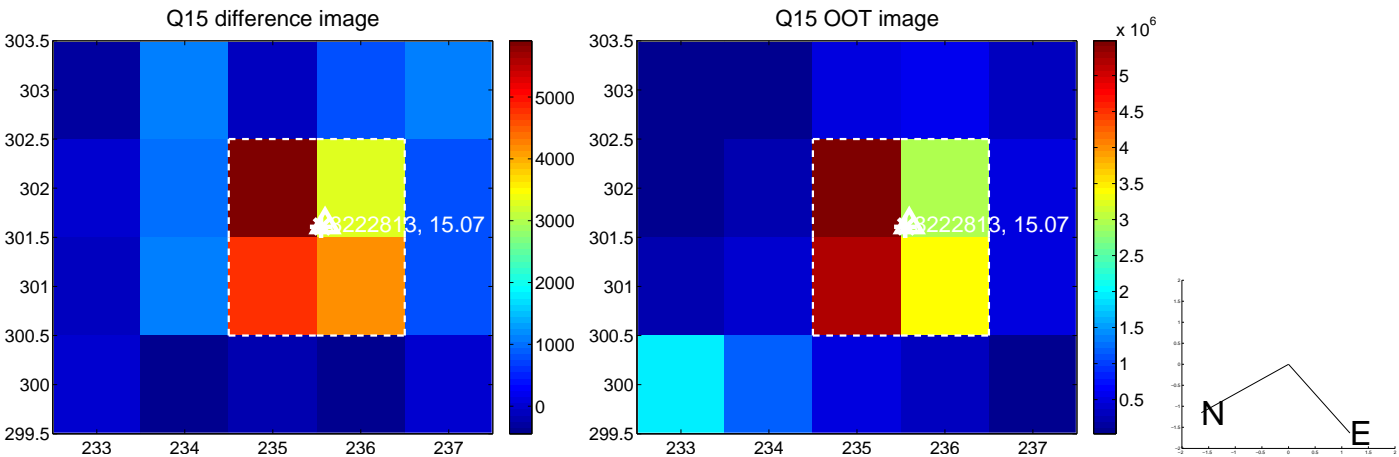
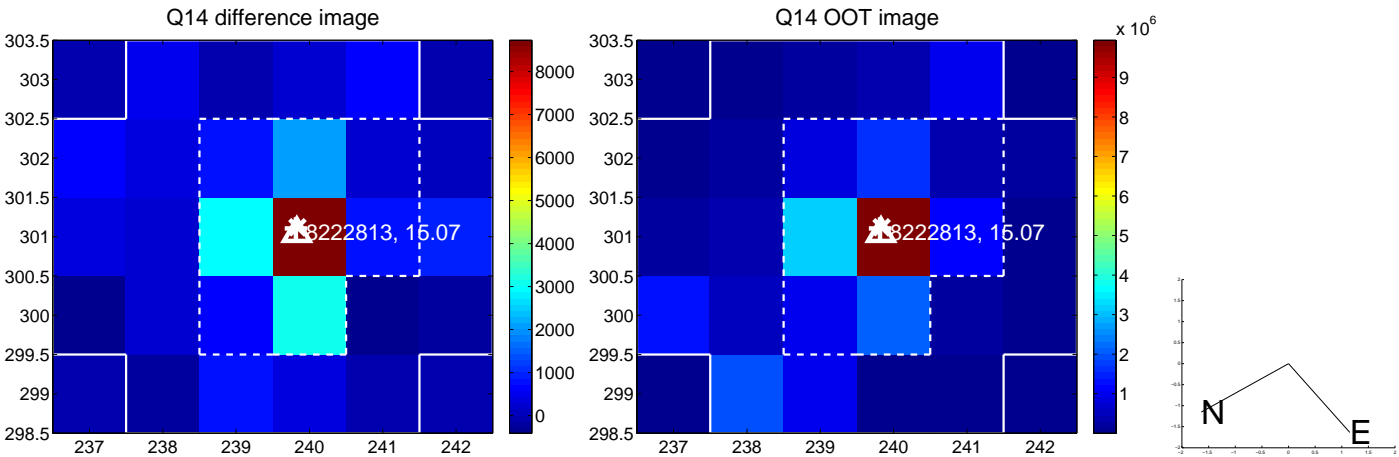
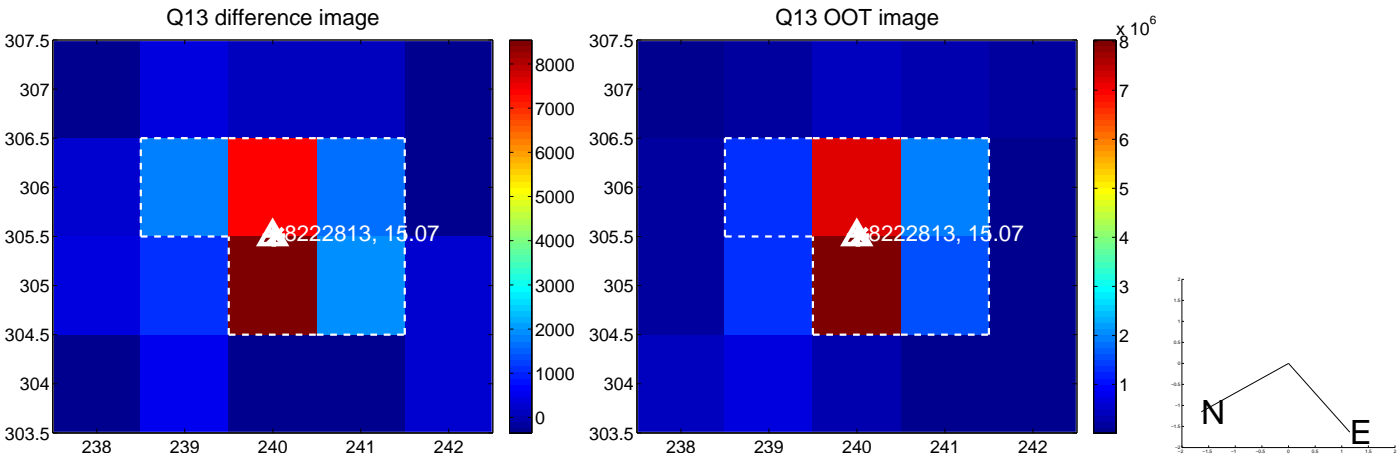
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



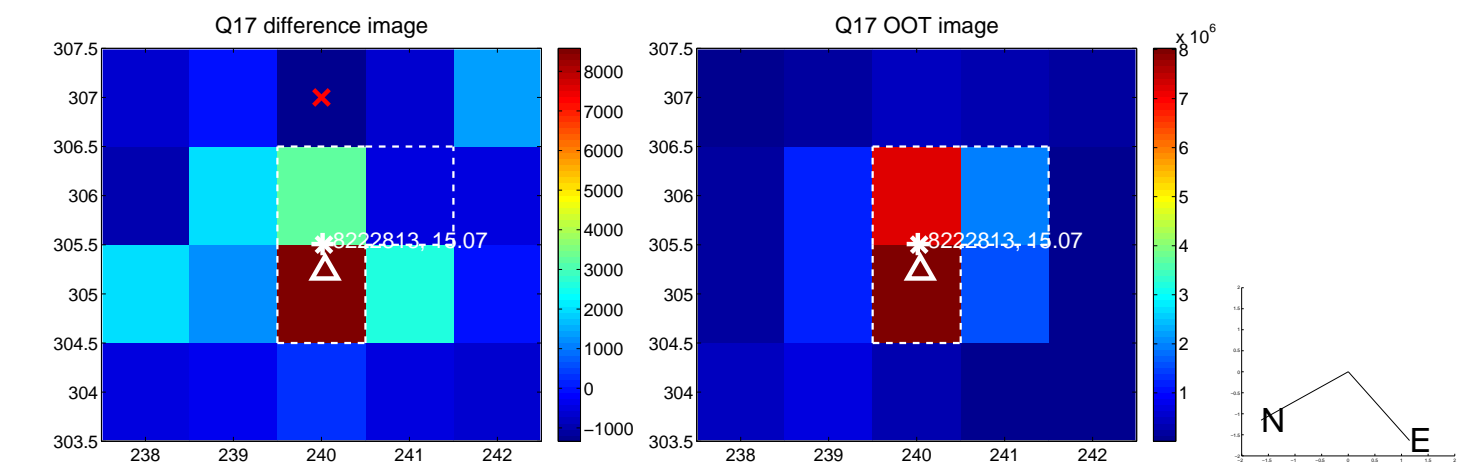
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



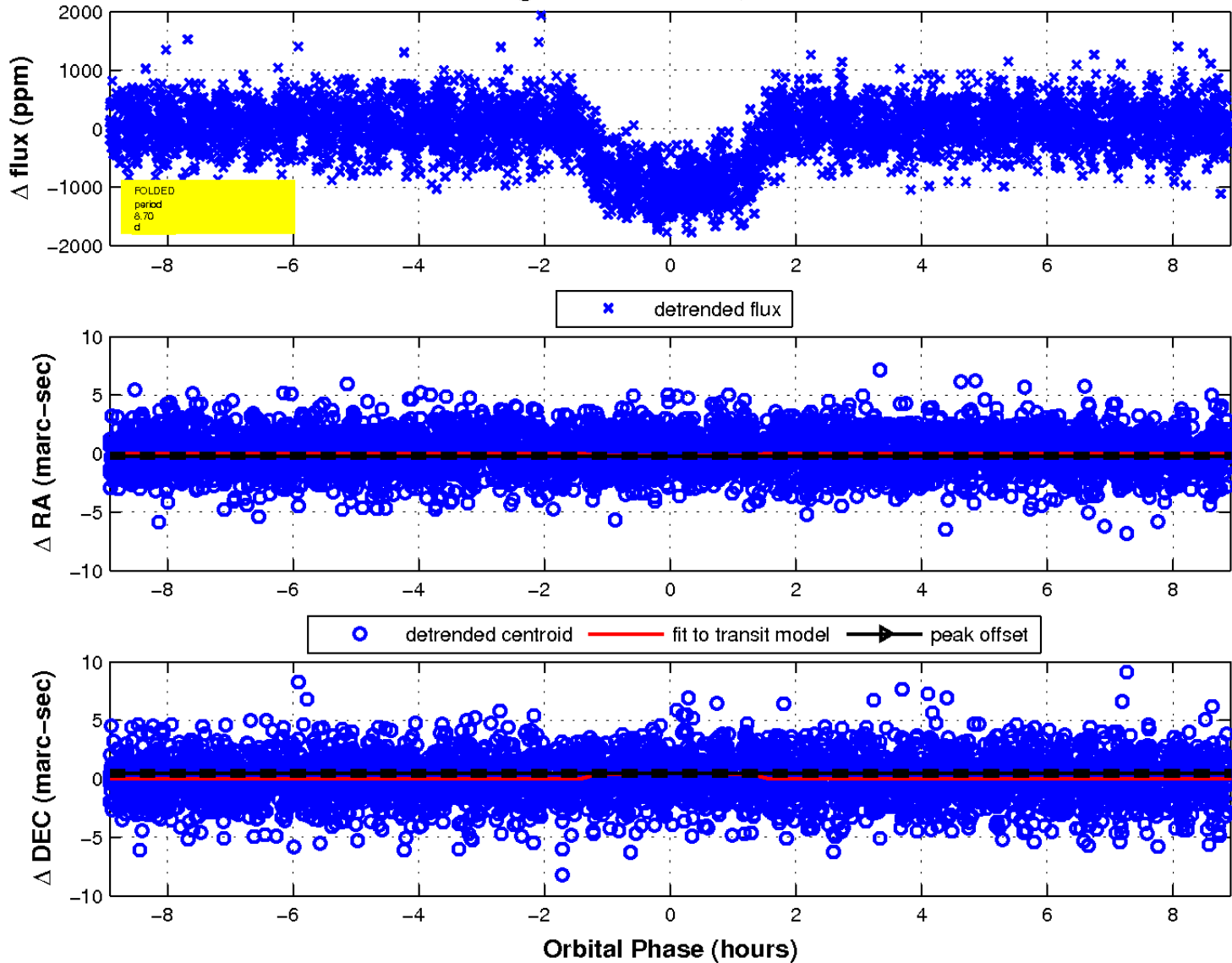
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



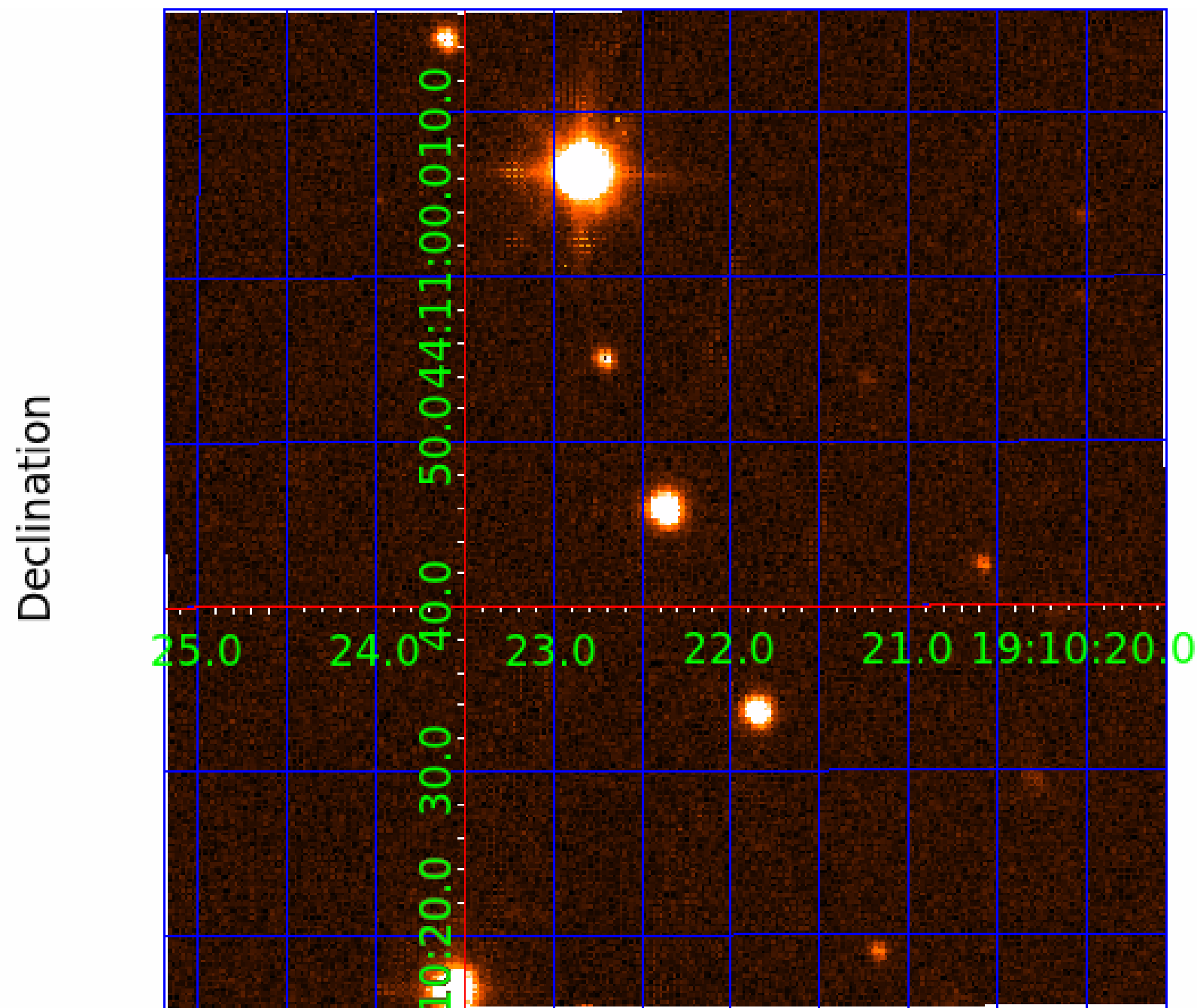
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 008222813

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})
008222813-01	OBS	1069.01	8.704201	139.954539	1064.4	2.974	60.6	68.1	0.86	5074	3.02	74.25
008222813-02	OBS	1069.02	2.466973	132.902738	292.0	1.776	24.8	27.7	0.86	5074	1.80	398.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008222813-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008222813-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

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

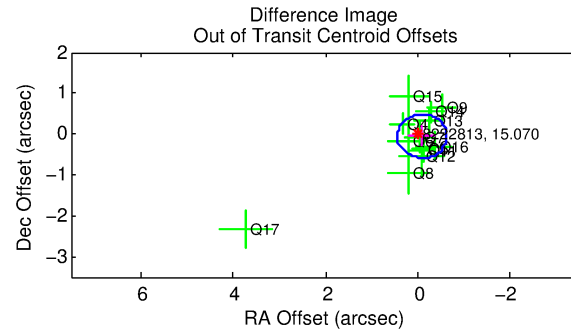
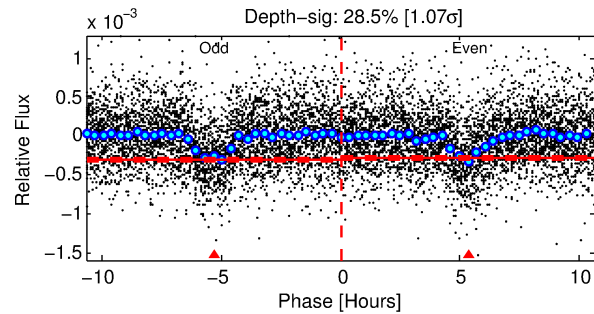
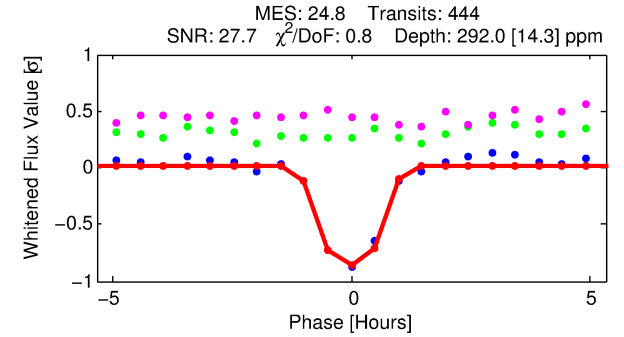
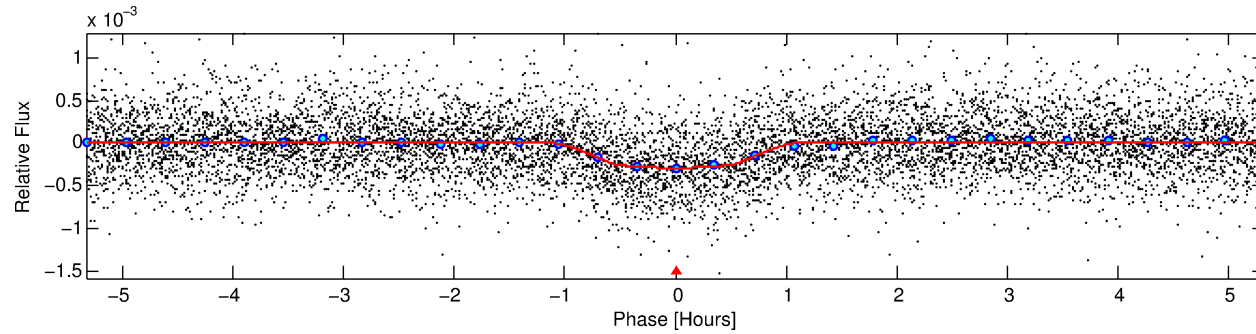
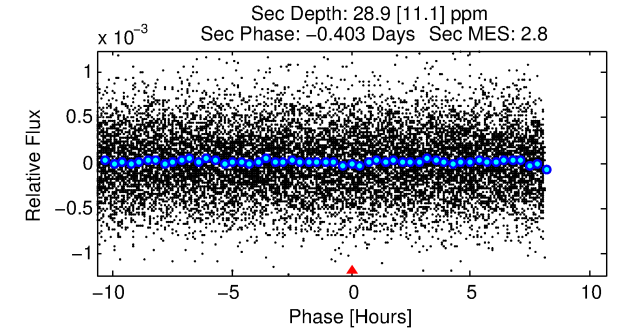
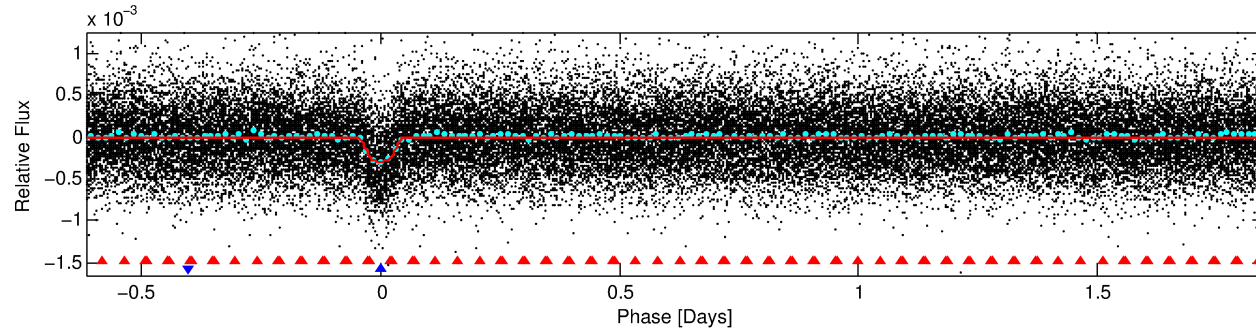
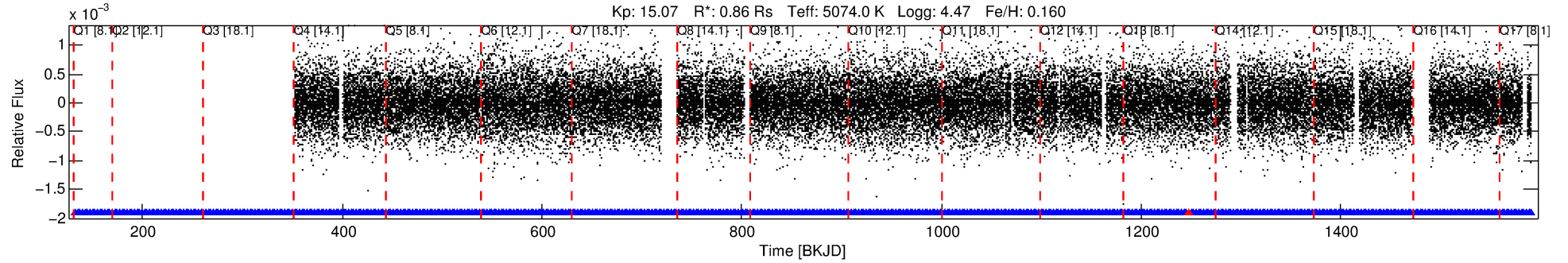
Ephemeris Match Information For 008222813-02

No Significant Match Found

DV One-Page Summary

KIC: 8222813 Candidate: 2 of 2 Period: 2.467 d

KOI: K01069.02 Corr: 0.939



DV Fit Results:

Period = 2.46697 [0.00001] d
Epoch = 132.9027 [0.0011] BKJD
Rp/R* = 0.0191 [0.0067]
a/R* = 5.17 [6.96]
b = 0.90 [0.31]
Seff = 398.80 [61.78]
Teff = 1139 [44] K
Rp = 1.80 [0.65] Re
a = 0.0333 [0.0028] AU
Ag = 5.45 [4.43] [1.00σ]
Teffp = 2691 [541] K [2.86σ]

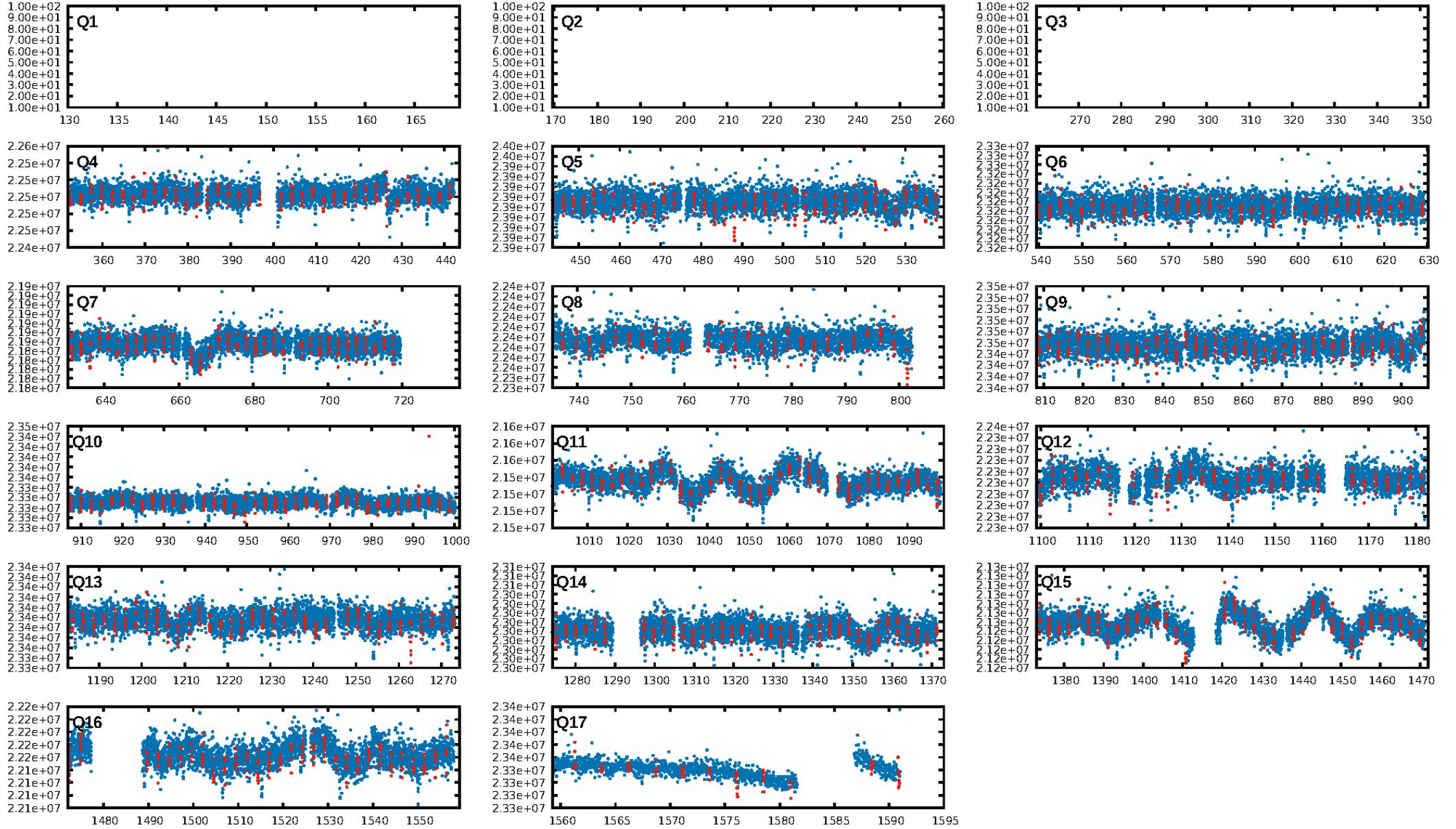
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [43.22σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.09e-129
RollingBand-fgt: 1.00 [433/434]
GhostDiagnostic-chr: 9.809
Centroid-sig: 38.8%
Centroid-so: 0.459 arcsec [0.93σ]
OotOffset-rm: 0.104 arcsec [0.58σ]
KicOffset-rm: 0.134 arcsec [0.46σ]
OotOffset-st: 2/3/4/4 [13]
KicOffset-st: 2/3/4/4 [13]
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DiffImageOverlap-fno: 1.00 [14/14]

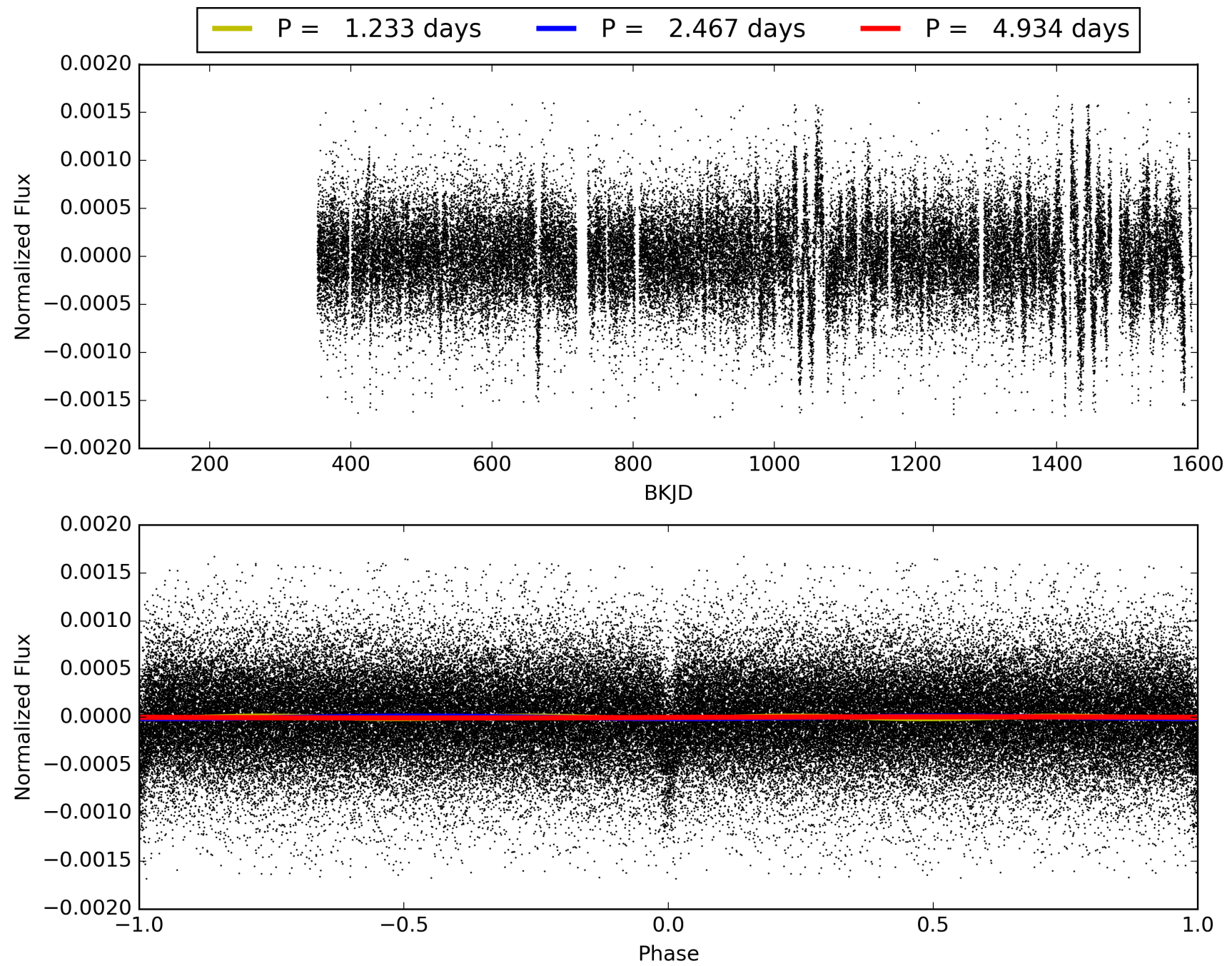
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:55:28 Z

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

TCE 008222813-02, PDC Light Curves

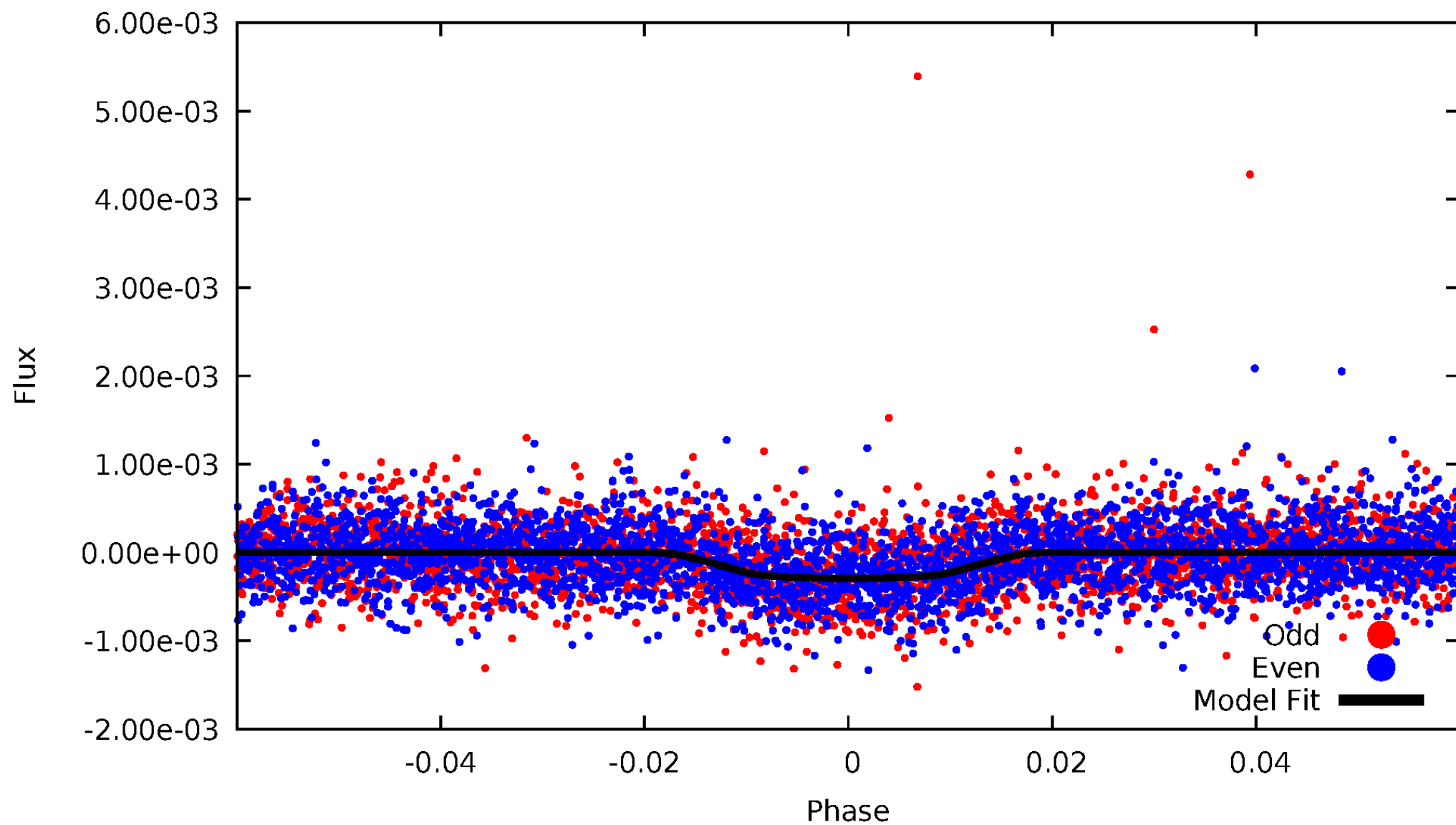


TCE 008222813-02



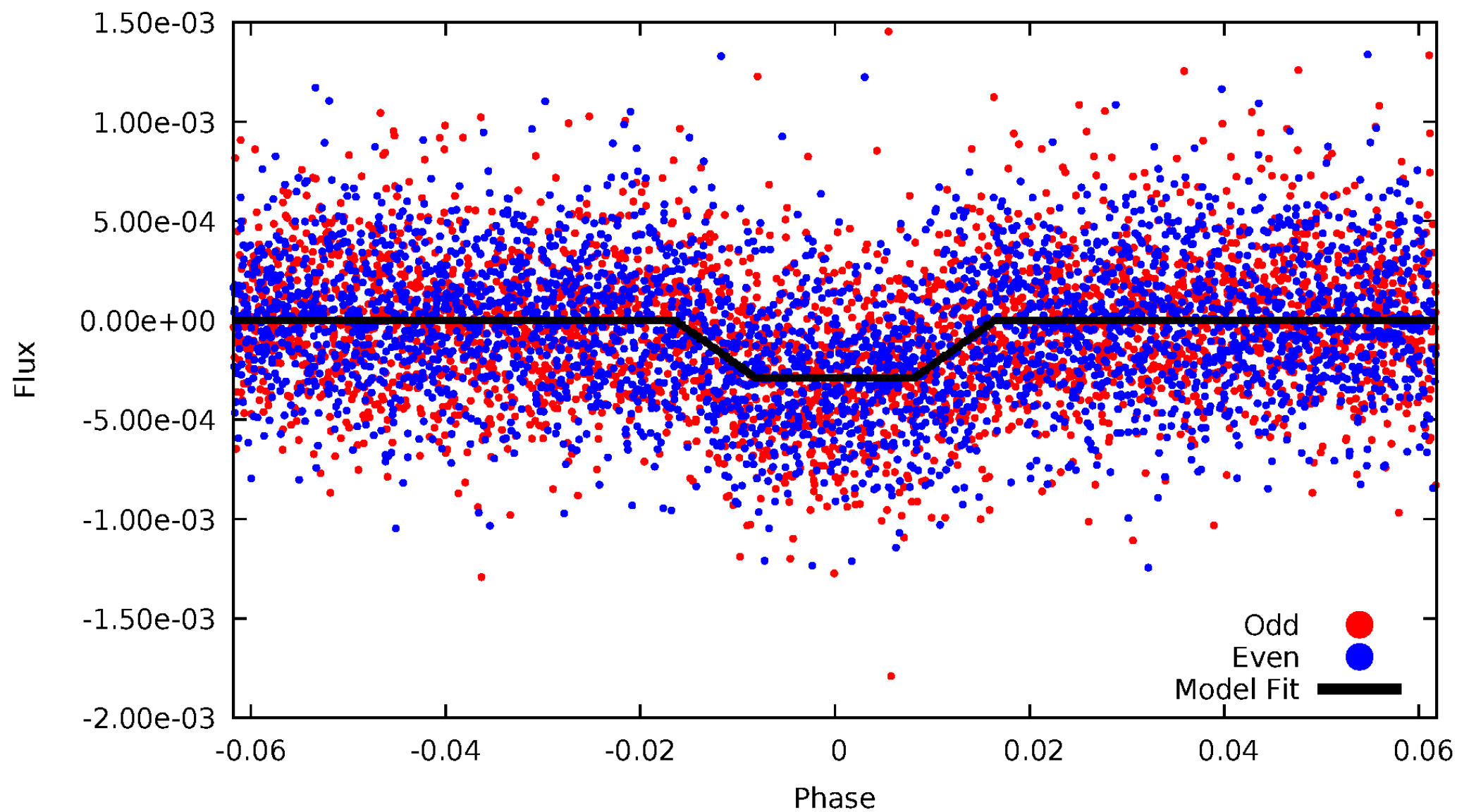
DV Odd/Even

TCE 008222813-02



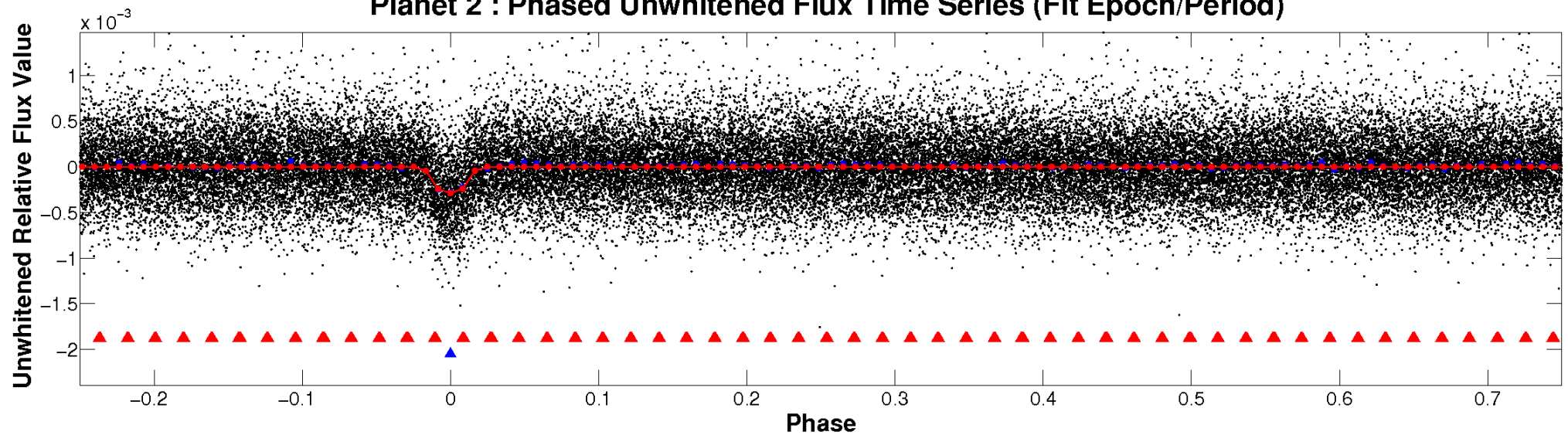
ALT Odd/Even

TCE 008222813-02

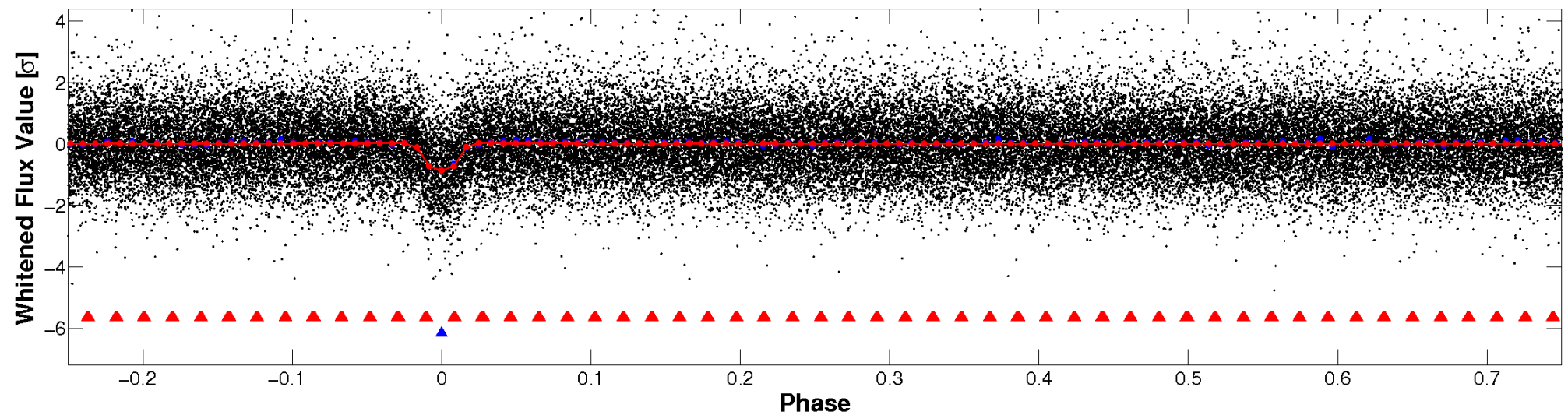


Non-Whitened Vs. Whitened Light Curve

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

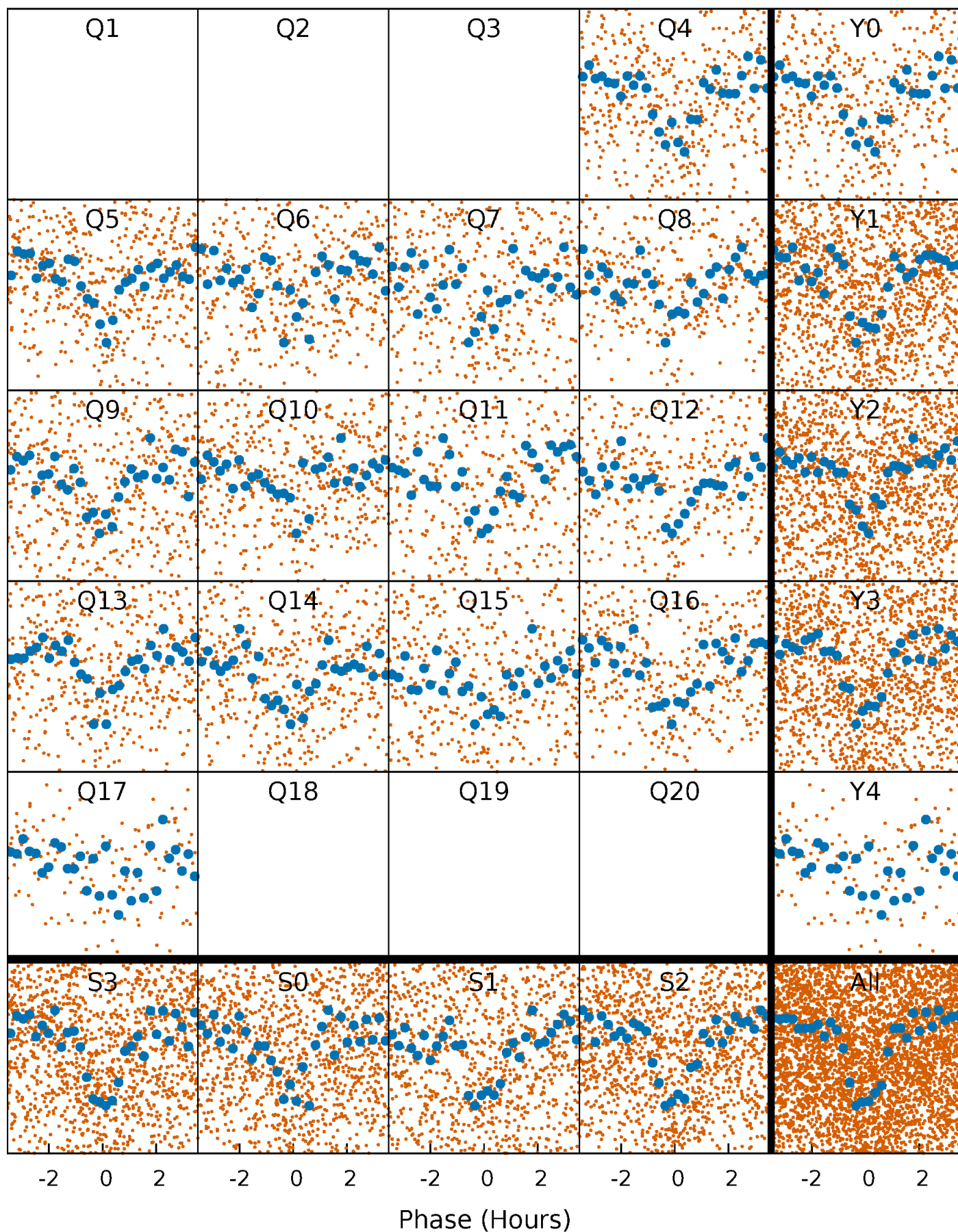


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



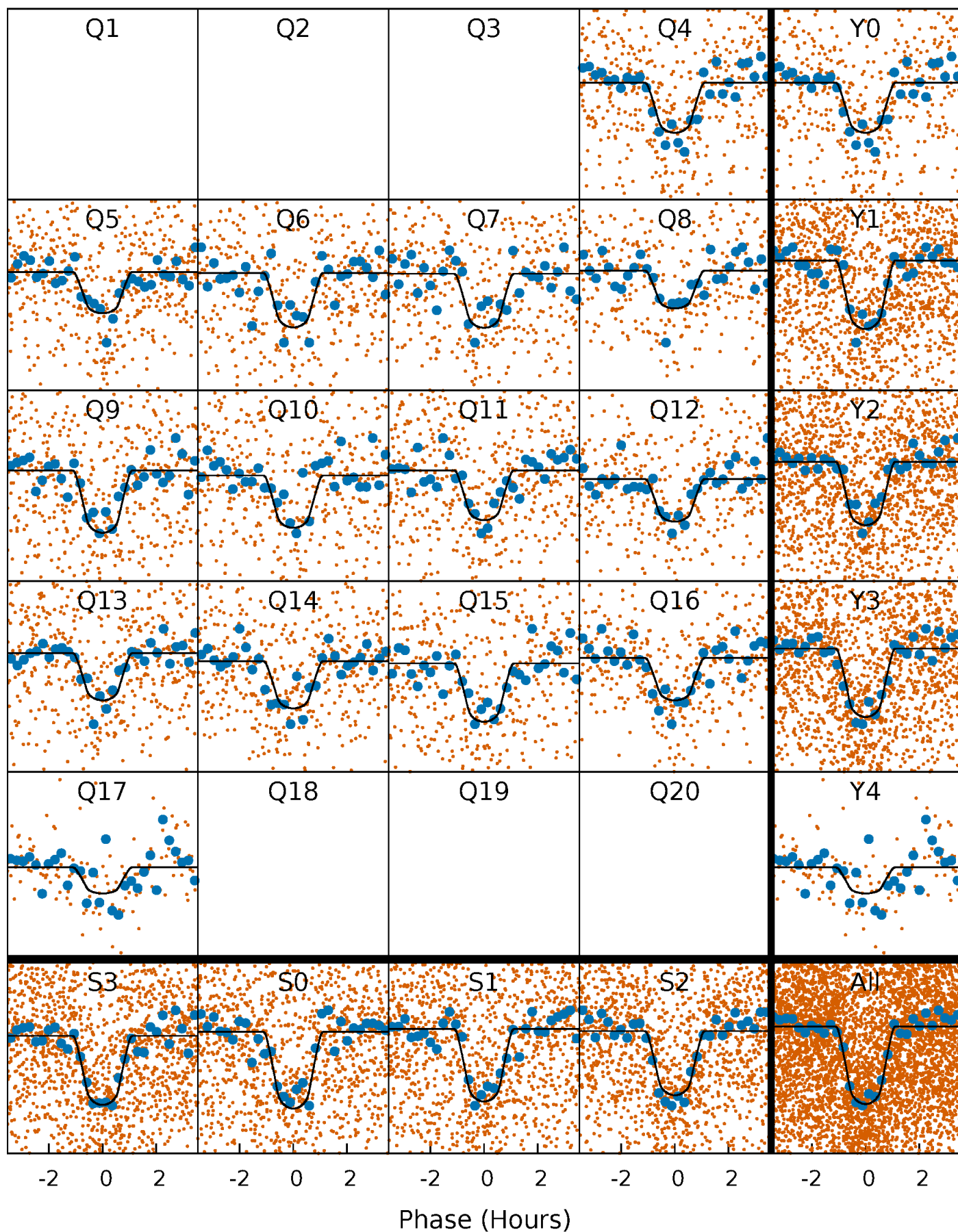
PDC Quarter-Phased Transit Curves

TCE 008222813-02 P= 2.466973 Days $T_0=132.902738$ (BKJD)



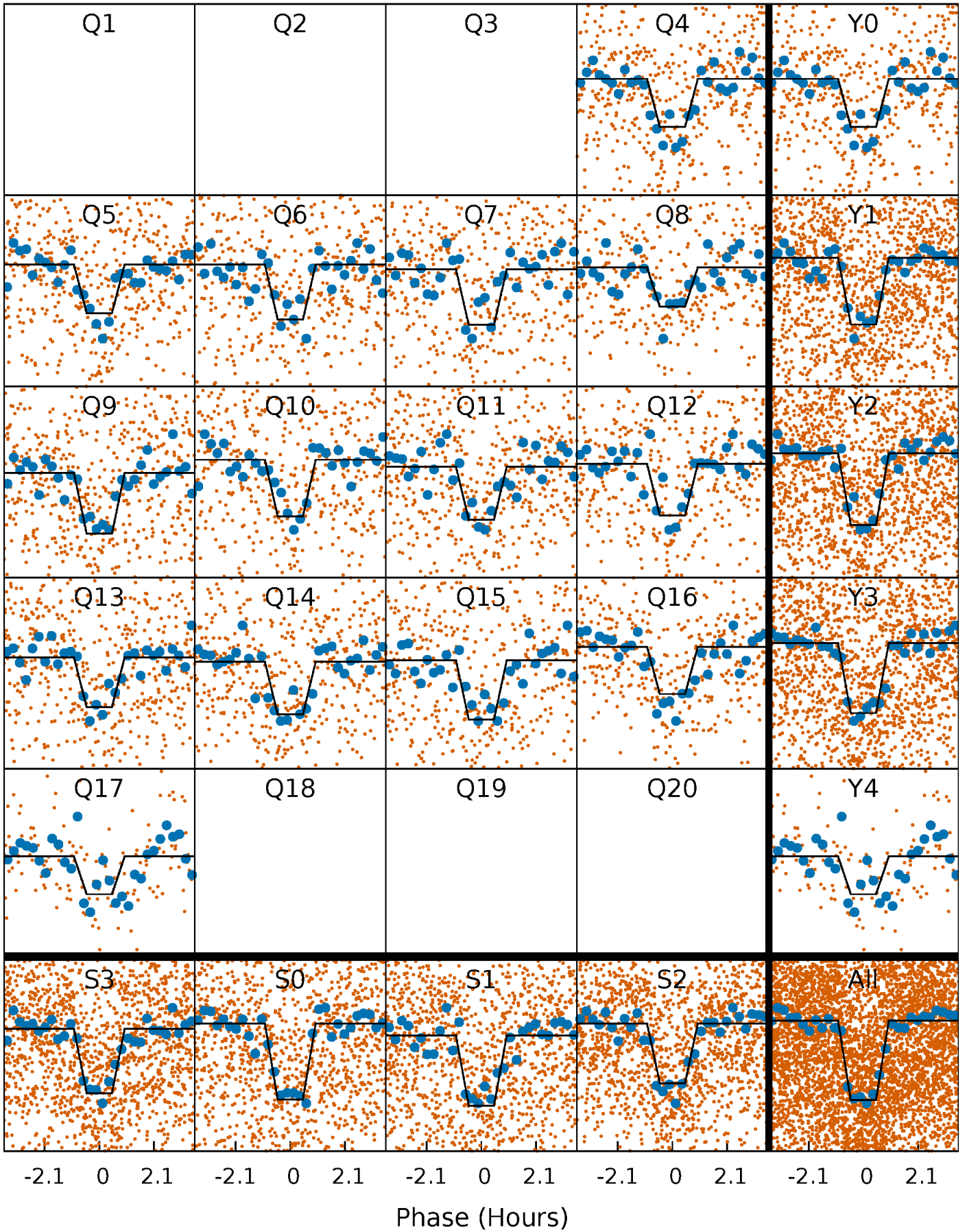
DV Quarter-Phased Transit Curves

TCE 008222813-02 P= 2.466973 Days $T_0=132.902738$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

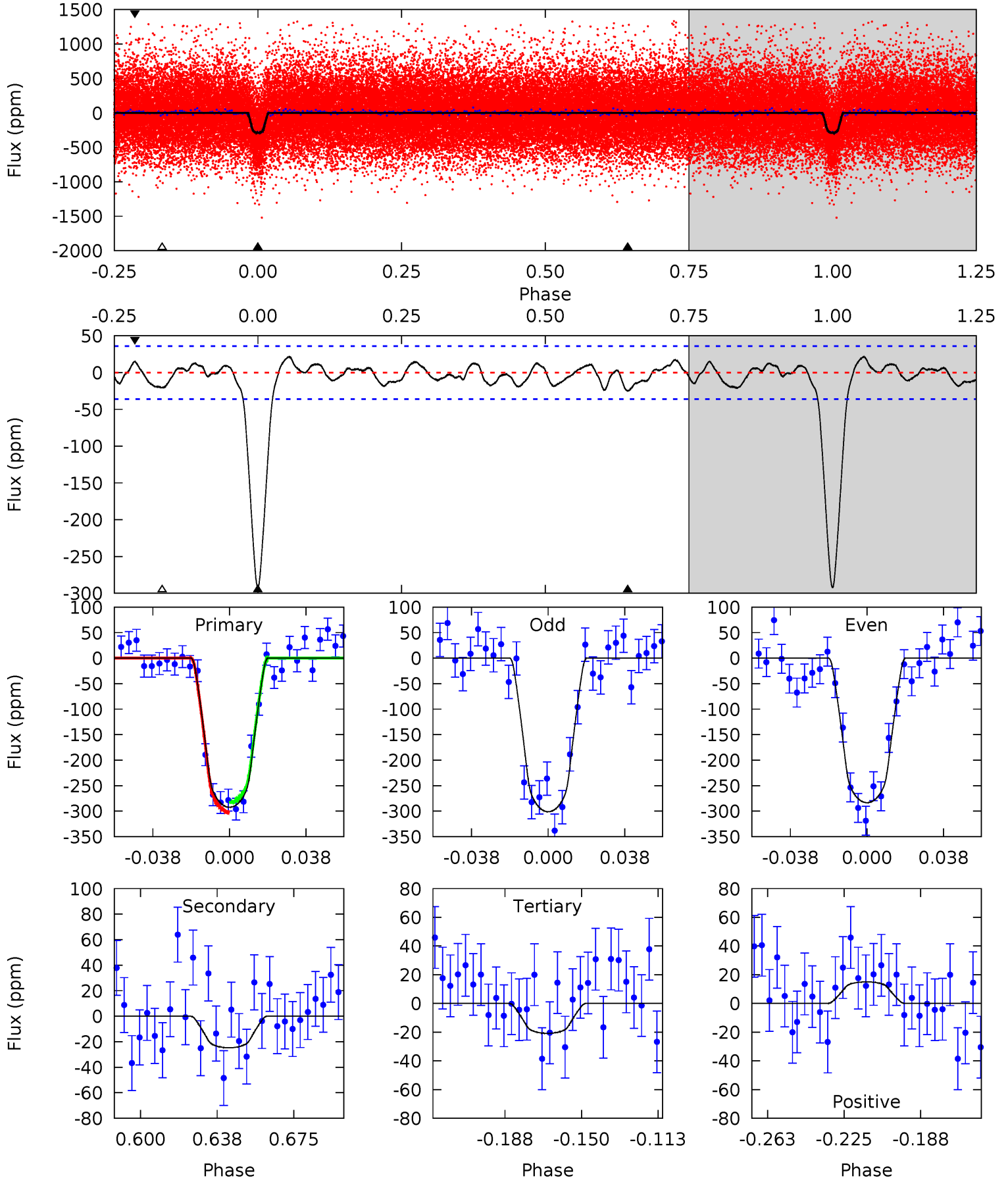
TCE 008222813-02 P= 2.466960 Days $T_0=132.906817$ (BKJD)



DV Model-Shift Uniqueness Test

008222813-02, P = 2.466973 Days, E = 132.902738 Days

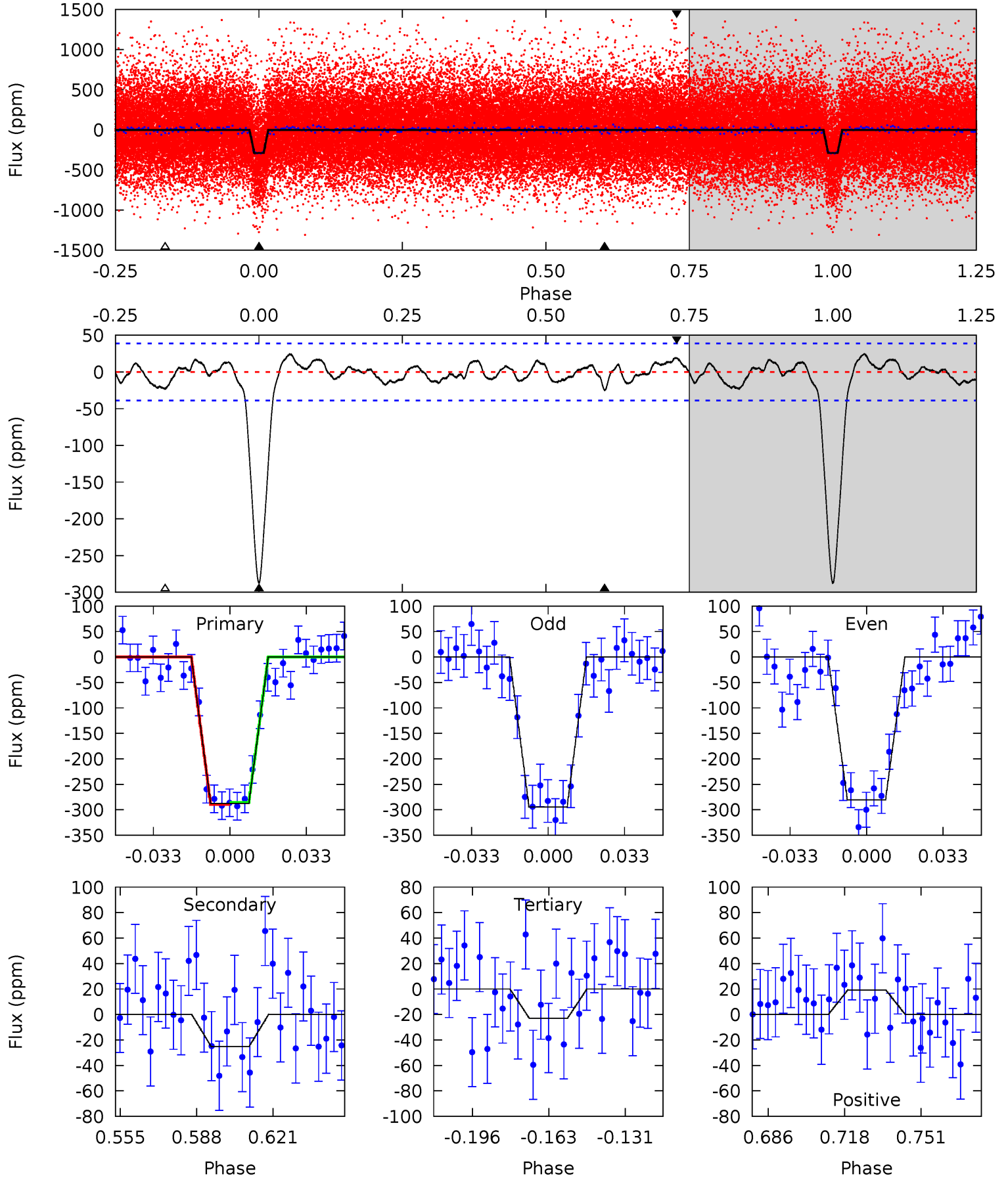
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.8	3.28	2.77	2.00	4.77	2.08	1.32	36.0	36.8	0.51	1.28	1.18	0.96	0.07	1.23



Alt Model-Shift Uniqueness Test

008222813-02, P = 2.466960 Days, E = 132.906817 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.4	3.08	2.83	2.36	4.79	2.14	1.26	32.6	33.1	0.25	0.72	0.85	0.98	0.08	0.25



Stellar Parameters For KIC 008222813

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5074^{+83}_{-76}	$4.474^{+0.084}_{-0.030}$	$0.160^{+0.150}_{-0.150}$	$0.863^{+0.039}_{-0.072}$	$0.809^{+0.060}_{-0.026}$	$1.775^{+0.565}_{-0.199}$
	+2%/-1%	+2%/-1%	+94%/-94%	+5%/-8%	+7%/-3%	+32%/-11%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 008222813-02 / KOI 1069.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-25 ± 8	$1.76^{+0.61}_{-0.63}$	1583^{+36}_{-41}	3128^{+511}_{-308}	$4.826^{+7.567}_{-2.407}$
Alt.	-25 ± 8	$1.57^{+0.68}_{-0.60}$	1584^{+36}_{-43}	3242^{+612}_{-387}	$6.010^{+11.252}_{-3.390}$

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

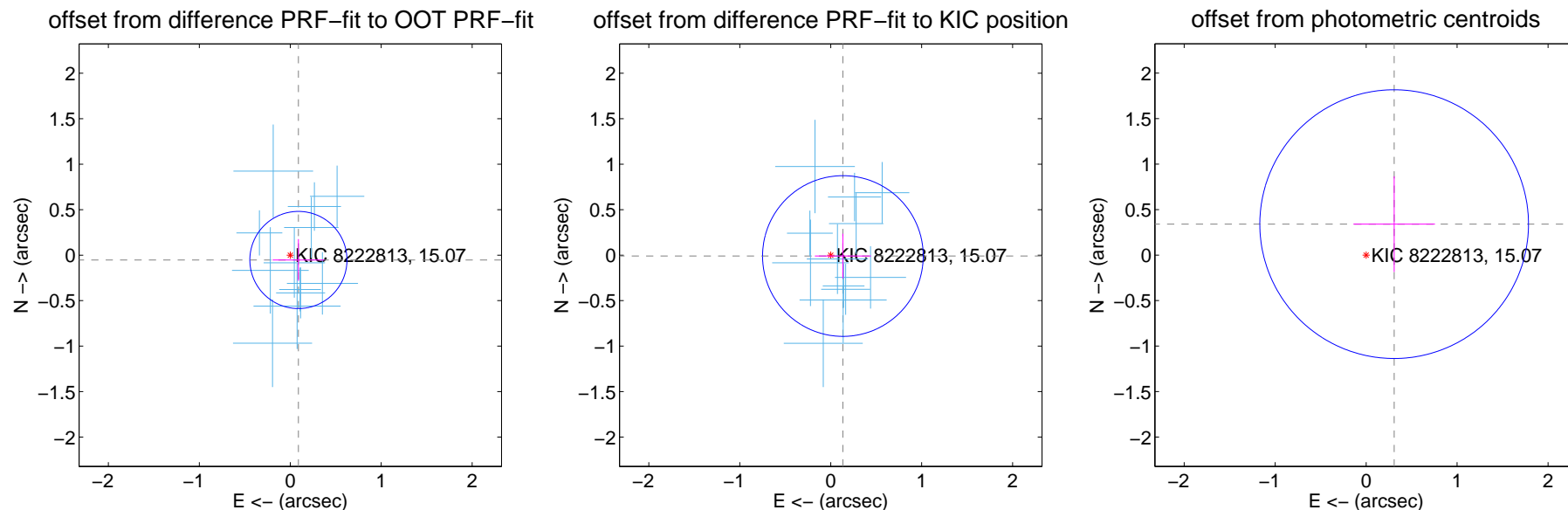
DV Centroid Data

Supplemental centroid analysis for 008222813-02. Kepler magnitude: 15.07. Transit SNR 27.70

There are 13 quarters with good PRF difference image offsets

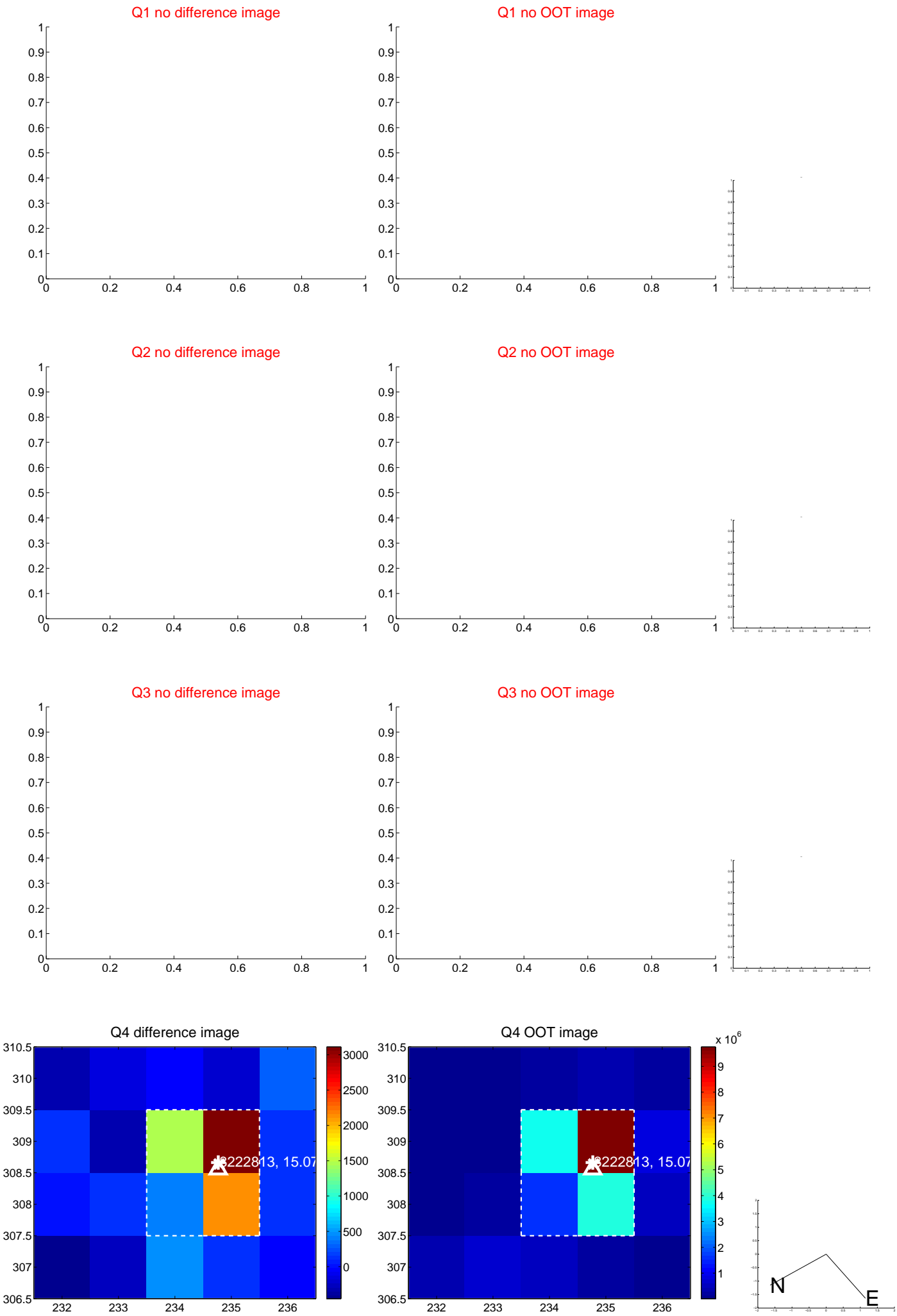
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.104 ± 0.178	0.58	-0.090 ± 0.283	-0.053 ± 0.229
PRF-fit source offset from KIC position	0.134 ± 0.294	0.46	-0.134 ± 0.308	-0.010 ± 0.245
photometric centroid source offset	0.46 ± 0.49	0.93	-0.31 ± 0.45	0.34 ± 0.53

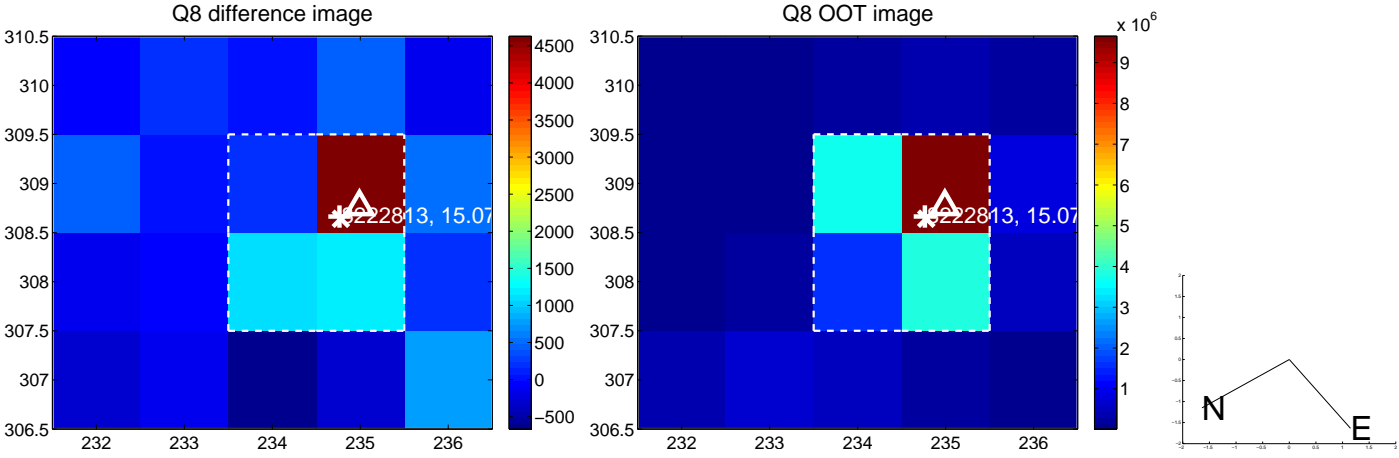
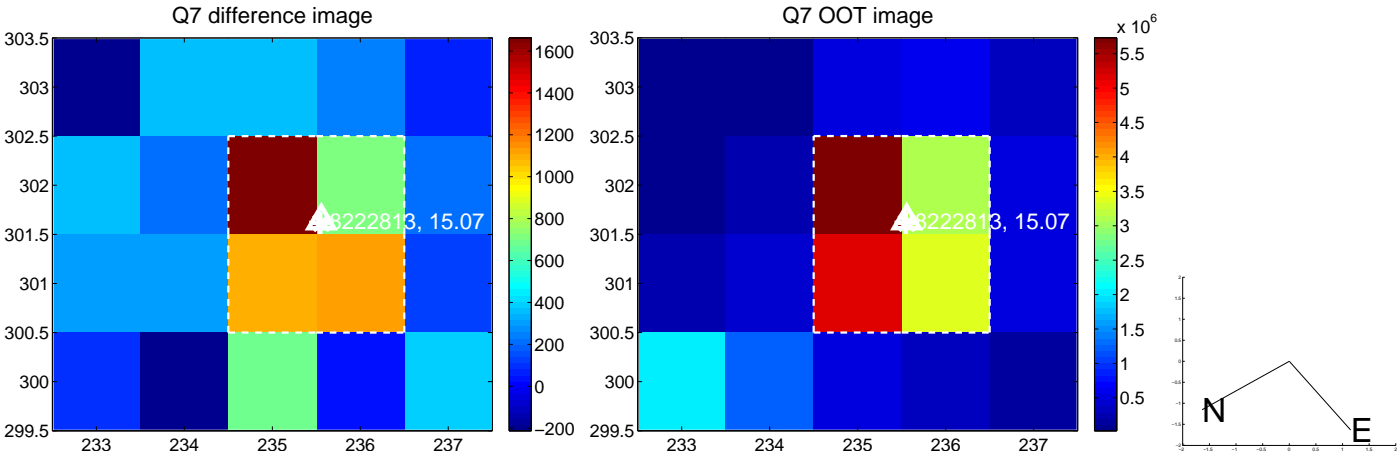
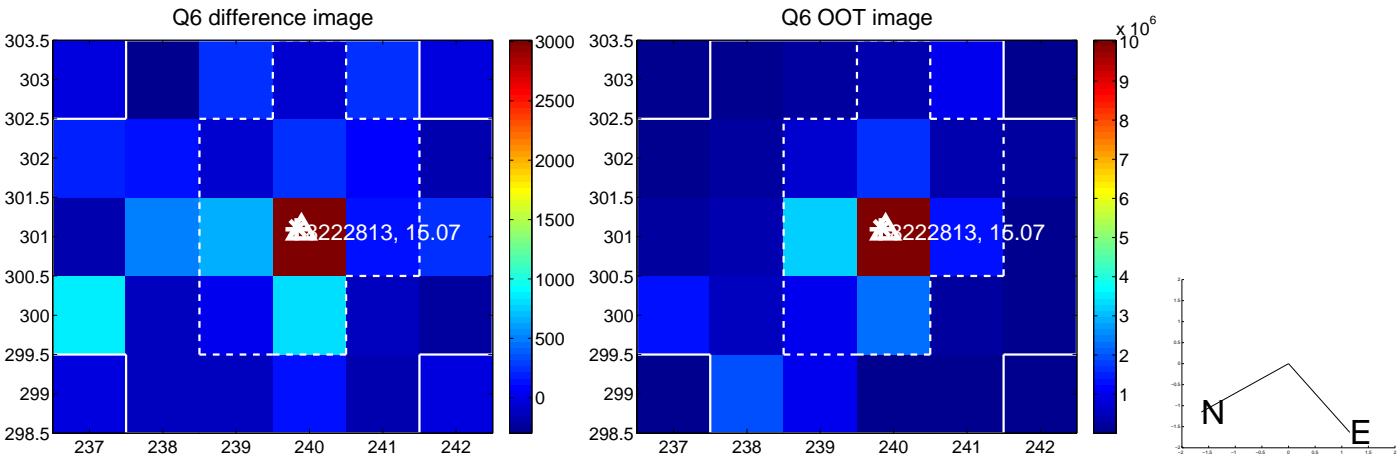
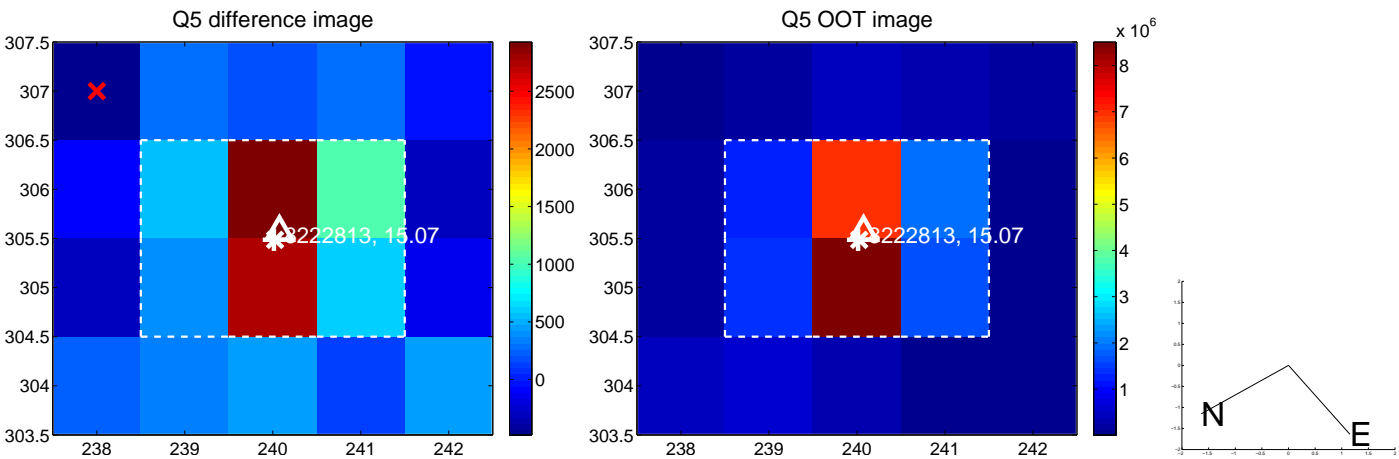


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

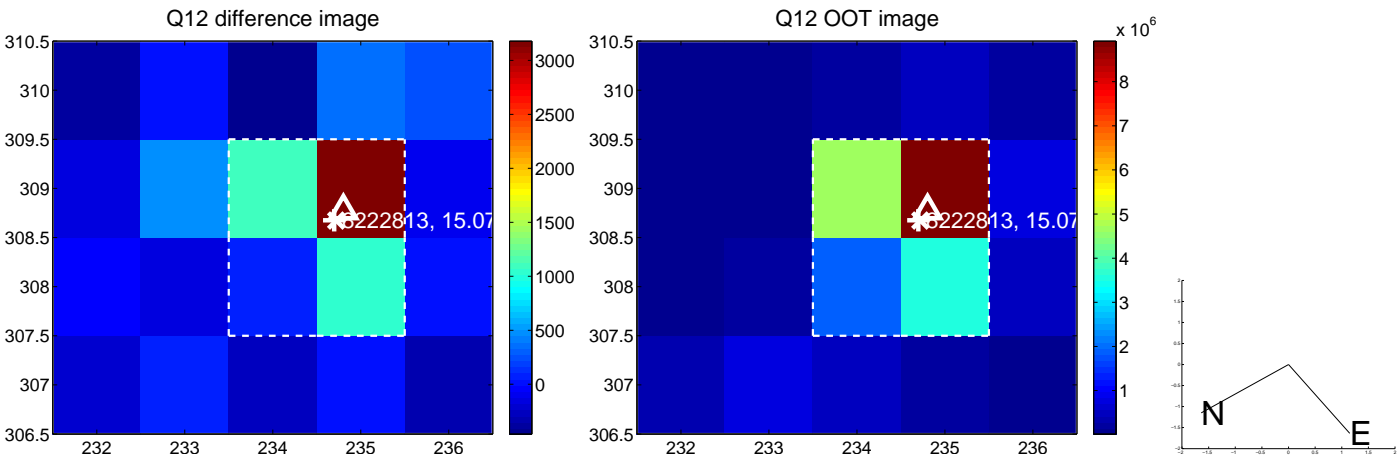
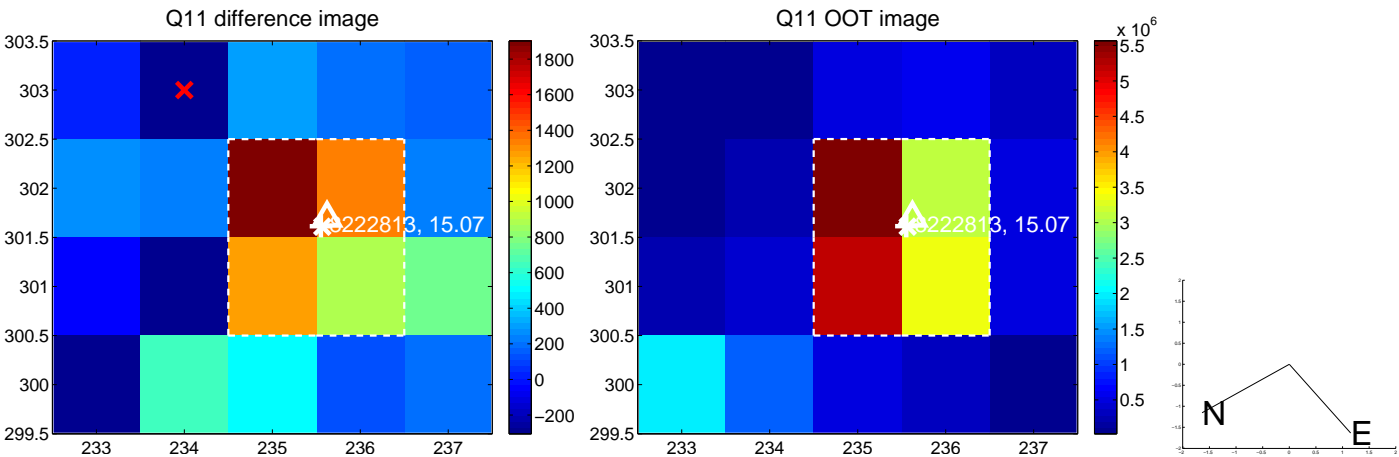
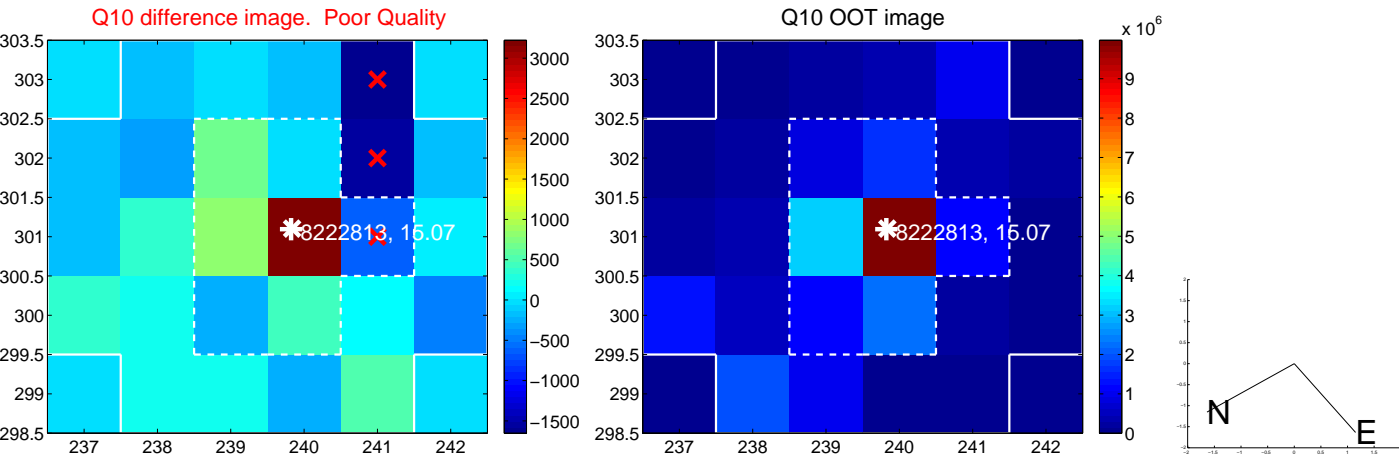
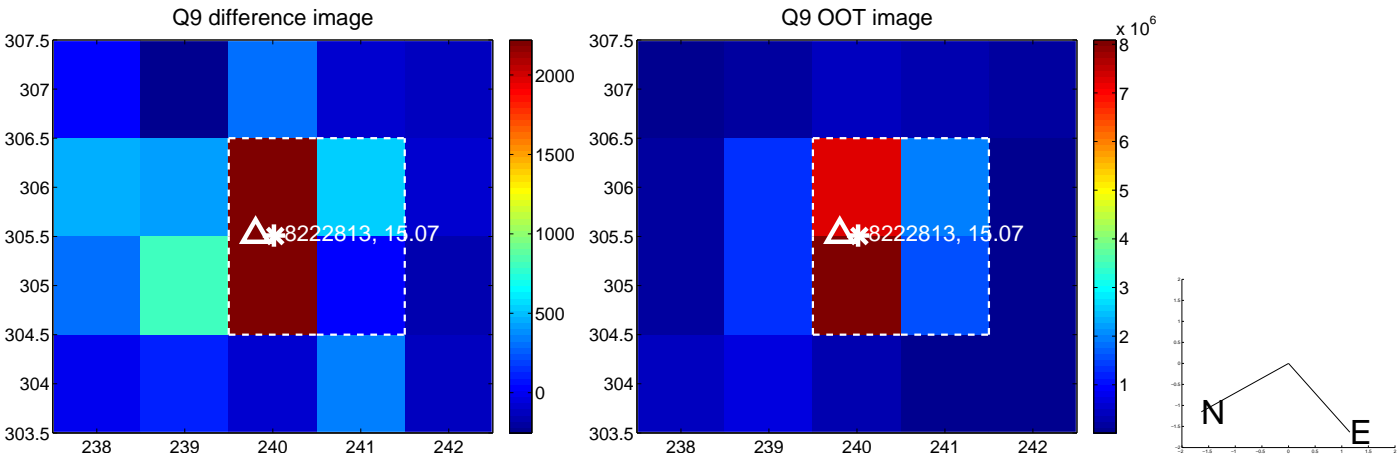
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



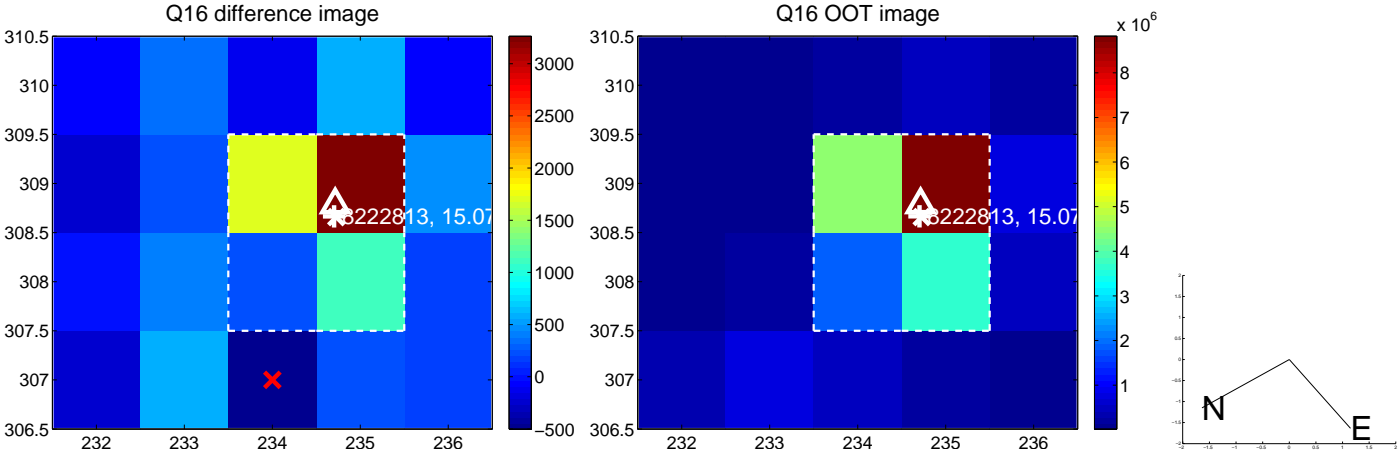
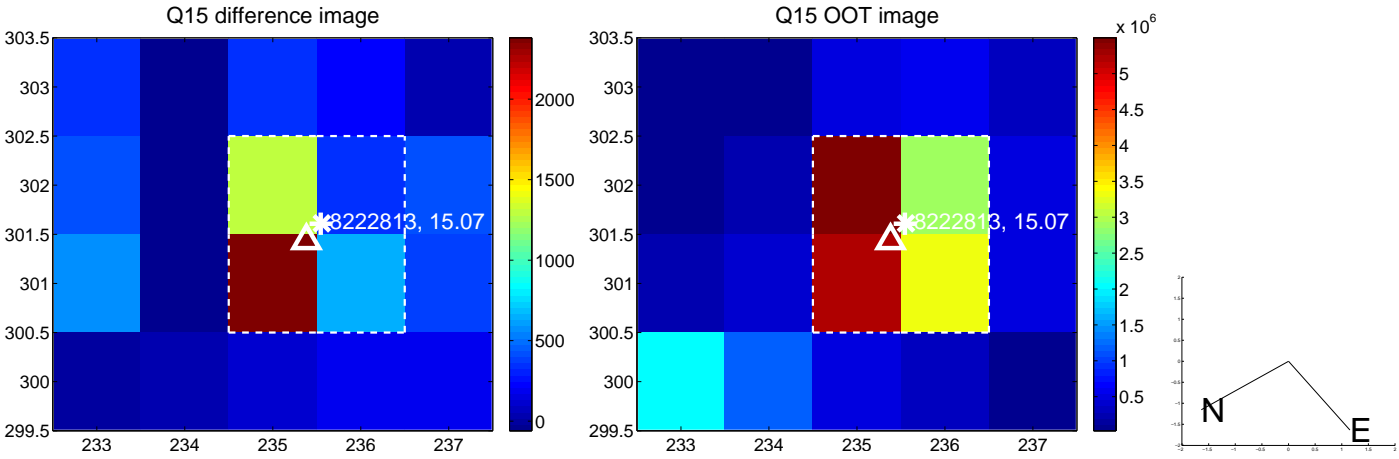
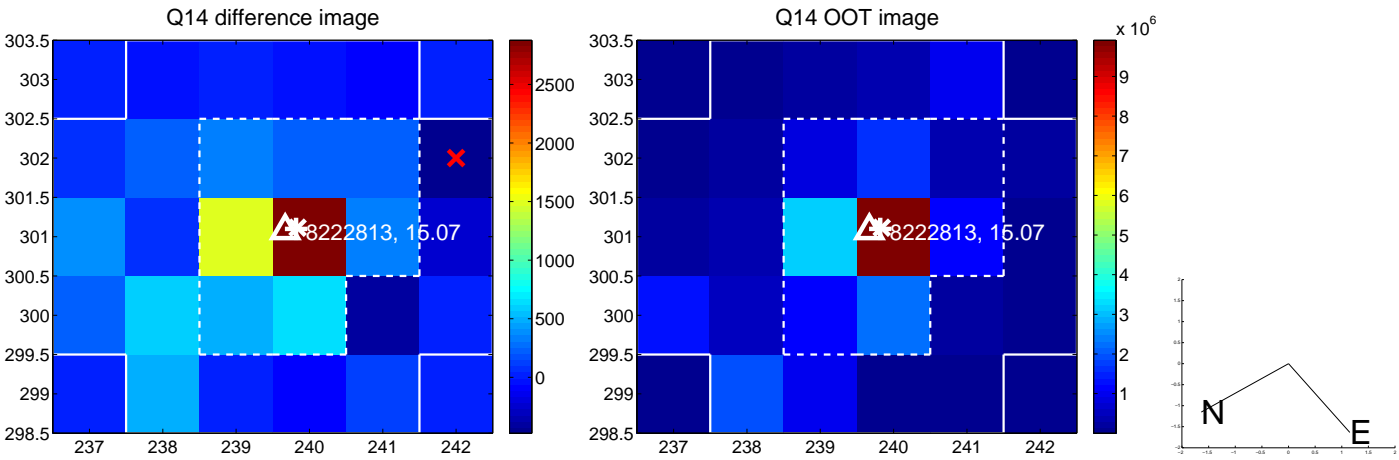
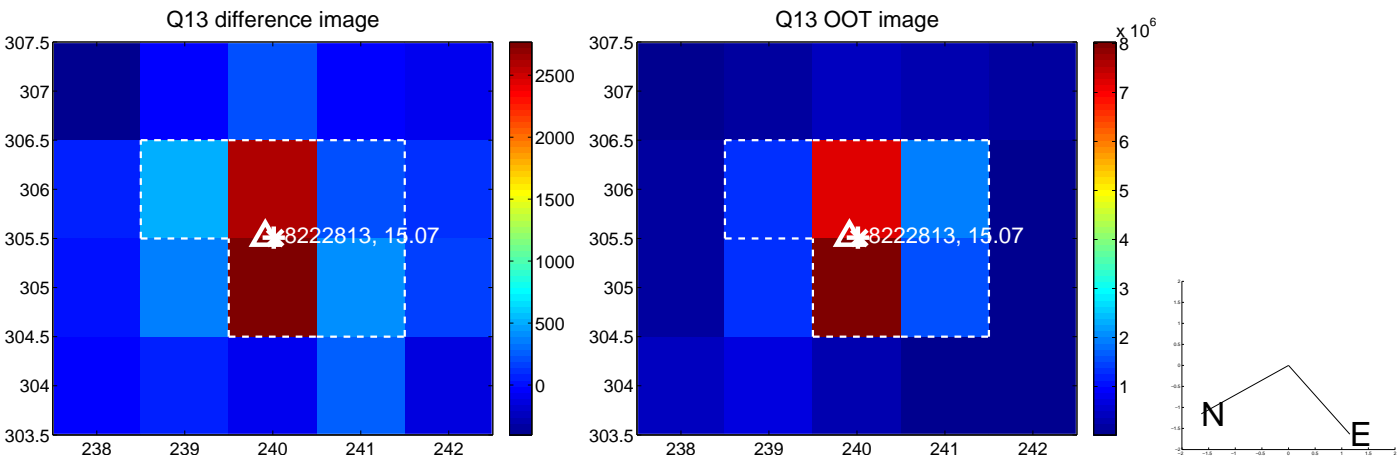
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



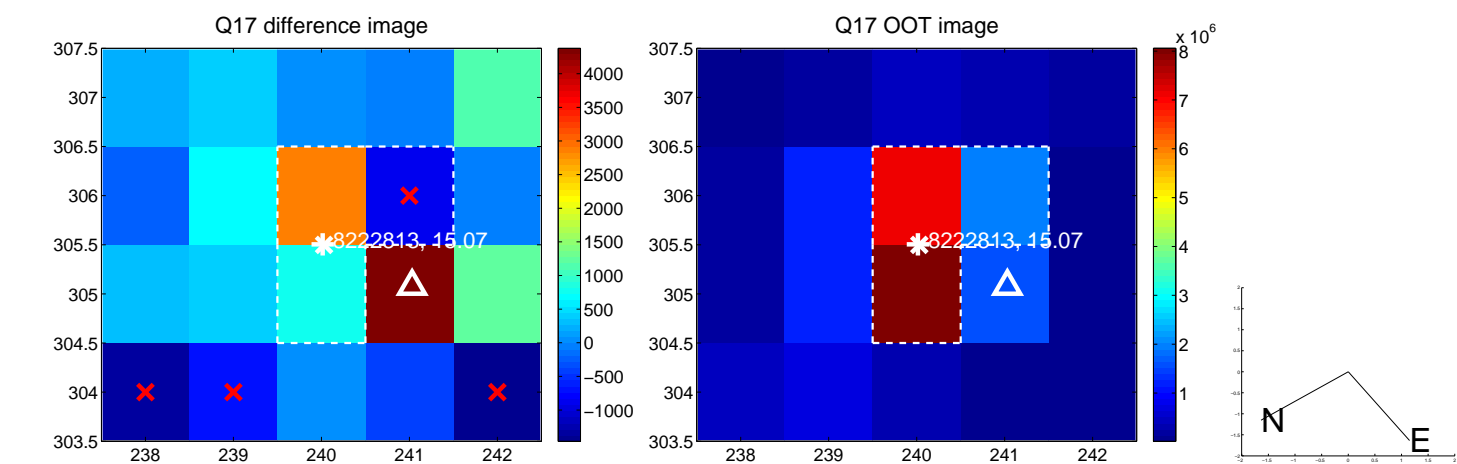
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



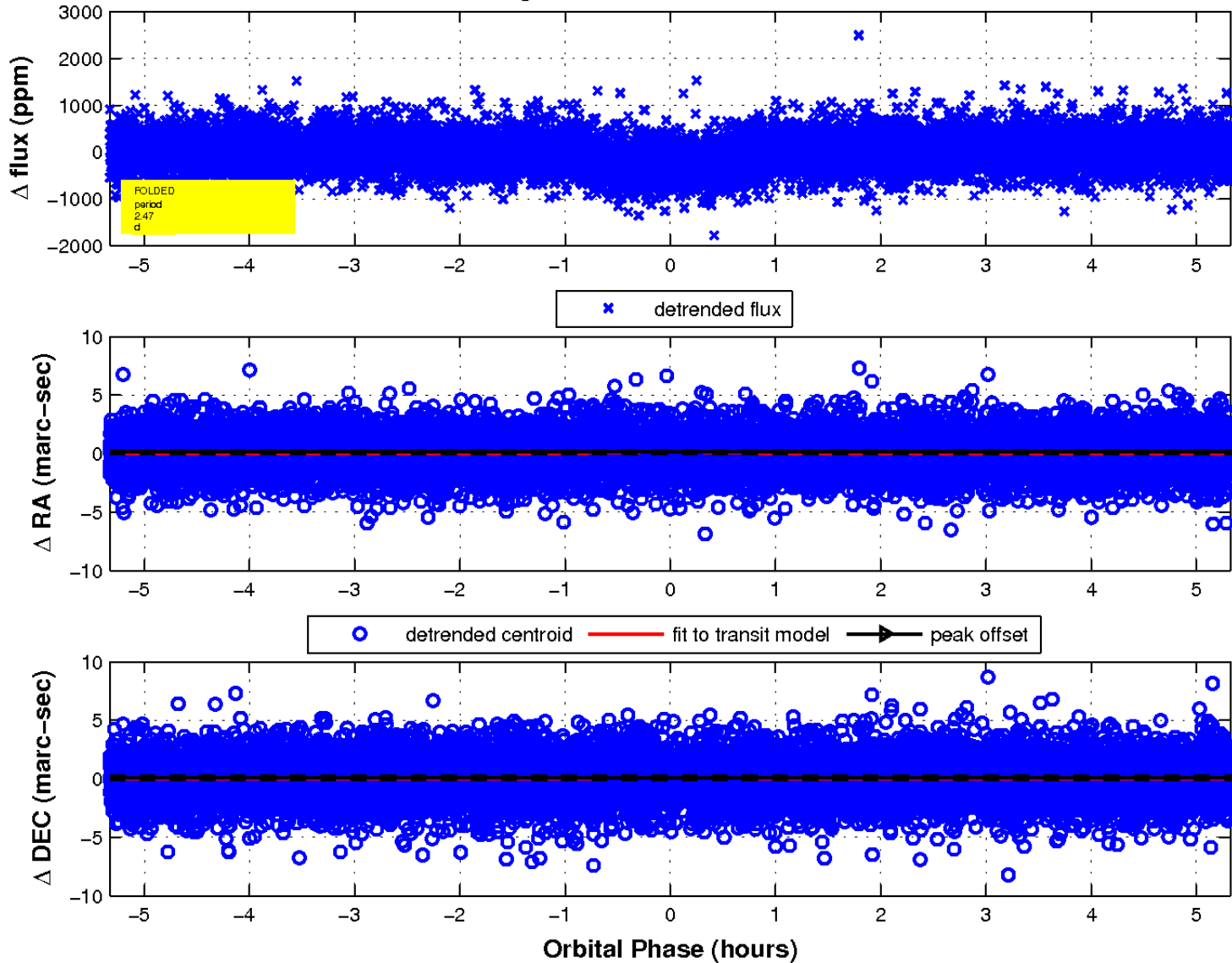
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

