

KIC 002438502

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})
002438502-01	OBS	1003.01	8.360612	138.822956	28063.0	7.485	556.0	501.9	2.44	5463	40.27	602.31
002438502-02	OBS	No	8.360561	135.226842	1362.9	7.244	27.5	29.7	2.44	5463	10.18	602.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002438502-01	OBS	FP	0.05	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_KIC_POS
002438502-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

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 002438502-01

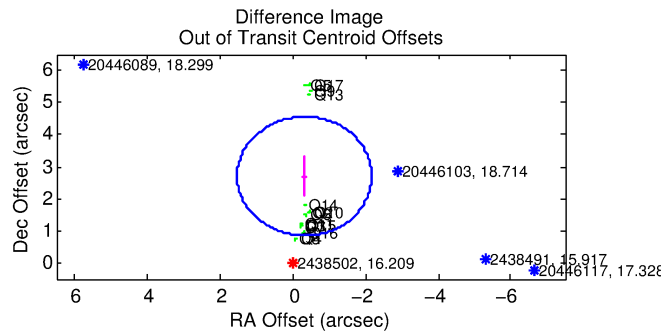
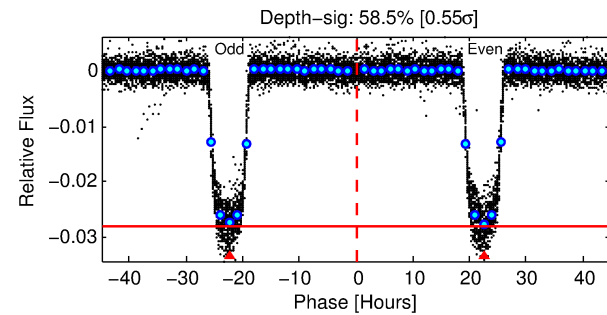
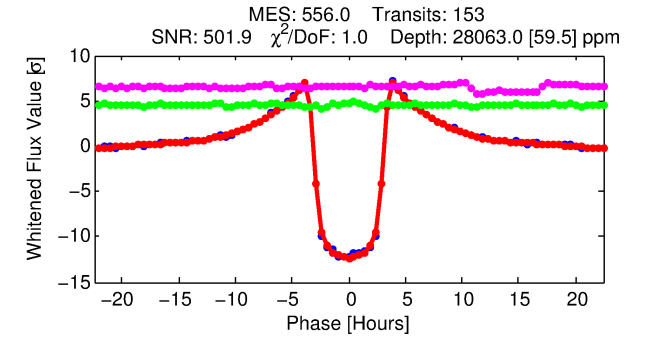
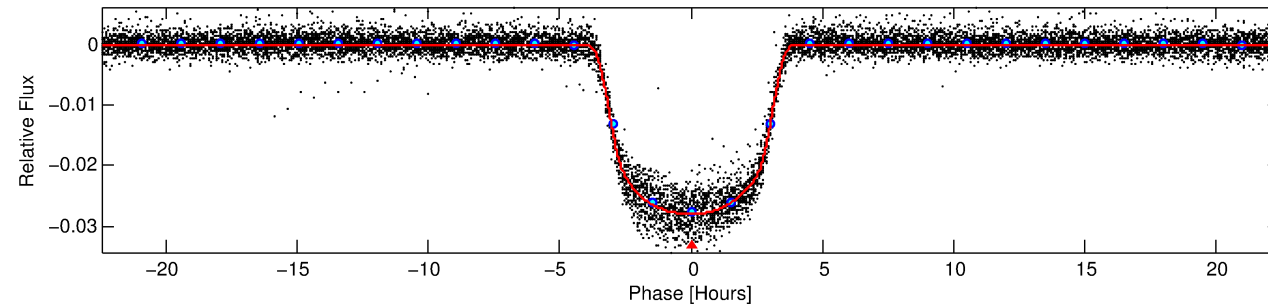
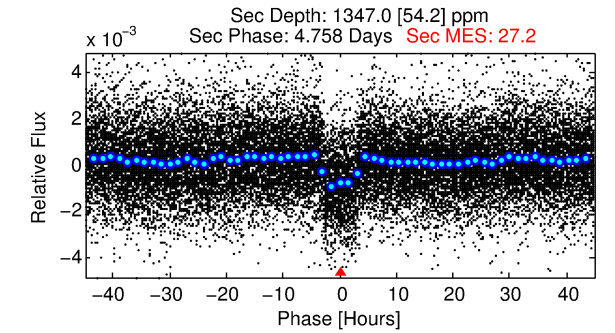
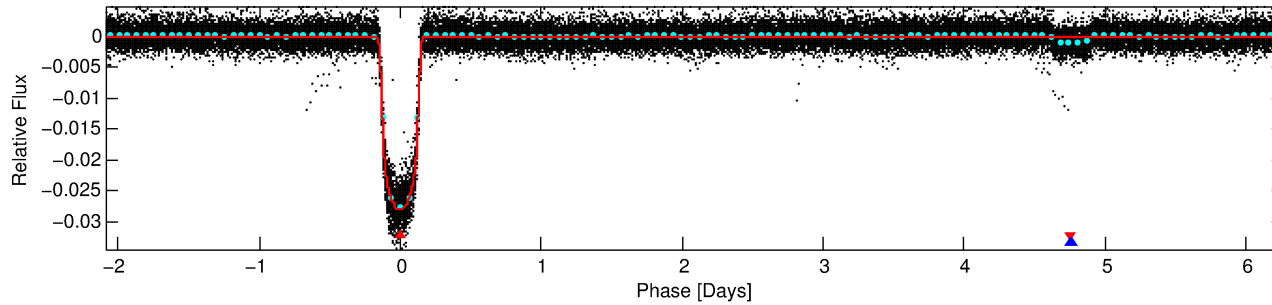
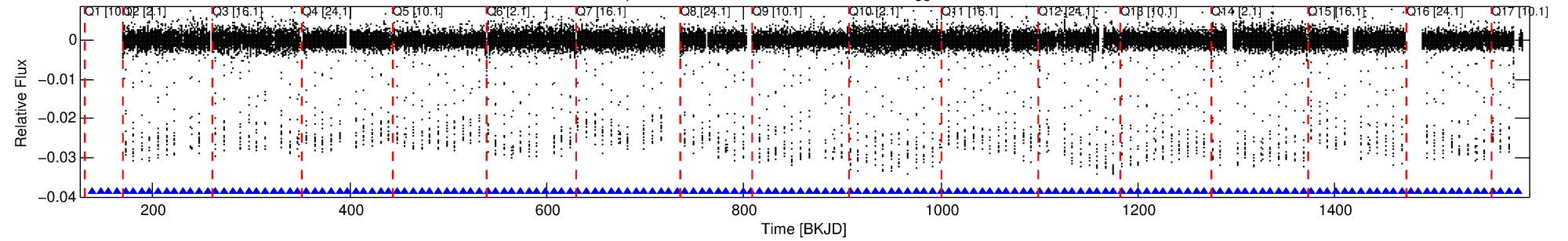
No Significant Match Found

DV One-Page Summary

KIC: 2438502 Candidate: 1 of 2 Period: 8.361 d

KOI: K01003.01 Corr: 0.934

Kp: 16.21 R*: 2.44 Rs Teff: 5463.0 K Logg: 3.79 Fe/H: 0.340



DV Fit Results:

Period = 8.36061 [0.00000] d
Epoch = 138.8230 [0.0002] BKJD
Rp/R* = 0.1510 [0.0004]
a/R* = 9.71 [0.08]
b = 0.19 [0.04]
Seff = 602.31 [262.62]
Teq = 1263 [138] K
Rp = 40.27 [13.85] Re
a = 0.0890 [0.0261] AU
Ag = 3.62 [1.57] [1.67σ]
Teffp = 2694 [51] K [9.75σ]

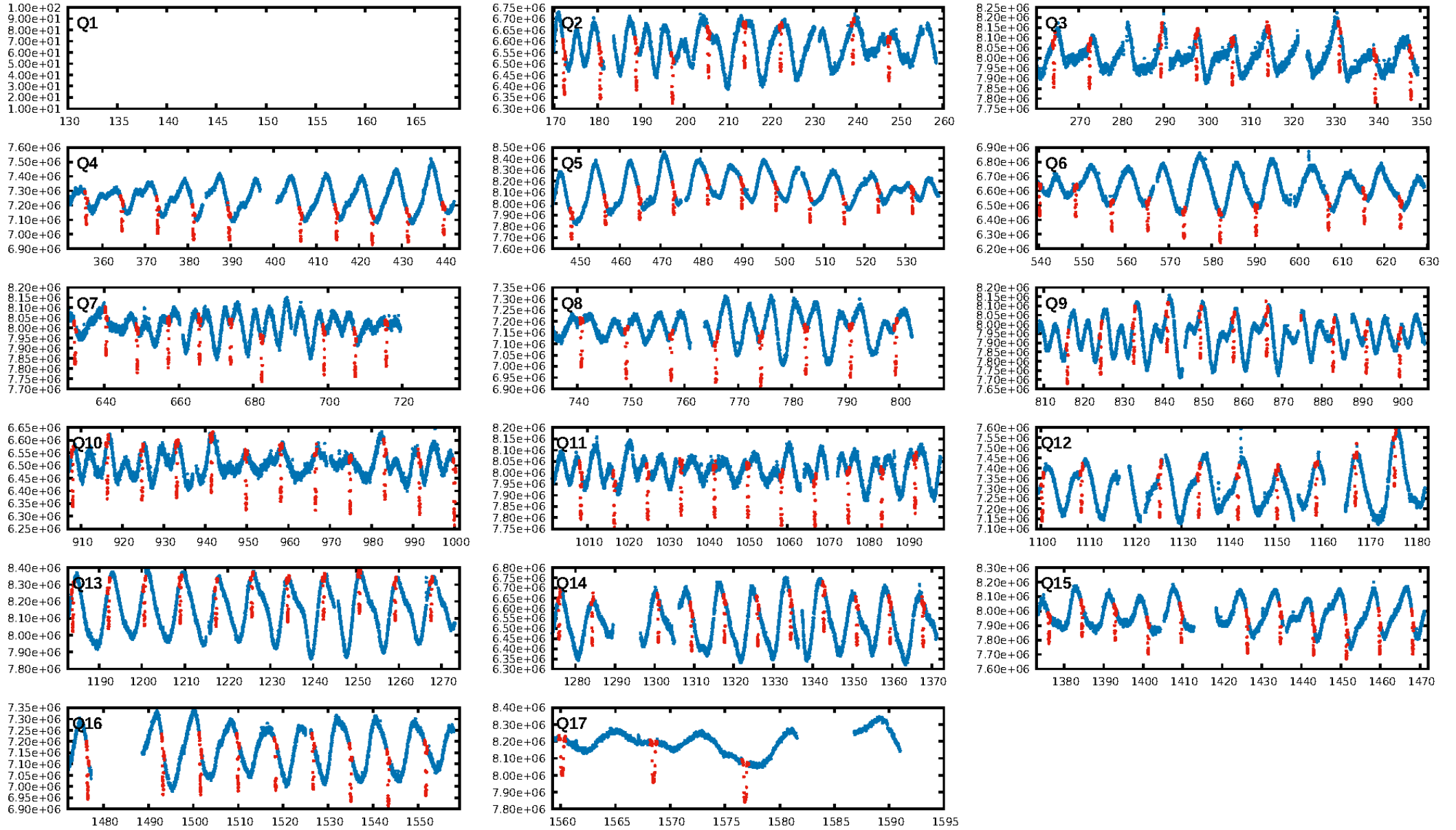
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [150/150]
GhostDiagnostic-chr: 2.087
Centroid-sig: 0.0%
Centroid-so: 1.724 arcsec [140.27σ]
OotOffset-rm: 2.721 arcsec [4.41σ]
KicOffset-rm: 0.232 arcsec [3.02σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 1.00 [16/16]

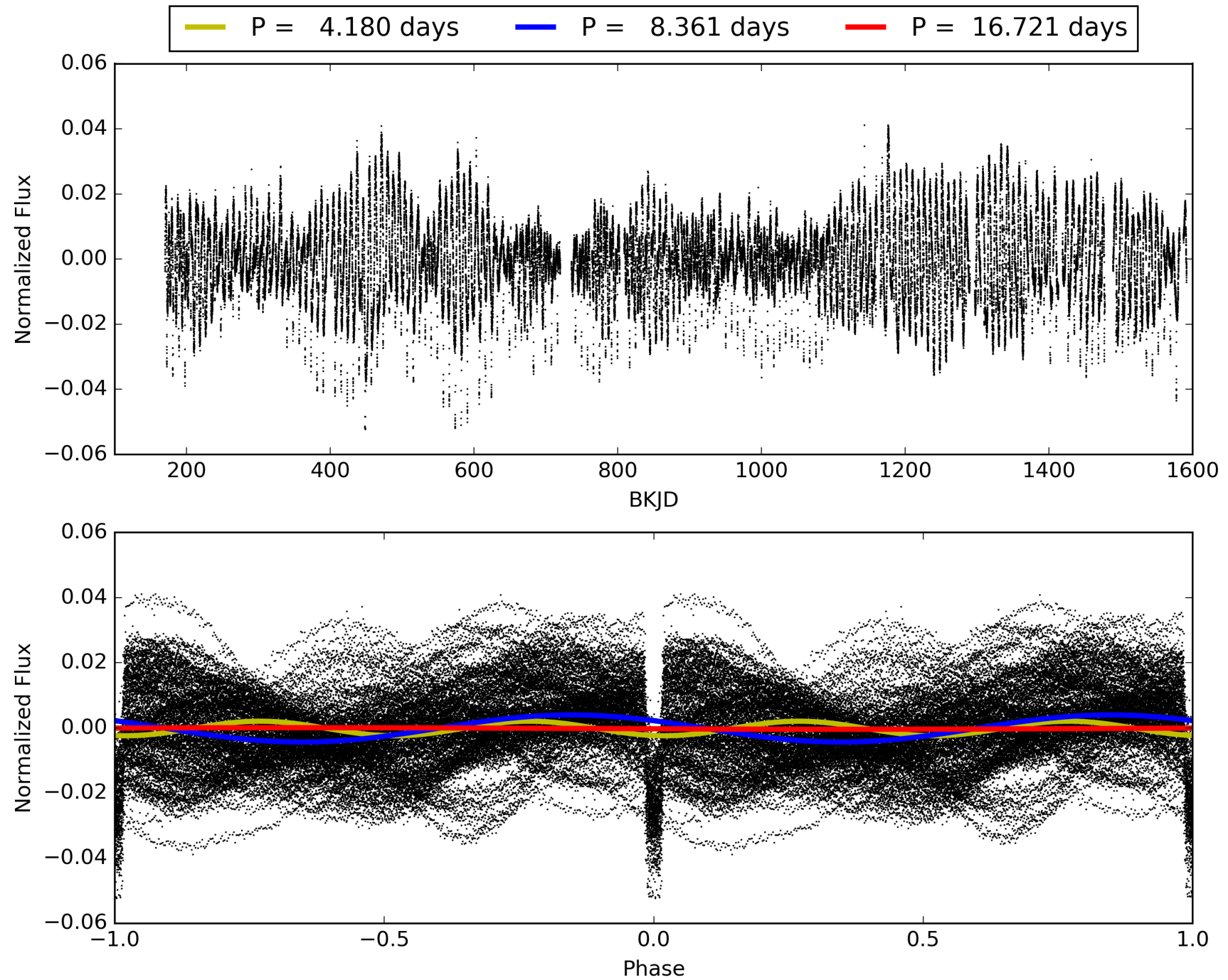
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:55:23 Z

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

TCE 002438502-01, PDC Light Curves

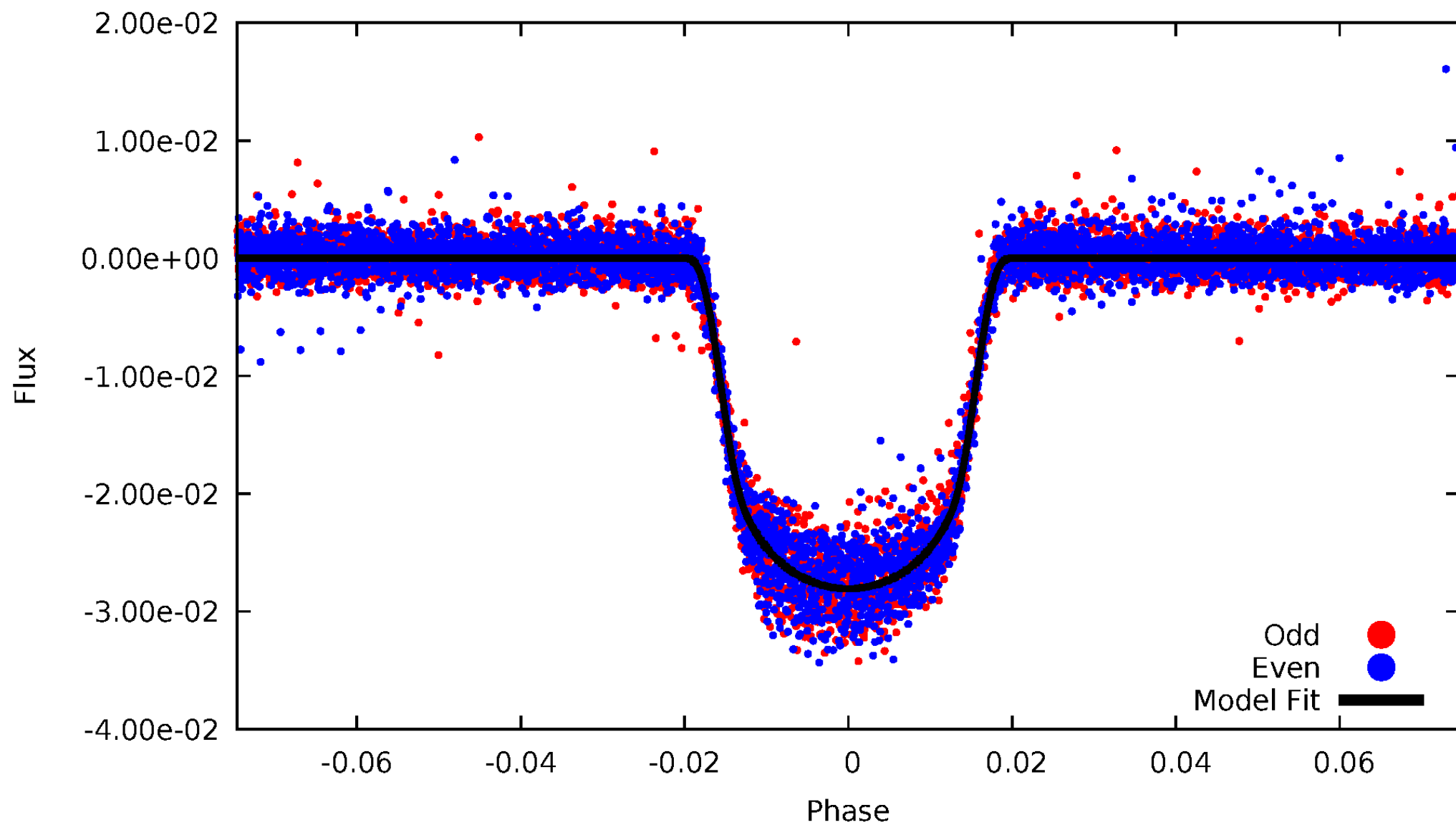


TCE 002438502-01



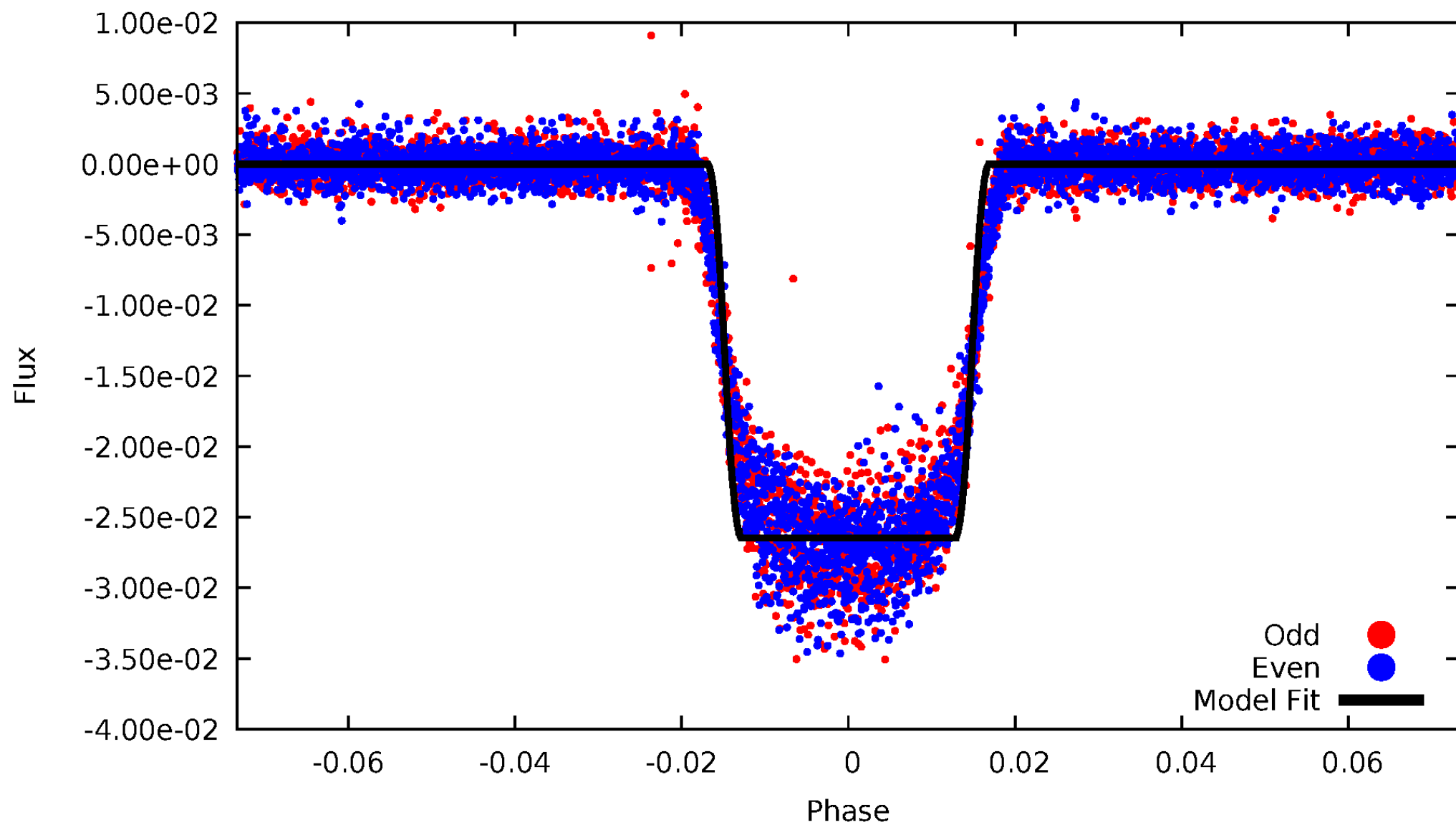
DV Odd/Even

TCE 002438502-01



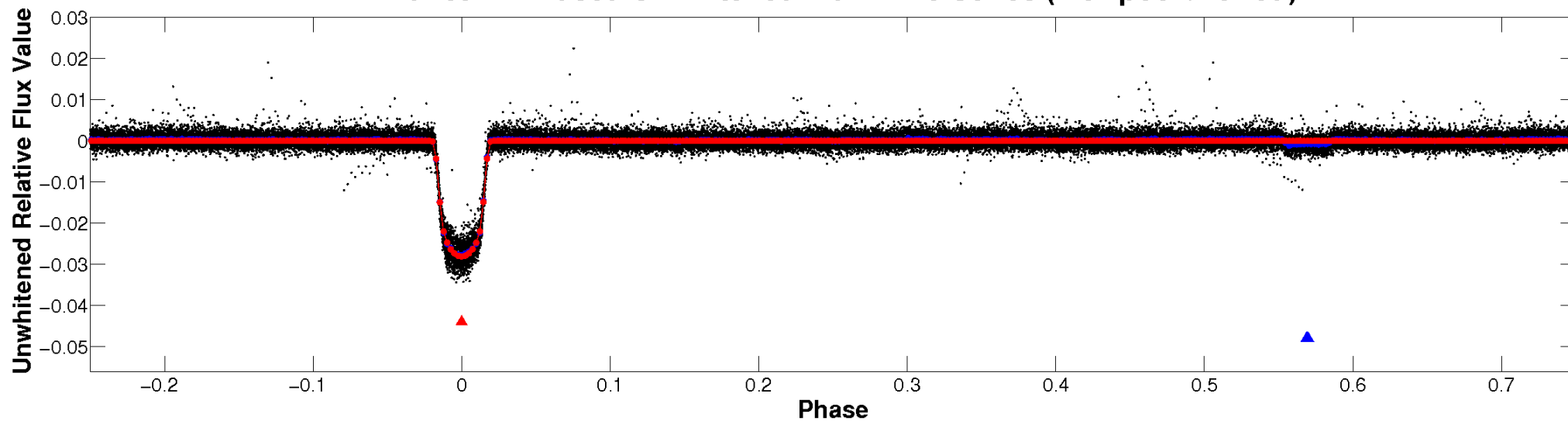
ALT Odd/Even

TCE 002438502-01

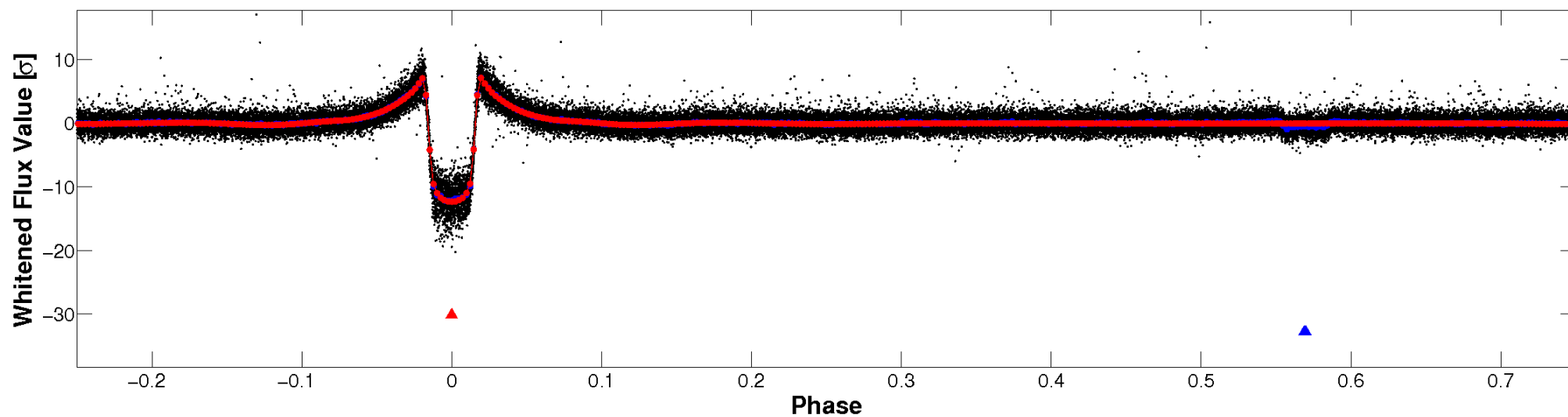


Non-Whitened Vs. Whitened Light Curve

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

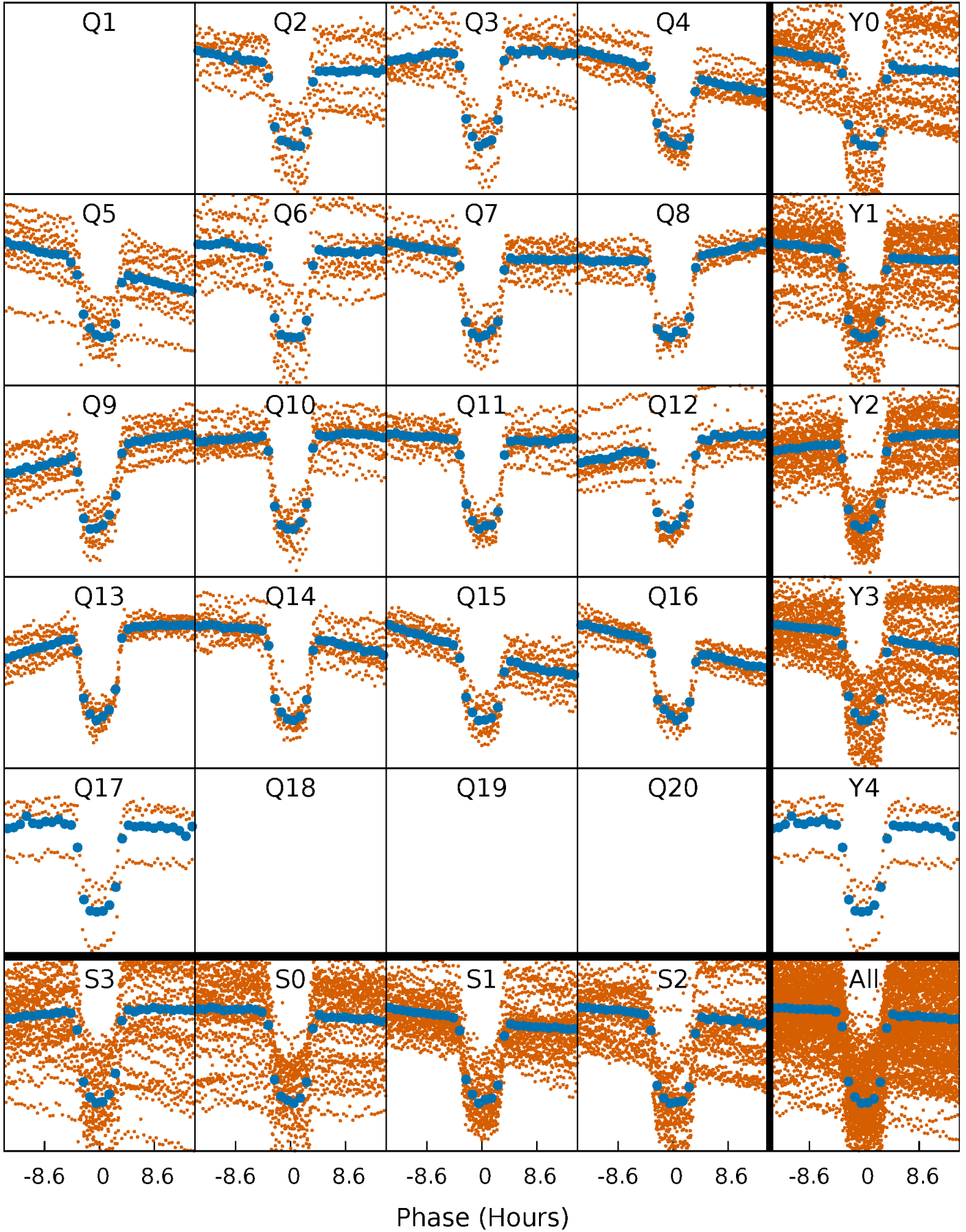


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



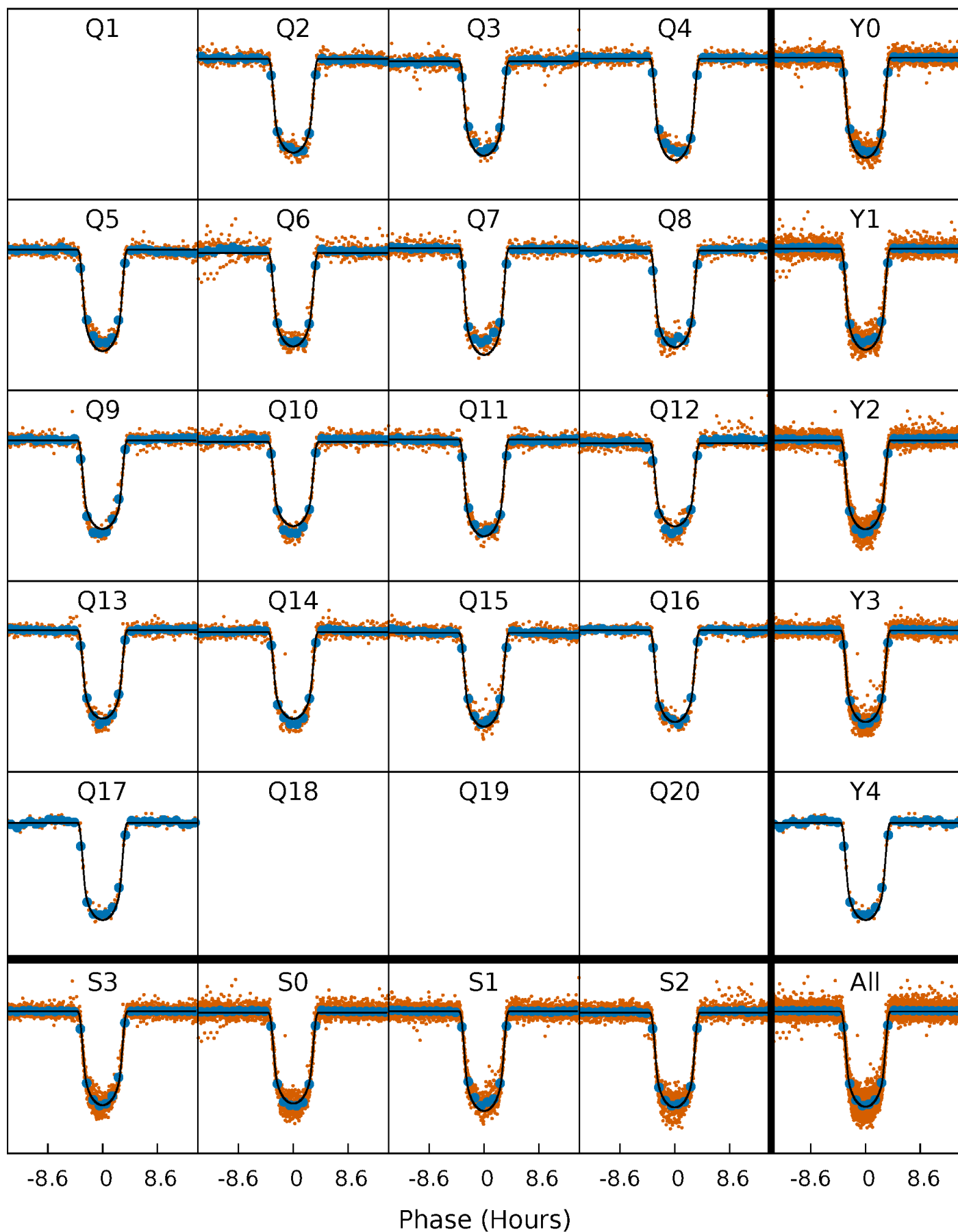
PDC Quarter-Phased Transit Curves

TCE 002438502-01 P= 8.360612 Days $T_0=138.822956$ (BKJD)



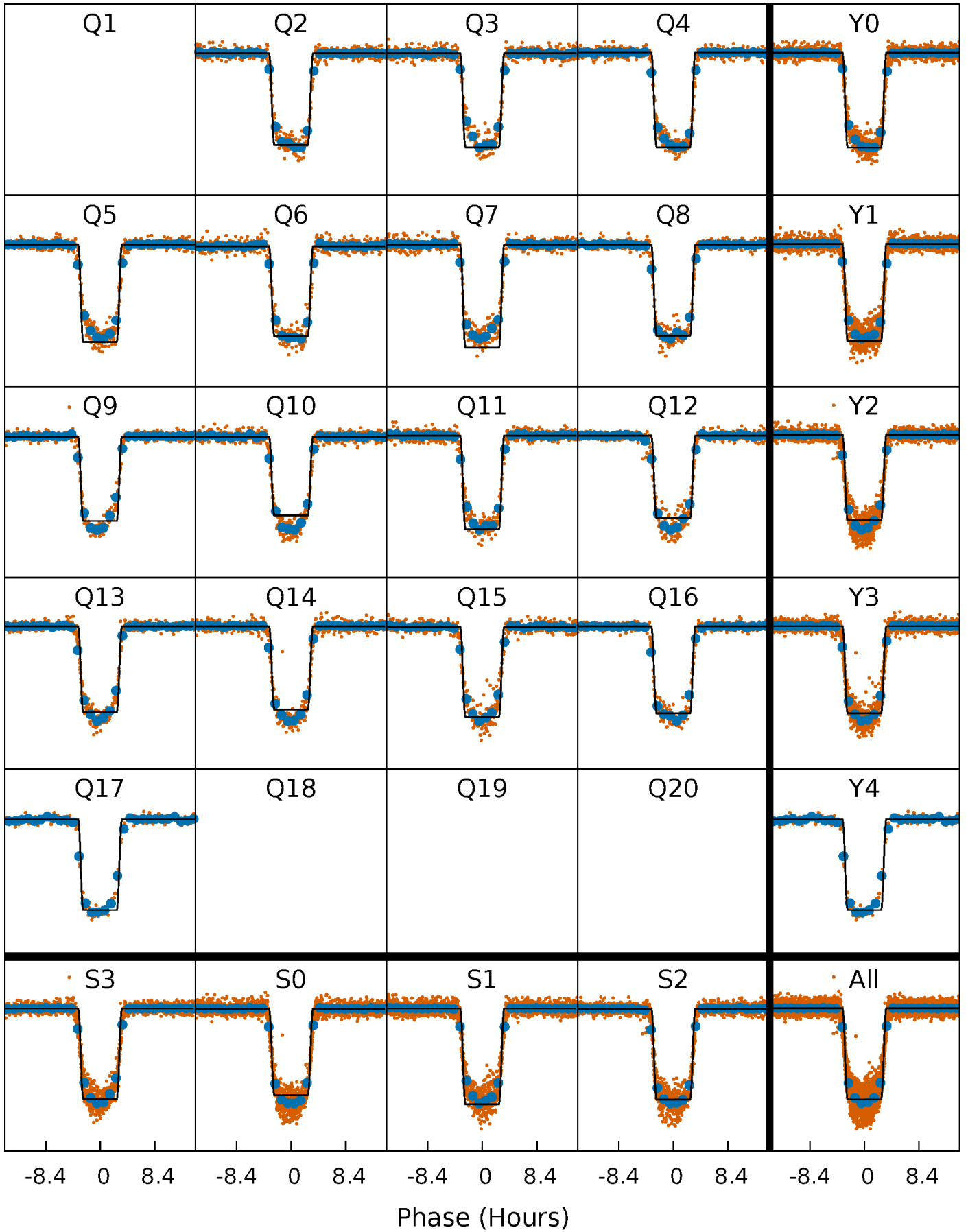
DV Quarter-Phased Transit Curves

TCE 002438502-01 P= 8.360612 Days $T_0=138.822956$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

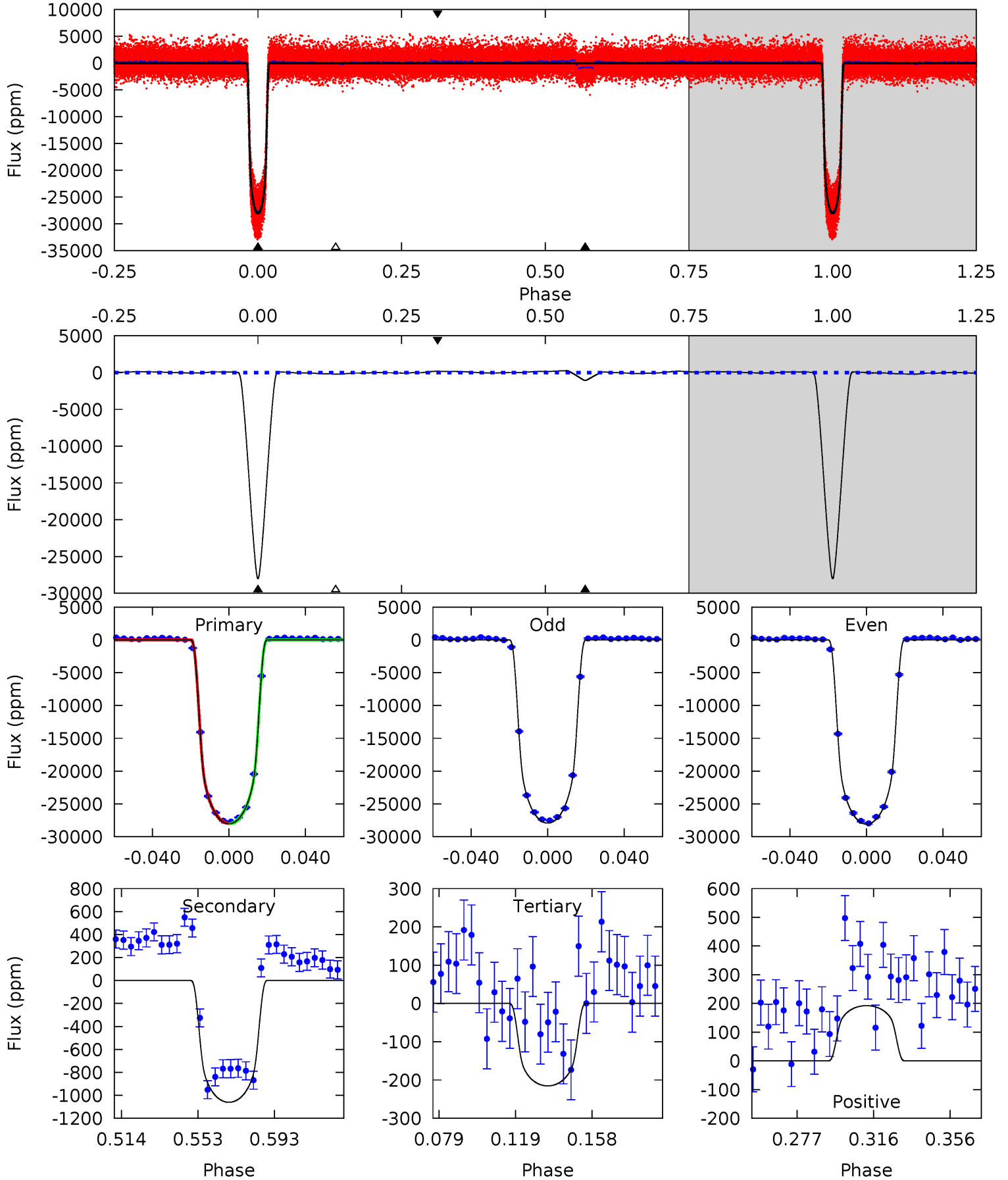
TCE 002438502-01 P= 8.360662 Days $T_0=138.818110$ (BKJD)



DV Model-Shift Uniqueness Test

002438502-01, P = 8.360612 Days, E = 138.822956 Days

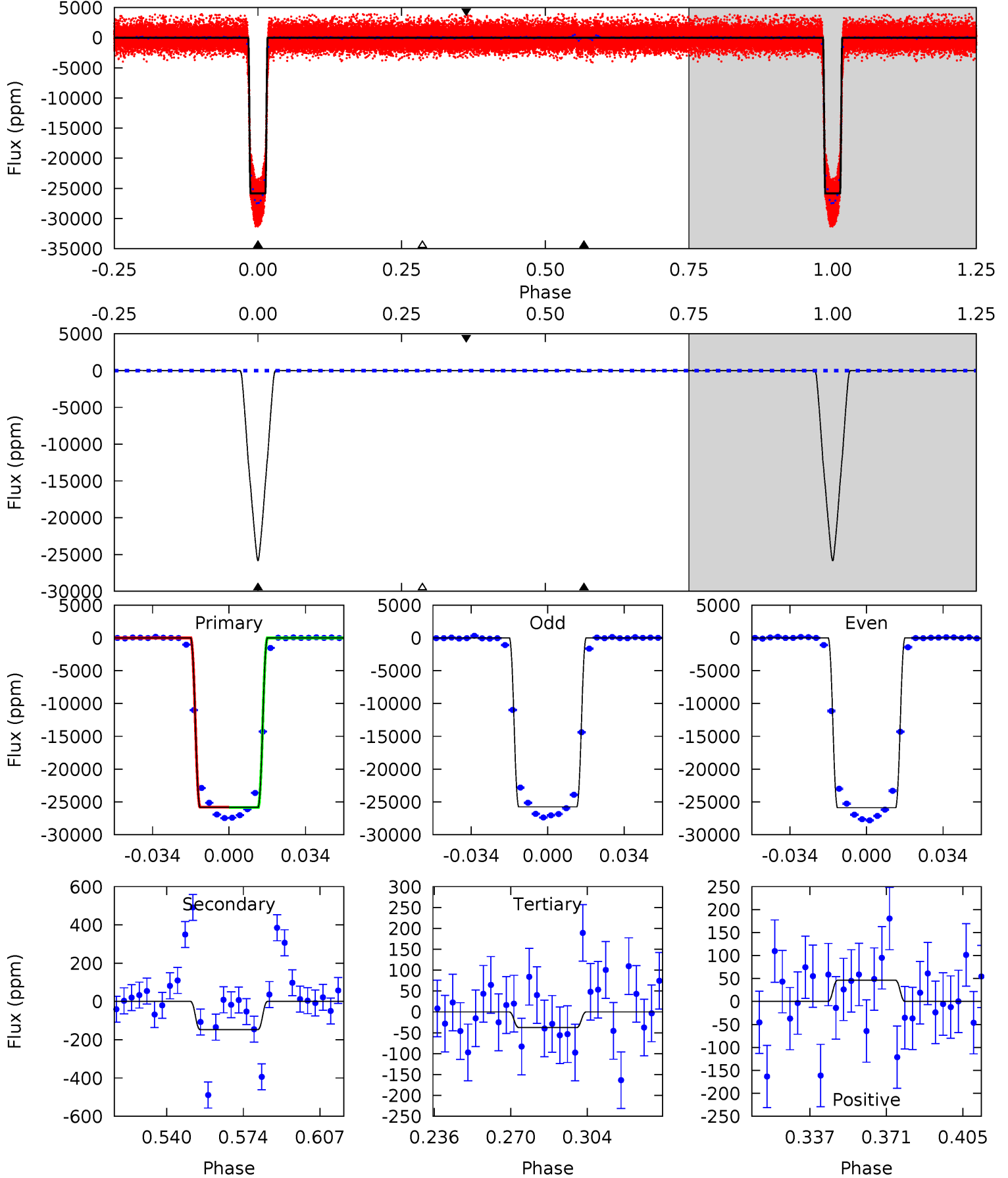
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1074	40.7	8.26	7.37	4.76	2.06	3.80	1066	1067	32.4	33.3	2.85	1.00	0.01	1.04



Alt Model-Shift Uniqueness Test

002438502-01, P = 8.360662 Days, E = 138.818110 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1099	6.25	1.60	1.96	4.79	2.12	0.56	1098	1097	4.64	4.28	3.15	1.00	0.01	0.99



Stellar Parameters For KIC 002438502

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5463^{+87}_{-76}	$3.790^{+0.238}_{-0.085}$	$0.340^{+0.100}_{-0.150}$	$2.445^{+0.420}_{-0.841}$	$1.343^{+0.144}_{-0.268}$	$0.129^{+0.218}_{-0.036}$
	+2%/-1%	+6%/-2%	+29%/-44%	+17%/-34%	+11%/-20%	+169%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002438502-01 / KOI 1003.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1061 ± 26	$39.62^{+3.90}_{-6.68}$	1746^{+83}_{-126}	3098^{+35}_{-33}	$2.972^{+1.069}_{-0.466}$
Alt.	-147 ± 23	$42.53^{+4.25}_{-7.35}$	1747^{+80}_{-136}	1956^{+208}_{-3744}	$0.361^{+0.136}_{-0.081}$

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

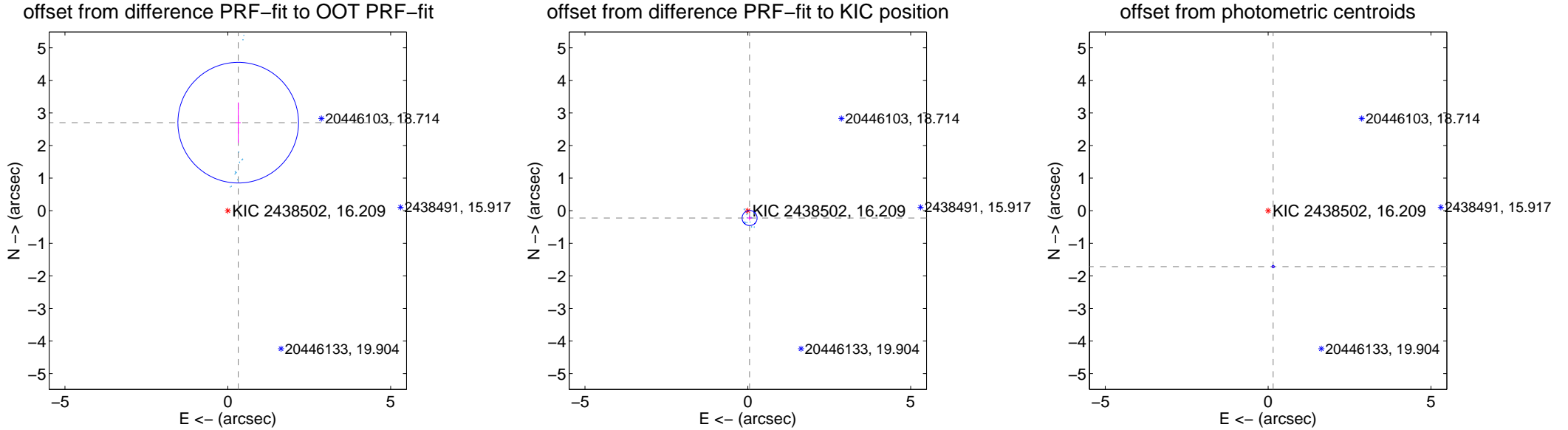
DV Centroid Data

Supplemental centroid analysis for 002438502-01. Kepler magnitude: 16.21. Transit SNR 501.91

There are 15 quarters with good PRF difference image offsets

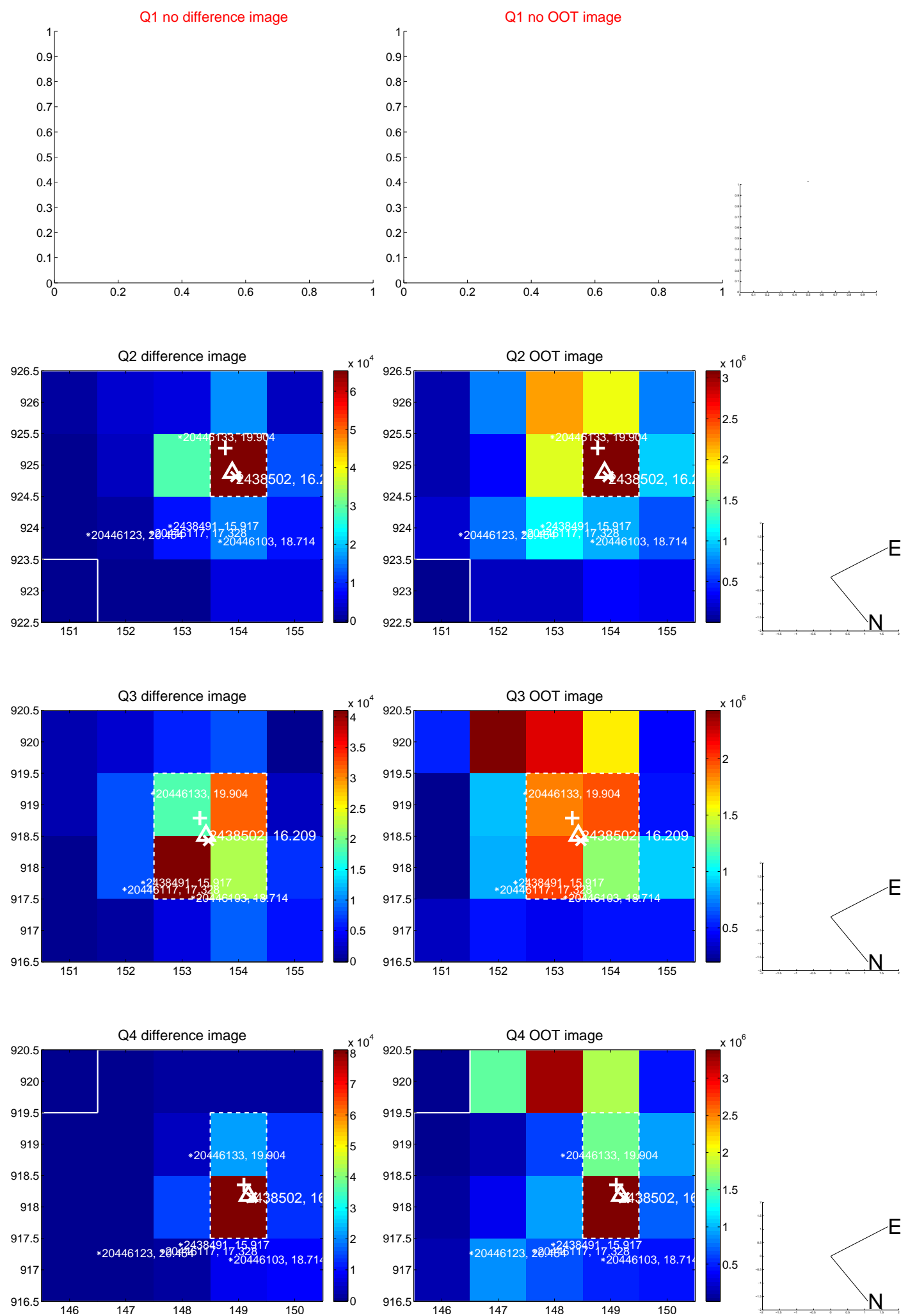
The OOT PRF centroid is offset from the target star catalog position by about 5.53 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.721 ± 0.617	4.41	-0.320 ± 0.076	2.702 ± 0.622
PRF-fit source offset from KIC position	0.232 ± 0.077	3.02	-0.054 ± 0.071	-0.226 ± 0.076
photometric centroid source offset	1.72 ± 0.01	140.27	-0.16 ± 0.01	-1.72 ± 0.01

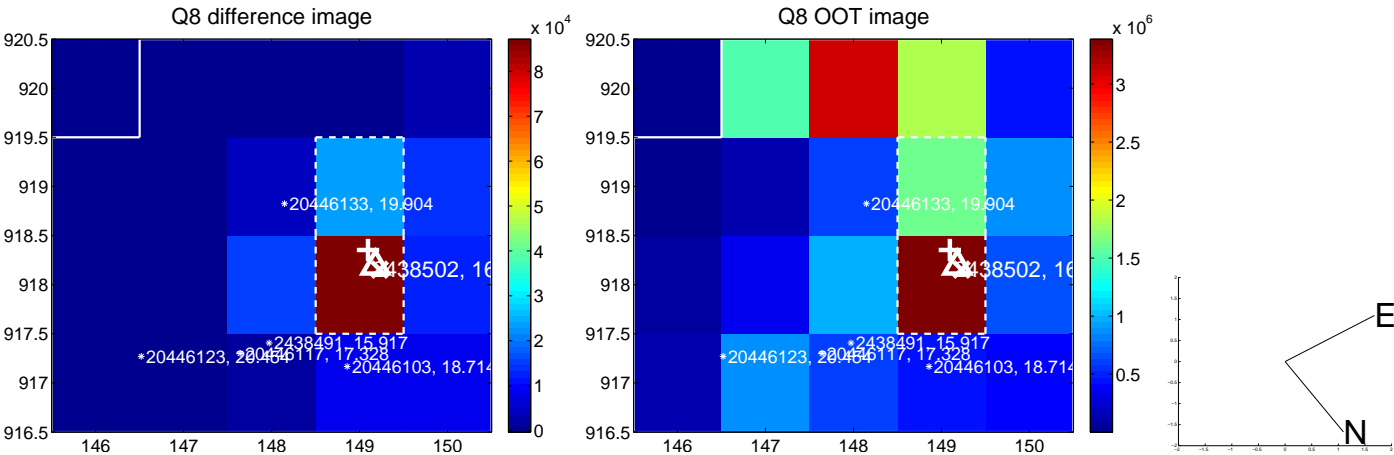
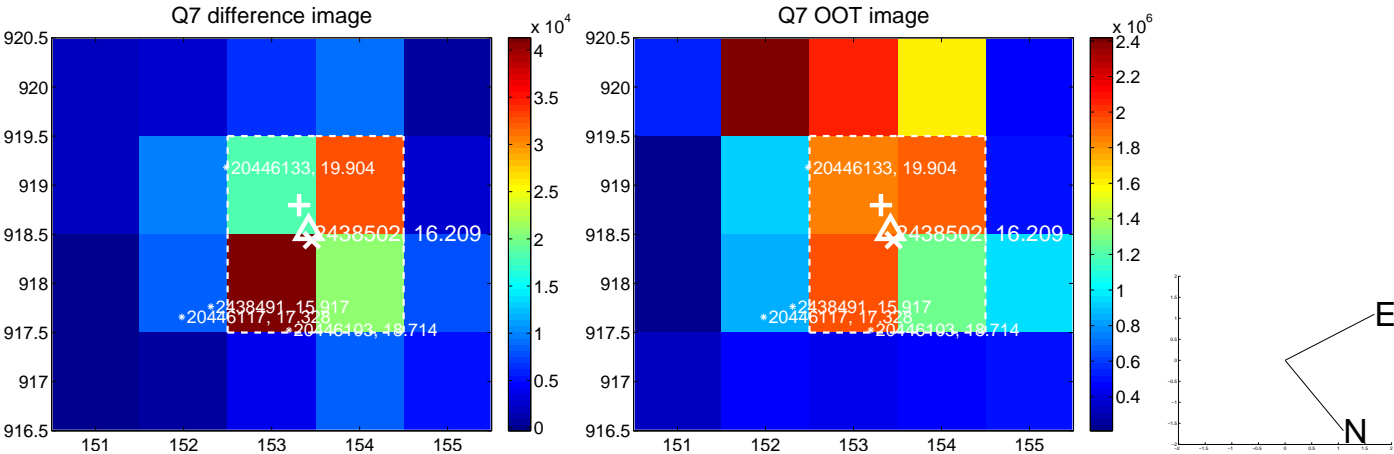
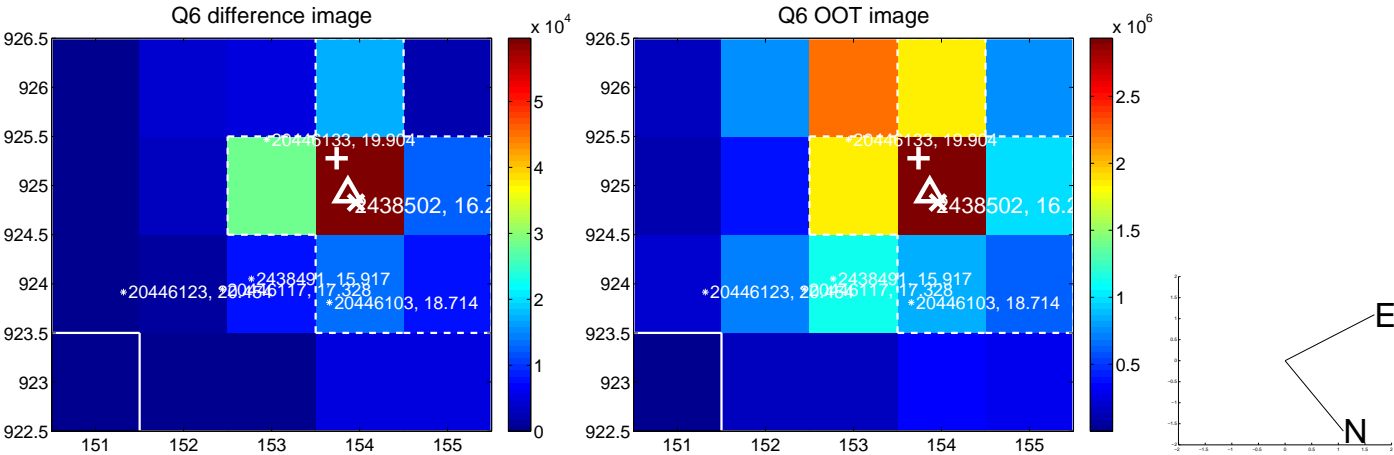
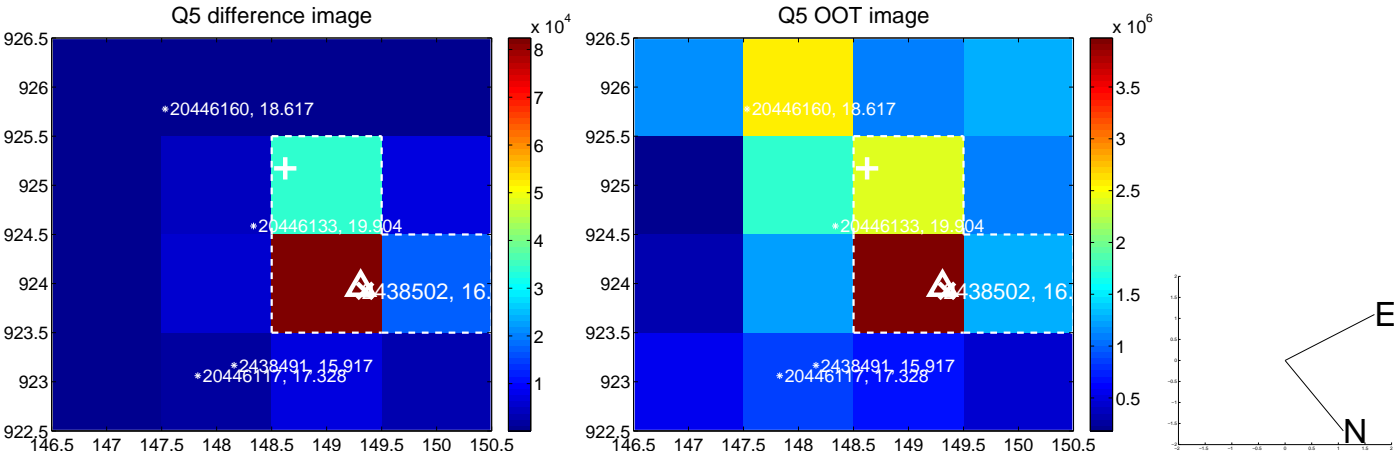


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

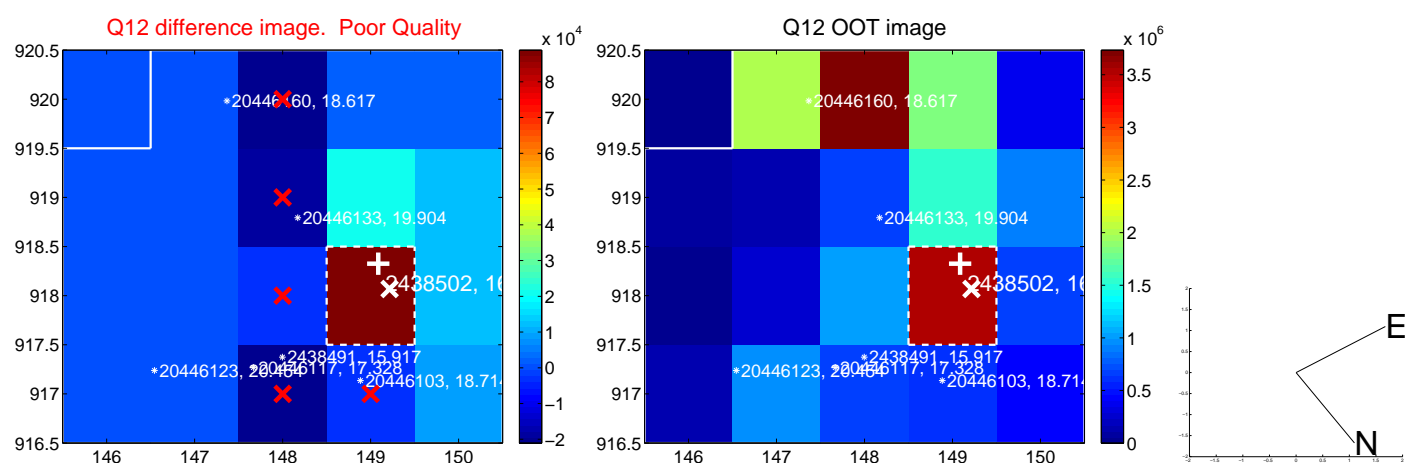
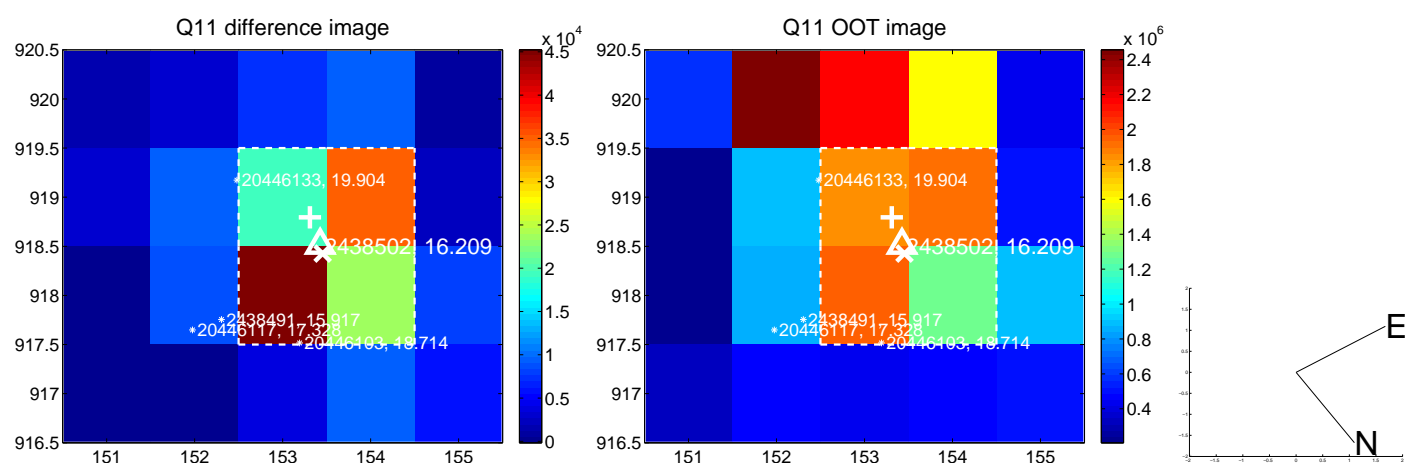
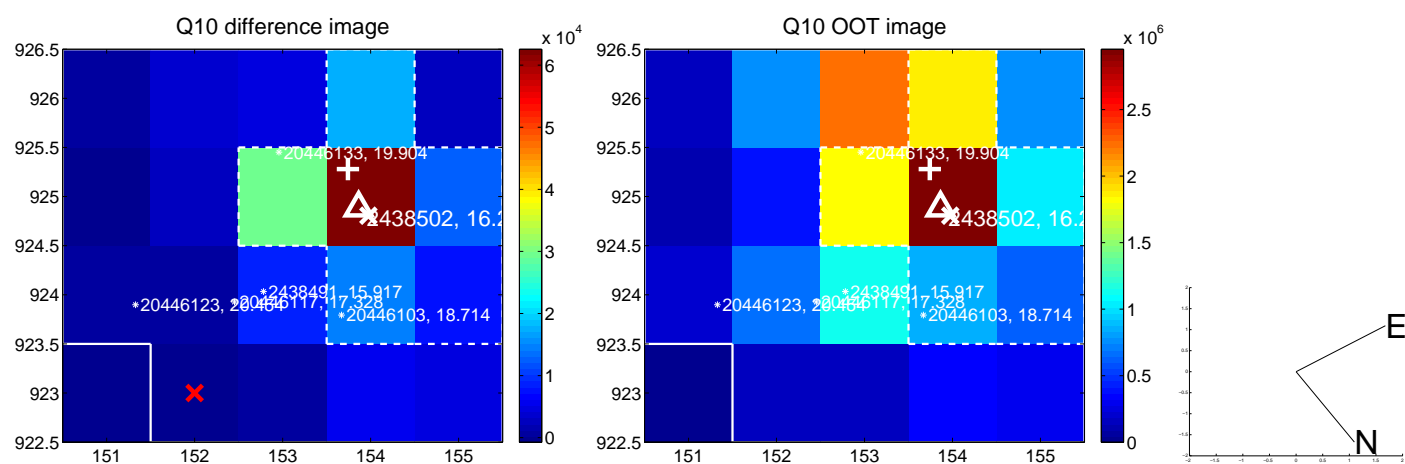
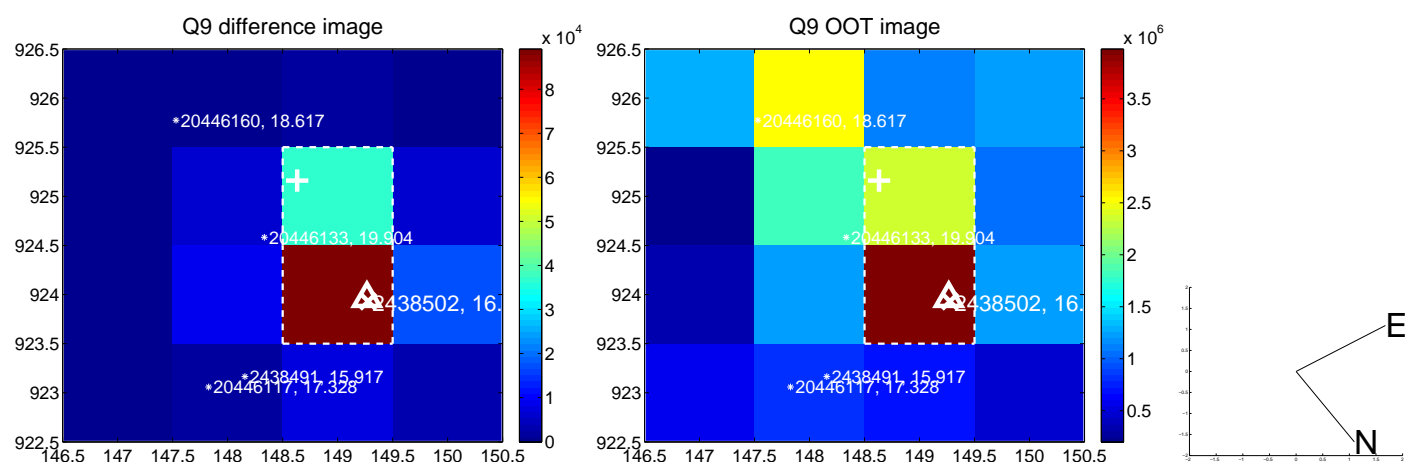
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



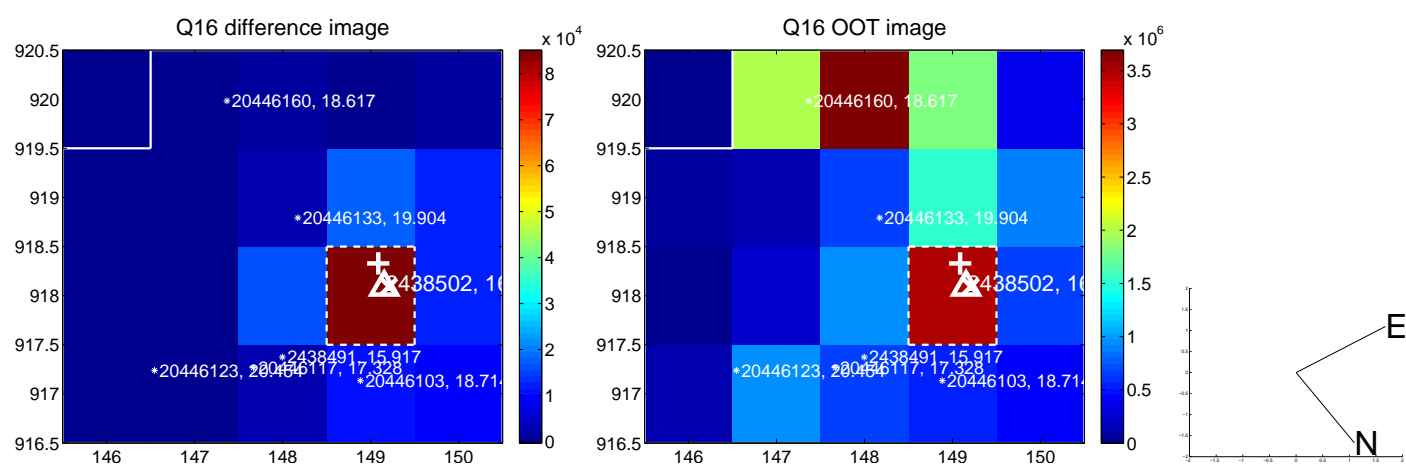
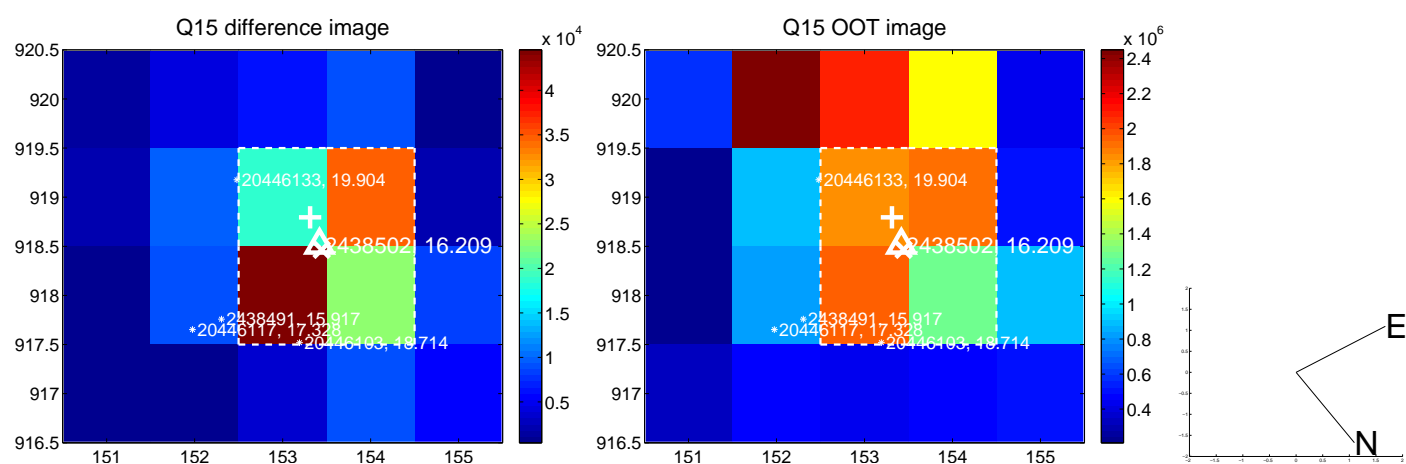
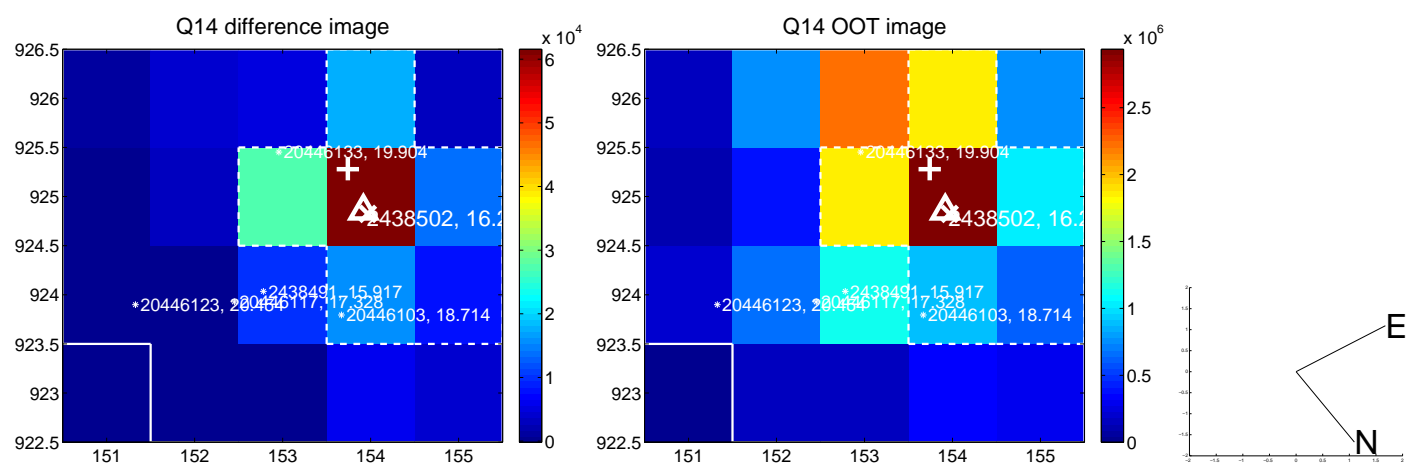
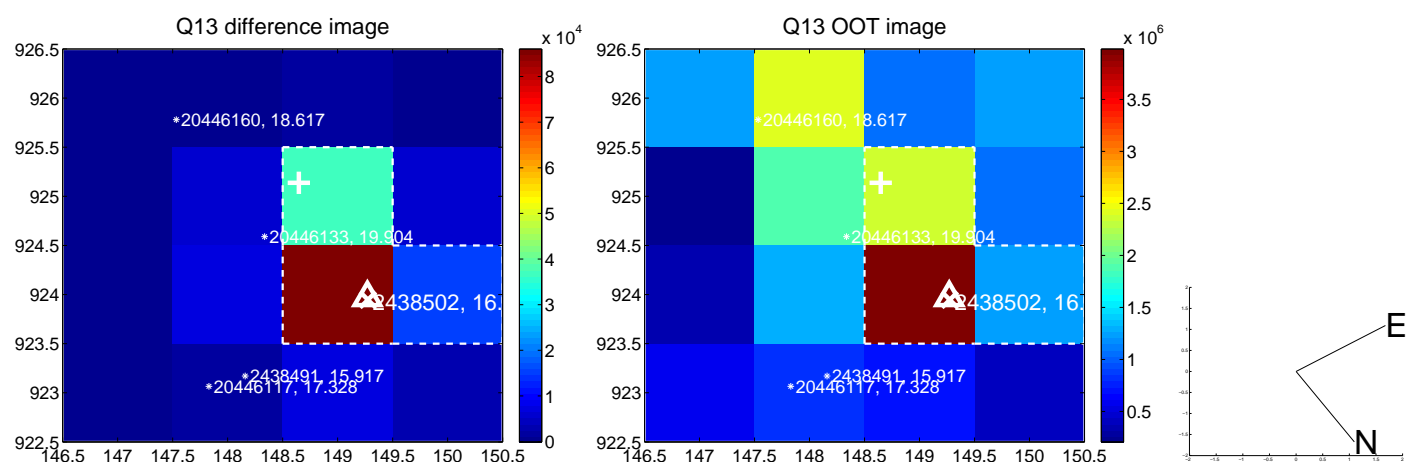
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



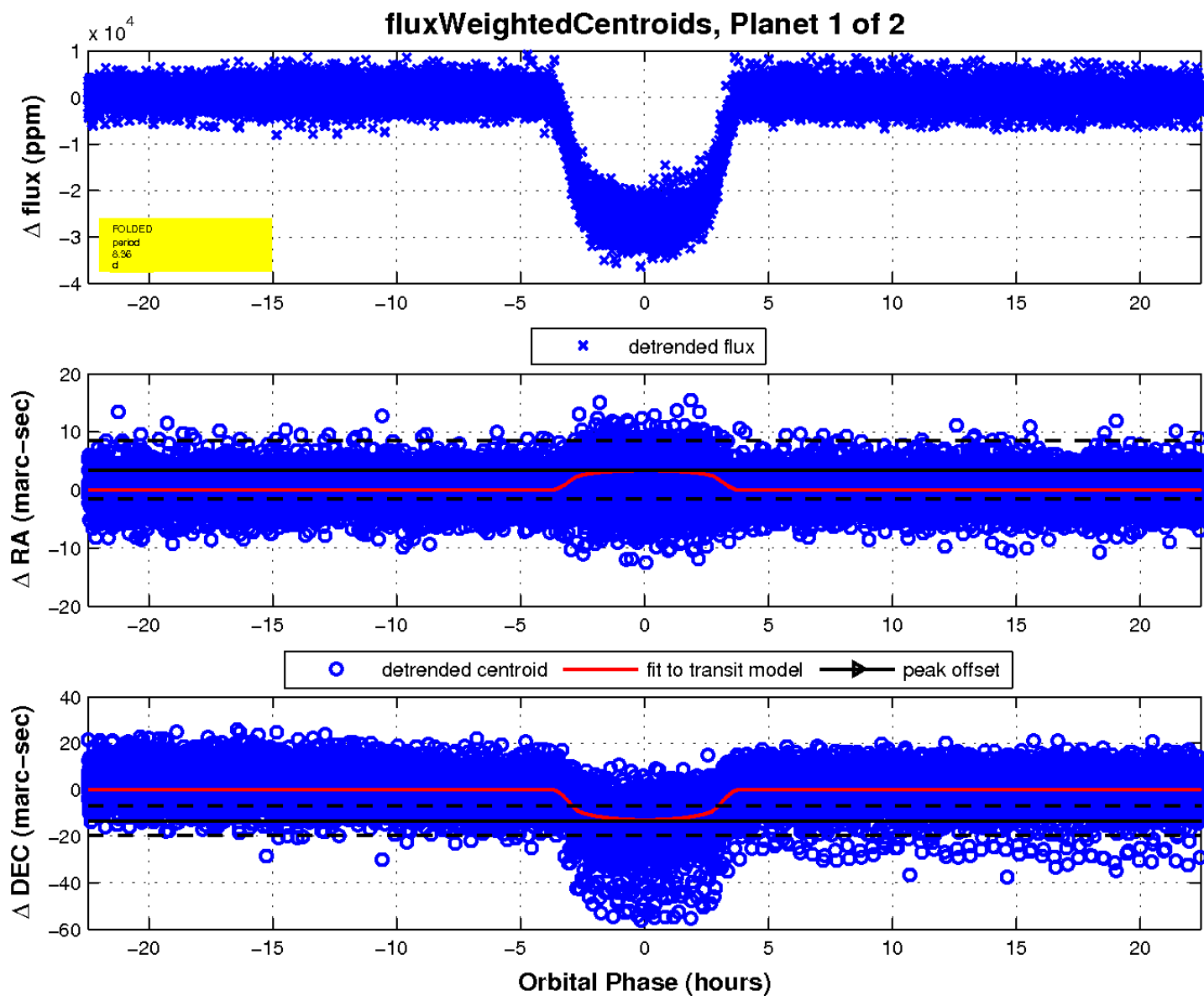
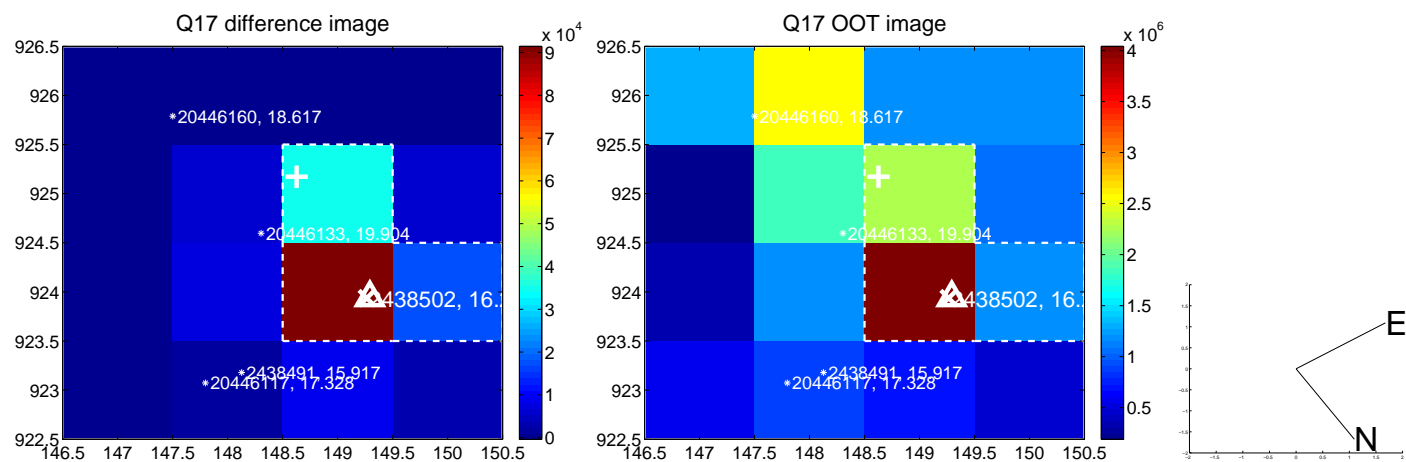
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

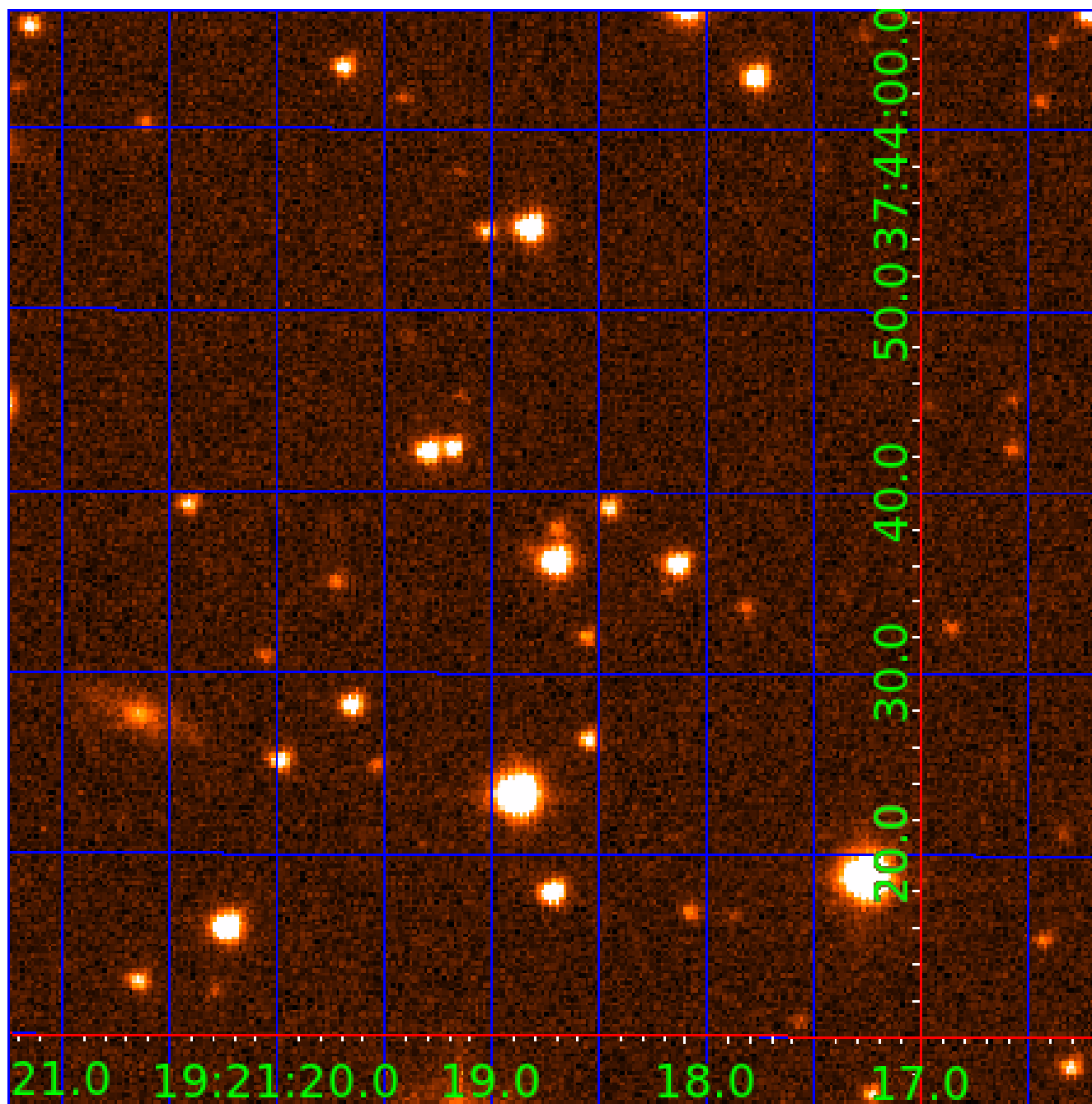


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



UKIRT Image

Declination



KIC 002438502

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})
002438502-01	OBS	1003.01	8.360612	138.822956	28063.0	7.485	556.0	501.9	2.44	5463	40.27	602.31
002438502-02	OBS	No	8.360561	135.226842	1362.9	7.244	27.5	29.7	2.44	5463	10.18	602.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002438502-01	OBS	FP	0.05	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_KIC_POS
002438502-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

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

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

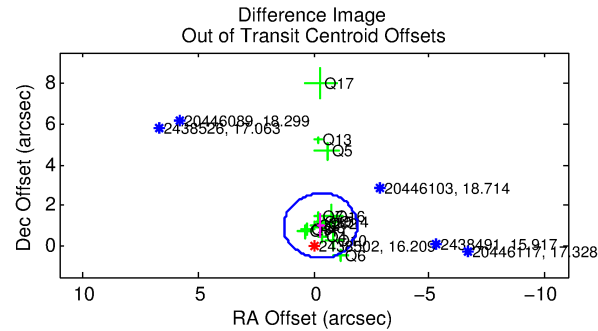
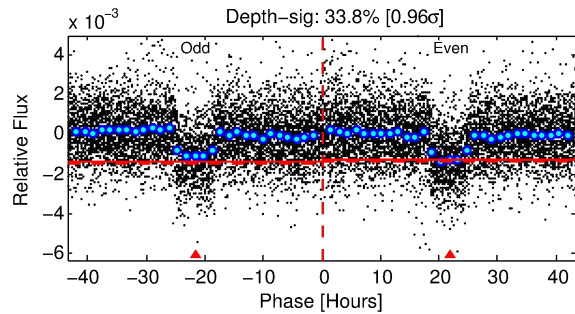
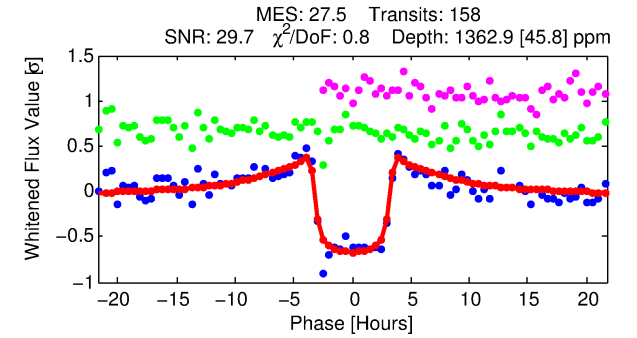
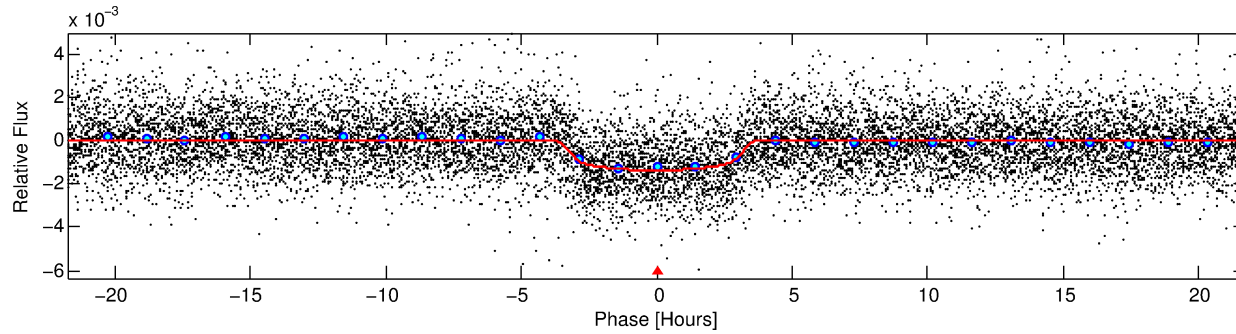
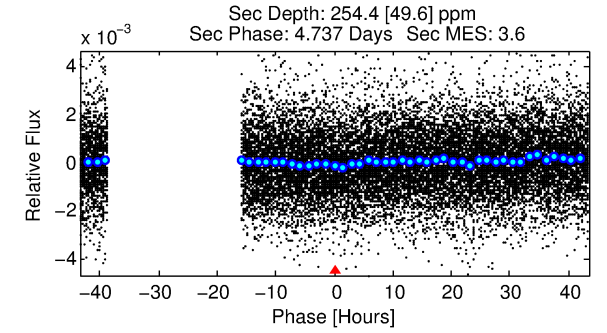
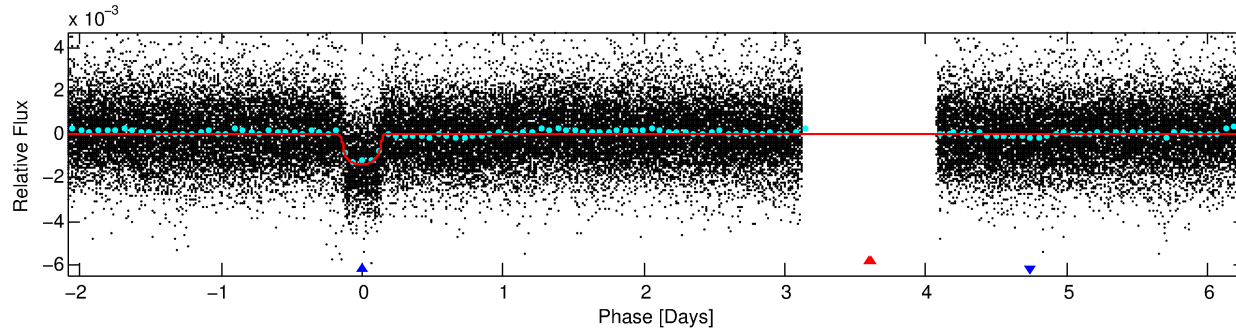
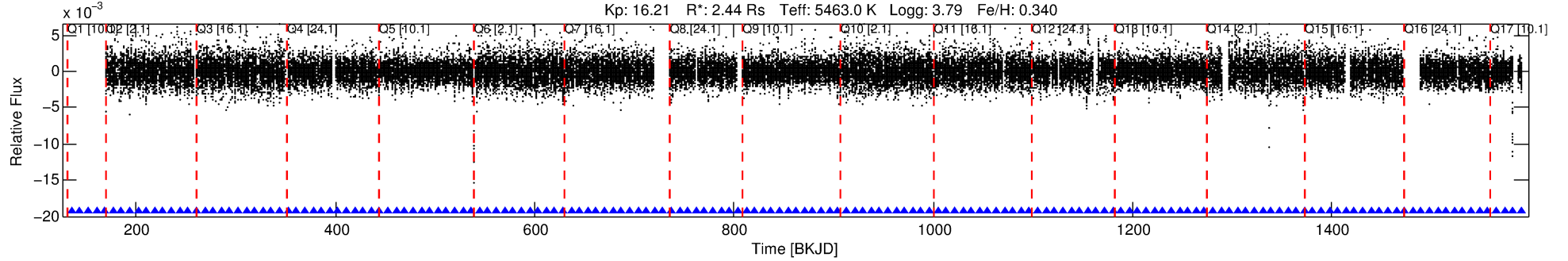
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002438502-02

No Significant Match Found

DV One-Page Summary

KIC: 2438502 Candidate: 2 of 2 Period: 8.361 d
KOI: K01003 Corr: No Ephemeris Match



DV Fit Results:

Period = 8.36056 [0.00004] d
Epoch = 135.2268 [0.0034] BKJD
Rp/R* = 0.0382 [0.0020]
a/R* = 5.70 [1.04]
b = 0.82 [0.08]
Seff = 602.32 [262.62]
Teq = 1263 [138] K
Rp = 10.18 [3.54] Re
a = 0.0890 [0.0261] AU
Ag = 10.70 [5.19] [1.87σ]
Teffp = 3532 [203] K [9.24σ]

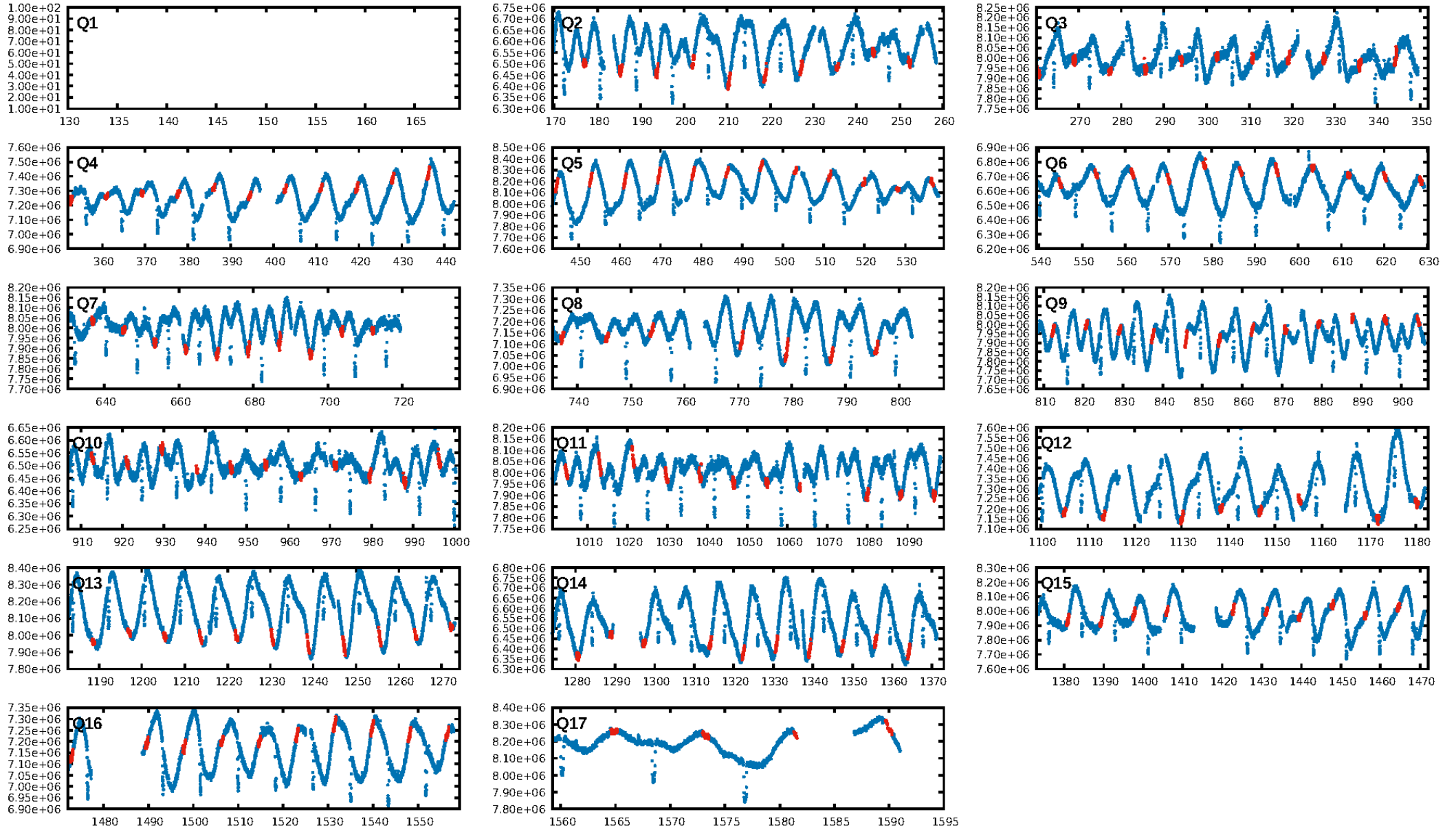
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 97.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 7.52e-132
RollingBand-fgt: 1.00 [154/154]
GhostDiagnostic-chr: 2.962
Centroid-sig: 0.0%
Centroid-so: 1.746 arcsec [7.17σ]
OotOffset-rm: 1.049 arcsec [1.98σ]
KicOffset-rm: 0.408 arcsec [1.42σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 1.00 [16/16]

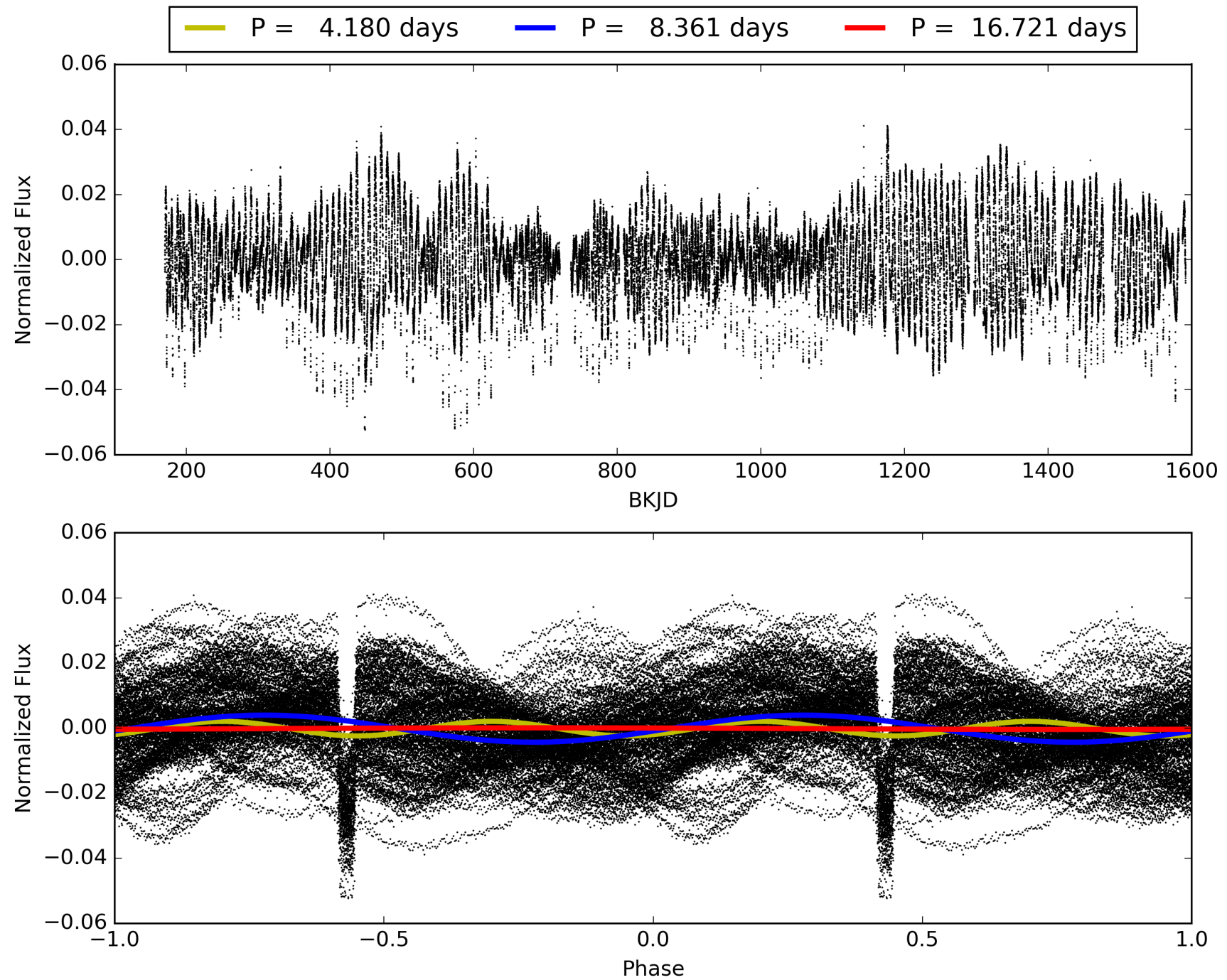
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:55:30 Z

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

TCE 002438502-02, PDC Light Curves

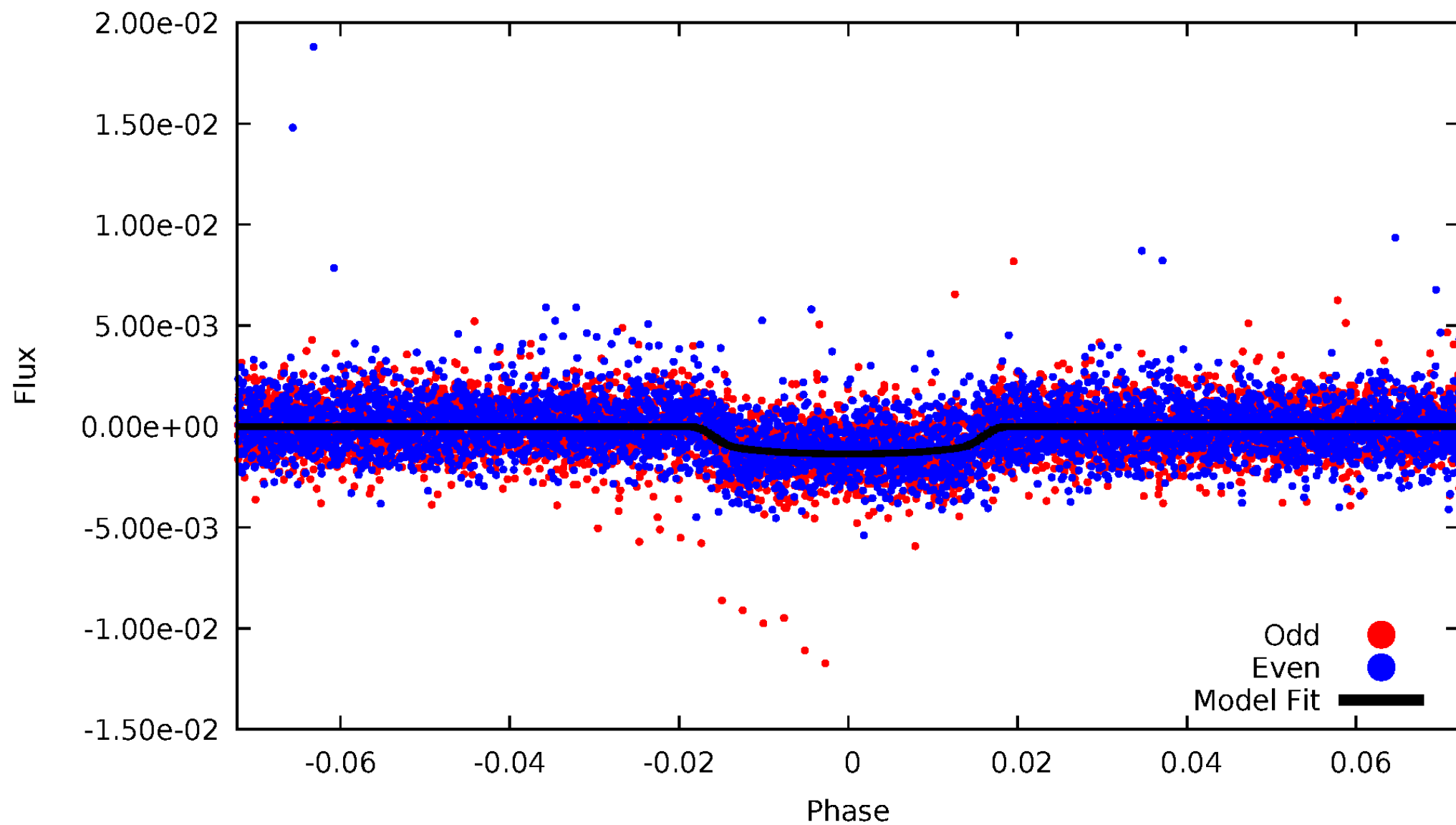


TCE 002438502-02



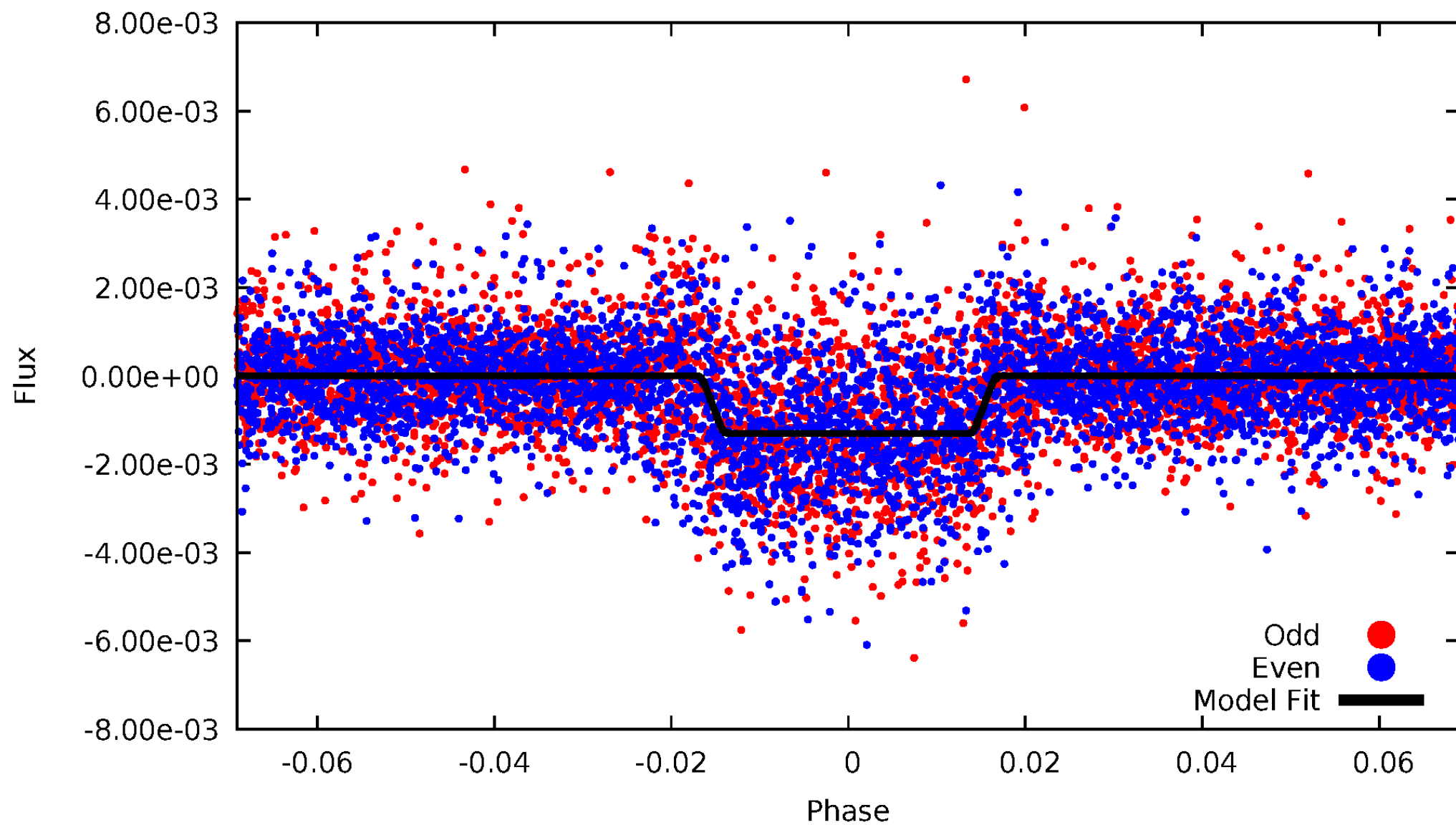
DV Odd/Even

TCE 002438502-02



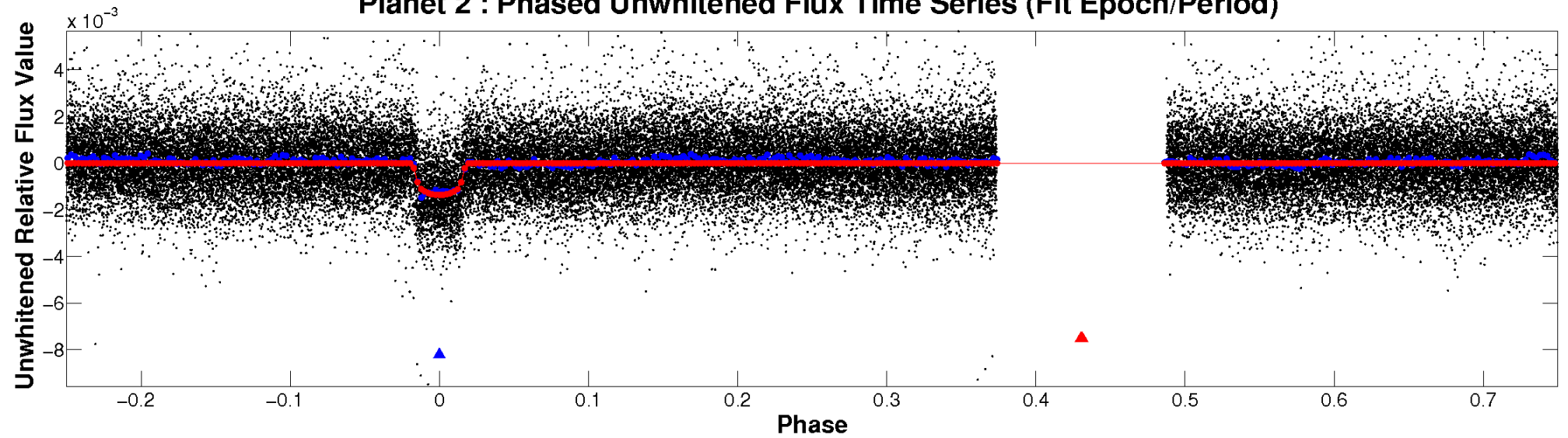
ALT Odd/Even

TCE 002438502-02

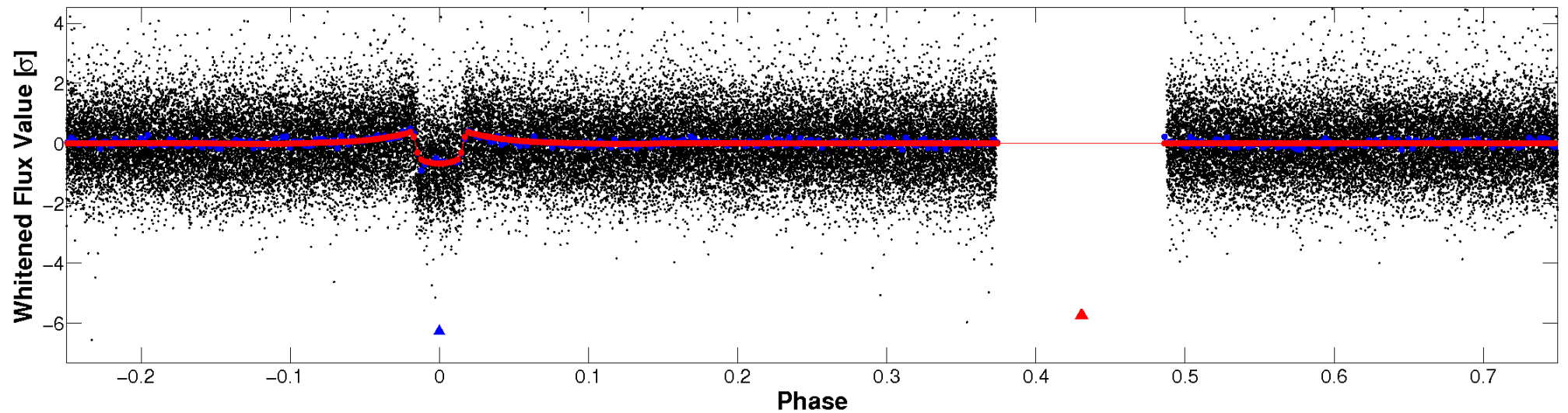


Non-Whitened Vs. Whitened Light Curve

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

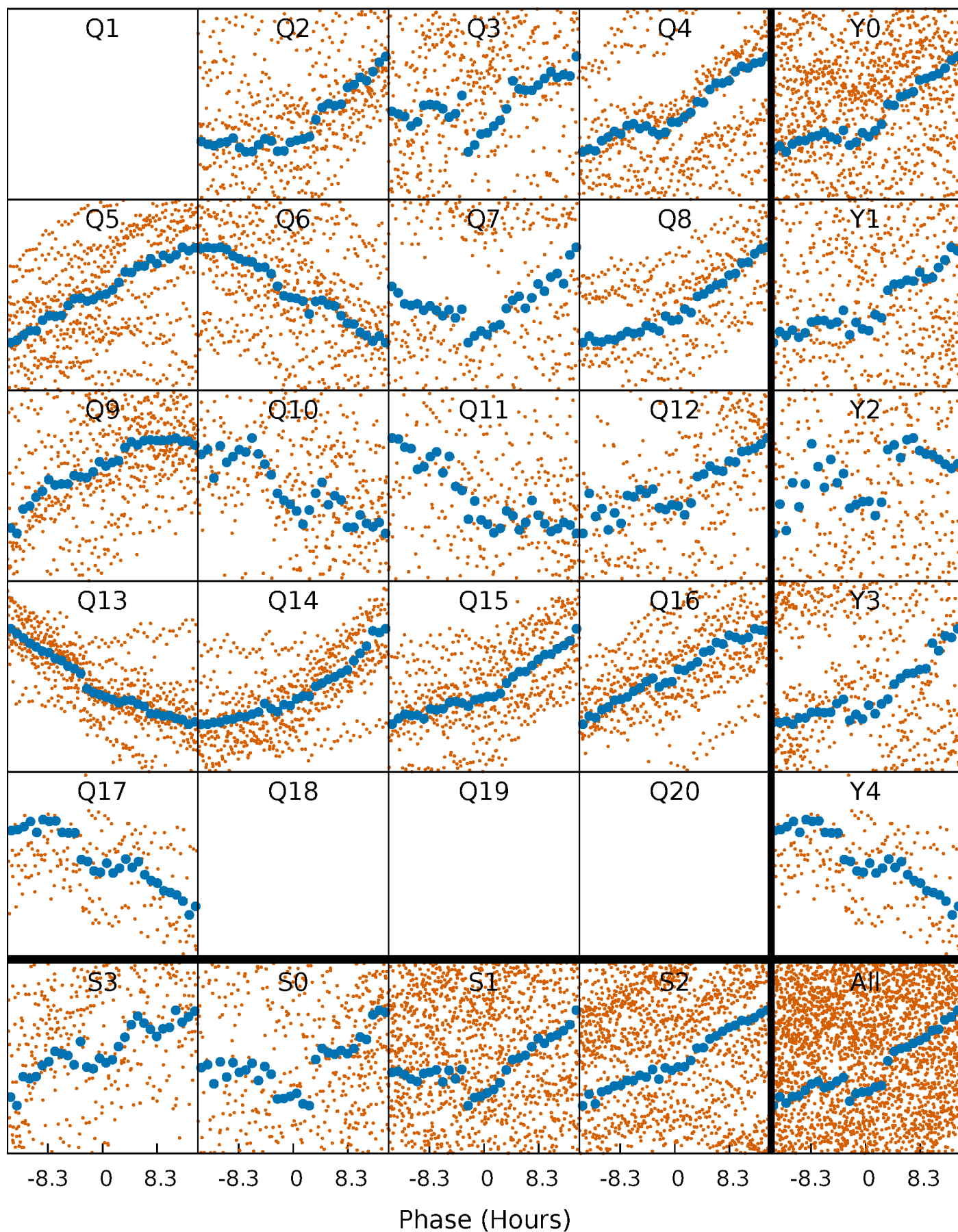


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



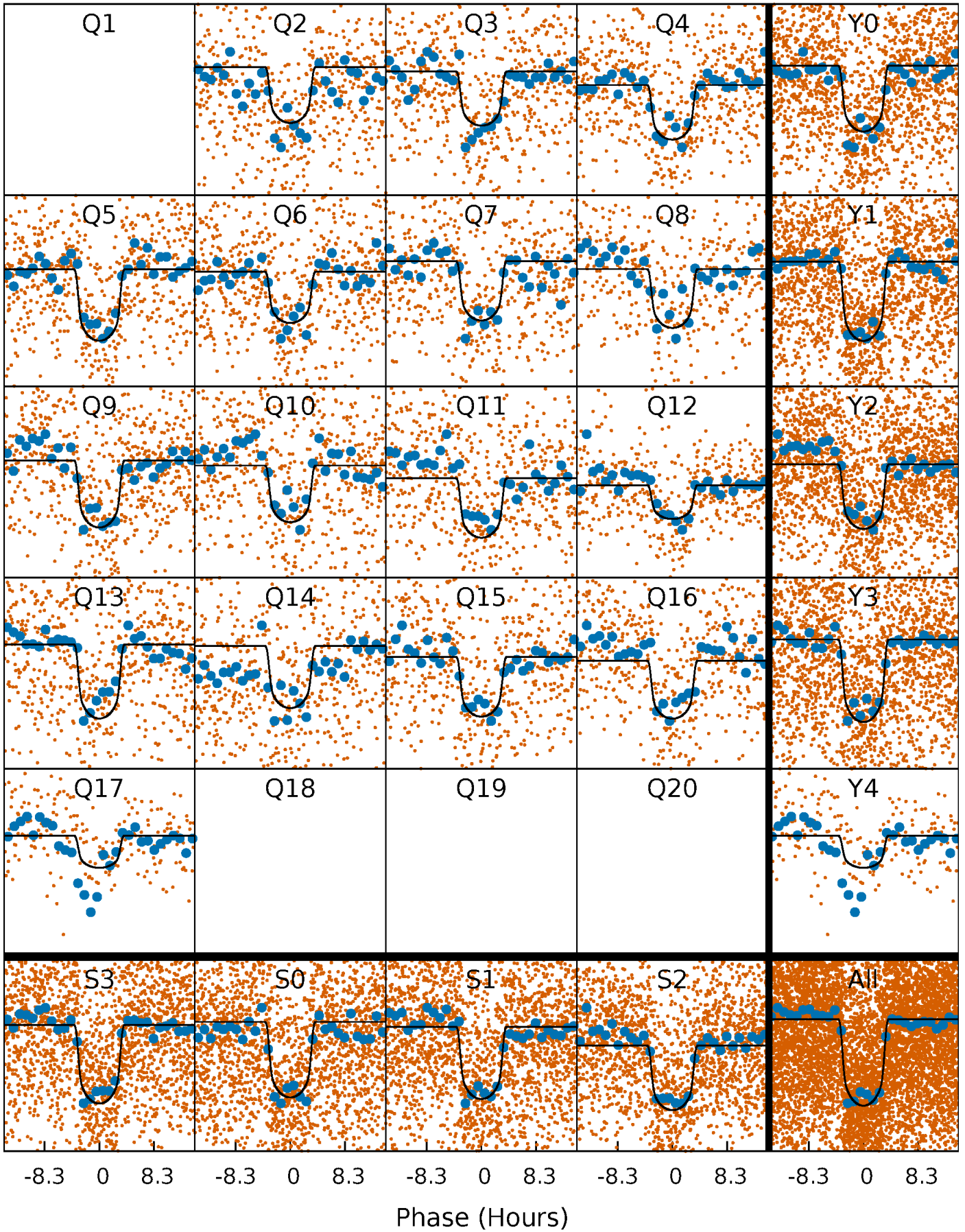
PDC Quarter-Phased Transit Curves

TCE 002438502-02 P= 8.360561 Days $T_0=135.226842$ (BKJD)



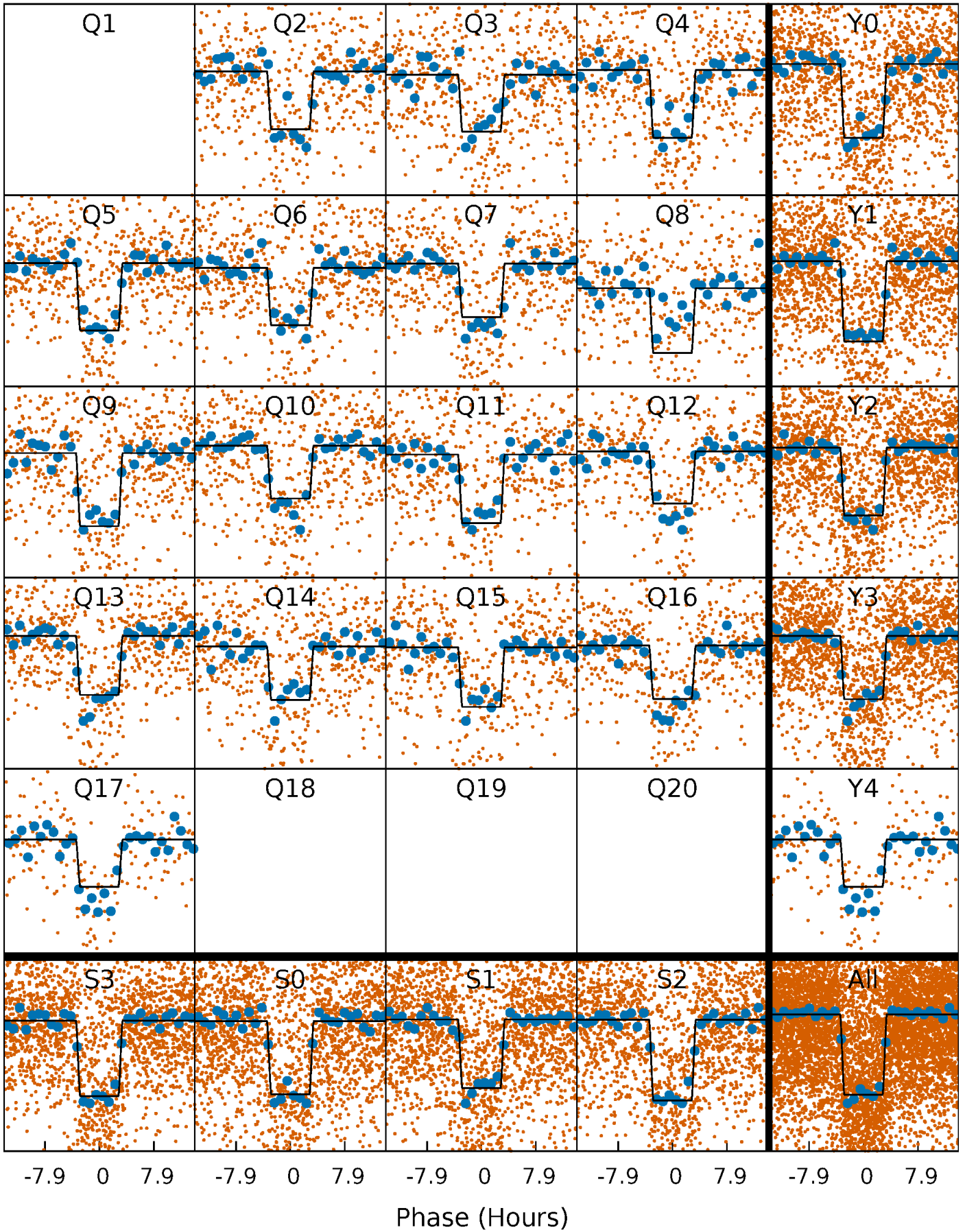
DV Quarter-Phased Transit Curves

TCE 002438502-02 P= 8.360561 Days $T_0=135.226842$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

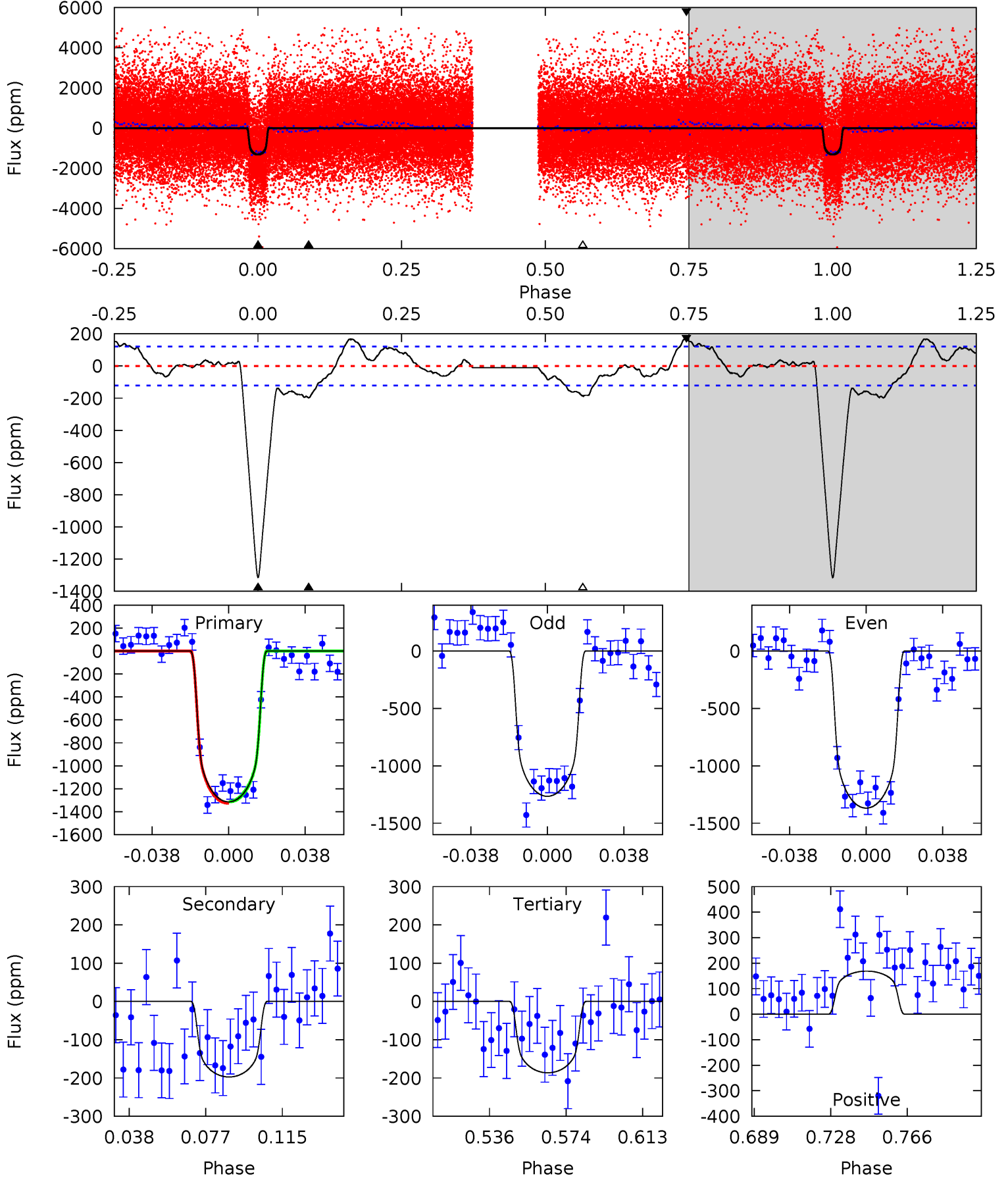
TCE 002438502-02 P= 8.360662 Days $T_0=135.218230$ (BKJD)



DV Model-Shift Uniqueness Test

002438502-02, P = 8.360561 Days, E = 135.226842 Days

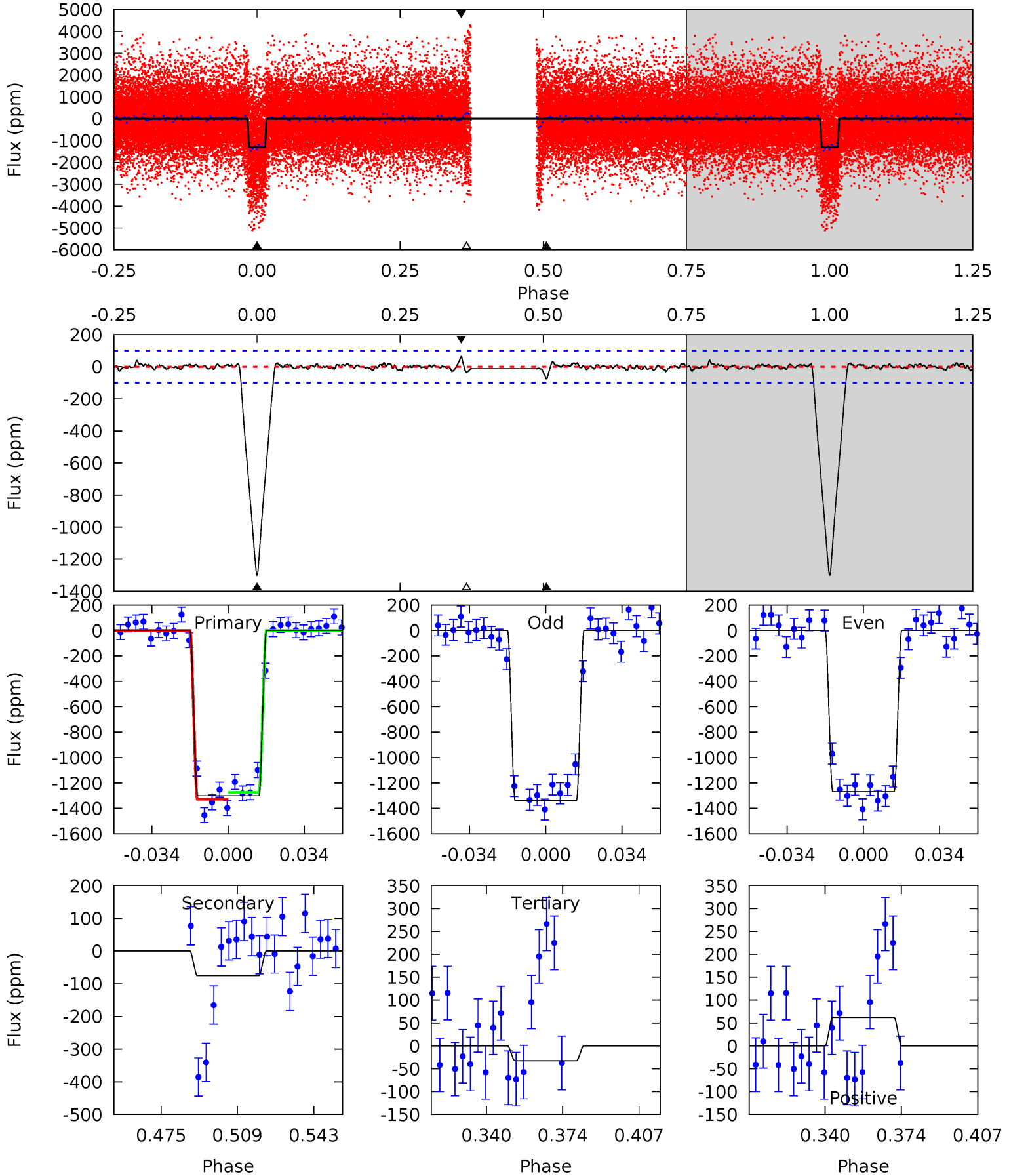
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
51.7	7.77	7.34	6.65	4.76	2.07	3.27	44.4	45.1	0.43	1.11	2.04	1.02	0.11	0.22



Alt Model-Shift Uniqueness Test

002438502-02, P = 8.360662 Days, E = 135.218230 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
61.9	3.61	1.55	2.96	4.79	2.12	0.55	60.4	59.0	2.06	0.65	1.63	1.01	0.05	1.27



Stellar Parameters For KIC 002438502

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5463^{+87}_{-76}	$3.790^{+0.238}_{-0.085}$	$0.340^{+0.100}_{-0.150}$	$2.445^{+0.420}_{-0.841}$	$1.343^{+0.144}_{-0.268}$	$0.129^{+0.218}_{-0.036}$
	+2%/-1%	+6%/-2%	+29%/-44%	+17%/-34%	+11%/-20%	+169%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002438502-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-197 ± 25	$9.90^{+1.22}_{-1.56}$	1743^{+87}_{-112}	3692^{+112}_{-108}	$8.813^{+3.154}_{-1.969}$
Alt.	-76 ± 21	$9.28^{+1.15}_{-1.54}$	1742^{+82}_{-135}	3212^{+153}_{-171}	$3.848^{+1.961}_{-1.199}$

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 $A_{obs} \gg 1.0$

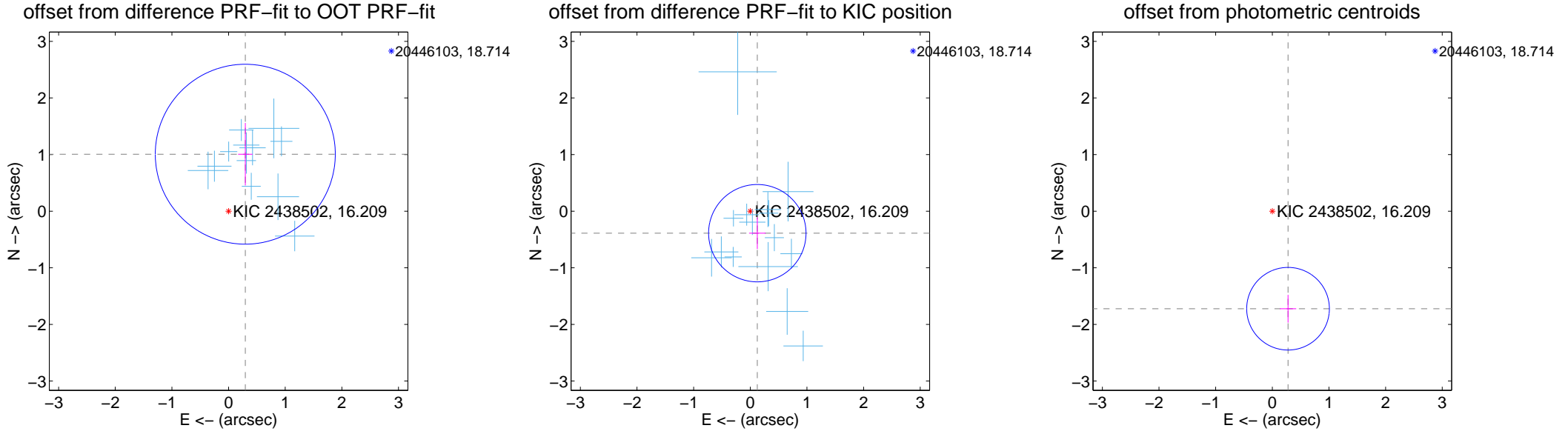
DV Centroid Data

Supplemental centroid analysis for 002438502-02. Kepler magnitude: 16.21. Transit SNR 29.69

There are 15 quarters with good PRF difference image offsets

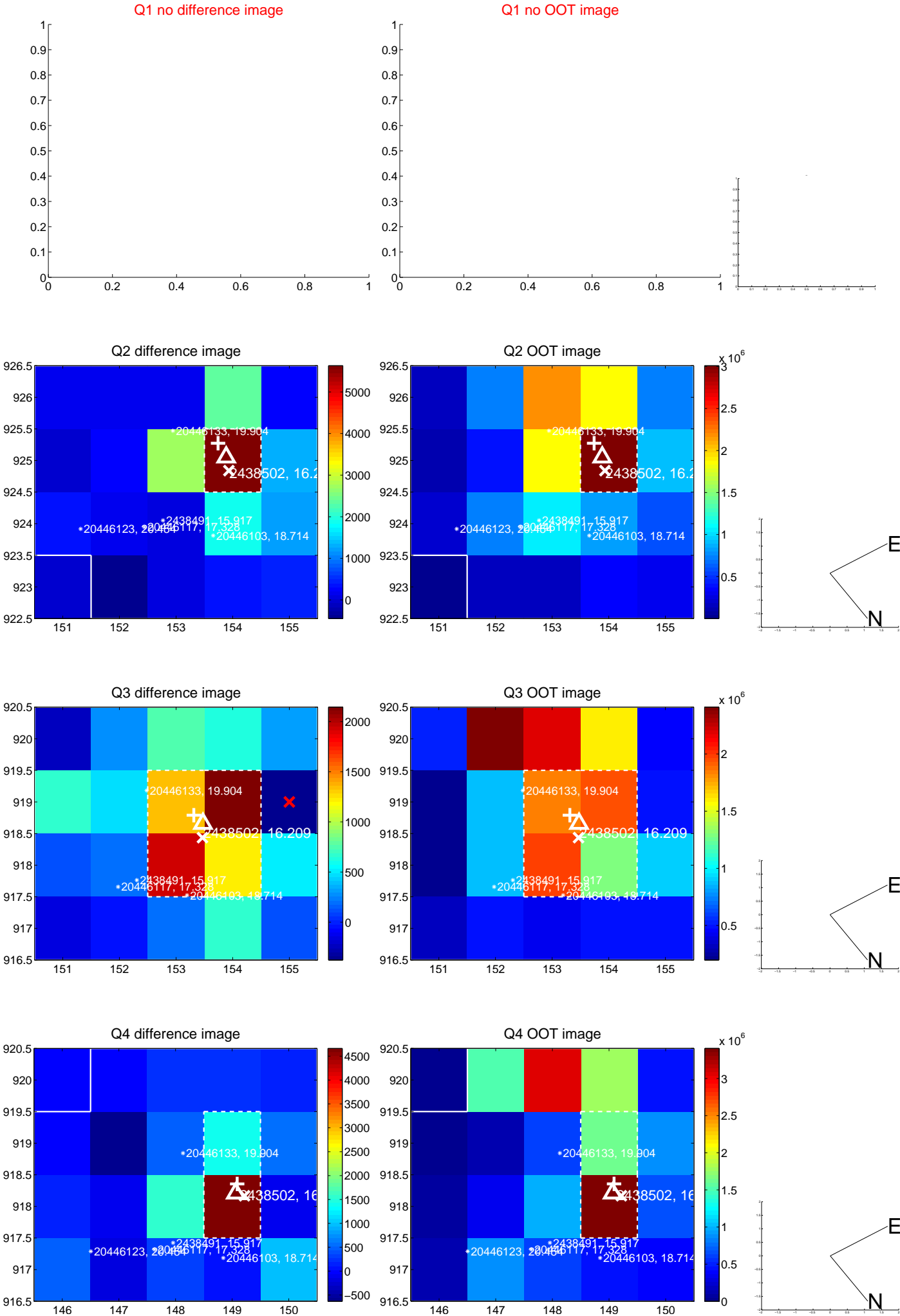
The OOT PRF centroid is offset from the target star catalog position by about 5.55 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.049 ± 0.530	1.98	-0.295 ± 0.127	1.006 ± 0.552
PRF-fit source offset from KIC position	0.408 ± 0.287	1.42	-0.124 ± 0.146	-0.389 ± 0.281
photometric centroid source offset	1.75 ± 0.24	7.17	-0.28 ± 0.14	-1.72 ± 0.25

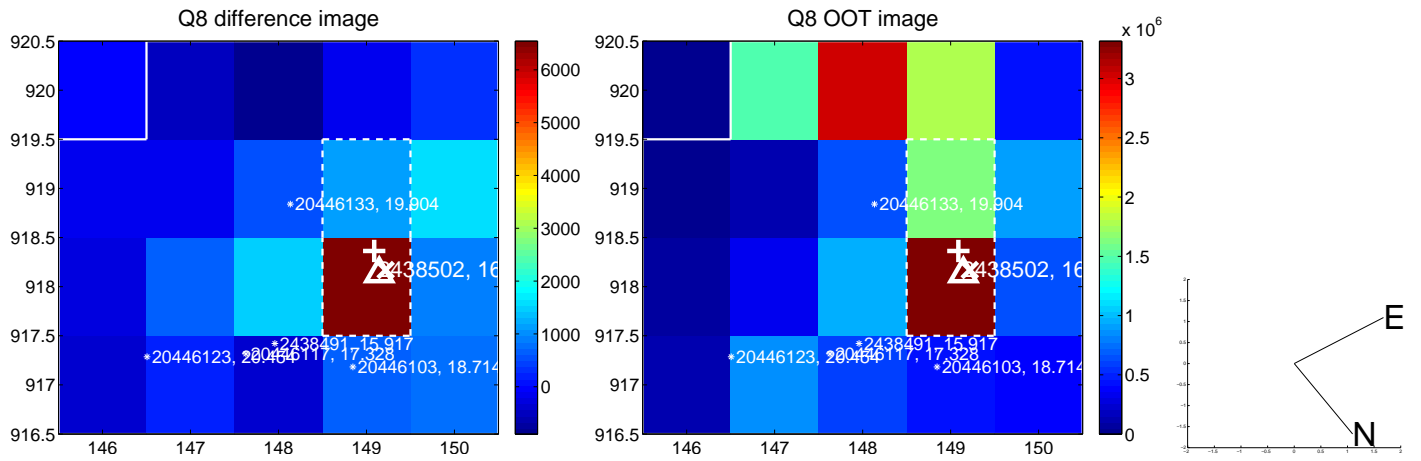
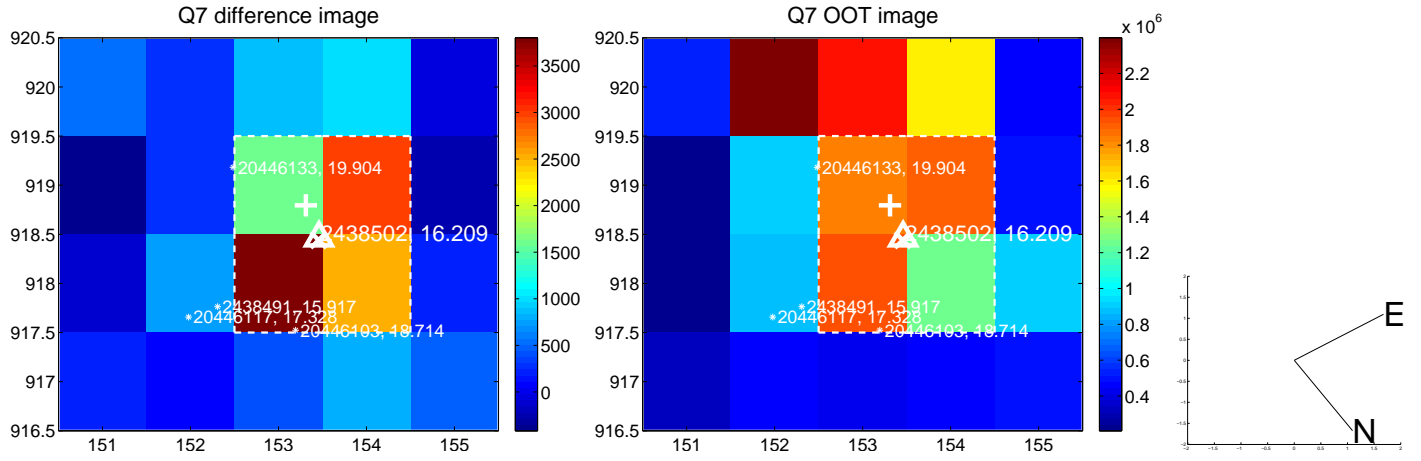
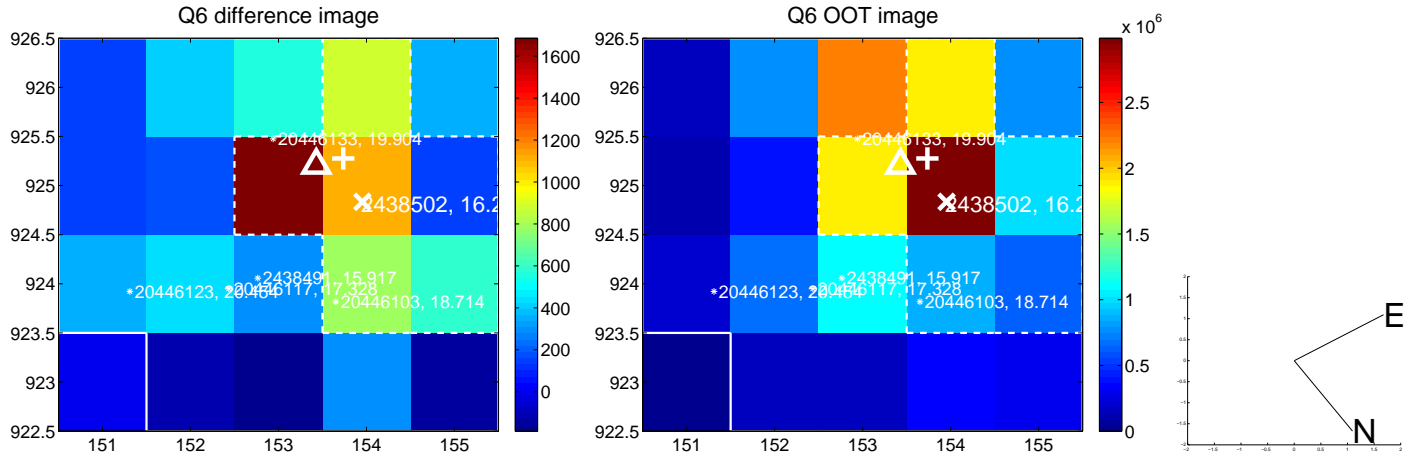
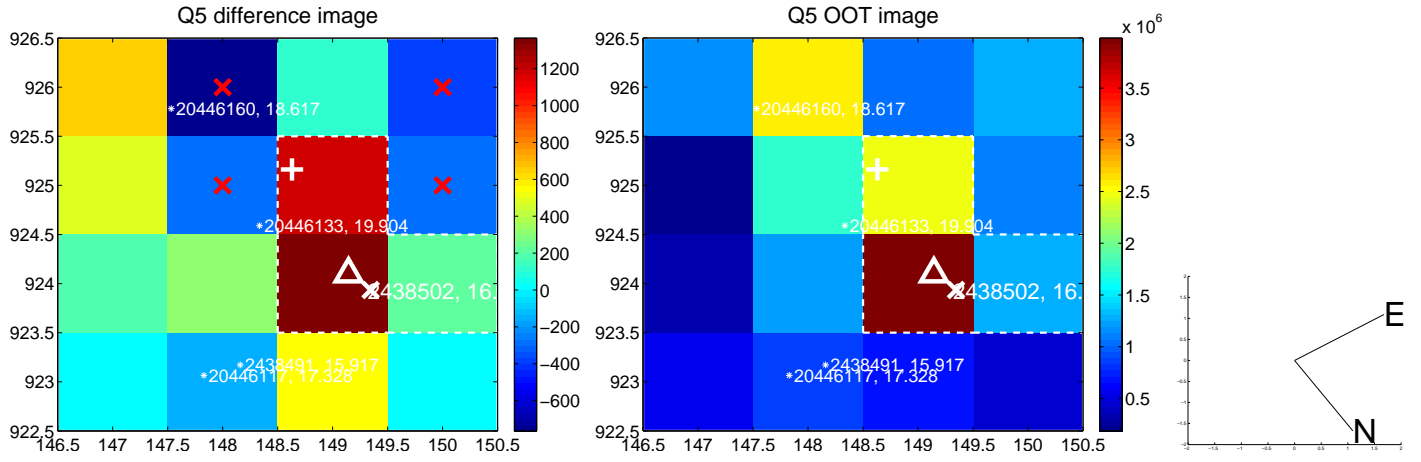


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

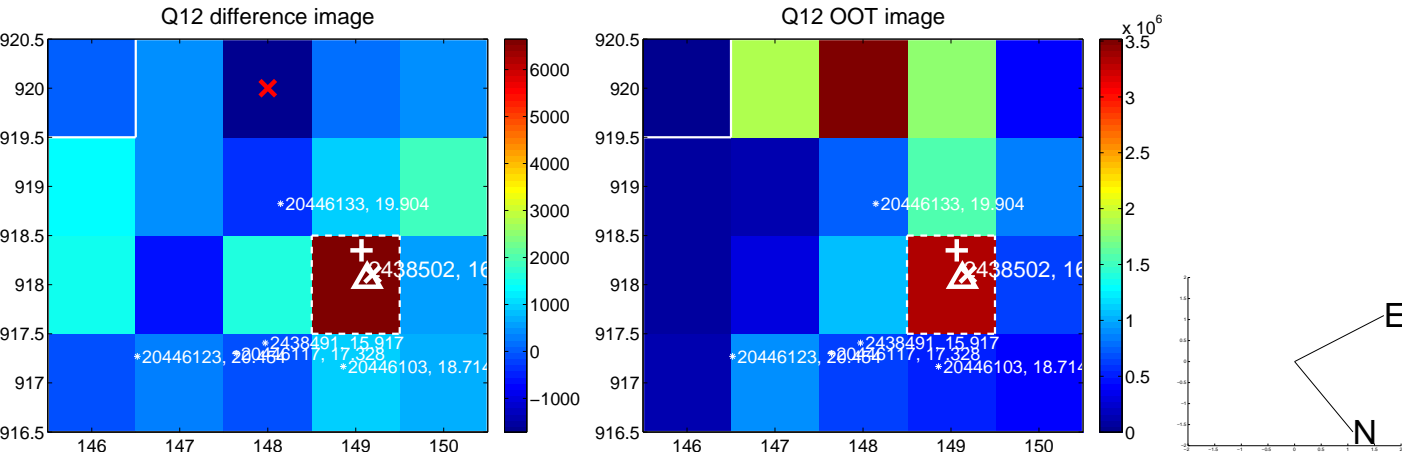
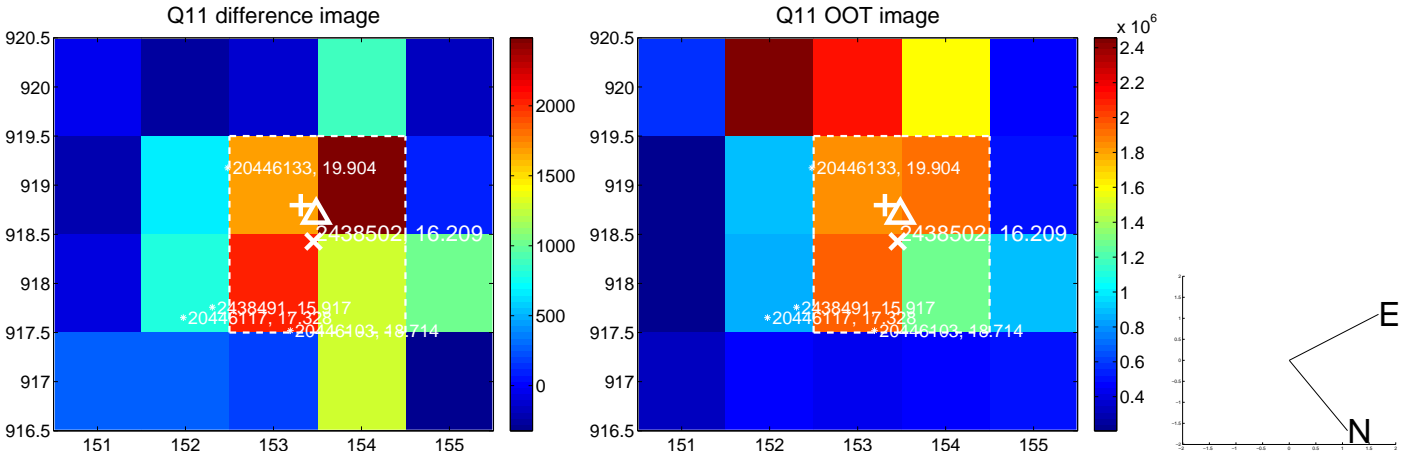
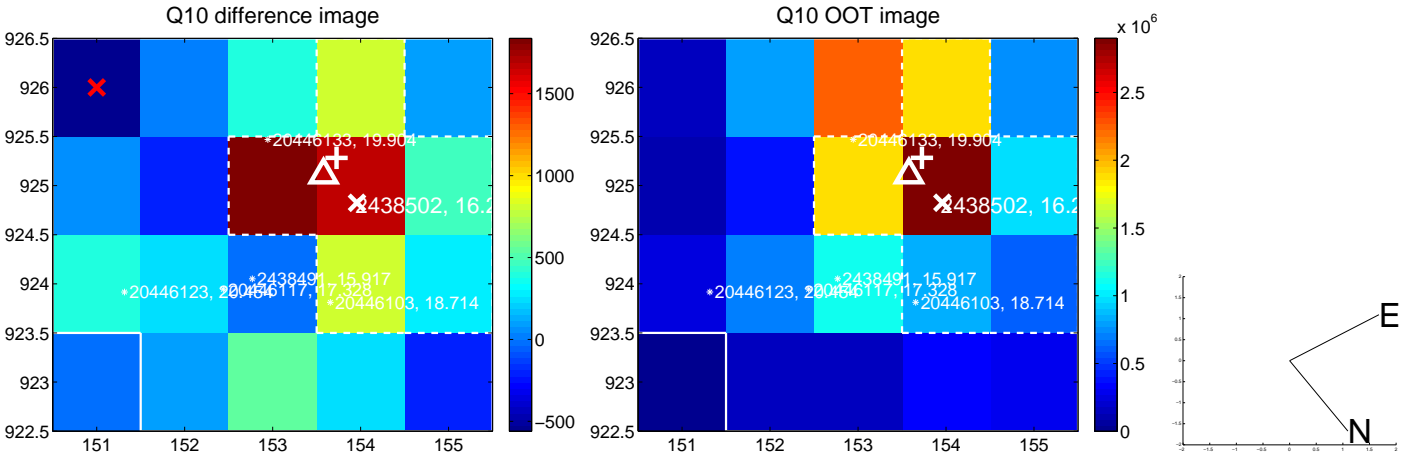
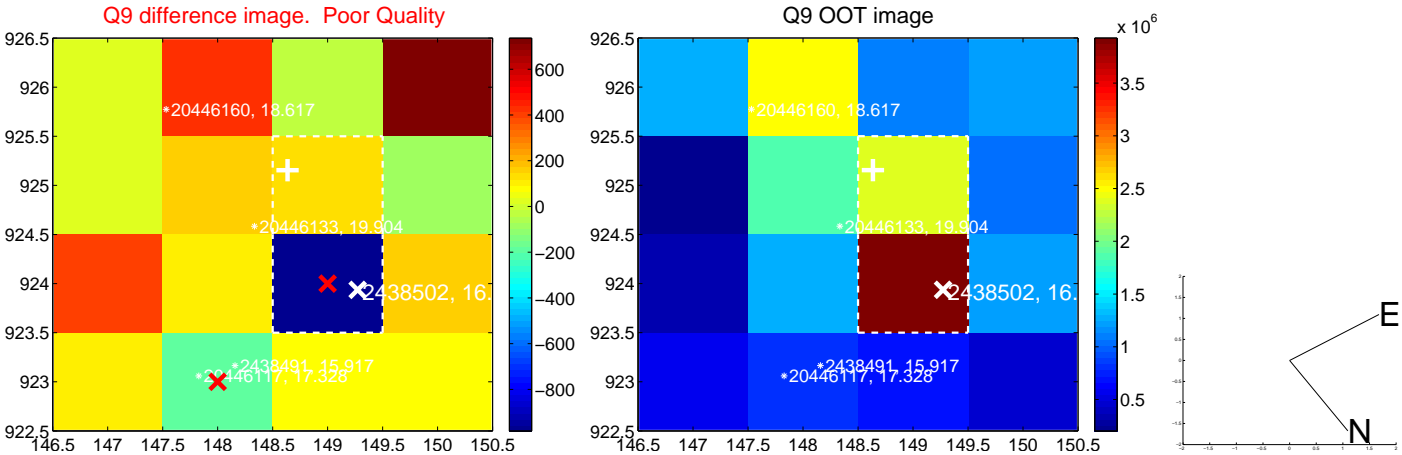
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



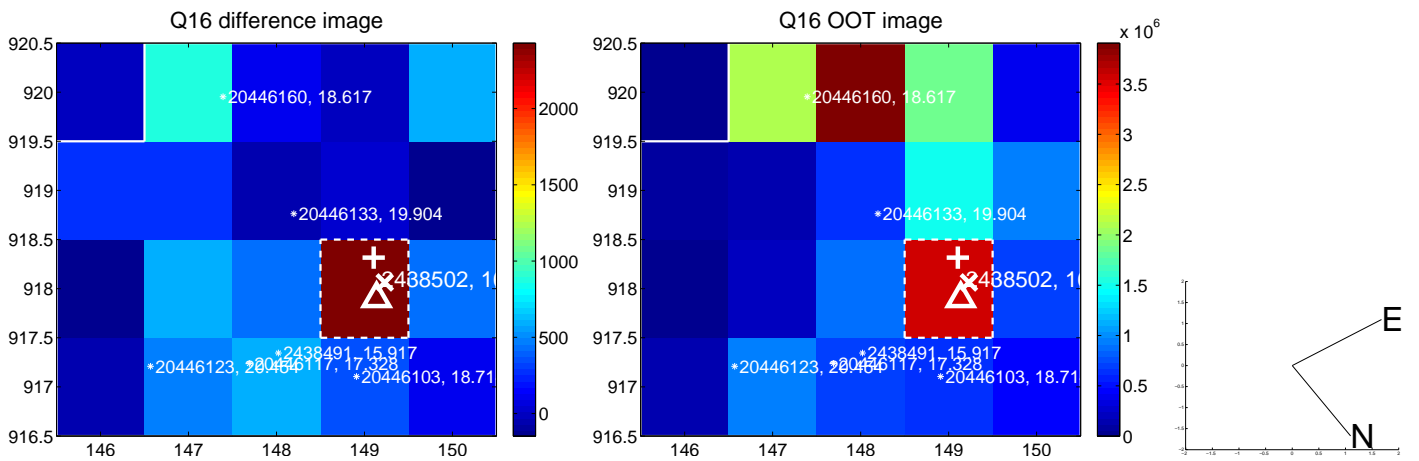
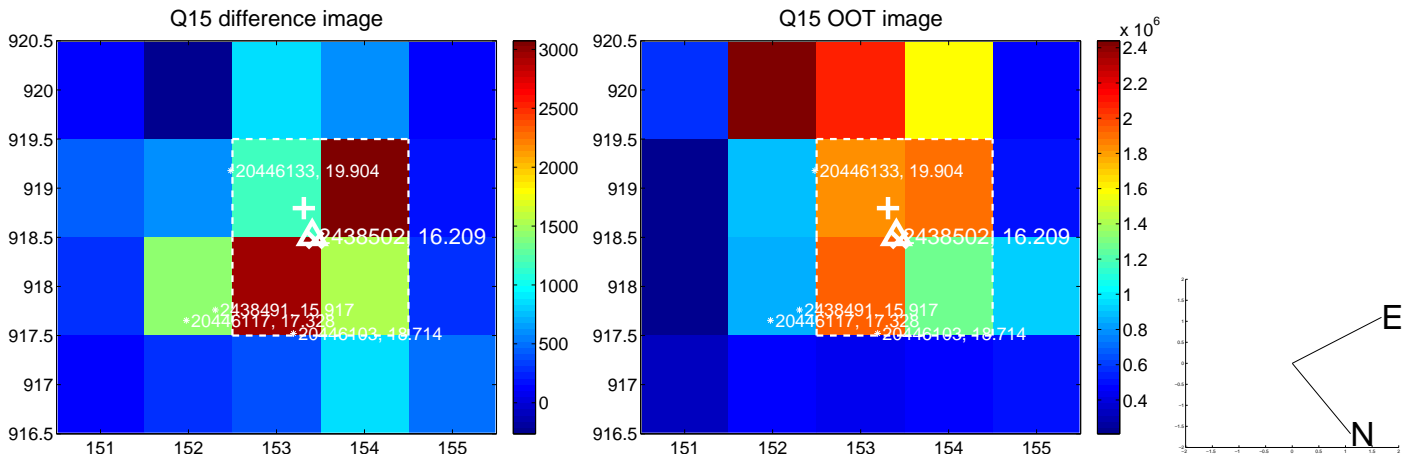
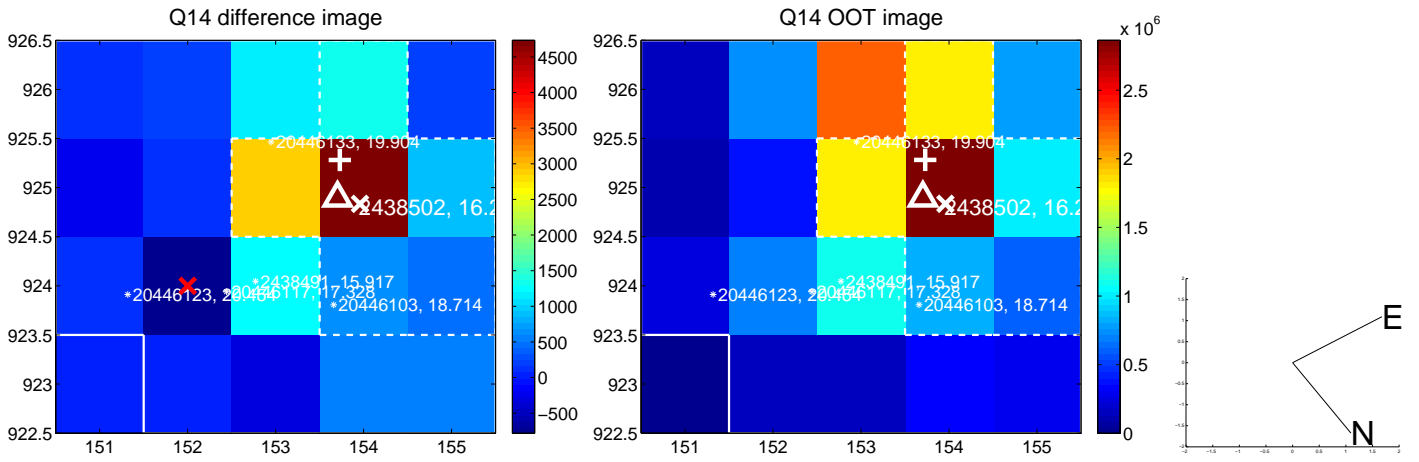
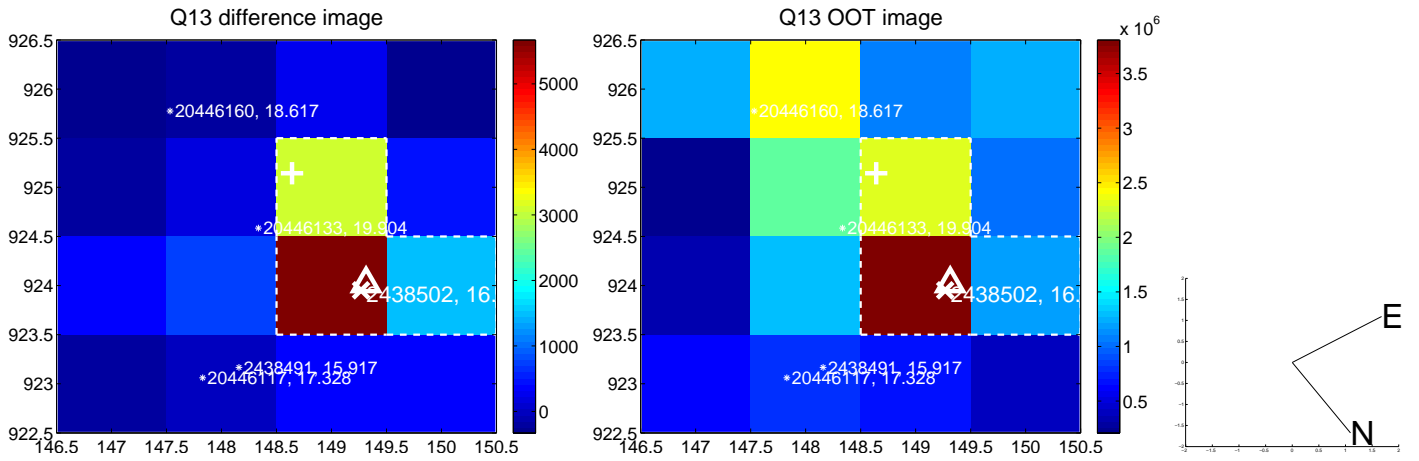
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



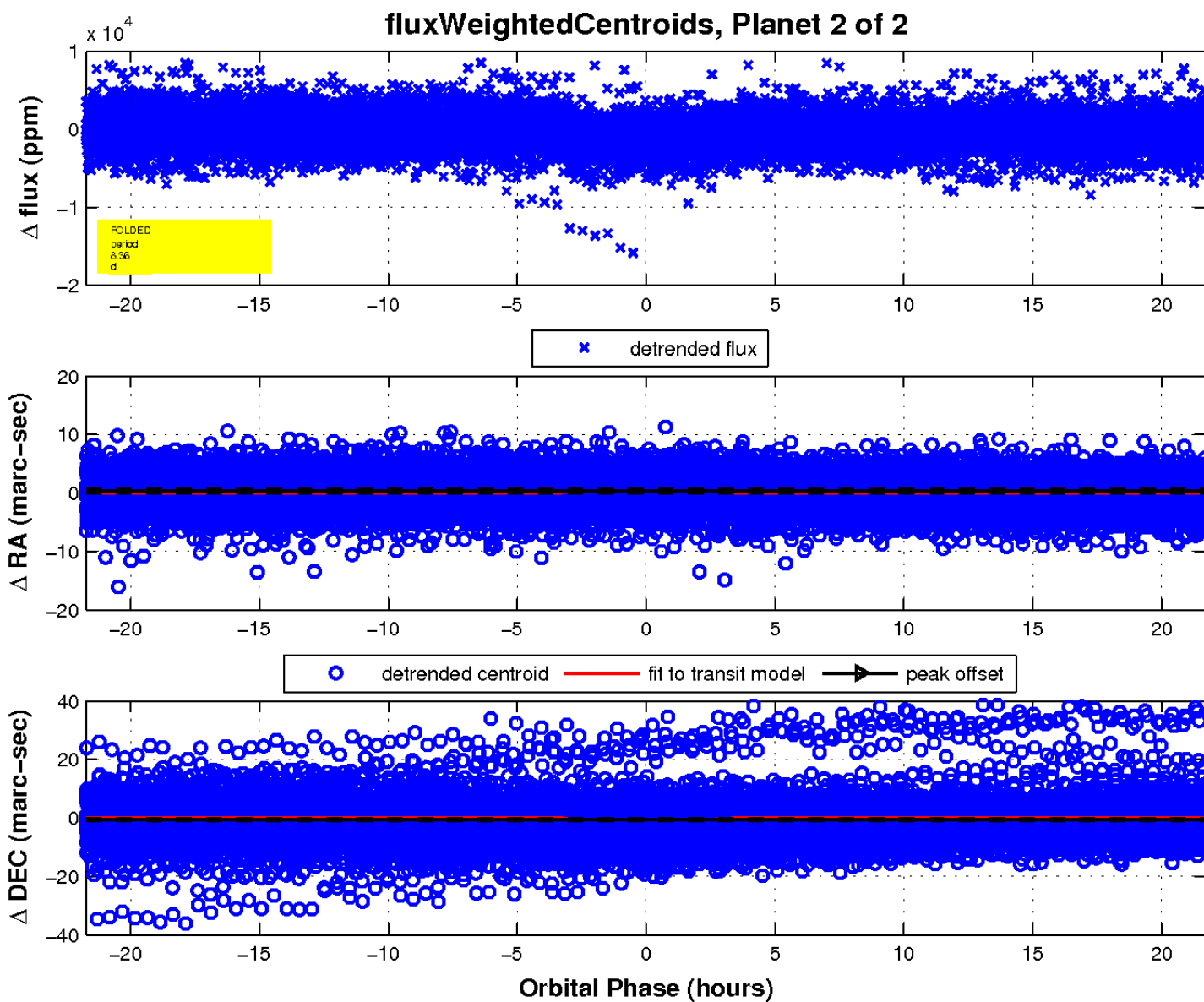
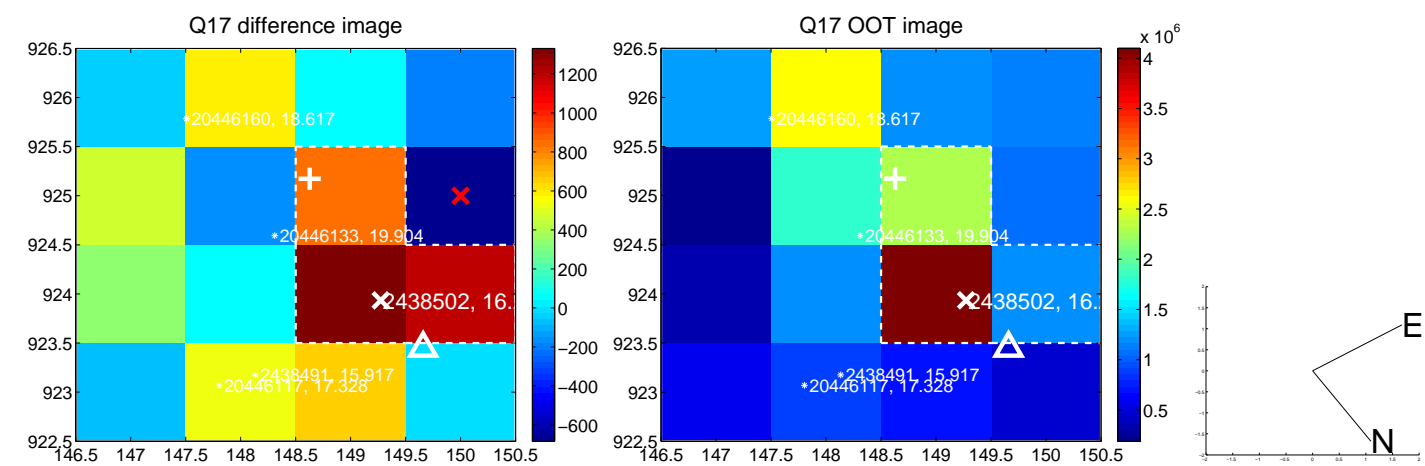
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

