

KIC 002989404

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})
002989404-01	OBS	1824.01	3.553817	134.644113	184.8	3.177	54.7	61.4	1.08	6015	1.73	659.87
002989404-02	OBS	1824.02	1.678326	132.696134	135.6	2.439	53.3	61.7	1.08	6015	1.49	1794.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002989404-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
002989404-02	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.

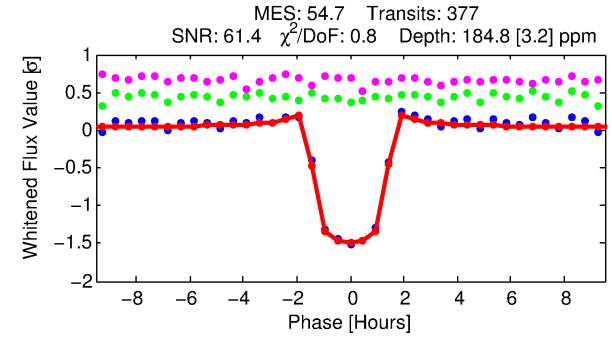
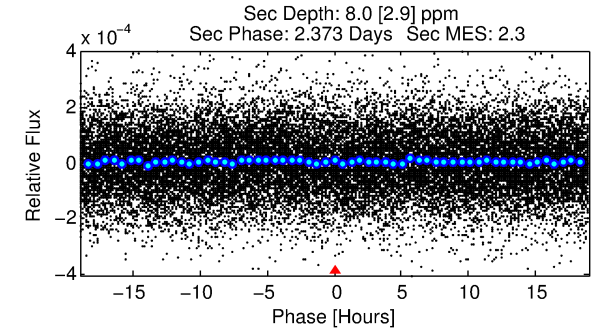
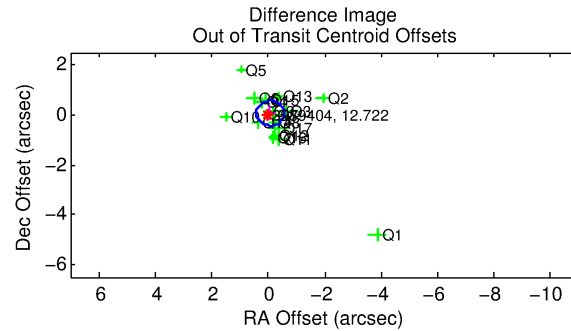
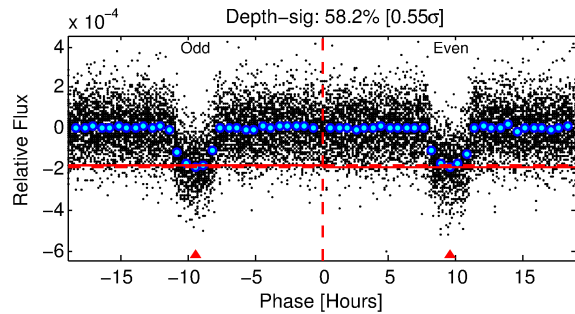
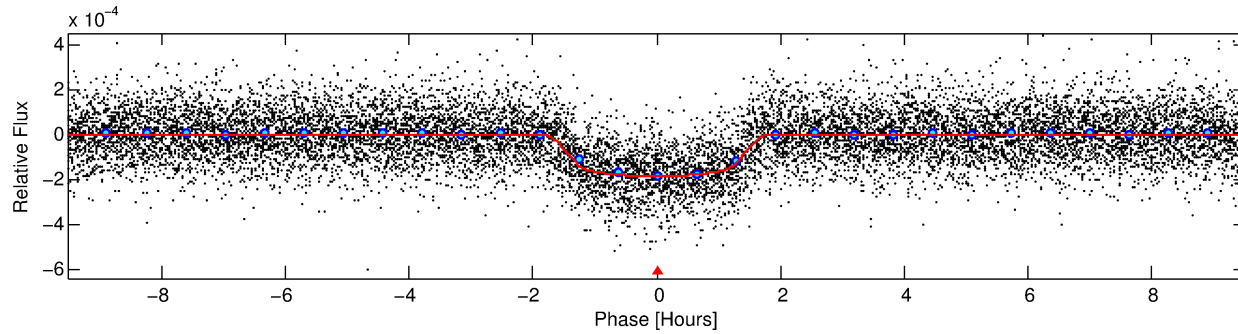
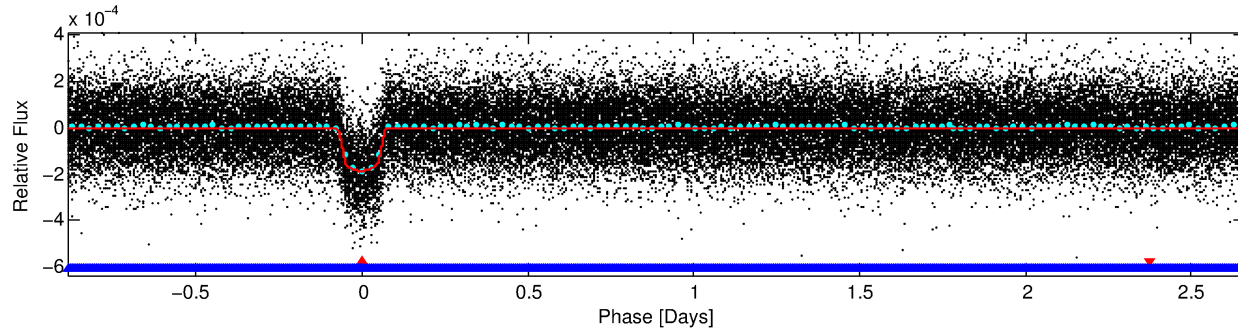
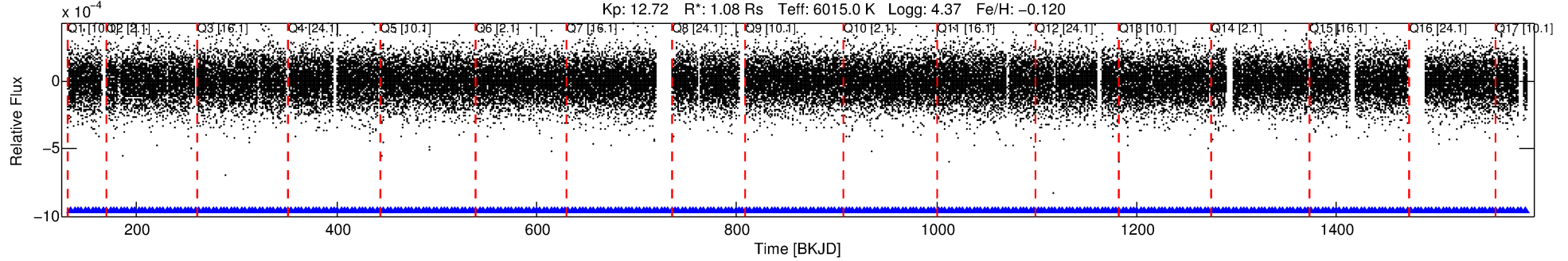
Ephemeris Match Information For 002989404-01

No Significant Match Found

DV One-Page Summary

KIC: 2989404 Candidate: 1 of 2 Period: 3.554 d
KOI: K01824.01 Name: Kepler-323c Corr: 0.979

Kp: 12.72 R*: 1.08 Rs Teff: 6015.0 K Logg: 4.37 Fe/H: -0.120



DV Fit Results:

Period = 3.55382 [0.00000] d
Epoch = 134.6441 [0.0007] BKJD
Rp/R* = 0.0147 [0.0011]
a/R* = 4.14 [1.48]
b = 0.90 [0.08]
Seff = 659.87 [150.09]
Teq = 1292 [73] K
Rp = 1.73 [0.32] Re
a = 0.0456 [0.0065] AU
Ag = 3.06 [1.36] [1.51σ]
Teffp = 2643 [265] K [4.91σ]

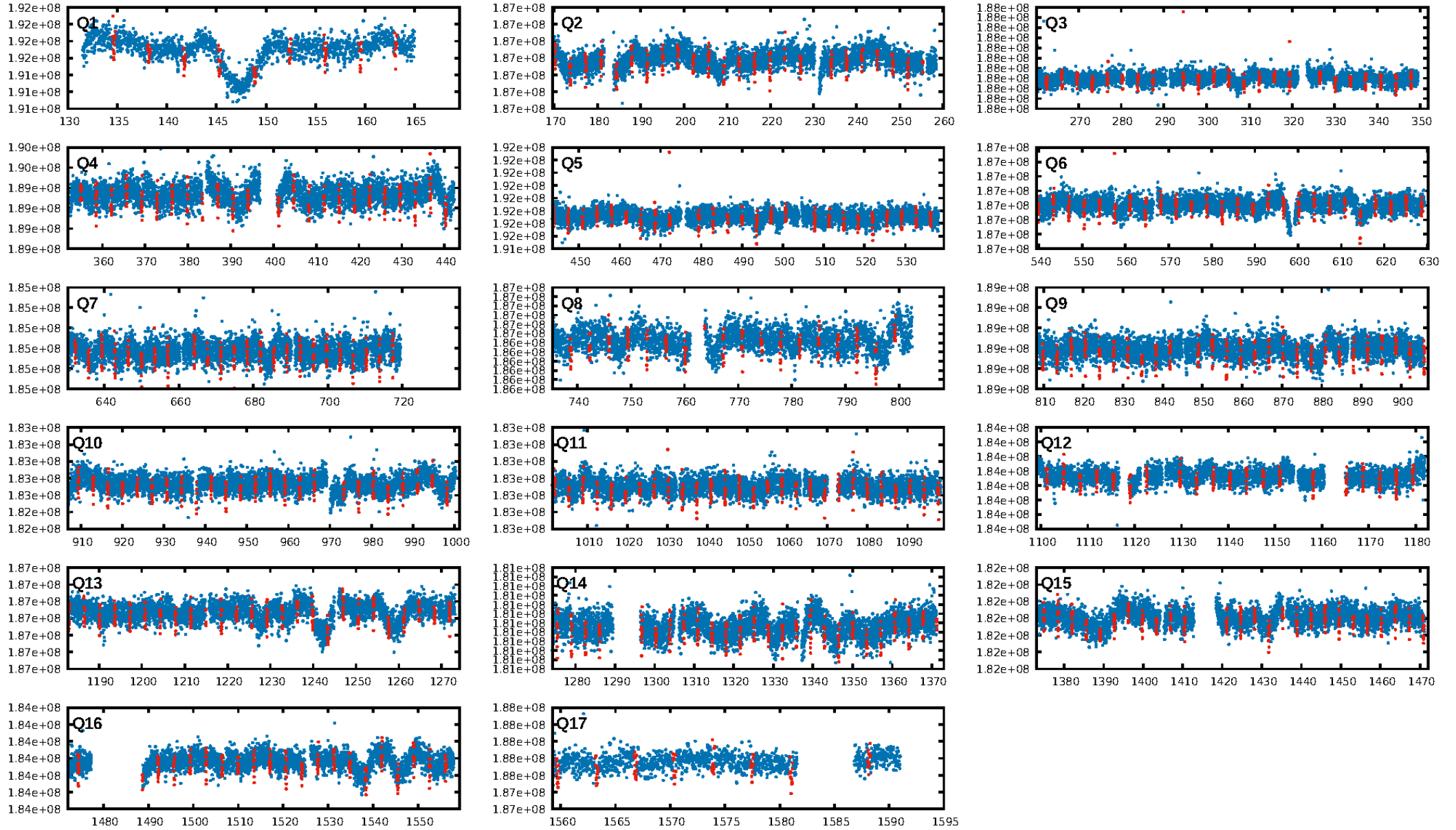
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [11.24σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [360/360]
GhostDiagnostic-chr: 4.732
Centroid-sig: 3.2%
Centroid-so: 0.234 arcsec [1.17σ]
OotOffset-rm: 0.093 arcsec [0.56σ]
KicOffset-rm: 0.104 arcsec [0.26σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 1.00 [17/17]

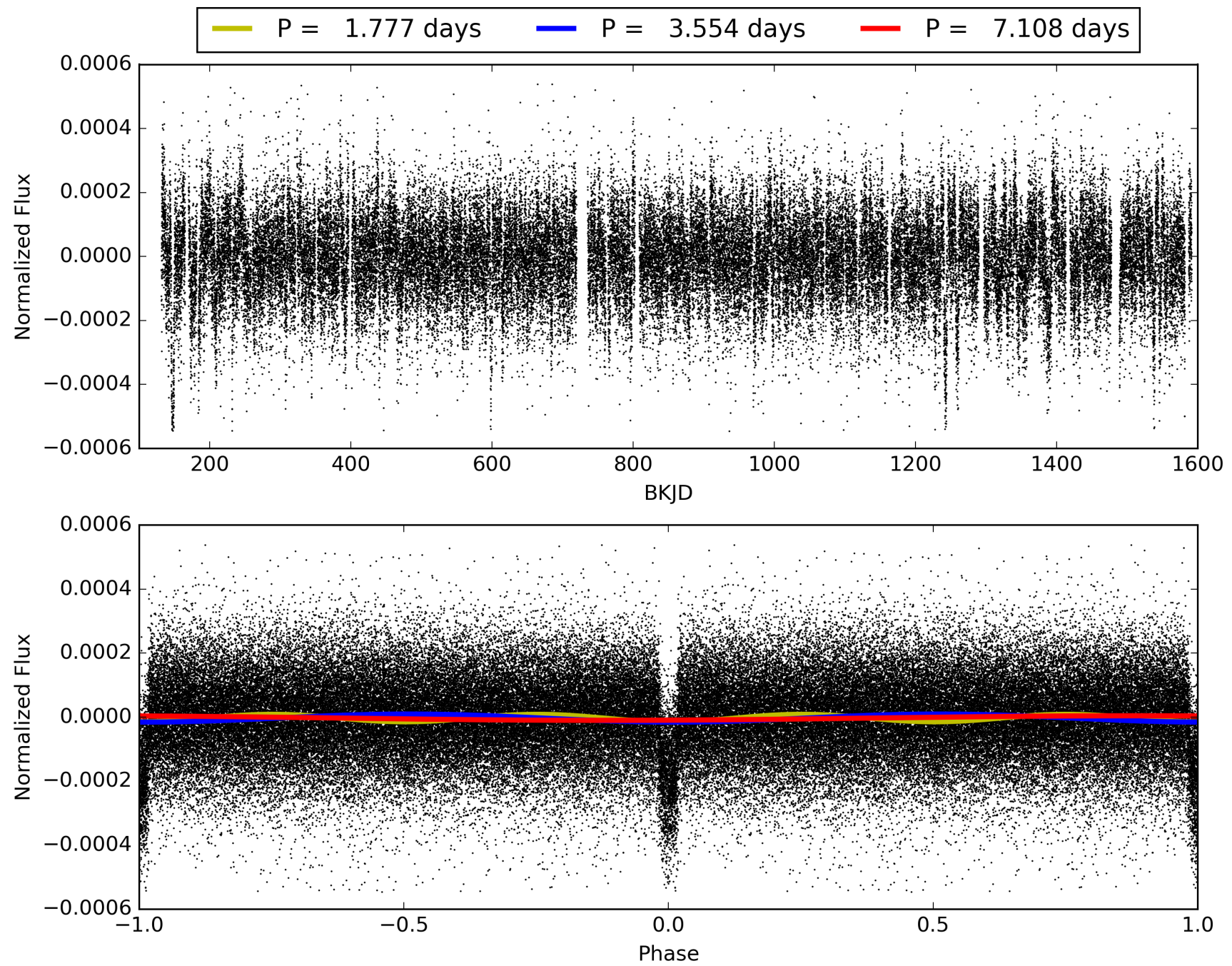
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:31:18 Z

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

TCE 002989404-01, PDC Light Curves

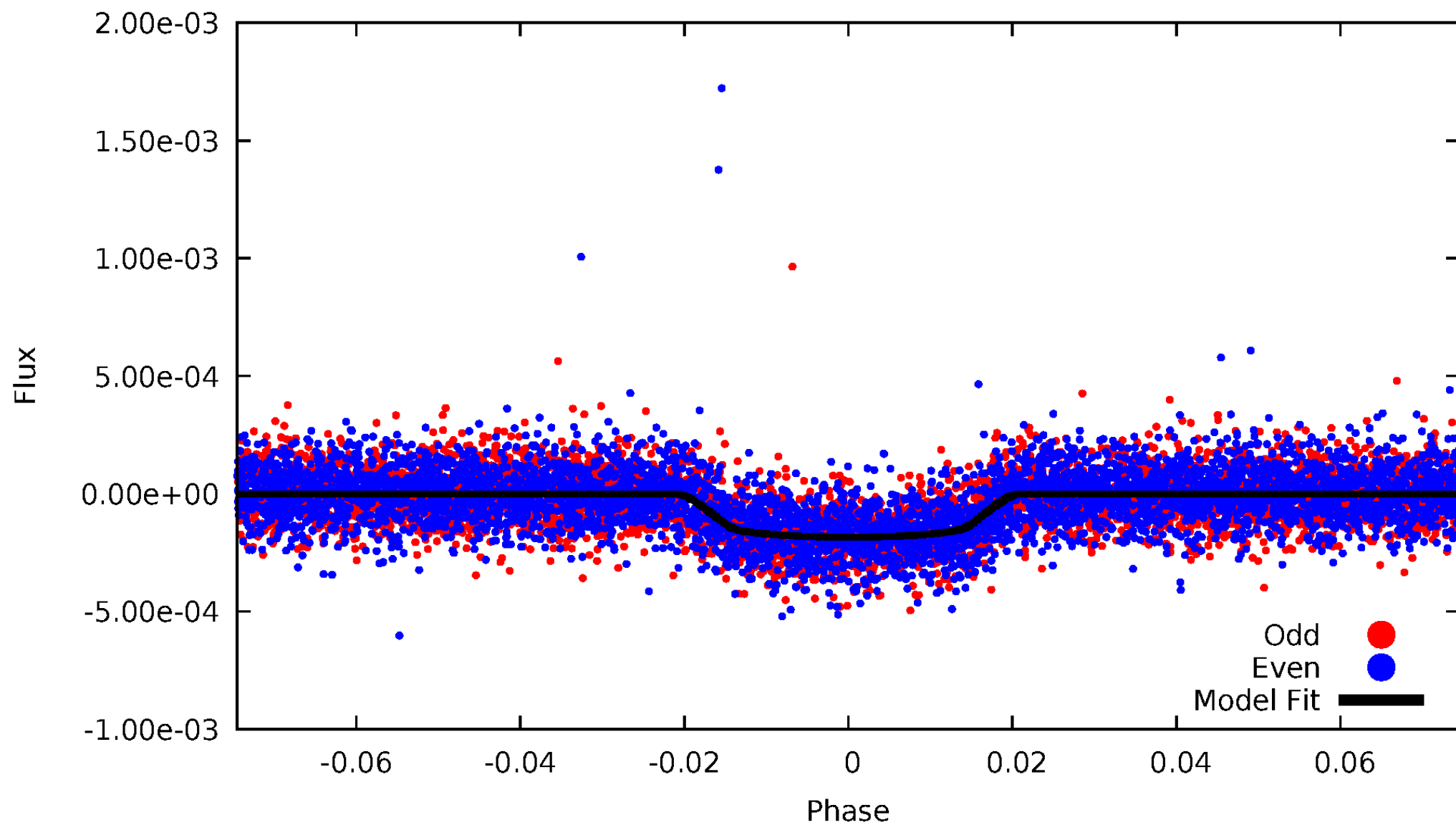


TCE 002989404-01



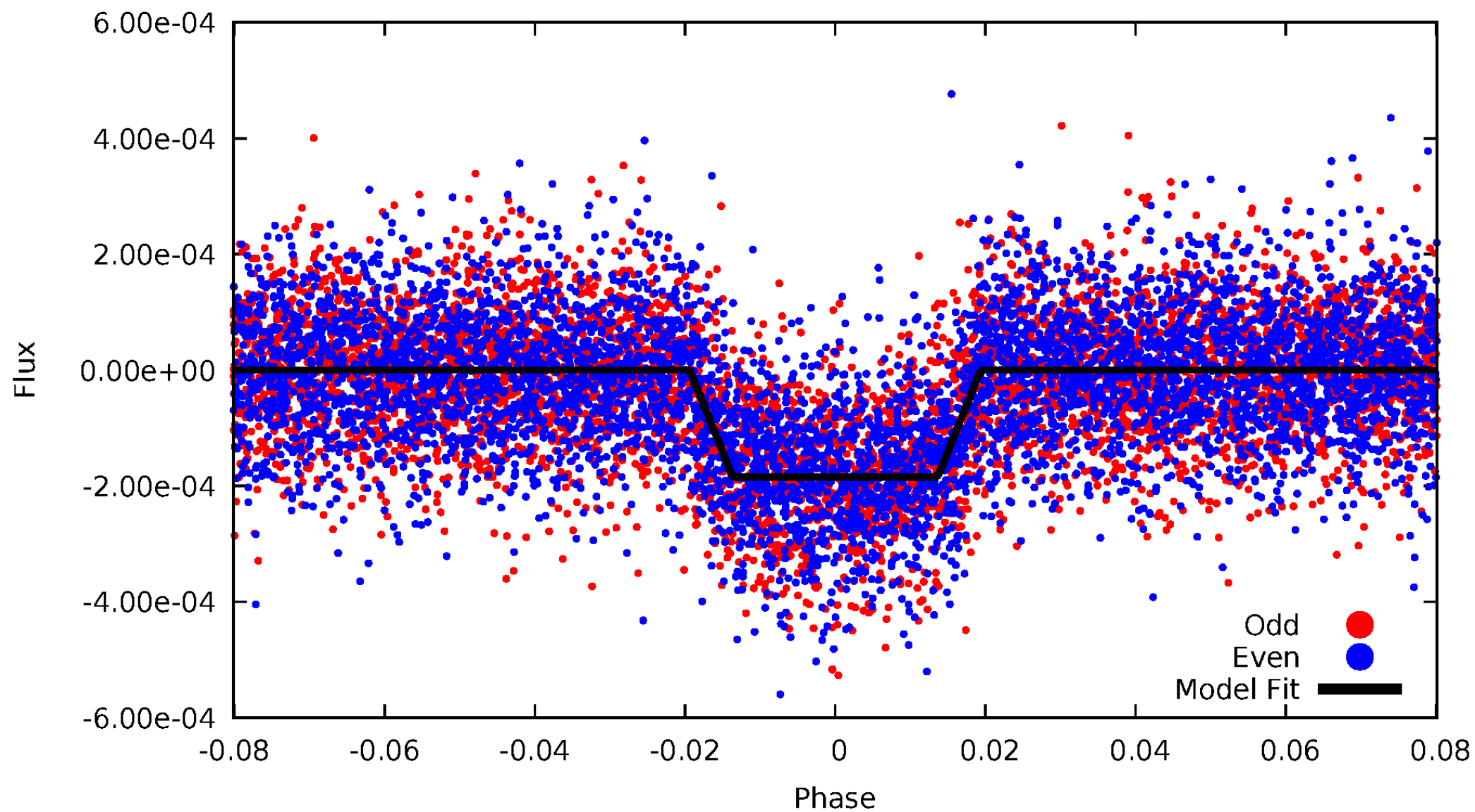
DV Odd/Even

TCE 002989404-01

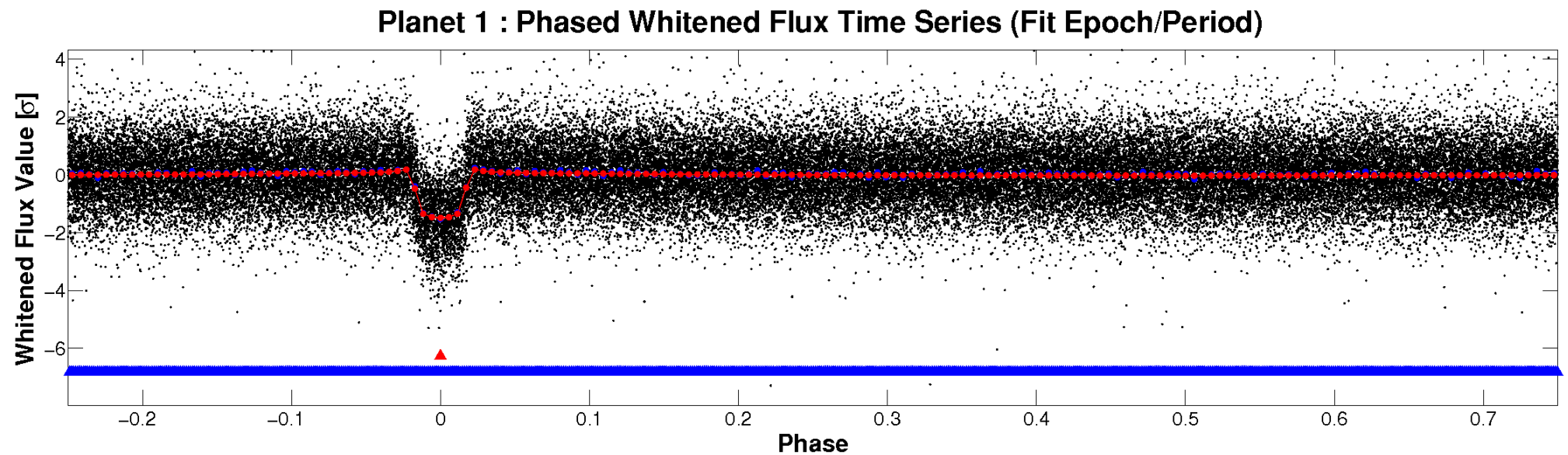
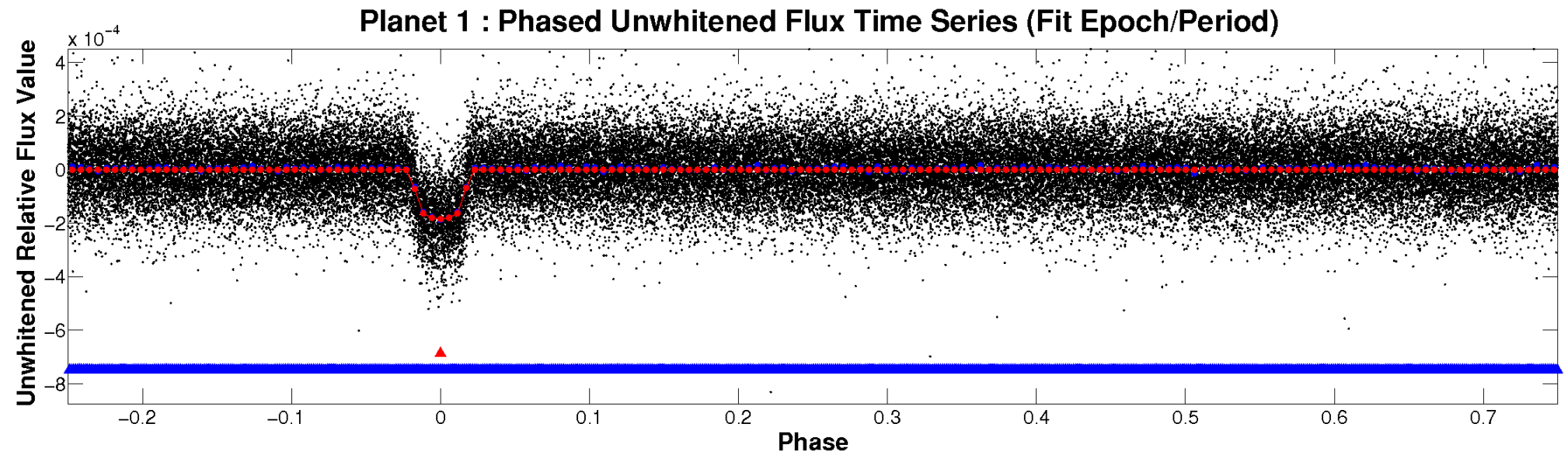


ALT Odd/Even

TCE 002989404-01

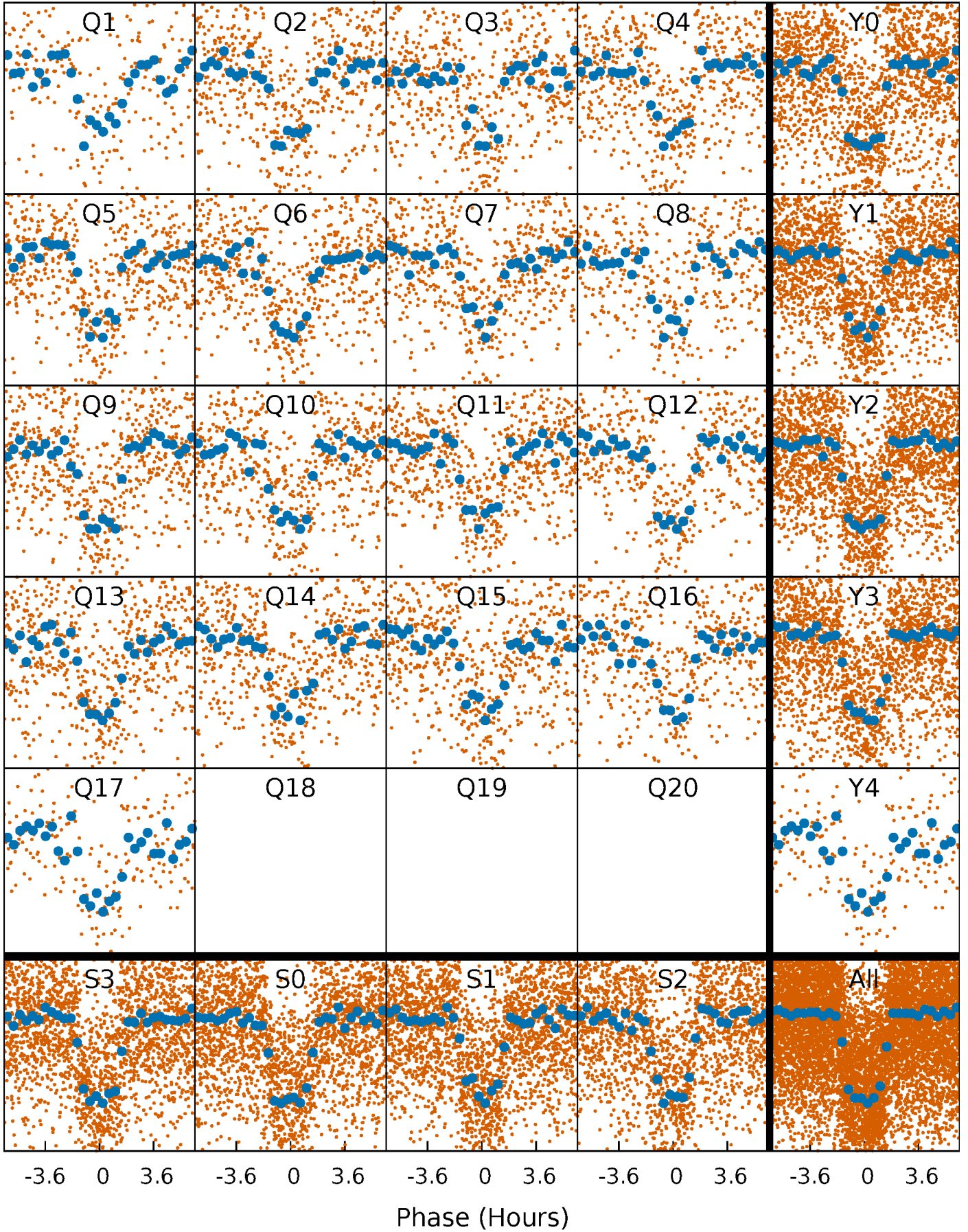


Non-Whitened Vs. Whitened Light Curve



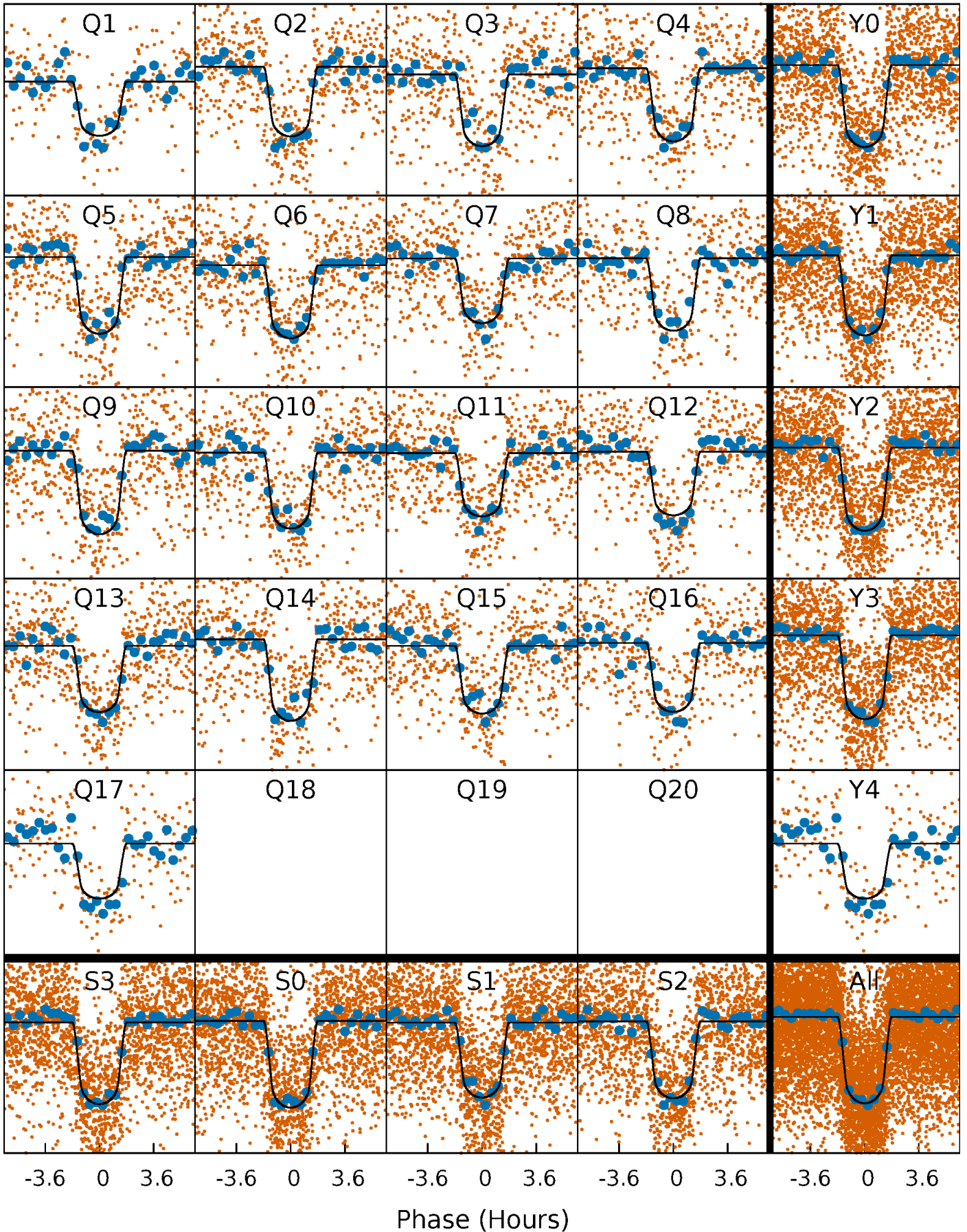
PDC Quarter-Phased Transit Curves

TCE 002989404-01 P= 3.553817 Days $T_0=134.644113$ (BKJD)



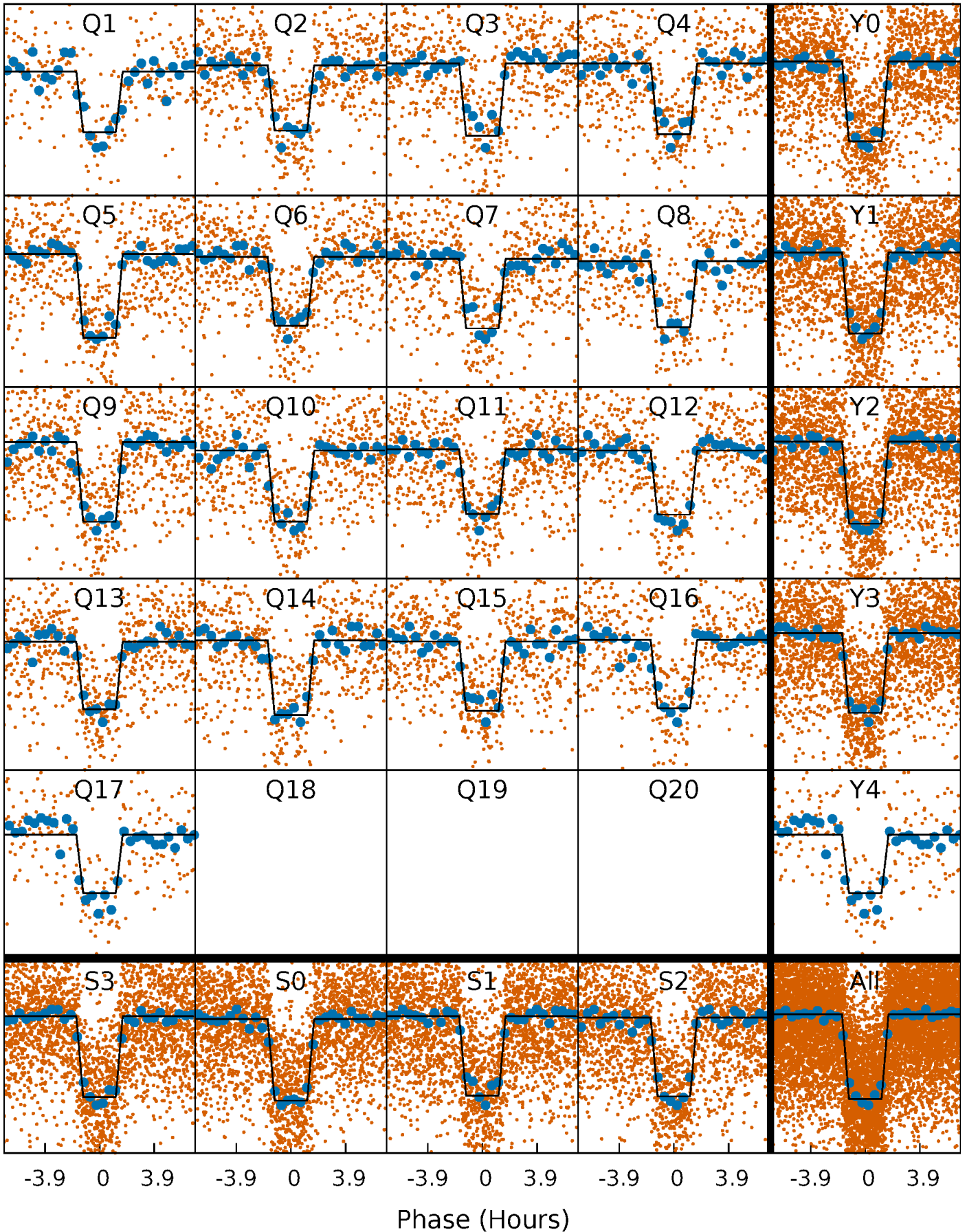
DV Quarter-Phased Transit Curves

TCE 002989404-01 P= 3.553817 Days $T_0=134.644113$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

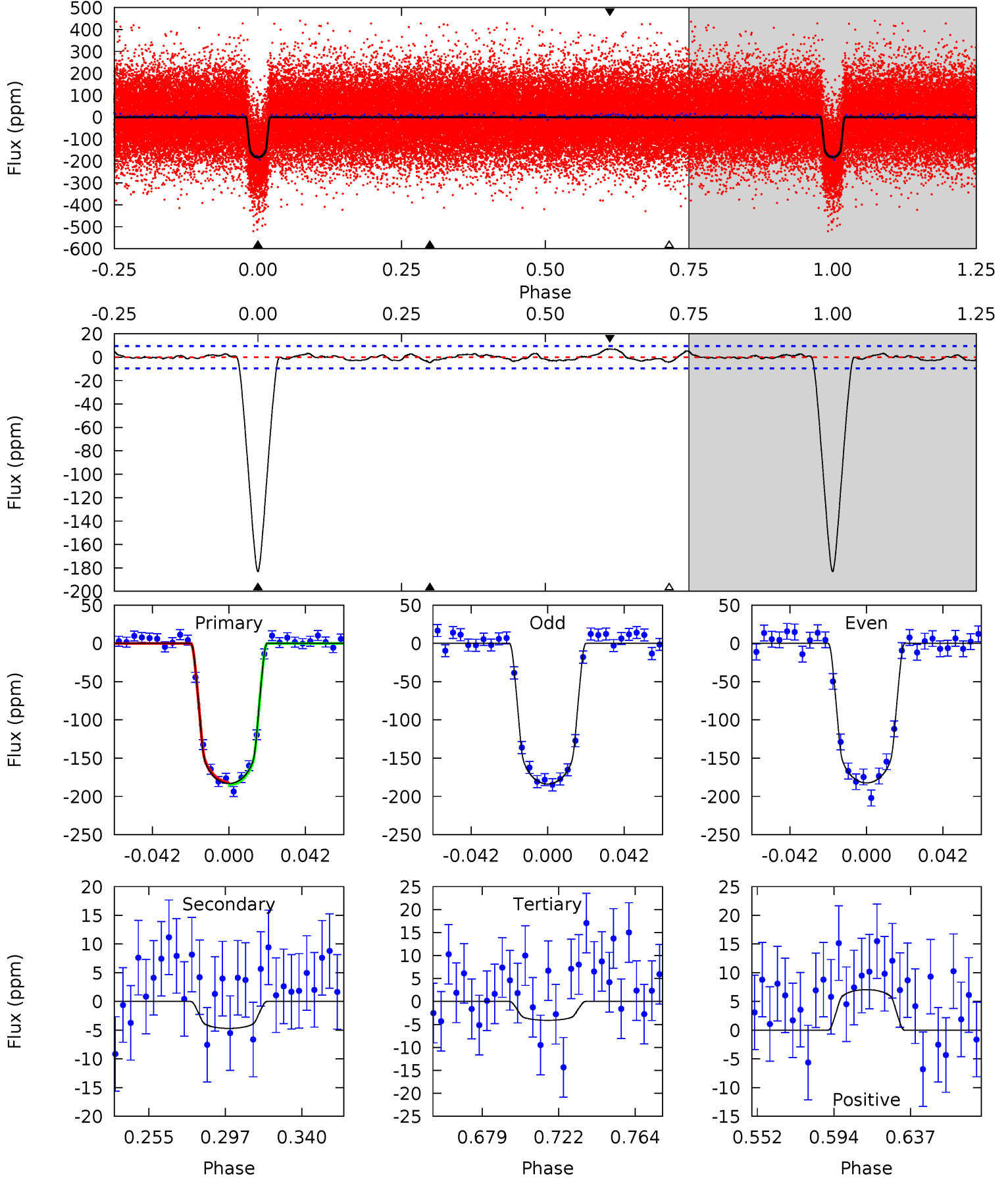
TCE 002989404-01 P= 3.553849 Days $T_0=134.637129$ (BKJD)



DV Model-Shift Uniqueness Test

002989404-01, P = 3.553817 Days, E = 131.090296 Days

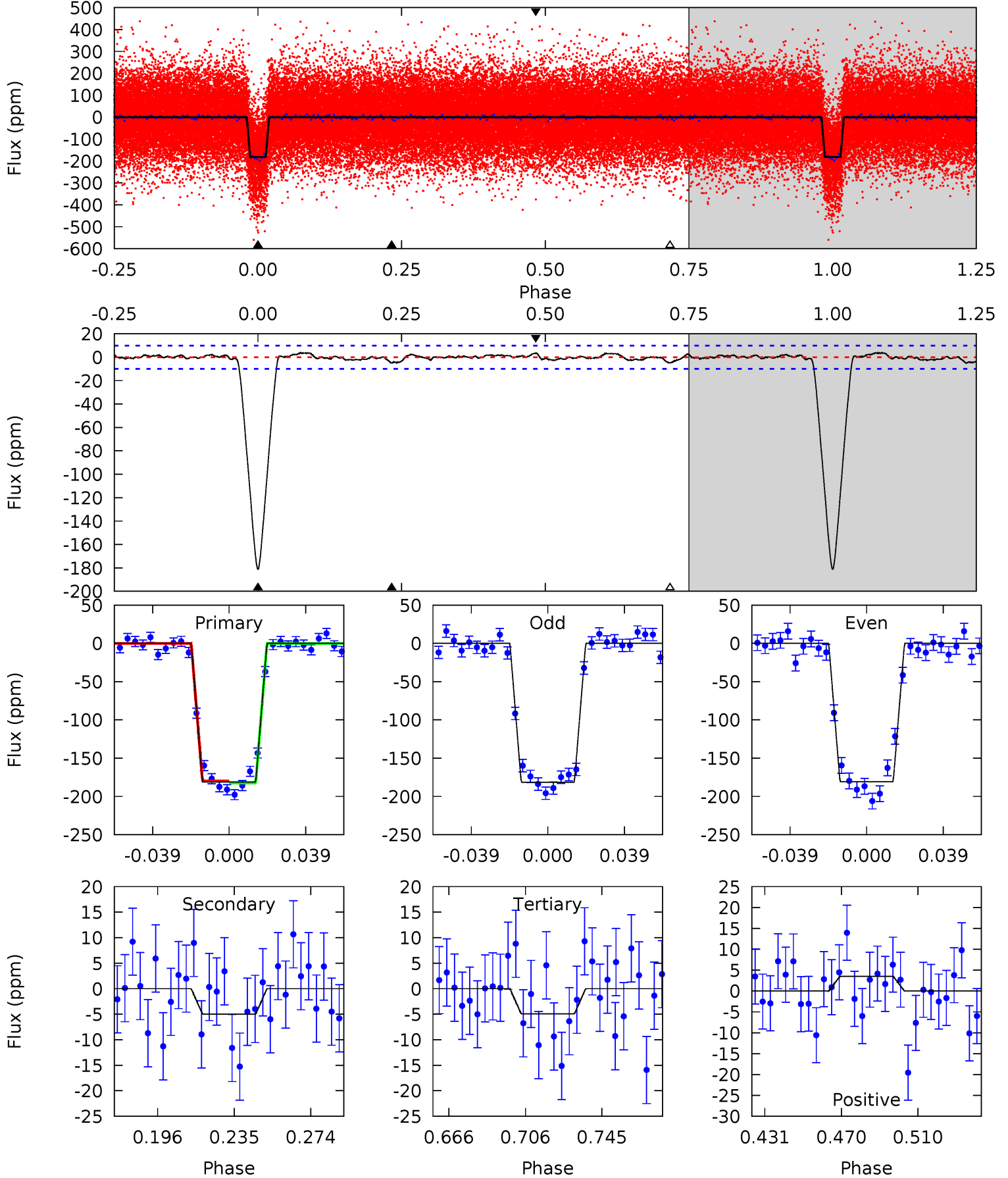
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
91.0	2.33	2.04	3.51	4.74	2.03	1.11	89.0	87.5	0.29	-1.18	0.35	1.00	0.04	0.70



Alt Model-Shift Uniqueness Test

002989404-01, P = 3.553849 Days, E = 131.083280 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
86.5	2.37	2.35	1.68	4.76	2.06	0.75	84.2	84.8	0.02	0.69	0.13	1.02	0.02	0.59



Stellar Parameters For KIC 002989404

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6015^{+108}_{-132}	$4.370^{+0.095}_{-0.116}$	$-0.120^{+0.150}_{-0.150}$	$1.081^{+0.180}_{-0.120}$	$0.998^{+0.075}_{-0.067}$	$1.112^{+0.437}_{-0.370}$
	+2%/-2%	+2%/-3%	+125%/-125%	+17%/-11%	+8%/-7%	+39%/-33%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 002989404-01 / KOI 1824.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-5 ± 2	$1.74^{+0.21}_{-0.18}$	1810^{+81}_{-77}	2908^{+198}_{-281}	$1.743^{+0.969}_{-0.783}$
Alt.	-5 ± 2	$1.61^{+0.19}_{-0.18}$	1804^{+87}_{-71}	3008^{+206}_{-266}	$2.190^{+1.160}_{-0.953}$

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

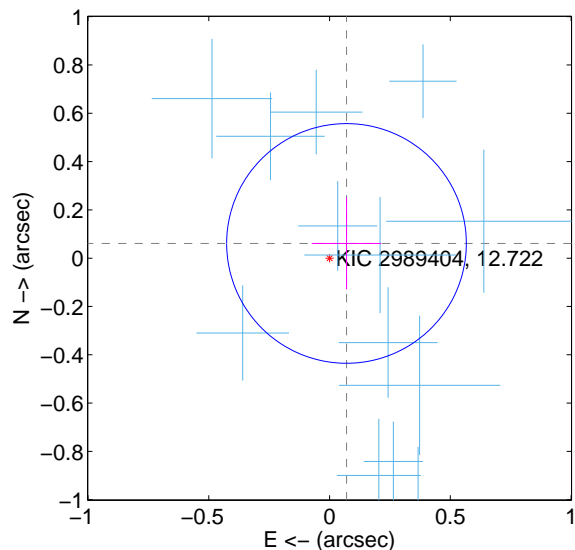
Supplemental centroid analysis for 002989404-01. Kepler magnitude: 12.72. Transit SNR 61.40

There are 16 quarters with good PRF difference image offsets

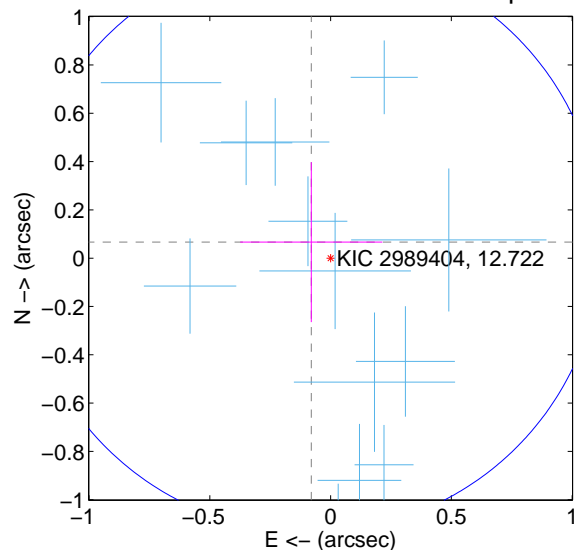
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.093 ± 0.165	0.56	-0.070 ± 0.144	0.061 ± 0.190
PRF-fit source offset from KIC position	0.104 ± 0.401	0.26	0.080 ± 0.294	0.067 ± 0.331
photometric centroid source offset	0.23 ± 0.20	1.17	-0.16 ± 0.17	-0.17 ± 0.22

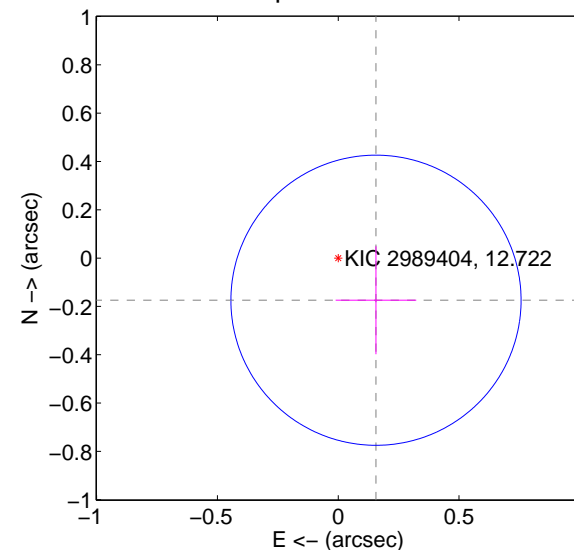
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

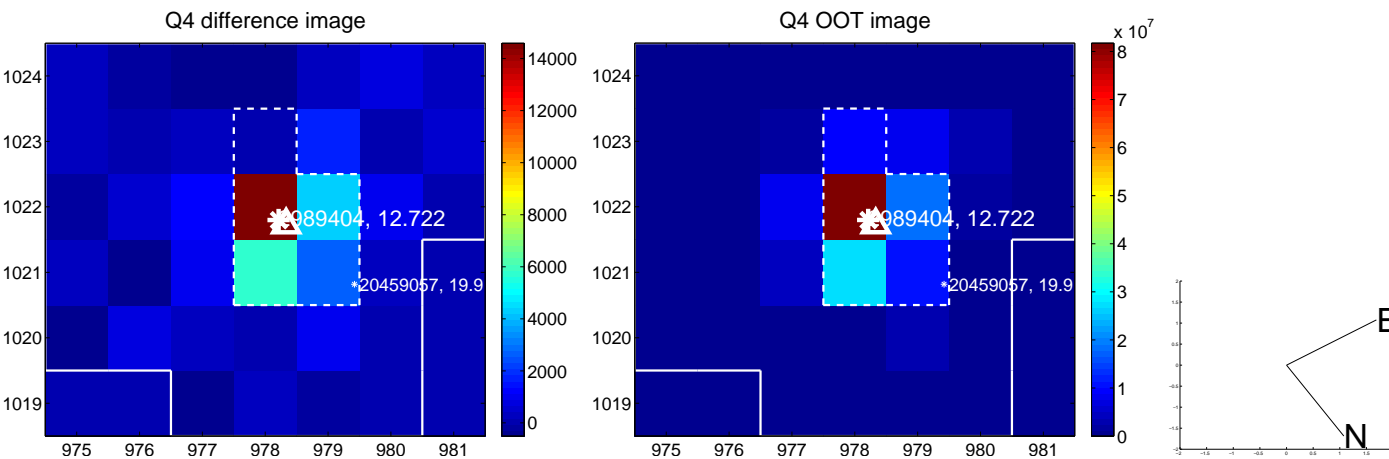
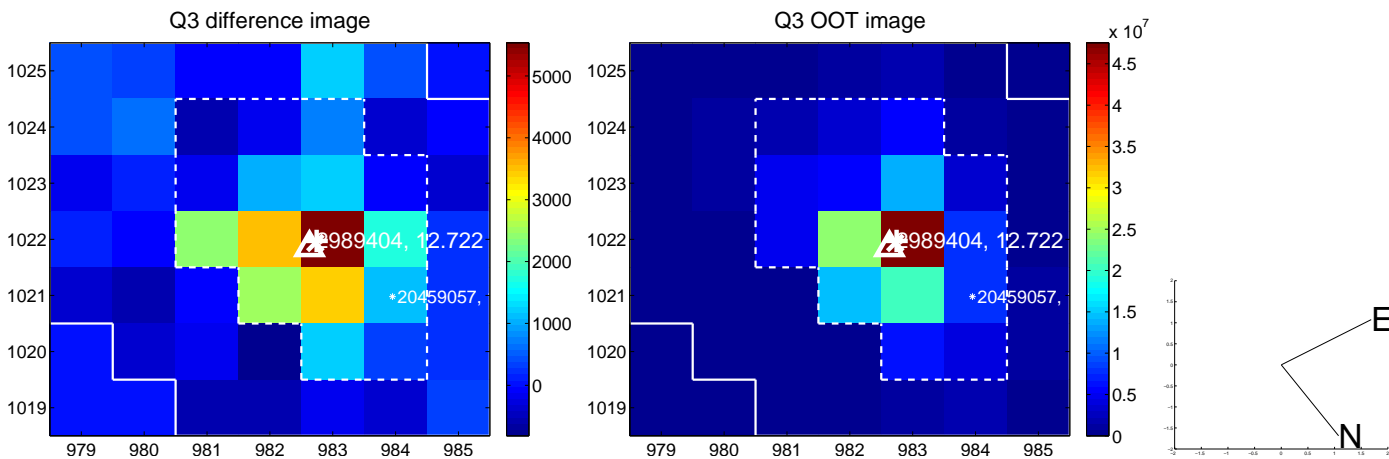
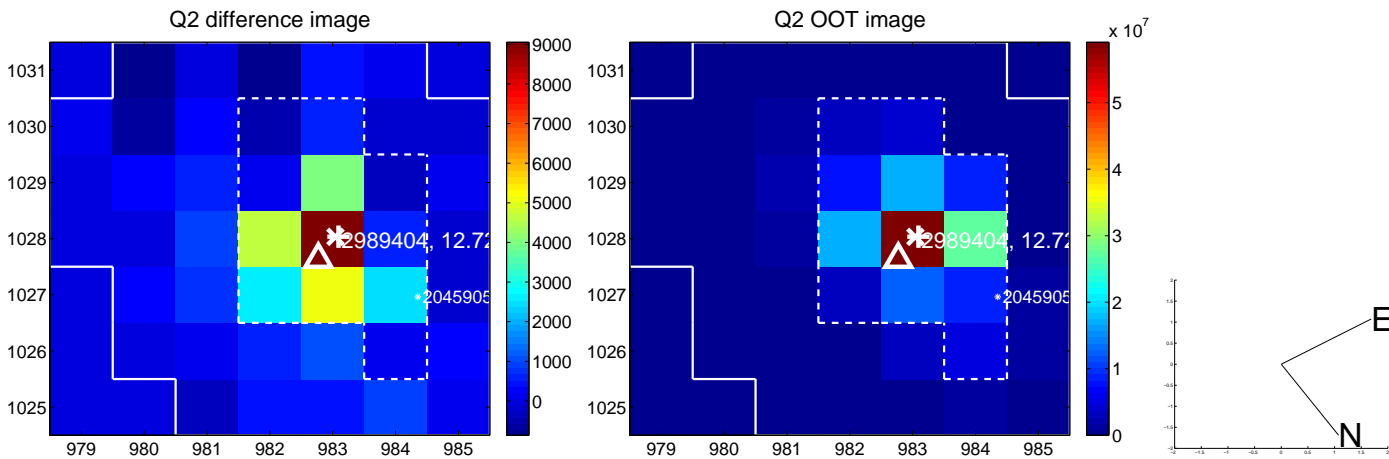
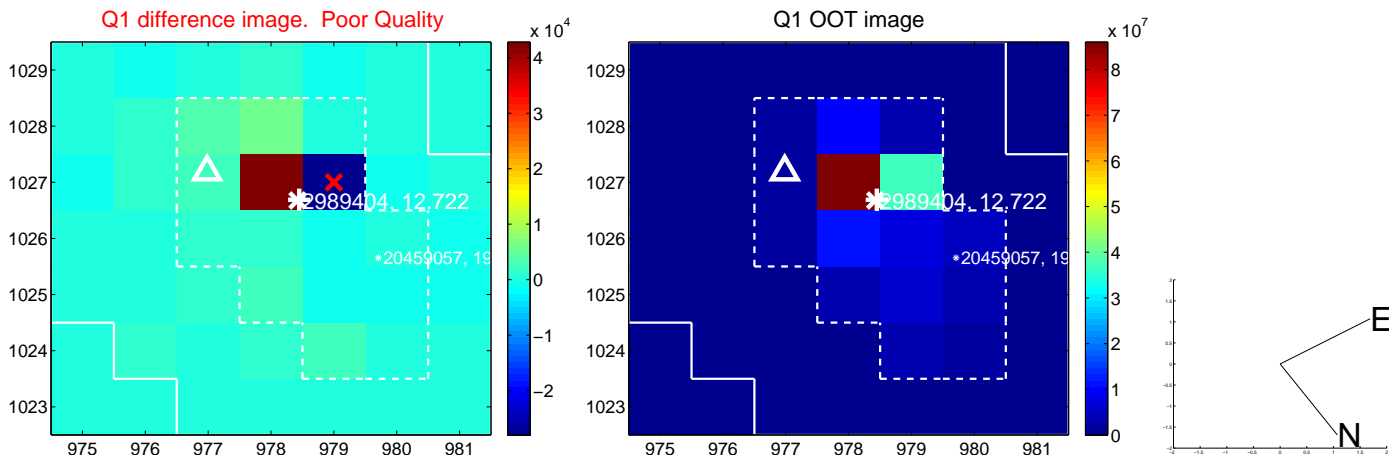


offset from photometric centroids

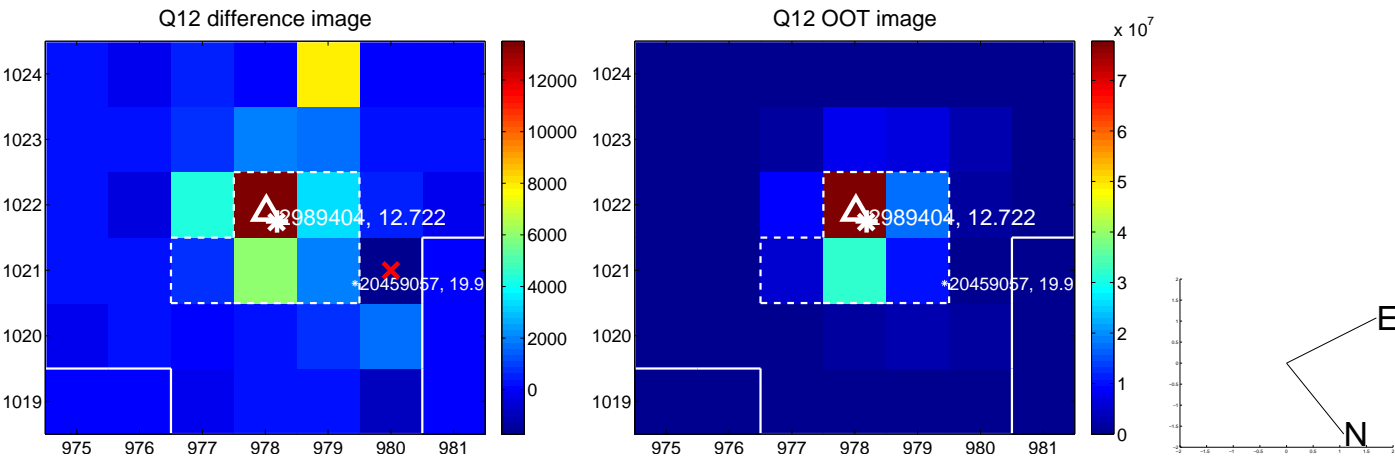
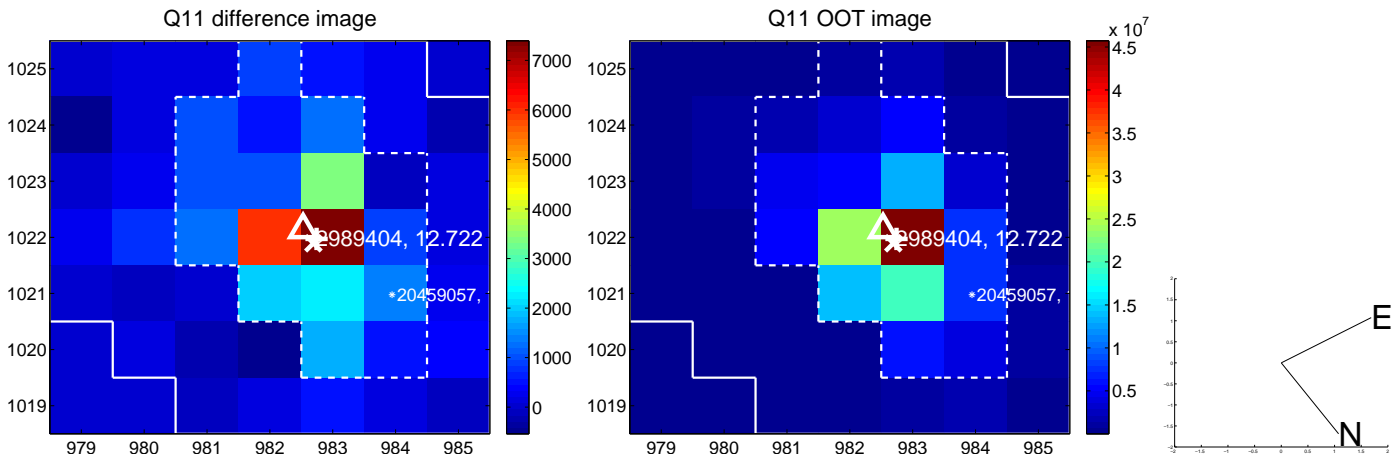
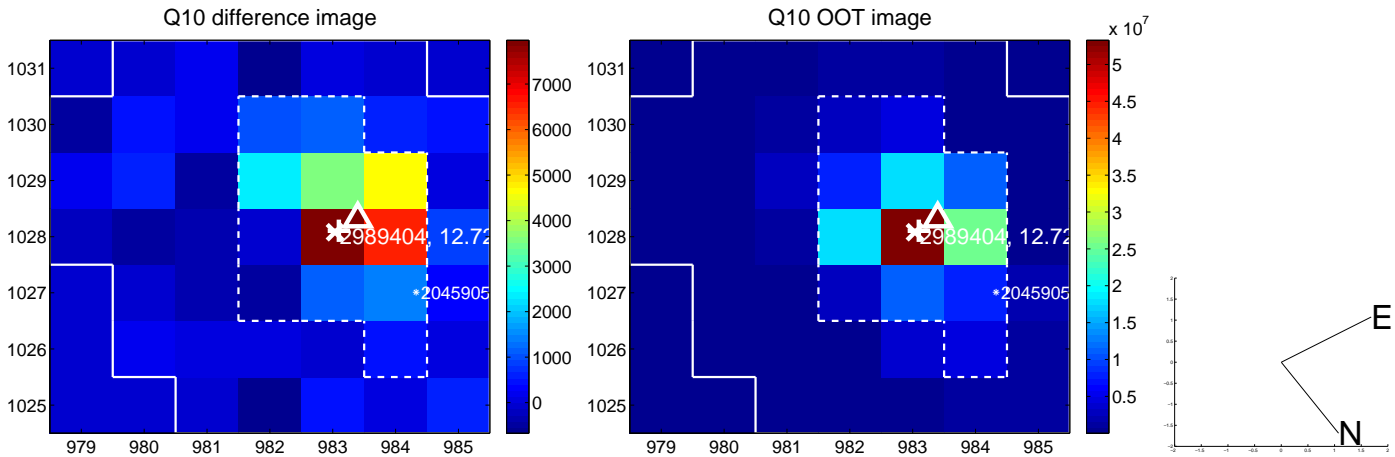
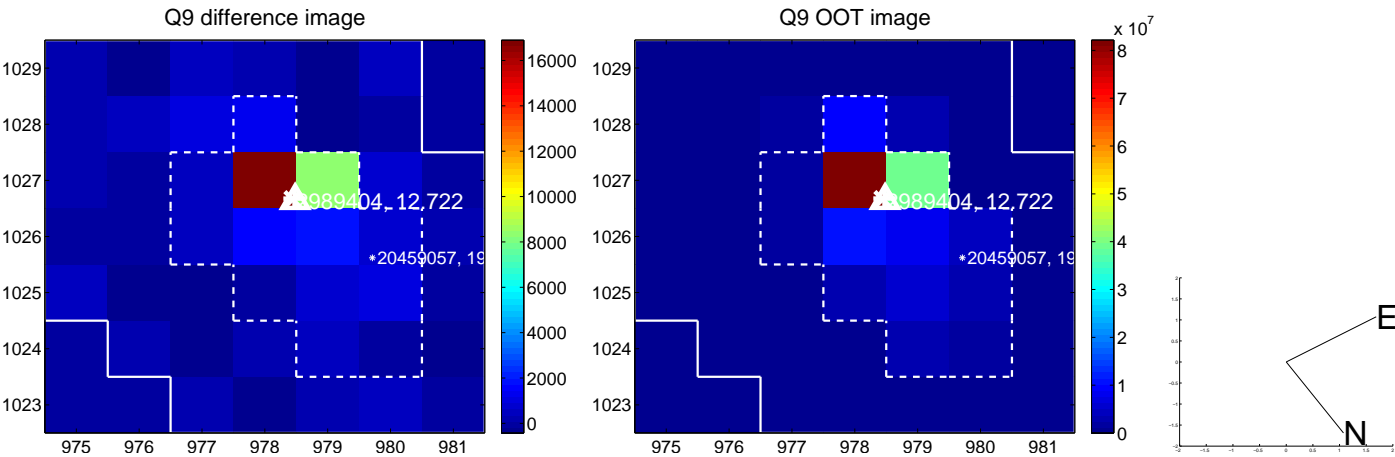


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

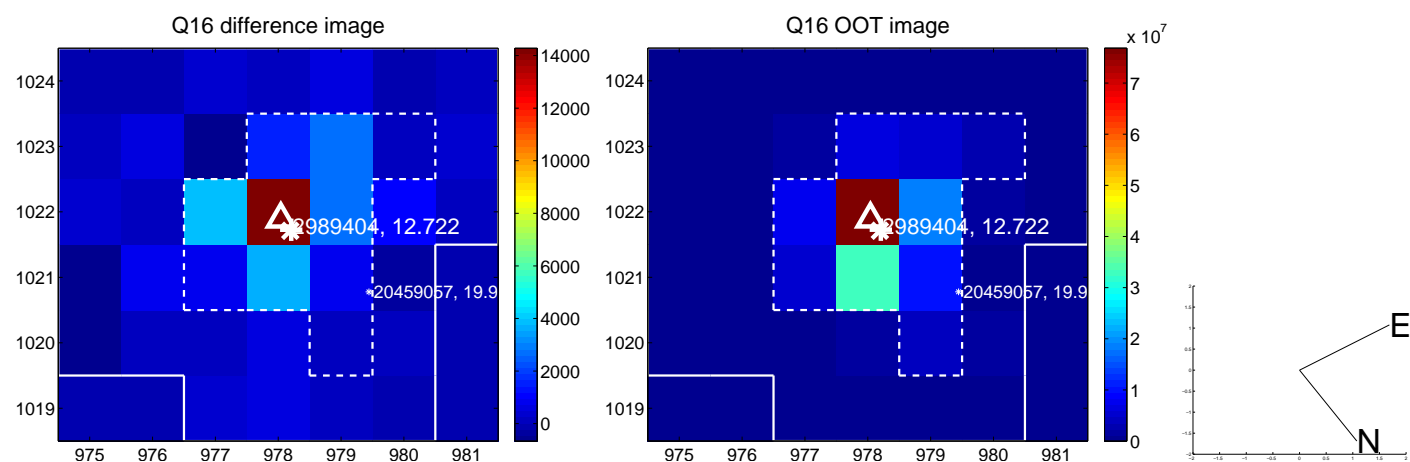
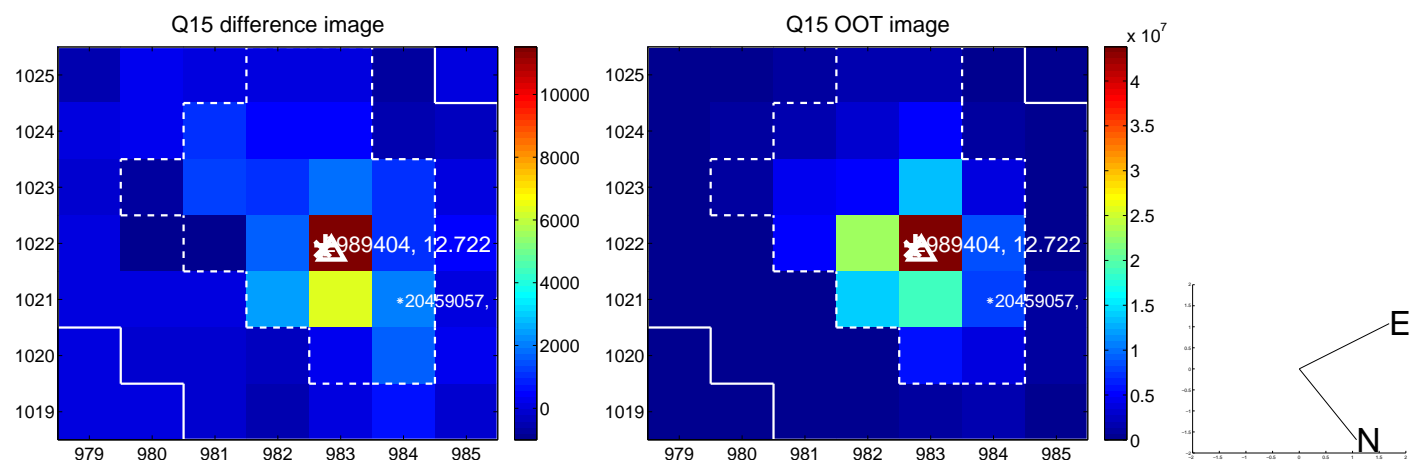
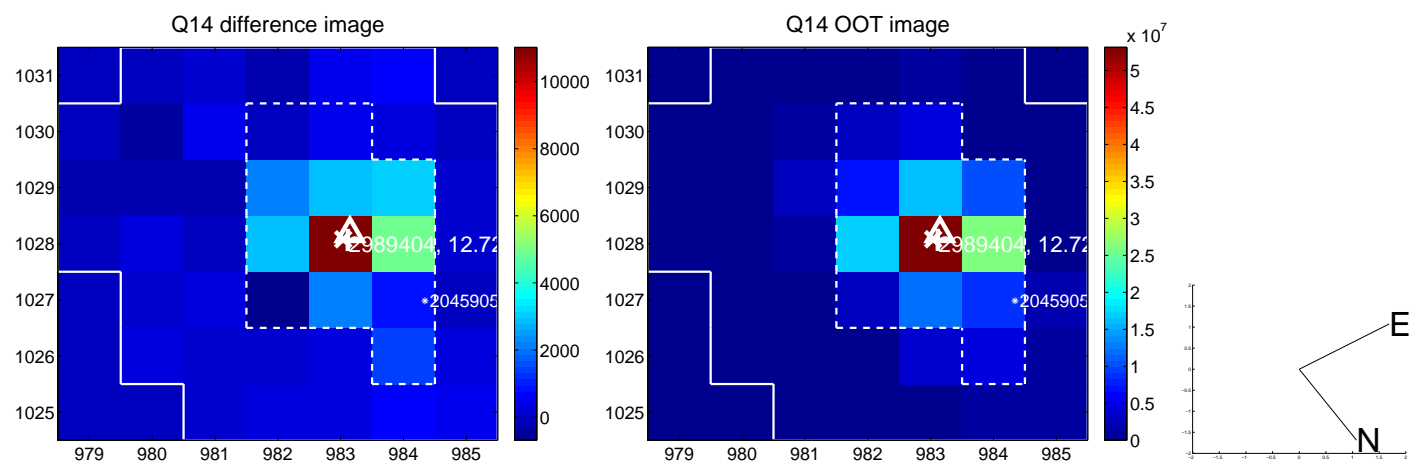
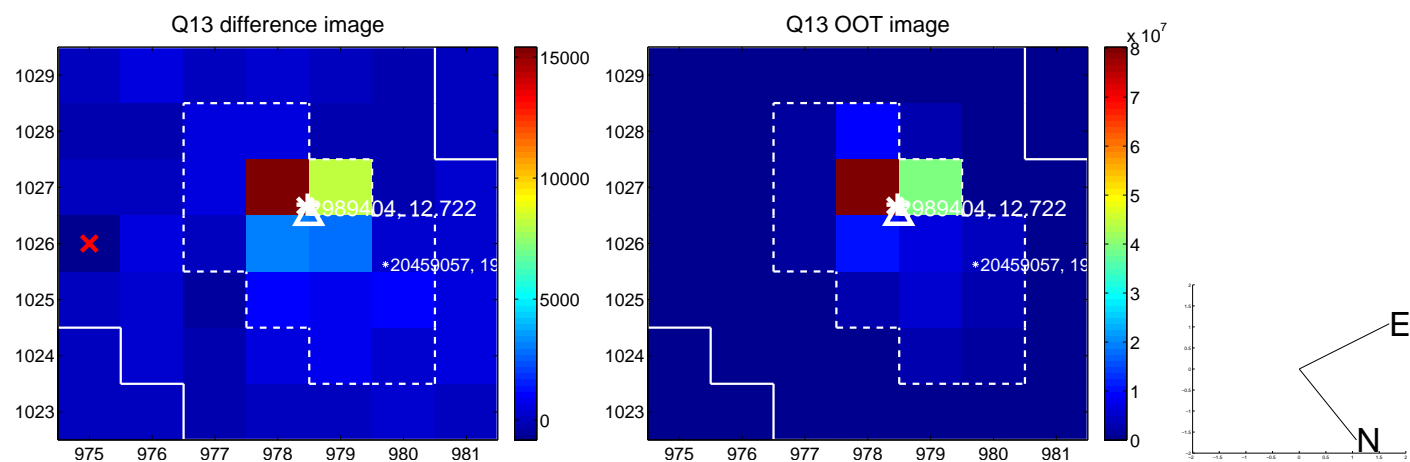
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



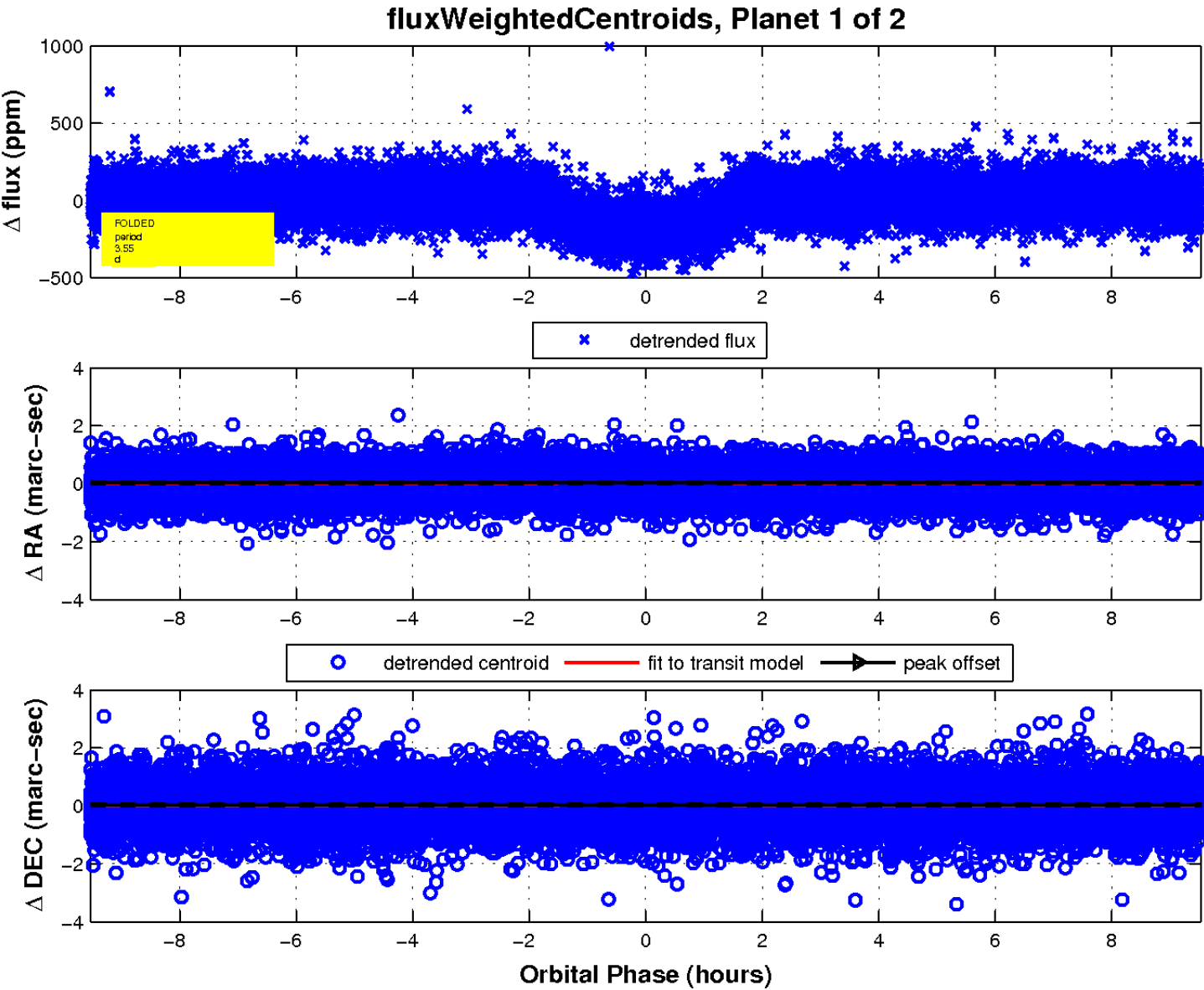
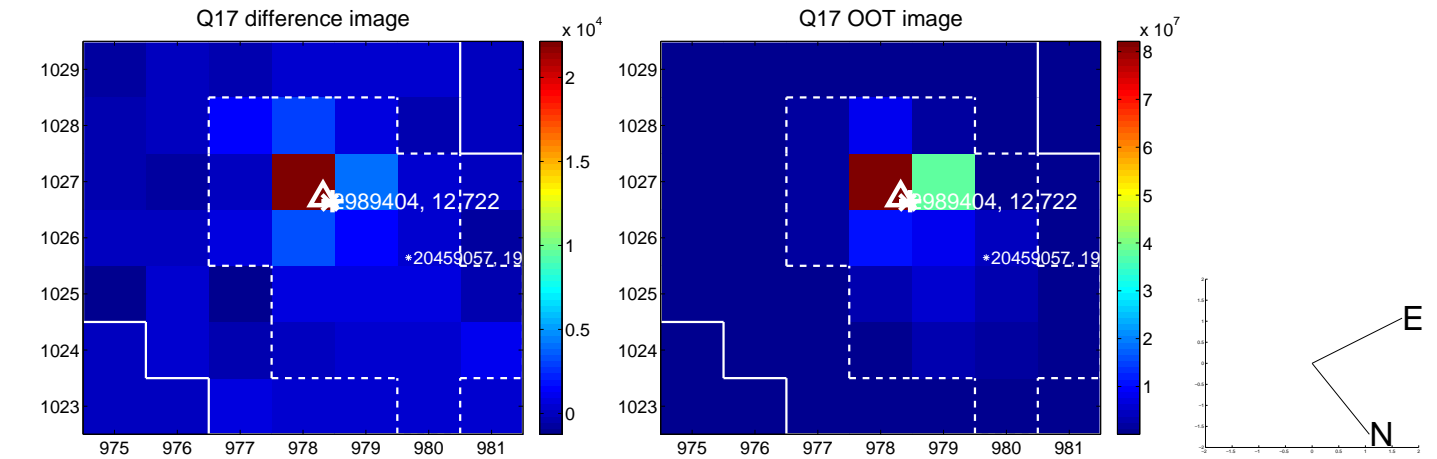
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

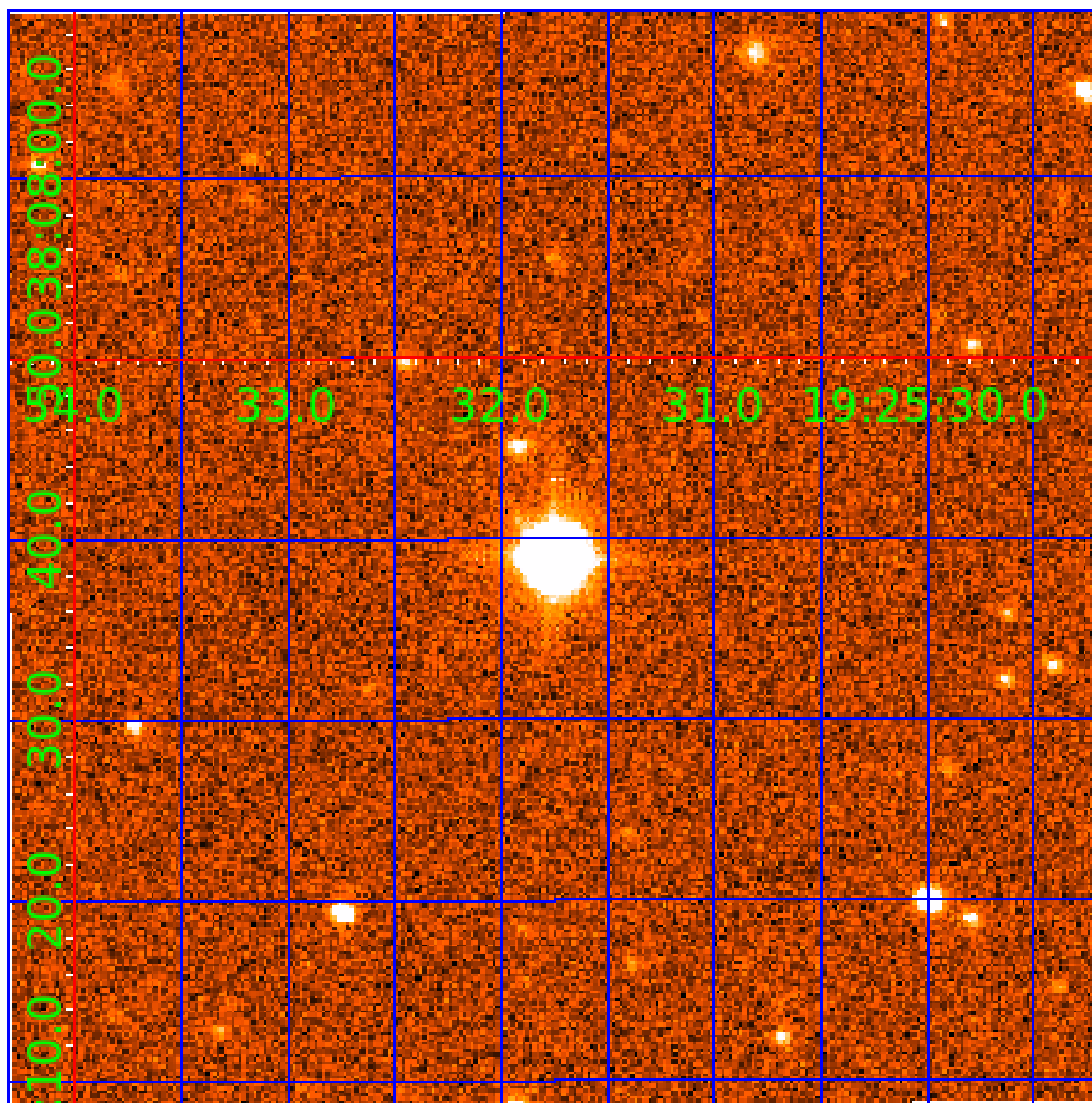


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002989404

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})
002989404-01	OBS	1824.01	3.553817	134.644113	184.8	3.177	54.7	61.4	1.08	6015	1.73	659.87
002989404-02	OBS	1824.02	1.678326	132.696134	135.6	2.439	53.3	61.7	1.08	6015	1.49	1794.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002989404-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
002989404-02	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.

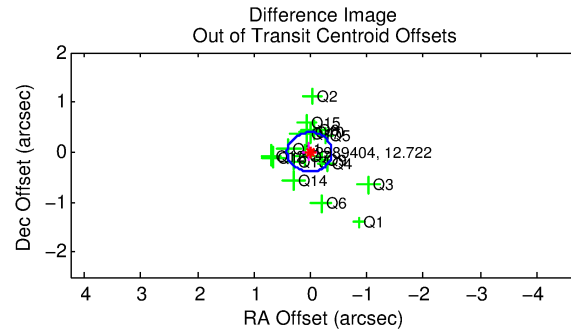
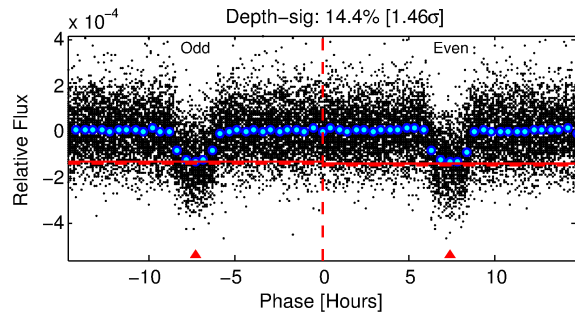
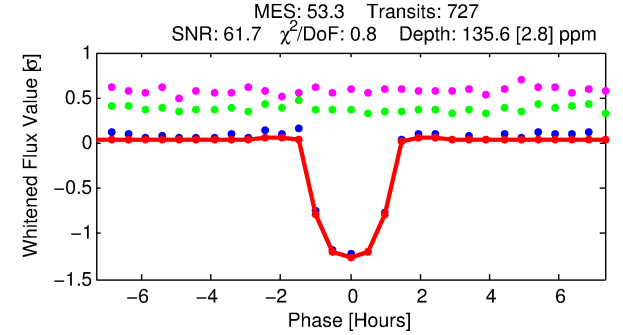
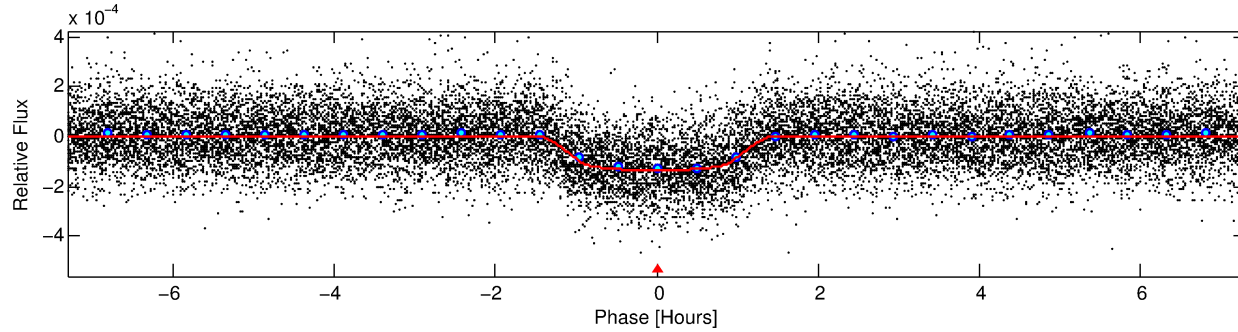
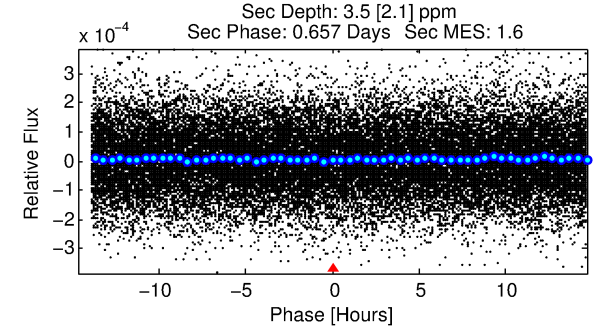
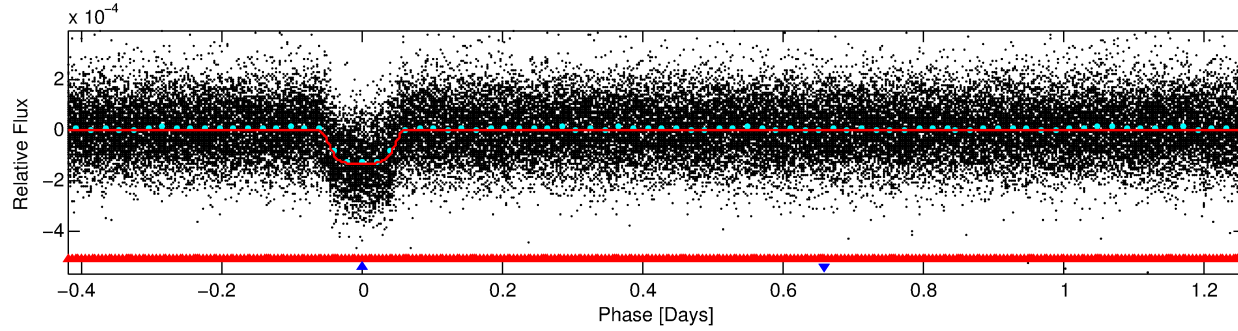
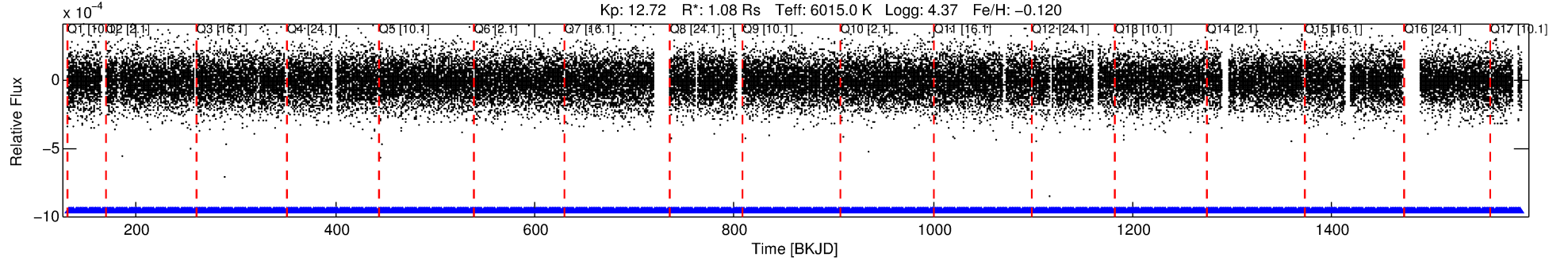
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002989404-02

No Significant Match Found

DV One-Page Summary

KIC: 2989404 Candidate: 2 of 2 Period: 1.678 d
KOI: K01824.02 Name: Kepler-323b Corr: 0.978



DV Fit Results:

Period = 1.67833 [0.00000] d
Epoch = 132.6961 [0.0006] BKJD
Rp/R* = 0.0126 [0.0014]
a/R* = 2.62 [1.28]
b = 0.90 [0.12]
Seff = 1794.26 [408.11]
Teq = 1660 [94] K
Rp = 1.49 [0.30] Re
a = 0.0276 [0.0039] AU
Ag = 0.67 [0.45] [-0.74σ]
Teffp = 2319 [377] K [1.70σ]

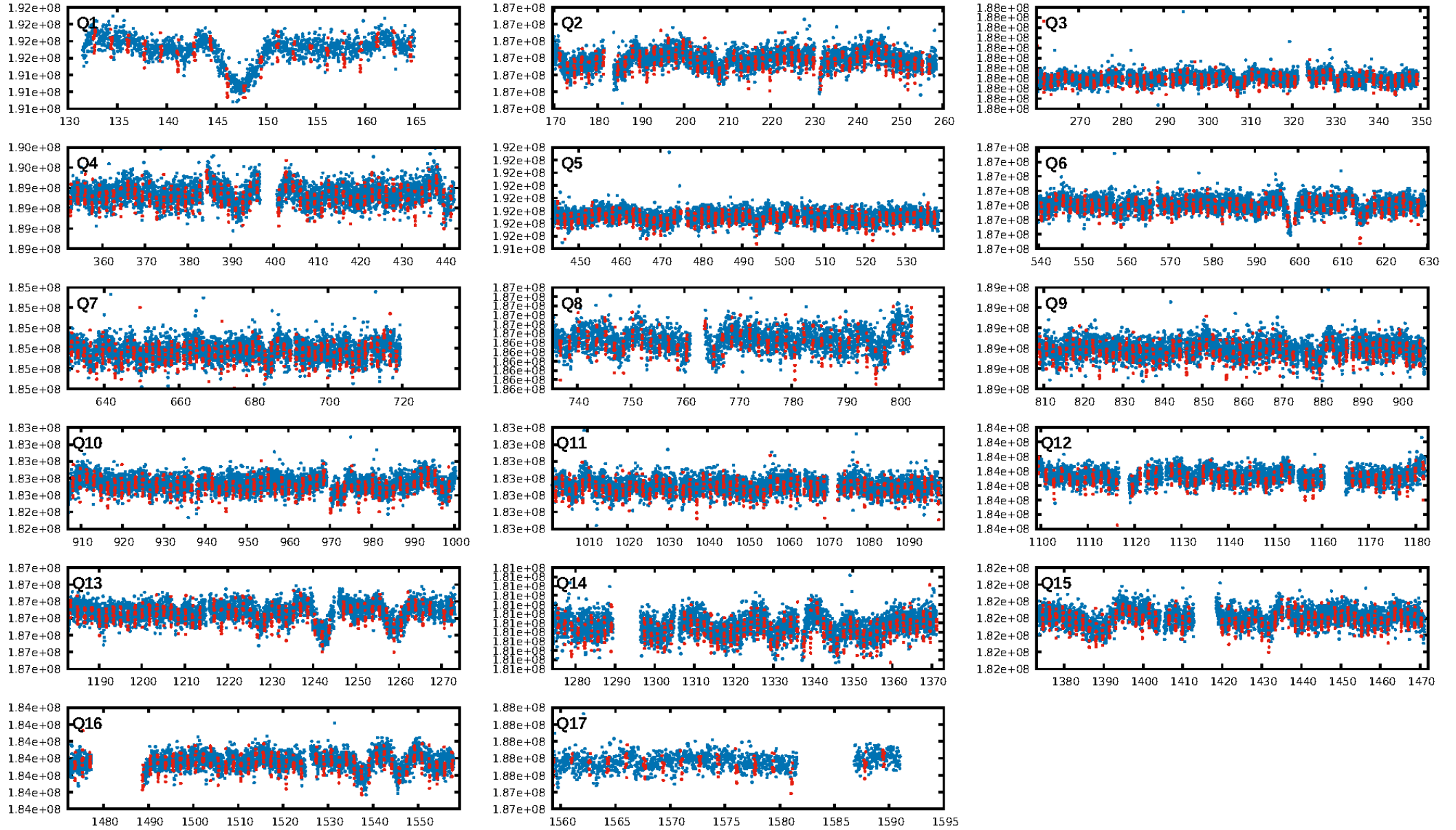
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [11.24σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [693/693]
GhostDiagnostic-chr: 3.772
Centroid-sig: 6.5%
Centroid-so: 0.208 arcsec [1.06σ]
OotOffset-rm: 0.018 arcsec [0.14σ]
KicOffset-rm: 0.159 arcsec [1.24σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

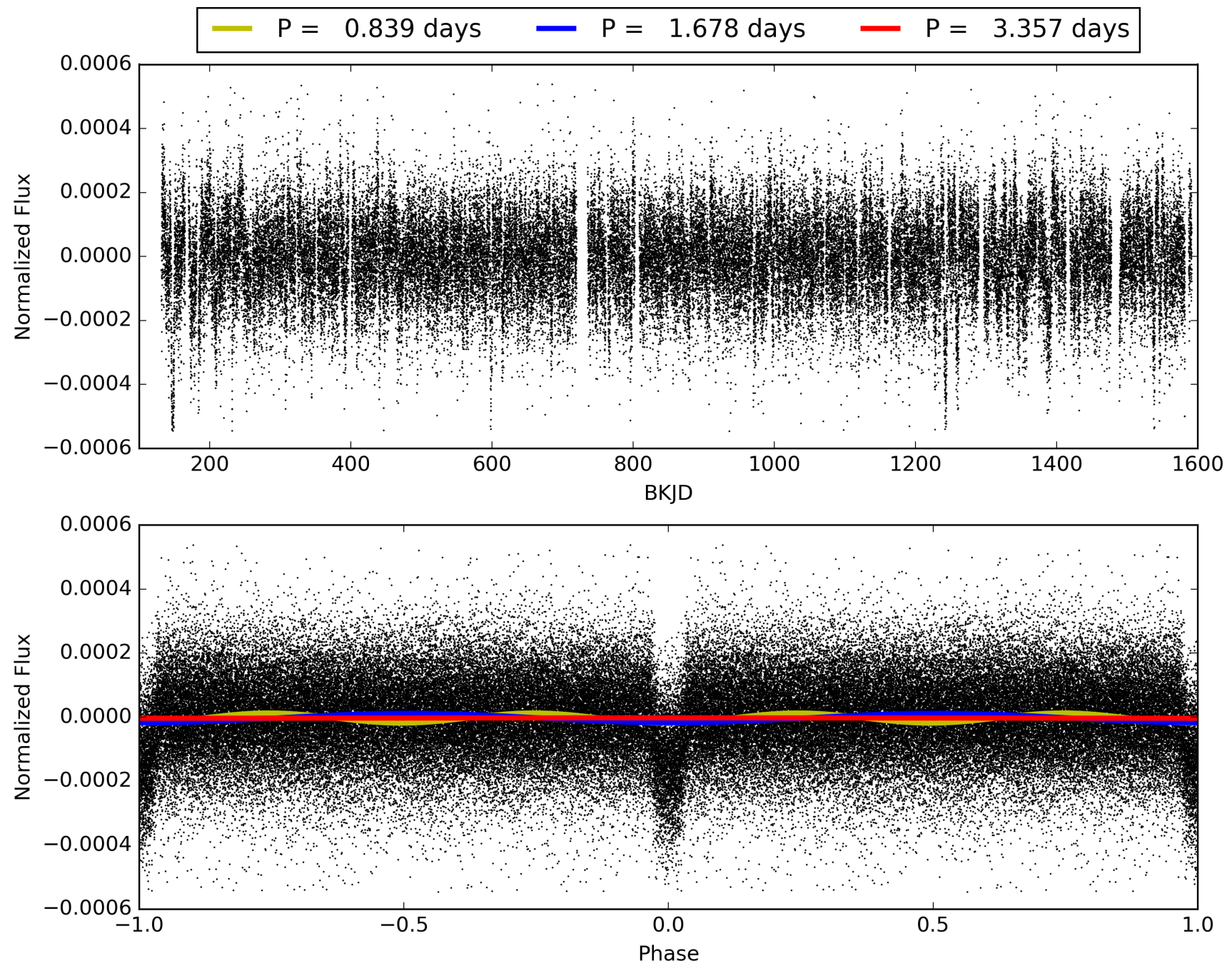
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:31:26 Z

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

TCE 002989404-02, PDC Light Curves

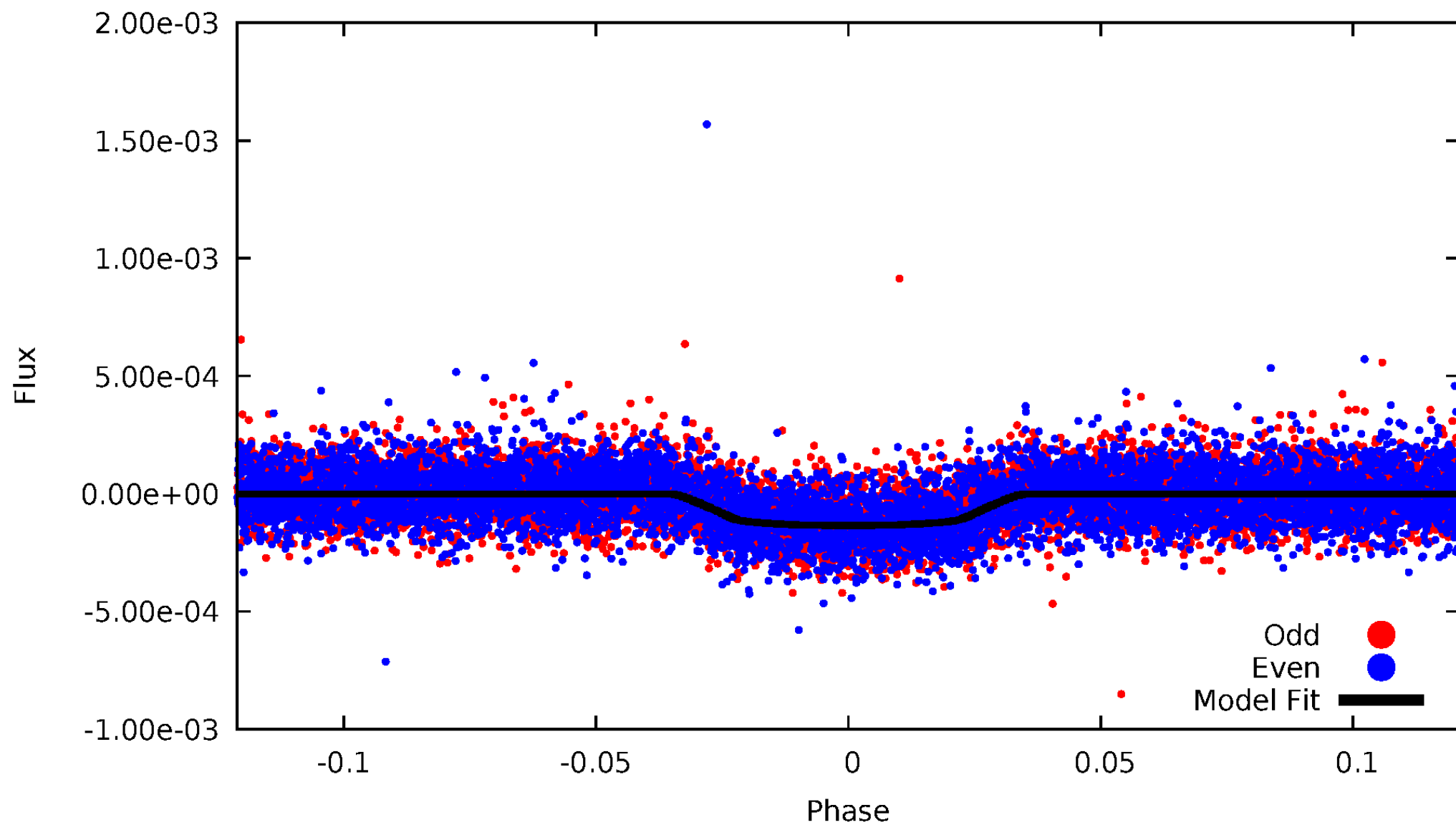


TCE 002989404-02



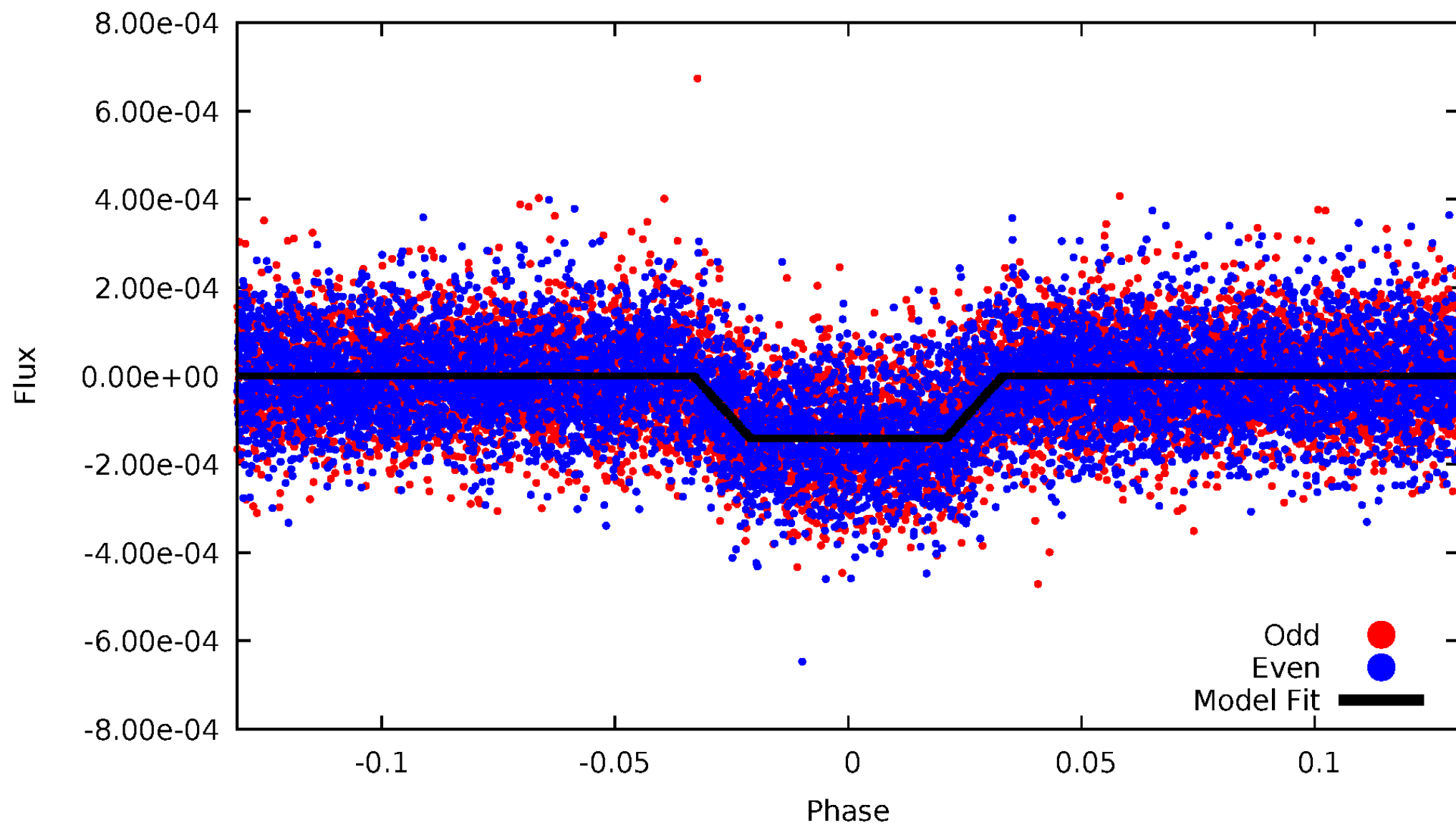
DV Odd/Even

TCE 002989404-02



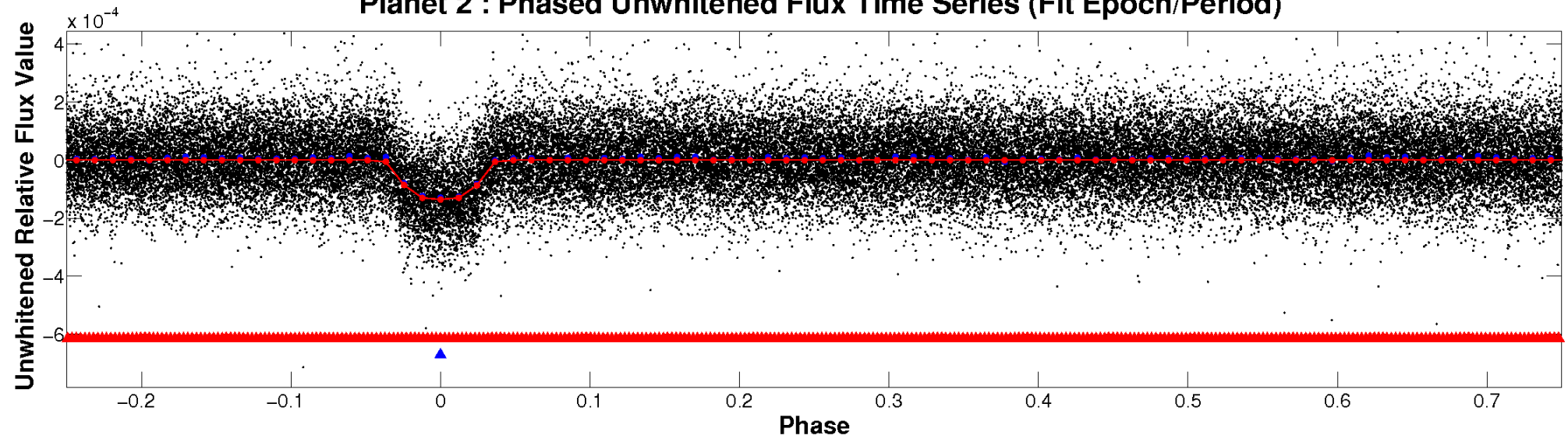
ALT Odd/Even

TCE 002989404-02

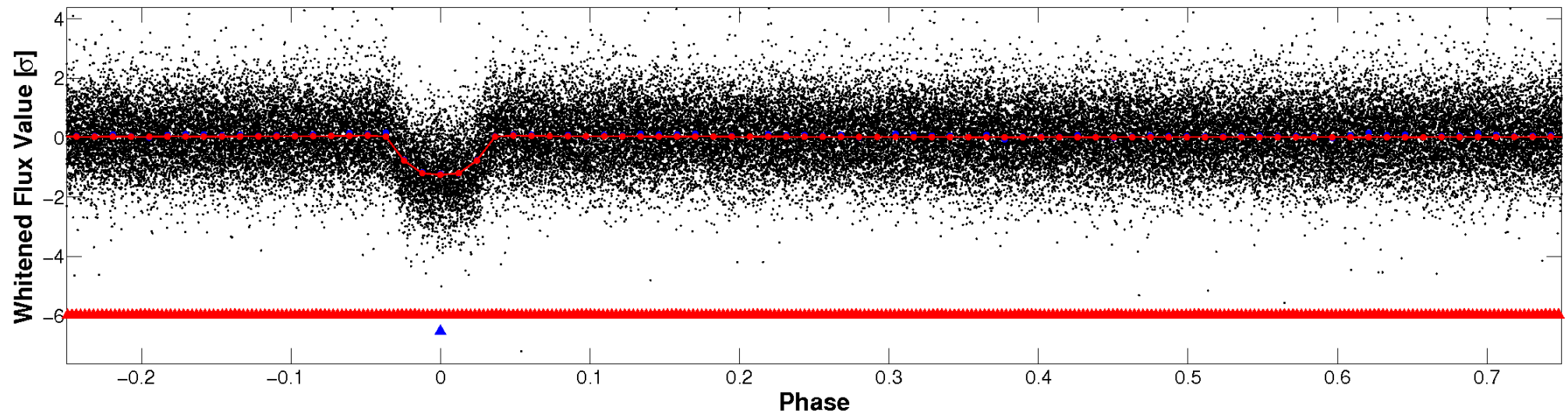


Non-Whitened Vs. Whitened Light Curve

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

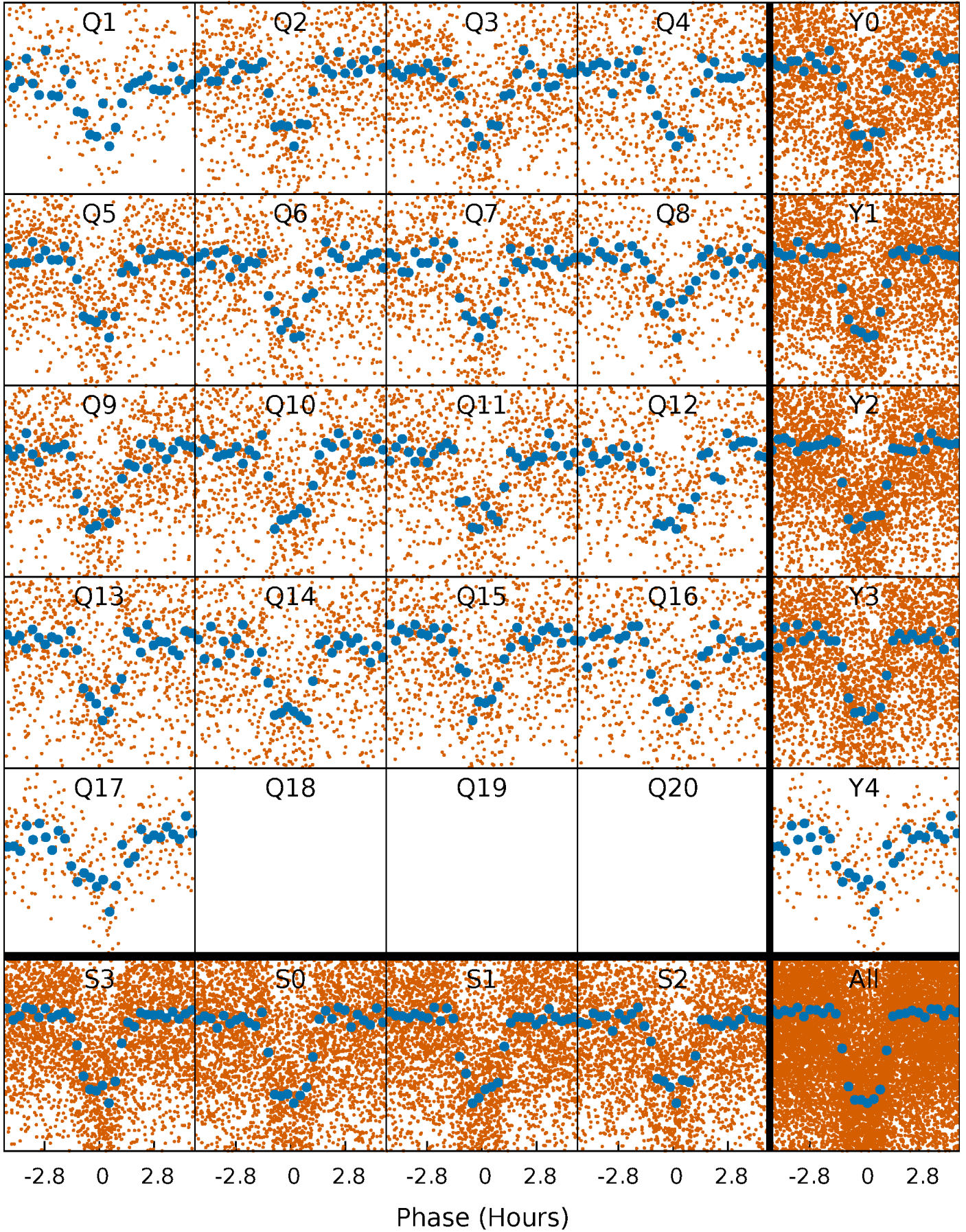


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



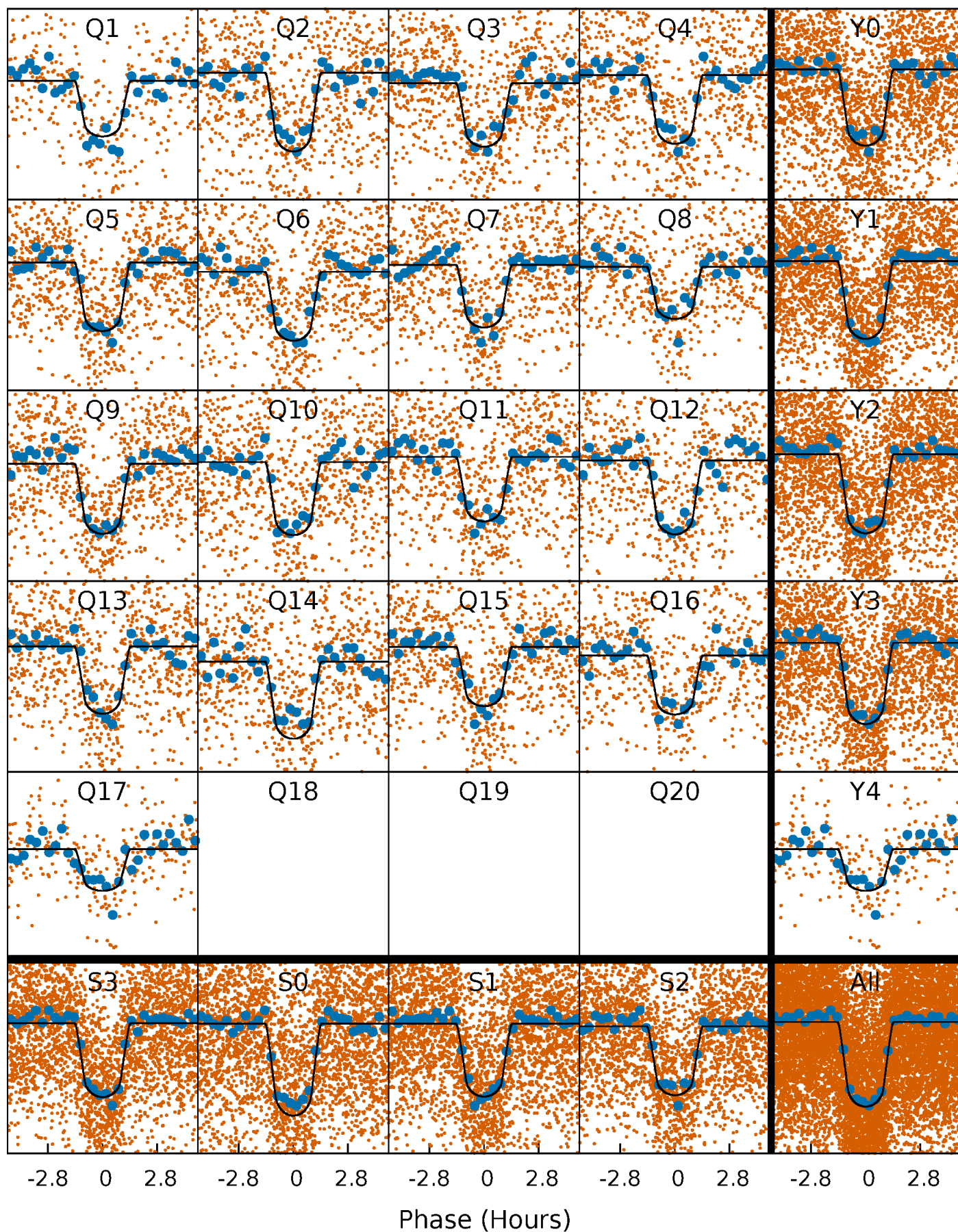
PDC Quarter-Phased Transit Curves

TCE 002989404-02 P= 1.678326 Days $T_0=132.696134$ (BKJD)



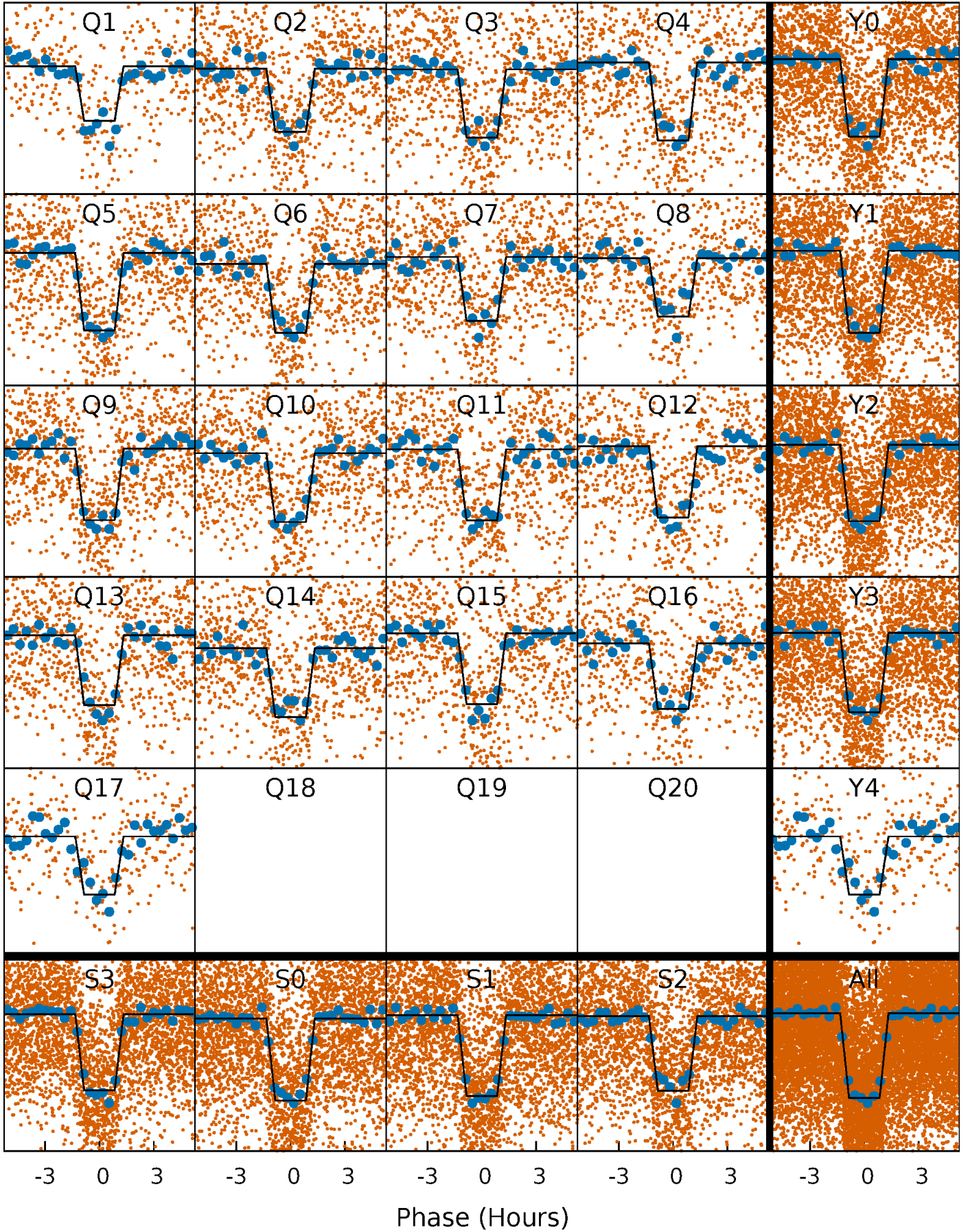
DV Quarter-Phased Transit Curves

TCE 002989404-02 P= 1.678326 Days $T_0=132.696134$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

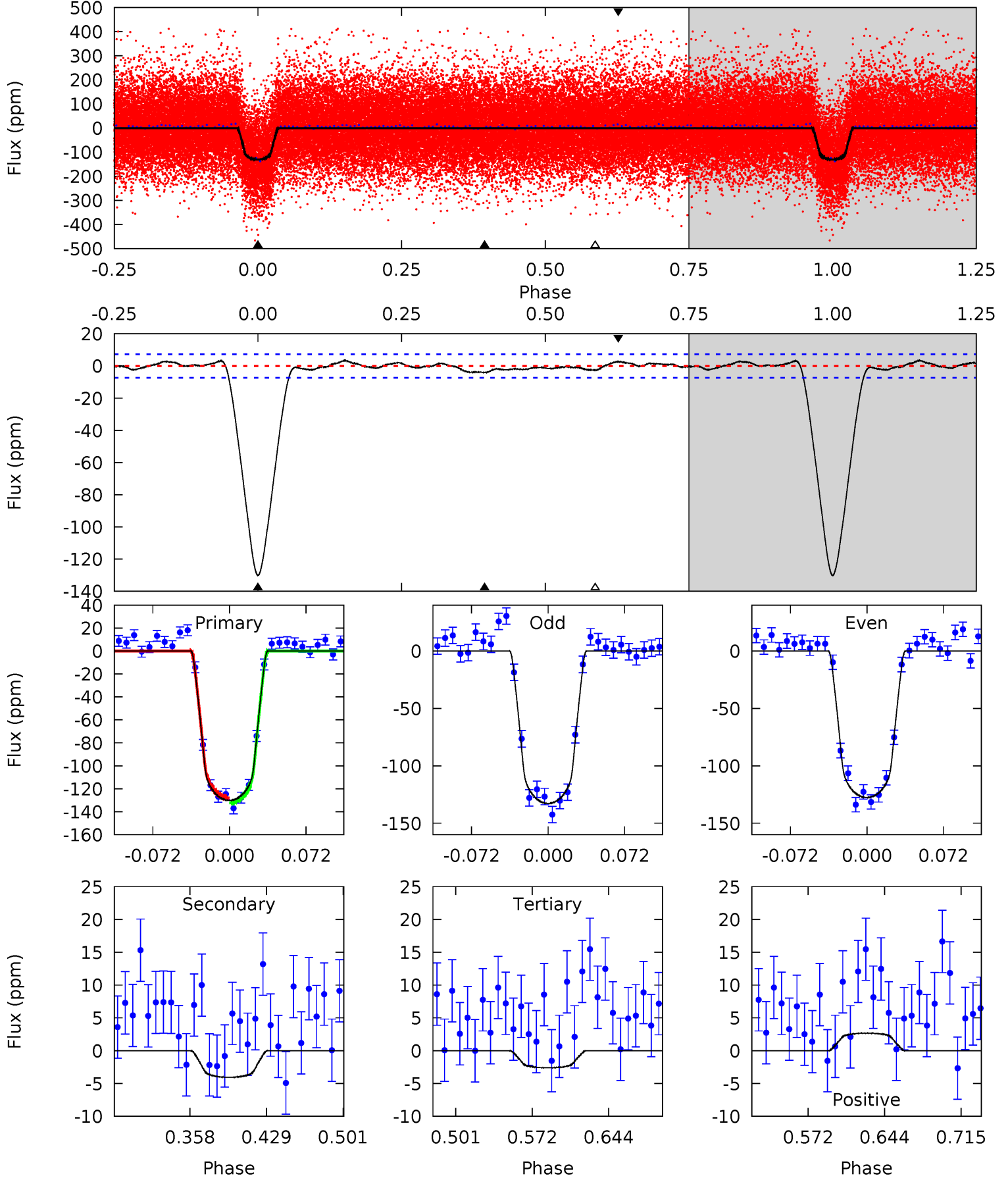
TCE 002989404-02 P= 1.678326 Days $T_0=132.695841$ (BKJD)



DV Model-Shift Uniqueness Test

002989404-02, P = 1.678326 Days, E = 131.017808 Days

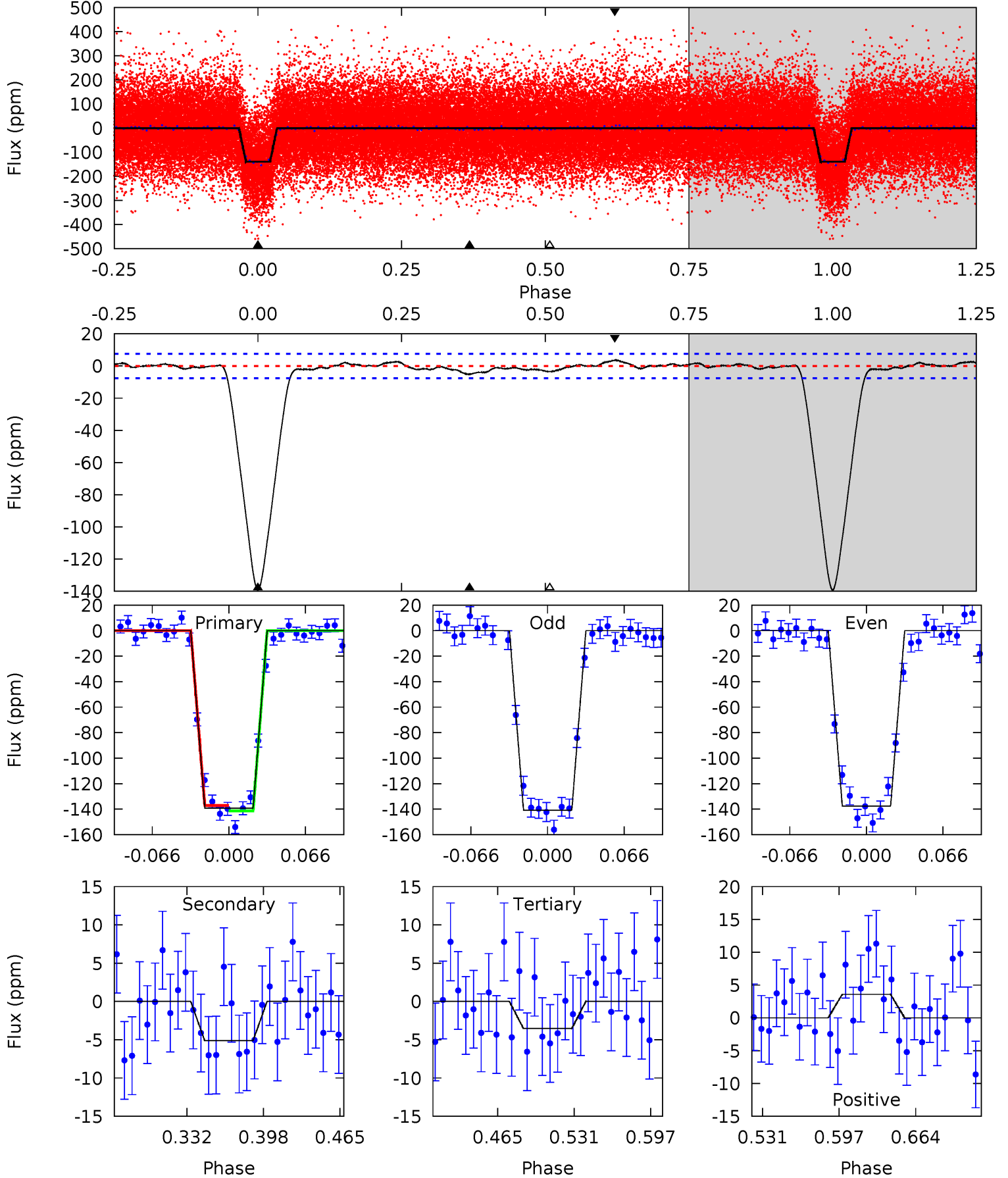
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
82.6	2.57	1.66	1.69	4.63	1.80	0.90	80.9	80.9	0.92	0.88	1.63	0.99	0.03	1.32



Alt Model-Shift Uniqueness Test

002989404-02, P = 1.678326 Days, E = 131.017515 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
85.2	3.13	2.16	2.19	4.65	1.84	0.92	83.0	83.0	0.97	0.94	1.00	0.99	0.03	1.27



Stellar Parameters For KIC 002989404

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6015^{+108}_{-132}	$4.370^{+0.095}_{-0.116}$	$-0.120^{+0.150}_{-0.150}$	$1.081^{+0.180}_{-0.120}$	$0.998^{+0.075}_{-0.067}$	$1.112^{+0.437}_{-0.370}$
	+2%/-2%	+2%/-3%	+125%/-125%	+17%/-11%	+8%/-7%	+39%/-33%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 002989404-02 / KOI 1824.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-4 ± 2	$1.48^{+0.22}_{-0.20}$	2313^{+109}_{-87}	2846^{+267}_{-429}	$0.753^{+0.462}_{-0.333}$
Alt.	-5 ± 2	$1.42^{+0.20}_{-0.20}$	2320^{+101}_{-88}	3045^{+231}_{-243}	$1.058^{+0.518}_{-0.358}$

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

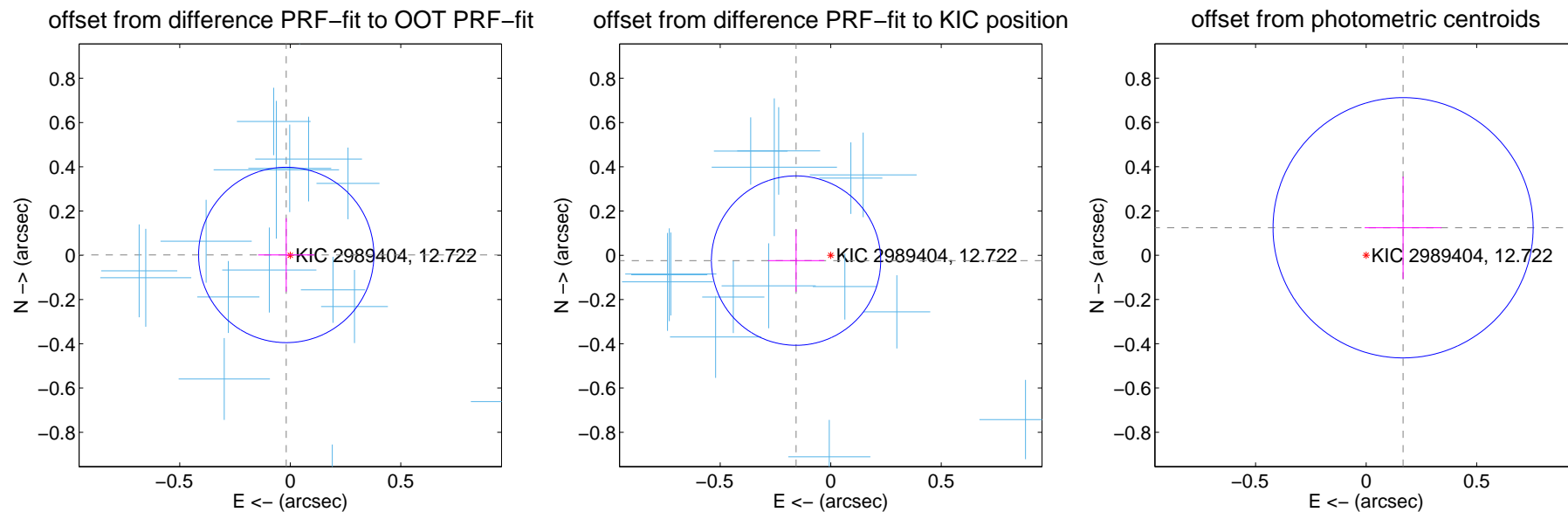
DV Centroid Data

Supplemental centroid analysis for 002989404-02. Kepler magnitude: 12.72. Transit SNR 61.68

There are 17 quarters with good PRF difference image offsets

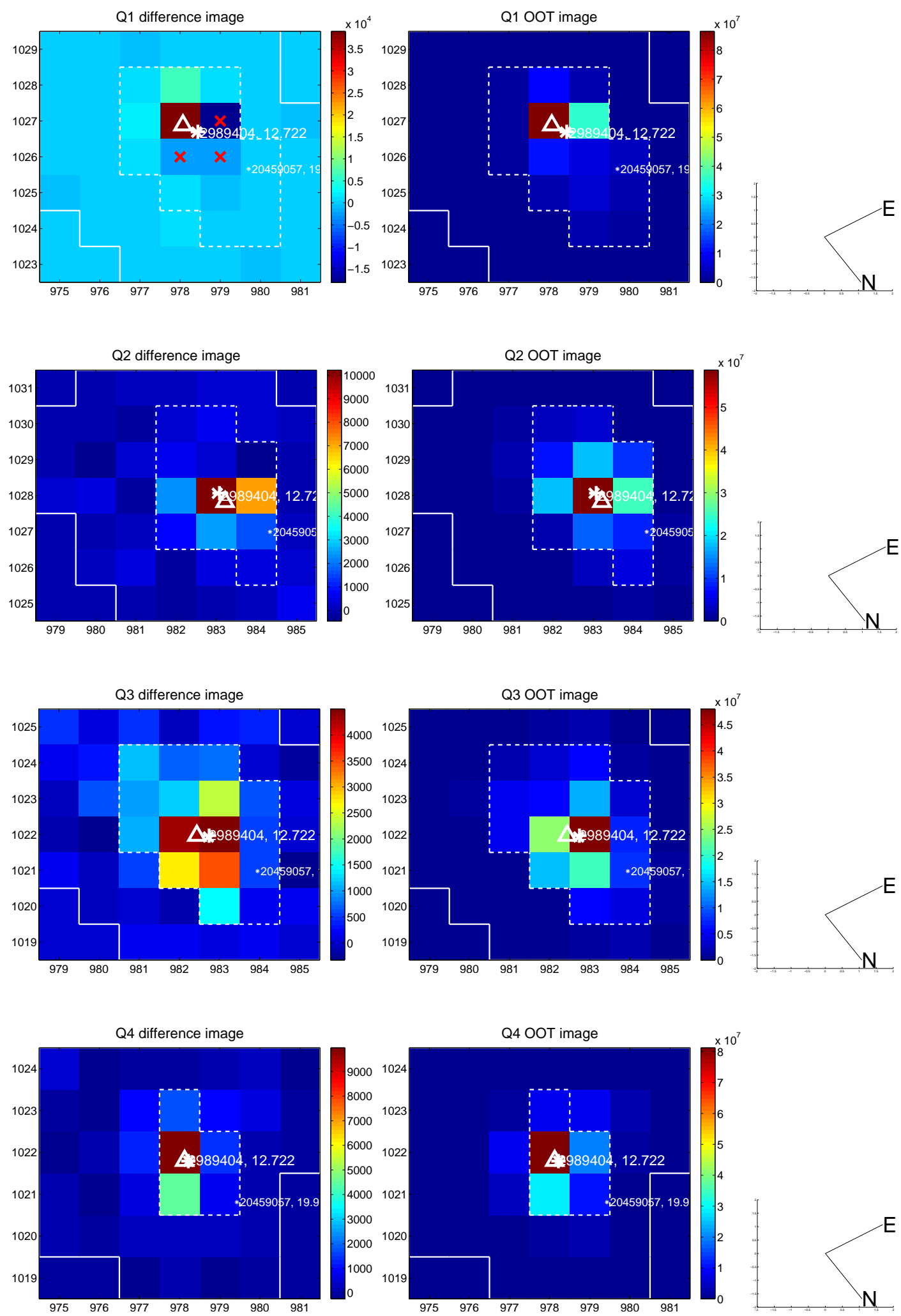
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.018 ± 0.132	0.14	0.018 ± 0.127	0.002 ± 0.166
PRF-fit source offset from KIC position	0.159 ± 0.128	1.24	0.157 ± 0.127	-0.024 ± 0.141
photometric centroid source offset	0.21 ± 0.20	1.06	-0.17 ± 0.17	0.12 ± 0.23

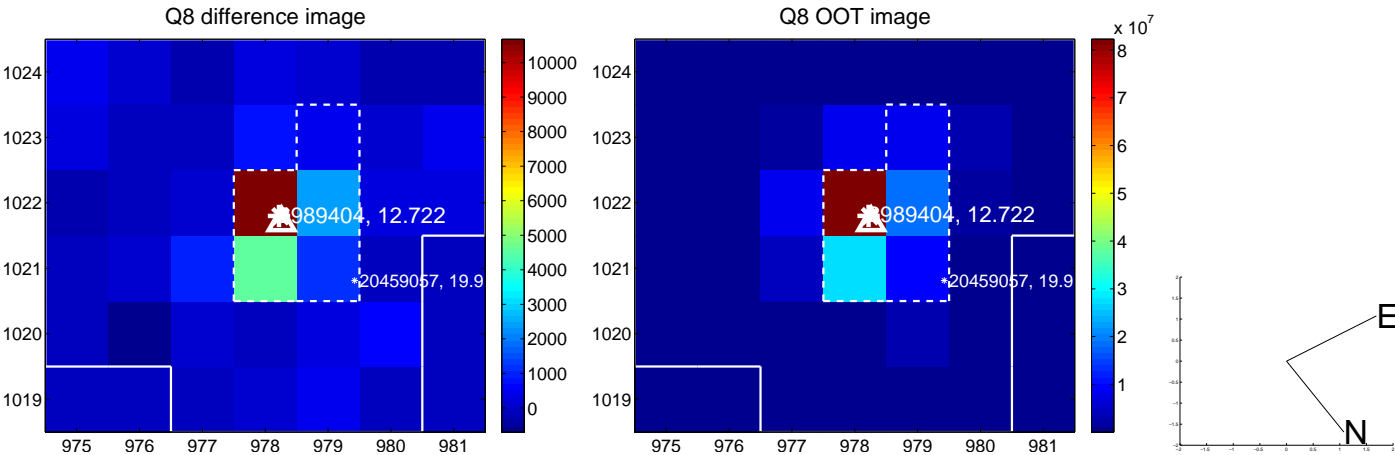
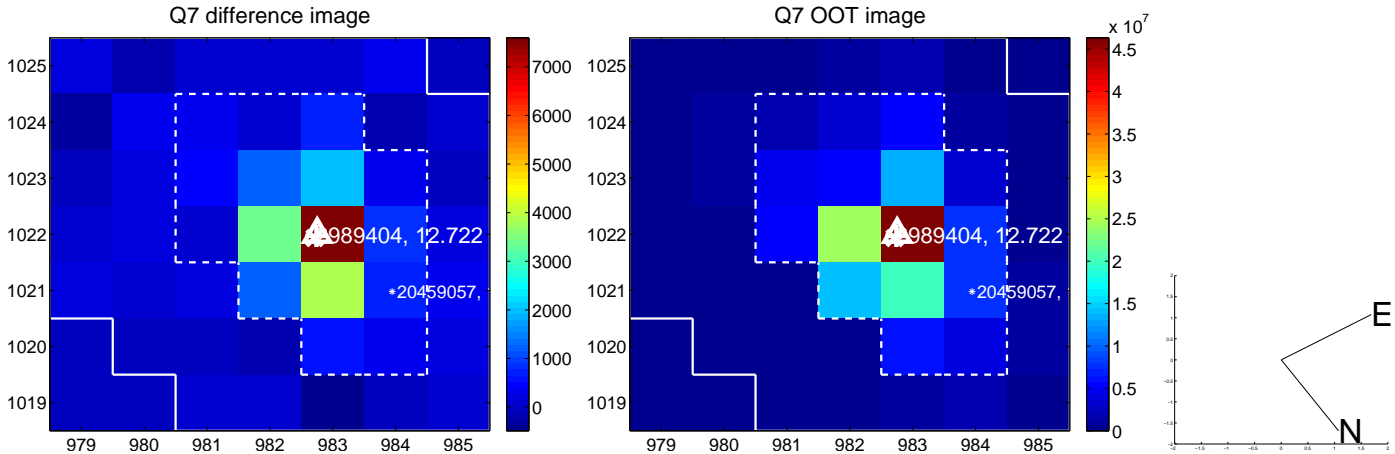
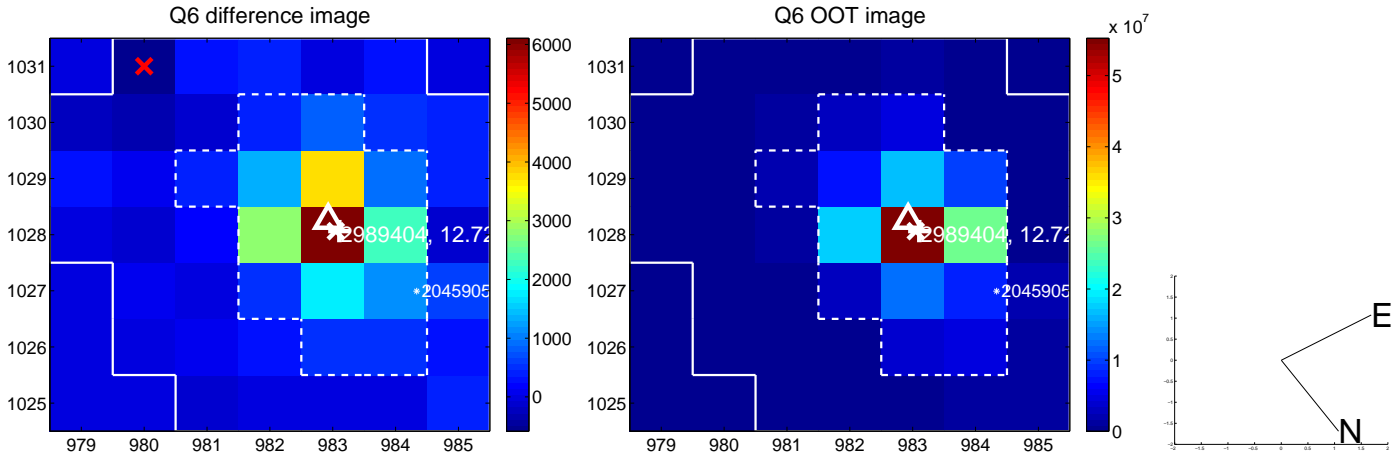
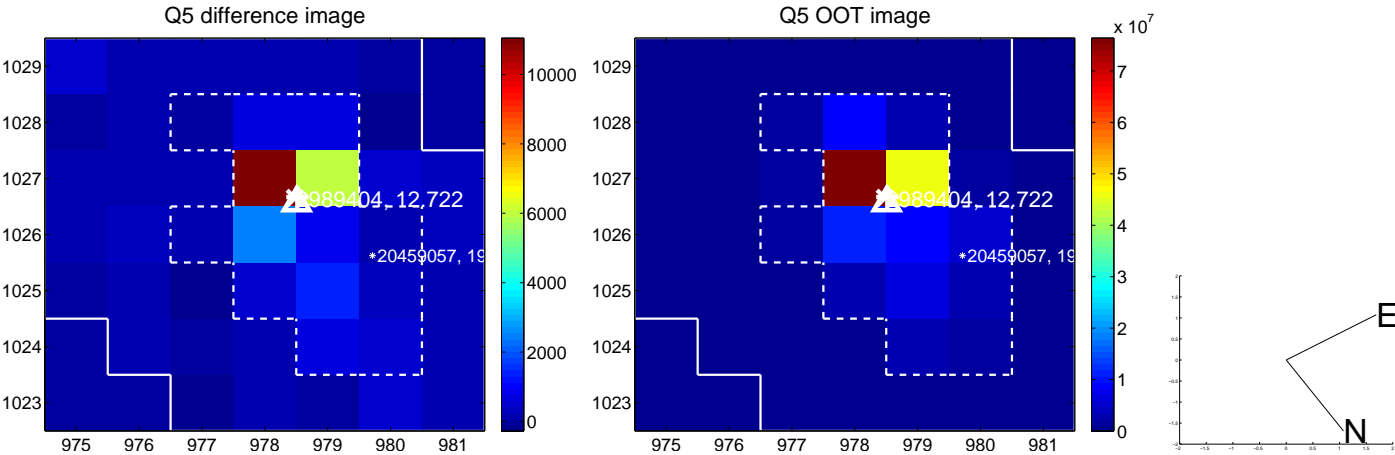


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

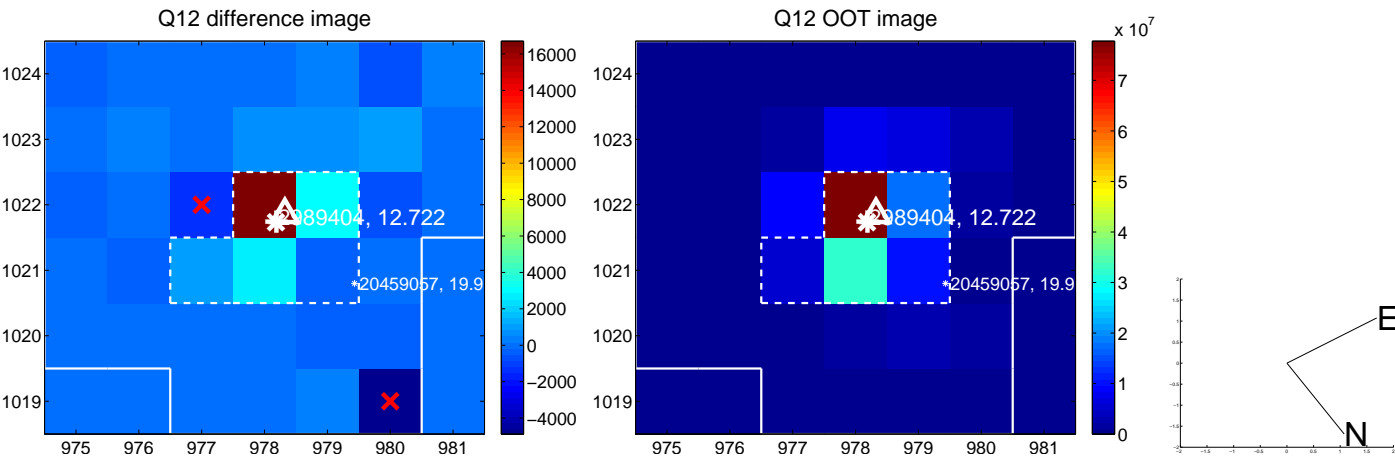
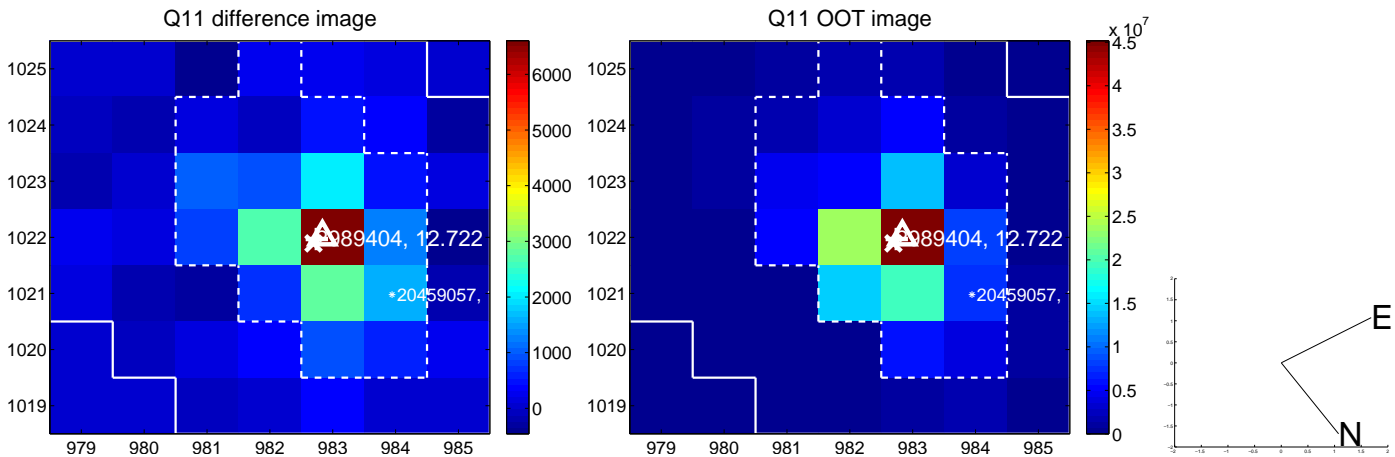
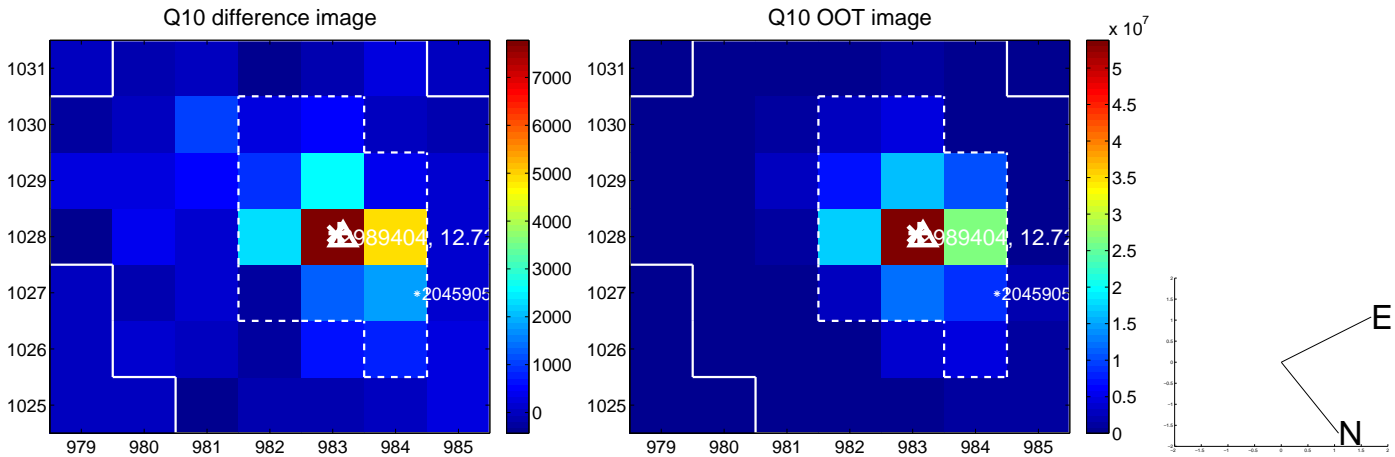
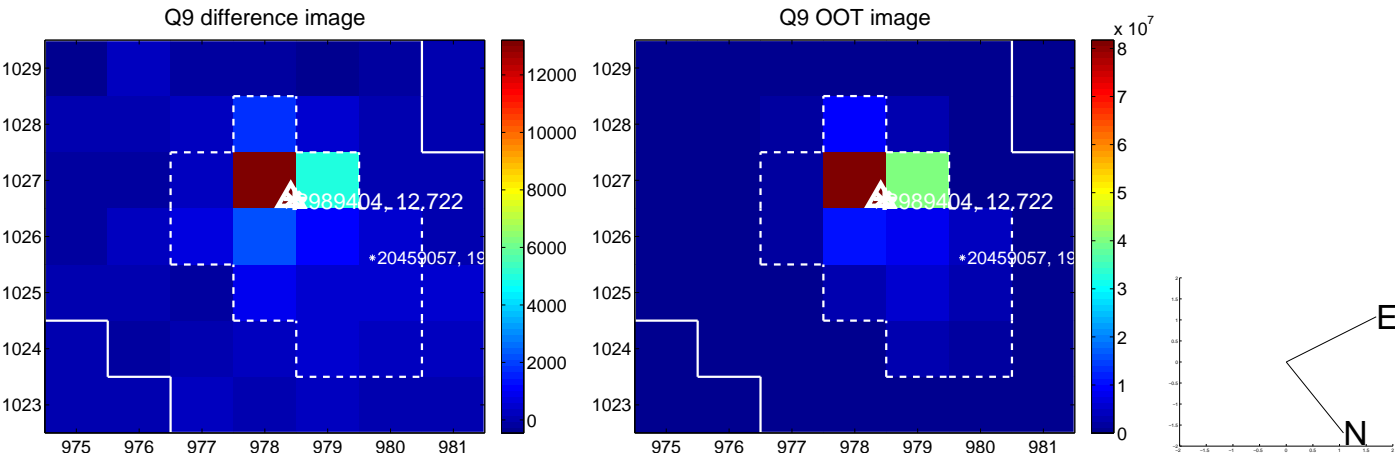
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



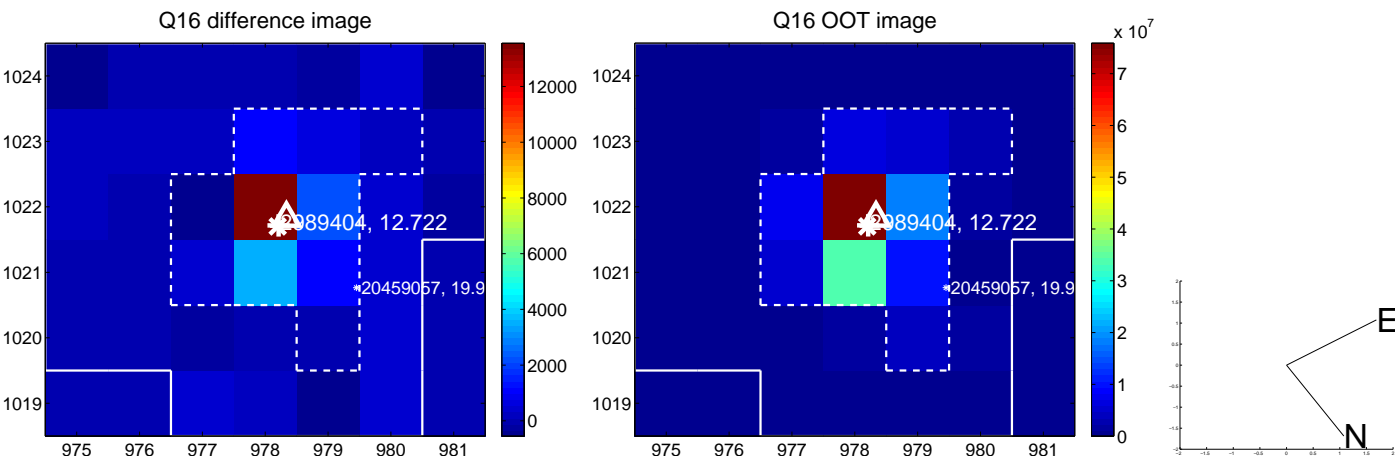
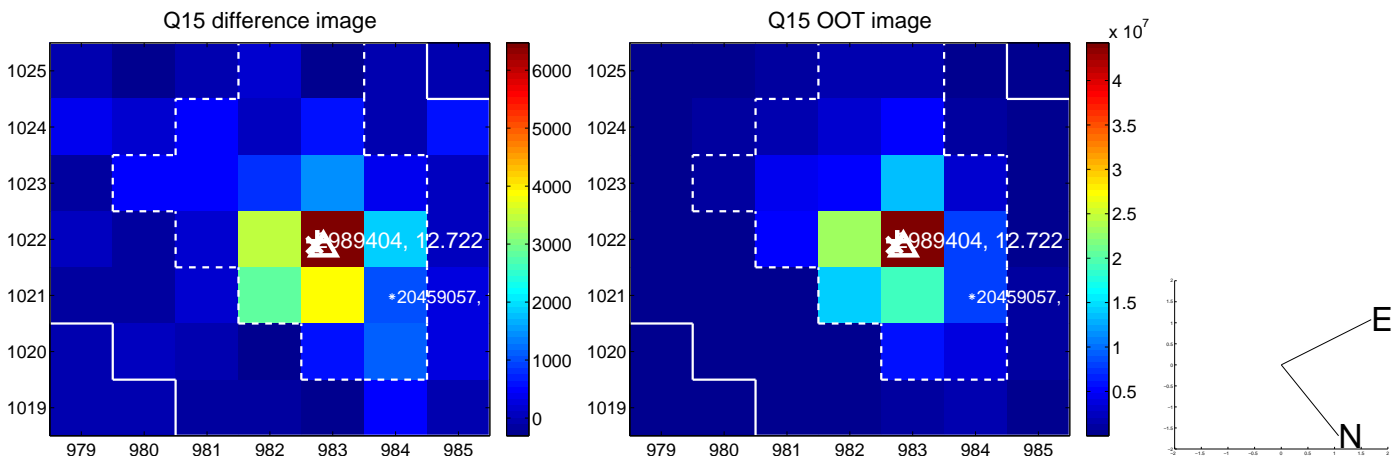
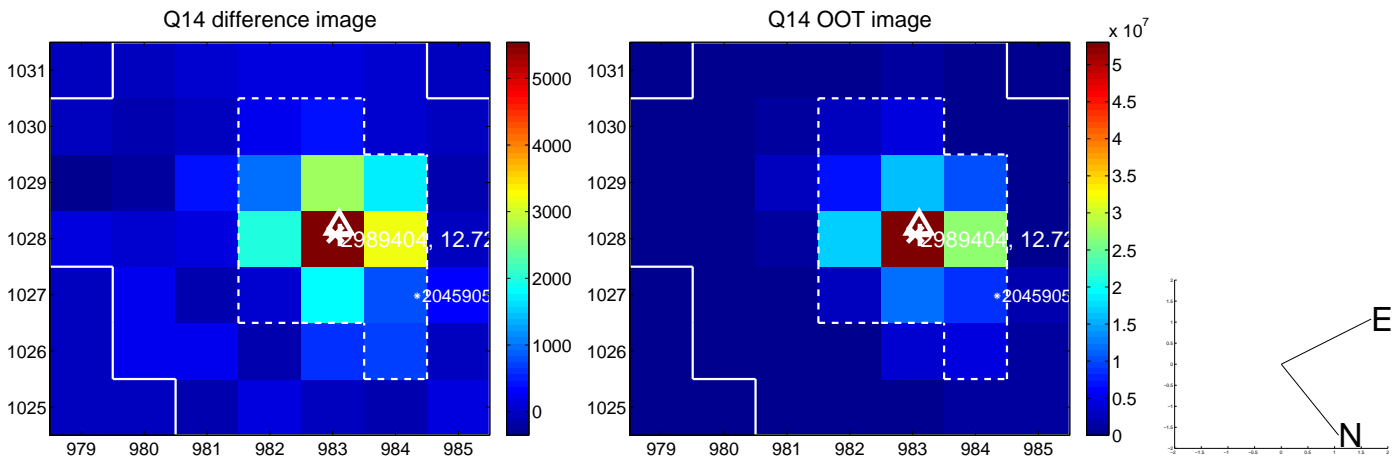
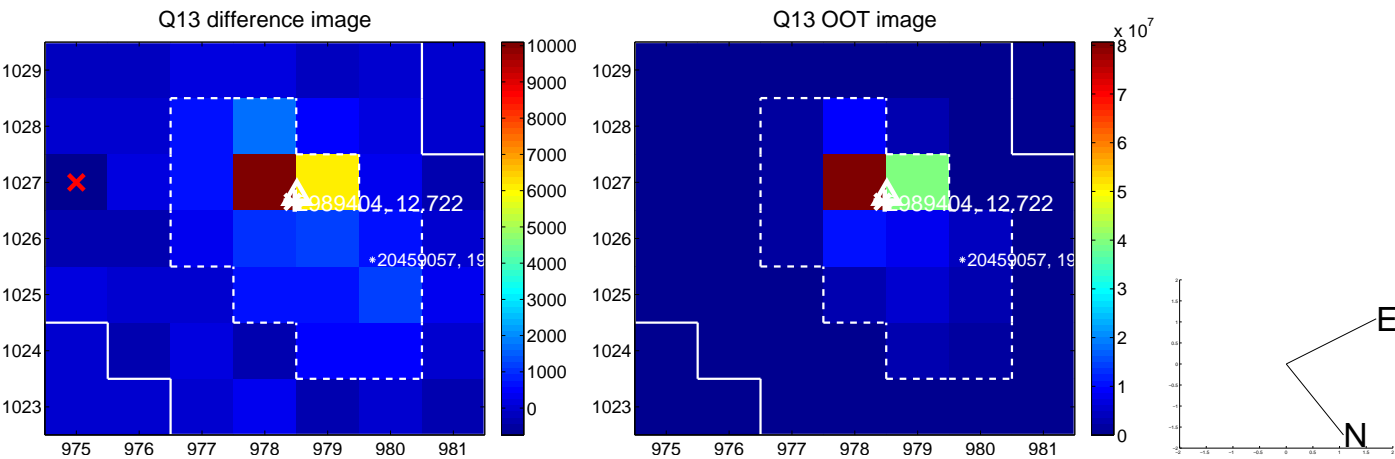
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



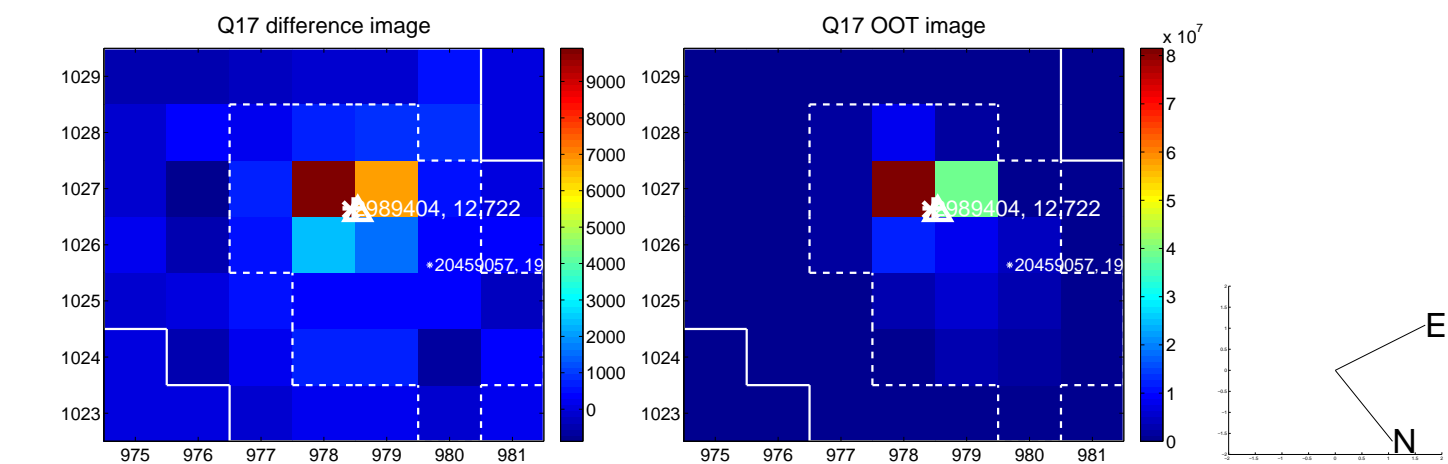
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



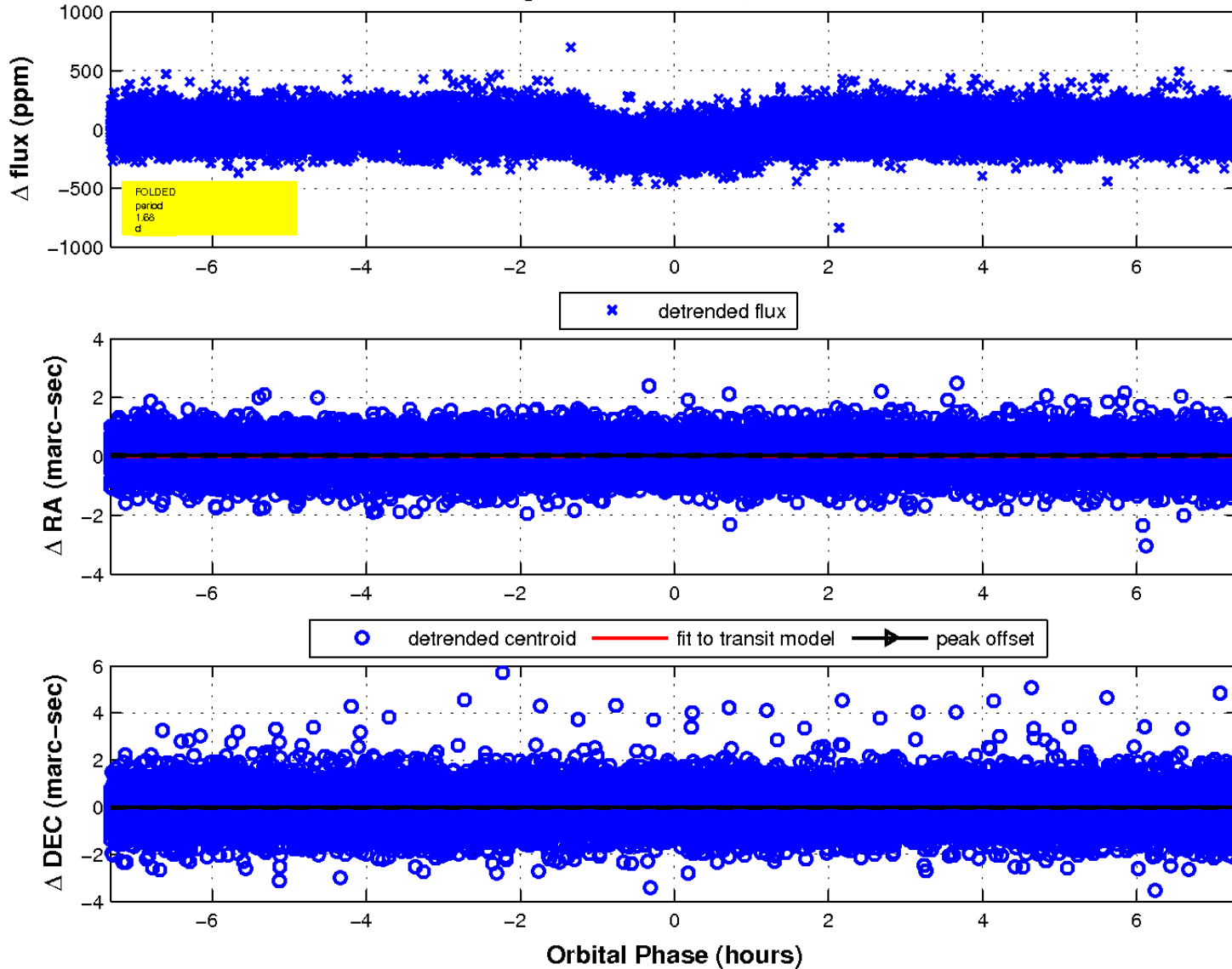
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

