

KIC 006042031

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})
006042031-01	OBS	4165.01	0.537101	131.567318	32.5	1.313	15.4	15.7	2.54	5395	1.74	24679.27
006042031-02	OBS	No	309.662265	162.495114	170.2	6.281	7.3	6.8	2.54	5395	3.76	5.14

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006042031-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—CENT_KIC_POS
006042031-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

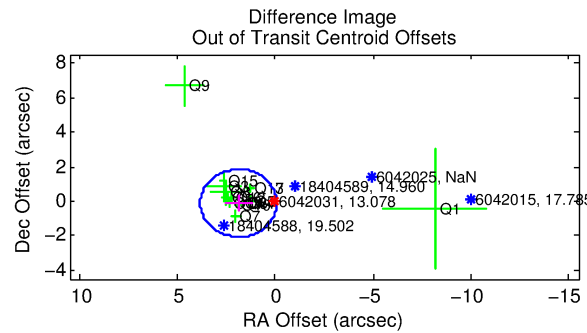
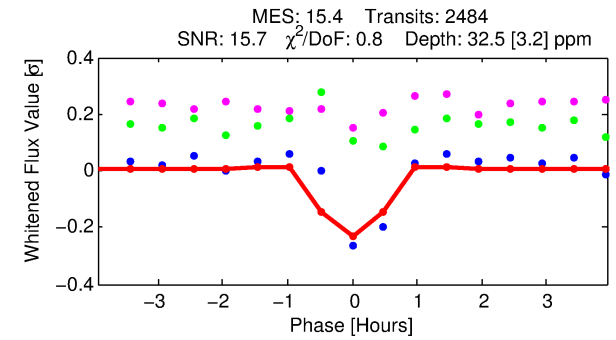
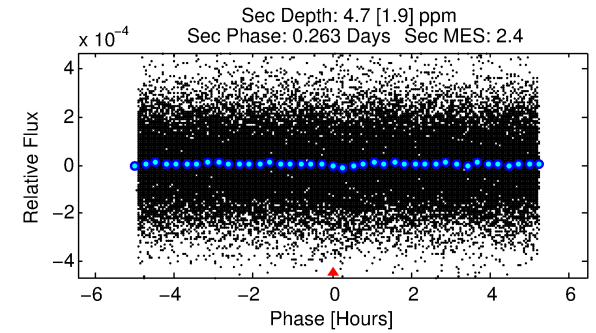
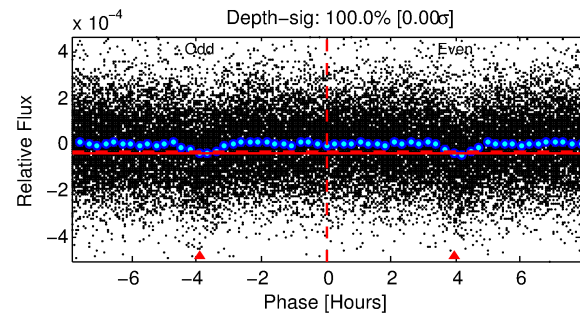
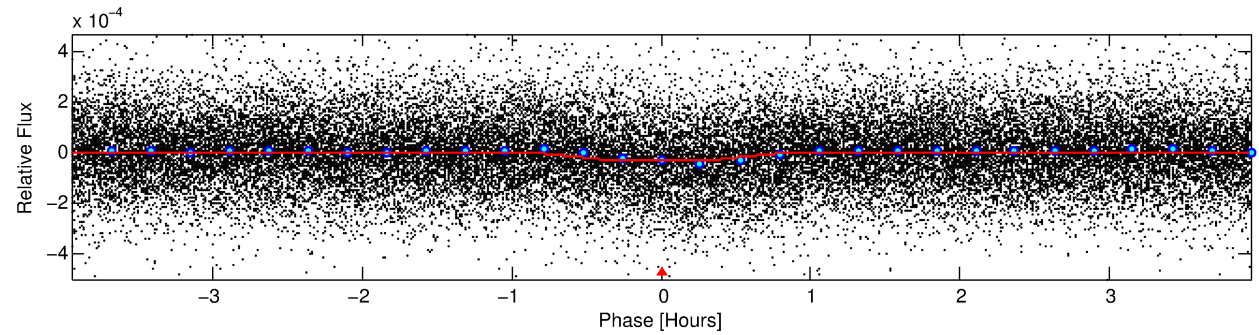
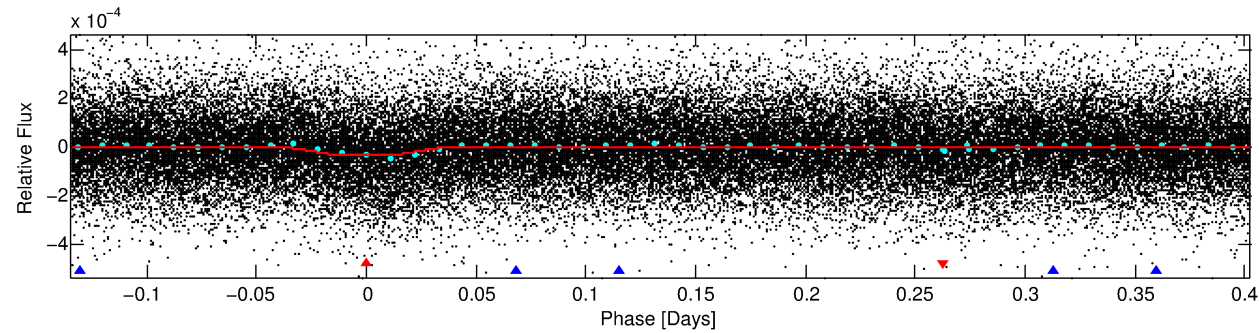
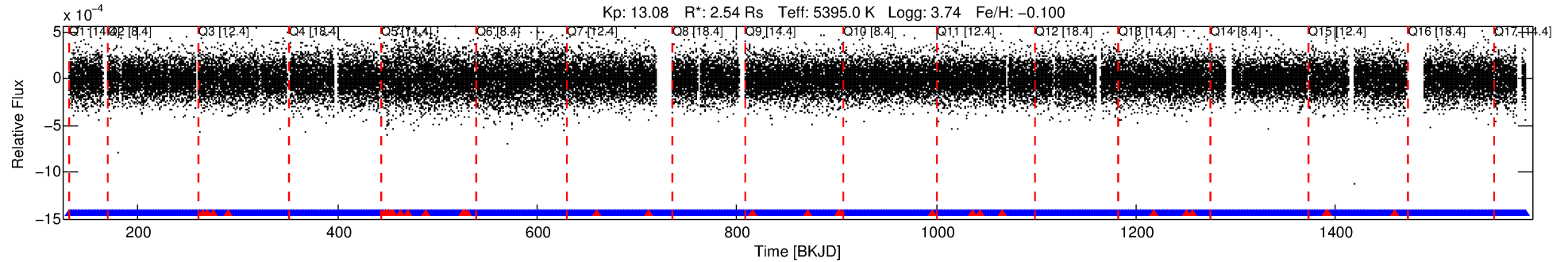
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006042031-01

No Significant Match Found

DV One-Page Summary

KIC: 6042031 Candidate: 1 of 2 Period: 0.537 d
KOI: K04165.01 Corr: 0.837



DV Fit Results:

Period = 0.53710 [0.00001] d
Epoch = 131.5673 [0.0012] BKJD
Rp/R* = 0.0063 [0.0014]
a/R* = 1.69 [1.11]
b = 0.90 [0.22]
Seff = 24679.27 [11858.74]
Teq = 3196 [384] K
Rp = 1.74 [0.73] Re
a = 0.0141 [0.0043] AU
Ag = 0.17 [0.13] [-6.43σ]
Teffp = 3161 [500] K [-0.05σ]

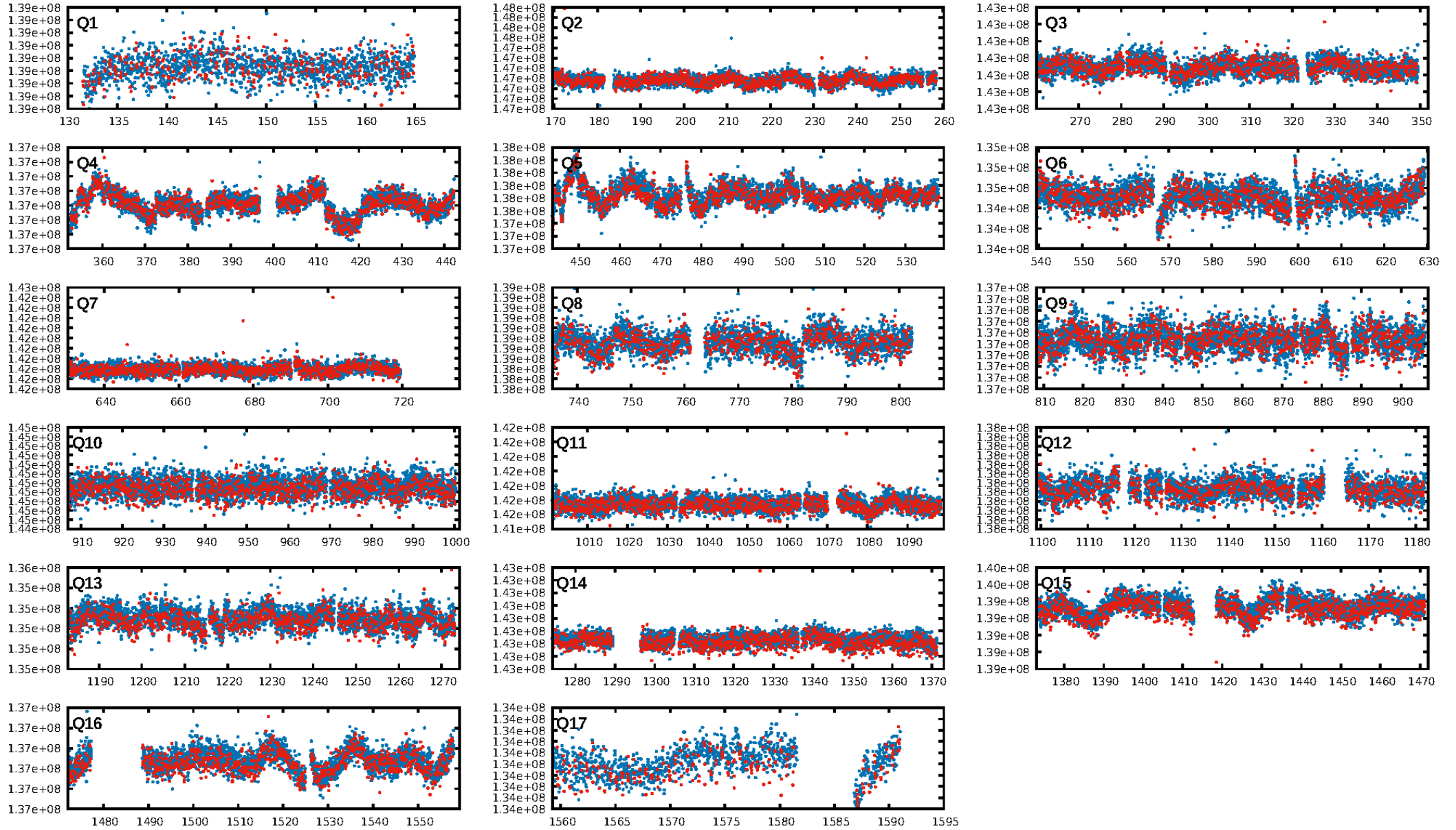
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1156.13σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.81e-47
RollingBand-fgt: 0.99 [2341/2372]
GhostDiagnostic-chr: -14.2
Centroid-sig: 0.0%
Centroid-so: 3.336 arcsec [5.31σ]
OotOffset-rm: 1.882 arcsec [2.89σ]
KicOffset-rm: 1.648 arcsec [2.36σ]
OotOffset-st: 3/4/3/5 [15]
KicOffset-st: 3/4/3/5 [15]
DiffImageQuality-fgm: 0.67 [10/15]
DiffImageOverlap-fno: 1.00 [17/17]

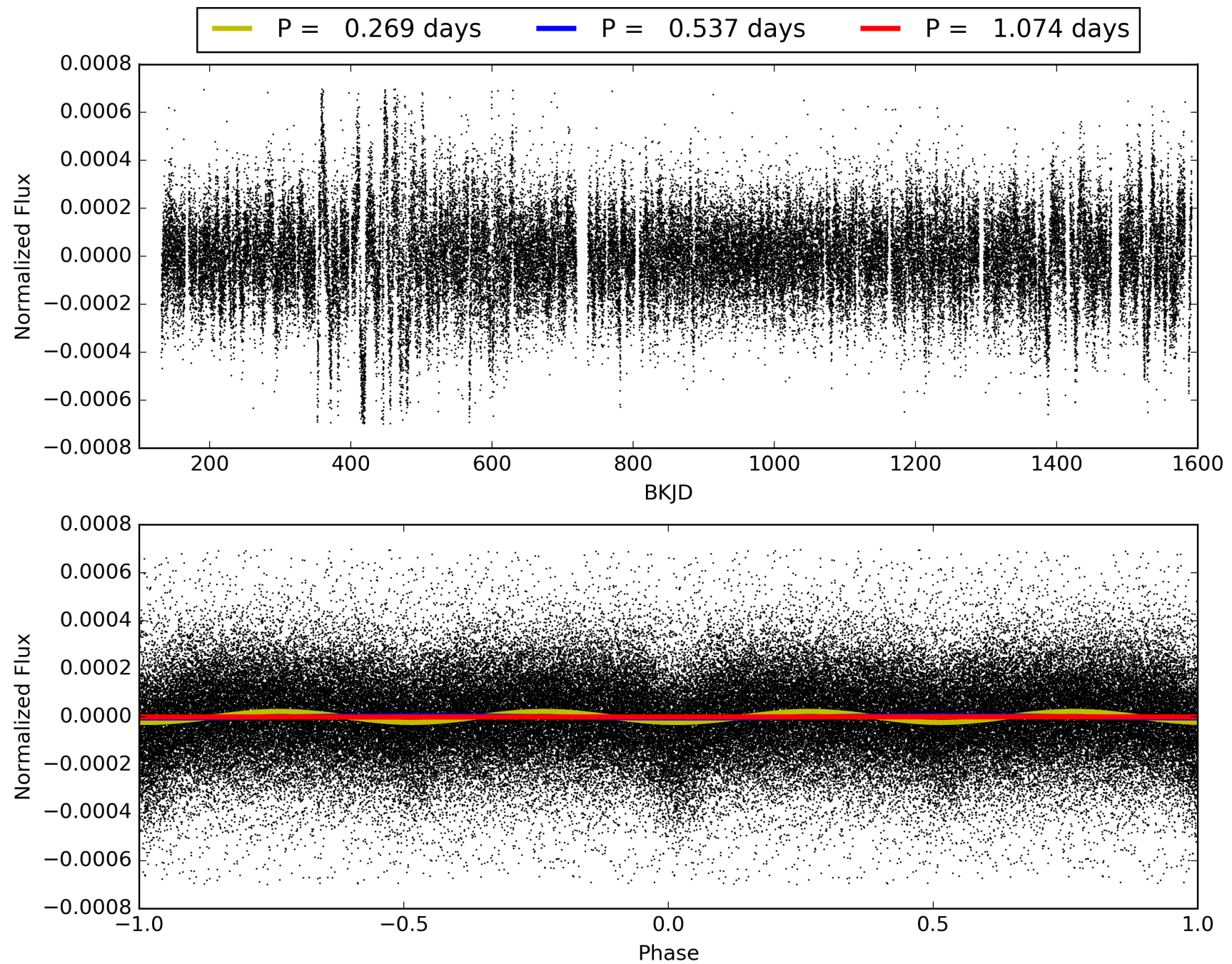
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:20:09 Z

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

TCE 006042031-01, PDC Light Curves

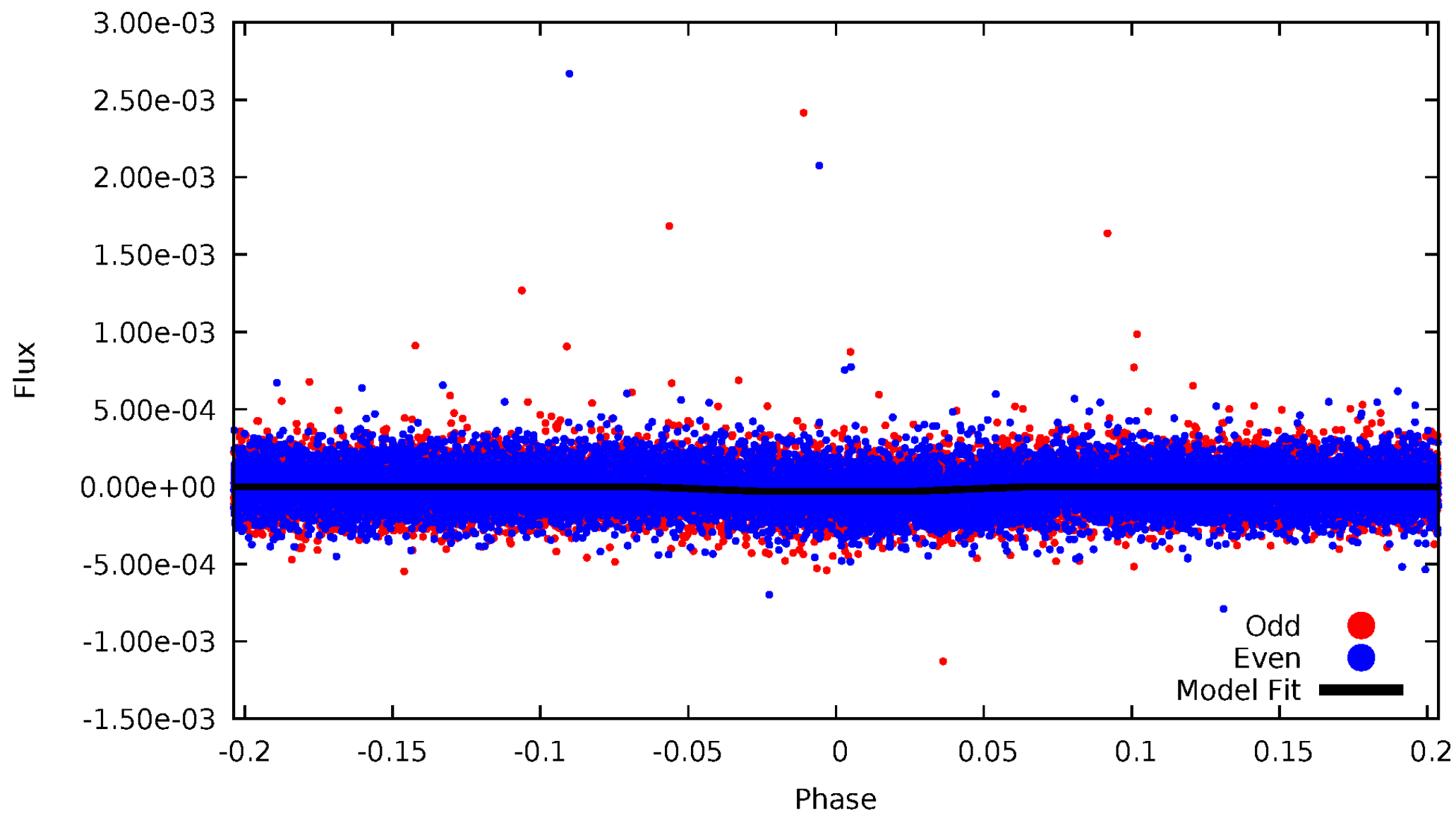


TCE 006042031-01



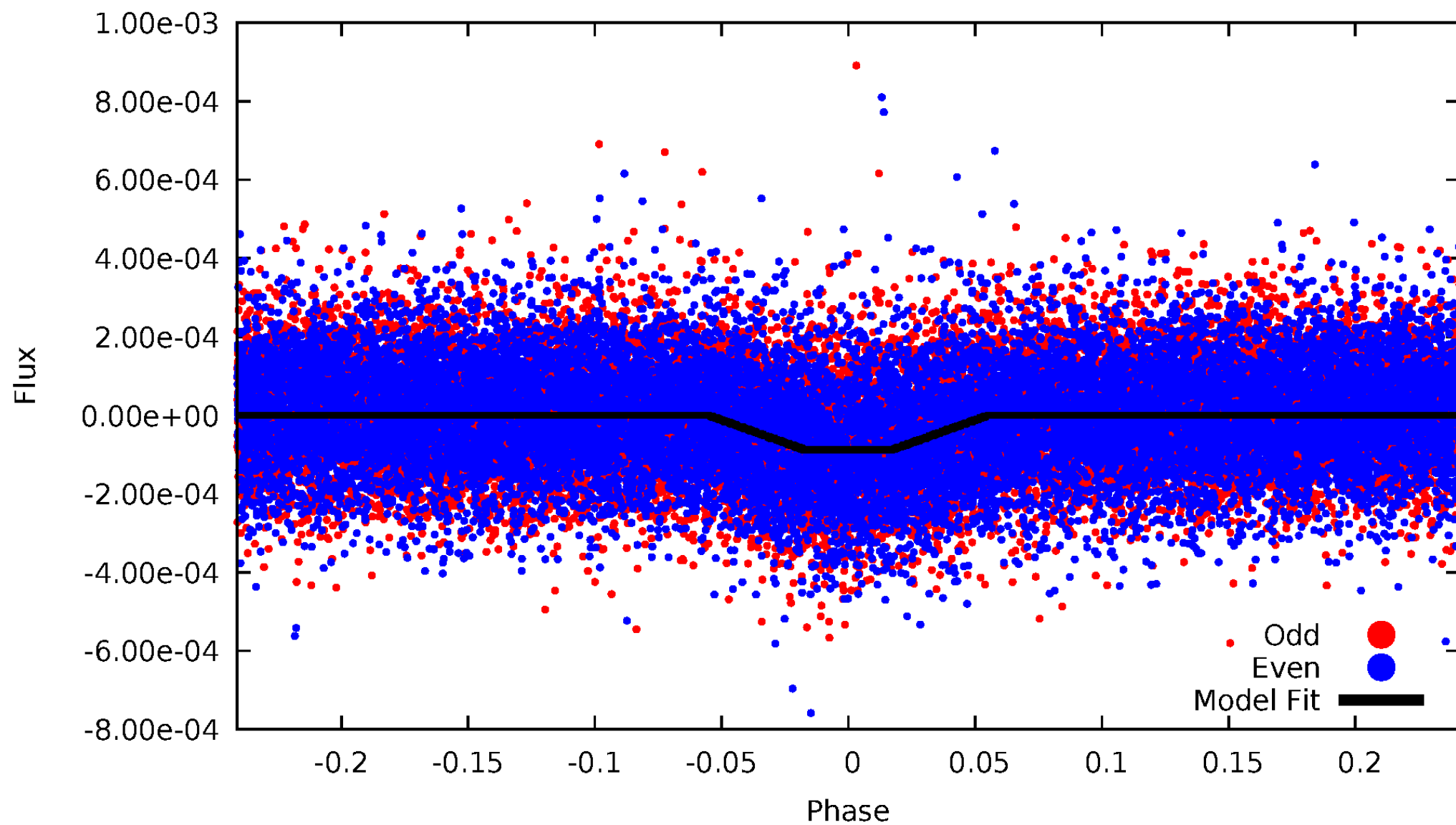
DV Odd/Even

TCE 006042031-01



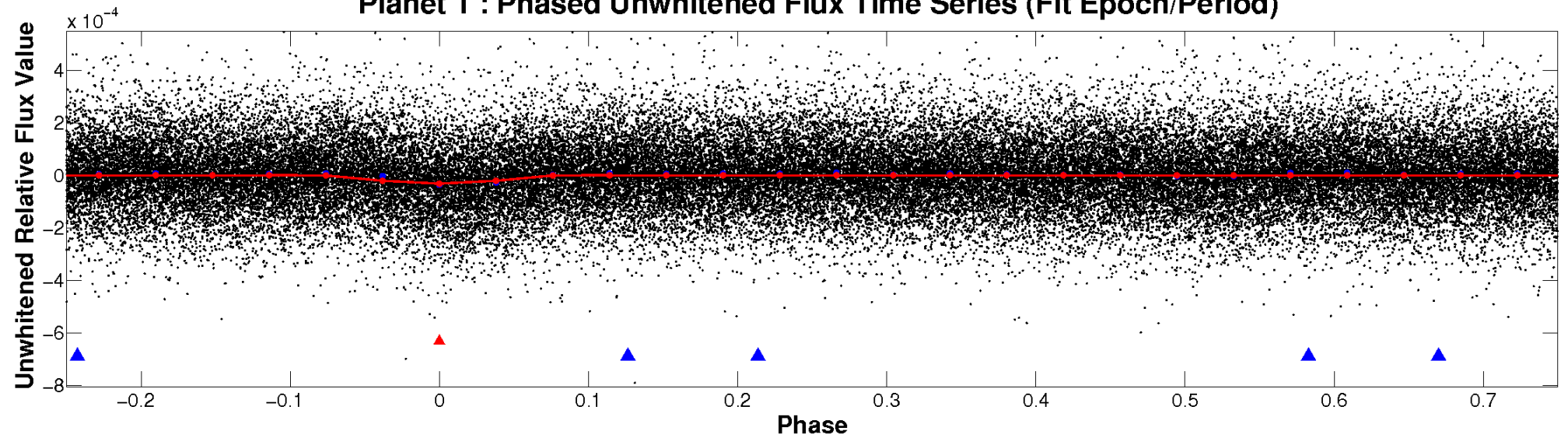
ALT Odd/Even

TCE 006042031-01

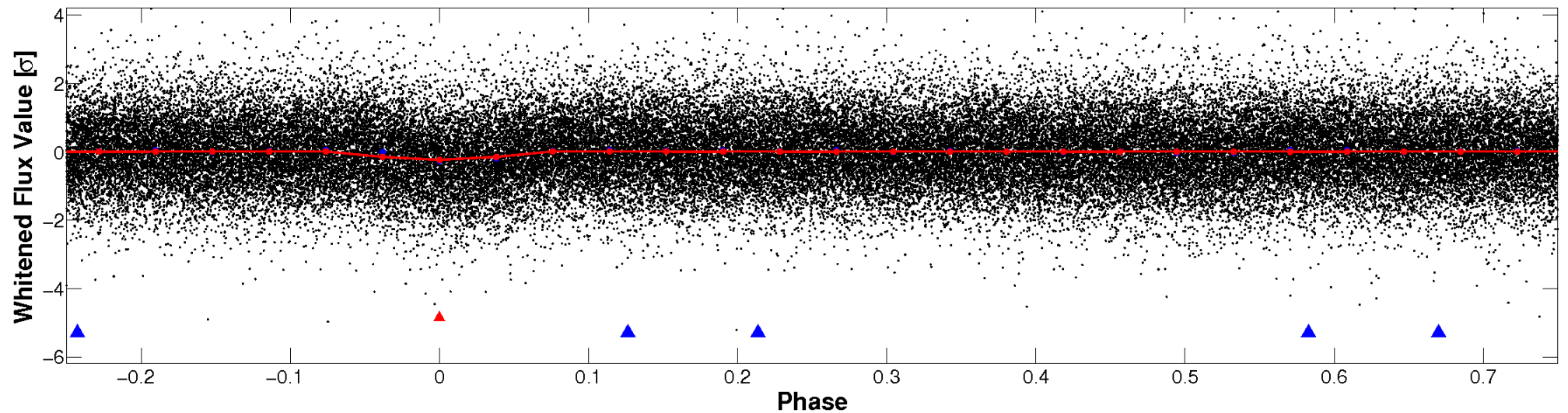


Non-Whitened Vs. Whitened Light Curve

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

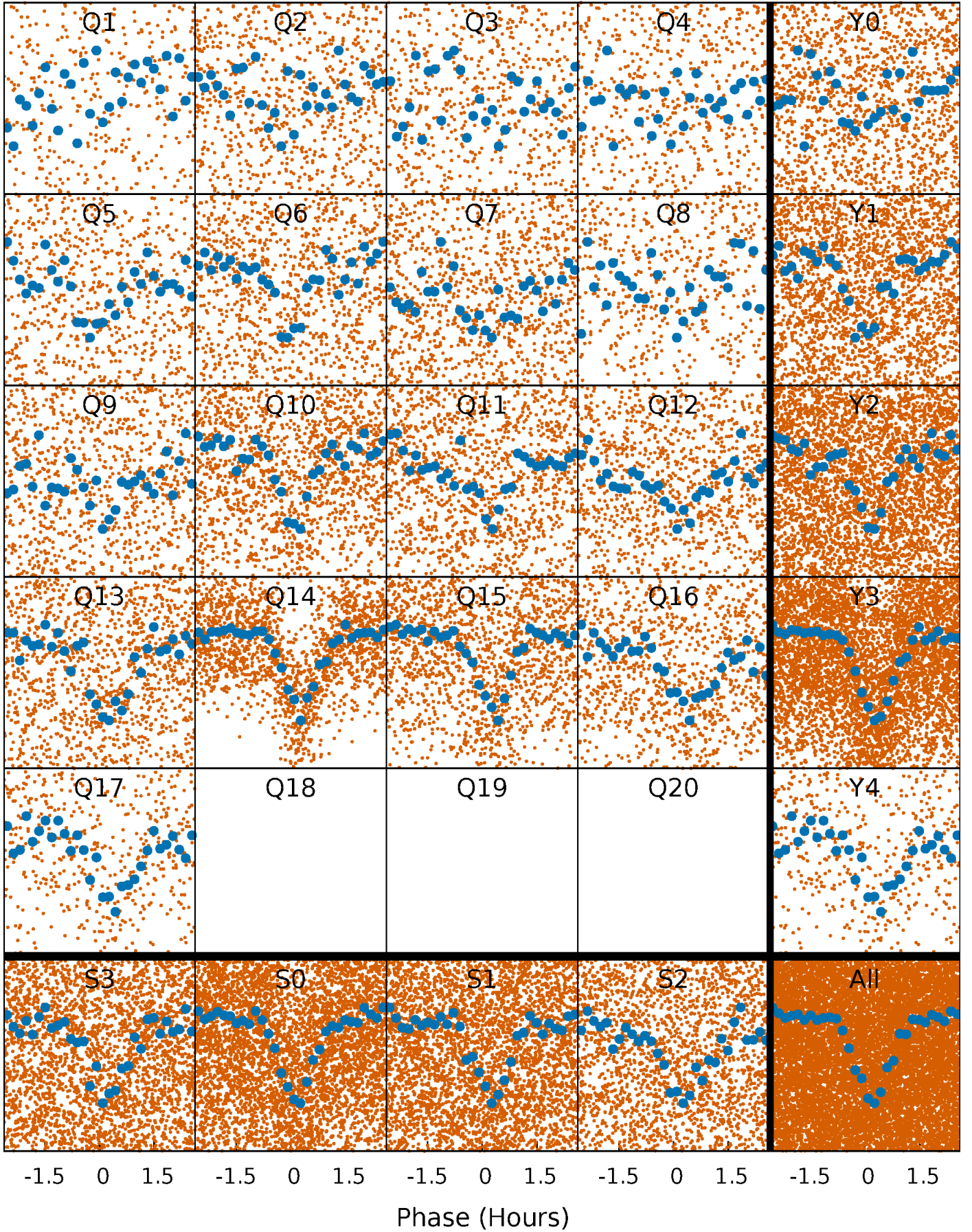


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



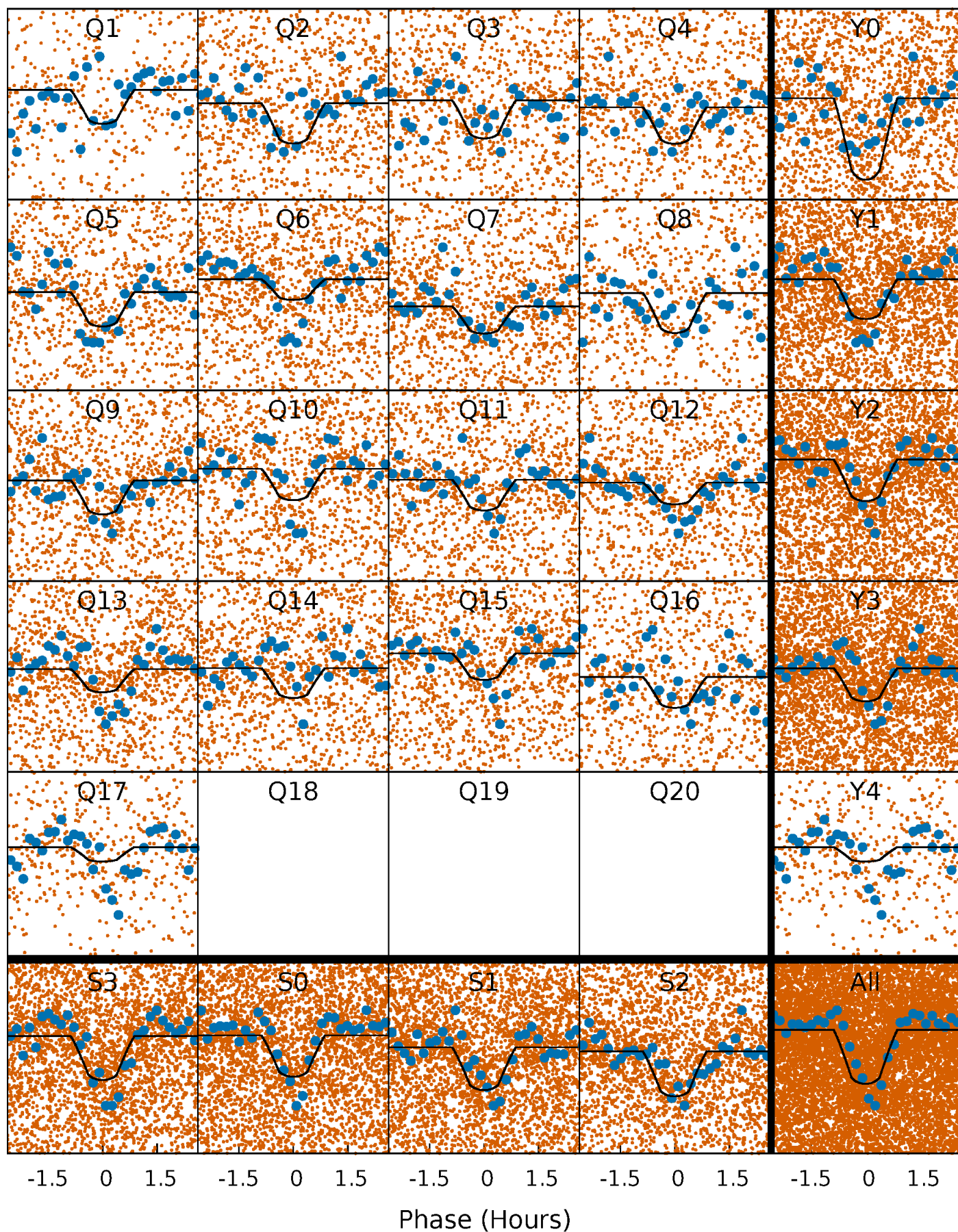
PDC Quarter-Phased Transit Curves

TCE 006042031-01 P= 0.537101 Days $T_0=131.567318$ (BKJD)



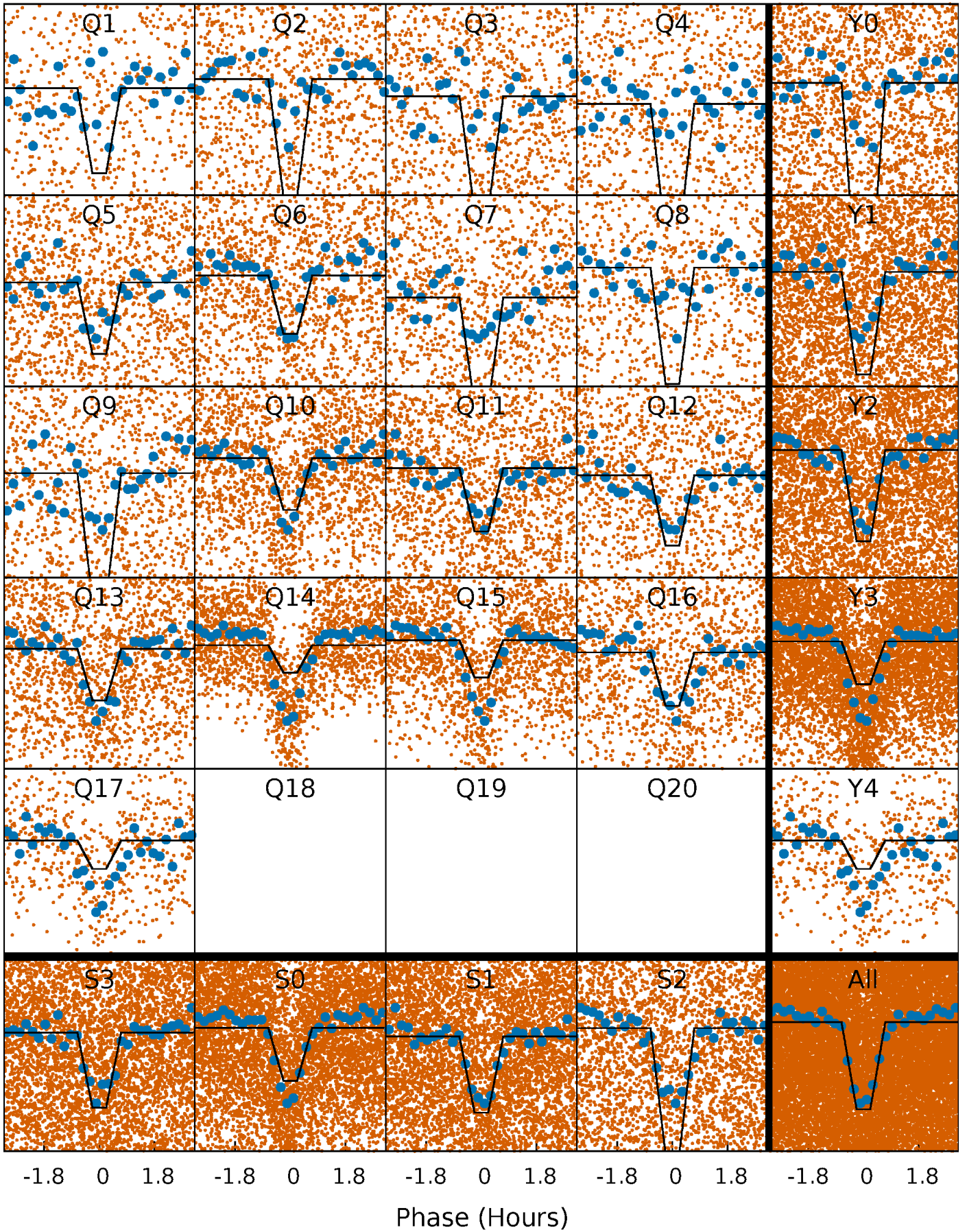
DV Quarter-Phased Transit Curves

TCE 006042031-01 P= 0.537101 Days $T_0=131.567318$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

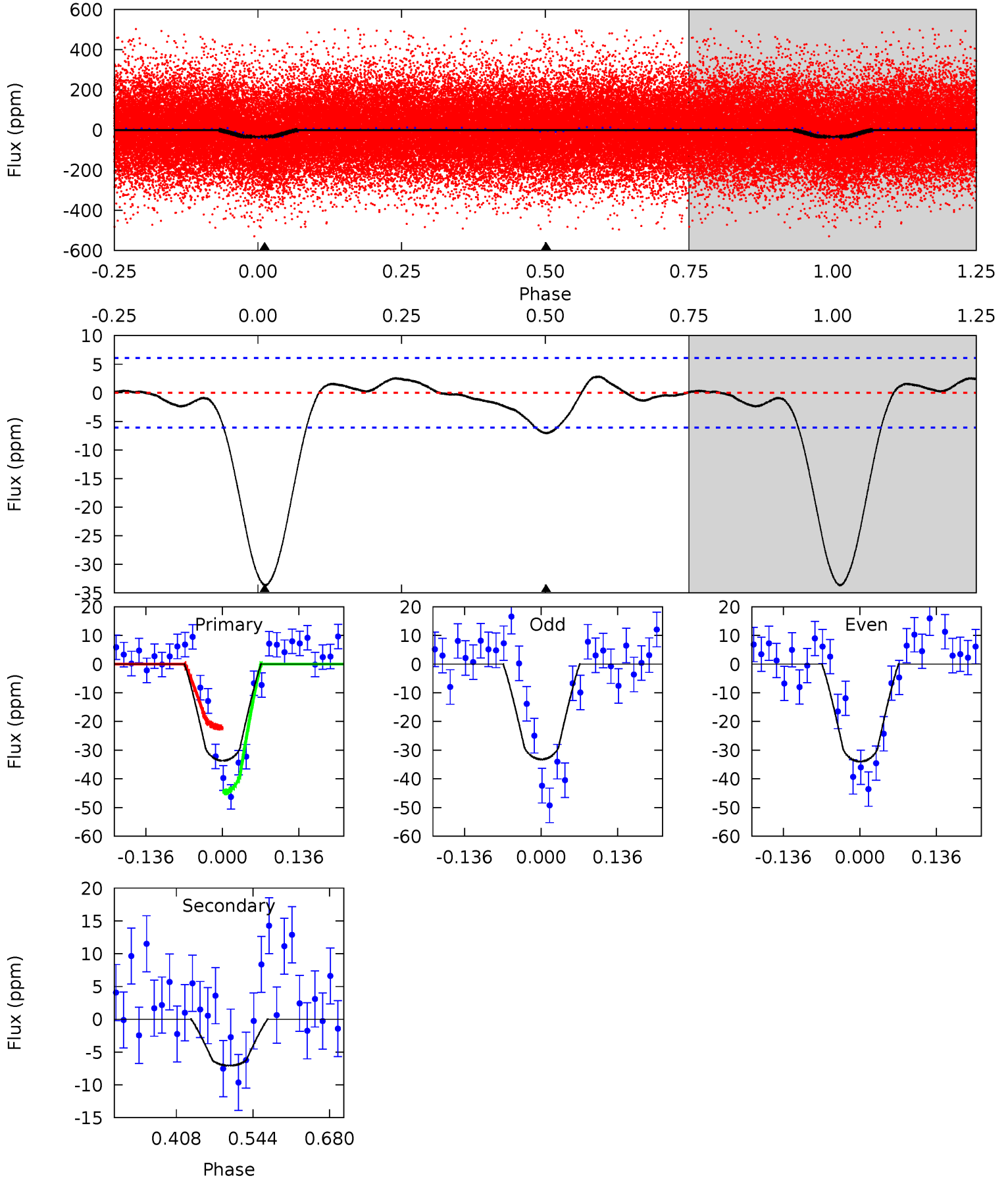
TCE 006042031-01 P= 0.537110 Days $T_0=131.559696$ (BKJD)



DV Model-Shift Uniqueness Test

006042031-01, P = 0.537101 Days, E = 131.030217 Days

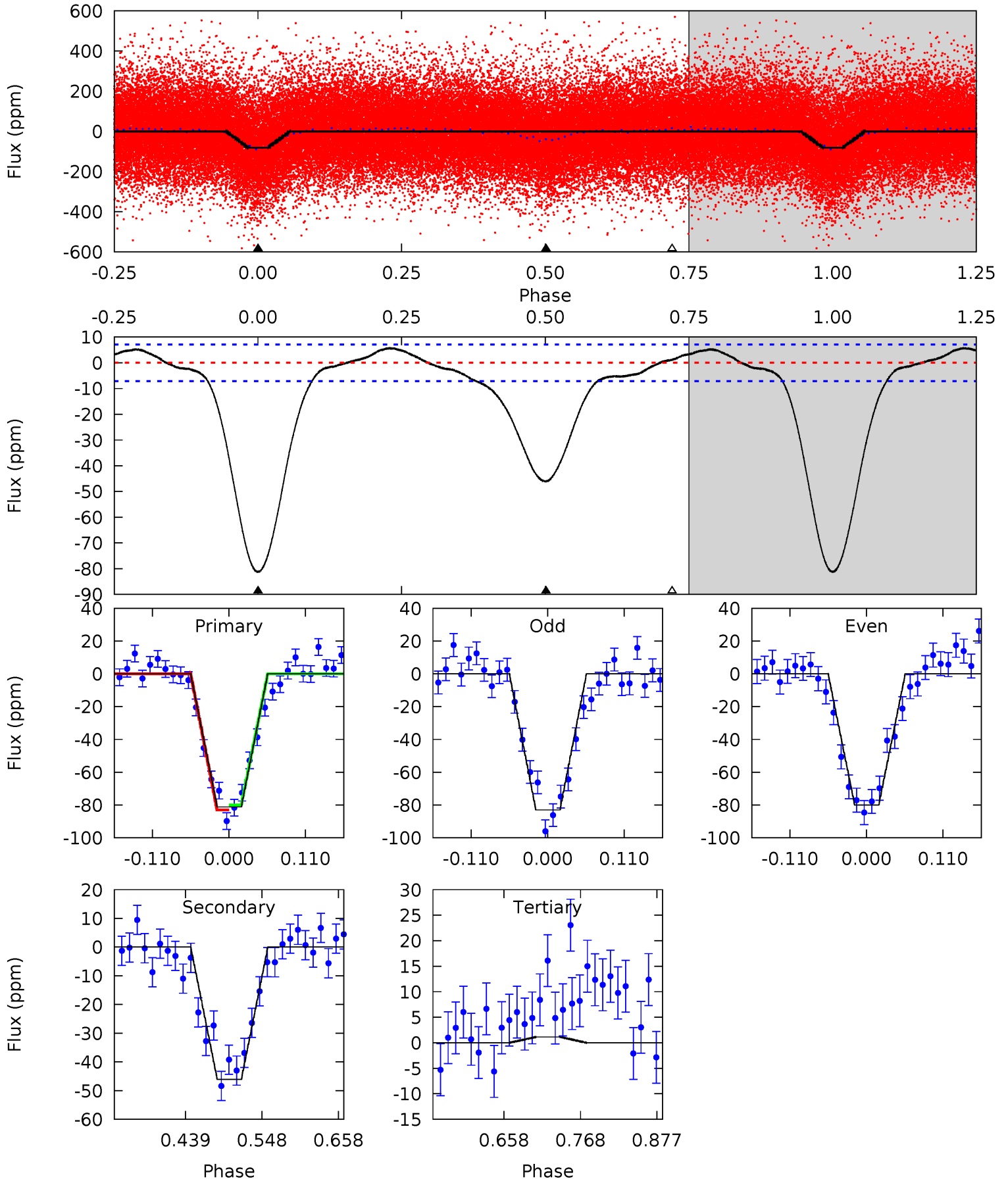
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.8	5.22	0	0	4.50	1.49	0.87	24.8	24.8	5.22	5.22	0.28	0.94	0.08	8.36



Alt Model-Shift Uniqueness Test

006042031-01, P = 0.537110 Days, E = 131.022586 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
51.9	29.4	-0.72	0	4.55	1.60	2.27	52.6	51.9	30.1	29.4	0.96	0.98	0.07	0.93



Stellar Parameters For KIC 006042031

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5395^{+176}_{-176}	$3.739^{+0.260}_{-0.140}$	$-0.100^{+0.300}_{-0.300}$	$2.537^{+0.547}_{-0.889}$	$1.288^{+0.137}_{-0.319}$	$0.111^{+0.188}_{-0.046}$
	+3%/-3%	+7%/-4%	+300%/-300%	+22%/-35%	+11%/-25%	+169%/-41%
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 006042031-01 / KOI 4165.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-7 ± 1	$1.66^{+0.48}_{-0.46}$	4409^{+326}_{-335}	-2775^{+6368}_{-772}	$0.267^{+0.252}_{-0.108}$
Alt.	-46 ± 2	$2.45^{+0.58}_{-0.53}$	4429^{+302}_{-374}	4314^{+475}_{-459}	$0.822^{+0.491}_{-0.277}$

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

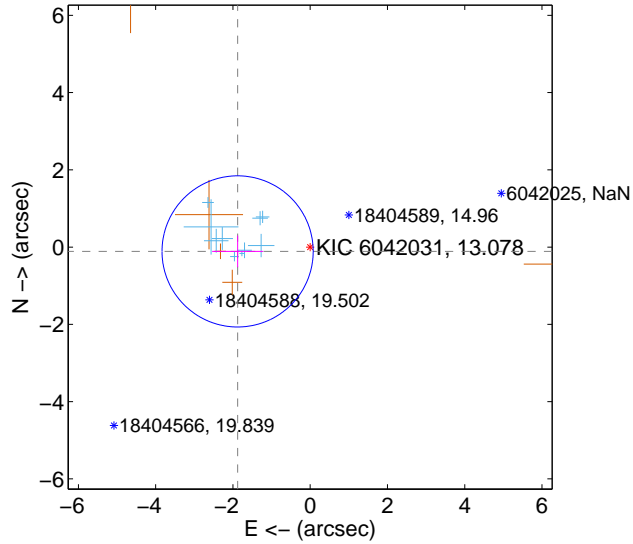
Supplemental centroid analysis for 006042031-01. Kepler magnitude: 13.08. Transit SNR 15.68

There are 10 quarters with good PRF difference image offsets

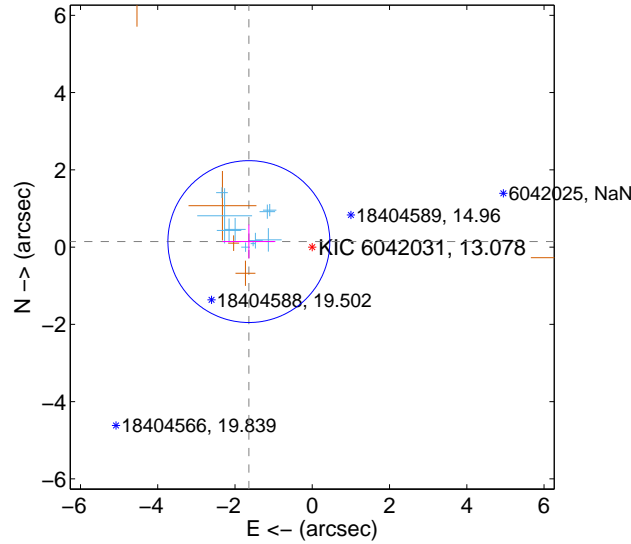
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.882 ± 0.652	2.89	1.879 ± 0.661	-0.112 ± 0.410
PRF-fit source offset from KIC position	1.648 ± 0.698	2.36	1.641 ± 0.685	0.143 ± 0.439
photometric centroid source offset	3.34 ± 0.63	5.31	3.28 ± 0.63	0.61 ± 0.55

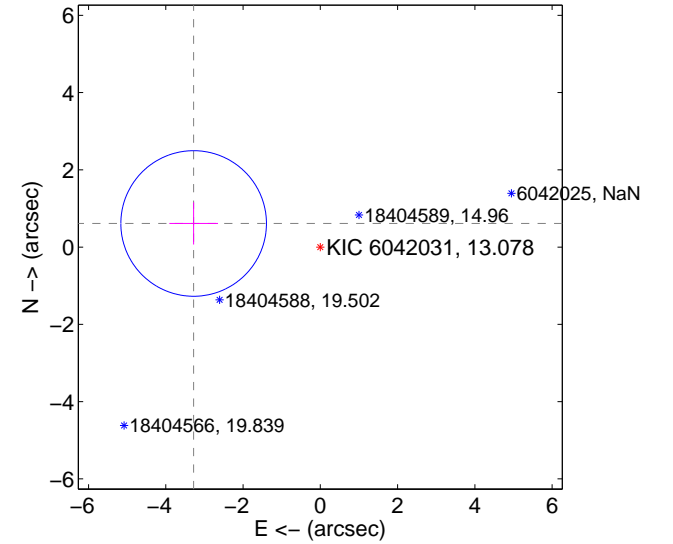
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

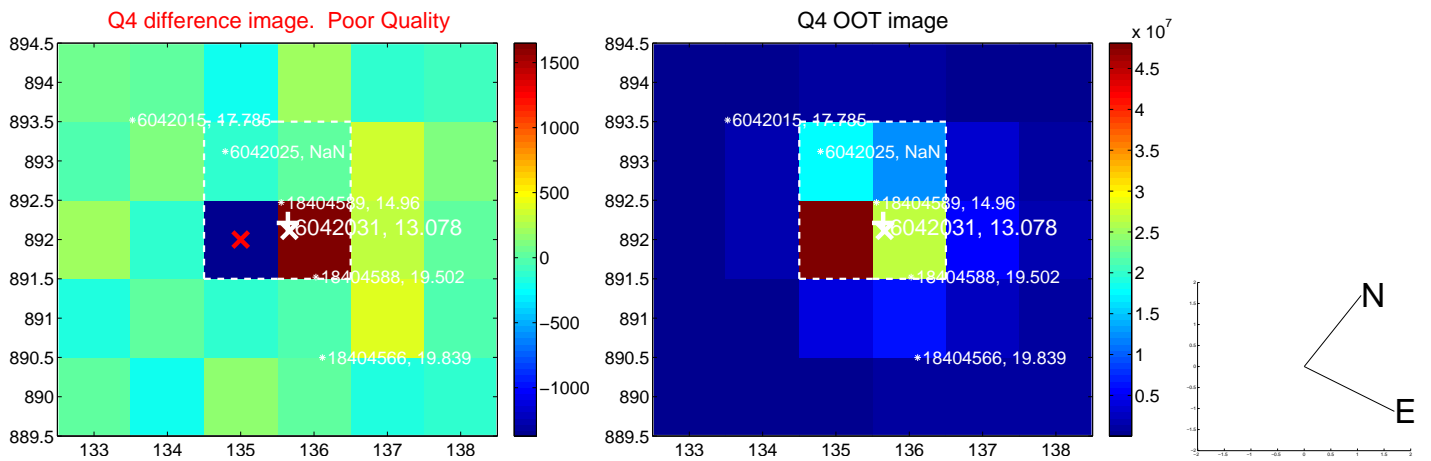
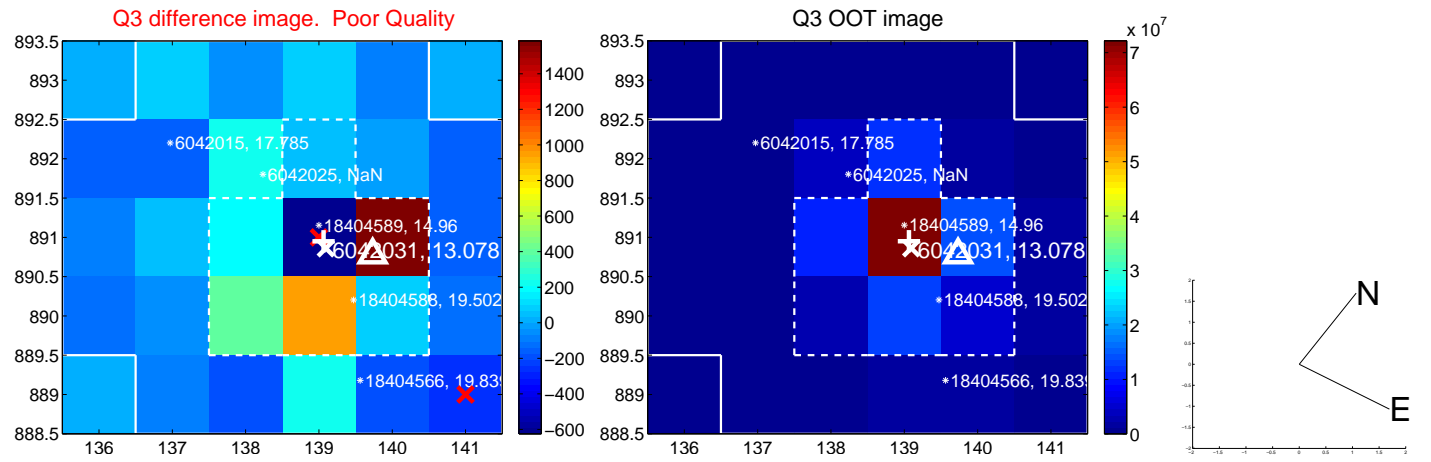
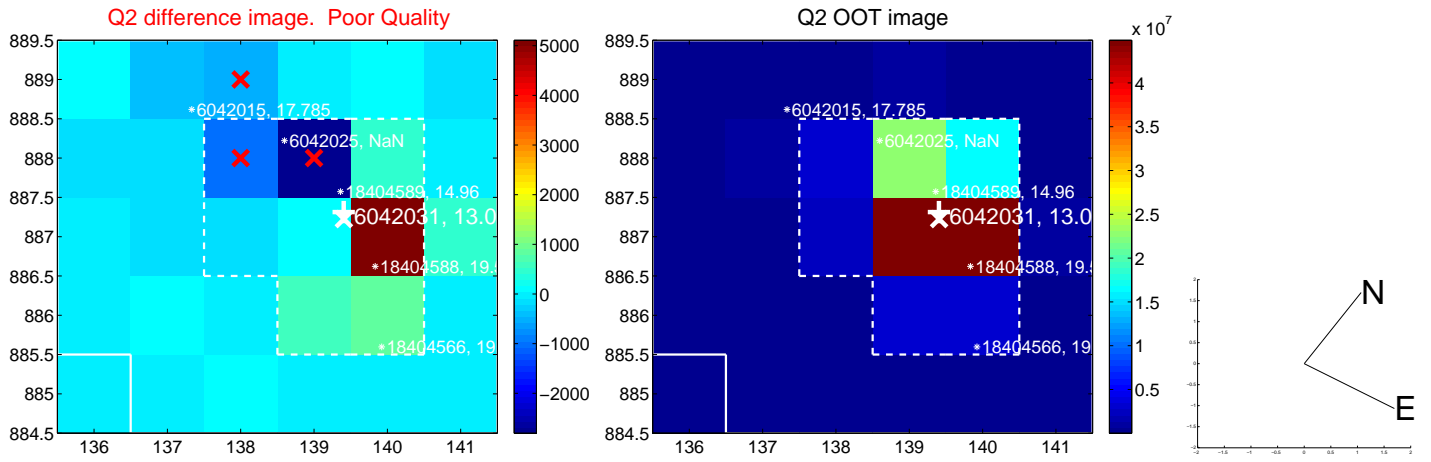
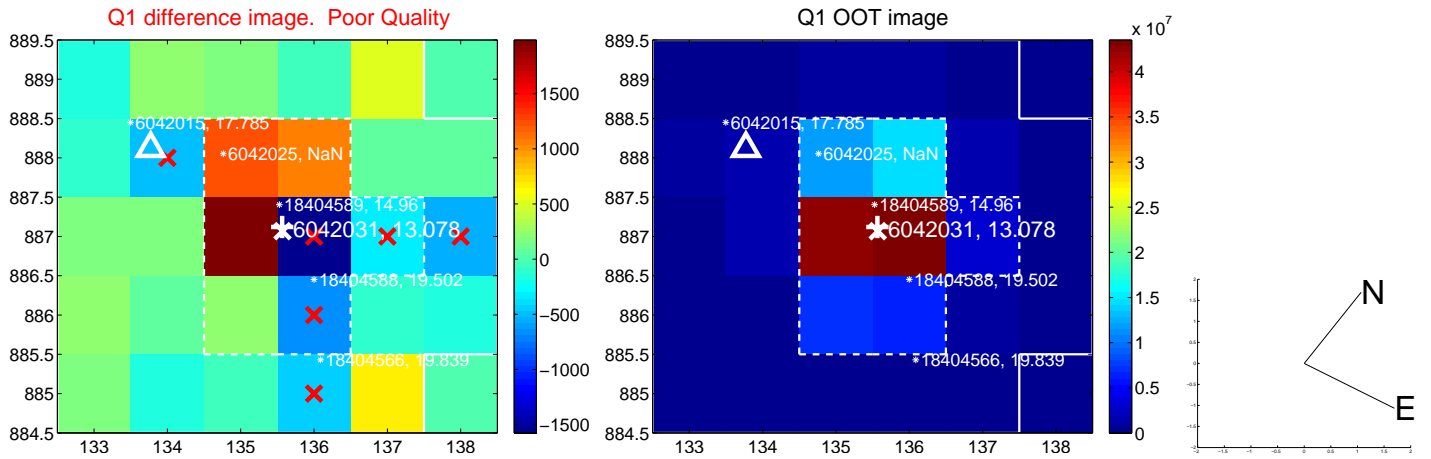


offset from photometric centroids

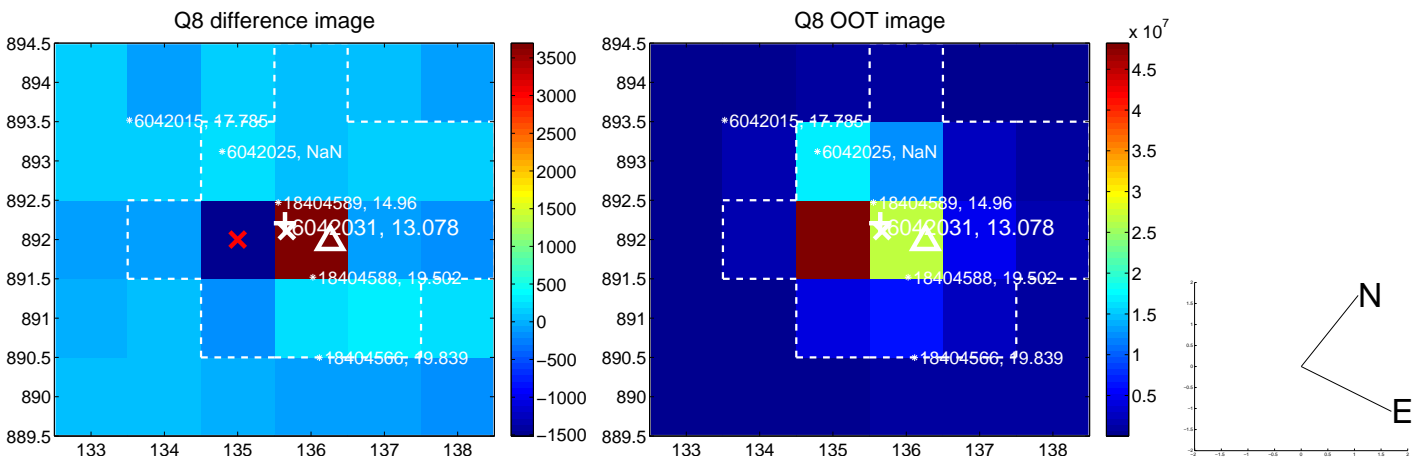
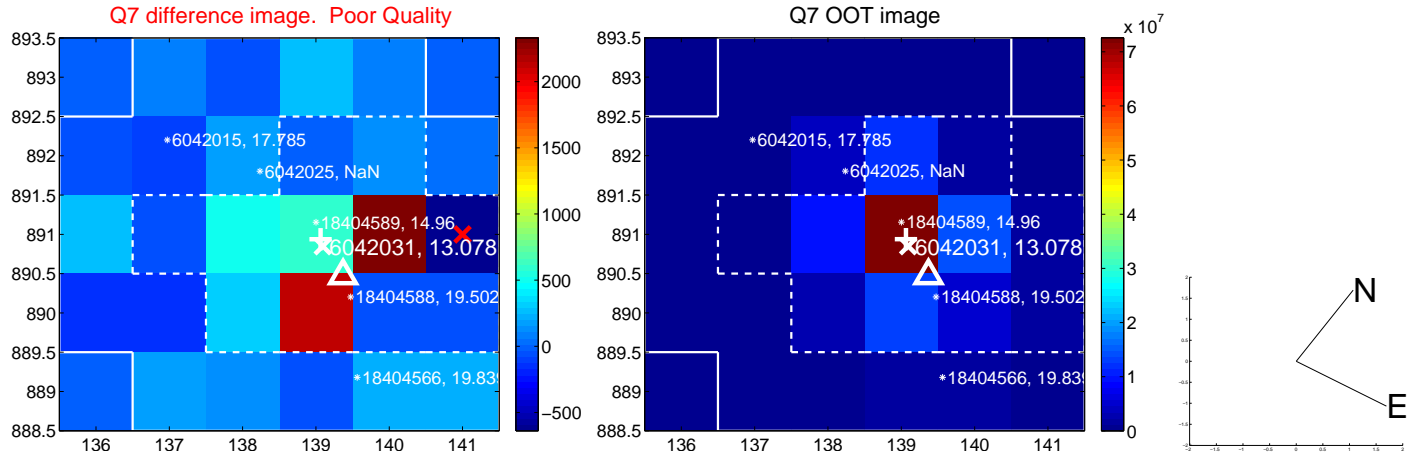
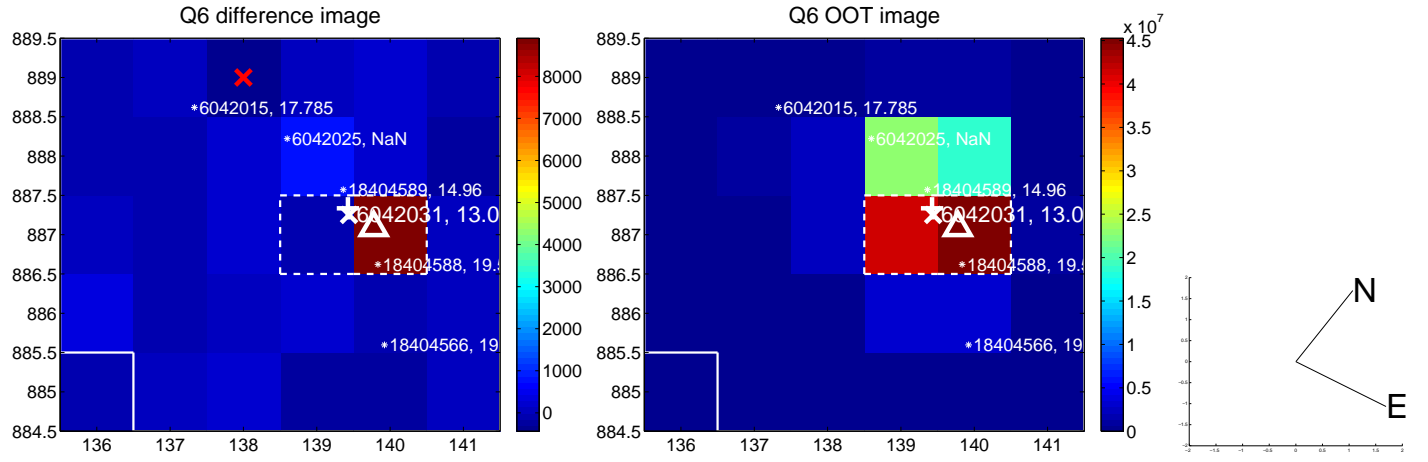
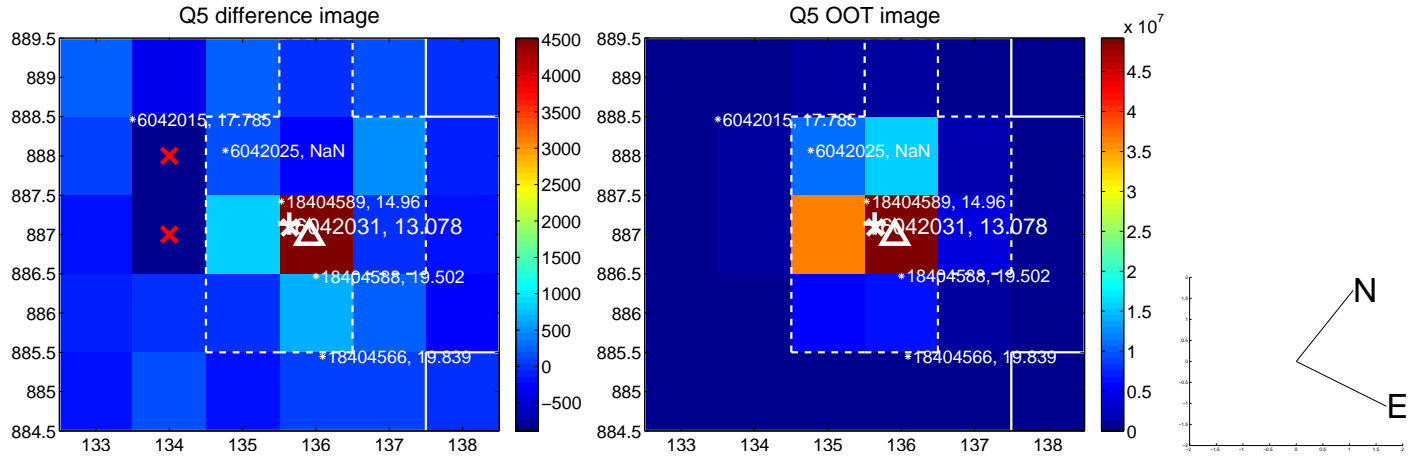


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

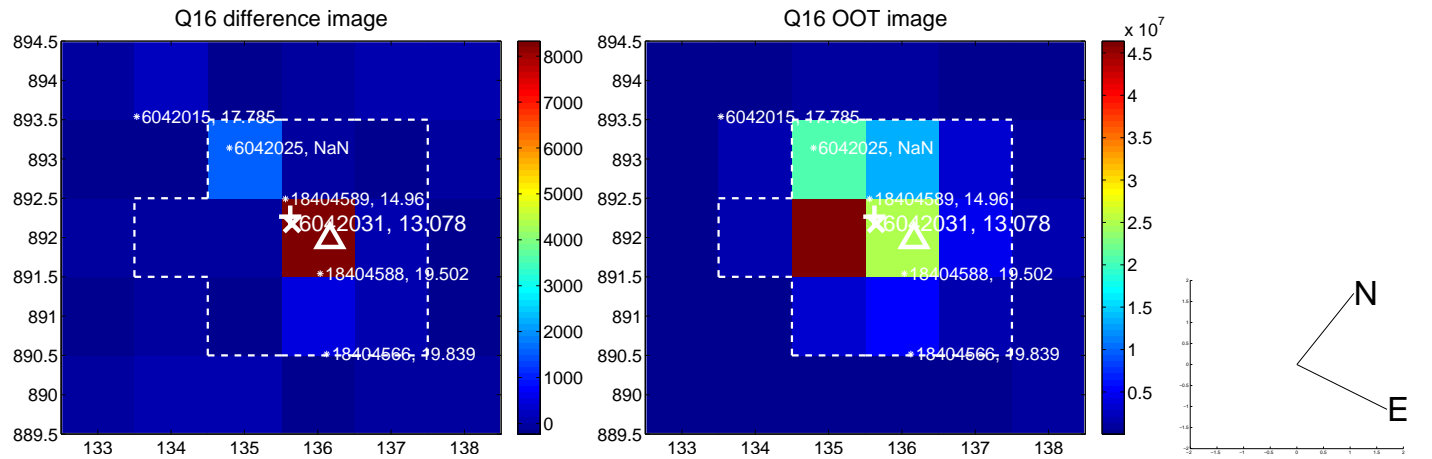
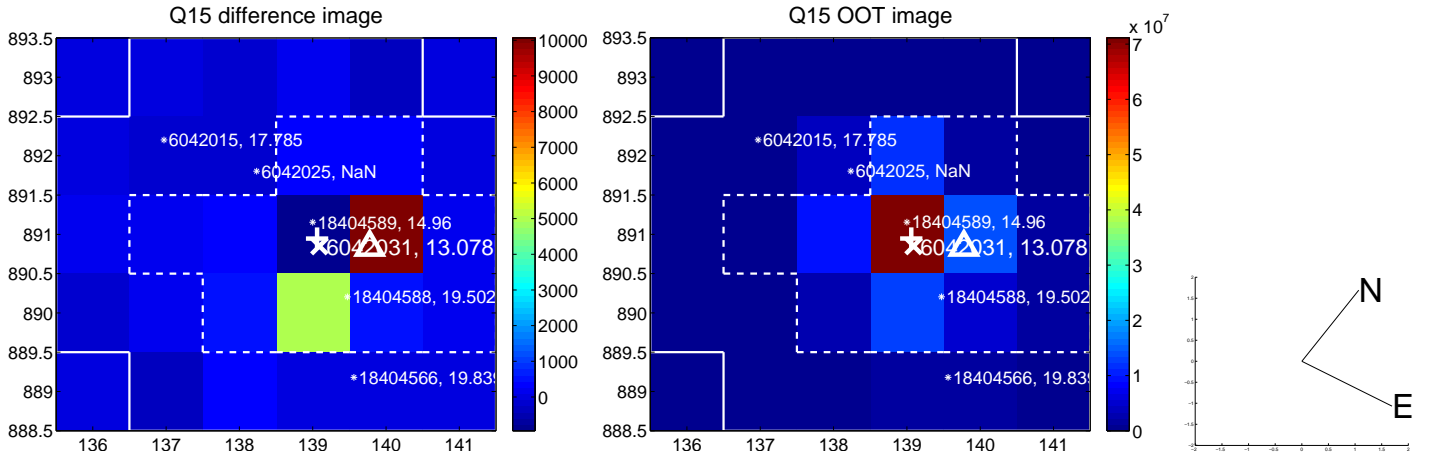
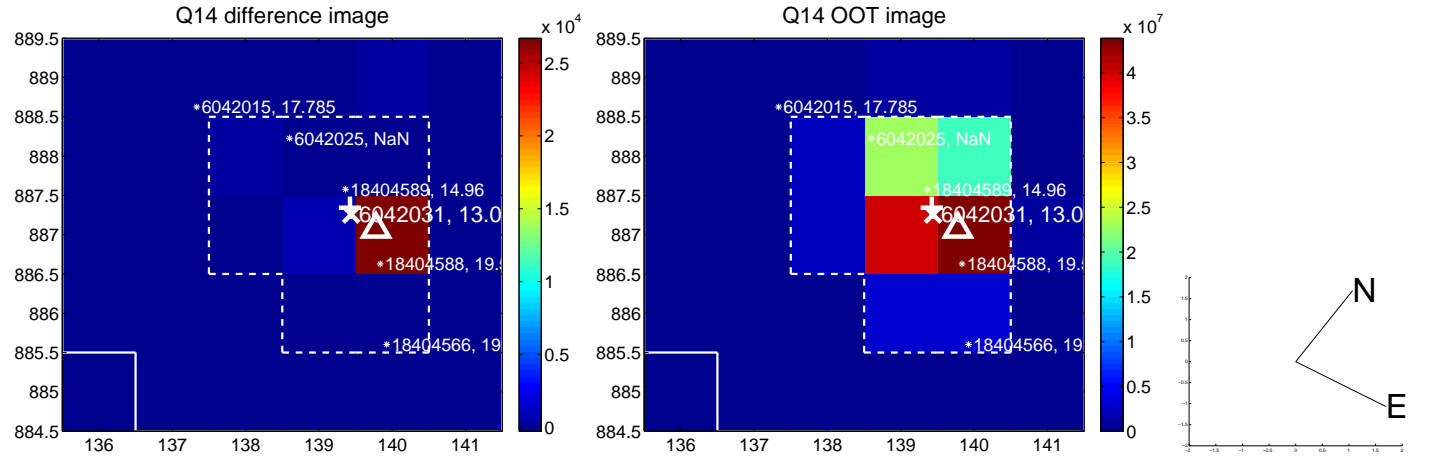
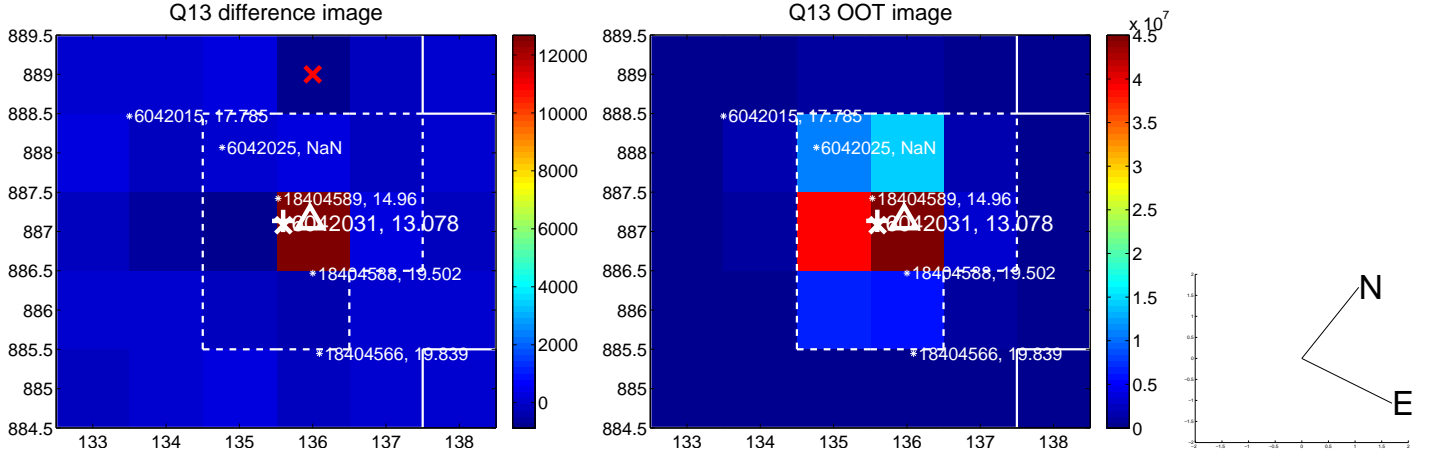
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

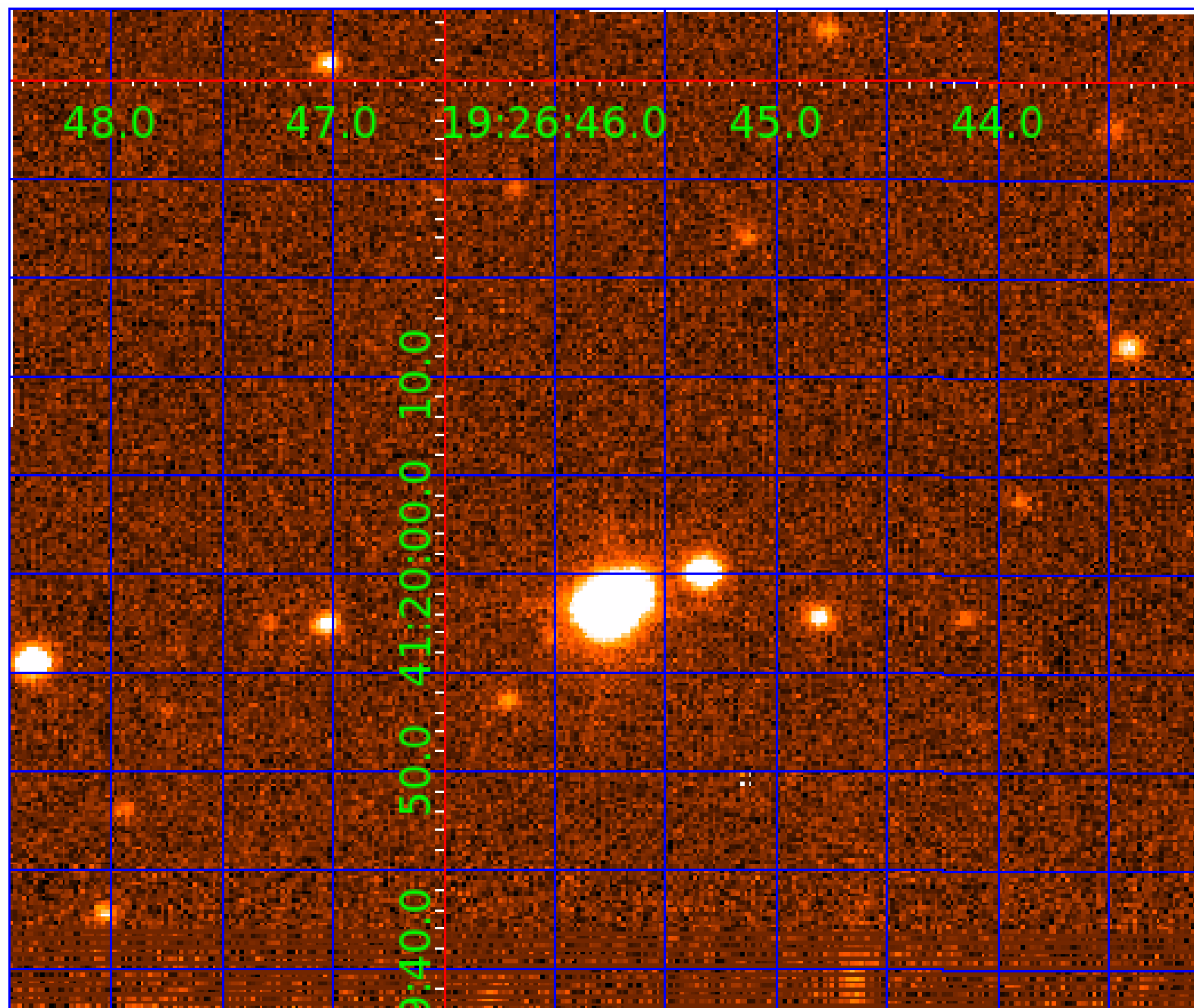


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006042031

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})
006042031-01	OBS	4165.01	0.537101	131.567318	32.5	1.313	15.4	15.7	2.54	5395	1.74	24679.27
006042031-02	OBS	No	309.662265	162.495114	170.2	6.281	7.3	6.8	2.54	5395	3.76	5.14

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006042031-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—CENT_KIC_POS
006042031-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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.

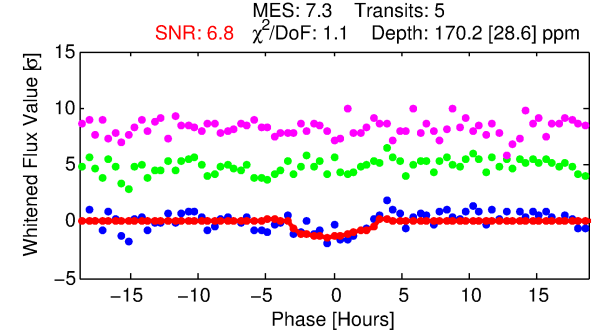
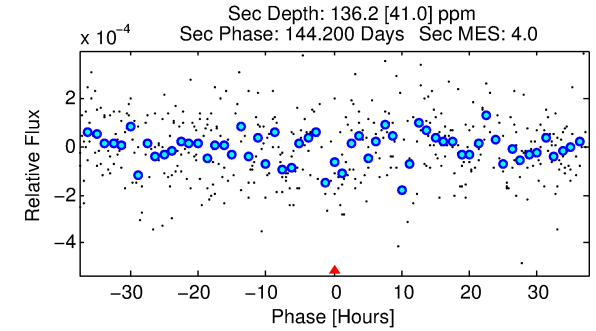
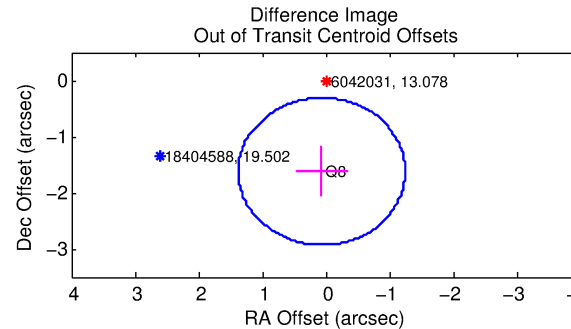
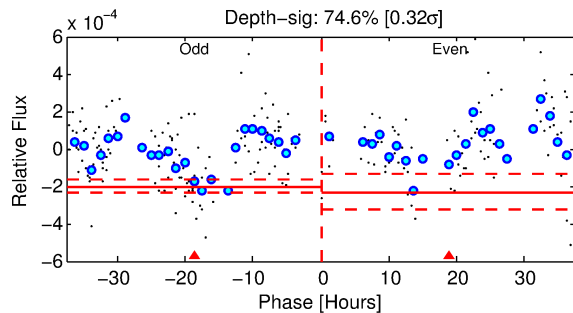
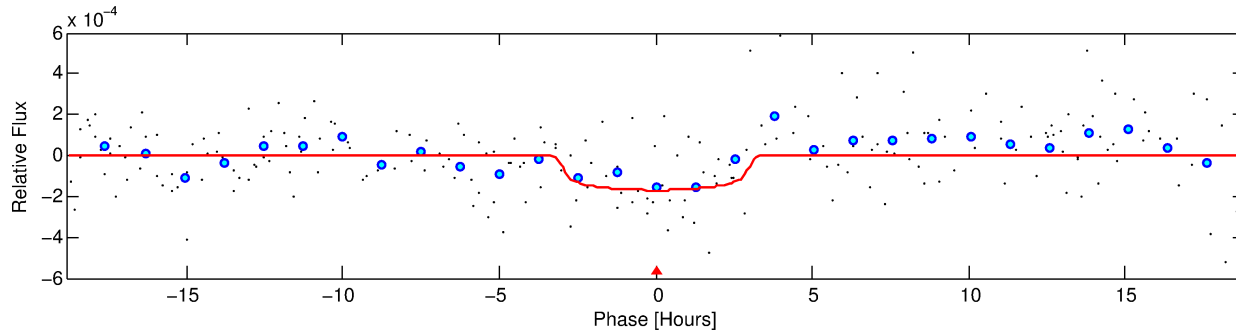
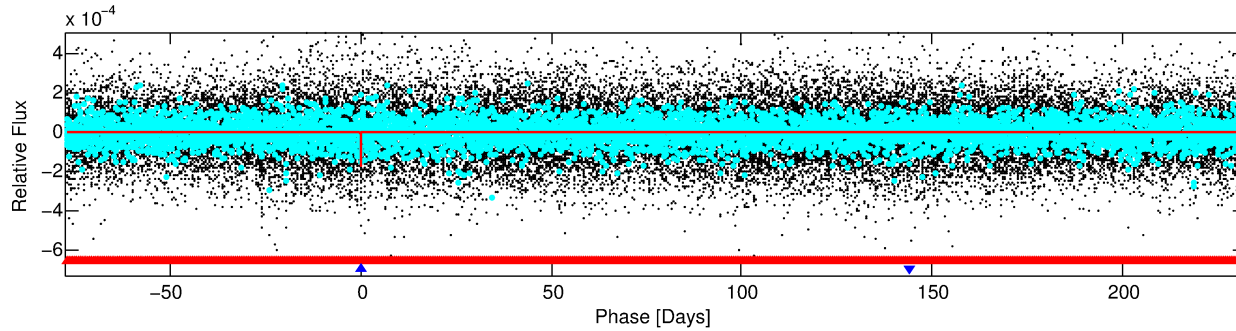
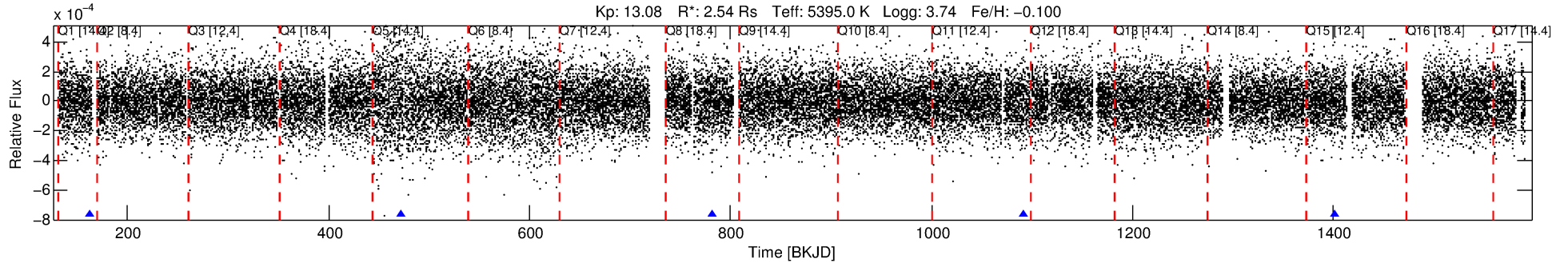
Ephemeris Match Information For 006042031-02

No Significant Match Found

DV One-Page Summary

KIC: 6042031 Candidate: 2 of 2 Period: 309.662 d
KOI: K04165 Corr: No Ephemeris Match

Kp: 13.08 R*: 2.54 Rs Teff: 5395.0 K Logg: 3.74 Fe/H: -0.100



DV Fit Results:

Period = 309.66227 [0.00731] d
Epoch = 162.4951 [0.0148] BKJD
Rp/R* = 0.0136 [0.0157]
a/R* = 216.30 [1057.23]
b = 0.84 [1.80]
Seff = 5.14 [2.47]
Teq = 384 [46] K
Rp = 3.76 [4.55] Re
a = 0.9746 [0.2994] AU
Ag = 5029.68 [11972.04] [0.42σ]
Teff = 5000 [2923] K [1.58σ]

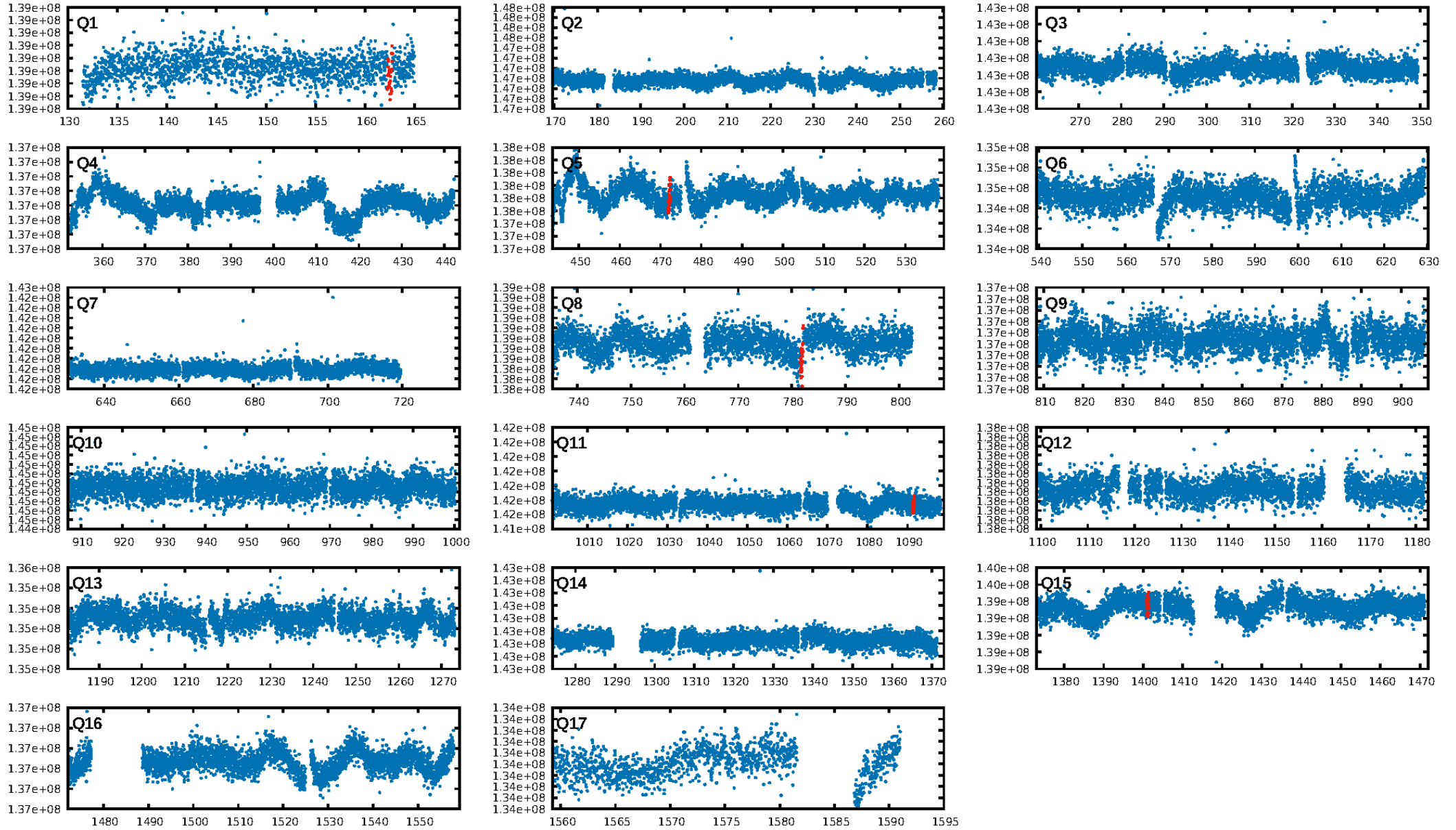
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1156.13σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 14.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.86e-12
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.353
Centroid-sig: 72.6%
Centroid-so: 0.506 arcsec [0.35σ]
OotOffset-rm: 1.623 arcsec [3.71σ]
KicOffset-rm: 1.364 arcsec [3.13σ]
OotOffset-st: 0/0/1/0 [1]
KicOffset-st: 0/0/1/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.00 [0/5]

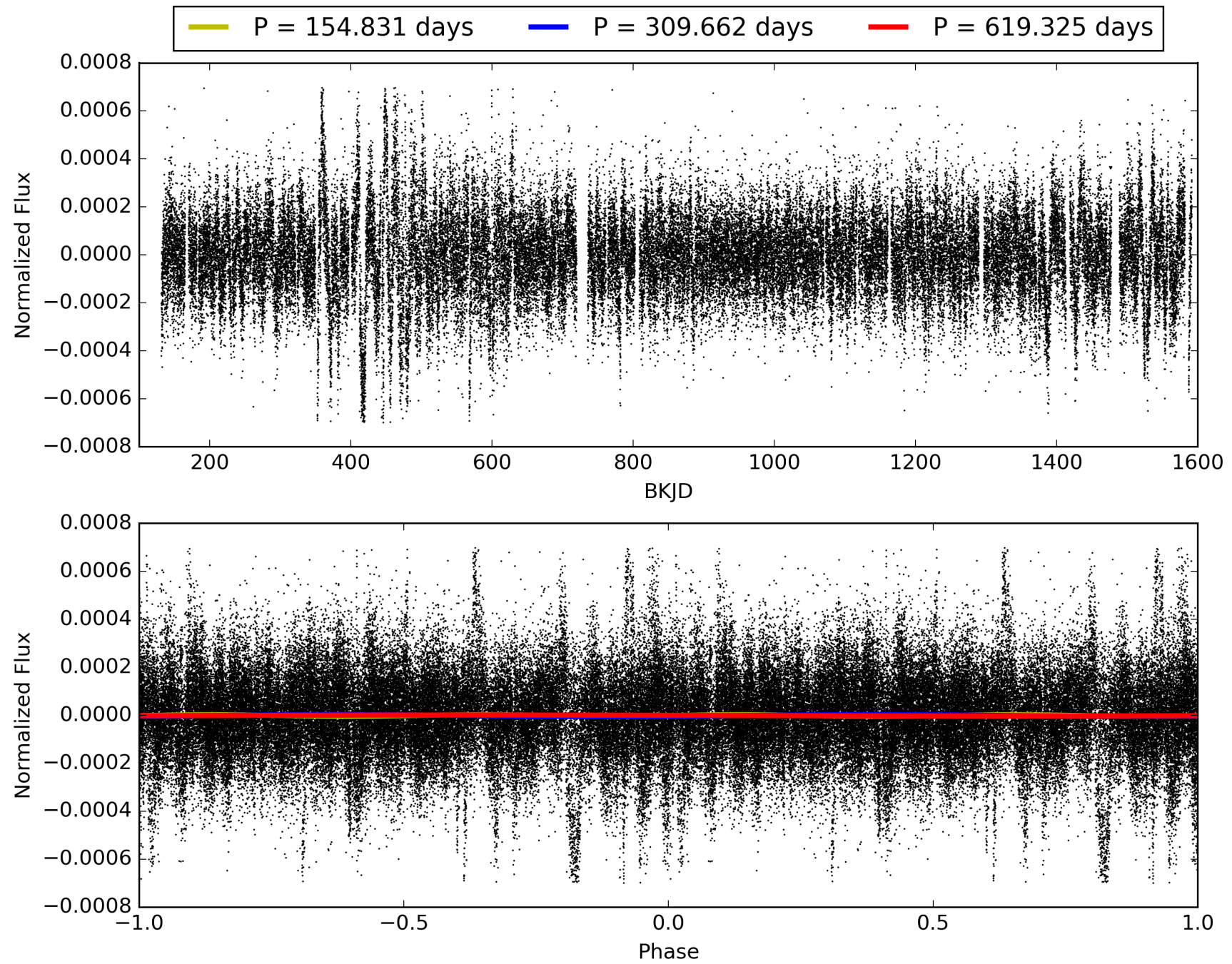
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:20:21 Z

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

TCE 006042031-02, PDC Light Curves

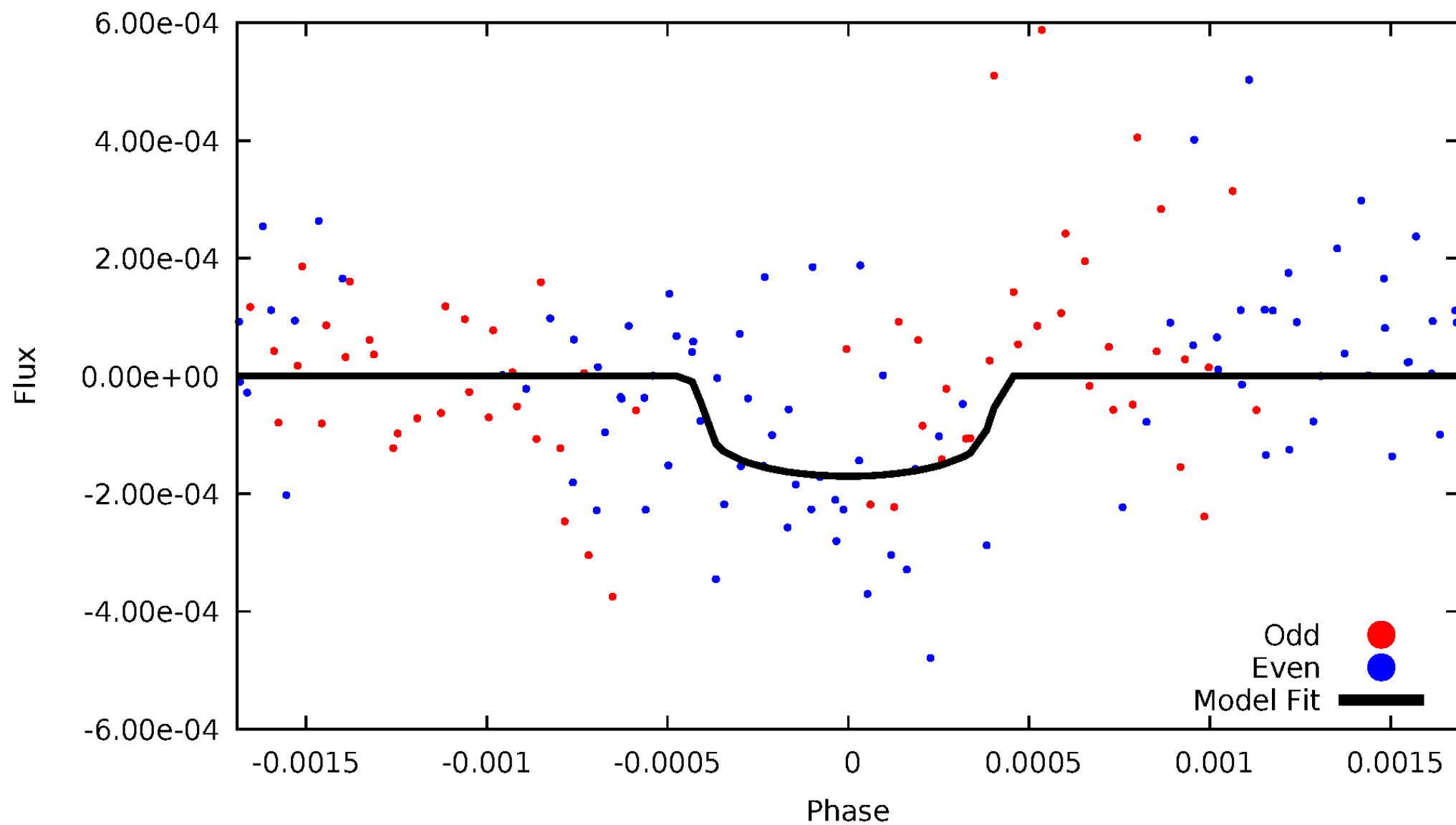


TCE 006042031-02



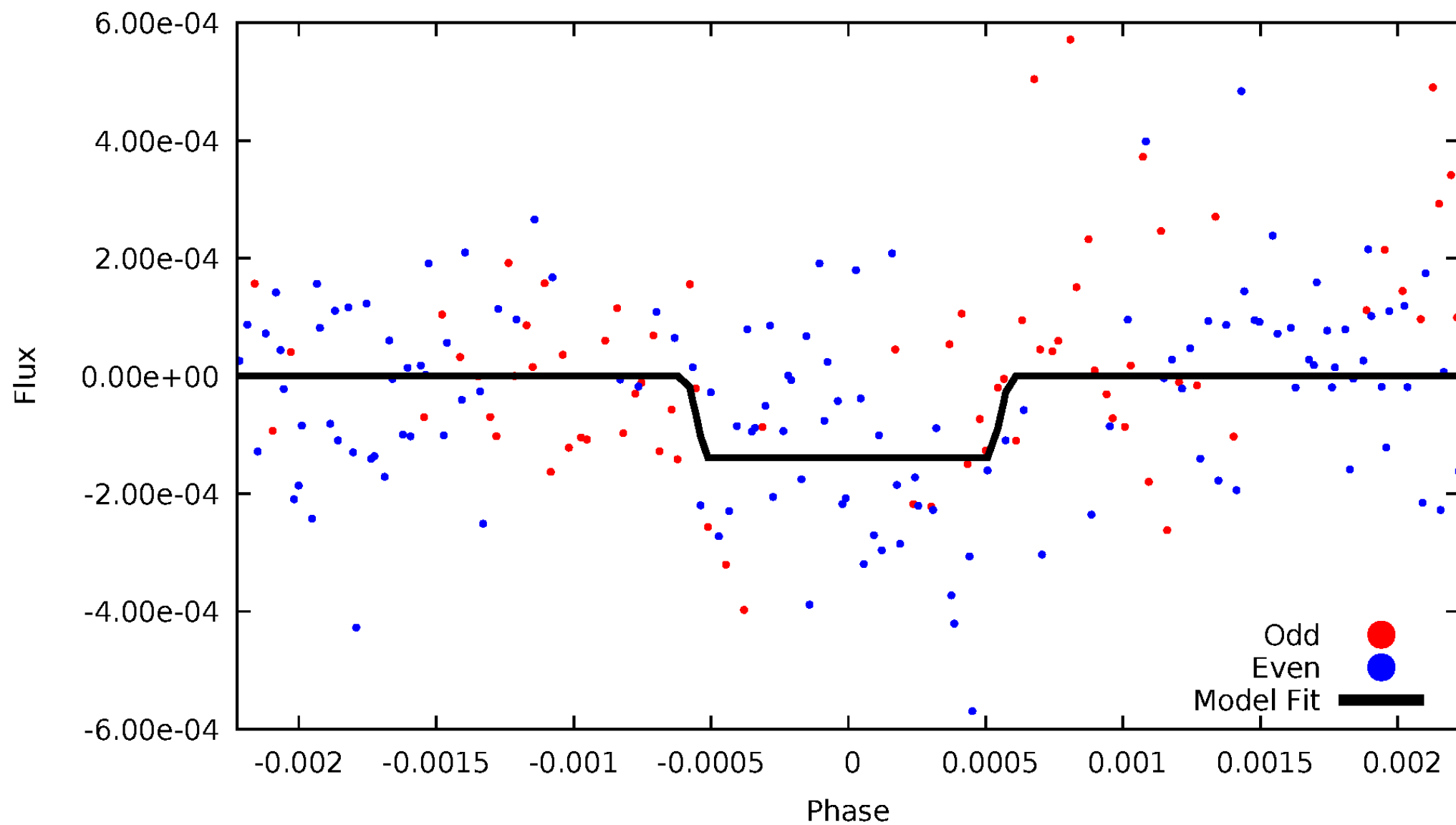
DV Odd/Even

TCE 006042031-02



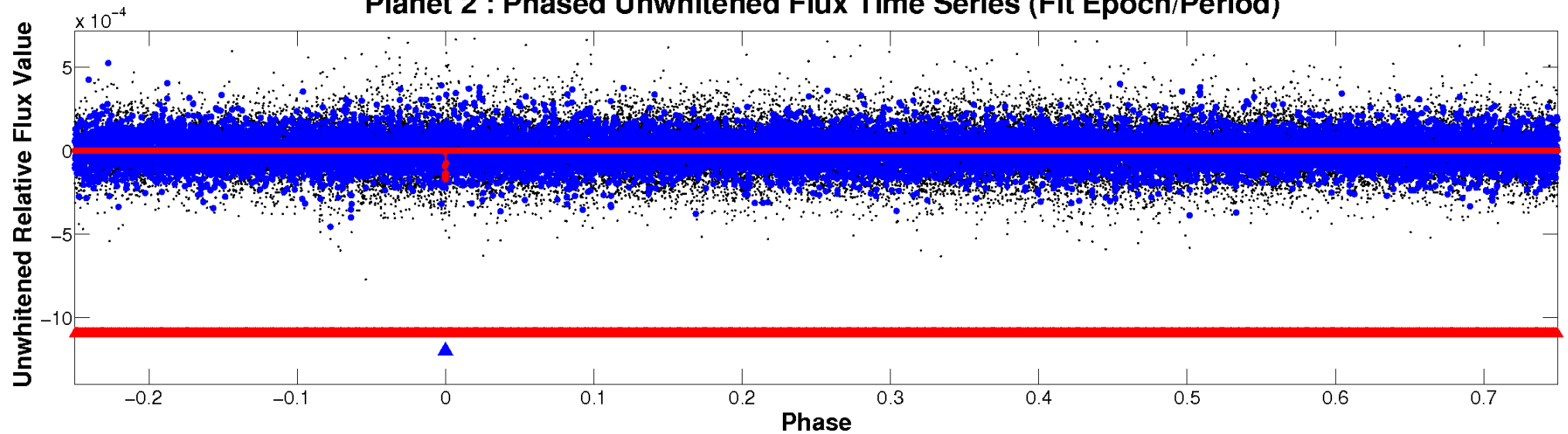
ALT Odd/Even

TCE 006042031-02

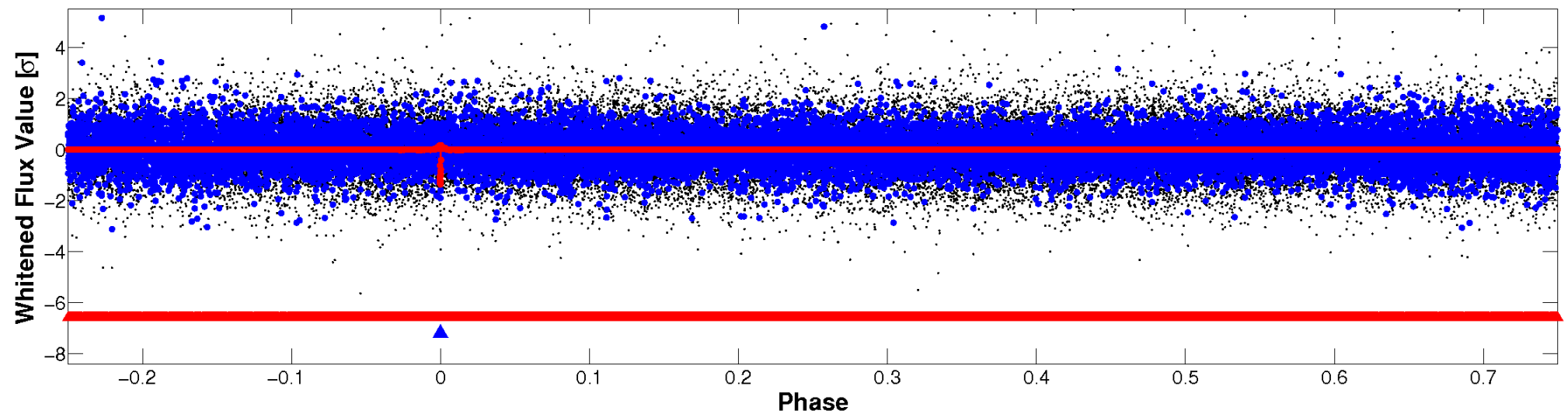


Non-Whitened Vs. Whitened Light Curve

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

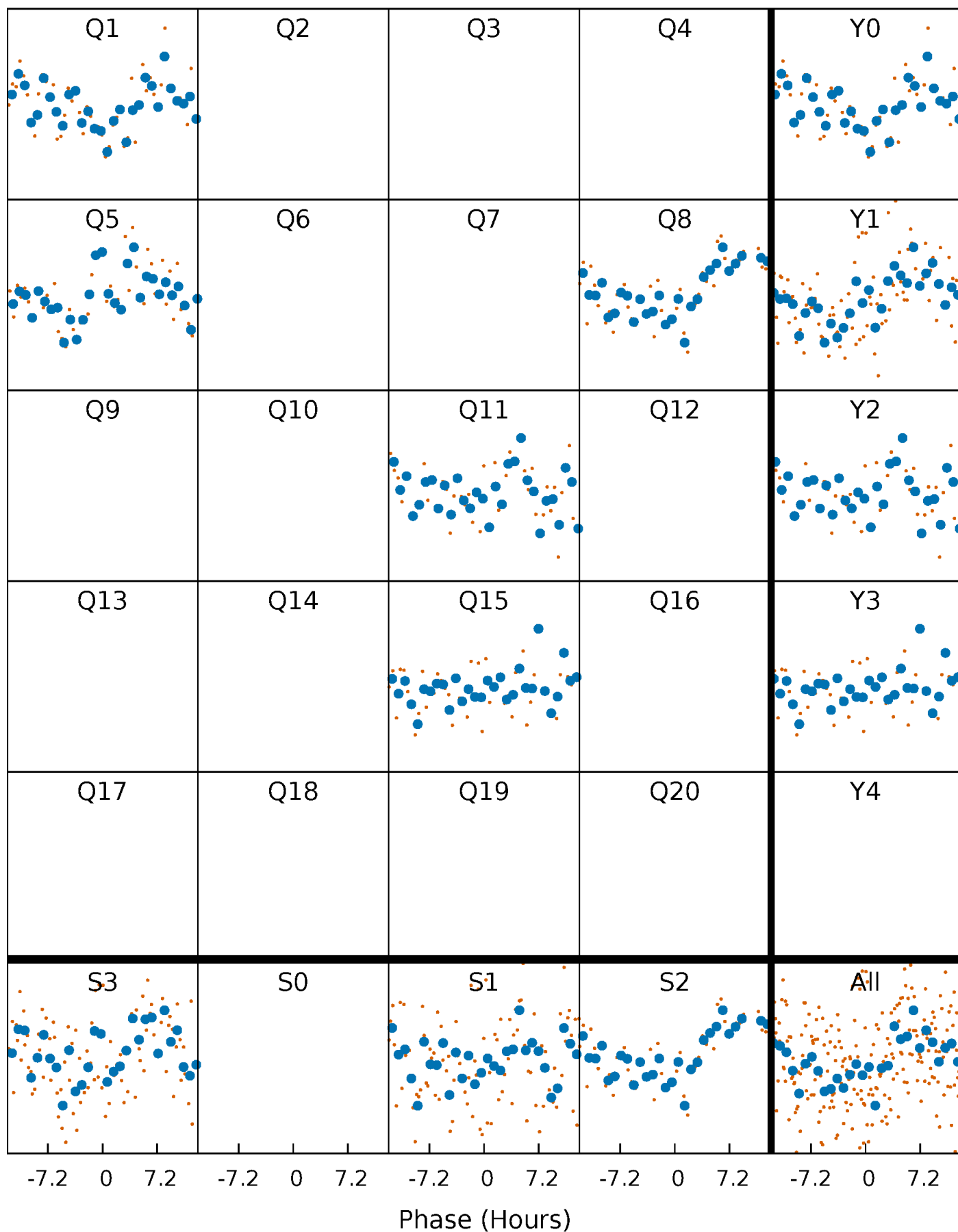


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 006042031-02 P=309.662265 Days $T_0=162.495114$ (BKJD)



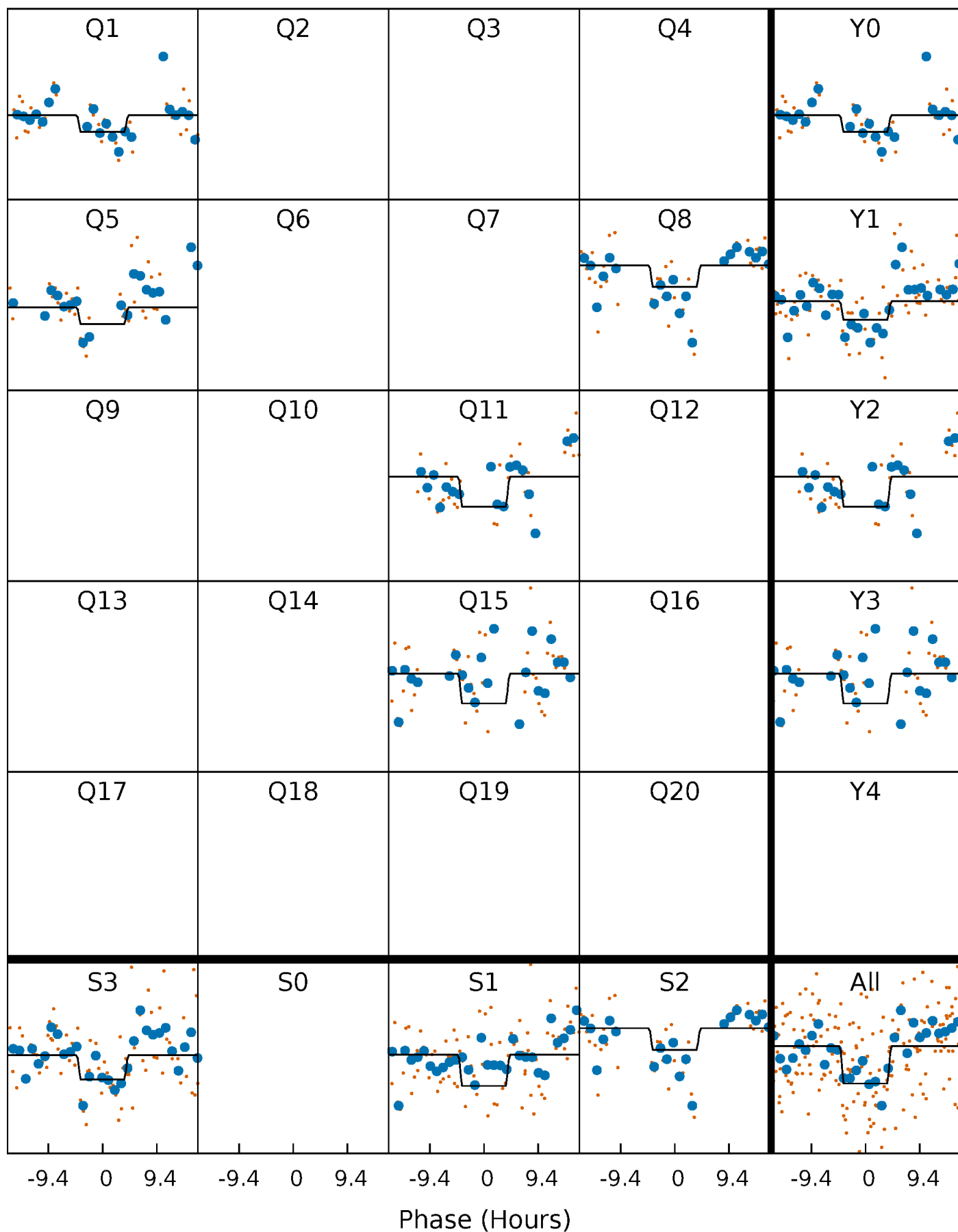
DV Quarter-Phased Transit Curves

TCE 006042031-02 $P=309.662265$ Days $T_0=162.495114$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

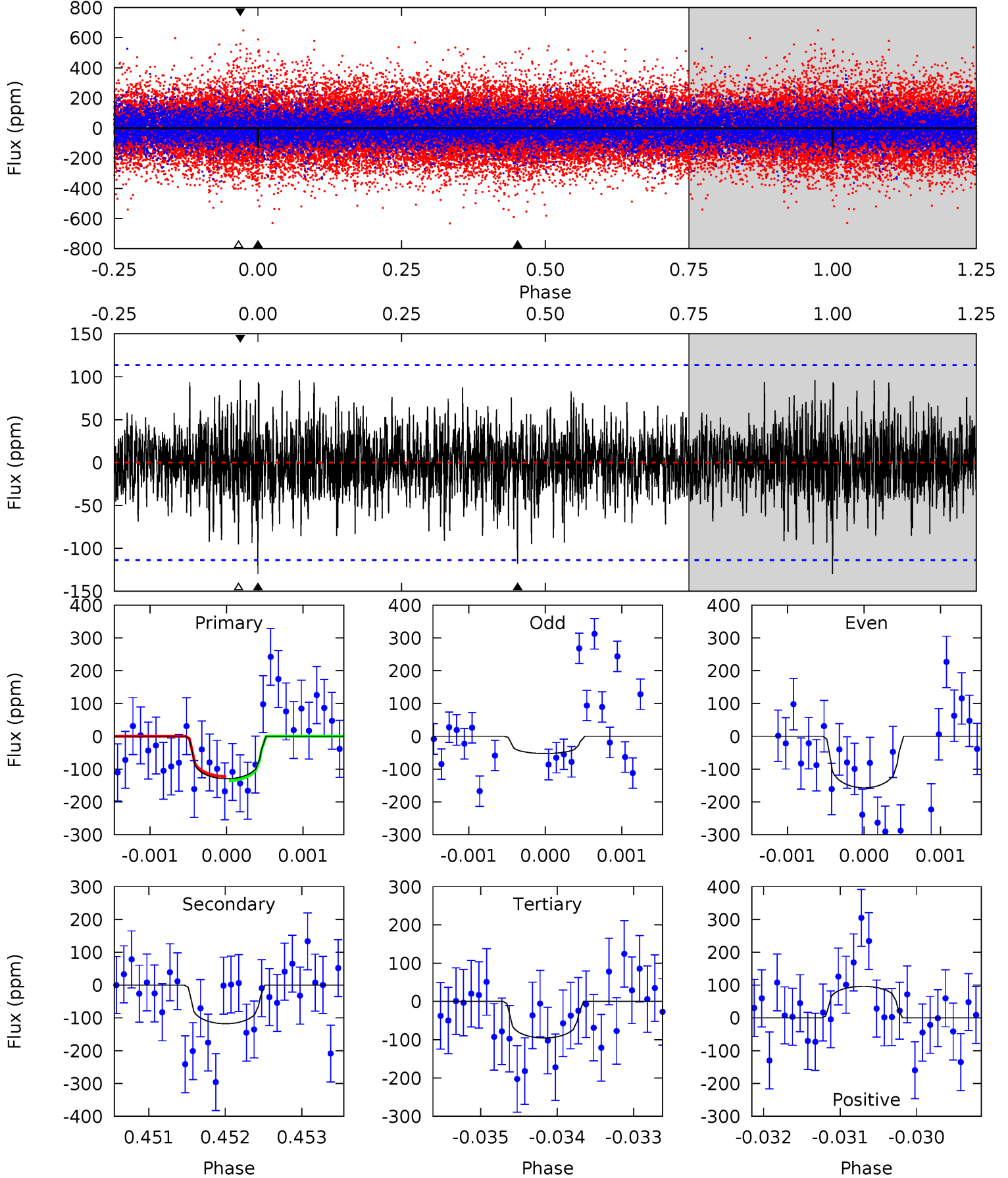
TCE 006042031-02 P=309.677400 Days $T_0=162.395384$ (BKJD)



DV Model-Shift Uniqueness Test

006042031-02, P = 309.662265 Days, E = 162.495114 Days

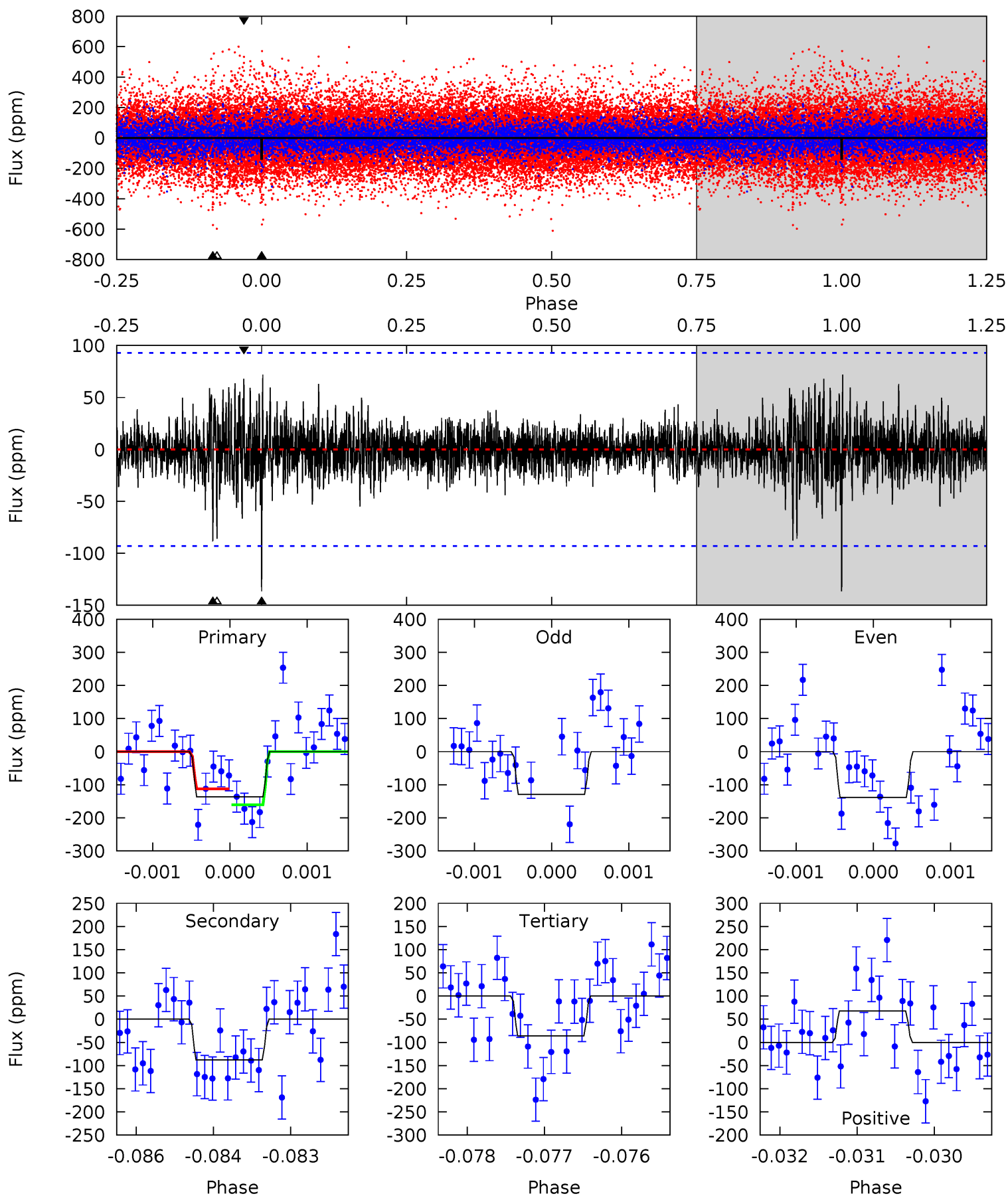
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.23	5.68	4.59	4.63	5.47	3.32	1.34	1.64	1.61	1.08	1.05	2.21	1.00	0.43	0.32



Alt Model-Shift Uniqueness Test

006042031-02, P = 309.677400 Days, E = 162.395384 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.96	5.11	5.01	3.96	5.42	3.24	0.92	2.95	4.00	0.10	1.15	0.23	0.99	0.35	1.41



Stellar Parameters For KIC 006042031

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	ρ_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5395^{+176}_{-176}	$3.739^{+0.260}_{-0.140}$	$-0.100^{+0.300}_{-0.300}$	$2.537^{+0.547}_{-0.889}$	$1.288^{+0.137}_{-0.319}$	$0.111^{+0.188}_{-0.046}$
	+3%/-3%	+7%/-4%	+300%/-300%	+22%/-35%	+11%/-25%	+169%/-41%
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 006042031-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-118 ± 21	$4.56^{+3.93}_{-2.95}$	533^{+37}_{-46}	4435^{+2708}_{-830}	2916^{+19823}_{-2106}
Alt.	-88 ± 17	$4.18^{+3.82}_{-2.71}$	532^{+38}_{-44}	4359^{+2484}_{-890}	2680^{+15815}_{-1990}

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

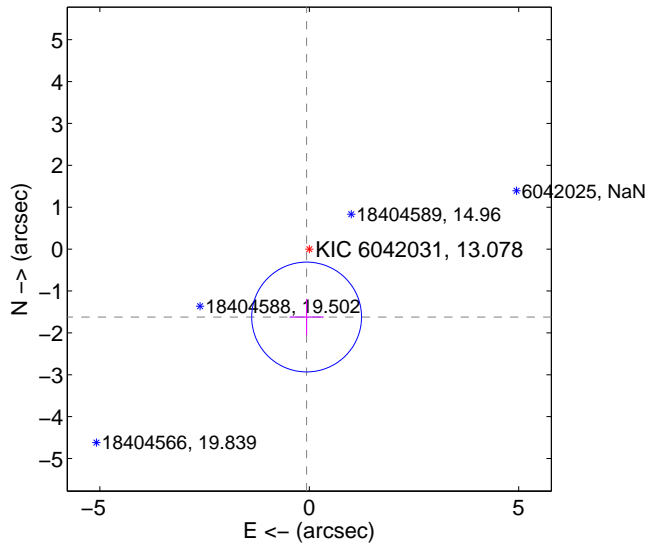
Supplemental centroid analysis for 006042031-02. Kepler magnitude: 13.08. Transit SNR 6.77

There are 1 quarters with good PRF difference image offsets

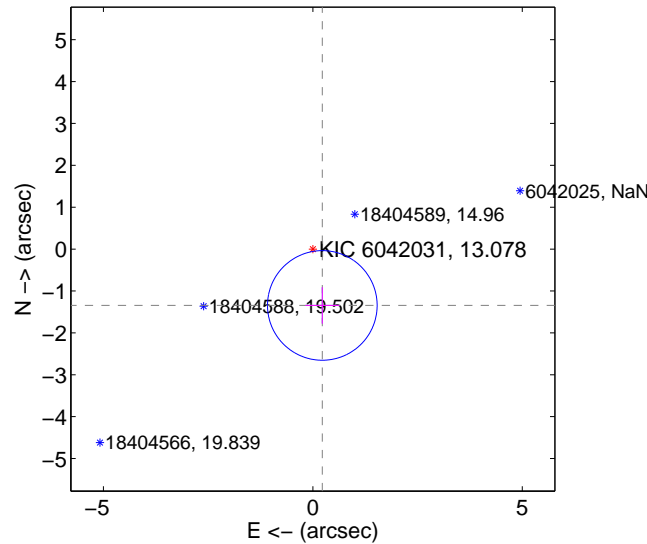
The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.623 ± 0.437	3.71	0.064 ± 0.406	-1.622 ± 0.437
PRF-fit source offset from KIC position	1.364 ± 0.436	3.13	-0.226 ± 0.406	-1.345 ± 0.437
photometric centroid source offset	0.51 ± 1.44	0.35	0.41 ± 1.49	0.29 ± 1.32

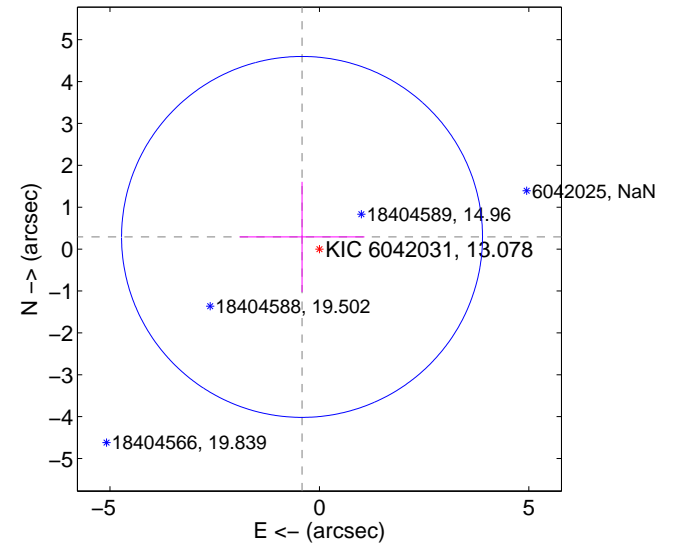
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

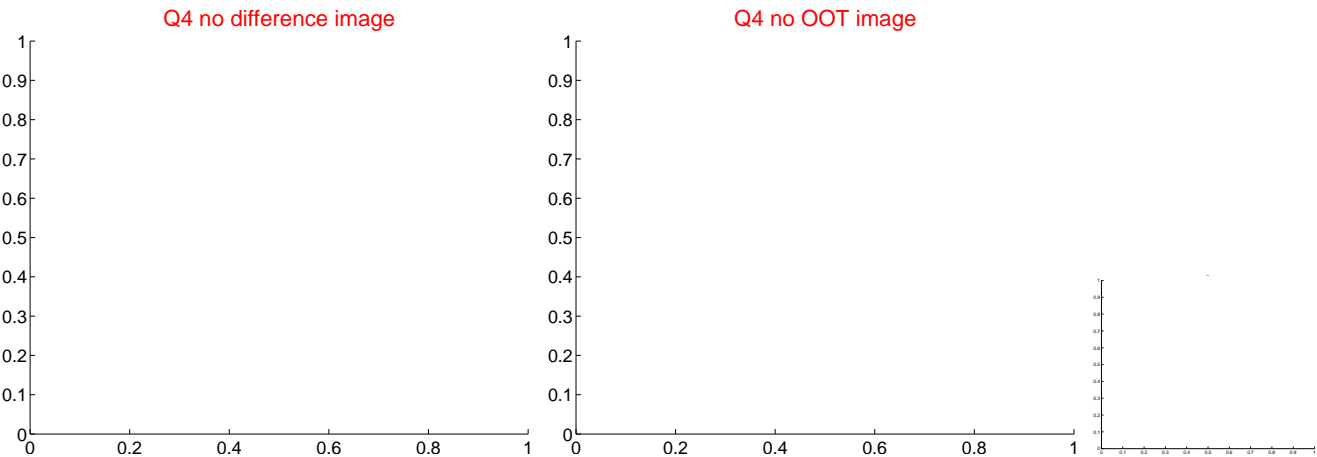
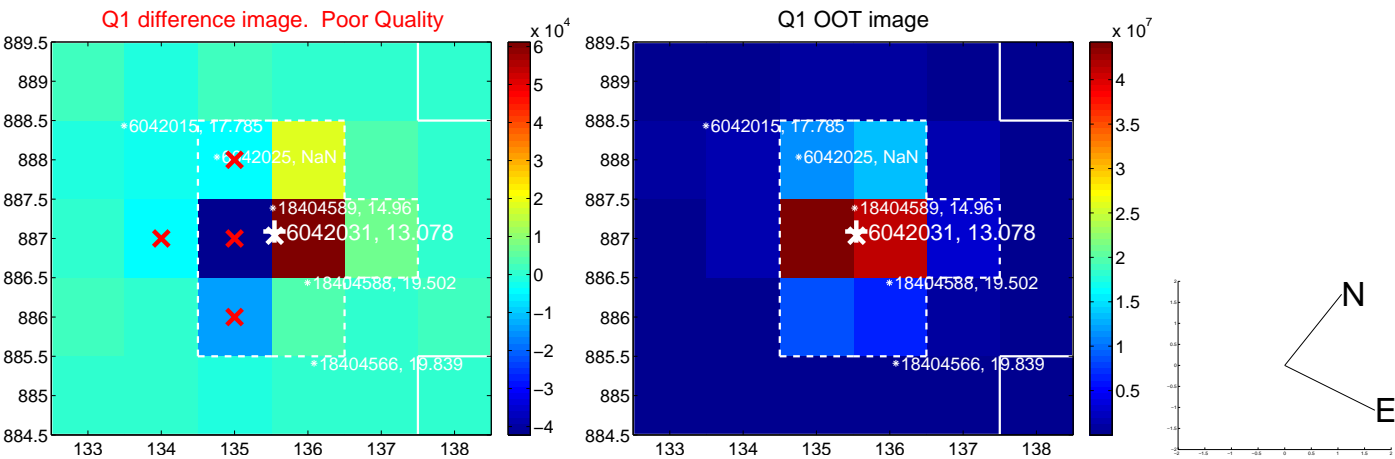


offset from photometric centroids

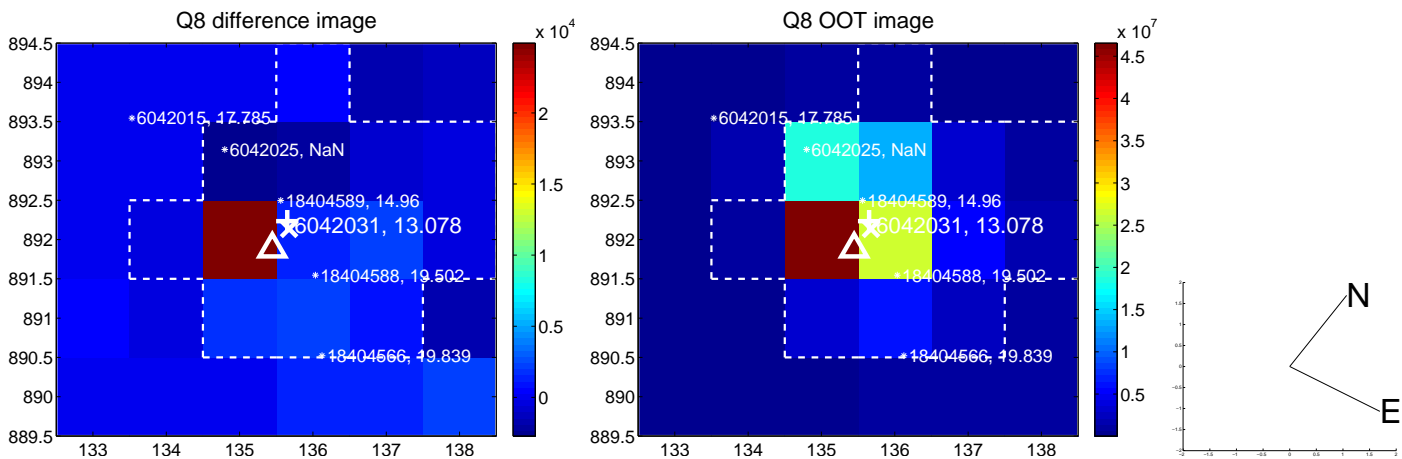
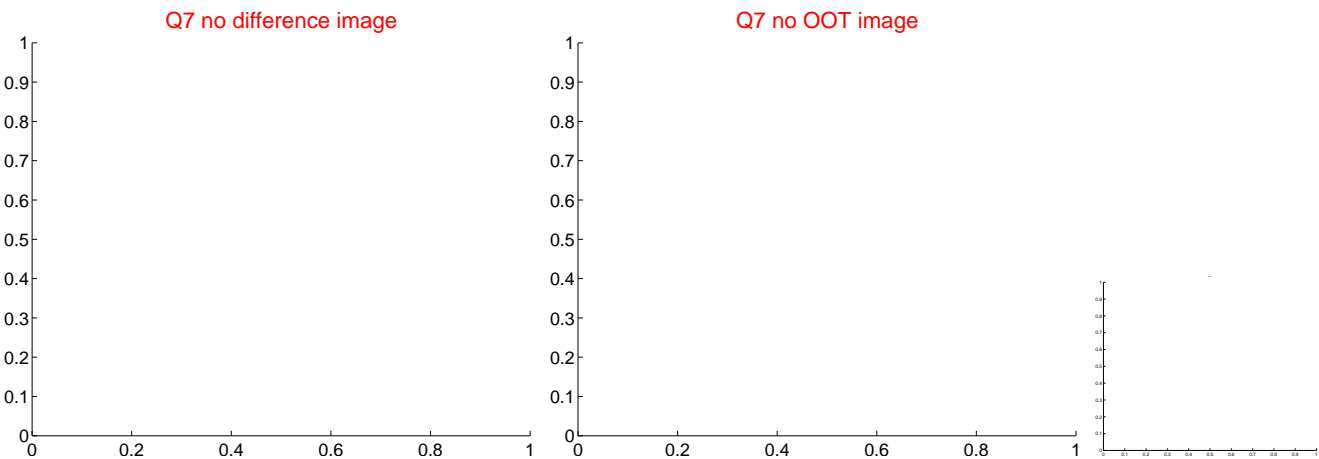
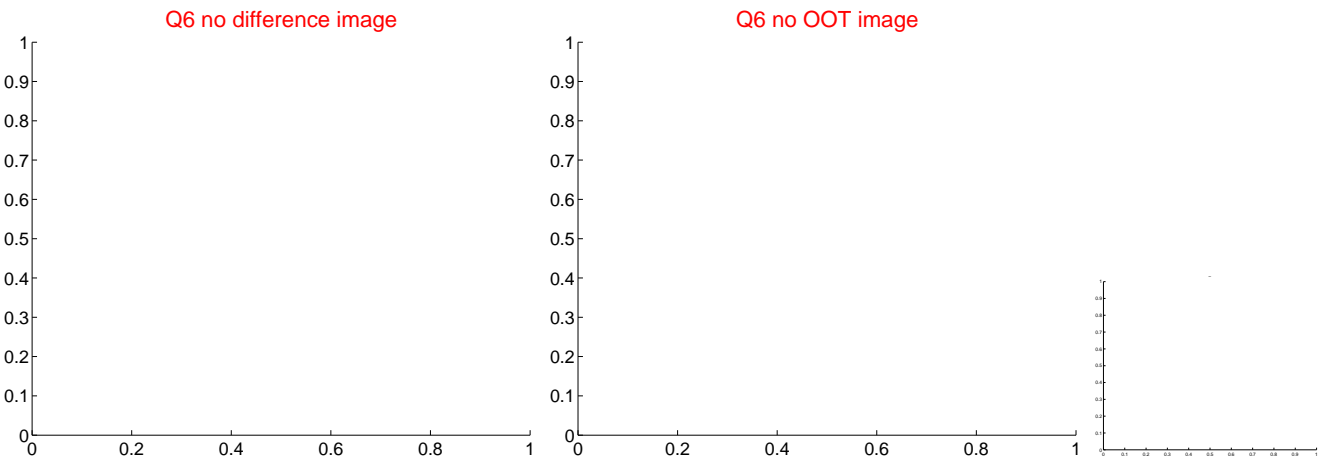
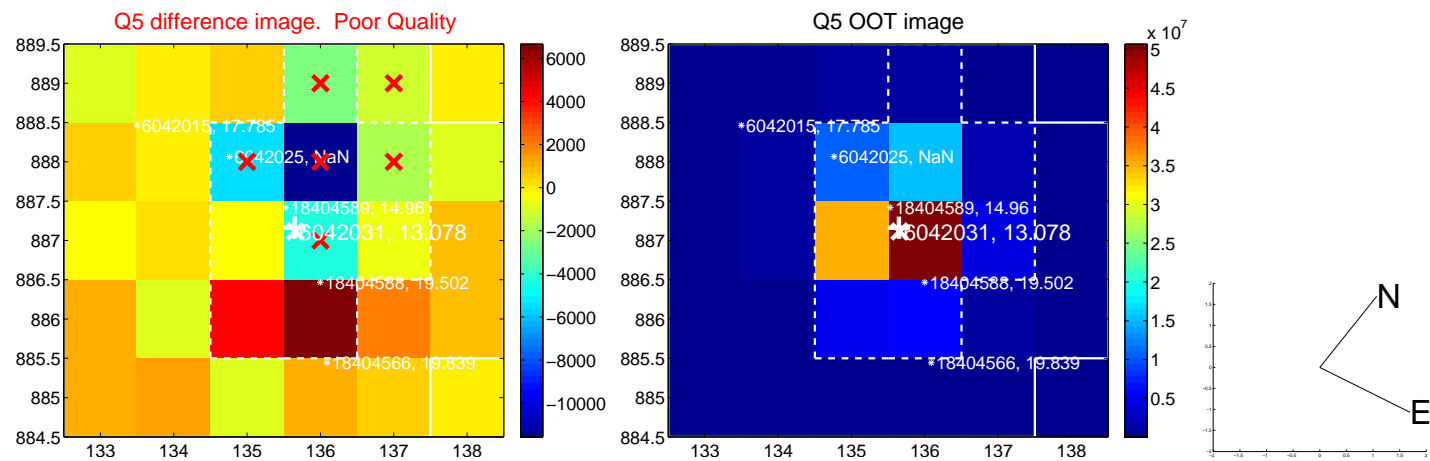


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

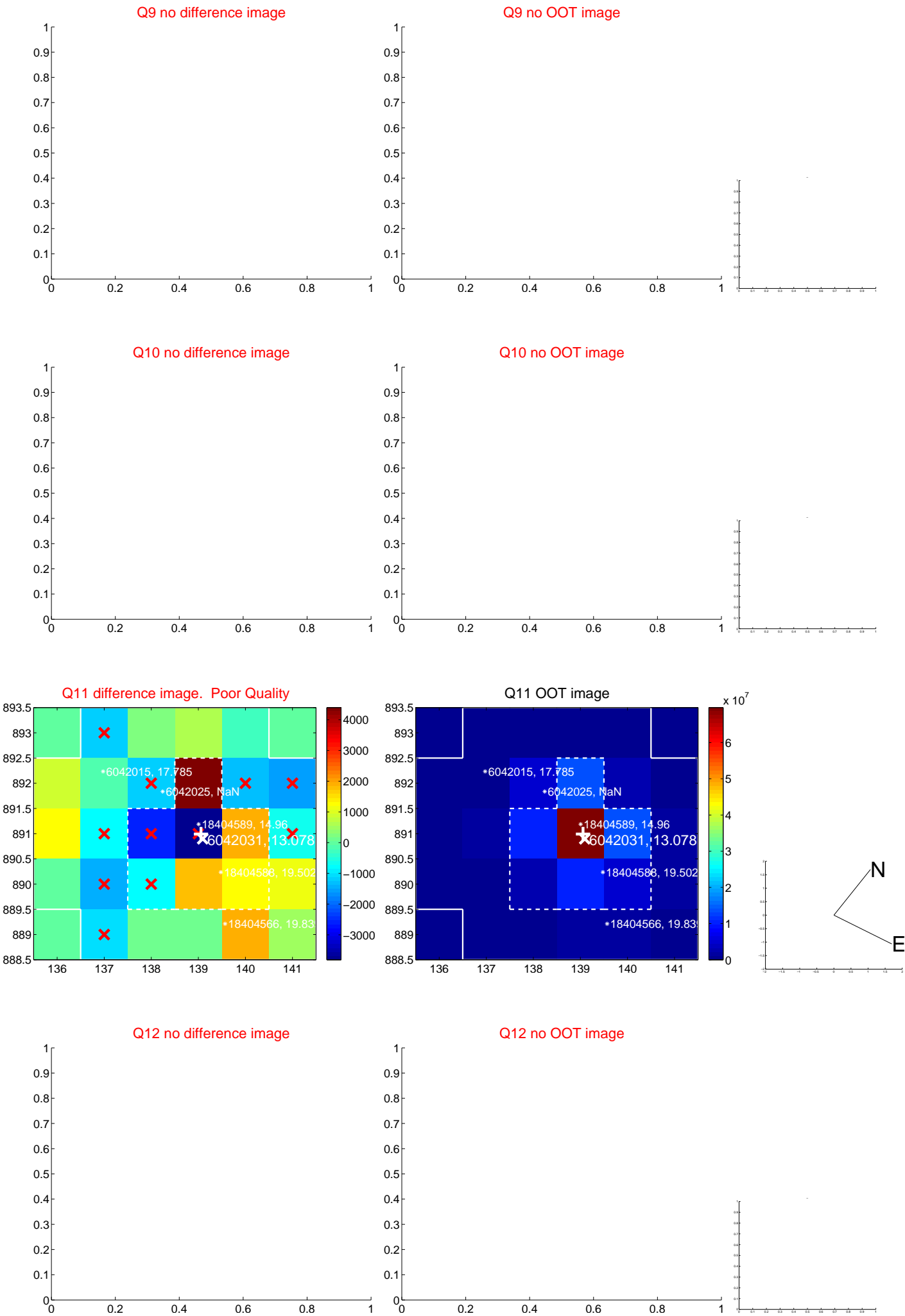
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



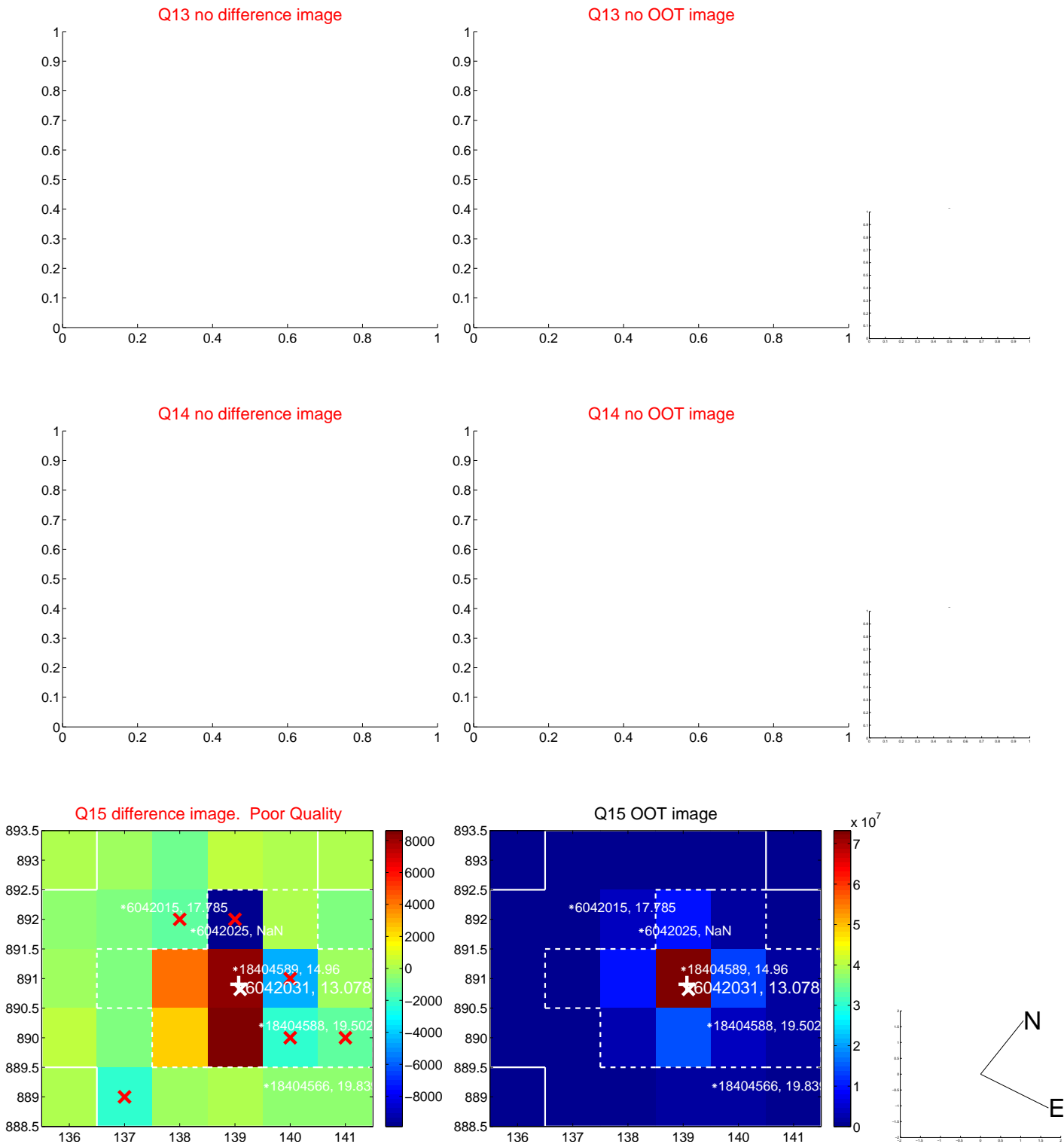
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



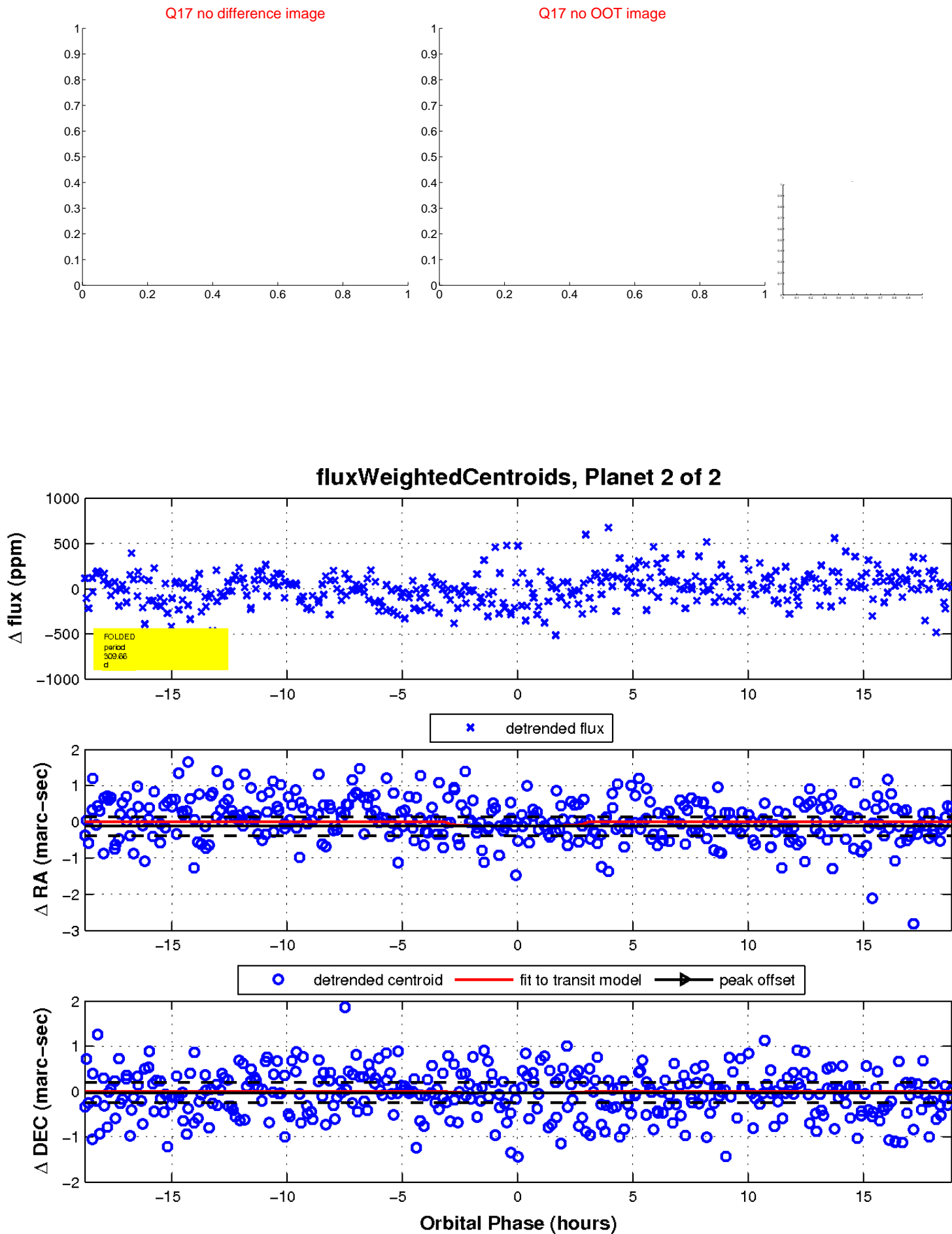
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

