

KIC 010259031

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})
010259031-01	OBS	0731.01	7.061137	134.560024	1506.2	3.321	94.9	61.8	0.85	5795	5.74	145.95
010259031-02	OBS	No	7.061185	131.628042	279.1	3.111	11.2	11.7	0.85	5795	2.88	145.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010259031-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
010259031-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH

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 010259031-01

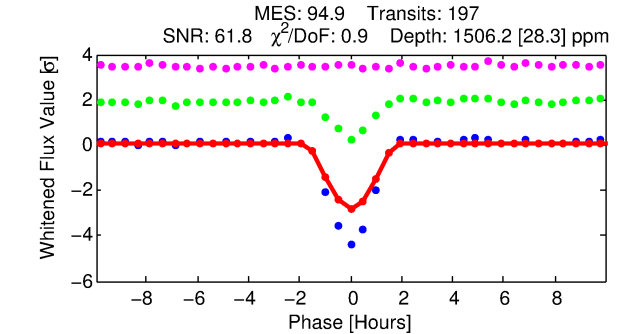
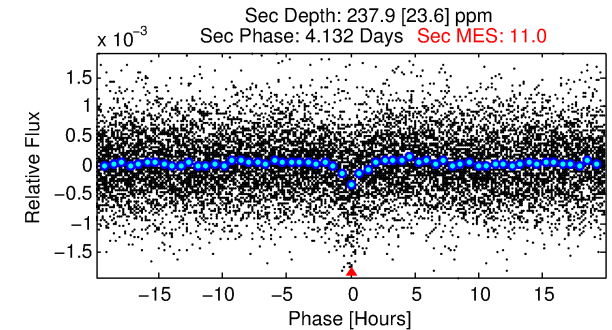
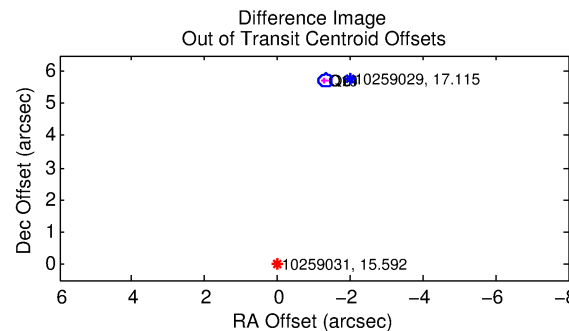
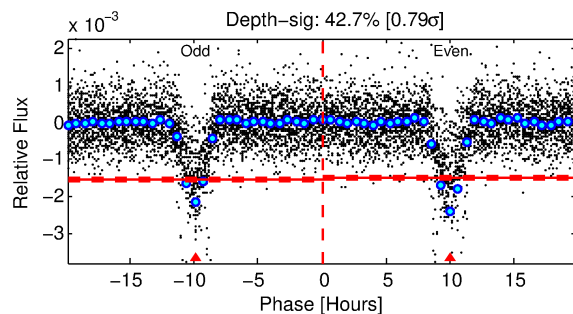
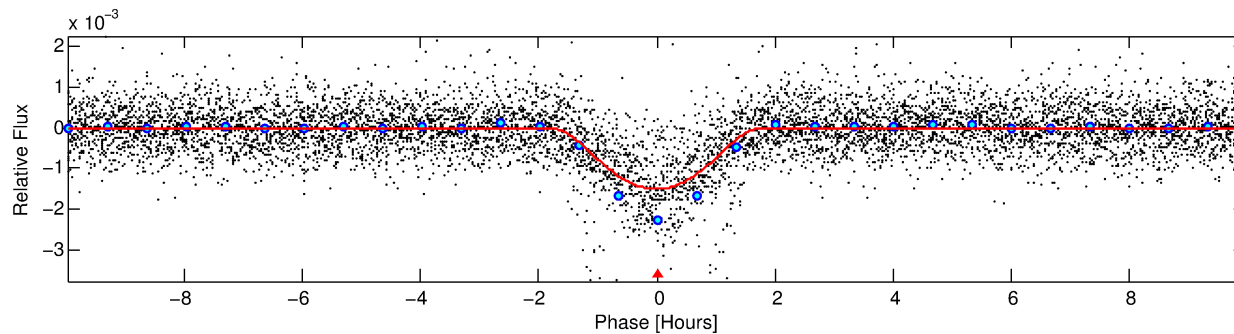
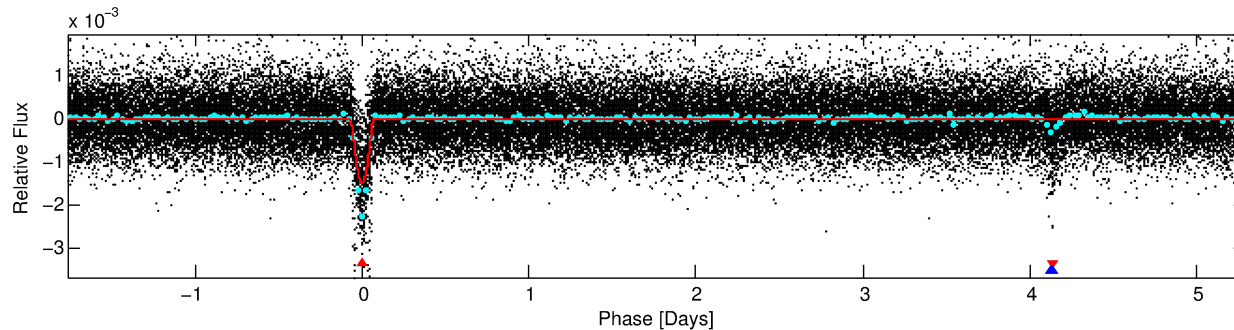
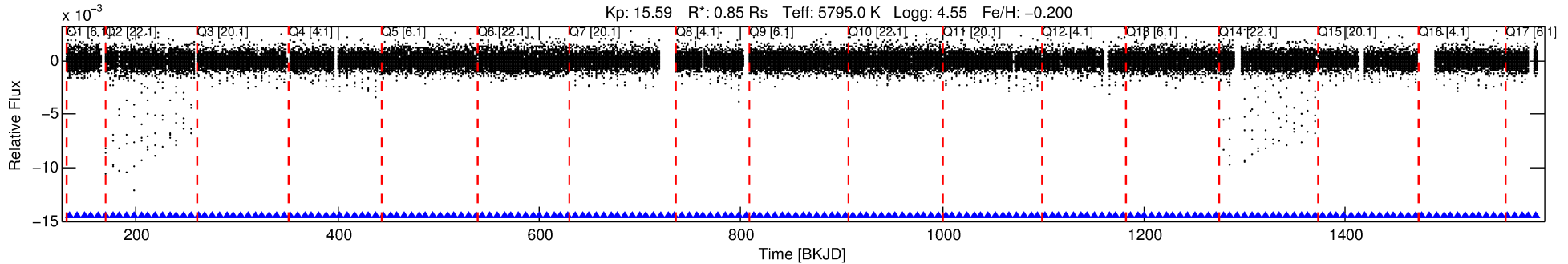
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	ΔRow	ΔCol	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
010259031-01	10259031	3630.01	10259029	1:1	6.1	-2	1	17.11	15.59	103.71	Direct-PRF	0	0.08	0.05

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 10259031 Candidate: 1 of 2 Period: 7.061 d
KOI: K00731.01 Corr: 0.991

Kp: 15.59 R*: 0.85 Rs Teff: 5795.0 K Logg: 4.55 Fe/H: -0.200



DV Fit Results:

Period = 7.06114 [0.00001] d
Epoch = 134.5600 [0.0013] BKJD
Rp/R* = 0.0620 [0.0324]
a/R* = 6.32 [0.86]
b = 0.99 [0.05]
Seff = 145.95 [45.78]
Teq = 886 [70] K
Rp = 5.74 [3.28] Re
a = 0.0706 [0.0139] AU
Ag = 19.78 [21.54] [0.87σ]
Teff = 2890 [763] K [2.62σ]

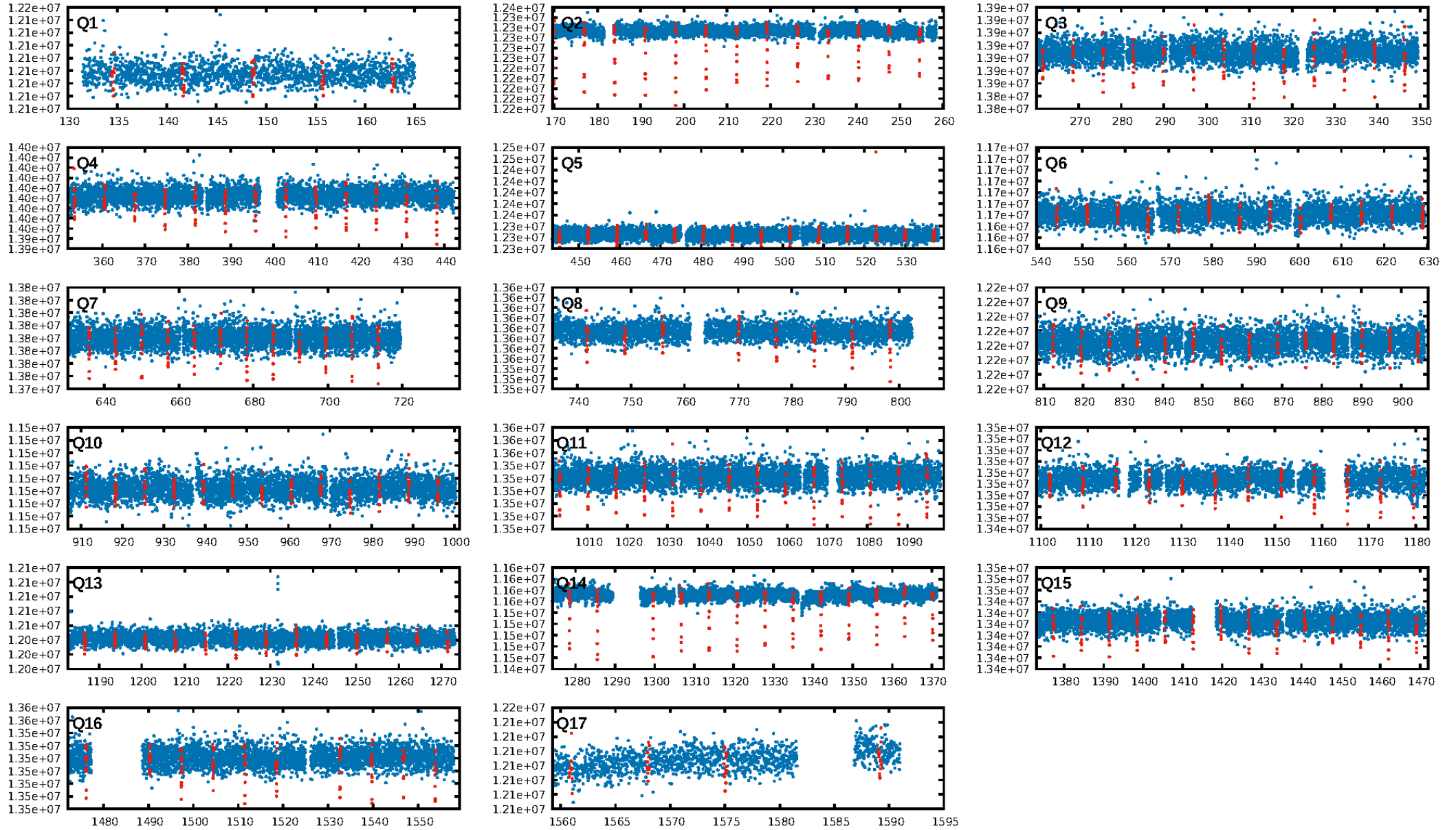
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [188/188]
GhostDiagnostic-chr: -0.4594
Centroid-sig: 0.0%
Centroid-so: 48.432 arcsec [259.08σ]
OotOffset-rm: 5.865 arcsec [87.80σ]
KicOffset-rm: 6.317 arcsec [94.23σ]
OotOffset-st: 4/0/0/0 [4]
KicOffset-st: 4/0/0/0 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [17/17]

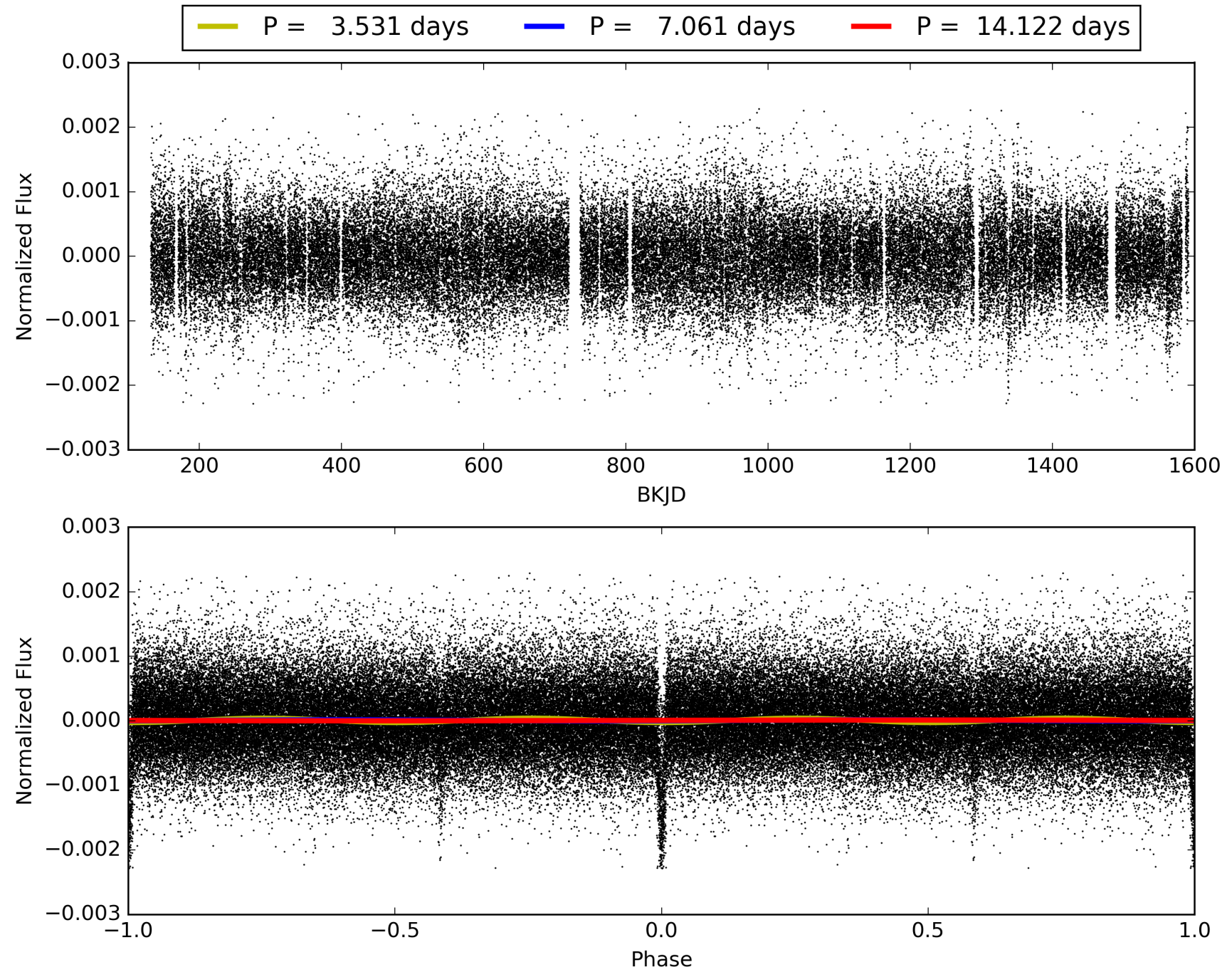
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:21:06 Z

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

TCE 010259031-01, PDC Light Curves

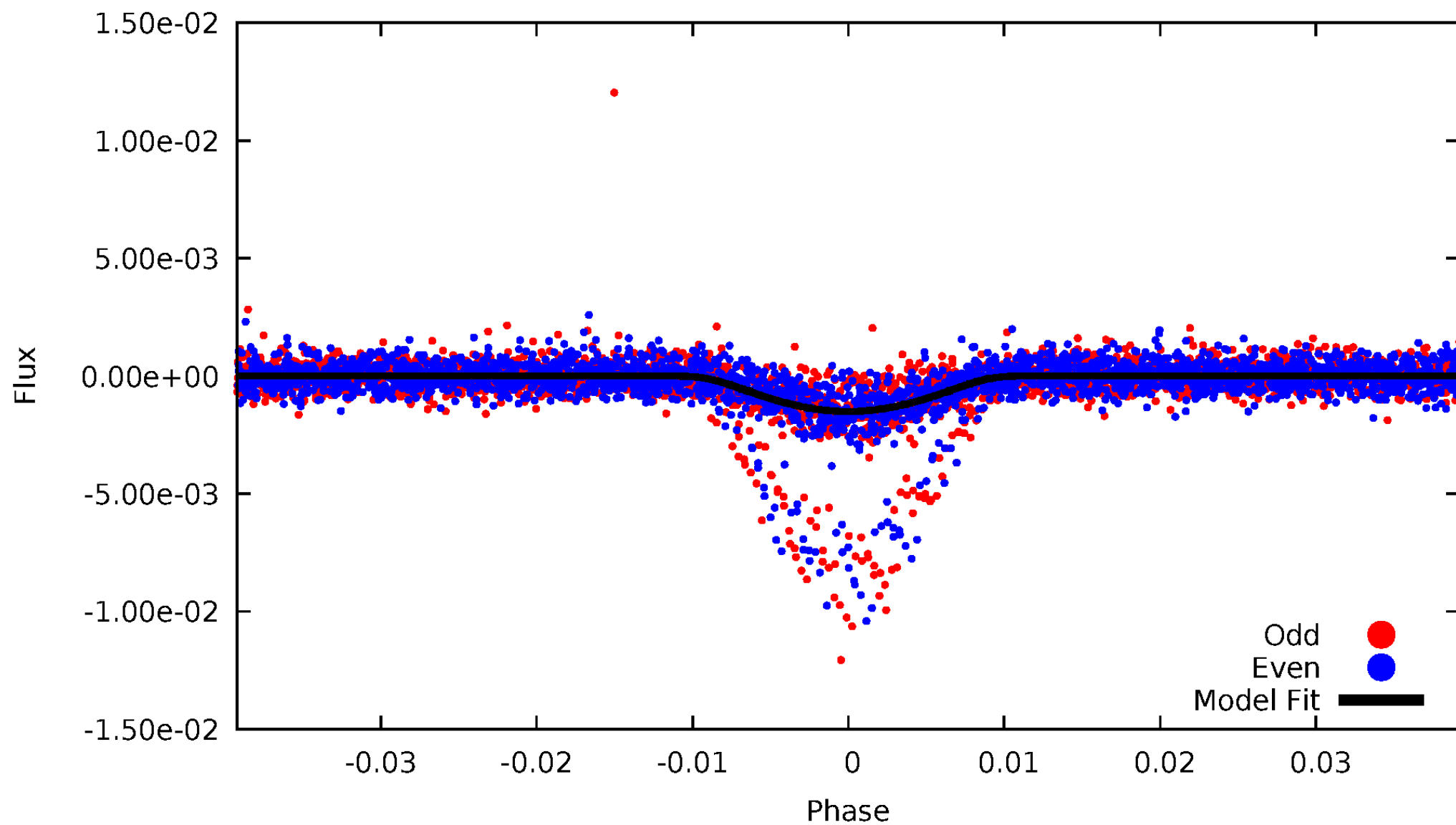


TCE 010259031-01



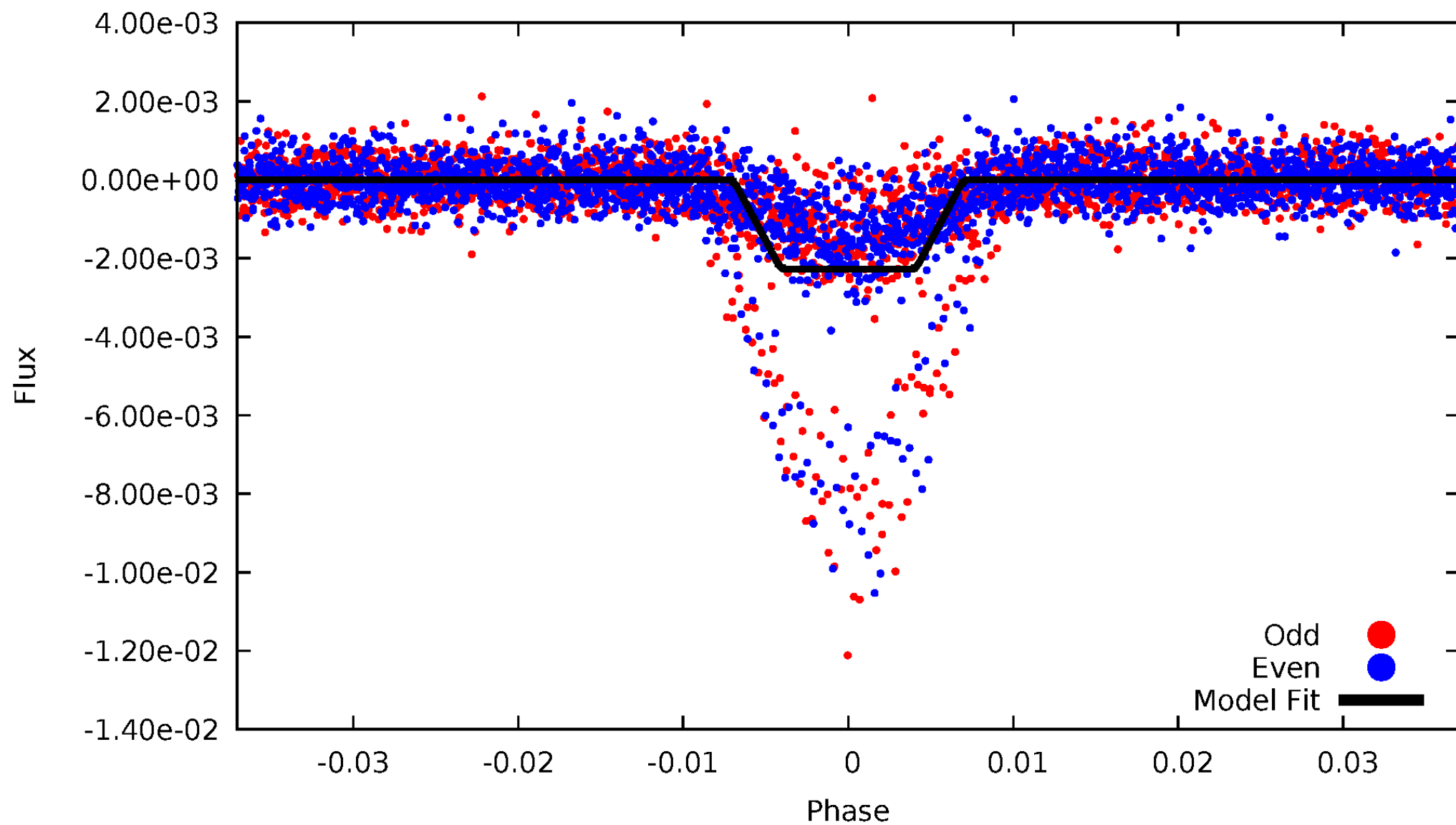
DV Odd/Even

TCE 010259031-01



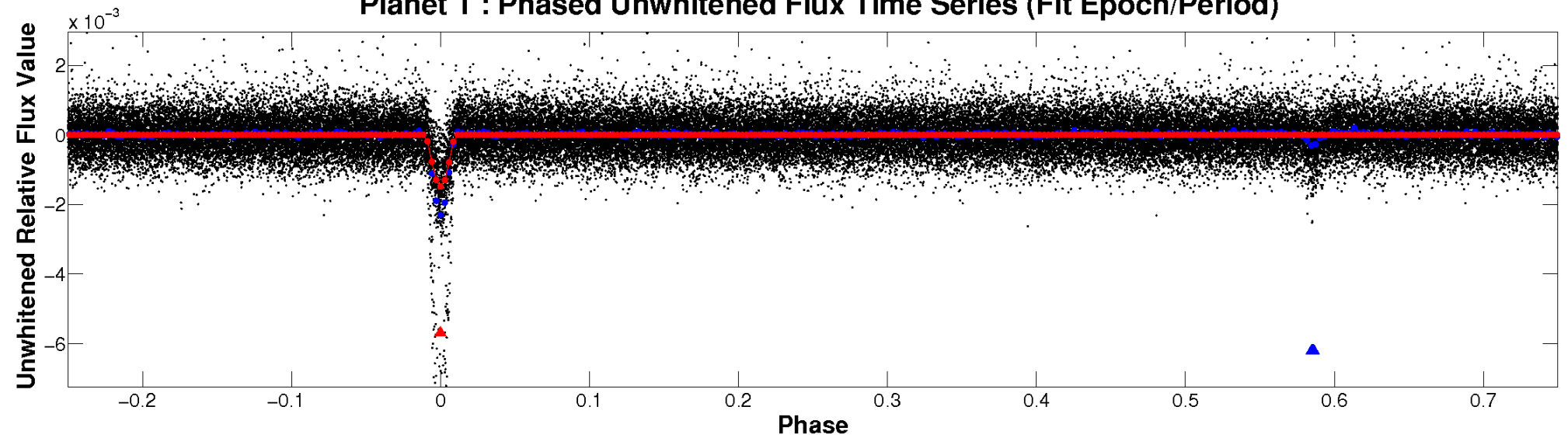
ALT Odd/Even

TCE 010259031-01

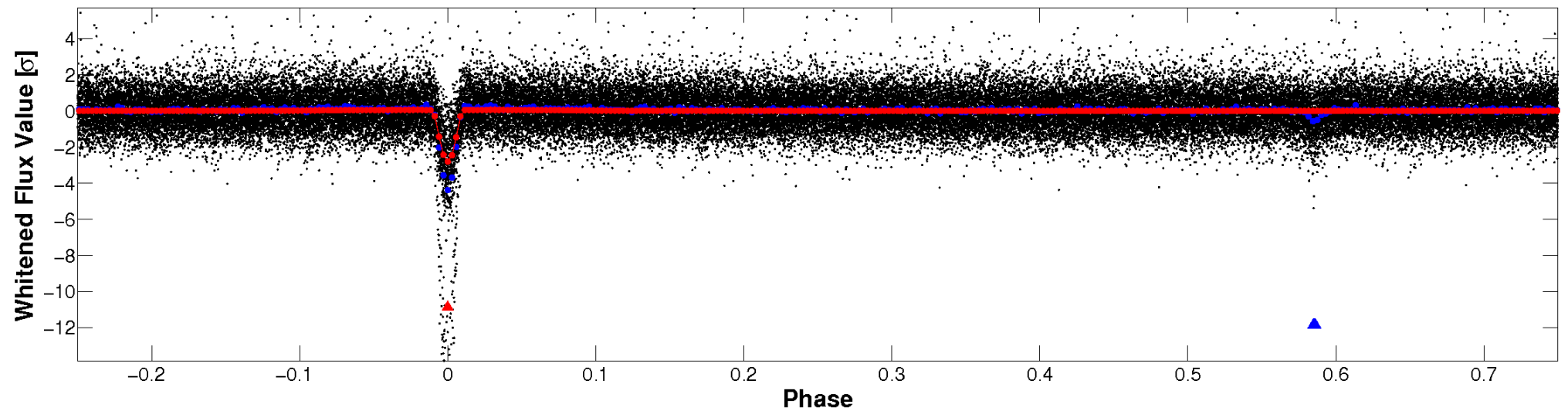


Non-Whitened Vs. Whitened Light Curve

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

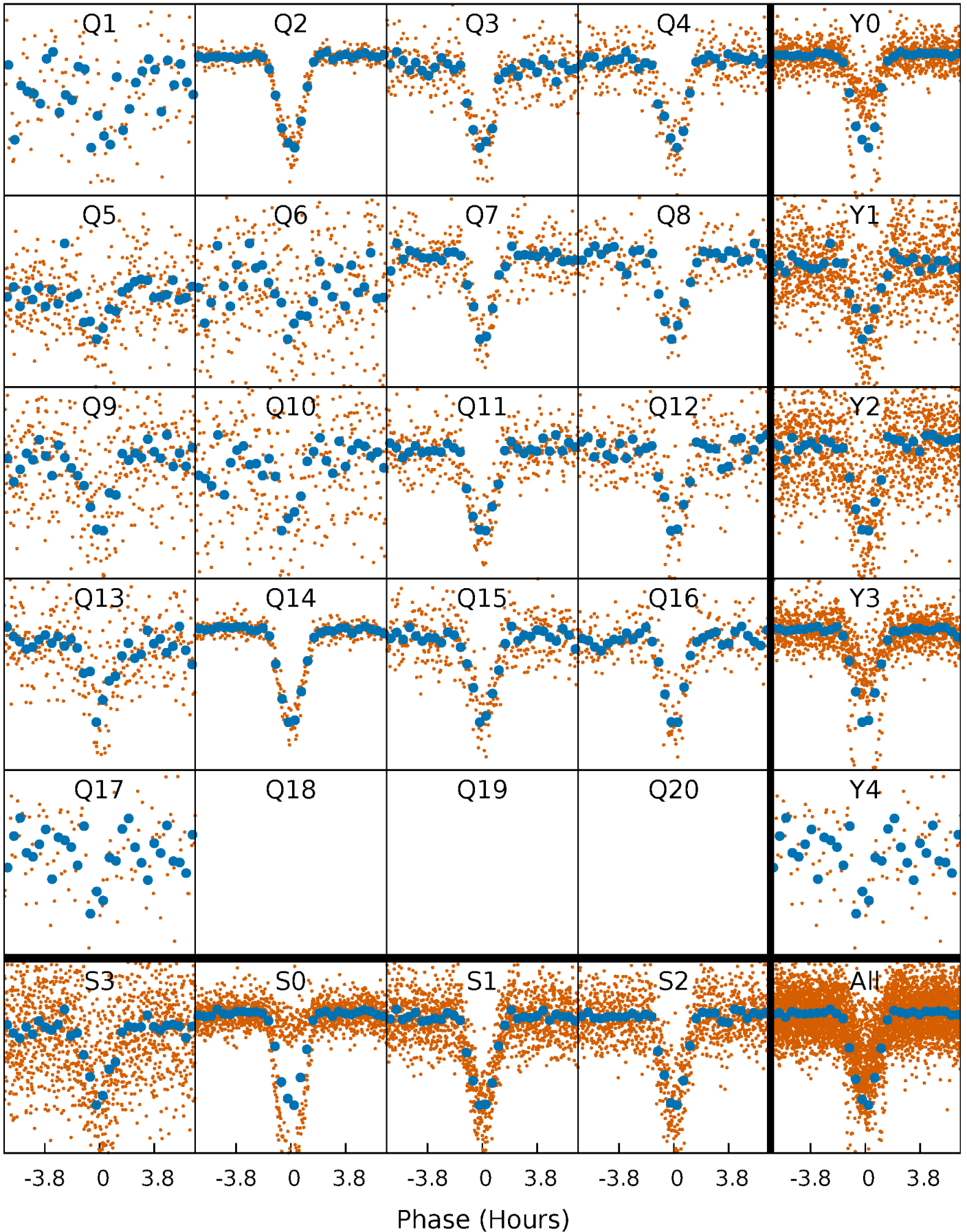


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



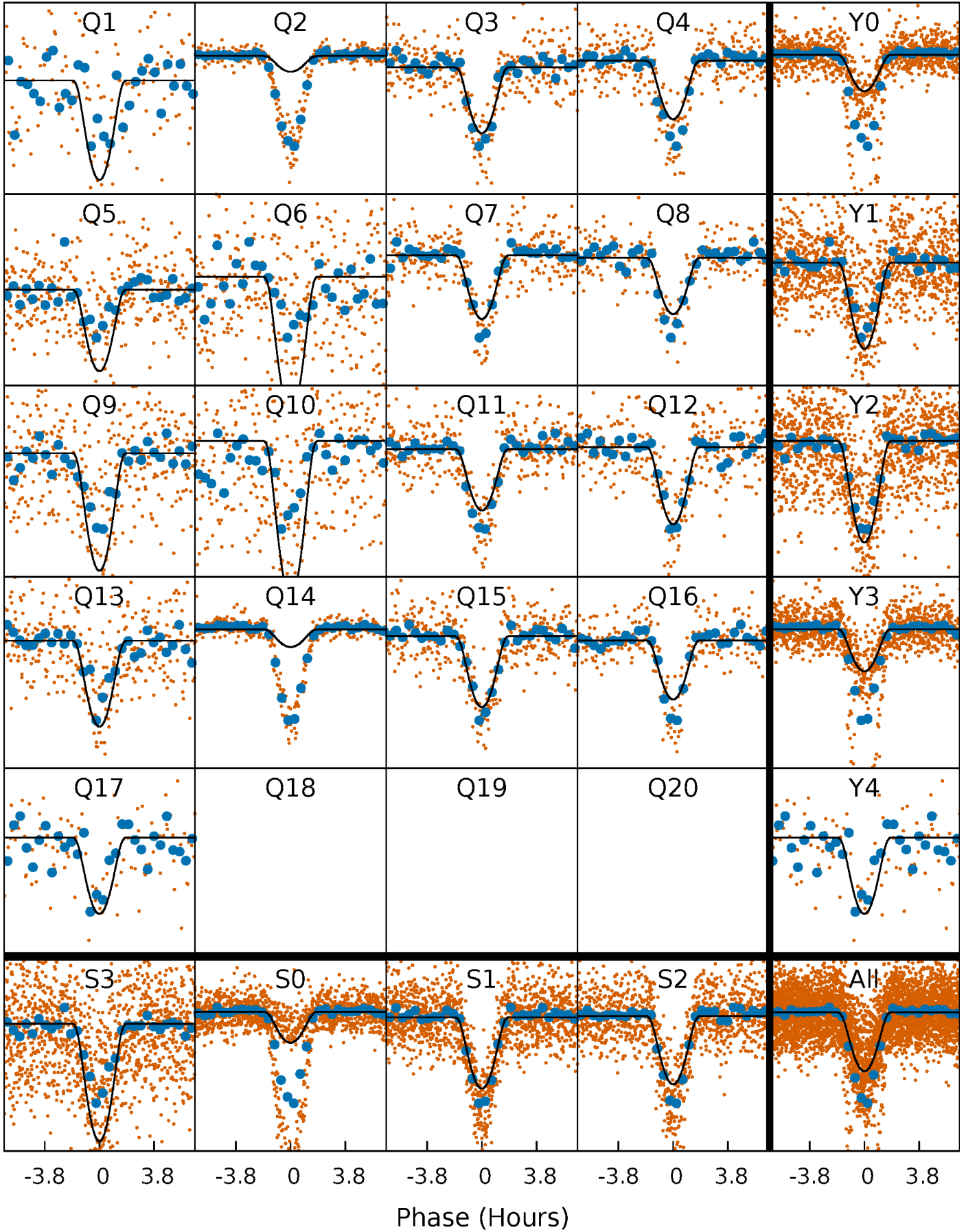
PDC Quarter-Phased Transit Curves

TCE 010259031-01 P= 7.061137 Days $T_0=134.560024$ (BKJD)



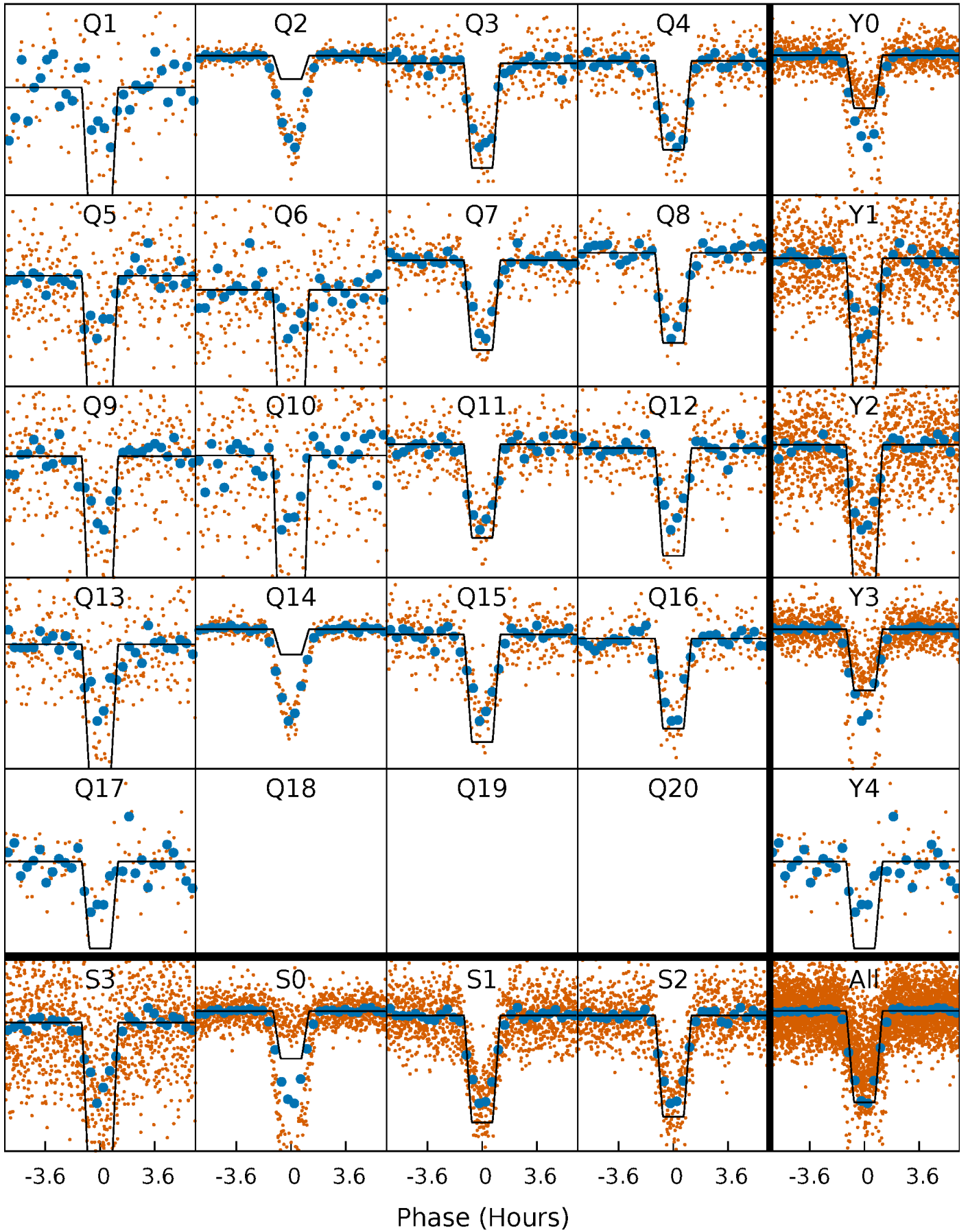
DV Quarter-Phased Transit Curves

TCE 010259031-01 P= 7.061137 Days $T_0=134.560024$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

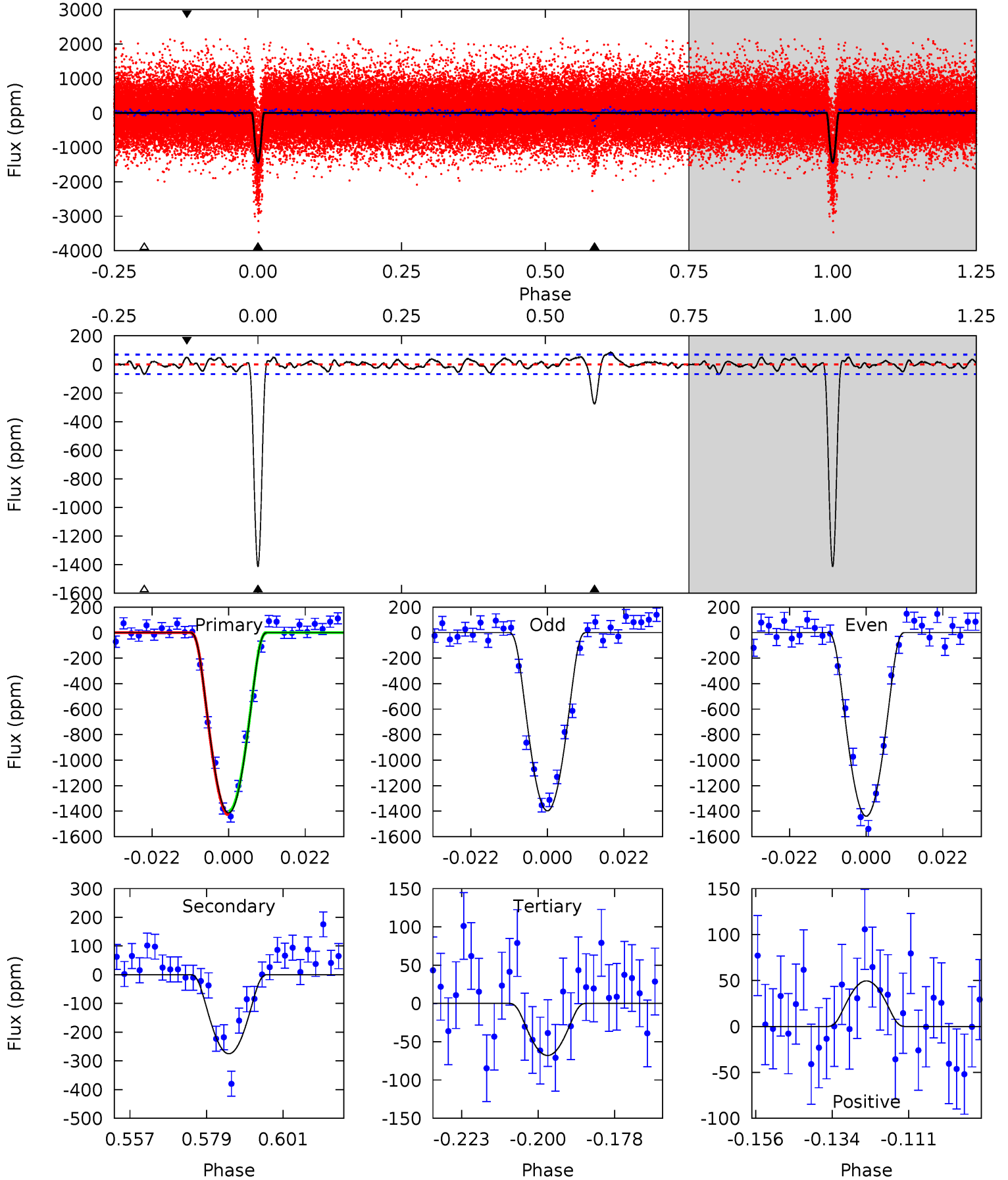
TCE 010259031-01 P= 7.061170 Days $T_0=134.556706$ (BKJD)



DV Model-Shift Uniqueness Test

010259031-01, P = 7.061137 Days, E = 127.498887 Days

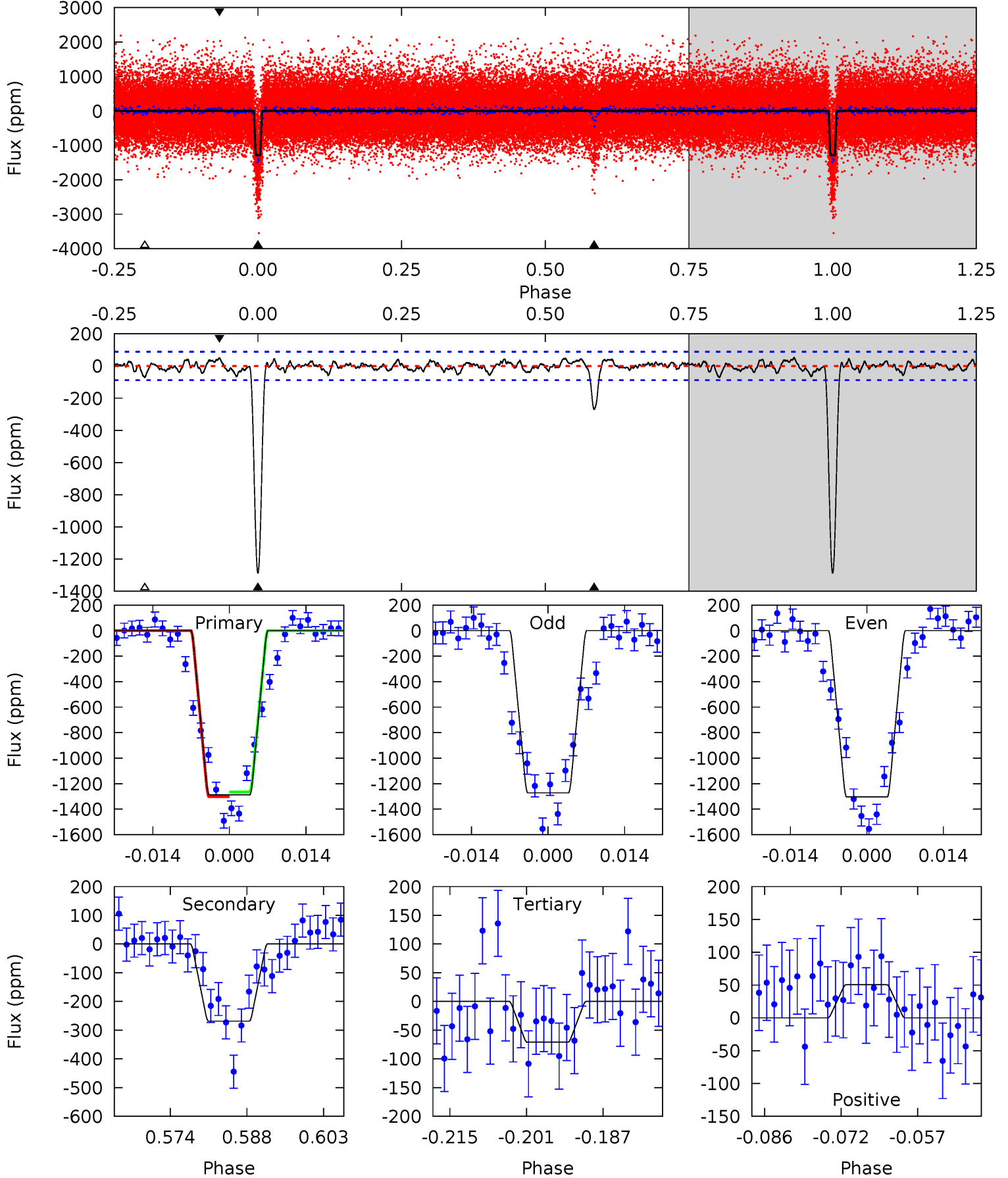
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
101.1	19.7	4.87	3.55	4.87	2.29	1.76	96.3	97.6	14.8	16.1	1.50	1.39	0.06	0.88



Alt Model-Shift Uniqueness Test

010259031-01, P = 7.061170 Days, E = 127.495536 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
72.2	15.1	3.98	2.83	4.96	2.45	1.24	68.2	69.3	11.1	12.2	0.87	1.42	0.04	1.02



Stellar Parameters For KIC 010259031

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5795^{+143}_{-172}	$4.554^{+0.040}_{-0.160}$	$-0.200^{+0.250}_{-0.300}$	$0.848^{+0.197}_{-0.071}$	$0.938^{+0.100}_{-0.110}$	$2.167^{+0.449}_{-0.932}$
	+2%/-3%	+1%/-4%	+125%/-150%	+23%/-8%	+11%/-12%	+21%/-43%
Source	PHO1	KIC0	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 010259031-01 / KOI 0731.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-275 ± 14	$6.08^{+3.37}_{-3.00}$	1256^{+74}_{-50}	3471^{+896}_{-449}	20^{+57}_{-12}
Alt.	-269 ± 18	$4.86^{+3.15}_{-2.79}$	1260^{+68}_{-54}	3715^{+1374}_{-541}	31^{+142}_{-19}

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 $A_{obs} \gg 1.0$

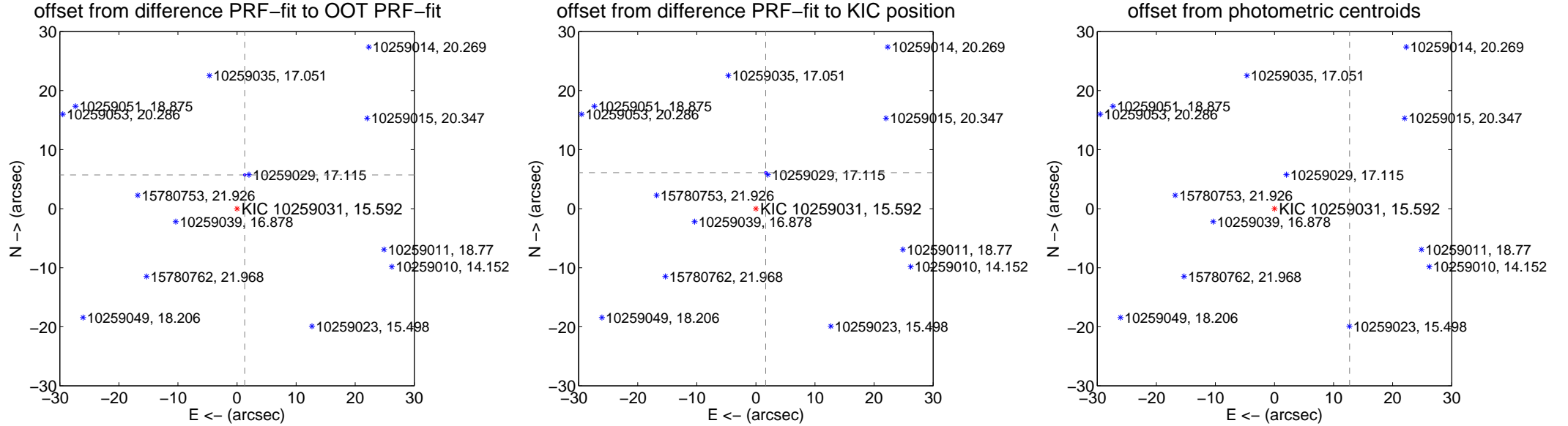
DV Centroid Data

Supplemental centroid analysis for 010259031-01. Kepler magnitude: 15.59. Transit SNR 61.76

There are 4 quarters with good PRF difference image offsets

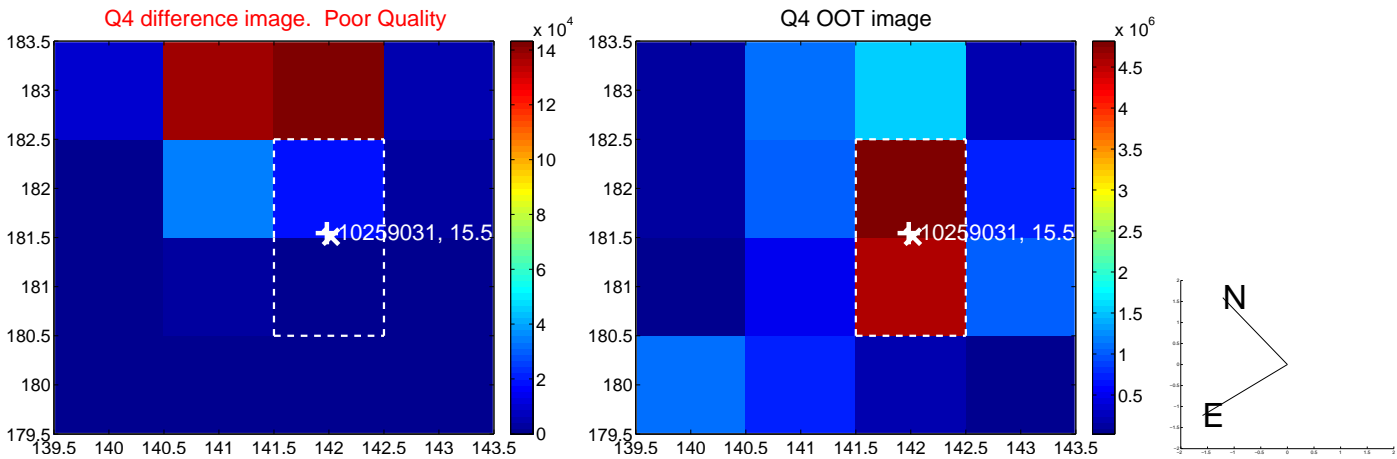
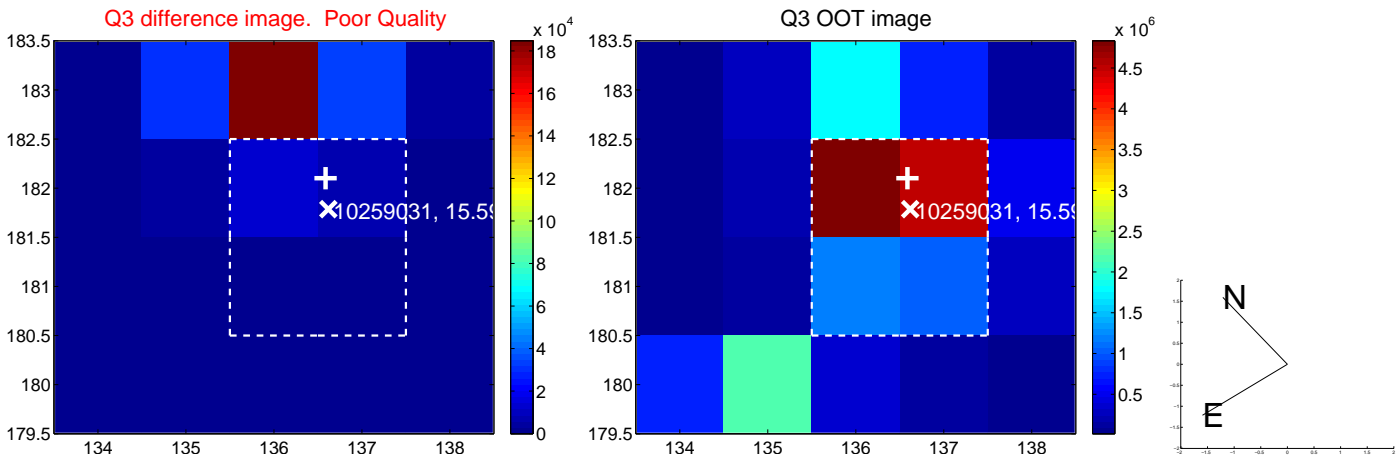
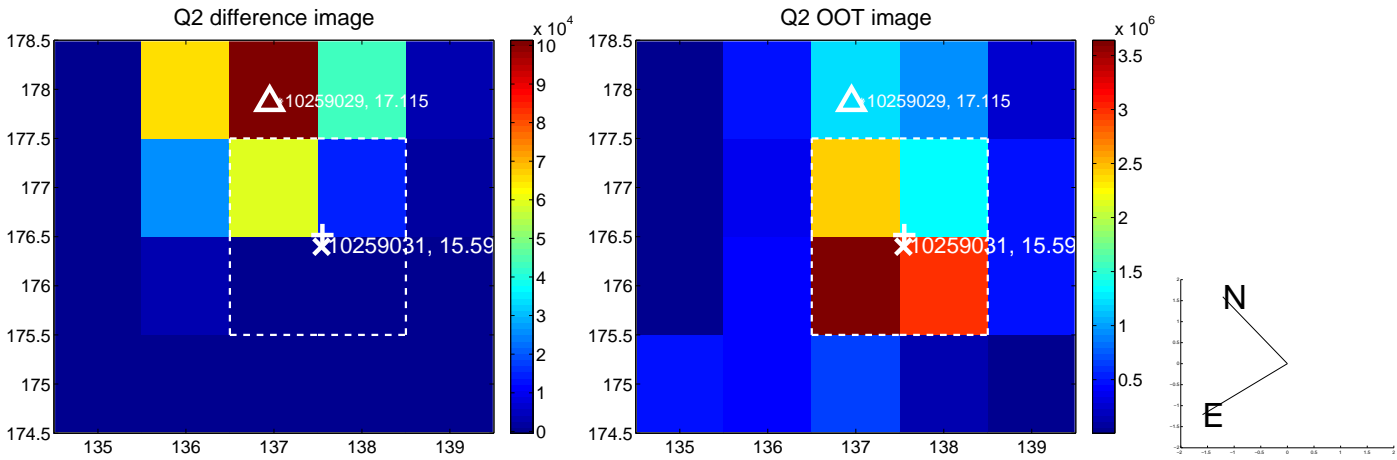
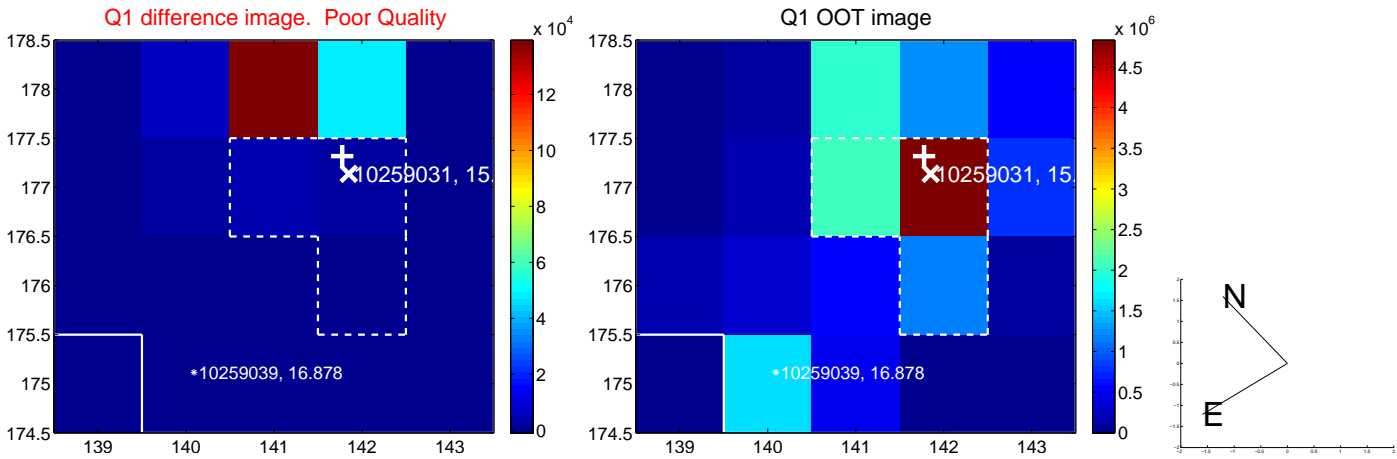
The direct PRF centroid is offset from the target star catalog position by about 0.51 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.865 \pm 0.067	87.80	-1.305 \pm 0.067	5.718 \pm 0.067
PRF-fit source offset from KIC position	6.317 \pm 0.067	94.23	-1.658 \pm 0.067	6.096 \pm 0.067
photometric centroid source offset	48.43 \pm 0.19	259.08	-12.72 \pm 0.17	46.73 \pm 0.19

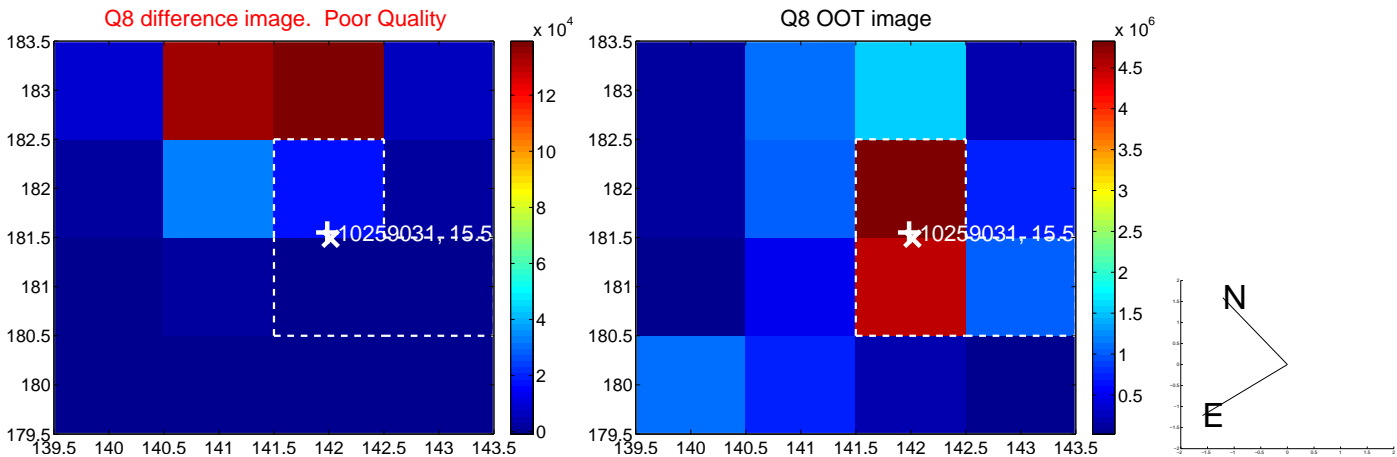
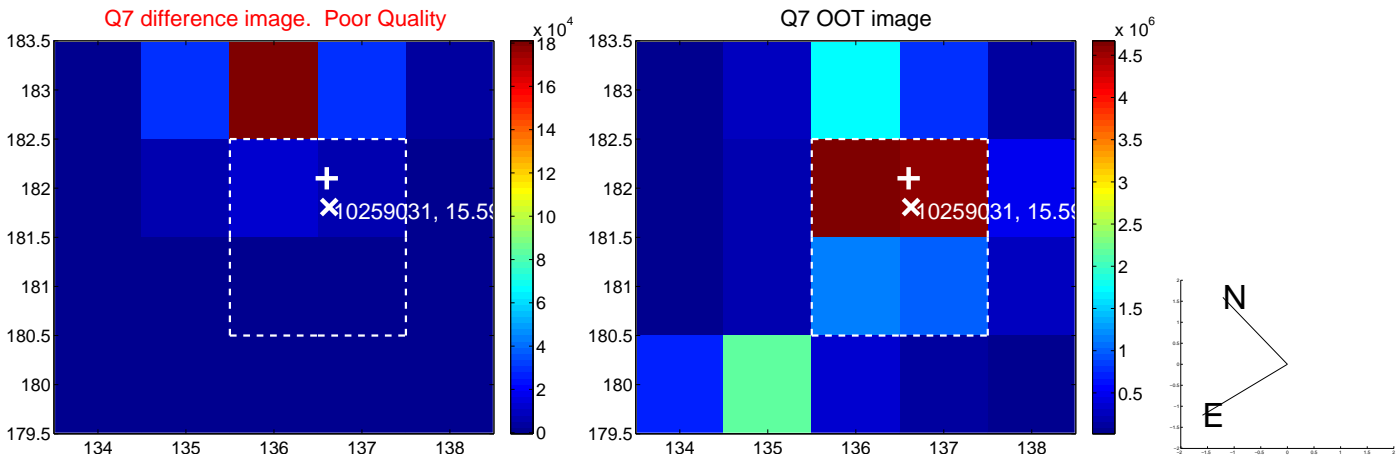
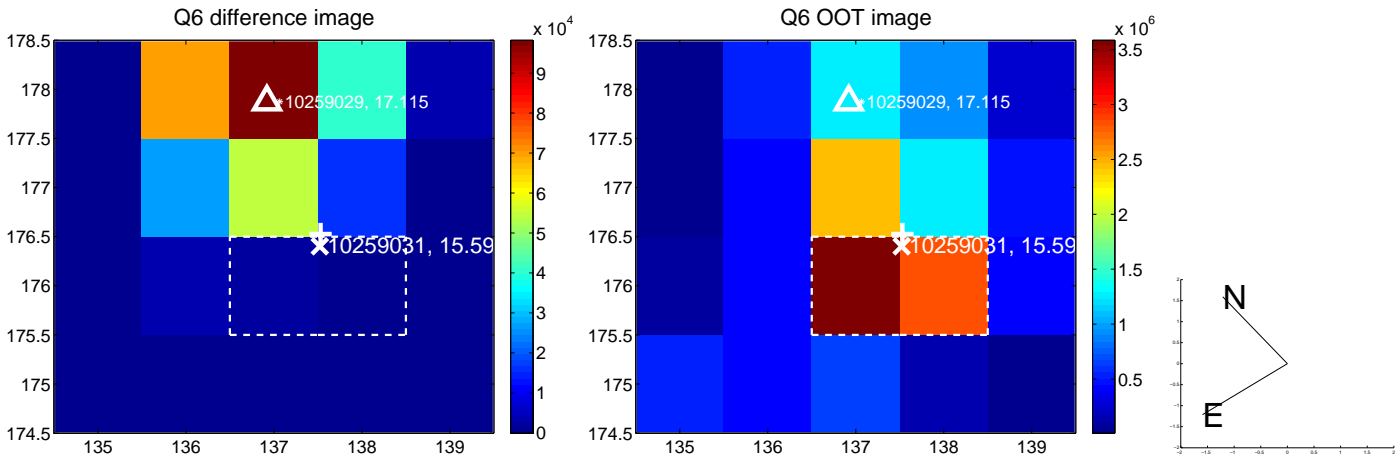
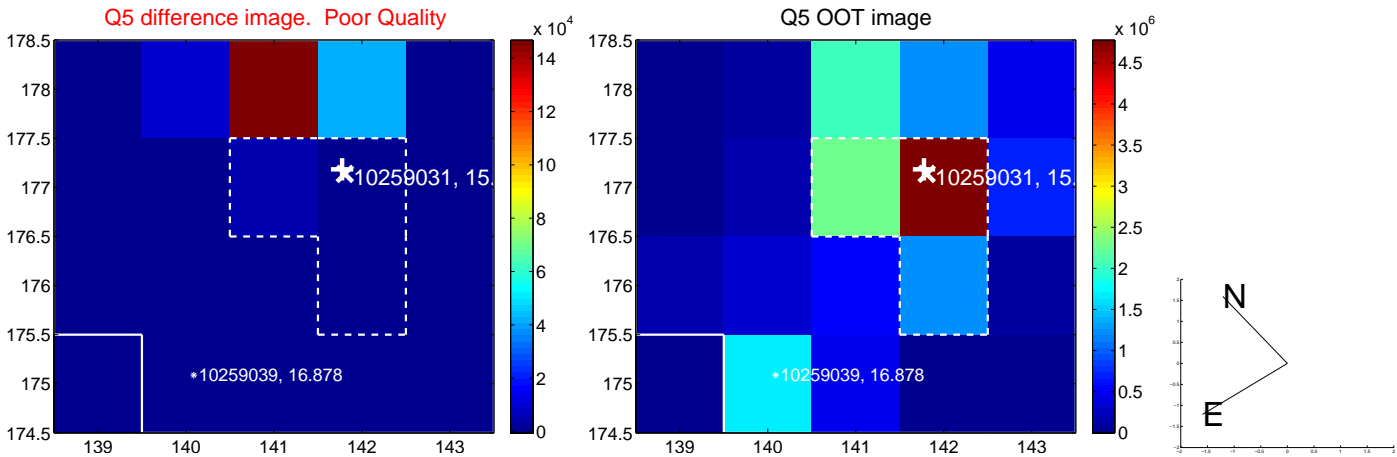


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

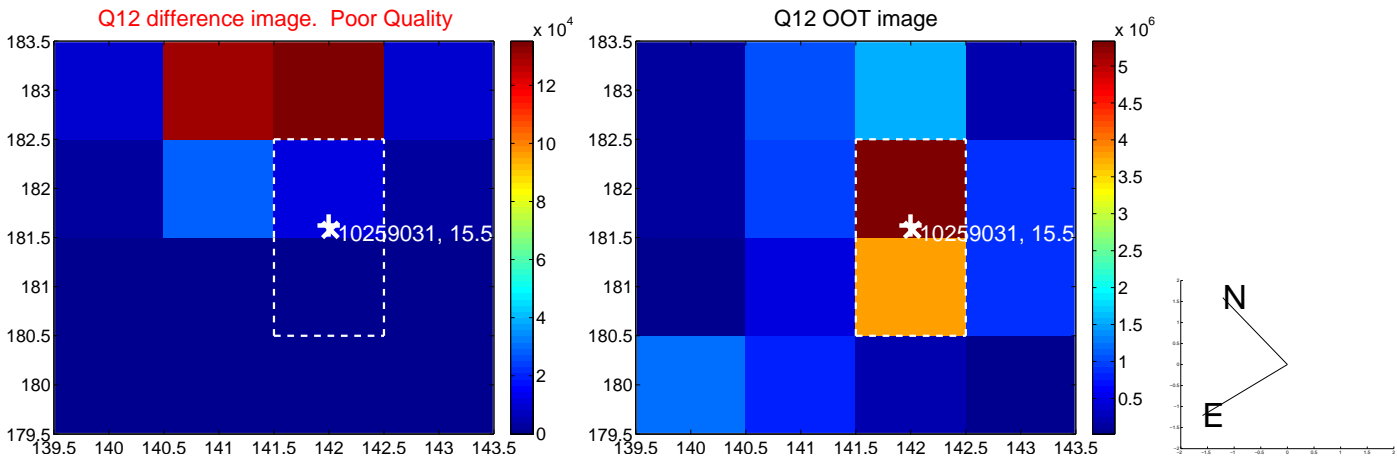
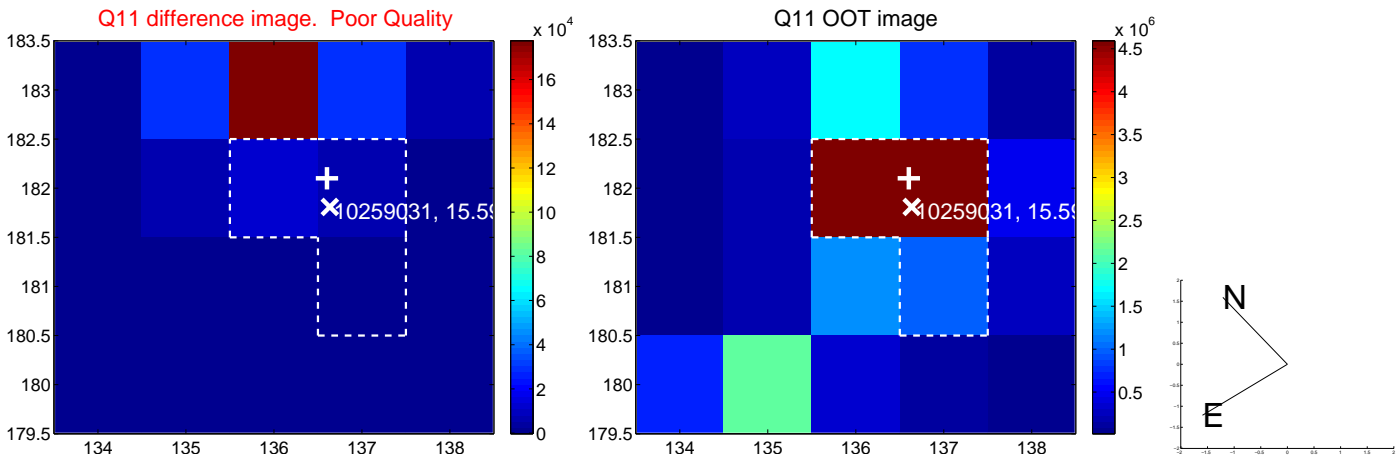
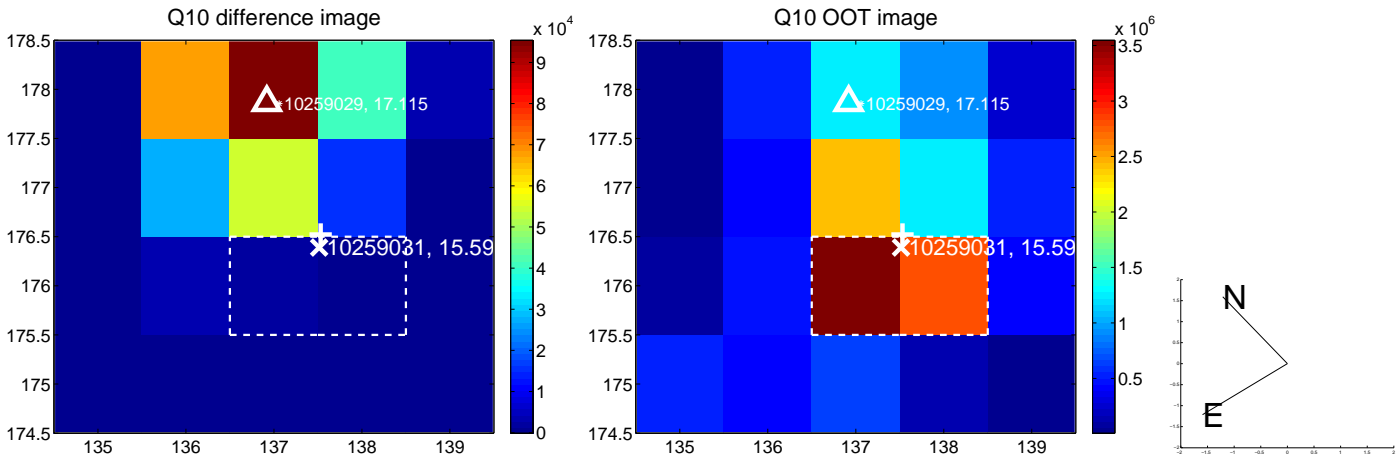
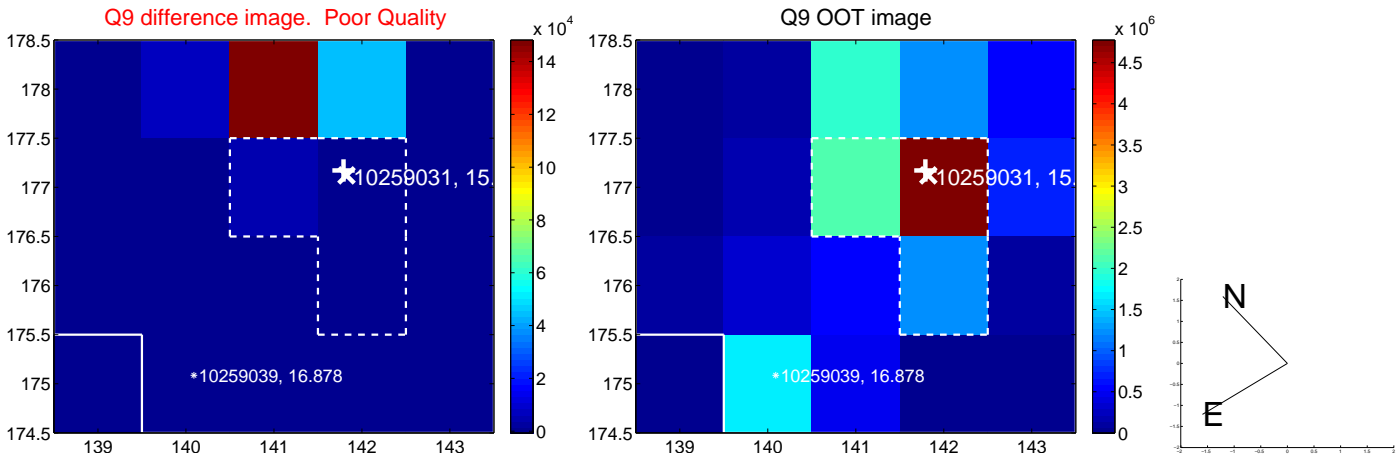
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



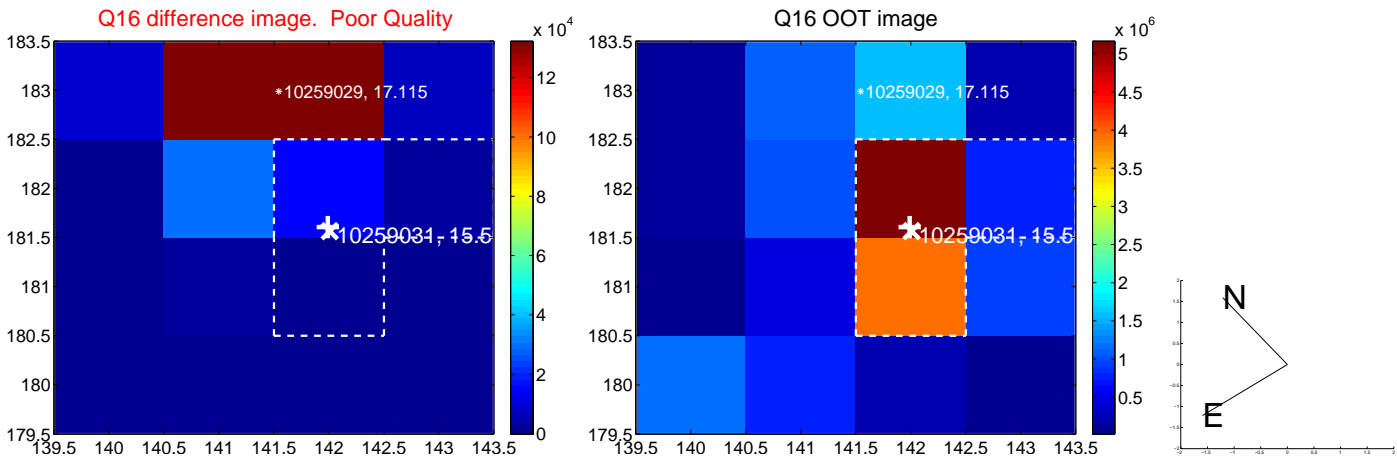
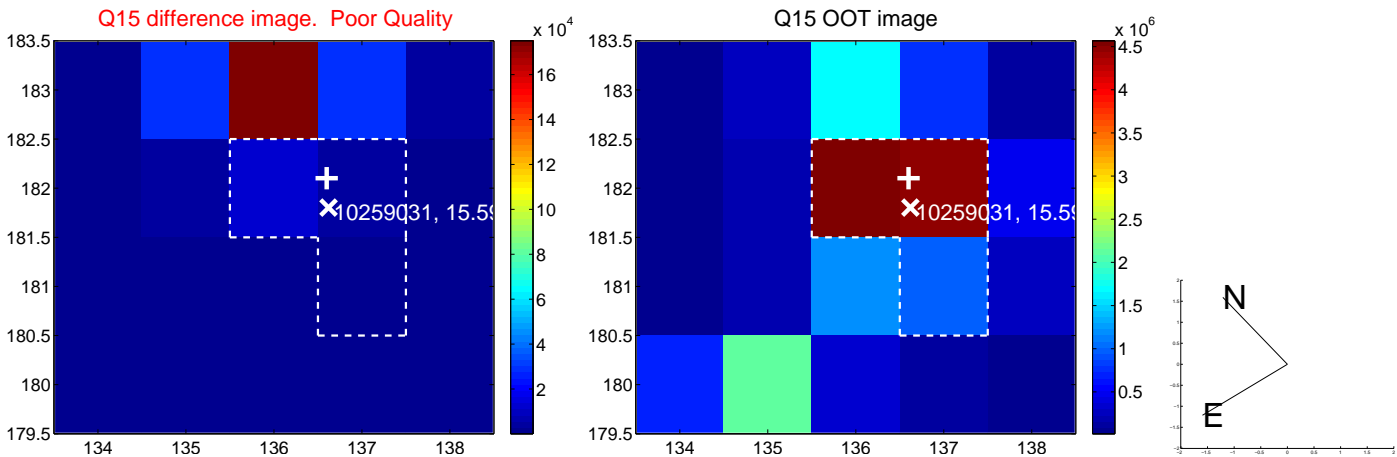
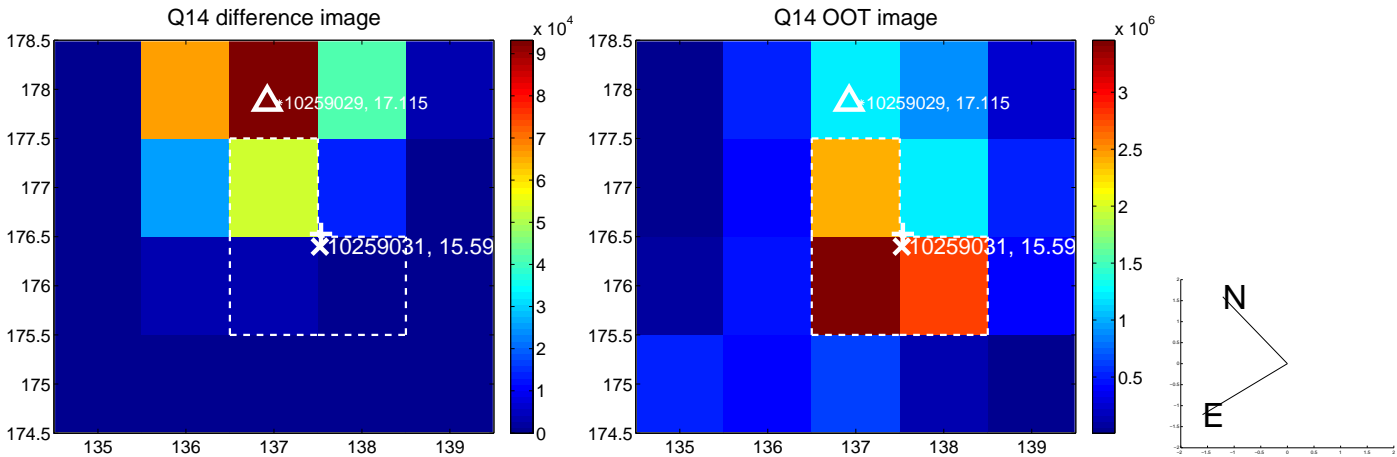
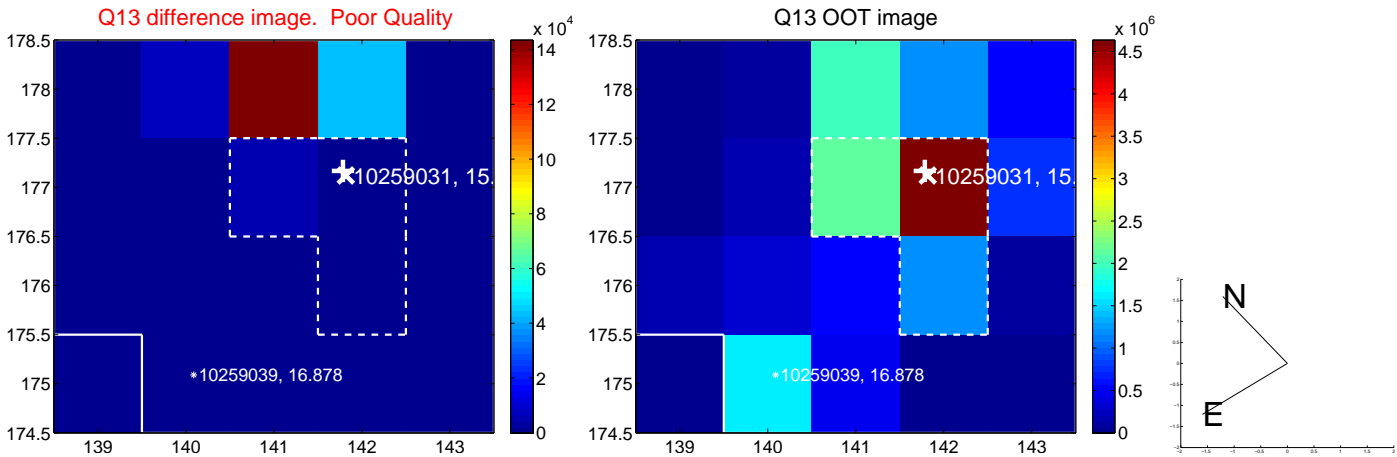
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



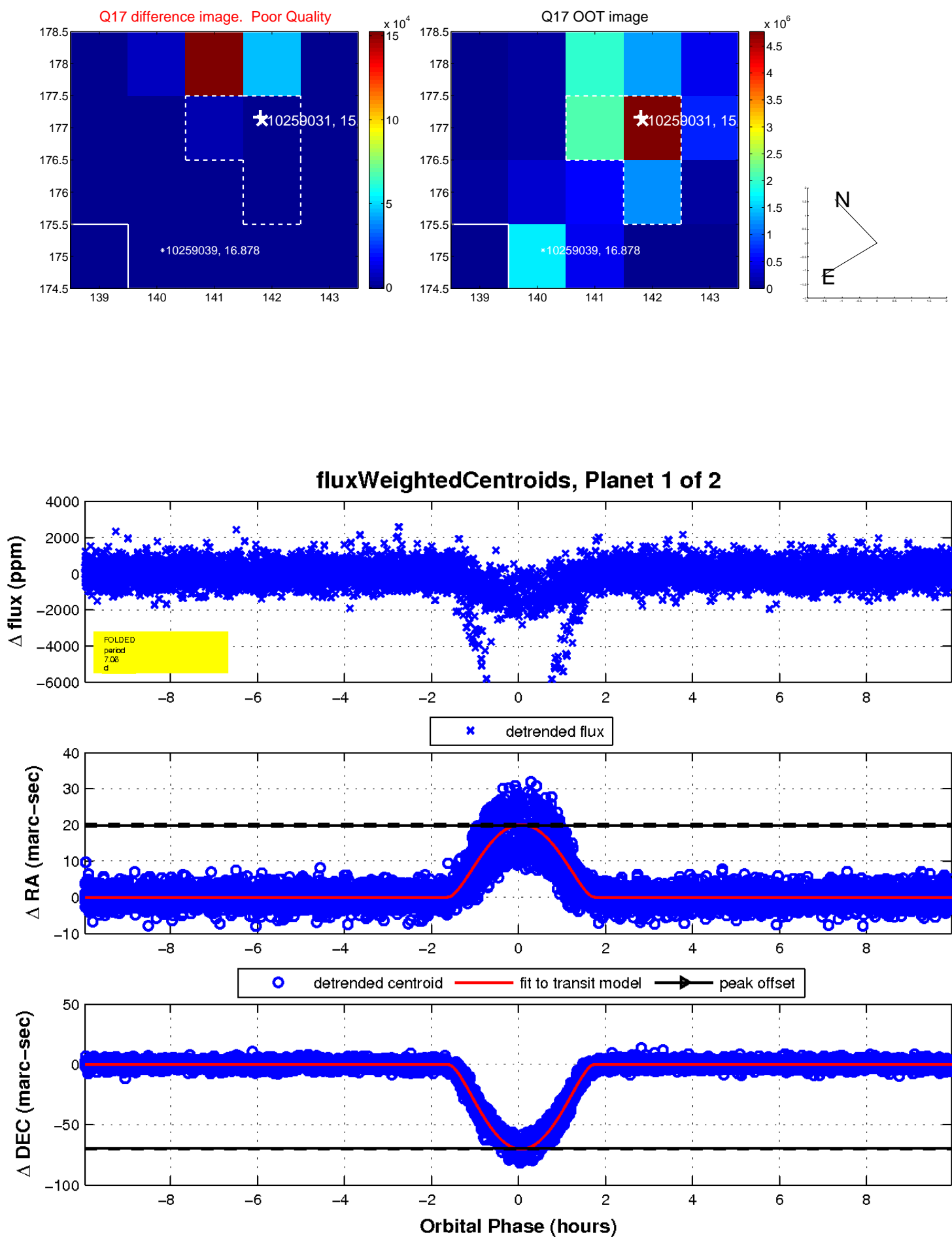
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

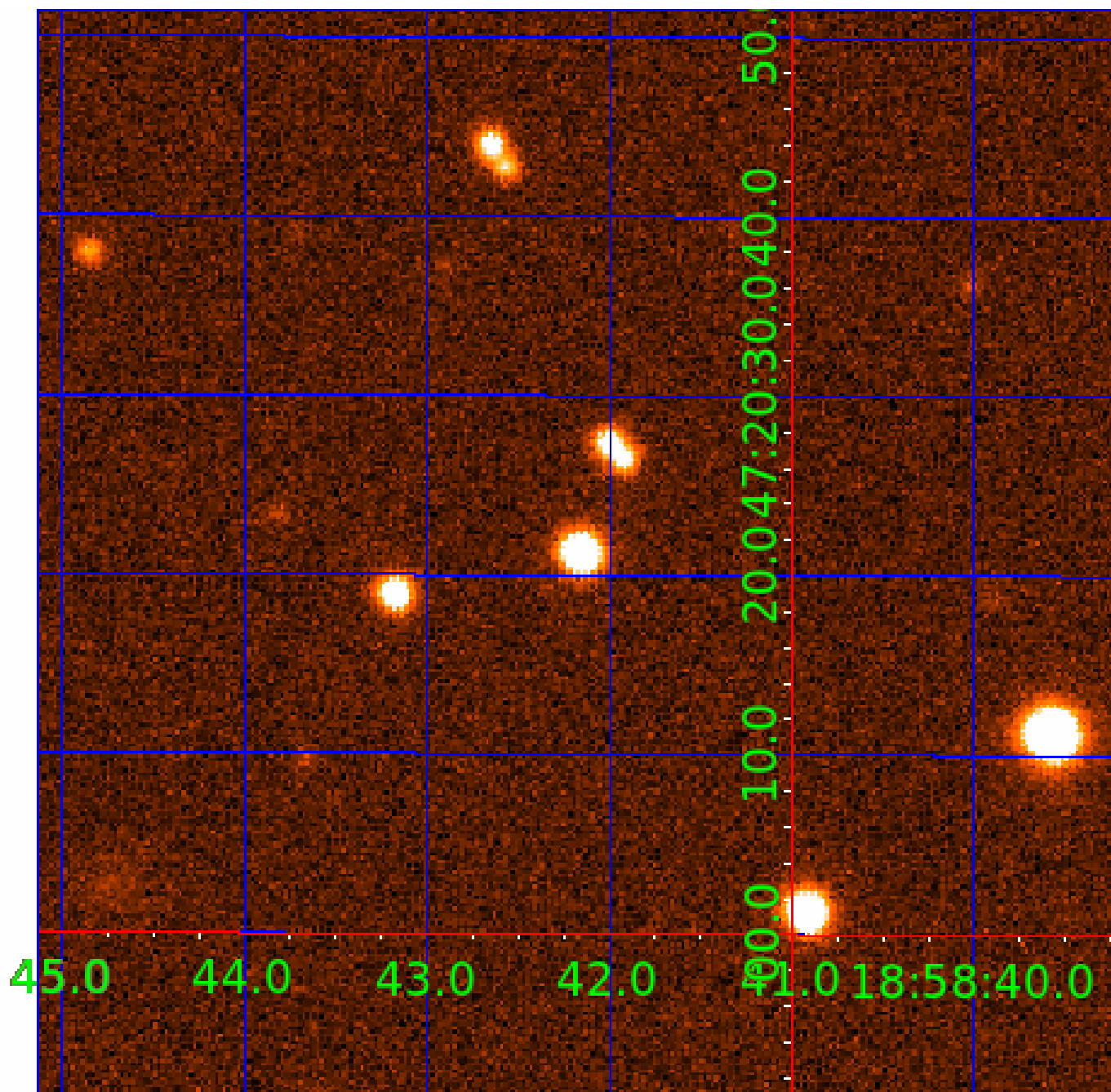


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010259031

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})
010259031-01	OBS	0731.01	7.061137	134.560024	1506.2	3.321	94.9	61.8	0.85	5795	5.74	145.95
010259031-02	OBS	No	7.061185	131.628042	279.1	3.111	11.2	11.7	0.85	5795	2.88	145.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010259031-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
010259031-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH

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 010259031-02

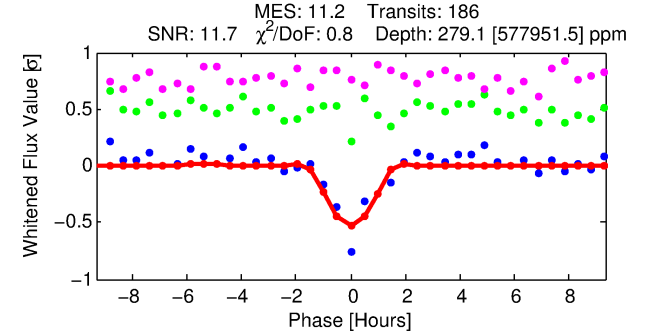
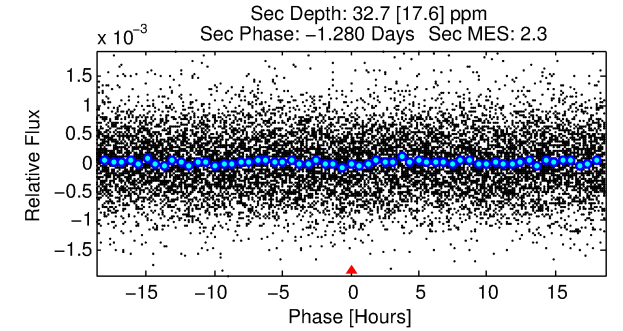
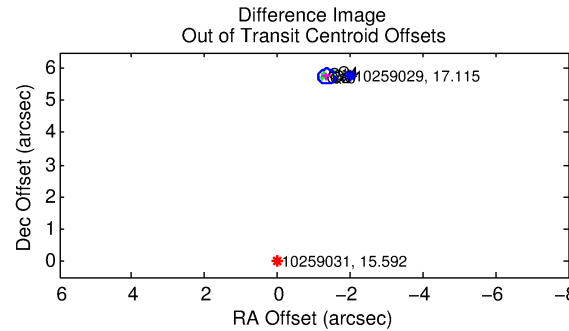
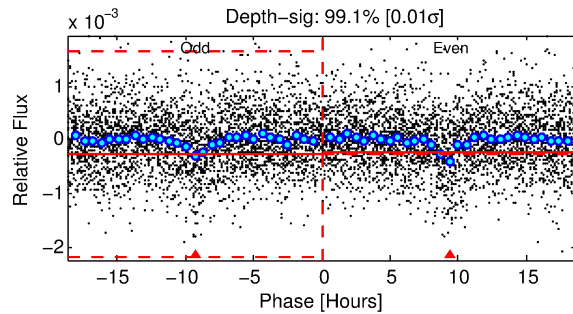
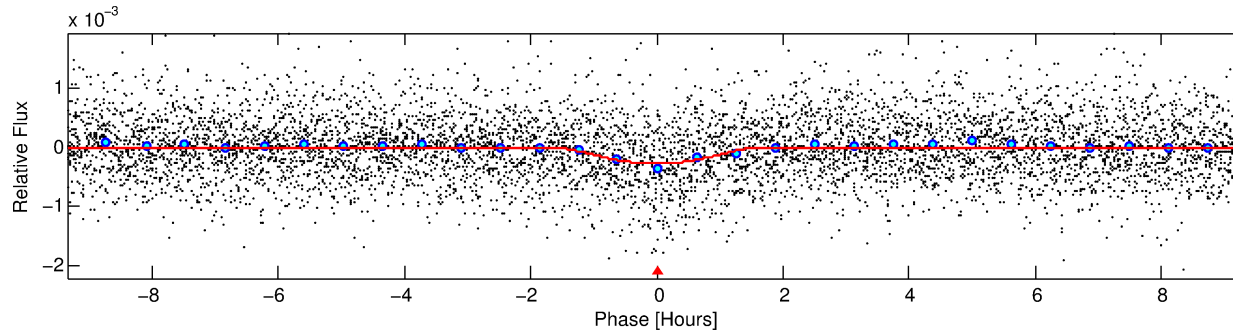
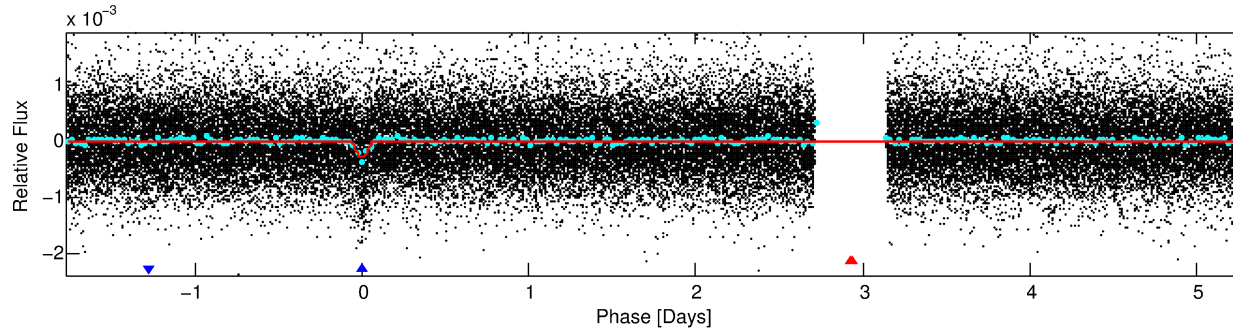
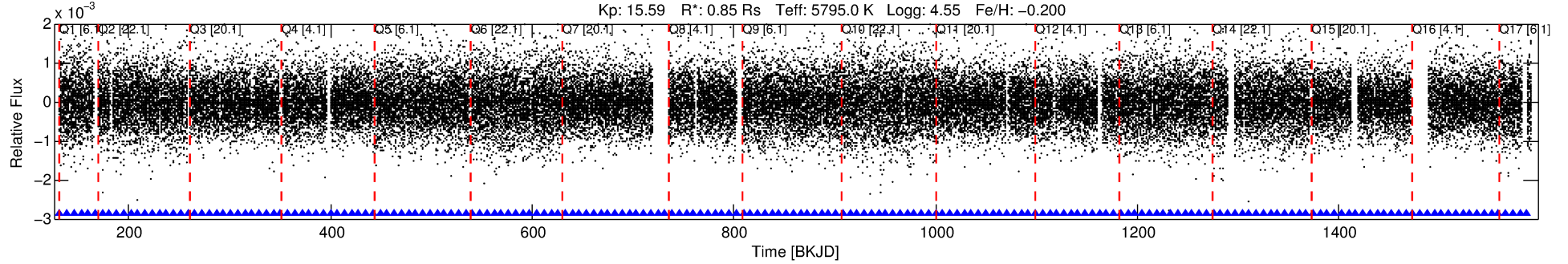
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist (μ)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
010259031-02	10259031	010259029-02	10259029	1:1	6.1	-2	1	17.11	15.59	57.61	Direct-PRF	0	0.51	0.40

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 10259031 Candidate: 2 of 2 Period: 7.061 d
KOI: K00731 Corr: No Ephemeris Match

Kp: 15.59 R*: 0.85 Rs Teff: 5795.0 K Logg: 4.55 Fe/H: -0.200



DV Fit Results:

Period = 7.06118 [0.00006] d
Epoch = 131.6280 [0.0064] BKJD
Rp/R* = 0.0311 [0.1231]
a/R* = 4.47 [4.41]
b = 1.00 [43.34]
Seff = 145.95 [45.78]
Teq = 886 [70] K
Rp = 2.88 [11.41] Re
a = 0.0706 [0.0139] AU
Ag = 10.80 [85.72] [0.11σ]
Teff = 2484 [4927] K [0.32σ]

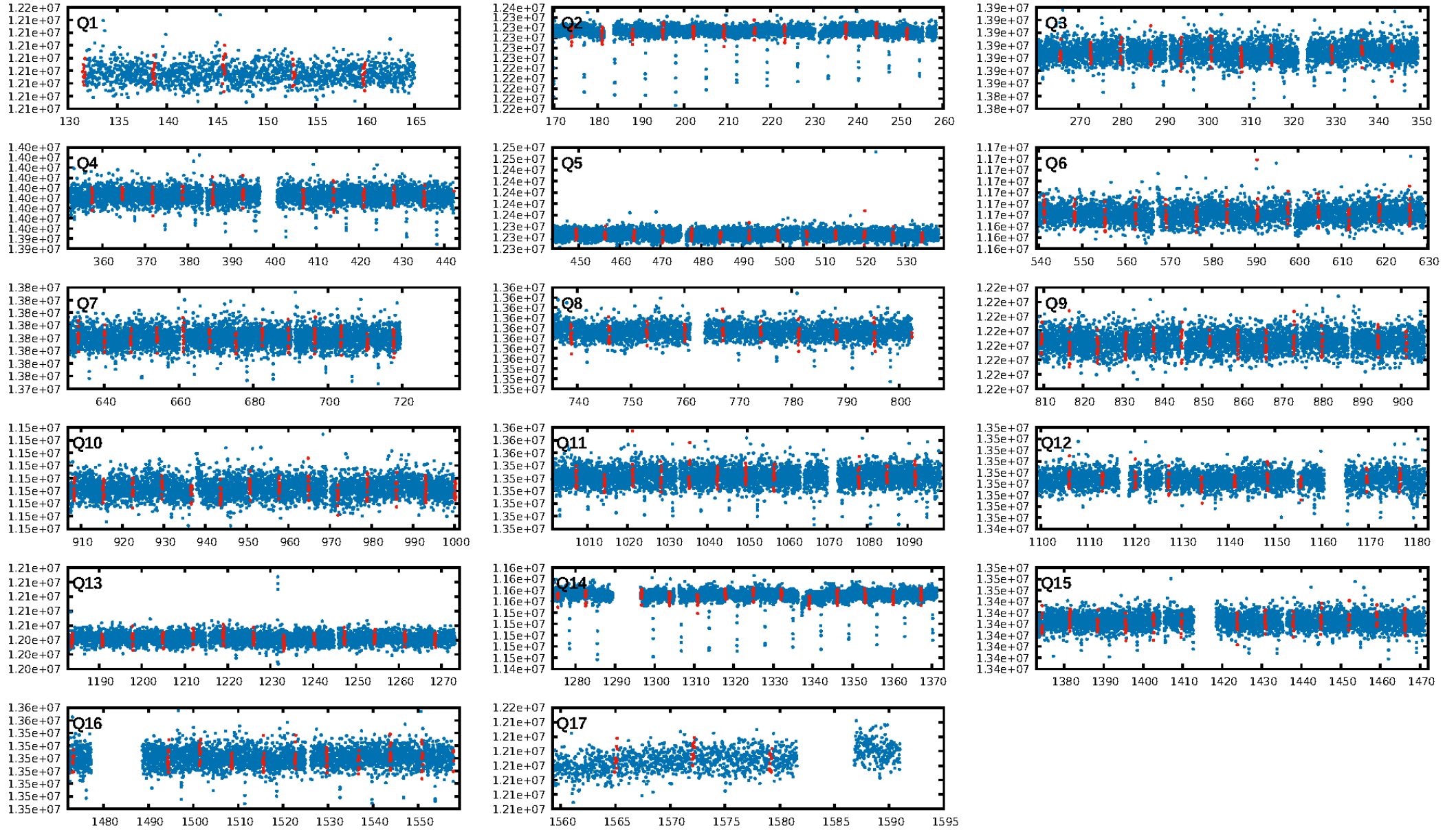
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 16.3%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 2.39e-29
RollingBand-fgt: 1.00 [178/178]
GhostDiagnostic-chr: -0.2667
Centroid-sig: 0.0%
Centroid-so: 39.342 arcsec [37.15σ]
OotOffset-rm: 5.899 arcsec [75.49σ]
KicOffset-rm: 6.331 arcsec [87.47σ]
OotOffset-st: 4/0/1/0 [5]
KicOffset-st: 4/0/1/0 [5]
DiffImageQuality-fgm: 1.00 [5/5]
DiffImageOverlap-fno: 1.00 [17/17]

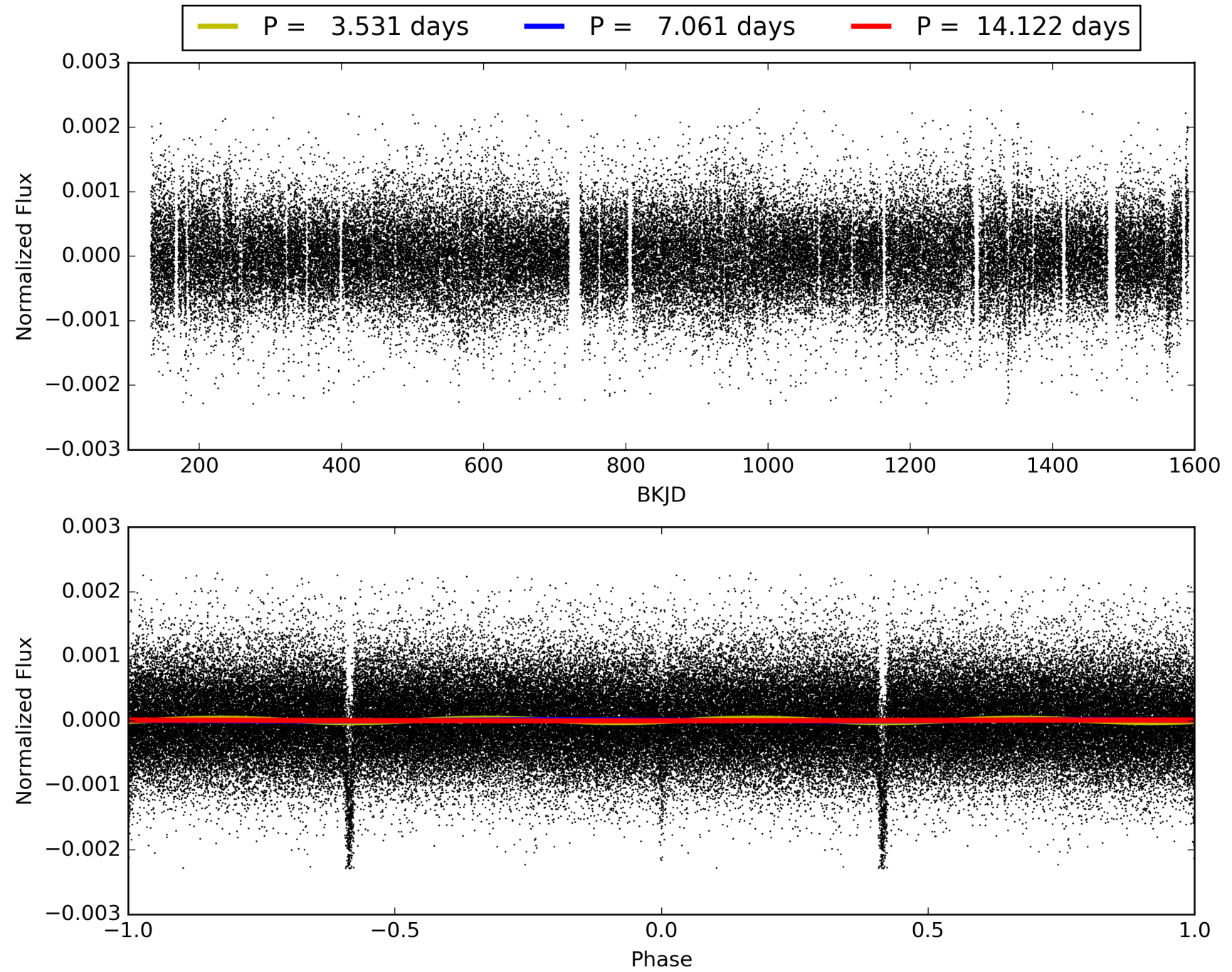
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010259031-02, PDC Light Curves

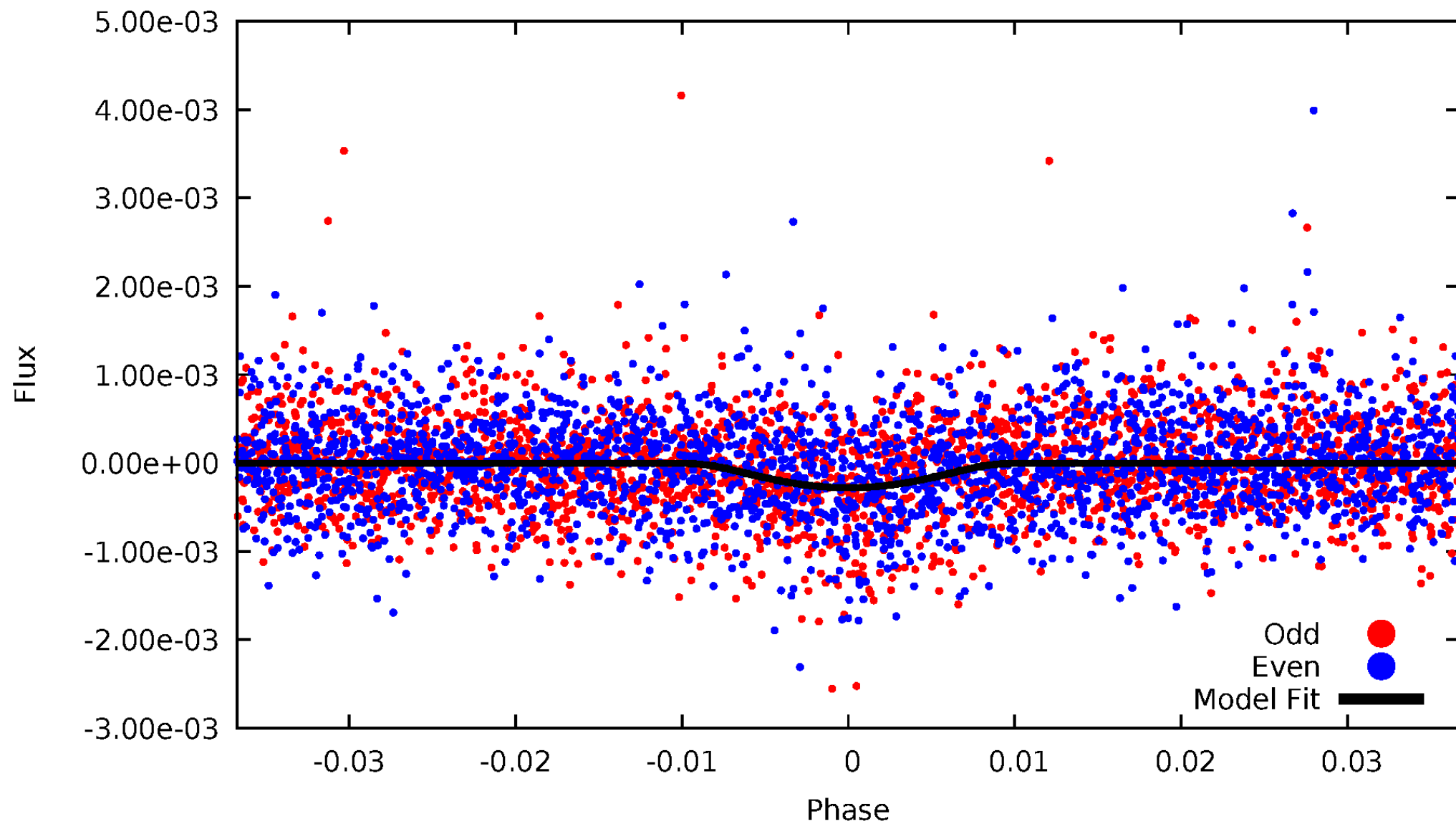


TCE 010259031-02



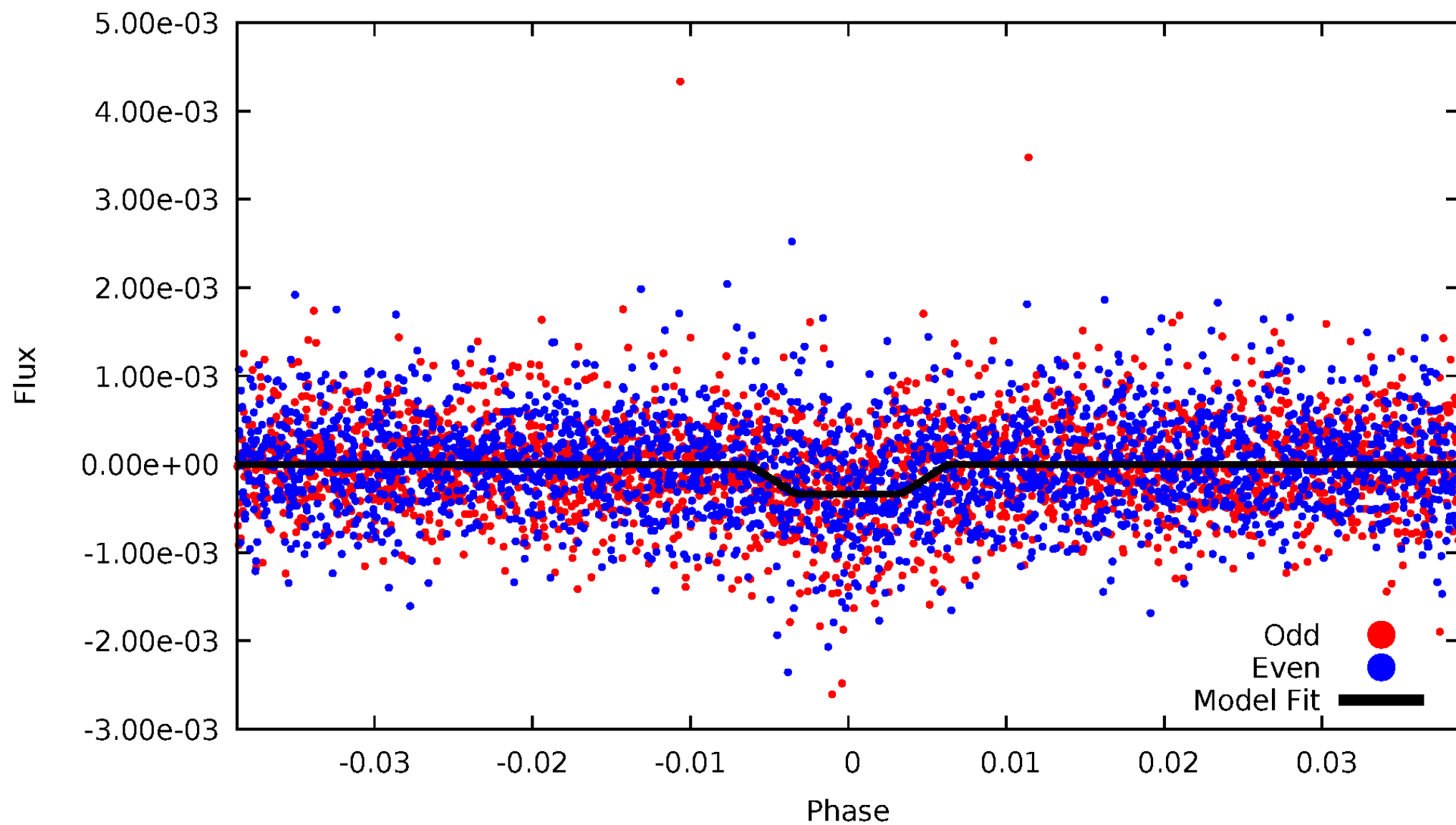
DV Odd/Even

TCE 010259031-02



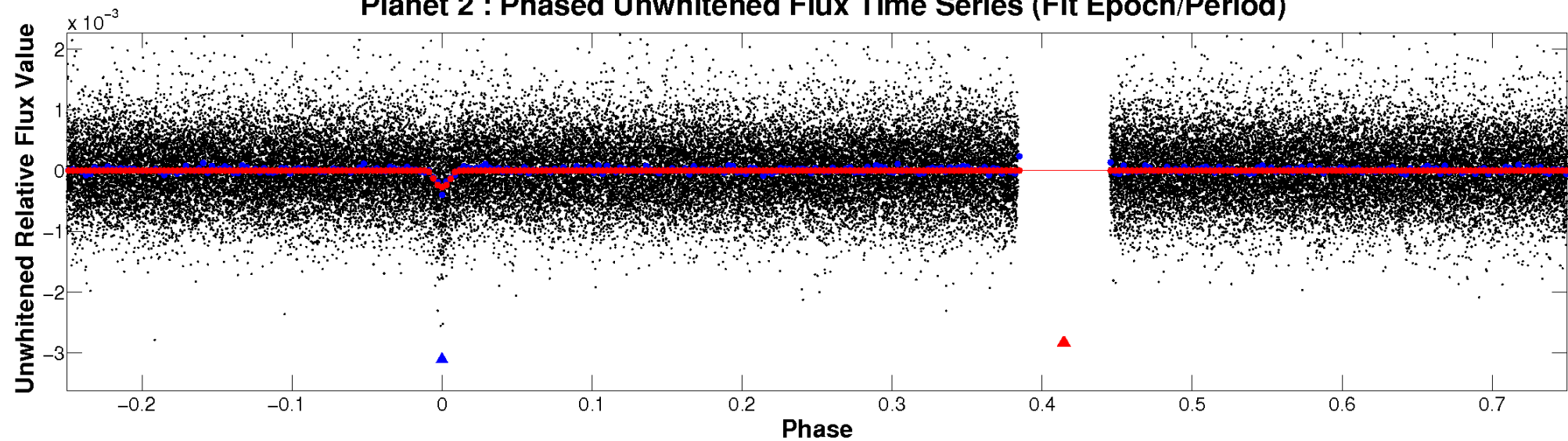
ALT Odd/Even

TCE 010259031-02

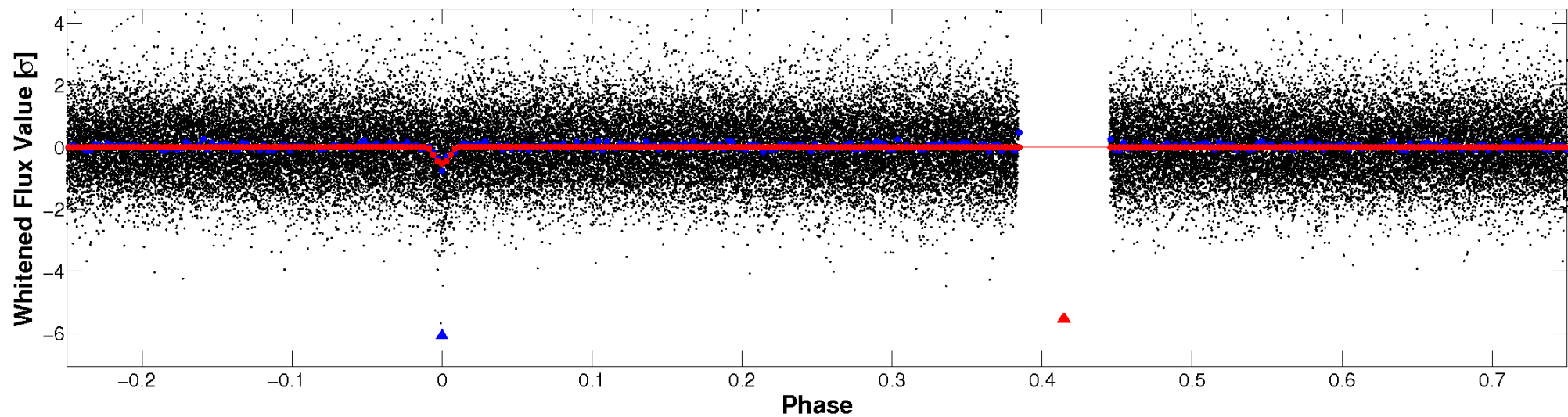


Non-Whitened Vs. Whitened Light Curve

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

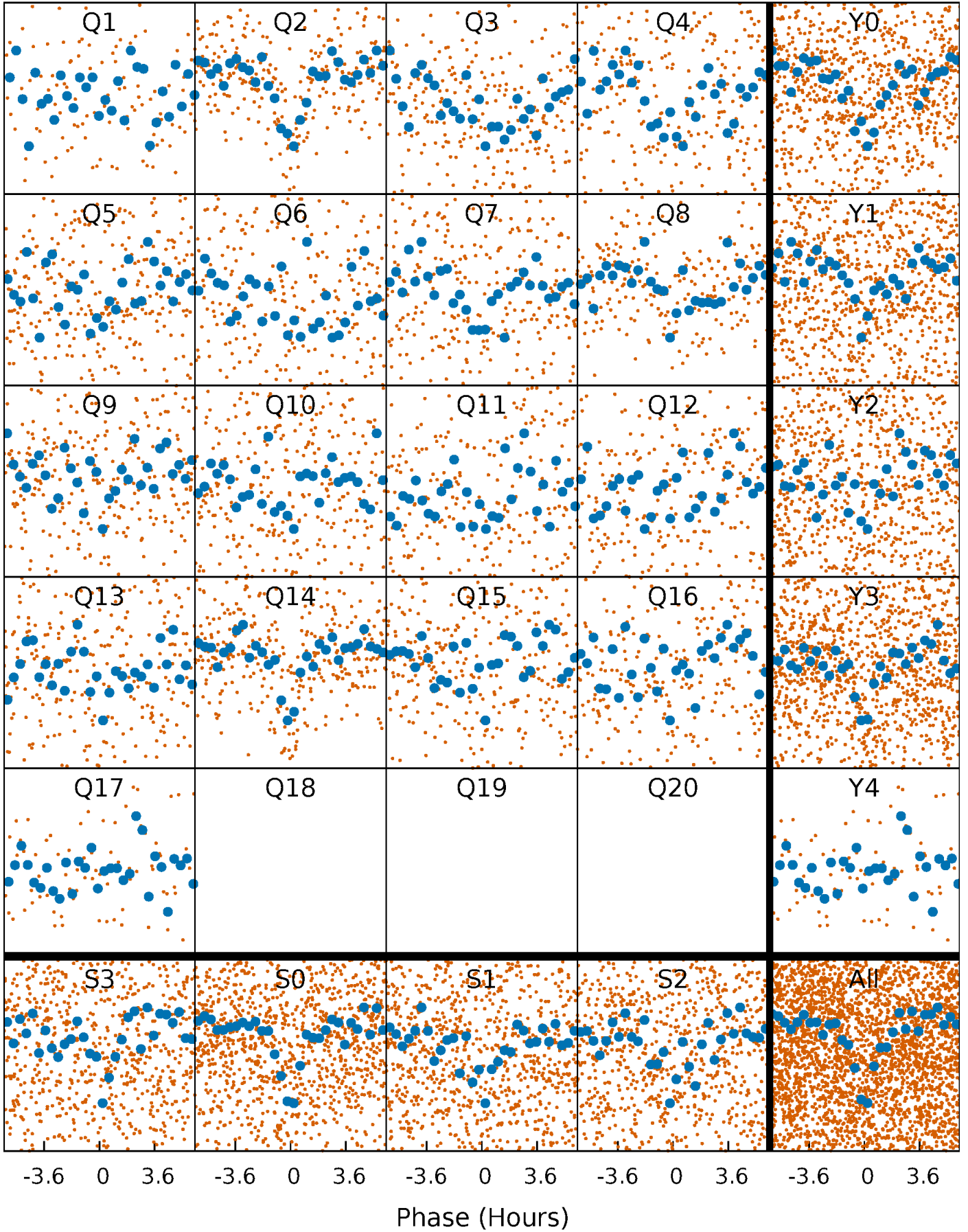


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



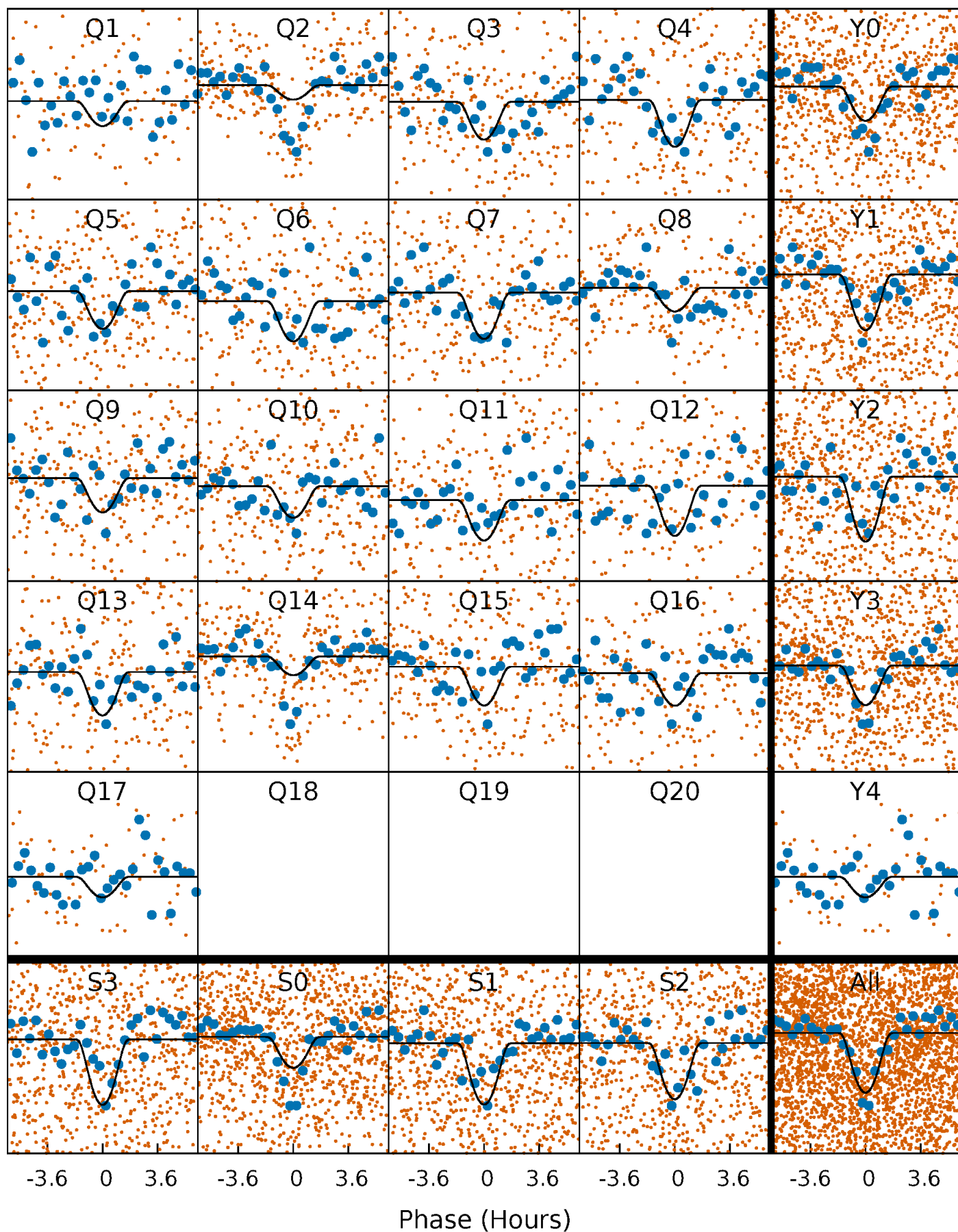
PDC Quarter-Phased Transit Curves

TCE 010259031-02 $P = 7.061185$ Days $T_0 = 131.628042$ (BKJD)



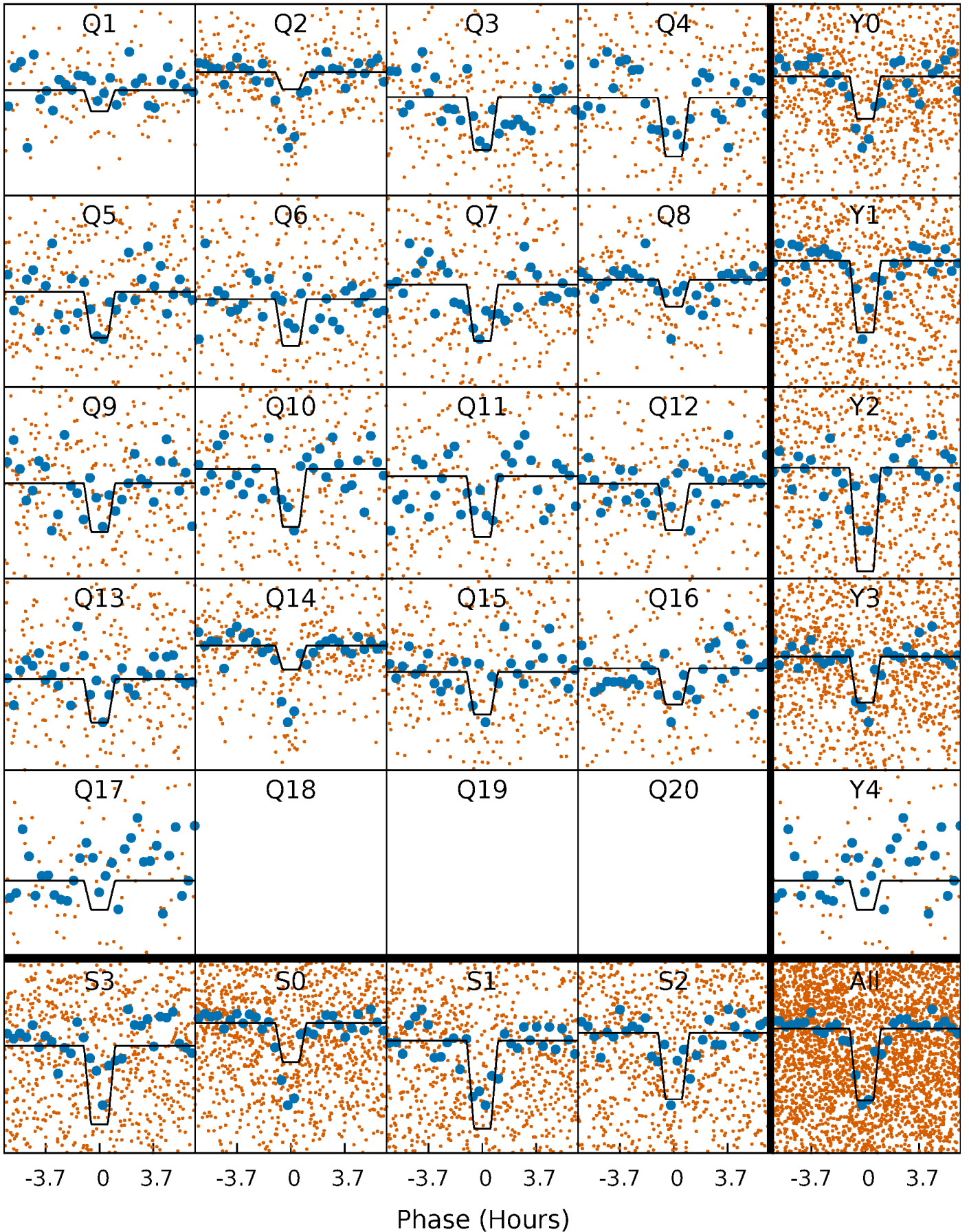
DV Quarter-Phased Transit Curves

TCE 010259031-02 P= 7.061185 Days $T_0=131.628042$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

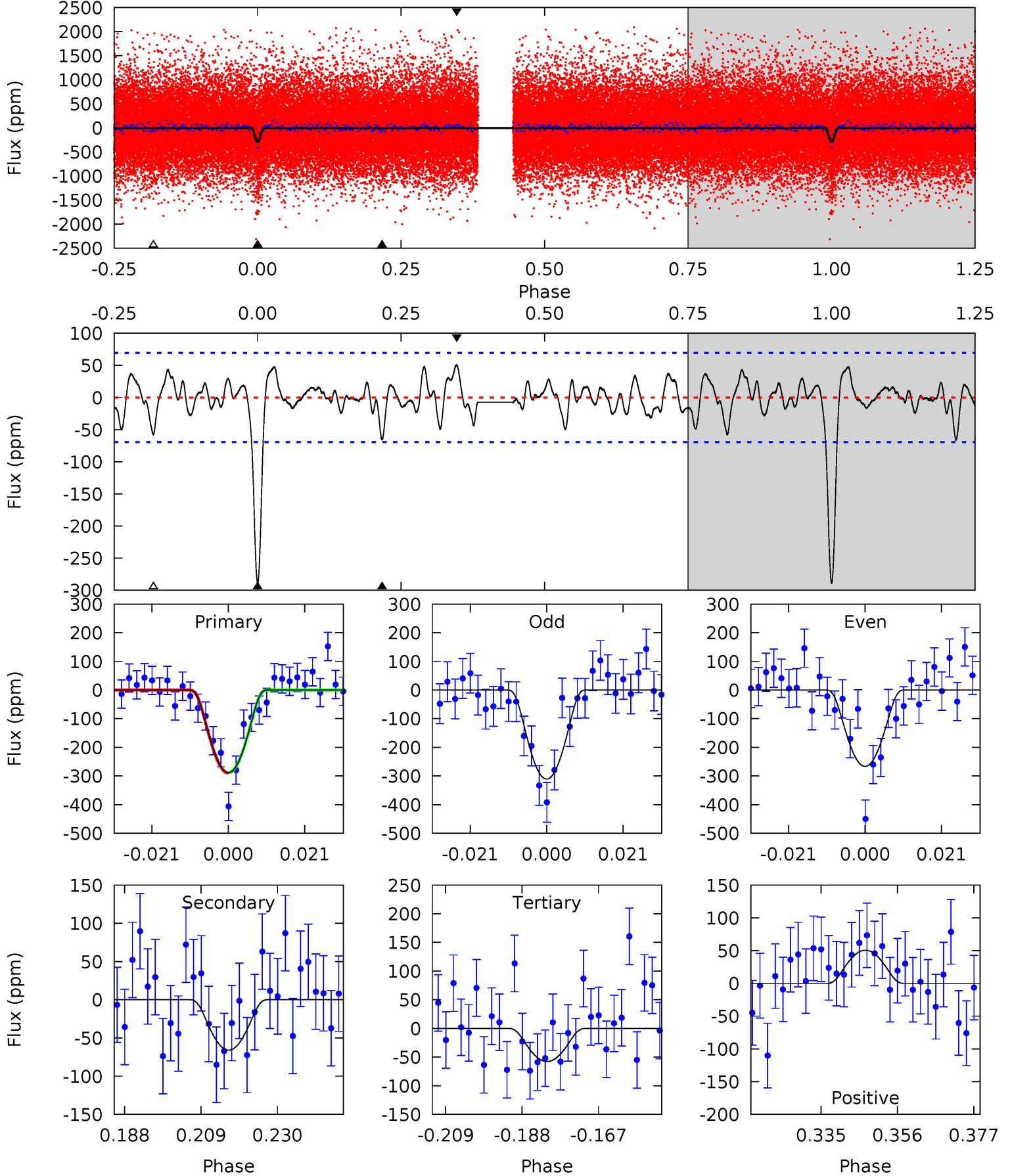
TCE 010259031-02 P= 7.061147 Days $T_0=131.634747$ (BKJD)



DV Model-Shift Uniqueness Test

010259031-02, P = 7.061185 Days, E = 124.566857 Days

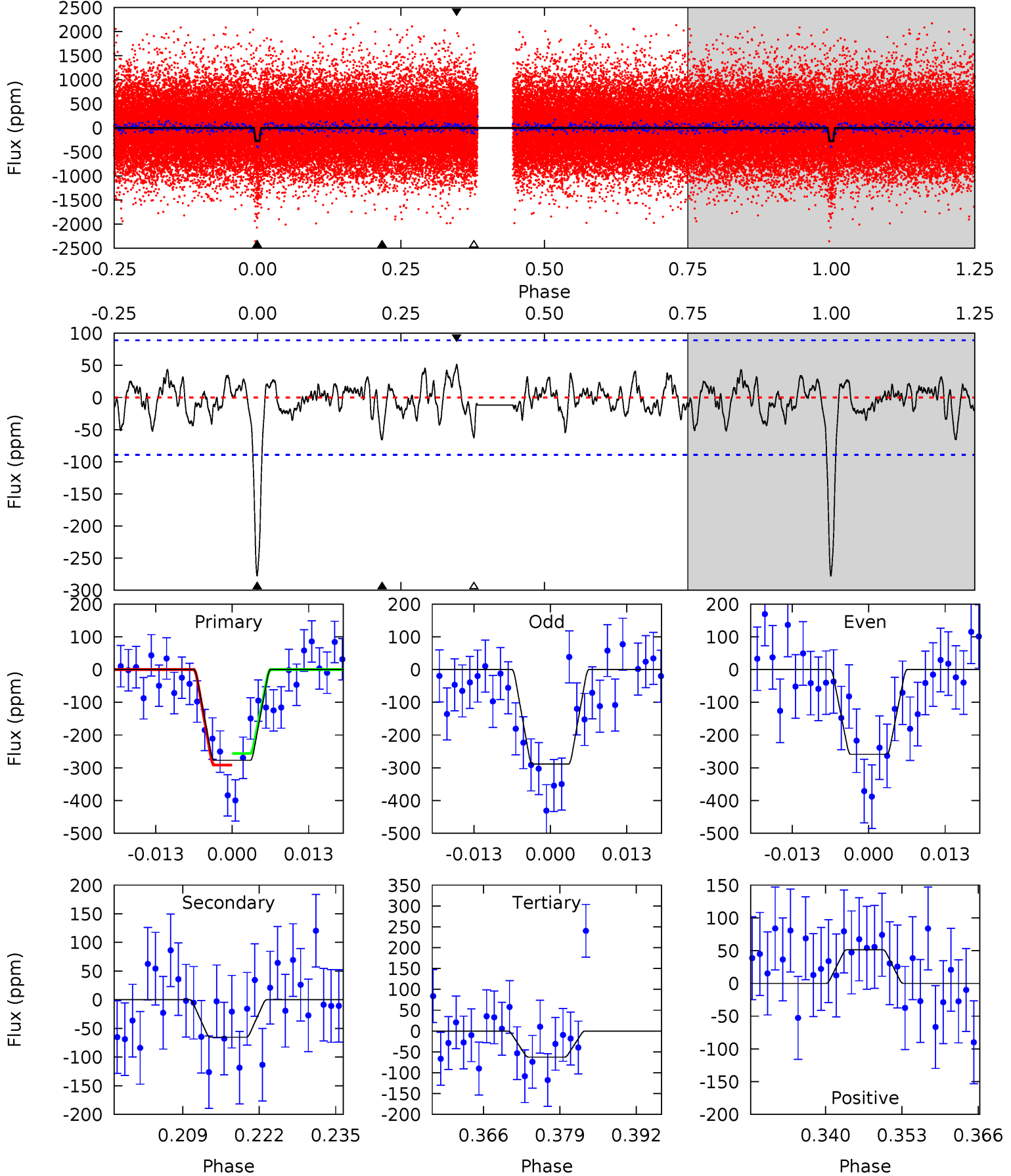
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.3	4.64	4.07	3.56	4.88	2.31	1.42	16.3	16.8	0.57	1.08	1.56	1.19	0.15	0.03



Alt Model-Shift Uniqueness Test

010259031-02, P = 7.061147 Days, E = 124.573600 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.5	3.65	3.49	2.87	4.97	2.48	1.12	12.0	12.6	0.16	0.77	0.82	1.10	0.16	0.99



Stellar Parameters For KIC 010259031

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5795^{+143}_{-172}	$4.554^{+0.040}_{-0.160}$	$-0.200^{+0.250}_{-0.300}$	$0.848^{+0.197}_{-0.071}$	$0.938^{+0.100}_{-0.110}$	$2.167^{+0.449}_{-0.932}$
	+2%/-3%	+1%/-4%	+125%/-150%	+23%/-8%	+11%/-12%	+21%/-43%
Source	PHO1	KIC0	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 010259031-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-66 ± 14	$9.36^{+8.69}_{-5.89}$	1258^{+71}_{-55}	2441^{+842}_{-447}	$1.961^{+12.515}_{-1.412}$
Alt.	-65 ± 18	$9.00^{+9.35}_{-5.80}$	1262^{+68}_{-55}	2450^{+888}_{-519}	$1.889^{+15.506}_{-1.405}$

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 $A_{obs} \gg 1.0$

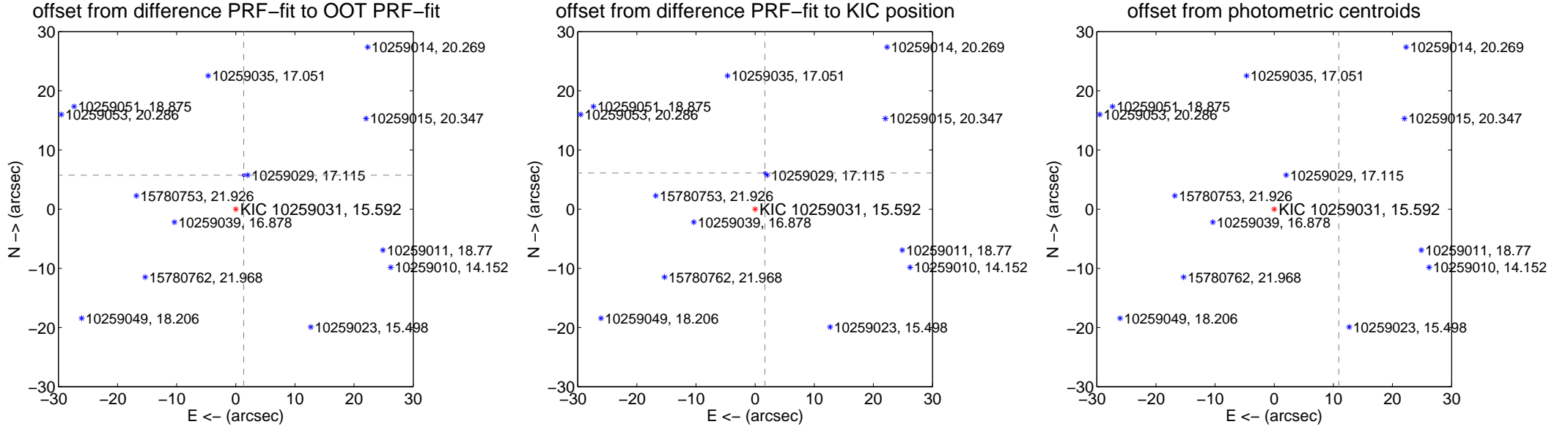
DV Centroid Data

Supplemental centroid analysis for 010259031-02. Kepler magnitude: 15.59. Transit SNR 11.72

There are 5 quarters with good PRF difference image offsets

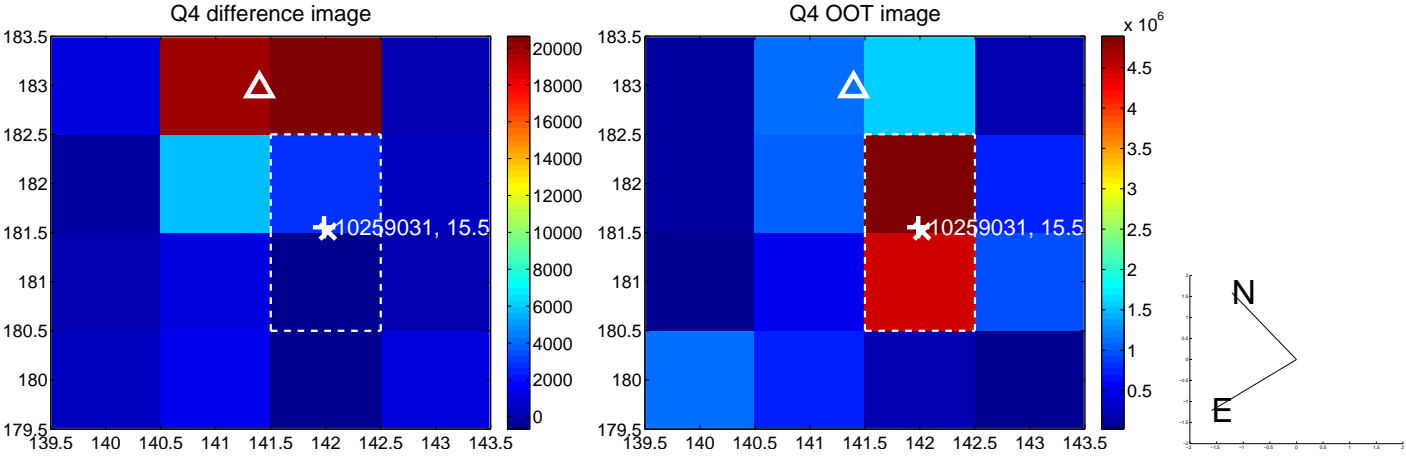
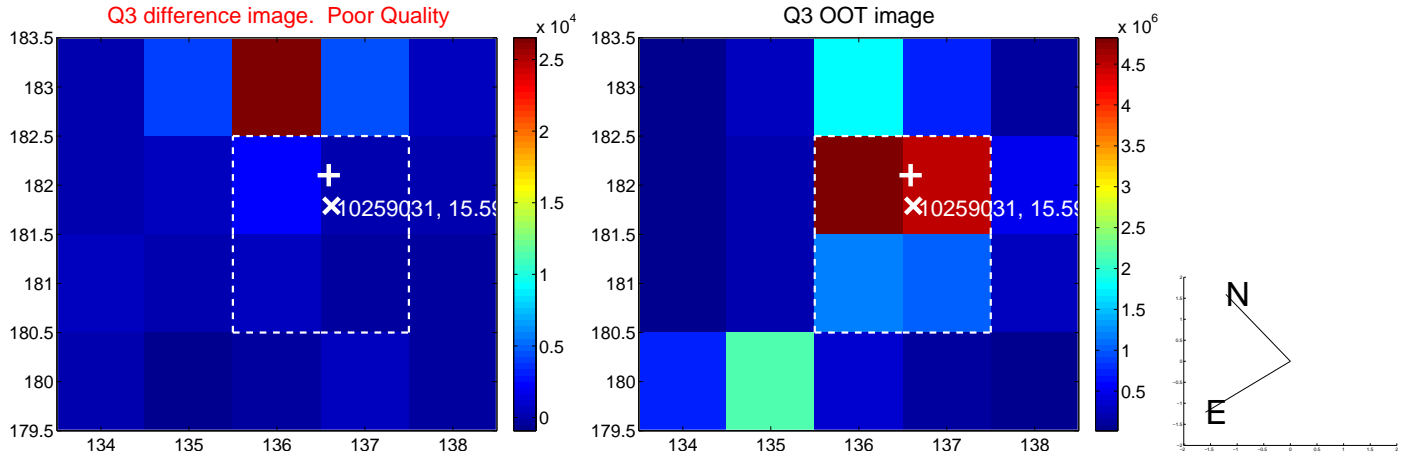
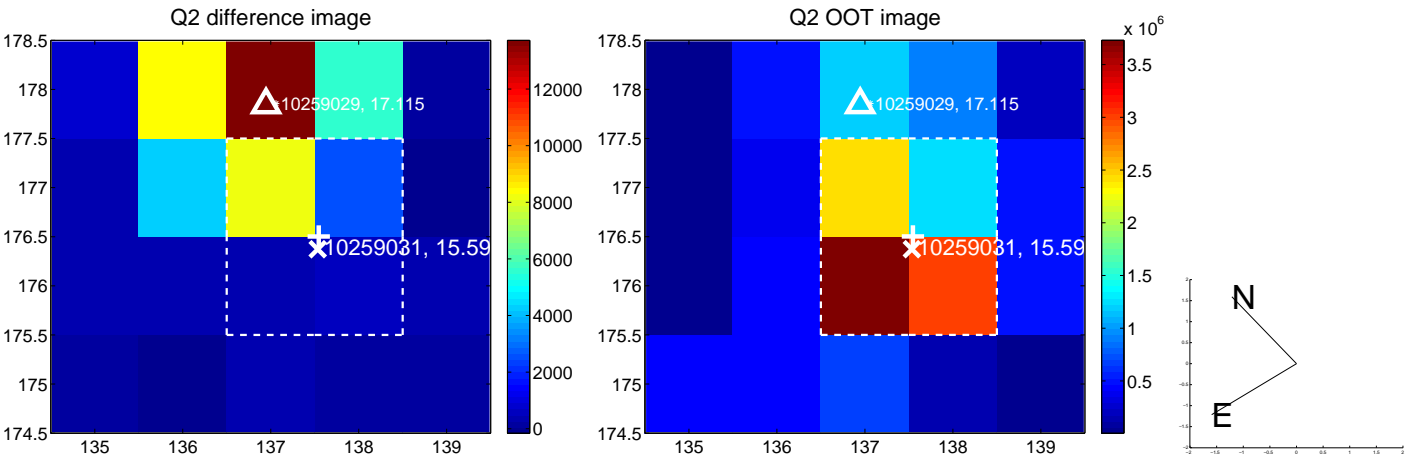
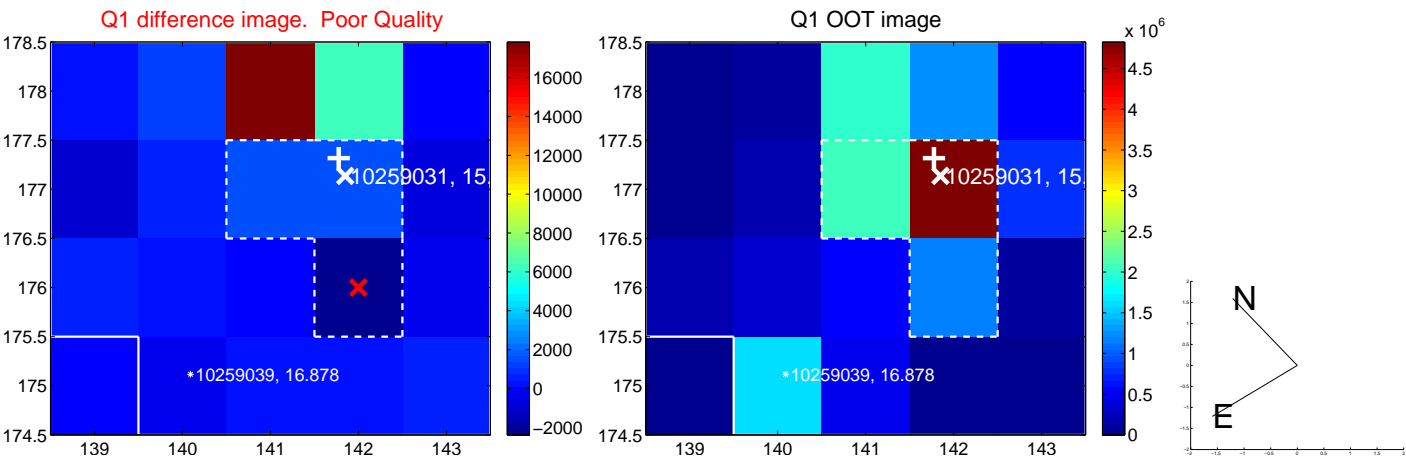
The direct PRF centroid is offset from the target star catalog position by about 0.50 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.899 ± 0.078	75.49	-1.340 ± 0.083	5.745 ± 0.074
PRF-fit source offset from KIC position	6.331 ± 0.072	87.47	-1.656 ± 0.071	6.111 ± 0.072
photometric centroid source offset	39.34 ± 1.06	37.15	-10.93 ± 0.95	37.79 ± 1.07

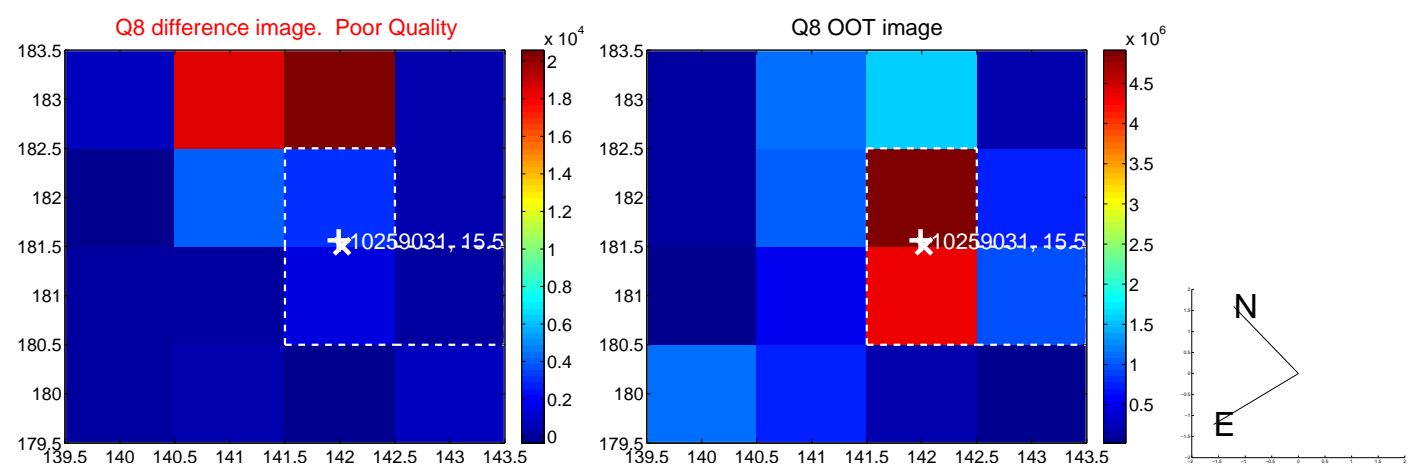
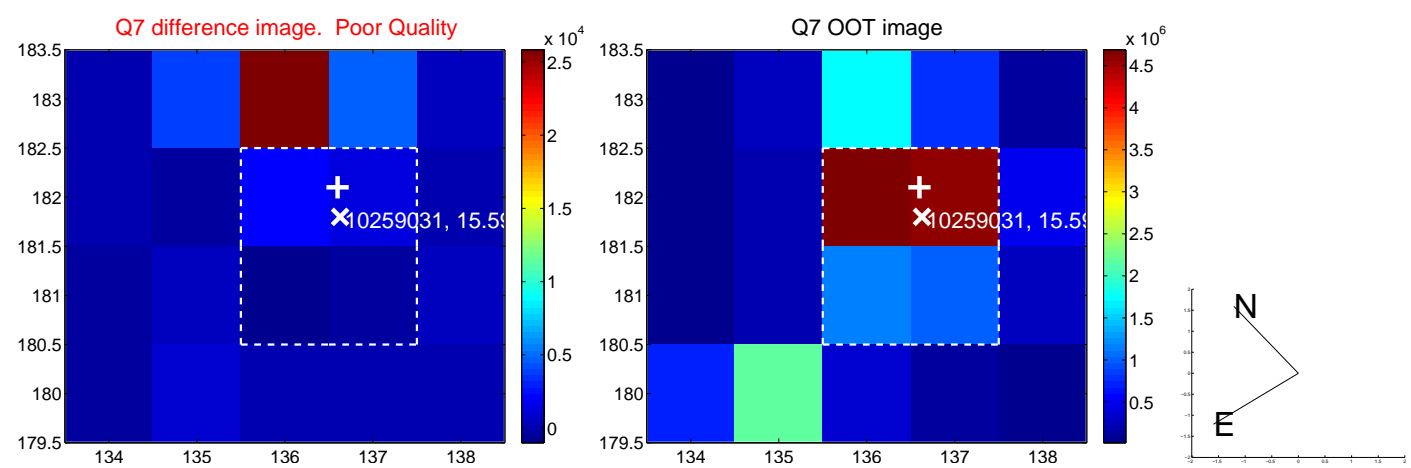
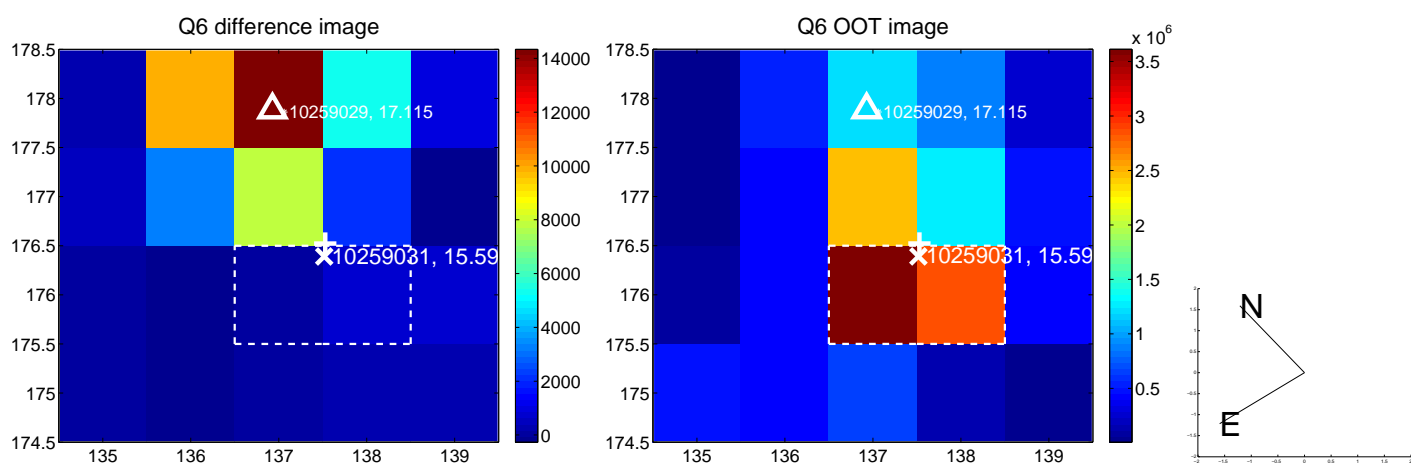
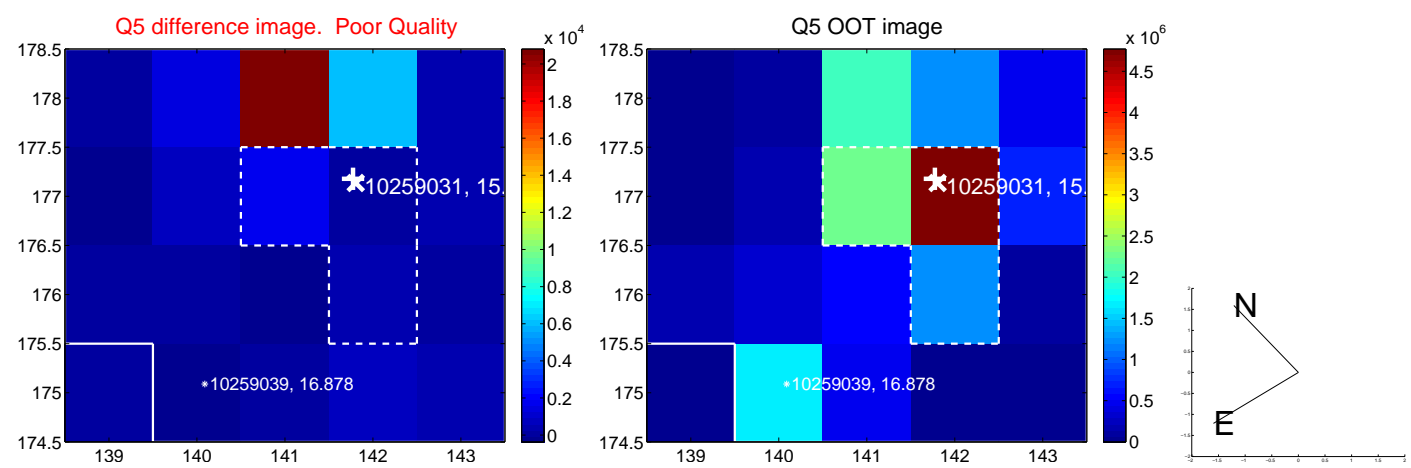


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

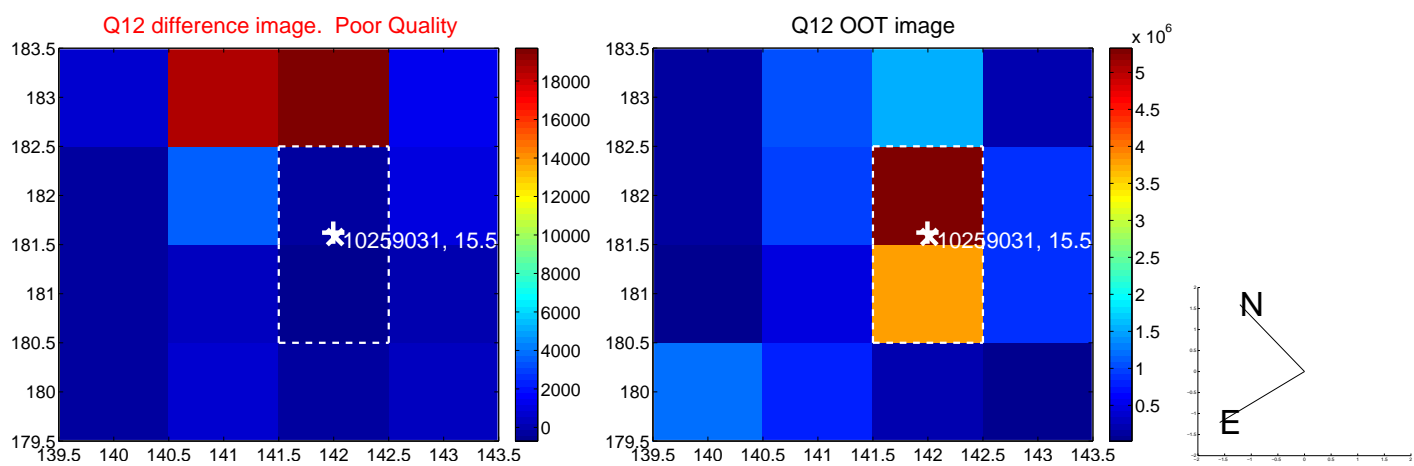
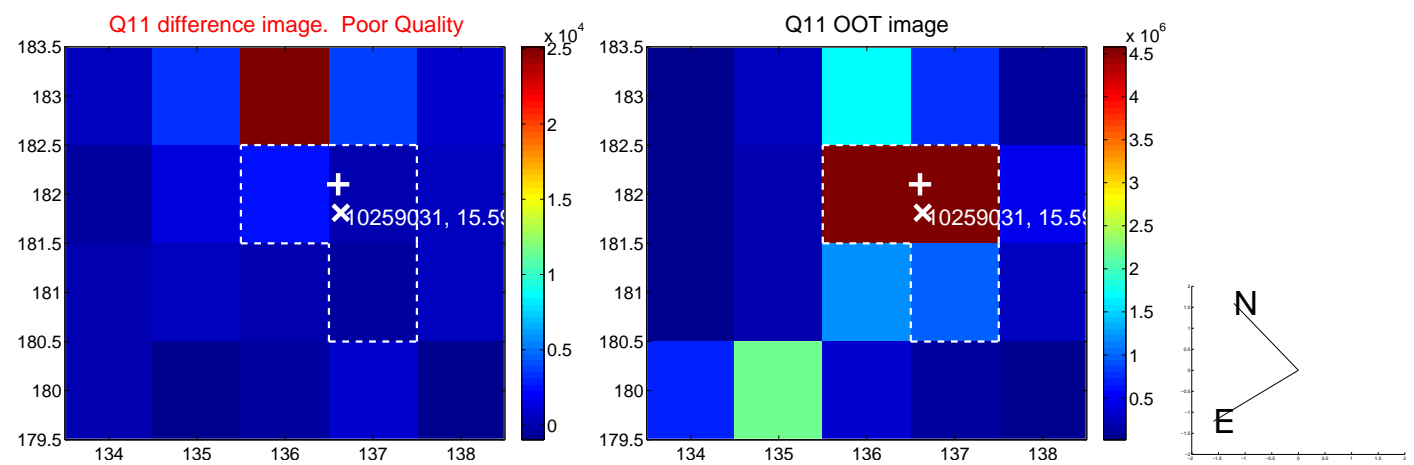
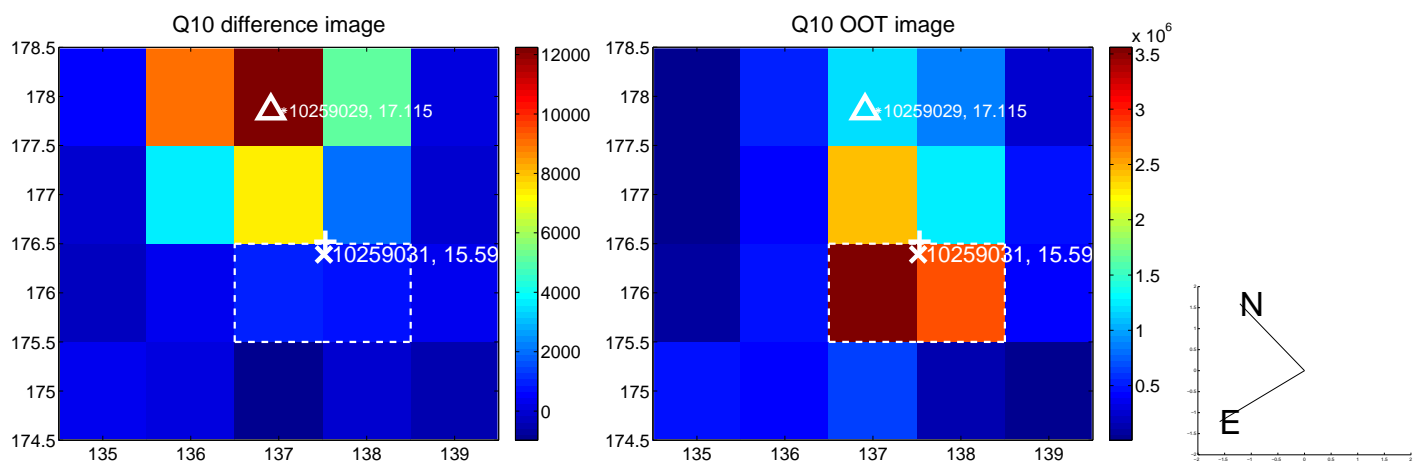
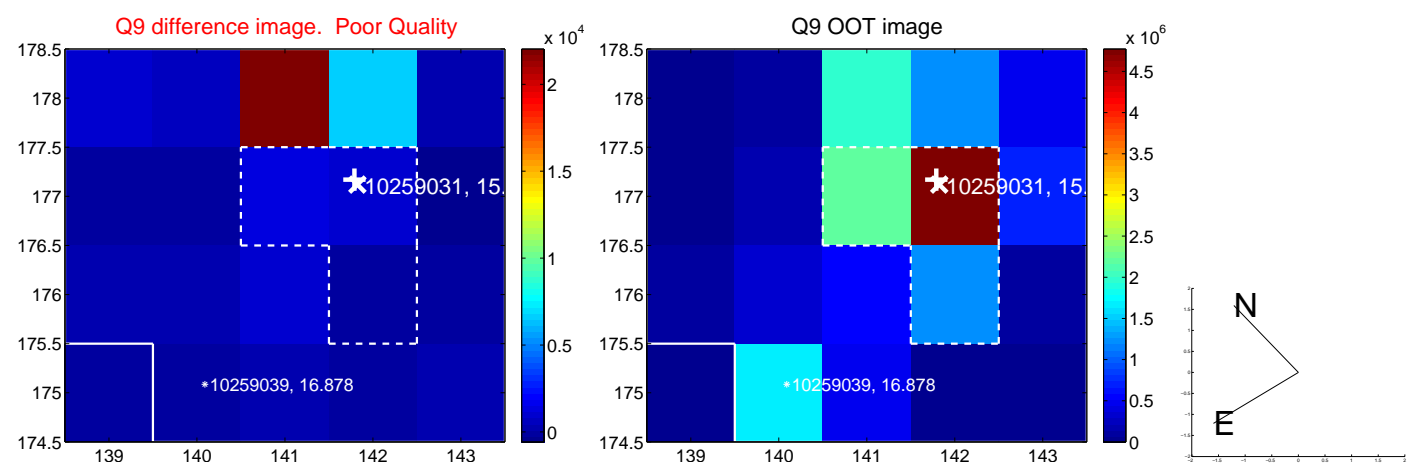
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



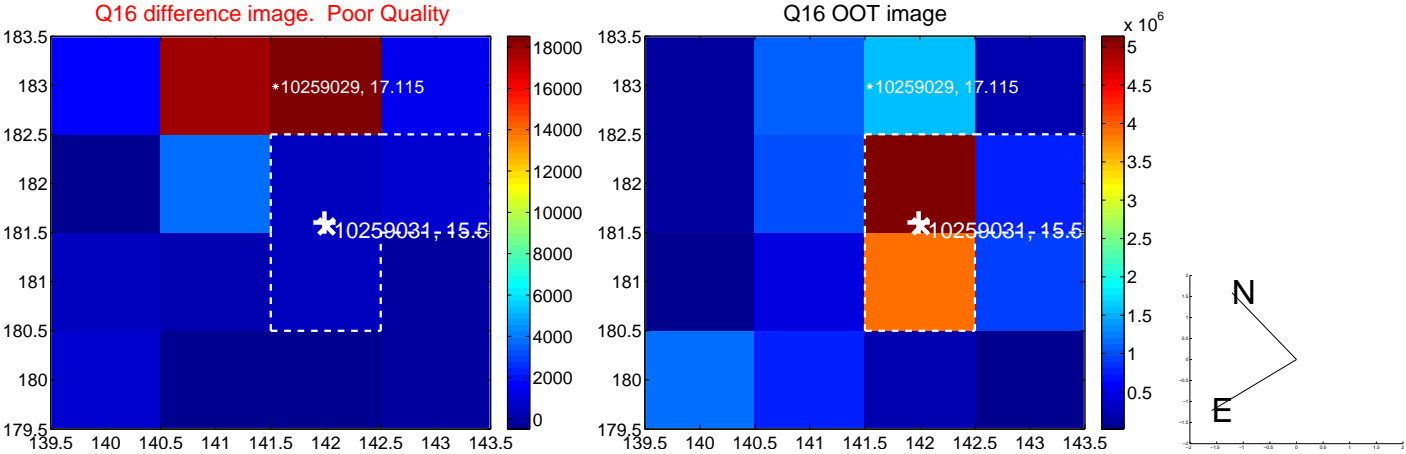
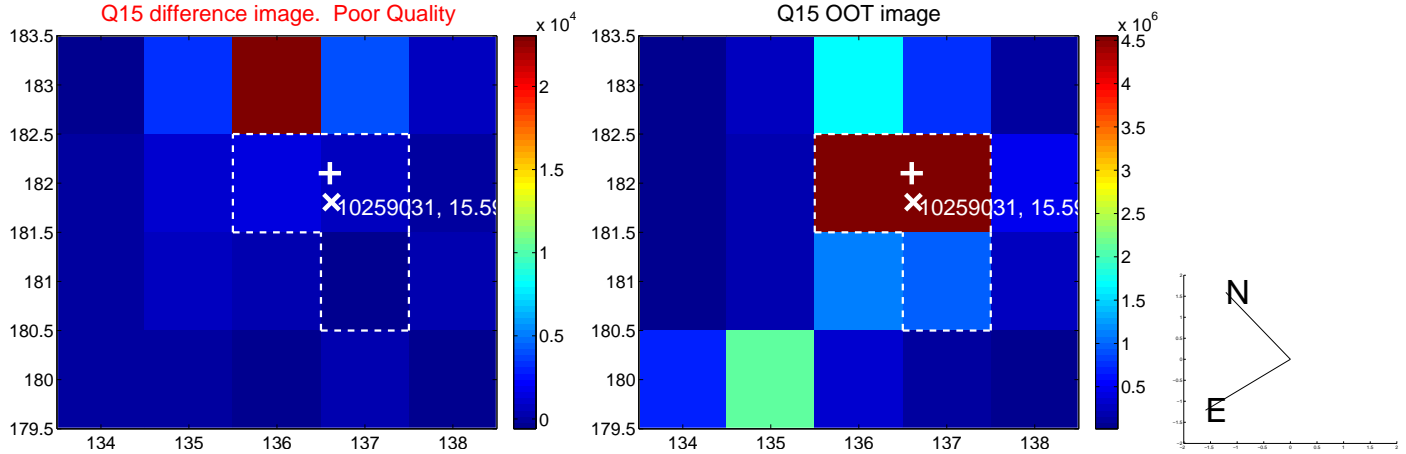
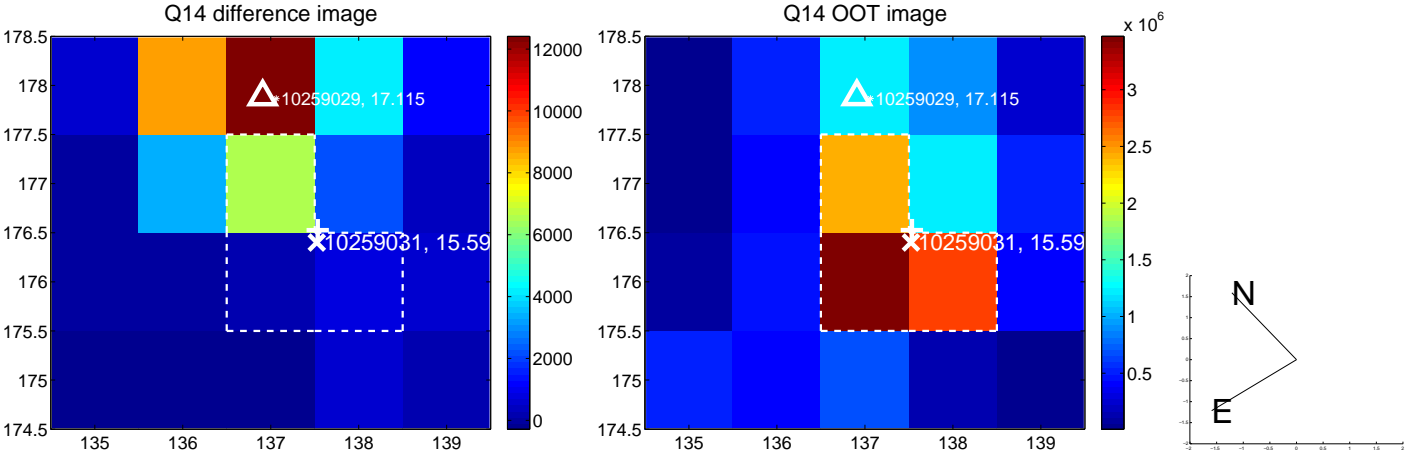
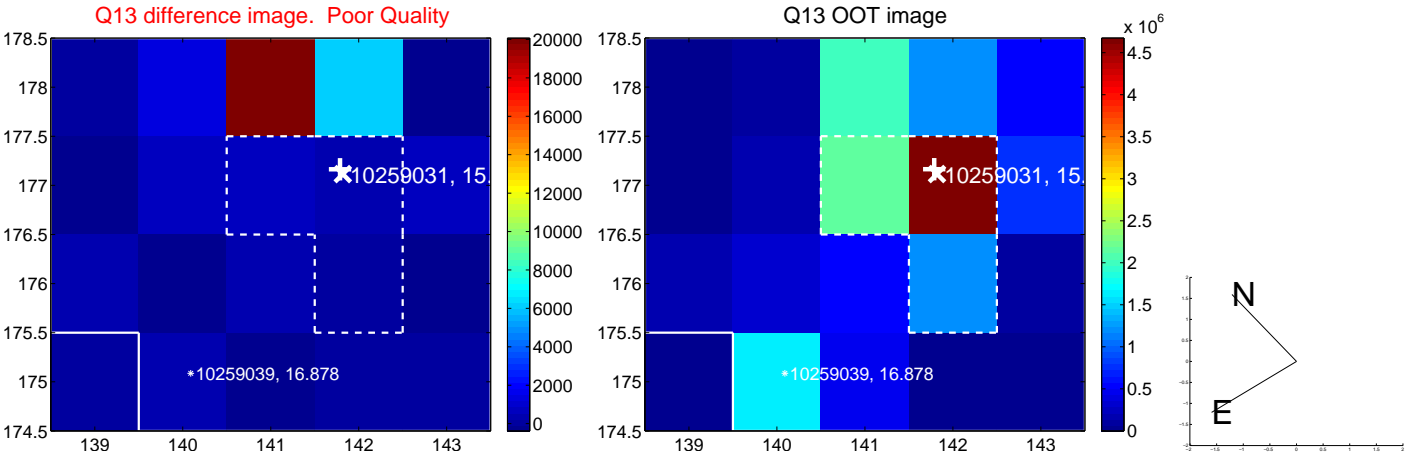
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



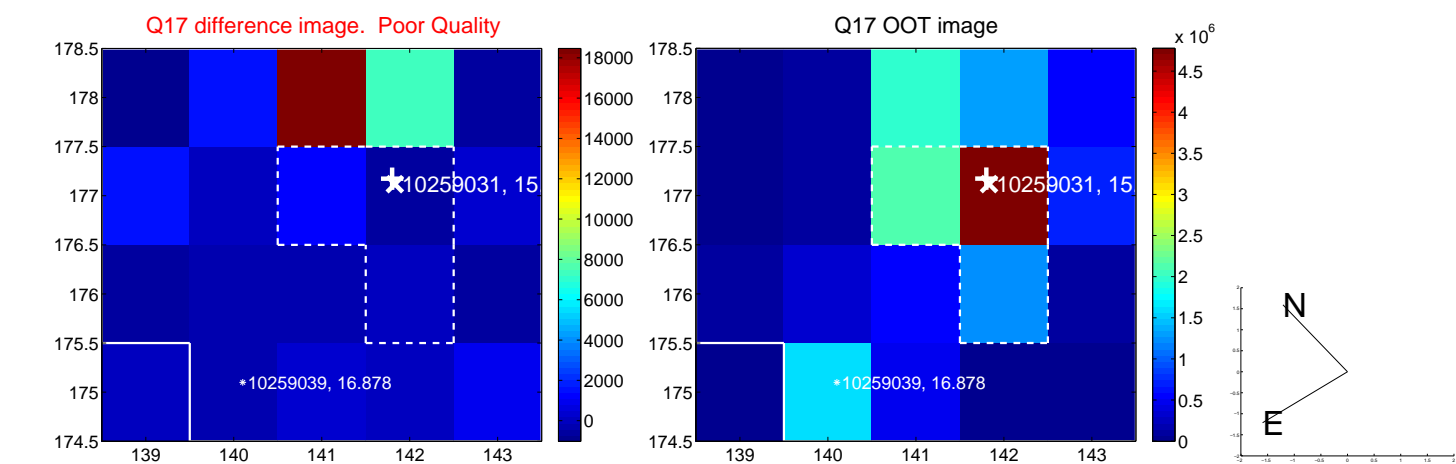
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



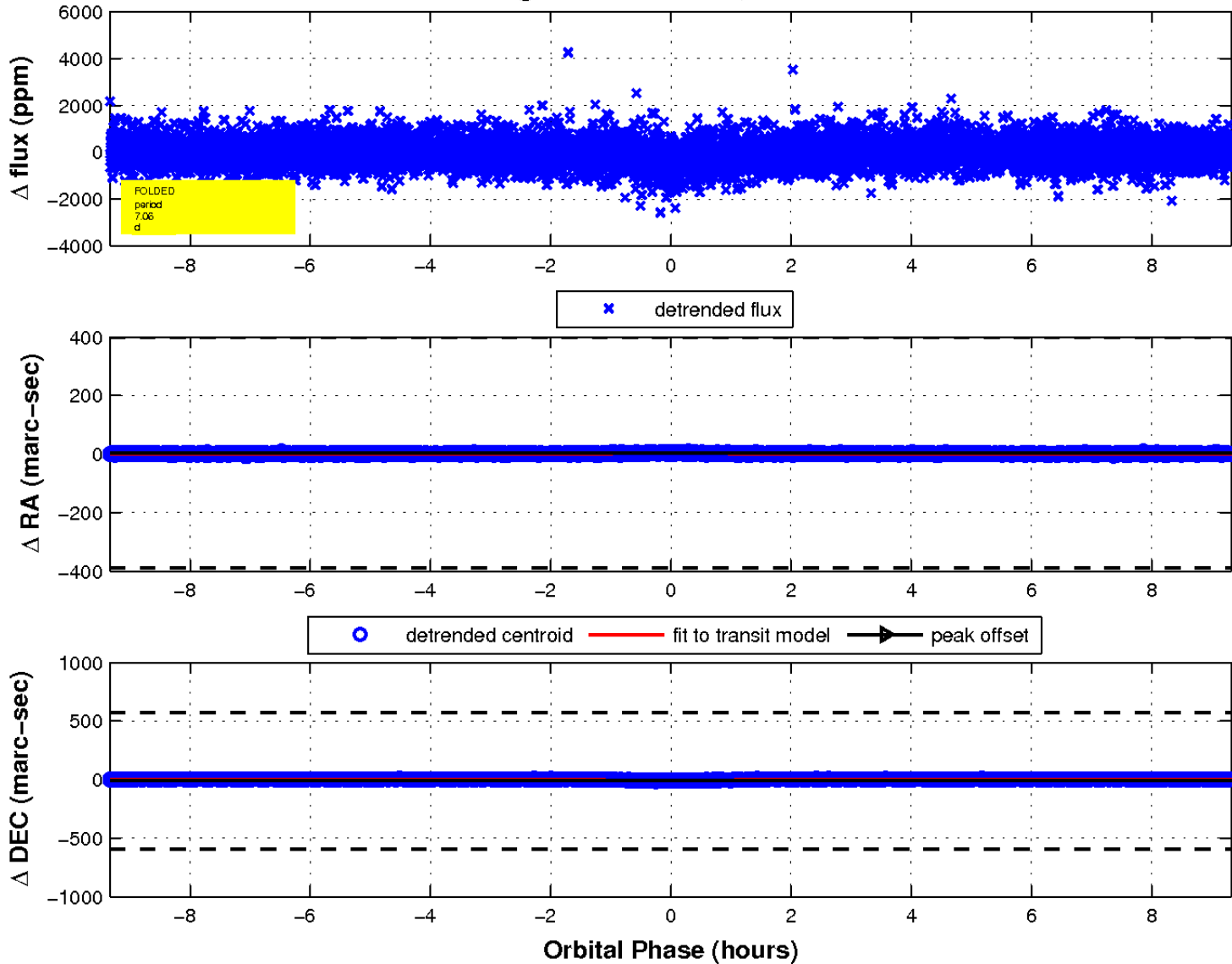
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

