

KIC 010933561

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})
010933561-01	OBS	0291.01	31.517764	153.634584	350.7	7.819	46.4	47.8	1.40	5611	2.85	45.75
010933561-02	OBS	0291.02	8.129959	134.104963	143.2	2.020	20.0	22.9	1.40	5611	1.99	278.63

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010933561-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
010933561-02	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.

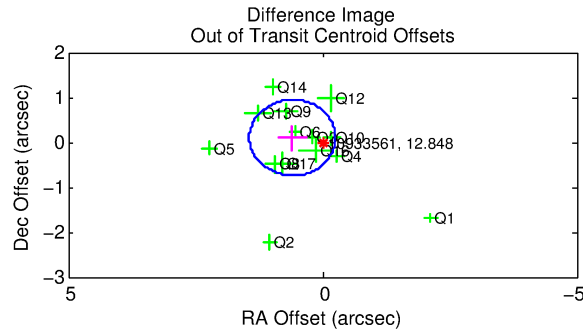
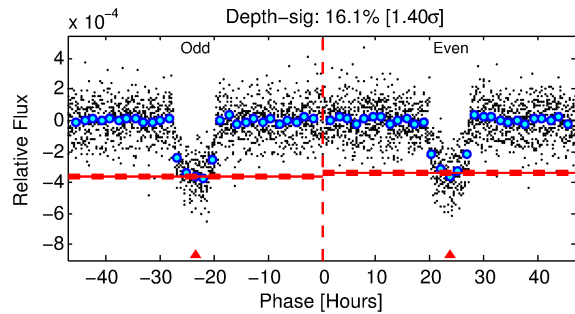
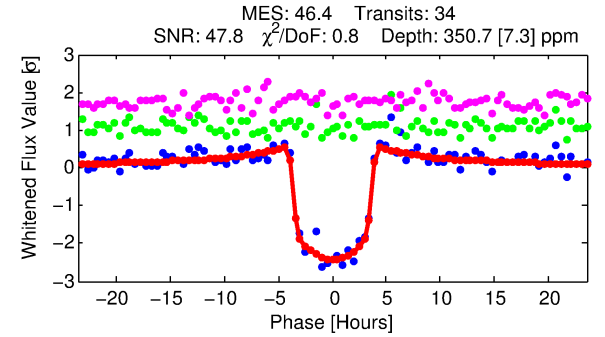
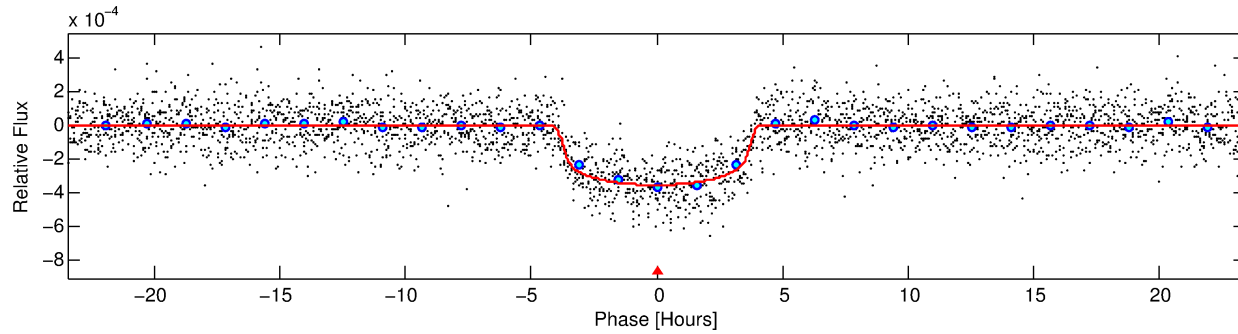
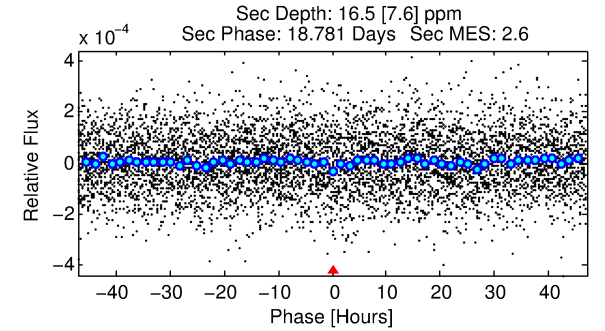
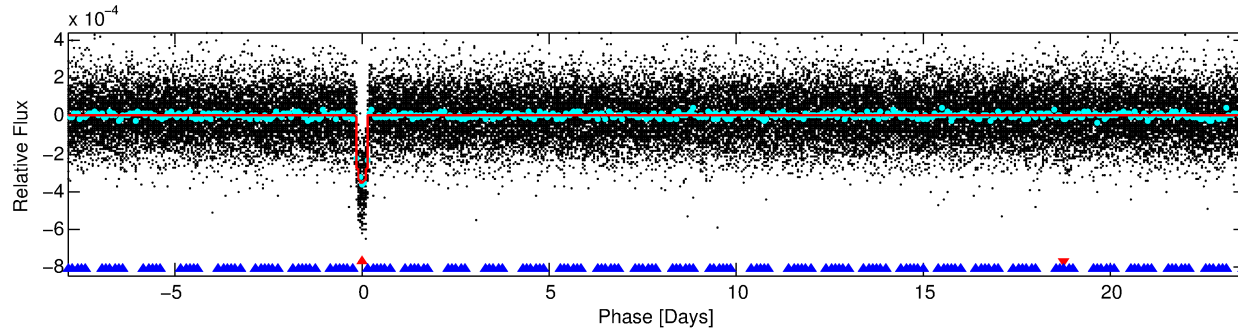
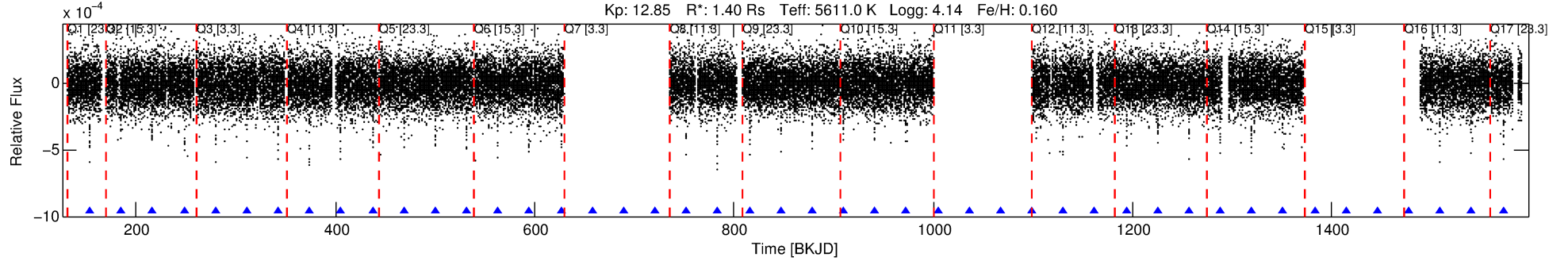
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010933561-01

No Significant Match Found

DV One-Page Summary

KIC: 10933561 Candidate: 1 of 2 Period: 31.518 d
KOI: K00291.01 Name: Kepler-133c Corr: 0.991



DV Fit Results:

Period = 31.51776 [0.00010] d
Epoch = 153.6346 [0.0024] BKJD
Rp/R* = 0.0186 [0.0022]
a/R* = 21.37 [10.43]
b = 0.75 [0.29]
Seff = 45.75 [15.77]
Teff = 663 [57] K
Rp = 2.84 [0.72] Re
a = 0.1951 [0.0414] AU
Ag = 42.68 [26.25] [1.59σ]
Teffp = 2621 [342] K [5.65σ]

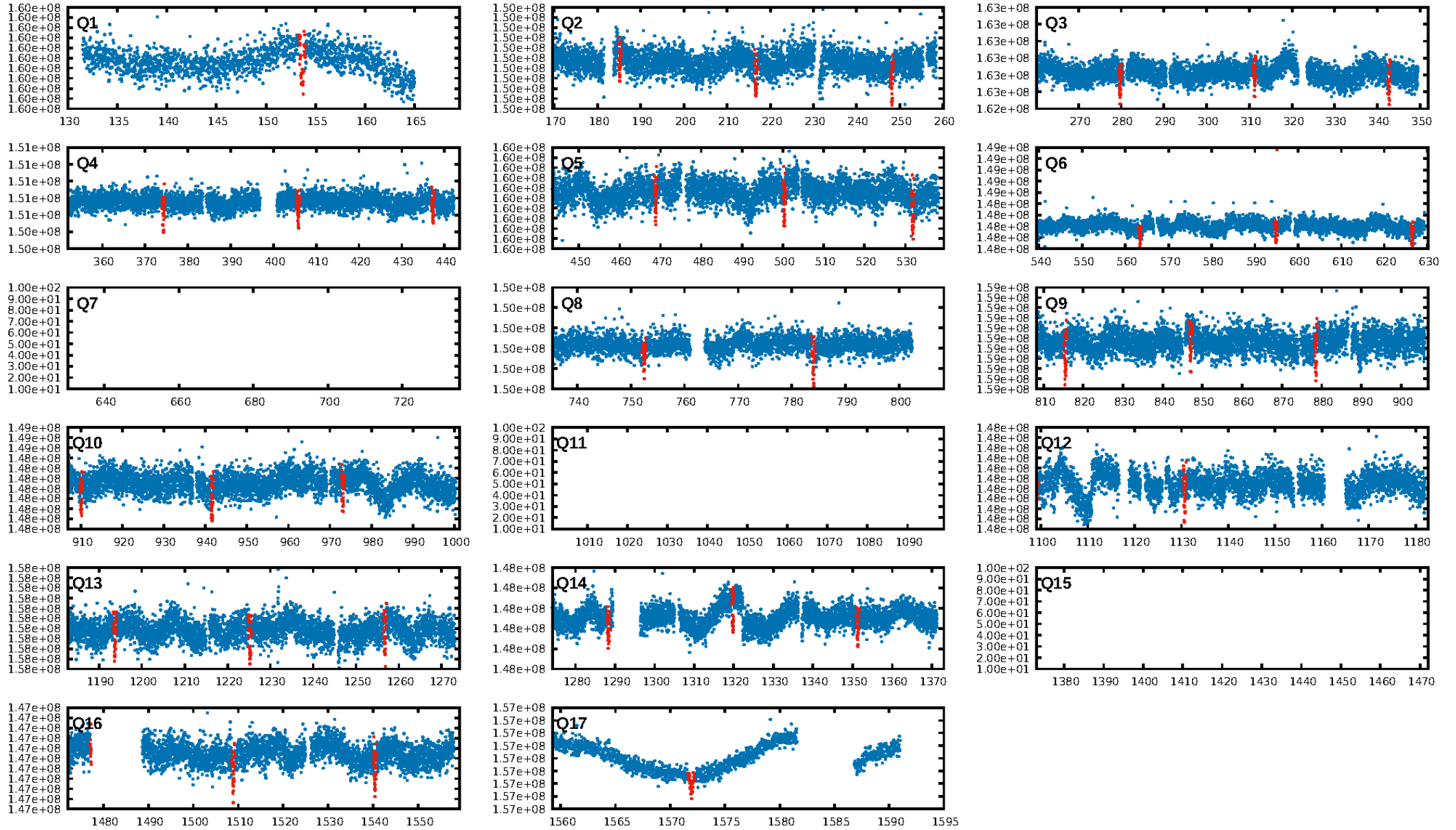
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [69.51σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 79.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [32/32]
GhostDiagnostic-chr: 7.485
Centroid-sig: 3.0%
Centroid-so: 0.604 arcsec [2.31σ]
OotOffset-rm: 0.604 arcsec [2.15σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-rm: 0.500 arcsec [1.62σ]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 0.93 [13/14]

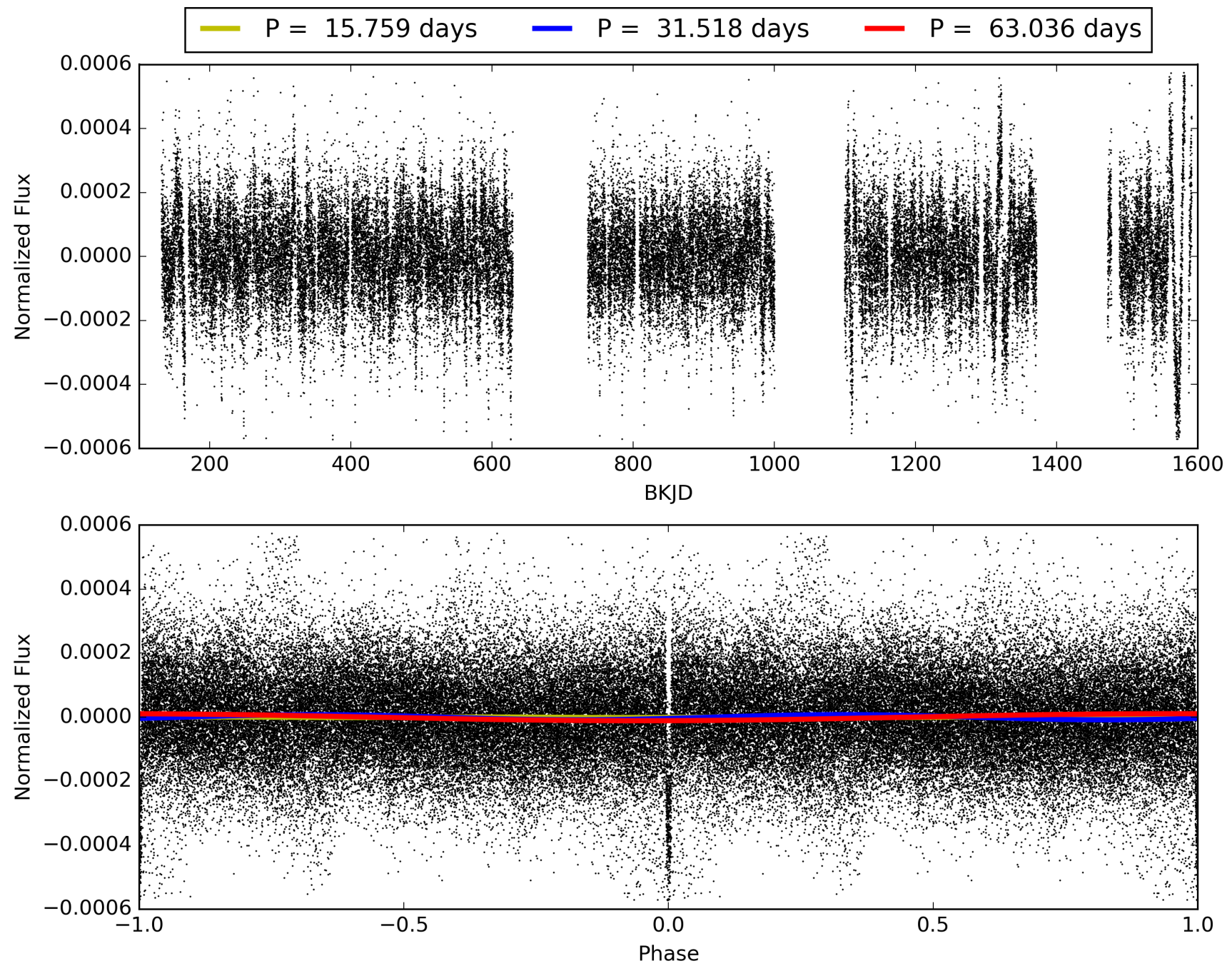
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:41:52 Z

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

TCE 010933561-01, PDC Light Curves

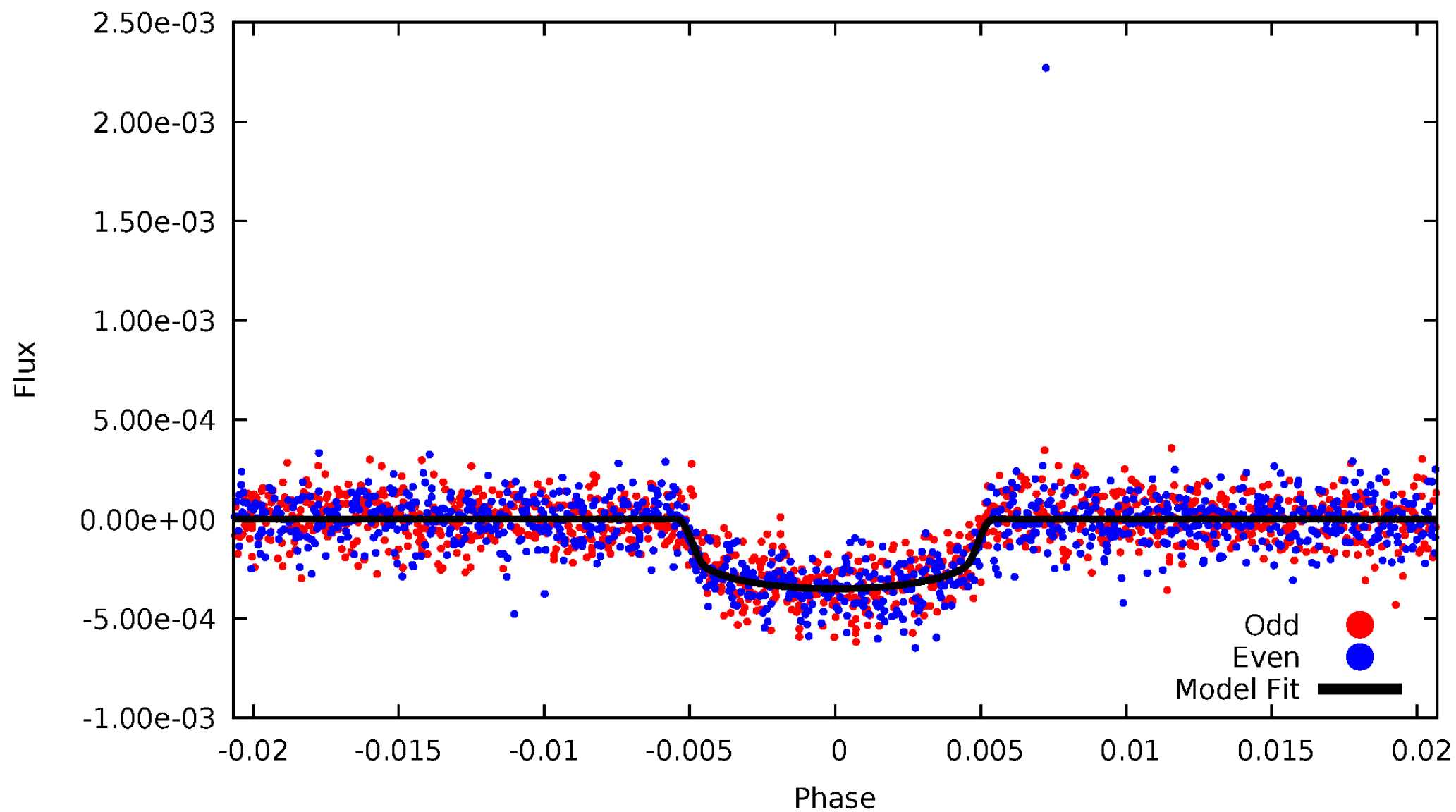


TCE 010933561-01



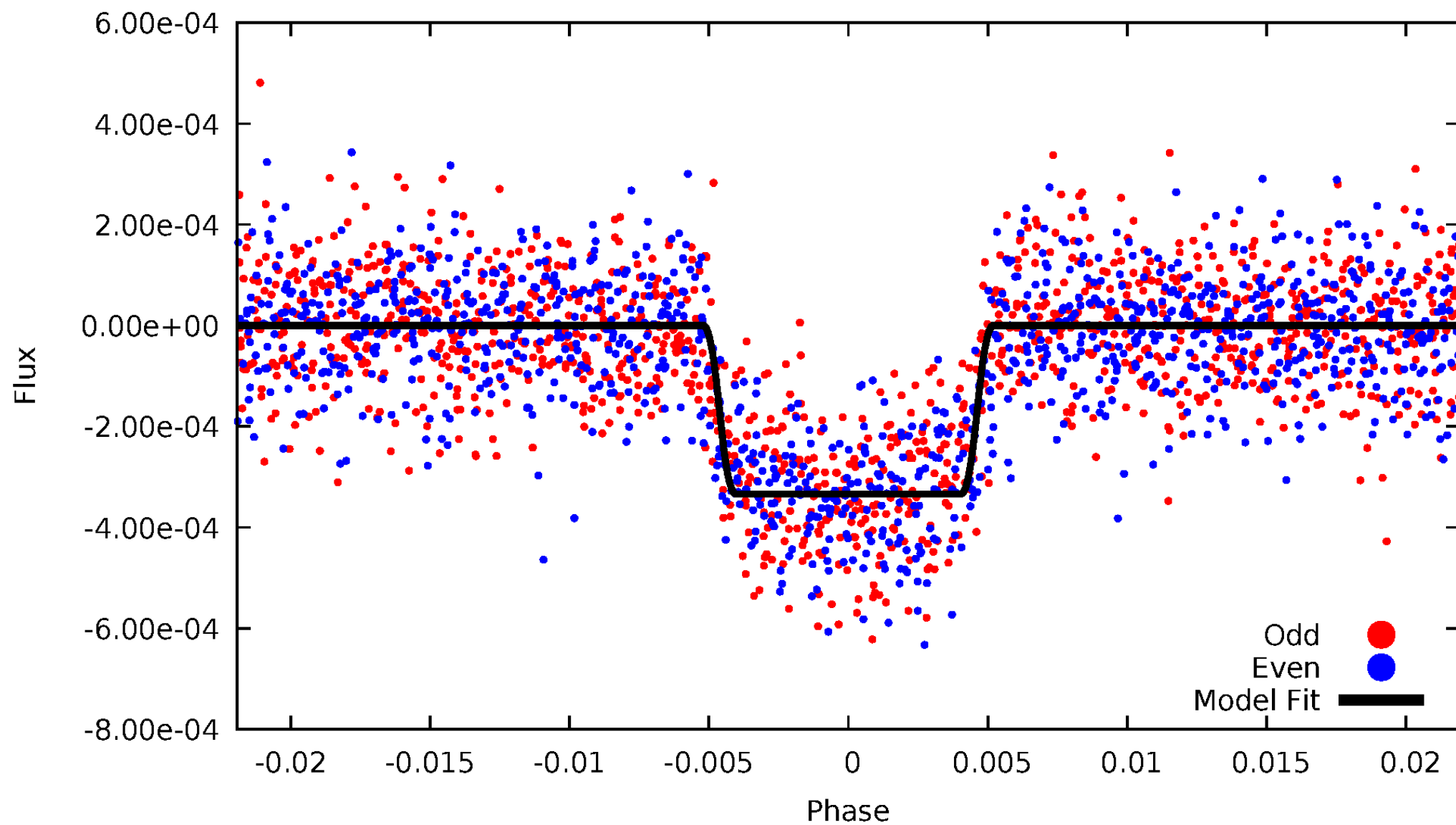
DV Odd/Even

TCE 010933561-01



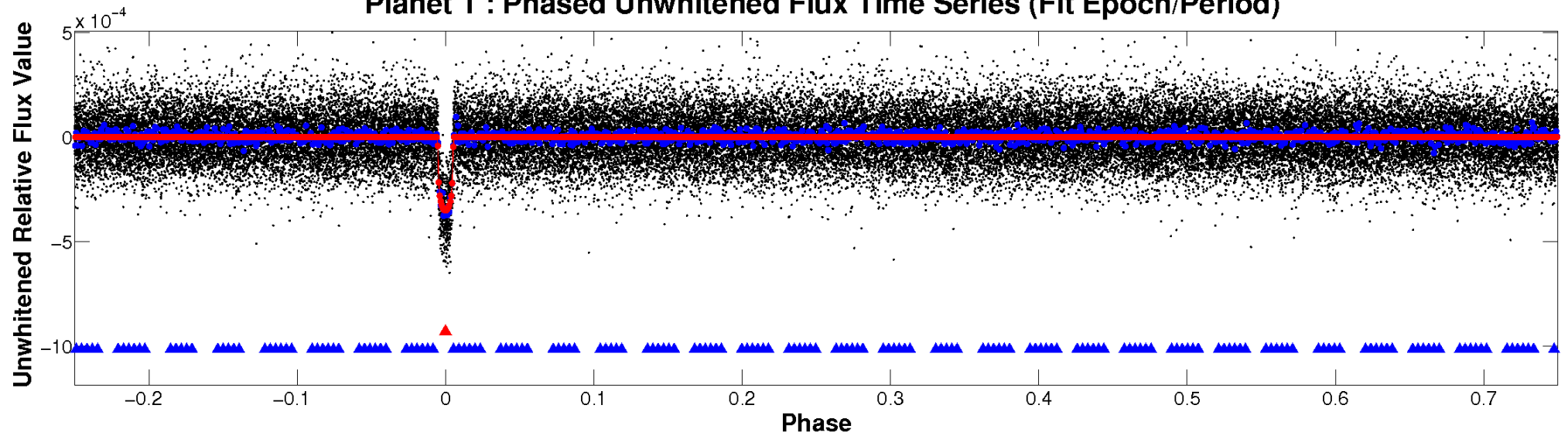
ALT Odd/Even

TCE 010933561-01

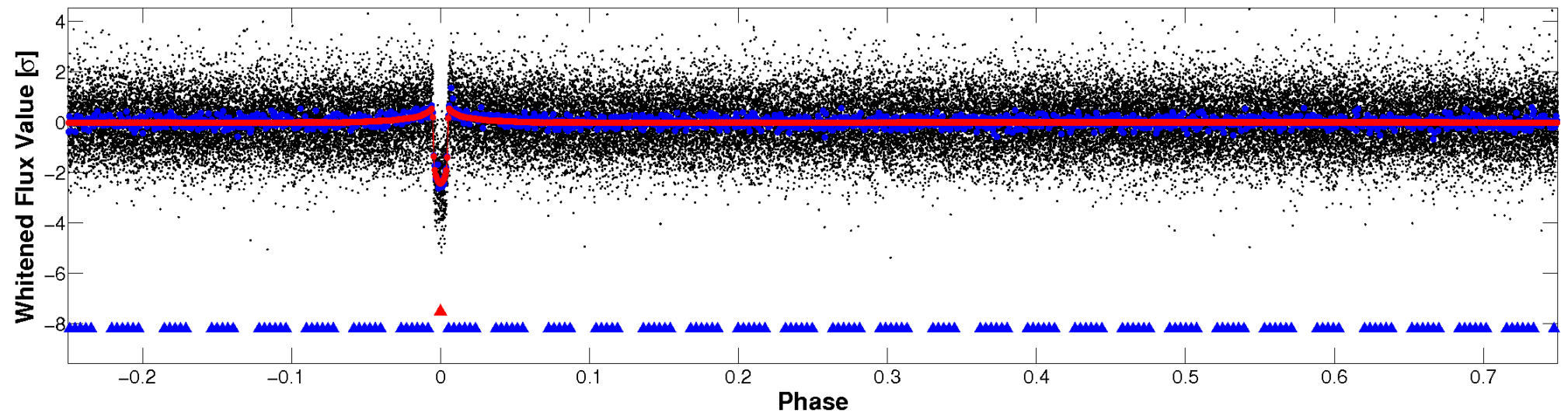


Non-Whitened Vs. Whitened Light Curve

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

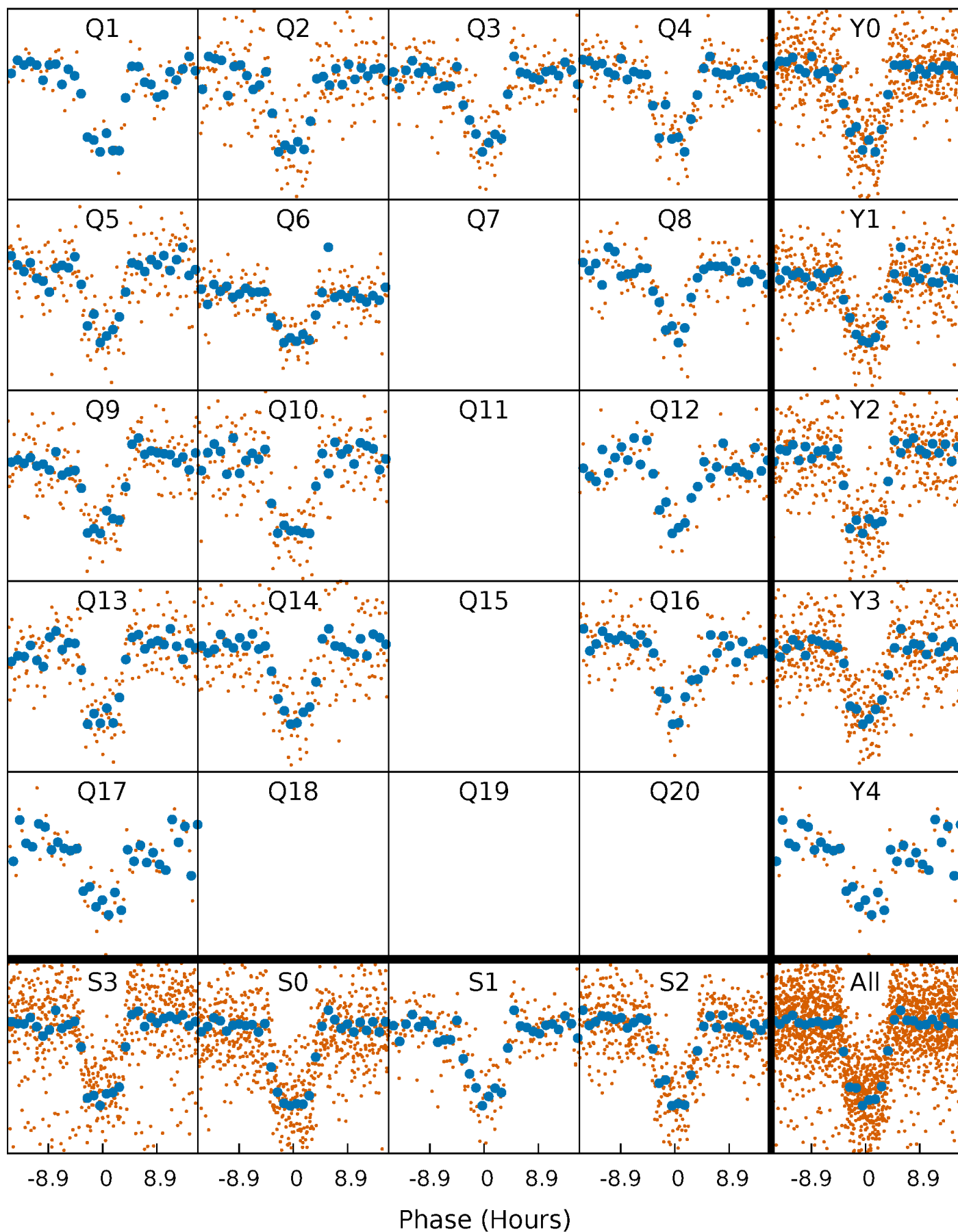


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



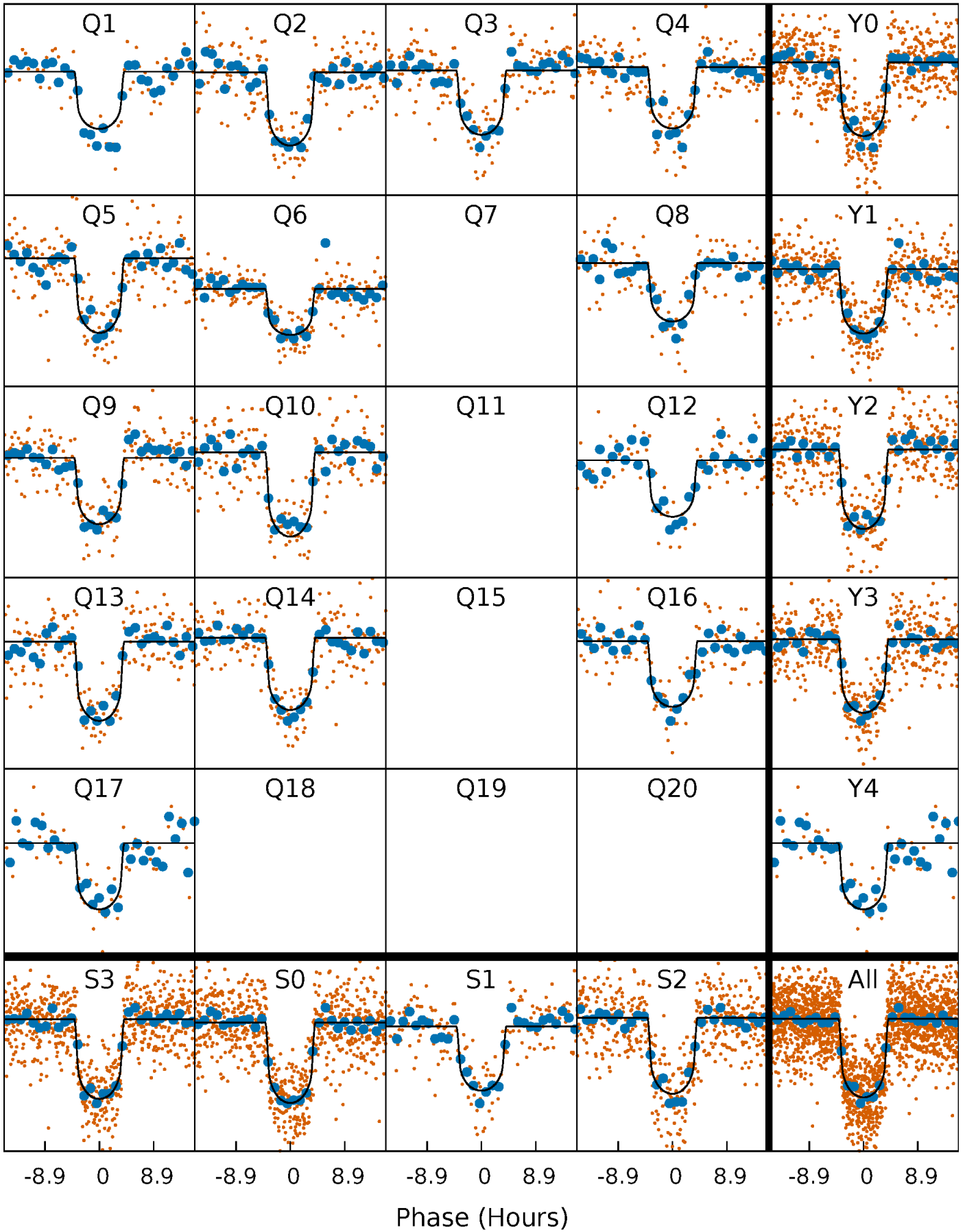
PDC Quarter-Phased Transit Curves

TCE 010933561-01 P= 31.517764 Days $T_0=153.634584$ (BKJD)



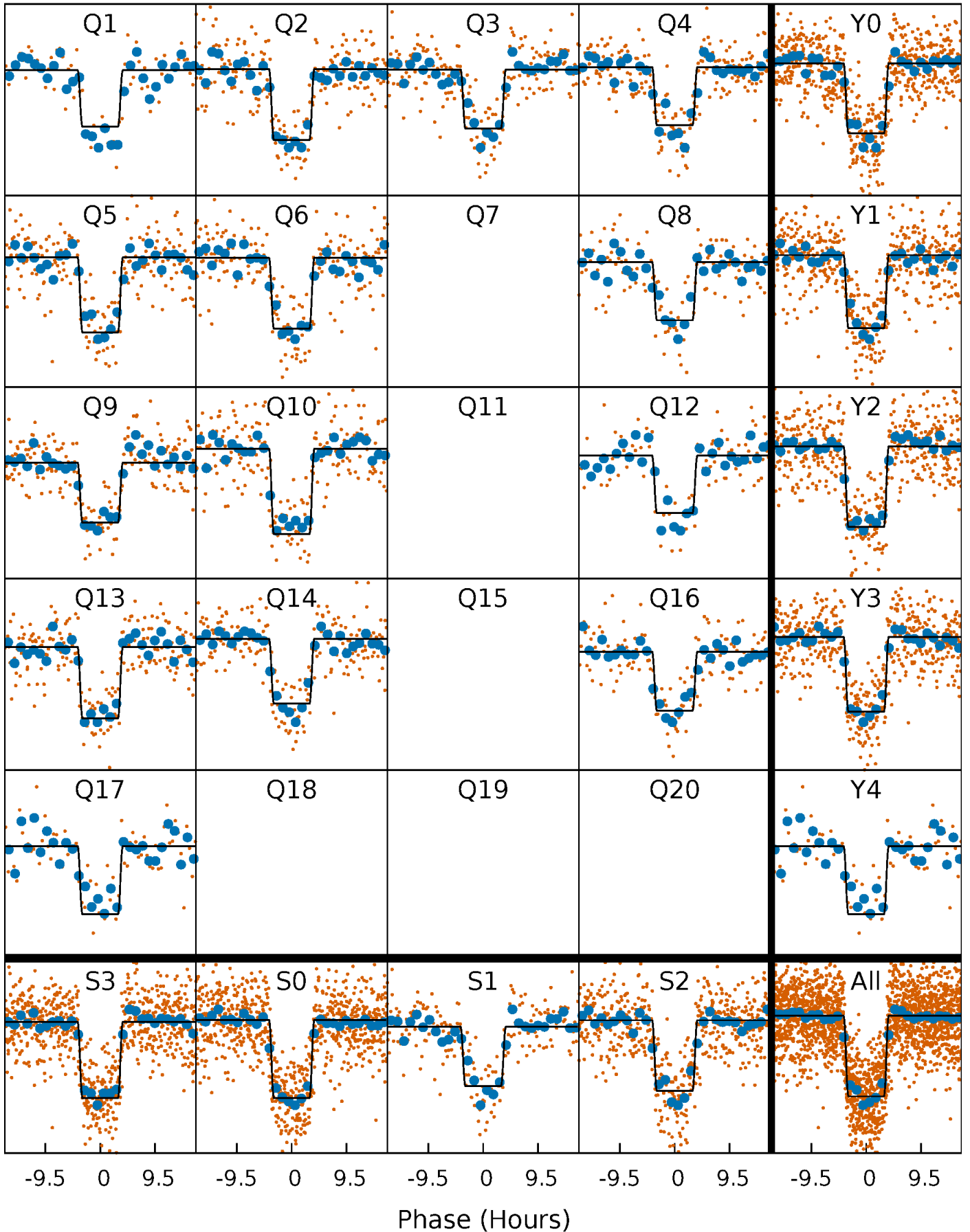
DV Quarter-Phased Transit Curves

TCE 010933561-01 P= 31.517764 Days $T_0=153.634584$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

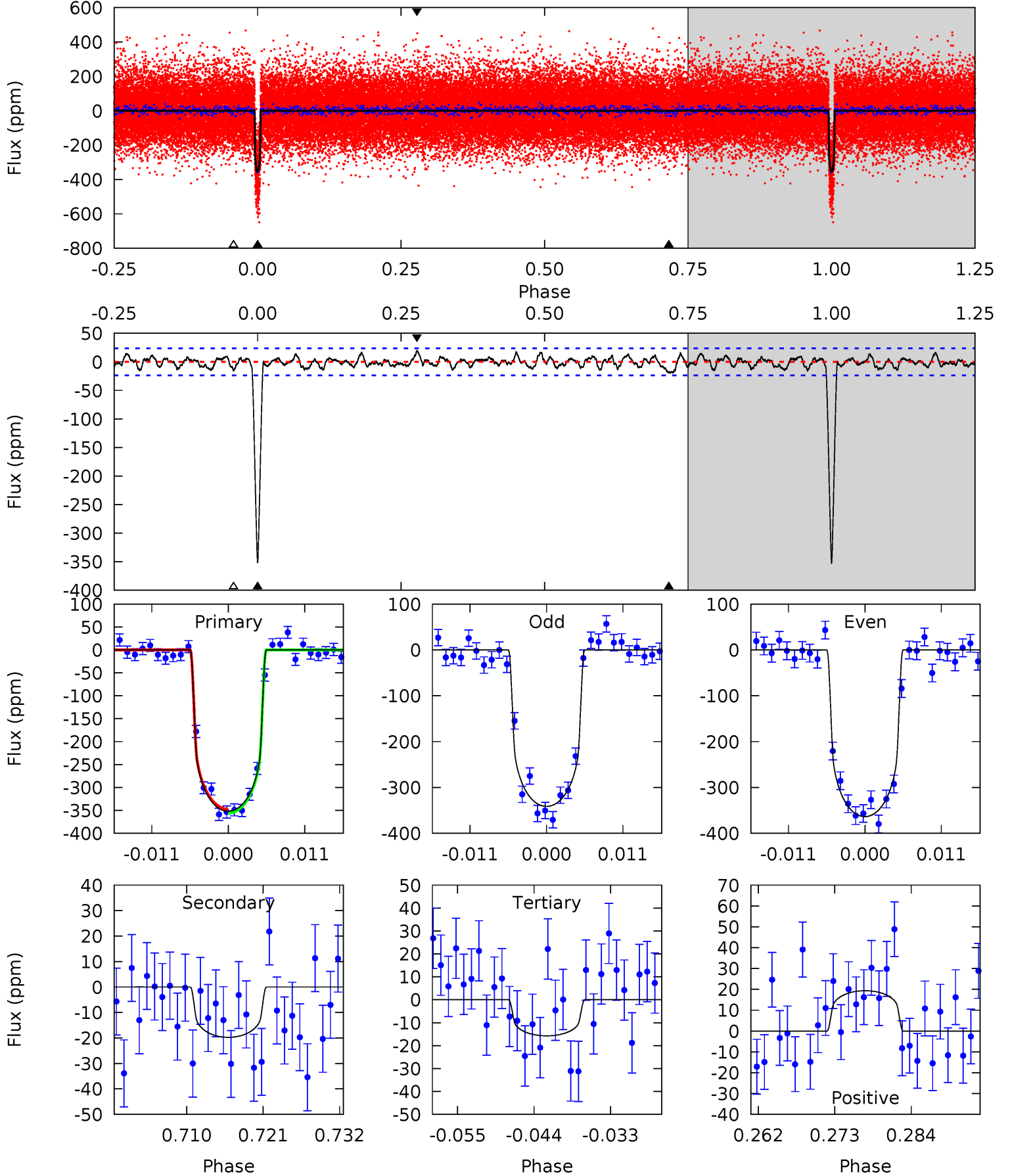
TCE 010933561-01 P= 31.518173 Days $T_0=153.627160$ (BKJD)



DV Model-Shift Uniqueness Test

010933561-01, $P = 31.517764$ Days, $E = 122.116820$ Days

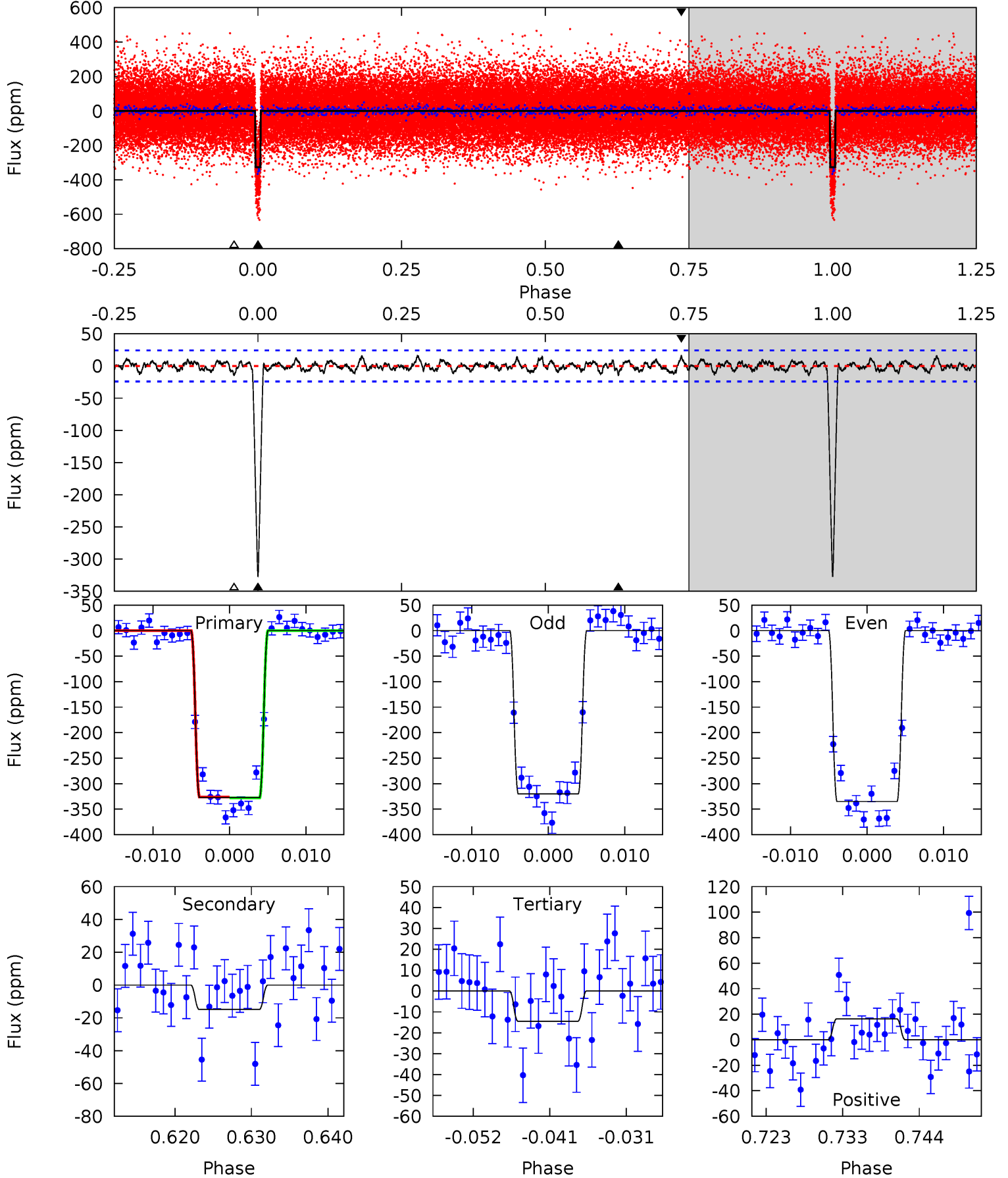
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
74.3	4.17	3.33	4.09	5.01	2.54	1.39	71.0	70.2	0.85	0.09	2.35	1.01	0.05	0.91



Alt Model-Shift Uniqueness Test

010933561-01, $P = 31.518173$ Days, $E = 122.108987$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
67.9	3.10	3.01	3.41	5.02	2.56	1.12	64.9	64.5	0.09	-0.31	1.56	1.02	0.05	0.22



Stellar Parameters For KIC 010933561

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5611^{+114}_{-91}	$4.144^{+0.195}_{-0.105}$	$0.160^{+0.150}_{-0.150}$	$1.400^{+0.211}_{-0.316}$	$0.995^{+0.087}_{-0.072}$	$0.511^{+0.520}_{-0.161}$
	+2%/-2%	+5%/-3%	+94%/-94%	+15%/-23%	+9%/-7%	+102%/-31%
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 010933561-01 / KOI 0291.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-20 ± 5	$2.83^{+0.44}_{-0.47}$	926^{+46}_{-61}	3284^{+167}_{-172}	52^{+25}_{-18}
Alt.	-15 ± 5	$2.77^{+0.44}_{-0.49}$	924^{+43}_{-55}	3166^{+196}_{-197}	41^{+21}_{-16}

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

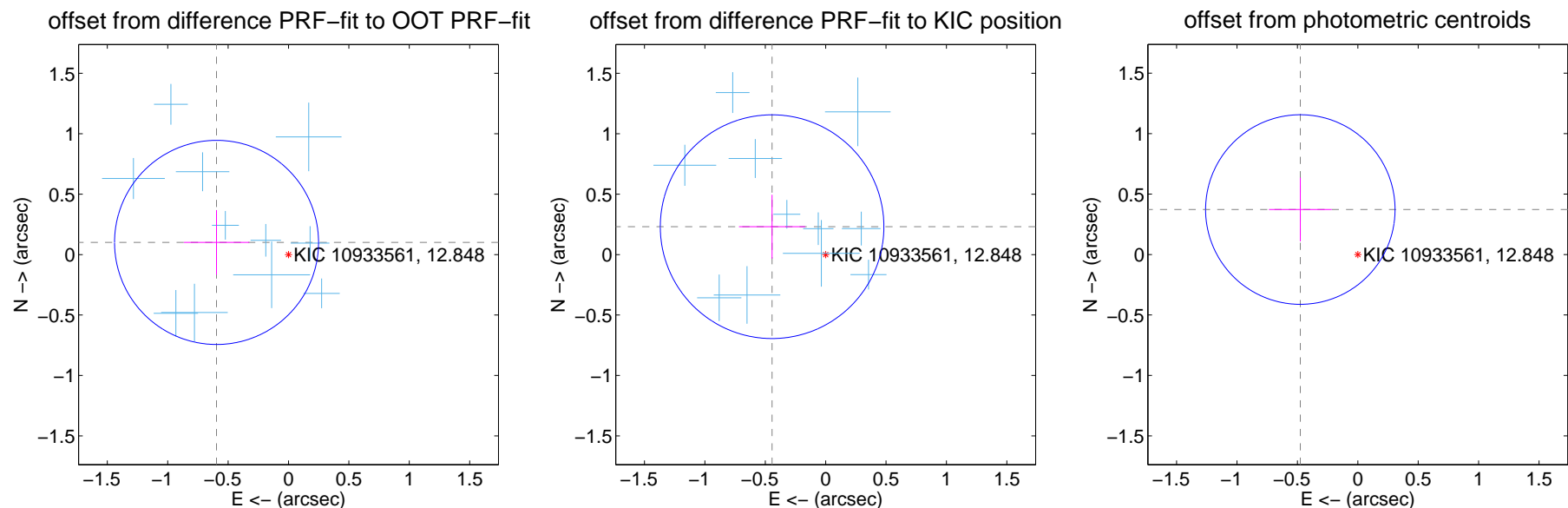
DV Centroid Data

Supplemental centroid analysis for 010933561-01. Kepler magnitude: 12.85. Transit SNR 47.75

There are 14 quarters with good PRF difference image offsets

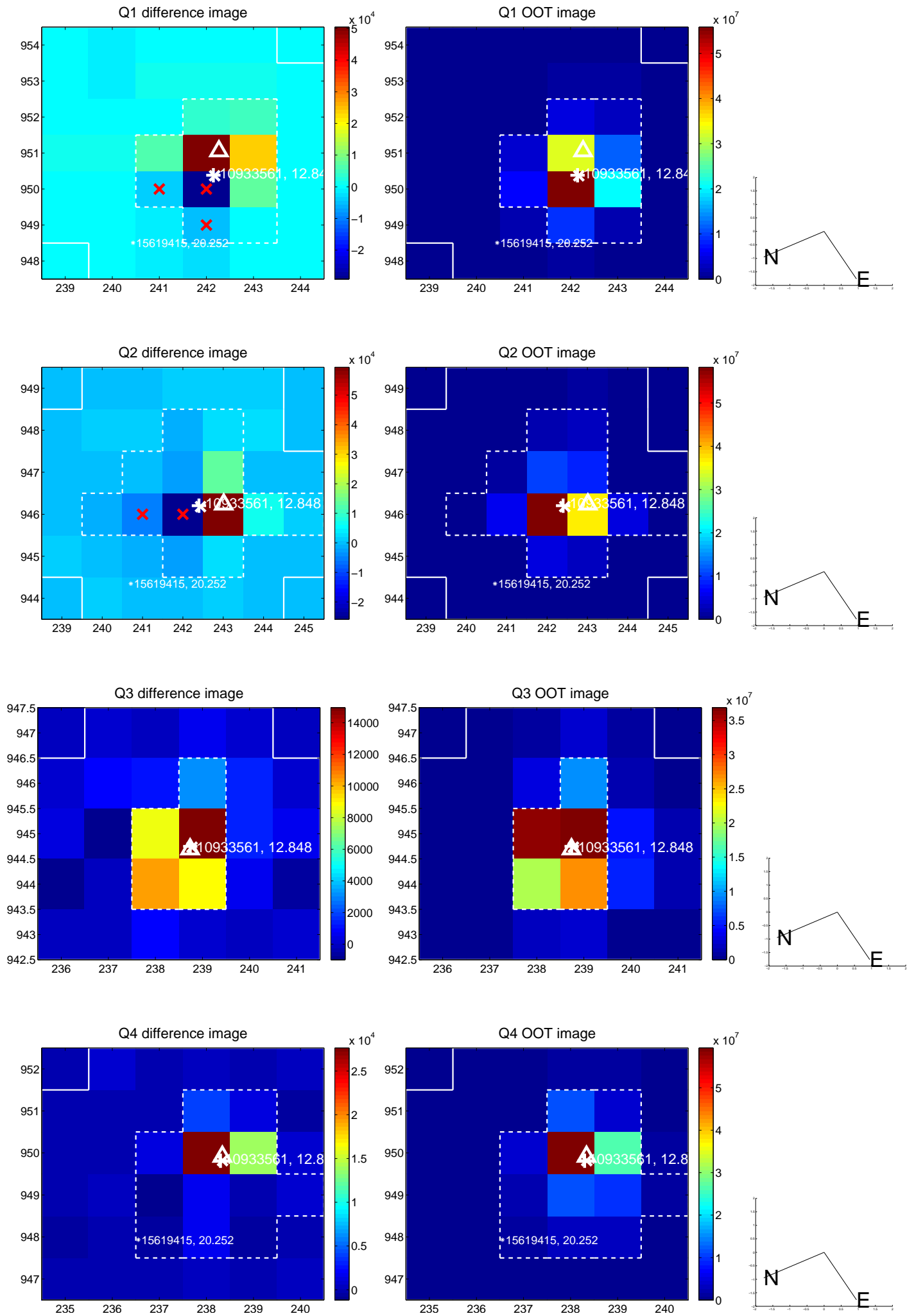
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.604 ± 0.281	2.15	0.596 ± 0.271	0.101 ± 0.268
PRF-fit source offset from KIC position	0.500 ± 0.308	1.62	0.443 ± 0.274	0.231 ± 0.264
photometric centroid source offset	0.60 ± 0.26	2.31	0.48 ± 0.26	0.37 ± 0.26

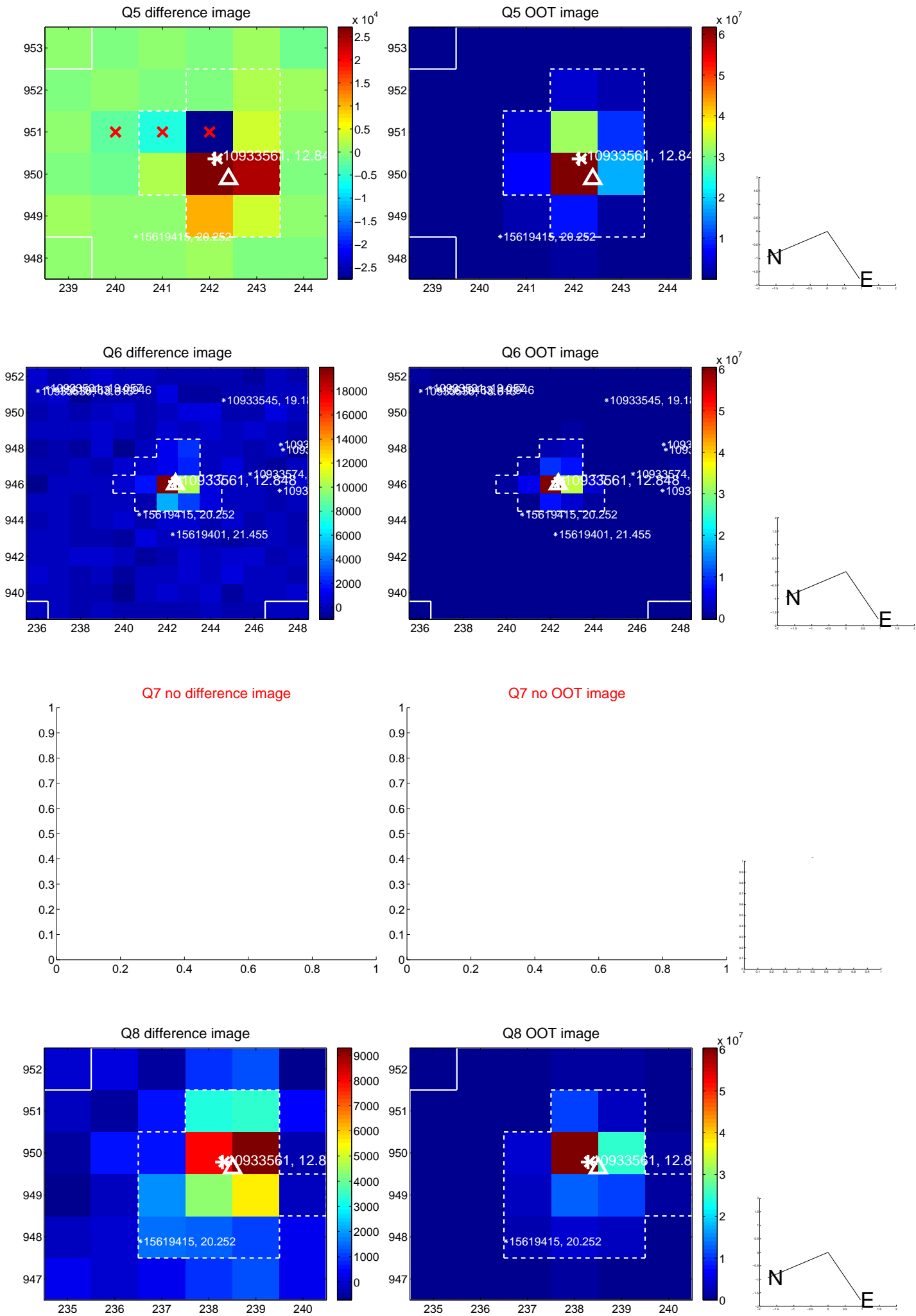


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

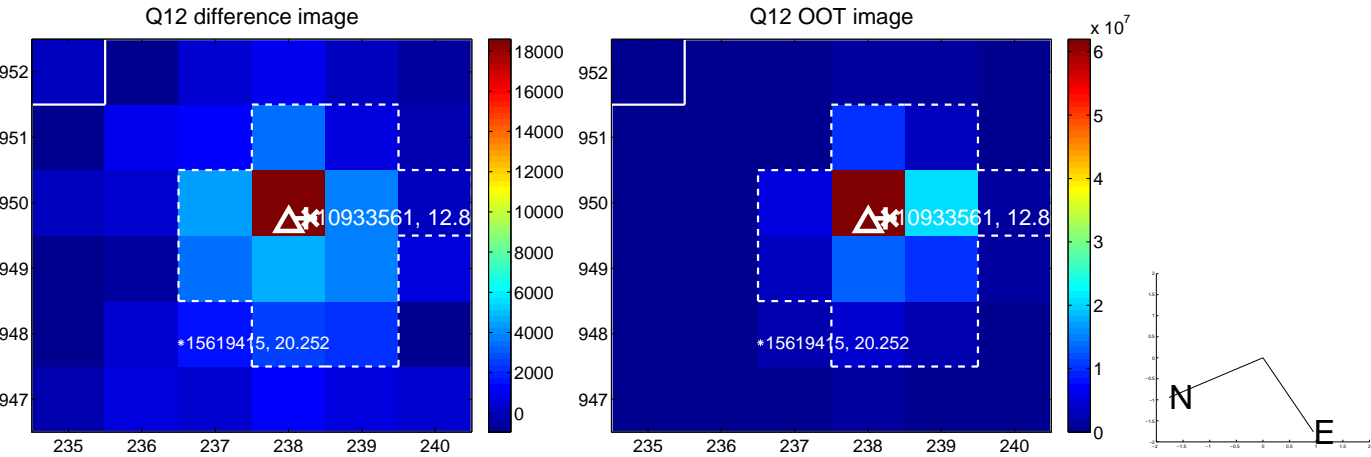
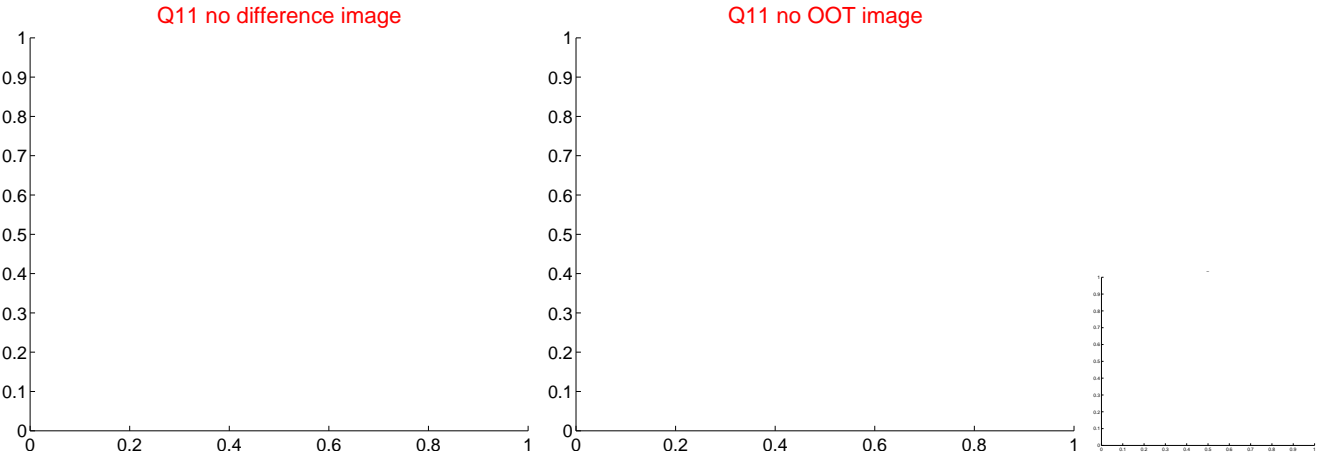
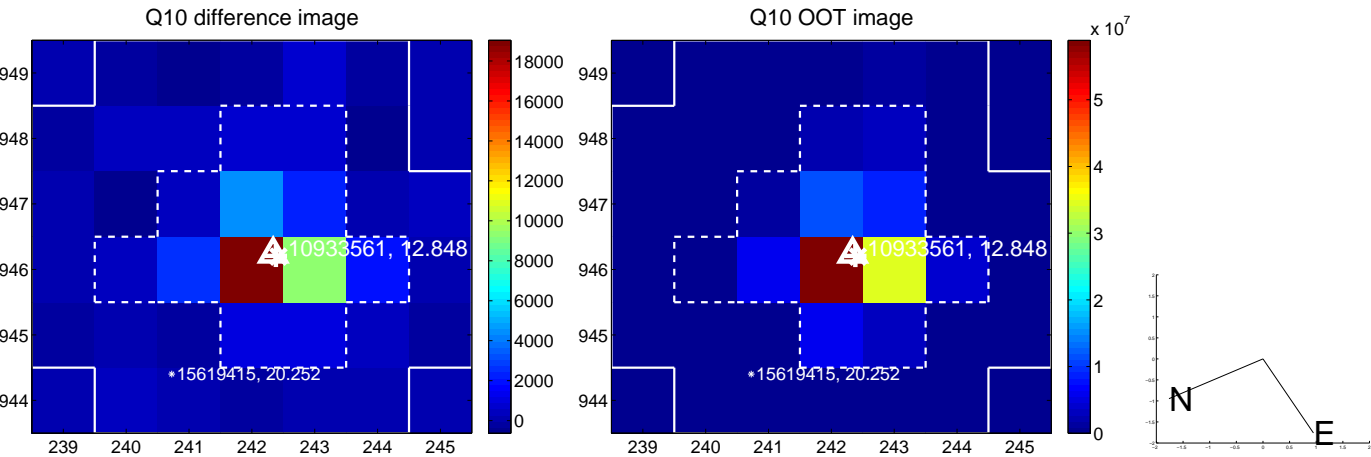
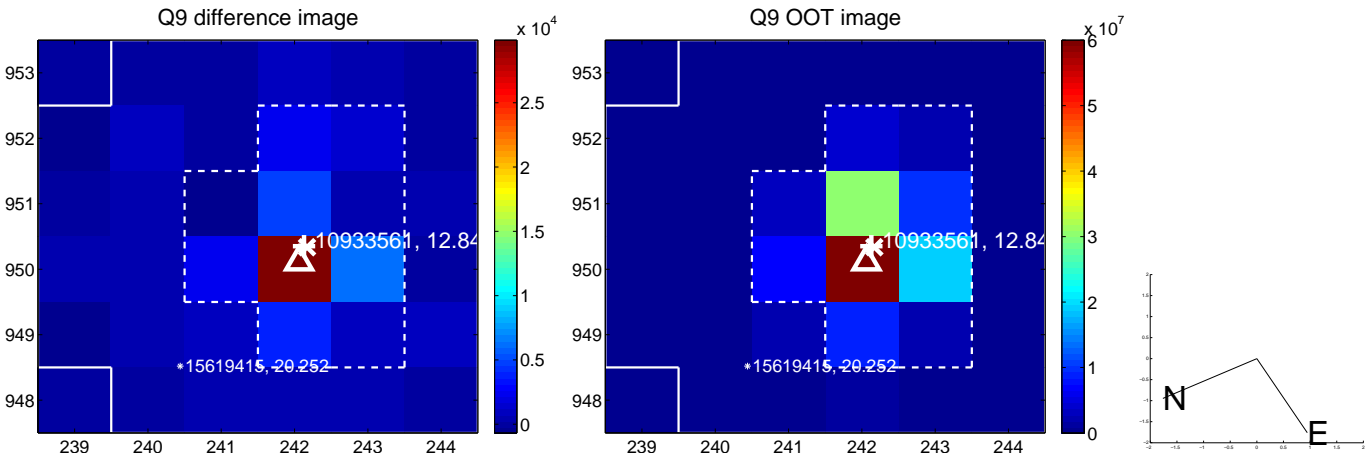
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



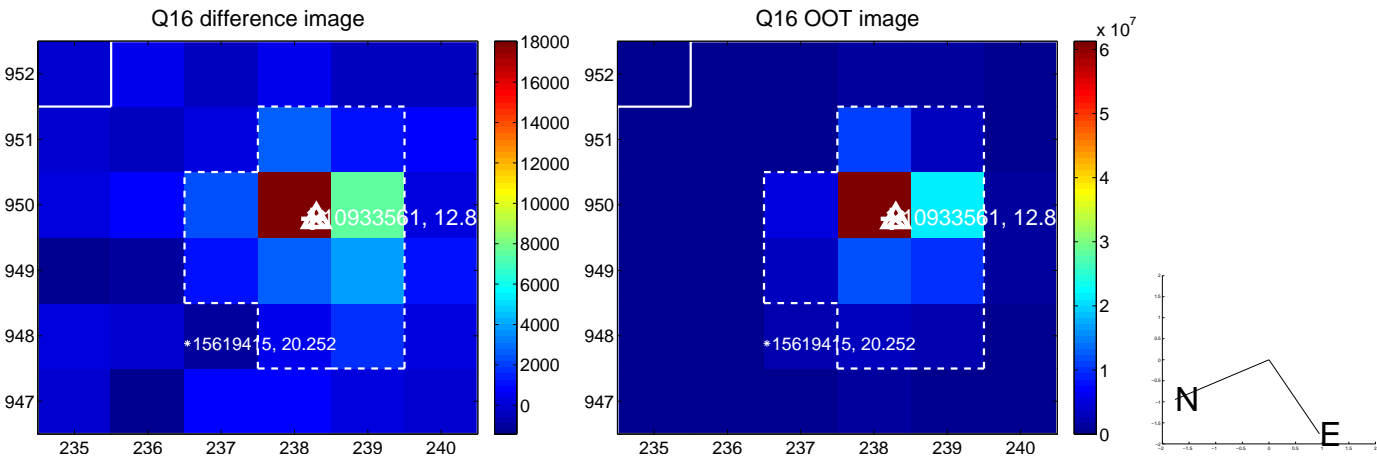
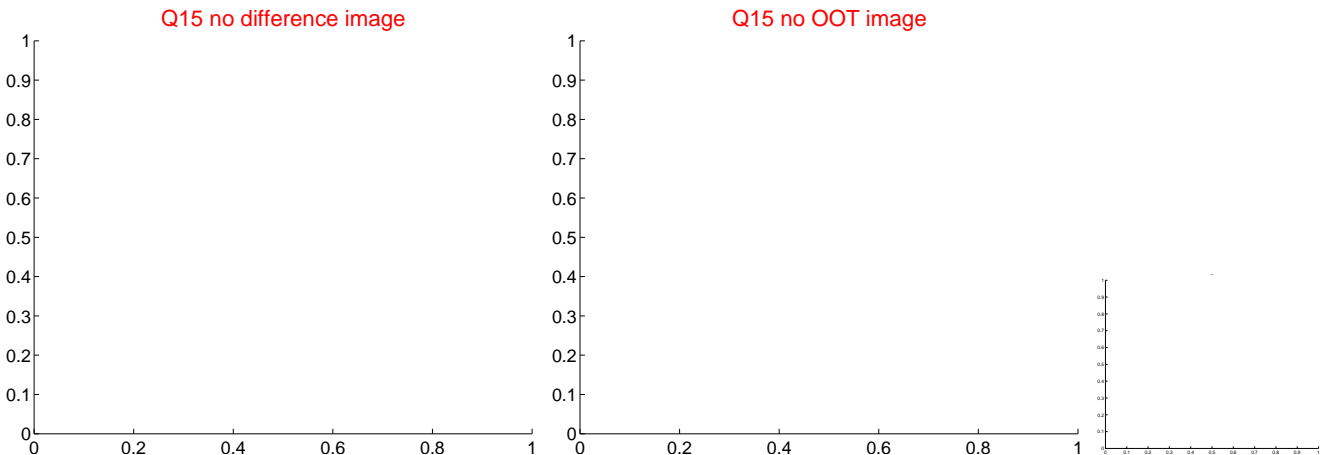
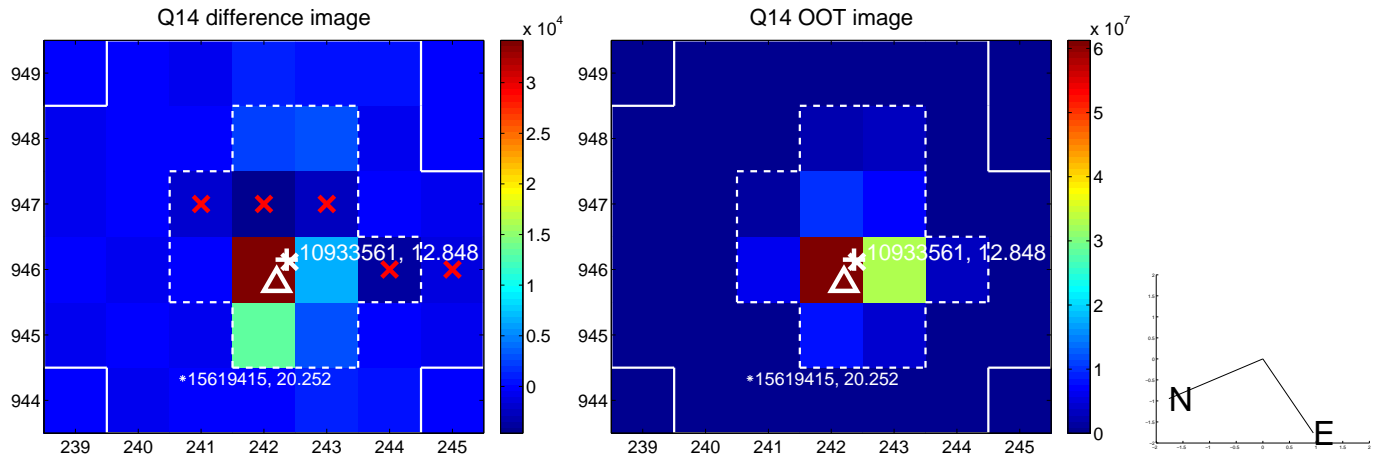
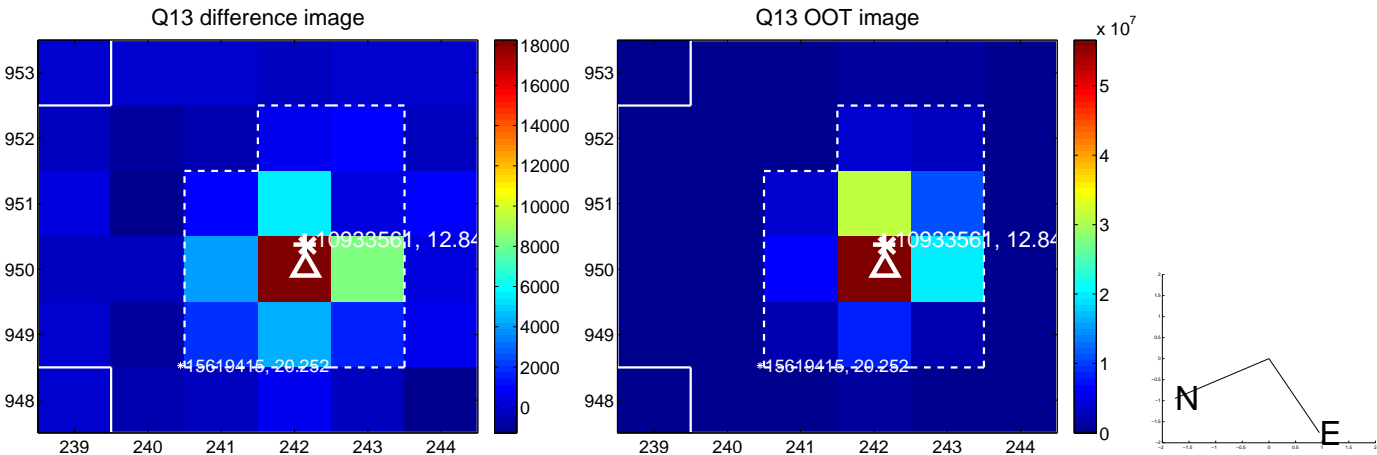
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



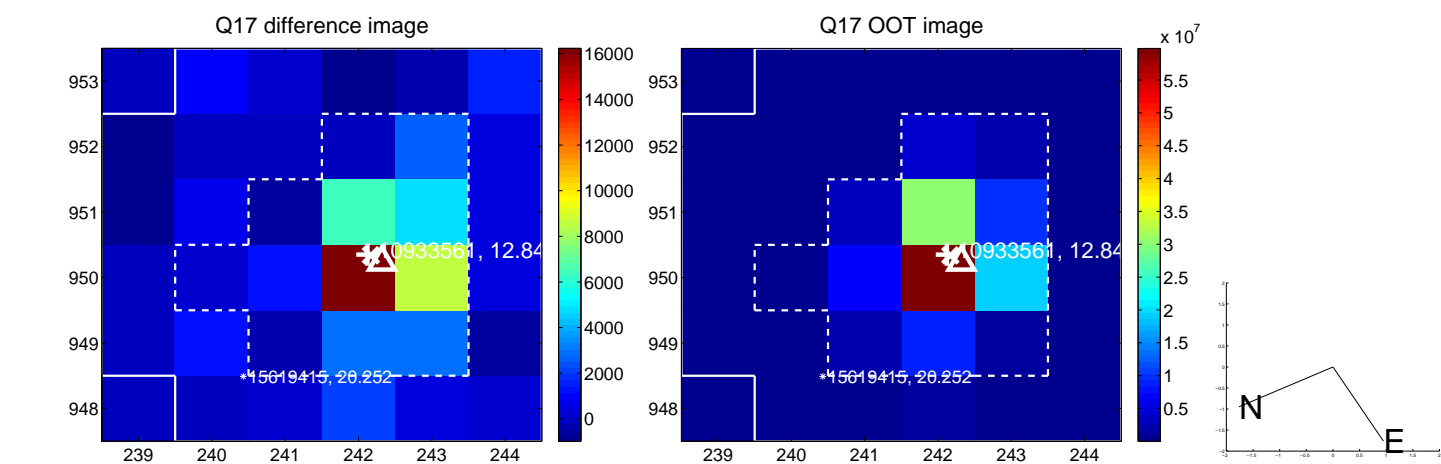
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



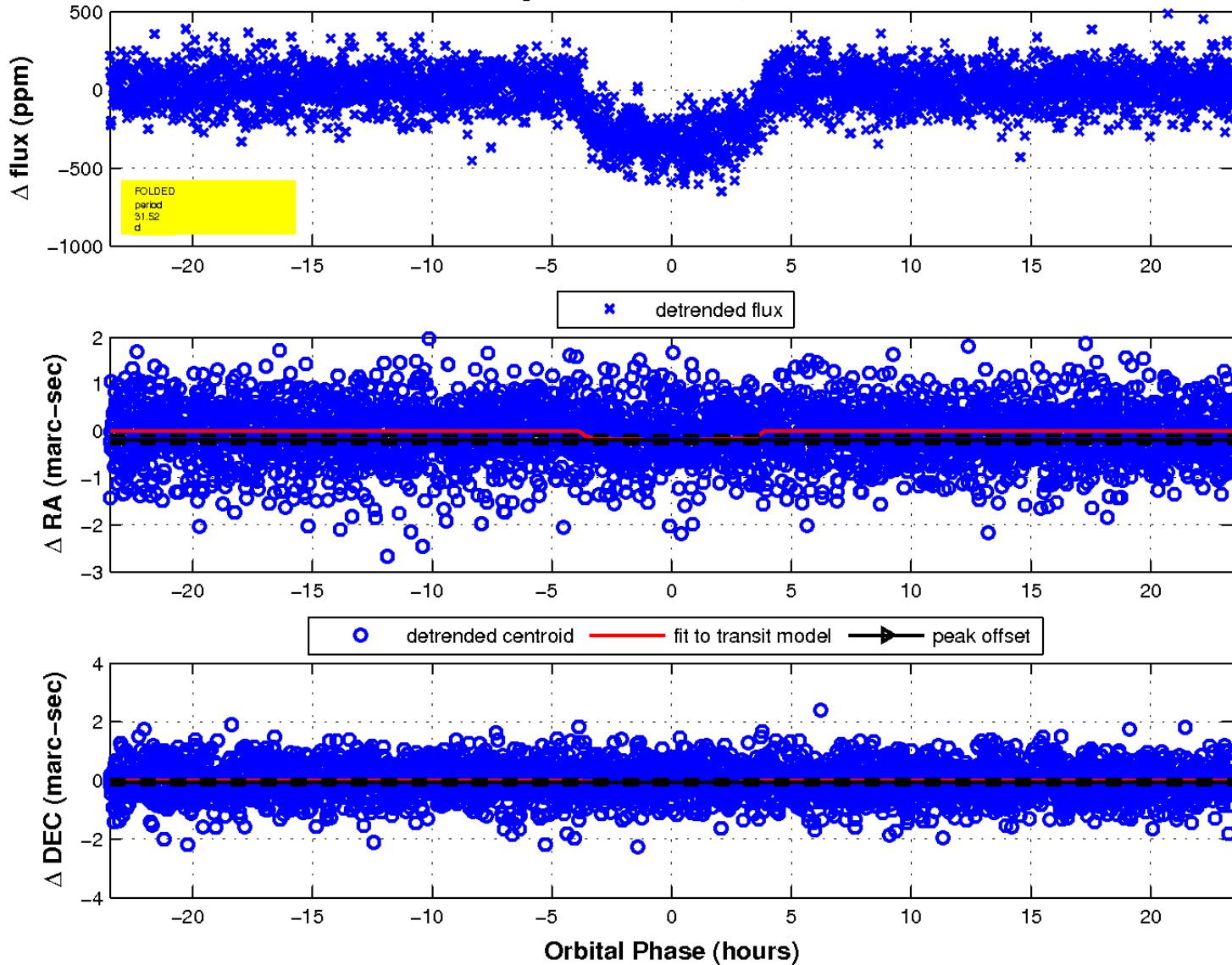
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

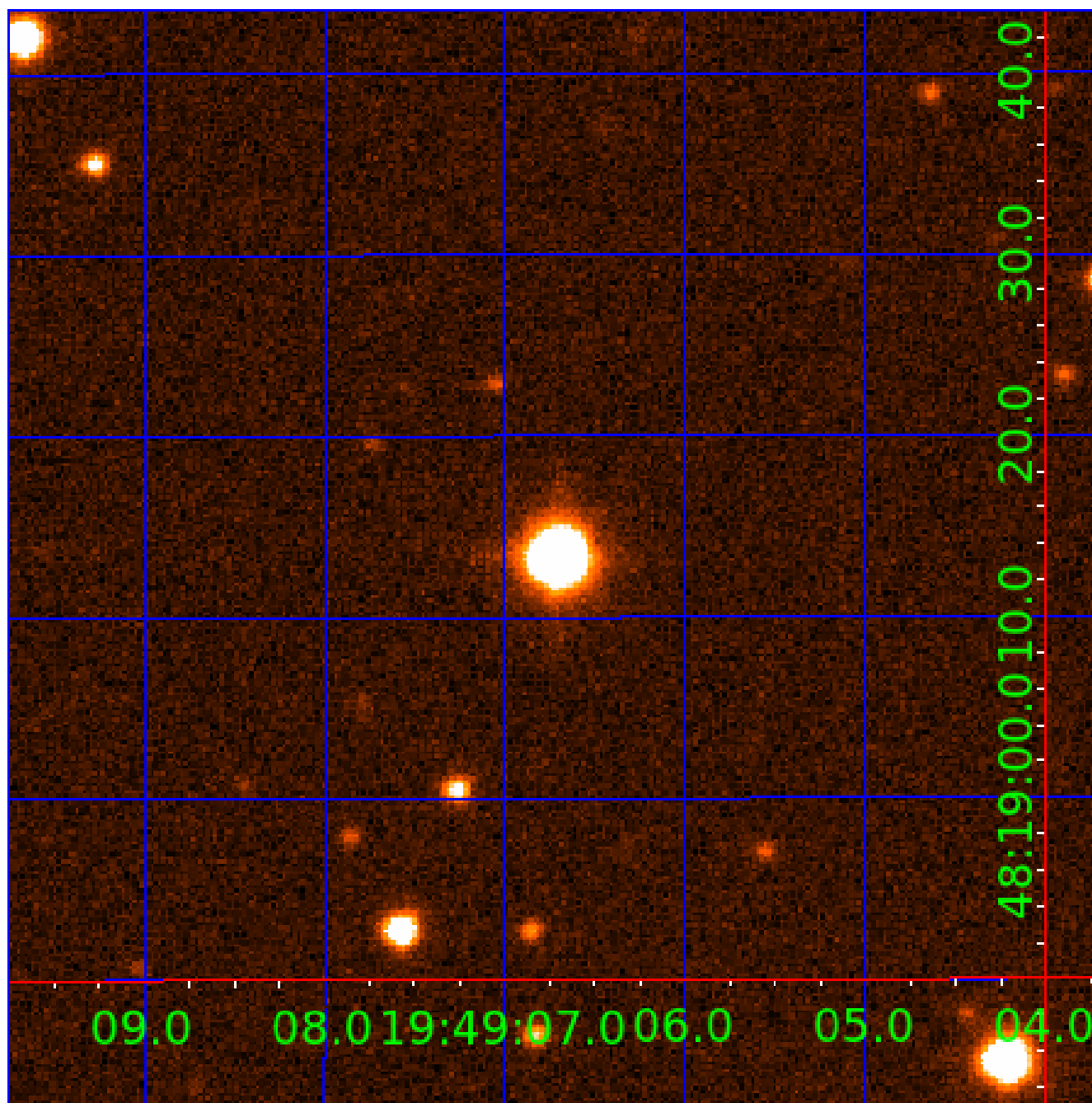


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010933561

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})
010933561-01	OBS	0291.01	31.517764	153.634584	350.7	7.819	46.4	47.8	1.40	5611	2.85	45.75
010933561-02	OBS	0291.02	8.129959	134.104963	143.2	2.020	20.0	22.9	1.40	5611	1.99	278.63

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010933561-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
010933561-02	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.

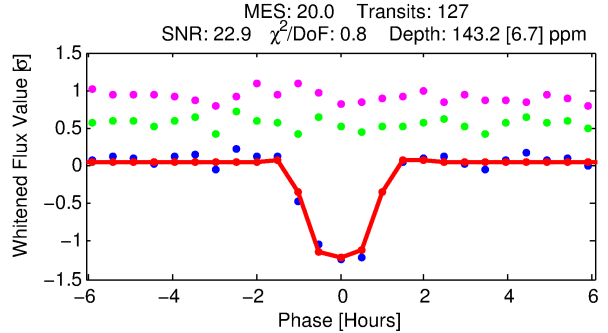
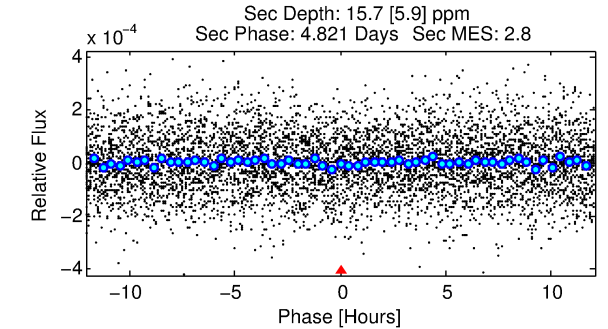
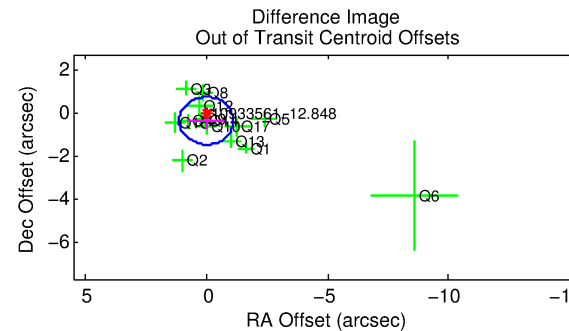
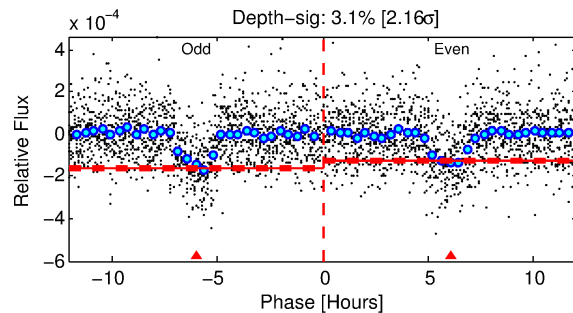
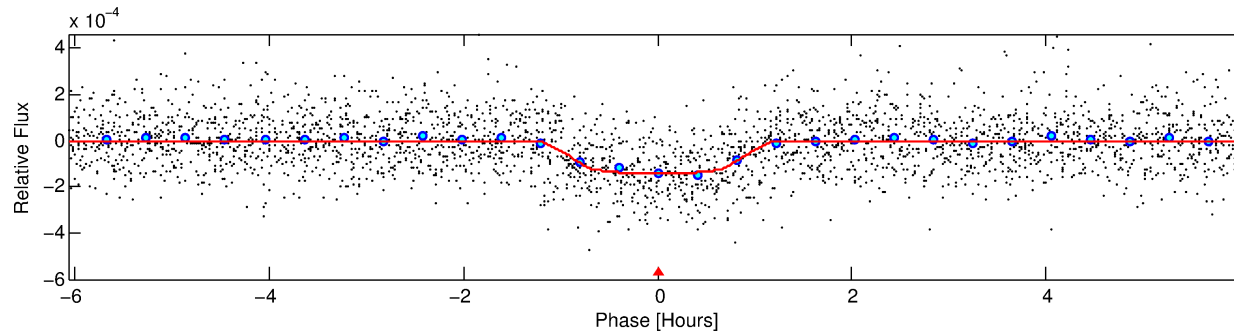
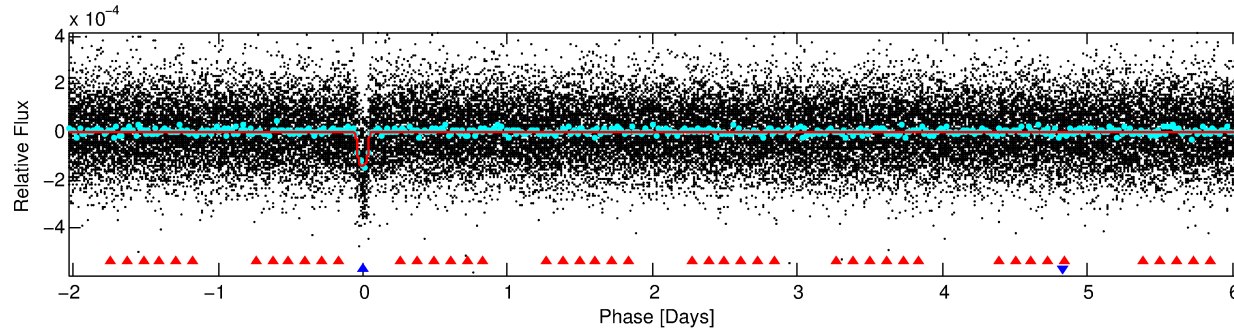
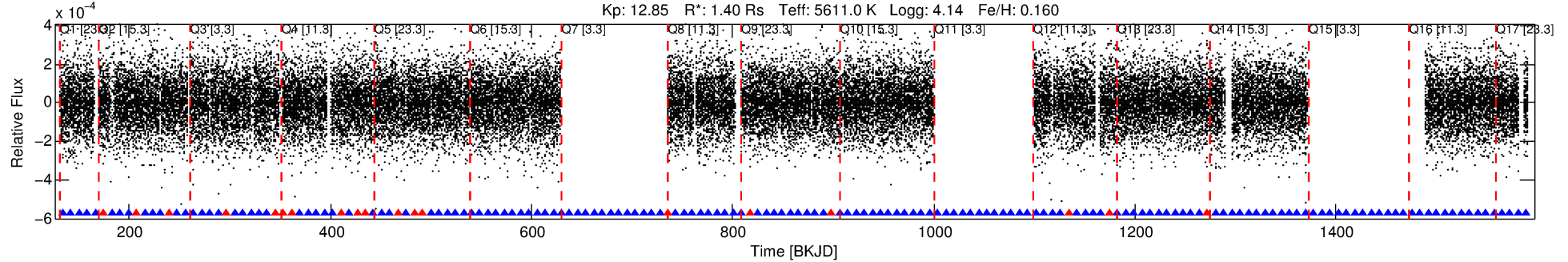
Ephemeris Match Information For 010933561-02

No Significant Match Found

DV One-Page Summary

KIC: 10933561 Candidate: 2 of 2 Period: 8.130 d
KOI: K00291.02 Name: Kepler-133b Corr: 0.971

Kp: 12.85 R*: 1.40 Rs Teff: 5611.0 K Logg: 4.14 Fe/H: 0.160



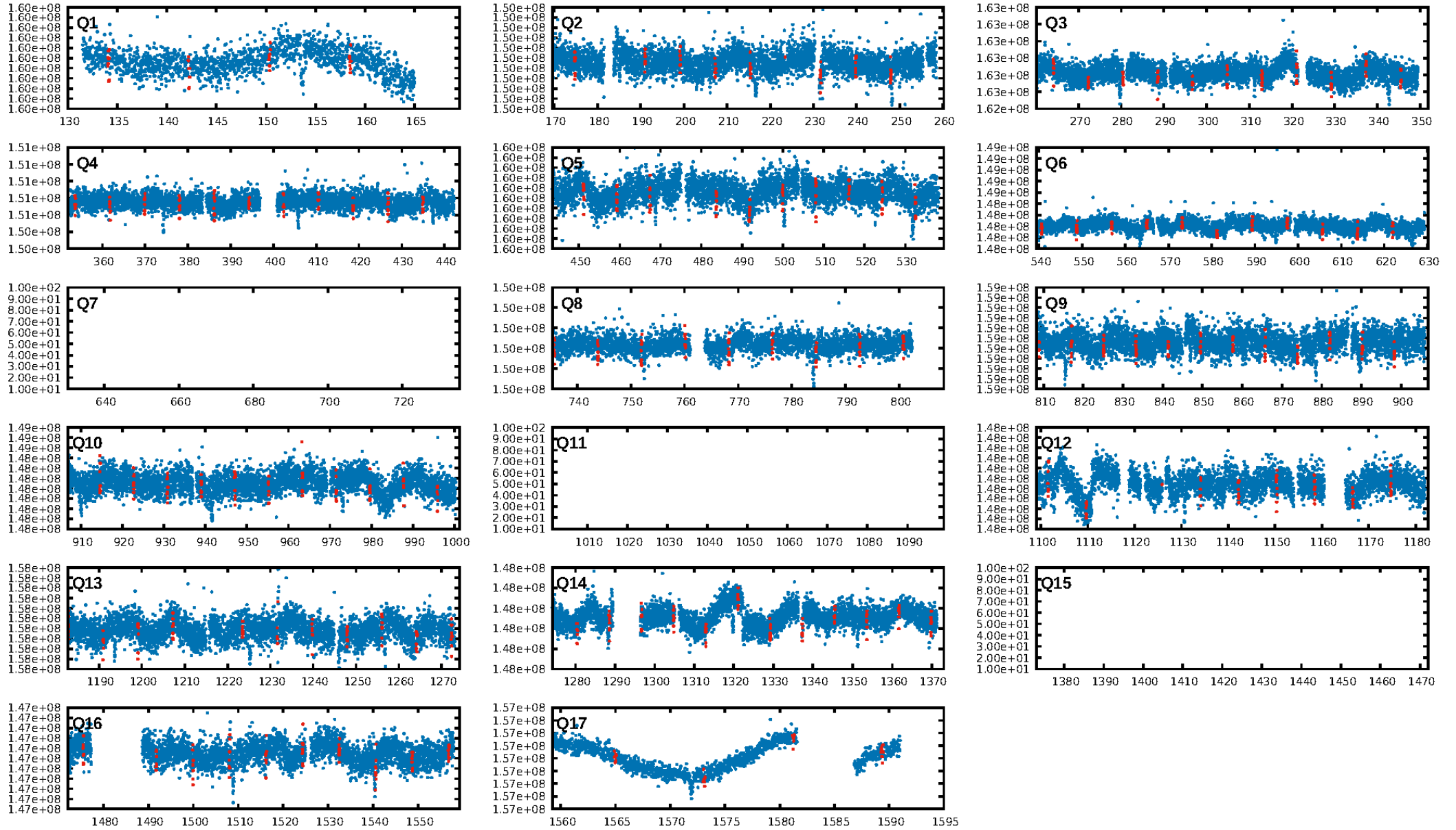
DV Fit Results:

Period = 8.12996 [0.00002] d
Epoch = 134.1050 [0.0020] BKJD
Rp/R* = 0.0130 [0.0049]
a/R* = 15.00 [25.41]
b = 0.89 [0.41]
Seff = 278.63 [96.06]
Teq = 1042 [90] K
Rp = 1.99 [0.88] Re
a = 0.0790 [0.0168] AU
Ag = 13.65 [12.45] [1.02σ]
Teffp = 3096 [660] K [3.09σ]

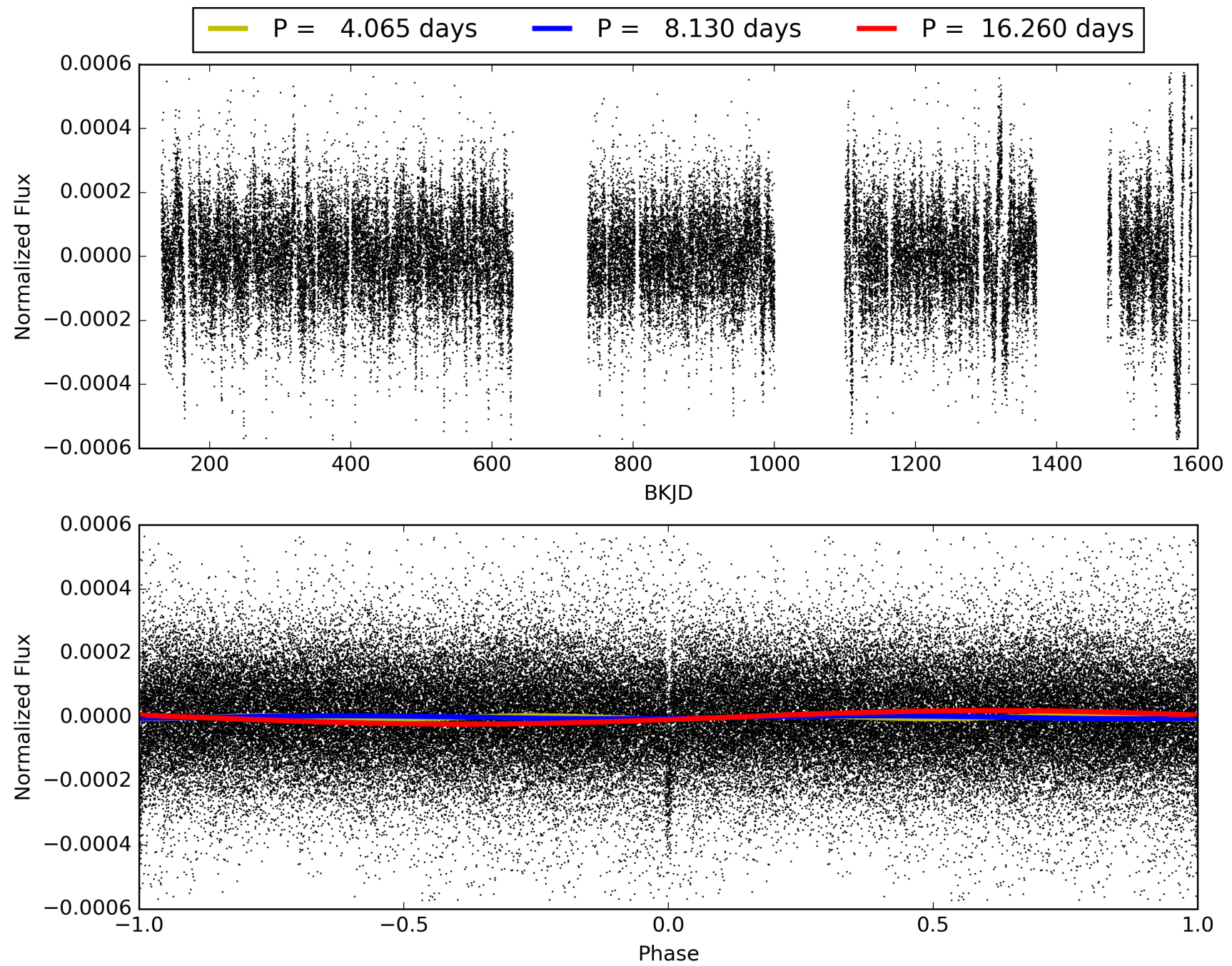
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [69.51σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.29e-87
RollingBand-fgt: 0.84 [100/119]
GhostDiagnostic-chr: 7.137
Centroid-sig: 48.7%
Centroid-so: 0.349 arcsec [0.62σ]
OotOffset-rm: 0.353 arcsec [0.95σ]
KicOffset-rm: 0.233 arcsec [0.40σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.93 [13/14]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 010933561-02, PDC Light Curves

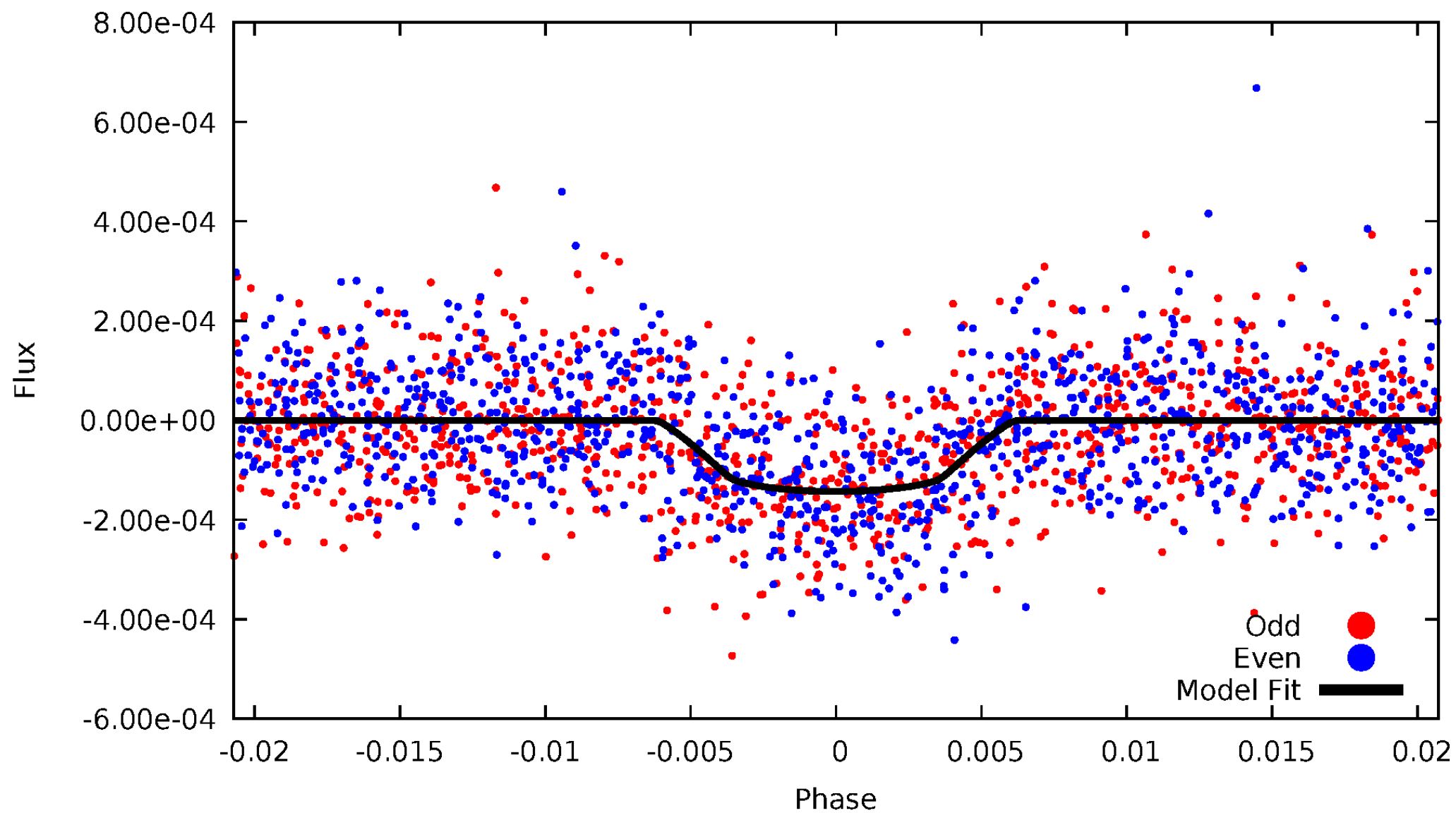


TCE 010933561-02



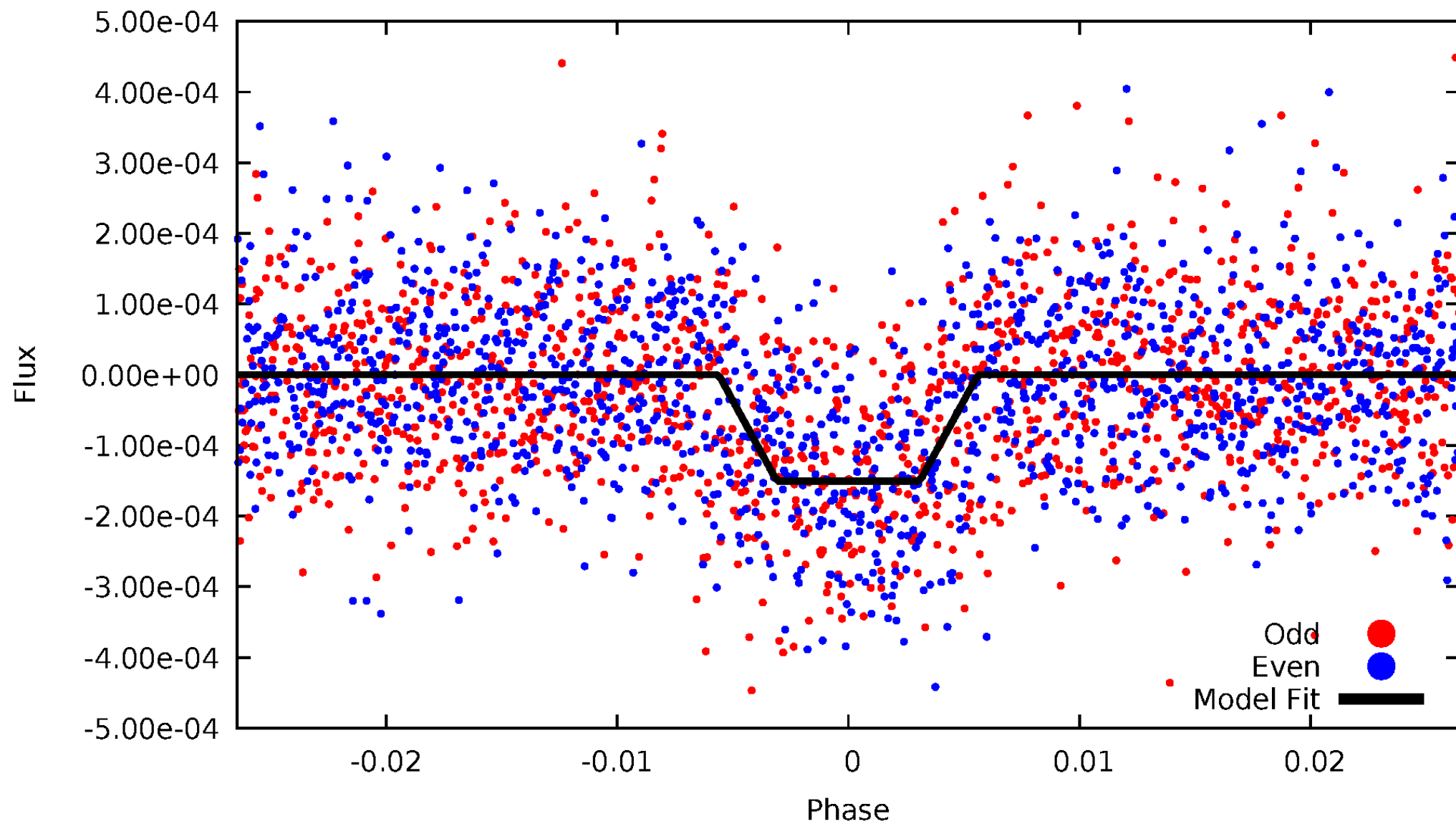
DV Odd/Even

TCE 010933561-02



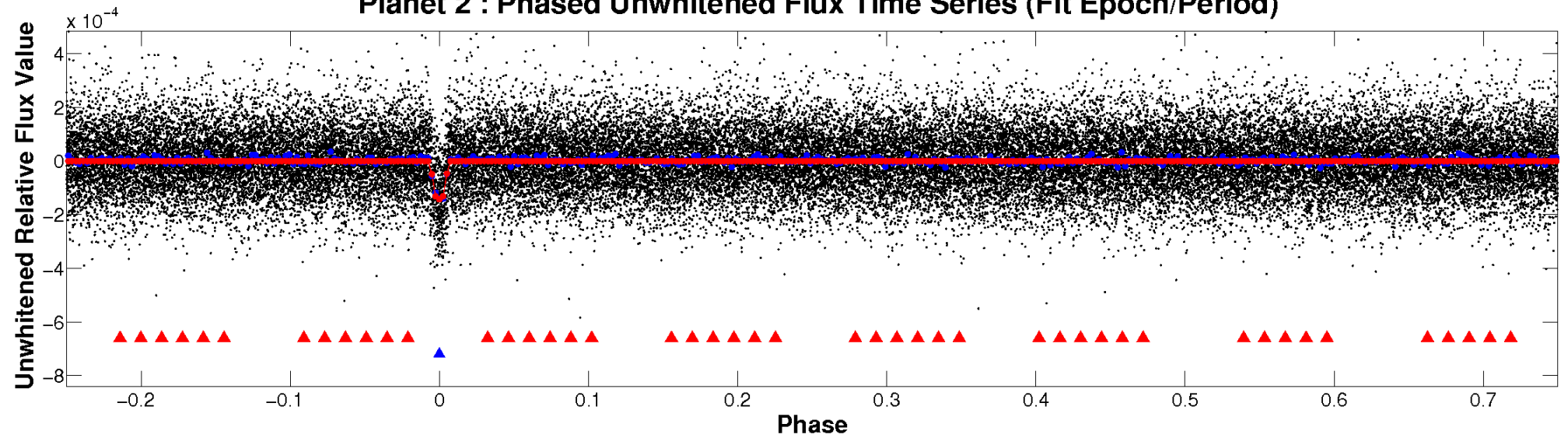
ALT Odd/Even

TCE 010933561-02

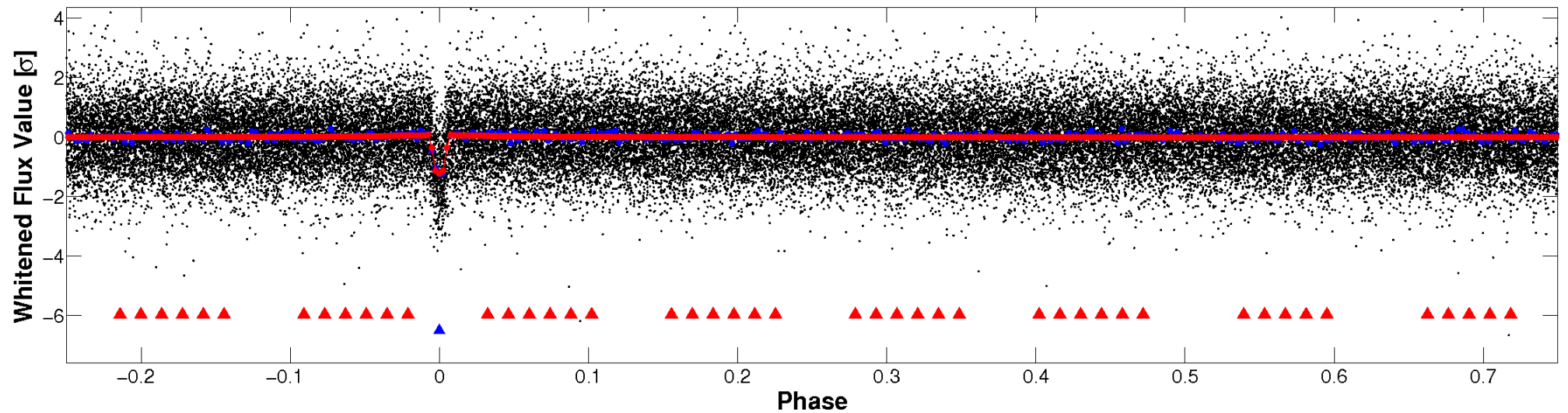


Non-Whitened Vs. Whitened Light Curve

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

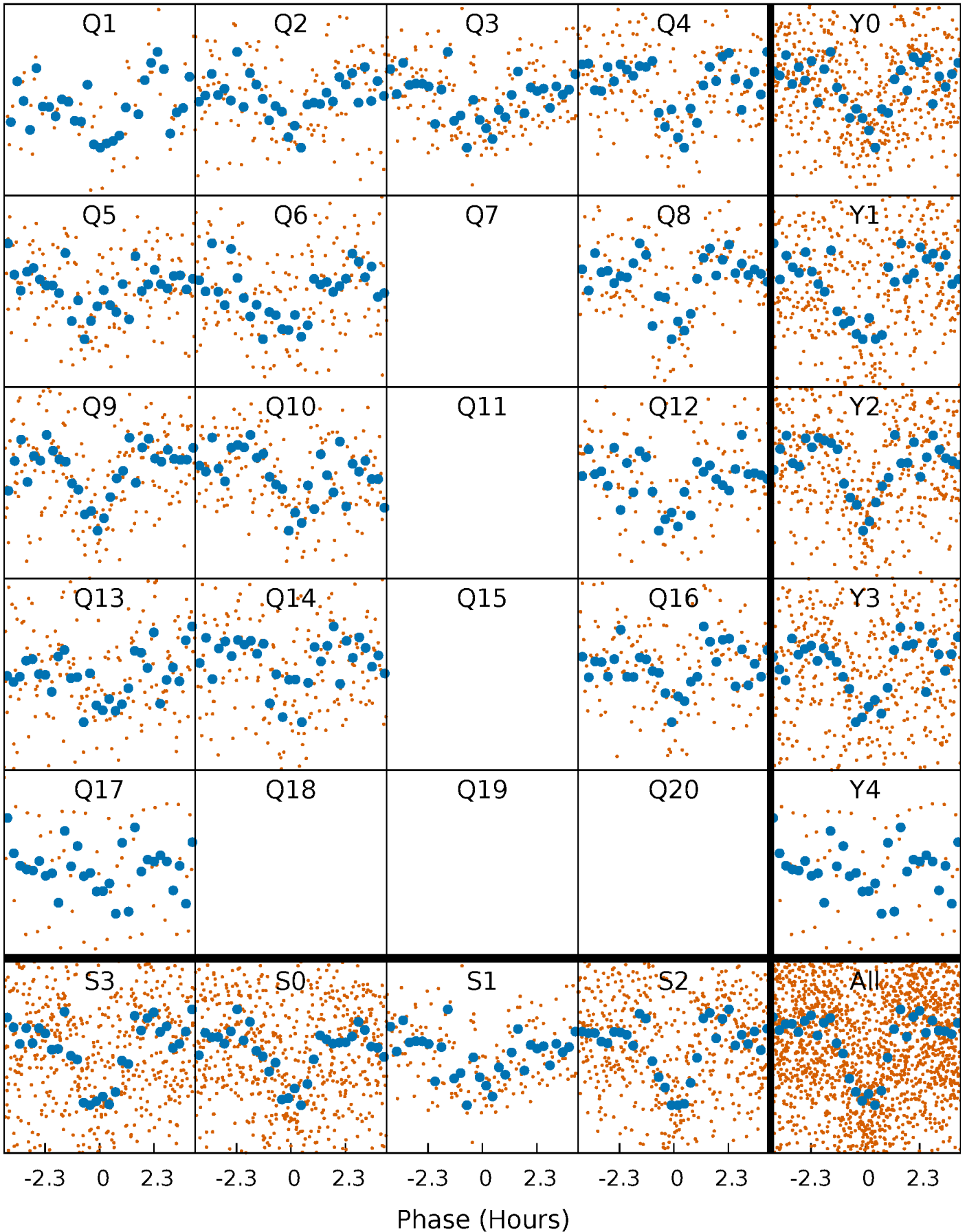


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 010933561-02 P= 8.129959 Days $T_0=134.104963$ (BKJD)



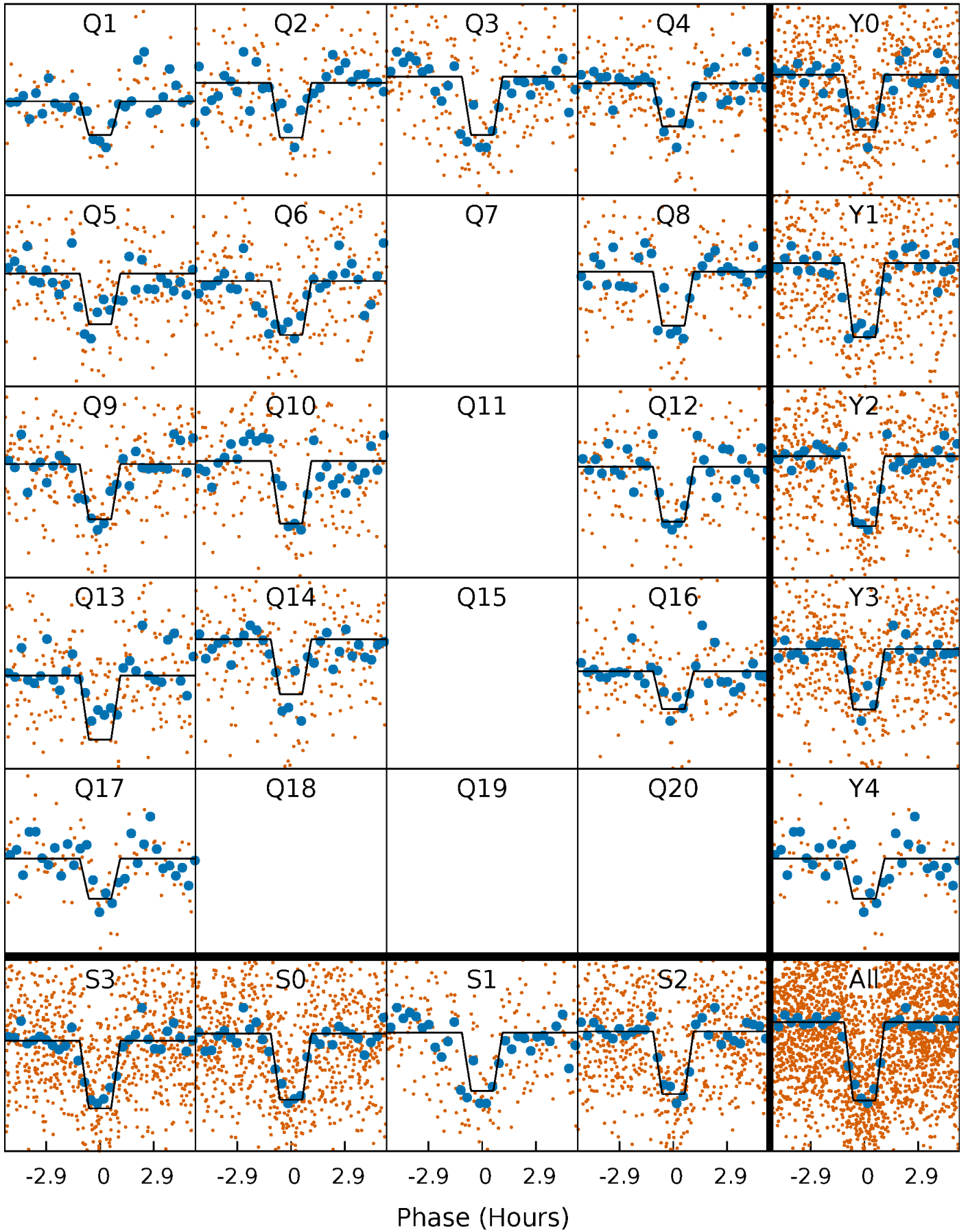
DV Quarter-Phased Transit Curves

TCE 010933561-02 P= 8.129959 Days $T_0=134.104963$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

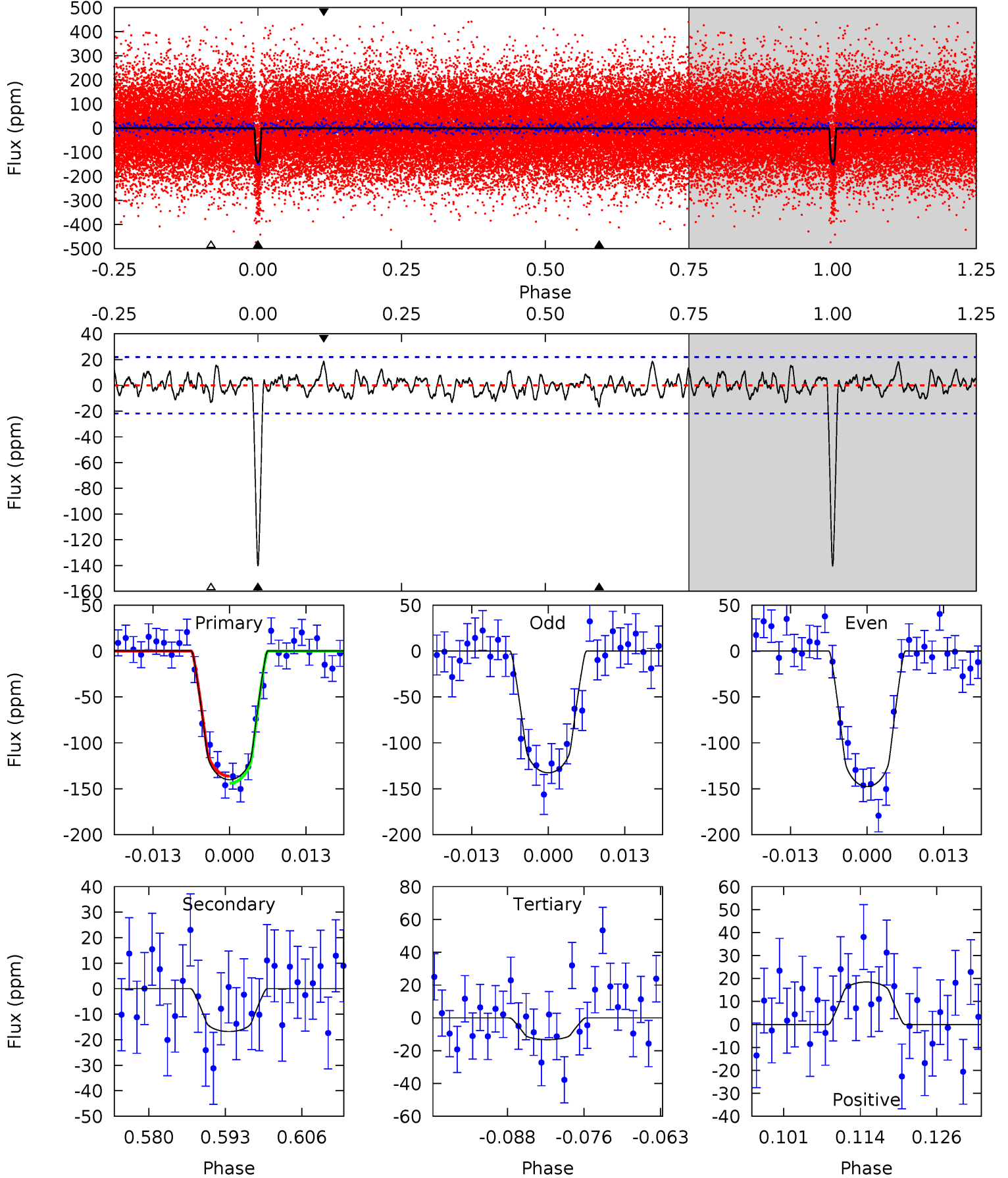
TCE 010933561-02 $P = 8.129894$ Days $T_0 = 134.111194$ (BKJD)



DV Model-Shift Uniqueness Test

010933561-02, P = 8.129959 Days, E = 125.975004 Days

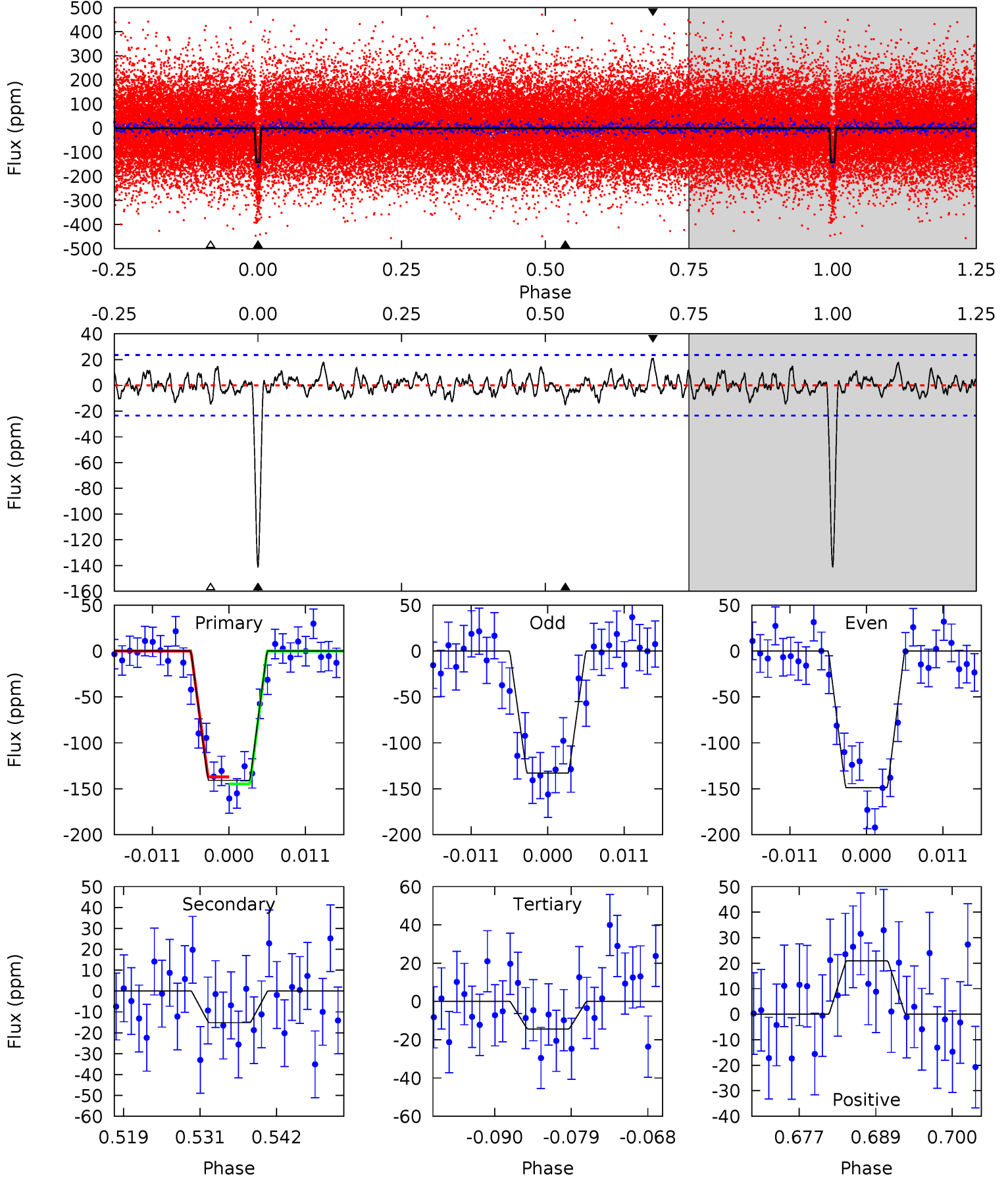
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.9	3.83	3.03	4.21	4.98	2.49	1.30	28.9	27.7	0.80	-0.38	1.71	0.99	0.12	0.88



Alt Model-Shift Uniqueness Test

010933561-02, P = 8.129894 Days, E = 125.981300 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.0	3.22	3.06	4.45	5.00	2.53	1.21	27.0	25.6	0.17	-1.22	1.70	1.03	0.13	0.80



Stellar Parameters For KIC 010933561

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5611^{+114}_{-91}	$4.144^{+0.195}_{-0.105}$	$0.160^{+0.150}_{-0.150}$	$1.400^{+0.211}_{-0.316}$	$0.995^{+0.087}_{-0.072}$	$0.511^{+0.520}_{-0.161}$
	+2%/-2%	+5%/-3%	+94%/-94%	+15%/-23%	+9%/-7%	+102%/-31%
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 010933561-02 / KOI 0291.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-17 ± 4	$1.92^{+0.77}_{-0.75}$	1452^{+63}_{-95}	3589^{+658}_{-390}	16^{+25}_{-8}
Alt.	-15 ± 5	$1.85^{+0.82}_{-0.71}$	1452^{+71}_{-85}	3561^{+655}_{-448}	15^{+26}_{-8}

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 $A_{obs} \gg 1.0$

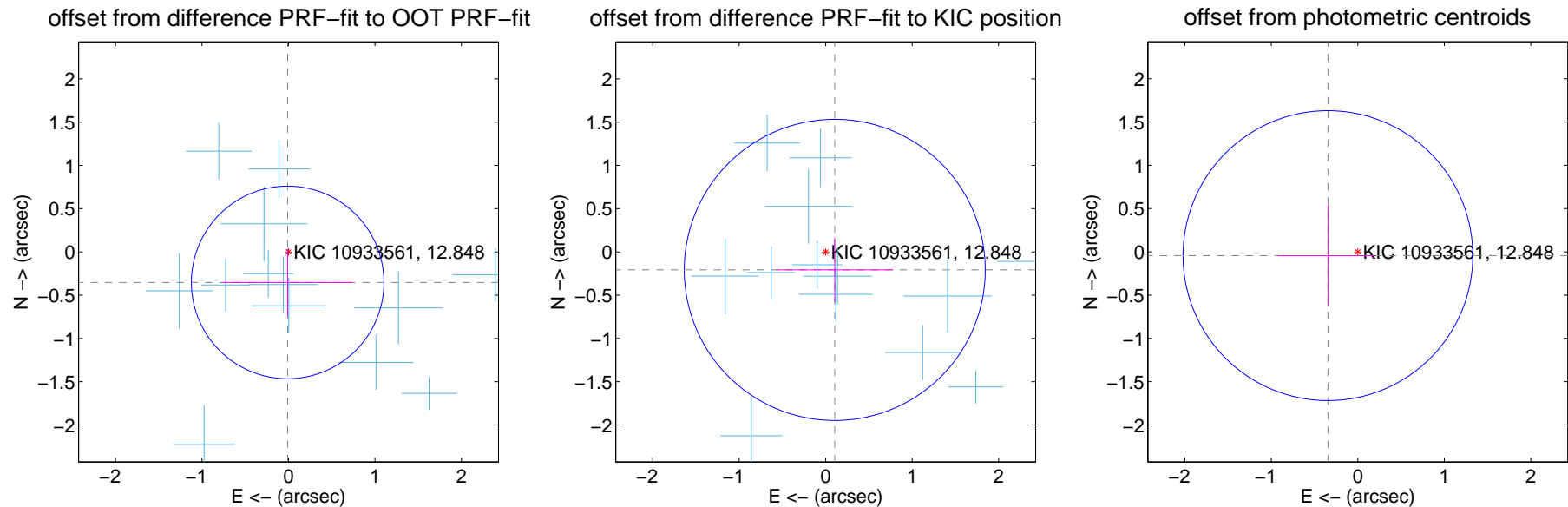
DV Centroid Data

Supplemental centroid analysis for 010933561-02. Kepler magnitude: 12.85. Transit SNR 22.87

There are 13 quarters with good PRF difference image offsets

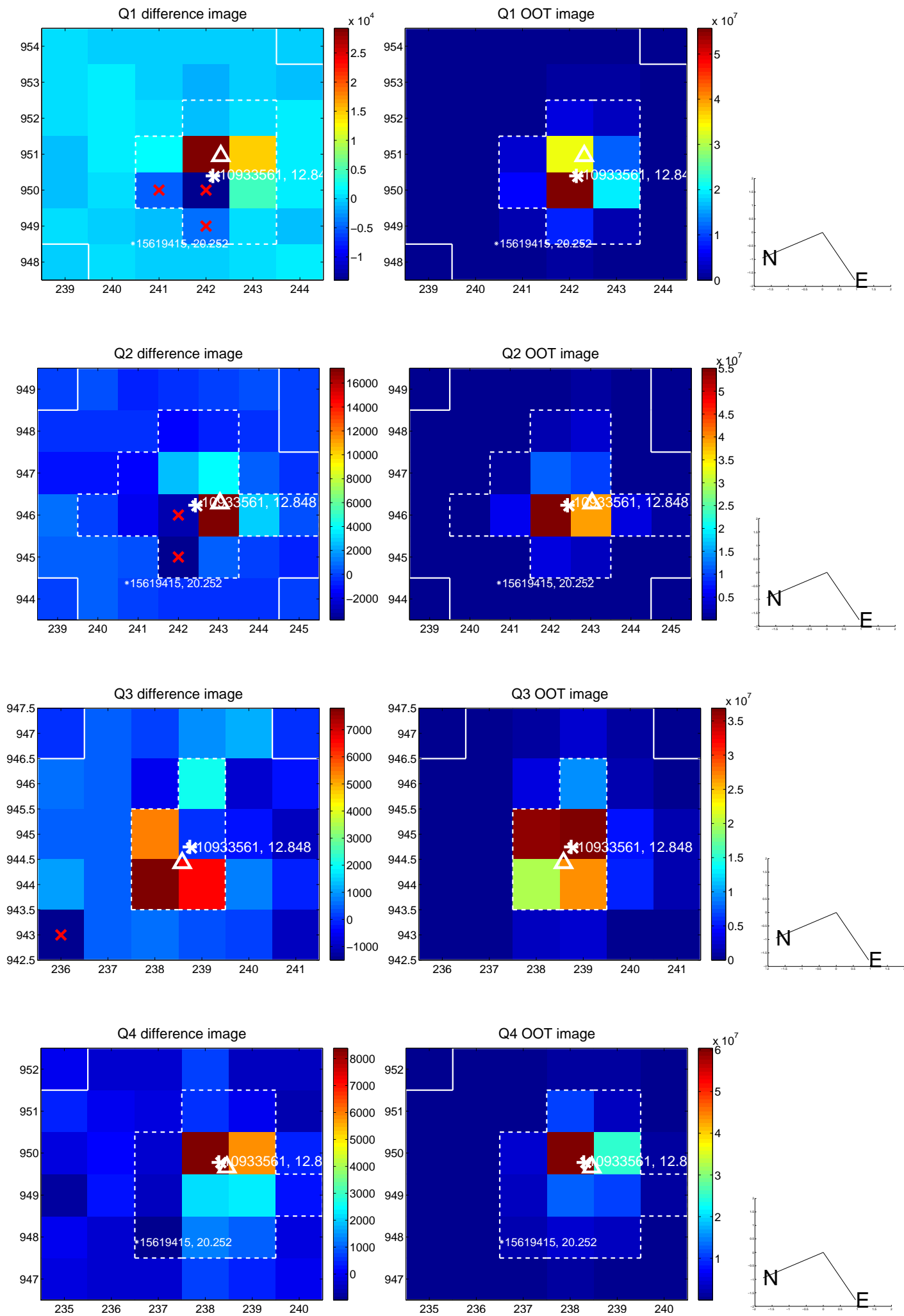
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.353 ± 0.371	0.95	0.010 ± 0.746	-0.353 ± 0.387
PRF-fit source offset from KIC position	0.233 ± 0.580	0.40	-0.105 ± 0.675	-0.208 ± 0.372
photometric centroid source offset	0.35 ± 0.56	0.62	0.35 ± 0.56	-0.04 ± 0.59

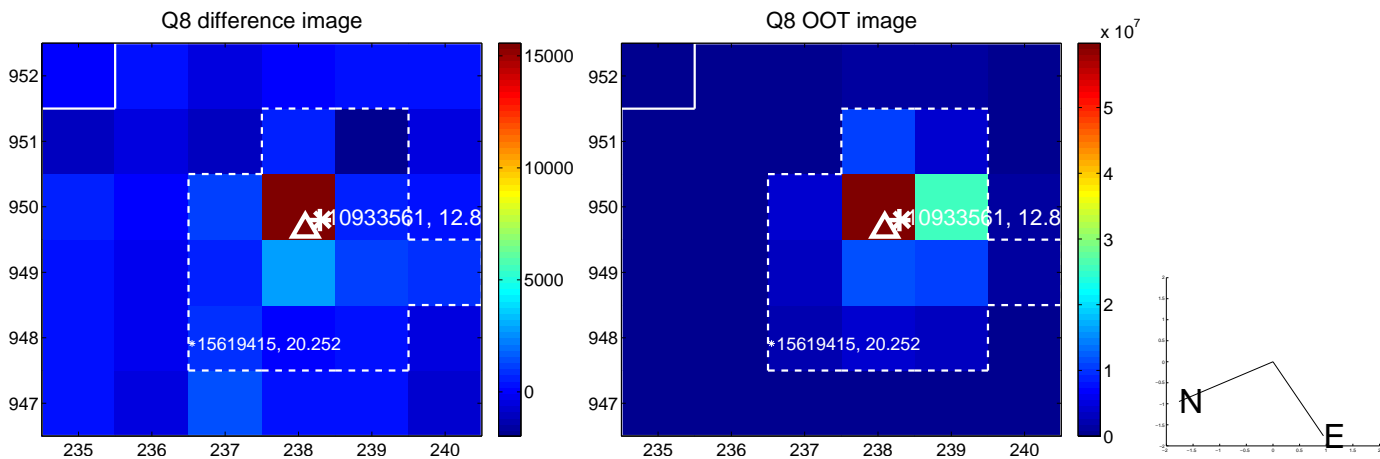
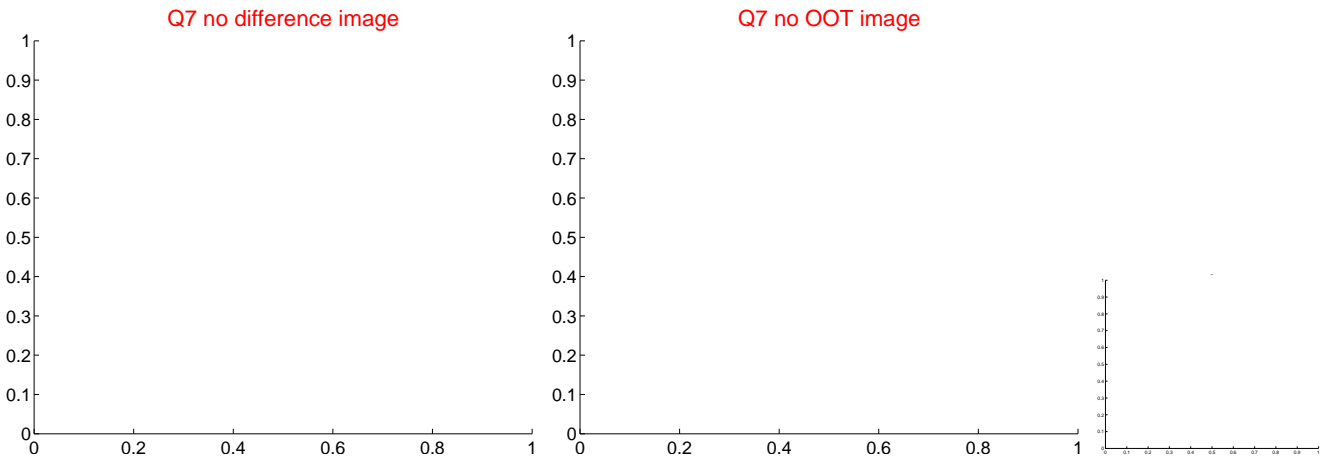
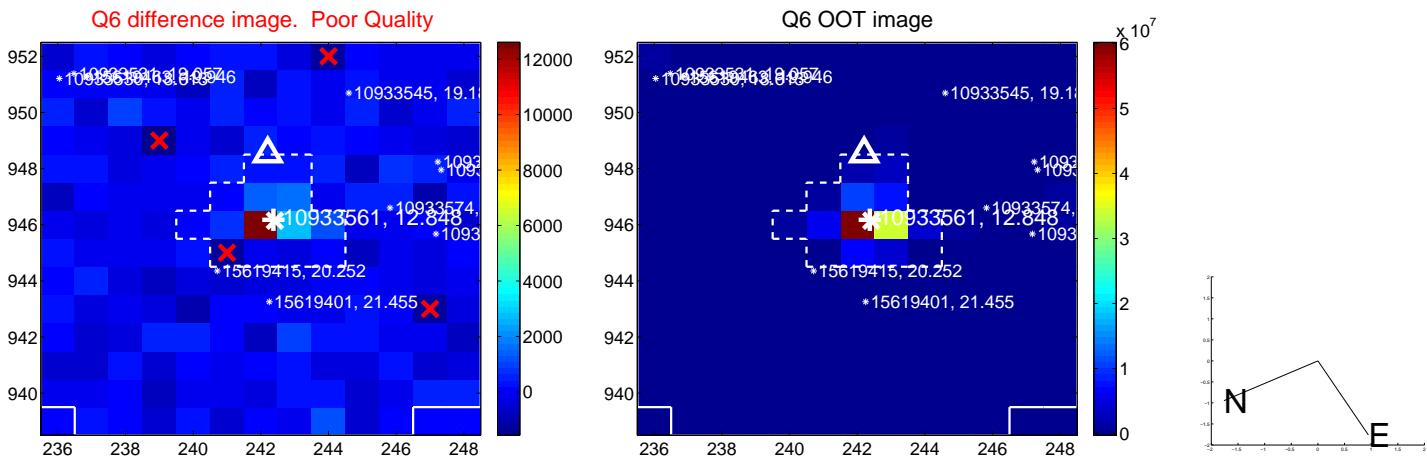
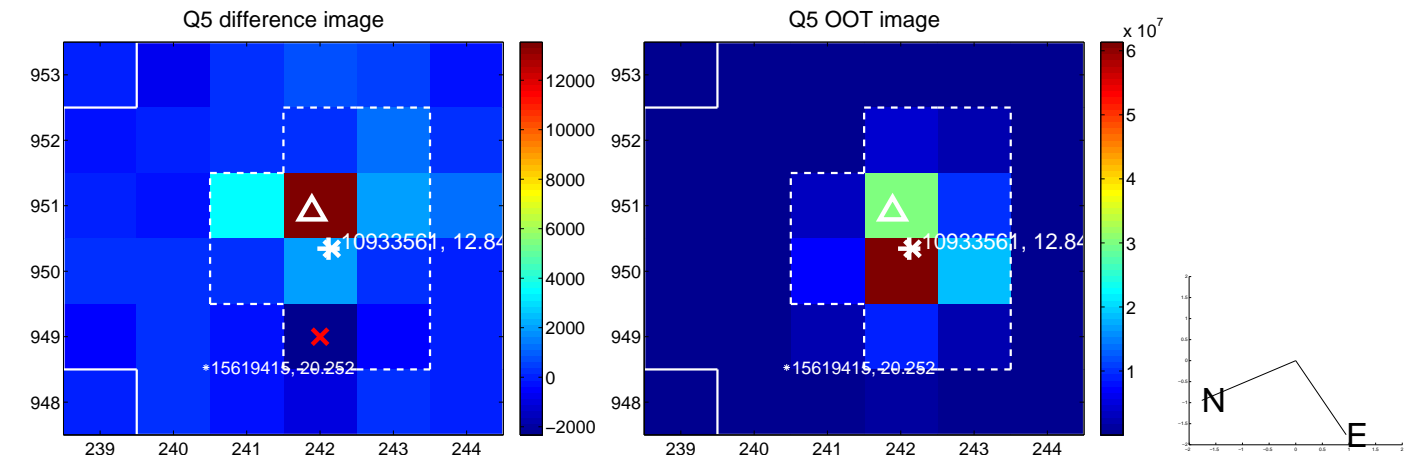


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

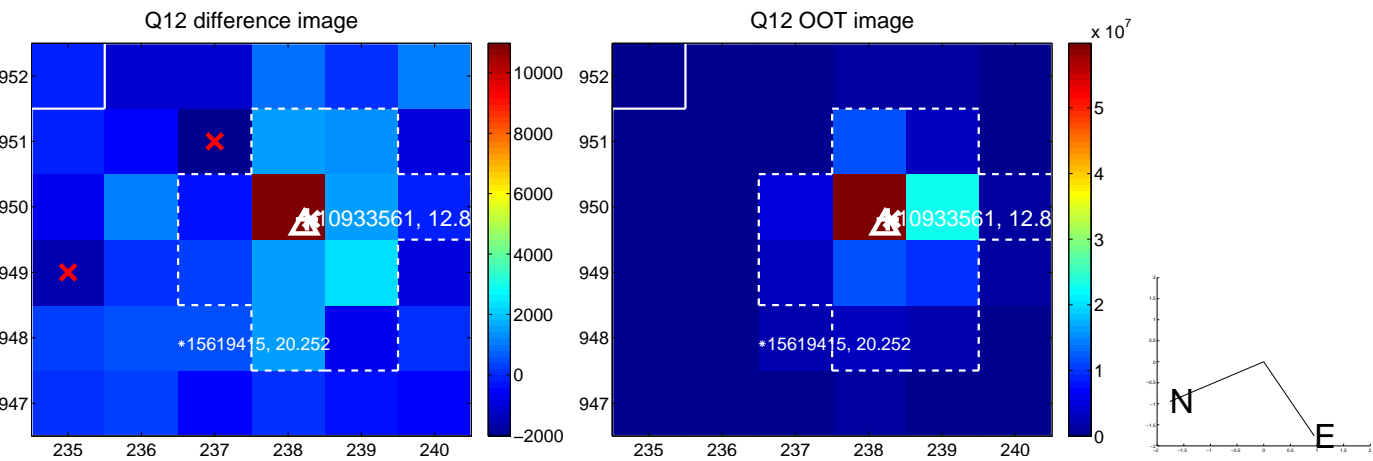
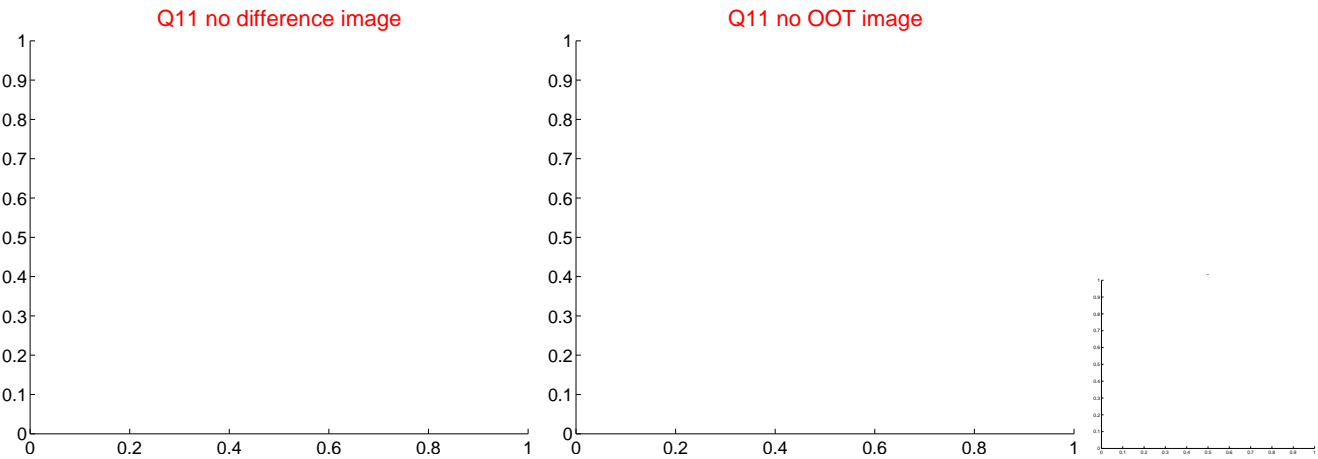
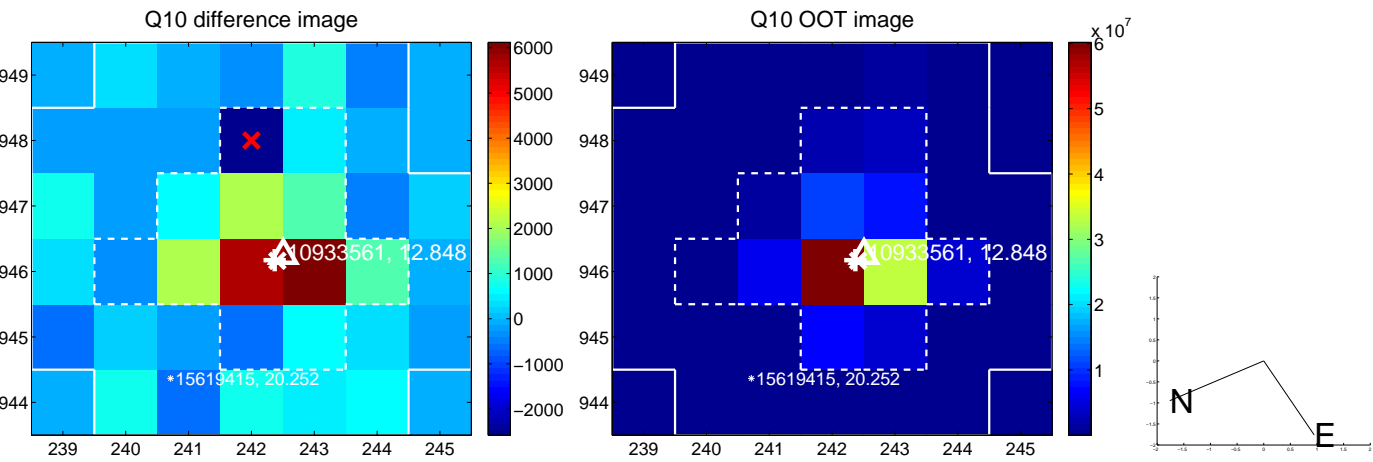
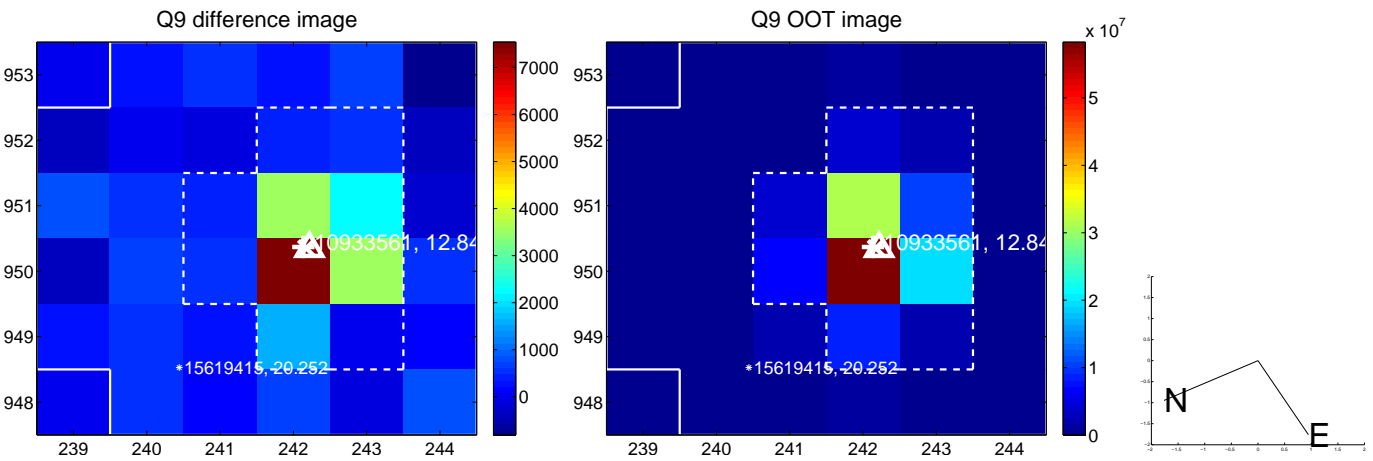
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



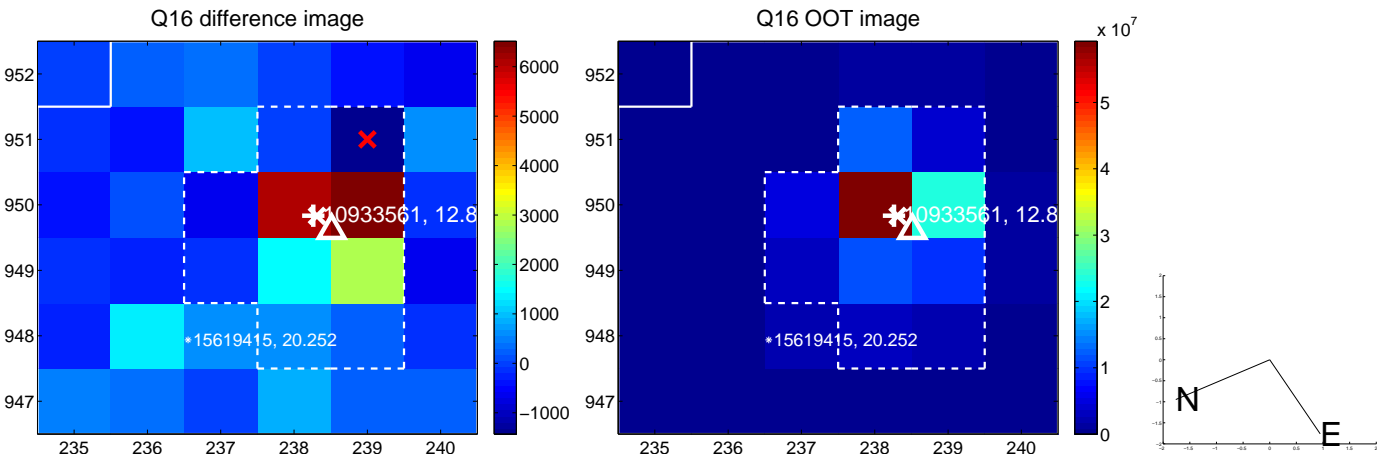
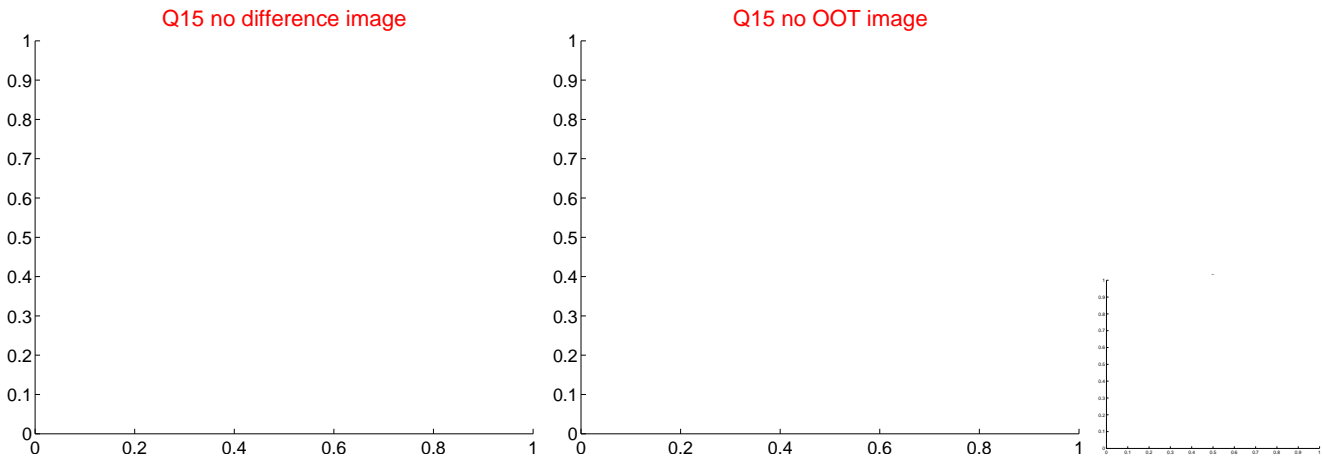
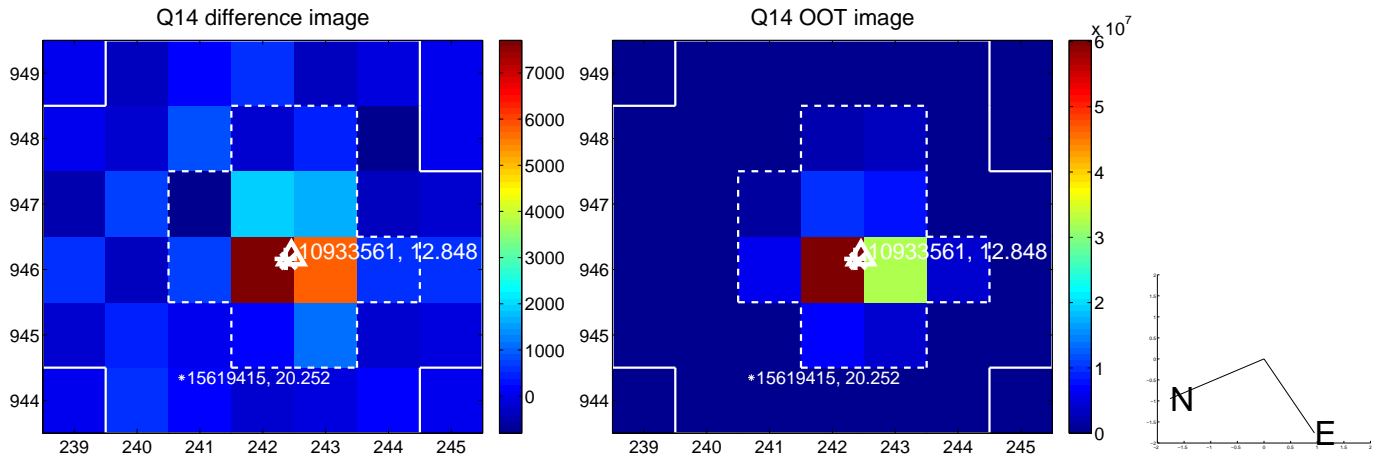
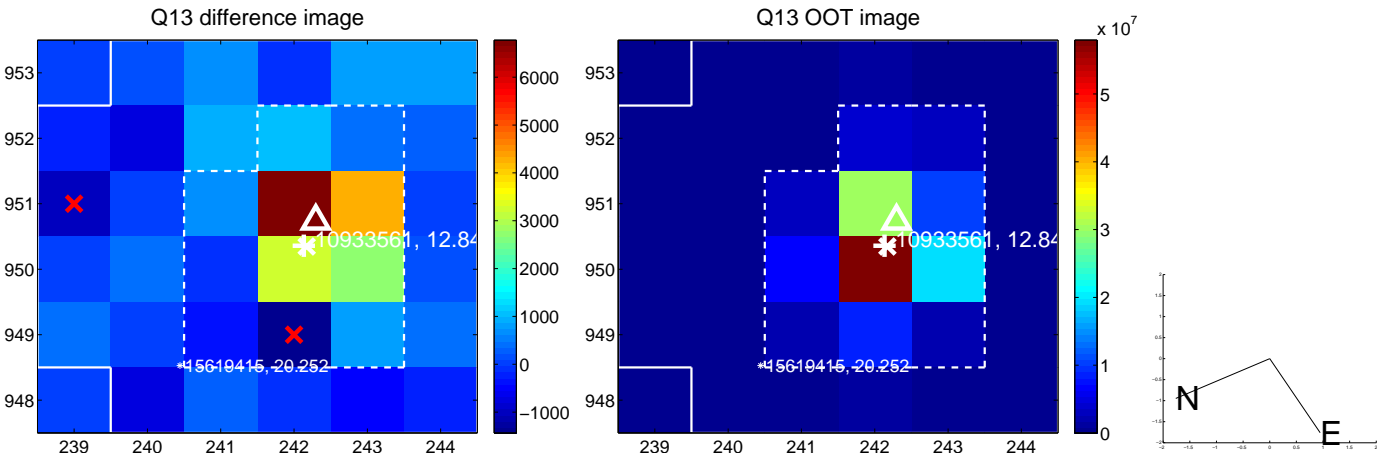
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



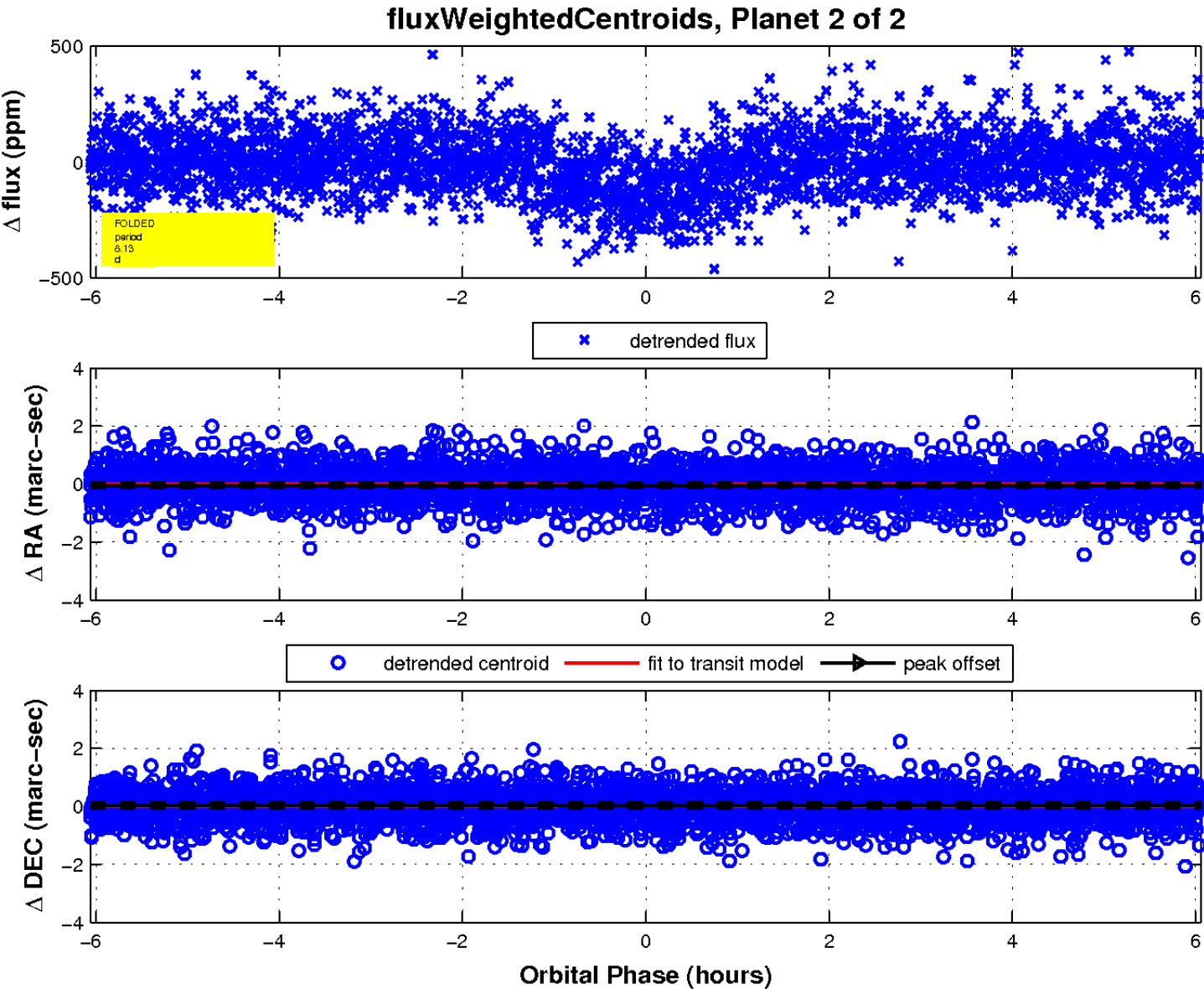
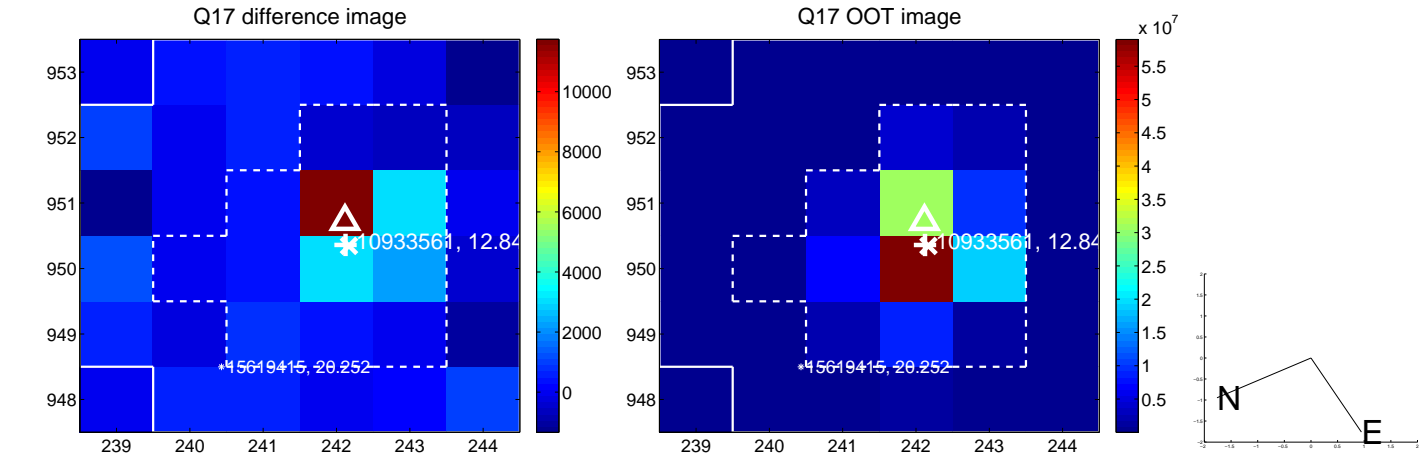
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

