

KIC 008378656

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})
008378656-01	OBS	7027.01	3.629440	134.701308	129563.1	5.913	14726.3	13014.2	1.09	6284	39.98	787.89
008378656-02	OBS	No	3.629439	132.916887	31943.9	5.861	3957.3	2696.3	1.09	6284	20.63	787.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008378656-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
008378656-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

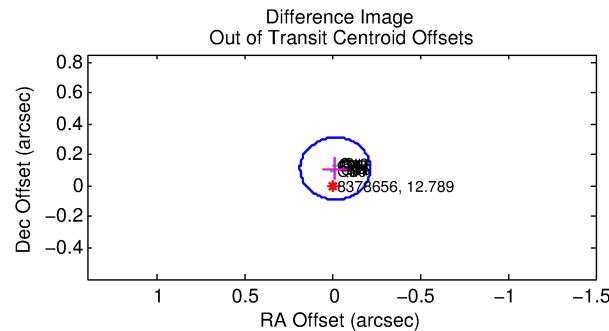
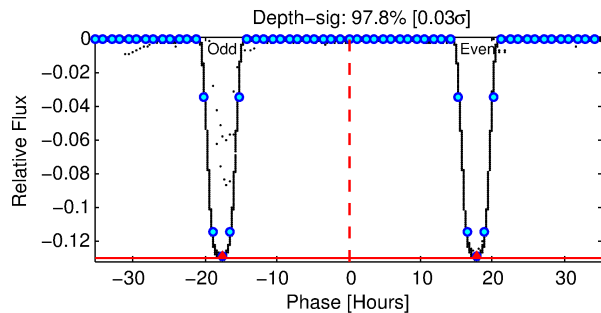
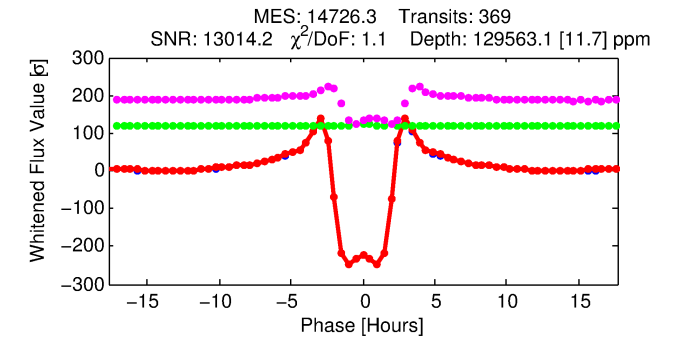
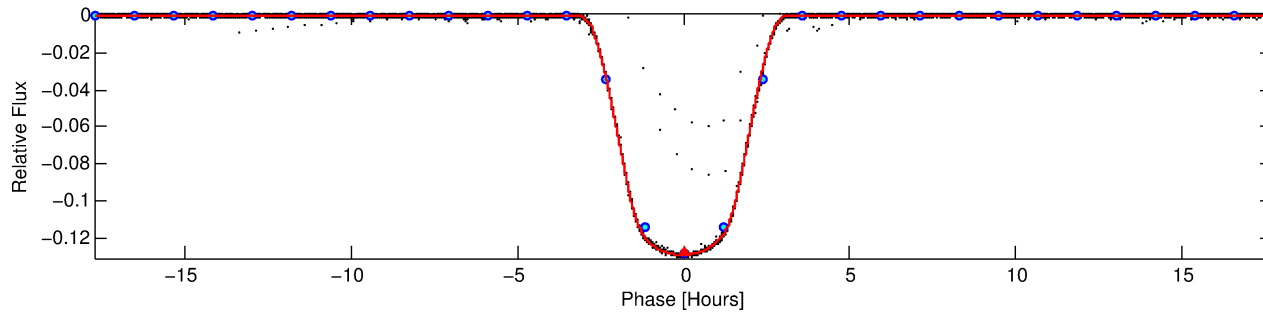
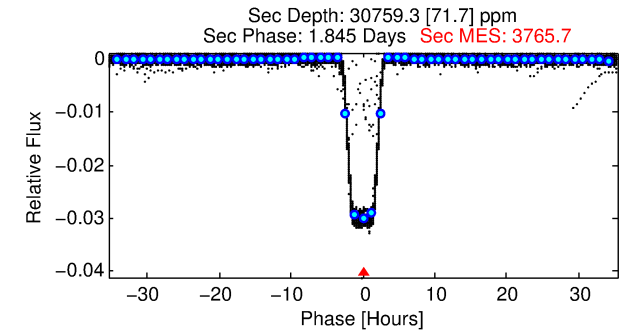
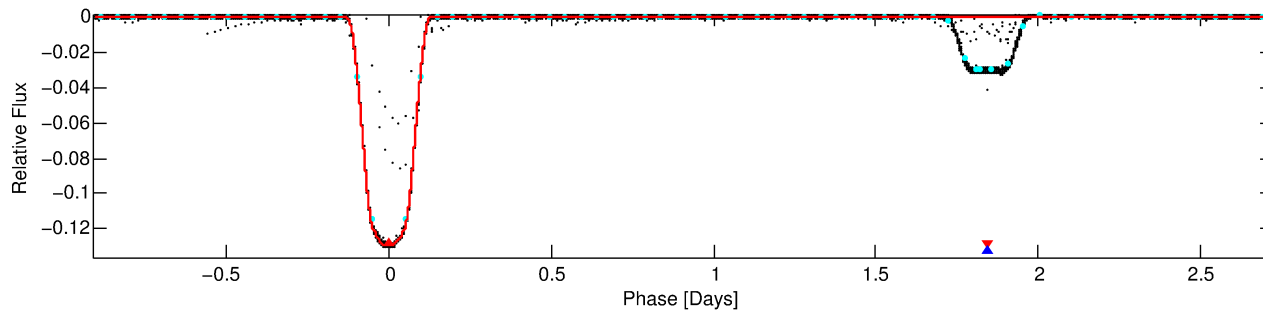
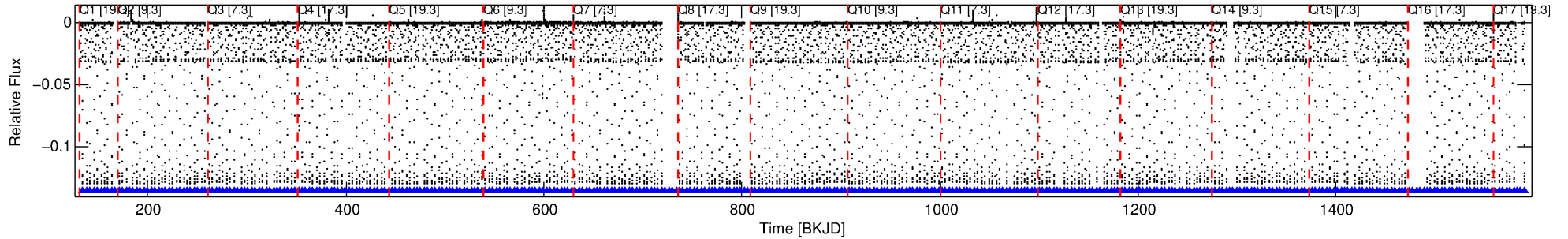
Ephemeris Match Information For 008378656-01

No Significant Match Found

DV One-Page Summary

KIC: 8378656 Candidate: 1 of 2 Period: 3.629 d
KOI: K07027.01 Corr: 0.998

Kp: 12.79 R*: 1.09 Rs Teff: 6284.0 K Logg: 4.36 Fe/H: -0.360



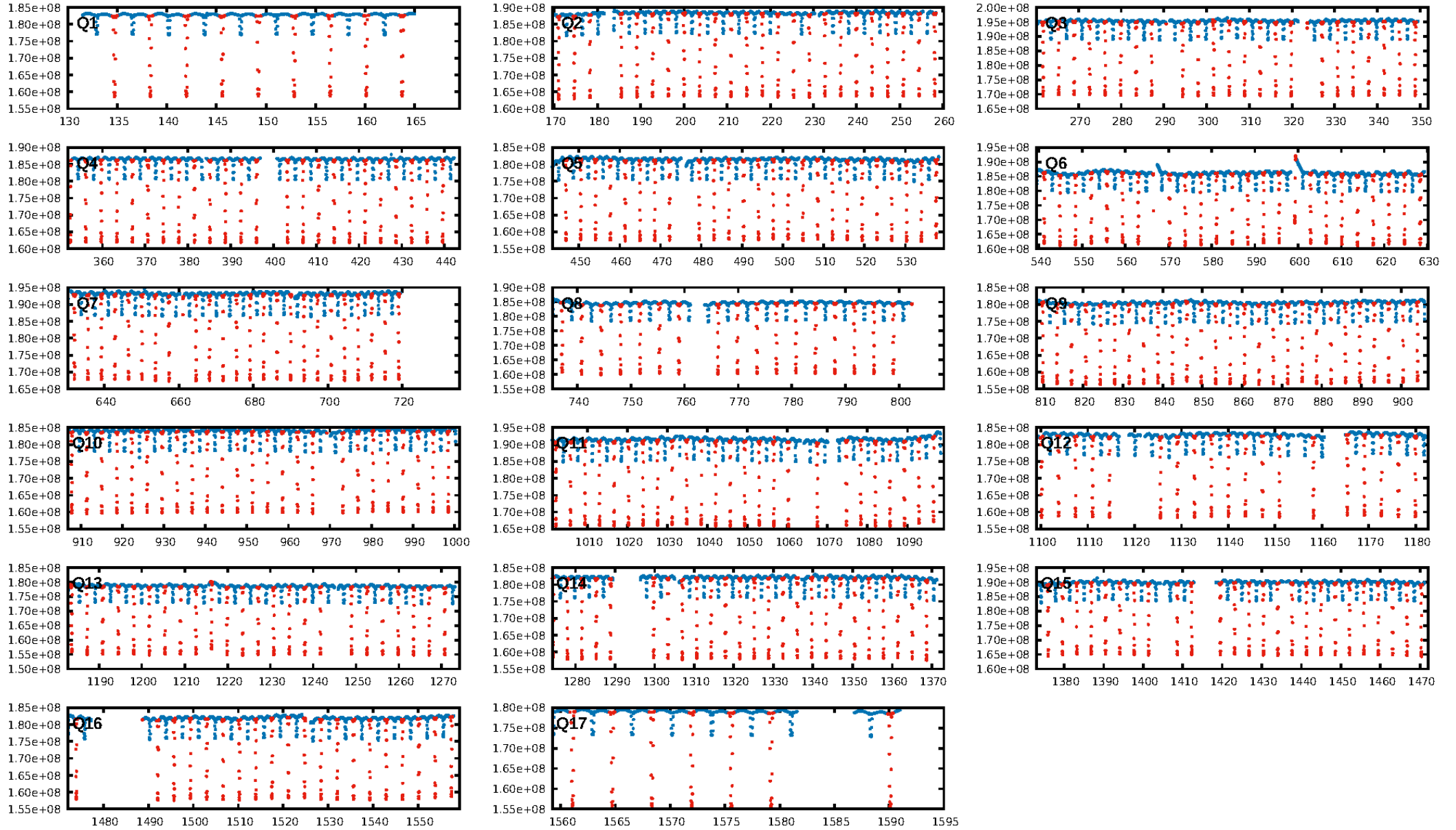
DV Fit Results:

Period = 3.62944 [0.00000] d
Epoch = 134.7013 [0.0000] BKJD
Rp/R* = 0.3352 [0.0000]
a/R* = 6.20 [0.00]
b = 0.25 [0.00]
Seff = 787.89 [290.16]
Teff = 1351 [124] K
Rp = 39.98 [11.96] Re
a = 0.0460 [0.0113] AU
Ag = 22.43 [7.81] [2.74σ]
Teffp = 4545 [136] K [17.33σ]

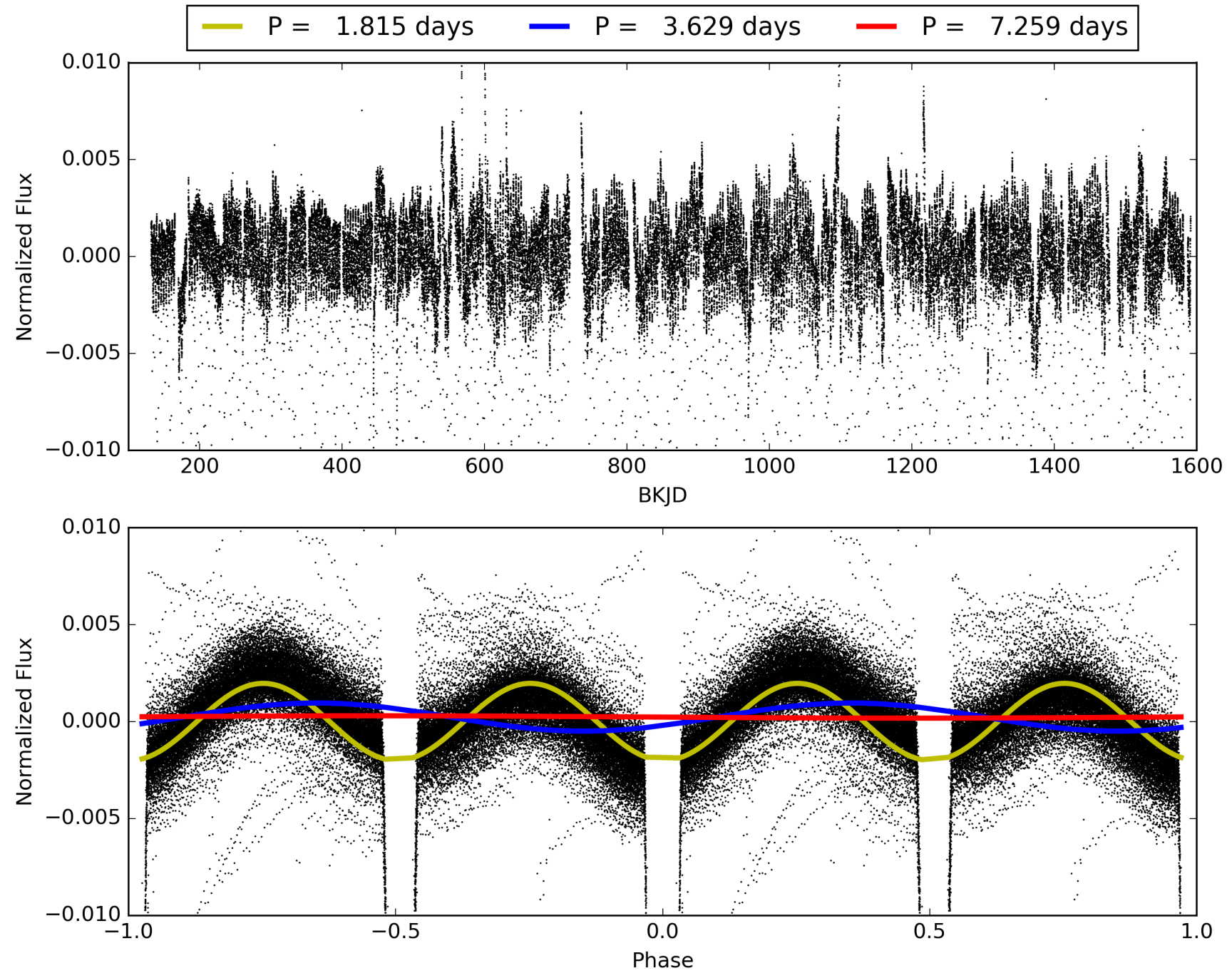
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [353/353]
GhostDiagnostic-chr: 6.116
Centroid-sig: 0.0%
Centroid-so: 0.166 arcsec [506.22σ]
OotOffset-rm: 0.114 arcsec [1.70σ]
KicOffset-rm: 0.056 arcsec [0.83σ]
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]

TCE 008378656-01, PDC Light Curves

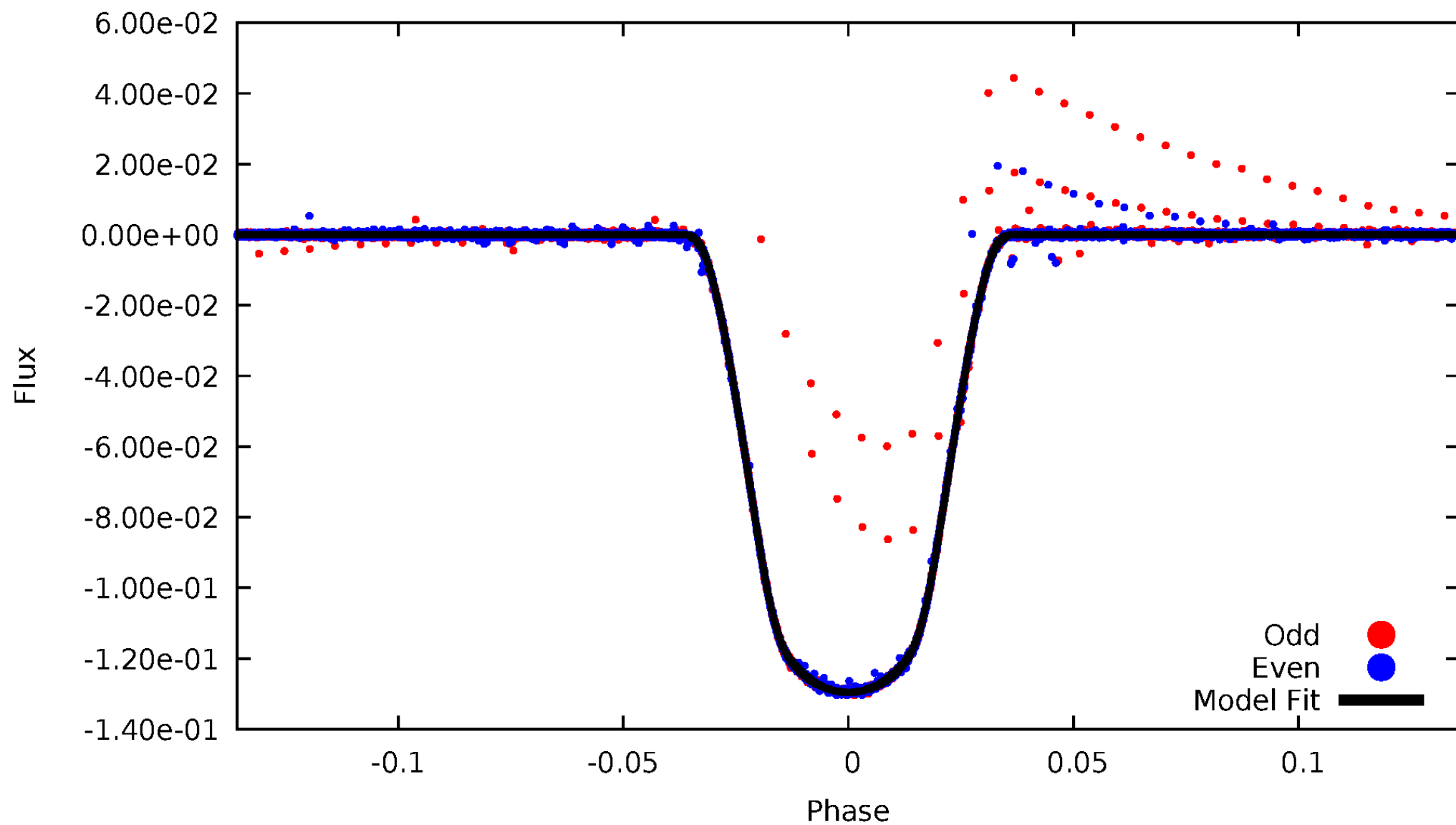


TCE 008378656-01



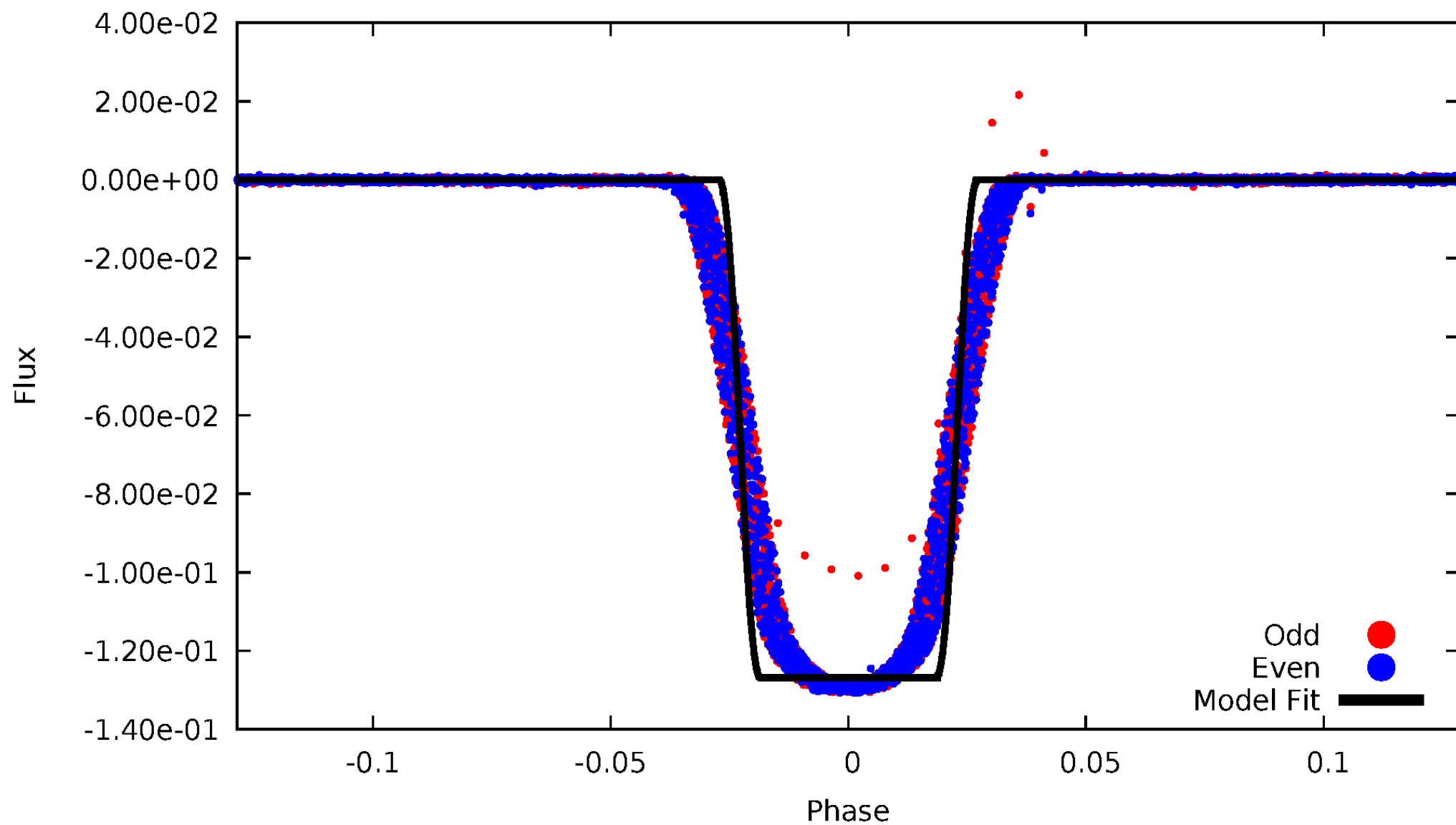
DV Odd/Even

TCE 008378656-01



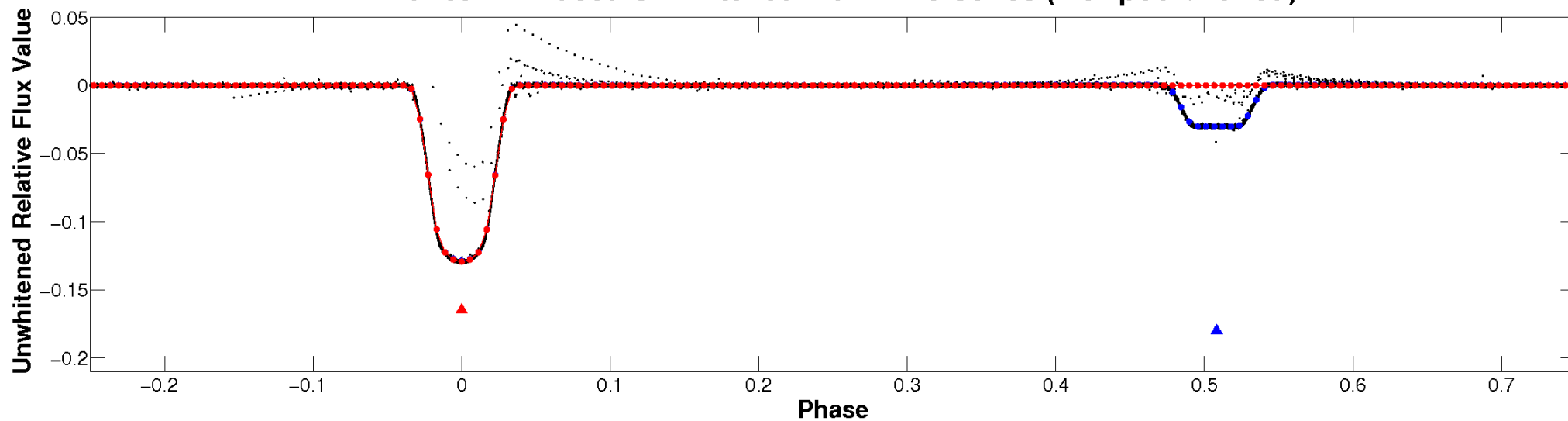
ALT Odd/Even

TCE 008378656-01

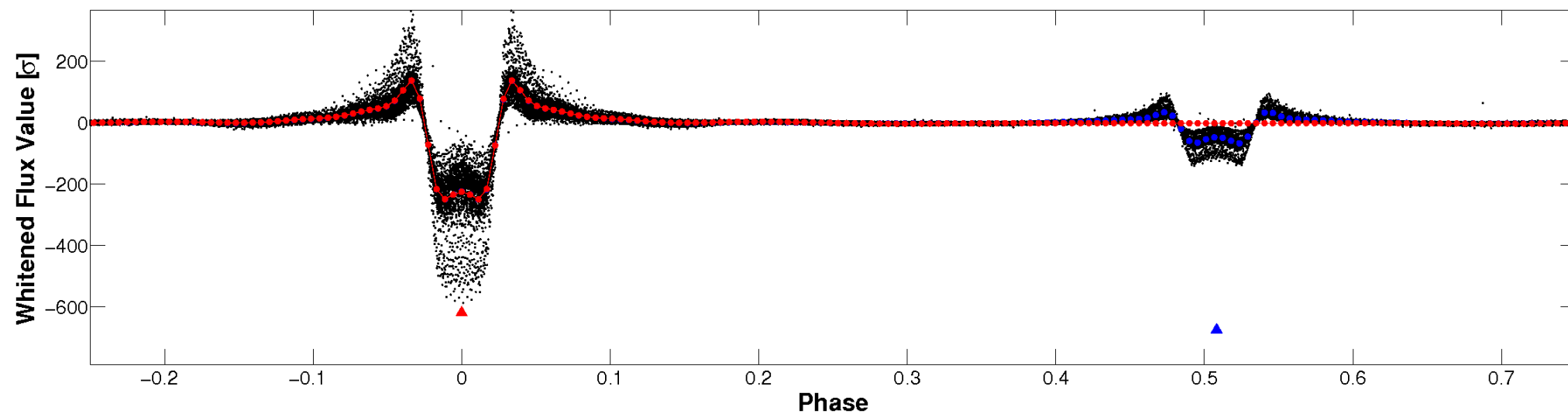


Non-Whitened Vs. Whitened Light Curve

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

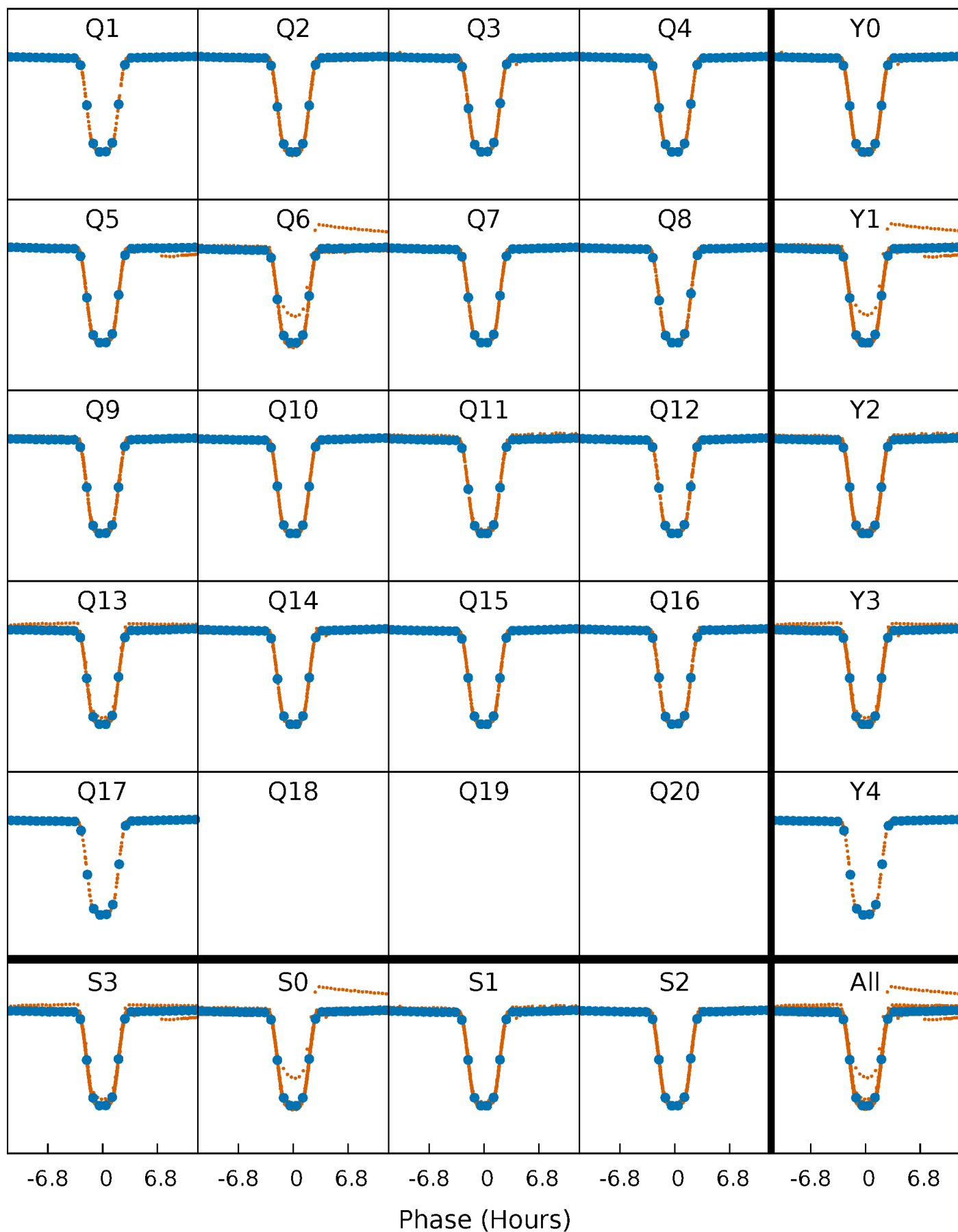


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



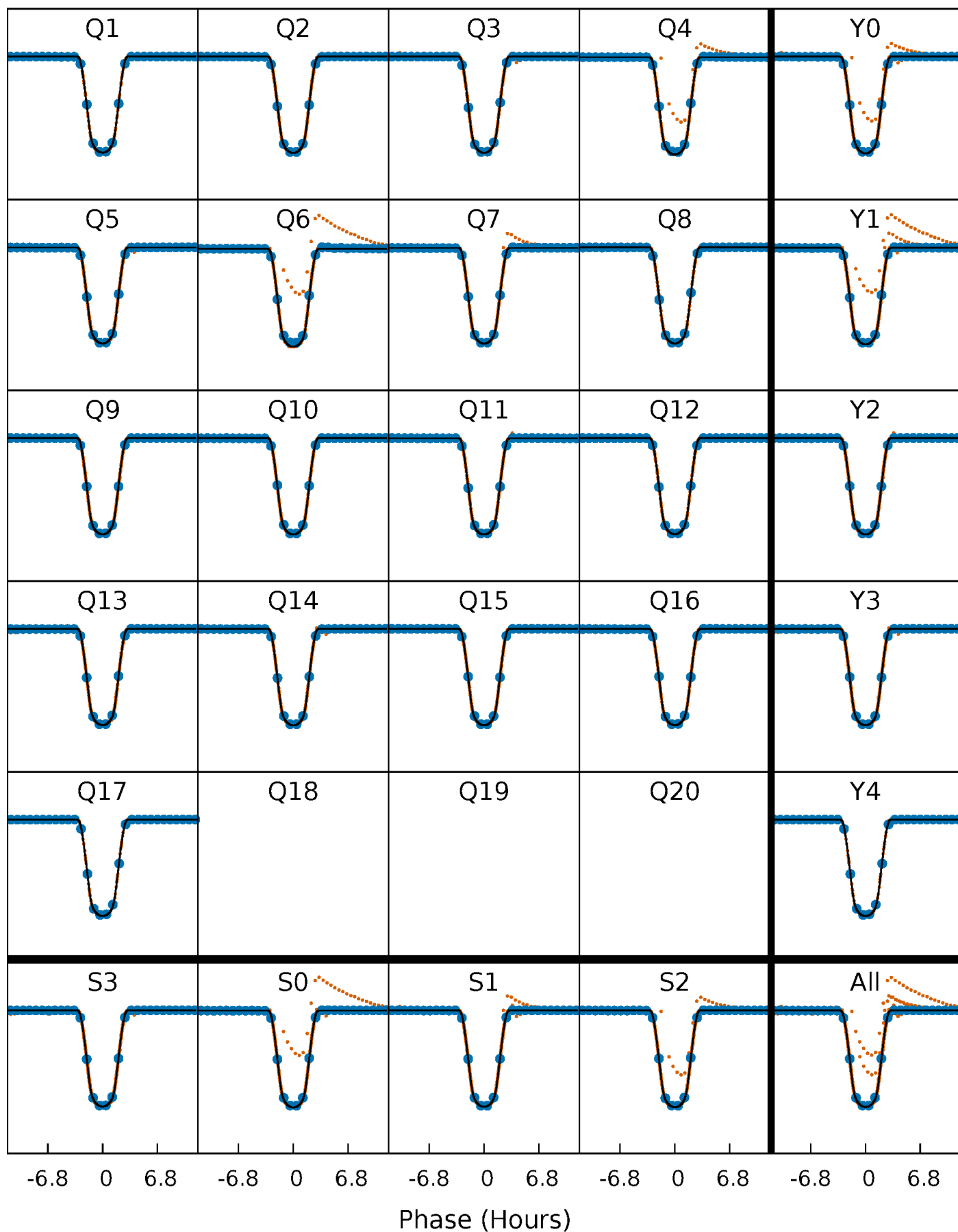
PDC Quarter-Phased Transit Curves

TCE 008378656-01 P= 3.629440 Days $T_0=134.701308$ (BKJD)



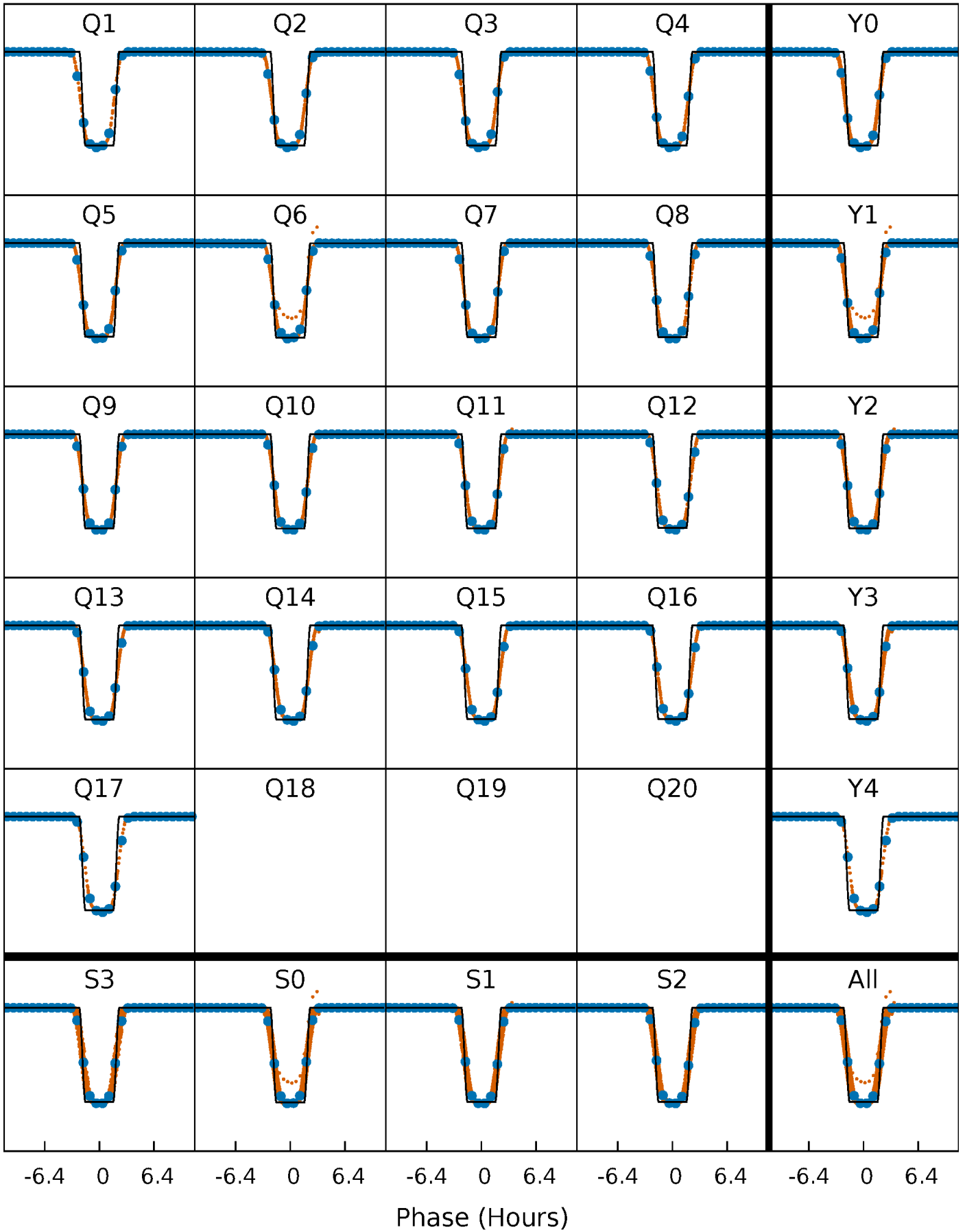
DV Quarter-Phased Transit Curves

TCE 008378656-01 P= 3.629440 Days $T_0=134.701308$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

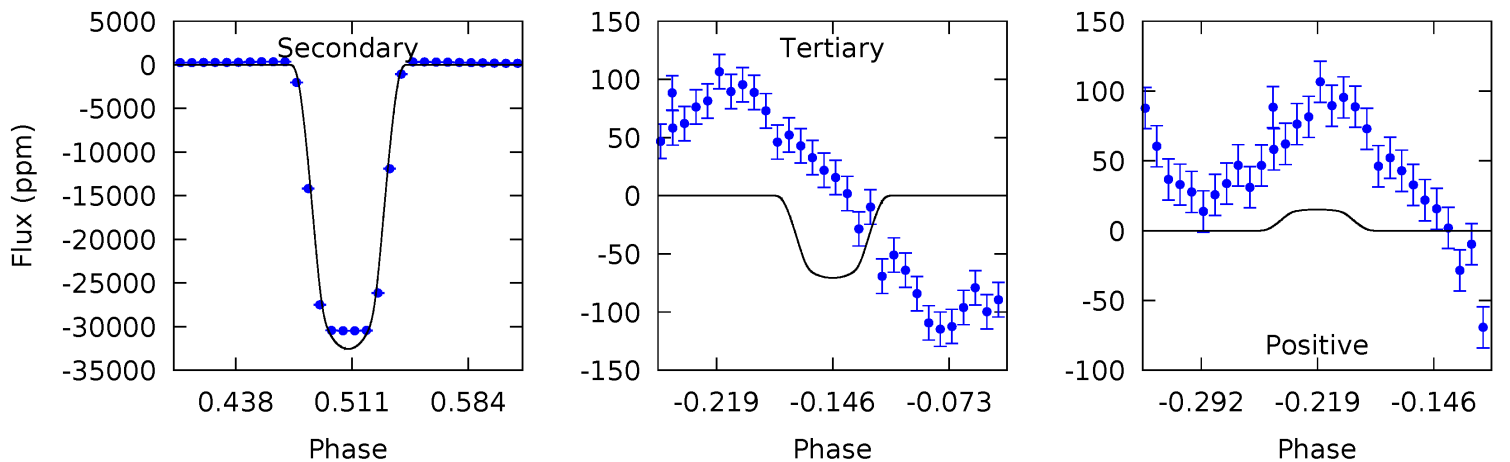
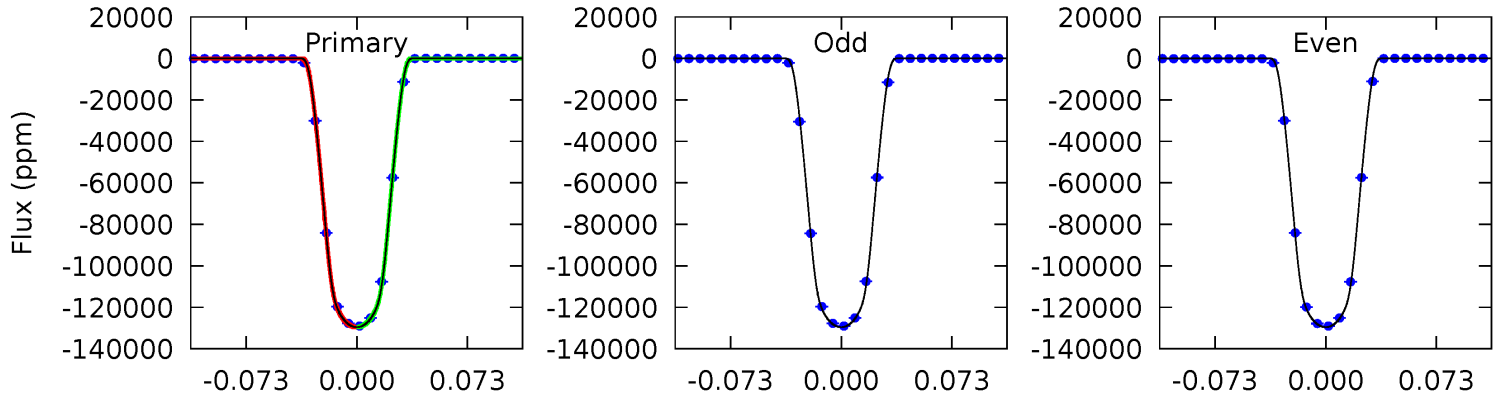
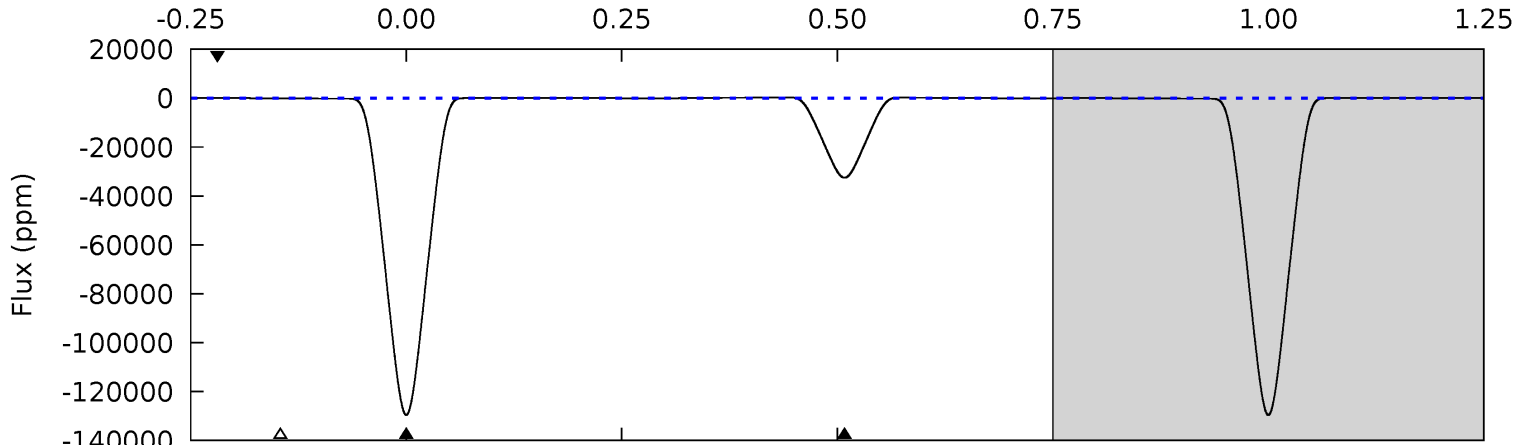
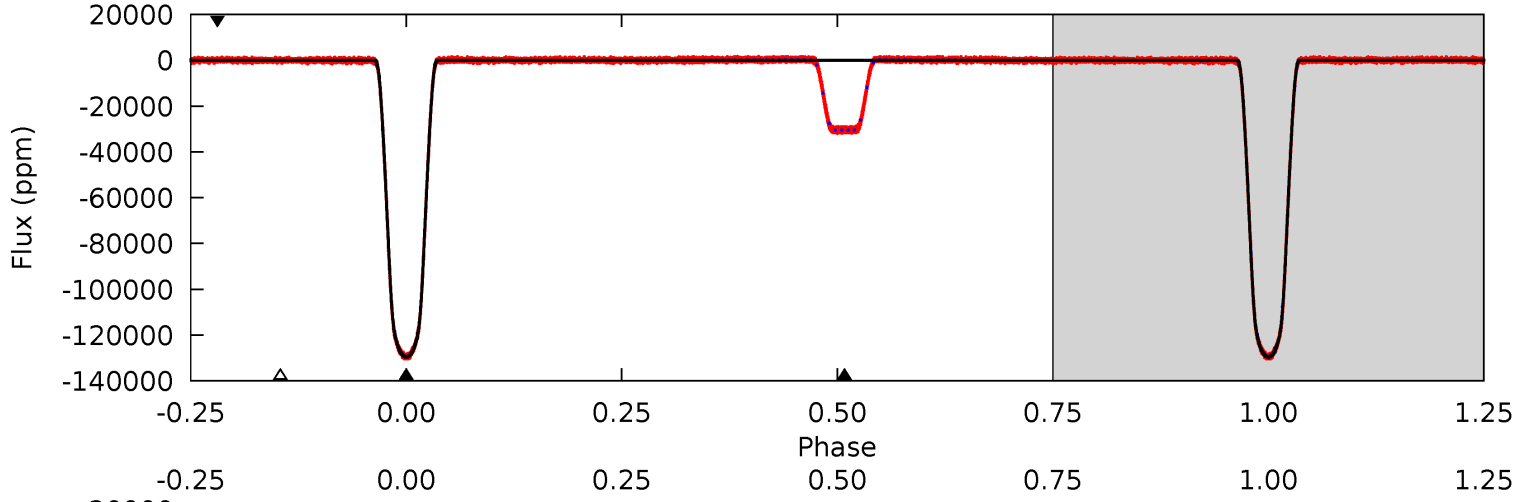
TCE 008378656-01 P= 3.629386 Days $T_0=134.711279$ (BKJD)



DV Model-Shift Uniqueness Test

008378656-01, P = 3.629440 Days, E = 131.071868 Days

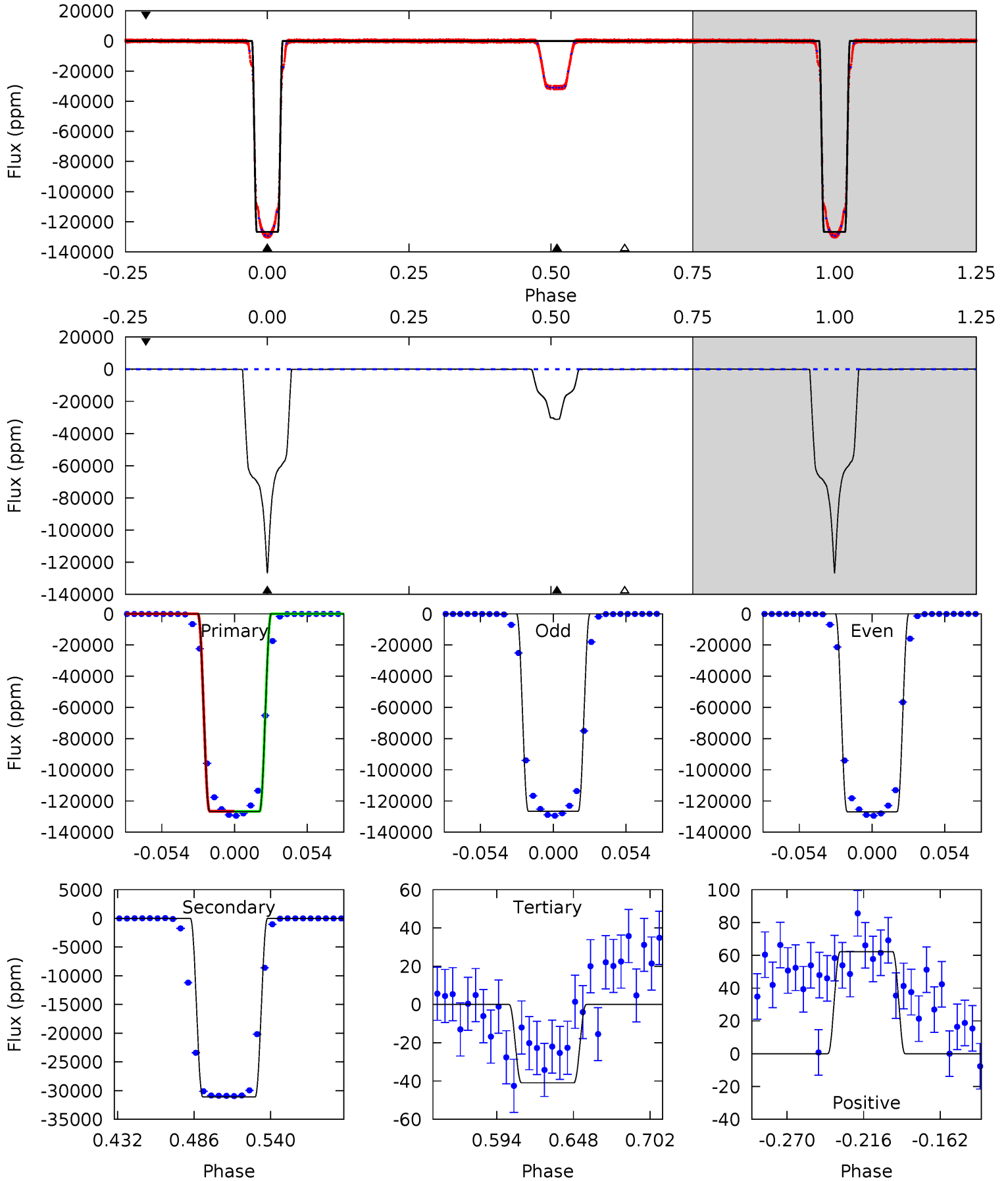
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25422	6388	13.9	2.97	4.63	1.79	18.6	25408	25419	6374	6385	0.01	0.99	0.00	7.39



Alt Model-Shift Uniqueness Test

008378656-01, P = 3.629386 Days, E = 131.081893 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16609	4077	5.36	8.15	4.69	1.93	4.44	16603	16601	4072	4069	18.6	1.00	0.00	9.48



Stellar Parameters For KIC 008378656

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6284^{+169}_{-188}	$4.355^{+0.108}_{-0.186}$	$-0.360^{+0.300}_{-0.300}$	$1.093^{+0.327}_{-0.176}$	$0.986^{+0.160}_{-0.107}$	$1.062^{+0.611}_{-0.527}$
	+3%/-3%	+2%/-4%	+83%/-83%	+30%/-16%	+16%/-11%	+58%/-50%
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 008378656-01 / KOI 7027.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-32559 ± 5	$40.72^{+6.67}_{-3.72}$	1915^{+130}_{-107}	4769^{+102}_{-115}	24^{+5}_{-5}
Alt.	-31106 ± 8	$42.77^{+7.38}_{-3.66}$	1902^{+140}_{-112}	4601^{+92}_{-115}	20^{+4}_{-4}

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

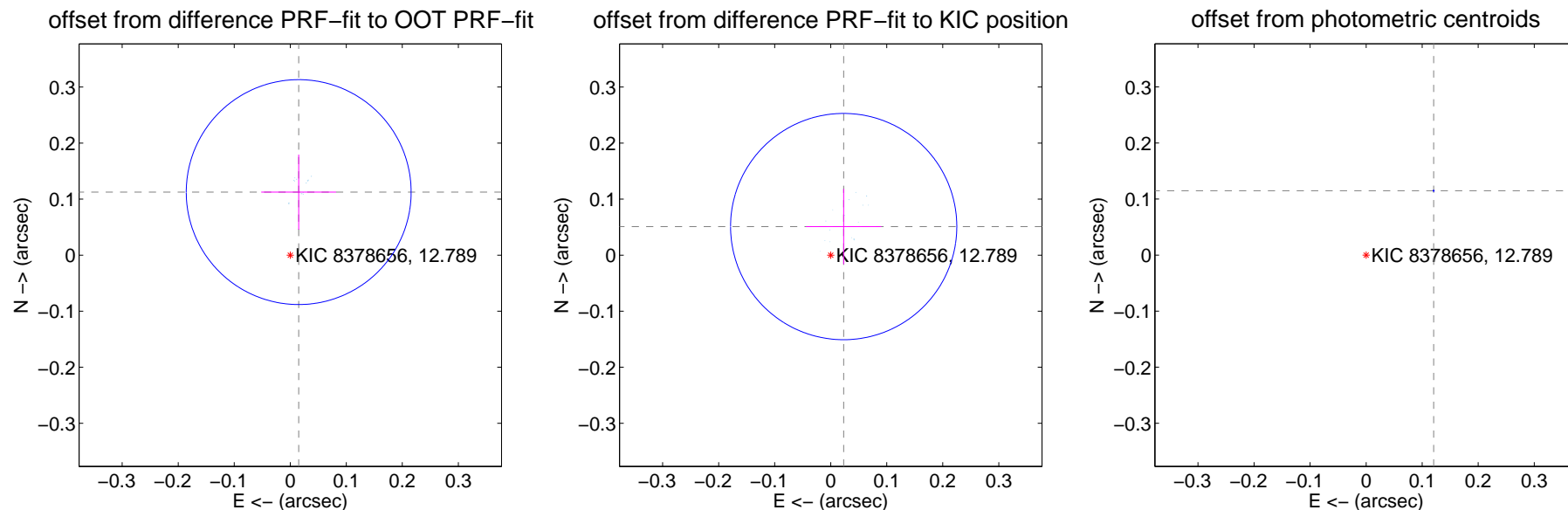
DV Centroid Data

Supplemental centroid analysis for 008378656-01. Kepler magnitude: 12.79. Transit SNR 13014.18

There are 17 quarters with good PRF difference image offsets

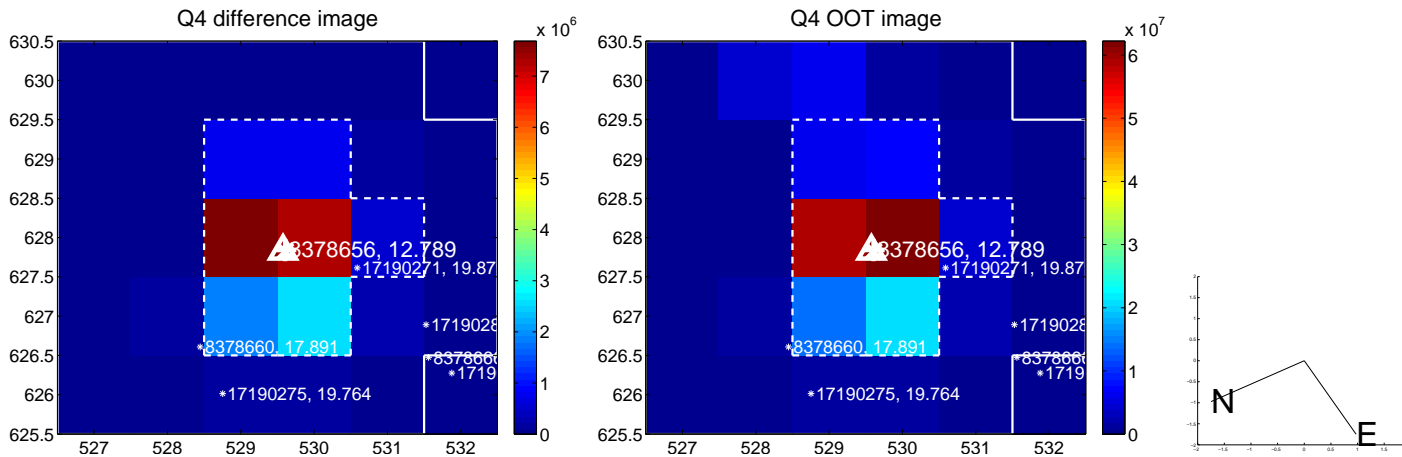
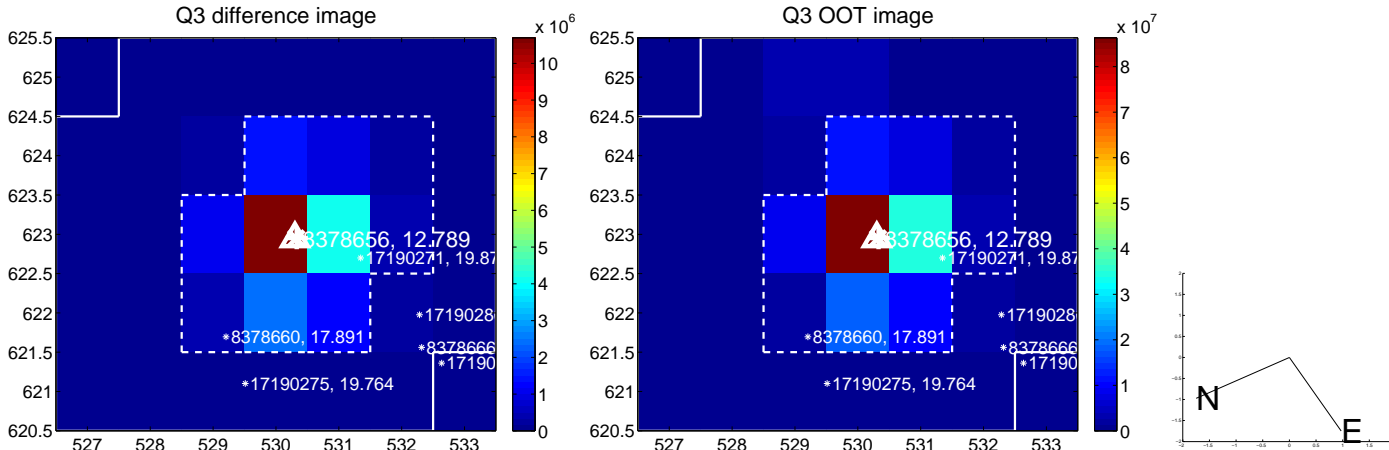
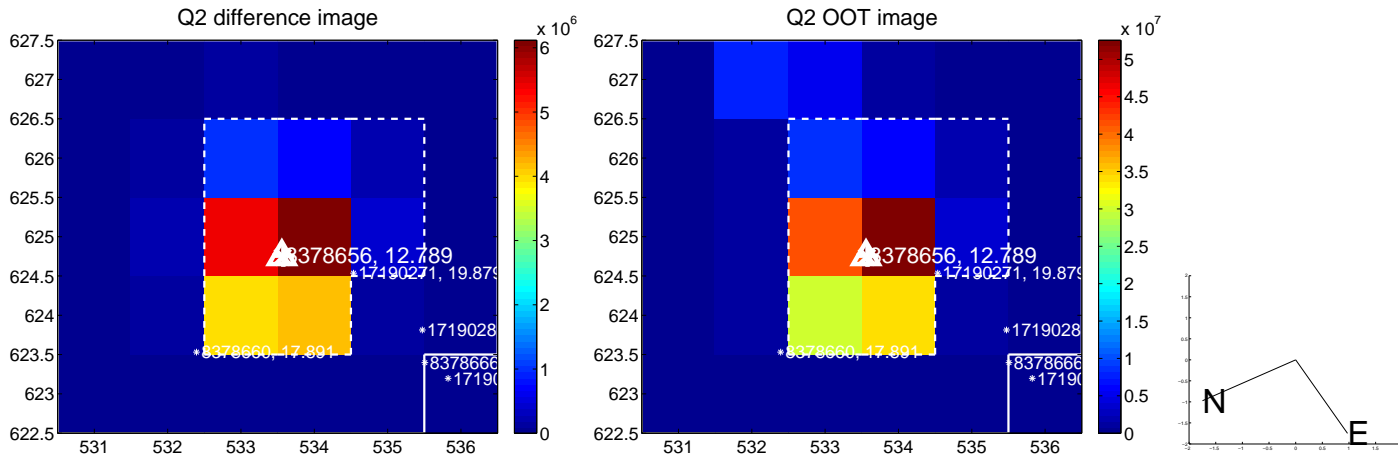
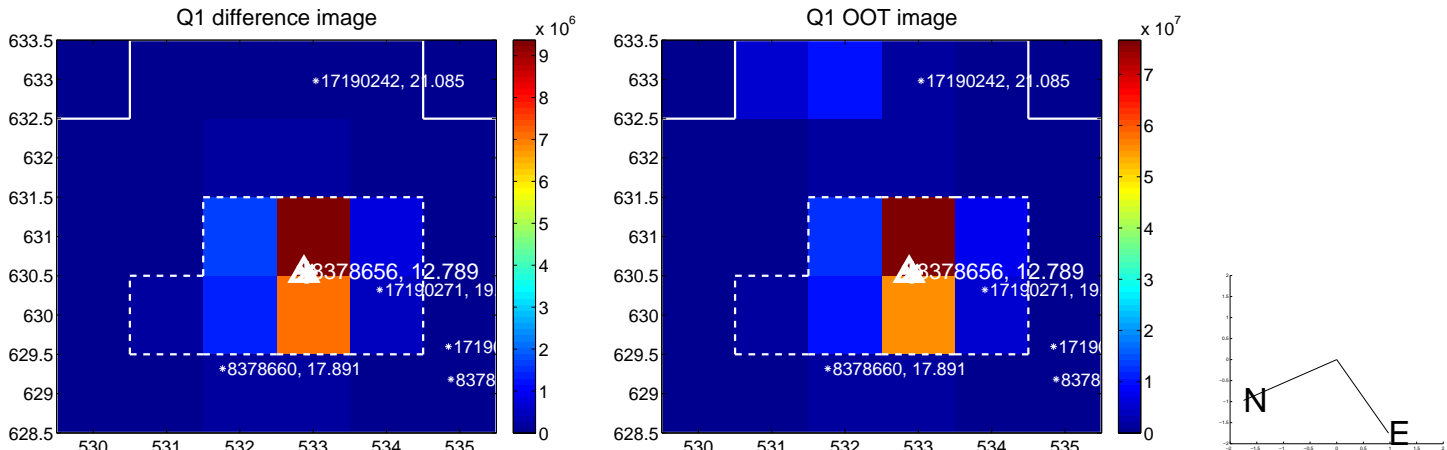
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.114 ± 0.067	1.70	-0.015 ± 0.067	0.113 ± 0.067
PRF-fit source offset from KIC position	0.056 ± 0.067	0.83	-0.023 ± 0.067	0.051 ± 0.067
photometric centroid source offset	0.17 ± 0.00	506.22	-0.12 ± 0.00	0.11 ± 0.00

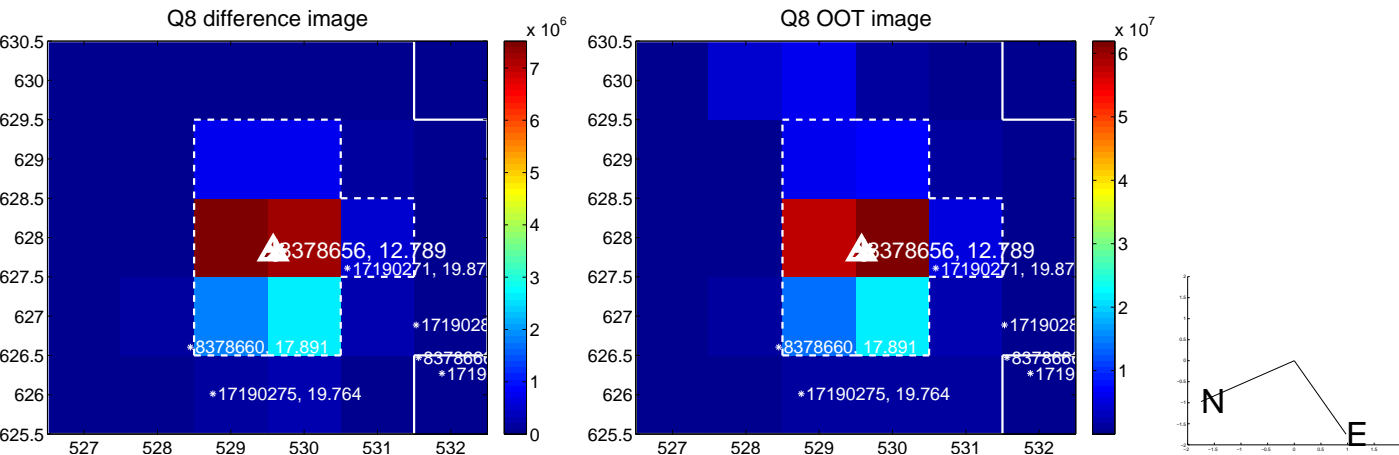
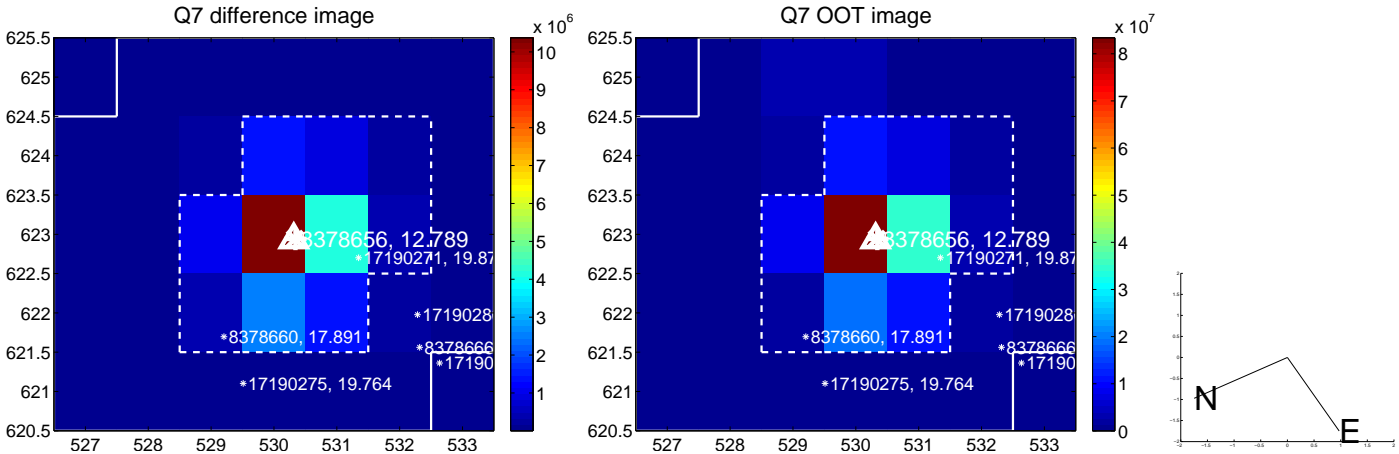
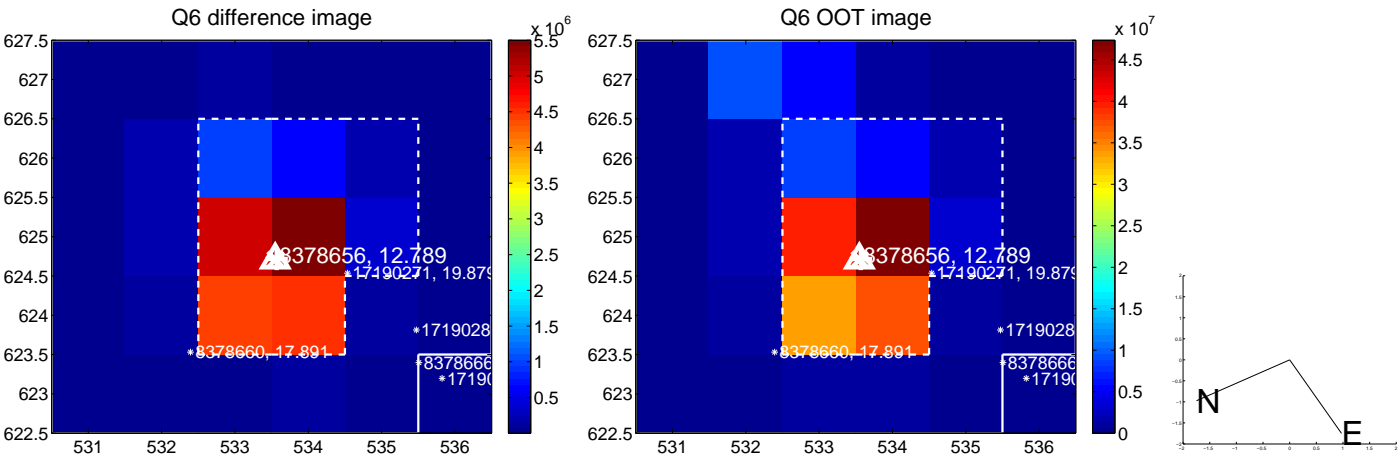
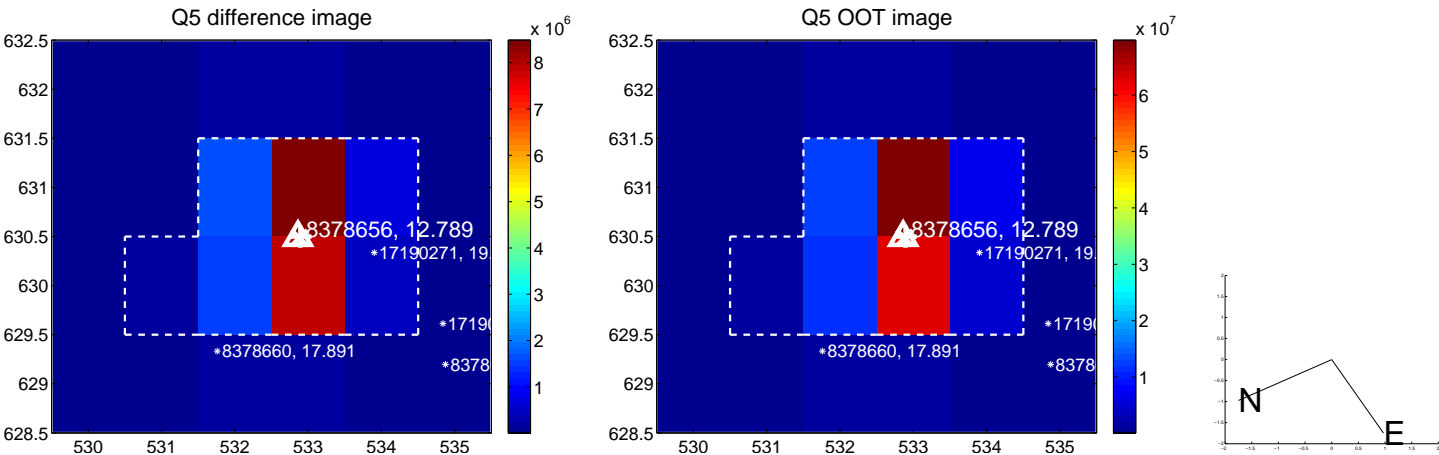


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

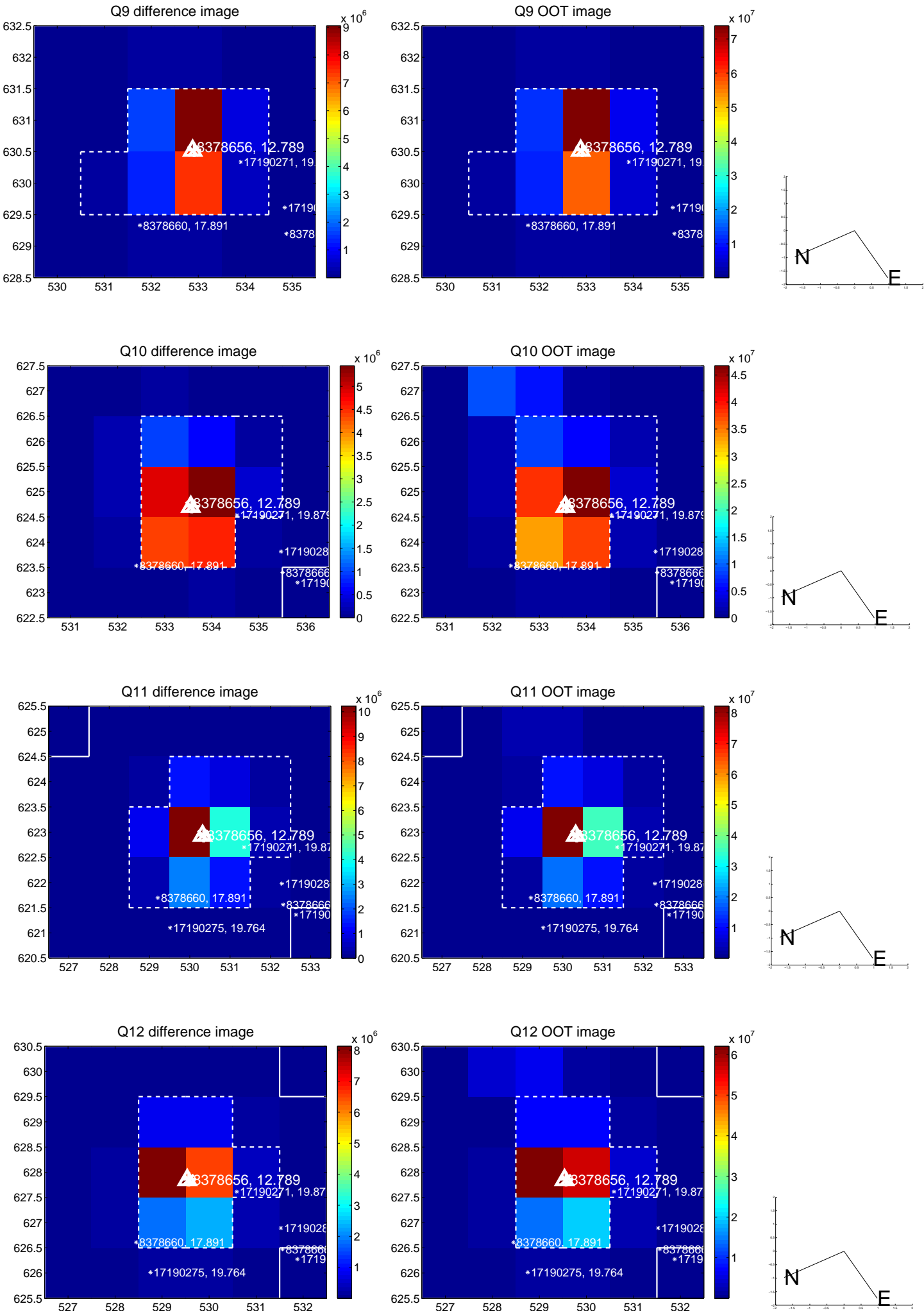
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



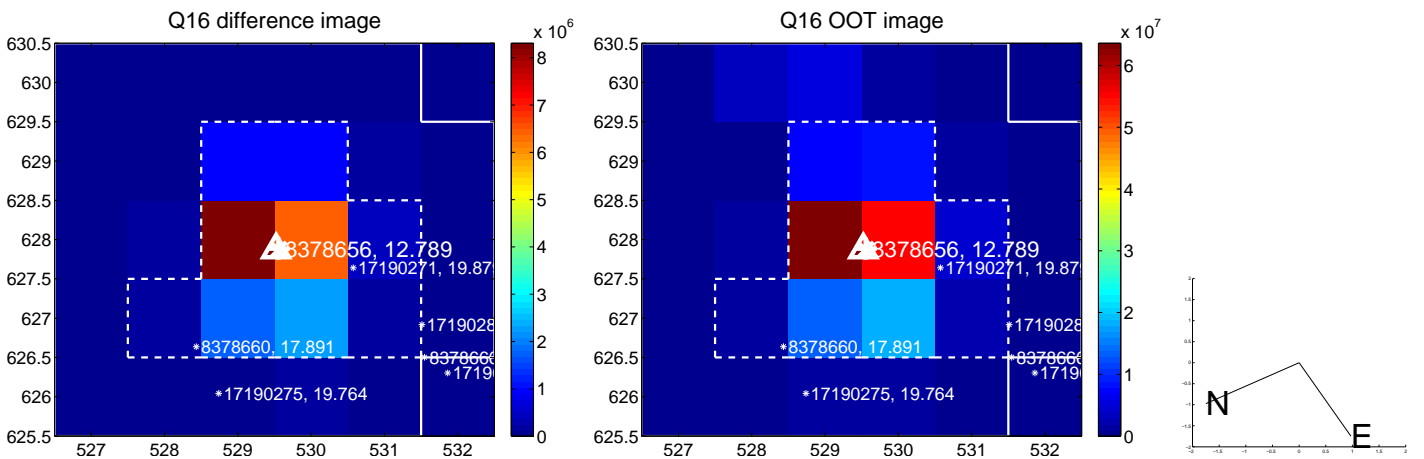
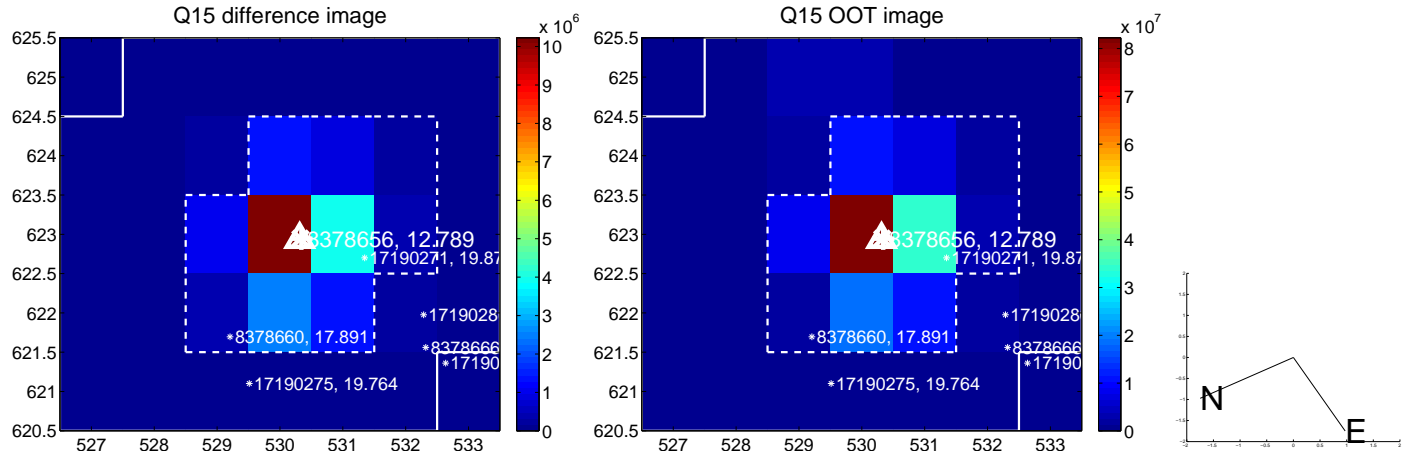
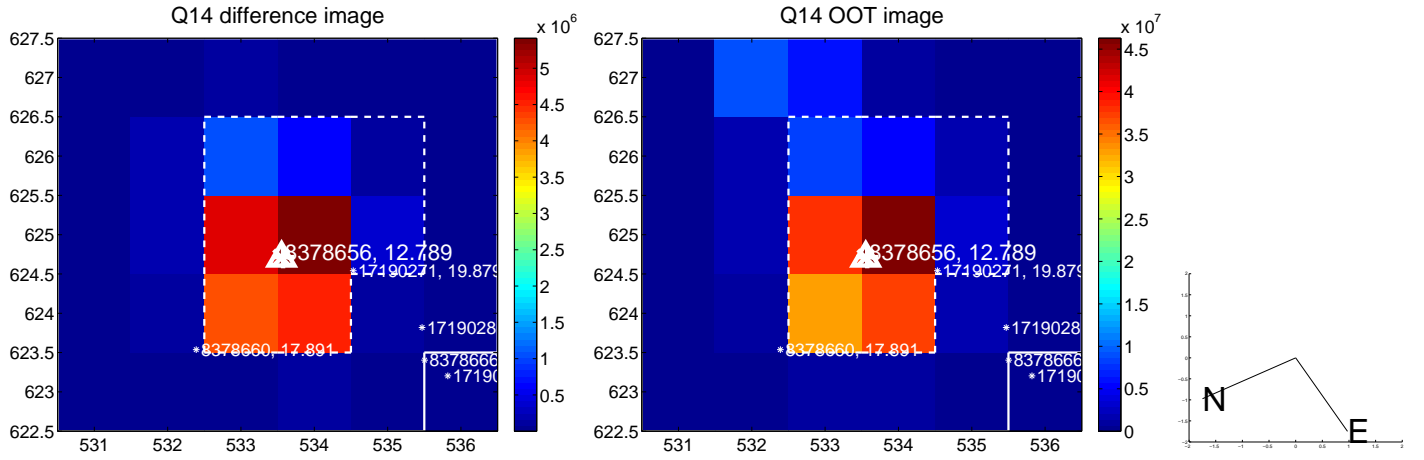
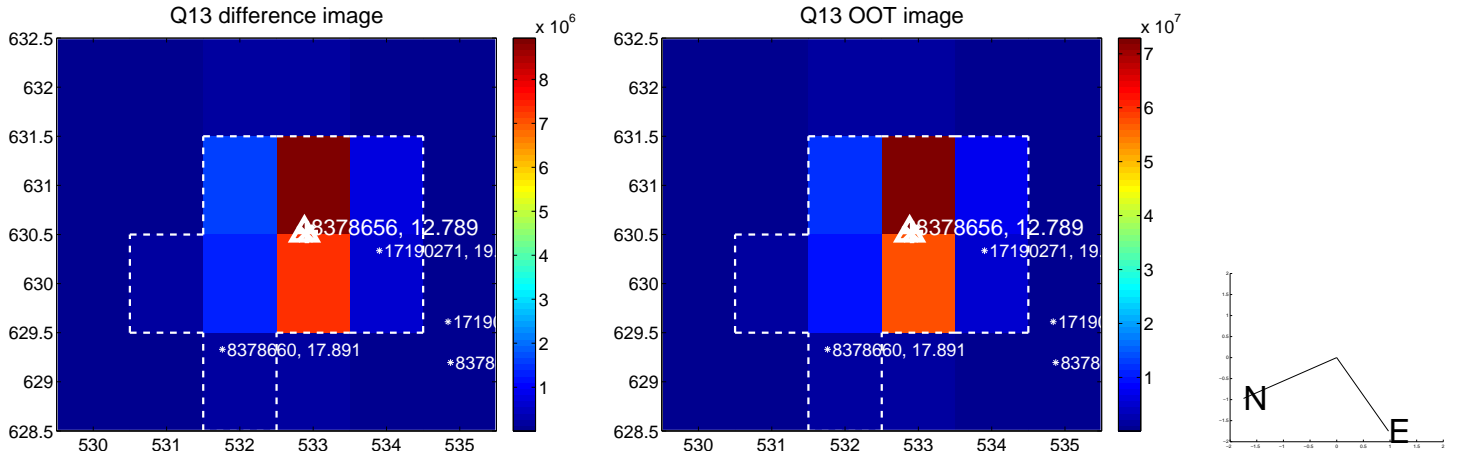
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



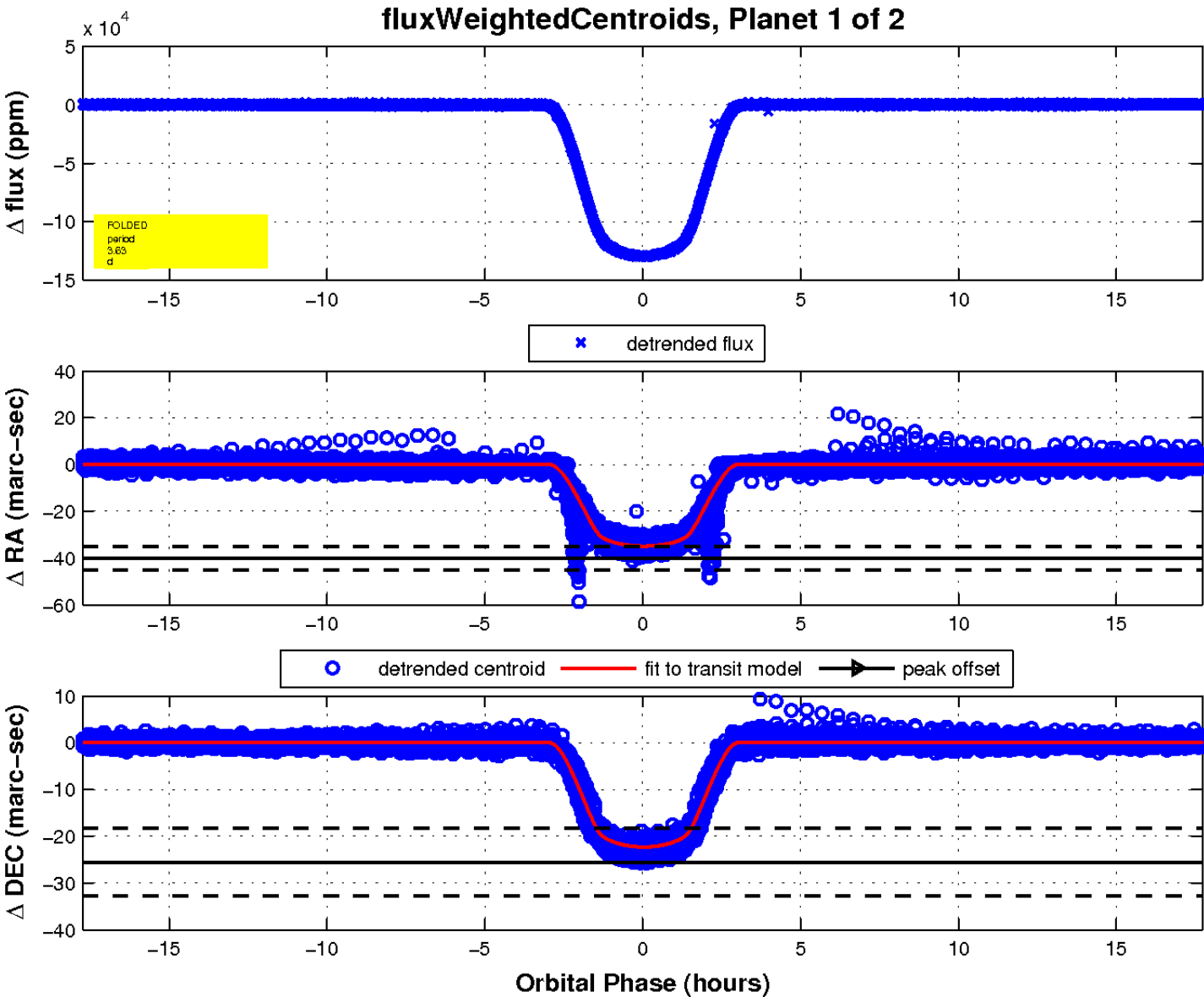
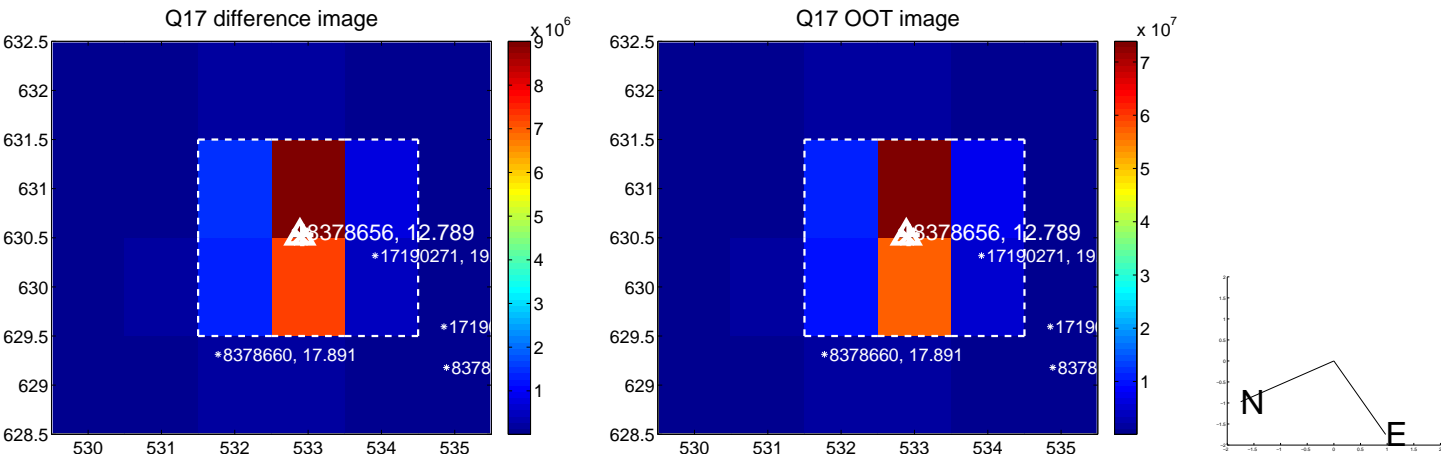
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

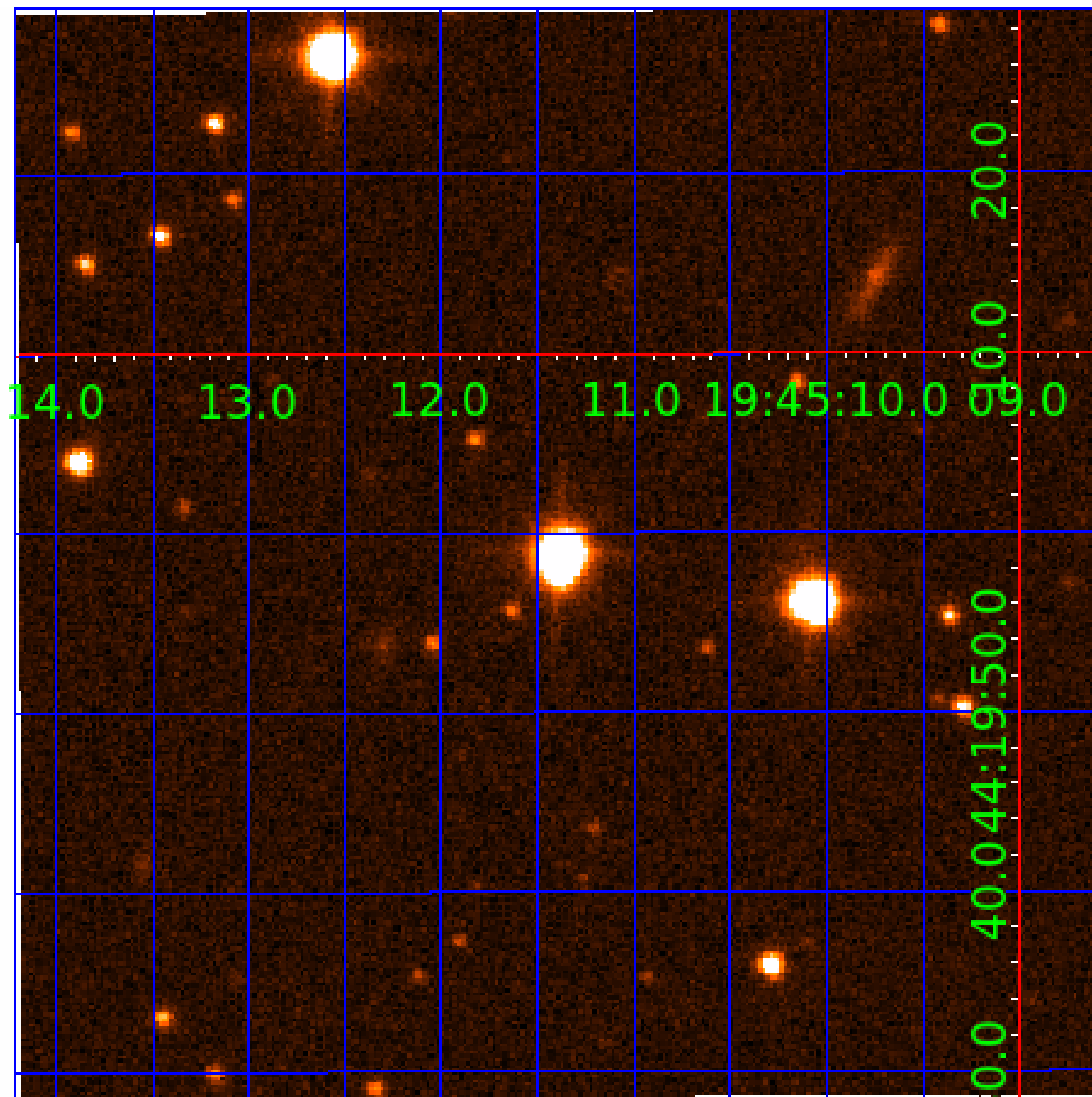


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008378656

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})
008378656-01	OBS	7027.01	3.629440	134.701308	129563.1	5.913	14726.3	13014.2	1.09	6284	39.98	787.89
008378656-02	OBS	No	3.629439	132.916887	31943.9	5.861	3957.3	2696.3	1.09	6284	20.63	787.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008378656-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
008378656-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

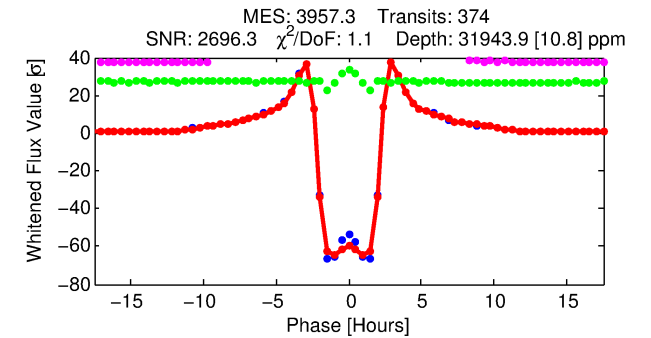
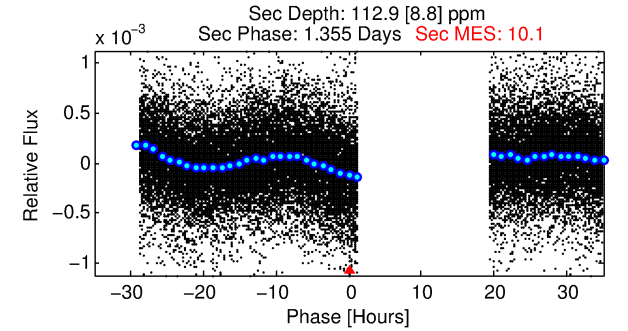
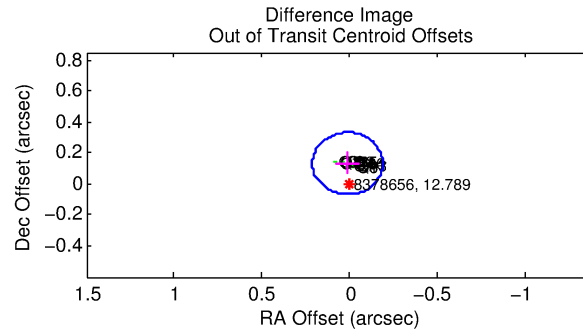
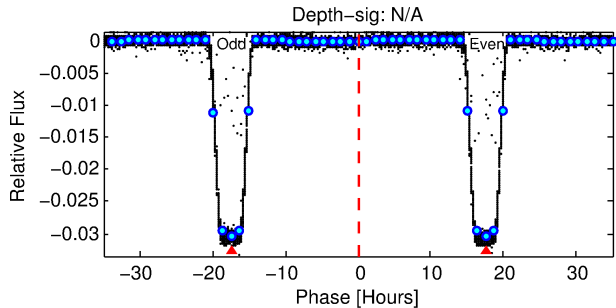
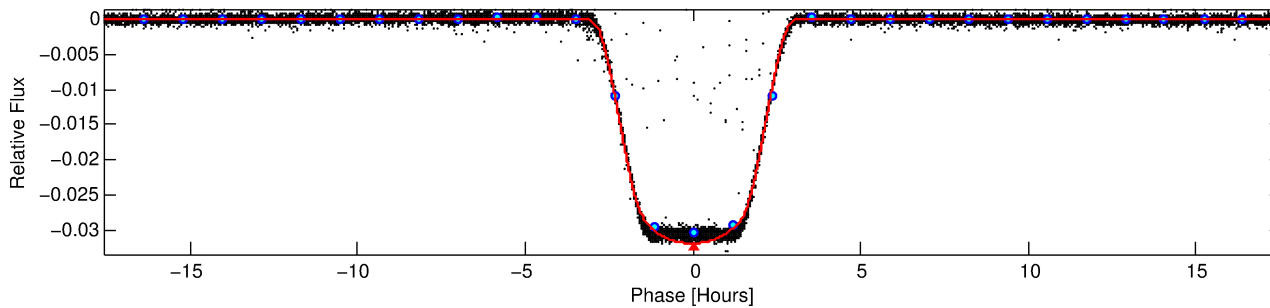
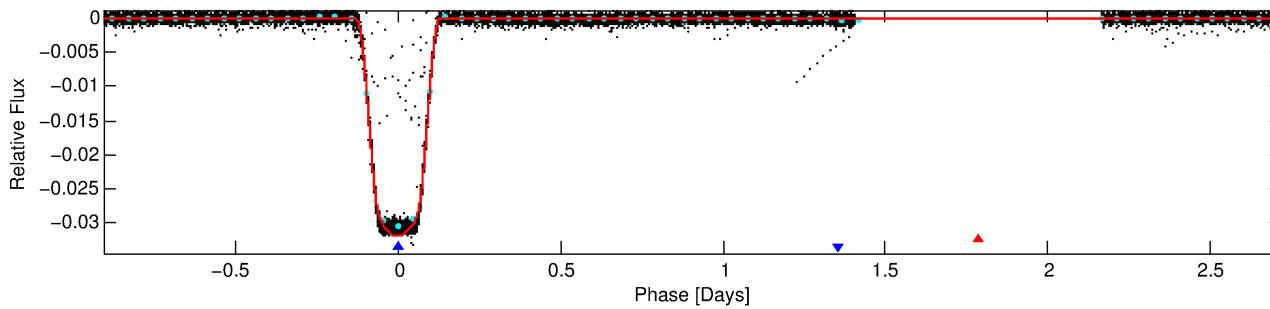
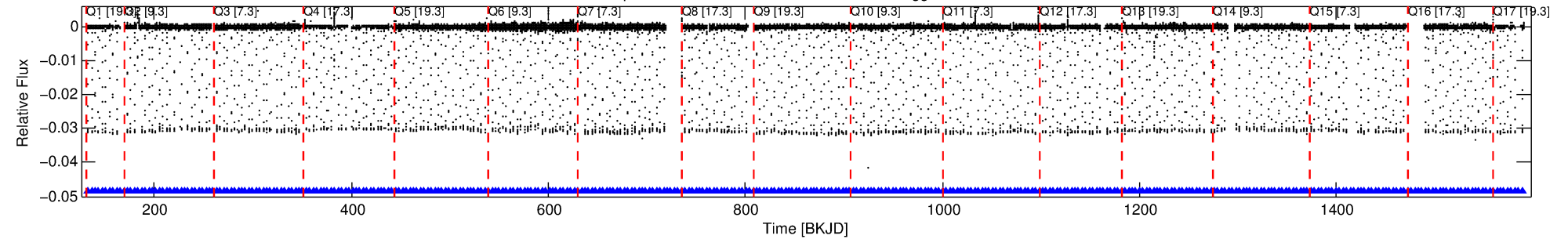
Ephemeris Match Information For 008378656-02

No Significant Match Found

DV One-Page Summary

KIC: 8378656 Candidate: 2 of 2 Period: 3.629 d
KOI: K07027 Corr: No Ephemeris Match

Kp: 12.79 R*: 1.09 Rs Teff: 6284.0 K Logg: 4.36 Fe/H: -0.360



DV Fit Results:

Period = 3.62944 [0.00000] d
Epoch = 132.9169 [0.0000] BKJD
Rp/R* = 0.1730 [0.0000]
a/R* = 4.77 [0.00]
b = 0.63 [0.00]
Seff = 787.89 [290.16]
Teq = 1351 [124] K
Rp = 20.63 [6.17] Re
a = 0.0460 [0.0113] AU
Ag = 0.31 [0.11] [-6.26σ]
Teffp = 1557 [56] K [1.52σ]

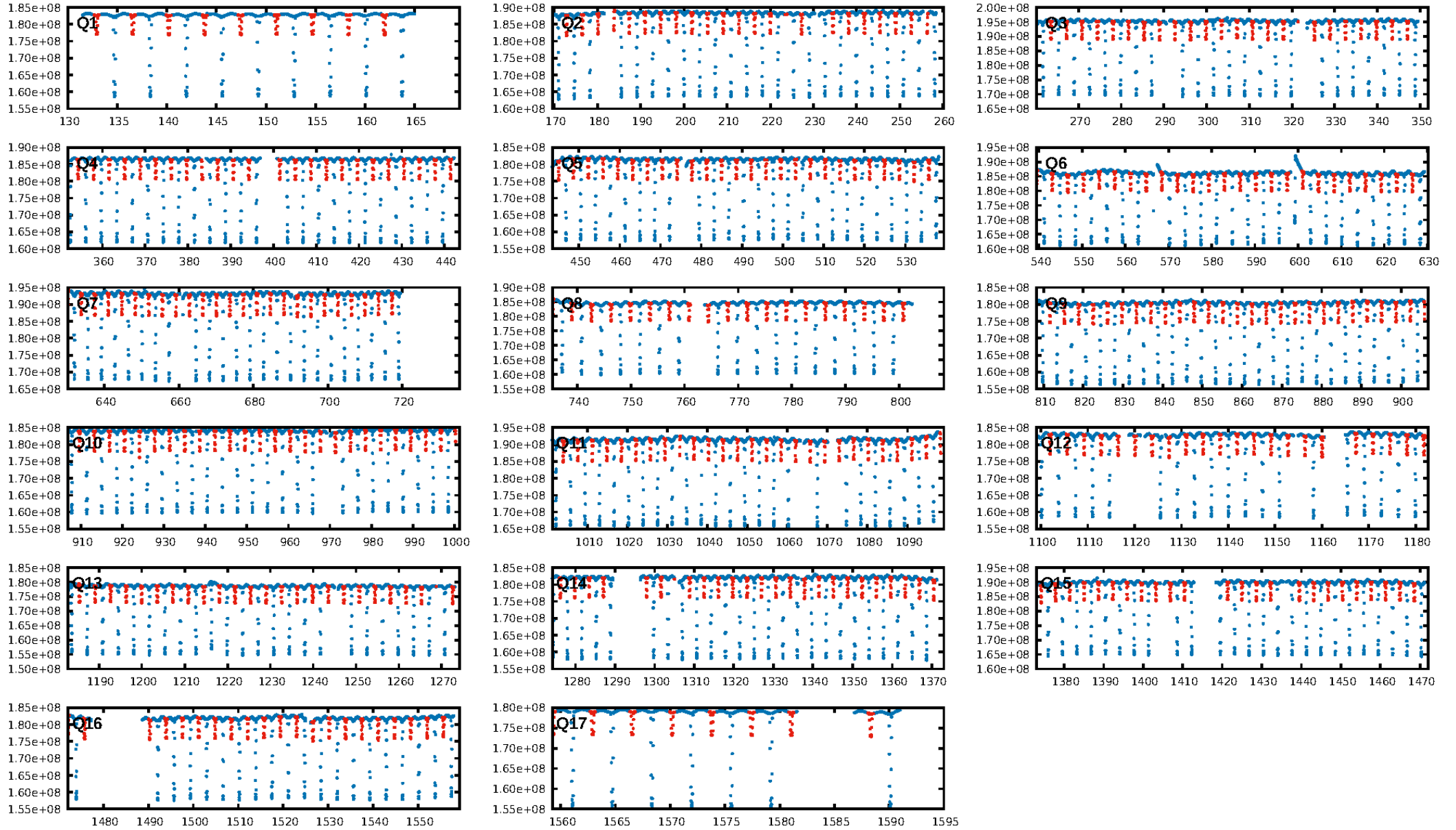
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [357/357]
GhostDiagnostic-chr: 2.897
Centroid-sig: 0.0%
Centroid-so: 0.133 arcsec [124.98σ]
OotOffset-rm: 0.133 arcsec [1.99σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.071 arcsec [1.06σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

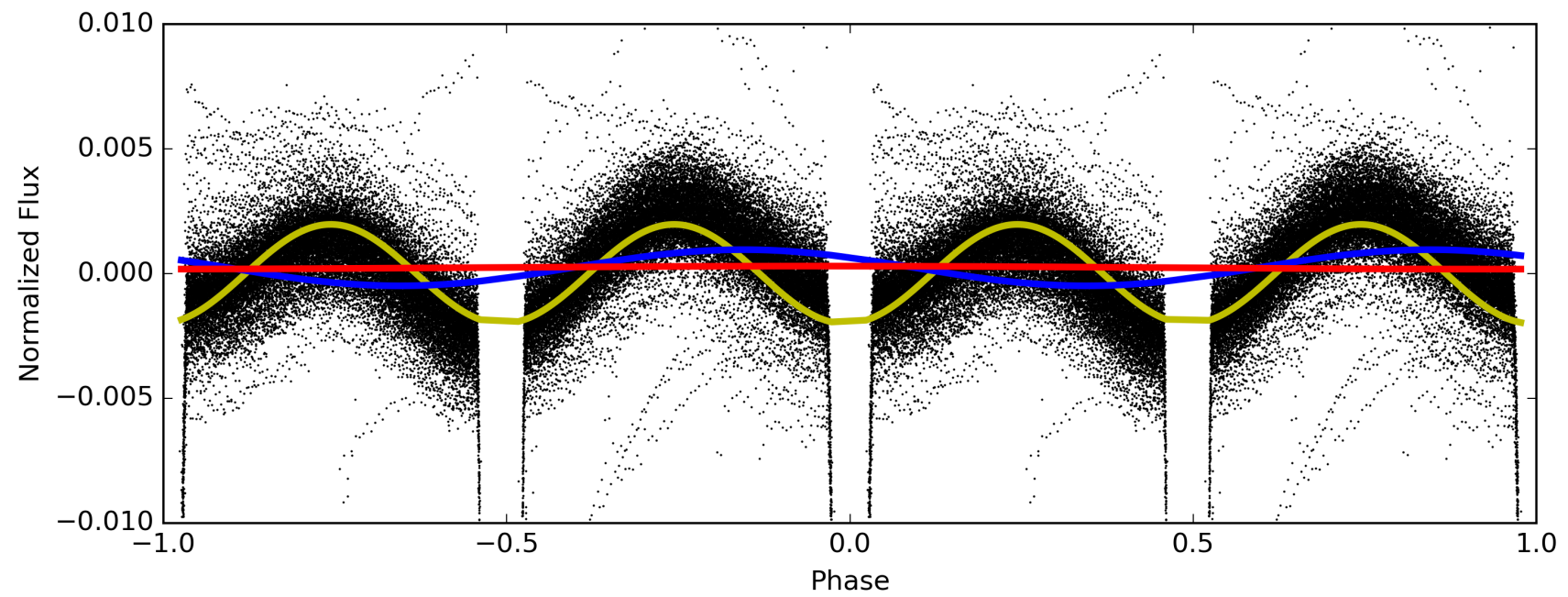
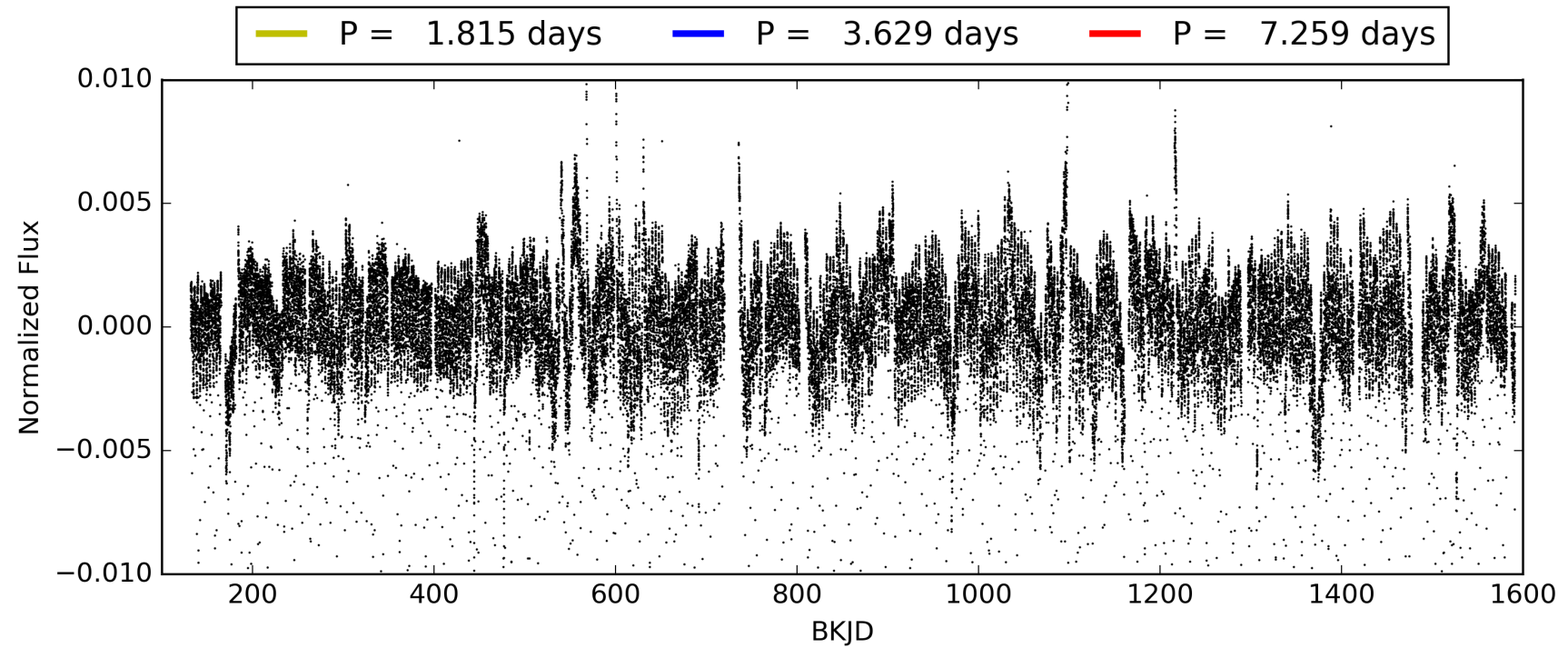
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008378656-02, PDC Light Curves

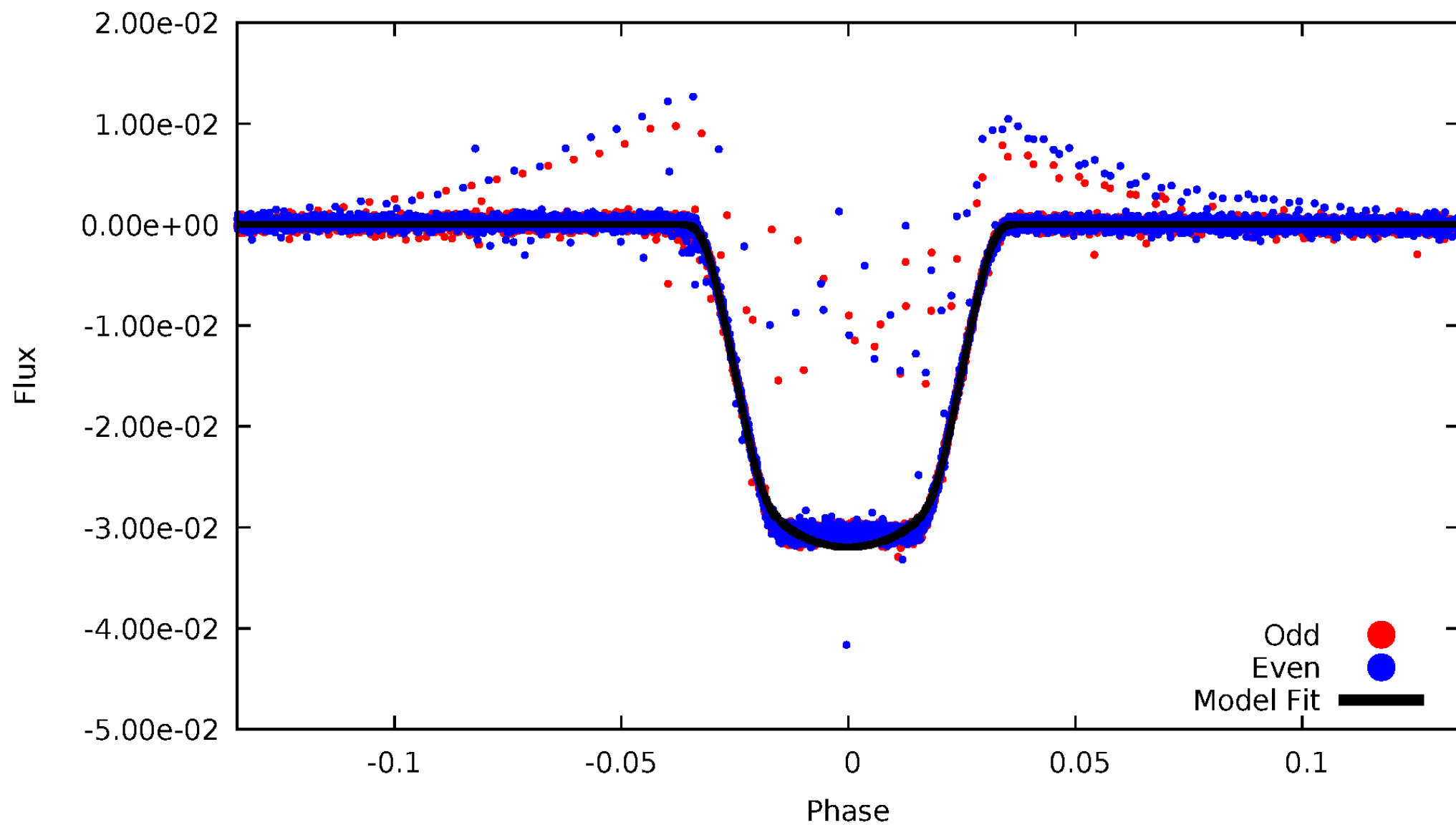


TCE 008378656-02



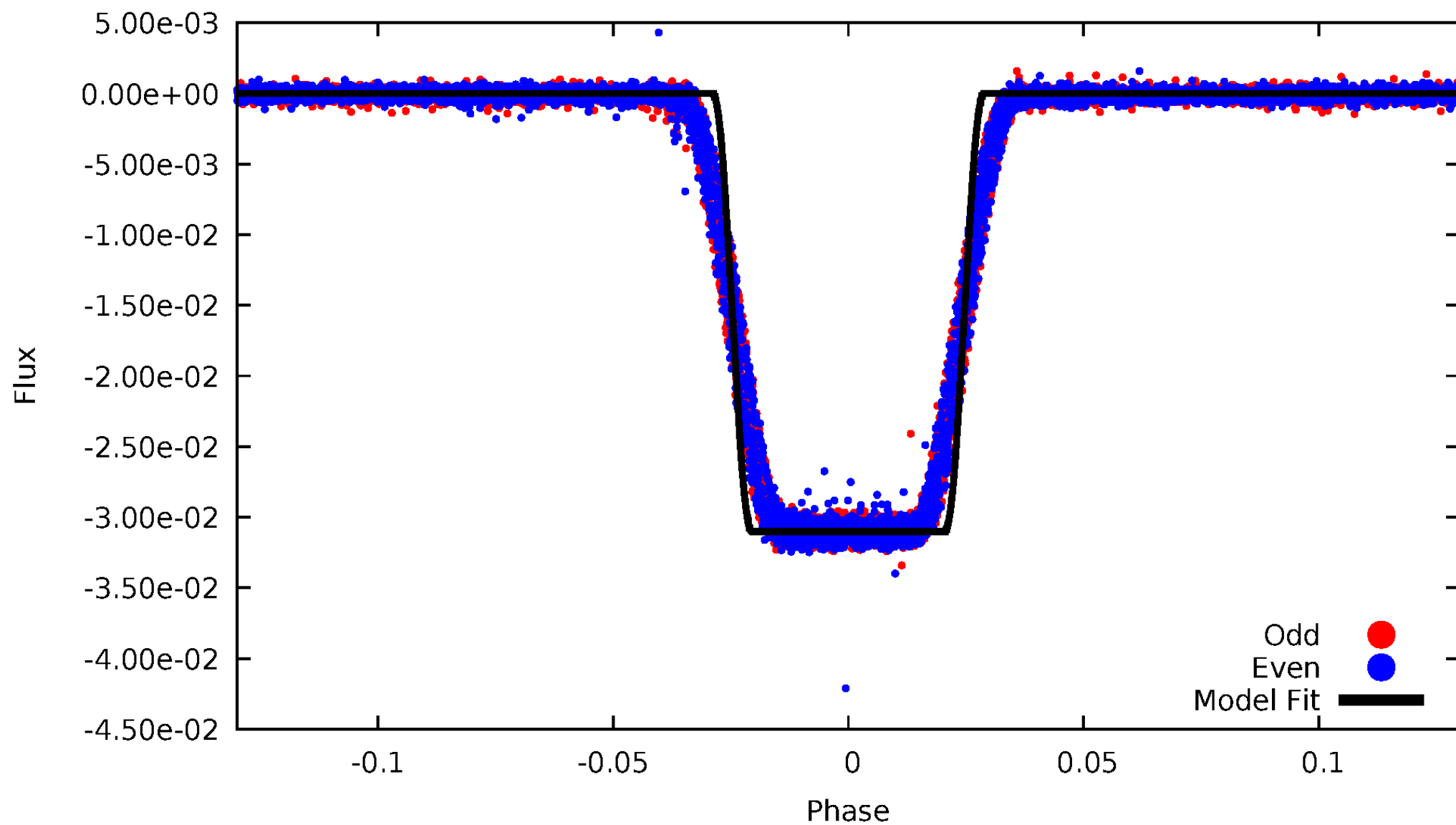
DV Odd/Even

TCE 008378656-02



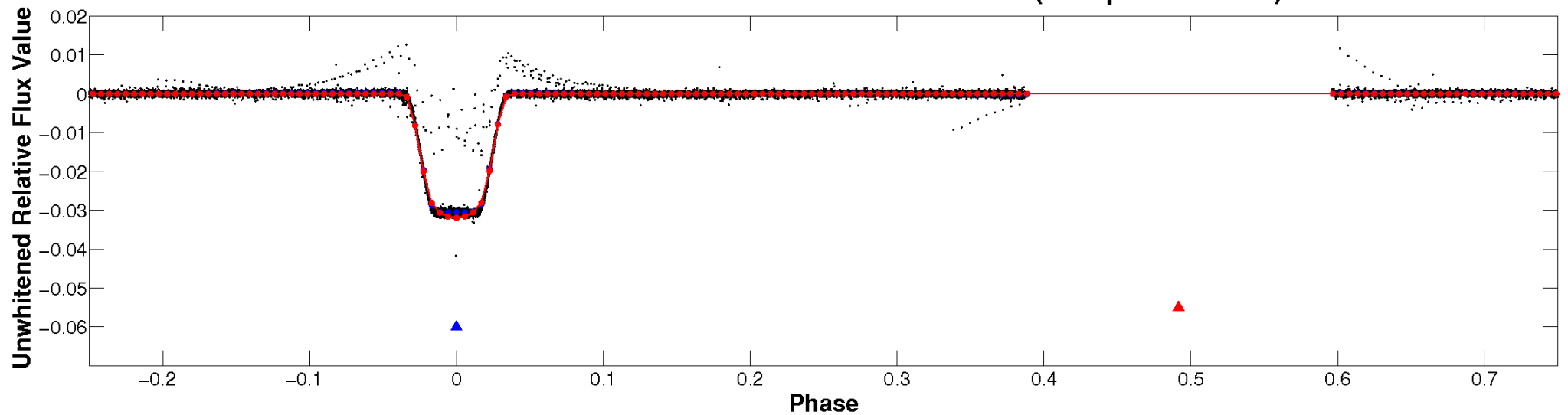
ALT Odd/Even

TCE 008378656-02

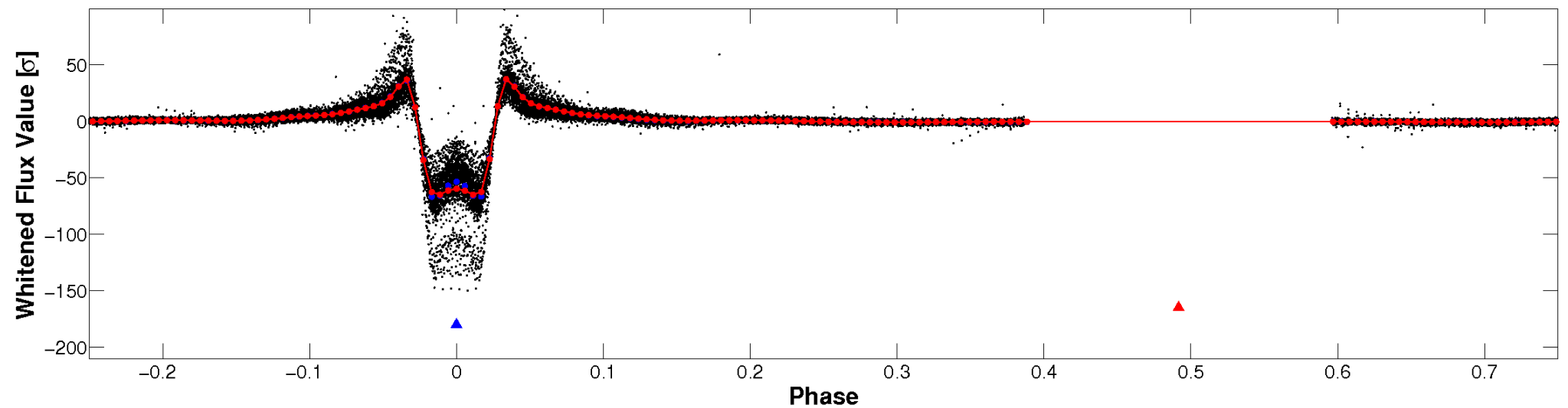


Non-Whitened Vs. Whitened Light Curve

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

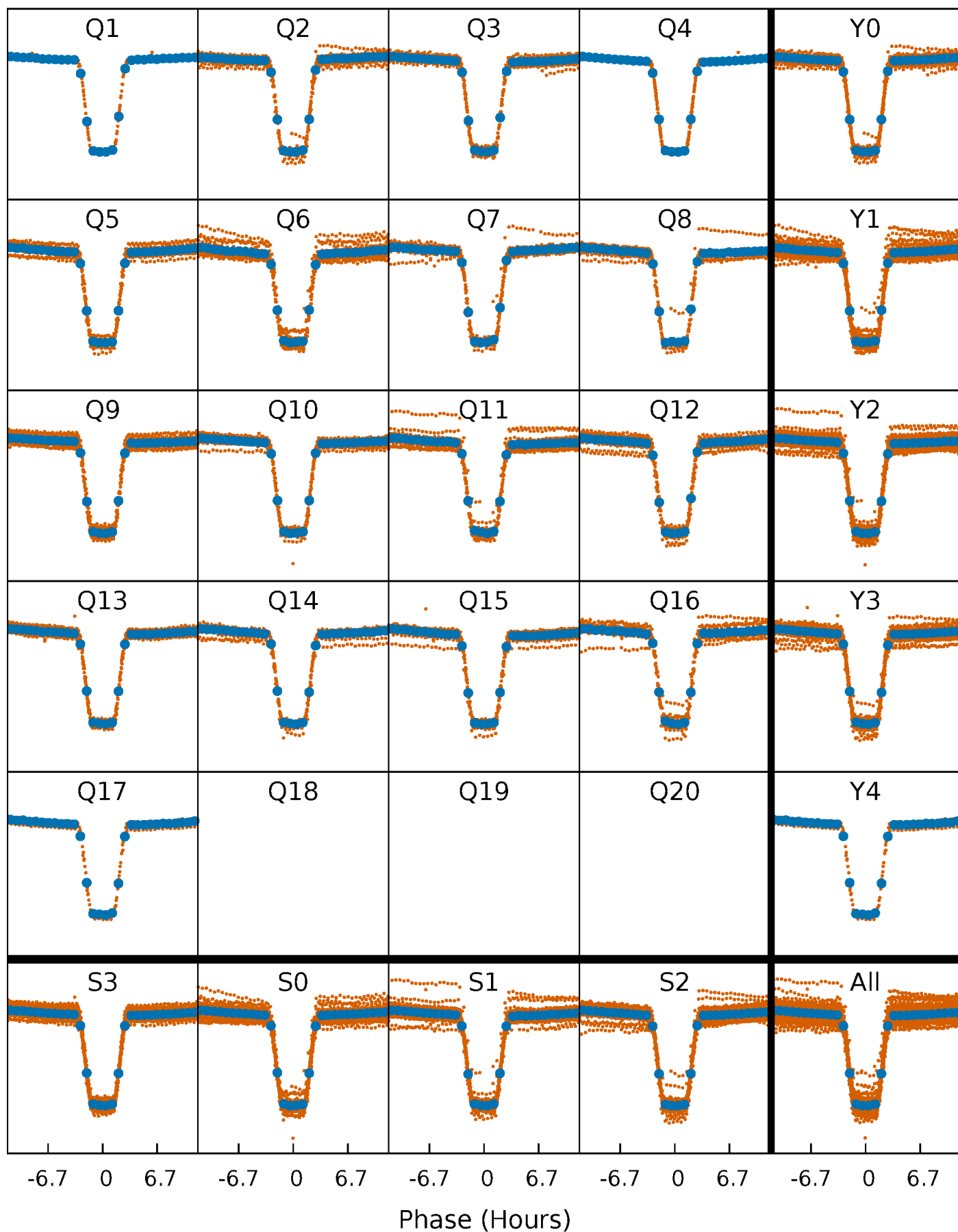


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



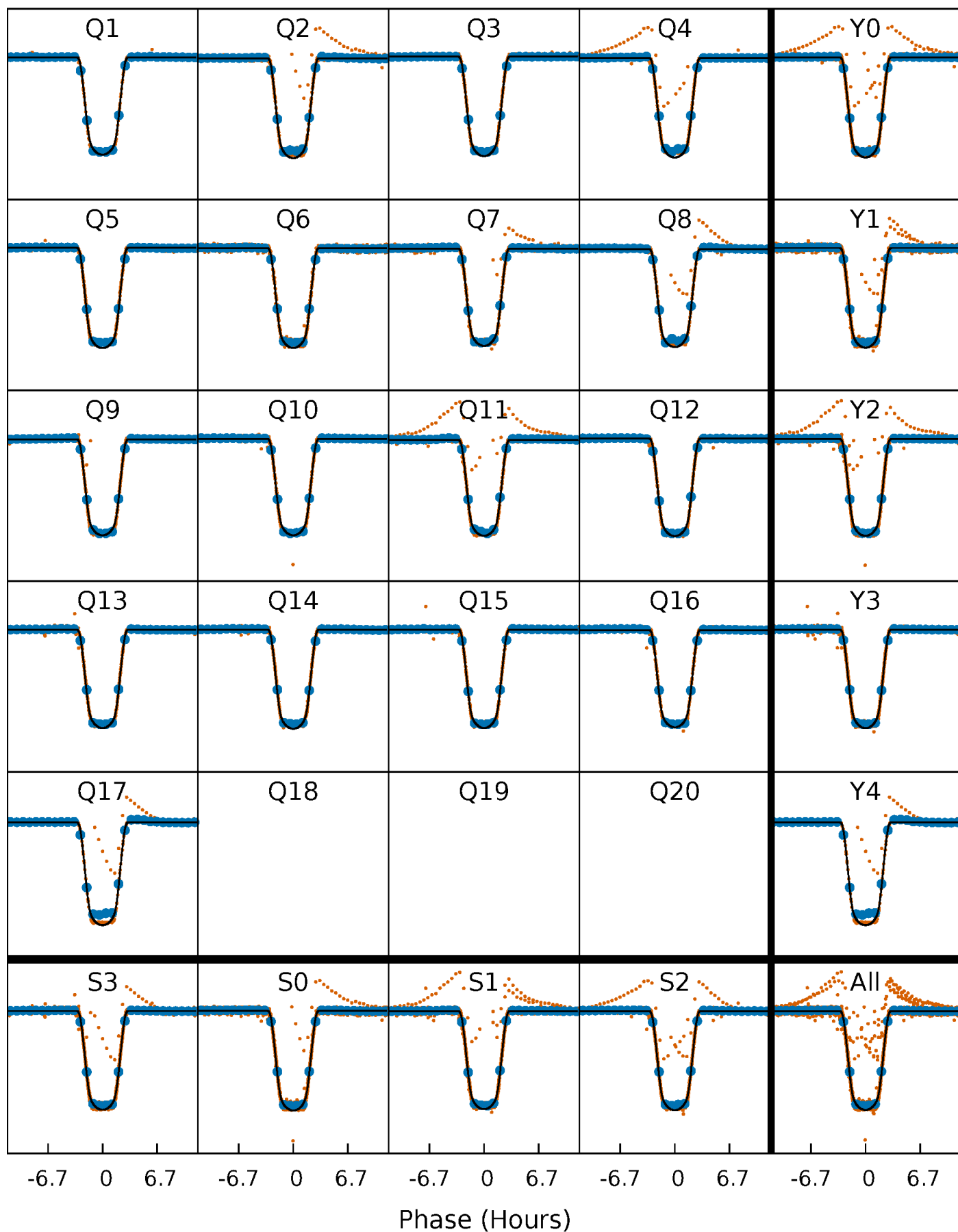
PDC Quarter-Phased Transit Curves

TCE 008378656-02 $P = 3.629439$ Days $T_0 = 132.916887$ (BKJD)



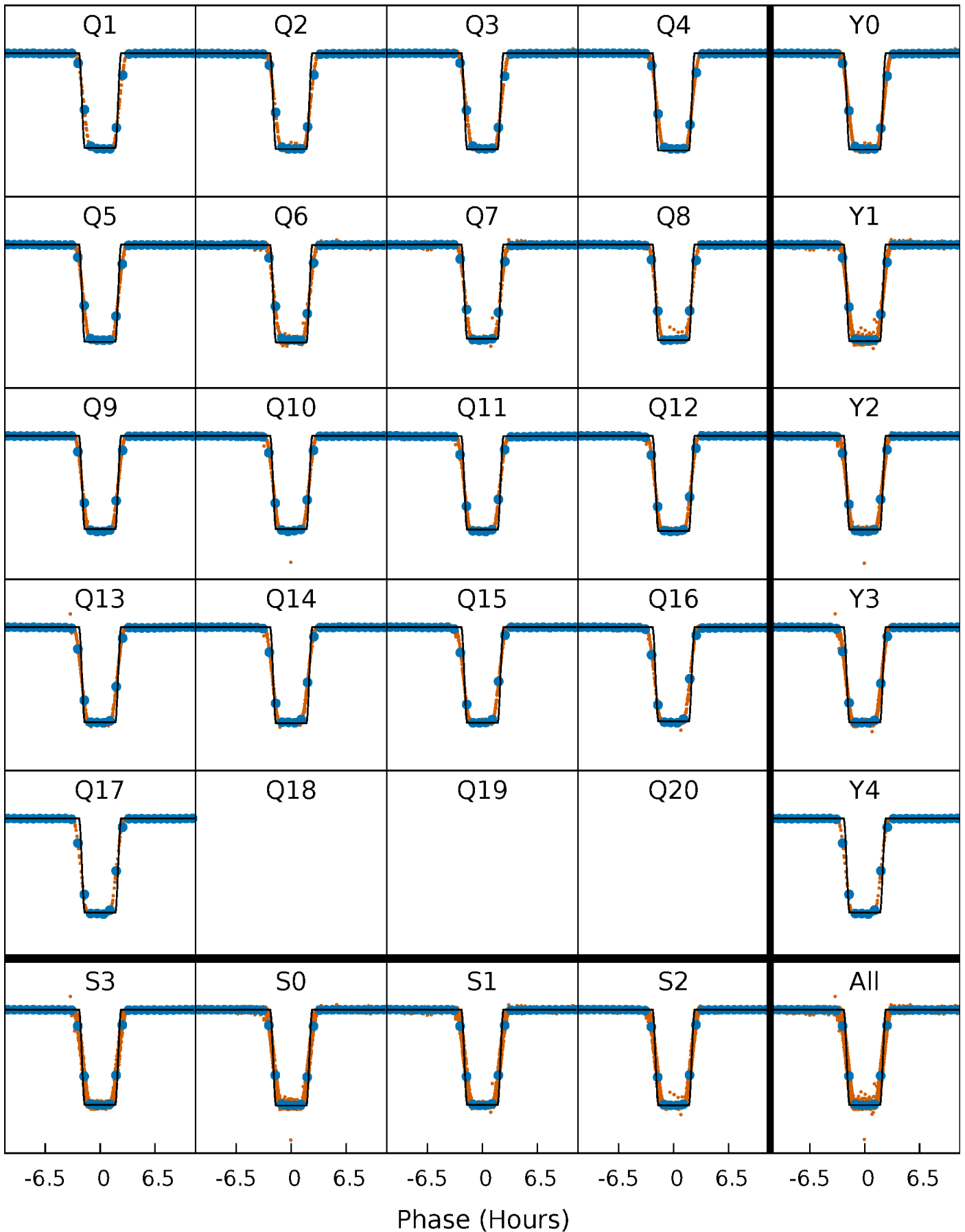
DV Quarter-Phased Transit Curves

TCE 008378656-02 P= 3.629439 Days $T_0=132.916887$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

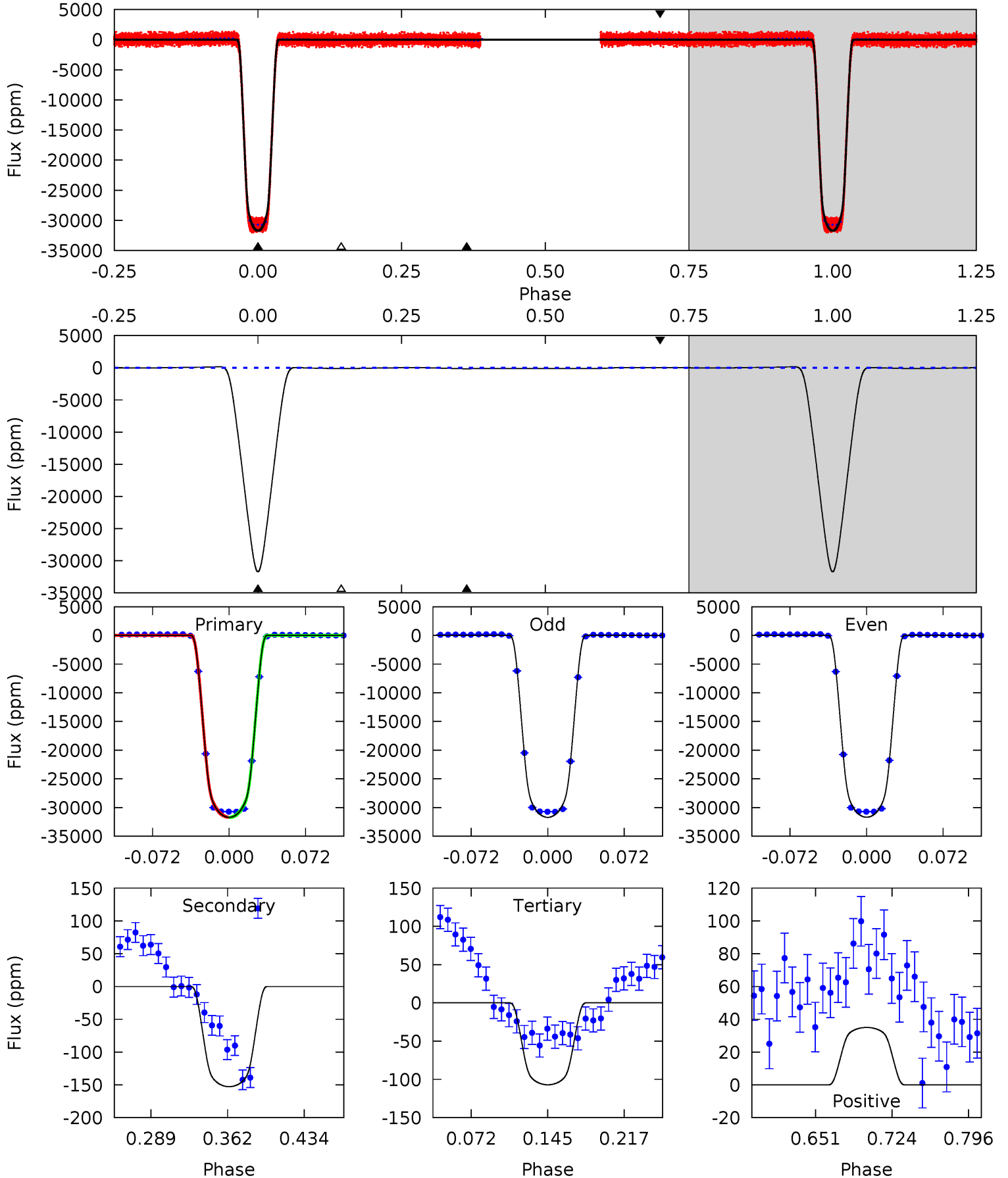
TCE 008378656-02 $P = 3.629476$ Days $T_0 = 132.909431$ (BKJD)



DV Model-Shift Uniqueness Test

008378656-02, P = 3.629439 Days, E = 129.287448 Days

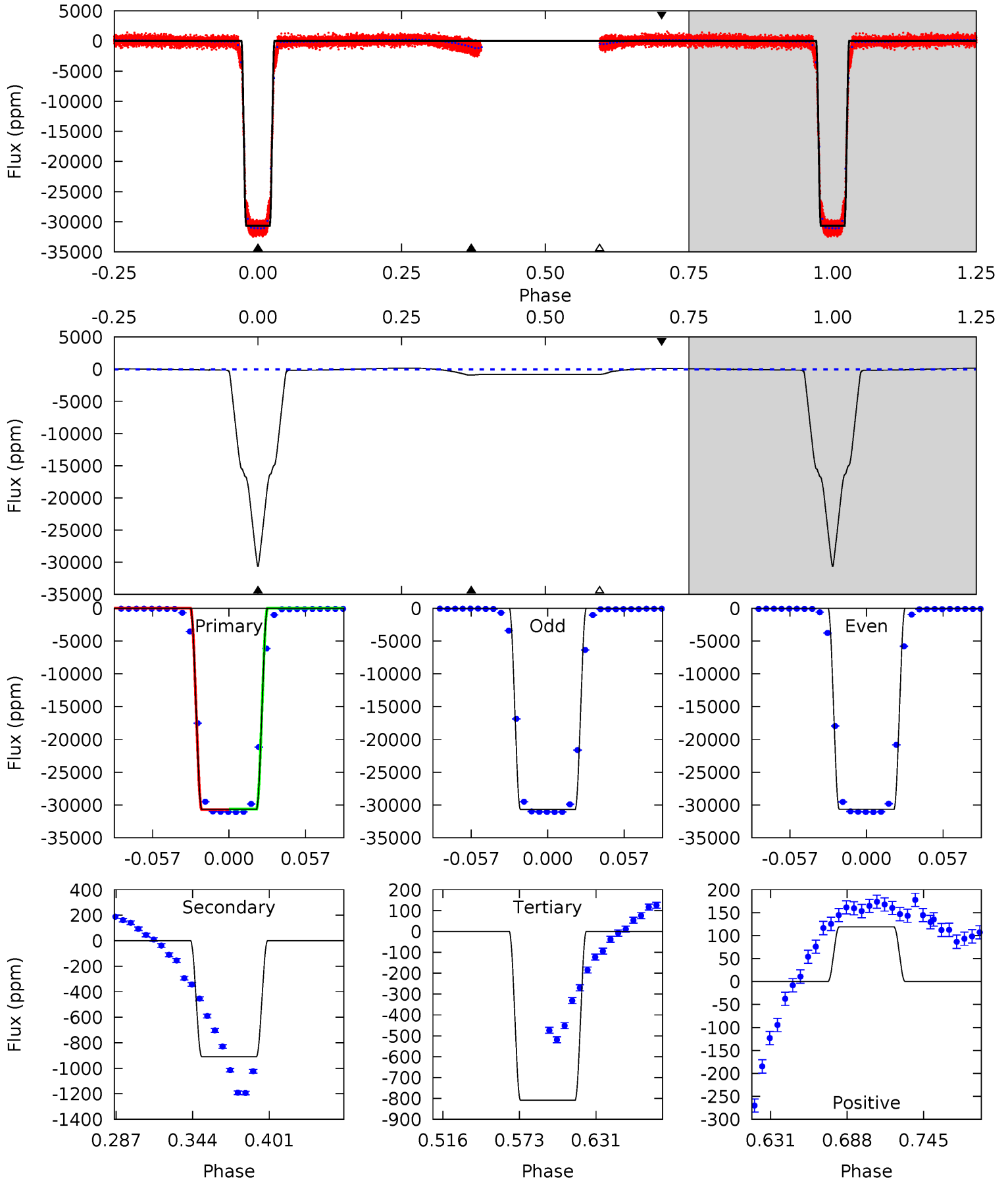
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6719	32.4	22.7	7.42	4.63	1.80	11.5	6696	6712	9.68	25.0	1.94	0.98	0.00	4.44



Alt Model-Shift Uniqueness Test

008378656-02, P = 3.629476 Days, E = 129.279955 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4910	145.6	129.4	19.1	4.68	1.90	24.4	4781	4891	16.2	126.5	1.70	1.00	0.01	7.68



Stellar Parameters For KIC 008378656

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6284^{+169}_{-188}	$4.355^{+0.108}_{-0.186}$	$-0.360^{+0.300}_{-0.300}$	$1.093^{+0.327}_{-0.176}$	$0.986^{+0.160}_{-0.107}$	$1.062^{+0.611}_{-0.527}$
	+3%/-3%	+2%/-4%	+83%/-83%	+30%/-16%	+16%/-11%	+58%/-50%
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 008378656-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-153 ± 5	$20.85^{+3.73}_{-1.81}$	1900^{+152}_{-104}	2159^{+104}_{-448}	$0.407^{+0.084}_{-0.099}$
Alt.	-909 ± 6	$21.28^{+3.59}_{-1.87}$	1909^{+142}_{-105}	3131^{+54}_{-60}	$2.317^{+0.462}_{-0.555}$

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

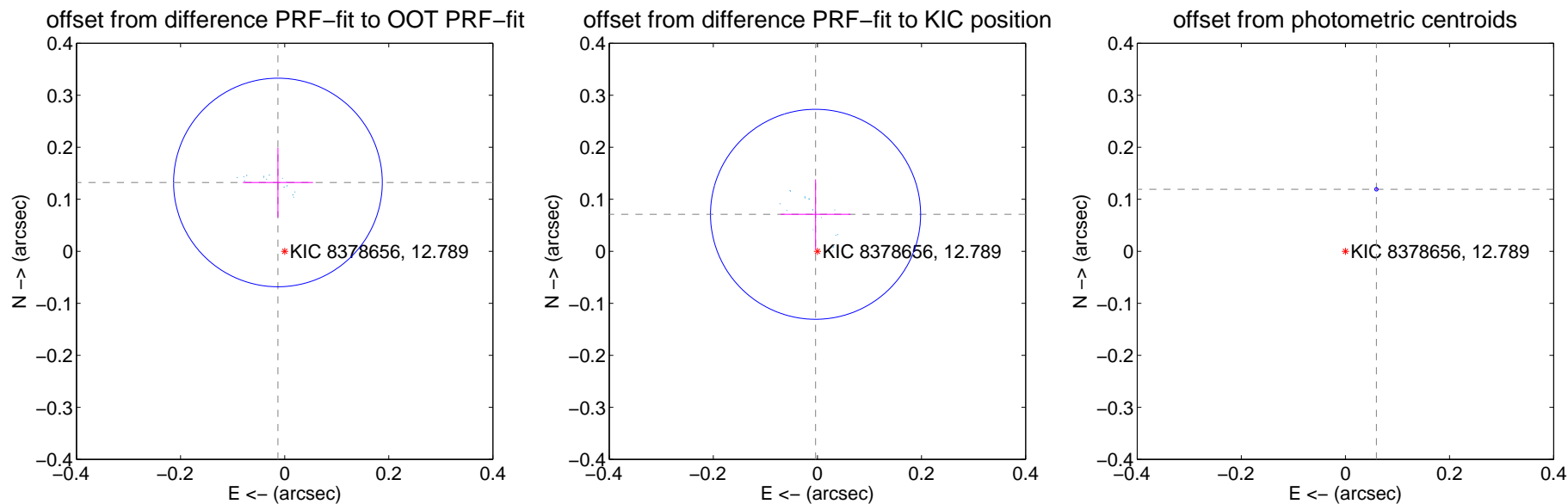
DV Centroid Data

Supplemental centroid analysis for 008378656-02. Kepler magnitude: 12.79. Transit SNR 2696.31

There are 17 quarters with good PRF difference image offsets

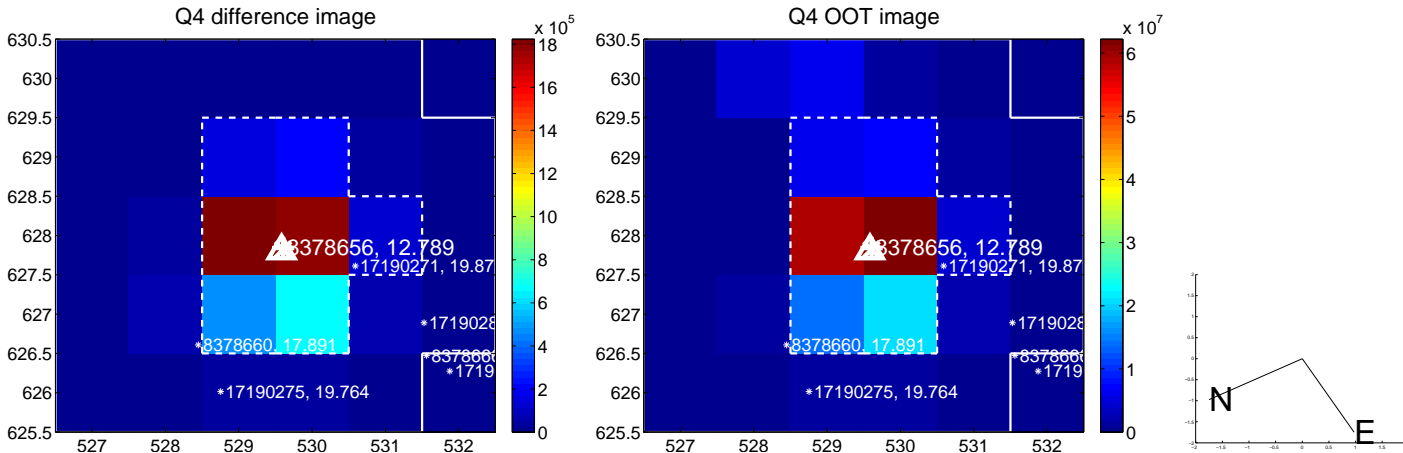
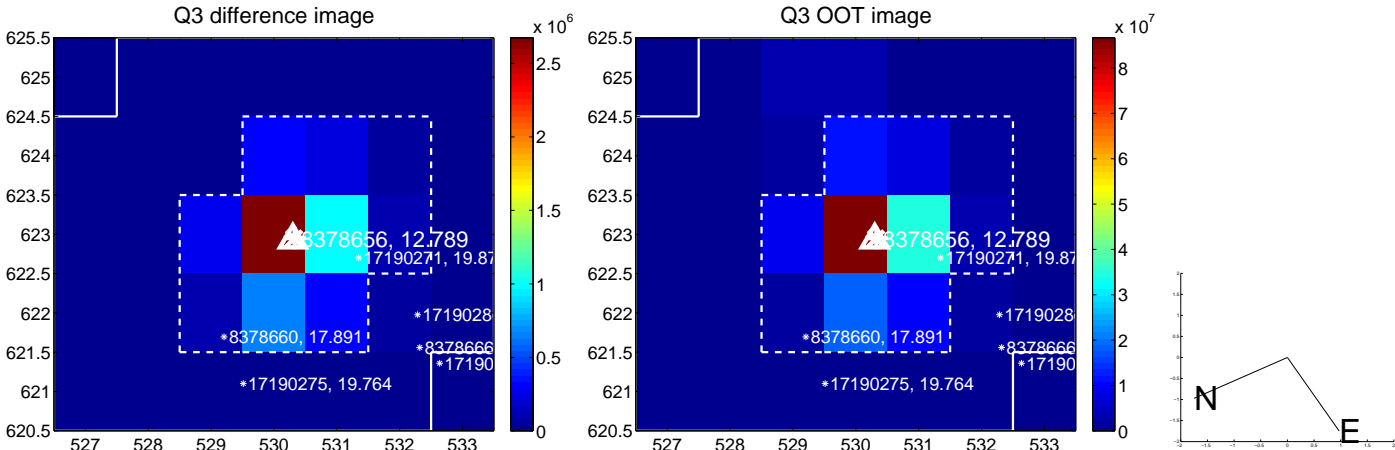
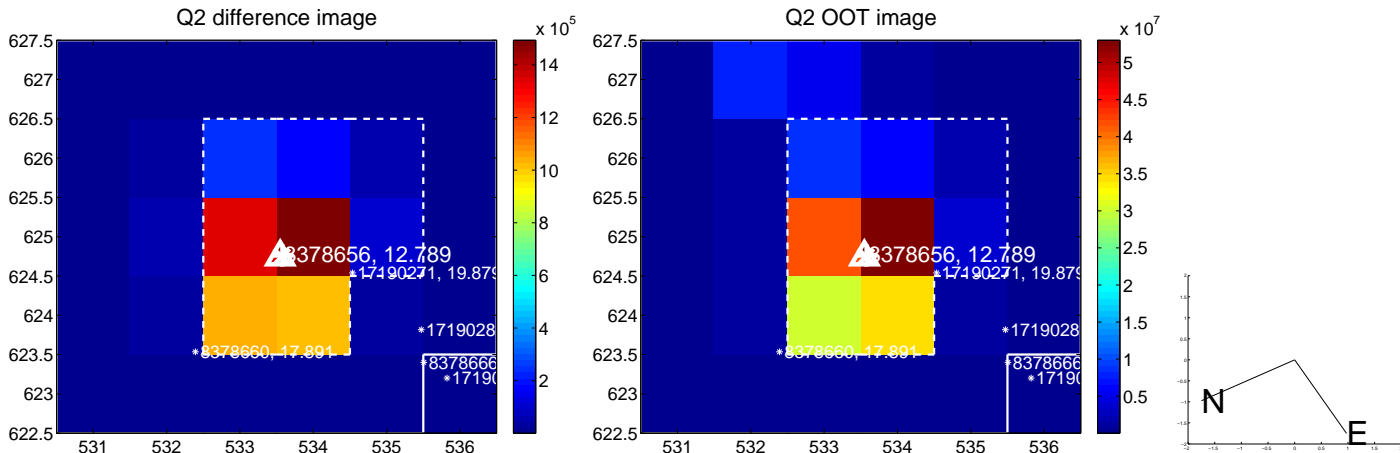
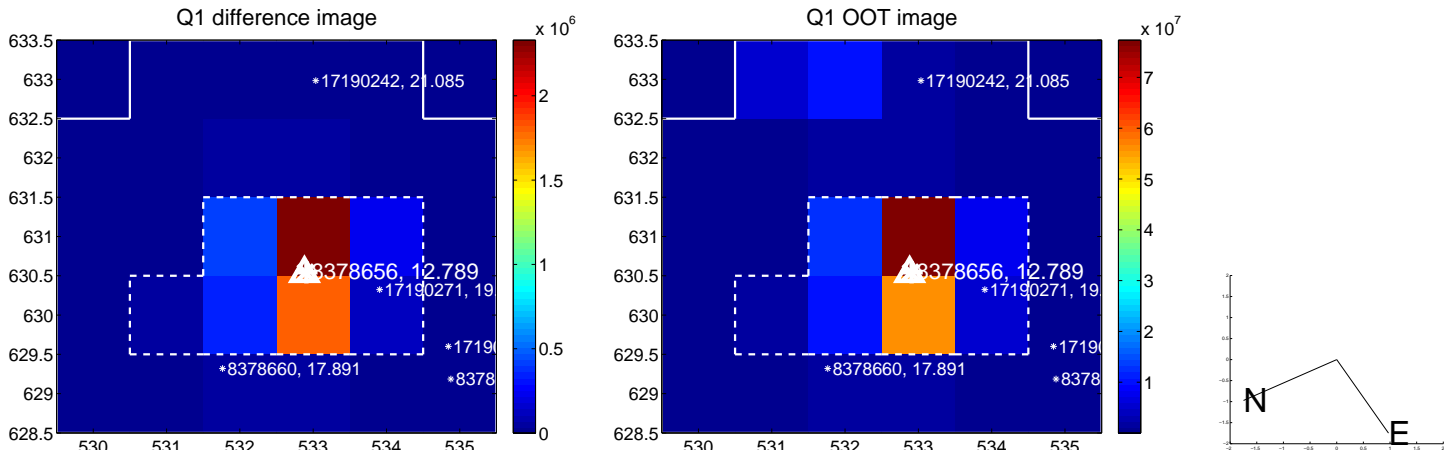
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.133 ± 0.067	1.99	0.013 ± 0.067	0.132 ± 0.067
PRF-fit source offset from KIC position	0.071 ± 0.067	1.06	0.004 ± 0.067	0.071 ± 0.067
photometric centroid source offset	0.13 ± 0.00	124.98	-0.06 ± 0.00	0.12 ± 0.00

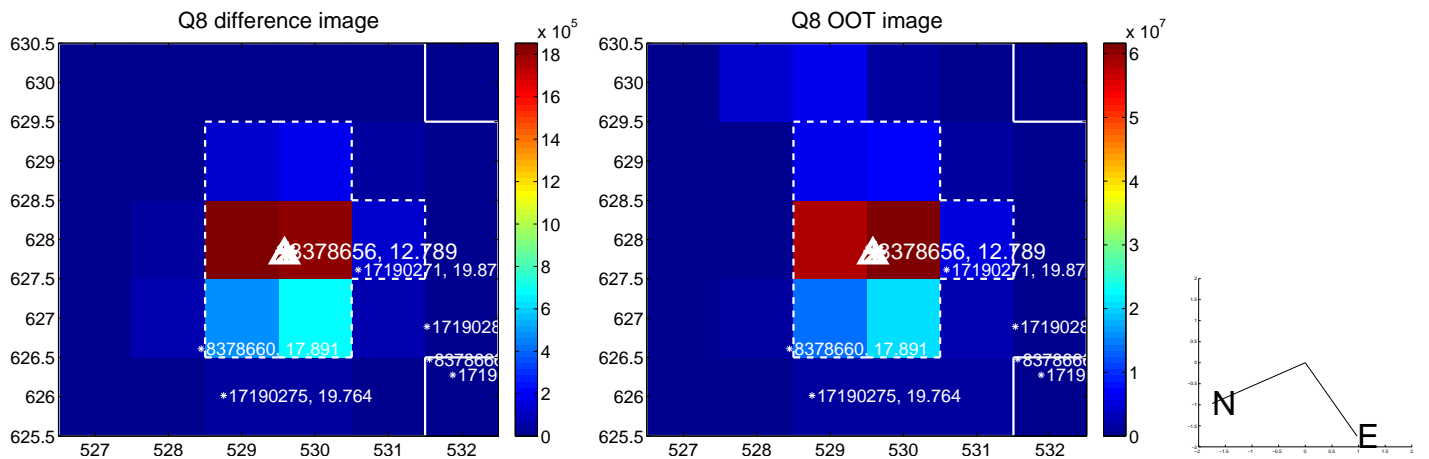
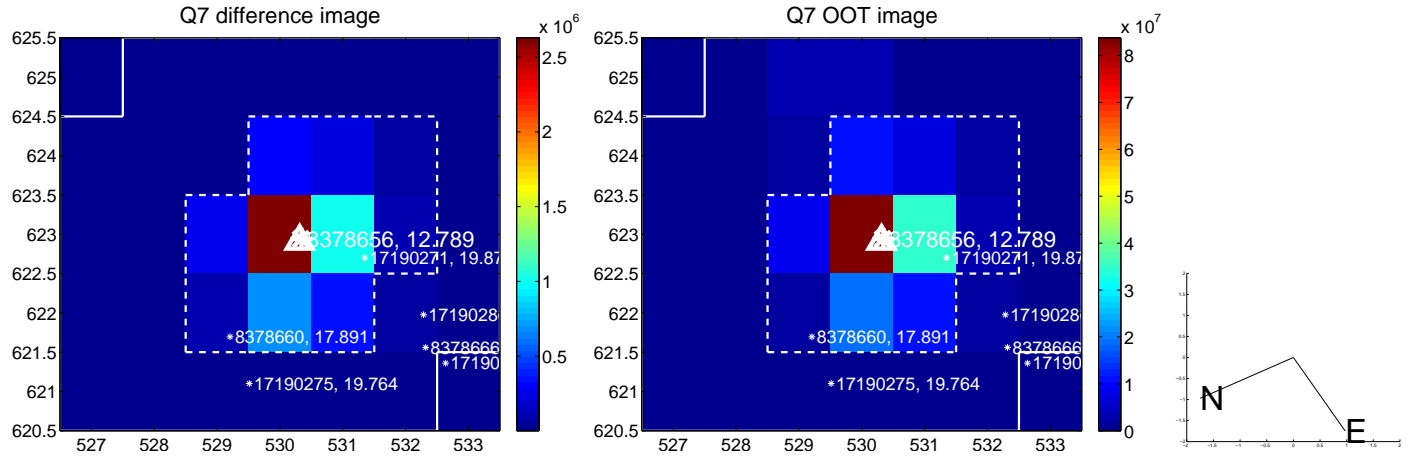
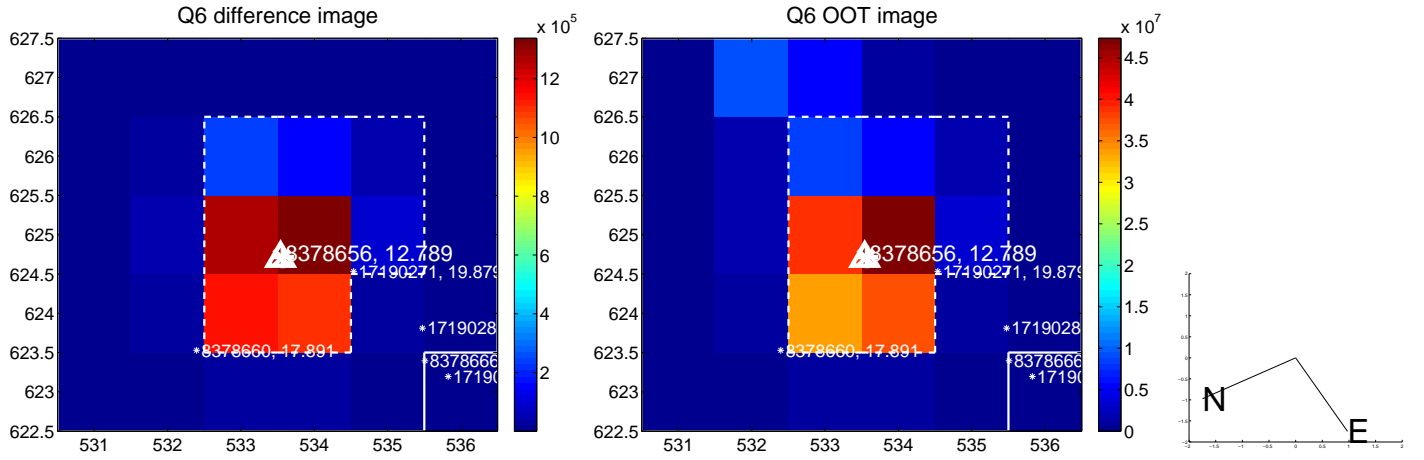
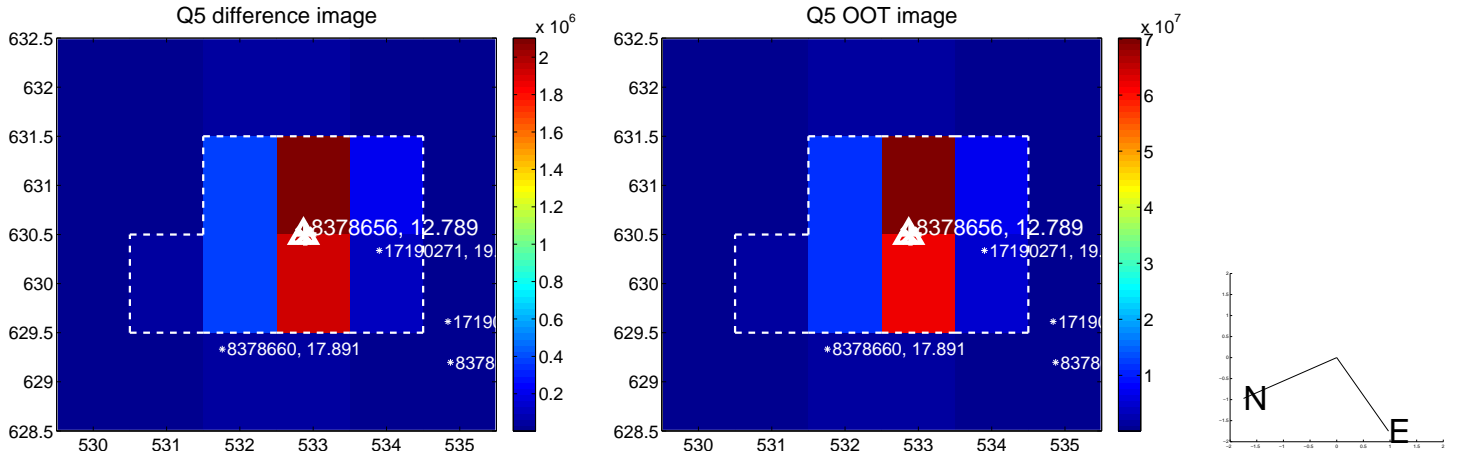


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

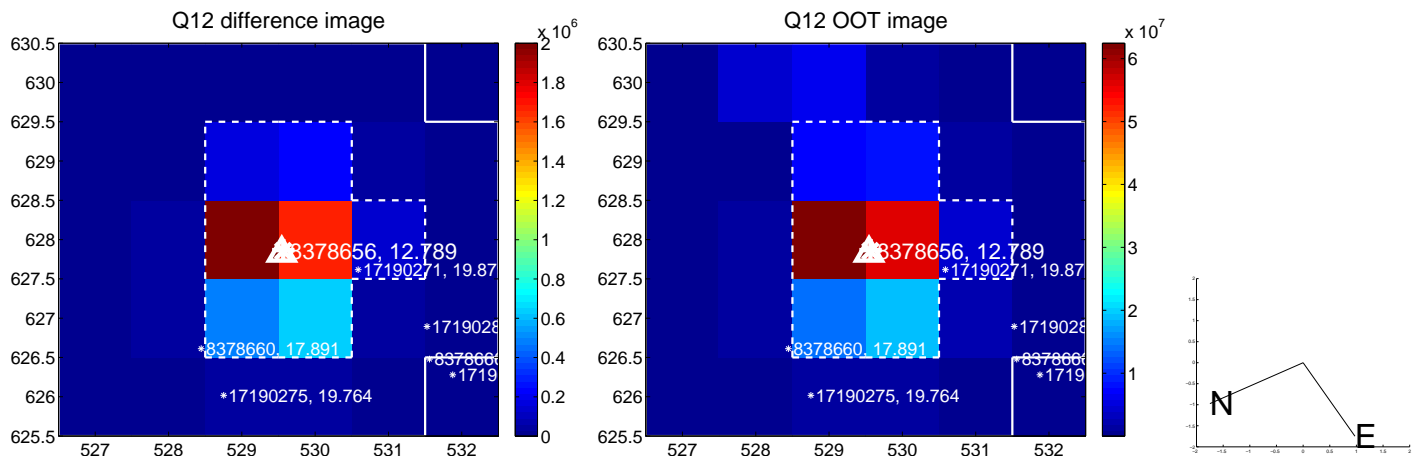
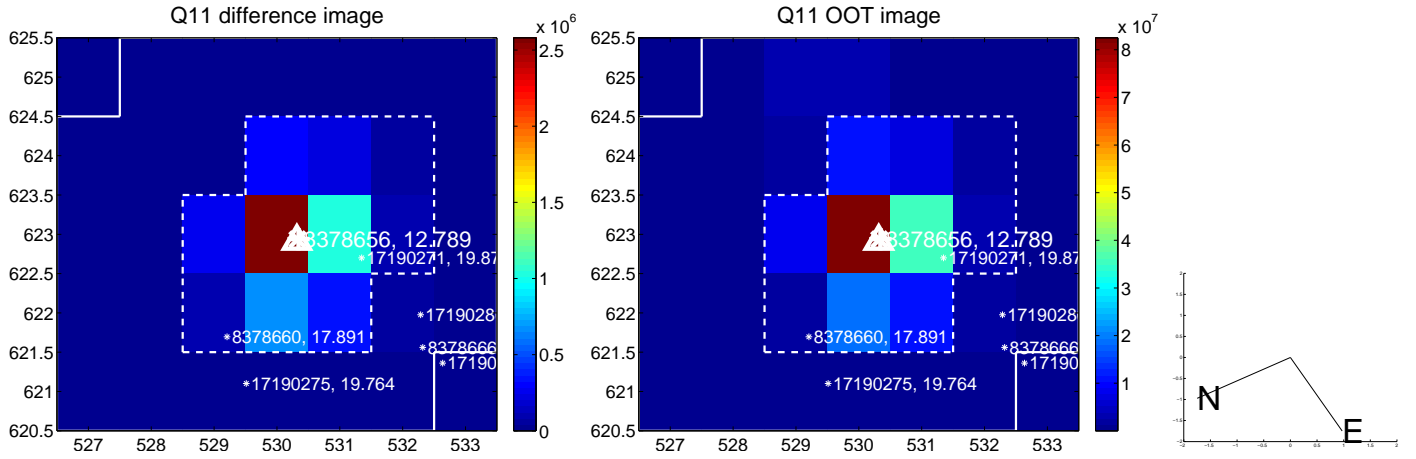
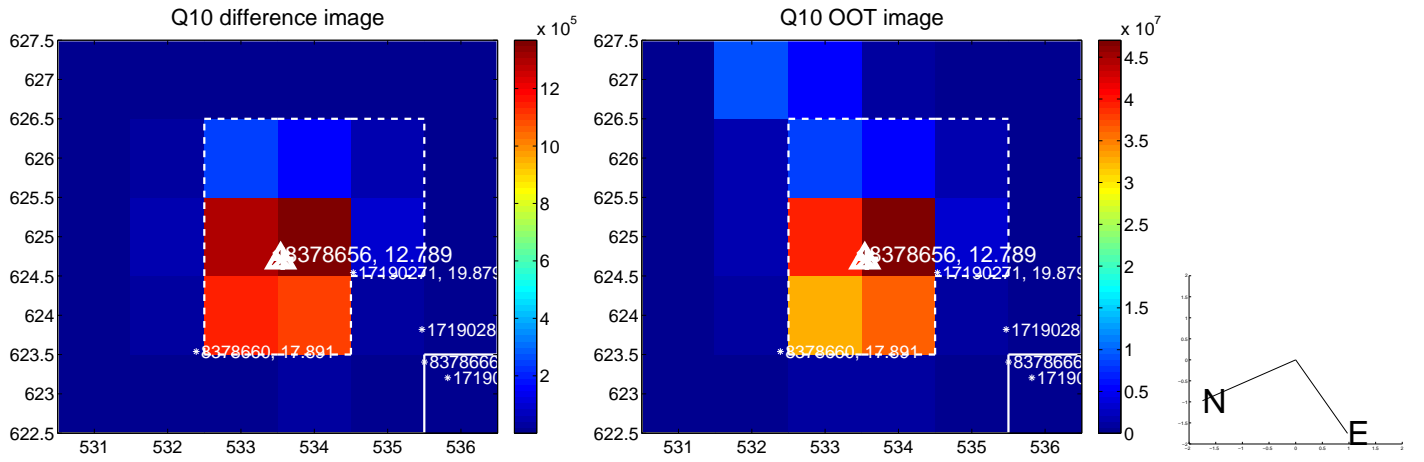
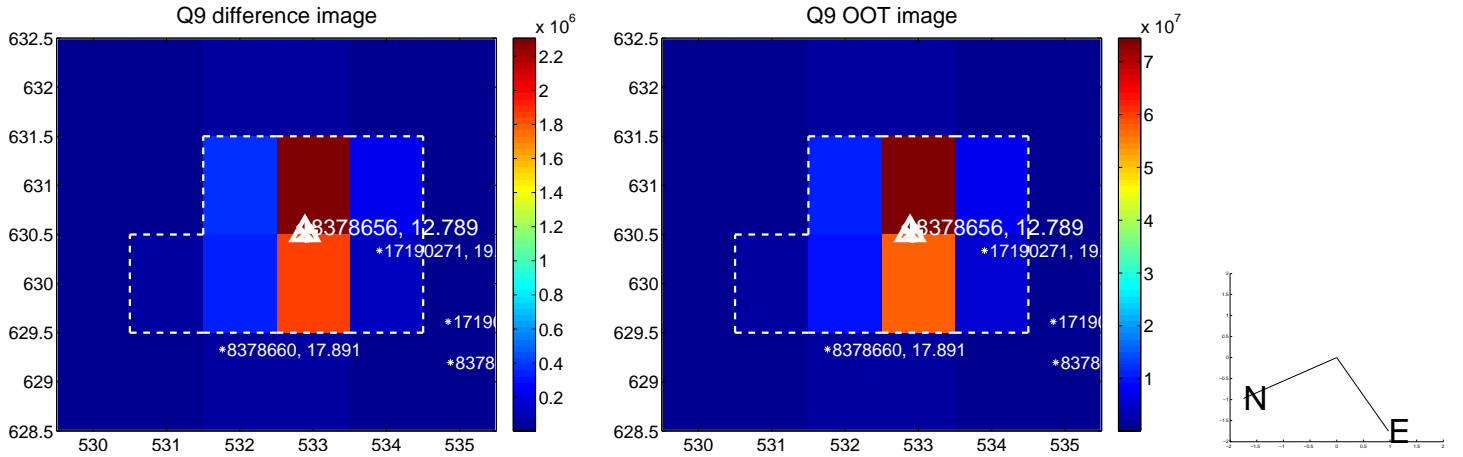
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



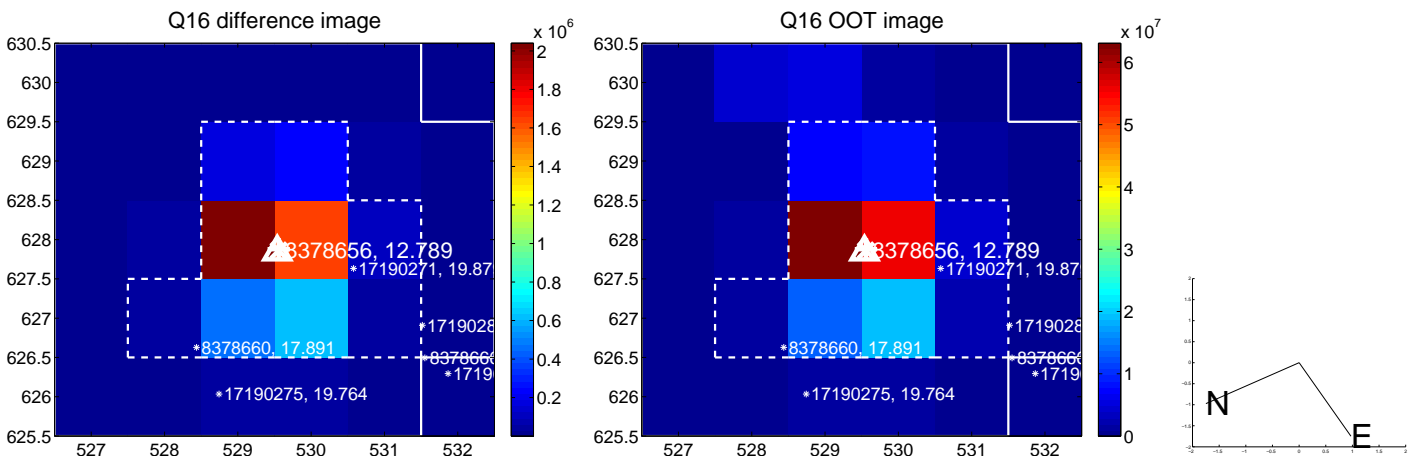
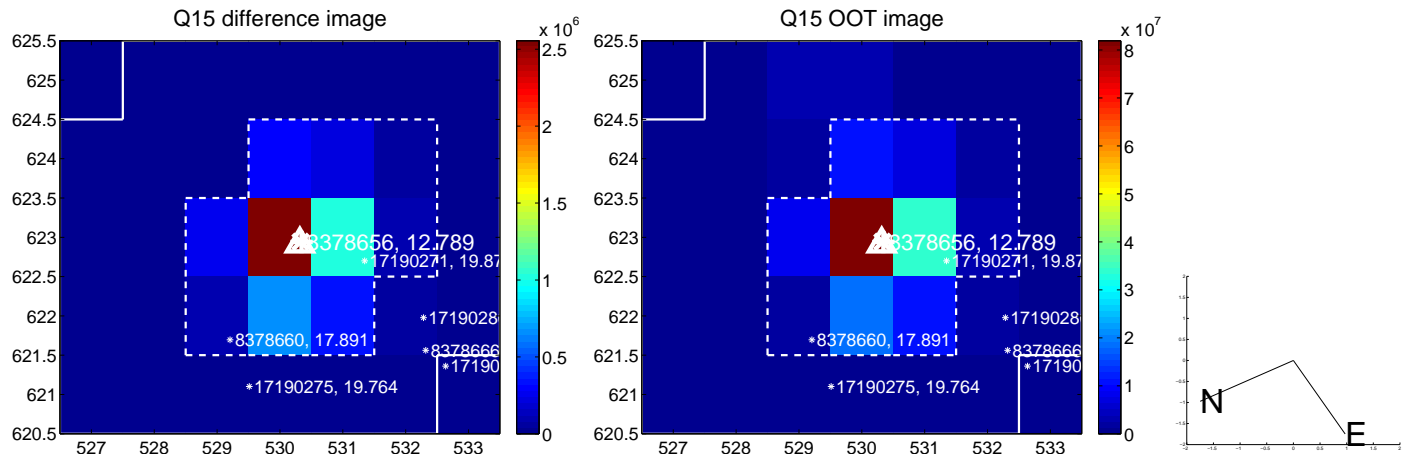
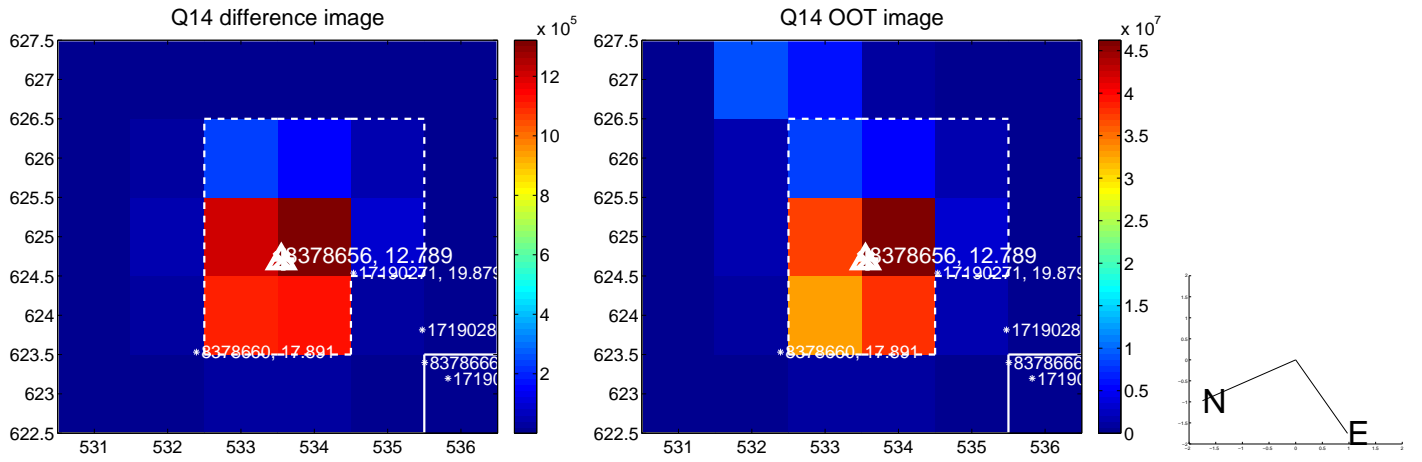
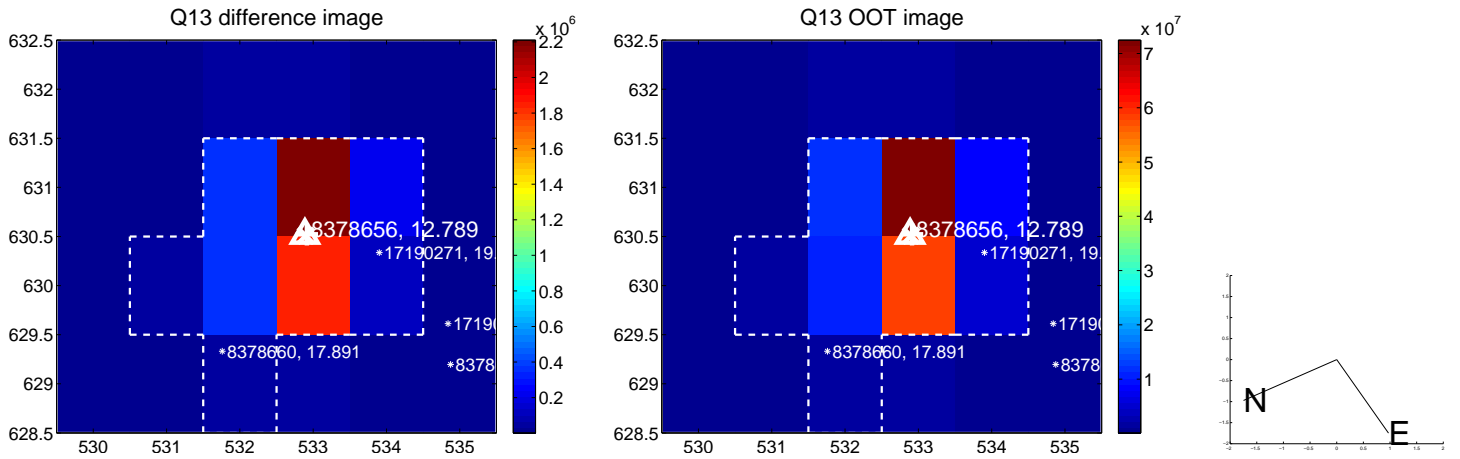
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



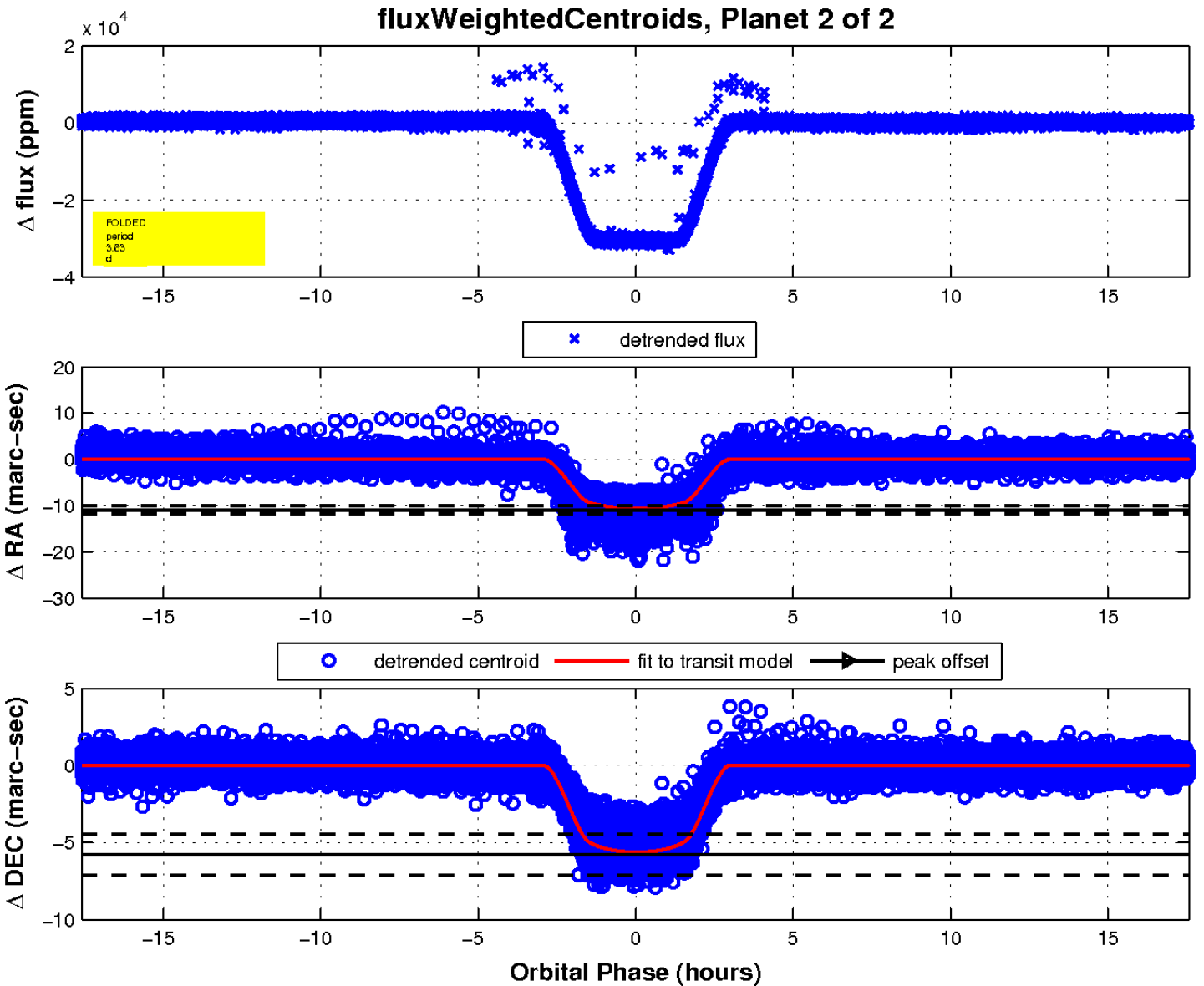
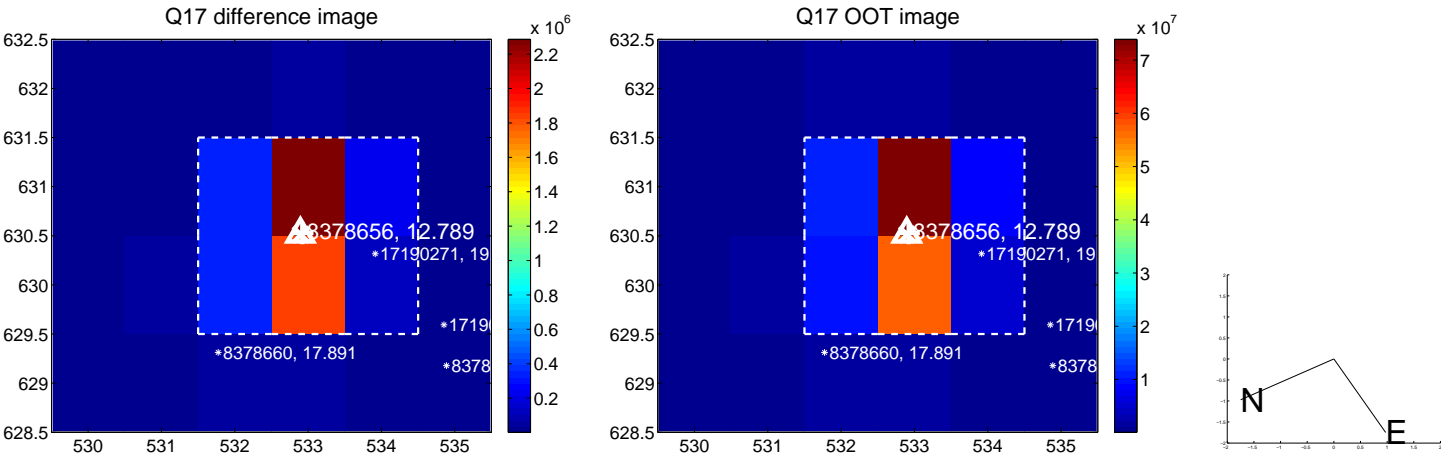
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white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

