

KIC 010991989

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})
010991989-01	OBS	7398.01	0.974483	132.368546	8245.2	2.569	1136.3	957.4	15.00	5210	216.96	0.00
010991989-02	OBS	No	0.974478	131.879744	877.0	1.500	713.1	-1.0	15.00	5210	43.52	173788.20

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010991989-01	OBS	FP	0.00	0	1	0	0	PLANET_IN_STAR—MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_SATURATED
010991989-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_SATURATED

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.

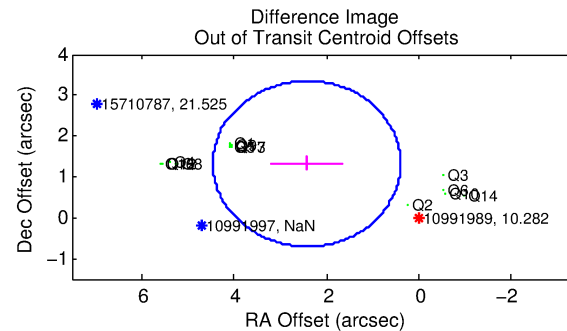
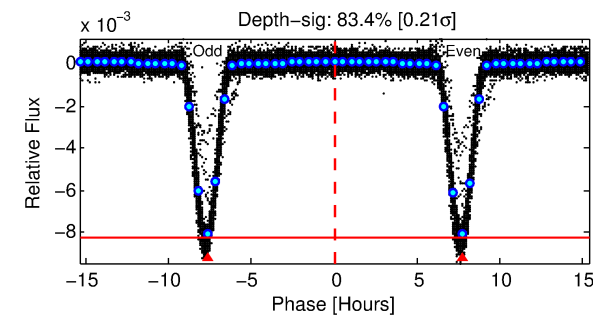
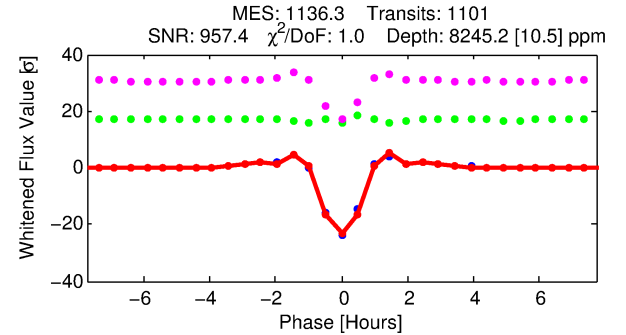
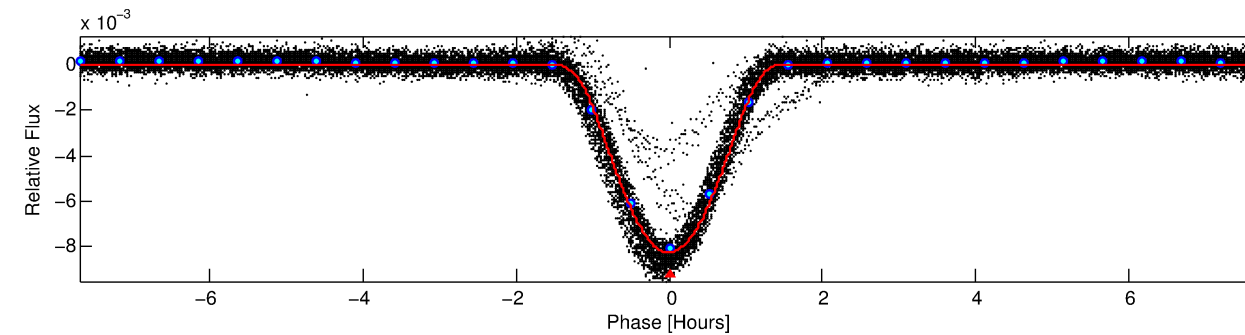
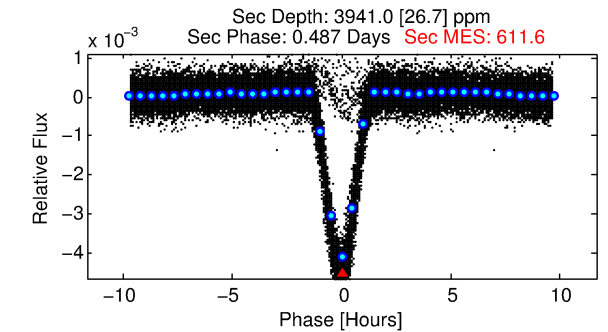
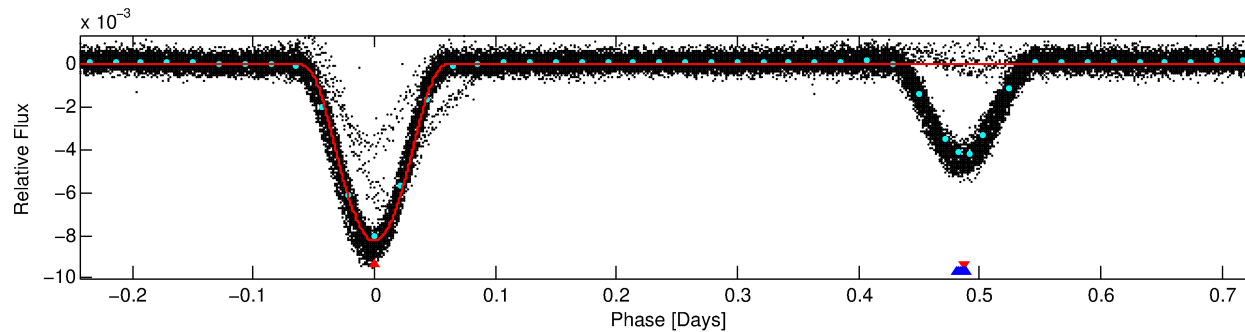
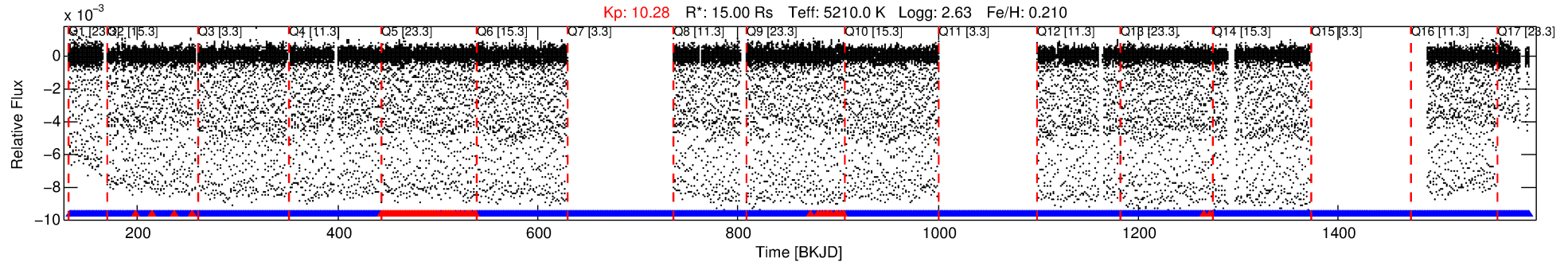
Ephemeris Match Information For 010991989-01

No Significant Match Found

DV One-Page Summary

KIC: 10991989 Candidate: 1 of 2 Period: 0.974 d
KOI: K07398.01 Corr: 0.970

Kp: 10.28 R*: 15.00 Rs Teff: 5210.0 K Logg: 2.63 Fe/H: 0.210



DV Fit Results:

Period = 0.97448 [0.00000] d
Epoch = 132.3685 [0.0000] BKJD
Rp/R* = 0.1325 [0.0017]
a/R* = 2.00 [0.00]
b = 0.96 [0.00]
Seff = N/A
Teq = N/A
Rp = 216.96 [166.74] Re
a = N/A
Ag = N/A
Teffp = N/A

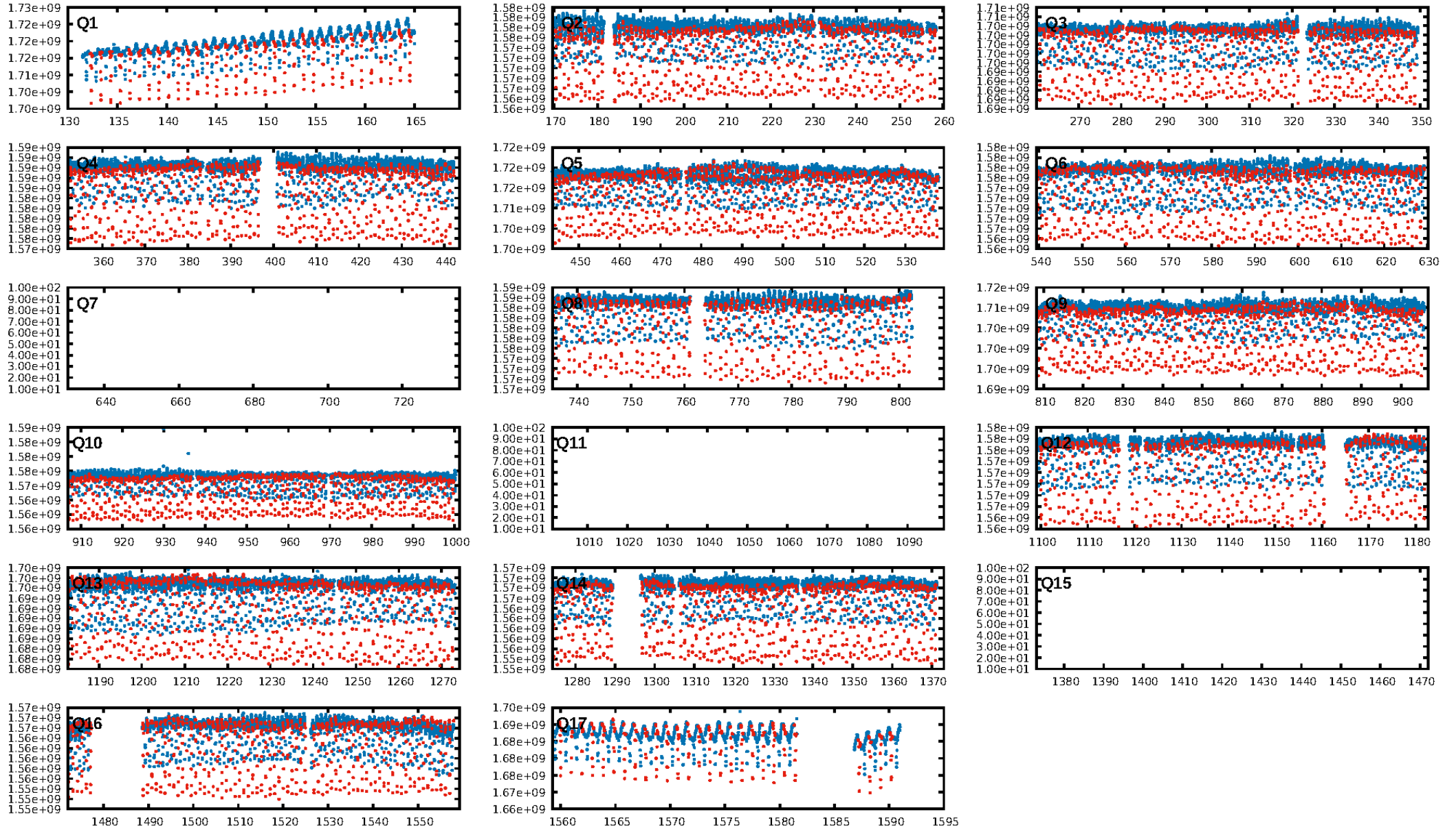
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.90 [937/1040]
GhostDiagnostic-chr: N/A
Centroid-sig: 0.0%
Centroid-so: 0.750 arcsec [266.47σ]
OotOffset-rm: 2.760 arcsec [4.09σ]
KicOffset-rm: 2.957 arcsec [4.65σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.36 [5/14]
DiffImageOverlap-fno: 1.00 [14/14]

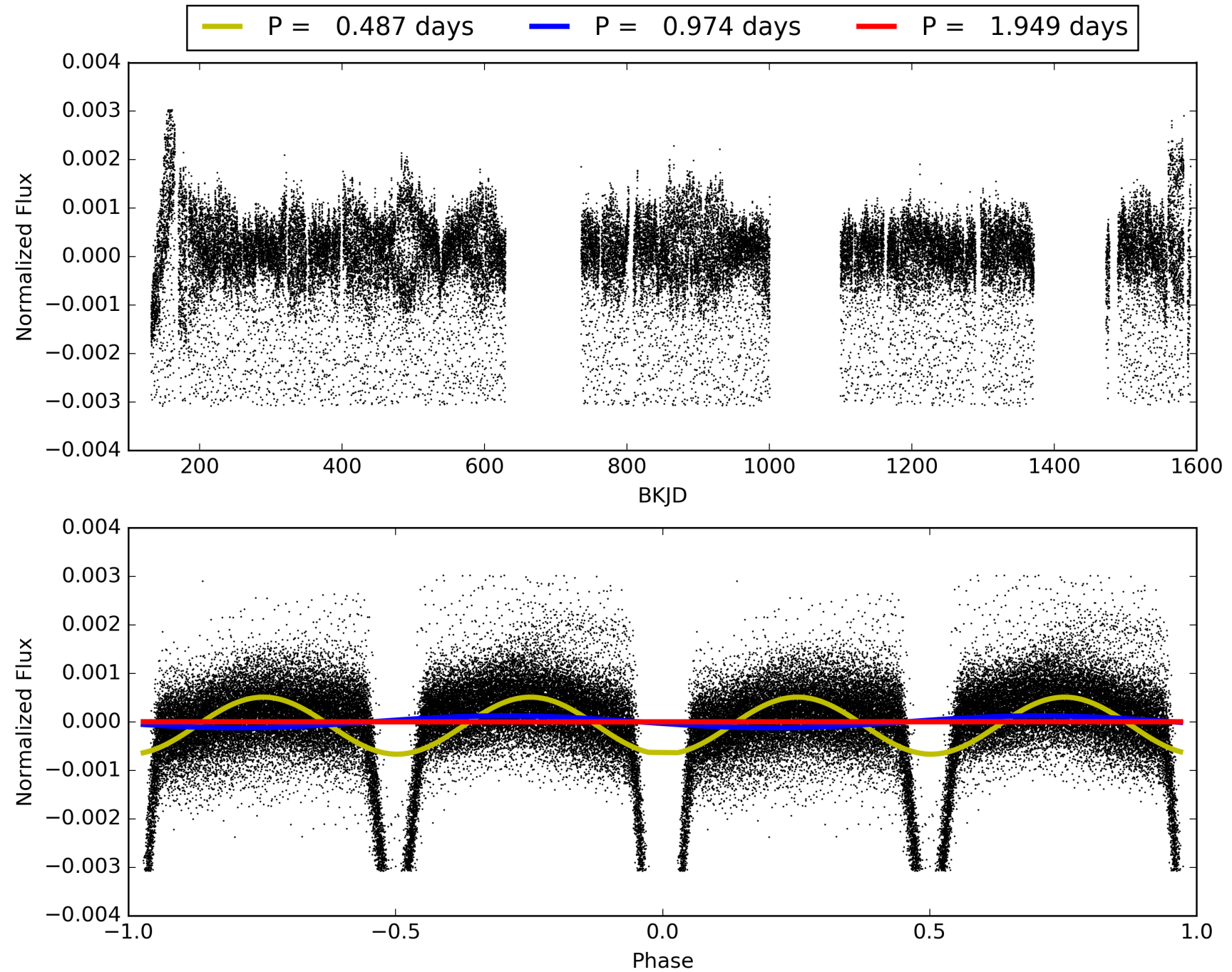
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010991989-01, PDC Light Curves

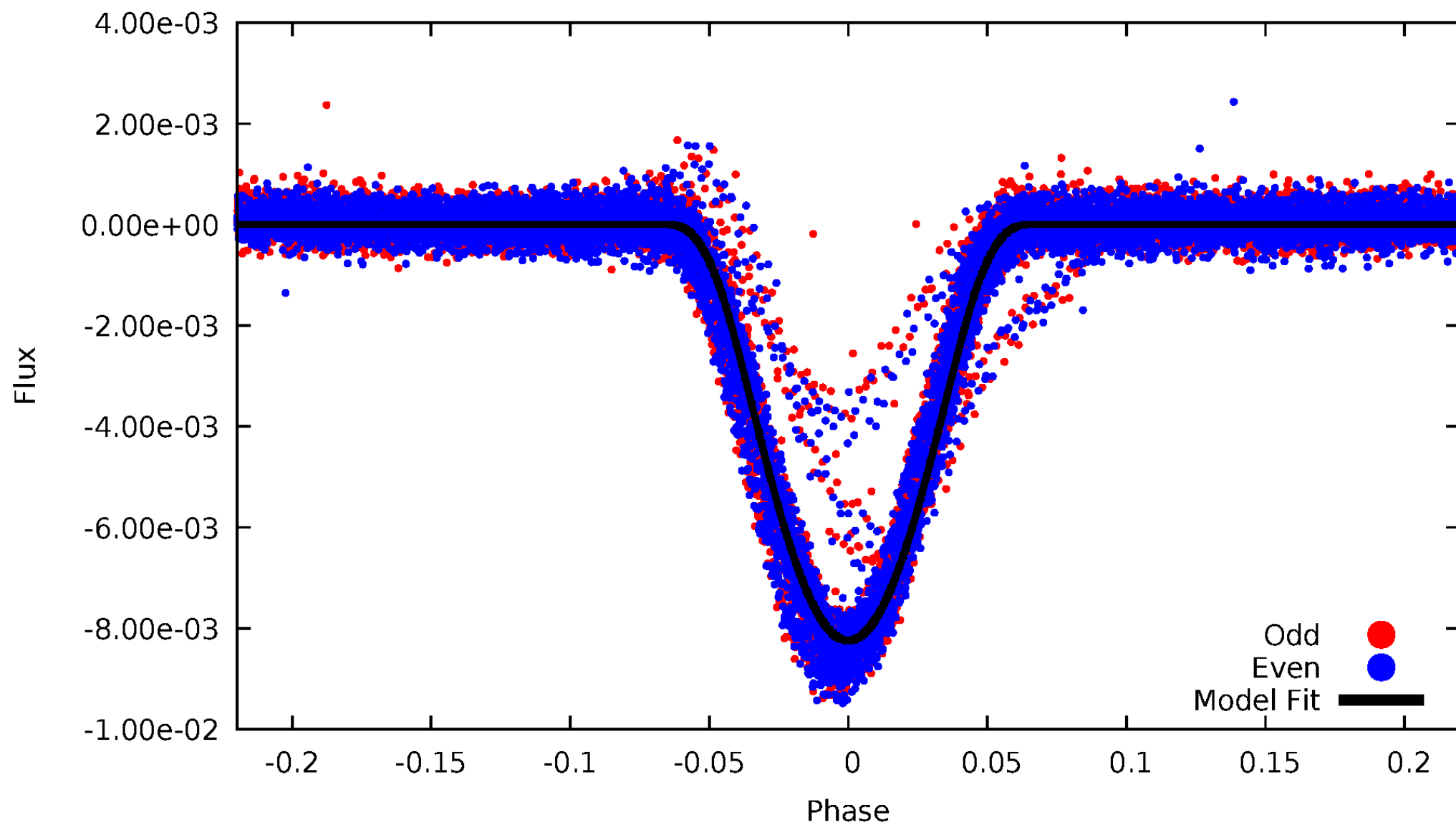


TCE 010991989-01



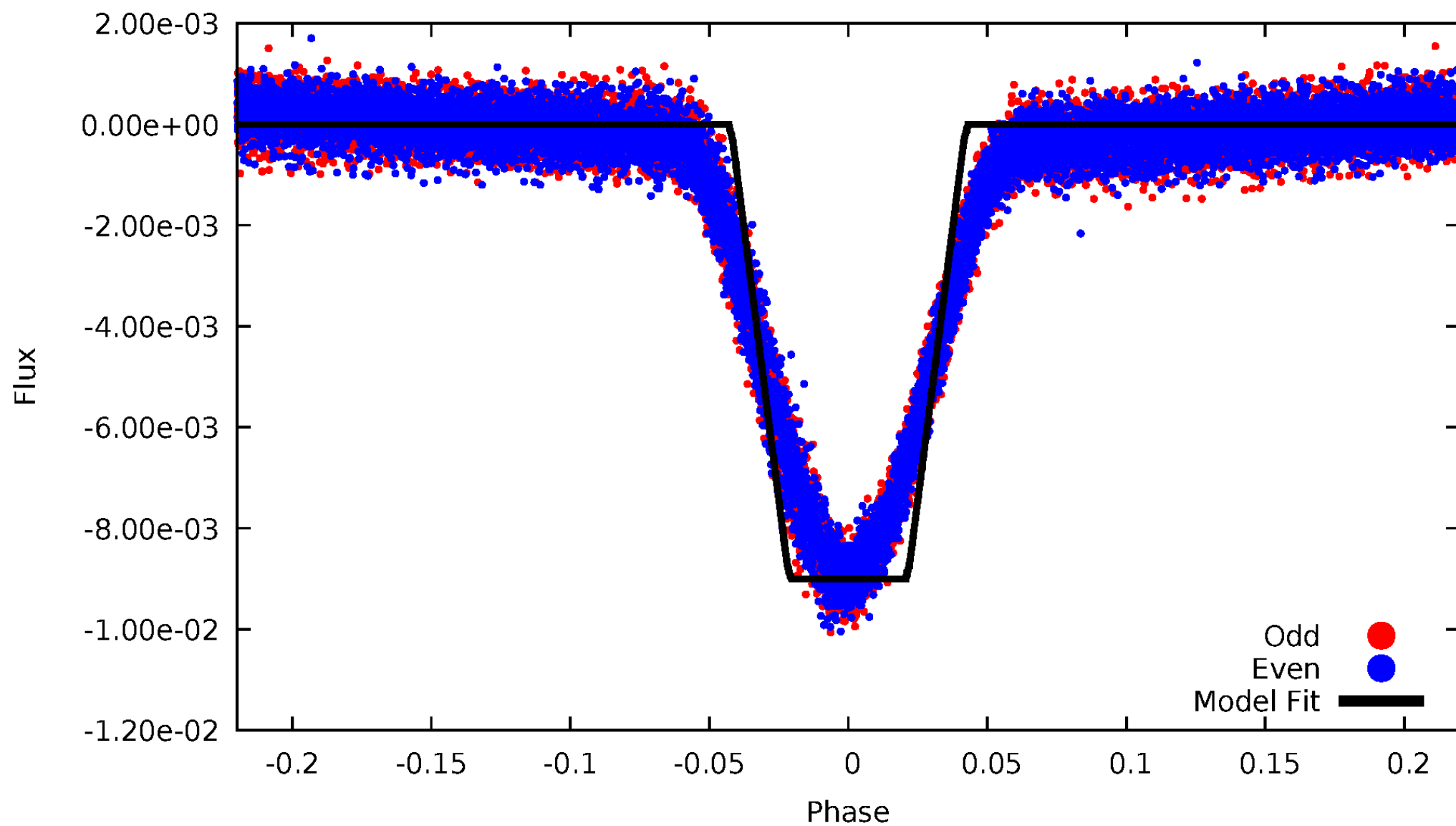
DV Odd/Even

TCE 010991989-01



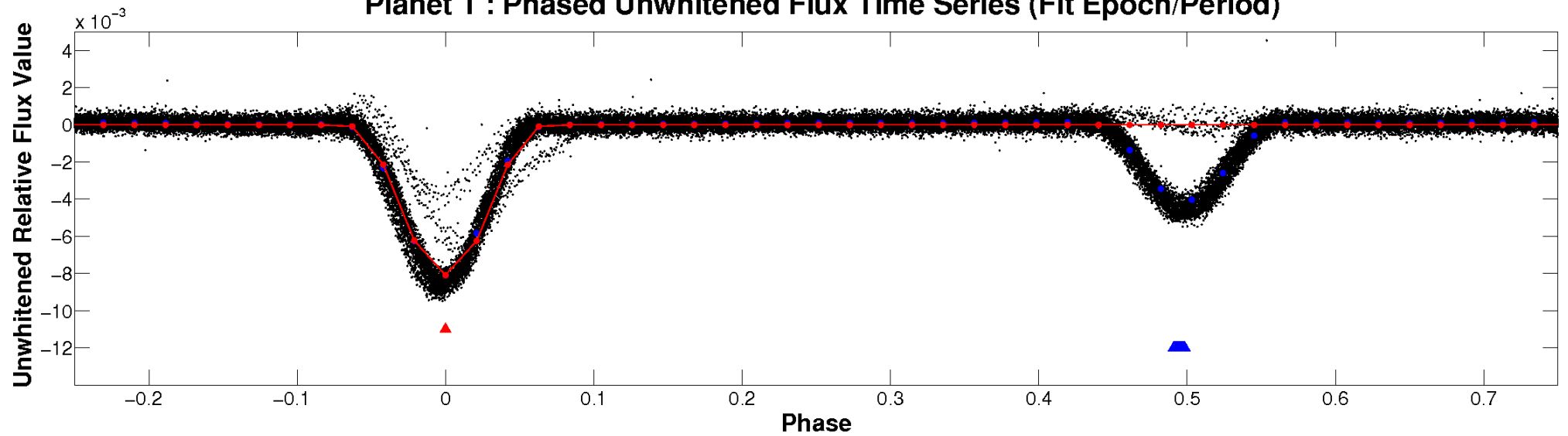
ALT Odd/Even

TCE 010991989-01

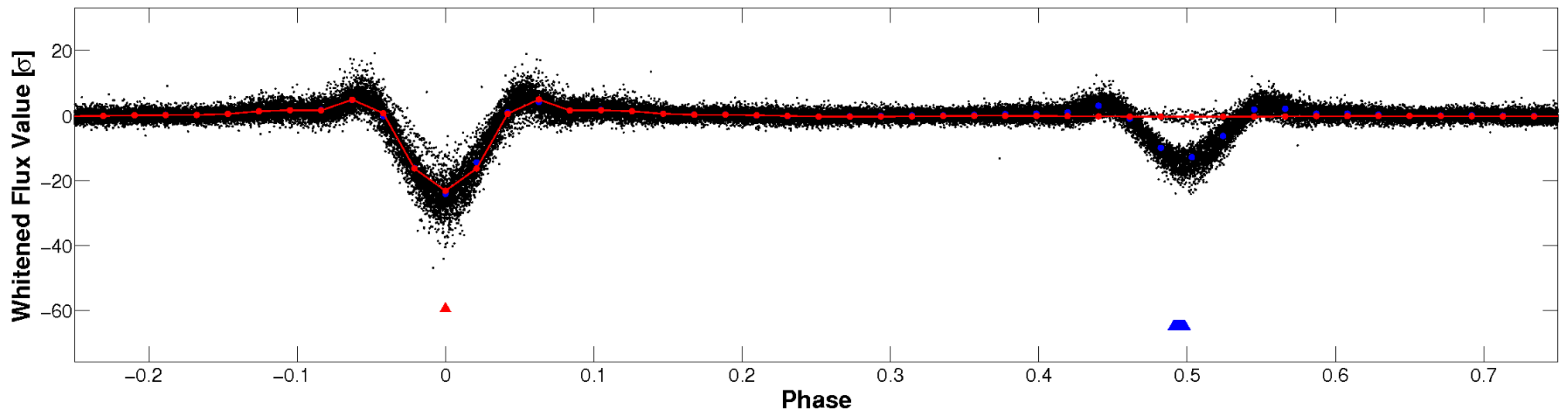


Non-Whitened Vs. Whitened Light Curve

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

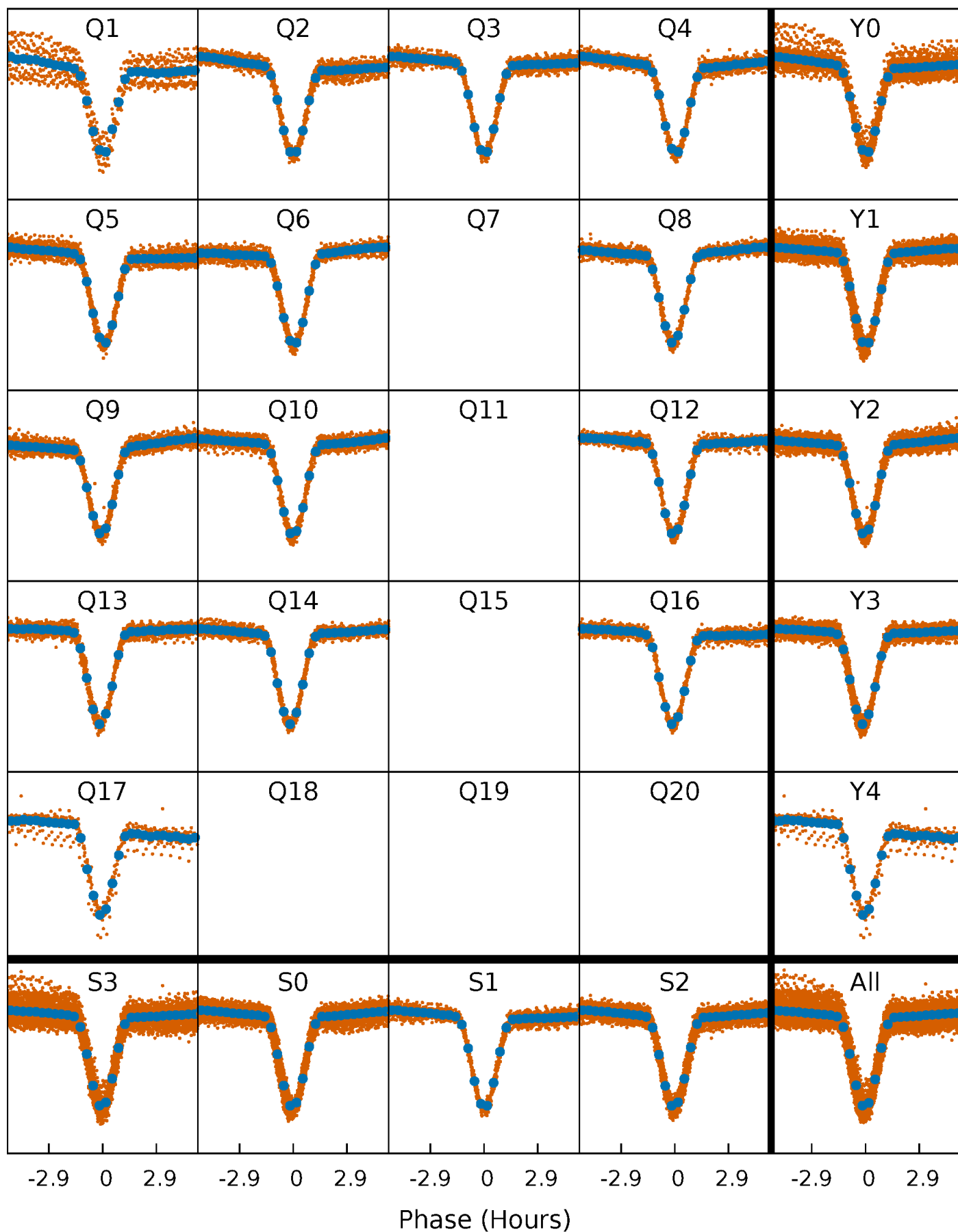


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



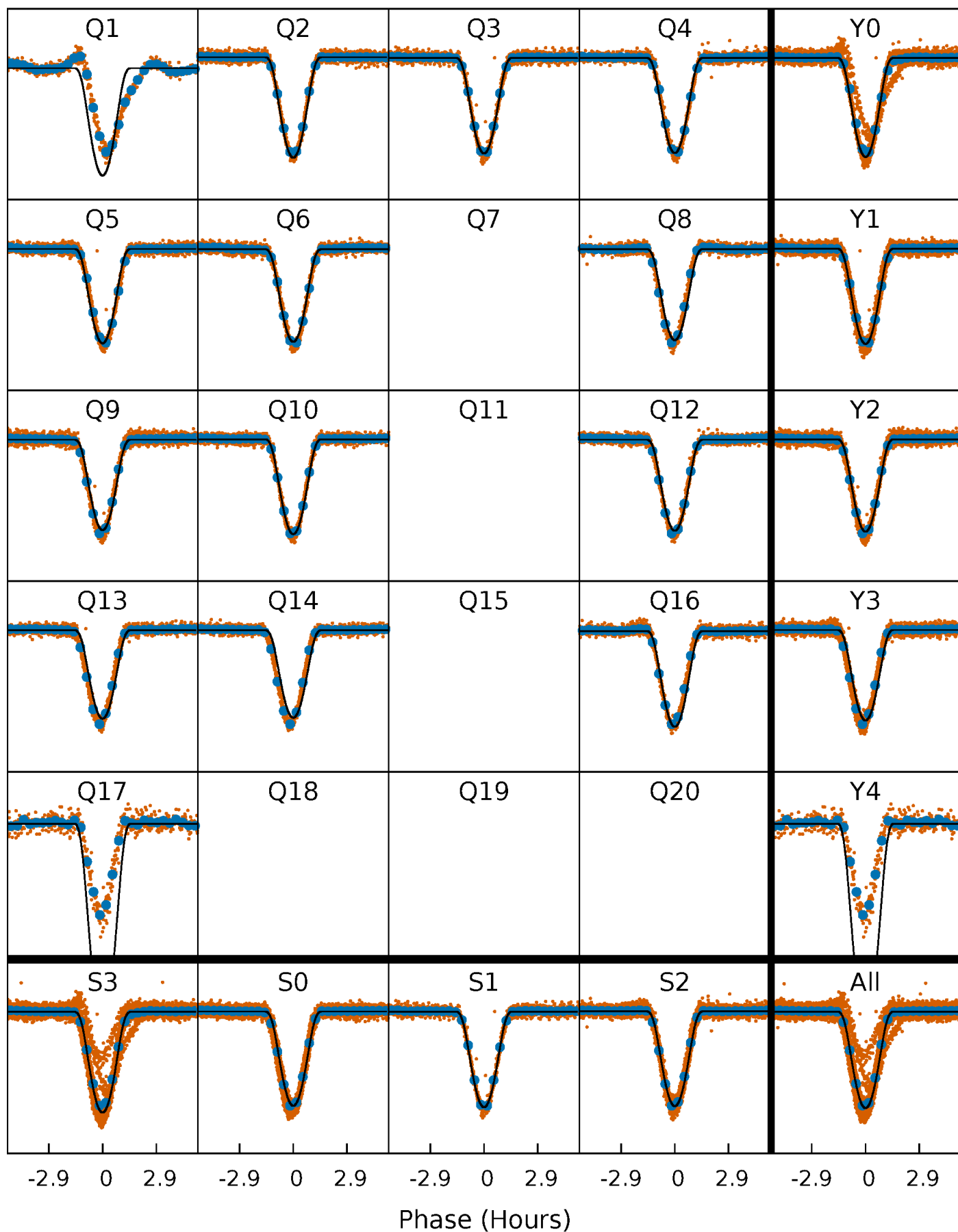
PDC Quarter-Phased Transit Curves

TCE 010991989-01 P= 0.974483 Days $T_0=132.368546$ (BKJD)



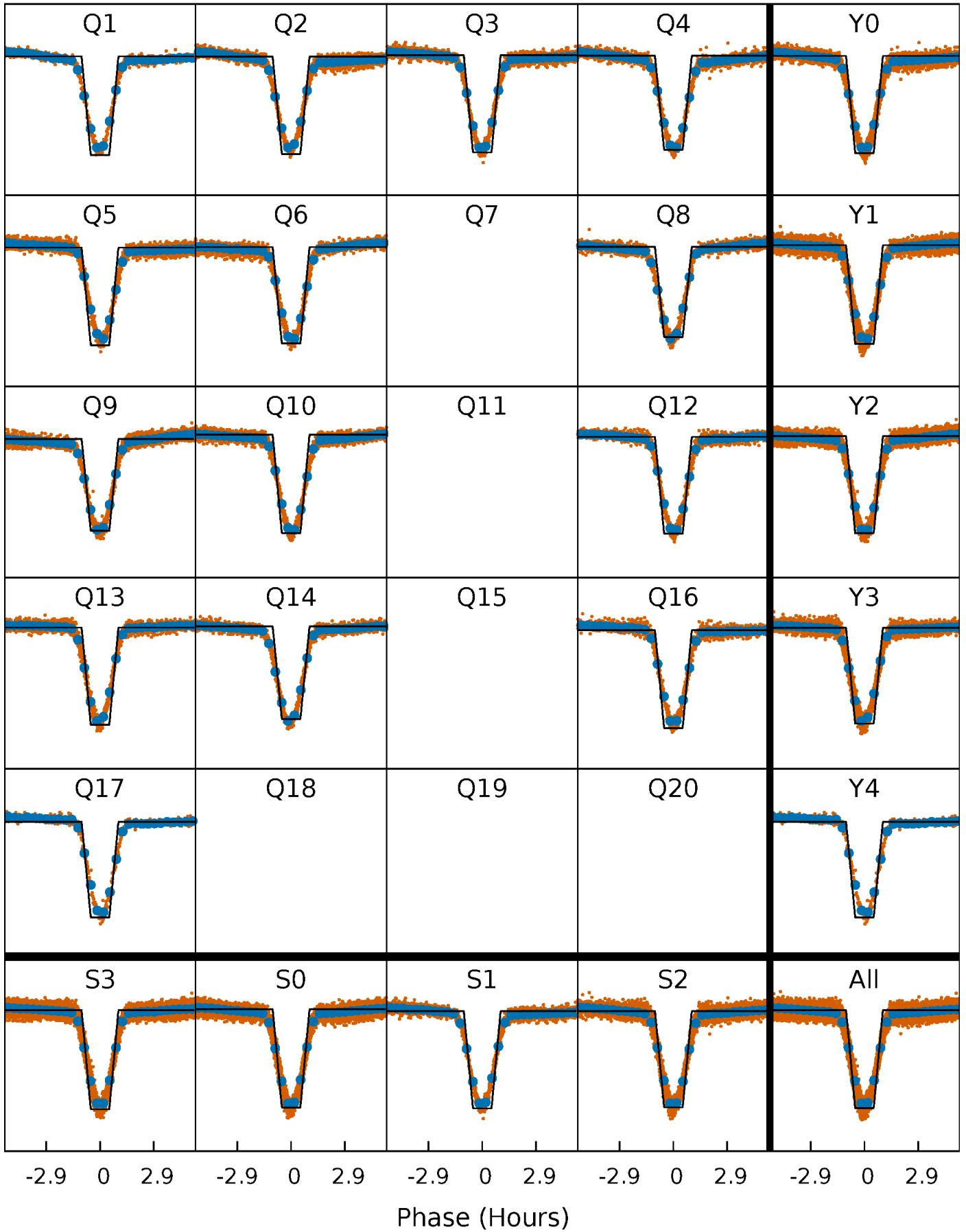
DV Quarter-Phased Transit Curves

TCE 010991989-01 P= 0.974483 Days $T_0=132.368546$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

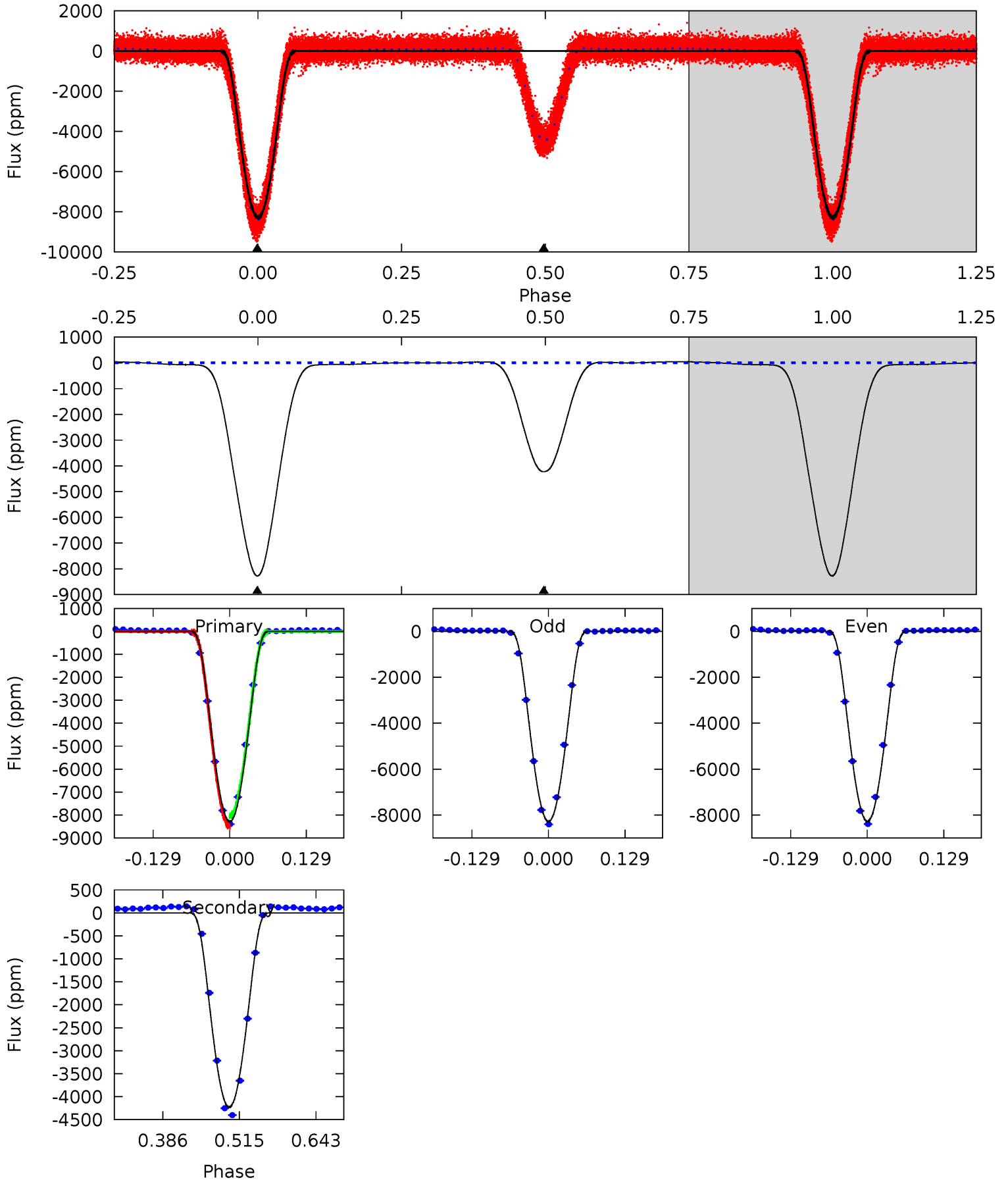
TCE 010991989-01 P= 0.974478 Days $T_0=132.370451$ (BKJD)



DV Model-Shift Uniqueness Test

010991989-01, P = 0.974483 Days, E = 131.394063 Days

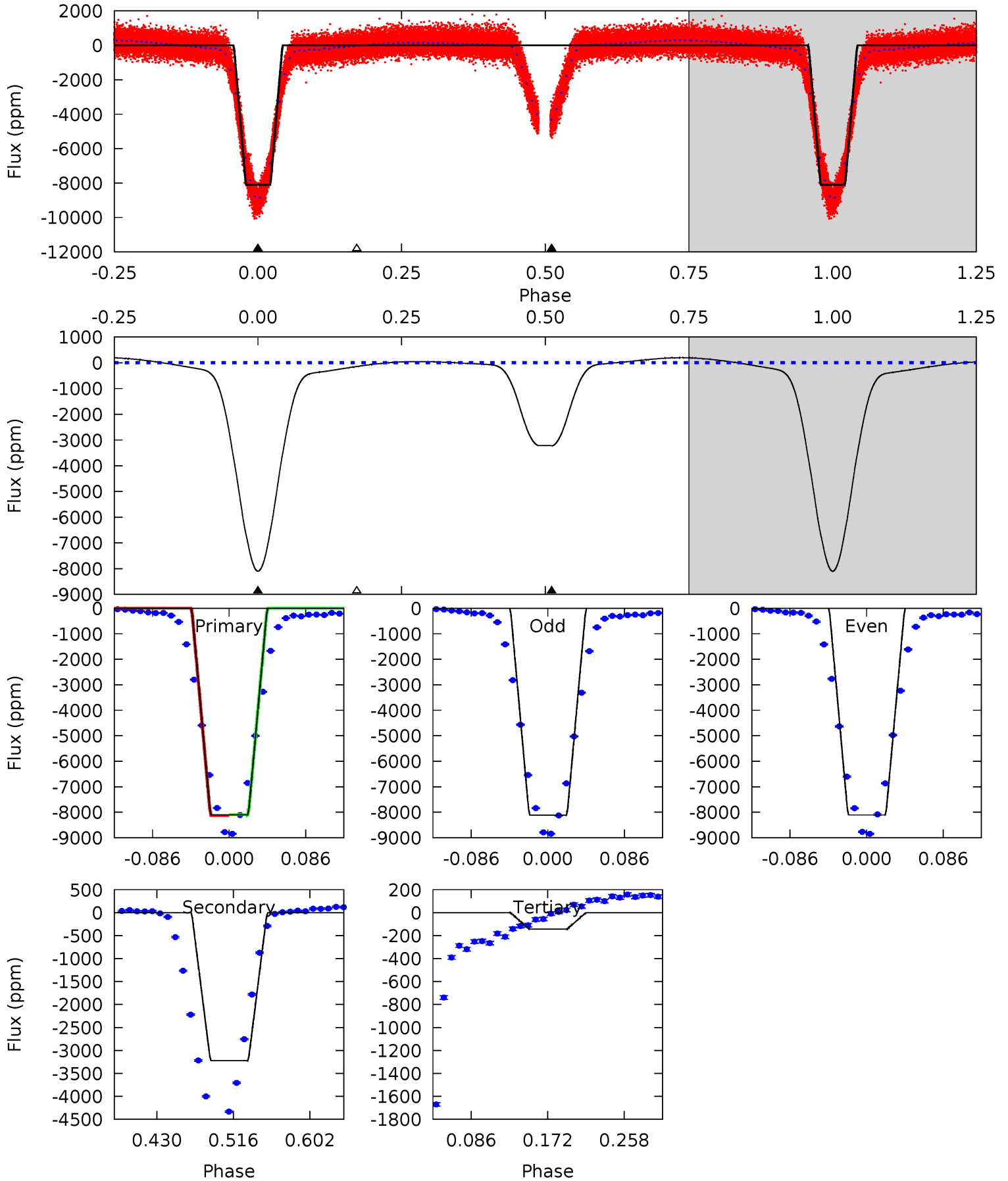
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2479	1266	0	0	4.51	1.52	9.64	2479	2479	1266	1266	0.88	0.98	0.01	66.9



Alt Model-Shift Uniqueness Test

010991989-01, P = 0.974478 Days, E = 131.395973 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1376	547.7	24.5	0	4.60	1.72	25.6	1351	1376	523.2	547.7	0.80	1.00	0.02	2.95



Stellar Parameters For KIC 010991989

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5210^{+136}_{-250}	$2.631^{+0.824}_{-0.145}$	$0.210^{+0.150}_{-0.500}$	$15.004^{+2.882}_{-11.529}$	$3.512^{+0.122}_{-2.322}$	$0.001^{+0.039}_{-0.001}$
	+3%/-5%	+31%/-6%	+71%/-238%	+19%/-77%	+3%/-66%	+2692%/-47%
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 010991989-01 / KOI 7398.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-4229 ± 3	$207.70^{+31.78}_{-83.47}$	6994^{+667}_{-1344}	-5443^{+1158}_{-583}	$0.045^{+0.064}_{-0.011}$
Alt.	-3224 ± 6	$150.13^{+22.47}_{-58.90}$	7038^{+654}_{-1267}	-5371^{+1208}_{-563}	$0.066^{+0.083}_{-0.015}$

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 $A_{obs} \gg 1.0$

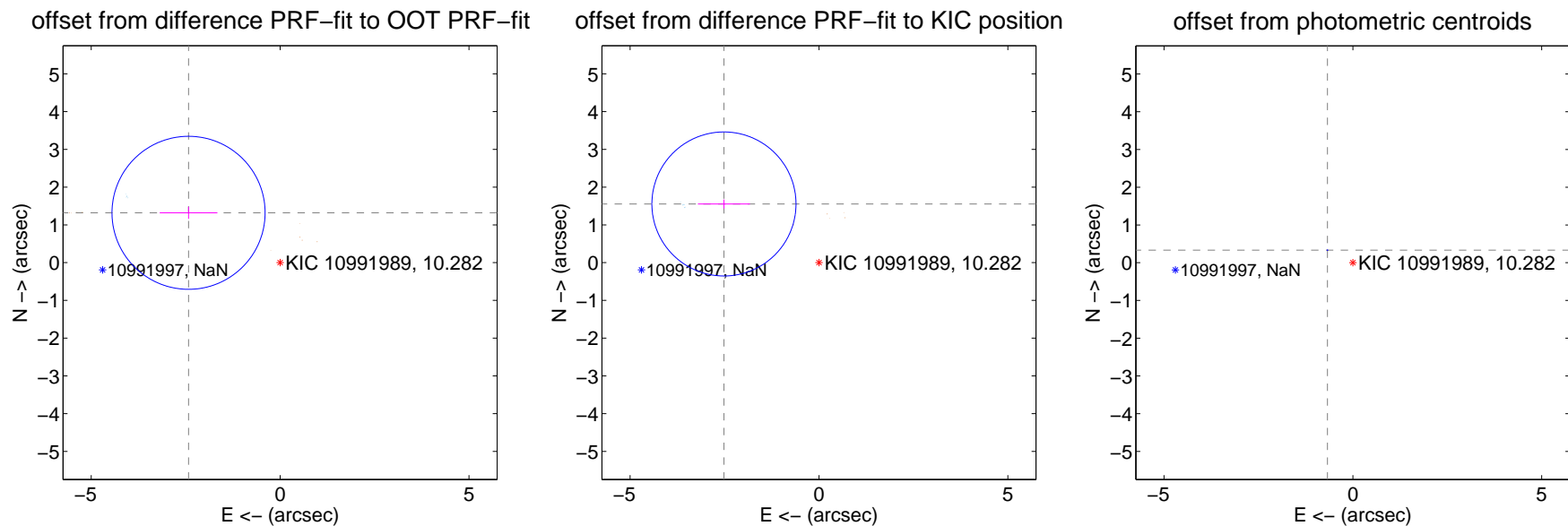
DV Centroid Data

Supplemental centroid analysis for 010991989-01. **Kepler magnitude: 10.28.** Transit SNR 957.37

There are 5 quarters with good PRF difference image offsets

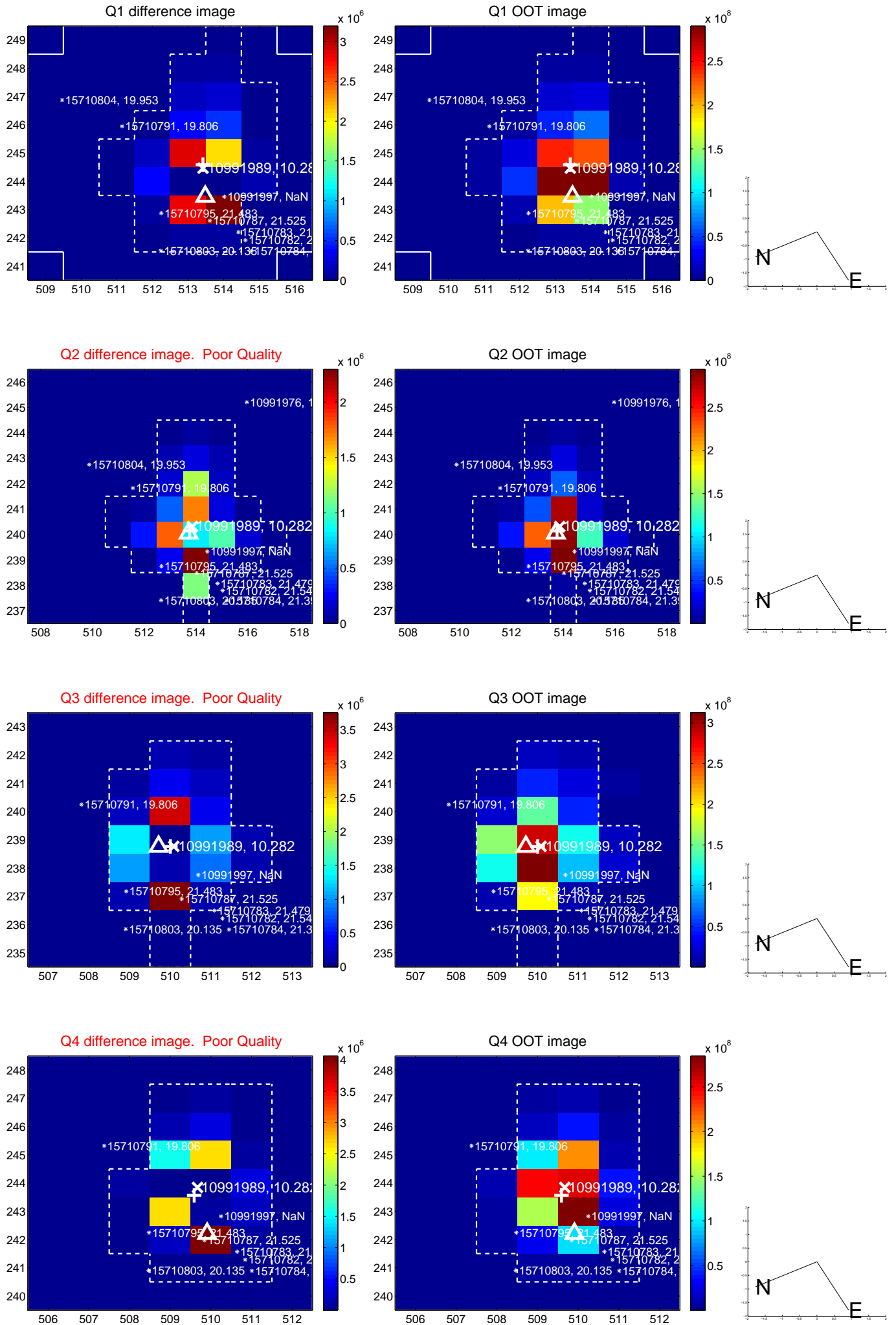
The direct PRF centroid is offset from the target star catalog position by about 0.54 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.760 \pm 0.676	4.09	2.424 \pm 0.764	1.320 \pm 0.160
PRF-fit source offset from KIC position	2.957 \pm 0.636	4.65	2.516 \pm 0.689	1.554 \pm 0.121
photometric centroid source offset	0.75 \pm 0.00	266.47	0.67 \pm 0.00	0.33 \pm 0.00

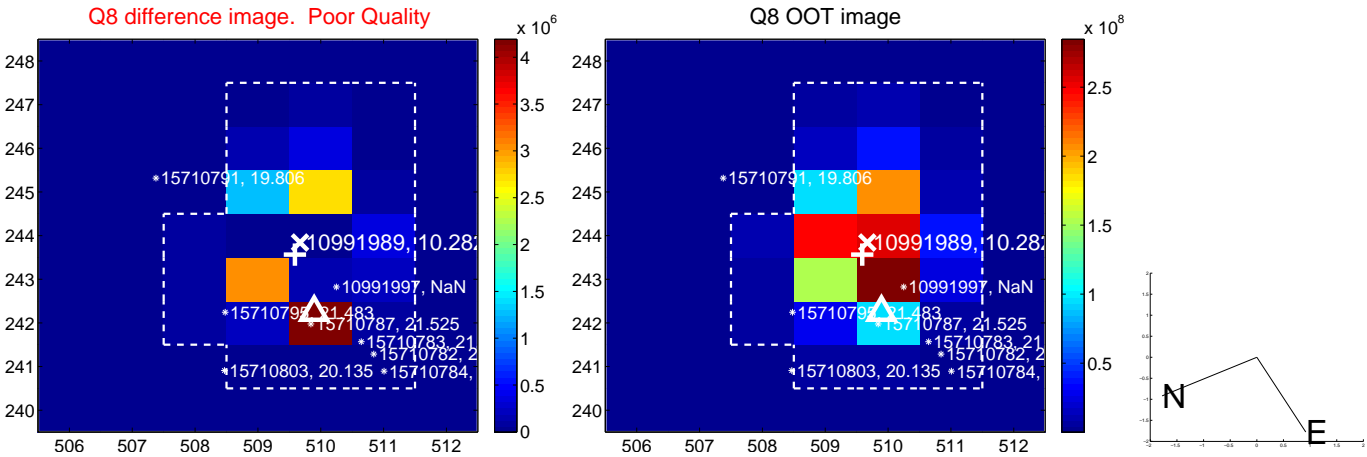
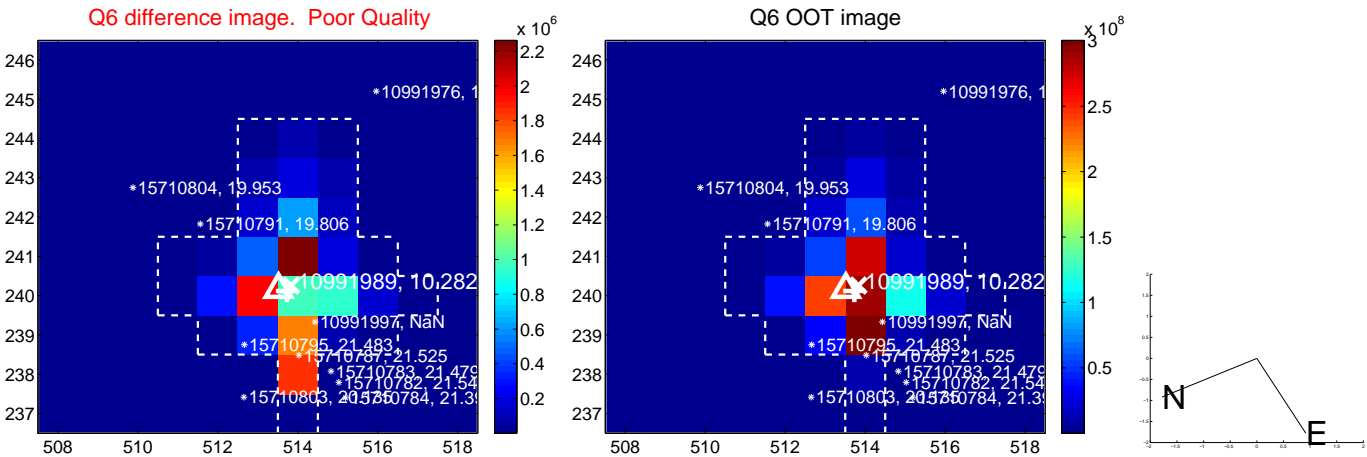
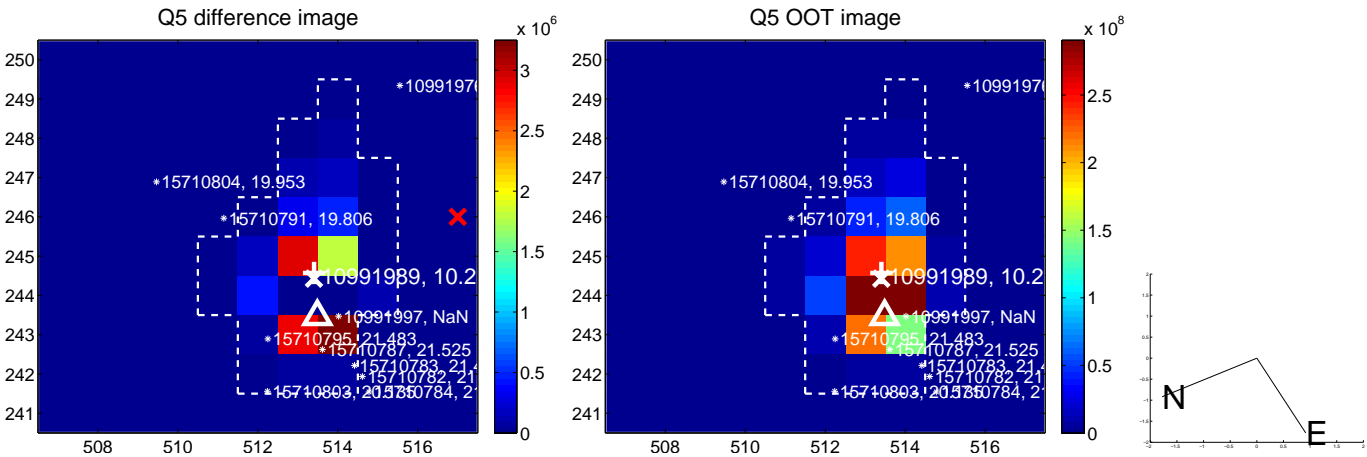


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

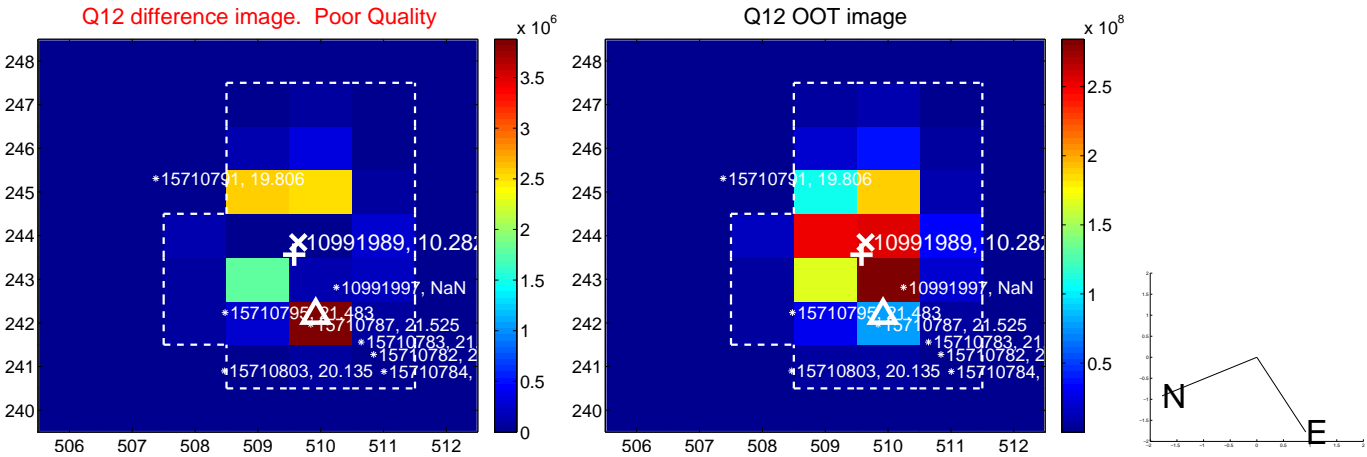
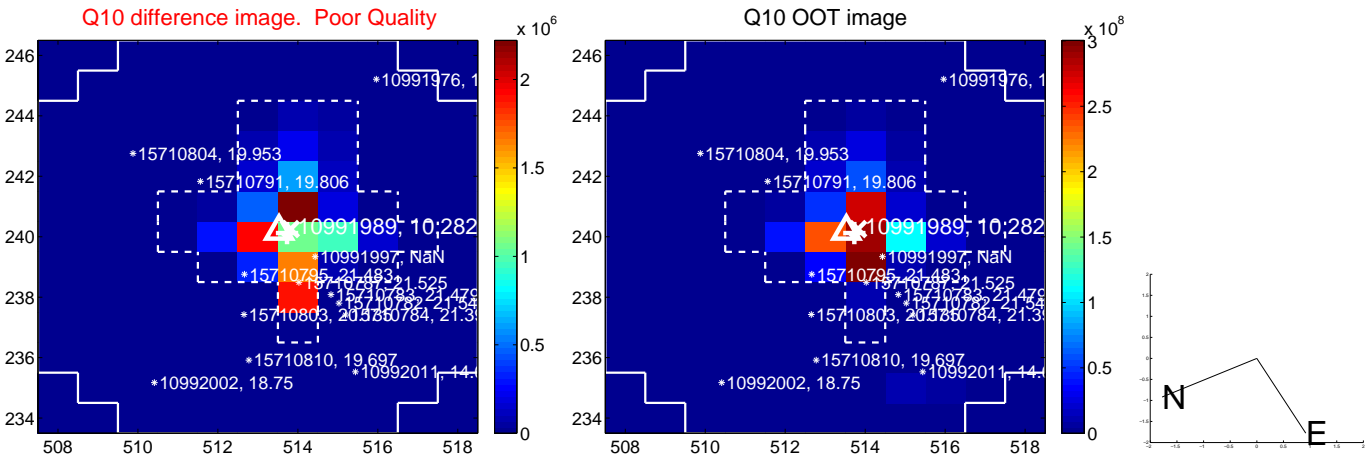
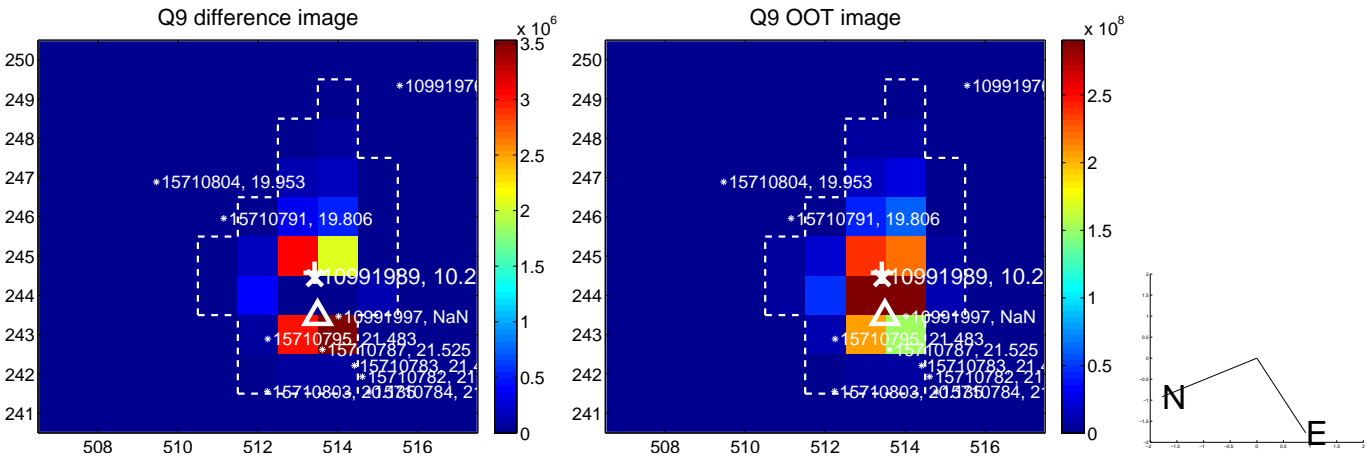
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



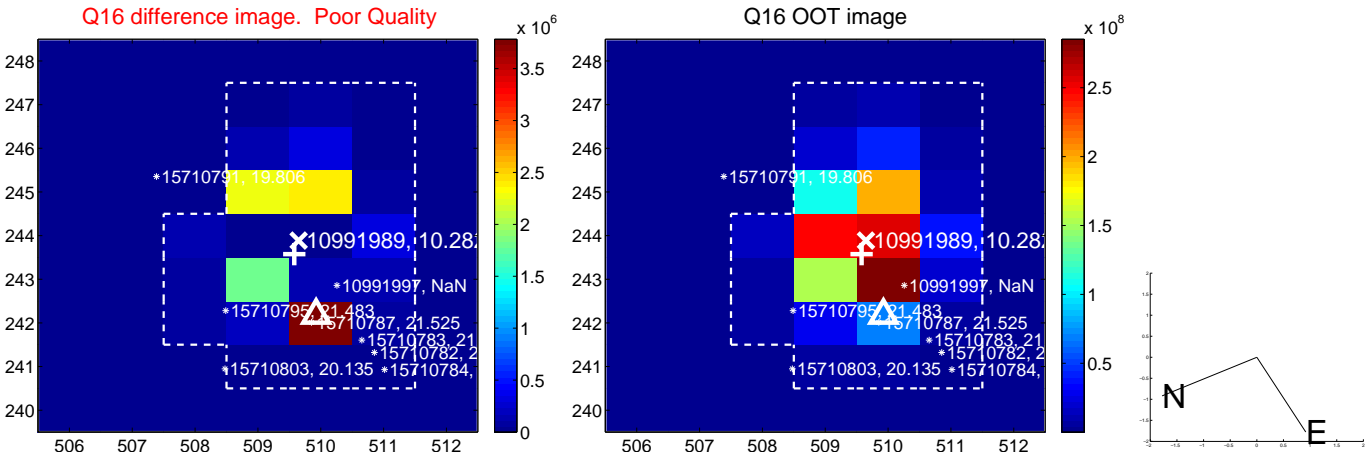
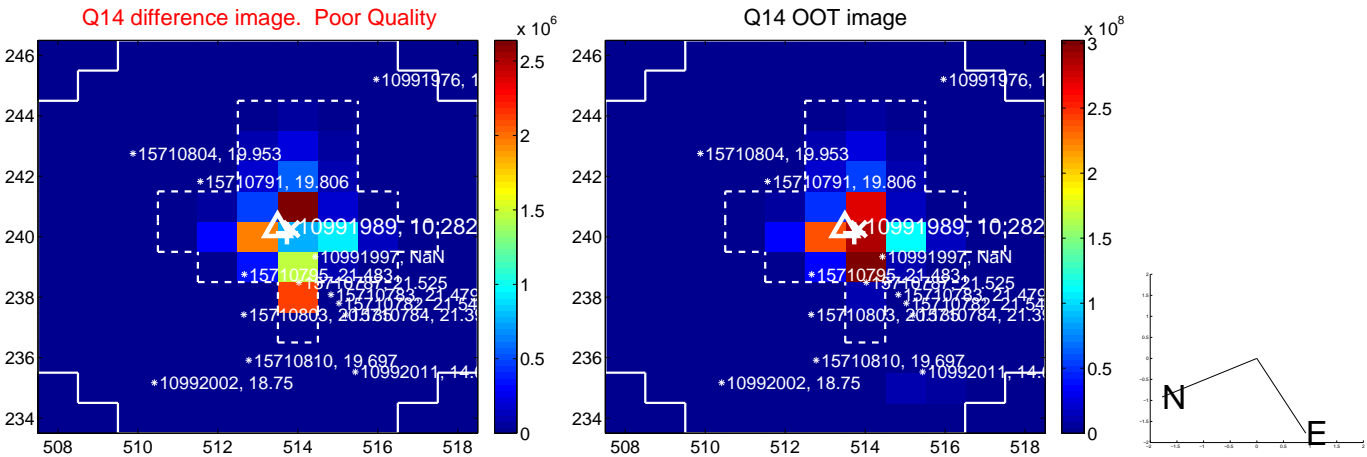
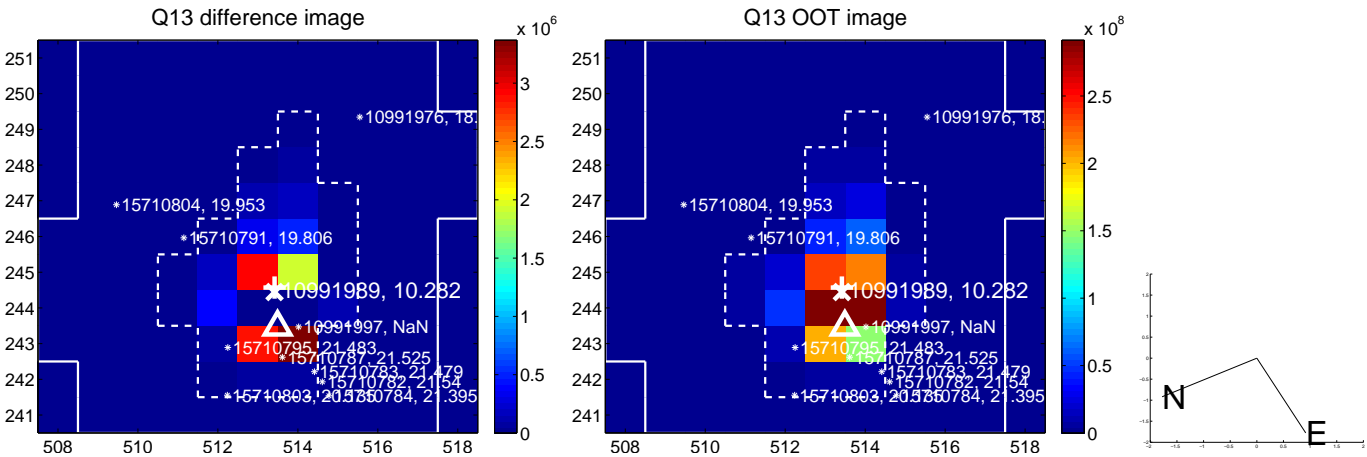
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



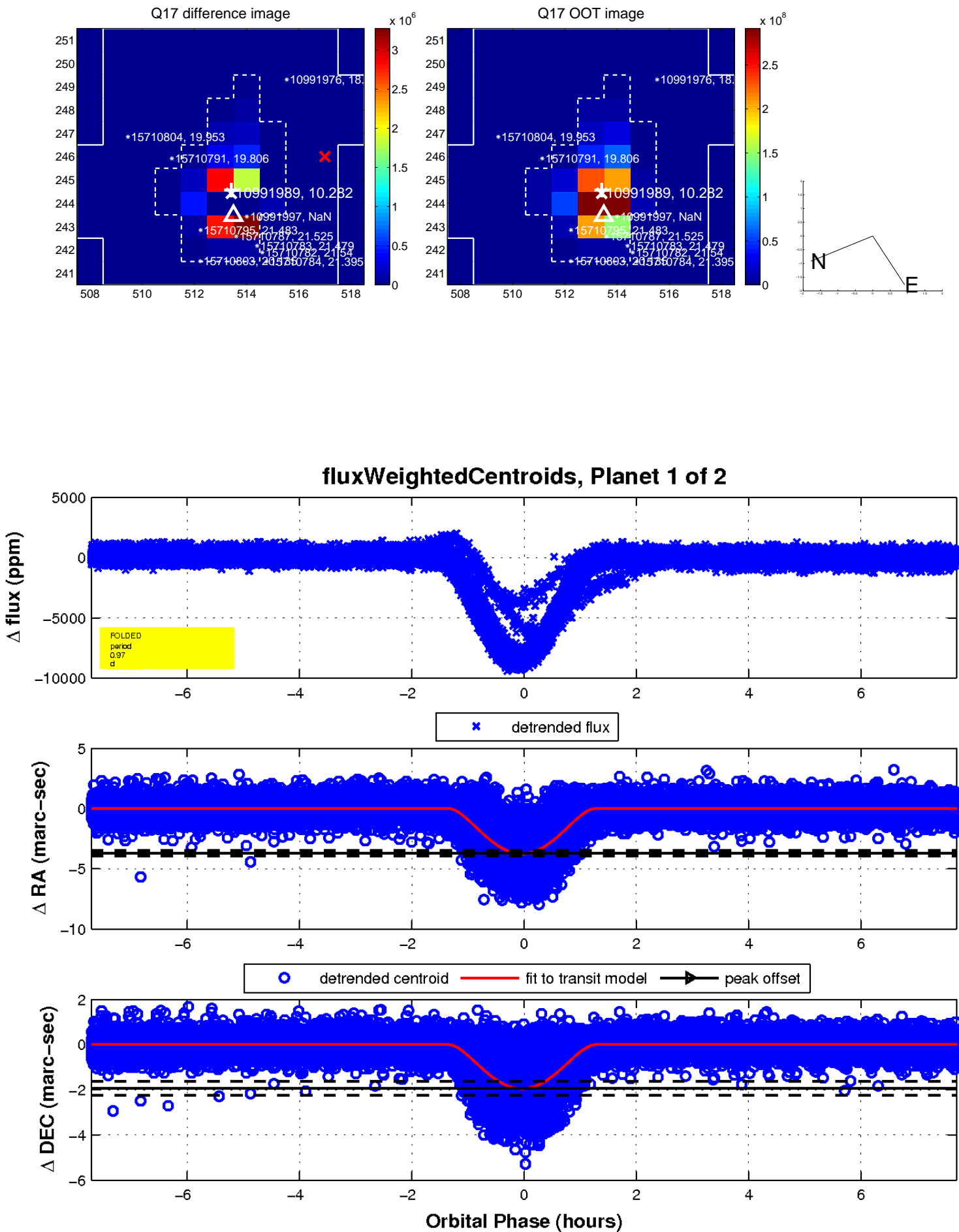
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white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

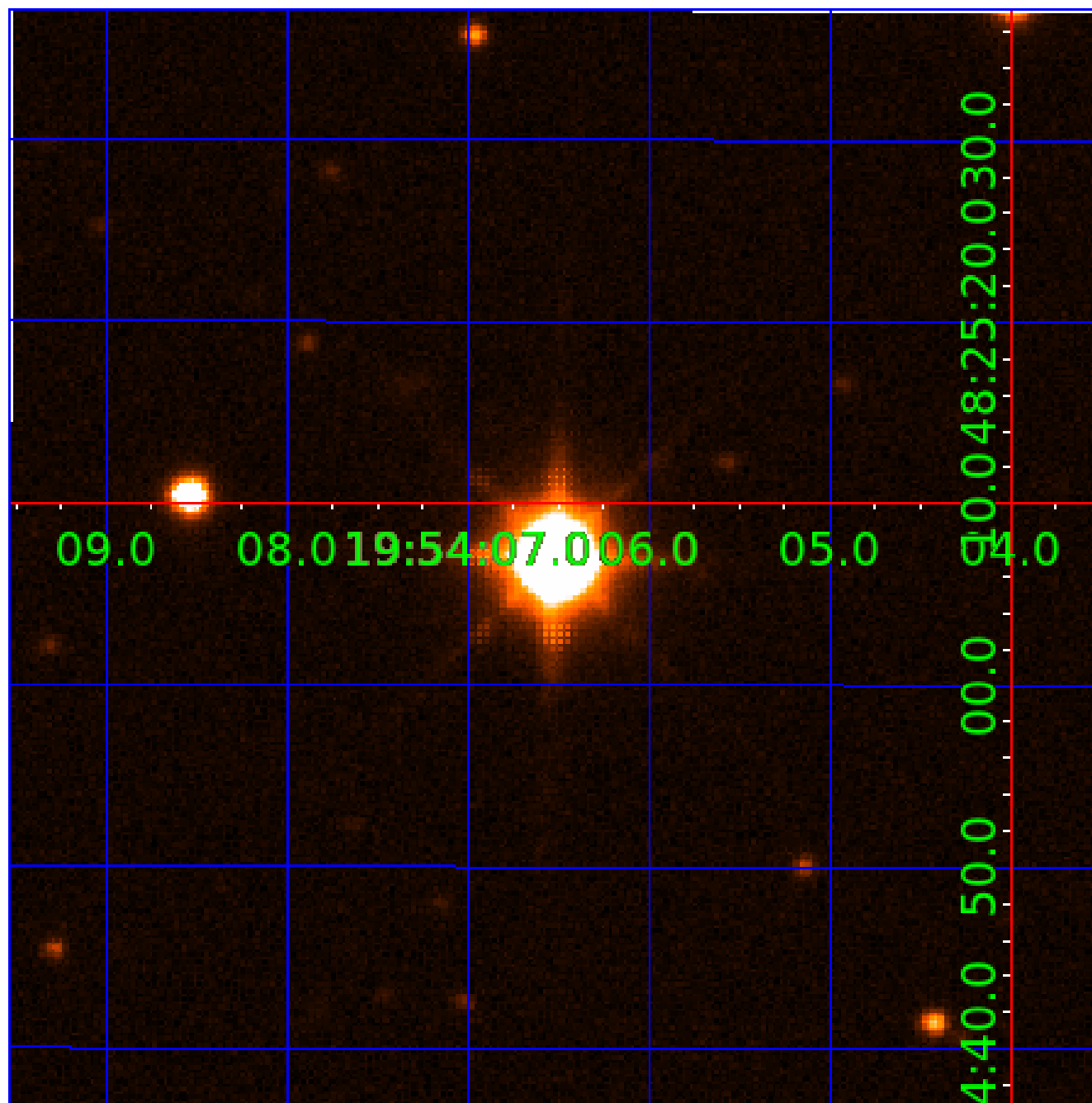


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010991989

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})
010991989-01	OBS	7398.01	0.974483	132.368546	8245.2	2.569	1136.3	957.4	15.00	5210	216.96	0.00
010991989-02	OBS	No	0.974478	131.879744	877.0	1.500	713.1	-1.0	15.00	5210	43.52	173788.20

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010991989-01	OBS	FP	0.00	0	1	0	0	PLANET_IN_STAR—MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_SATURATED
010991989-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_SATURATED

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.

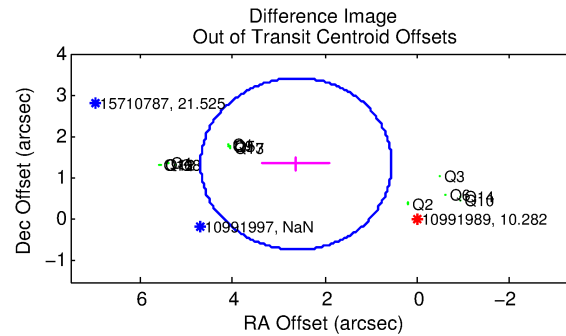
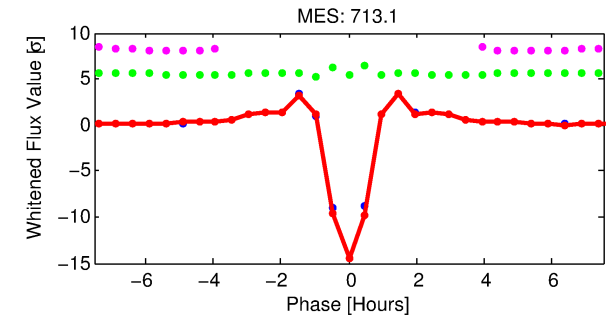
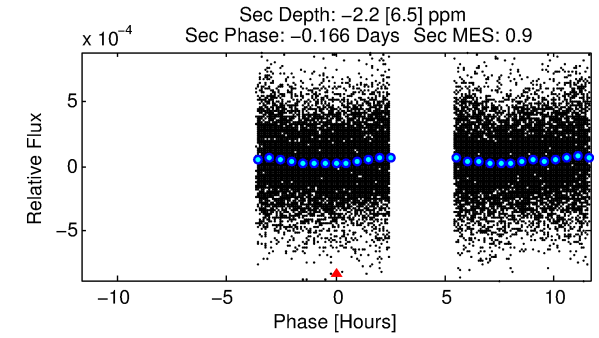
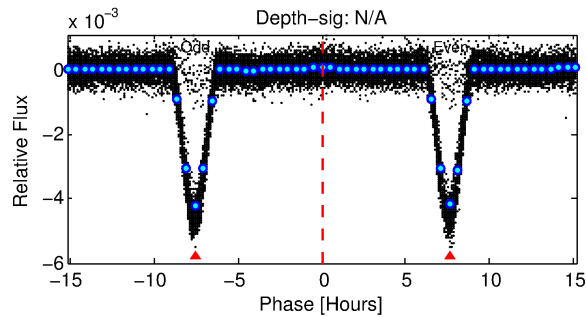
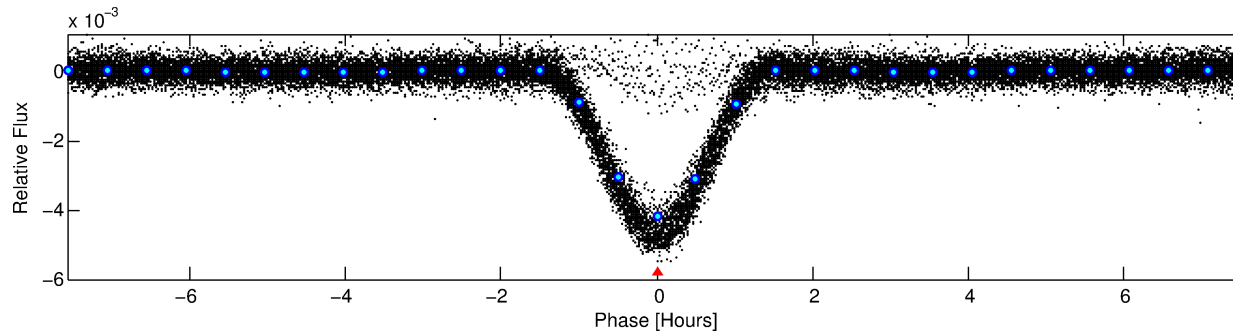
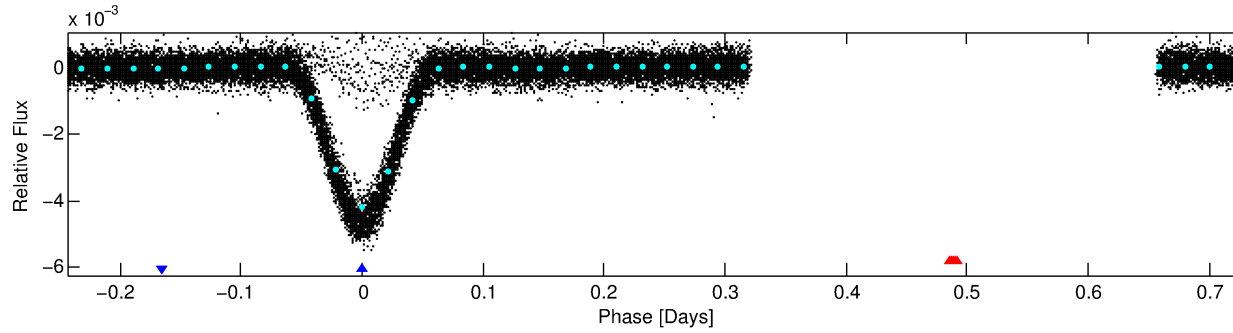
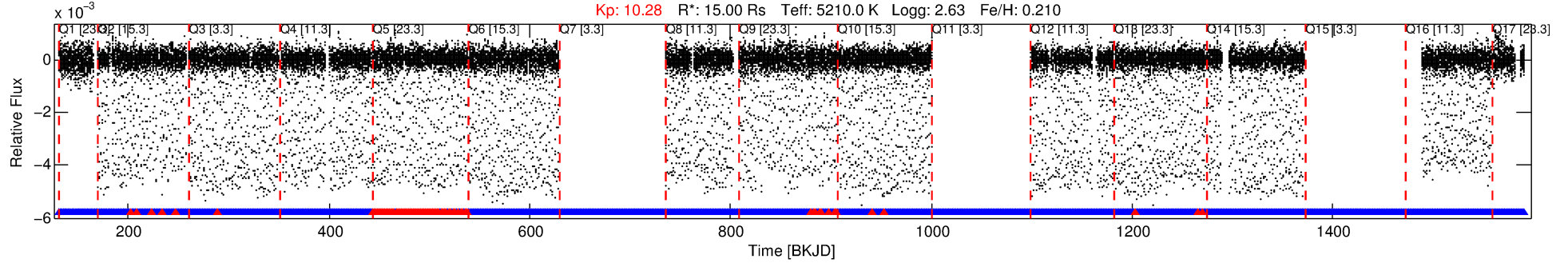
Ephemeris Match Information For 010991989-02

No Significant Match Found

DV One-Page Summary

KIC: 10991989 Candidate: 2 of 2 Period: 0.974 d
KOI: K07398 Corr: No Ephemeris Match

Kp: 10.28 R*: 15.00 Rs Teff: 5210.0 K Logg: 2.63 Fe/H: 0.210



TPS TCE Results:

Period = 0.97448 d
Epoch = 131.8797 BKJD

DV fit results are unavailable

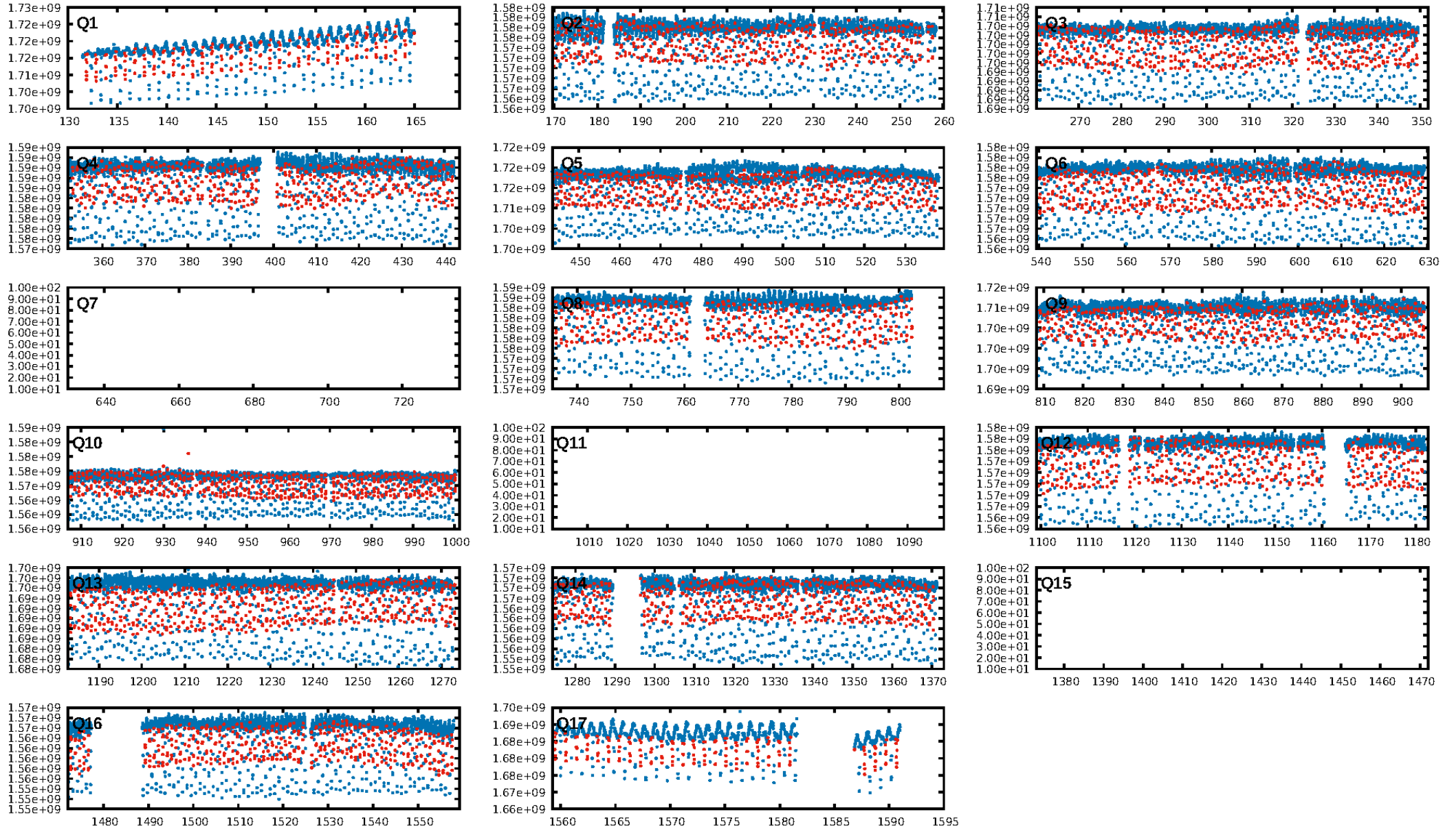
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.006]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.90 [933/1033]
GhostDiagnostic-chr: N/A
Centroid-sig: 0.0%
Centroid-so: 0.470 arcsec [120.29σ]
OotOffset-rm: 2.942 arcsec [4.27σ]
KicOffset-rm: 3.061 arcsec [4.82σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.36 [5/14]
DiffImageOverlap-fno: 1.00 [14/14]

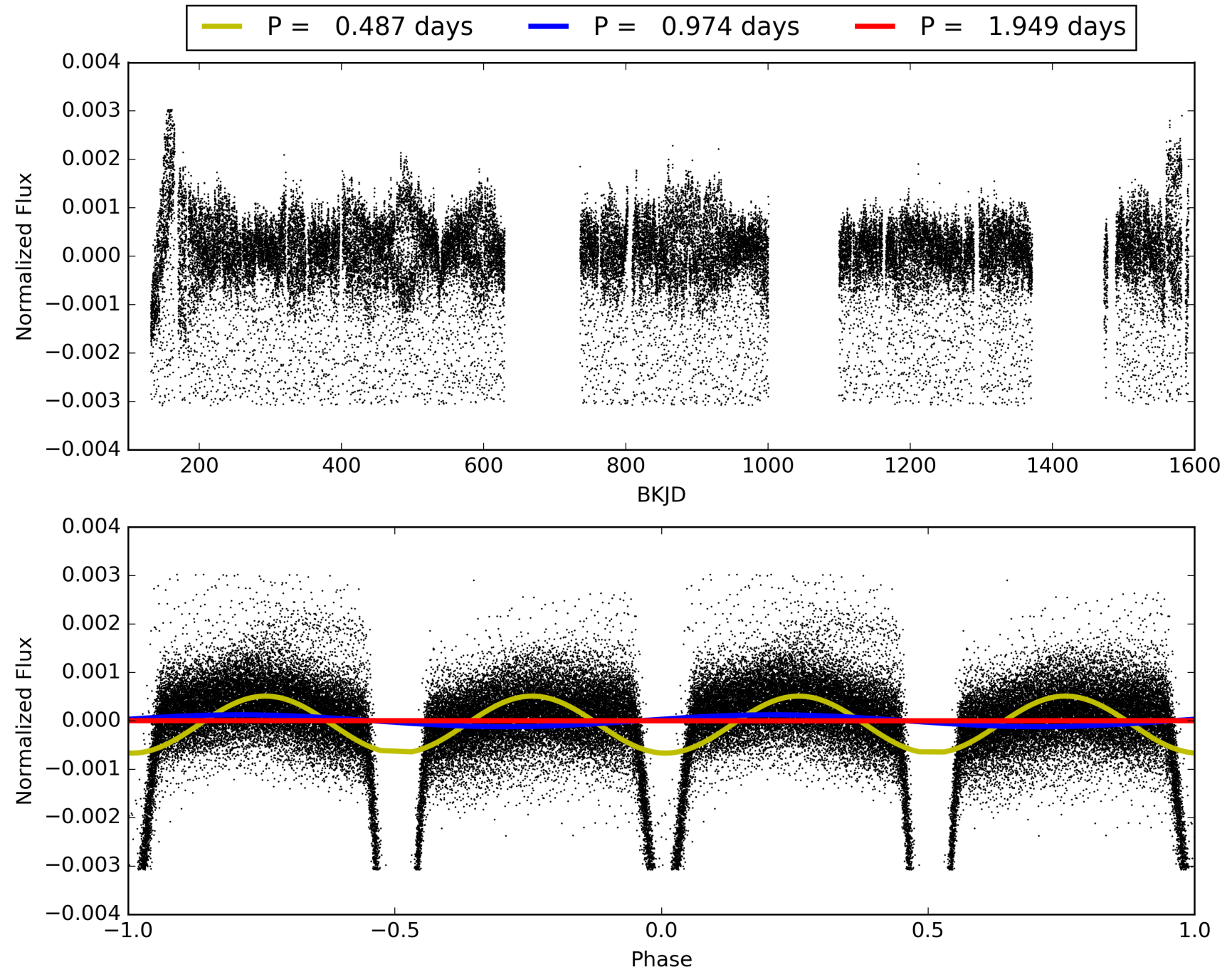
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010991989-02, PDC Light Curves

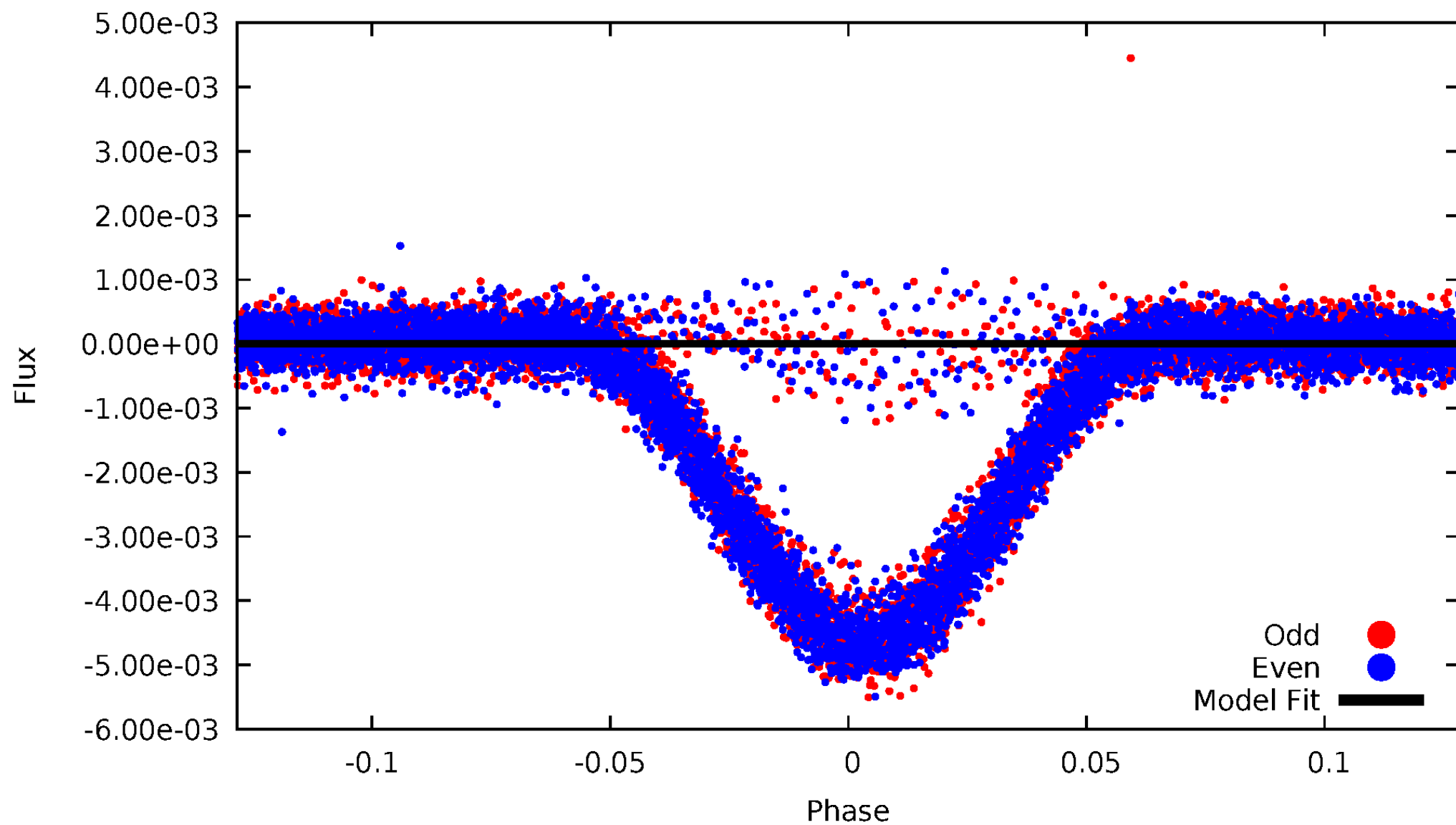


TCE 010991989-02



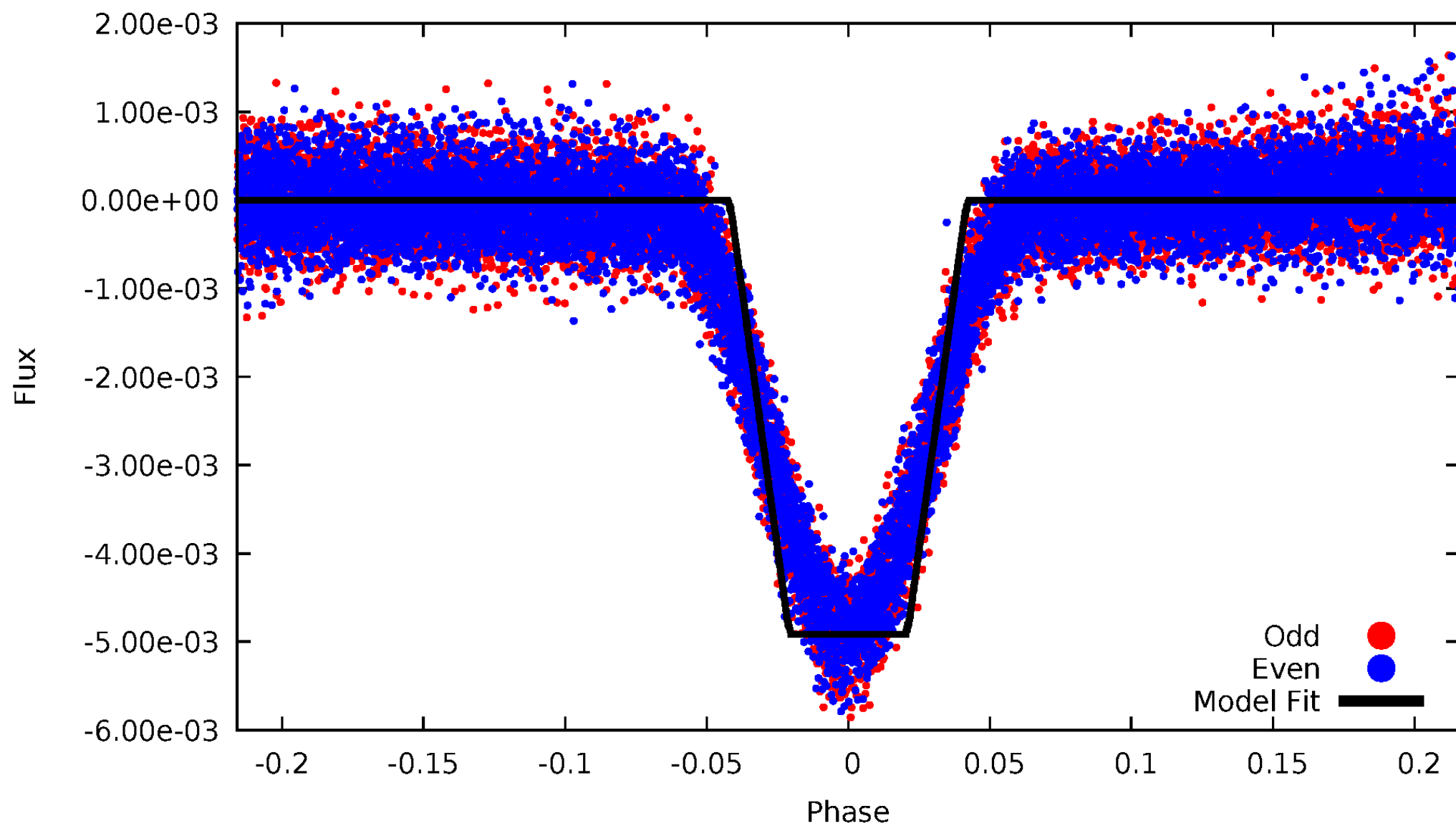
DV Odd/Even

TCE 010991989-02



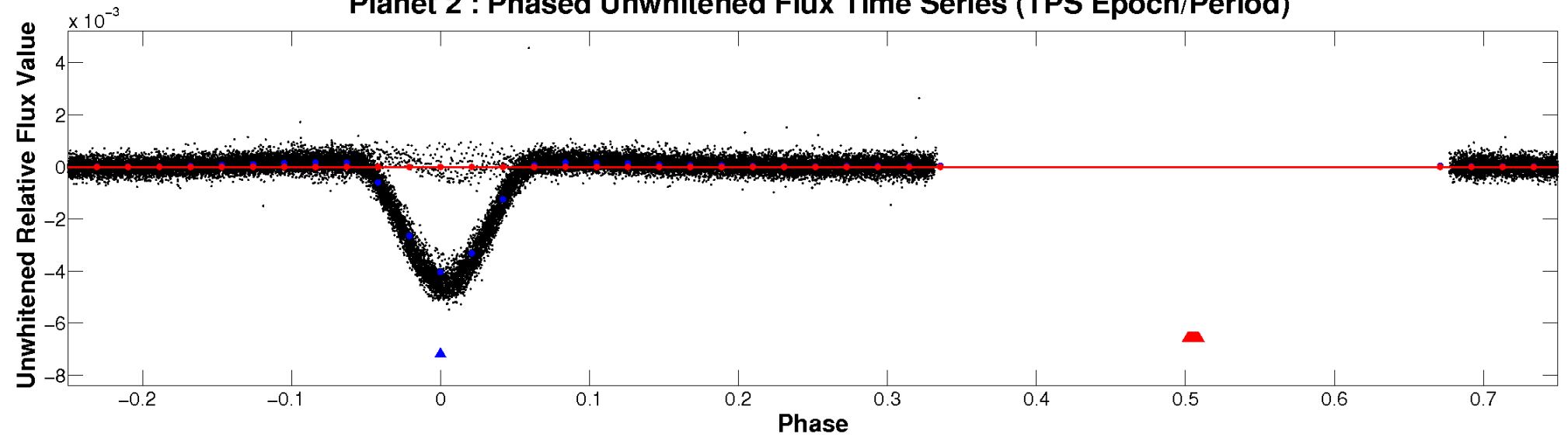
ALT Odd/Even

TCE 010991989-02

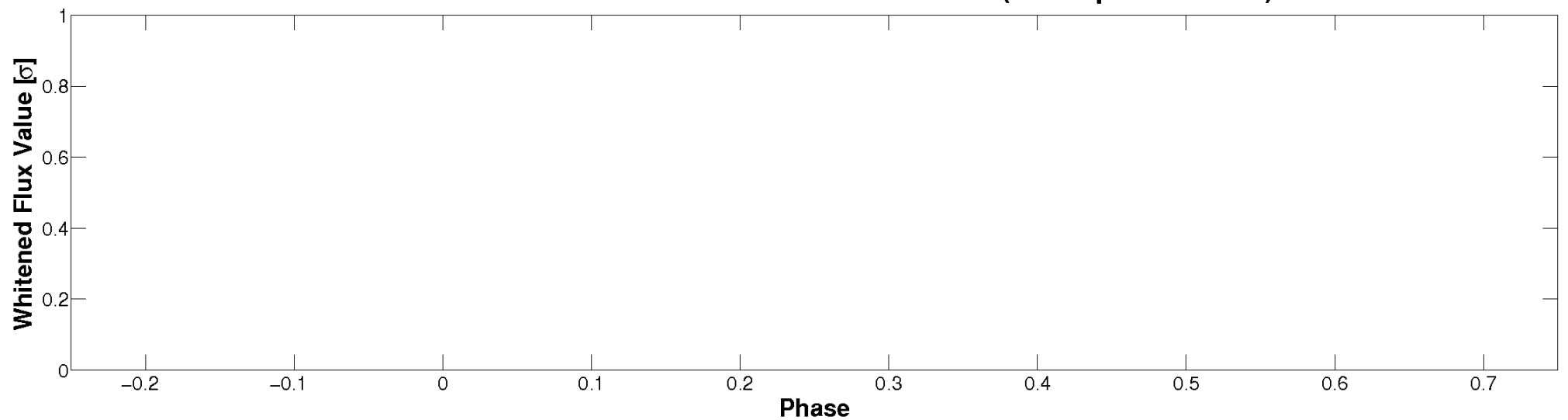


Non-Whitened Vs. Whitened Light Curve

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

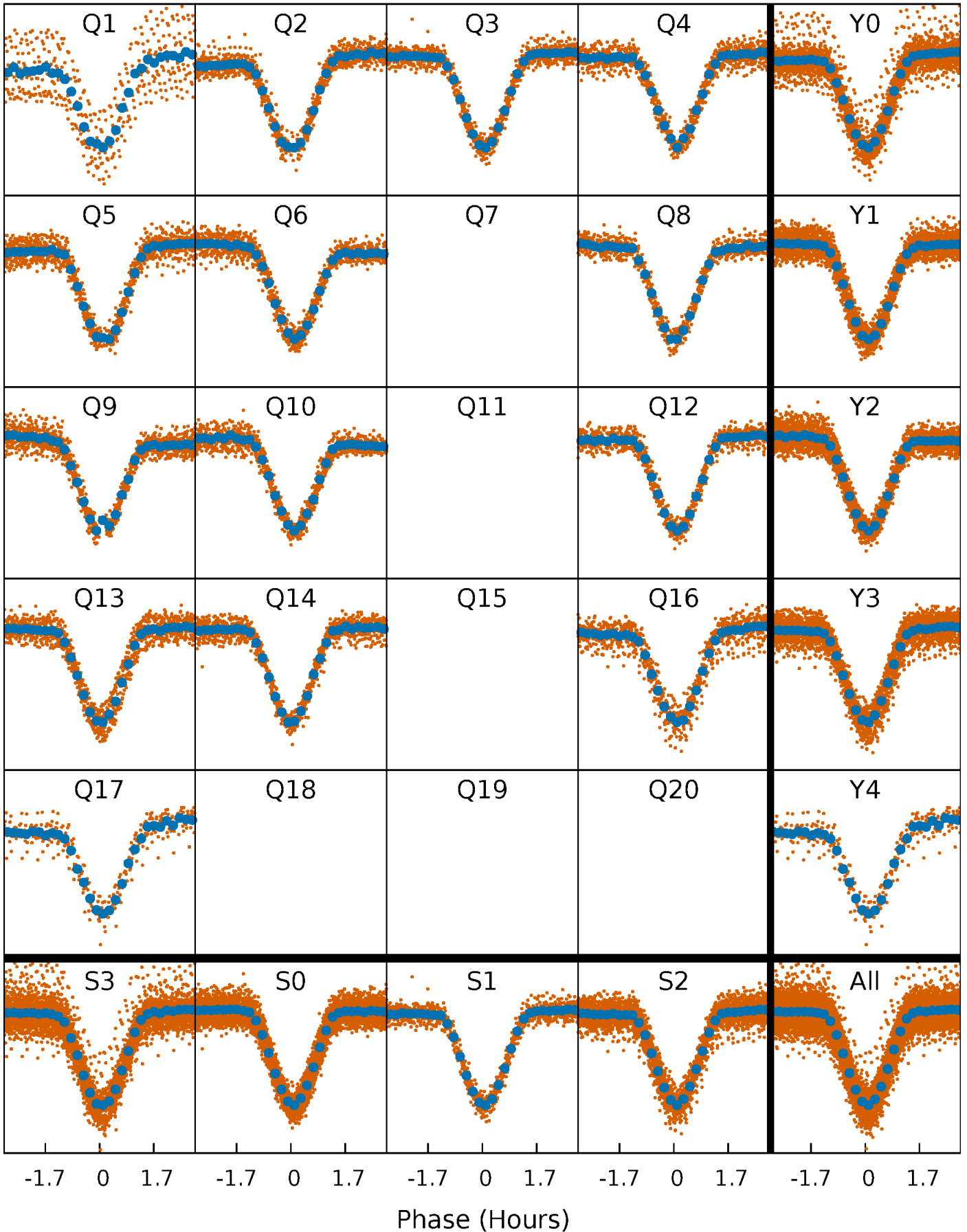


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



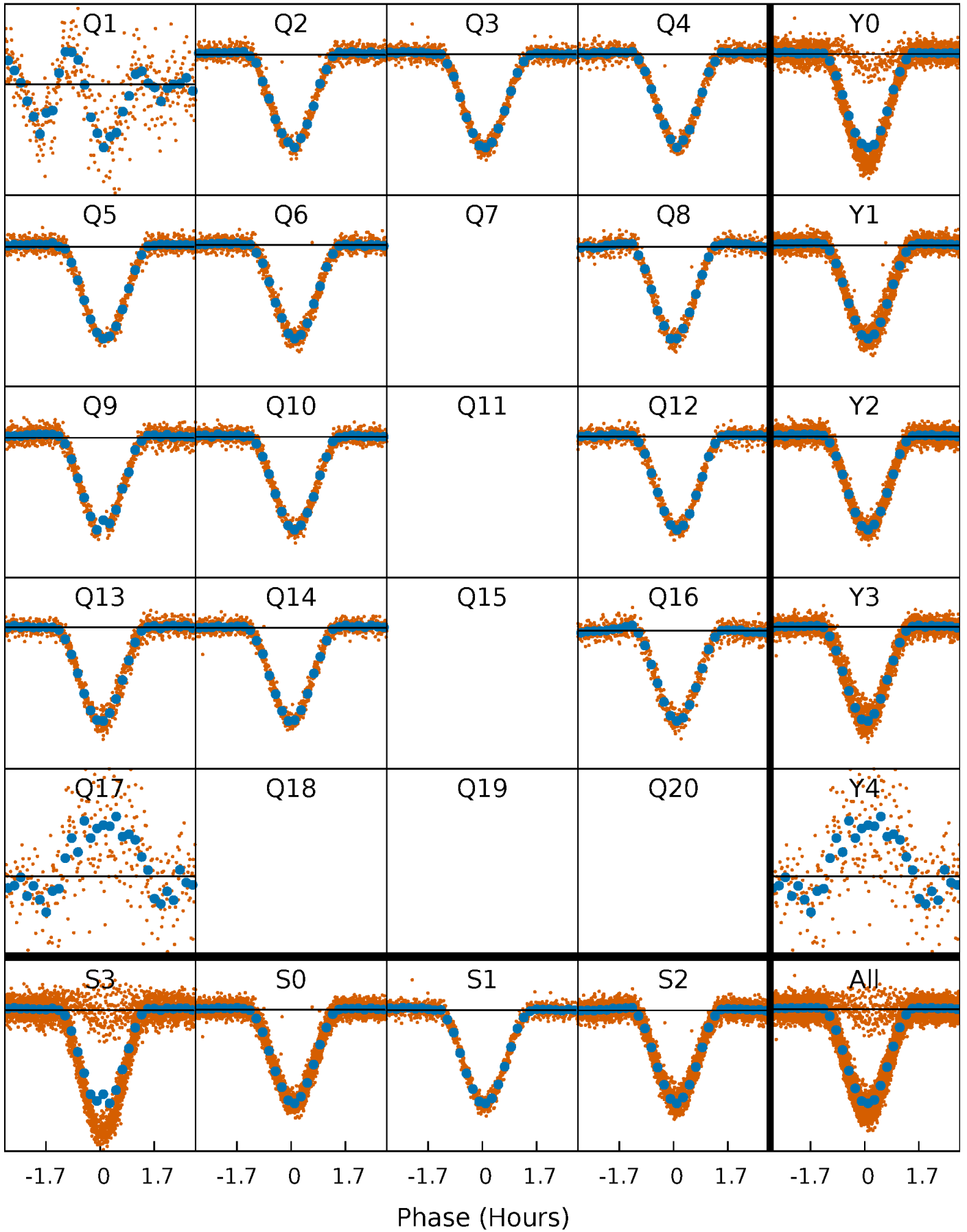
PDC Quarter-Phased Transit Curves

TCE 010991989-02 P= 0.974478 Days $T_0=131.879744$ (BKJD)



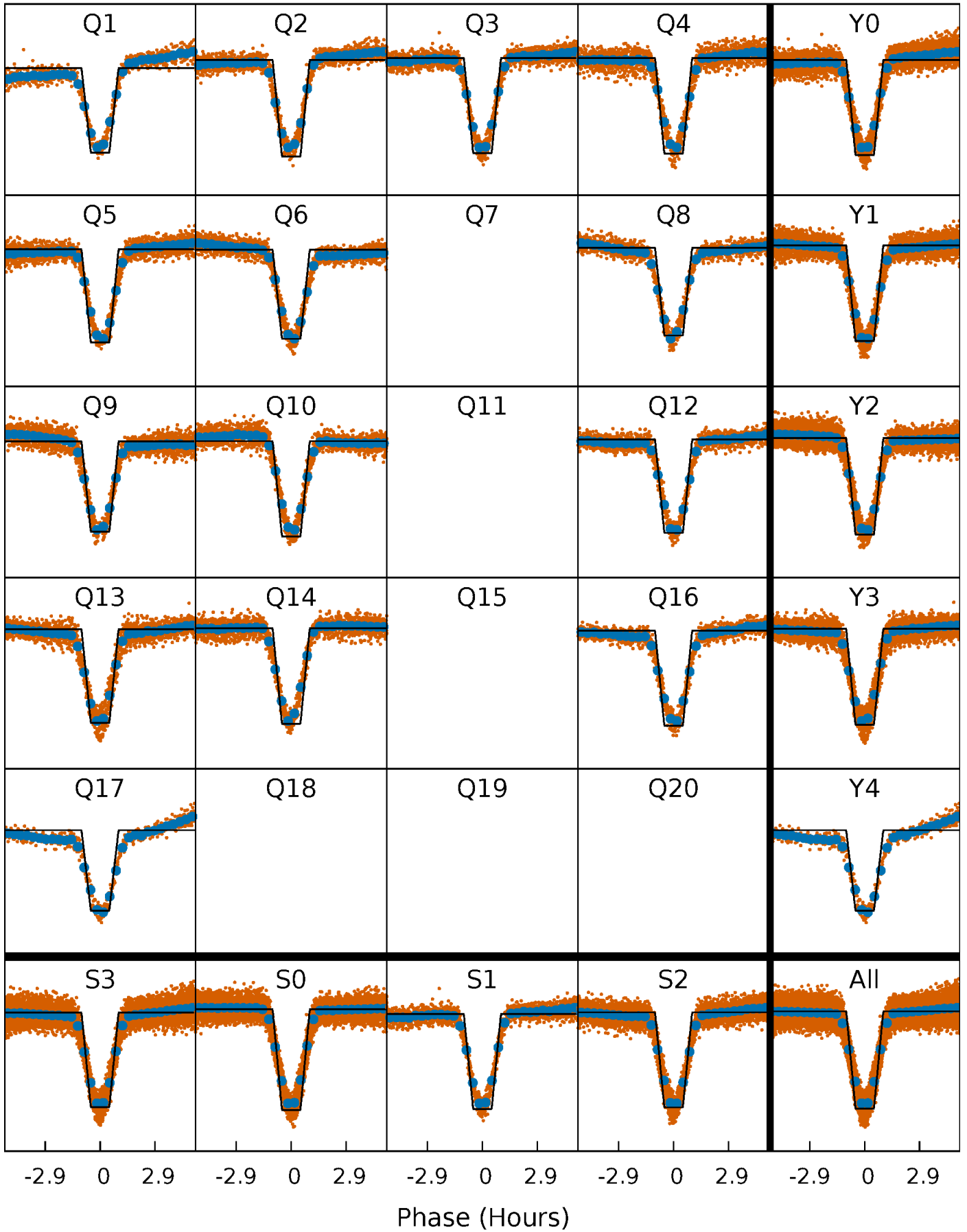
DV Quarter-Phased Transit Curves

TCE 010991989-02 P= 0.974478 Days $T_0=131.879744$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

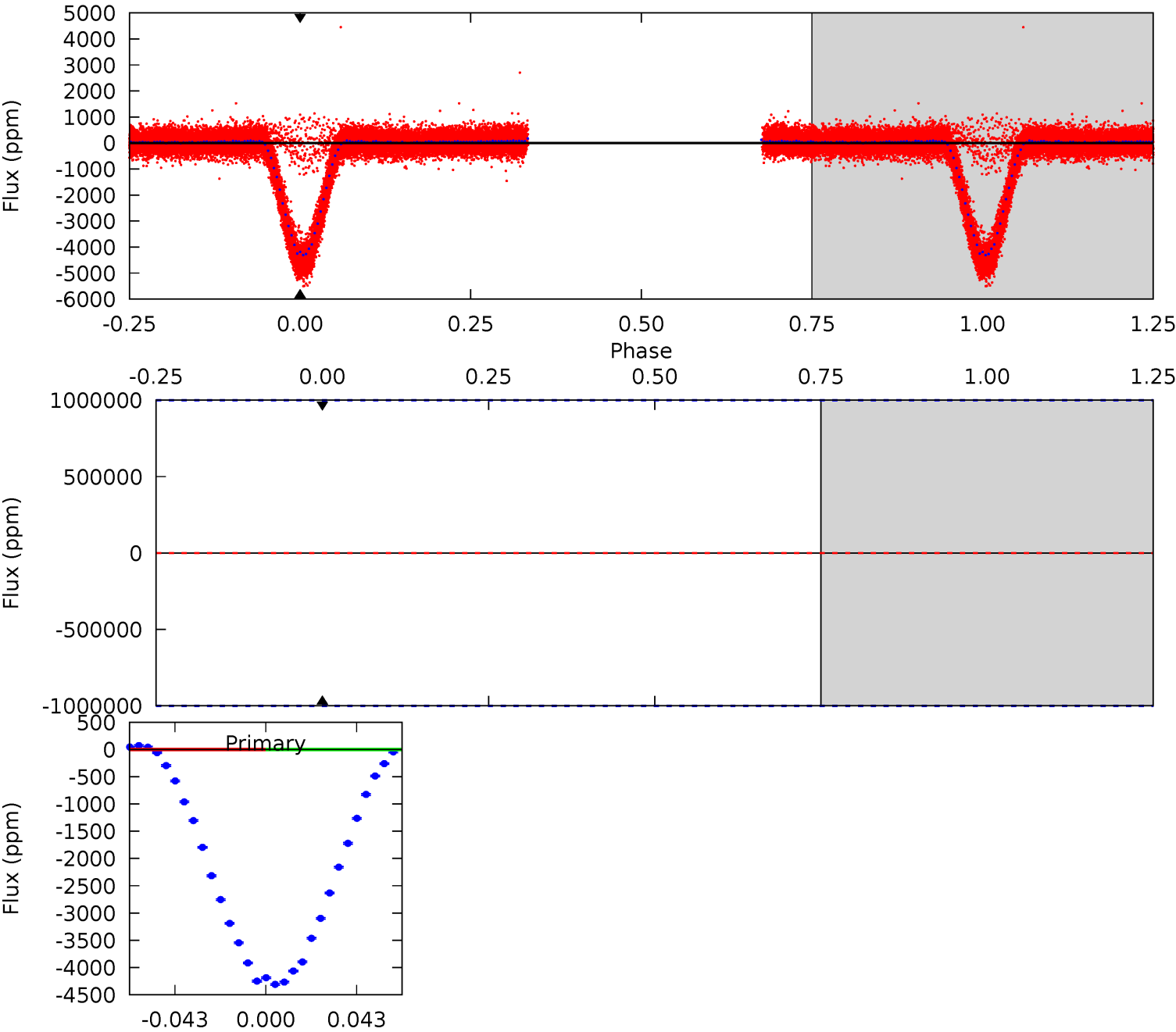
TCE 010991989-02 $P = 0.974478$ Days $T_0 = 131.883065$ (BKJD)



DV Model-Shift Uniqueness Test

010991989-02, P = 0.974478 Days, E = 130.905266 Days

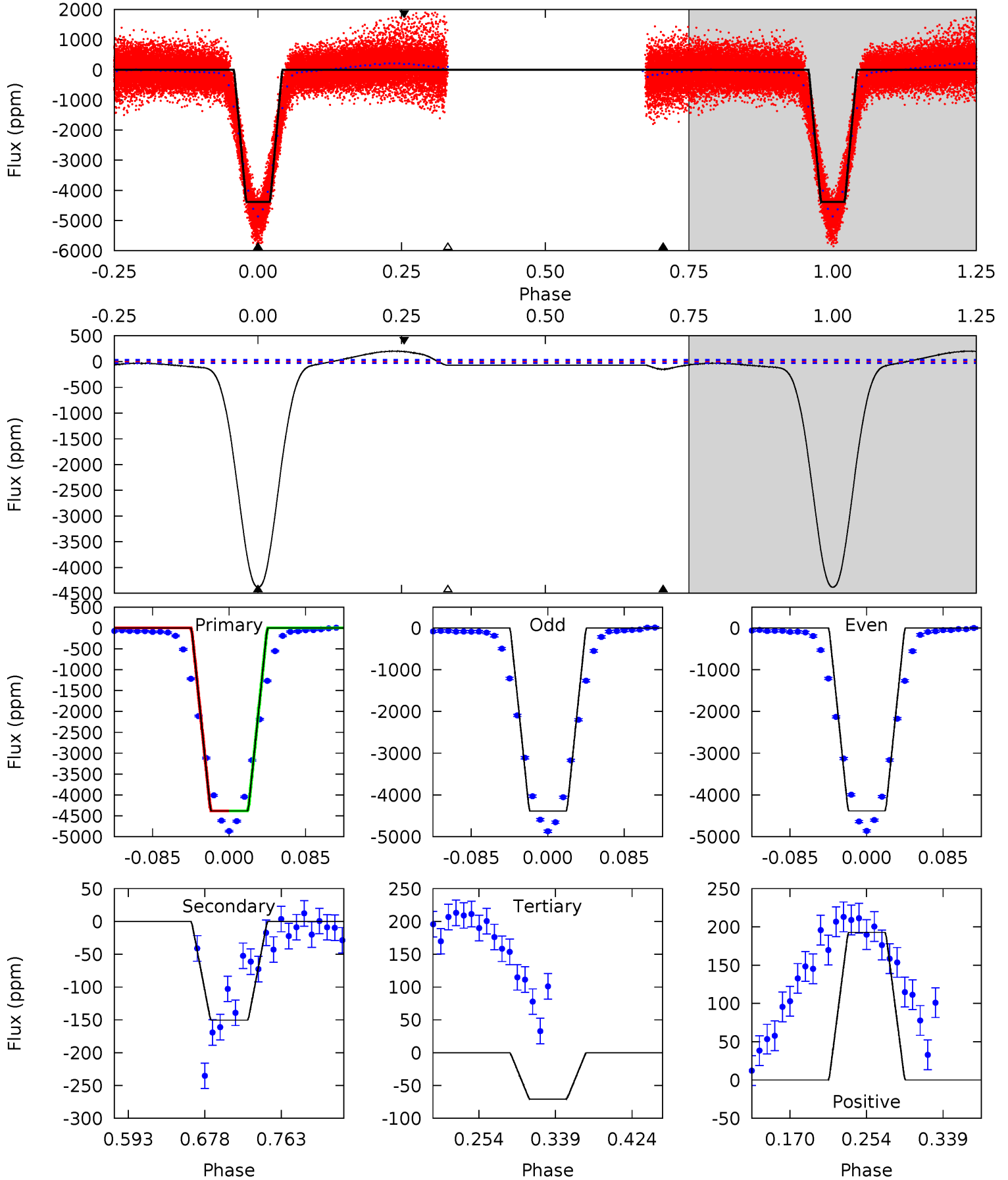
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

010991989-02, P = 0.974478 Days, E = 130.908587 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
685.6	23.5	11.1	30.2	4.60	1.72	17.0	674.5	655.4	12.5	-6.64	0.40	1.00	0.04	0.25



Stellar Parameters For KIC 010991989

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5210^{+136}_{-250}	$2.631^{+0.824}_{-0.145}$	$0.210^{+0.150}_{-0.500}$	$15.004^{+2.882}_{-11.529}$	$3.512^{+0.122}_{-2.322}$	$0.001^{+0.039}_{-0.001}$
	+3%/-5%	+31%/-6%	+71%/-238%	+19%/-77%	+3%/-66%	+2692%/-47%
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 010991989-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$109.18^{+122.52}_{-77.31}$	7096^{+622}_{-1370}	-5526^{+21179}_{-9455}	$0.016^{+7.879}_{-6.823}$
Alt.	-150 ± 6	$130.32^{+158.05}_{-87.47}$	7034^{+655}_{-1476}	-5568^{+1198}_{-600}	$0.004^{+0.032}_{-0.003}$

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 $A_{obs} \gg 1.0$

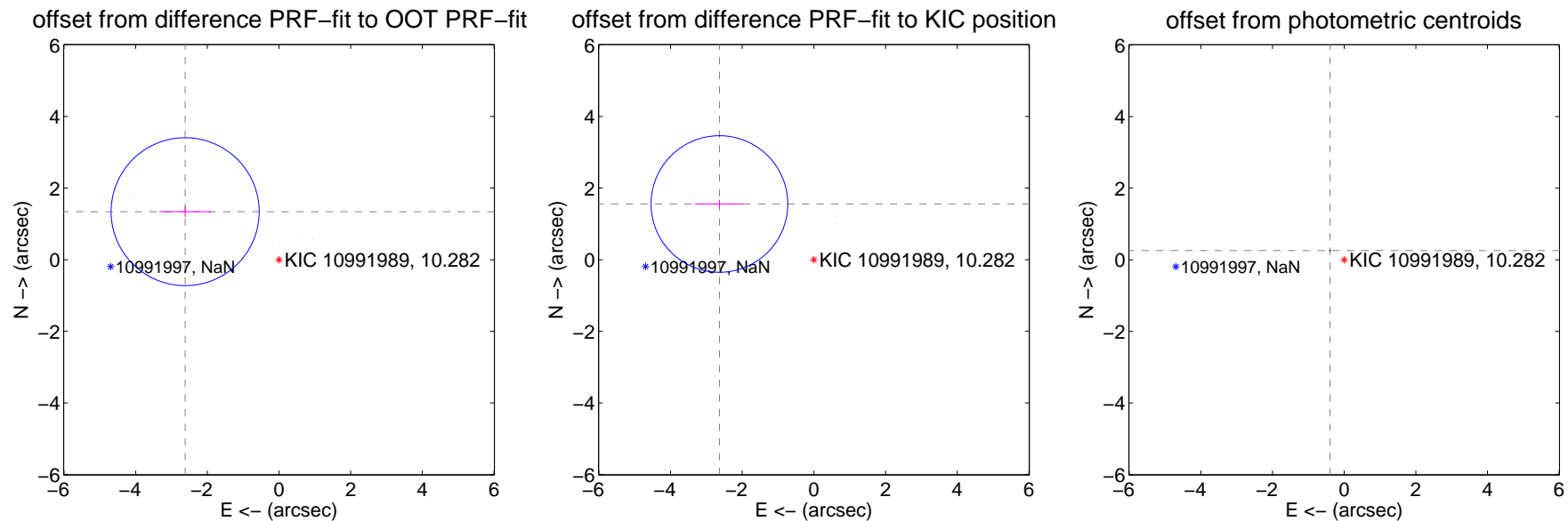
DV Centroid Data

Supplemental centroid analysis for 010991989-02. **Kepler magnitude: 10.28.** Transit SNR -1.00

There are 5 quarters with good PRF difference image offsets

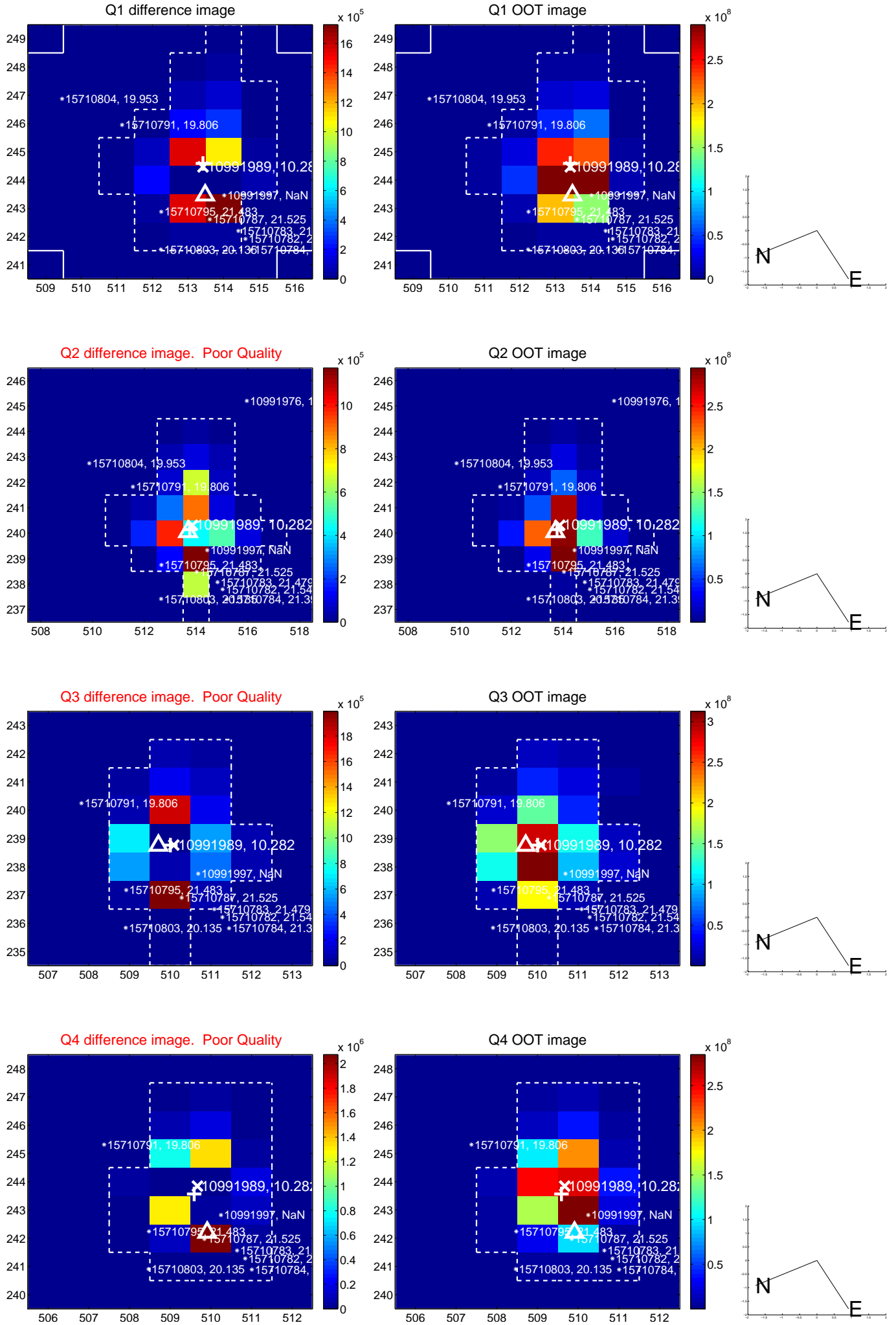
The direct PRF centroid is offset from the target star catalog position by about 0.54 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.942 \pm 0.689	4.27	2.619 \pm 0.718	1.341 \pm 0.147
PRF-fit source offset from KIC position	3.061 \pm 0.636	4.82	2.636 \pm 0.681	1.556 \pm 0.121
photometric centroid source offset	0.47 \pm 0.00	120.29	0.39 \pm 0.00	0.26 \pm 0.00

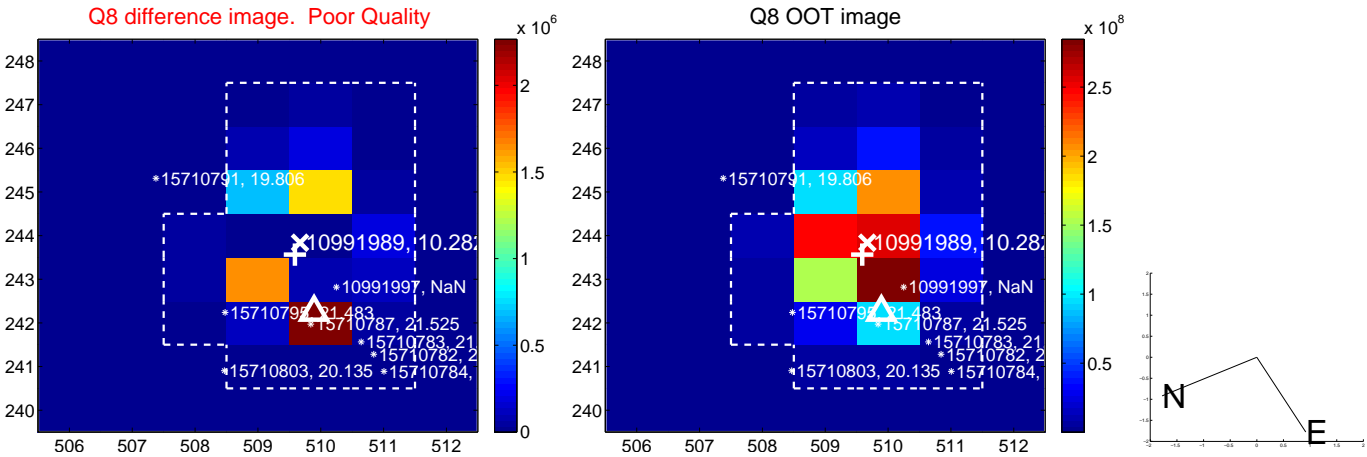
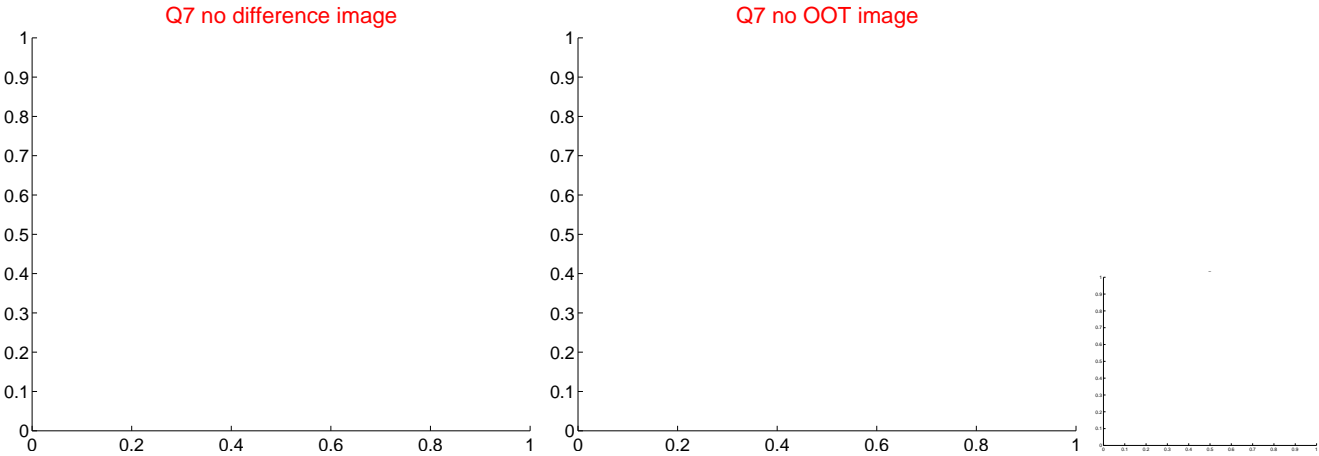
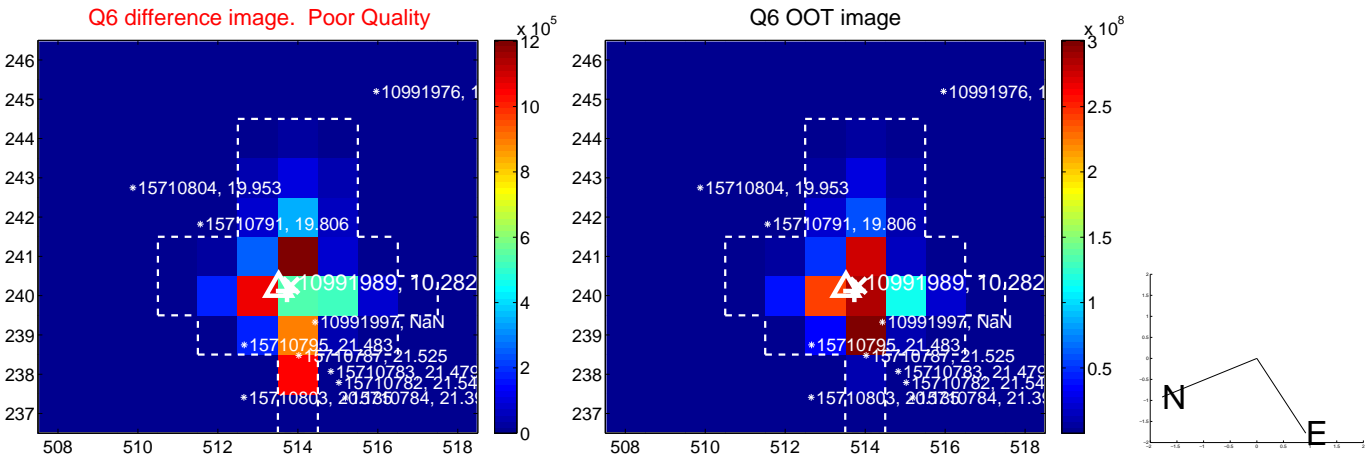
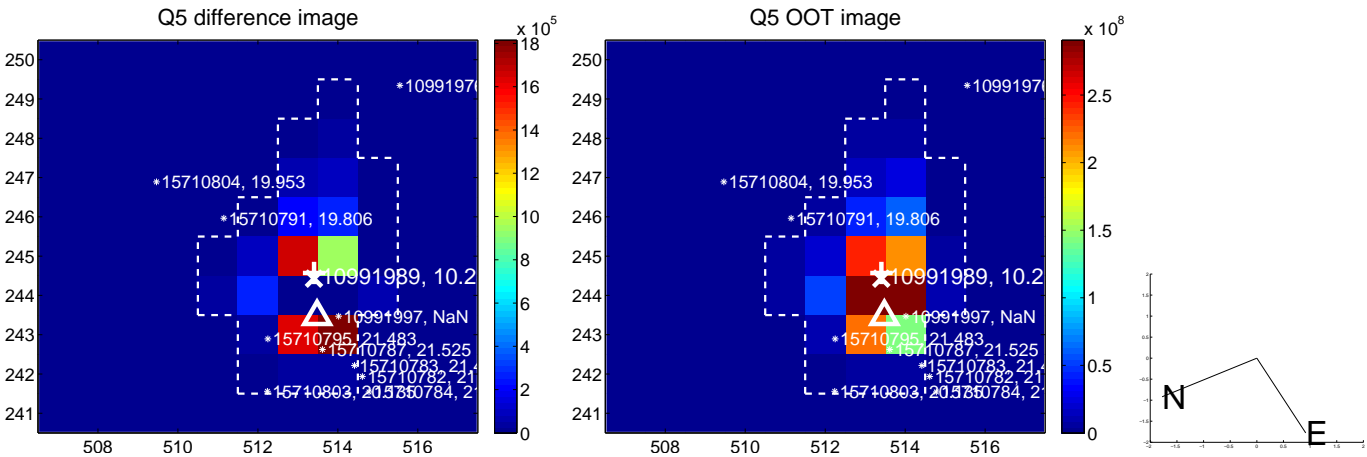


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

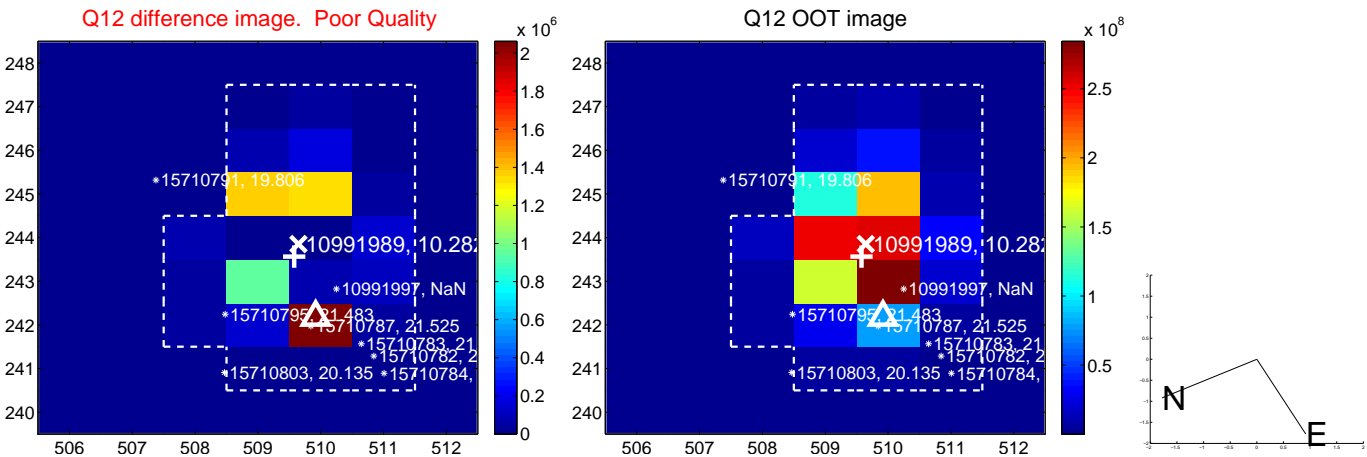
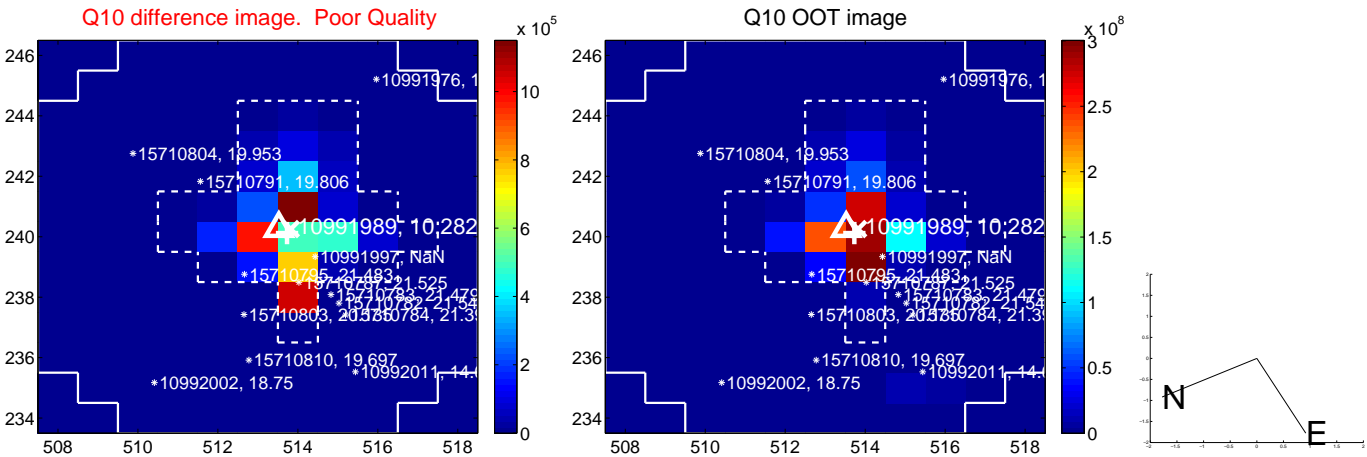
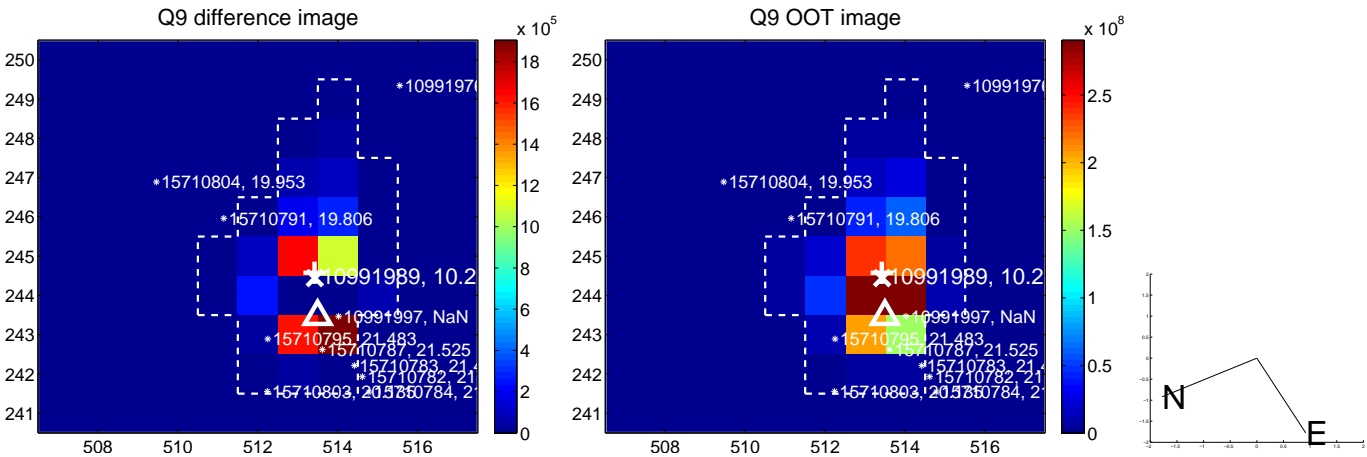
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



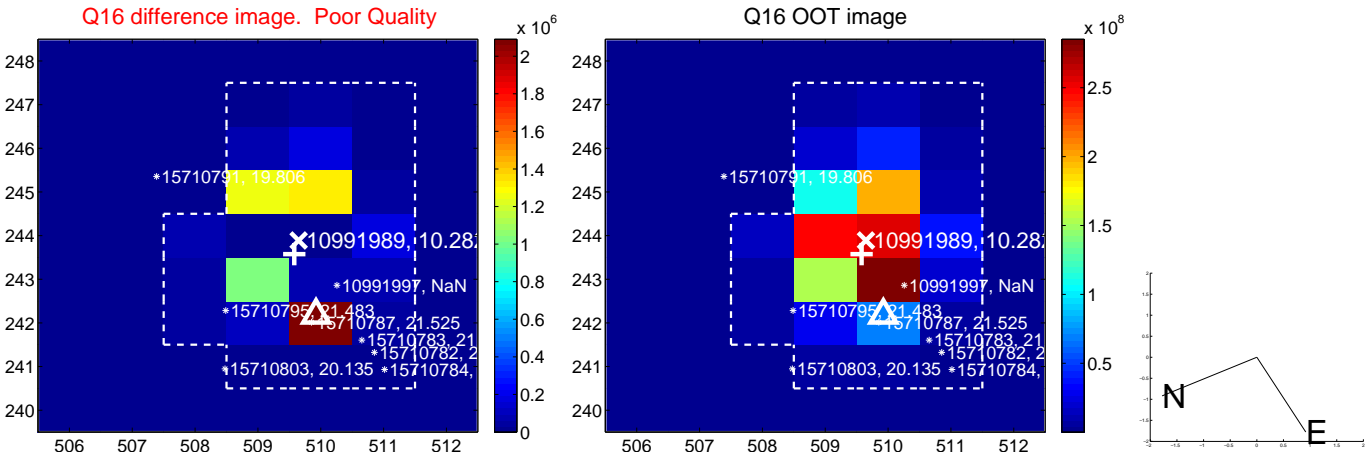
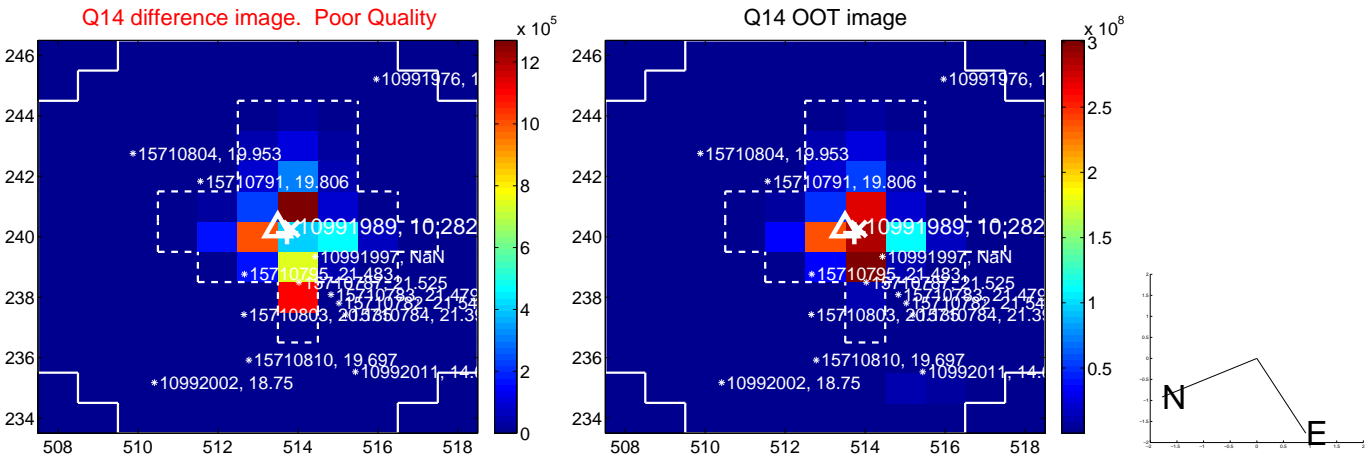
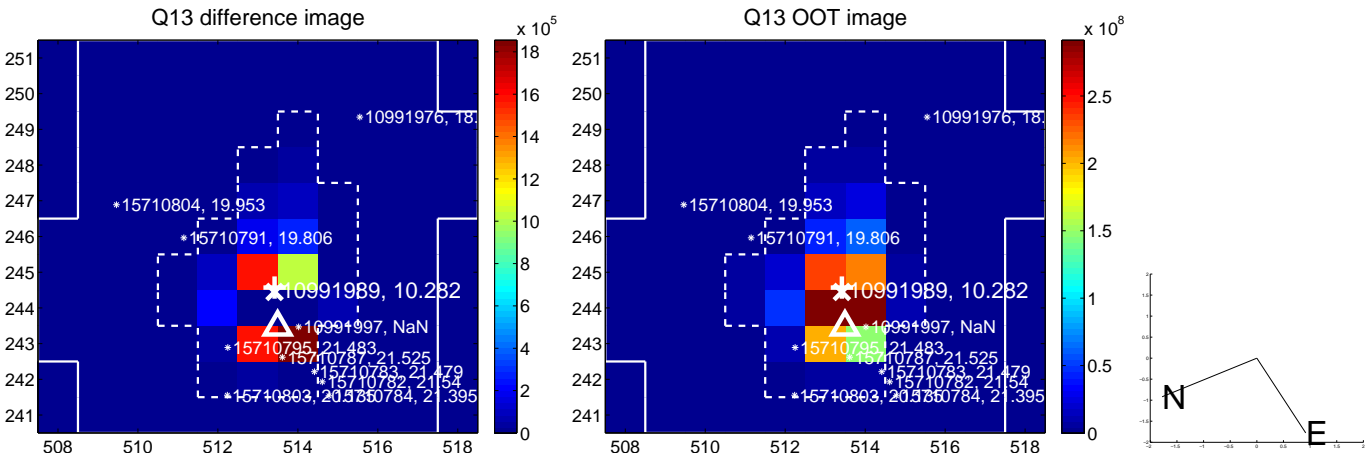
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



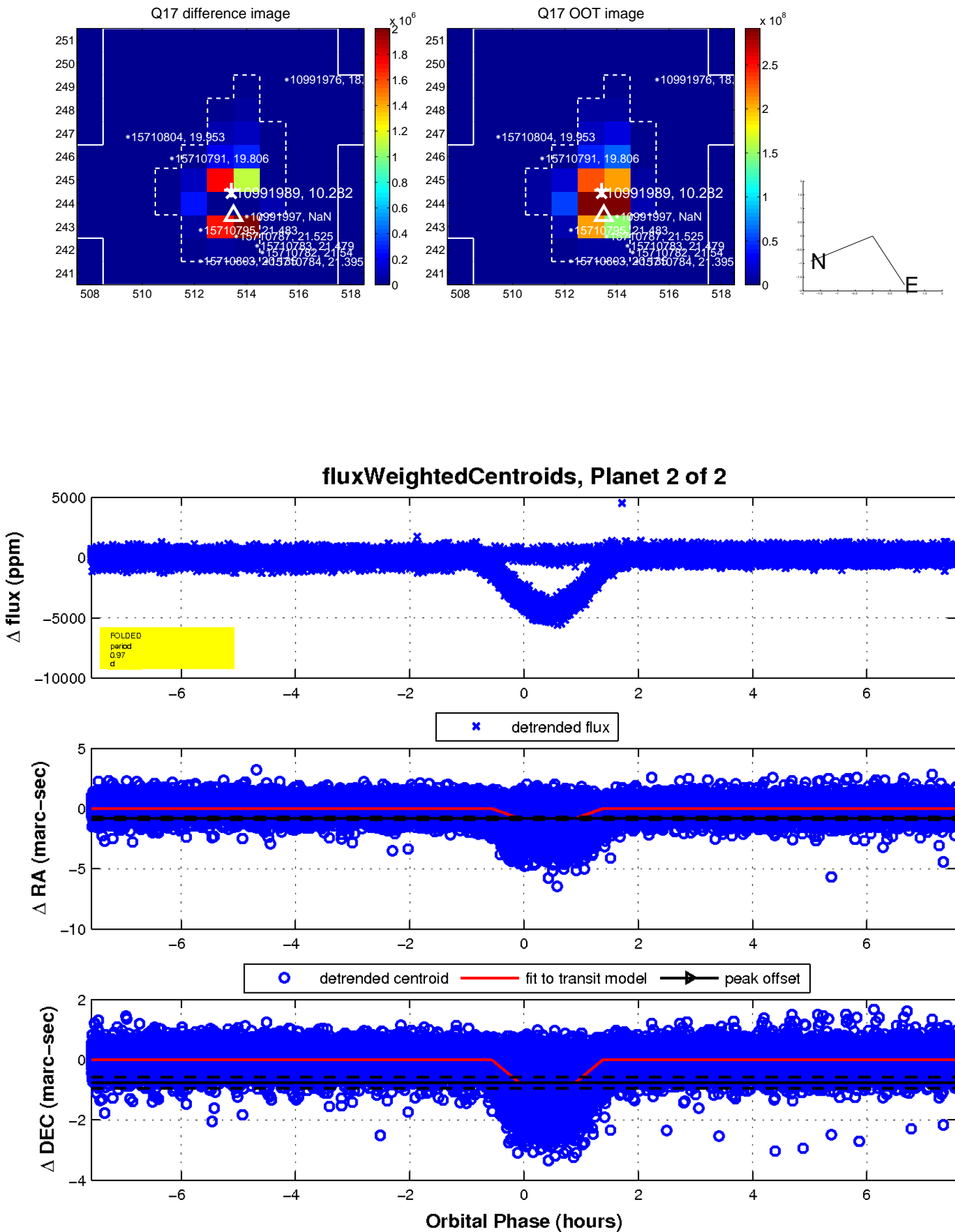
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

