

KIC 004737302

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})
004737302-01	OBS	6441.01	9.455589	133.670353	115800.3	8.452	18902.3	17912.9	4.24	7221	173.86	3580.49
004737302-02	OBS	No	4.727839	133.598623	34375.2	6.000	9558.1	-1.0	4.24	7221	78.83	9022.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004737302-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
004737302-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_NOFITS

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.

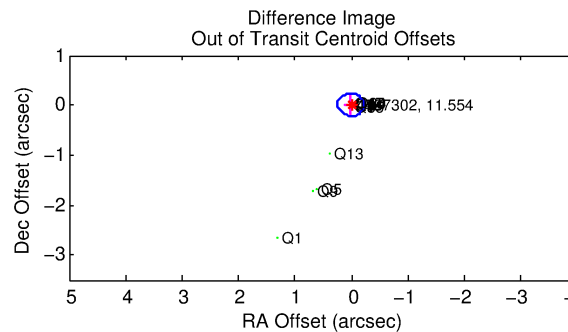
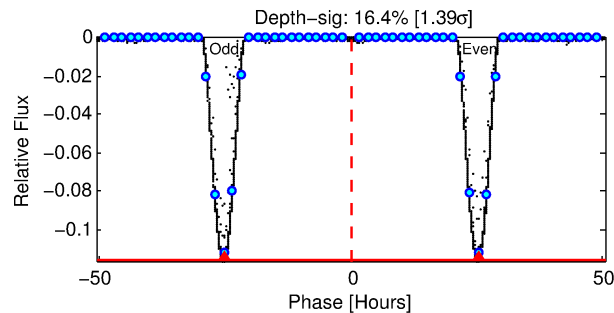
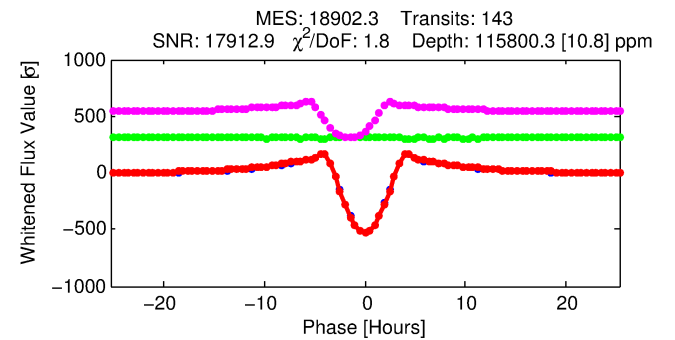
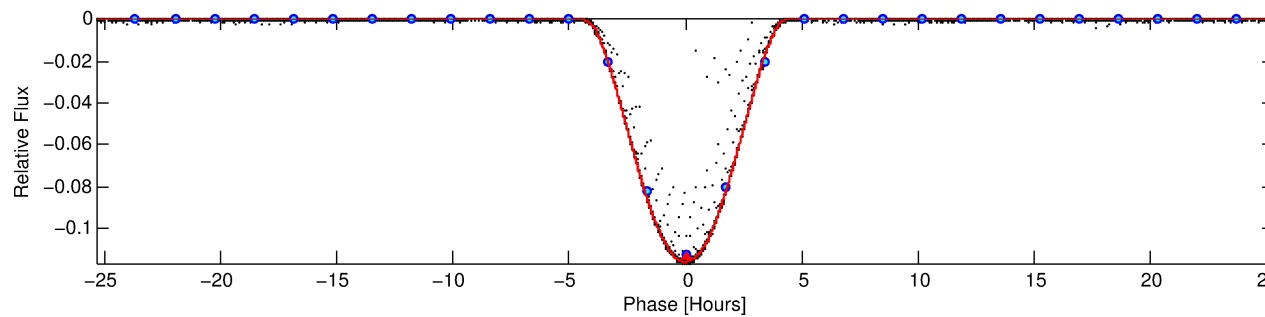
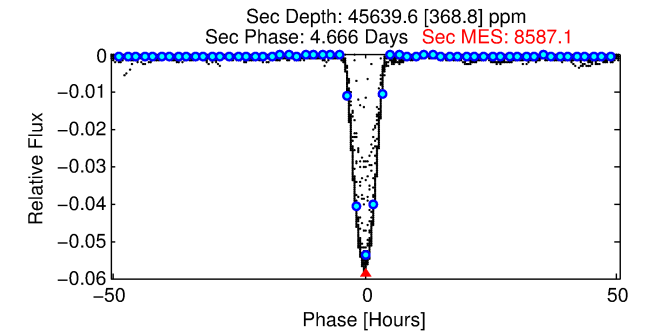
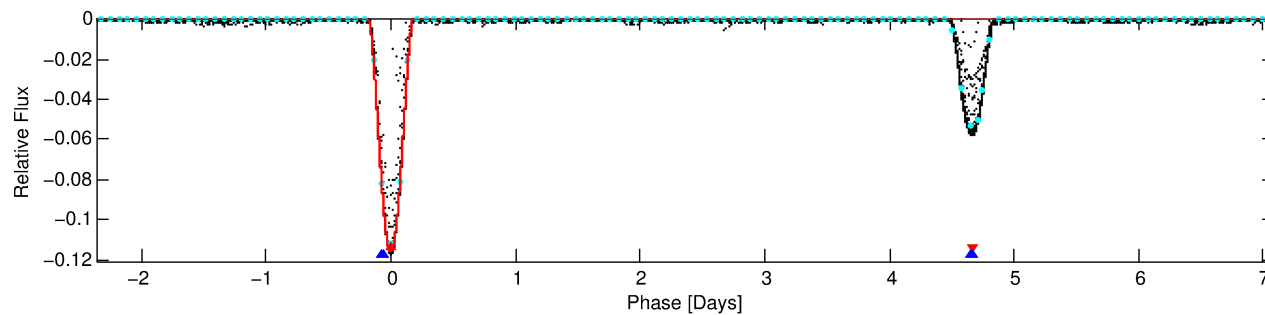
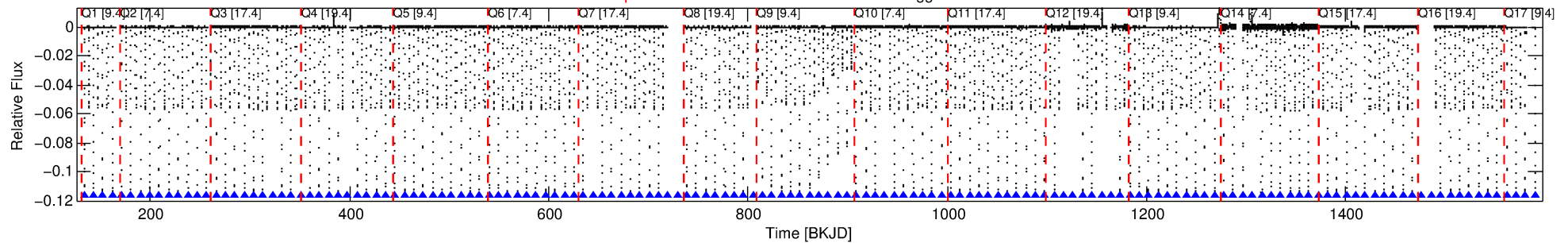
Ephemeris Match Information For 004737302-01

No Significant Match Found

DV One-Page Summary

KIC: 4737302 Candidate: 1 of 2 Period: 9.456 d
KOI: K06441.01 Corr: 1.000

Kp: 11.55 R*: 4.24 Rs Teff: 7221.0 K Logg: 3.49 Fe/H: -0.180



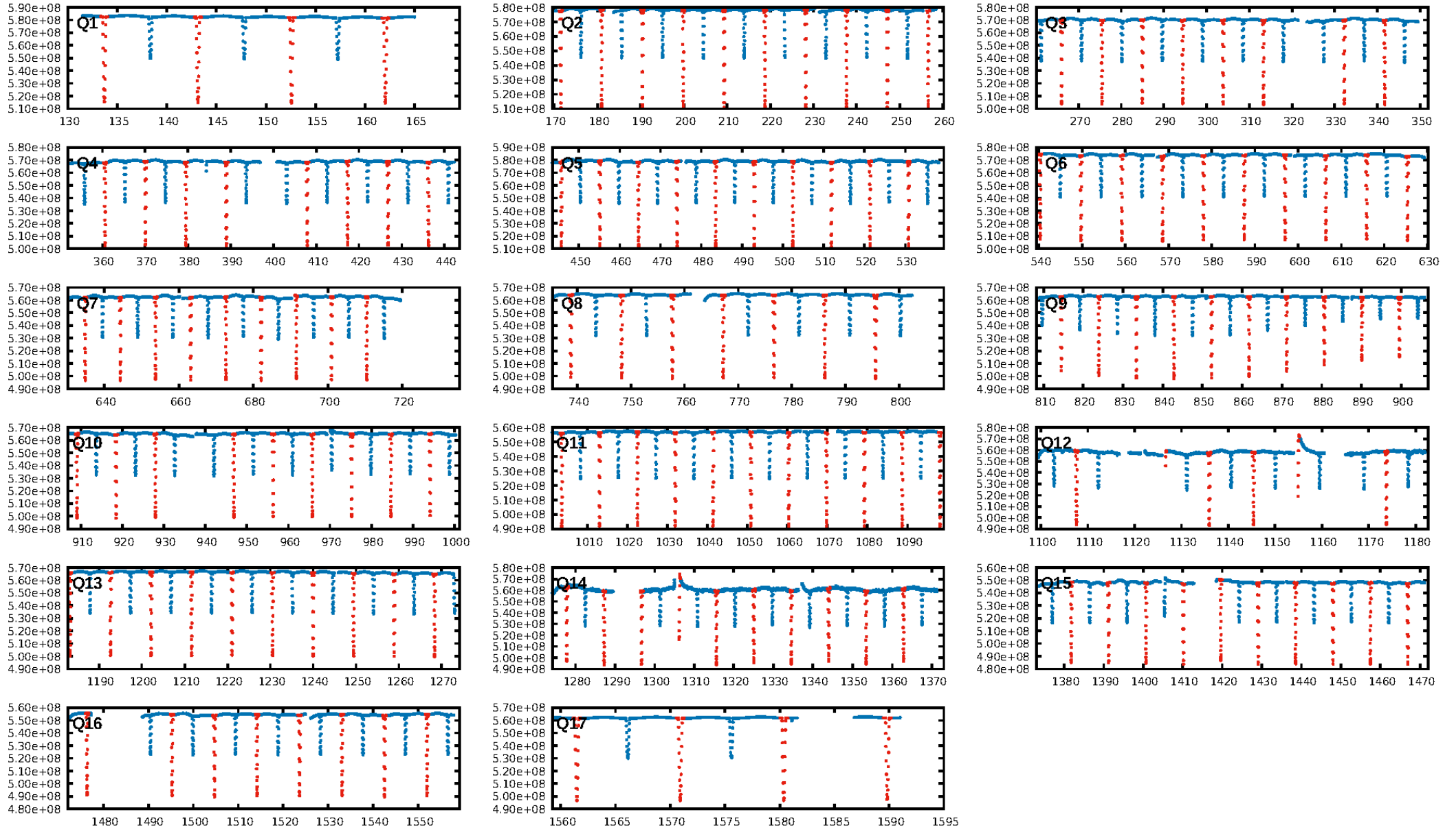
DV Fit Results:

Period = 9.45559 [0.00000] d
Epoch = 133.6704 [0.0000] BKJD
Rp/R* = 0.3758 [0.0003]
a/R* = 9.81 [0.00]
b = 0.77 [0.00]
Seff = 3580.49 [3668.23]
Teff = 1972 [505] K
Rp = 173.86 [105.14] Re
a = 0.1106 [0.0679] AU
Ag = 10.16 [10.27] [0.89σ]
Teffp = 5445 [226] K [6.28σ]

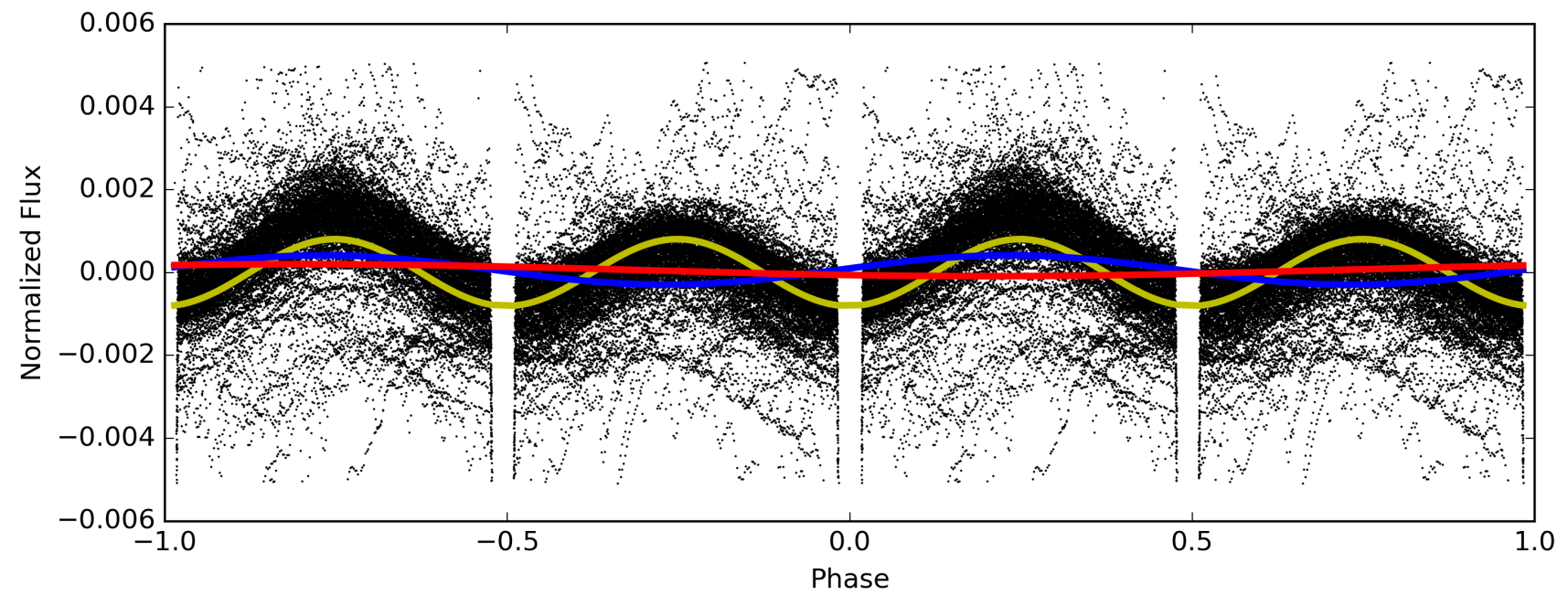
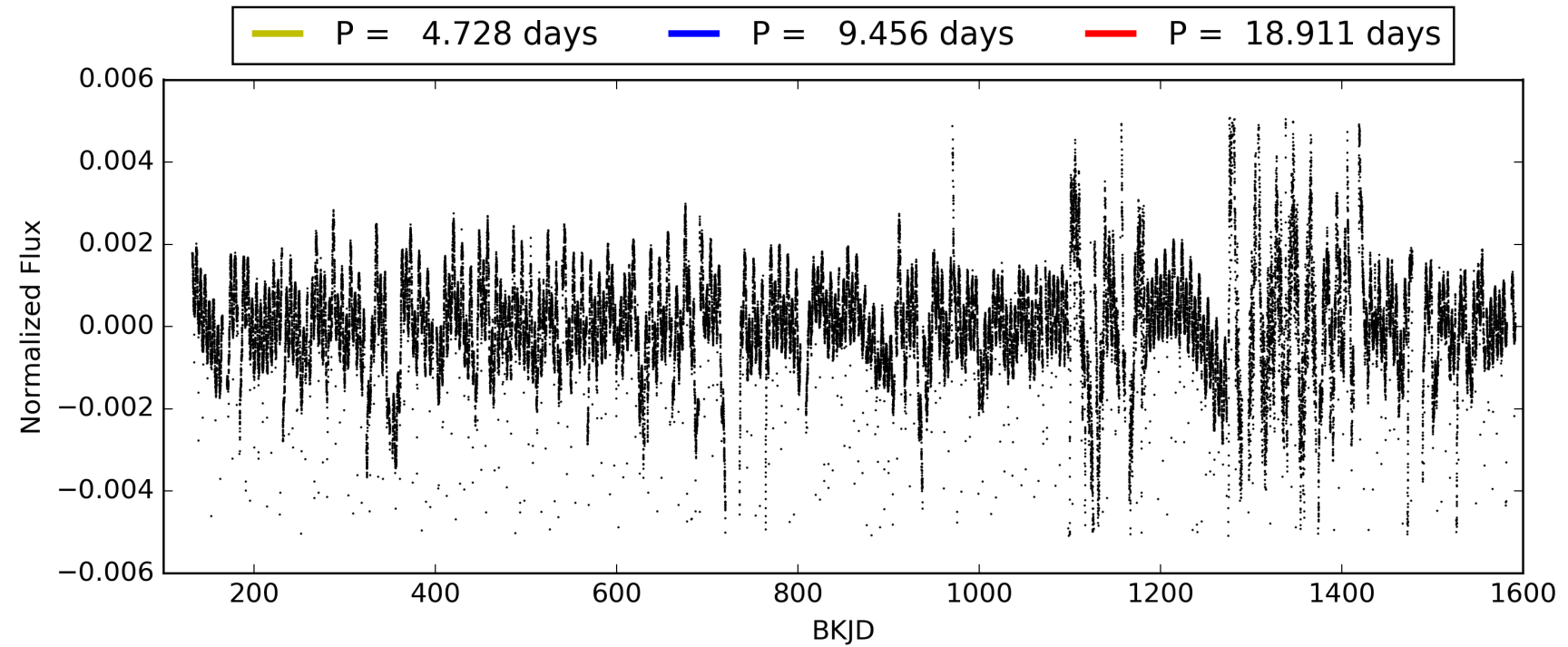
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.95σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [135/135]
GhostDiagnostic-chr: 4.115
Centroid-sig: 0.0%
Centroid-so: 0.120 arcsec [340.95σ]
OotOffset-rm: 0.019 arcsec [0.26σ]
KicOffset-rm: 0.043 arcsec [0.27σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 004737302-01, PDC Light Curves

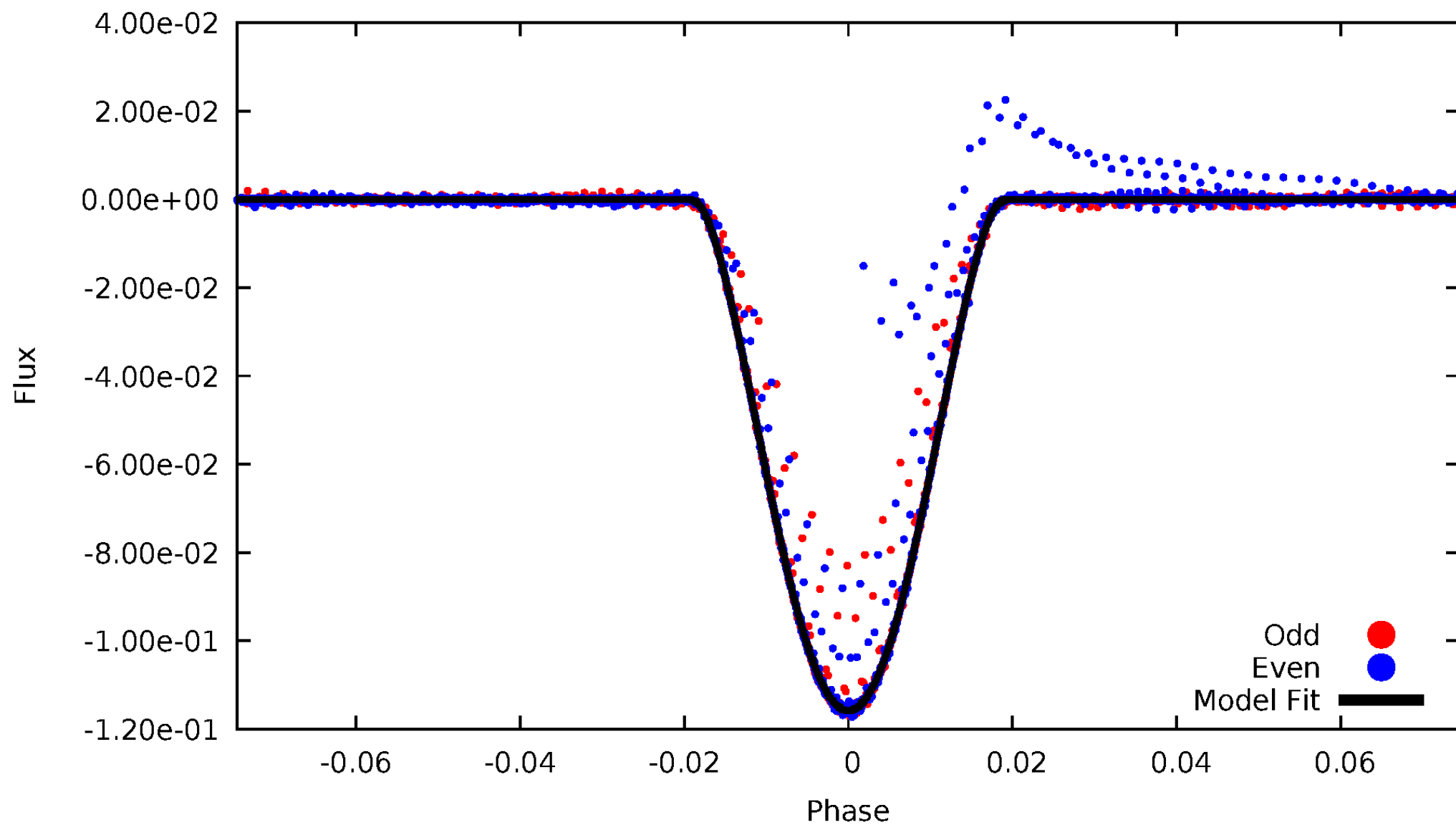


TCE 004737302-01



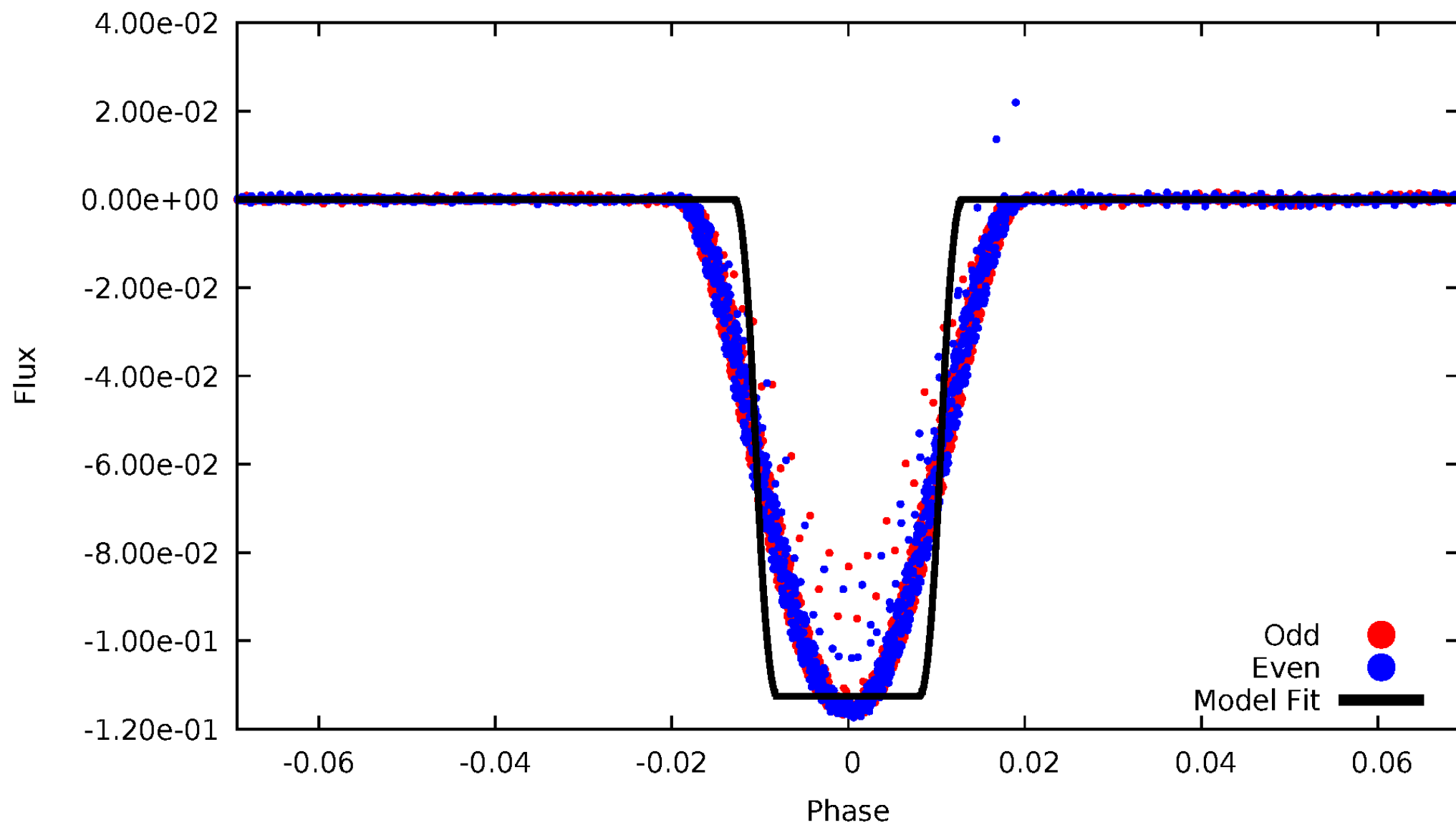
DV Odd/Even

TCE 004737302-01



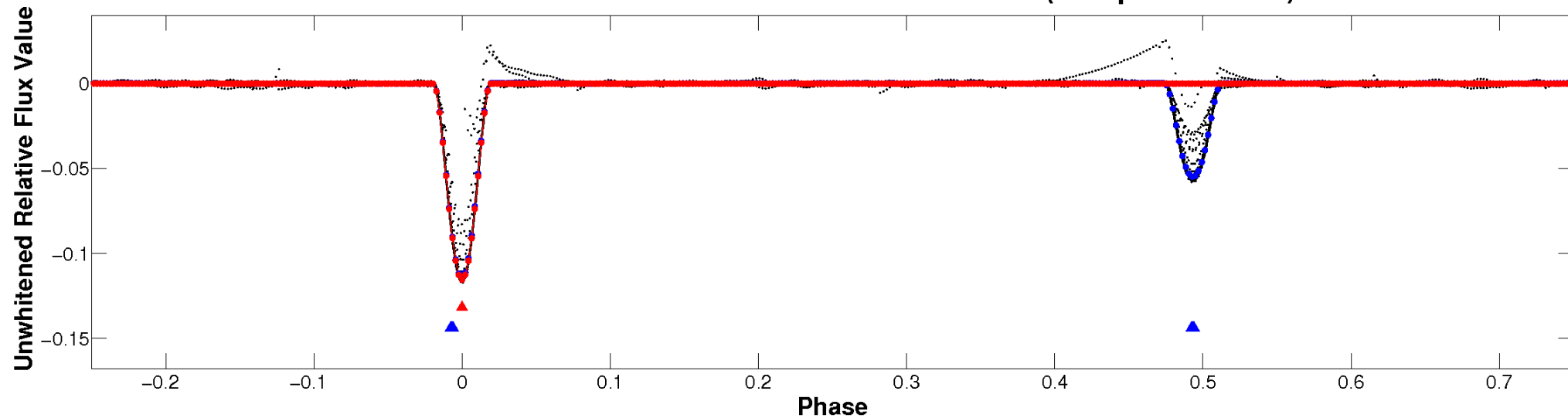
ALT Odd/Even

TCE 004737302-01

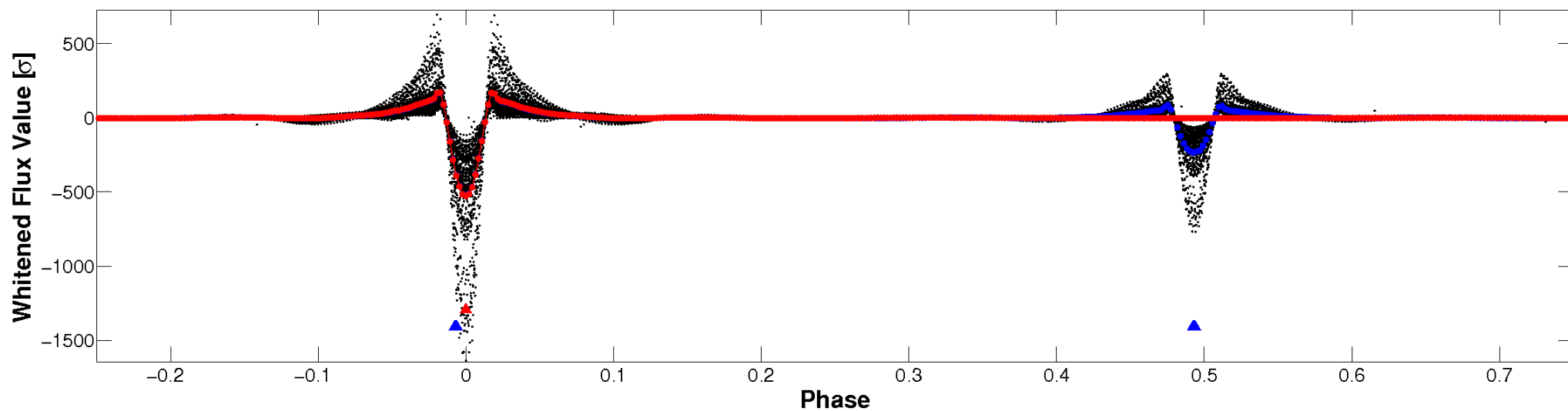


Non-Whitened Vs. Whitened Light Curve

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

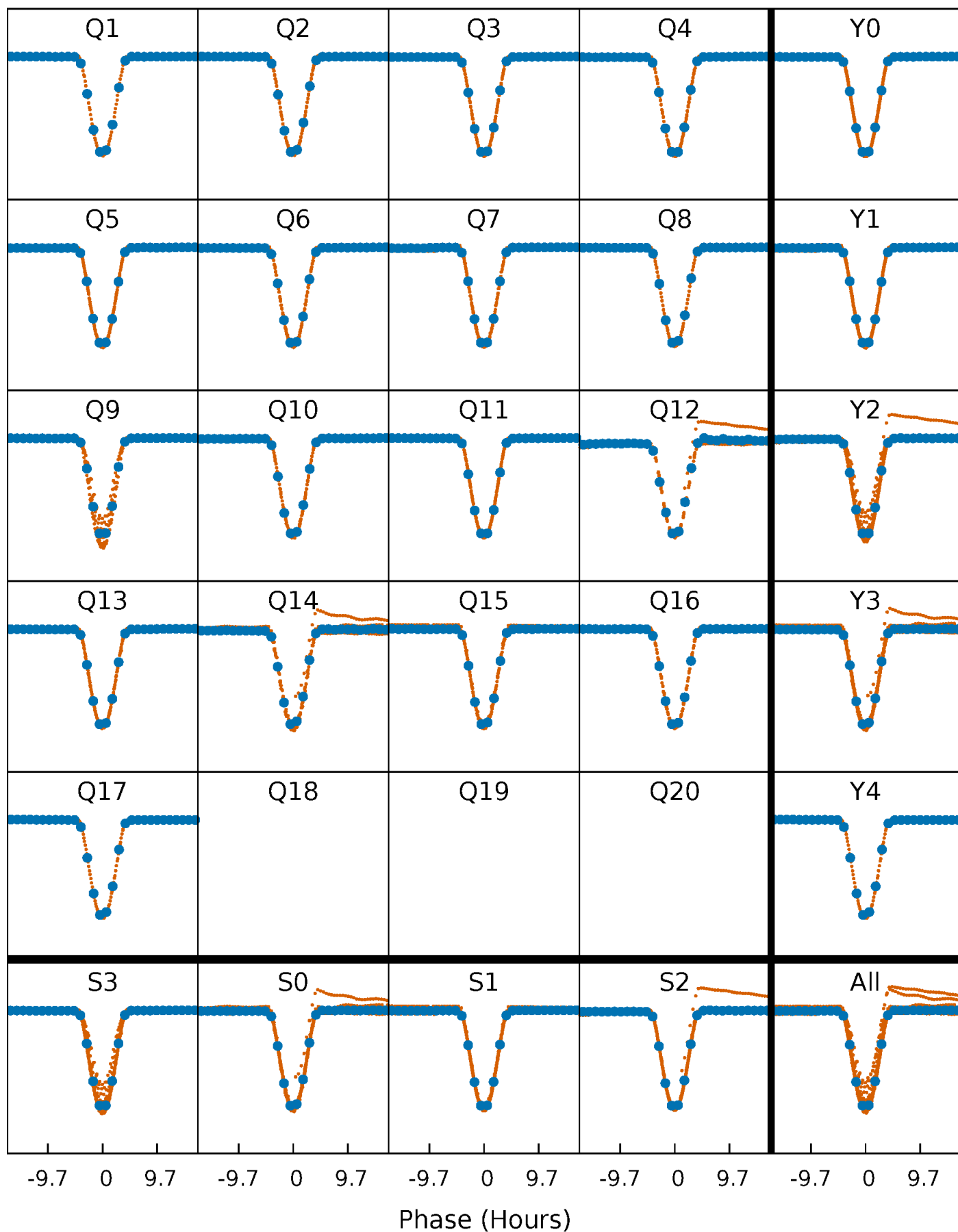


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



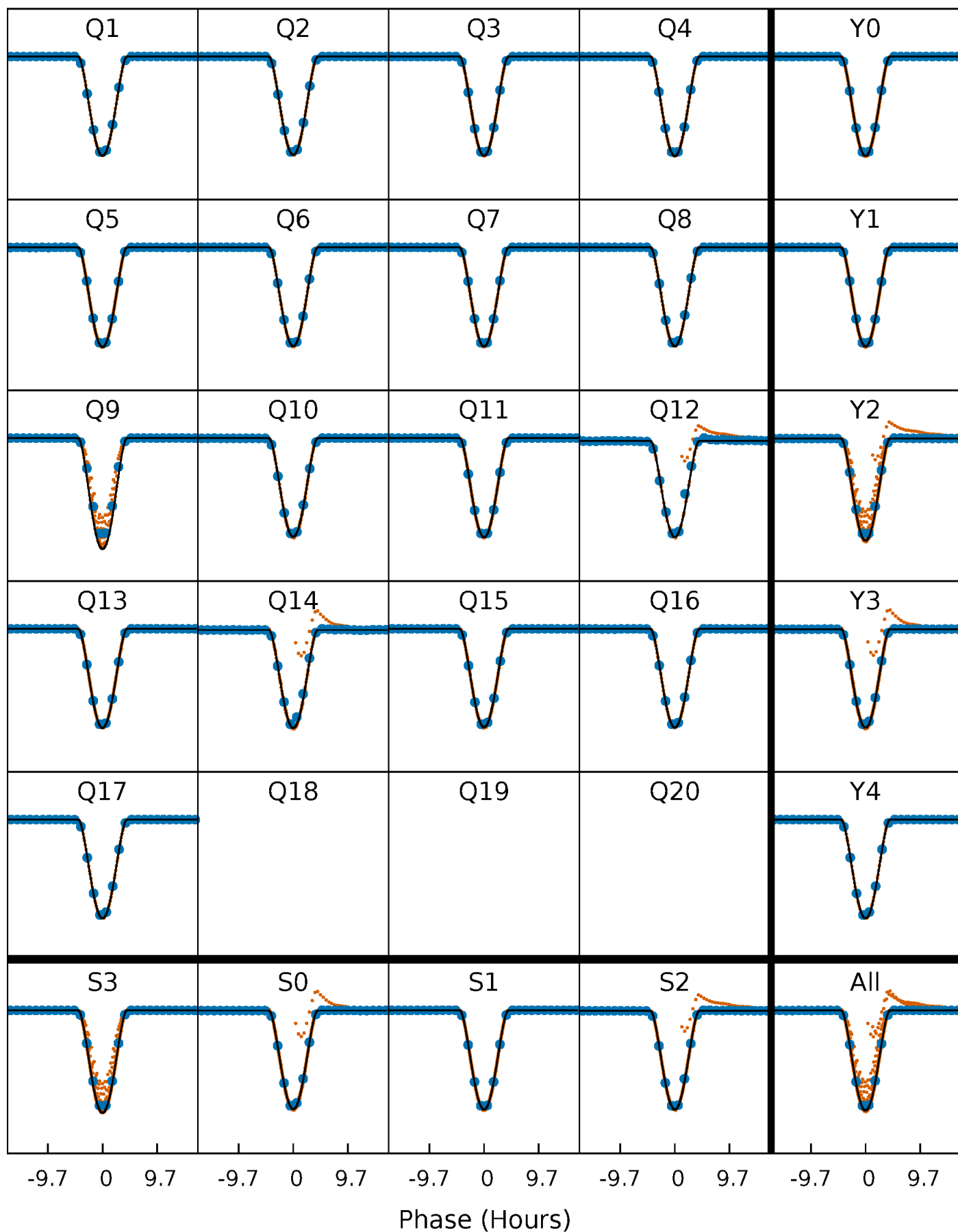
PDC Quarter-Phased Transit Curves

TCE 004737302-01 P= 9.455589 Days $T_0=133.670353$ (BKJD)



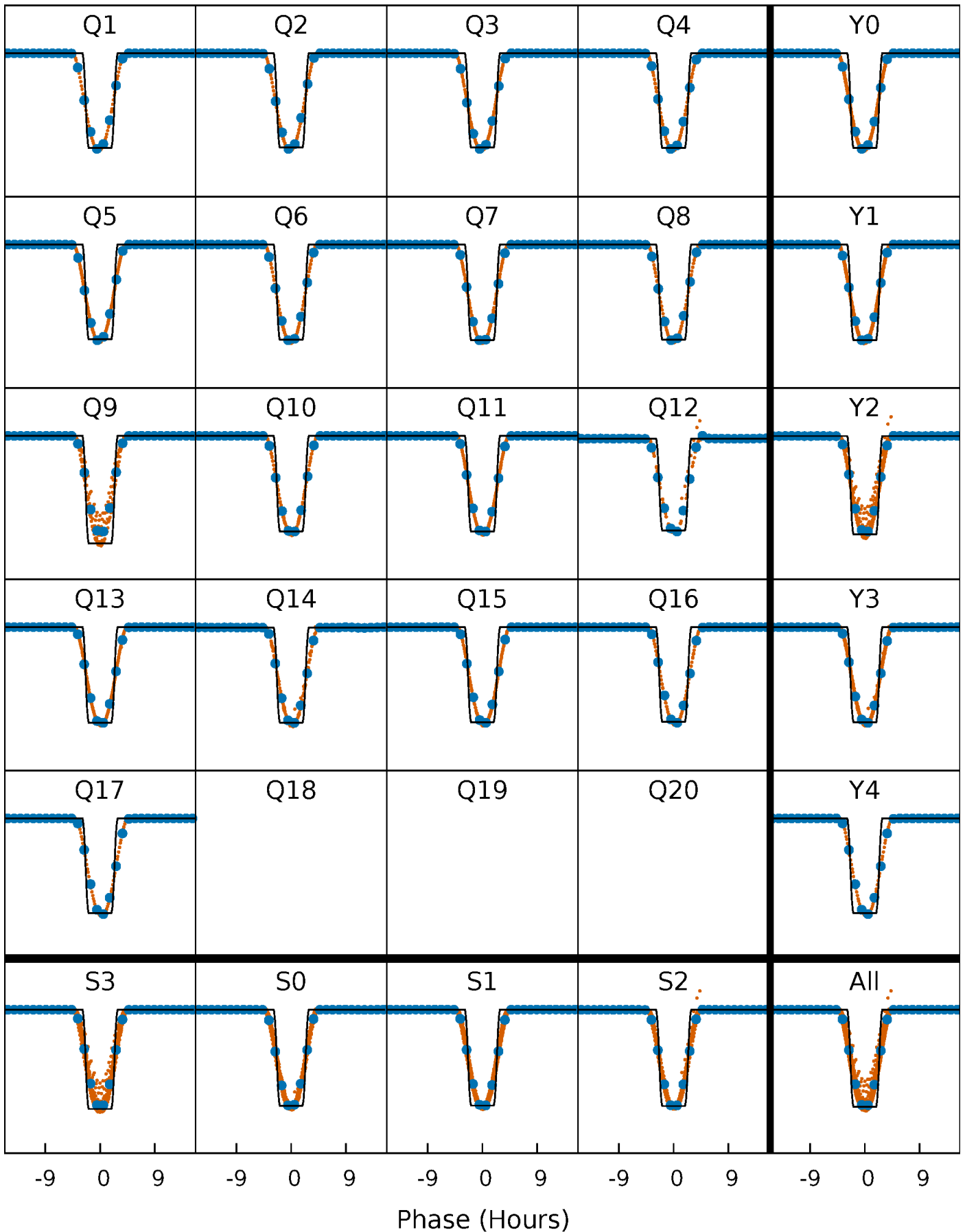
DV Quarter-Phased Transit Curves

TCE 004737302-01 P= 9.455589 Days $T_0=133.670353$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

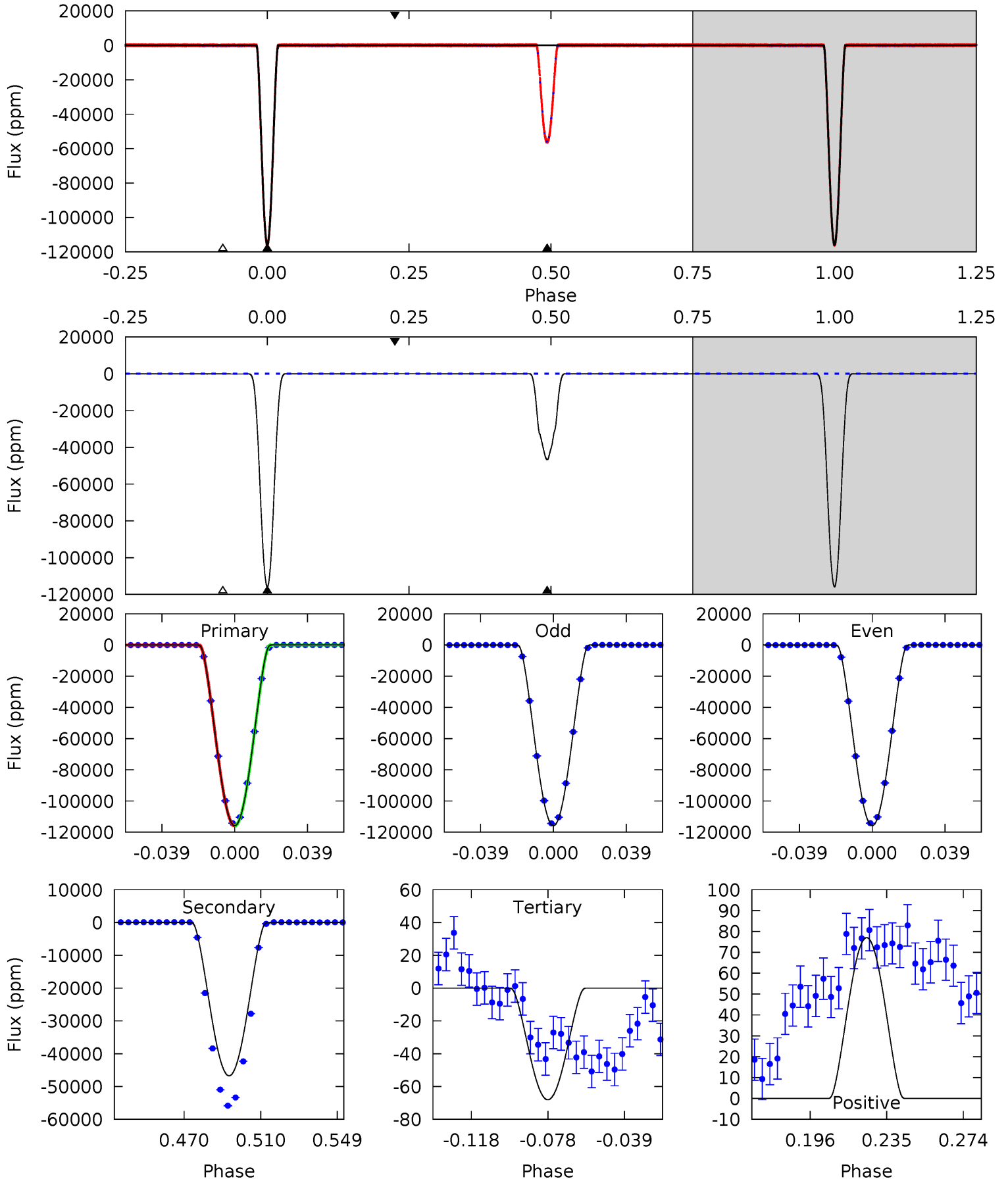
TCE 004737302-01 P= 9.455463 Days $T_0=133.679258$ (BKJD)



DV Model-Shift Uniqueness Test

004737302-01, P = 9.455589 Days, E = 124.214764 Days

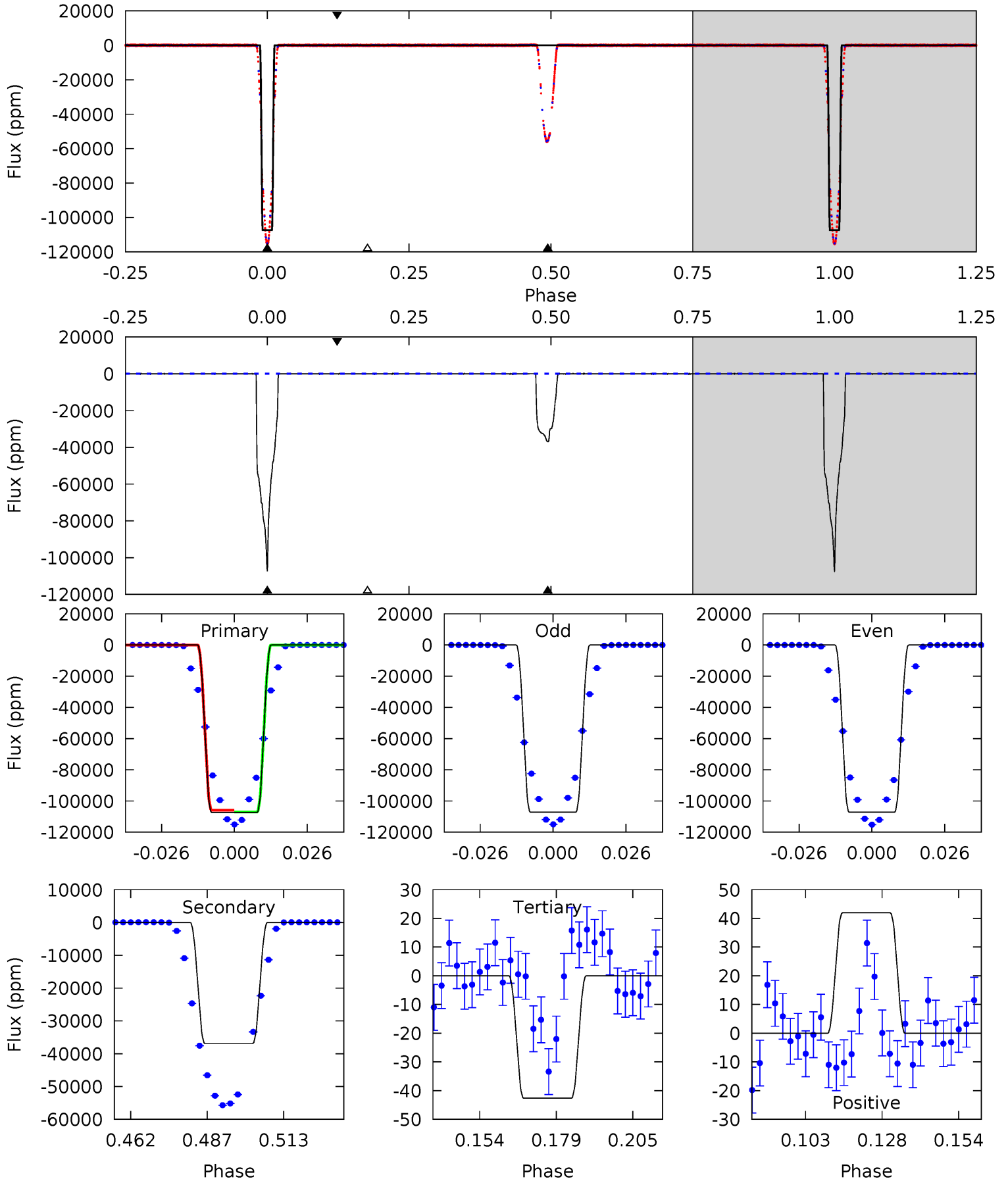
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33710	13596	19.8	22.4	4.76	2.06	10.4	33690	33688	13576	13573	5.14	0.98	0.00	0



Alt Model-Shift Uniqueness Test

004737302-01, P = 9.455463 Days, E = 124.223795 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11443	3932	4.54	4.47	4.84	2.23	1.62	11438	11438	3928	3928	0.98	0.99	0.00	0



Stellar Parameters For KIC 004737302

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7221^{+199}_{-299}	$3.488^{+0.604}_{-0.071}$	$-0.180^{+0.250}_{-0.300}$	$4.240^{+0.285}_{-2.564}$	$2.018^{+0.068}_{-0.616}$	$0.037^{+0.339}_{-0.008}$
	+3%/-4%	+17%/-2%	+139%/-167%	+7%/-60%	+3%/-31%	+909%/-22%
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 004737302-01 / KOI 6441.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-46724 ± 3	$167.21^{+14.73}_{-52.17}$	2646^{+181}_{-358}	5472^{+140}_{-189}	12^{+10}_{-2}
Alt.	-36902 ± 9	$153.46^{+8.94}_{-48.28}$	2673^{+173}_{-363}	5456^{+120}_{-192}	11^{+10}_{-1}

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

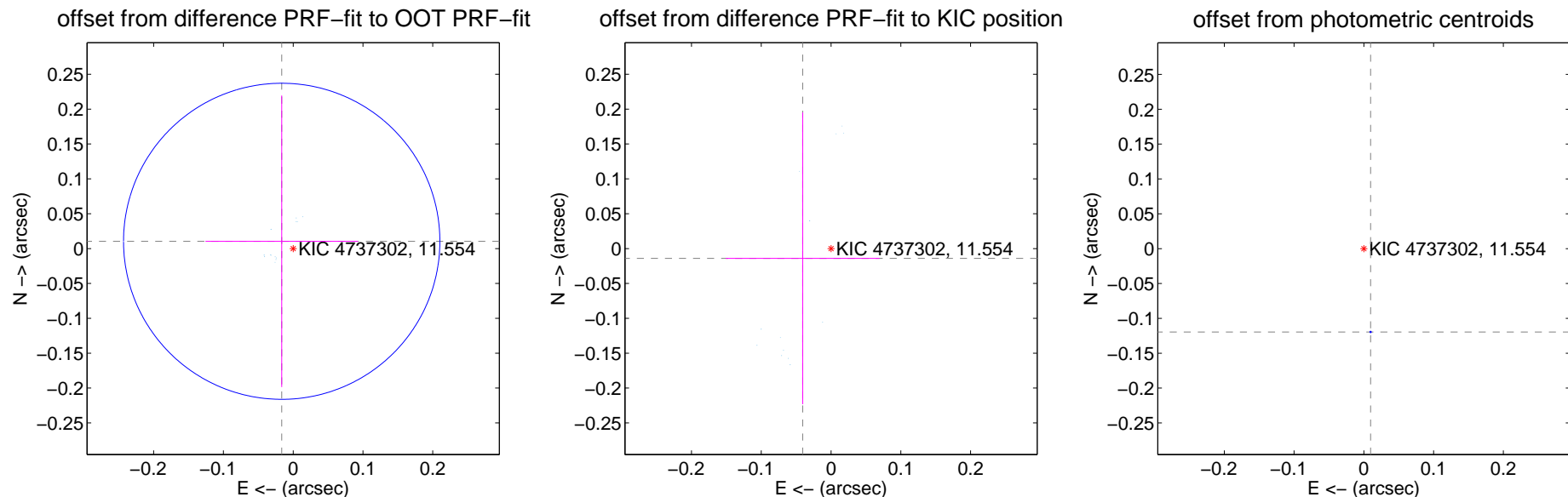
DV Centroid Data

Supplemental centroid analysis for 004737302-01. **Kepler magnitude: 11.55.** Transit SNR 17912.91

There are 17 quarters with good PRF difference image offsets

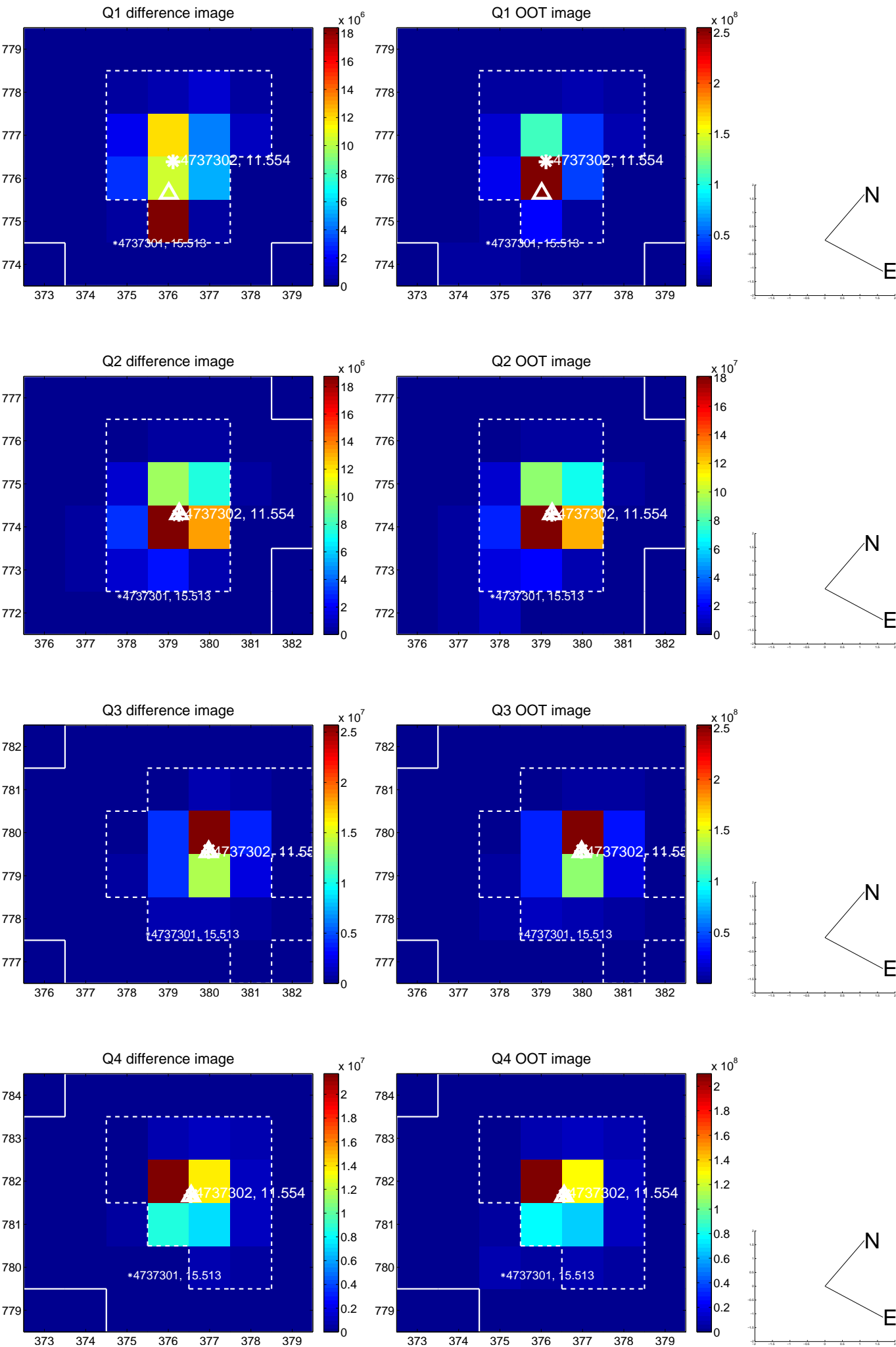
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.019 ± 0.076	0.26	0.016 ± 0.109	0.010 ± 0.209
PRF-fit source offset from KIC position	0.043 ± 0.161	0.27	0.041 ± 0.110	-0.014 ± 0.209
photometric centroid source offset	0.12 ± 0.00	340.95	-0.01 ± 0.00	-0.12 ± 0.00

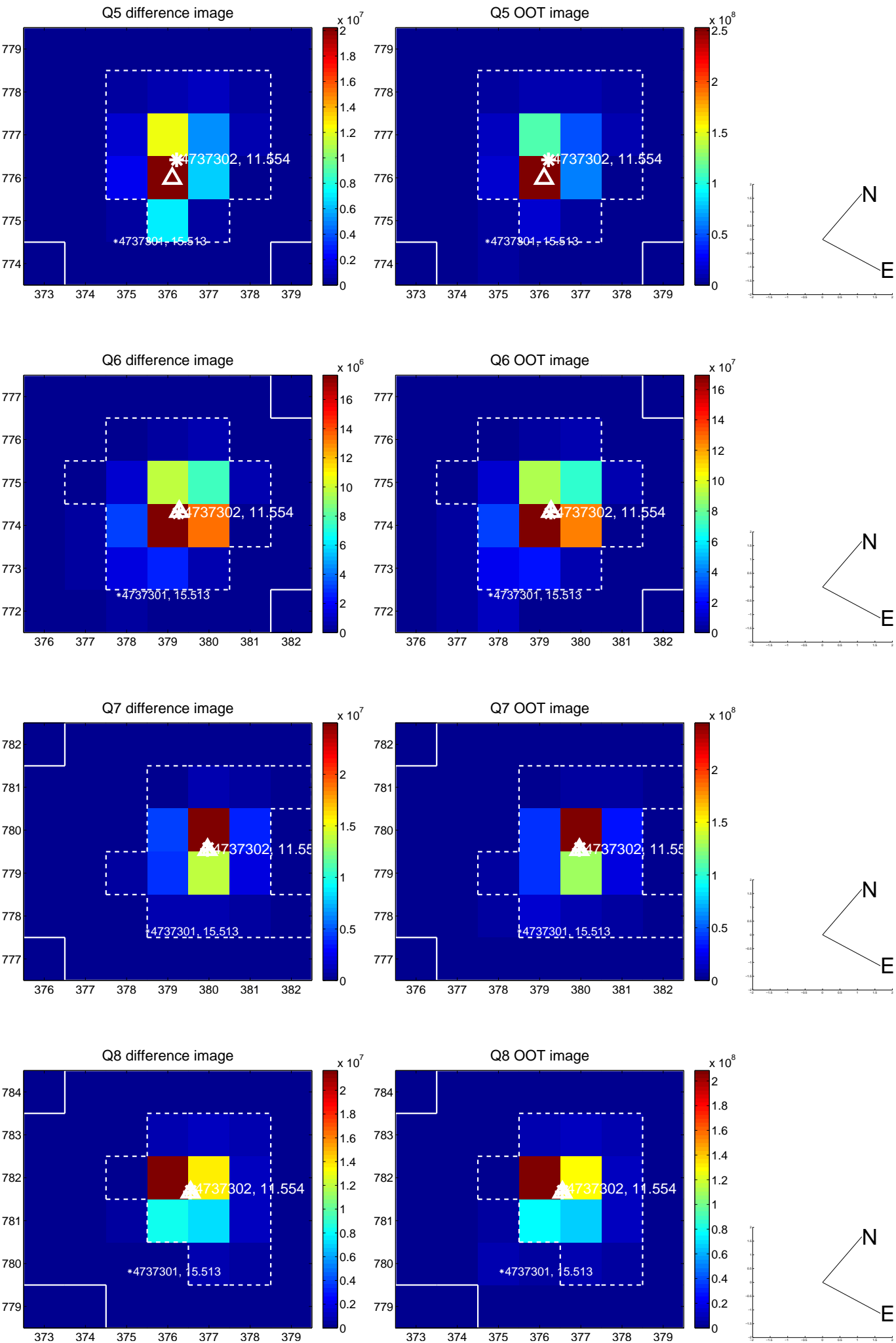


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

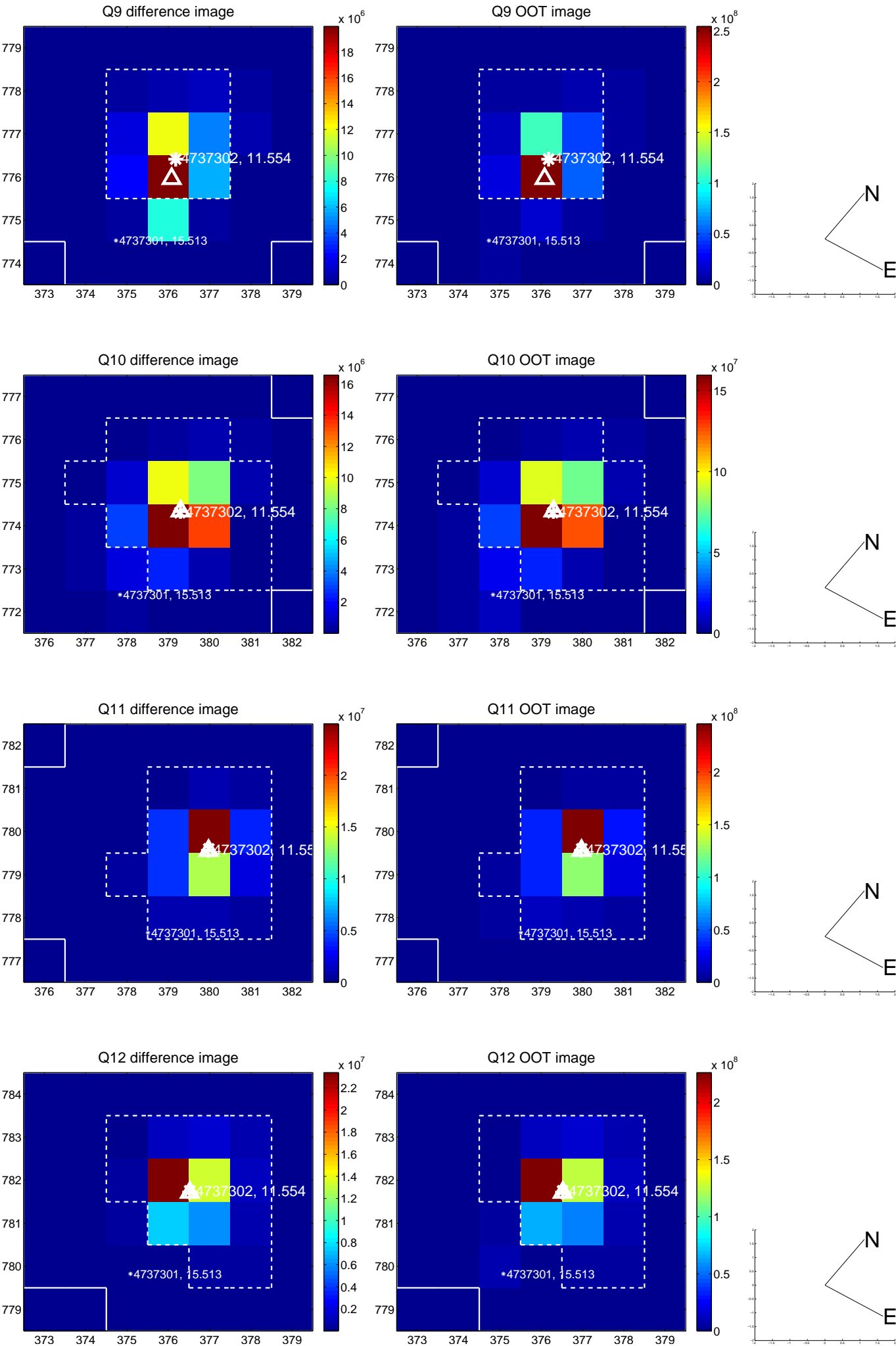
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



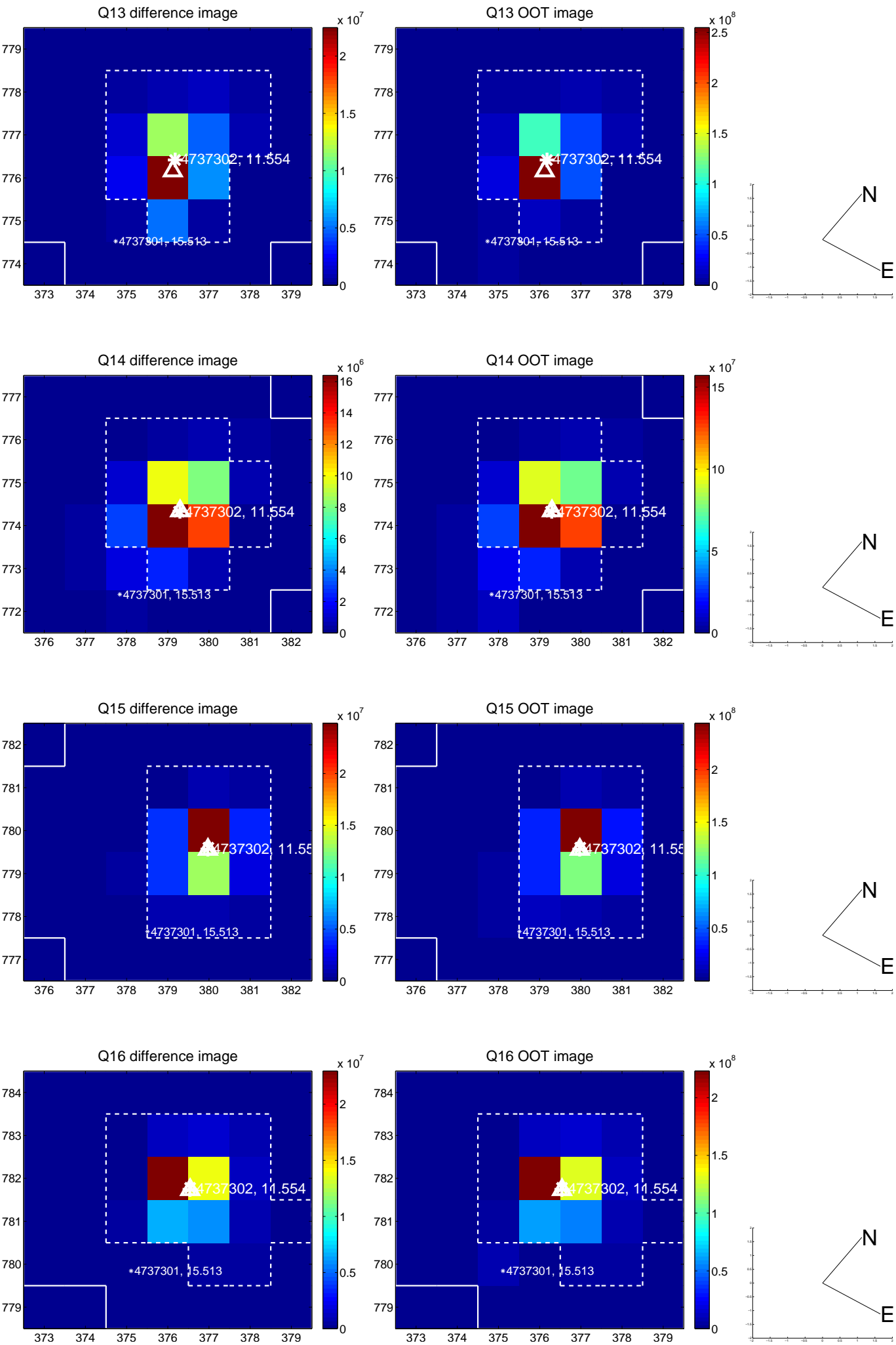
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



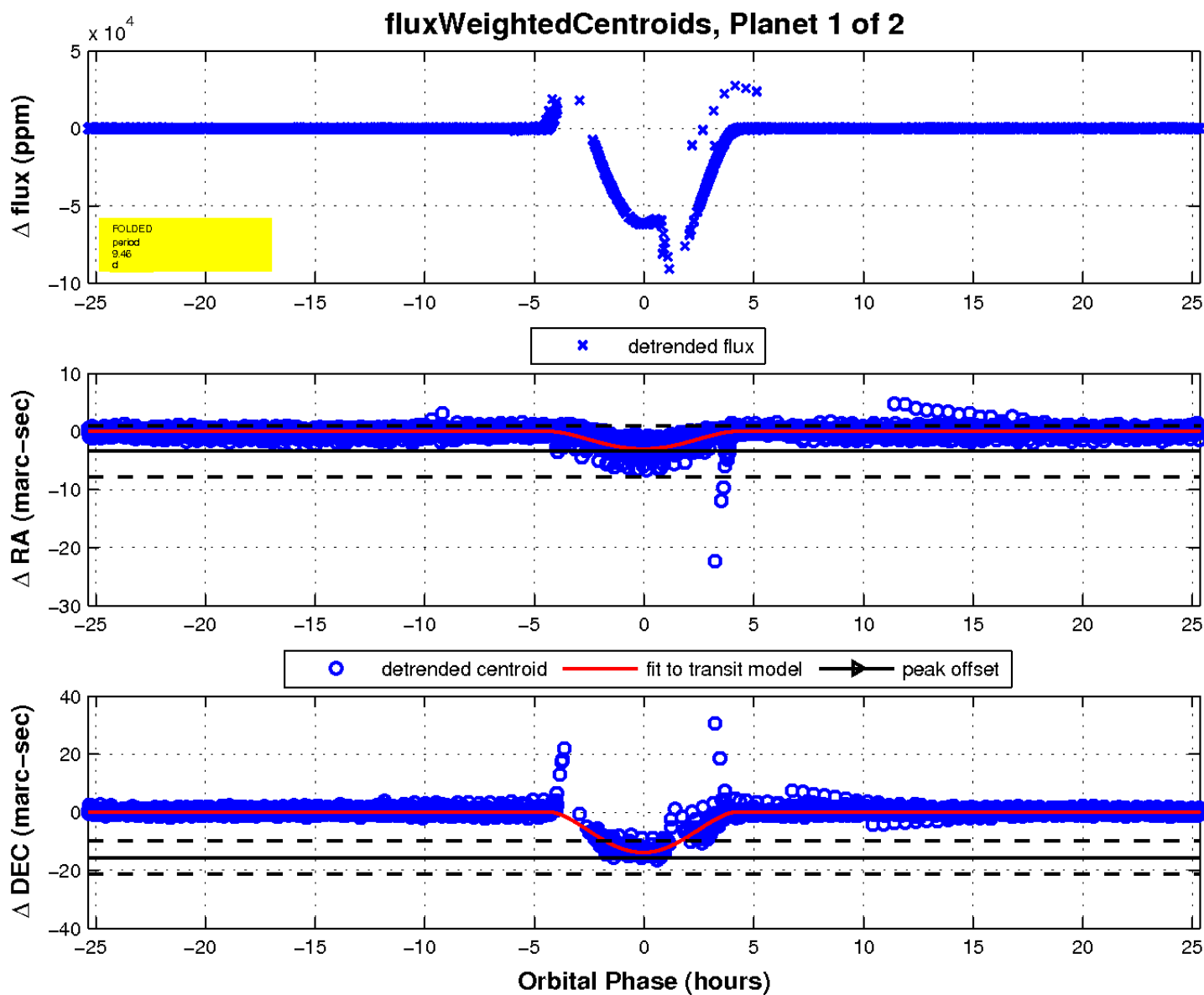
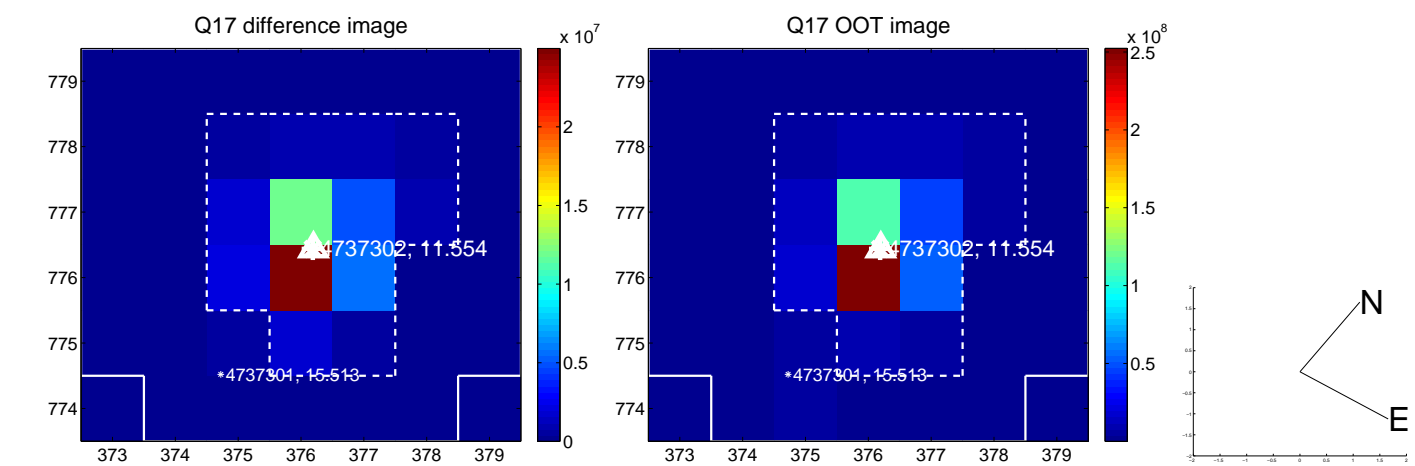
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



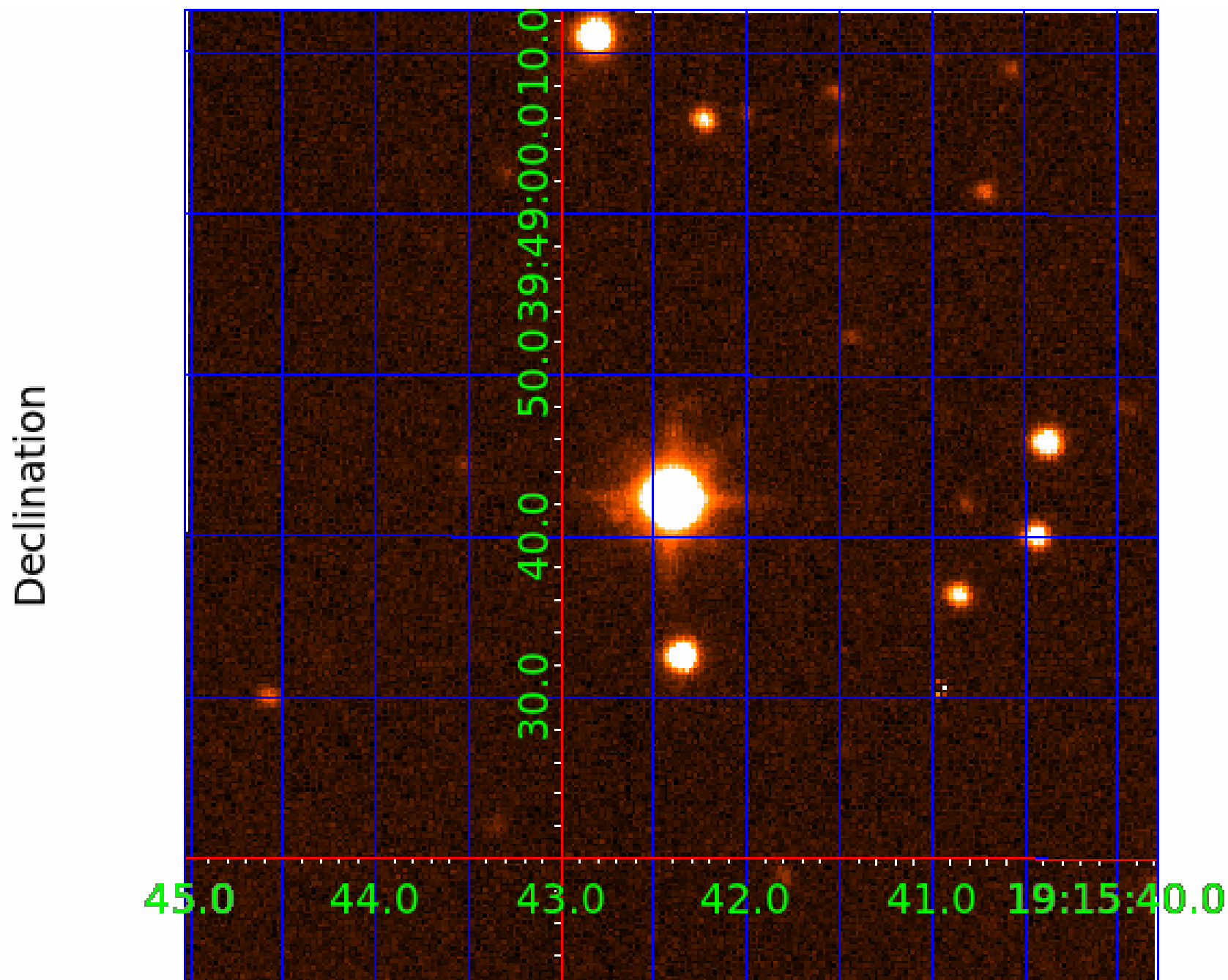
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 004737302

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})
004737302-01	OBS	6441.01	9.455589	133.670353	115800.3	8.452	18902.3	17912.9	4.24	7221	173.86	3580.49
004737302-02	OBS	No	4.727839	133.598623	34375.2	6.000	9558.1	-1.0	4.24	7221	78.83	9022.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004737302-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
004737302-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_NOFITS

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.

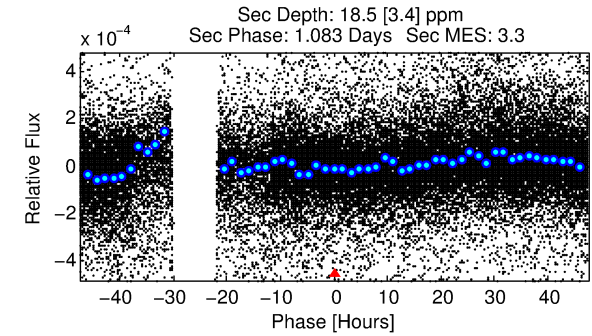
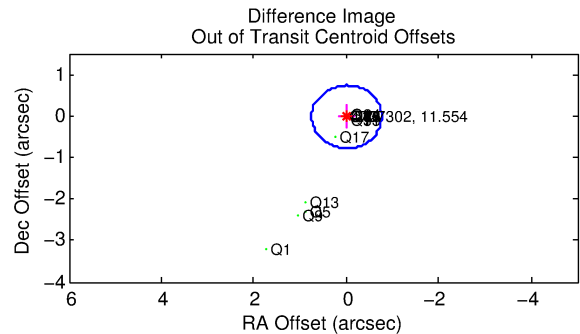
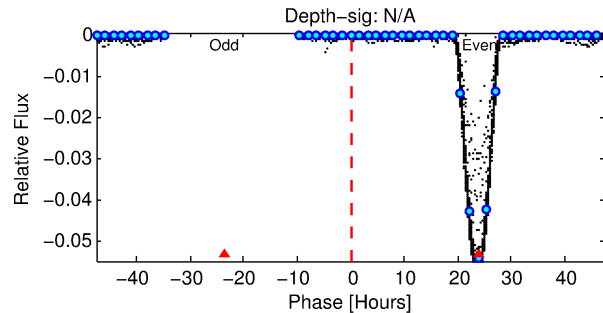
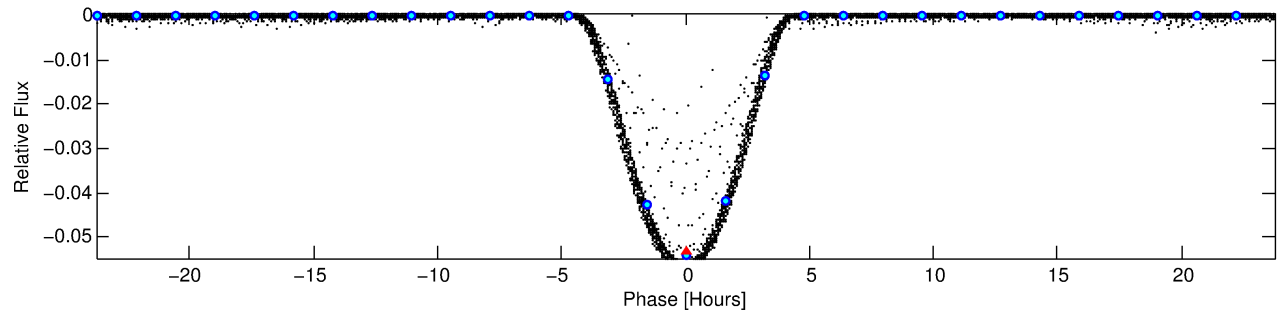
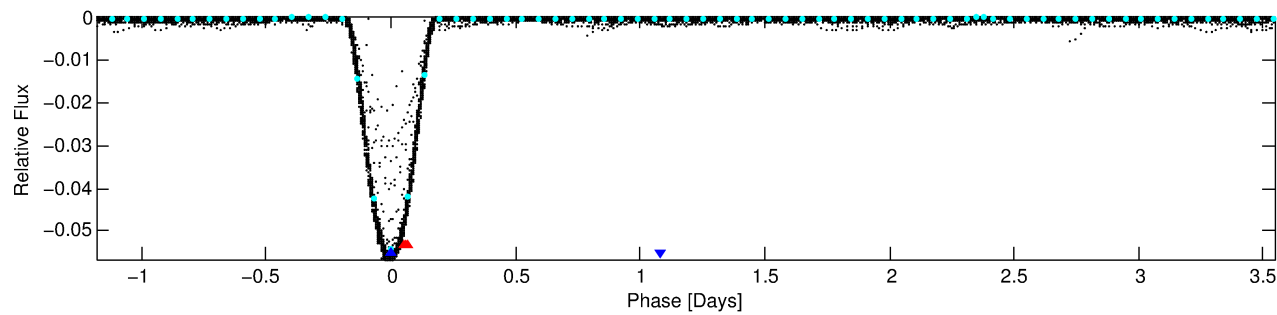
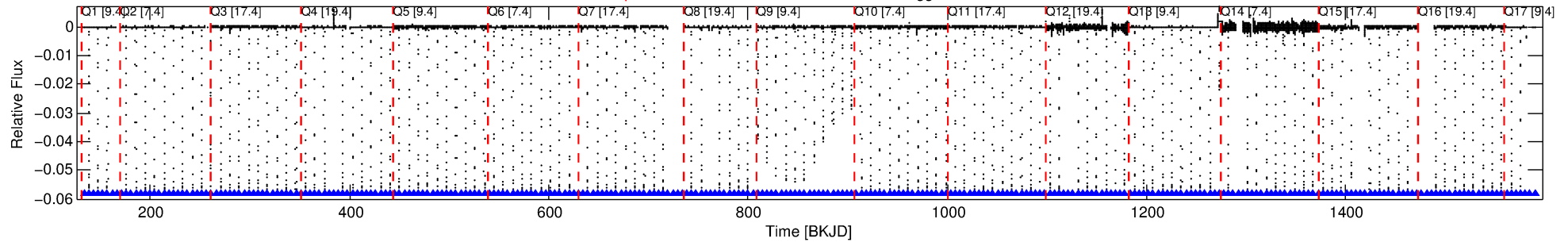
Ephemeris Match Information For 004737302-02

No Significant Match Found

DV One-Page Summary

KIC: 4737302 Candidate: 2 of 2 Period: 4.728 d
KOI: K06441 Corr: No Ephemeris Match

Kp: 11.55 R*: 4.24 Rs Teff: 7221.0 K Logg: 3.49 Fe/H: -0.180



TPS TCE Results:

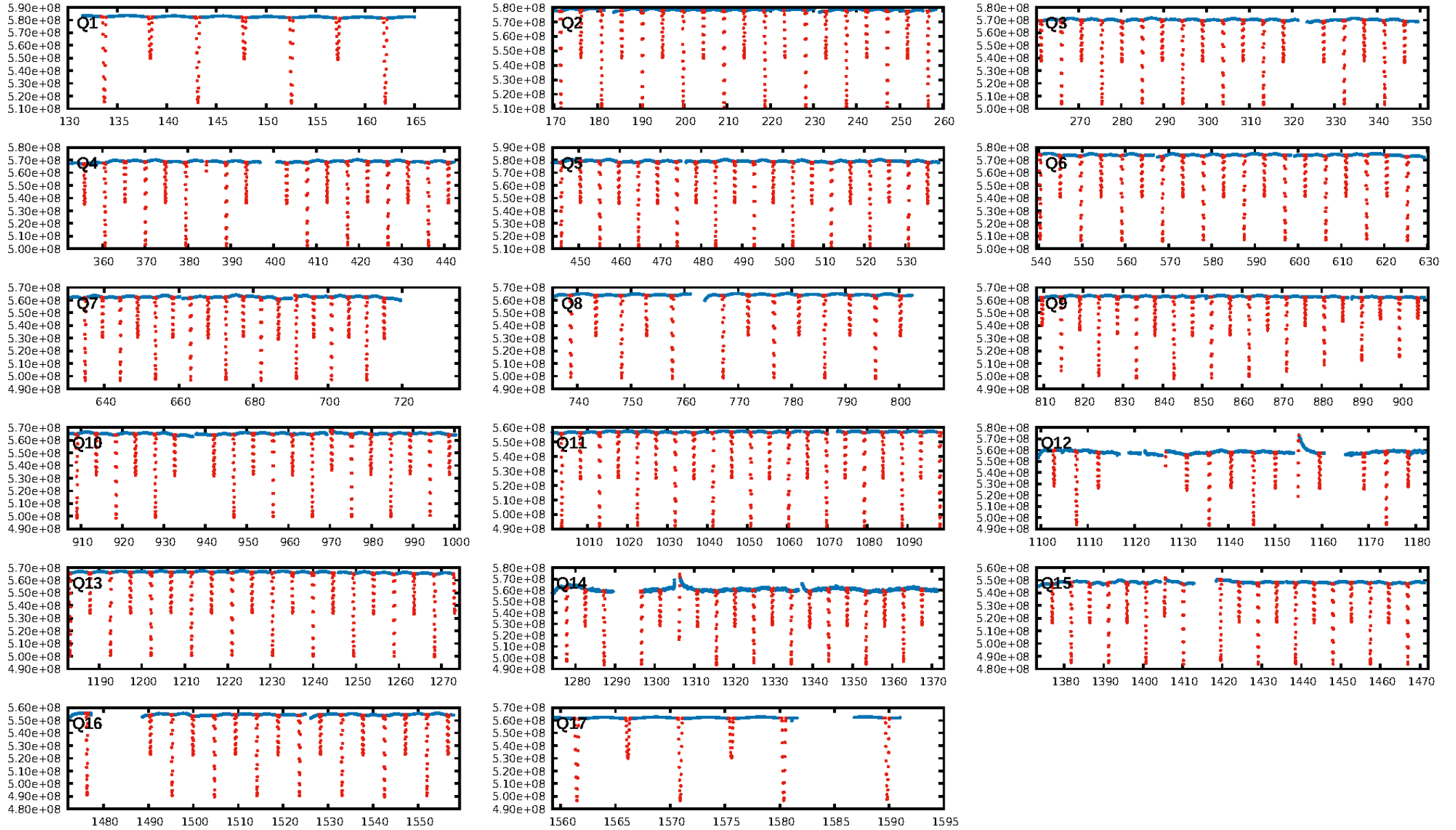
Period = 4.72784 d
Epoch = 133.5986 BKJD

DV fit results are unavailable

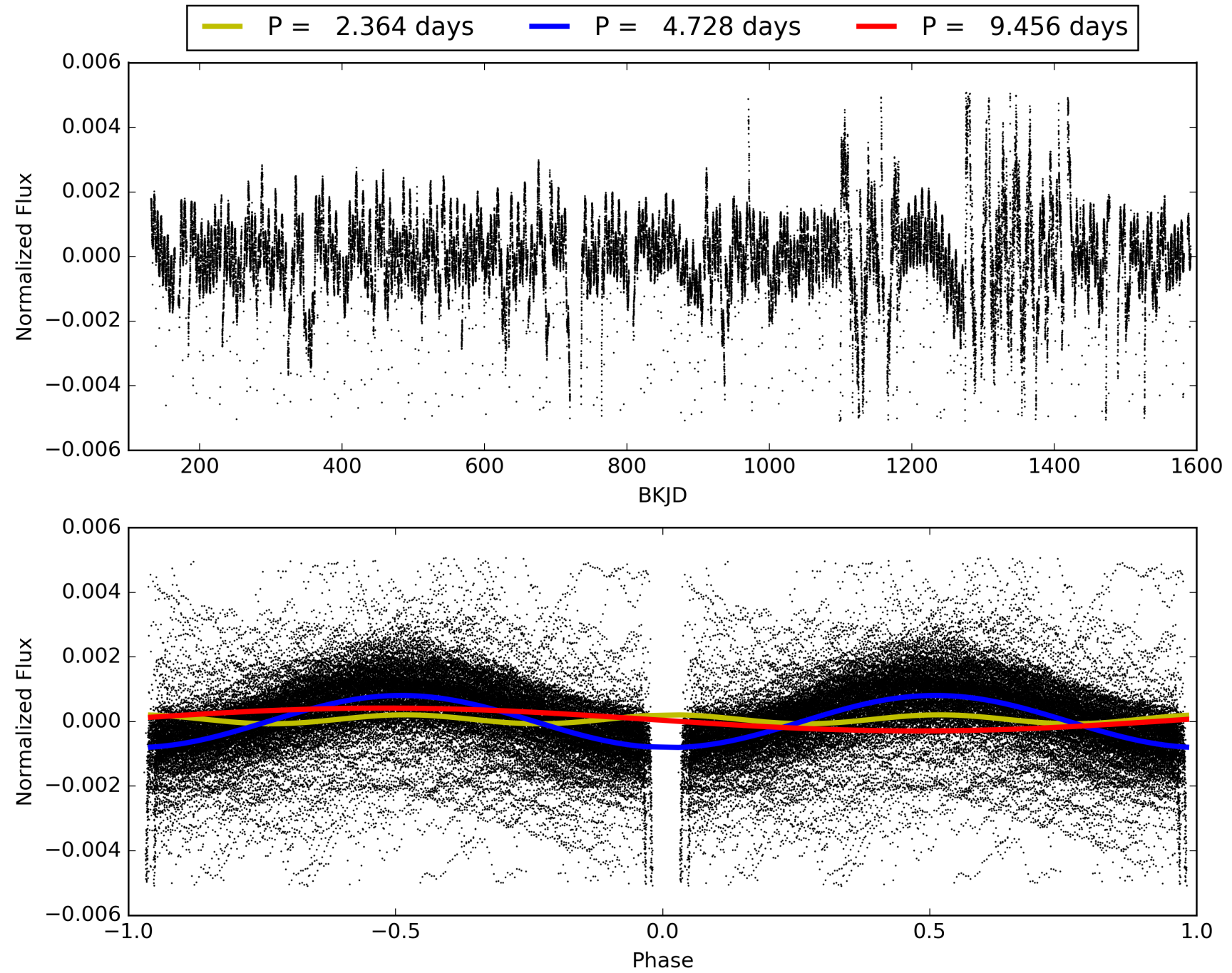
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [10.95σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [138/138]
GhostDiagnostic-chr: 1.307
Centroid-sig: 0.0%
Centroid-so: 0.112 arcsec [267.28σ]
OotOffset-rm: 0.023 arcsec [0.09σ]
KicOffset-rm: 0.054 arcsec [0.18σ]
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 004737302-02, PDC Light Curves

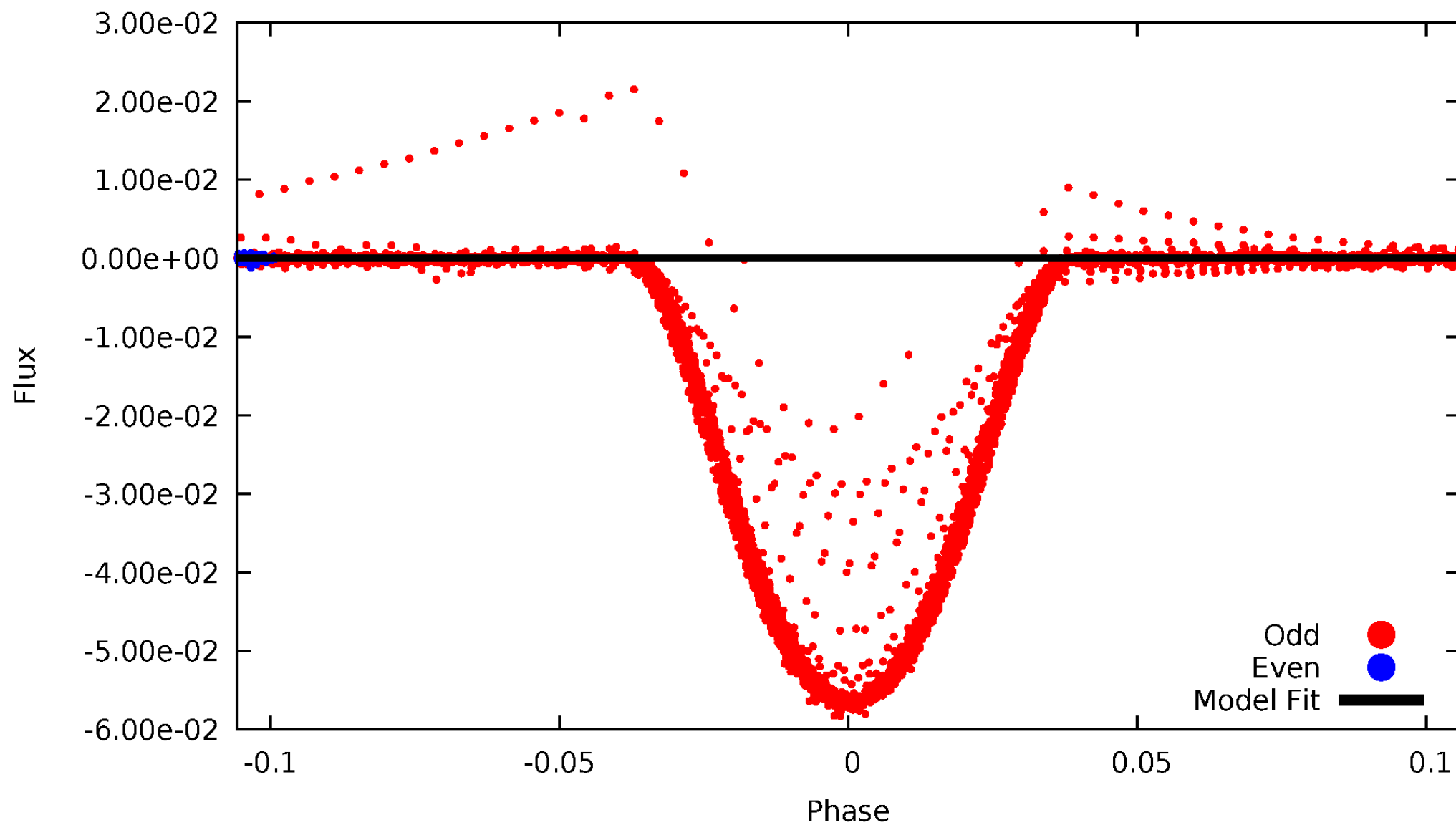


TCE 004737302-02



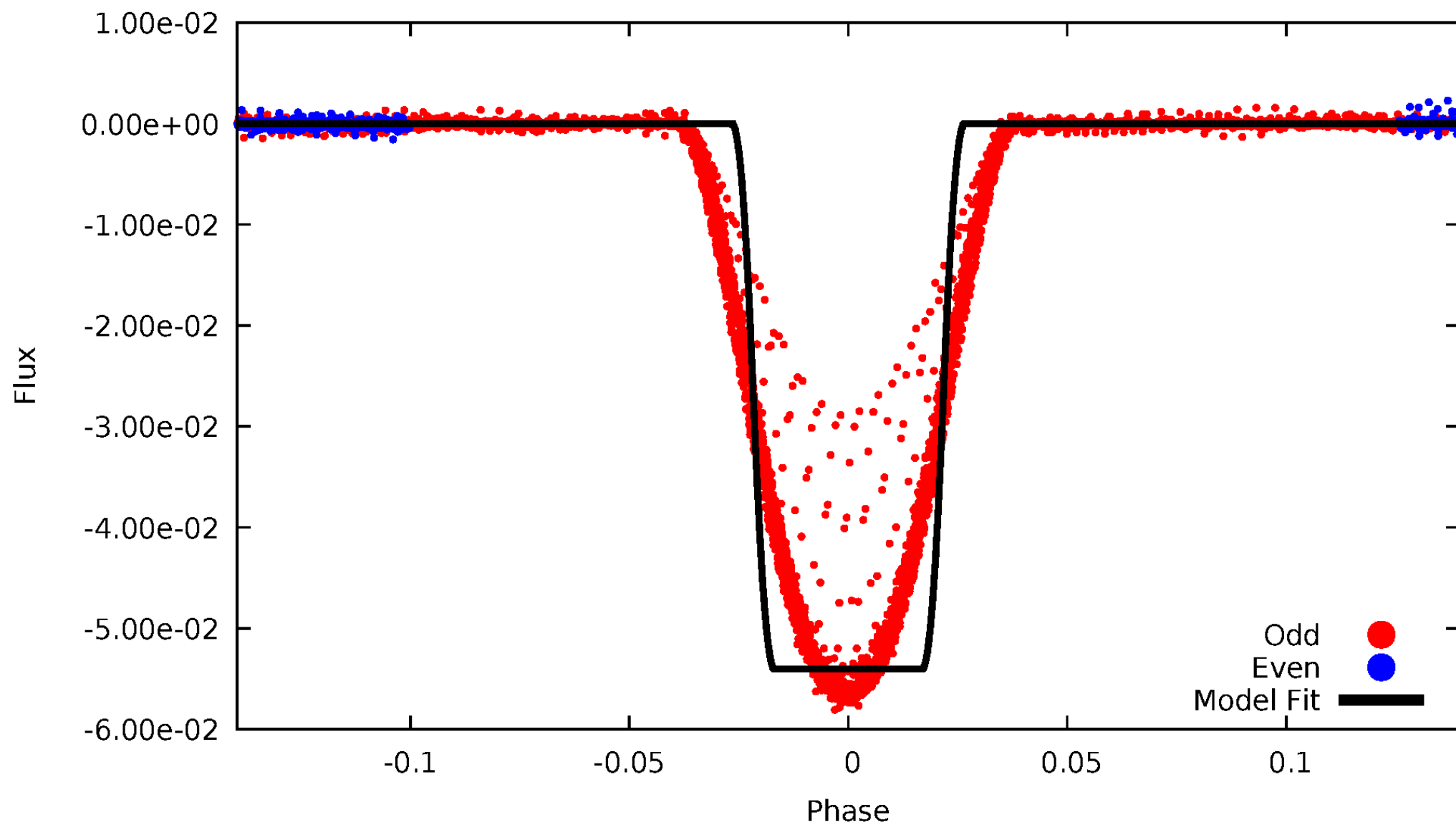
DV Odd/Even

TCE 004737302-02



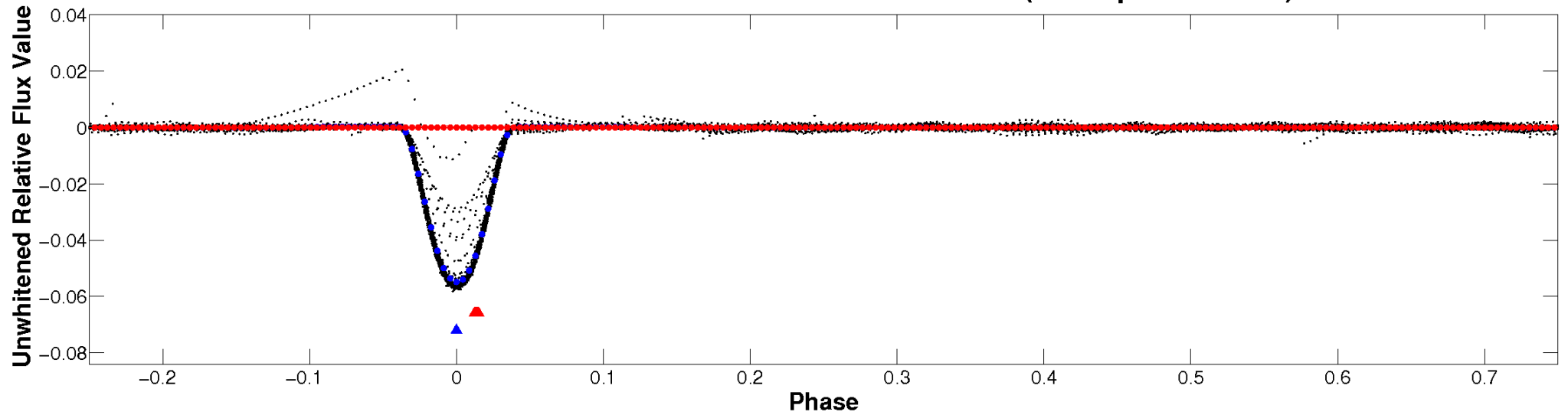
ALT Odd/Even

TCE 004737302-02

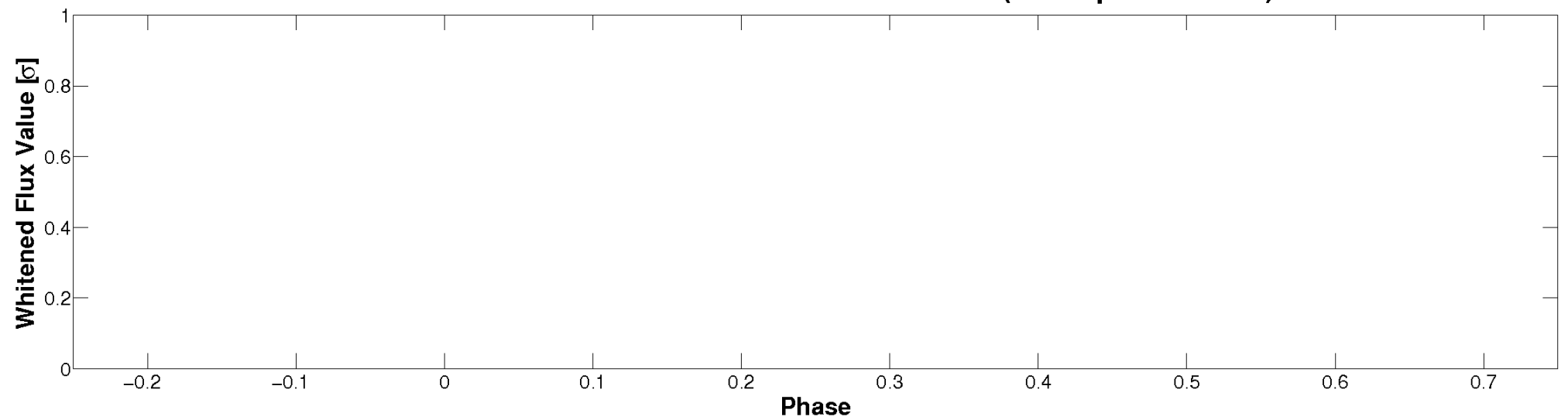


Non-Whitened Vs. Whitened Light Curve

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

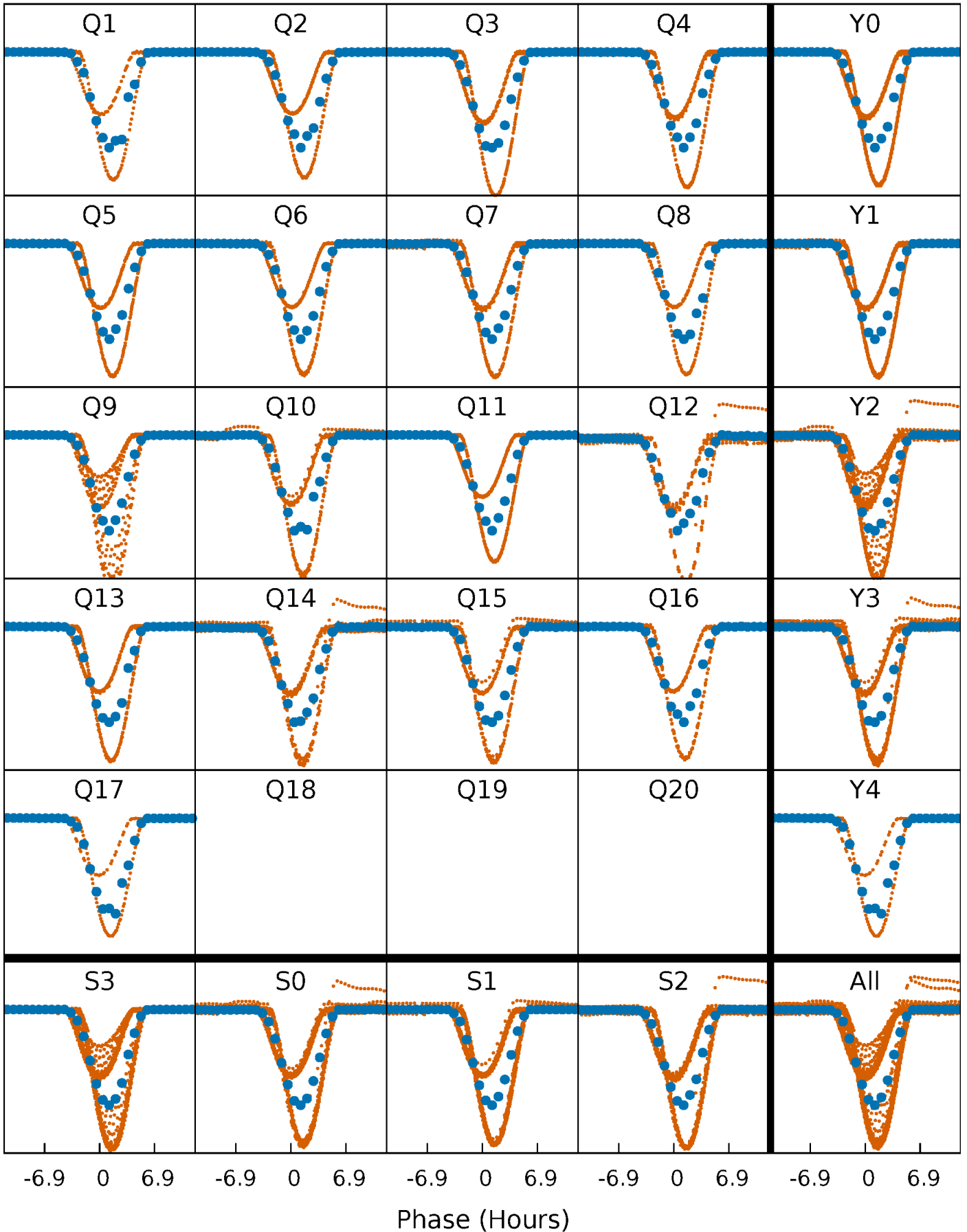


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



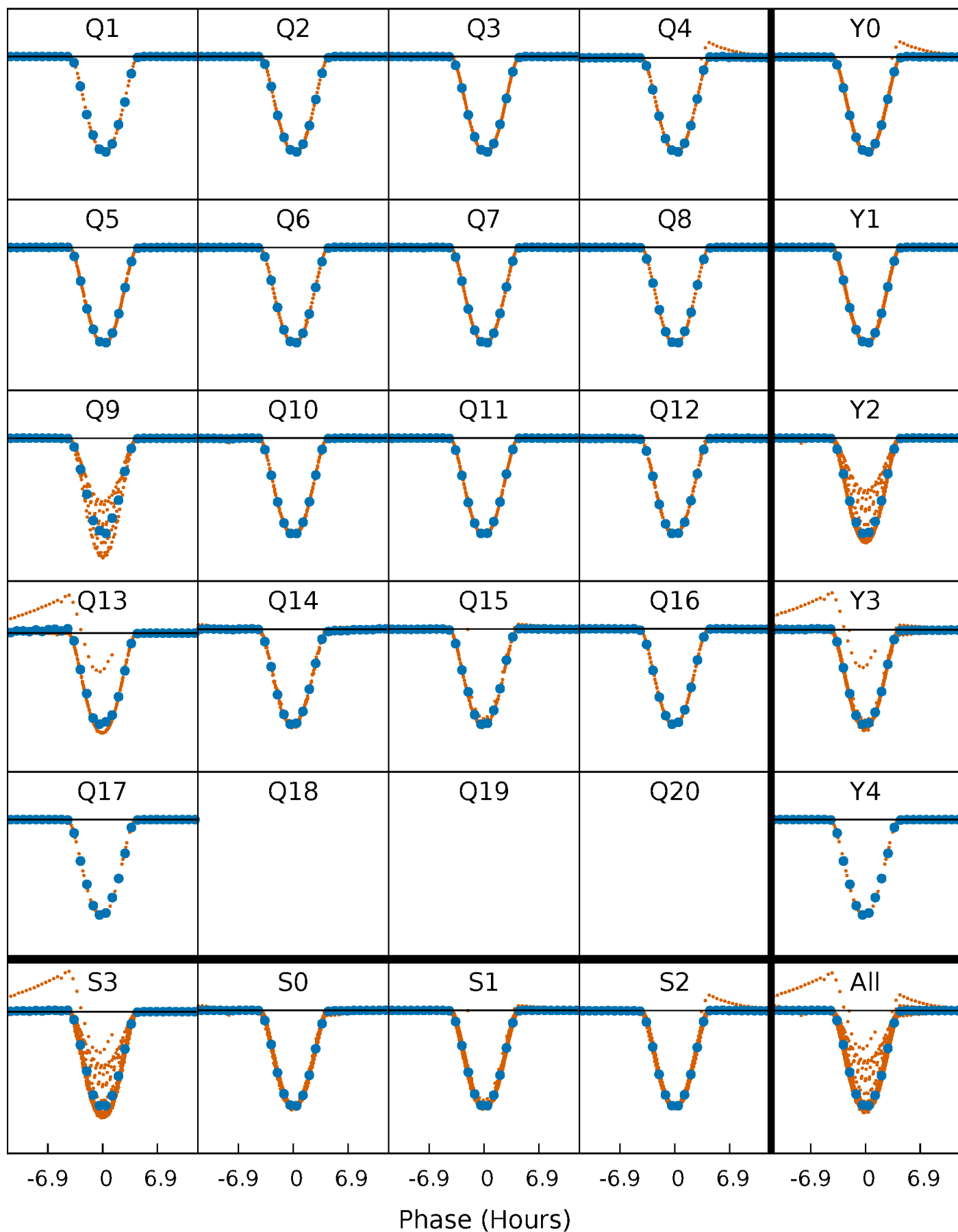
PDC Quarter-Phased Transit Curves

TCE 004737302-02 P= 4.727839 Days $T_0=133.598623$ (BKJD)



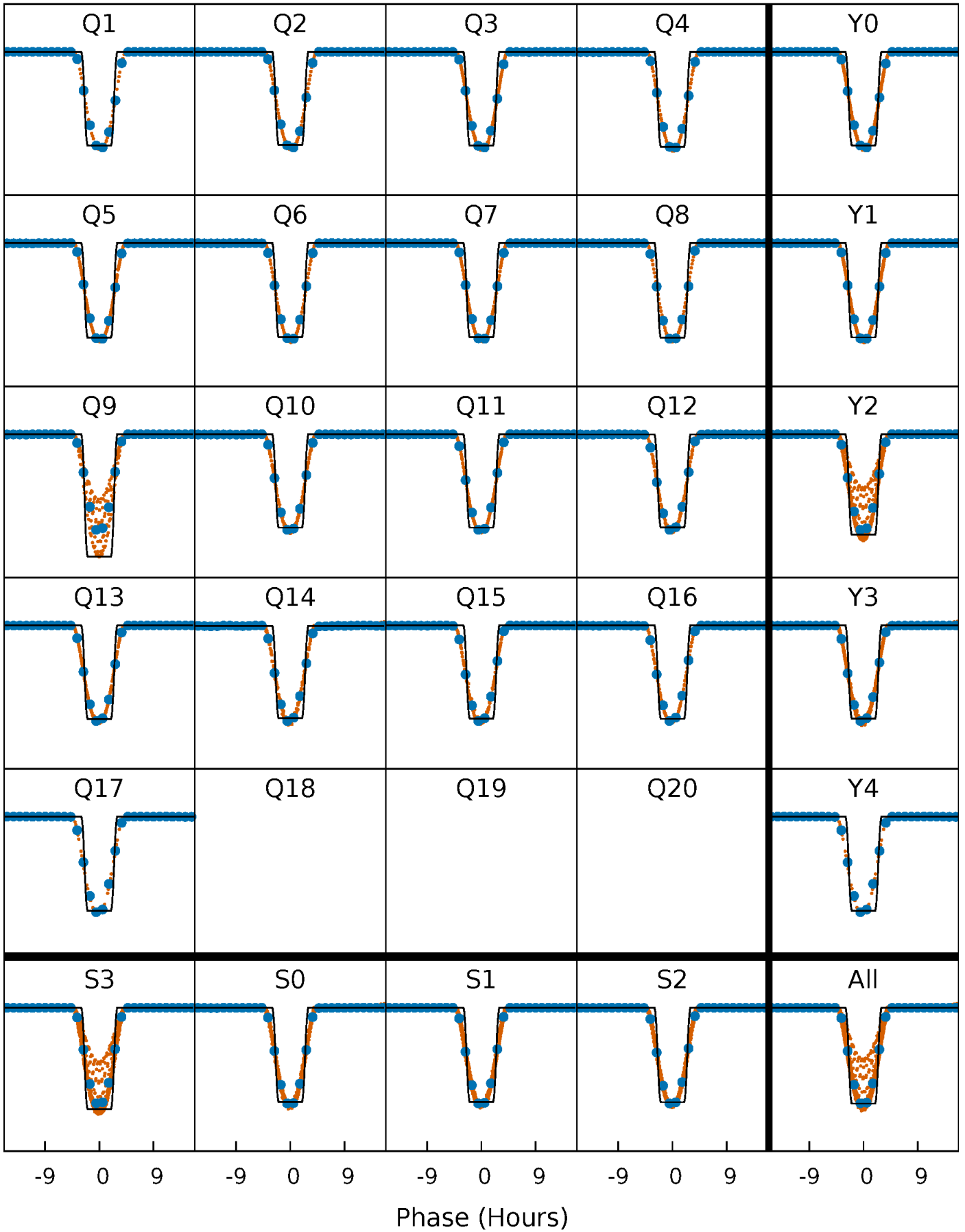
DV Quarter-Phased Transit Curves

TCE 004737302-02 P= 4.727839 Days $T_0=133.598623$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

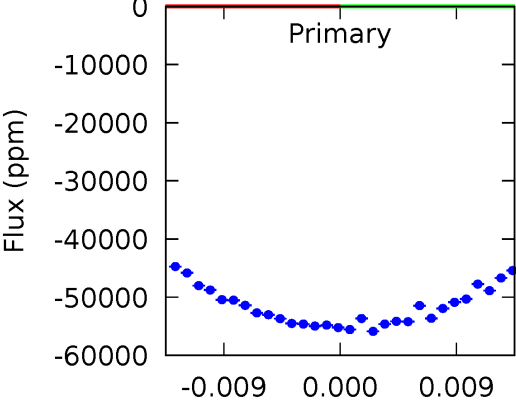
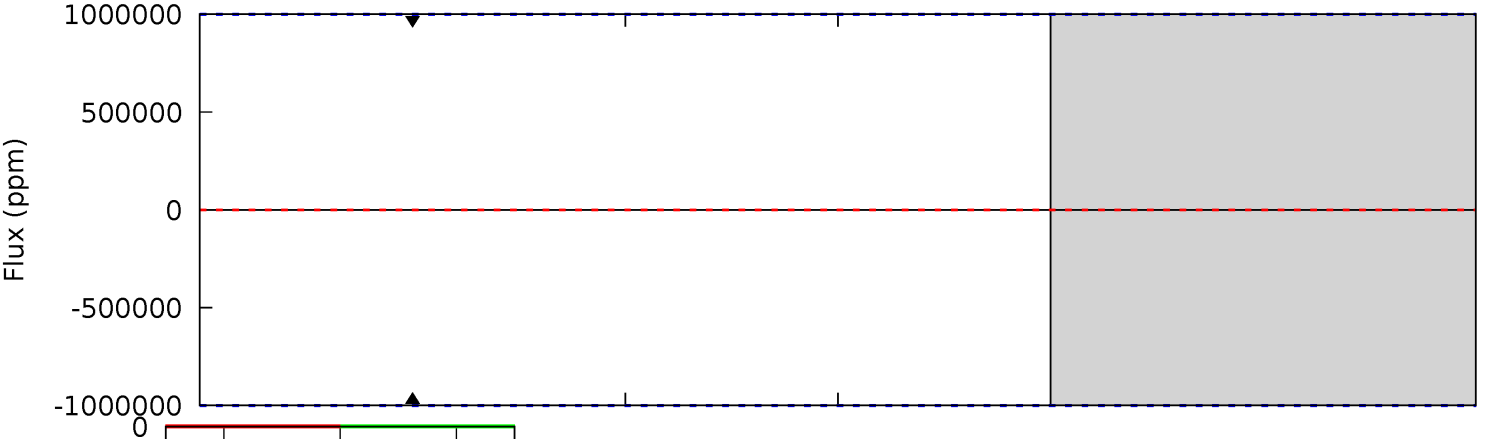
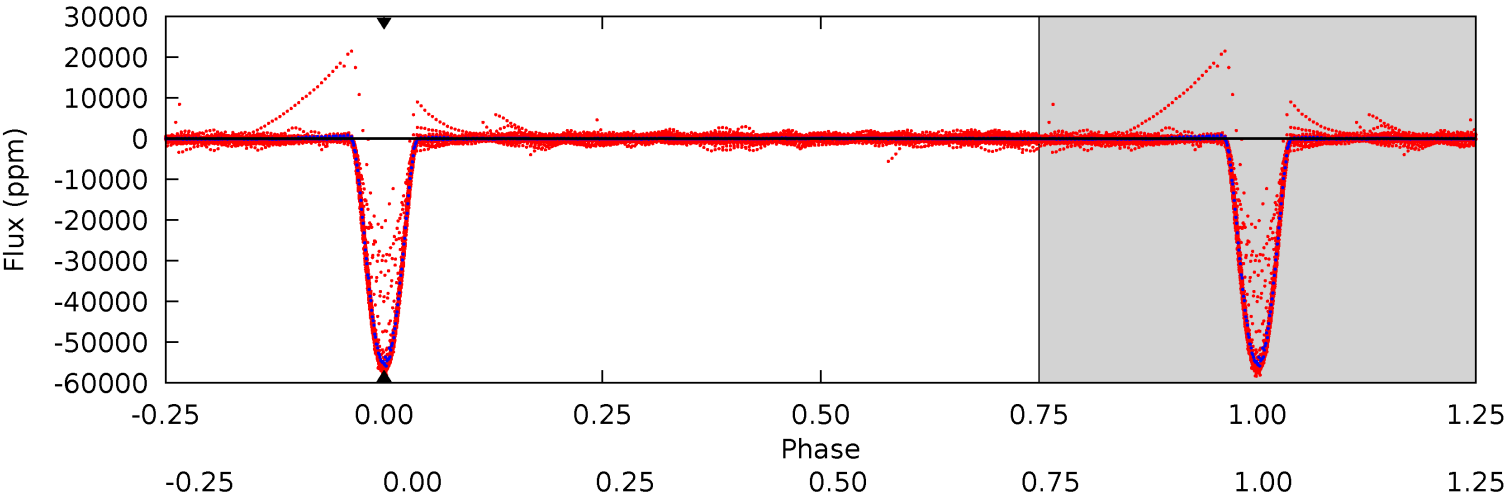
TCE 004737302-02 $P = 4.727839$ Days $T_0 = 133.601528$ (BKJD)



DV Model-Shift Uniqueness Test

004737302-02, P = 4.727839 Days, E = 128.870784 Days

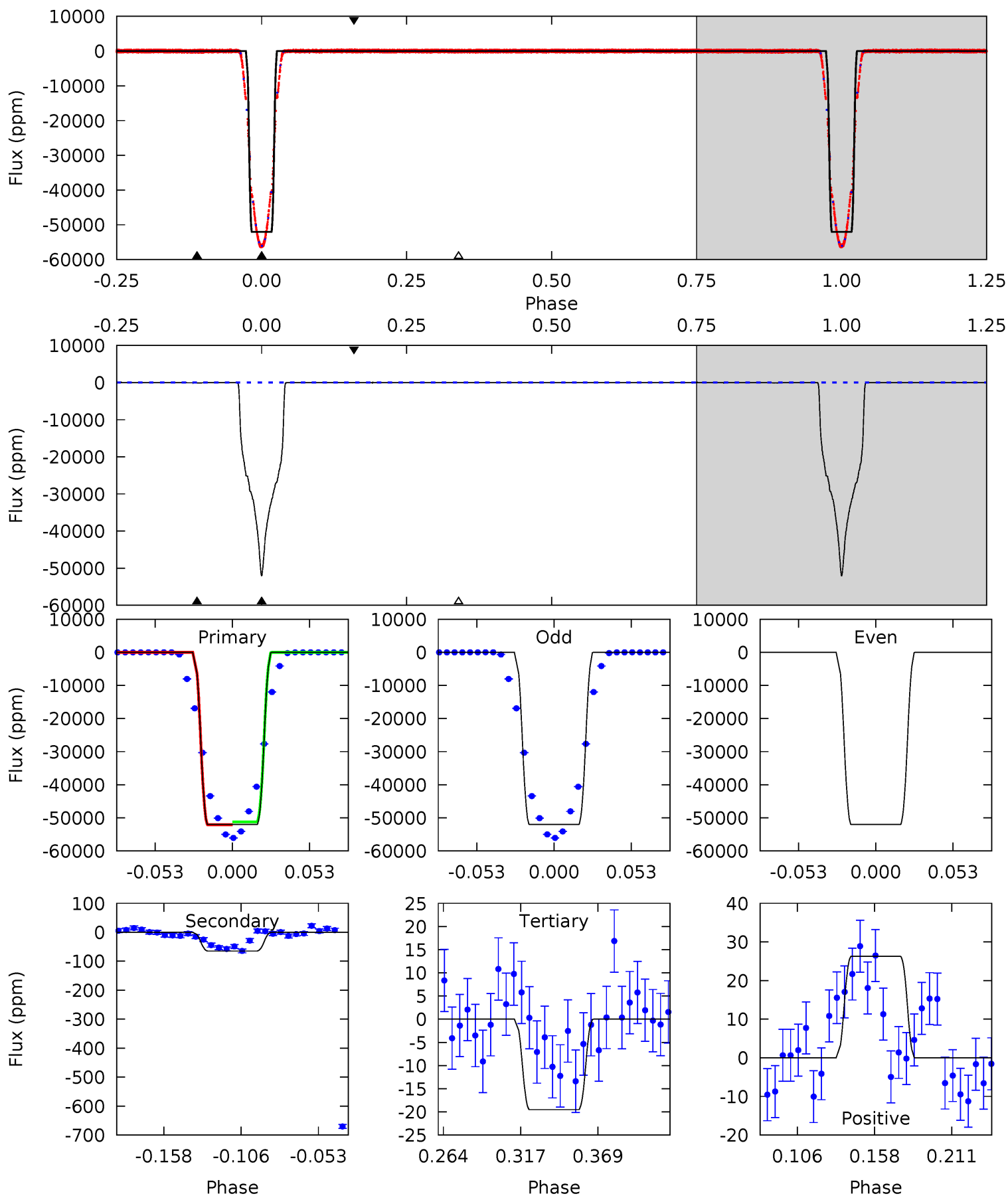
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

004737302-02, P = 4.727839 Days, E = 128.873689 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8582	10.7	3.22	4.33	4.70	1.94	1.41	8579	8578	7.44	6.33	0	0.98	0.00	68.0



Stellar Parameters For KIC 004737302

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7221^{+199}_{-299}	$3.488^{+0.604}_{-0.071}$	$-0.180^{+0.250}_{-0.300}$	$4.240^{+0.285}_{-2.564}$	$2.018^{+0.068}_{-0.616}$	$0.037^{+0.339}_{-0.008}$
	+3%/-4%	+17%/-2%	+139%/-167%	+7%/-60%	+3%/-31%	+909%/-22%
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 004737302-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$69.47^{+51.84}_{-39.37}$	3348^{+222}_{-513}	3485^{+8202}_{-14931}	$0.687^{+74.111}_{-68.669}$
Alt.	-65 ± 6	$90.48^{+51.05}_{-38.84}$	3350^{+226}_{-437}	-3243^{+342}_{-134}	$0.020^{+0.039}_{-0.012}$

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 $A_{obs} \gg 1.0$

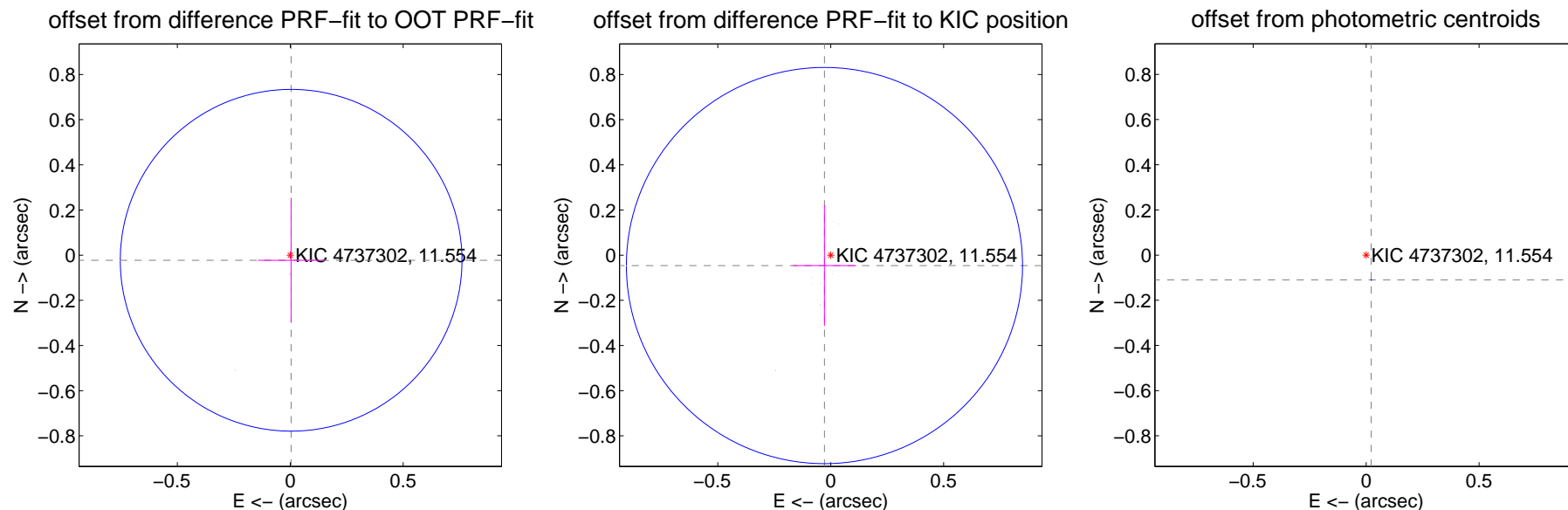
DV Centroid Data

Supplemental centroid analysis for 004737302-02. **Kepler magnitude: 11.55.** Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

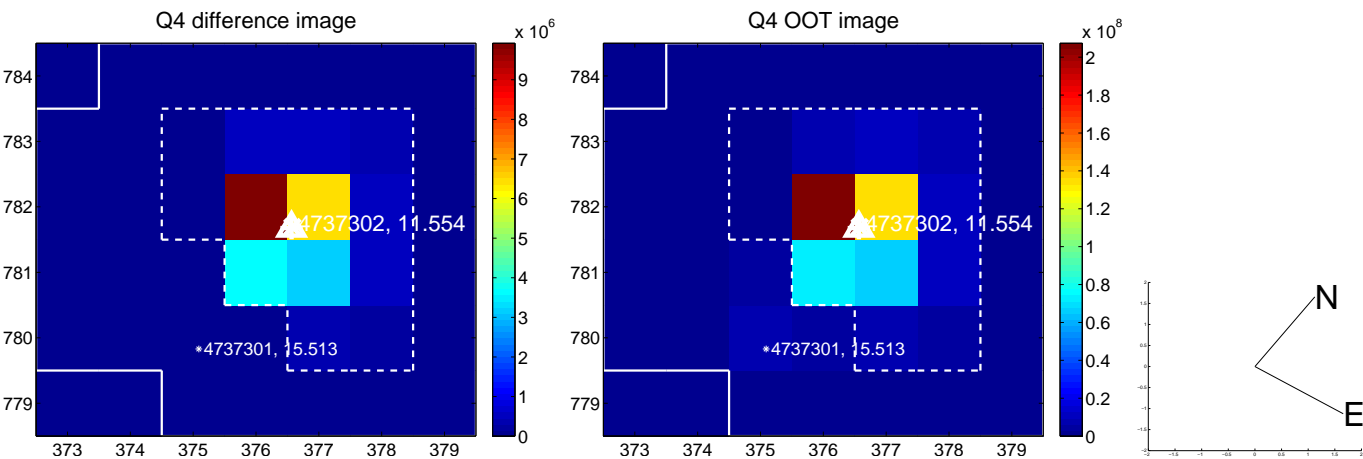
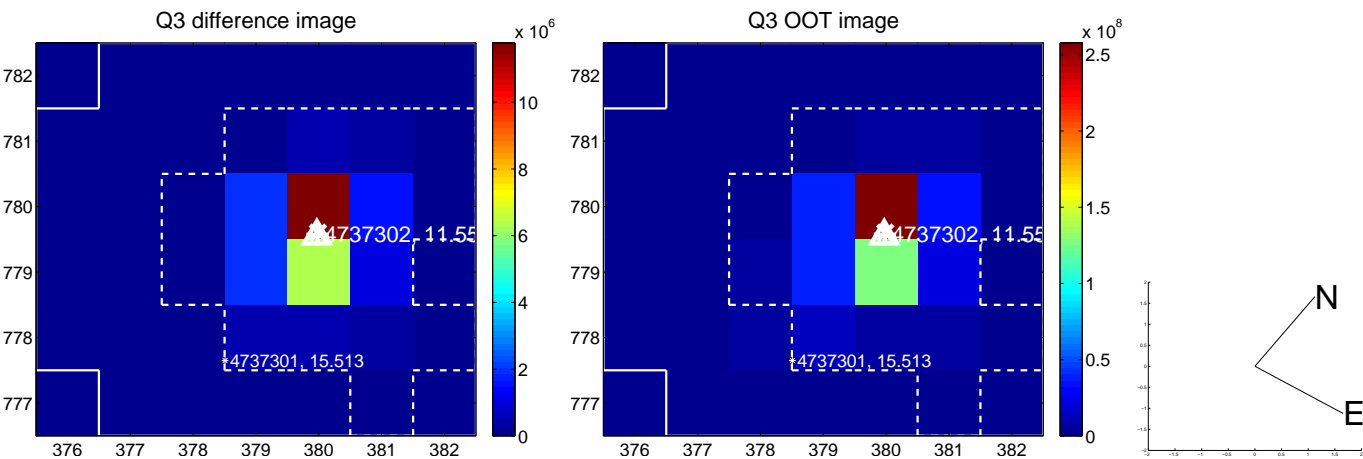
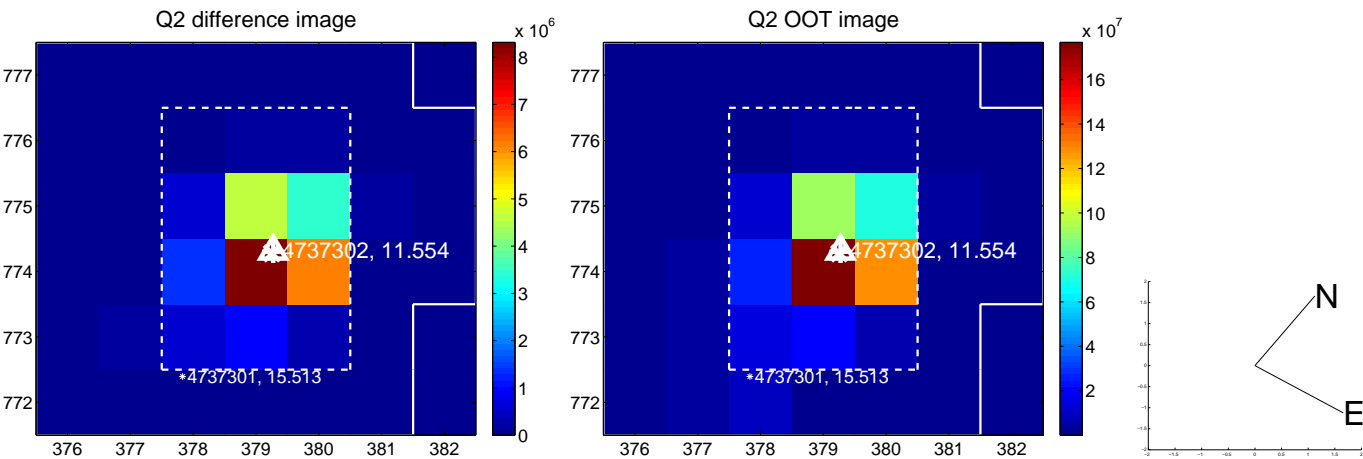
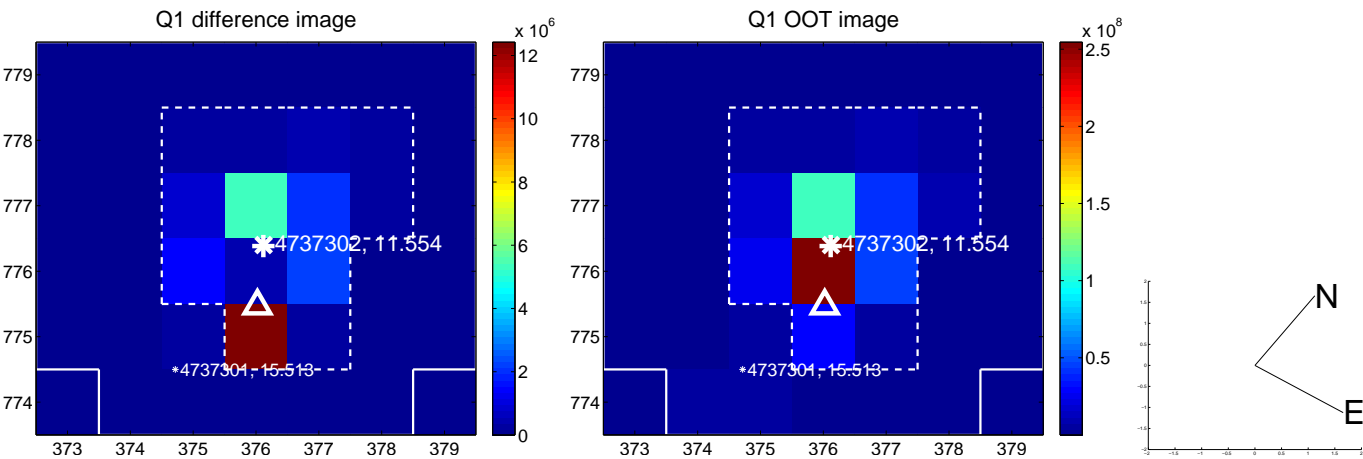
The direct PRF centroid is offset from the target star catalog position by about 0.00 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.023 ± 0.252	0.09	-0.004 ± 0.146	-0.023 ± 0.276
PRF-fit source offset from KIC position	0.054 ± 0.292	0.18	0.028 ± 0.140	-0.046 ± 0.267
photometric centroid source offset	0.11 ± 0.00	267.28	-0.02 ± 0.00	-0.11 ± 0.00

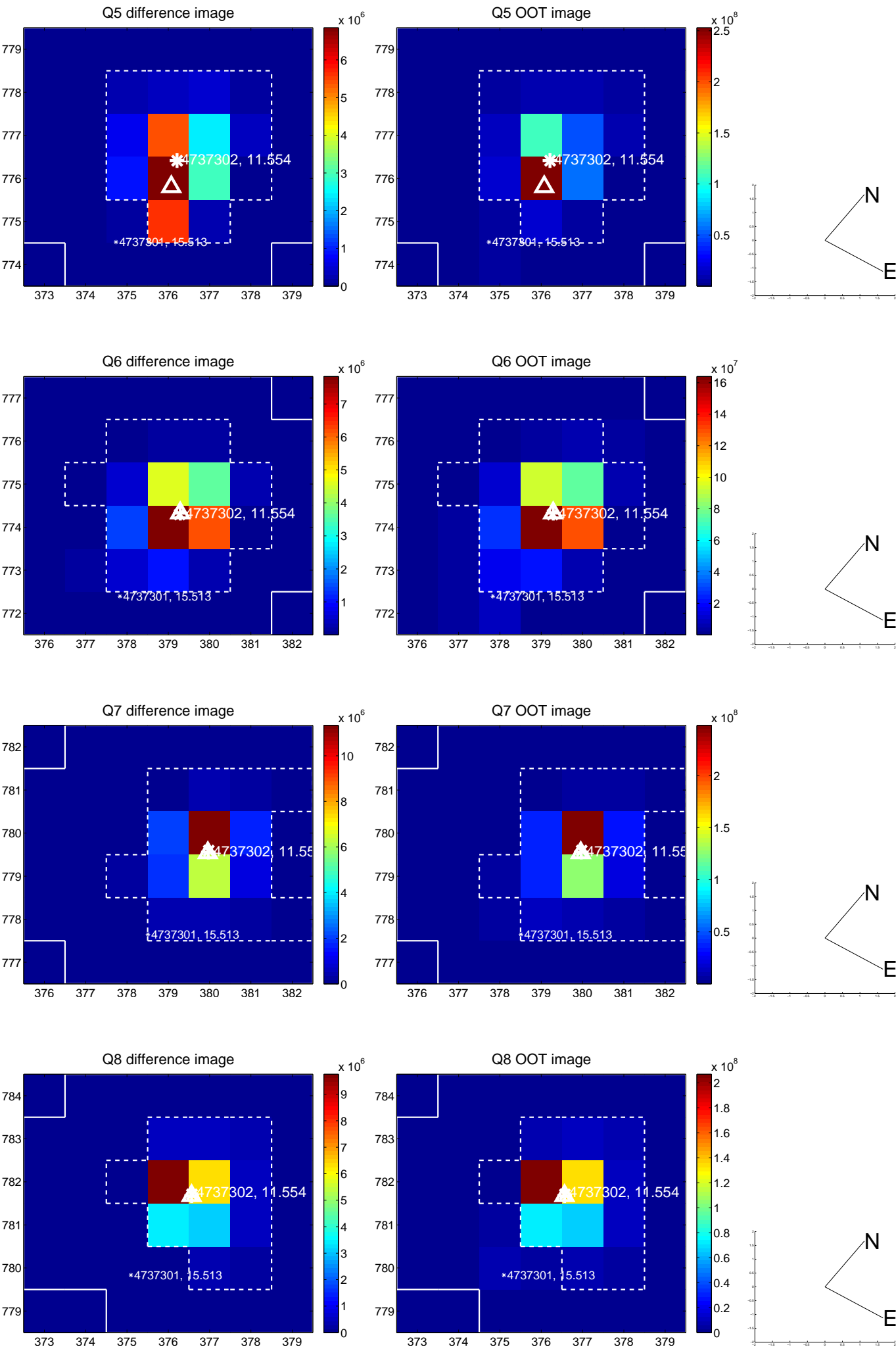


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

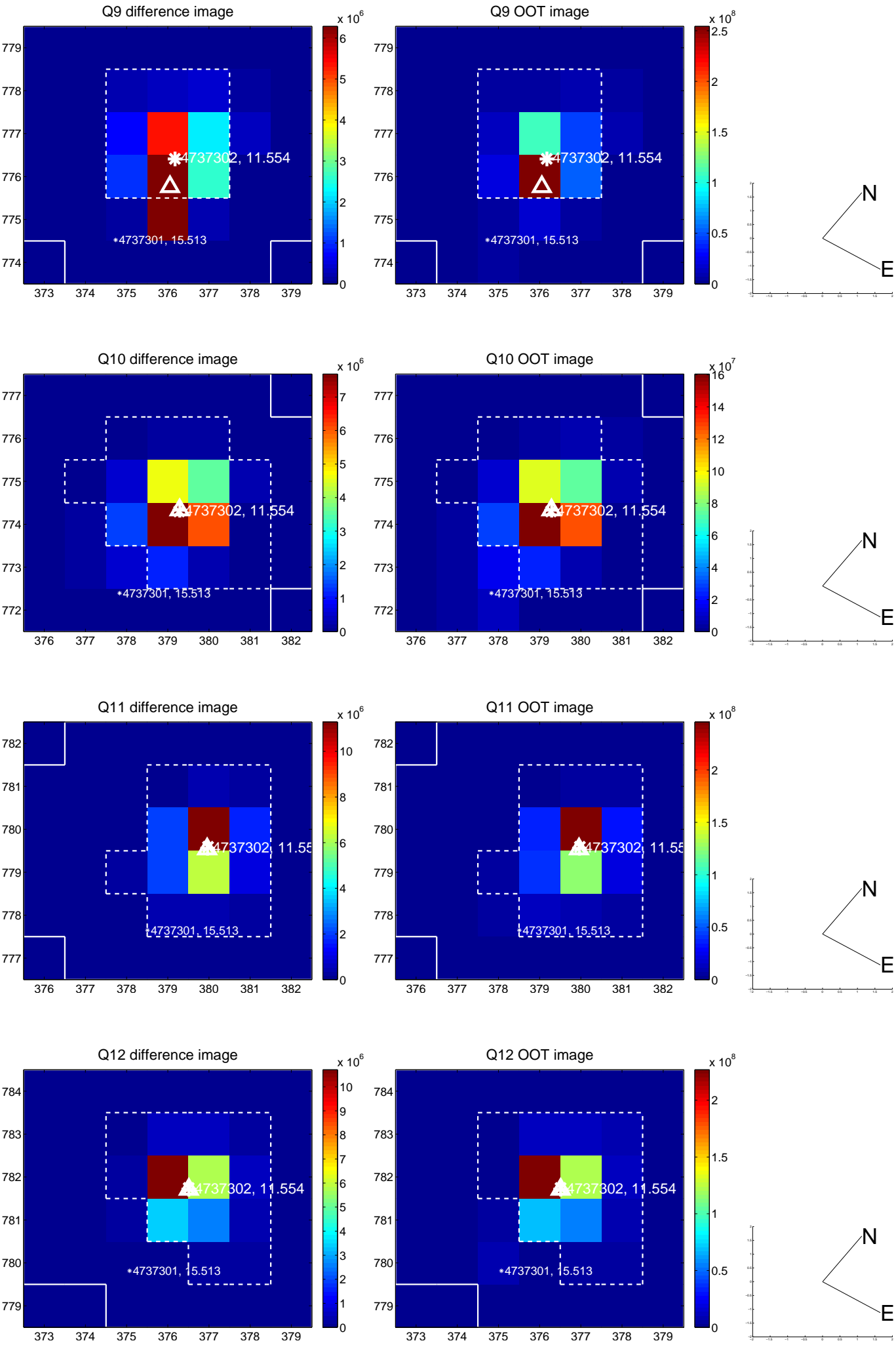
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



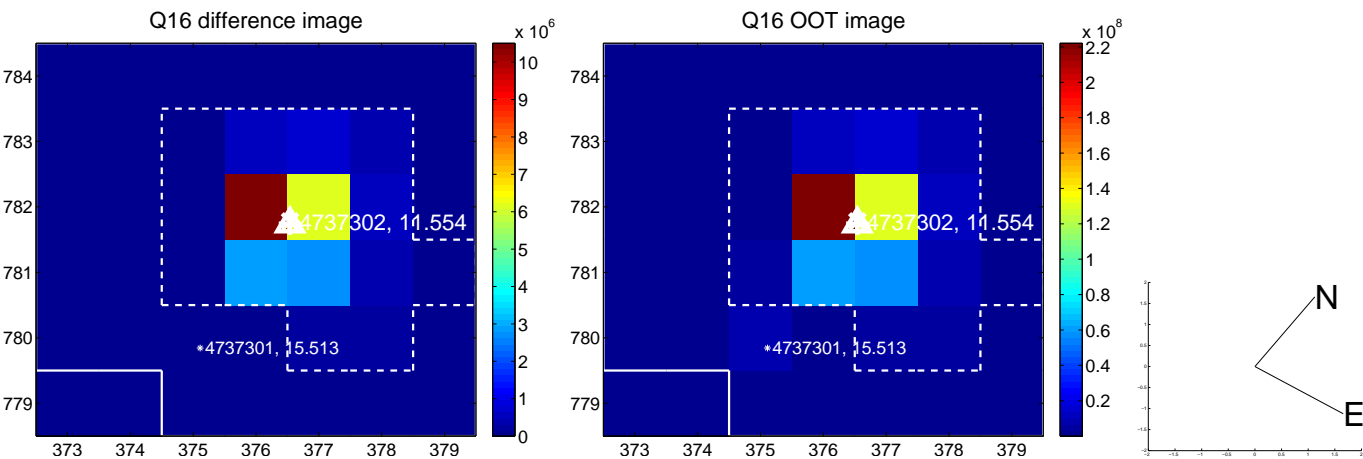
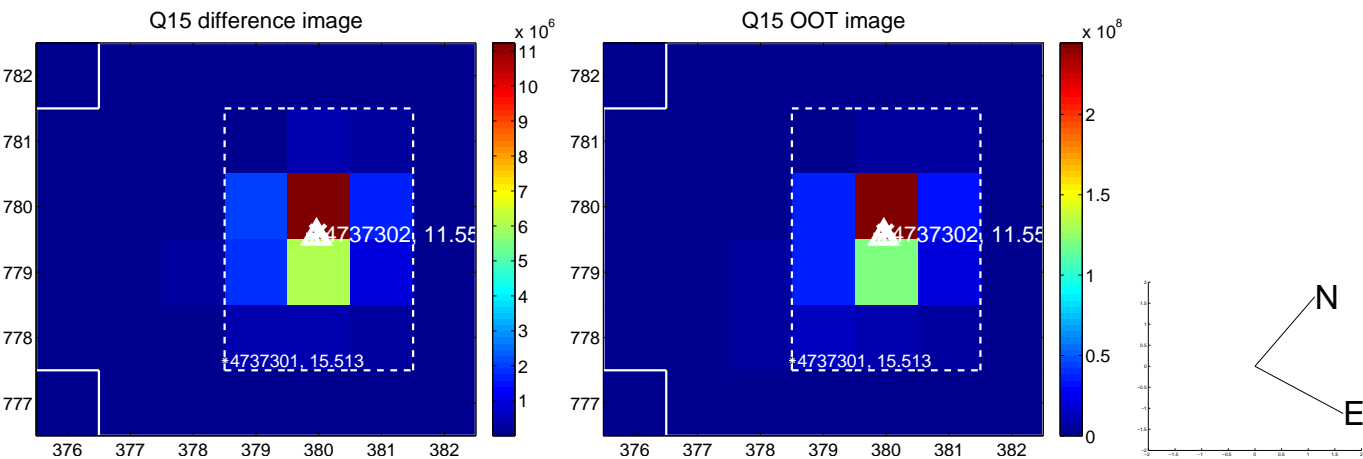
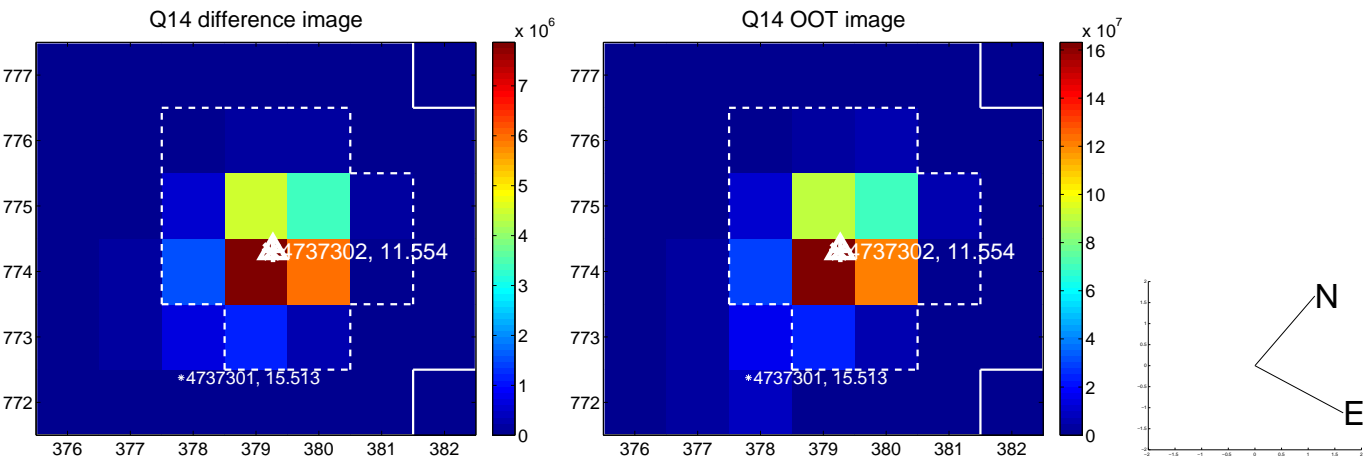
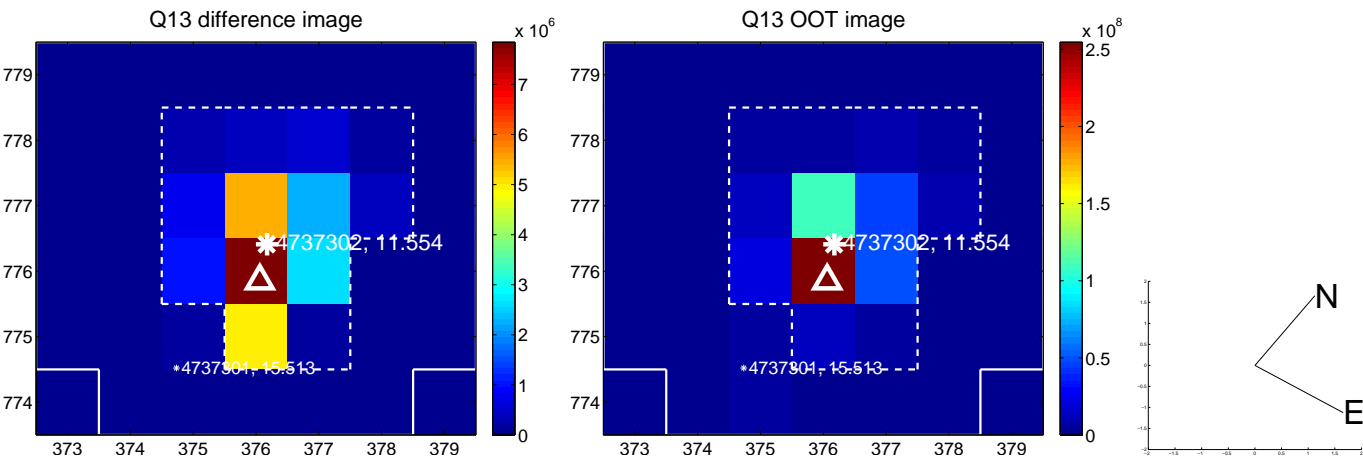
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



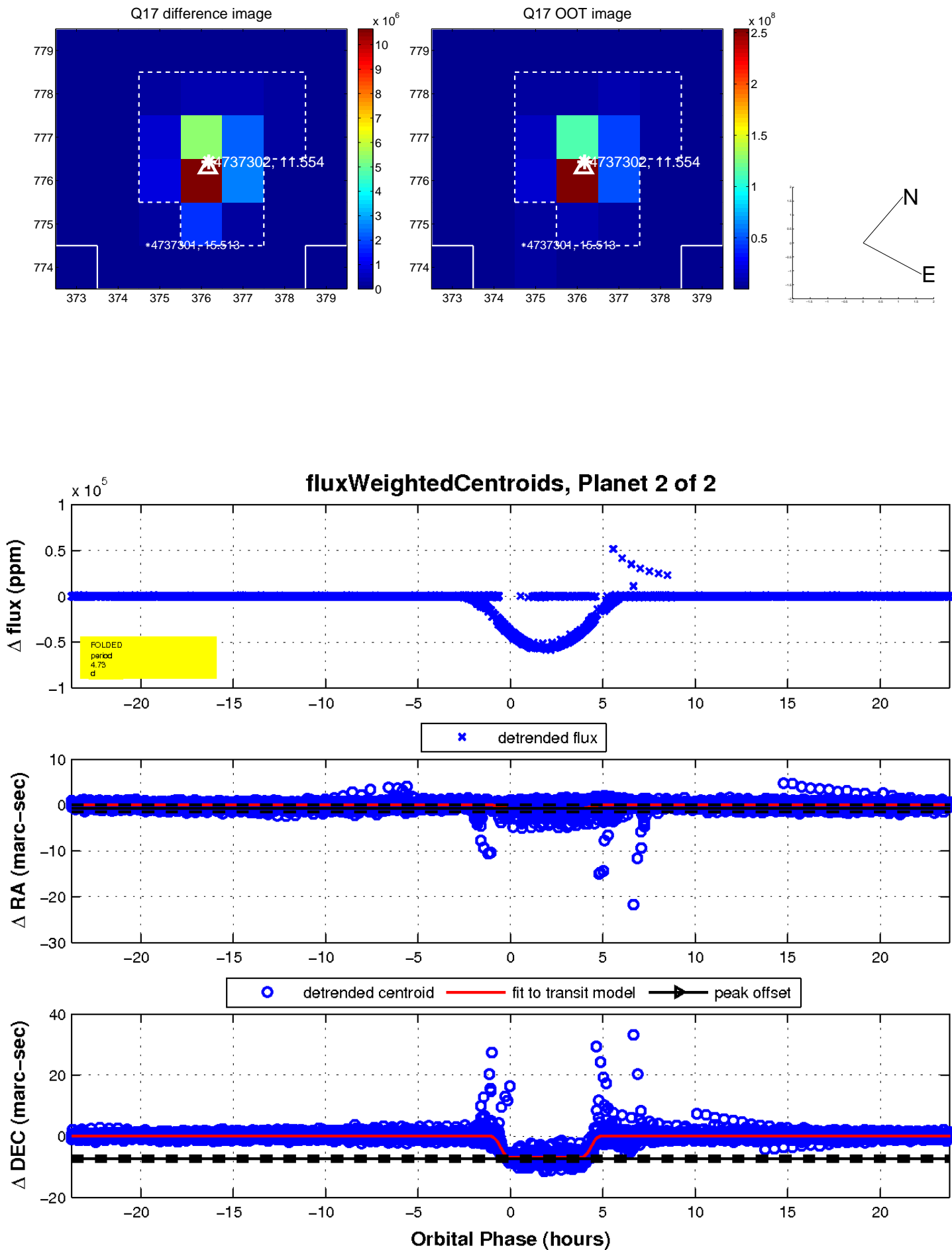
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UKIRT Image

