

KIC 009965206

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})
009965206-01	OBS	3558.01	16.227549	136.639701	191396.9	5.110	3094.6	2319.4	0.80	5297	43.55	30.59
009965206-02	OBS	No	16.227548	145.005847	167369.5	5.493	2852.3	2243.1	0.80	5297	48.77	30.59

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009965206-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009965206-02	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.

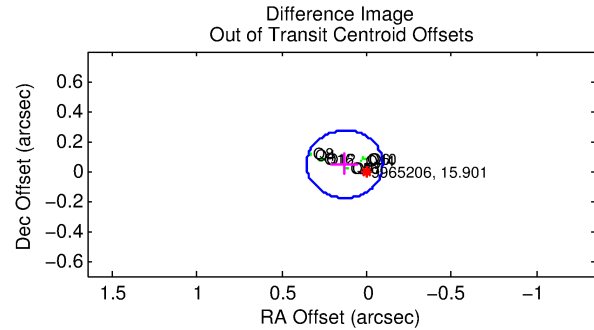
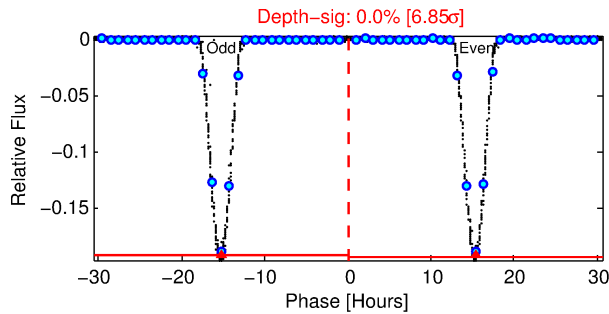
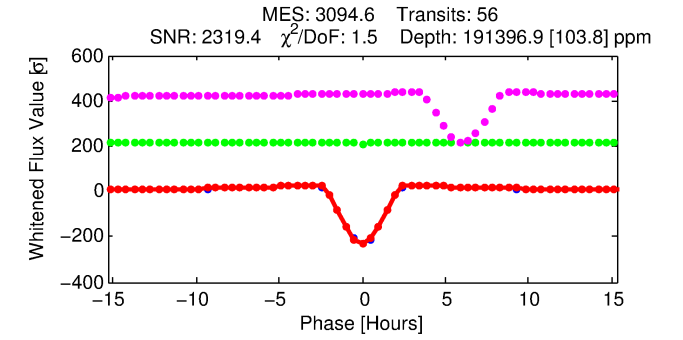
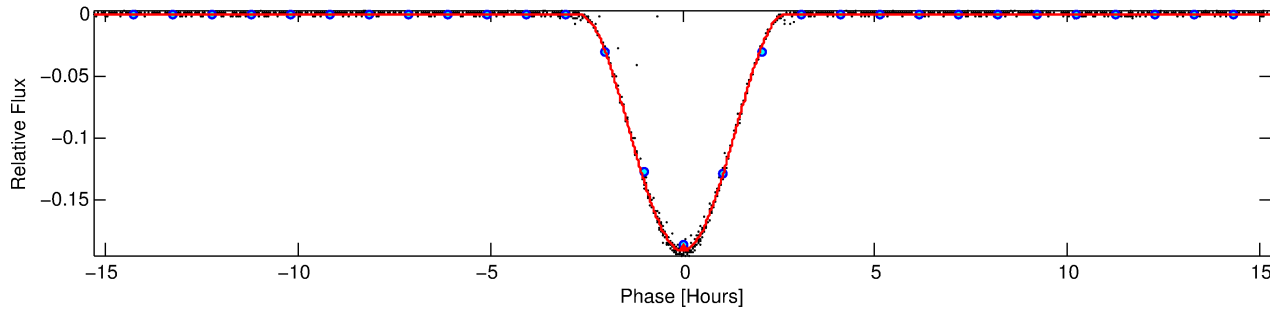
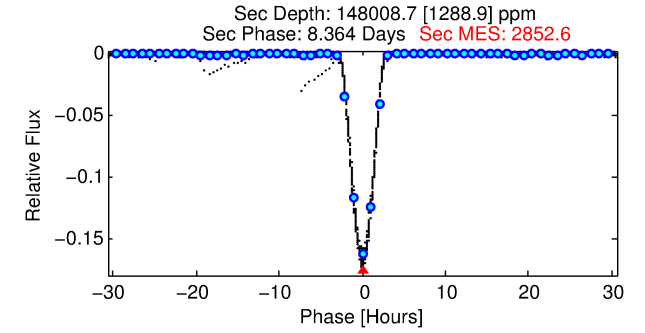
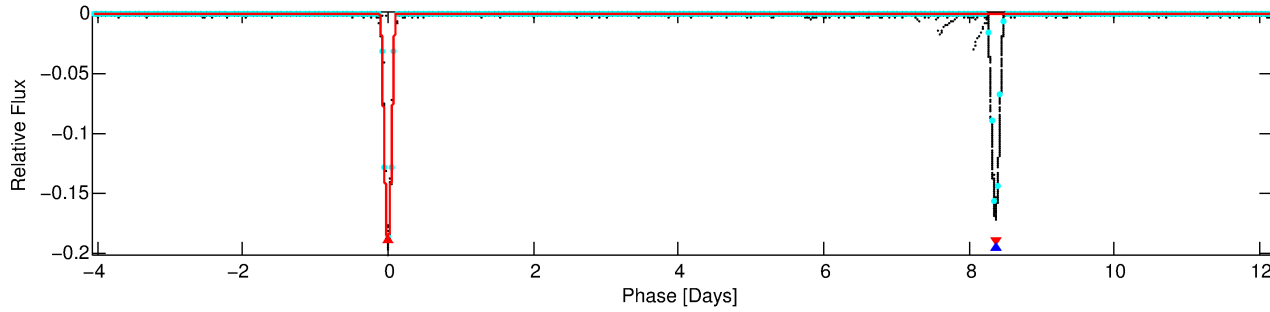
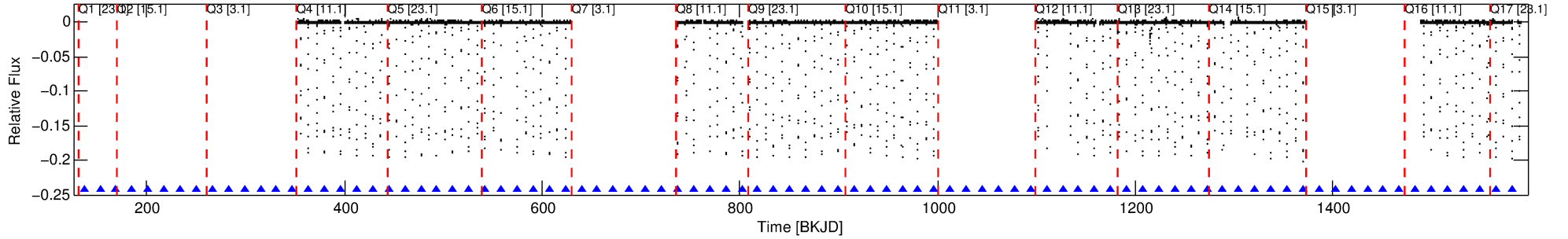
Ephemeris Match Information For 009965206-01

No Significant Match Found

DV One-Page Summary

KIC: 9965206 Candidate: 1 of 2 Period: 16.228 d
KOI: K03558.01 Corr: 0.998

Kp: 15.90 R*: 0.80 Rs Teff: 5297.0 K Logg: 4.59 Fe/H: 0.070



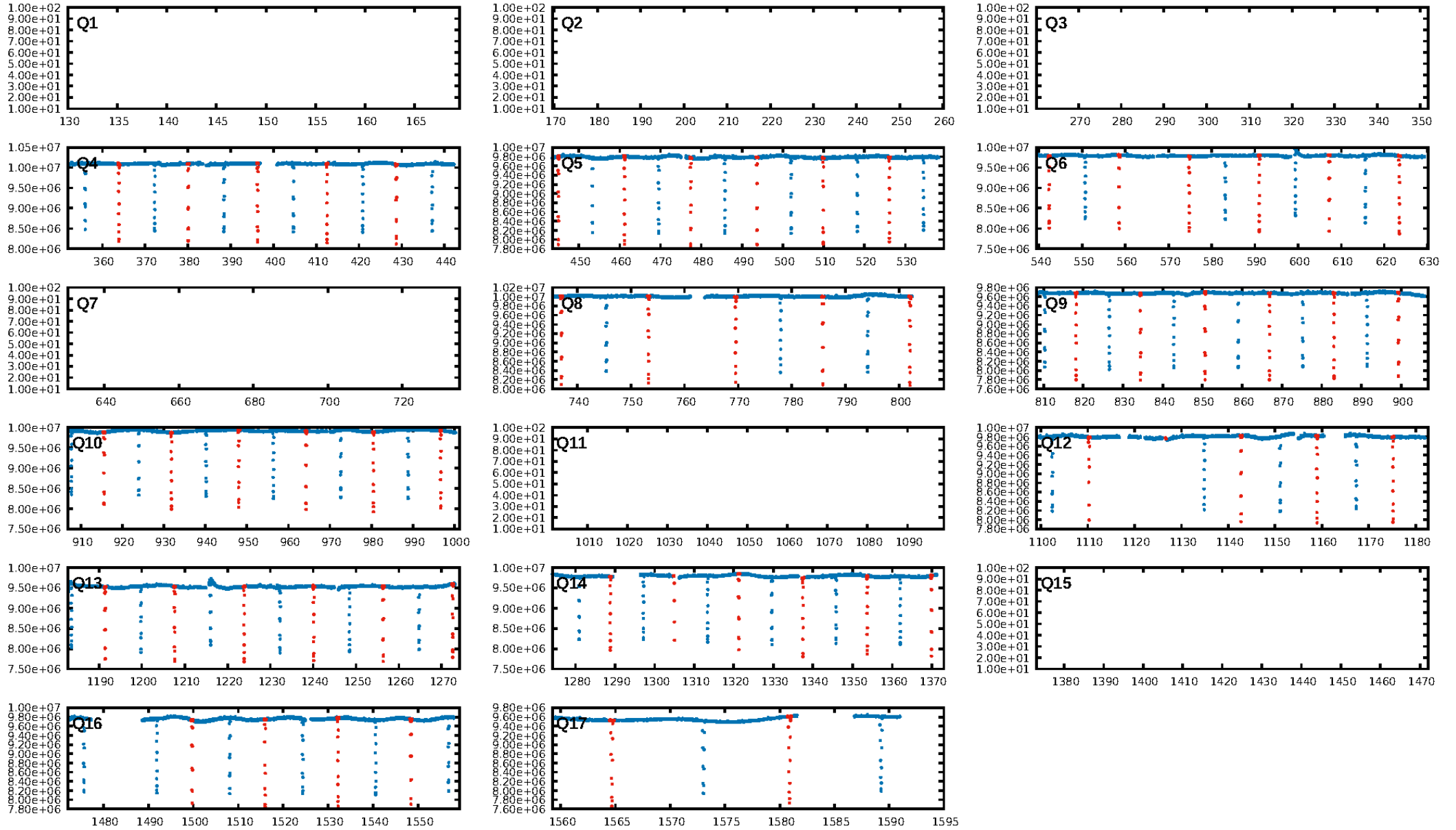
DV Fit Results:

Period = 16.22755 [0.00000] d
Epoch = 136.6397 [0.0001] BKJD
Rp/R* = 0.5020 [0.0158]
a/R* = 31.67 [0.07]
b = 0.74 [0.03]
Seff = 30.59 [8.00]
Teq = 600 [39] K
Rp = 43.55 [7.74] Re
a = 0.1207 [0.0179] AU
Ag = 625.69 [142.10] [4.40σ]
Teffp = 4637 [183] K [21.60σ]

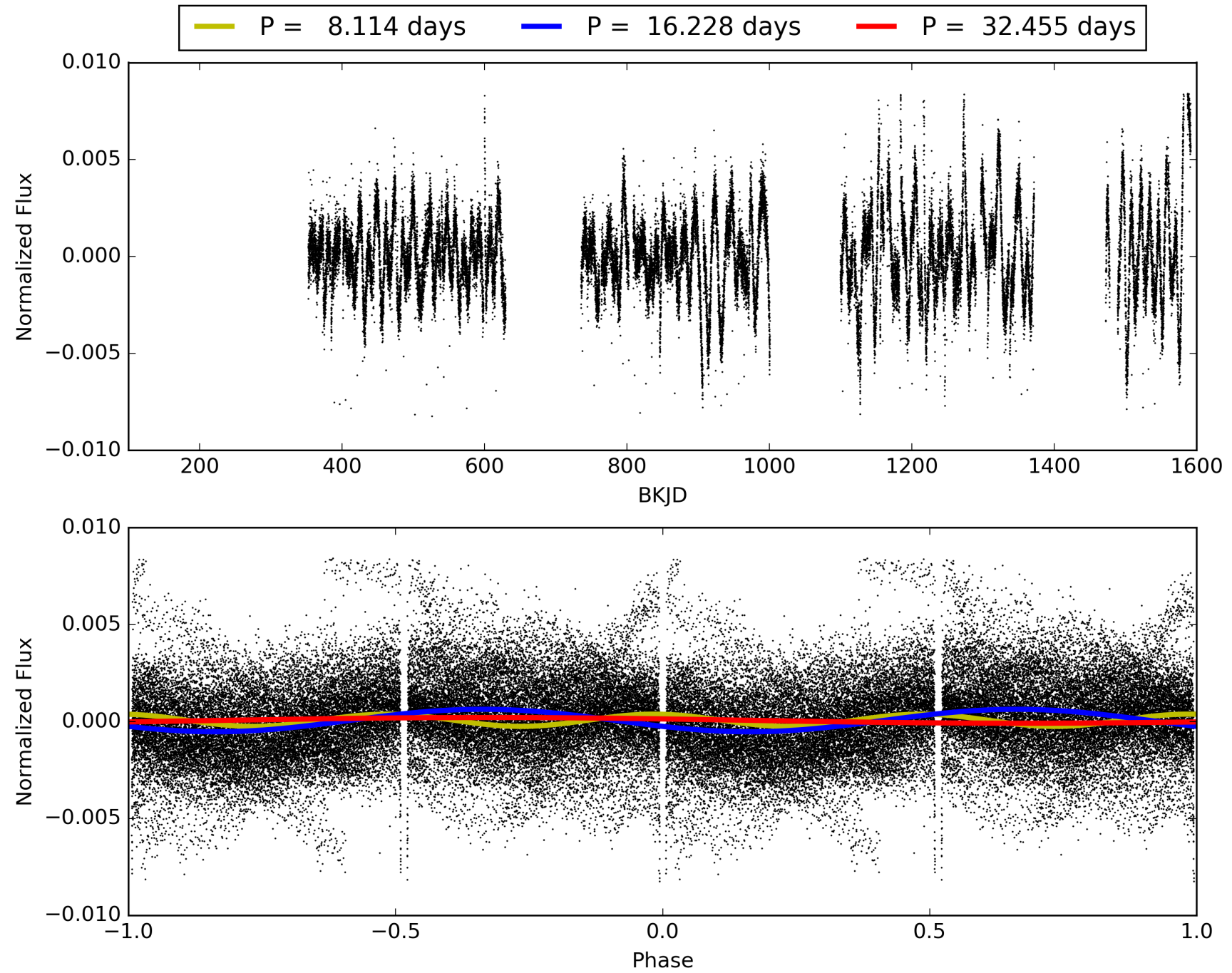
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [54/54]
GhostDiagnostic-chr: 5.291
Centroid-sig: 0.0%
Centroid-so: 0.178 arcsec [48.25σ]
OotOffset-rm: 0.140 arcsec [1.87σ]
KicOffset-rm: 0.046 arcsec [0.67σ]
OotOffset-st: 3/0/4/4 [11]
KicOffset-st: 3/0/4/4 [11]
DiffImageQuality-fgm: 1.00 [11/11]
DiffImageOverlap-fno: 1.00 [11/11]

TCE 009965206-01, PDC Light Curves

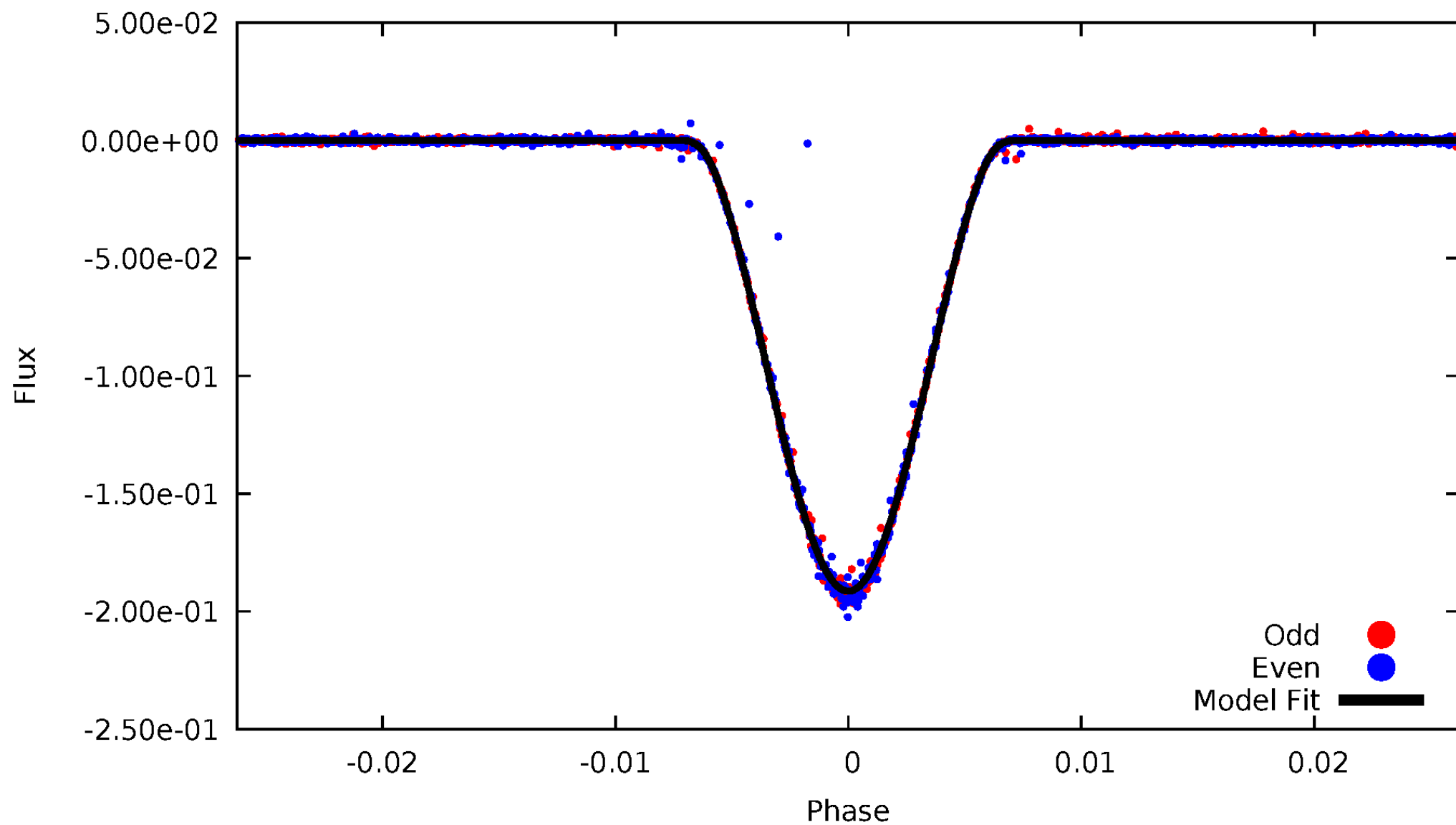


TCE 009965206-01



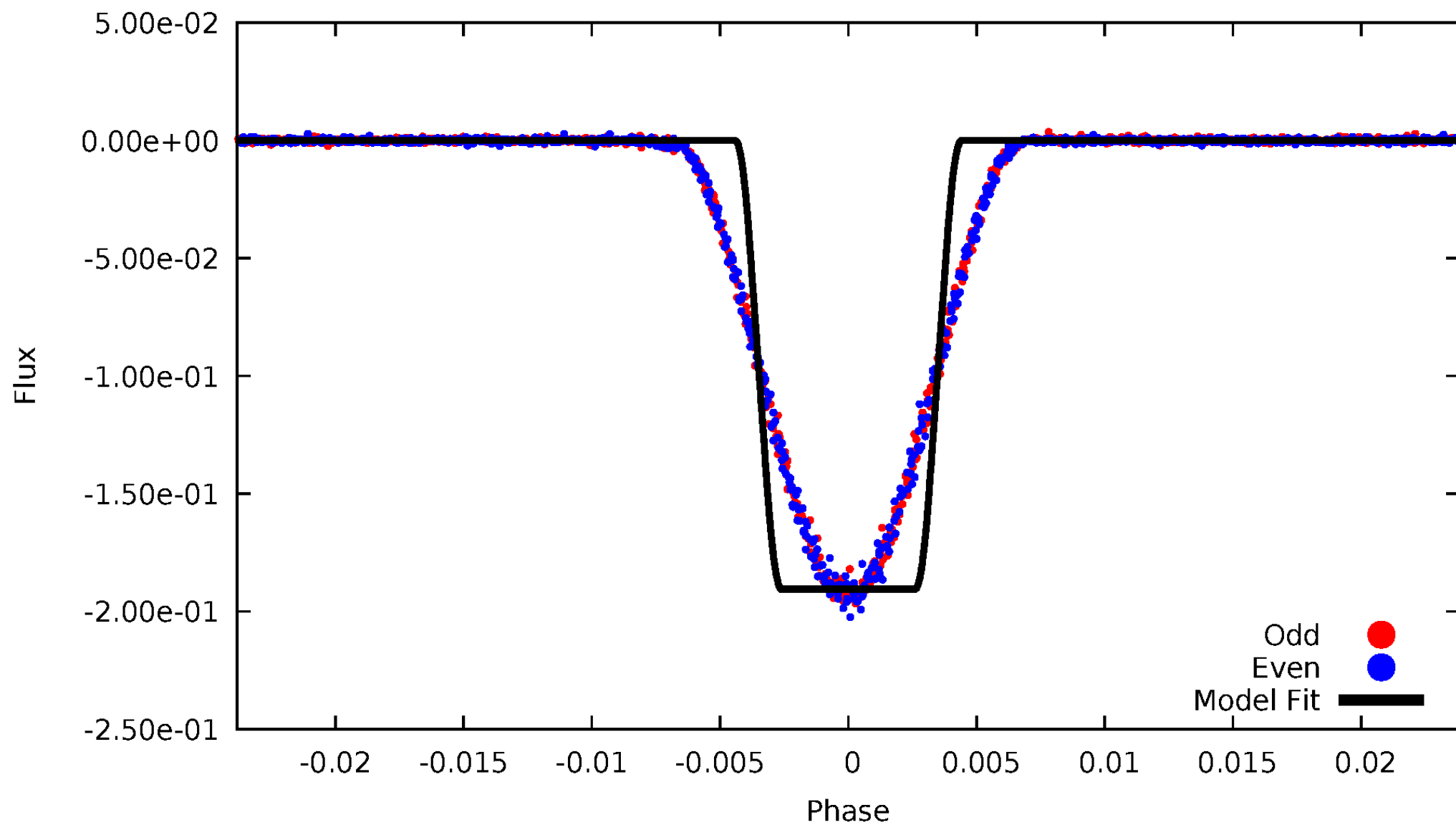
DV Odd/Even

TCE 009965206-01



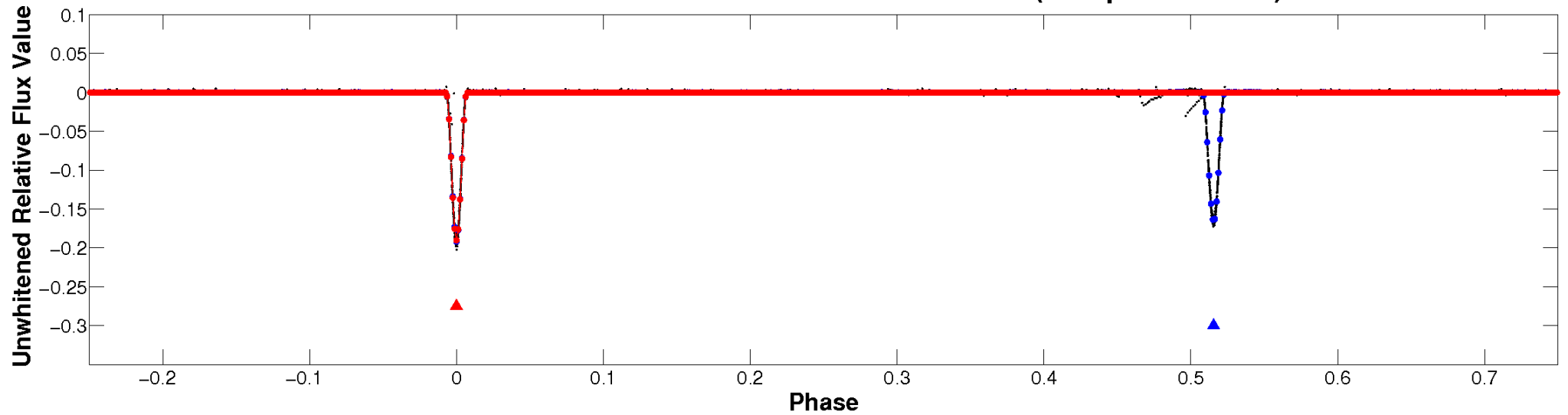
ALT Odd/Even

TCE 009965206-01

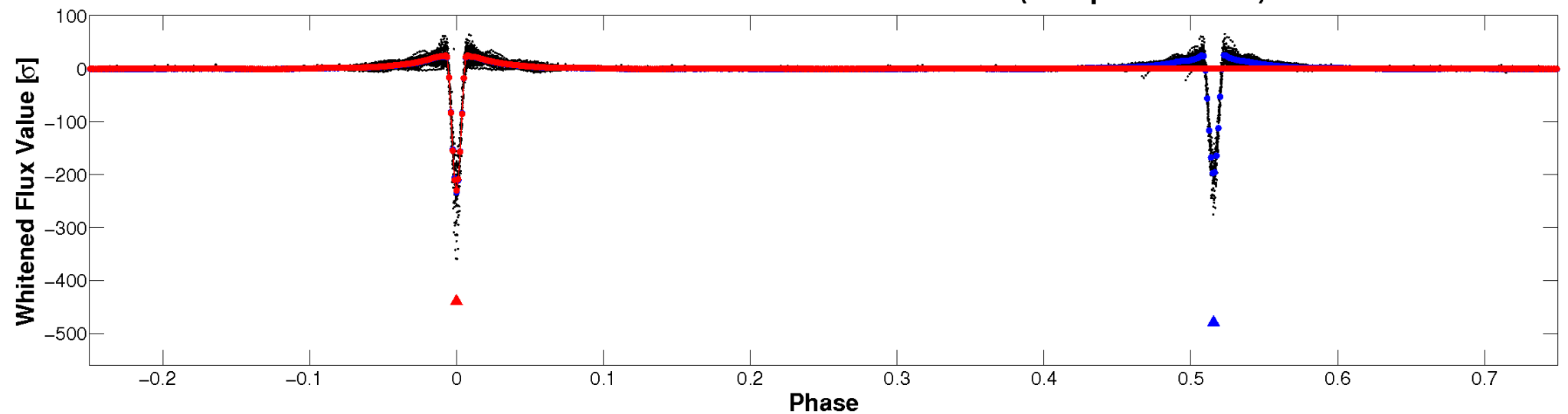


Non-Whitened Vs. Whitened Light Curve

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

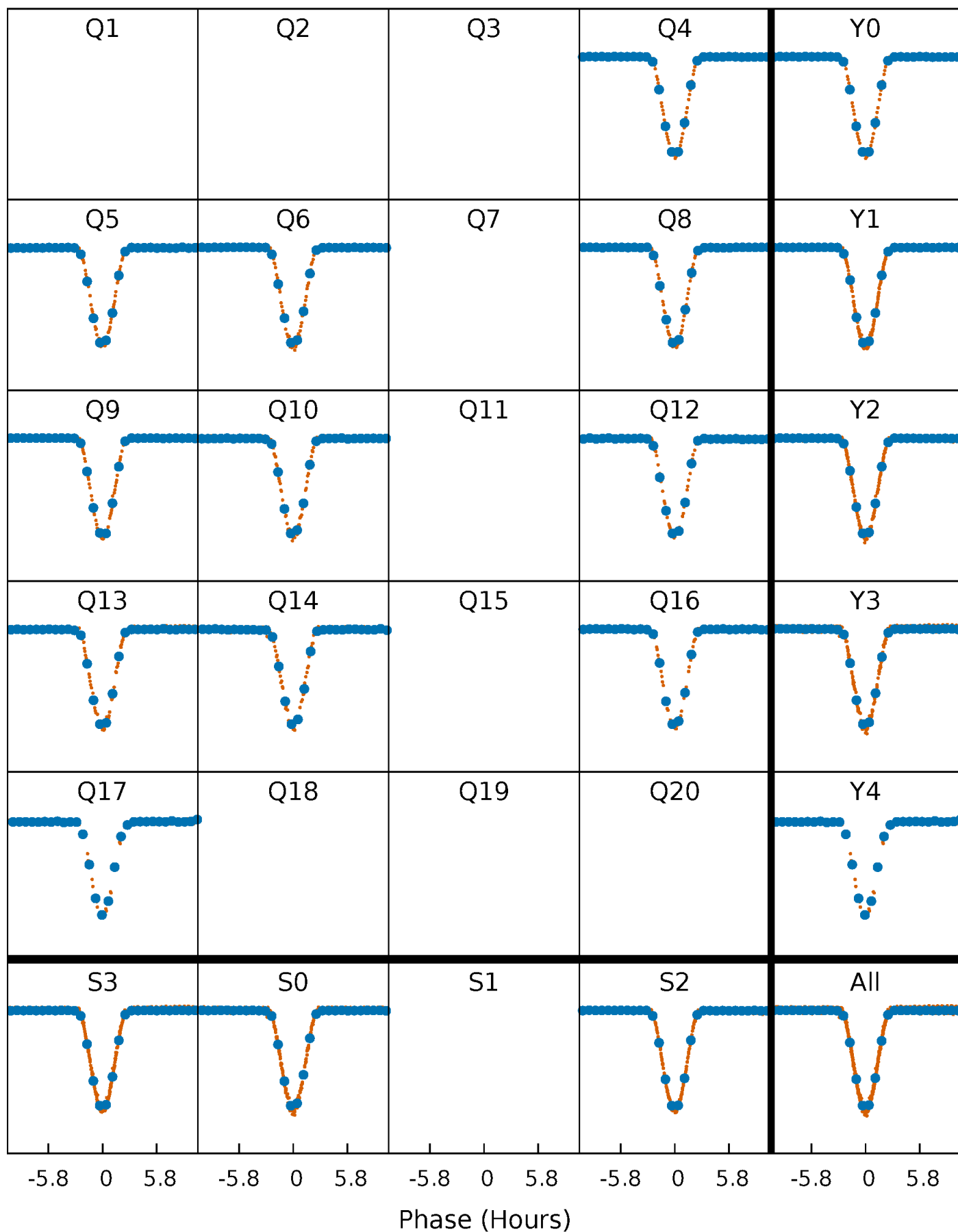


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



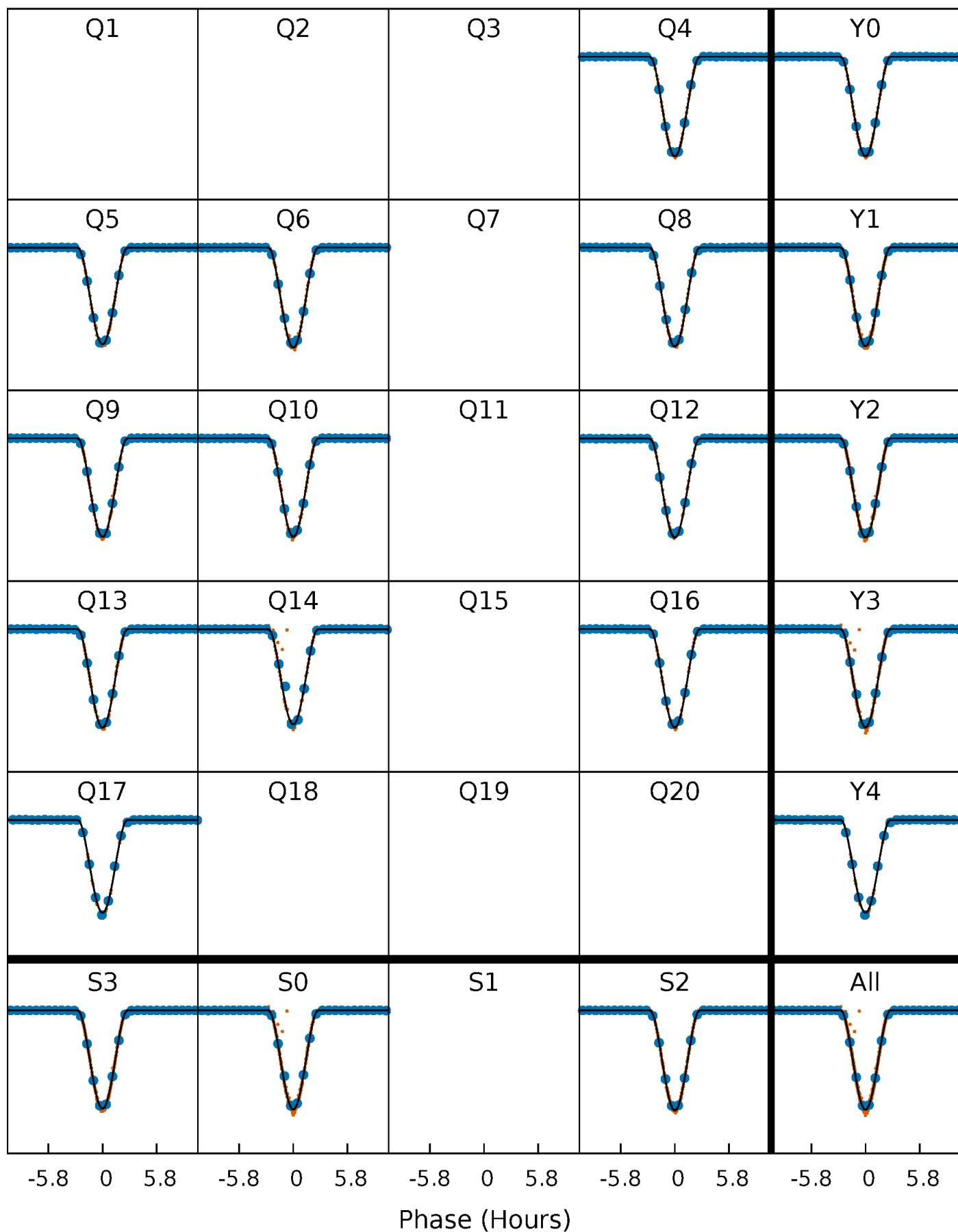
PDC Quarter-Phased Transit Curves

TCE 009965206-01 P= 16.227549 Days $T_0=136.639701$ (BKJD)



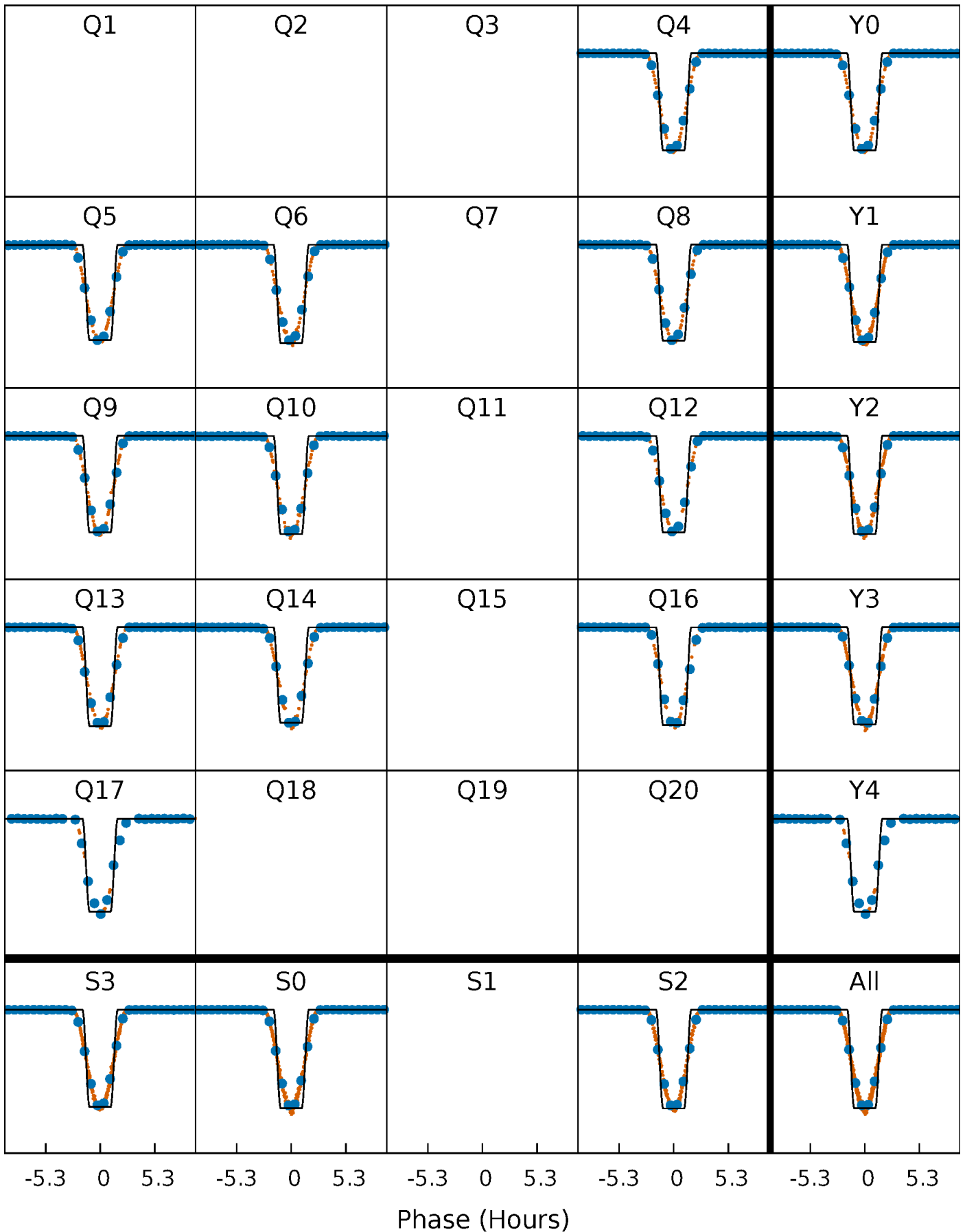
DV Quarter-Phased Transit Curves

TCE 009965206-01 P= 16.227549 Days $T_0=136.639701$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

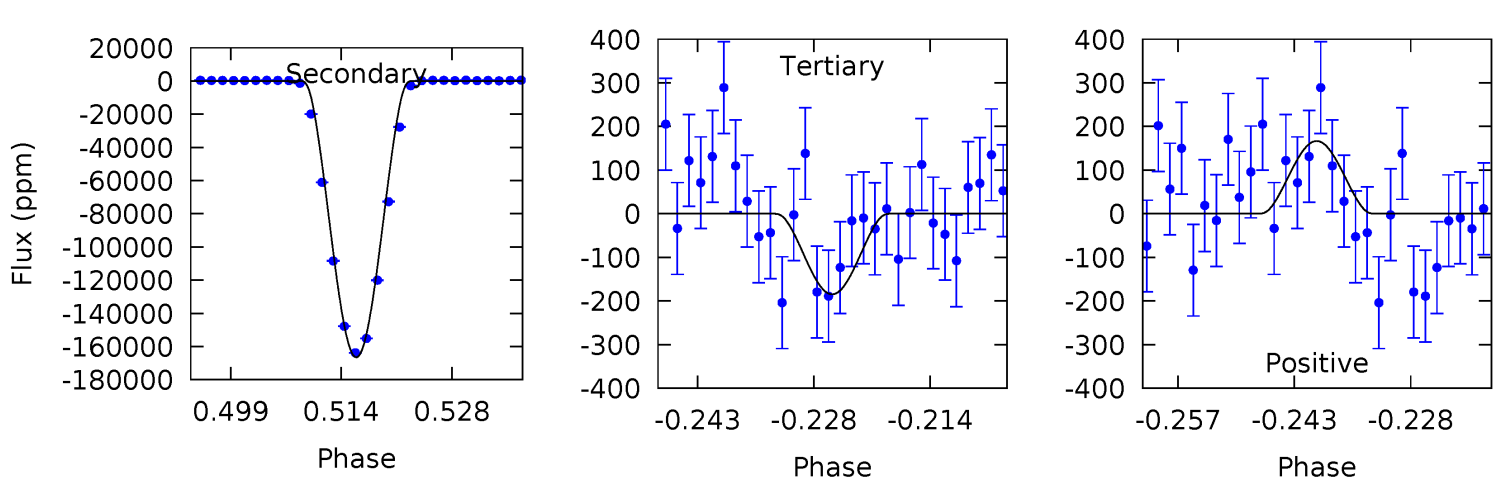
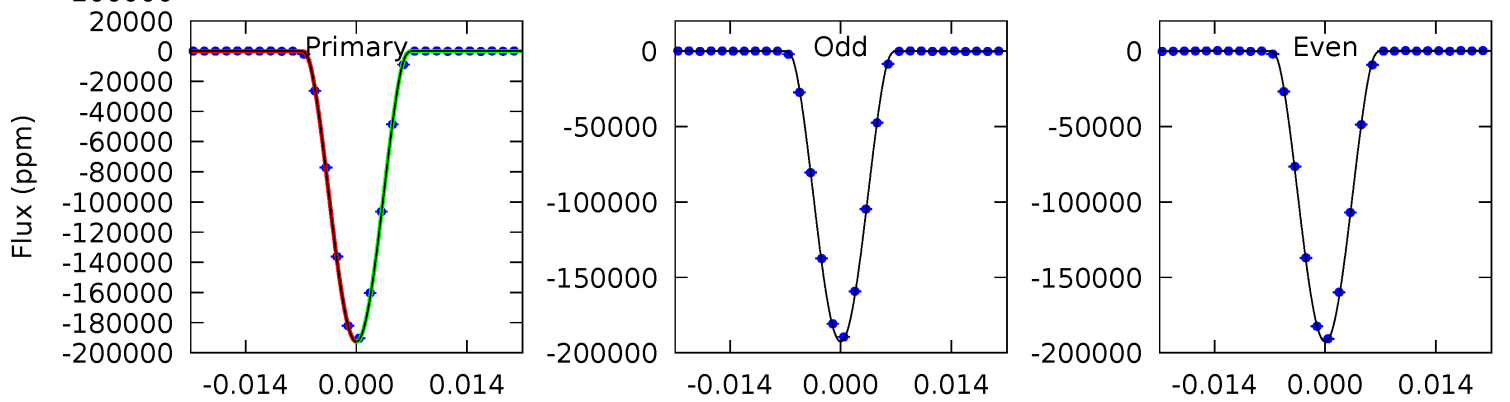
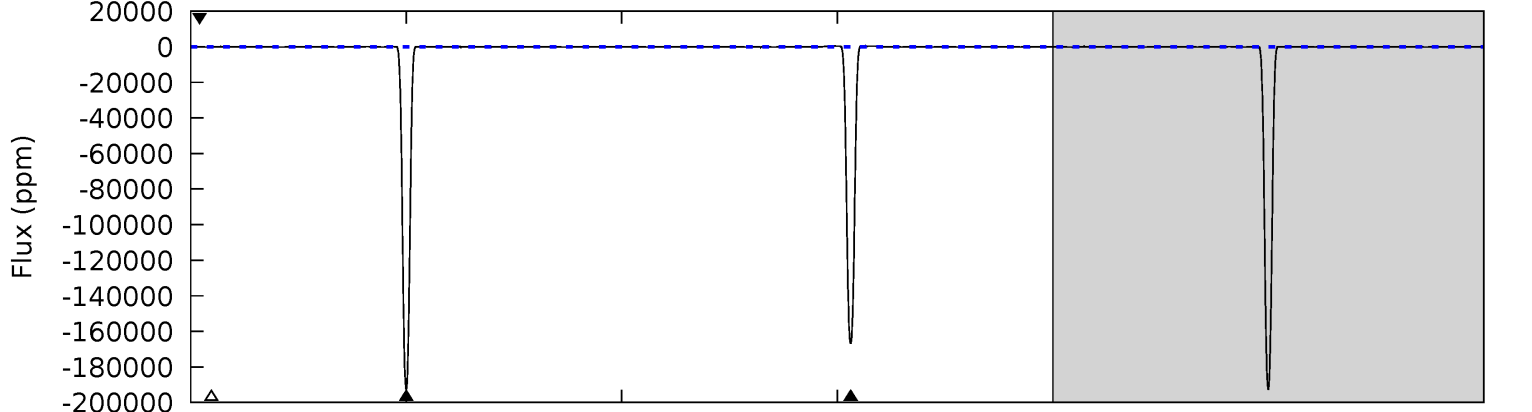
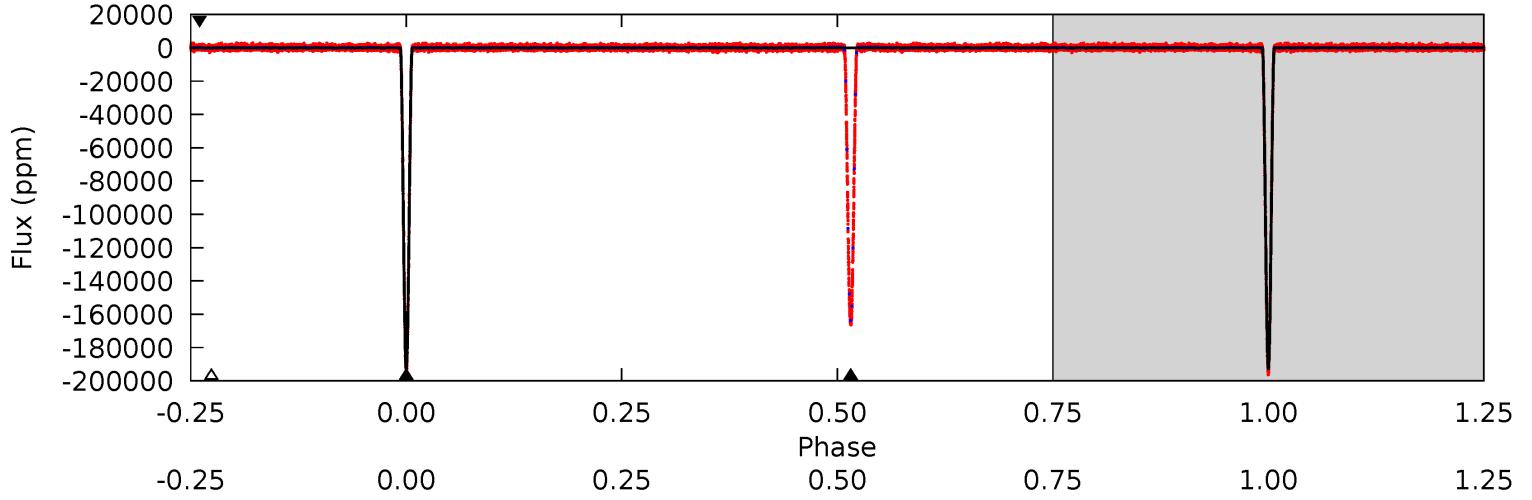
TCE 009965206-01 P= 16.227489 Days $T_0=136.642660$ (BKJD)



DV Model-Shift Uniqueness Test

009965206-01, P = 16.227549 Days, E = 136.639701 Days

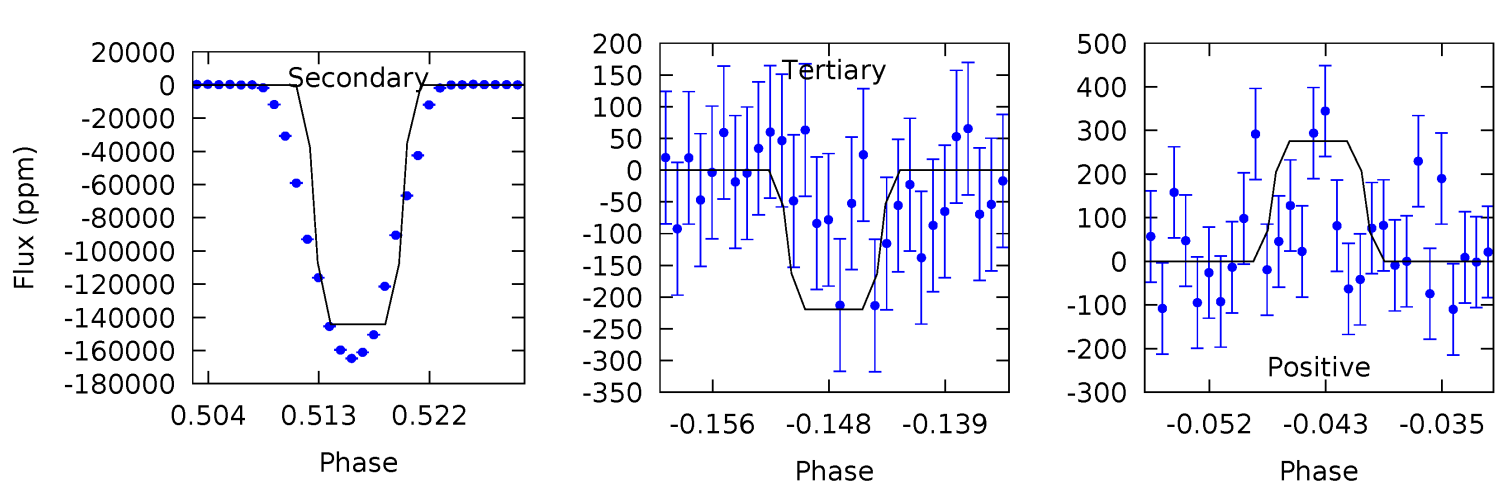
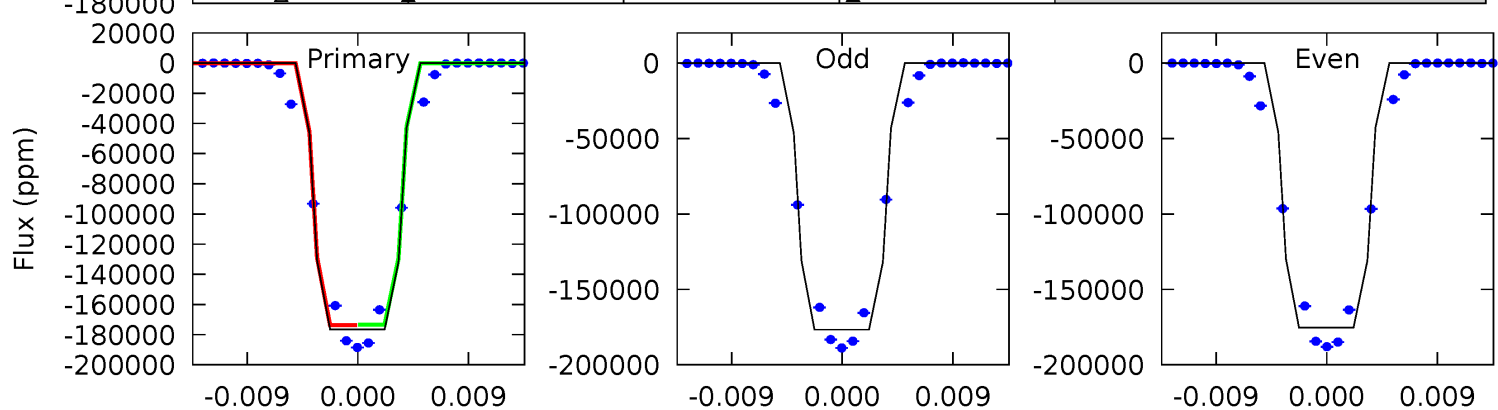
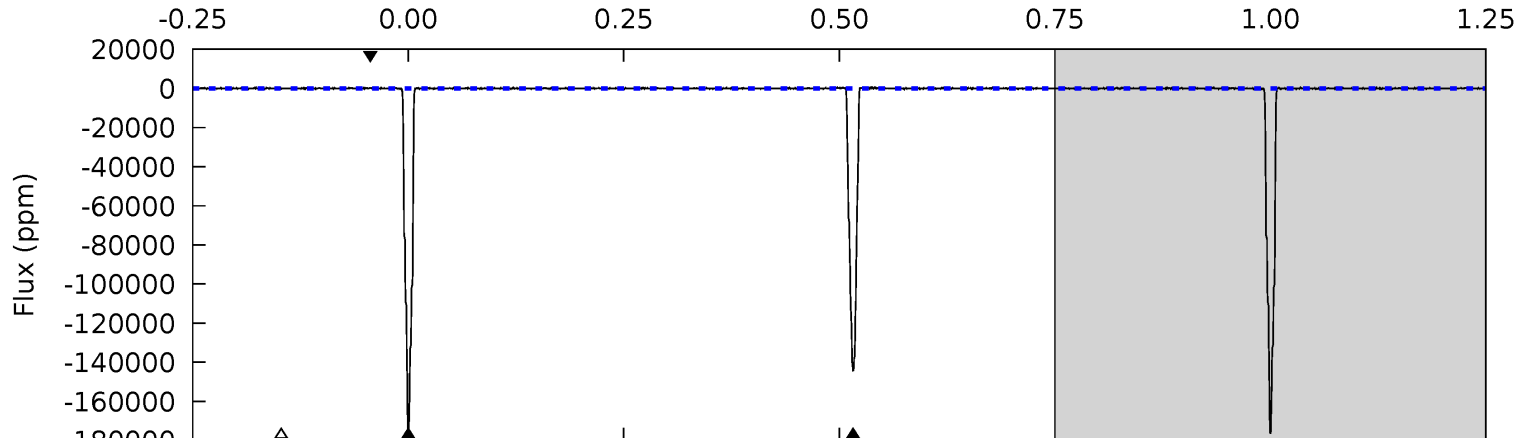
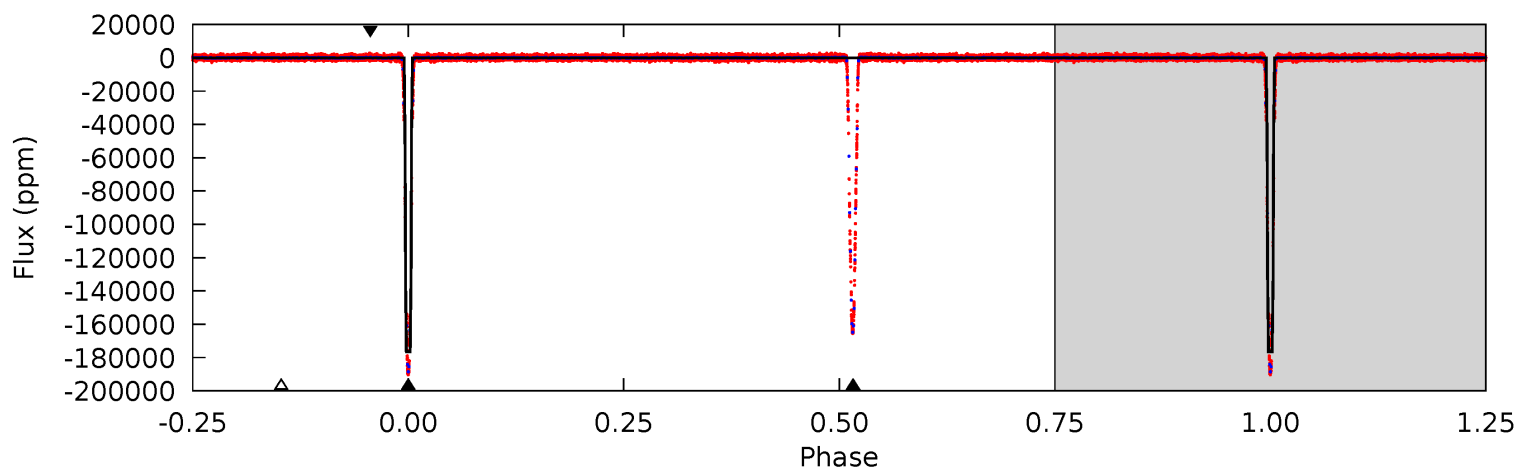
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6317	5461	6.06	5.47	4.96	2.45	3.03	6311	6312	5455	5455	1.97	0.98	0.00	3.42



Alt Model-Shift Uniqueness Test

009965206-01, P = 16.227489 Days, E = 136.642660 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2713	2217	3.37	4.24	5.05	2.62	1.26	2709	2708	2214	2213	9.98	1.00	0.00	0



Stellar Parameters For KIC 009965206

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5297^{+175}_{-191}	$4.587^{+0.030}_{-0.120}$	$0.070^{+0.300}_{-0.300}$	$0.795^{+0.139}_{-0.053}$	$0.905^{+0.066}_{-0.099}$	$2.536^{+0.389}_{-0.880}$
	+3%/-4%	+1%/-3%	+429%/-429%	+17%/-7%	+7%/-11%	+15%/-35%
Source	KIC0	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 009965206-01 / KOI 3558.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-166503 ± 30	$44.73^{+4.02}_{-3.00}$	850^{+41}_{-33}	5030^{+168}_{-184}	794^{+96}_{-111}
Alt.	-144236 ± 65	$38.80^{+3.73}_{-2.54}$	849^{+42}_{-33}	5148^{+197}_{-203}	889^{+106}_{-128}

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

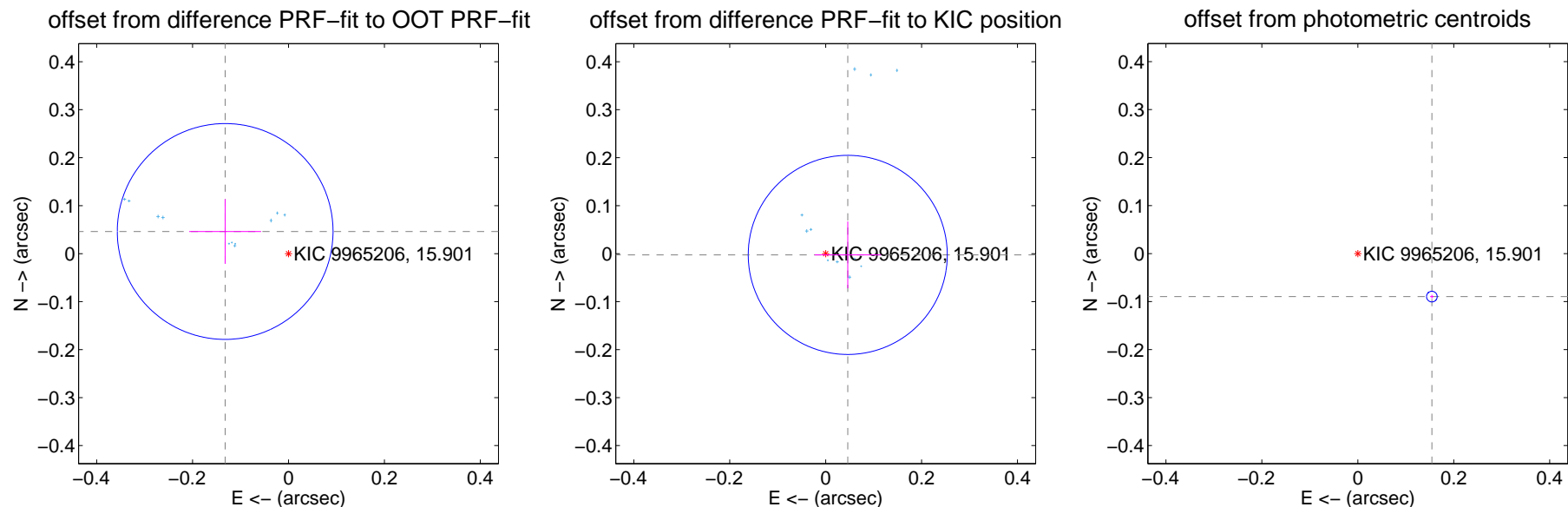
DV Centroid Data

Supplemental centroid analysis for 009965206-01. Kepler magnitude: 15.90. Transit SNR 2319.44

There are 11 quarters with good PRF difference image offsets

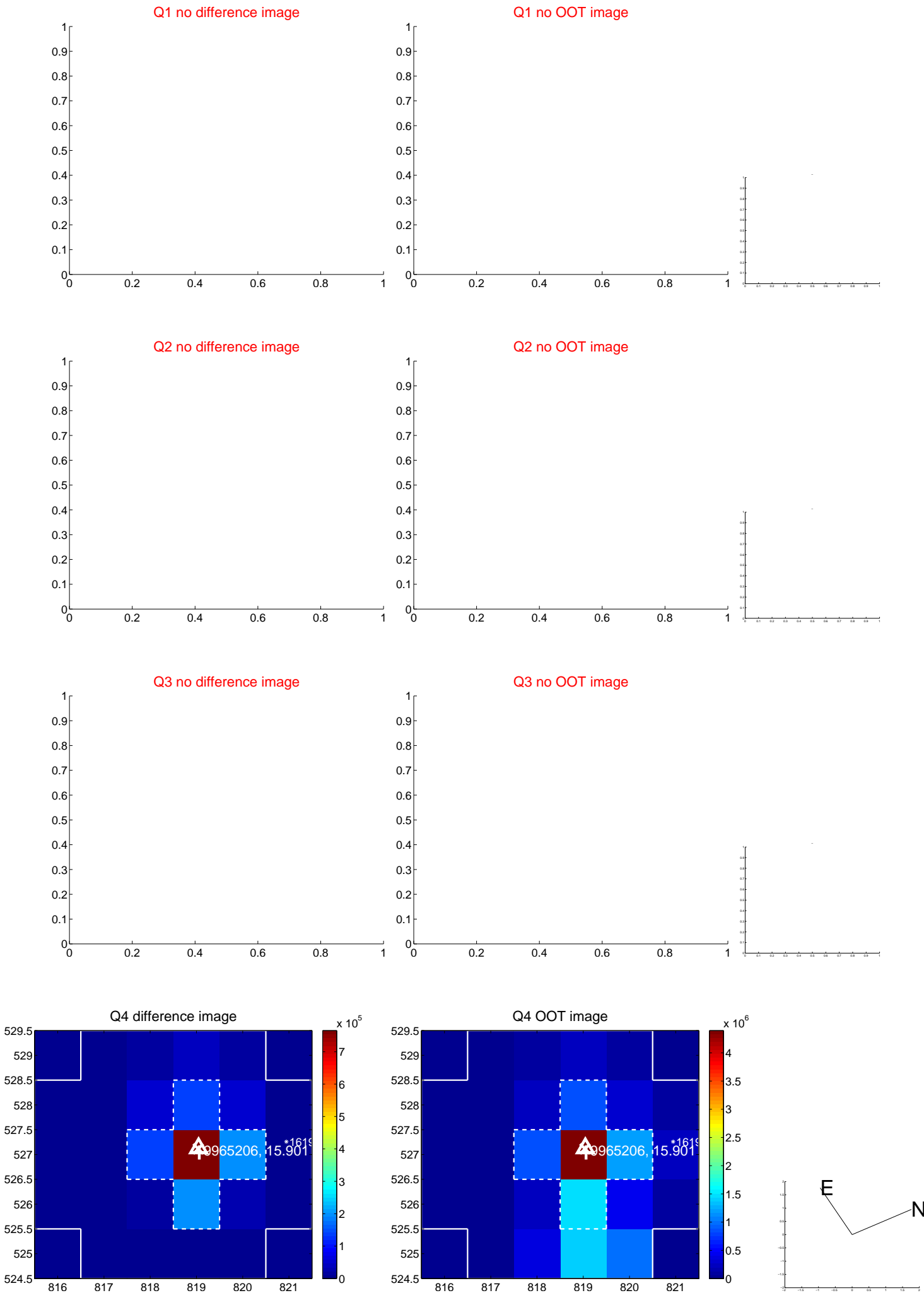
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.140 ± 0.075	1.87	0.132 ± 0.075	0.046 ± 0.068
PRF-fit source offset from KIC position	0.046 ± 0.069	0.67	-0.046 ± 0.069	-0.003 ± 0.070
photometric centroid source offset	0.18 ± 0.00	48.25	-0.15 ± 0.00	-0.09 ± 0.00

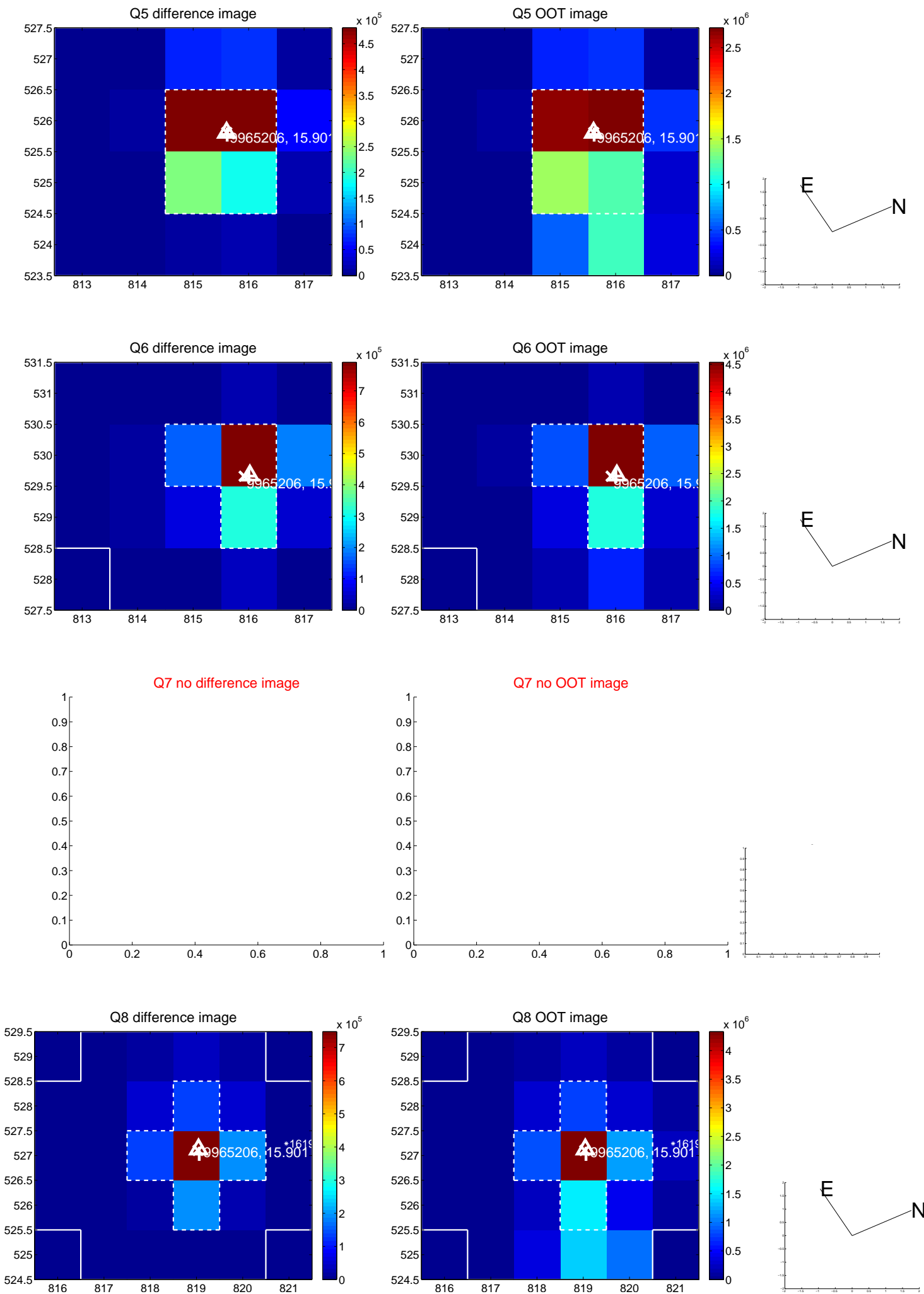


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

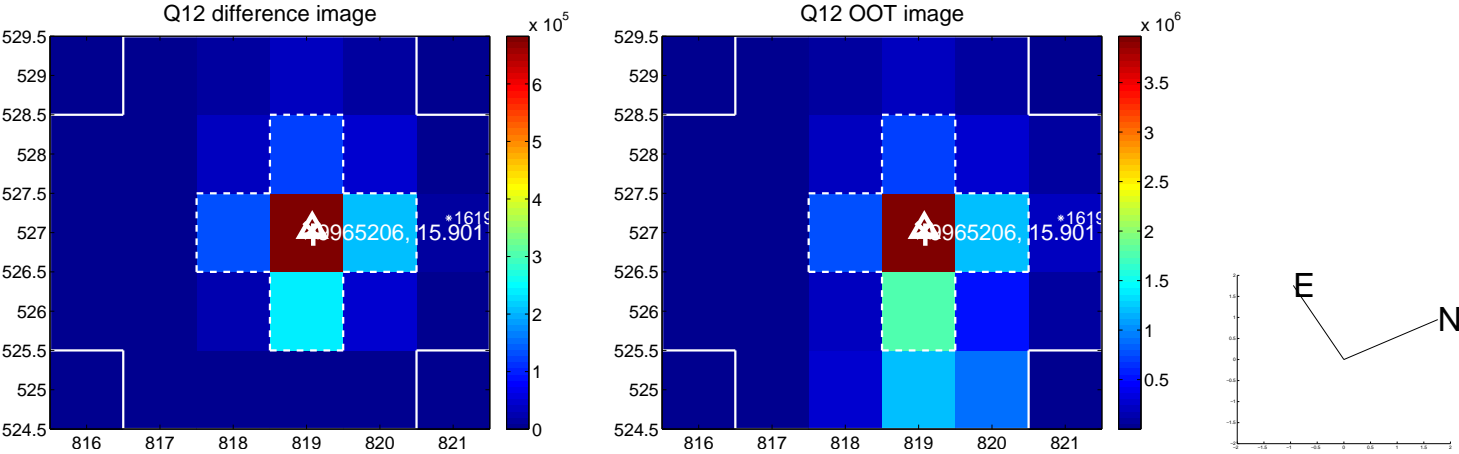
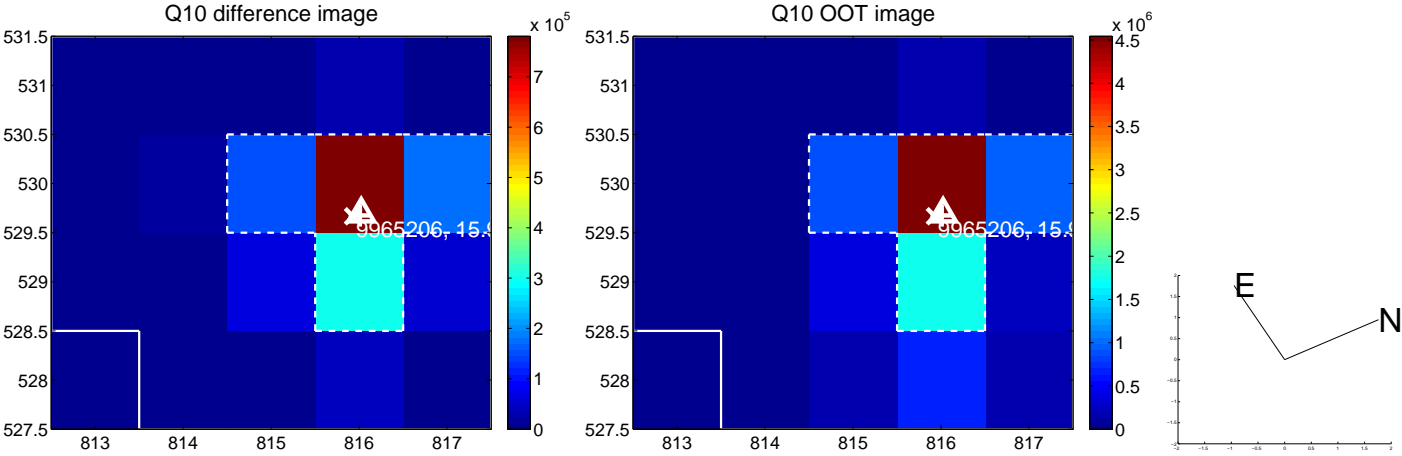
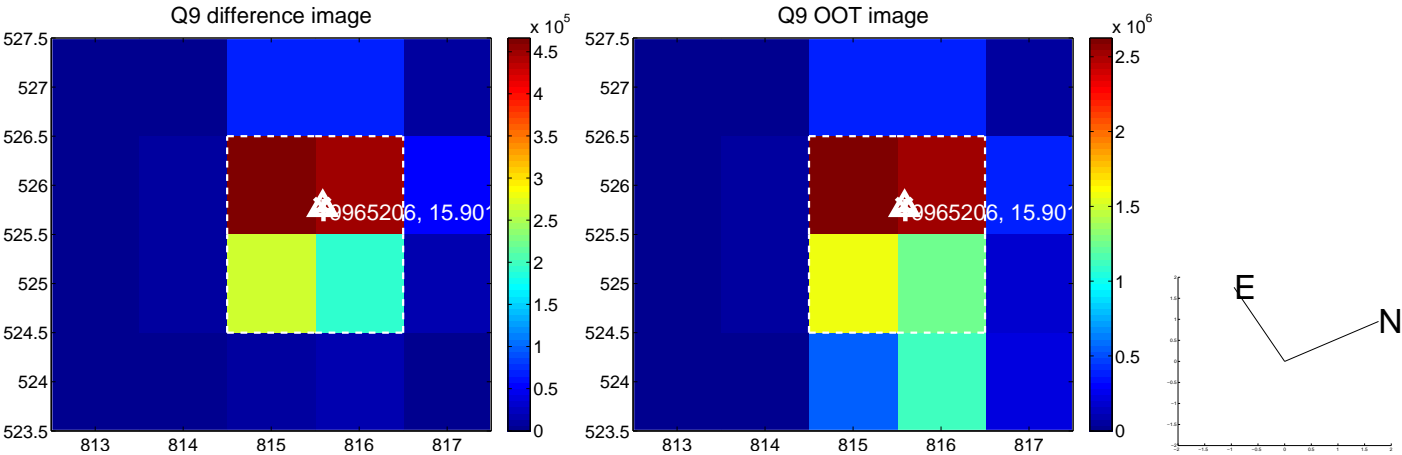
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



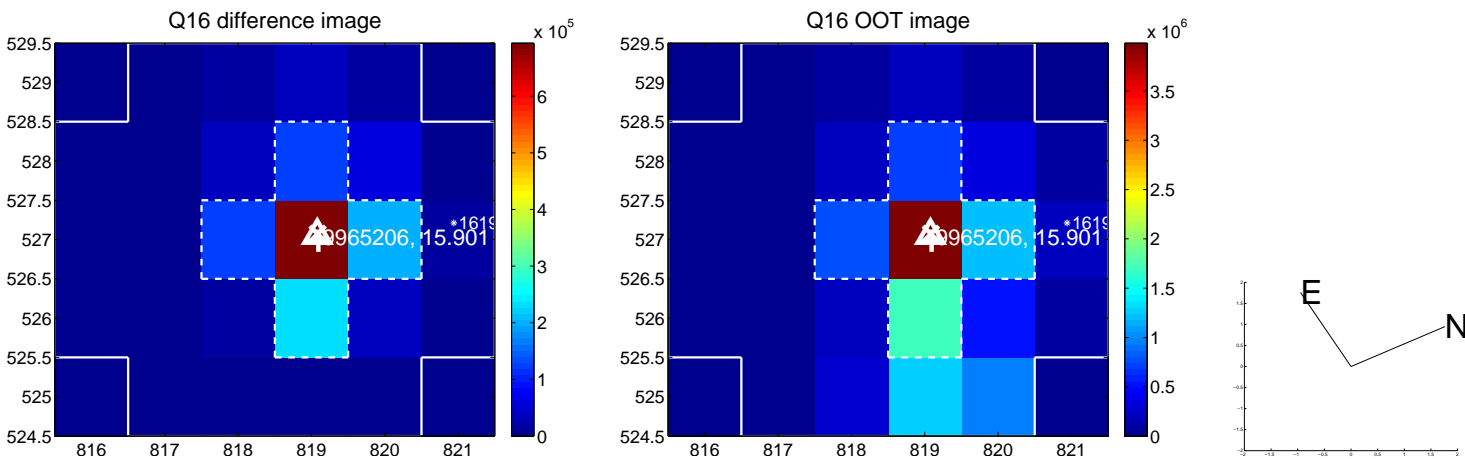
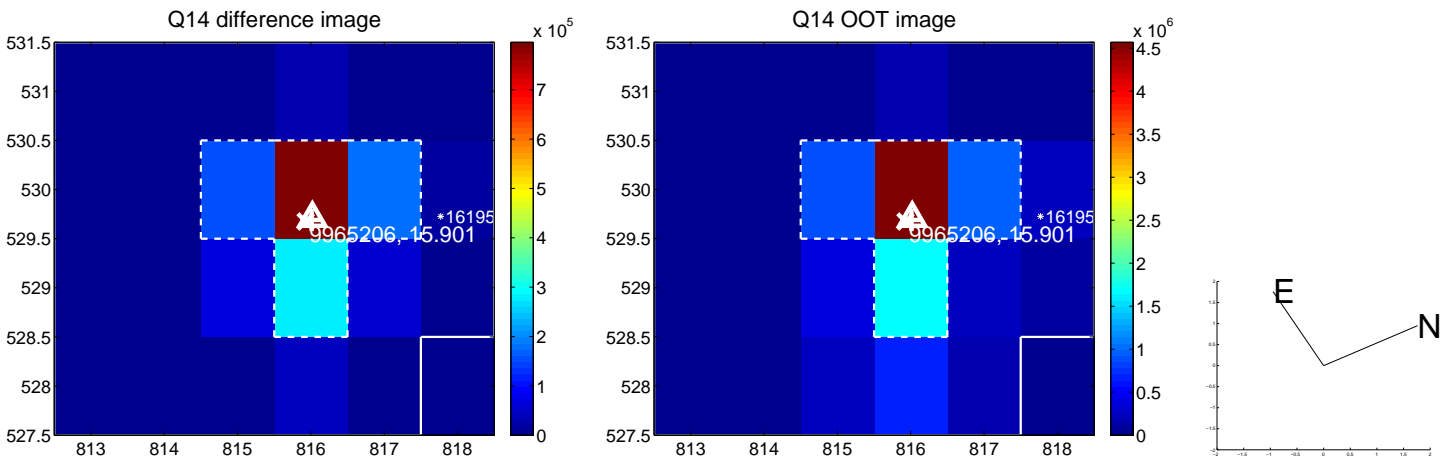
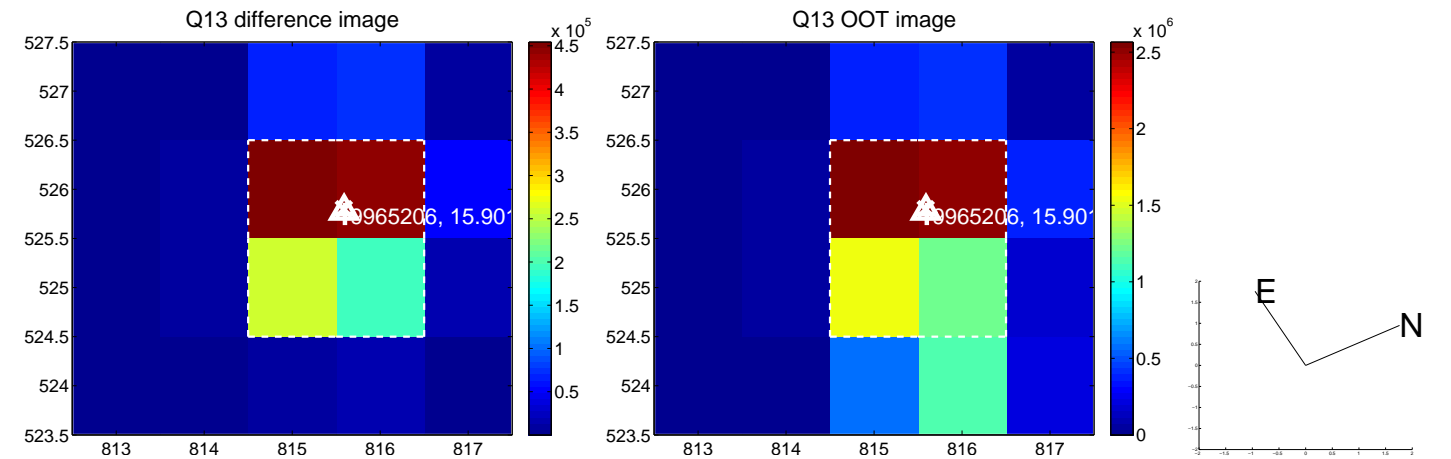
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



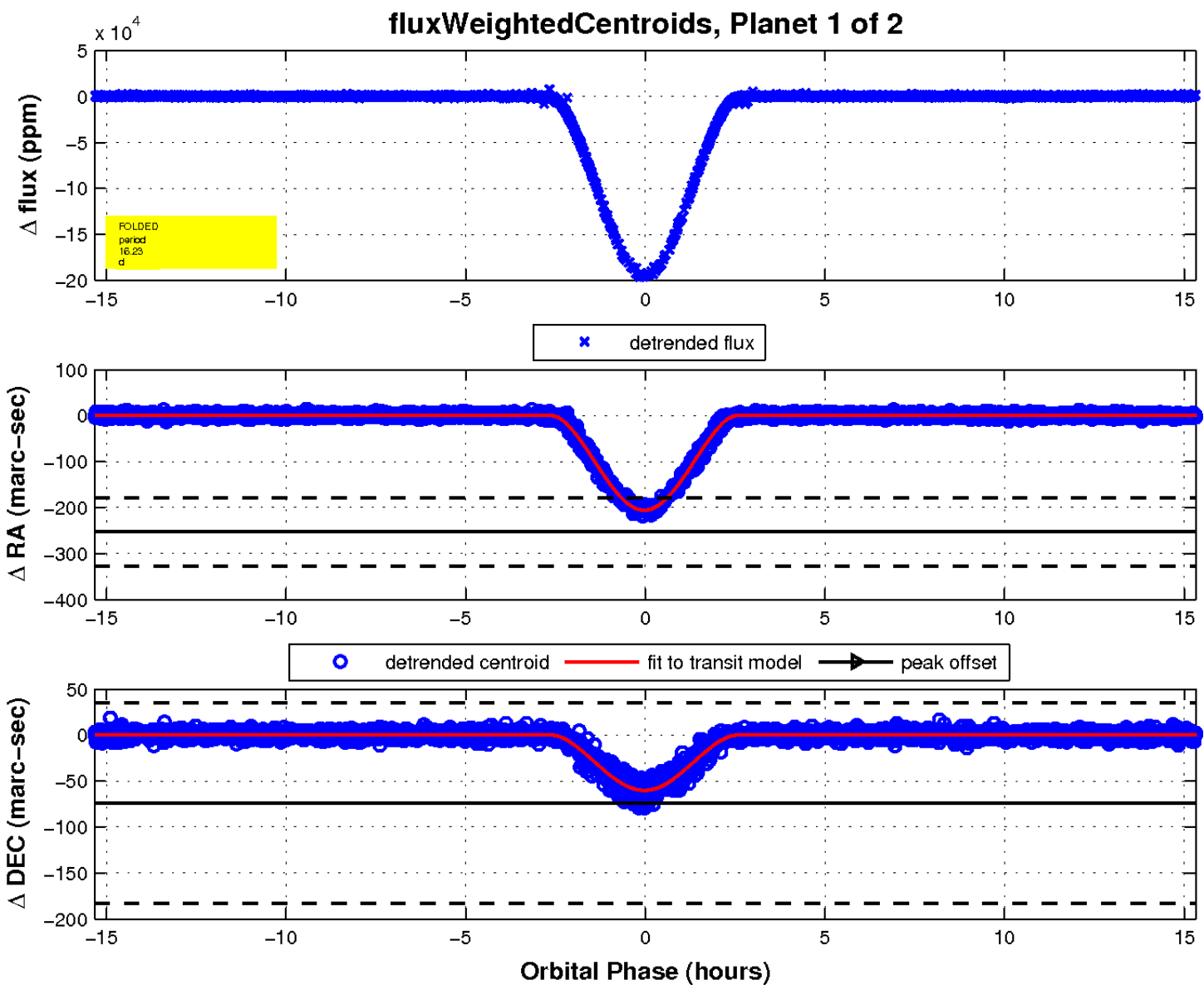
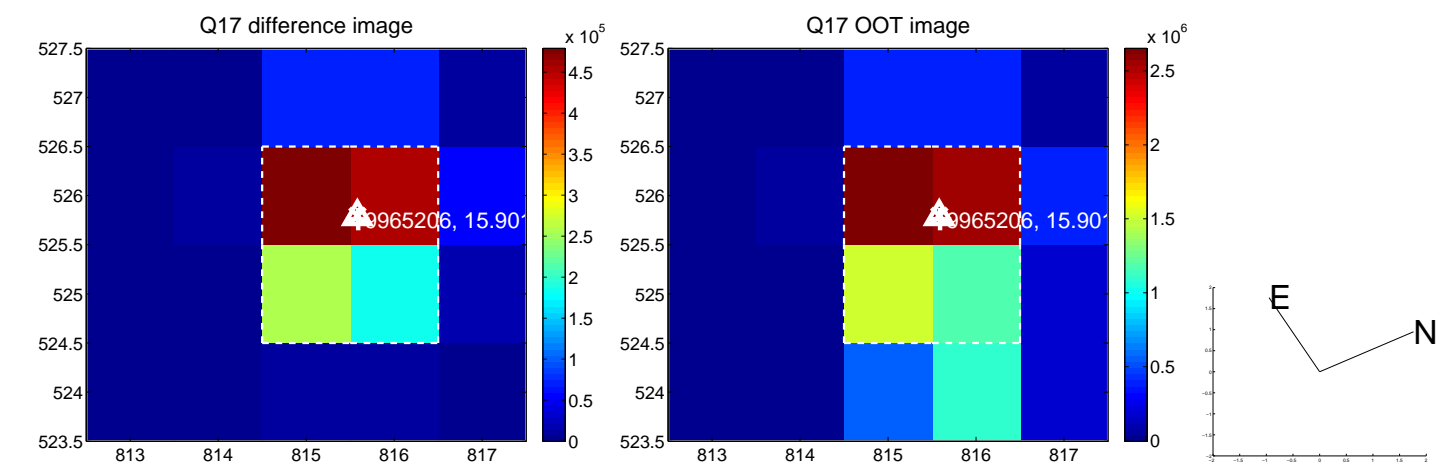
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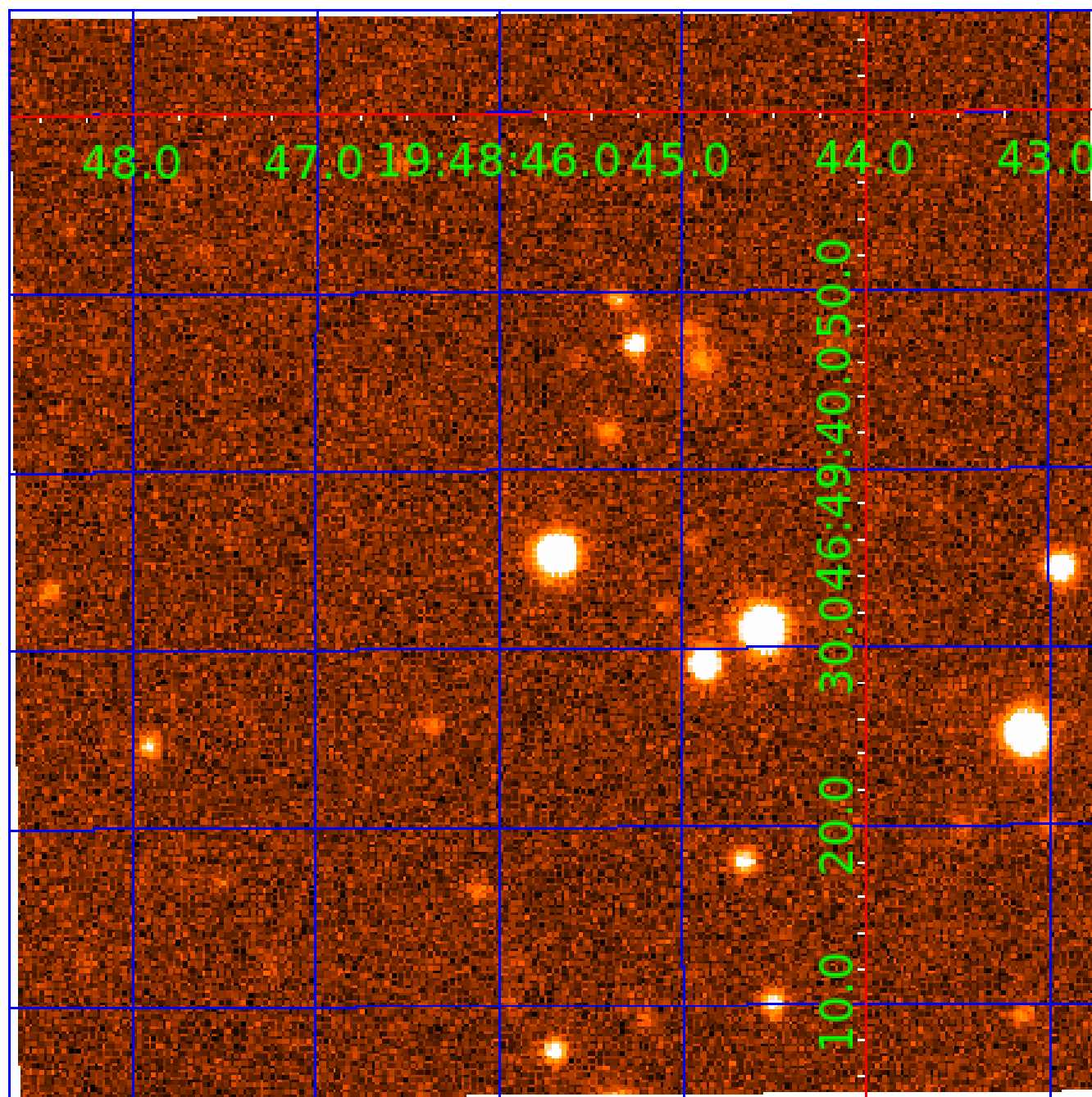


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009965206

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})
009965206-01	OBS	3558.01	16.227549	136.639701	191396.9	5.110	3094.6	2319.4	0.80	5297	43.55	30.59
009965206-02	OBS	No	16.227548	145.005847	167369.5	5.493	2852.3	2243.1	0.80	5297	48.77	30.59

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009965206-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009965206-02	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.

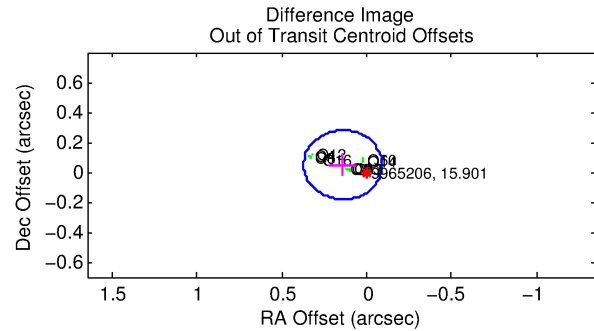
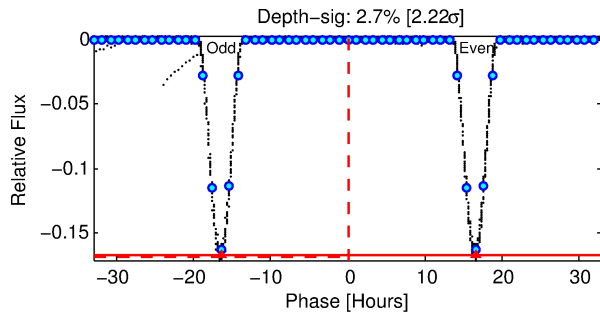
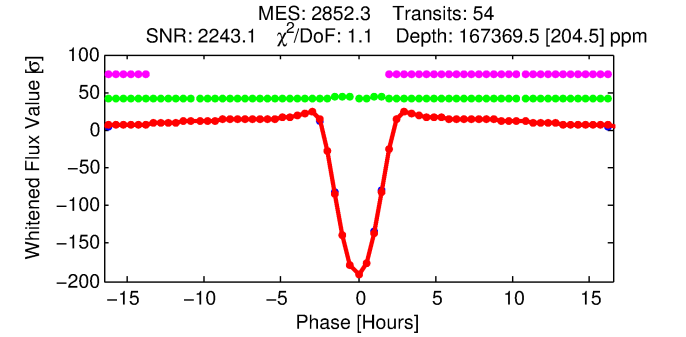
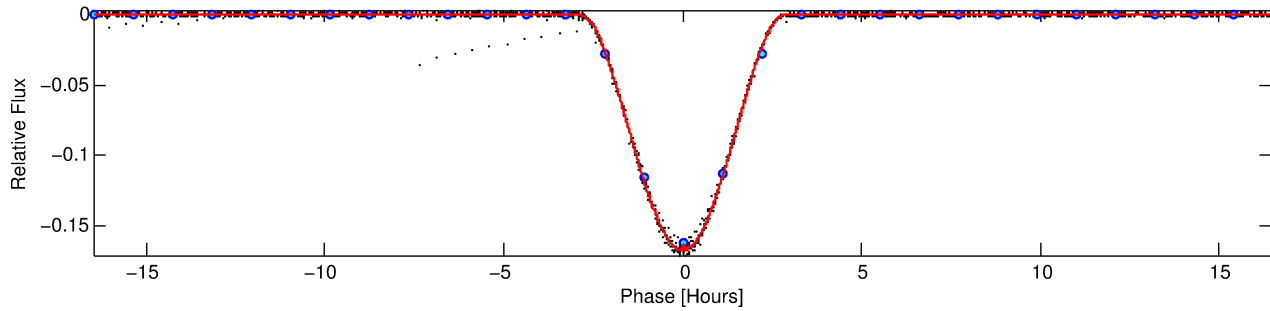
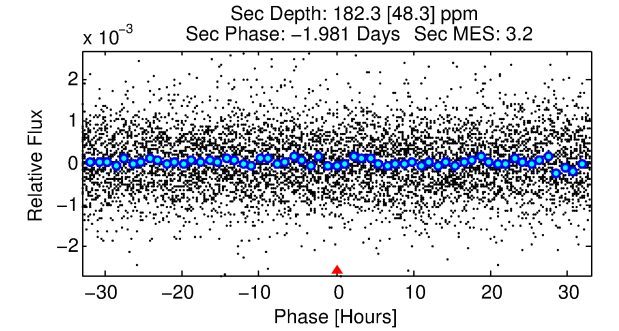
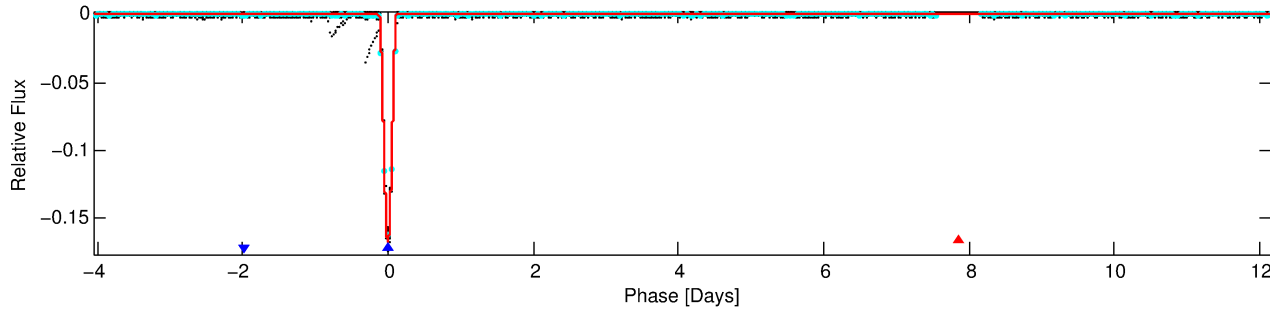
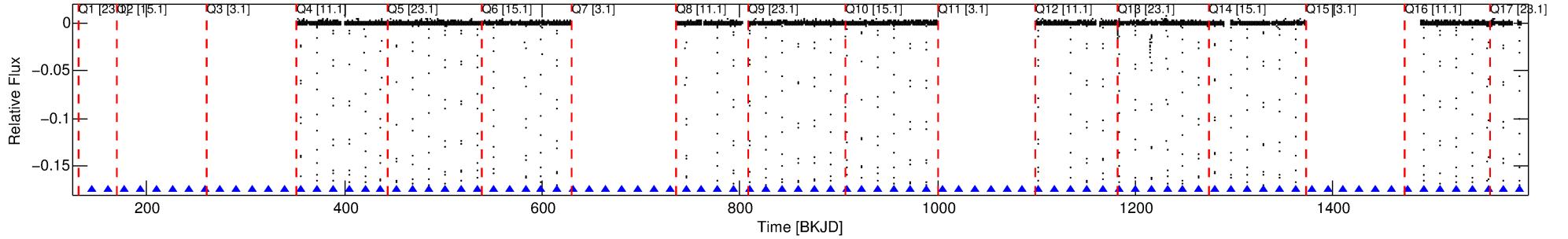
Ephemeris Match Information For 009965206-02

No Significant Match Found

DV One-Page Summary

KIC: 9965206 Candidate: 2 of 2 Period: 16.228 d
KOI: K03558 Corr: No Ephemeris Match

Kp: 15.90 R*: 0.80 Rs Teff: 5297.0 K Logg: 4.59 Fe/H: 0.070



DV Fit Results:

Period = 16.22755 [0.00000] d
Epoch = 145.0058 [0.0001] BKJD
Rp/R* = 0.5622 [0.0371]
a/R* = 28.87 [0.25]
b = 0.90 [0.05]
Seff = 30.59 [8.00]
Teq = 600 [39] K
Rp = 48.77 [9.11] Re
a = 0.1207 [0.0179] AU
Ag = 0.61 [0.23] [-1.71σ]
Teffp = 821 [68] K [2.83σ]

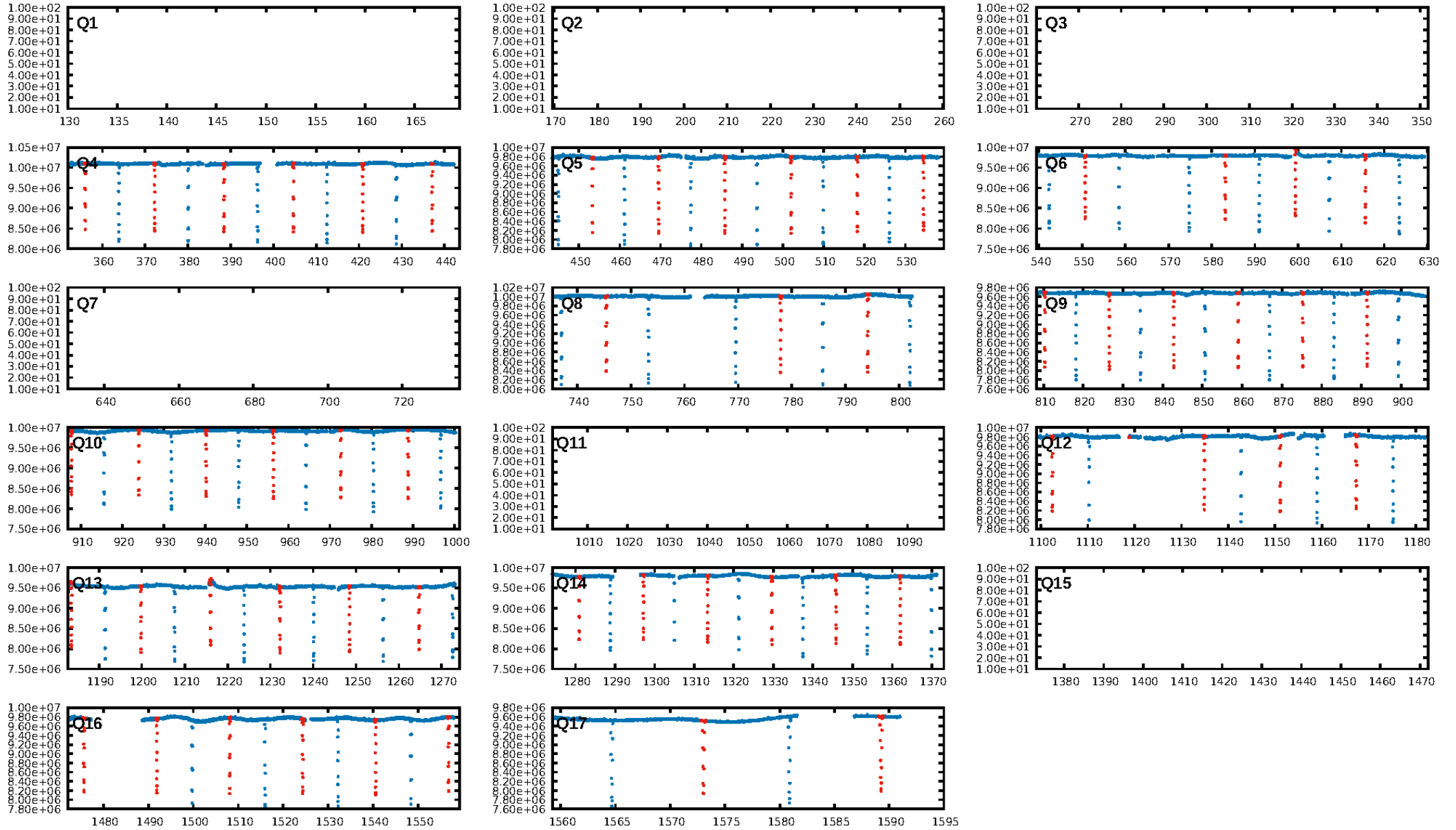
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [52/52]
GhostDiagnostic-chr: 6.404
Centroid-sig: 0.0%
Centroid-so: 0.271 arcsec [65.58σ]
OotOffset-rm: 0.151 arcsec [1.96σ]
KicOffset-rm: 0.041 arcsec [0.60σ]
OotOffset-st: 3/0/4/4 [11]
KicOffset-st: 3/0/4/4 [11]
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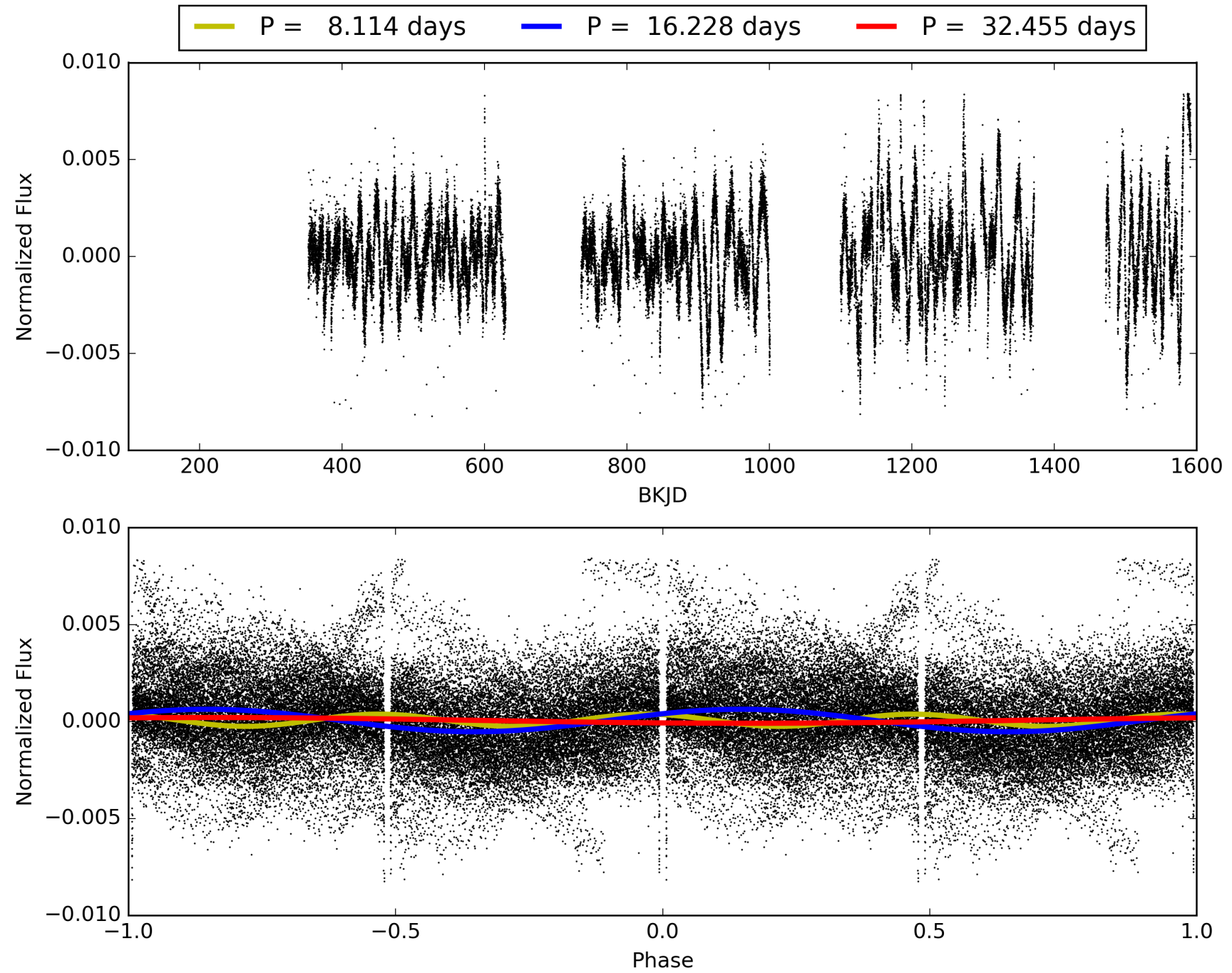
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009965206-02, PDC Light Curves

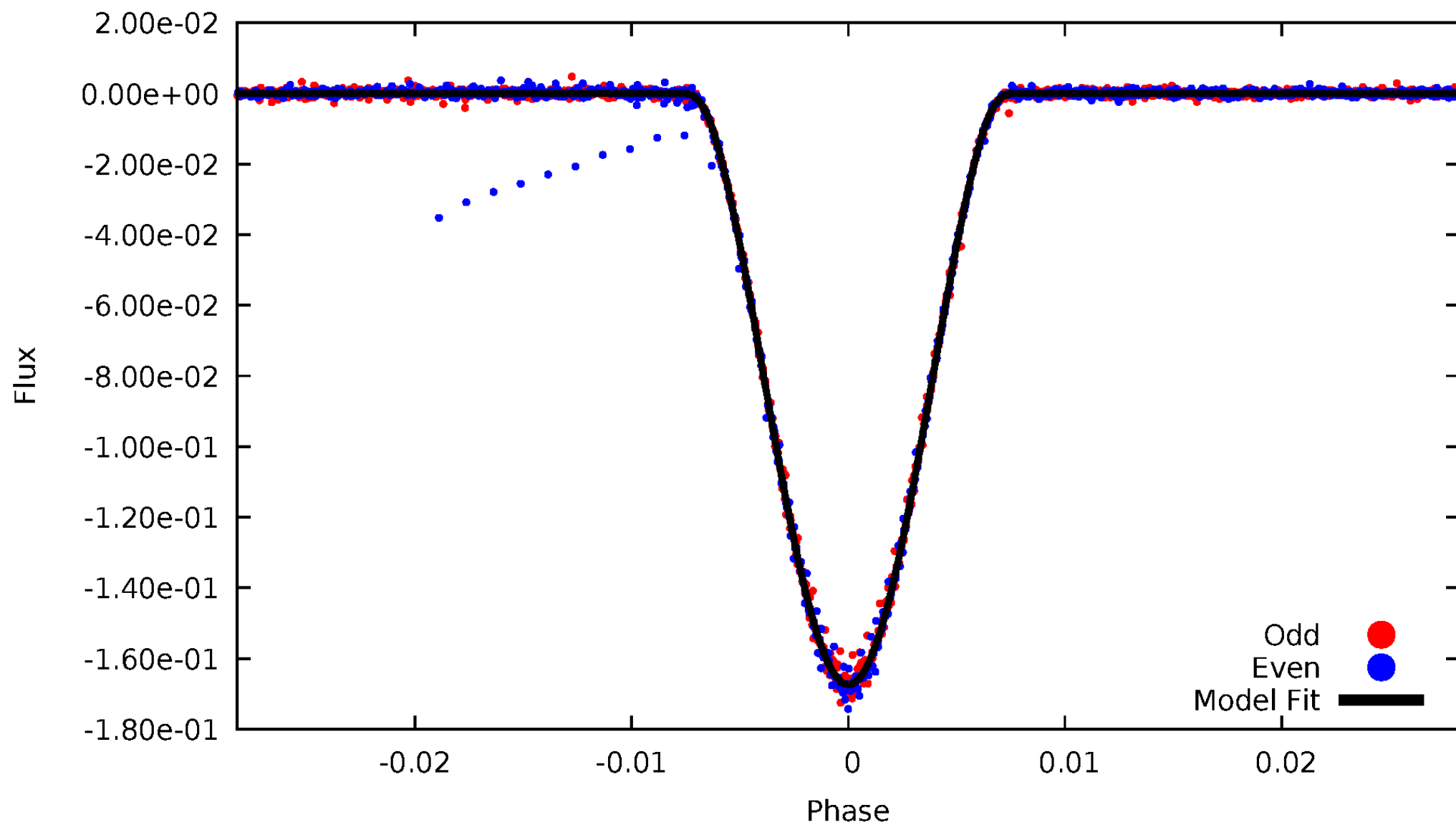


TCE 009965206-02



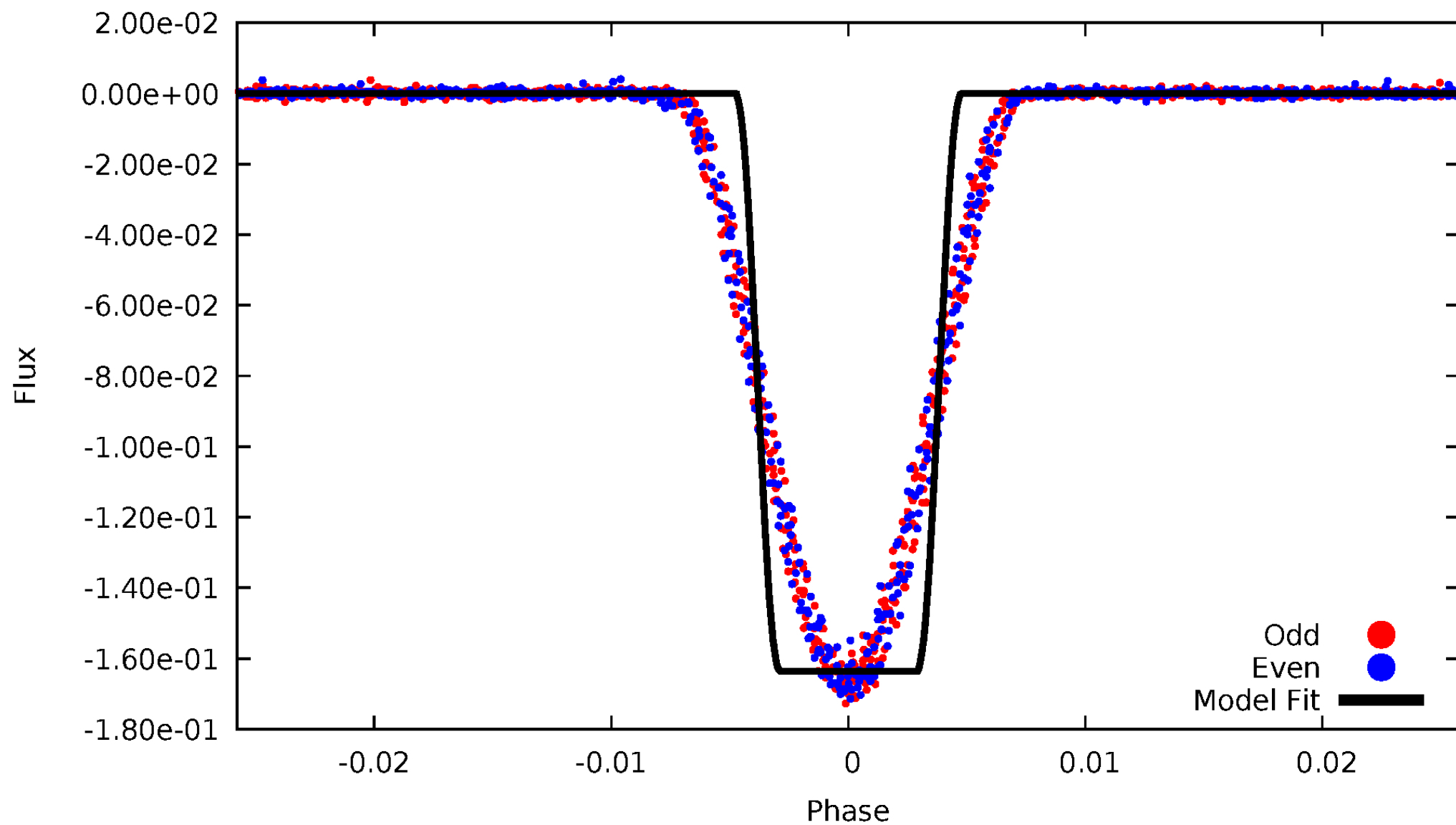
DV Odd/Even

TCE 009965206-02



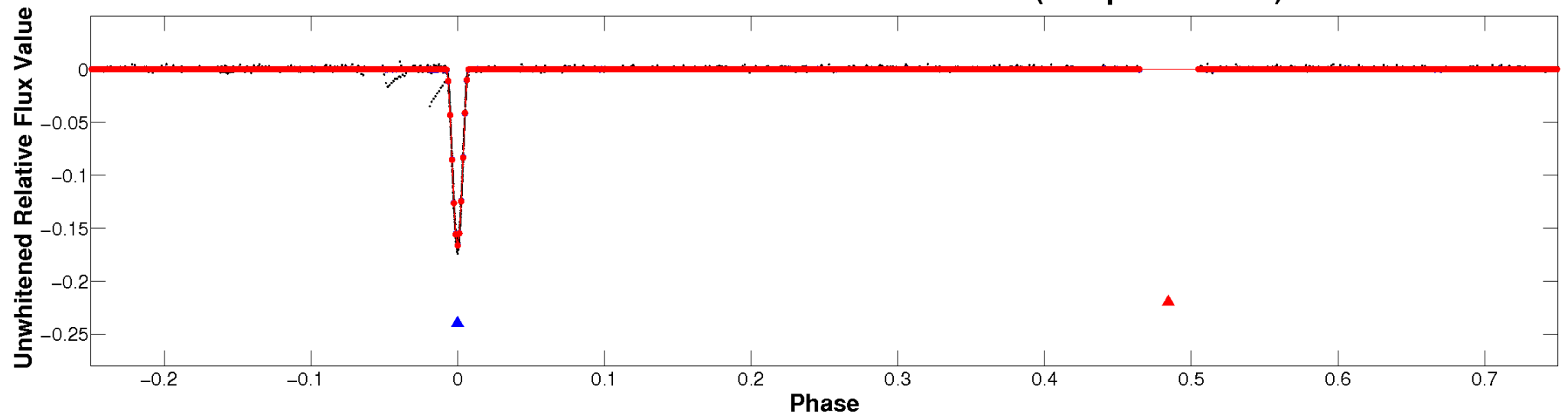
ALT Odd/Even

TCE 009965206-02

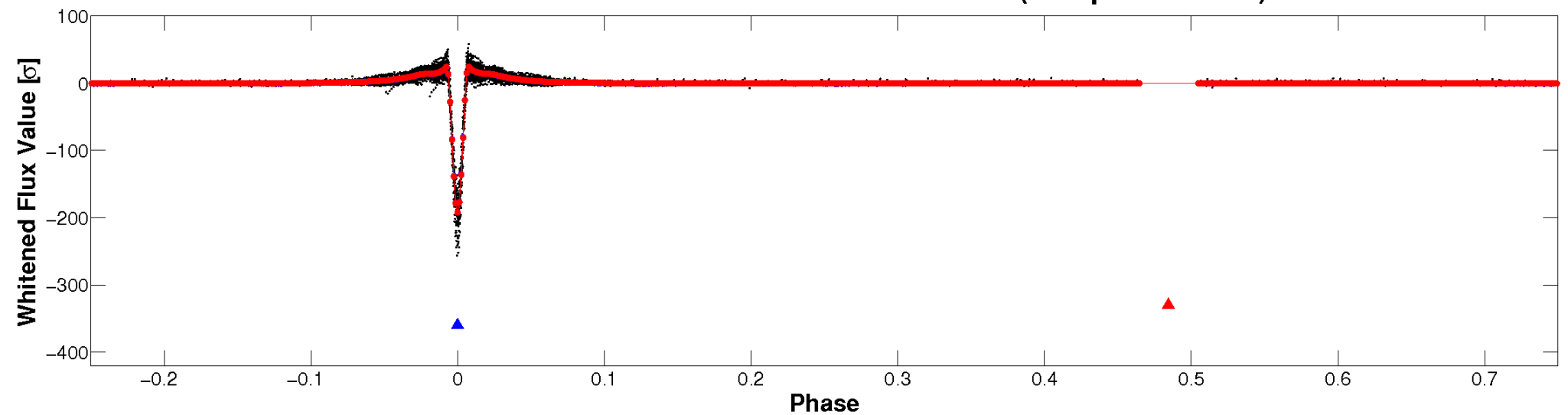


Non-Whitened Vs. Whitened Light Curve

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

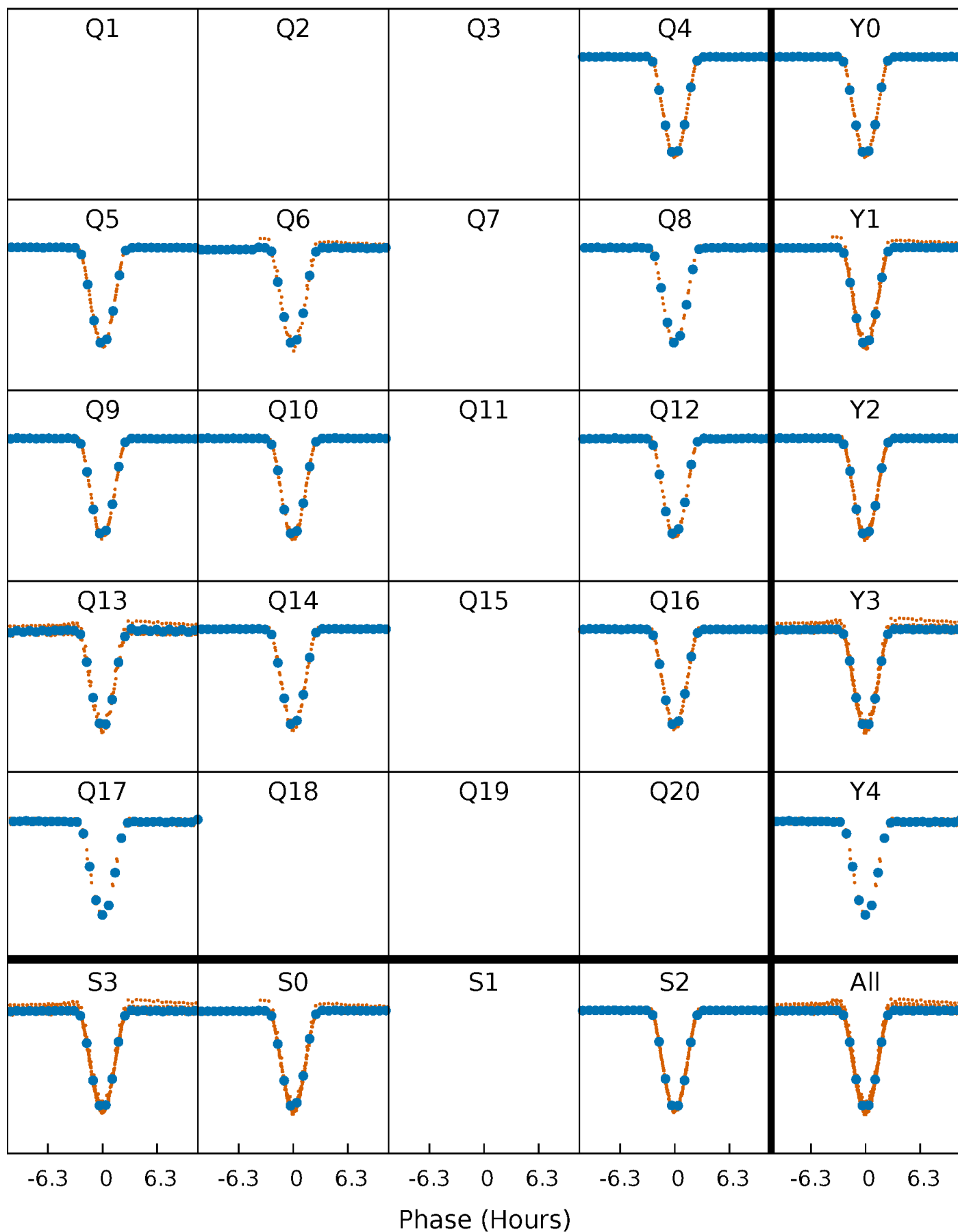


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



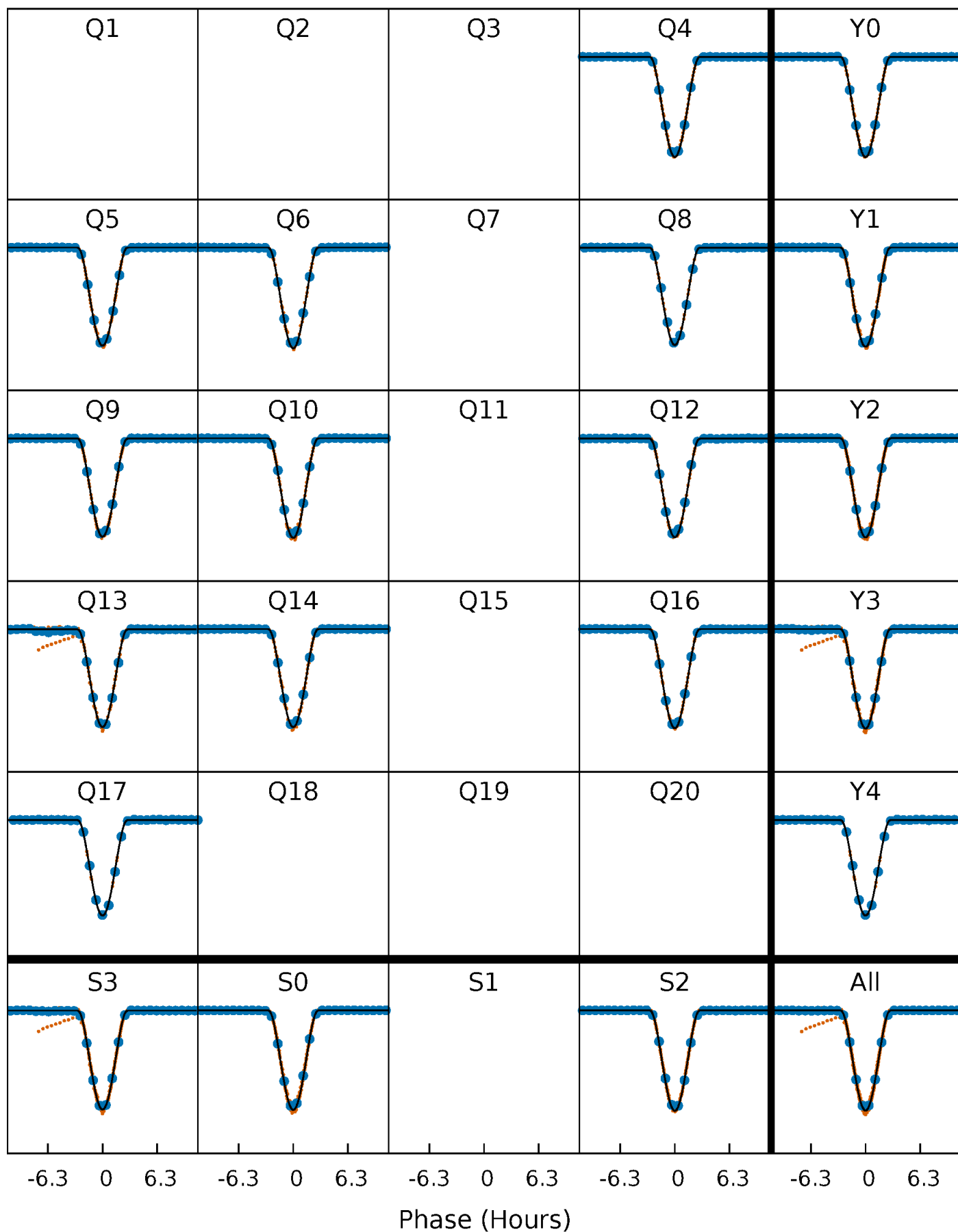
PDC Quarter-Phased Transit Curves

TCE 009965206-02 P= 16.227548 Days $T_0=145.005847$ (BKJD)



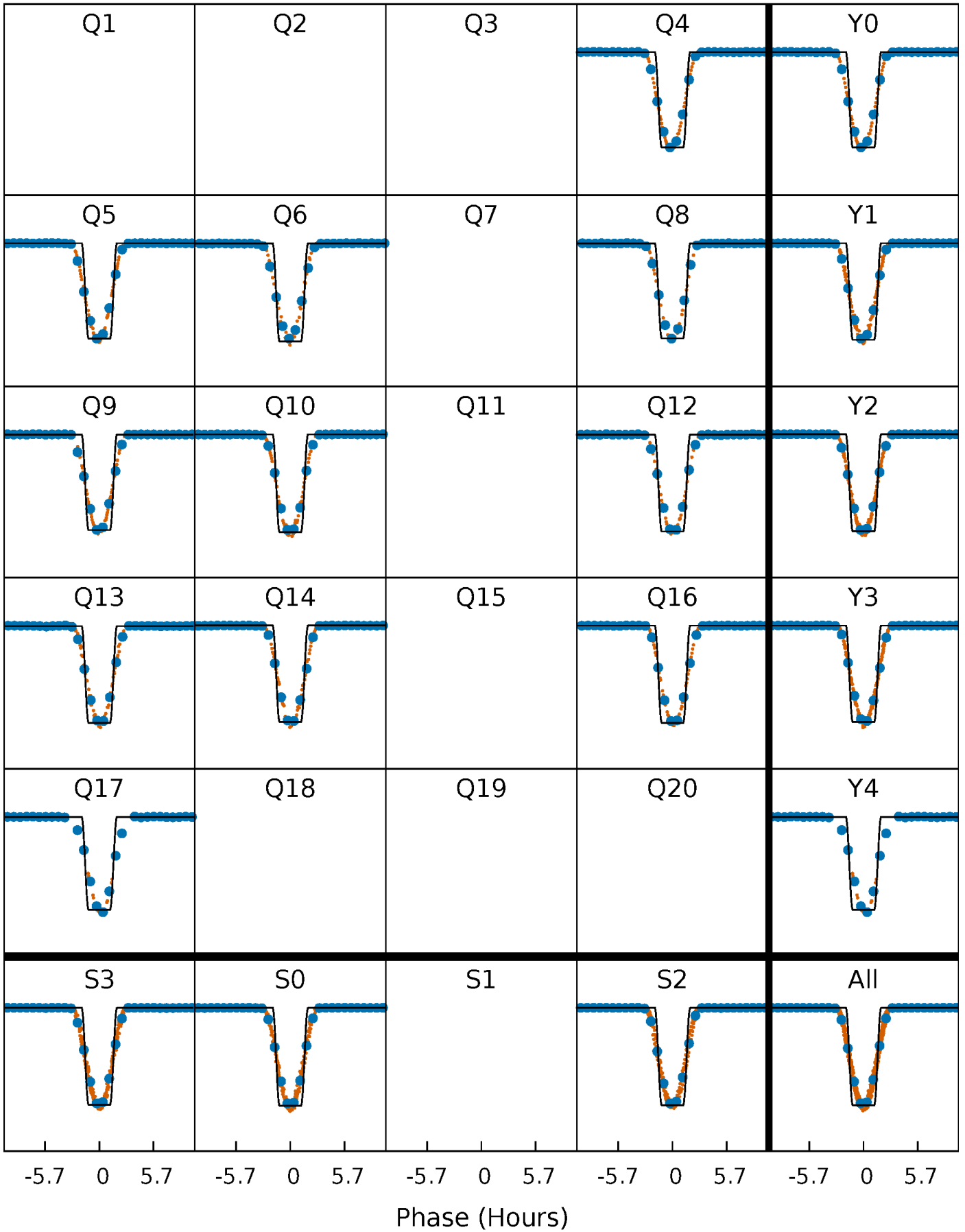
DV Quarter-Phased Transit Curves

TCE 009965206-02 P= 16.227548 Days $T_0=145.005847$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

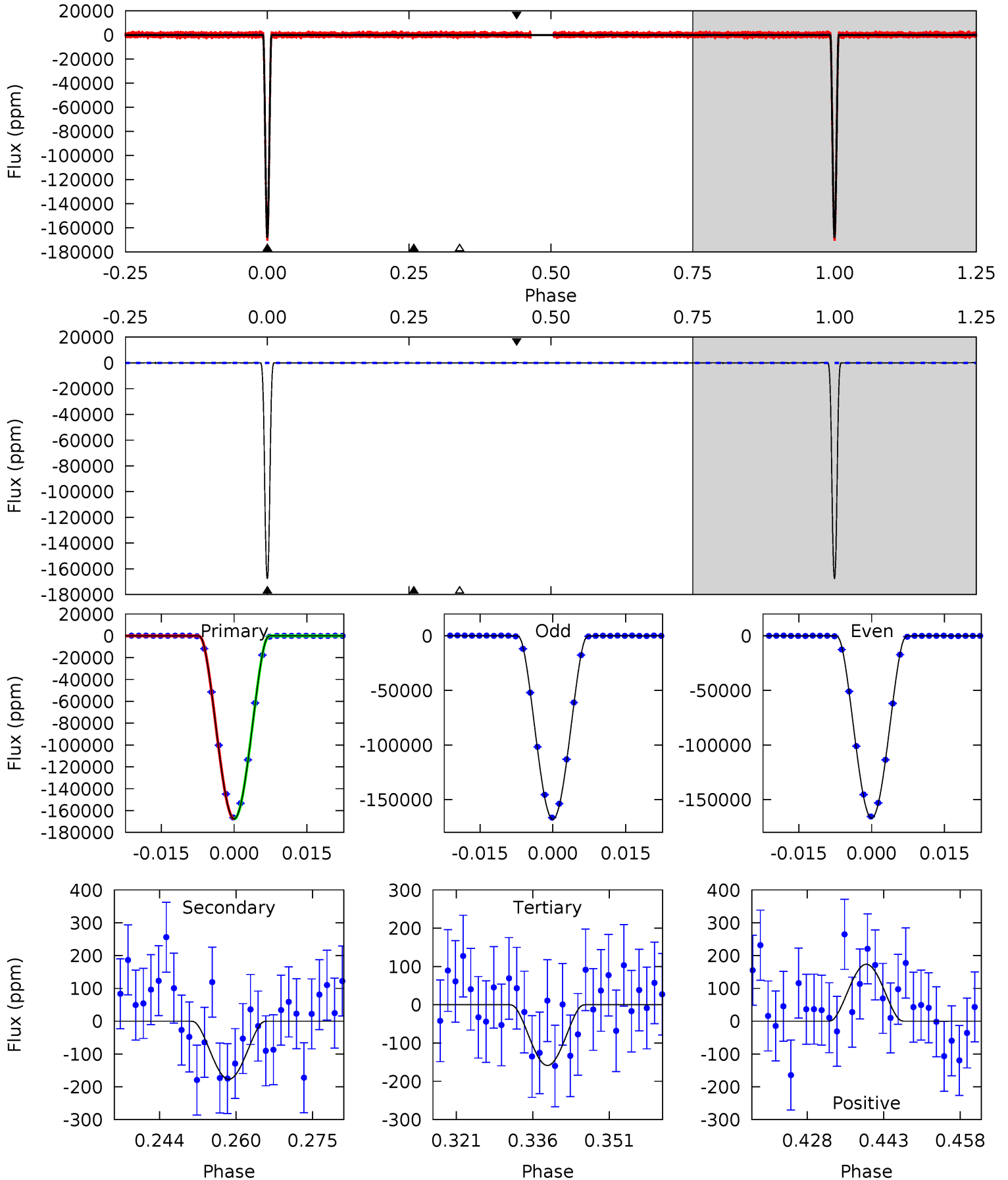
TCE 009965206-02 P= 16.227387 Days $T_0=145.014047$ (BKJD)



DV Model-Shift Uniqueness Test

009965206-02, P = 16.227548 Days, E = 145.005847 Days

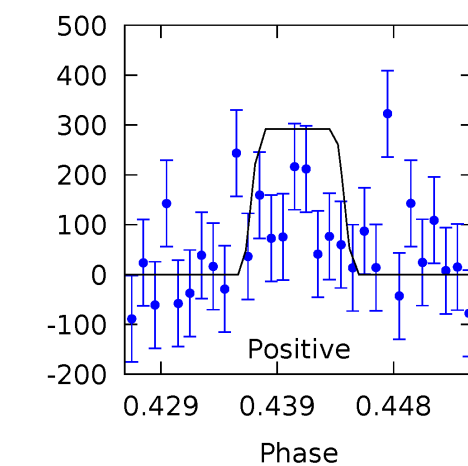
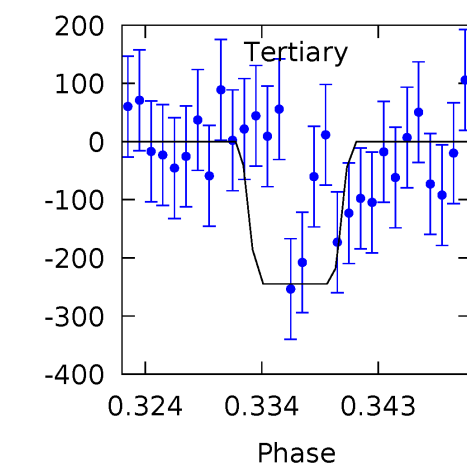
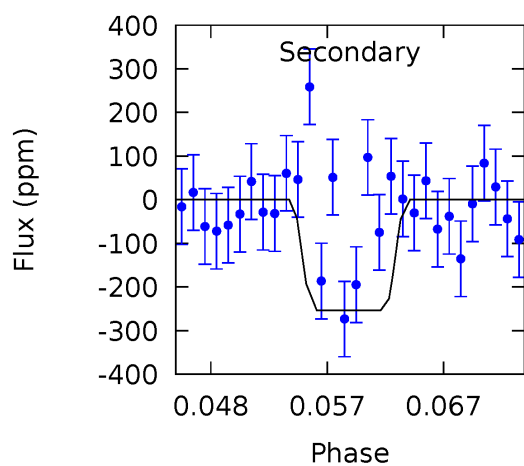
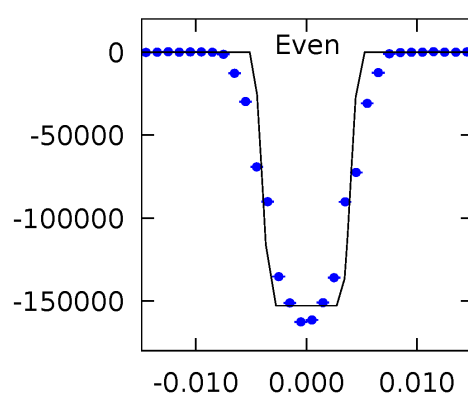
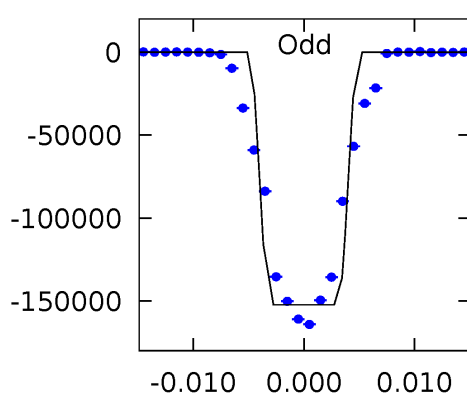
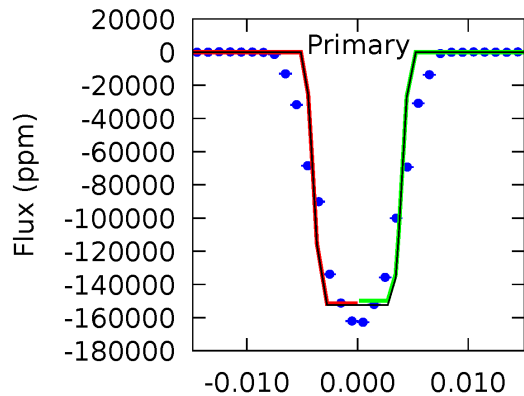
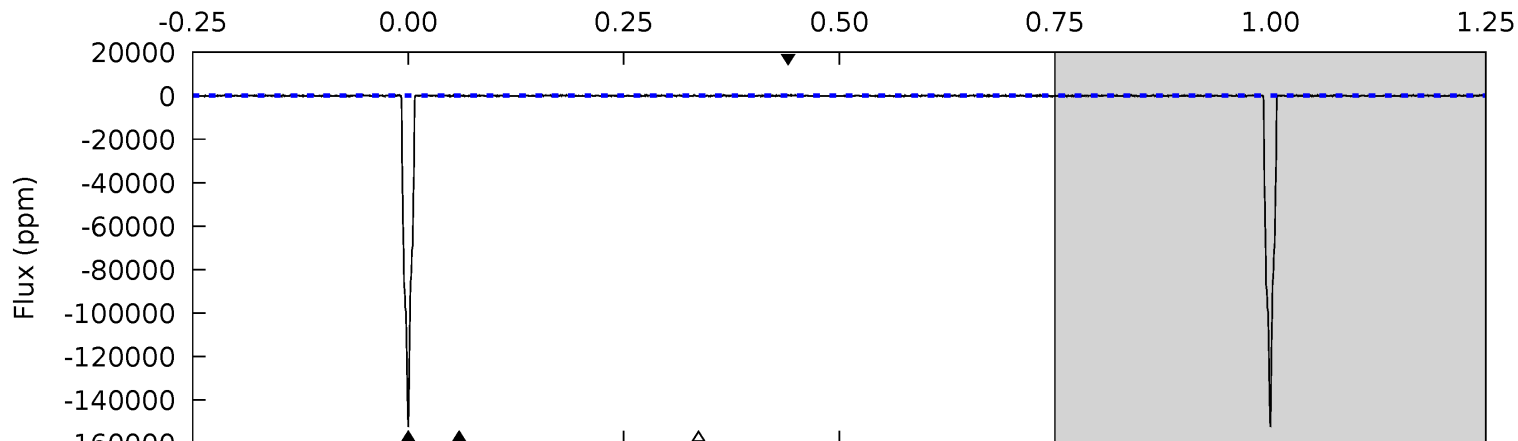
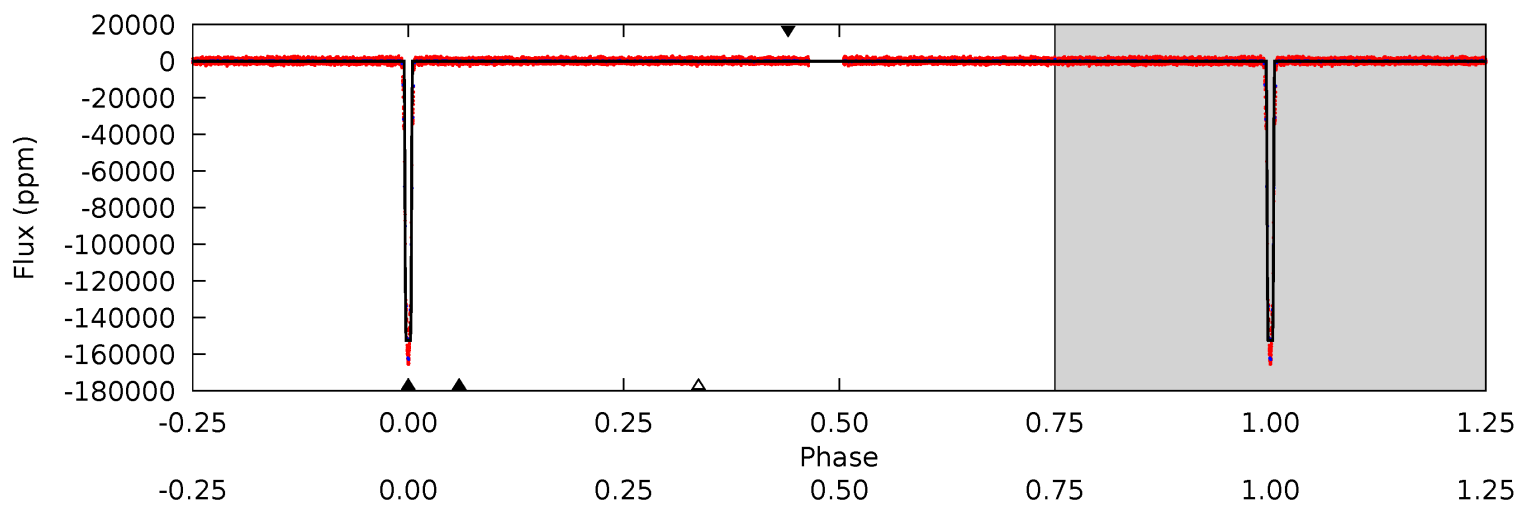
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5693	6.02	5.39	5.89	4.94	2.43	2.07	5688	5687	0.63	0.13	18.2	1.00	0.00	0



Alt Model-Shift Uniqueness Test

009965206-02, P = 16.227387 Days, E = 145.014047 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2102	3.50	3.37	4.03	5.04	2.59	1.05	2098	2098	0.13	-0.53	3.86	1.00	0.00	11.8



Stellar Parameters For KIC 009965206

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5297^{+175}_{-191}	$4.587^{+0.030}_{-0.120}$	$0.070^{+0.300}_{-0.300}$	$0.795^{+0.139}_{-0.053}$	$0.905^{+0.066}_{-0.099}$	$2.536^{+0.389}_{-0.880}$
	+3%/-4%	+1%/-3%	+429%/-429%	+17%/-7%	+7%/-11%	+15%/-35%
Source	KIC0	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 009965206-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-177 ± 29	$50.10^{+5.52}_{-4.27}$	849^{+43}_{-33}	1708^{+71}_{-91}	$0.551^{+0.151}_{-0.123}$
Alt.	-254 ± 73	$36.26^{+4.69}_{-4.04}$	853^{+42}_{-36}	1983^{+89}_{-94}	$1.523^{+0.596}_{-0.517}$

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

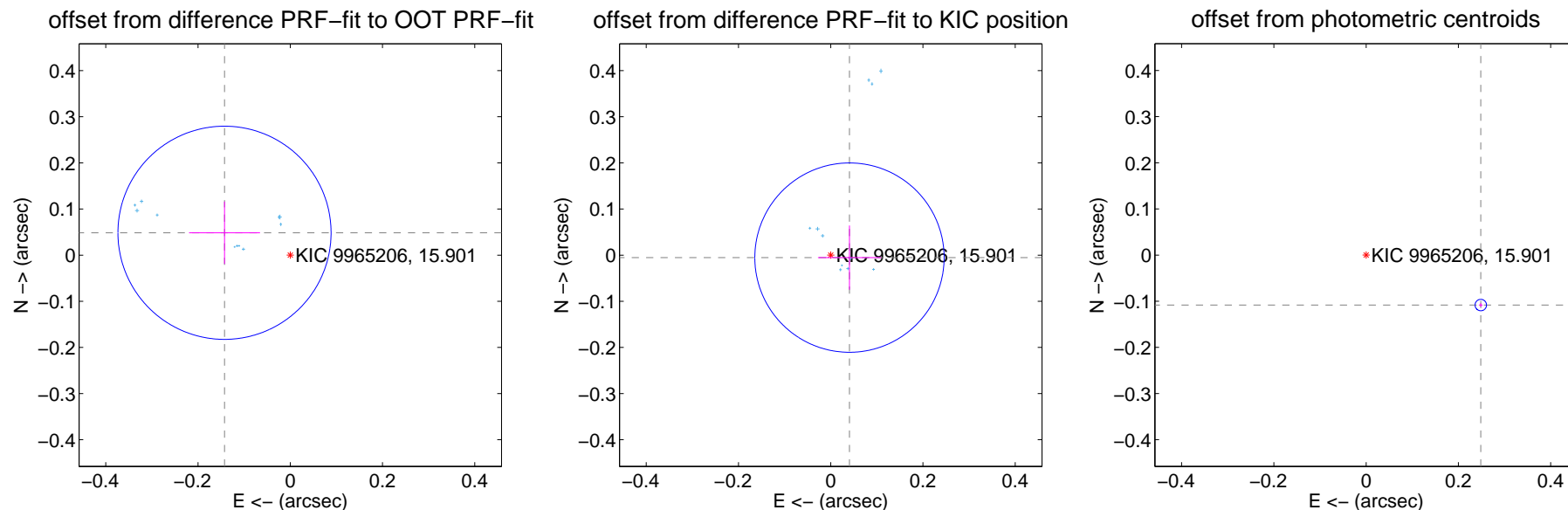
DV Centroid Data

Supplemental centroid analysis for 009965206-02. Kepler magnitude: 15.90. Transit SNR 2243.11

There are 11 quarters with good PRF difference image offsets

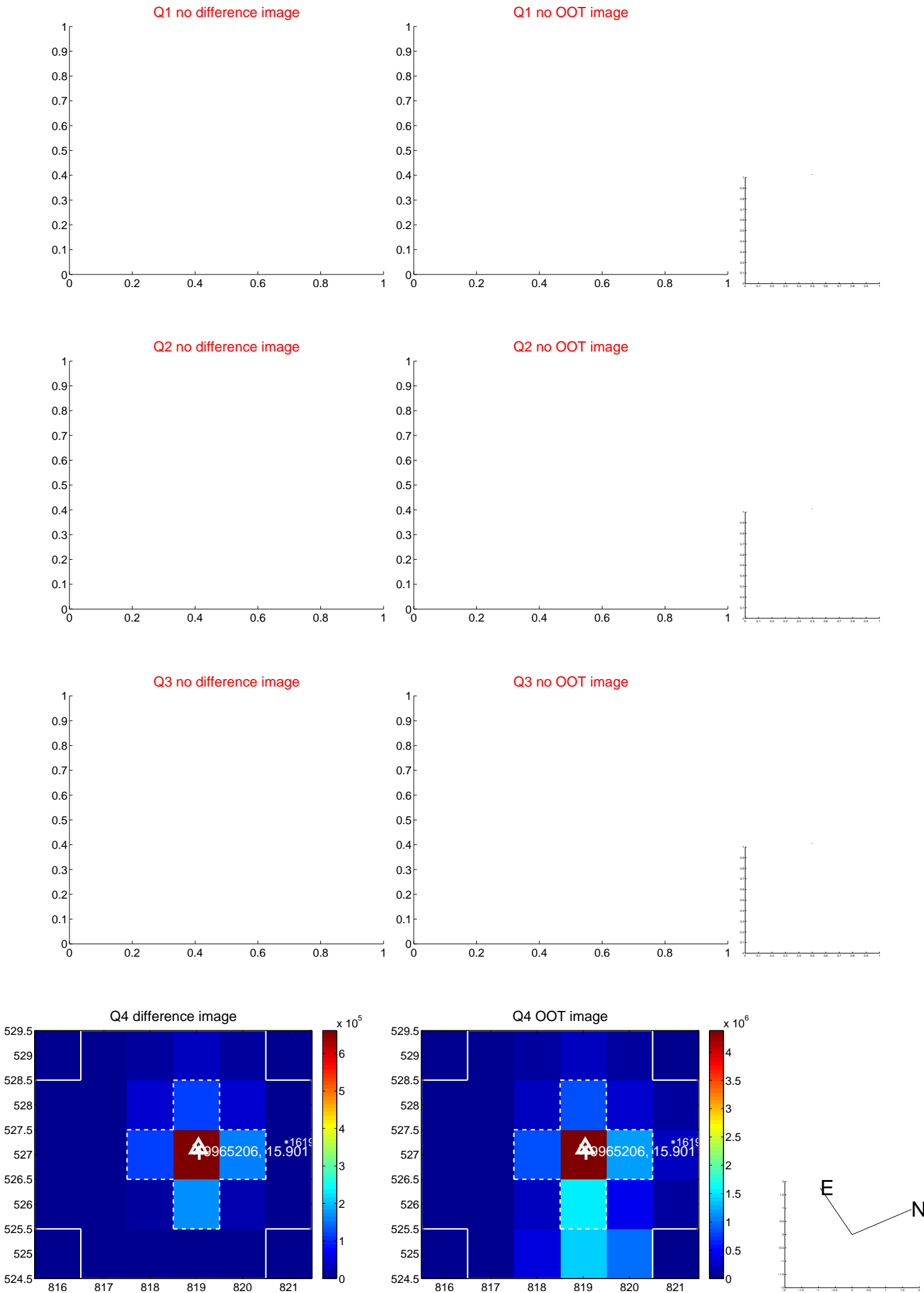
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.151 ± 0.077	1.96	0.143 ± 0.077	0.048 ± 0.068
PRF-fit source offset from KIC position	0.041 ± 0.068	0.60	-0.041 ± 0.068	-0.005 ± 0.070
photometric centroid source offset	0.27 ± 0.00	65.58	-0.25 ± 0.00	-0.11 ± 0.00

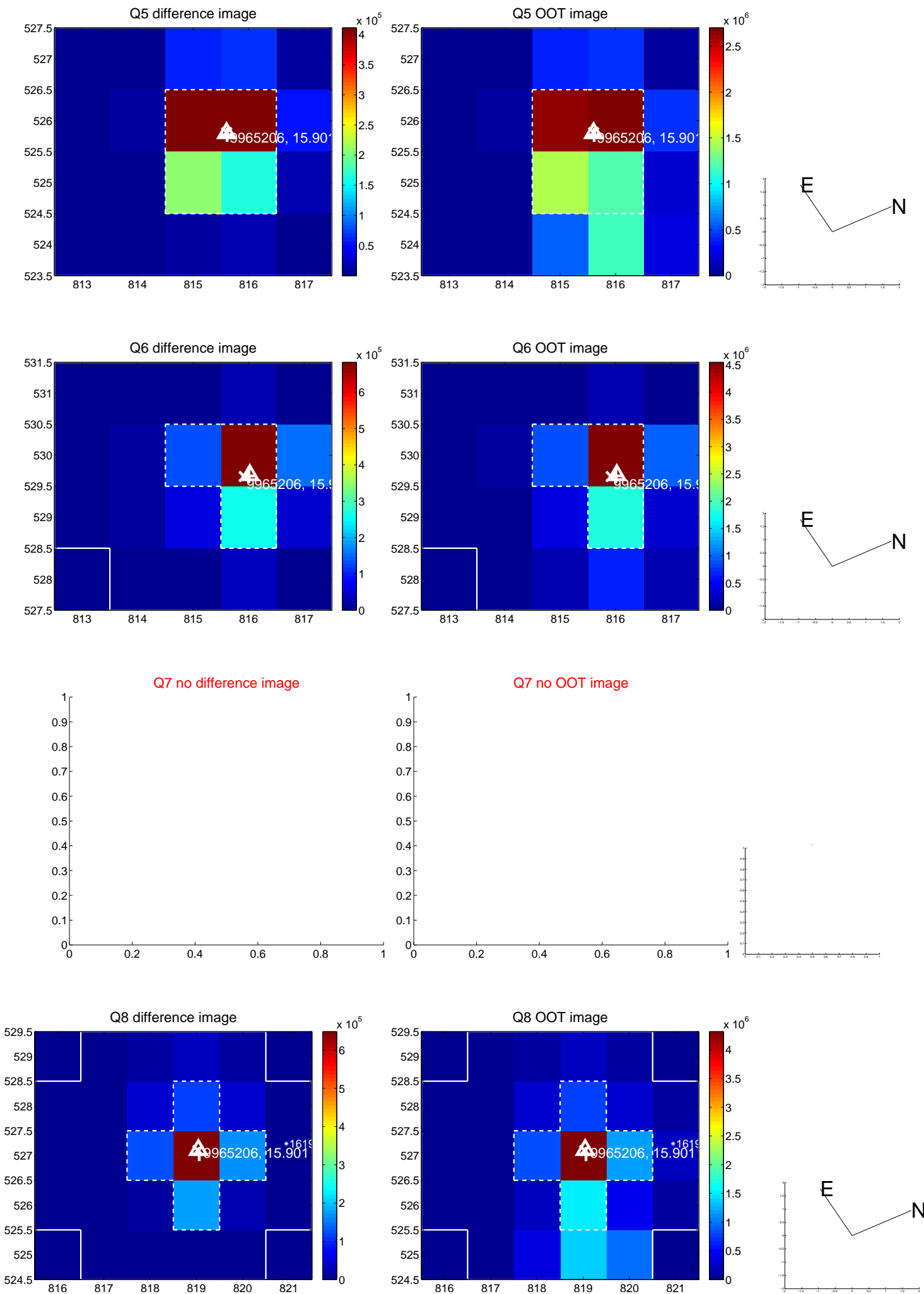


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

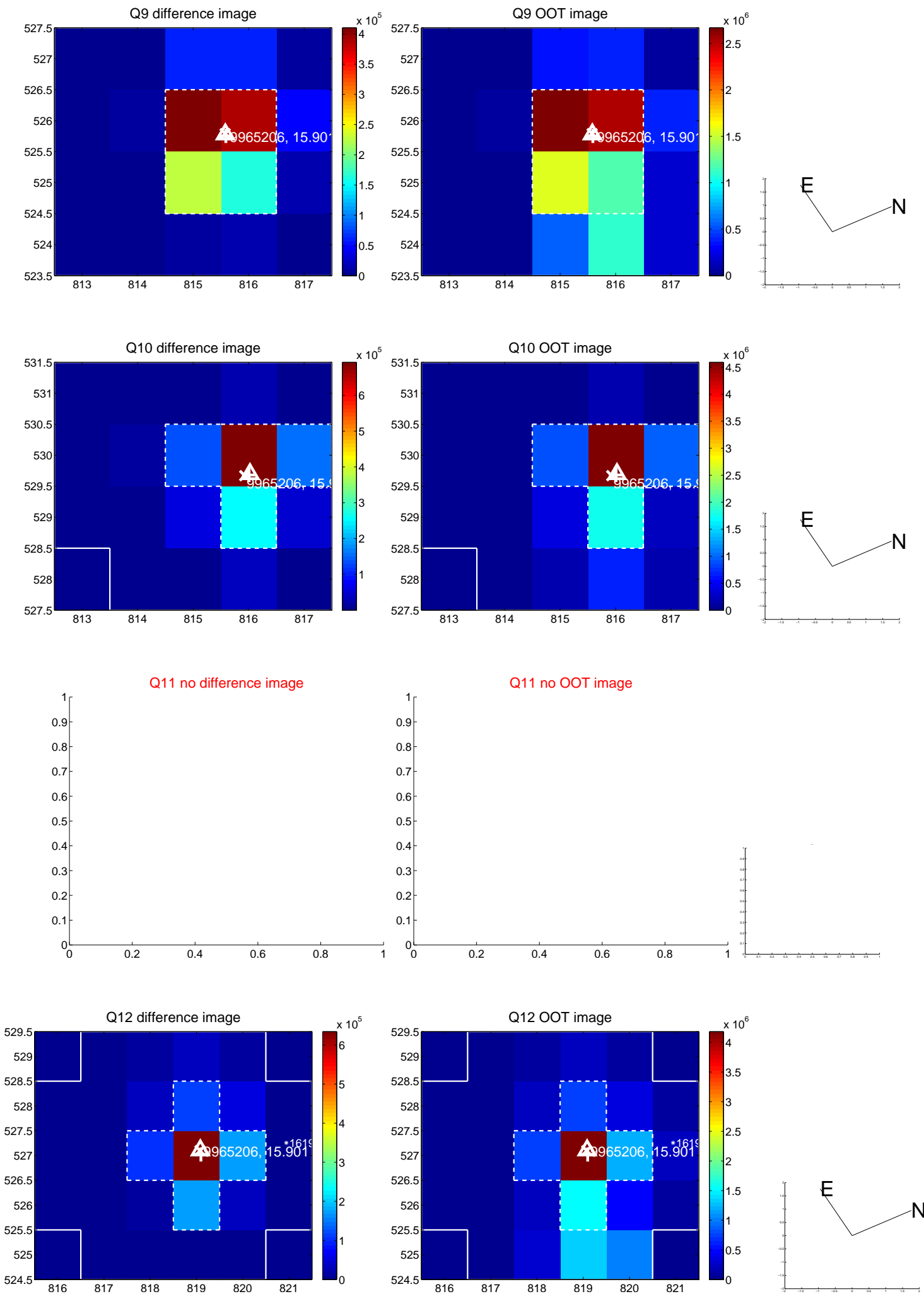
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



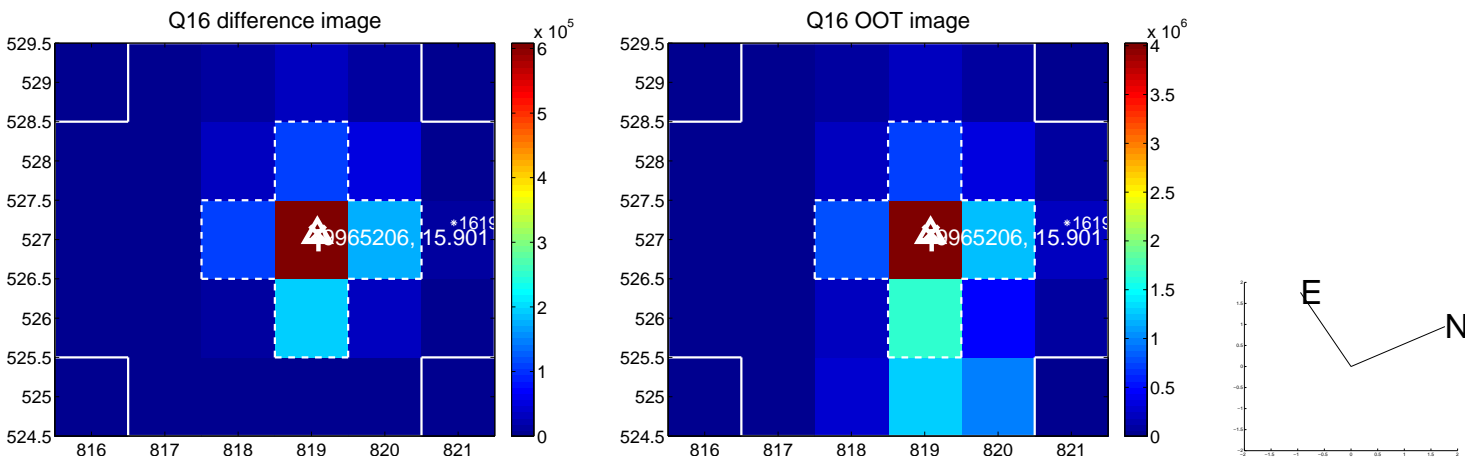
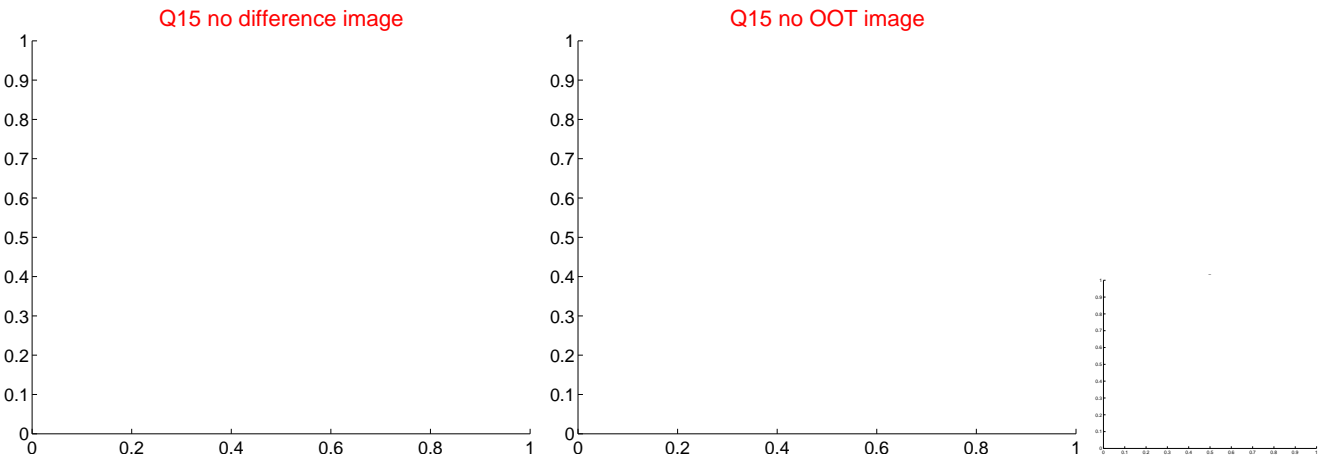
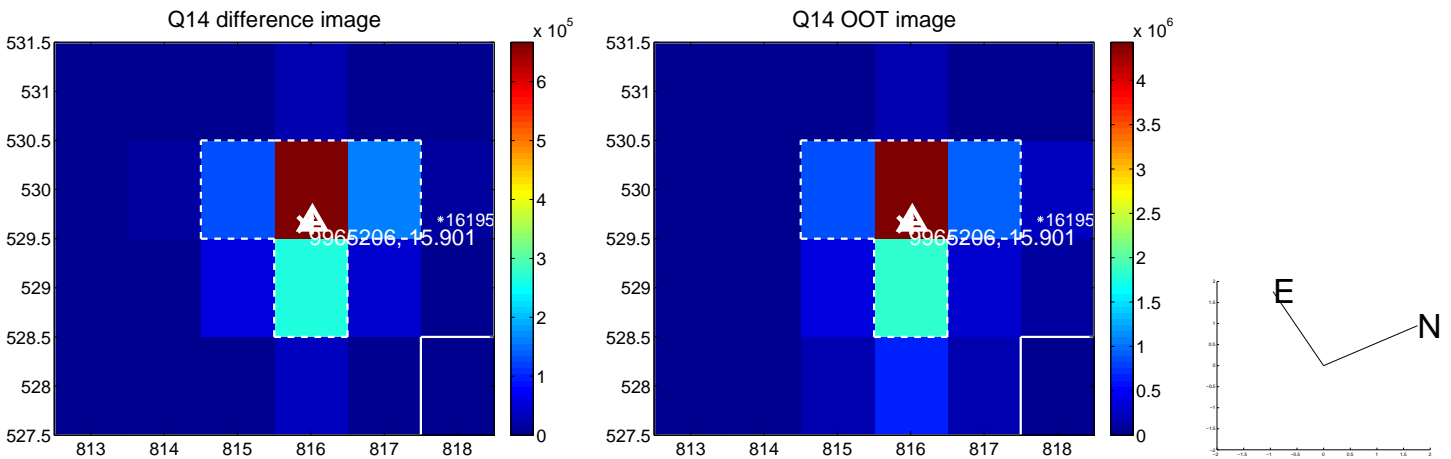
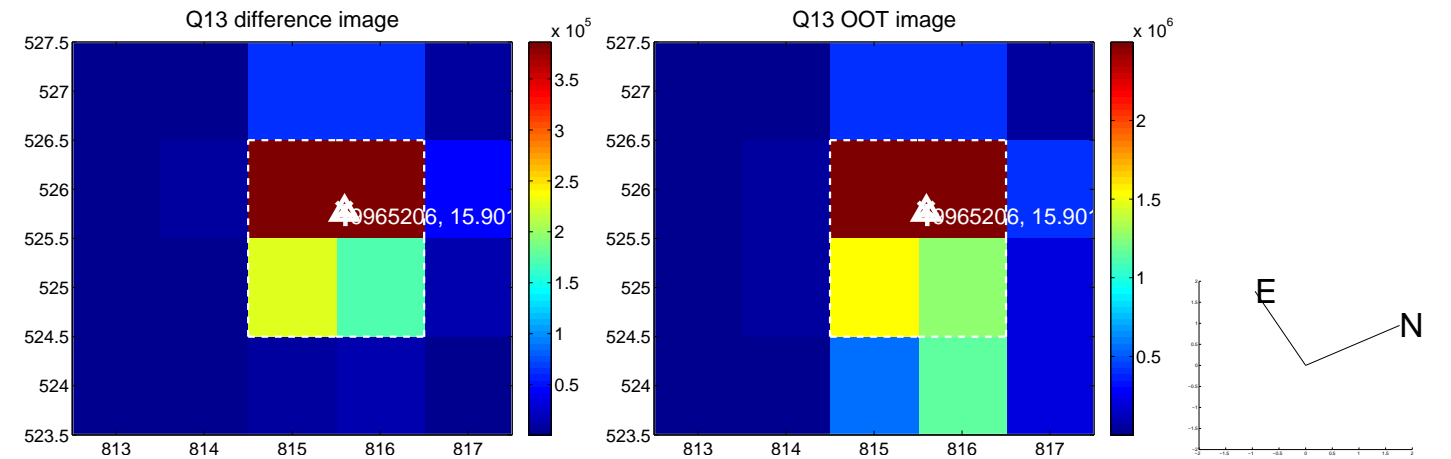
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



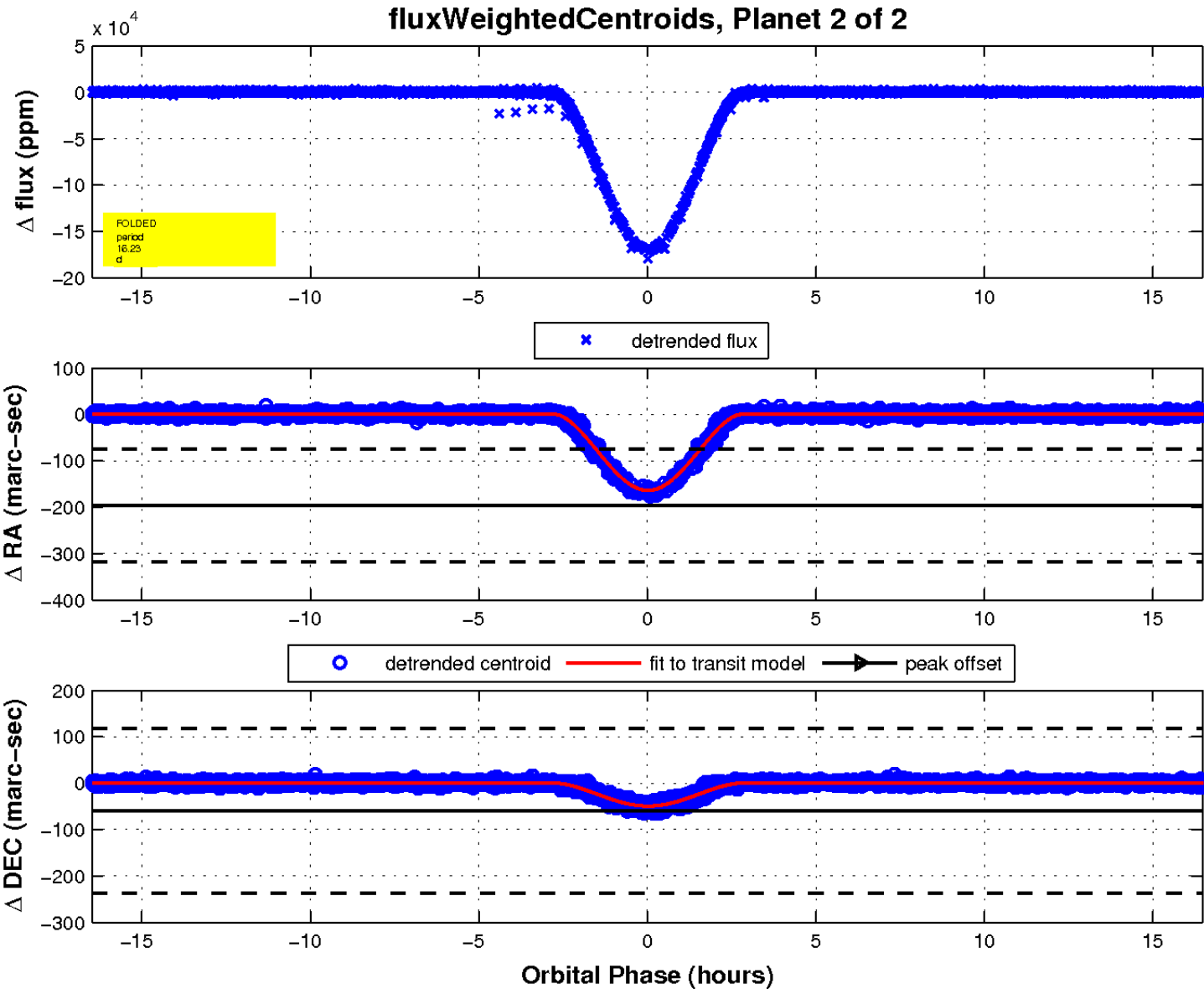
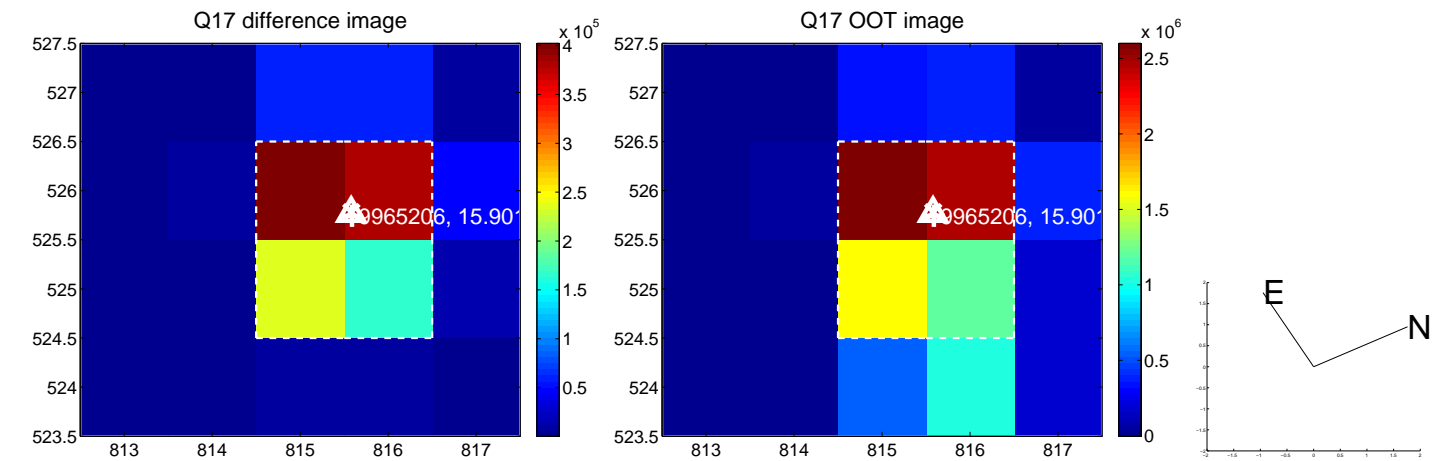
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

