

KIC 007509886

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})
007509886-01	OBS	0678.02	4.138528	132.019951	245.3	2.261	38.7	43.7	0.82	5297	1.56	196.57
007509886-02	OBS	0678.01	6.040477	136.350387	245.9	2.141	31.0	35.8	0.82	5297	1.56	118.73

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007509886-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007509886-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

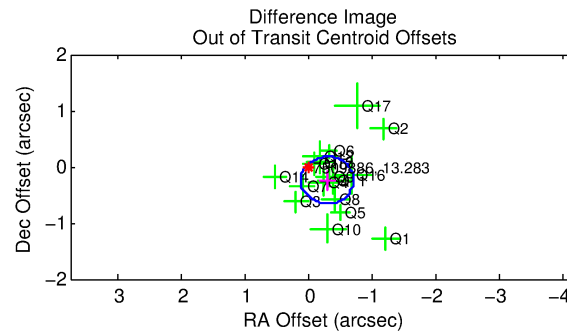
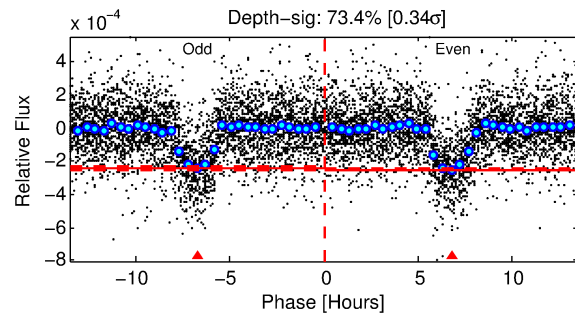
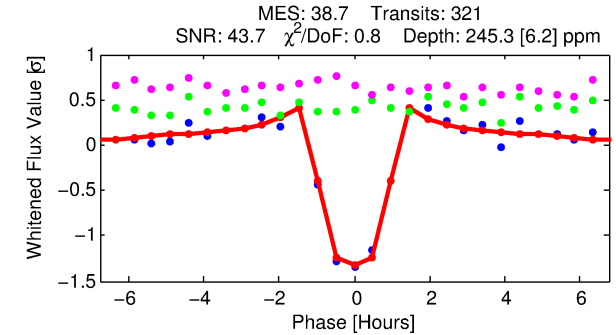
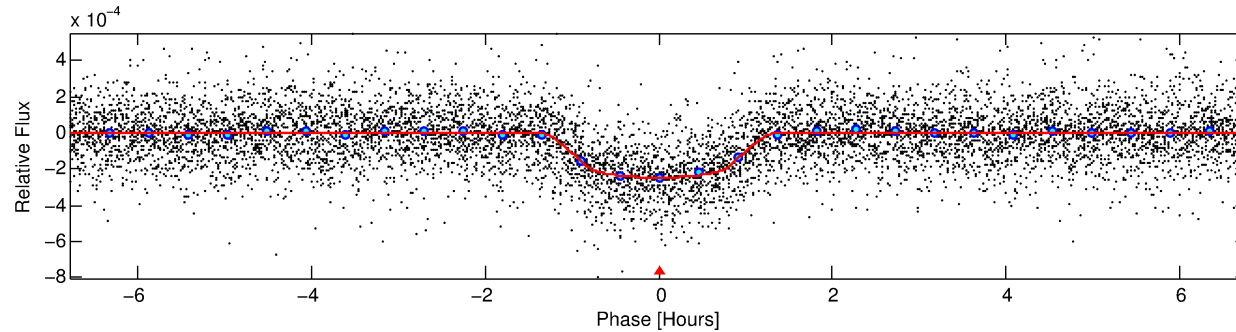
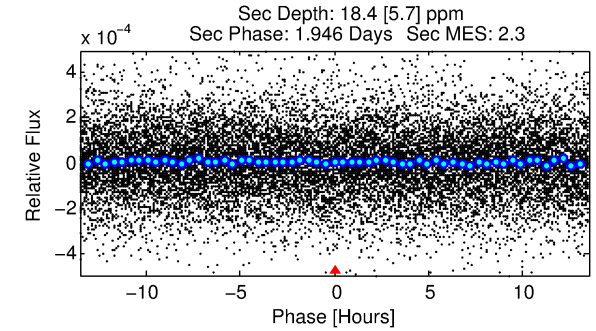
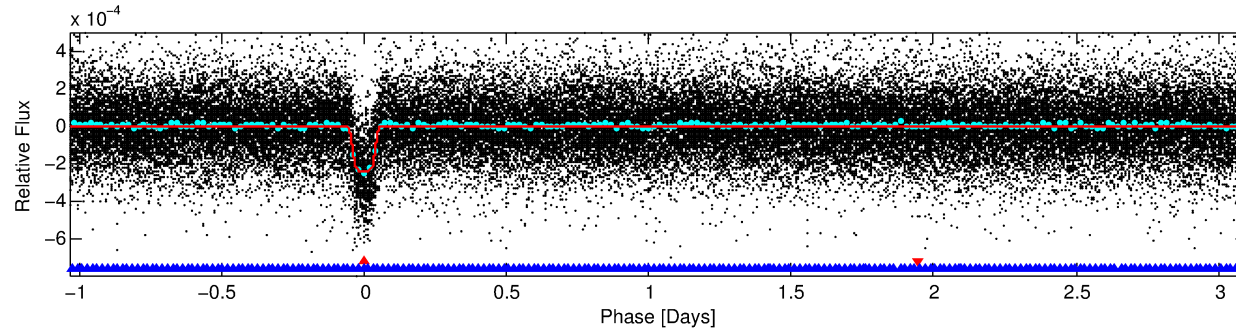
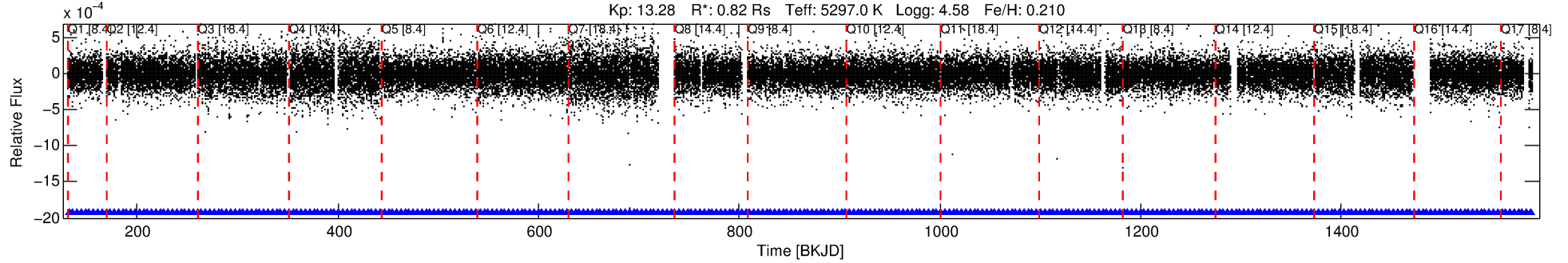
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007509886-01

No Significant Match Found

DV One-Page Summary

KIC: 7509886 Candidate: 1 of 2 Period: 4.139 d
KOI: K00678.02 Name: Kepler-211b Corr: 0.988



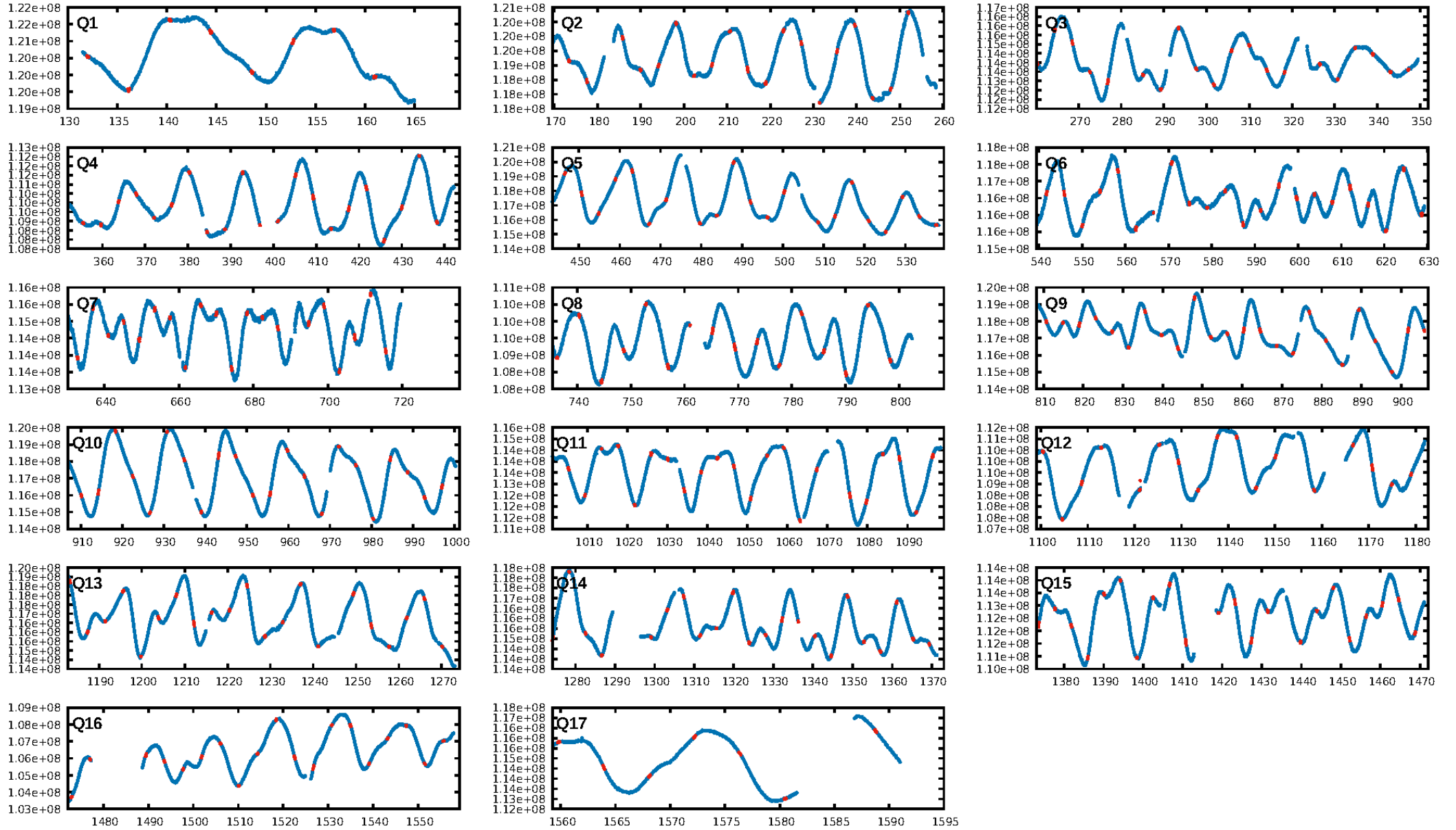
DV Fit Results:

Period = 4.13853 [0.00000] d
Epoch = 132.0200 [0.0007] BKJD
Rp/R* = 0.0174 [0.0023]
a/R* = 6.70 [3.56]
b = 0.90 [0.12]
Seff = 196.57 [31.79]
Teq = 955 [39] K
Rp = 1.57 [0.24] Re
a = 0.0494 [0.0041] AU
Ag = 10.10 [4.33] [2.10σ]
Teffp = 2631 [274] K [6.06σ]

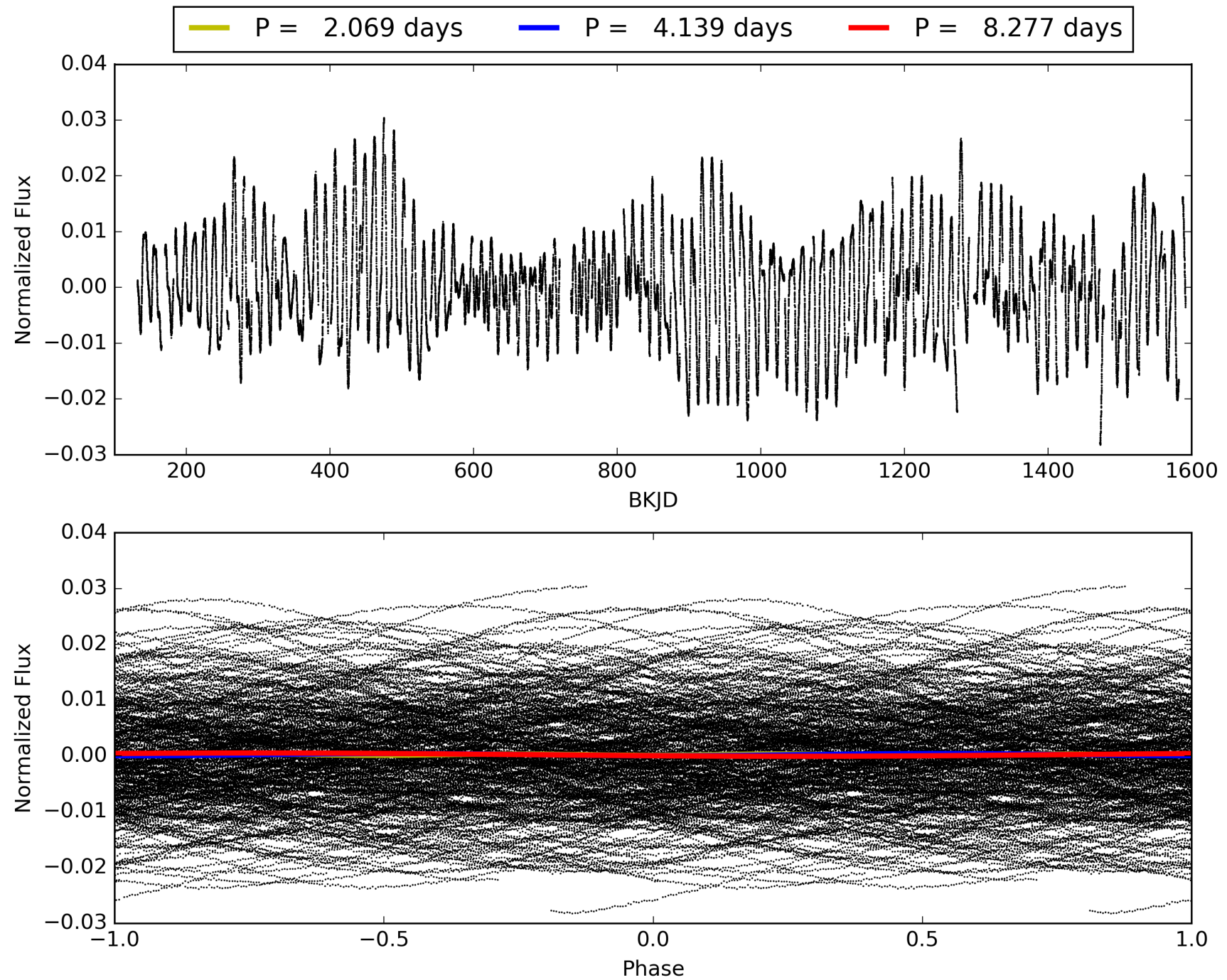
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [14.66σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.46e-303
RollingBand-fgt: 1.00 [306/306]
GhostDiagnostic-chr: 3.68
Centroid-sig: 1.0%
Centroid-so: 0.192 arcsec [0.93σ]
OotOffset-rm: 0.377 arcsec [2.71σ]
KicOffset-rm: 0.457 arcsec [3.56σ]
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 007509886-01, PDC Light Curves

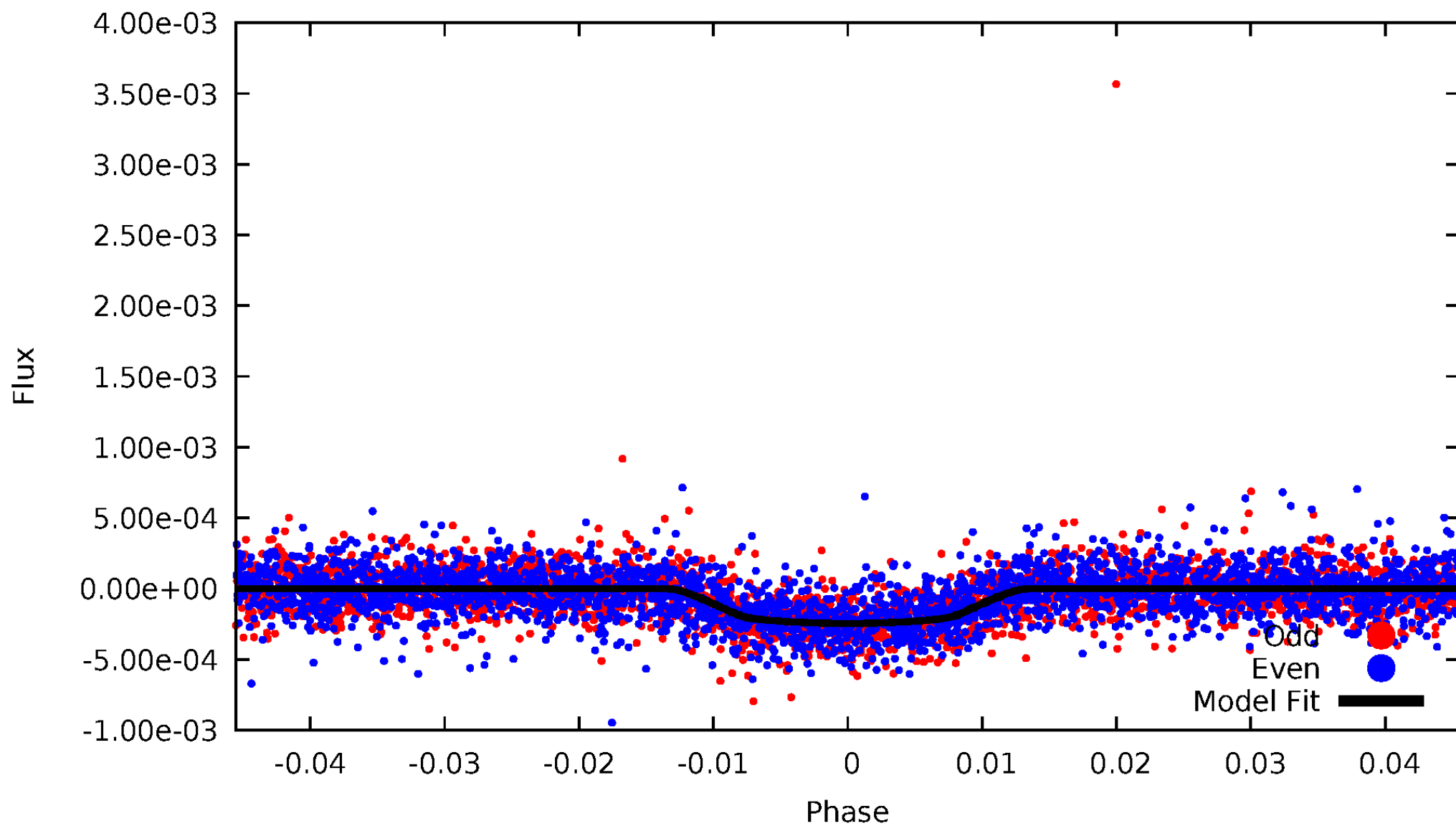


TCE 007509886-01



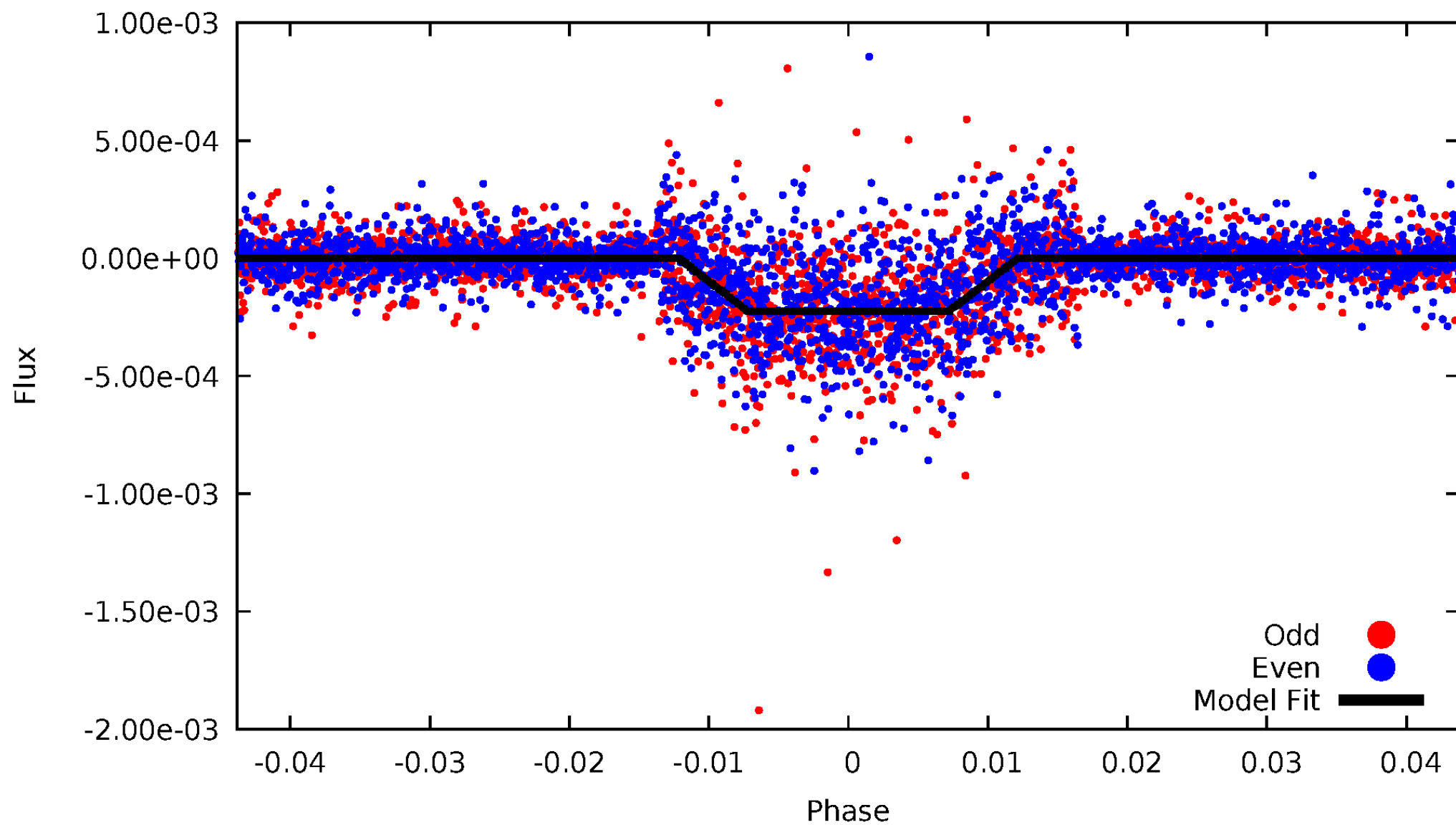
DV Odd/Even

TCE 007509886-01



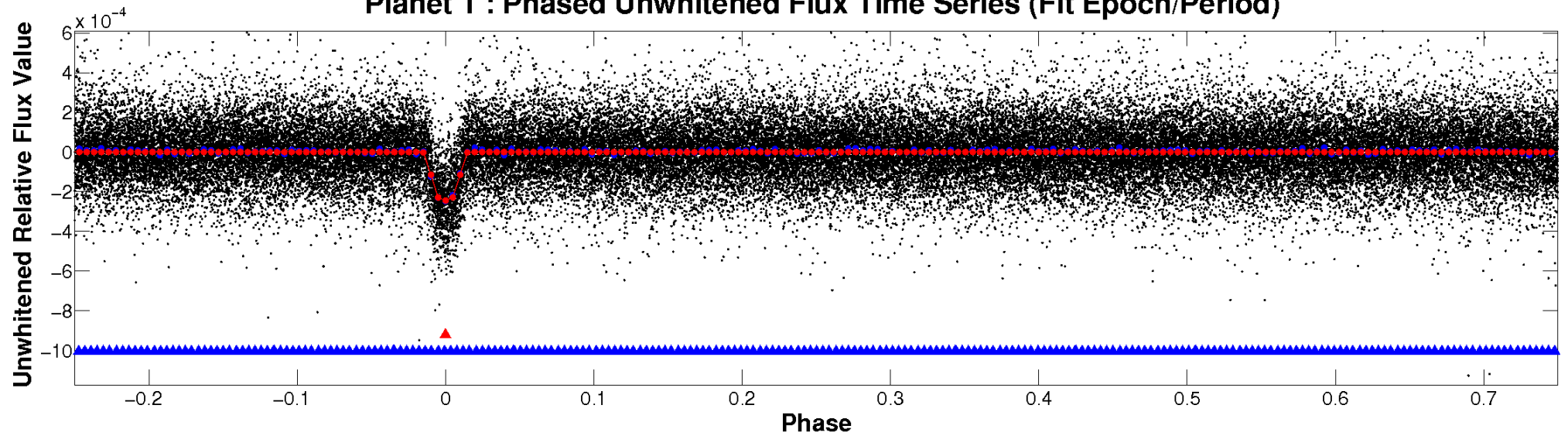
ALT Odd/Even

TCE 007509886-01

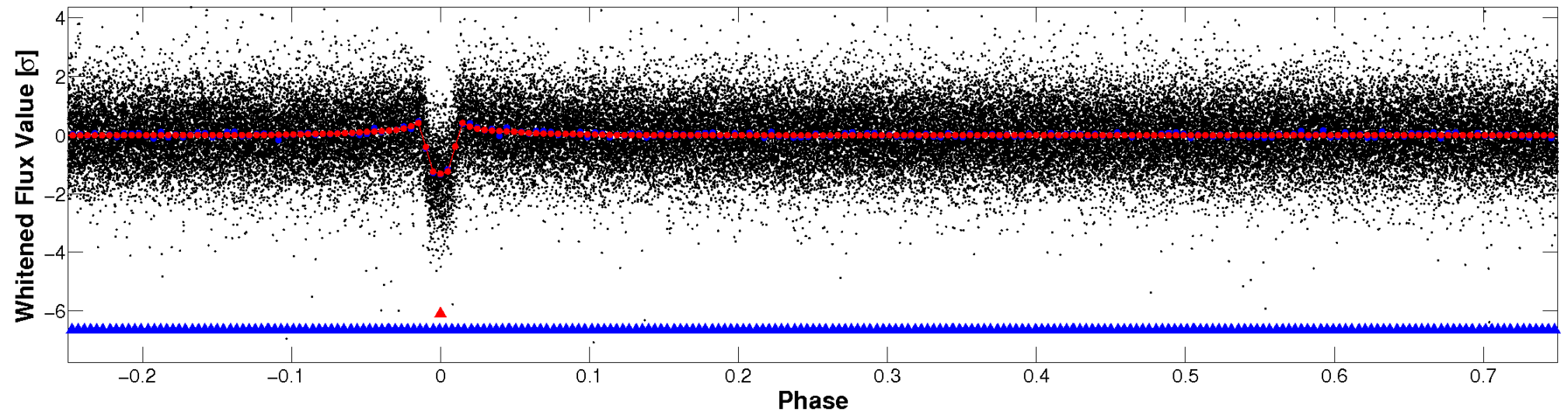


Non-Whitened Vs. Whitened Light Curve

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

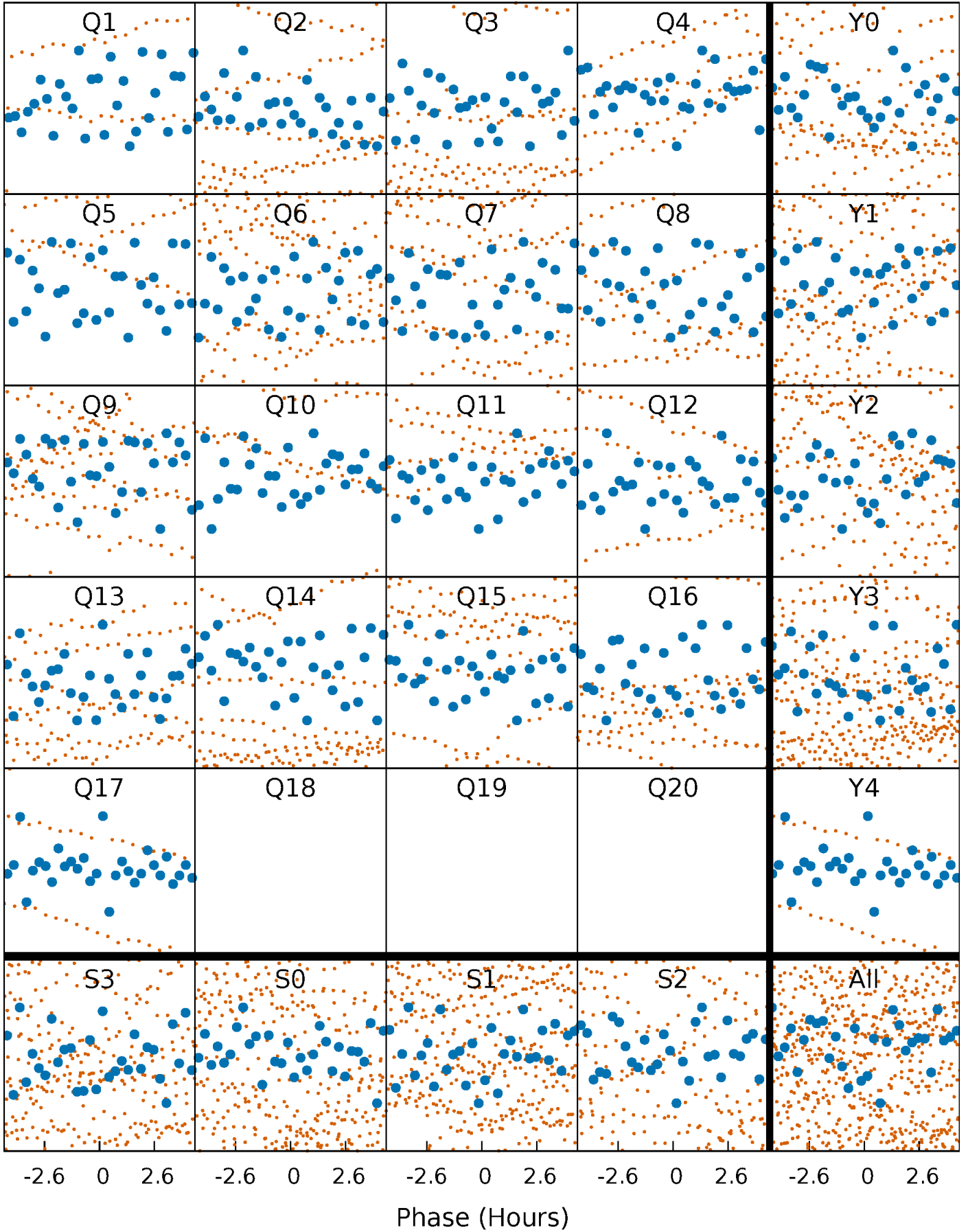


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



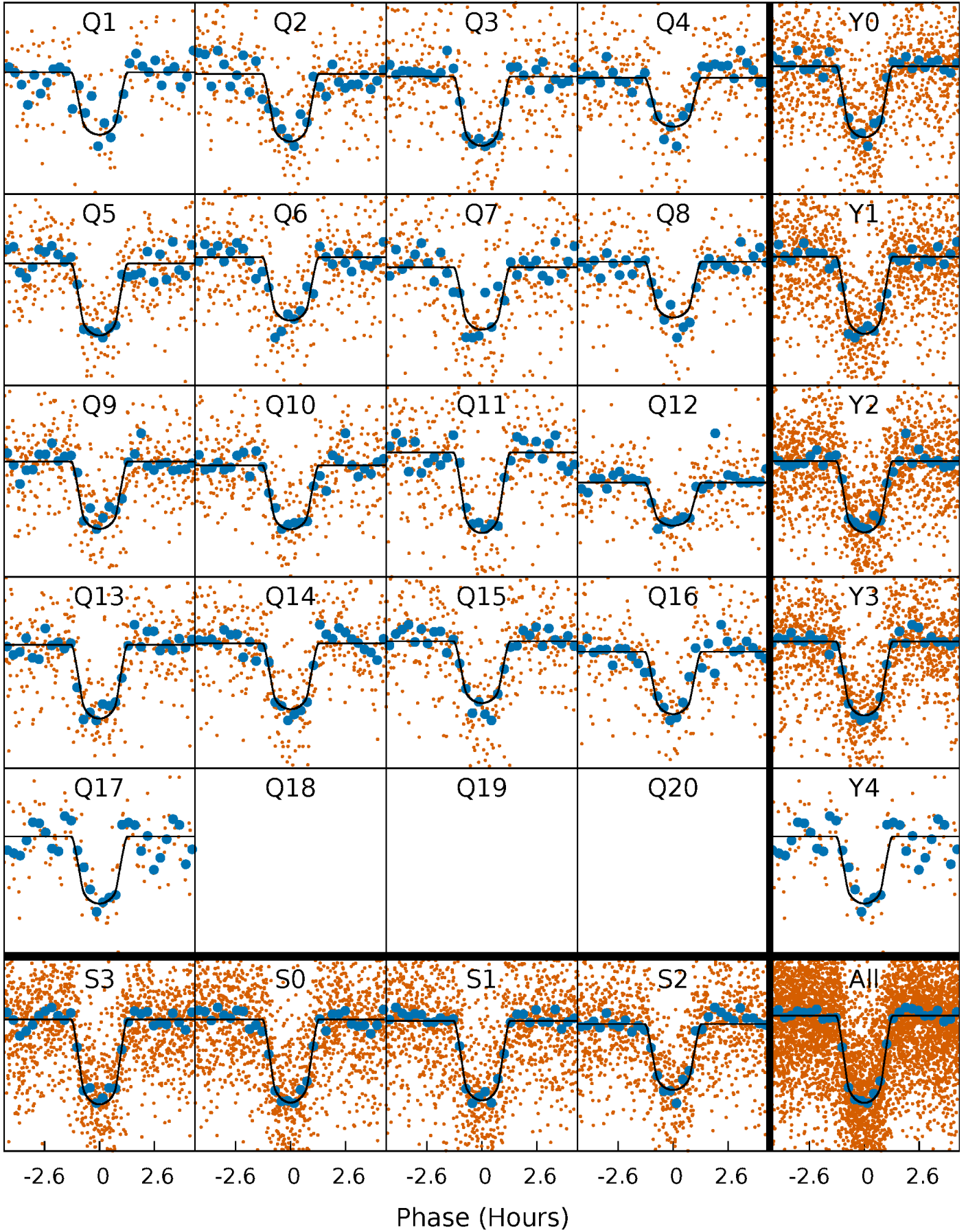
PDC Quarter-Phased Transit Curves

TCE 007509886-01 P= 4.138528 Days $T_0=132.019951$ (BKJD)



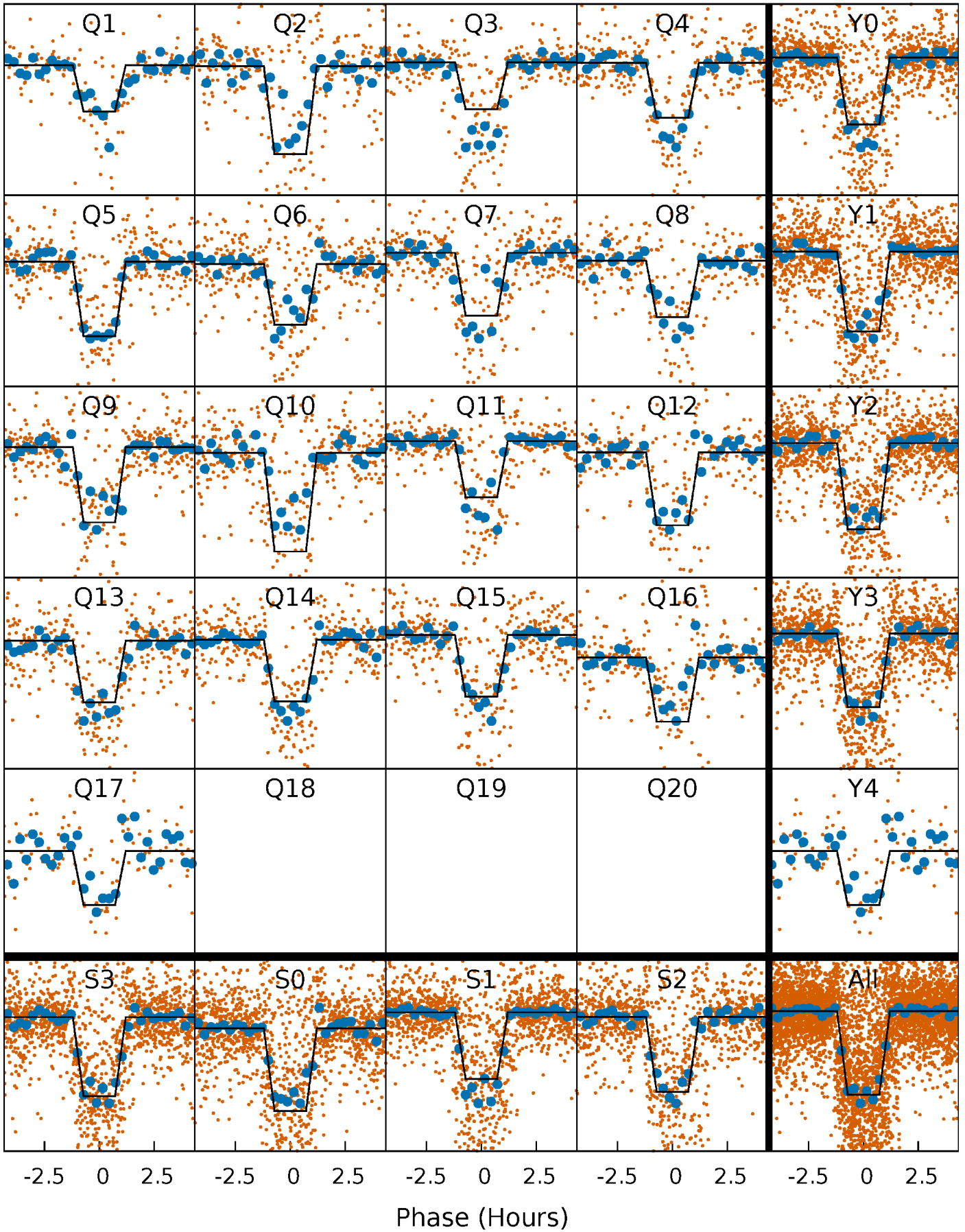
DV Quarter-Phased Transit Curves

TCE 007509886-01 P= 4.138528 Days $T_0=132.019951$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

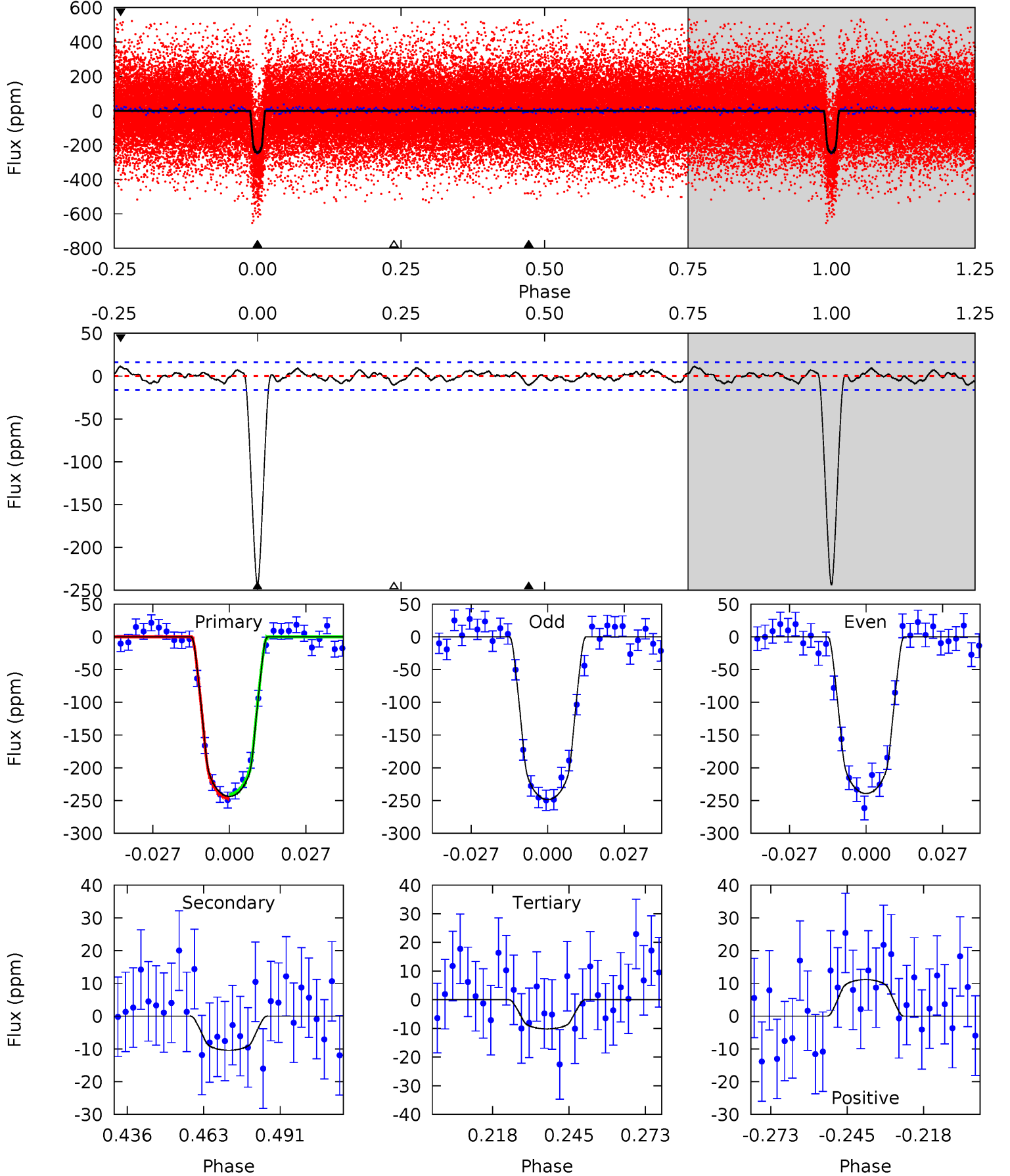
TCE 007509886-01 P= 4.138539 Days $T_0=132.017605$ (BKJD)



DV Model-Shift Uniqueness Test

007509886-01, P = 4.138528 Days, E = 127.881423 Days

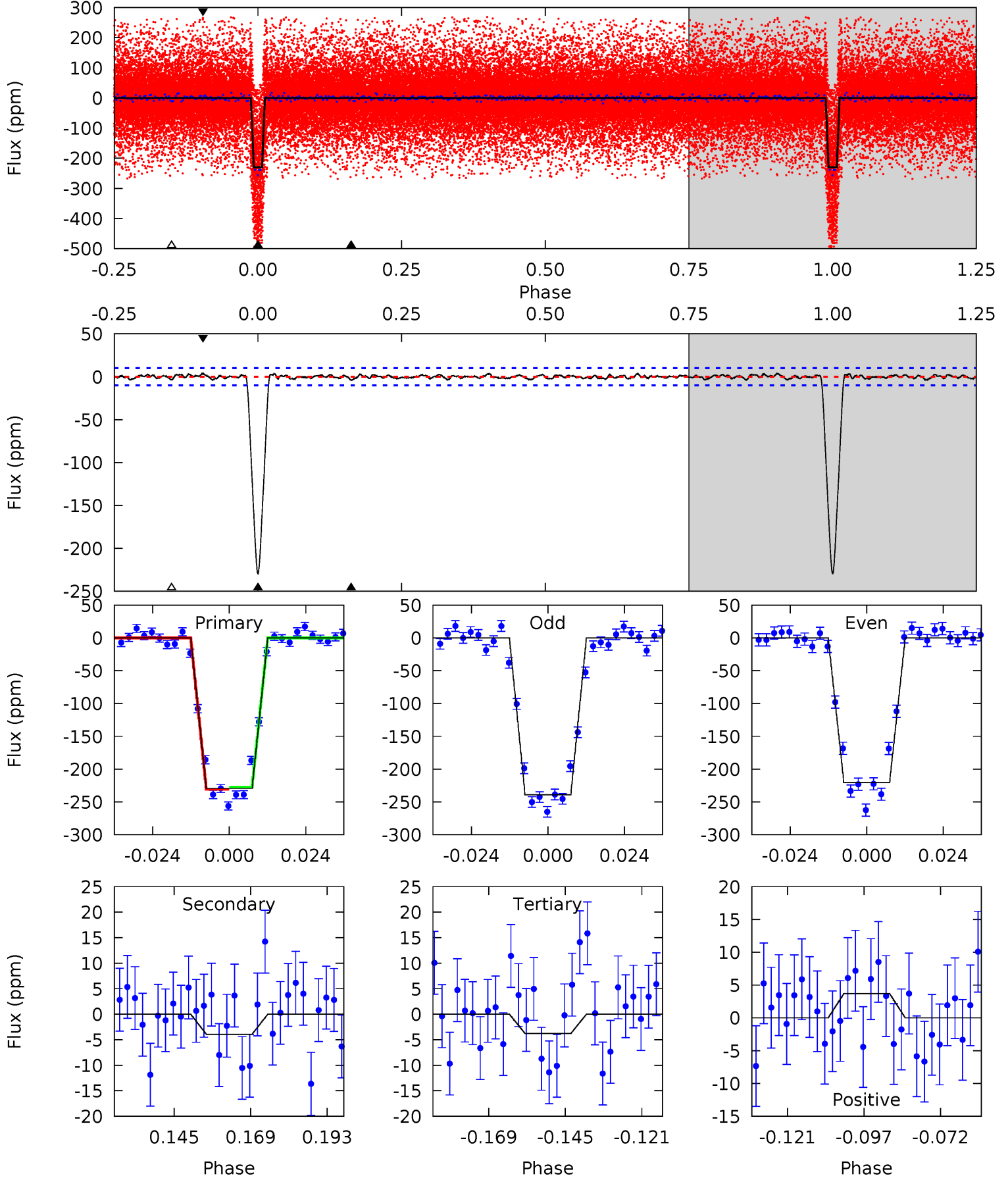
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
73.0	3.12	3.05	3.34	4.83	2.21	1.30	69.9	69.6	0.07	-0.22	1.40	1.00	0.04	0.85



Alt Model-Shift Uniqueness Test

007509886-01, P = 4.138539 Days, E = 127.879066 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
110.7	1.90	1.83	1.78	4.85	2.26	0.71	108.9	108.9	0.07	0.11	4.47	0.97	0.02	0.76



Stellar Parameters For KIC 007509886

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5297^{+95}_{-116}	$4.578^{+0.014}_{-0.081}$	$0.210^{+0.150}_{-0.150}$	$0.825^{+0.068}_{-0.034}$	$0.938^{+0.027}_{-0.077}$	$2.354^{+0.198}_{-0.537}$
	+2%/-2%	+0%/-2%	+71%/-71%	+8%/-4%	+3%/-8%	+8%/-23%
Source	SPE59	SPE59	SPE59	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 007509886-01 / KOI 0678.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-10 ± 3	$1.60^{+0.22}_{-0.23}$	1348^{+40}_{-34}	2939^{+170}_{-192}	$5.505^{+2.656}_{-2.075}$
Alt.	-4 ± 2	$1.37^{+0.22}_{-0.21}$	1349^{+37}_{-33}	2634^{+215}_{-282}	$2.677^{+1.832}_{-1.475}$

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

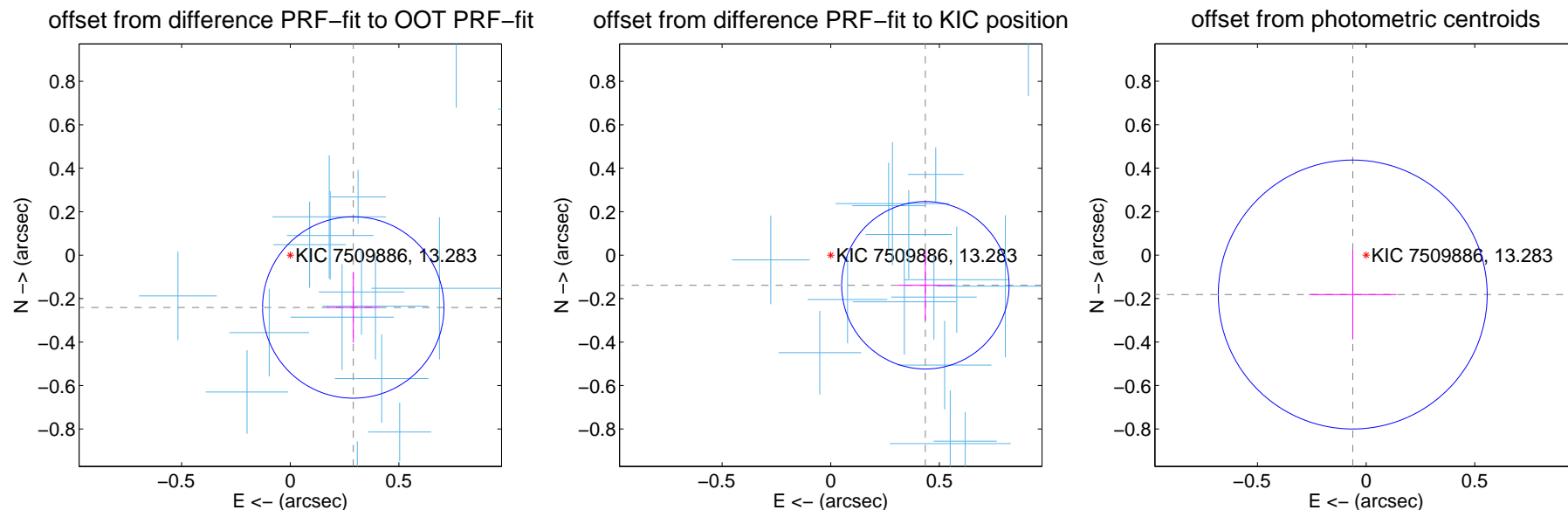
DV Centroid Data

Supplemental centroid analysis for 007509886-01. Kepler magnitude: 13.28. Transit SNR 43.70

There are 17 quarters with good PRF difference image offsets

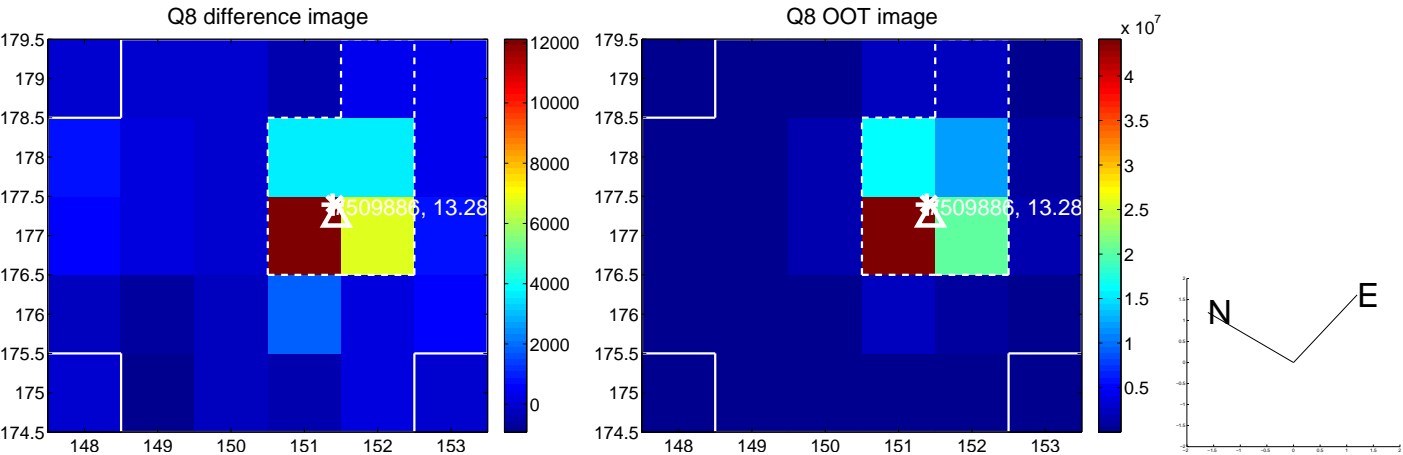
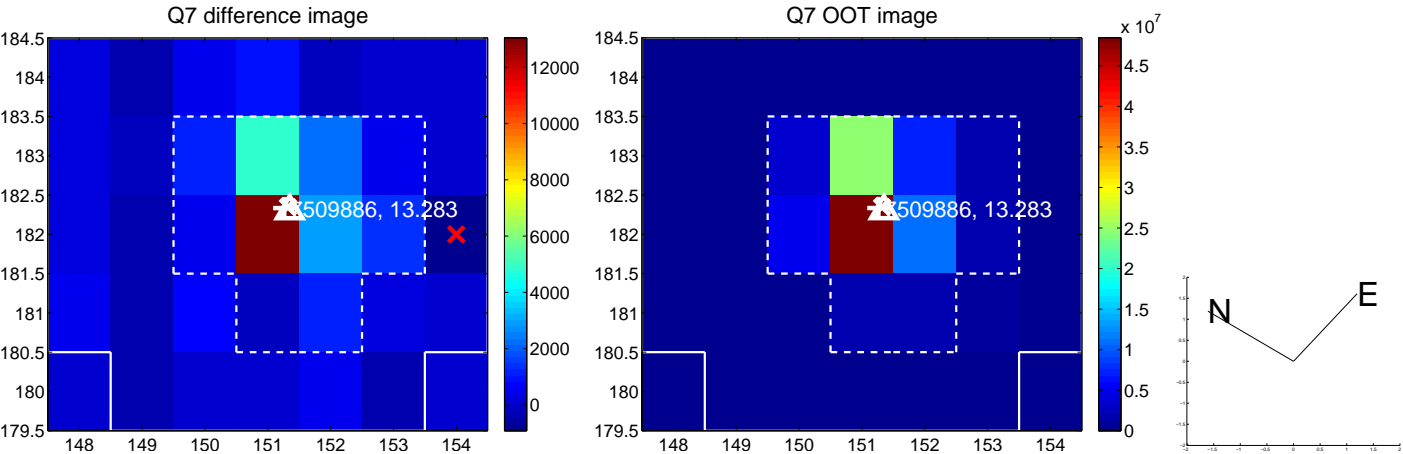
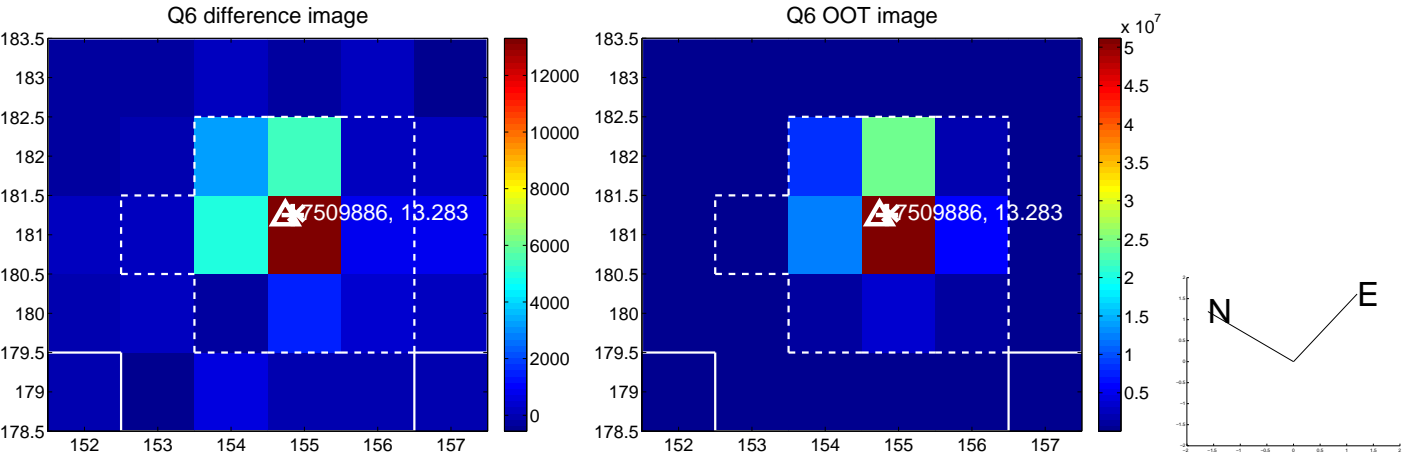
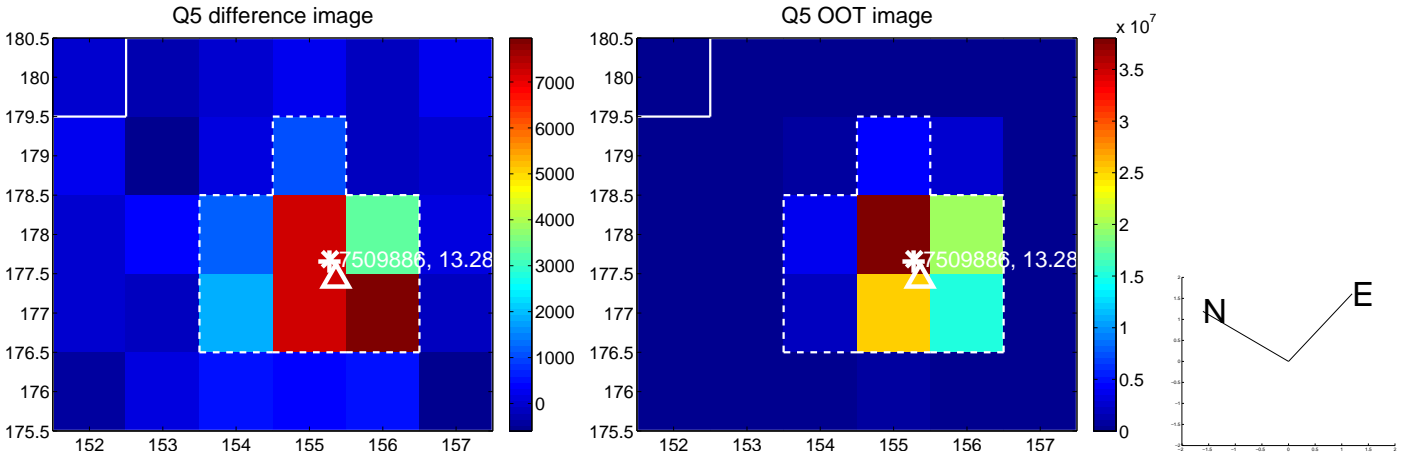
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.377 ± 0.139	2.71	-0.290 ± 0.121	-0.241 ± 0.162
PRF-fit source offset from KIC position	0.457 ± 0.128	3.56	-0.436 ± 0.125	-0.139 ± 0.161
photometric centroid source offset	0.19 ± 0.21	0.93	0.06 ± 0.20	-0.18 ± 0.21

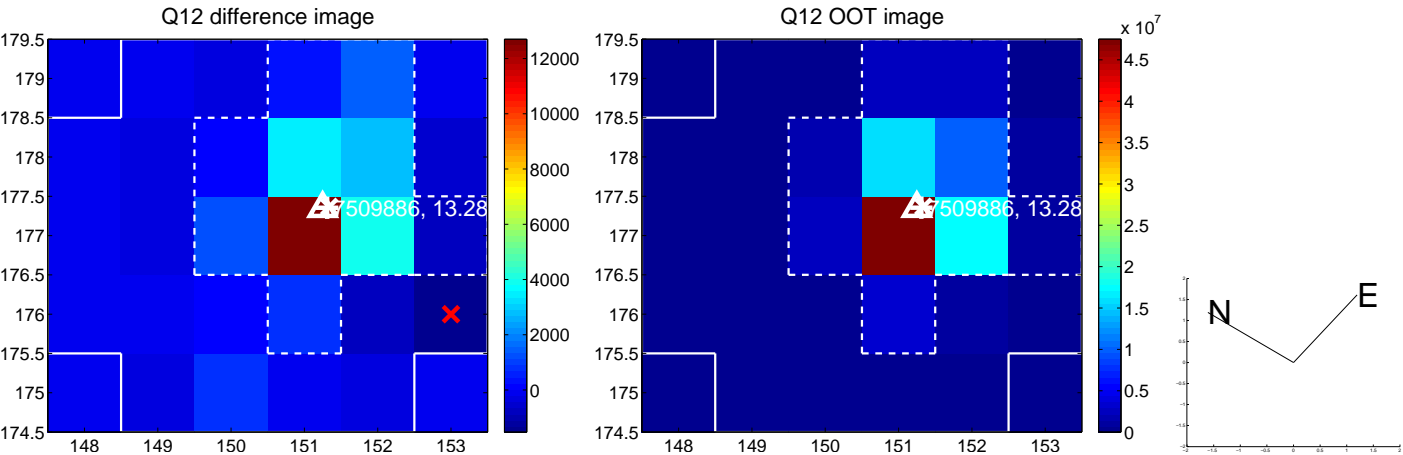
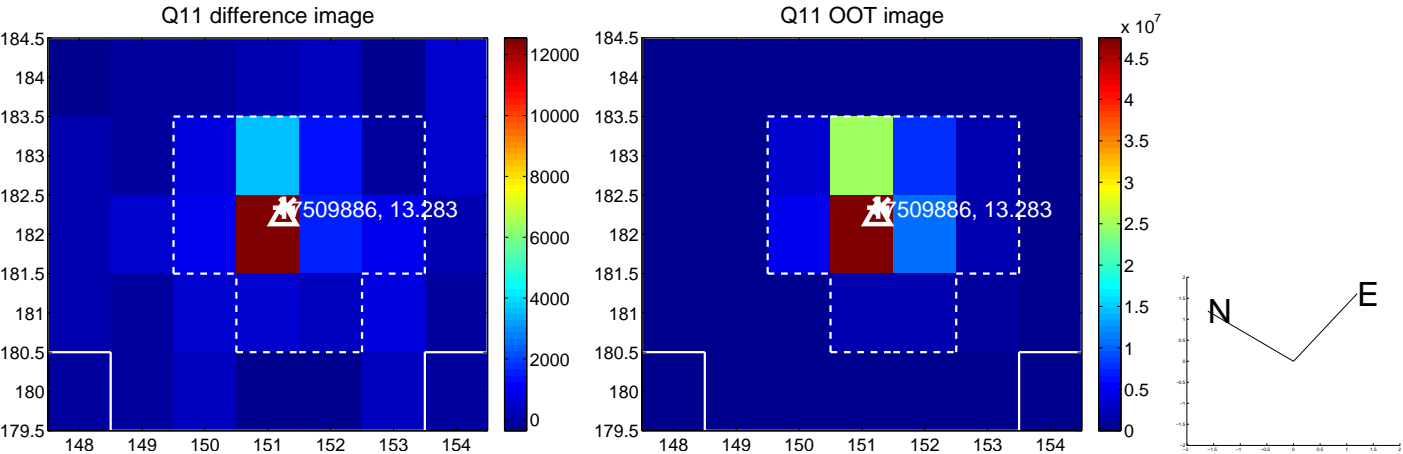
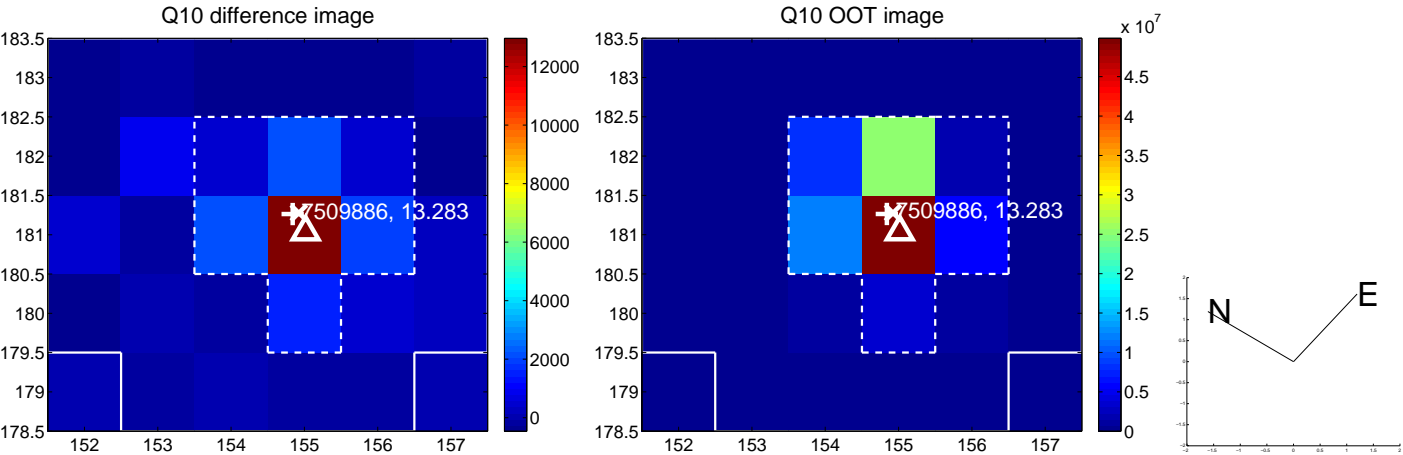
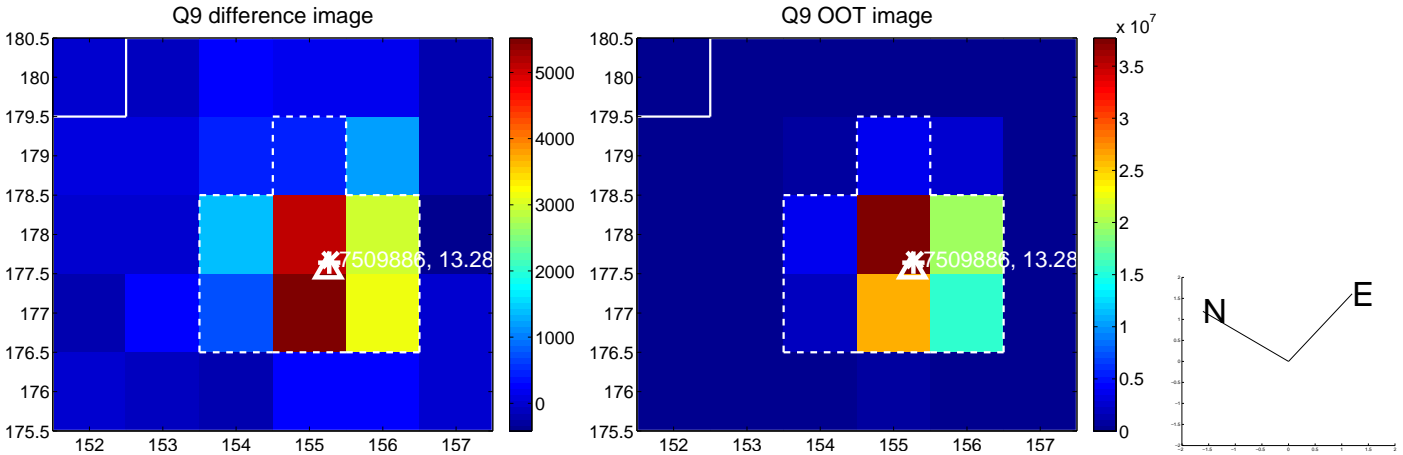


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

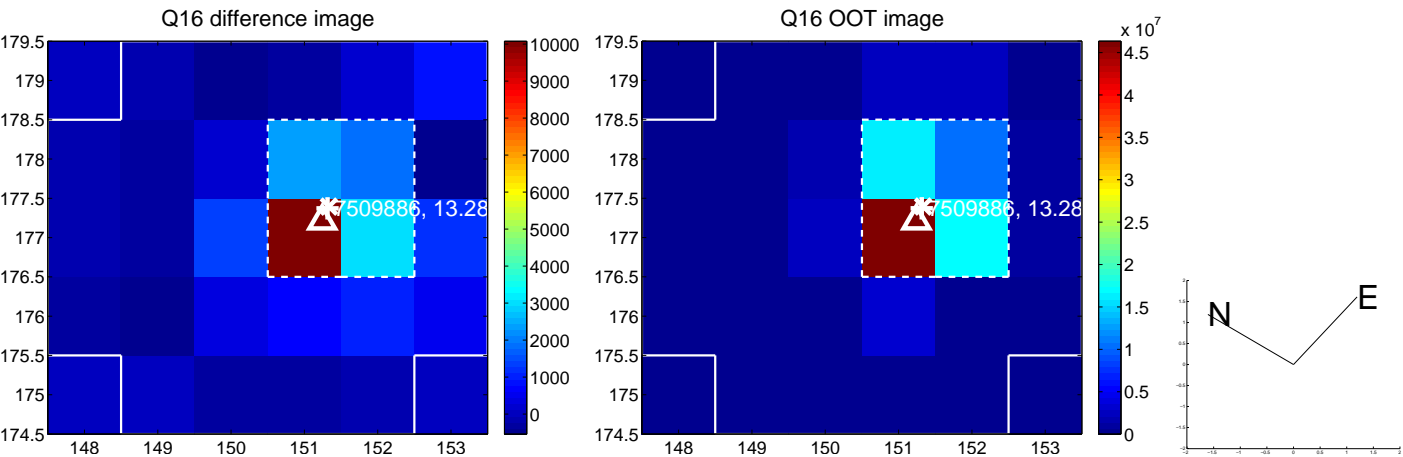
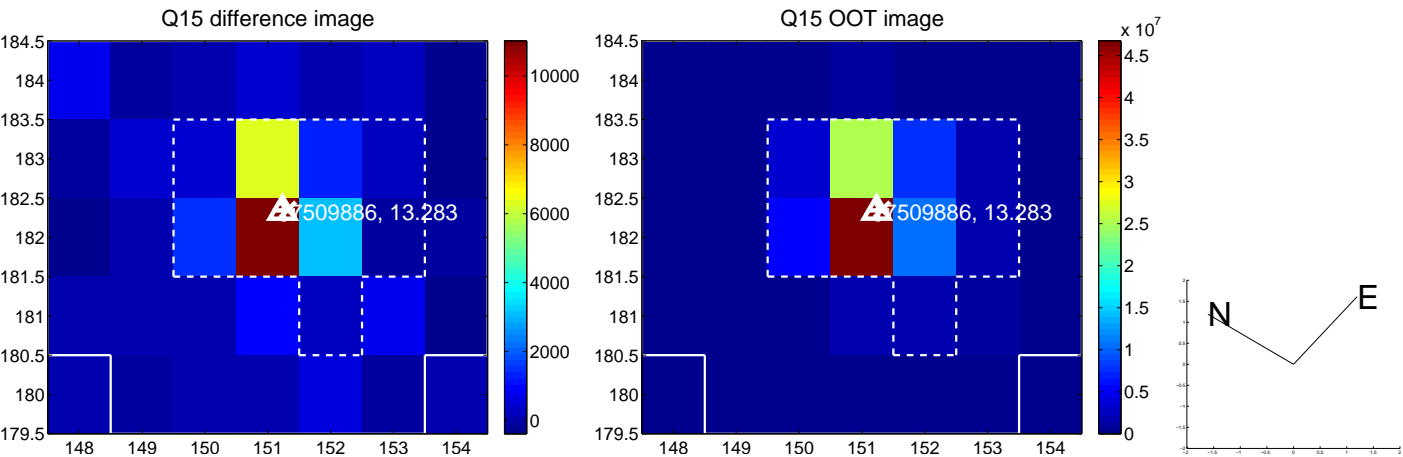
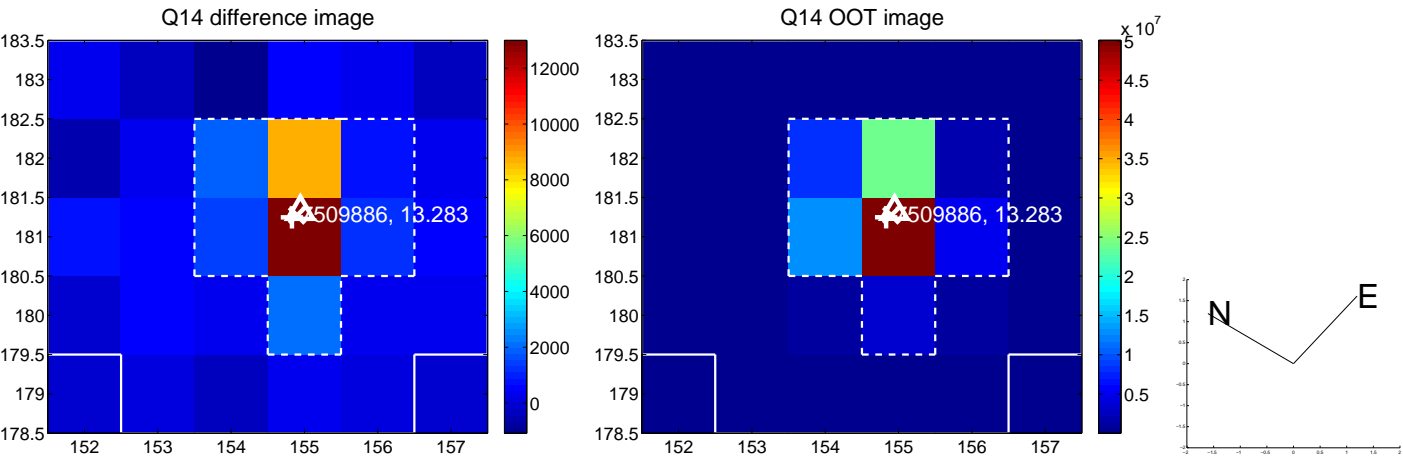
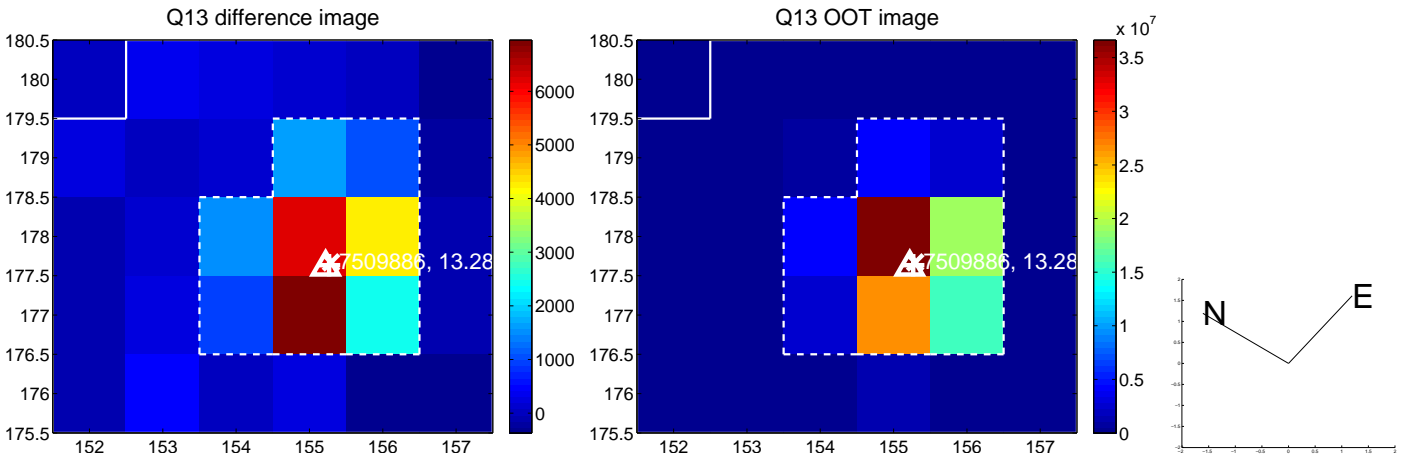
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



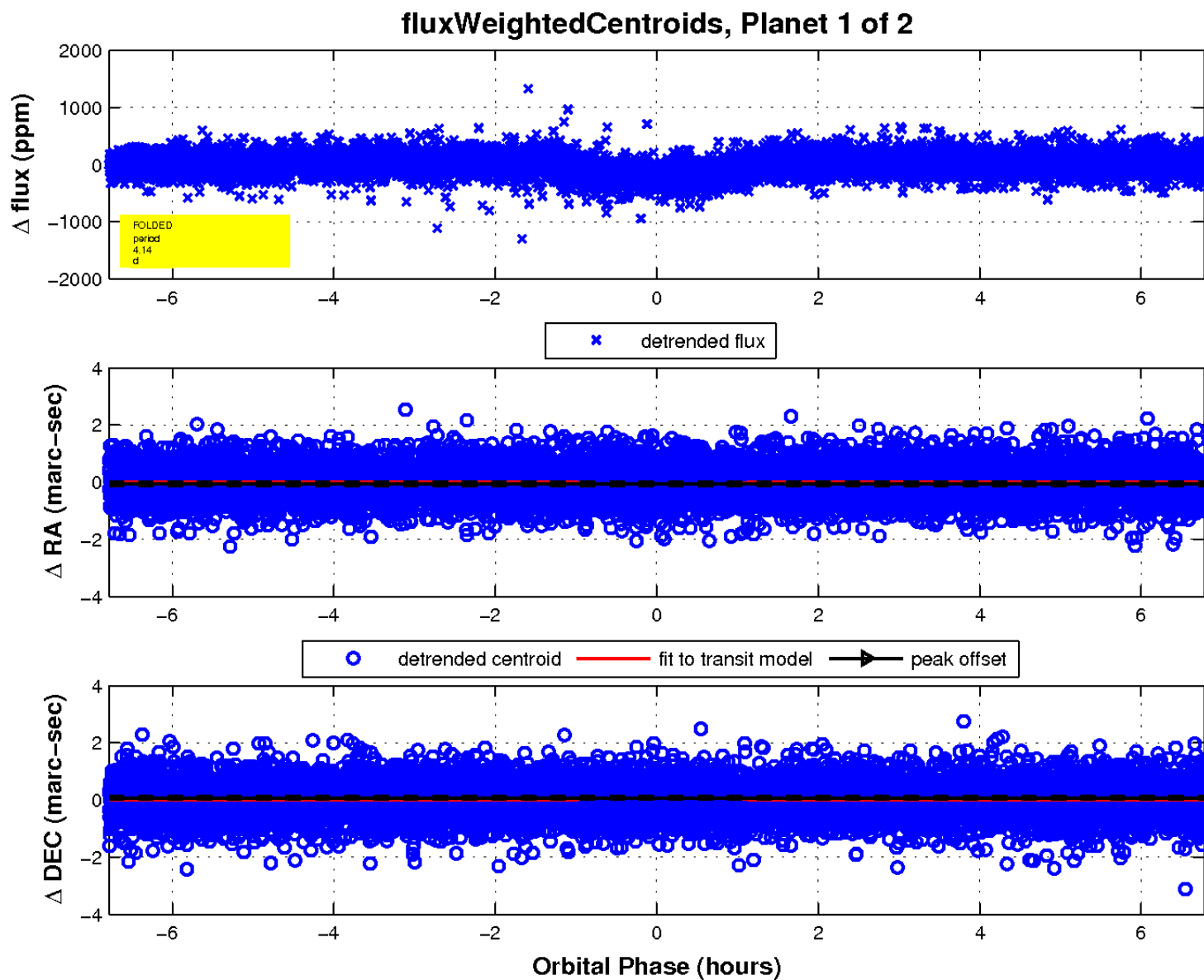
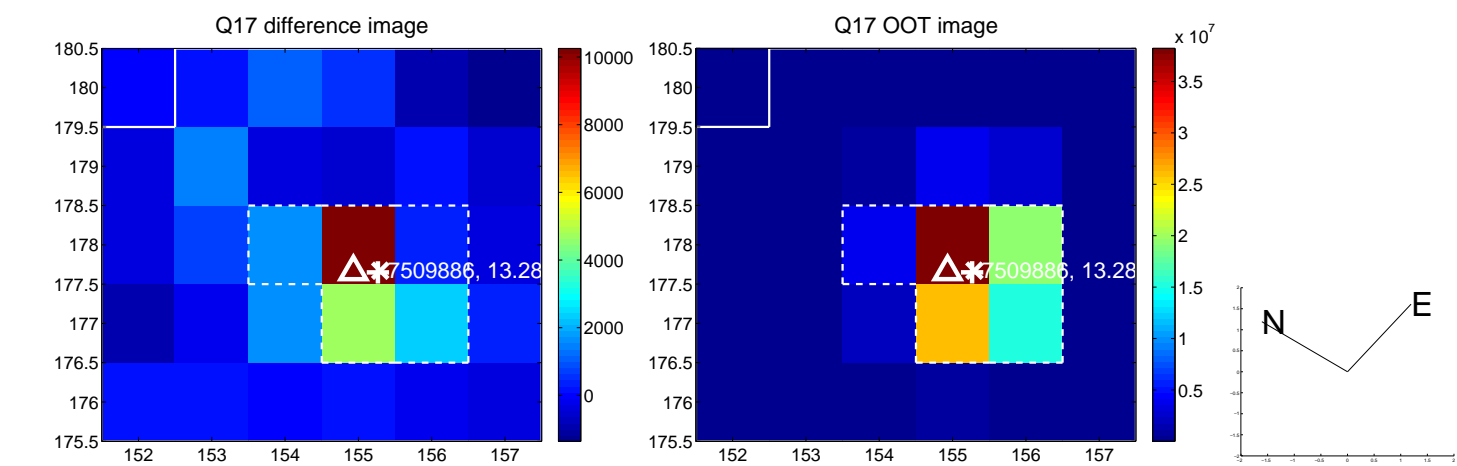
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

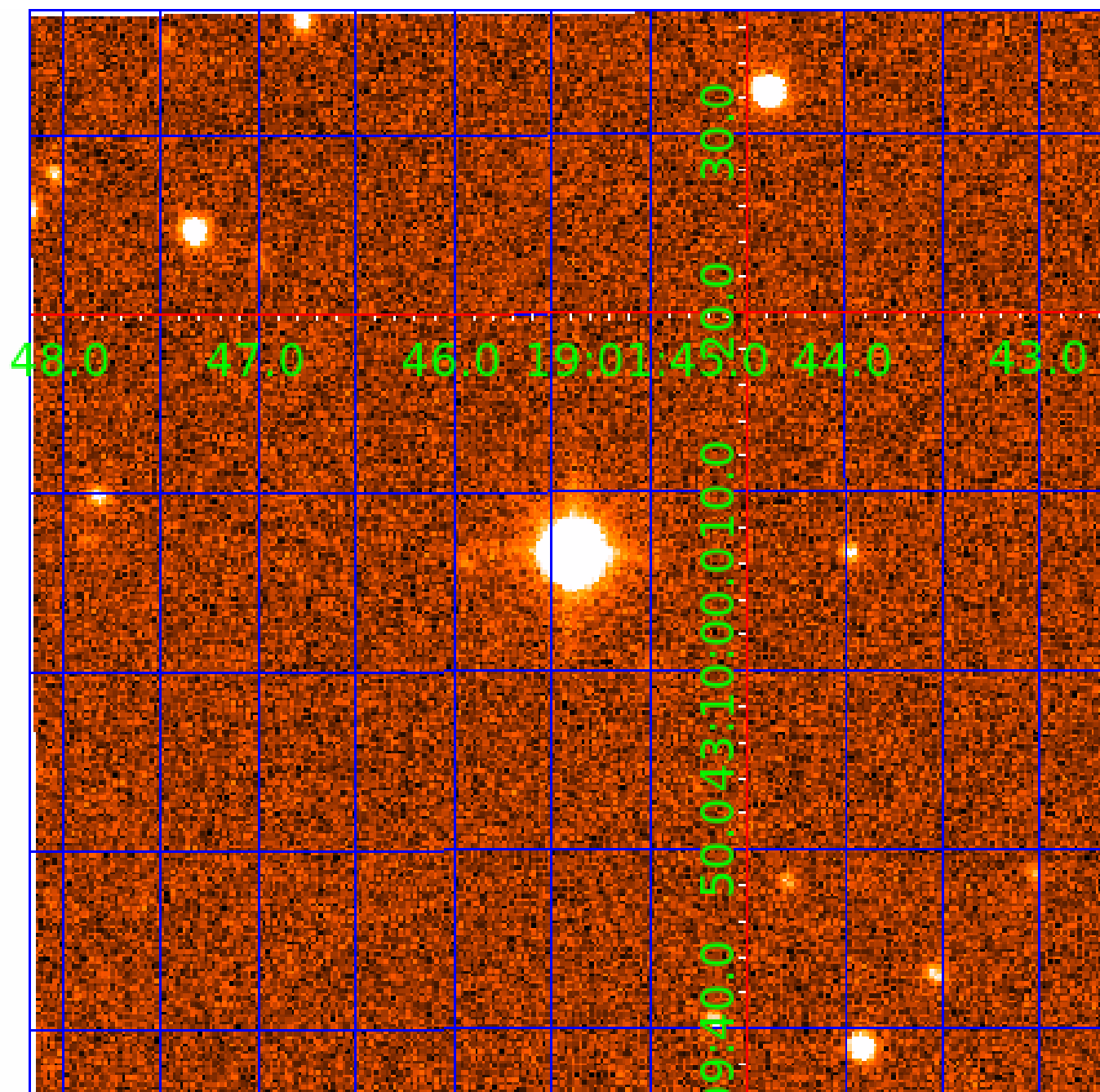


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007509886

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})
007509886-01	OBS	0678.02	4.138528	132.019951	245.3	2.261	38.7	43.7	0.82	5297	1.56	196.57
007509886-02	OBS	0678.01	6.040477	136.350387	245.9	2.141	31.0	35.8	0.82	5297	1.56	118.73

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007509886-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007509886-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

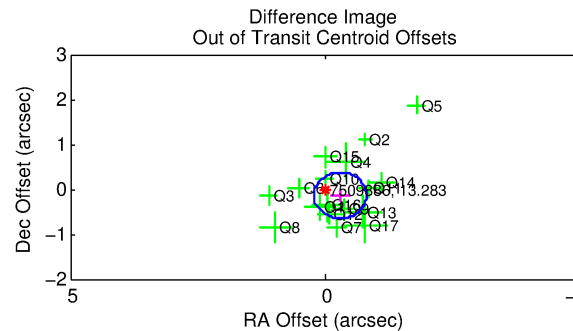
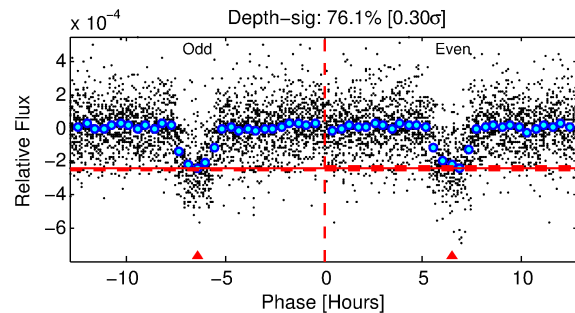
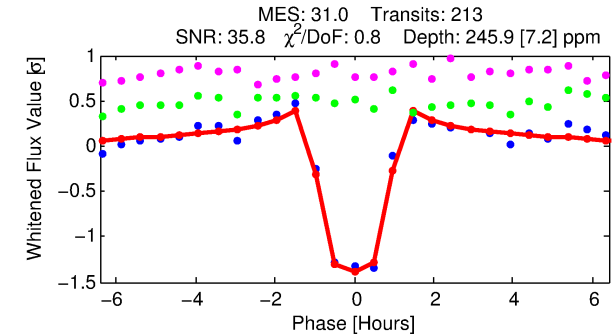
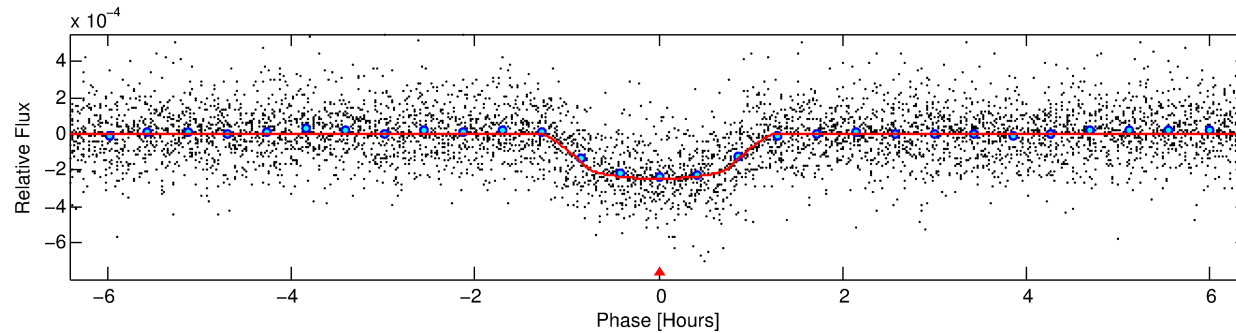
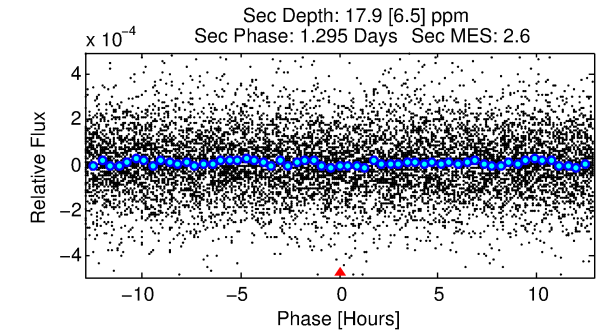
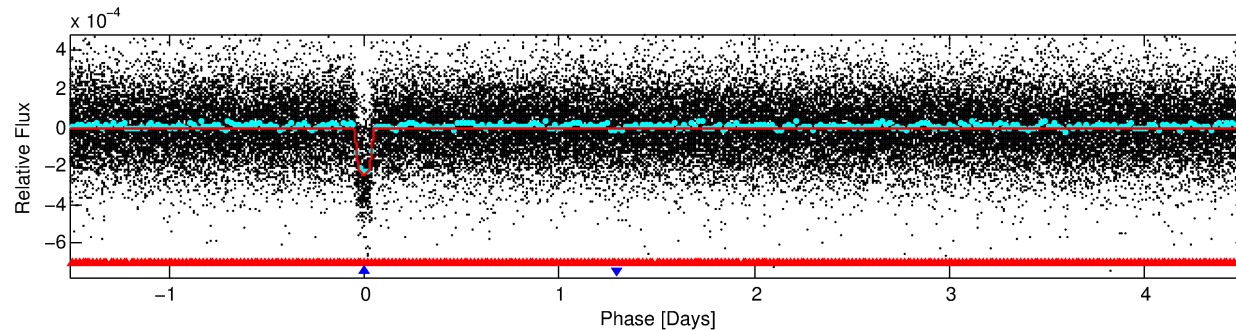
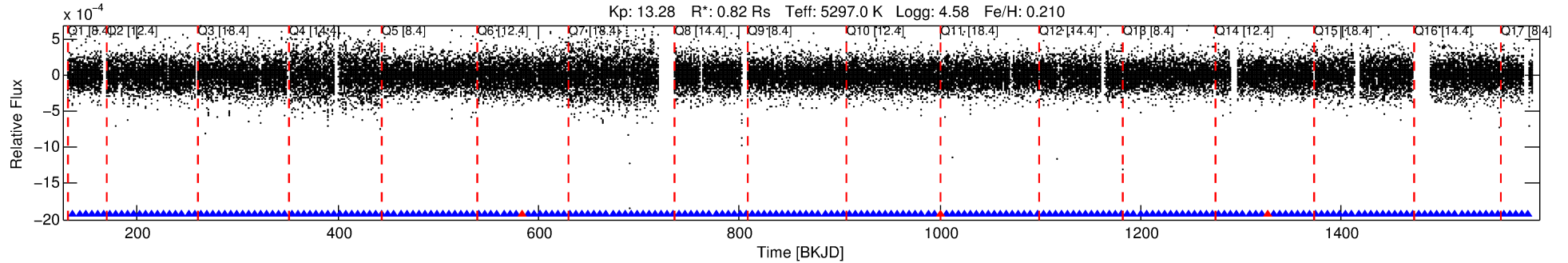
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007509886-02

No Significant Match Found

DV One-Page Summary

KIC: 7509886 Candidate: 2 of 2 Period: 6.040 d
KOI: K00678.01 Name: Kepler-211c Corr: 0.973



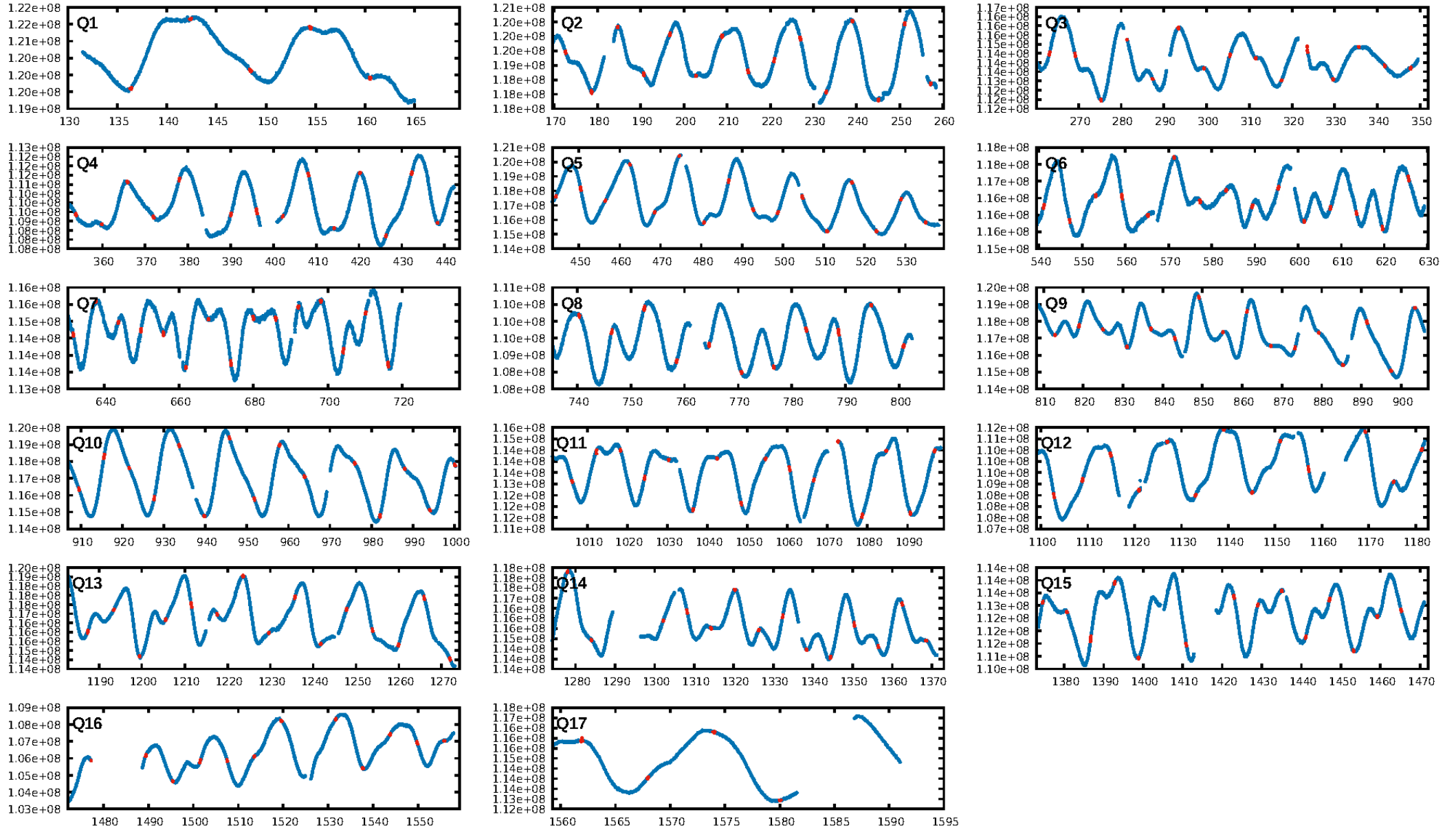
DV Fit Results:

Period = 6.04048 [0.00001] d
Epoch = 136.3504 [0.0010] BKJD
Rp/R* = 0.0173 [0.0032]
a/R* = 10.45 [7.88]
b = 0.90 [0.17]
Seff = 118.73 [19.20]
Teq = 842 [34] K
Rp = 1.56 [0.32] Re
a = 0.0636 [0.0053] AU
Ag = 16.34 [8.74] [1.76σ]
Teffp = 2616 [343] K [5.15σ]

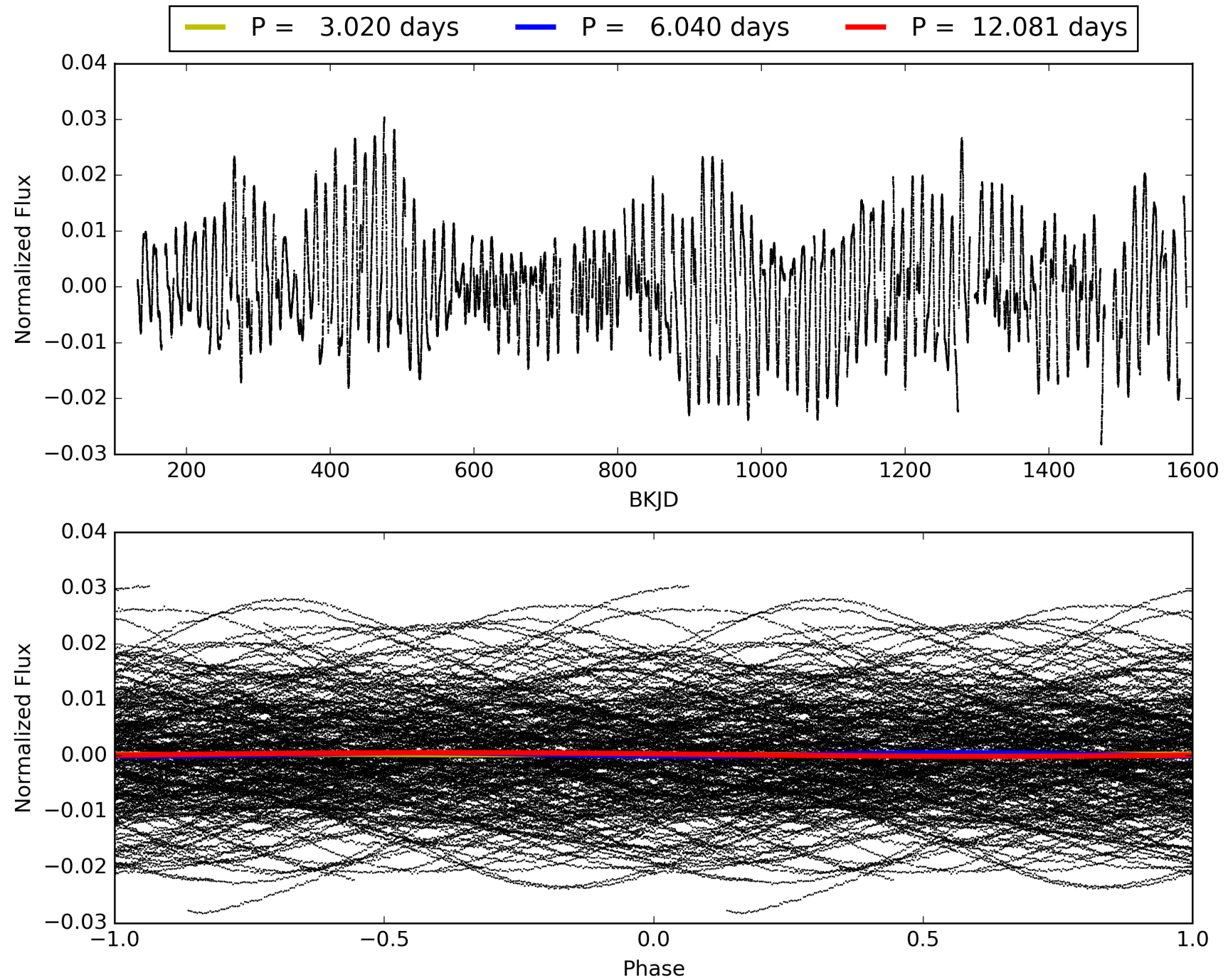
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [14.66σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.44e-195
RollingBand-fgt: 0.99 [201/204]
GhostDiagnostic-chr: 0.9691
Centroid-sig: 6.3%
Centroid-so: 0.226 arcsec [0.89σ]
OotOffset-rm: 0.333 arcsec [1.95σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.488 arcsec [2.34σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 007509886-02, PDC Light Curves

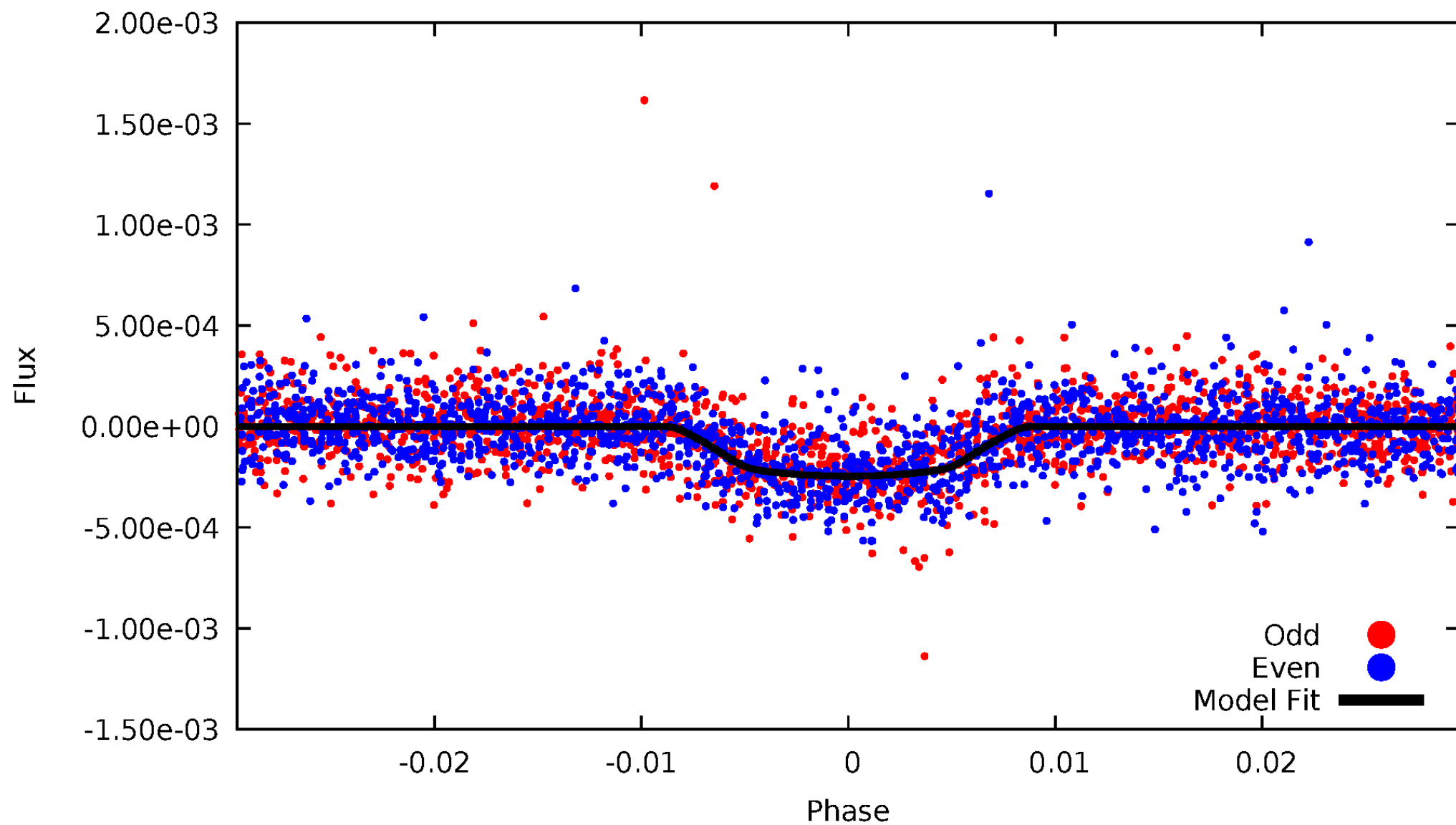


TCE 007509886-02



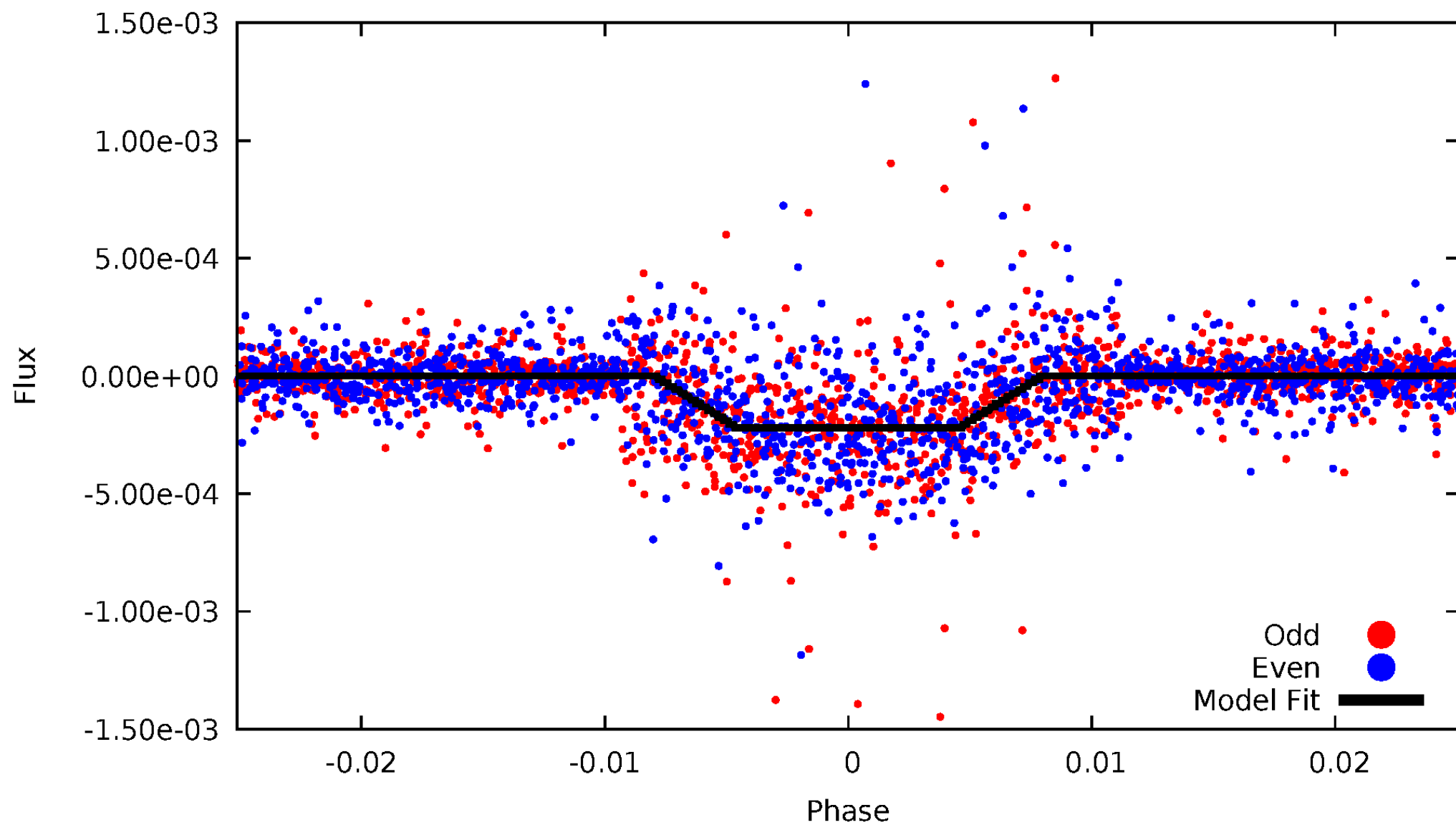
DV Odd/Even

TCE 007509886-02



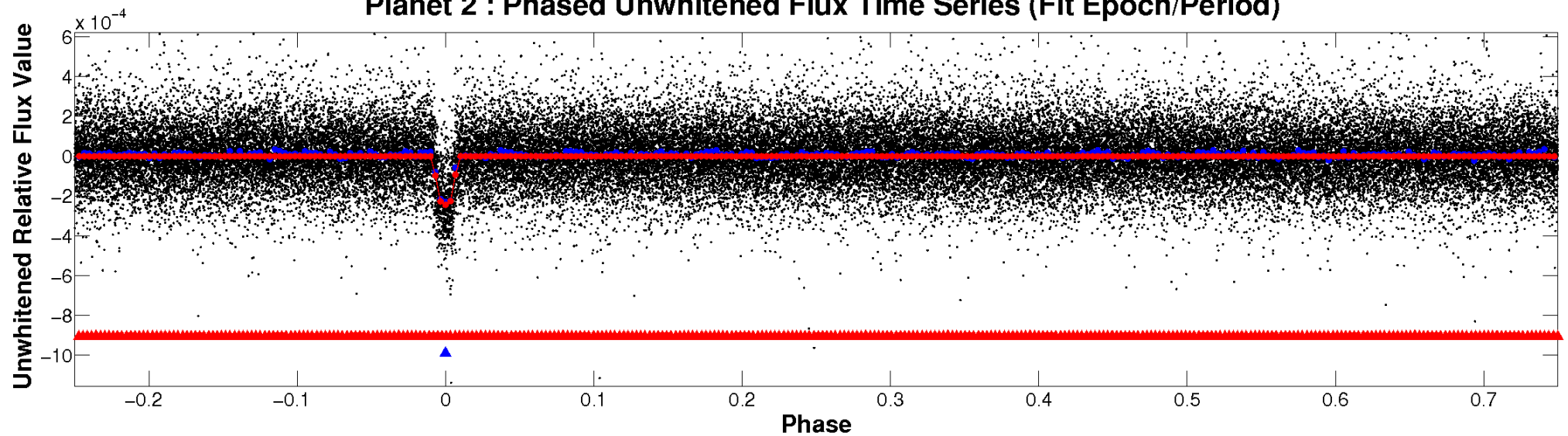
ALT Odd/Even

TCE 007509886-02

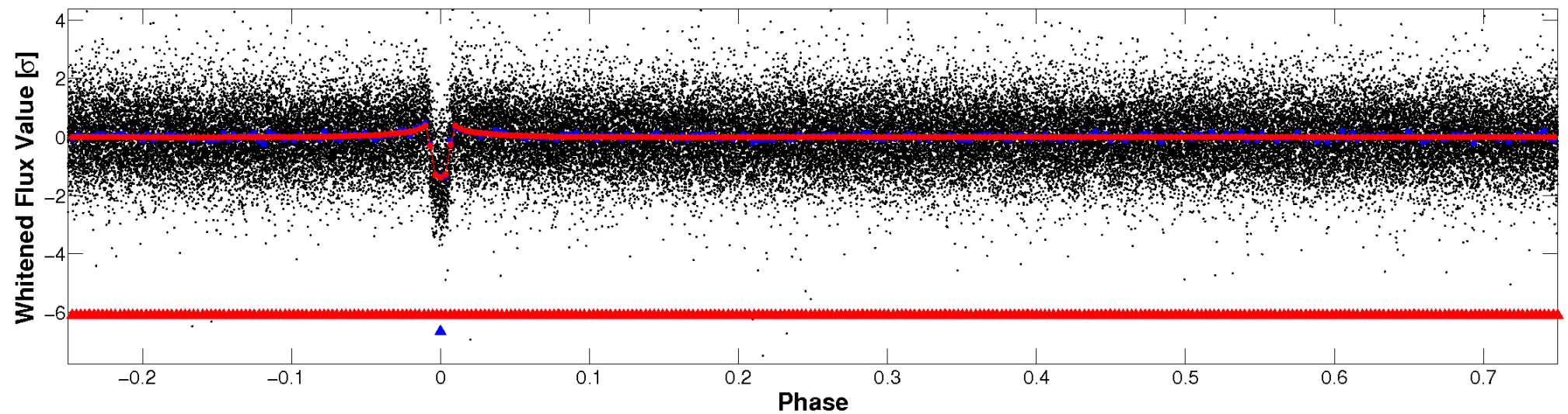


Non-Whitened Vs. Whitened Light Curve

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

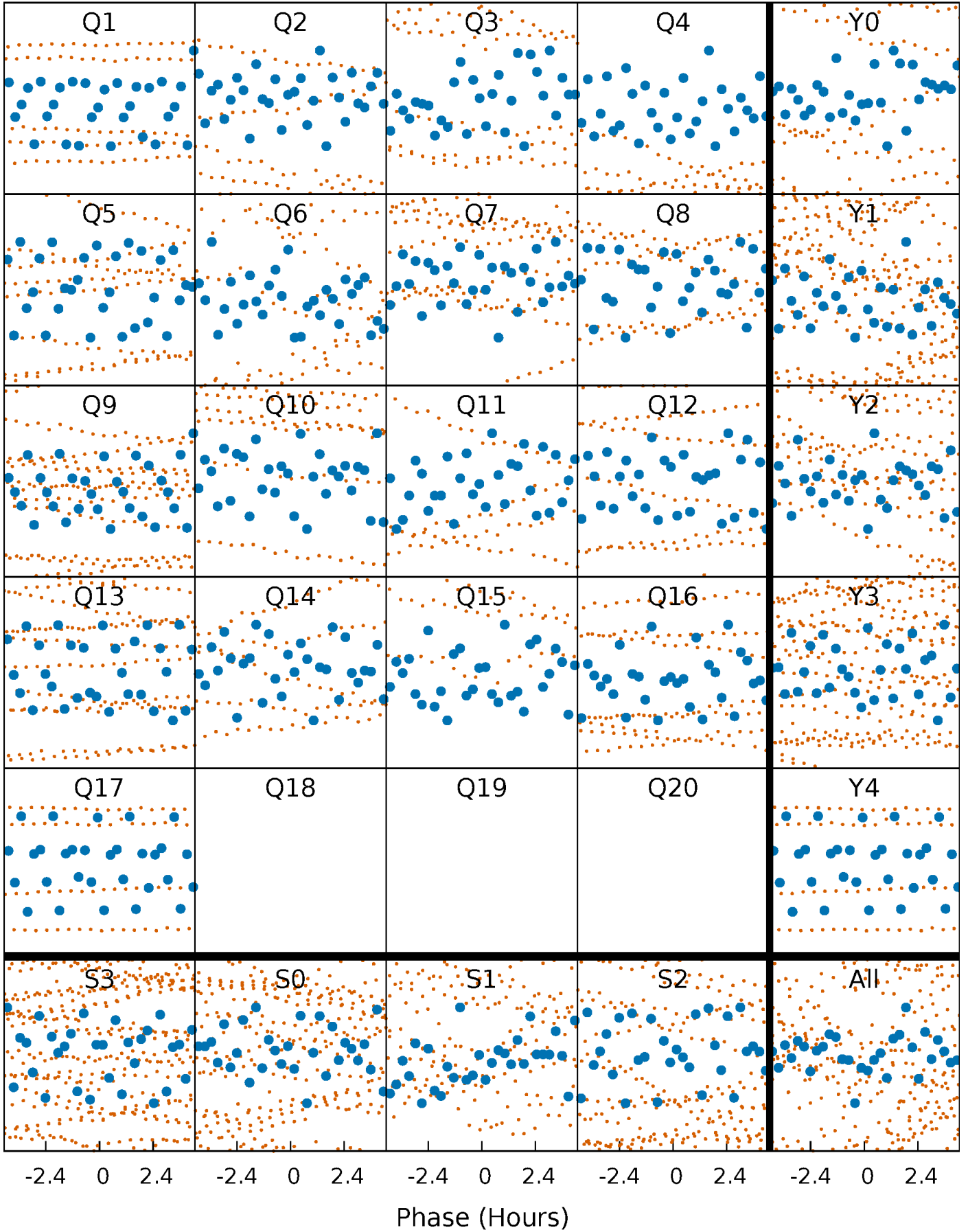


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



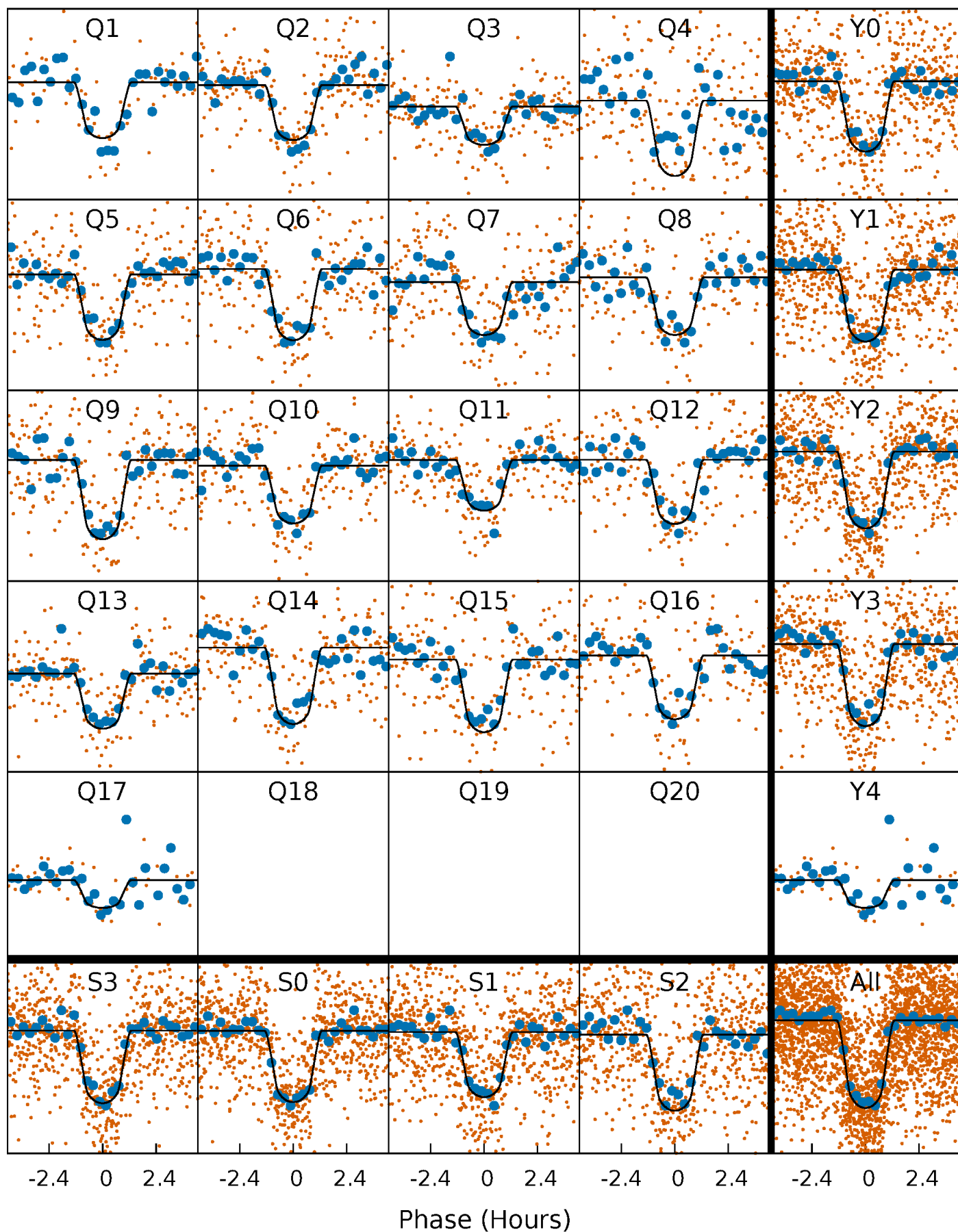
PDC Quarter-Phased Transit Curves

TCE 007509886-02 $P = 6.040477$ Days $T_0 = 136.350387$ (BKJD)



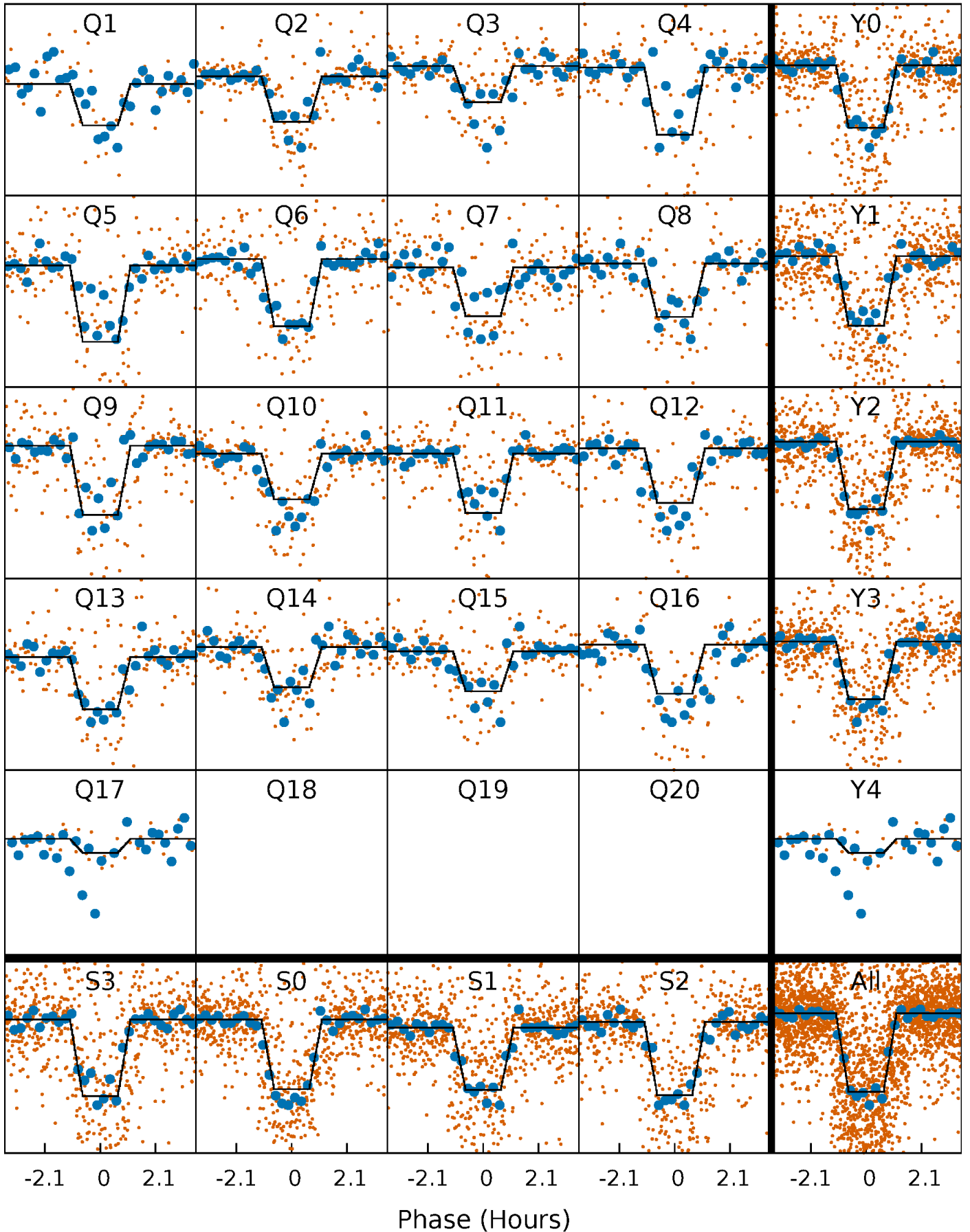
DV Quarter-Phased Transit Curves

TCE 007509886-02 P= 6.040477 Days $T_0=136.350387$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

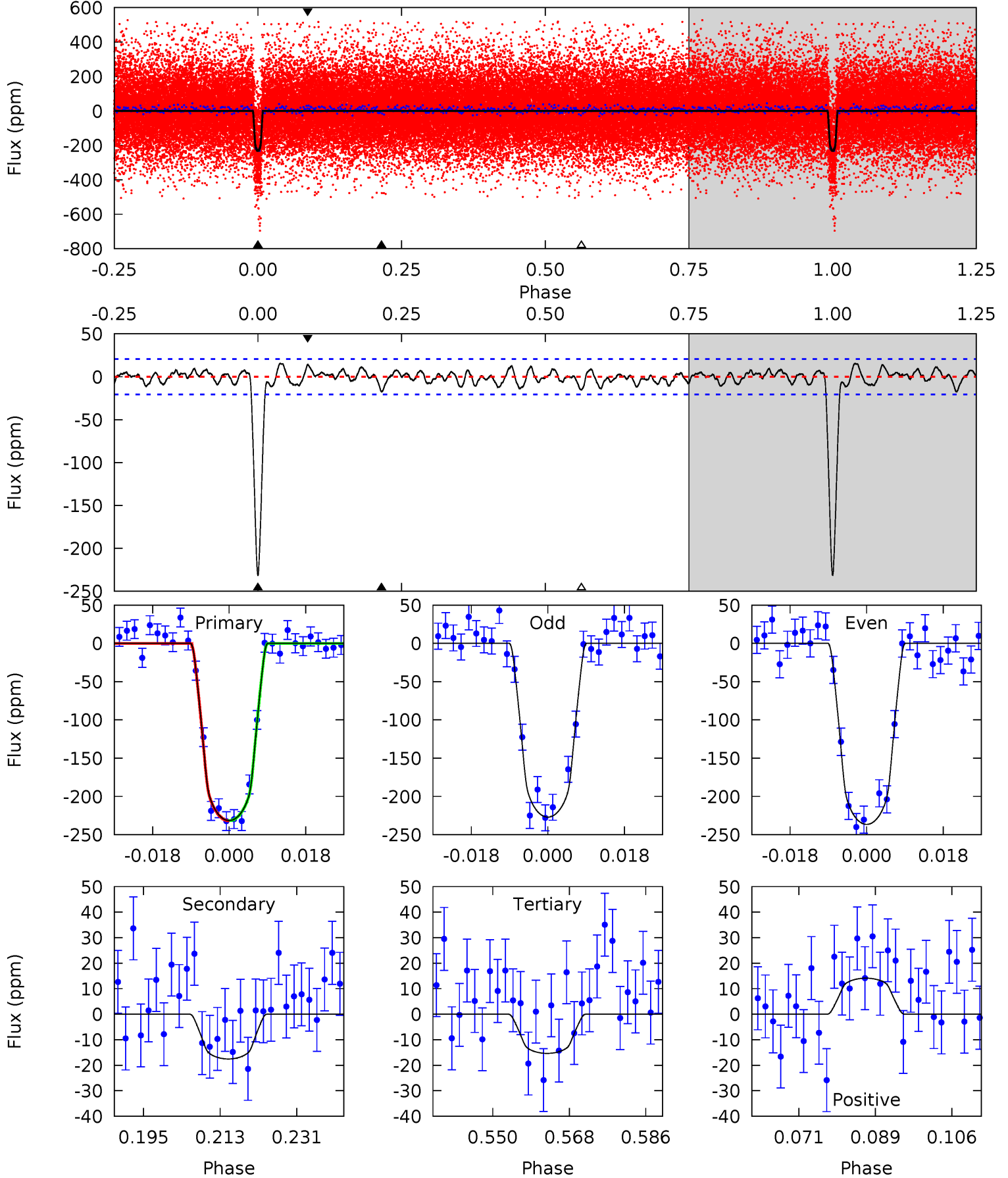
TCE 007509886-02 $P = 6.040469$ Days $T_0 = 136.350030$ (BKJD)



DV Model-Shift Uniqueness Test

007509886-02, P = 6.040477 Days, E = 130.309910 Days

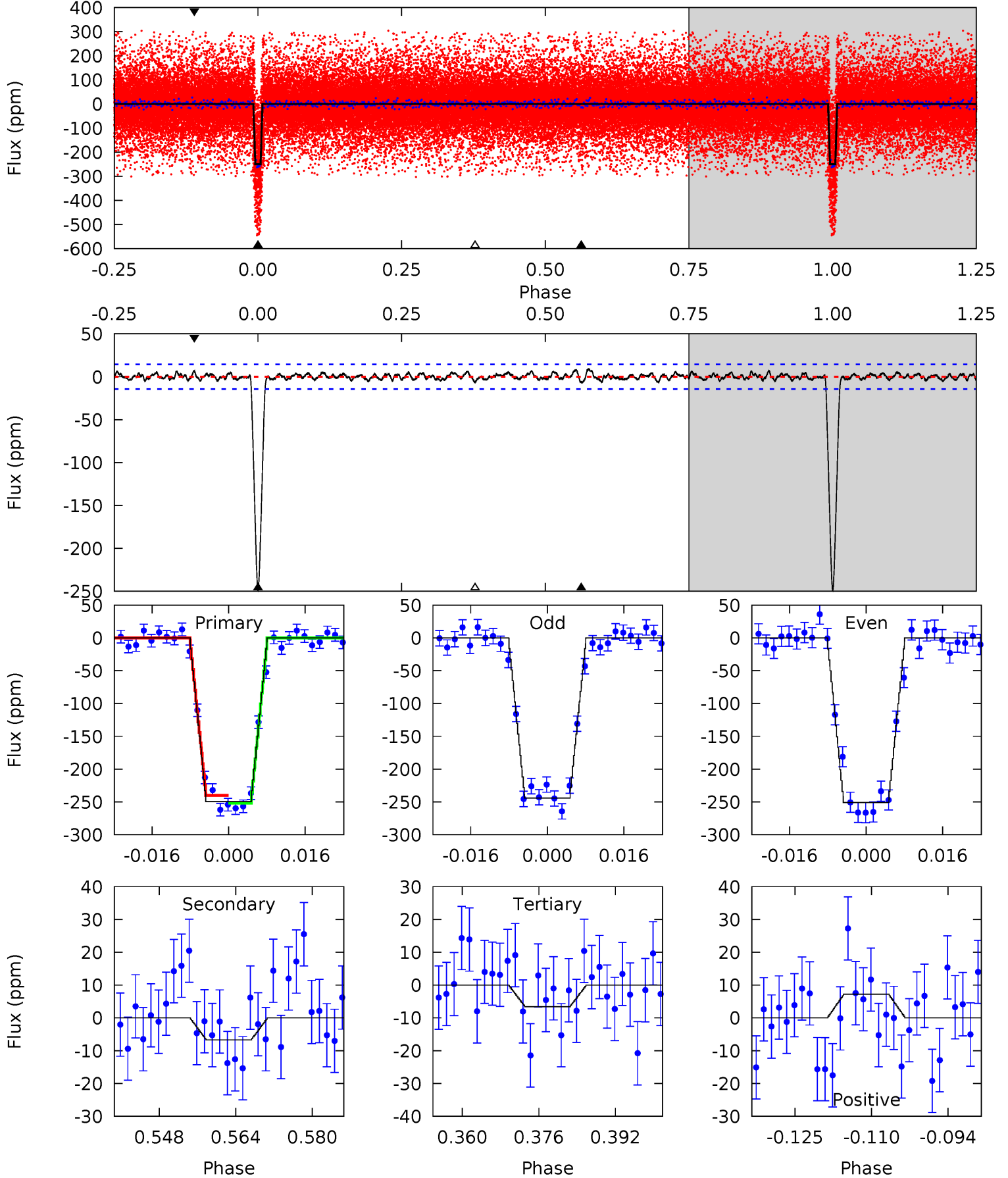
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
55.2	4.18	3.66	3.36	4.92	2.37	1.42	51.5	51.8	0.52	0.82	1.14	0.97	0.06	0.04



Alt Model-Shift Uniqueness Test

007509886-02, P = 6.040469 Days, E = 130.309561 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
85.4	2.30	2.26	2.46	4.94	2.42	0.88	83.2	83.0	0.04	-0.16	1.14	0.90	0.03	2.04



Stellar Parameters For KIC 007509886

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5297^{+95}_{-116}	$4.578^{+0.014}_{-0.081}$	$0.210^{+0.150}_{-0.150}$	$0.825^{+0.068}_{-0.034}$	$0.938^{+0.027}_{-0.077}$	$2.354^{+0.198}_{-0.537}$
	+2%/-2%	+0%/-2%	+71%/-71%	+8%/-4%	+3%/-8%	+8%/-23%
Source	SPE59	SPE59	SPE59	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 007509886-02 / KOI 0678.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-18 ± 4	$1.57^{+0.32}_{-0.31}$	1186^{+34}_{-31}	3166^{+258}_{-200}	15^{+10}_{-5}
Alt.	-7 ± 3	$1.35^{+0.33}_{-0.29}$	1191^{+35}_{-31}	2891^{+291}_{-278}	$8.045^{+7.379}_{-4.239}$

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

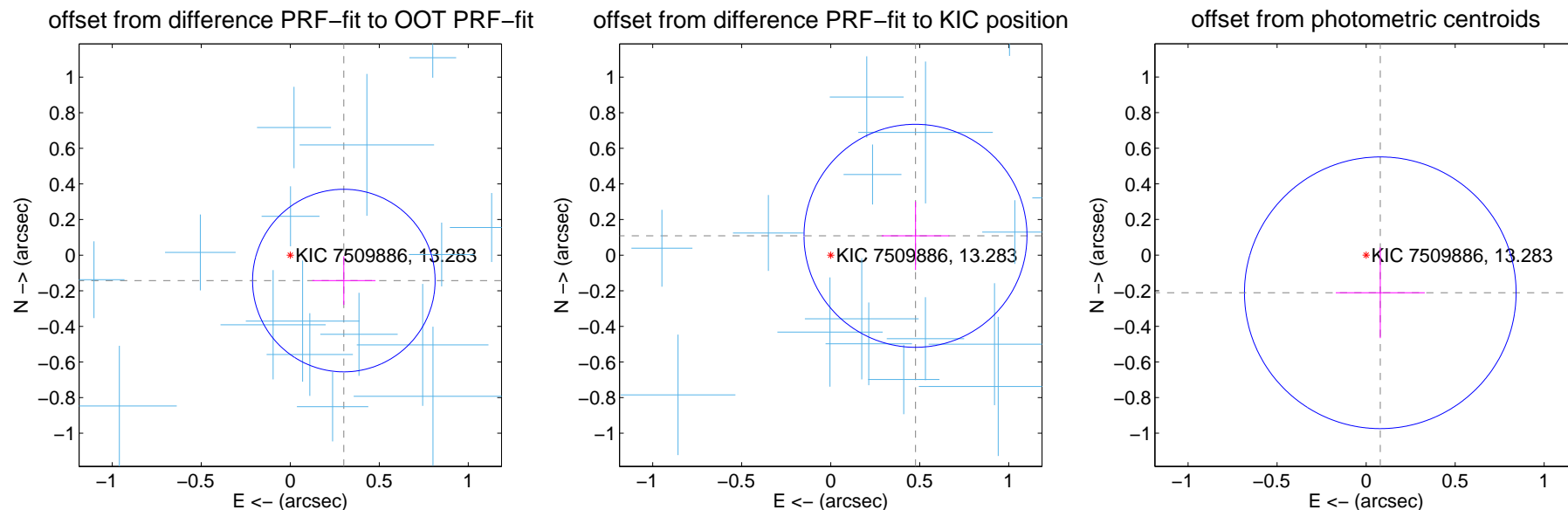
DV Centroid Data

Supplemental centroid analysis for 007509886-02. Kepler magnitude: 13.28. Transit SNR 35.79

There are 17 quarters with good PRF difference image offsets

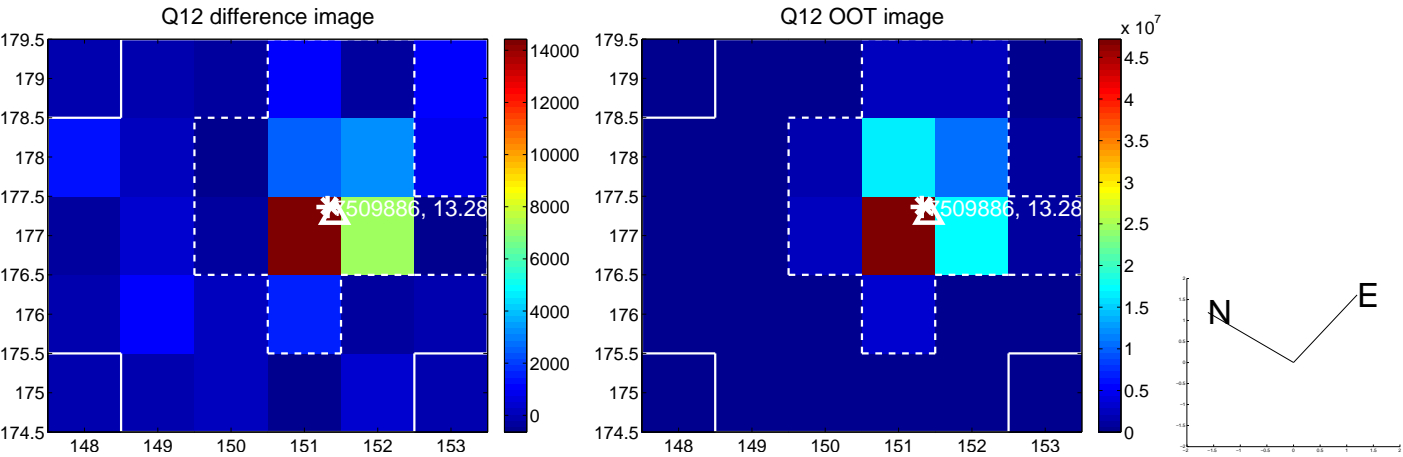
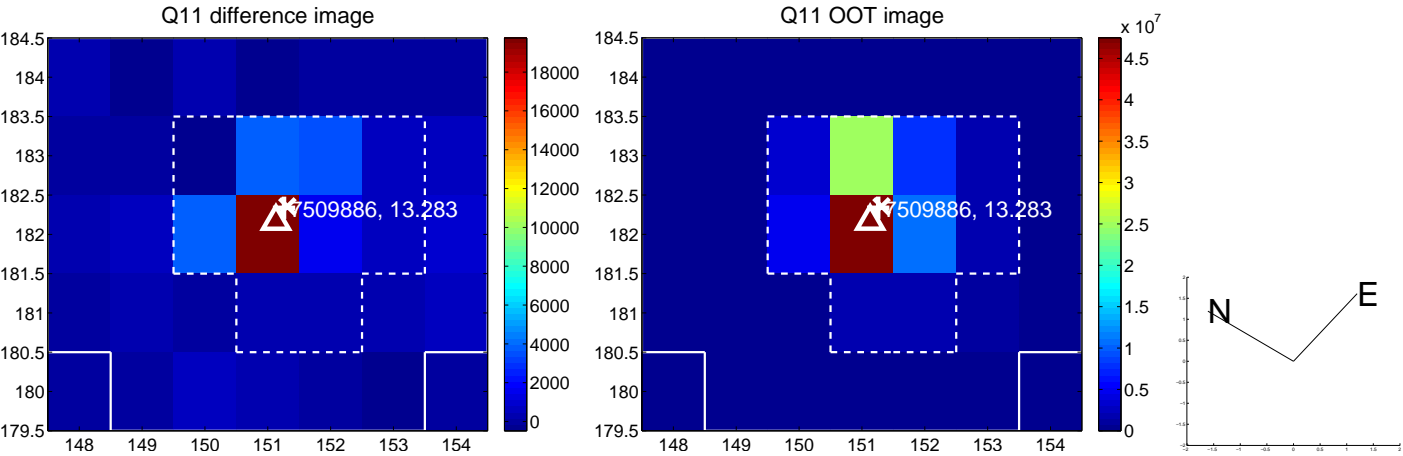
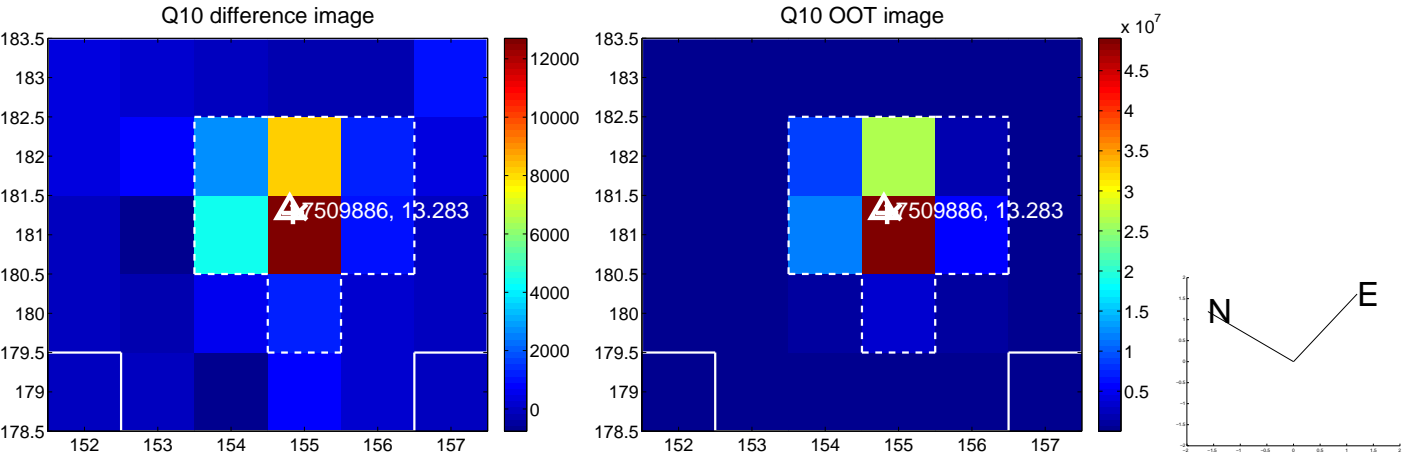
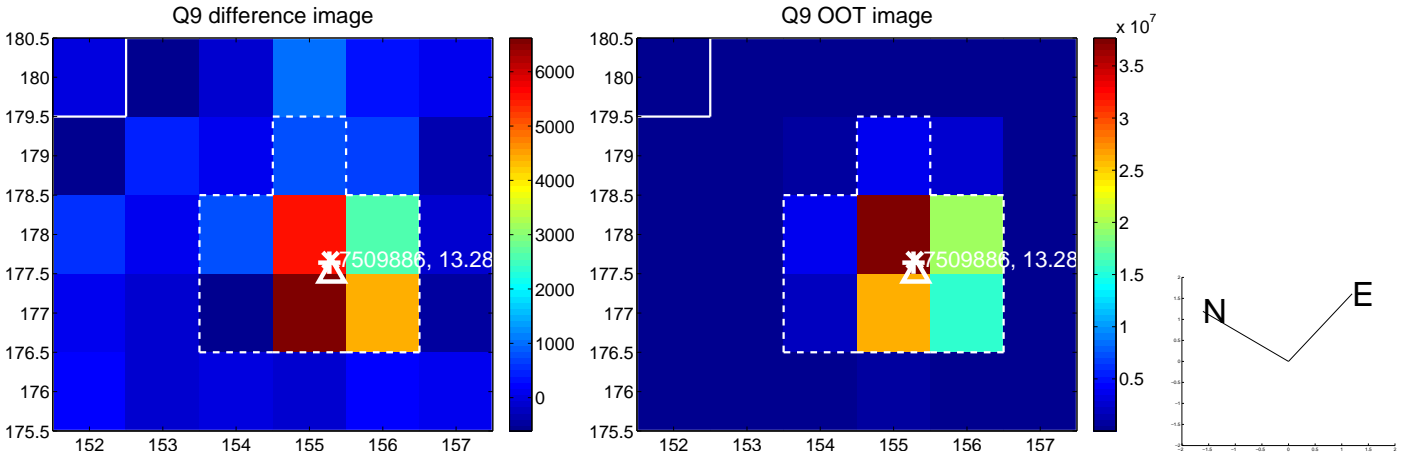
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.333 ± 0.171	1.95	-0.301 ± 0.178	-0.143 ± 0.136
PRF-fit source offset from KIC position	0.488 ± 0.209	2.34	-0.476 ± 0.190	0.109 ± 0.192
photometric centroid source offset	0.23 ± 0.25	0.89	-0.08 ± 0.25	-0.21 ± 0.25

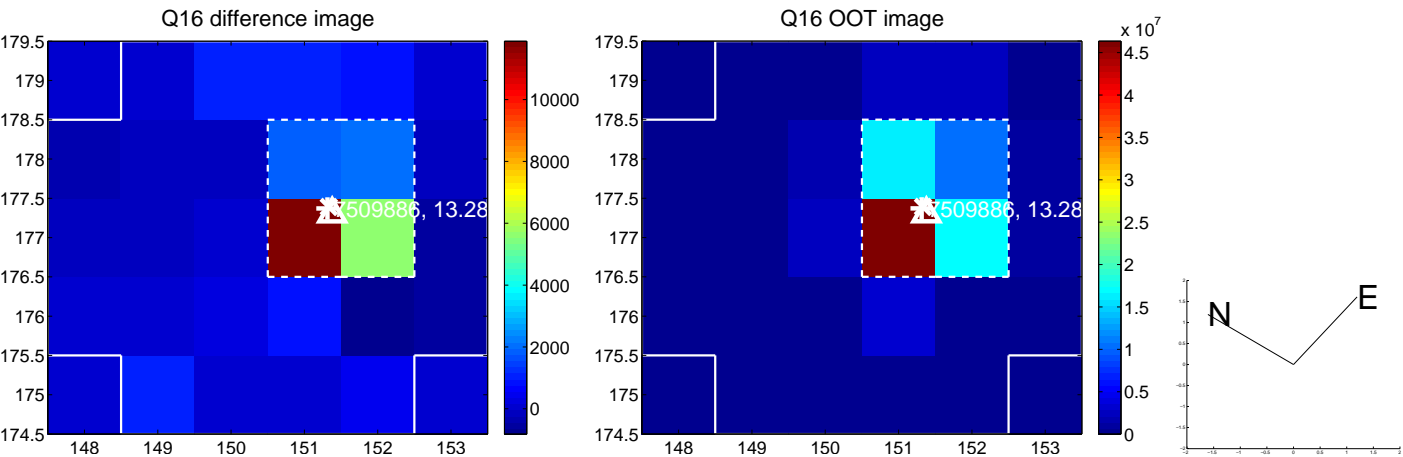
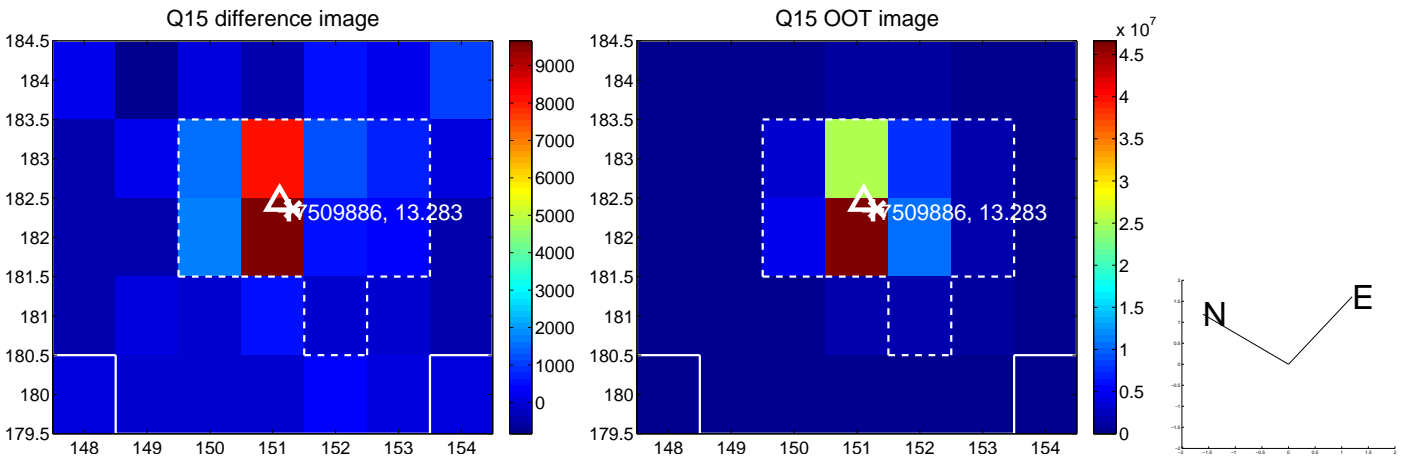
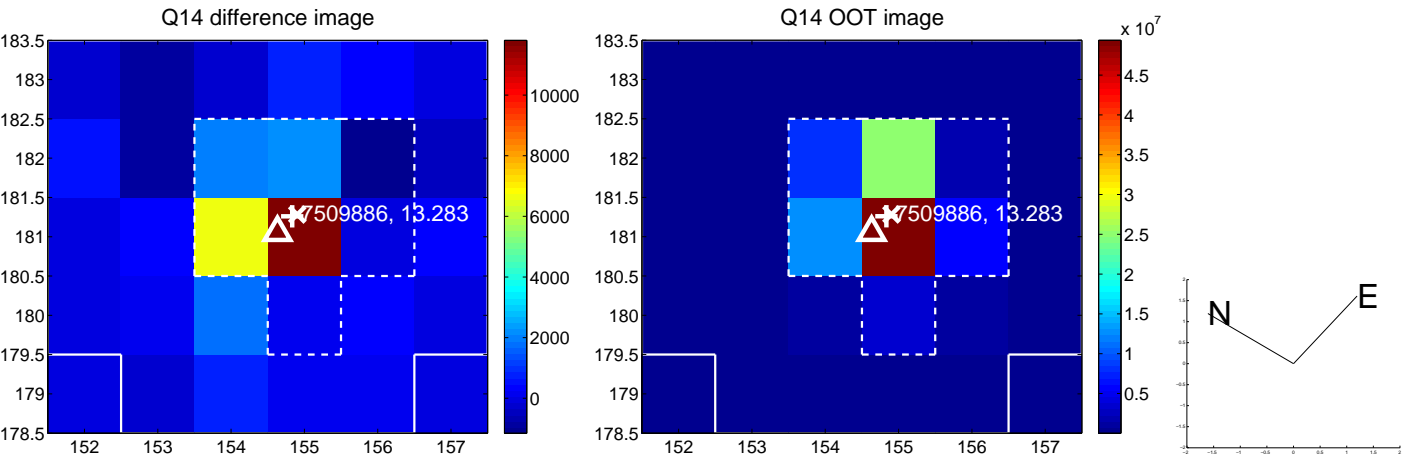
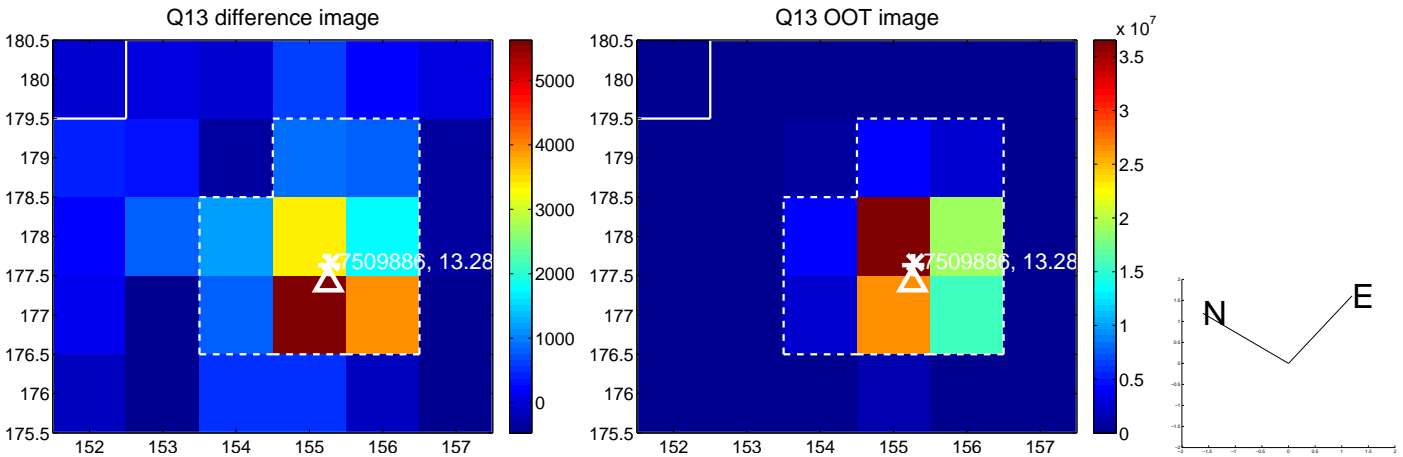


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

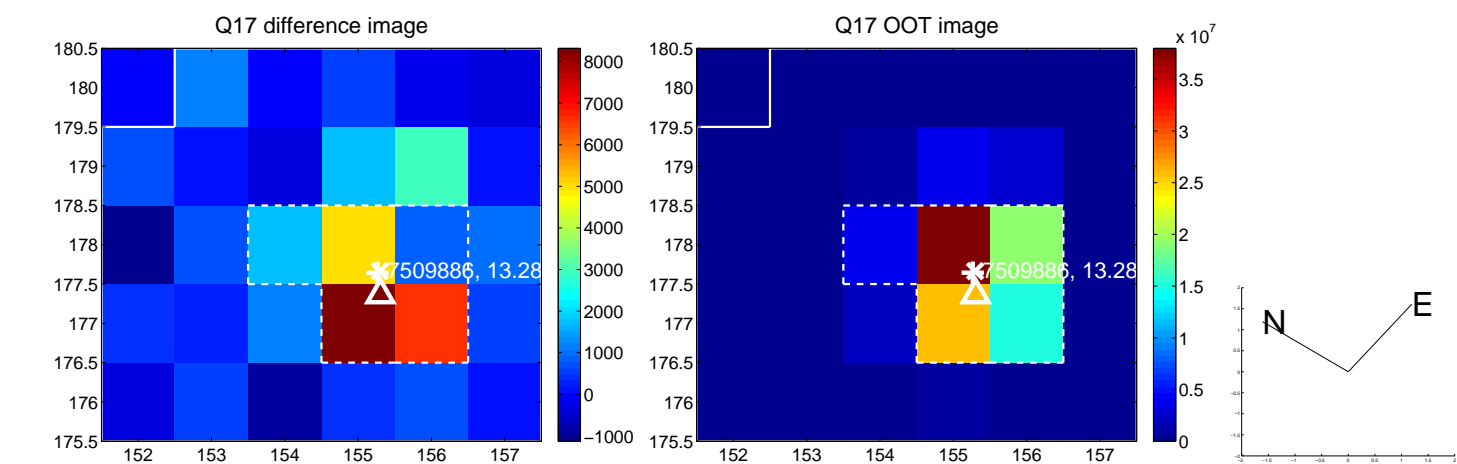
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



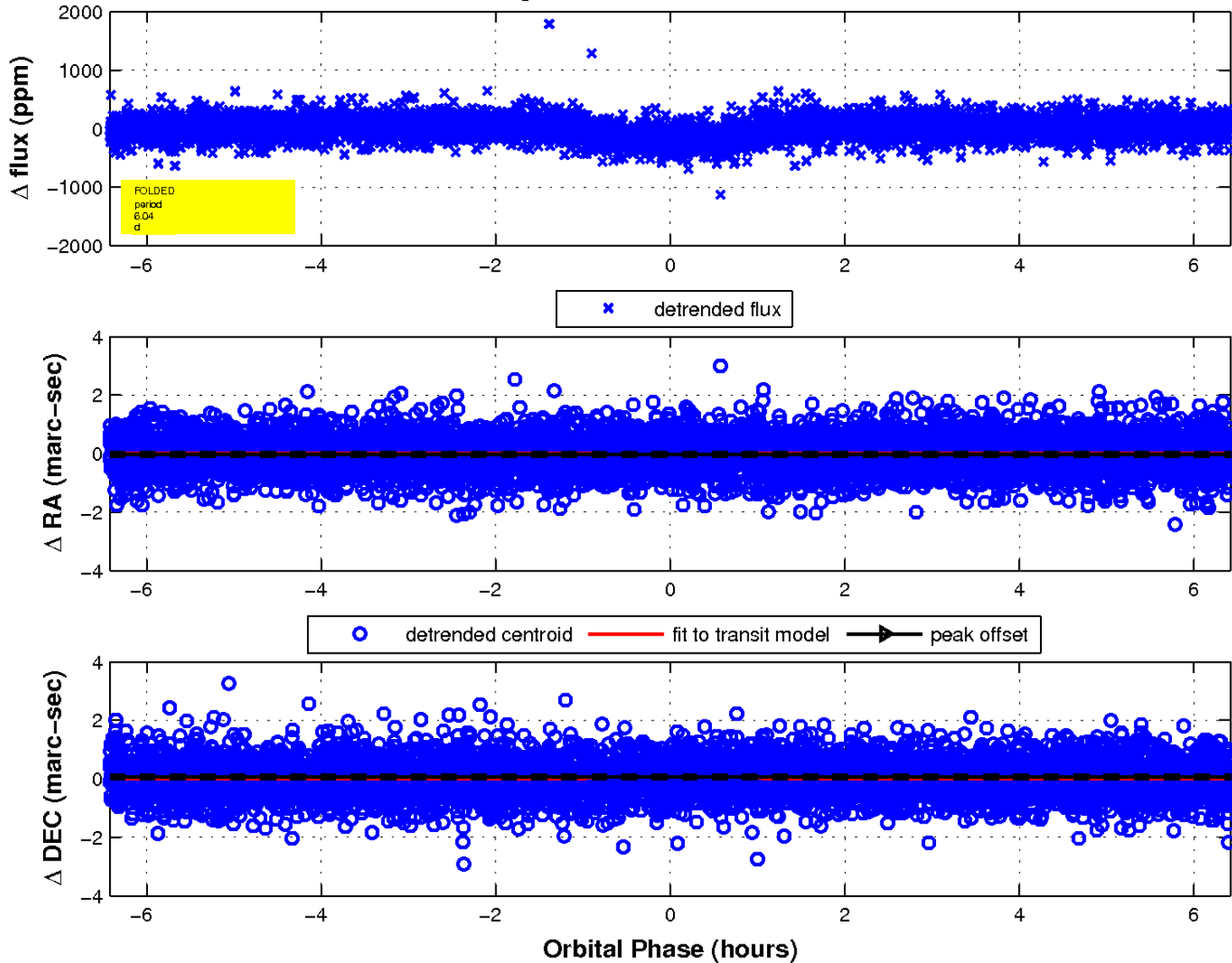
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

