

KIC 008168187

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})
008168187-01	OBS	2209.01	18.302828	142.888671	185.1	8.494	20.6	21.6	1.84	5528	2.90	157.11
008168187-02	OBS	2209.02	35.502016	150.402796	101.9	10.119	9.4	9.1	1.84	5528	2.10	64.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008168187-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
008168187-02	OBS	PC	0.90	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.

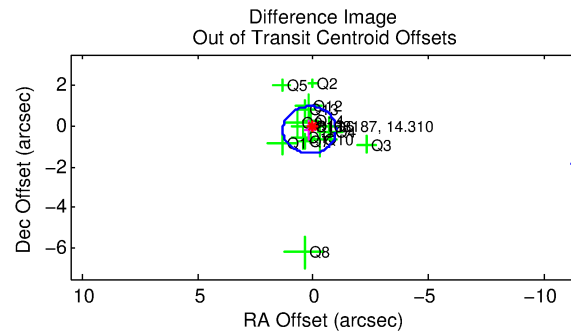
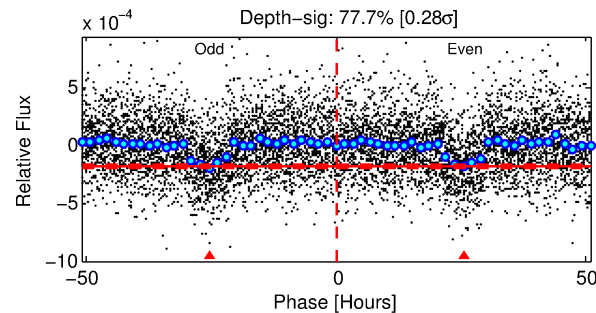
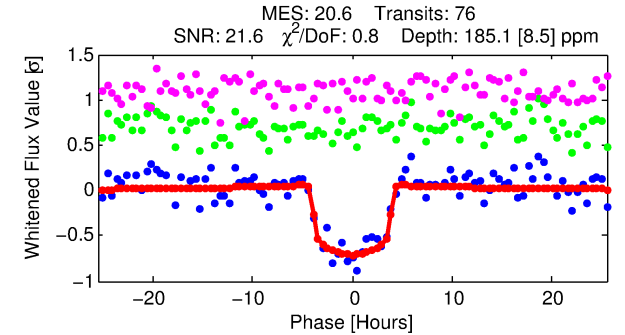
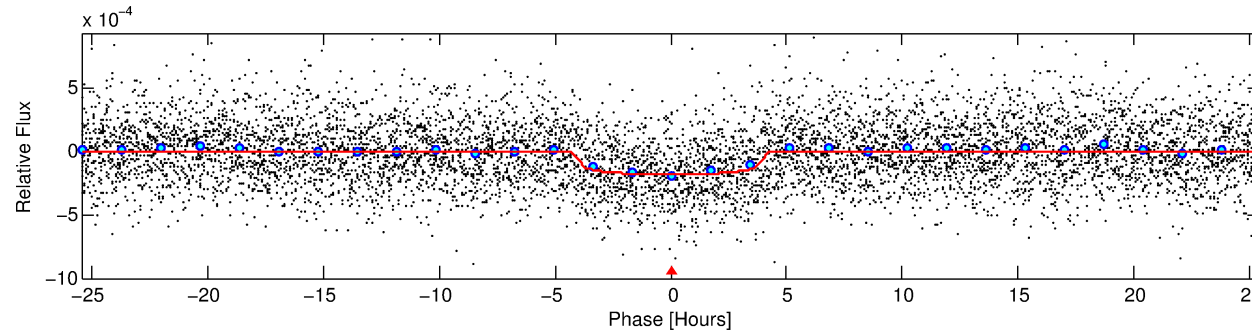
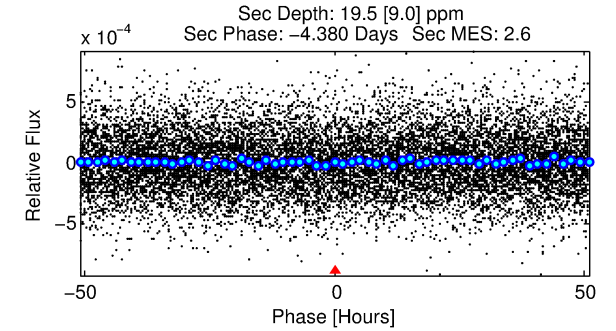
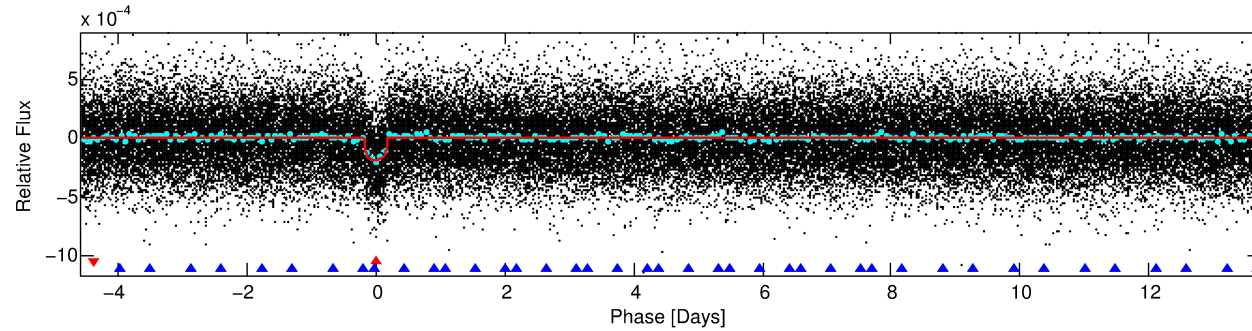
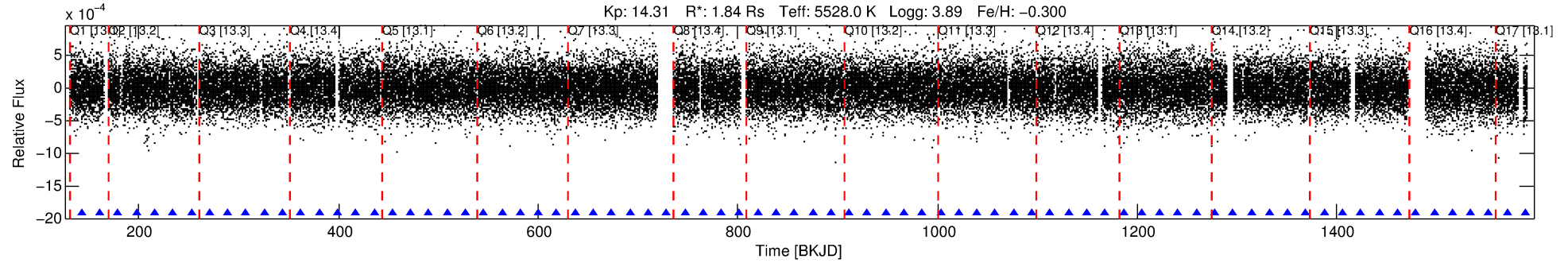
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008168187-01

No Significant Match Found

DV One-Page Summary

KIC: 8168187 Candidate: 1 of 2 Period: 18.303 d
KOI: K02209.01 Corr: 0.980



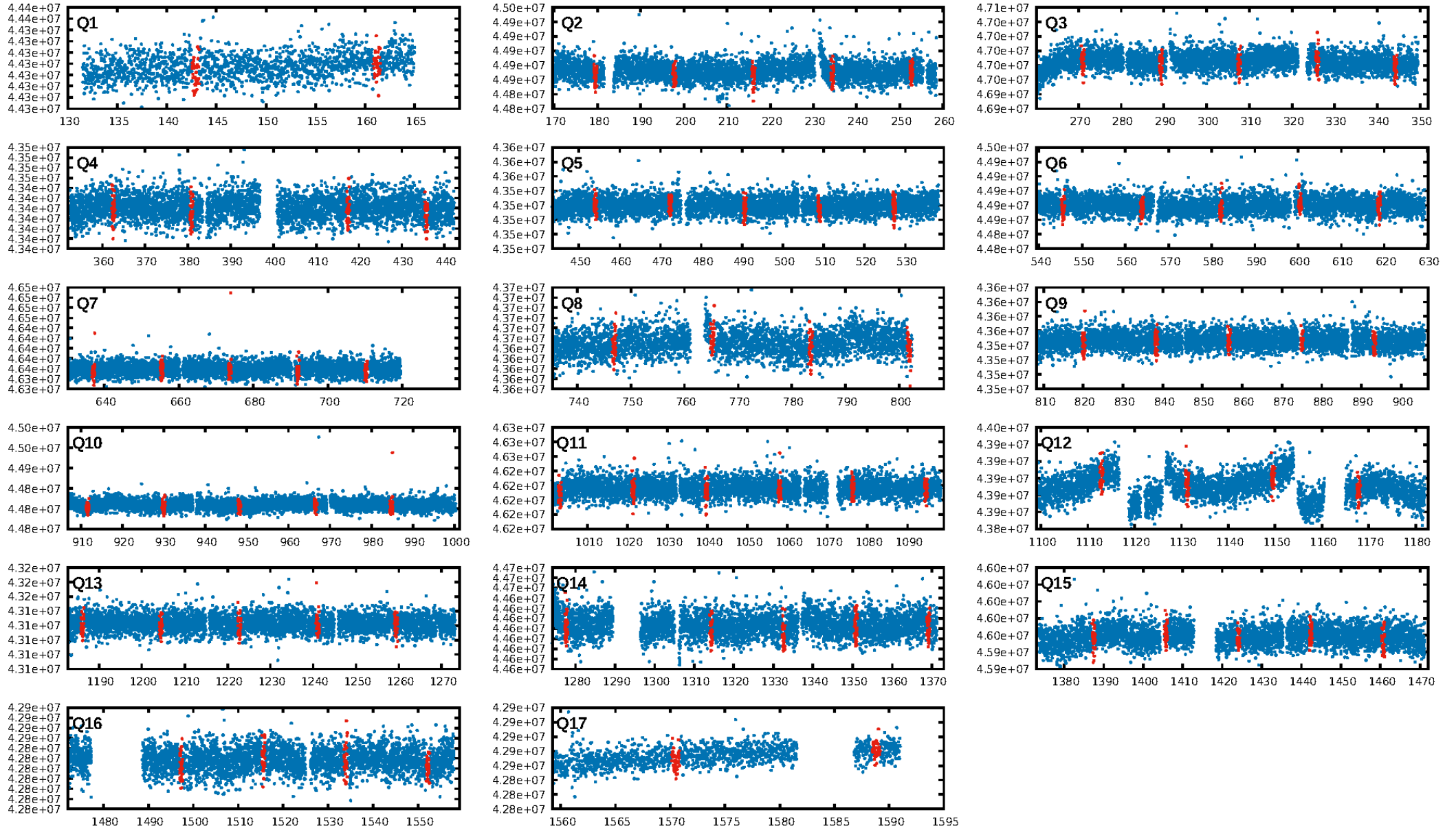
DV Fit Results:

Period = 18.30283 [0.00015] d
Epoch = 142.8887 [0.0068] BKJD
Rp/R* = 0.0144 [0.0020]
a/R* = 8.68 [5.42]
b = 0.87 [0.18]
Seff = 157.11 [39.57]
Teq = 903 [57] K
Rp = 2.90 [0.80] Re
a = 0.1342 [0.0247] AU
Ag = 23.01 [13.64] [1.61σ]
Teffp = 3057 [416] K [5.13σ]

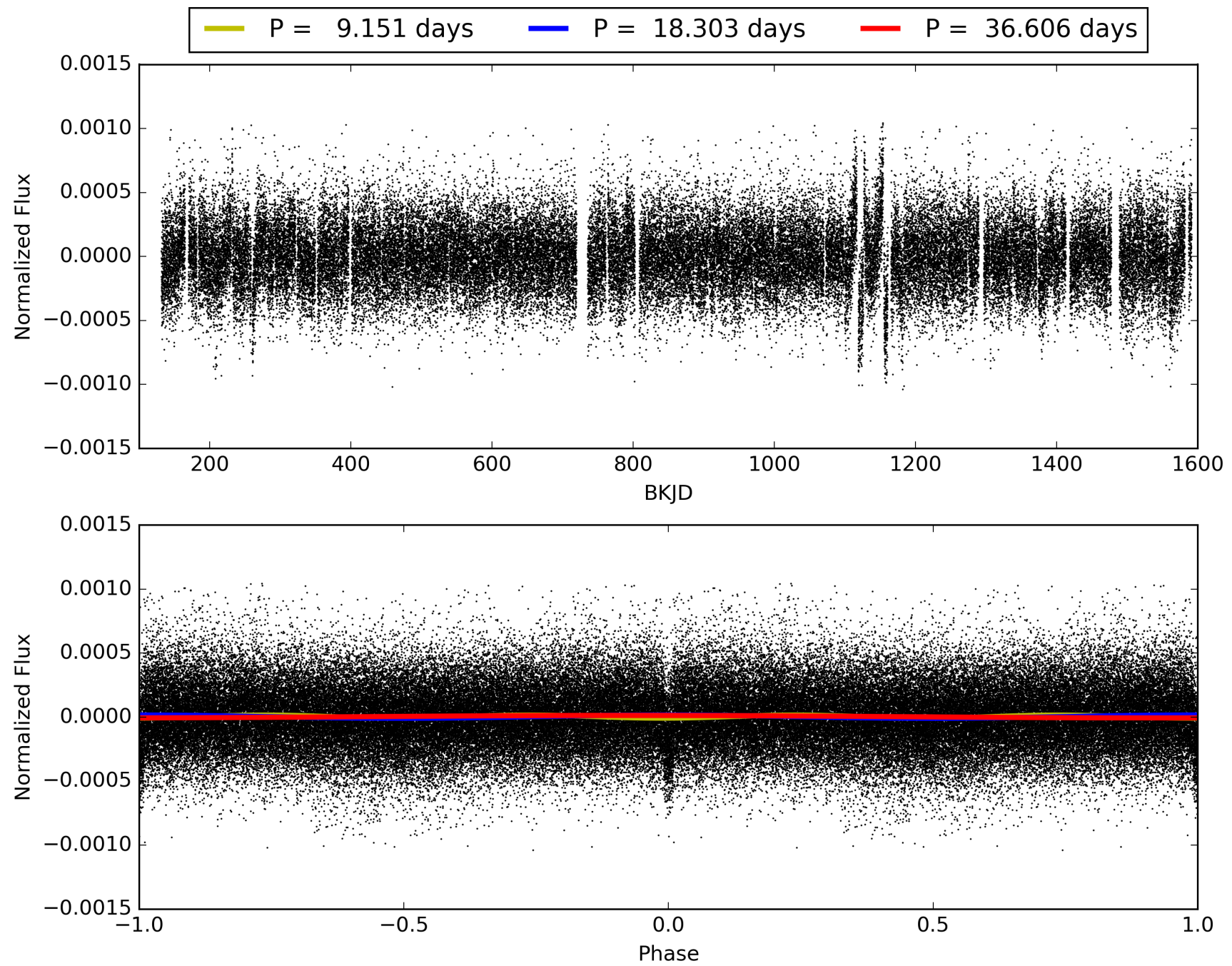
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [31.24σ]
ModelChiSquare2-sig: 88.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.64e-93
RollingBand-fgt: 1.00 [72/72]
GhostDiagnostic-chr: 3.077
Centroid-sig: 20.4%
Centroid-so: 0.907 arcsec [1.51σ]
OotOffset-rm: 0.254 arcsec [0.66σ]
KicOffset-rm: 0.436 arcsec [1.21σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.87 [13/15]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 008168187-01, PDC Light Curves

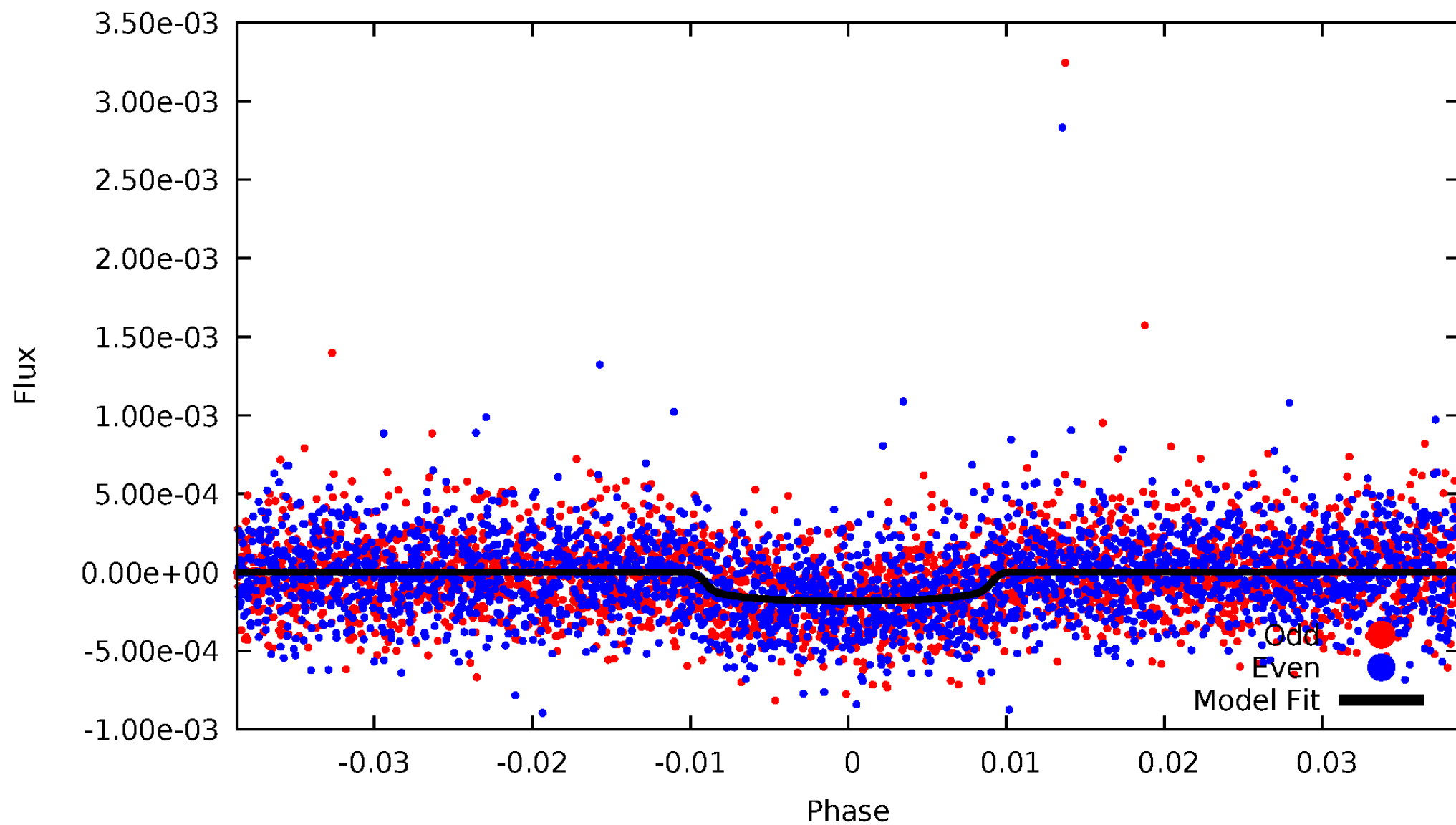


TCE 008168187-01



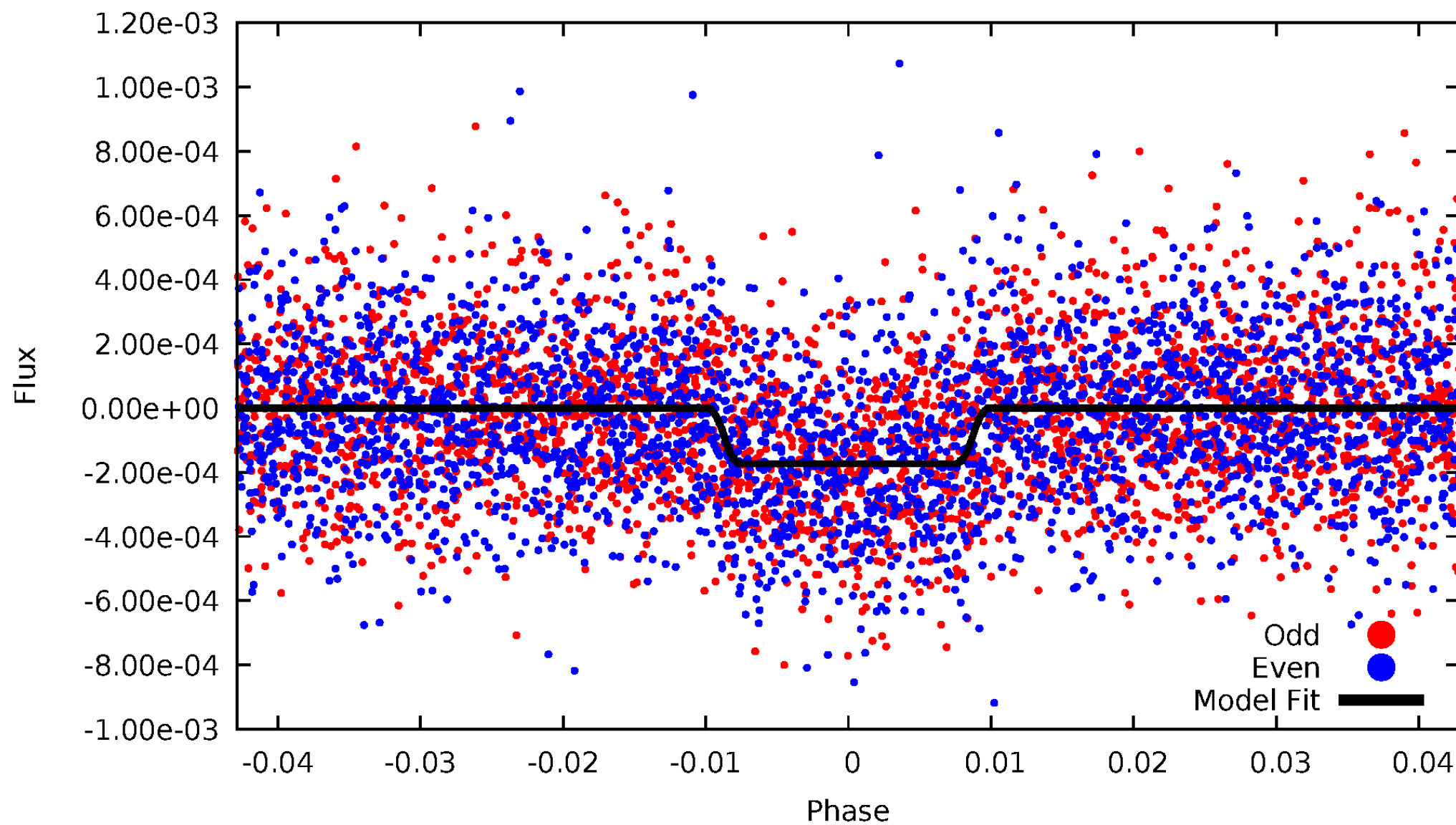
DV Odd/Even

TCE 008168187-01



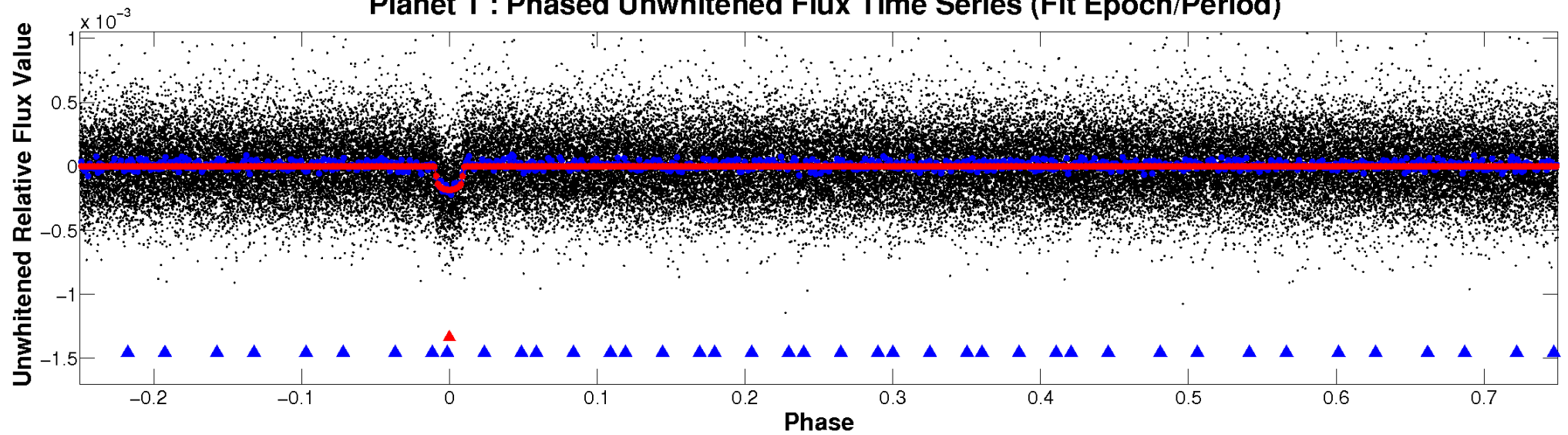
ALT Odd/Even

TCE 008168187-01

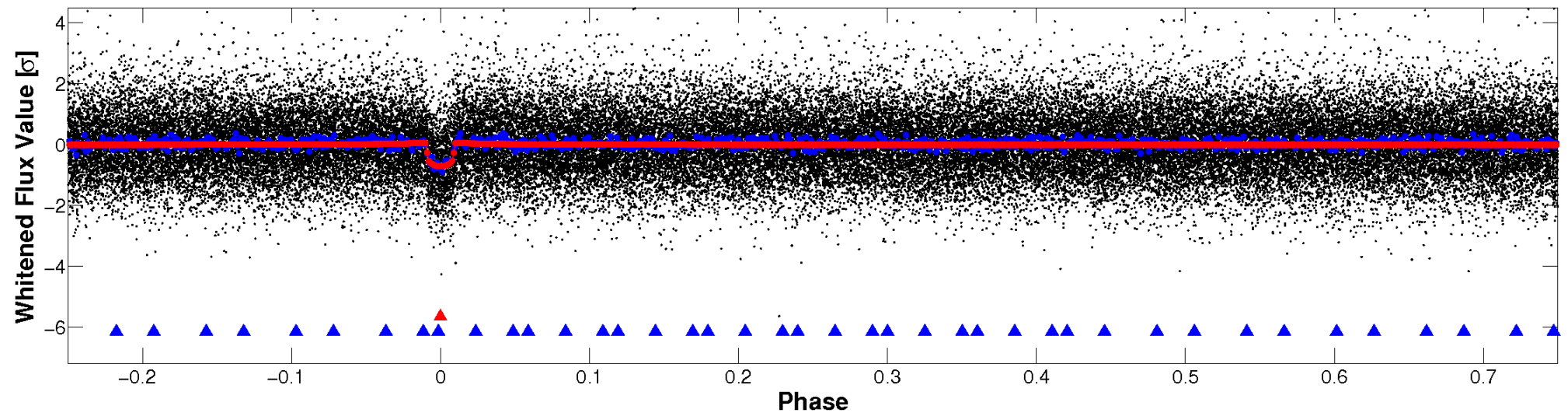


Non-Whitened Vs. Whitened Light Curve

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

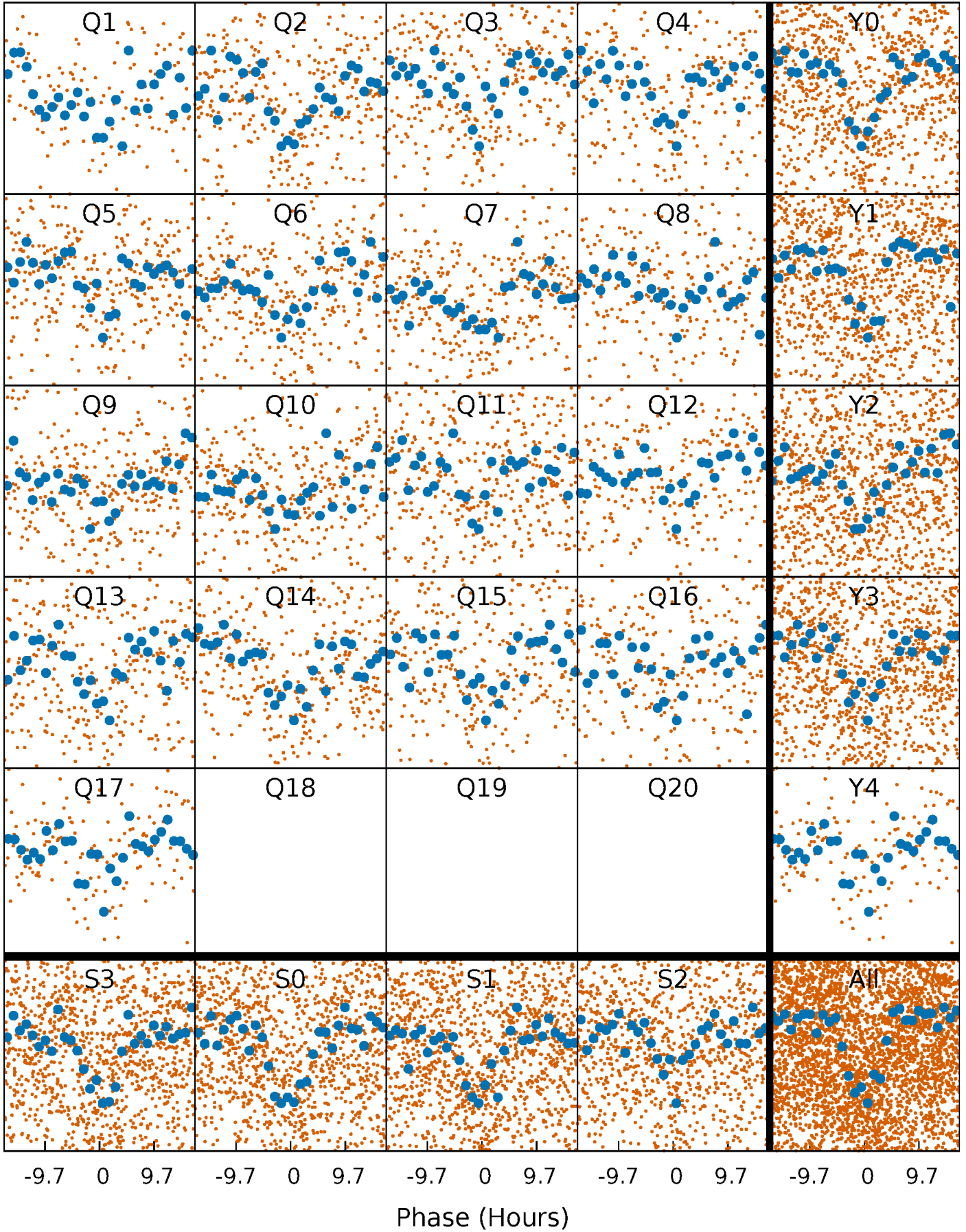


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



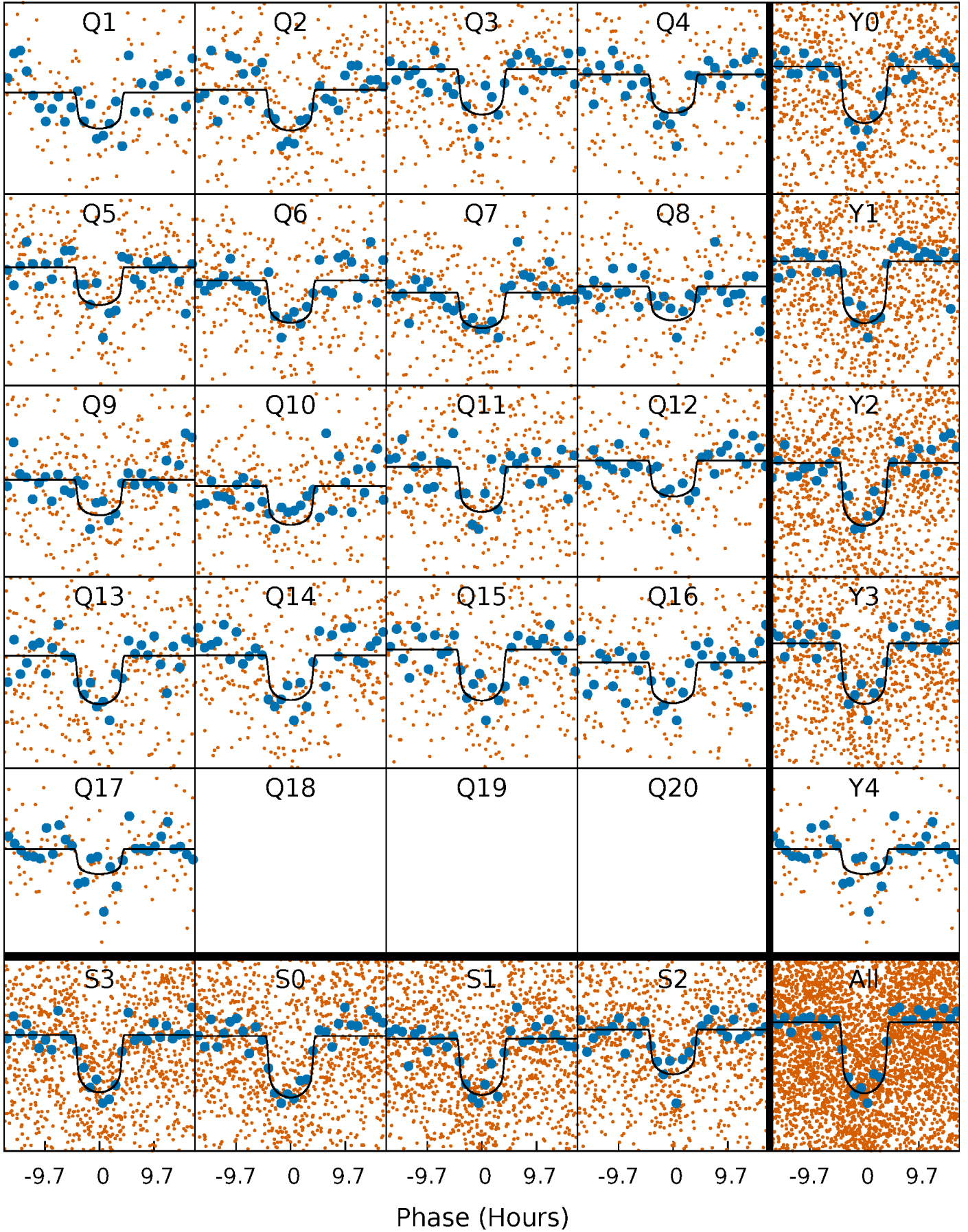
PDC Quarter-Phased Transit Curves

TCE 008168187-01 P= 18.302828 Days $T_0=142.888671$ (BKJD)



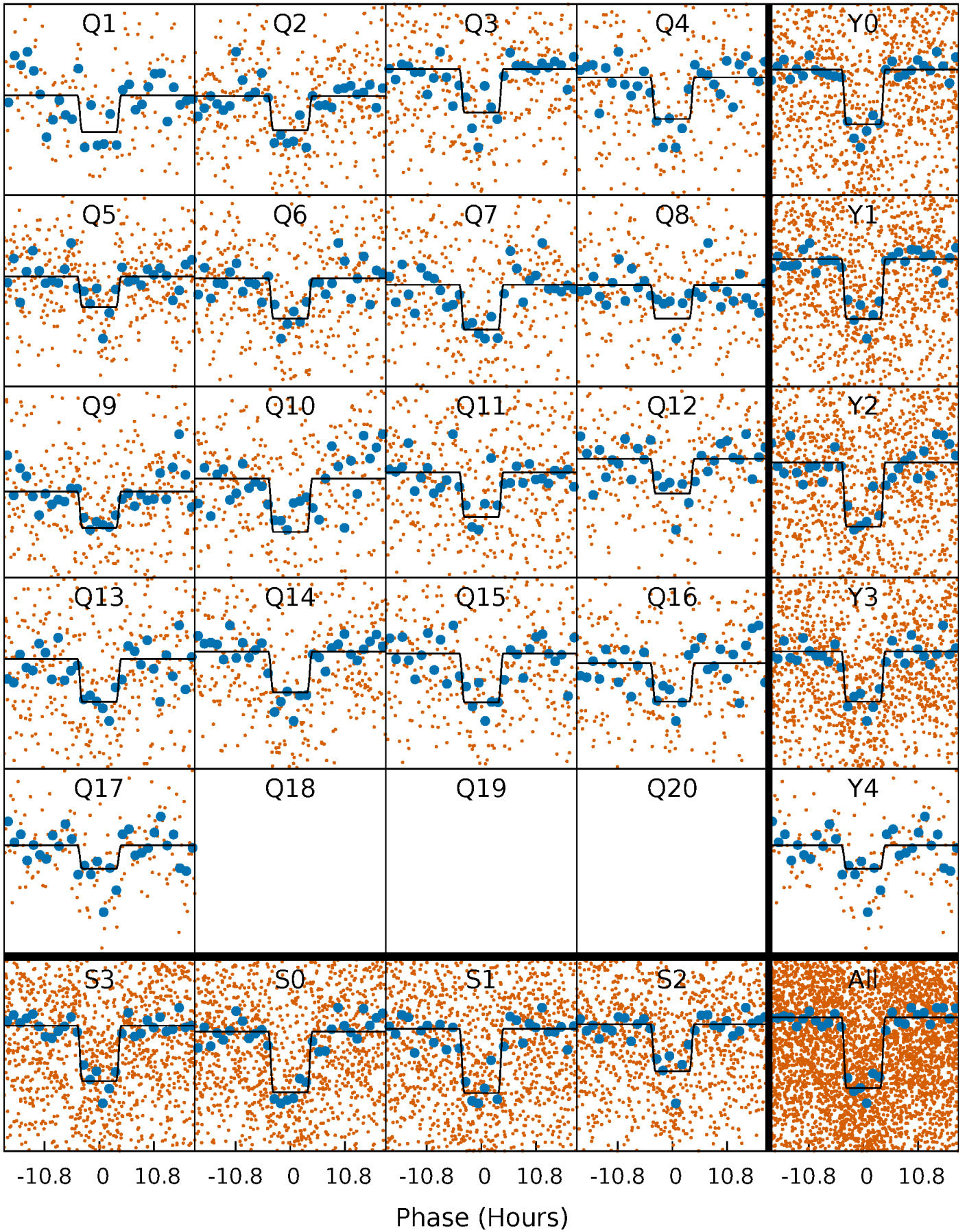
DV Quarter-Phased Transit Curves

TCE 008168187-01 P= 18.302828 Days $T_0=142.888671$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

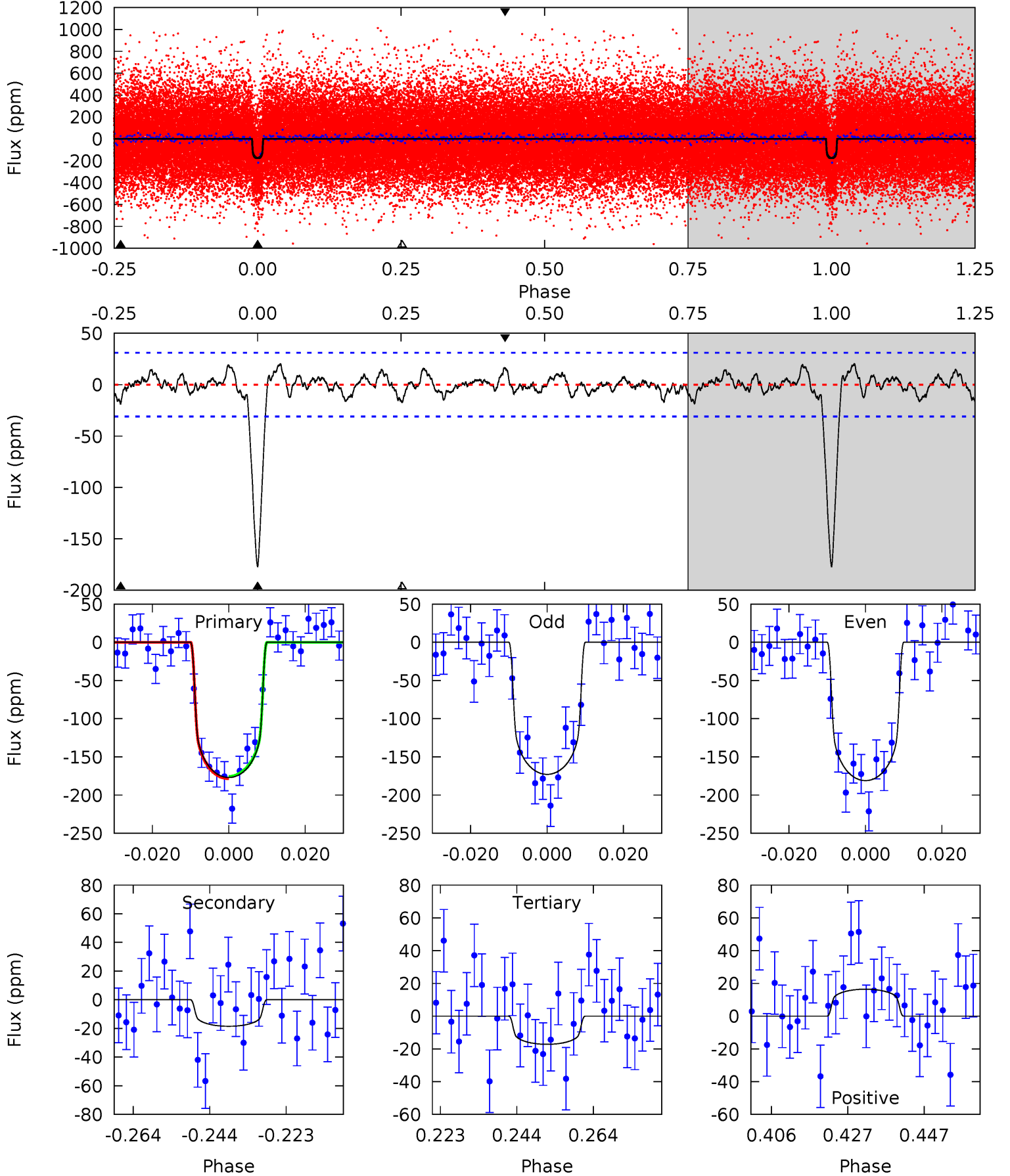
TCE 008168187-01 P= 18.302738 Days $T_0=142.890915$ (BKJD)



DV Model-Shift Uniqueness Test

008168187-01, P = 18.302828 Days, E = 124.585843 Days

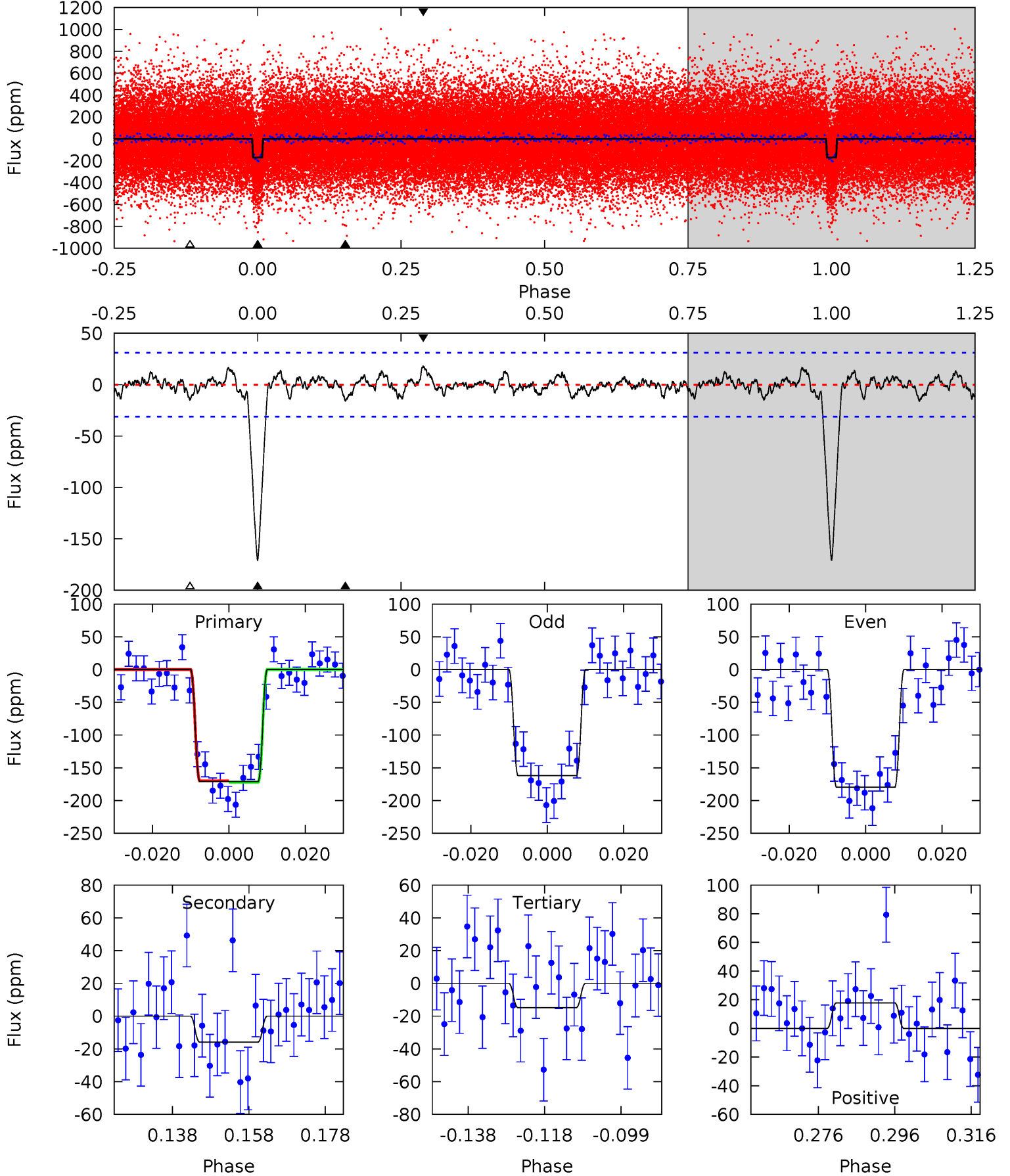
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.9	2.92	2.71	2.59	4.89	2.32	1.08	25.2	25.3	0.21	0.33	0.65	1.02	0.10	0.23



Alt Model-Shift Uniqueness Test

008168187-01, P = 18.302738 Days, E = 124.588177 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.9	2.49	2.33	2.81	4.89	2.33	0.93	24.6	24.1	0.16	-0.32	1.39	1.04	0.09	0.16



Stellar Parameters For KIC 008168187

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5528^{+88}_{-77}	$3.892^{+0.120}_{-0.120}$	$-0.300^{+0.150}_{-0.100}$	$1.839^{+0.440}_{-0.293}$	$0.962^{+0.154}_{-0.083}$	$0.218^{+0.129}_{-0.088}$
	+2%/-1%	+3%/-3%	+50%/-33%	+24%/-16%	+16%/-9%	+59%/-40%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 008168187-01 / KOI 2209.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-19 ± 6	$2.87^{+0.55}_{-0.47}$	1260^{+66}_{-56}	3497^{+263}_{-277}	22^{+14}_{-10}
Alt.	-16 ± 6	$2.68^{+0.49}_{-0.47}$	1266^{+63}_{-58}	3492^{+281}_{-296}	21^{+14}_{-10}

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 $A_{obs} \gg 1.0$

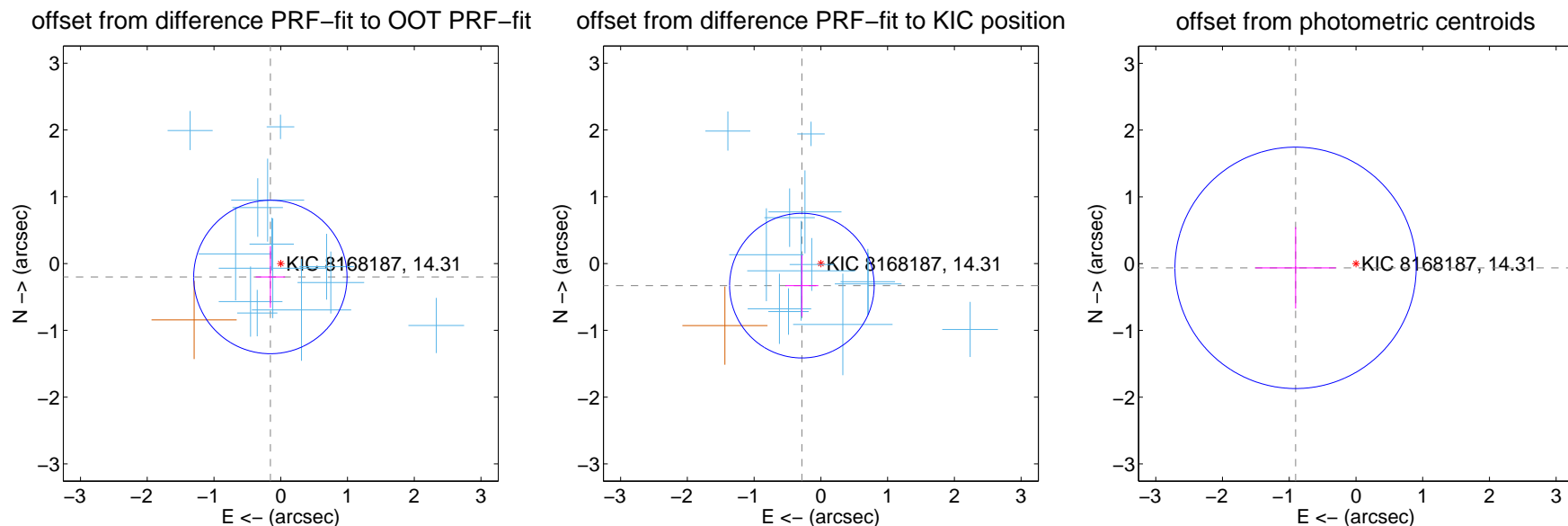
DV Centroid Data

Supplemental centroid analysis for 008168187-01. Kepler magnitude: 14.31. Transit SNR 21.62

There are 13 quarters with good PRF difference image offsets

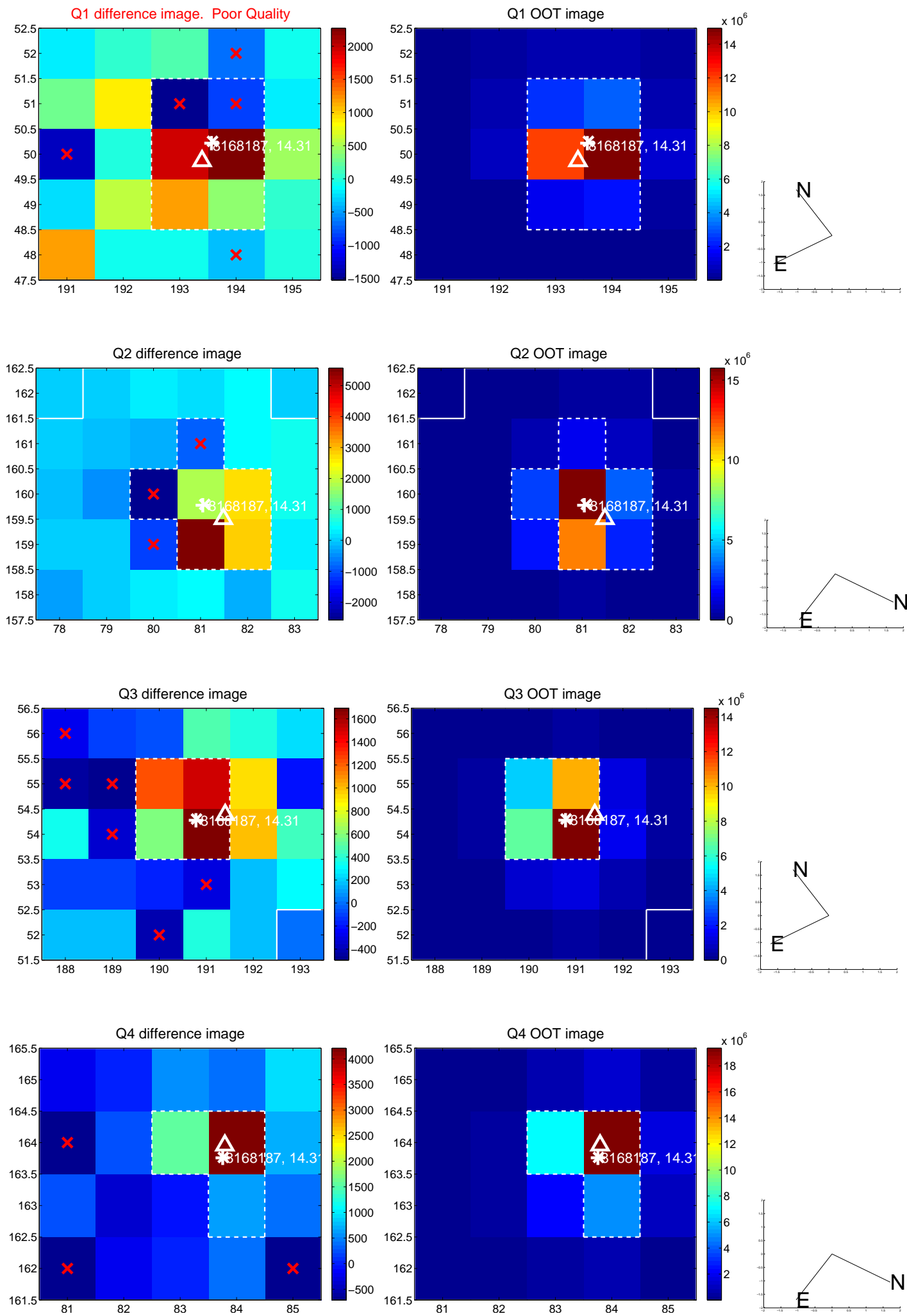
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.254 ± 0.383	0.66	0.156 ± 0.220	-0.201 ± 0.462
PRF-fit source offset from KIC position	0.436 ± 0.361	1.21	0.284 ± 0.247	-0.331 ± 0.458
photometric centroid source offset	0.91 ± 0.60	1.51	0.90 ± 0.60	-0.06 ± 0.61

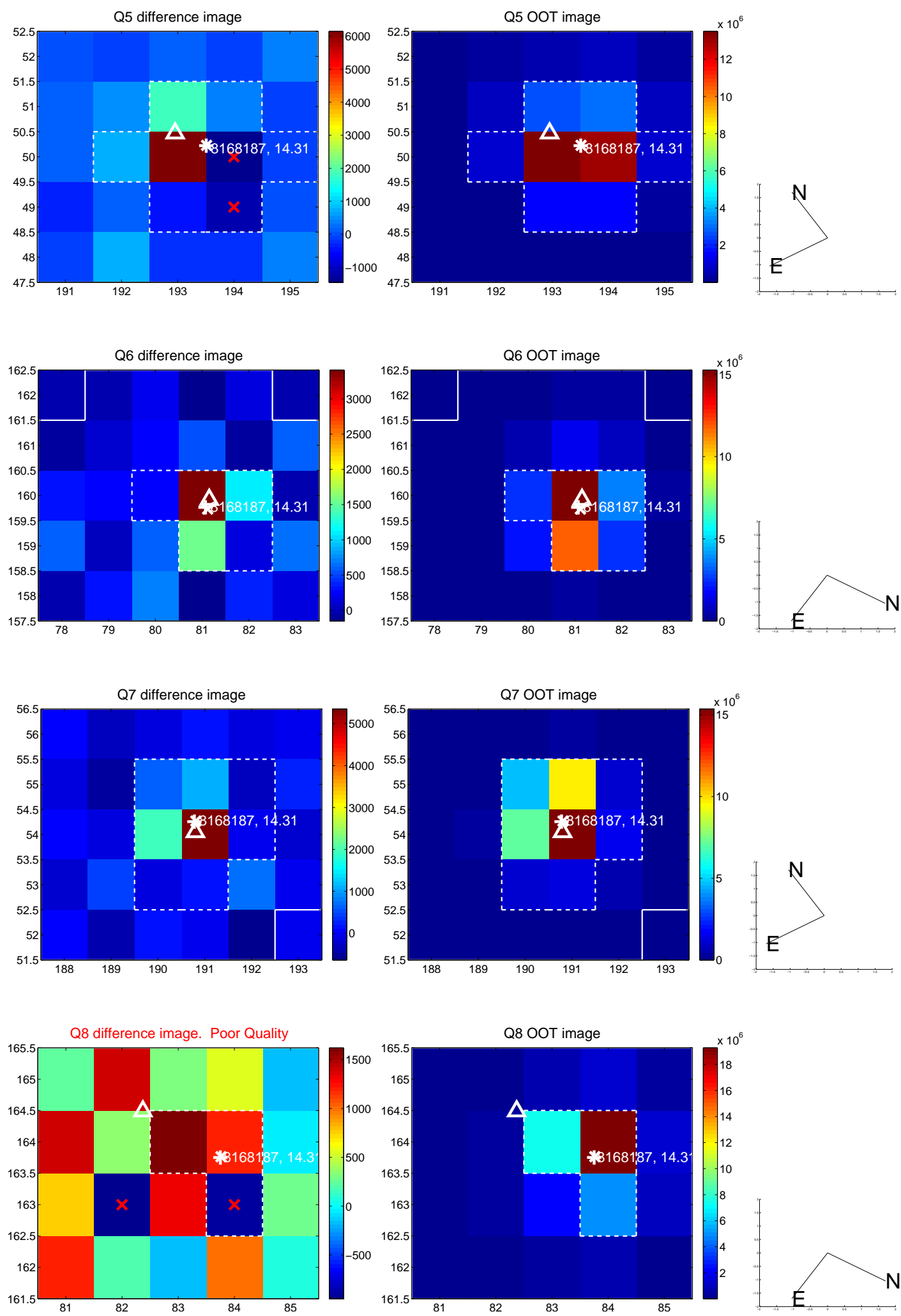


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

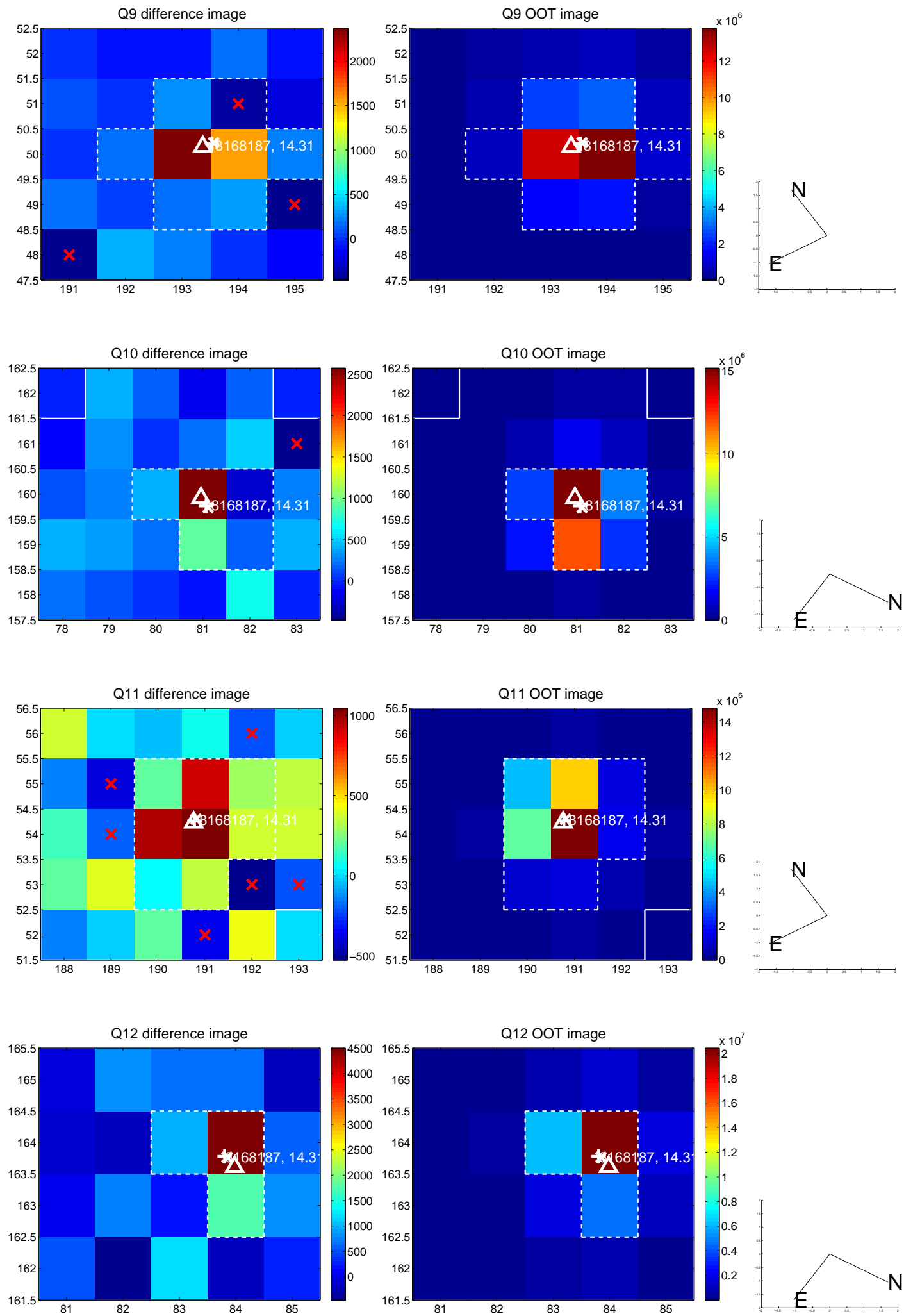
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



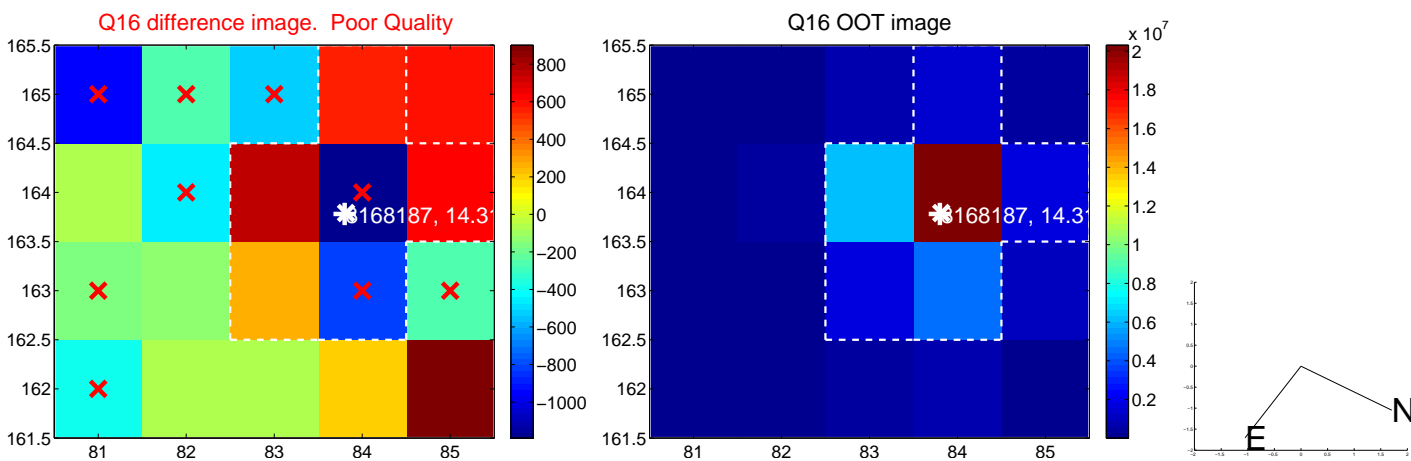
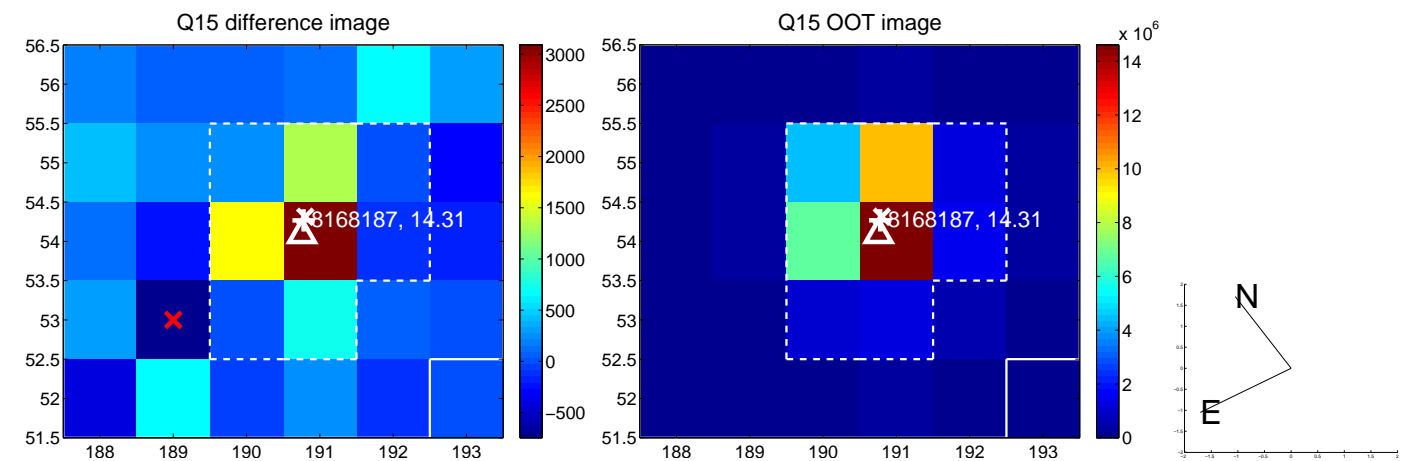
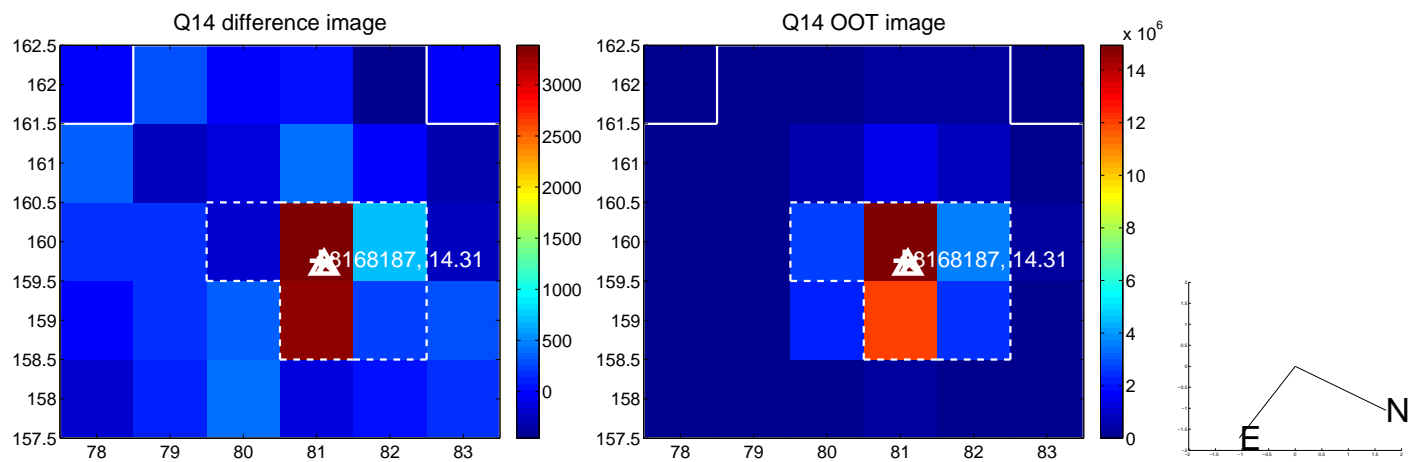
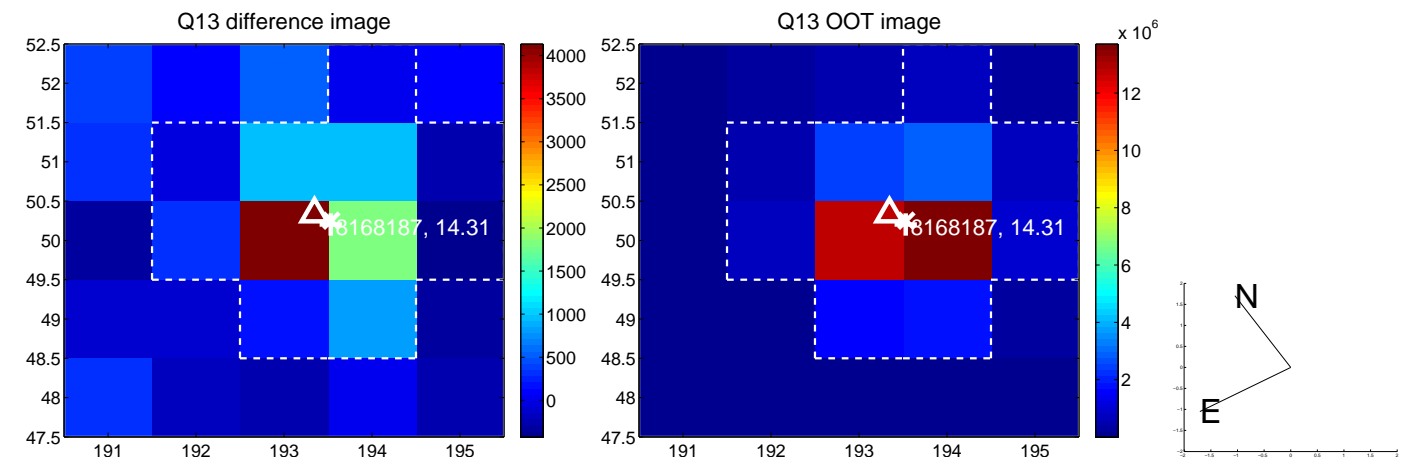
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



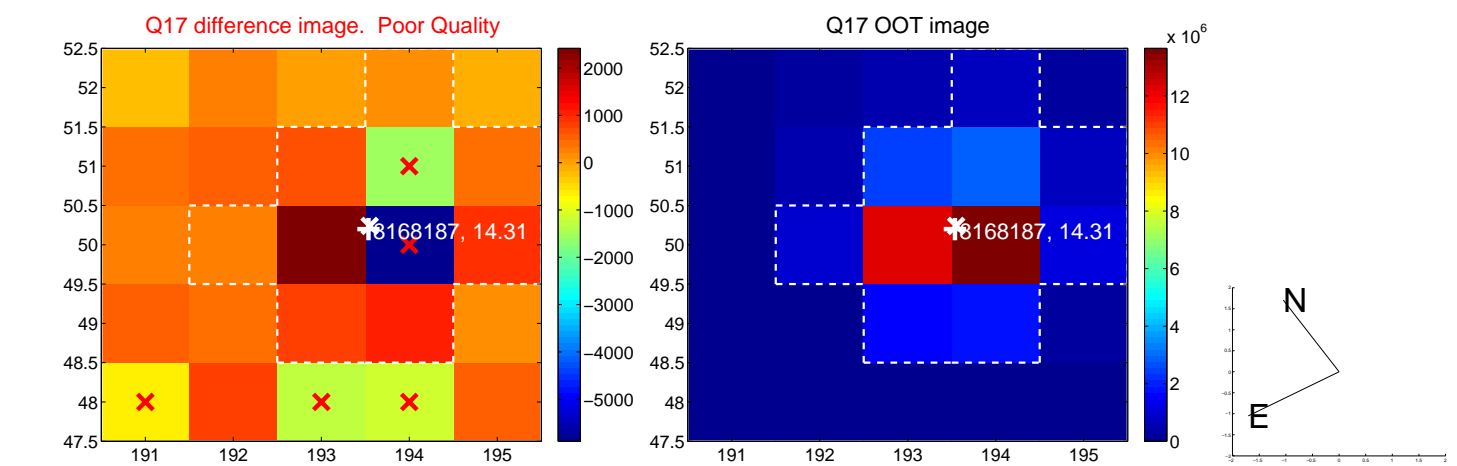
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



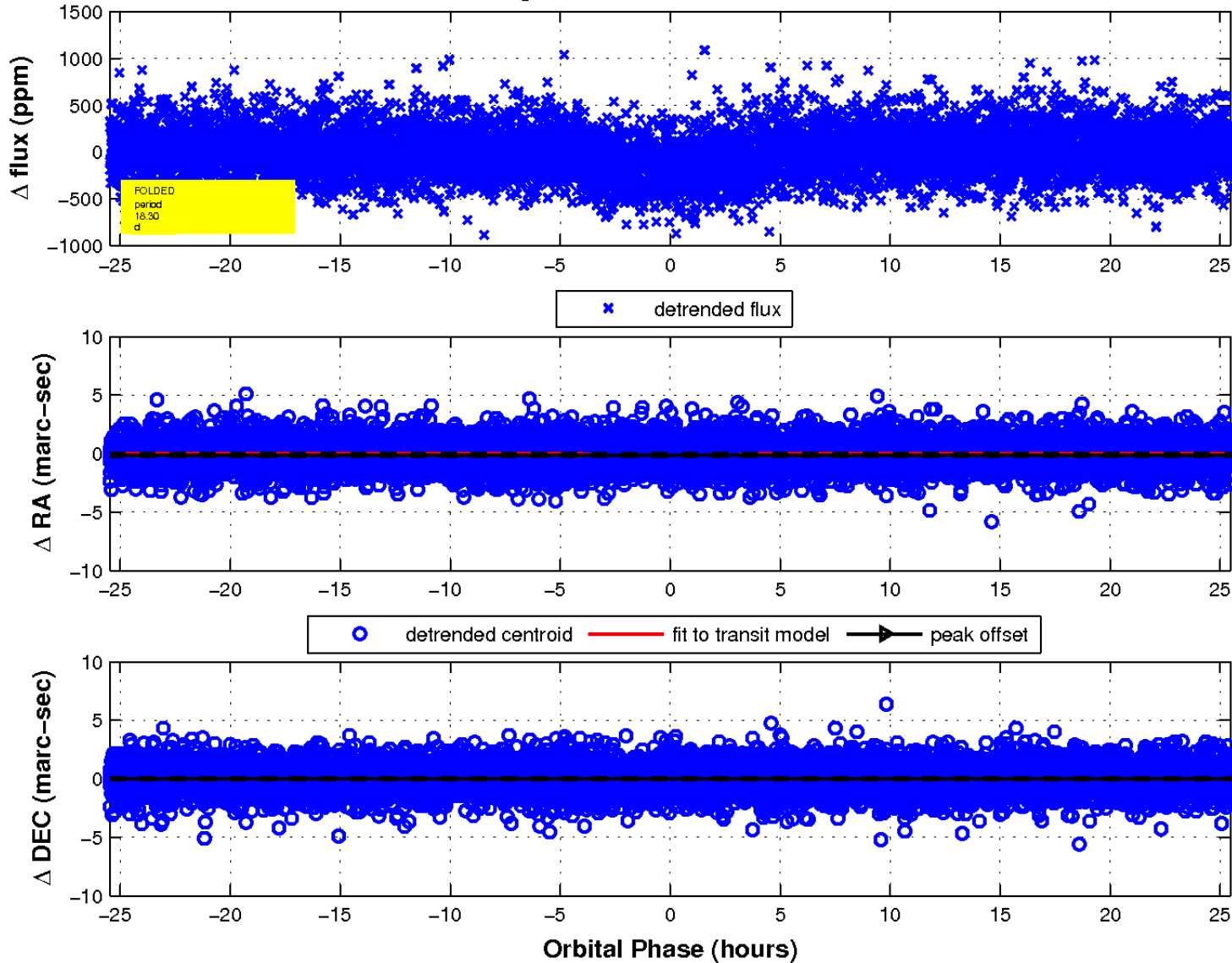
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



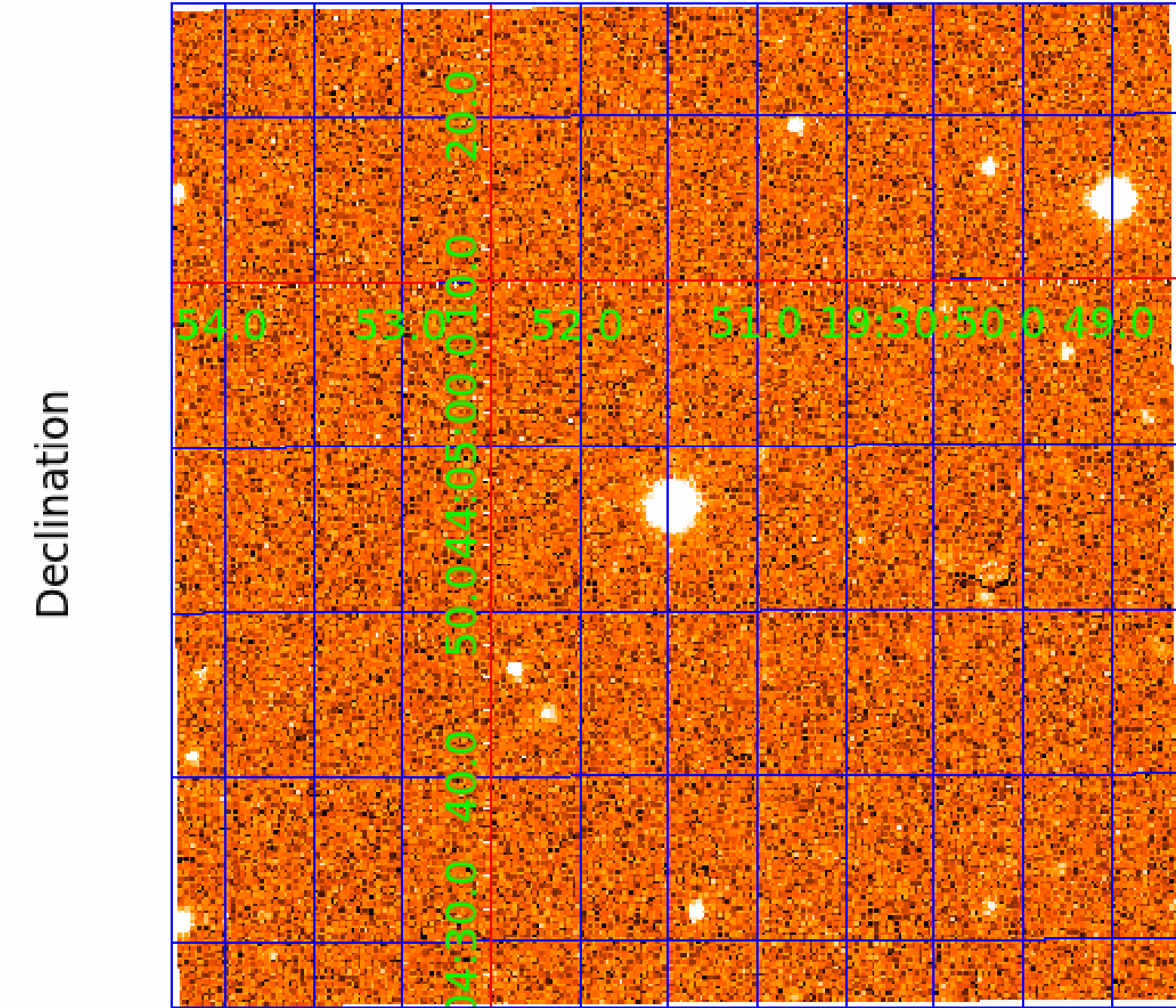
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 008168187

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})
008168187-01	OBS	2209.01	18.302828	142.888671	185.1	8.494	20.6	21.6	1.84	5528	2.90	157.11
008168187-02	OBS	2209.02	35.502016	150.402796	101.9	10.119	9.4	9.1	1.84	5528	2.10	64.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008168187-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
008168187-02	OBS	PC	0.90	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.

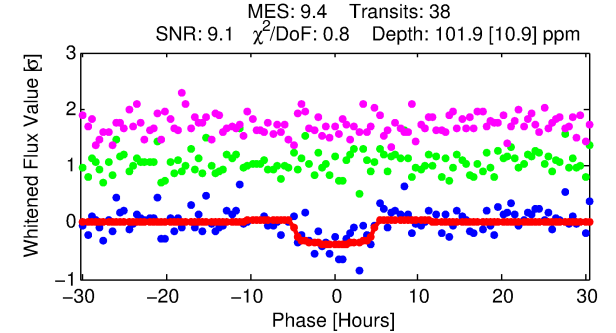
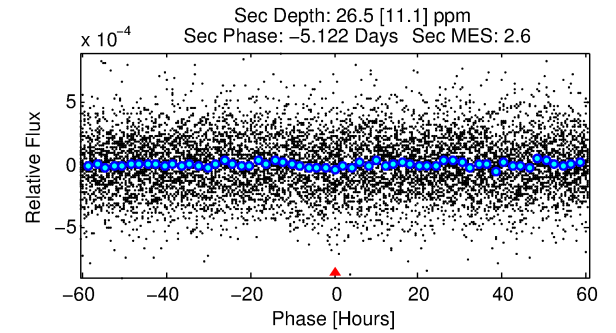
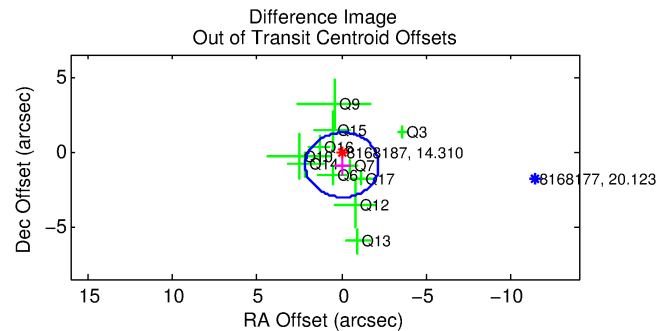
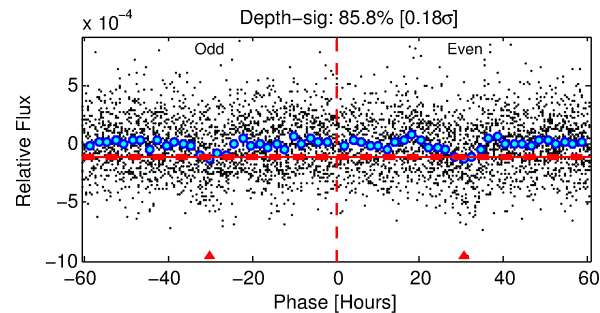
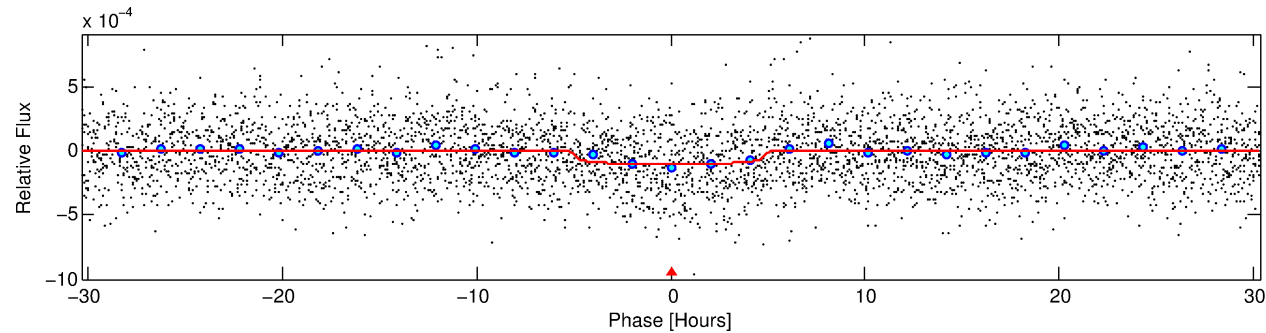
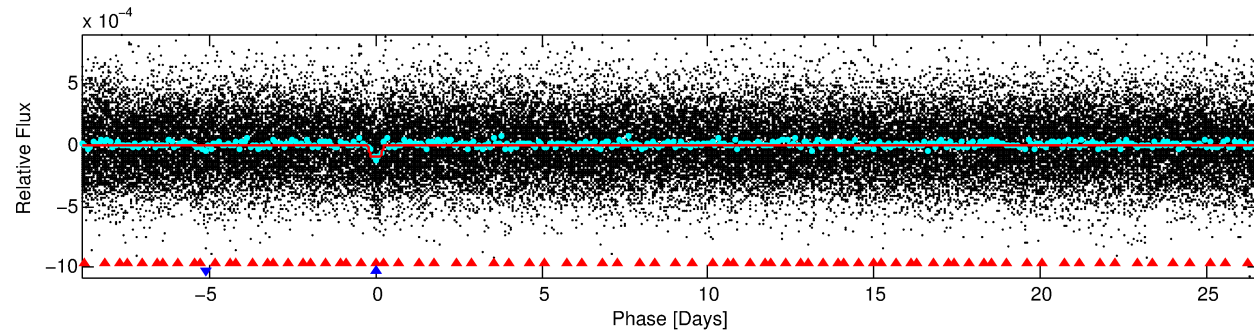
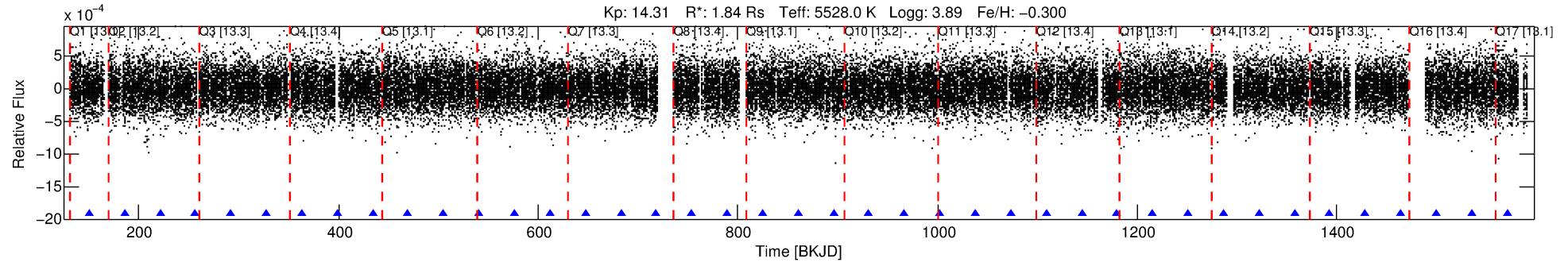
Ephemeris Match Information For 008168187-02

No Significant Match Found

DV One-Page Summary

KIC: 8168187 Candidate: 2 of 2 Period: 35.502 d

KOI: K02209.02 Corr: 0.885



DV Fit Results:

Period = 35.50202 [0.00076] d
Epoch = 150.4028 [0.0174] BKJD
Rp/R* = 0.0105 [0.0046]
a/R* = 15.22 [30.21]
b = 0.84 [0.72]
Seff = 64.95 [16.36]
Teq = 724 [46] K
Rp = 2.10 [1.05] Re
a = 0.2087 [0.0384] AU
Ag = 143.59 [144.40] [0.99σ]
Teffp = 3874 [947] K [3.32σ]

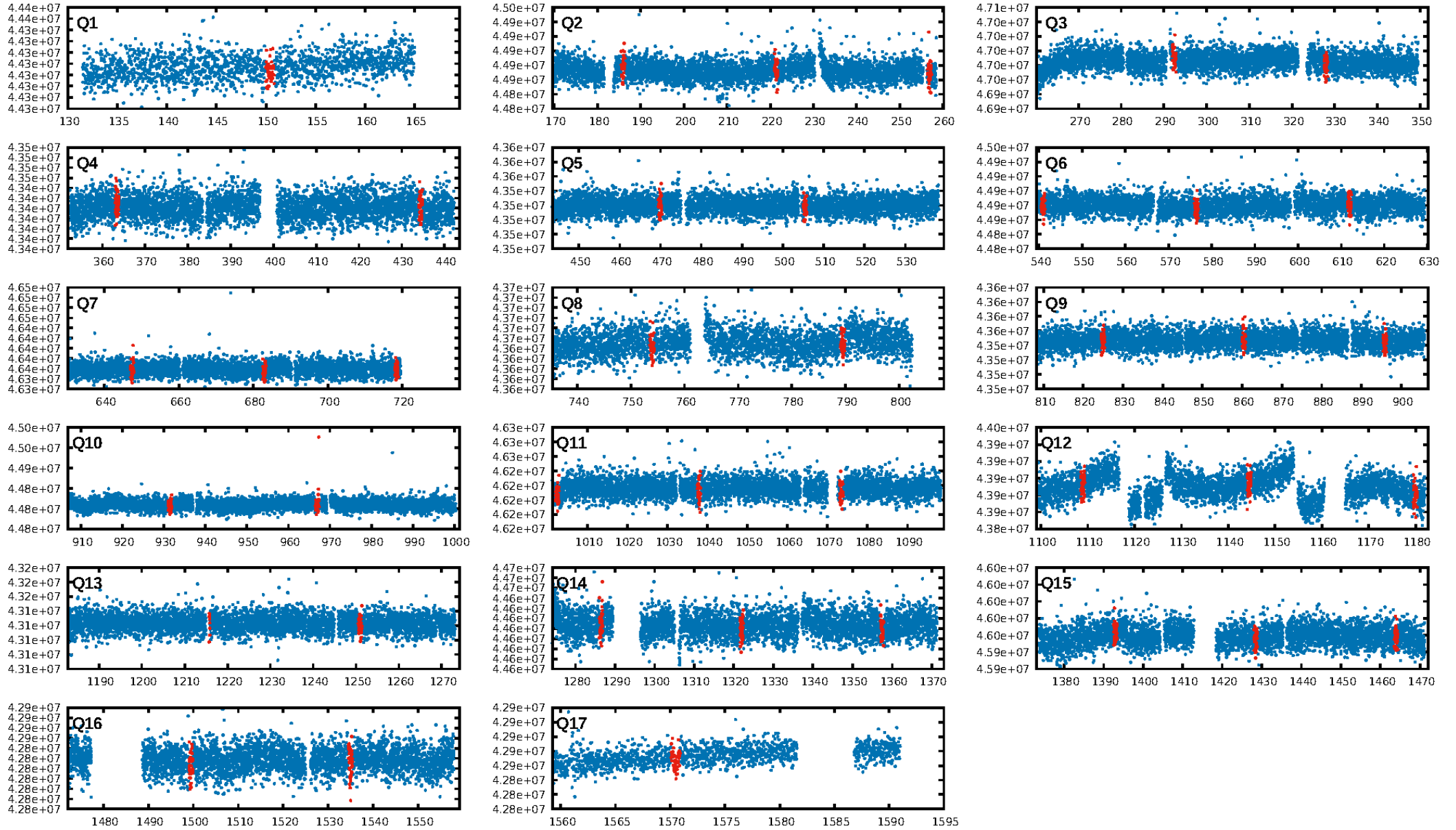
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [31.24σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 94.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.44e-20
RollingBand-fgt: 1.00 [37/37]
GhostDiagnostic-chr: 2.706
Centroid-sig: 12.2%
Centroid-so: 1.477 arcsec [1.05σ]
OotOffset-rm: 0.889 arcsec [1.23σ]
KicOffset-rm: 0.965 arcsec [1.45σ]
OotOffset-st: 3/3/2/3 [11]
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DiffImageQuality-fgm: 0.18 [2/11]
DiffImageOverlap-fno: 0.94 [15/16]

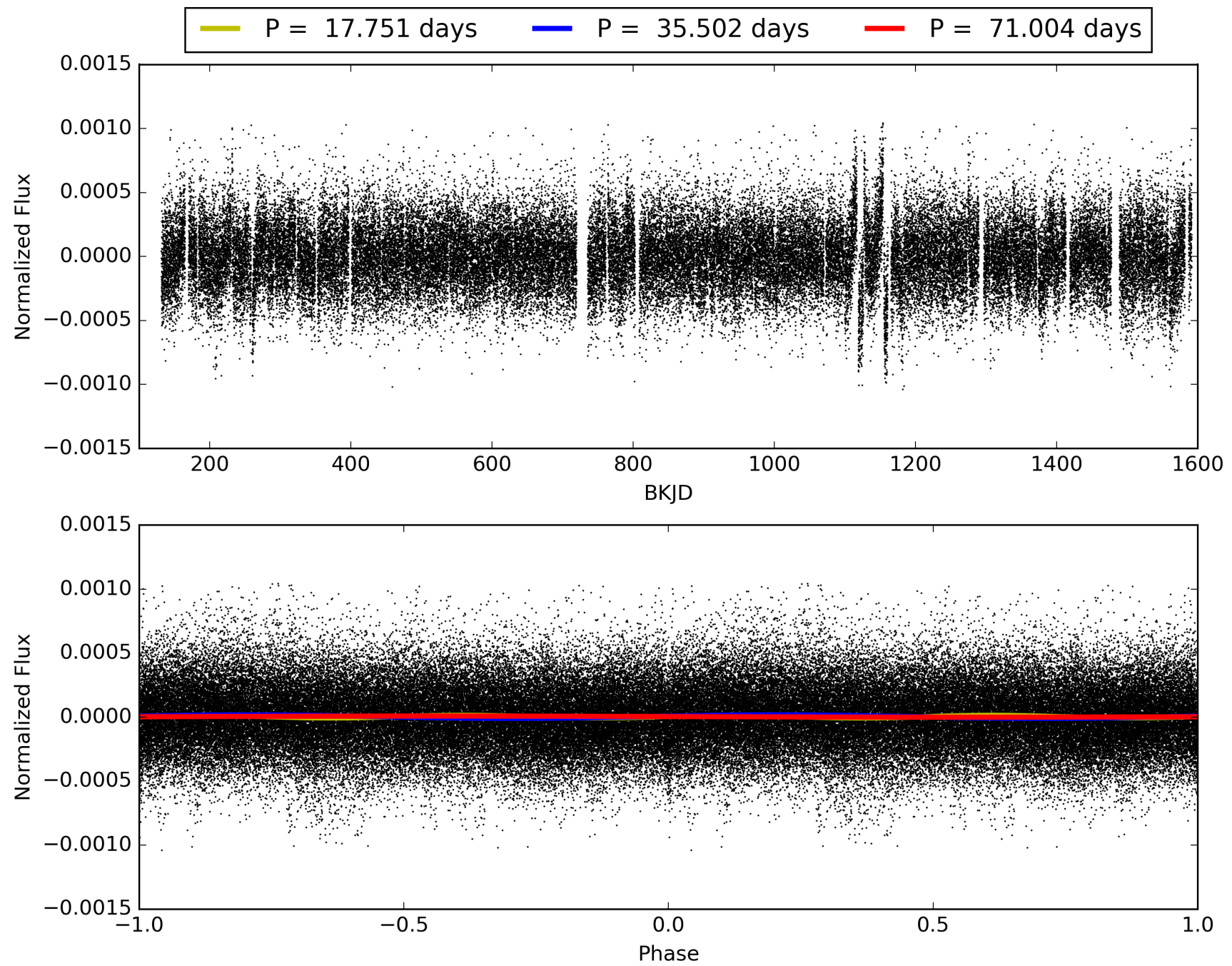
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 11:21:25 Z

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

TCE 008168187-02, PDC Light Curves

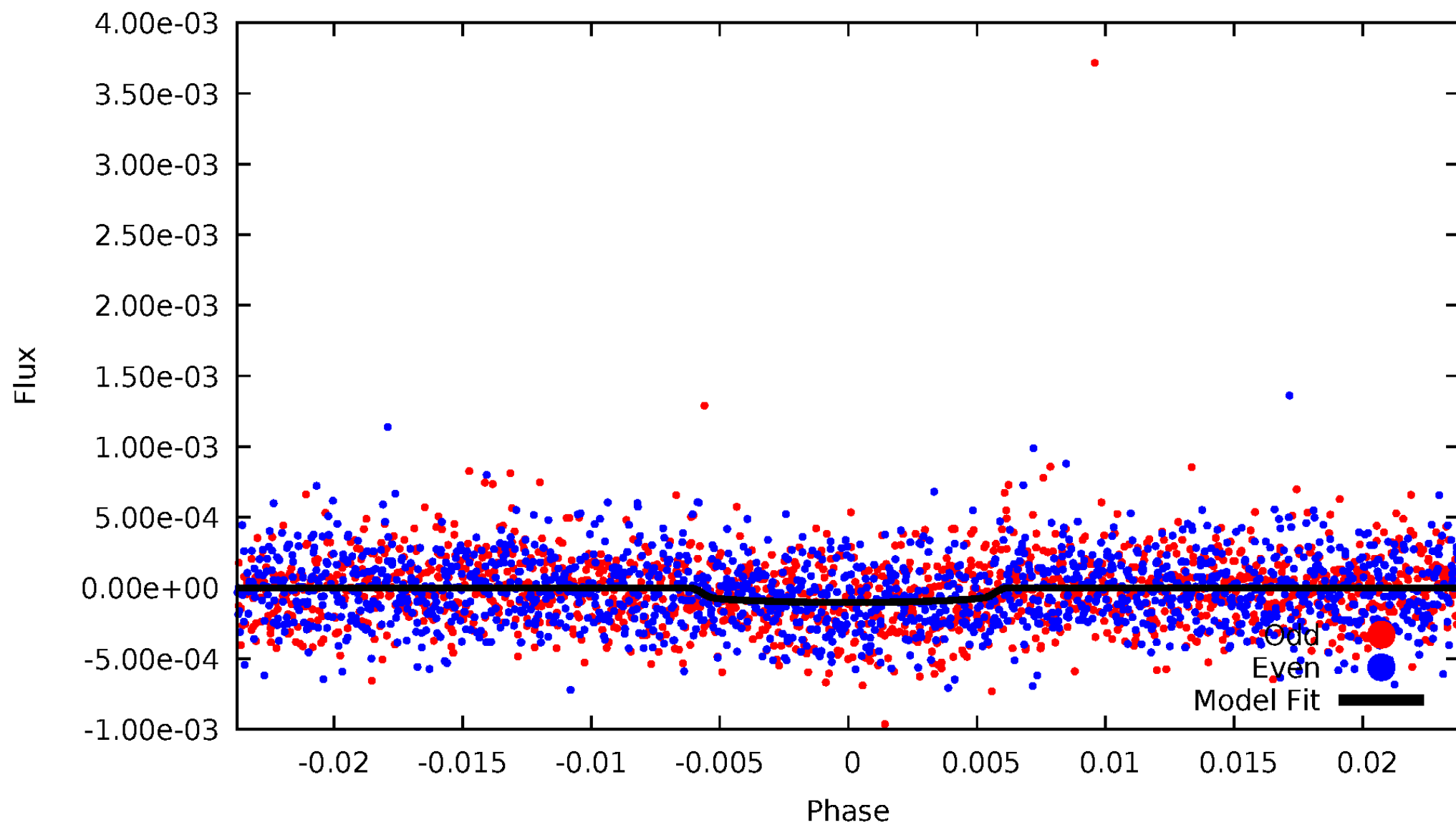


TCE 008168187-02



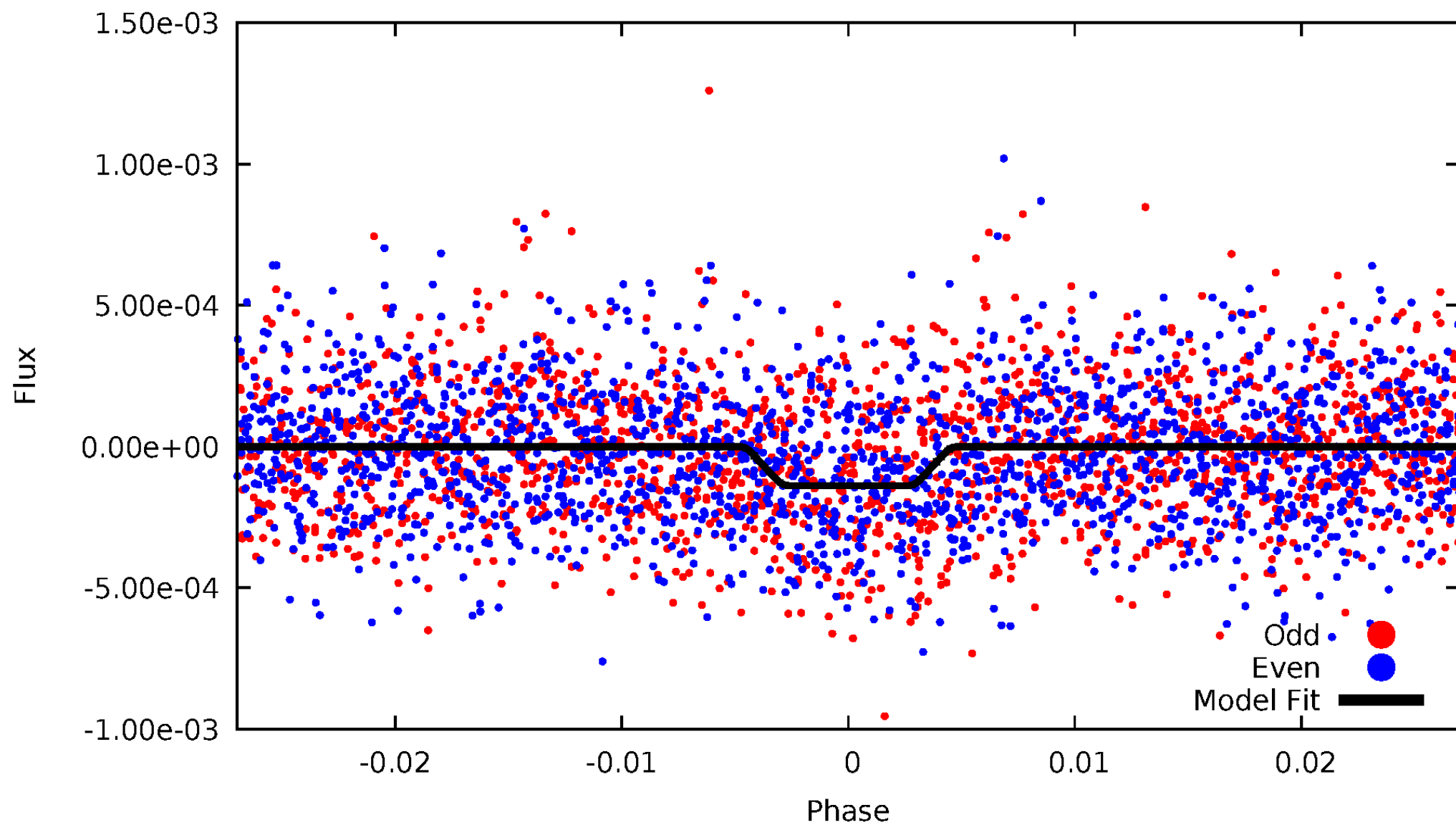
DV Odd/Even

TCE 008168187-02



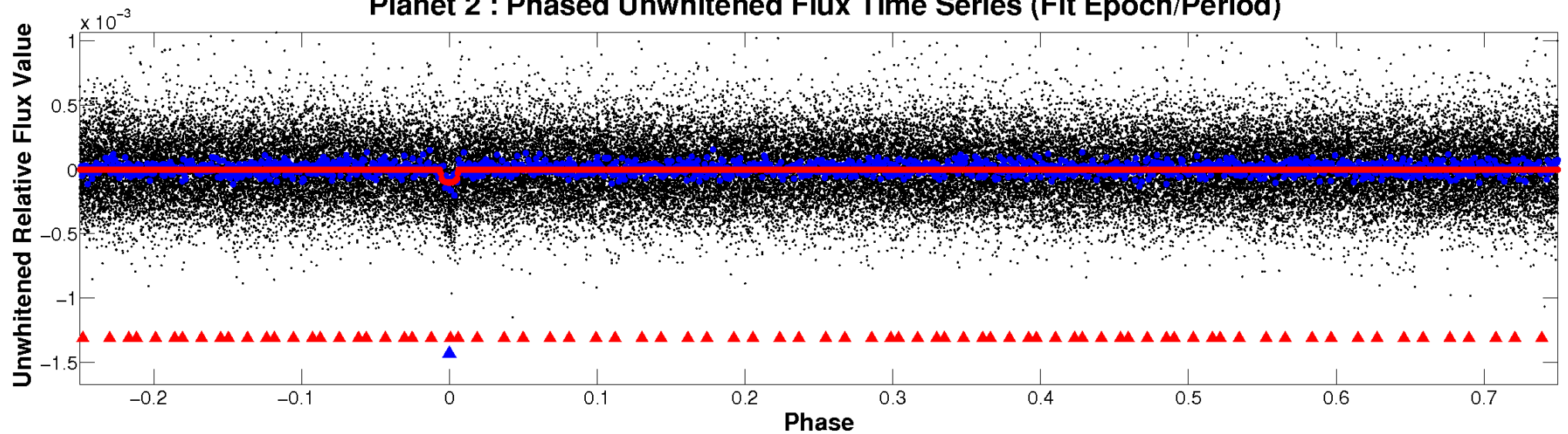
ALT Odd/Even

TCE 008168187-02

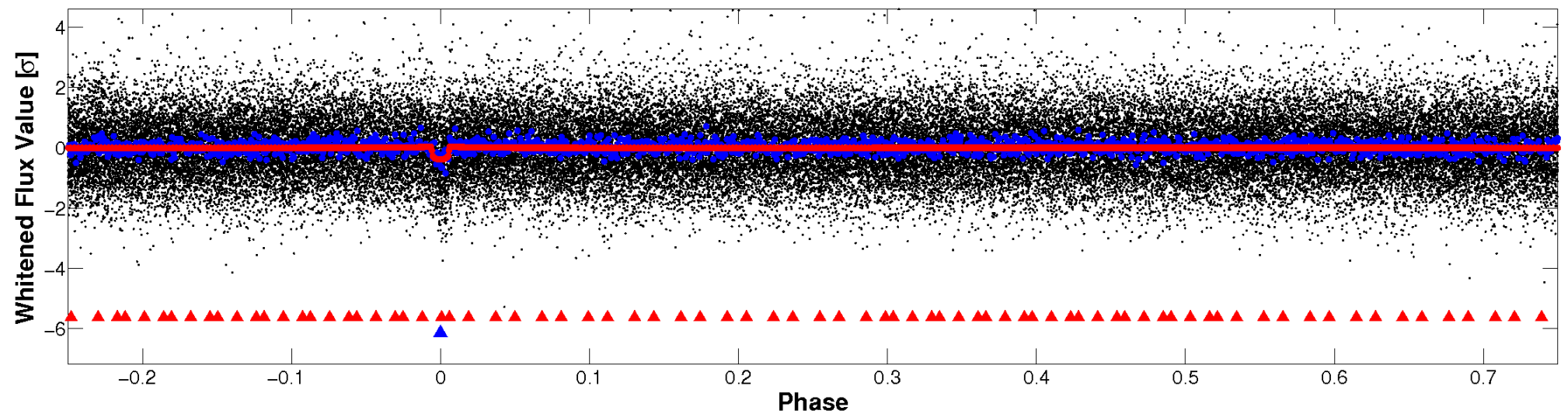


Non-Whitened Vs. Whitened Light Curve

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

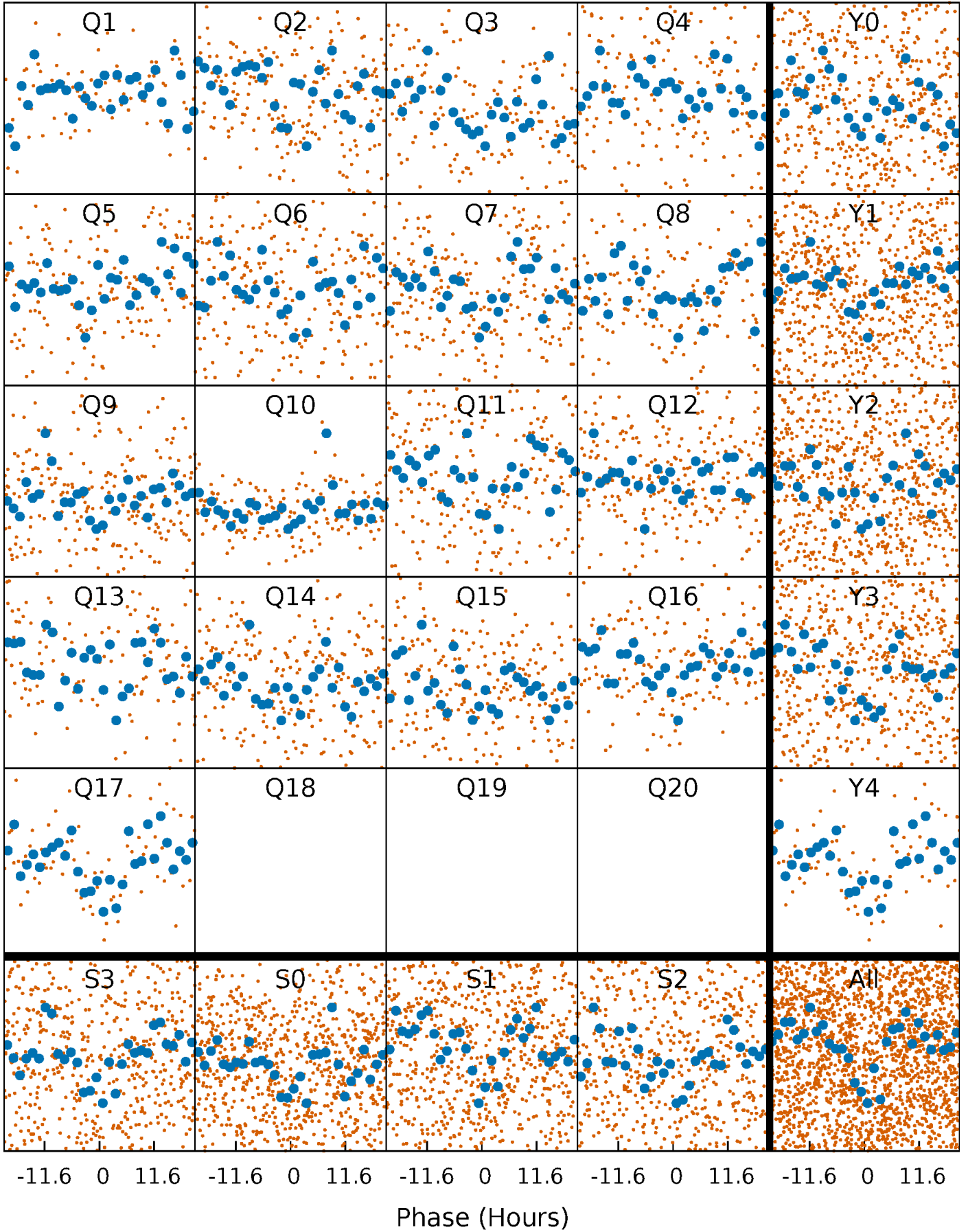


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



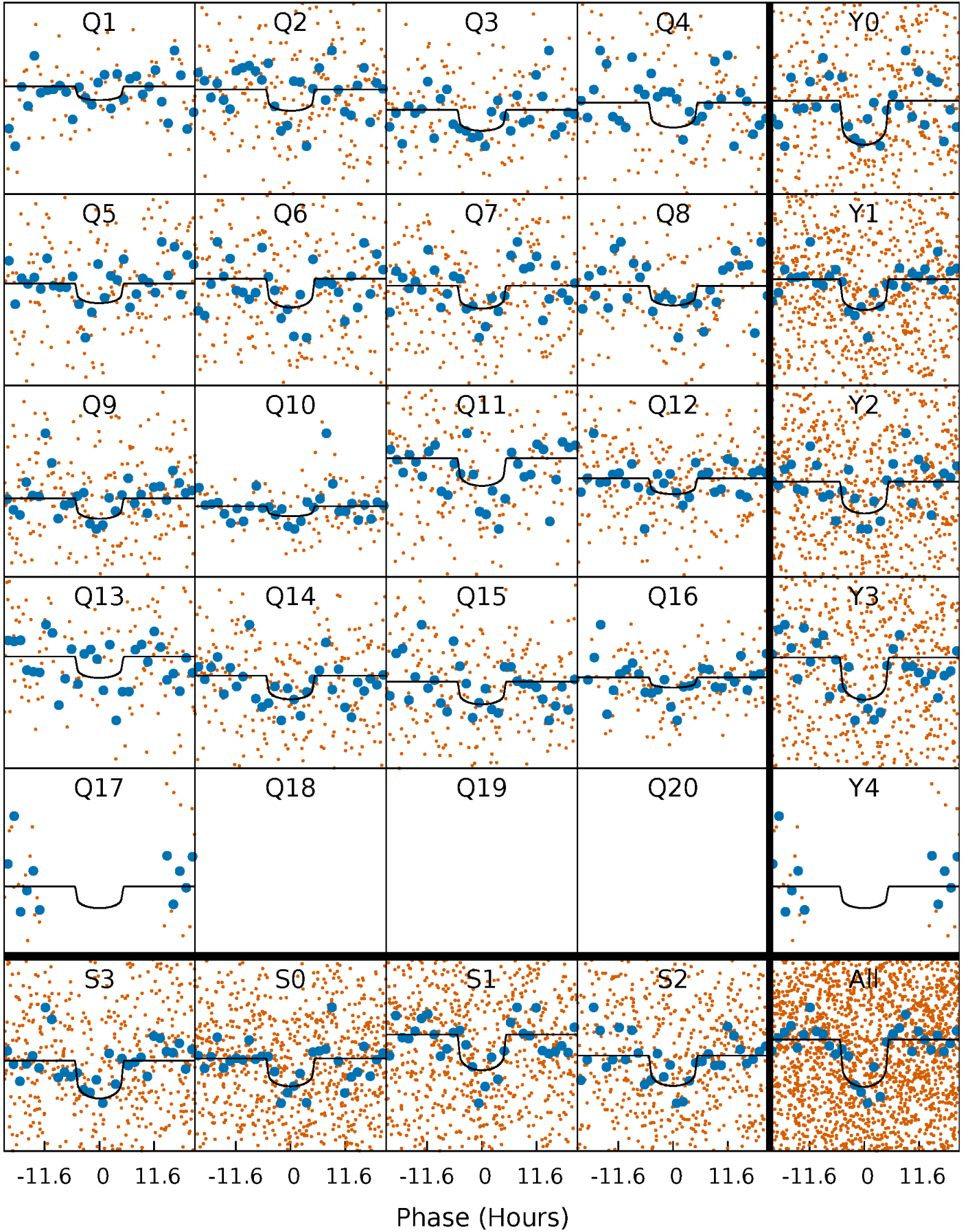
PDC Quarter-Phased Transit Curves

TCE 008168187-02 P= 35.502016 Days $T_0=150.402796$ (BKJD)



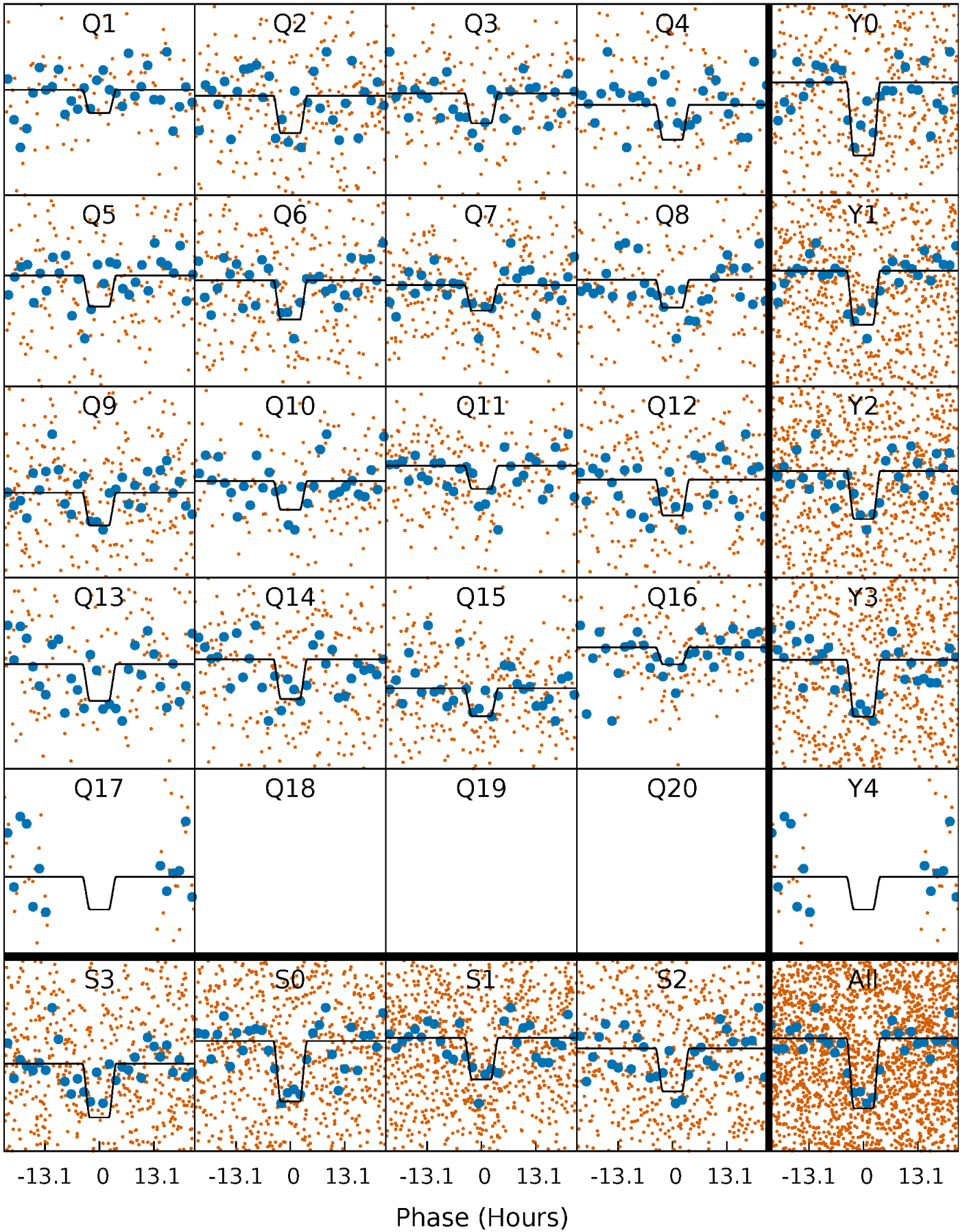
DV Quarter-Phased Transit Curves

TCE 008168187-02 P= 35.502016 Days $T_0=150.402796$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

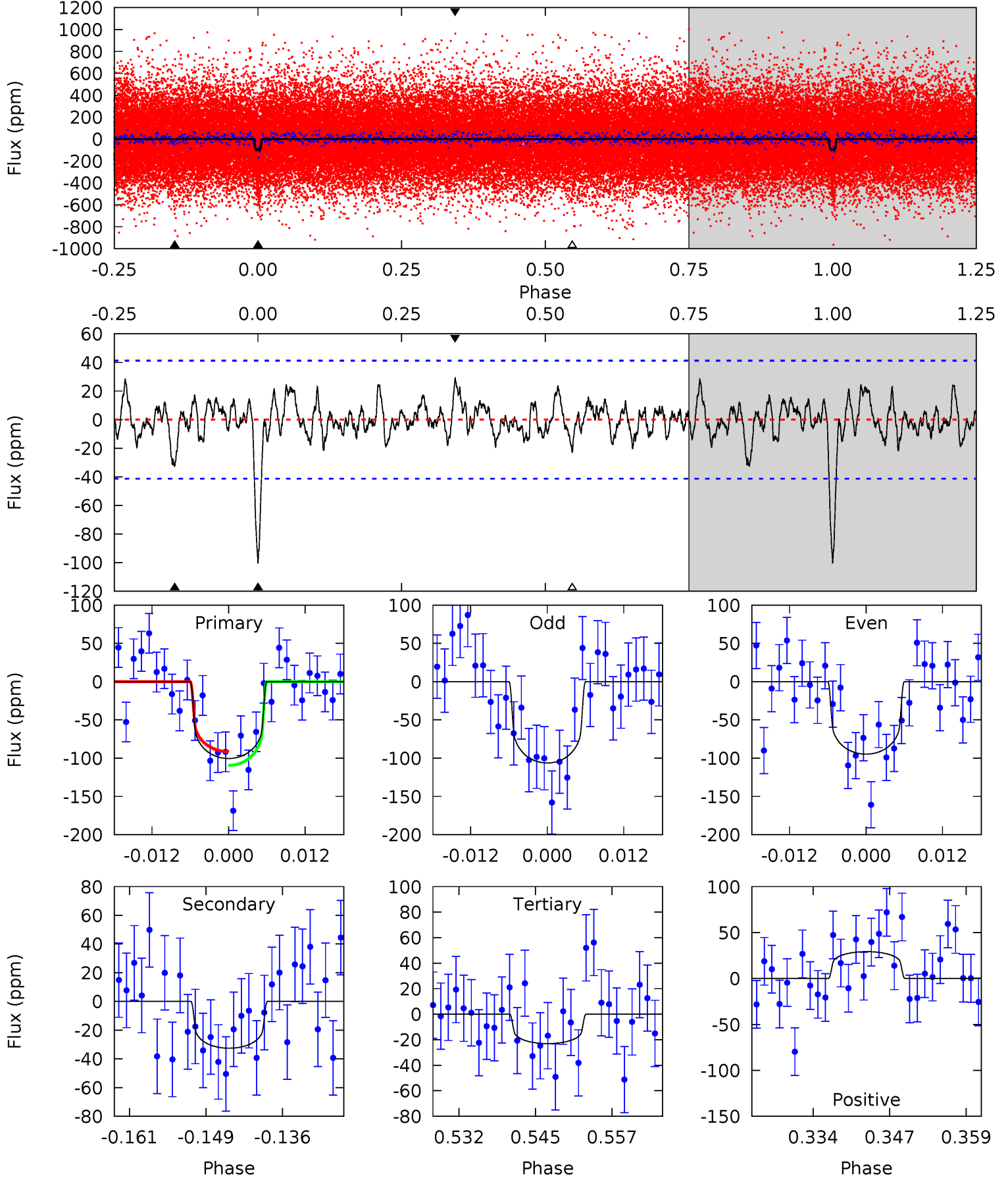
TCE 008168187-02 P= 35.501292 Days $T_0=150.424752$ (BKJD)



DV Model-Shift Uniqueness Test

008168187-02, P = 35.502016 Days, E = 114.900780 Days

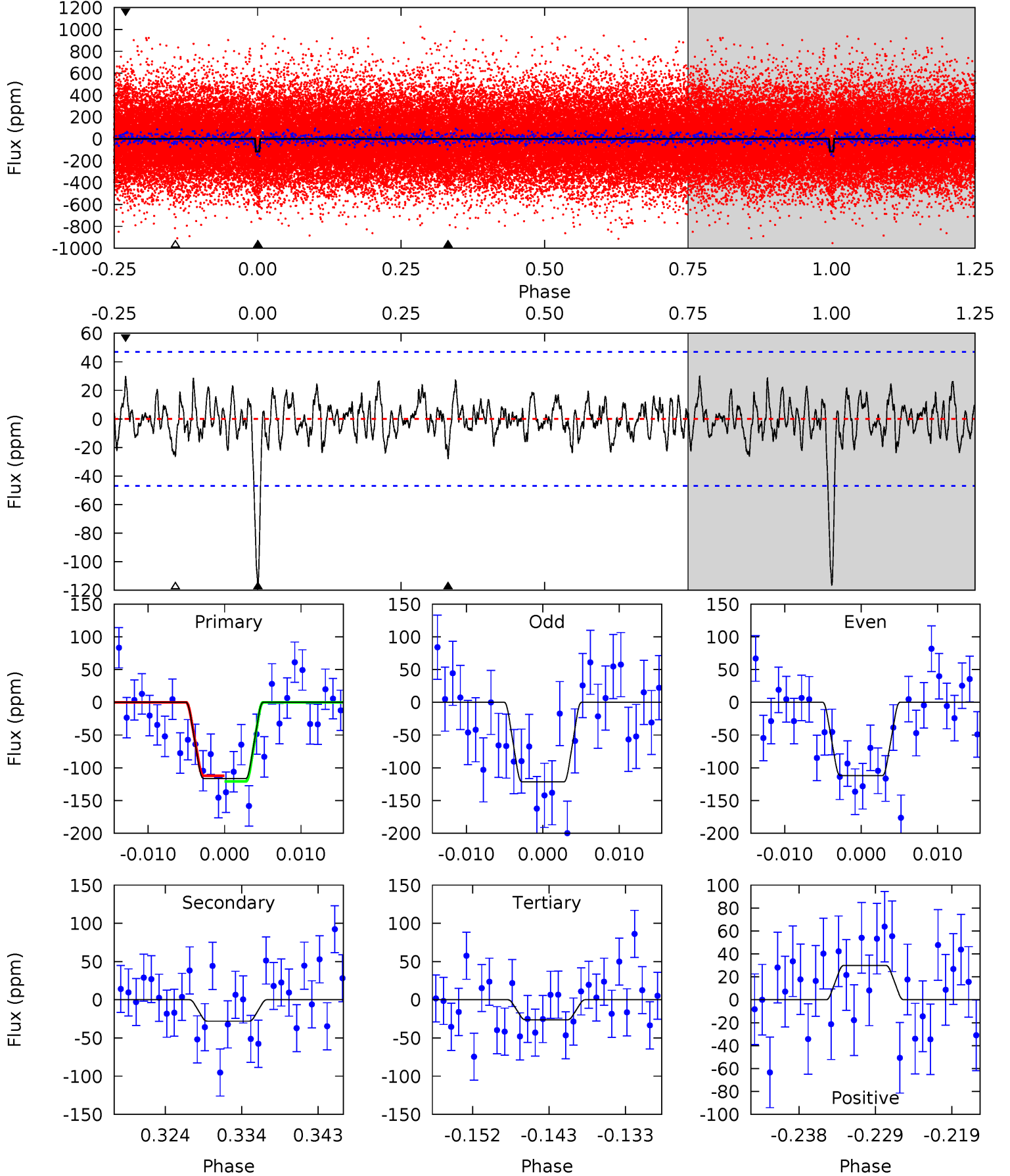
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	3.93	2.78	3.53	4.99	2.50	1.14	9.34	8.60	1.15	0.41	0.70	1.10	0.23	1.09



Alt Model-Shift Uniqueness Test

008168187-02, P = 35.501292 Days, E = 114.923460 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	3.01	2.81	3.21	5.04	2.59	1.08	9.69	9.29	0.20	-0.20	0.51	0.99	0.20	0.47



Stellar Parameters For KIC 008168187

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5528^{+88}_{-77}	$3.892^{+0.120}_{-0.120}$	$-0.300^{+0.150}_{-0.100}$	$1.839^{+0.440}_{-0.293}$	$0.962^{+0.154}_{-0.083}$	$0.218^{+0.129}_{-0.088}$
	+2%/-1%	+3%/-3%	+50%/-33%	+24%/-16%	+16%/-9%	+59%/-40%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 008168187-02 / KOI 2209.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-33 ± 8	$2.15^{+1.11}_{-0.91}$	1011^{+53}_{-42}	4253^{+1066}_{-551}	165^{+352}_{-95}
Alt.	-28 ± 9	$2.33^{+1.02}_{-0.83}$	1009^{+53}_{-44}	4026^{+804}_{-527}	123^{+198}_{-69}

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 $A_{obs} \gg 1.0$

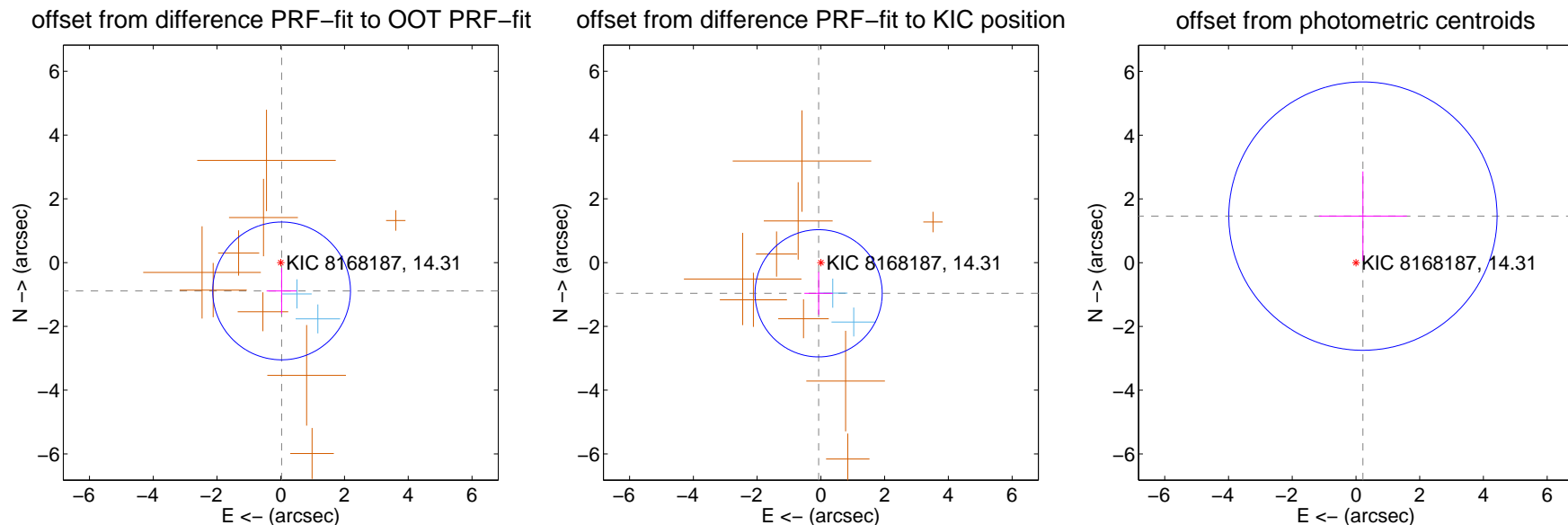
DV Centroid Data

Supplemental centroid analysis for 008168187-02. Kepler magnitude: 14.31. Transit SNR 9.09

There are 2 quarters with good PRF difference image offsets

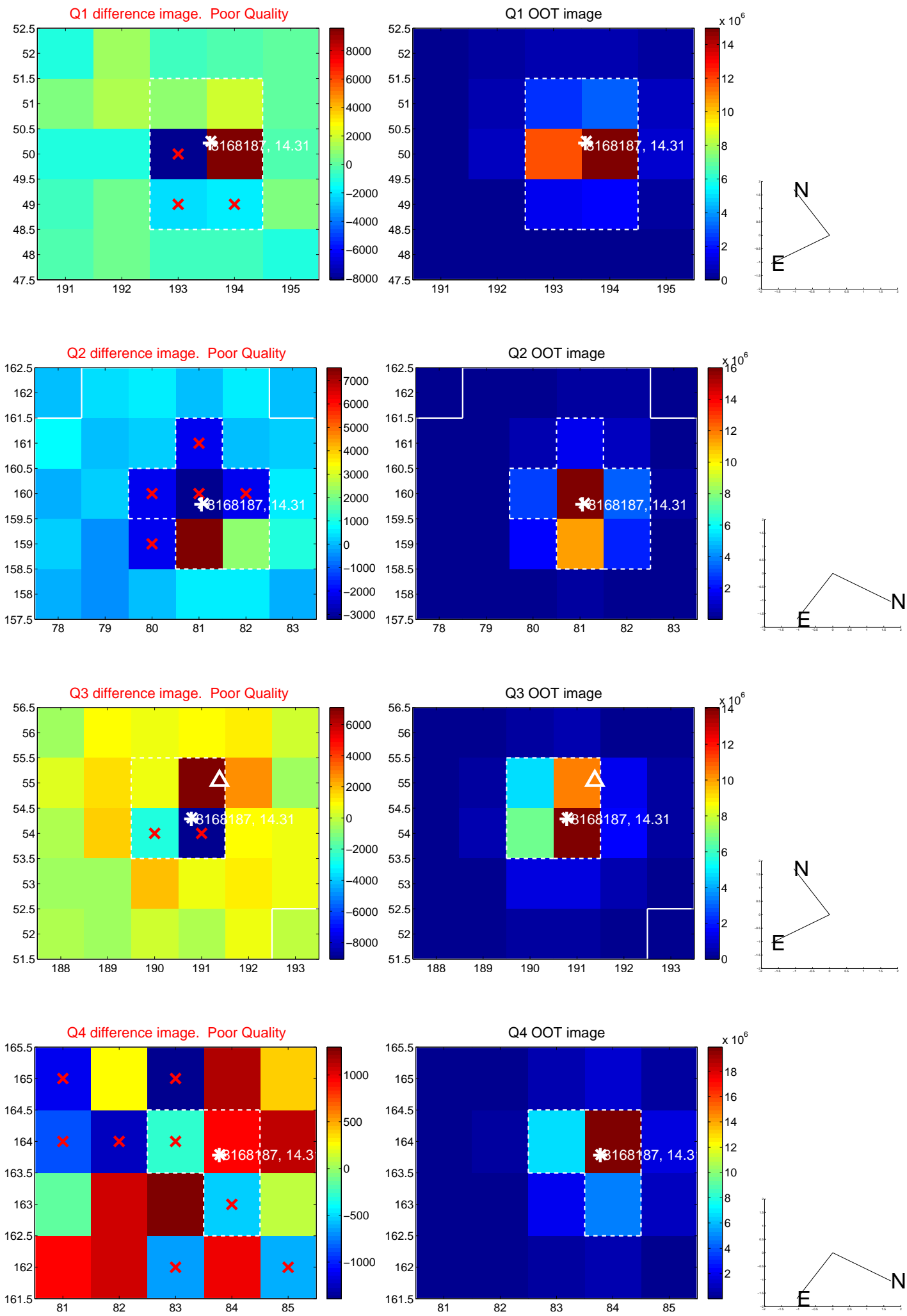
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.889 ± 0.720	1.23	-0.026 ± 0.469	-0.888 ± 0.719
PRF-fit source offset from KIC position	0.965 ± 0.665	1.45	0.071 ± 0.448	-0.963 ± 0.671
photometric centroid source offset	1.48 ± 1.40	1.05	-0.22 ± 1.38	1.46 ± 1.40

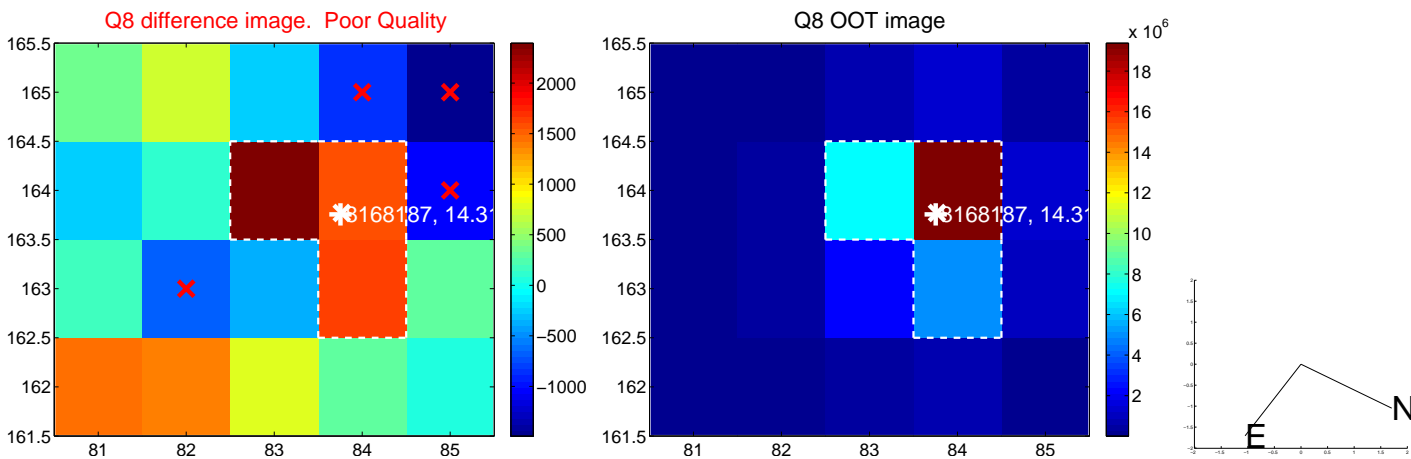
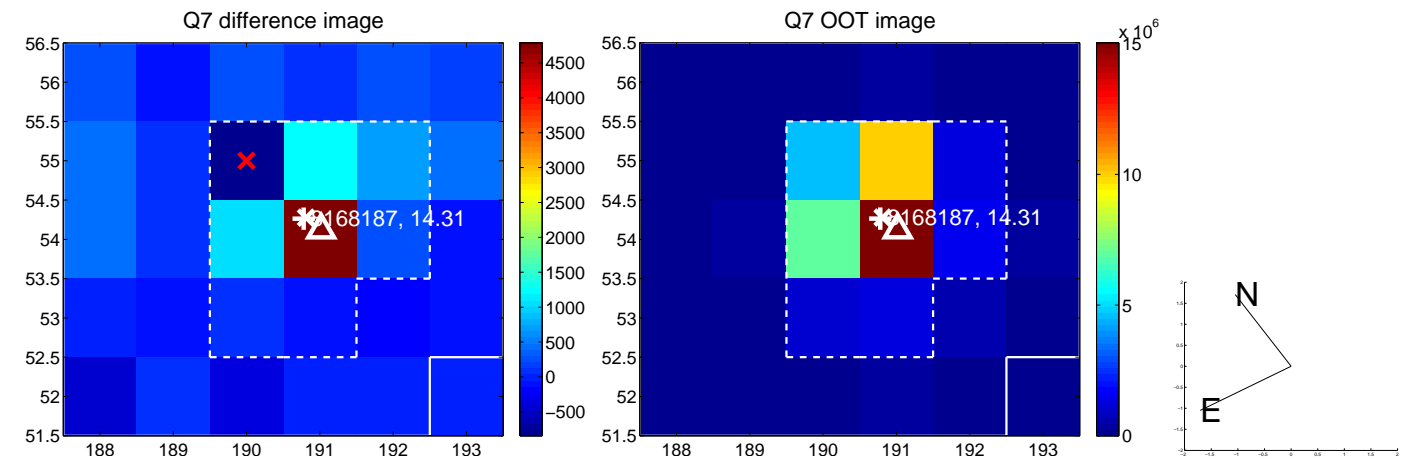
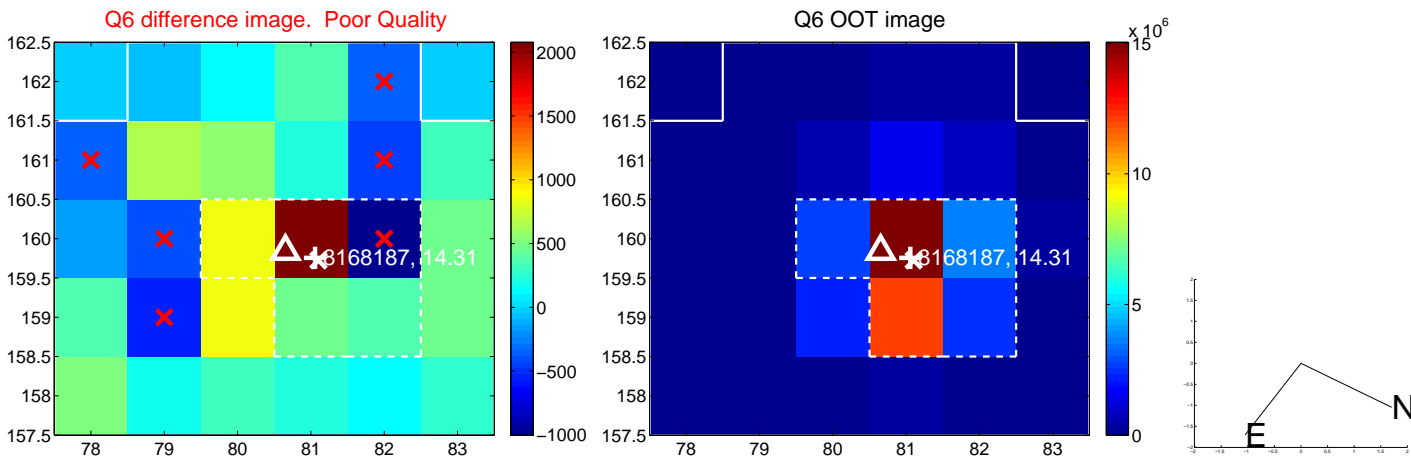
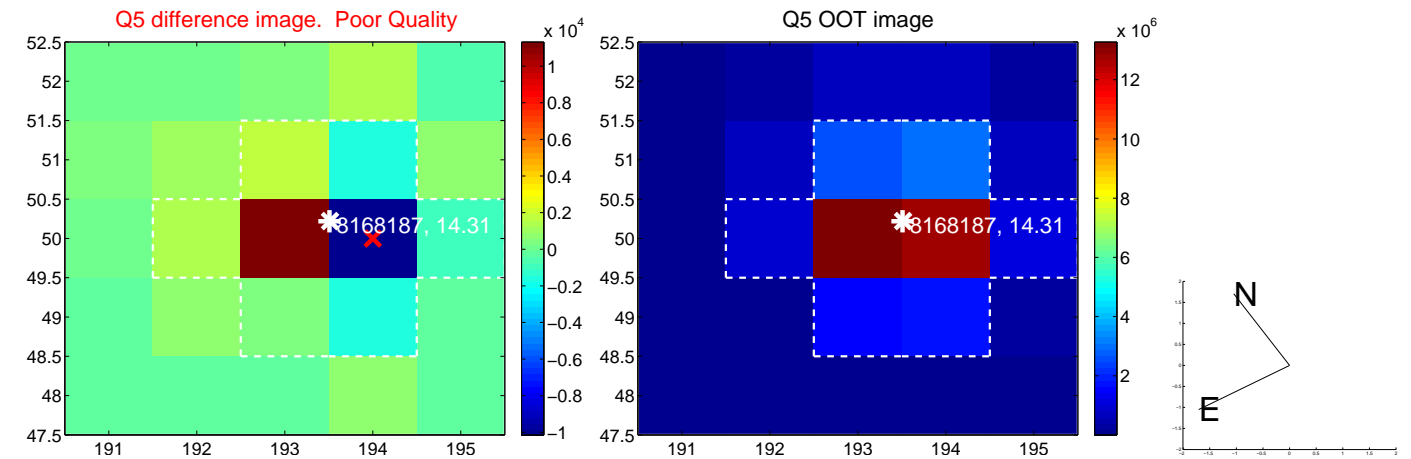


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

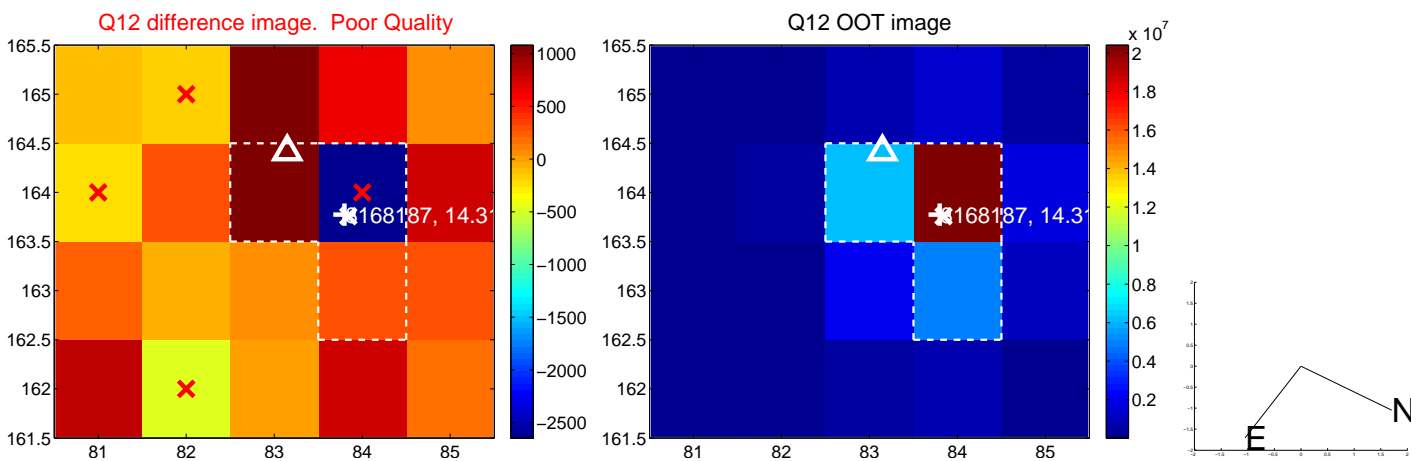
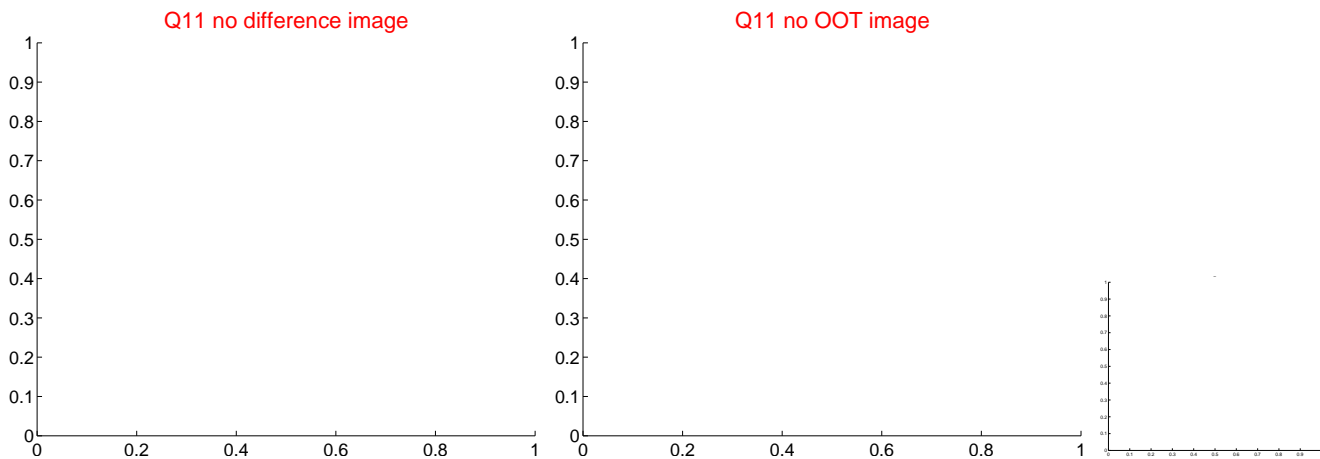
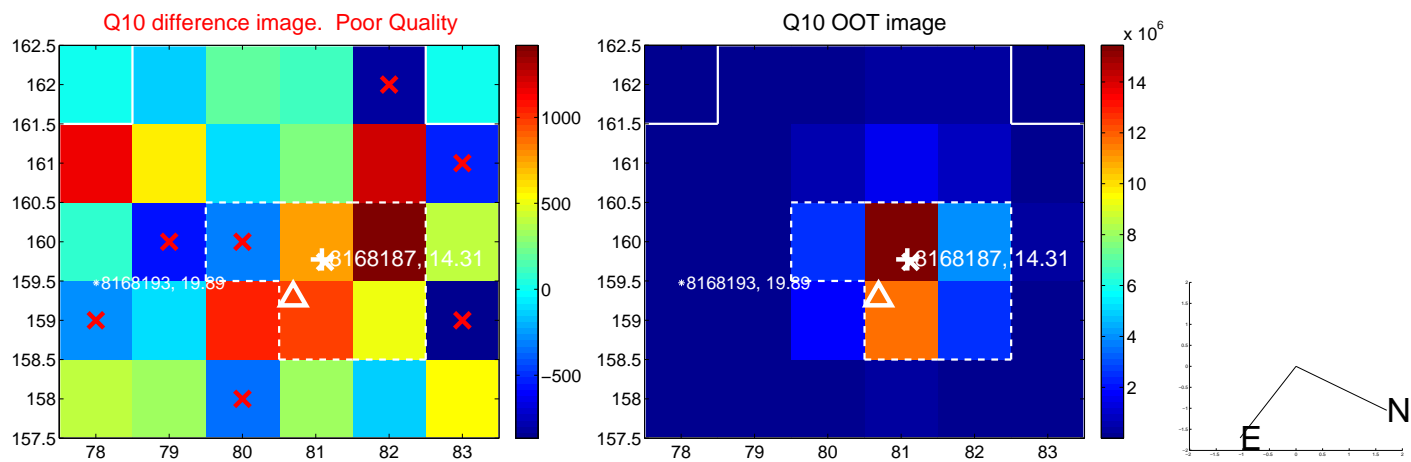
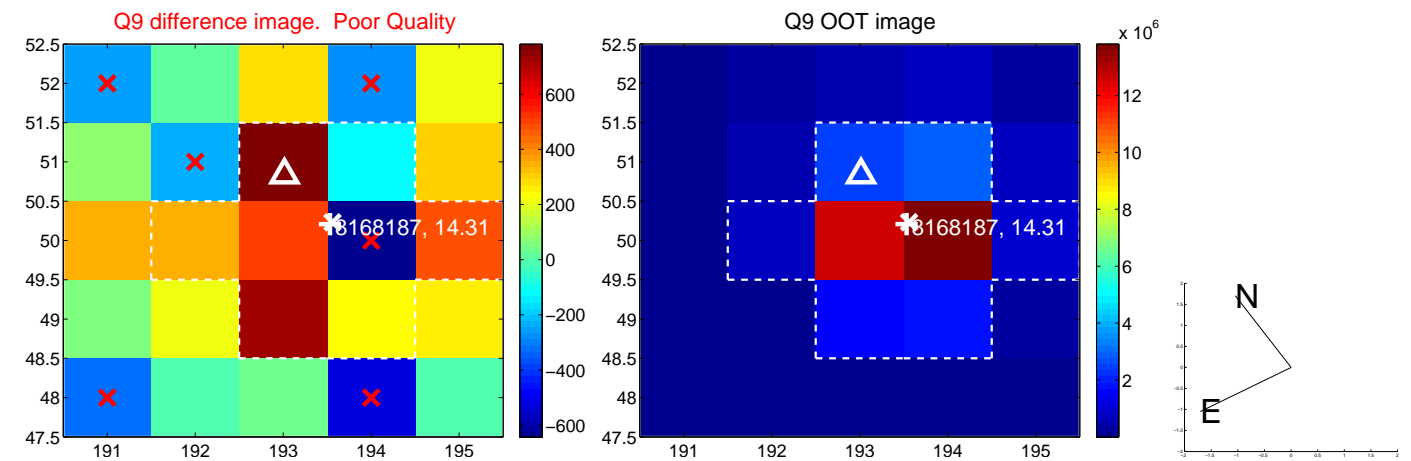
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



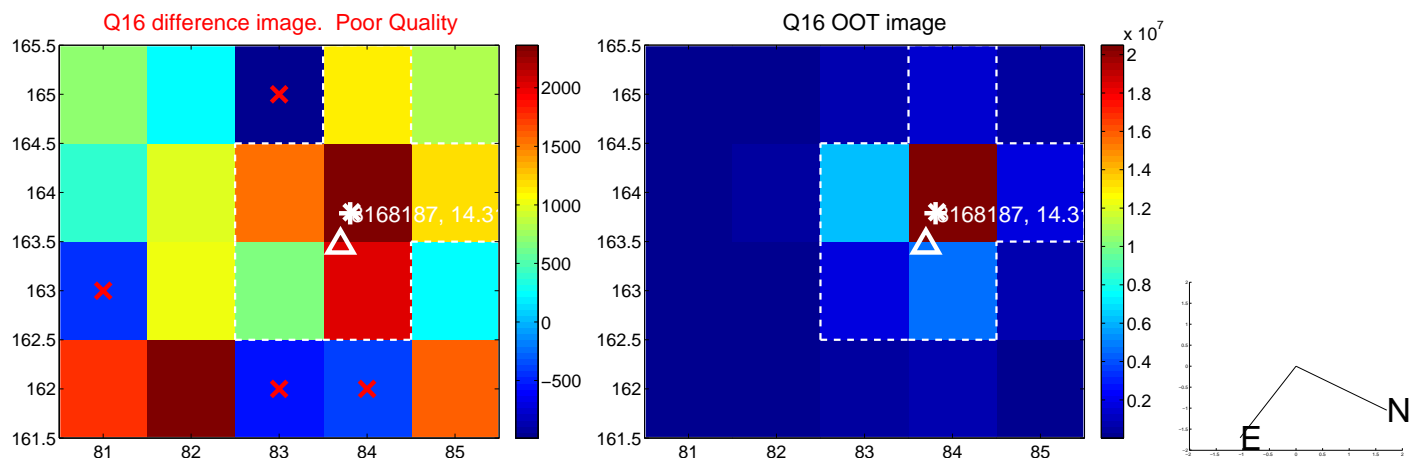
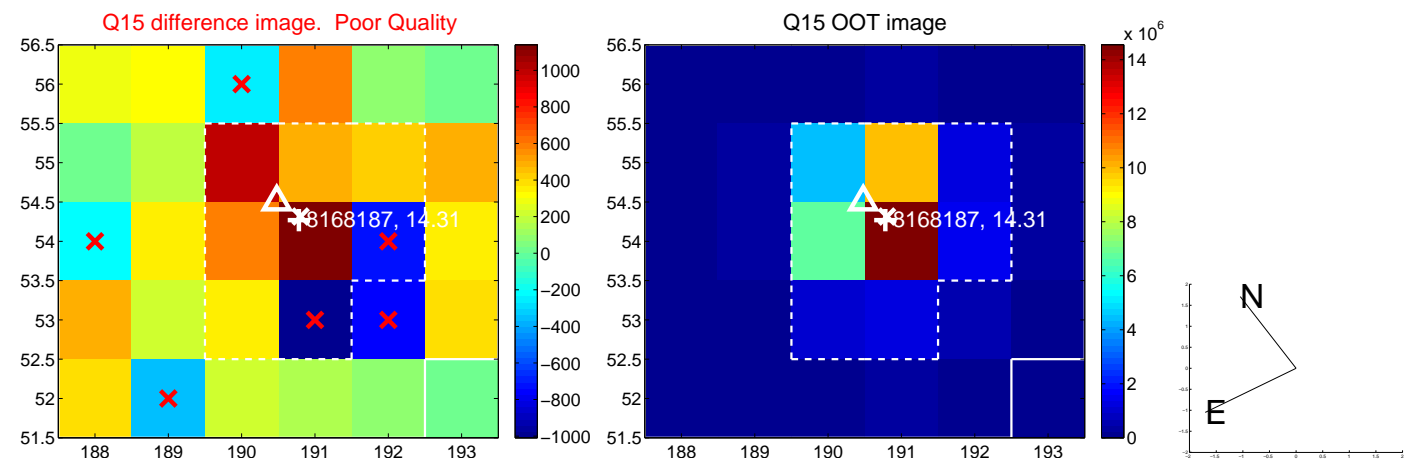
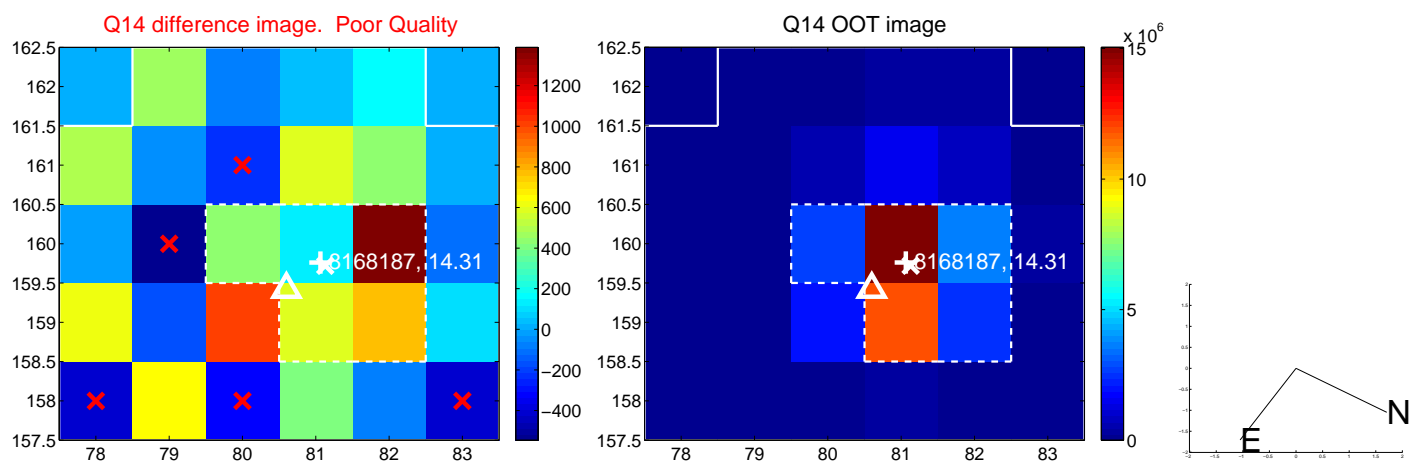
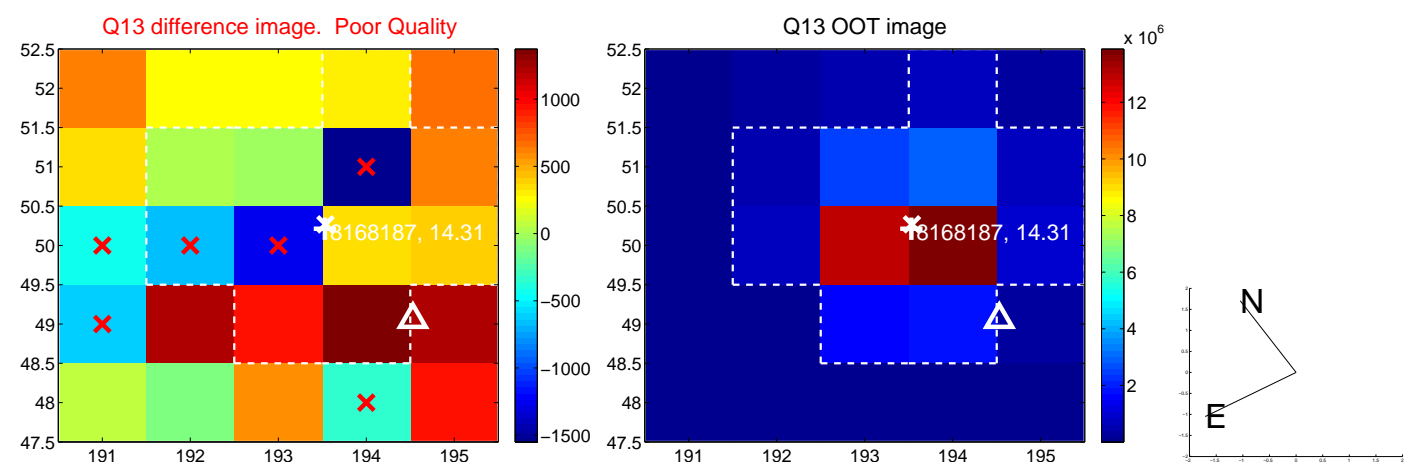
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



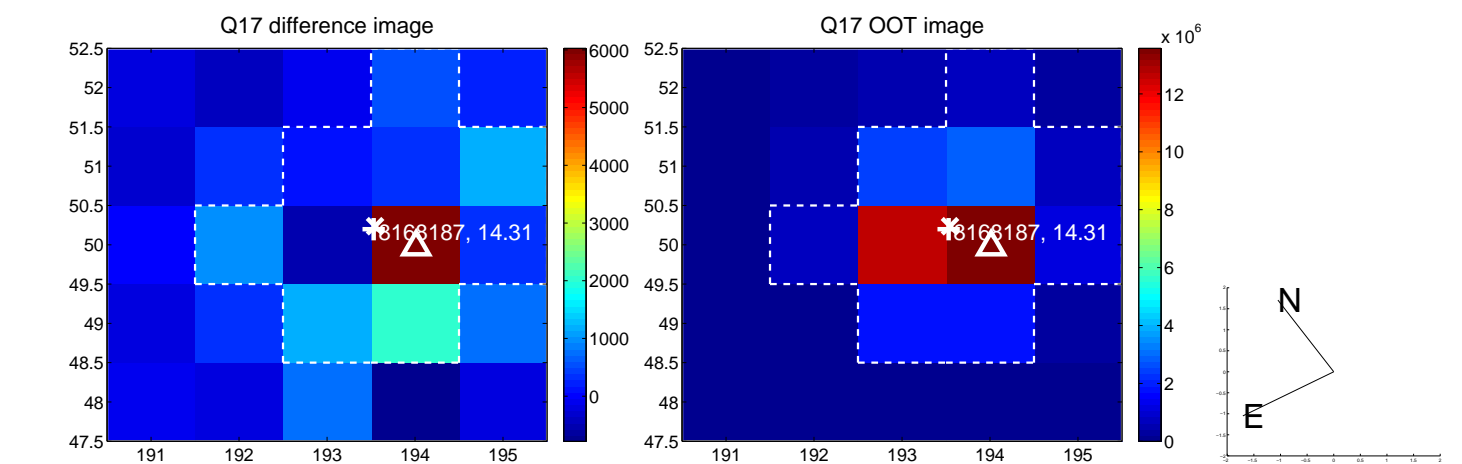
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



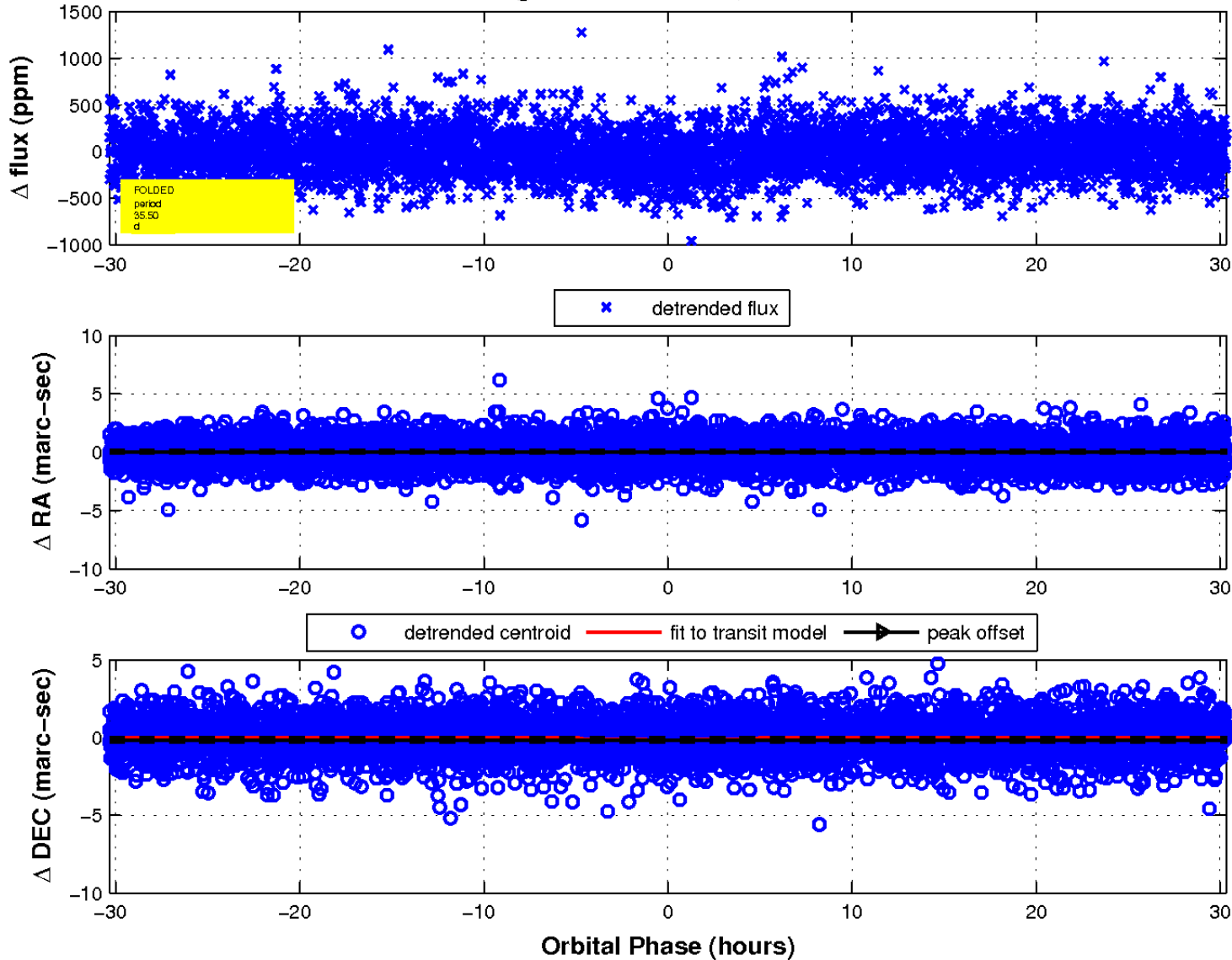
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

