

KIC 009899181

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})
009899181-01	OBS	2867.01	1.332503	132.086636	22.5	3.502	20.2	17.7	0.71	4947	0.40	576.11
009899181-02	OBS	2867.02	18.936139	139.172597	38.8	32.945	9.4	12.6	0.71	4947	0.46	16.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009899181-01	OBS	FP	0.00	0	0	1	1	HALO_GHOST—EPHEM_MATCH
009899181-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV

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.

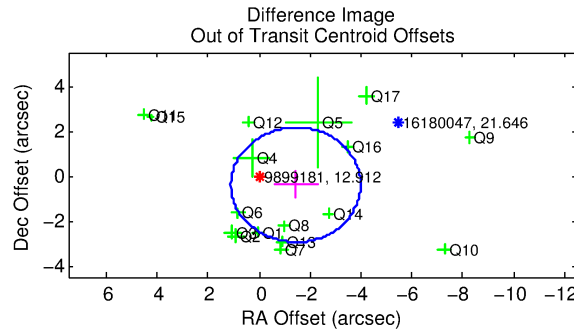
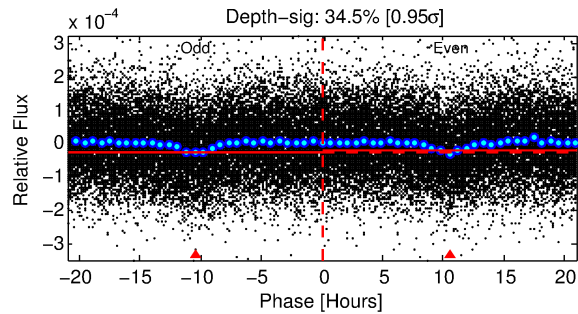
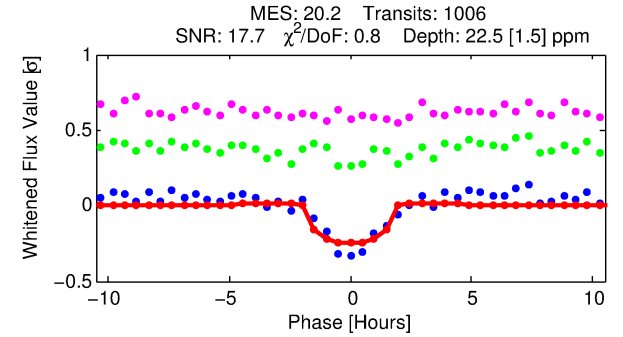
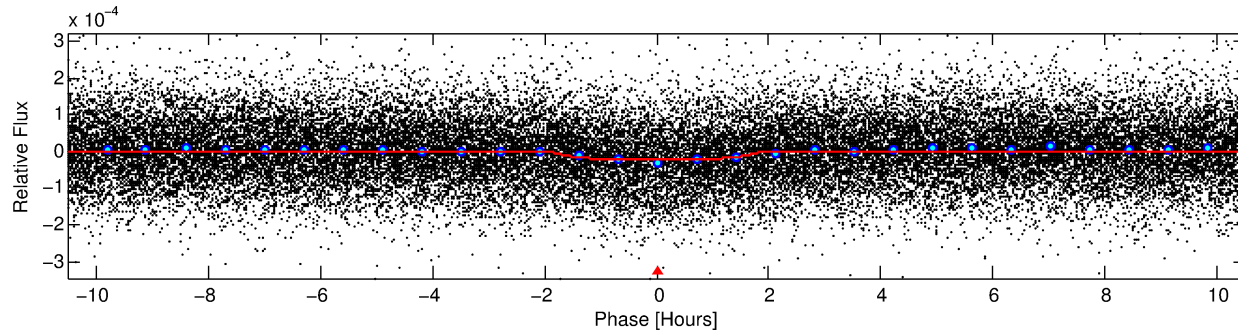
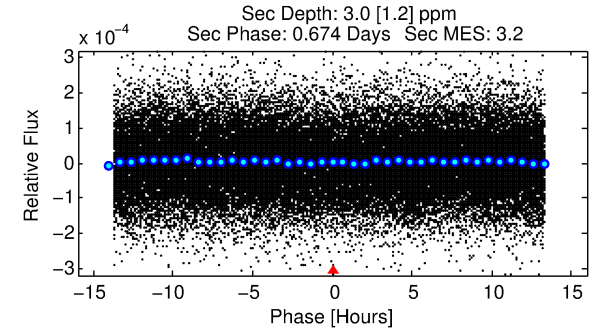
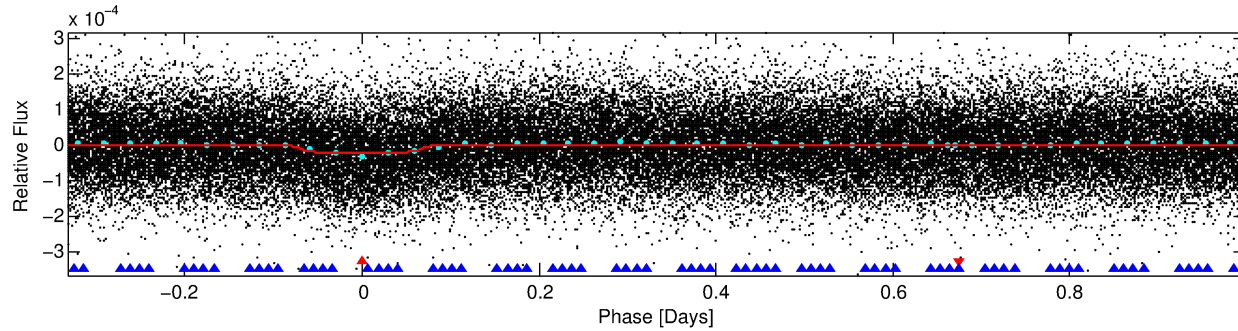
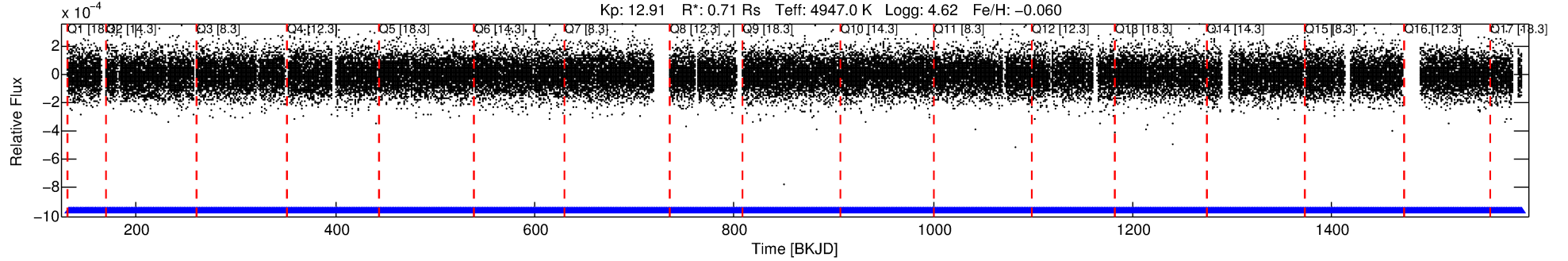
Ephemeris Match Information For 009899181-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
009899181-01	9899181	BR-Cyg-pri	9899416	1:1	196.6	47	-14	10.03	12.91	29081.00	Direct-PRF	0	3.80	2.62

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 9899181 Candidate: 1 of 2 Period: 1.333 d
KOI: K02867.01 Corr: 0.892



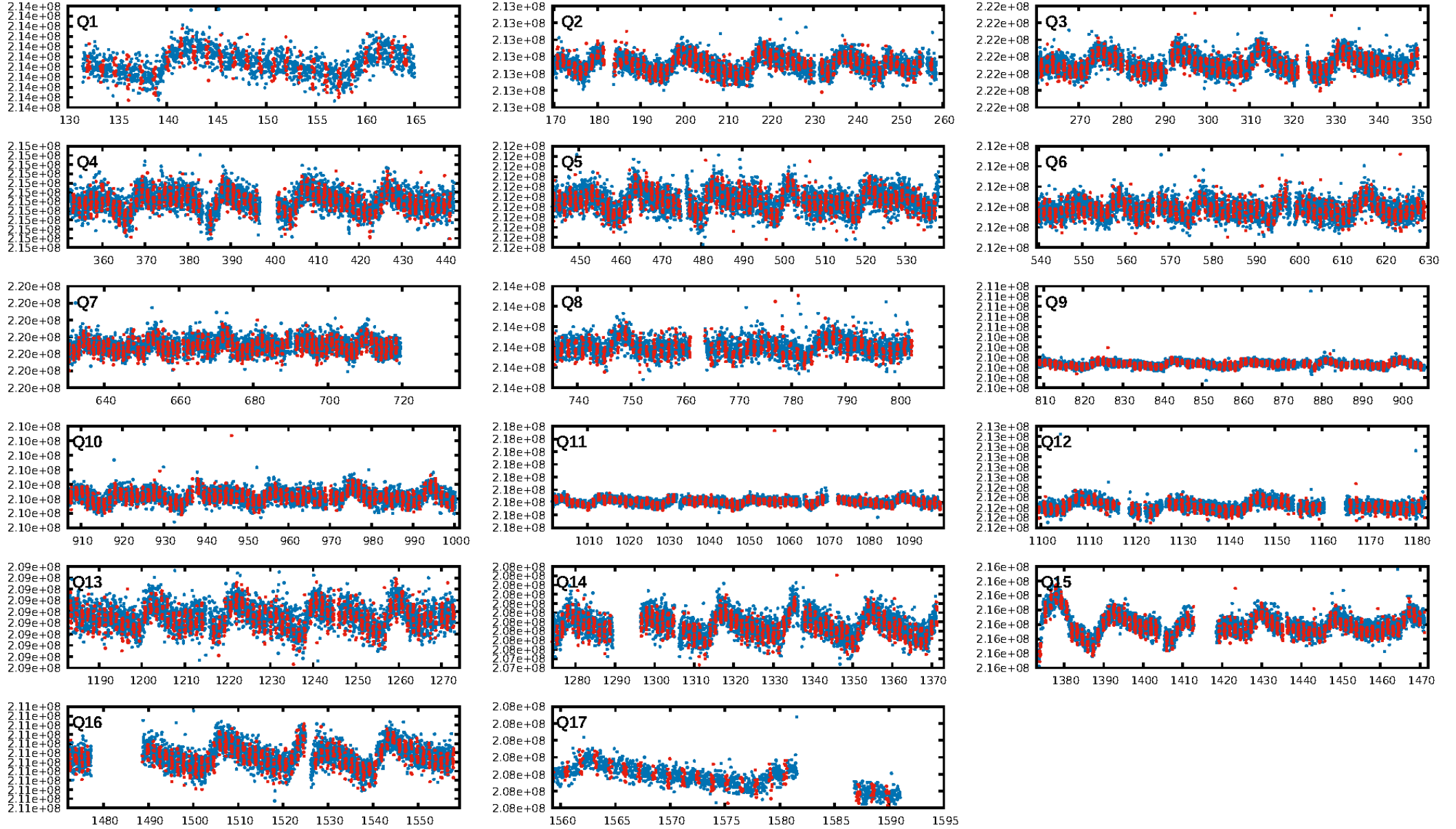
DV Fit Results:

Period = 1.33250 [0.00001] d
Epoch = 132.0866 [0.0026] BKJD
Rp/R* = 0.0051 [0.0015]
a/R* = 1.78 [1.37]
b = 0.86 [0.36]
Seff = 576.11 [68.97]
Teq = 1249 [37] K
Rp = 0.40 [0.12] Re
a = 0.0218 [0.0013] AU
Ag = 5.03 [3.64] [1.11σ]
Teffp = 2892 [522] K [3.14σ]

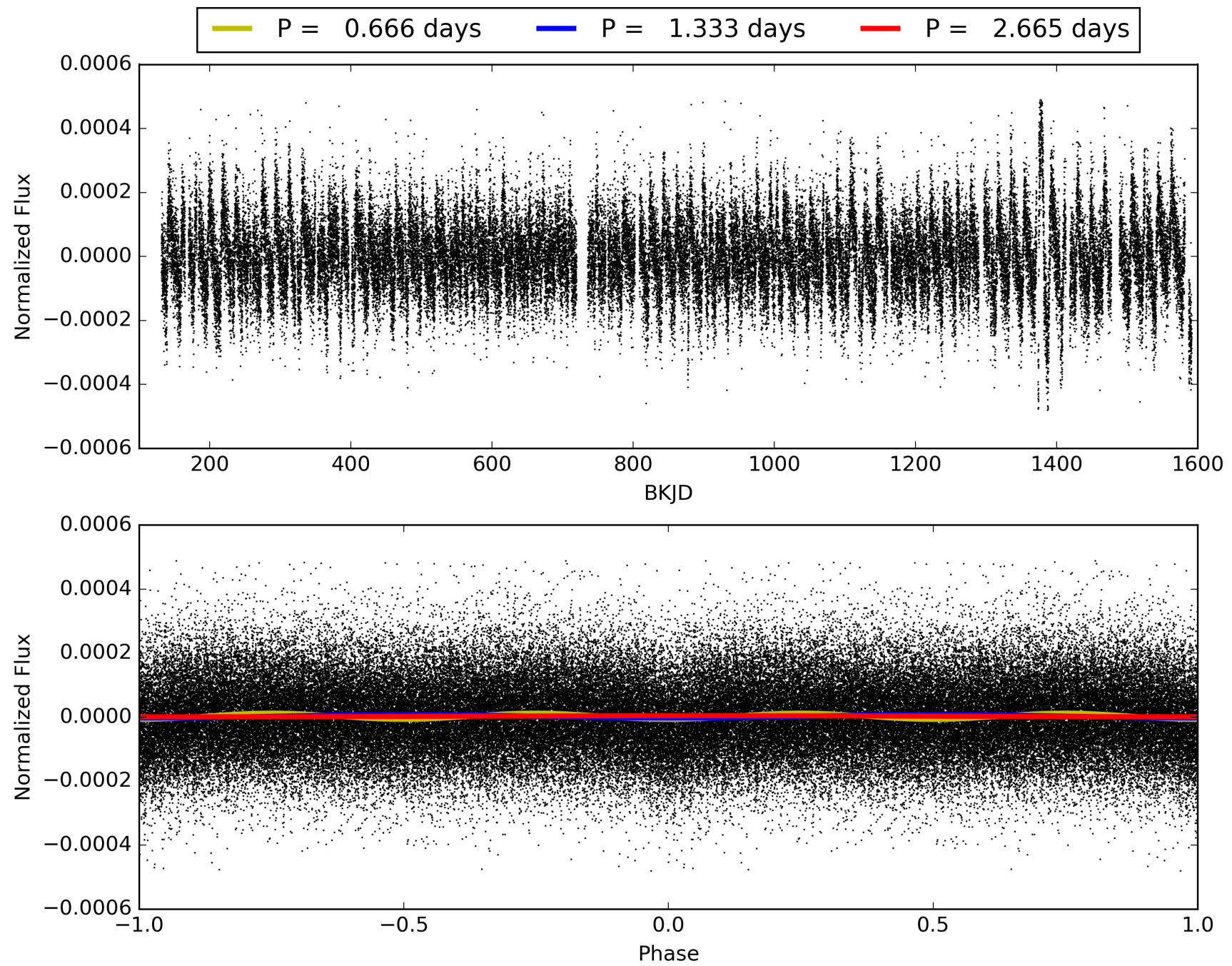
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [12.75σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.21e-86
RollingBand-fgt: 1.00 [961/961]
GhostDiagnostic-chr: 0.1915
Centroid-sig: 0.6%
Centroid-so: 0.905 arcsec [1.29σ]
OotOffset-rm: 1.498 arcsec [1.76σ]
KicOffset-rm: 1.478 arcsec [1.78σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.24 [4/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009899181-01, PDC Light Curves

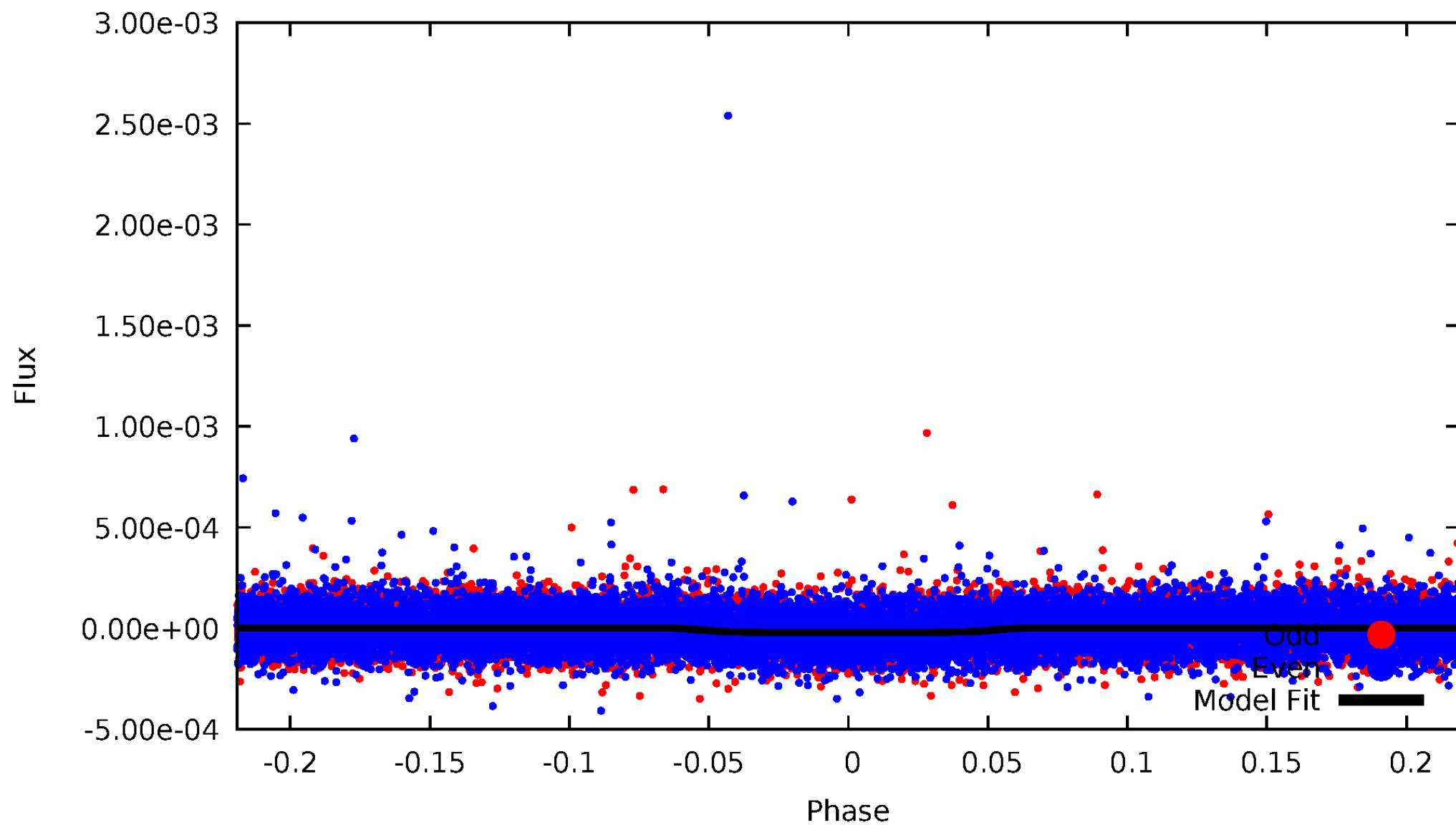


TCE 009899181-01



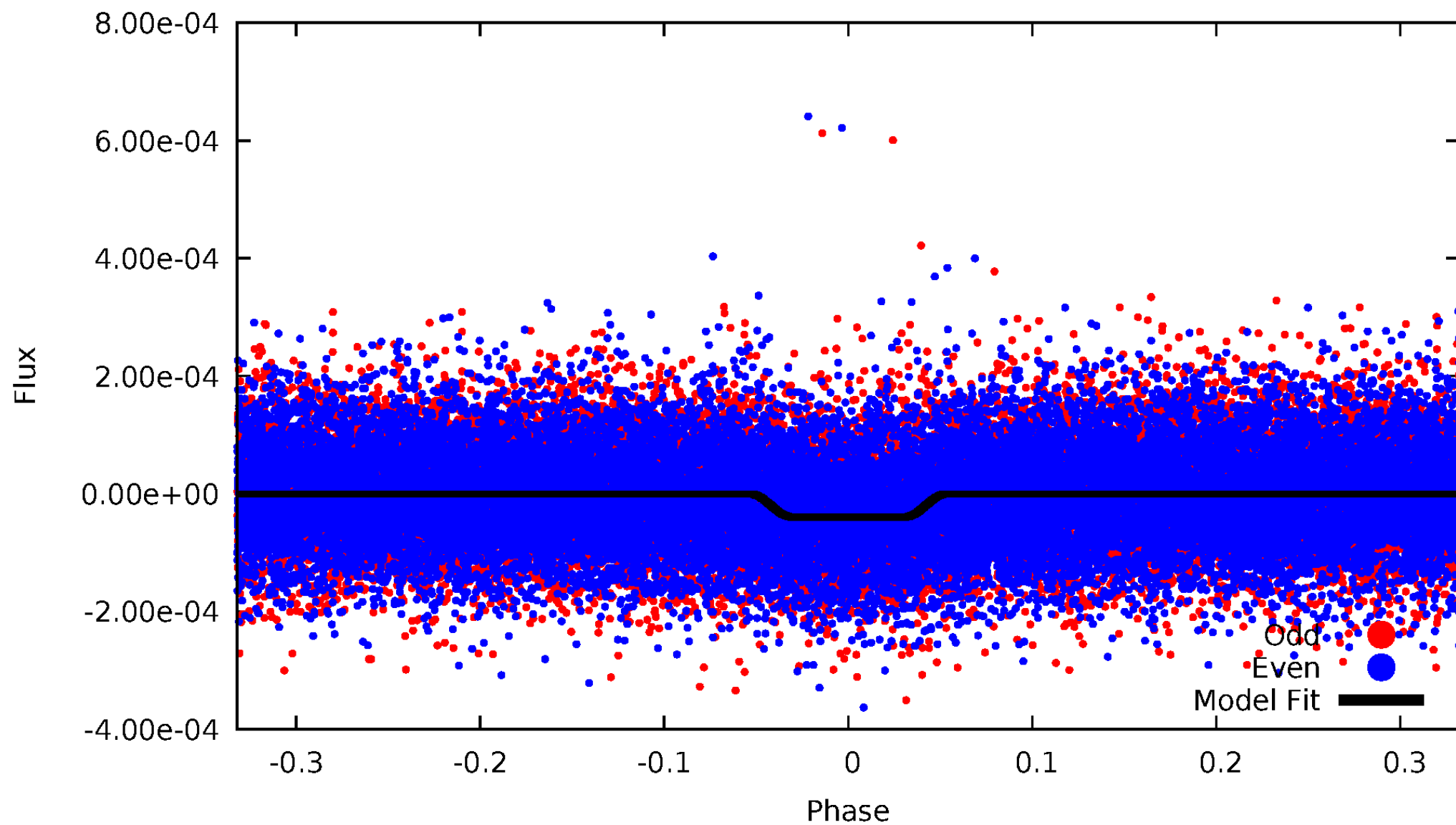
DV Odd/Even

TCE 009899181-01



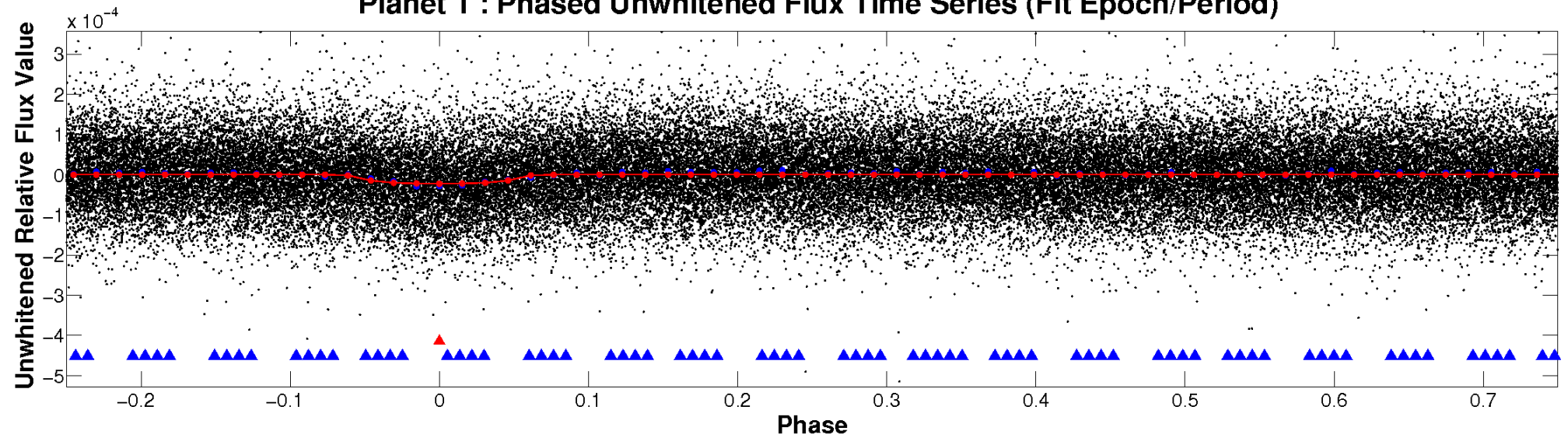
ALT Odd/Even

TCE 009899181-01

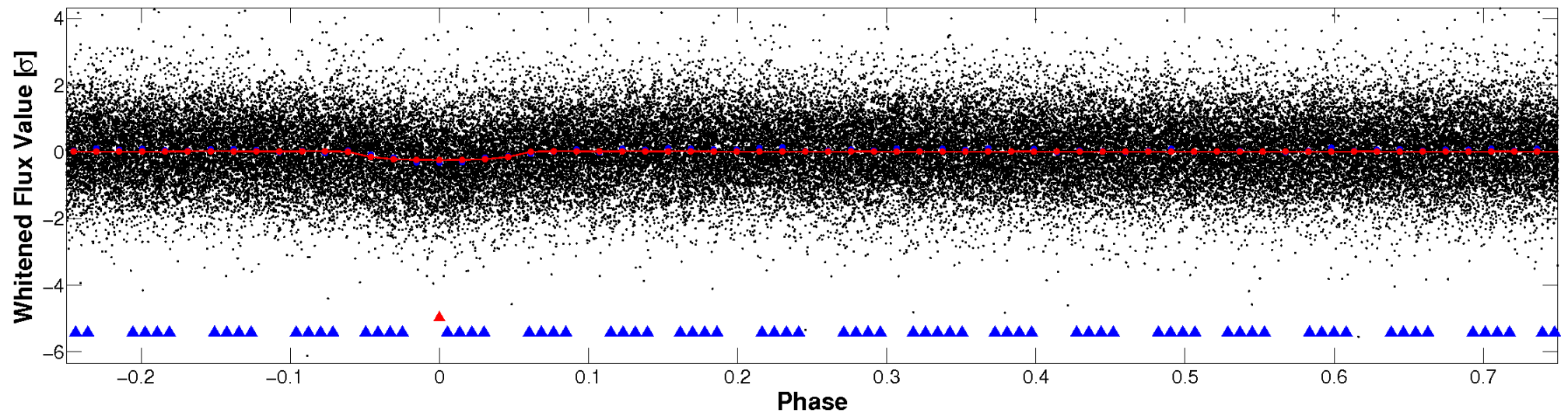


Non-Whitened Vs. Whitened Light Curve

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

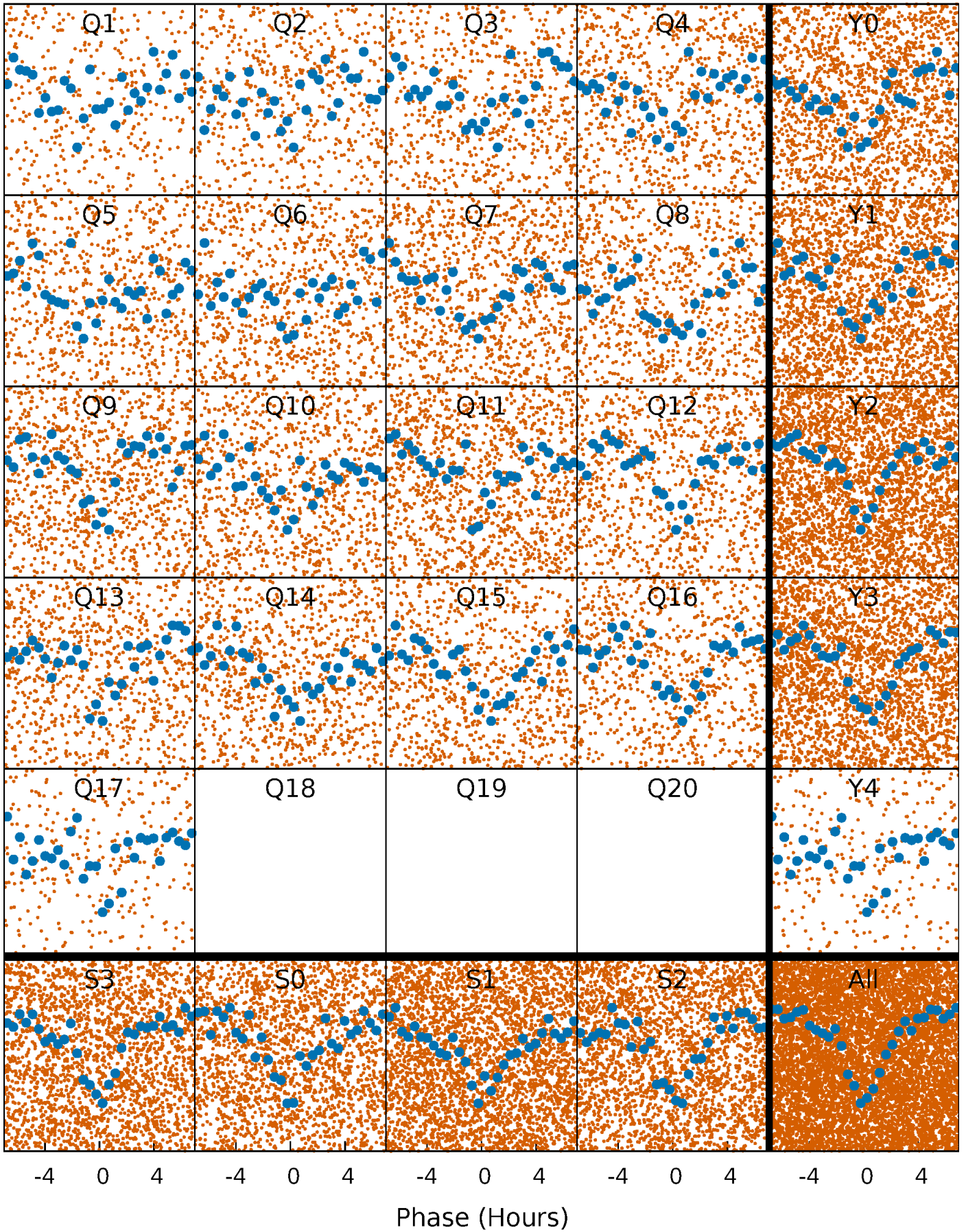


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



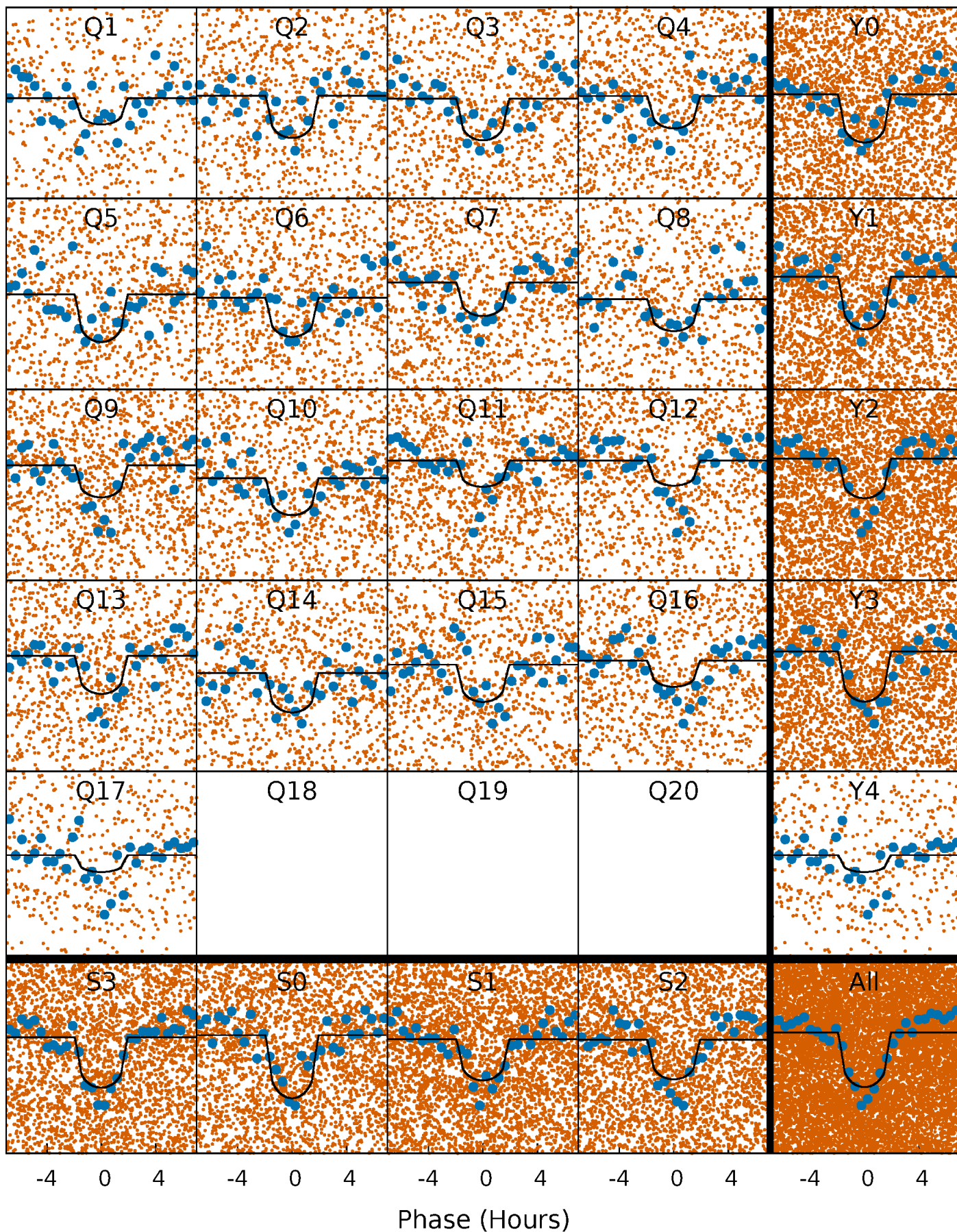
PDC Quarter-Phased Transit Curves

TCE 009899181-01 P= 1.332503 Days $T_0=132.086635$ (BKJD)



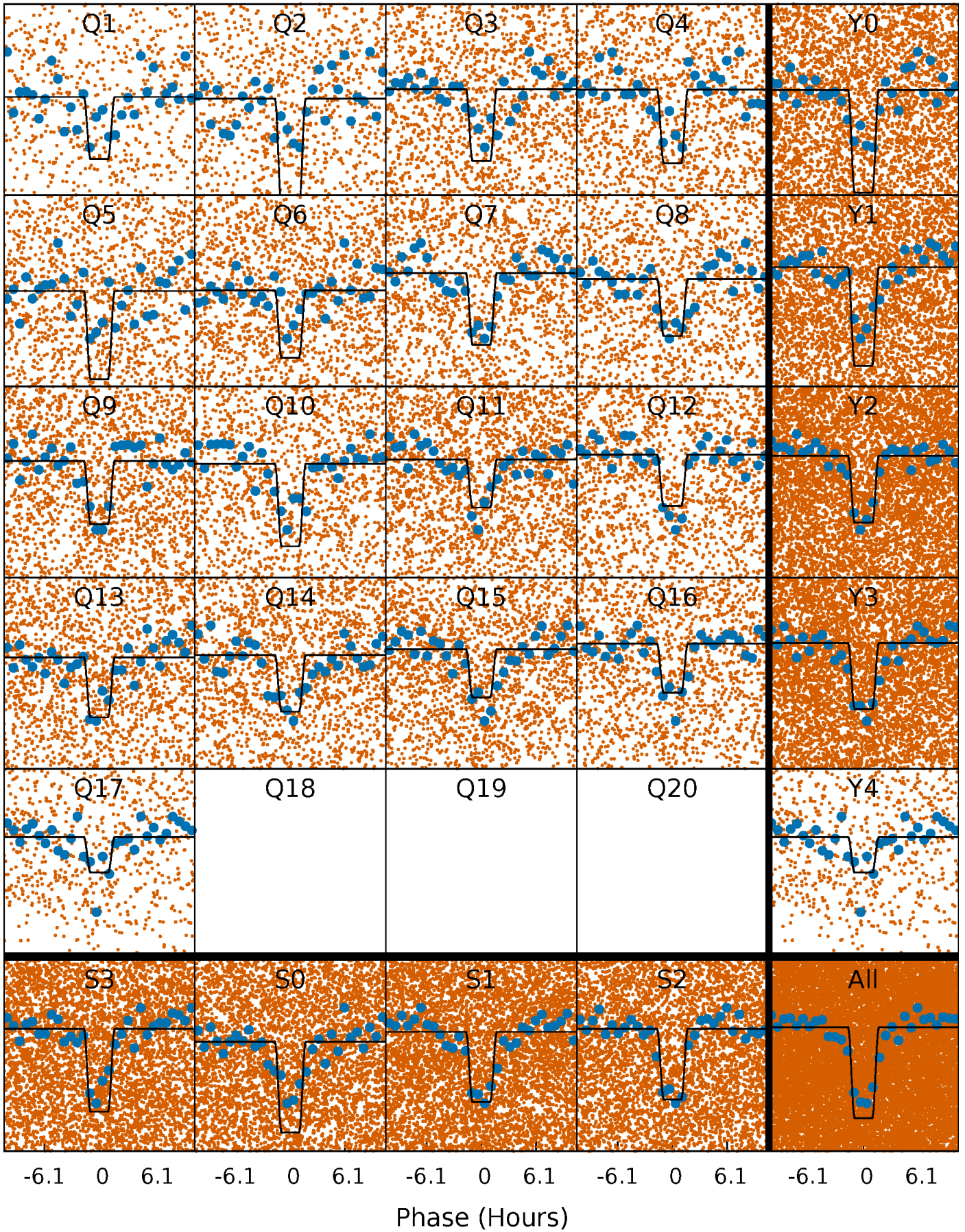
DV Quarter-Phased Transit Curves

TCE 009899181-01 P= 1.332503 Days $T_0=132.086635$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

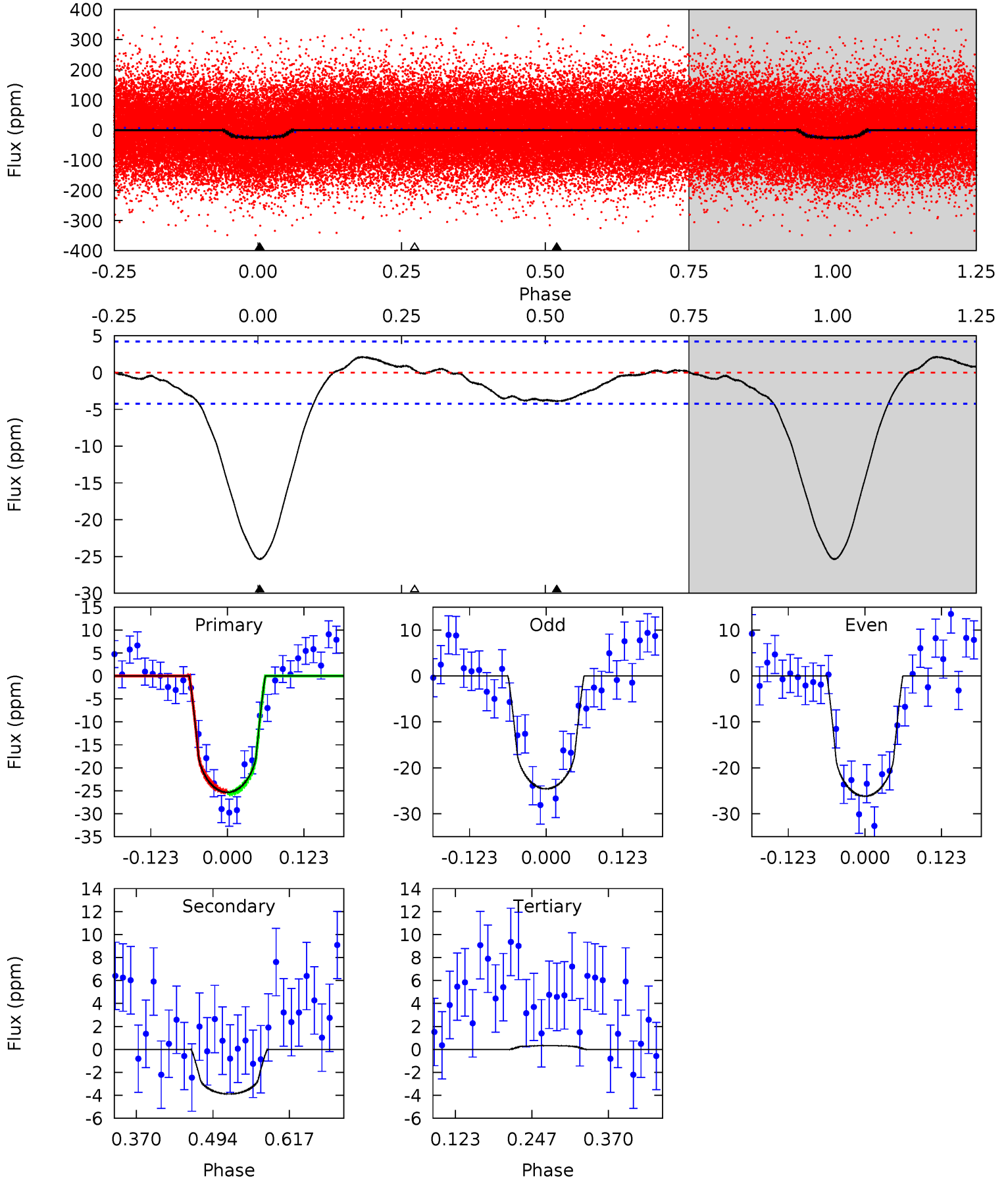
TCE 009899181-01 P= 1.332553 Days $T_0=132.058428$ (BKJD)



DV Model-Shift Uniqueness Test

009899181-01, P = 1.332503 Days, E = 130.754132 Days

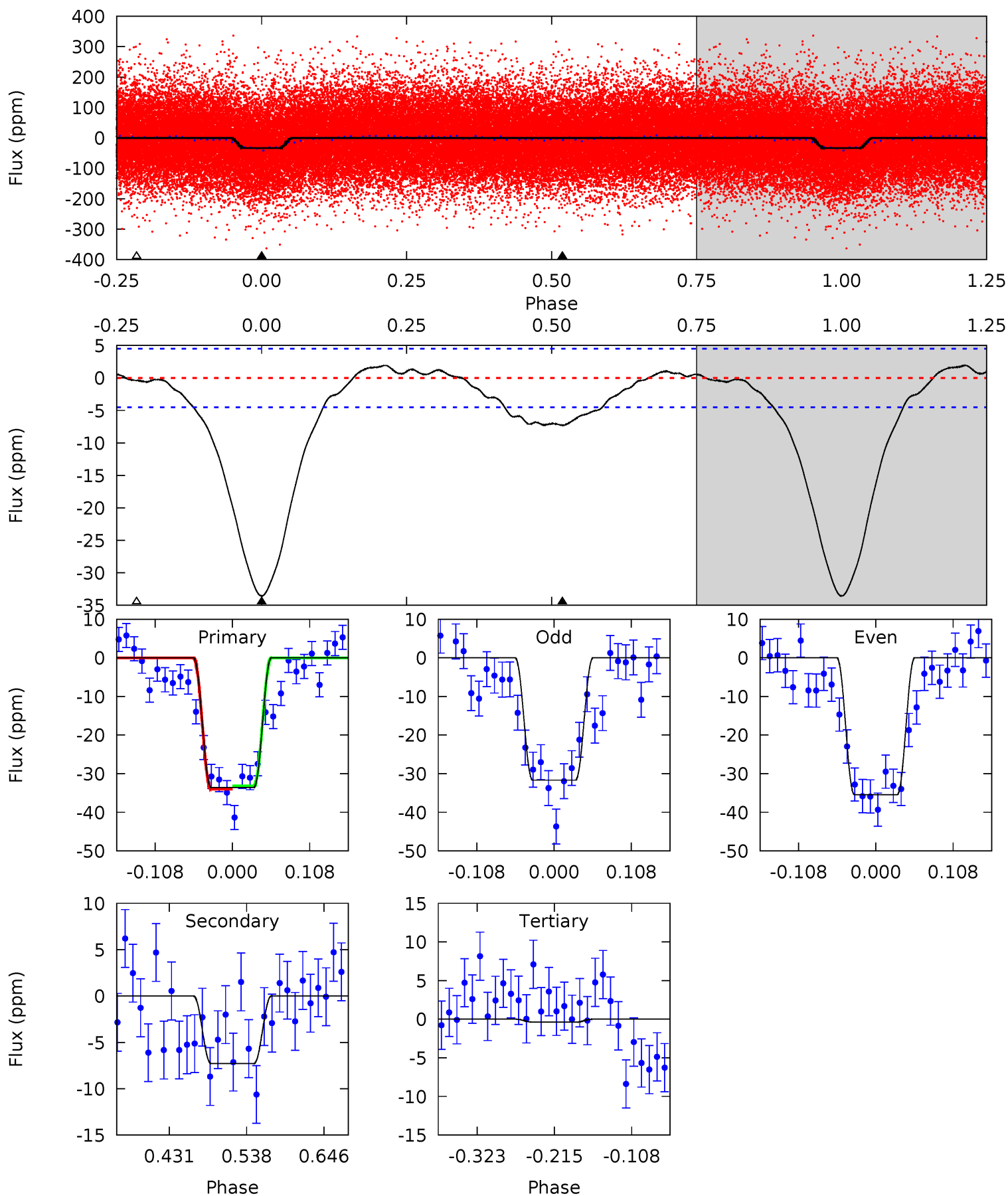
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.1	4.16	-0.35	0	4.52	1.54	1.14	27.5	27.1	4.51	4.16	0.86	0.99	0.08	0.23



Alt Model-Shift Uniqueness Test

009899181-01, P = 1.332553 Days, E = 130.725875 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.9	7.37	0.39	0	4.55	1.61	1.61	33.6	33.9	6.98	7.37	1.89	0.98	0.05	0.41



Stellar Parameters For KIC 009899181

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4947^{+98}_{-98}	$4.621^{+0.012}_{-0.051}$	$-0.060^{+0.150}_{-0.150}$	$0.714^{+0.047}_{-0.026}$	$0.800^{+0.029}_{-0.062}$	$3.089^{+0.220}_{-0.541}$
	+2%/-2%	+0%/-1%	+250%/-250%	+7%/-4%	+4%/-8%	+7%/-18%
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 009899181-01 / KOI 2867.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-4 ± 1	$0.40^{+0.12}_{-0.12}$	1765^{+42}_{-42}	3482^{+477}_{-328}	$6.209^{+6.736}_{-2.801}$
Alt.	-7 ± 1	$0.49^{+0.12}_{-0.12}$	1760^{+42}_{-39}	3626^{+383}_{-284}	$7.856^{+6.243}_{-2.880}$

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

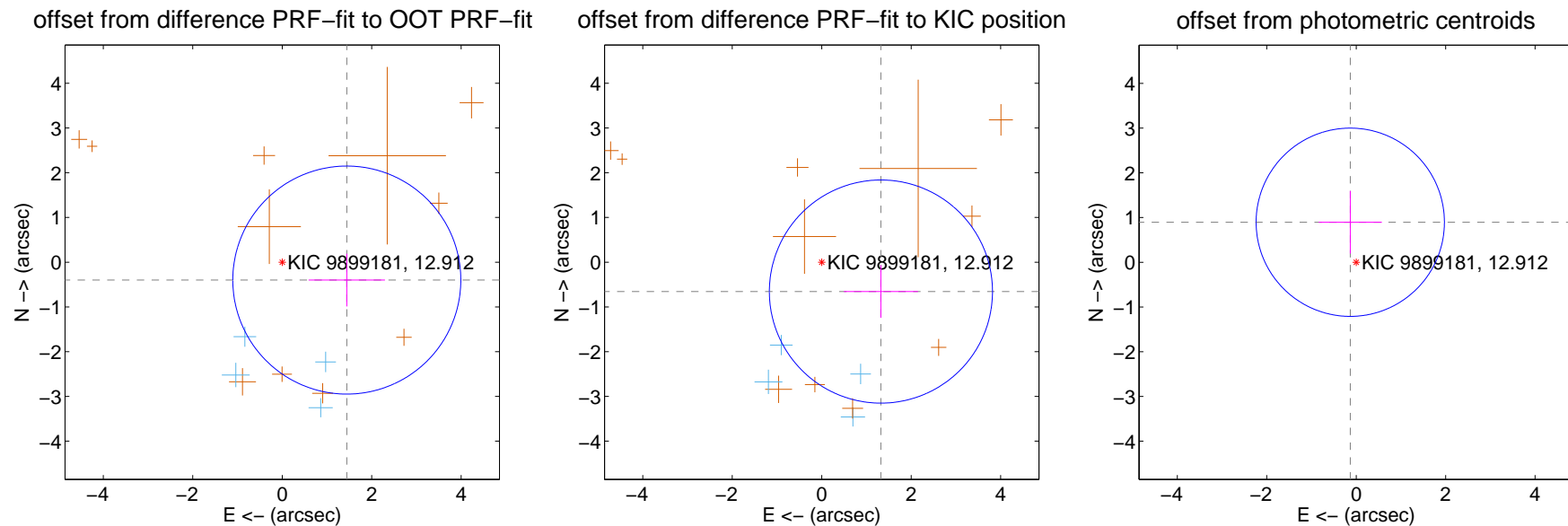
DV Centroid Data

Supplemental centroid analysis for 009899181-01. Kepler magnitude: 12.91. Transit SNR 17.71

There are 4 quarters with good PRF difference image offsets

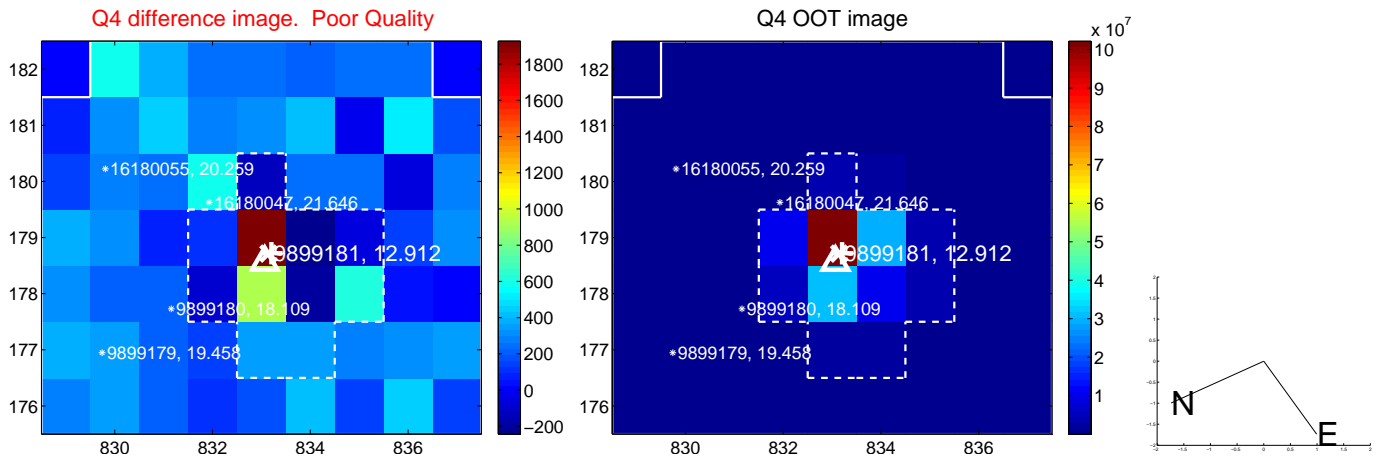
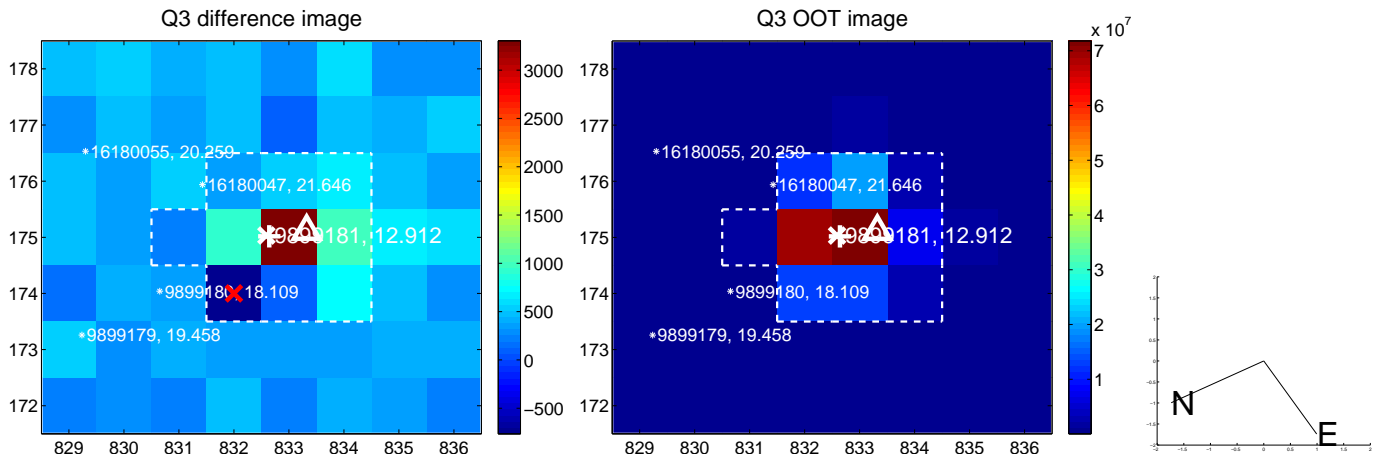
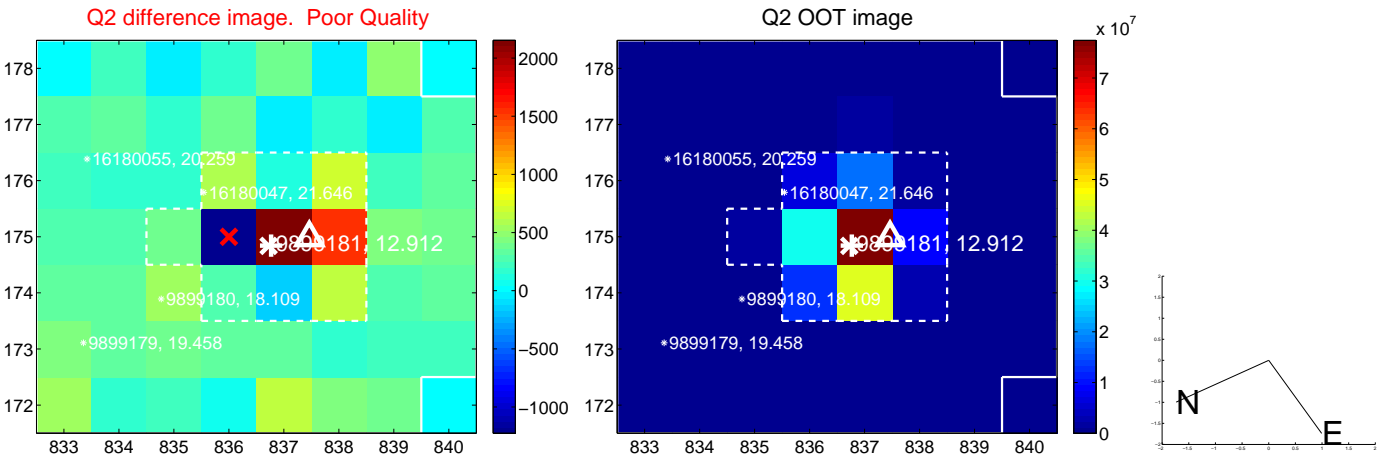
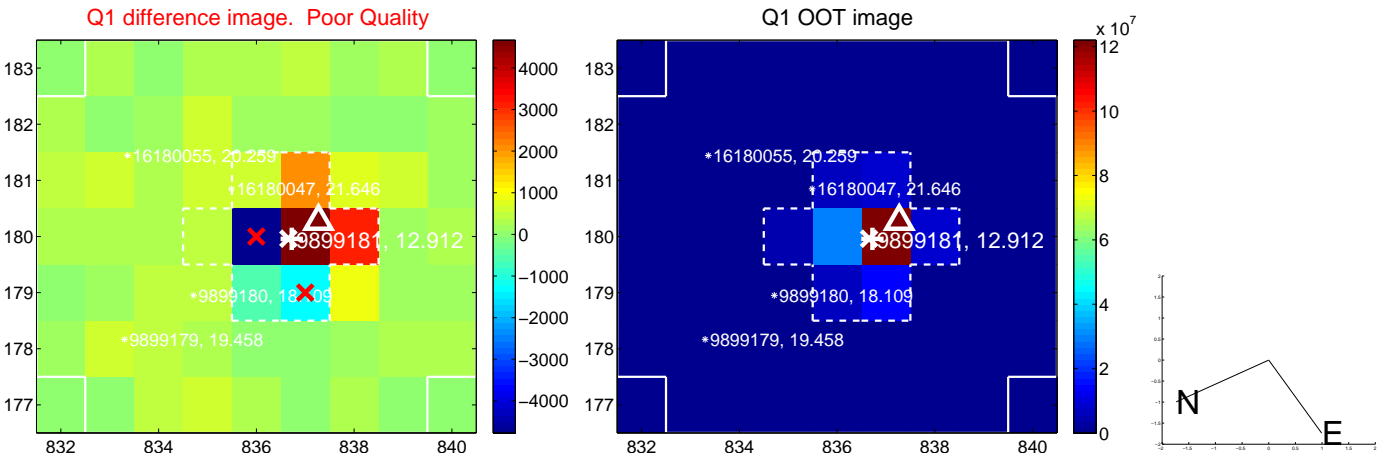
The direct PRF centroid is offset from the target star catalog position by about 0.45 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.498 ± 0.850	1.76	-1.444 ± 0.854	-0.400 ± 0.590
PRF-fit source offset from KIC position	1.478 ± 0.832	1.78	-1.324 ± 0.829	-0.657 ± 0.589
photometric centroid source offset	0.90 ± 0.70	1.29	0.13 ± 0.71	0.89 ± 0.70

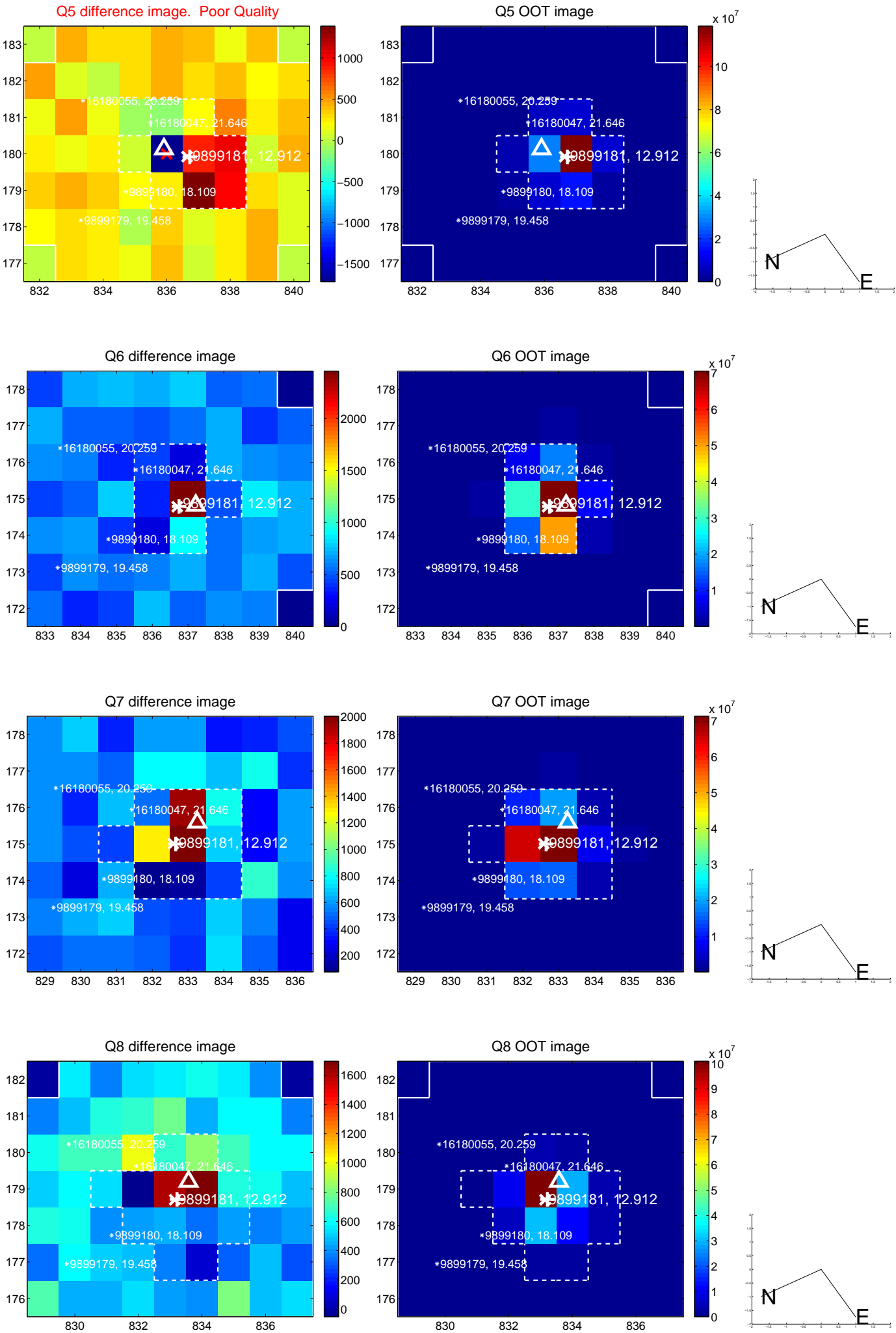


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

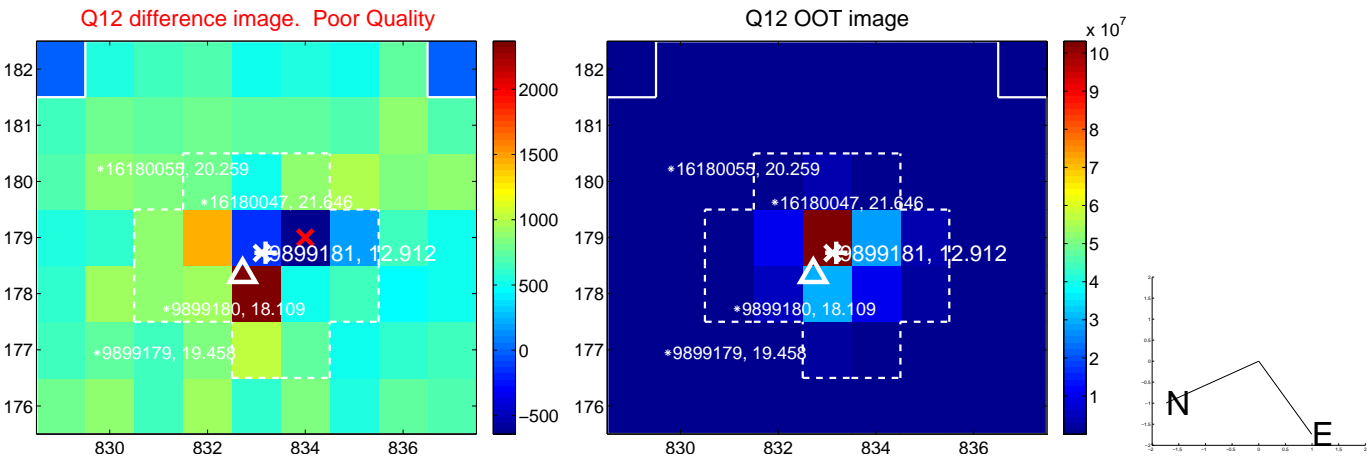
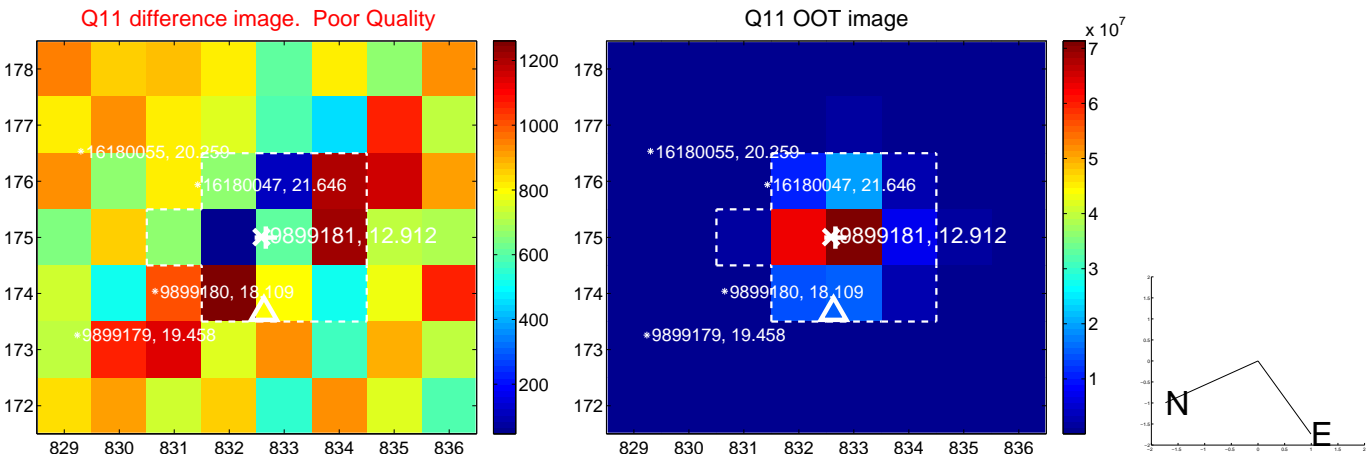
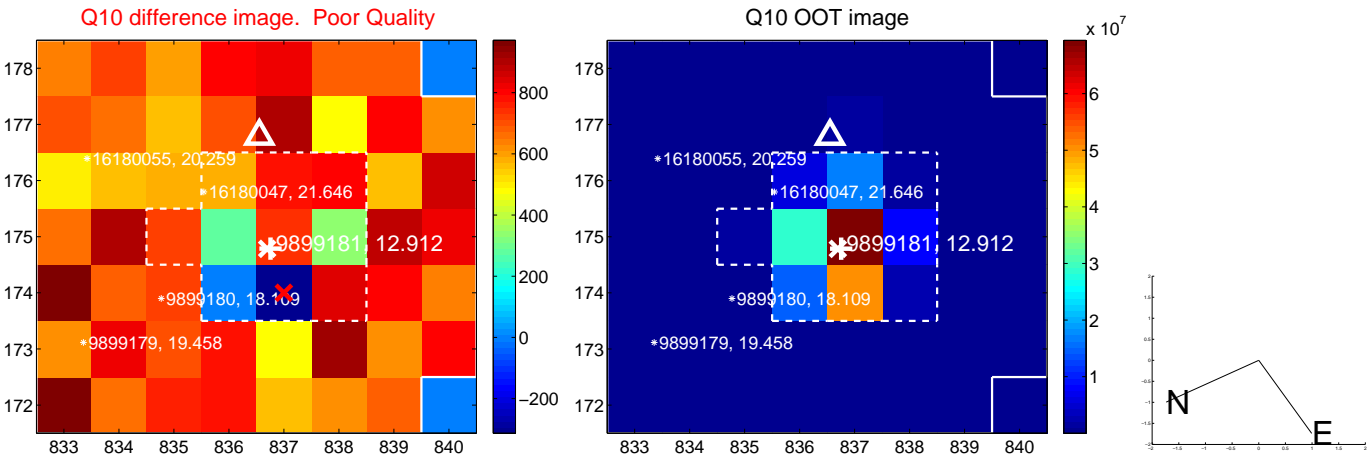
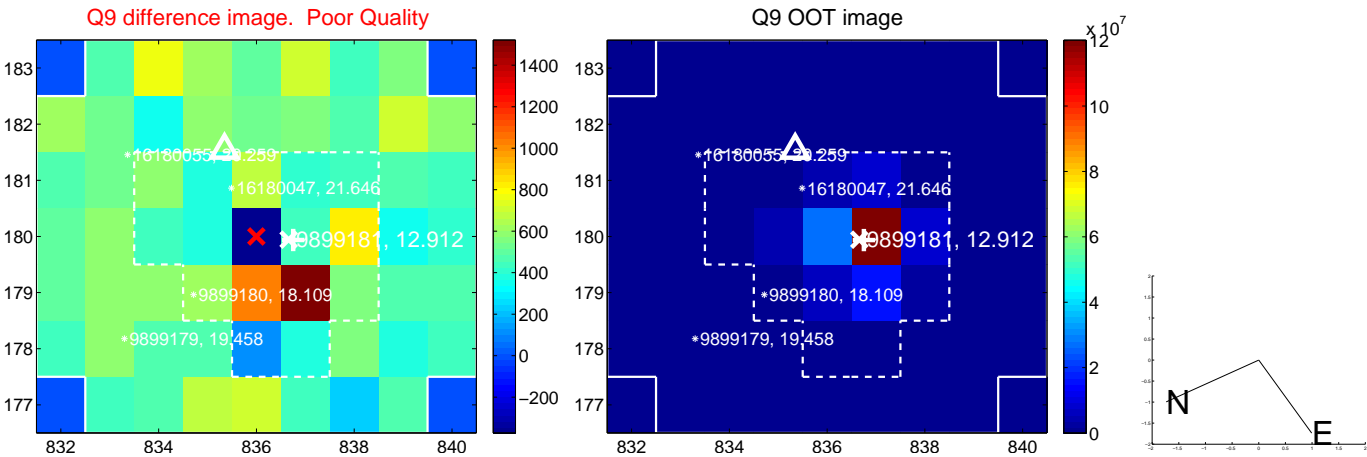
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



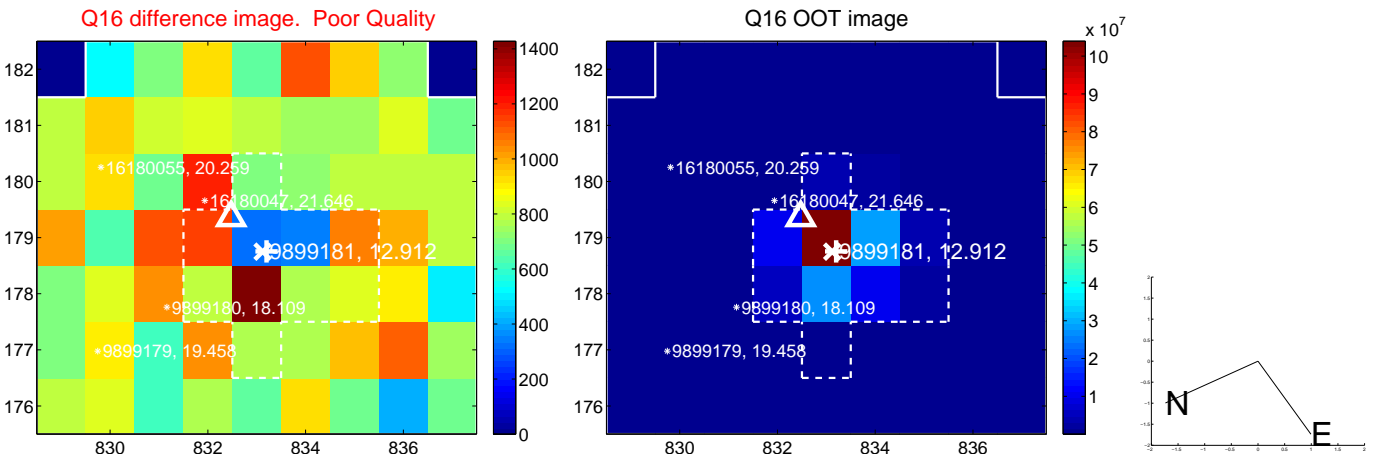
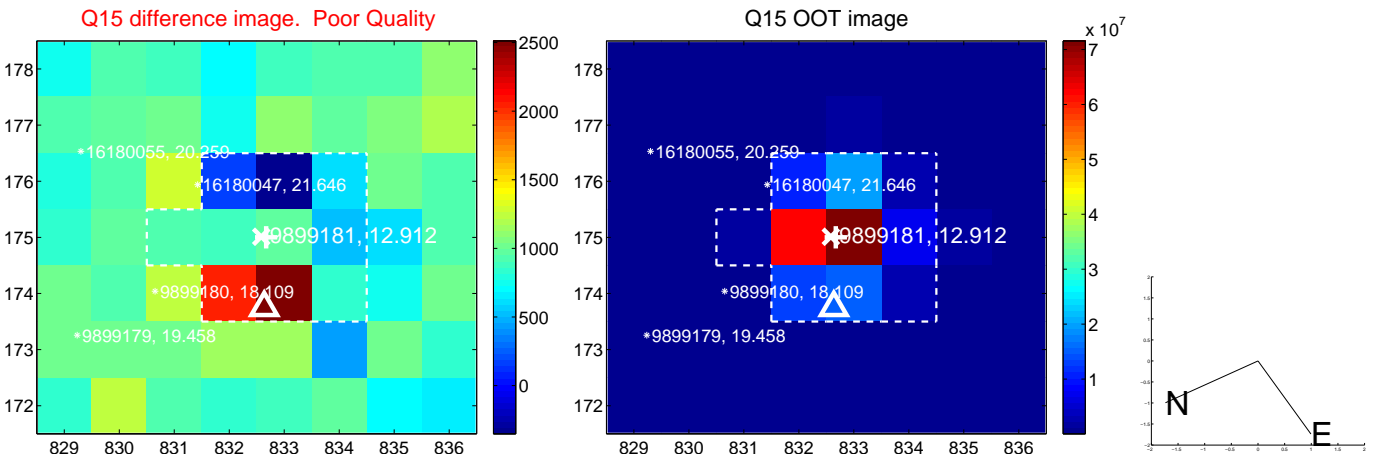
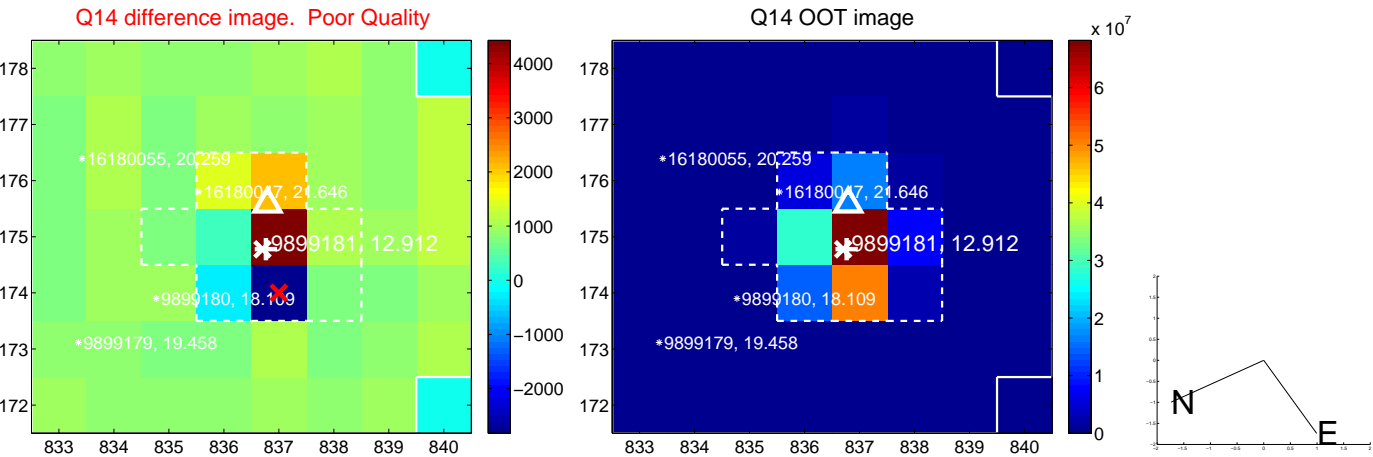
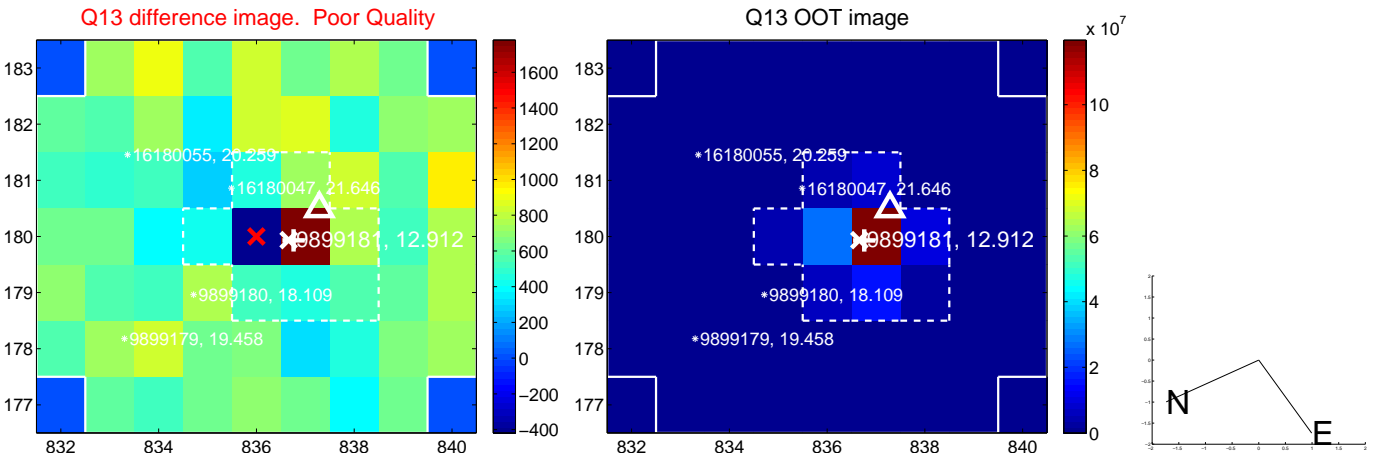
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



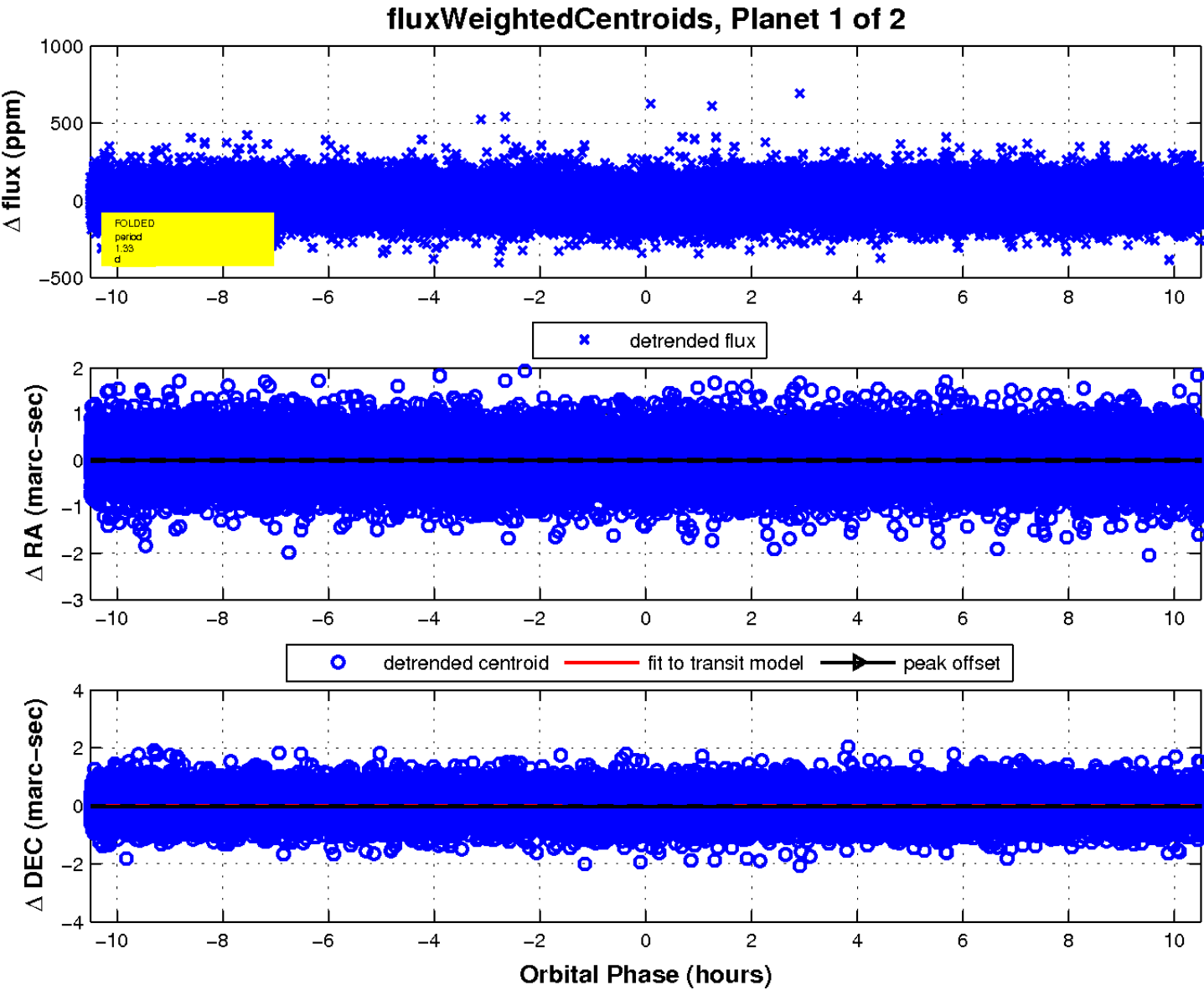
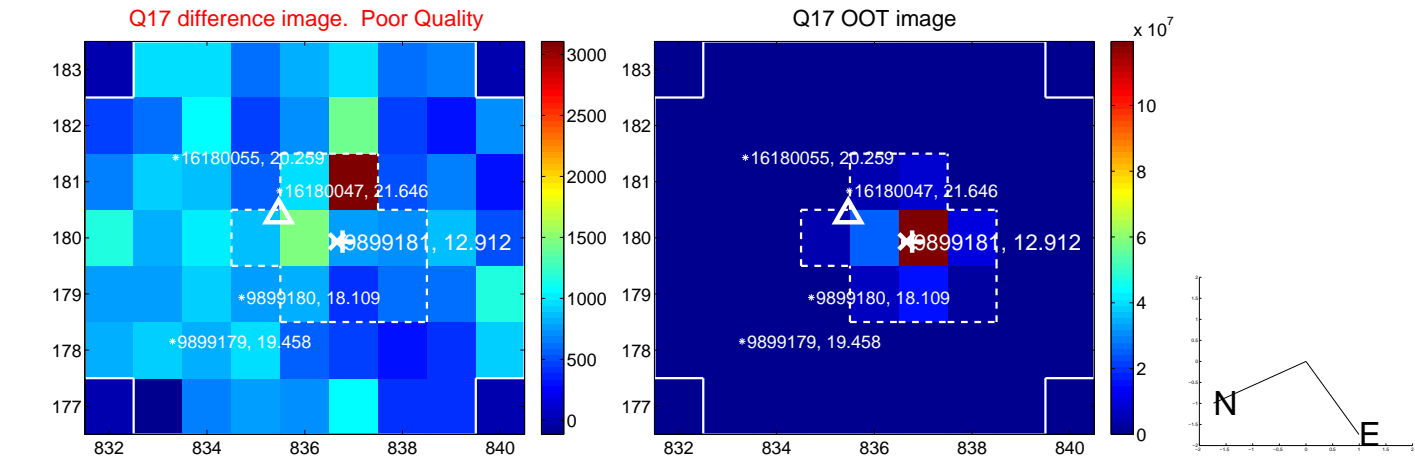
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



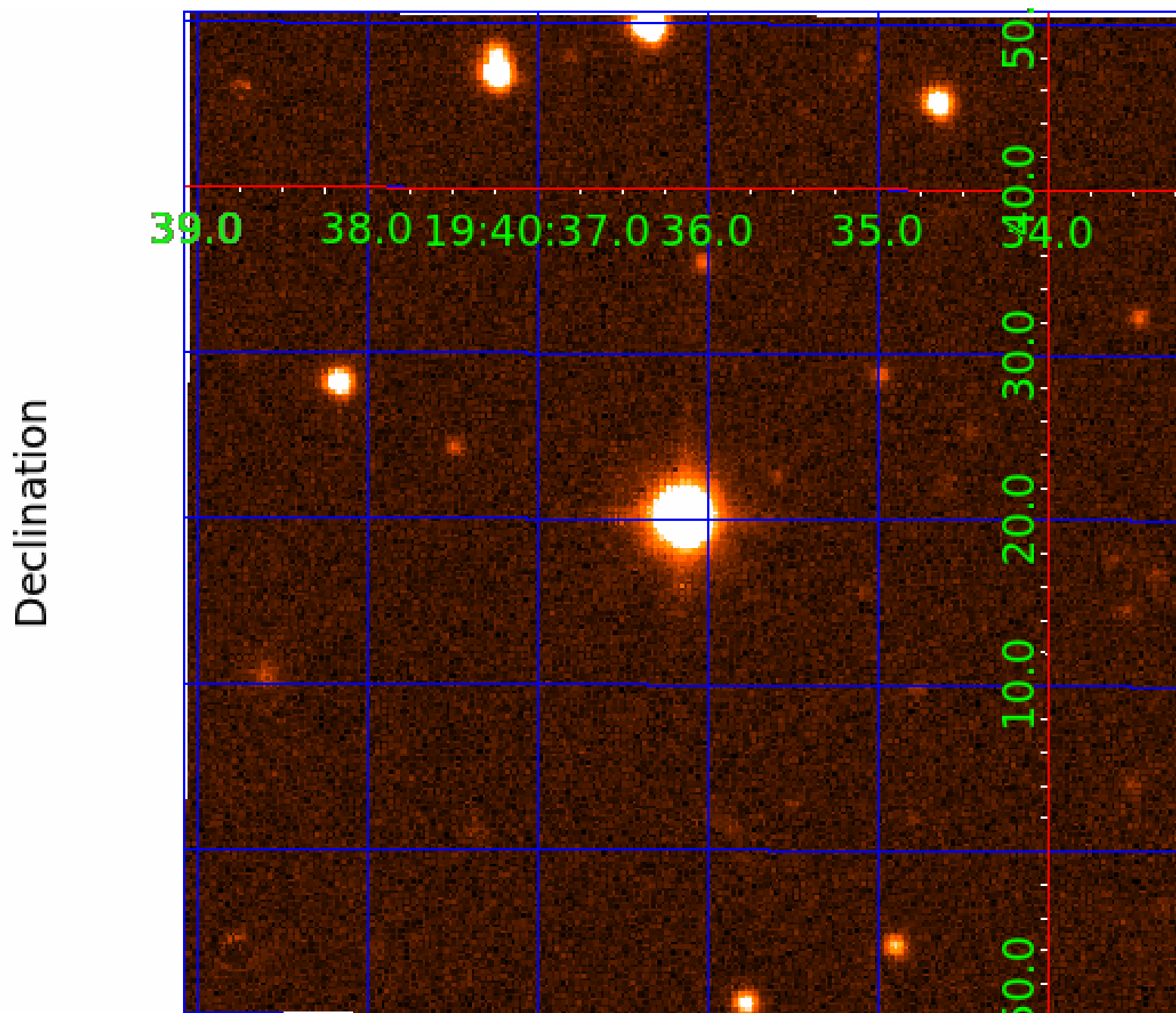
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009899181

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})
009899181-01	OBS	2867.01	1.332503	132.086636	22.5	3.502	20.2	17.7	0.71	4947	0.40	576.11
009899181-02	OBS	2867.02	18.936139	139.172597	38.8	32.945	9.4	12.6	0.71	4947	0.46	16.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009899181-01	OBS	FP	0.00	0	0	1	1	HALO_GHOST—EPHEM_MATCH
009899181-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV

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

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

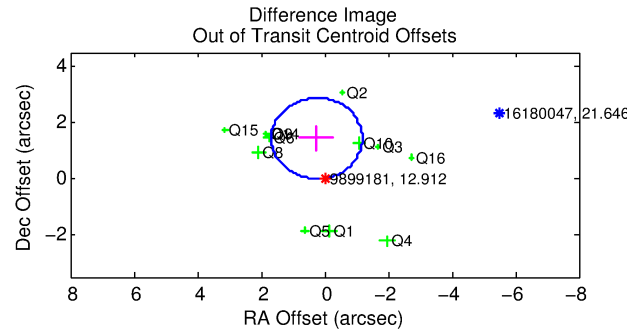
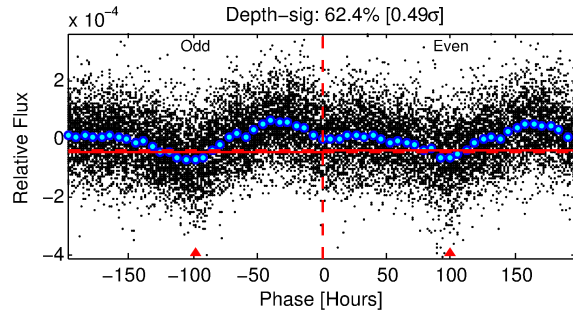
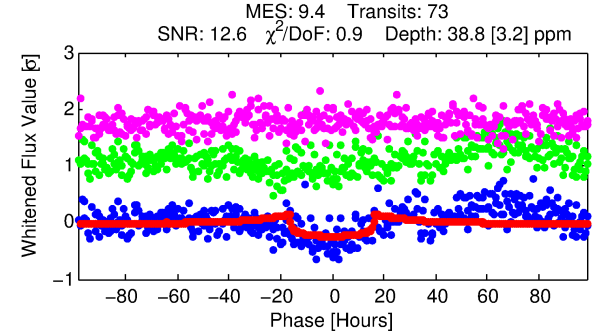
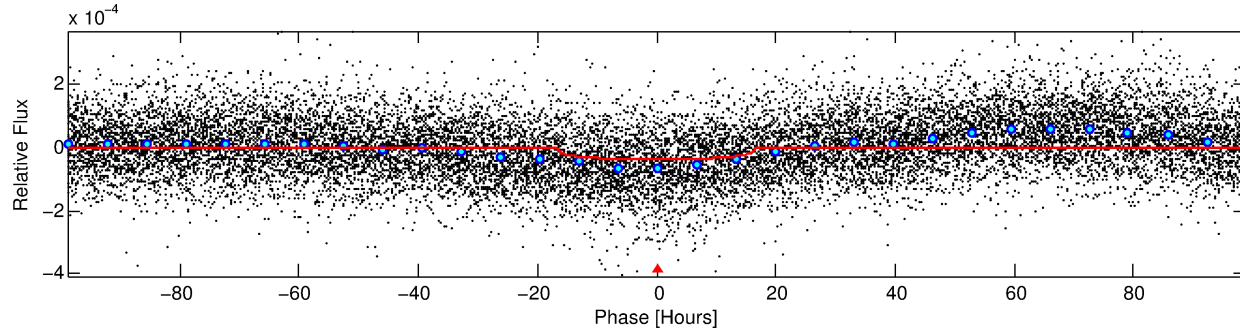
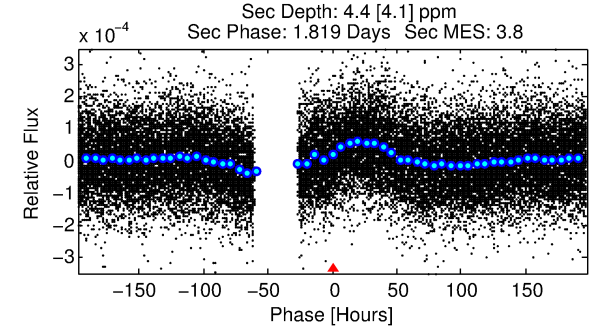
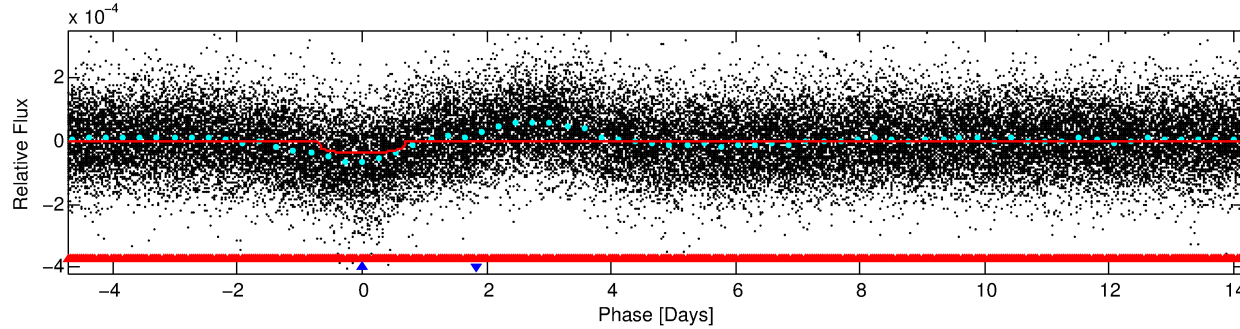
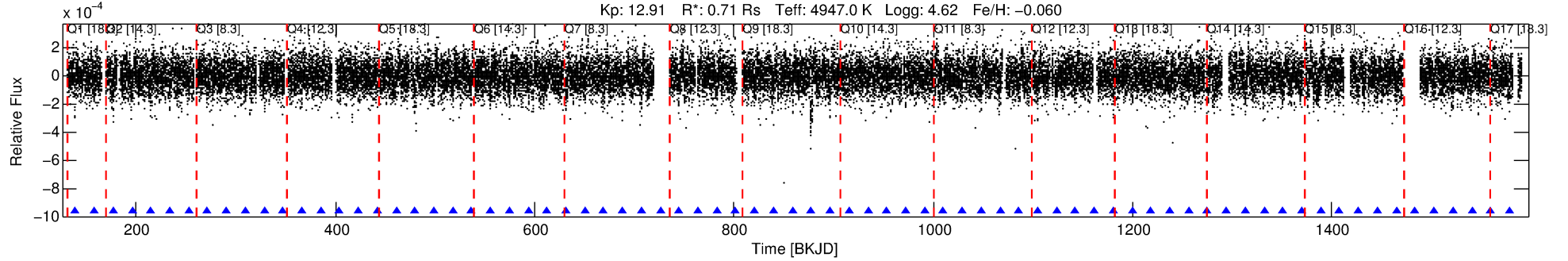
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009899181-02

No Significant Match Found

DV One-Page Summary

KIC: 9899181 Candidate: 2 of 2 Period: 18.936 d
KOI: K02867.02 Corr: 0.817



DV Fit Results:

Period = 18.93614 [0.00050] d
Epoch = 139.1726 [0.0214] BKJD
Rp/R* = 0.0059 [0.0015]
a/R* = 3.67 [2.99]
b = 0.59 [1.00]
Seff = 16.74 [2.00]
Teq = 516 [15] K
Rp = 0.46 [0.12] Re
a = 0.1278 [0.0075] AU
Ag = 187.42 [201.02] [0.93σ]
Teffp = 2950 [791] K [3.08σ]

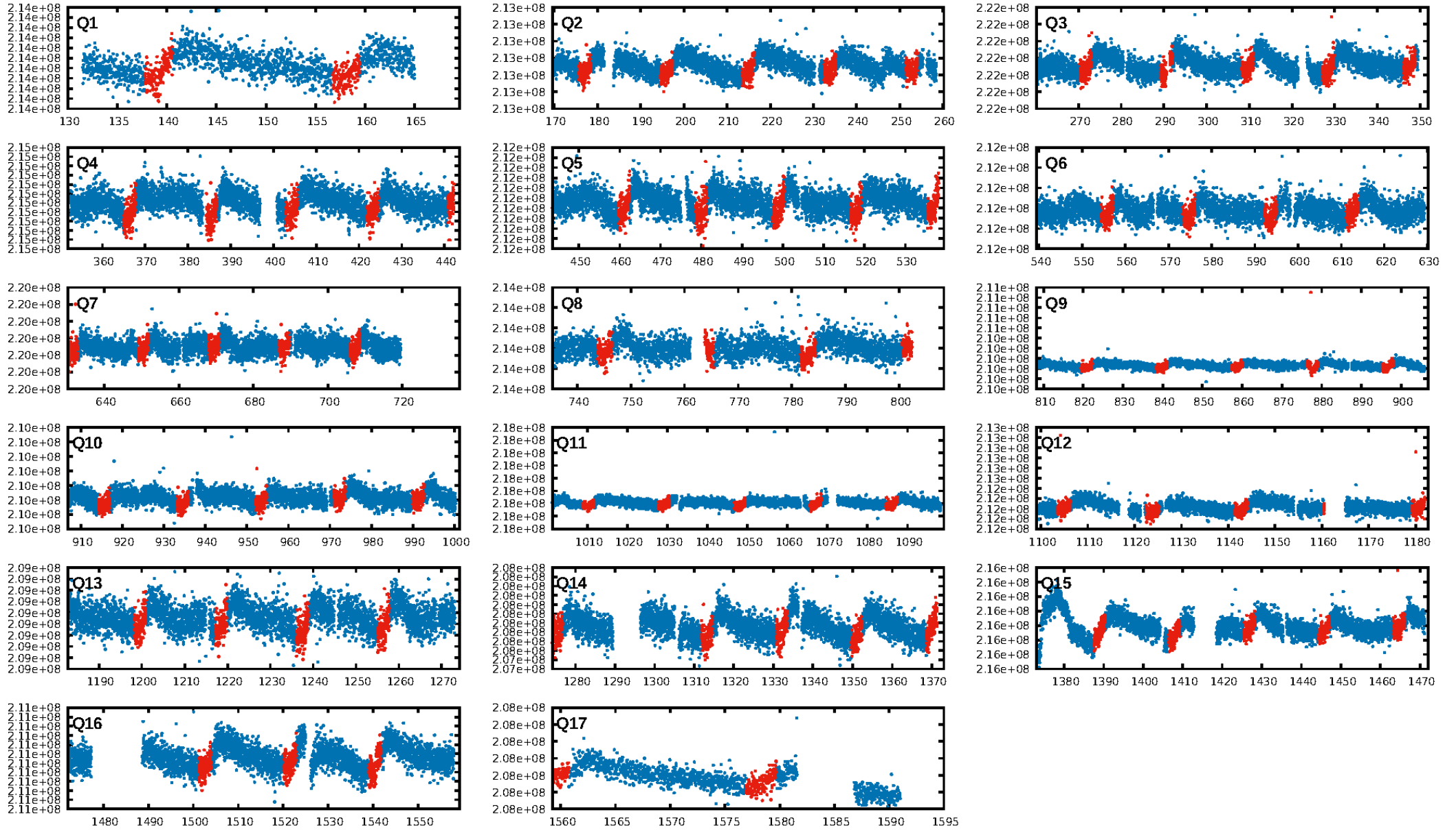
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.75σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 14.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.21e-21
RollingBand-fgt: 1.00 [69/69]
GhostDiagnostic-chr: 0.9667
Centroid-sig: 62.8%
Centroid-so: 0.038 arcsec [0.06σ]
OotOffset-rm: 1.458 arcsec [3.05σ]
KicOffset-rm: 1.214 arcsec [2.36σ]
OotOffset-st: 4/2/3/3 [12]
KicOffset-st: 4/2/3/3 [12]
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DiffImageOverlap-fno: 0.00 [0/17]

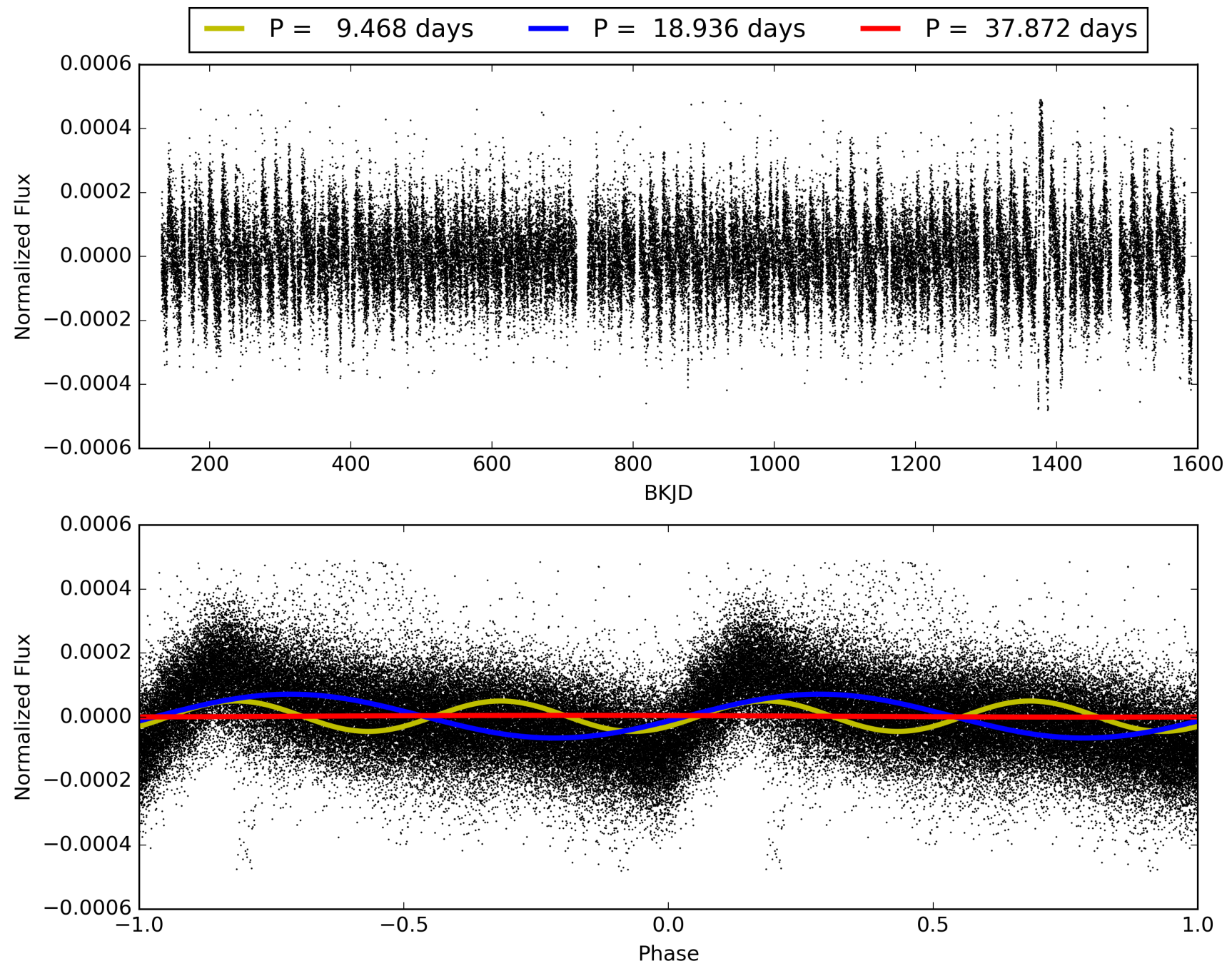
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 21:47:42 Z

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

TCE 009899181-02, PDC Light Curves

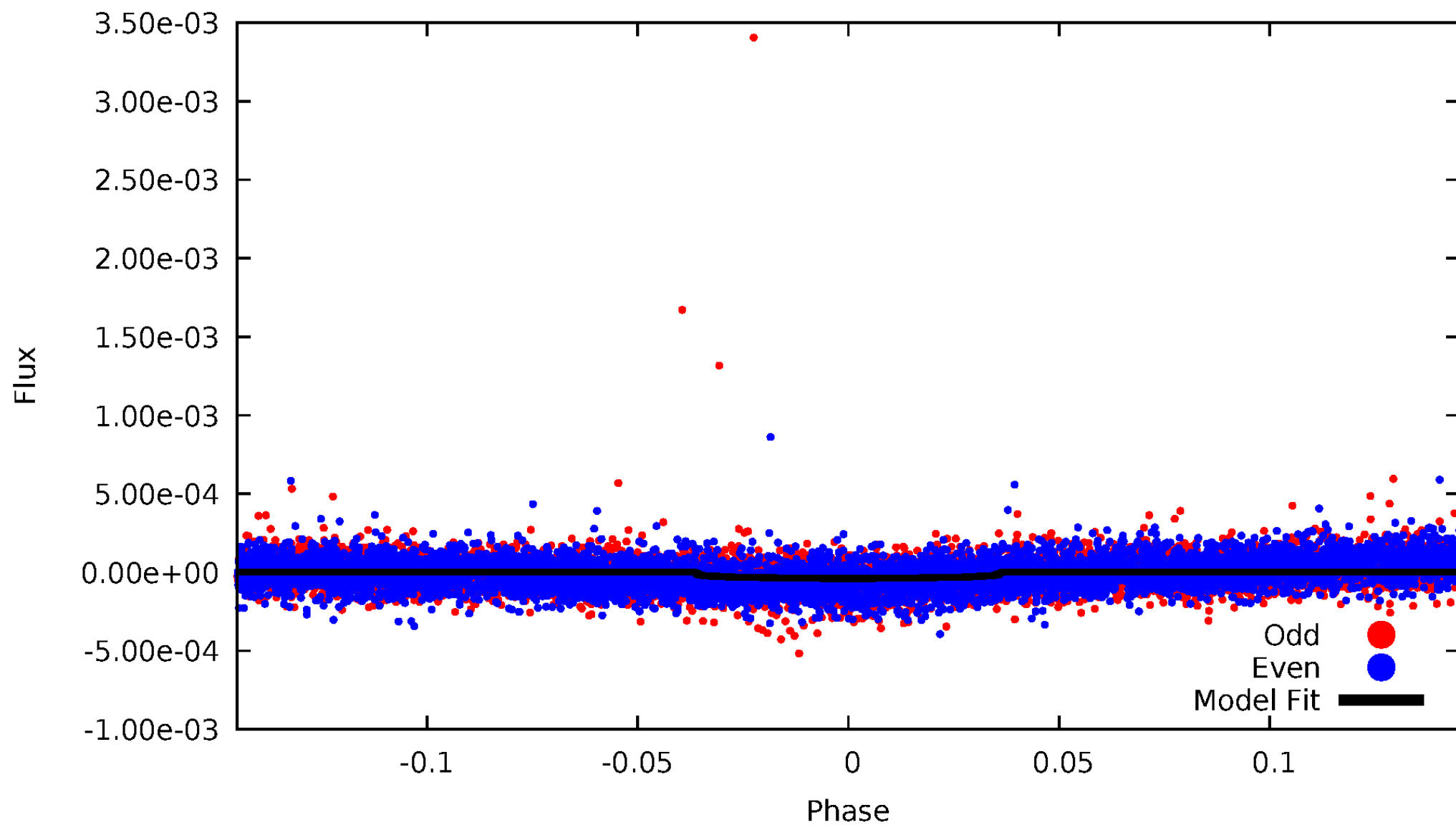


TCE 009899181-02



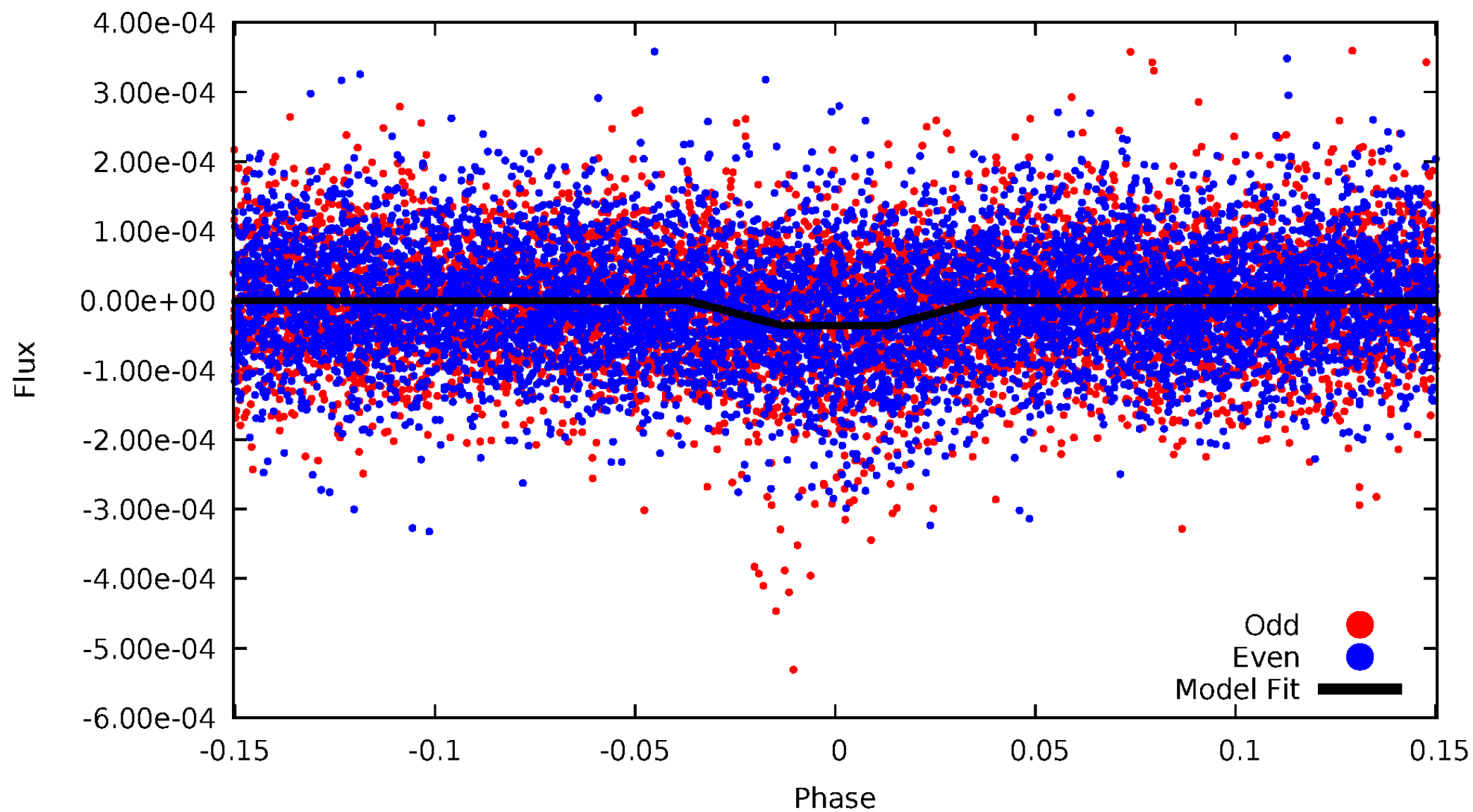
DV Odd/Even

TCE 009899181-02



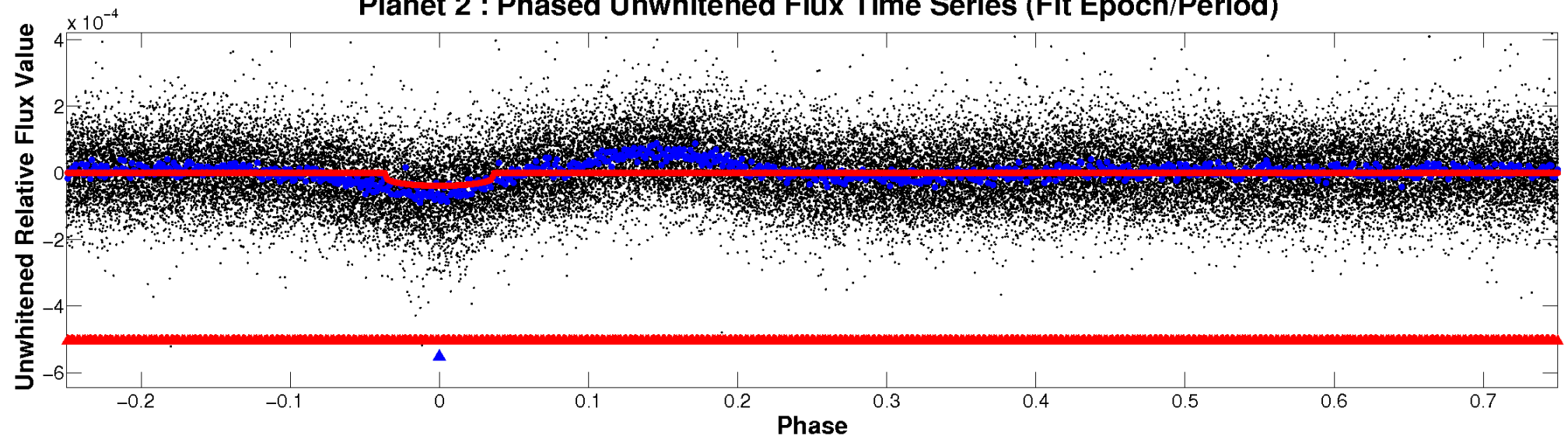
ALT Odd/Even

TCE 009899181-02

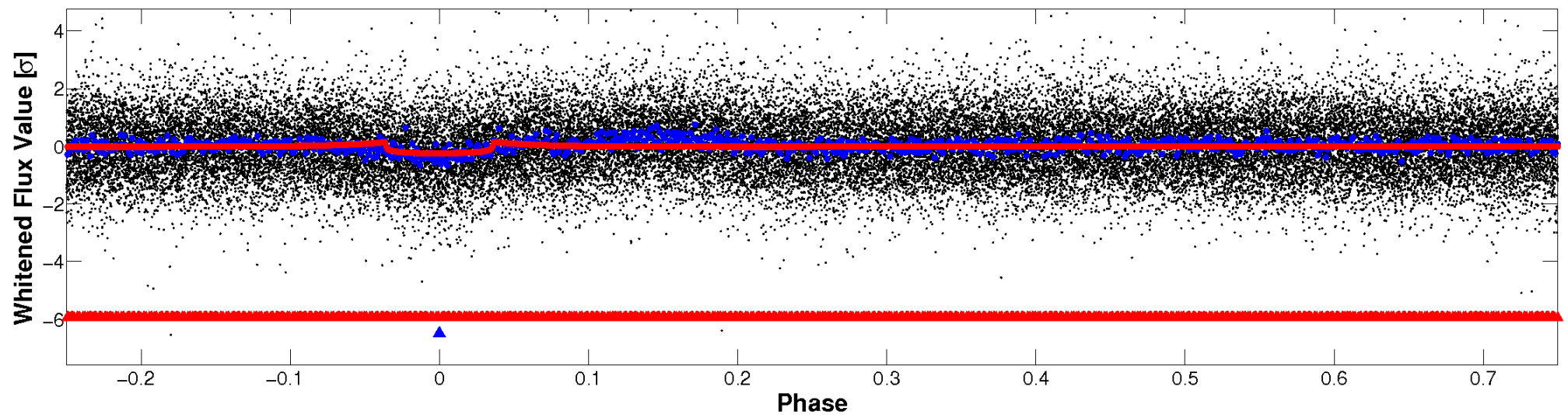


Non-Whitened Vs. Whitened Light Curve

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

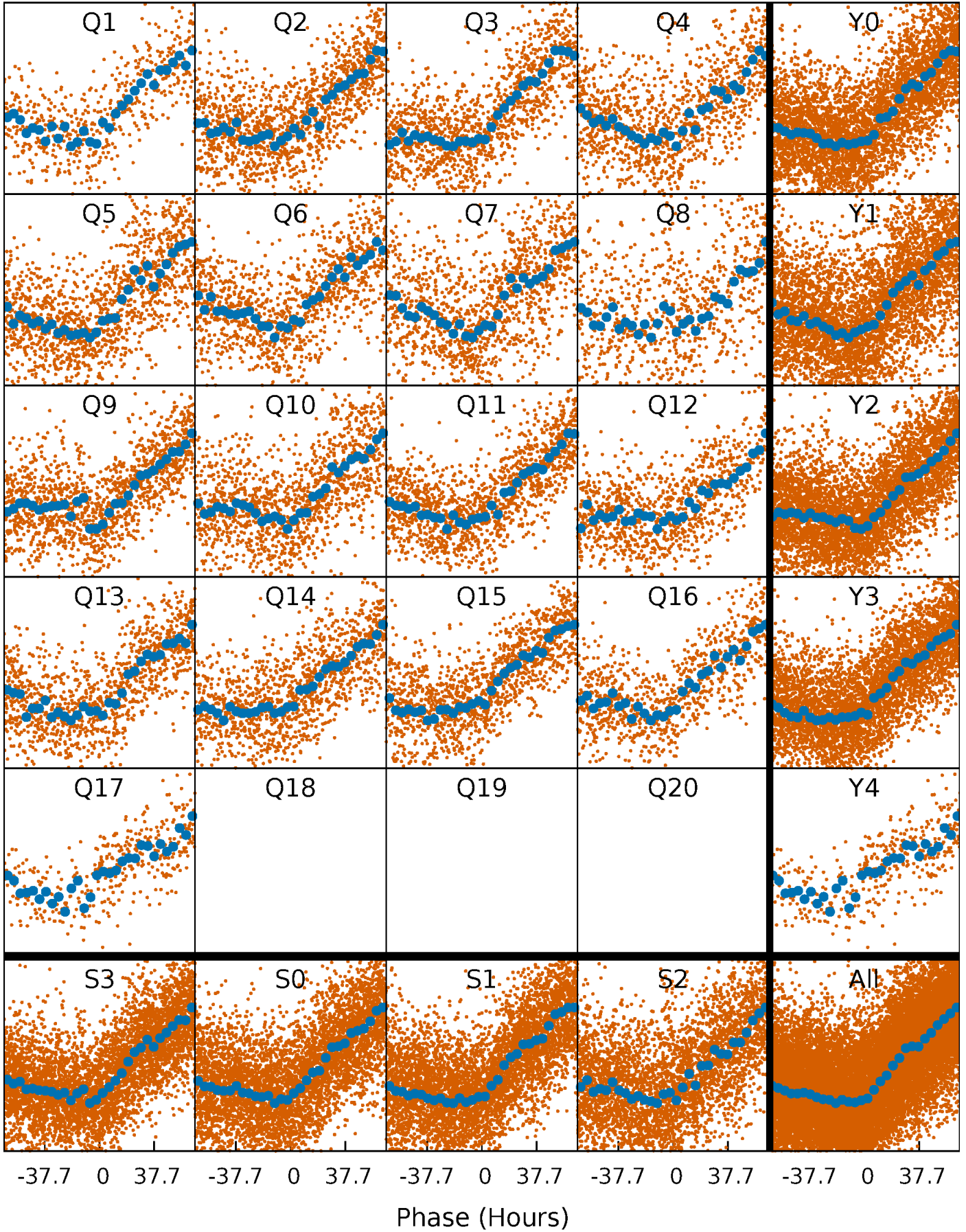


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



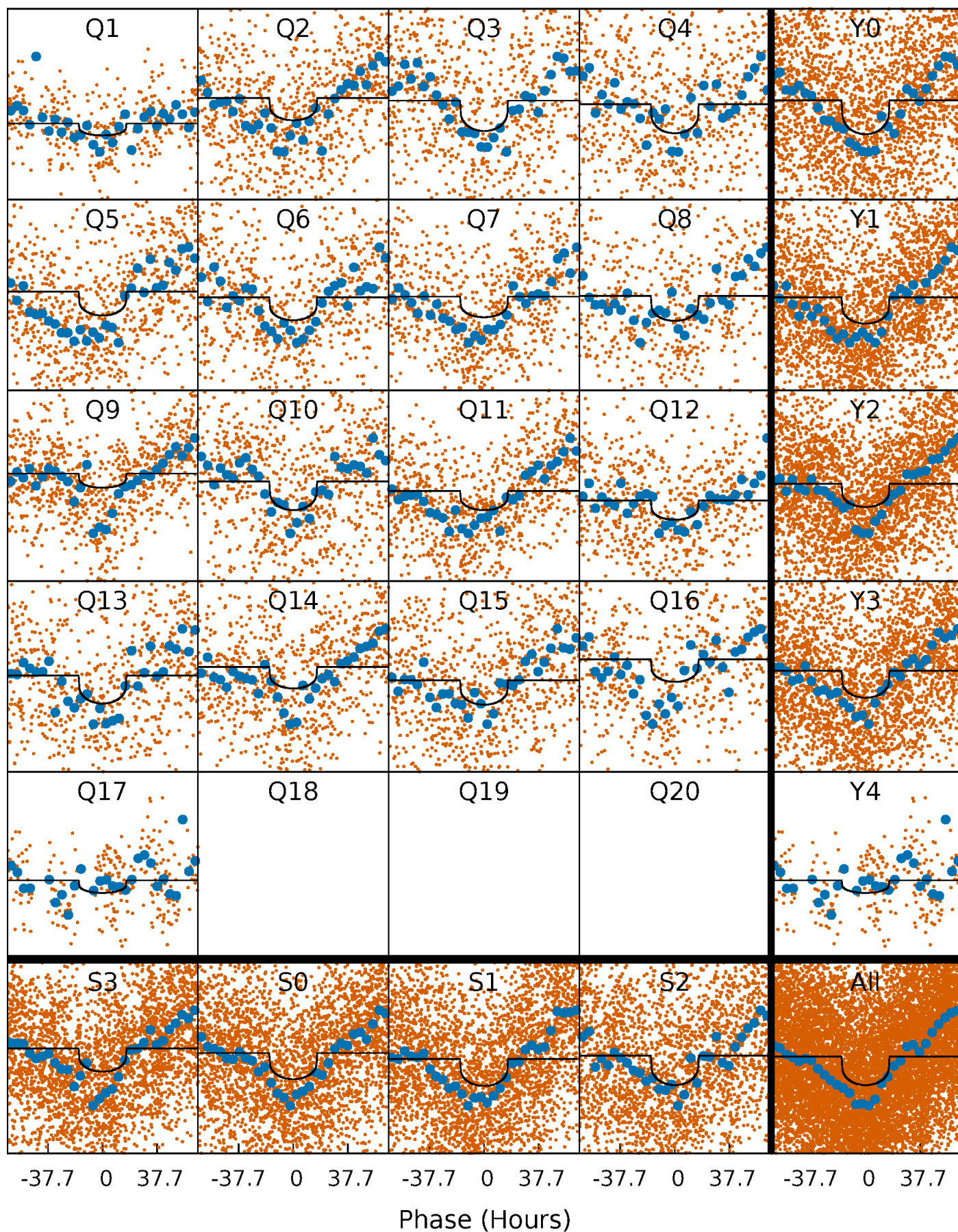
PDC Quarter-Phased Transit Curves

TCE 009899181-02 P= 18.936139 Days $T_0=139.172597$ (BKJD)



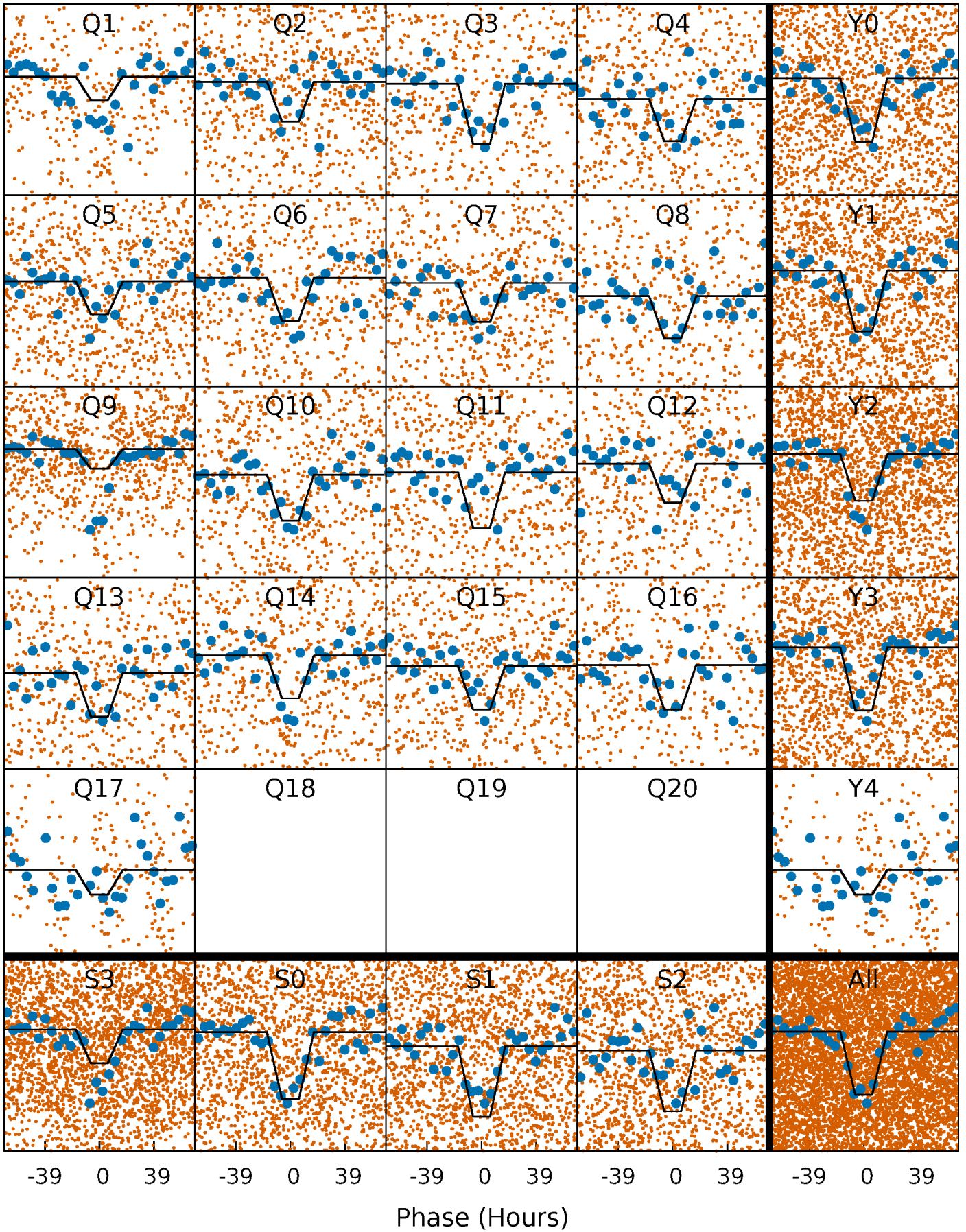
DV Quarter-Phased Transit Curves

TCE 009899181-02 P= 18.936139 Days $T_0=139.172597$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

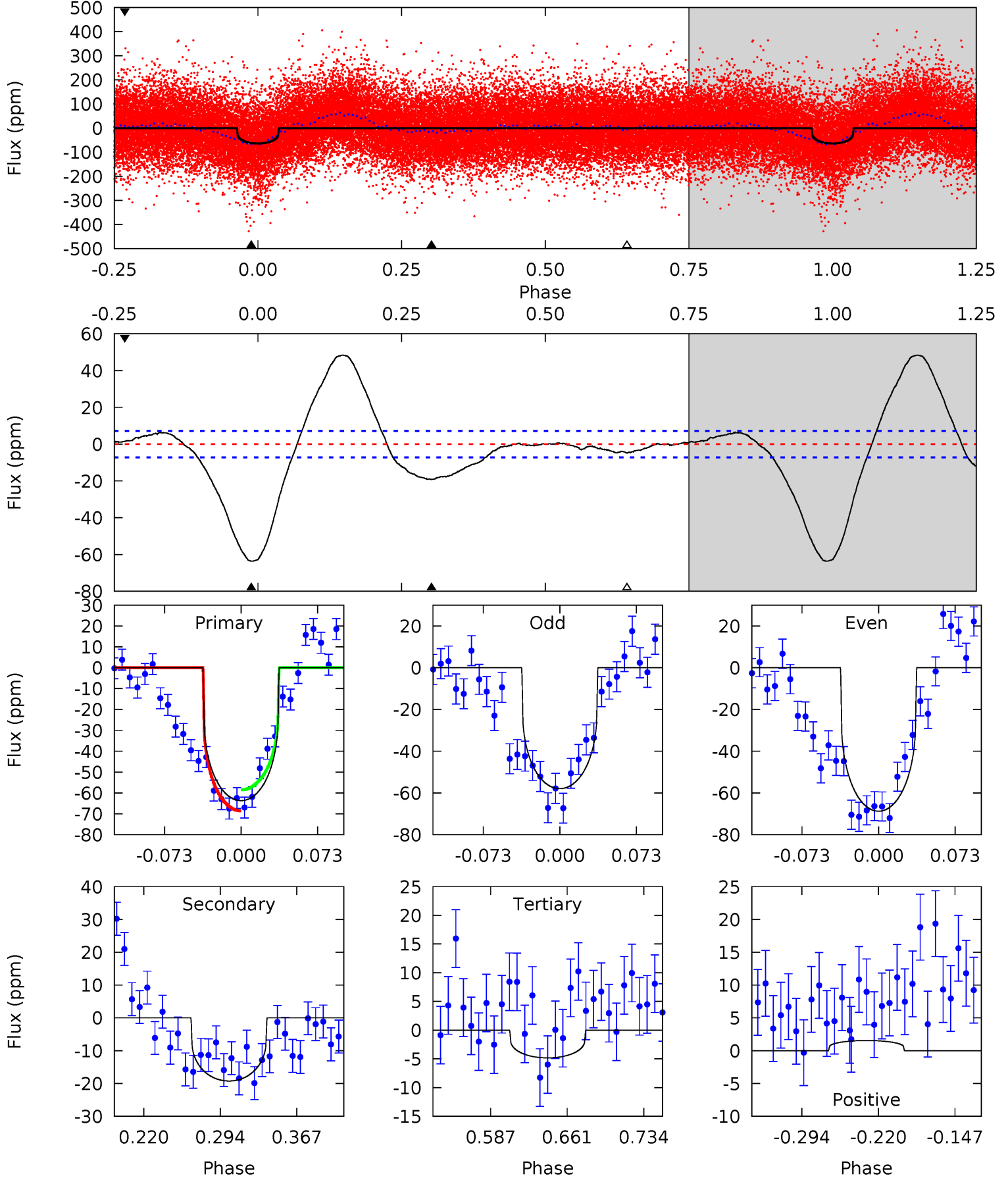
TCE 009899181-02 P= 18.936843 Days $T_0=139.122510$ (BKJD)



DV Model-Shift Uniqueness Test

009899181-02, P = 18.936139 Days, E = 120.236458 Days

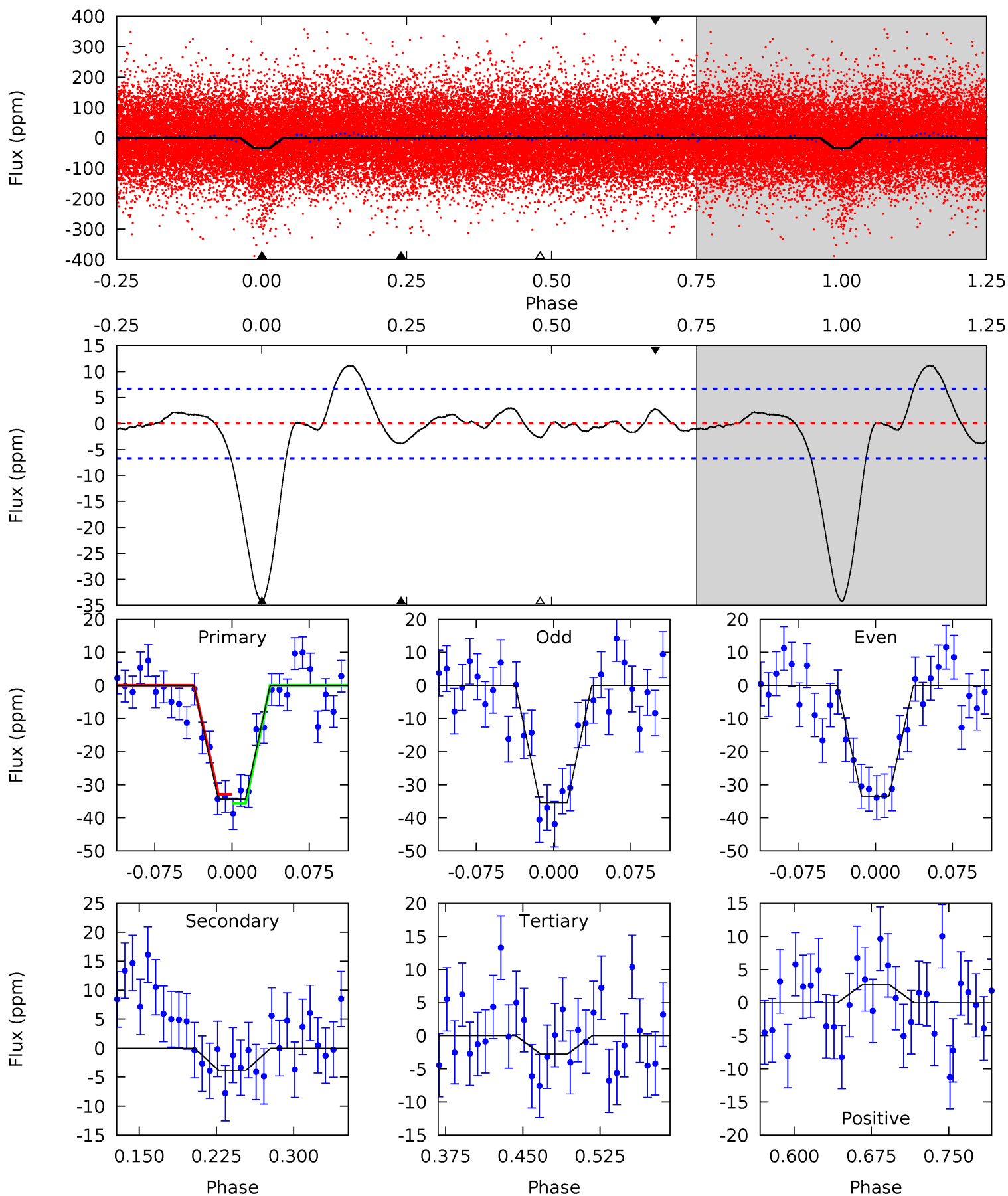
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.9	12.4	3.10	0.99	4.63	1.79	9.27	37.8	39.9	9.25	11.4	3.47	1.00	0.43	3.23



Alt Model-Shift Uniqueness Test

009899181-02, P = 18.936843 Days, E = 120.185667 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.7	2.65	1.89	1.86	4.62	1.78	1.85	21.8	21.9	0.76	0.79	0.67	1.11	0.25	0.94



Stellar Parameters For KIC 009899181

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4947^{+98}_{-98}	$4.621^{+0.012}_{-0.051}$	$-0.060^{+0.150}_{-0.150}$	$0.714^{+0.047}_{-0.026}$	$0.800^{+0.029}_{-0.062}$	$3.089^{+0.220}_{-0.541}$
	+2%/-2%	+0%/-1%	+250%/-250%	+7%/-4%	+4%/-8%	+7%/-18%
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 009899181-02 / KOI 2867.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-19 ± 2	$0.47^{+0.12}_{-0.12}$	727^{+18}_{-16}	4399^{+589}_{-381}	791^{+659}_{-302}
Alt.	-4 ± 1	$0.48^{+0.11}_{-0.13}$	727^{+17}_{-15}	3311^{+398}_{-282}	150^{+142}_{-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 $A_{obs} \gg 1.0$

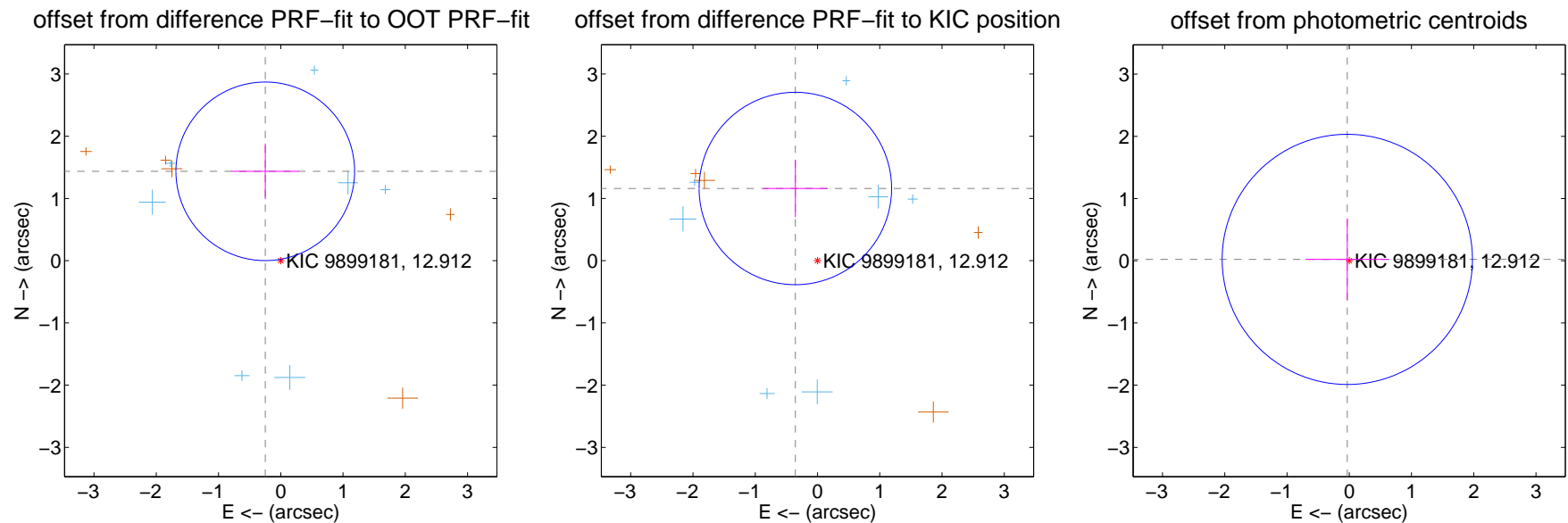
DV Centroid Data

Supplemental centroid analysis for 009899181-02. Kepler magnitude: 12.91. Transit SNR 12.56

There are 7 quarters with good PRF difference image offsets

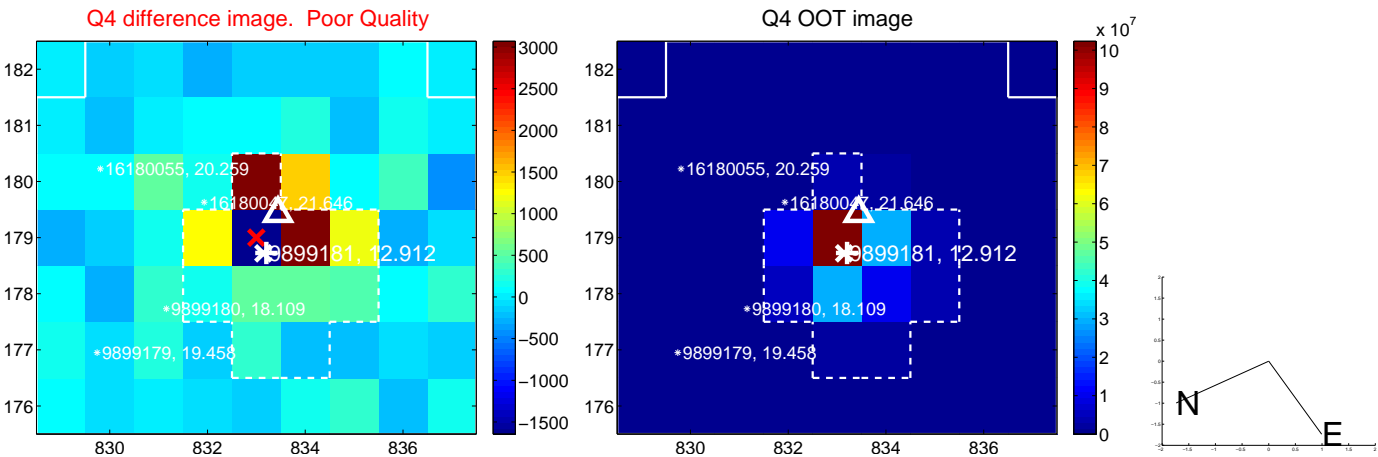
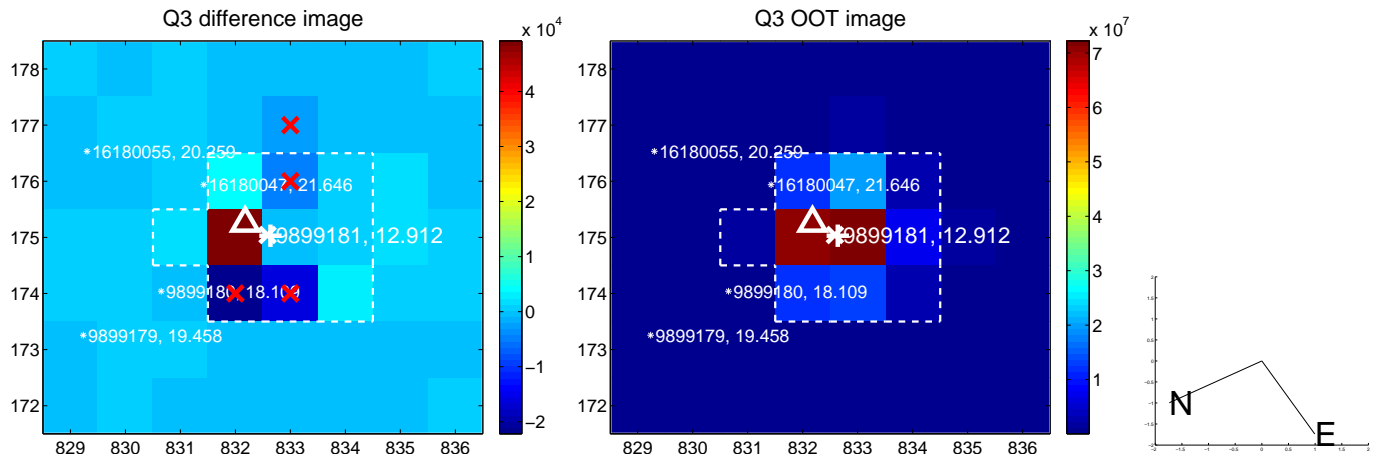
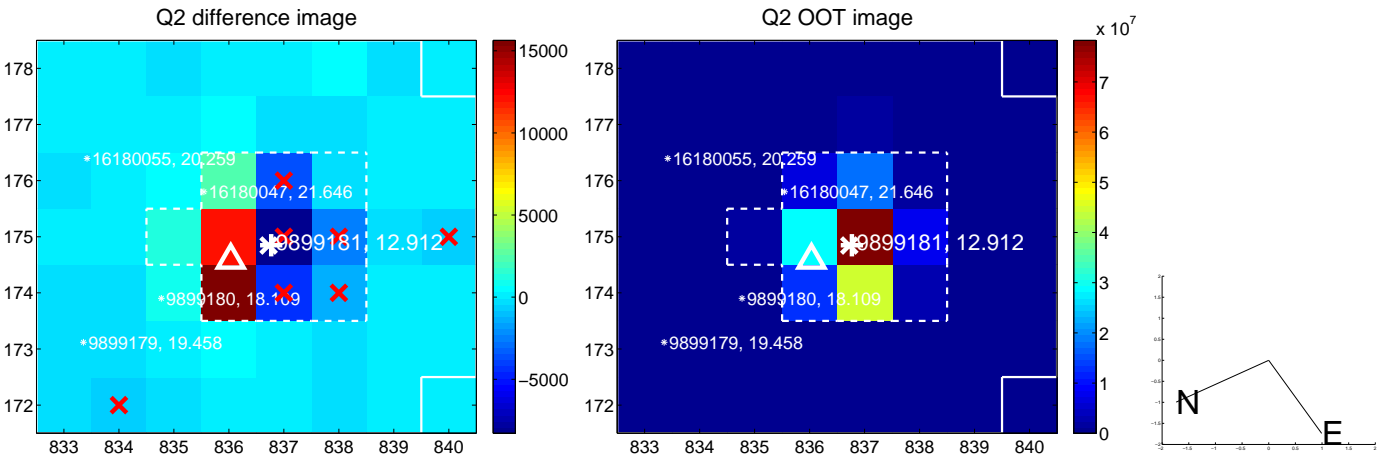
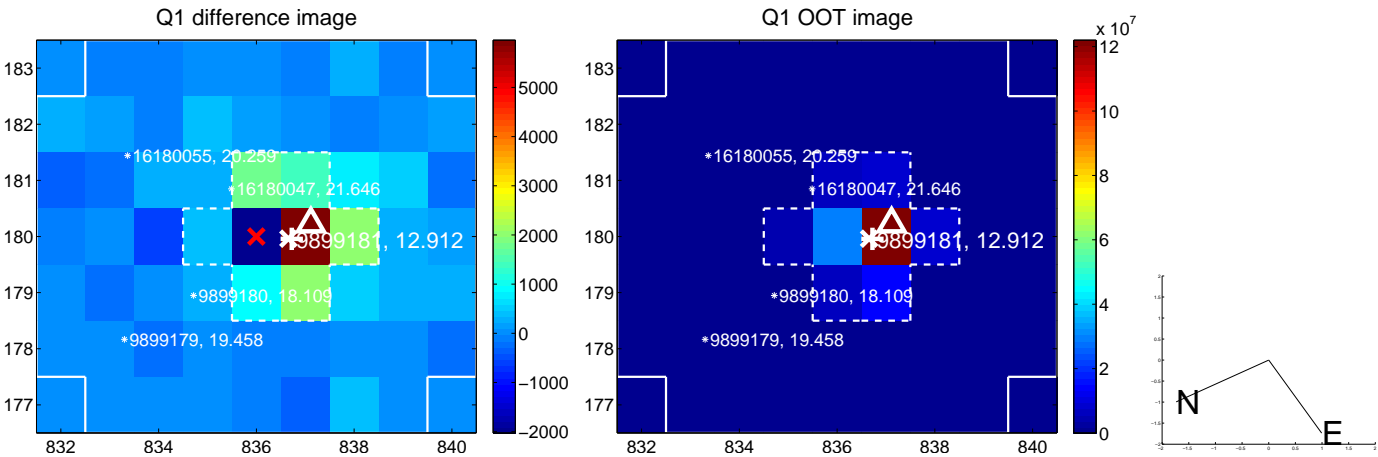
The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.458 \pm 0.478	3.05	0.249 \pm 0.543	1.436 \pm 0.448
PRF-fit source offset from KIC position	1.214 \pm 0.515	2.36	0.356 \pm 0.518	1.160 \pm 0.462
photometric centroid source offset	0.04 \pm 0.67	0.06	0.03 \pm 0.68	0.02 \pm 0.66

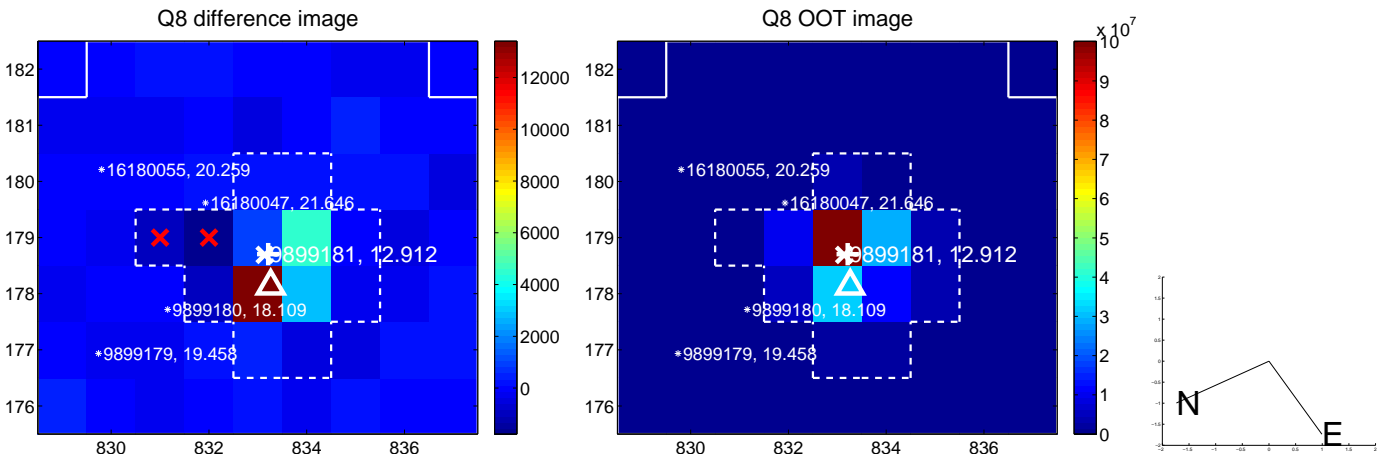
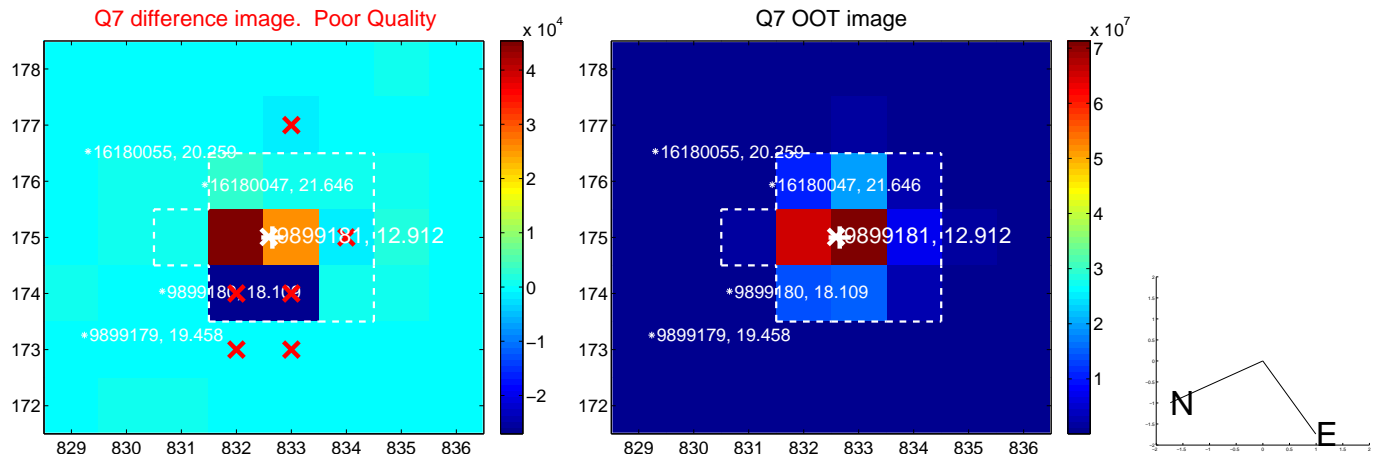
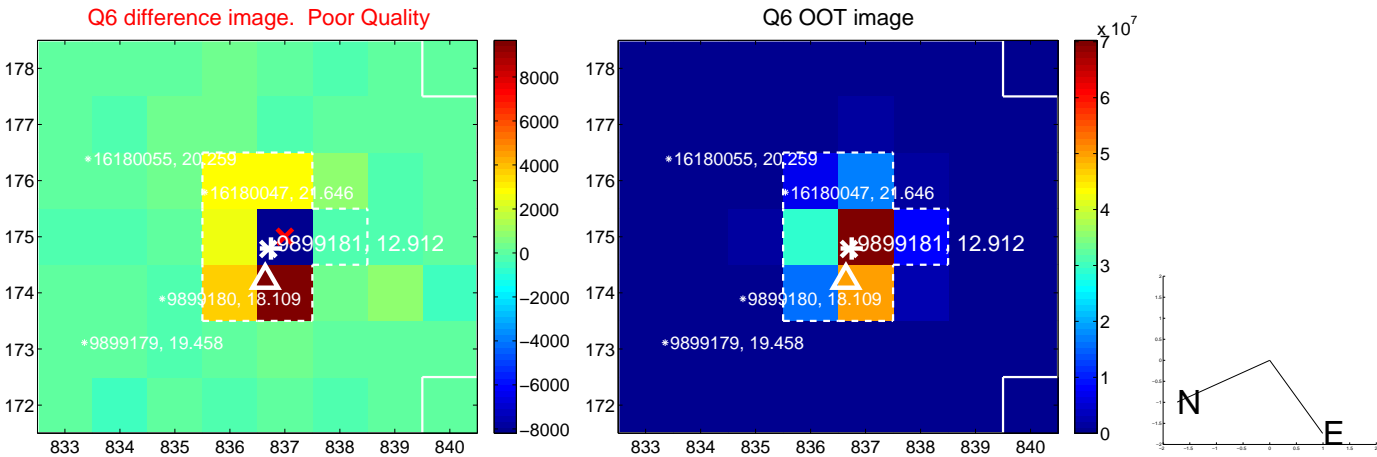
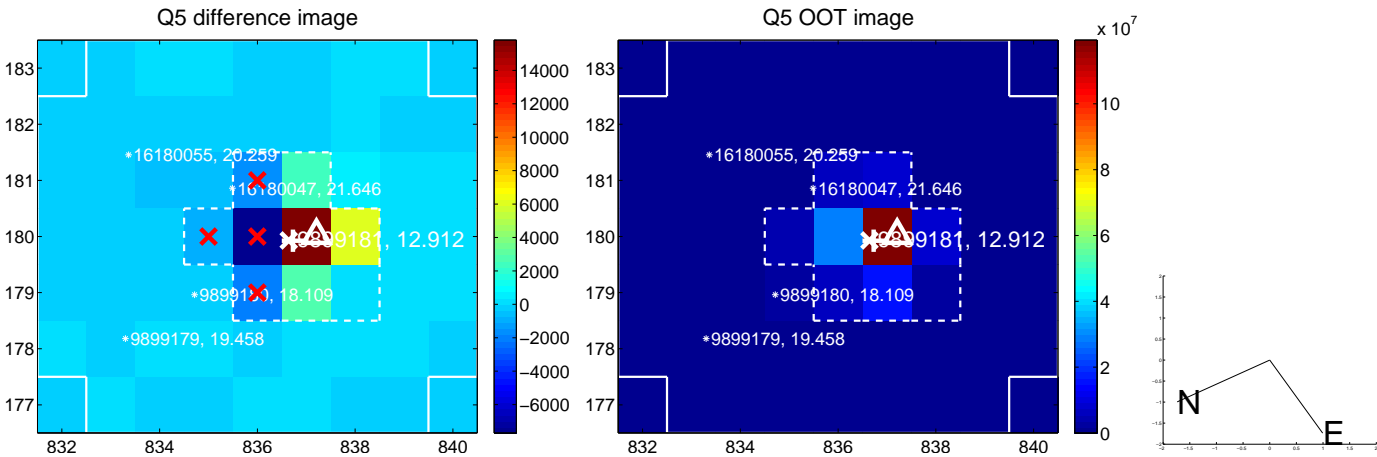


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

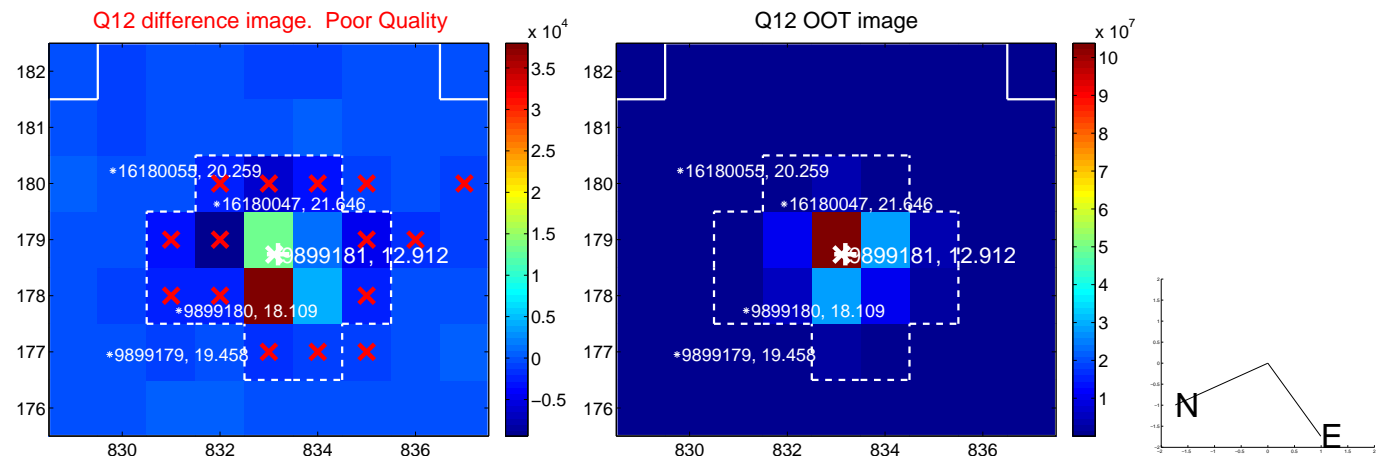
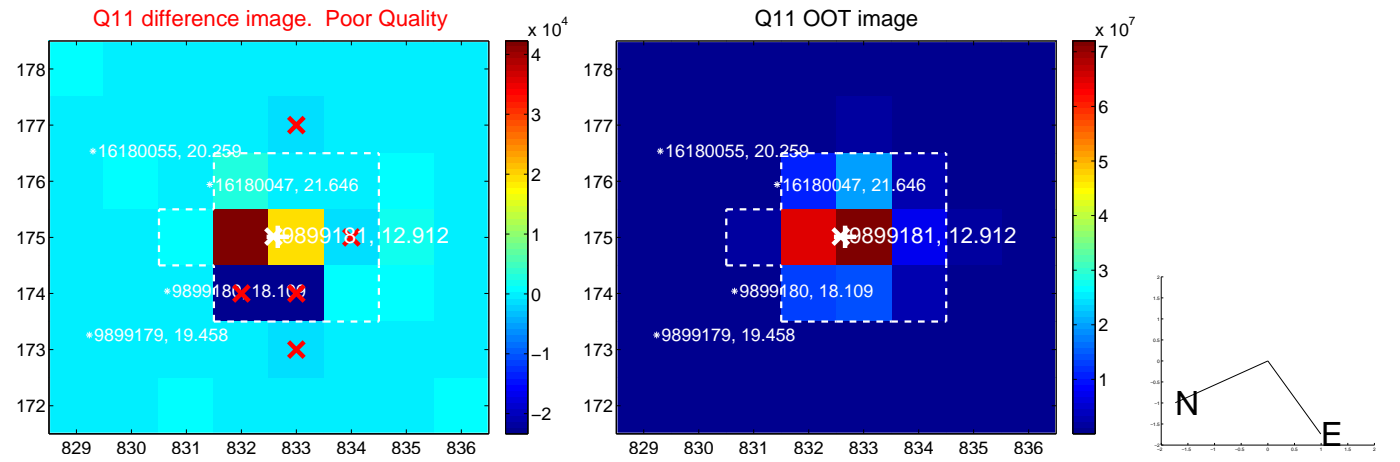
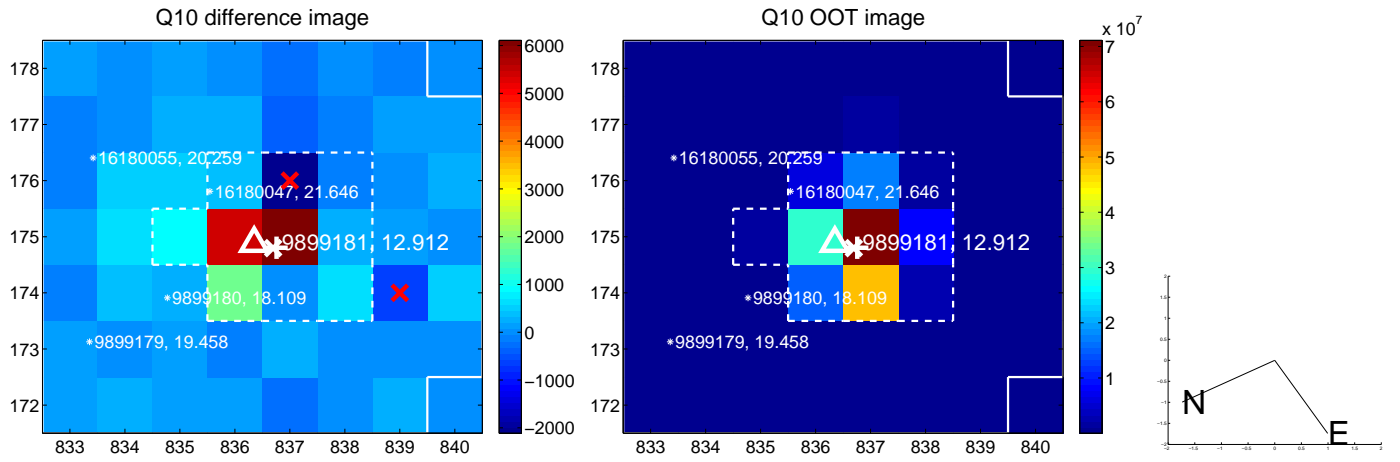
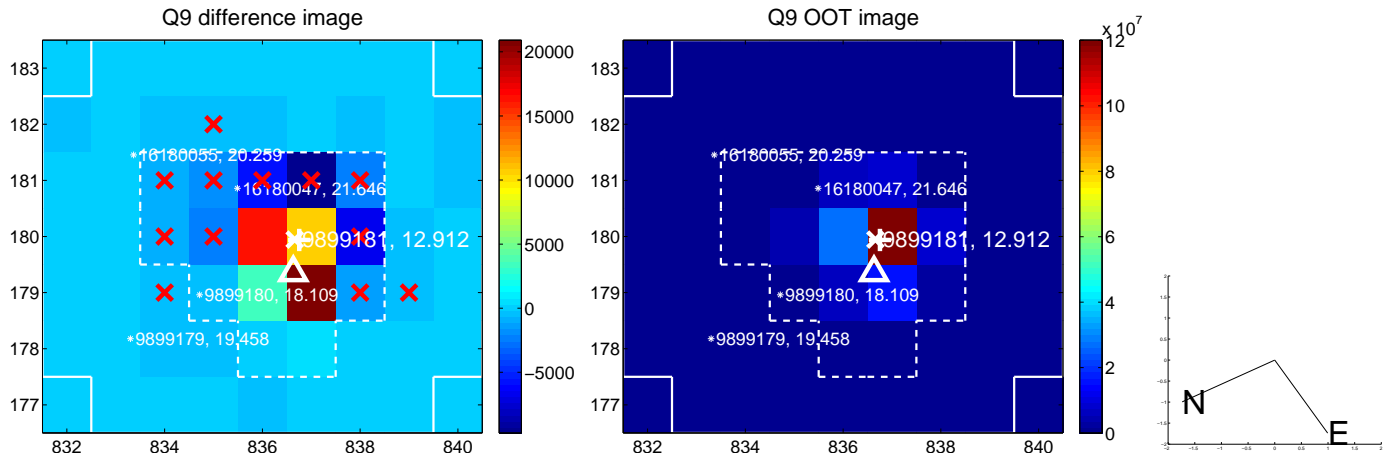
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



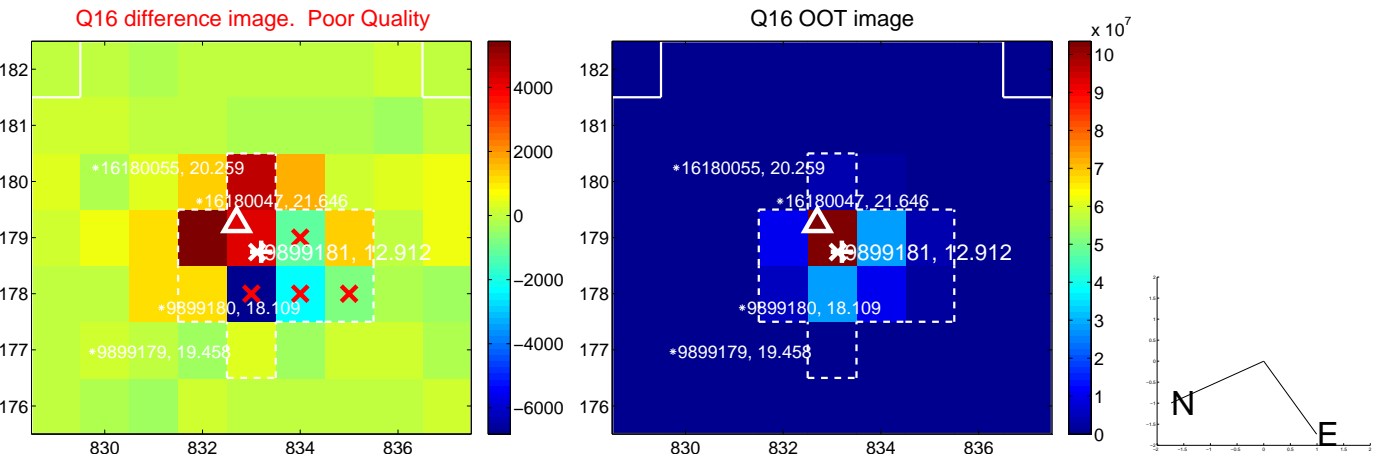
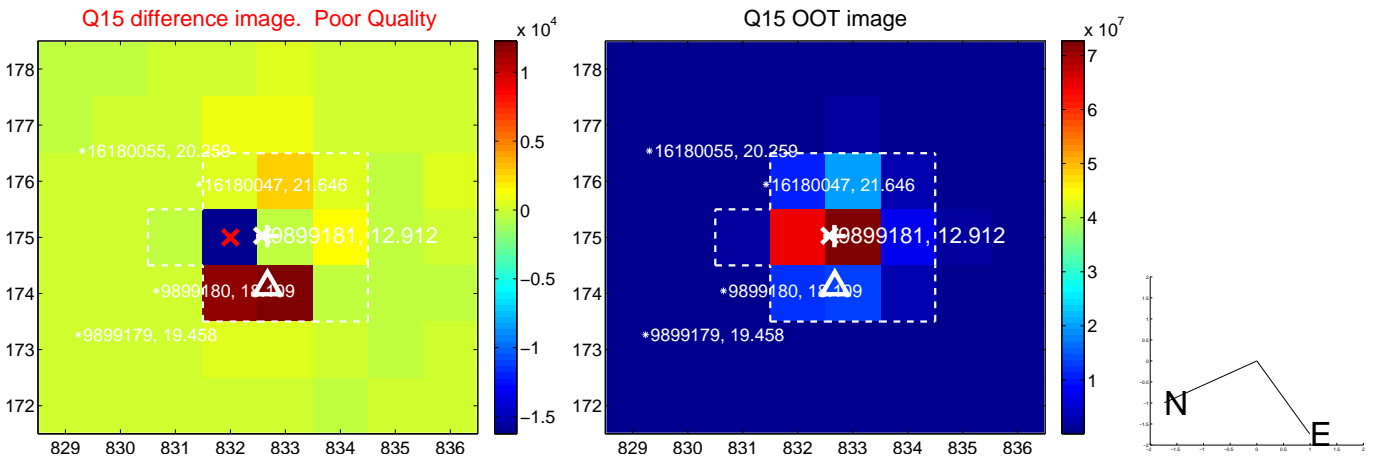
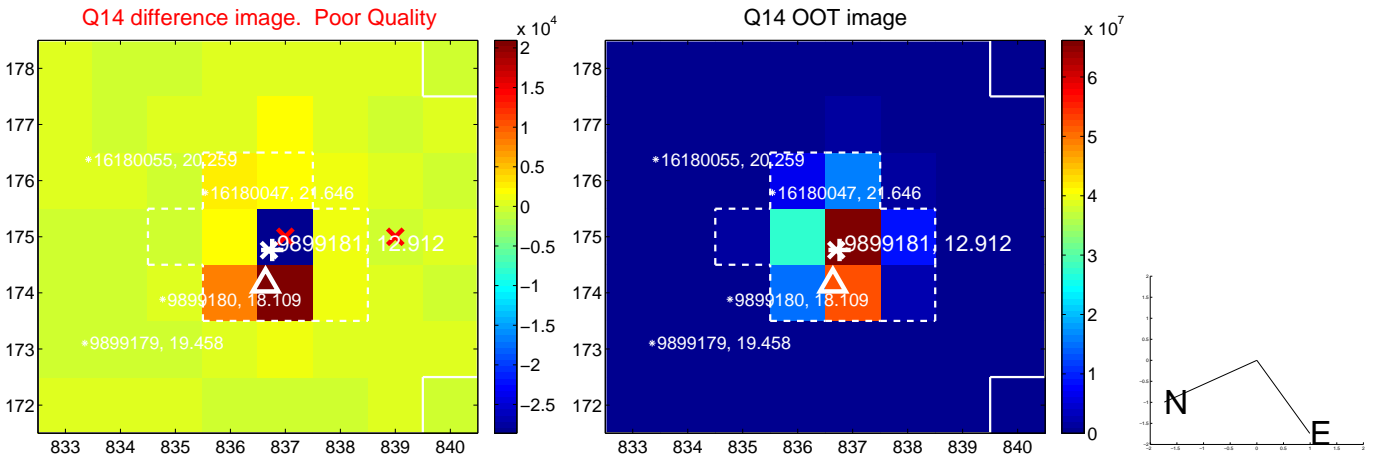
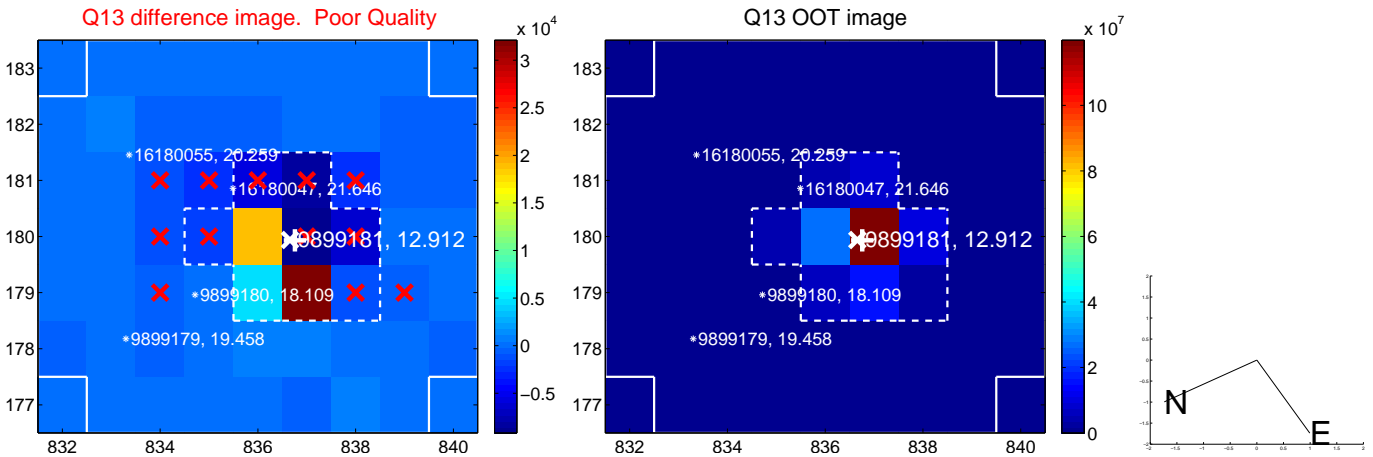
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



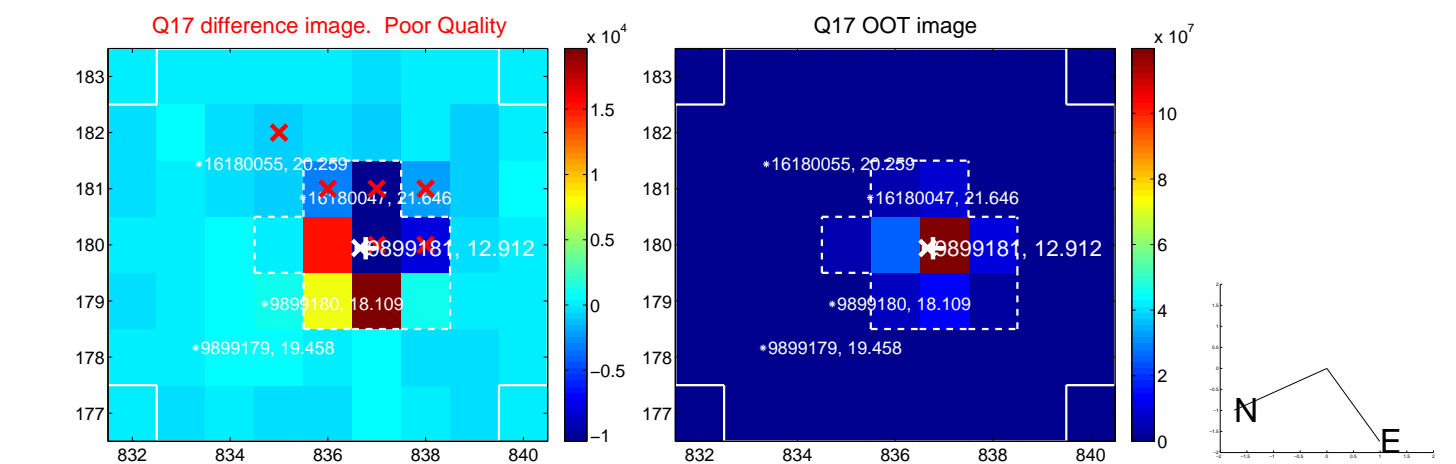
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



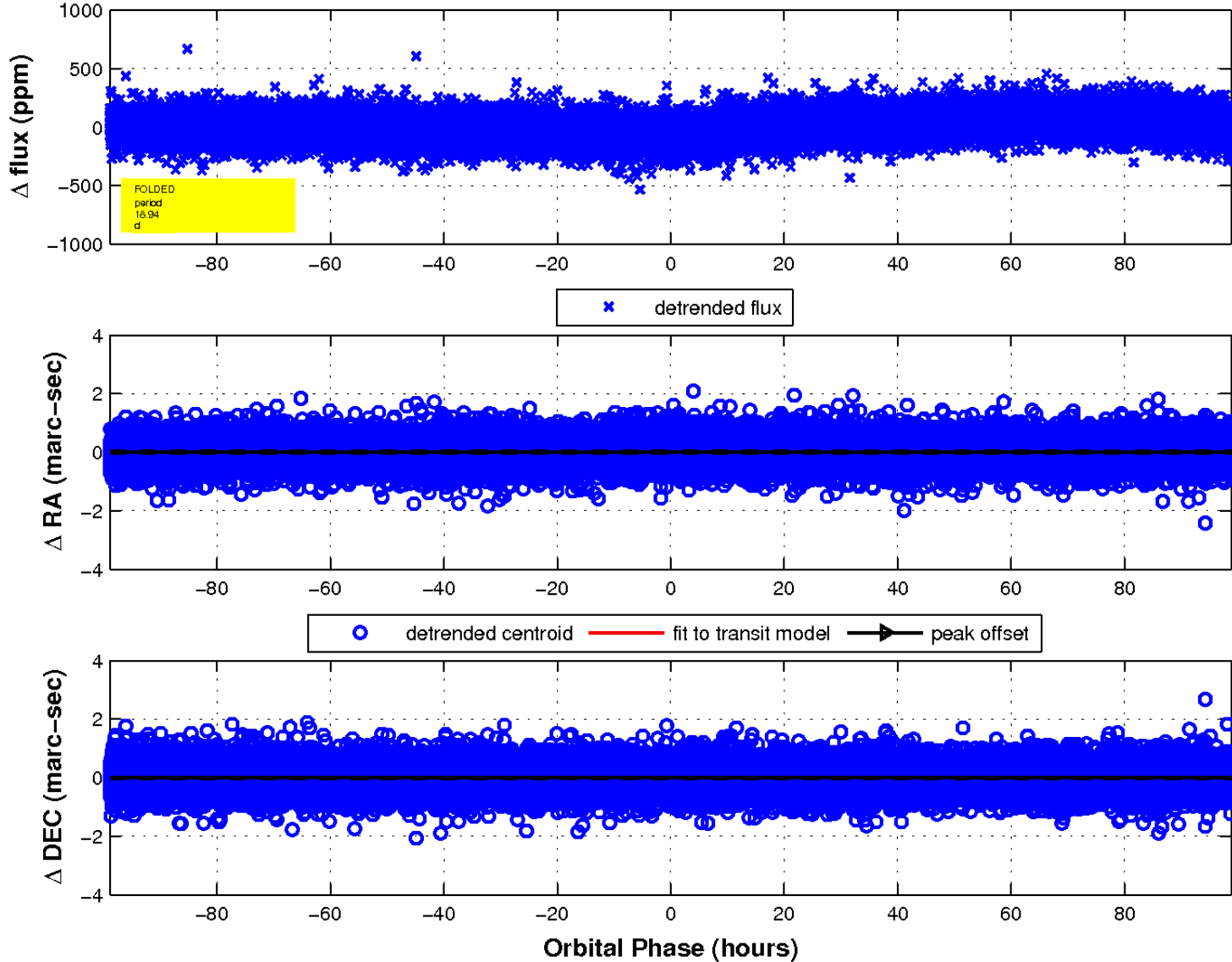
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

