

KIC 009535876

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})
009535876-01	OBS	4225.01	0.960832	131.771966	63.9	2.164	12.7	11.7	1.13	5708	1.08	3112.40
009535876-02	OBS	No	0.960827	132.262749	66.7	1.888	12.4	11.9	1.13	5708	1.11	3112.43

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009535876-01	OBS	FP	0.00	1	0	1	1	LPP_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—EPHEM_MATCH
009535876-02	OBS	FP	0.00	1	0	1	1	LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH

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 009535876-01

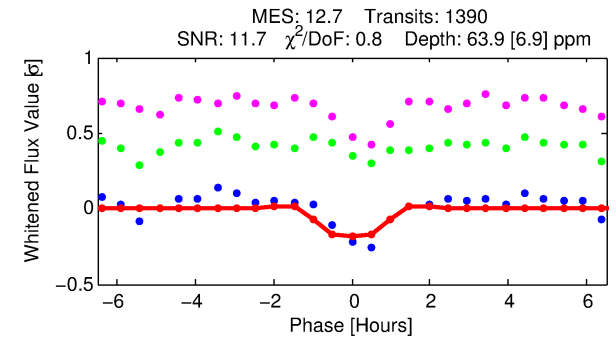
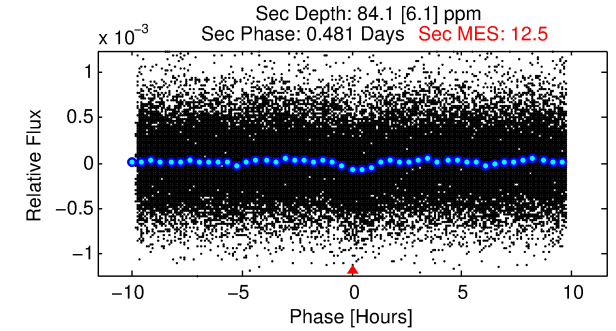
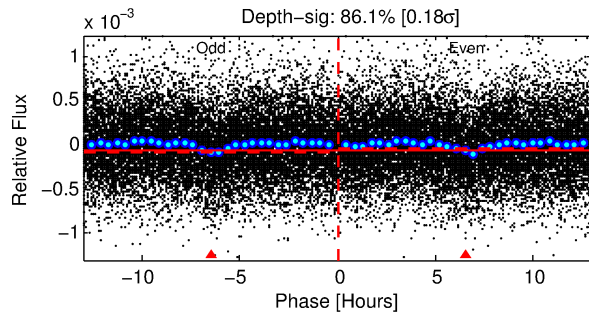
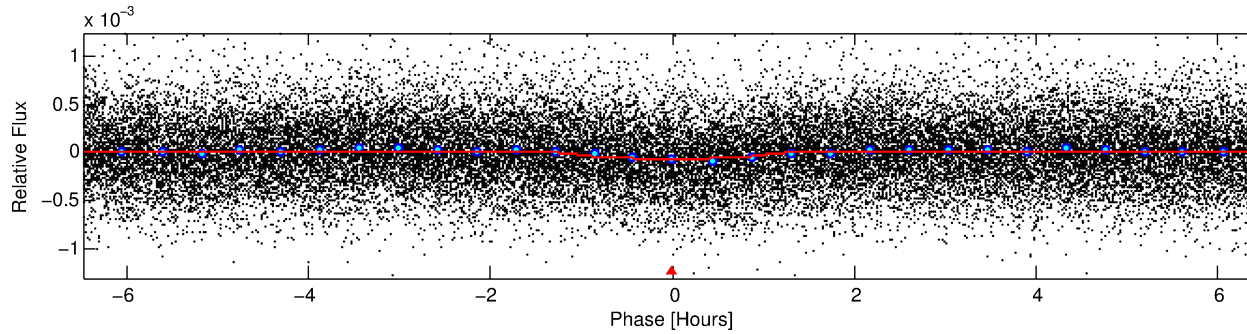
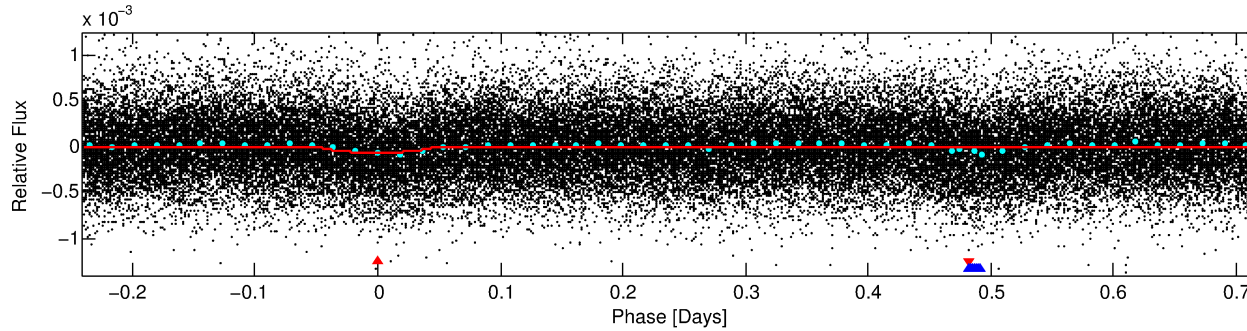
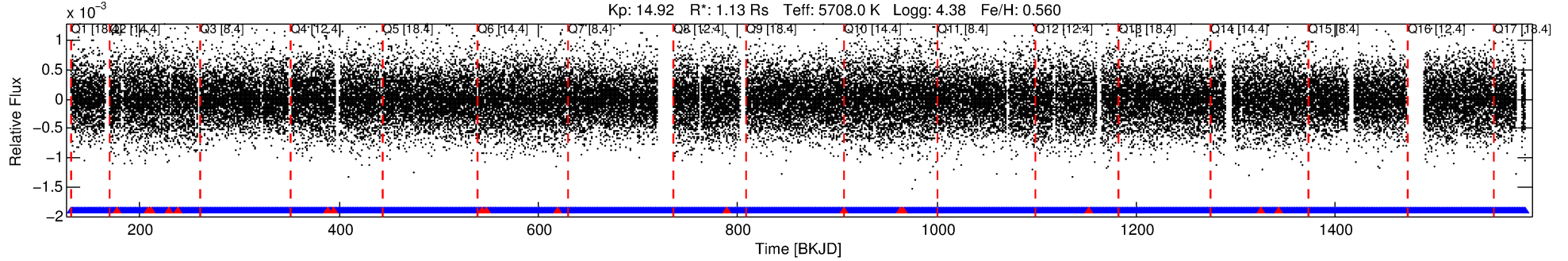
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
009535876-01	9535876	4228.01	9535881	1:1	21.5	4	-4	13.40	14.92	45.03	Direct-PRF	0	0.94	0.46

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: 9535876 Candidate: 1 of 2 Period: 0.961 d
KOI: K04225.01 Corr: 0.902

Kp: 14.92 R*: 1.13 Rs Teff: 5708.0 K Logg: 4.38 Fe/H: 0.560



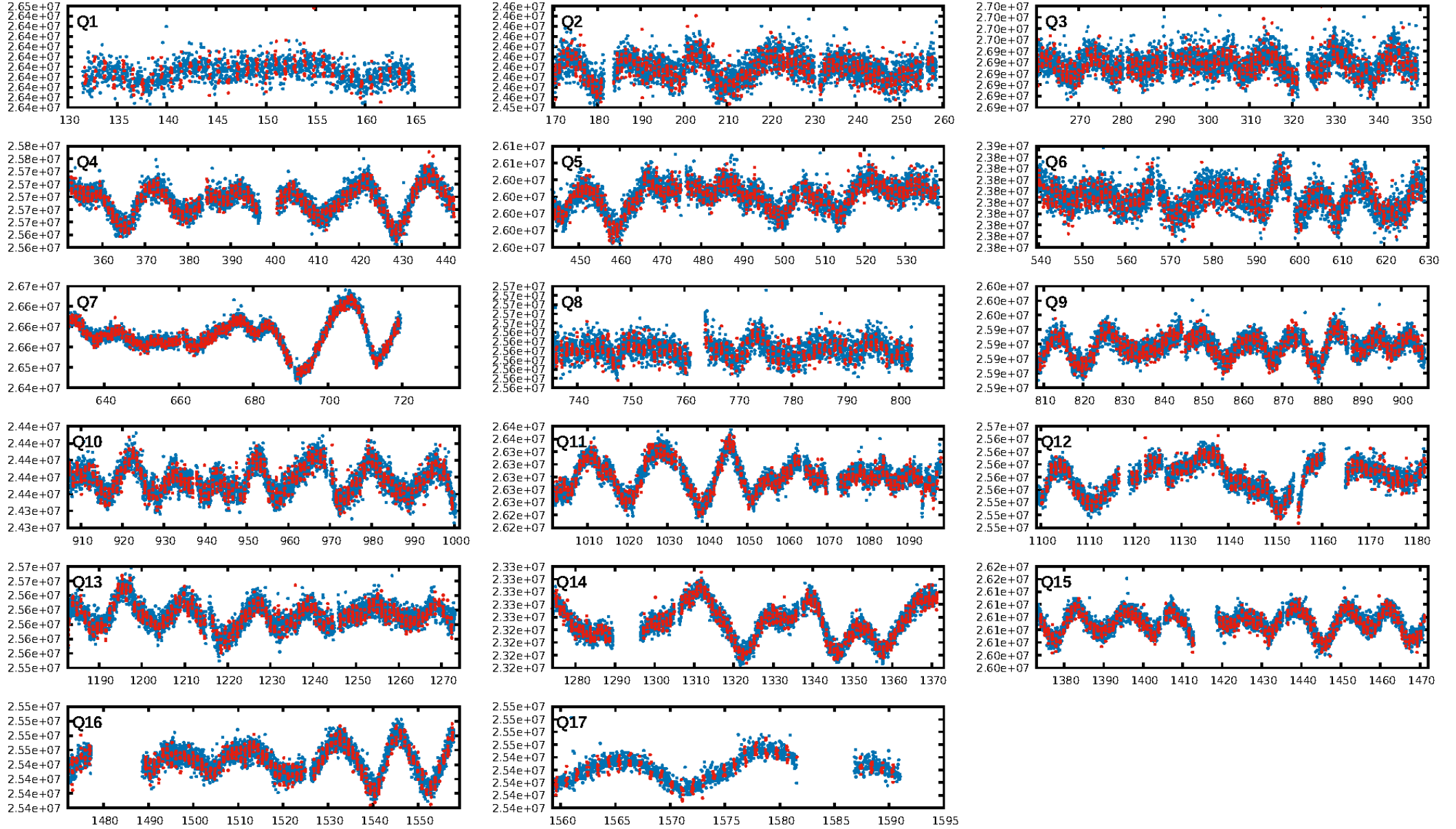
DV Fit Results:

Period = 0.96083 [0.00001] d
Epoch = 131.7720 [0.0024] BKJD
Rp/R* = 0.0088 [0.0054]
a/R* = 1.81 [3.44]
b = 0.90 [0.59]
Seff = 3112.40 [1156.99]
Teq = 1905 [177] K
Rp = 1.09 [0.74] Re
a = 0.0197 [0.0047] AU
Ag = 15.31 [19.63] [0.73σ]
Teffp = 5825 [1810] K [2.16σ]

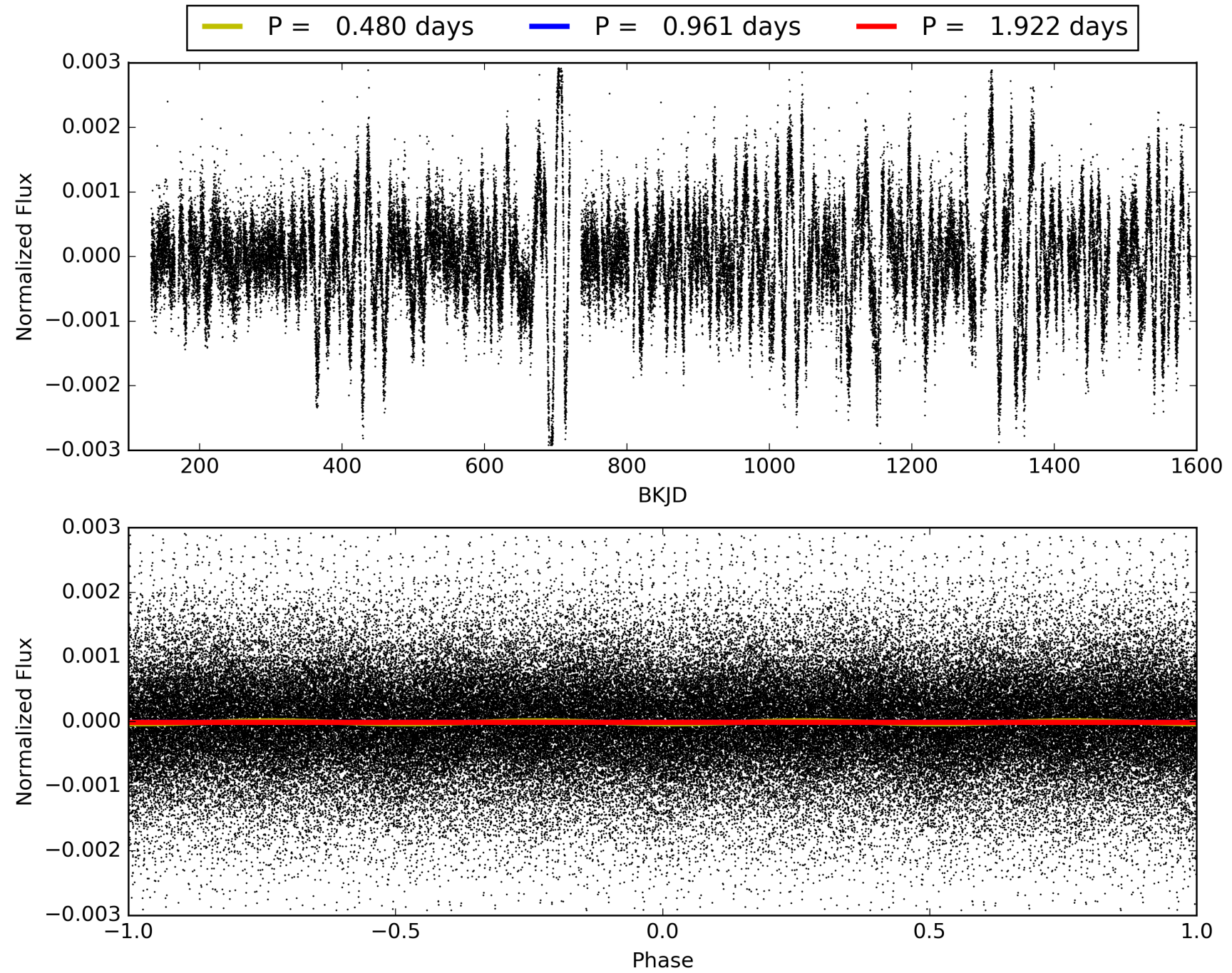
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.56e-37
RollingBand-fgt: 0.99 [1311/1328]
GhostDiagnostic-chr: -0.3486
Centroid-sig: N/A
Centroid-so: 61.238 arcsec [23.21σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009535876-01, PDC Light Curves

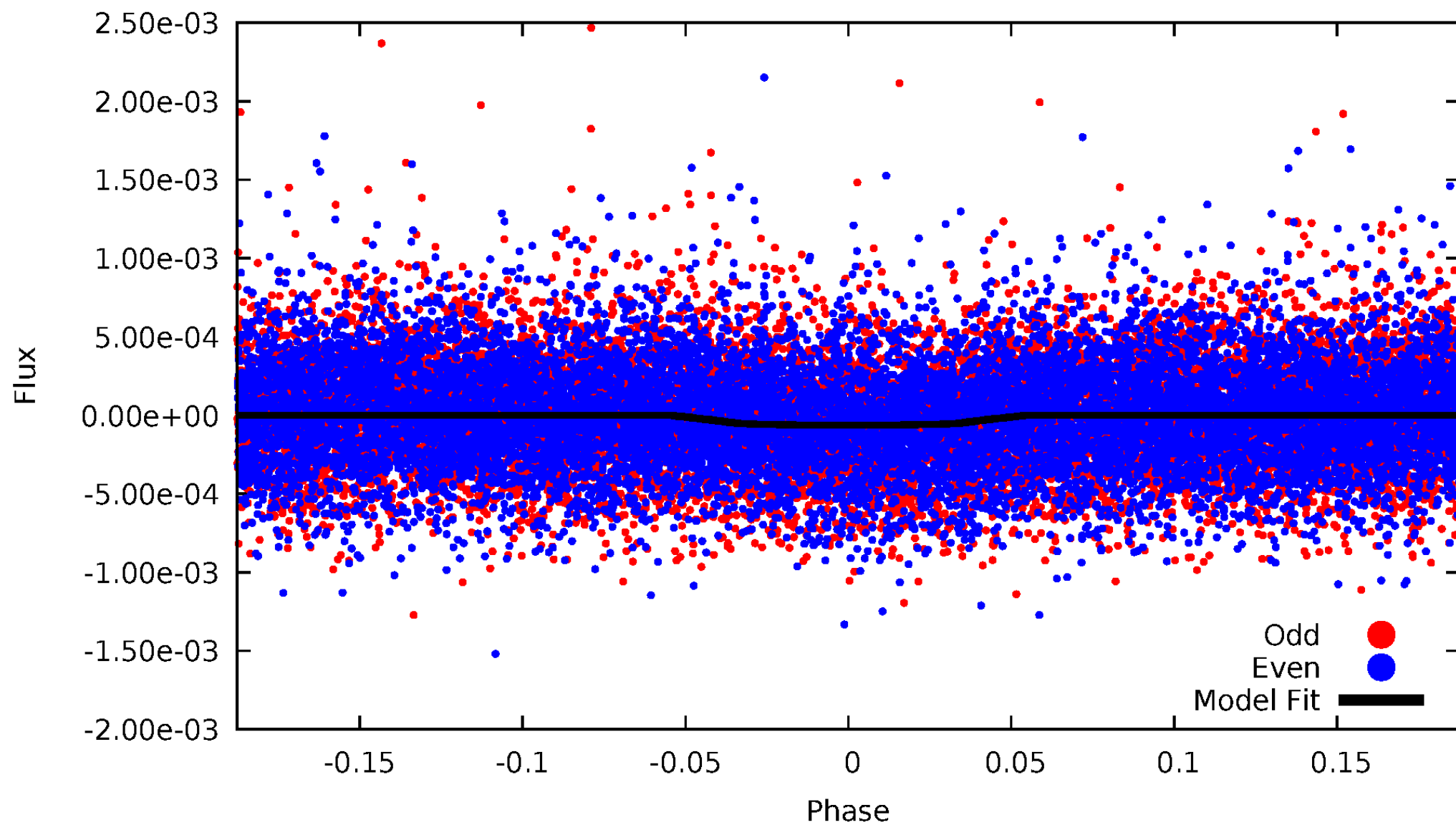


TCE 009535876-01



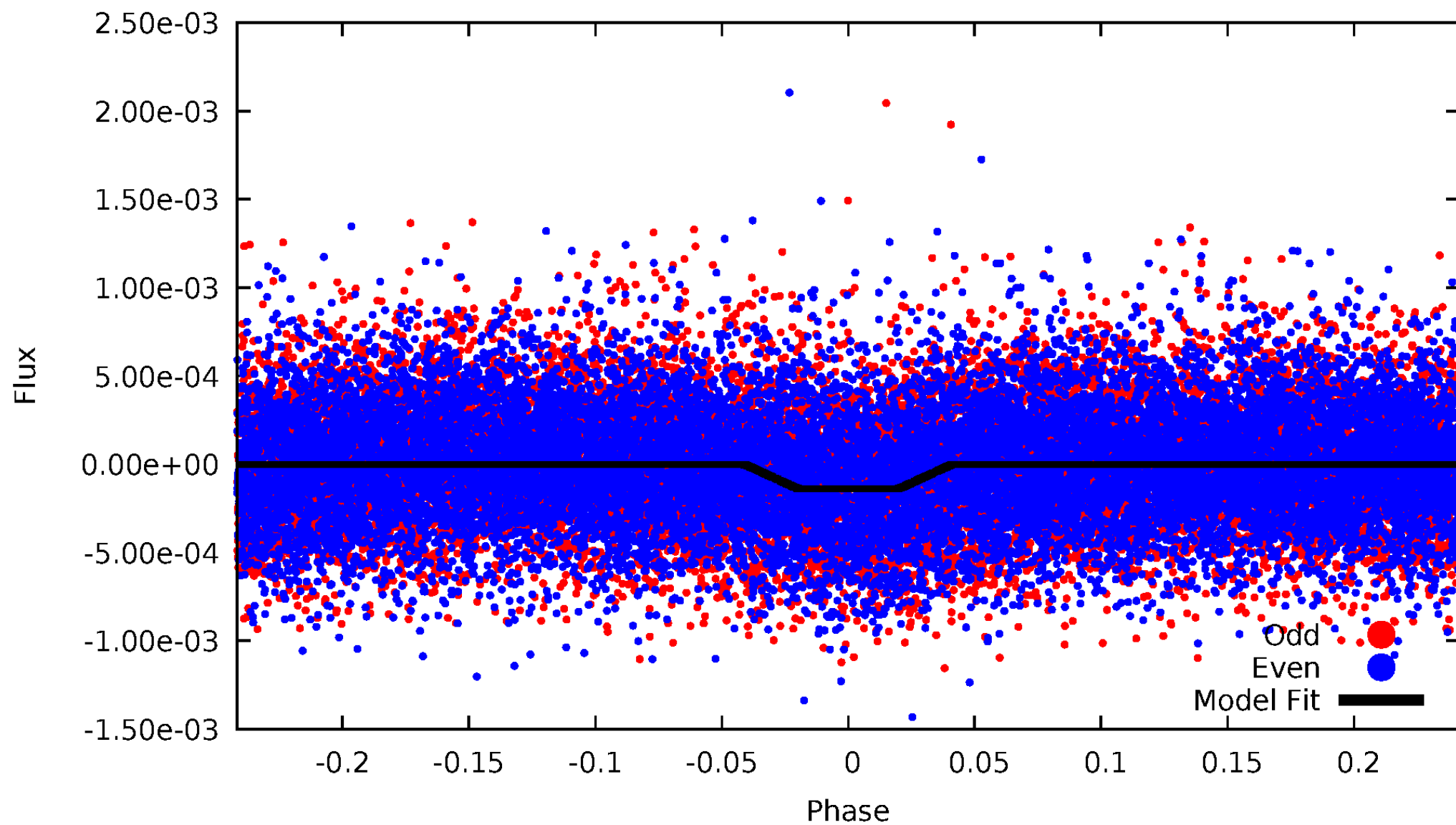
DV Odd/Even

TCE 009535876-01

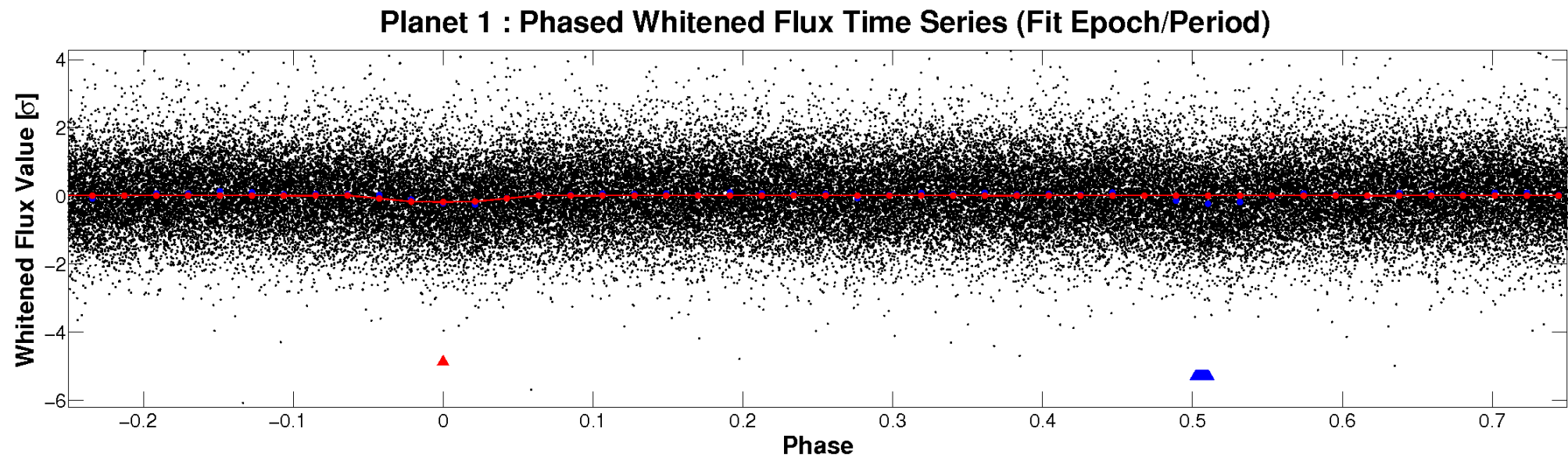
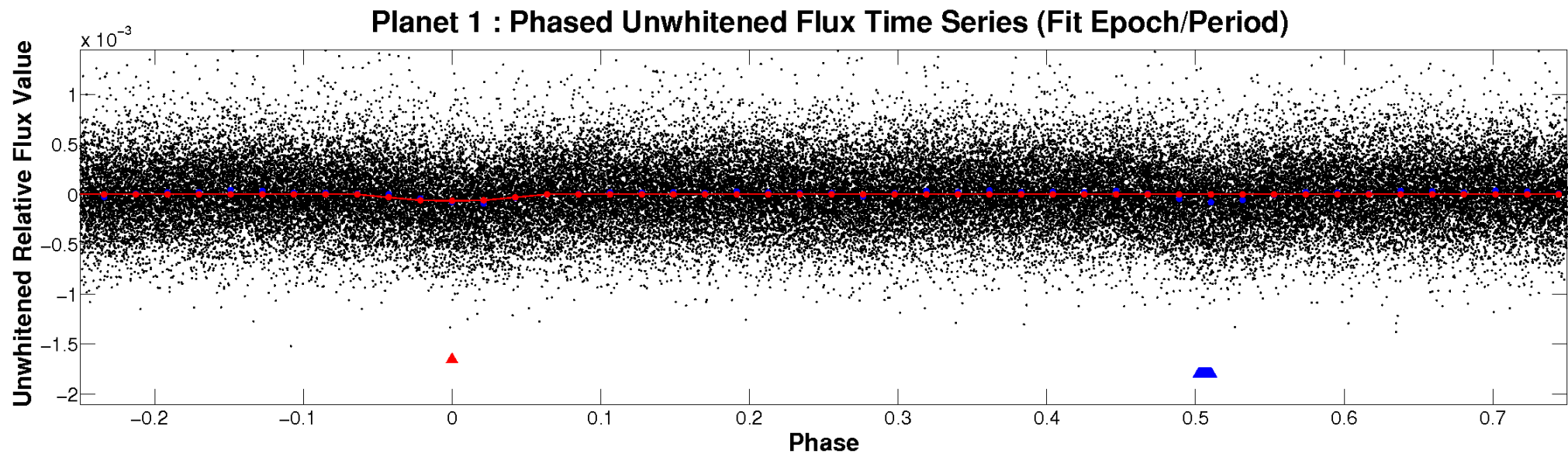


ALT Odd/Even

TCE 009535876-01

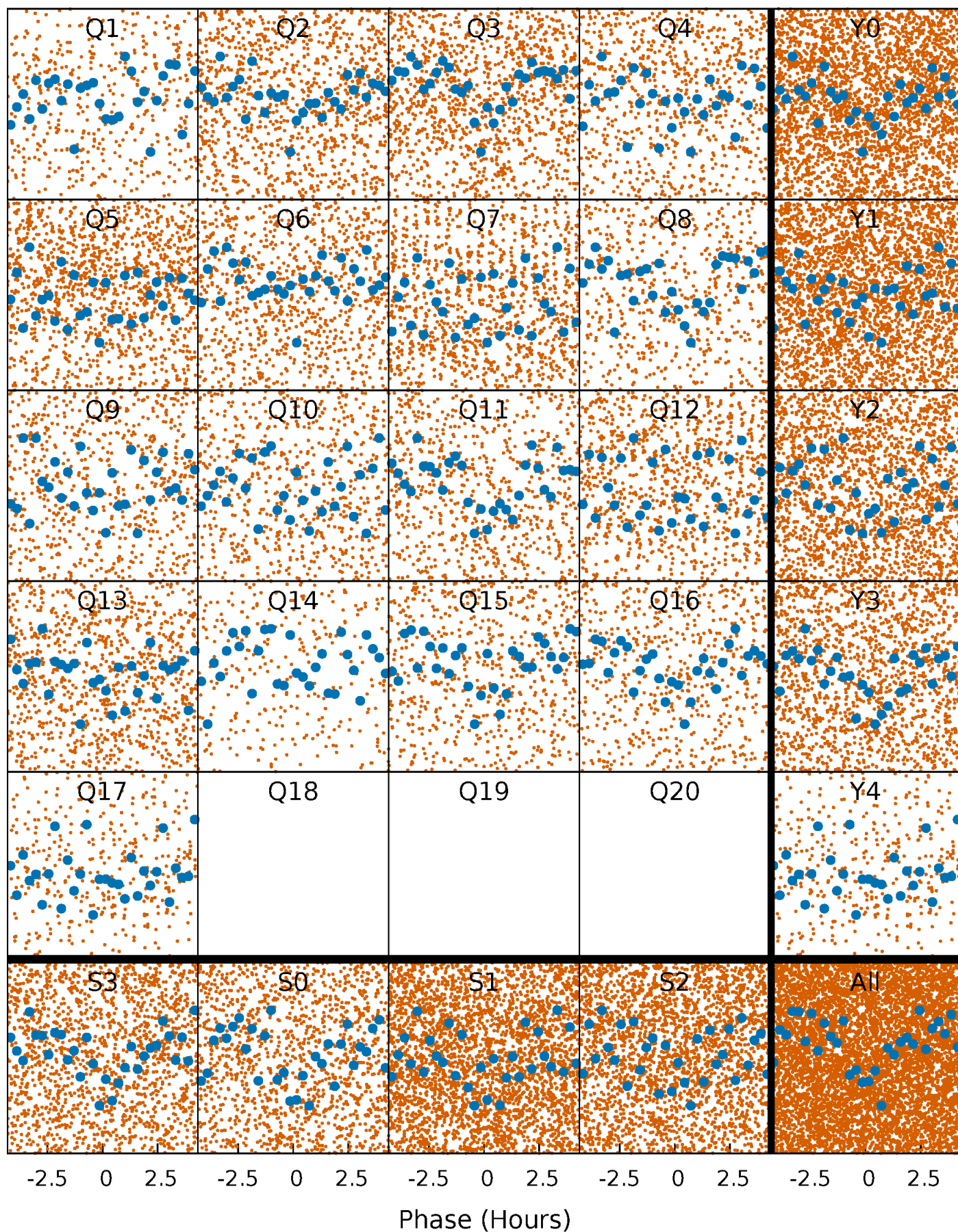


Non-Whitened Vs. Whitened Light Curve



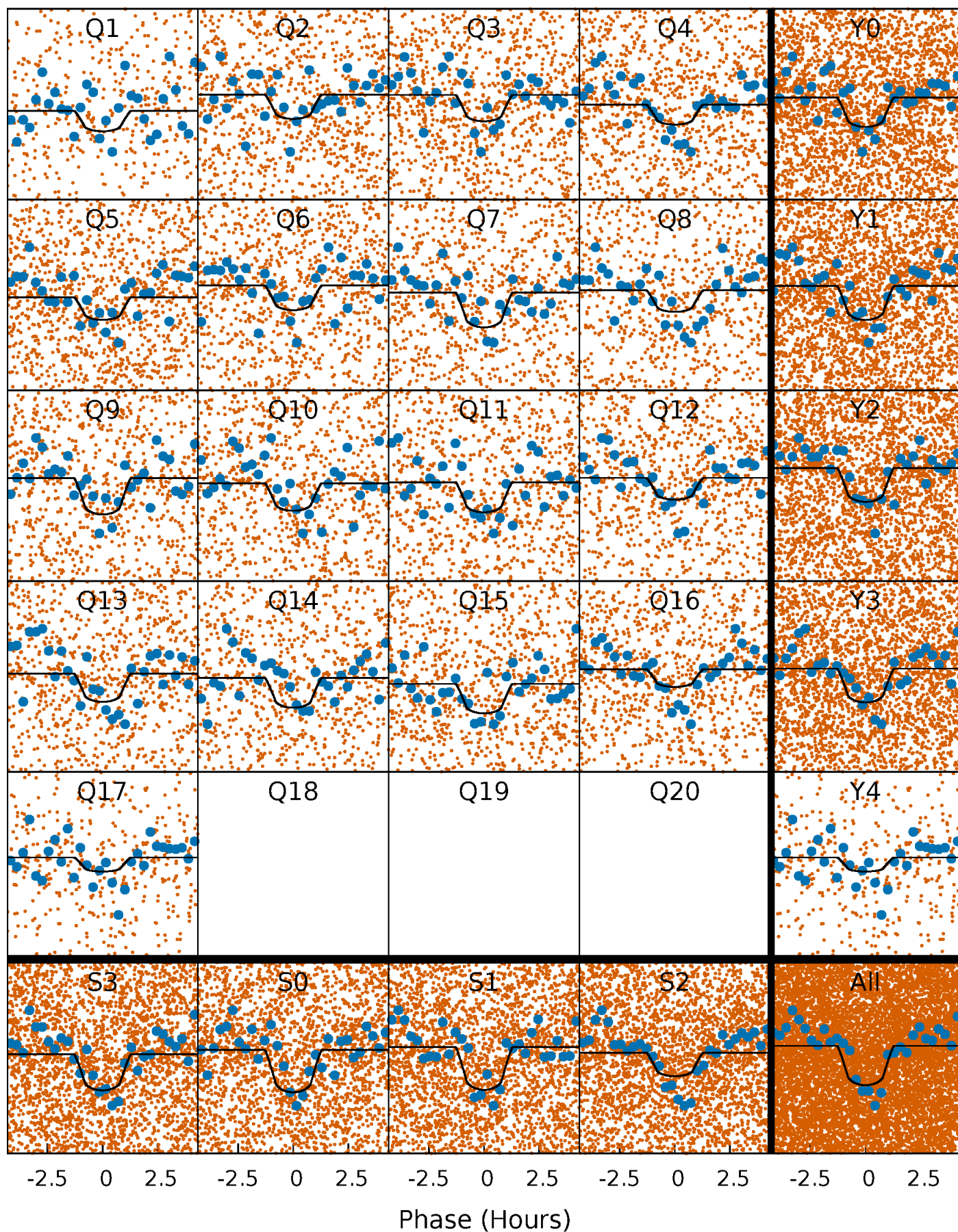
PDC Quarter-Phased Transit Curves

TCE 009535876-01 P= 0.960833 Days $T_0=131.771966$ (BKJD)



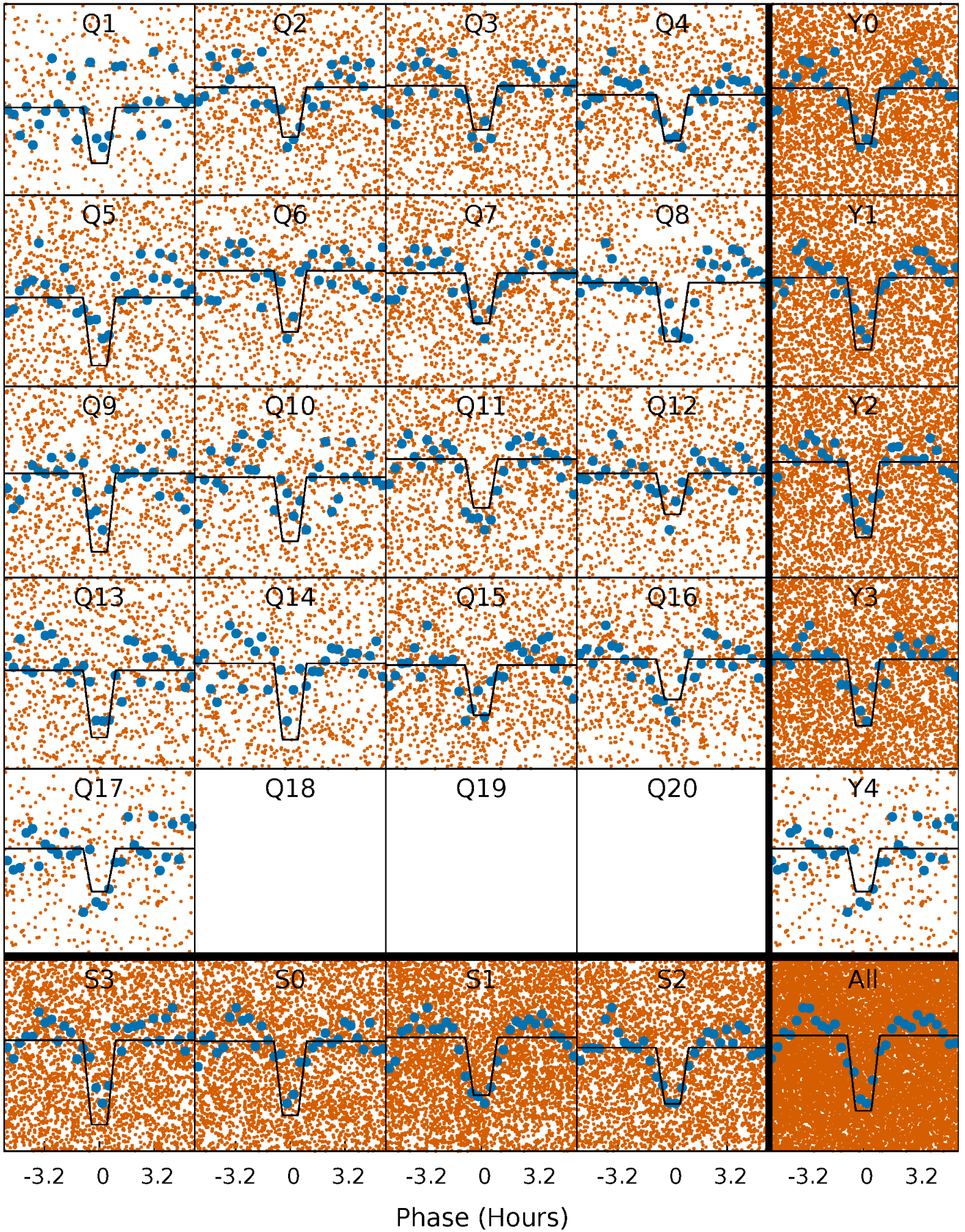
DV Quarter-Phased Transit Curves

TCE 009535876-01 P= 0.960833 Days $T_0=131.771966$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

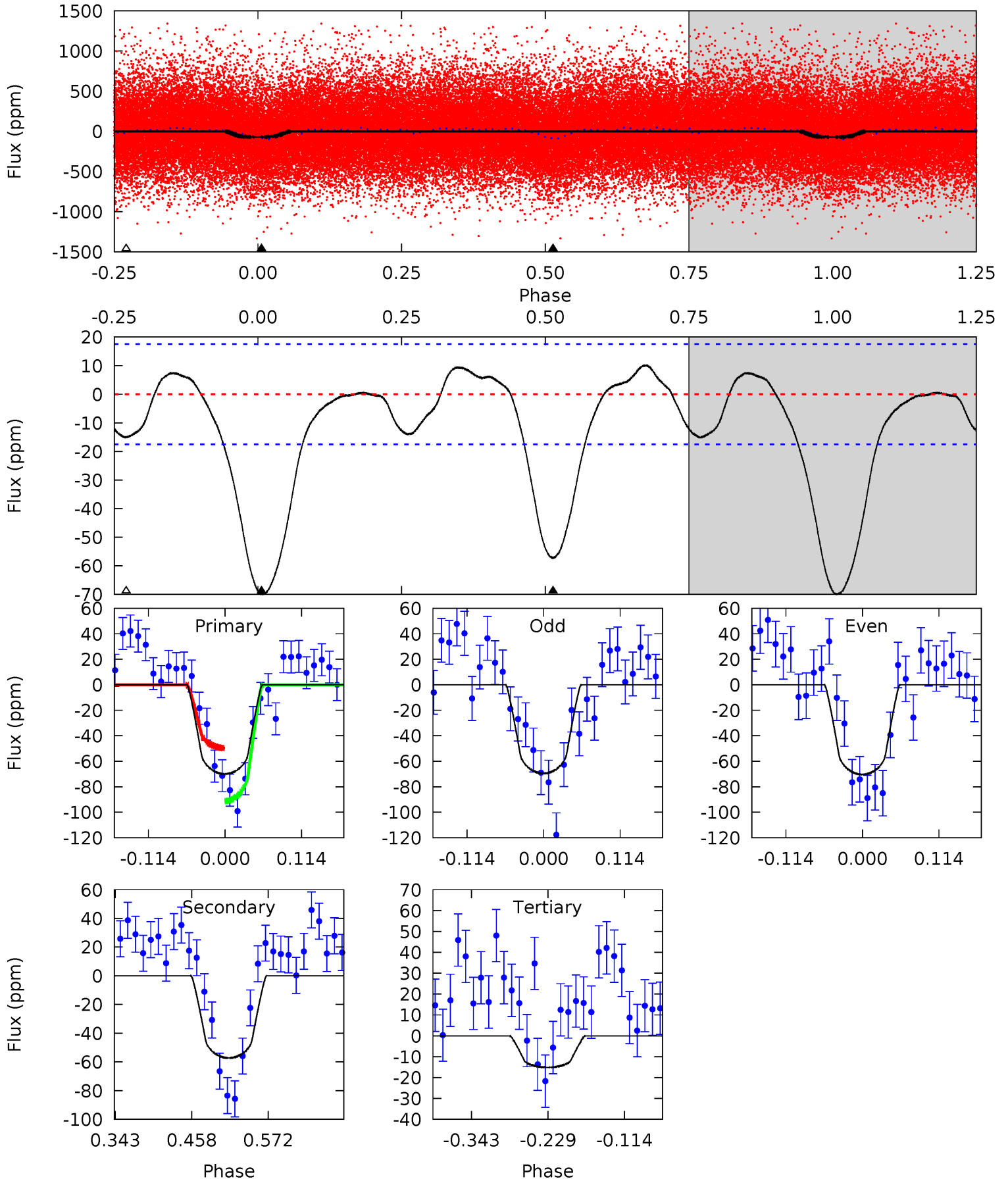
TCE 009535876-01 P= 0.960850 Days $T_0=131.769095$ (BKJD)



DV Model-Shift Uniqueness Test

009535876-01, P = 0.960833 Days, E = 130.811133 Days

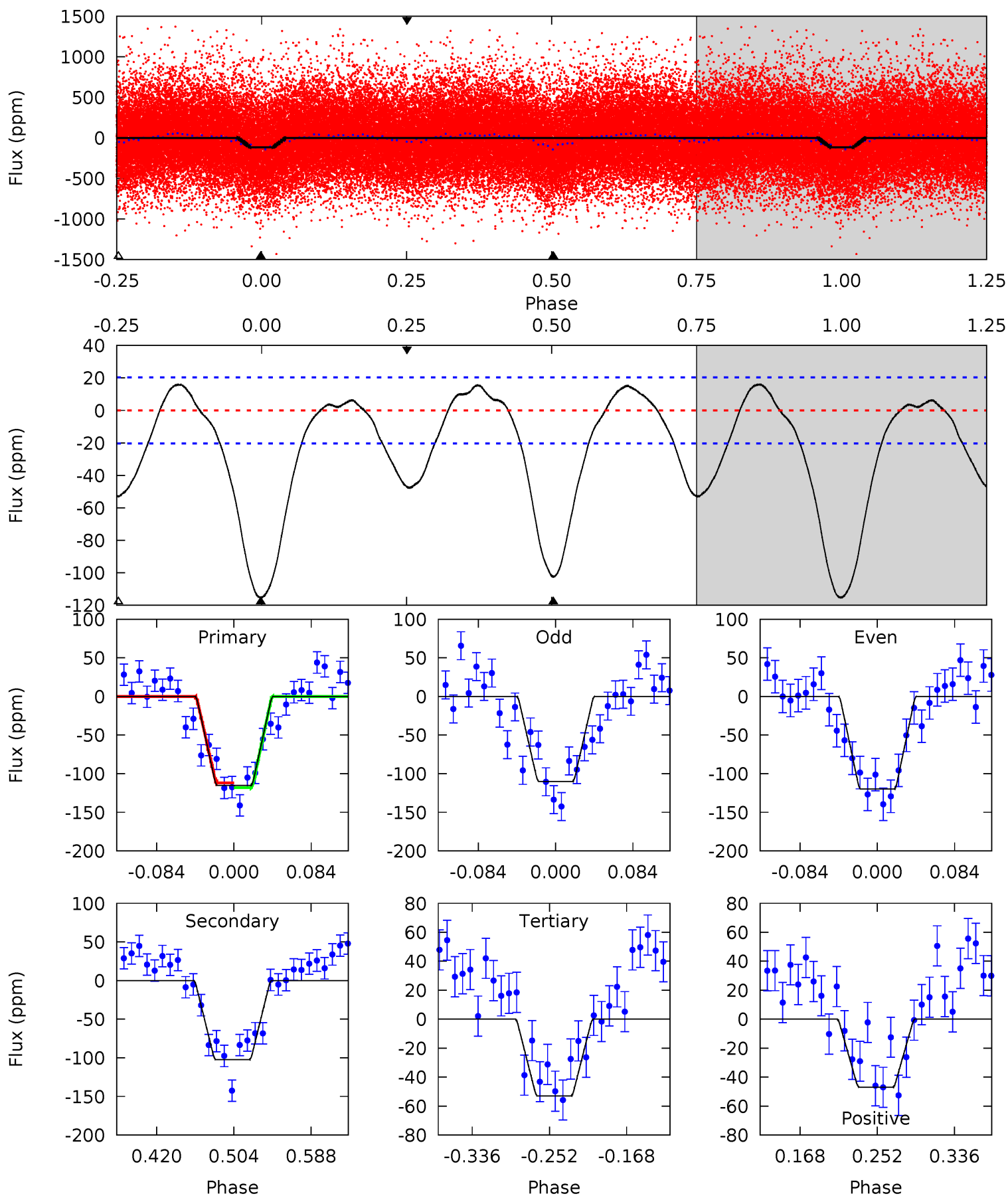
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.1	14.8	3.92	0	4.54	1.58	1.98	14.2	18.1	10.9	14.8	0.11	0.98	0.13	5.42



Alt Model-Shift Uniqueness Test

009535876-01, P = 0.960850 Days, E = 130.808245 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.1	23.1	12.0	-10.6	4.60	1.73	4.72	14.1	36.7	11.2	33.8	1.11	1.04	0.12	0.68



Stellar Parameters For KIC 009535876

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5708^{+160}_{-200}	$4.378^{+0.087}_{-0.188}$	$0.560^{+0.050}_{-0.300}$	$1.129^{+0.318}_{-0.159}$	$1.112^{+0.110}_{-0.134}$	$1.088^{+0.501}_{-0.555}$
	+3%/-4%	+2%/-4%	+9%/-54%	+28%/-14%	+10%/-12%	+46%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009535876-01 / KOI 4225.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-57 ± 4	$1.12^{+0.77}_{-0.60}$	2697^{+197}_{-142}	5280^{+2558}_{-1010}	$9.601^{+34.795}_{-6.148}$
Alt.	-102 ± 4	$1.56^{+0.70}_{-0.69}$	2686^{+176}_{-144}	5177^{+1721}_{-760}	$8.943^{+19.766}_{-4.764}$

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

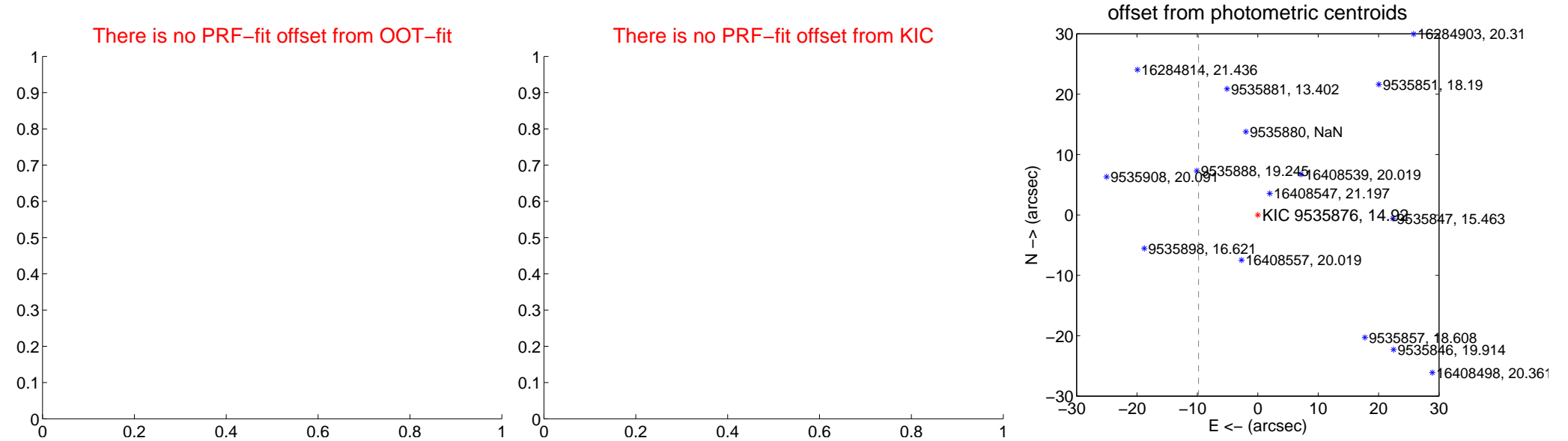
DV Centroid Data

Supplemental centroid analysis for 009535876-01. Kepler magnitude: 14.92. Transit SNR 11.72

There are 0 quarters with good PRF difference image offsets

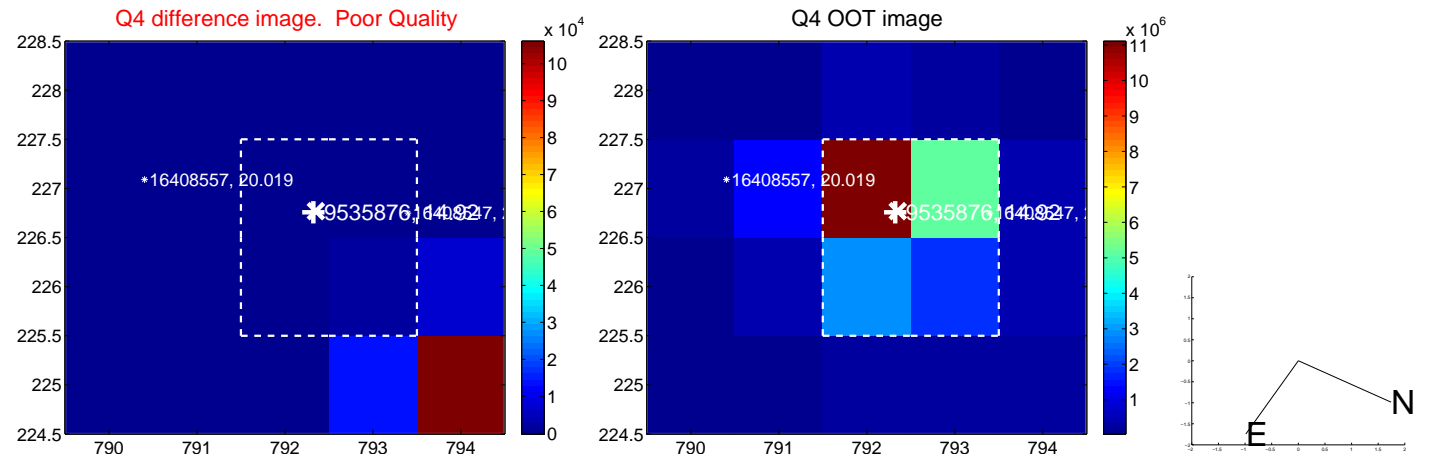
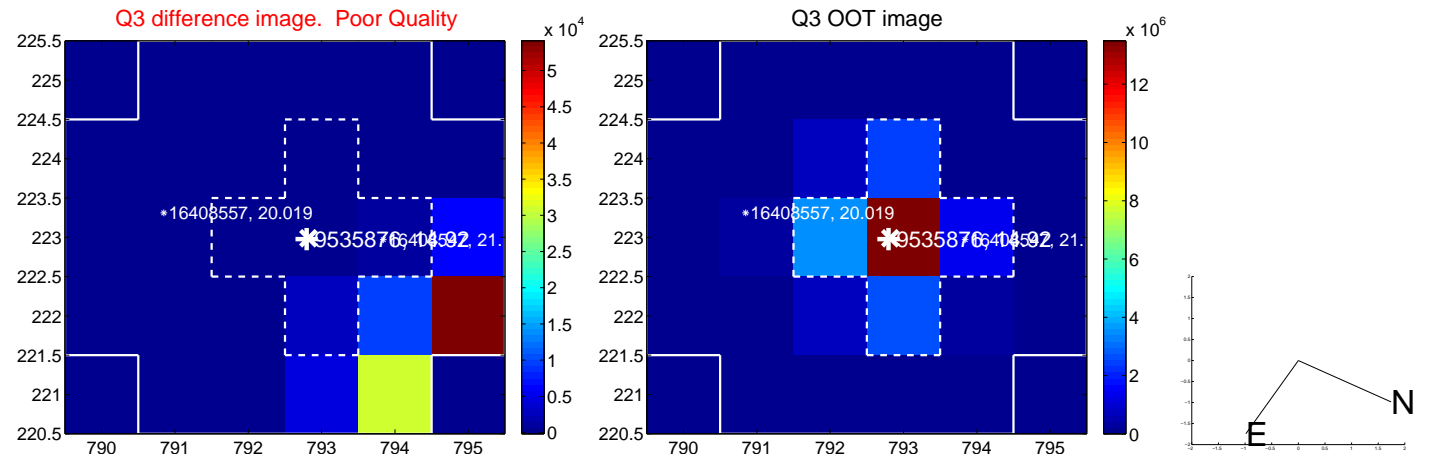
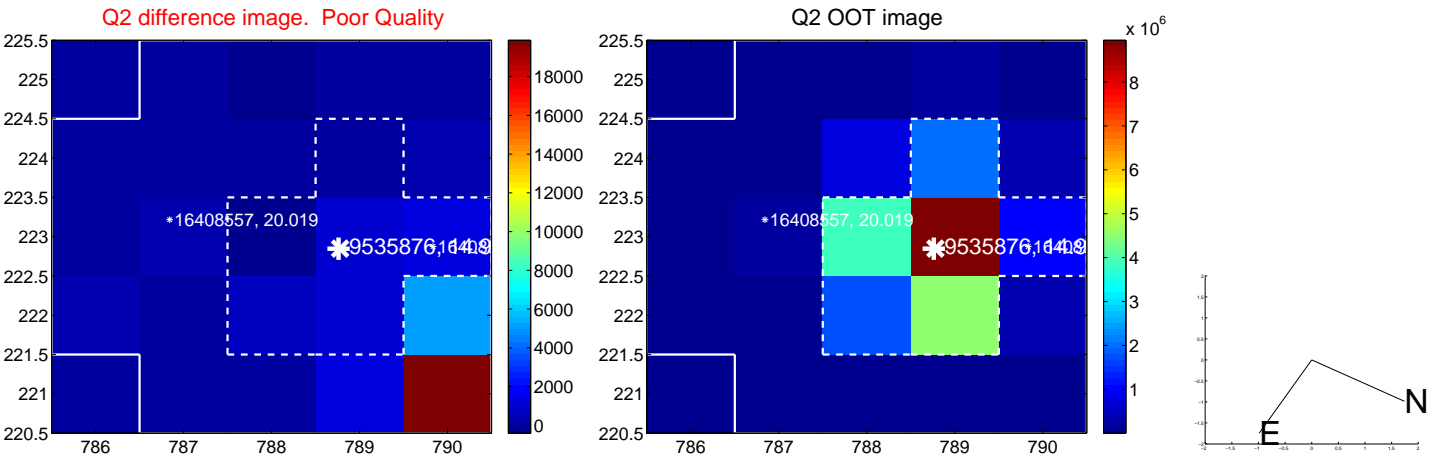
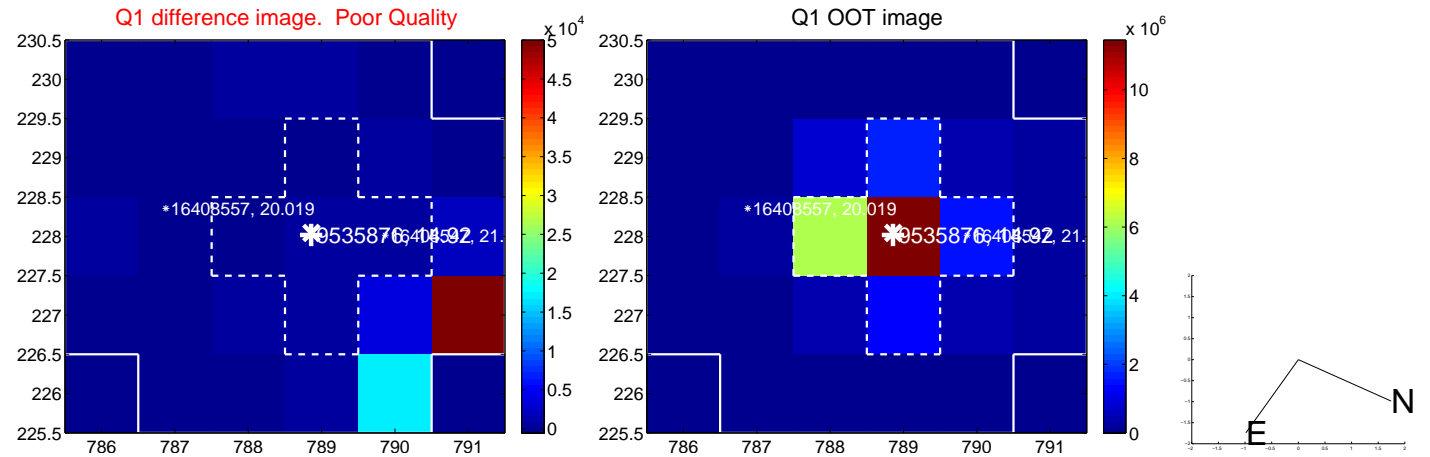
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	61.24 ± 2.64	23.21	9.80 ± 1.32	60.45 ± 2.66

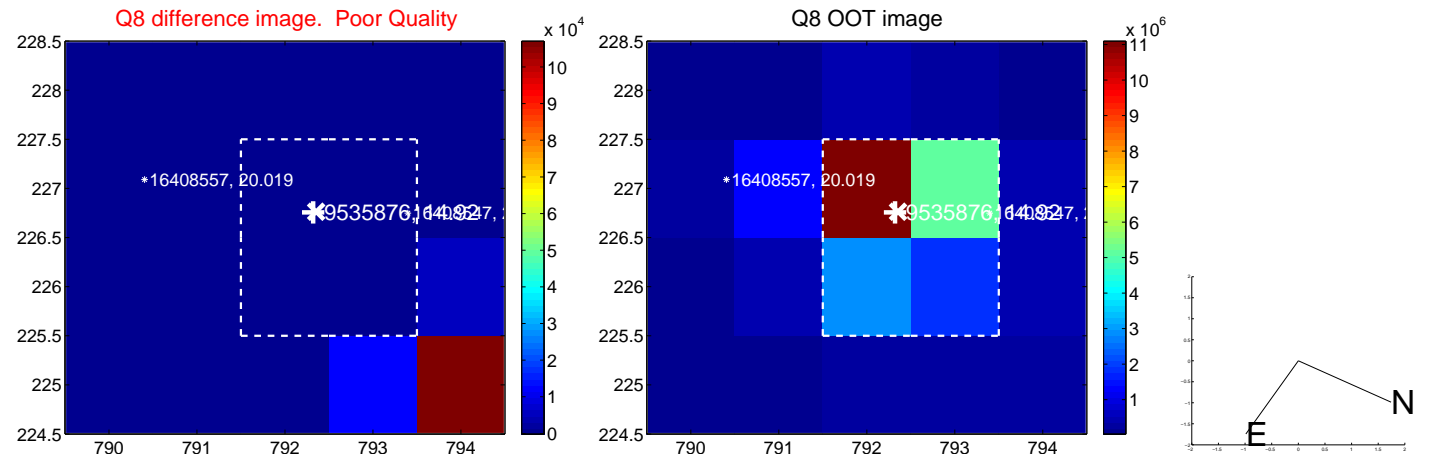
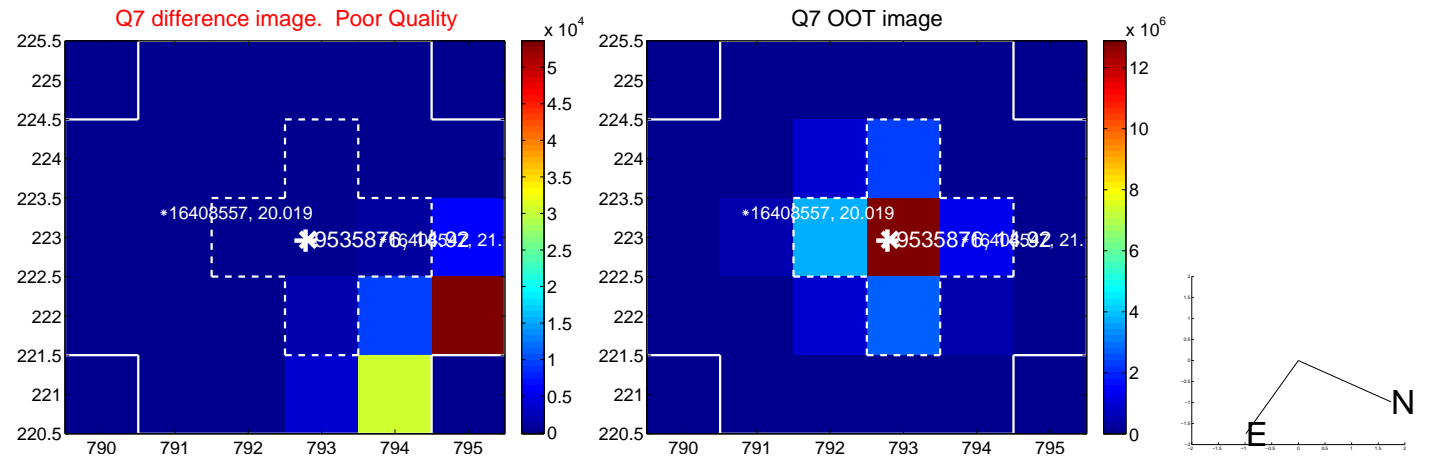
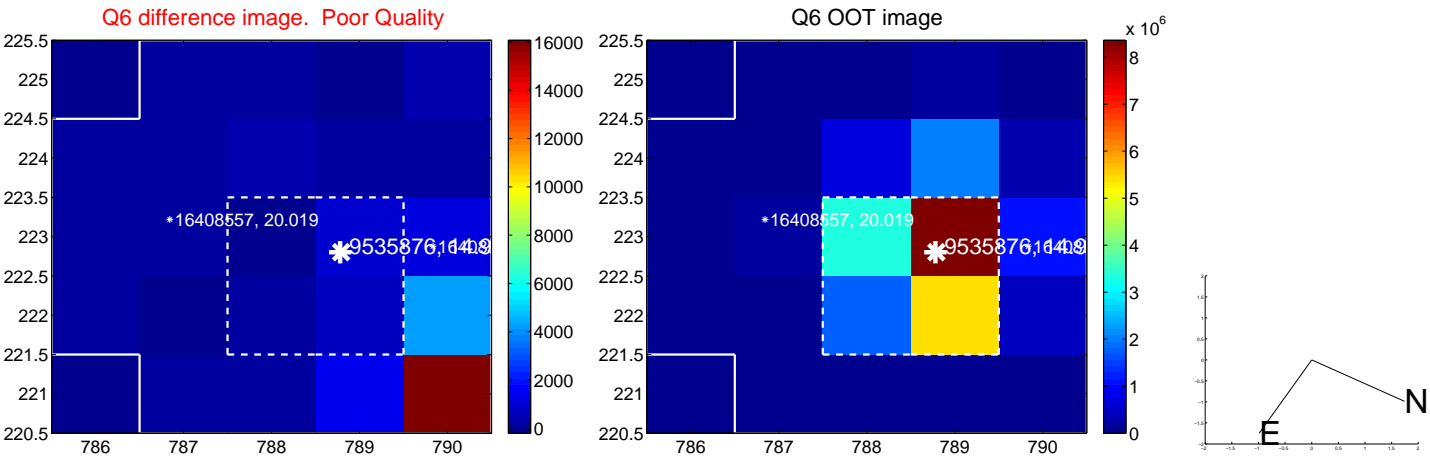
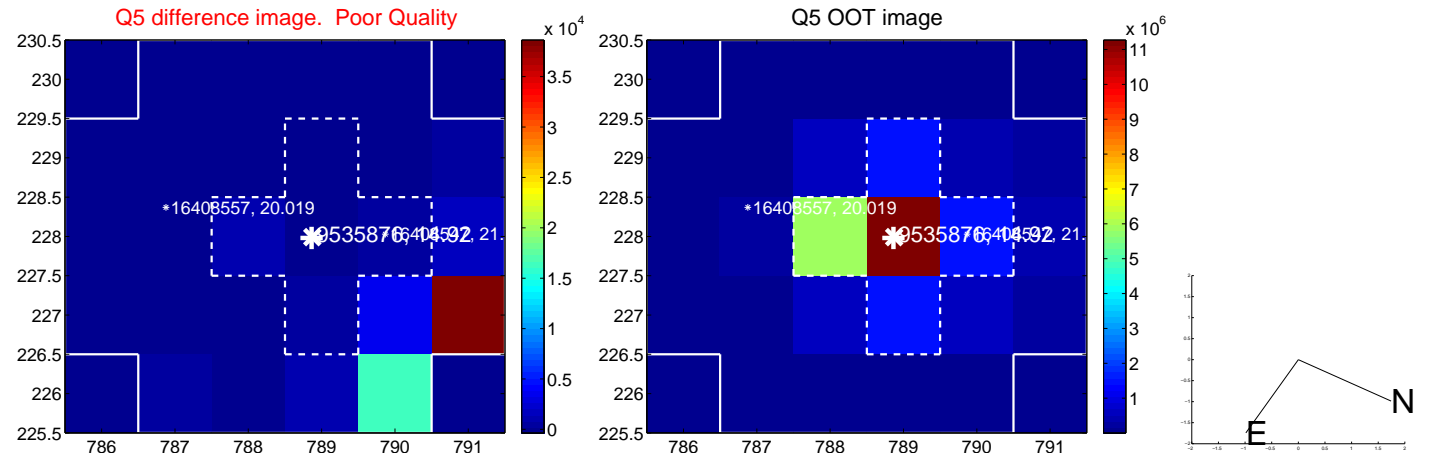


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

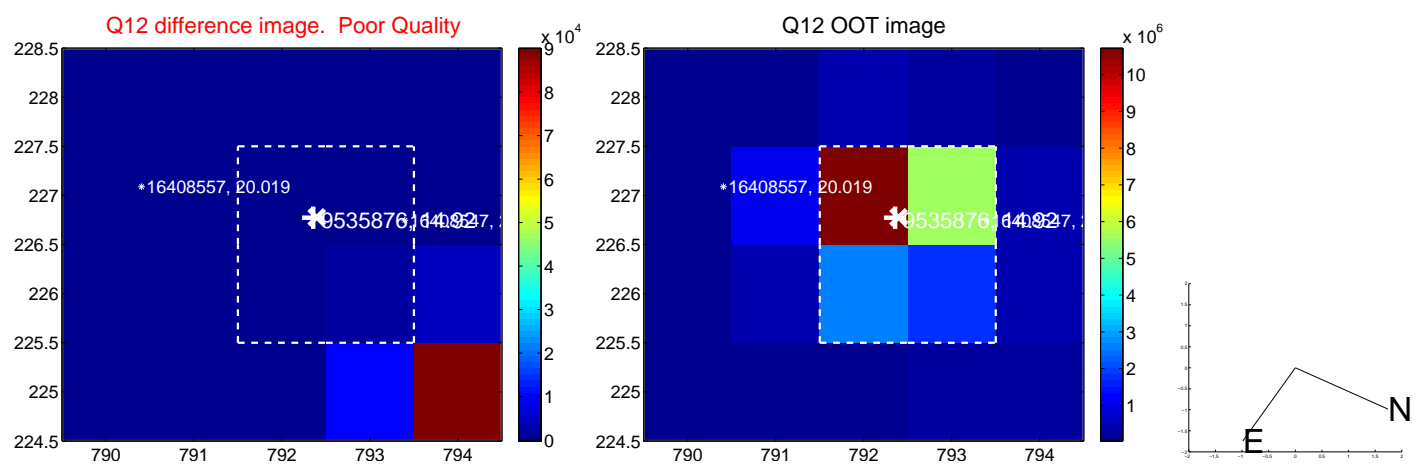
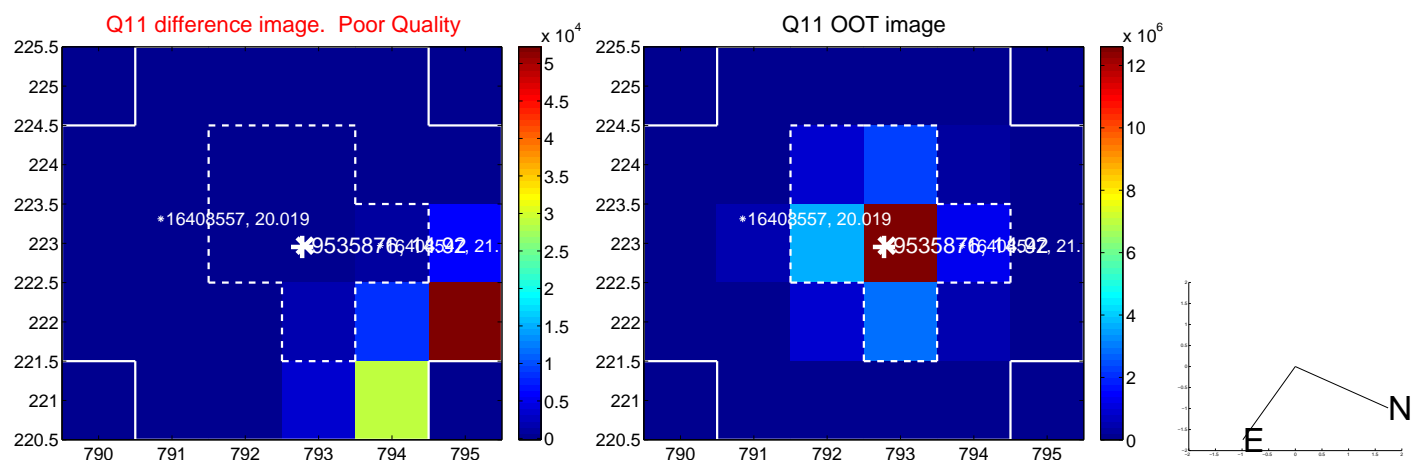
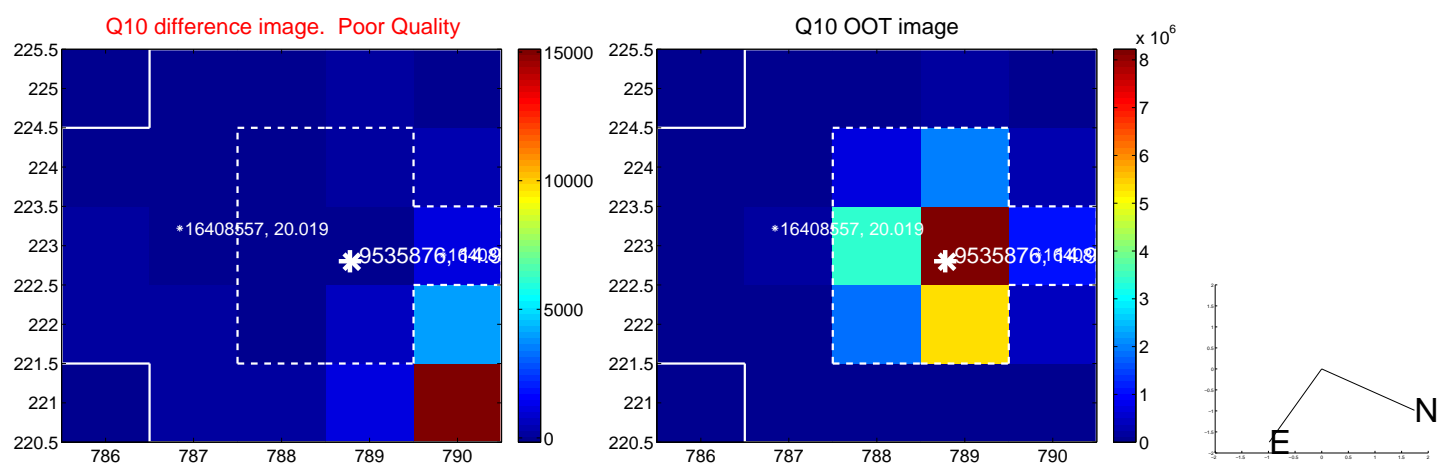
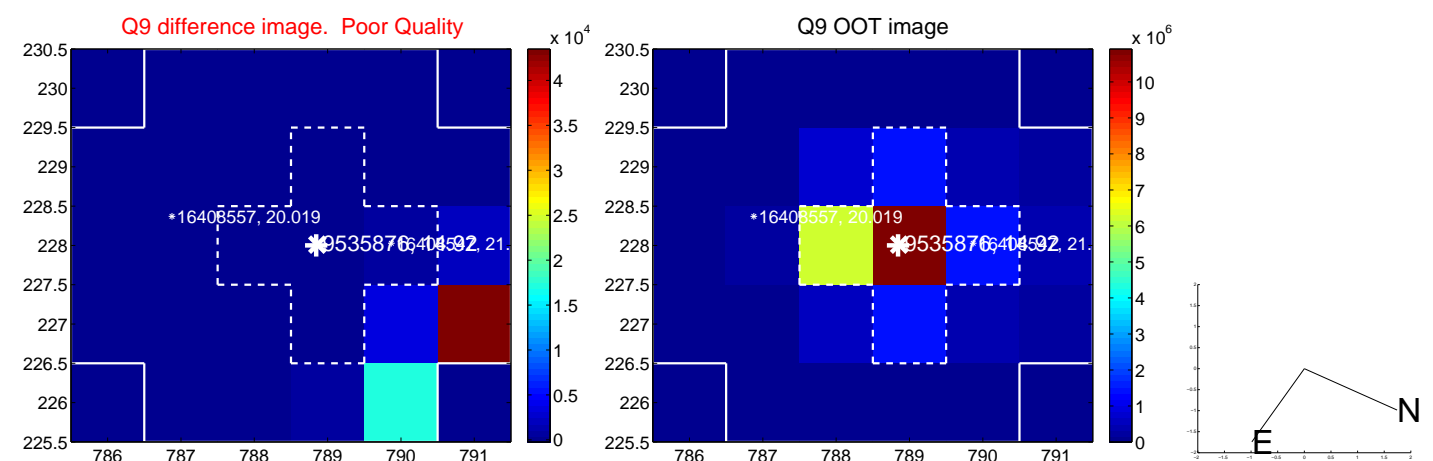
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



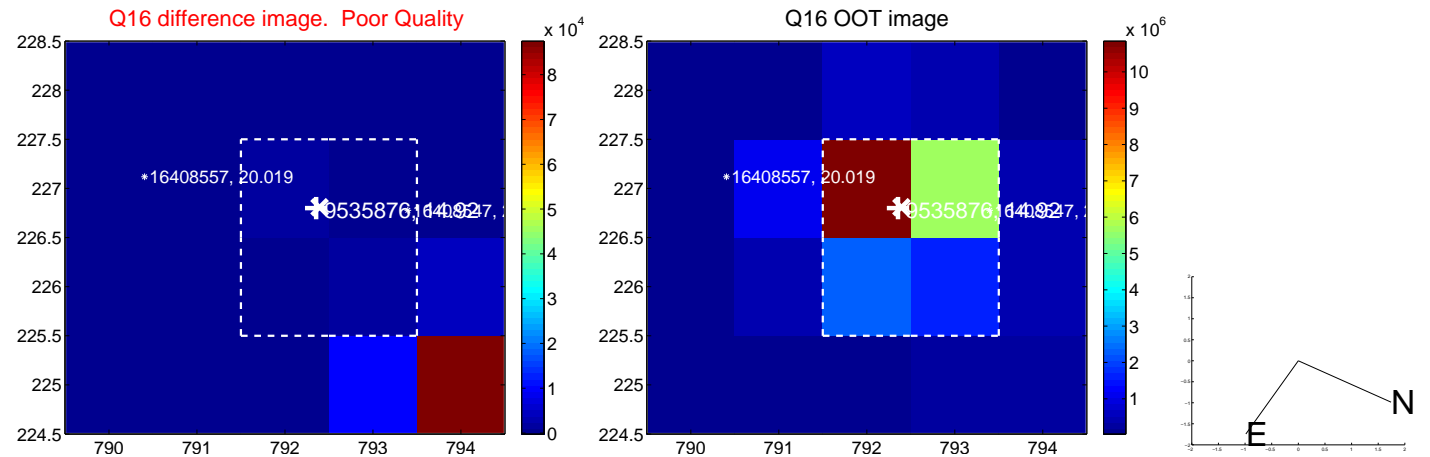
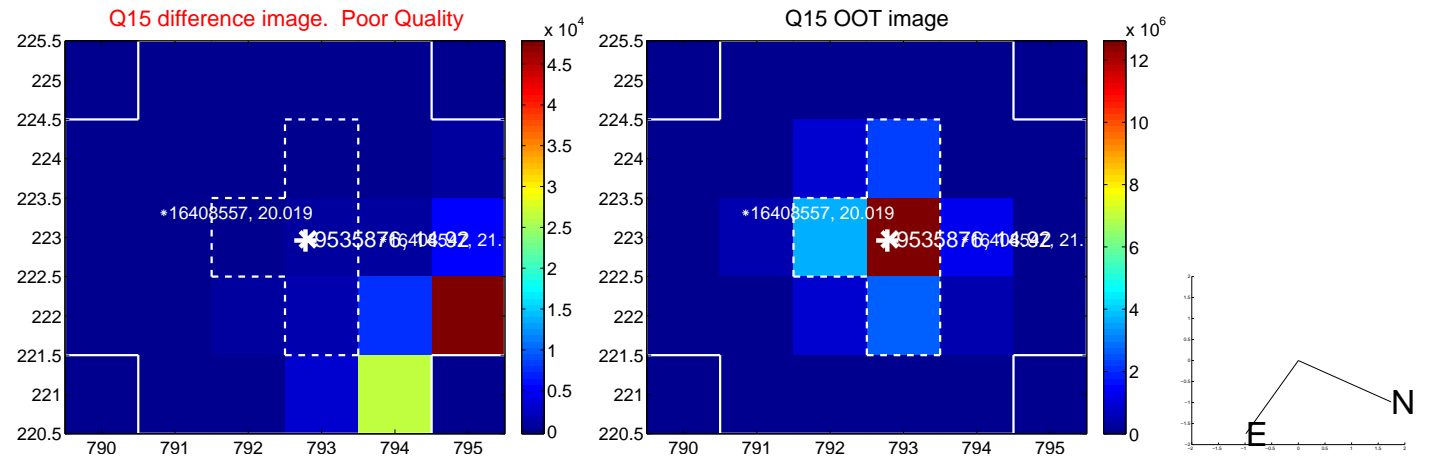
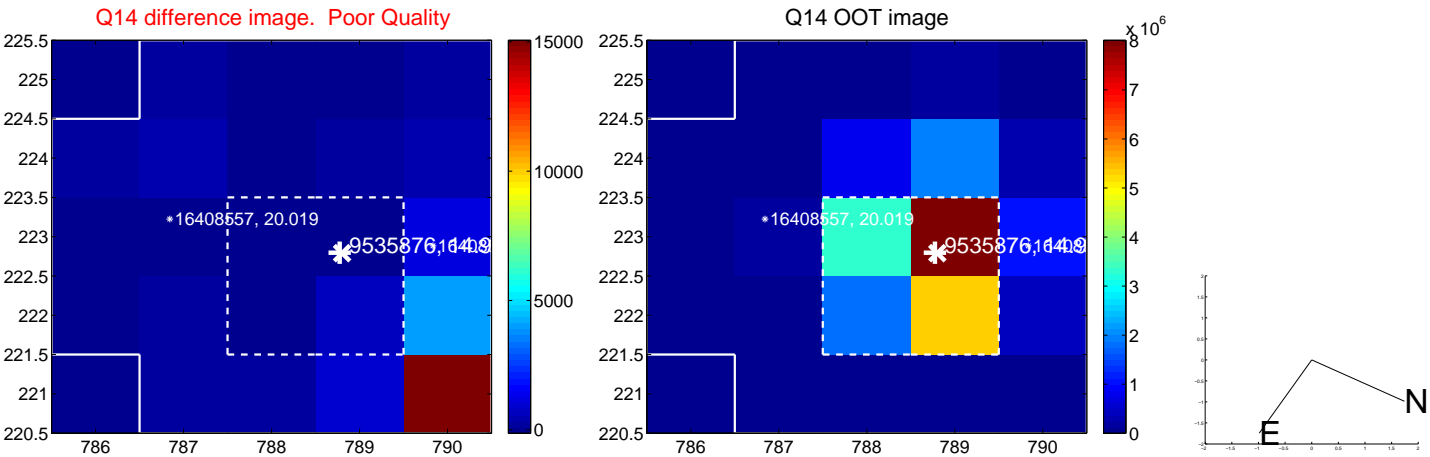
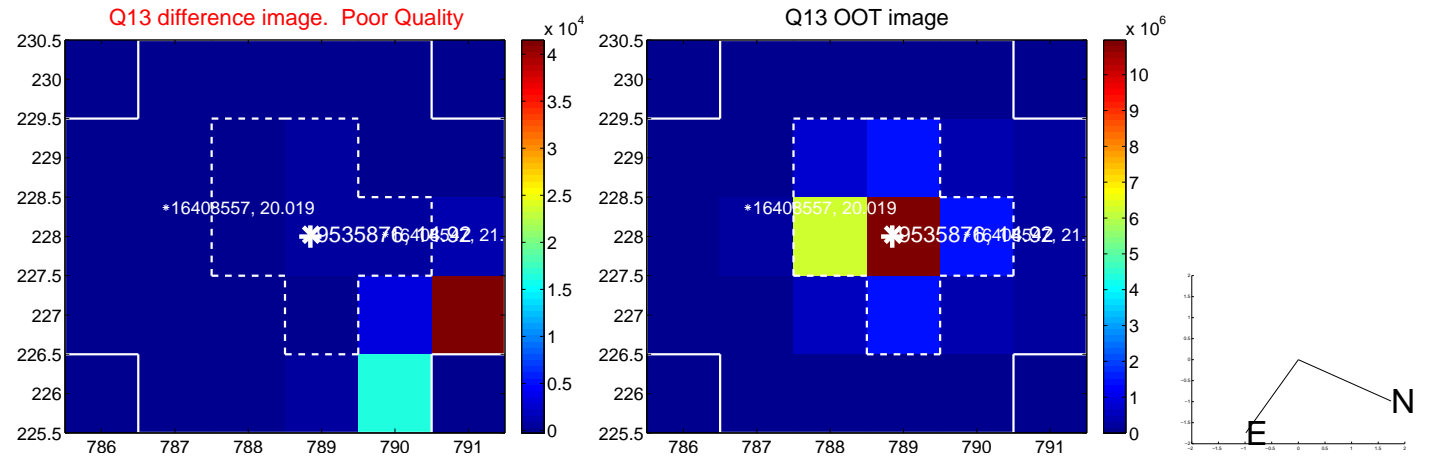
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



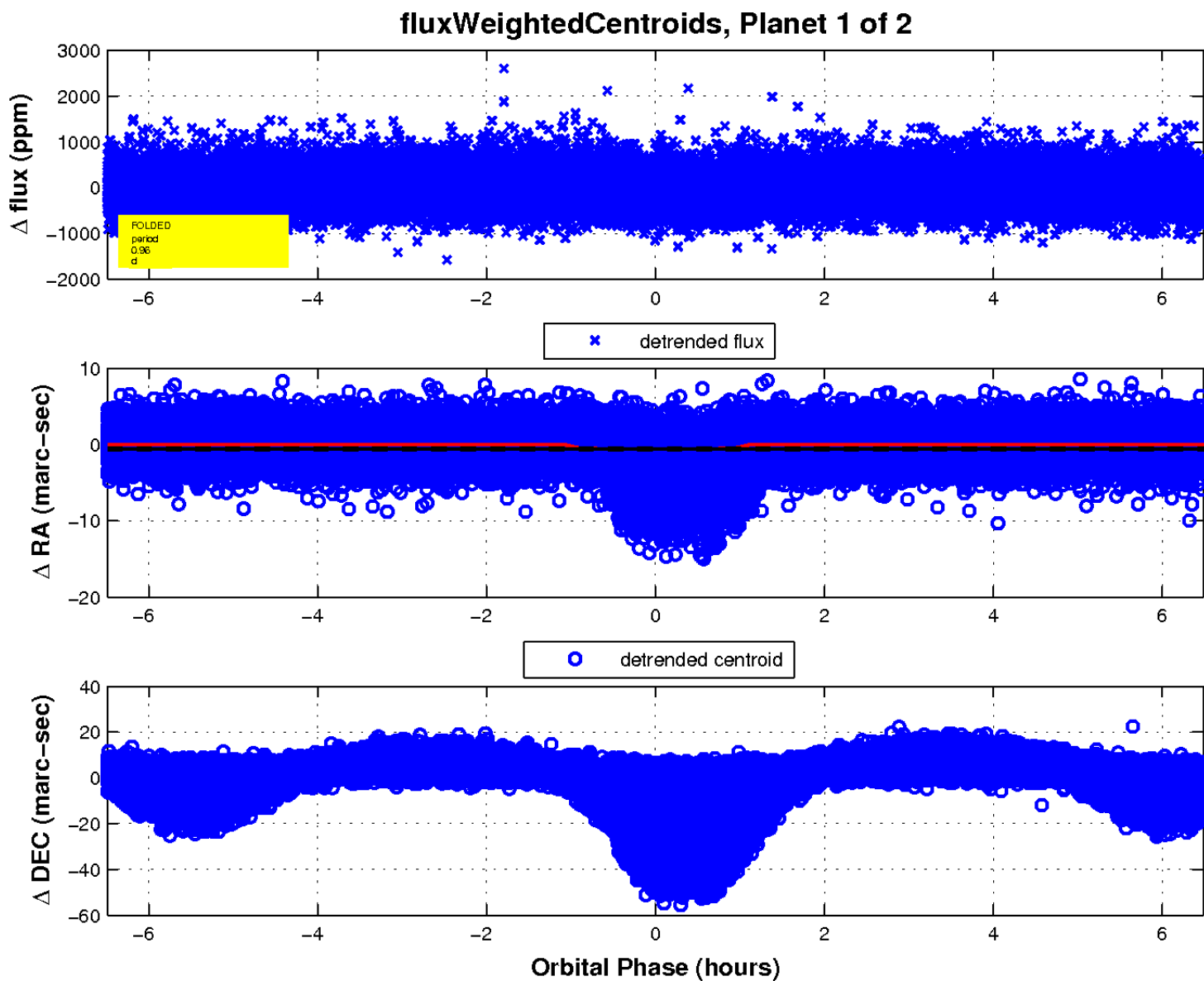
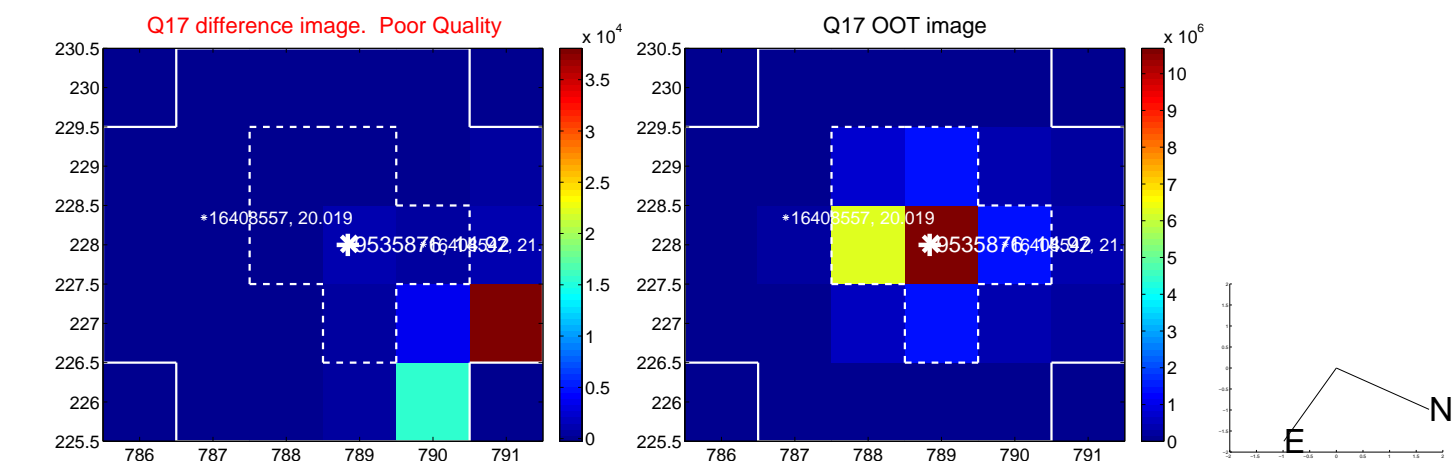
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



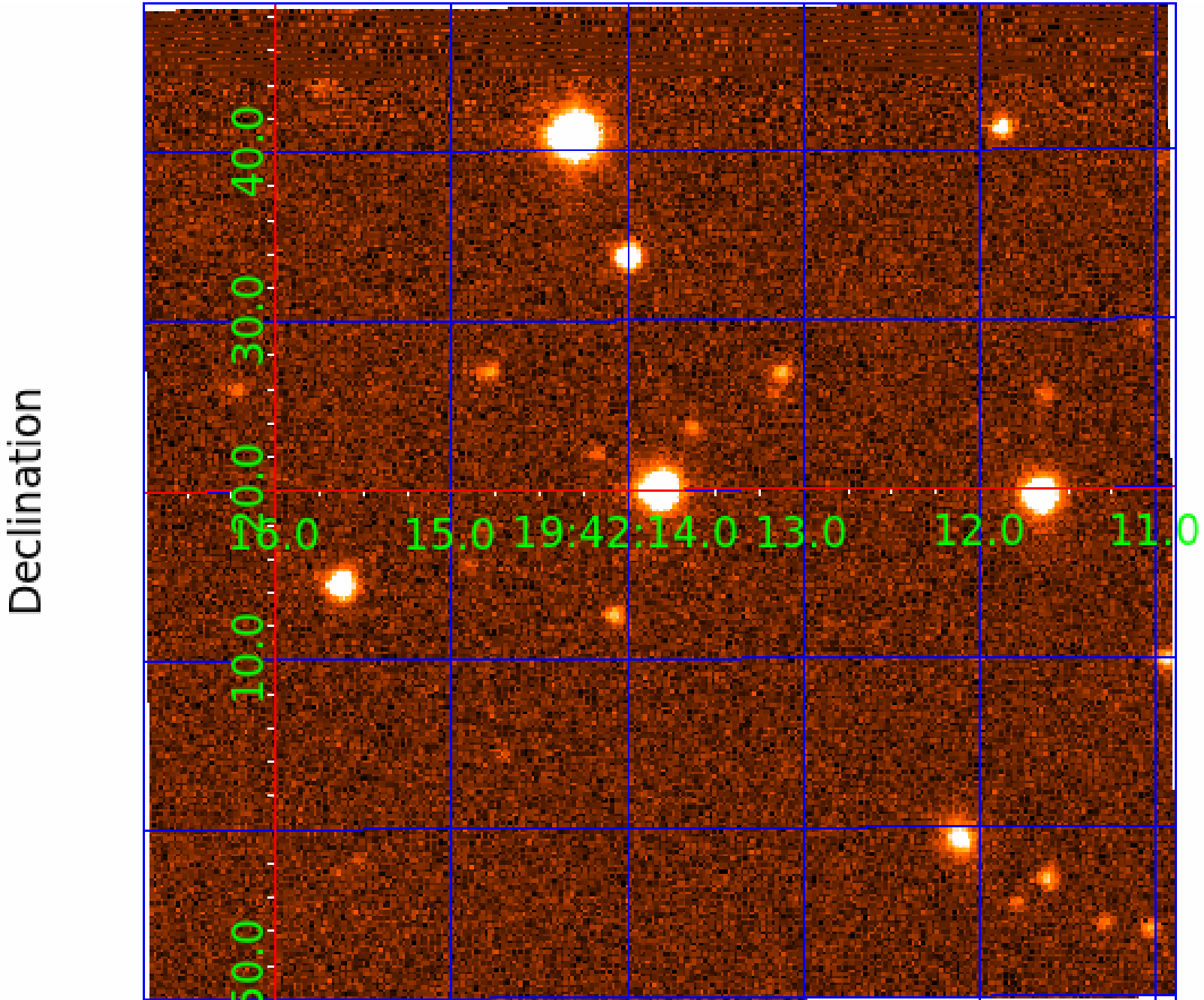
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009535876

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})
009535876-01	OBS	4225.01	0.960832	131.771966	63.9	2.164	12.7	11.7	1.13	5708	1.08	3112.40
009535876-02	OBS	No	0.960827	132.262749	66.7	1.888	12.4	11.9	1.13	5708	1.11	3112.43

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009535876-01	OBS	FP	0.00	1	0	1	1	LPP_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—EPHEM_MATCH
009535876-02	OBS	FP	0.00	1	0	1	1	LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH

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 009535876-02

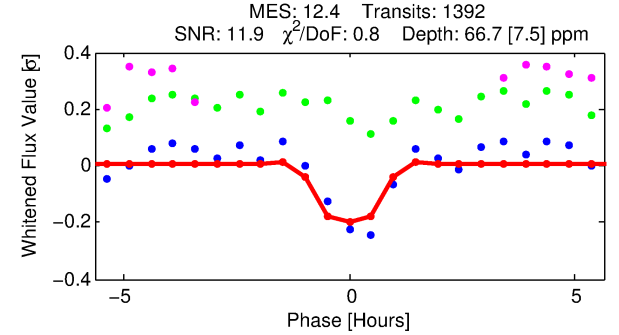
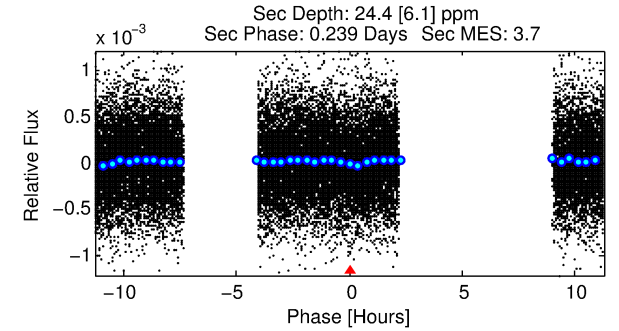
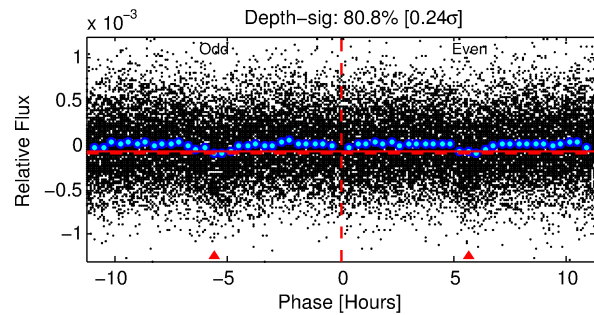
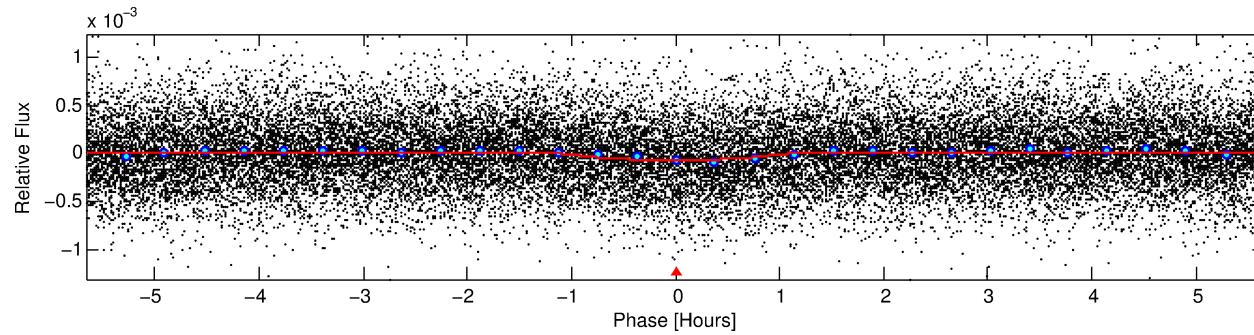
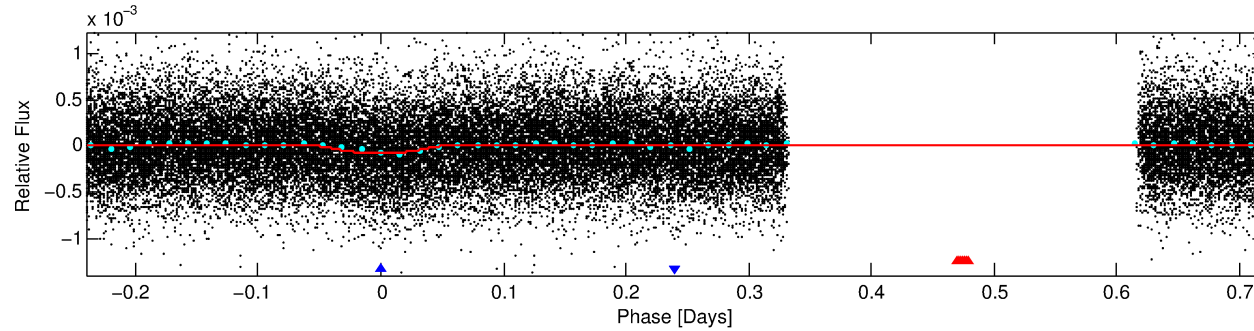
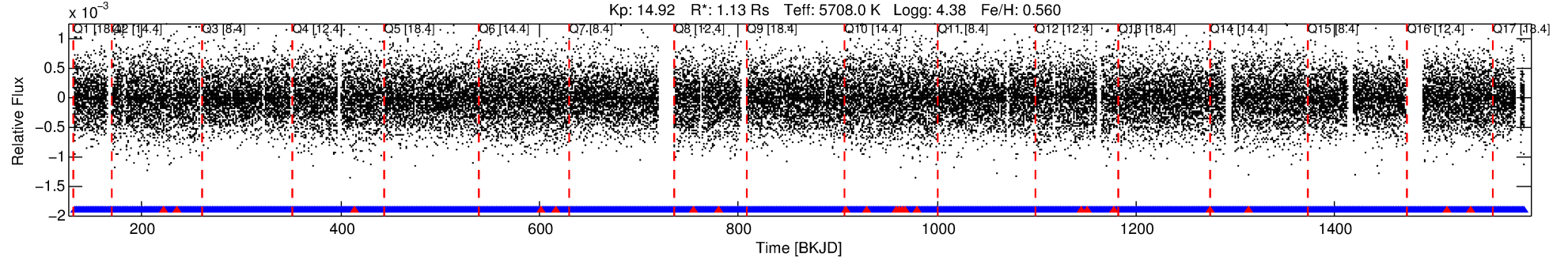
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
009535876-02	9535876	009535881-02	9535881	1:1	21.5	4	-4	13.40	14.92	2.21	Direct-PRF	0	3.91	0.35

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: 9535876 Candidate: 2 of 2 Period: 0.961 d
KOI: K04225 Corr: No Ephemeris Match

Kp: 14.92 R*: 1.13 Rs Teff: 5708.0 K Logg: 4.38 Fe/H: 0.560



DV Fit Results:

Period = 0.96083 [0.00001] d
Epoch = 132.2627 [0.0022] BKJD
Rp/R* = 0.0090 [0.0051]
a/R* = 2.01 [3.82]
b = 0.90 [0.55]
Seff = 3112.43 [1157.00]
Teff = 1905 [177] K
Rp = 1.11 [0.71] Re
a = 0.0197 [0.0047] AU
Ag = 4.24 [5.17] [0.63σ]
Teffp = 4226 [1243] K [1.85σ]

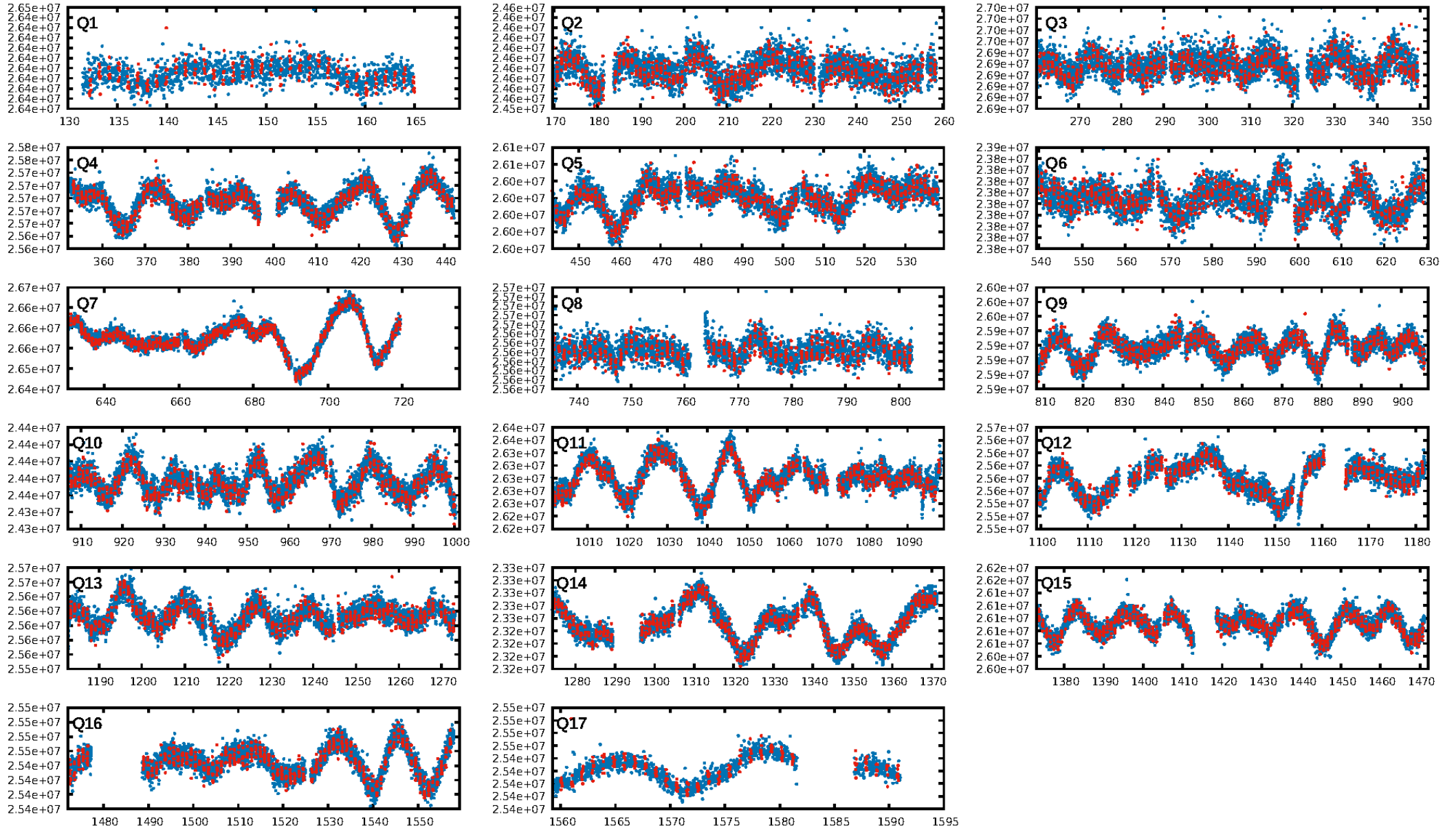
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.35e-36
RollingBand-fgt: 0.98 [1308/1329]
GhostDiagnostic-chr: -0.2481
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 1.00 [17/17]

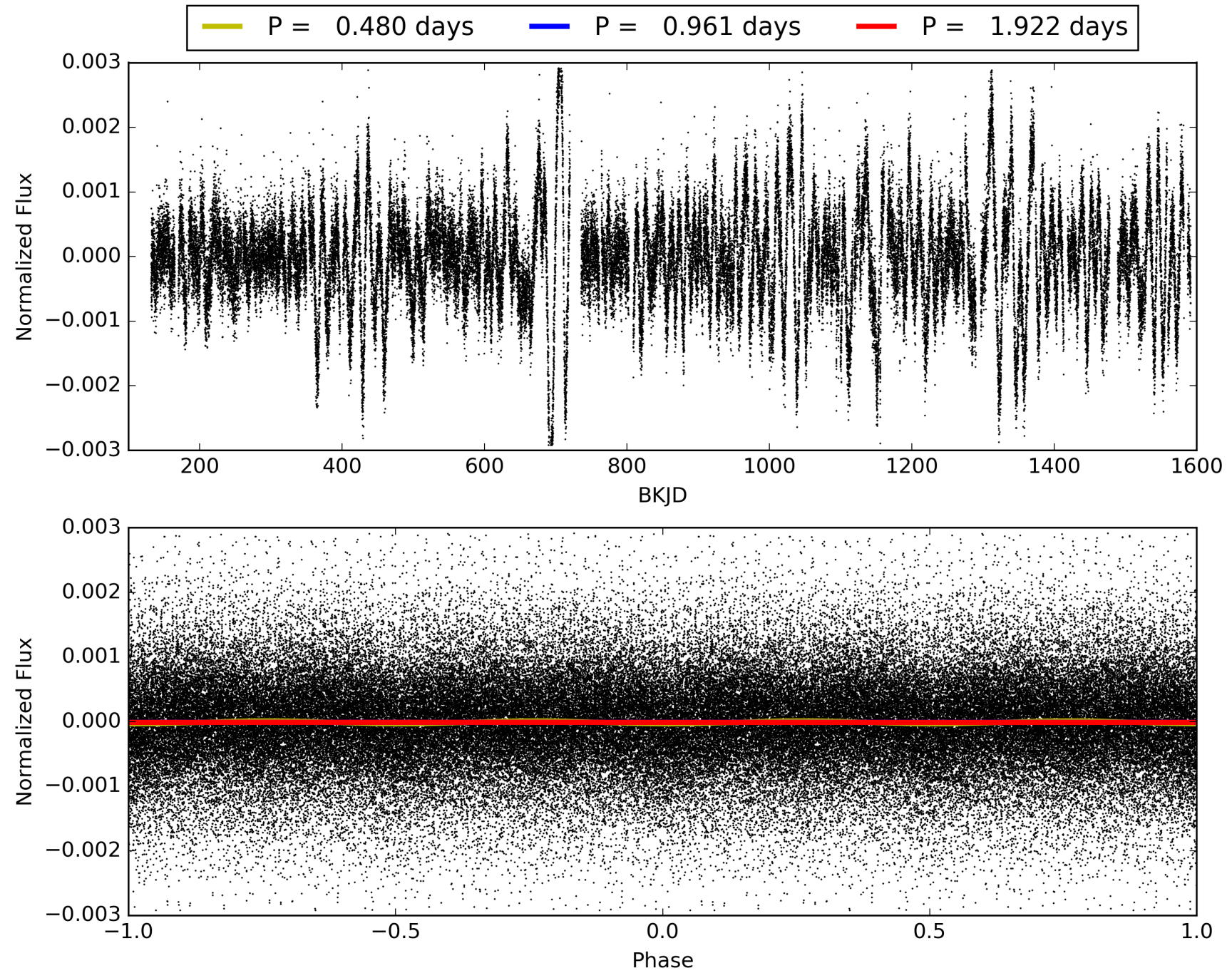
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009535876-02, PDC Light Curves

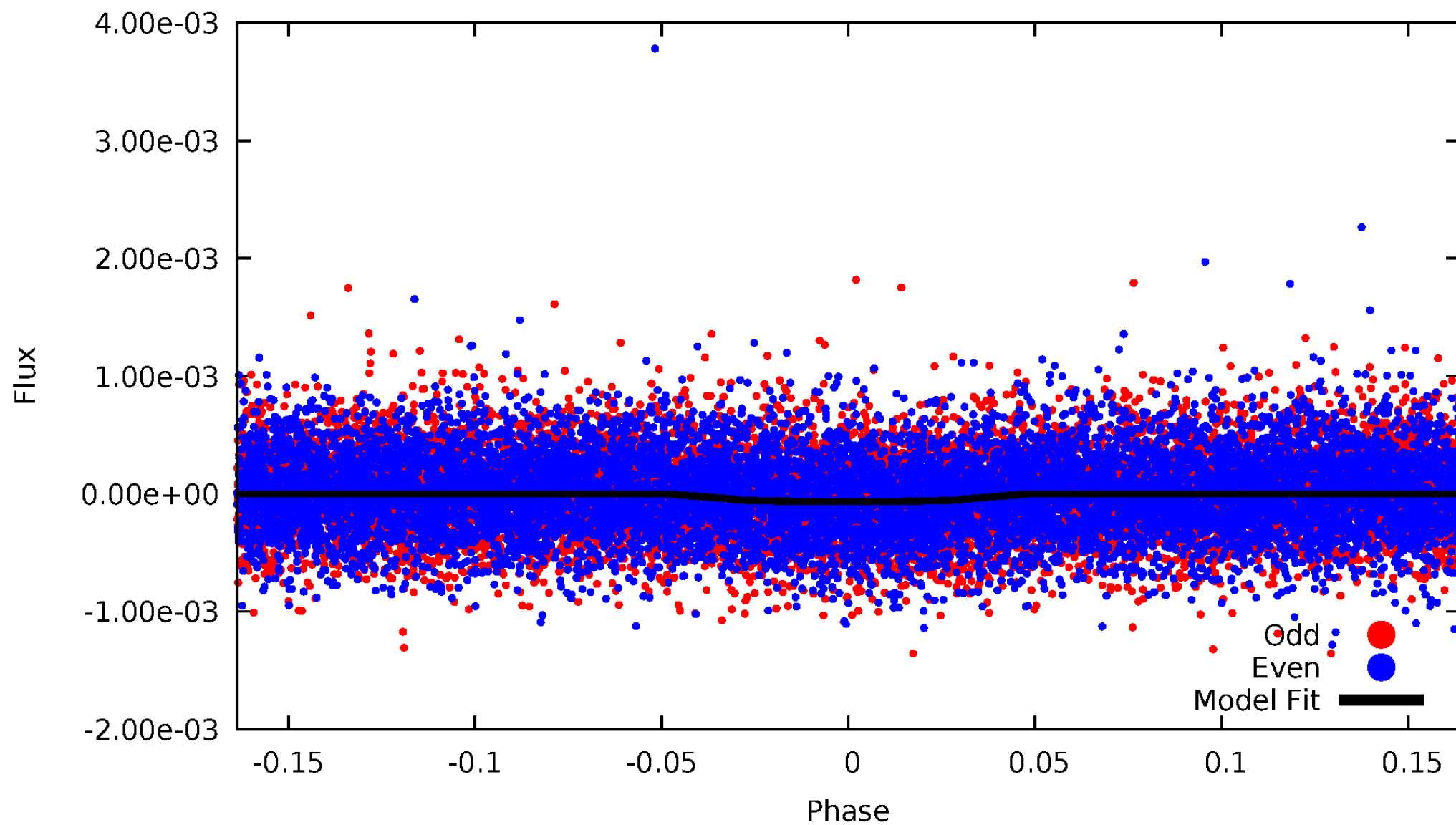


TCE 009535876-02



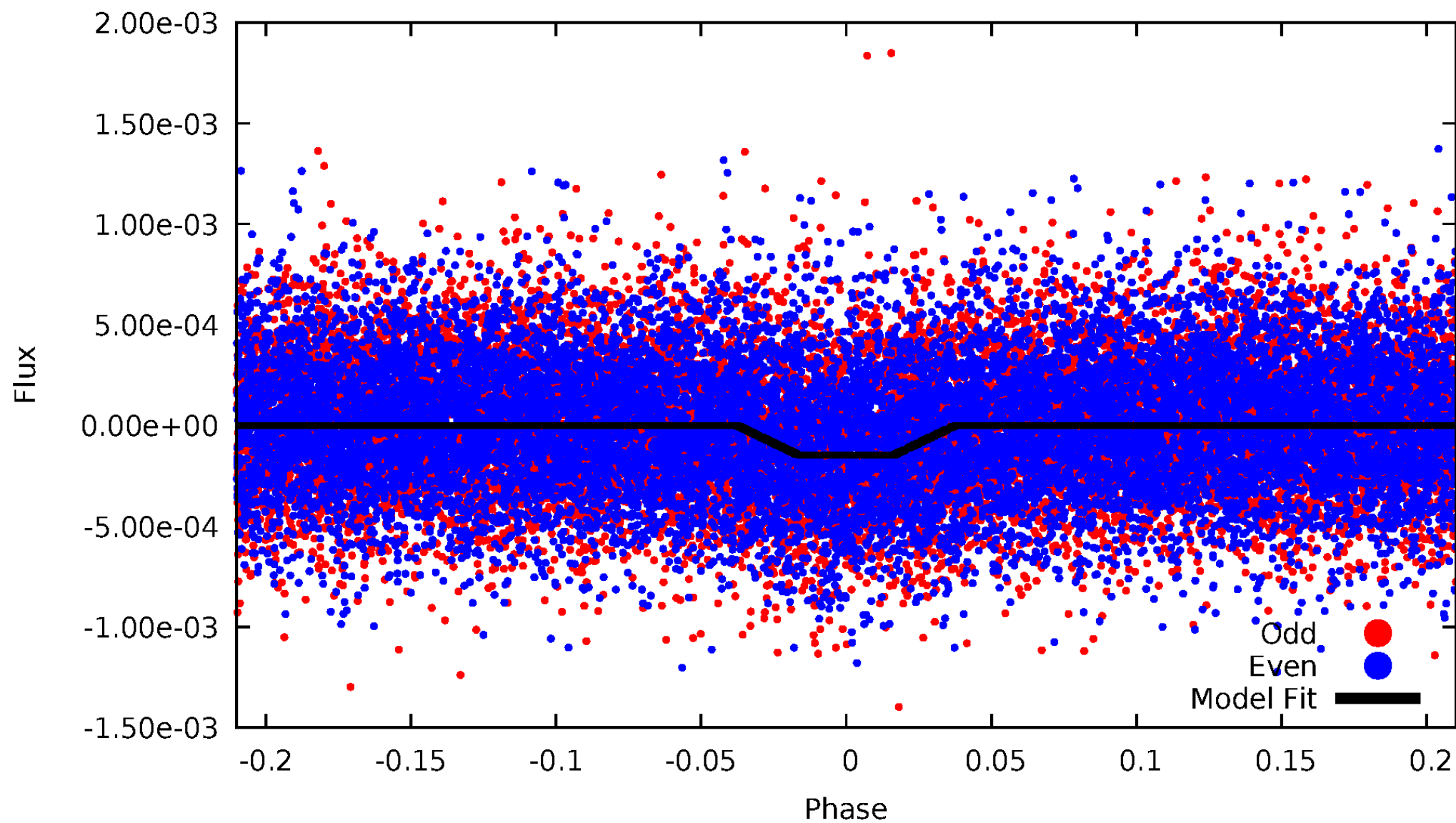
DV Odd/Even

TCE 009535876-02



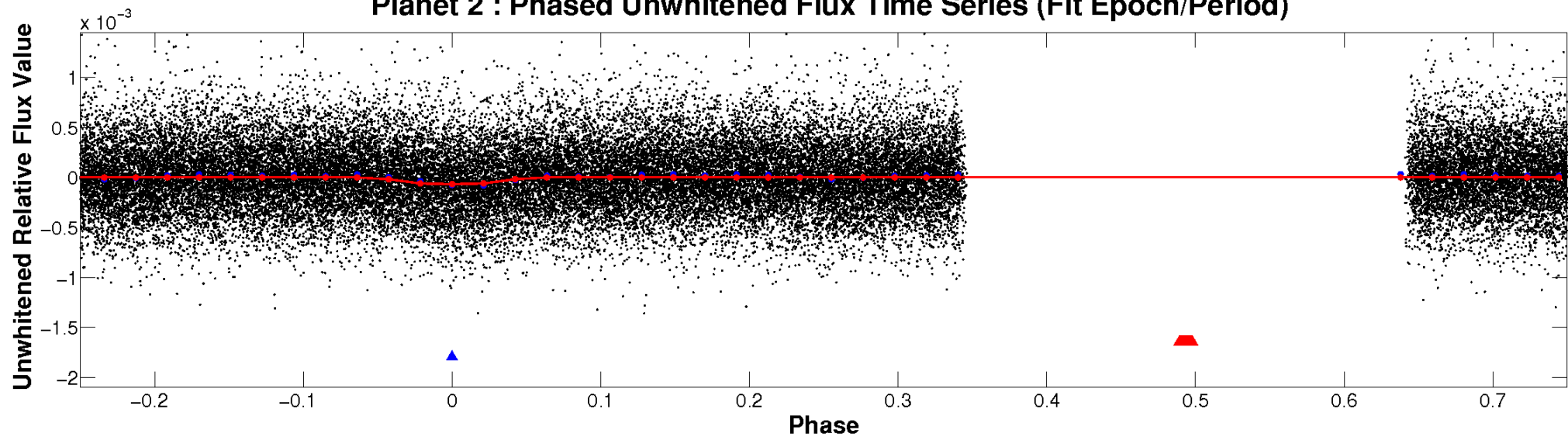
ALT Odd/Even

TCE 009535876-02

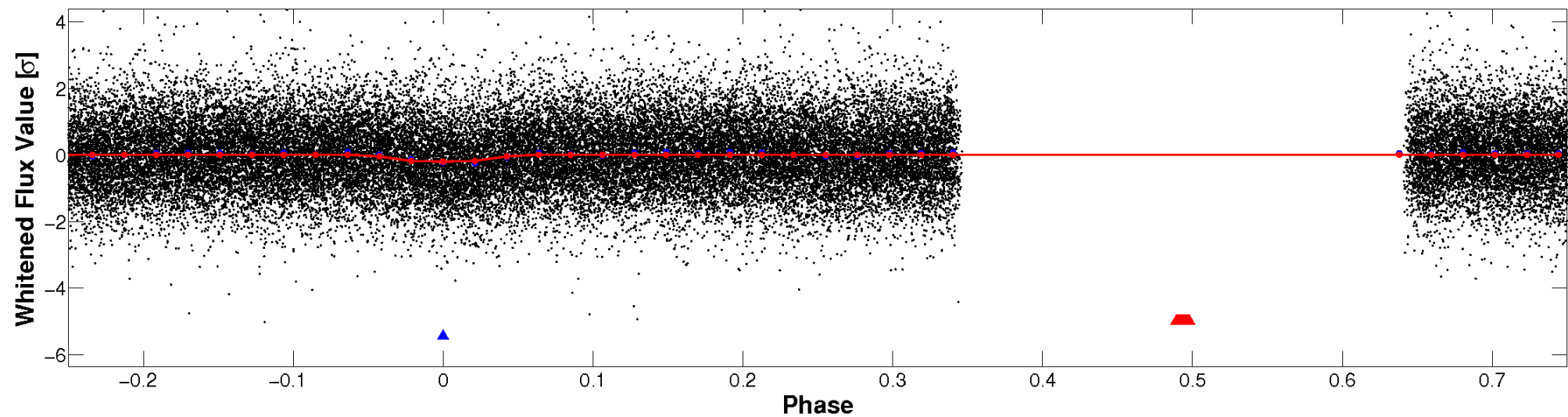


Non-Whitened Vs. Whitened Light Curve

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

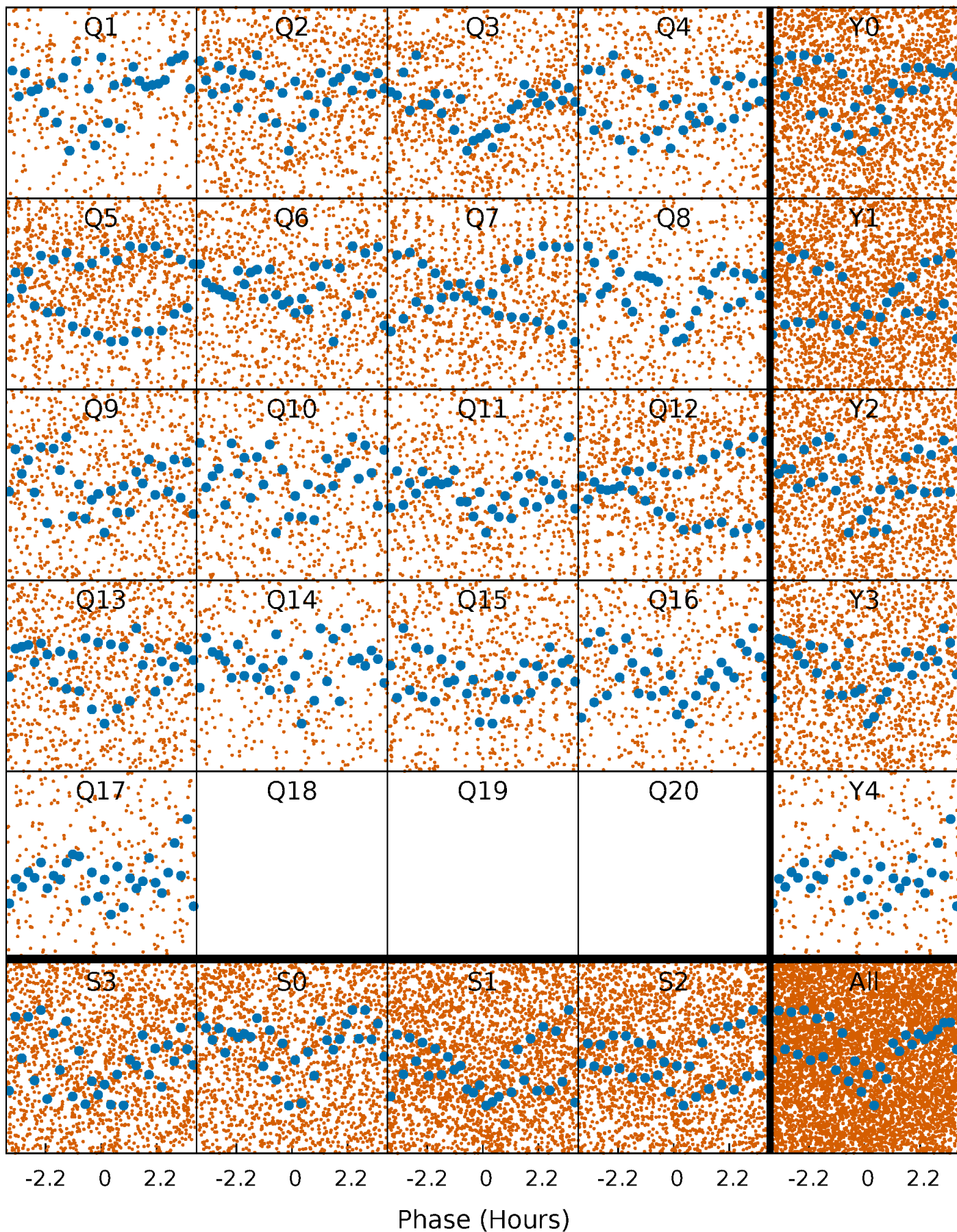


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



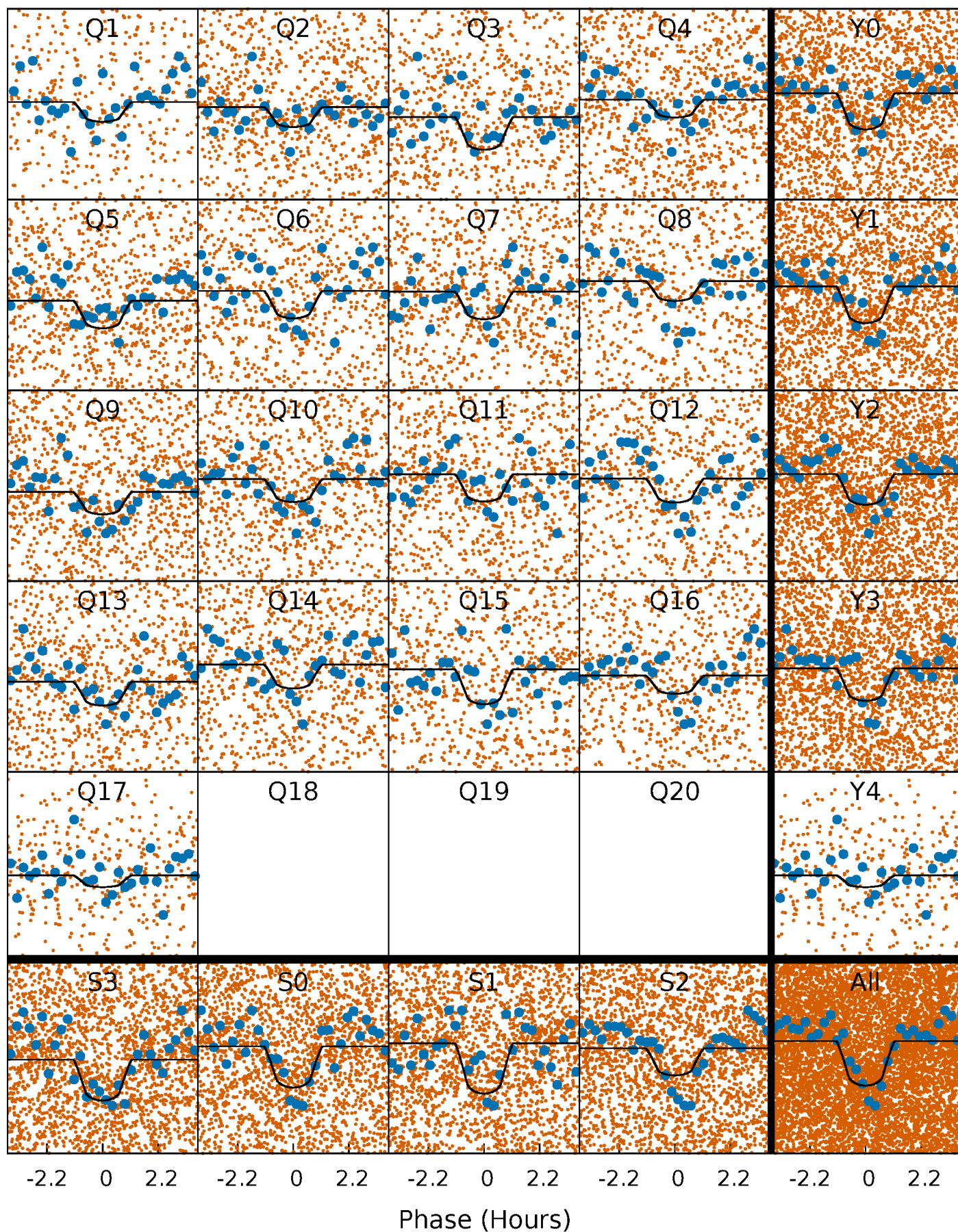
PDC Quarter-Phased Transit Curves

TCE 009535876-02 P= 0.960827 Days $T_0=132.262749$ (BKJD)



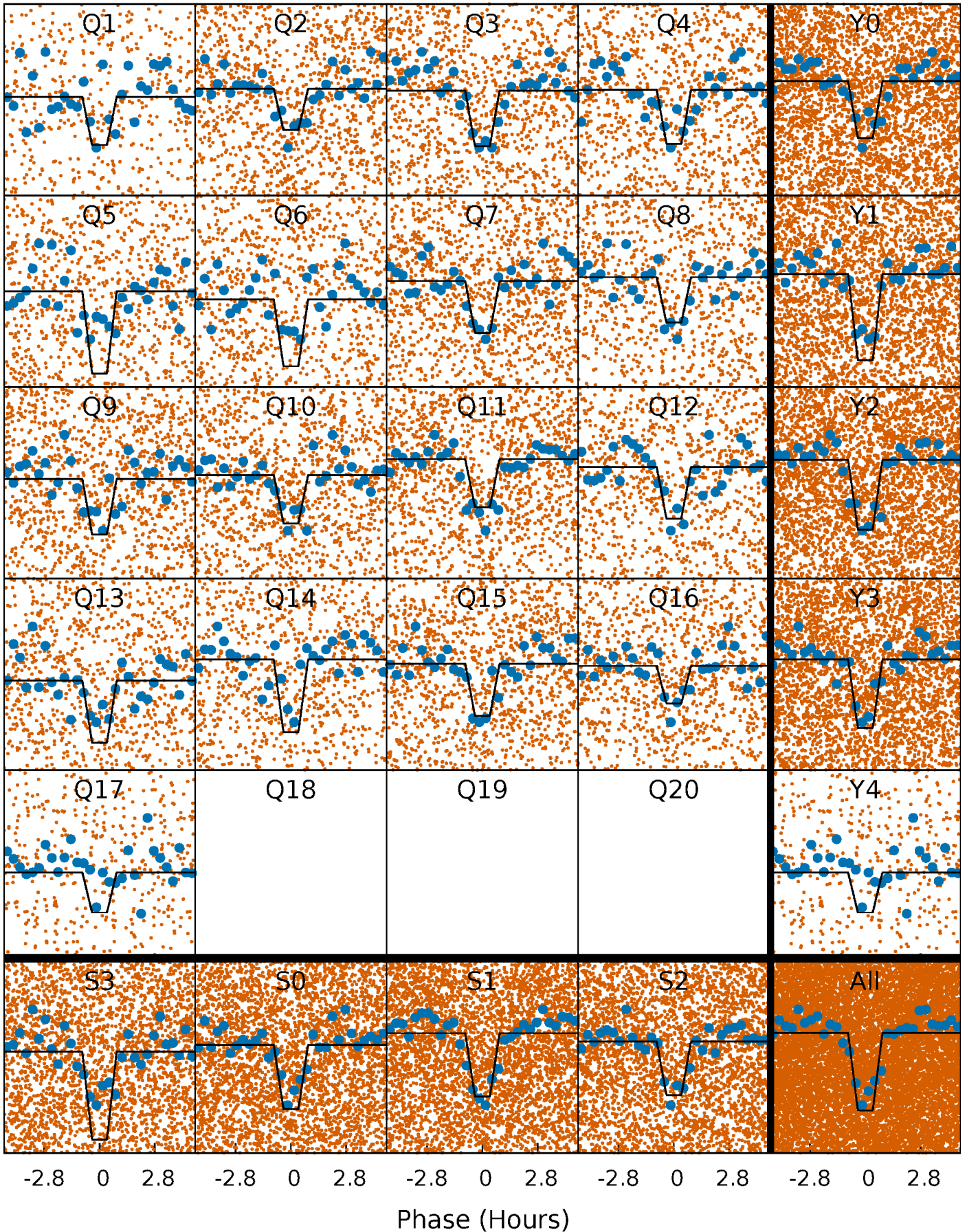
DV Quarter-Phased Transit Curves

TCE 009535876-02 P= 0.960827 Days $T_0=132.262749$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

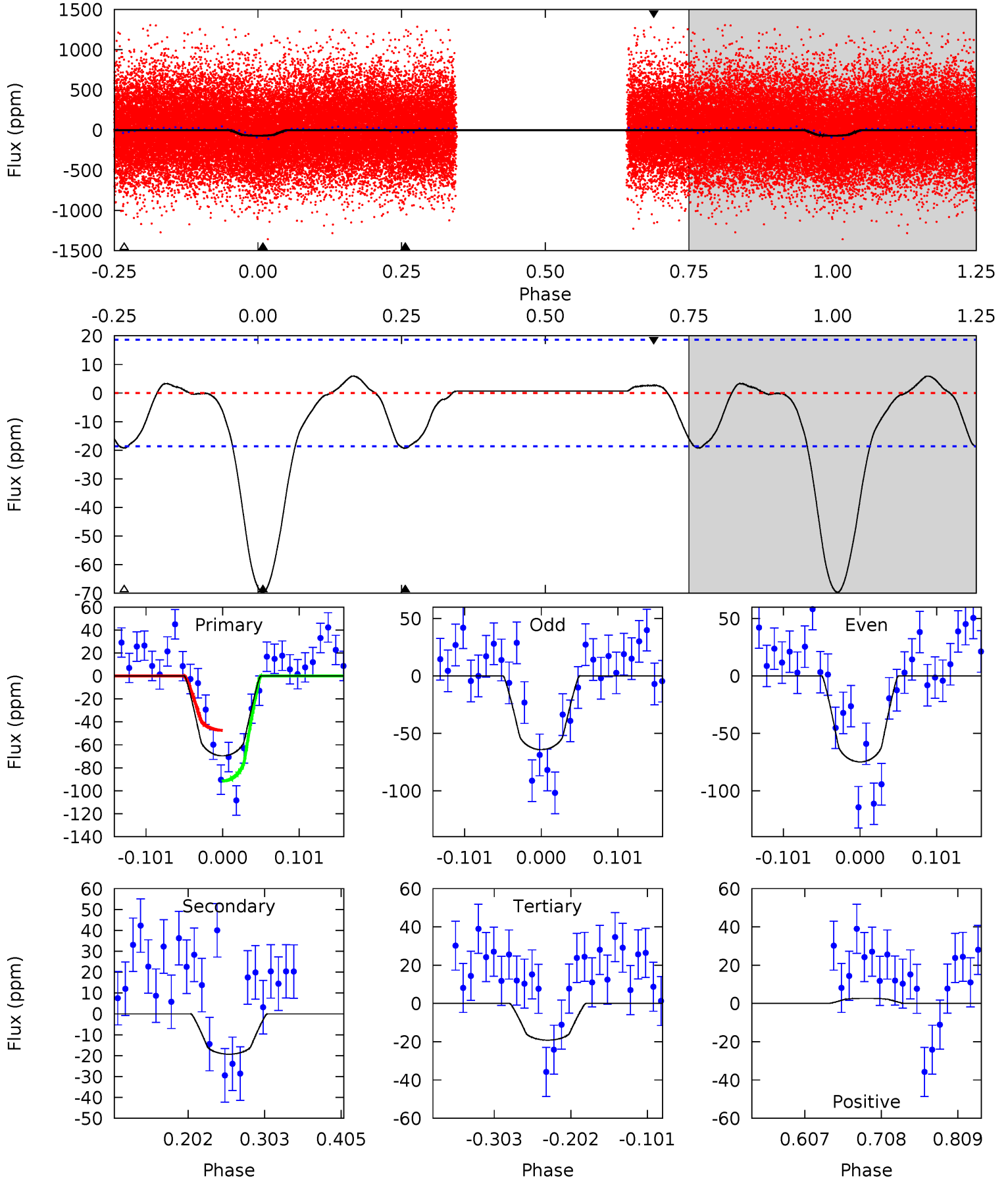
TCE 009535876-02 $P = 0.960842$ Days $T_0 = 132.257708$ (BKJD)



DV Model-Shift Uniqueness Test

009535876-02, P = 0.960827 Days, E = 131.301922 Days

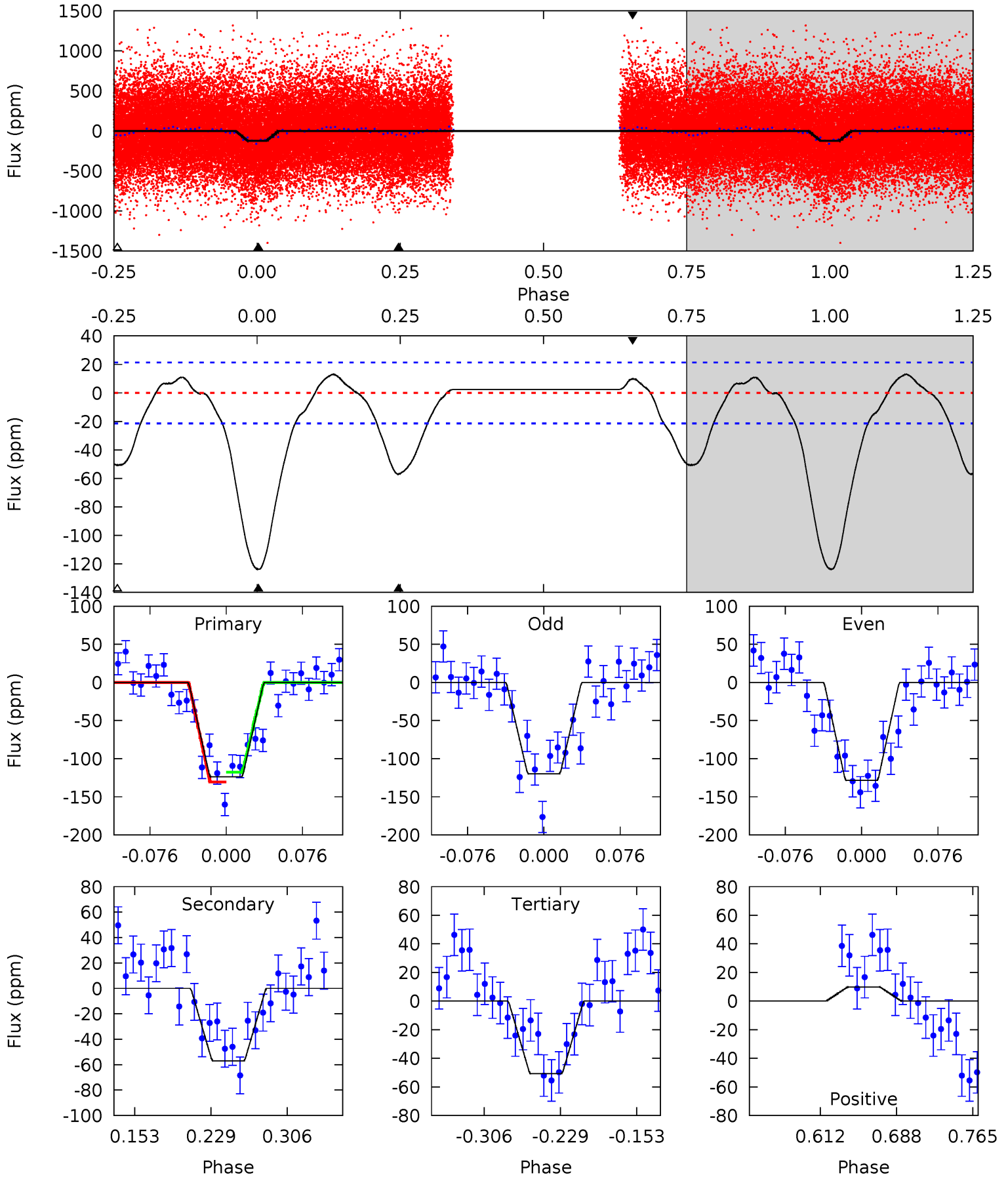
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.0	4.72	4.69	0.65	4.56	1.64	1.80	12.3	16.4	0.03	4.07	1.32	0.88	0.08	5.44



Alt Model-Shift Uniqueness Test

009535876-02, P = 0.960842 Days, E = 131.296866 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.7	12.3	11.0	2.13	4.62	1.77	4.12	15.8	24.6	1.36	10.2	0.92	0.90	0.10	1.37



Stellar Parameters For KIC 009535876

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5708^{+160}_{-200}	$4.378^{+0.087}_{-0.188}$	$0.560^{+0.050}_{-0.300}$	$1.129^{+0.318}_{-0.159}$	$1.112^{+0.110}_{-0.134}$	$1.088^{+0.501}_{-0.555}$
	+3%/-4%	+2%/-4%	+9%/-54%	+28%/-14%	+10%/-12%	+46%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009535876-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-19 ± 4	$1.17^{+0.69}_{-0.58}$	2691^{+189}_{-139}	4046^{+1379}_{-670}	$2.792^{+8.712}_{-1.652}$
Alt.	-57 ± 5	$1.57^{+0.69}_{-0.68}$	2683^{+204}_{-135}	4543^{+1335}_{-603}	$4.752^{+10.637}_{-2.356}$

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 $A_{obs} \gg 1.0$

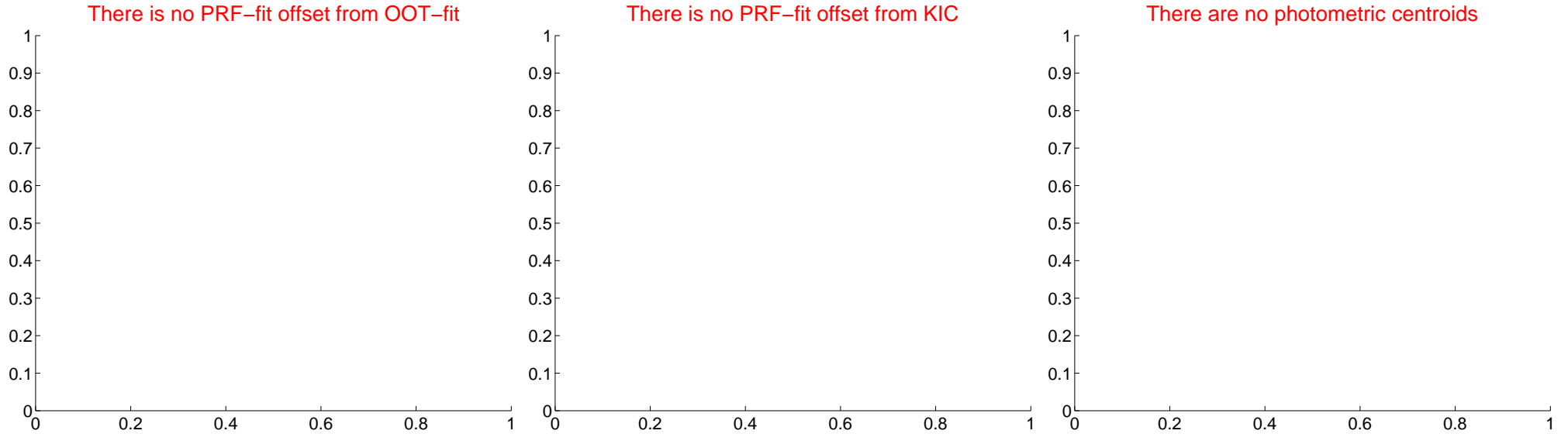
DV Centroid Data

Supplemental centroid analysis for 009535876-02. Kepler magnitude: 14.92. Transit SNR 11.90

There are 0 quarters with good PRF difference image offsets

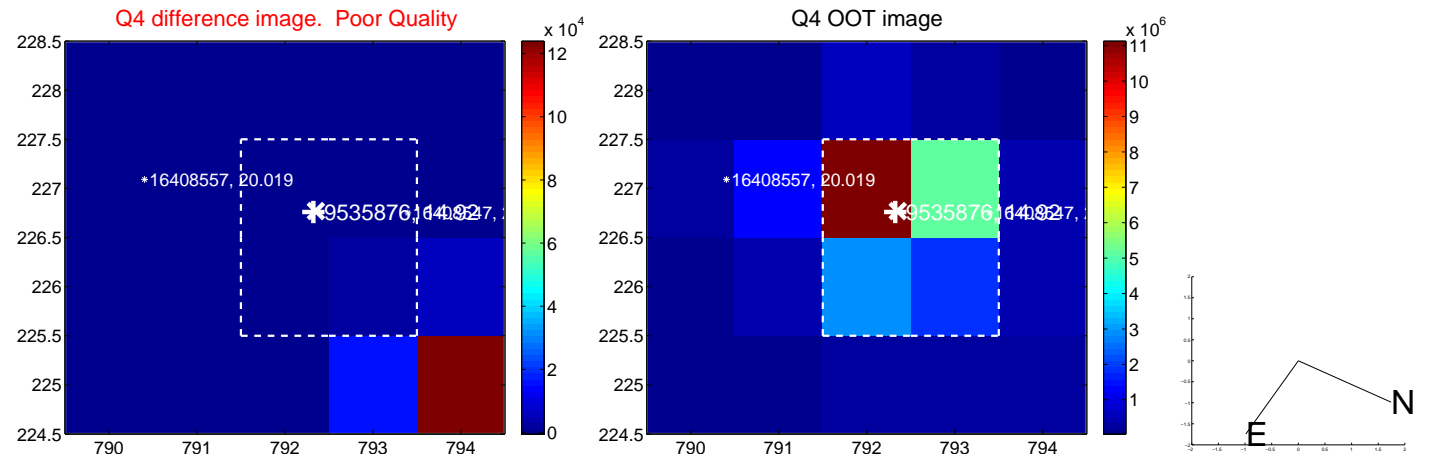
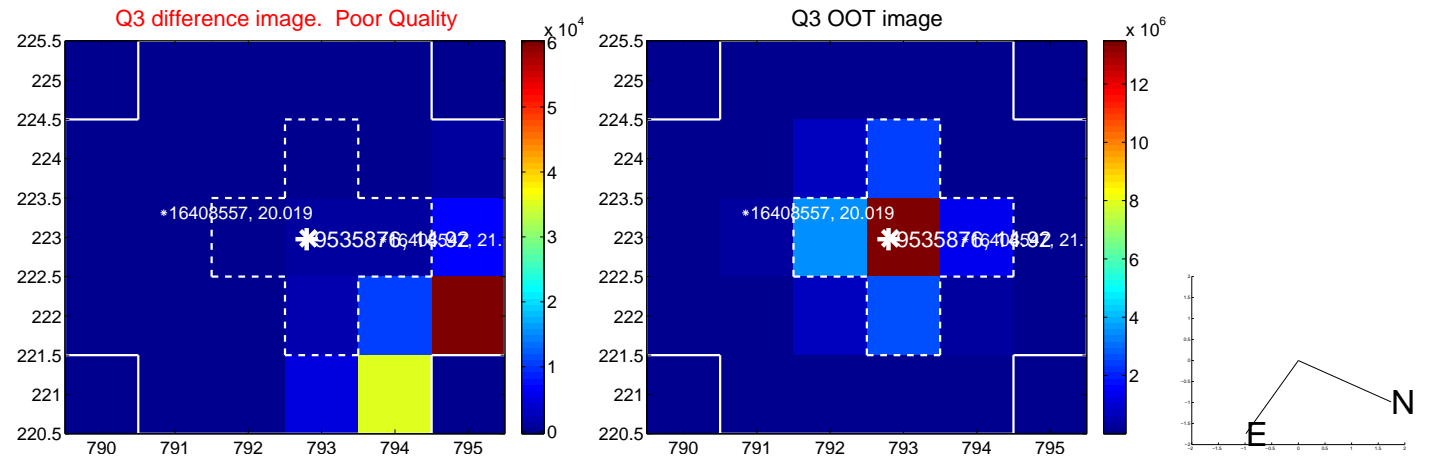
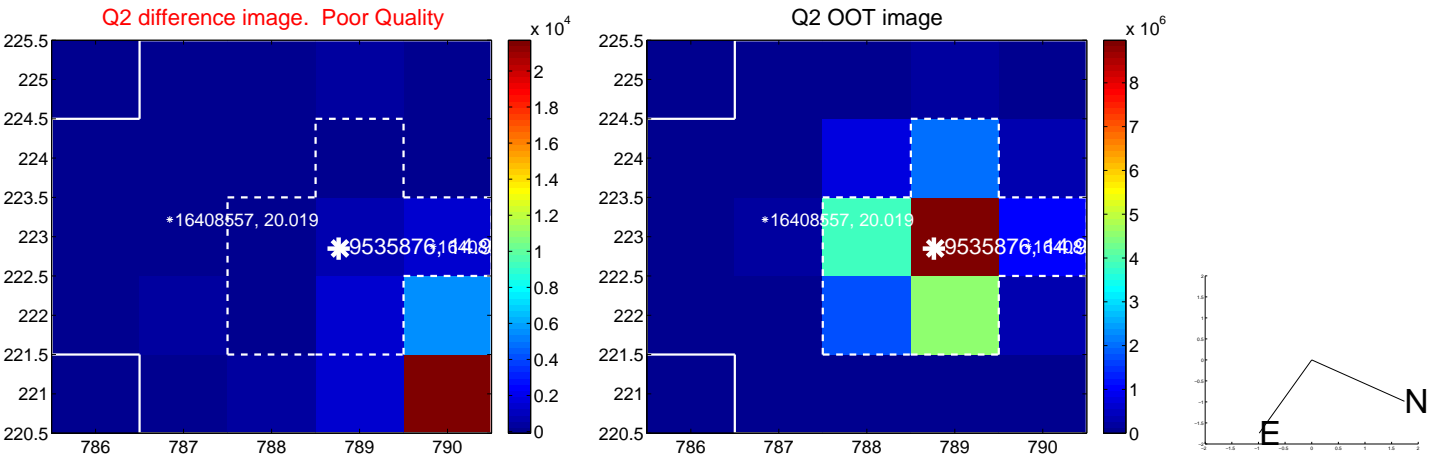
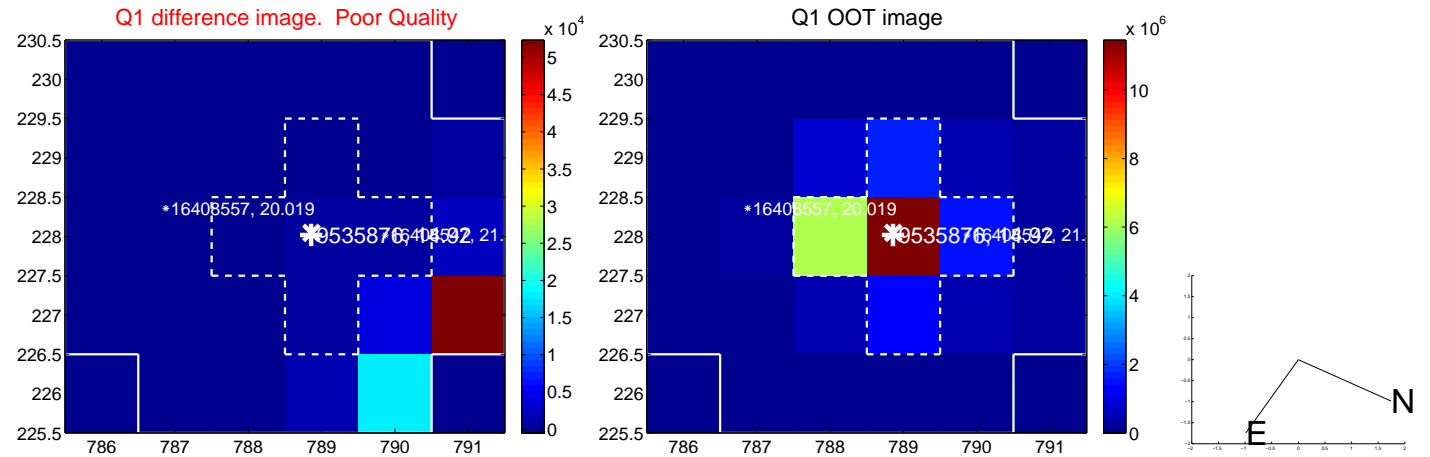
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	—	—	—	—

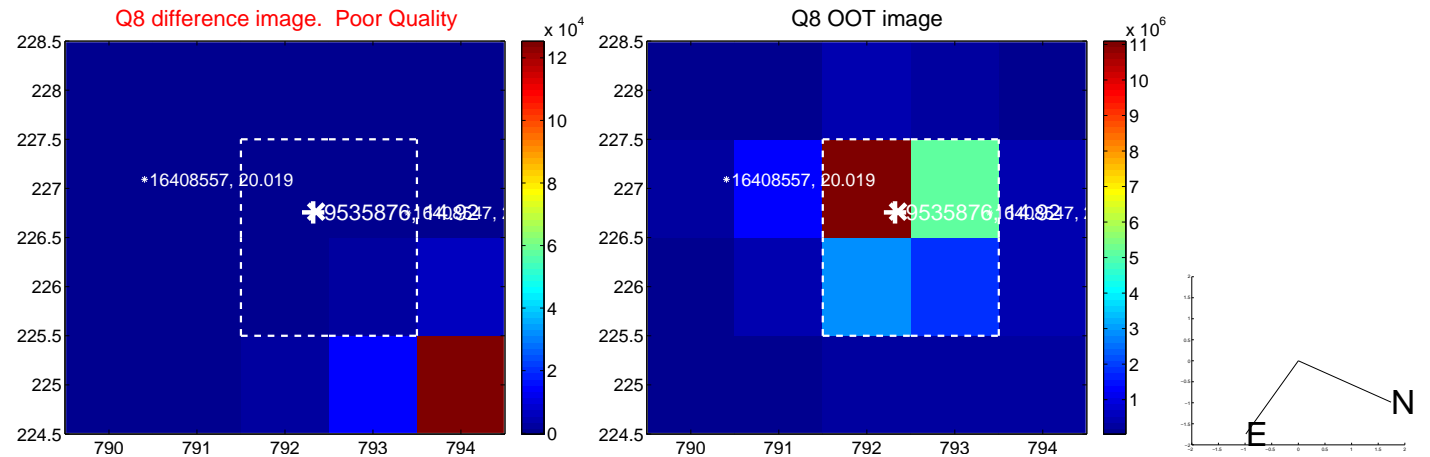
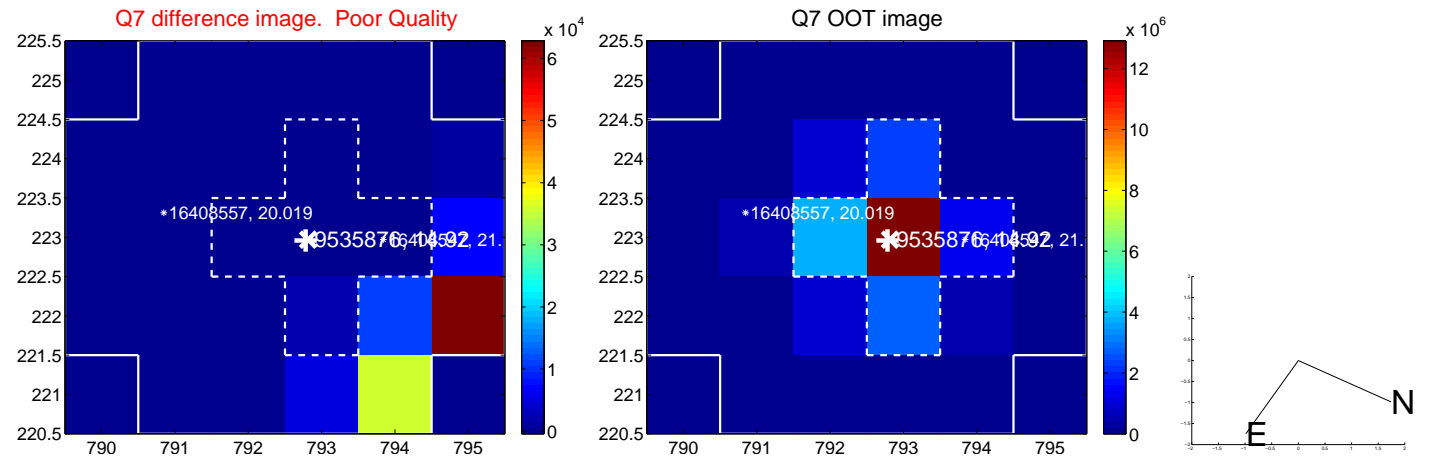
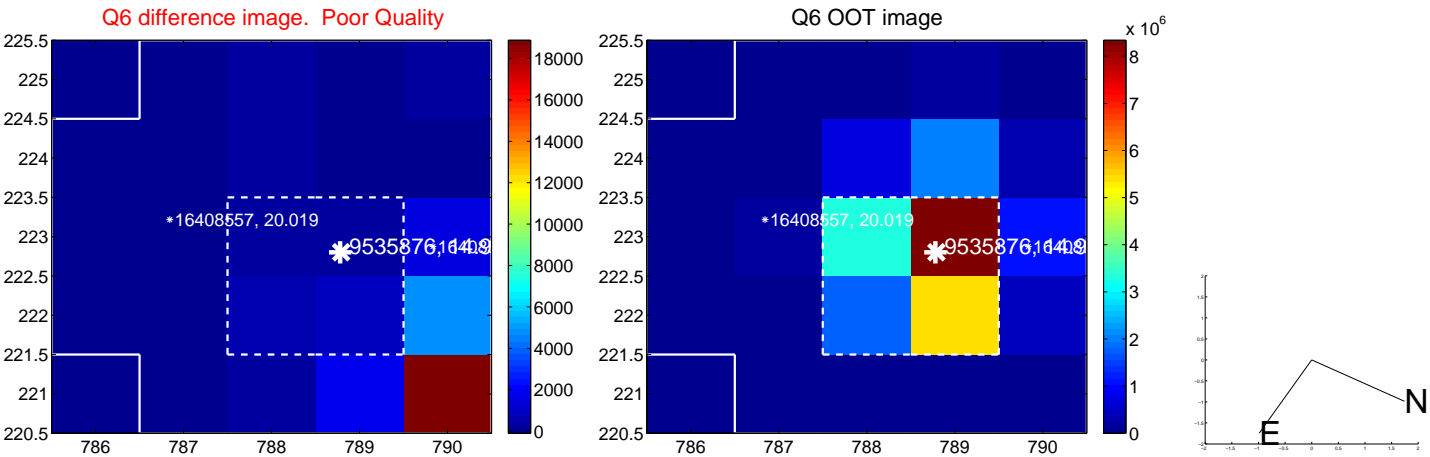
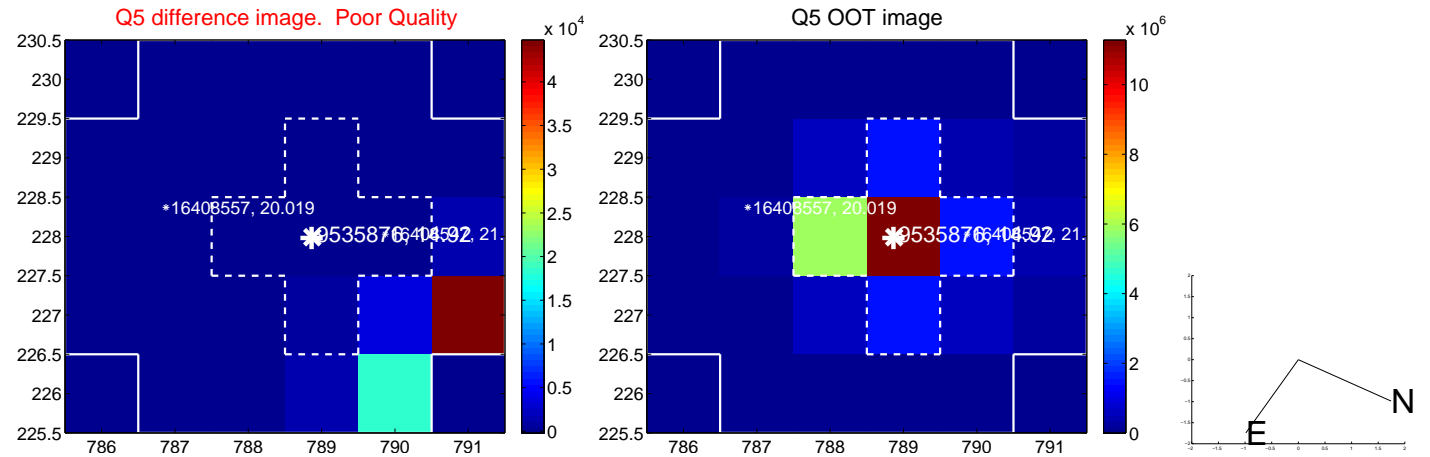


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

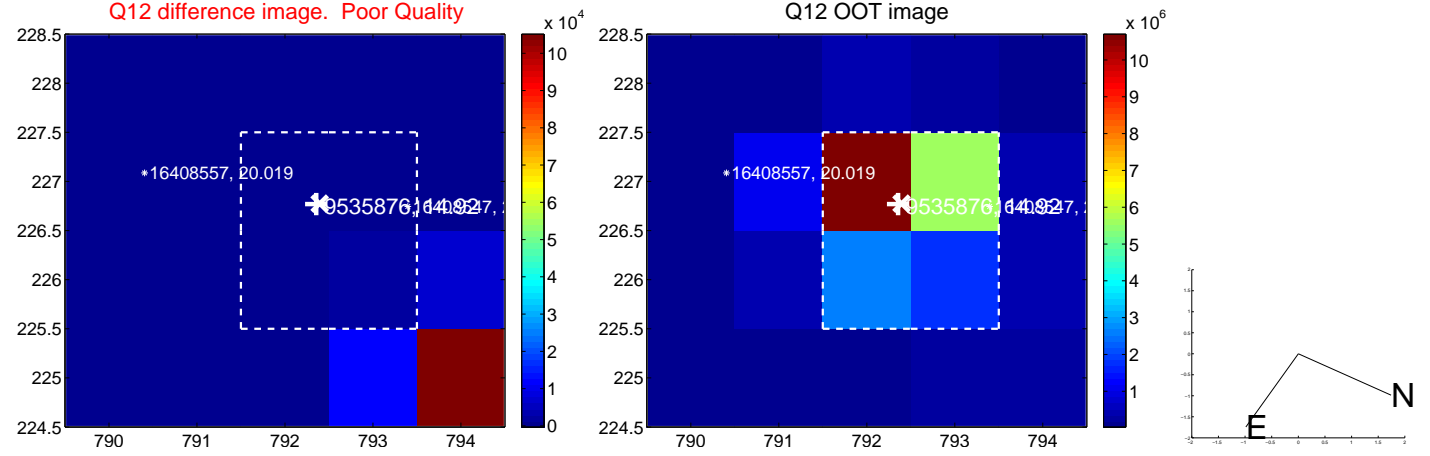
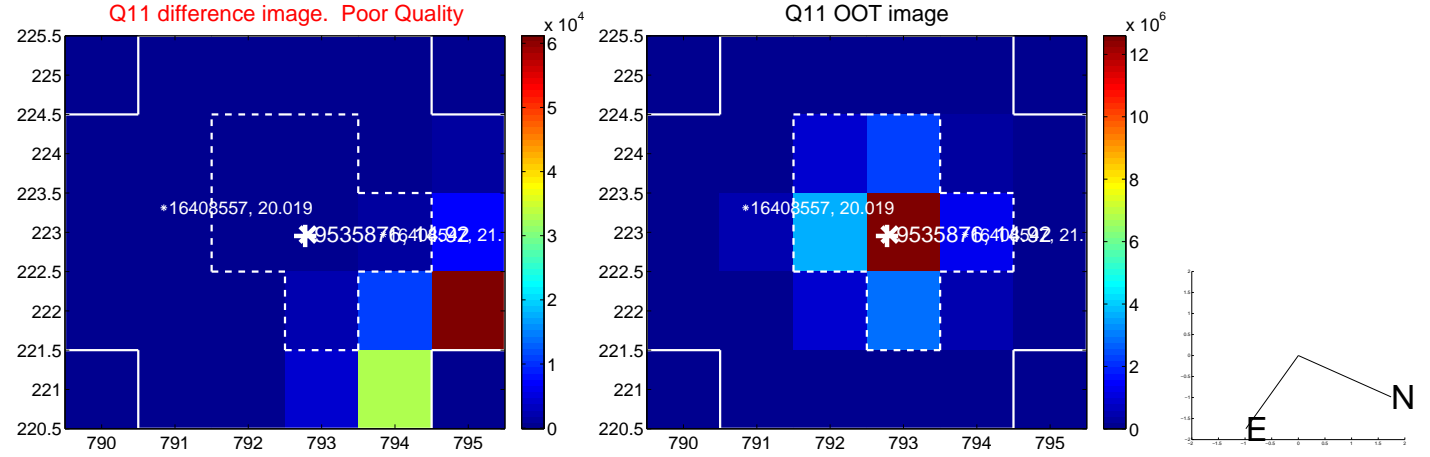
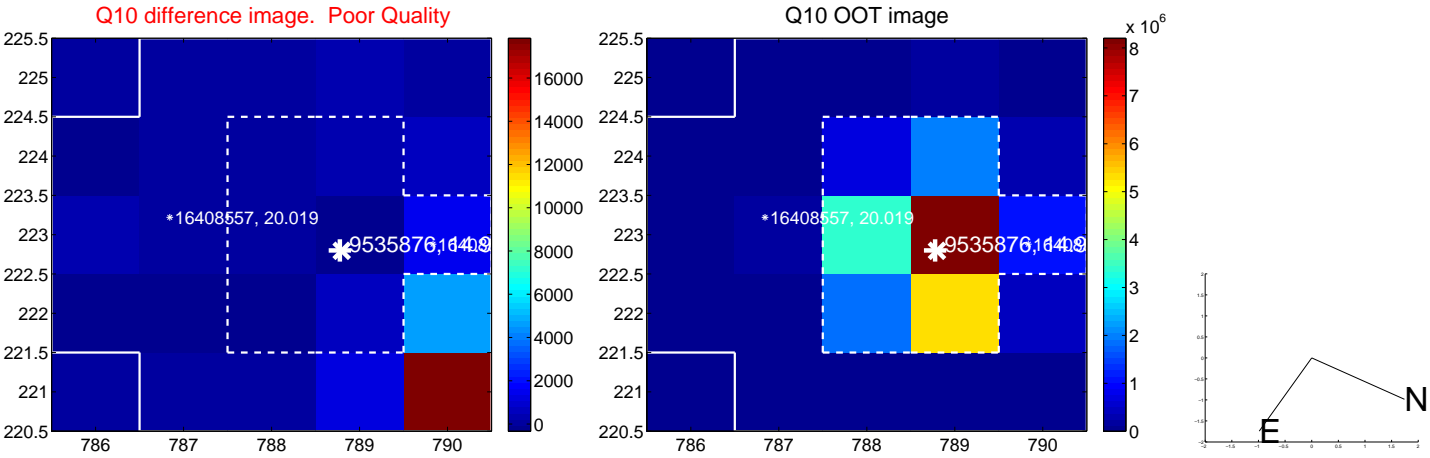
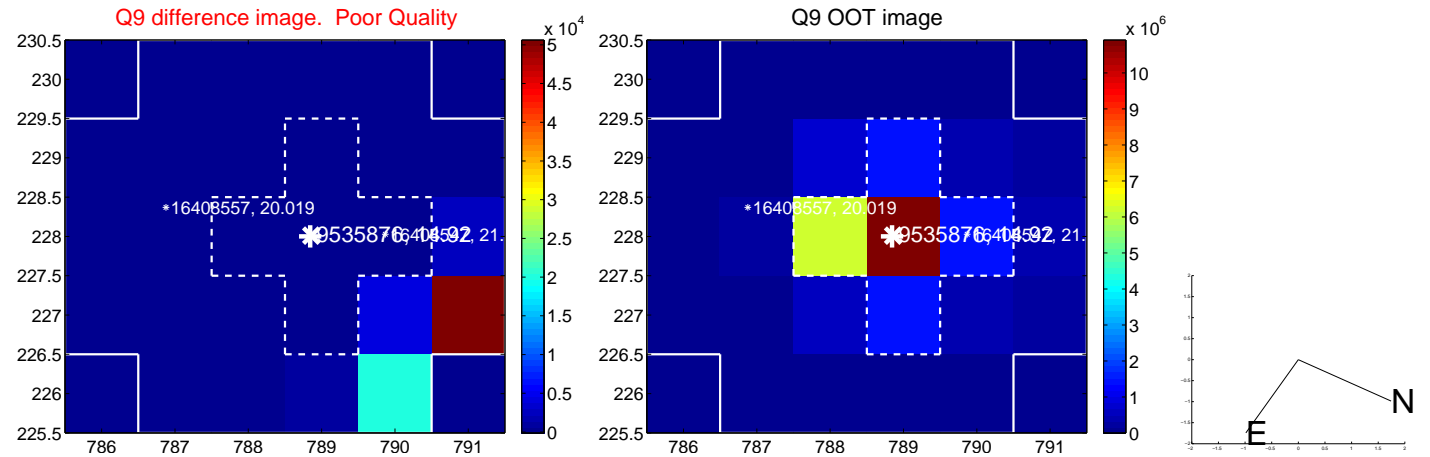
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



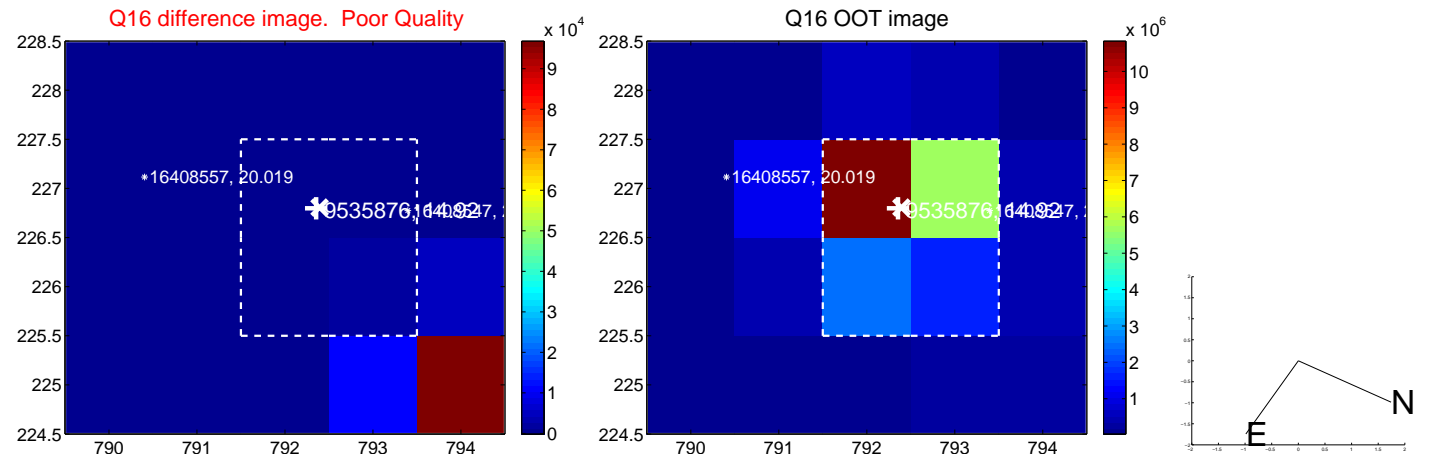
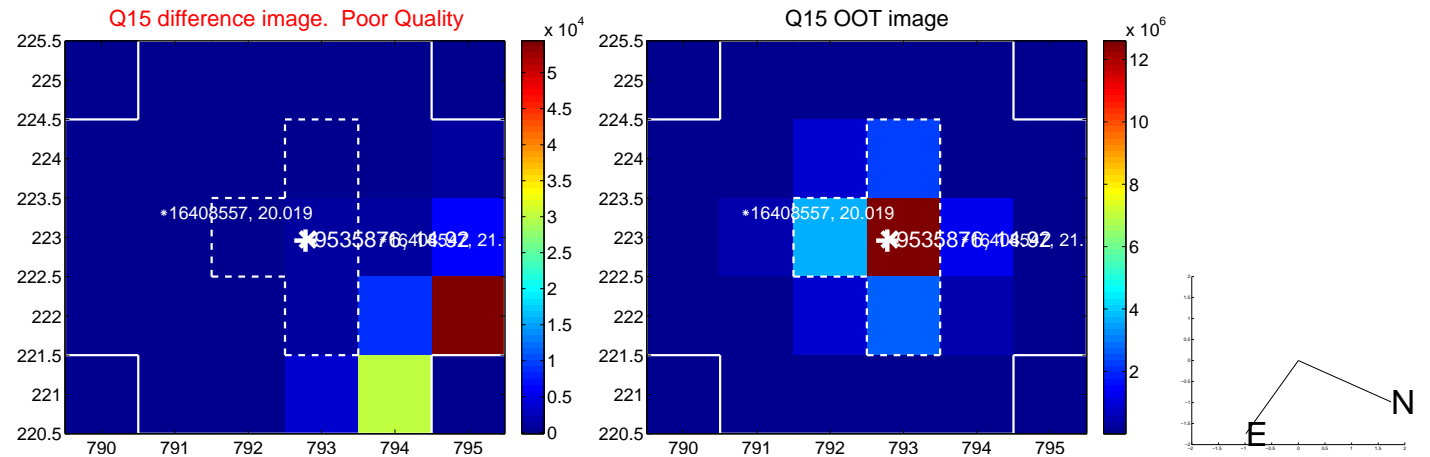
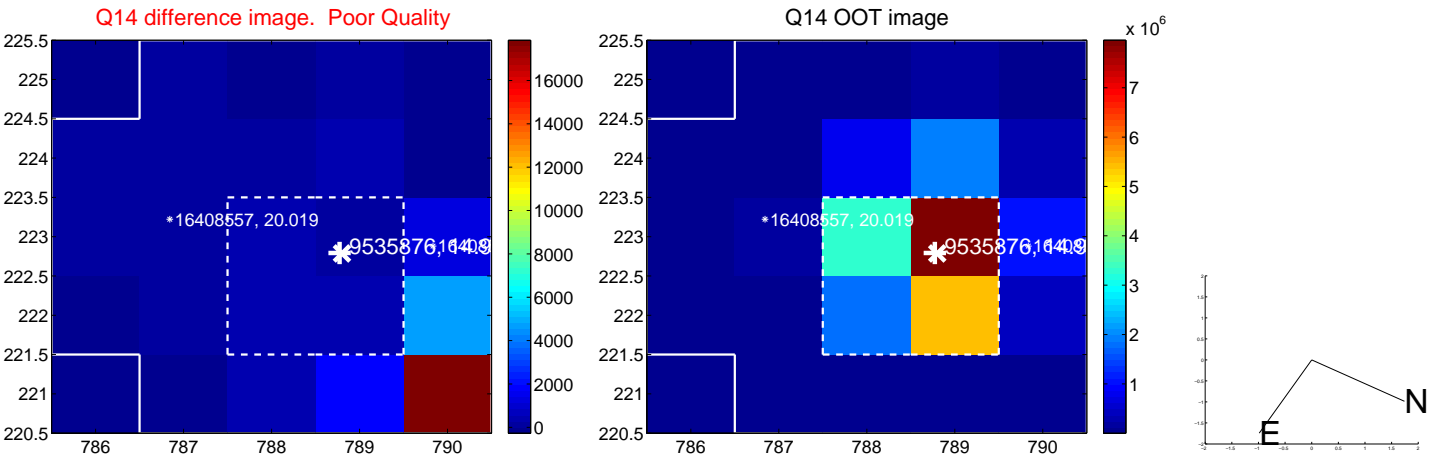
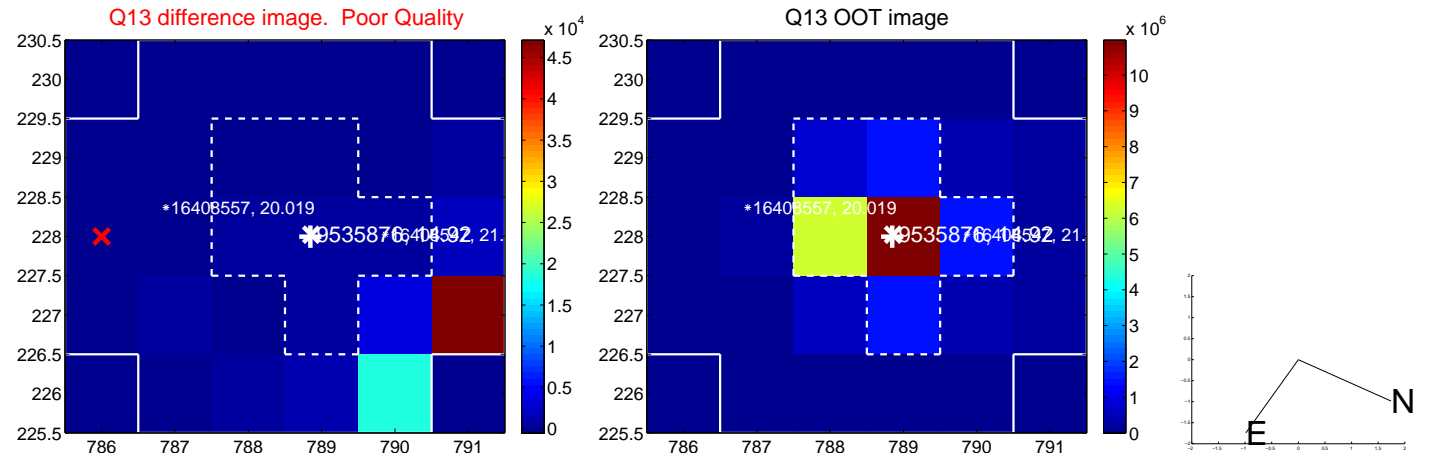
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



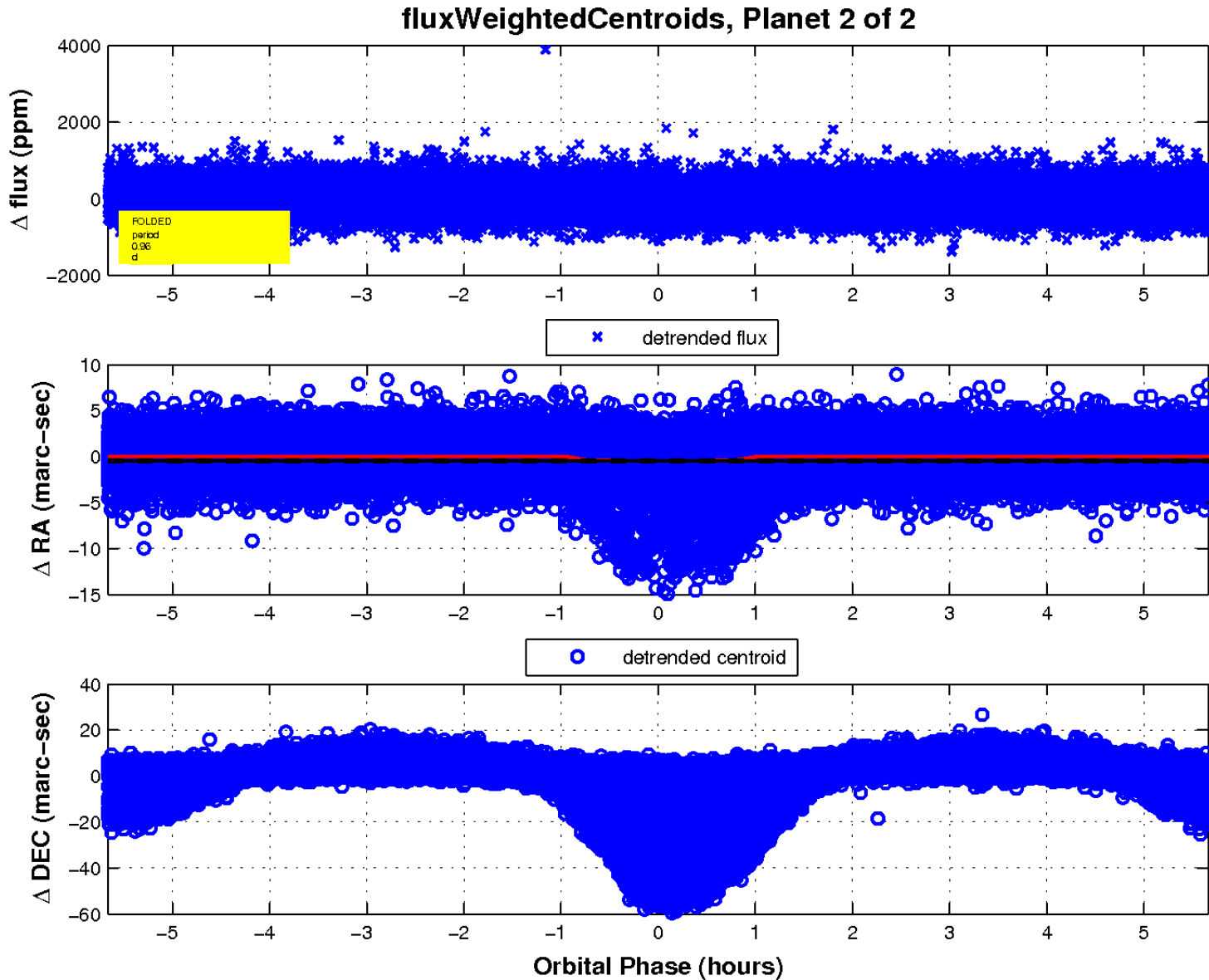
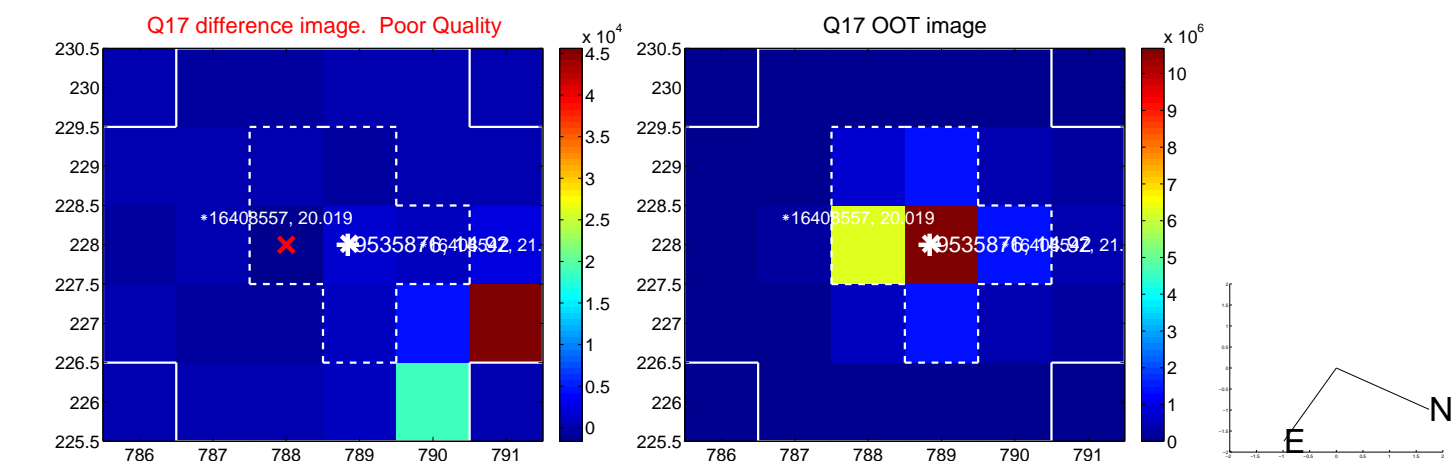
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

