

KIC 002987660

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})
002987660-01	OBS	No	1.117100	132.187373	144.1	4.233	10.0	11.5	3.75	7524	5.34	55843.62
002987660-02	OBS	No	3.042126	134.258049	180.5	9.156	7.8	9.5	3.75	7524	5.76	14684.52

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002987660-01	OBS	FP	0.00	1	0	0	1	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED—EPHEM_MATCH
002987660-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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.

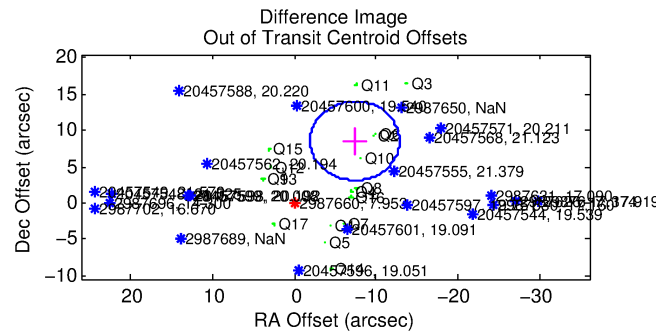
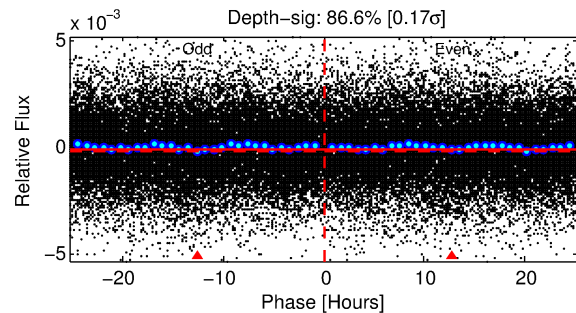
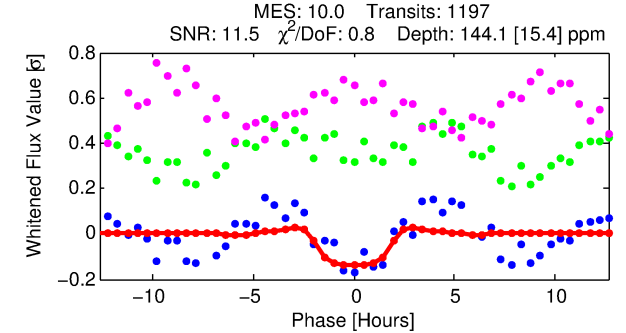
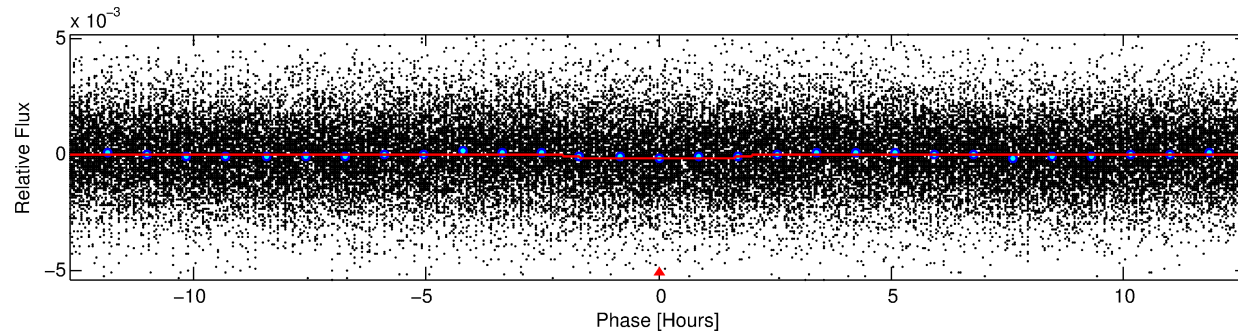
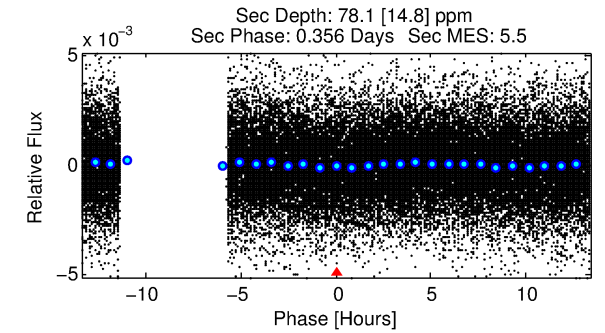
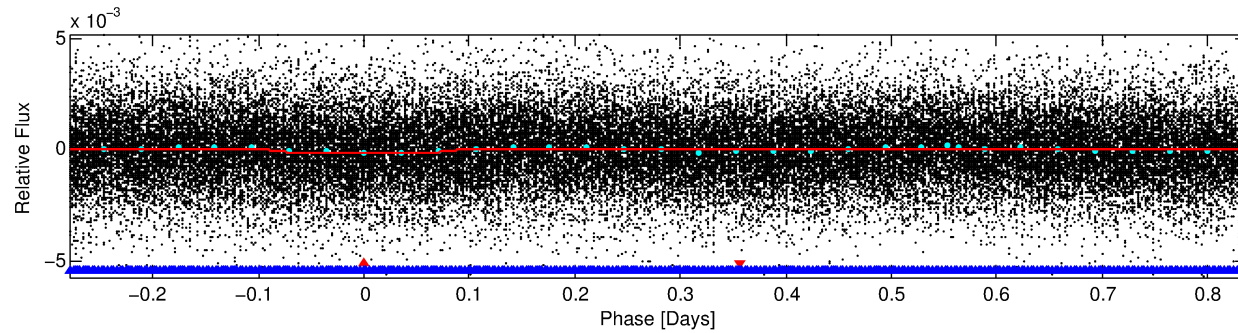
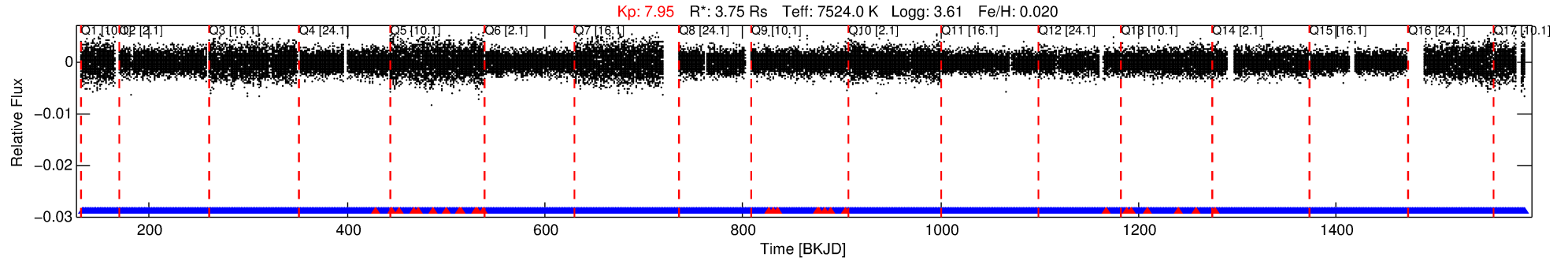
Ephemeris Match Information For 002987660-01

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
002987660-01	2987660	4947.01	2574543	1:6	1094.7	-116	8	13.25	7.95	6.10	Direct-PRF	1	0.16	3.43

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: 2987660 Candidate: 1 of 2 Period: 1.117 d



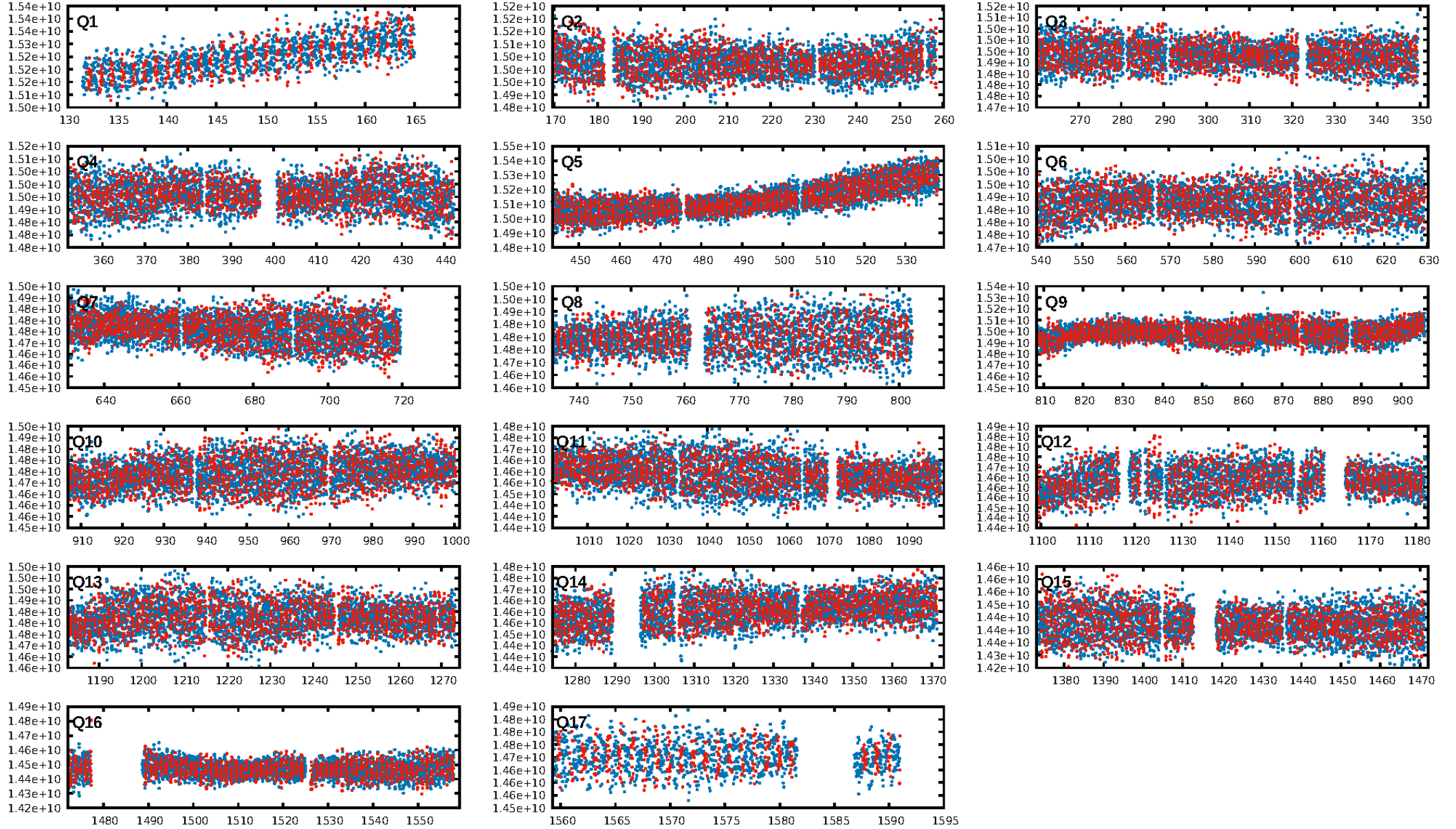
DV Fit Results:

Period = 1.11710 [0.00001] d
Epoch = 132.1874 [0.0044] BKJD
Rp/R* = 0.0130 [0.0036]
a/R* = 1.28 [0.83]
b = 0.92 [0.28]
Seff = 55843.62 [48408.87]
Teff = 3920 [849] K
Rp = 5.34 [3.19] Re
a = 0.0269 [0.0141] AU
Ag = 1.09 [1.13] [0.08 σ]
Teffp = 6198 [934] K [1.80 σ]

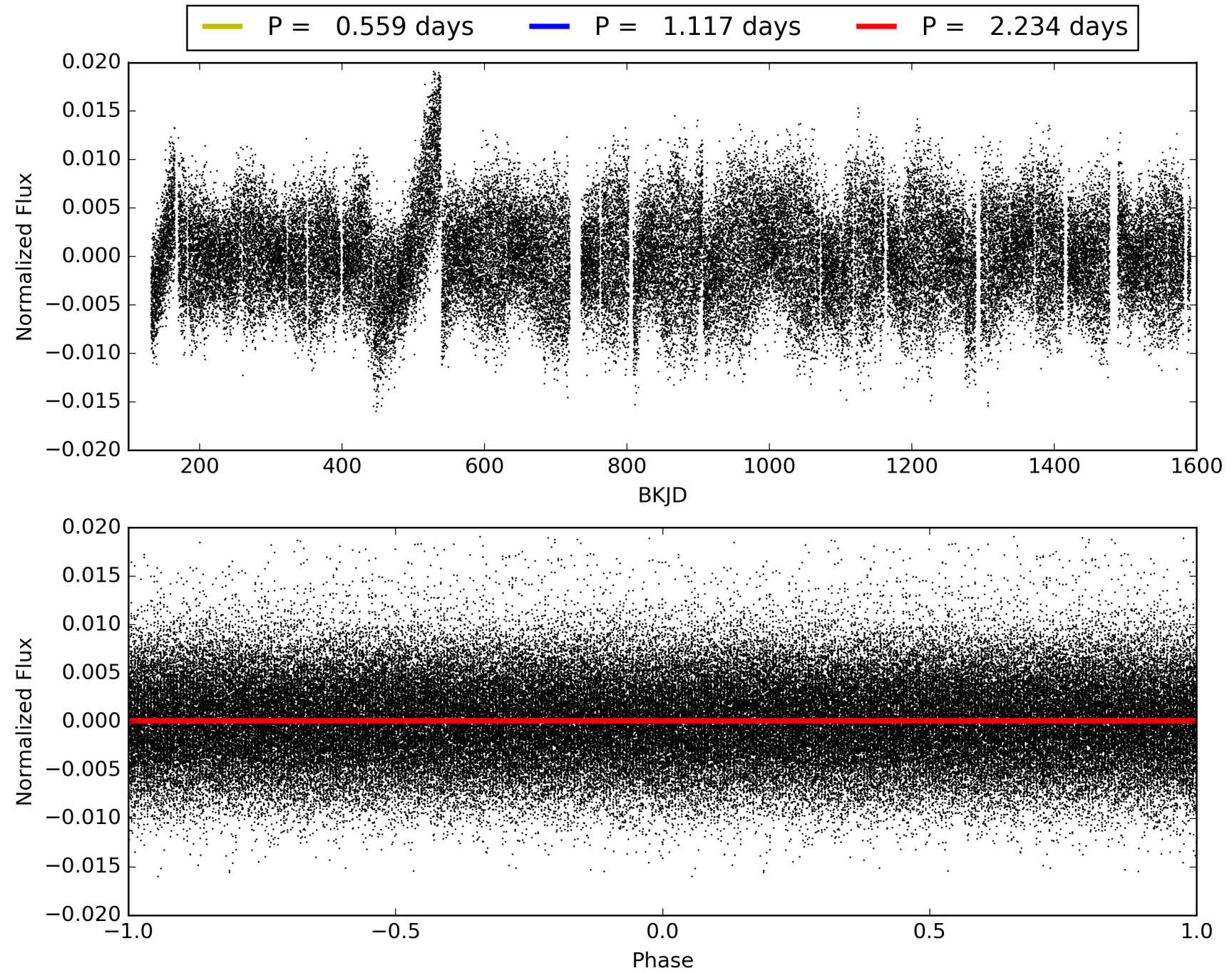
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [4.58 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.56e-20
RollingBand-fgt: 0.98 [1117/1144]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: 2.813 arcsec [4.30 σ]
OotOffset-rm: 11.289 arcsec [6.22 σ]
KicOffset-rm: 13.343 arcsec [6.80 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.00 [0/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 002987660-01, PDC Light Curves

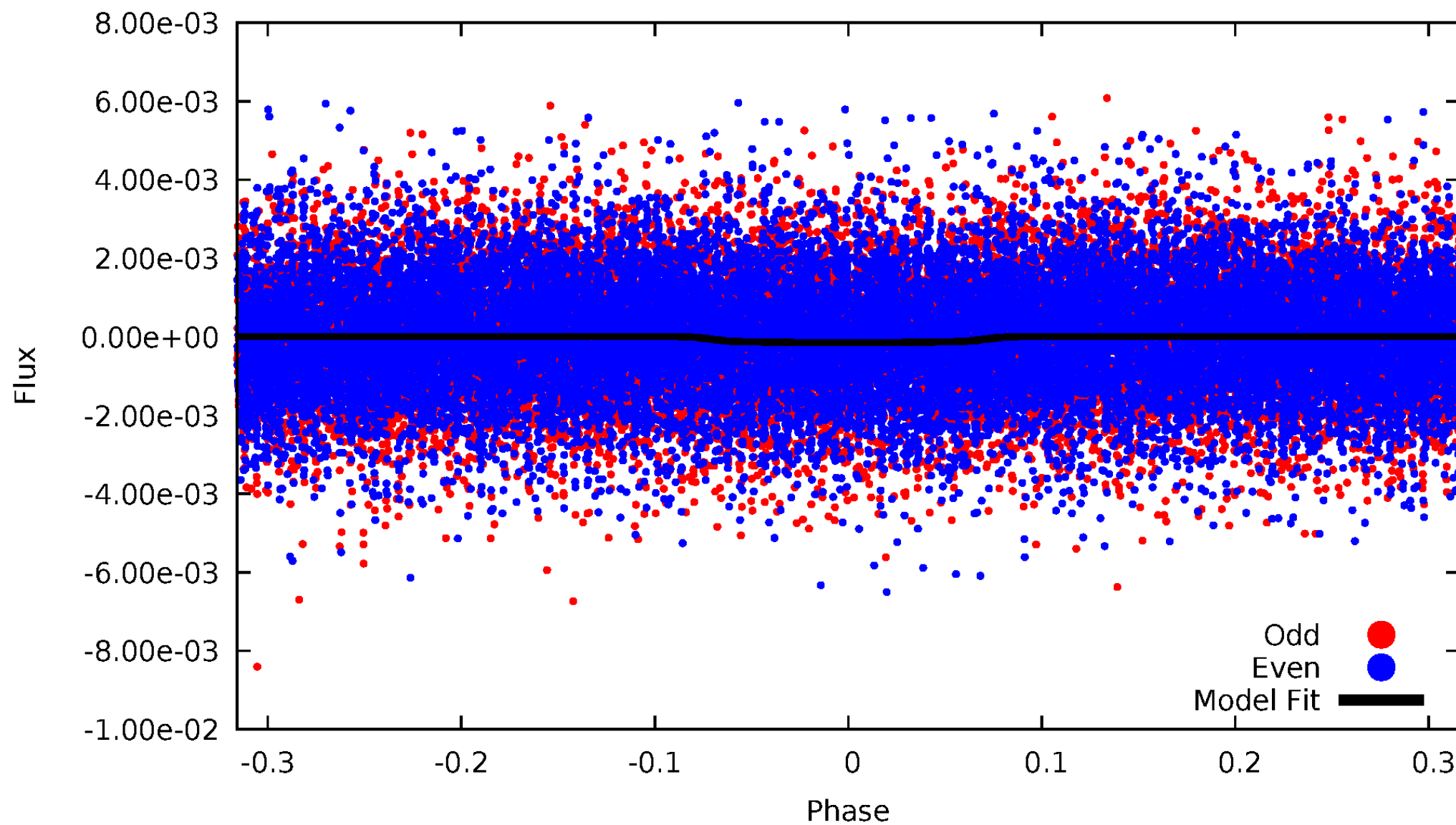


TCE 002987660-01



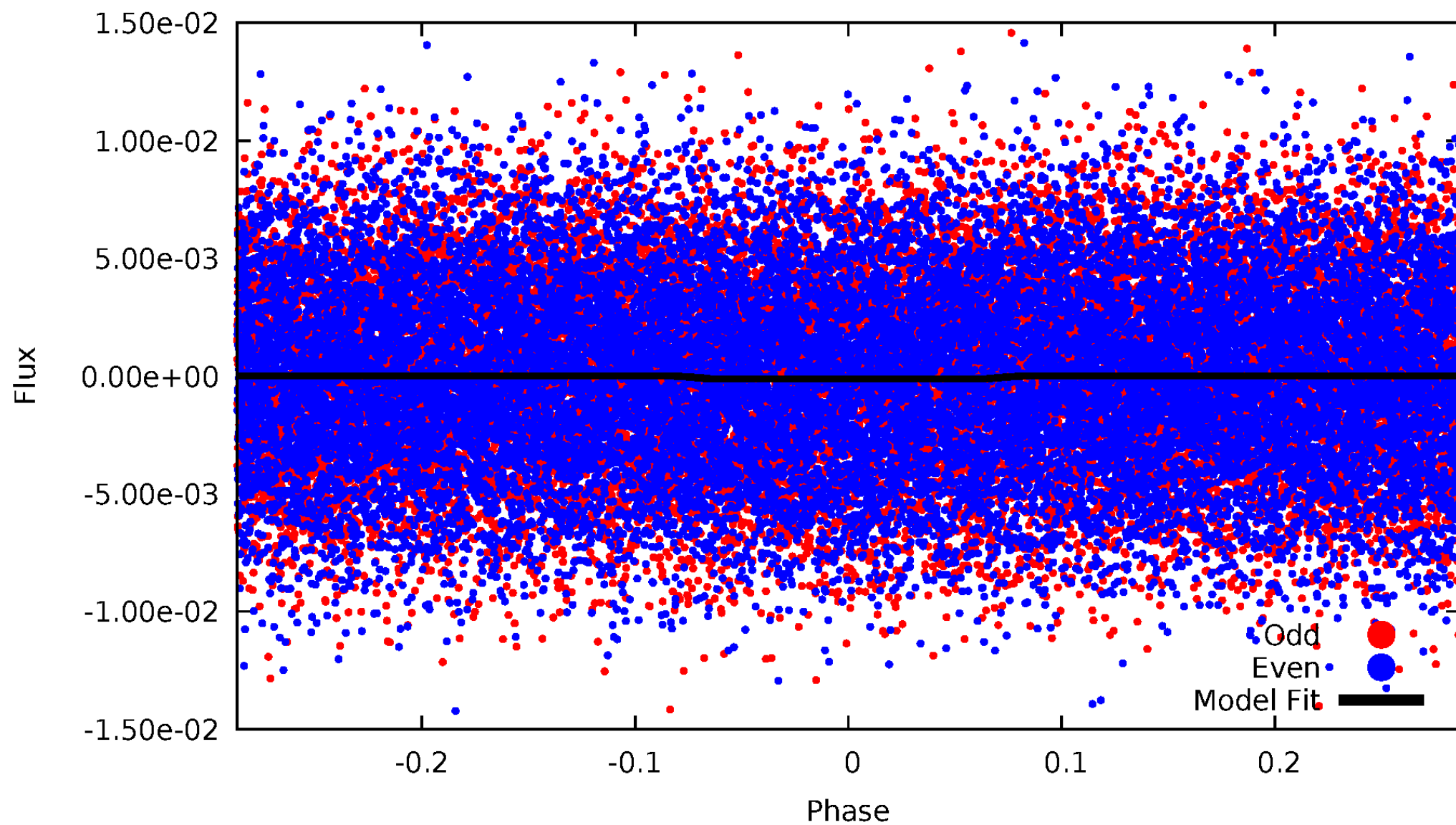
DV Odd/Even

TCE 002987660-01

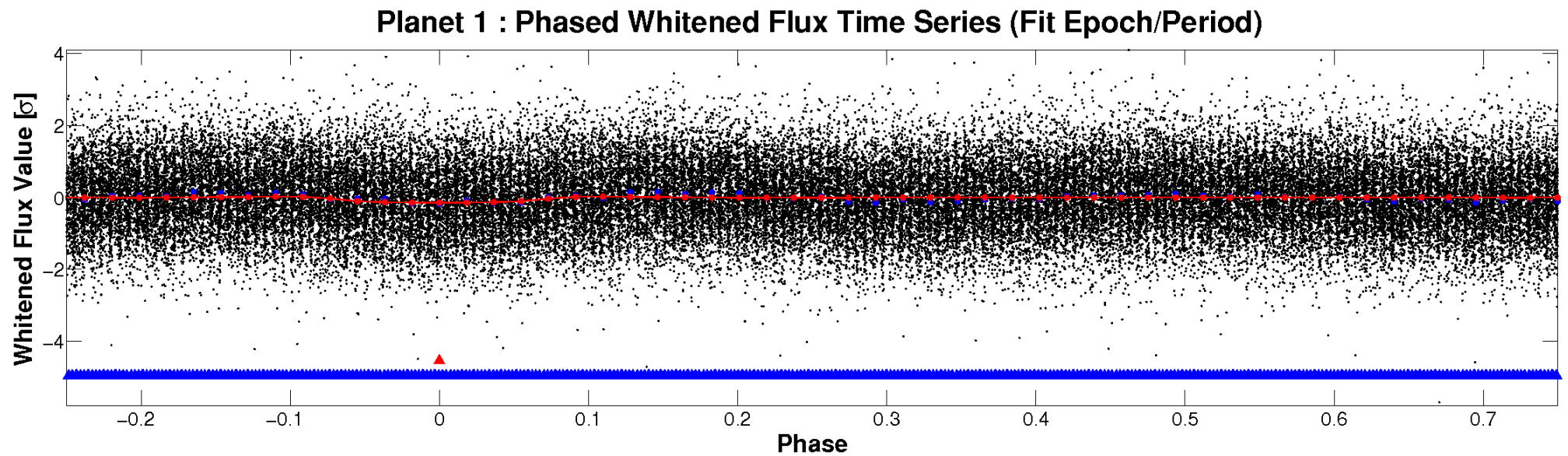
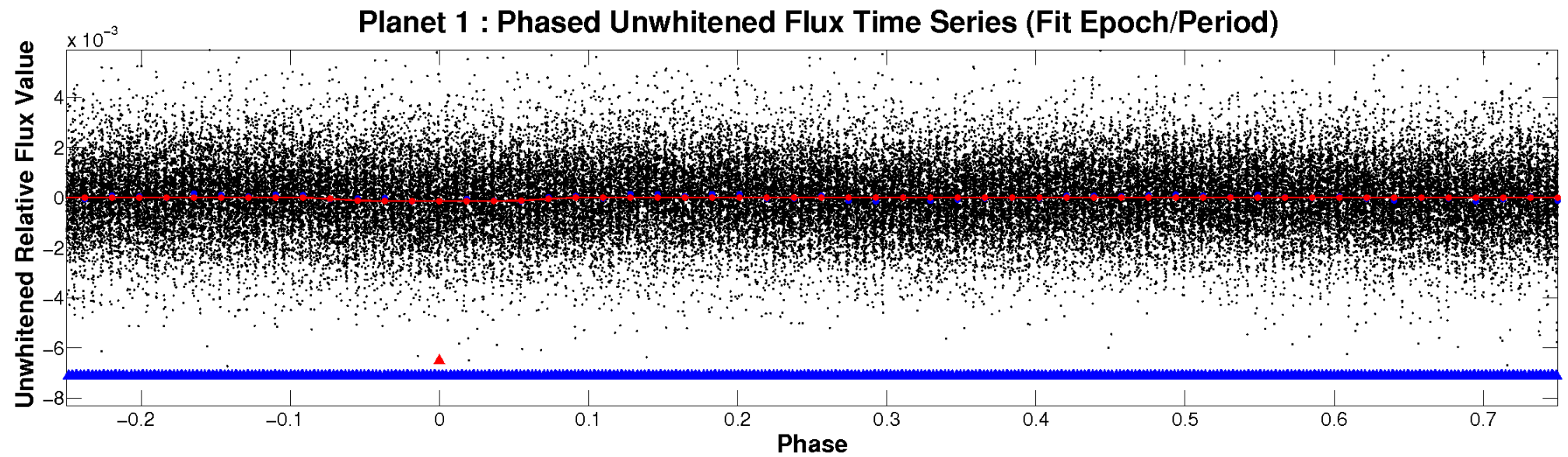


ALT Odd/Even

TCE 002987660-01

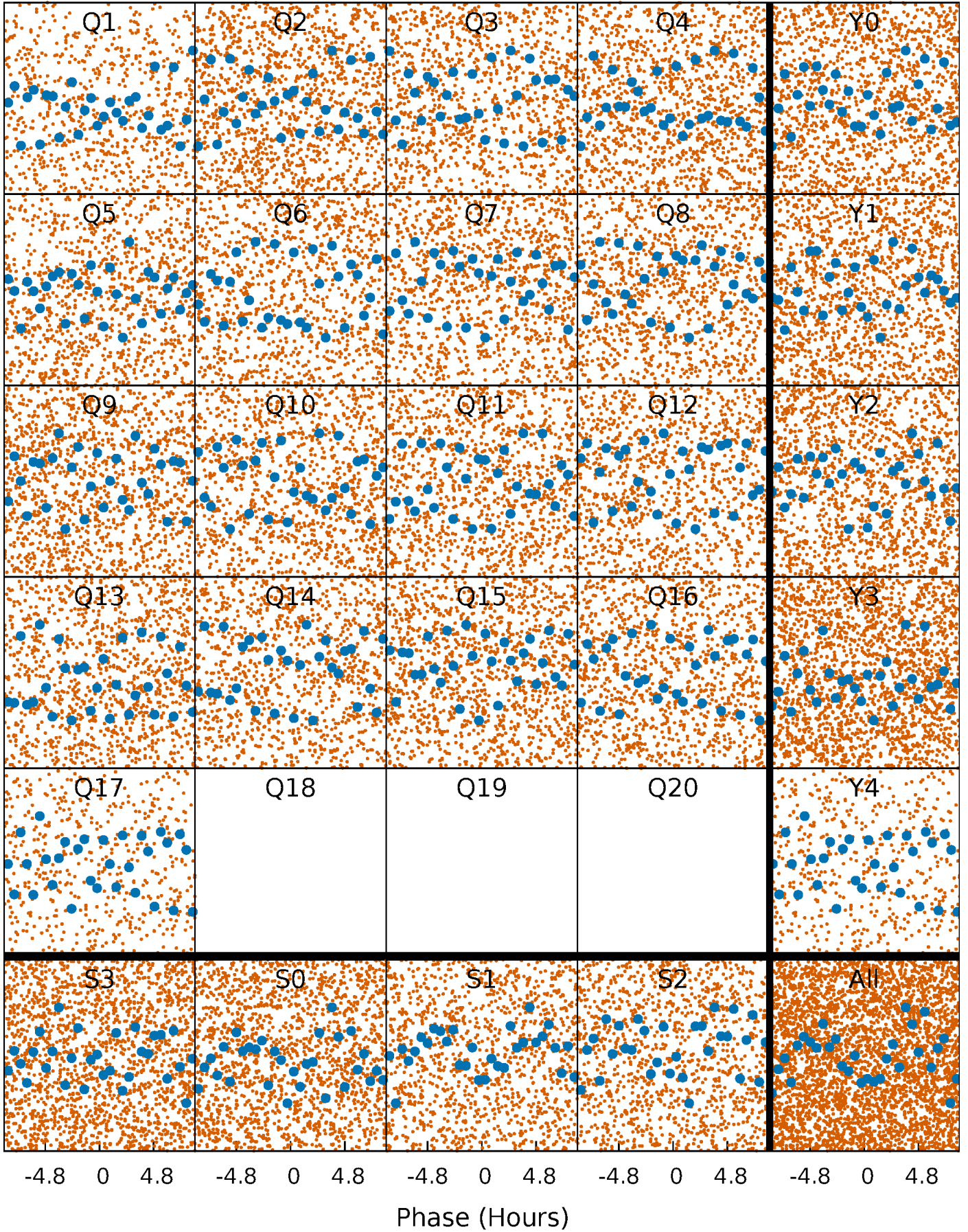


Non-Whitened Vs. Whitened Light Curve



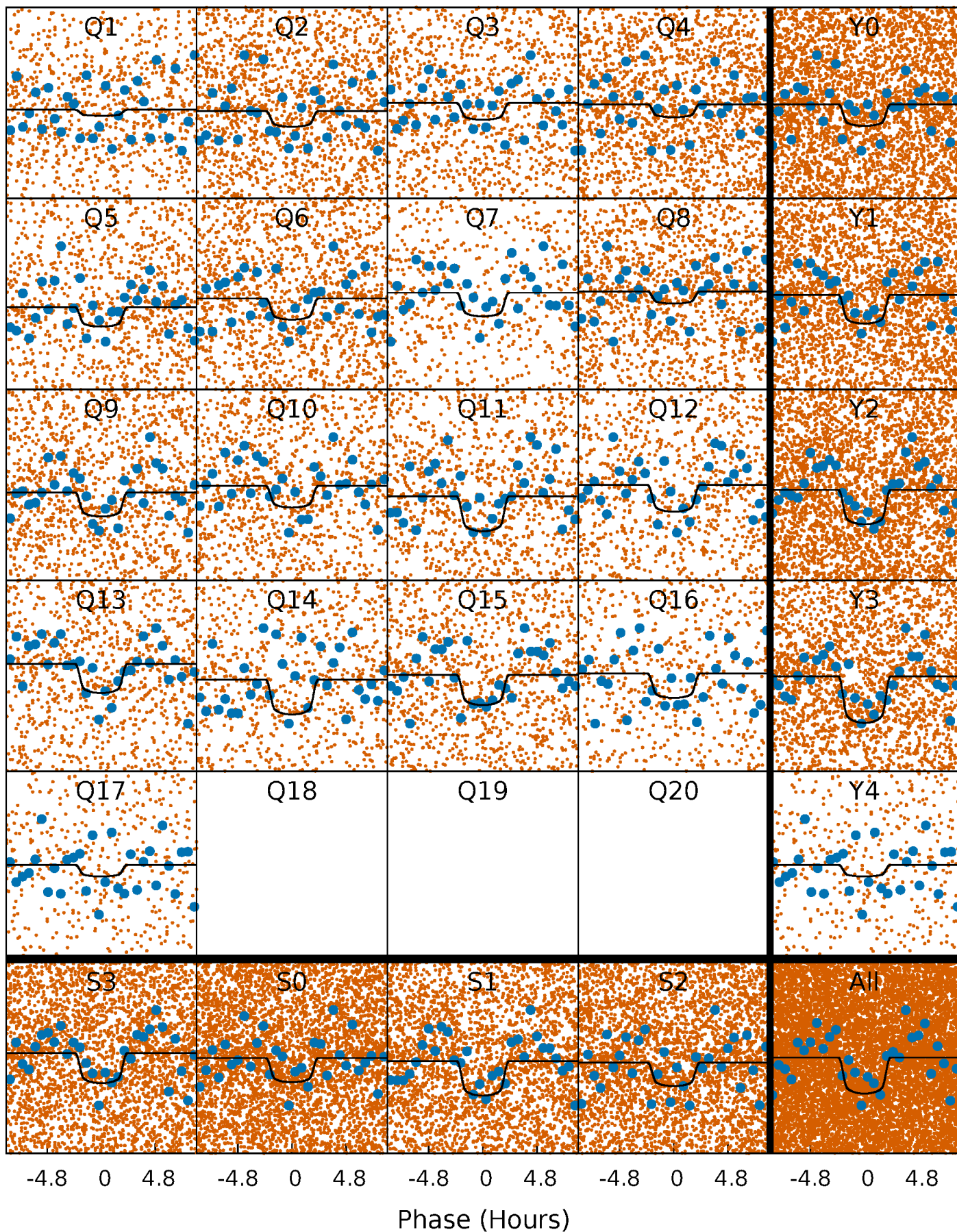
PDC Quarter-Phased Transit Curves

TCE 002987660-01 P= 1.117100 Days $T_0=132.187373$ (BKJD)



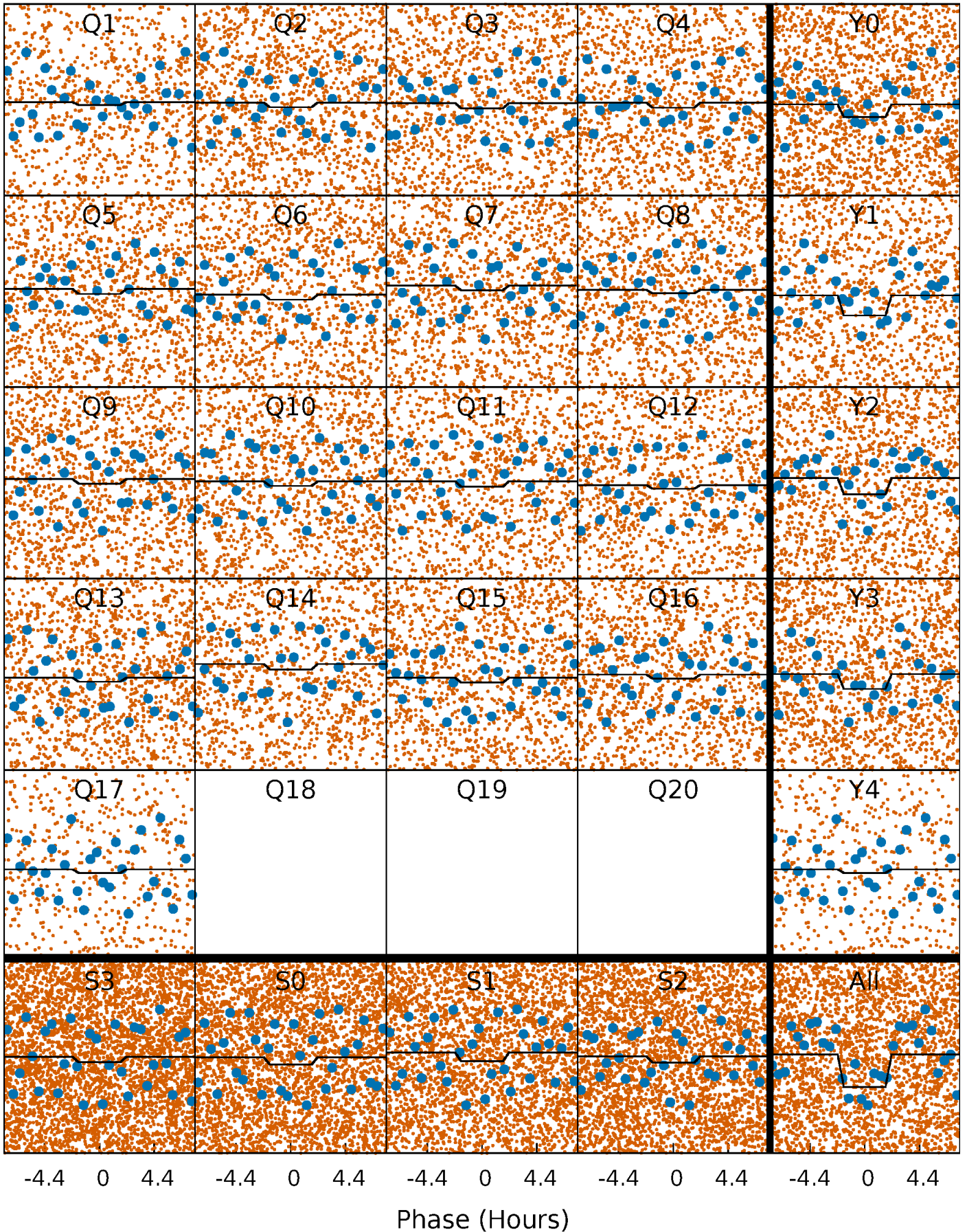
DV Quarter-Phased Transit Curves

TCE 002987660-01 P= 1.117100 Days $T_0=132.187373$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

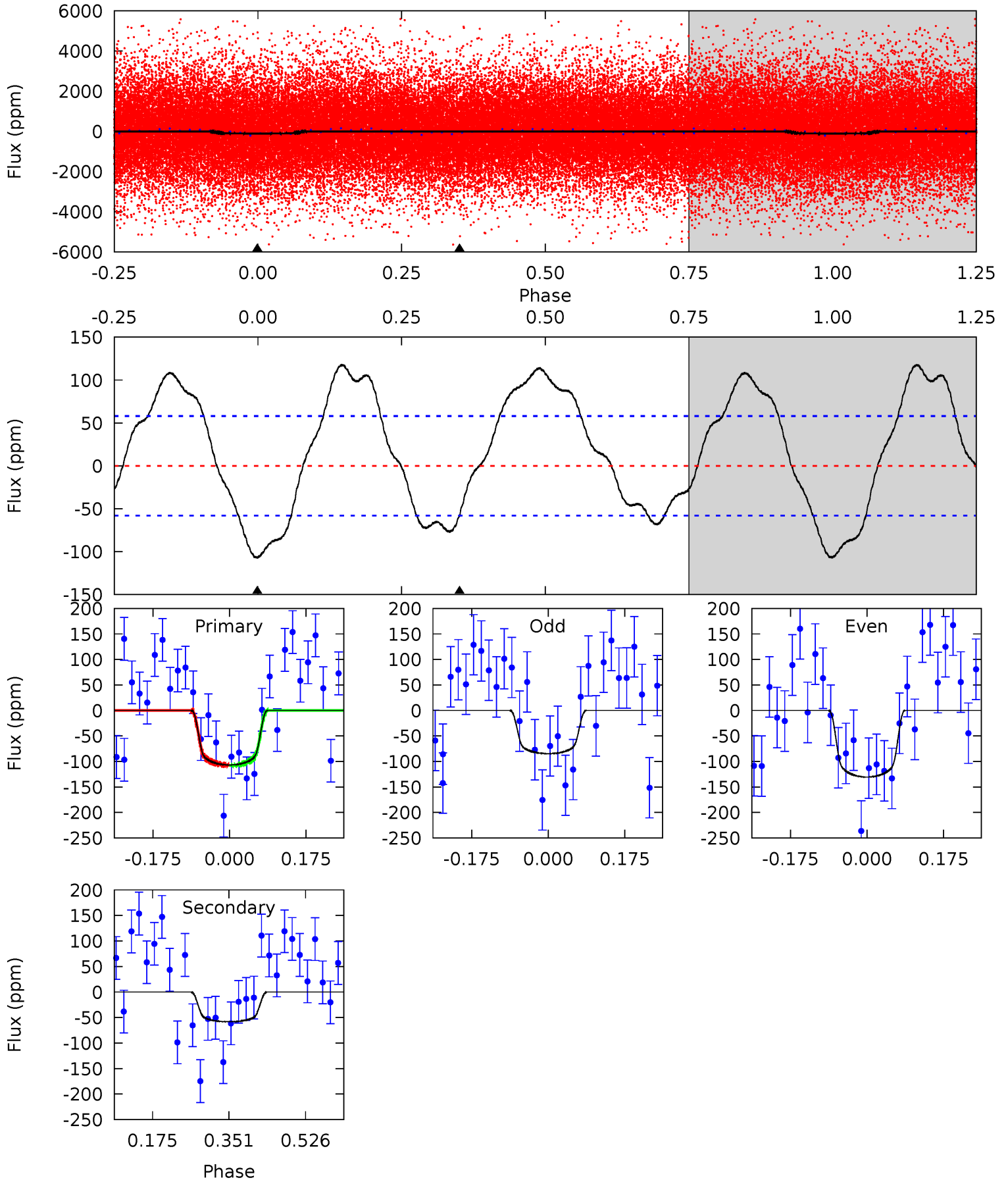
TCE 002987660-01 P= 1.117129 Days $T_0=132.178997$ (BKJD)



DV Model-Shift Uniqueness Test

002987660-01, P = 1.117100 Days, E = 131.070273 Days

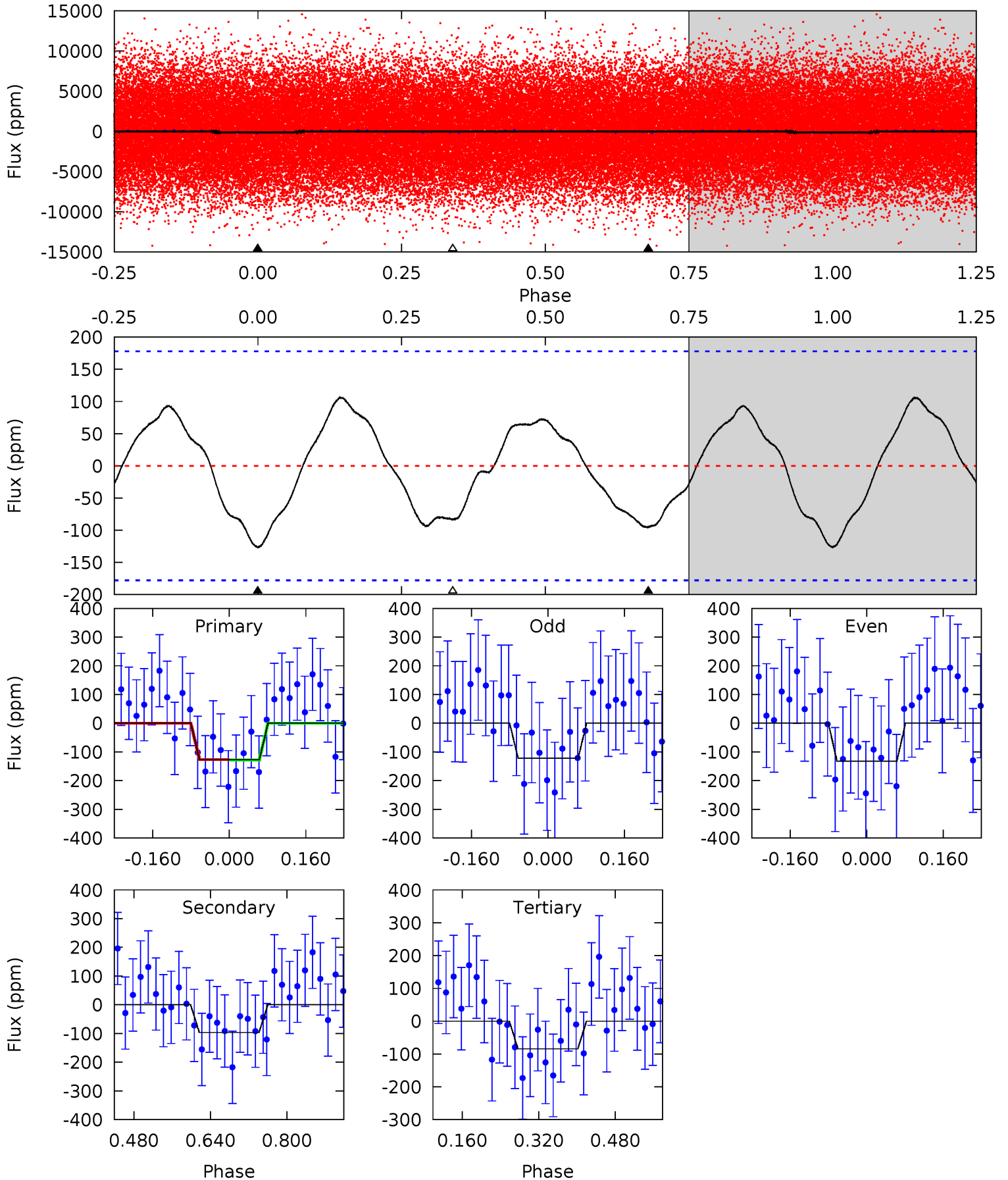
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.20	4.47	0	0	4.45	1.36	3.79	8.20	8.20	4.47	4.47	1.75	1.06	0.52	0.03



Alt Model-Shift Uniqueness Test

002987660-01, P = 1.117129 Days, E = 131.061868 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.20	2.42	2.12	0	4.47	1.40	1.53	1.08	3.20	0.30	2.42	0.13	0.98	0.46	0.02



Stellar Parameters For KIC 002987660

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7524^{+209}_{-313}	$3.608^{+0.504}_{-0.056}$	$0.020^{+0.200}_{-0.300}$	$3.755^{+0.498}_{-1.993}$	$2.086^{+0.282}_{-0.564}$	$0.055^{+0.303}_{-0.016}$
	+3%/-4%	+14%/-2%	+1000%/-1500%	+13%/-53%	+14%/-27%	+547%/-29%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 002987660-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-58 ± 13	$4.77^{+1.74}_{-1.72}$	5236^{+360}_{-651}	5244^{+1146}_{-971}	$1.043^{+1.497}_{-0.514}$
Alt.	-96 ± 40	$4.09^{+1.69}_{-1.52}$	5232^{+363}_{-673}	6597^{+1791}_{-1412}	$2.318^{+3.320}_{-1.354}$

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 $A_{obs} \gg 1.0$

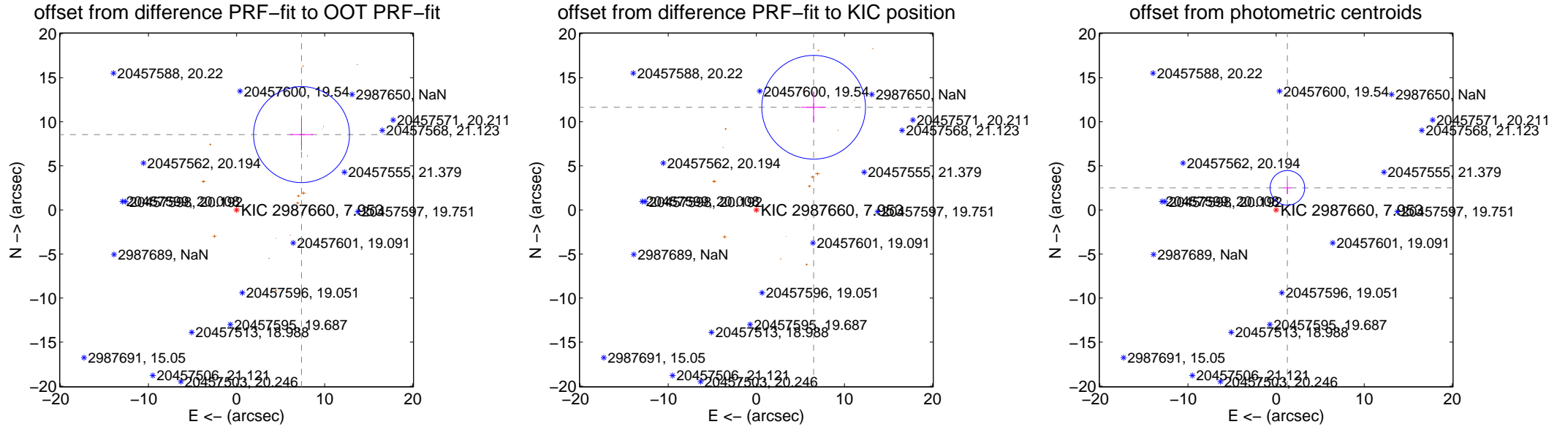
DV Centroid Data

Supplemental centroid analysis for 002987660-01. **Kepler magnitude: 7.95.** Transit SNR 11.47

There are 0 quarters with good PRF difference image offsets

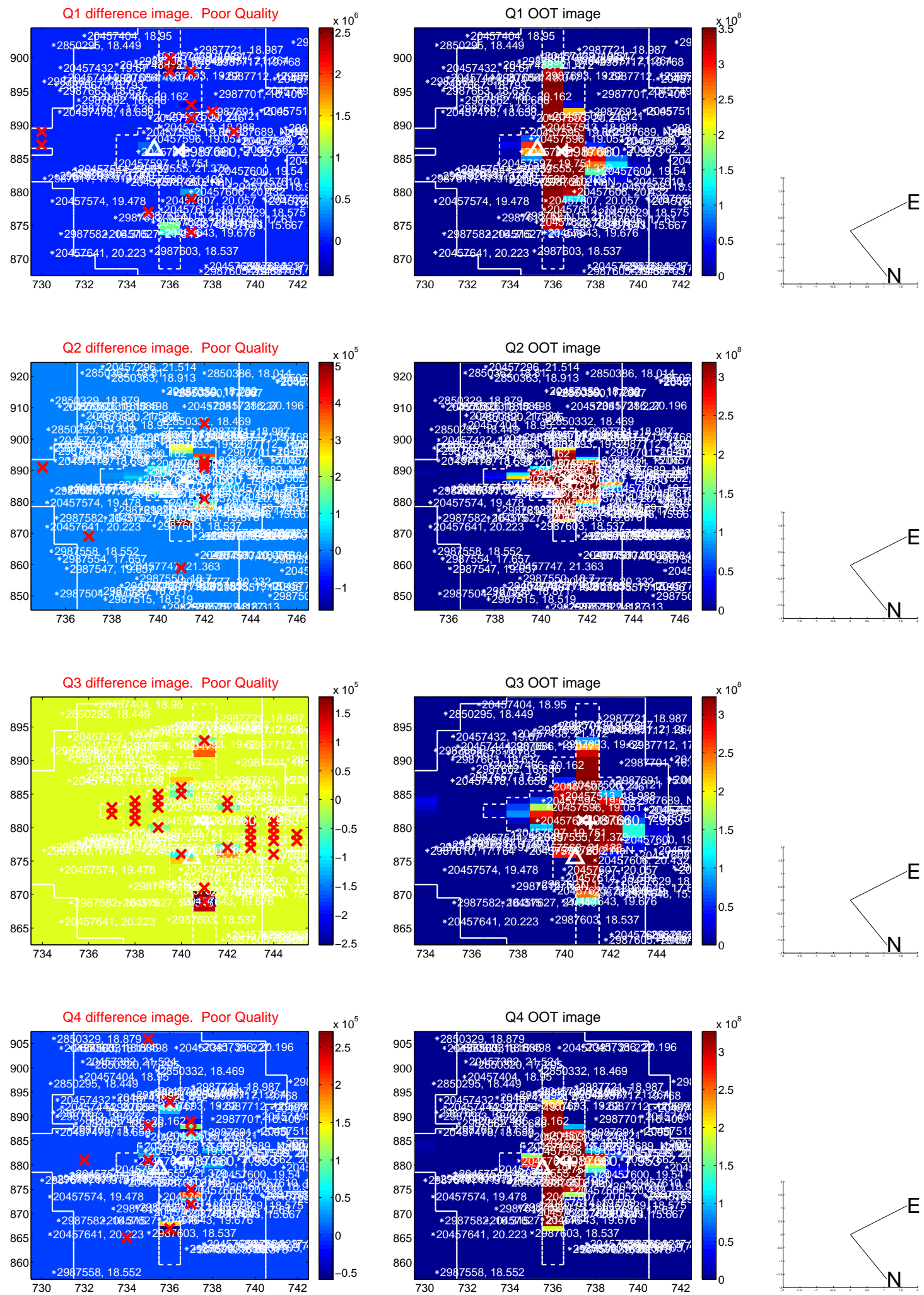
The direct PRF centroid is offset from the target star catalog position by about 1.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	11.289 ± 1.815	6.22	-7.373 ± 1.297	8.549 ± 1.791
PRF-fit source offset from KIC position	13.343 ± 1.962	6.80	-6.505 ± 1.419	11.650 ± 1.774
photometric centroid source offset	2.81 ± 0.65	4.30	-1.28 ± 0.42	2.50 ± 0.70

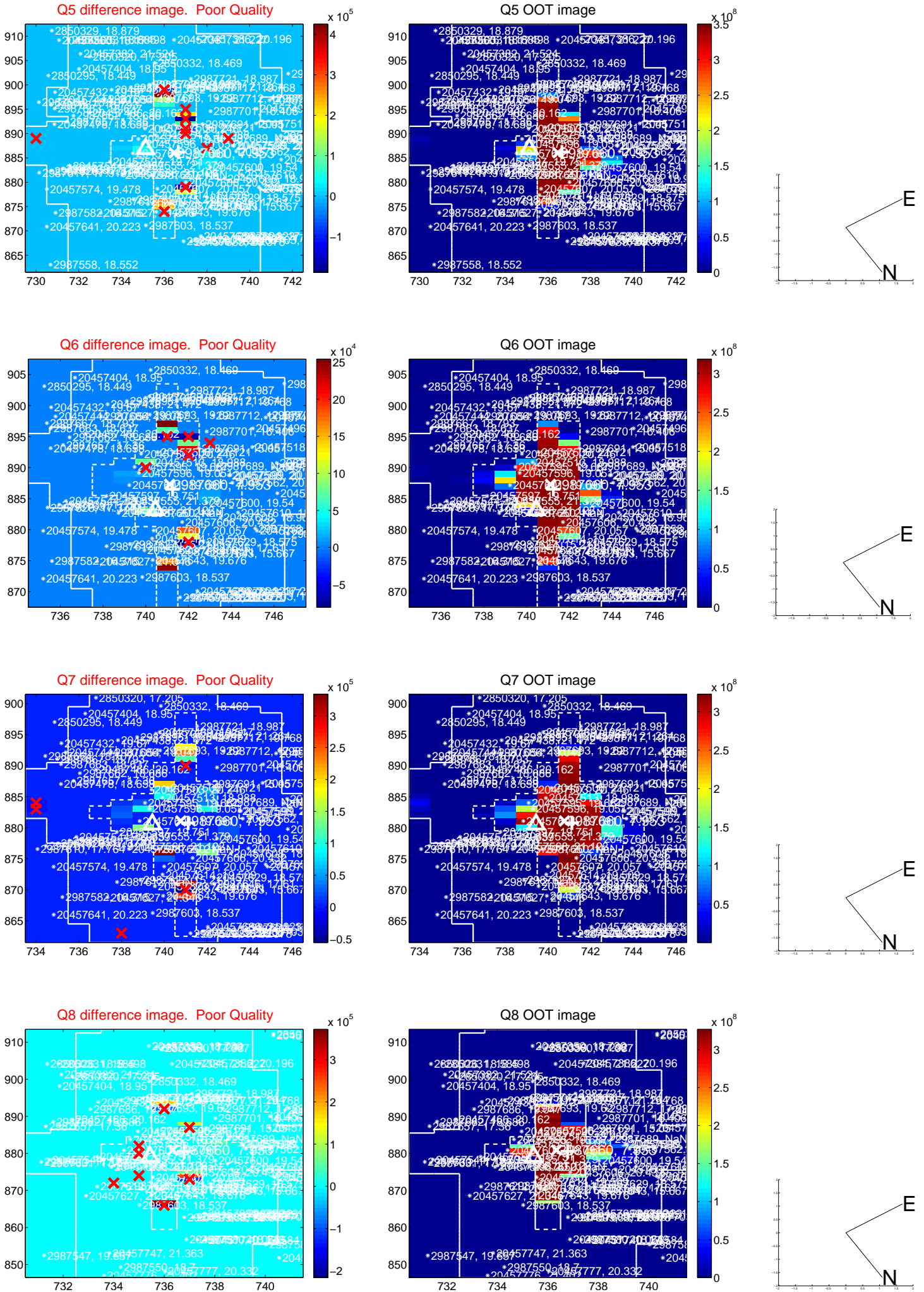


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

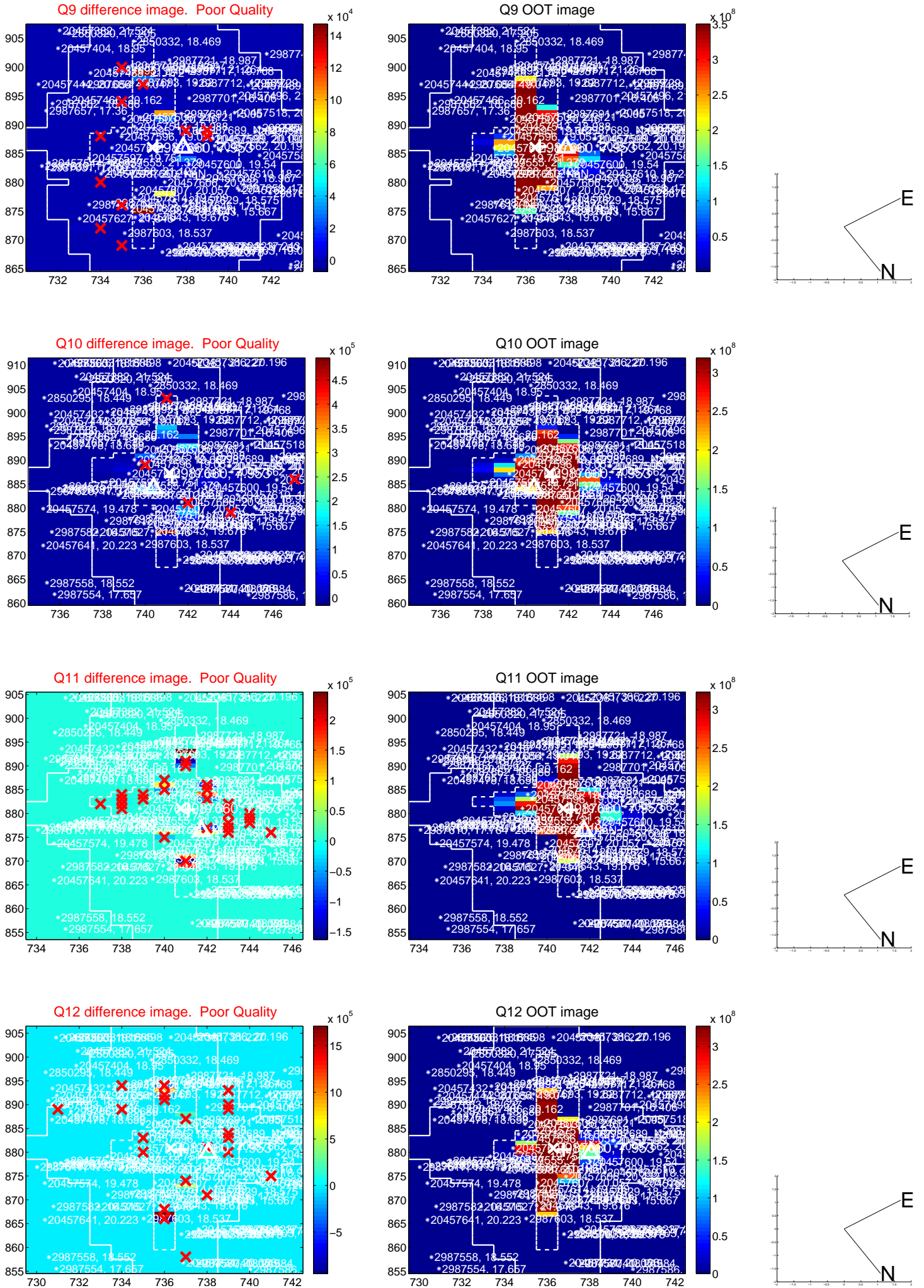
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



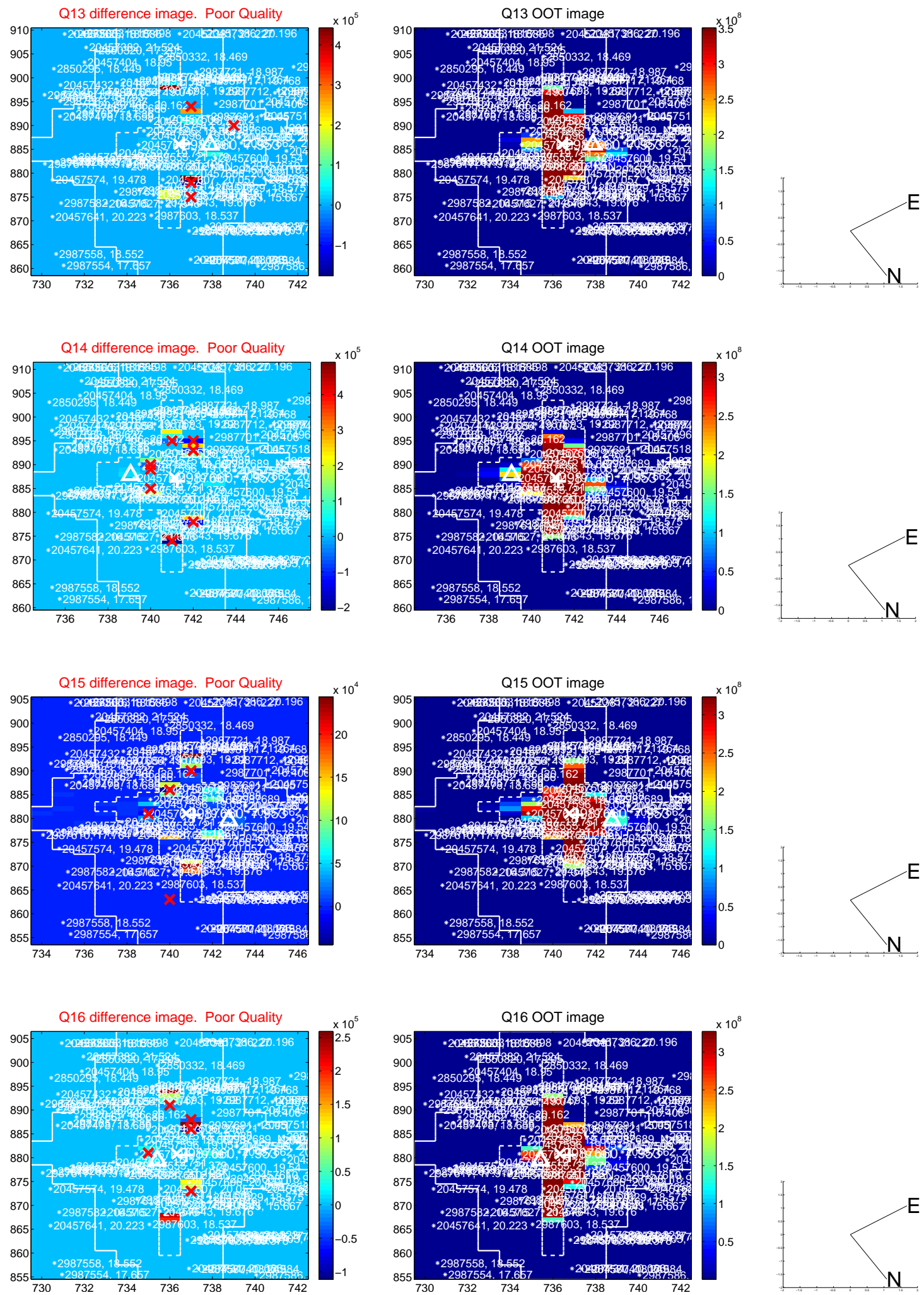
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



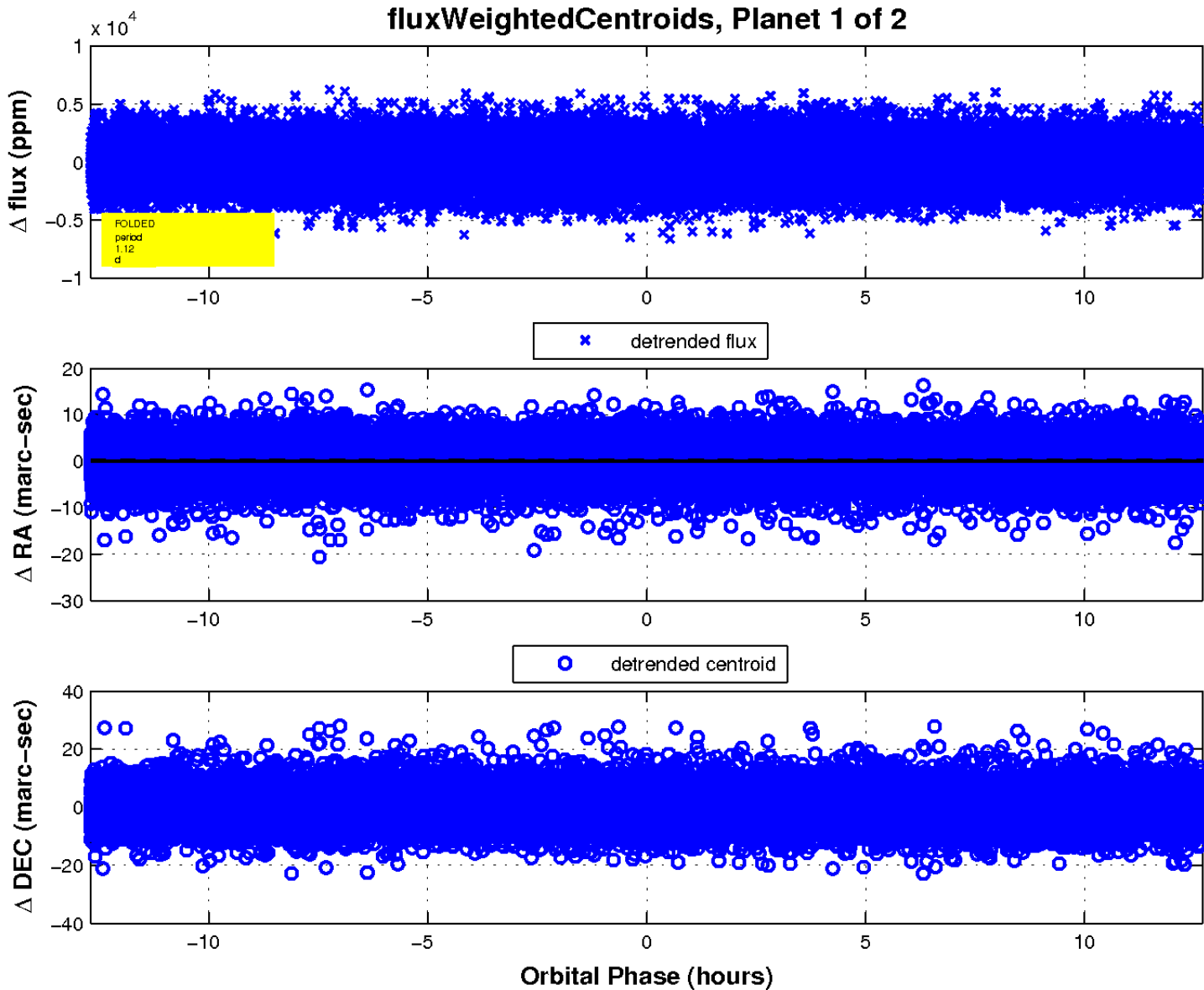
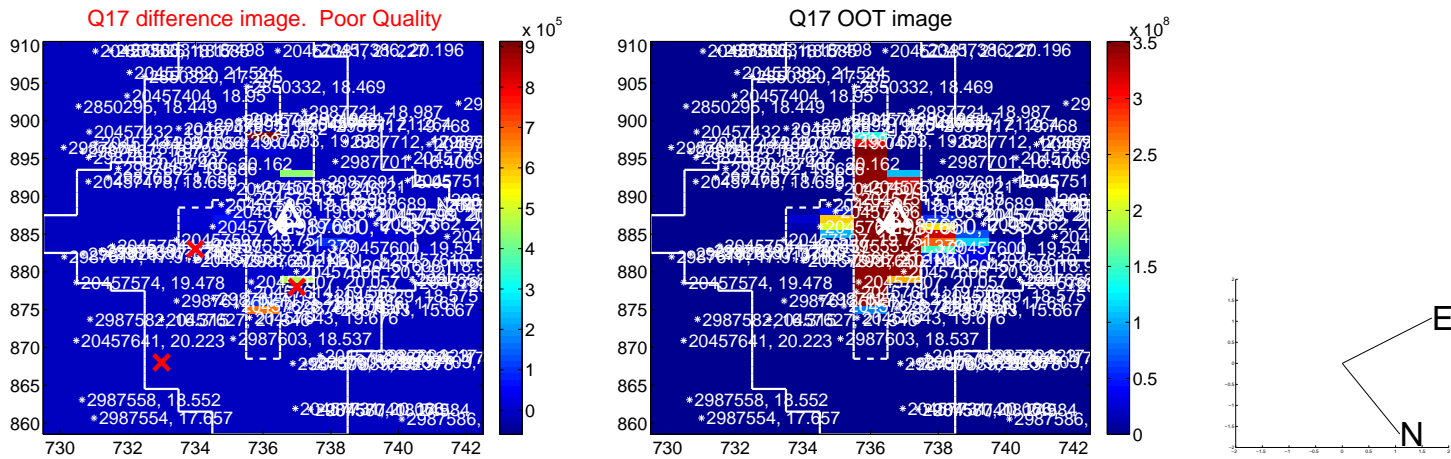
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



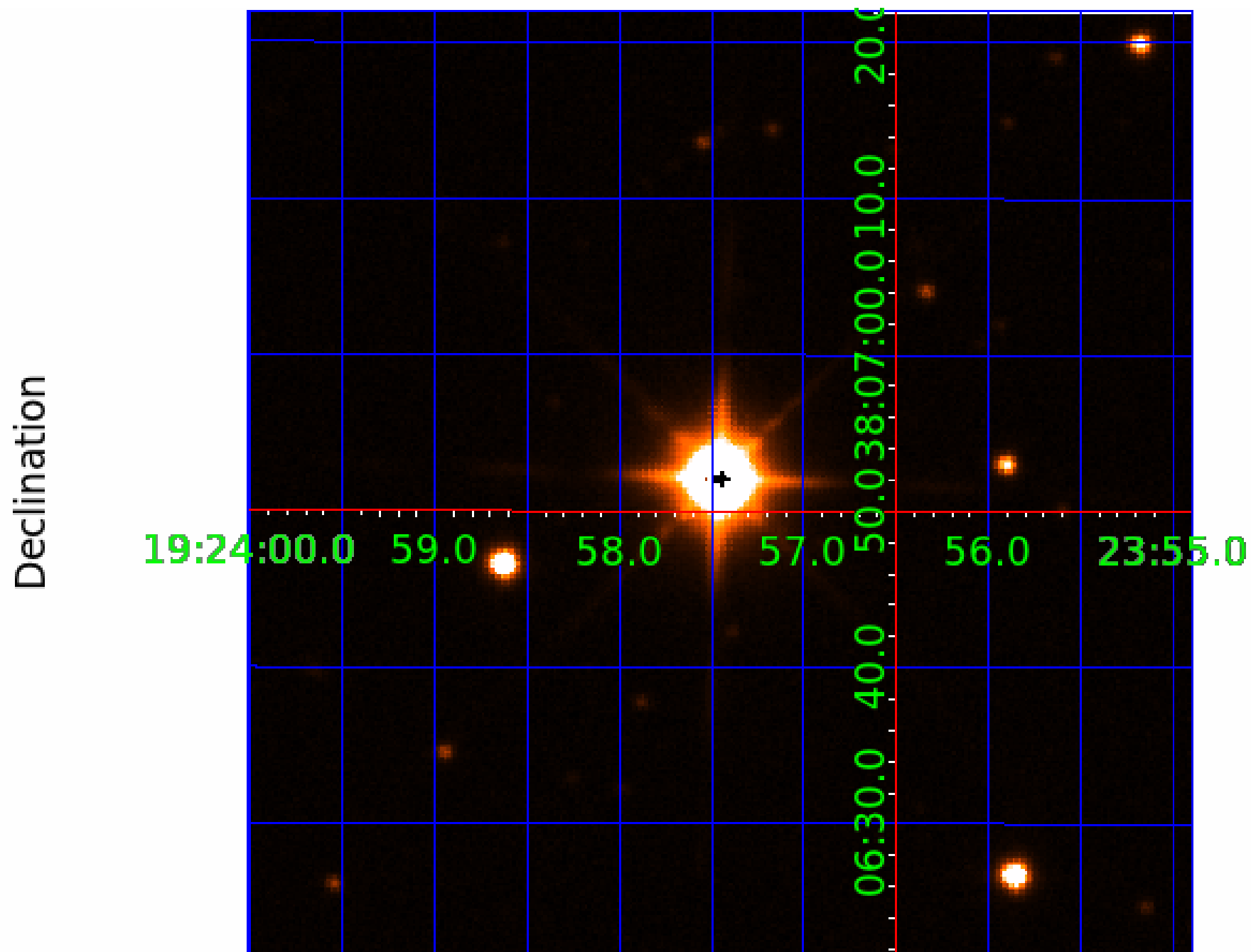
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 002987660

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})
002987660-01	OBS	No	1.117100	132.187373	144.1	4.233	10.0	11.5	3.75	7524	5.34	55843.62
002987660-02	OBS	No	3.042126	134.258049	180.5	9.156	7.8	9.5	3.75	7524	5.76	14684.52

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002987660-01	OBS	FP	0.00	1	0	0	1	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED—EPHEM_MATCH
002987660-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

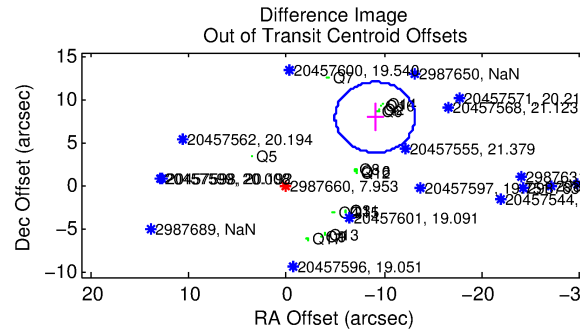
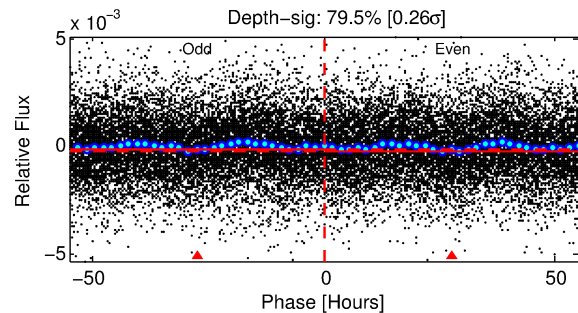
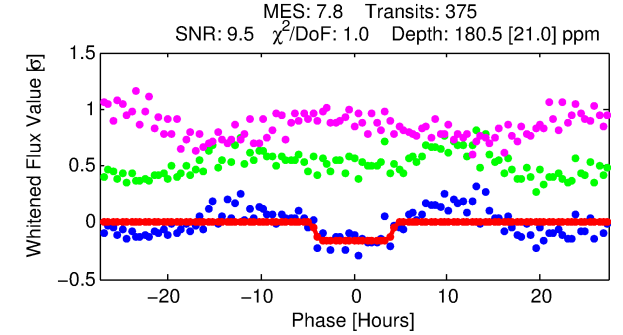
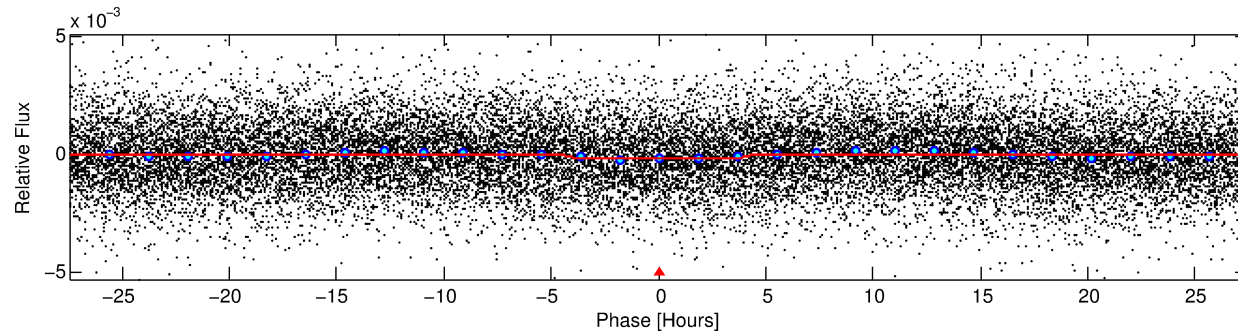
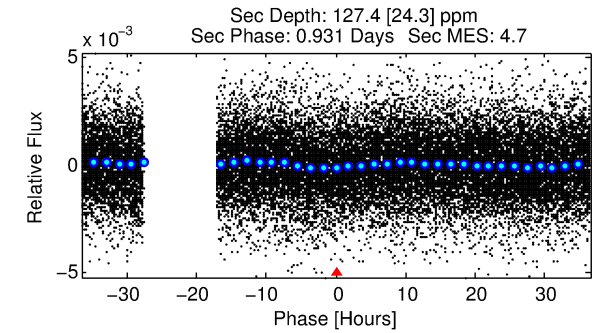
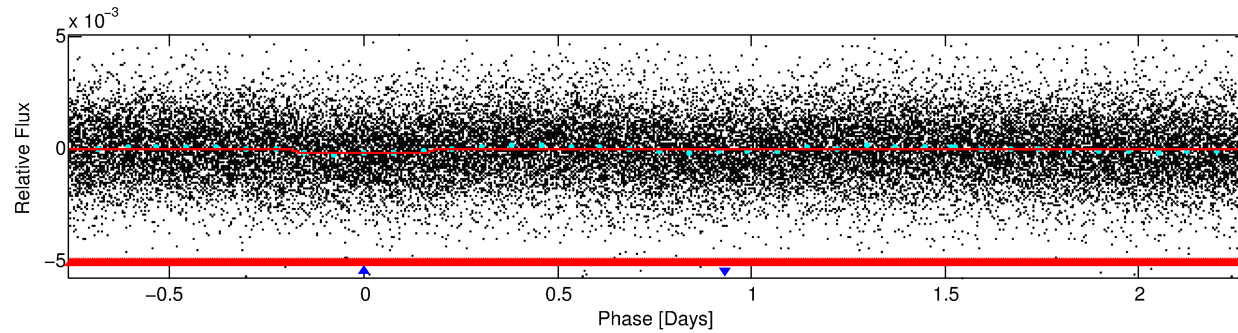
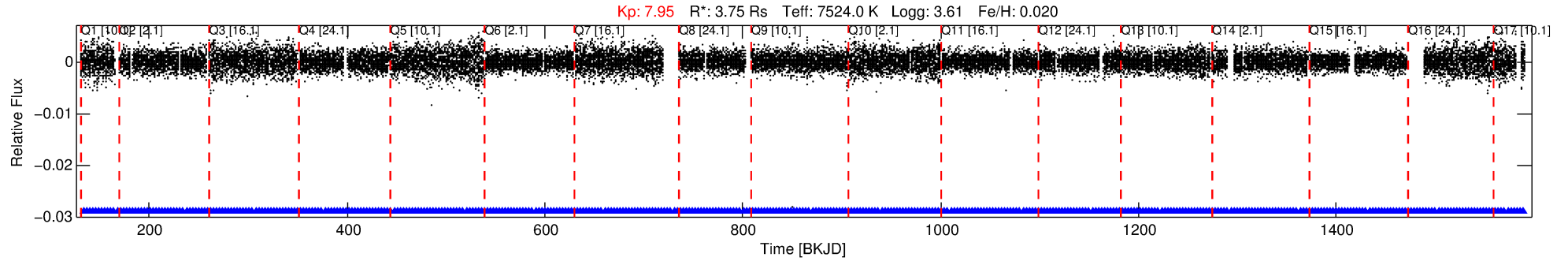
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002987660-02

No Significant Match Found

DV One-Page Summary

KIC: 2987660 Candidate: 2 of 2 Period: 3.042 d



DV Fit Results:

Period = 3.04213 [0.00006] d
Epoch = 134.2580 [0.0135] BKJD
Rp/R* = 0.0141 [0.0040]
a/R* = 1.60 [1.70]
b = 0.87 [0.48]
Teff = 14684.52 [12729.50]
Teq = 2807 [608] K
Rp = 5.76 [3.47] Re
a = 0.0525 [0.0275] AU
Ag = 5.83 [6.08] [0.79 σ]
Teffp = 6743 [1054] K [3.23 σ]

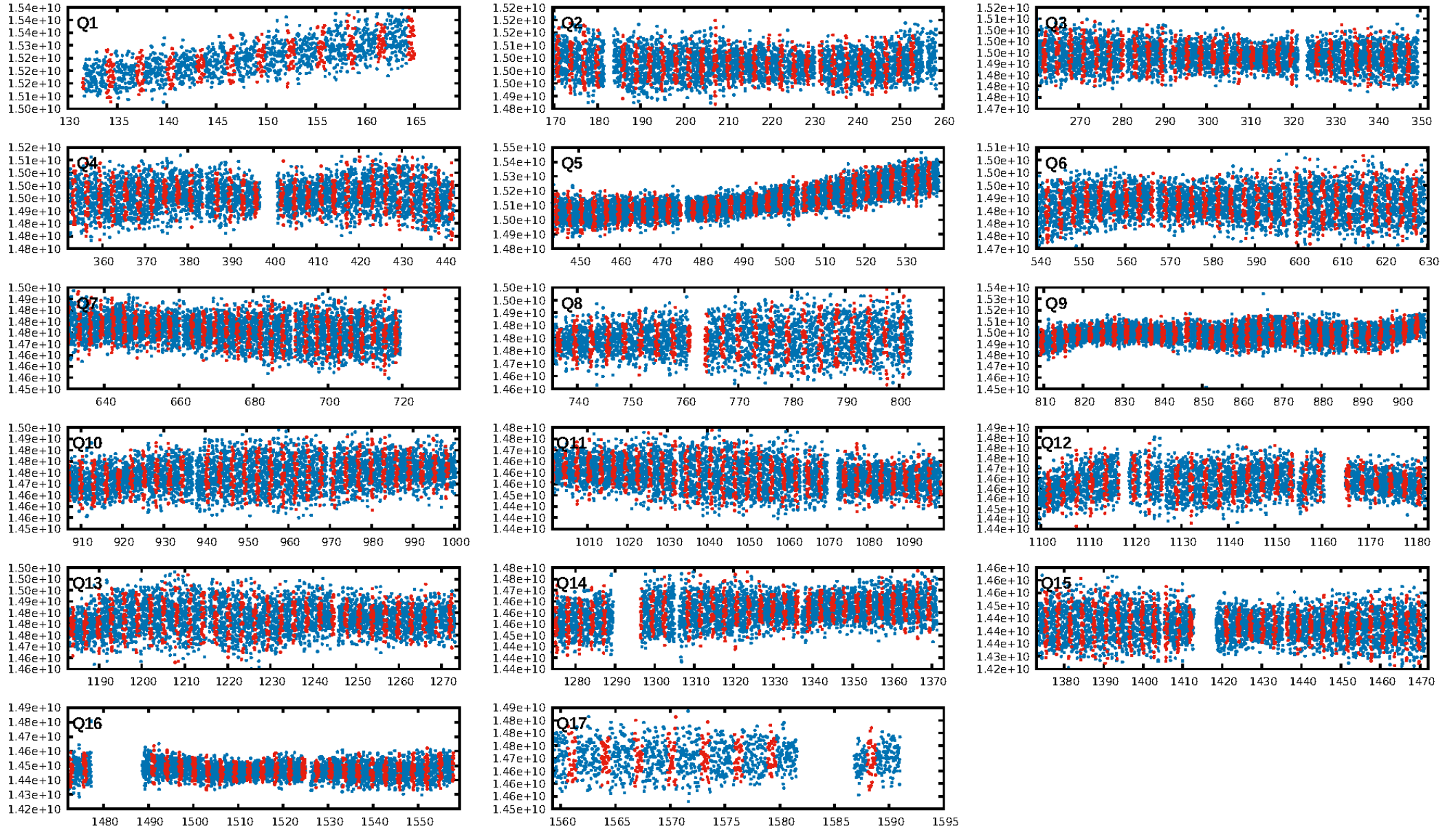
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.58 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.13e-11
RollingBand-fgt: 1.00 [359/359]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: 3.382 arcsec [4.83 σ]
OotOffset-rm: 12.078 arcsec [8.88 σ]
KicOffset-rm: 14.575 arcsec [8.26 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.00 [0/17]
DiffImageOverlap-fno: 0.00 [0/17]

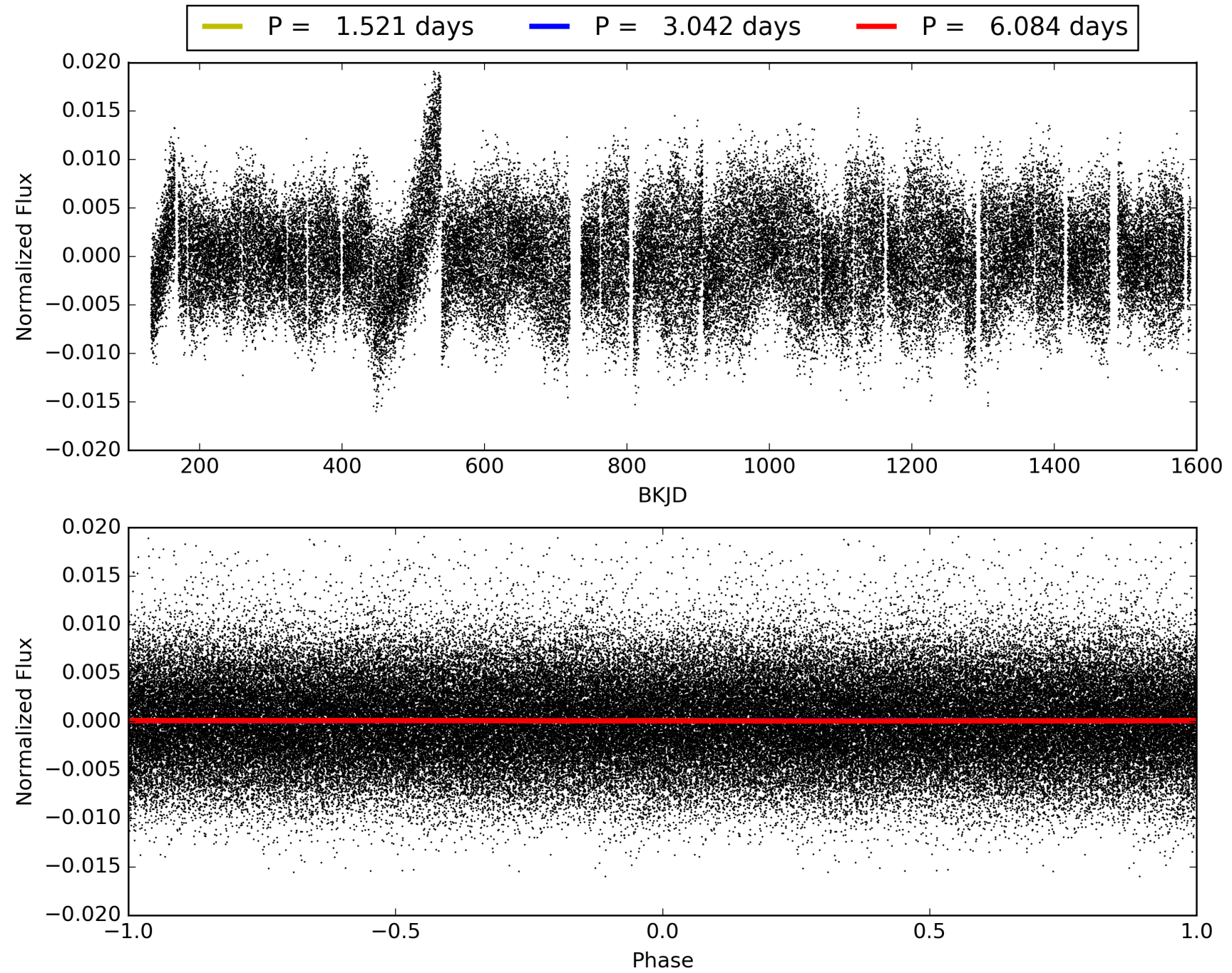
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:49:37 Z

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

TCE 002987660-02, PDC Light Curves

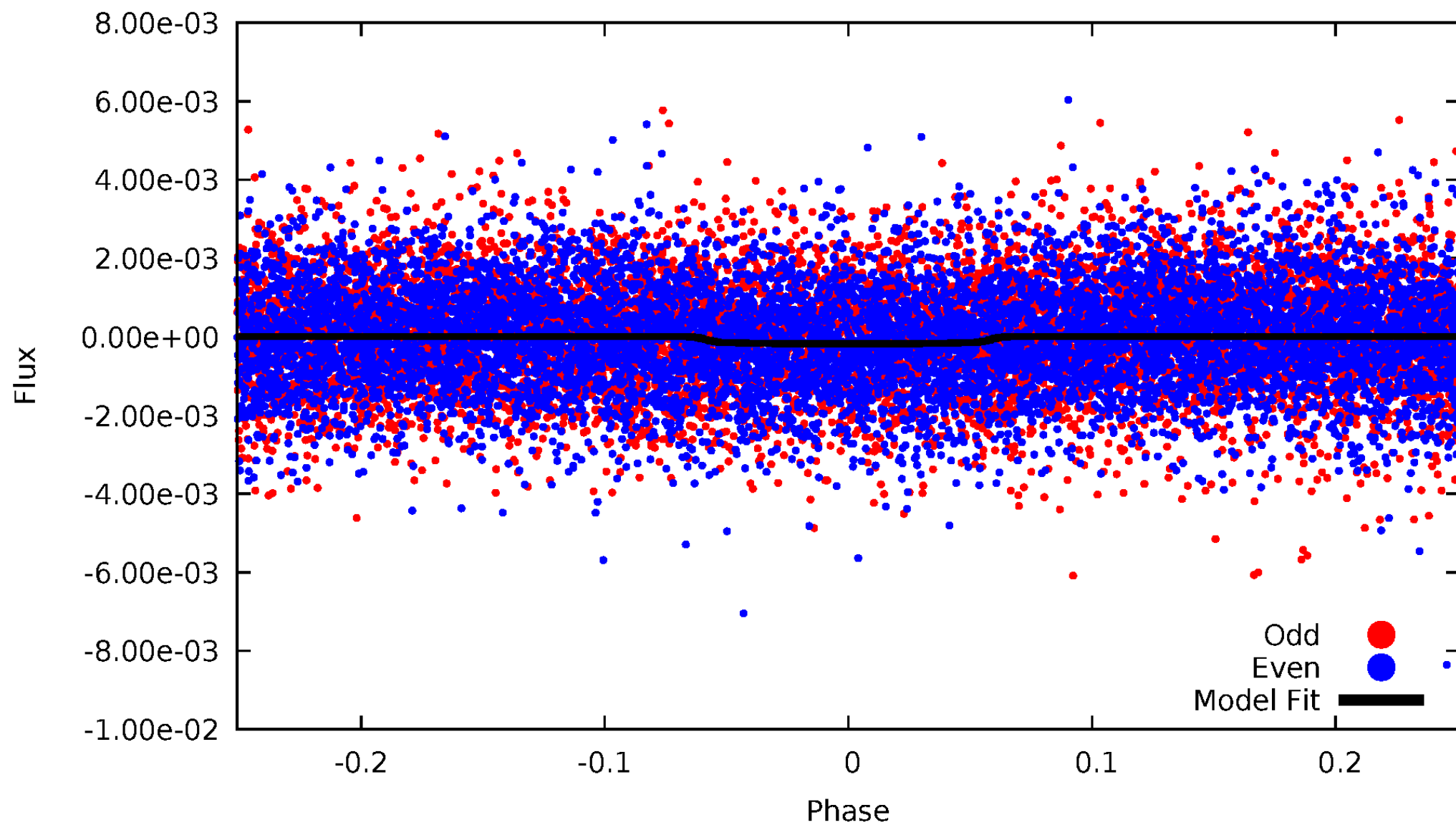


TCE 002987660-02



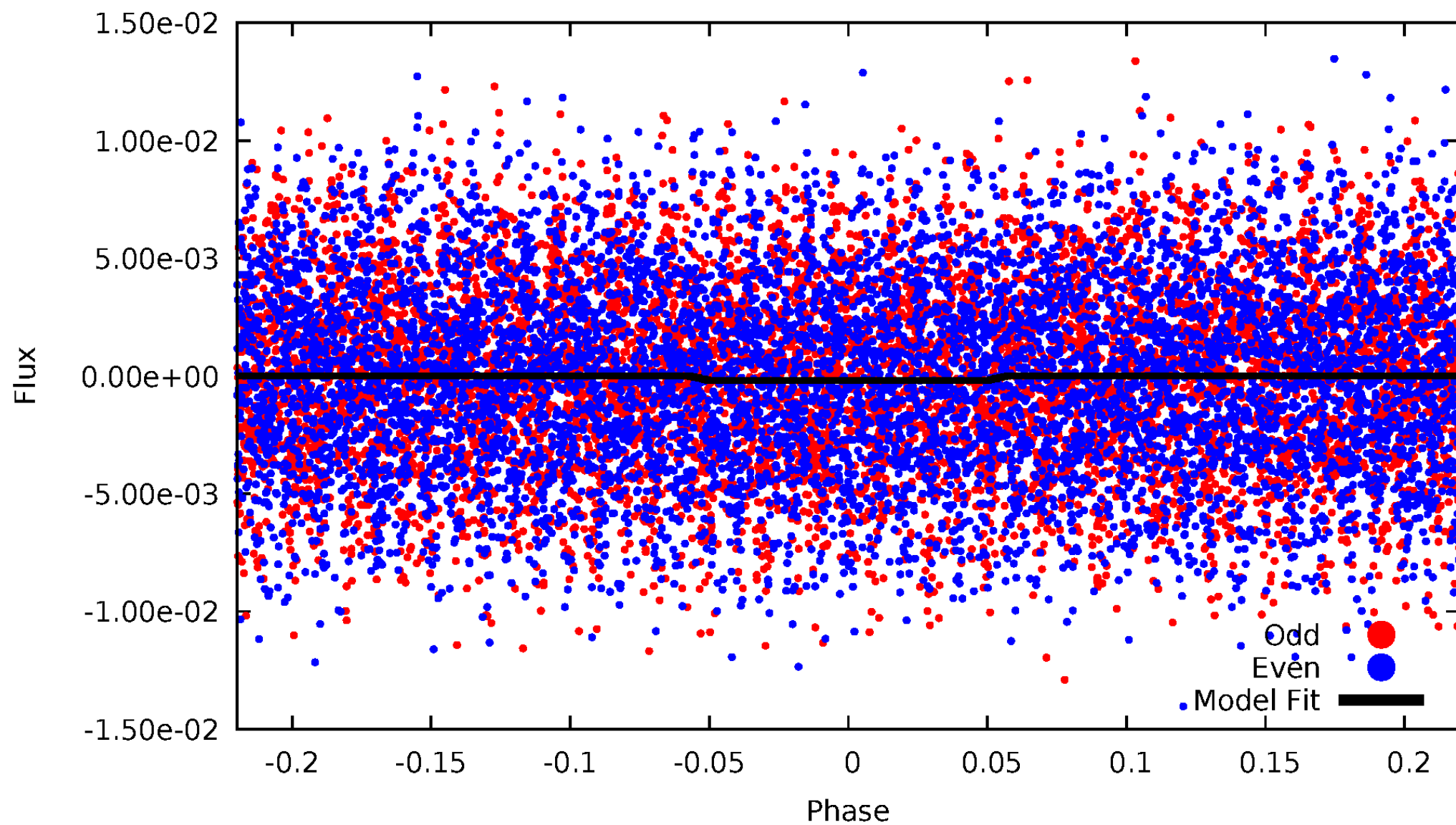
DV Odd/Even

TCE 002987660-02



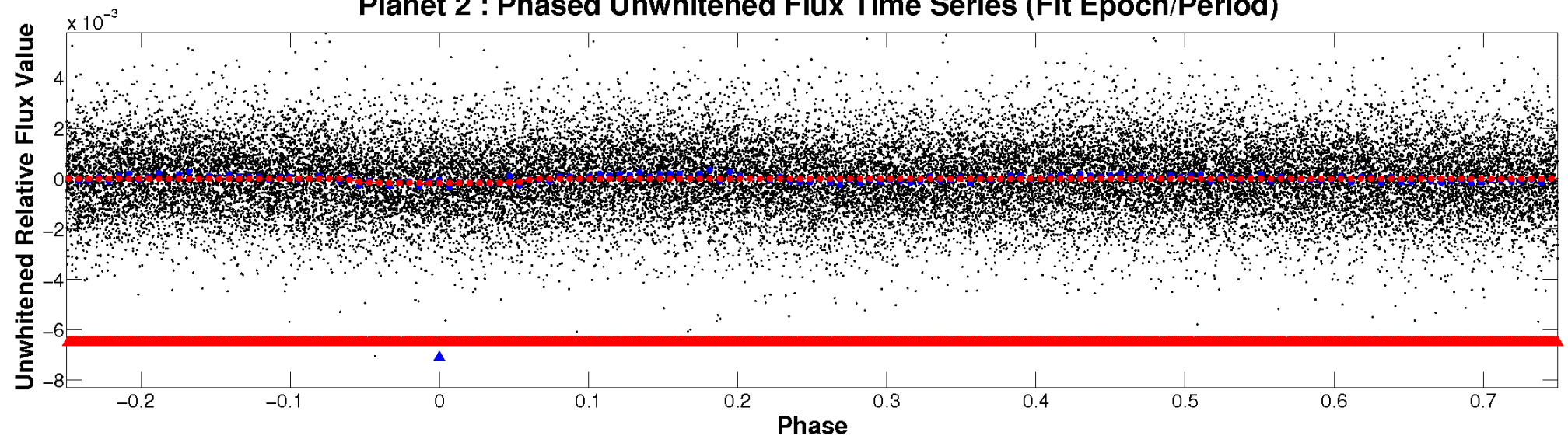
ALT Odd/Even

TCE 002987660-02

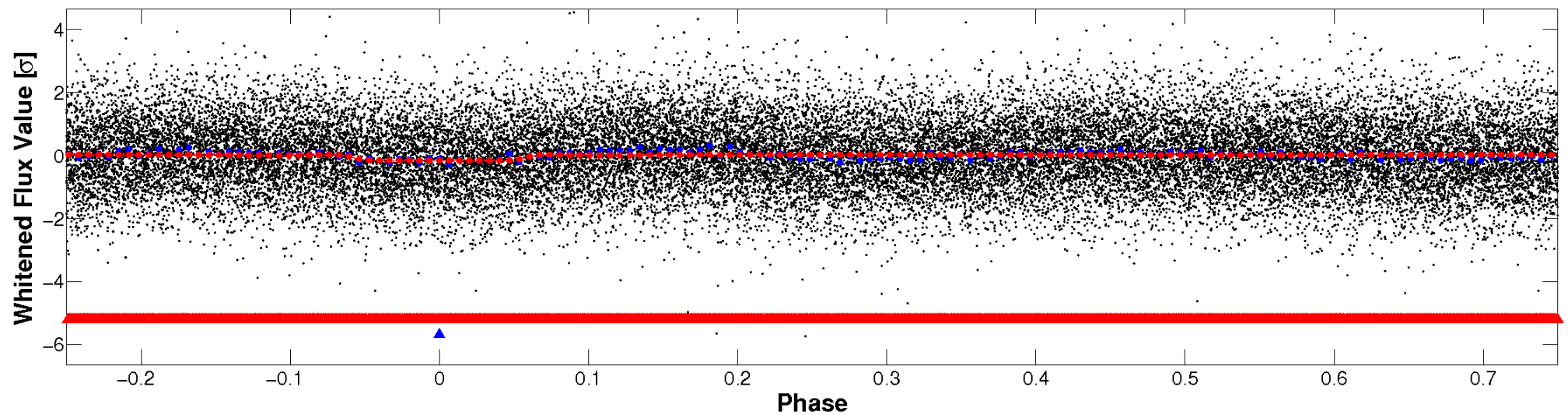


Non-Whitened Vs. Whitened Light Curve

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

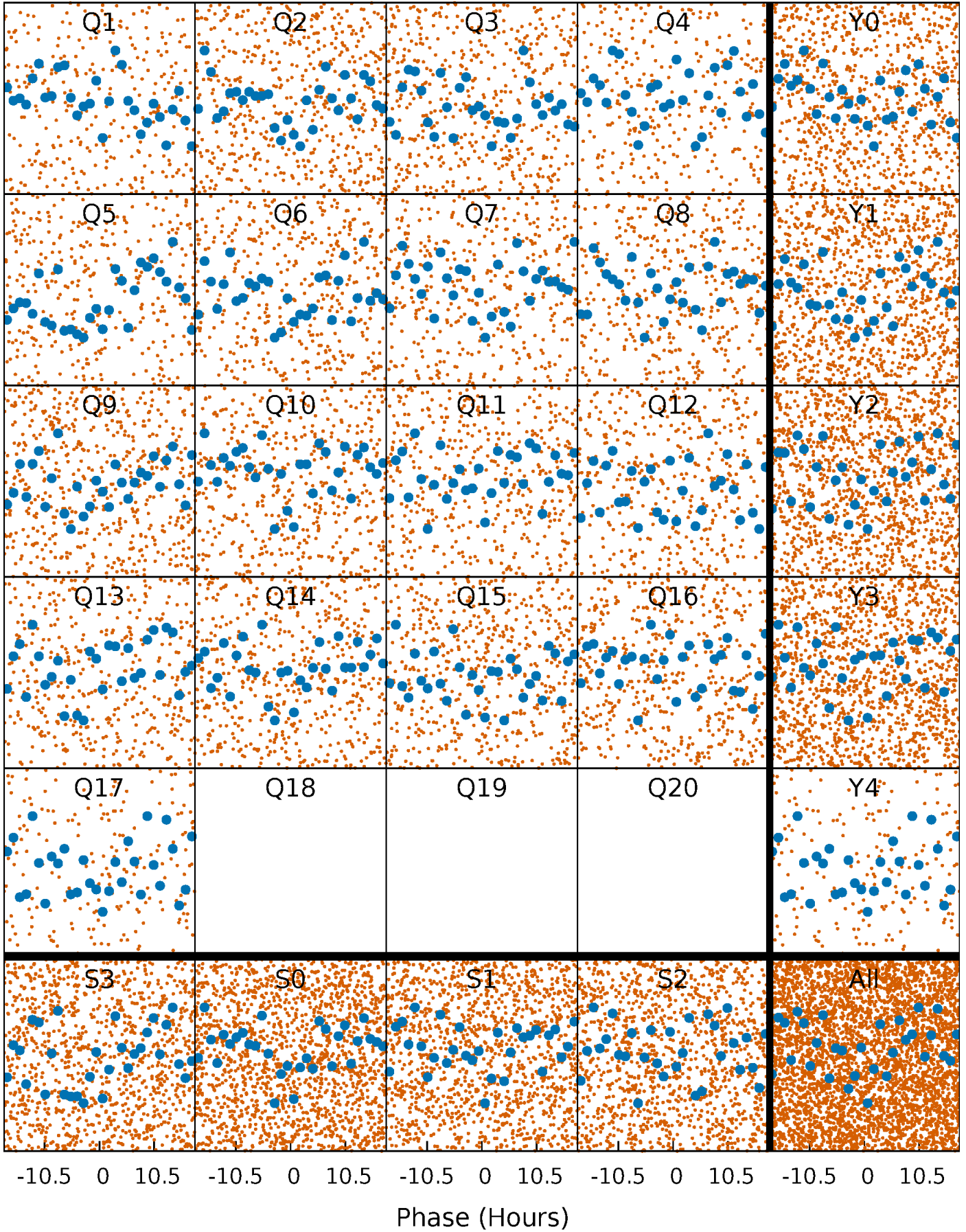


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



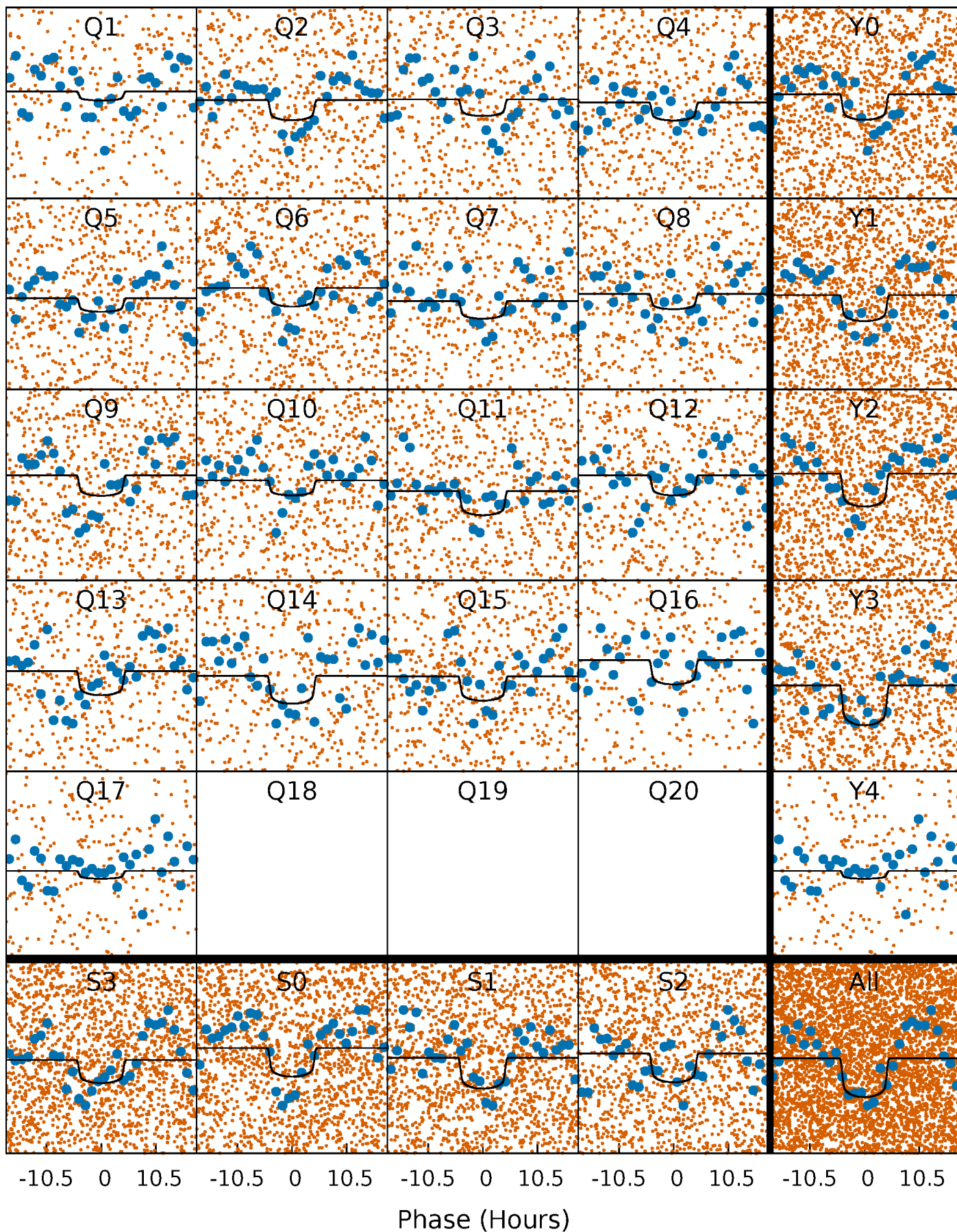
PDC Quarter-Phased Transit Curves

TCE 002987660-02 P= 3.042126 Days $T_0=134.258049$ (BKJD)



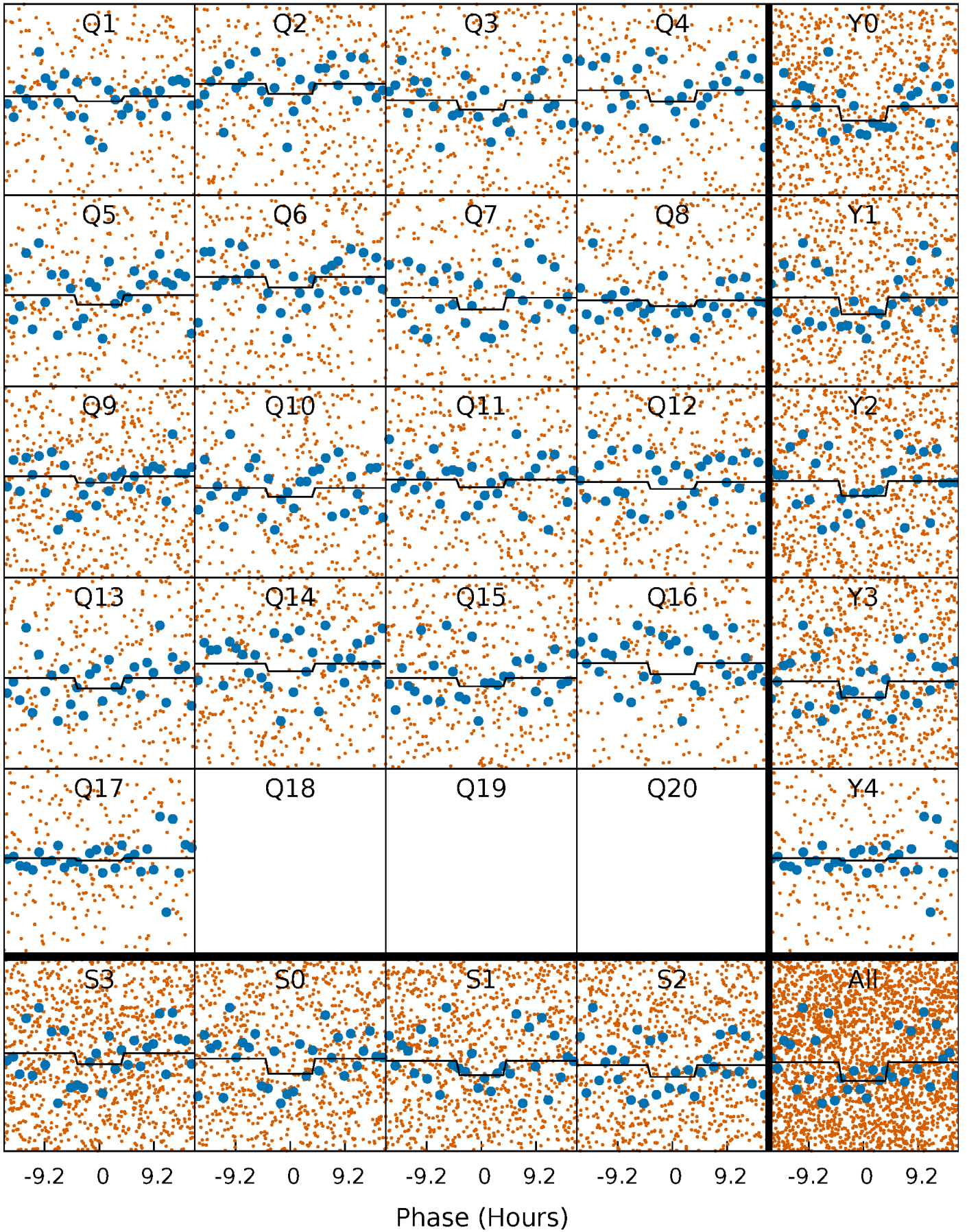
DV Quarter-Phased Transit Curves

TCE 002987660-02 $P = 3.042126$ Days $T_0 = 134.258049$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

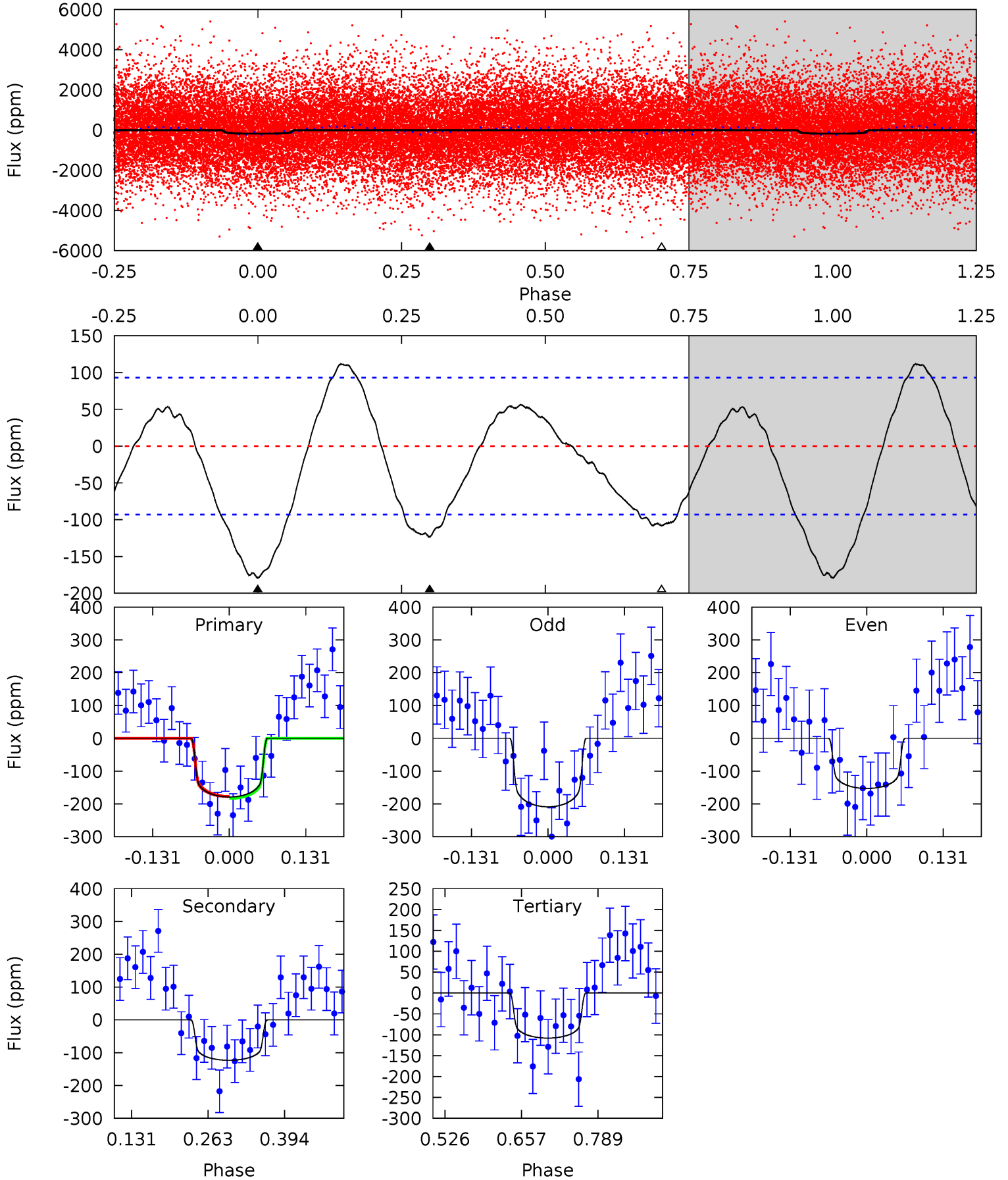
TCE 002987660-02 $P = 3.042144$ Days $T_0 = 134.261350$ (BKJD)



DV Model-Shift Uniqueness Test

002987660-02, P = 3.042126 Days, E = 131.215923 Days

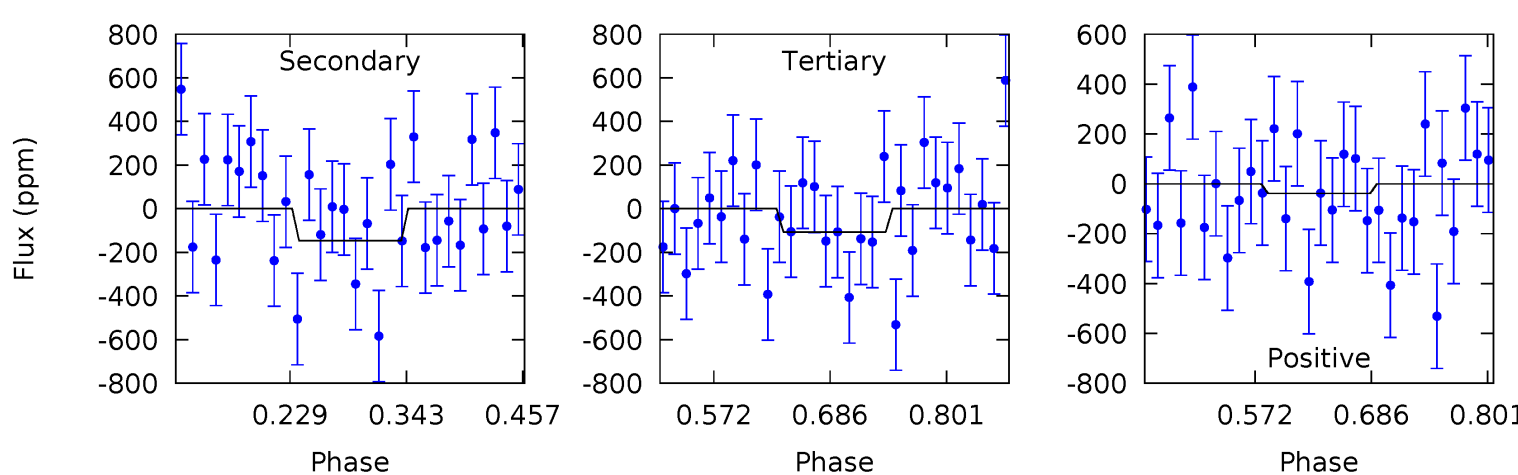
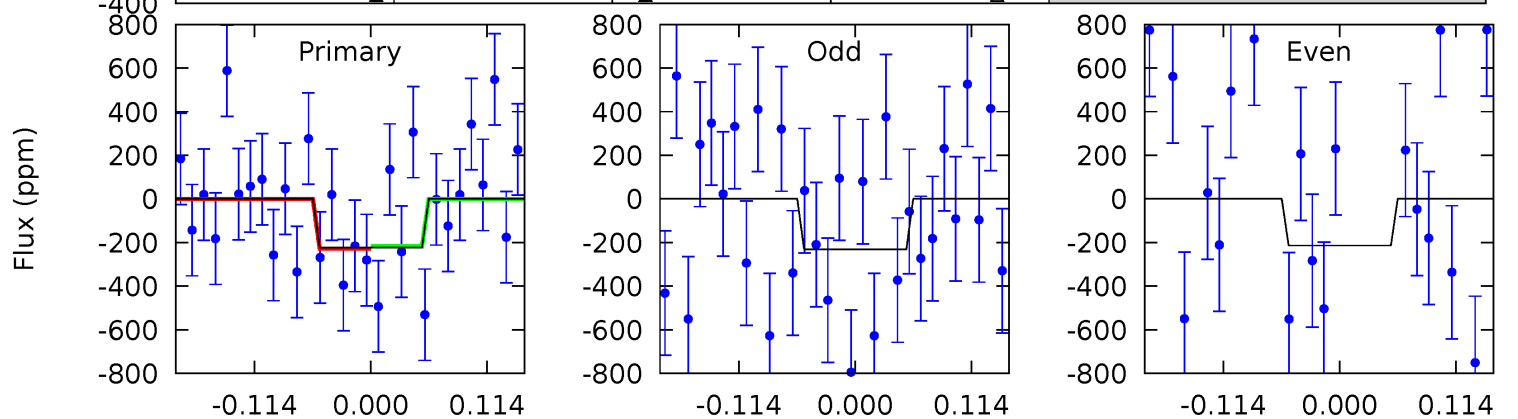
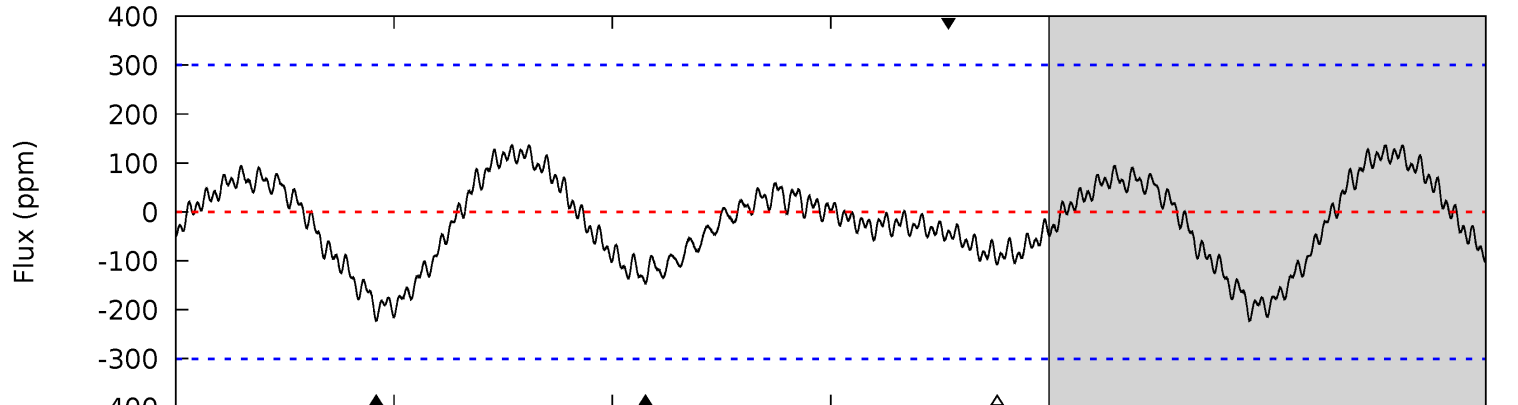
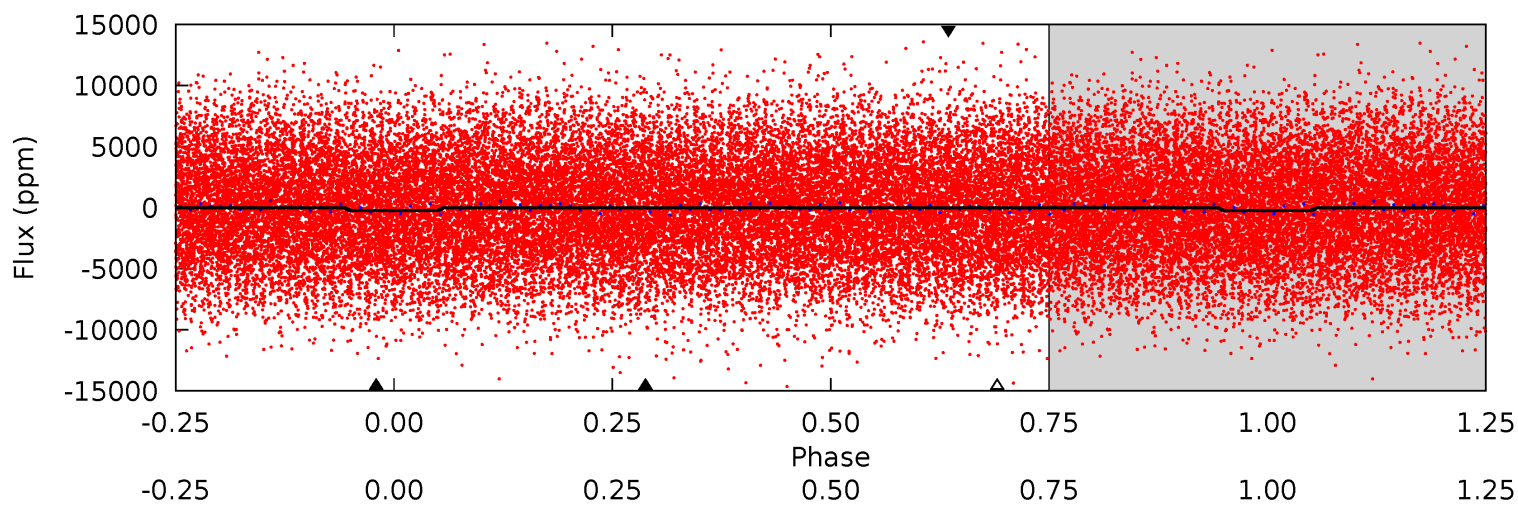
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.66	5.97	5.23	0	4.51	1.51	3.06	3.43	8.66	0.74	5.97	1.36	1.15	0.38	0.14



Alt Model-Shift Uniqueness Test

002987660-02, P = 3.042144 Days, E = 131.219206 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.36	2.20	1.62	-0.58	4.54	1.58	0.91	1.74	3.94	0.59	2.78	0.13	1.72	0.38	0.09



Stellar Parameters For KIC 002987660

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7524^{+209}_{-313}	$3.608^{+0.504}_{-0.056}$	$0.020^{+0.200}_{-0.300}$	$3.755^{+0.498}_{-1.993}$	$2.086^{+0.282}_{-0.564}$	$0.055^{+0.303}_{-0.016}$
	+3%/-4%	+14%/-2%	+1000%/-1500%	+13%/-53%	+14%/-27%	+547%/-29%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 002987660-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-123 ± 21	$5.03^{+1.93}_{-1.85}$	3751^{+274}_{-501}	6524^{+1405}_{-925}	$7.539^{+10.648}_{-3.721}$
Alt.	-146 ± 66	$4.88^{+2.05}_{-1.82}$	3741^{+269}_{-485}	6842^{+2050}_{-1368}	$8.873^{+14.892}_{-5.515}$

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

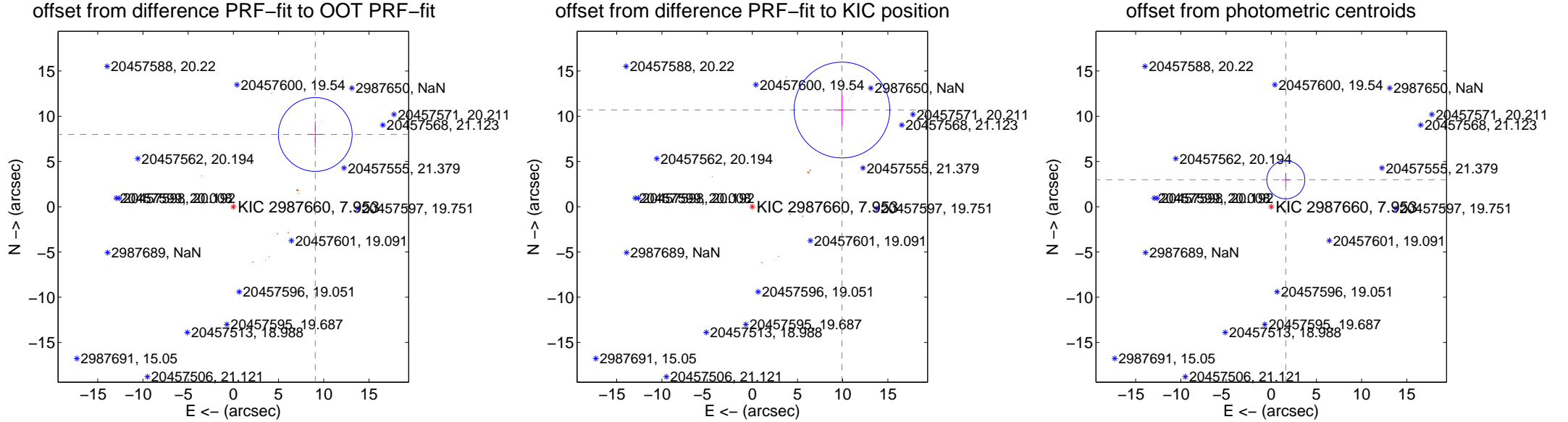
DV Centroid Data

Supplemental centroid analysis for 002987660-02. **Kepler magnitude: 7.95.** Transit SNR 9.55

There are 0 quarters with good PRF difference image offsets

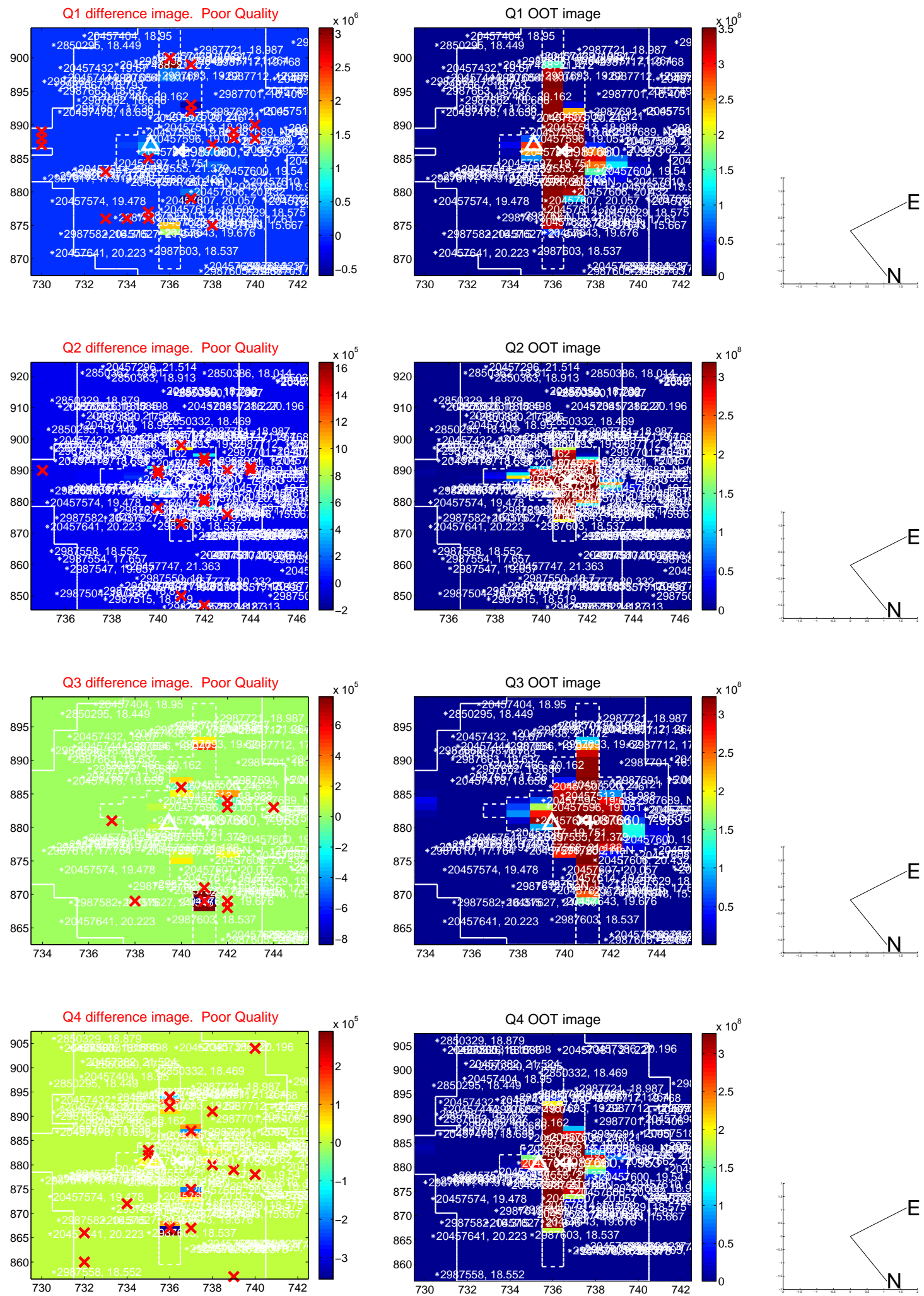
The direct PRF centroid is offset from the target star catalog position by about 1.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	12.078 ± 1.360	8.88	-9.063 ± 0.806	7.984 ± 1.475
PRF-fit source offset from KIC position	14.575 ± 1.765	8.26	-9.914 ± 0.993	10.684 ± 1.744
photometric centroid source offset	3.38 ± 0.70	4.83	-1.61 ± 0.45	2.97 ± 0.76

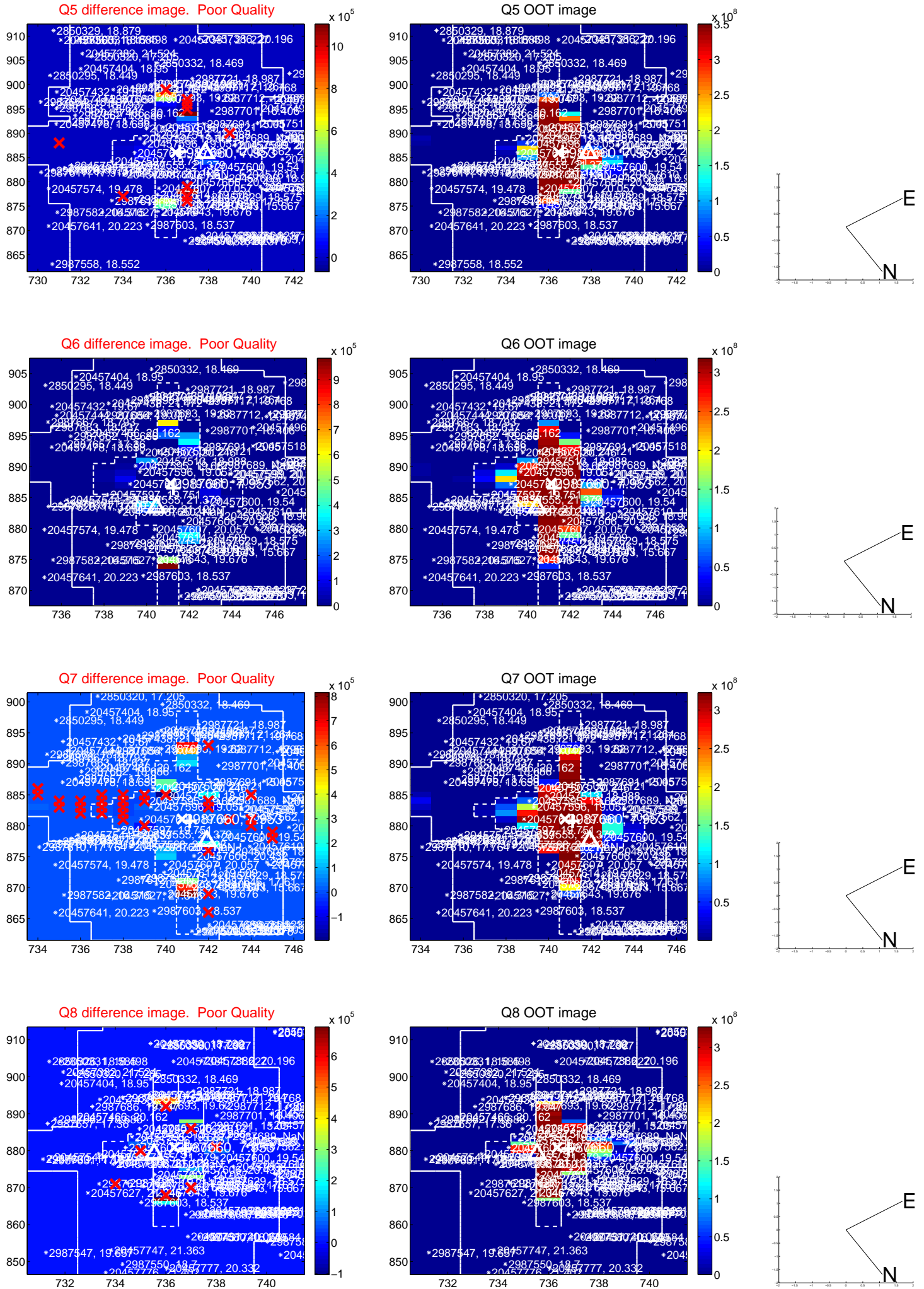


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

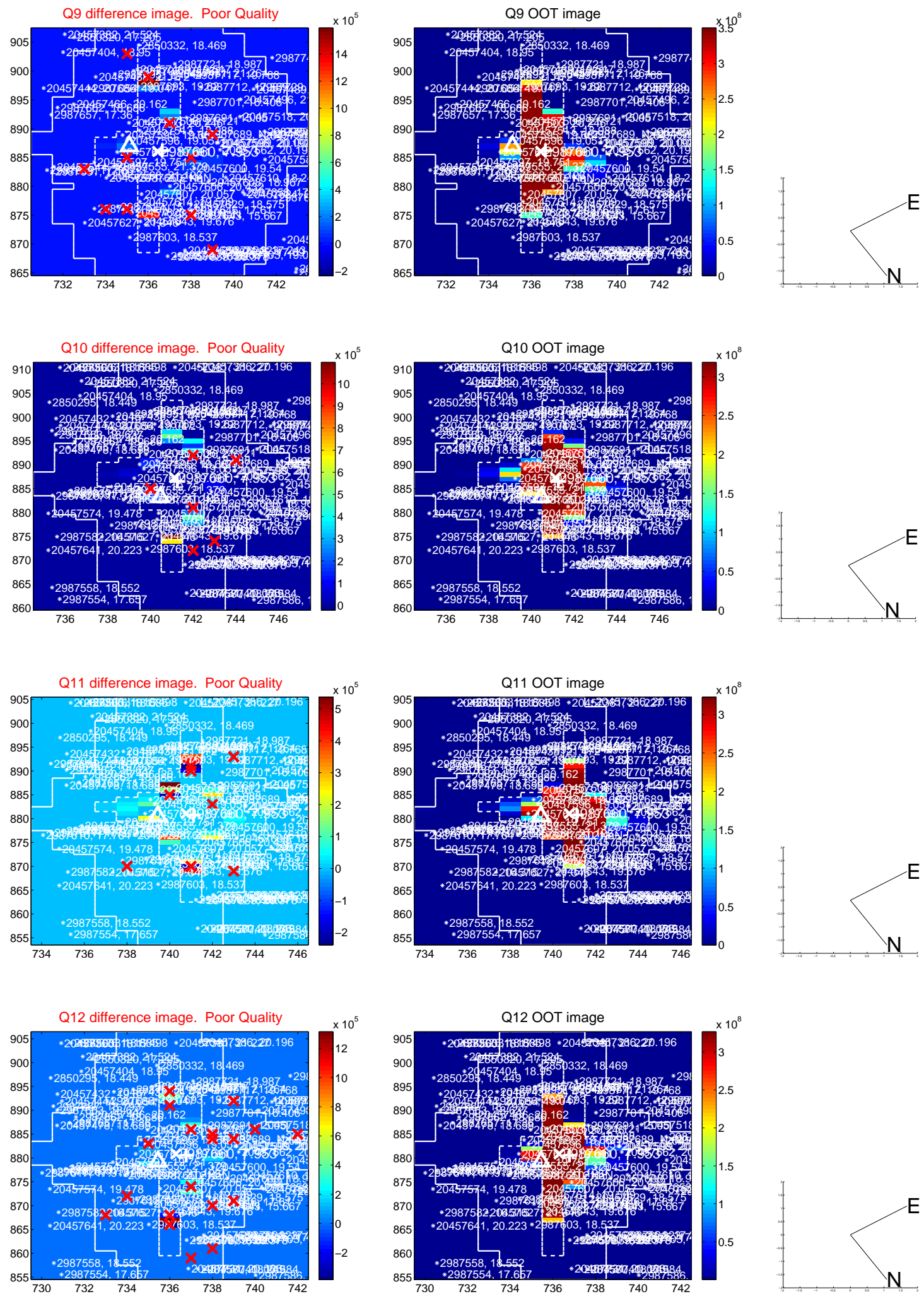
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



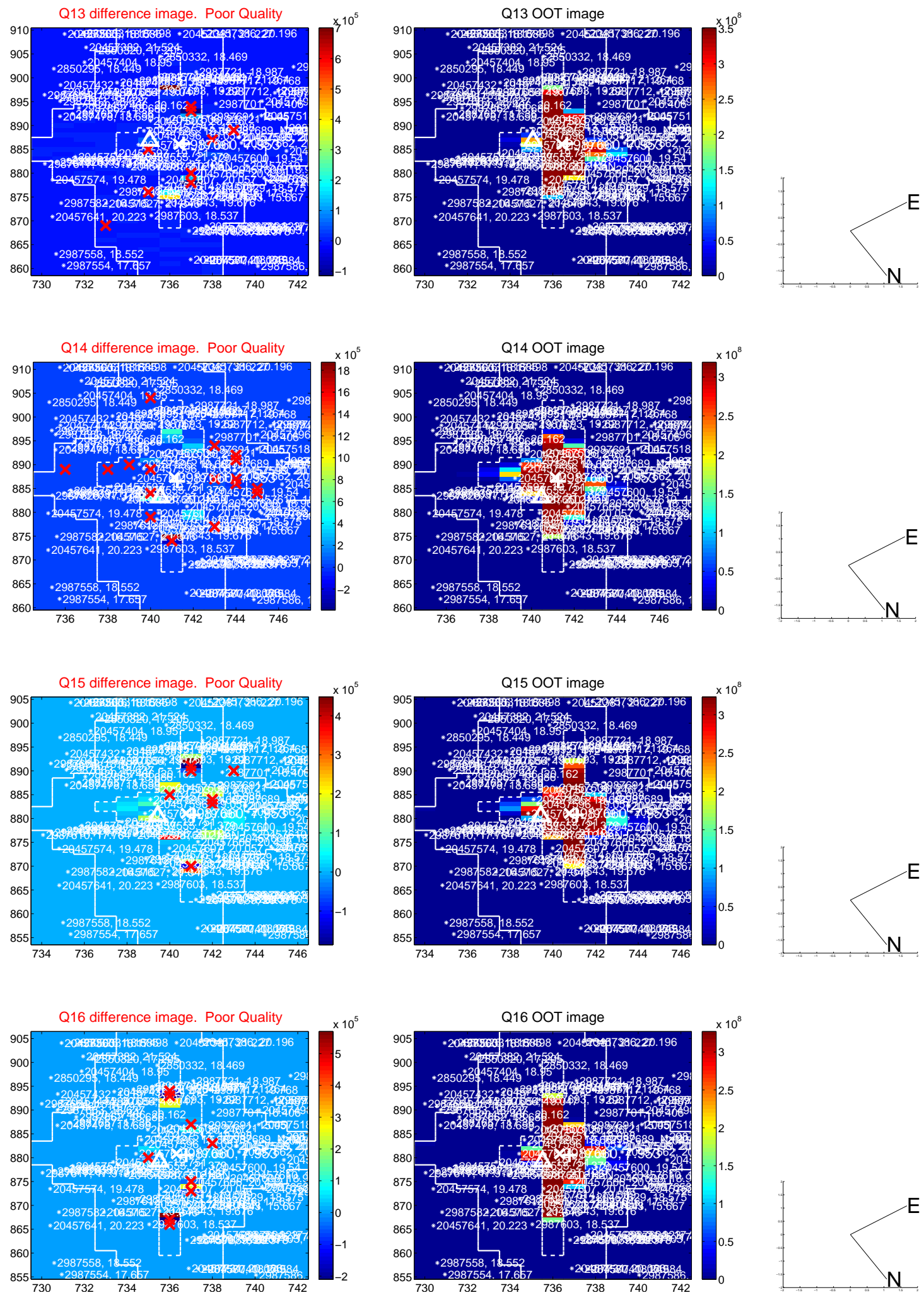
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



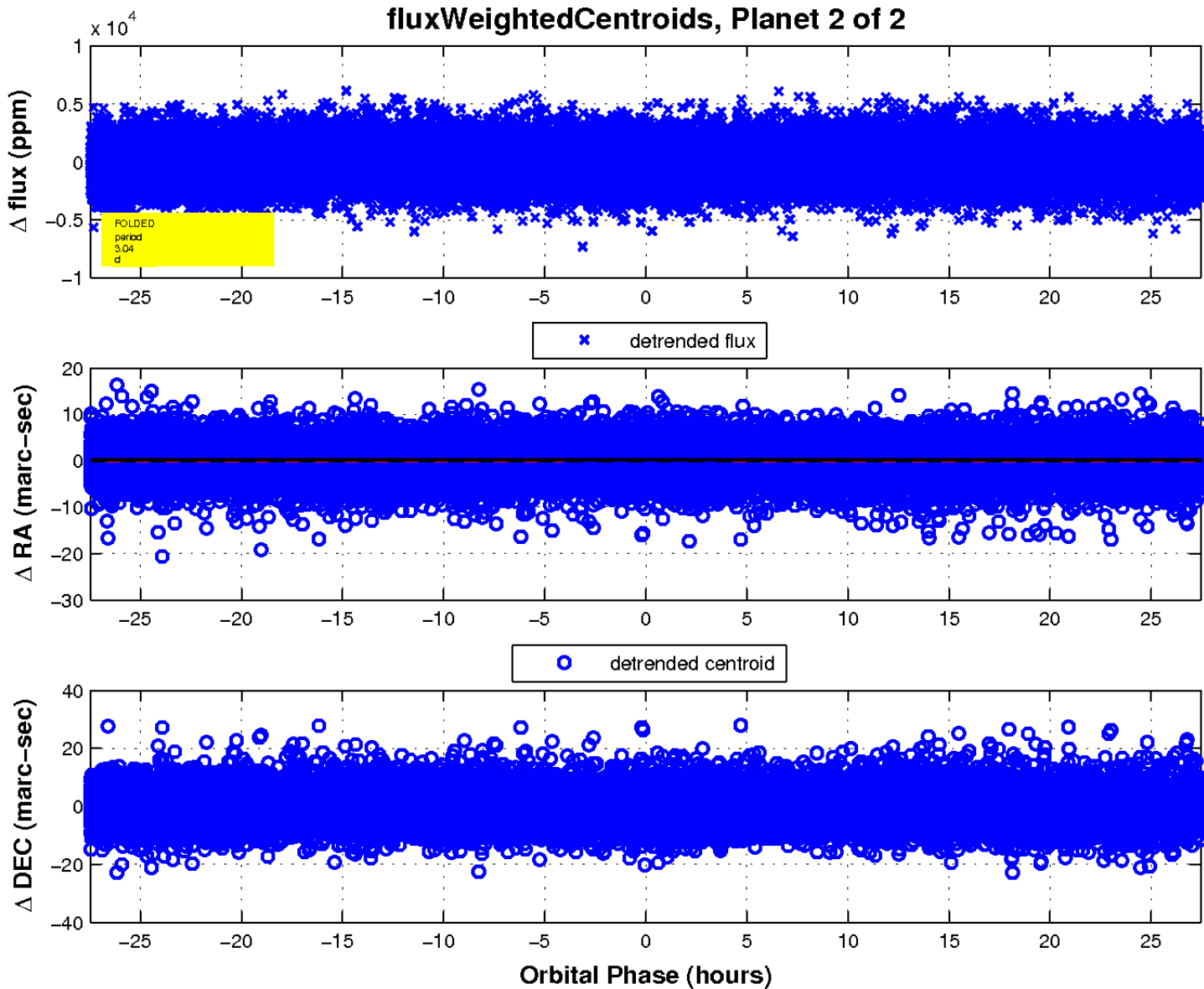
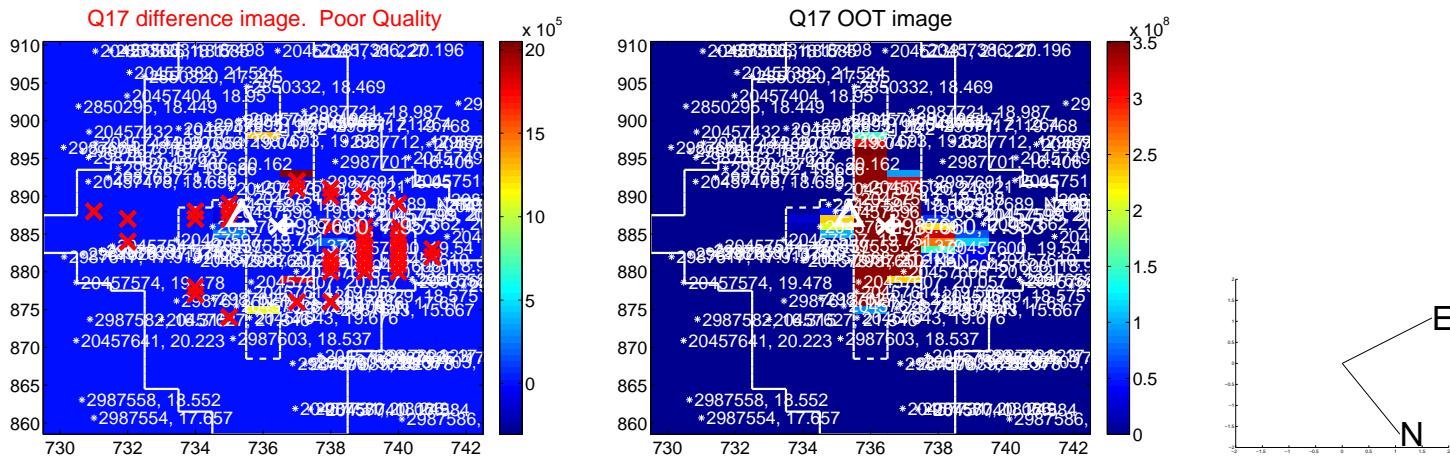
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UKIRT Image

