

KIC 008022144

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})
008022144-01	OBS	No	0.620441	131.541439	15.7	4.026	10.7	9.4	1.73	8081	0.74	43253.23
008022144-02	OBS	No	76.123745	158.456555	302.3	3.255	9.8	5.5	1.73	8081	3.38	70.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008022144-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
008022144-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

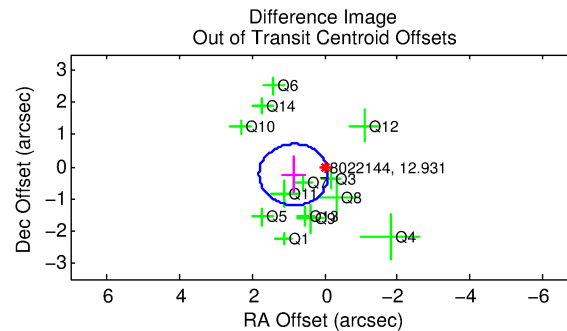
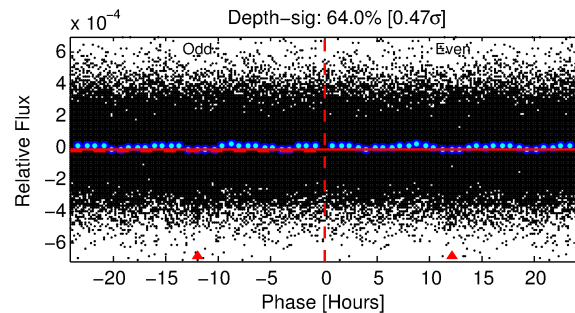
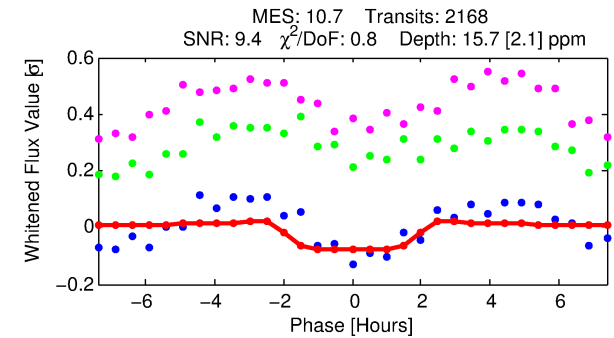
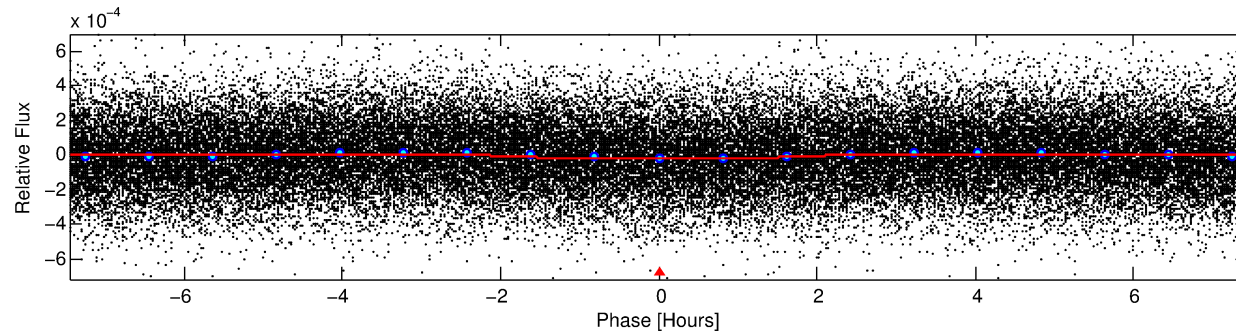
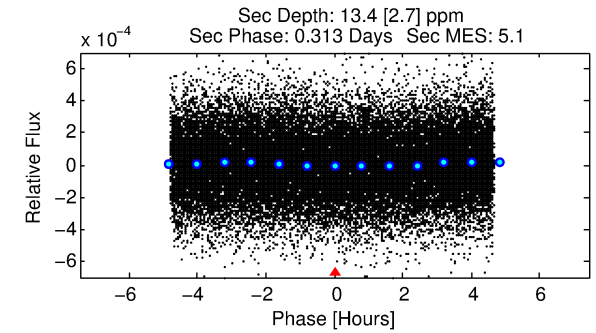
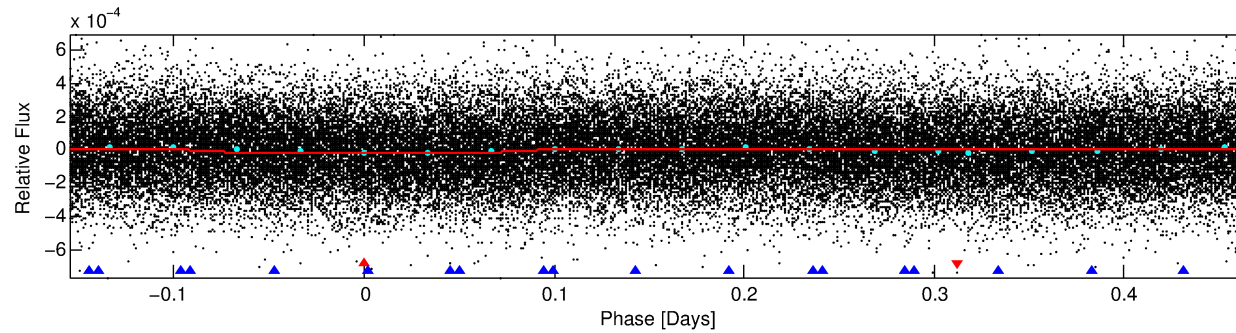
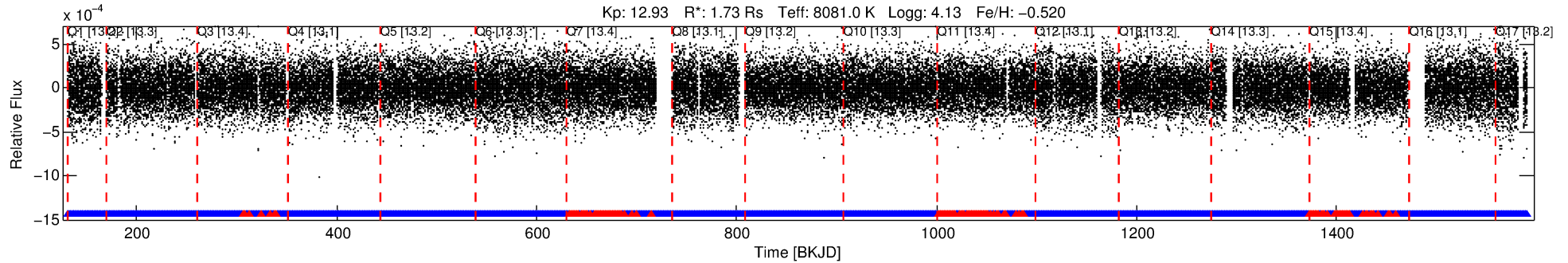
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008022144-01

No Significant Match Found

DV One-Page Summary

KIC: 8022144 Candidate: 1 of 2 Period: 0.620 d



DV Fit Results:

Period = 0.62044 [0.00001] d
Epoch = 131.5414 [0.0043] BKJD
Rp/R* = 0.0039 [0.0019]
a/R* = 1.17 [0.89]
b = 0.74 [1.76]
Seff = 43253.23 [14670.57]
Teq = 3677 [312] K
Rp = 0.74 [0.40] Re
a = 0.0163 [0.0035] AU
Ag = 3.54 [3.59] [0.71σ]
Teffp = 7797 [1908] K [2.13σ]

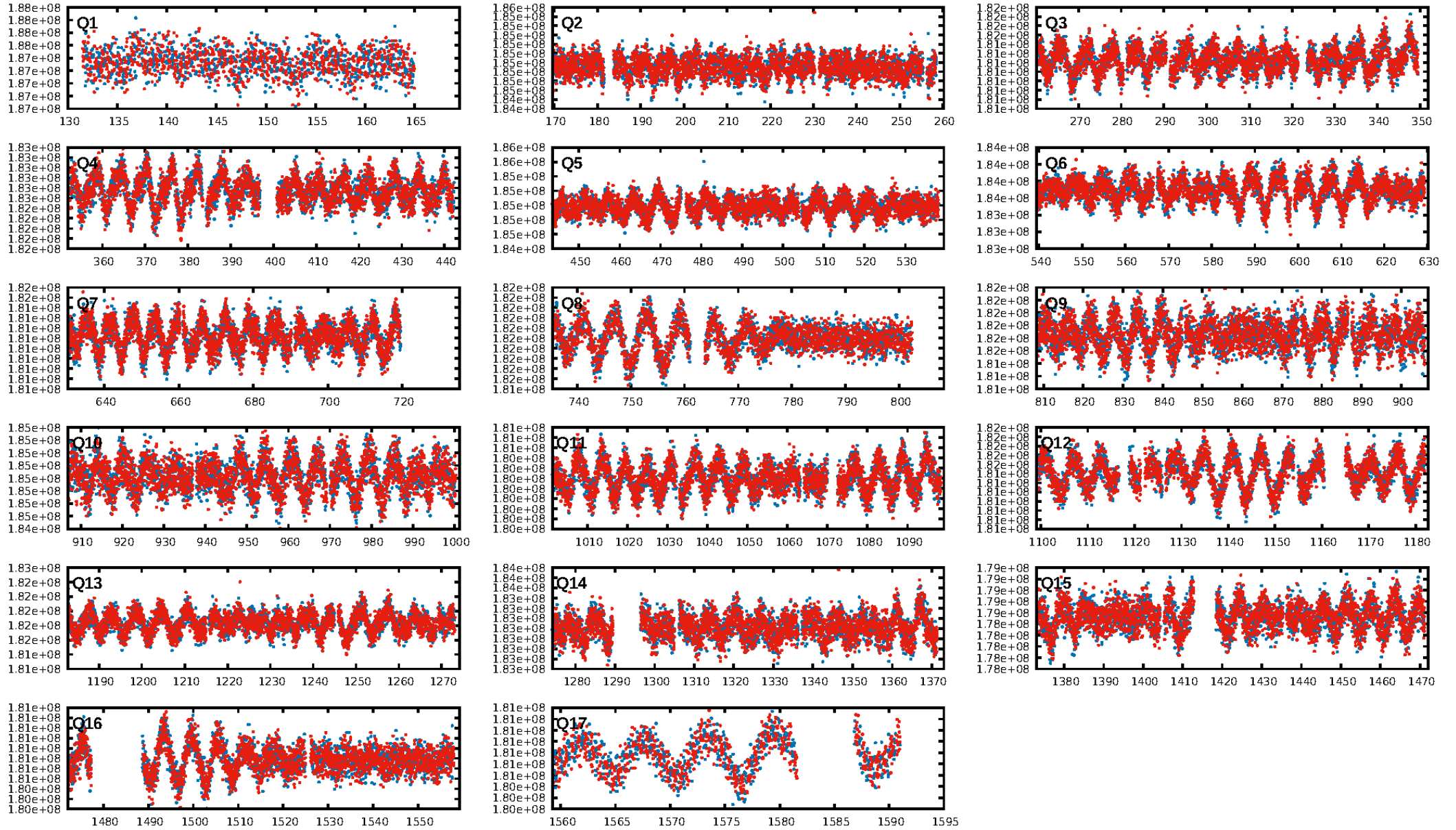
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [350.05σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.47e-16
RollingBand-fgt: 0.91 [1877/2069]
GhostDiagnostic-chr: 31.23
Centroid-sig: 27.1%
Centroid-so: 1.007 arcsec [1.23σ]
OotOffset-rm: 0.887 arcsec [2.79σ]
KicOffset-rm: 0.797 arcsec [2.23σ]
OotOffset-st: 3/3/3/4 [13]
KicOffset-st: 3/3/3/4 [13]
DiffImageQuality-fgm: 0.85 [11/13]
DiffImageOverlap-fno: 1.00 [17/17]

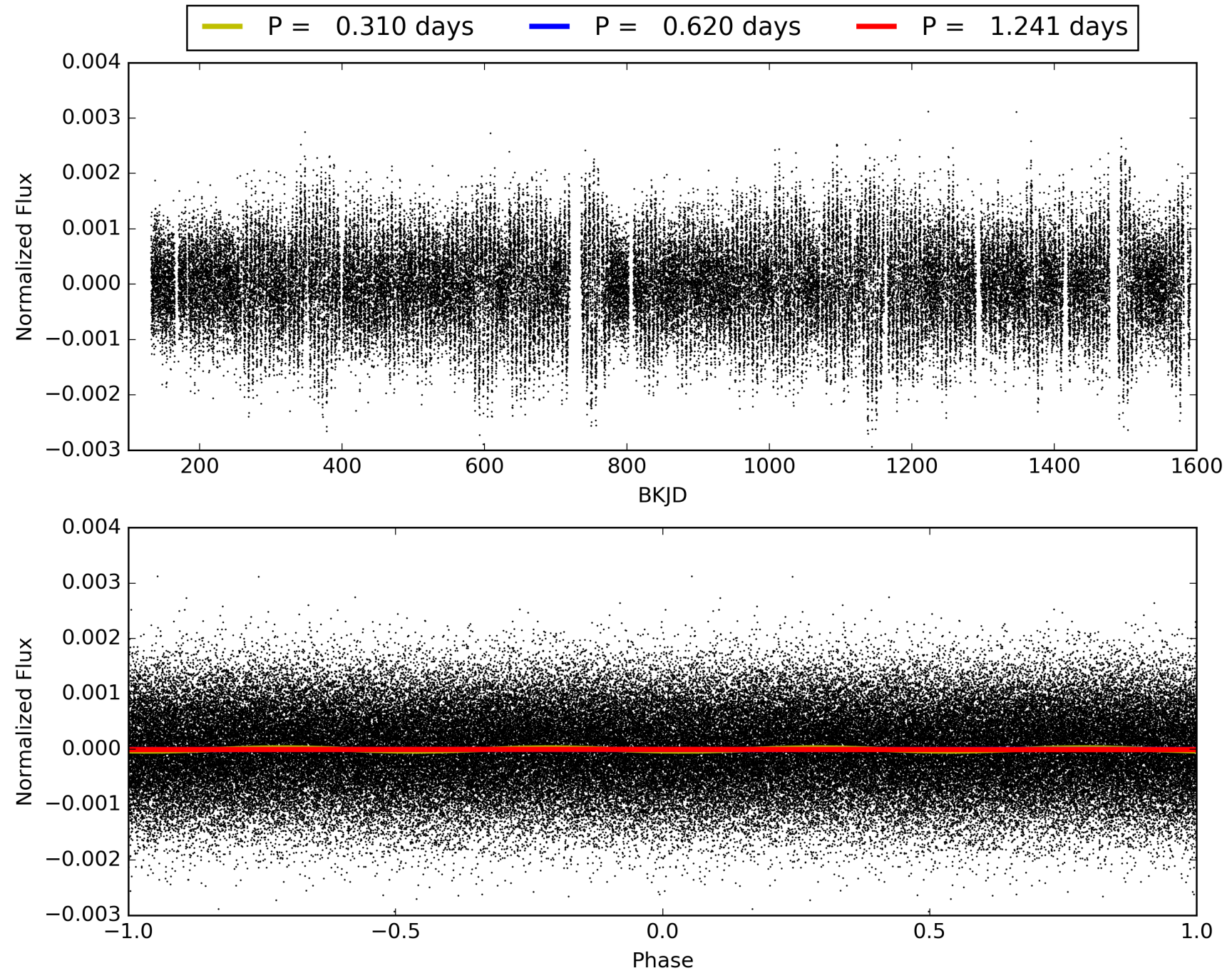
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:33:31 Z

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

TCE 008022144-01, PDC Light Curves

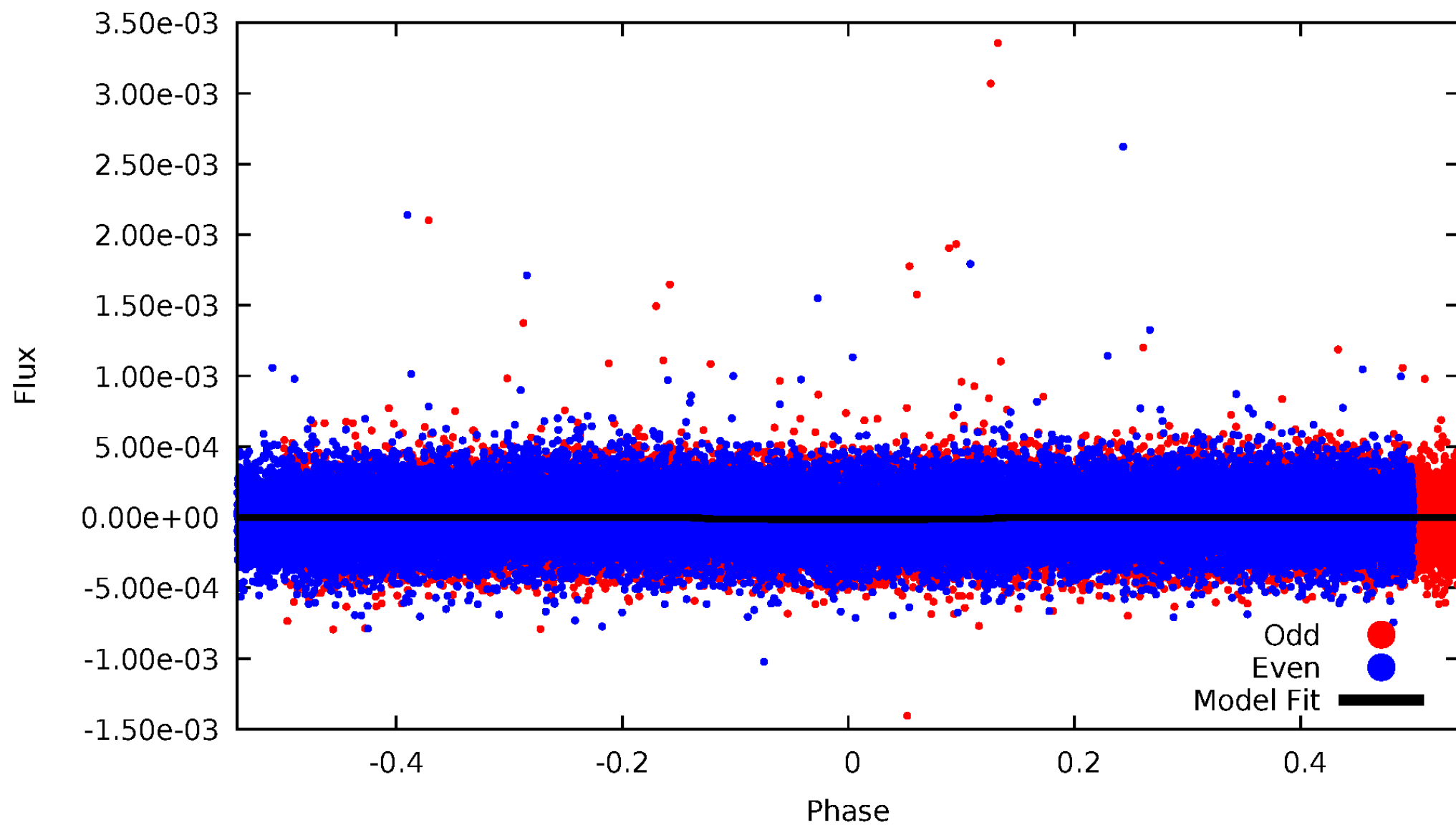


TCE 008022144-01



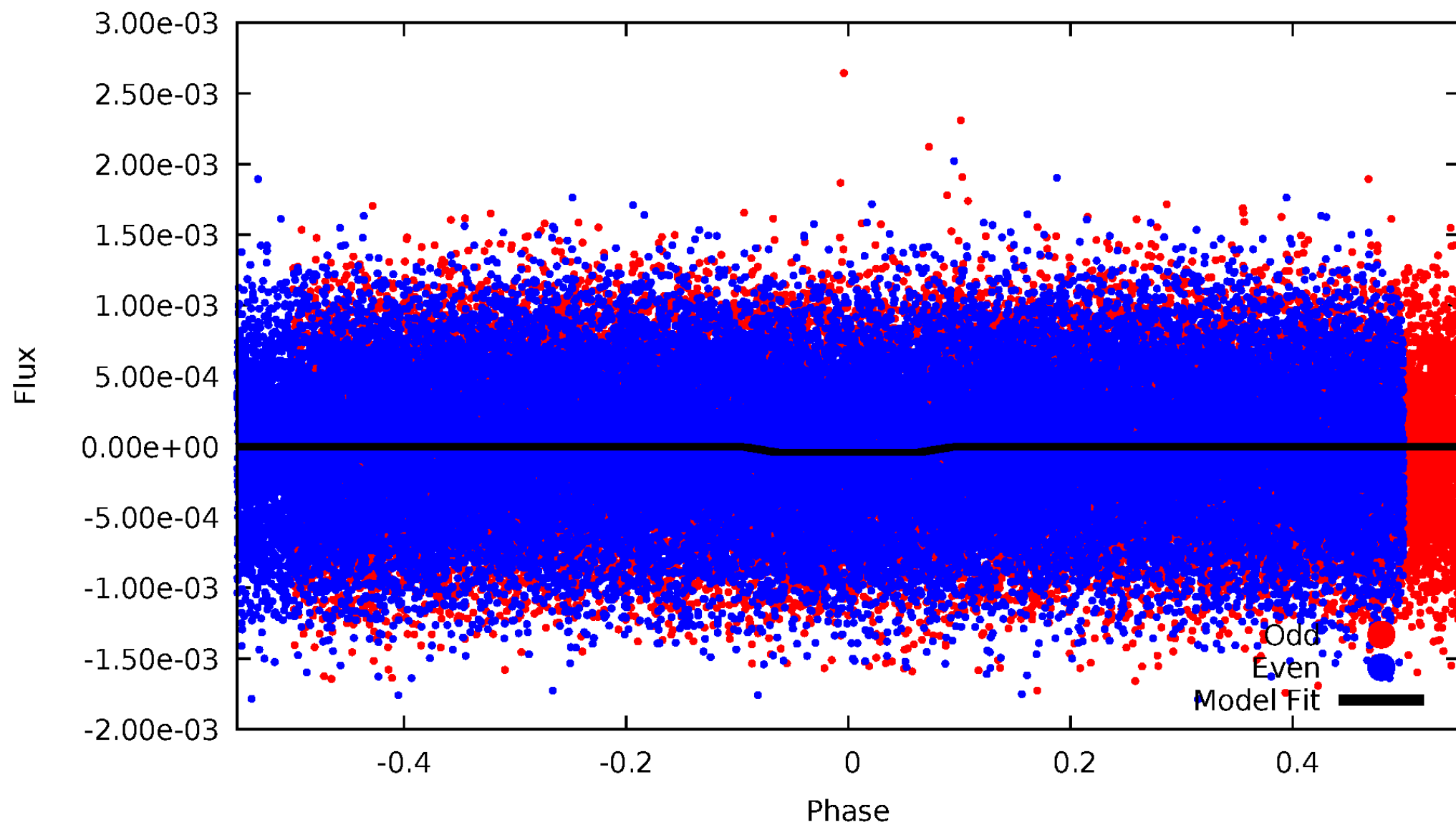
DV Odd/Even

TCE 008022144-01



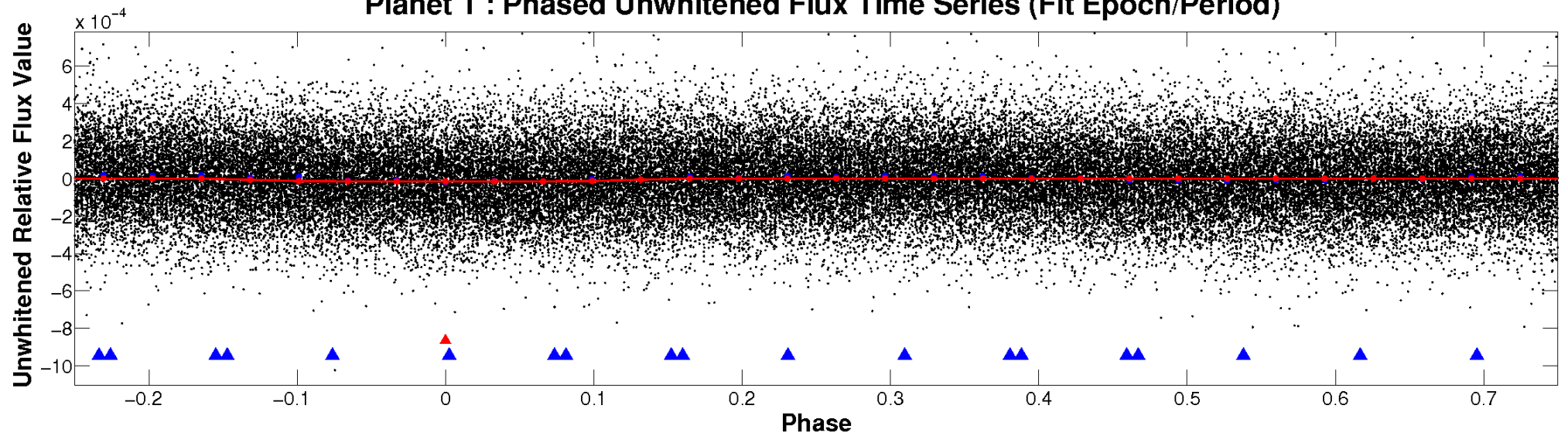
ALT Odd/Even

TCE 008022144-01

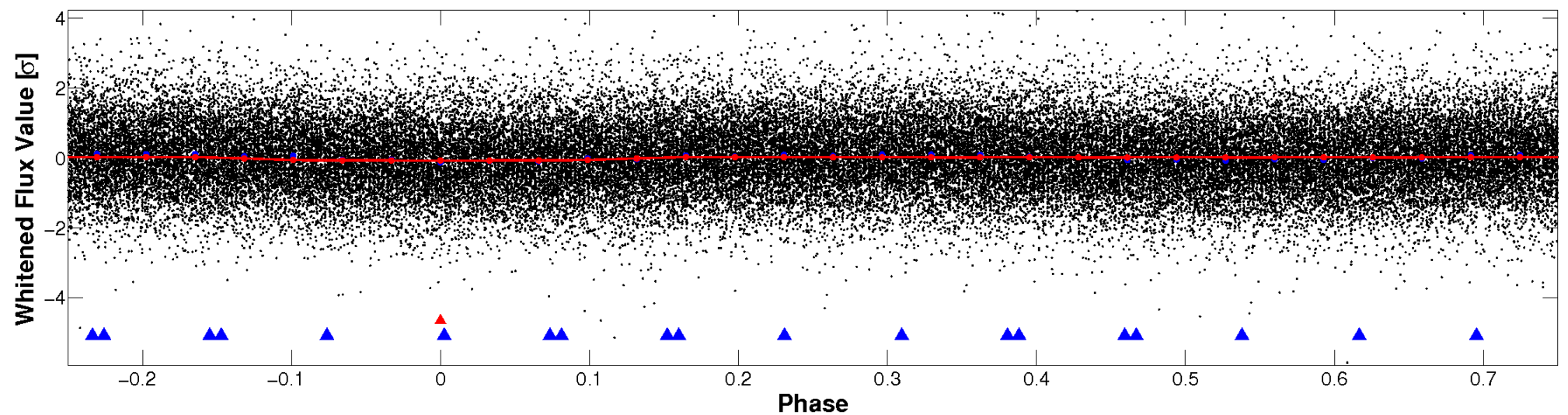


Non-Whitened Vs. Whitened Light Curve

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

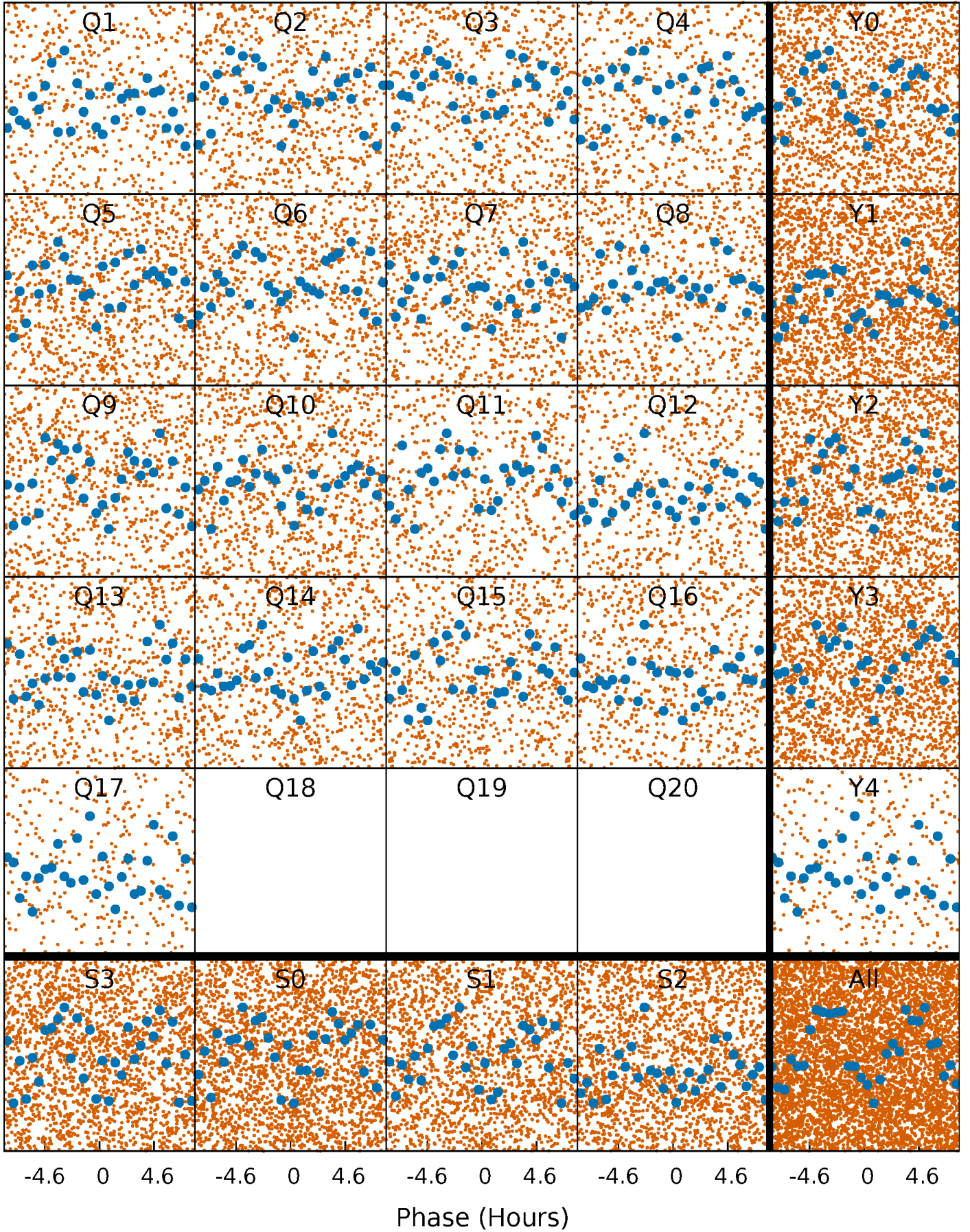


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



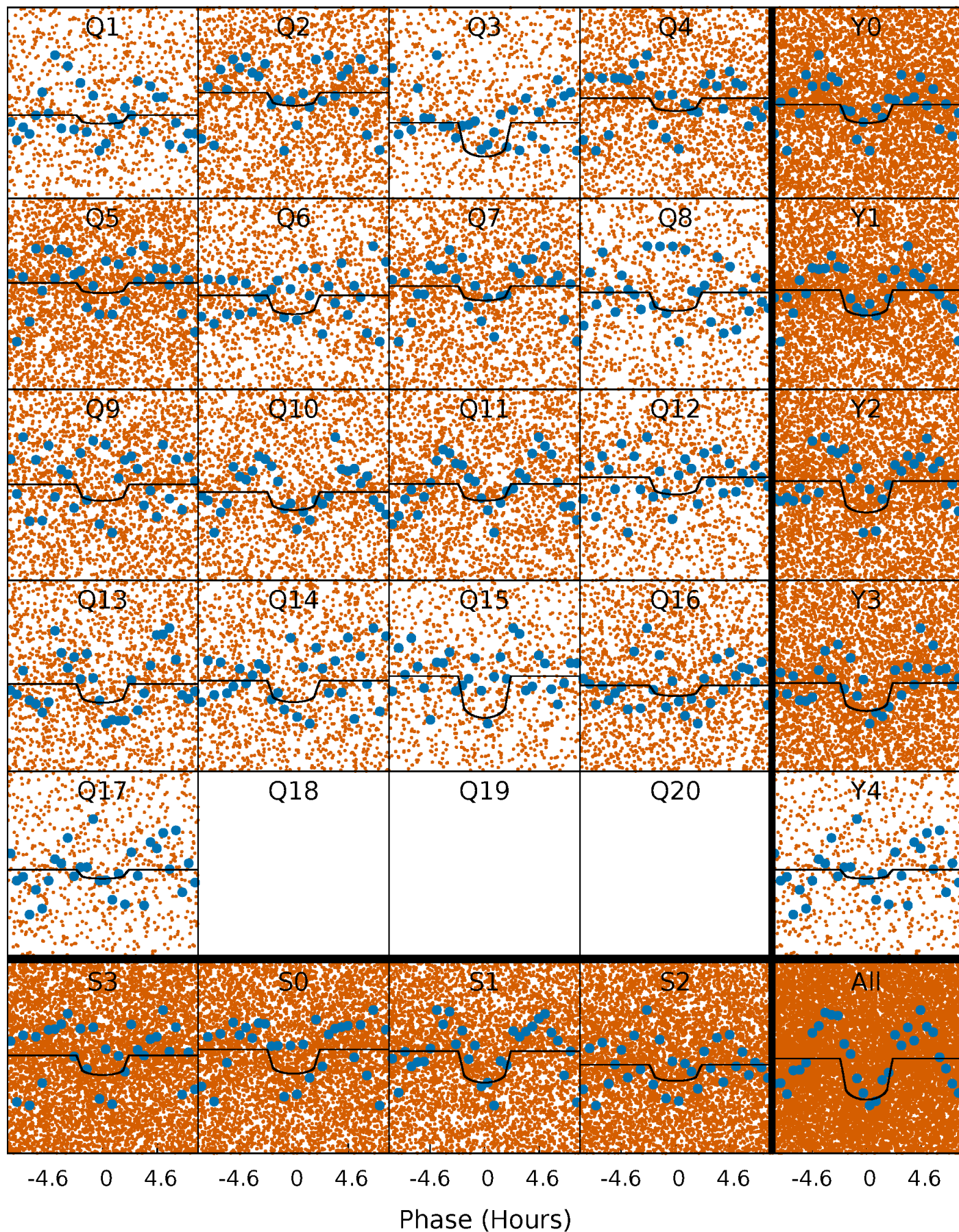
PDC Quarter-Phased Transit Curves

TCE 008022144-01 P= 0.620441 Days $T_0=131.541439$ (BKJD)



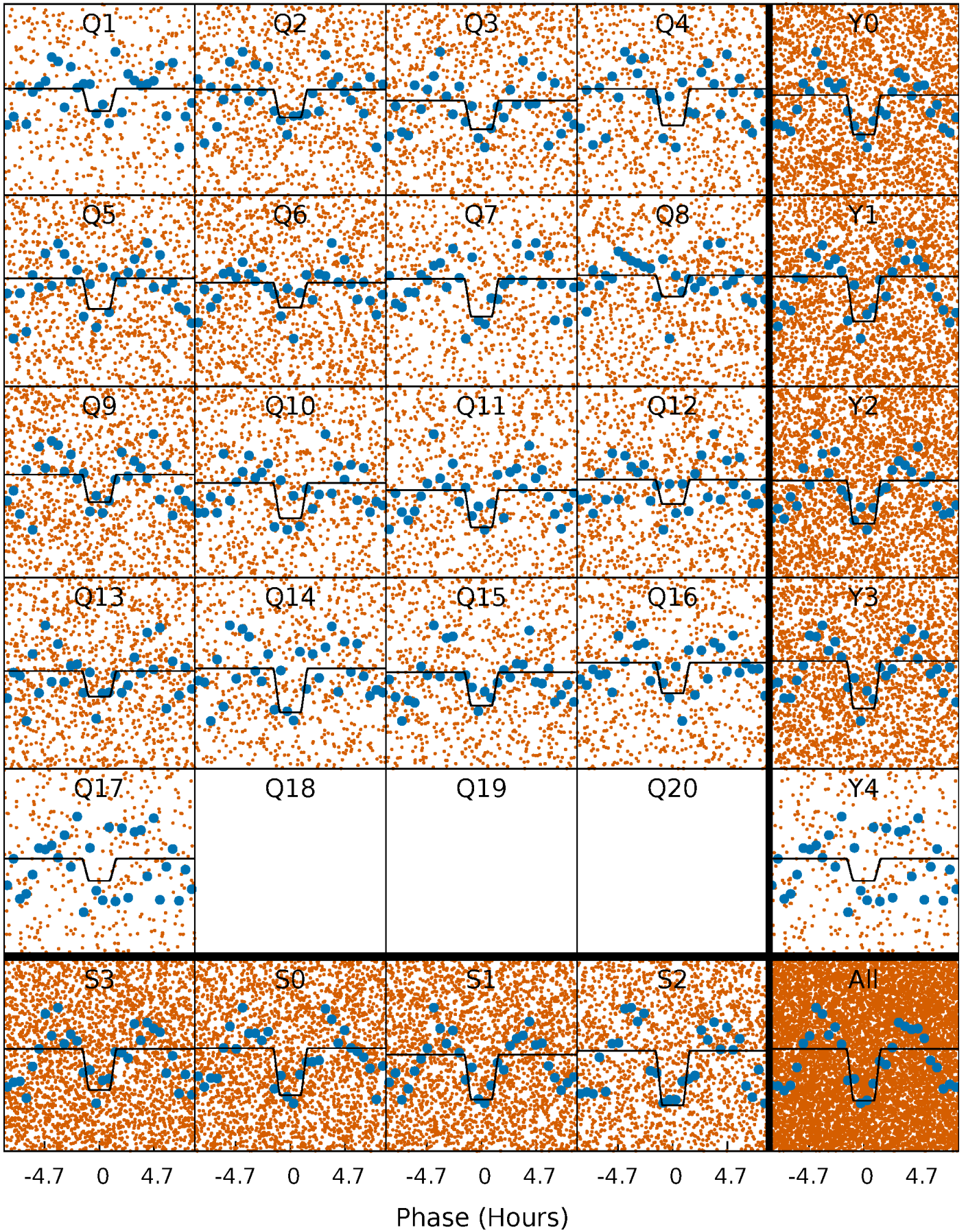
DV Quarter-Phased Transit Curves

TCE 008022144-01 P= 0.620441 Days $T_0=131.541439$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

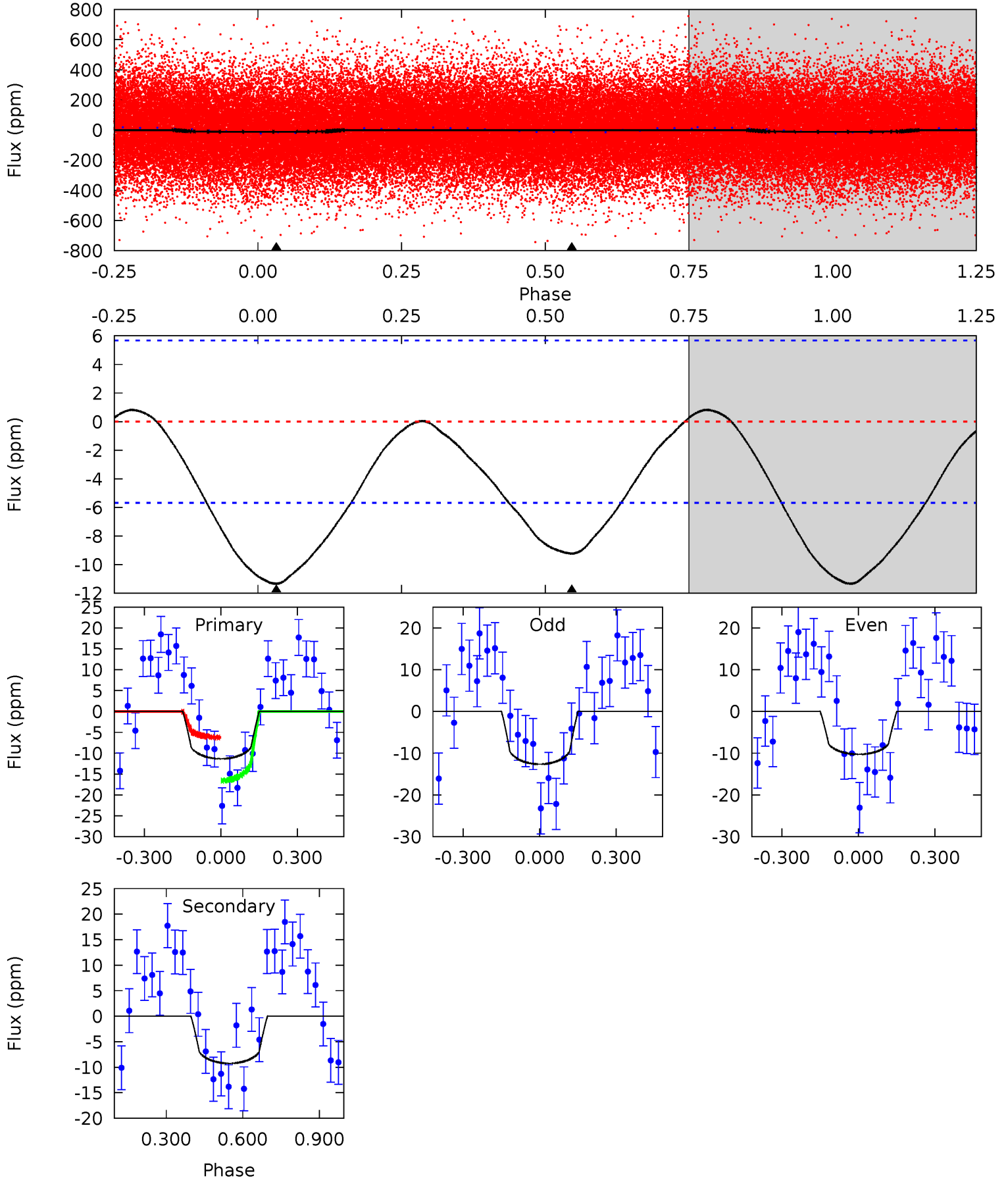
TCE 008022144-01 P= 0.620470 Days $T_0=131.527441$ (BKJD)



DV Model-Shift Uniqueness Test

008022144-01, P = 0.620441 Days, E = 130.920998 Days

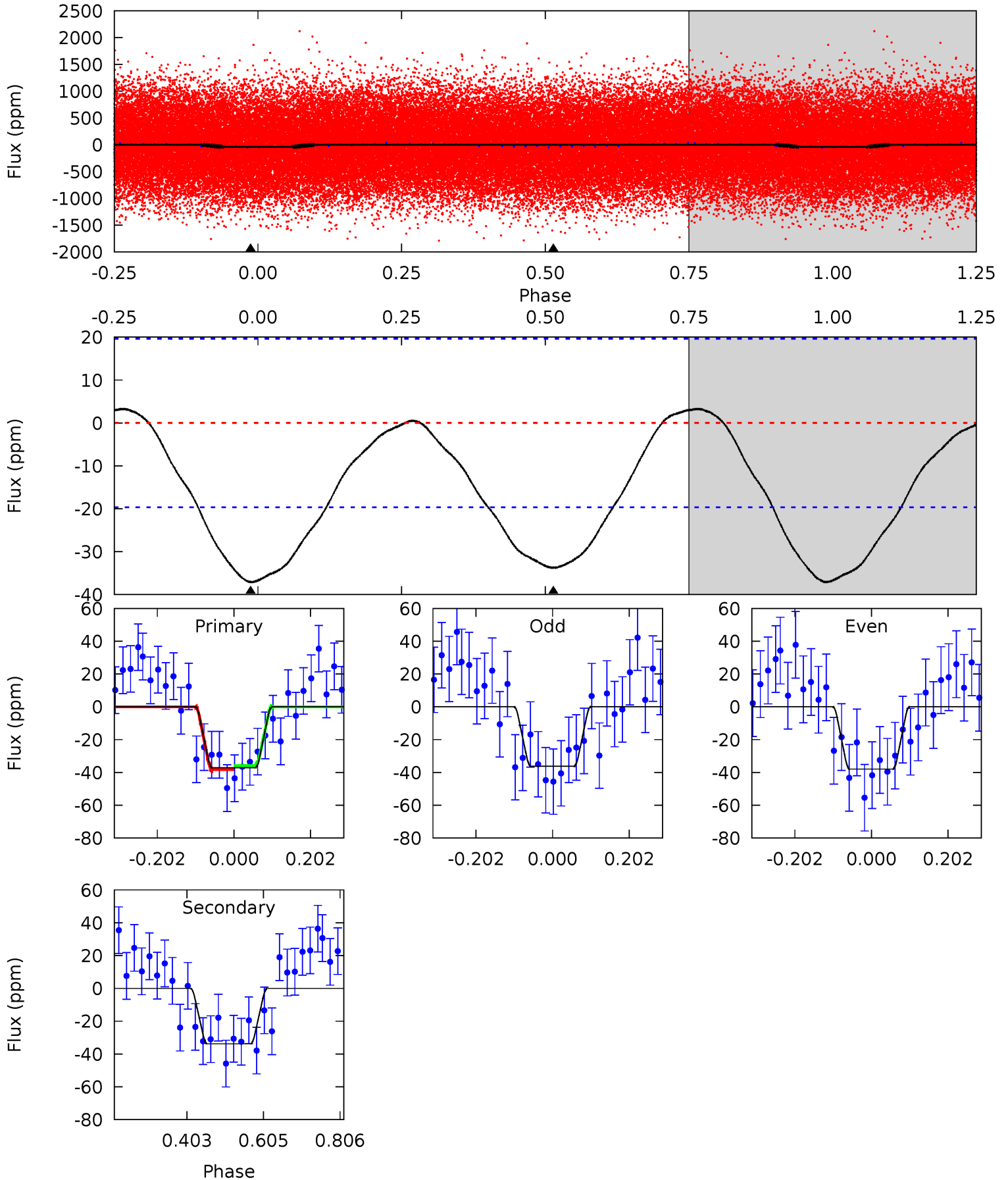
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.64	7.04	0	0	4.33	1.04	0.39	8.64	8.64	7.04	7.04	0.90	0.93	0.07	3.98



Alt Model-Shift Uniqueness Test

008022144-01, P = 0.620470 Days, E = 130.906971 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.34	7.58	0	0	4.42	1.28	0.58	8.34	8.34	7.58	7.58	0.18	1.15	0.08	0.28



Stellar Parameters For KIC 008022144

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8081^{+287}_{-287}	$4.135^{+0.165}_{-0.149}$	$-0.520^{+0.200}_{-0.300}$	$1.731^{+0.455}_{-0.372}$	$1.492^{+0.177}_{-0.197}$	$0.405^{+0.389}_{-0.170}$
	+4%/-4%	+4%/-4%	+38%/-58%	+26%/-21%	+12%/-13%	+96%/-42%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 008022144-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-9 ± 1	$0.74^{+0.36}_{-0.35}$	5132^{+373}_{-352}	6658^{+3522}_{-1446}	$2.387^{+6.048}_{-1.327}$
Alt.	-34 ± 4	$1.23^{+0.39}_{-0.39}$	5156^{+353}_{-338}	7293^{+1894}_{-1109}	$3.196^{+3.321}_{-1.374}$

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

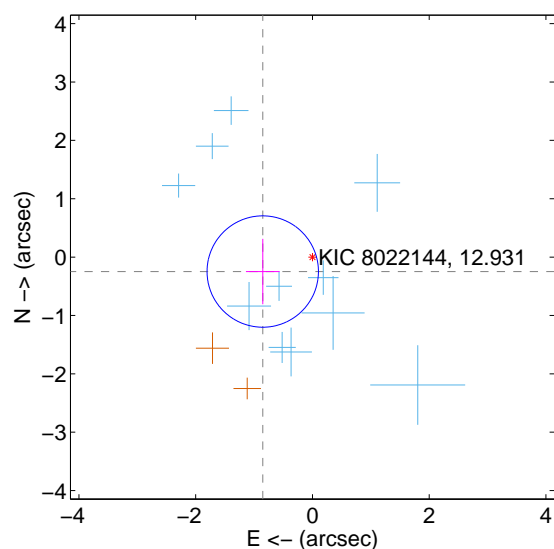
Supplemental centroid analysis for 008022144-01. Kepler magnitude: 12.93. Transit SNR 9.41

There are 11 quarters with good PRF difference image offsets

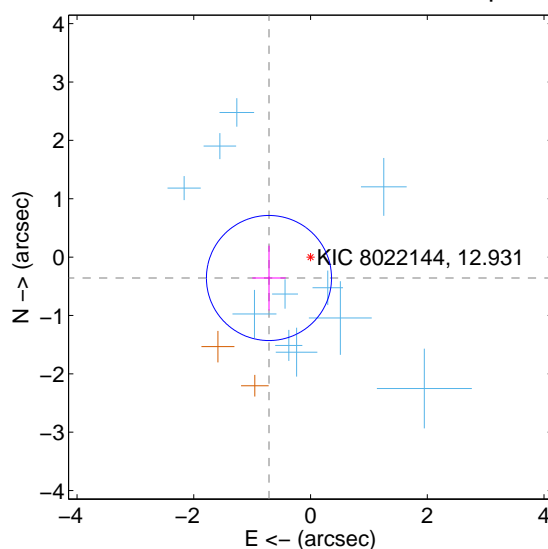
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.887 ± 0.318	2.79	0.851 ± 0.288	-0.247 ± 0.560
PRF-fit source offset from KIC position	0.797 ± 0.357	2.23	0.712 ± 0.286	-0.358 ± 0.554
photometric centroid source offset	1.01 ± 0.82	1.23	-0.86 ± 0.80	-0.52 ± 0.86

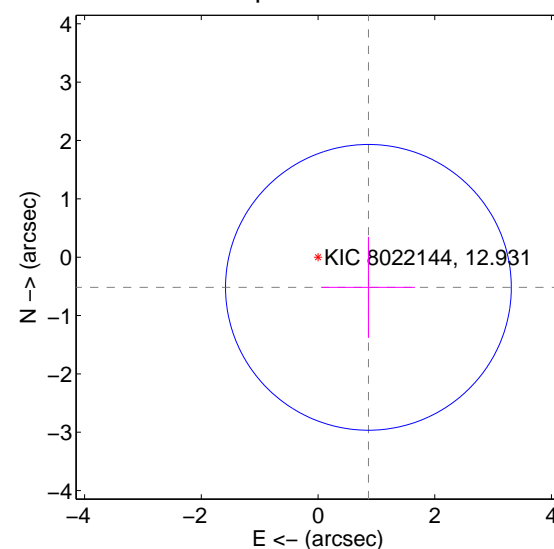
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

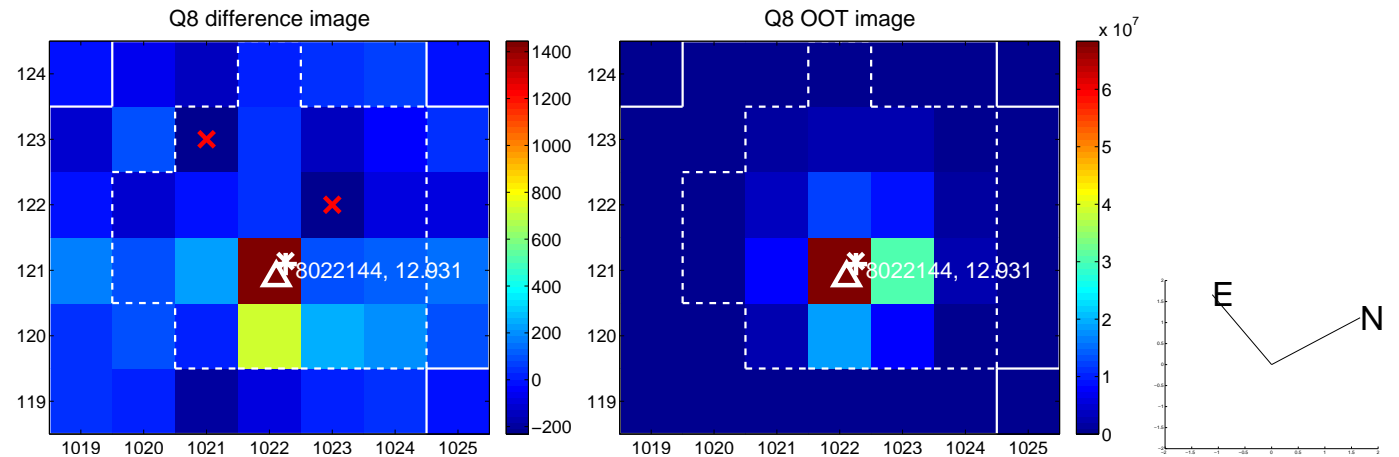
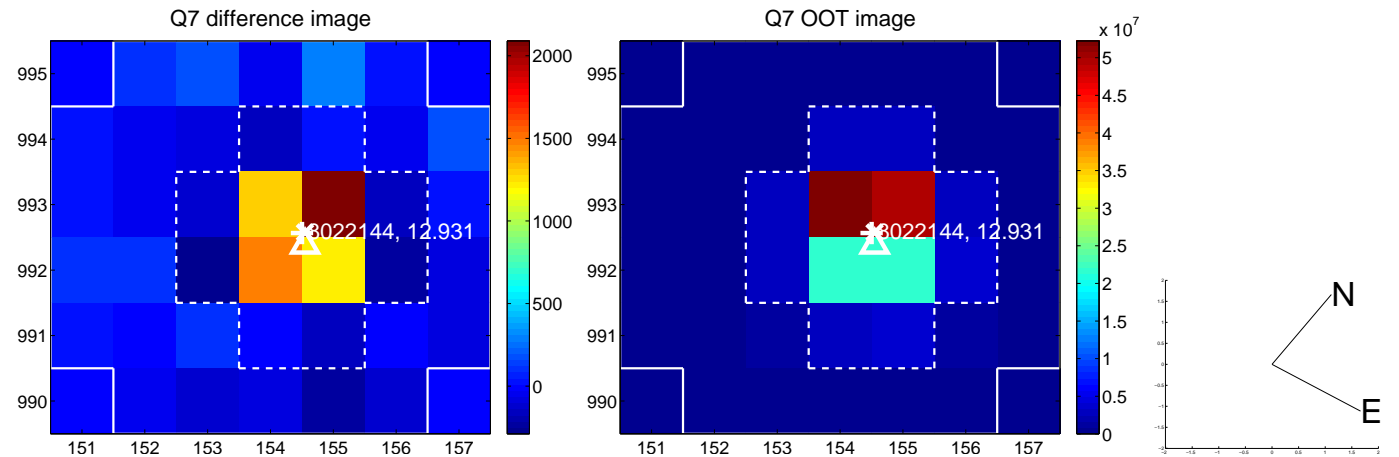
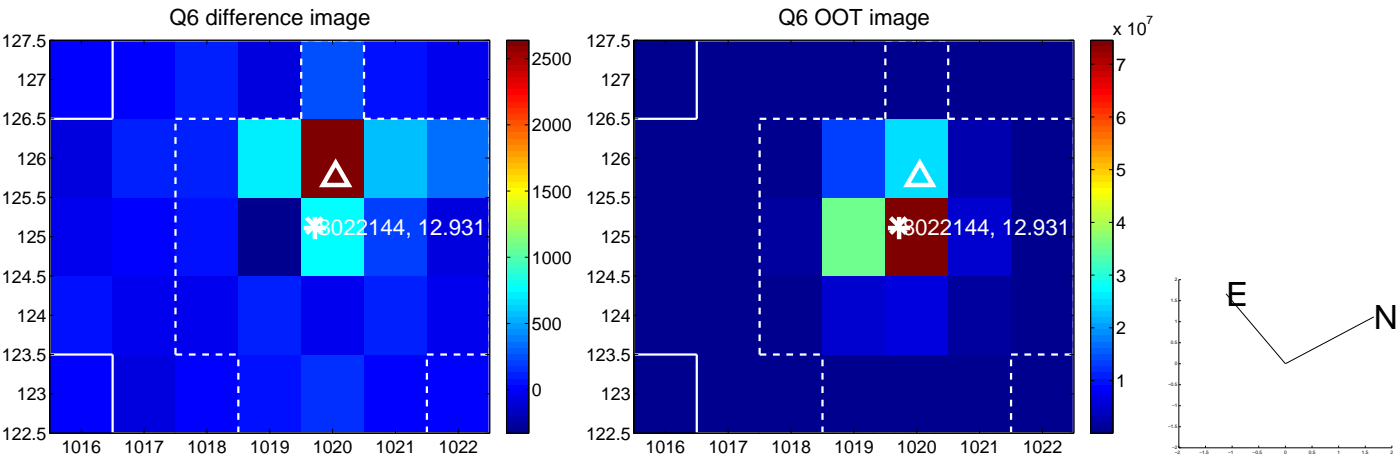
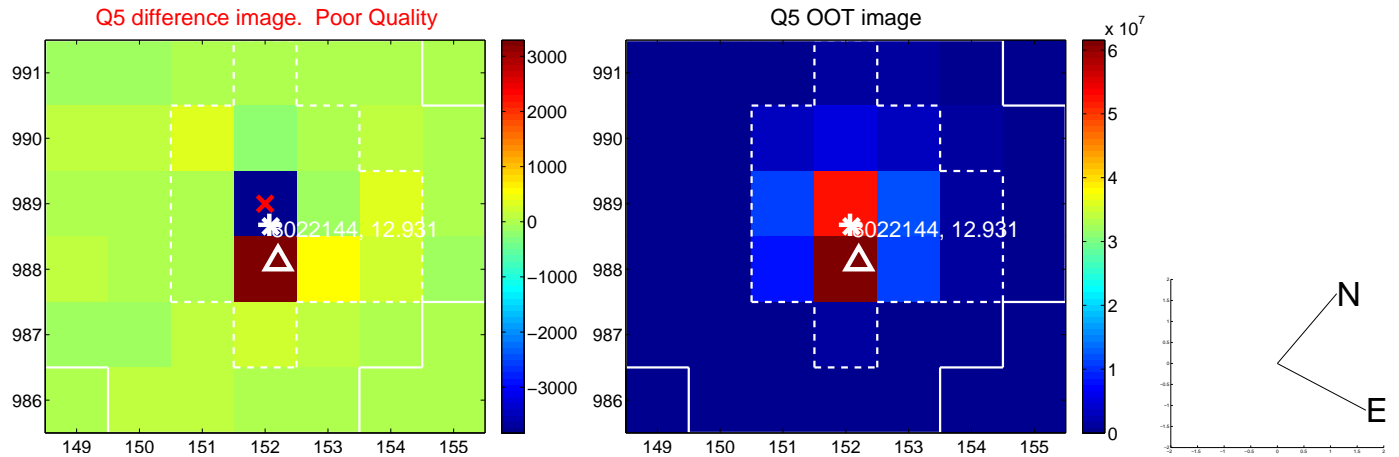


offset from photometric centroids

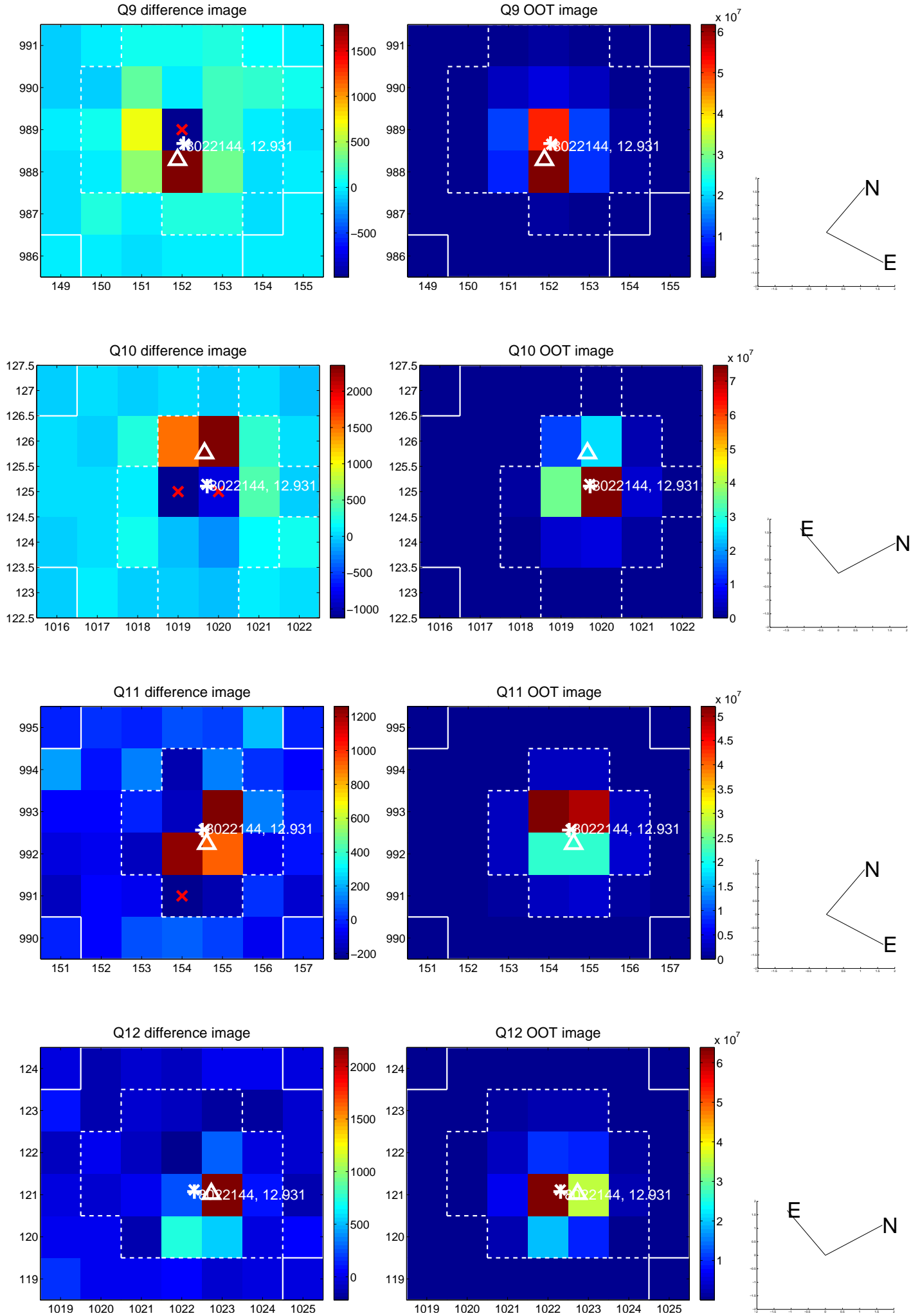


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

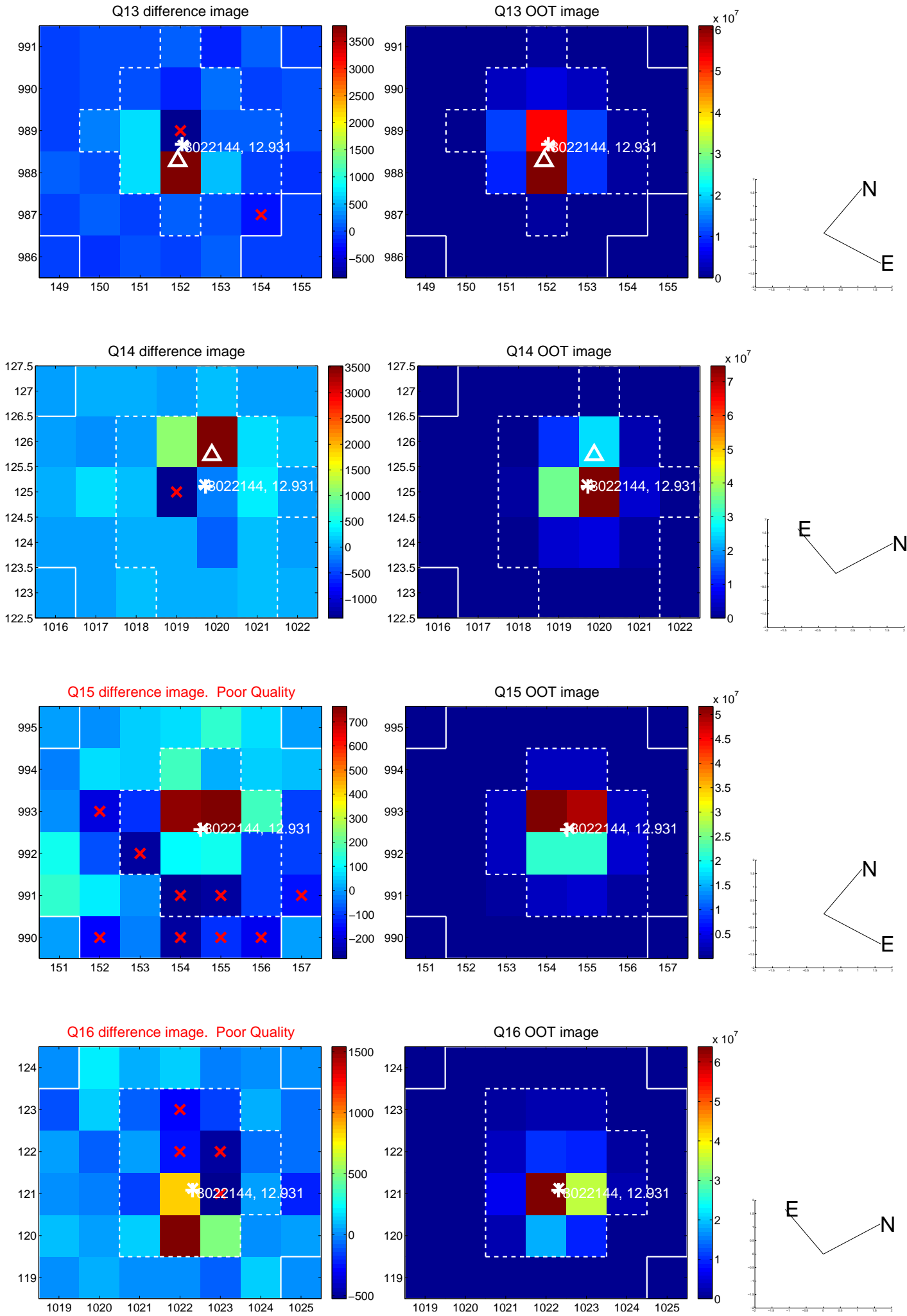
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



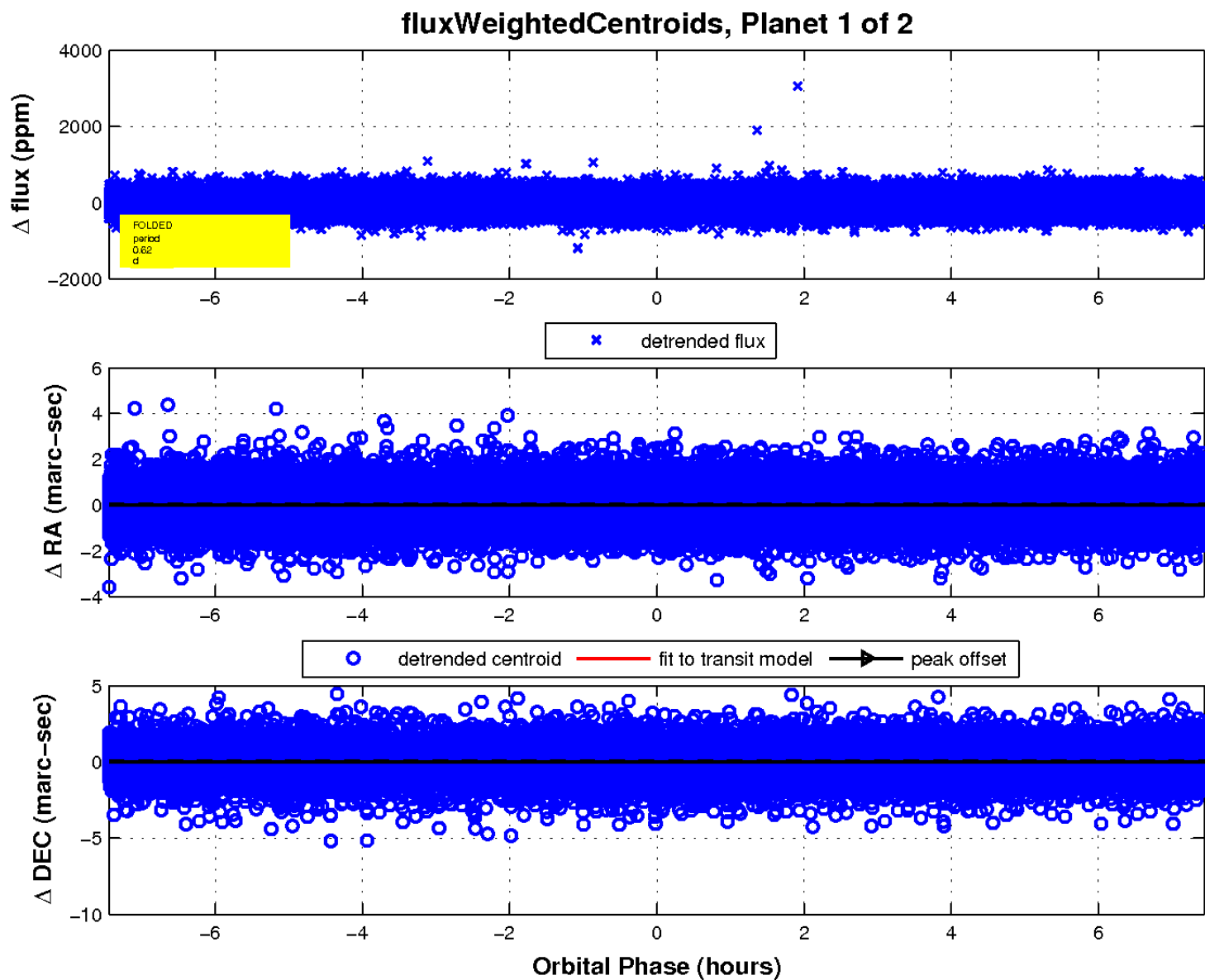
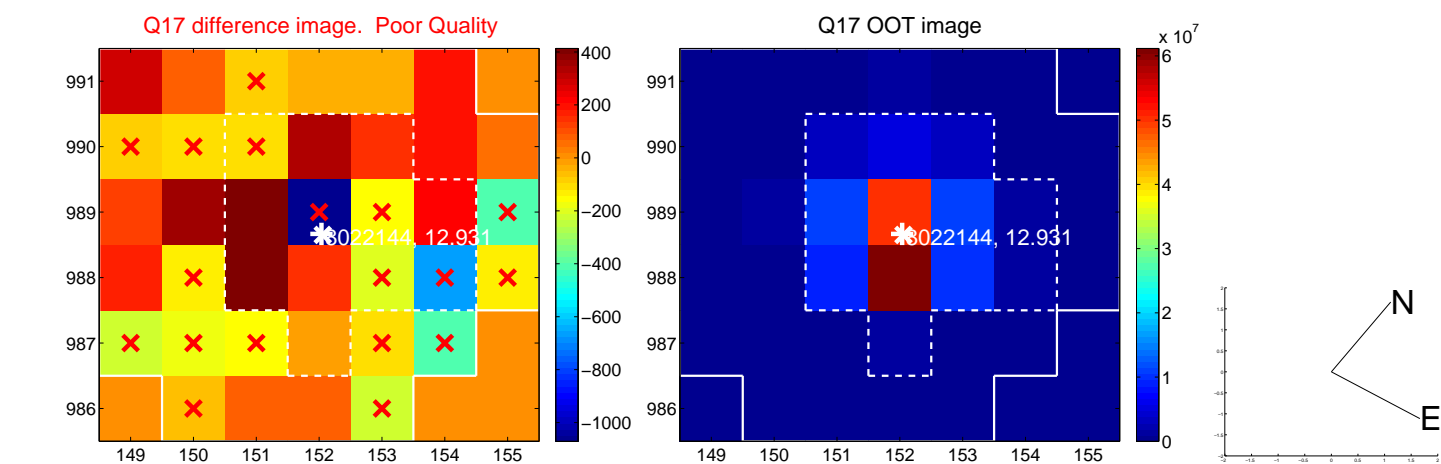
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

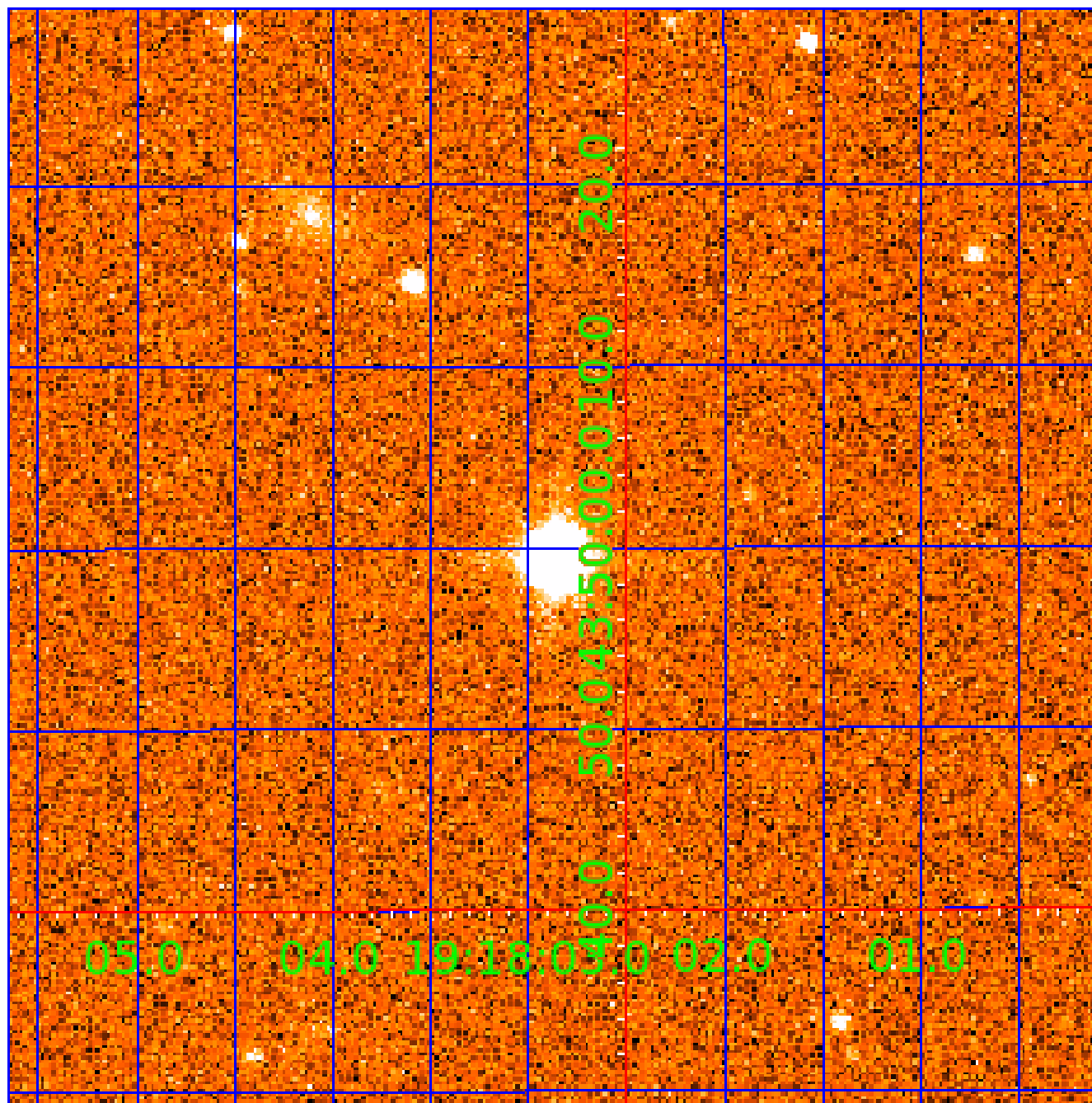


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008022144

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})
008022144-01	OBS	No	0.620441	131.541439	15.7	4.026	10.7	9.4	1.73	8081	0.74	43253.23
008022144-02	OBS	No	76.123745	158.456555	302.3	3.255	9.8	5.5	1.73	8081	3.38	70.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008022144-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
008022144-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

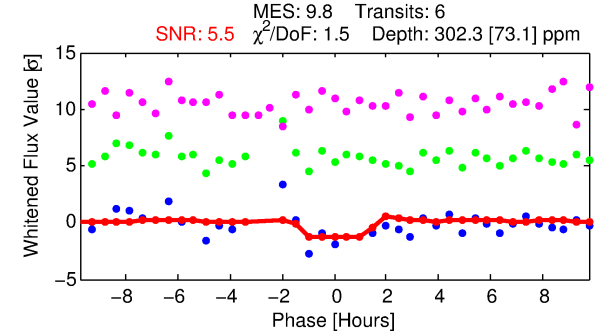
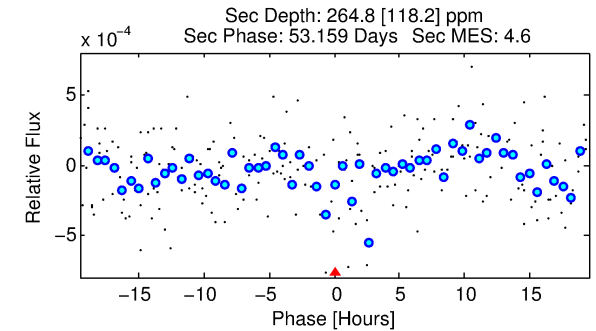
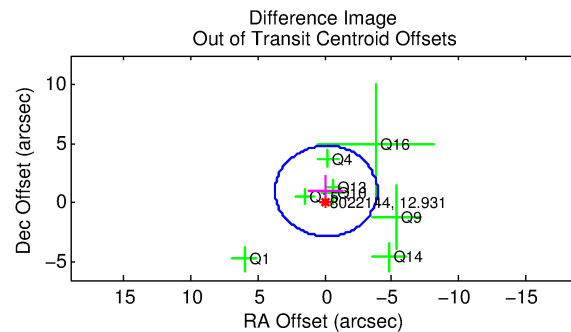
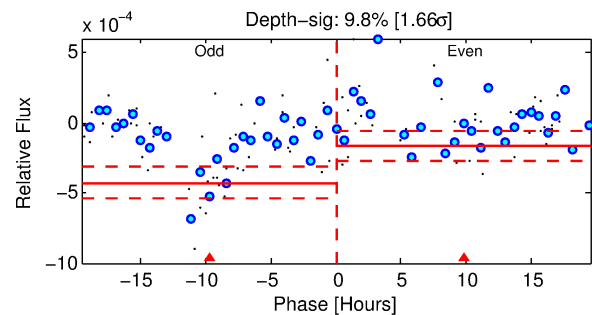
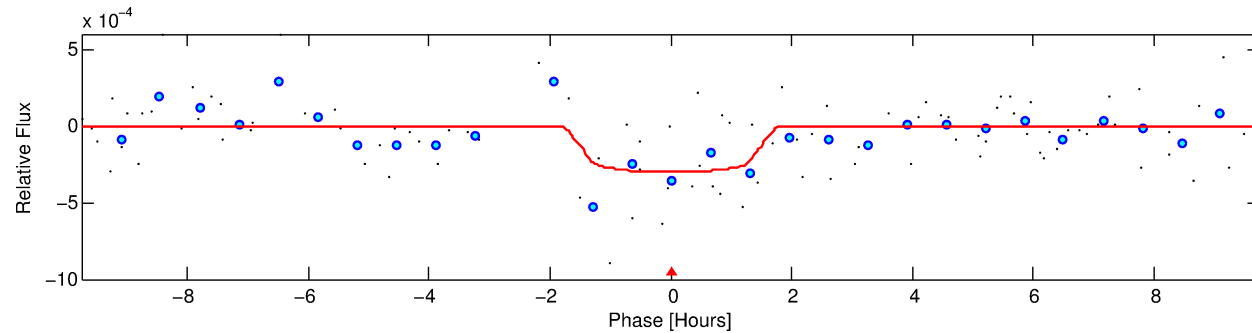
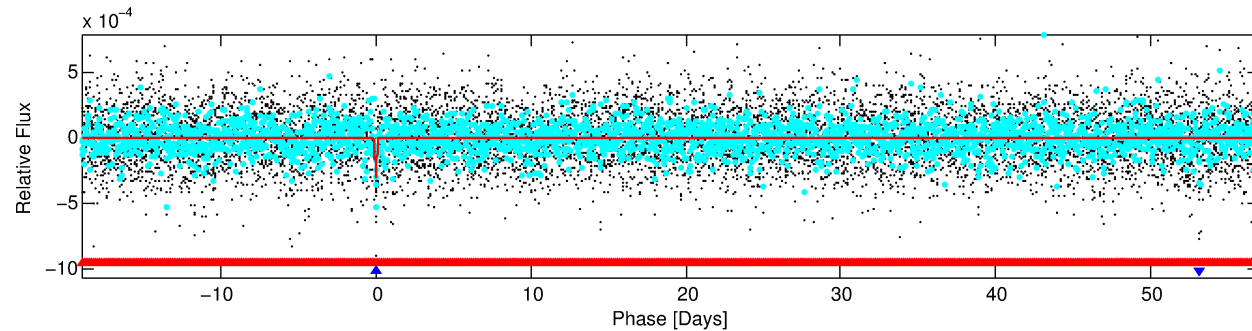
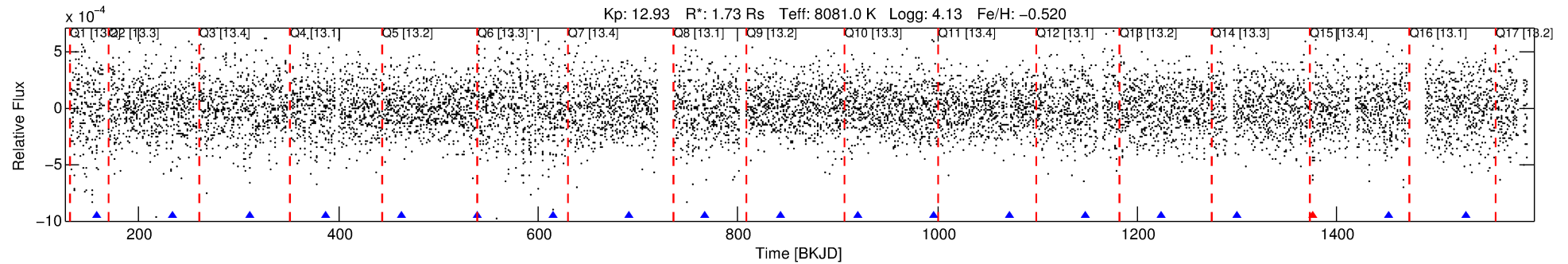
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008022144-02

No Significant Match Found

DV One-Page Summary

KIC: 8022144 Candidate: 2 of 2 Period: 76.124 d



DV Fit Results:

Period = 76.12374 [0.00154] d
Epoch = 158.4566 [0.0118] BKJD
Rp/R* = 0.0179 [0.0376]
a/R* = 102.22 [1345.68]
b = 0.84 [4.58]
Seff = 70.95 [24.06]
Teq = 740 [63] K
Rp = 3.38 [7.16] Re
a = 0.4017 [0.0869] AU
Ag = 2062.16 [8746.33] [0.24σ]
Teffp = 7710 [8159] K [0.85σ]

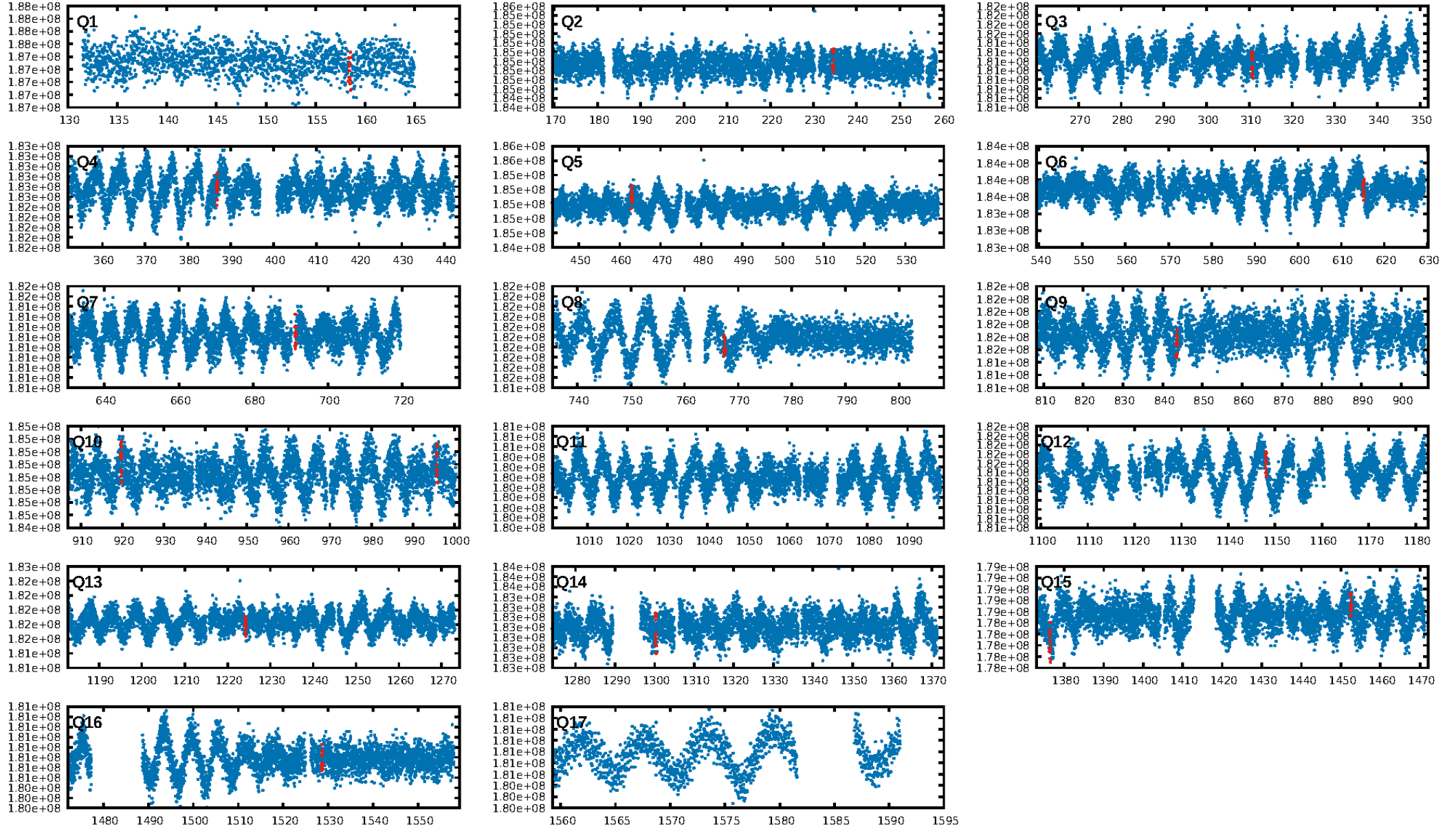
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [350.05σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.5%
ModelChiSquareGof-sig: 86.5%
Bootstrap-pfa: 2.13e-13
RollingBand-fgt: 0.80 [4/5]
GhostDiagnostic-chr: 1.201
Centroid-sig: 1.3%
Centroid-so: 0.987 arcsec [1.83σ]
OotOffset-rm: 1.023 arcsec [0.80σ]
OotOffset-st: 2/1/2/3 [8]
KicOffset-rm: 0.839 arcsec [0.65σ]
KicOffset-st: 2/1/2/3 [8]
DiffImageQuality-fgm: 0.25 [2/8]
DiffImageOverlap-fno: 0.00 [0/14]

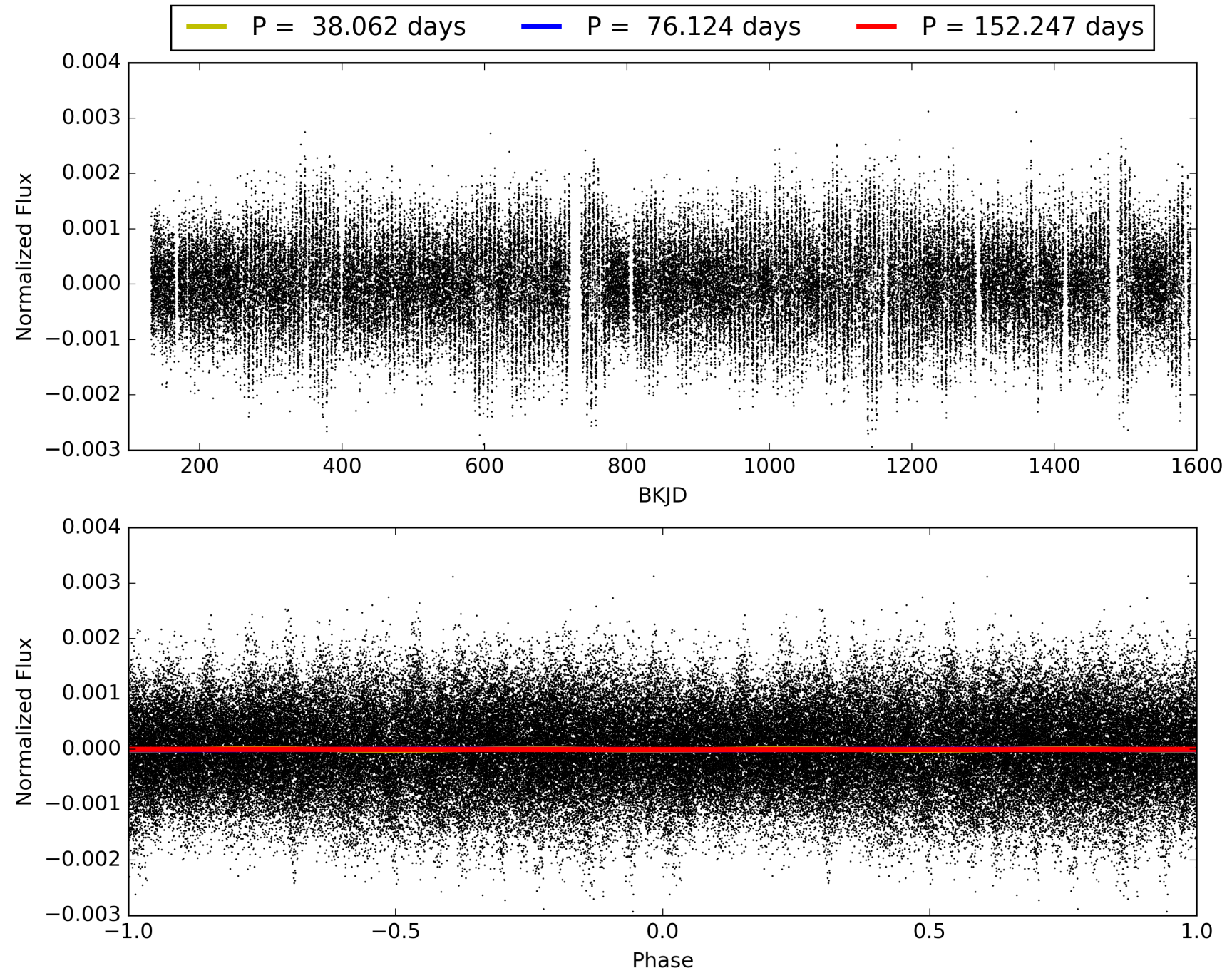
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:33:42 Z

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

TCE 008022144-02, PDC Light Curves

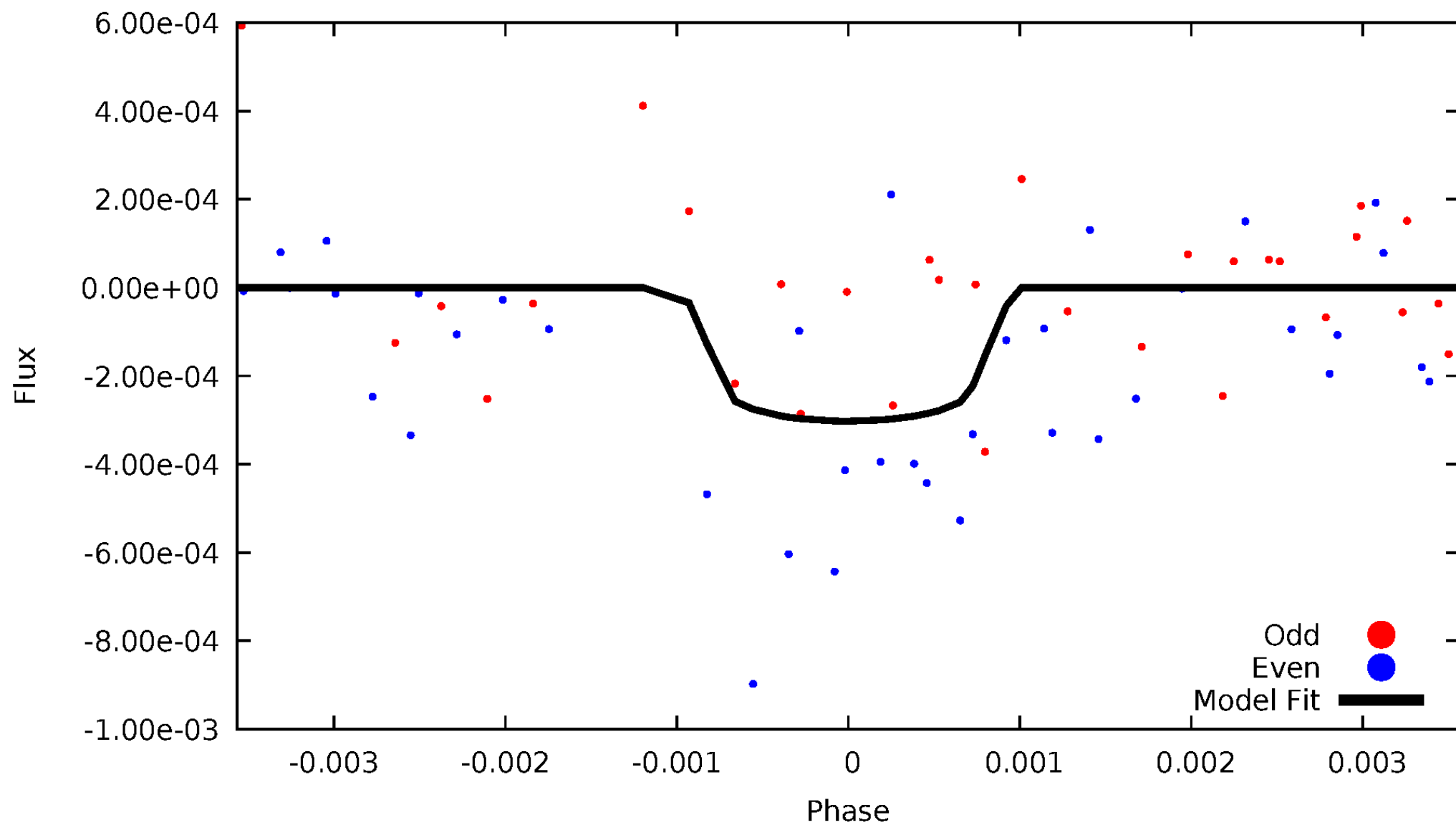


TCE 008022144-02



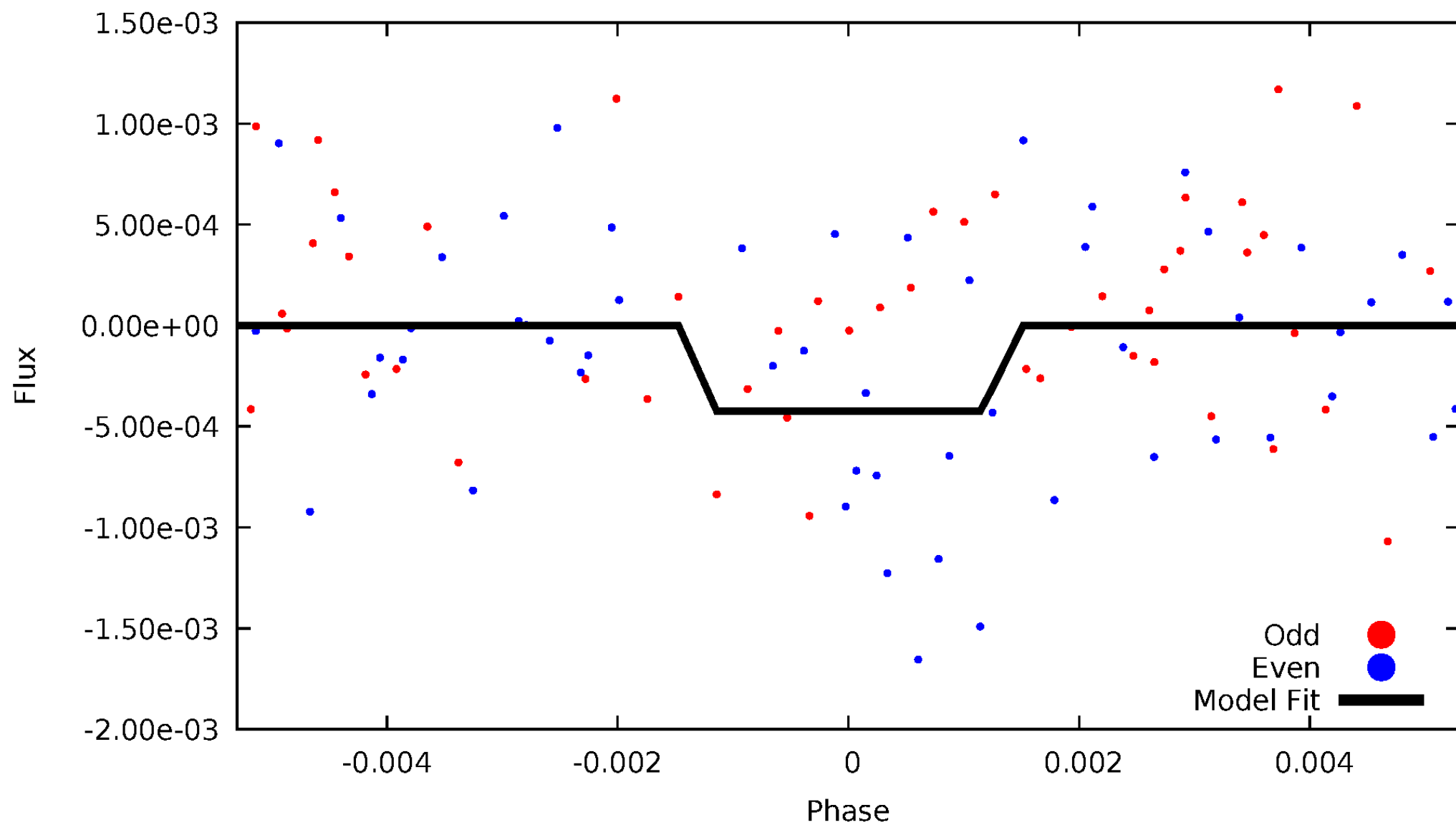
DV Odd/Even

TCE 008022144-02



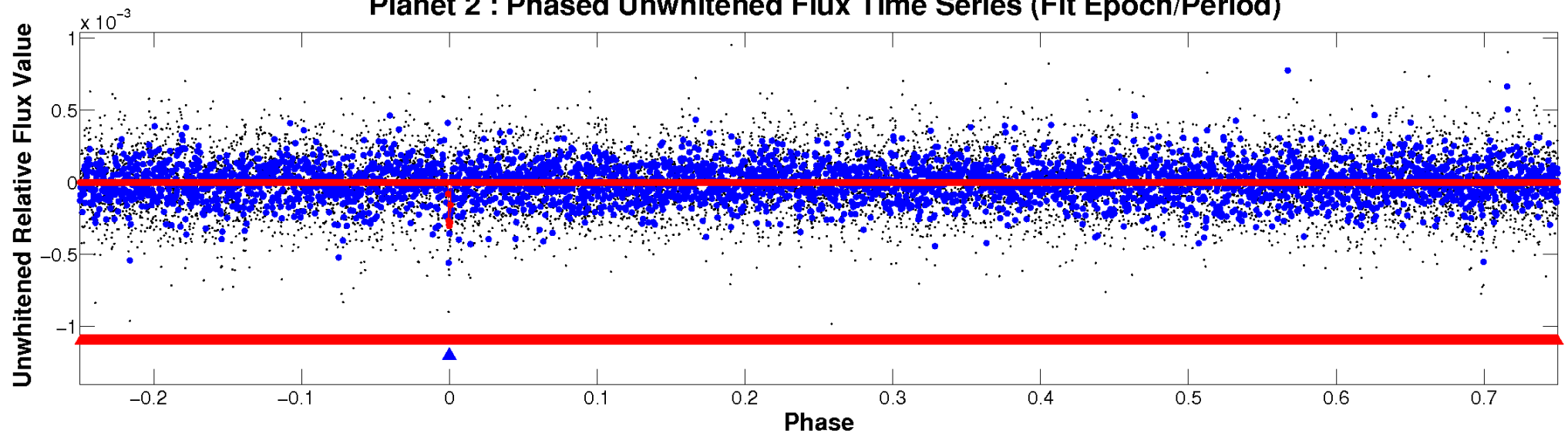
ALT Odd/Even

TCE 008022144-02

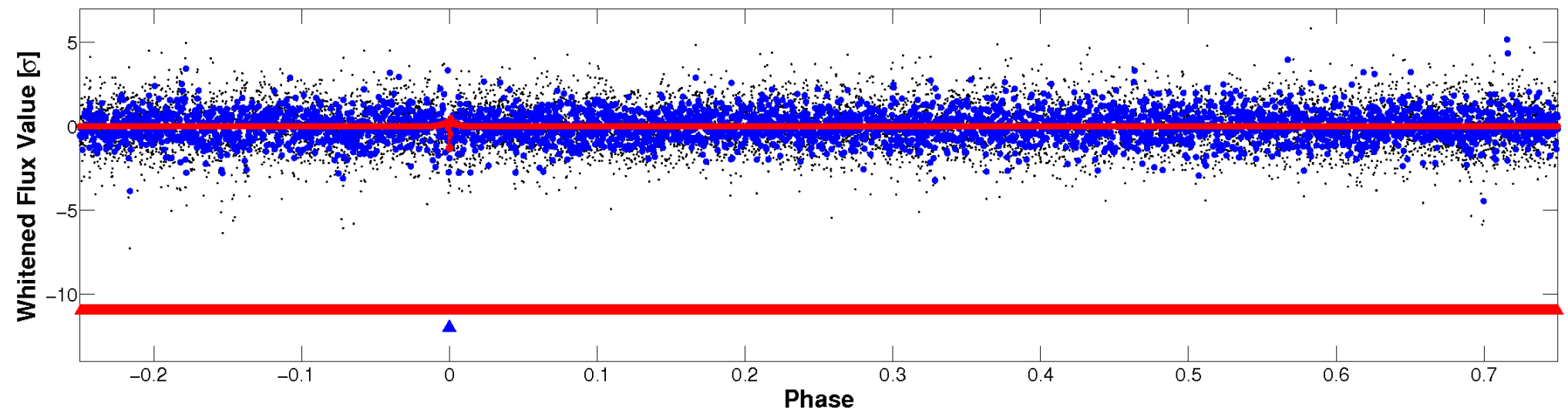


Non-Whitened Vs. Whitened Light Curve

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

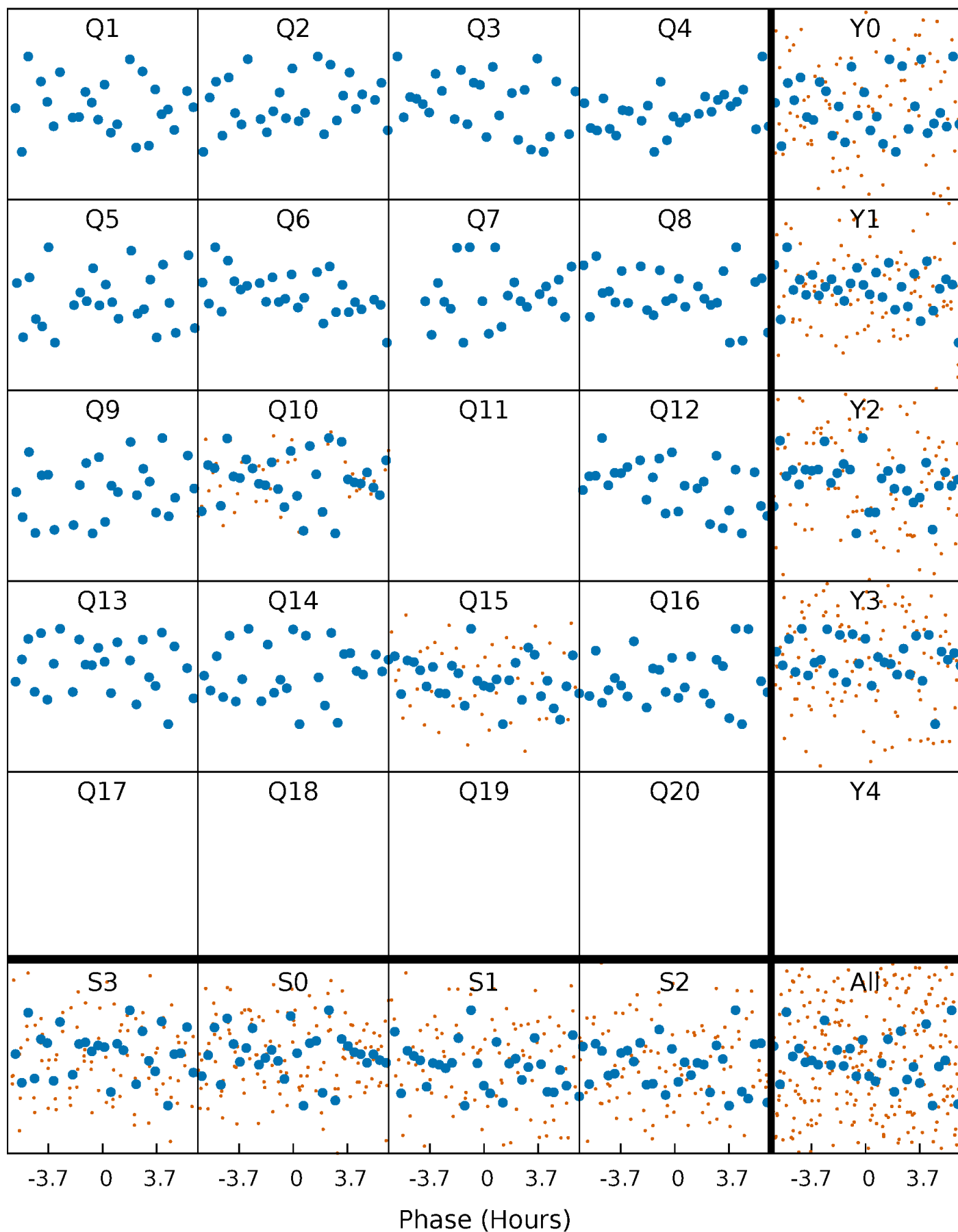


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



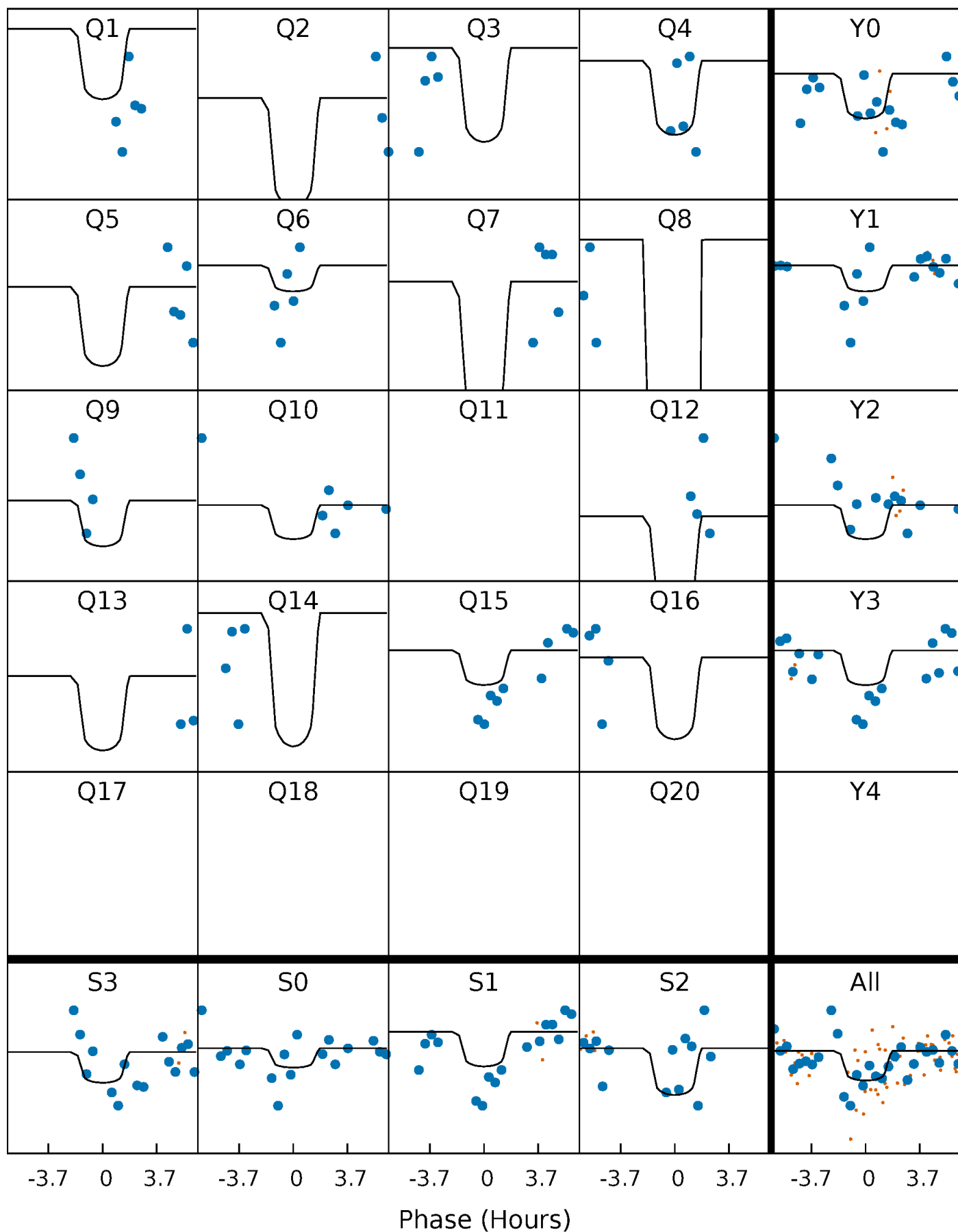
PDC Quarter-Phased Transit Curves

TCE 008022144-02 P= 76.123745 Days $T_0=158.456555$ (BKJD)



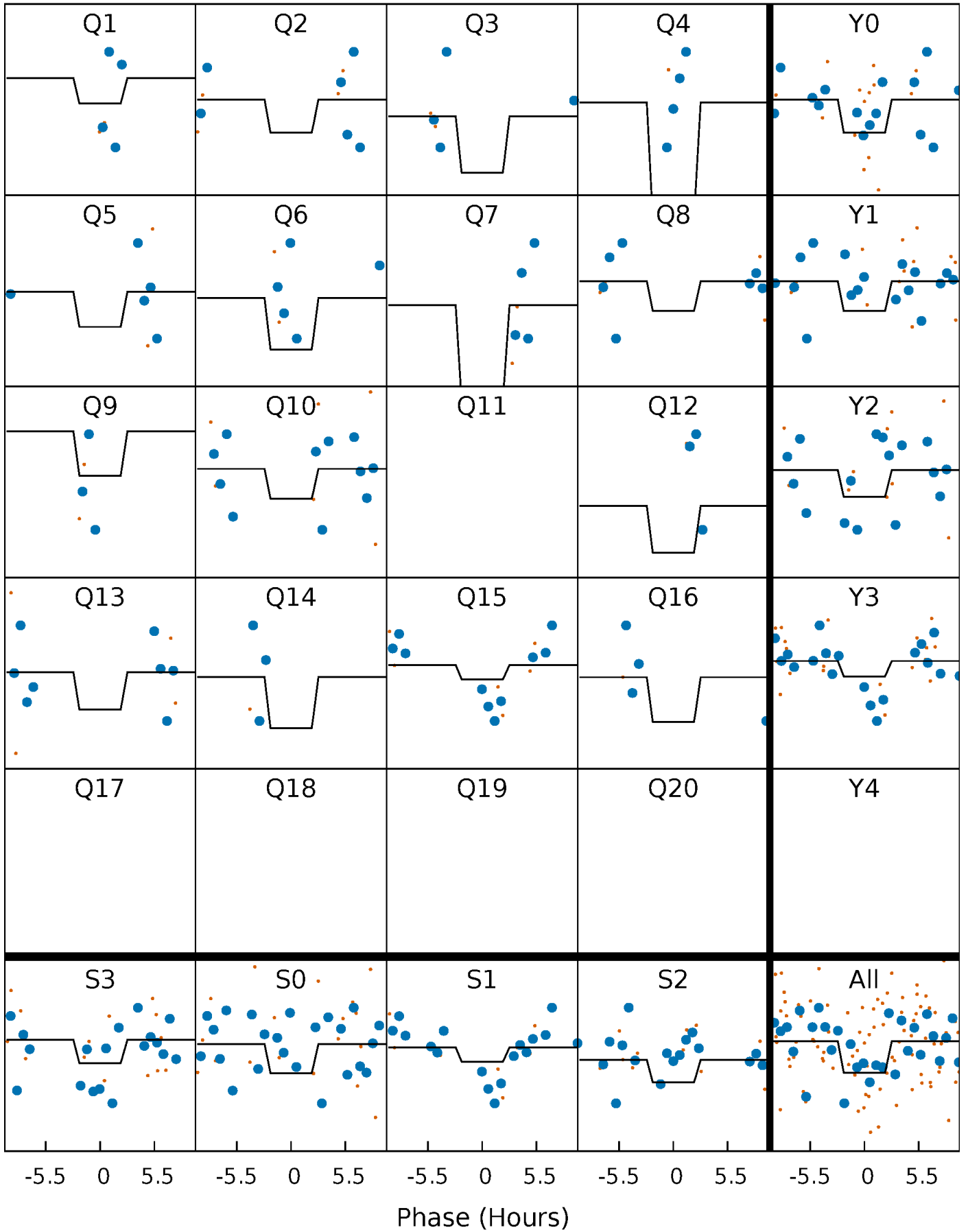
DV Quarter-Phased Transit Curves

TCE 008022144-02 P= 76.123745 Days $T_0=158.456555$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

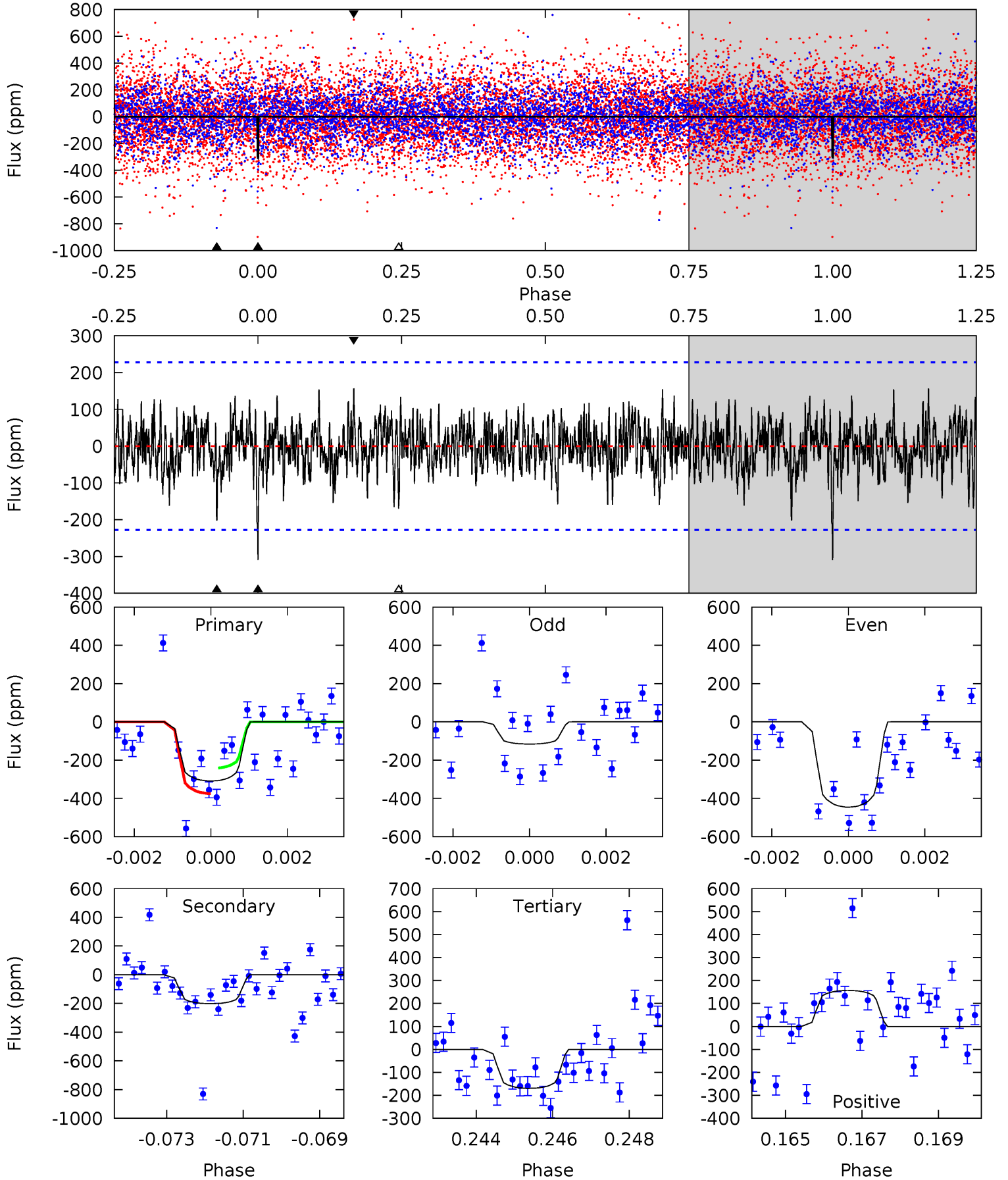
TCE 008022144-02 P= 76.119827 Days $T_0=158.487549$ (BKJD)



DV Model-Shift Uniqueness Test

008022144-02, P = 76.123745 Days, E = 82.332810 Days

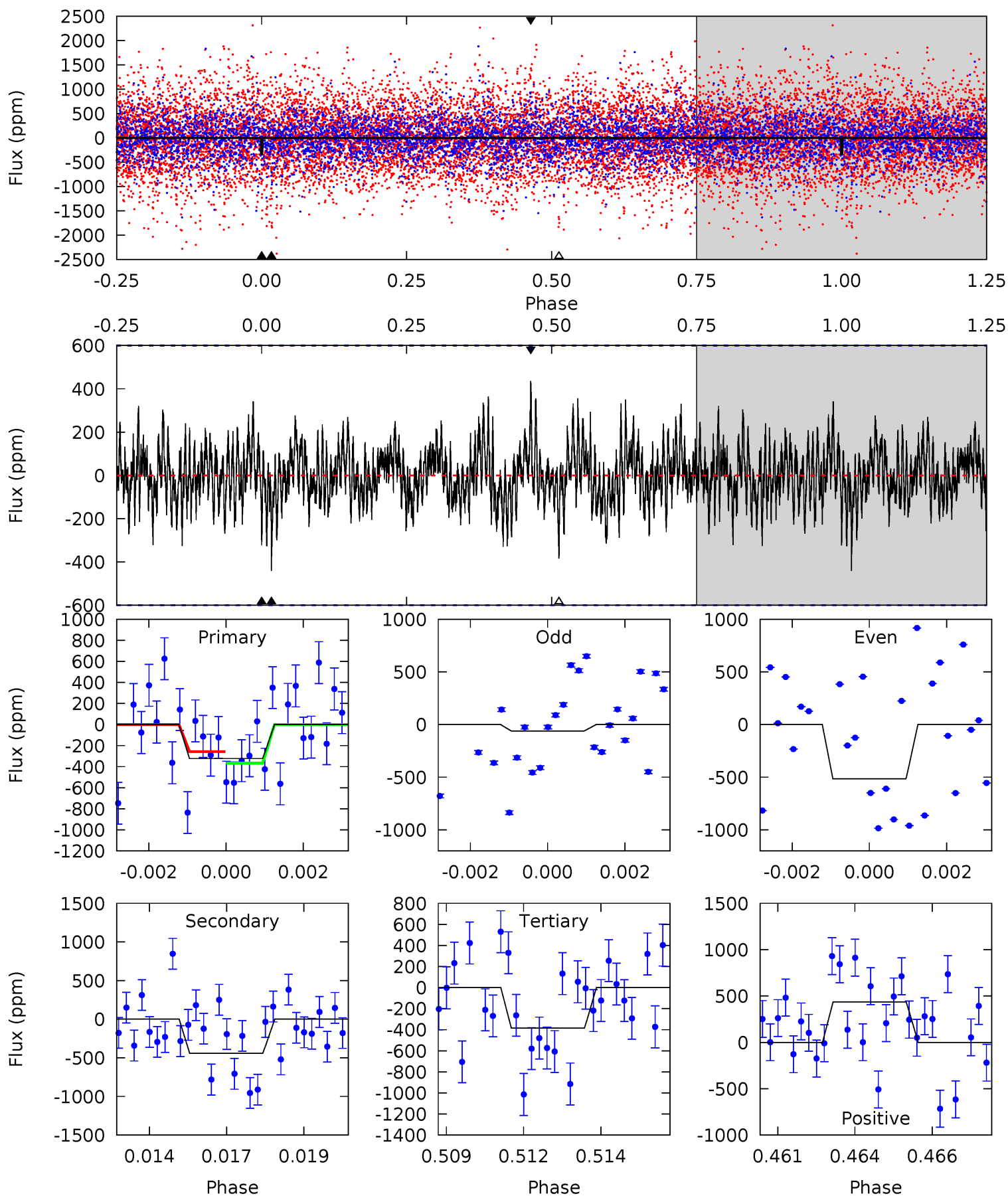
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.24	4.72	3.97	3.67	5.33	3.10	1.24	3.26	3.57	0.75	1.06	3.87	1.03	0.34	1.53



Alt Model-Shift Uniqueness Test

008022144-02, P = 76.119827 Days, E = 82.367722 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.85	3.89	3.39	3.84	5.29	3.03	1.01	-0.55	-0.99	0.50	0.05	1.92	1.10	0.50	0.47



Stellar Parameters For KIC 008022144

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8081^{+287}_{-287}	$4.135^{+0.165}_{-0.149}$	$-0.520^{+0.200}_{-0.300}$	$1.731^{+0.455}_{-0.372}$	$1.492^{+0.177}_{-0.197}$	$0.405^{+0.389}_{-0.170}$
	+4%/-4%	+4%/-4%	+38%/-58%	+26%/-21%	+12%/-13%	+96%/-42%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 008022144-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-202 ± 43	$6.22^{+6.05}_{-4.16}$	1035^{+72}_{-64}	5215^{+4407}_{-1210}	463^{+3630}_{-347}
Alt.	-441 ± 113	$6.53^{+6.22}_{-4.34}$	1033^{+70}_{-70}	6032^{+6364}_{-1538}	924^{+7536}_{-708}

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

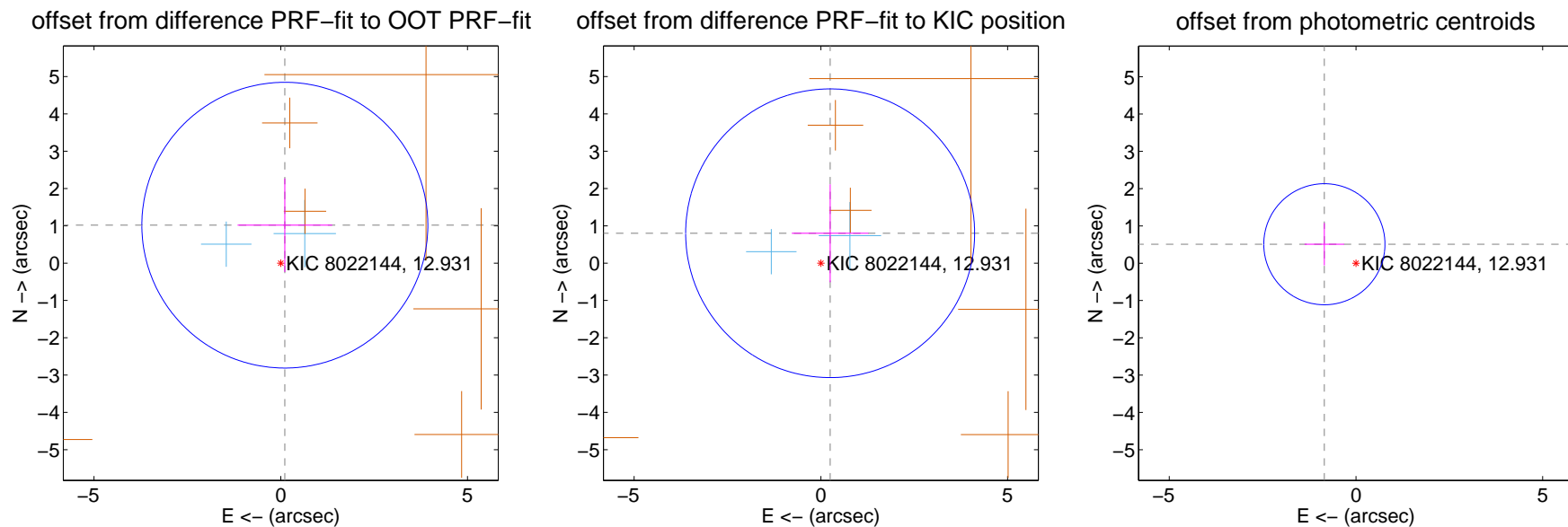
DV Centroid Data

Supplemental centroid analysis for 008022144-02. Kepler magnitude: 12.93. Transit SNR 5.52

There are 2 quarters with good PRF difference image offsets

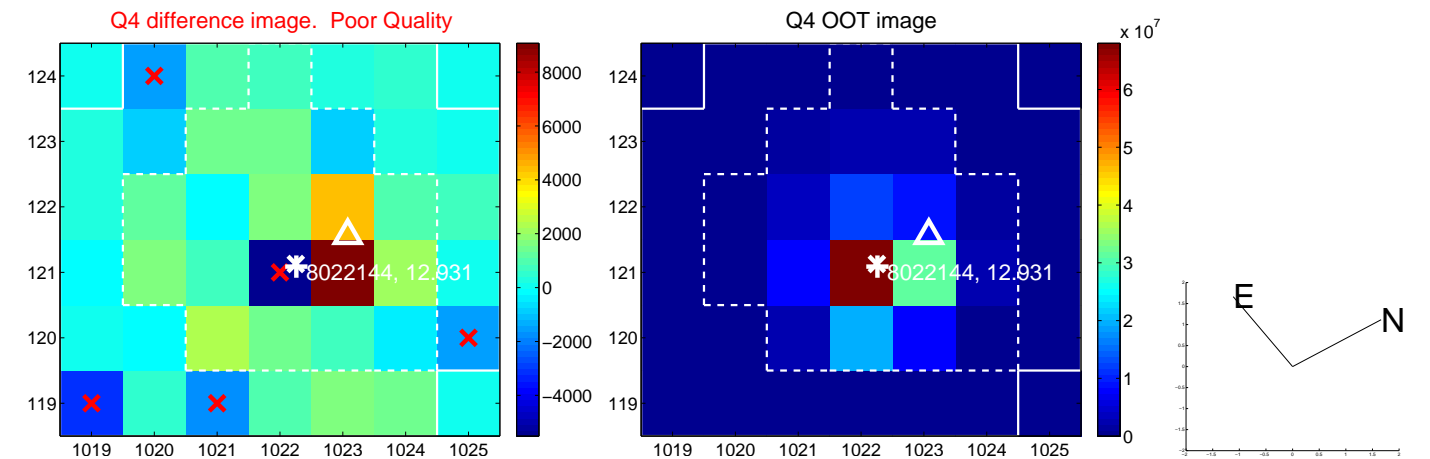
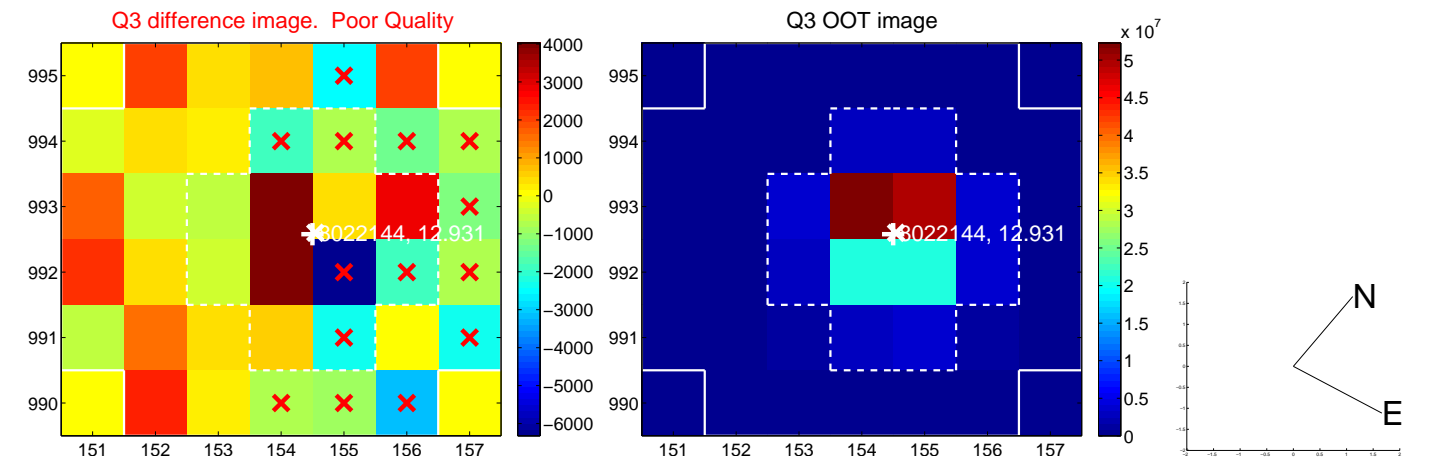
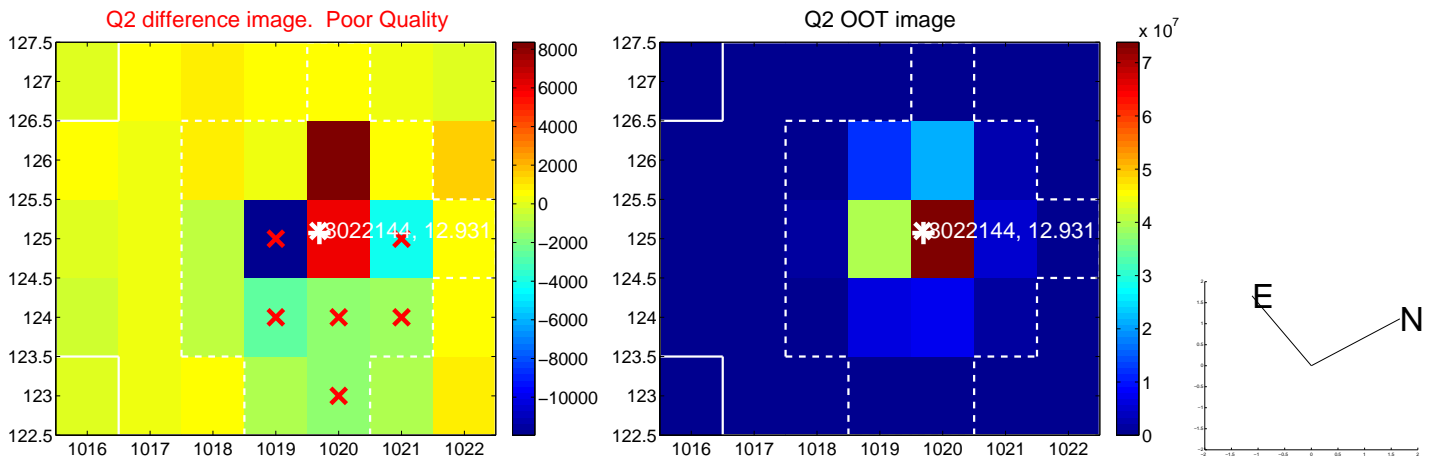
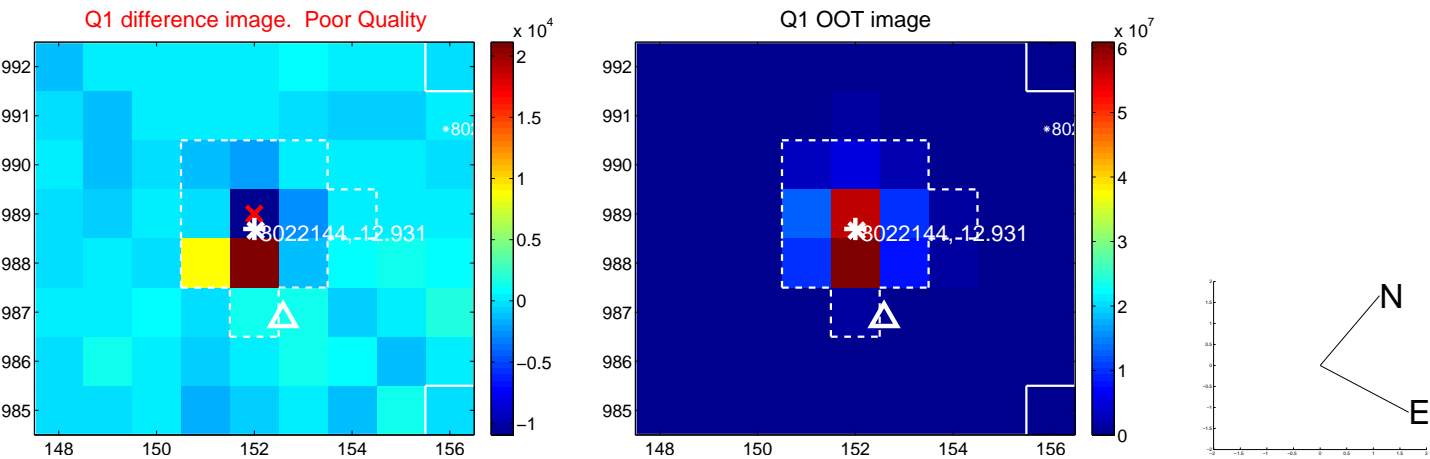
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.023 ± 1.276	0.80	-0.110 ± 1.267	1.018 ± 1.253
PRF-fit source offset from KIC position	0.839 ± 1.289	0.65	-0.248 ± 1.026	0.801 ± 1.312
photometric centroid source offset	0.99 ± 0.54	1.83	0.85 ± 0.53	0.51 ± 0.57

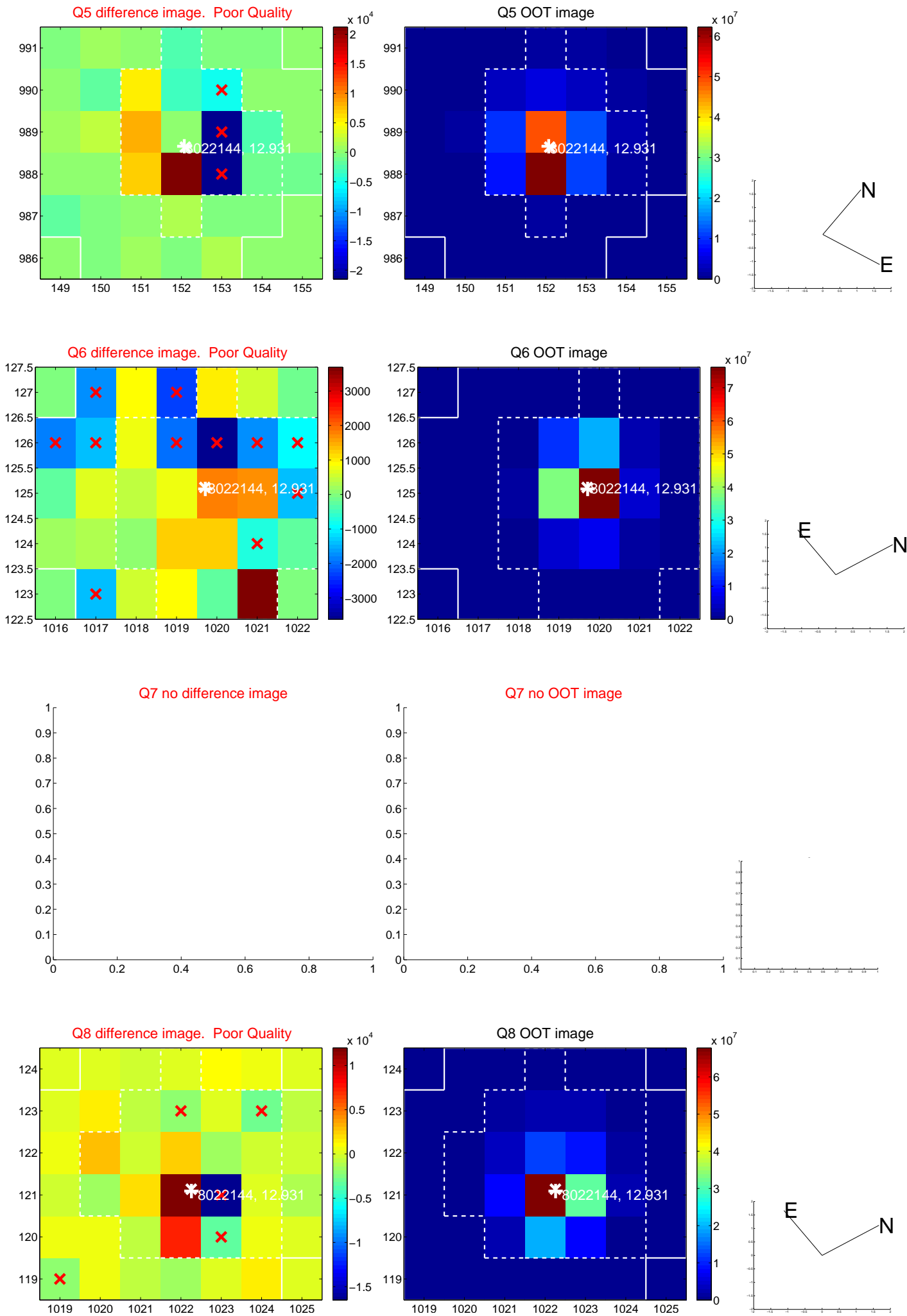


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

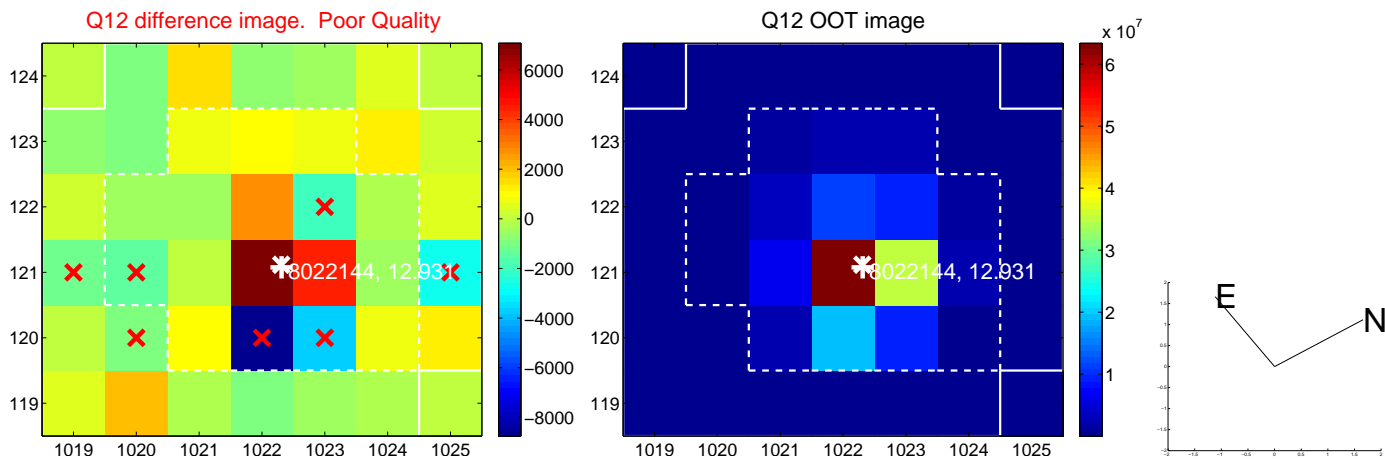
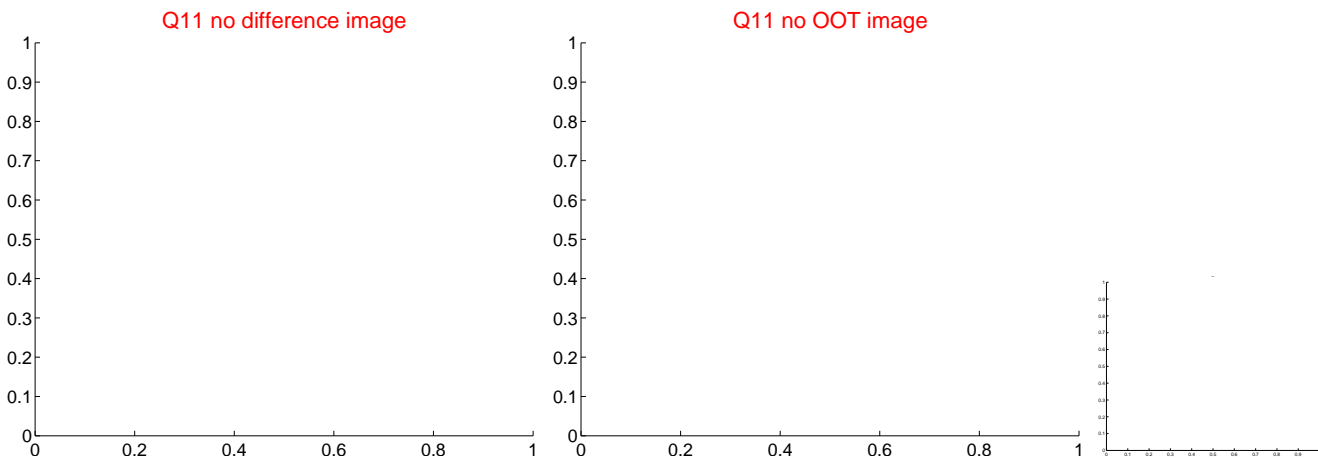
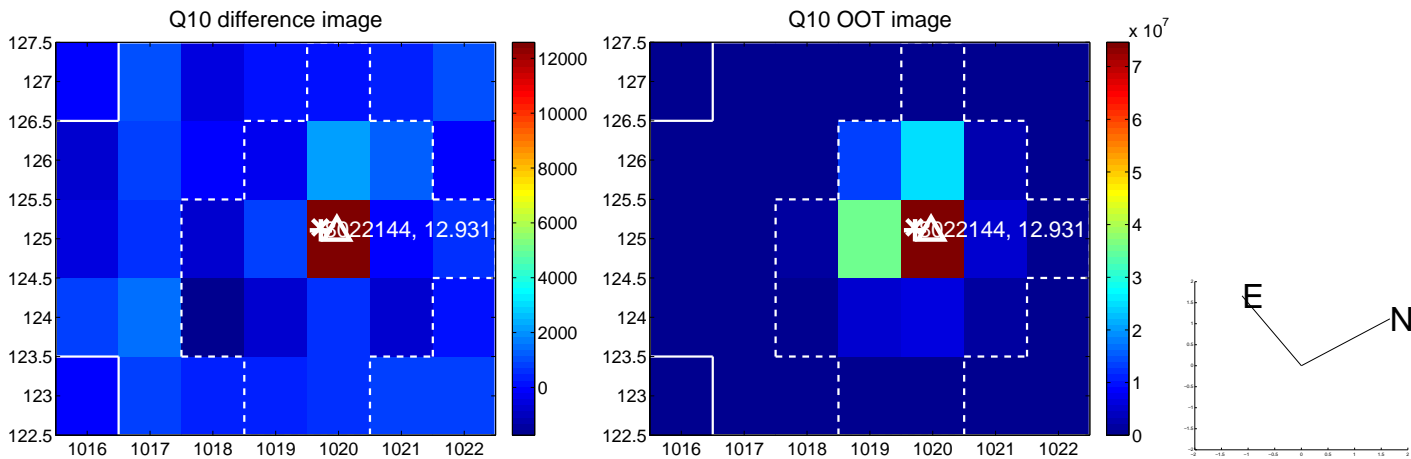
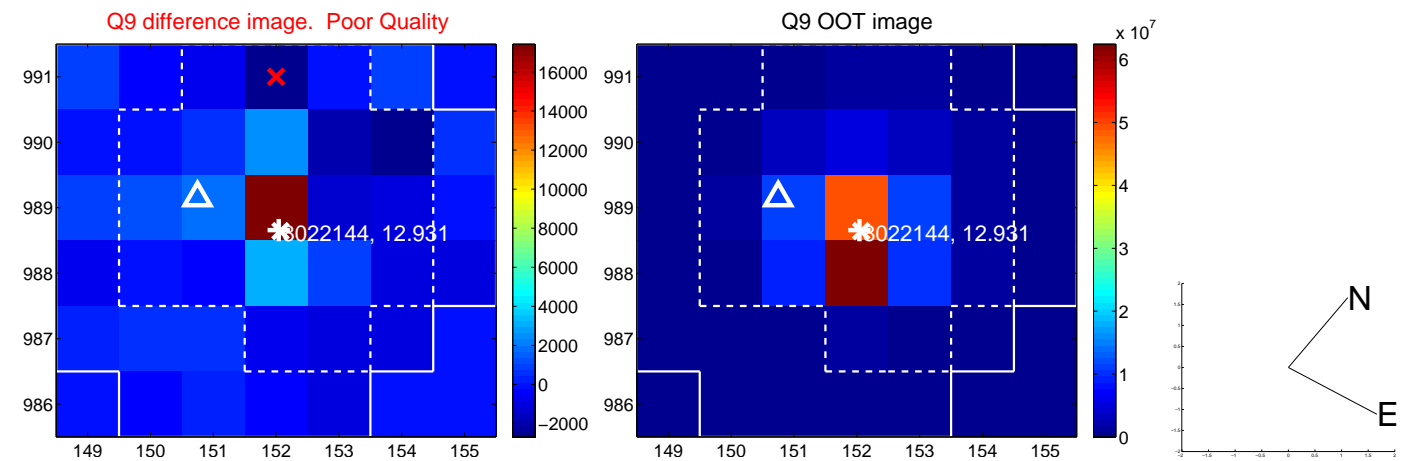
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



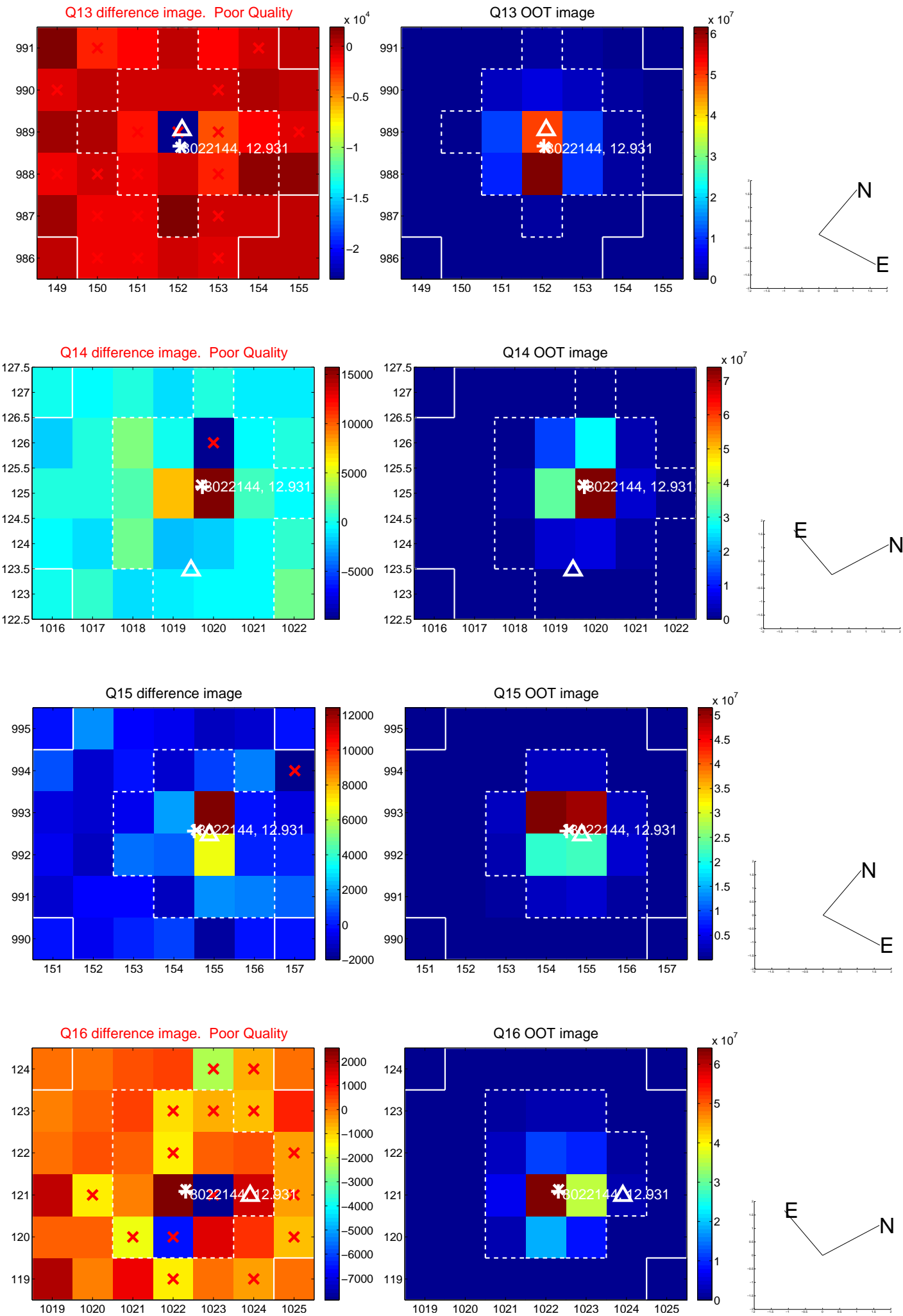
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



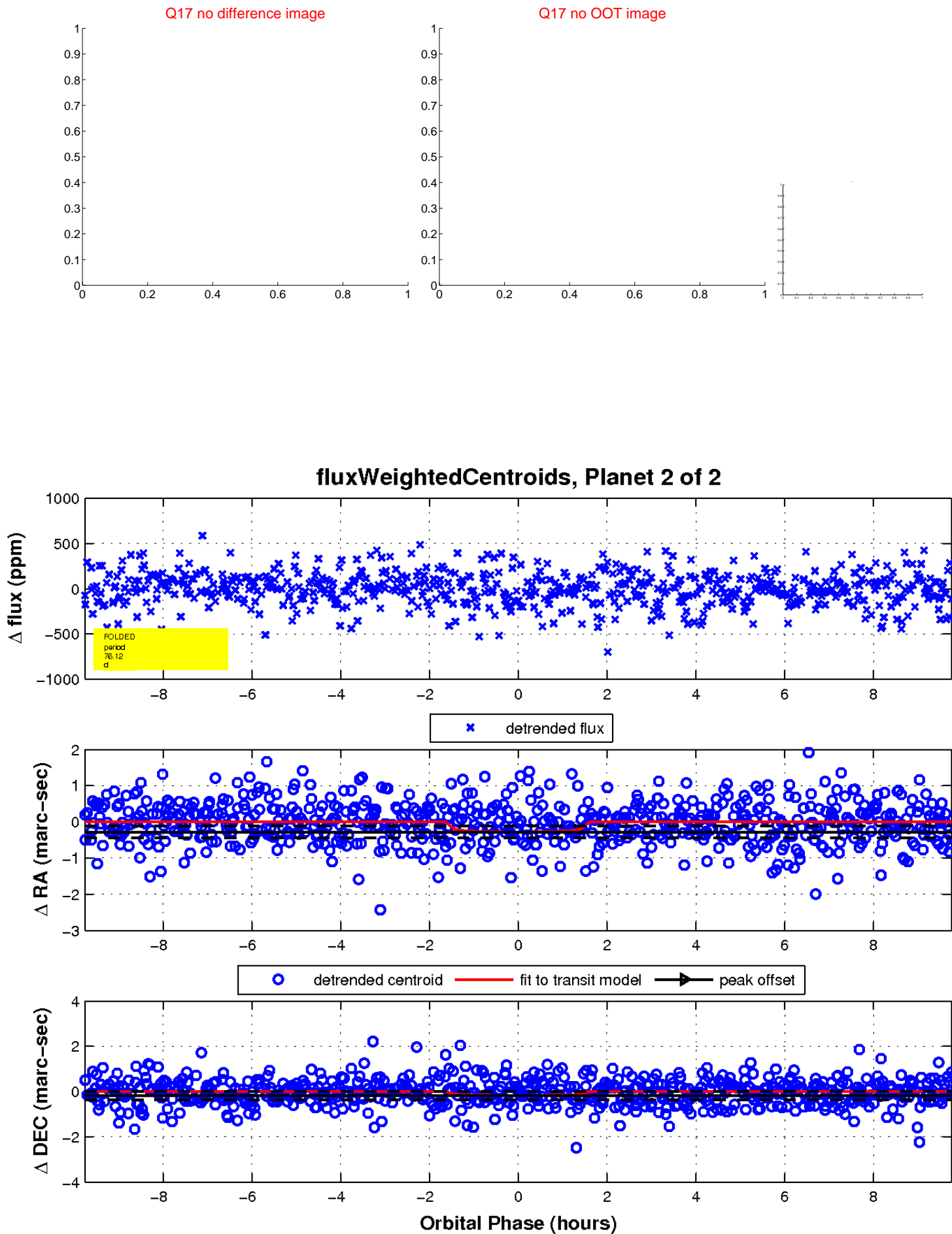
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

Declination

