

KIC 003644602

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})
003644602-01	OBS	4479.01	359.074325	415.418979	598.7	12.766	9.6	10.0	0.93	6256	2.90	1.23
003644602-02	OBS	No	359.098095	295.675248	482.2	25.704	8.6	9.6	0.93	6256	2.07	1.23

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003644602-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_CHASES_MARSHALL_SKYE—CENT_FEW_DIFFS—EPHEM_MATCH
003644602-02	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_SKYE—SAME_NTL_PERIOD—CENT_FEW_DIFFS—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 003644602-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	ΔRow	ΔCol	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
003644602-01	3644602	3511.01	3644542	3:1	133.3	33	5	8.35	15.14	499.18	Direct-PRF	0	4.46	0.60

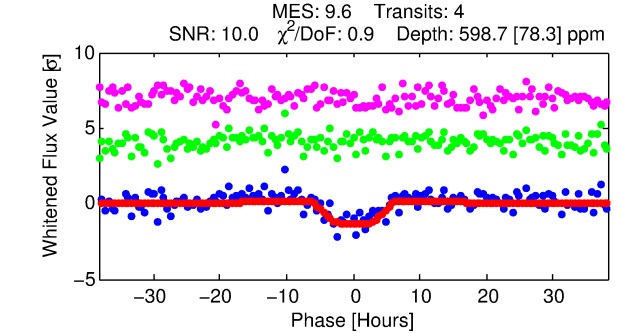
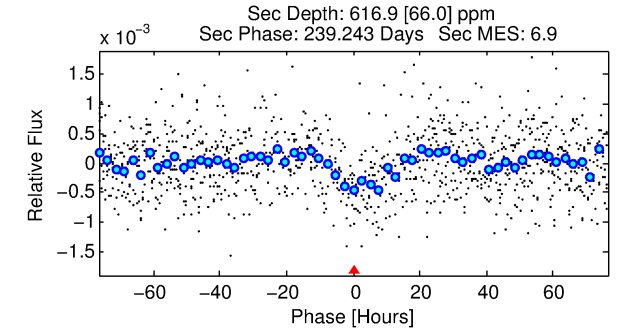
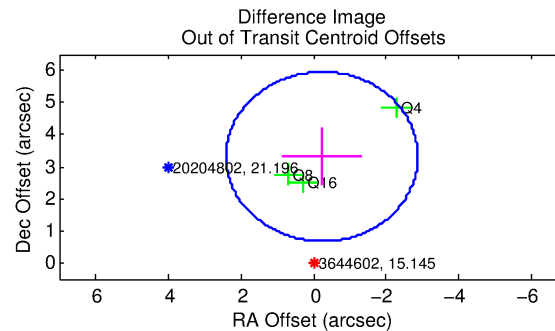
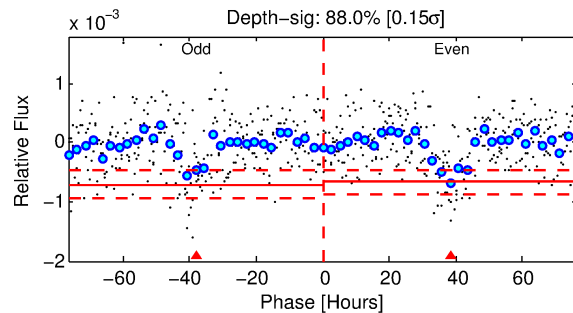
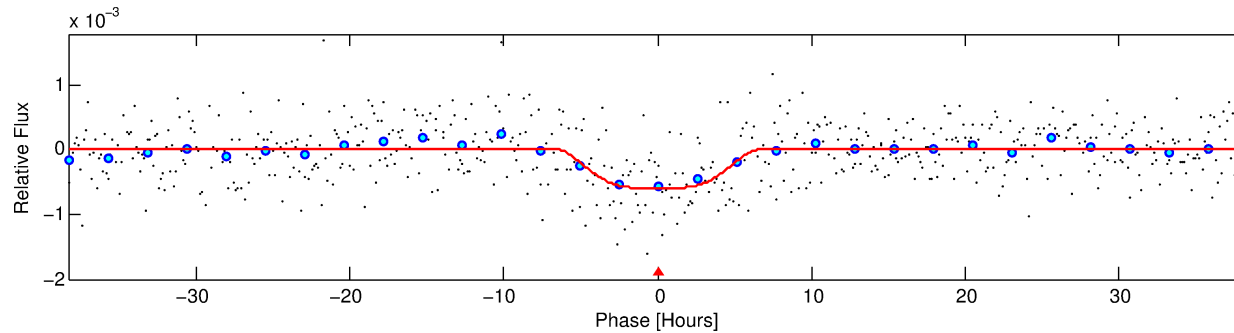
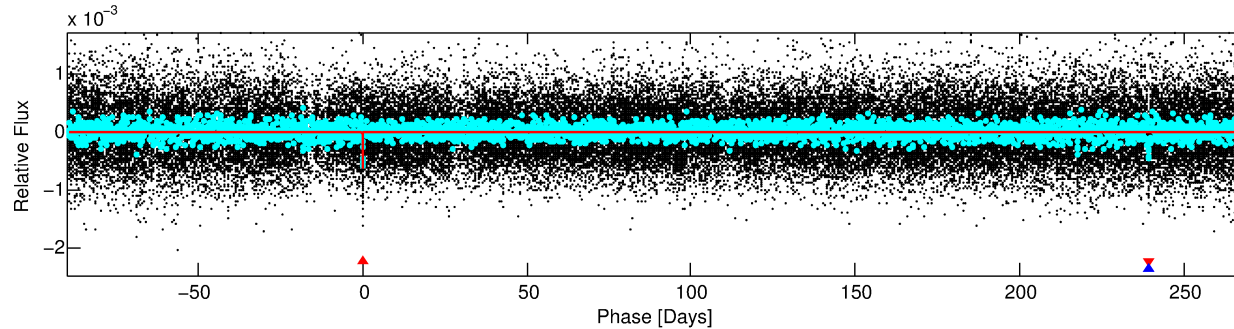
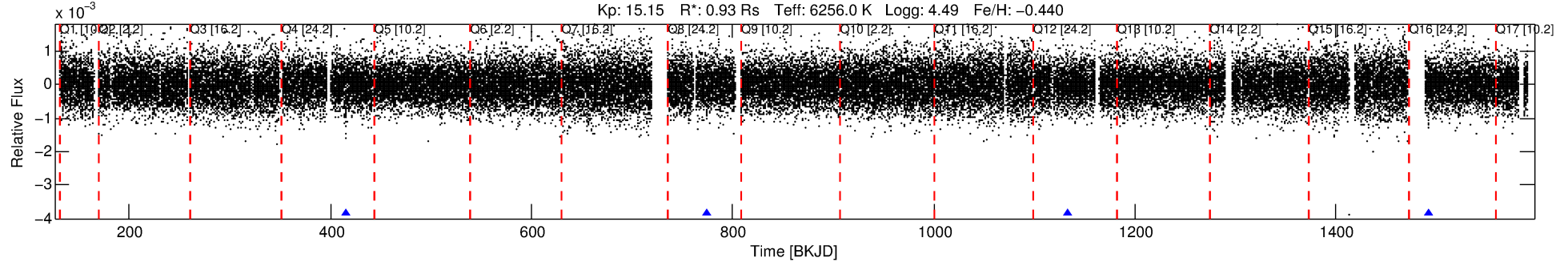
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 3644602 Candidate: 1 of 2 Period: 359.074 d

KOI: K04479.01 Corr: 0.772

Kp: 15.15 R*: 0.93 Rs Teff: 6256.0 K Logg: 4.49 Fe/H: -0.440



DV Fit Results:

Period = 359.07433 [0.01385] d
Epoch = 415.4190 [0.0263] BKJD
Rp/R* = 0.0286 [0.0027]
a/R* = 77.50 [18.11]
b = 0.96 [0.02]
Seff = 1.23 [0.49]
Teq = 269 [27] K
Rp = 2.90 [0.95] Re
a = 0.9842 [0.2549] AU
Ag = 38960.39 [16867.40] [2.31σ]
Teffp = 5834 [380] K [14.59σ]

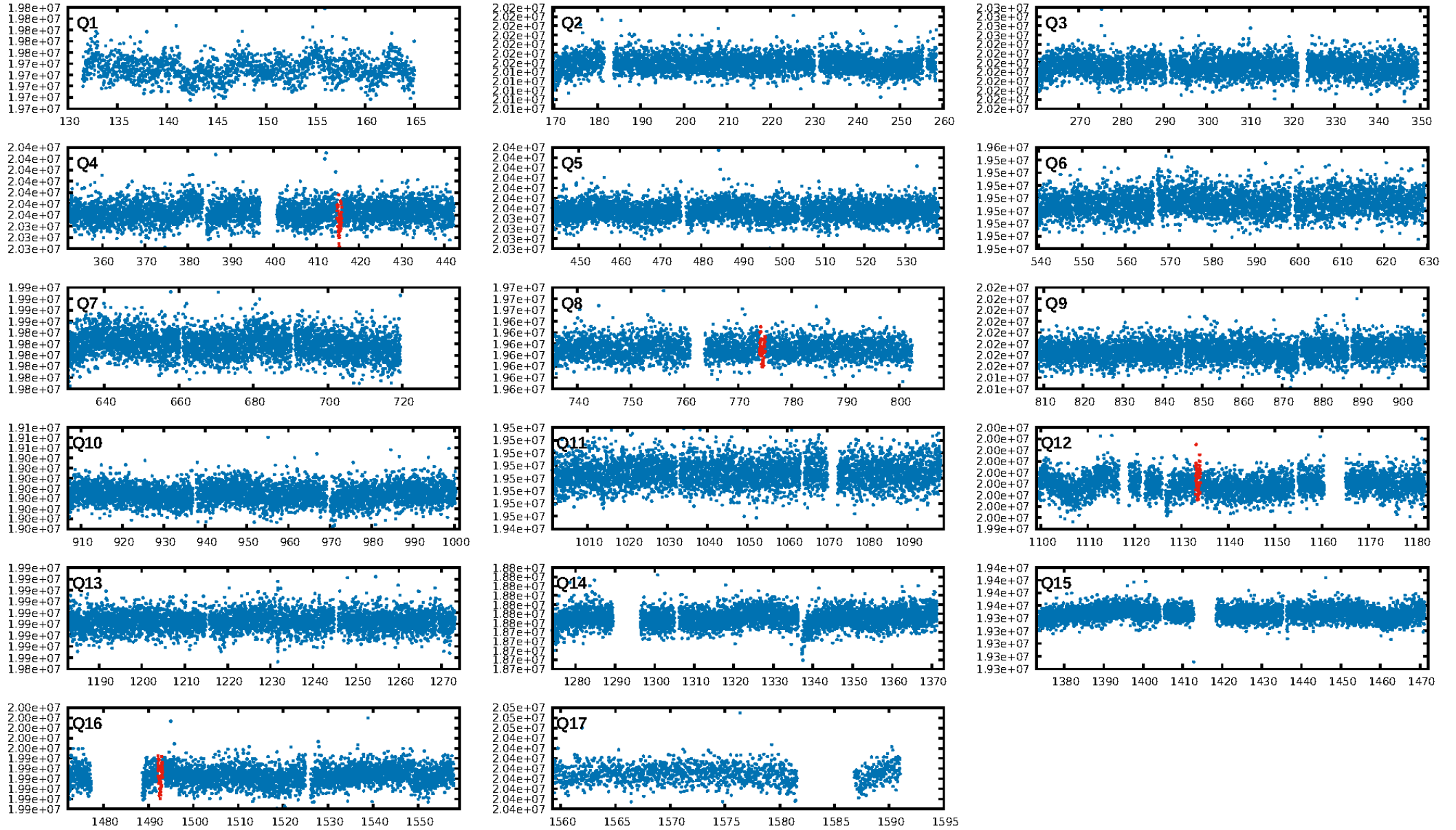
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 1.6% [0.02σ]
ModelChiSquare2-sig: 1.3%
ModelChiSquareGof-sig: 97.2%
Bootstrap-pfa: 1.52e-22
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.595
Centroid-sig: 0.0%
Centroid-so: 3.601 arcsec [2.41σ]
OotOffset-rm: 3.320 arcsec [3.77σ]
KicOffset-rm: 3.319 arcsec [3.79σ]
OotOffset-st: 0/0/3/0 [3]
KicOffset-st: 0/0/3/0 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 1.00 [3/3]

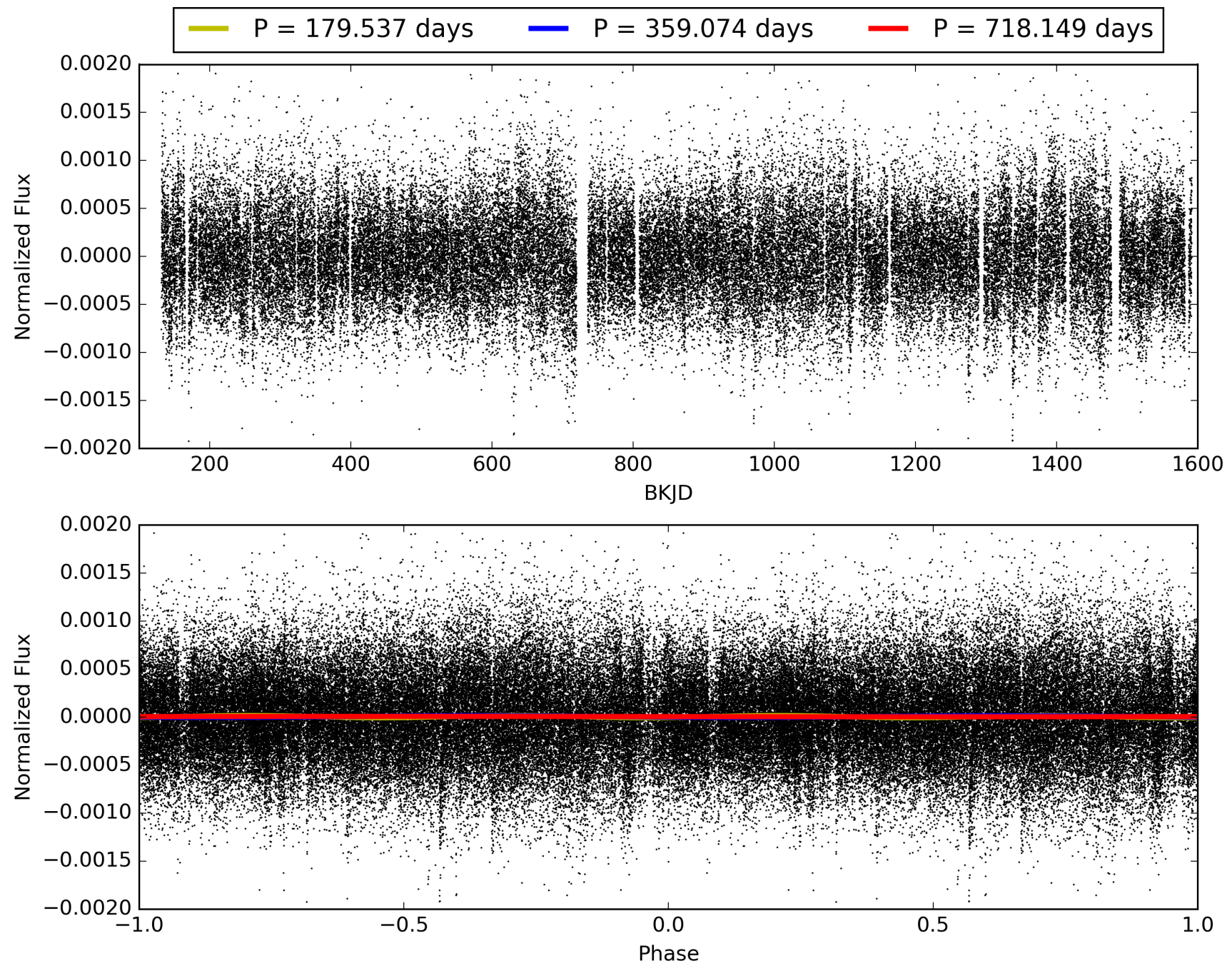
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:54:13 Z

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

TCE 003644602-01, PDC Light Curves

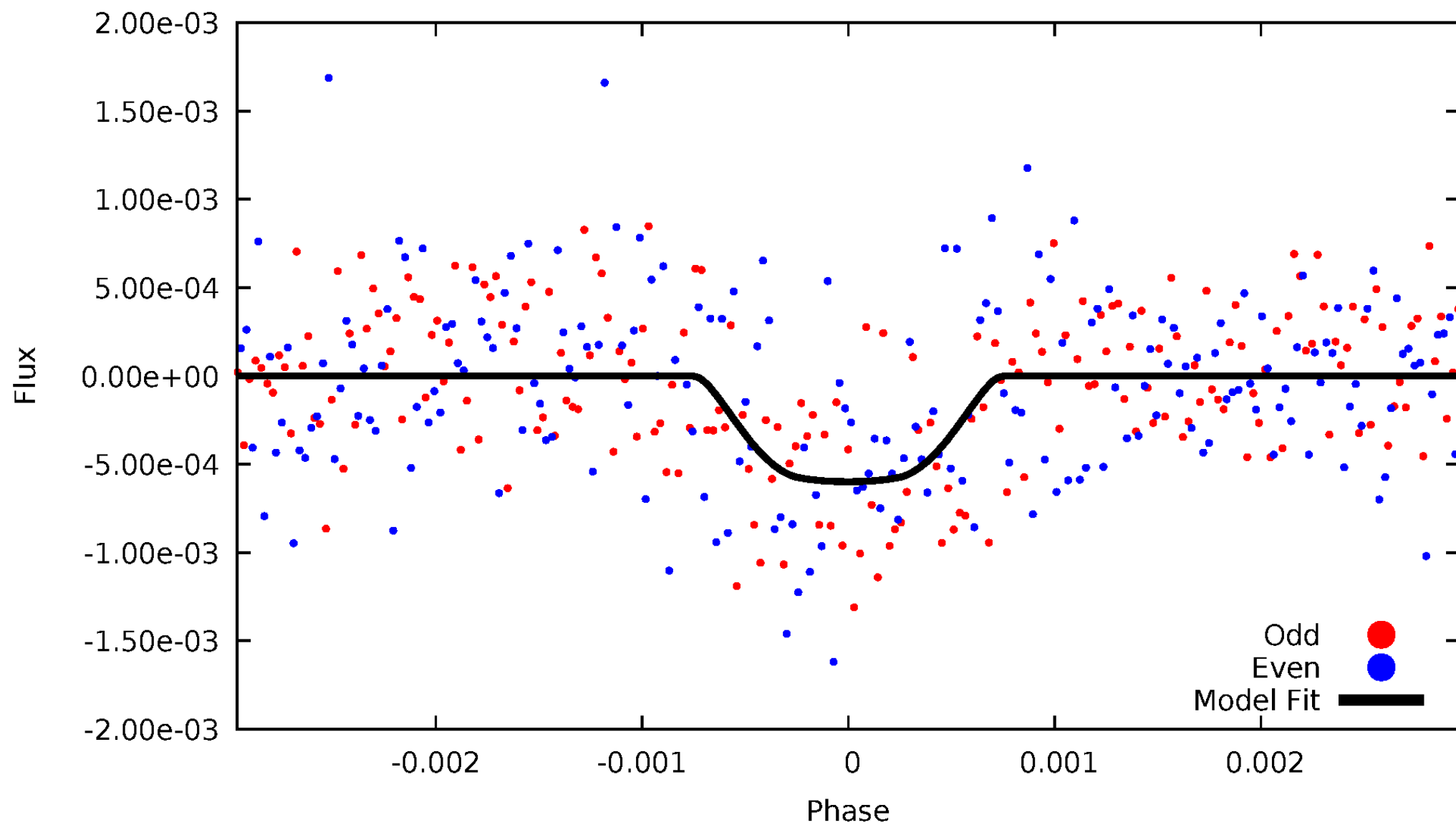


TCE 003644602-01



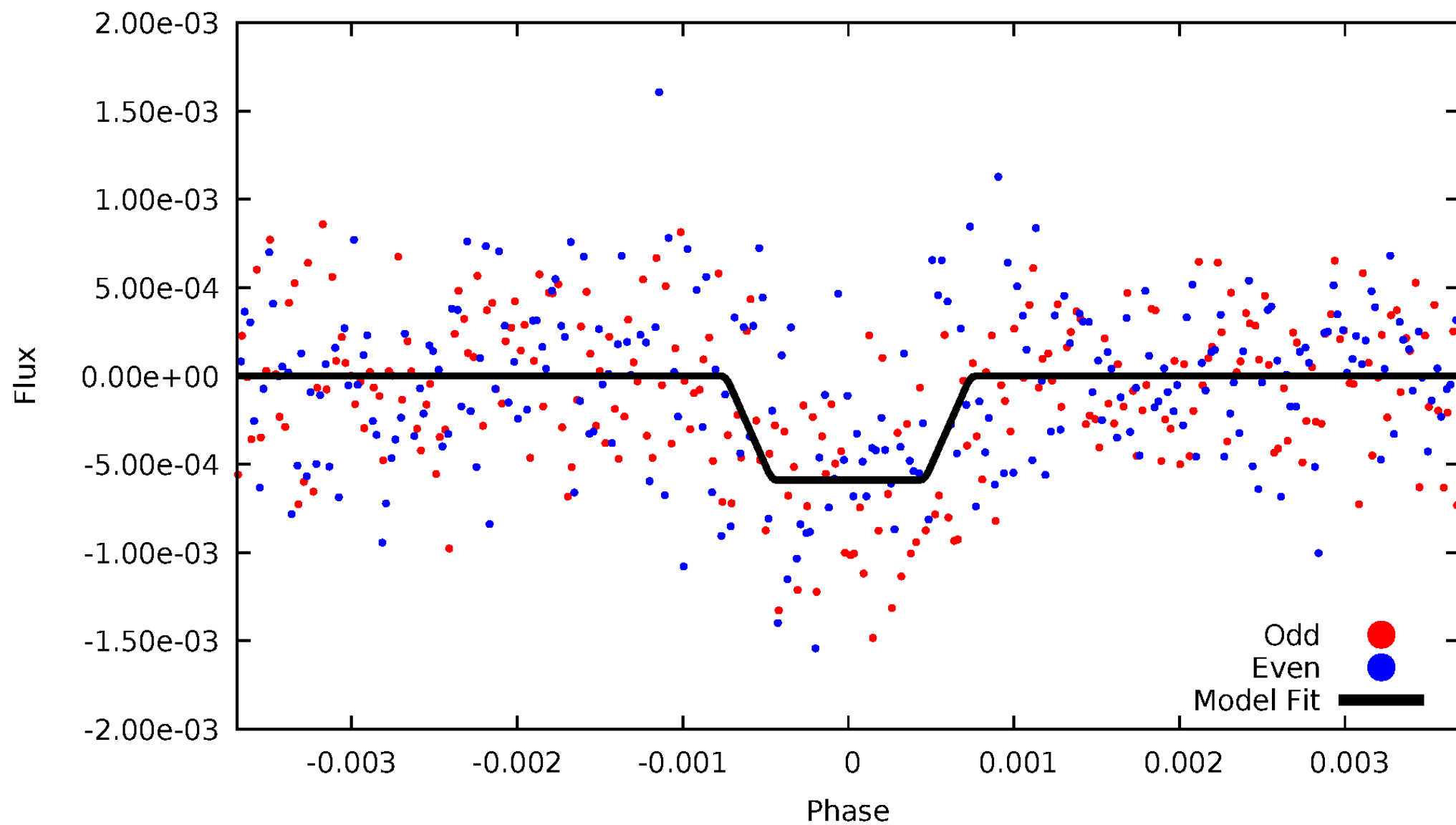
DV Odd/Even

TCE 003644602-01

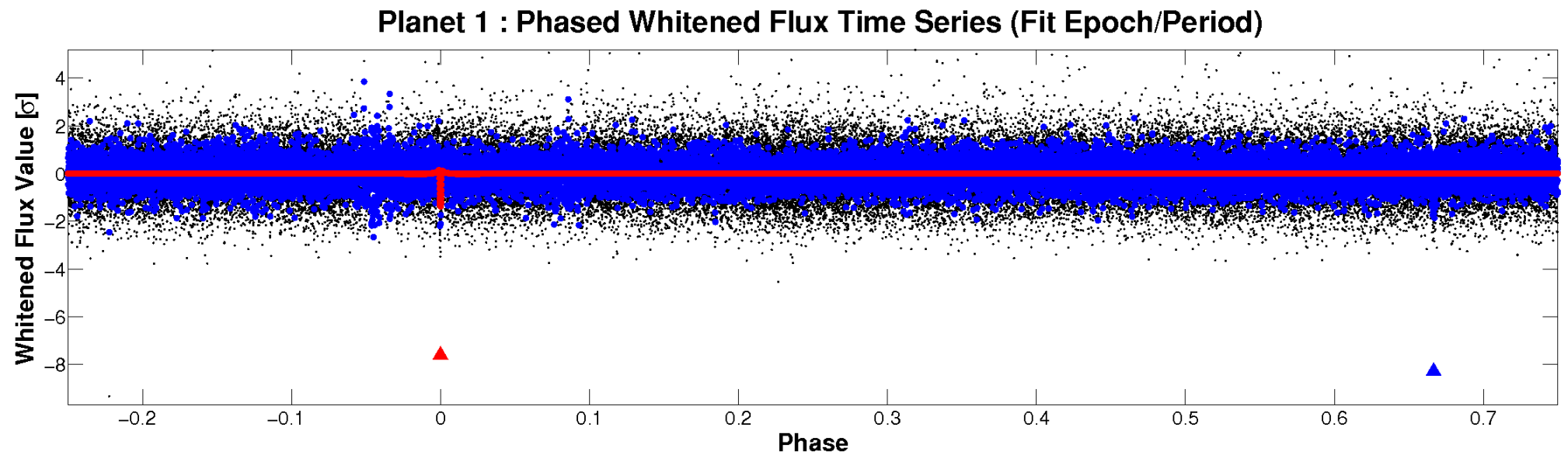
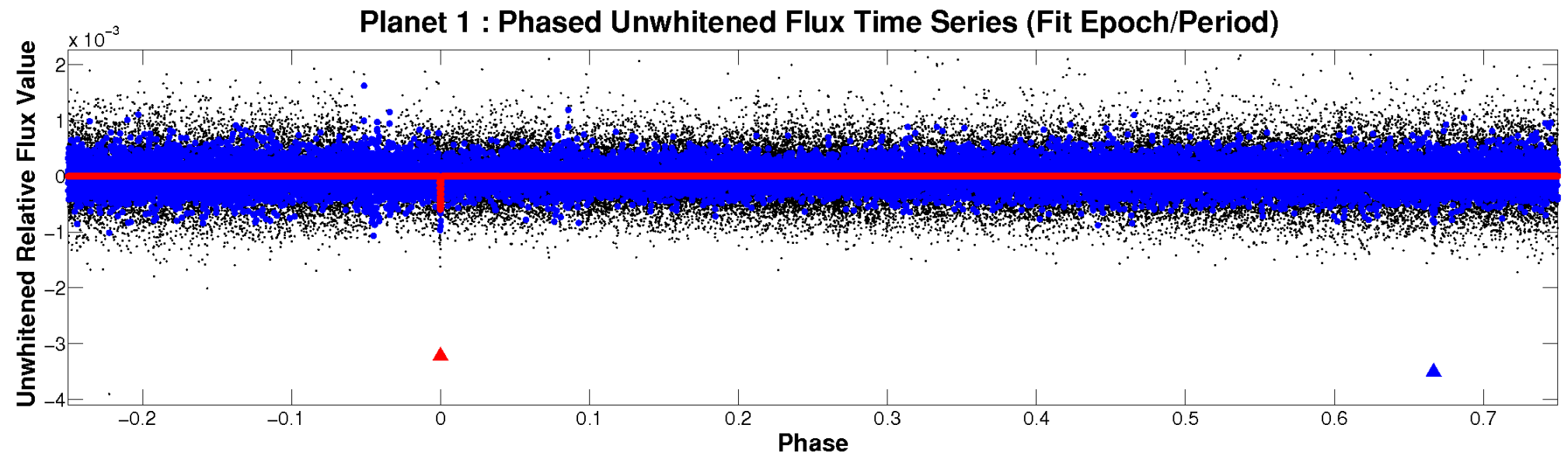


ALT Odd/Even

TCE 003644602-01



Non-Whitened Vs. Whitened Light Curve



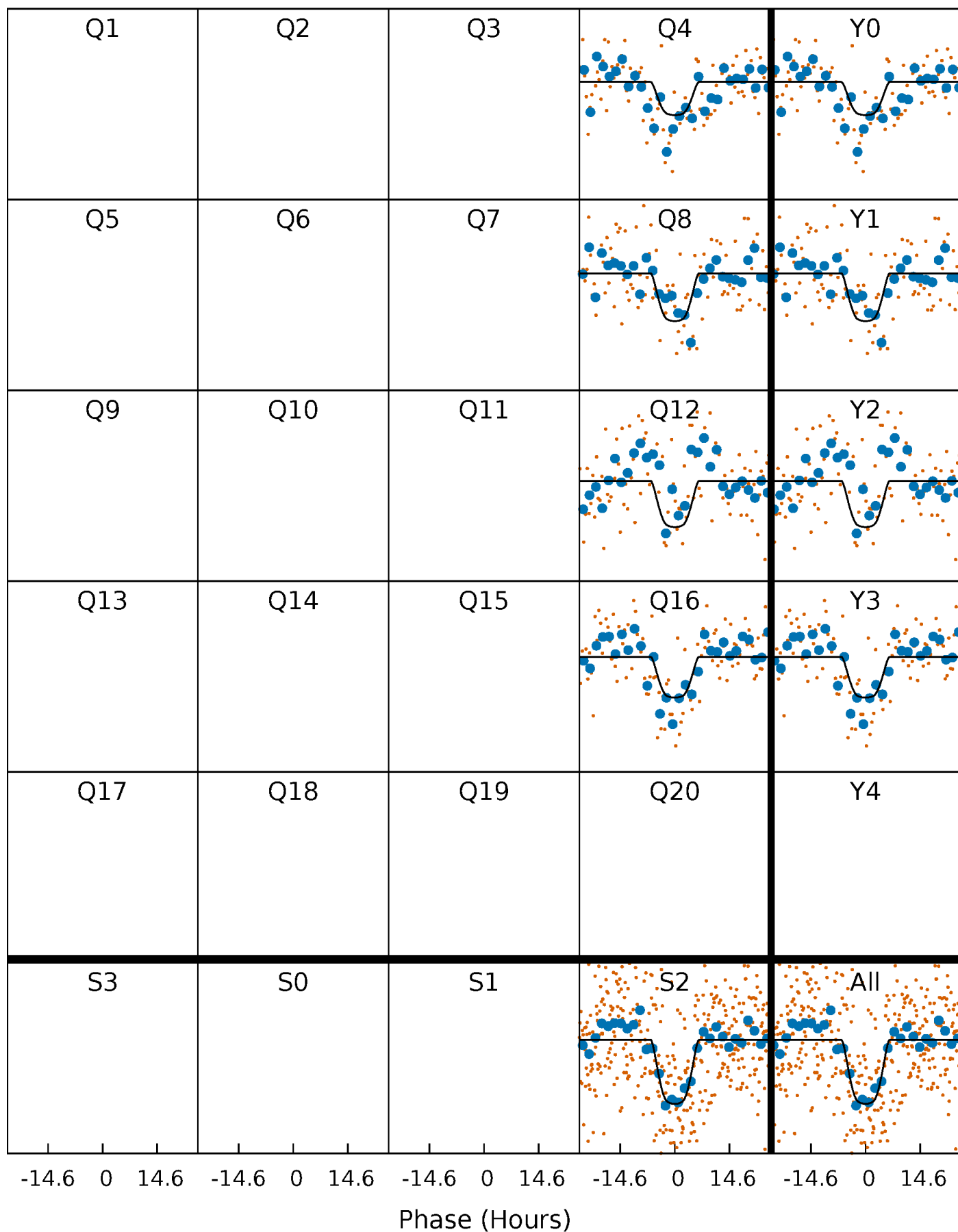
PDC Quarter-Phased Transit Curves

TCE 003644602-01 P=359.074325 Days $T_0=415.418979$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 003644602-01 P=359.074325 Days $T_0=415.418979$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

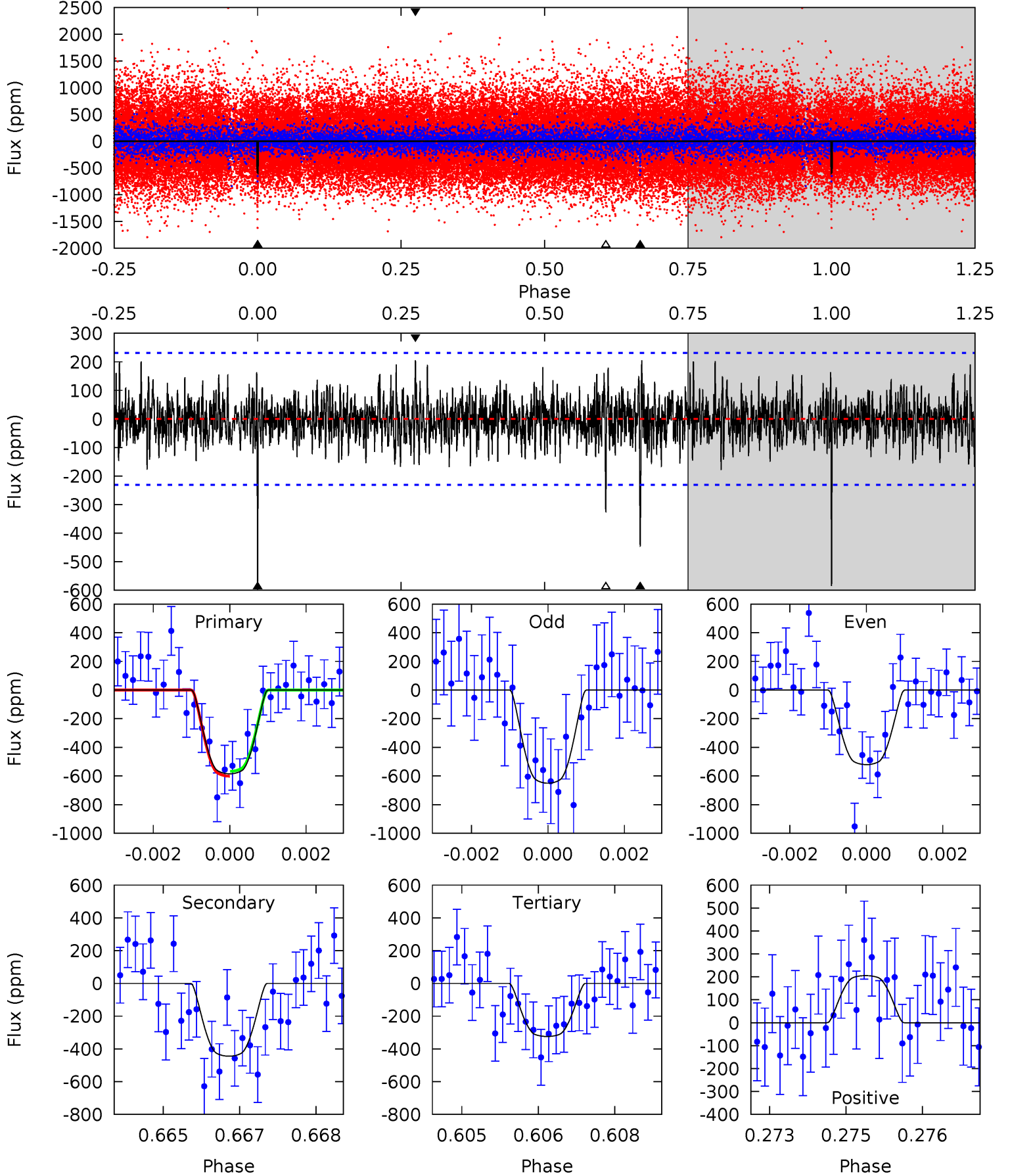
TCE 003644602-01 P=359.044894 Days $T_0=415.463997$ (BKJD)



DV Model-Shift Uniqueness Test

003644602-01, P = 359.074325 Days, E = 56.344654 Days

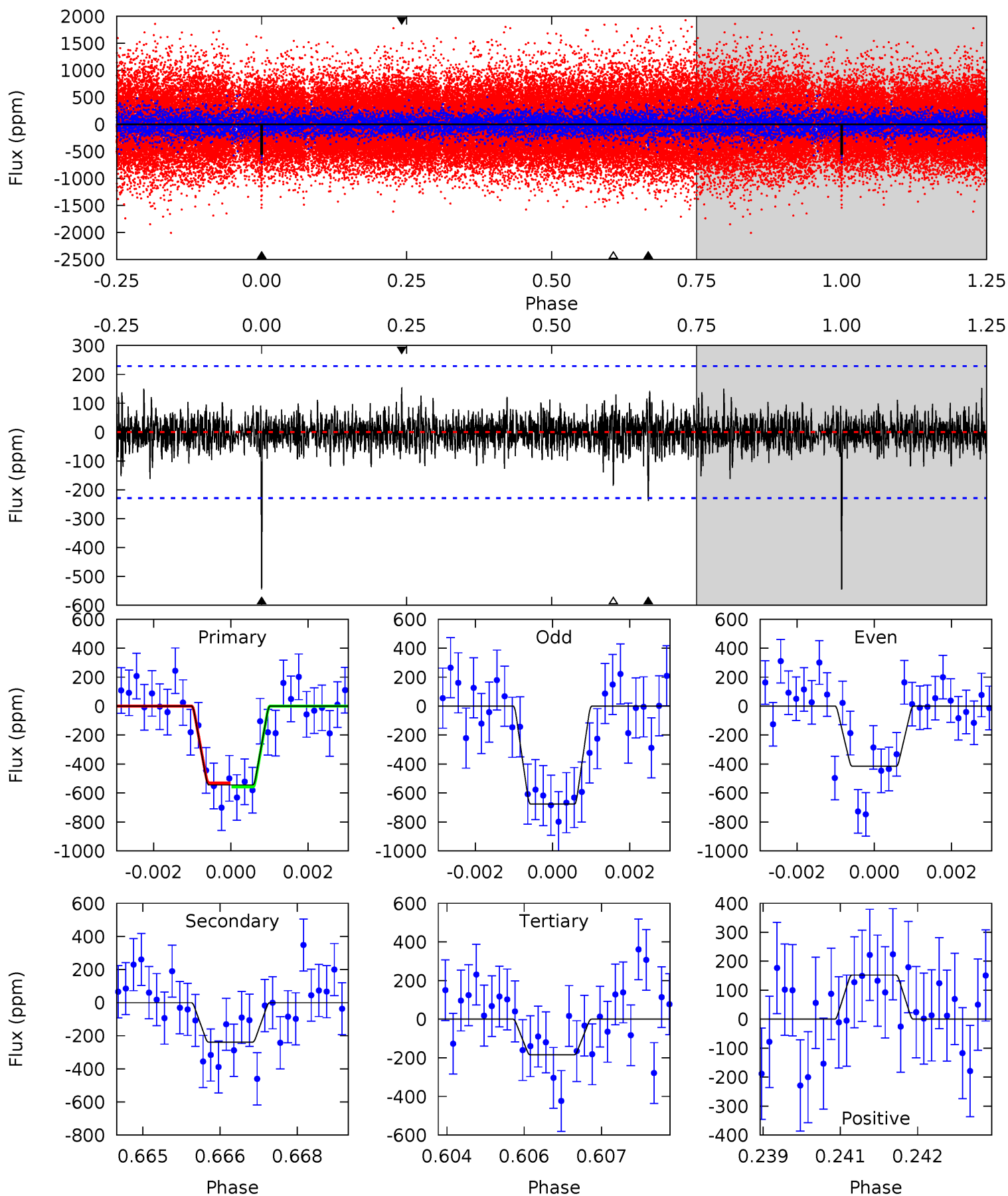
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.6	10.3	7.55	4.78	5.38	3.17	1.38	6.07	8.84	2.80	5.57	1.52	0.90	0.26	0.39



Alt Model-Shift Uniqueness Test

003644602-01, P = 359.044894 Days, E = 56.419103 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	5.61	4.34	3.59	5.38	3.17	0.97	8.47	9.23	1.27	2.02	3.07	0.99	0.22	0.32



Stellar Parameters For KIC 003644602

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6256^{+176}_{-220}	$4.493^{+0.054}_{-0.202}$	$-0.440^{+0.300}_{-0.300}$	$0.932^{+0.290}_{-0.097}$	$0.986^{+0.123}_{-0.123}$	$1.716^{+0.472}_{-0.930}$
	+3%/-4%	+1%/-4%	+68%/-68%	+31%/-10%	+12%/-12%	+28%/-54%
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 003644602-01 / KOI 4479.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-445 ± 43	$3.03^{+0.53}_{-0.39}$	382^{+30}_{-19}	5394^{+324}_{-290}	25379^{+7702}_{-6924}
Alt.	-238 ± 42	$2.57^{+0.44}_{-0.37}$	381^{+28}_{-18}	5024^{+375}_{-308}	18460^{+8056}_{-5724}

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

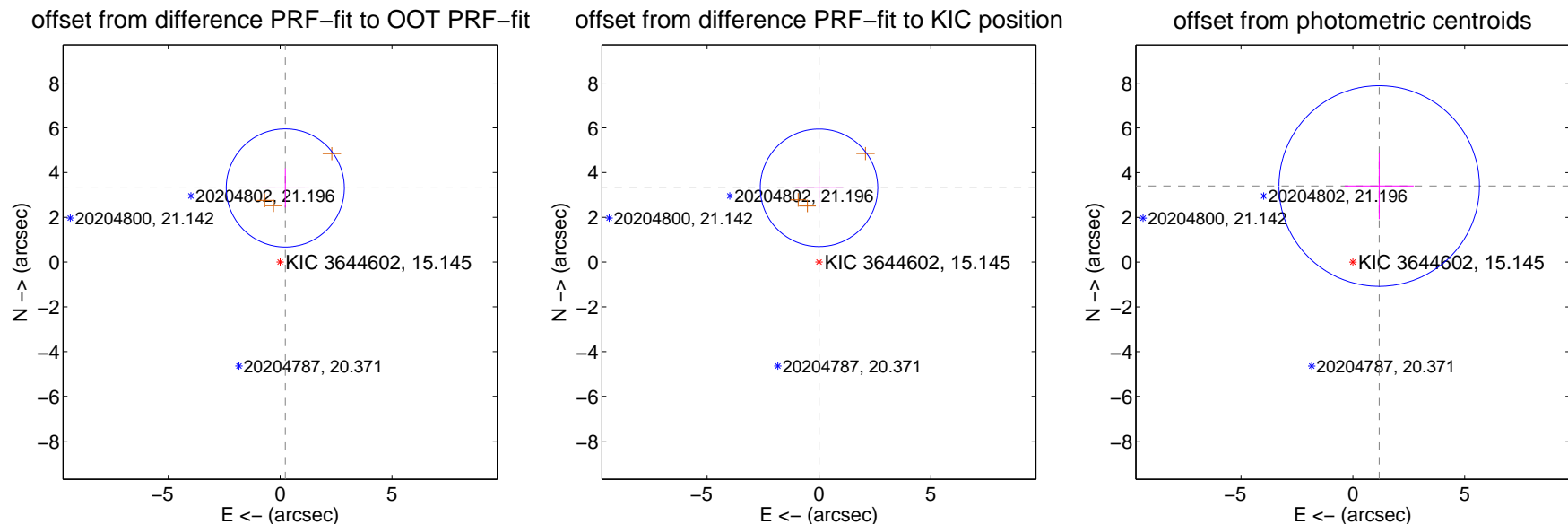
DV Centroid Data

Supplemental centroid analysis for 003644602-01. Kepler magnitude: 15.14. Transit SNR 10.00

There are 0 quarters with good PRF difference image offsets

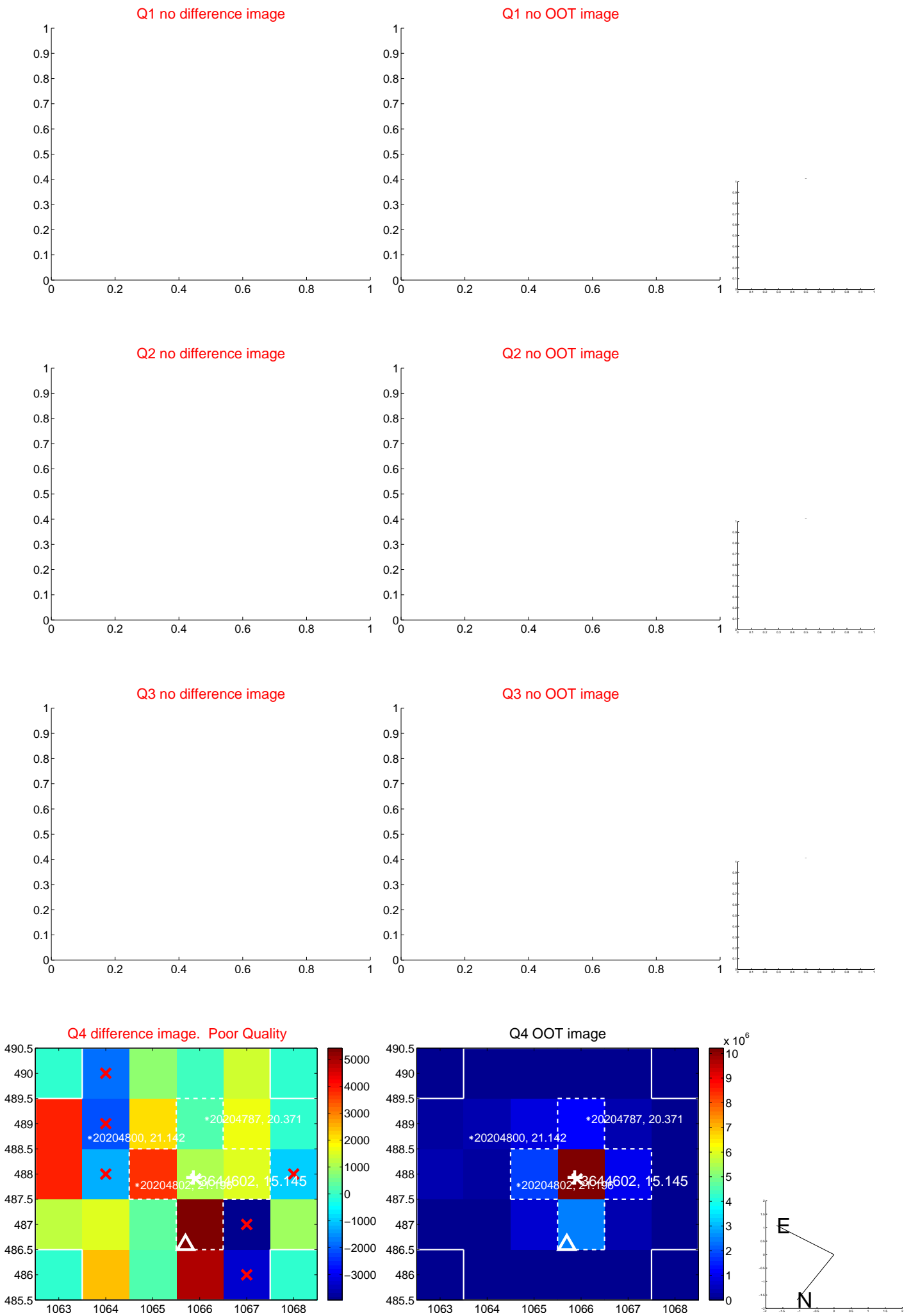
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.320 ± 0.880	3.77	-0.231 ± 1.063	3.312 ± 0.879
PRF-fit source offset from KIC position	3.319 ± 0.875	3.79	-0.001 ± 1.060	3.319 ± 0.875
photometric centroid source offset	3.60 ± 1.49	2.41	-1.18 ± 1.54	3.40 ± 1.49

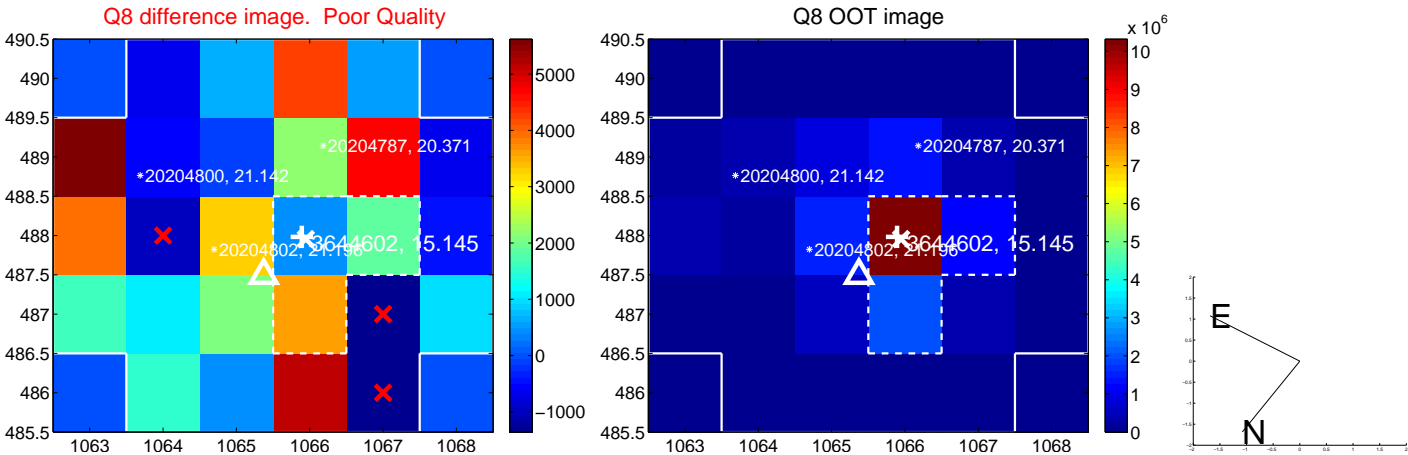


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



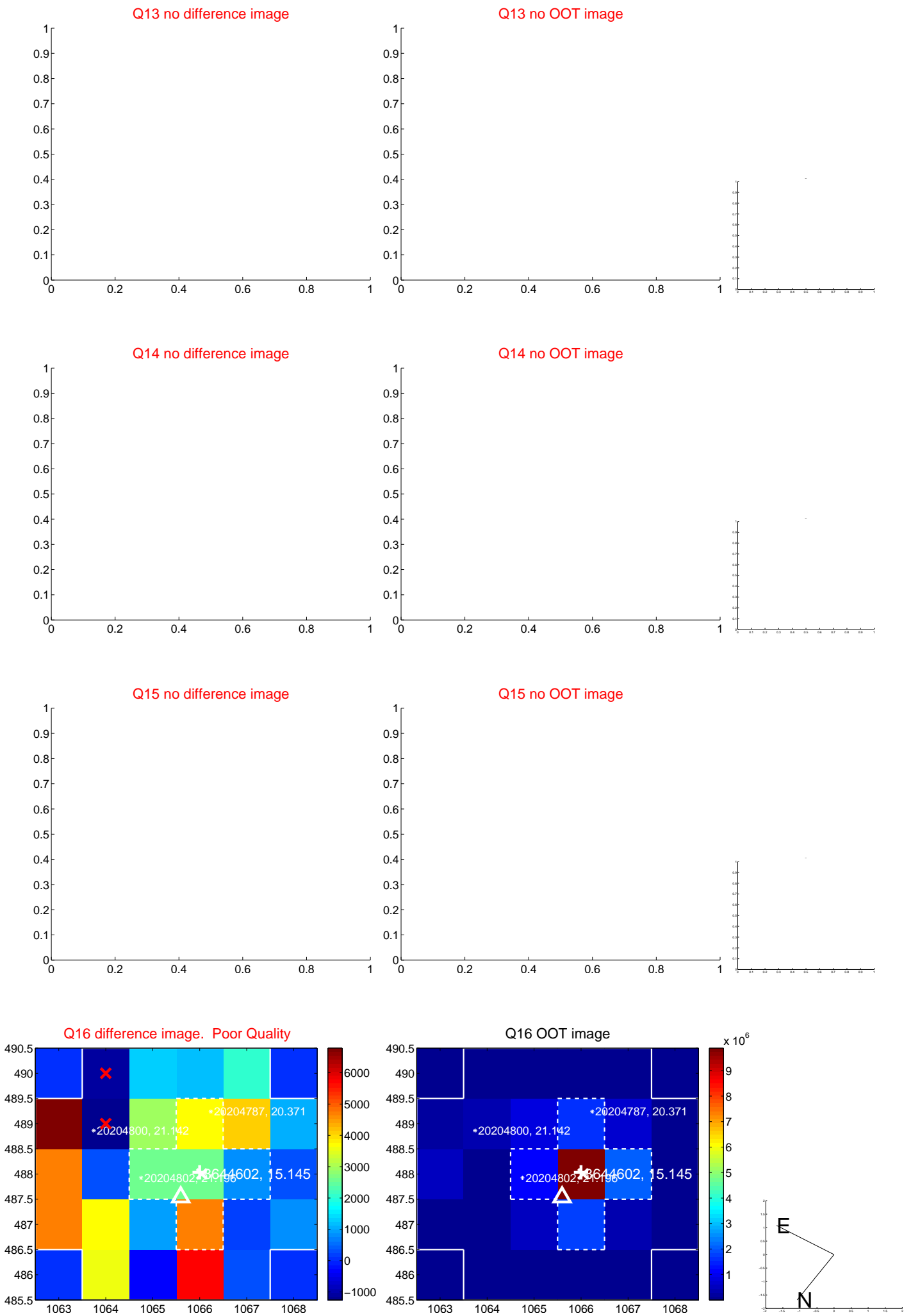
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



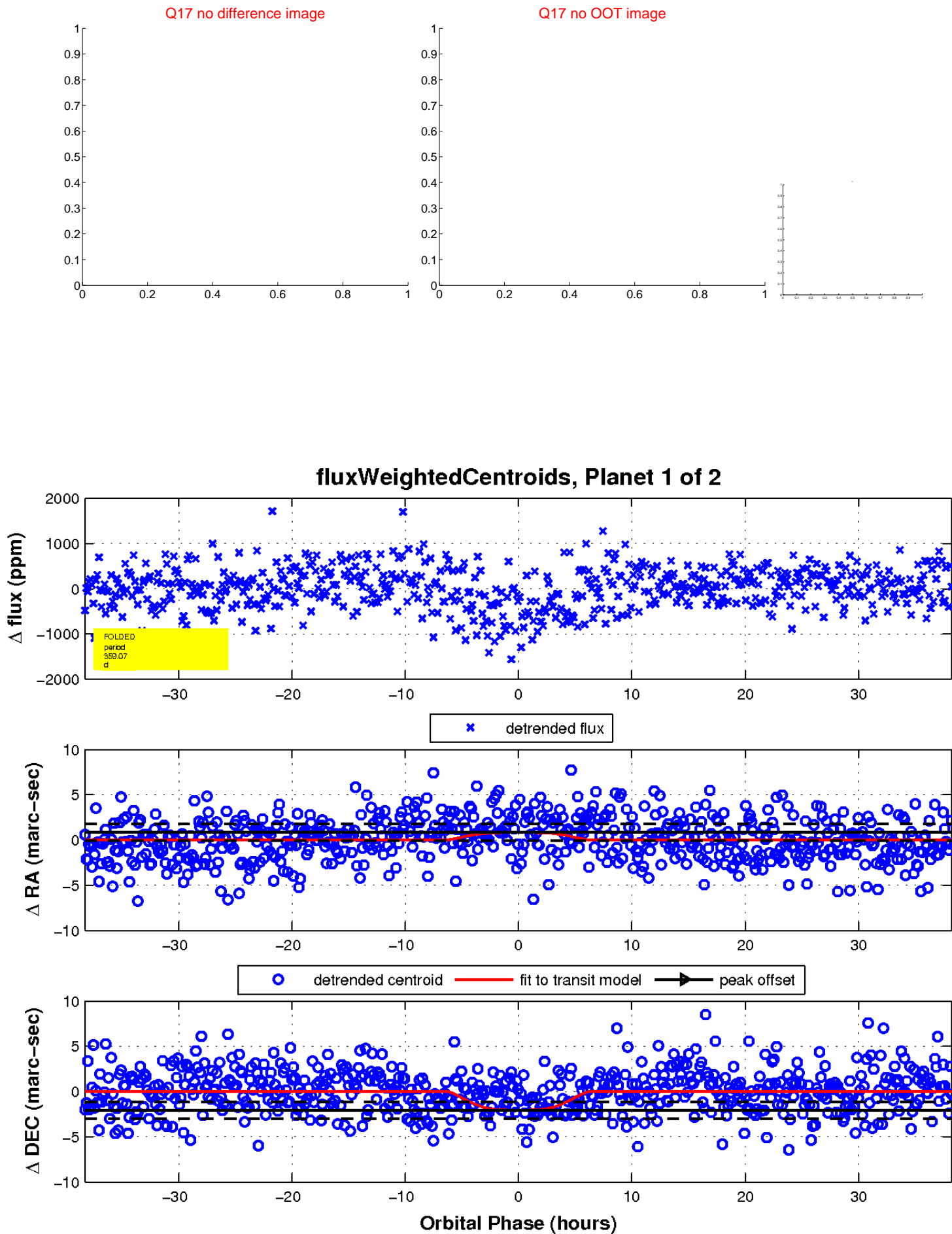
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



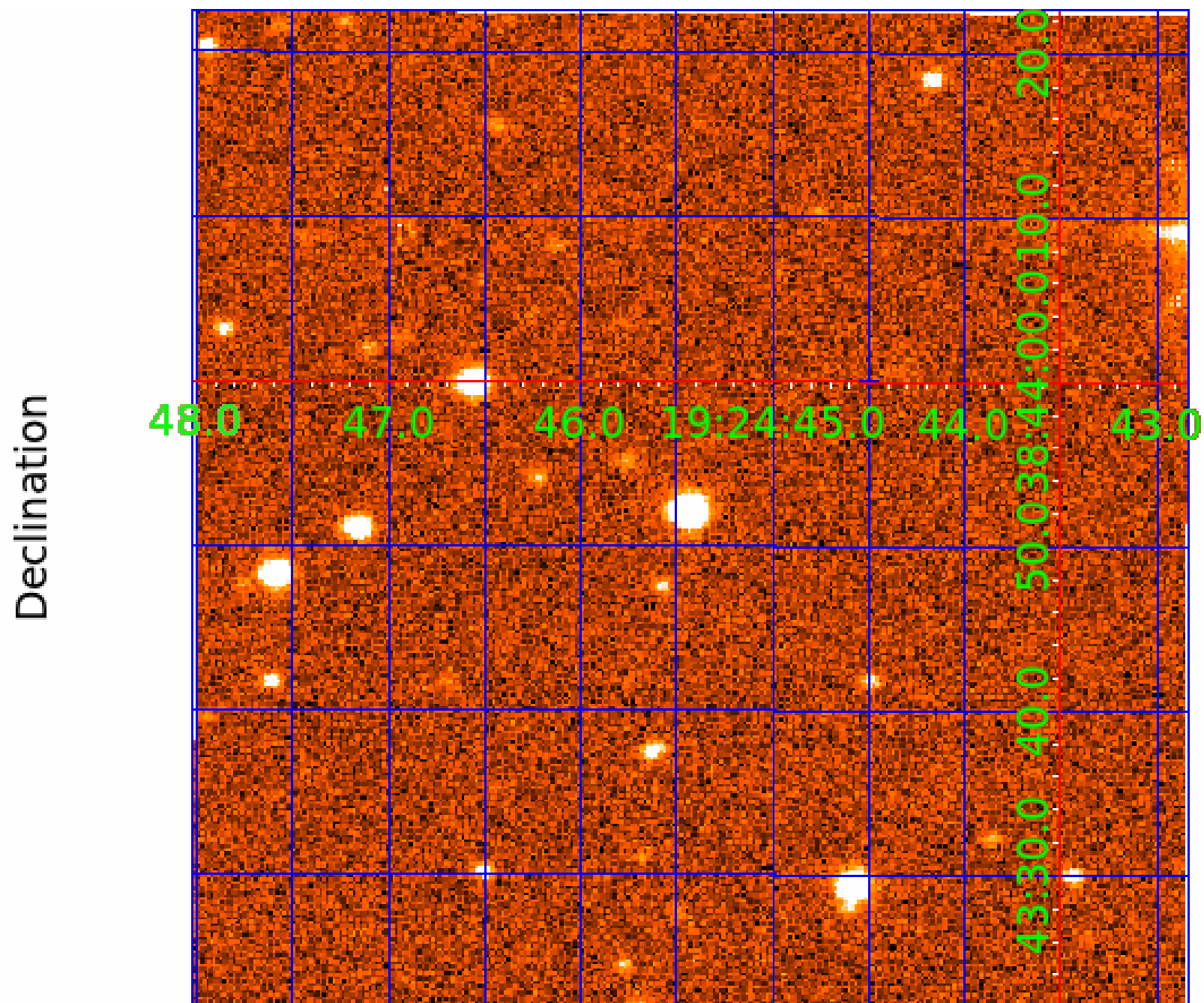
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 003644602

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})
003644602-01	OBS	4479.01	359.074325	415.418979	598.7	12.766	9.6	10.0	0.93	6256	2.90	1.23
003644602-02	OBS	No	359.098095	295.675248	482.2	25.704	8.6	9.6	0.93	6256	2.07	1.23

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003644602-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_CHASES_MARSHALL_SKYE—CENT_FEW_DIFFS—EPHEM_MATCH
003644602-02	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_SKYE—SAME_NTL_PERIOD—CENT_FEW_DIFFS—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 003644602-02

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
003644602-02	3644602	003644601-01	3644601	1:1	72.4	16	9	15.16	15.14	5.57	Direct-PRF	1	1.61	0.98

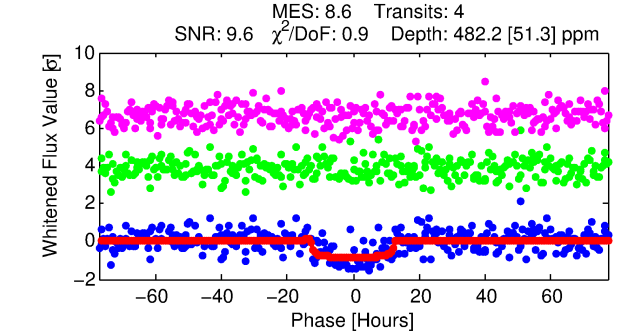
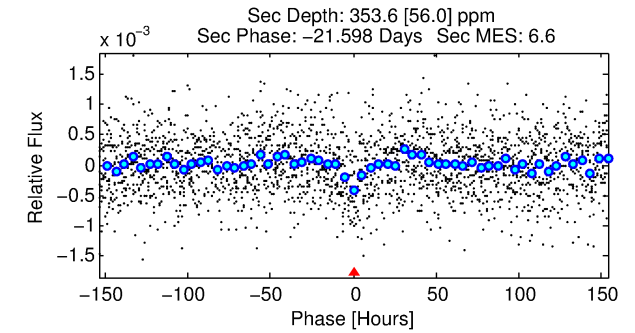
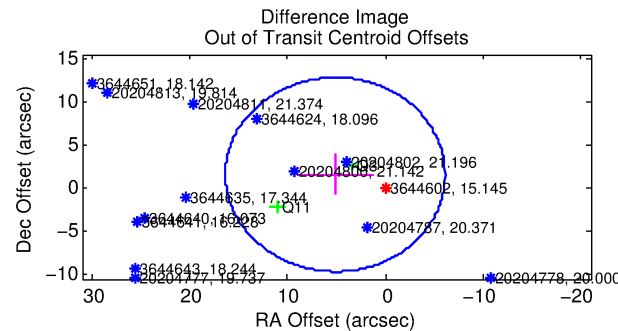
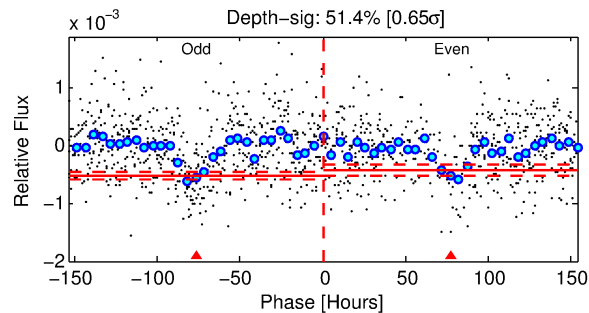
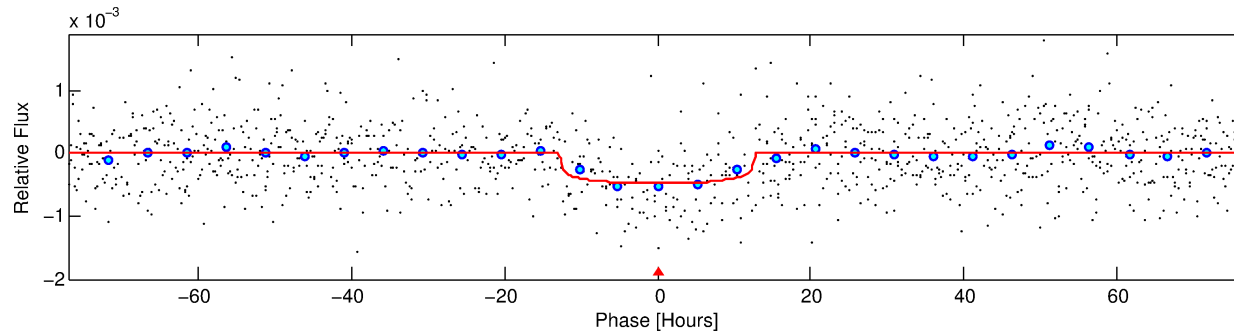
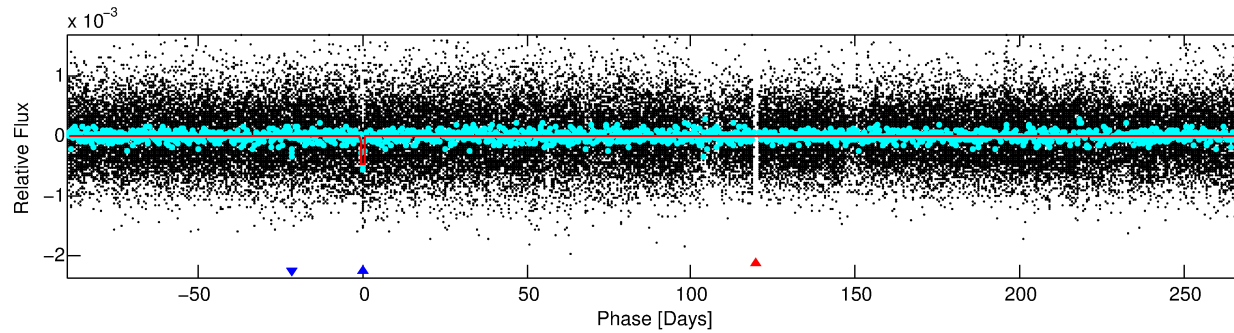
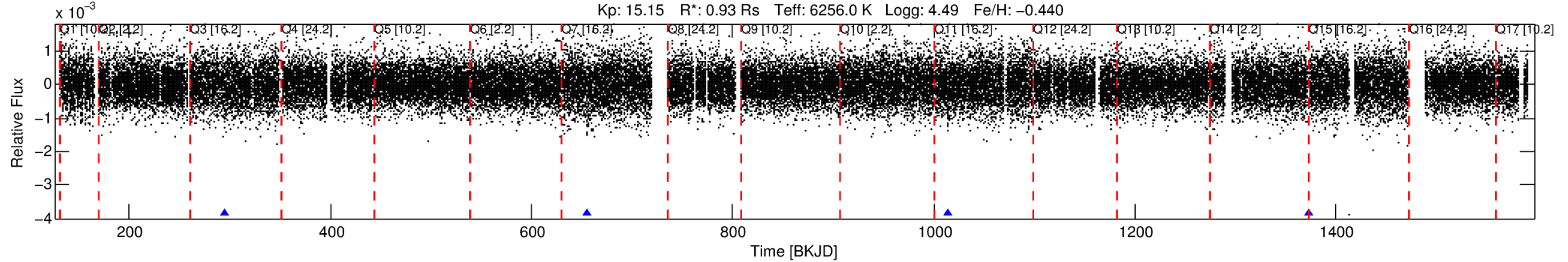
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 3644602 Candidate: 2 of 2 Period: 359.098 d

KOI: K04479 Corr: No Ephemeris Match

Kp: 15.15 R*: 0.93 Rs Teff: 6256.0 K Logg: 4.49 Fe/H: -0.440



DV Fit Results:

Period = 359.09810 [0.02086] d
Epoch = 295.6752 [0.0283] BKJD
Rp/R* = 0.0203 [0.0102]
a/R* = 104.75 [271.94]
b = 0.28 [8.63]
Seff = 1.23 [0.49]
Teq = 269 [27] K
Rp = 2.07 [1.22] Re
a = 0.9843 [0.2549] AU
Ag = 44007.89 [47705.02] [0.92σ]
Teffp = 6014 [1545] K [3.72σ]

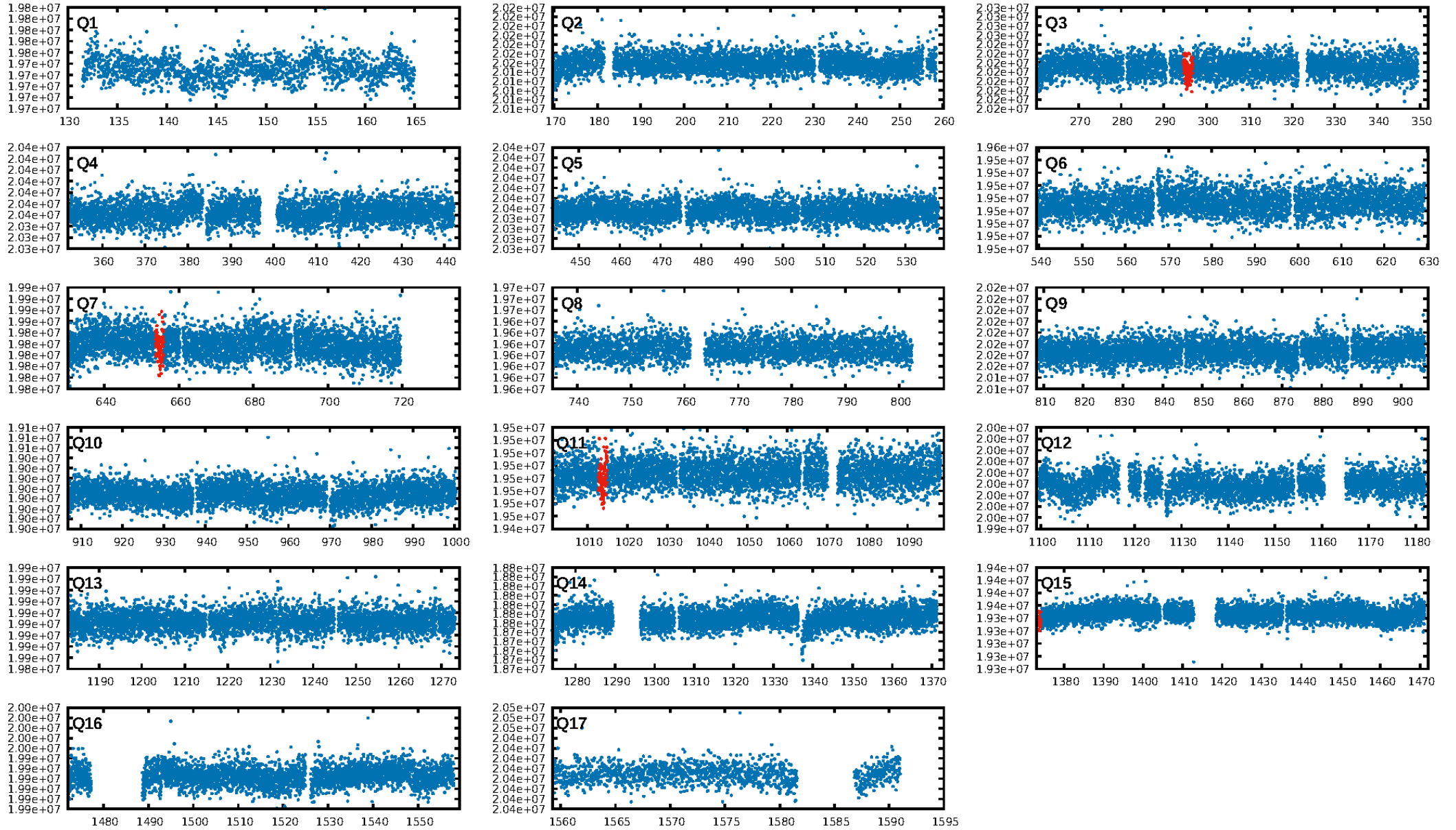
DV Diagnostic Results:

ShortPeriod-sig: 1.6% [0.02σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 71.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.62e-14
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -4.261
Centroid-sig: 0.0%
Centroid-so: 5.636 arcsec [3.41σ]
OotOffset-rm: 5.367 arcsec [1.43σ]
KicOffset-rm: 5.398 arcsec [1.45σ]
OotOffset-st: 0/2/0/0 [2]
KicOffset-st: 0/2/0/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 1.00 [3/3]

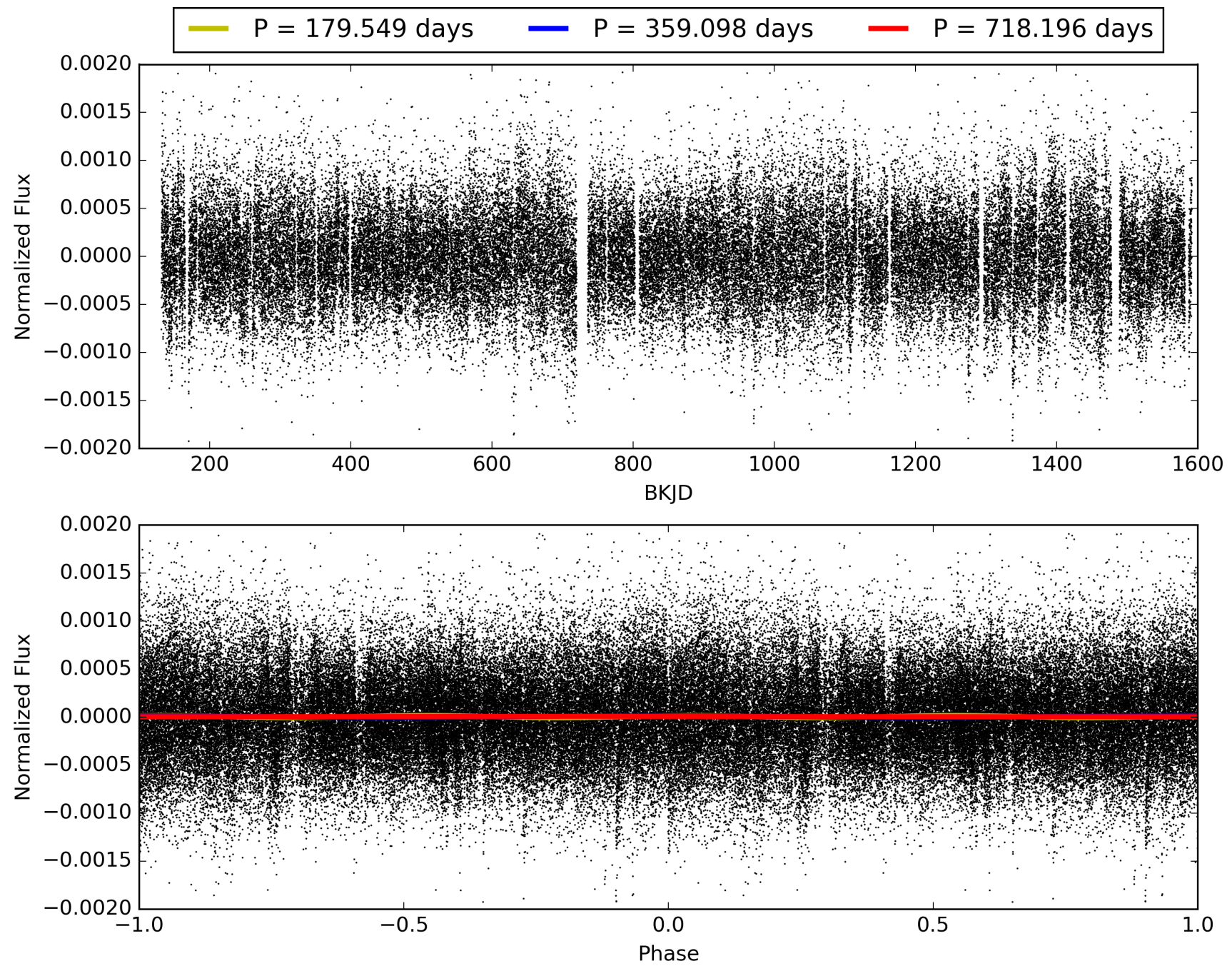
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:54:28 Z

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

TCE 003644602-02, PDC Light Curves

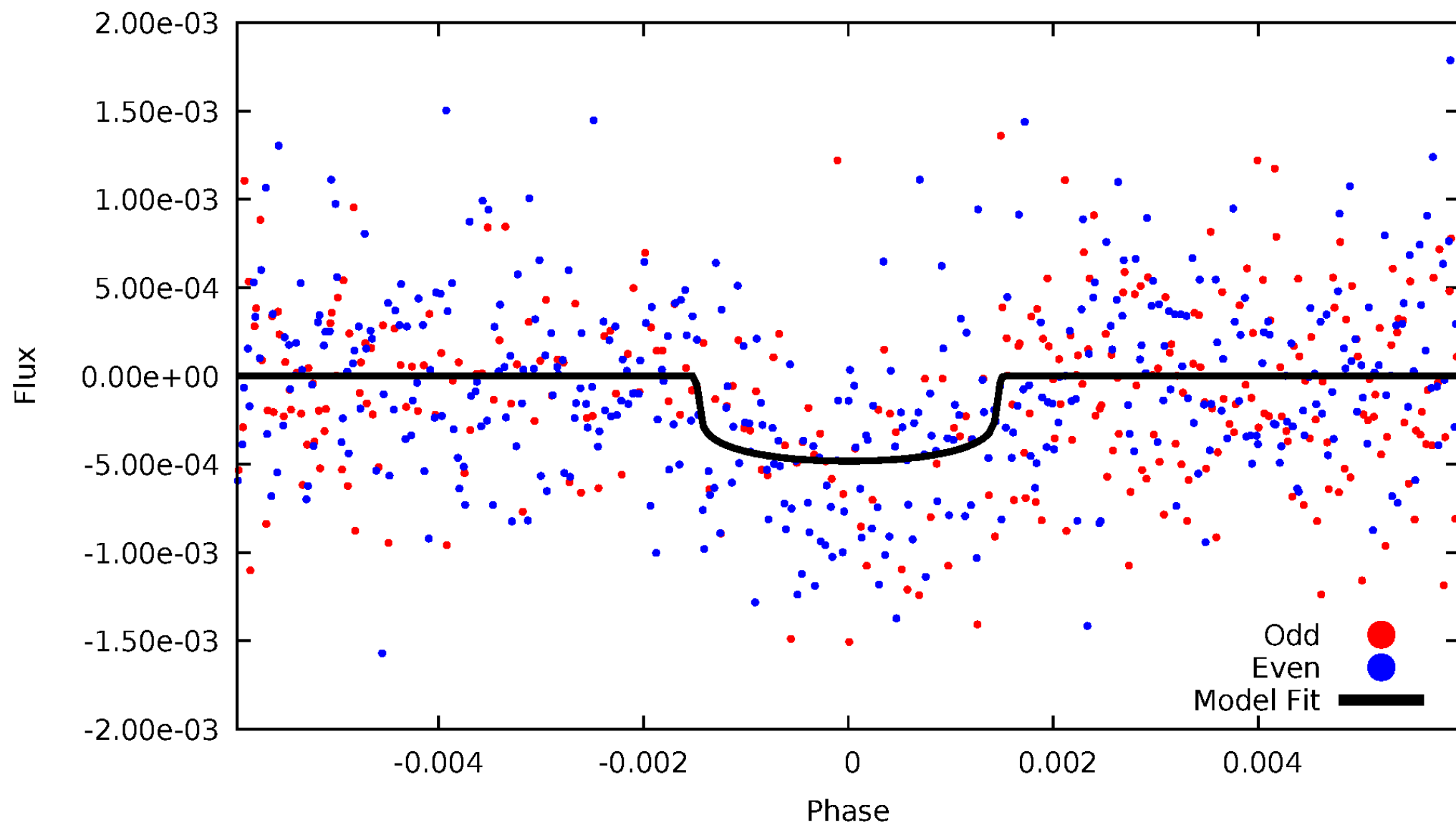


TCE 003644602-02



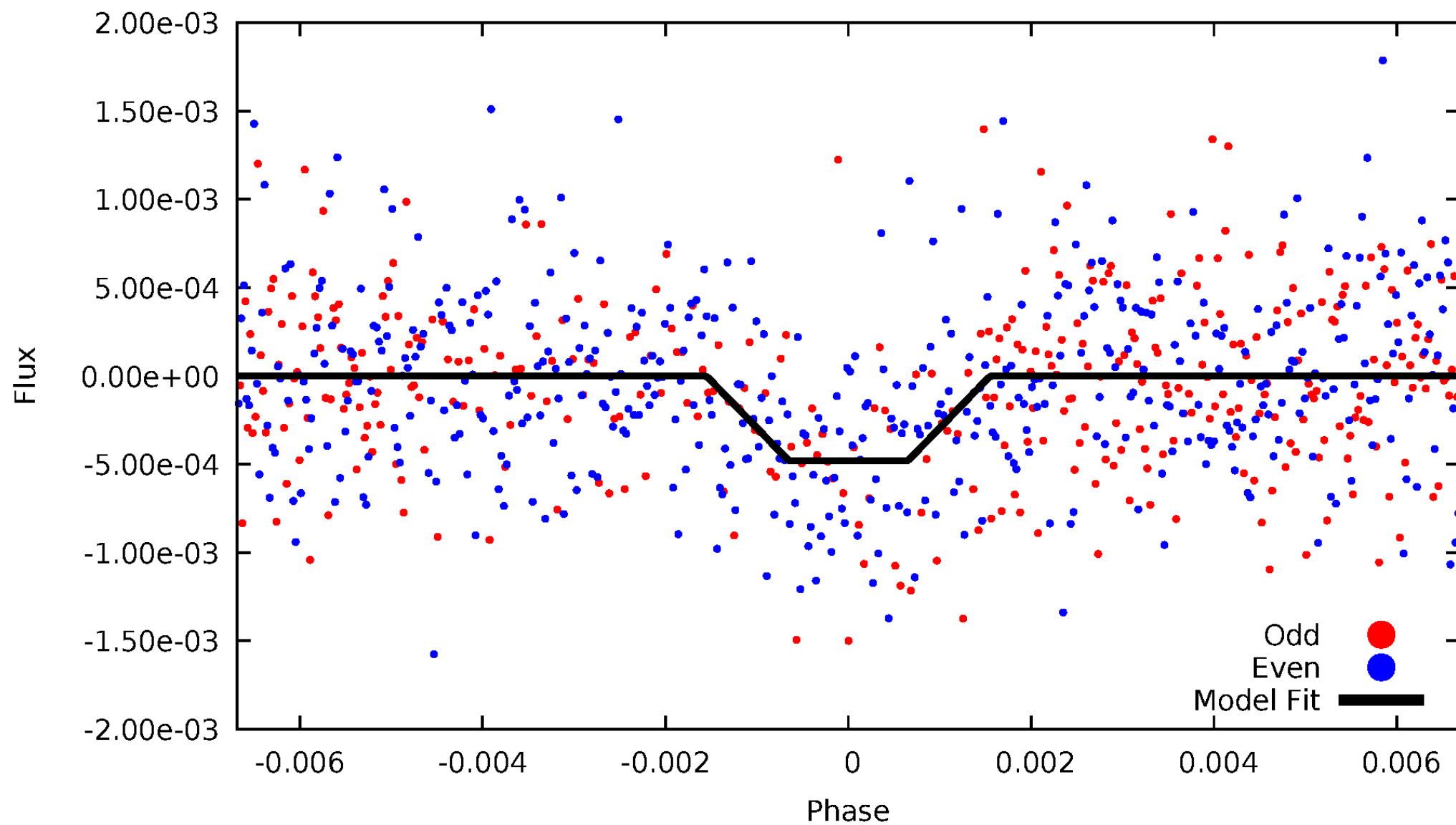
DV Odd/Even

TCE 003644602-02



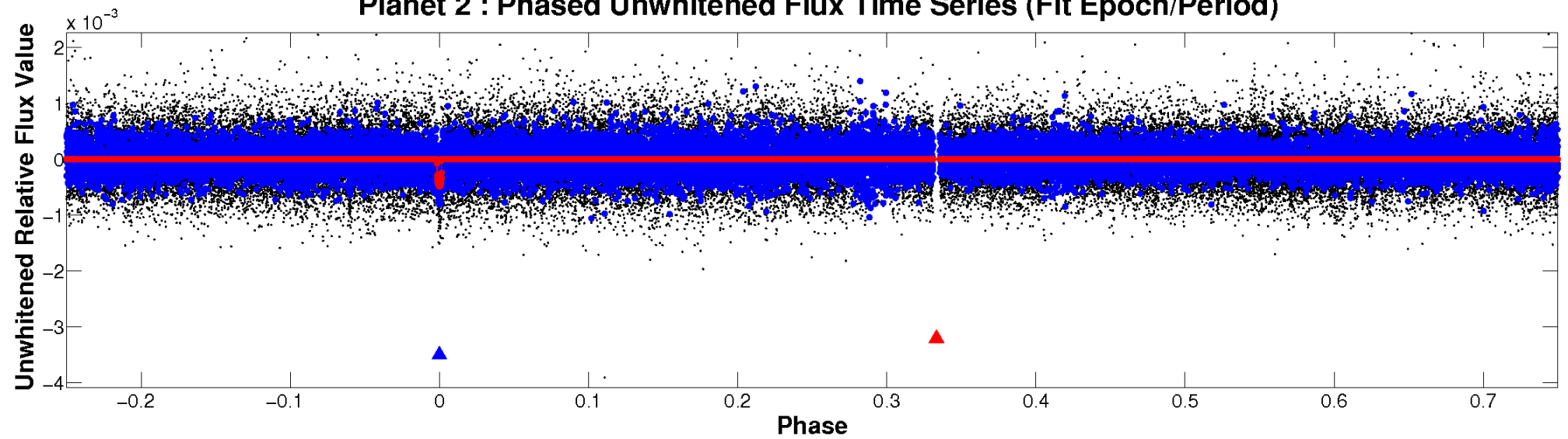
ALT Odd/Even

TCE 003644602-02

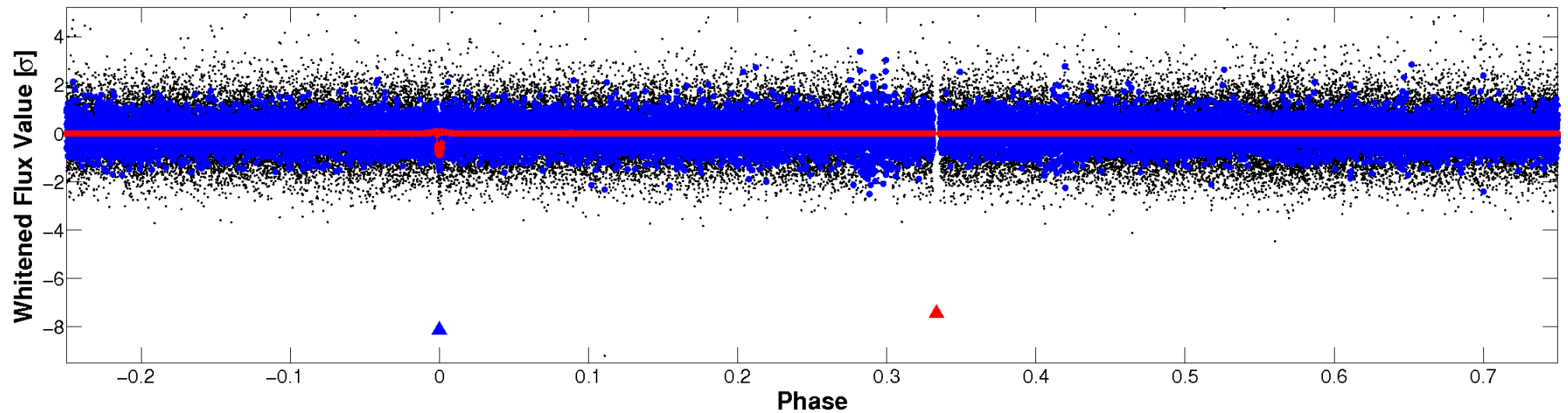


Non-Whitened Vs. Whitened Light Curve

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

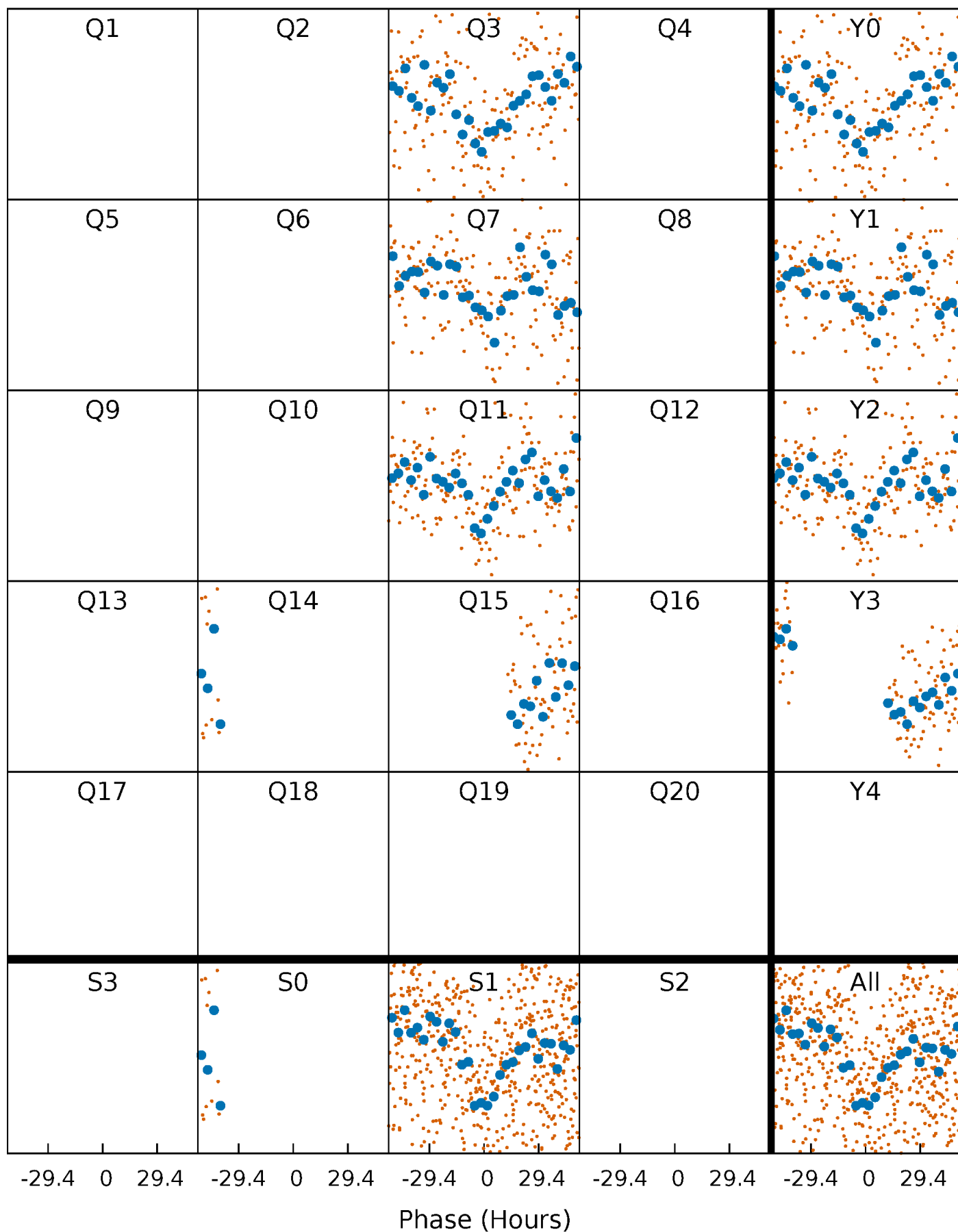


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



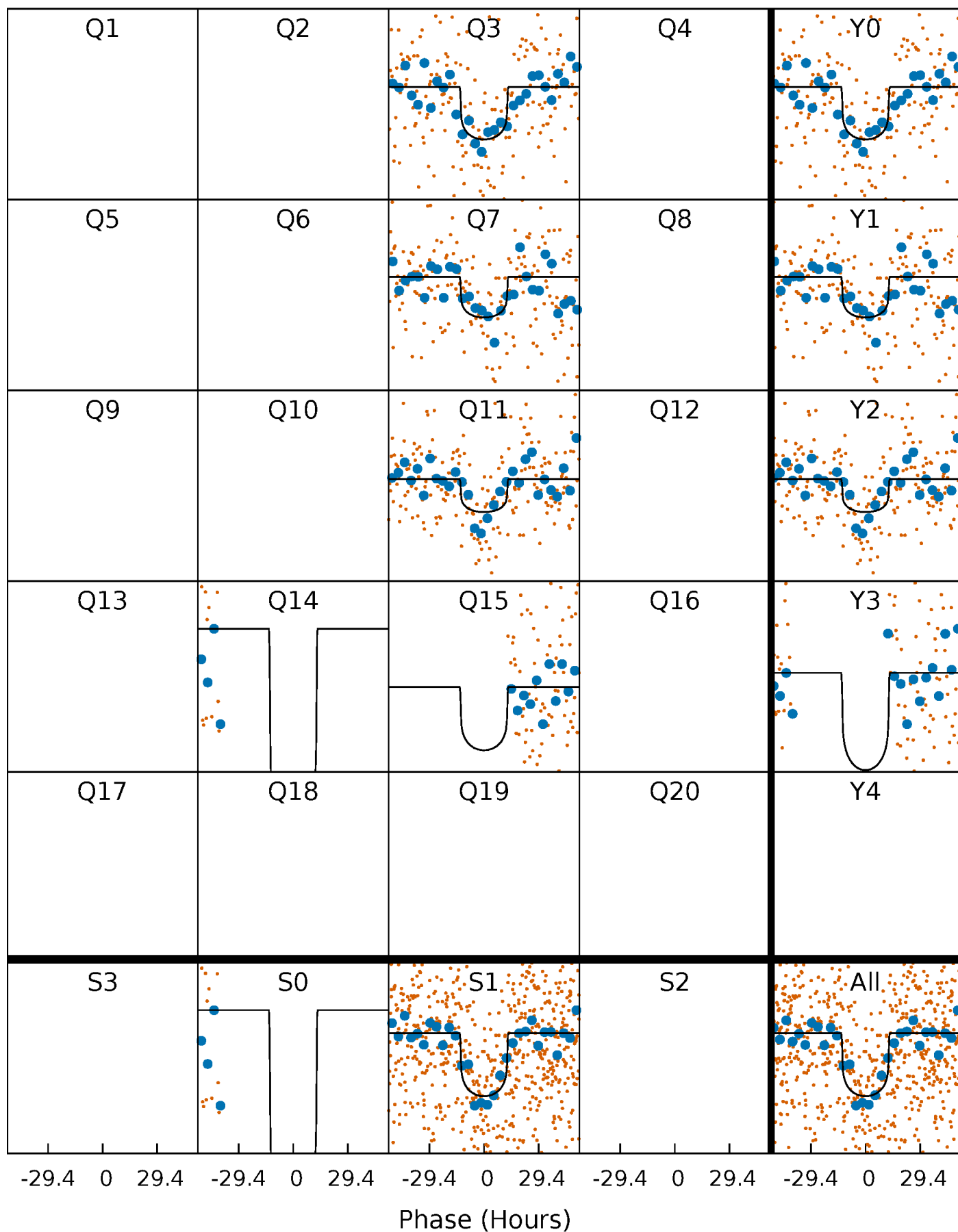
PDC Quarter-Phased Transit Curves

TCE 003644602-02 $P=359.098095$ Days $T_0=295.675248$ (BKJD)



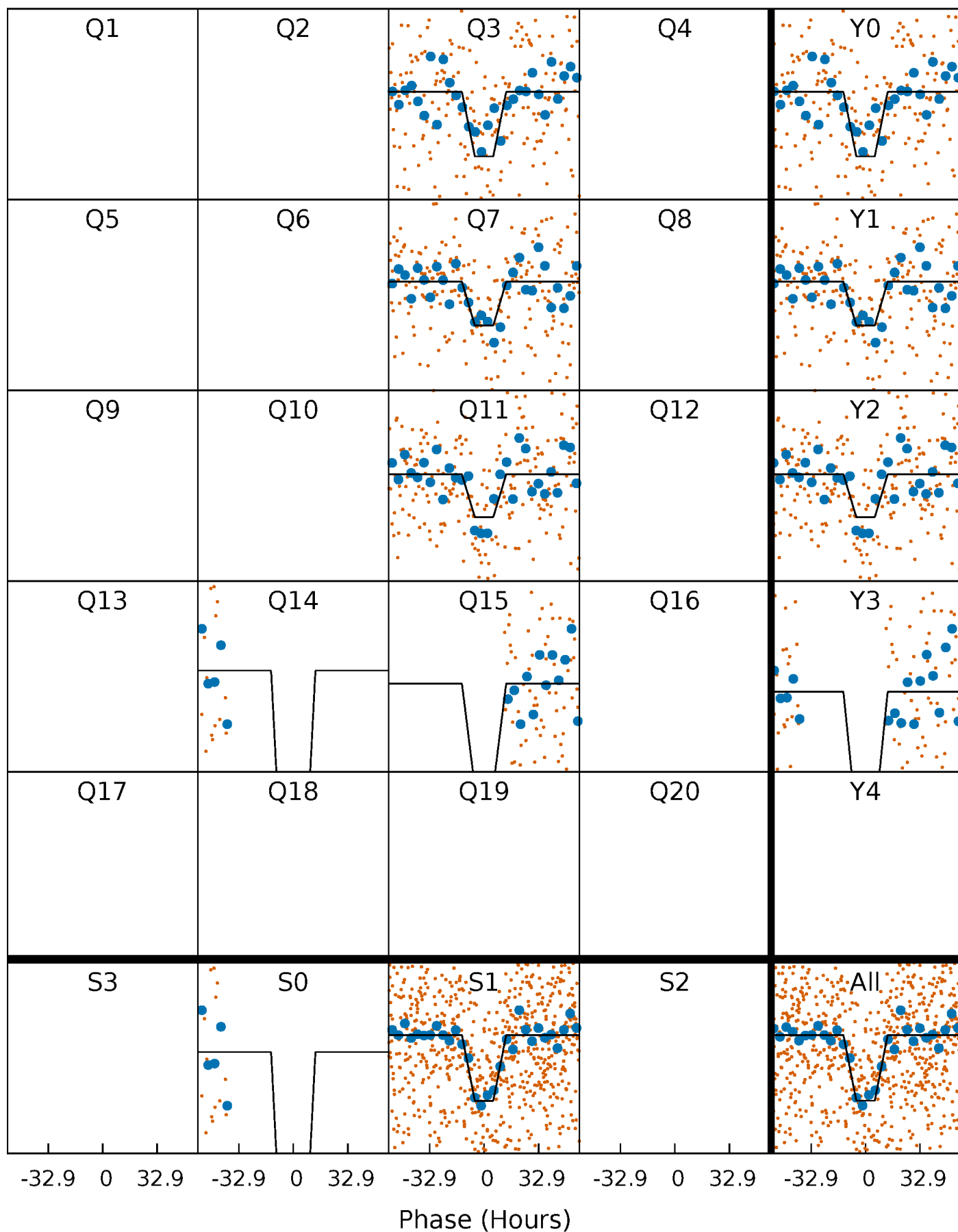
DV Quarter-Phased Transit Curves

TCE 003644602-02 P=359.098095 Days $T_0=295.675248$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

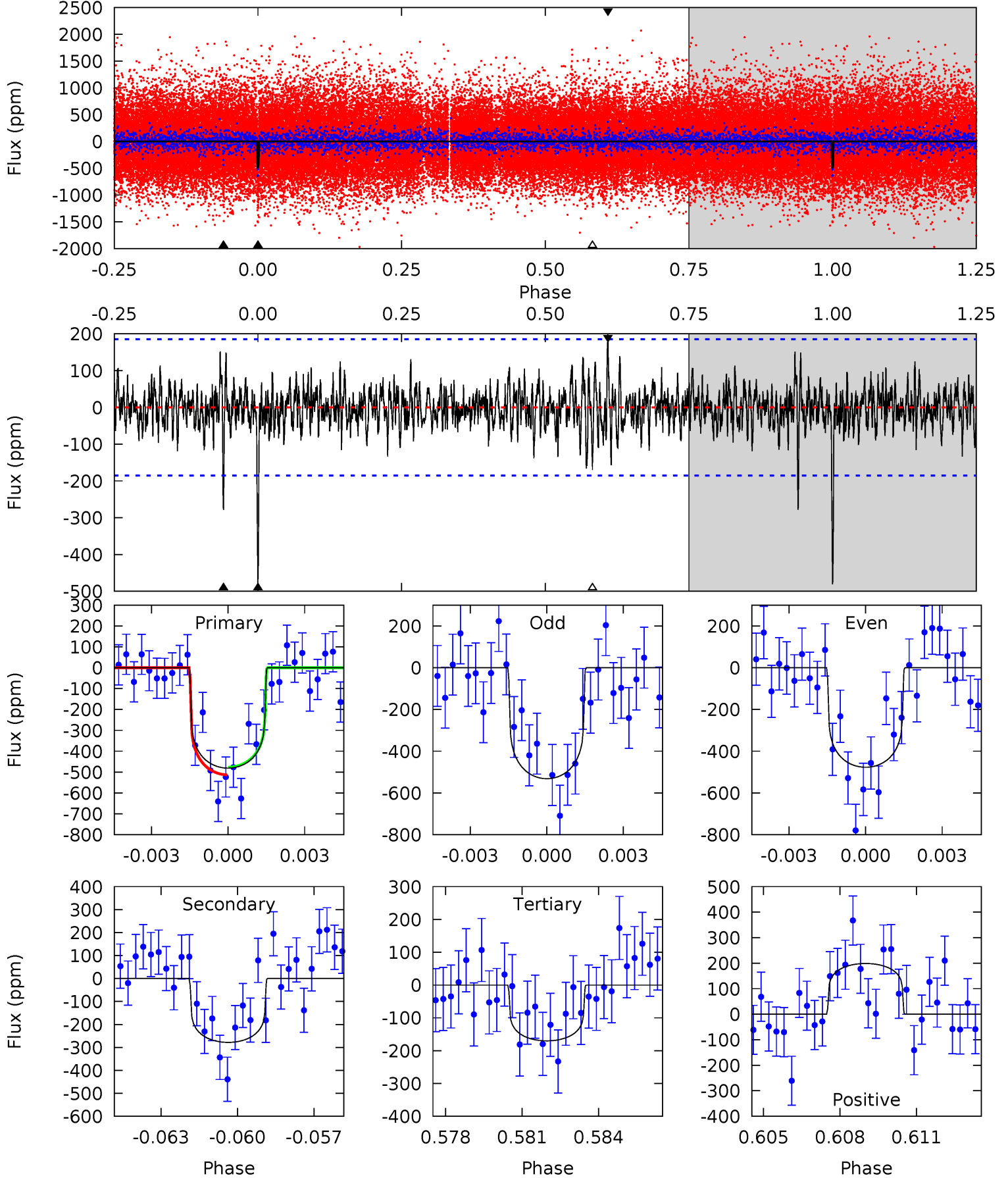
TCE 003644602-02 P=359.106195 Days $T_0=295.669499$ (BKJD)



DV Model-Shift Uniqueness Test

003644602-02, P = 359.098095 Days, E = 295.675248 Days

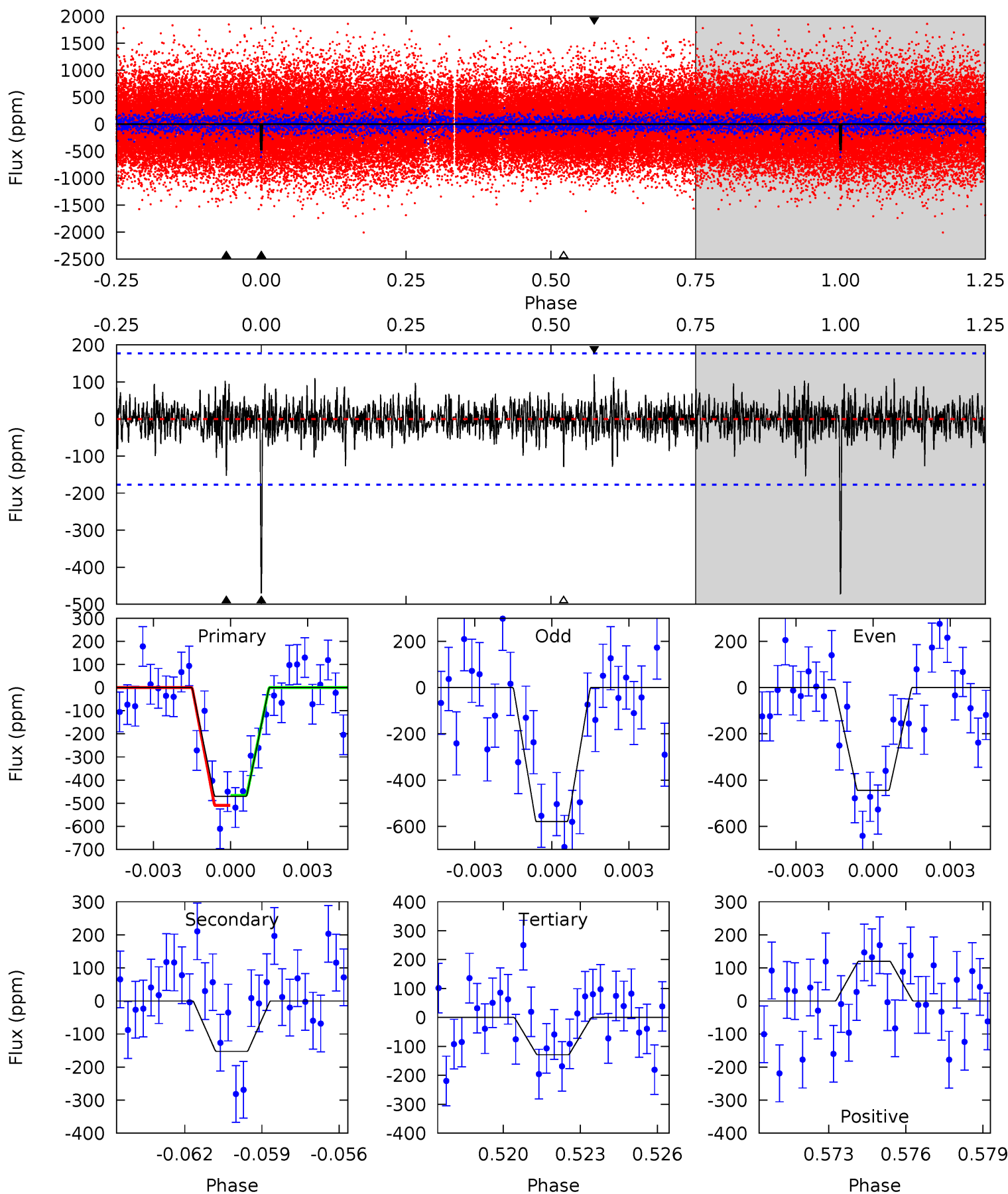
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.6	7.89	4.82	5.64	5.25	2.97	1.28	8.82	8.01	3.07	2.26	0.73	1.00	0.29	0.52



Alt Model-Shift Uniqueness Test

003644602-02, P = 359.106195 Days, E = 295.669499 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.9	4.52	3.82	3.56	5.25	2.96	0.95	10.1	10.4	0.70	0.96	1.88	0.08	0.20	0.63



Stellar Parameters For KIC 003644602

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6256^{+176}_{-220}	$4.493^{+0.054}_{-0.202}$	$-0.440^{+0.300}_{-0.300}$	$0.932^{+0.290}_{-0.097}$	$0.986^{+0.123}_{-0.123}$	$1.716^{+0.472}_{-0.930}$
	+3%/-4%	+1%/-4%	+68%/-68%	+31%/-10%	+12%/-12%	+28%/-54%
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 003644602-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-278 ± 35	$2.21^{+1.15}_{-1.06}$	382^{+26}_{-20}	5600^{+2286}_{-907}	30205^{+78668}_{-17551}
Alt.	-153 ± 34	$2.41^{+1.06}_{-1.07}$	384^{+27}_{-20}	4765^{+1460}_{-626}	13767^{+32540}_{-7427}

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

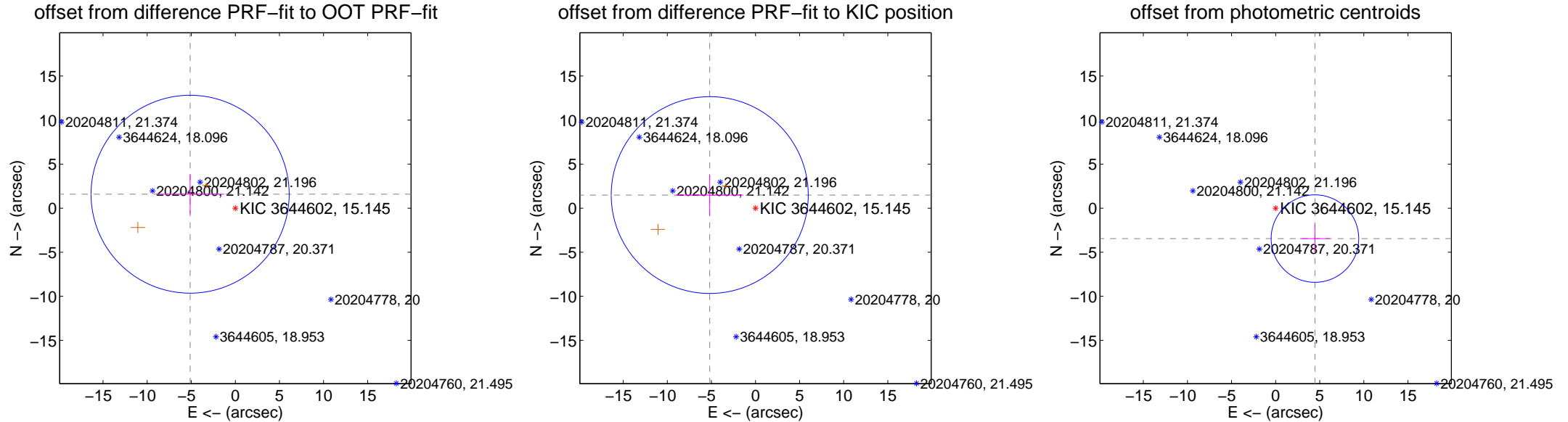
DV Centroid Data

Supplemental centroid analysis for 003644602-02. Kepler magnitude: 15.14. Transit SNR 9.58

There are 0 quarters with good PRF difference image offsets

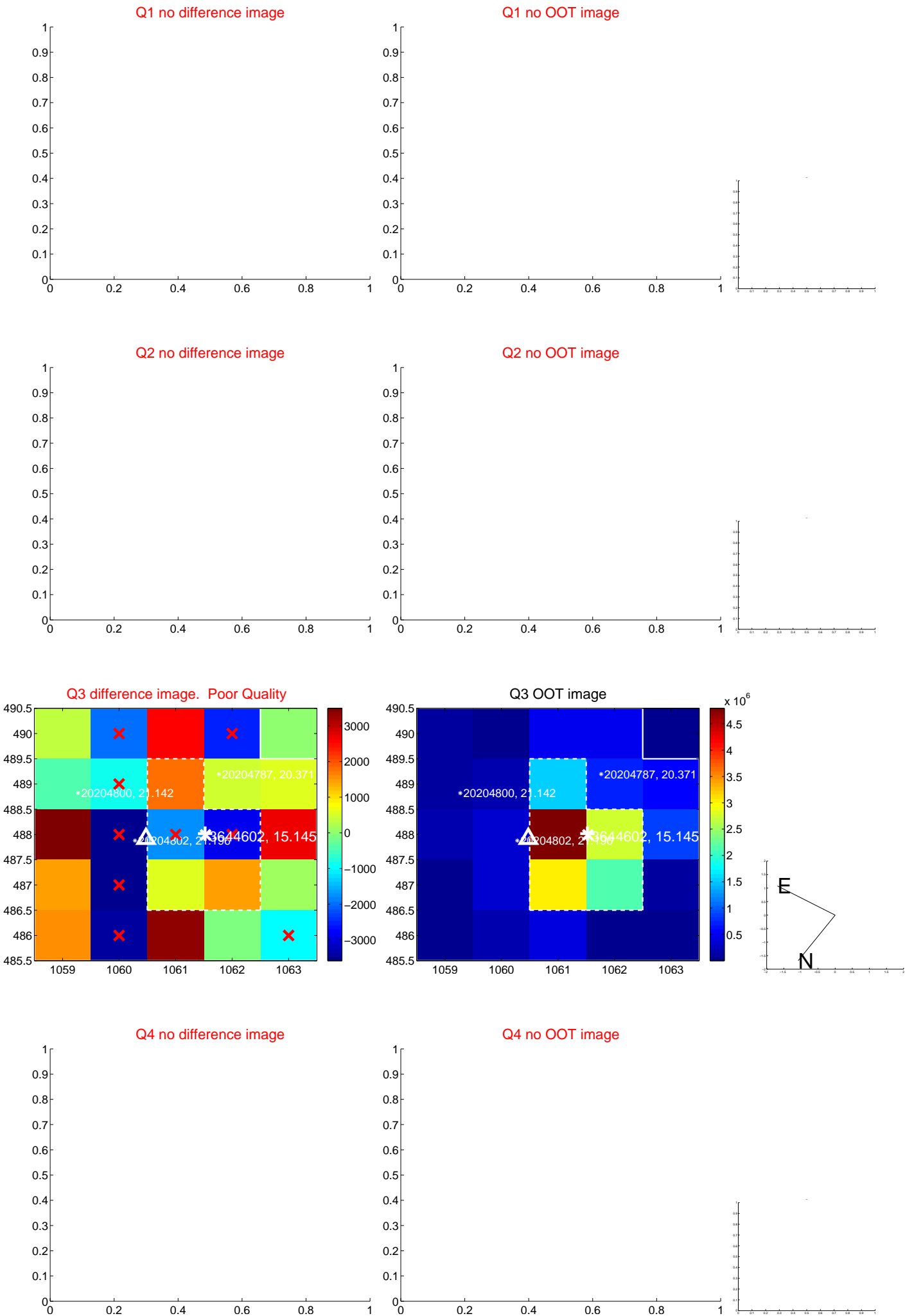
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.367 ± 3.744	1.43	5.128 ± 3.856	1.584 ± 2.265
PRF-fit source offset from KIC position	5.398 ± 3.723	1.45	5.188 ± 3.815	1.489 ± 2.336
photometric centroid source offset	5.64 ± 1.65	3.41	-4.46 ± 1.68	-3.45 ± 1.62

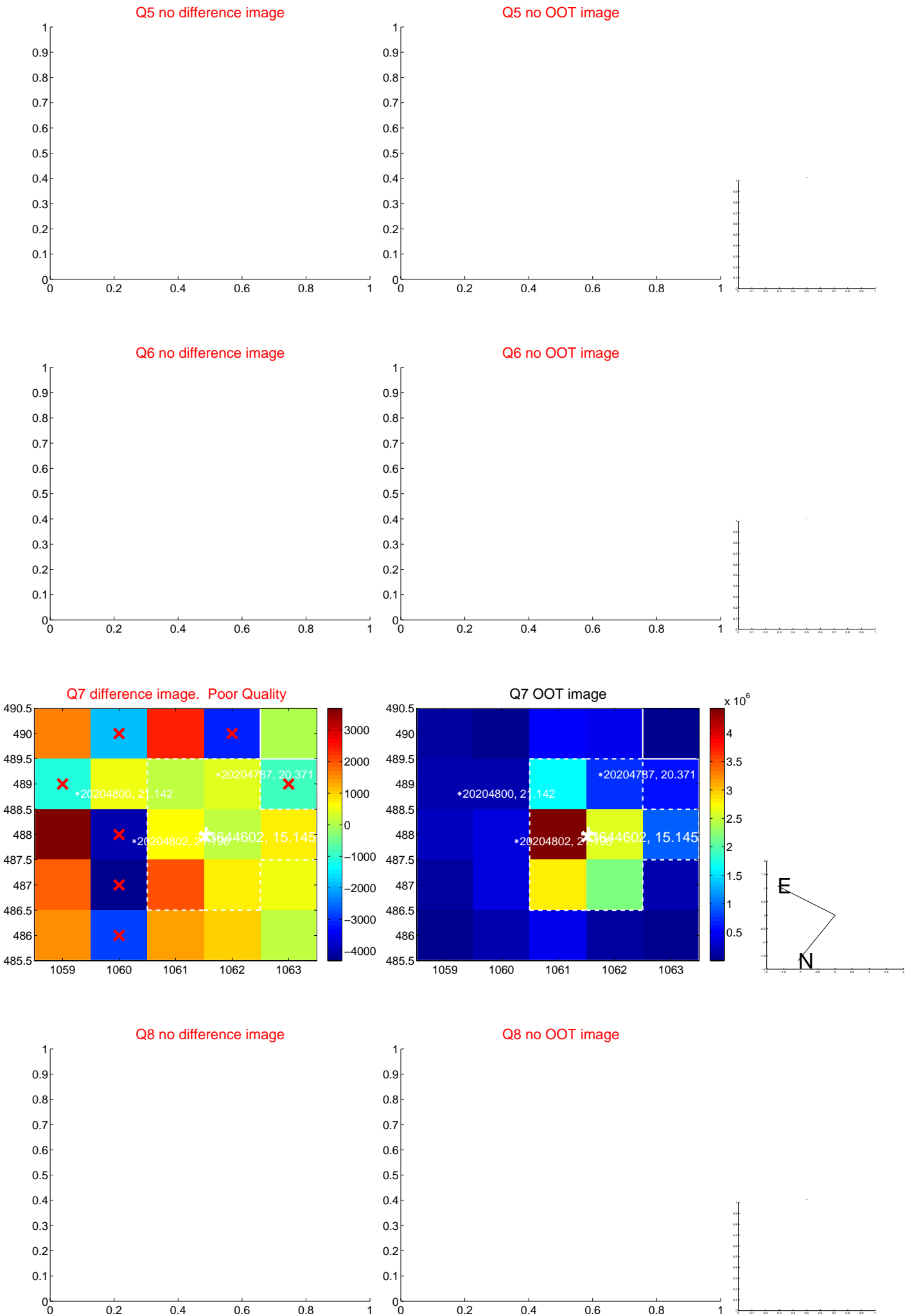


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

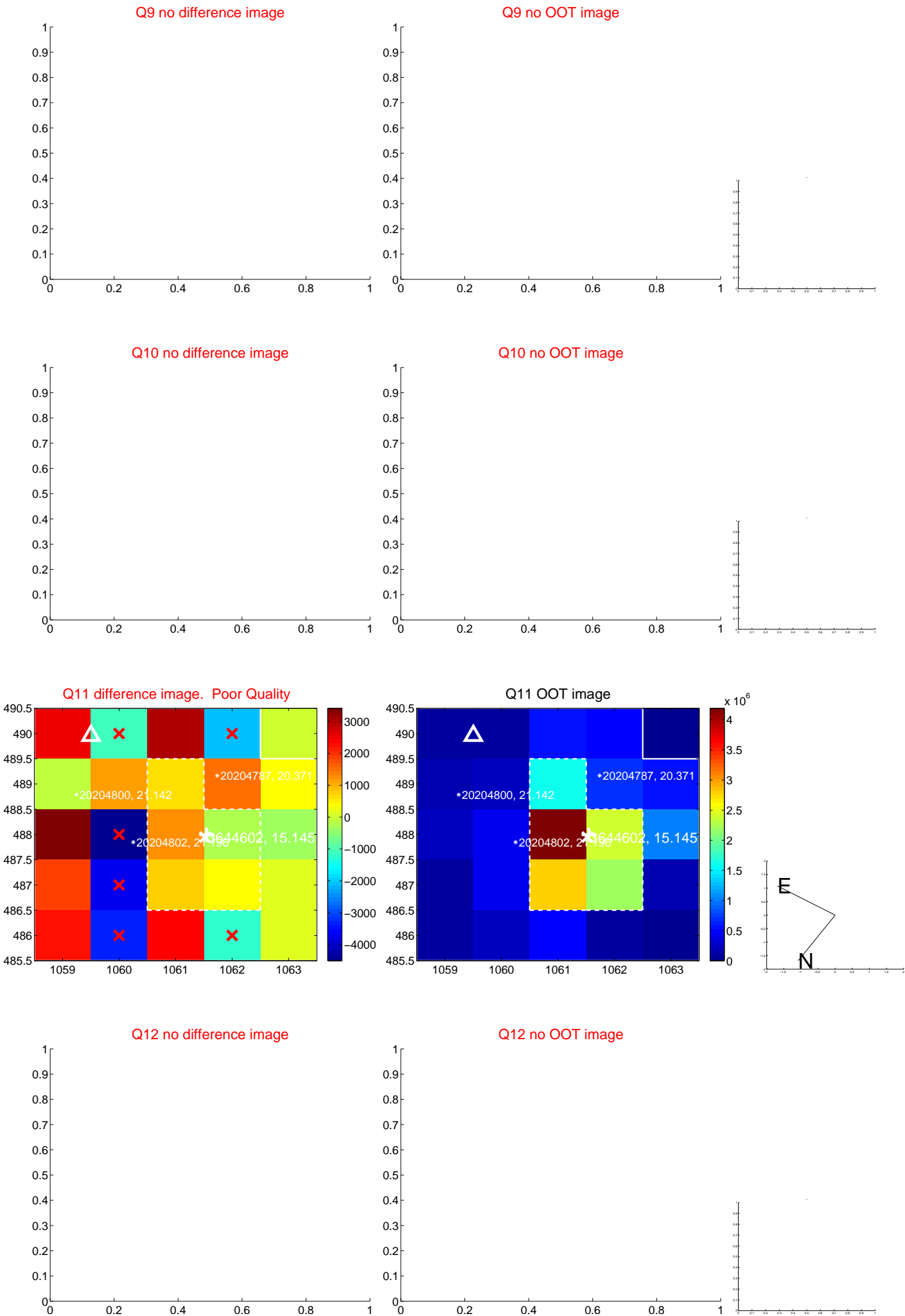
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



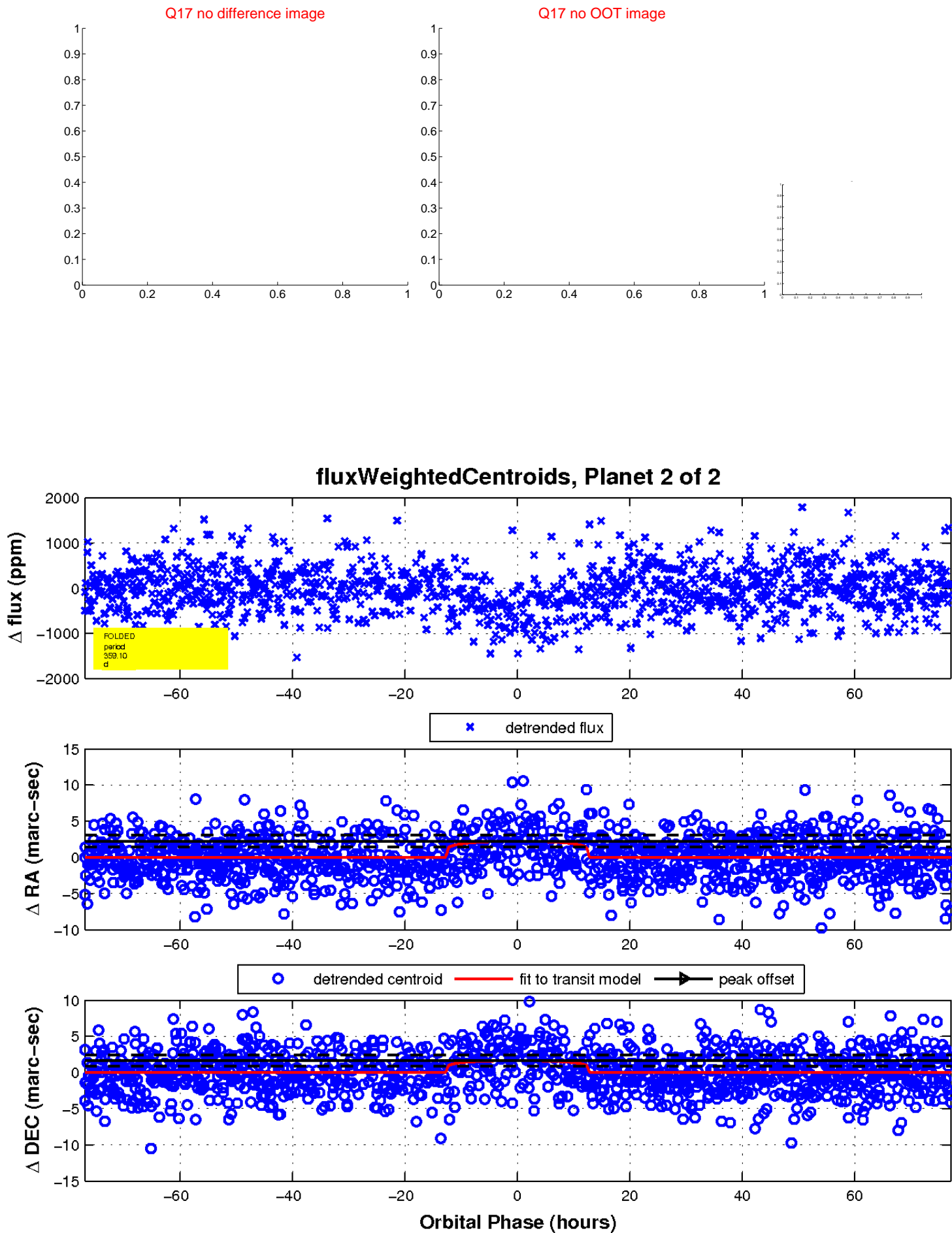
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

