

KIC 004939346

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})
004939346-01	OBS	1873.01	71.311704	132.390433	2158.3	8.975	33.8	35.4	1.07	6194	5.19	12.04
004939346-02	OBS	1873.02	34.917801	157.620613	470.2	8.471	11.9	12.7	1.07	6194	2.41	31.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004939346-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
004939346-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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.

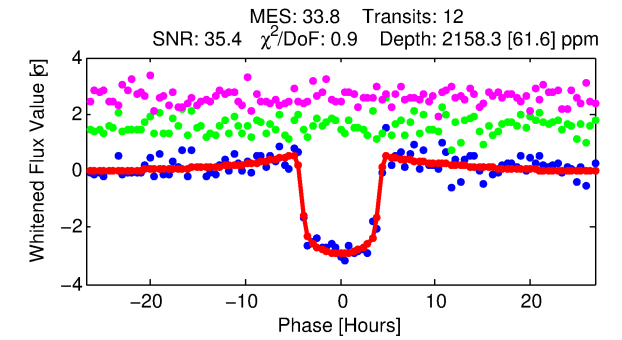
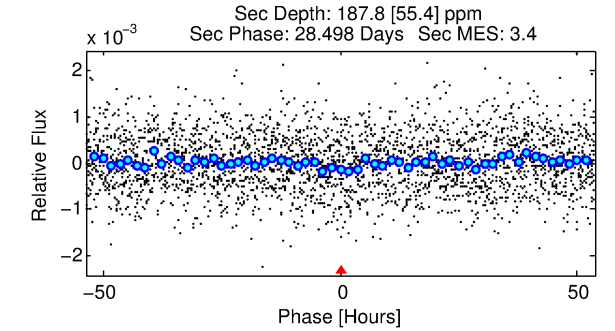
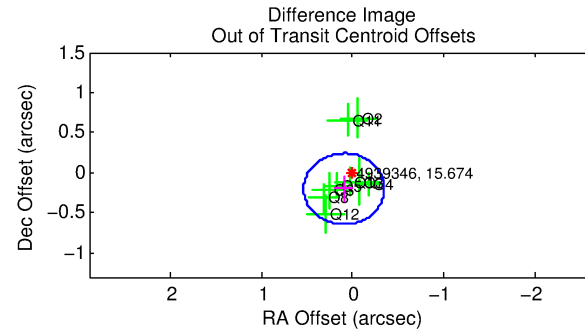
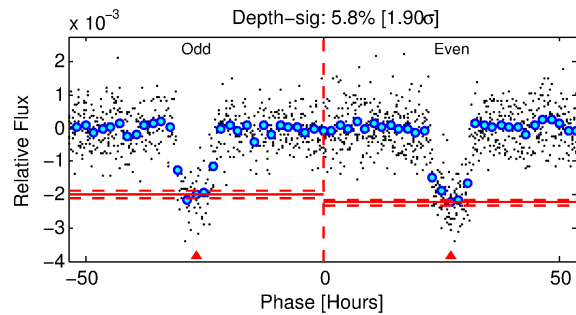
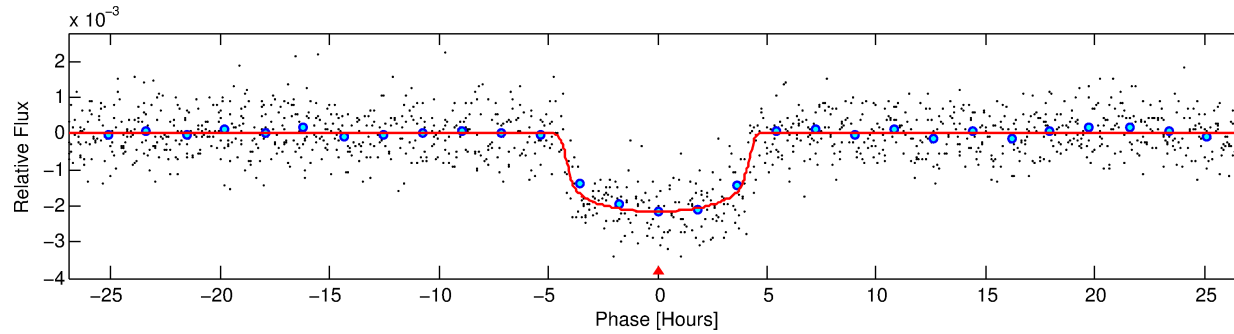
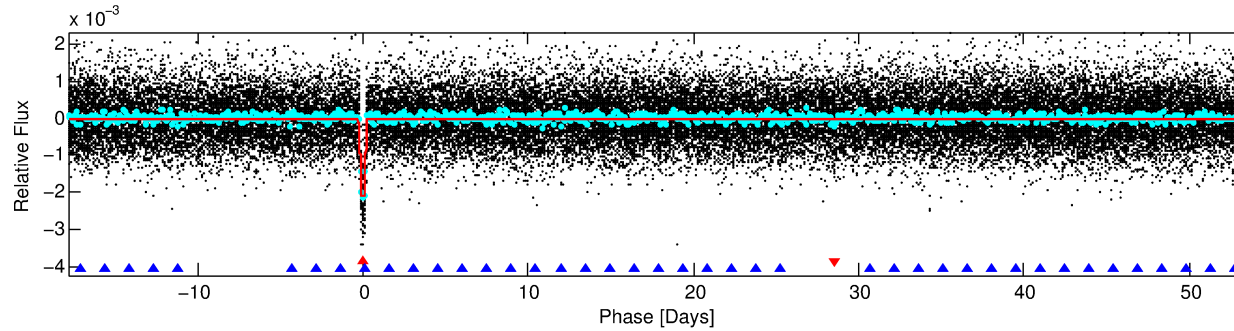
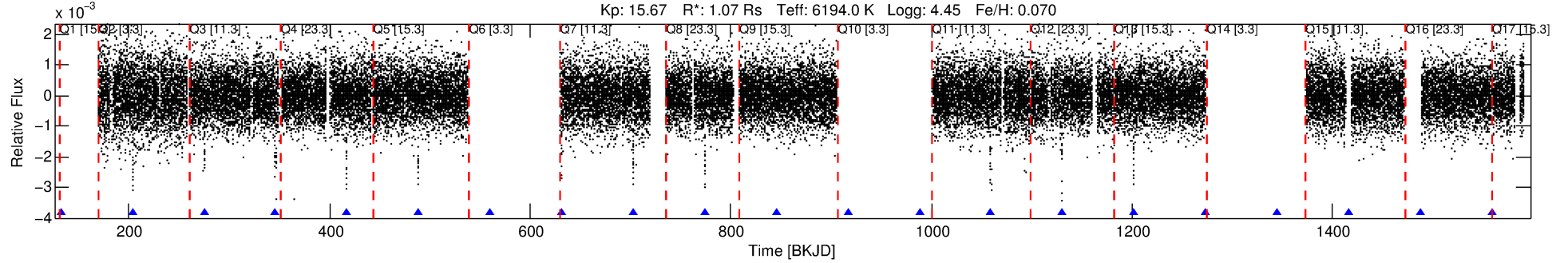
Ephemeris Match Information For 004939346-01

No Significant Match Found

DV One-Page Summary

KIC: 4939346 Candidate: 1 of 2 Period: 71.312 d
KOI: K01873.01 Name: Kepler-328c Corr: 0.989

Kp: 15.67 R*: 1.07 Rs Teff: 6194.0 K Logg: 4.45 Fe/H: 0.070



DV Fit Results:

Period = 71.31170 [0.00048] d
Epoch = 132.3904 [0.0042] BKJD
Rp/R* = 0.0445 [0.0029]
a/R* = 51.79 [15.79]
b = 0.60 [0.33]
Seff = 12.04 [4.91]
Teq = 475 [48] K
Rp = 5.19 [1.61] Re
a = 0.3538 [0.0888] AU
Ag = 480.27 [232.70] [2.06σ]
Teffp = 3438 [323] K [9.08σ]

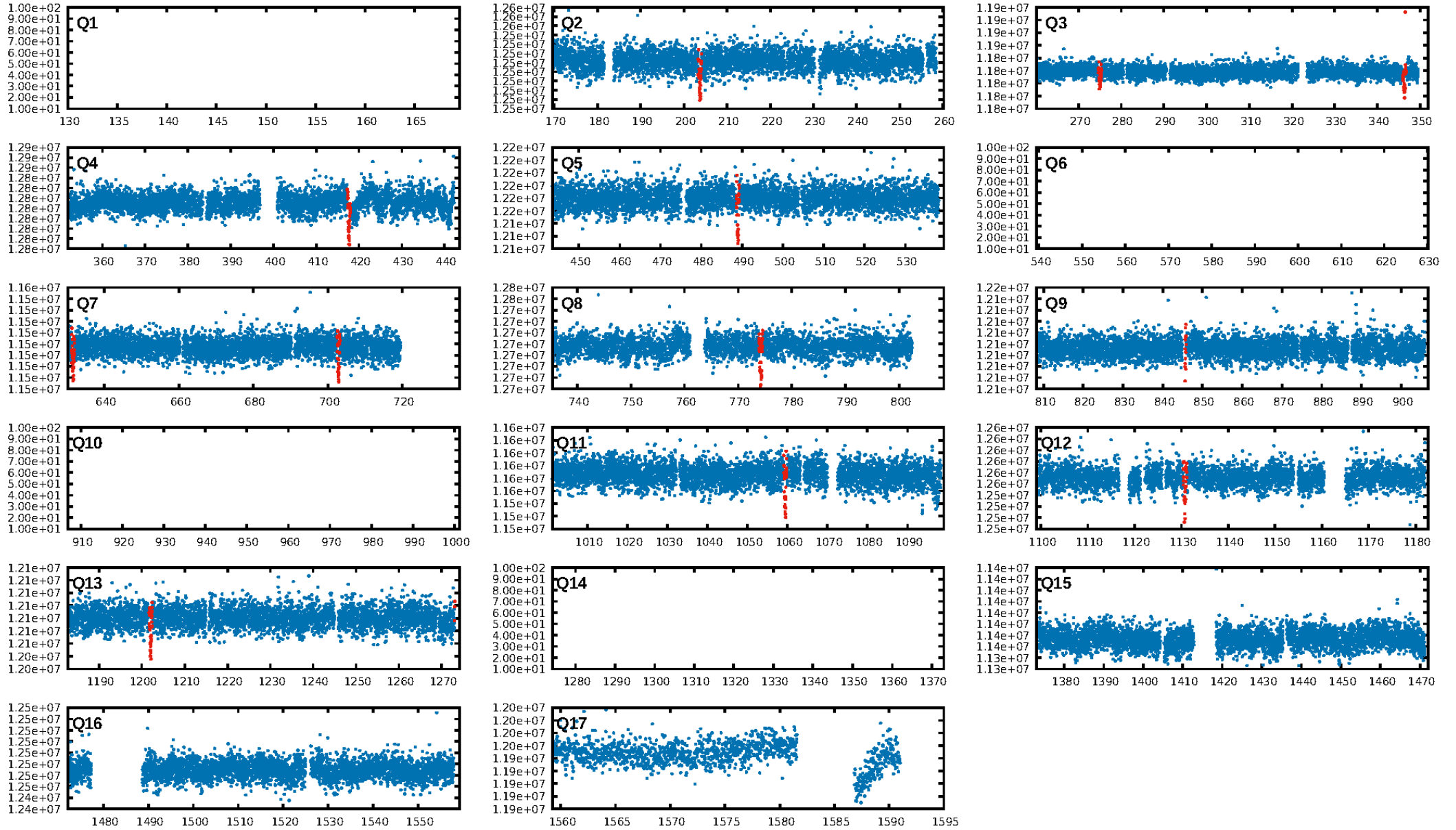
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [70.77σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 9.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.80e-236
RollingBand-fgt: 1.00 [12/12]
GhostDiagnostic-chr: 3.723
Centroid-sig: 76.7%
Centroid-so: 0.058 arcsec [0.17σ]
OotOffset-rm: 0.224 arcsec [1.52σ]
OotOffset-st: 1/3/3/2 [9]
KicOffset-rm: 0.171 arcsec [1.30σ]
KicOffset-st: 1/3/3/2 [9]
DiffImageQuality-fgm: 1.00 [9/9]
DiffImageOverlap-fno: 1.00 [9/9]

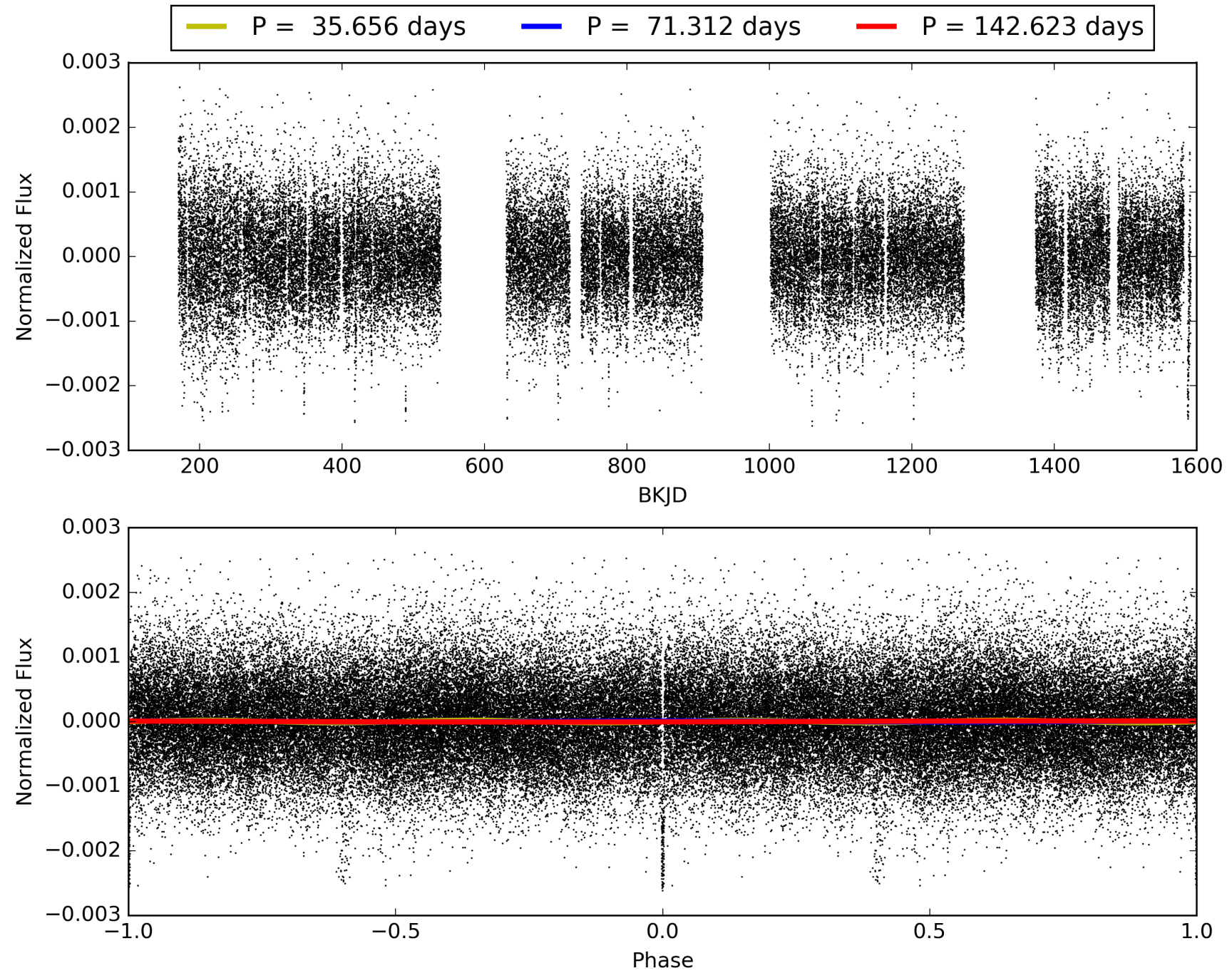
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:50:08 Z

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

TCE 004939346-01, PDC Light Curves

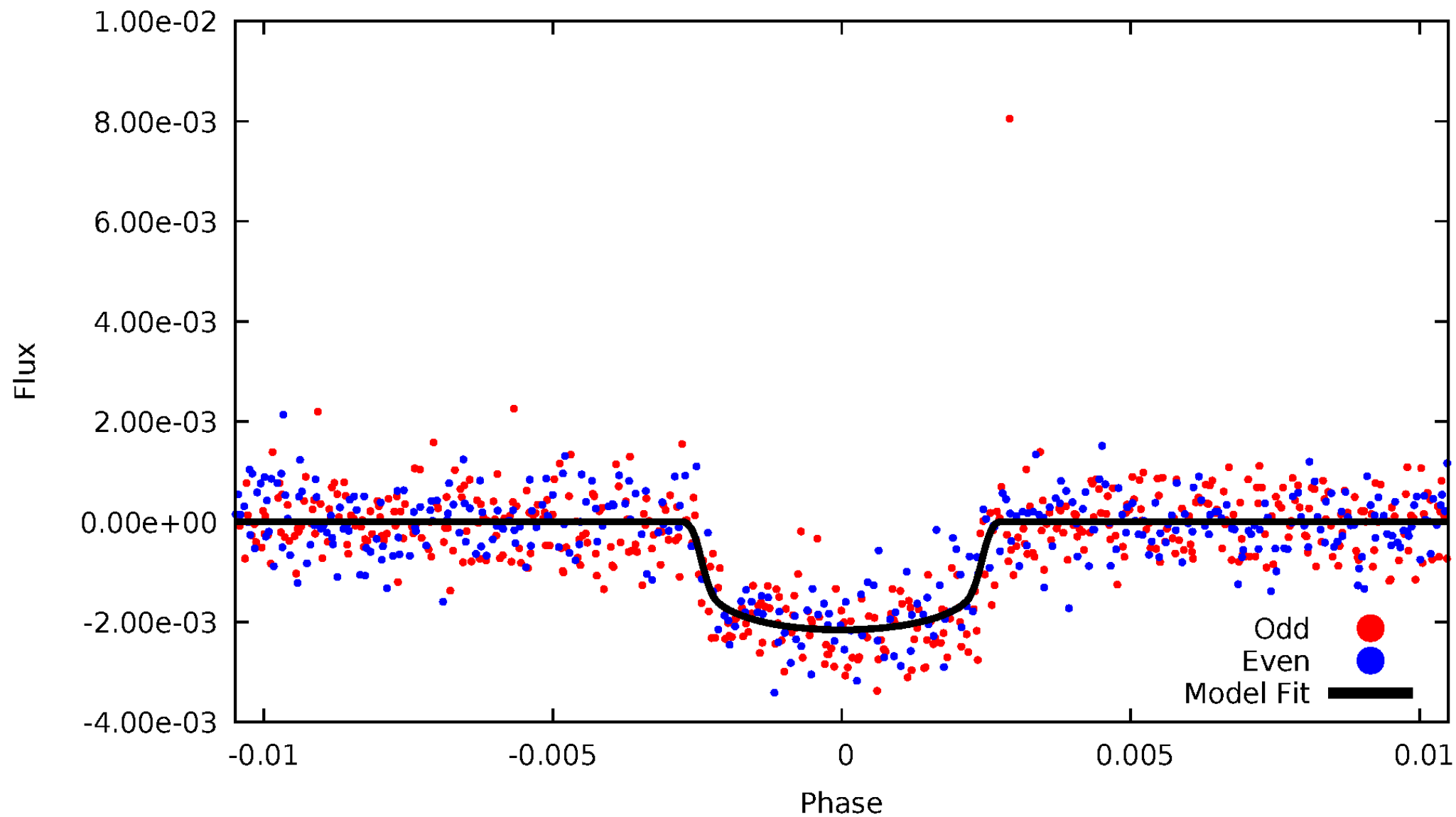


TCE 004939346-01



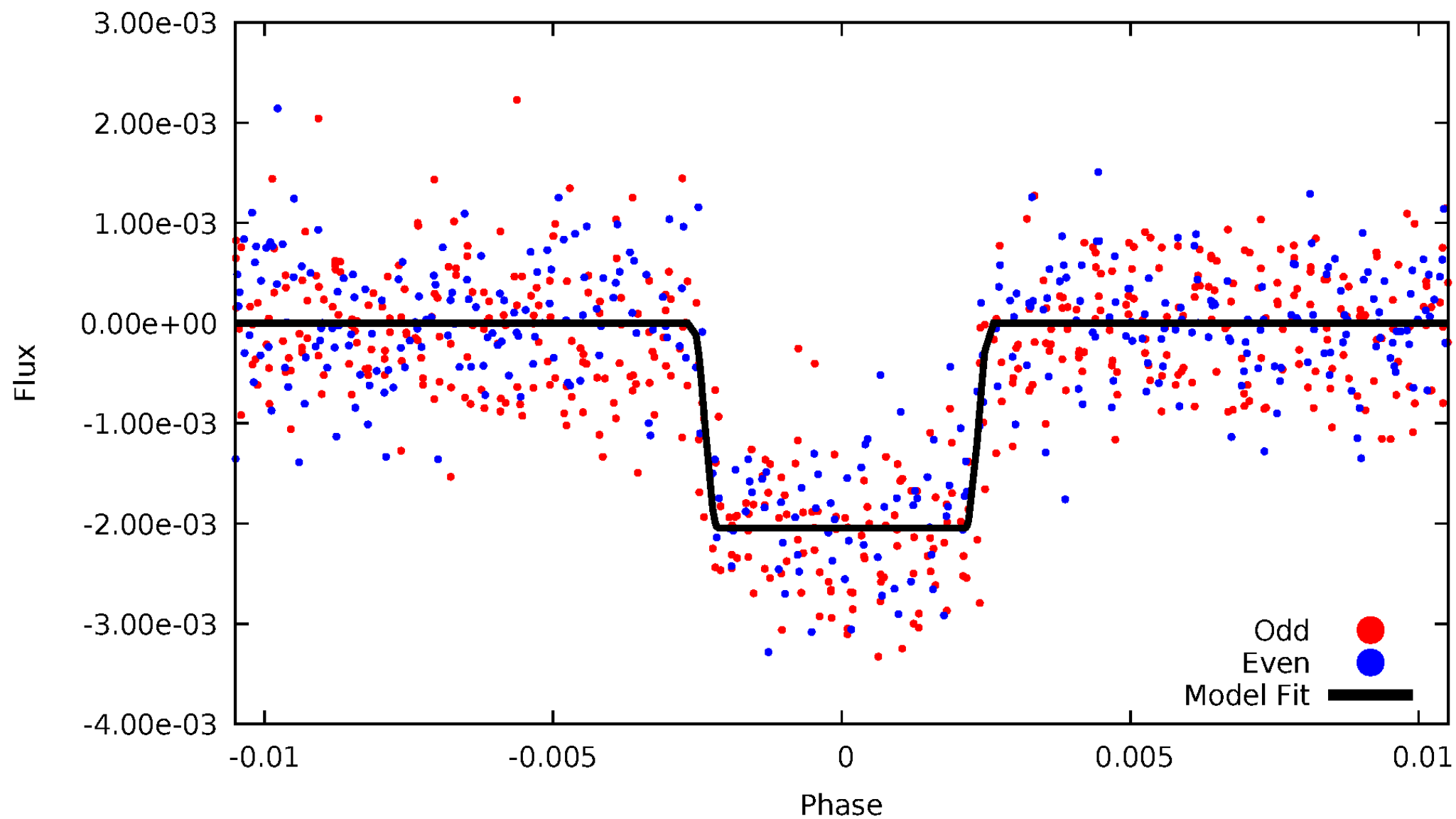
DV Odd/Even

TCE 004939346-01



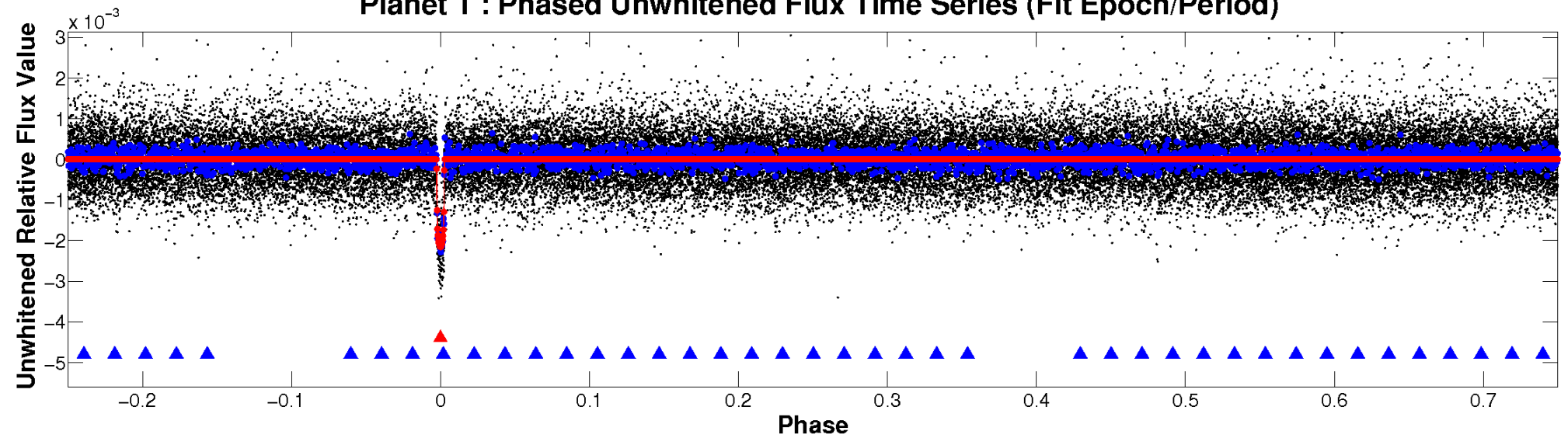
ALT Odd/Even

TCE 004939346-01

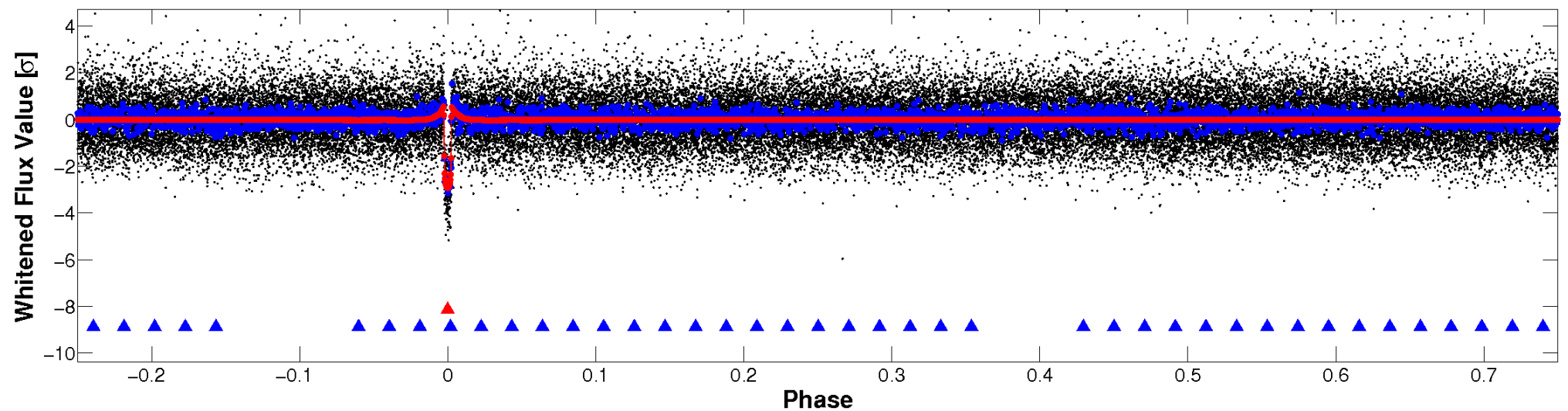


Non-Whitened Vs. Whitened Light Curve

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

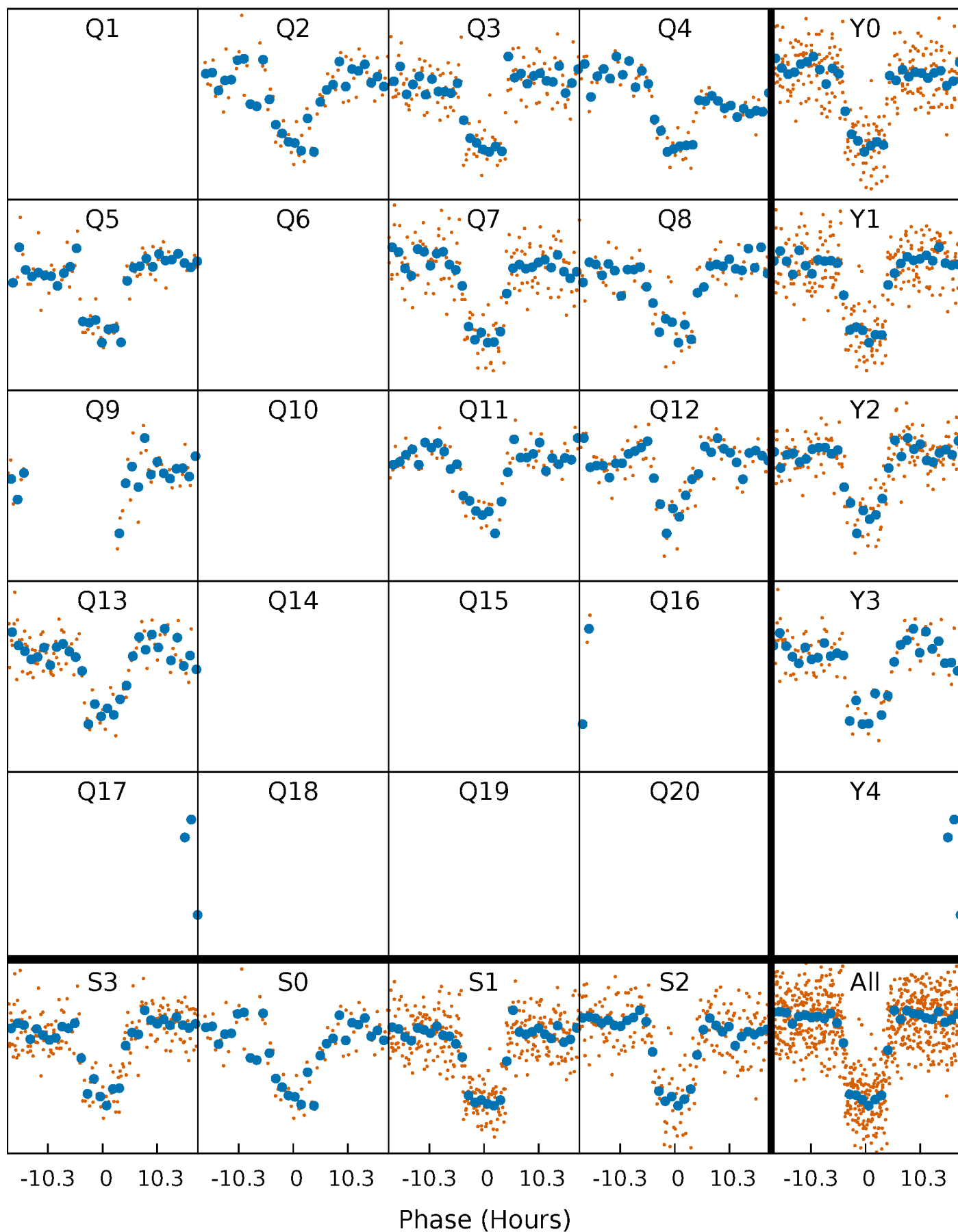


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



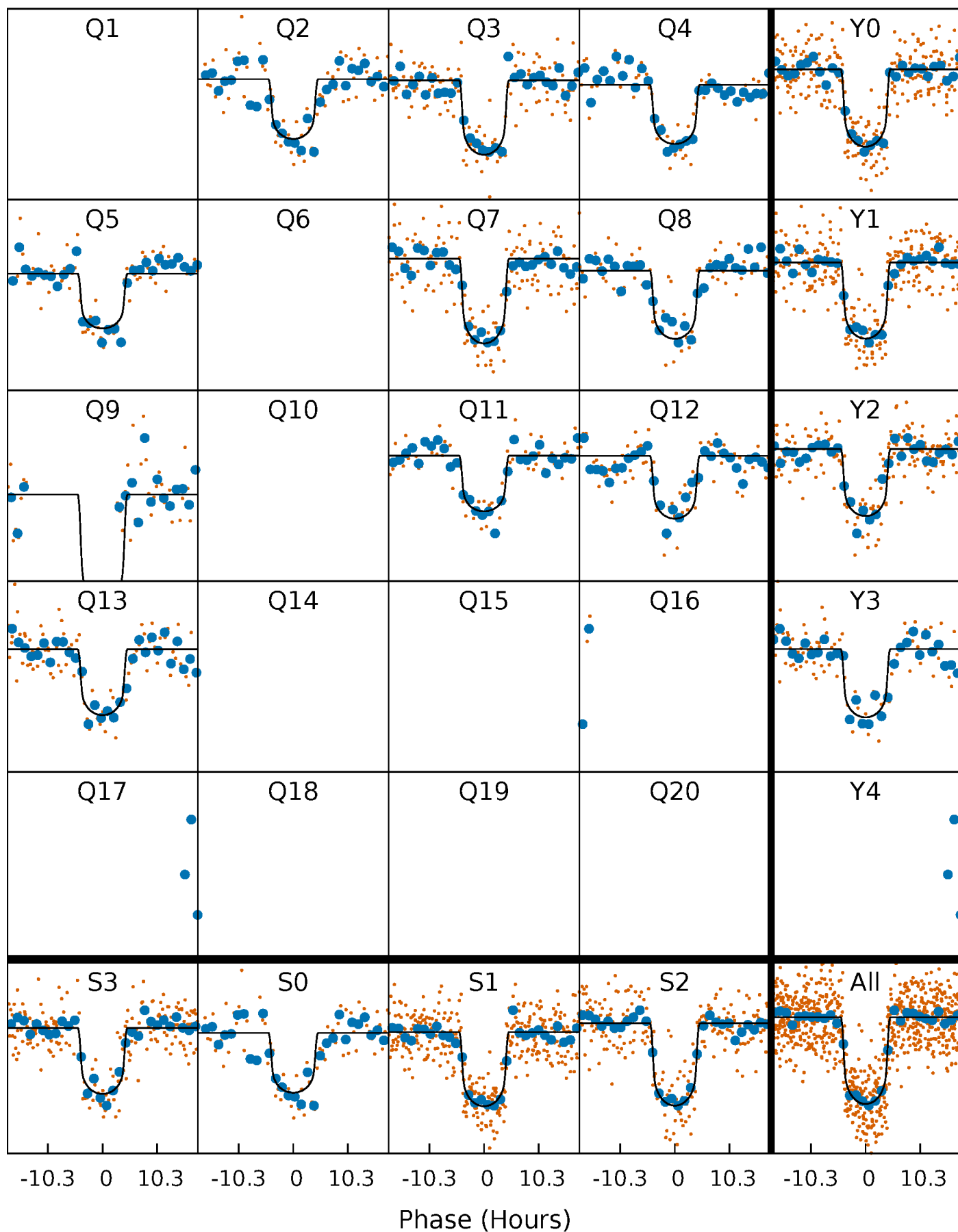
PDC Quarter-Phased Transit Curves

TCE 004939346-01 P= 71.311704 Days $T_0=132.390433$ (BKJD)



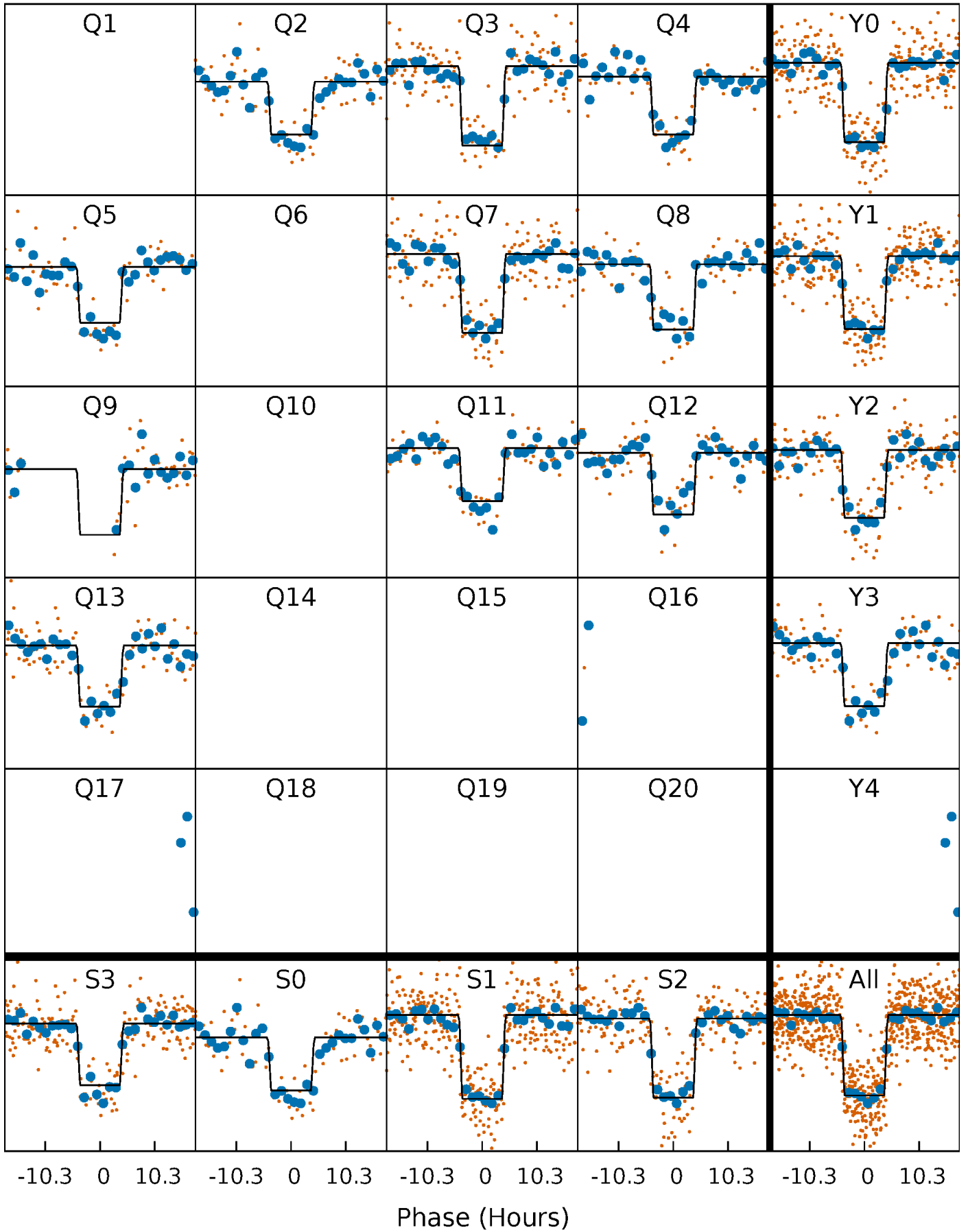
DV Quarter-Phased Transit Curves

TCE 004939346-01 P= 71.311704 Days $T_0=132.390433$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

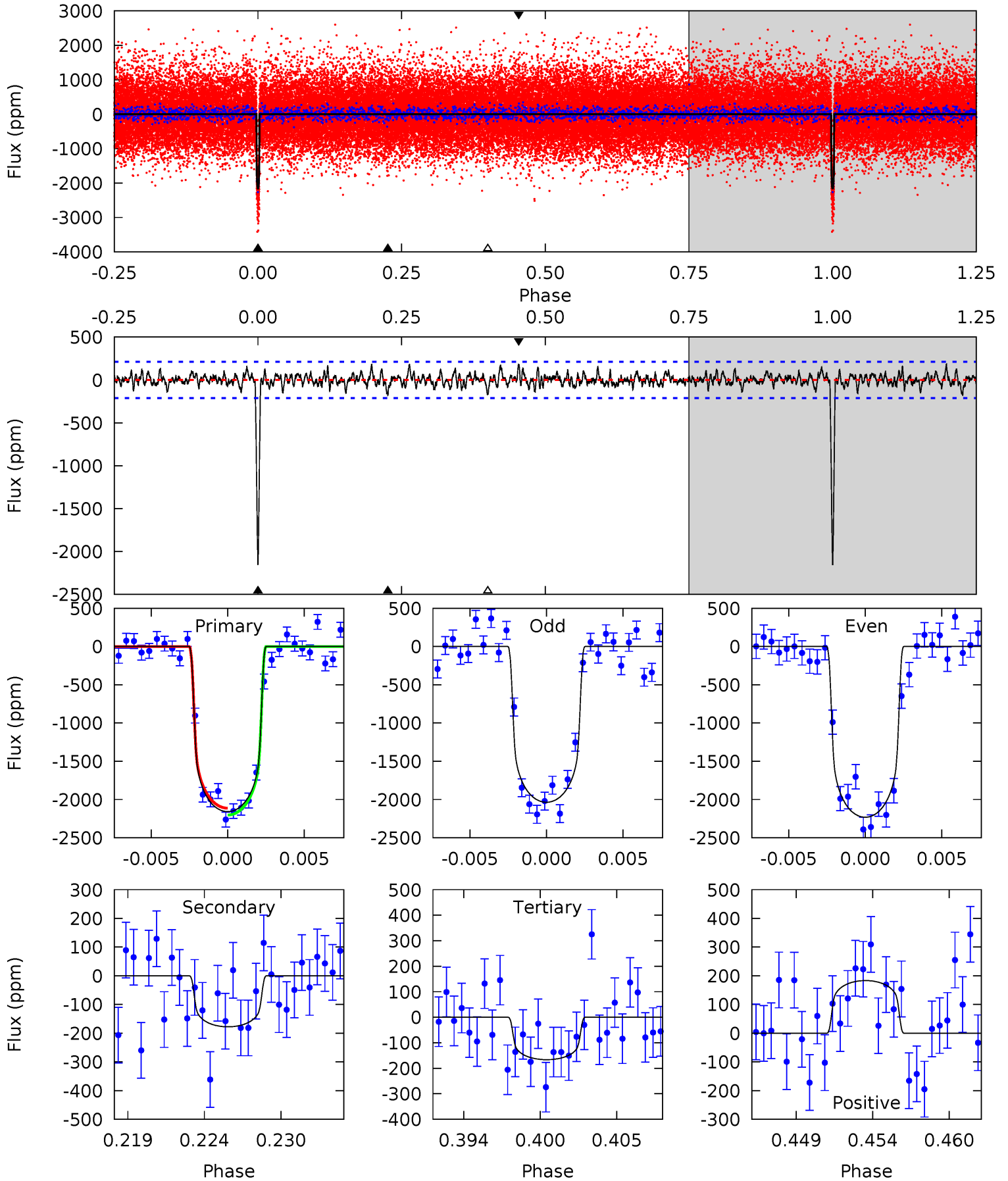
TCE 004939346-01 P= 71.312464 Days $T_0=132.386950$ (BKJD)



DV Model-Shift Uniqueness Test

004939346-01, $P = 71.311704$ Days, $E = 132.390433$ Days

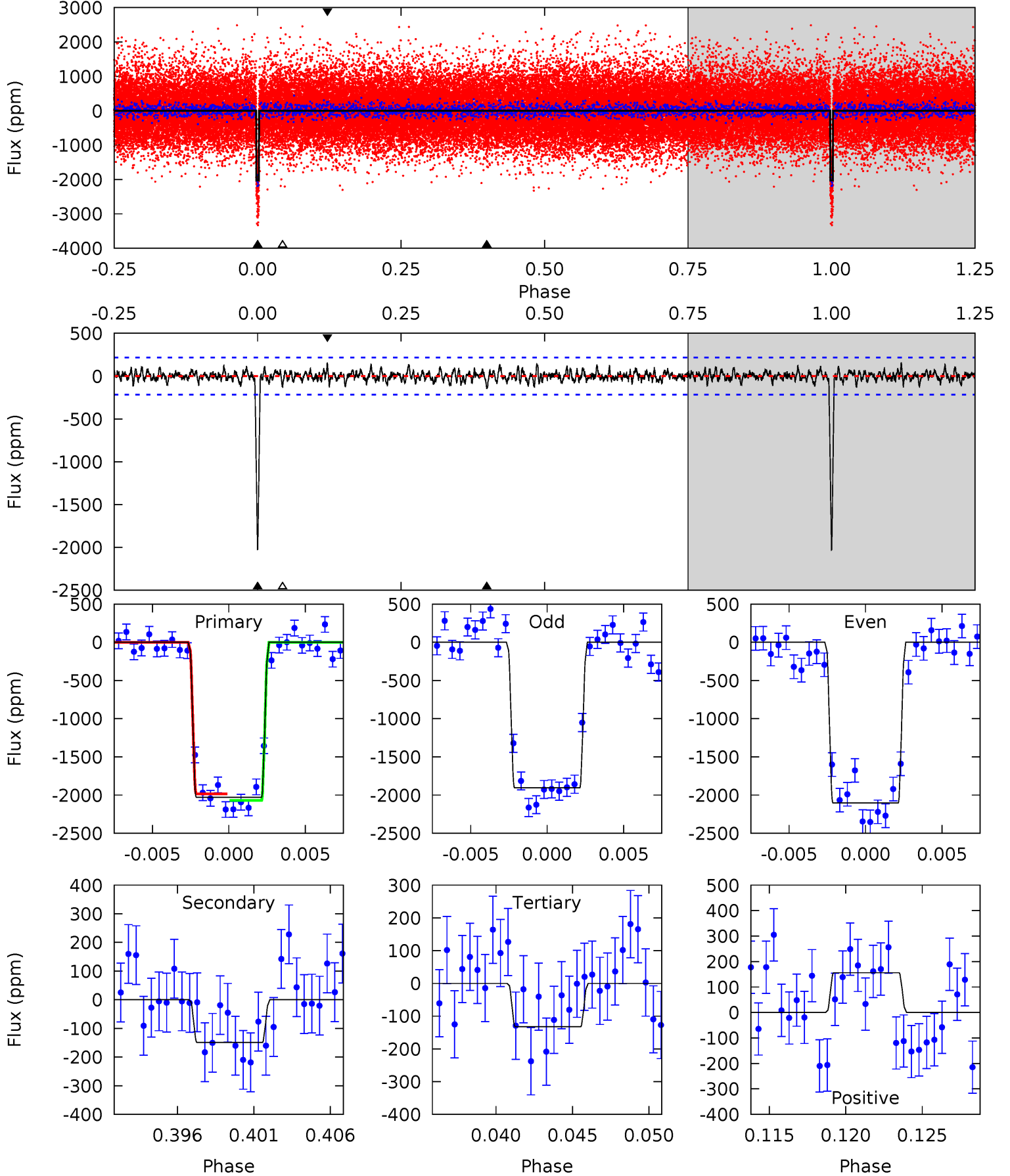
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
52.4	4.31	4.04	4.45	5.14	2.78	1.30	48.3	47.9	0.28	-0.14	2.31	0.93	0.08	1.08



Alt Model-Shift Uniqueness Test

004939346-01, P = 71.312464 Days, E = 132.386950 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
48.3	3.55	3.15	3.71	5.16	2.81	1.04	45.1	44.5	0.40	-0.16	2.30	0.99	0.07	1.02



Stellar Parameters For KIC 004939346

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6194^{+196}_{-295}	$4.445^{+0.052}_{-0.195}$	$0.070^{+0.250}_{-0.300}$	$1.069^{+0.323}_{-0.129}$	$1.161^{+0.138}_{-0.169}$	$1.340^{+0.359}_{-0.645}$
	+3%/-5%	+1%/-4%	+357%/-429%	+30%/-12%	+12%/-15%	+27%/-48%
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 004939346-01 / KOI 1873.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-178 ± 41	$5.46^{+0.82}_{-0.65}$	679^{+46}_{-39}	3763^{+196}_{-210}	399^{+149}_{-125}
Alt.	-149 ± 42	$5.45^{+0.87}_{-0.61}$	676^{+49}_{-39}	3618^{+214}_{-220}	321^{+136}_{-109}

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

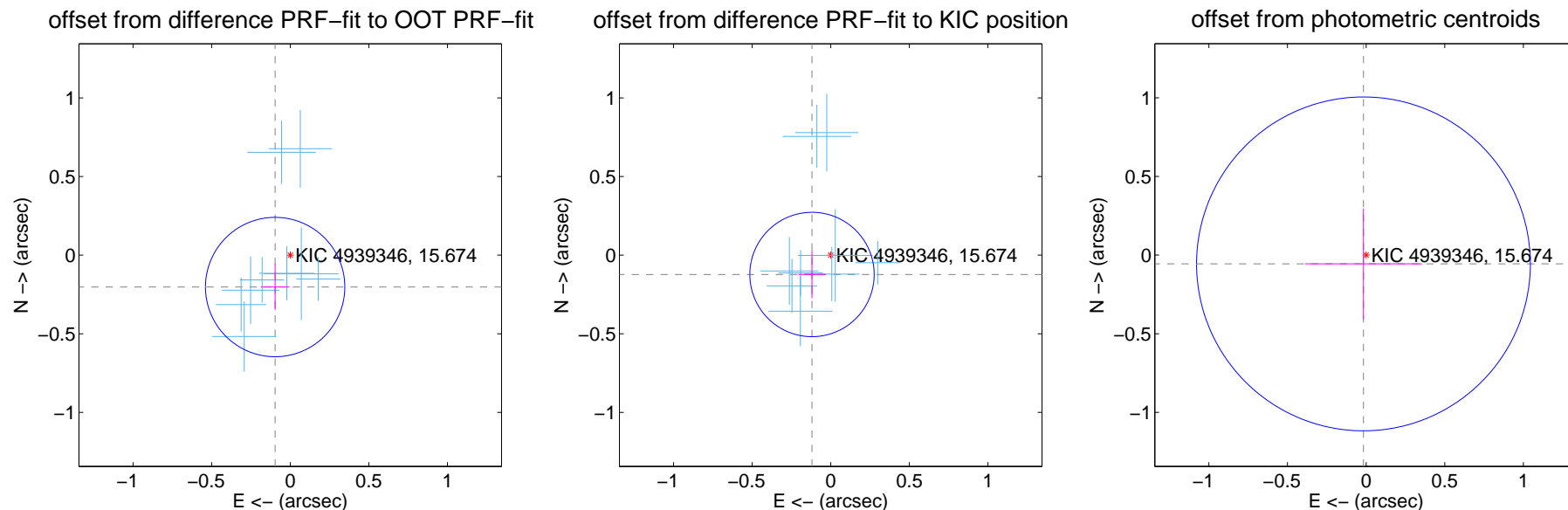
DV Centroid Data

Supplemental centroid analysis for 004939346-01. Kepler magnitude: 15.67. Transit SNR 35.41

There are 9 quarters with good PRF difference image offsets

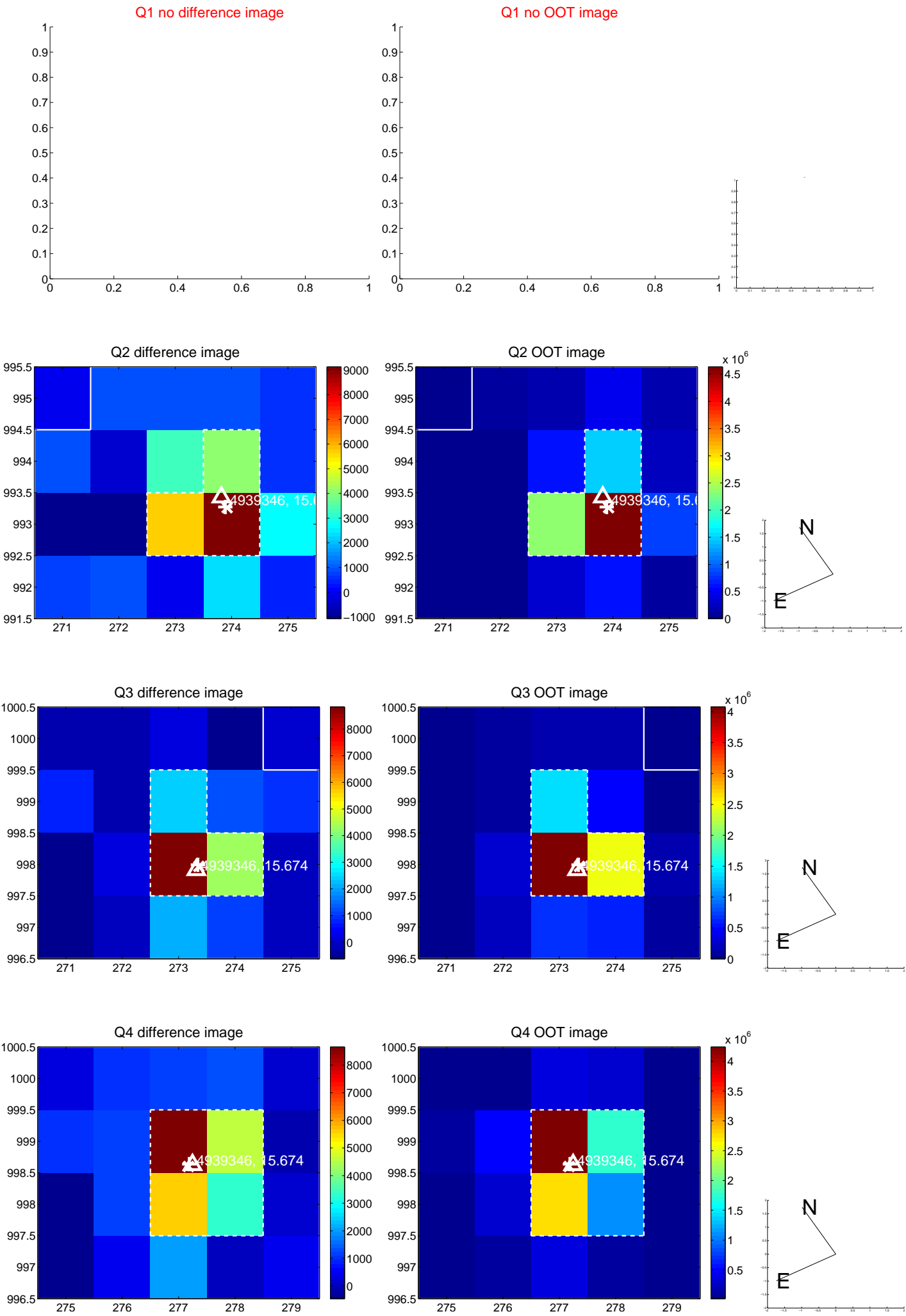
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.224 ± 0.148	1.52	0.096 ± 0.091	-0.203 ± 0.146
PRF-fit source offset from KIC position	0.171 ± 0.132	1.30	0.119 ± 0.087	-0.123 ± 0.152
photometric centroid source offset	0.06 ± 0.35	0.17	0.02 ± 0.37	-0.06 ± 0.35

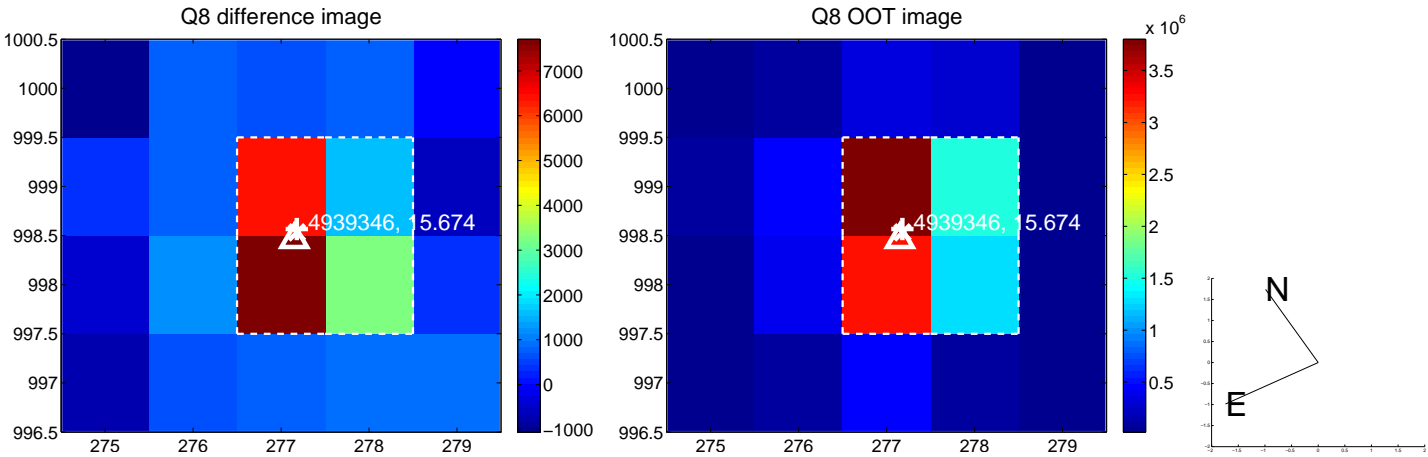
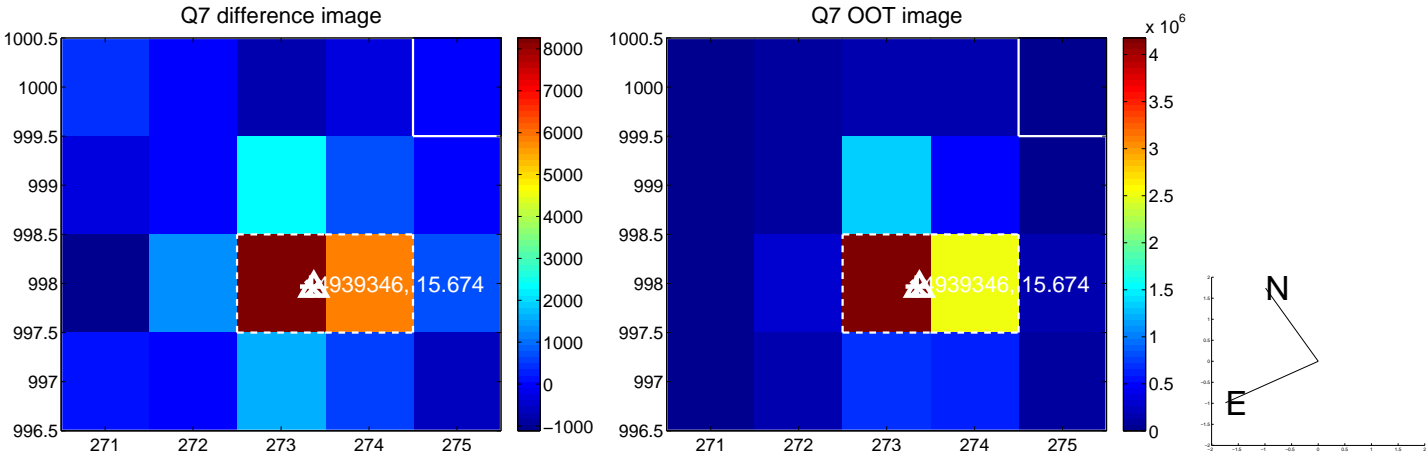
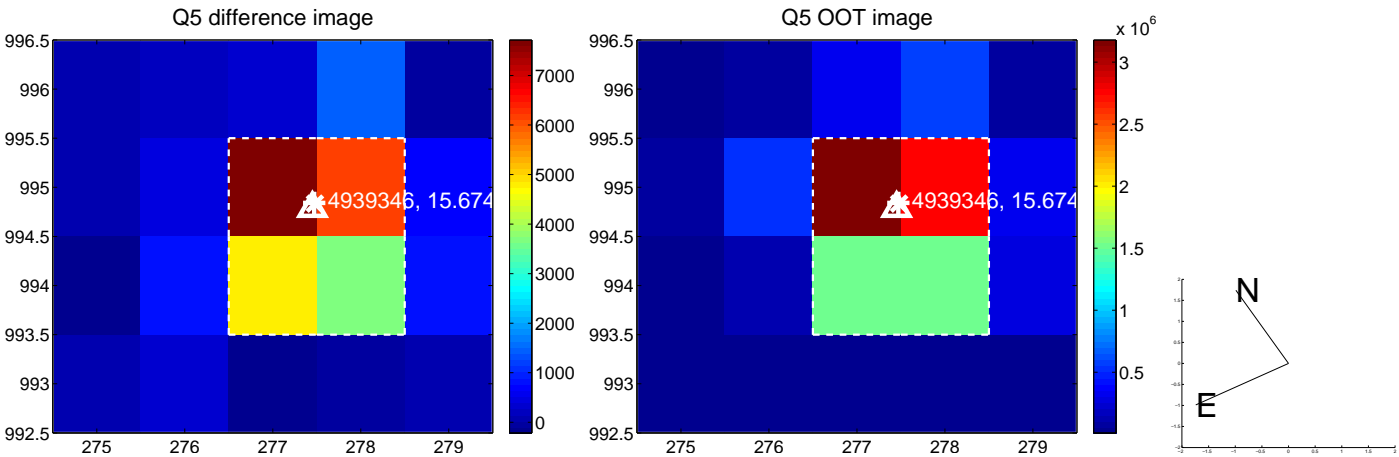


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

Q9 no difference image



Q9 no OOT image



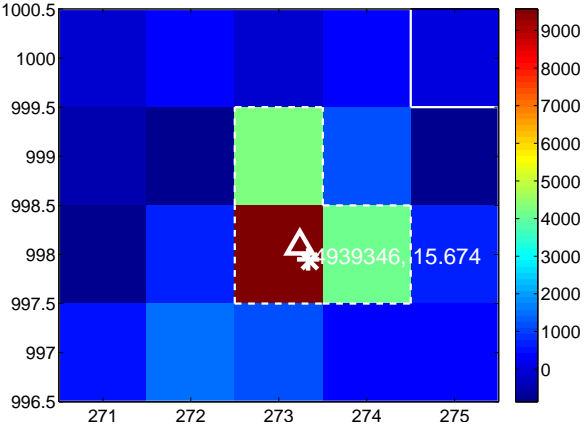
Q10 no difference image



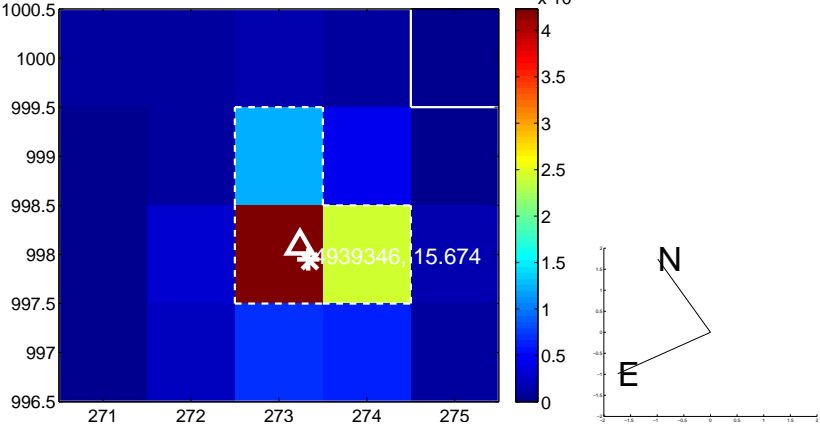
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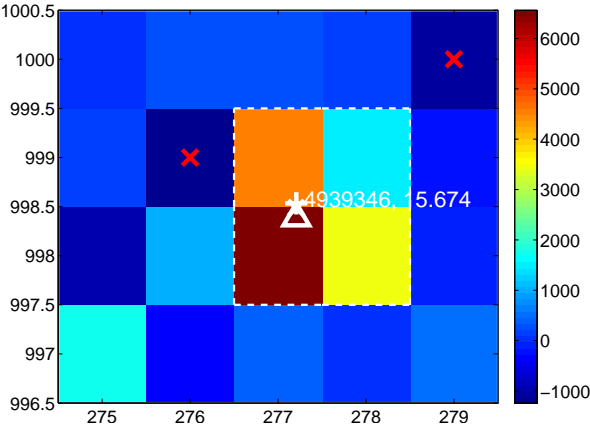
Q11 difference image



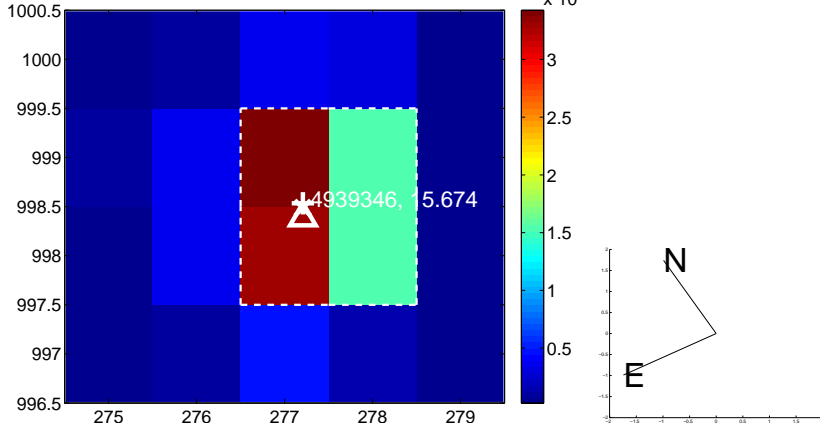
Q11 OOT image



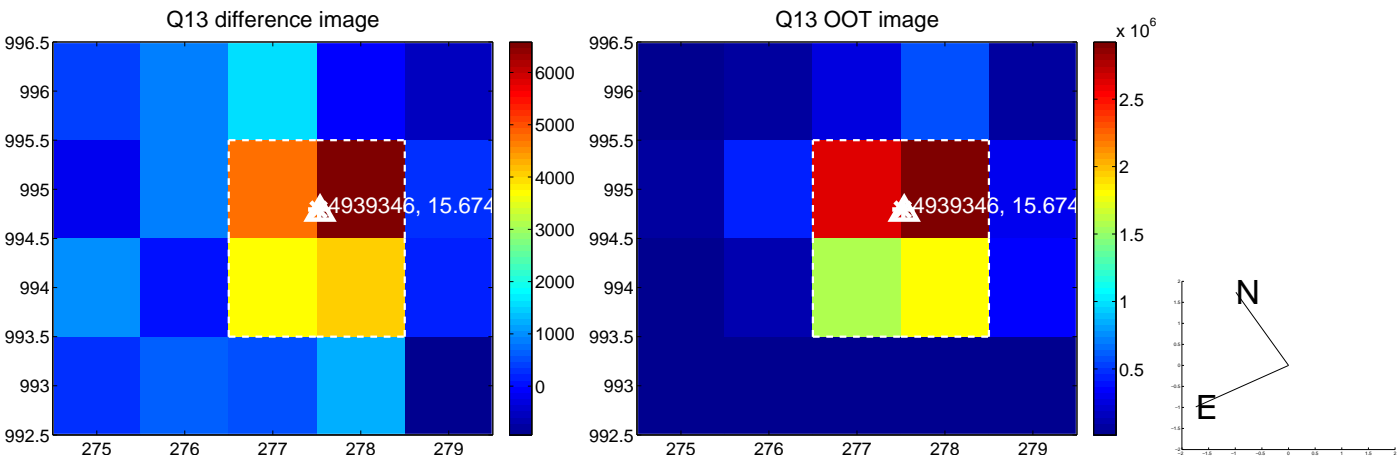
Q12 difference image



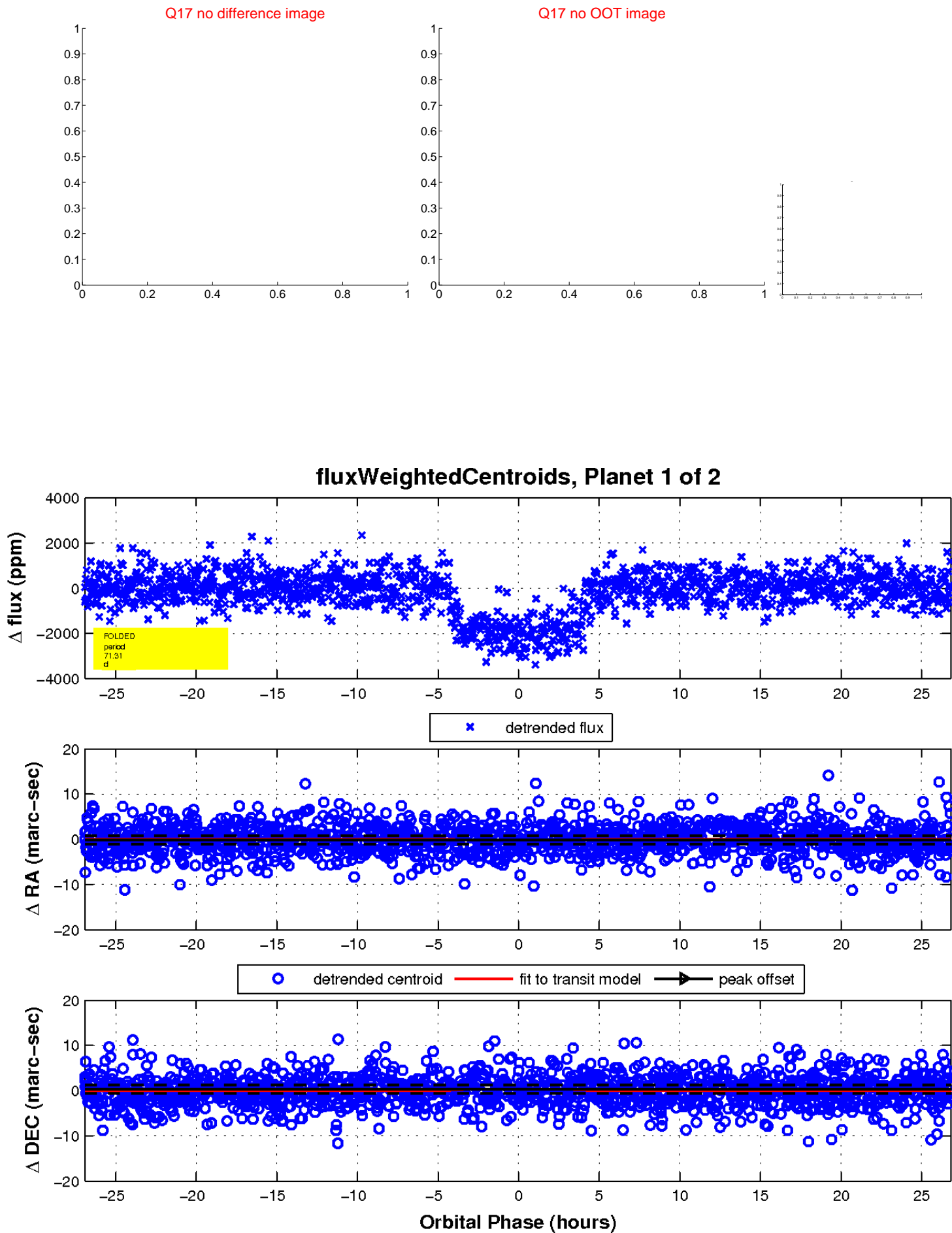
Q12 OOT image



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

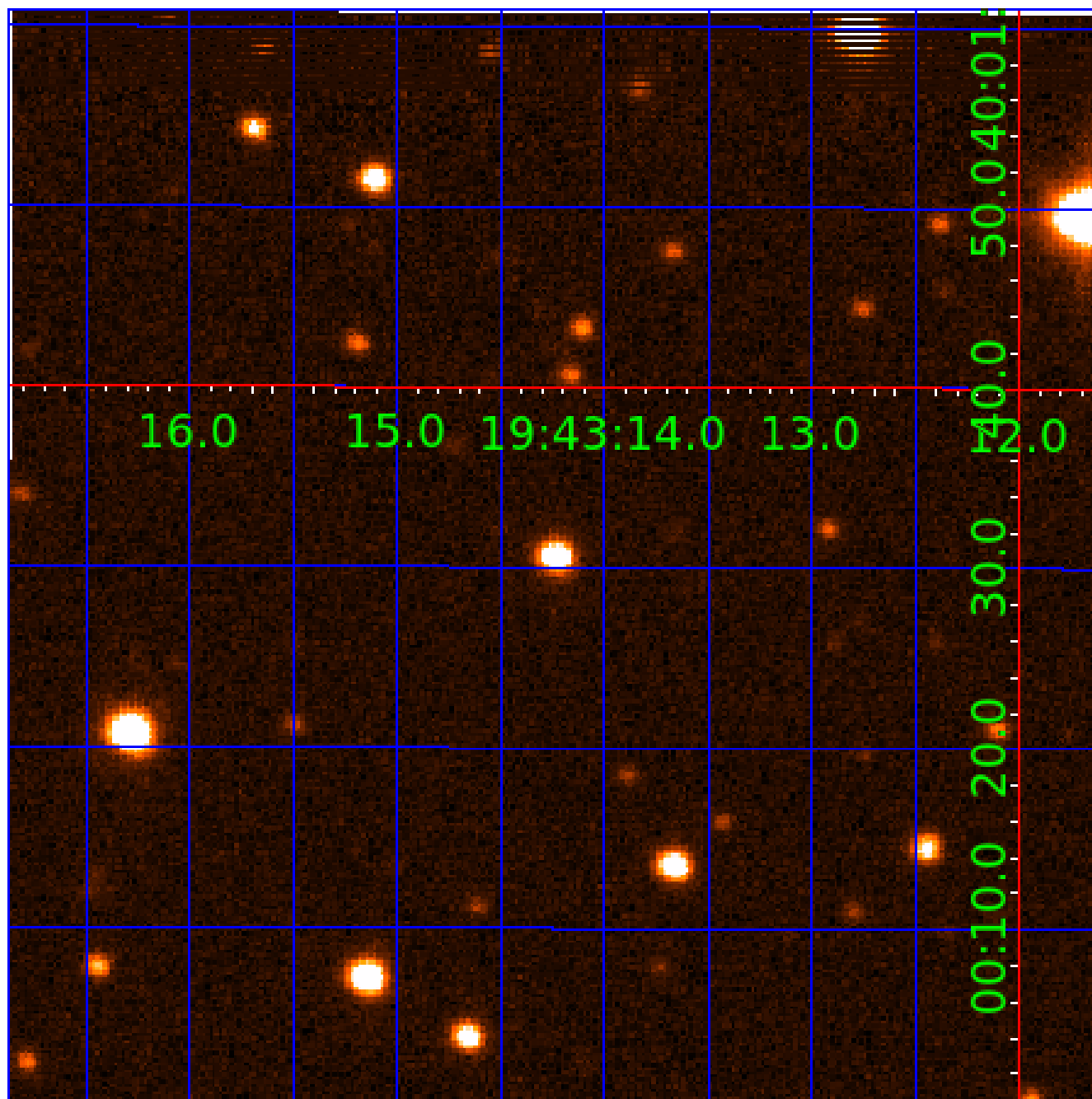


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004939346

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})
004939346-01	OBS	1873.01	71.311704	132.390433	2158.3	8.975	33.8	35.4	1.07	6194	5.19	12.04
004939346-02	OBS	1873.02	34.917801	157.620613	470.2	8.471	11.9	12.7	1.07	6194	2.41	31.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004939346-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
004939346-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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.

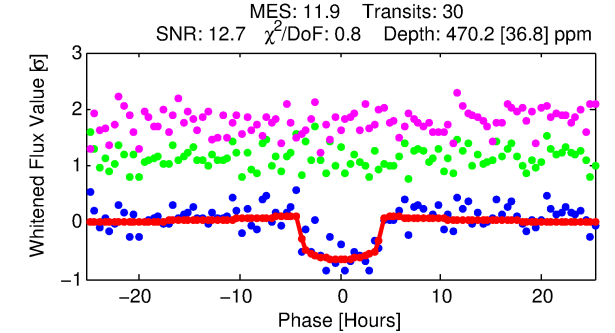
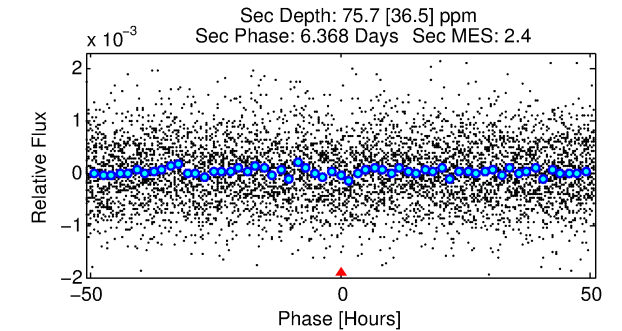
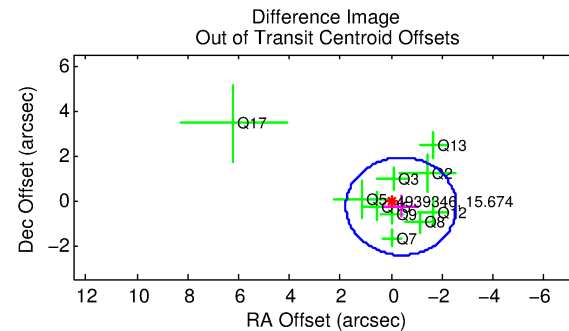
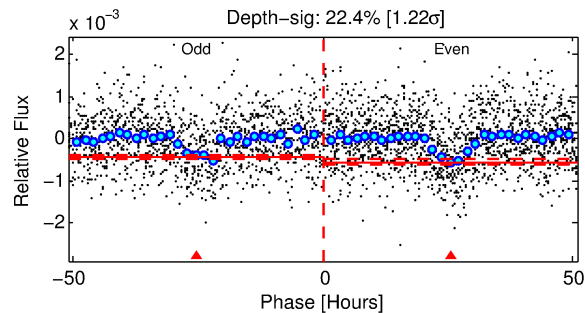
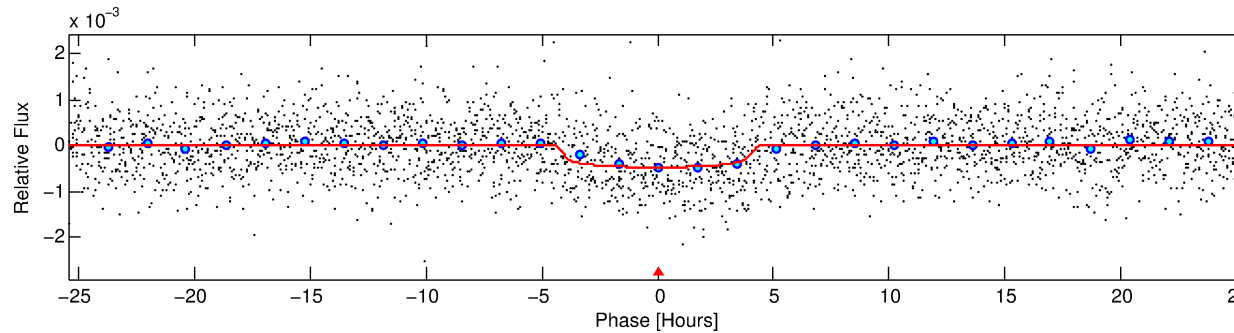
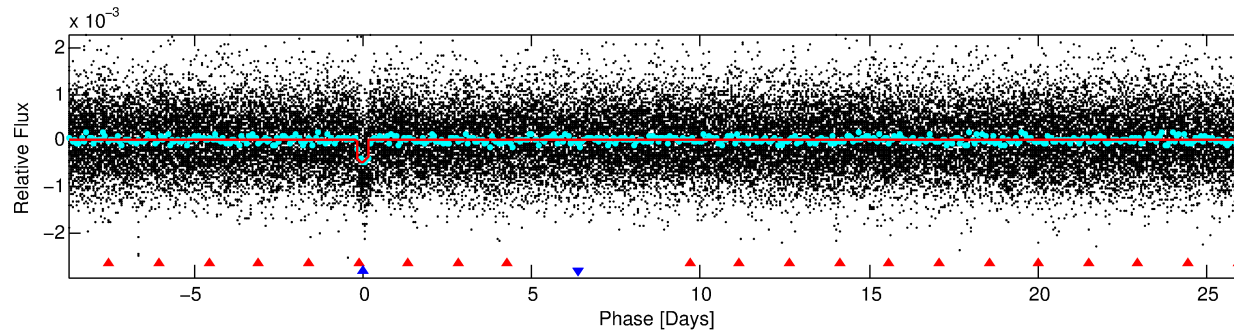
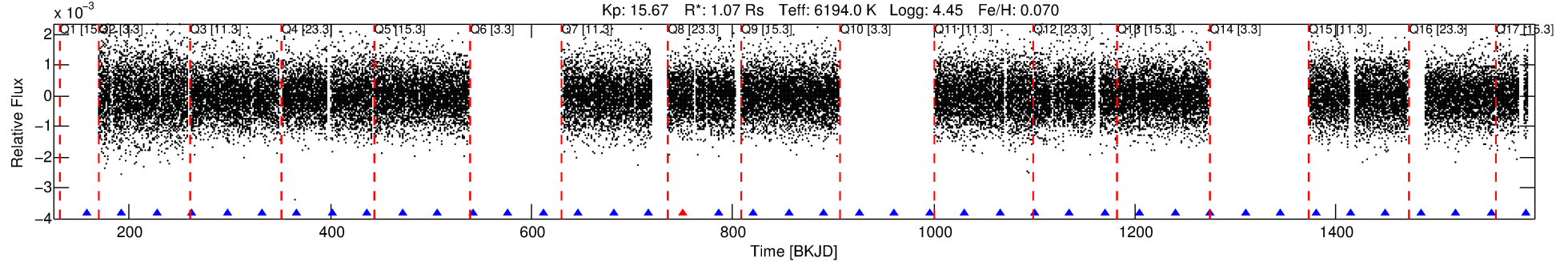
Ephemeris Match Information For 004939346-02

No Significant Match Found

DV One-Page Summary

KIC: 4939346 Candidate: 2 of 2 Period: 34.918 d
KOI: K01873.02 Name: Kepler-328b Corr: 0.926

Kp: 15.67 R*: 1.07 Rs Teff: 6194.0 K Logg: 4.45 Fe/H: 0.070



DV Fit Results:

Period = 34.91780 [0.00044] d
Epoch = 157.6206 [0.0105] BKJD
Rp/R* = 0.0206 [0.0137]
a/R* = 26.67 [86.19]
b = 0.57 [3.86]
Seff = 31.19 [12.73]
Teq = 603 [61] K
Rp = 2.41 [1.76] Re
a = 0.2198 [0.0552] AU
Ag = 347.34 [506.08] [0.68σ]
Teff = 4022 [1432] K [2.39σ]

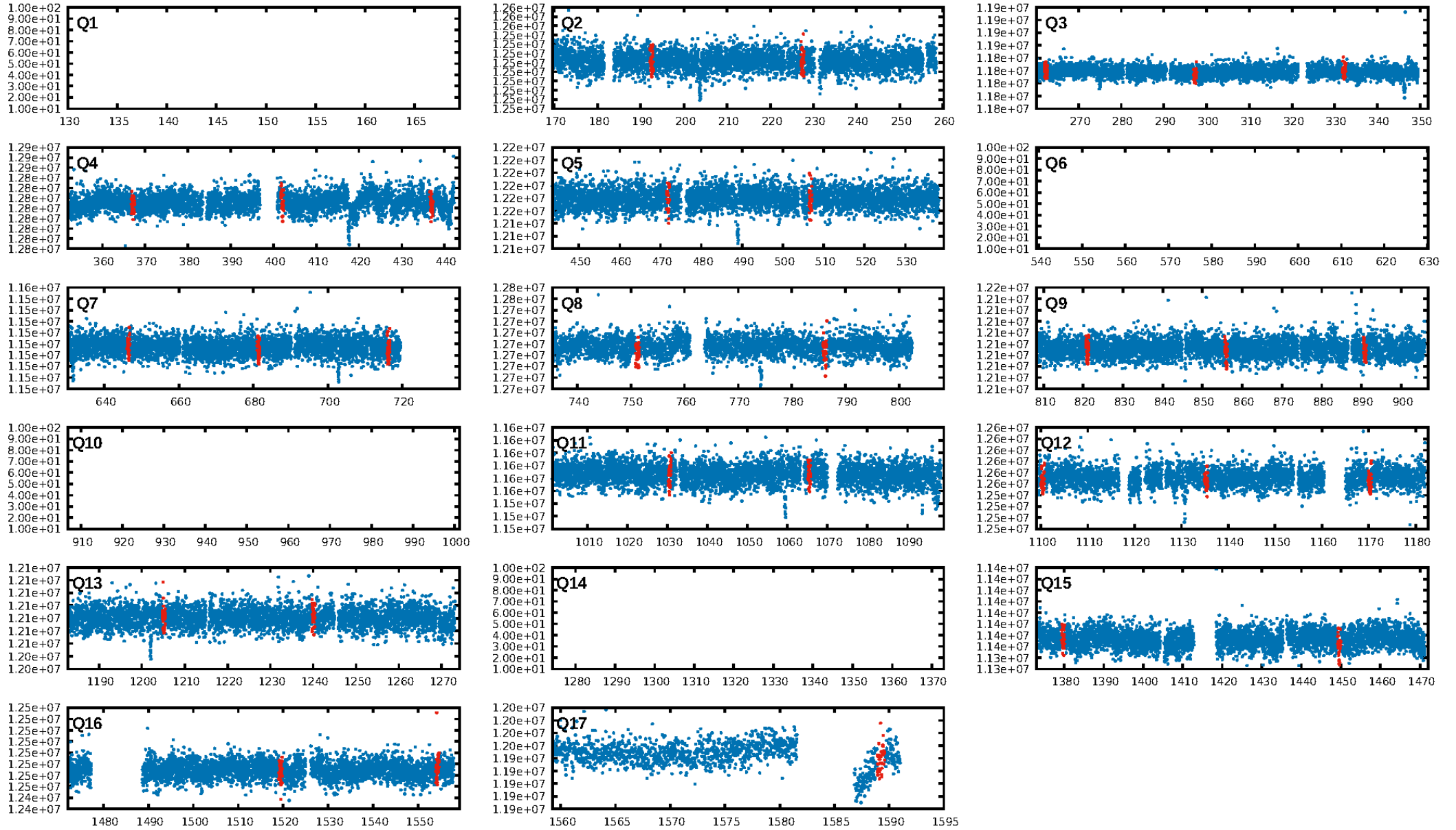
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [70.77σ]
ModelChiSquare2-sig: 90.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.17e-31
RollingBand-fgt: 0.97 [28/29]
GhostDiagnostic-chr: 1.611
Centroid-sig: 0.5%
Centroid-so: 1.807 arcsec [1.86σ]
OotOffset-rm: 0.478 arcsec [0.66σ]
KicOffset-rm: 0.431 arcsec [0.61σ]
OotOffset-st: 1/3/2/4 [10]
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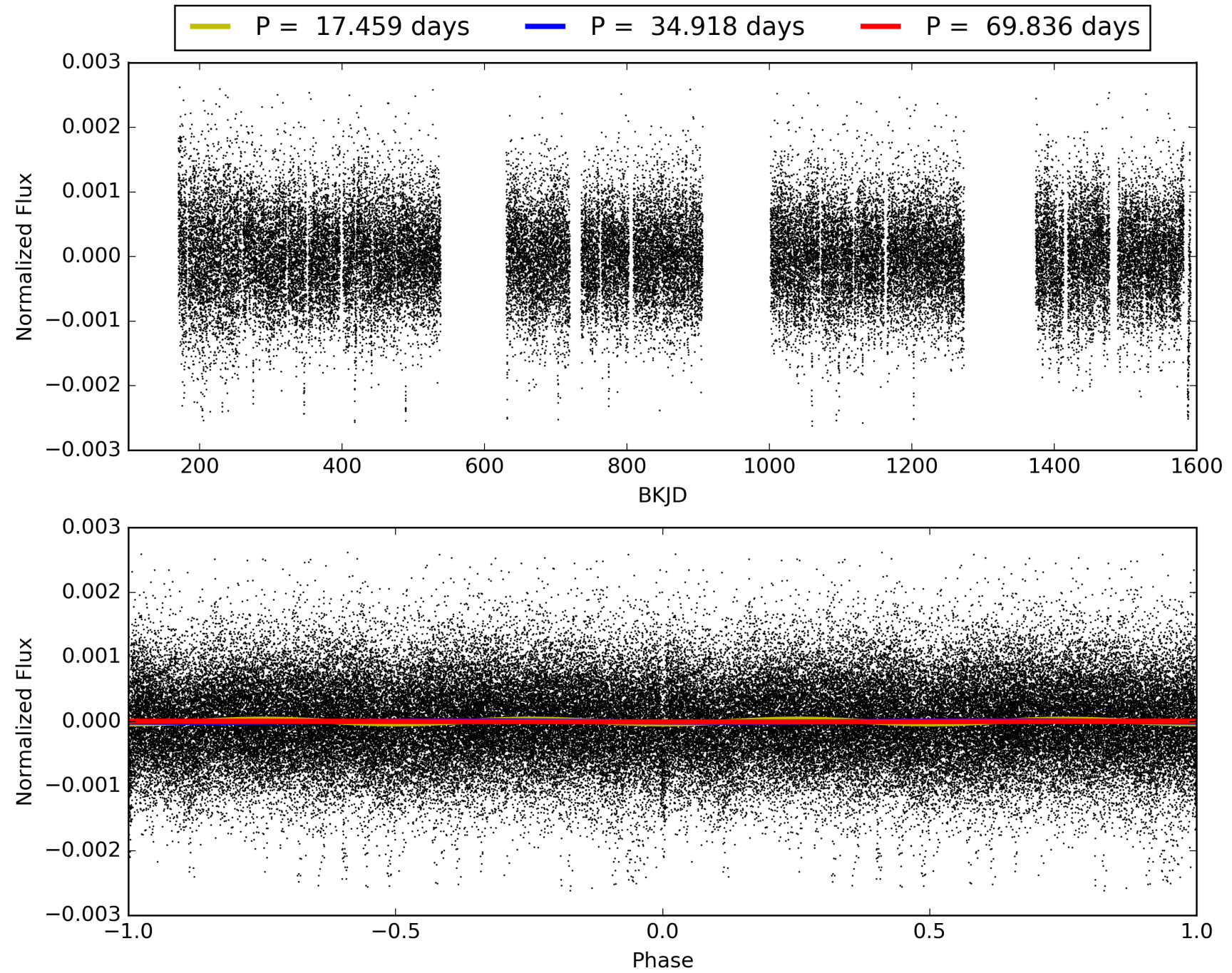
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004939346-02, PDC Light Curves

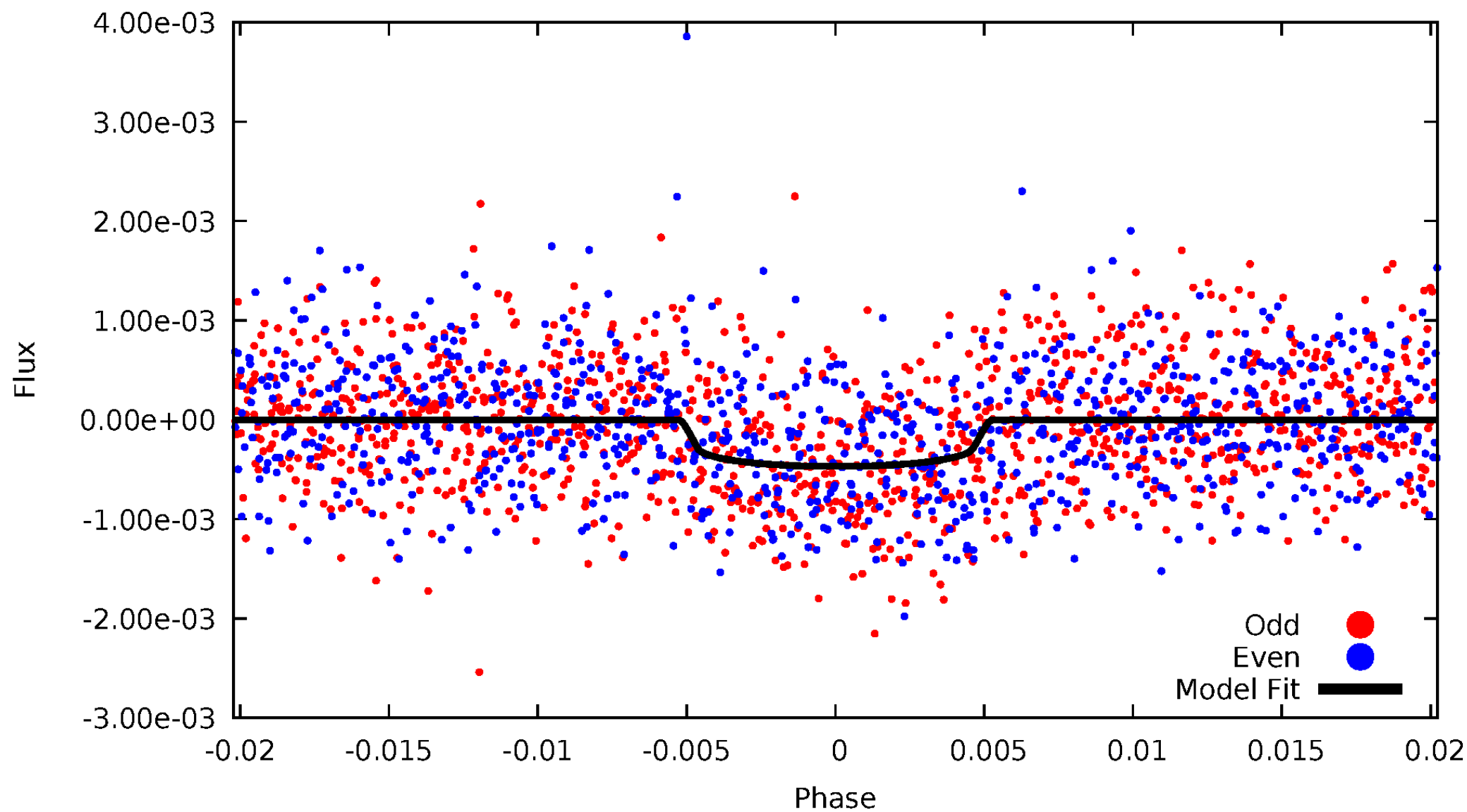


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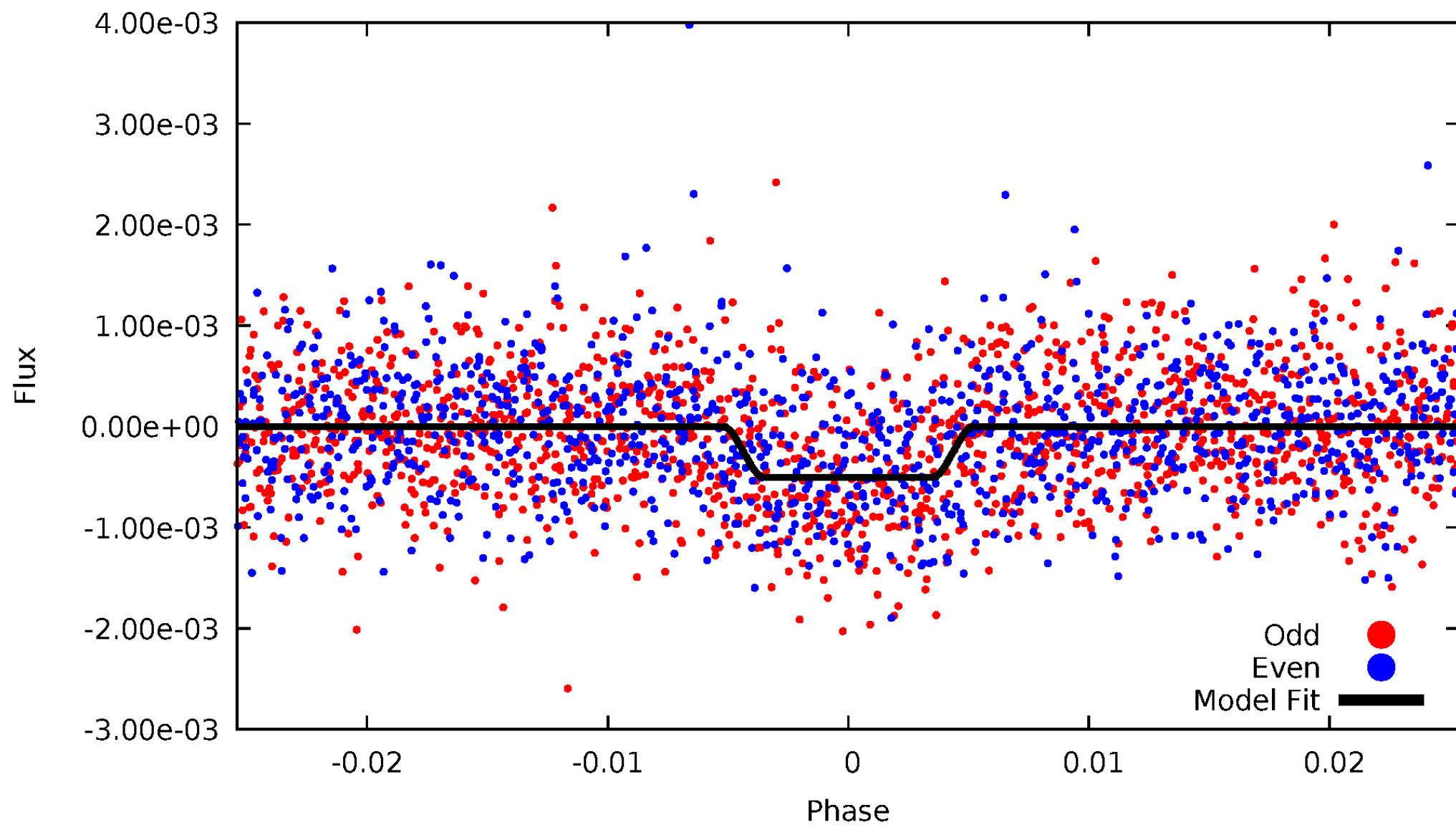
DV Odd/Even

TCE 004939346-02



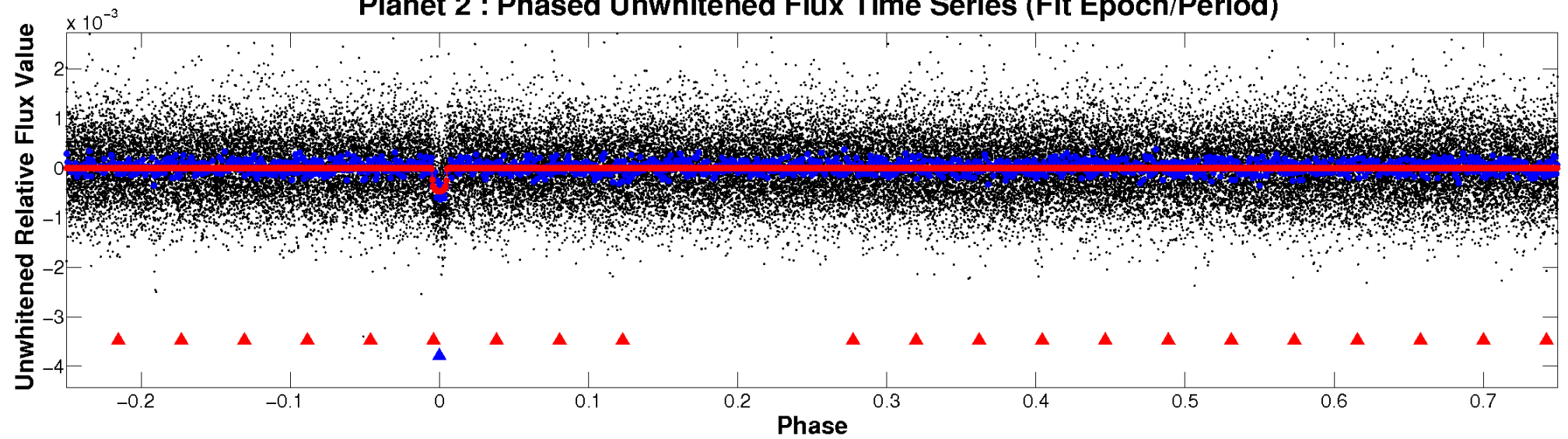
ALT Odd/Even

TCE 004939346-02

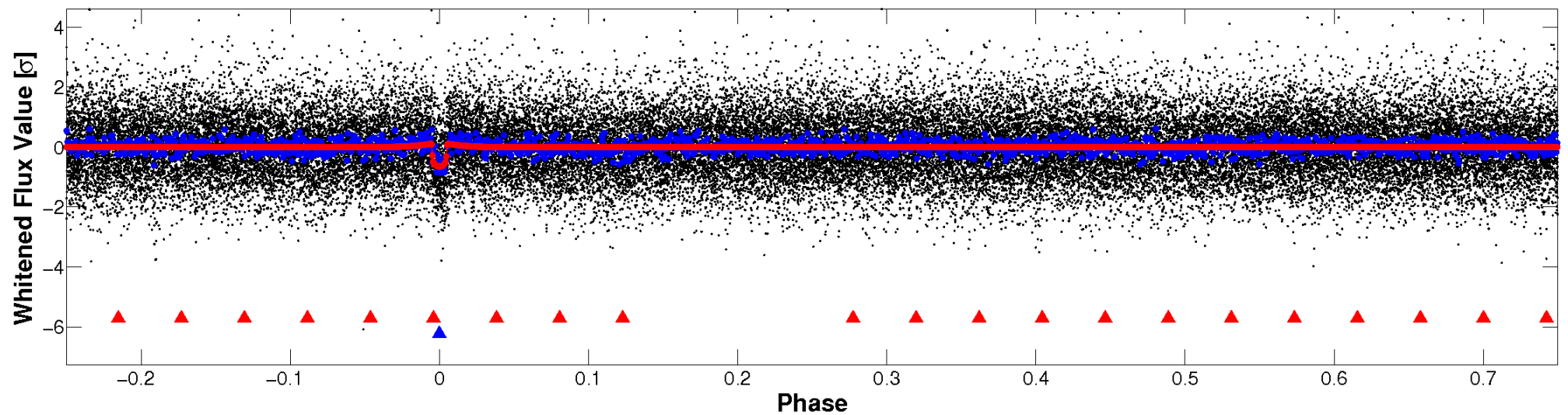


Non-Whitened Vs. Whitened Light Curve

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

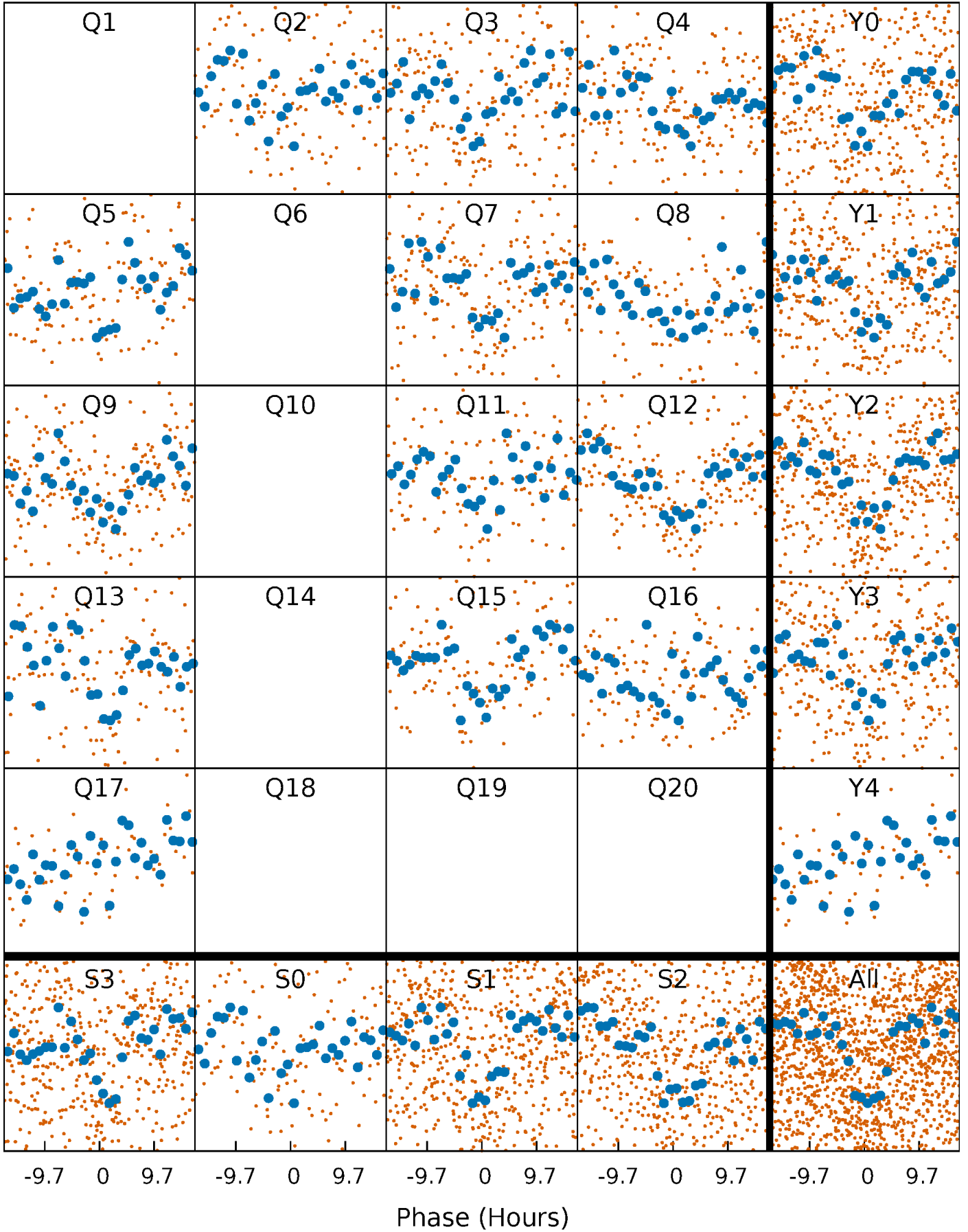


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



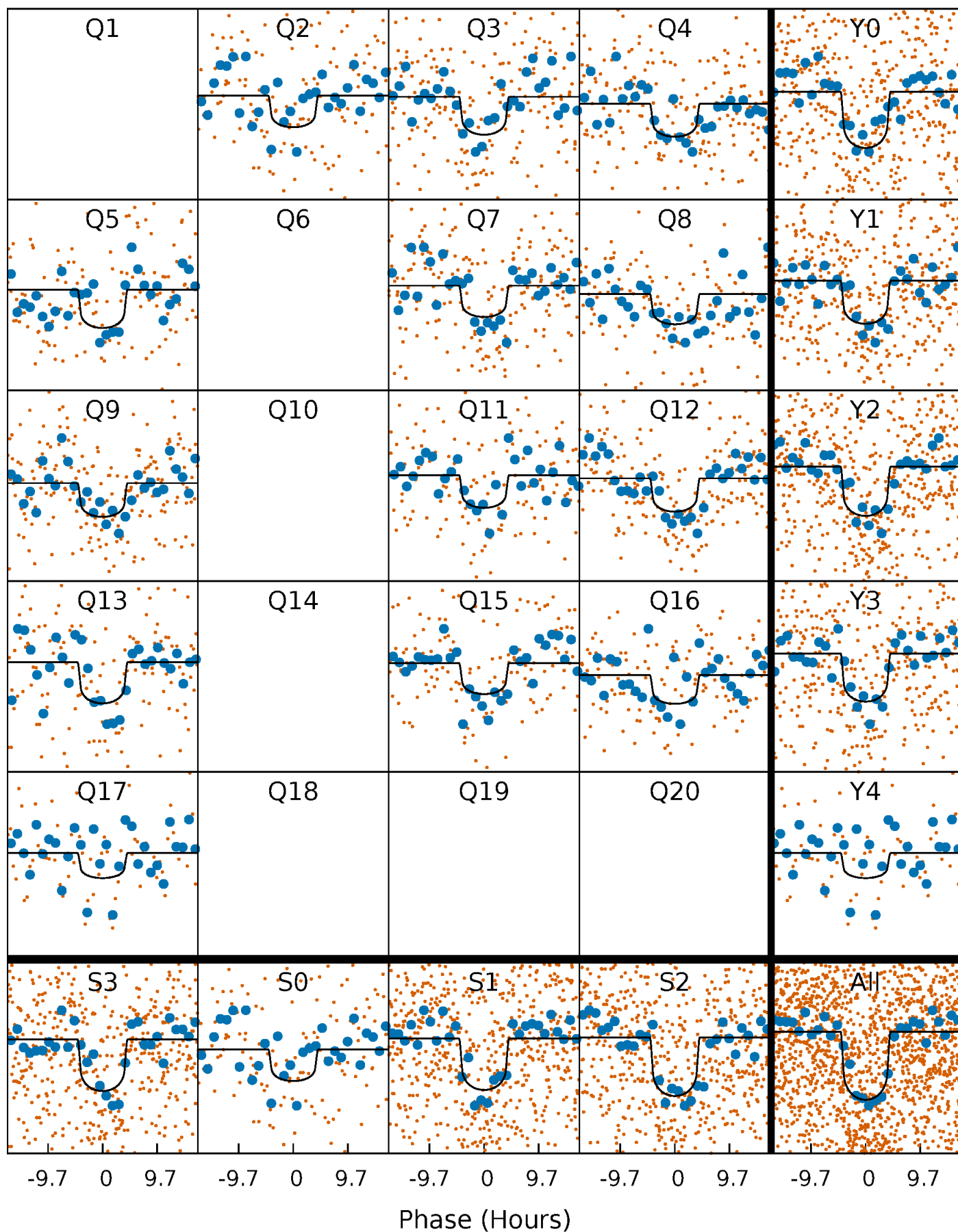
PDC Quarter-Phased Transit Curves

TCE 004939346-02 P= 34.917801 Days $T_0=157.620613$ (BKJD)



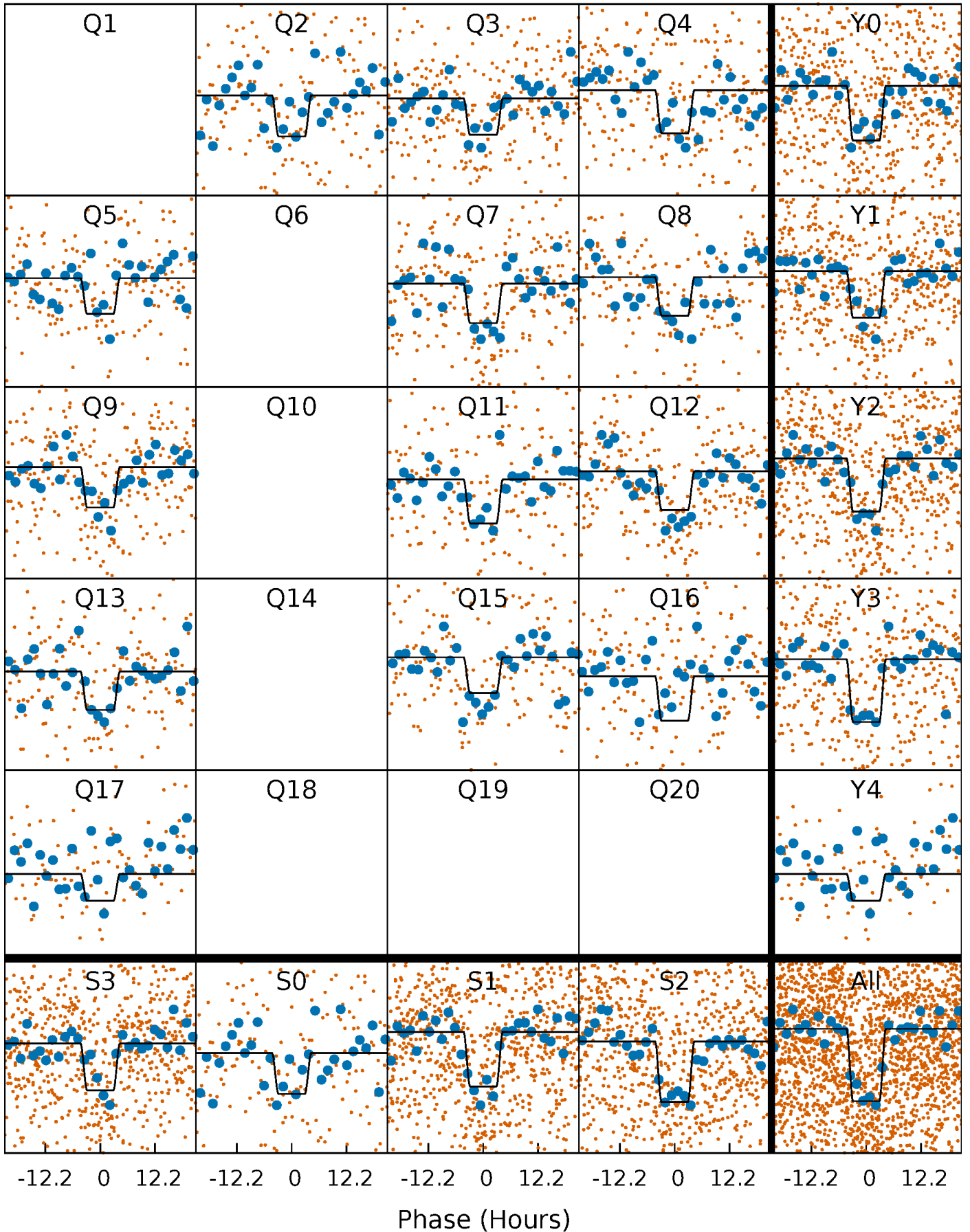
DV Quarter-Phased Transit Curves

TCE 004939346-02 P= 34.917801 Days $T_0=157.620613$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

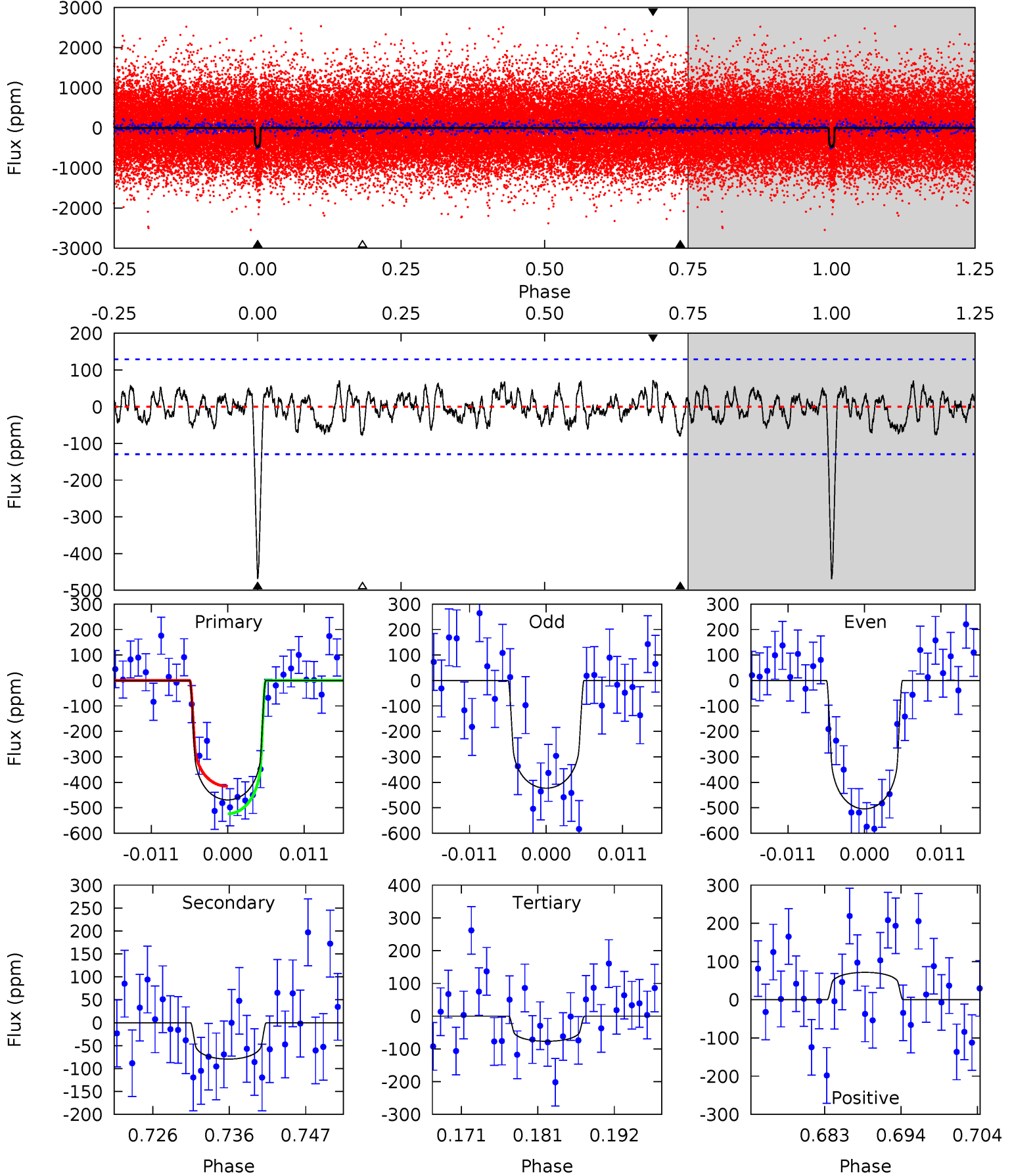
TCE 004939346-02 P= 34.919509 Days $T_0=157.608117$ (BKJD)



DV Model-Shift Uniqueness Test

004939346-02, P = 34.917801 Days, E = 157.620613 Days

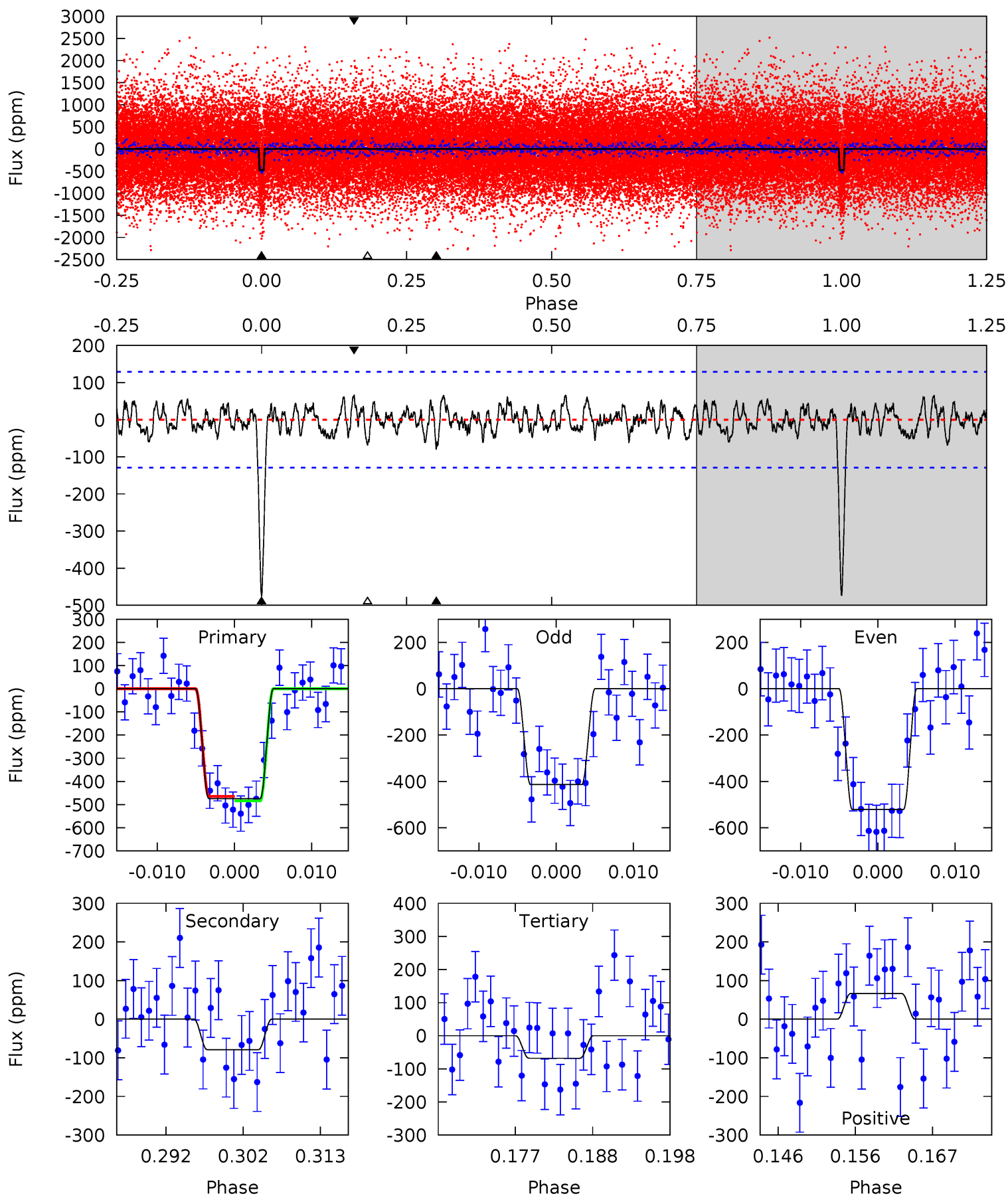
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.2	3.08	2.98	2.78	5.01	2.55	1.18	15.2	15.4	0.11	0.30	1.57	1.16	0.13	2.10



Alt Model-Shift Uniqueness Test

004939346-02, P = 34.919509 Days, E = 157.608117 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.4	3.06	2.64	2.57	5.02	2.56	1.04	15.8	15.9	0.42	0.49	2.07	1.01	0.12	0.38



Stellar Parameters For KIC 004939346

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6194^{+196}_{-295}	$4.445^{+0.052}_{-0.195}$	$0.070^{+0.250}_{-0.300}$	$1.069^{+0.323}_{-0.129}$	$1.161^{+0.138}_{-0.169}$	$1.340^{+0.359}_{-0.645}$
	+3%/-5%	+1%/-4%	+357%/-429%	+30%/-12%	+12%/-15%	+27%/-48%
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 004939346-02 / KOI 1873.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-79 ± 26	$2.62^{+1.75}_{-1.39}$	859^{+58}_{-53}	4190^{+1663}_{-683}	295^{+1125}_{-198}
Alt.	-79 ± 26	$2.85^{+1.65}_{-1.54}$	855^{+63}_{-42}	4044^{+1500}_{-586}	244^{+867}_{-153}

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 $A_{obs} \gg 1.0$

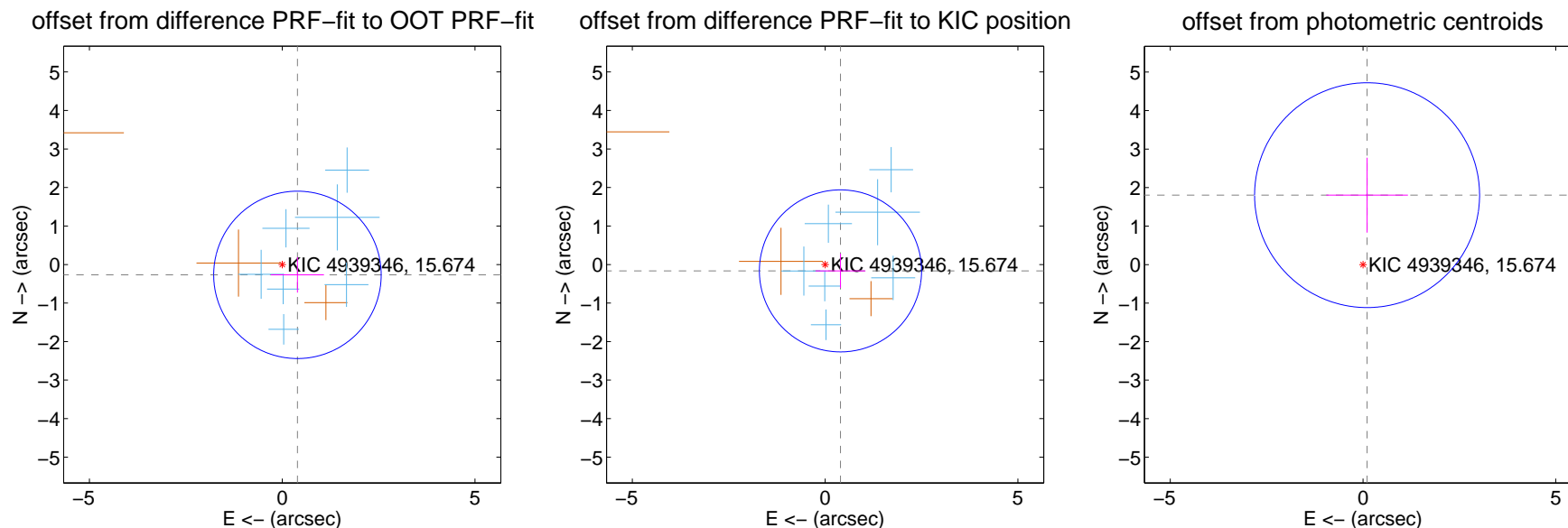
DV Centroid Data

Supplemental centroid analysis for 004939346-02. Kepler magnitude: 15.67. Transit SNR 12.66

There are 7 quarters with good PRF difference image offsets

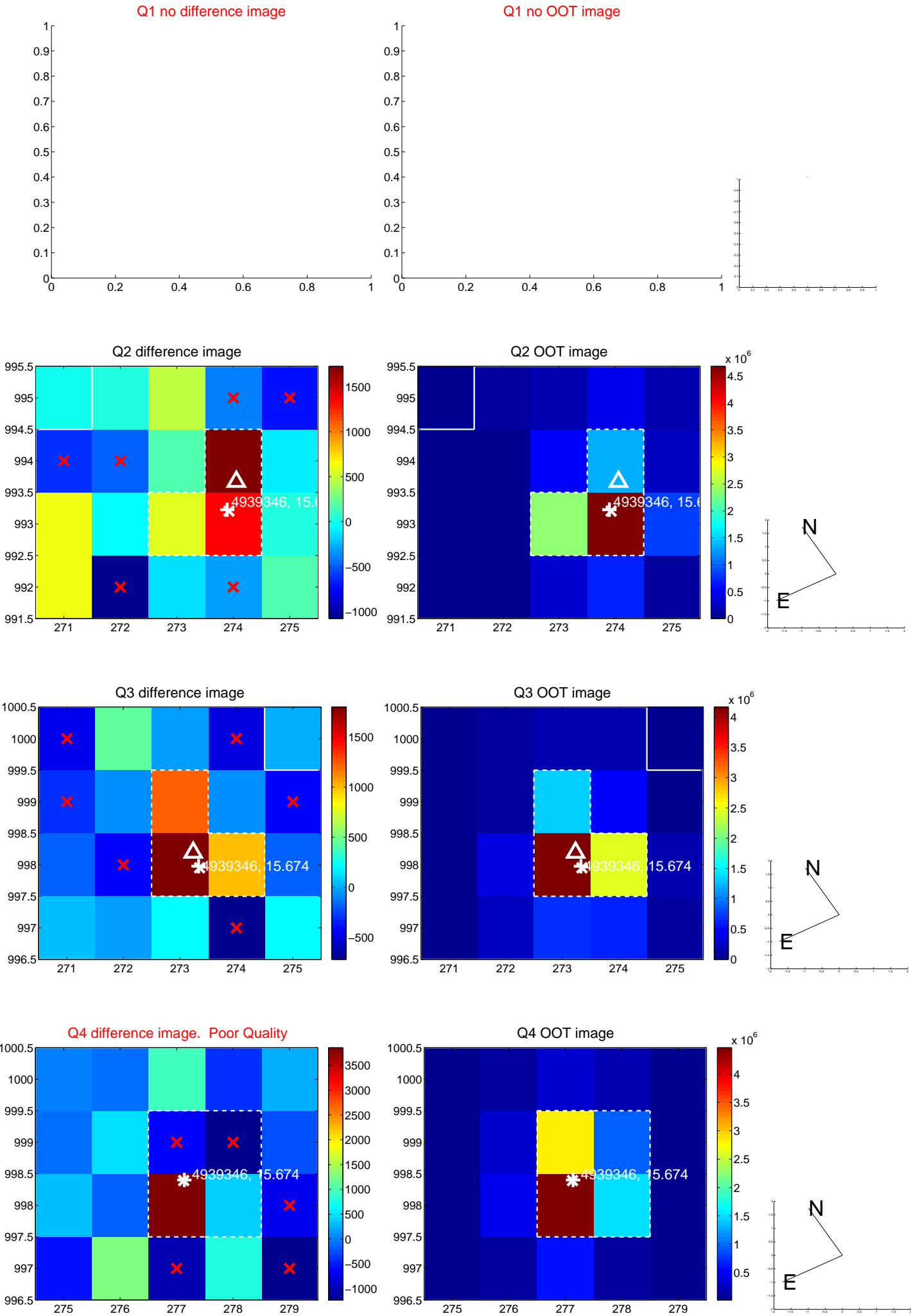
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.478 ± 0.724	0.66	-0.395 ± 0.688	-0.268 ± 0.460
PRF-fit source offset from KIC position	0.431 ± 0.701	0.61	-0.398 ± 0.646	-0.165 ± 0.444
photometric centroid source offset	1.81 ± 0.97	1.86	-0.11 ± 1.06	1.80 ± 0.97

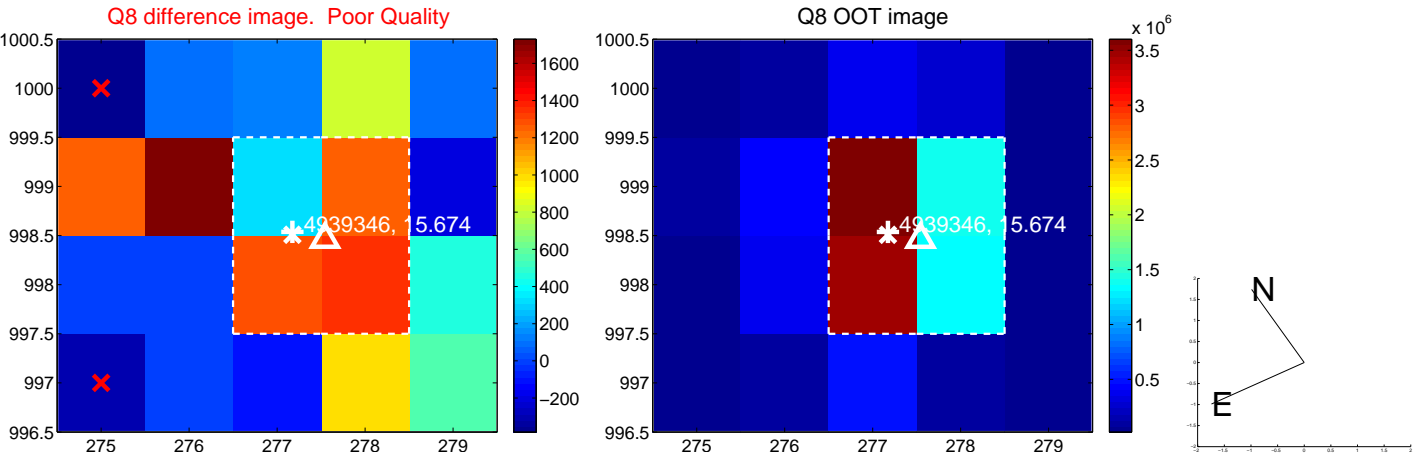
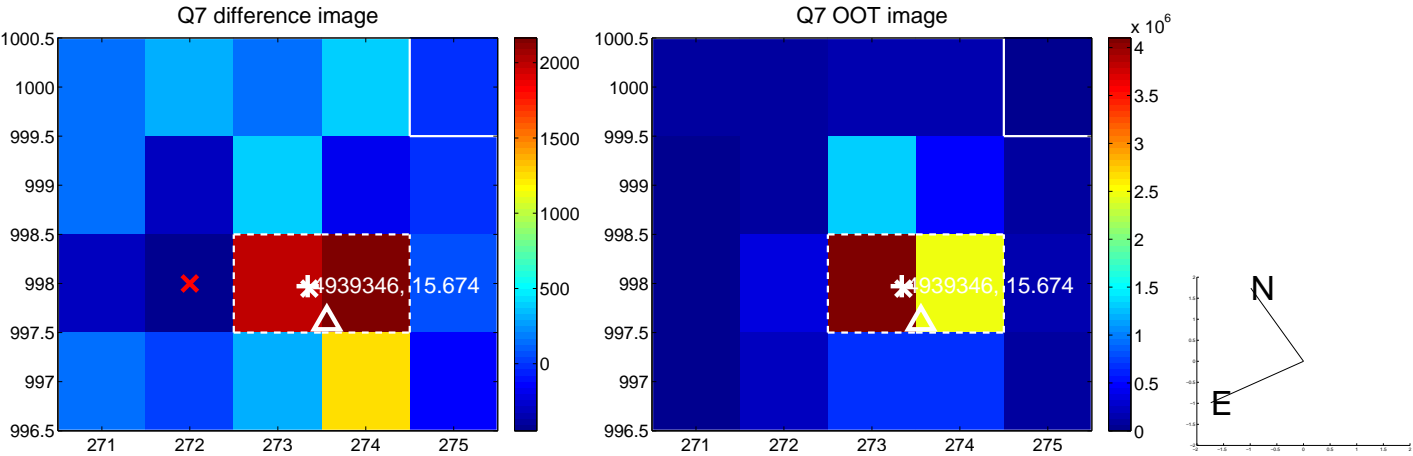
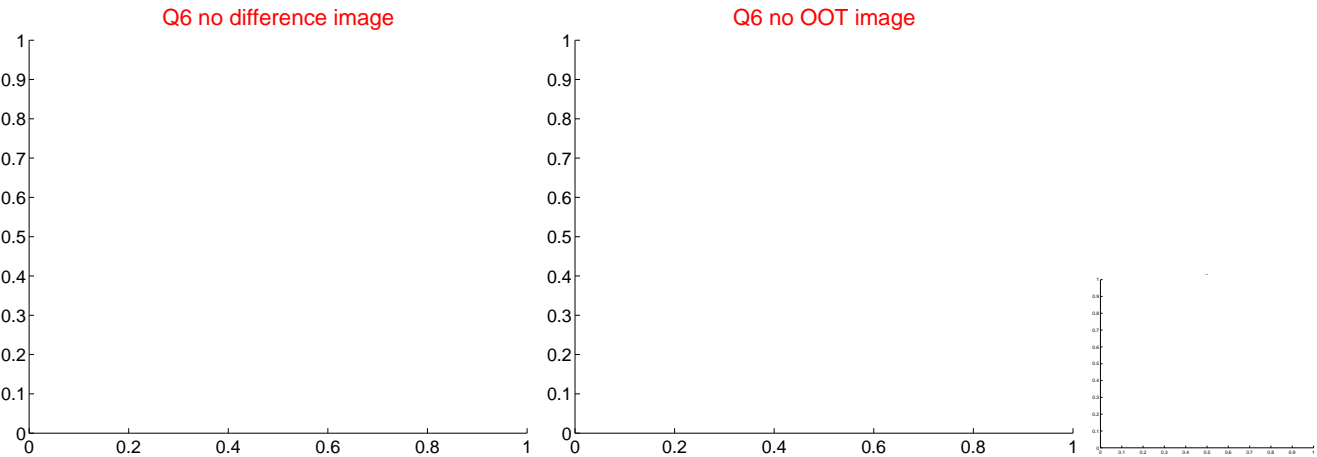
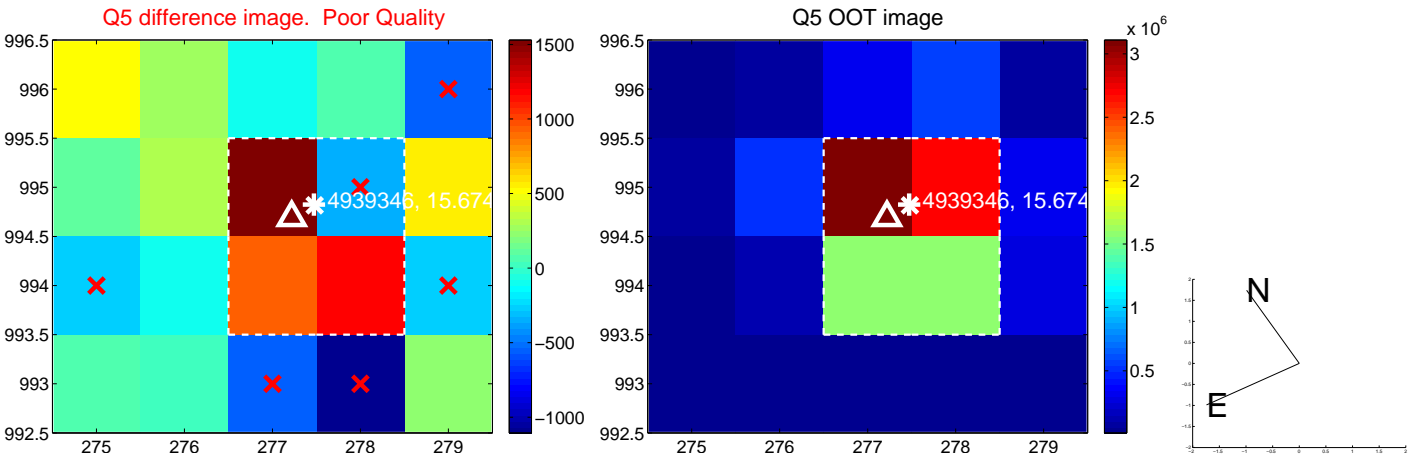


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

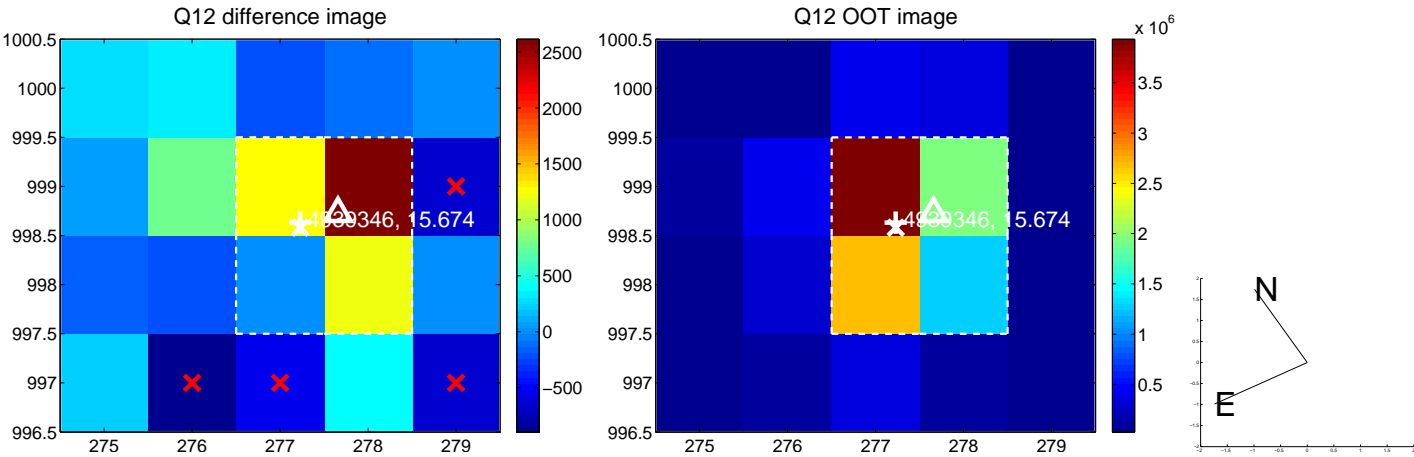
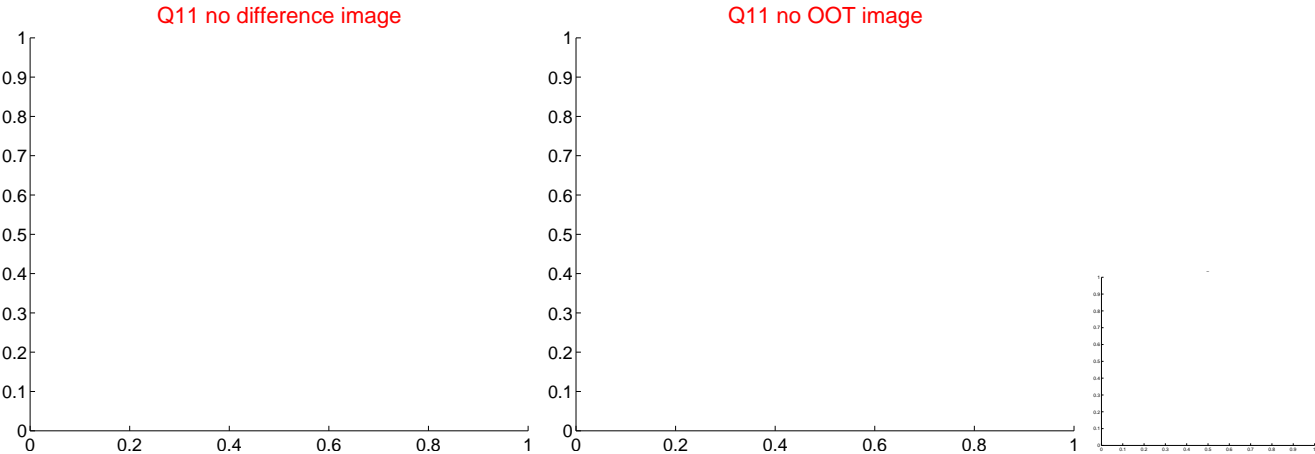
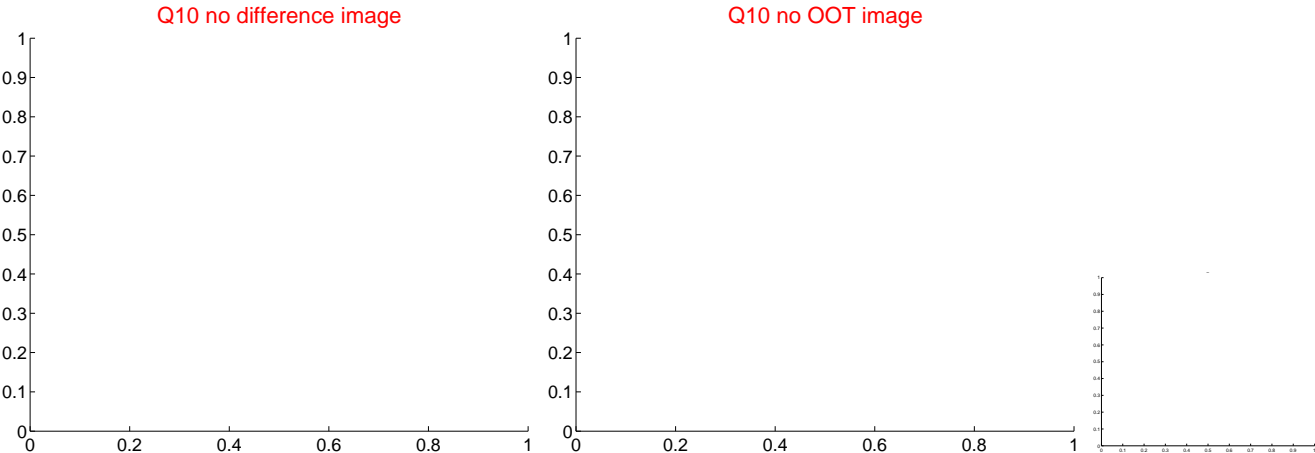
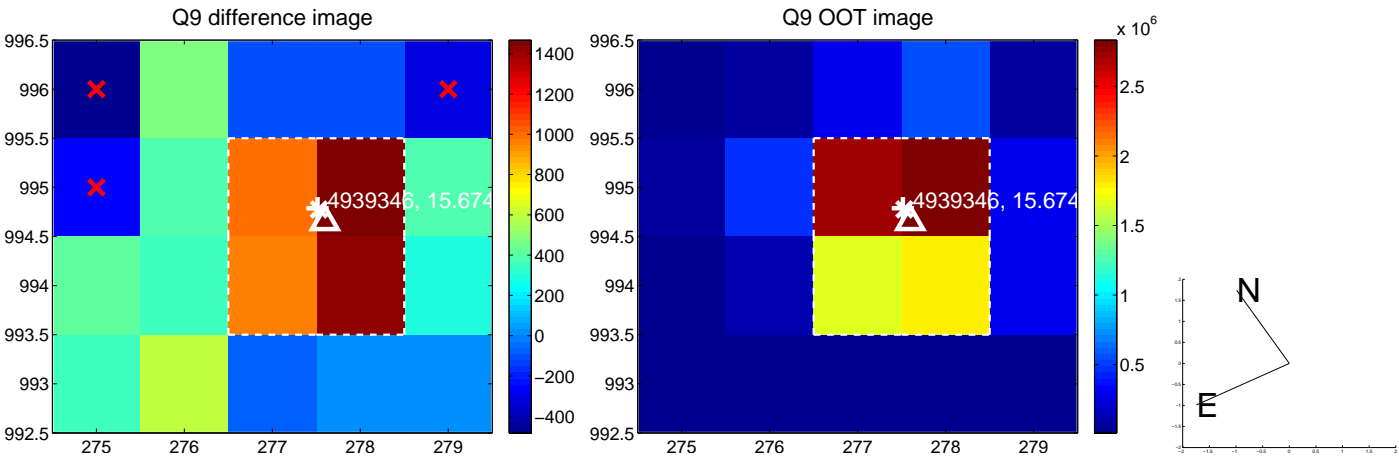
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



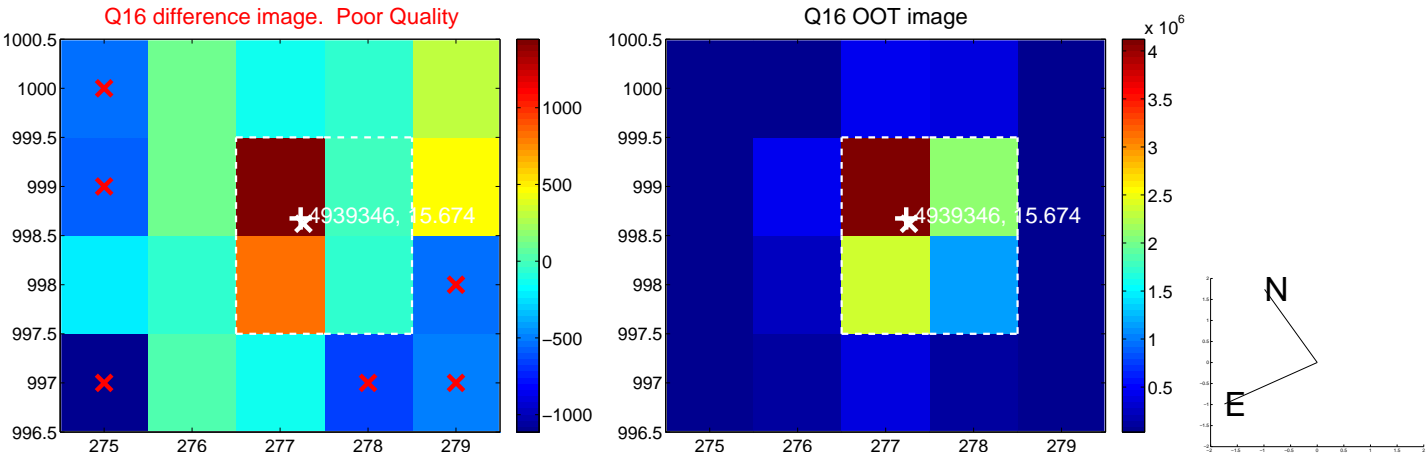
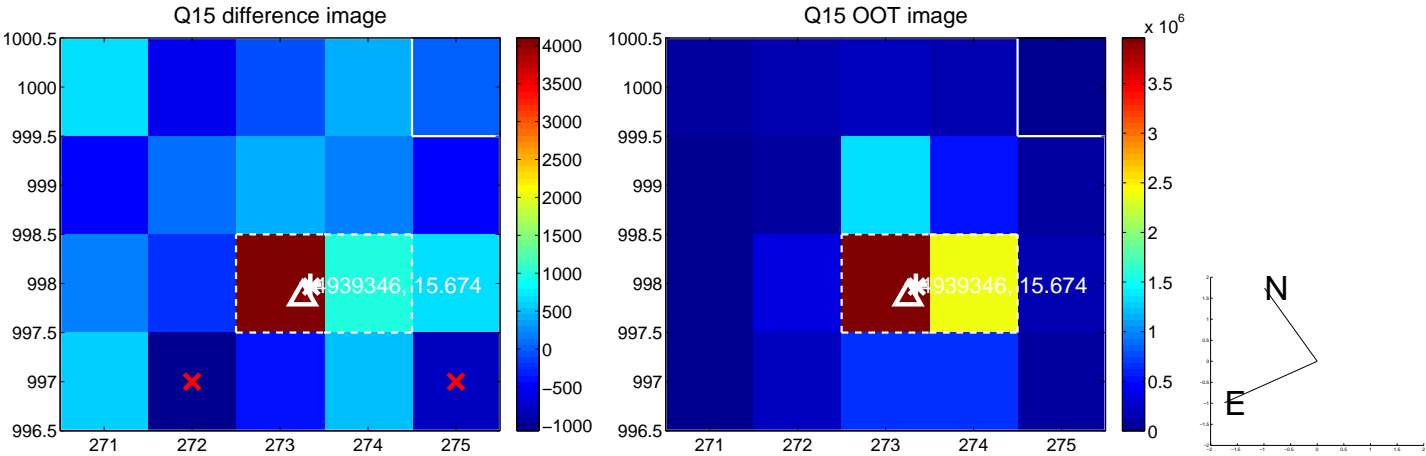
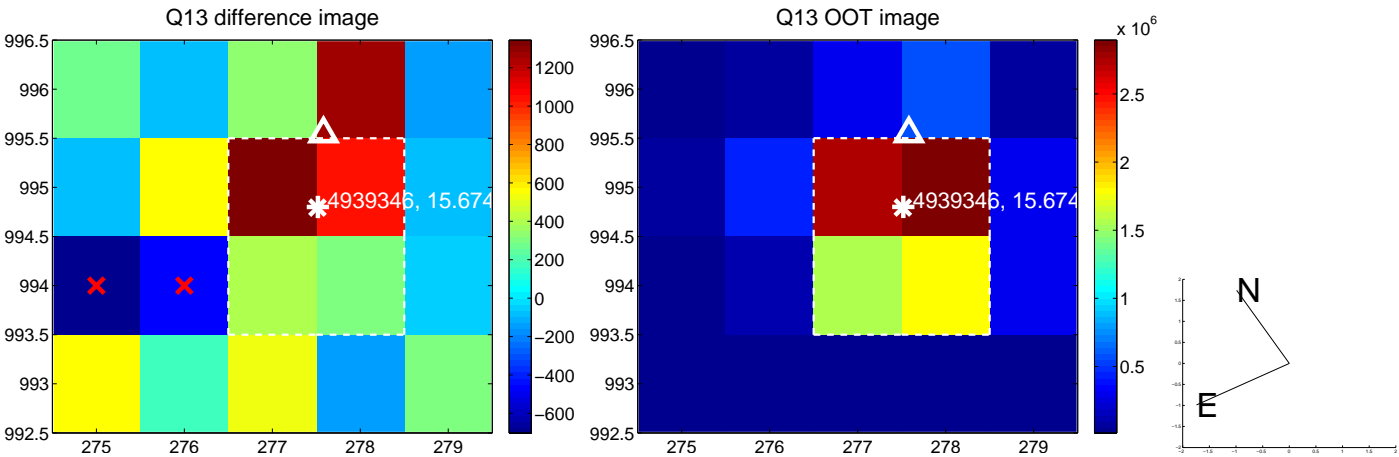
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



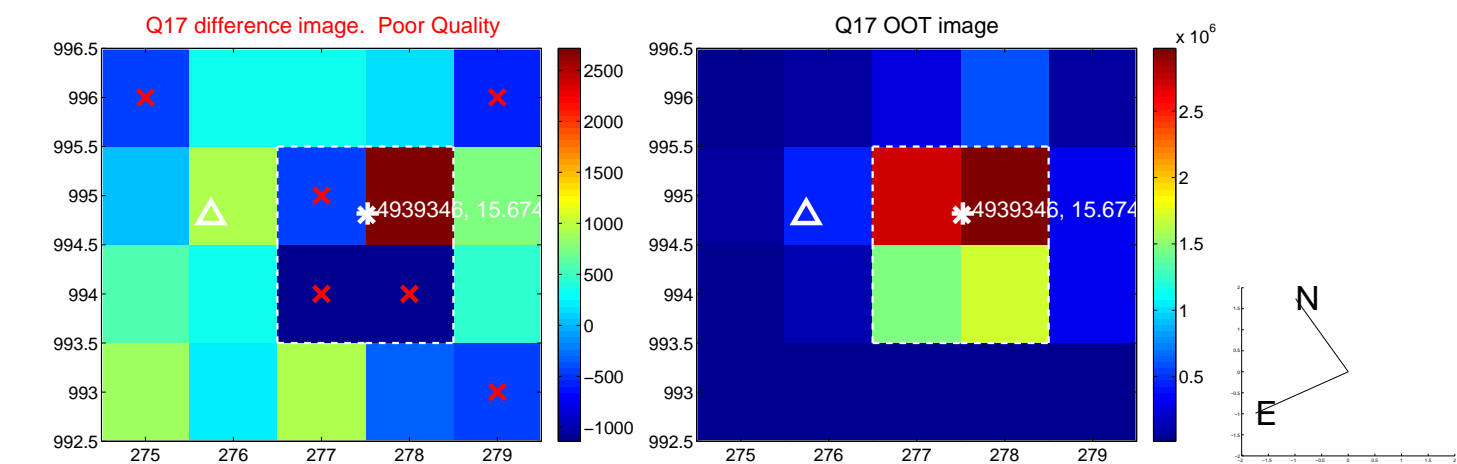
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



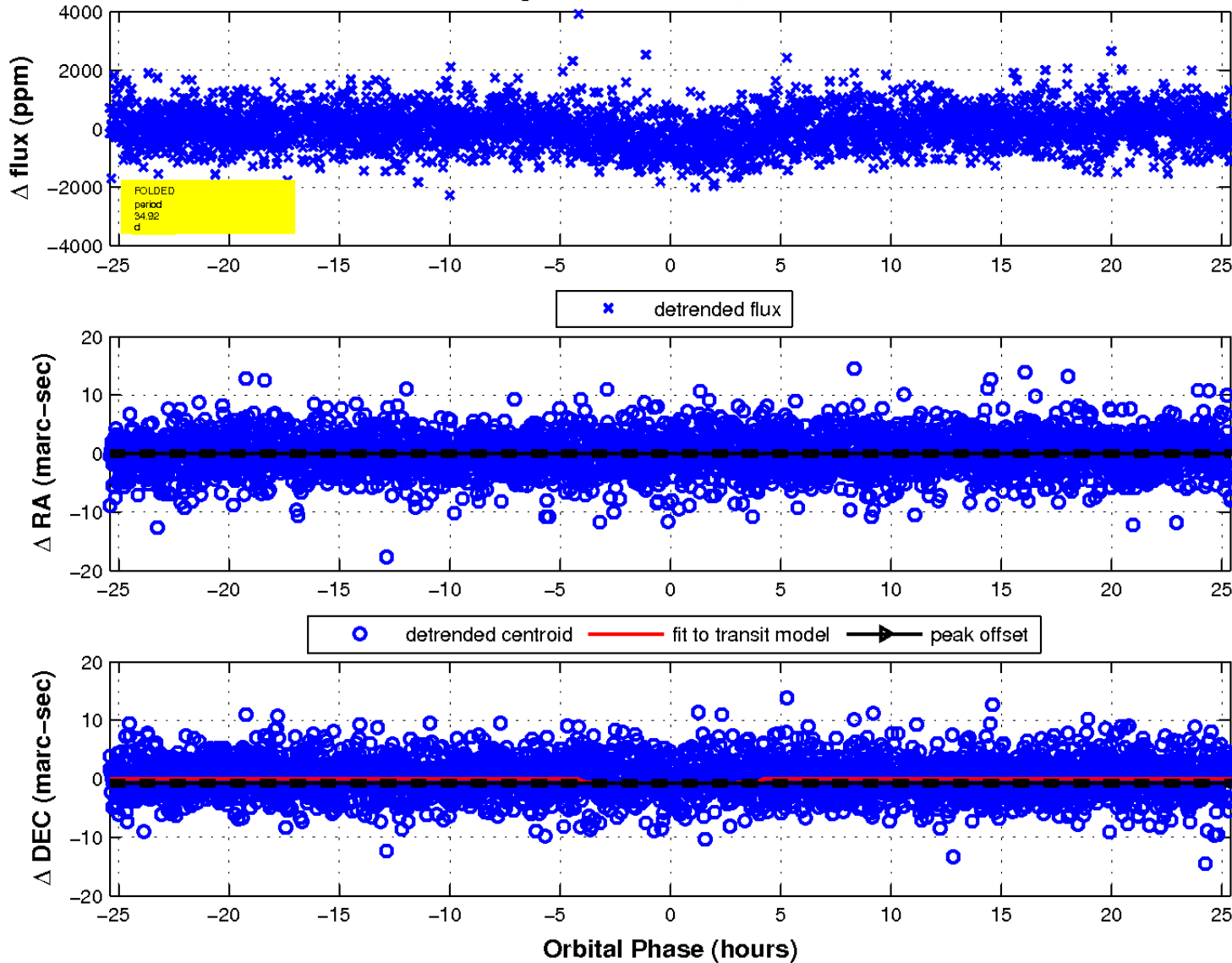
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

