

KIC 008331612

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})
008331612-01	OBS	3318.01	13.835414	134.309118	729.2	3.914	11.3	12.7	1.06	6020	3.17	101.24
008331612-02	OBS	3318.02	51.395472	144.211990	1048.7	3.618	7.5	8.1	1.06	6020	4.03	17.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008331612-01	OBS	PC	0.95	0	0	0	0	CENT_KIC_POS
008331612-02	OBS	PC	0.56	0	0	0	0	CENT_FEW_DIFFS

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.

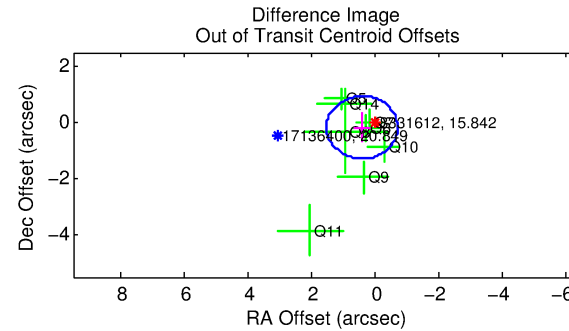
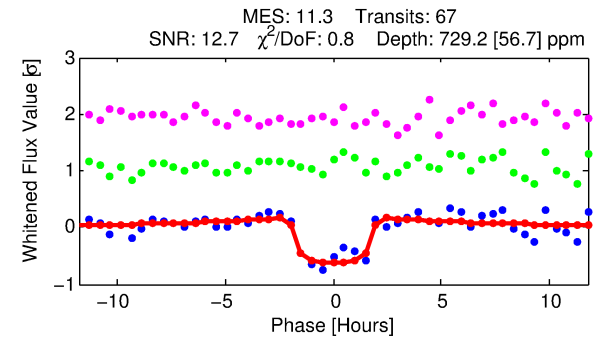
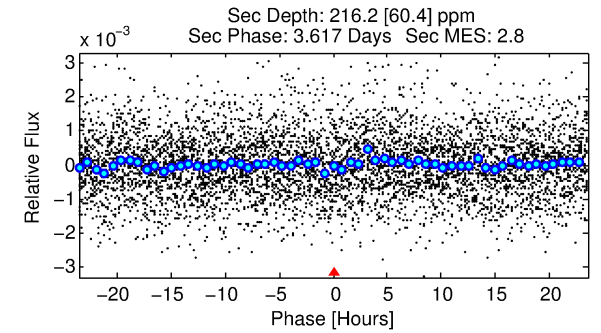
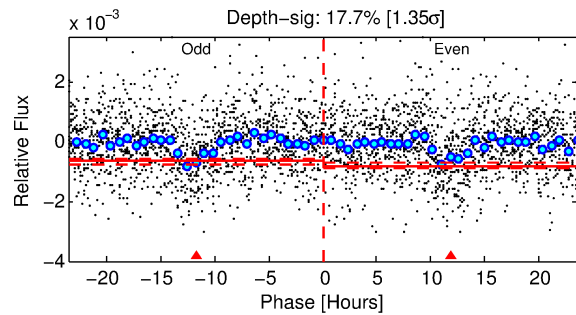
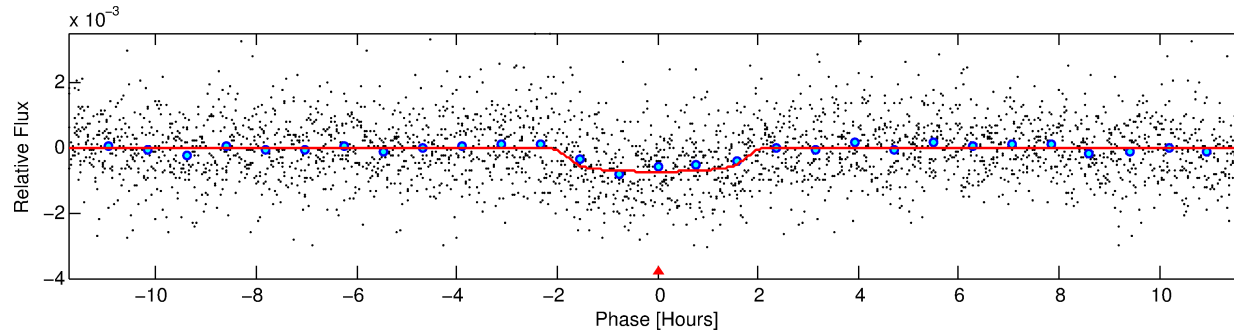
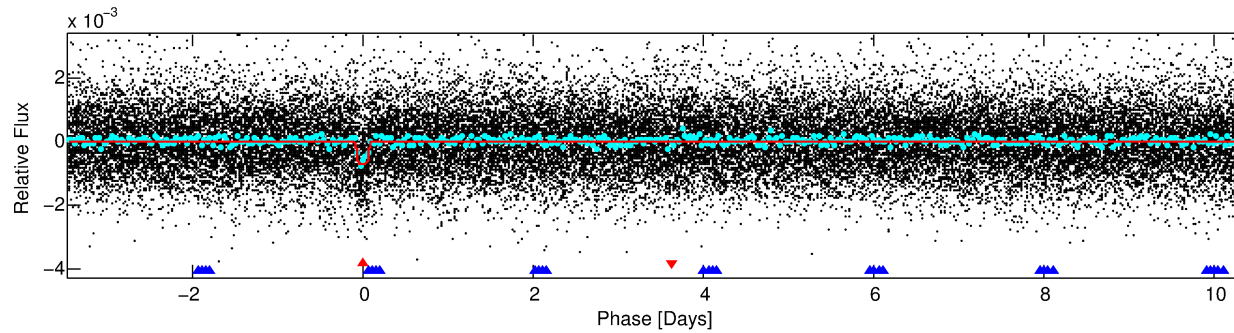
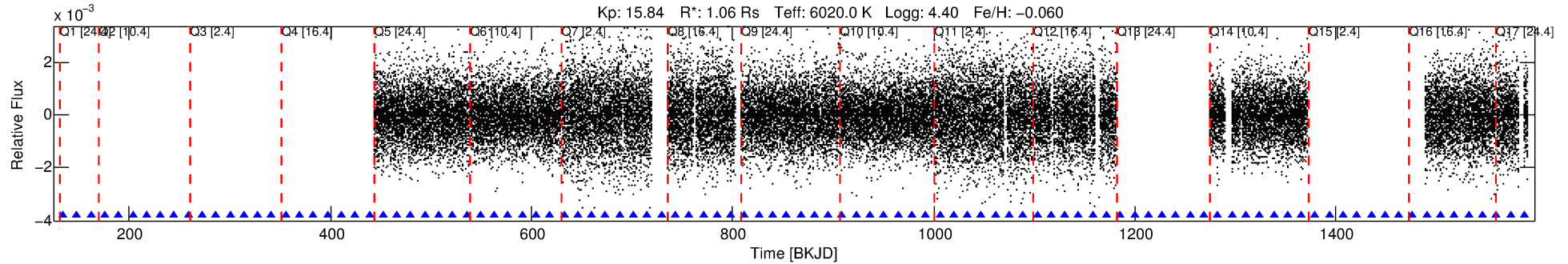
Ephemeris Match Information For 008331612-01

No Significant Match Found

DV One-Page Summary

KIC: 8331612 Candidate: 1 of 2 Period: 13.835 d

KOI: K03318.01 Corr: 0.983



DV Fit Results:

Period = 13.83541 [0.00012] d
Epoch = 134.3091 [0.0072] BKJD
Rp/R* = 0.0275 [0.0095]
a/R* = 17.23 [28.23]
b = 0.81 [0.72]
Seff = 101.24 [40.88]
Teq = 809 [82] K
Rp = 3.17 [1.50] Re
a = 0.1140 [0.0303] AU
Ag = 153.53 [128.04] [1.19 σ]
Teff = 4402 [832] K [4.30 σ]

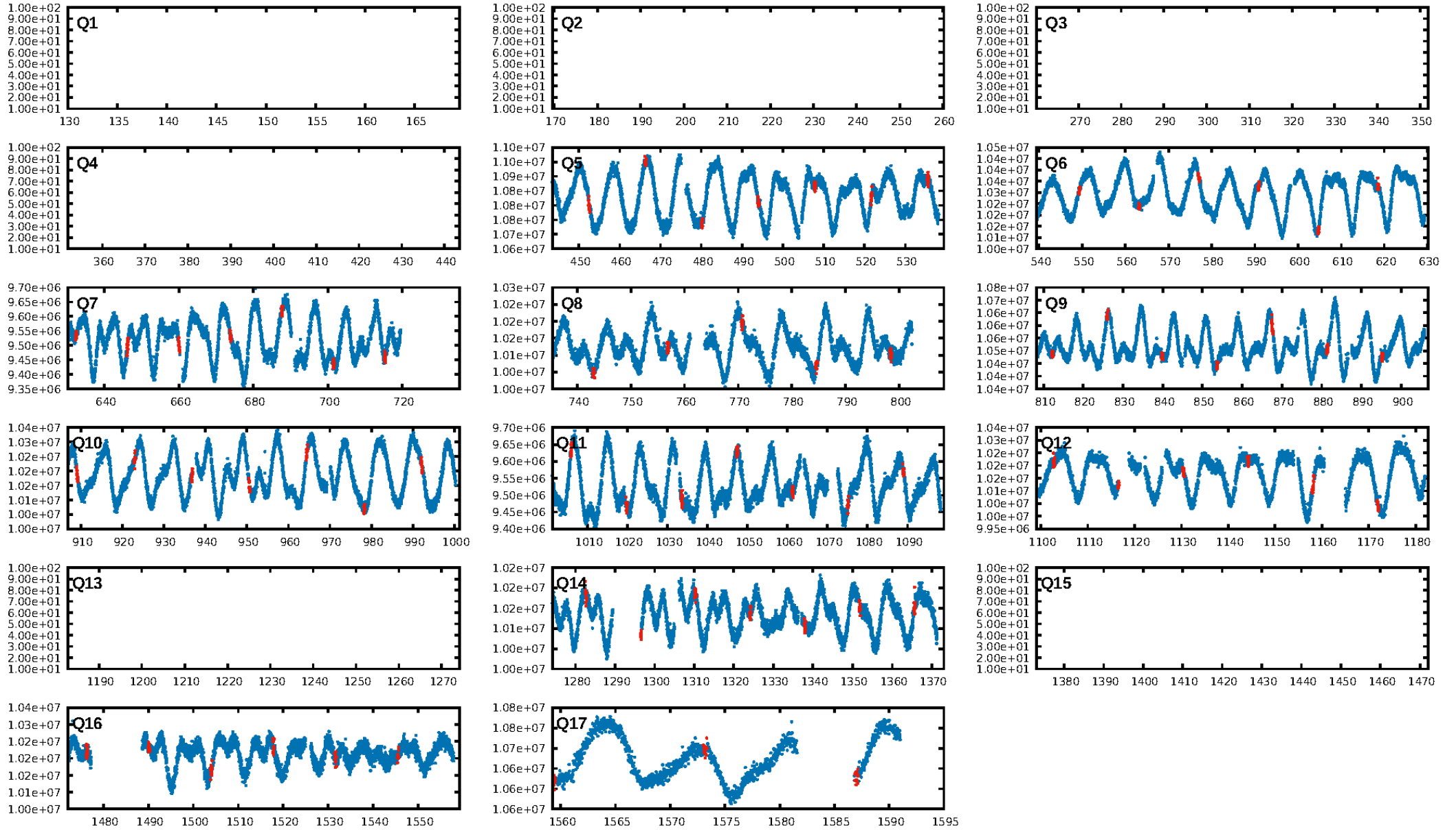
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [169.13 σ]
ModelChiSquare2-sig: 99.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.81e-29
RollingBand-fgt: 1.00 [64/64]
GhostDiagnostic-chr: 4.116
Centroid-sig: 3.1%
Centroid-so: 2.566 arcsec [3.46 σ]
OotOffset-rm: 0.453 arcsec [1.22 σ]
KicOffset-rm: 0.505 arcsec [1.67 σ]
OotOffset-st: 3/2/1/2 [8]
KicOffset-st: 3/2/1/2 [8]
DiffImageQuality-fgm: 0.62 [5/8]
DiffImageOverlap-fno: 1.00 [11/11]

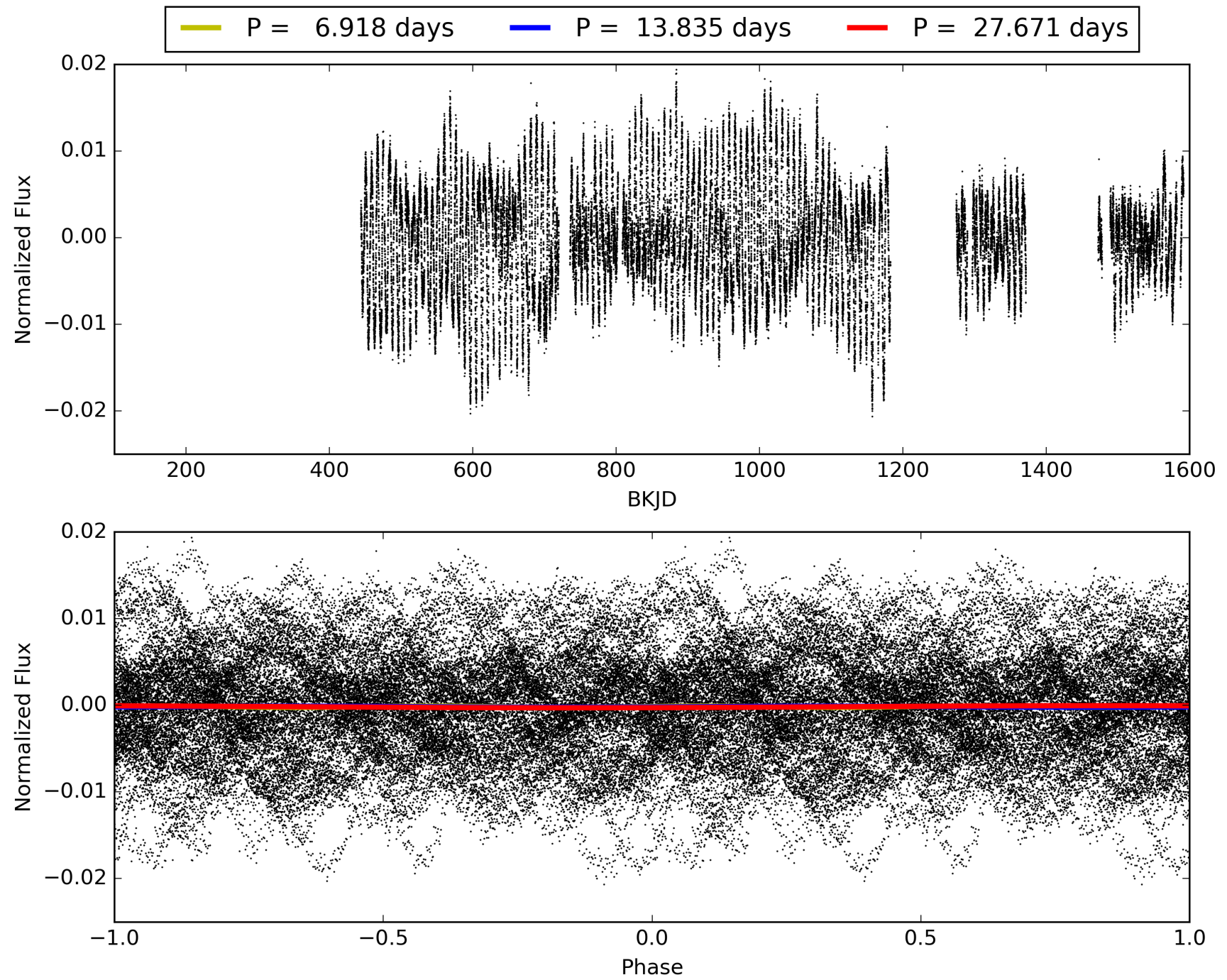
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008331612-01, PDC Light Curves

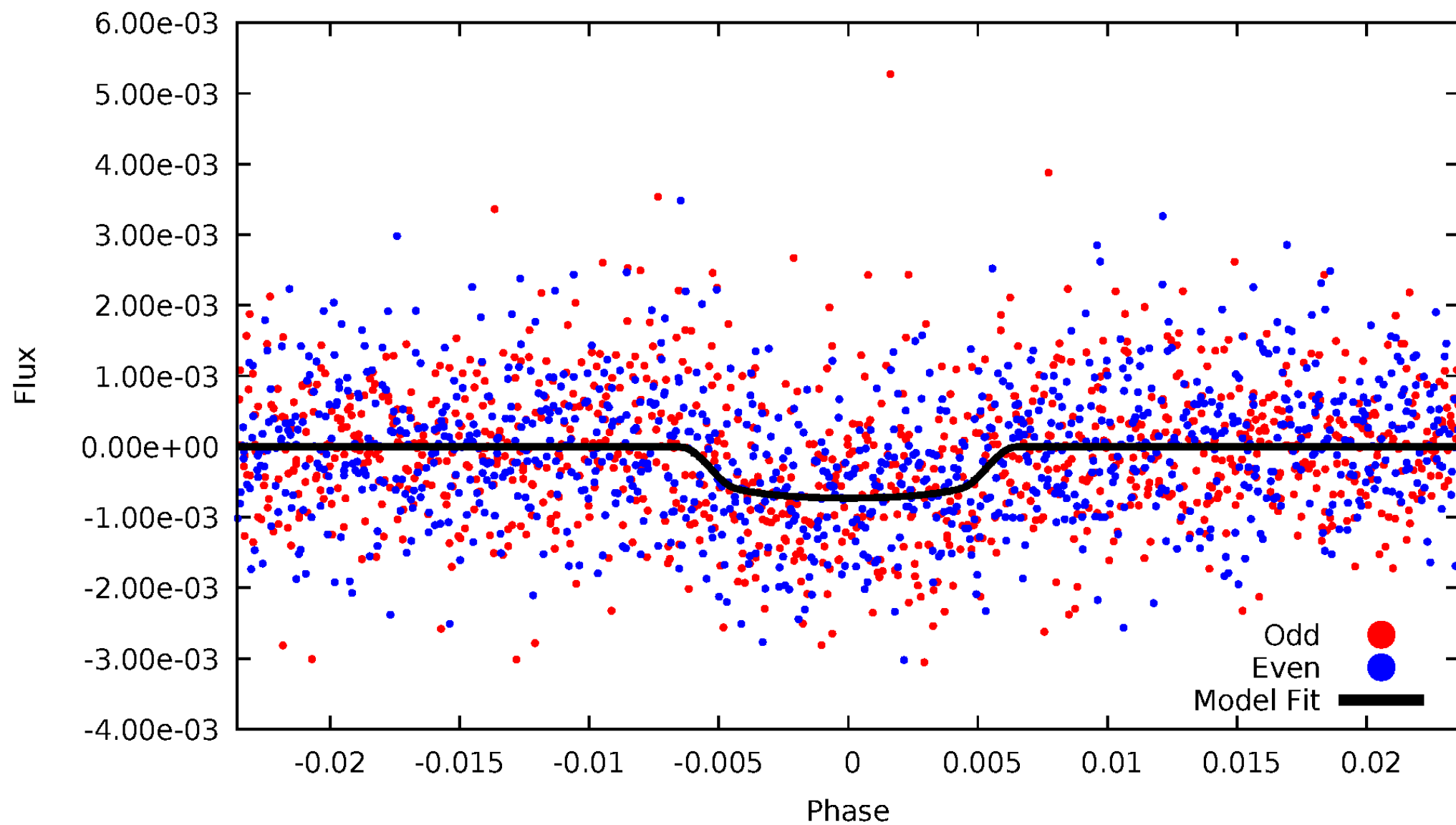


TCE 008331612-01



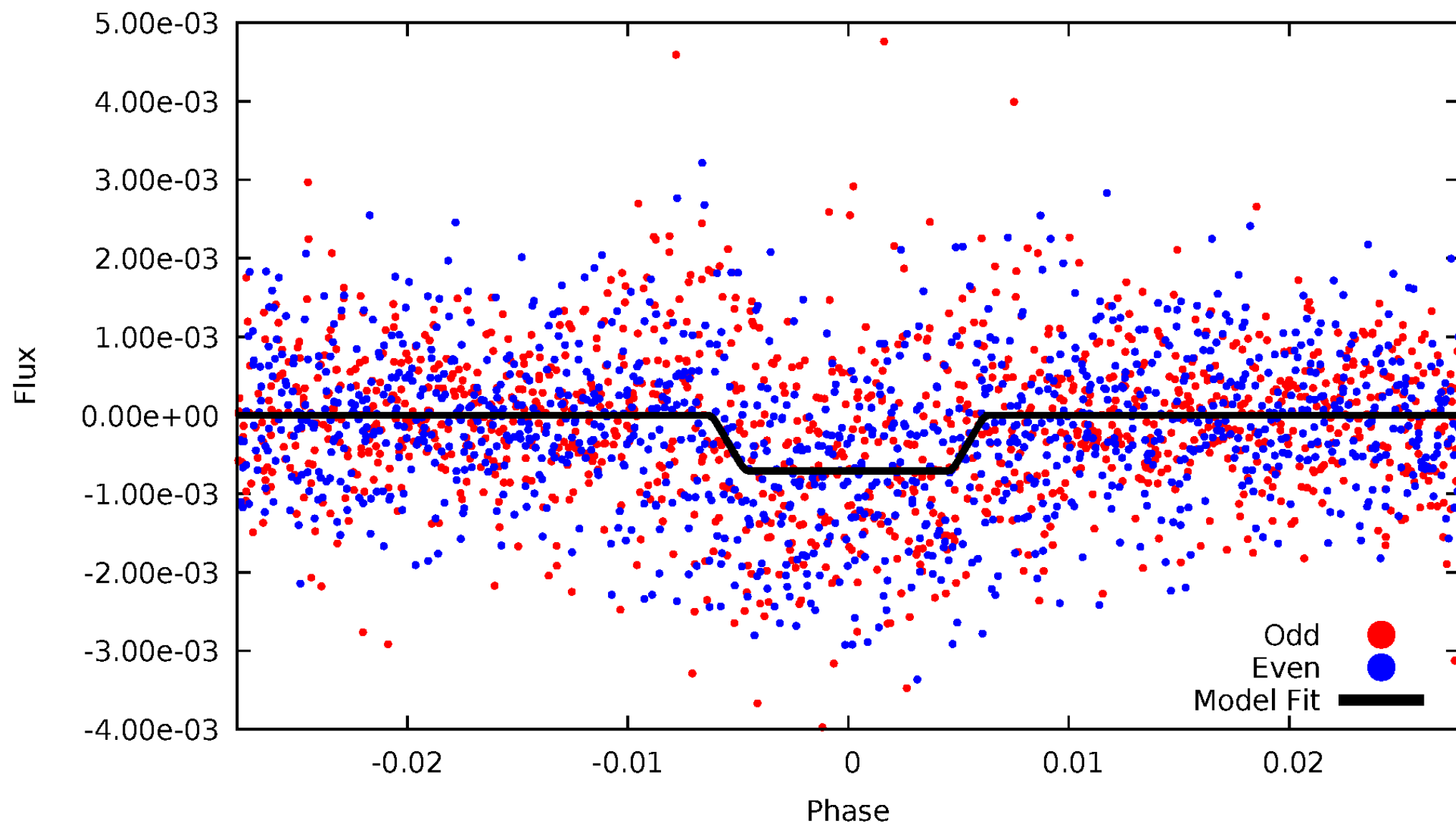
DV Odd/Even

TCE 008331612-01

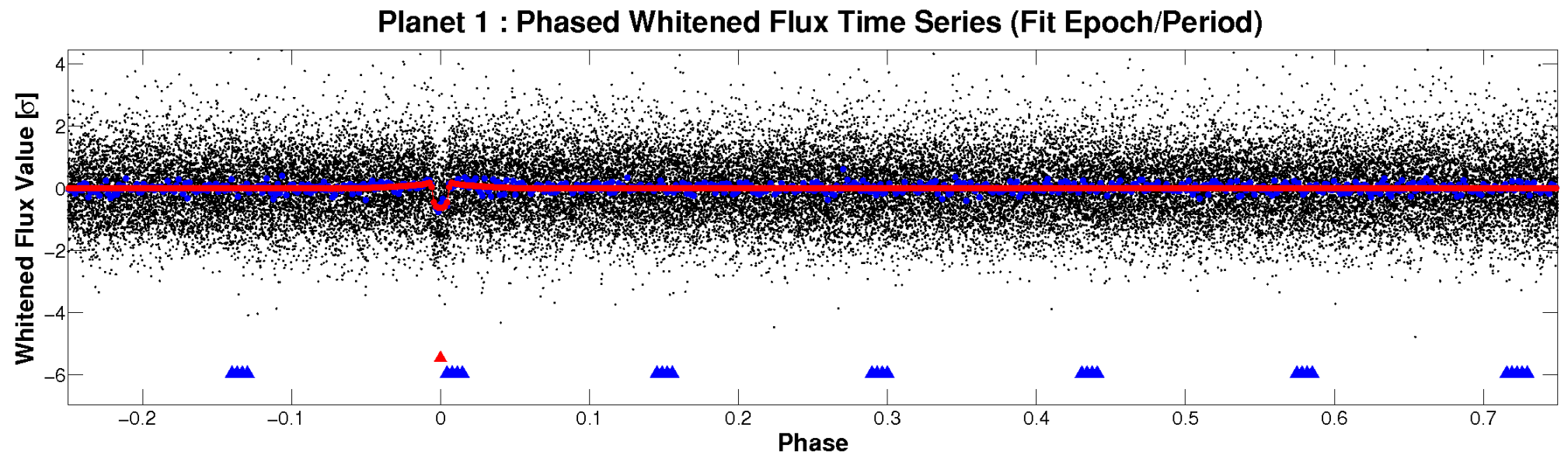
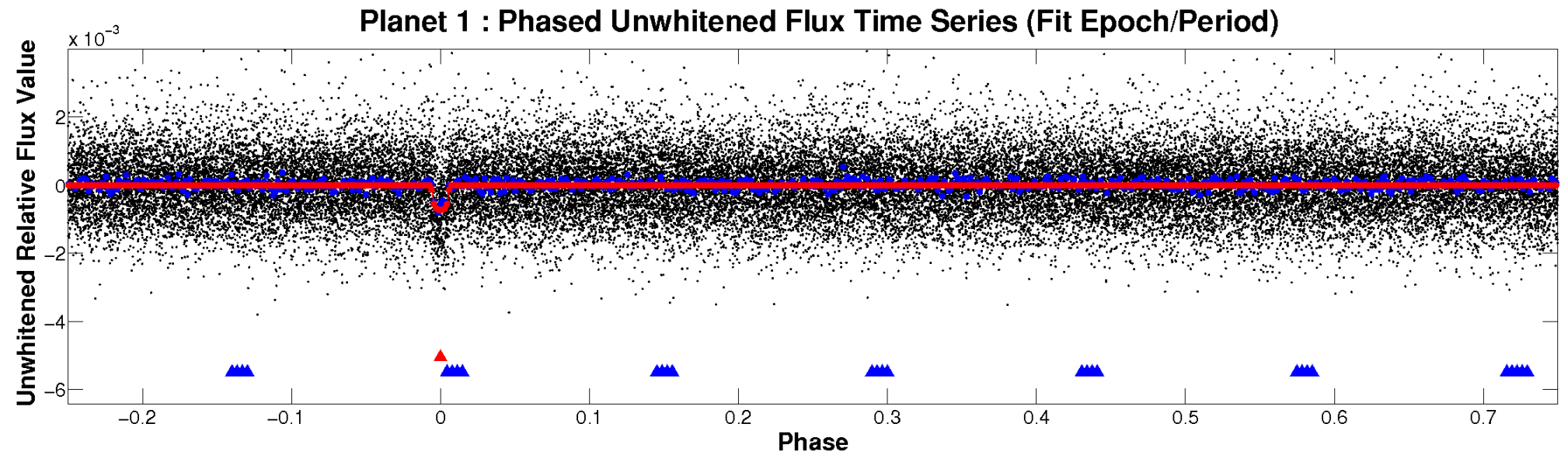


ALT Odd/Even

TCE 008331612-01

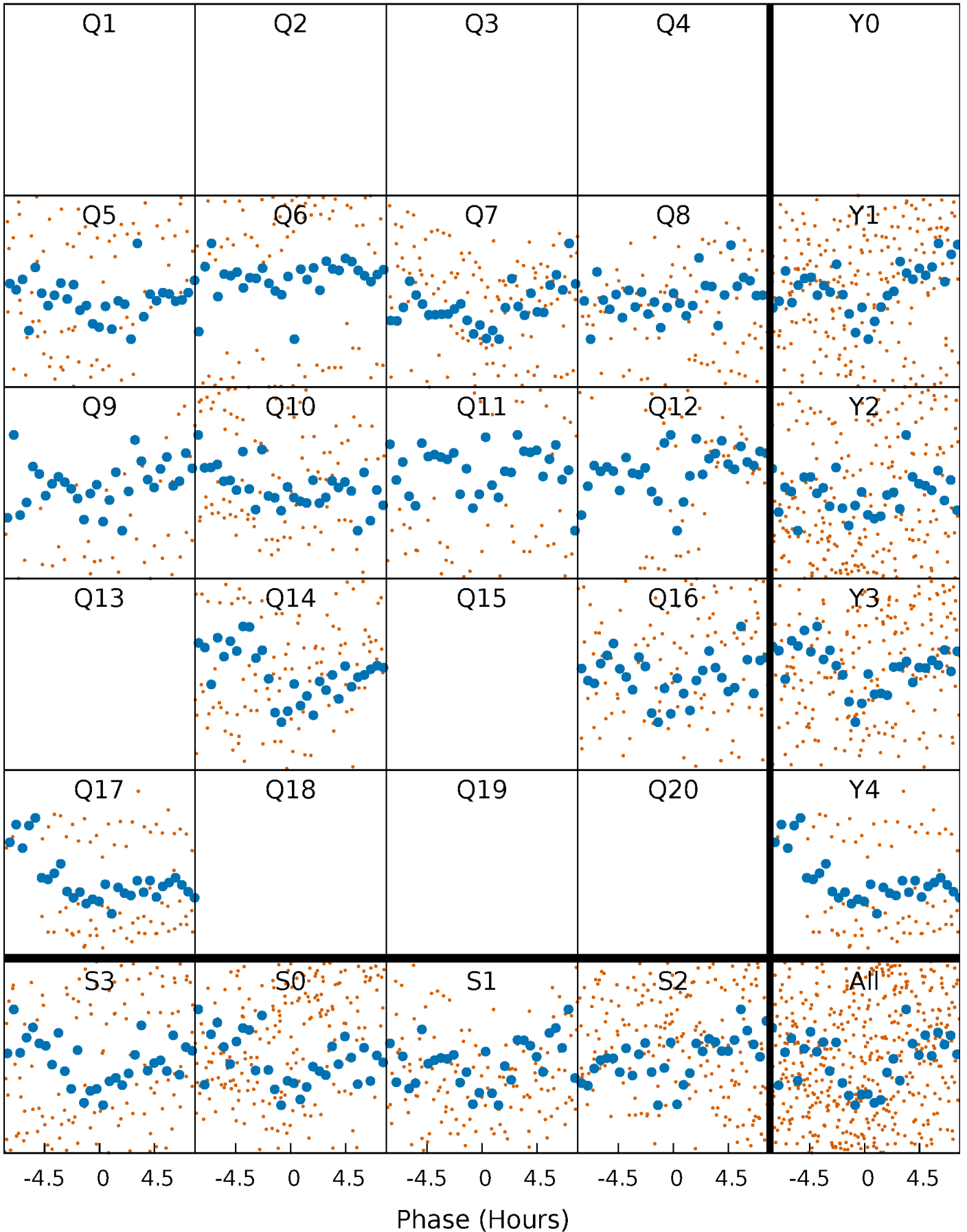


Non-Whitened Vs. Whitened Light Curve



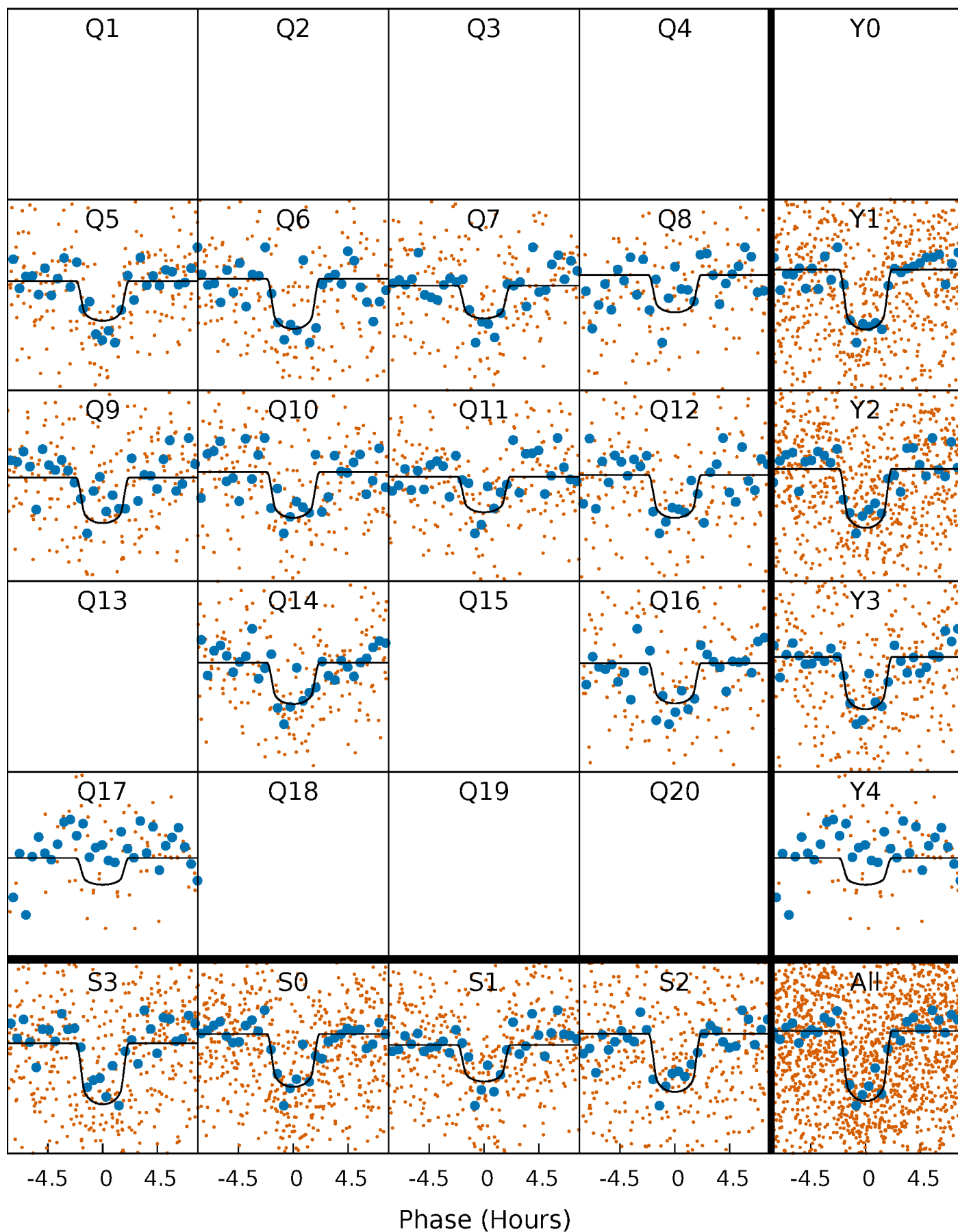
PDC Quarter-Phased Transit Curves

TCE 008331612-01 P= 13.835414 Days $T_0=134.309118$ (BKJD)



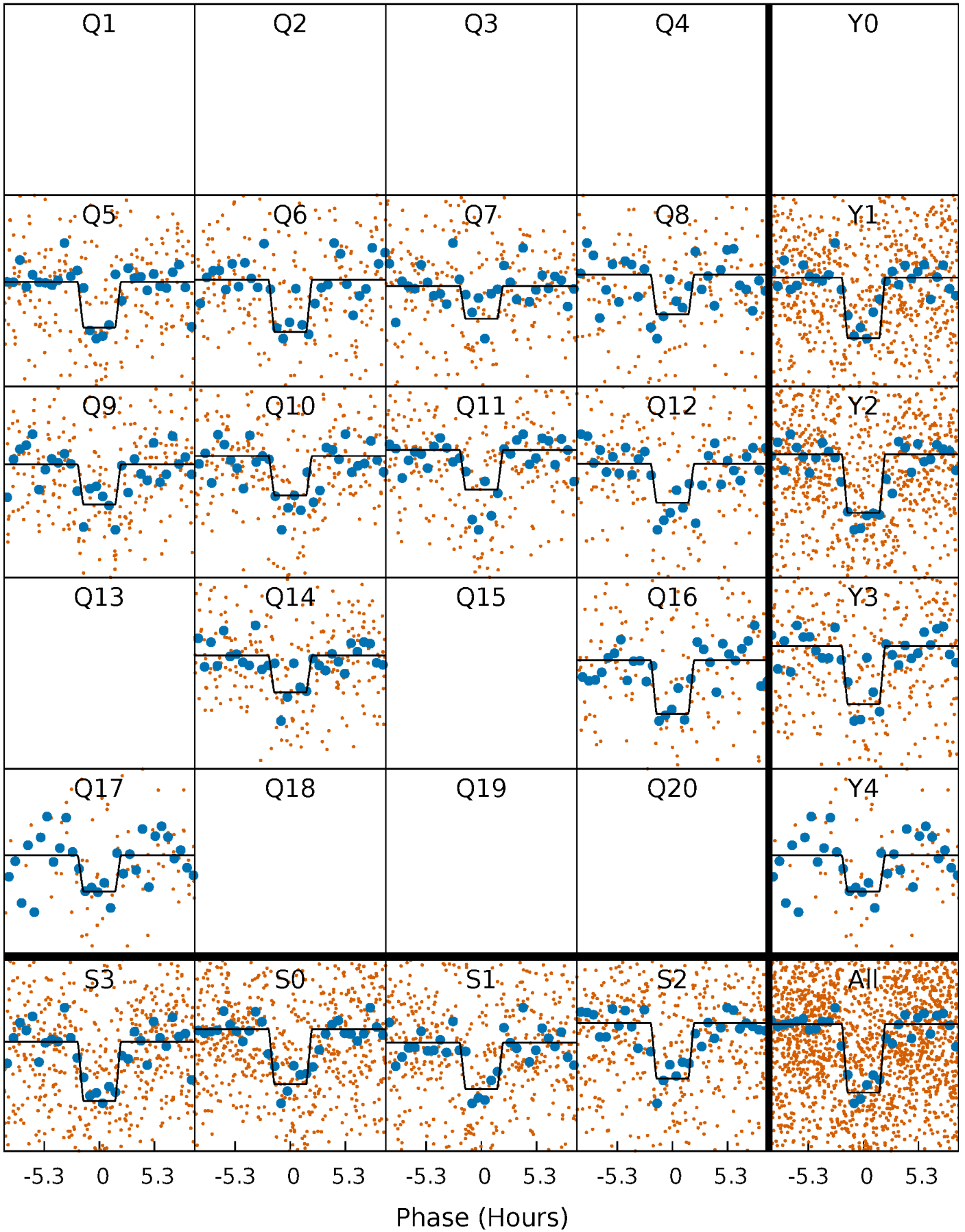
DV Quarter-Phased Transit Curves

TCE 008331612-01 P= 13.835414 Days $T_0=134.309118$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

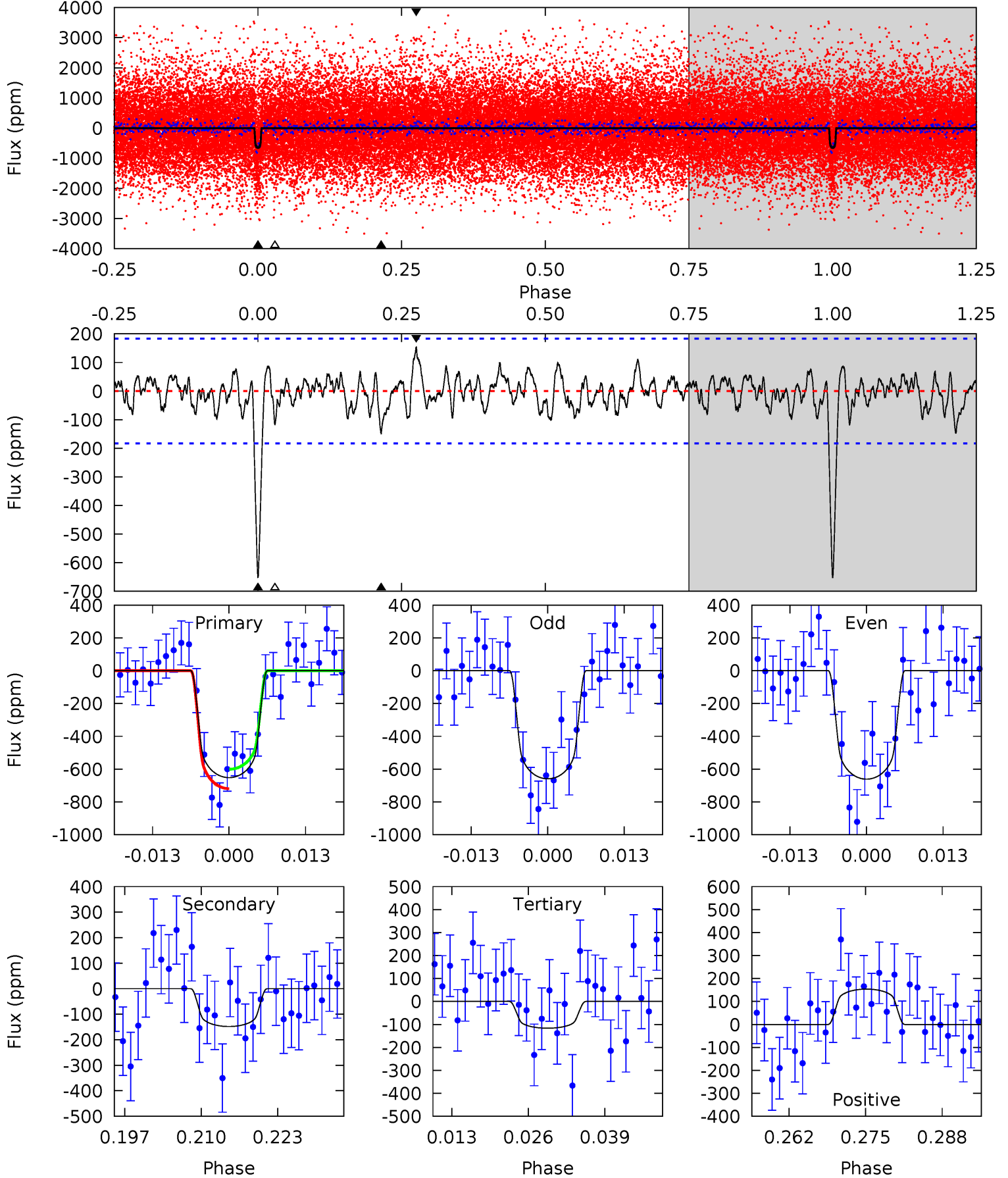
TCE 008331612-01 P= 13.835290 Days $T_0=134.320008$ (BKJD)



DV Model-Shift Uniqueness Test

008331612-01, P = 13.835414 Days, E = 134.309118 Days

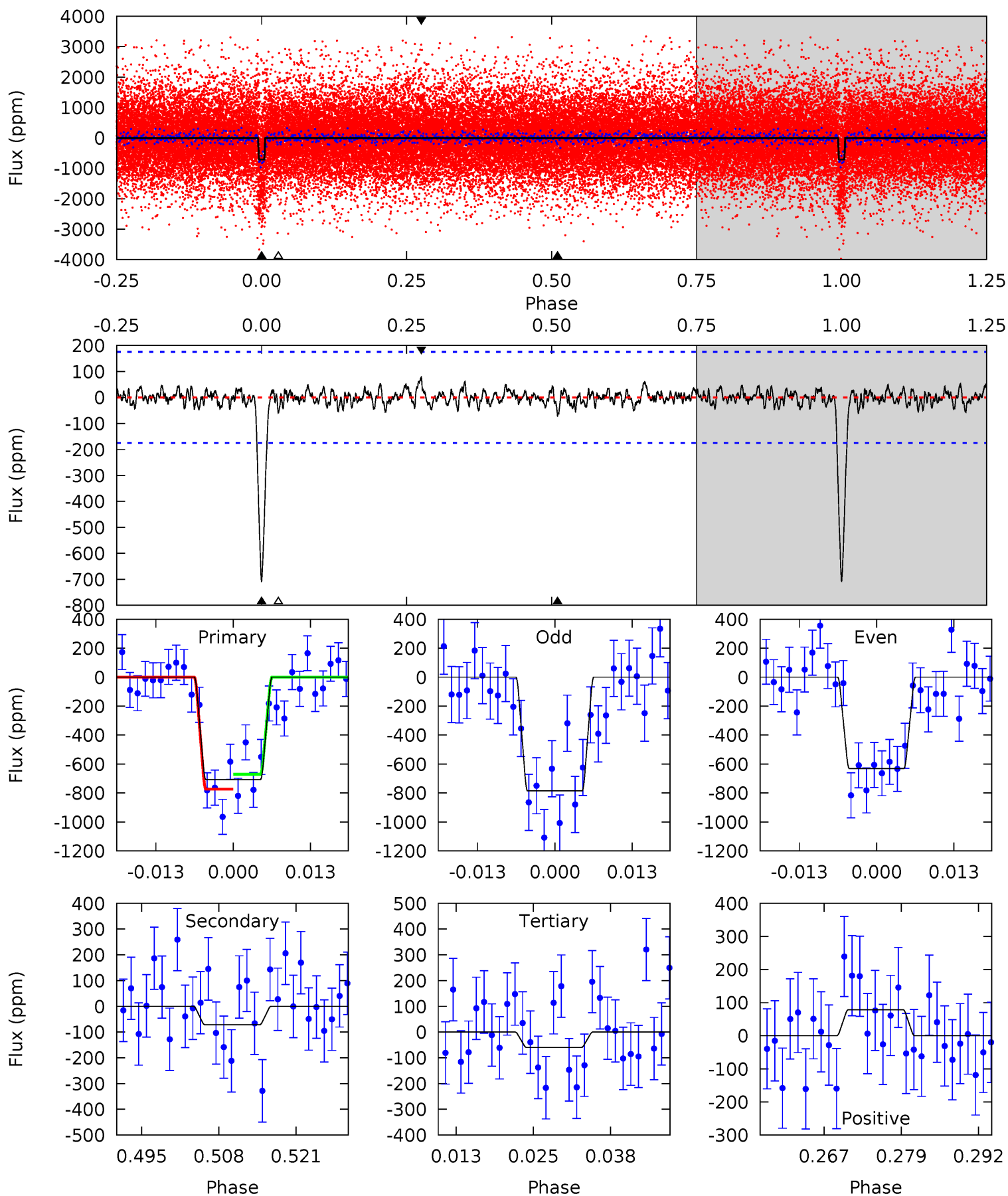
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.7	4.03	3.17	4.18	4.97	2.48	1.23	14.6	13.6	0.86	-0.15	0.03	0.92	0.19	1.61



Alt Model-Shift Uniqueness Test

008331612-01, $P = 13.835290$ Days, $E = 134.320008$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.1	2.04	1.70	2.24	4.98	2.49	0.62	18.4	17.9	0.33	-0.20	2.20	1.04	0.10	1.46



Stellar Parameters For KIC 008331612

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6020^{+211}_{-211}	$4.403^{+0.087}_{-0.203}$	$-0.060^{+0.250}_{-0.300}$	$1.057^{+0.341}_{-0.146}$	$1.030^{+0.145}_{-0.130}$	$1.229^{+0.566}_{-0.653}$
	+4%/-4%	+2%/-5%	+417%/-500%	+32%/-14%	+14%/-13%	+46%/-53%
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 008331612-01 / KOI 3318.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-148 ± 37	$3.34^{+1.15}_{-1.21}$	1148^{+102}_{-64}	4241^{+817}_{-494}	92^{+142}_{-45}
Alt.	-72 ± 35	$3.23^{+1.38}_{-1.17}$	1151^{+90}_{-67}	3726^{+729}_{-513}	46^{+79}_{-28}

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 $A_{obs} \gg 1.0$

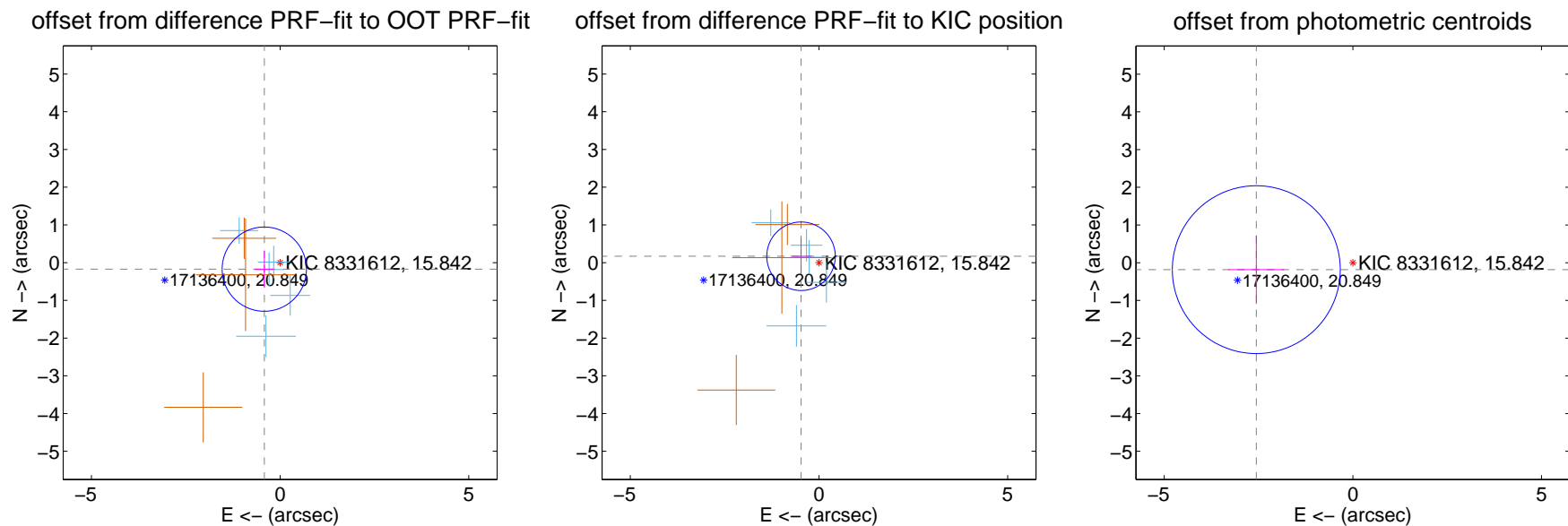
DV Centroid Data

Supplemental centroid analysis for 008331612-01. Kepler magnitude: 15.84. Transit SNR 12.70

There are 5 quarters with good PRF difference image offsets

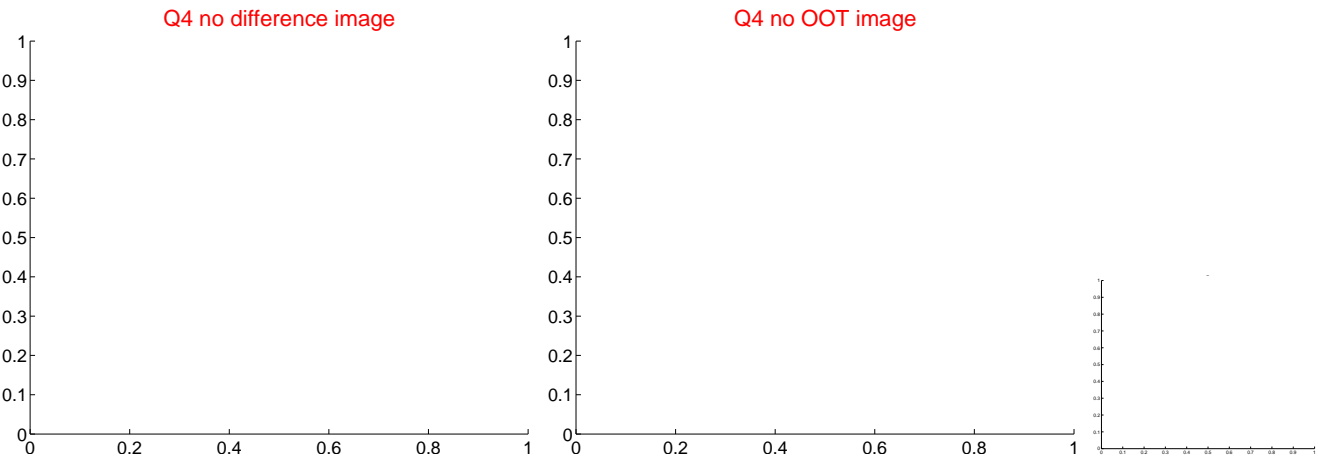
The direct PRF centroid is offset from the target star catalog position by about 0.38 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.453 ± 0.372	1.22	0.419 ± 0.253	-0.172 ± 0.485
PRF-fit source offset from KIC position	0.505 ± 0.303	1.67	0.475 ± 0.273	0.169 ± 0.477
photometric centroid source offset	2.57 ± 0.74	3.46	2.56 ± 0.74	-0.18 ± 0.91

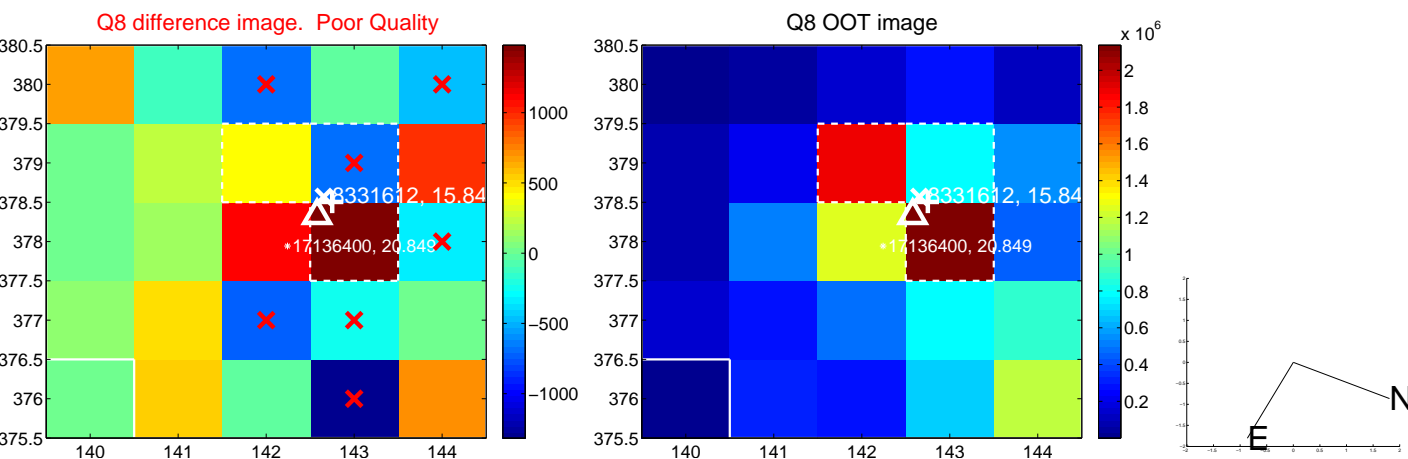
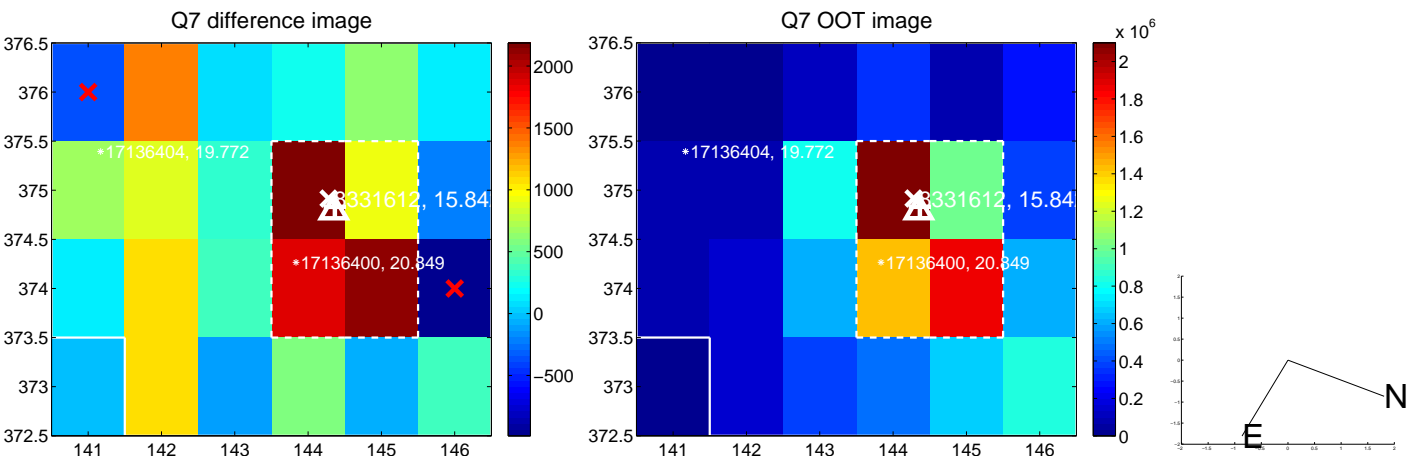
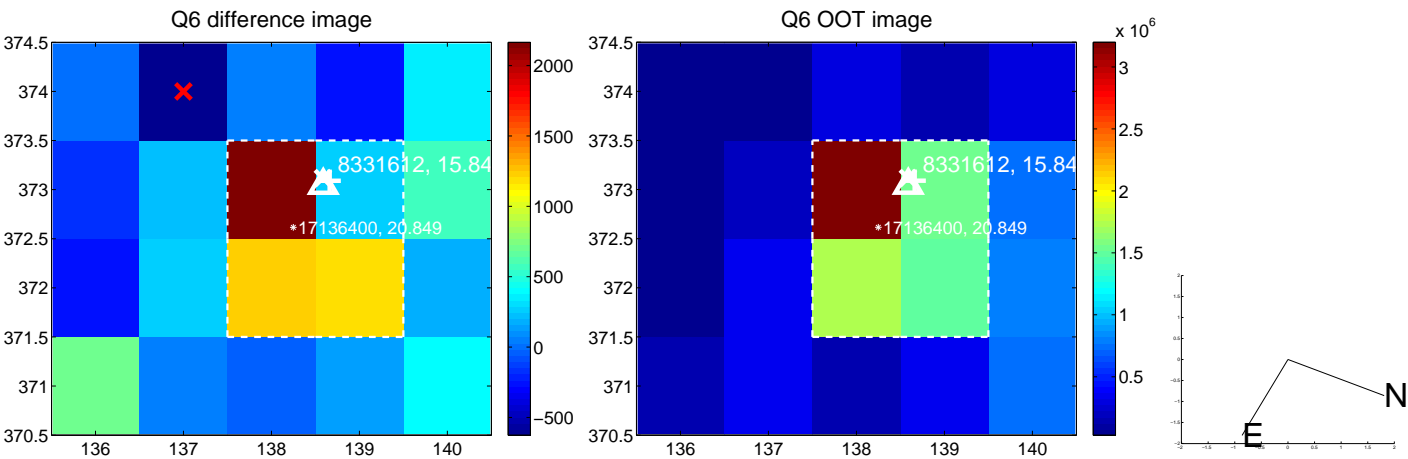
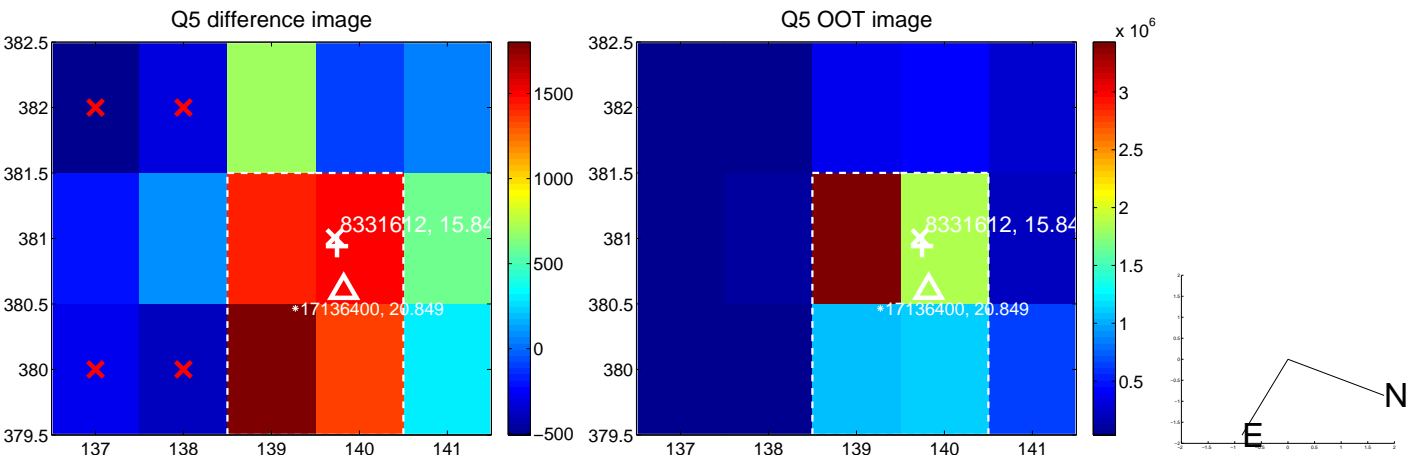


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

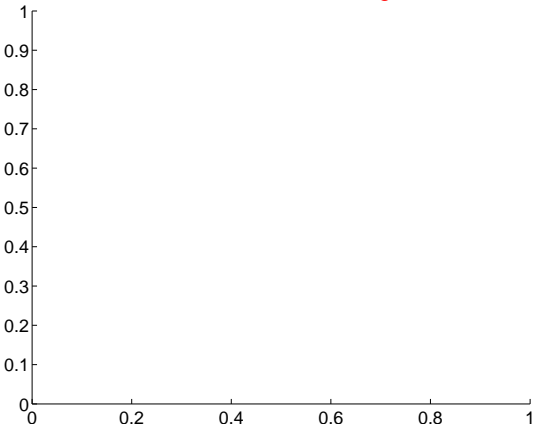


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

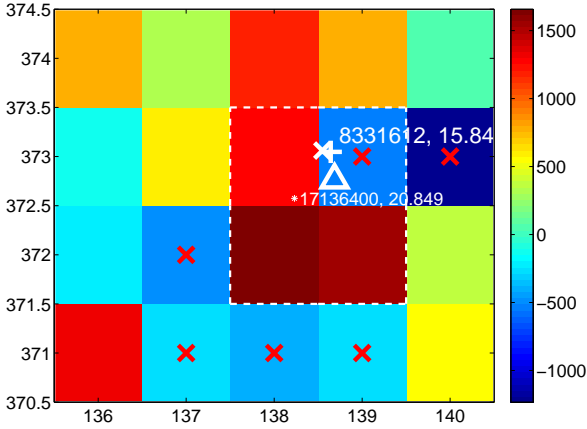
Q13 no difference image



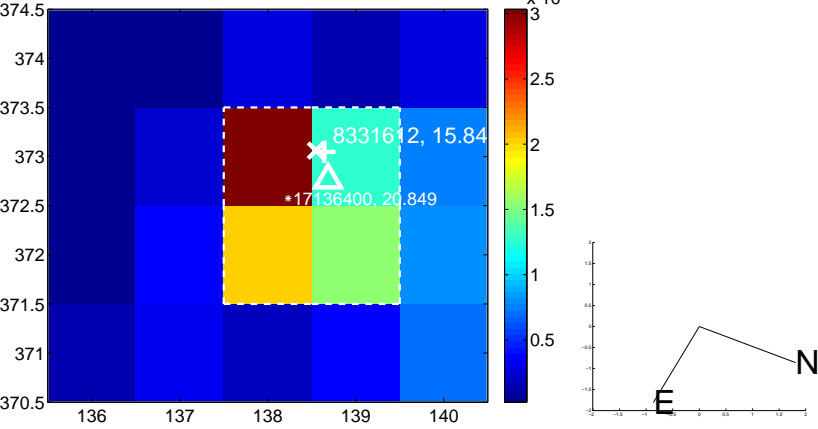
Q13 no OOT image



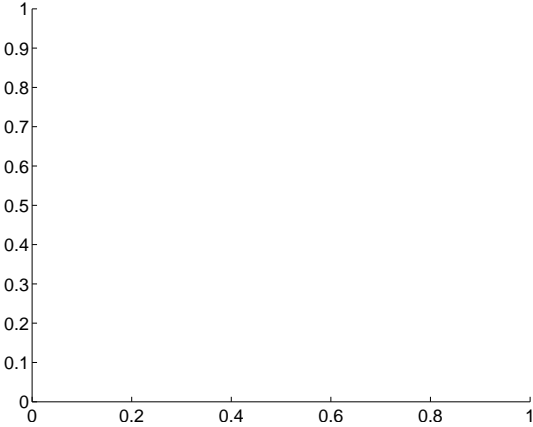
Q14 difference image. Poor Quality



Q14 OOT image



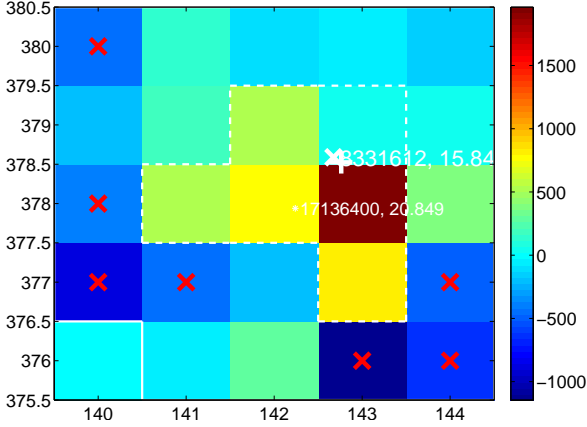
Q15 no difference image



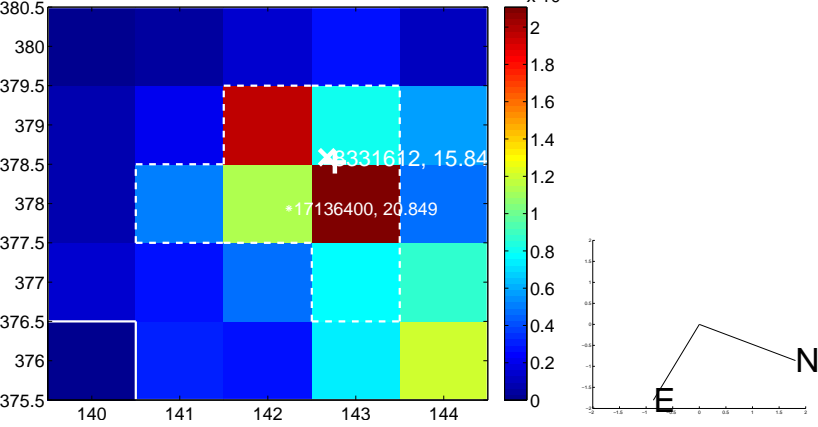
Q15 no OOT image



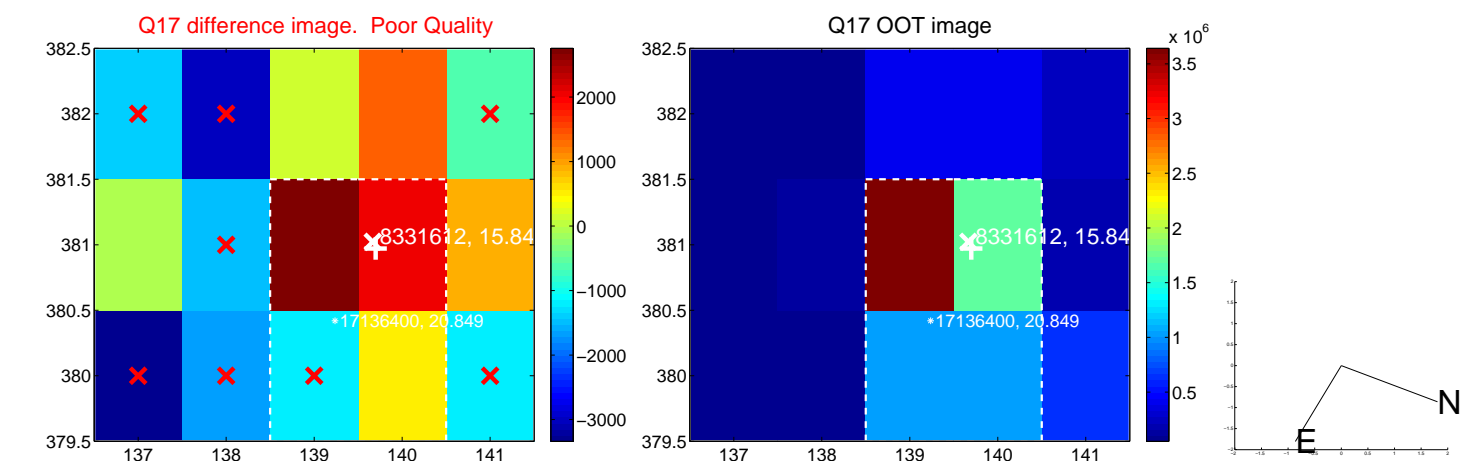
Q16 difference image. Poor Quality



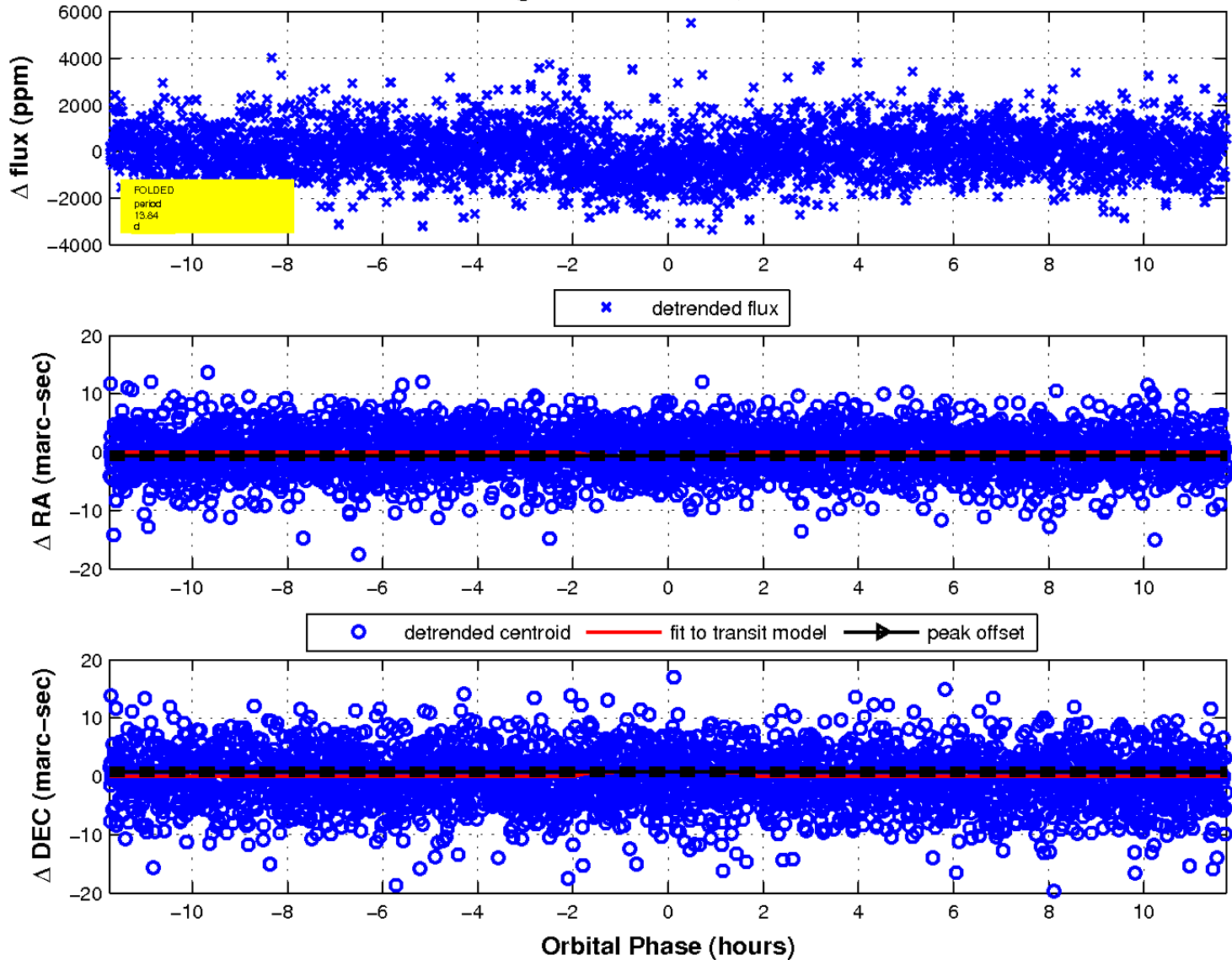
Q16 OOT image



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

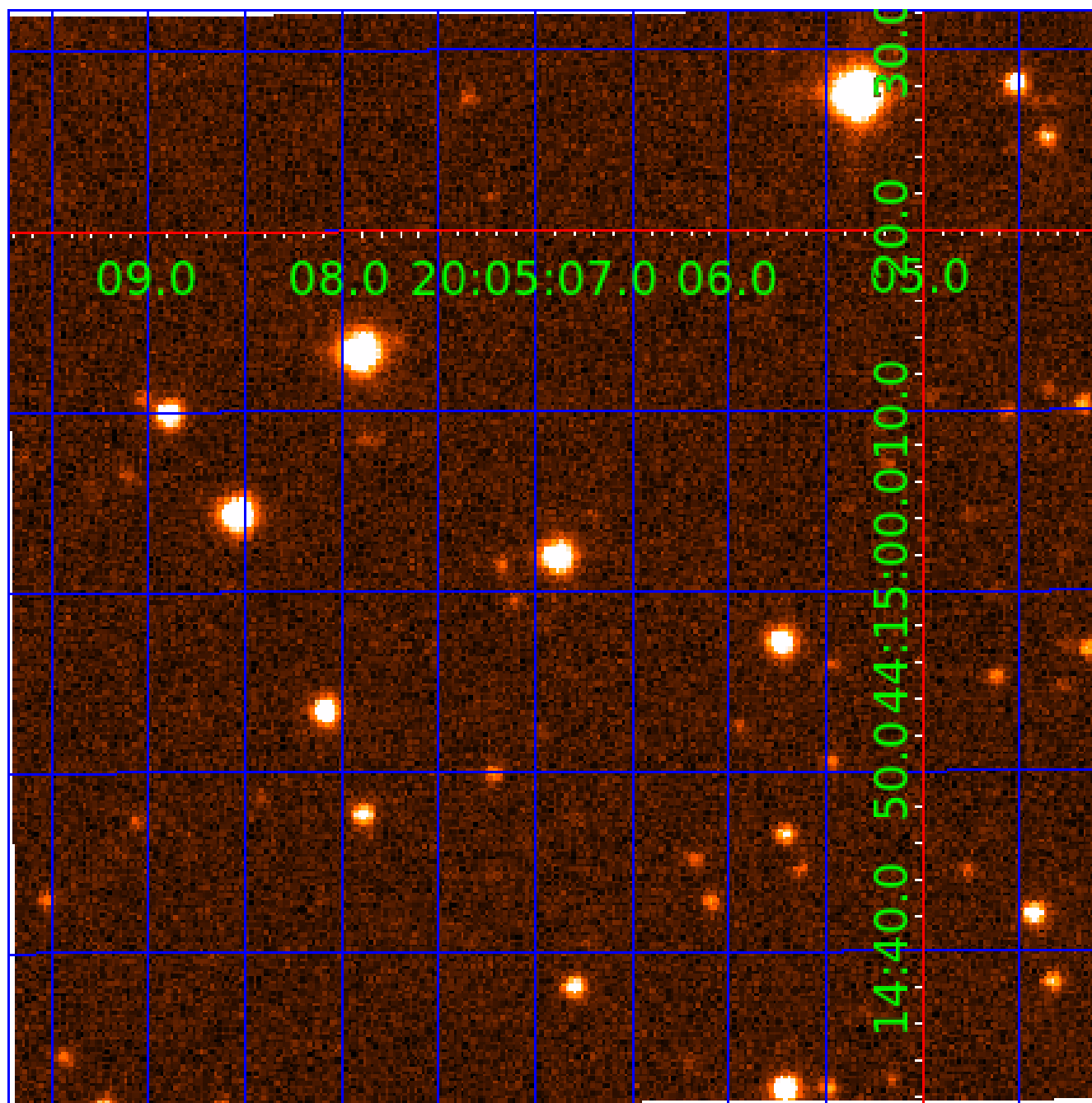


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 008331612

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})
008331612-01	OBS	3318.01	13.835414	134.309118	729.2	3.914	11.3	12.7	1.06	6020	3.17	101.24
008331612-02	OBS	3318.02	51.395472	144.211990	1048.7	3.618	7.5	8.1	1.06	6020	4.03	17.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008331612-01	OBS	PC	0.95	0	0	0	0	CENT_KIC_POS
008331612-02	OBS	PC	0.56	0	0	0	0	CENT_FEW_DIFFS

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

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

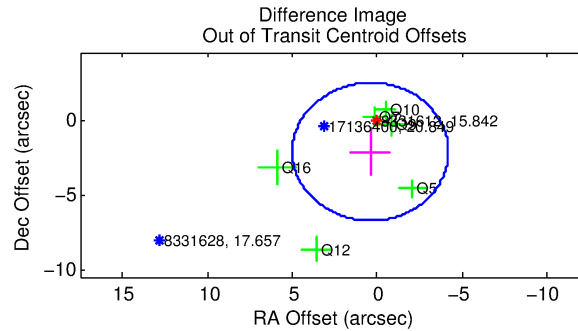
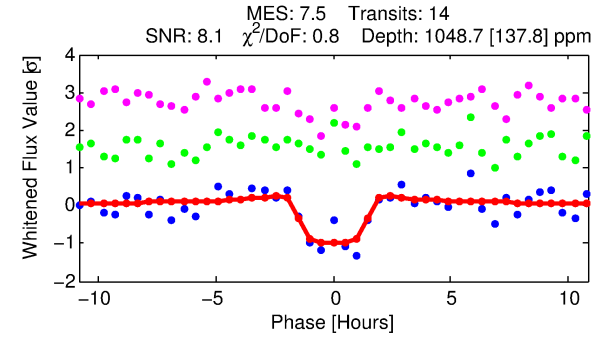
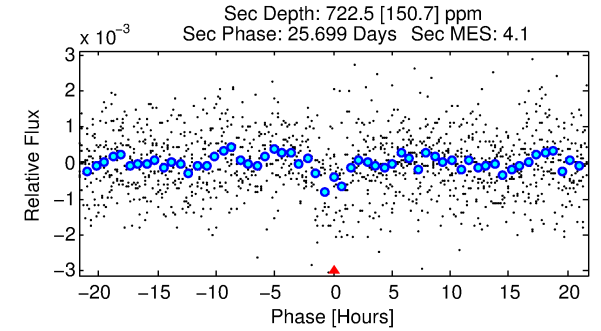
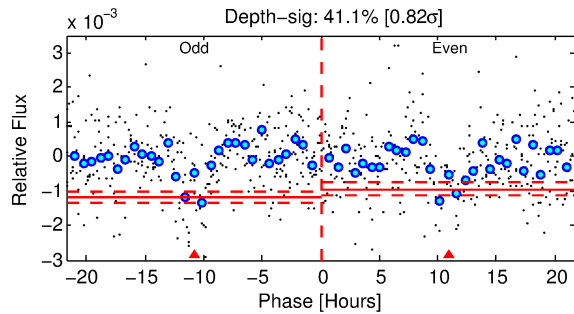
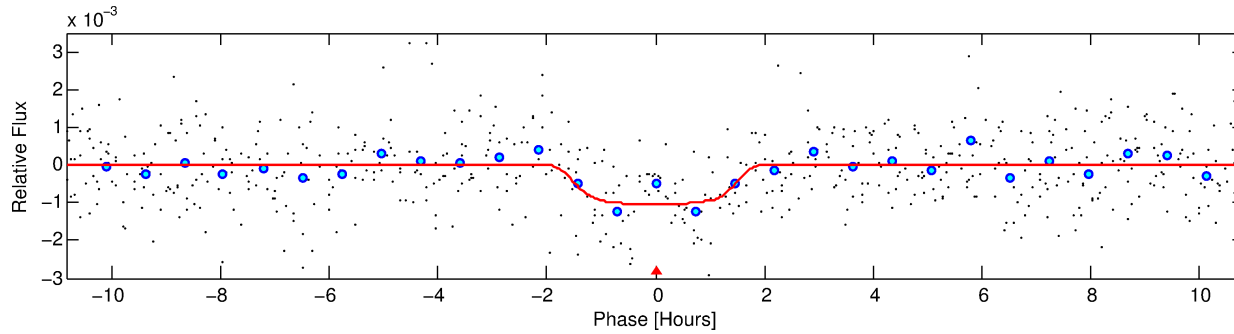
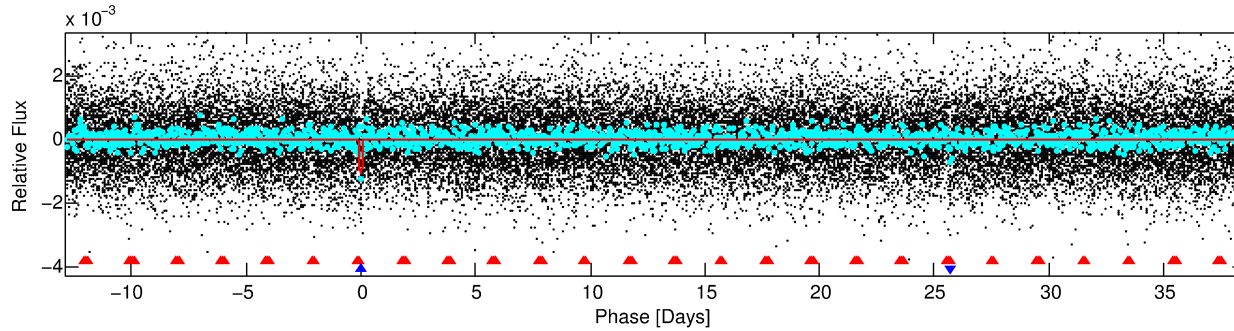
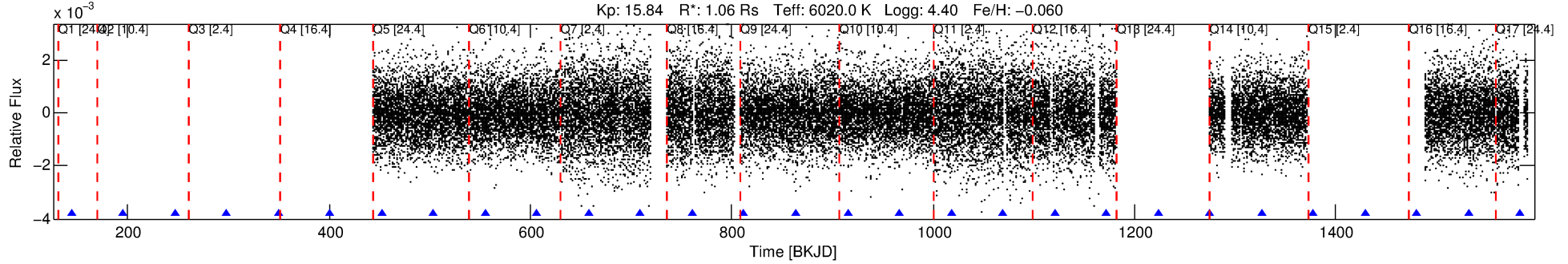
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008331612-02

No Significant Match Found

DV One-Page Summary

KIC: 8331612 Candidate: 2 of 2 Period: 51.395 d
KOI: K03318 Corr: No Ephemeris Match



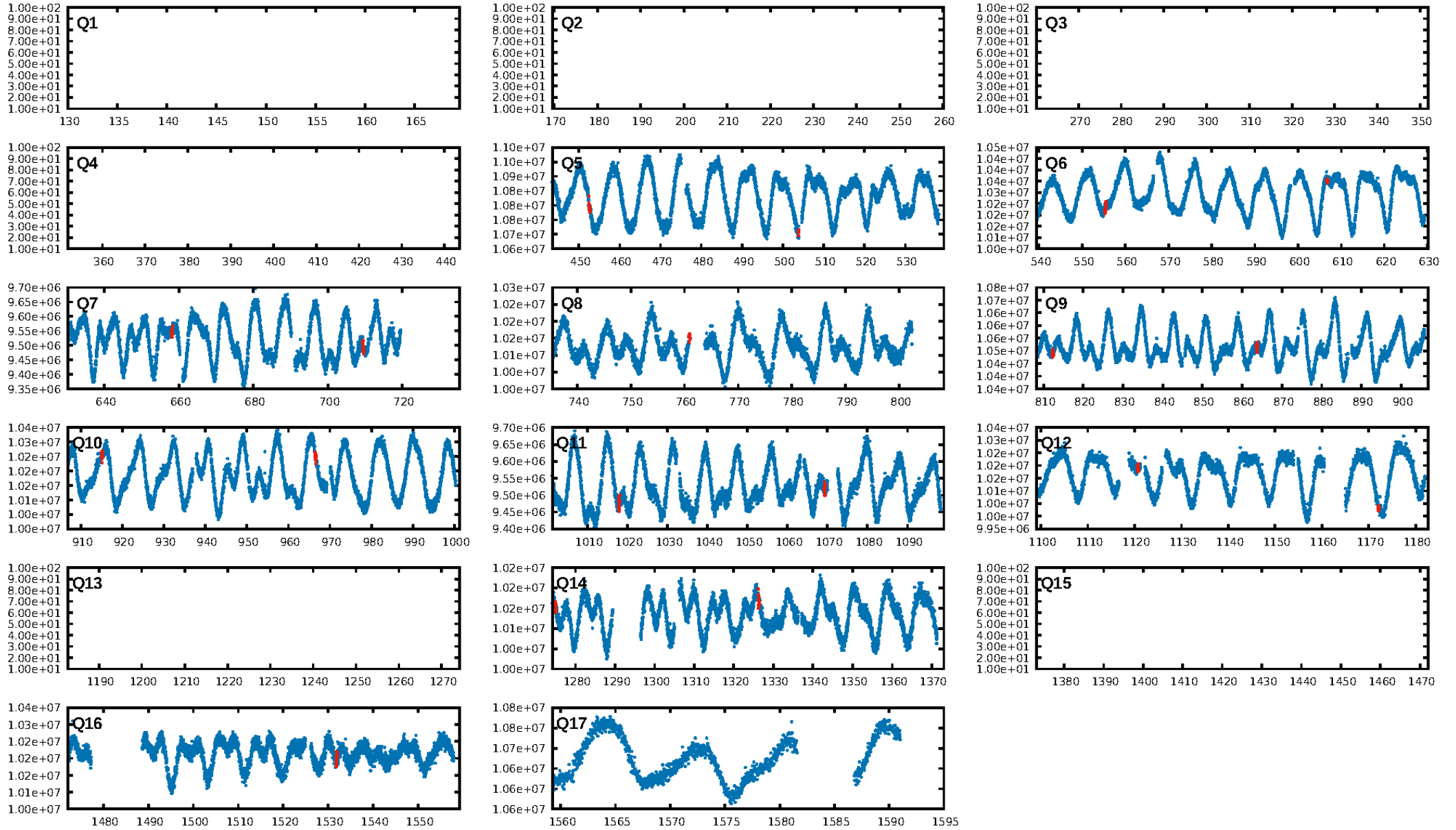
DV Fit Results:

Period = 51.39547 [0.00085] d
Epoch = 144.2120 [0.0140] BKJD
Rp/R* = 0.0350 [0.0072]
a/R* = 56.07 [50.79]
b = 0.90 [0.20]
Seff = 17.60 [7.10]
Teq = 522 [53] K
Rp = 4.03 [1.55] Re
a = 0.2733 [0.0726] AU
Ag = 1825.62 [1091.83] [1.67 σ]
Teffp = 5278 [638] K [7.43 σ]

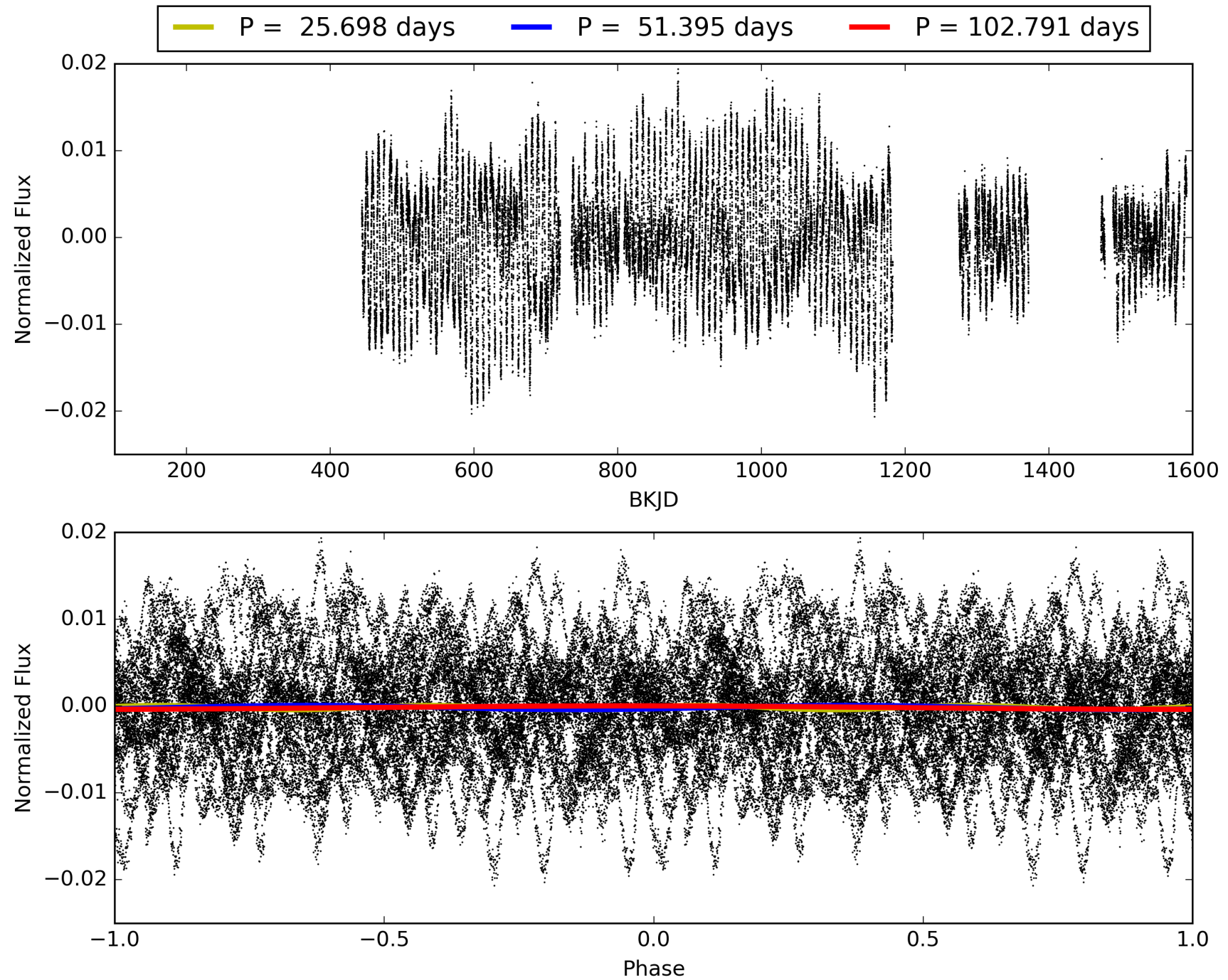
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [169.13 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 36.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.36e-13
RollingBand-fgt: 1.00 [14/14]
GhostDiagnostic-chr: 0.4437
Centroid-sig: 75.2%
Centroid-so: 1.672 arcsec [1.48 σ]
OotOffset-rm: 2.173 arcsec [1.42 σ]
OotOffset-st: 1/1/2/2 [6]
KicOffset-rm: 1.909 arcsec [1.26 σ]
KicOffset-st: 1/1/2/2 [6]
DiffImageQuality-fgm: 0.00 [0/6]
DiffImageOverlap-fno: 0.78 [7/9]

TCE 008331612-02, PDC Light Curves

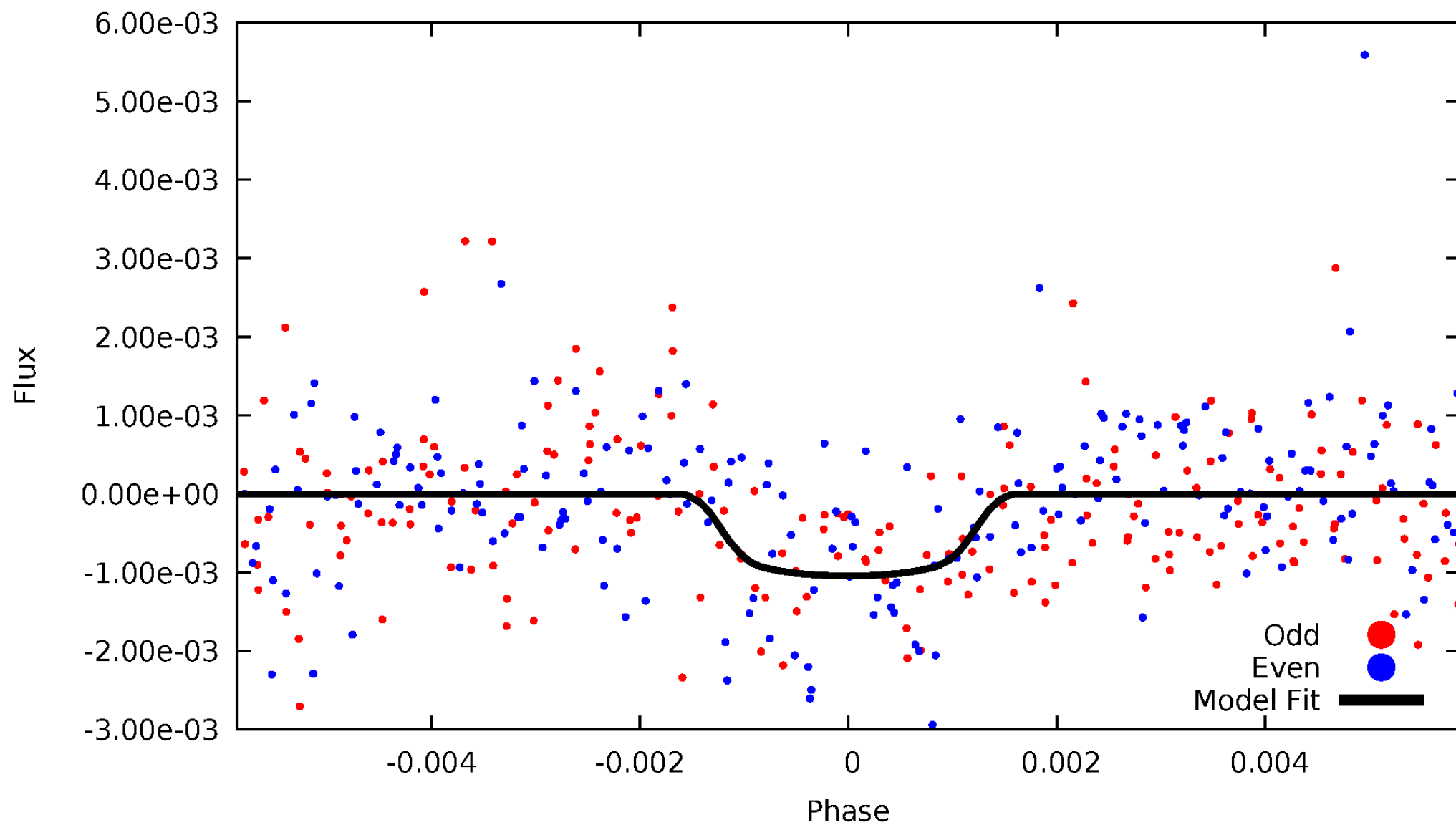


TCE 008331612-02



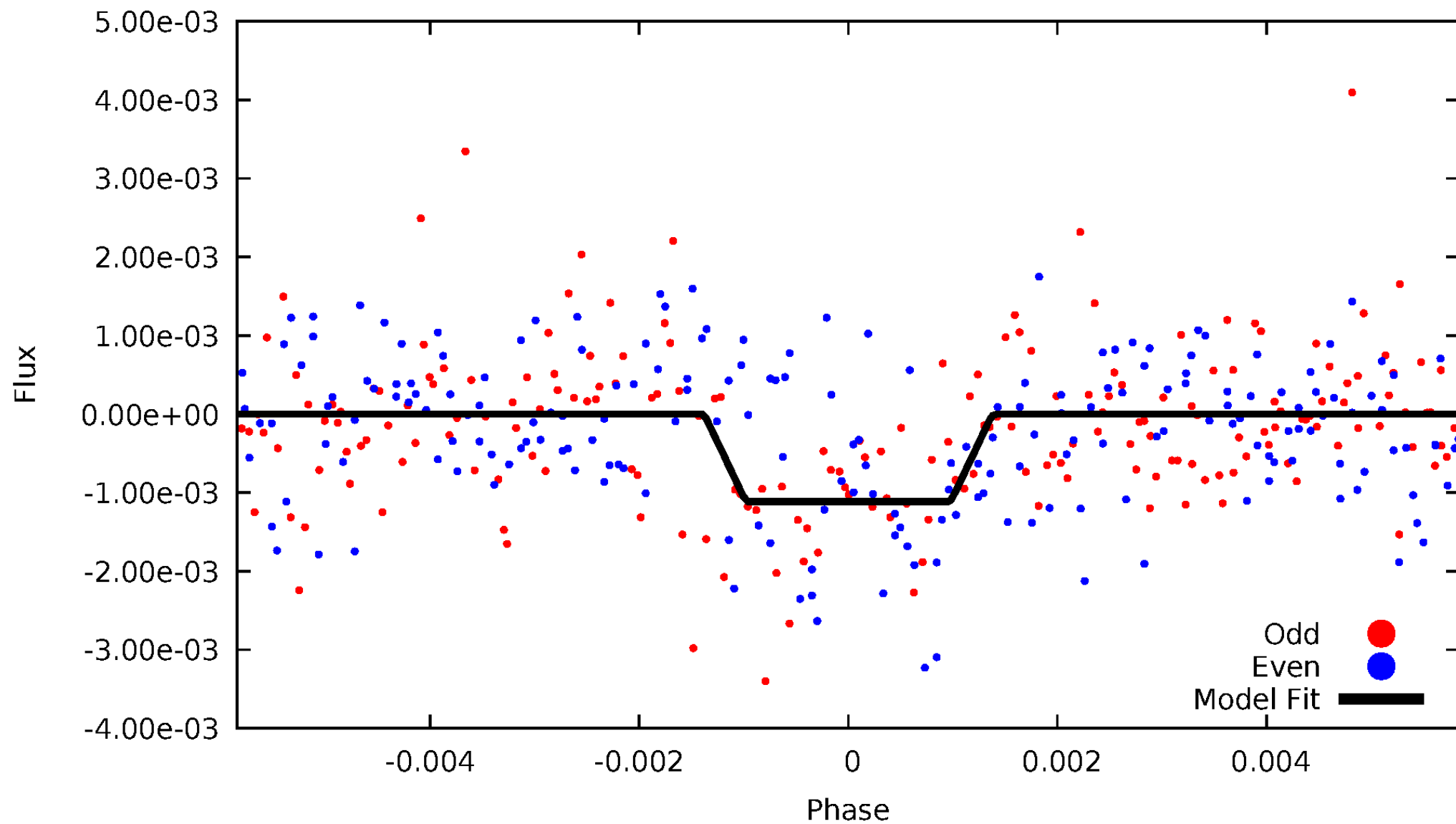
DV Odd/Even

TCE 008331612-02



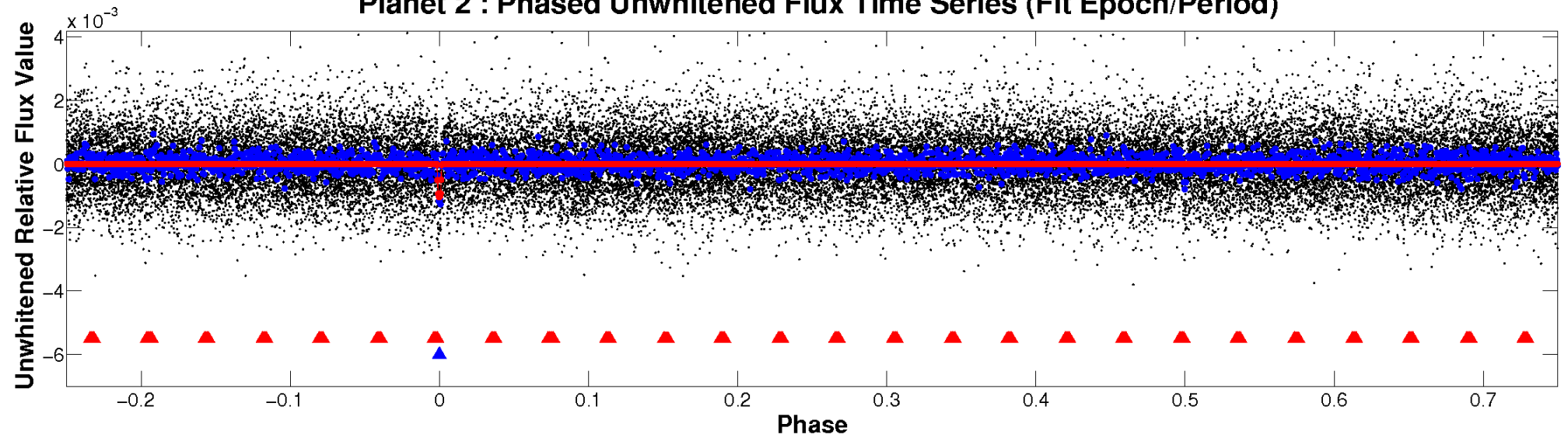
ALT Odd/Even

TCE 008331612-02

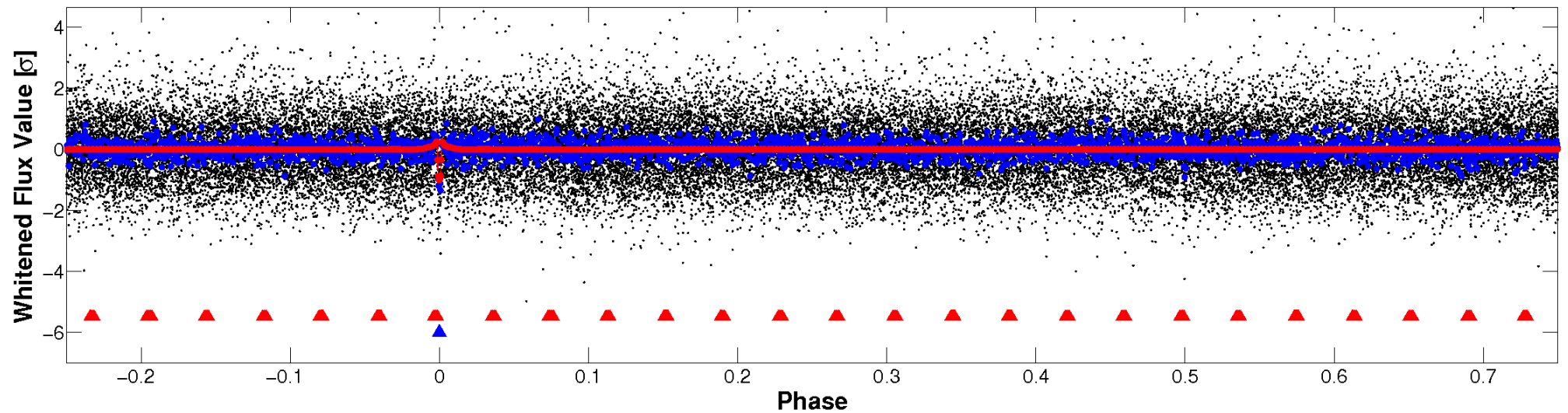


Non-Whitened Vs. Whitened Light Curve

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

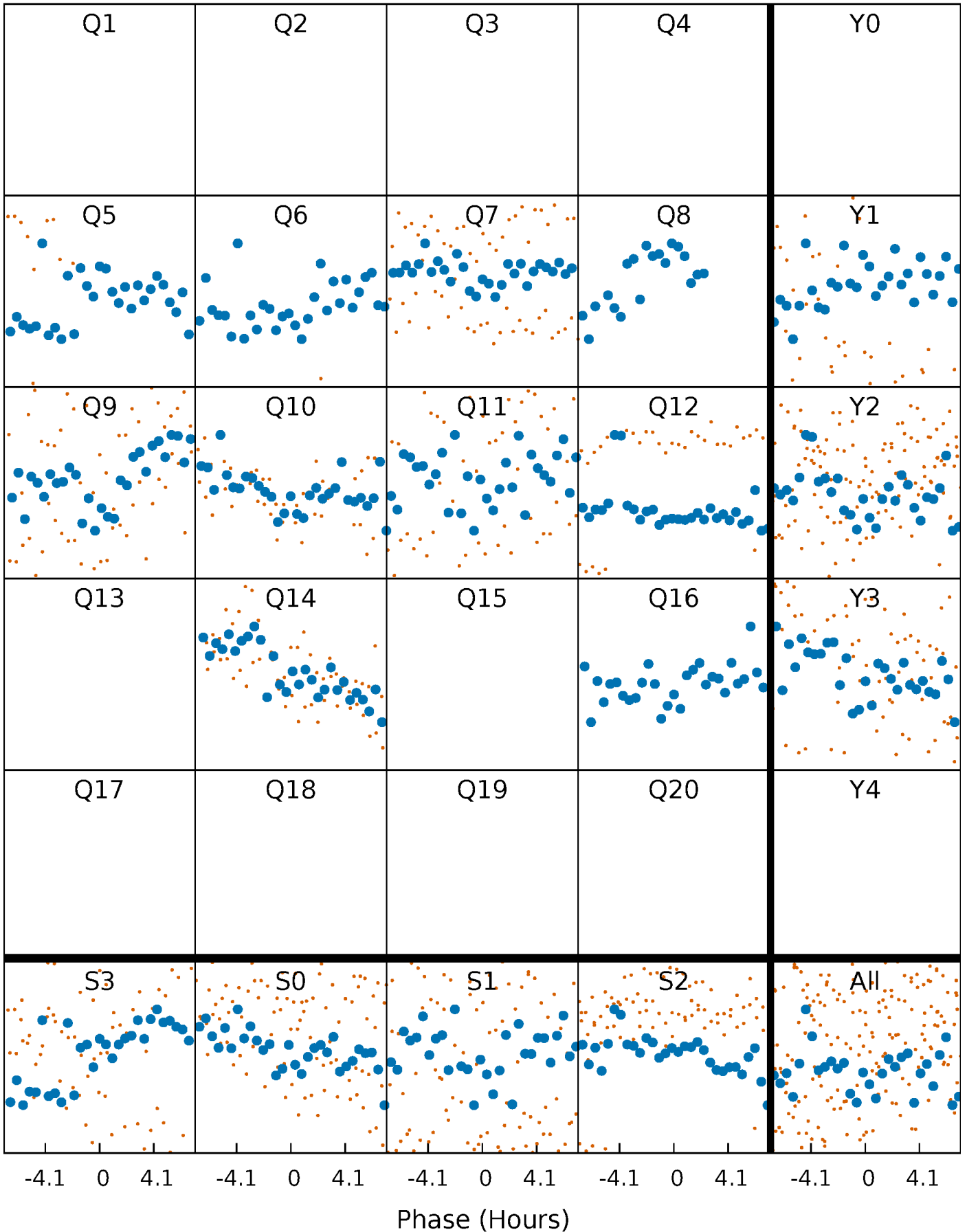


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



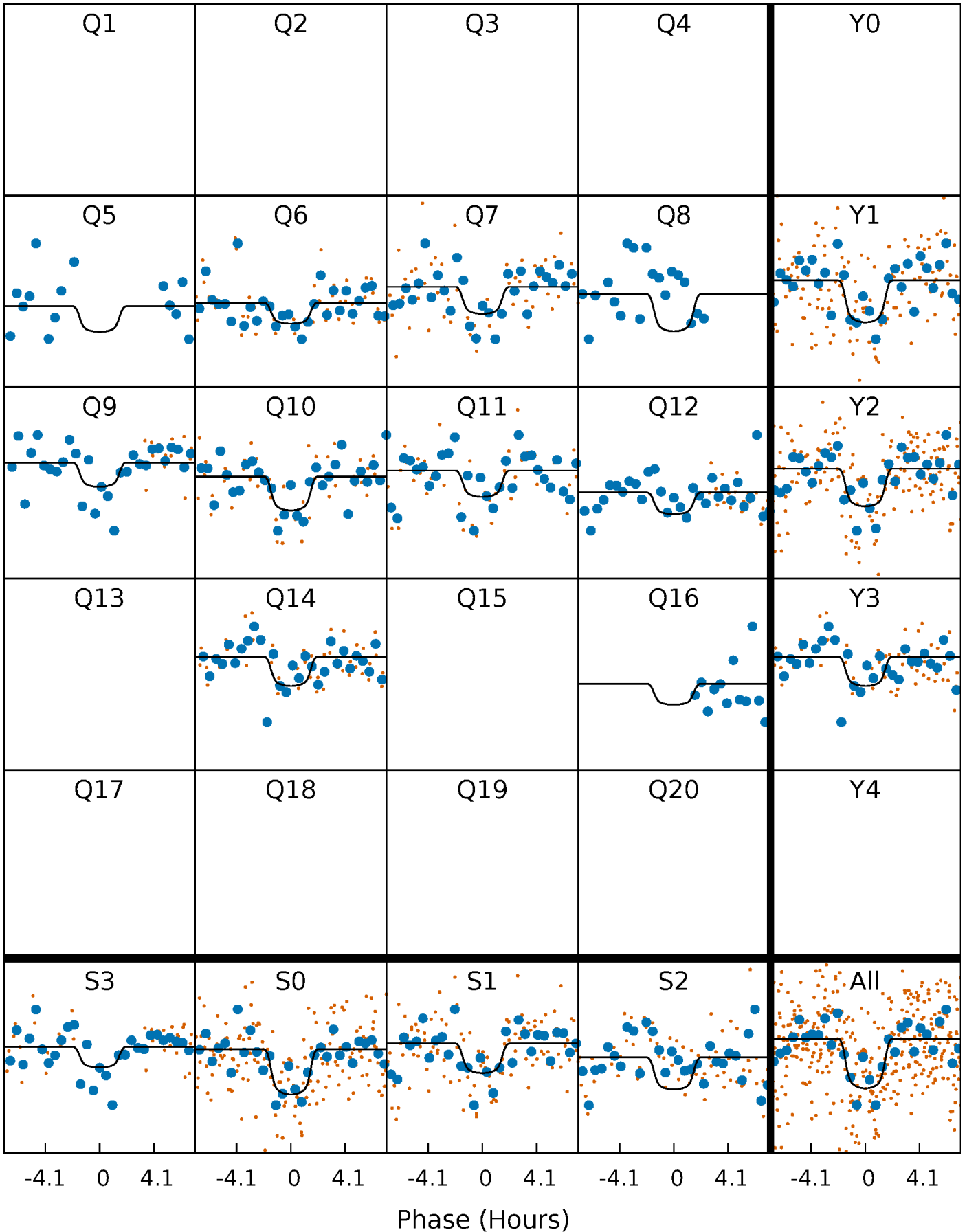
PDC Quarter-Phased Transit Curves

TCE 008331612-02 P= 51.395472 Days $T_0=144.211990$ (BKJD)



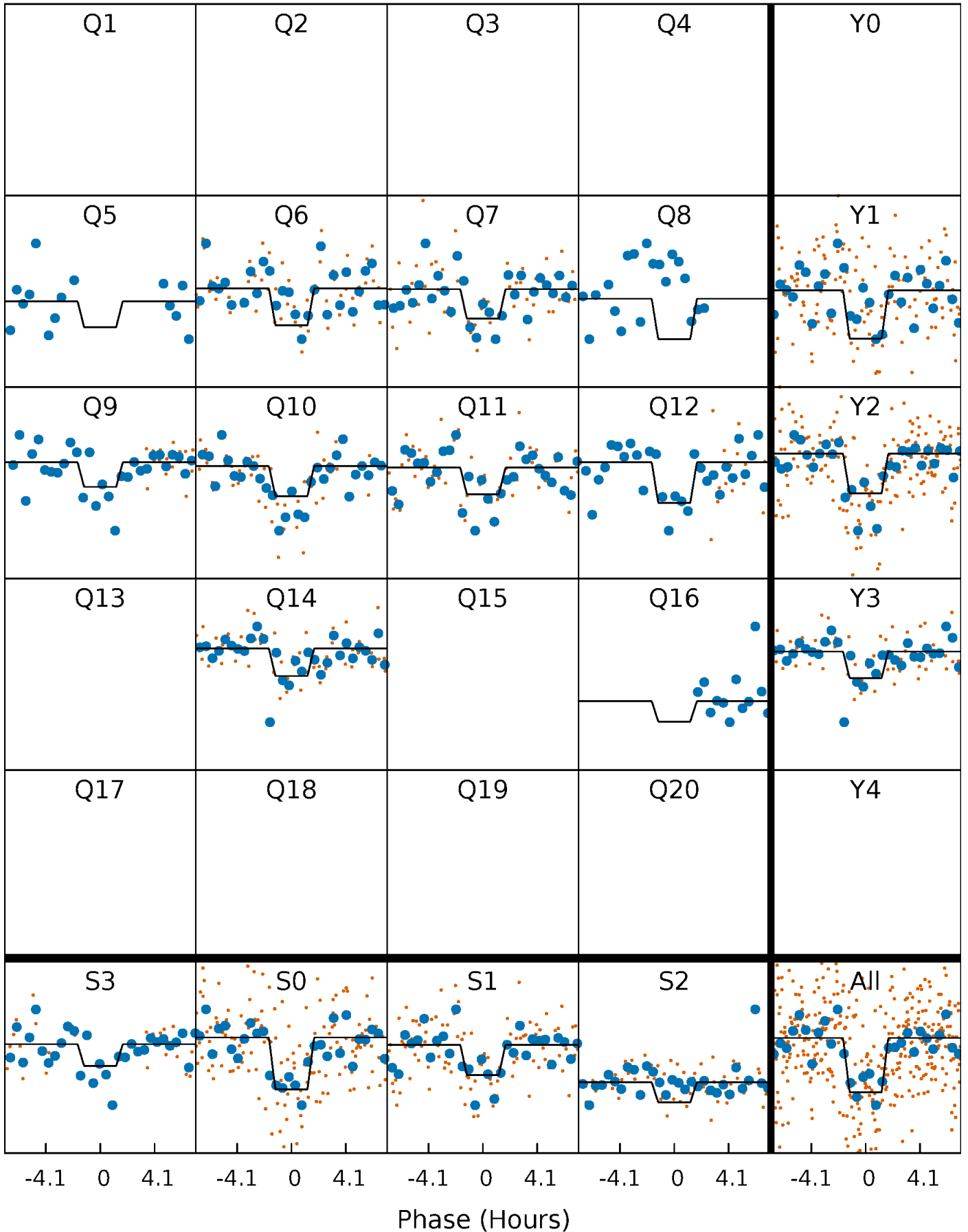
DV Quarter-Phased Transit Curves

TCE 008331612-02 P= 51.395472 Days $T_0=144.211990$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

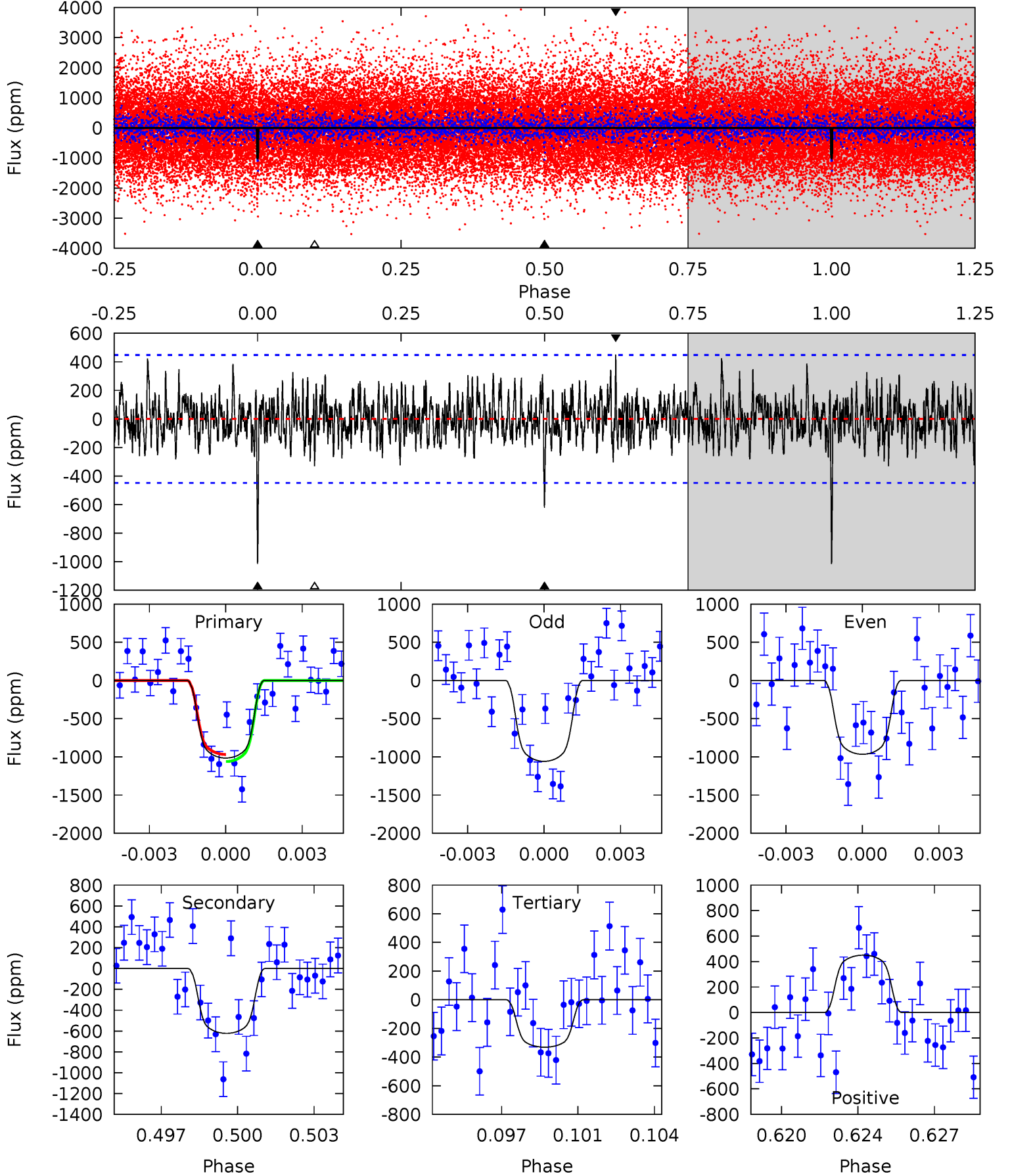
TCE 008331612-02 P= 51.395063 Days $T_0=144.215760$ (BKJD)



DV Model-Shift Uniqueness Test

008331612-02, P = 51.395472 Days, E = 144.211990 Days

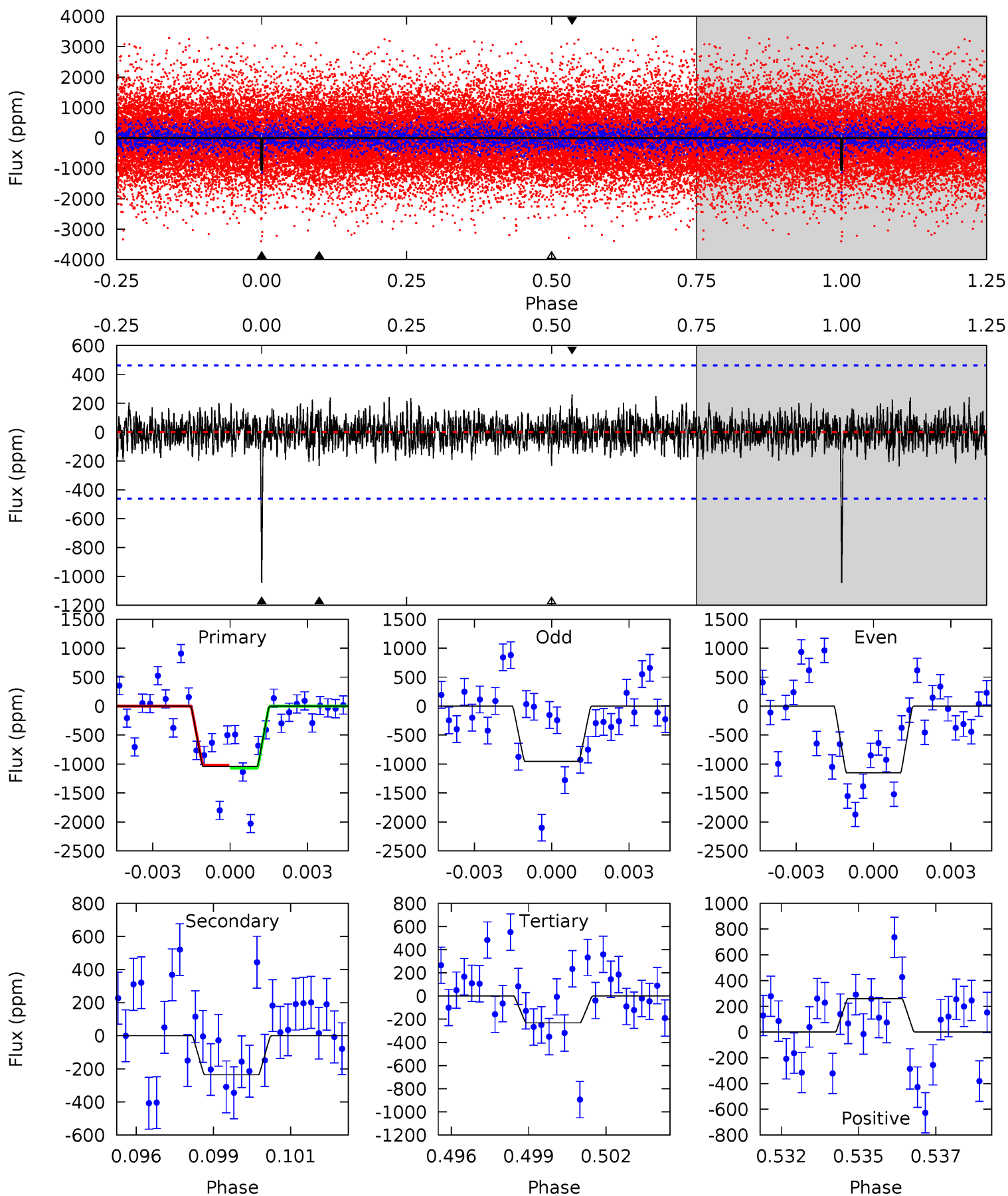
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	7.28	3.87	5.26	5.24	2.94	1.39	8.01	6.61	3.41	2.02	0.54	0.90	0.31	0.55



Alt Model-Shift Uniqueness Test

008331612-02, P = 51.395063 Days, E = 144.215760 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	2.69	2.64	2.97	5.27	3.00	0.85	9.27	8.94	0.04	-0.28	1.13	0.94	0.20	0.29



Stellar Parameters For KIC 008331612

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6020^{+211}_{-211}	$4.403^{+0.087}_{-0.203}$	$-0.060^{+0.250}_{-0.300}$	$1.057^{+0.341}_{-0.146}$	$1.030^{+0.145}_{-0.130}$	$1.229^{+0.566}_{-0.653}$
	+4%/-4%	+2%/-5%	+417%/-500%	+32%/-14%	+14%/-13%	+46%/-53%
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 008331612-02 / KOI 3318.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-622 ± 85	$4.19^{+1.01}_{-1.04}$	743^{+59}_{-44}	5154^{+621}_{-417}	1457^{+1090}_{-546}
Alt.	-236 ± 88	$4.03^{+1.10}_{-0.99}$	743^{+56}_{-43}	4254^{+561}_{-446}	551^{+537}_{-271}

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

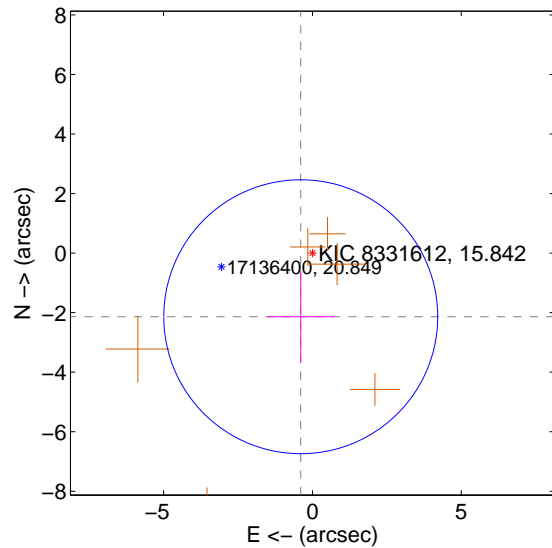
Supplemental centroid analysis for 008331612-02. Kepler magnitude: 15.84. Transit SNR 8.14

There are 0 quarters with good PRF difference image offsets

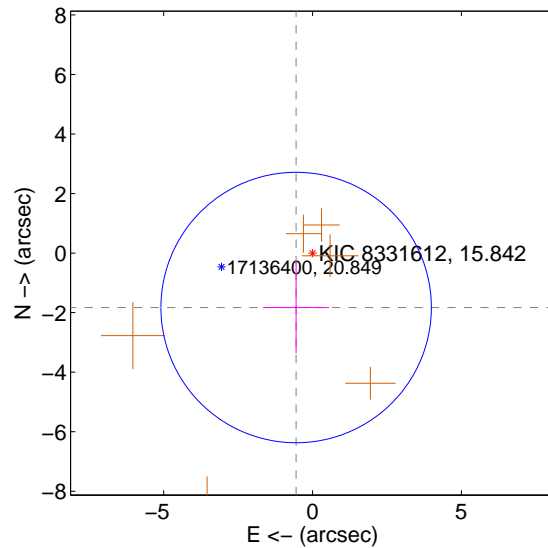
The direct PRF centroid is offset from the target star catalog position by about 0.48 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.173 ± 1.533	1.42	0.392 ± 1.128	-2.138 ± 1.545
PRF-fit source offset from KIC position	1.909 ± 1.514	1.26	0.550 ± 1.106	-1.828 ± 1.545
photometric centroid source offset	1.67 ± 1.13	1.48	1.63 ± 1.12	0.36 ± 1.33

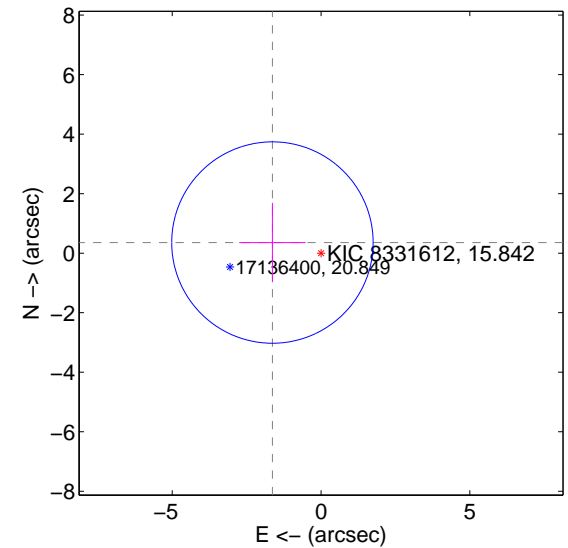
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

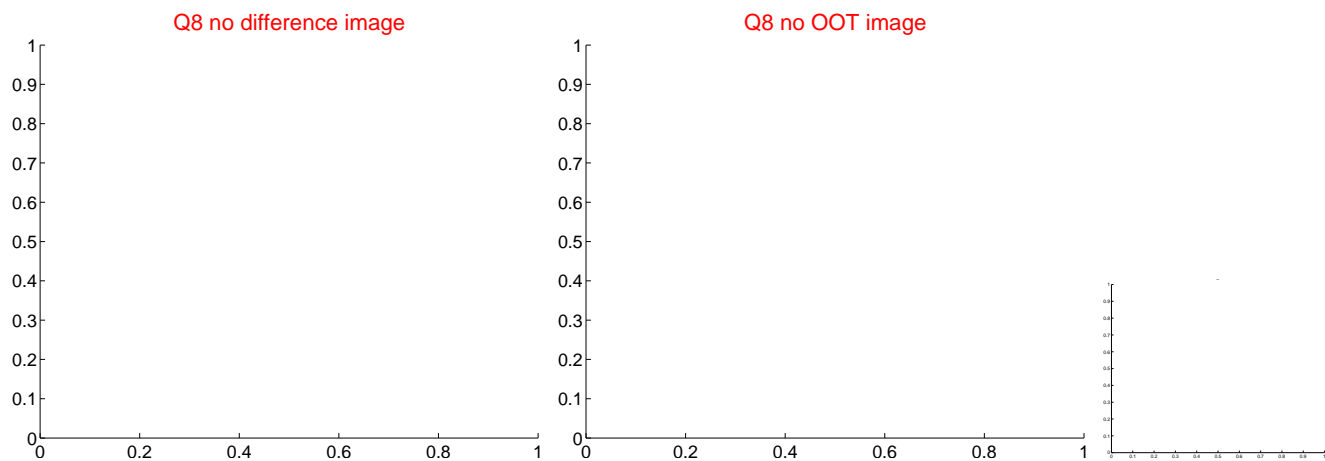
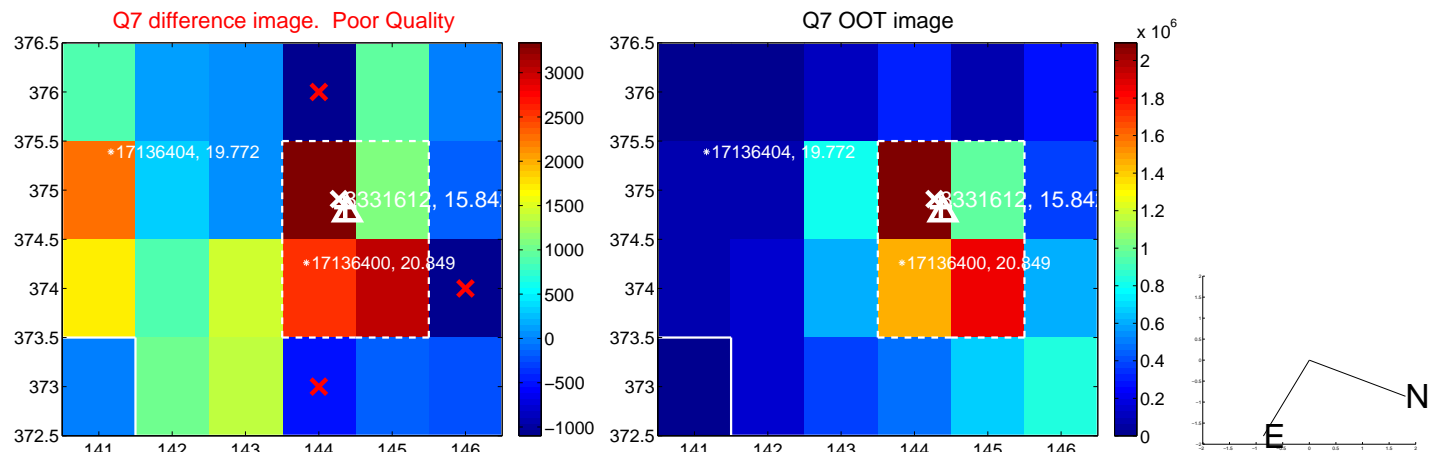
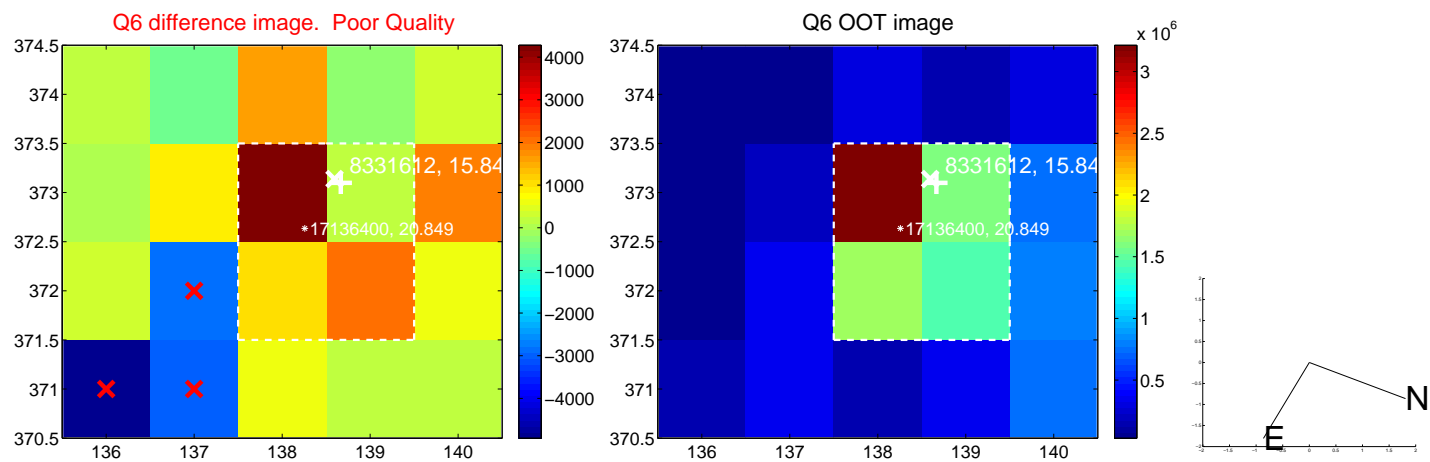
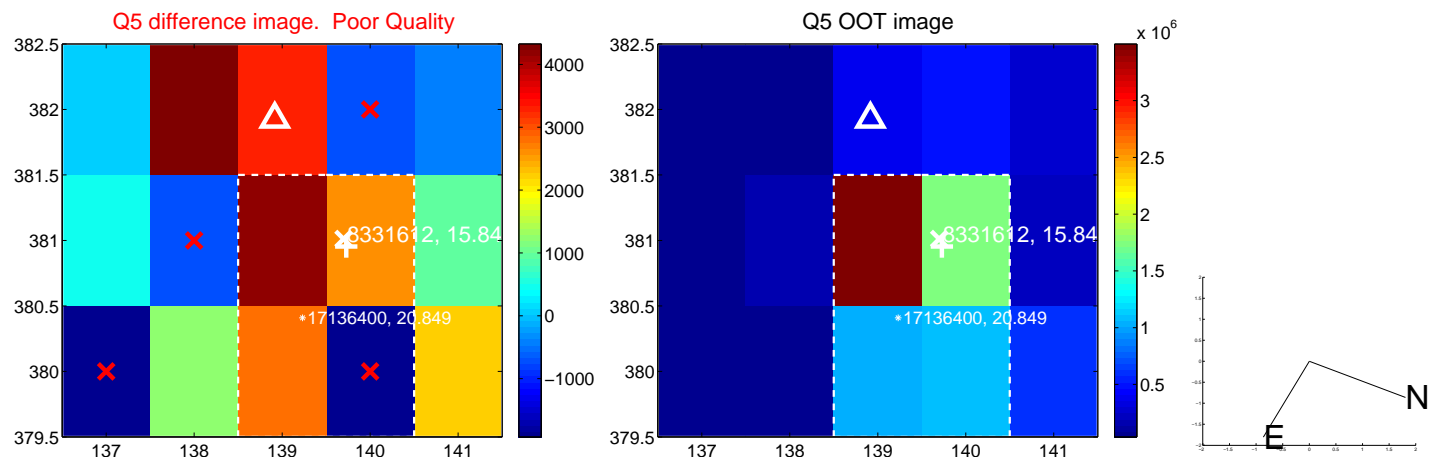


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

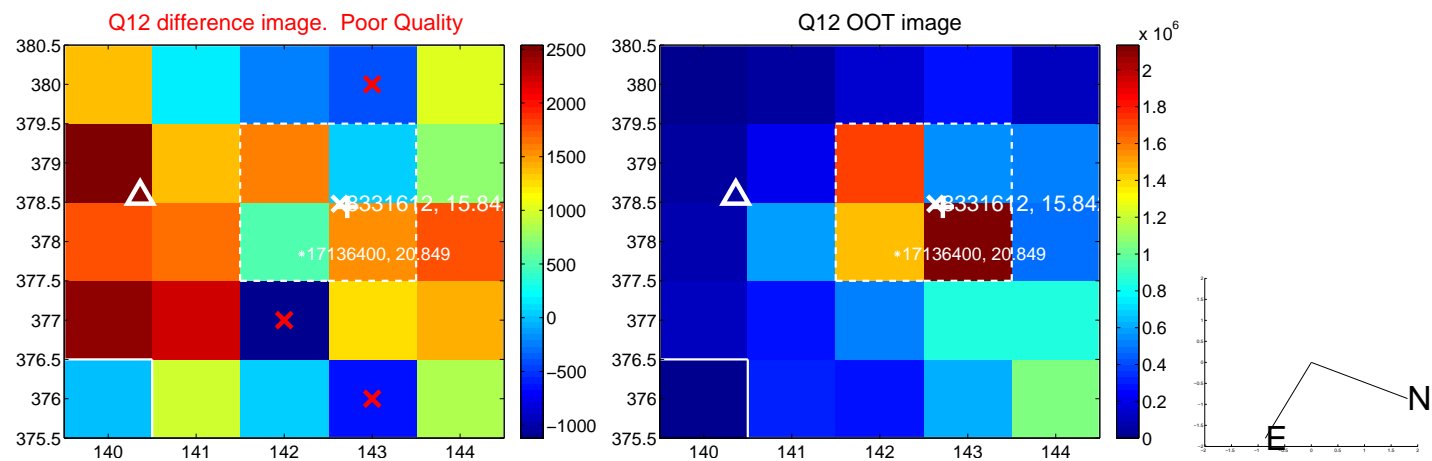
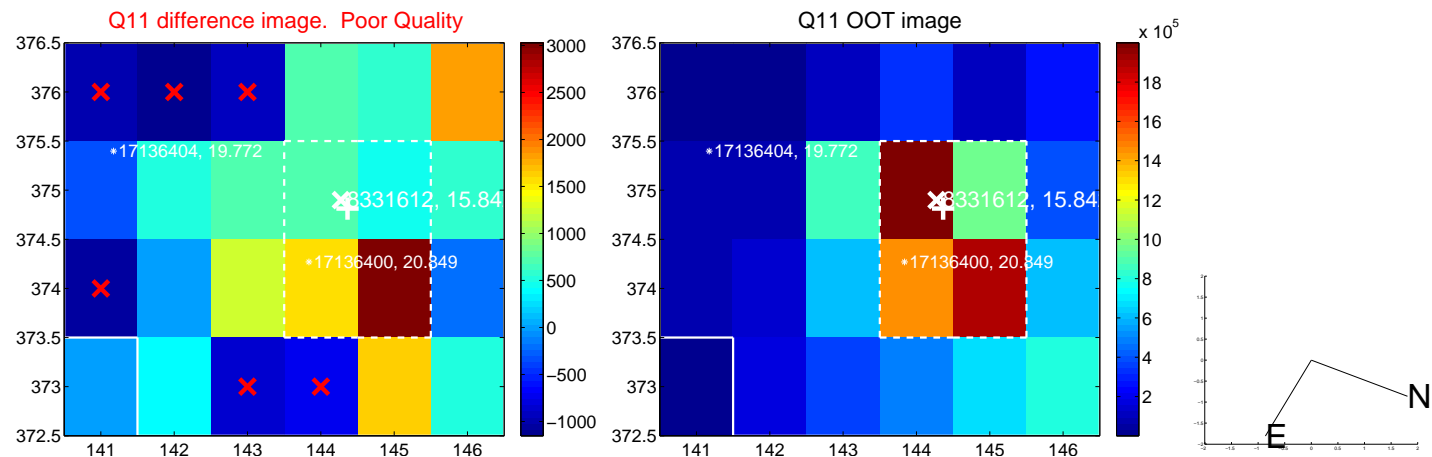
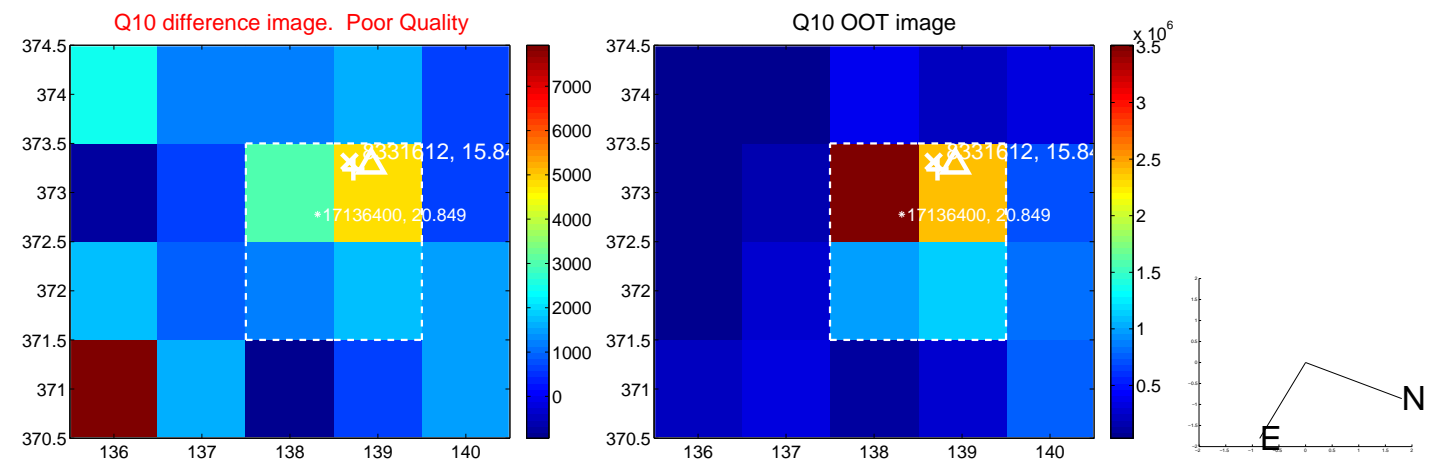
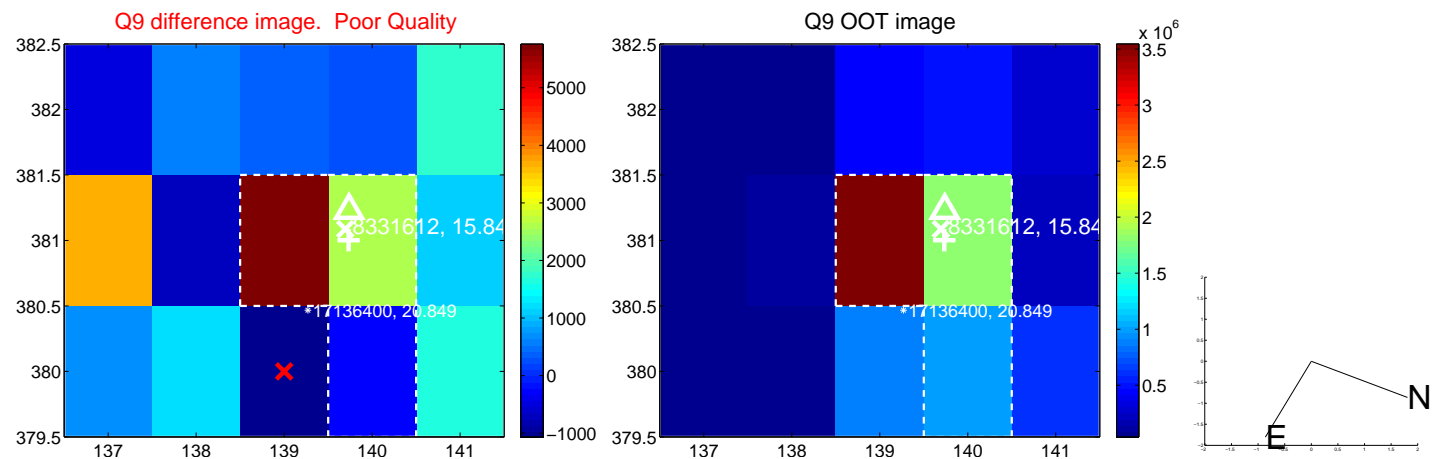
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



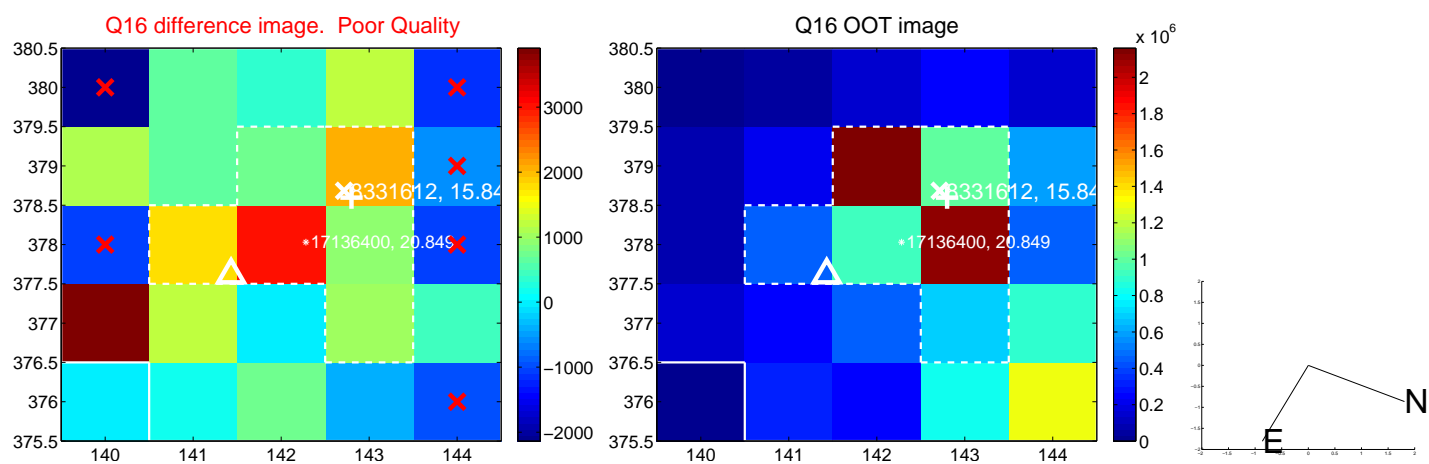
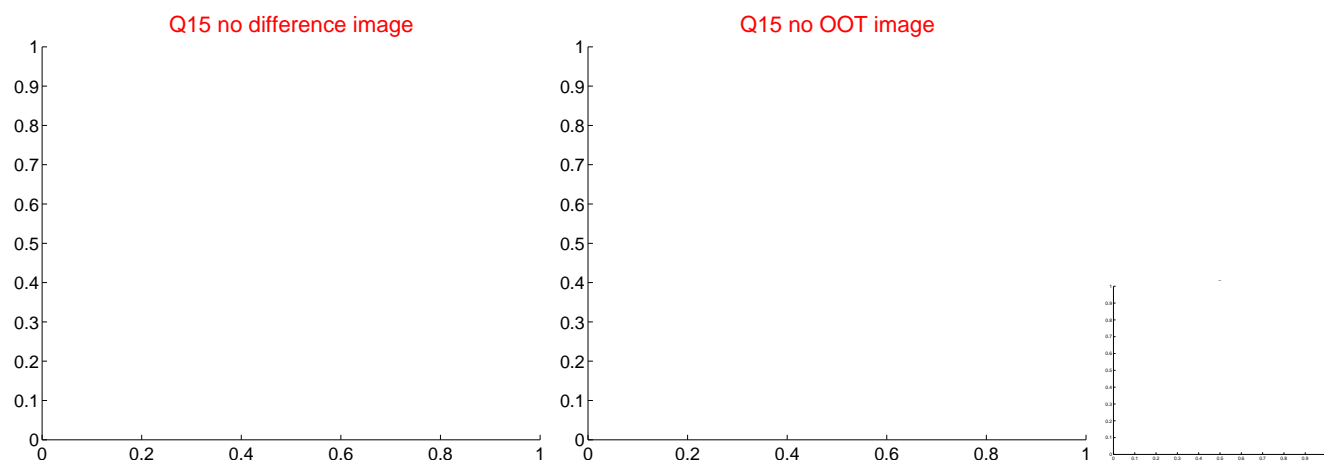
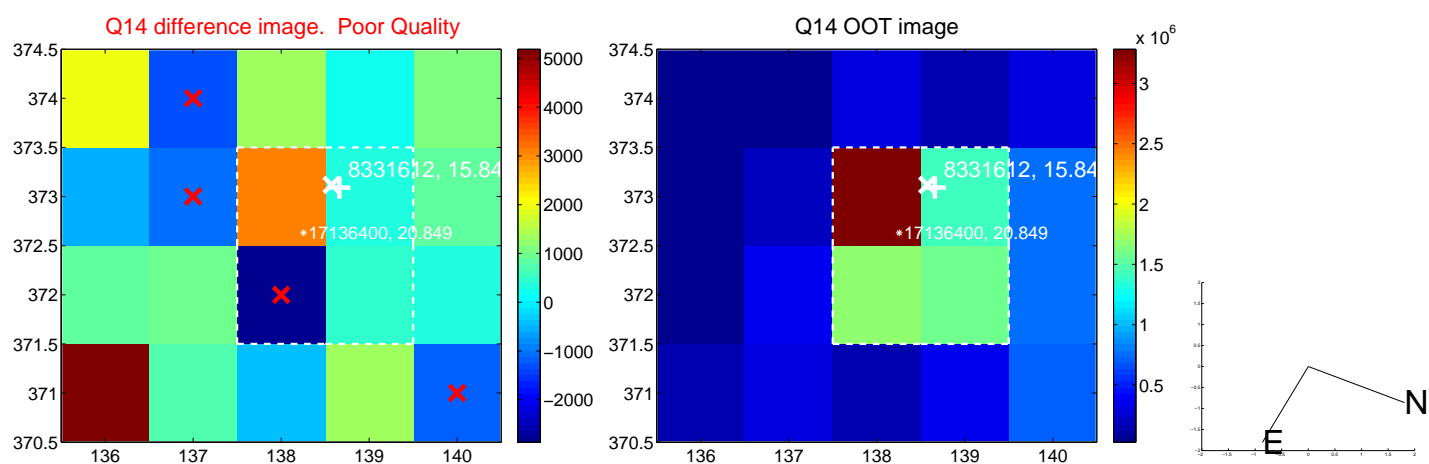
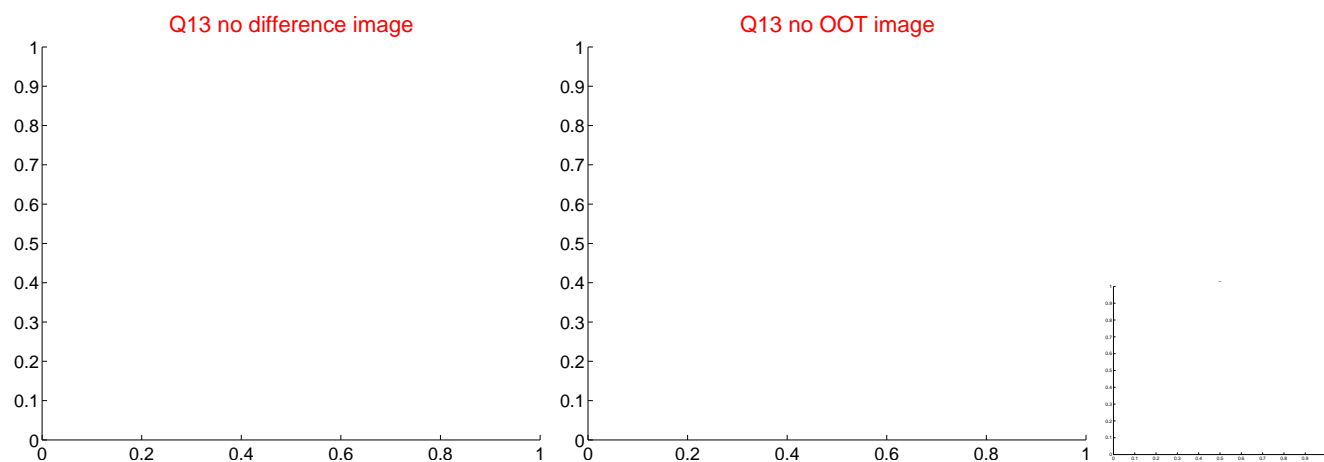
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



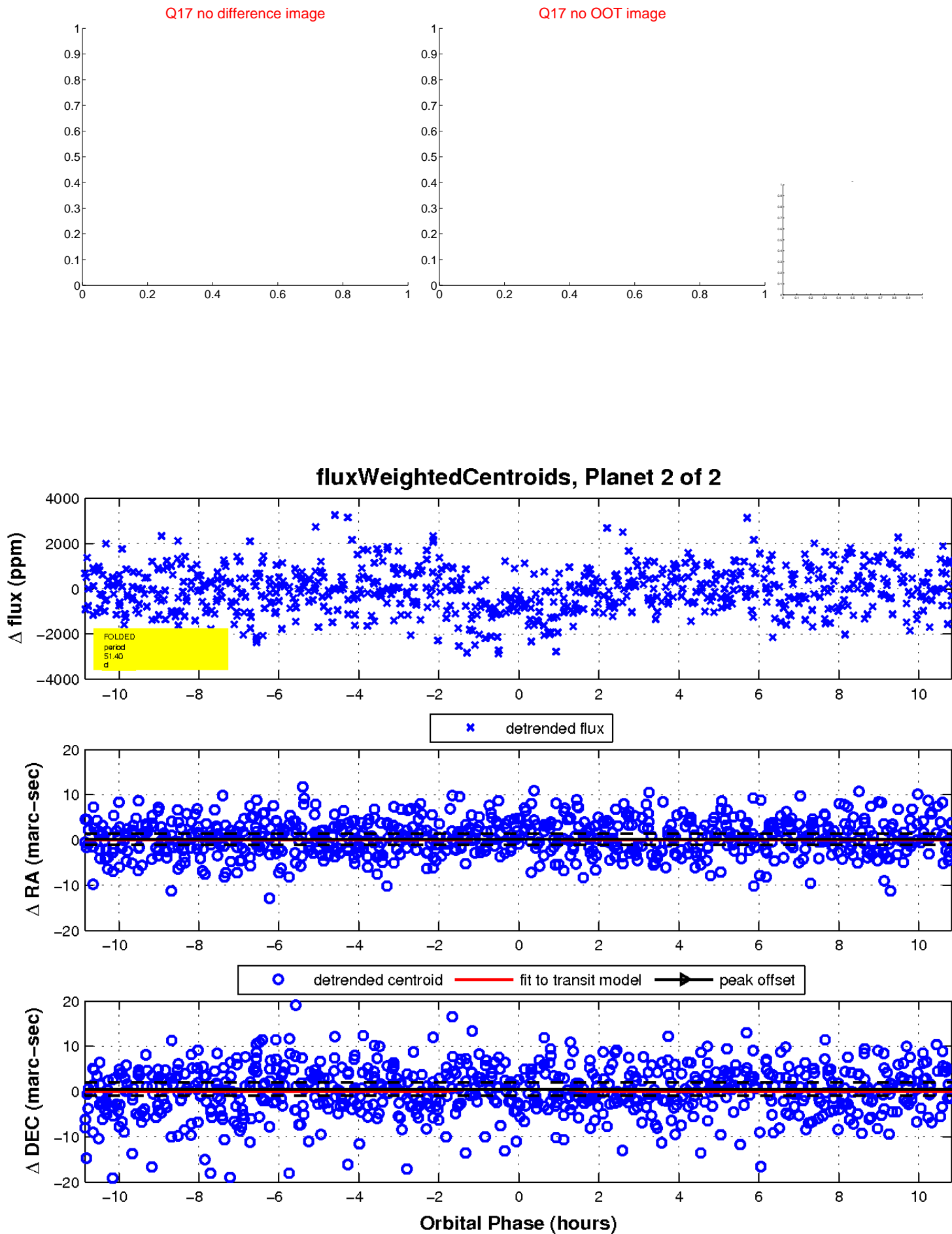
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UKIRT Image

Declination

