

KIC 006863158

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})
006863158-01	OBS	7793.01	1.994725	131.553678	78.3	4.988	7.3	8.0	0.51	3799	0.52	78.12
006863158-02	OBS	No	447.688541	407.555571	668.5	11.455	9.1	5.4	0.51	3799	1.62	0.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006863158-01	OBS	PC	0.60	0	0	0	0	CENT_KIC_POS
006863158-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

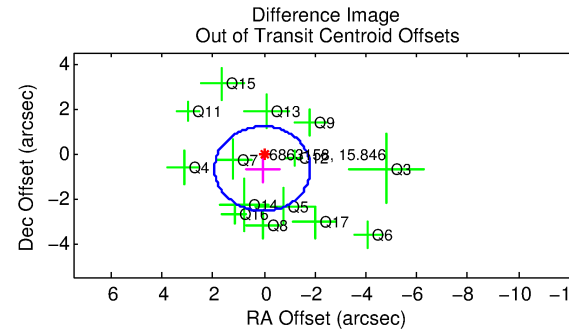
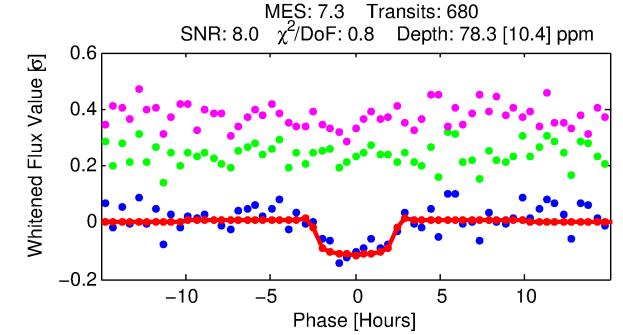
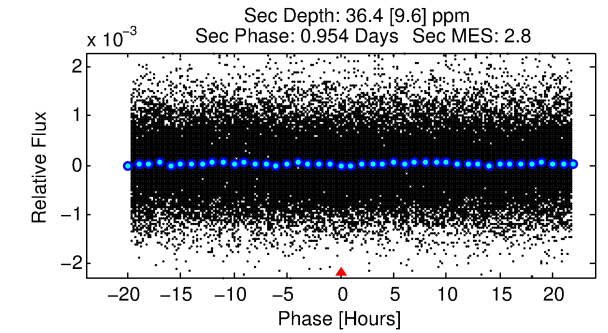
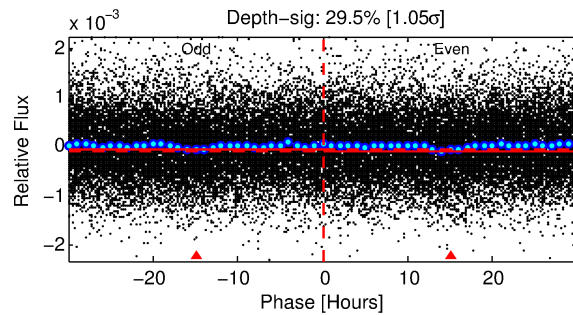
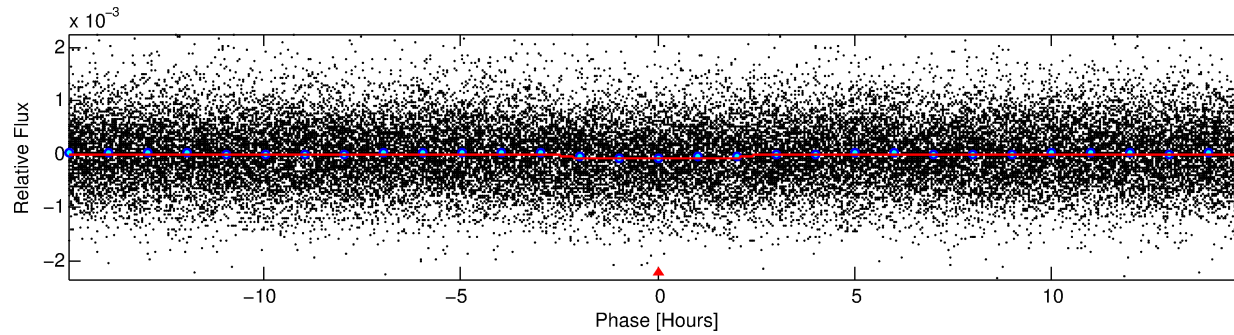
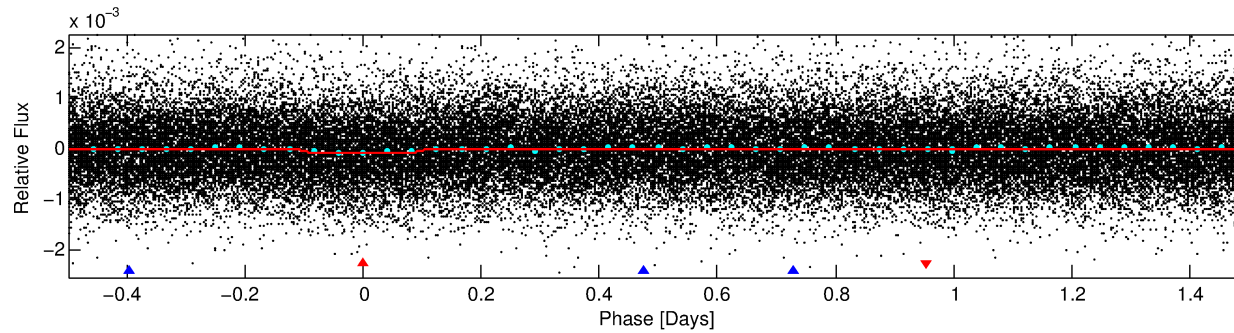
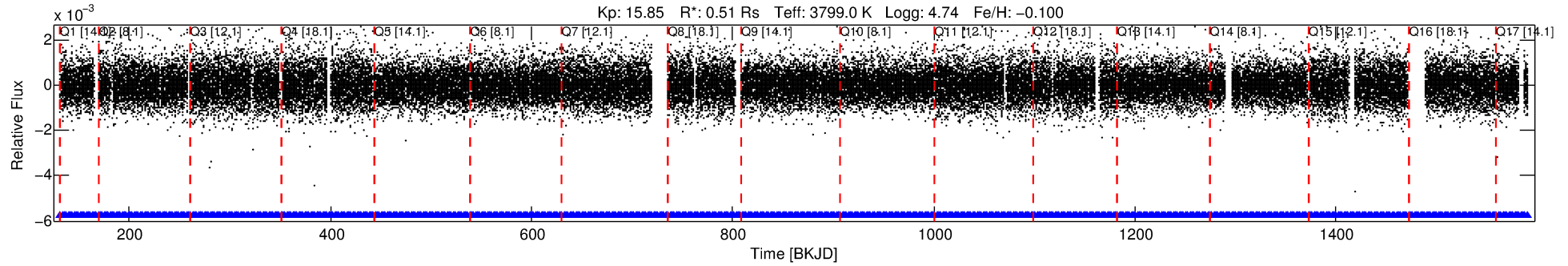
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006863158-01

No Significant Match Found

DV One-Page Summary

KIC: 6863158 Candidate: 1 of 2 Period: 1.995 d



DV Fit Results:

Period = 1.99473 [0.00003] d
Epoch = 131.5537 [0.0072] BKJD
Rp/R* = 0.0093 [0.0071]
a/R* = 1.88 [4.71]
b = 0.85 [1.13]
Seff = 78.12 [7.87]
Teq = 758 [19] K
Rp = 0.52 [0.39] Re
a = 0.0249 [0.0013] AU
Ag = 46.90 [72.74] [0.63 σ]
Teffp = 3067 [1189] K [1.94 σ]

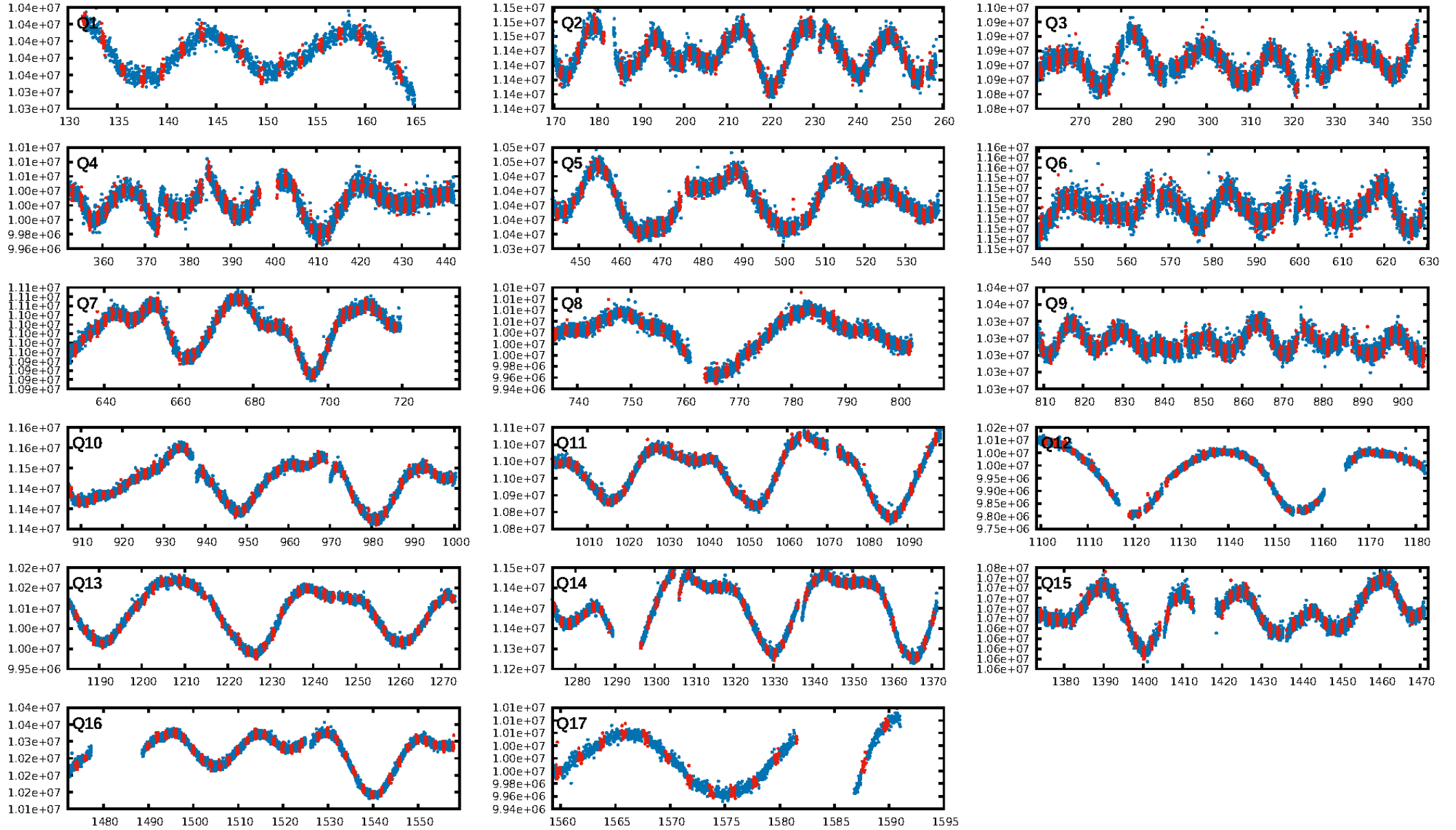
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [856.15 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.23e-14
RollingBand-fgt: 1.00 [650/650]
GhostDiagnostic-chr: -0.3177
Centroid-sig: 11.8%
Centroid-so: 1.544 arcsec [1.11 σ]
OotOffset-rm: 0.683 arcsec [1.09 σ]
KicOffset-rm: 0.992 arcsec [1.57 σ]
OotOffset-st: 2/4/4/4 [14]
KicOffset-st: 2/4/4/4 [14]
DiffImageQuality-fgm: 0.21 [3/14]
DiffImageOverlap-fno: 1.00 [17/17]

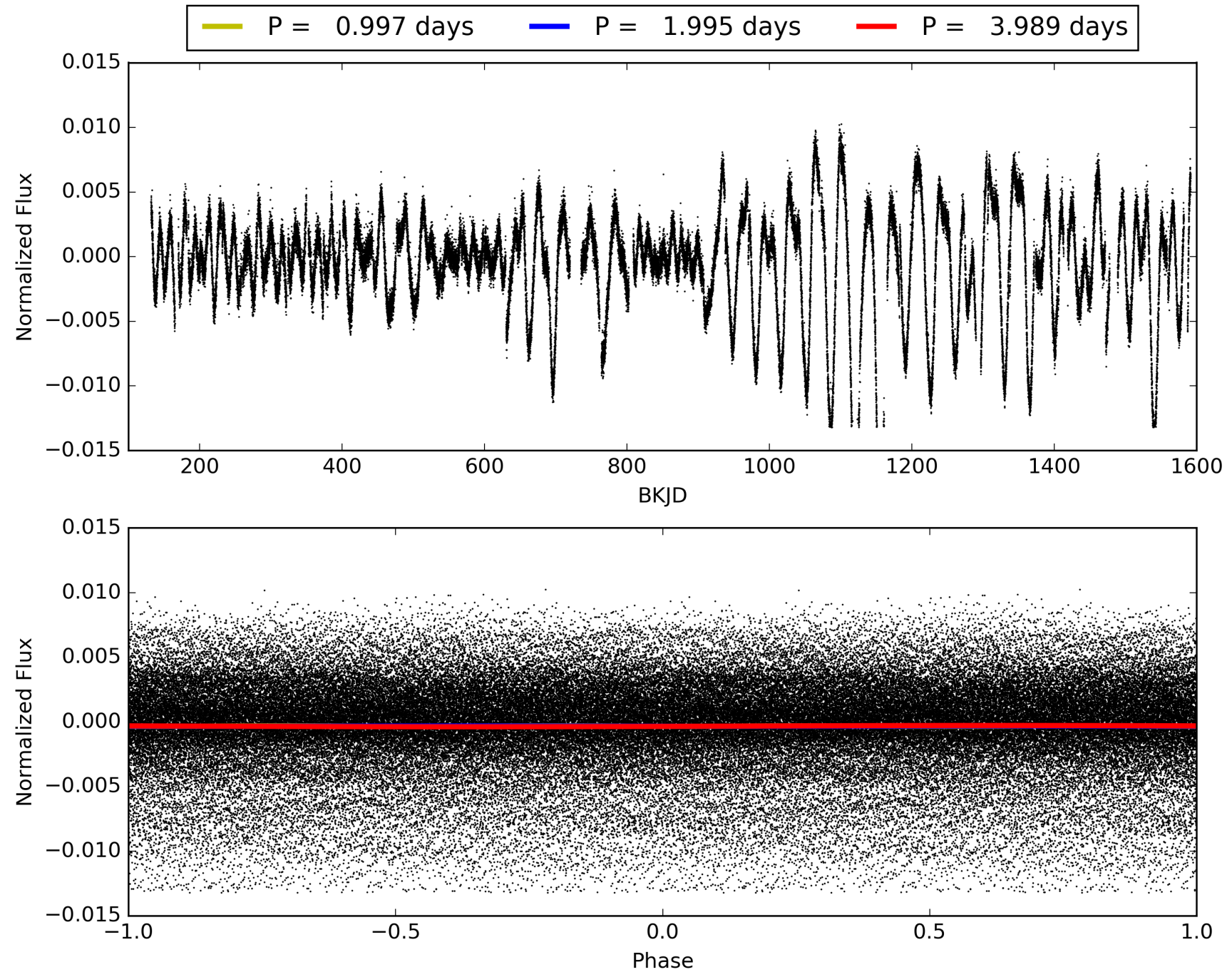
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:45:31 Z

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

TCE 006863158-01, PDC Light Curves

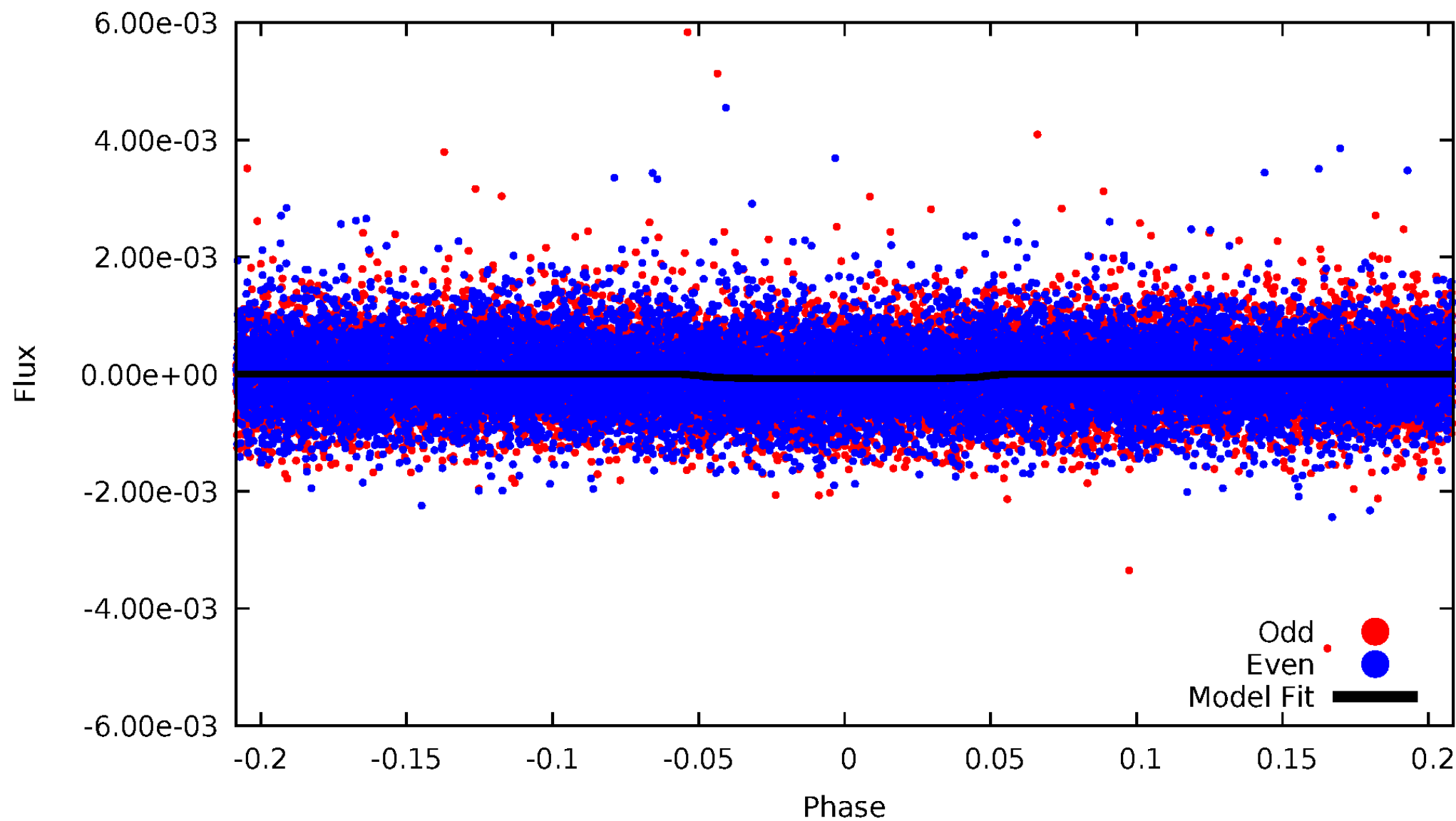


TCE 006863158-01



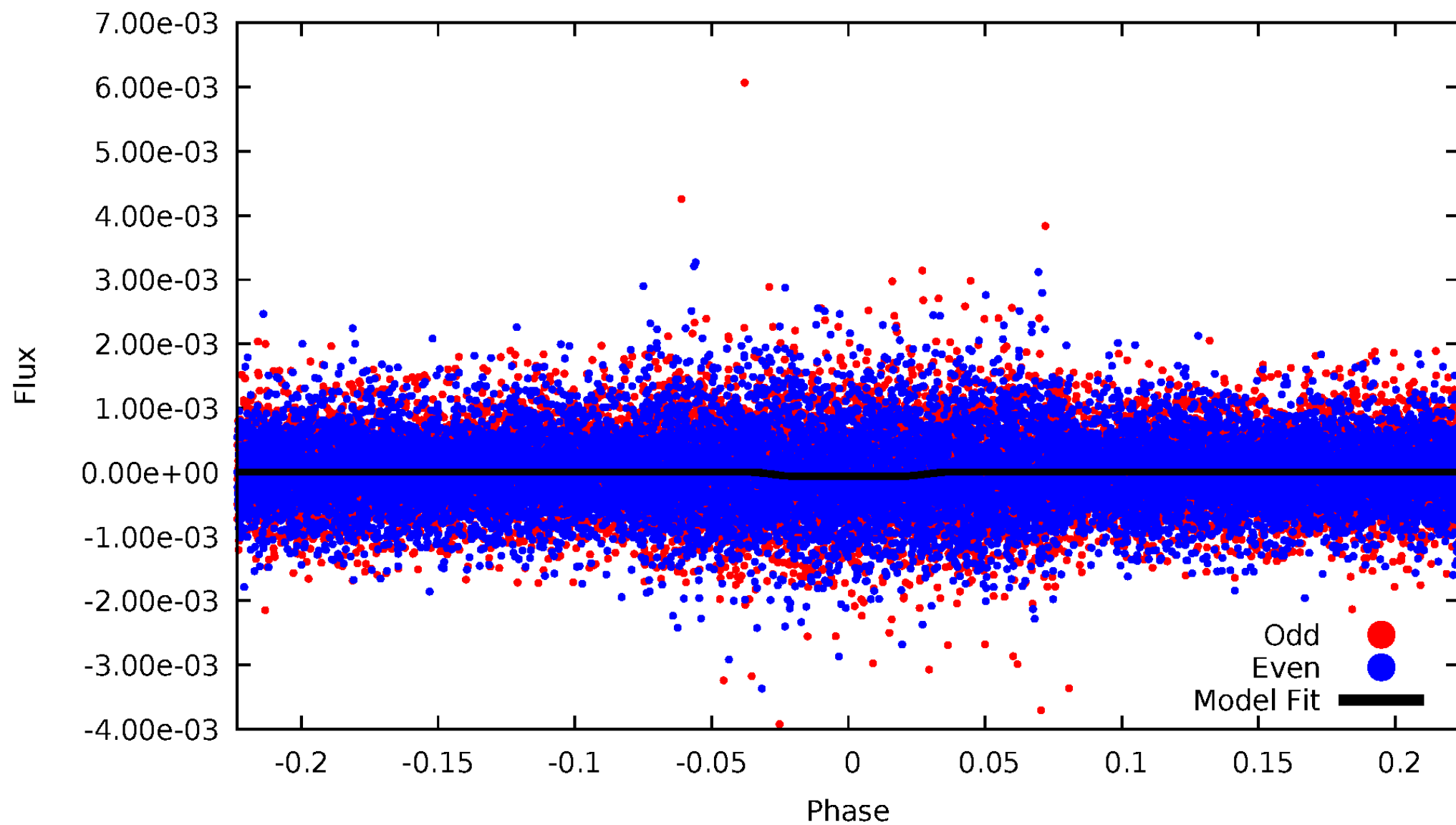
DV Odd/Even

TCE 006863158-01



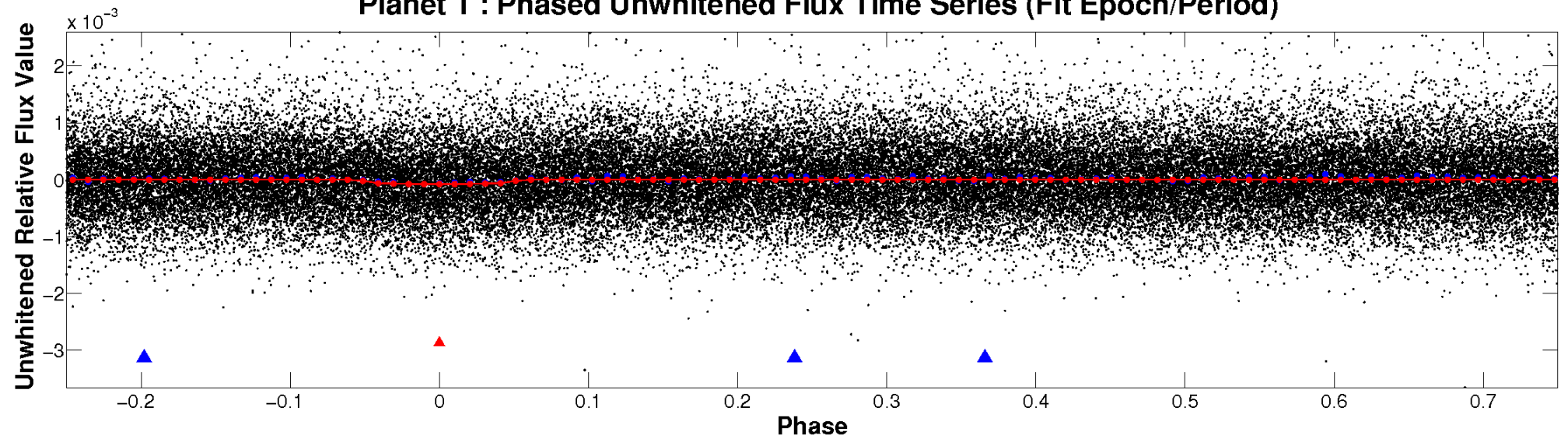
ALT Odd/Even

TCE 006863158-01

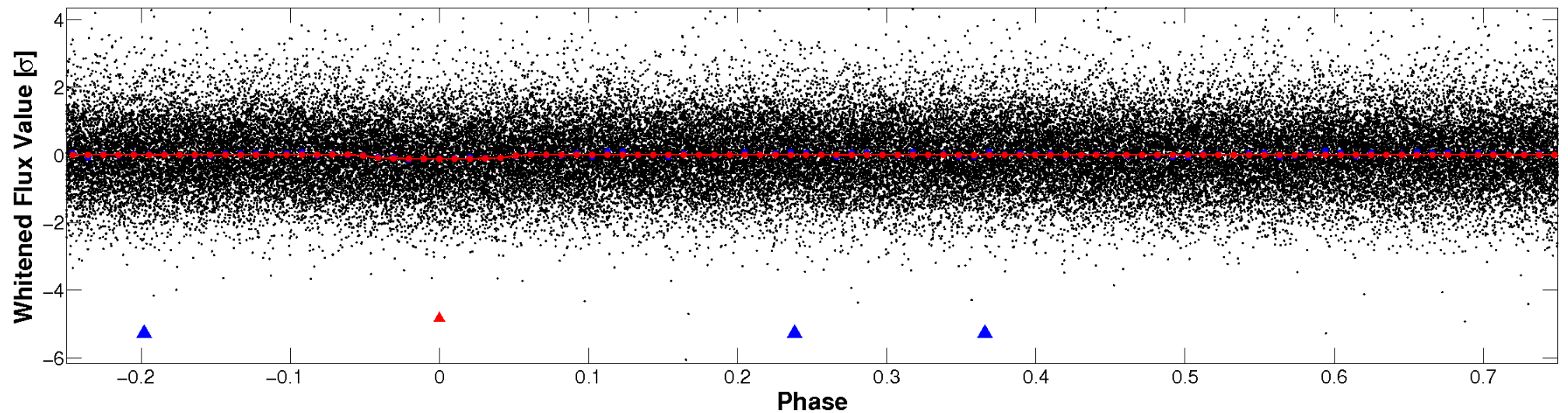


Non-Whitened Vs. Whitened Light Curve

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

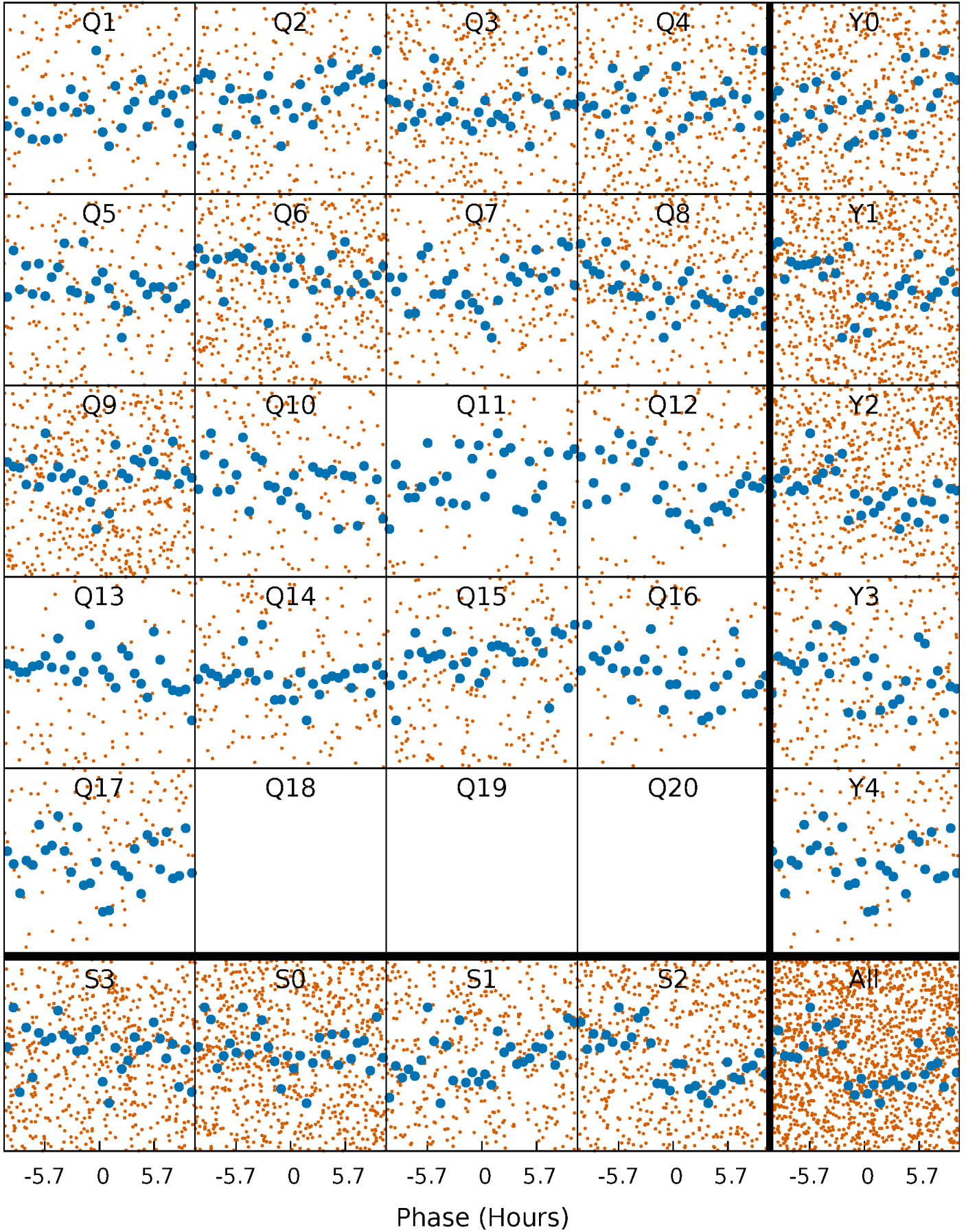


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



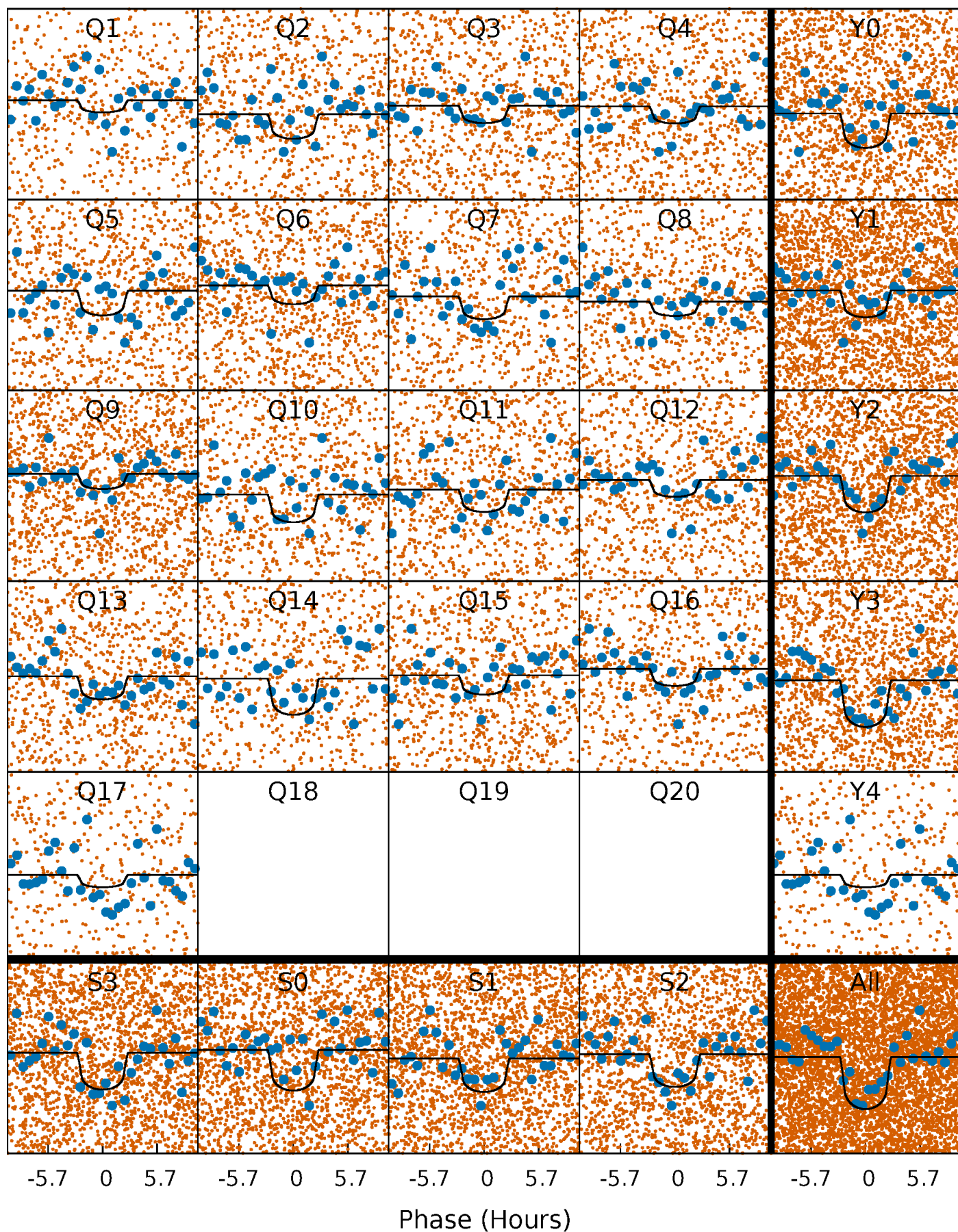
PDC Quarter-Phased Transit Curves

TCE 006863158-01 P= 1.994725 Days $T_0=131.553678$ (BKJD)



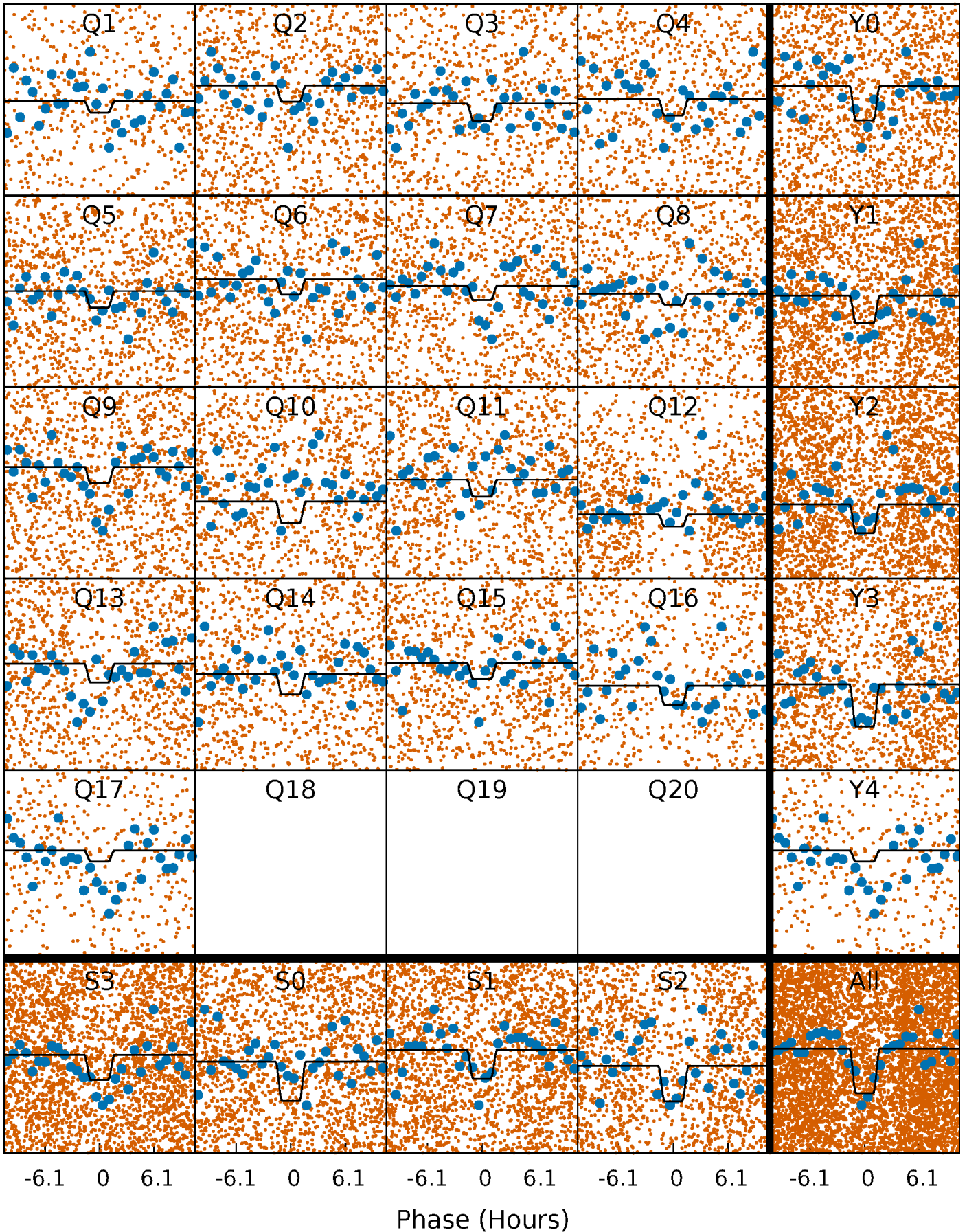
DV Quarter-Phased Transit Curves

TCE 006863158-01 P= 1.994725 Days $T_0=131.553678$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

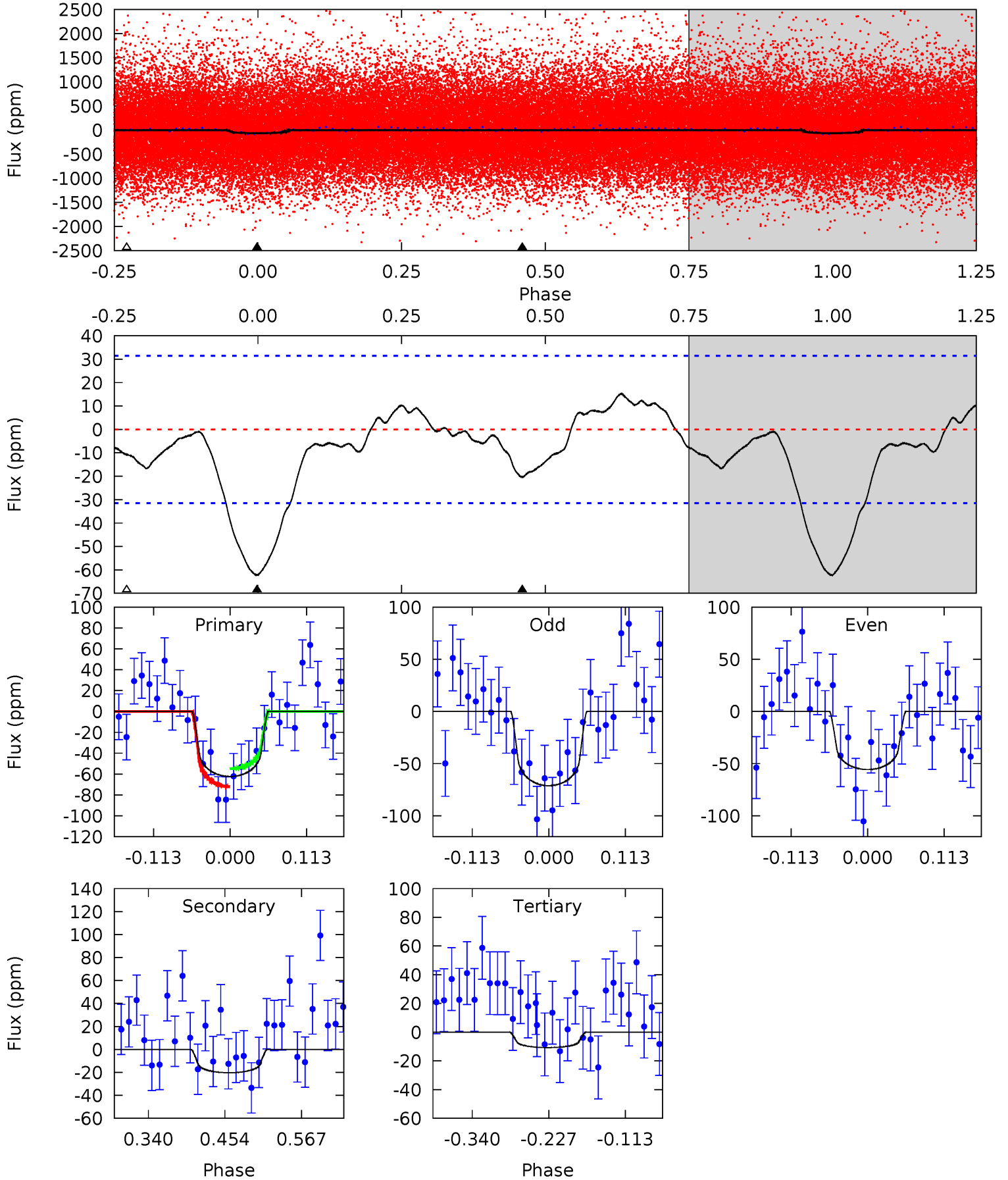
TCE 006863158-01 P= 1.994755 Days $T_0=131.527437$ (BKJD)



DV Model-Shift Uniqueness Test

006863158-01, P = 1.994725 Days, E = 129.558953 Days

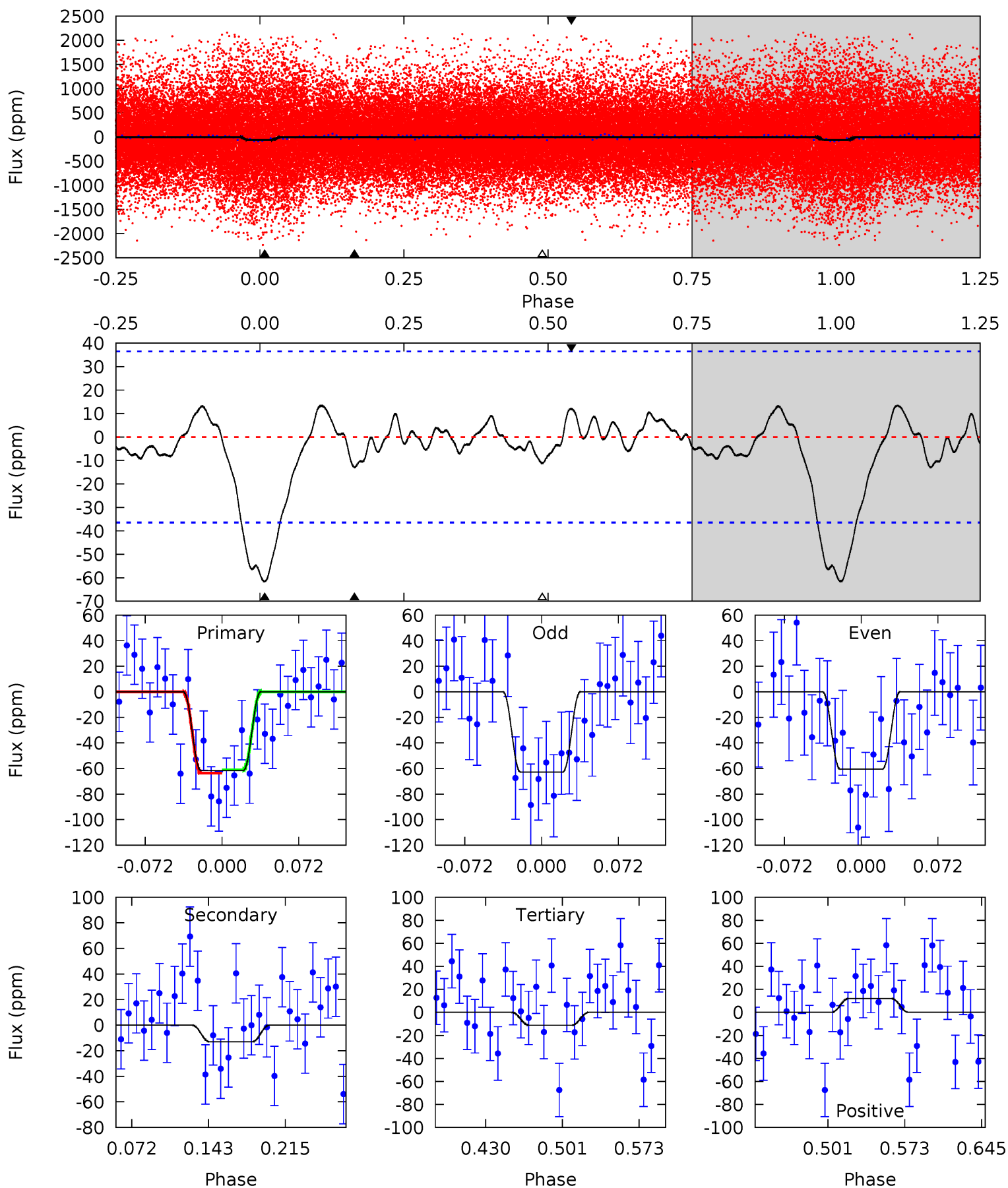
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.99	2.93	1.55	0	4.54	1.58	1.23	7.44	8.99	1.38	2.93	1.12	1.01	0.20	1.25



Alt Model-Shift Uniqueness Test

006863158-01, P = 1.994755 Days, E = 129.532682 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.82	1.65	1.42	1.53	4.63	1.80	0.72	6.40	6.30	0.23	0.12	0.14	0.90	0.18	0.16



Stellar Parameters For KIC 006863158

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3799^{+68}_{-68}	$4.738^{+0.036}_{-0.021}$	$-0.100^{+0.100}_{-0.100}$	$0.510^{+0.025}_{-0.034}$	$0.518^{+0.030}_{-0.030}$	$5.508^{+0.982}_{-0.466}$
	+2%/-2%	+1%/-0%	+100%/-100%	+5%/-7%	+6%/-6%	+18%/-8%
Source	PHO2	PHO2	PHO2	DSEP		

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

Secondary Eclipse Parameters for KIC 006863158-01 / KOI 7793.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-20 ± 7	$0.57^{+0.36}_{-0.31}$	1056^{+23}_{-24}	2952^{+773}_{-406}	21^{+80}_{-14}
Alt.	-13 ± 8	$0.51^{+0.36}_{-0.33}$	1055^{+23}_{-23}	2798^{+1096}_{-449}	15^{+113}_{-11}

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

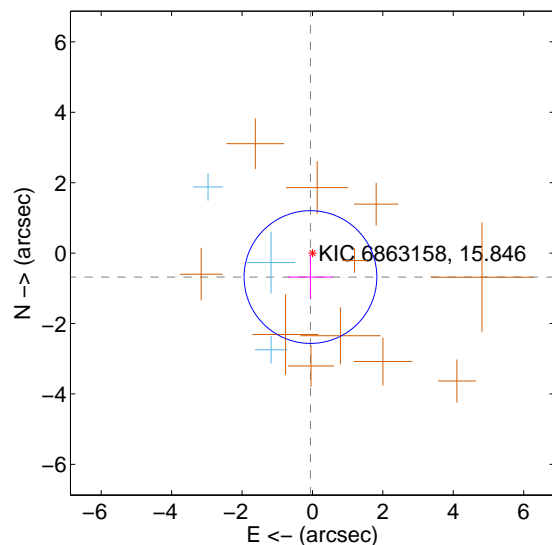
Supplemental centroid analysis for 006863158-01. Kepler magnitude: 15.85. Transit SNR 8.02

There are 3 quarters with good PRF difference image offsets

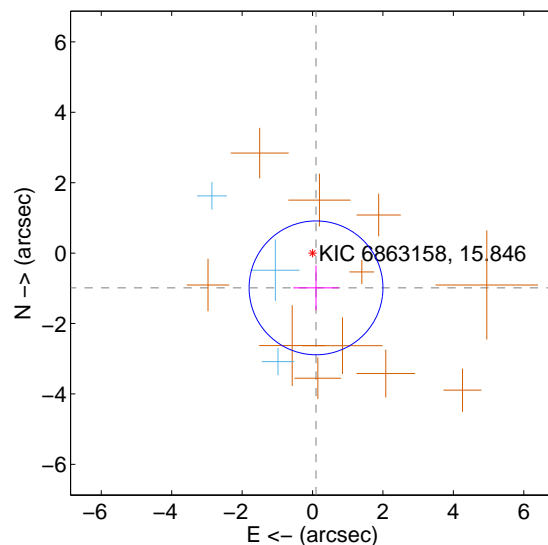
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.683 ± 0.628	1.09	0.056 ± 0.645	-0.680 ± 0.628
PRF-fit source offset from KIC position	0.992 ± 0.633	1.57	-0.099 ± 0.645	-0.987 ± 0.633
photometric centroid source offset	1.54 ± 1.39	1.11	-0.51 ± 1.65	1.46 ± 1.36

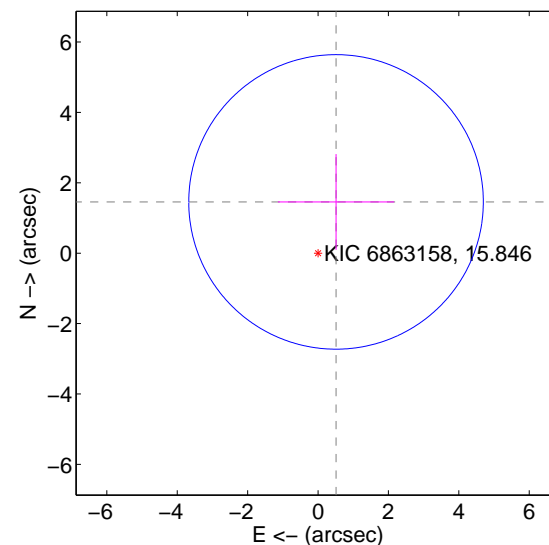
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

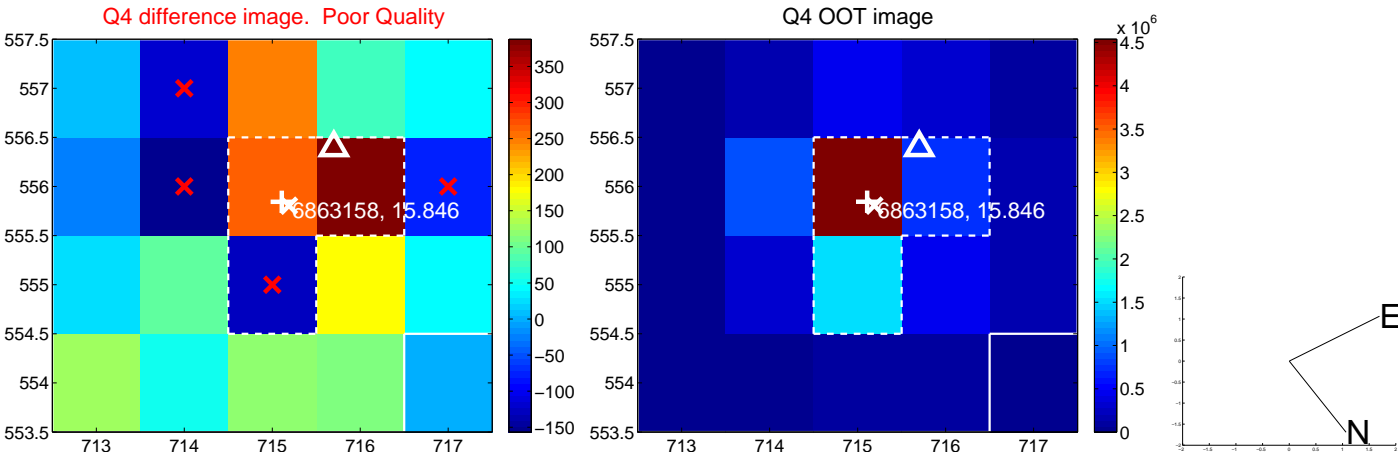
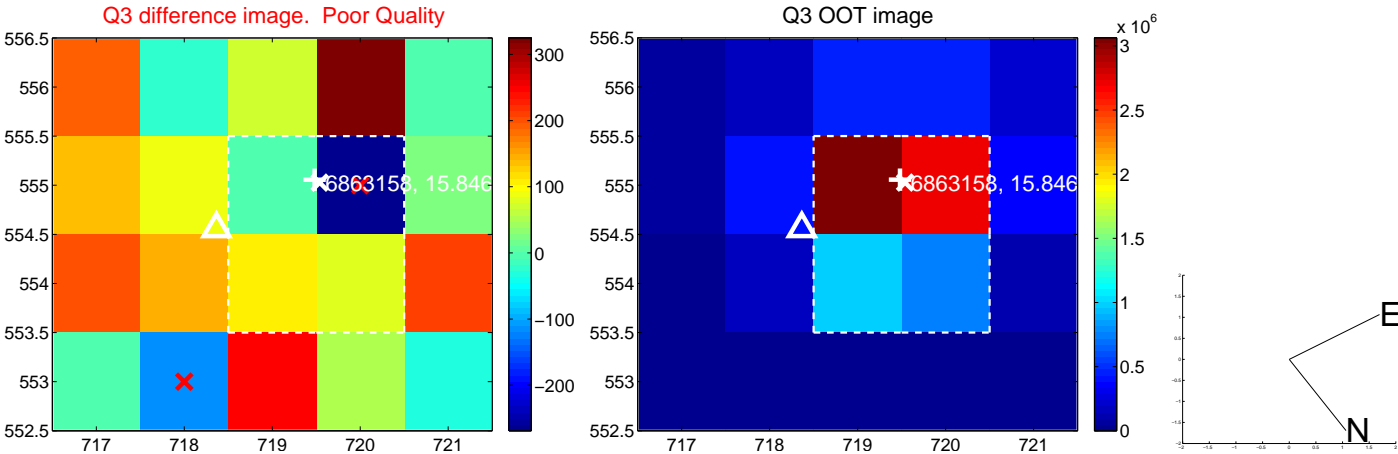
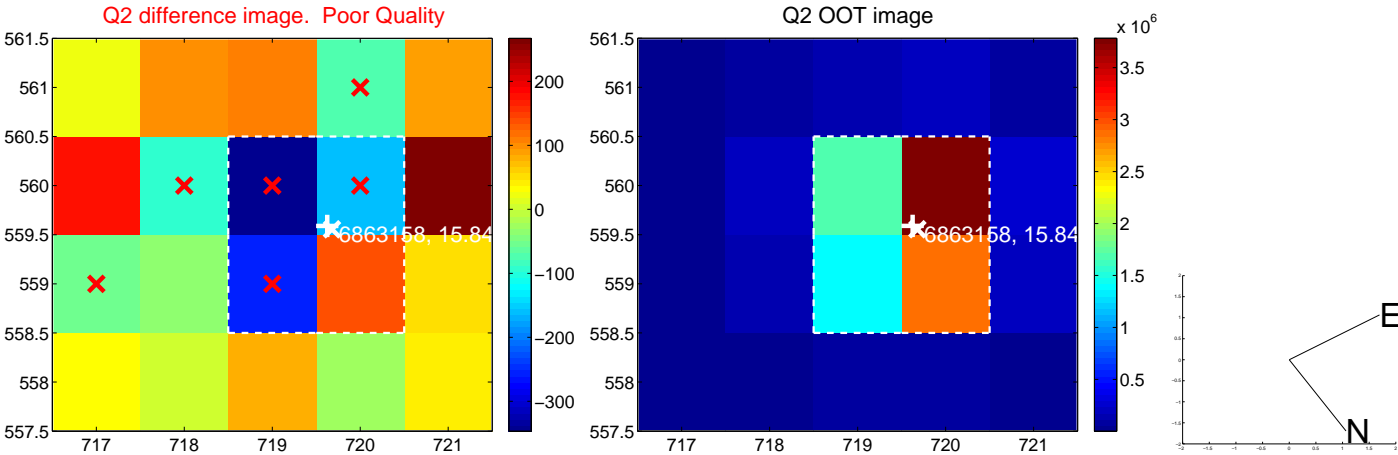
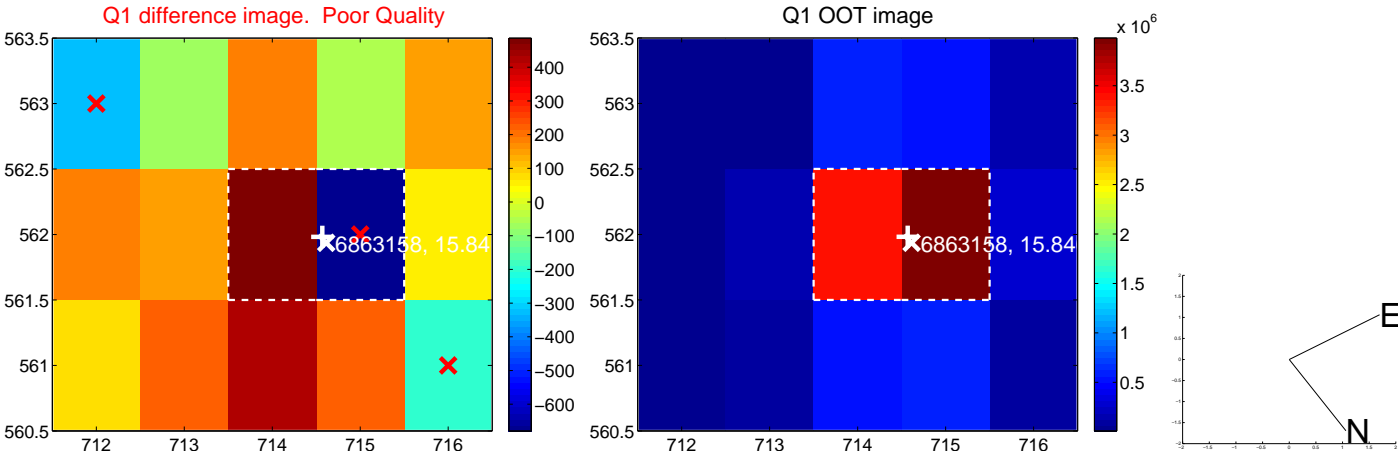


offset from photometric centroids

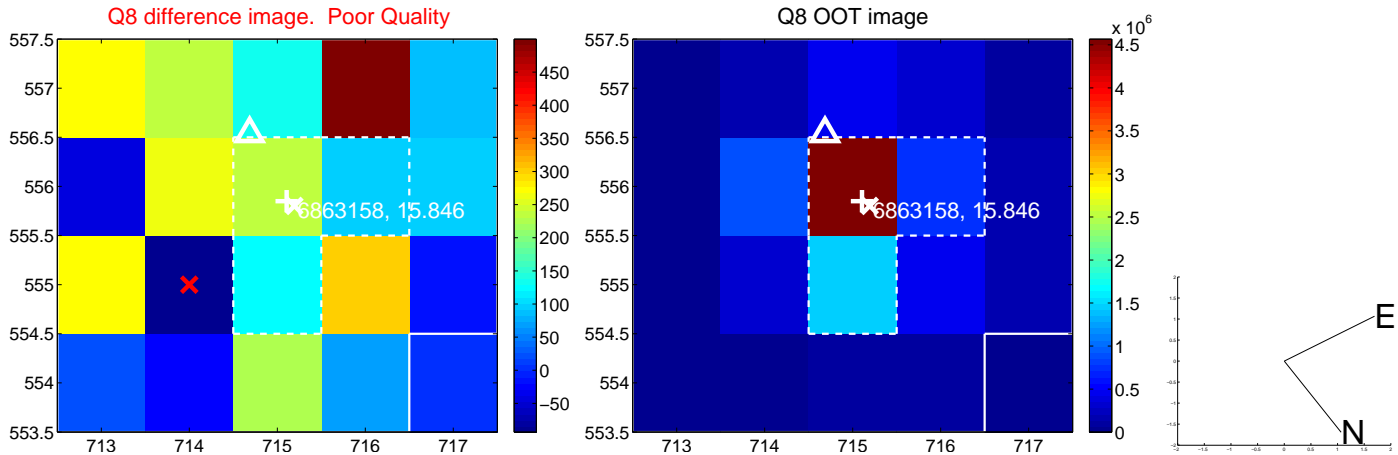
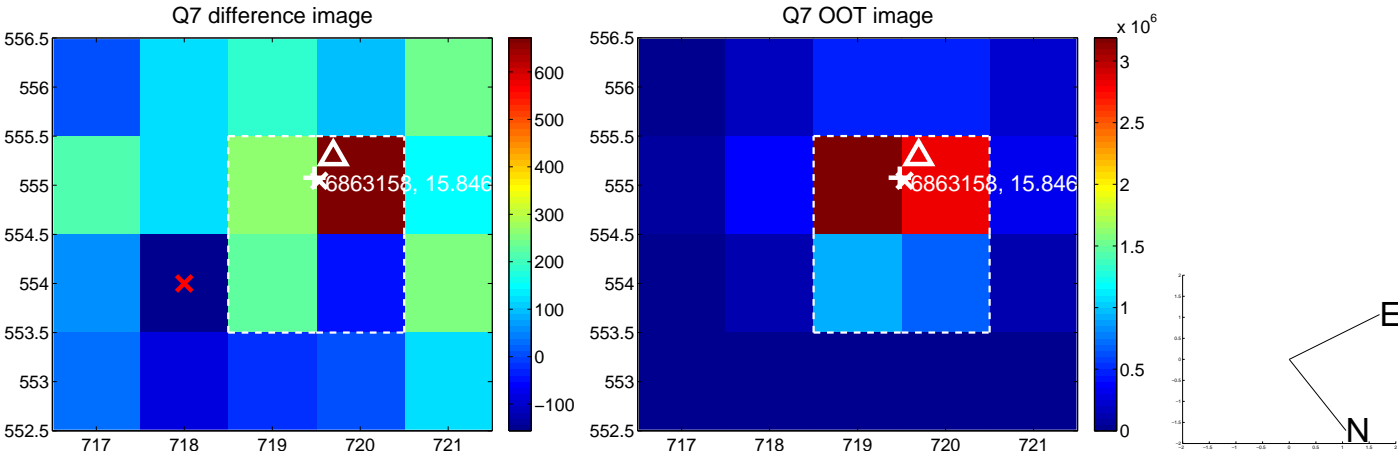
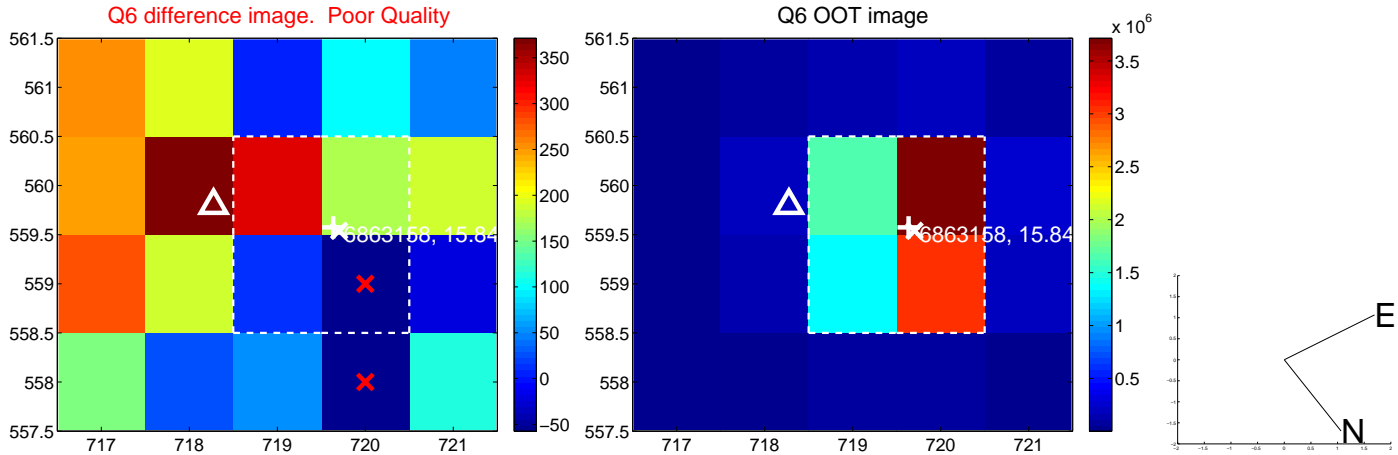
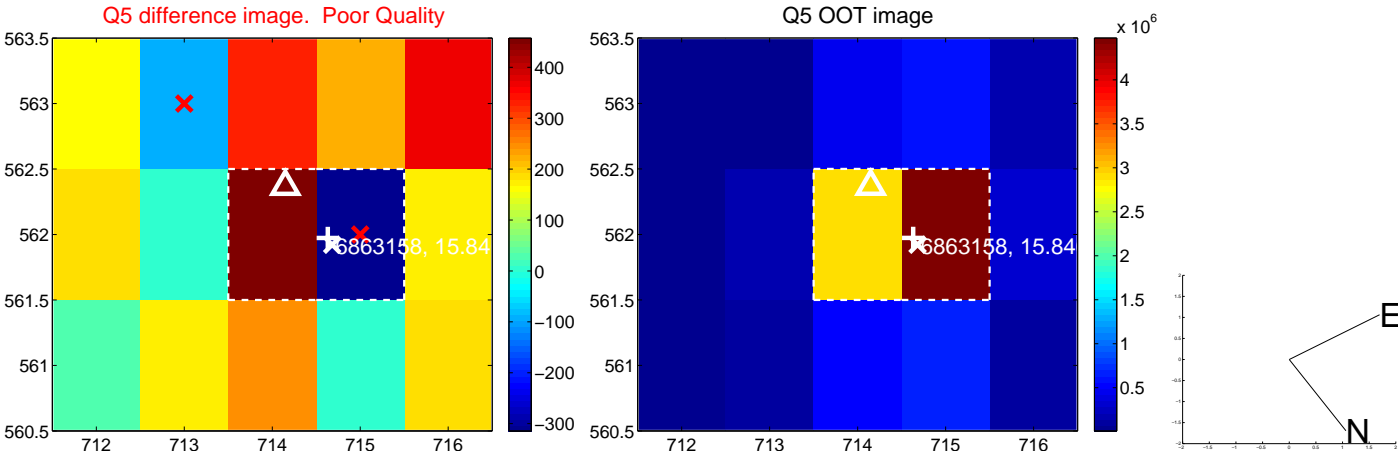


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

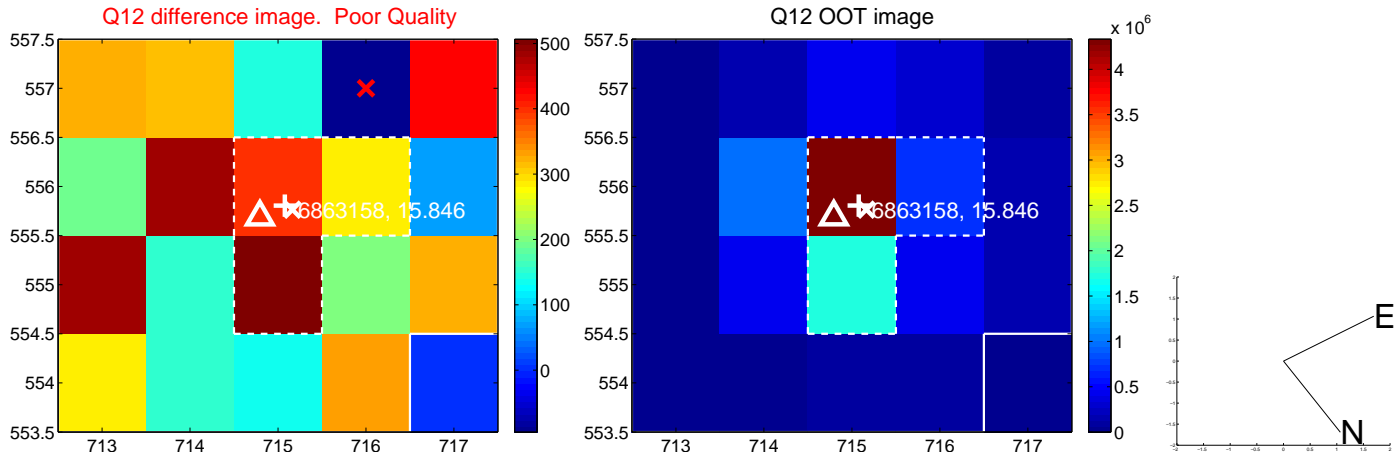
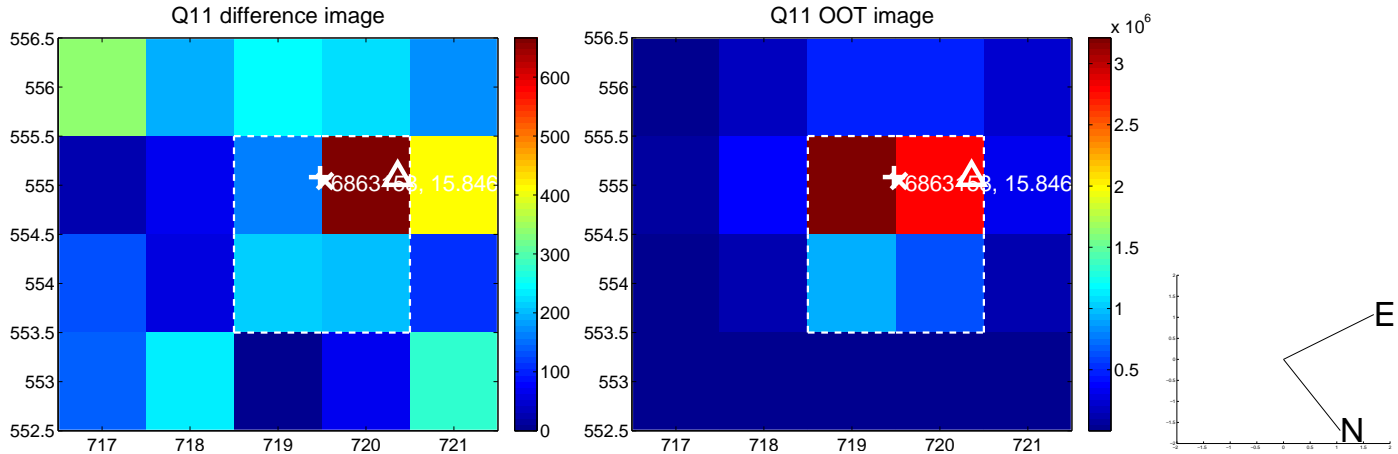
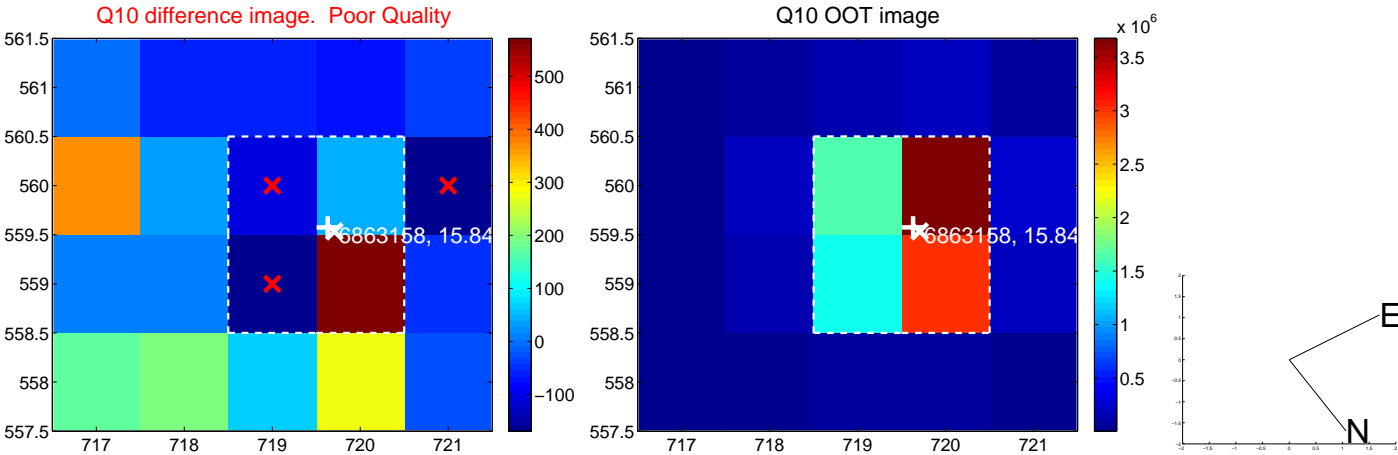
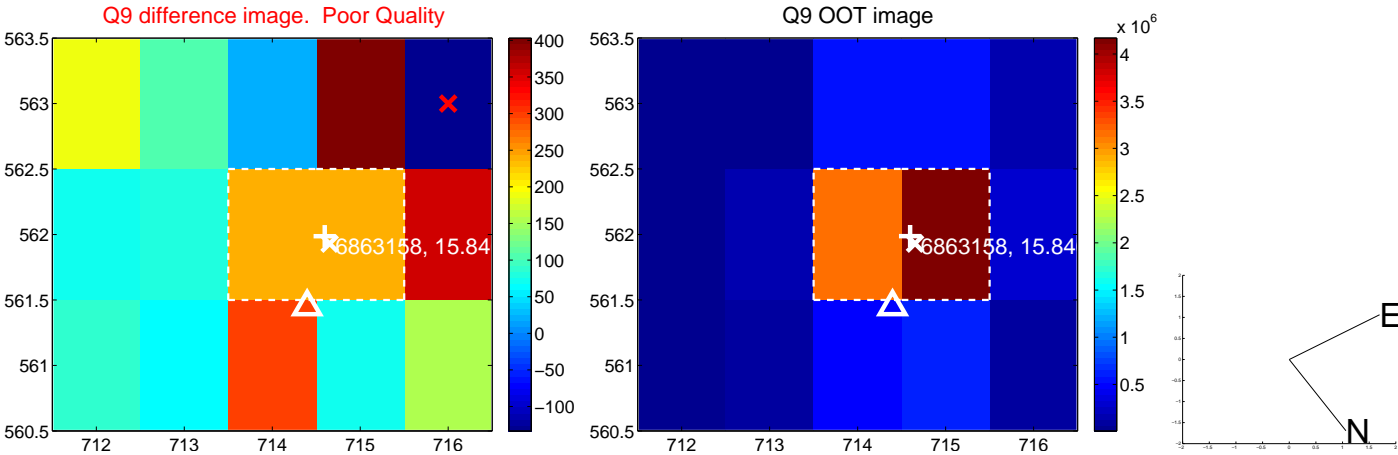
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



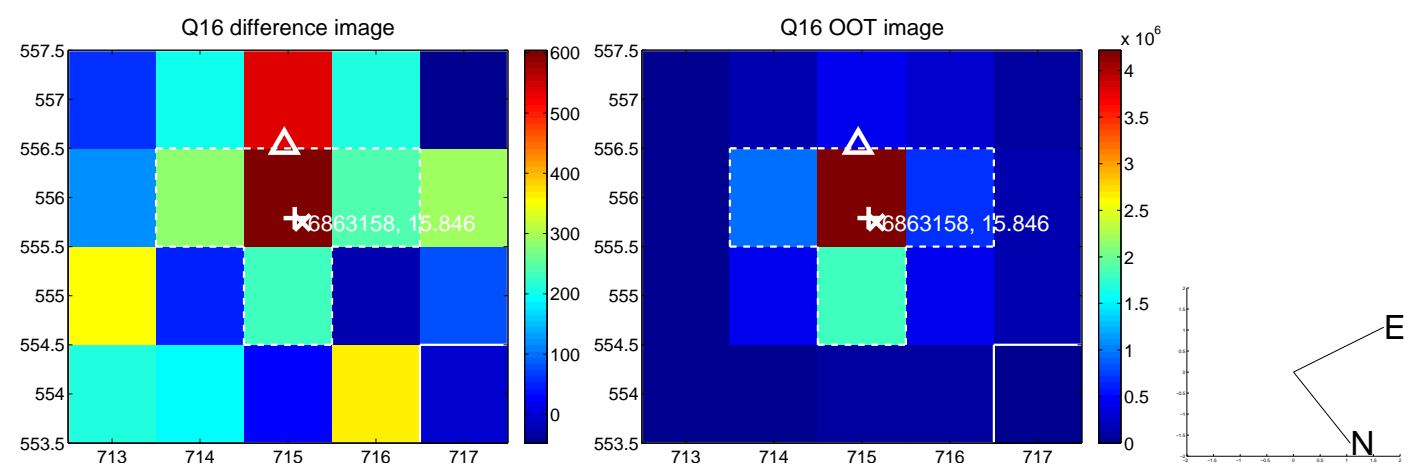
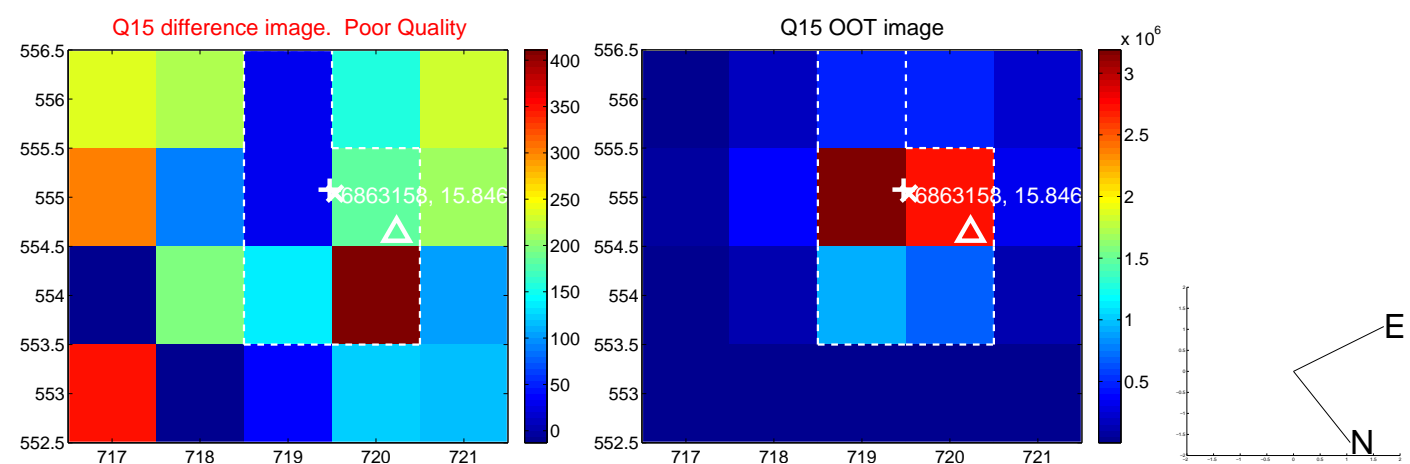
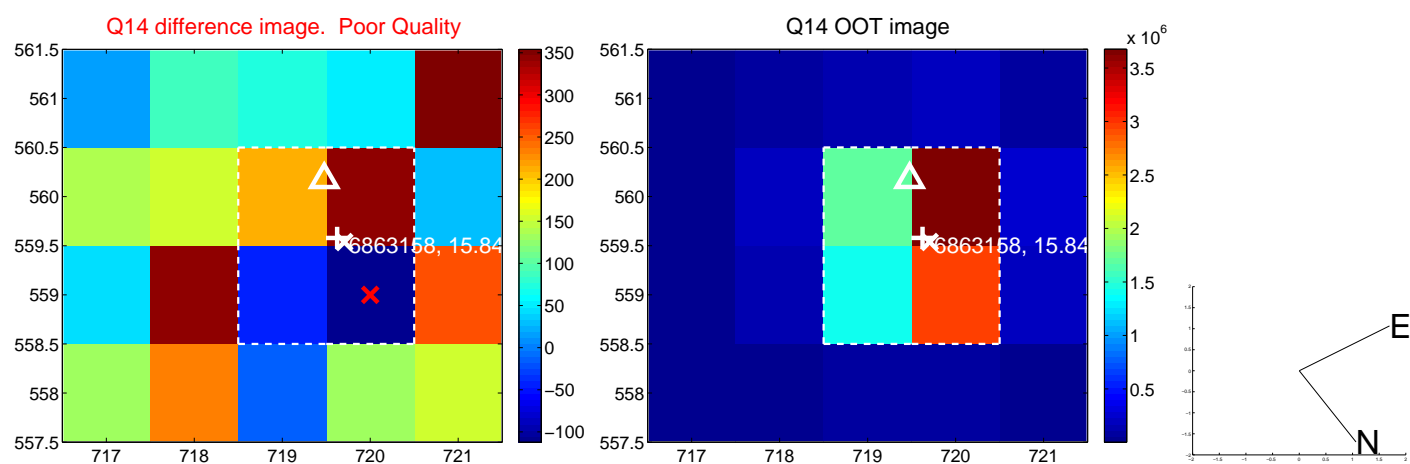
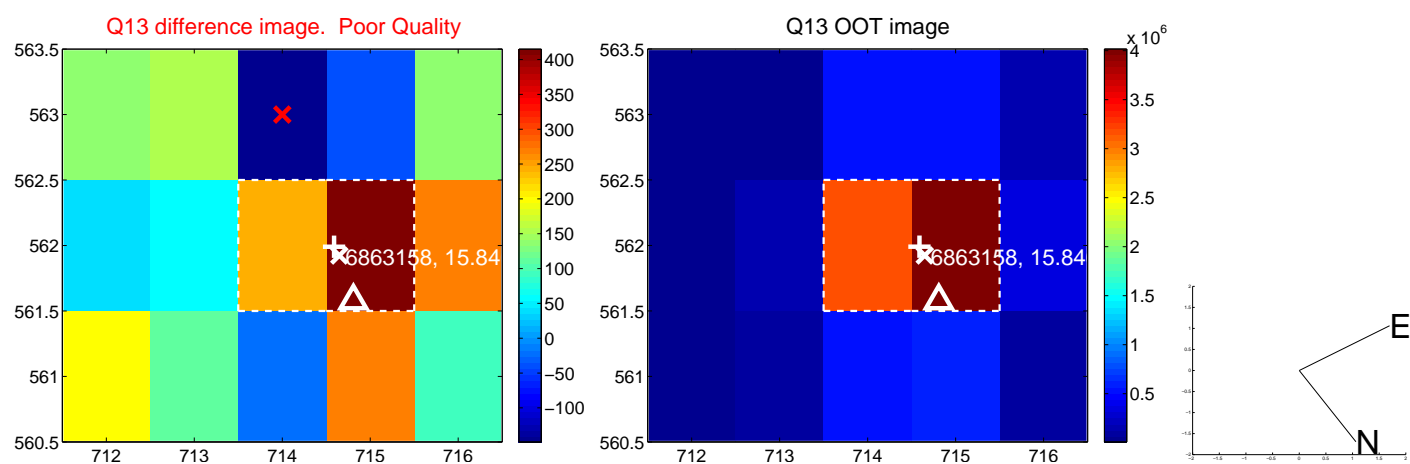
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

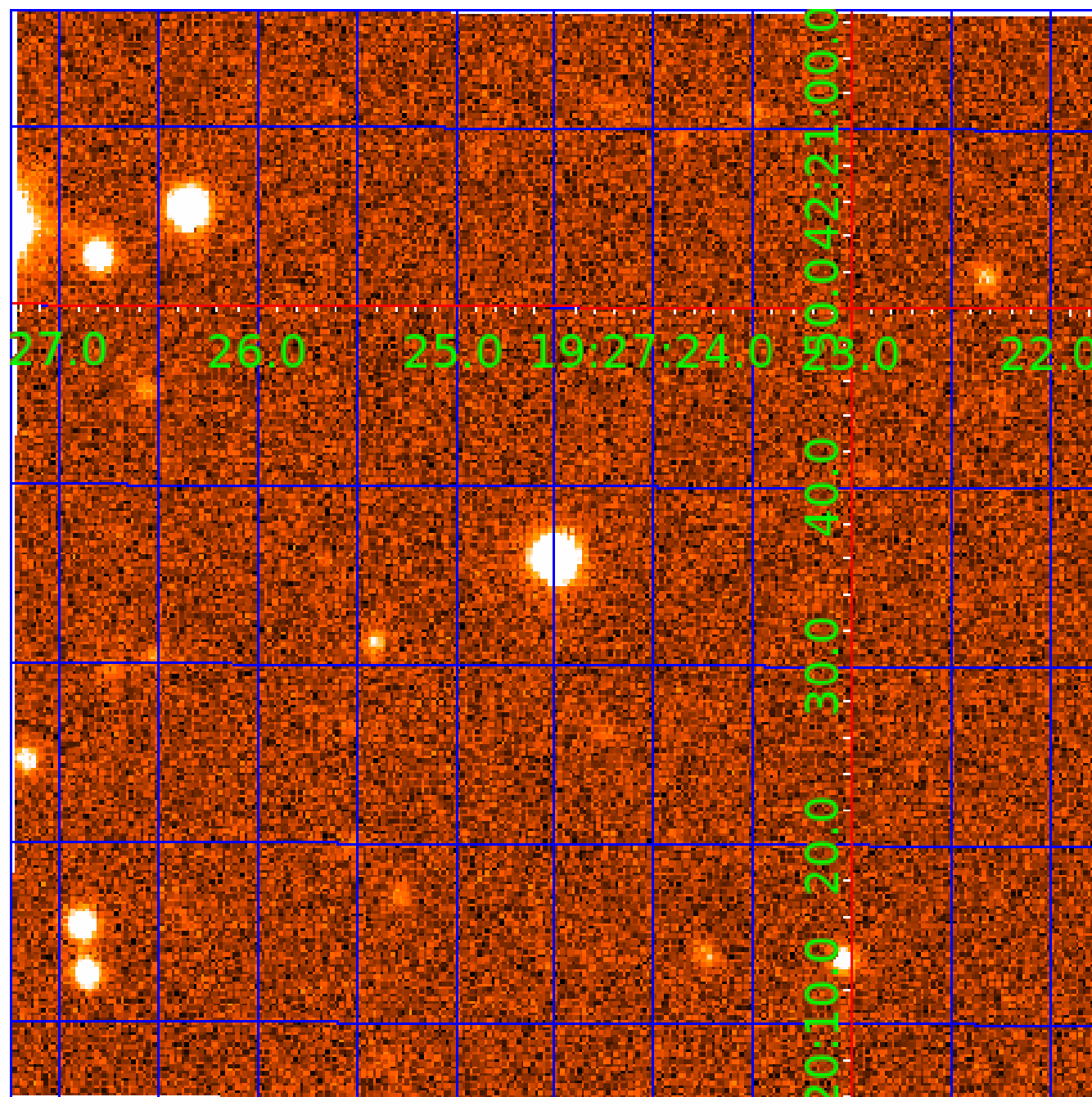


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006863158

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})
006863158-01	OBS	7793.01	1.994725	131.553678	78.3	4.988	7.3	8.0	0.51	3799	0.52	78.12
006863158-02	OBS	No	447.688541	407.555571	668.5	11.455	9.1	5.4	0.51	3799	1.62	0.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006863158-01	OBS	PC	0.60	0	0	0	0	CENT_KIC_POS
006863158-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

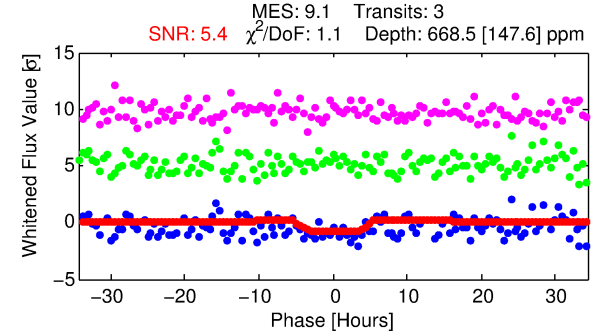
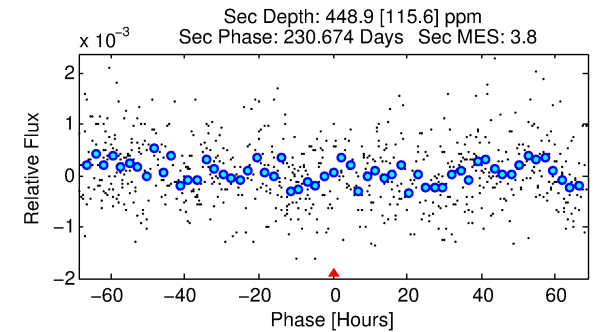
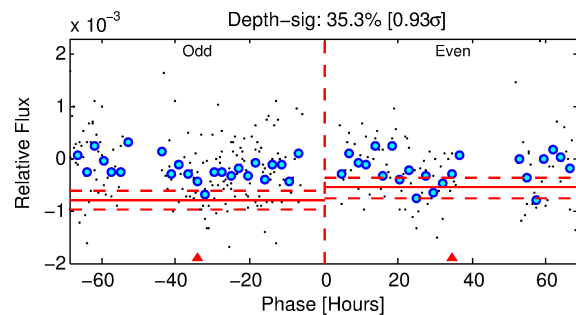
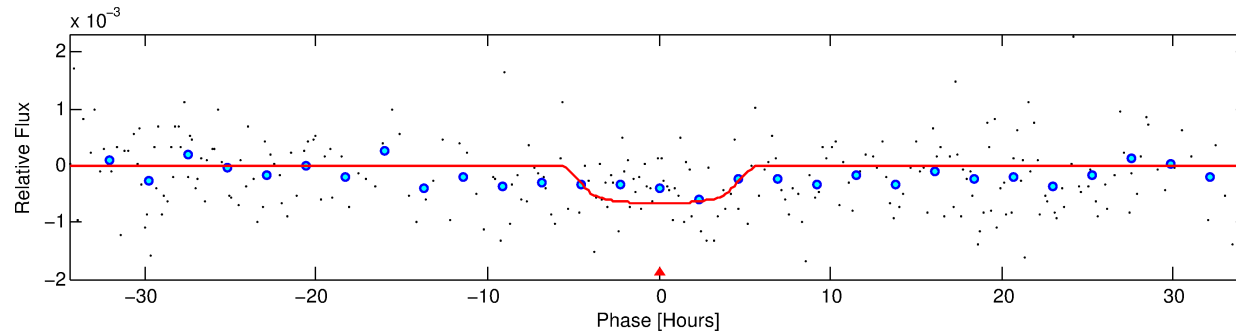
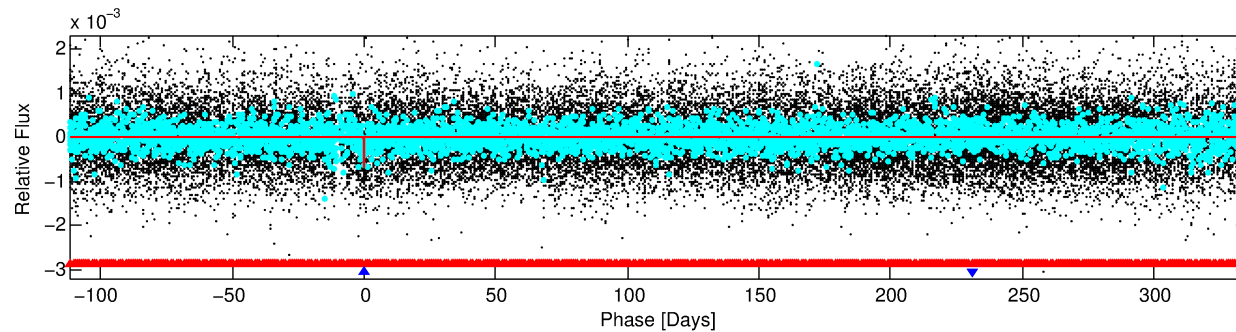
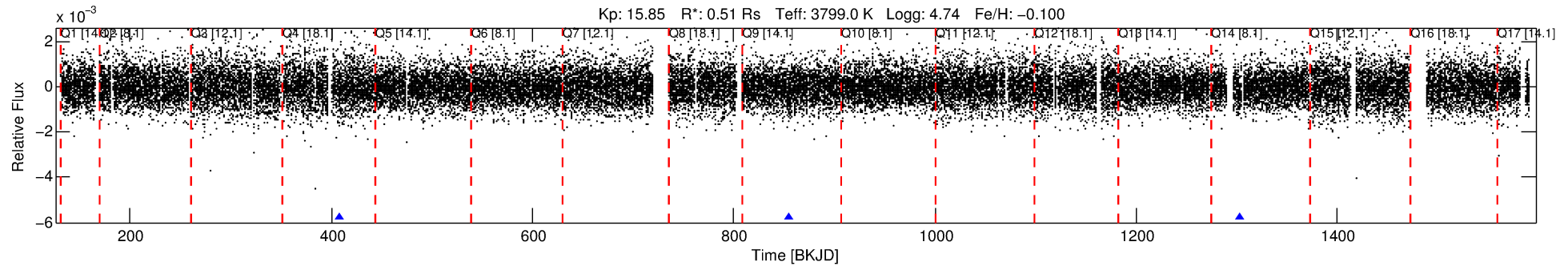
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006863158-02

No Significant Match Found

DV One-Page Summary

KIC: 6863158 Candidate: 2 of 2 Period: 447.689 d



DV Fit Results:

Period = 447.68854 [0.03295] d
Epoch = 407.5556 [0.0423] BKJD
Rp/R* = 0.0292 [0.0065]
a/R* = 131.68 [102.14]
b = 0.93 [0.12]
Seff = 0.06 [0.01]
Teq = 125 [3] K
Rp = 1.62 [0.38] Re
a = 0.9206 [0.0482] AU
Ag = 79297.30 [40998.95] [1.93 σ]
Teffp = 3237 [418] K [7.44 σ]

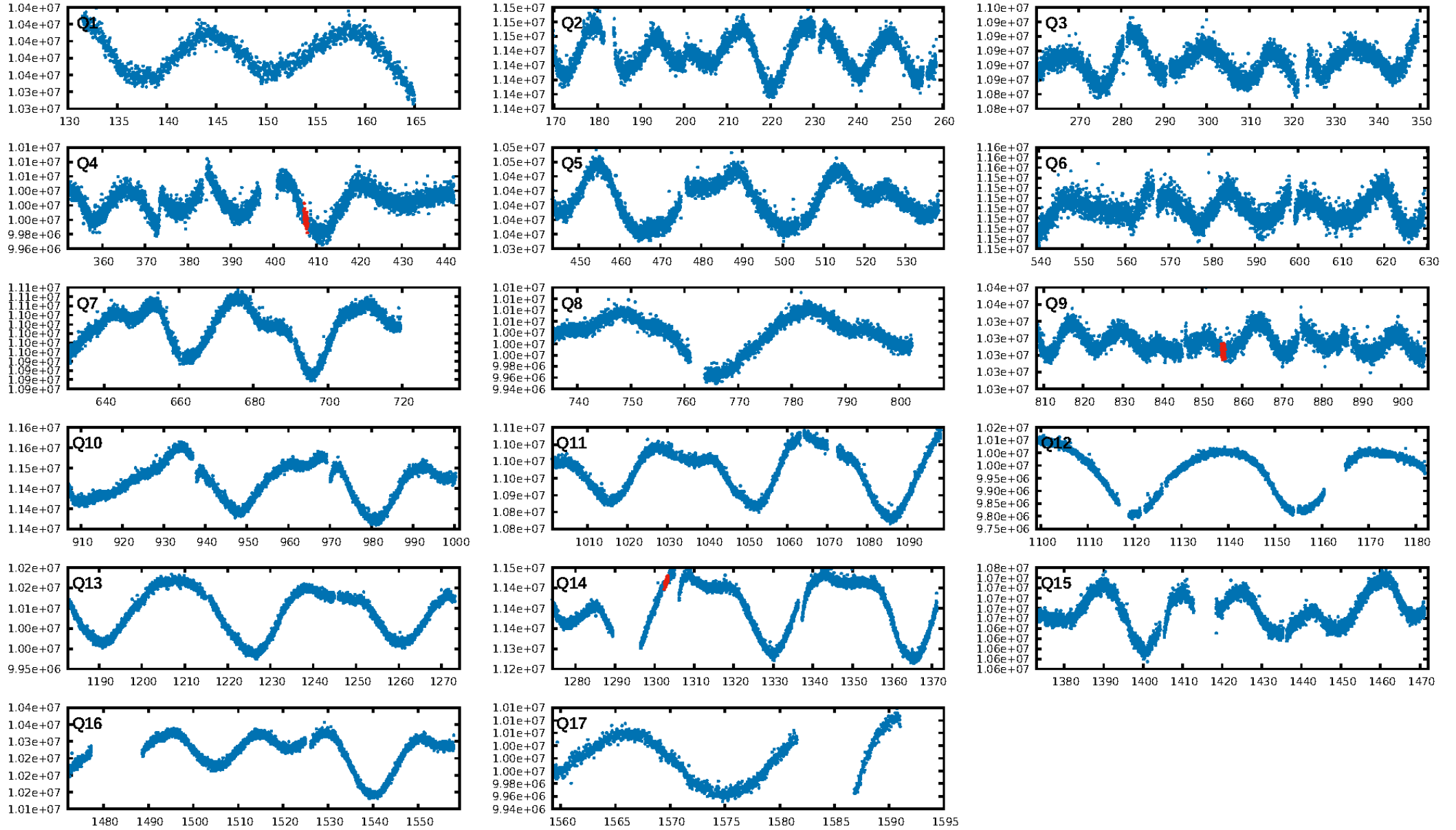
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [856.15 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 10.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.32e-24
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.3183
Centroid-sig: 34.9%
Centroid-so: 1.658 arcsec [0.98 σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 0.00 [0/3]

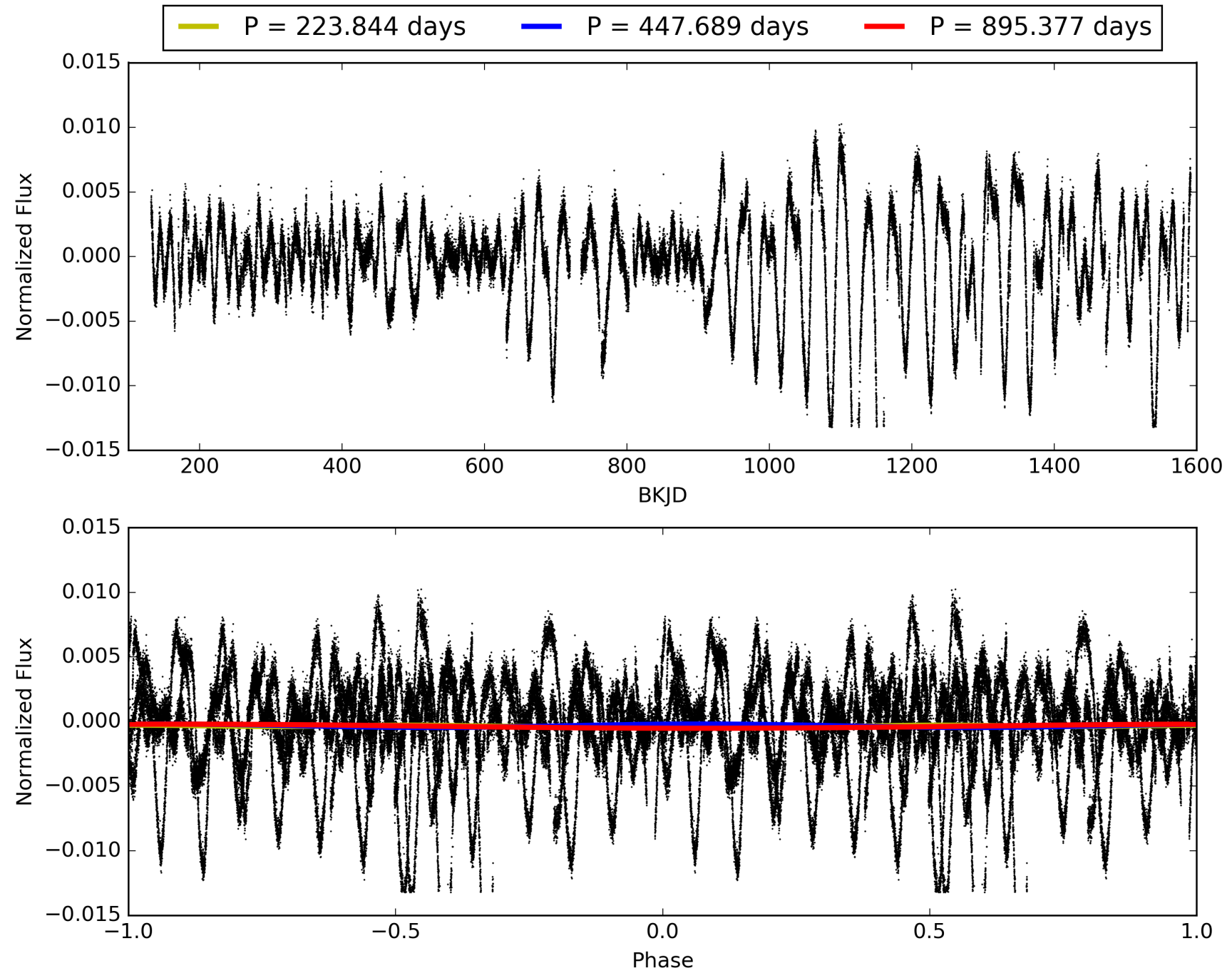
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:45:42 Z

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

TCE 006863158-02, PDC Light Curves

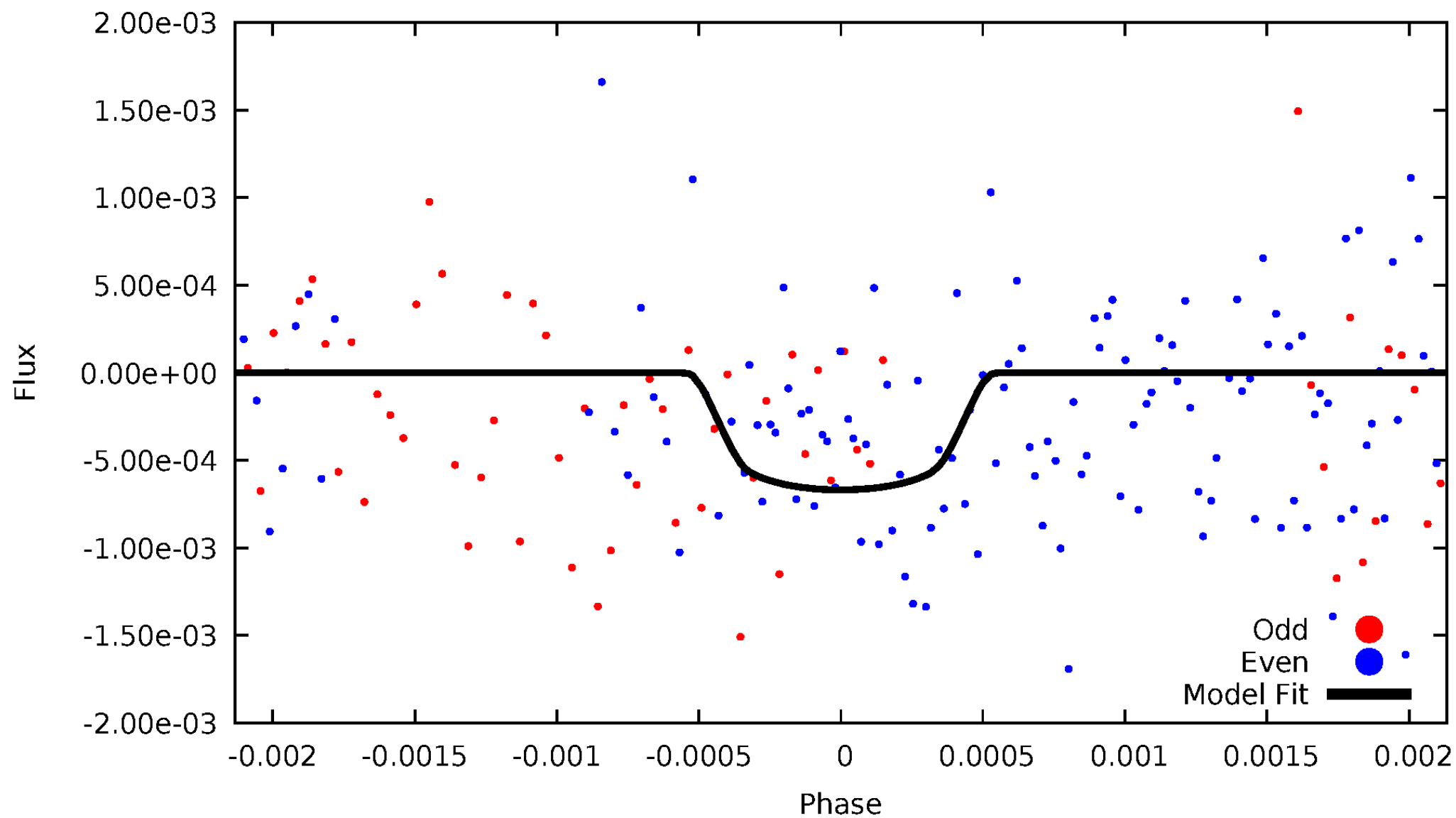


TCE 006863158-02



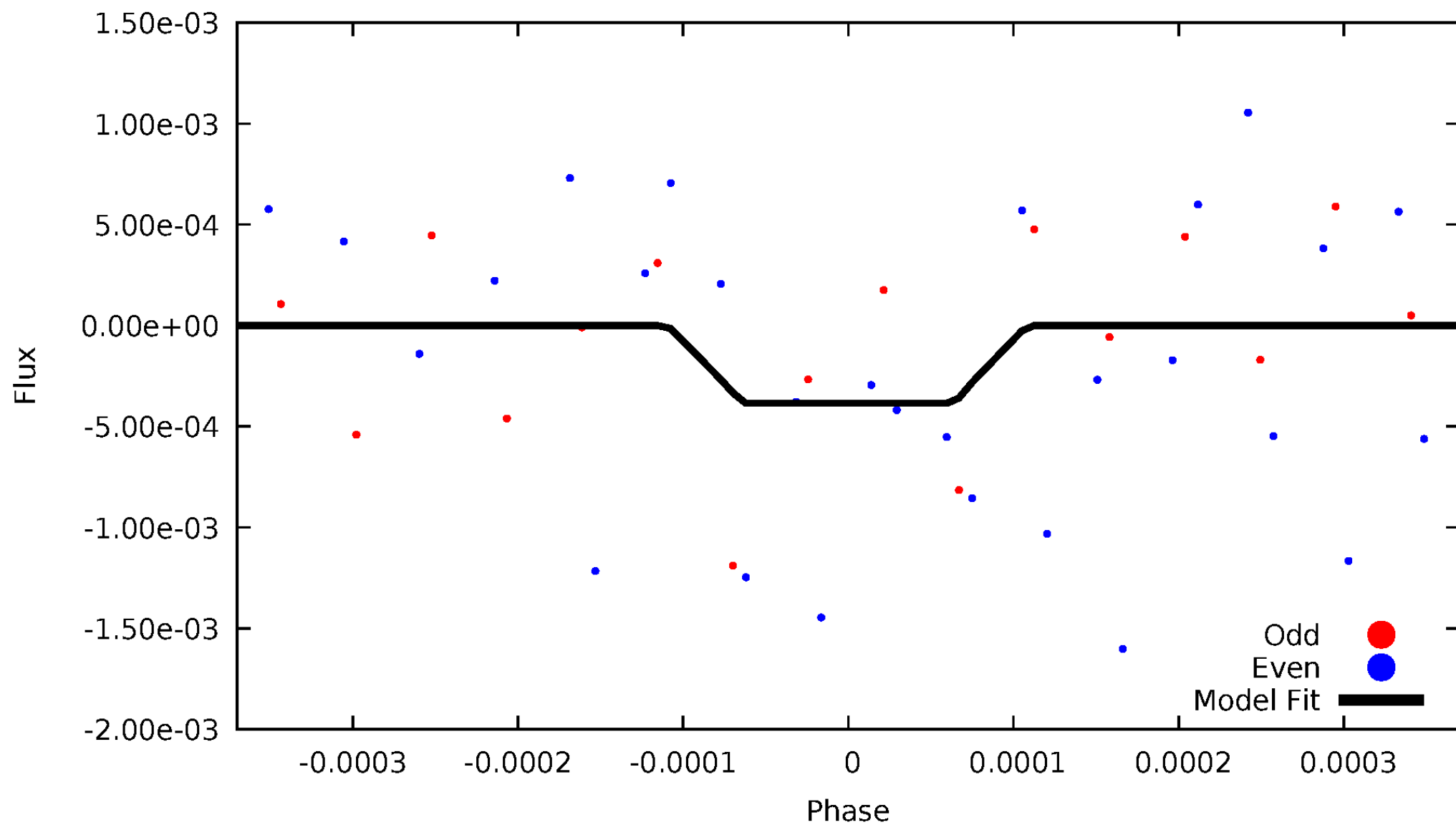
DV Odd/Even

TCE 006863158-02



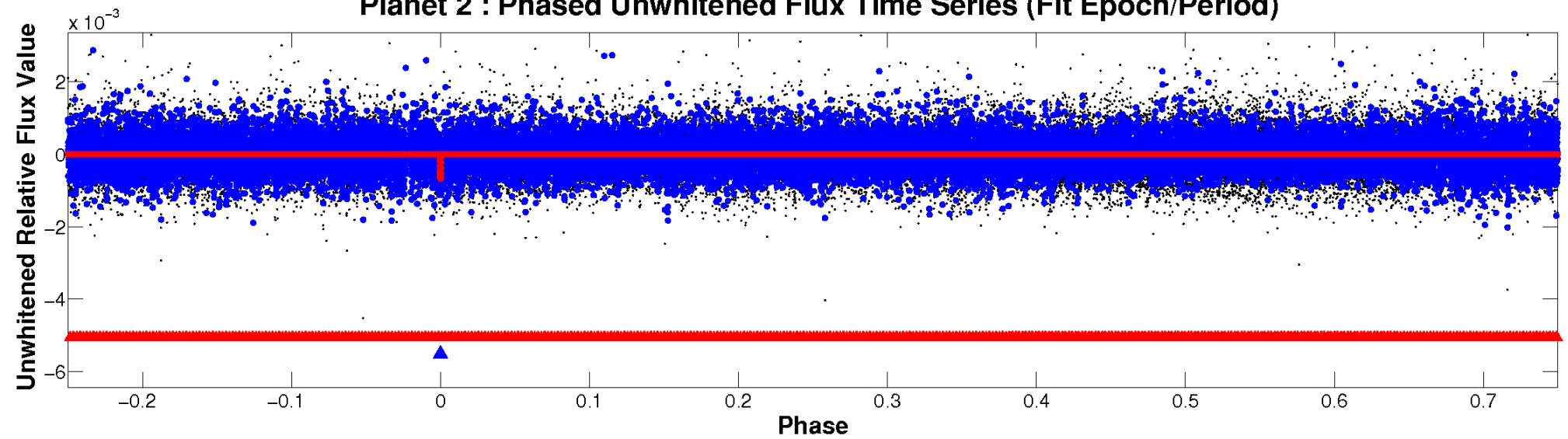
ALT Odd/Even

TCE 006863158-02

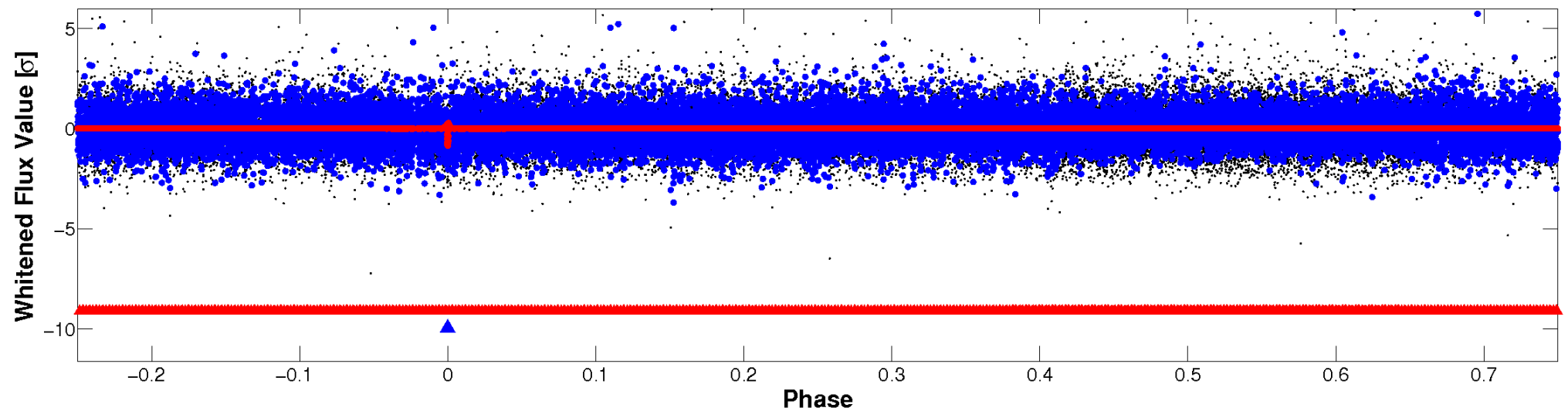


Non-Whitened Vs. Whitened Light Curve

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

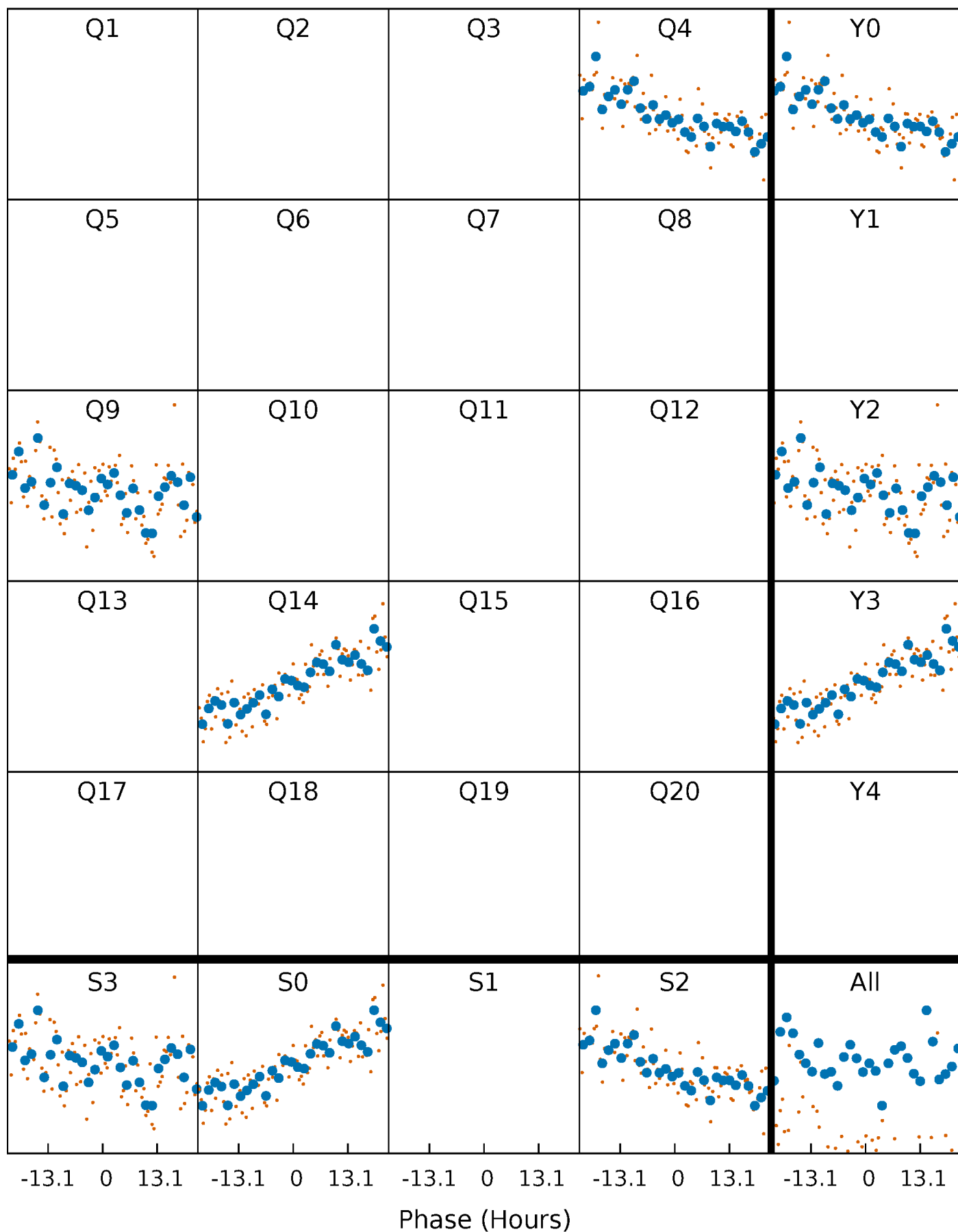


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



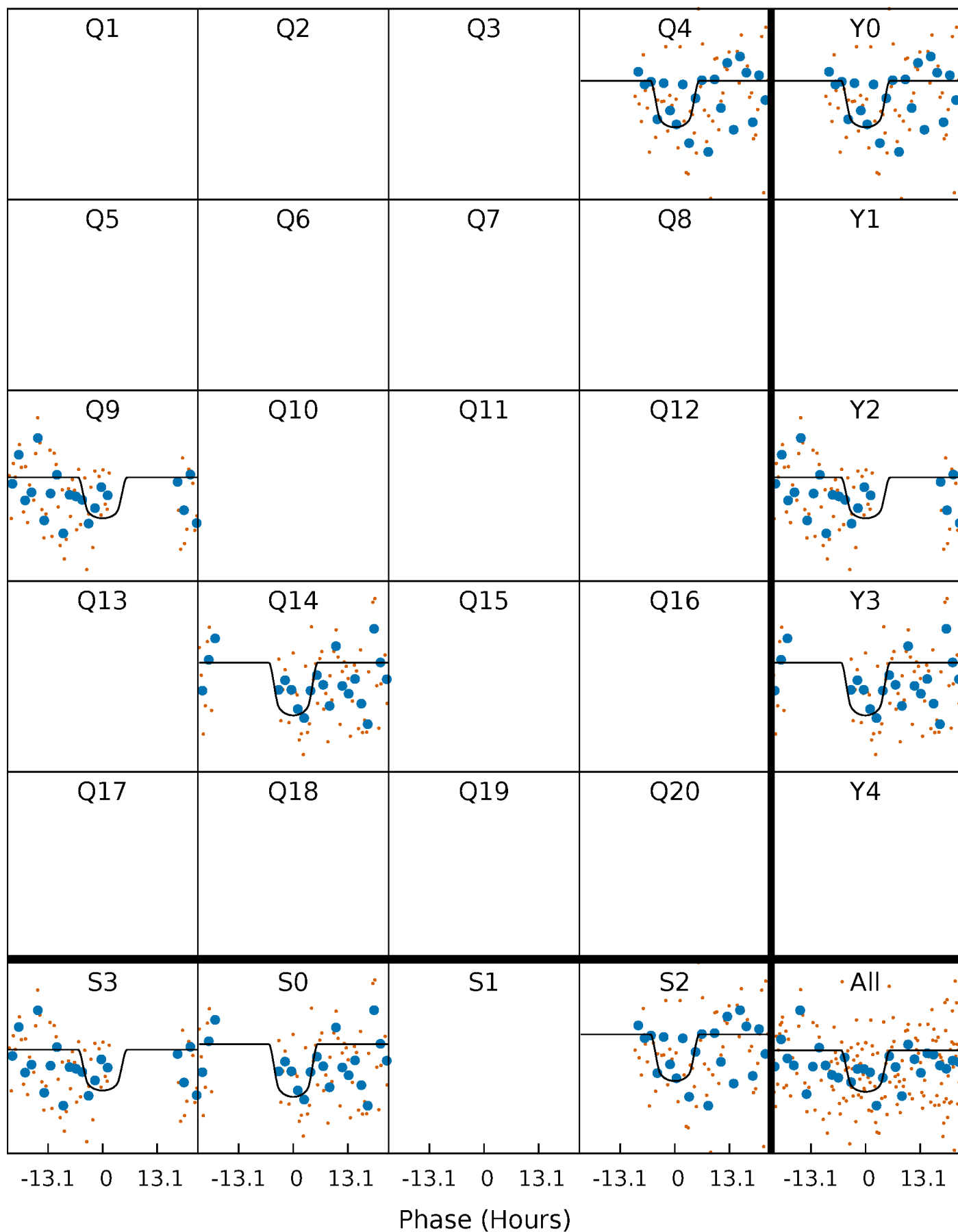
PDC Quarter-Phased Transit Curves

TCE 006863158-02 $P=447.688541$ Days $T_0=407.555571$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 006863158-02 $P=447.688541$ Days $T_0=407.555571$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

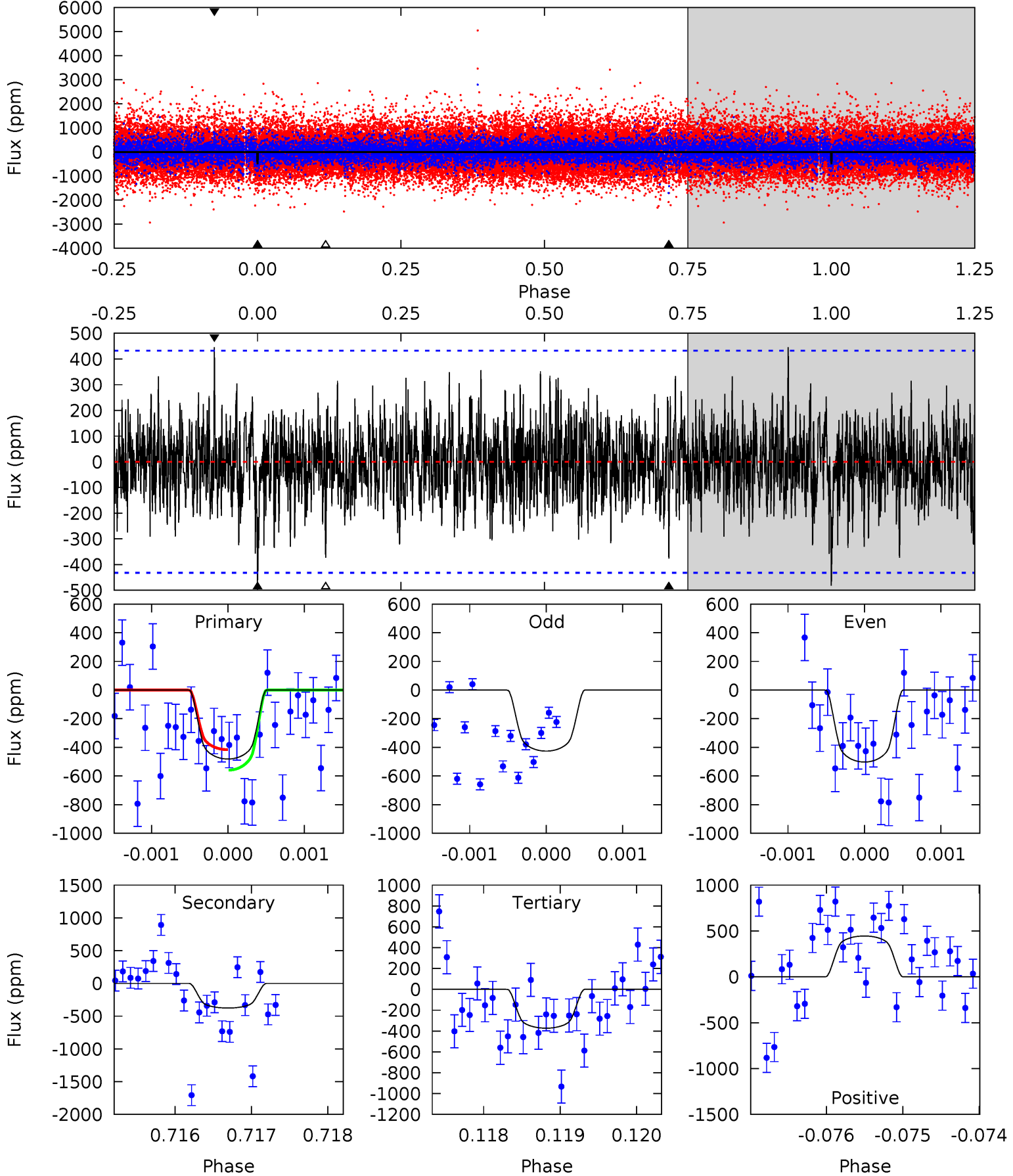
TCE 006863158-02 P=447.890013 Days $T_0=407.227046$ (BKJD)



DV Model-Shift Uniqueness Test

006863158-02, P = 447.688541 Days, E = 407.555571 Days

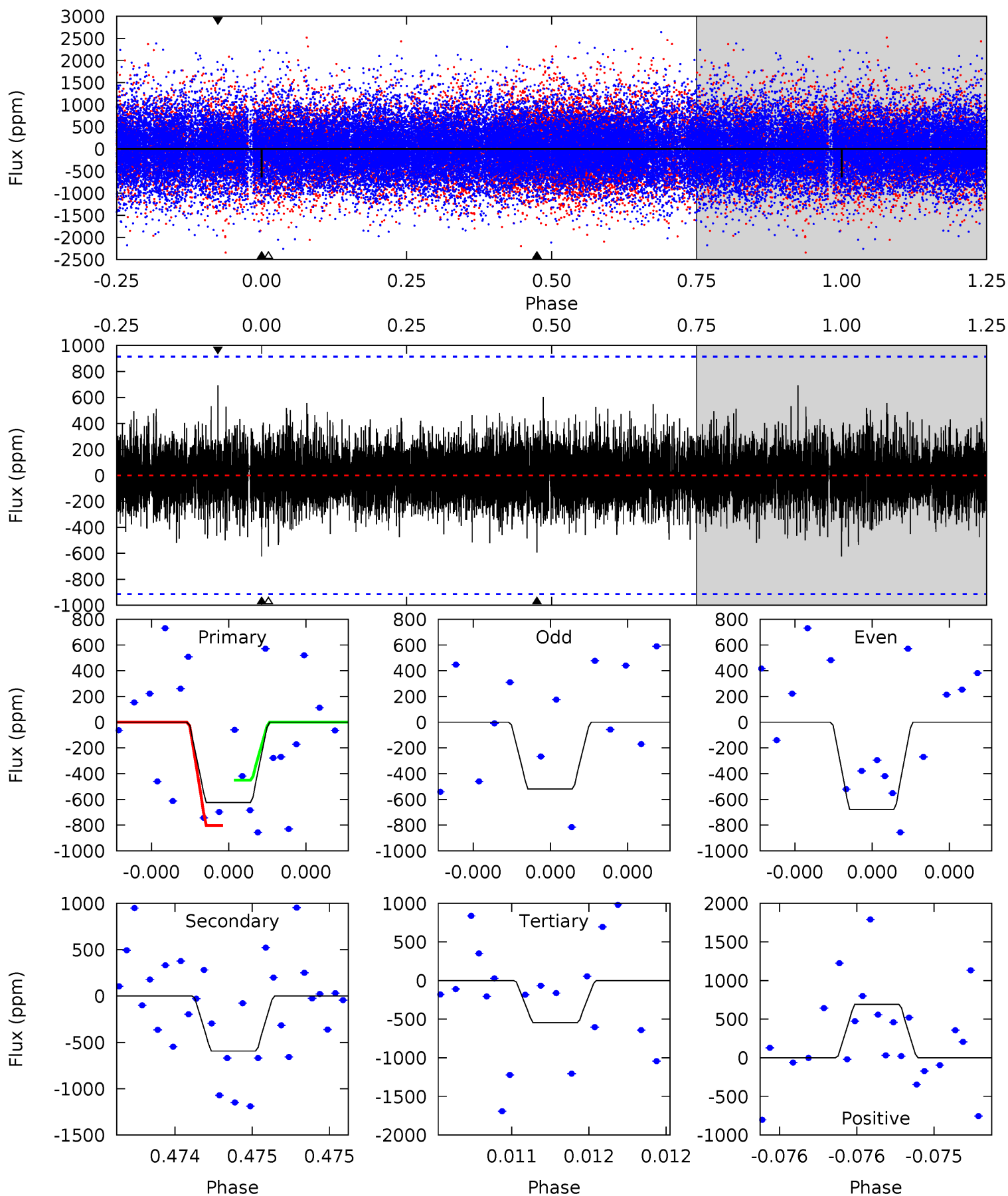
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.06	4.73	4.69	5.60	5.44	3.27	1.43	1.37	0.45	0.04	-0.87	0.43	0.96	0.48	0.90



Alt Model-Shift Uniqueness Test

006863158-02, P = 447.890013 Days, E = 407.227046 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.91	3.72	3.42	4.33	5.72	3.70	0.89	0.48	-0.43	0.30	-0.61	0.48	1.20	0.53	1.10



Stellar Parameters For KIC 006863158

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3799^{+68}_{-68}	$4.738^{+0.036}_{-0.021}$	$-0.100^{+0.100}_{-0.100}$	$0.510^{+0.025}_{-0.034}$	$0.518^{+0.030}_{-0.030}$	$5.508^{+0.982}_{-0.466}$
	+2%/-2%	+1%/-0%	+100%/-100%	+5%/-7%	+6%/-6%	+18%/-8%
Source	PHO2	PHO2	PHO2	DSEP		

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

Secondary Eclipse Parameters for KIC 006863158-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-376 ± 80	$1.60^{+0.38}_{-0.35}$	174^{+4}_{-4}	3337^{+271}_{-219}	68746^{+44082}_{-25560}
Alt.	-594 ± 160	$1.09^{+0.36}_{-0.36}$	174^{+4}_{-4}	4093^{+736}_{-418}	$232579^{+320620}_{-108570}$

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 $A_{obs} \gg 1.0$

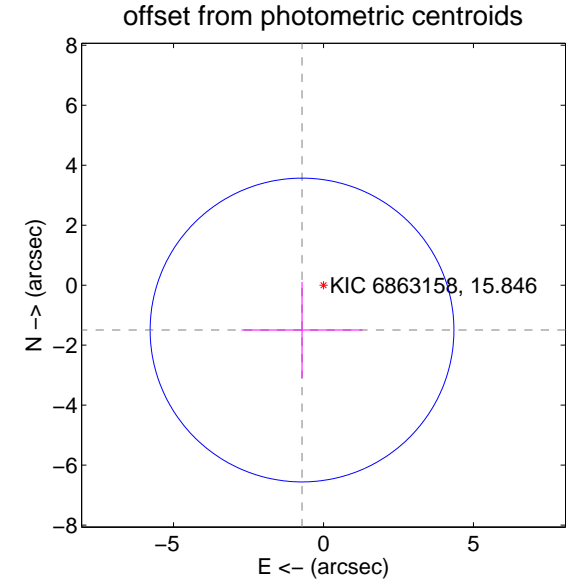
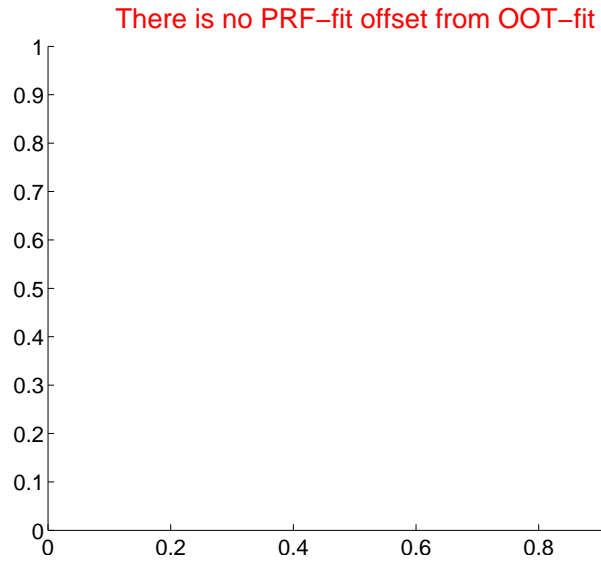
DV Centroid Data

Supplemental centroid analysis for 006863158-02. Kepler magnitude: 15.85. Transit SNR 5.44

There are 0 quarters with good PRF difference image offsets

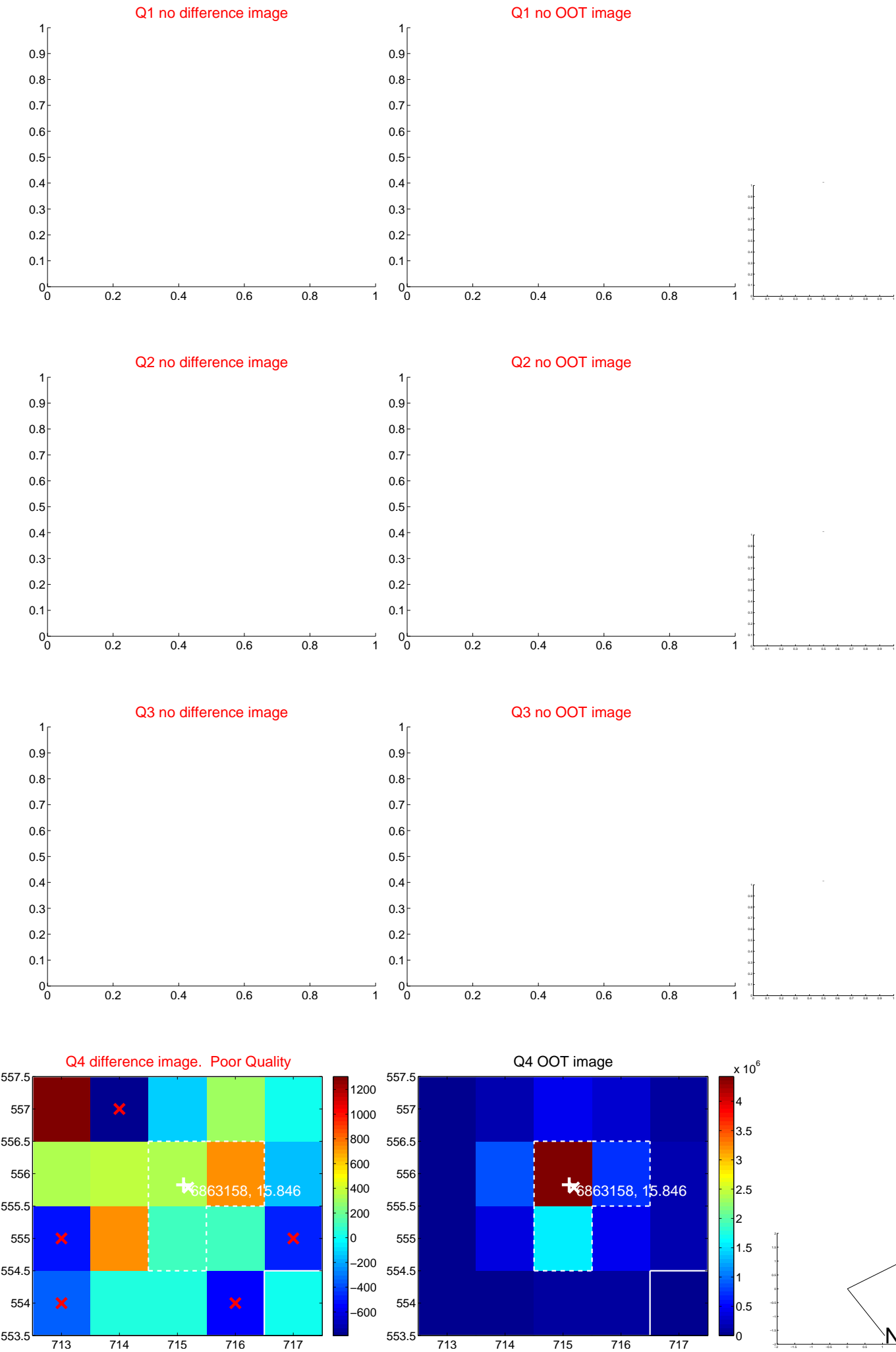
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	1.66 ± 1.69	0.98	0.72 ± 2.02	-1.50 ± 1.60



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.

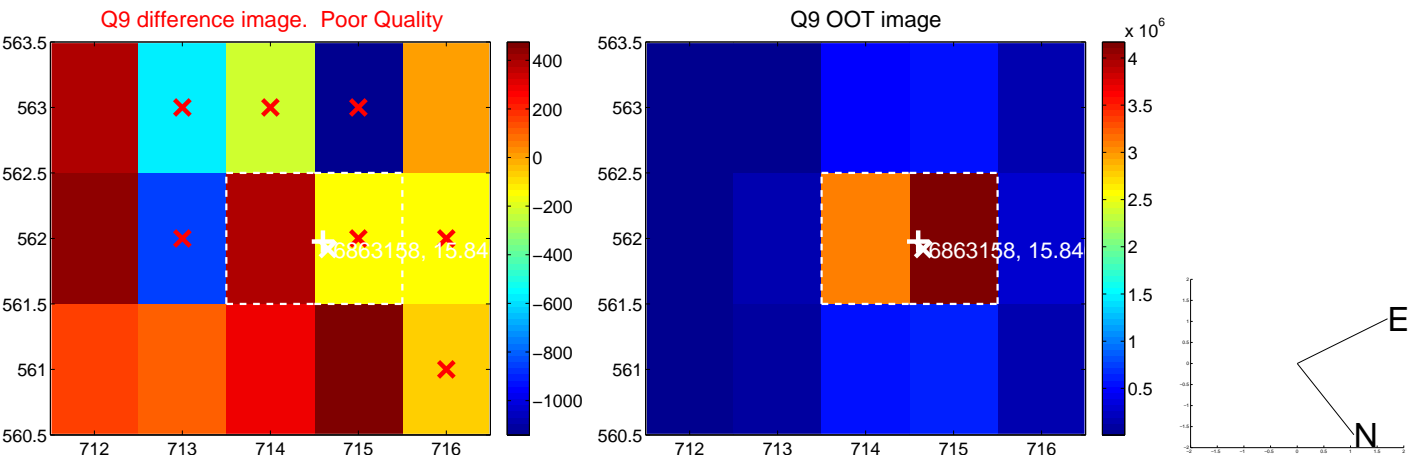
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



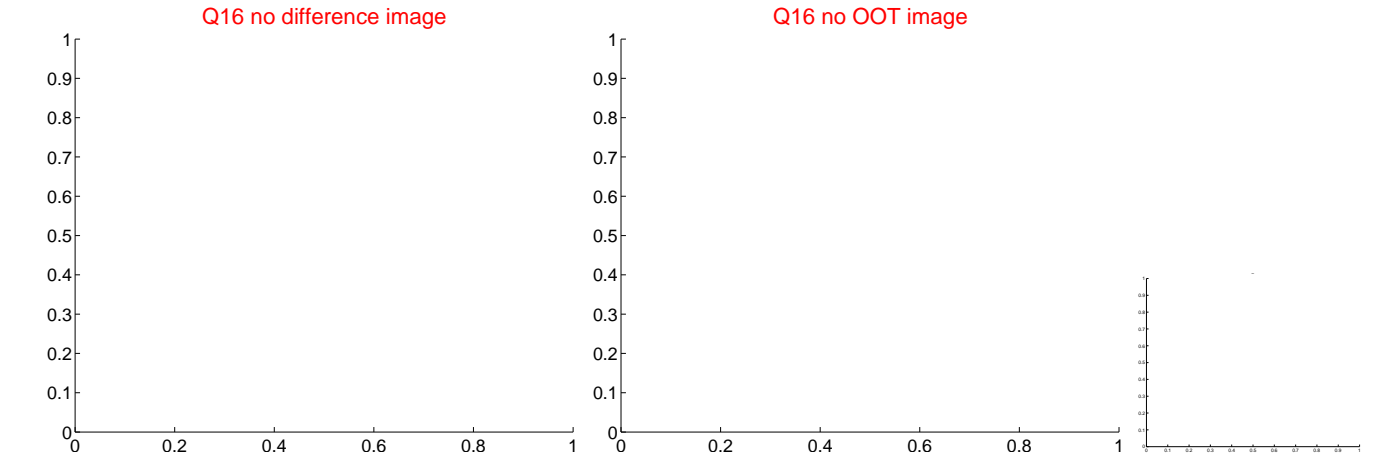
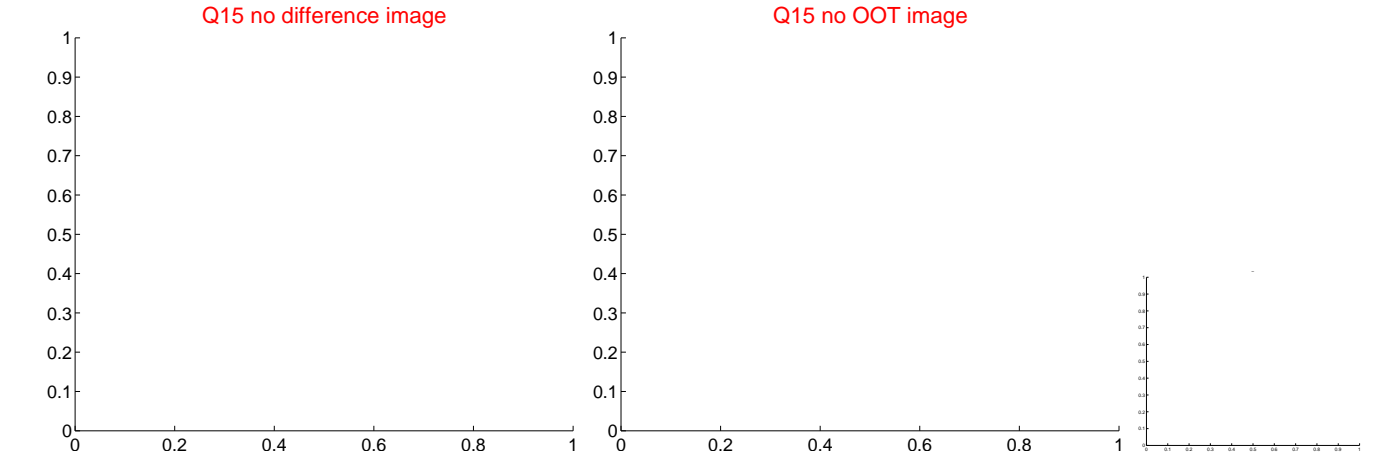
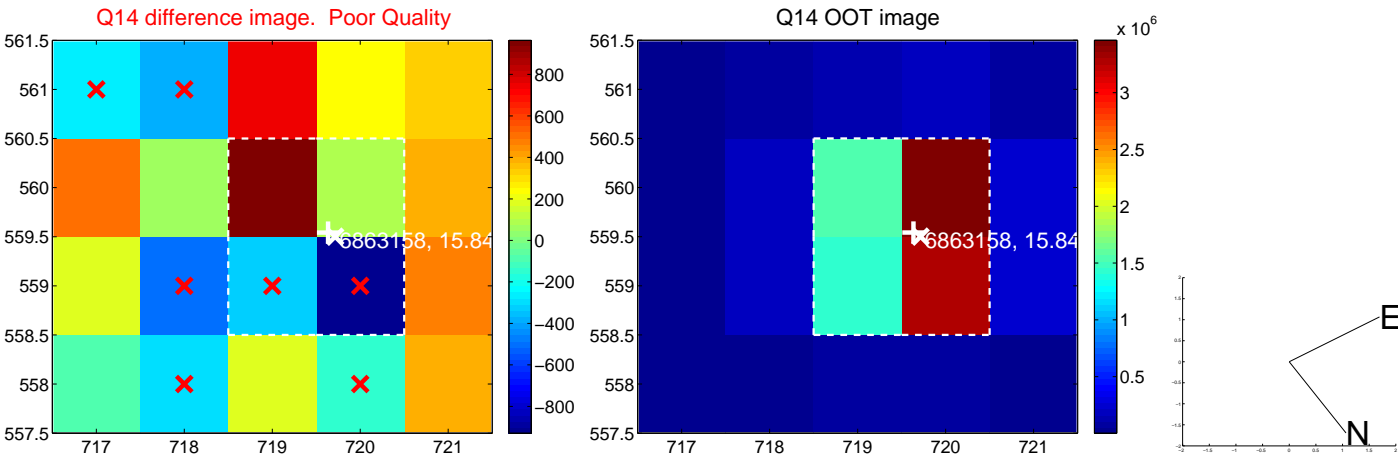
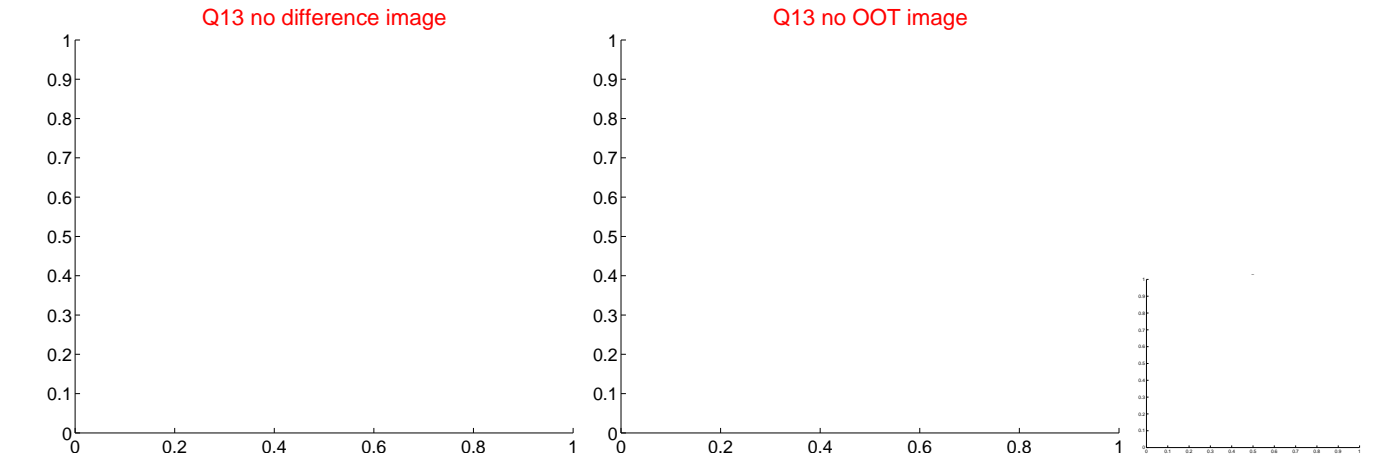
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



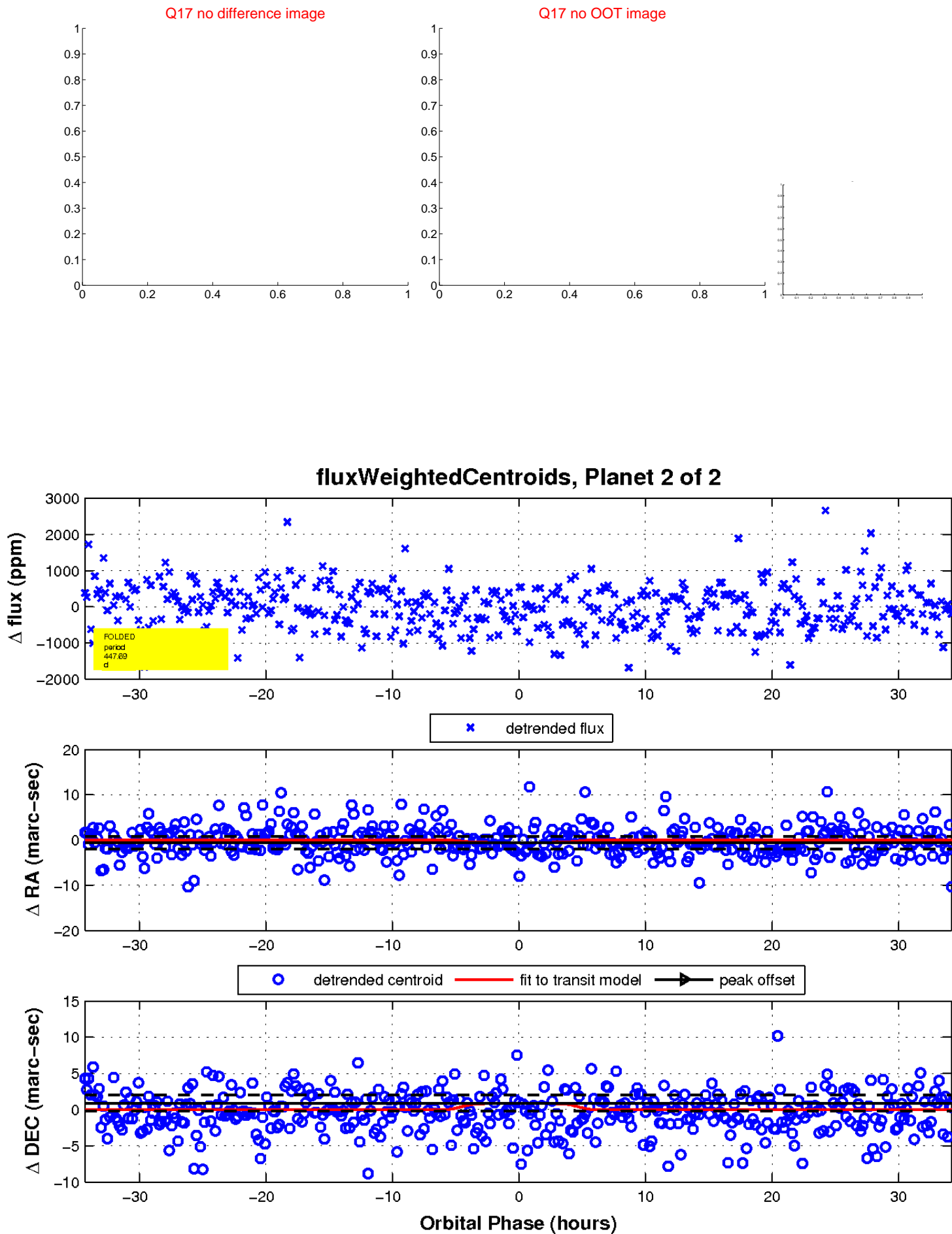
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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.



UKIRT Image

Declination

