

KIC 002716853

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})
002716853-01	OBS	1022.01	18.827412	139.708839	944.8	4.723	25.1	26.9	0.86	5687	2.79	37.88
002716853-02	OBS	1022.02	68.831585	172.136601	655.4	3.660	7.4	8.3	0.86	5687	2.27	6.72

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002716853-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
002716853-02	OBS	FP	0.04	1	0	1	0	MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET

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

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

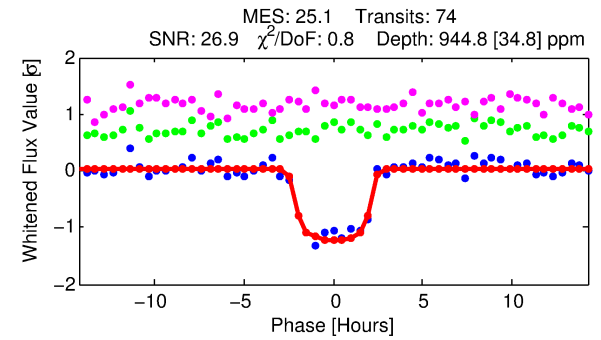
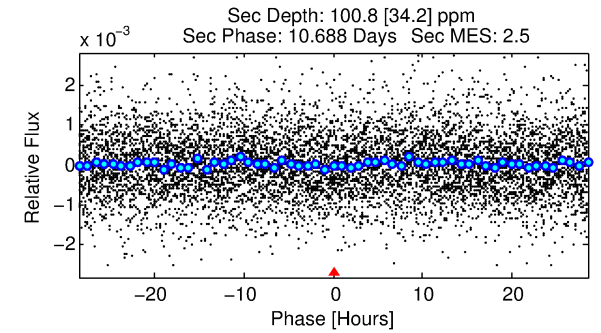
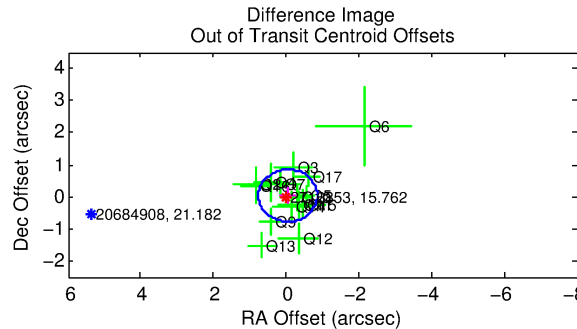
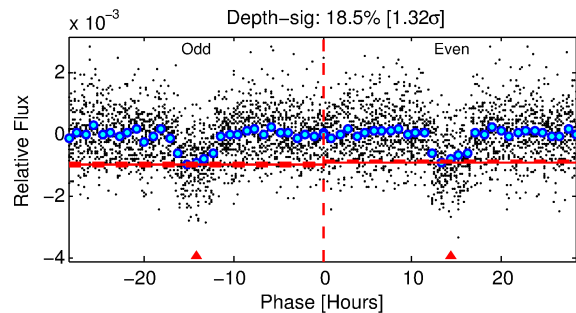
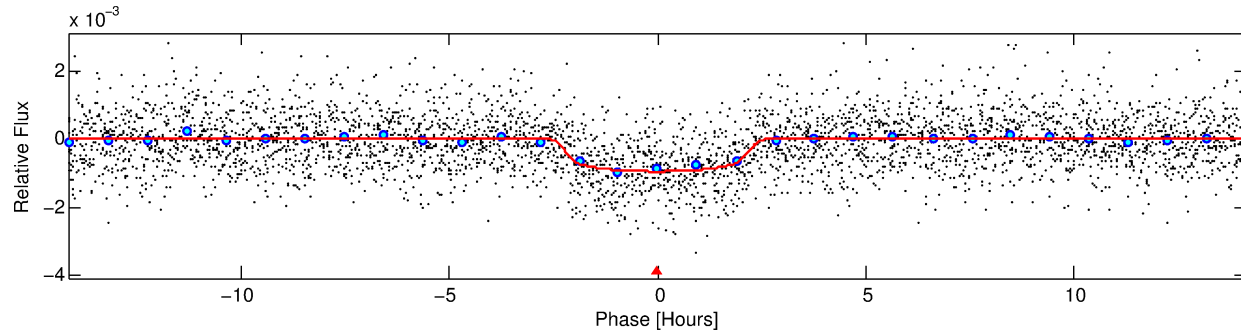
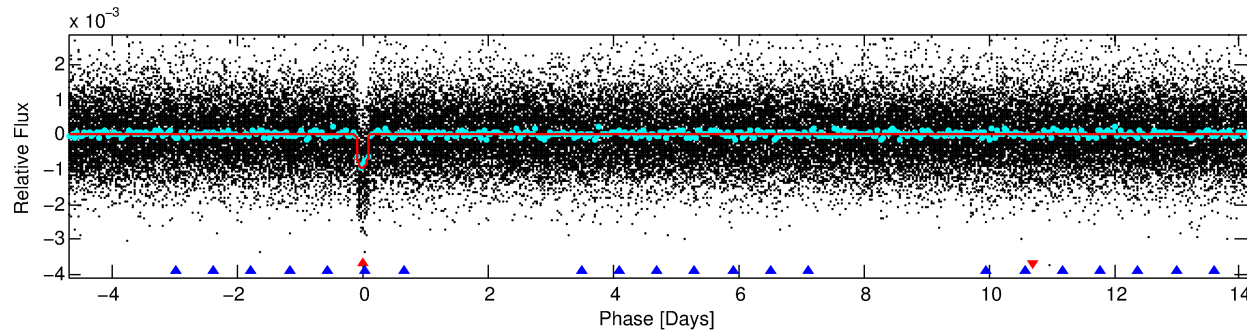
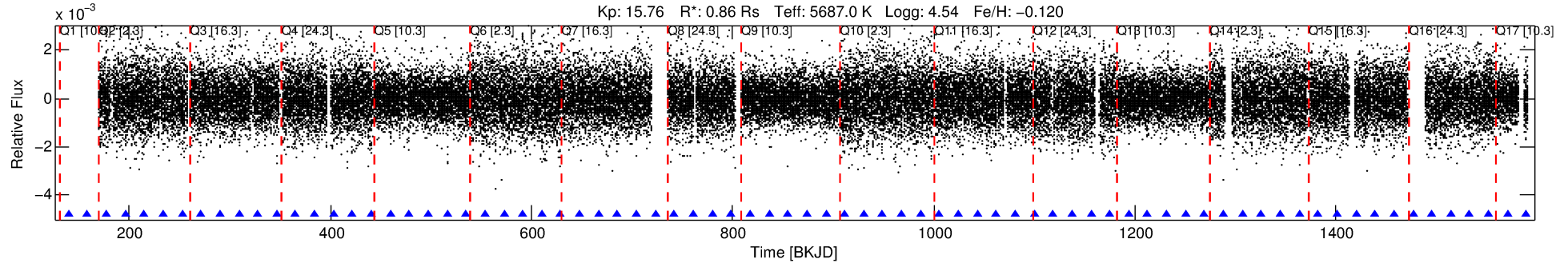
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002716853-01

No Significant Match Found

DV One-Page Summary

KIC: 2716853 Candidate: 1 of 2 Period: 18.827 d
KOI: K01022.01 Corr: 0.994



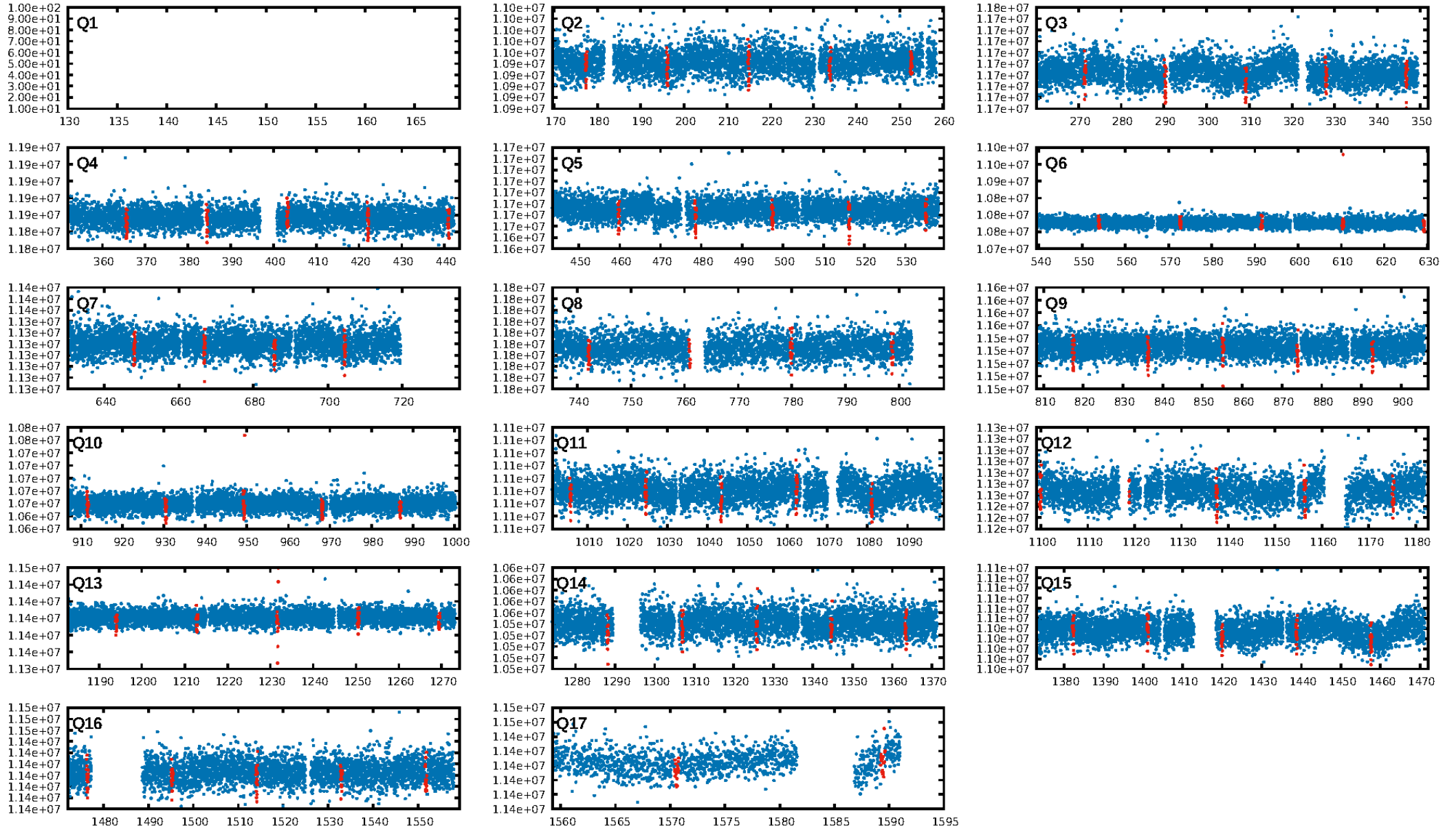
DV Fit Results:

Period = 18.82741 [0.00009] d
Epoch = 139.7088 [0.0039] BKJD
Rp/R* = 0.0298 [0.0107]
a/R* = 23.97 [37.10]
b = 0.66 [1.32]
Seff = 37.88 [13.67]
Teq = 633 [57] K
Rp = 2.79 [1.28] Re
a = 0.1353 [0.0321] AU
Ag = 130.07 [112.39] [1.15 σ]
Teffp = 3303 [663] K [4.01 σ]

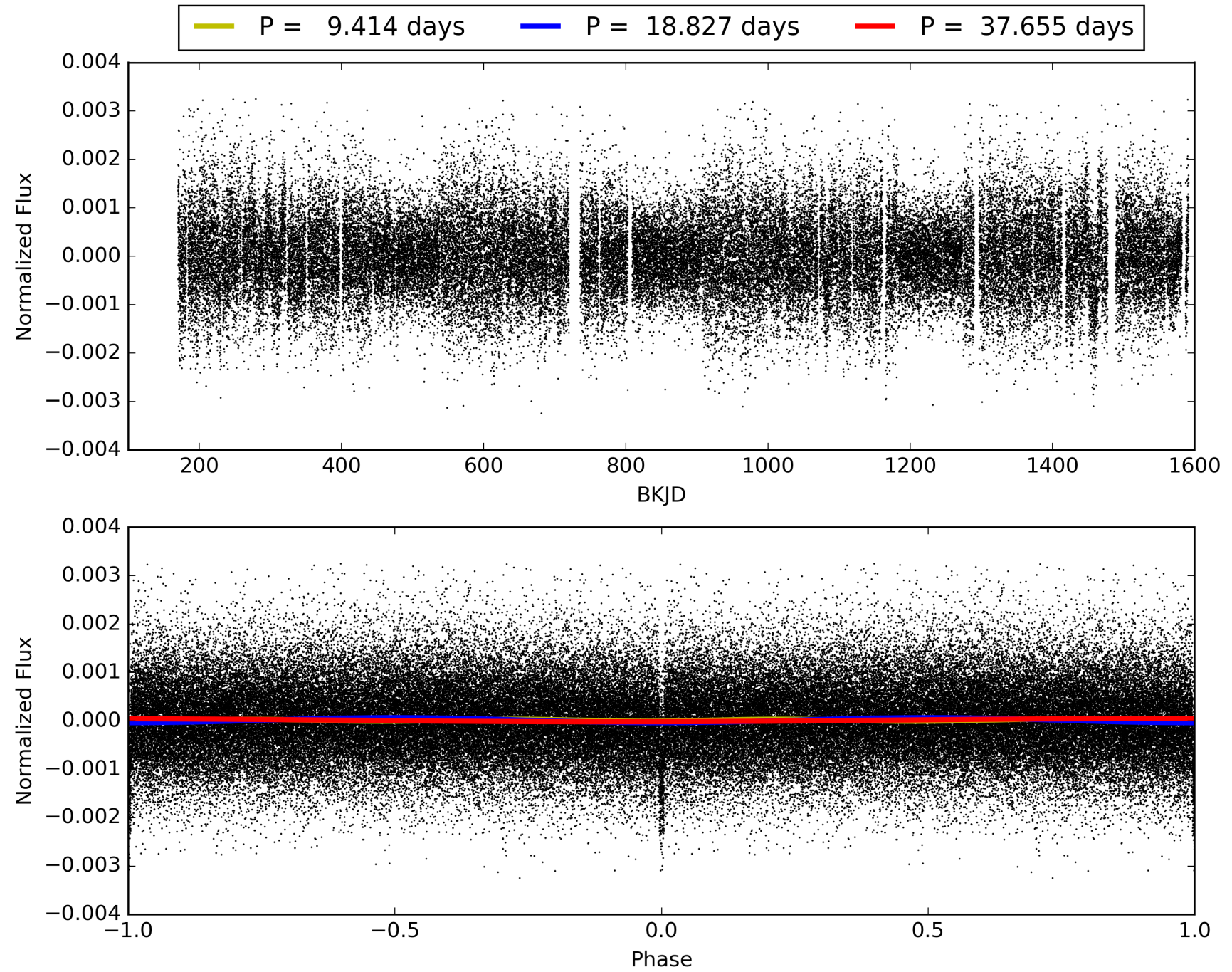
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [200.84 σ]
ModelChiSquare2-sig: 77.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.04e-137
RollingBand-fgt: 1.00 [72/72]
GhostDiagnostic-chr: 2.512
Centroid-sig: 11.0%
Centroid-so: 0.048 arcsec [0.09 σ]
OotOffset-rm: 0.055 arcsec [0.20 σ]
KicOffset-rm: 0.185 arcsec [0.91 σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.93 [14/15]
DiffImageOverlap-fno: 1.00 [16/16]

TCE 002716853-01, PDC Light Curves

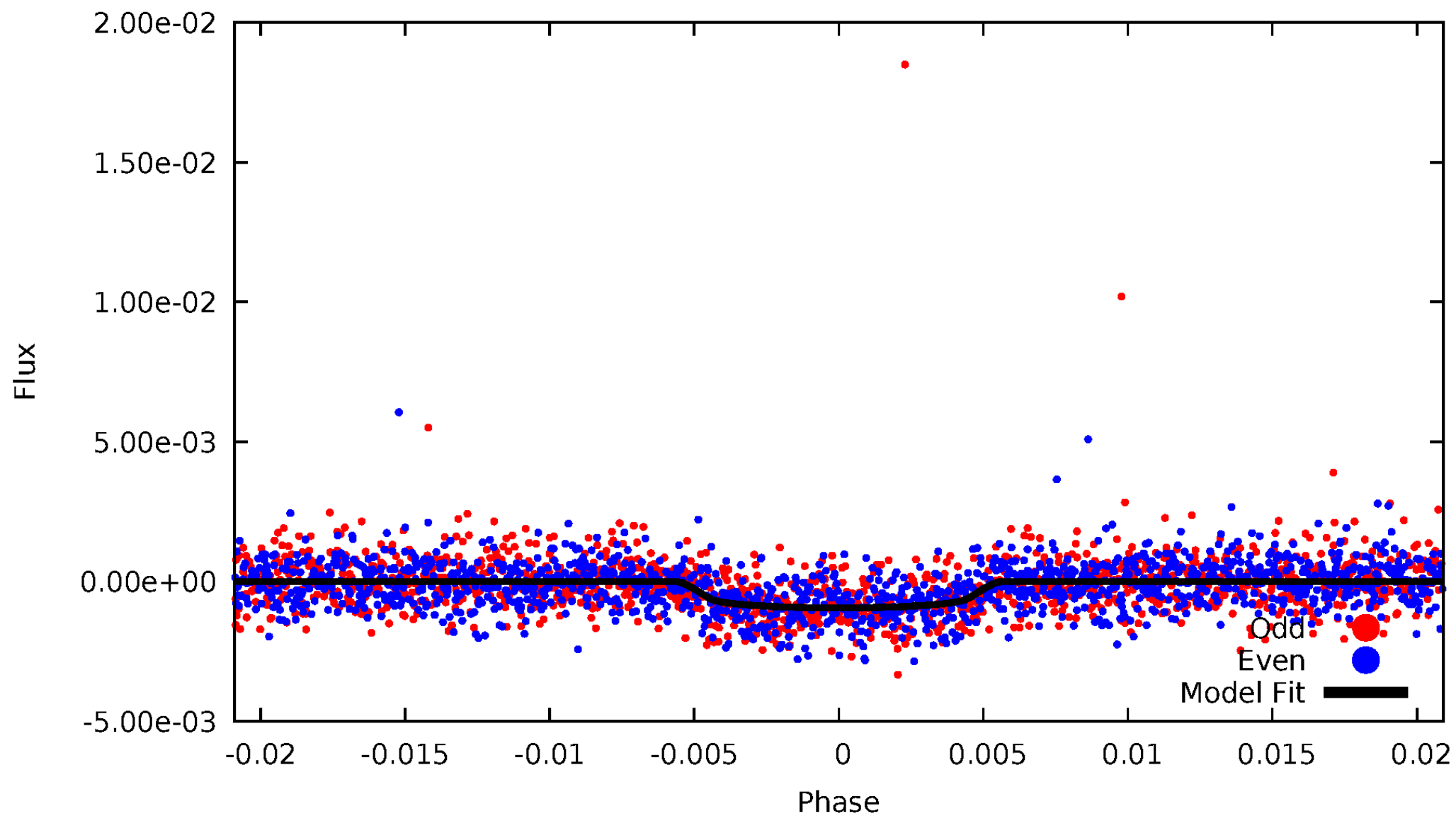


TCE 002716853-01



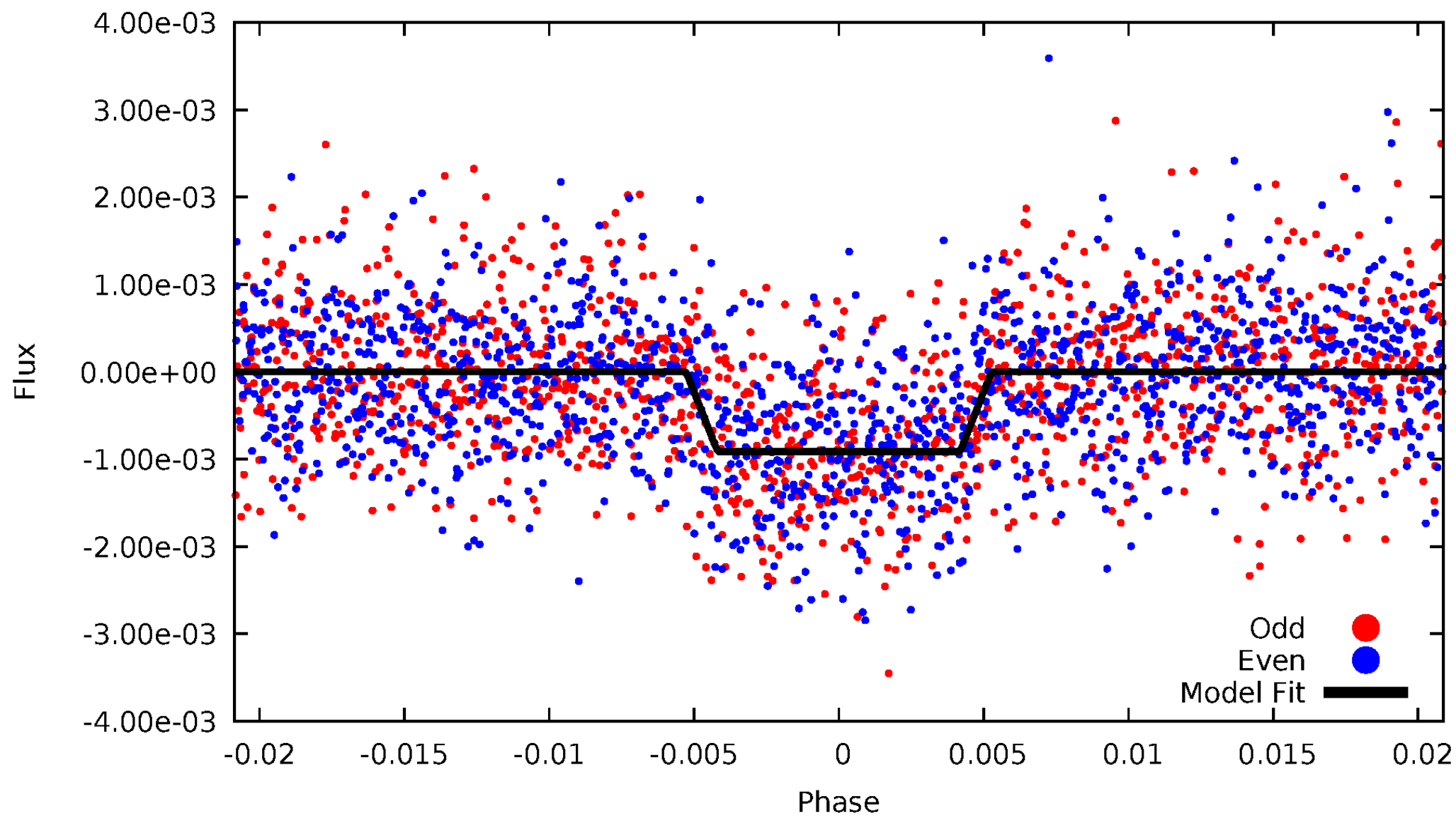
DV Odd/Even

TCE 002716853-01

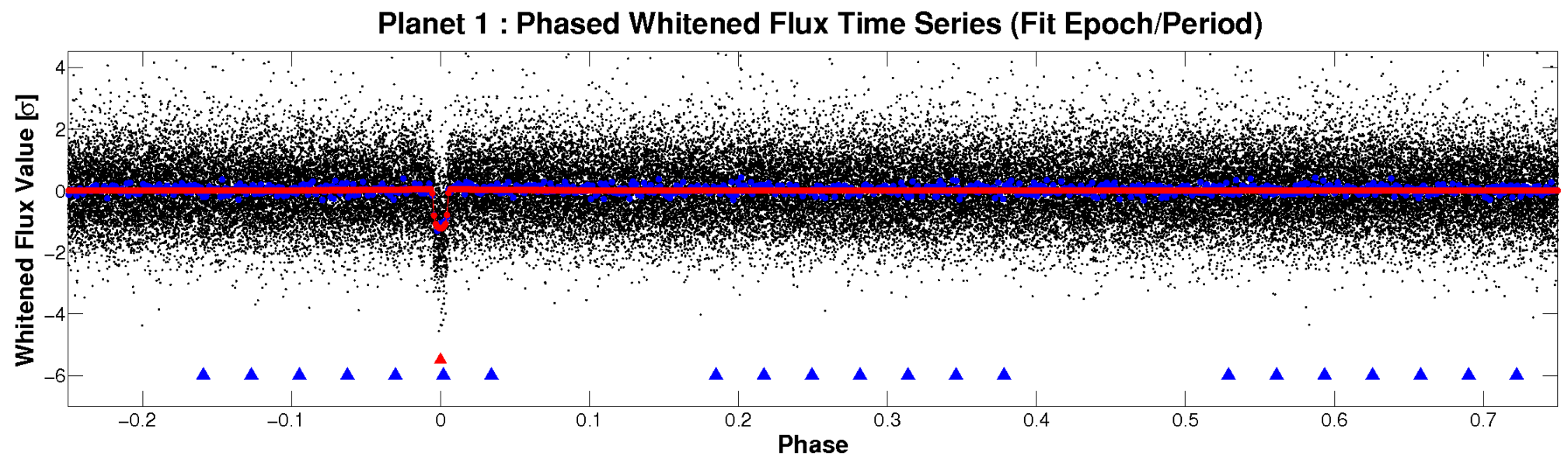
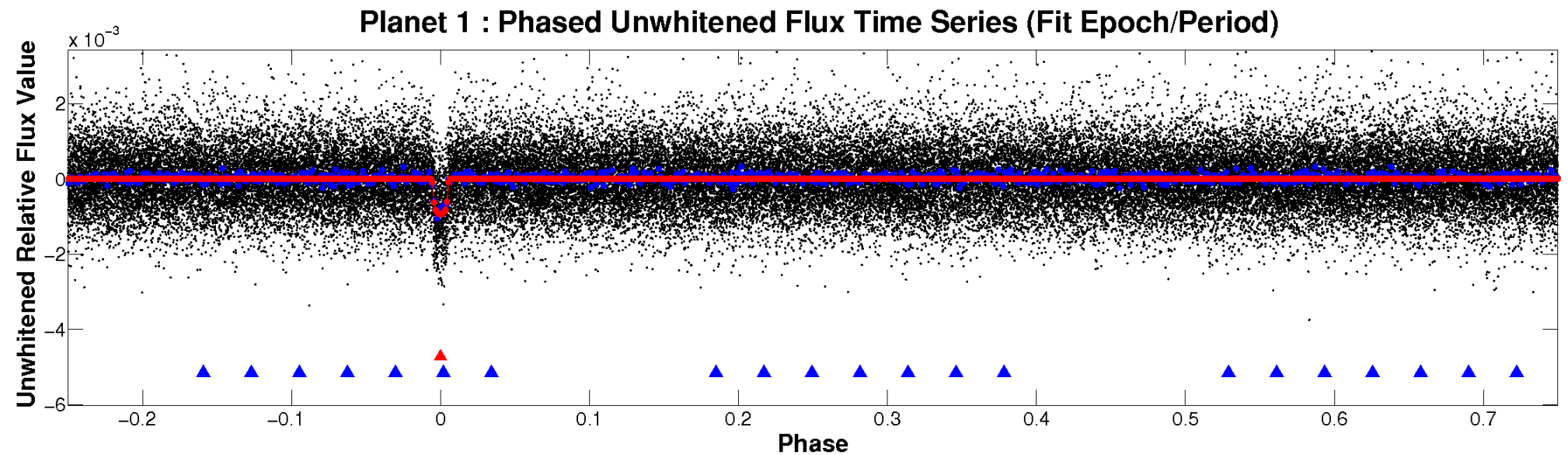


ALT Odd/Even

TCE 002716853-01

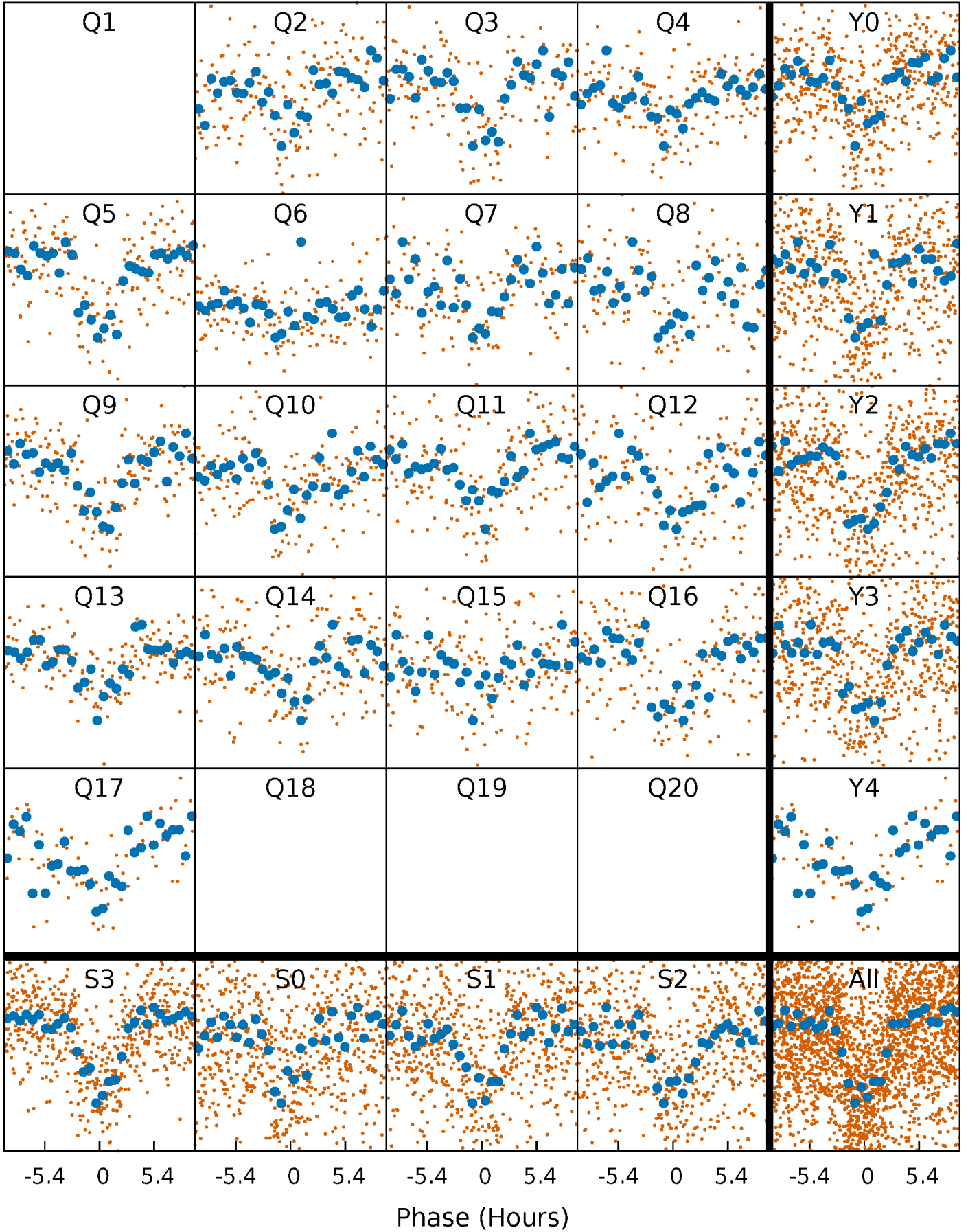


Non-Whitened Vs. Whitened Light Curve



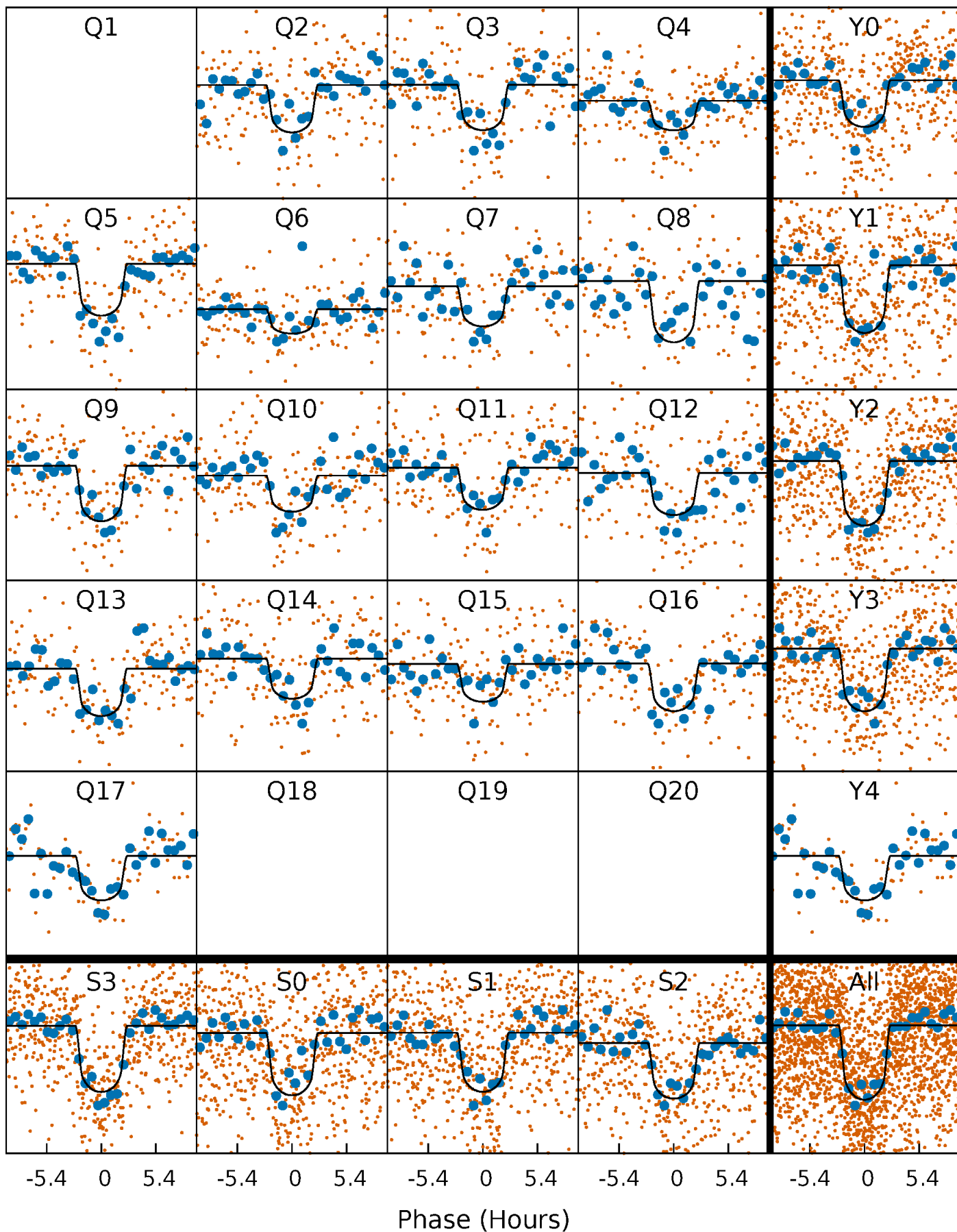
PDC Quarter-Phased Transit Curves

TCE 002716853-01 P= 18.827412 Days $T_0=139.708839$ (BKJD)



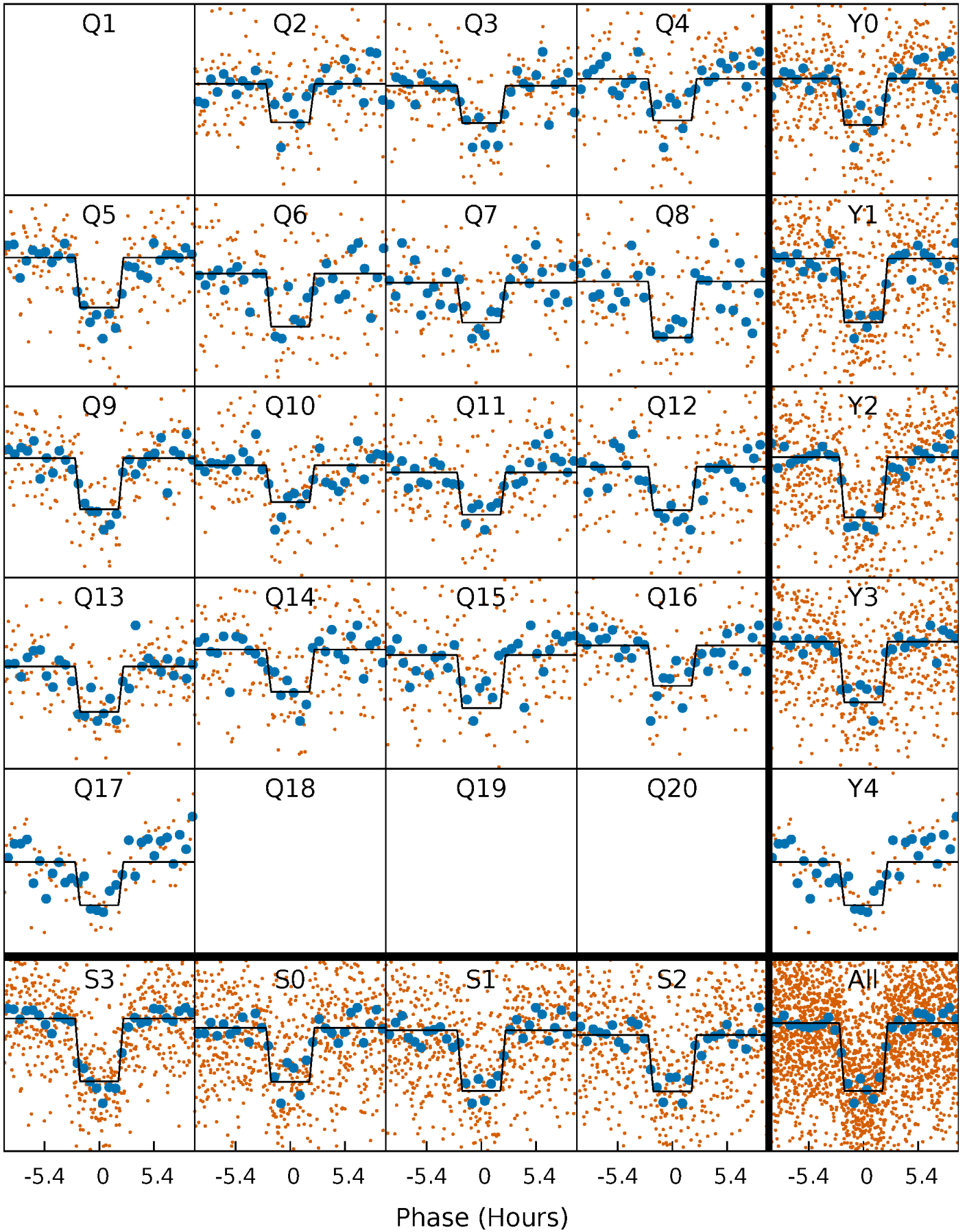
DV Quarter-Phased Transit Curves

TCE 002716853-01 P= 18.827412 Days $T_0=139.708839$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

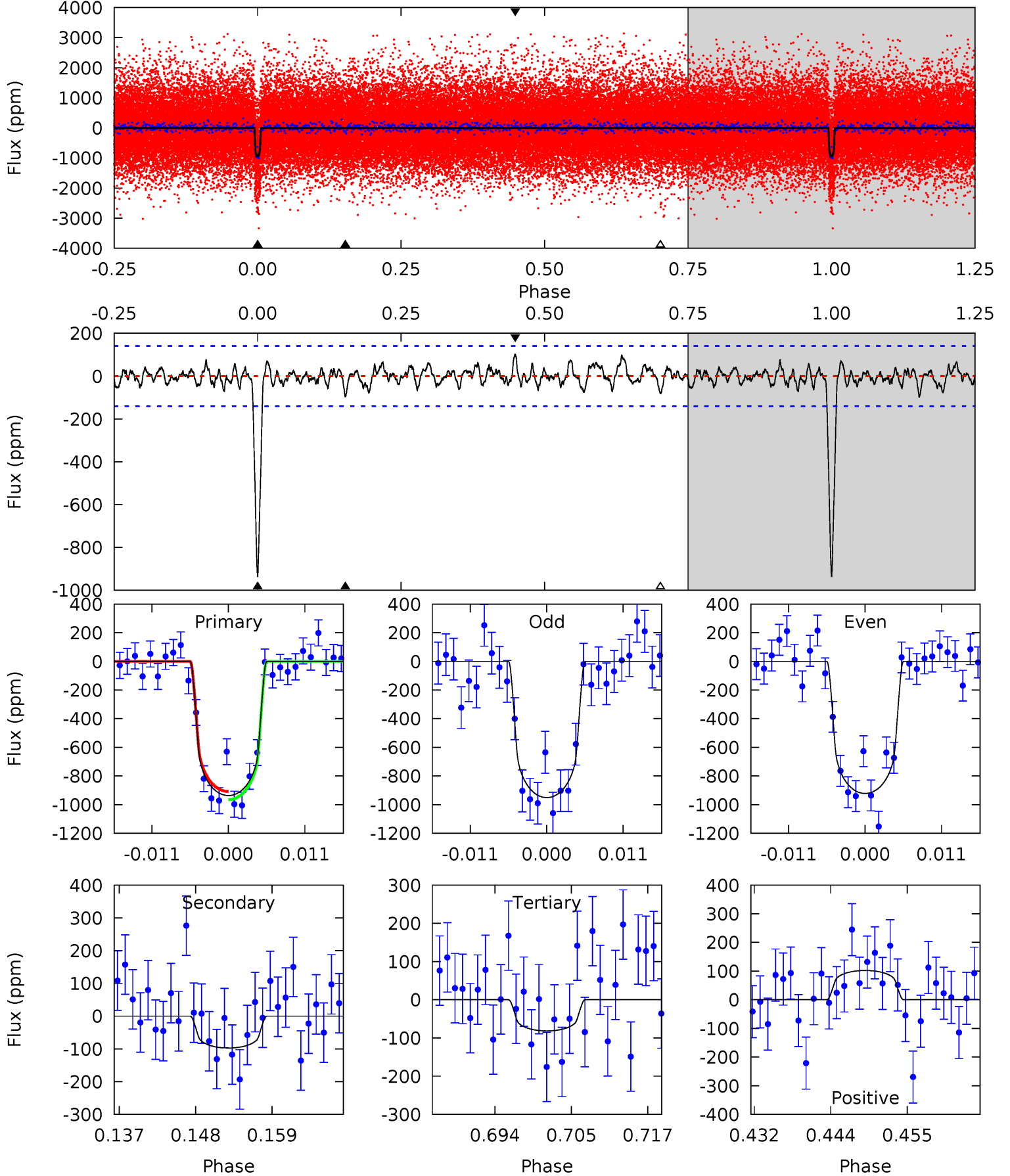
TCE 002716853-01 P= 18.827610 Days $T_0=139.702742$ (BKJD)



DV Model-Shift Uniqueness Test

002716853-01, $P = 18.827412$ Days, $E = 139.708839$ Days

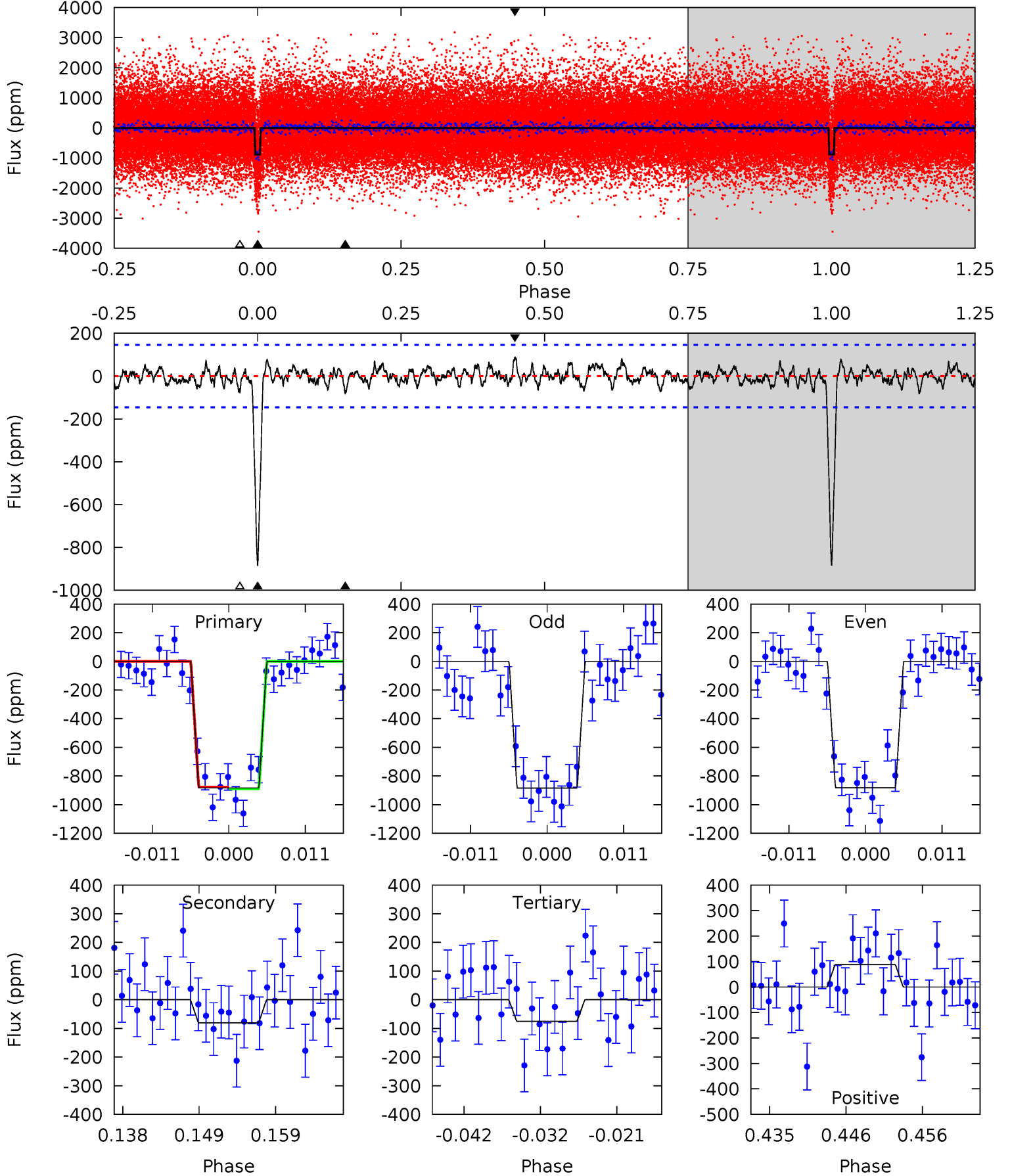
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.3	3.46	2.90	3.63	5.00	2.53	1.13	30.4	29.7	0.56	-0.17	0.52	0.97	0.10	1.02



Alt Model-Shift Uniqueness Test

002716853-01, $P = 18.827610$ Days, $E = 139.702742$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.4	2.77	2.59	3.03	5.01	2.56	0.99	27.8	27.4	0.18	-0.27	0.05	0.99	0.09	0.22



Stellar Parameters For KIC 002716853

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5687^{+169}_{-169}	$4.538^{+0.046}_{-0.184}$	$-0.120^{+0.300}_{-0.300}$	$0.860^{+0.246}_{-0.082}$	$0.930^{+0.104}_{-0.104}$	$2.062^{+0.403}_{-1.059}$
	+3%/-3%	+1%/-4%	+250%/-250%	+29%/-10%	+11%/-11%	+20%/-51%
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 002716853-01 / KOI 1022.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-97 ± 28	$2.92^{+1.13}_{-1.04}$	904^{+57}_{-43}	3701^{+588}_{-410}	113^{+154}_{-58}
Alt.	-80 ± 29	$2.96^{+1.18}_{-1.03}$	905^{+61}_{-41}	3531^{+578}_{-401}	87^{+123}_{-49}

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 $A_{obs} \gg 1.0$

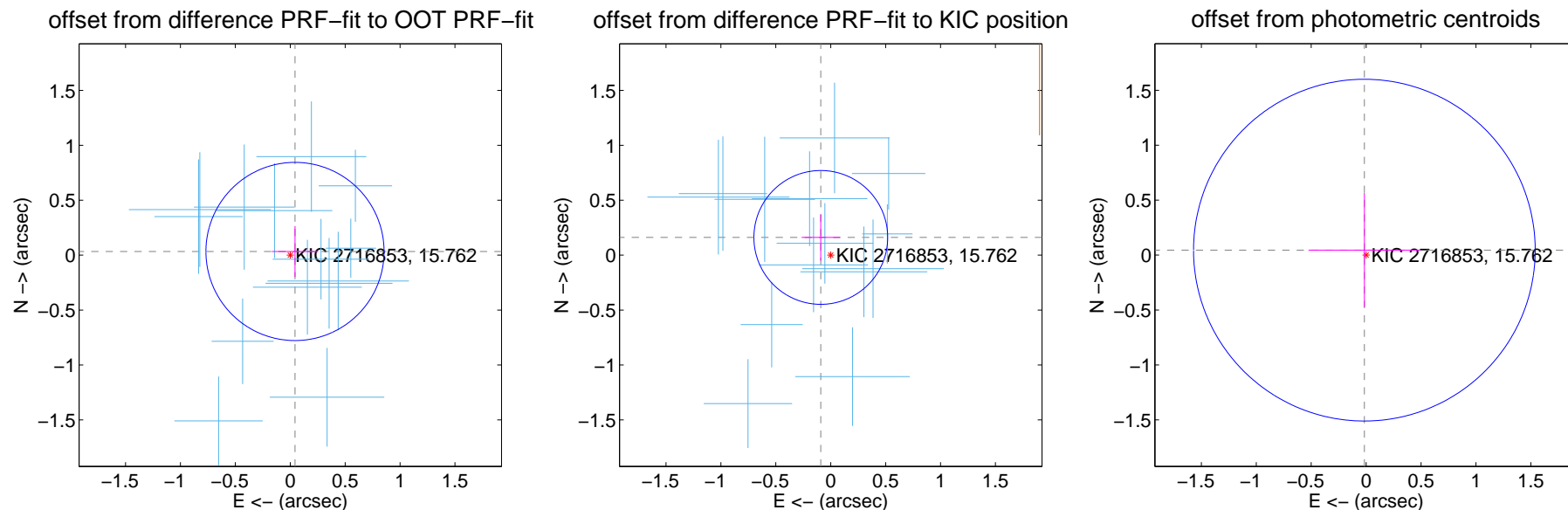
DV Centroid Data

Supplemental centroid analysis for 002716853-01. Kepler magnitude: 15.76. Transit SNR 26.94

There are 14 quarters with good PRF difference image offsets

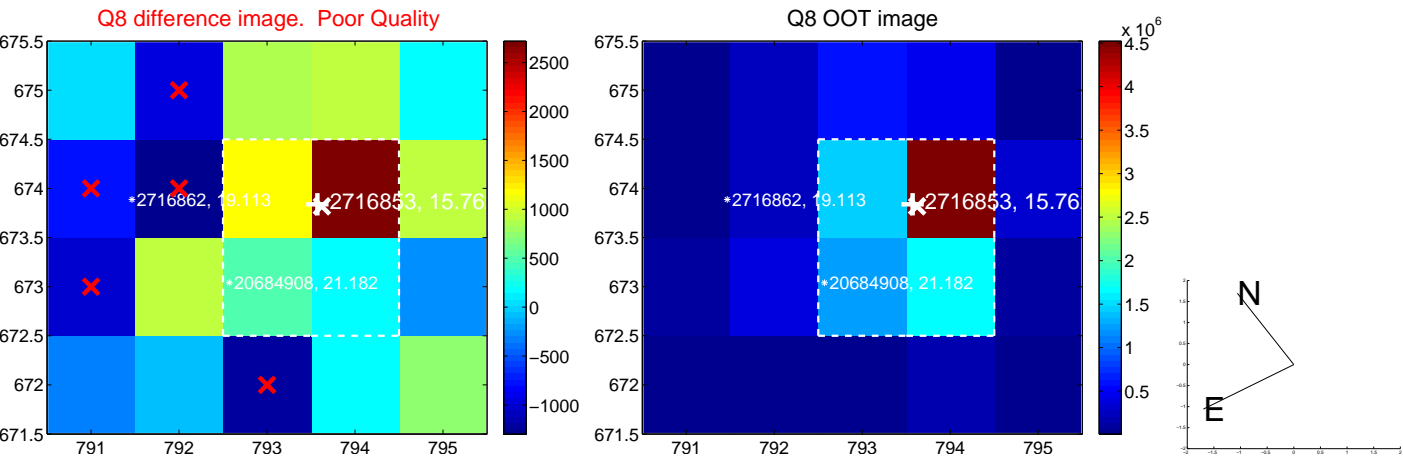
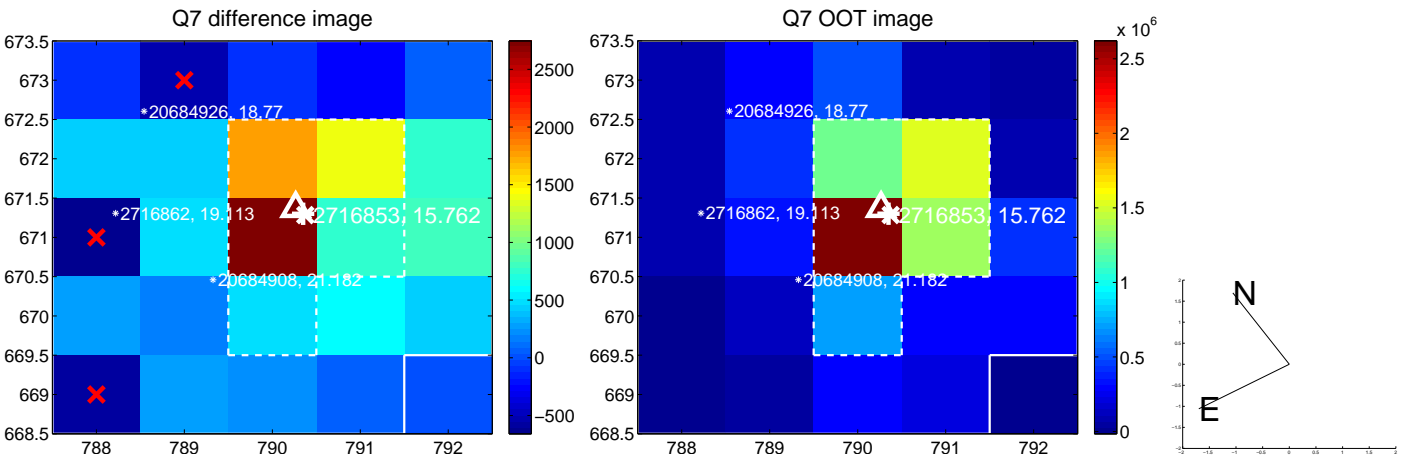
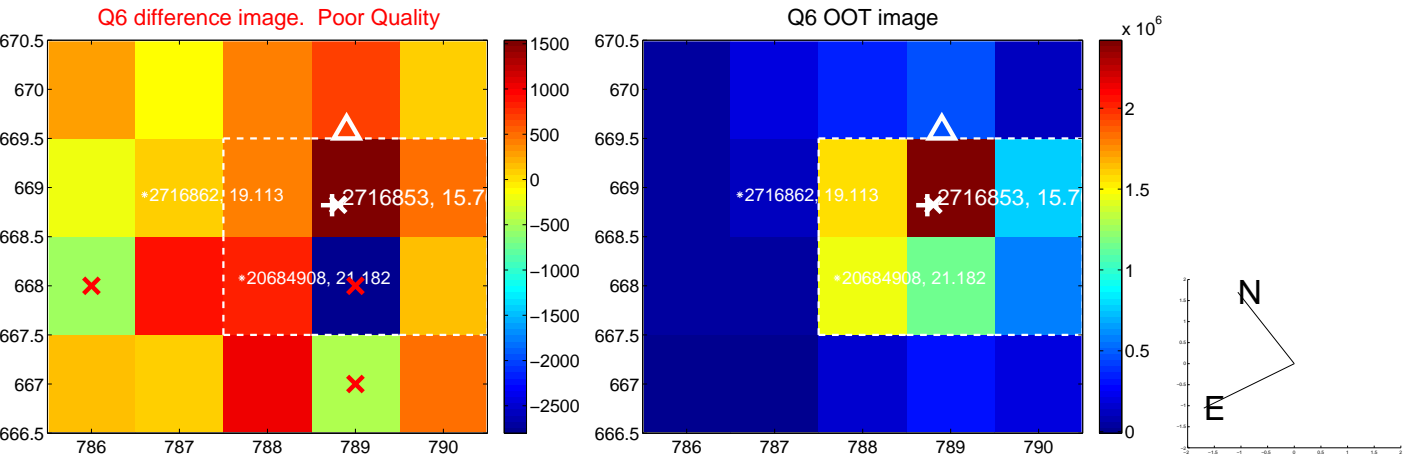
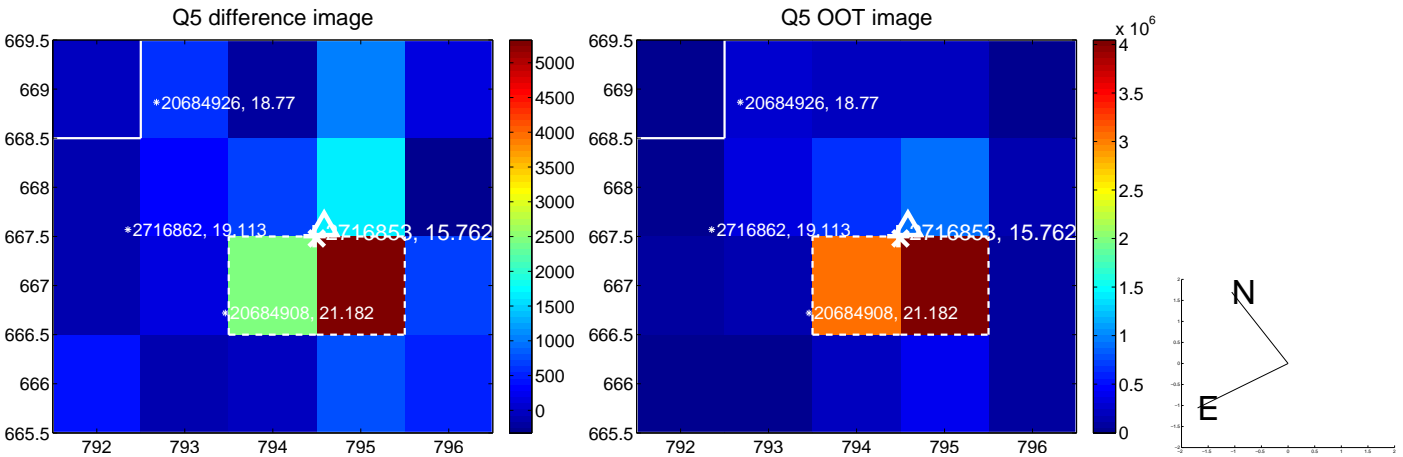
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.055 ± 0.270	0.20	-0.043 ± 0.211	0.034 ± 0.232
PRF-fit source offset from KIC position	0.185 ± 0.203	0.91	0.090 ± 0.176	0.161 ± 0.211
photometric centroid source offset	0.05 ± 0.52	0.09	0.02 ± 0.51	0.04 ± 0.52

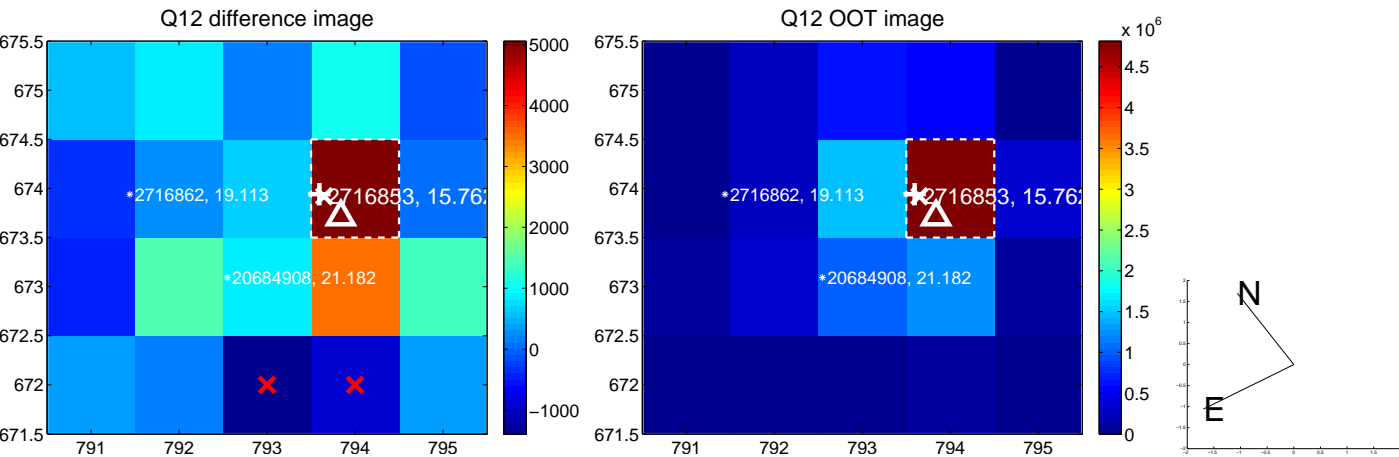
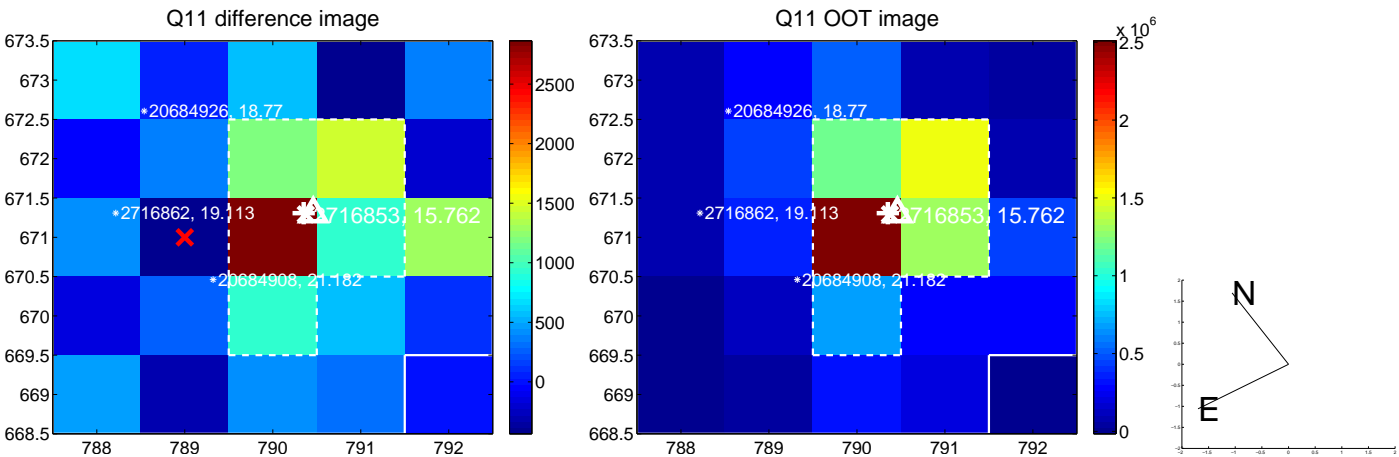
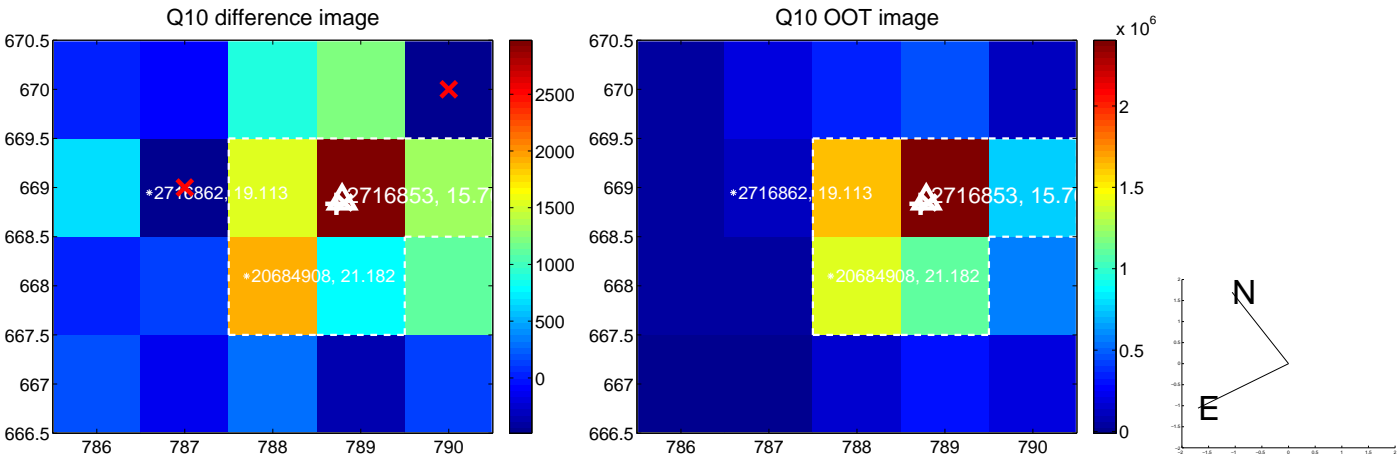
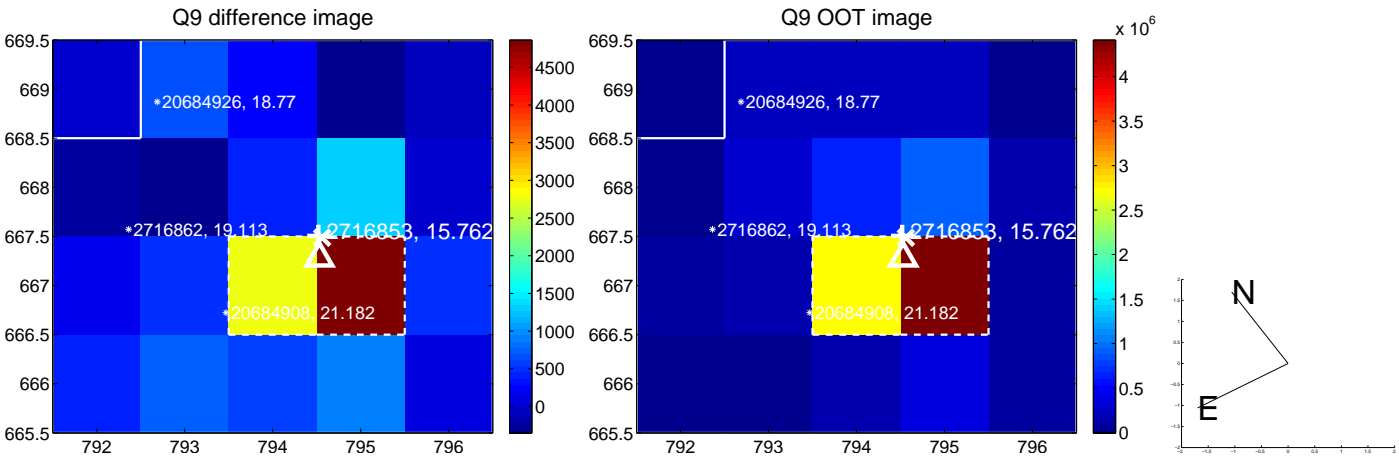


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

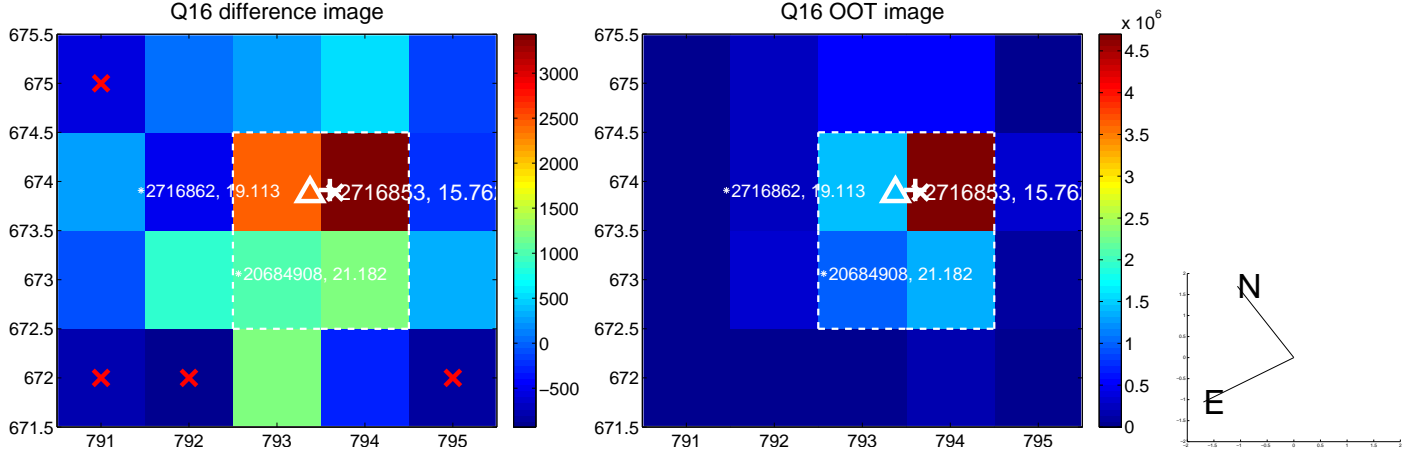
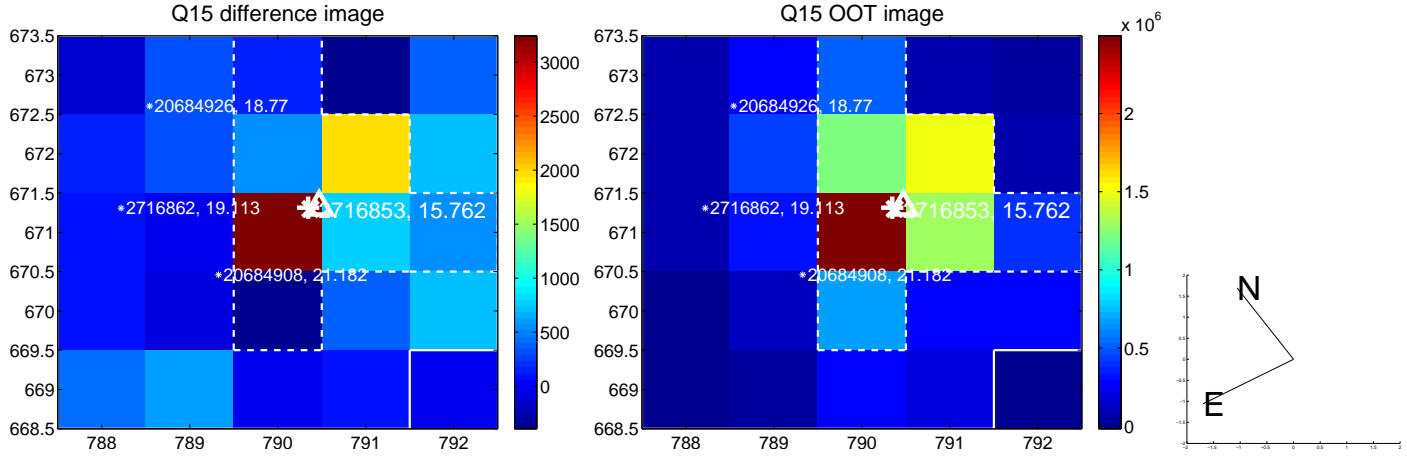
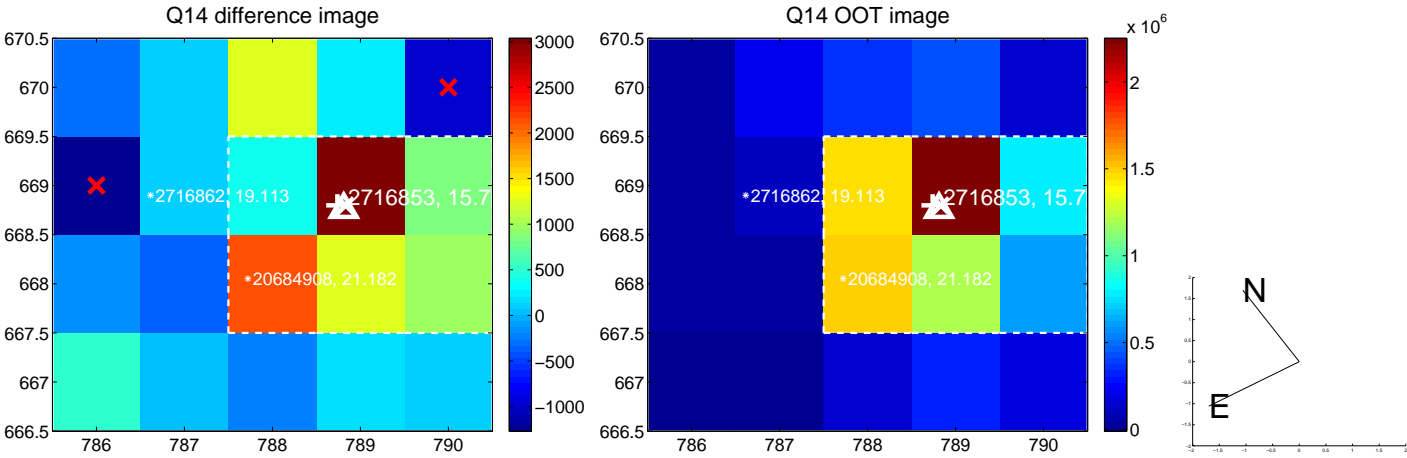
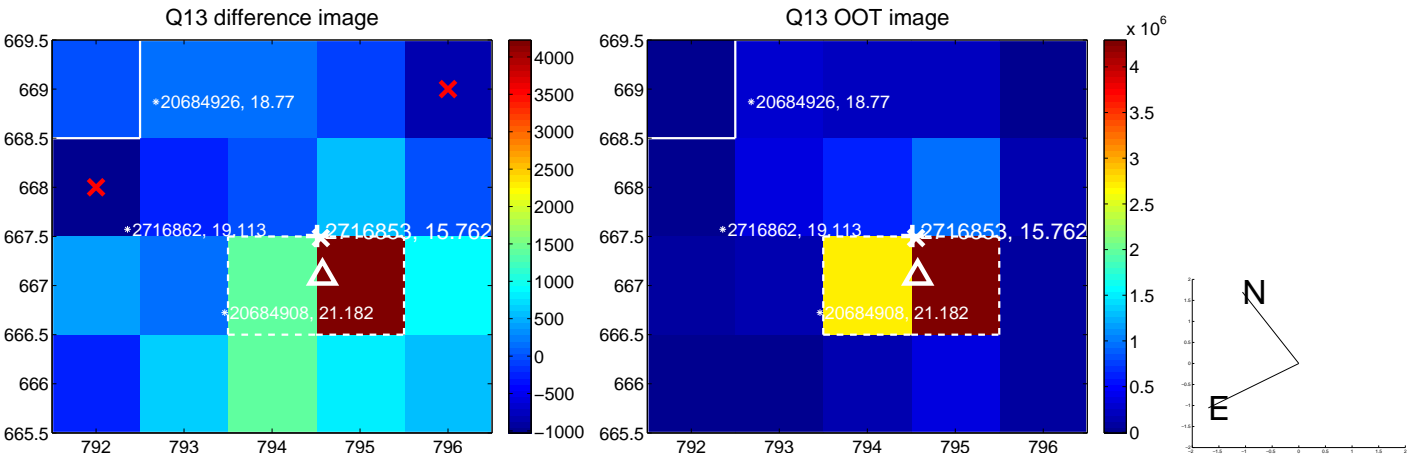
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



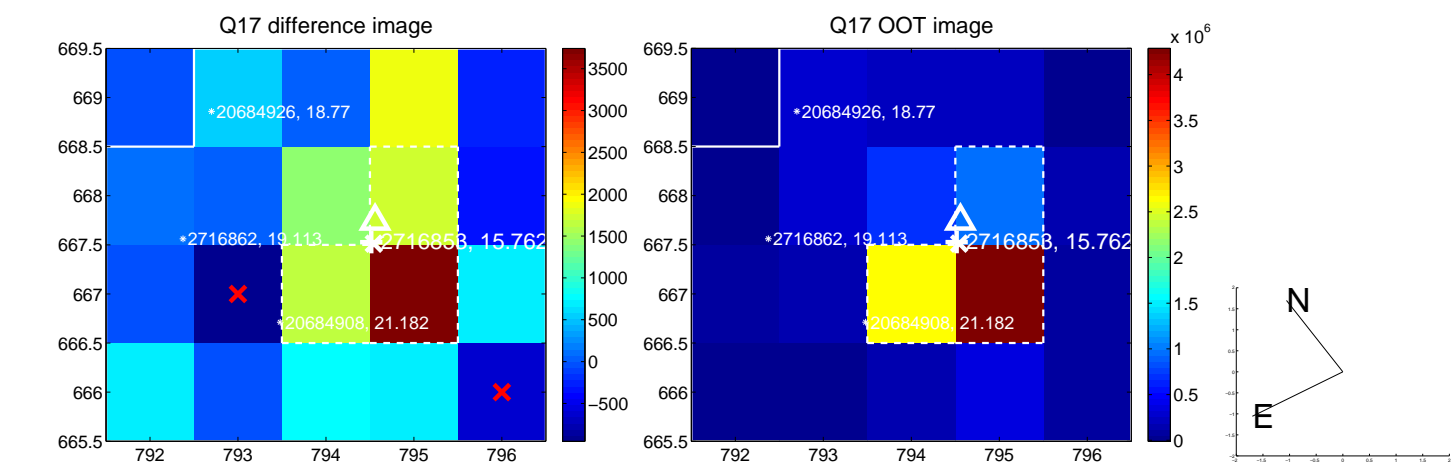
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



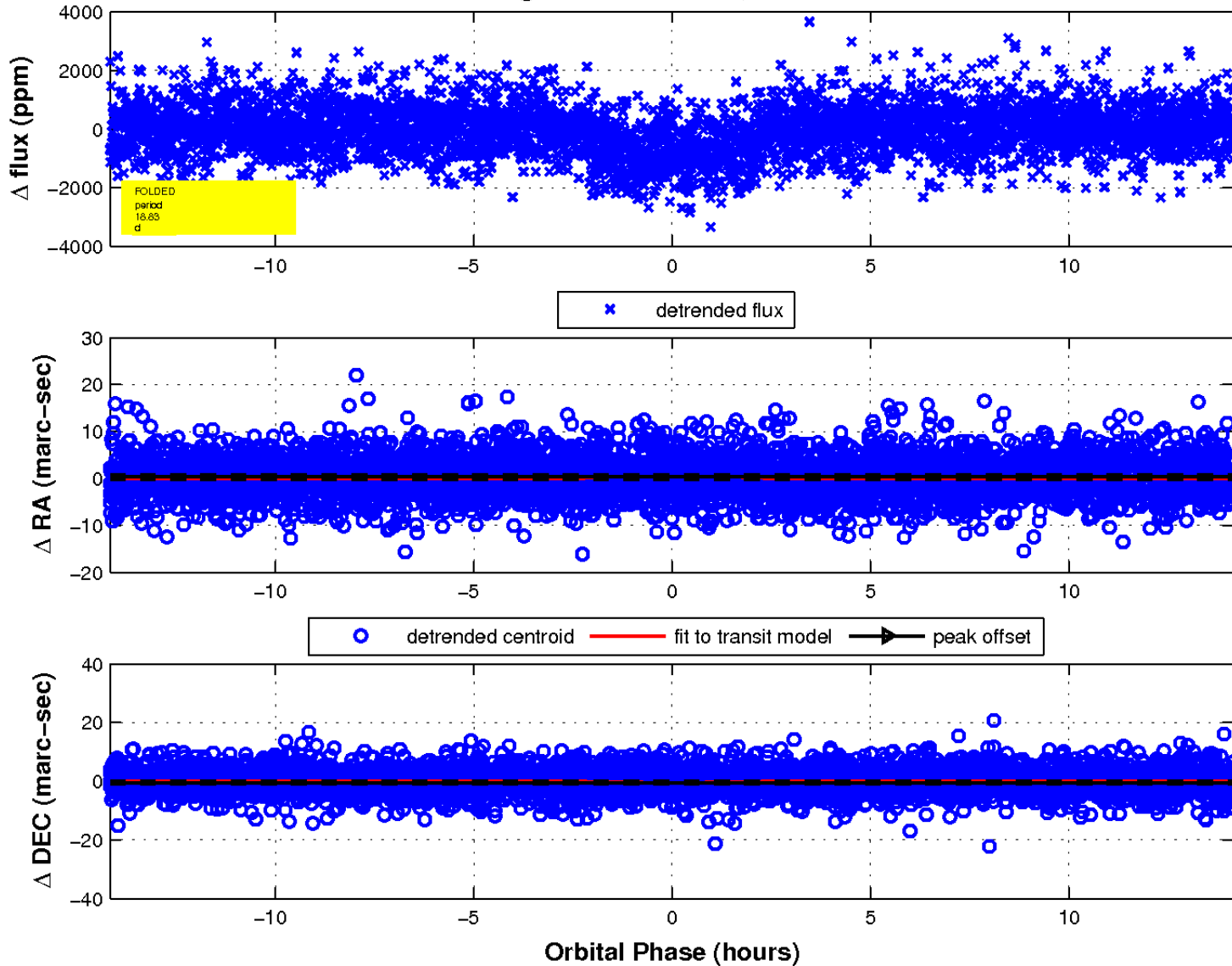
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

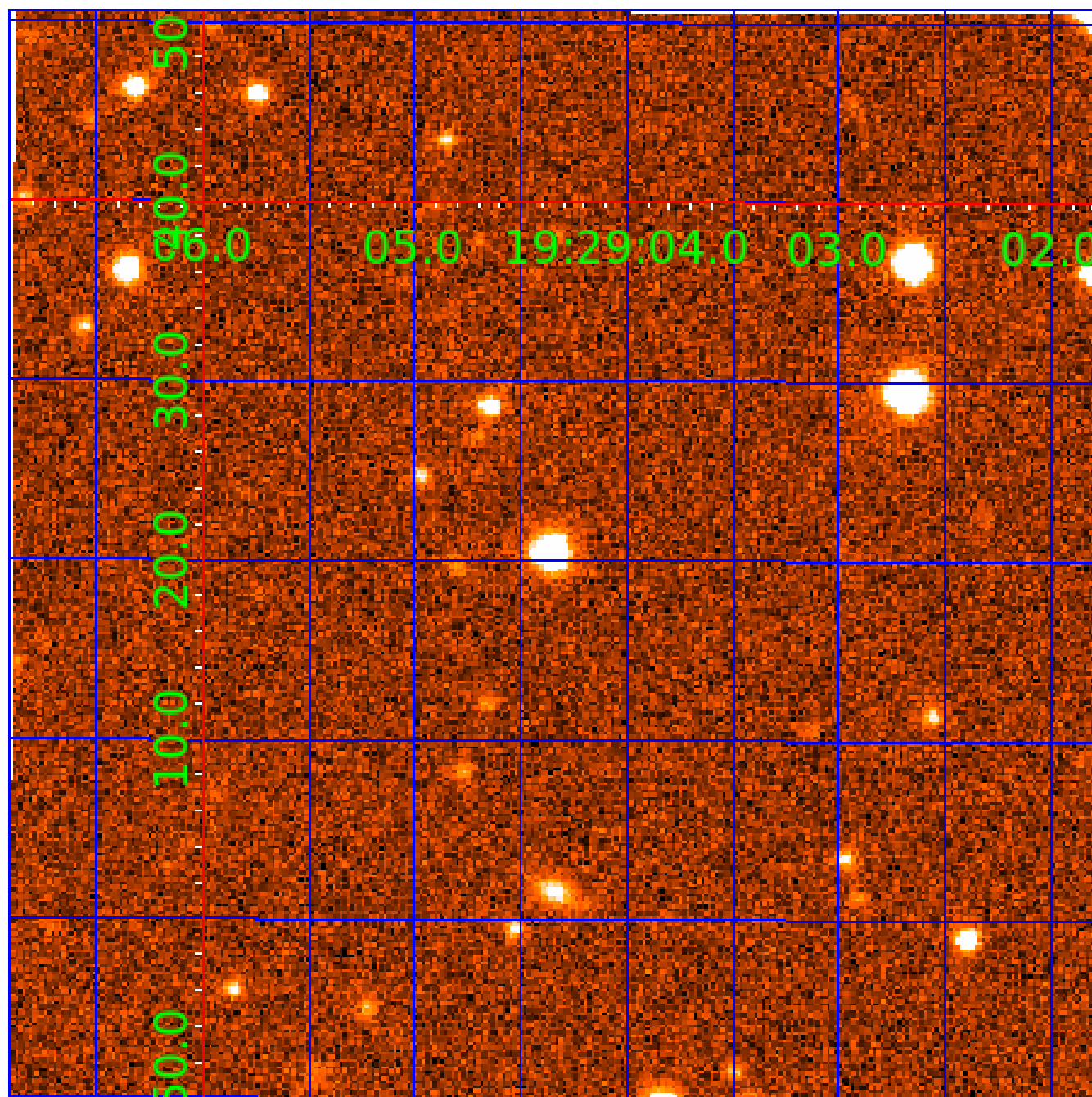


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 002716853

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})
002716853-01	OBS	1022.01	18.827412	139.708839	944.8	4.723	25.1	26.9	0.86	5687	2.79	37.88
002716853-02	OBS	1022.02	68.831585	172.136601	655.4	3.660	7.4	8.3	0.86	5687	2.27	6.72

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002716853-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
002716853-02	OBS	FP	0.04	1	0	1	0	MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET

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 002716853-02

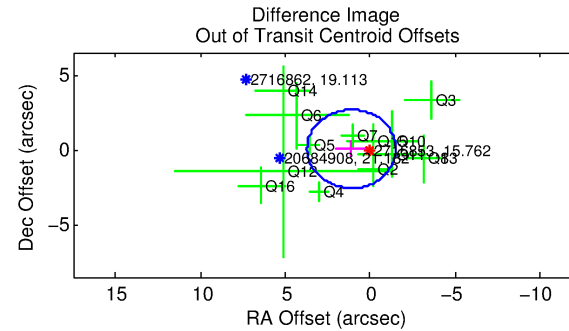
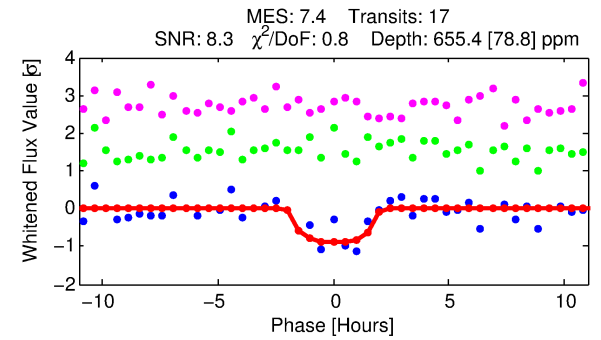
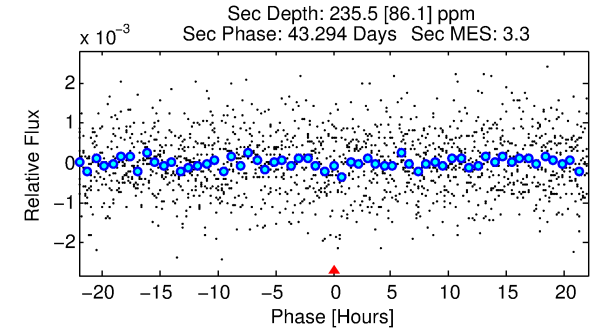
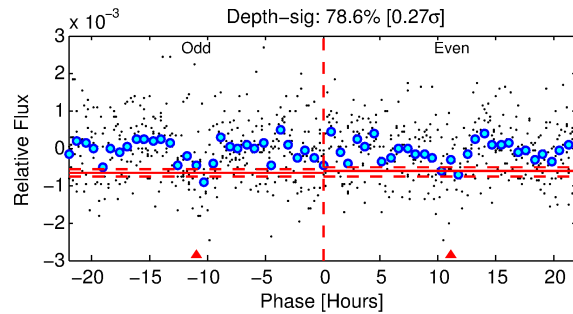
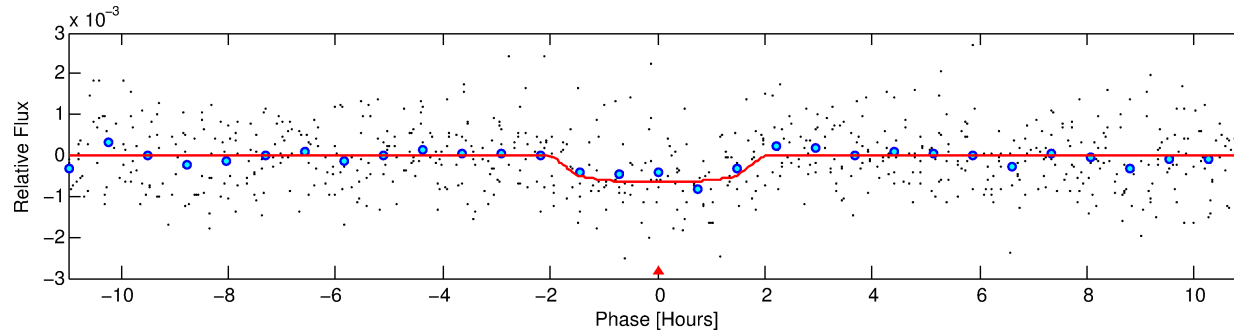
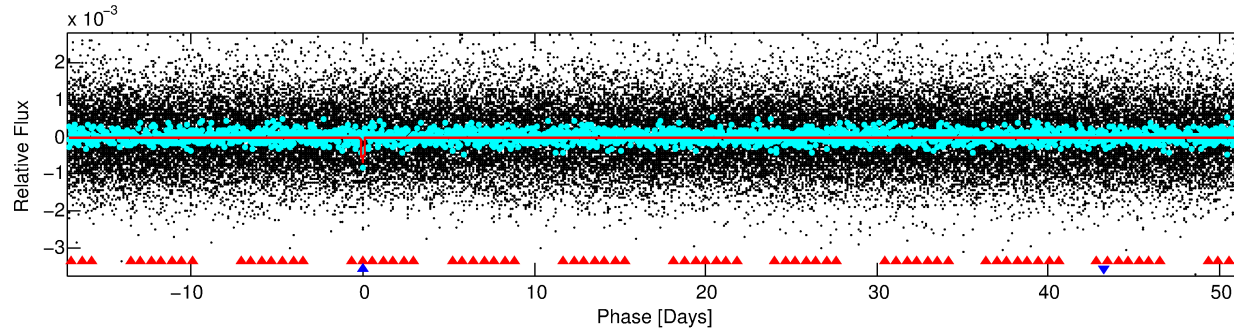
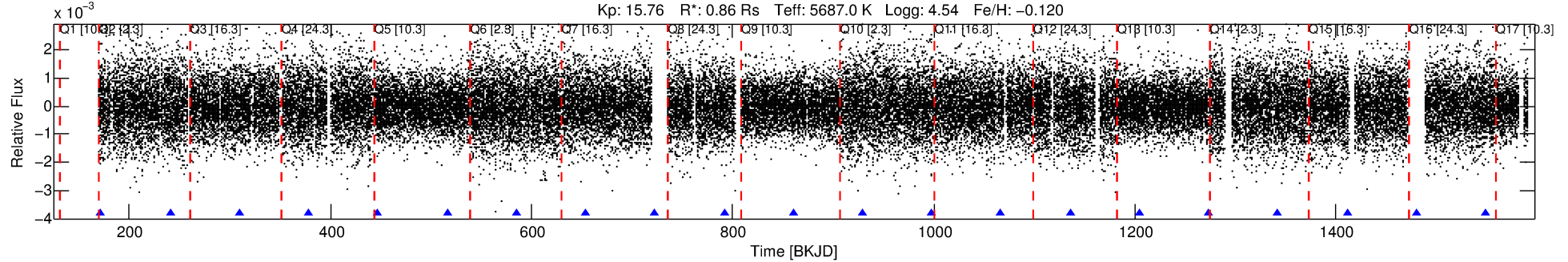
No Significant Match Found

DV One-Page Summary

KIC: 2716853 Candidate: 2 of 2 Period: 68.832 d

KOI: K01022 Corr: No Ephemeris Match

Kp: 15.76 R*: 0.86 Rs Teff: 5687.0 K Logg: 4.54 Fe/H: -0.120



DV Fit Results:

Period = 68.83158 [0.00089] d
Epoch = 172.1366 [0.0096] BKJD
Rp/R* = 0.0241 [0.0692]
a/R* = 124.99 [1547.37]
b = 0.54 [16.42]
Seff = 6.73 [2.43]
Teq = 411 [37] K
Rp = 2.26 [6.53] Re
a = 0.3210 [0.0762] AU
Ag = 2604.15 [14995.69] [0.17σ]
Teffp = 4535 [6519] K [0.63σ]

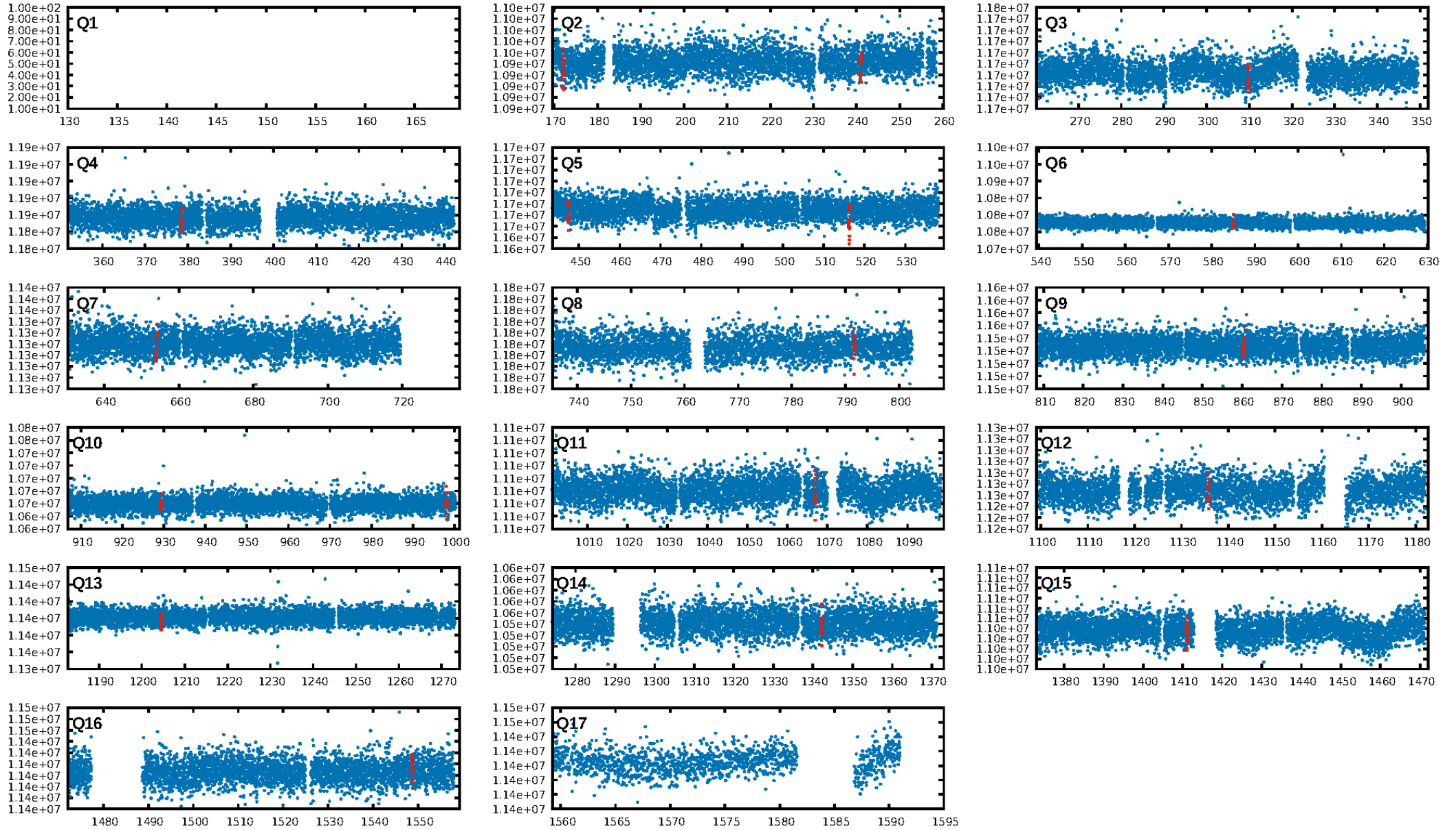
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [200.84σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 86.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.83e-14
RollingBand-fgt: 1.00 [17/17]
GhostDiagnostic-chr: 2.289
Centroid-sig: 55.5%
Centroid-so: 1.444 arcsec [0.86σ]
OotOffset-rm: 1.099 arcsec [1.26σ]
KicOffset-rm: 1.195 arcsec [1.29σ]
OotOffset-st: 4/4/4/2 [14]
KicOffset-st: 4/4/4/2 [14]
DiffImageQuality-fgm: 0.00 [0/14]
DiffImageOverlap-fno: 1.00 [15/15]

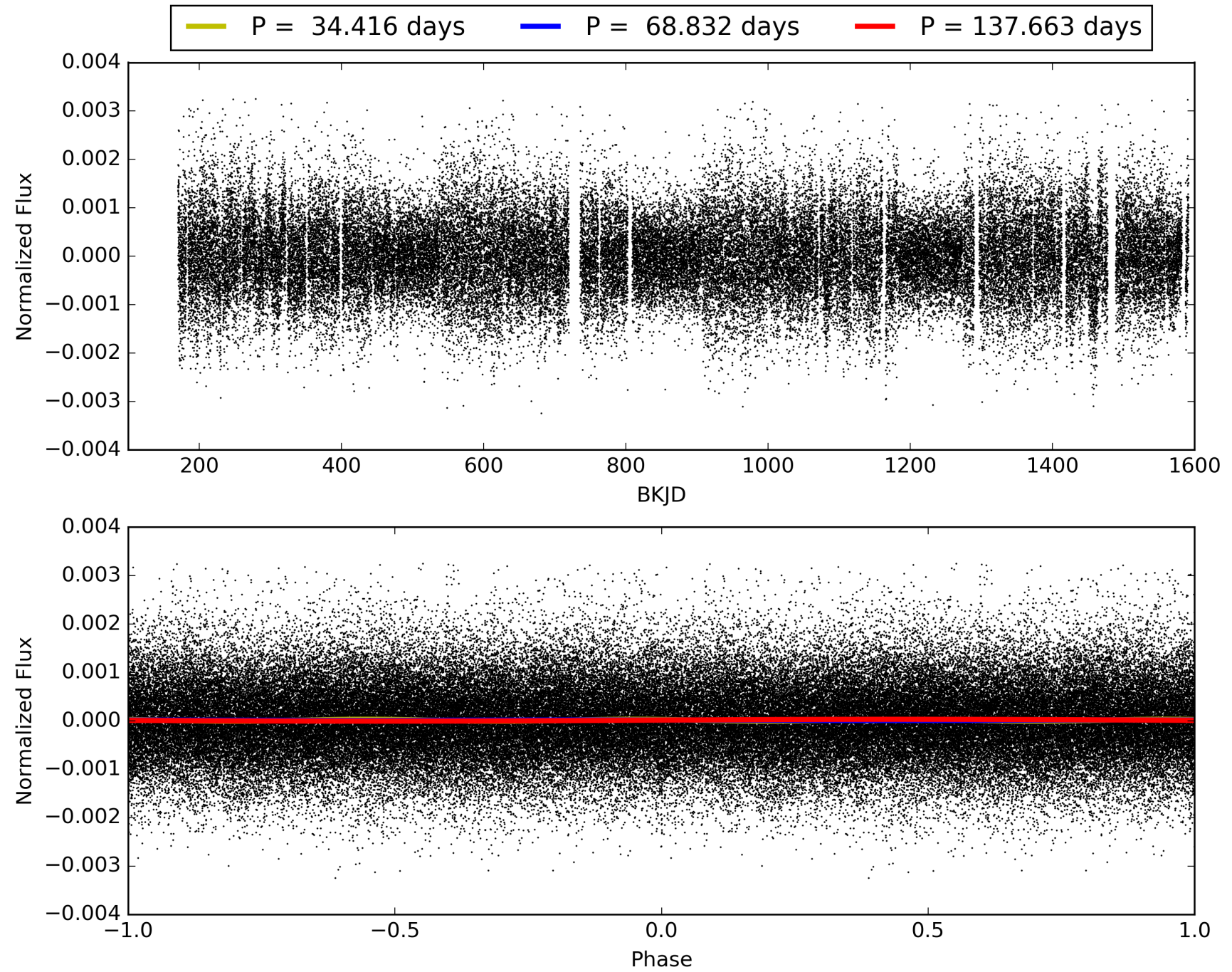
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:26:55 Z

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

TCE 002716853-02, PDC Light Curves

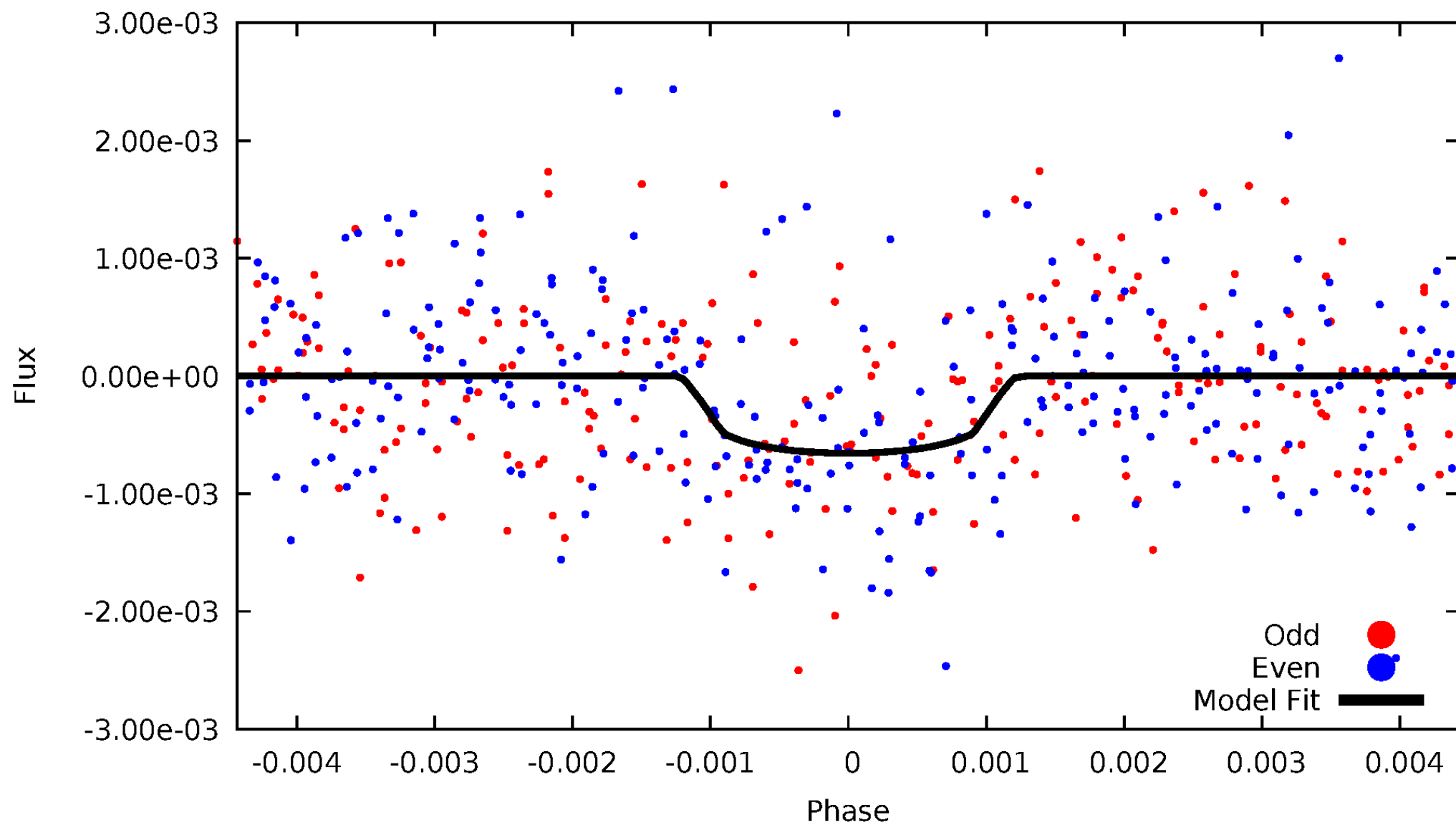


TCE 002716853-02



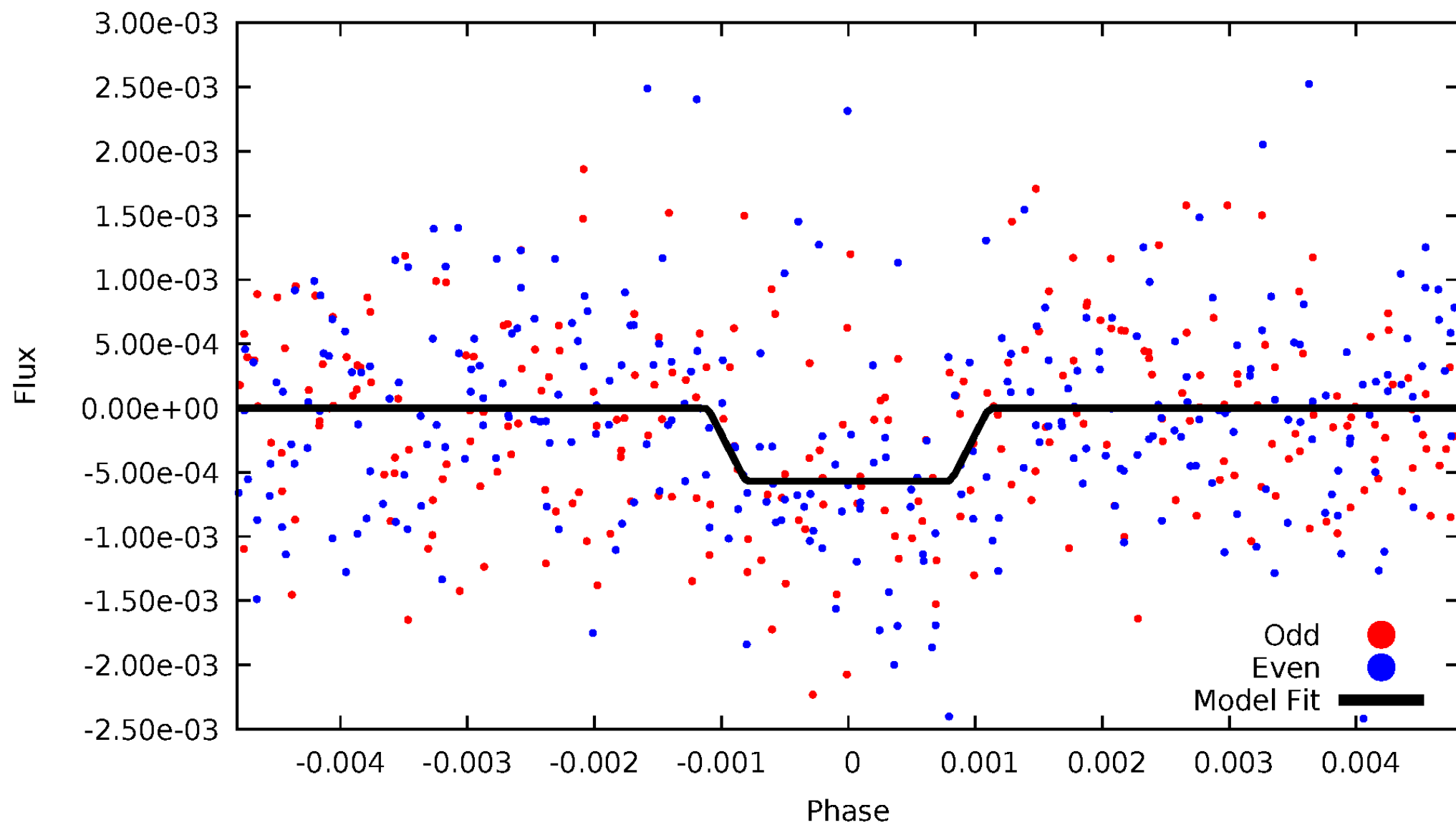
DV Odd/Even

TCE 002716853-02



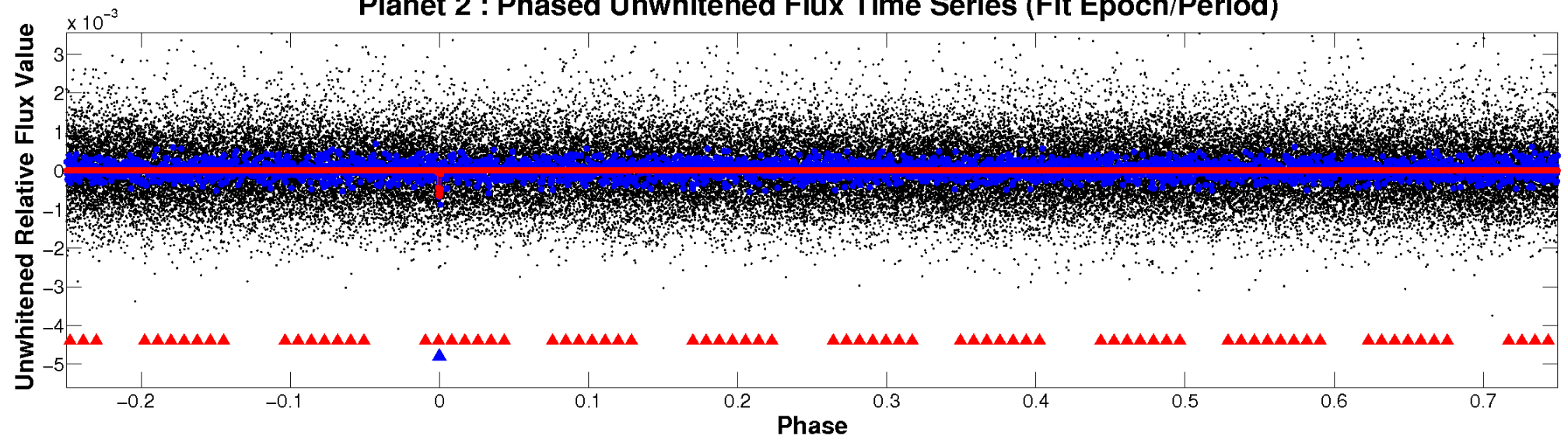
ALT Odd/Even

TCE 002716853-02

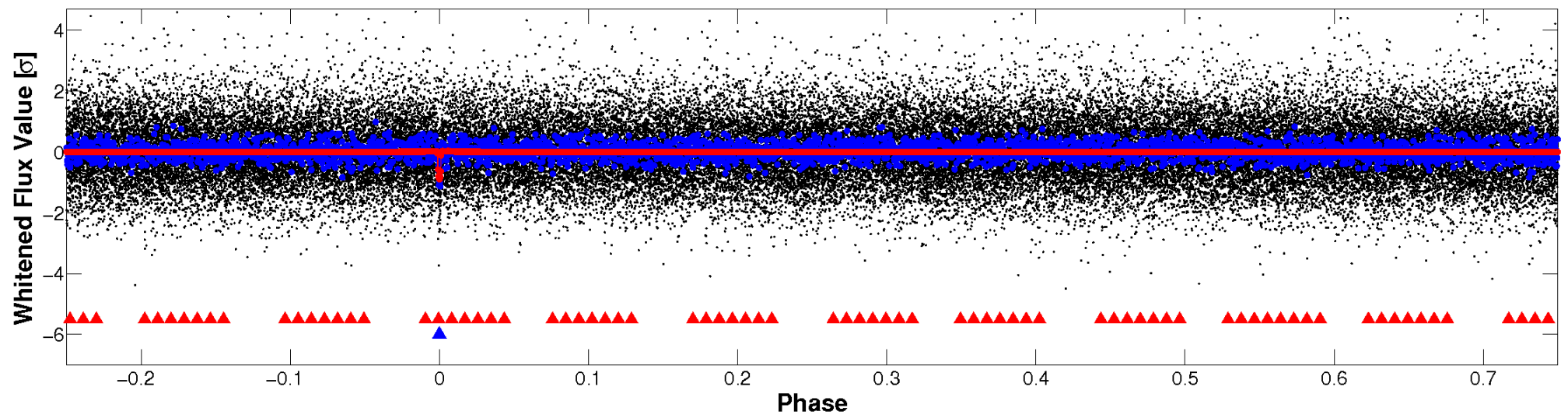


Non-Whitened Vs. Whitened Light Curve

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

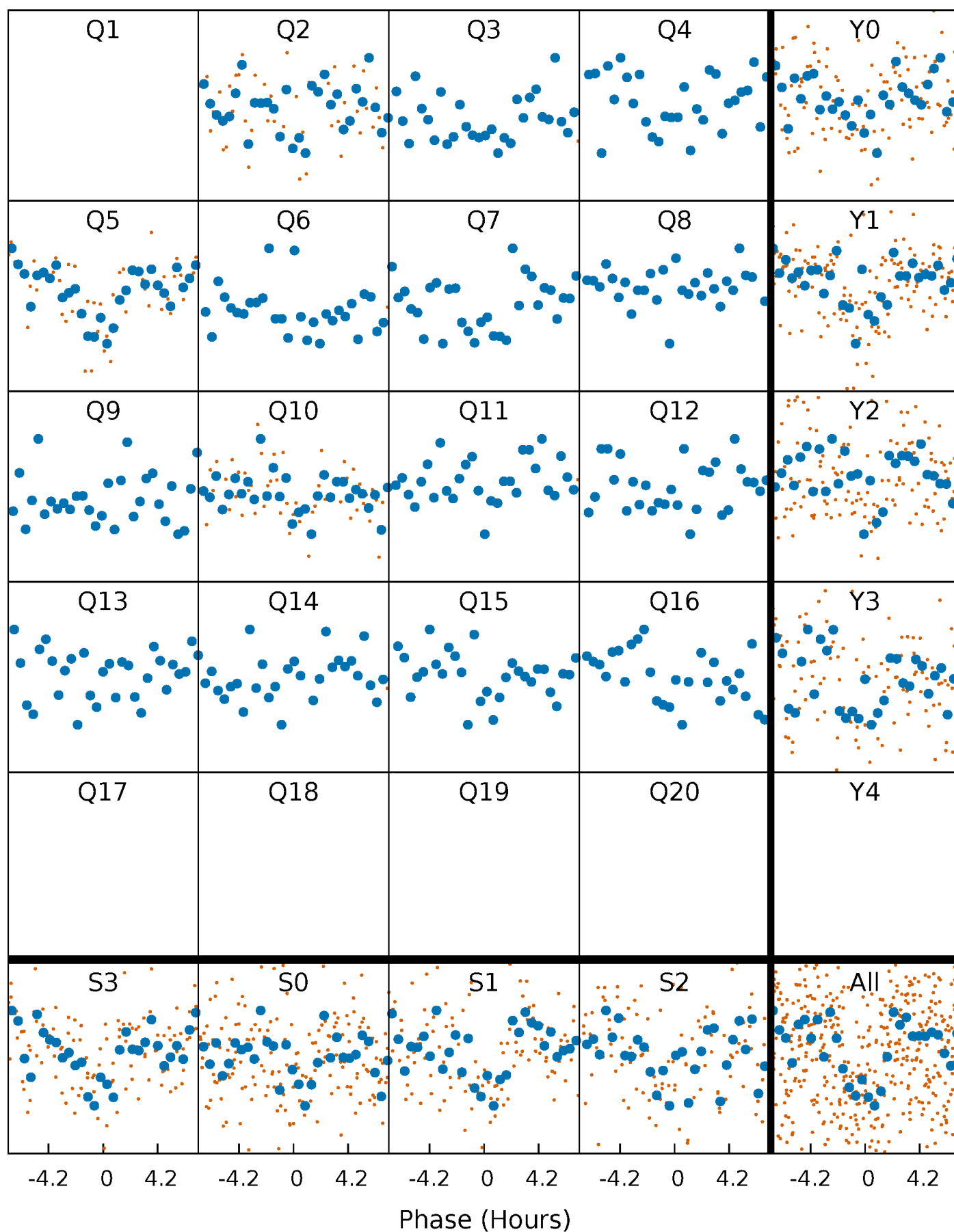


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



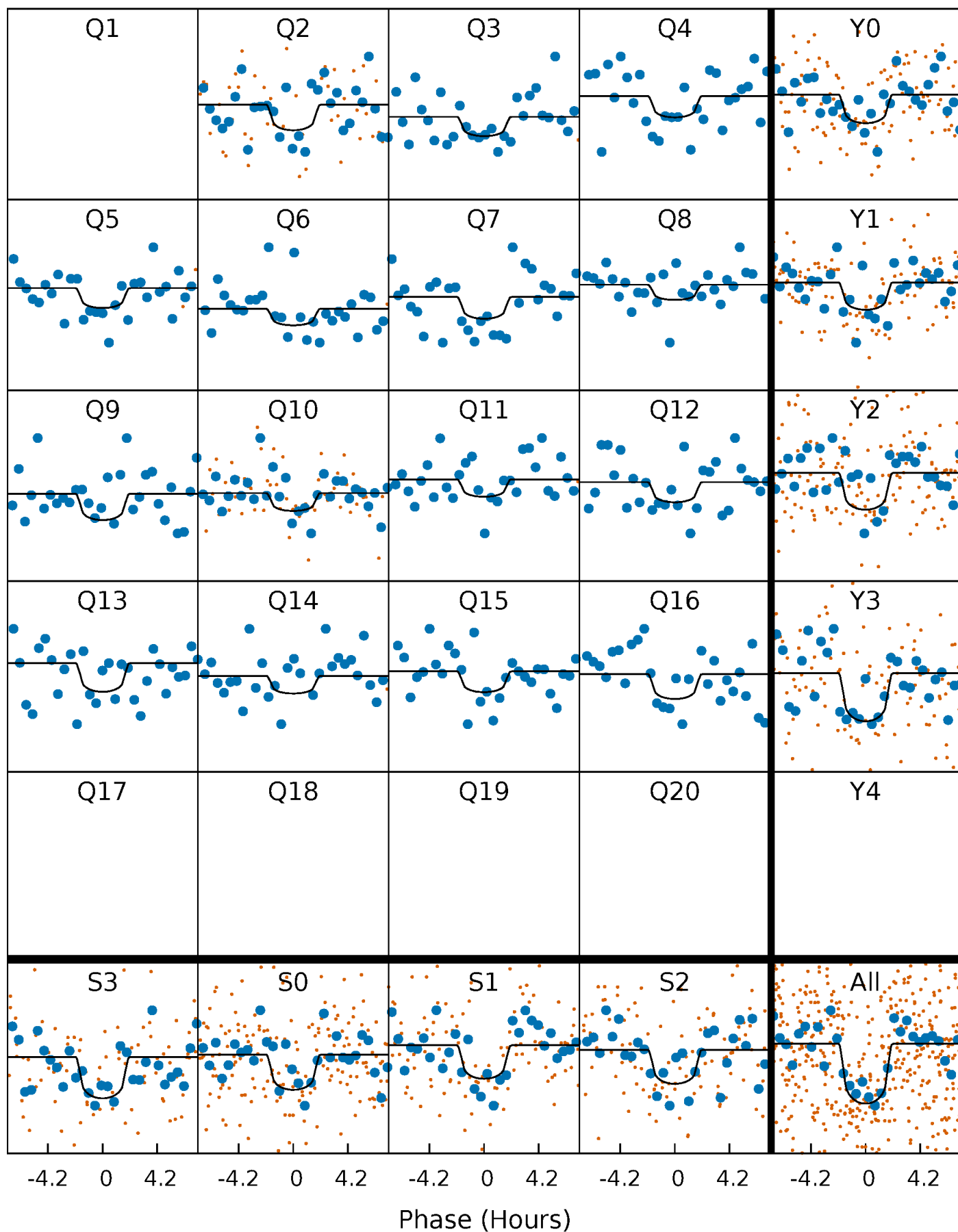
PDC Quarter-Phased Transit Curves

TCE 002716853-02 P= 68.831585 Days $T_0=172.136601$ (BKJD)



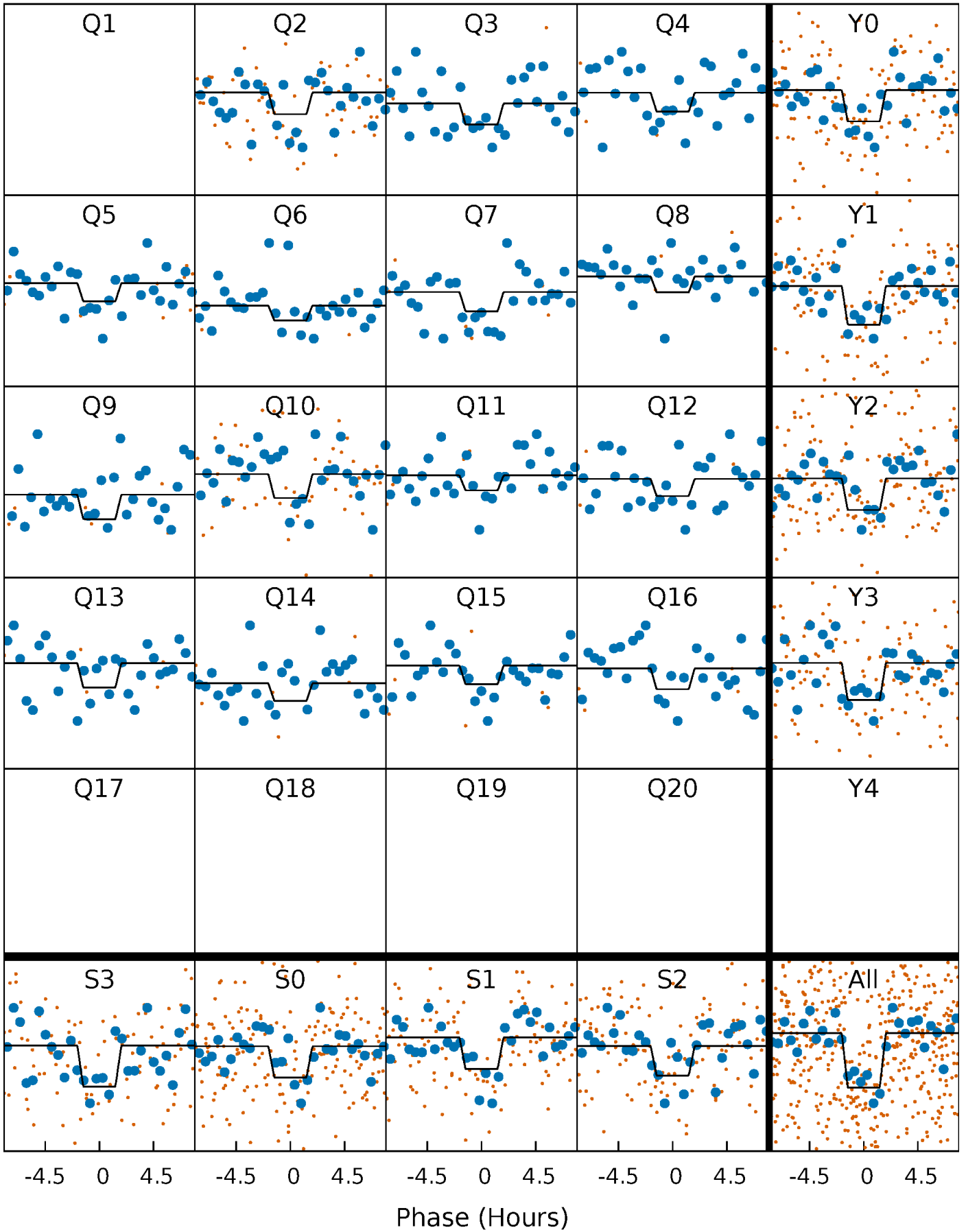
DV Quarter-Phased Transit Curves

TCE 002716853-02 P= 68.831585 Days $T_0=172.136601$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

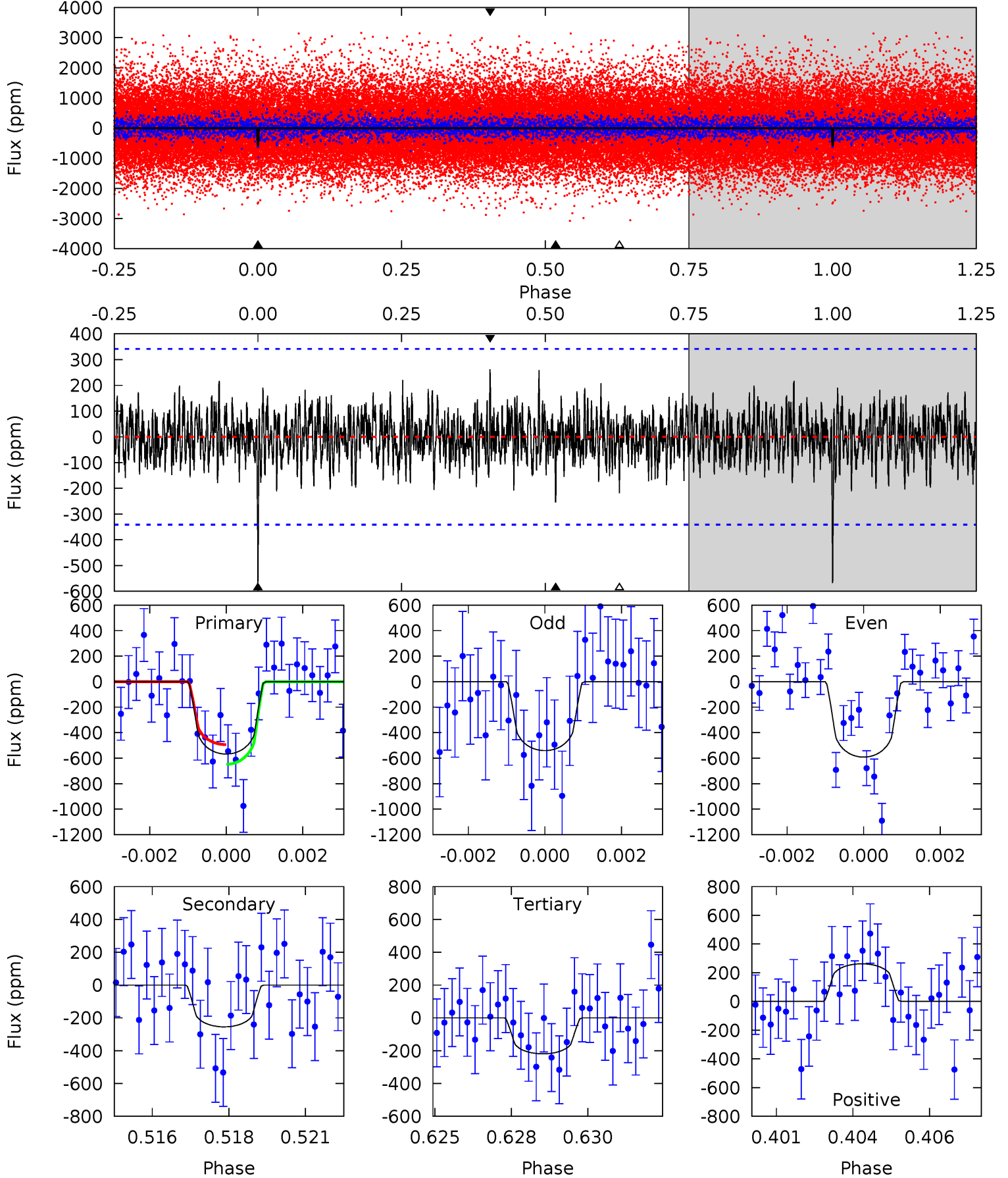
TCE 002716853-02 P= 68.831506 Days $T_0=172.131716$ (BKJD)



DV Model-Shift Uniqueness Test

002716853-02, P = 68.831585 Days, E = 103.305016 Days

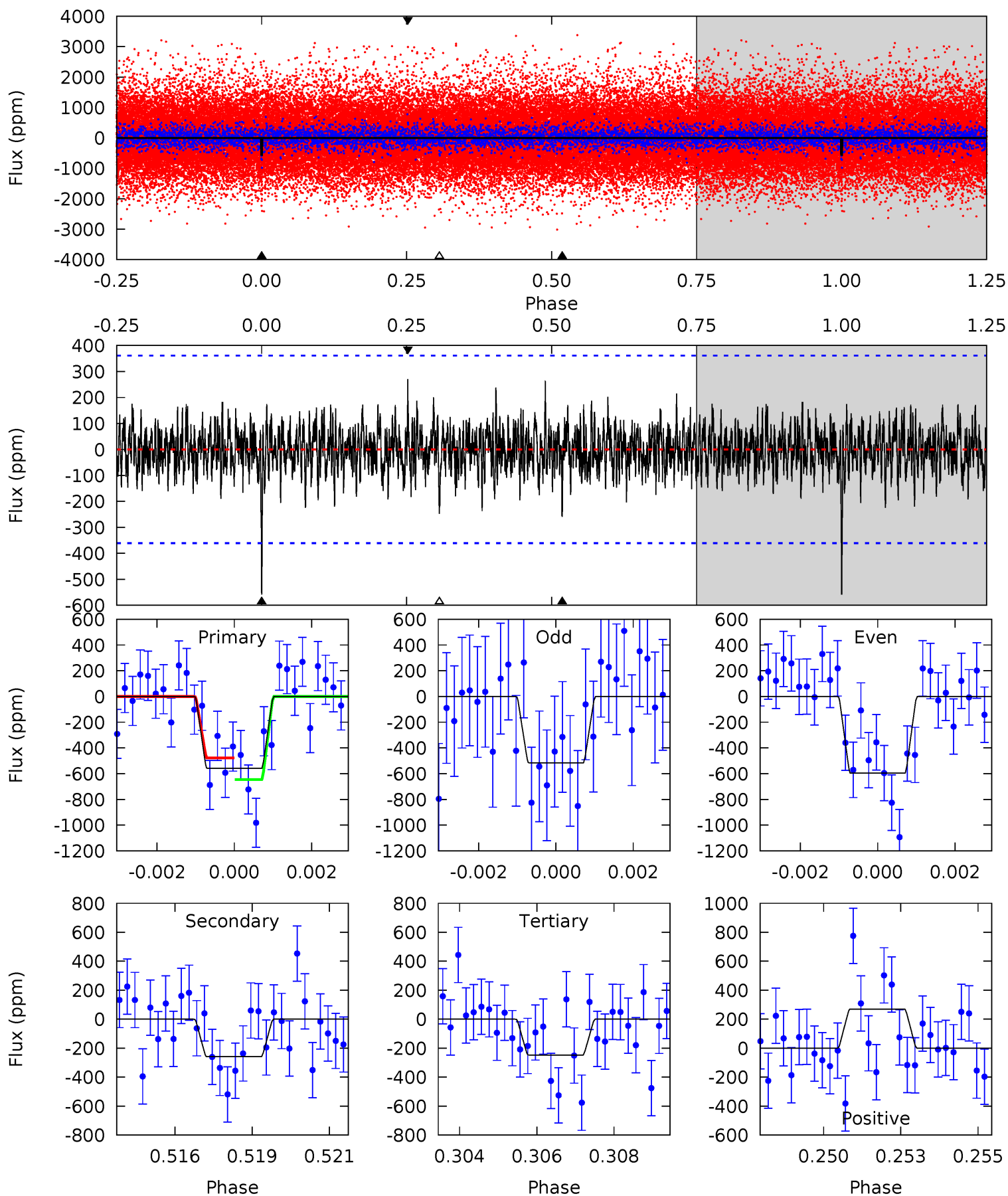
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.79	3.94	3.39	4.06	5.29	3.02	1.14	5.39	4.73	0.55	-0.11	0.40	1.00	0.32	1.20



Alt Model-Shift Uniqueness Test

002716853-02, P = 68.831506 Days, E = 103.300210 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.22	3.81	3.64	3.97	5.31	3.06	1.04	4.57	4.25	0.17	-0.15	0.59	1.04	0.33	1.24



Stellar Parameters For KIC 002716853

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5687^{+169}_{-169}	$4.538^{+0.046}_{-0.184}$	$-0.120^{+0.300}_{-0.300}$	$0.860^{+0.246}_{-0.082}$	$0.930^{+0.104}_{-0.104}$	$2.062^{+0.403}_{-1.059}$
	+3%/-3%	+1%/-4%	+250%/-250%	+29%/-10%	+11%/-11%	+20%/-51%
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 002716853-02 / KOI 1022.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-255 ± 65	$5.51^{+5.46}_{-3.80}$	584^{+36}_{-25}	3471^{+1932}_{-610}	452^{+4589}_{-338}
Alt.	-259 ± 68	$5.98^{+5.98}_{-4.12}$	585^{+35}_{-26}	3422^{+1894}_{-615}	406^{+3688}_{-308}

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 $A_{obs} \gg 1.0$

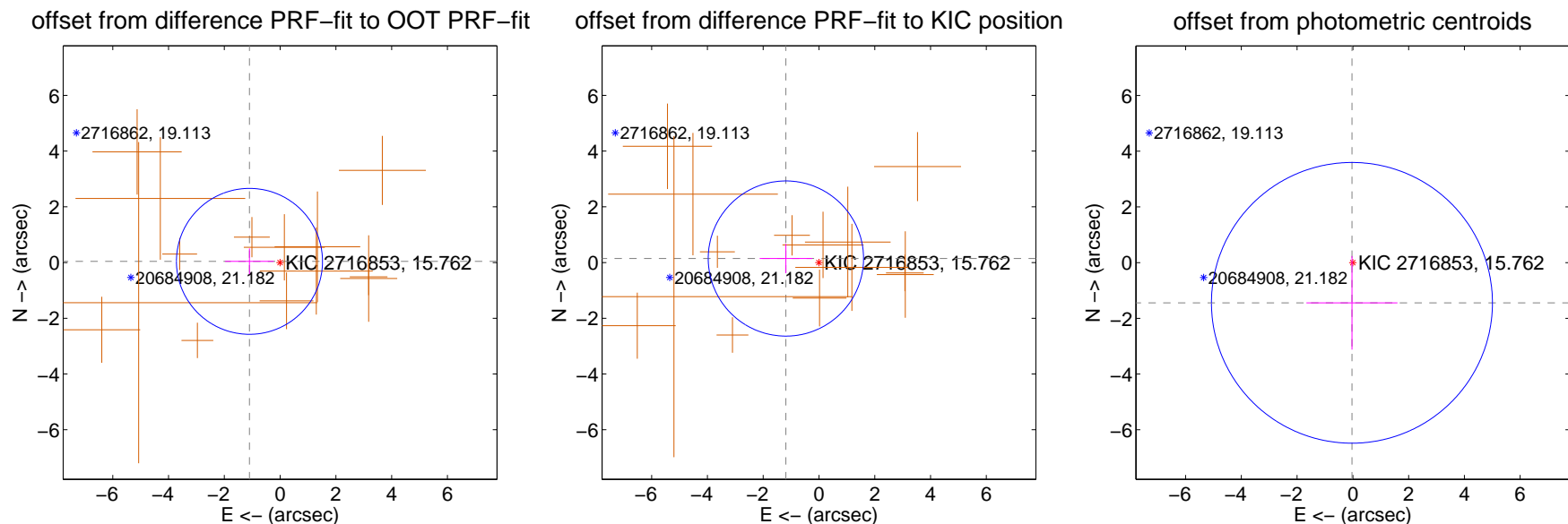
DV Centroid Data

Supplemental centroid analysis for 002716853-02. Kepler magnitude: 15.76. Transit SNR 8.30

There are 0 quarters with good PRF difference image offsets

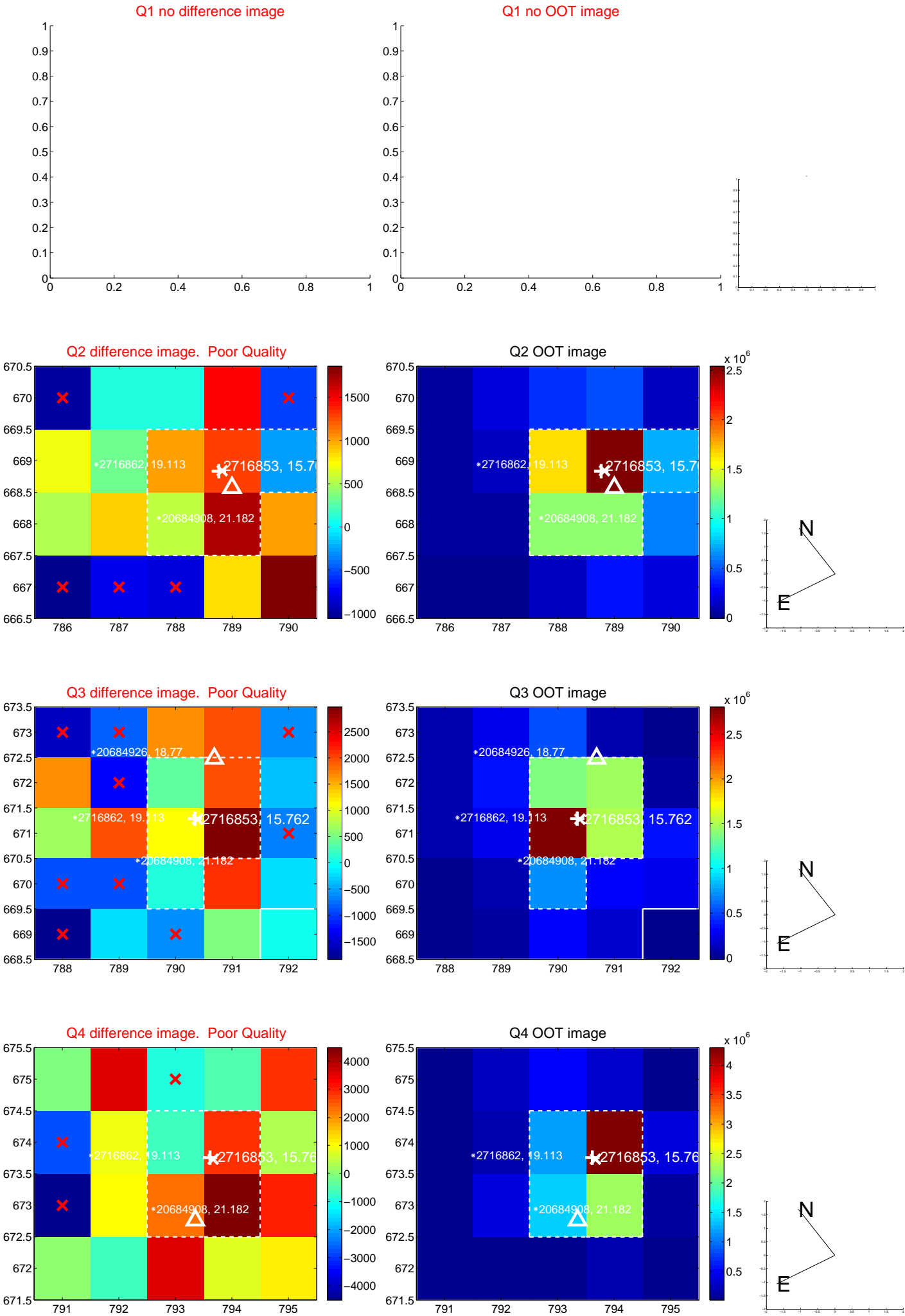
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.099 ± 0.873	1.26	1.098 ± 0.873	0.043 ± 0.463
PRF-fit source offset from KIC position	1.195 ± 0.928	1.29	1.186 ± 0.940	0.144 ± 0.527
photometric centroid source offset	1.44 ± 1.68	0.86	0.03 ± 1.63	-1.44 ± 1.68

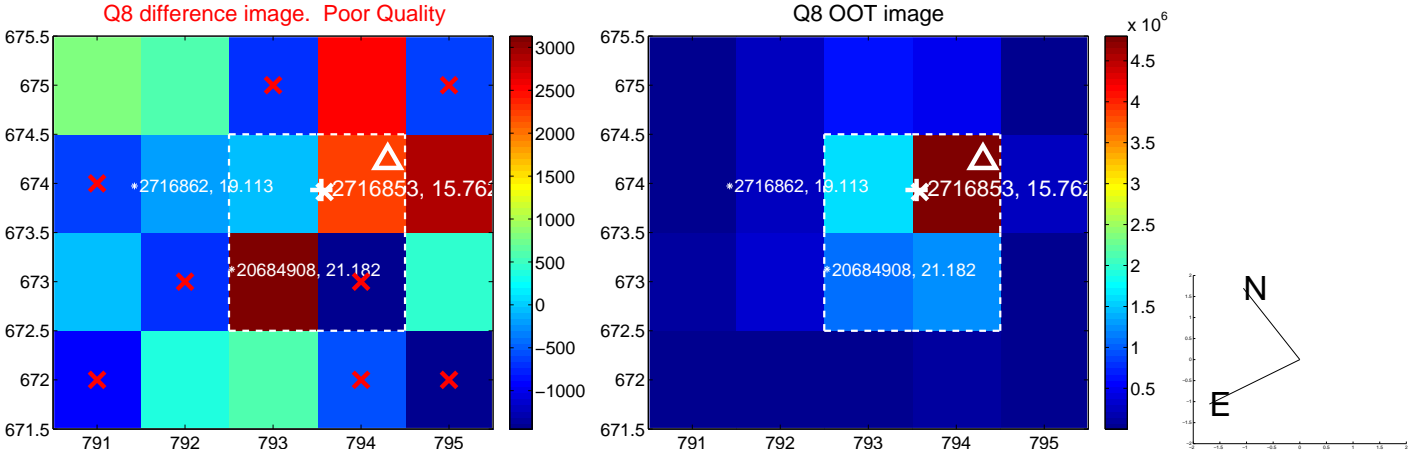
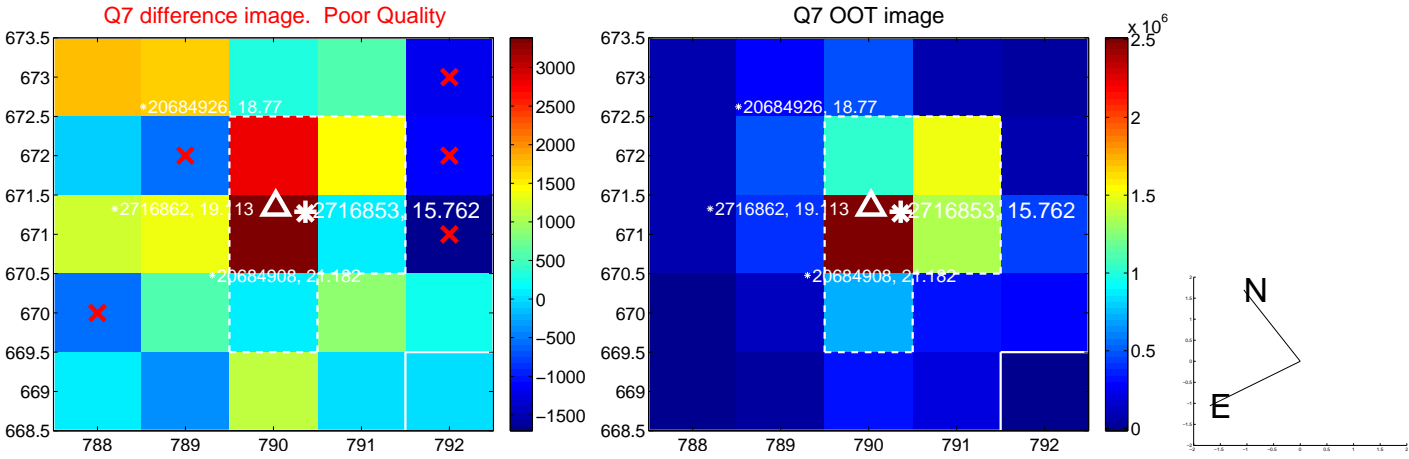
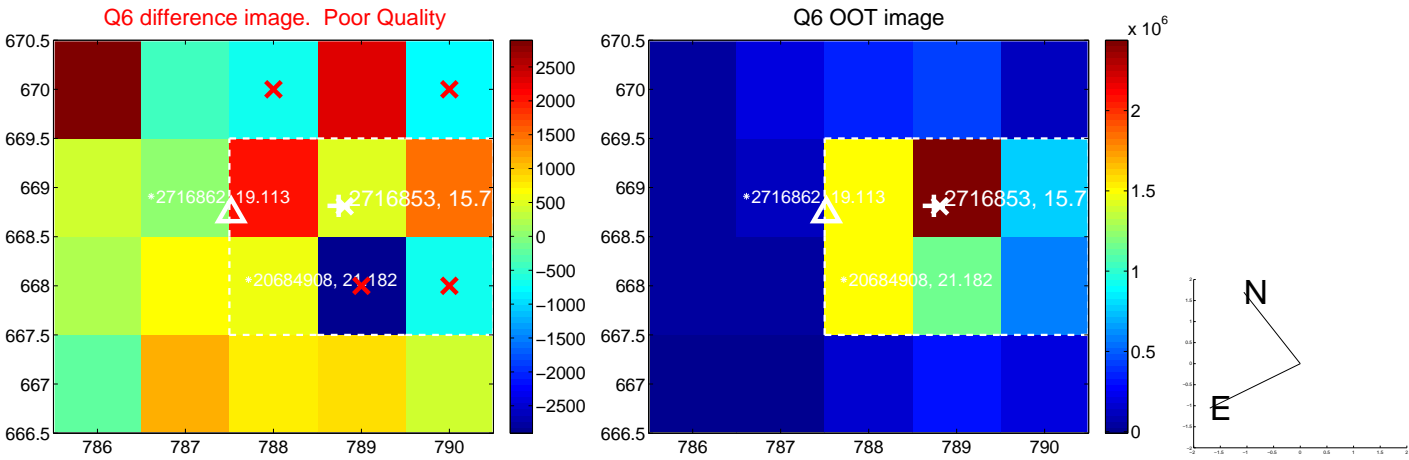
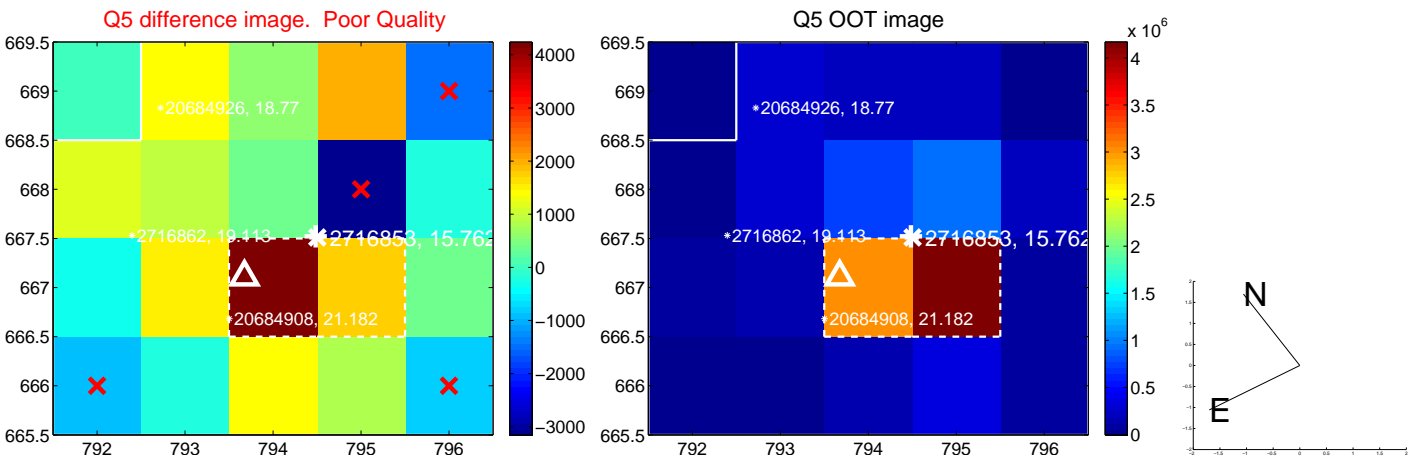


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

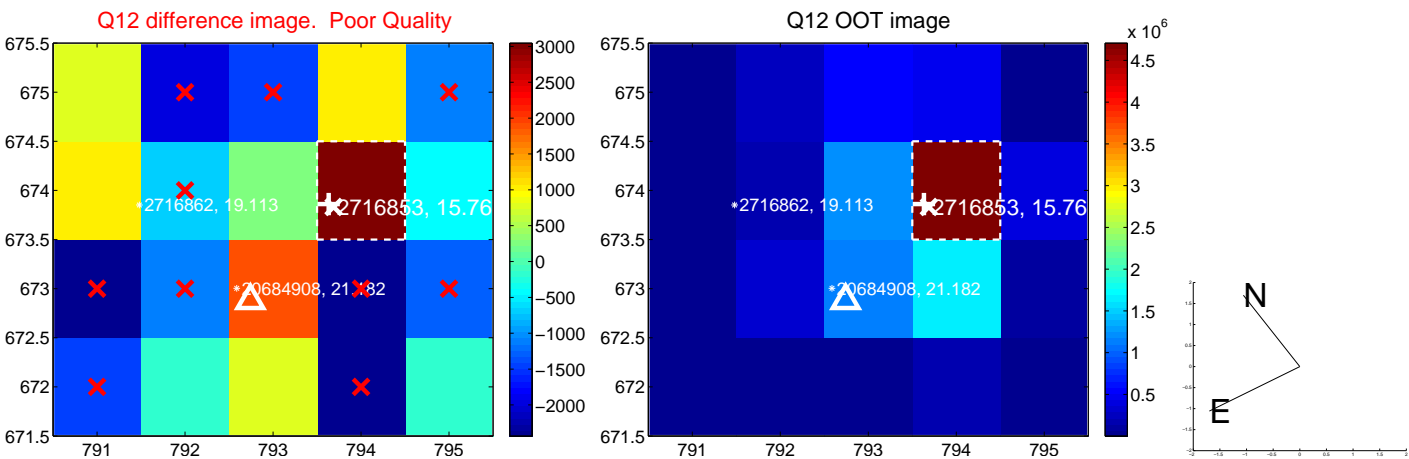
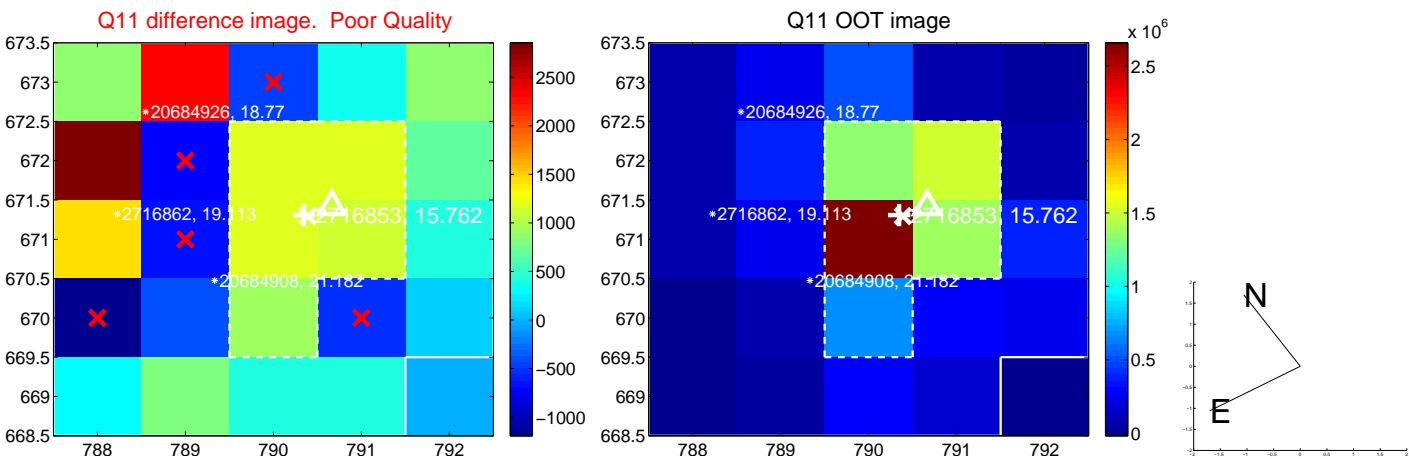
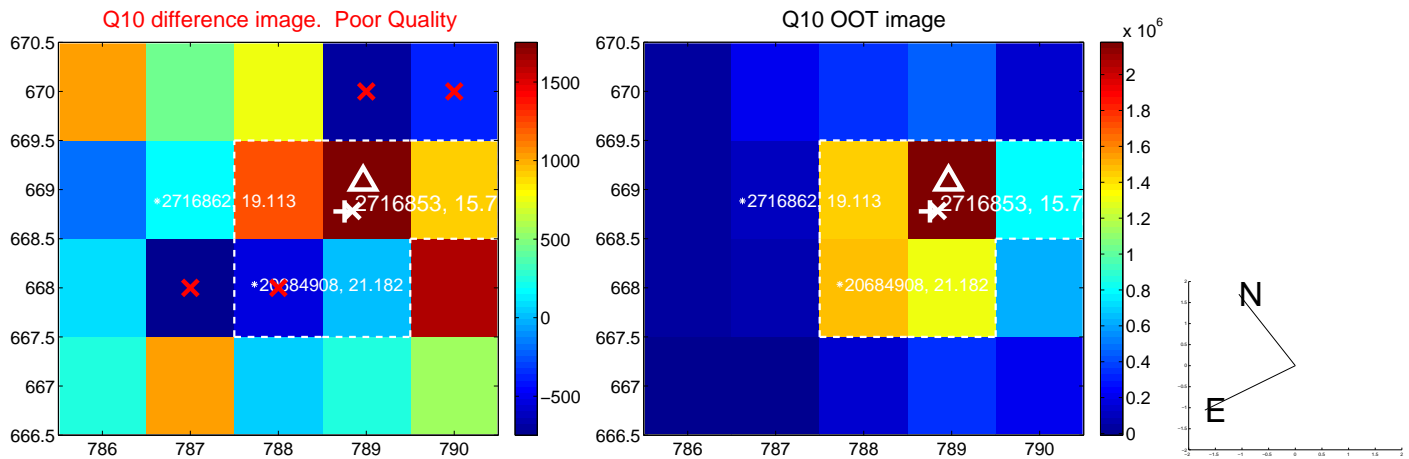
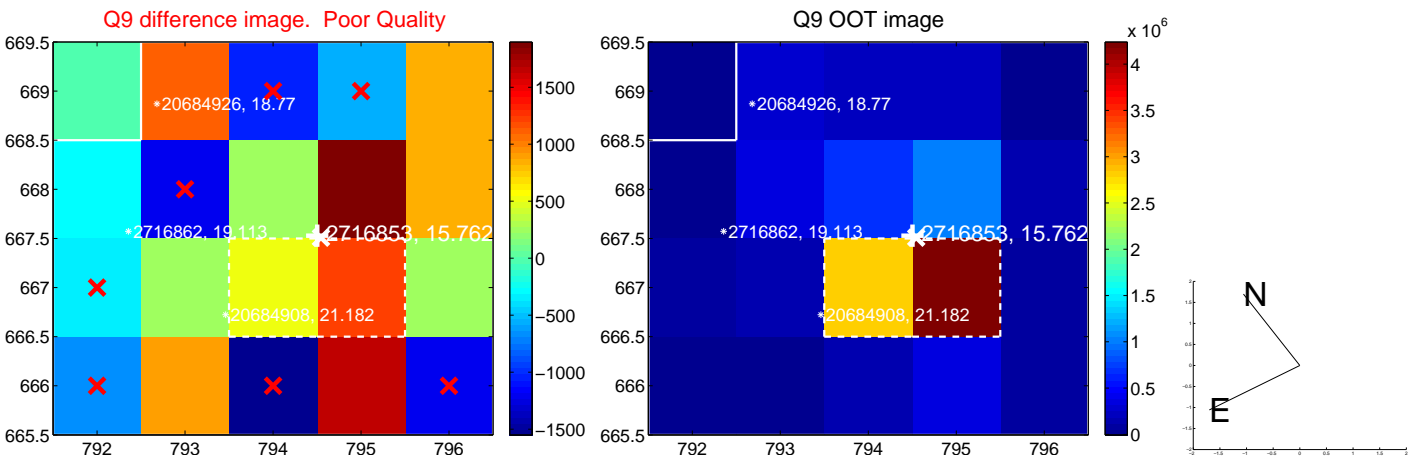
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



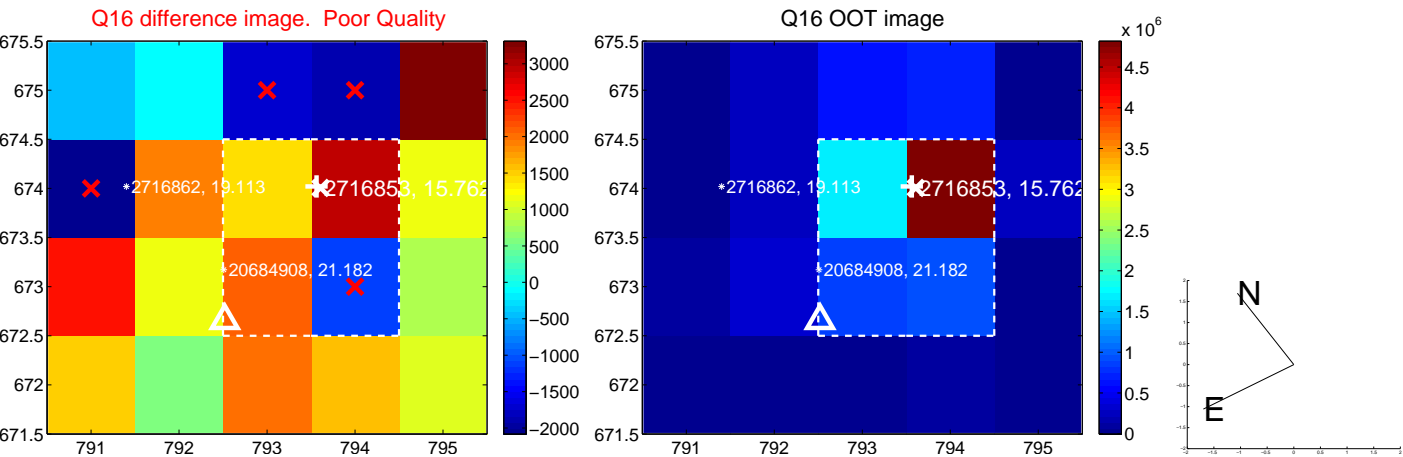
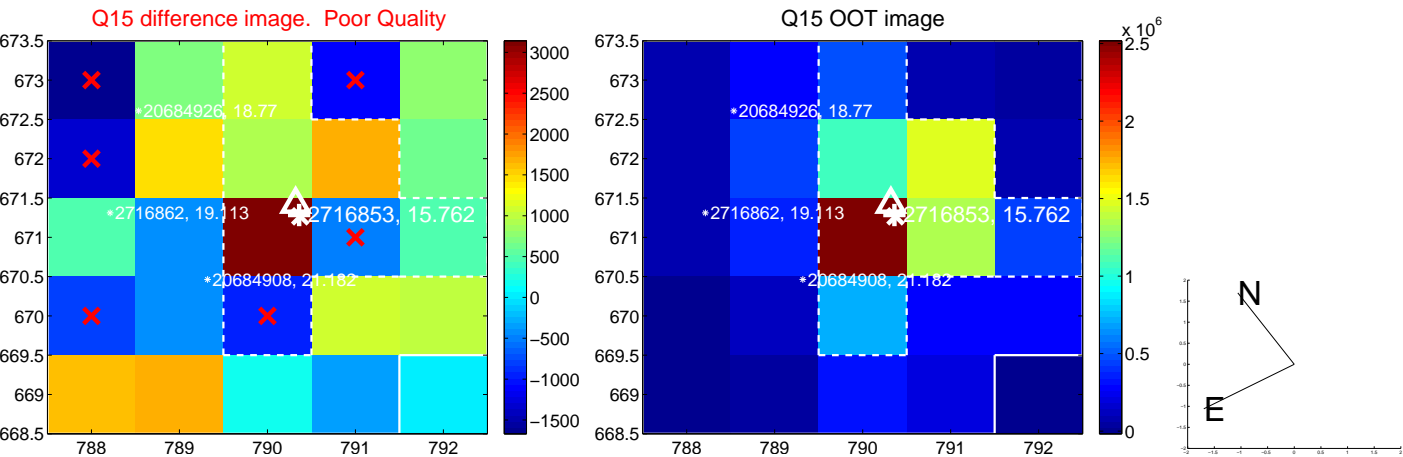
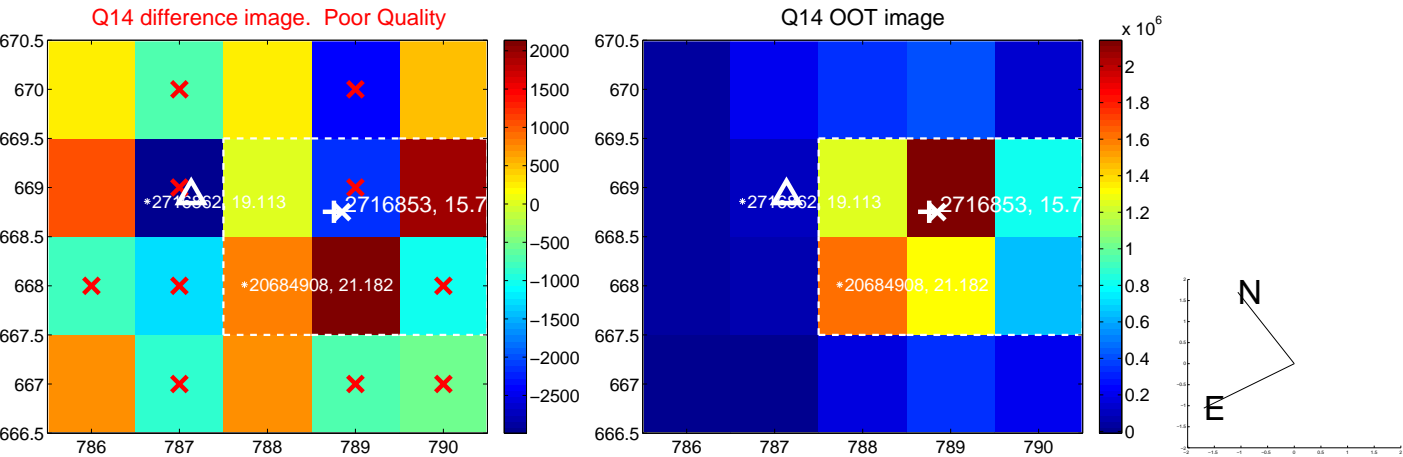
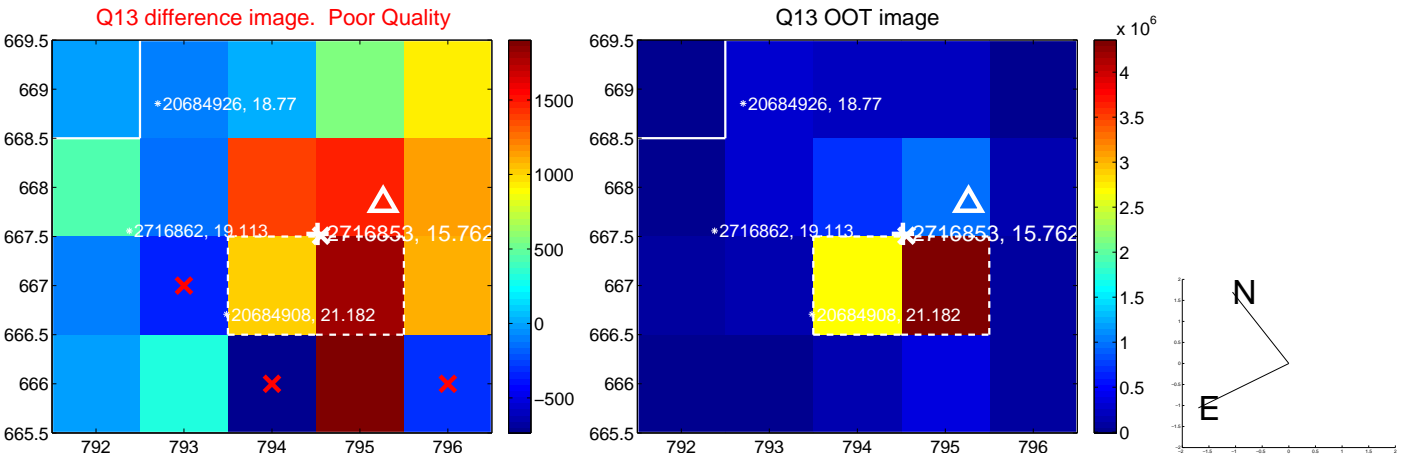
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



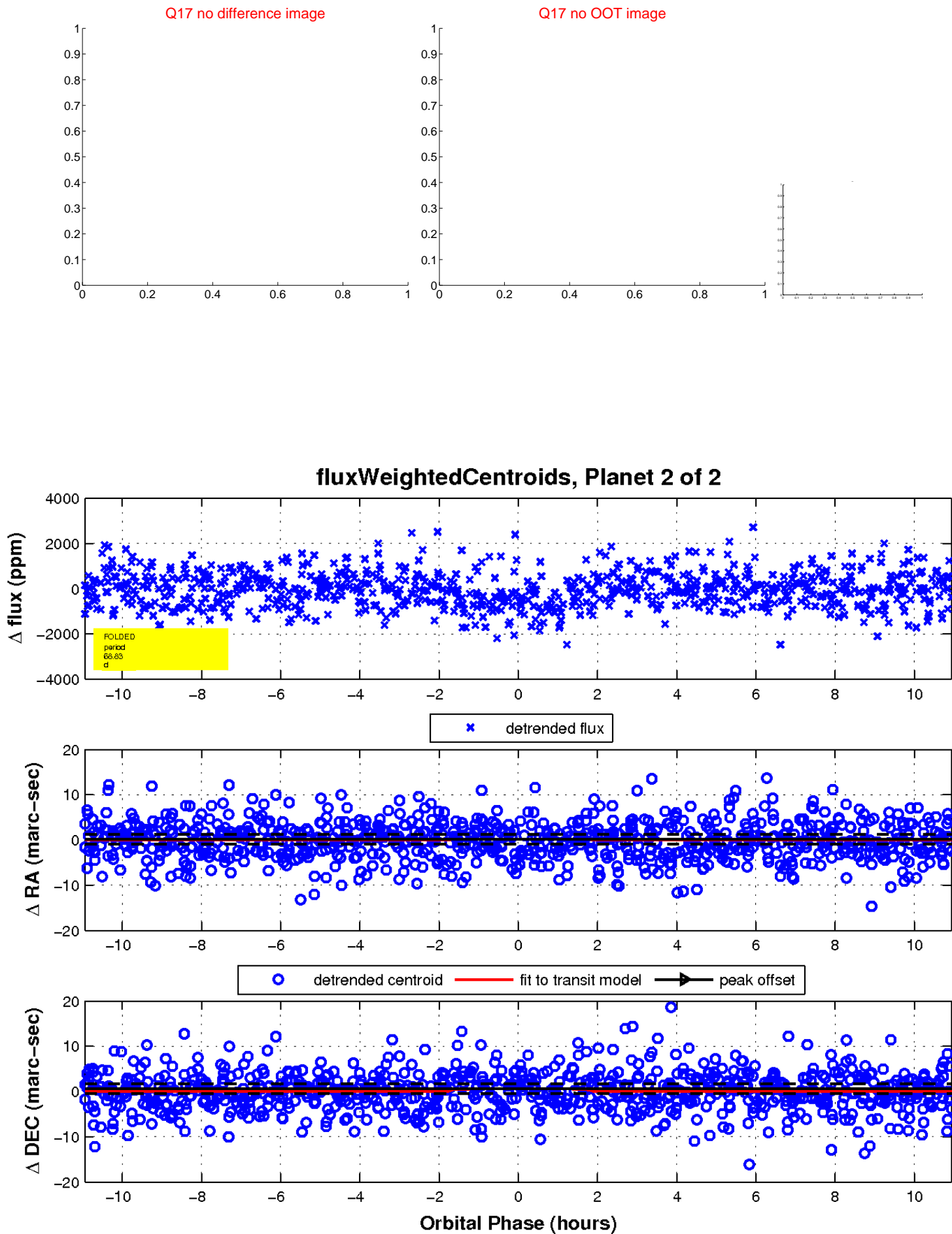
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

