

KIC 002837111

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})
002837111-01	OBS	1110.01	8.734872	135.082848	268.9	4.788	21.2	23.2	0.96	5982	1.85	148.86
002837111-02	OBS	1110.02	3.718379	134.667925	72.7	3.540	8.0	8.3	0.96	5982	0.97	464.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002837111-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
002837111-02	OBS	FP	0.05	1	0	0	0	LPP_DV

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.

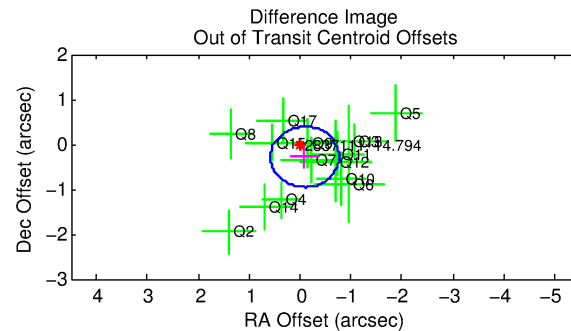
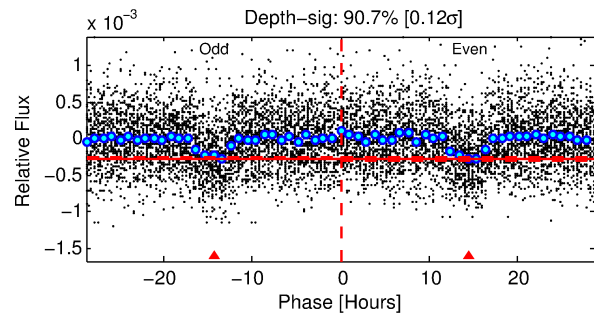
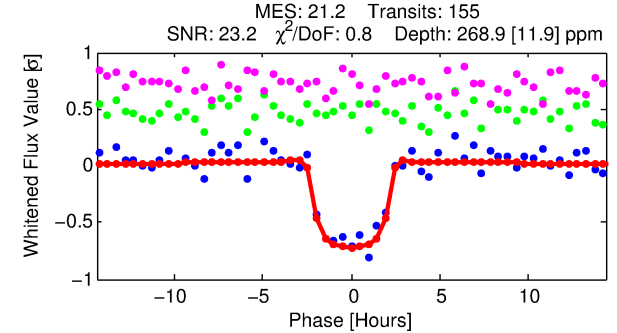
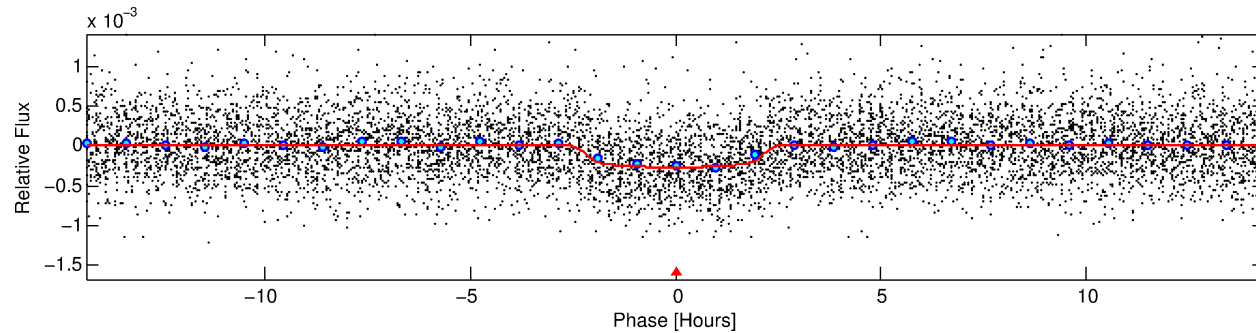
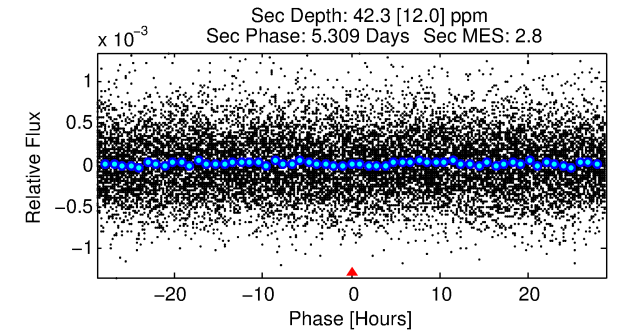
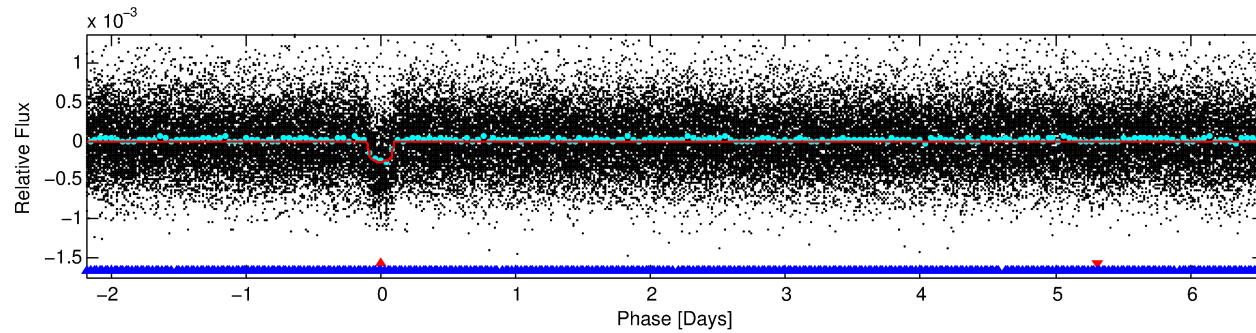
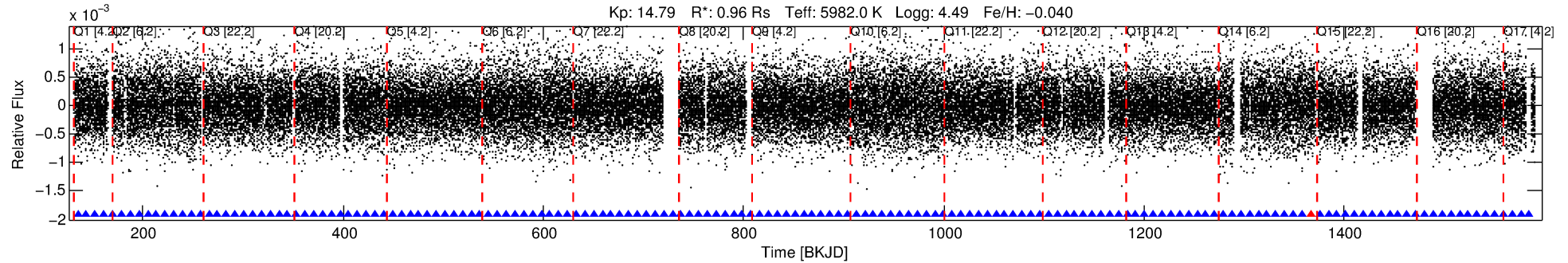
Ephemeris Match Information For 002837111-01

No Significant Match Found

DV One-Page Summary

KIC: 2837111 Candidate: 1 of 2 Period: 8.735 d

KOI: K01110.01 Corr: 0.963



DV Fit Results:

Period = 8.73487 [0.00004] d
Epoch = 135.0828 [0.0040] BKJD
Rp/R* = 0.0177 [0.0025]
a/R* = 6.79 [4.57]
b = 0.90 [0.15]
Seff = 148.86 [62.18]
Teq = 891 [93] K
Rp = 1.85 [0.66] Re
a = 0.0843 [0.0231] AU
Ag = 48.12 [27.07] [1.74σ]
Teffp = 3627 [380] K [6.99σ]

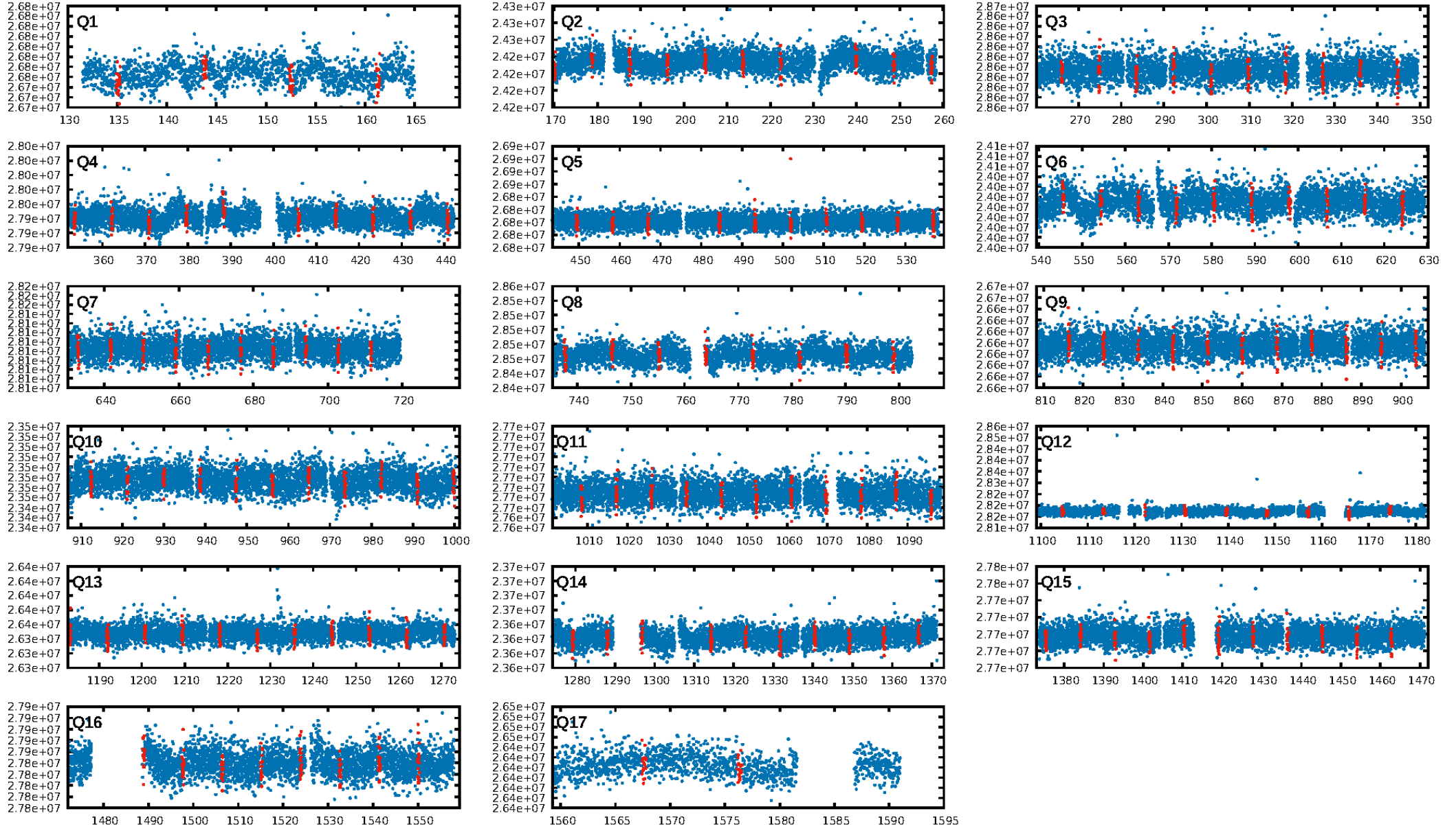
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [20.22σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.11e-98
RollingBand-fgt: 0.99 [148/149]
GhostDiagnostic-chr: 3.073
Centroid-sig: 0.0%
Centroid-so: 1.920 arcsec [3.06σ]
OotOffset-rm: 0.299 arcsec [1.33σ]
KicOffset-rm: 0.365 arcsec [1.85σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.93 [14/15]
DiffImageOverlap-fno: 1.00 [17/17]

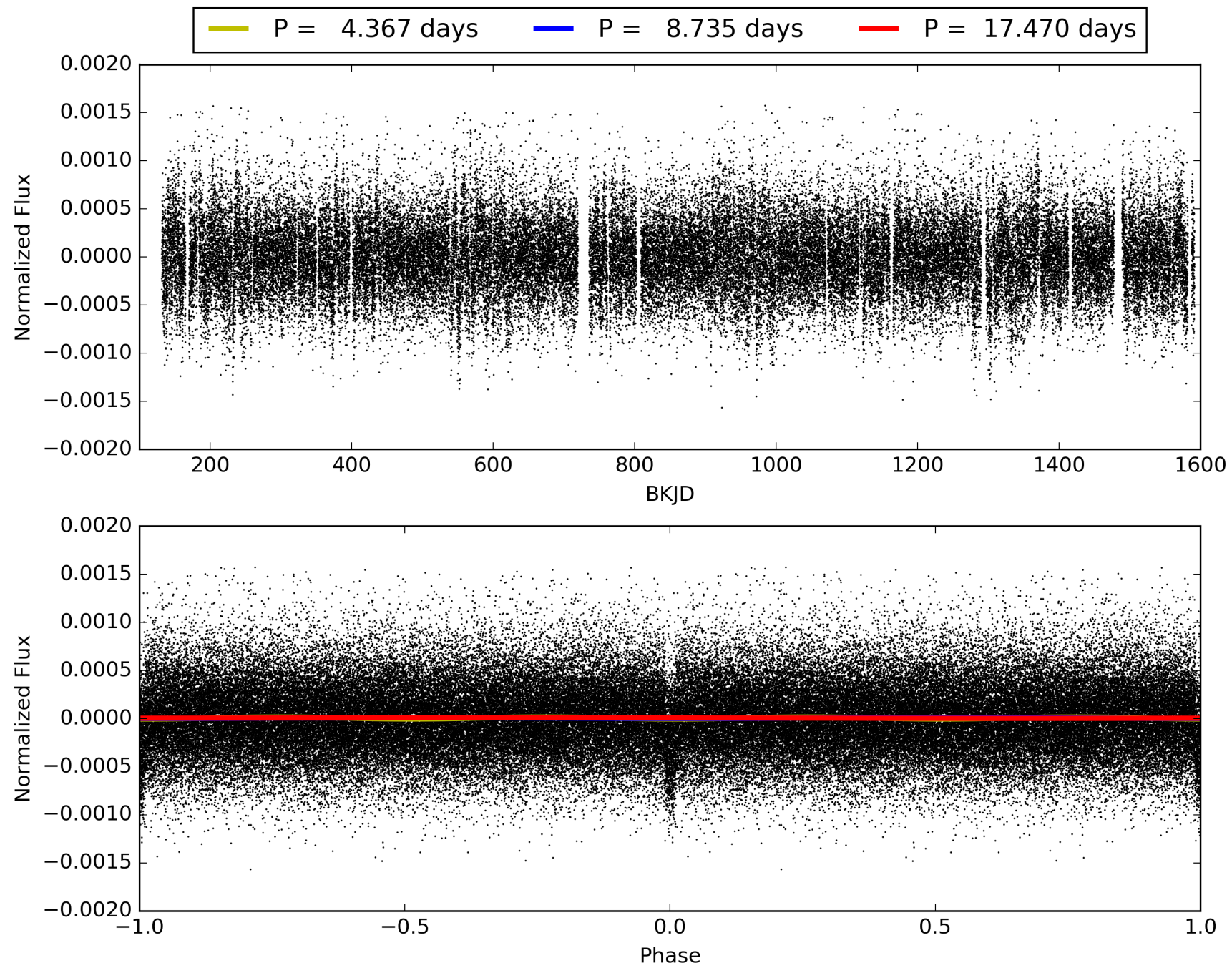
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 002837111-01, PDC Light Curves

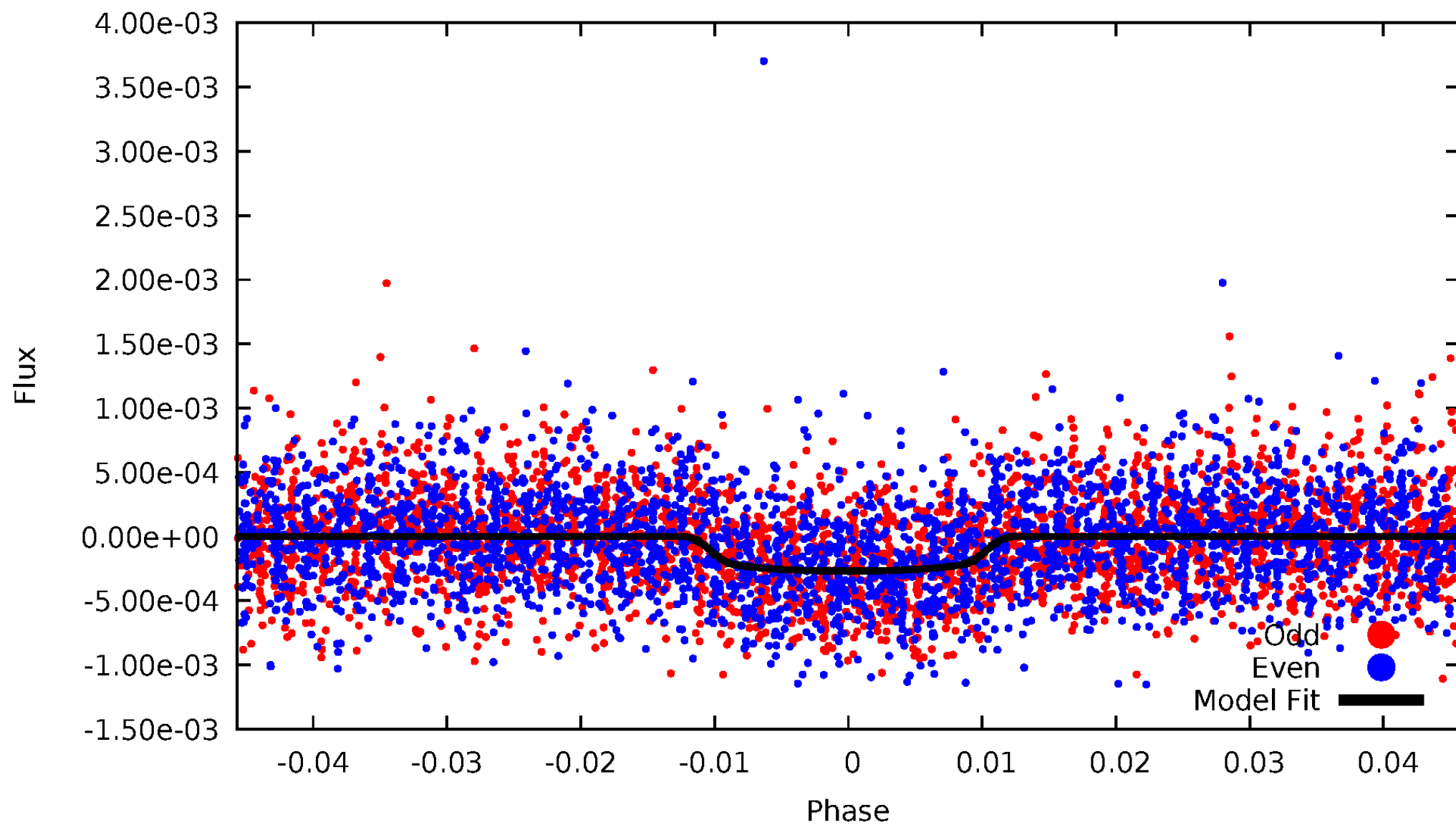


TCE 002837111-01



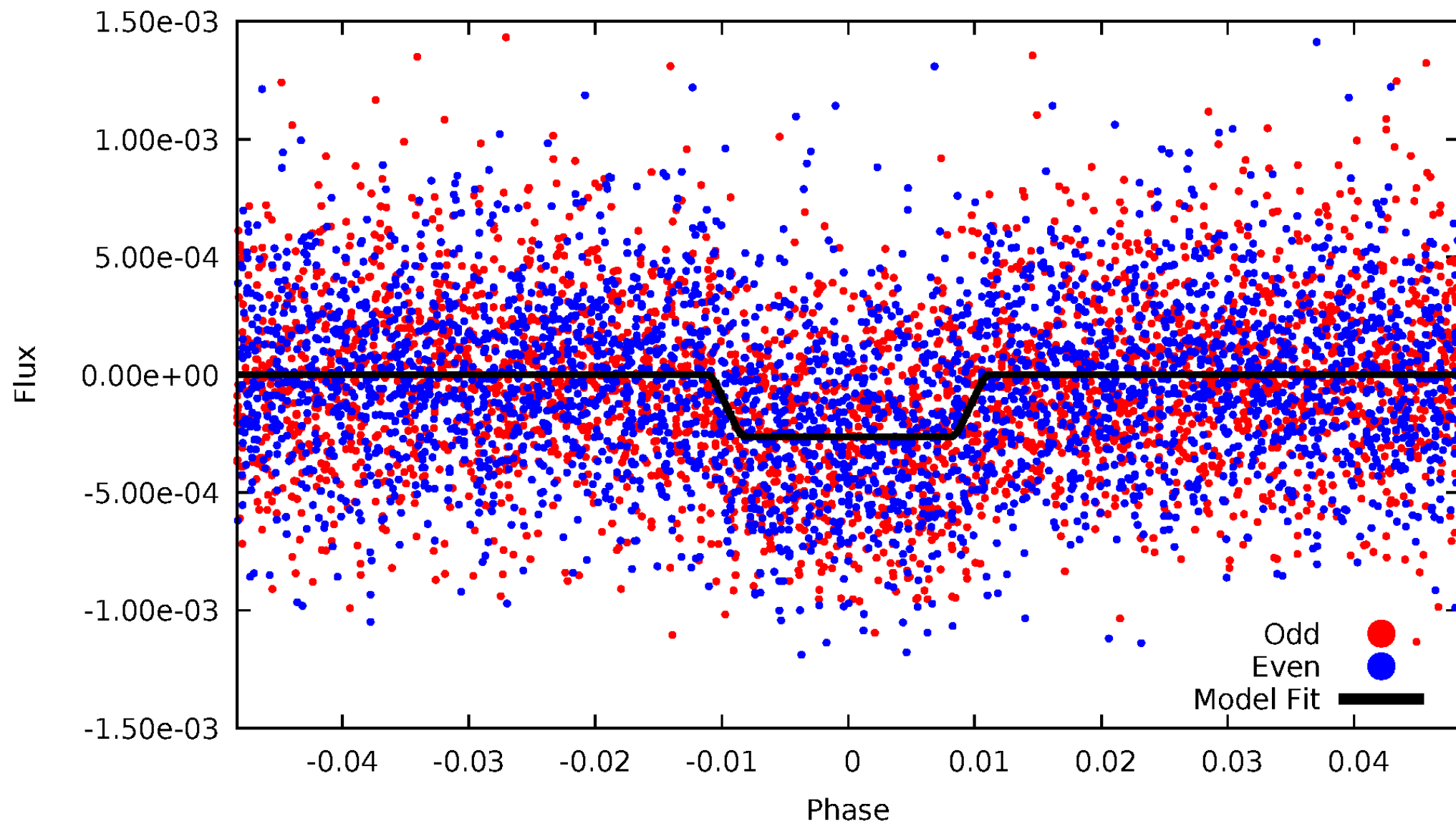
DV Odd/Even

TCE 002837111-01

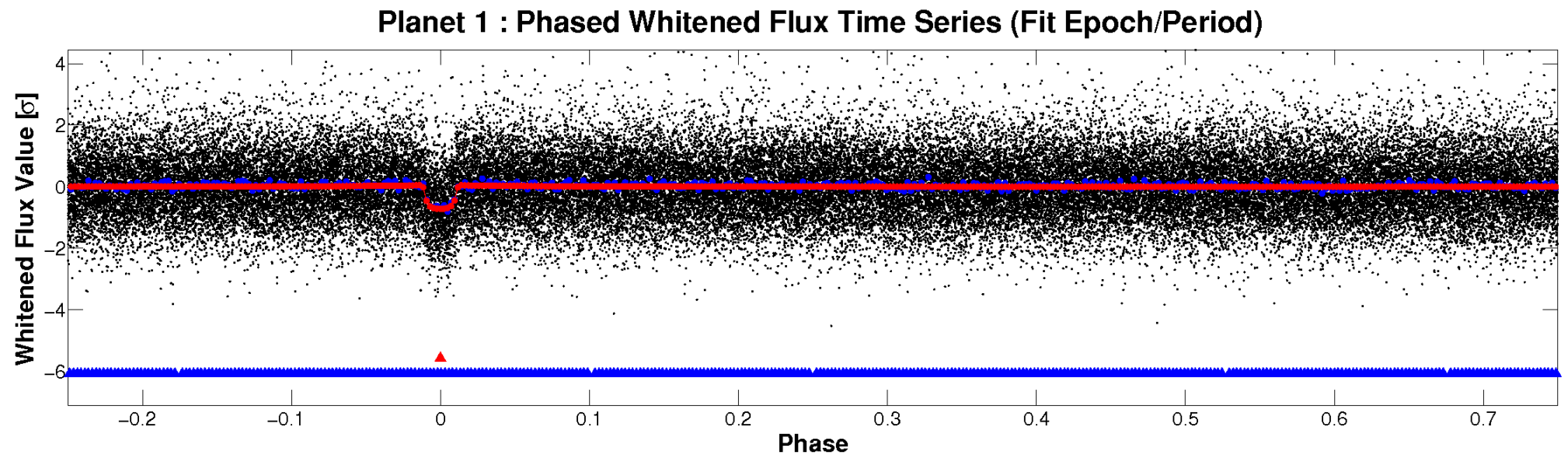
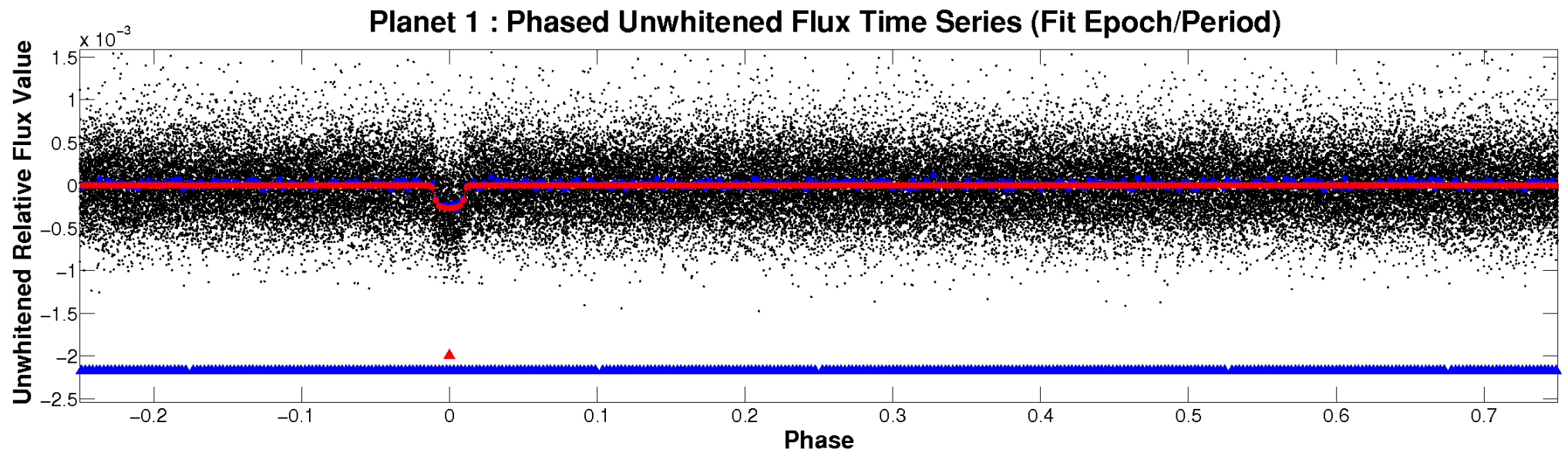


ALT Odd/Even

TCE 002837111-01

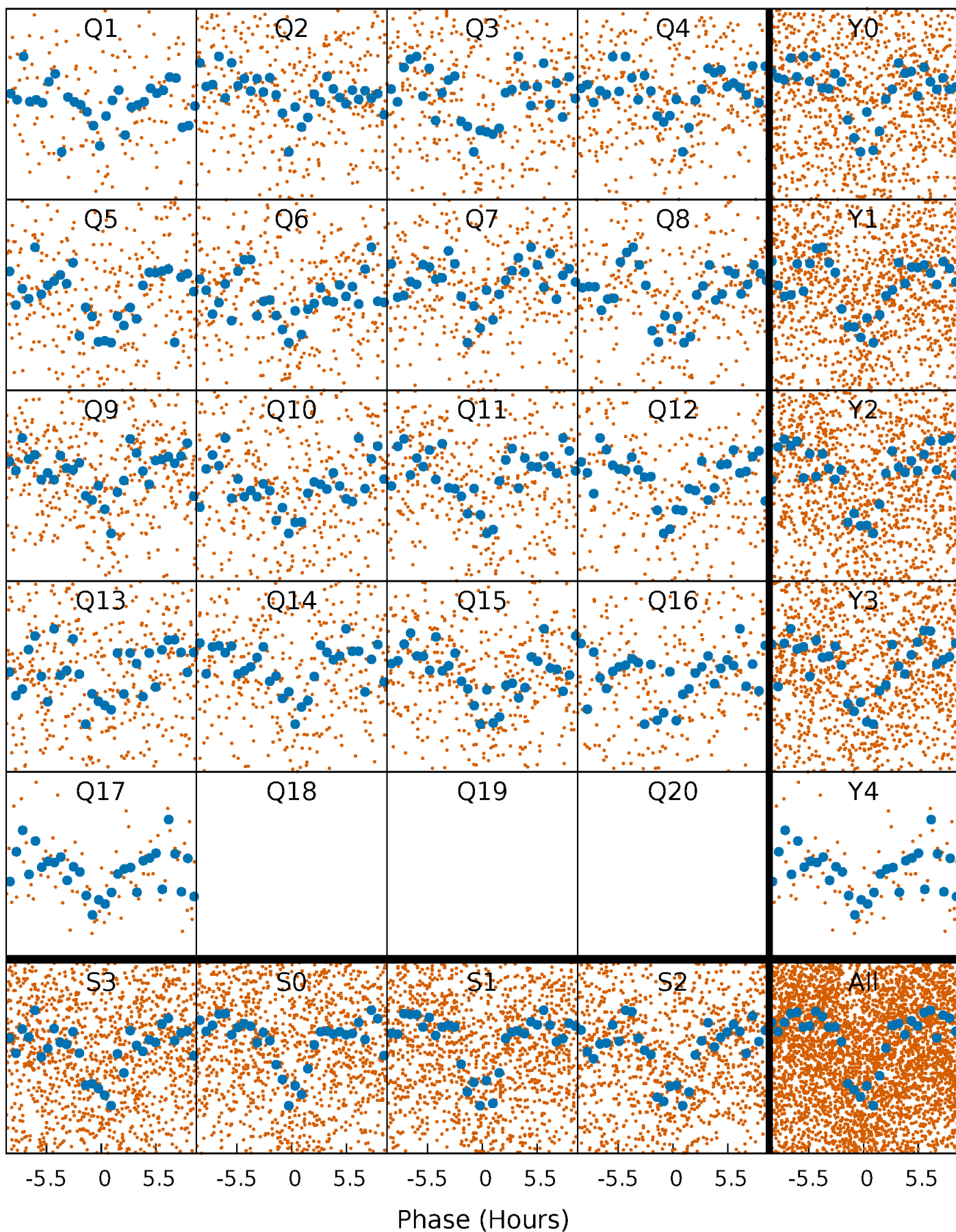


Non-Whitened Vs. Whitened Light Curve



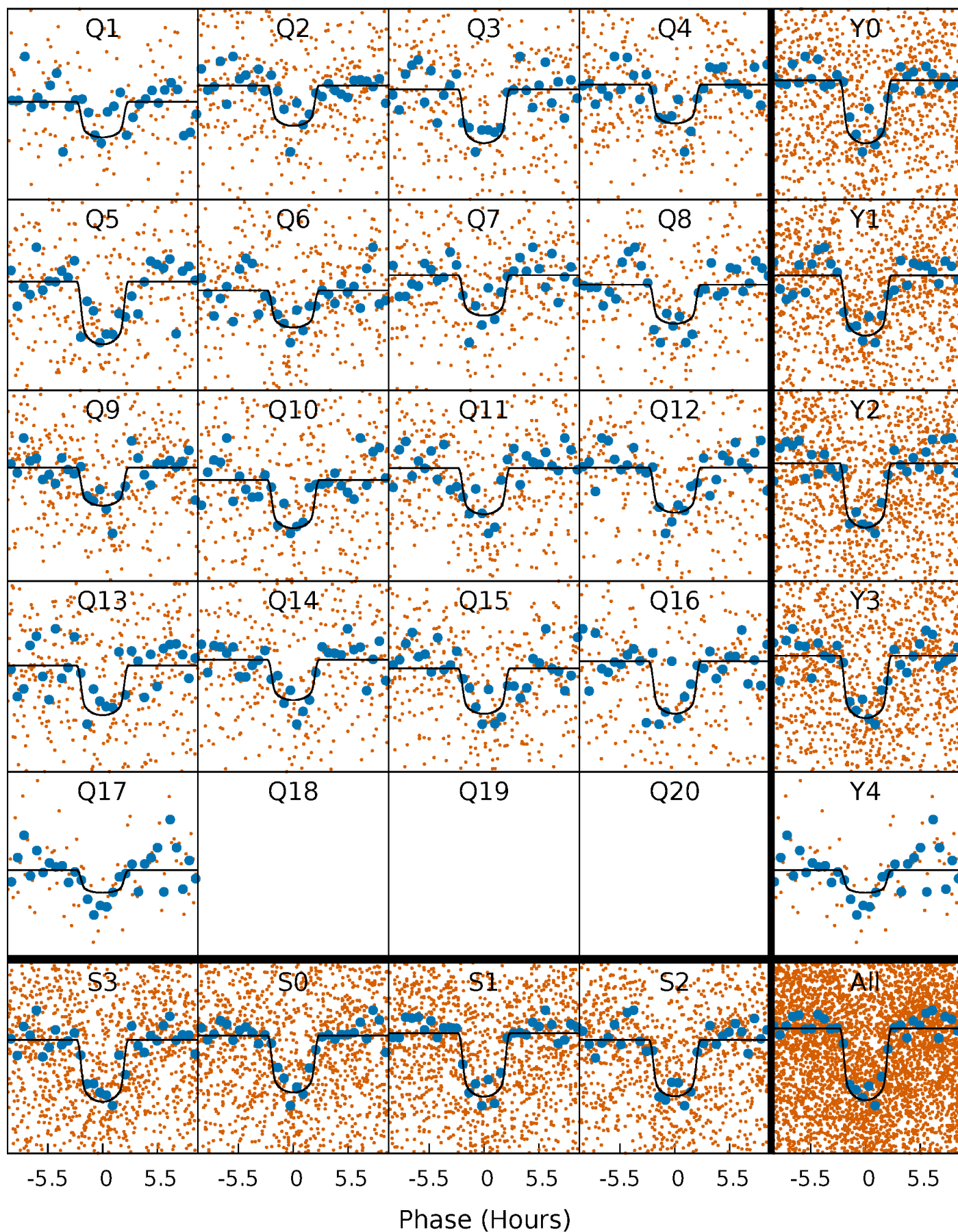
PDC Quarter-Phased Transit Curves

TCE 002837111-01 P= 8.734872 Days $T_0=135.082848$ (BKJD)



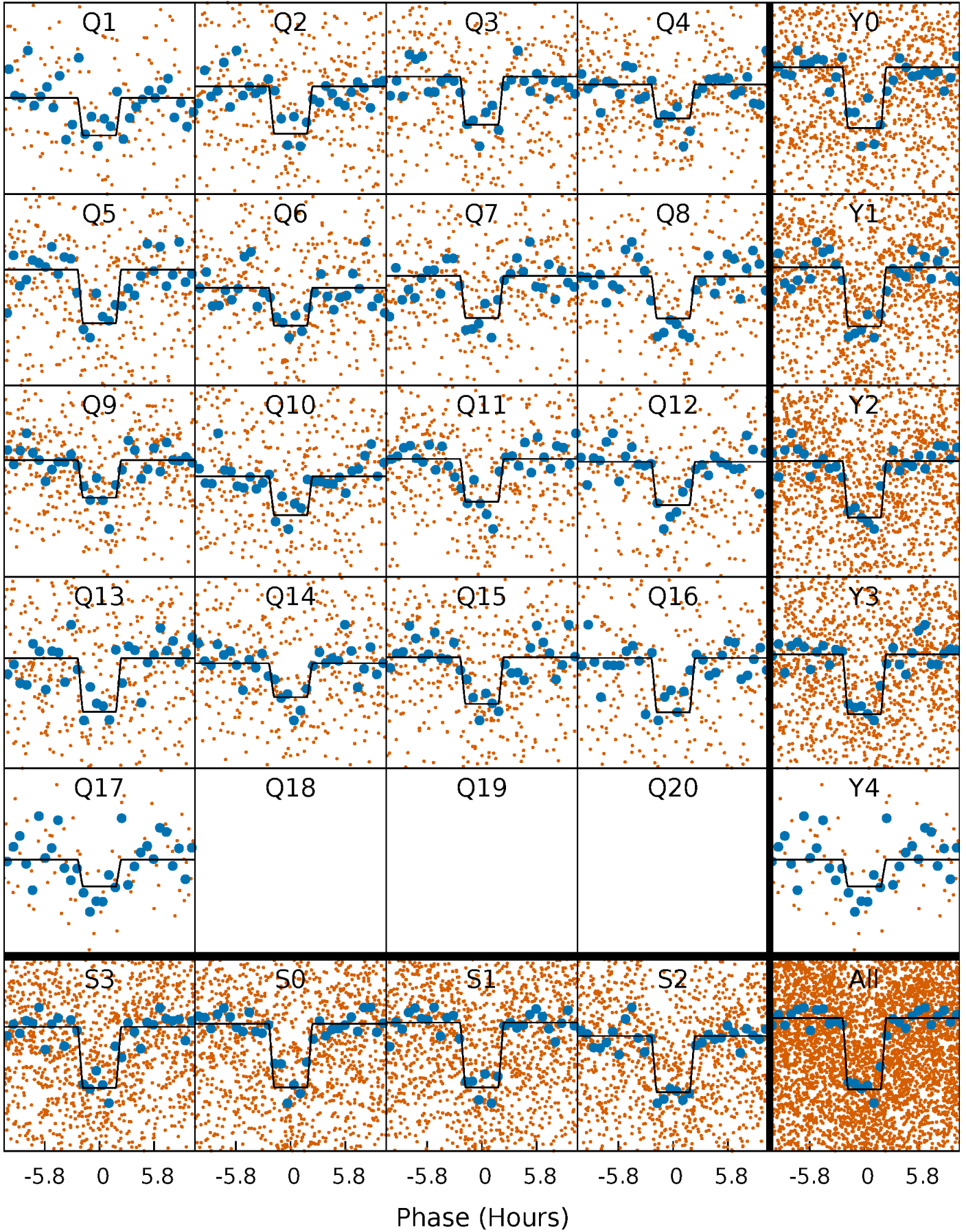
DV Quarter-Phased Transit Curves

TCE 002837111-01 P= 8.734872 Days $T_0=135.082848$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

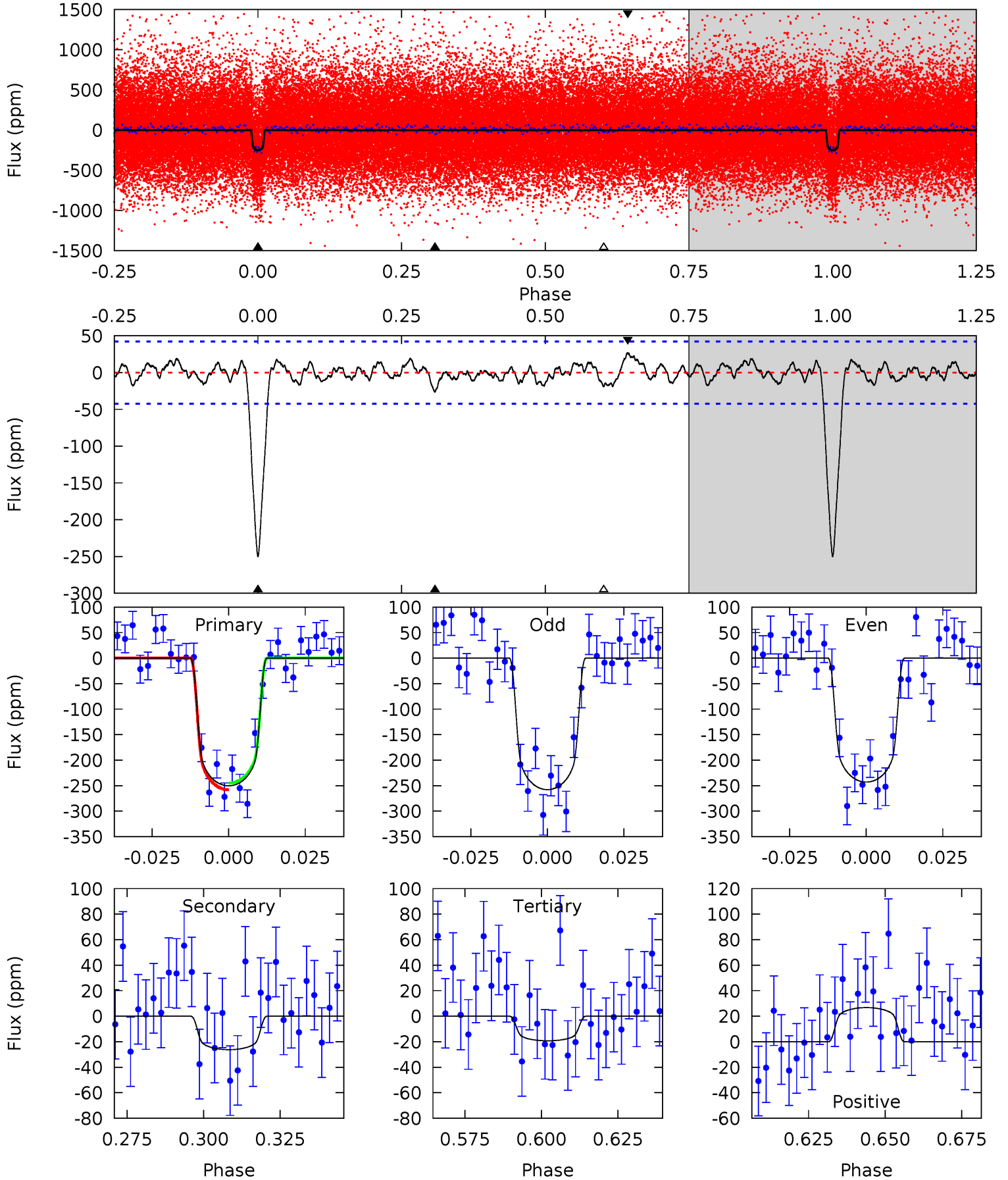
TCE 002837111-01 P= 8.734962 Days $T_0=135.074450$ (BKJD)



DV Model-Shift Uniqueness Test

002837111-01, P = 8.734872 Days, E = 126.347976 Days

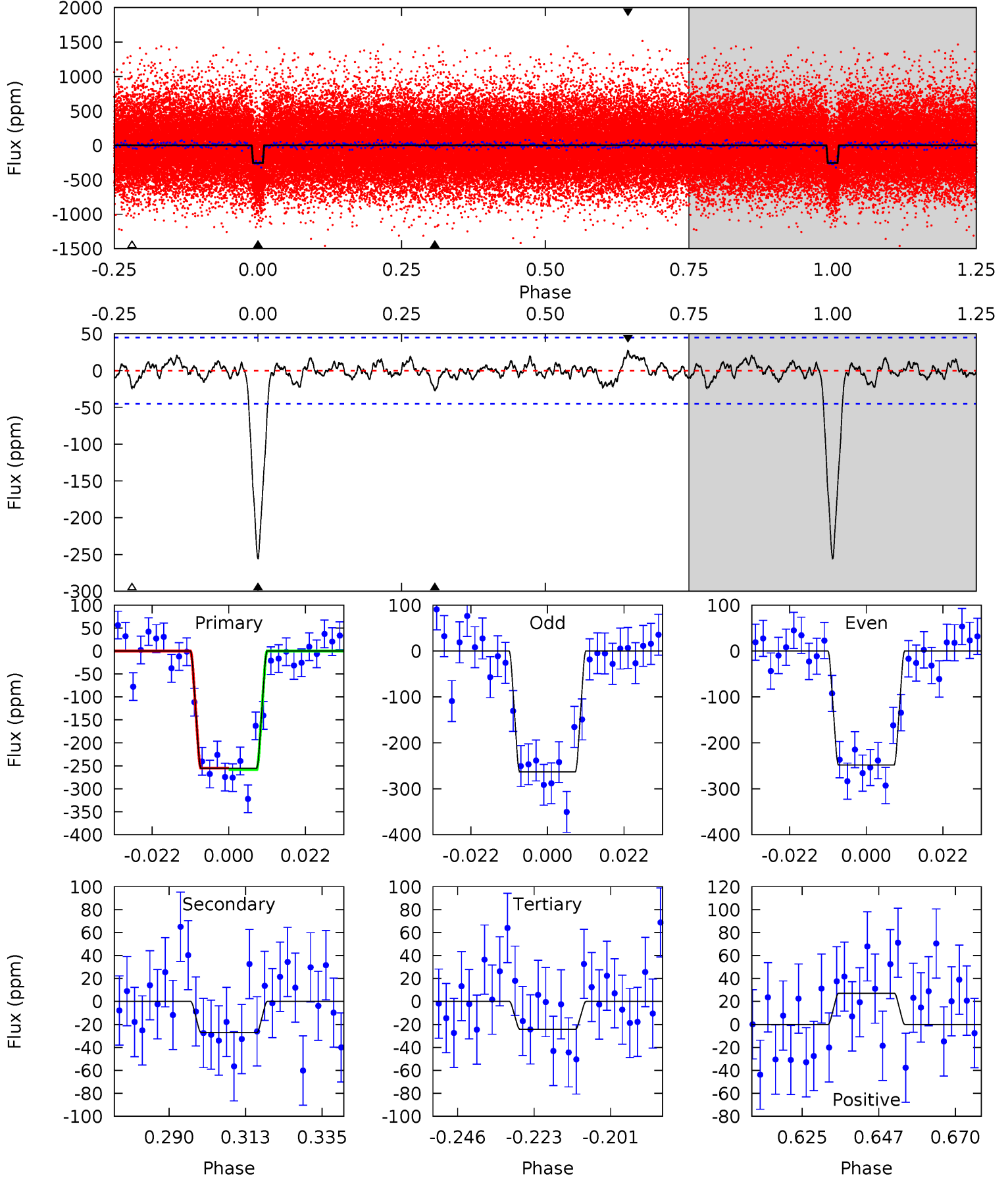
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.6	3.00	2.21	3.06	4.85	2.24	1.05	26.4	25.6	0.79	-0.06	0.85	0.97	0.10	0.75



Alt Model-Shift Uniqueness Test

002837111-01, P = 8.734962 Days, E = 126.339488 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.7	2.93	2.62	2.94	4.87	2.28	0.97	25.1	24.7	0.32	-0.00	0.81	0.99	0.10	0.15



Stellar Parameters For KIC 002837111

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5982^{+160}_{-195}	$4.493^{+0.054}_{-0.216}$	$-0.040^{+0.250}_{-0.300}$	$0.960^{+0.314}_{-0.105}$	$1.047^{+0.129}_{-0.142}$	$1.667^{+0.364}_{-0.910}$
	+3%/-3%	+1%/-5%	+625%/-750%	+33%/-11%	+12%/-14%	+22%/-55%
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 002837111-01 / KOI 1110.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-26 ± 9	$1.94^{+0.38}_{-0.32}$	1273^{+82}_{-67}	3643^{+263}_{-289}	27^{+15}_{-11}
Alt.	-27 ± 9	$1.78^{+0.35}_{-0.33}$	1272^{+93}_{-66}	3771^{+315}_{-303}	32^{+21}_{-13}

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 $A_{obs} \gg 1.0$

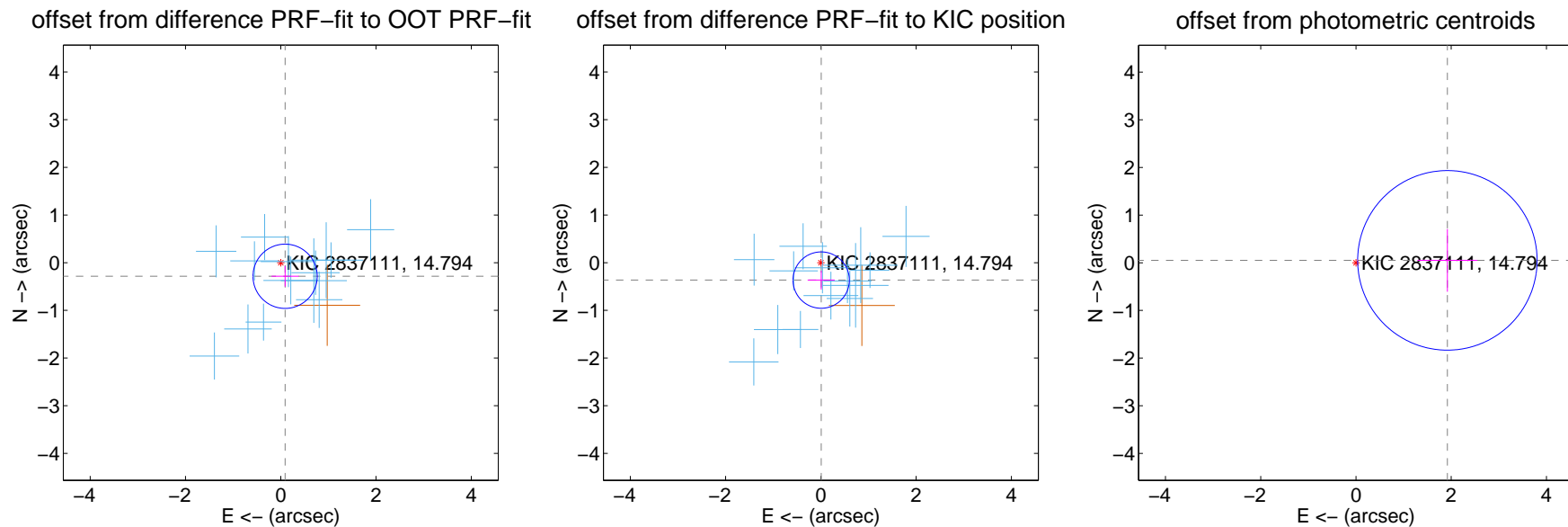
DV Centroid Data

Supplemental centroid analysis for 002837111-01. Kepler magnitude: 14.79. Transit SNR 23.21

There are 14 quarters with good PRF difference image offsets

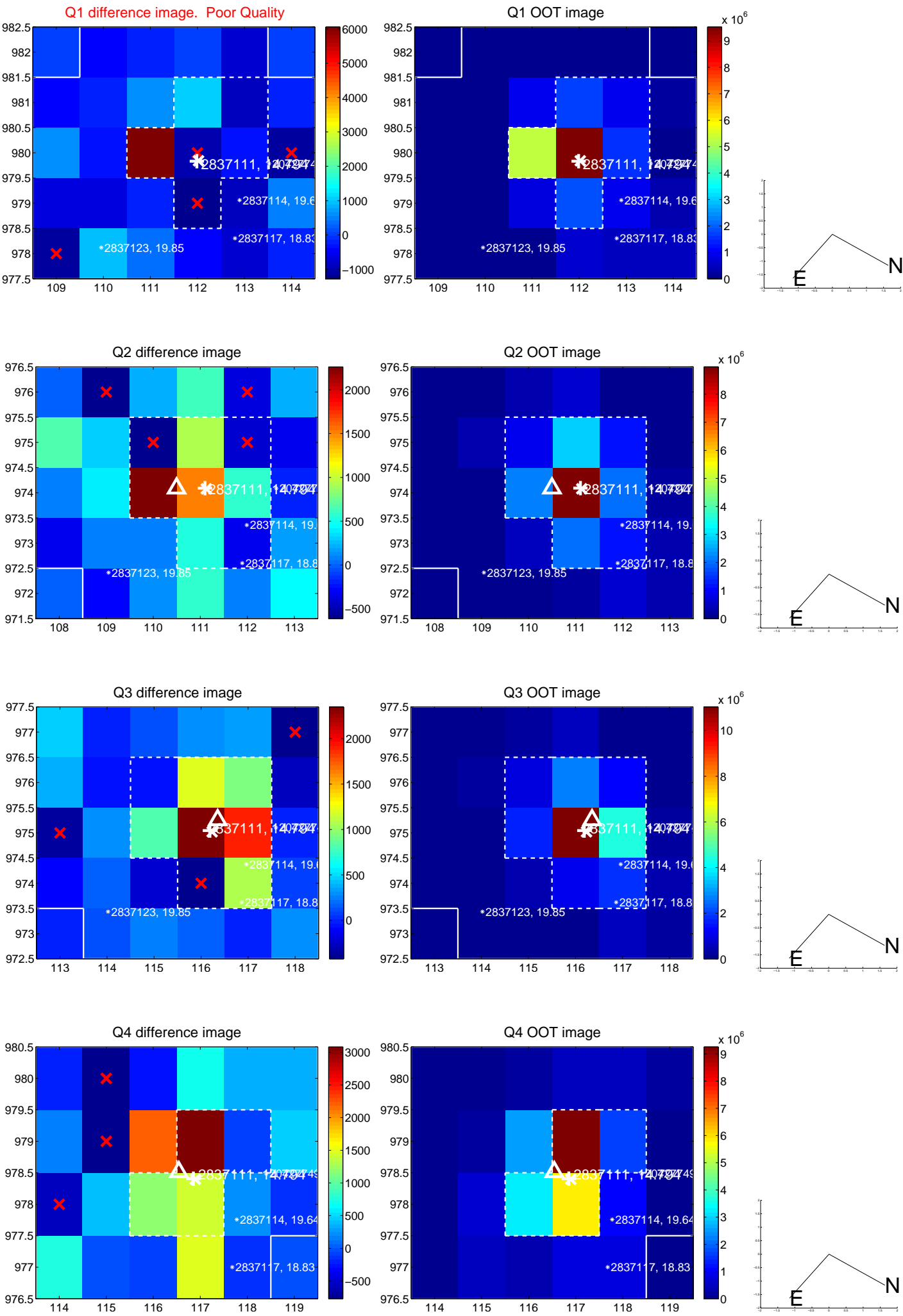
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.299 ± 0.225	1.33	-0.091 ± 0.285	-0.285 ± 0.217
PRF-fit source offset from KIC position	0.365 ± 0.197	1.85	-0.007 ± 0.284	-0.365 ± 0.197
photometric centroid source offset	1.92 ± 0.63	3.06	-1.92 ± 0.63	0.05 ± 0.66

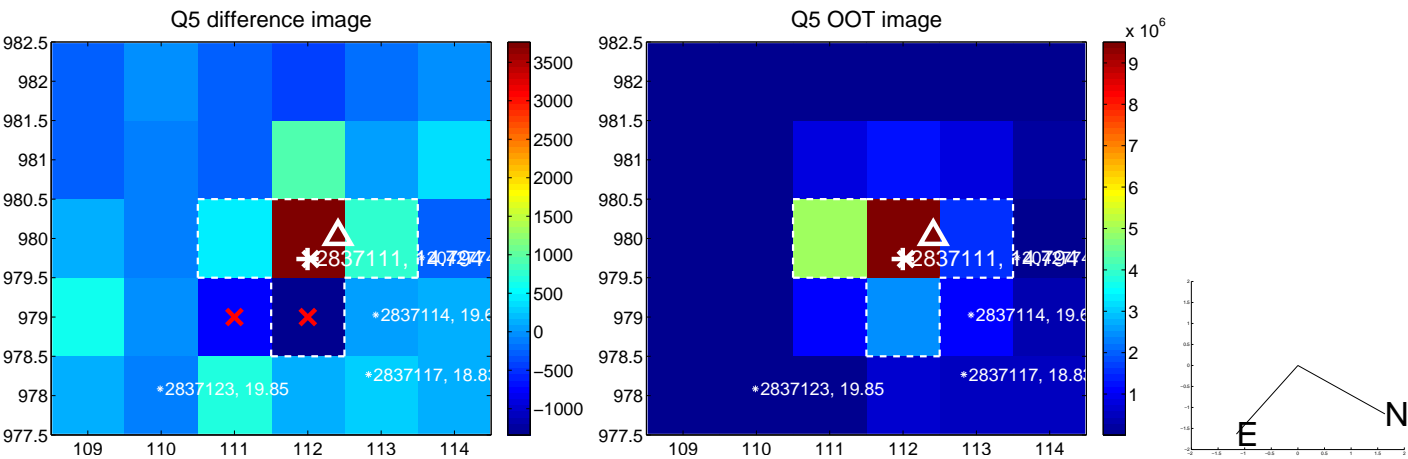


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

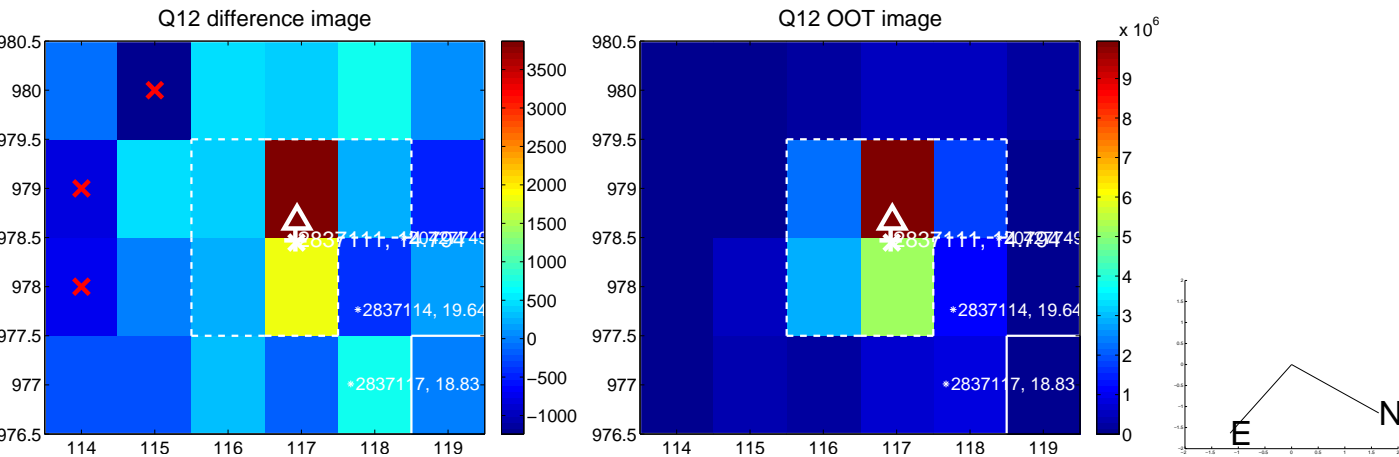
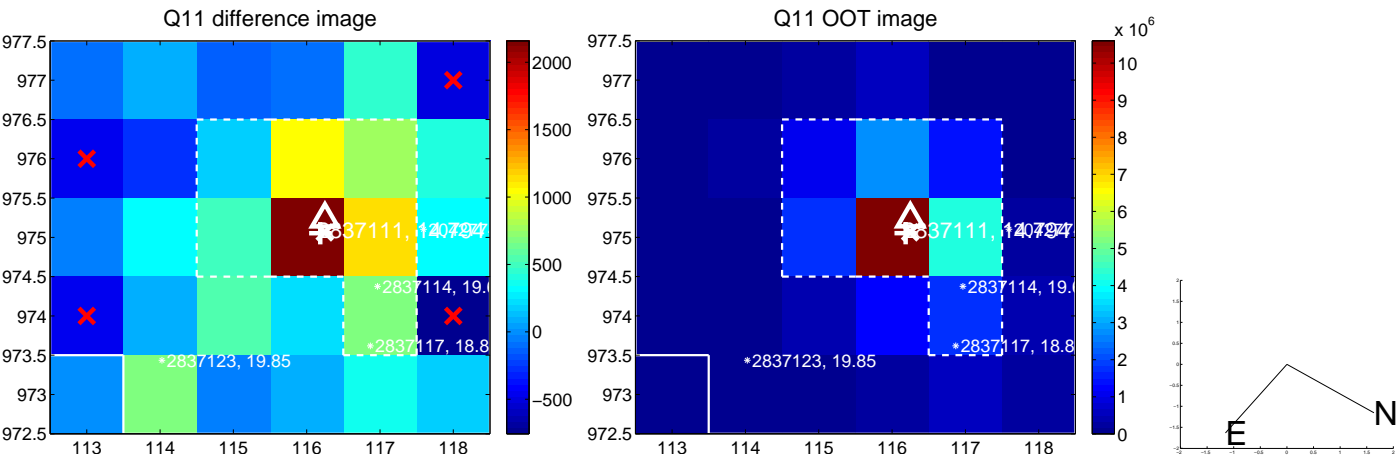
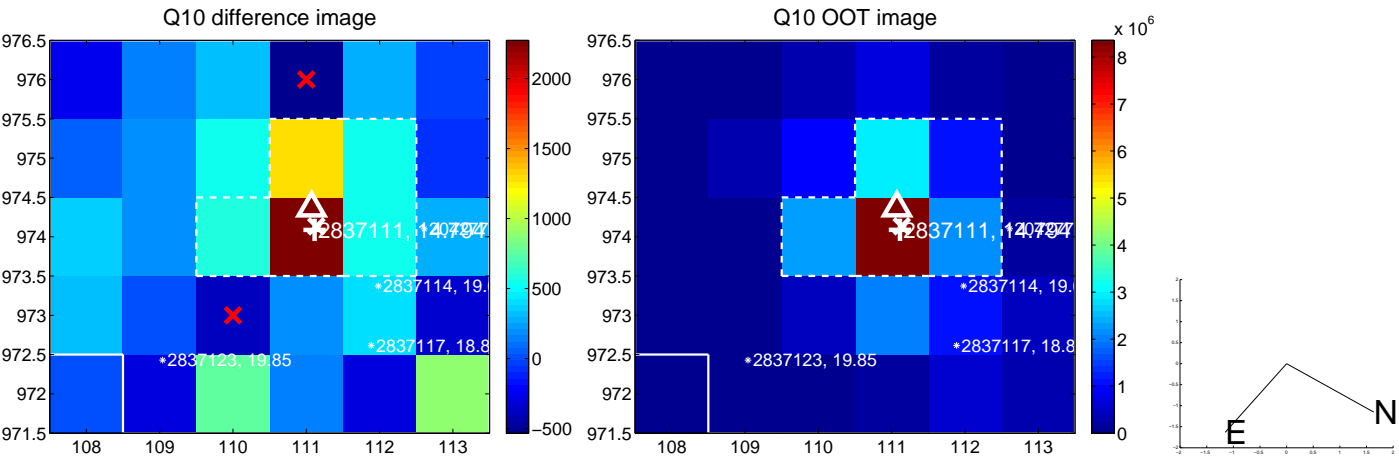
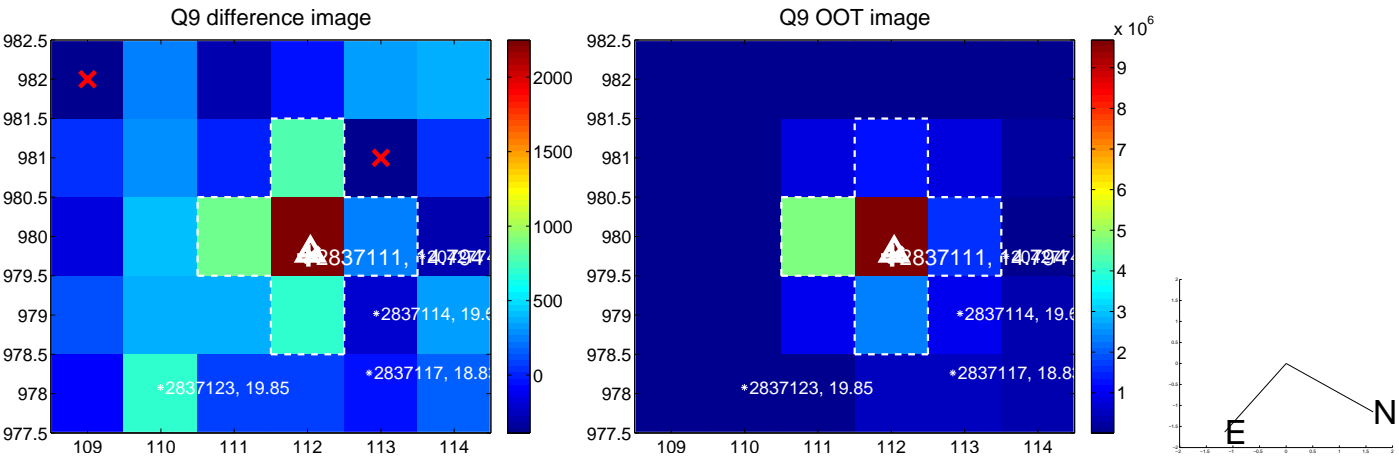
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



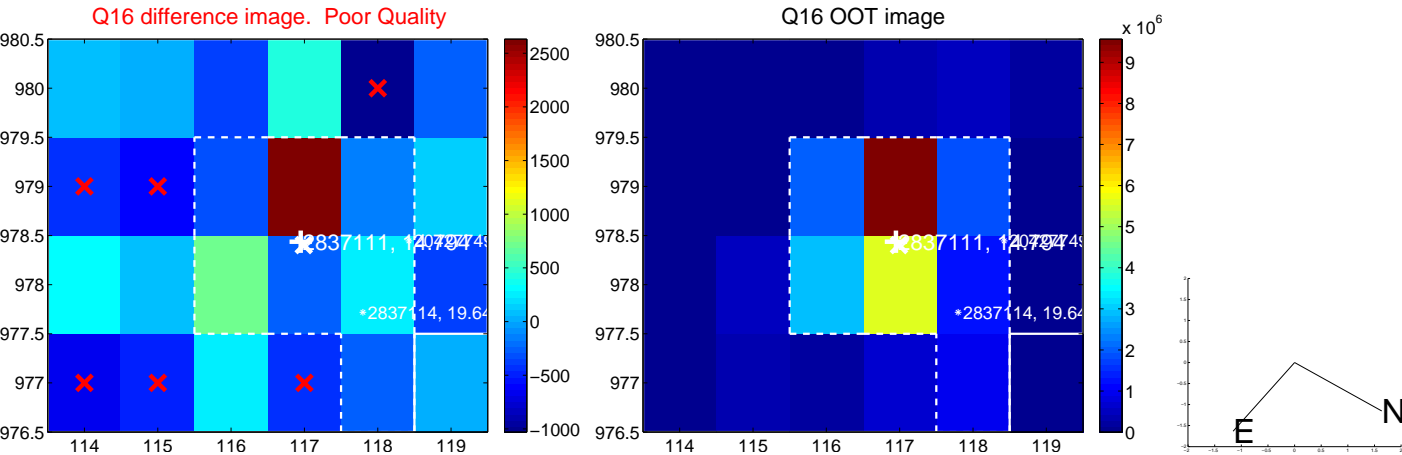
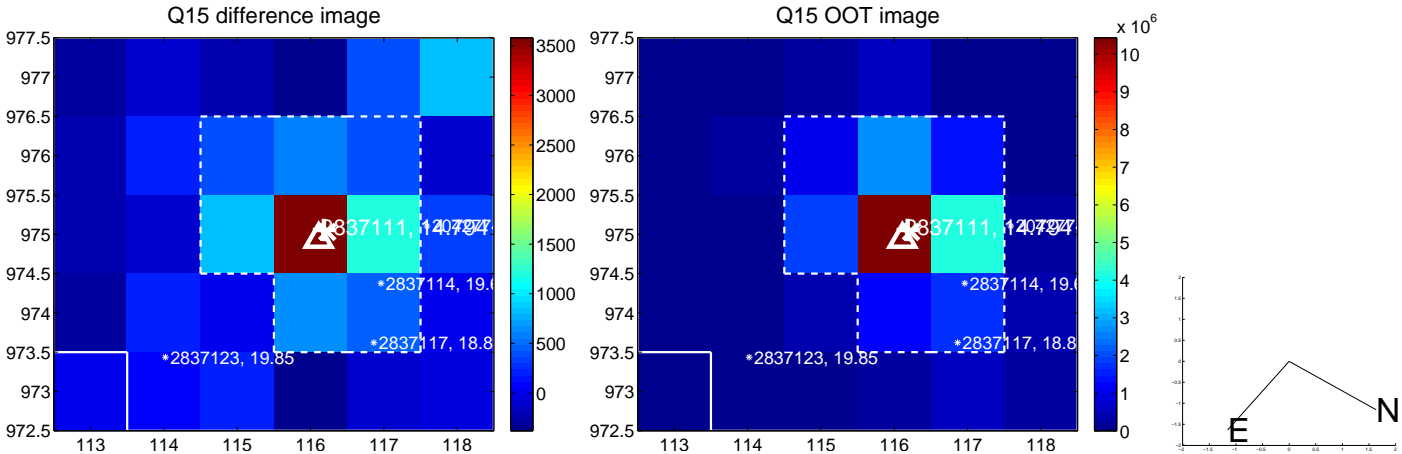
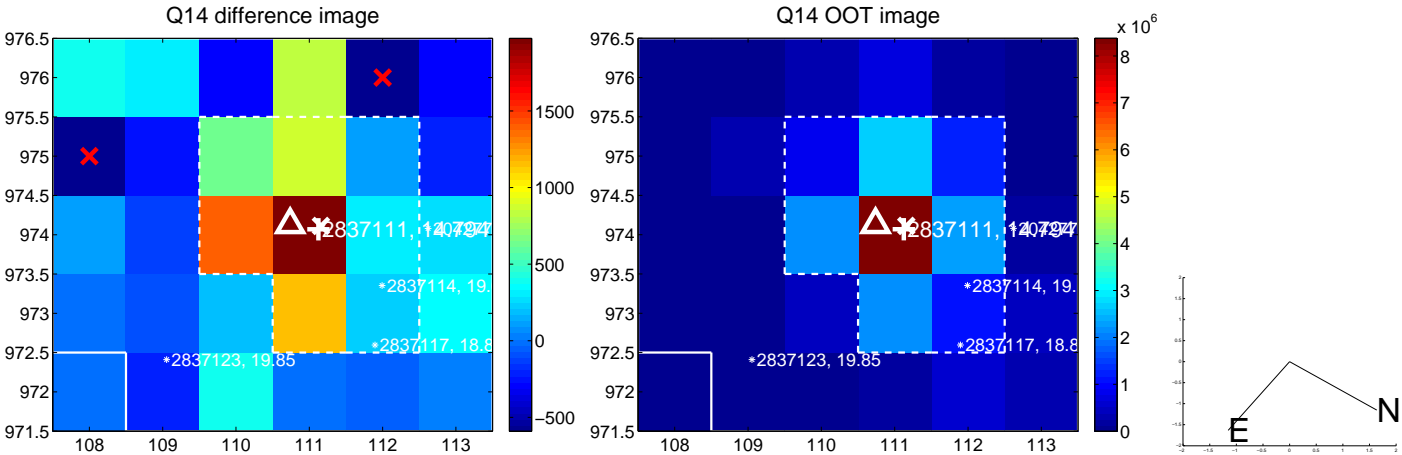
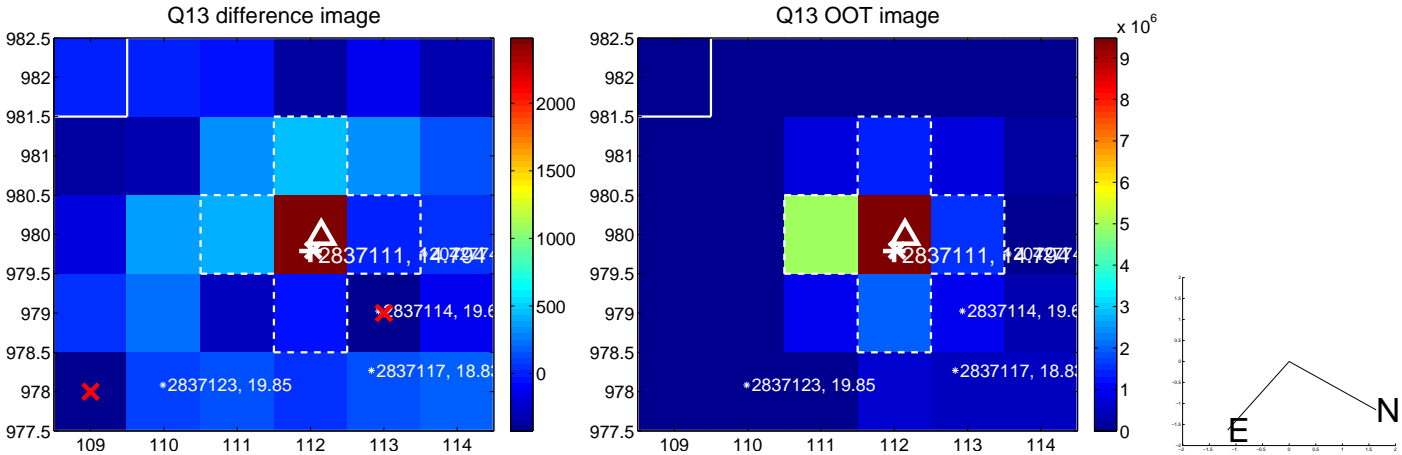
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



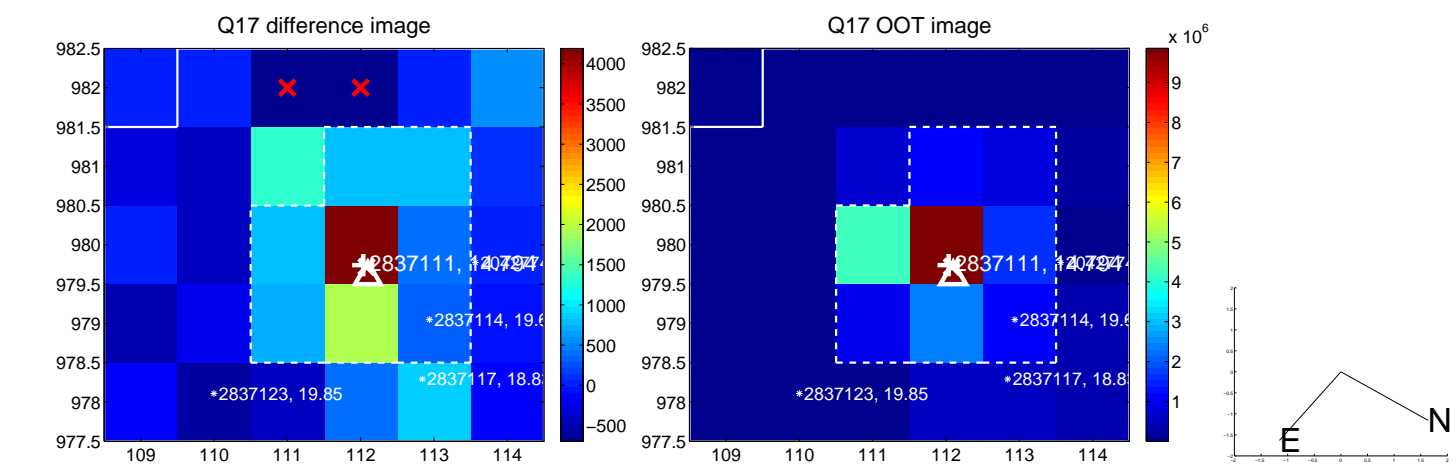
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



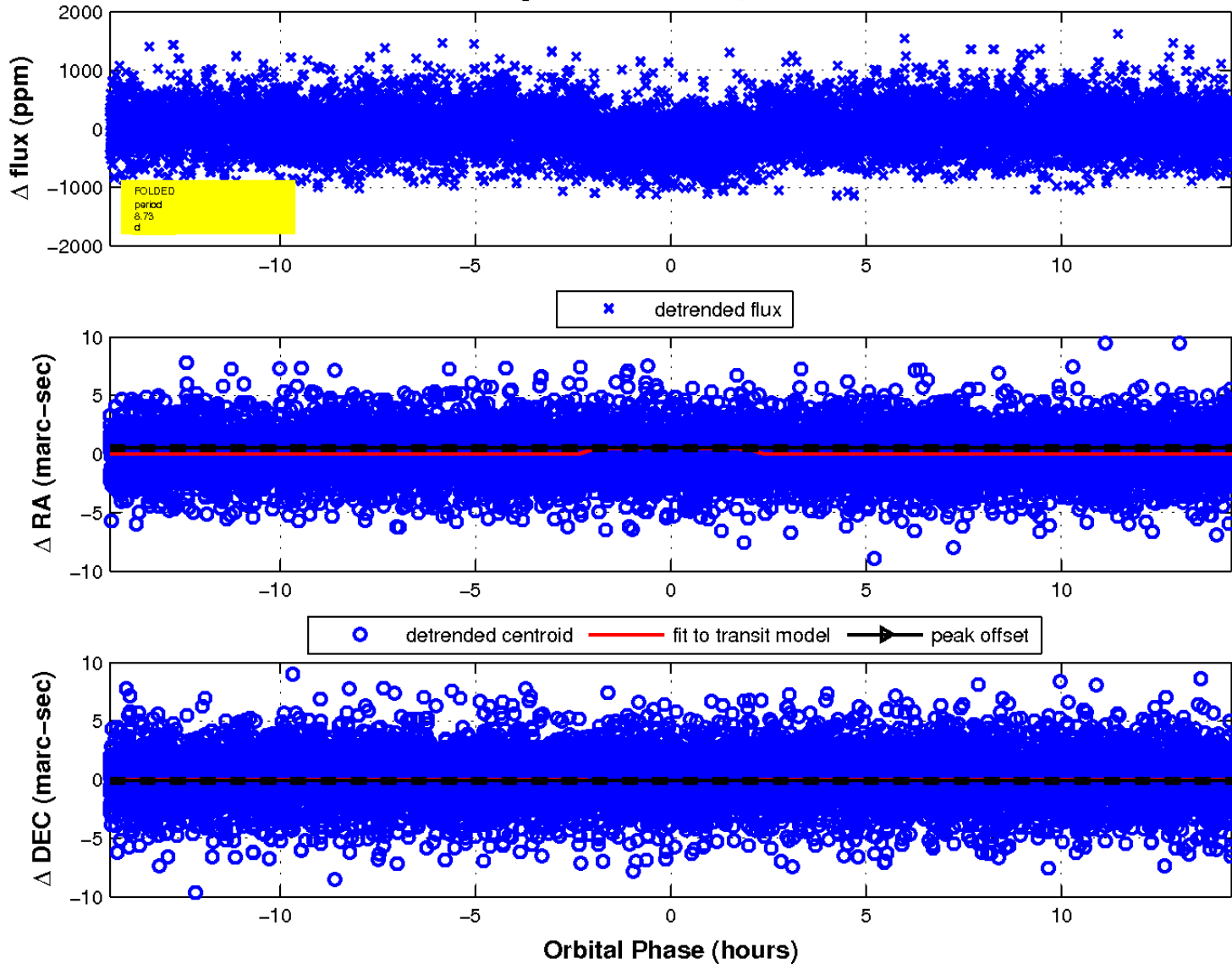
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



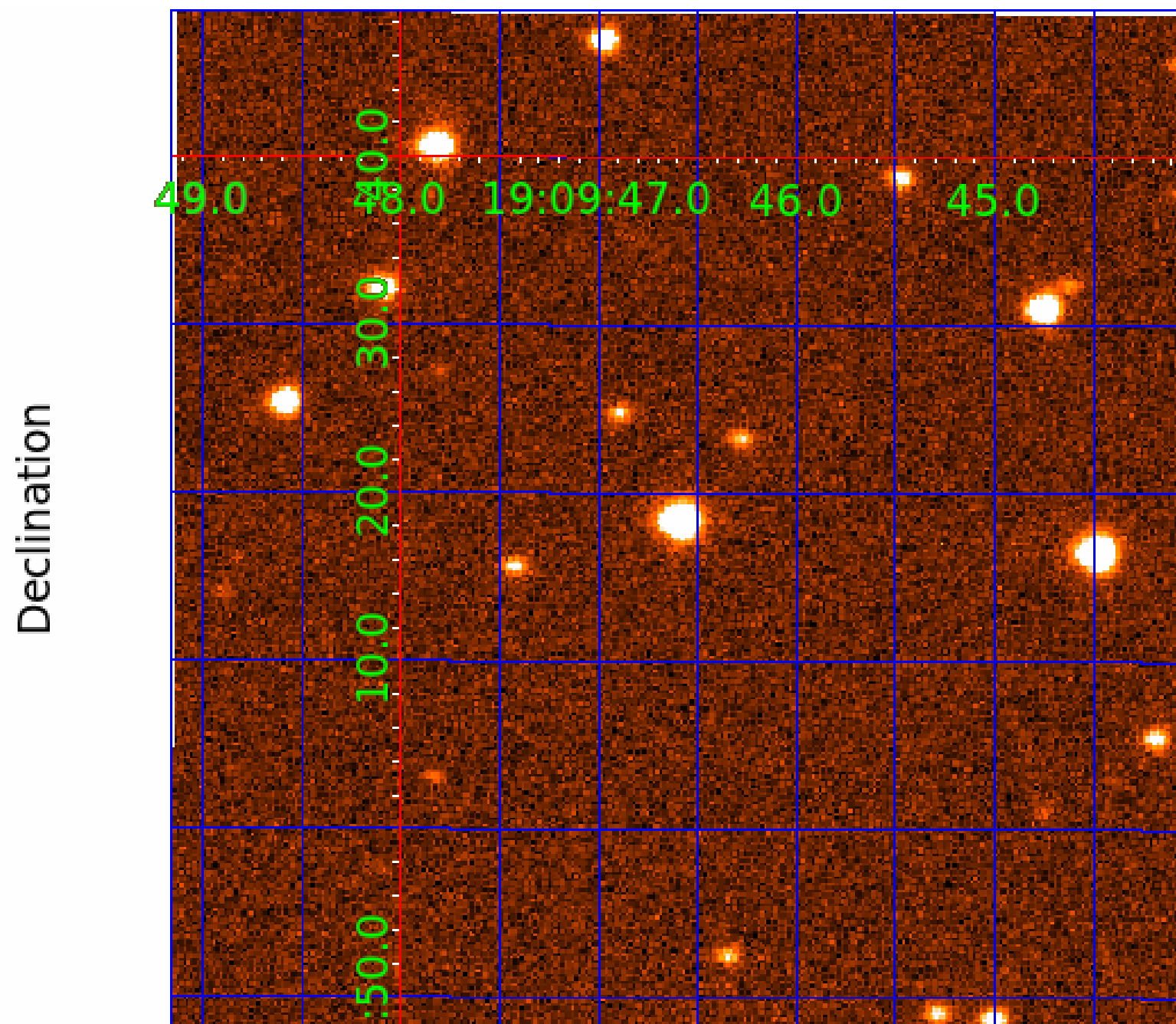
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 002837111

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})
002837111-01	OBS	1110.01	8.734872	135.082848	268.9	4.788	21.2	23.2	0.96	5982	1.85	148.86
002837111-02	OBS	1110.02	3.718379	134.667925	72.7	3.540	8.0	8.3	0.96	5982	0.97	464.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002837111-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
002837111-02	OBS	FP	0.05	1	0	0	0	LPP_DV

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.

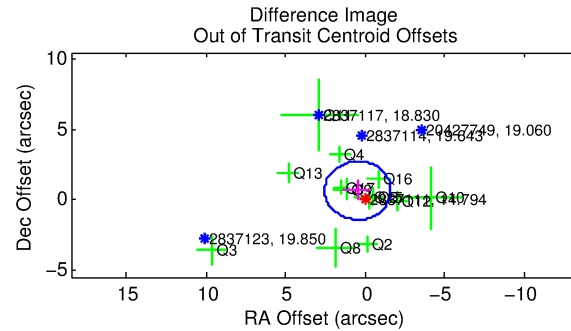
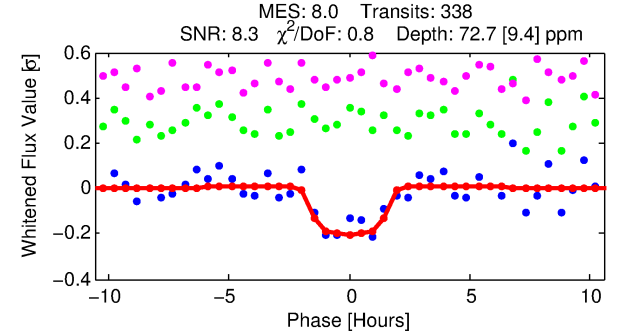
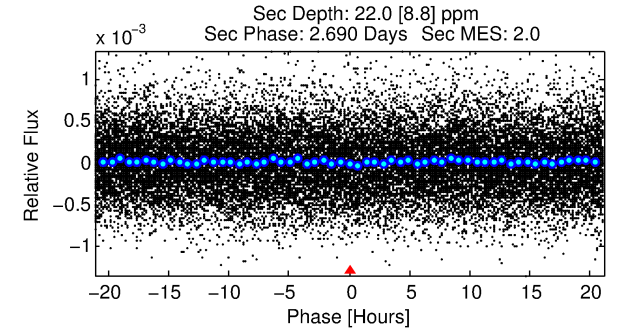
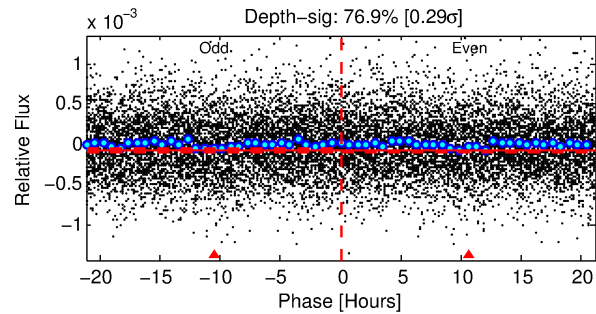
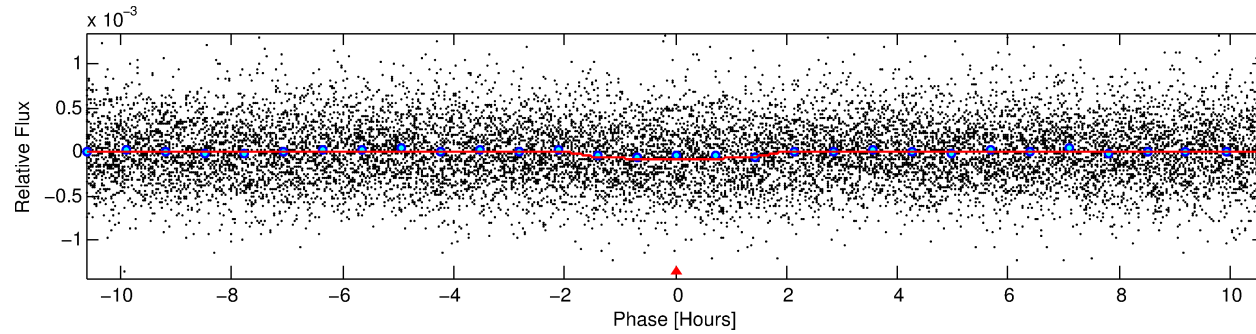
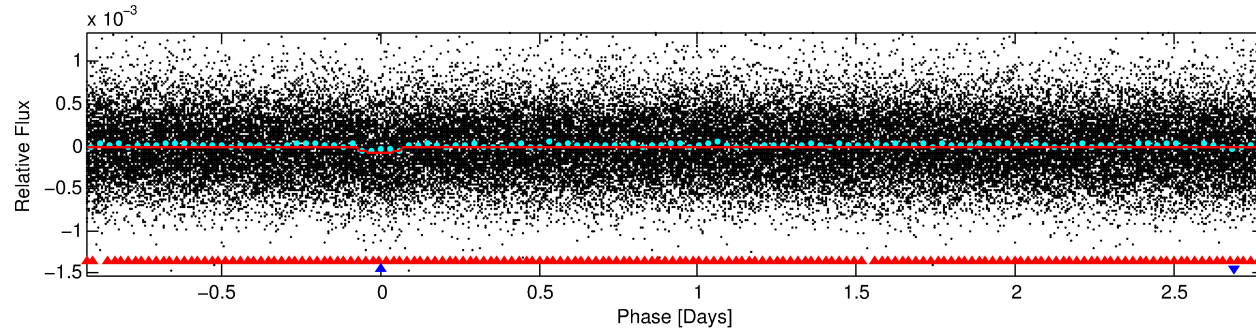
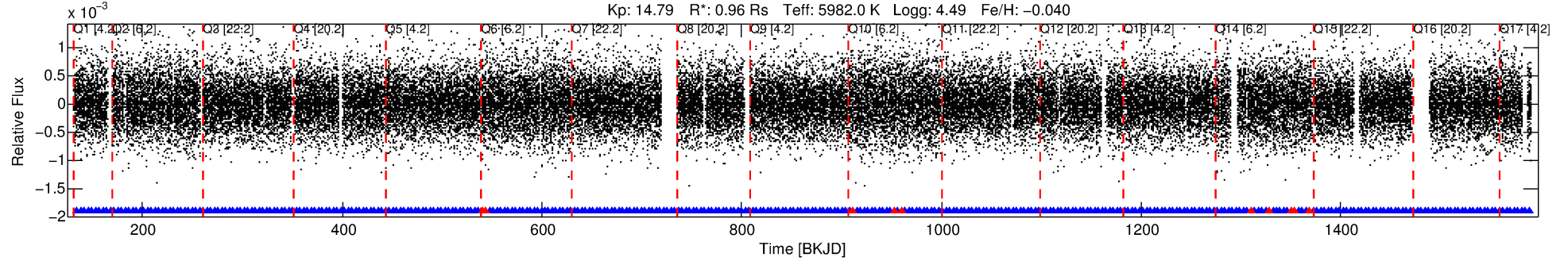
Ephemeris Match Information For 002837111-02

No Significant Match Found

DV One-Page Summary

KIC: 2837111 Candidate: 2 of 2 Period: 3.718 d

KOI: K01110.02 Corr: 0.964



DV Fit Results:

Period = 3.71838 [0.00004] d
Epoch = 134.6679 [0.0067] BKJD
Rp/R* = 0.0093 [0.0064]
a/R* = 3.73 [12.23]
b = 0.90 [0.73]
Seff = 464.86 [194.18]
Teff = 1184 [124] K
Rp = 0.97 [0.74] Re
a = 0.0477 [0.0131] AU
Ag = 29.21 [43.49] [0.65 σ]
Teffp = 4256 [1533] K [2.00 σ]

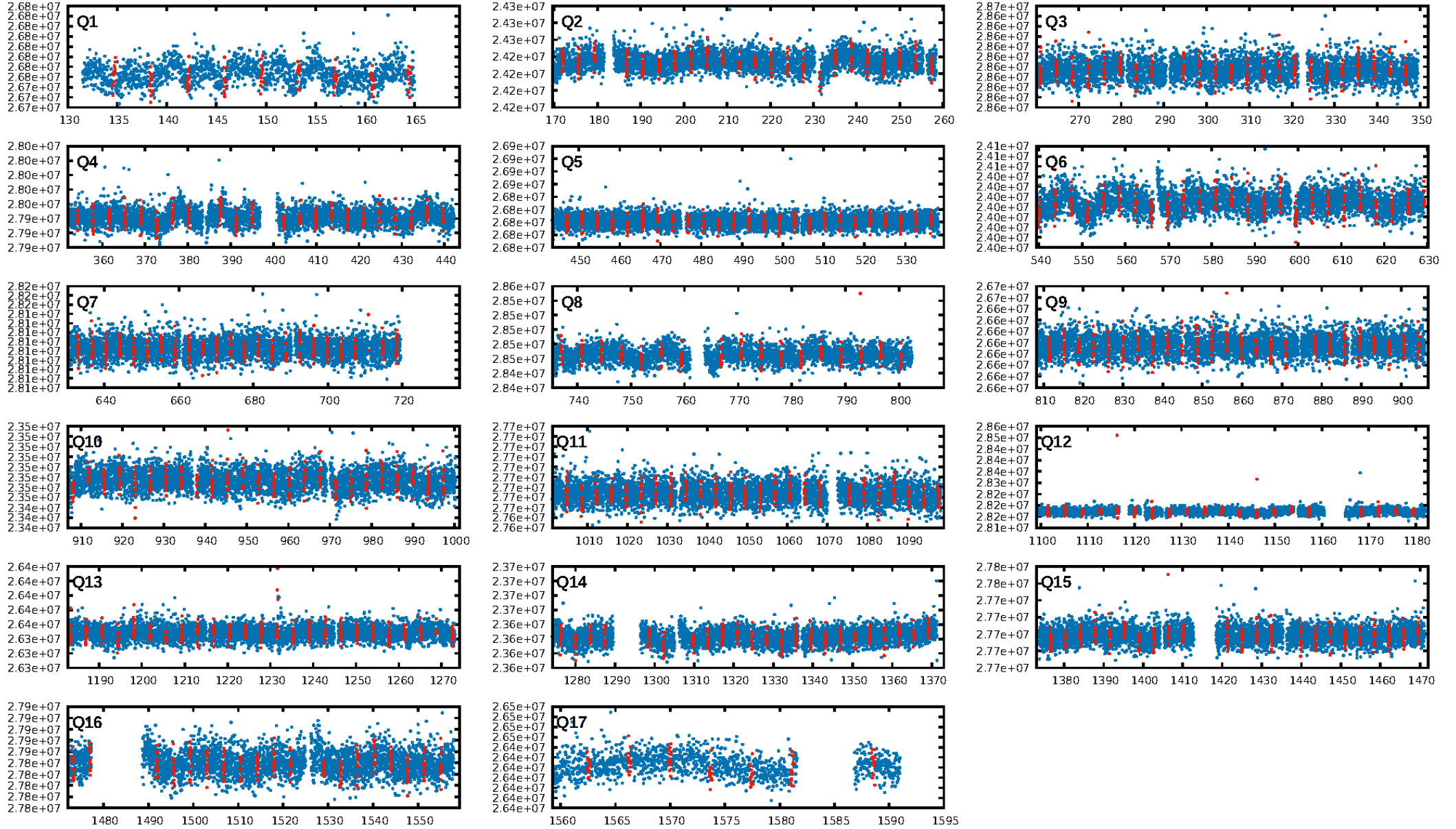
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [20.22 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.19e-16
RollingBand-fgt: 0.97 [312/322]
GhostDiagnostic-chr: 2.663
Centroid-sig: 36.5%
Centroid-so: 1.769 arcsec [0.97 σ]
OotOffset-rm: 0.807 arcsec [1.16 σ]
KicOffset-rm: 0.730 arcsec [0.93 σ]
OotOffset-st: 2/3/4/4 [13]
KicOffset-st: 2/3/4/4 [13]
DiffImageQuality-fgm: 0.31 [4/13]
DiffImageOverlap-fno: 1.00 [17/17]

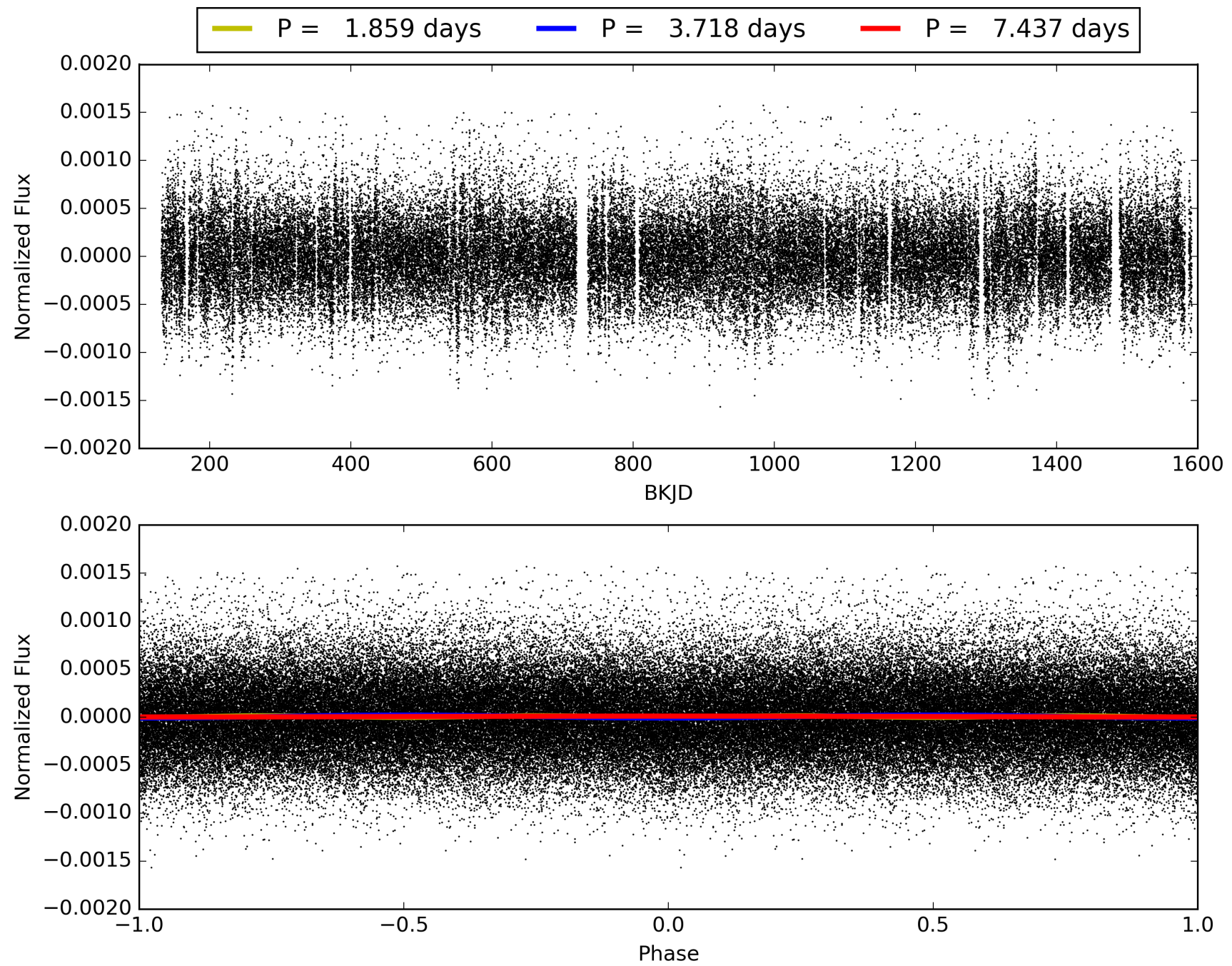
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 002837111-02, PDC Light Curves

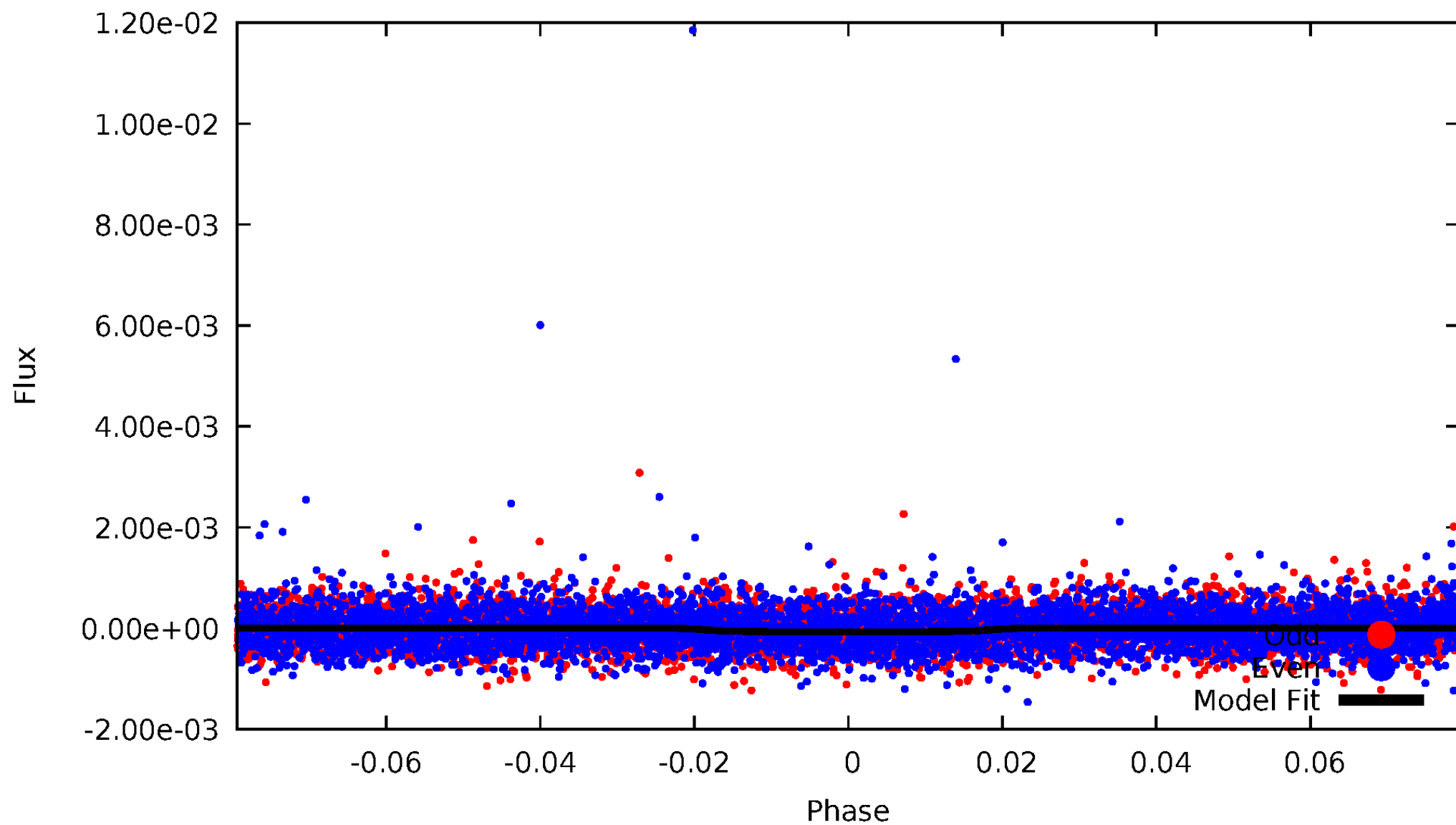


TCE 002837111-02



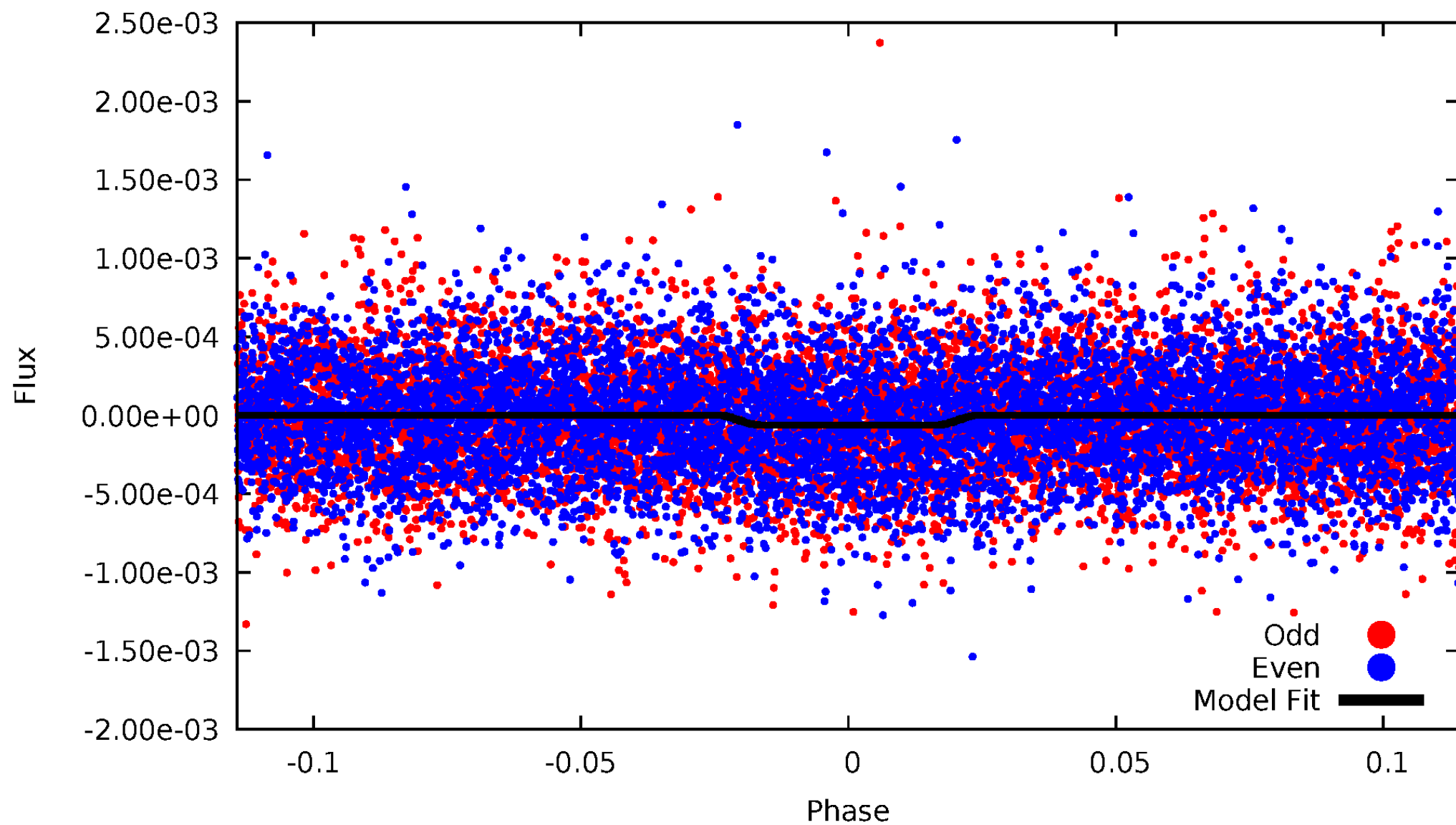
DV Odd/Even

TCE 002837111-02



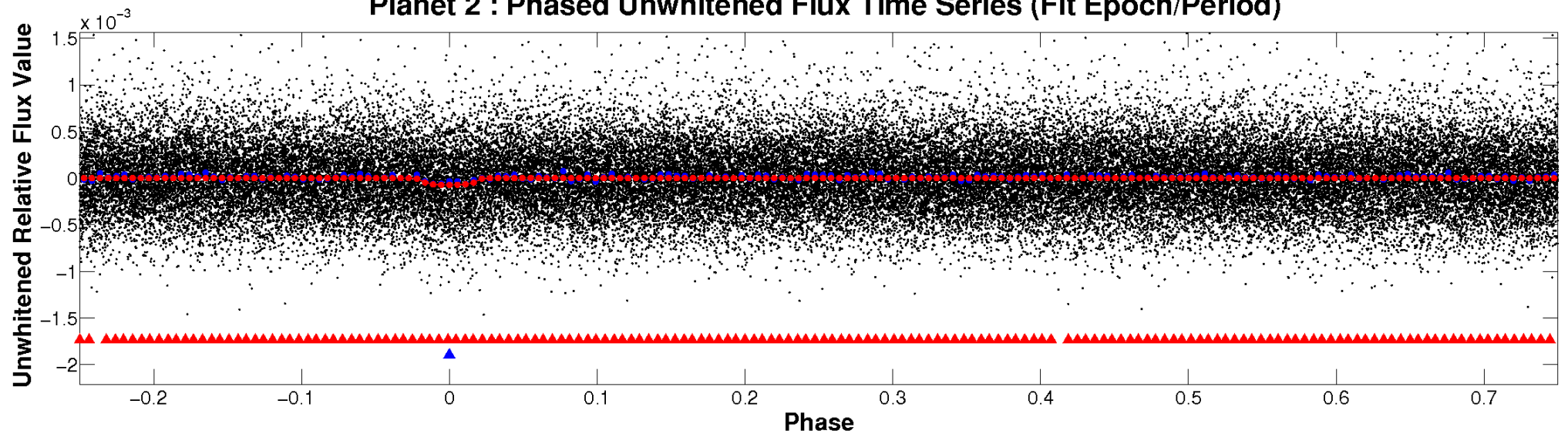
ALT Odd/Even

TCE 002837111-02

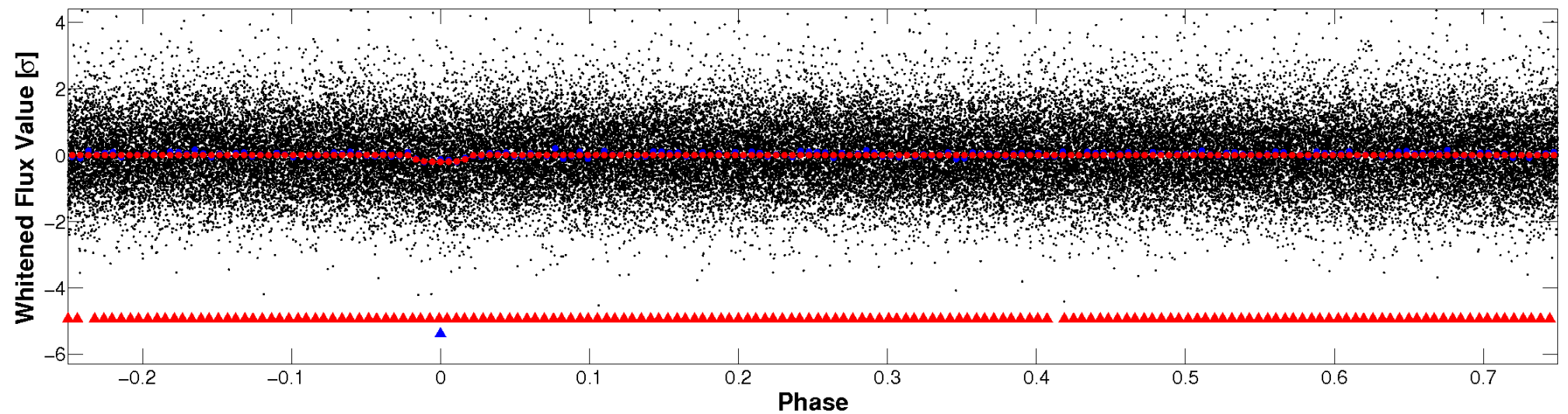


Non-Whitened Vs. Whitened Light Curve

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

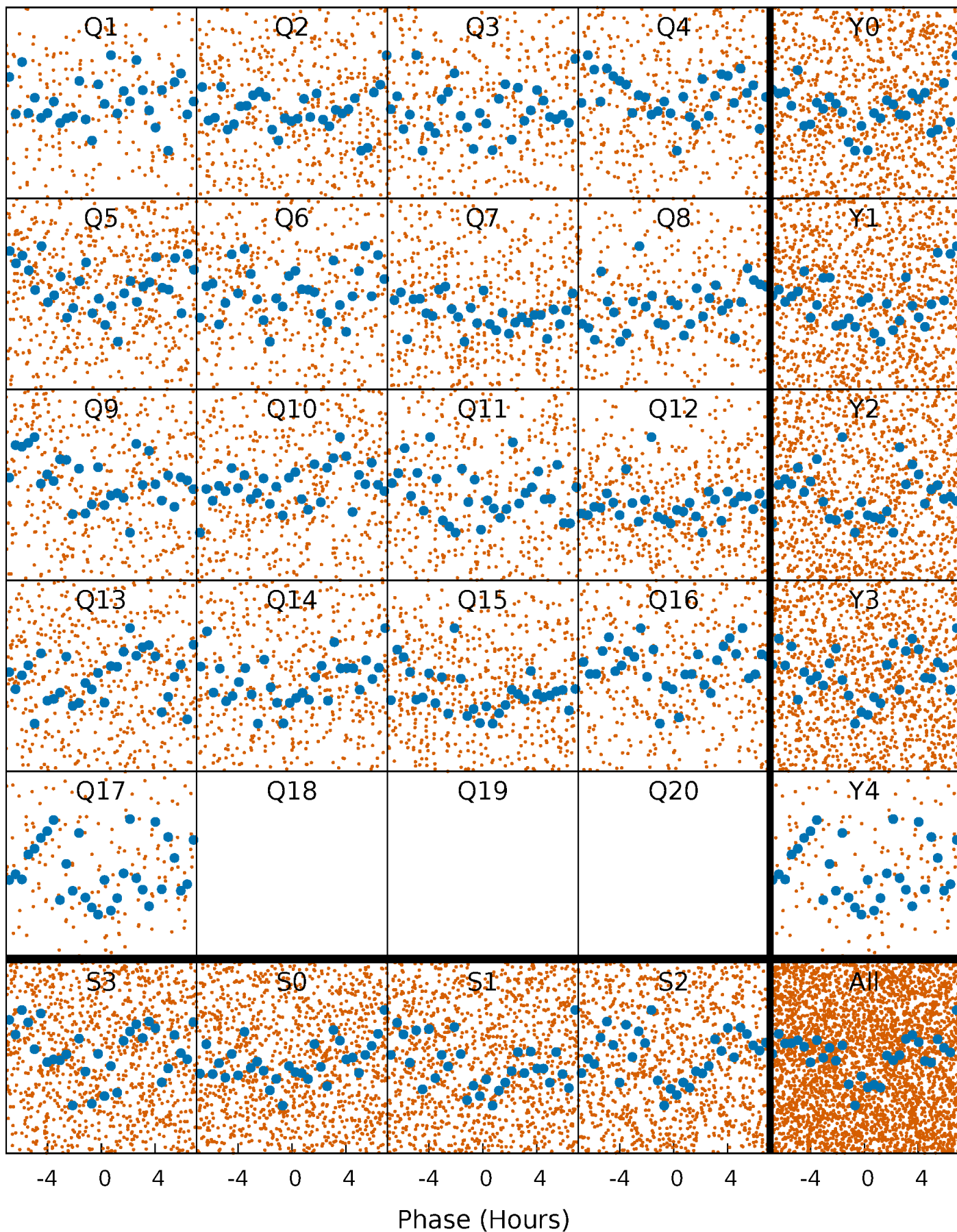


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



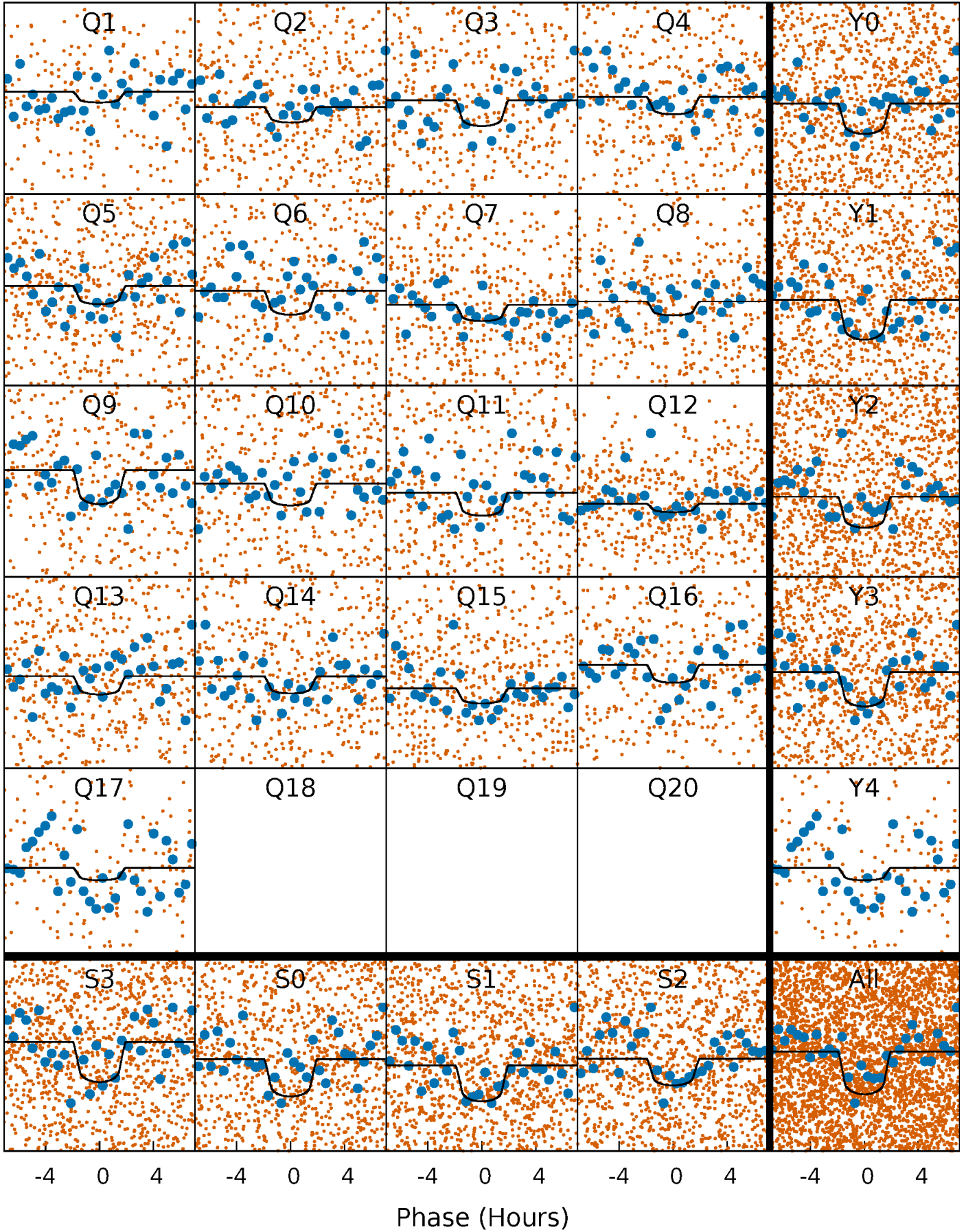
PDC Quarter-Phased Transit Curves

TCE 002837111-02 P= 3.718379 Days $T_0=134.667925$ (BKJD)



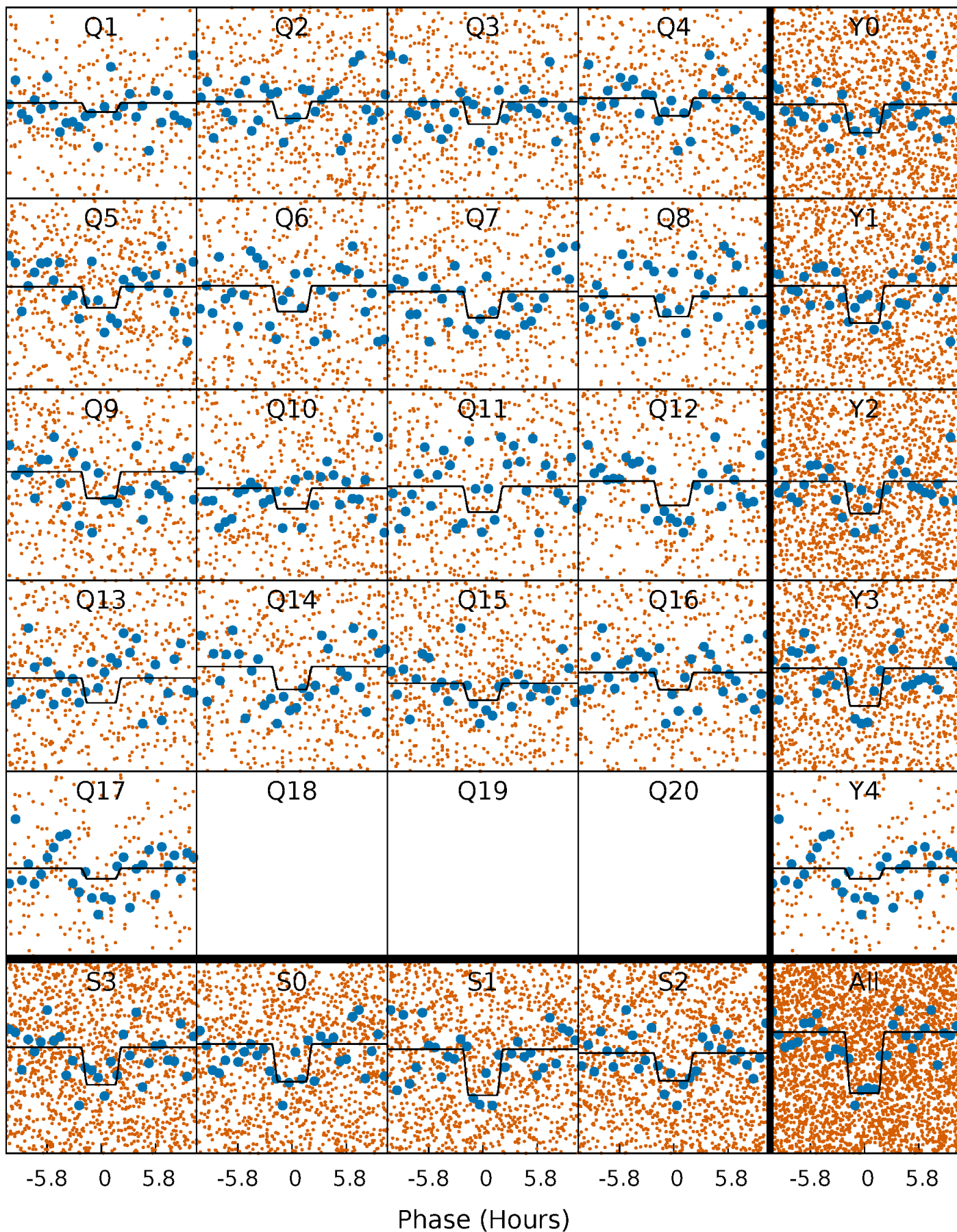
DV Quarter-Phased Transit Curves

TCE 002837111-02 P= 3.718379 Days $T_0=134.667925$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

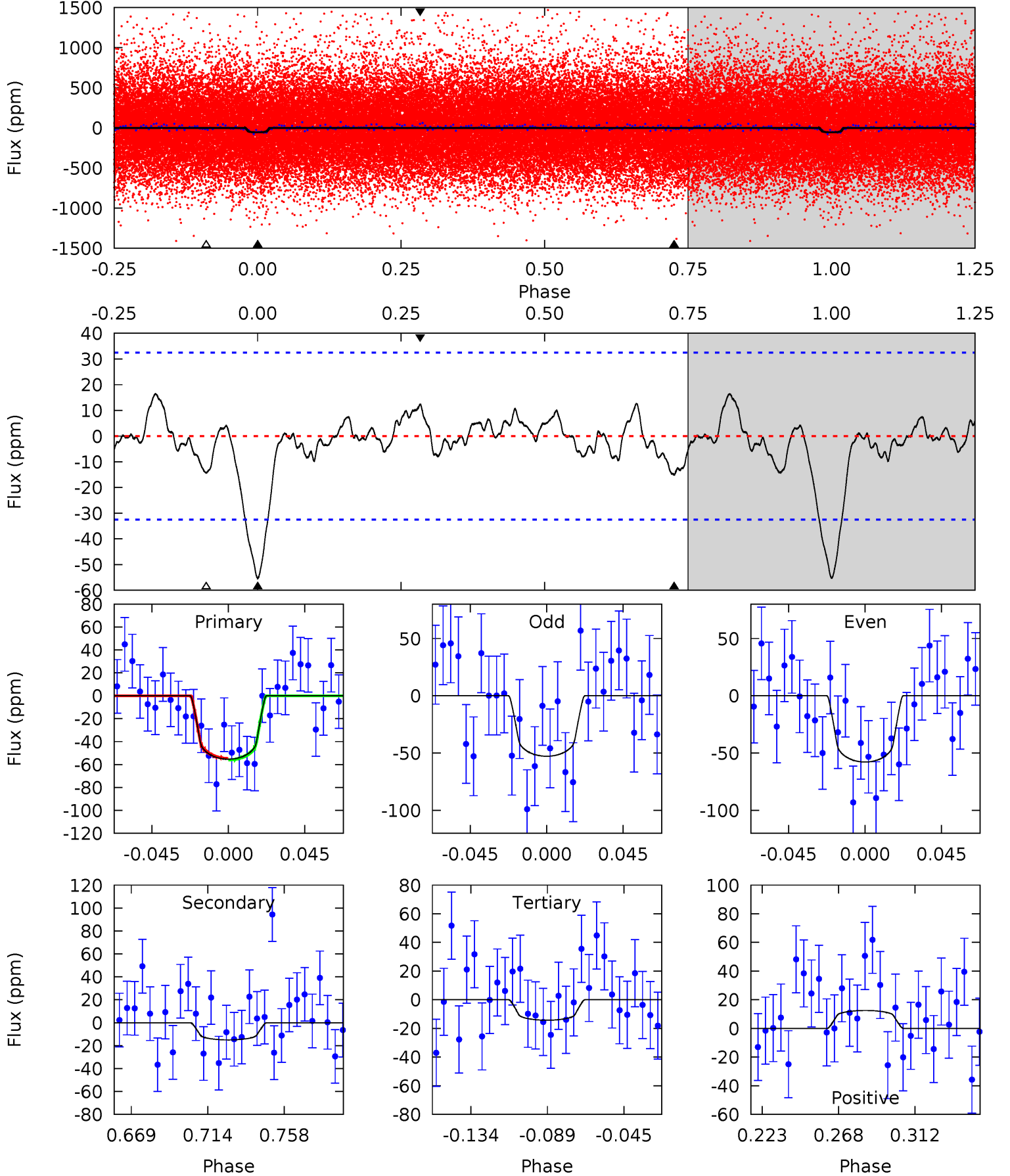
TCE 002837111-02 P= 3.718432 Days $T_0=134.656815$ (BKJD)



DV Model-Shift Uniqueness Test

002837111-02, P = 3.718379 Days, E = 130.949546 Days

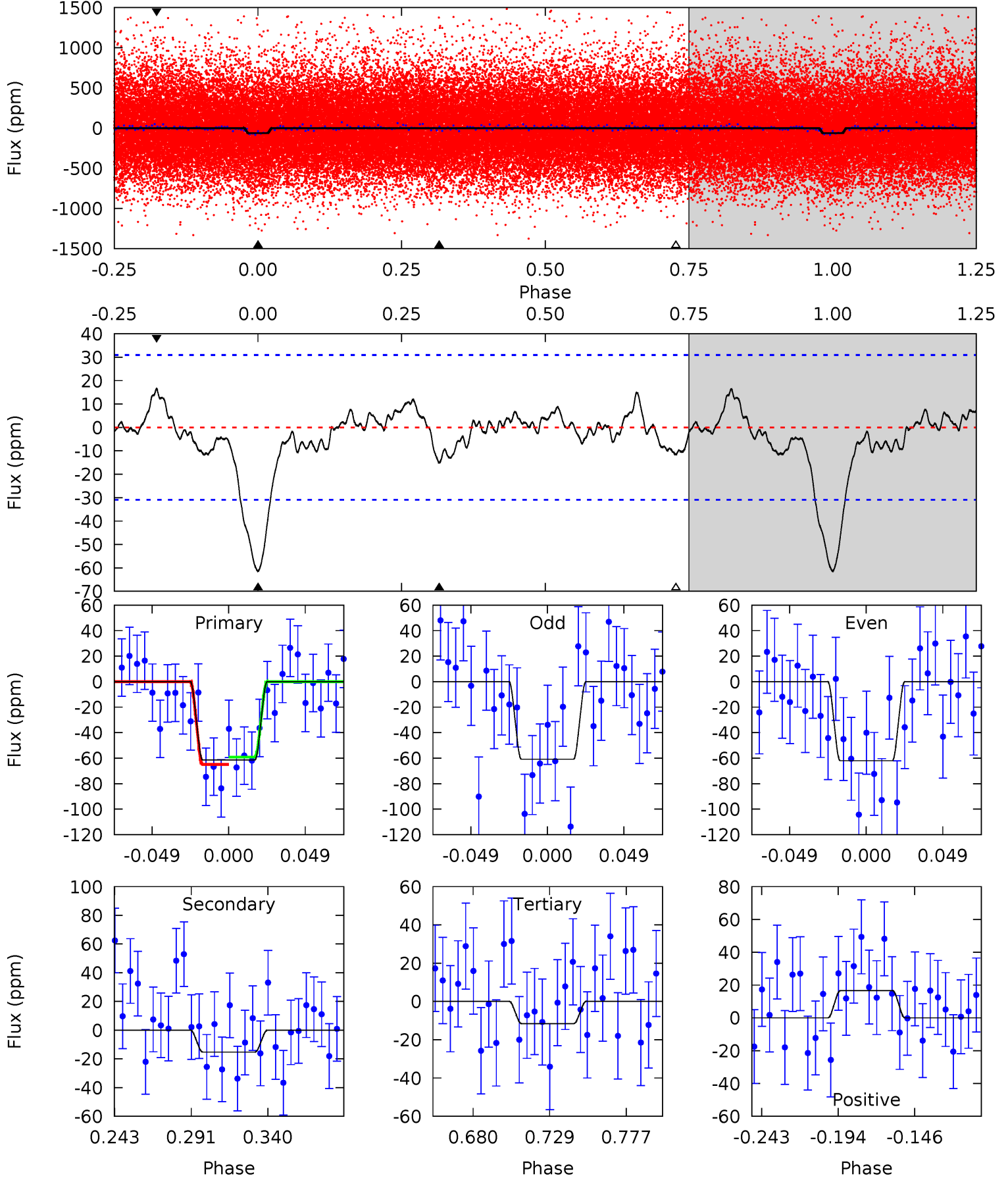
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.06	2.19	2.08	1.82	4.73	2.01	0.85	5.98	6.24	0.11	0.37	0.37	0.79	0.23	0.09



Alt Model-Shift Uniqueness Test

002837111-02, P = 3.718432 Days, E = 130.938383 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.36	2.32	1.76	2.52	4.71	1.97	0.91	7.60	6.84	0.56	-0.20	0.09	0.93	0.21	0.44



Stellar Parameters For KIC 002837111

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5982^{+160}_{-195}	$4.493^{+0.054}_{-0.216}$	$-0.040^{+0.250}_{-0.300}$	$0.960^{+0.314}_{-0.105}$	$1.047^{+0.129}_{-0.142}$	$1.667^{+0.364}_{-0.910}$
	+3%/-3%	+1%/-5%	+625%/-750%	+33%/-11%	+12%/-14%	+22%/-55%
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 002837111-02 / KOI 1110.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-15 ± 7	$1.04^{+0.70}_{-0.57}$	1691^{+130}_{-83}	3989^{+1514}_{-719}	15^{+57}_{-11}
Alt.	-15 ± 7	$0.98^{+0.64}_{-0.62}$	1687^{+120}_{-84}	4180^{+2189}_{-794}	19^{+102}_{-13}

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

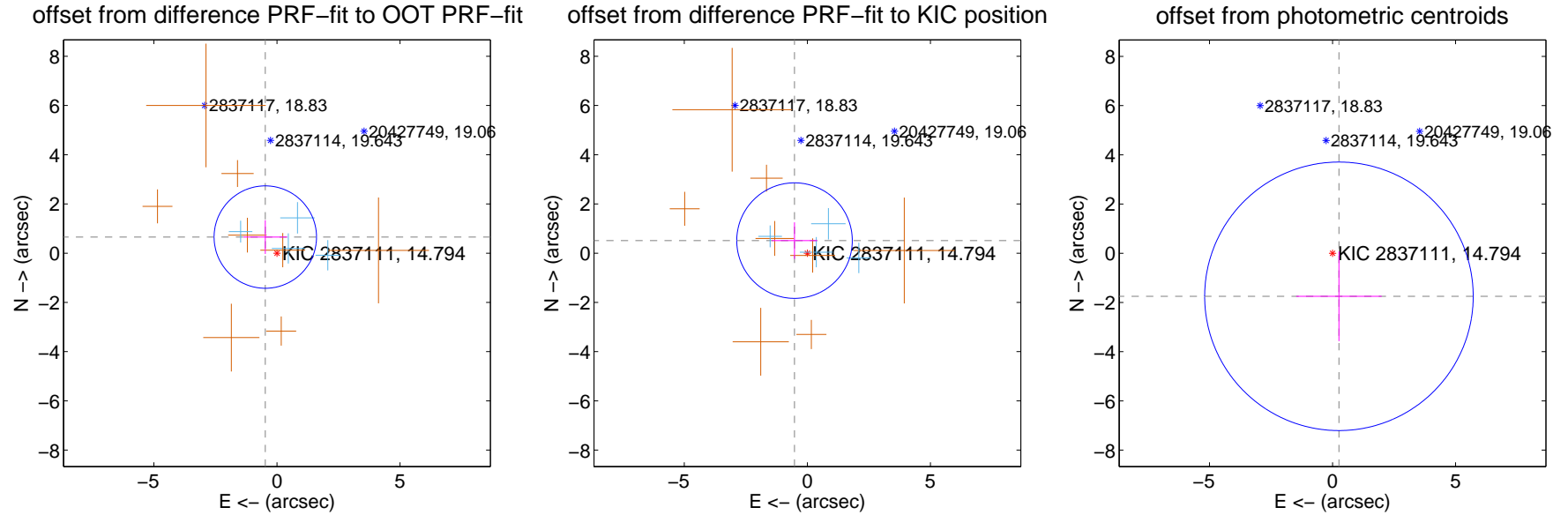
DV Centroid Data

Supplemental centroid analysis for 002837111-02. Kepler magnitude: 14.79. Transit SNR 8.32

There are 4 quarters with good PRF difference image offsets

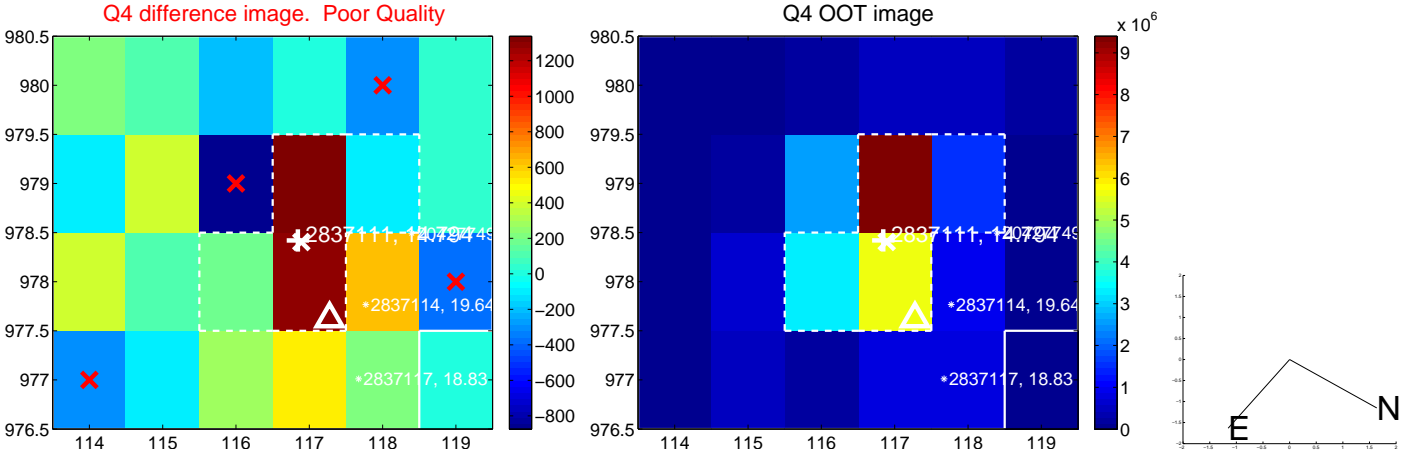
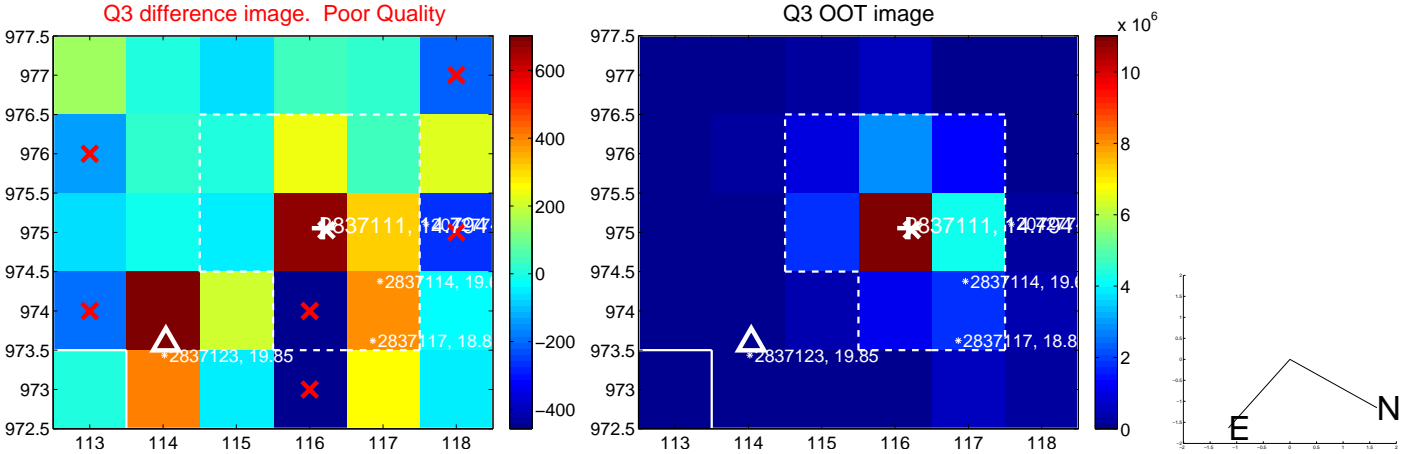
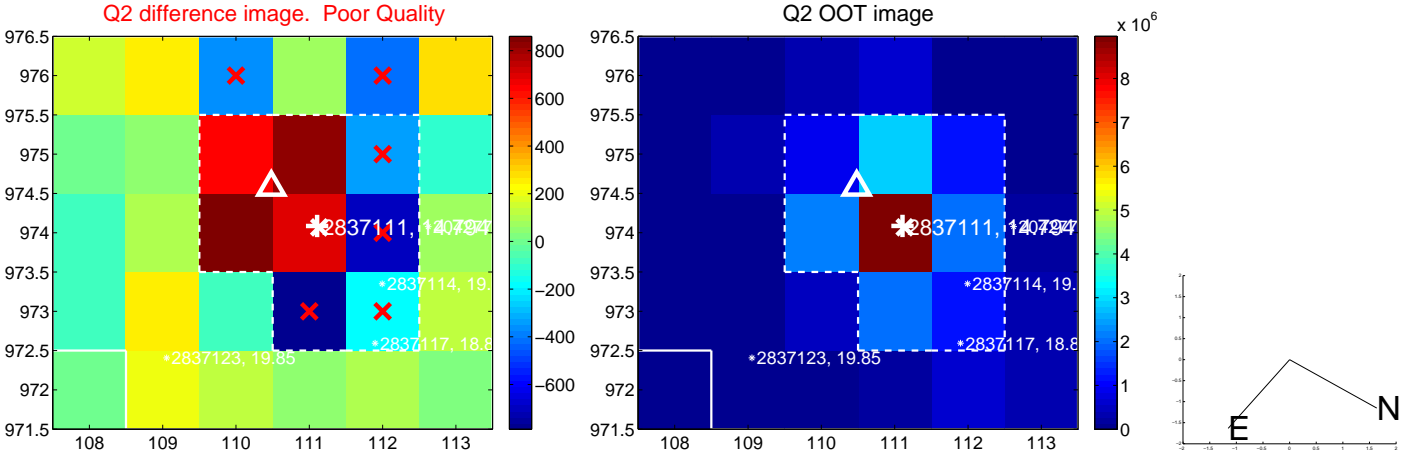
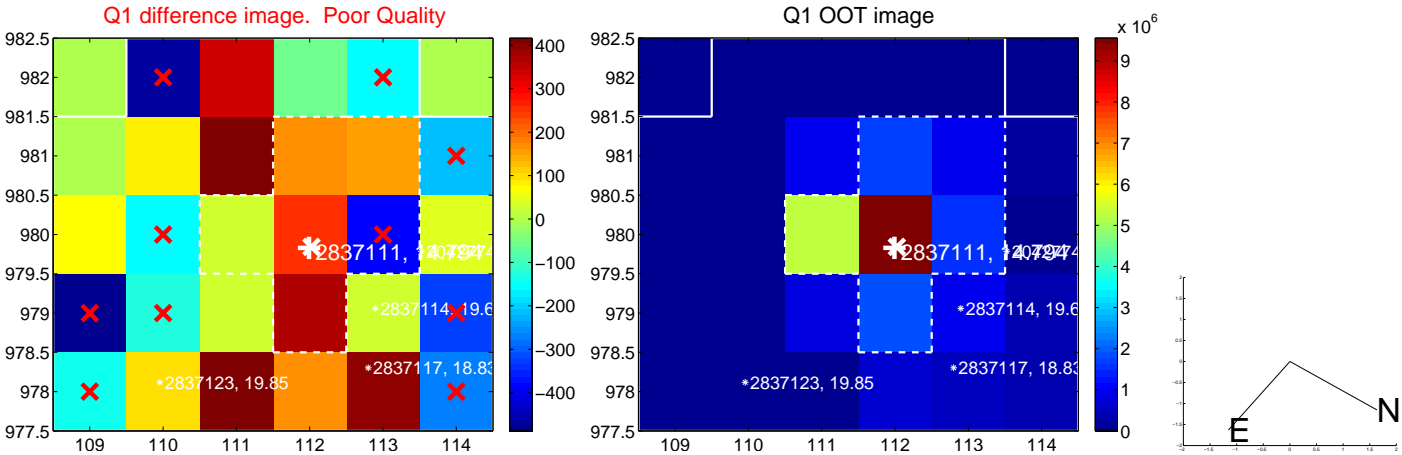
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.807 ± 0.693	1.16	0.473 ± 0.890	0.654 ± 0.686
PRF-fit source offset from KIC position	0.730 ± 0.782	0.93	0.522 ± 0.921	0.511 ± 0.741
photometric centroid source offset	1.77 ± 1.82	0.97	-0.26 ± 1.74	-1.75 ± 1.82

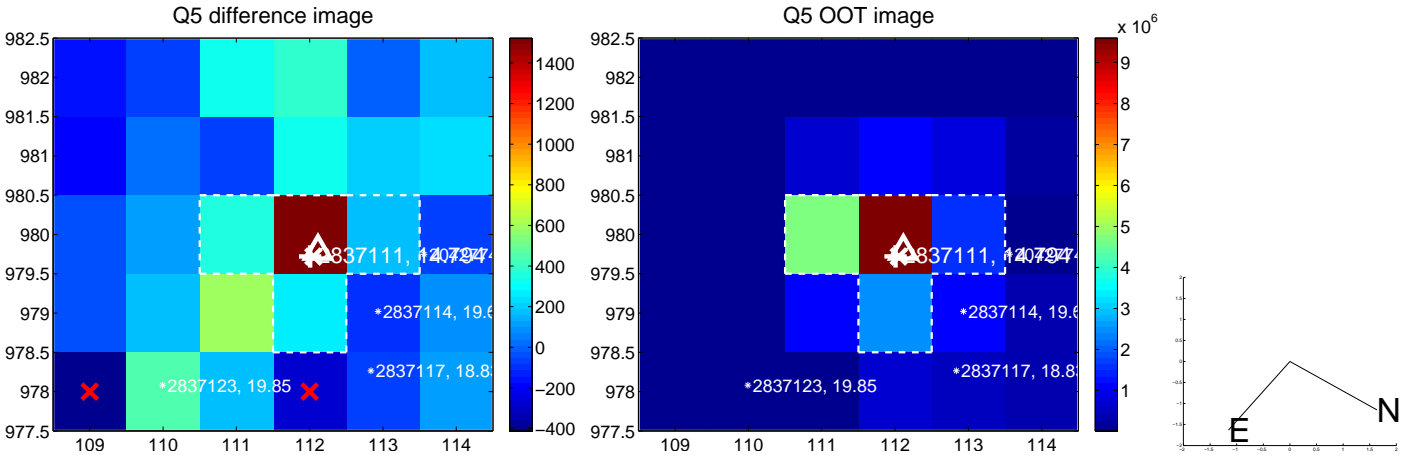


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

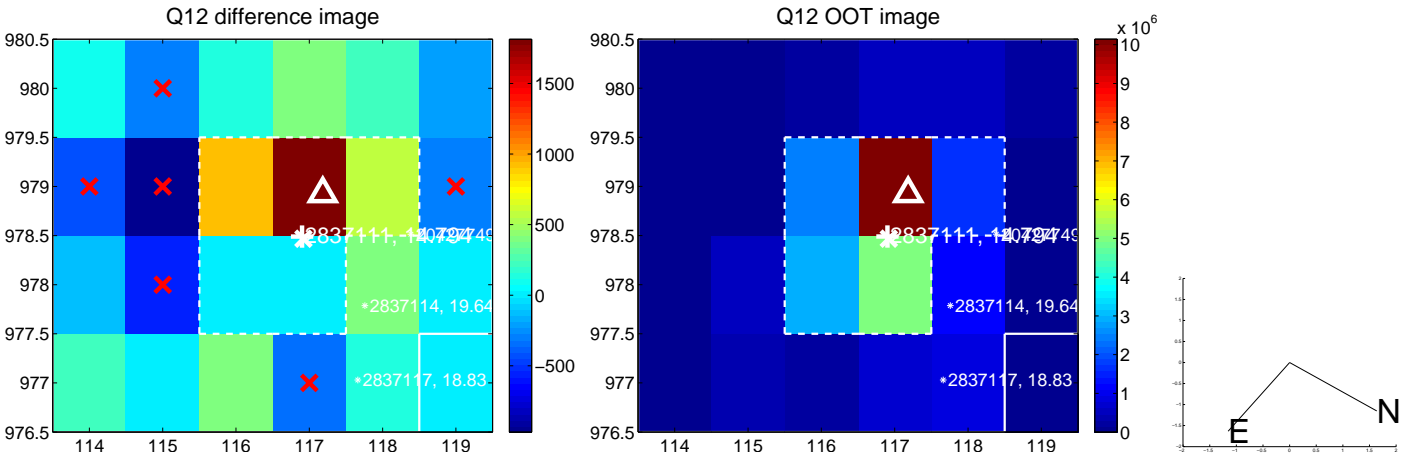
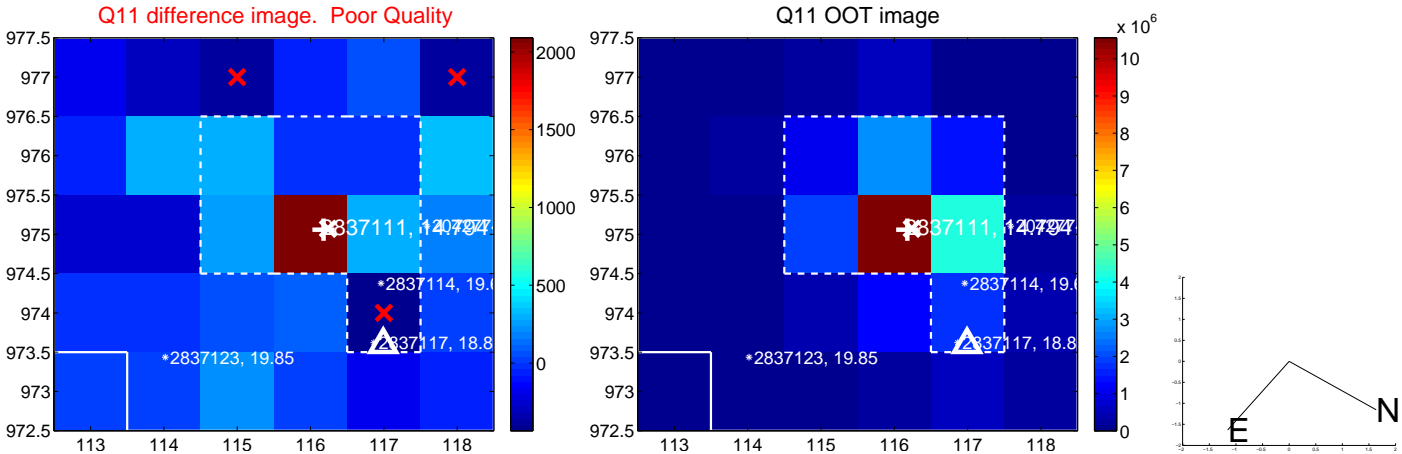
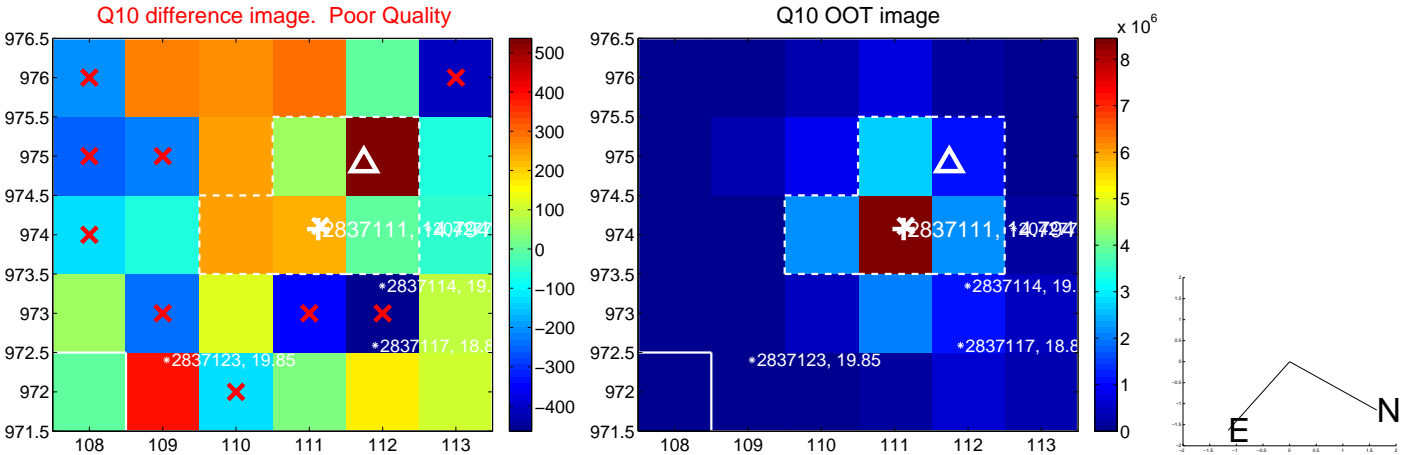
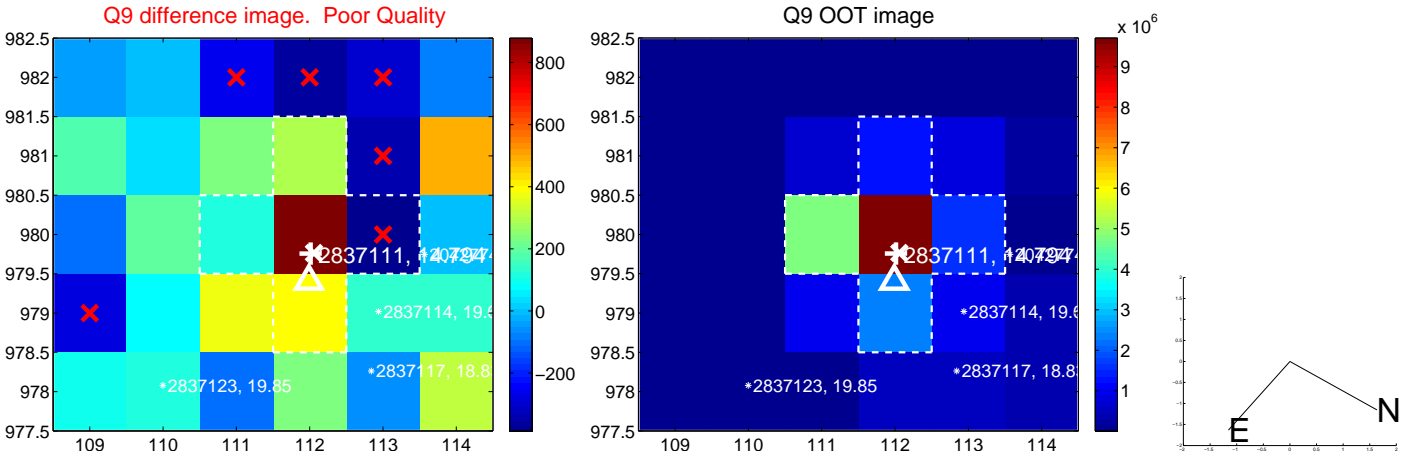
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



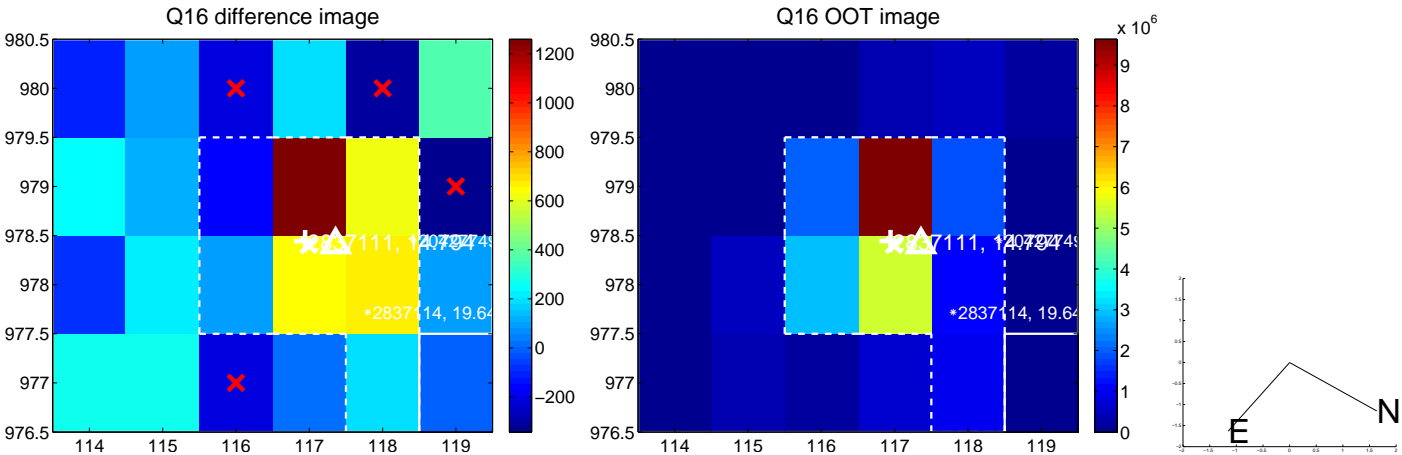
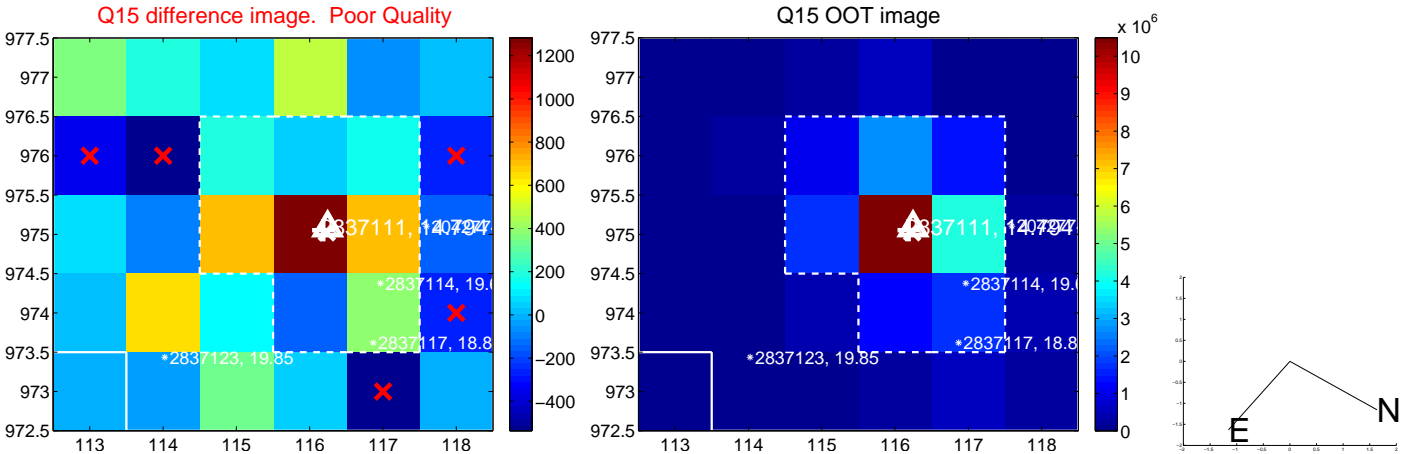
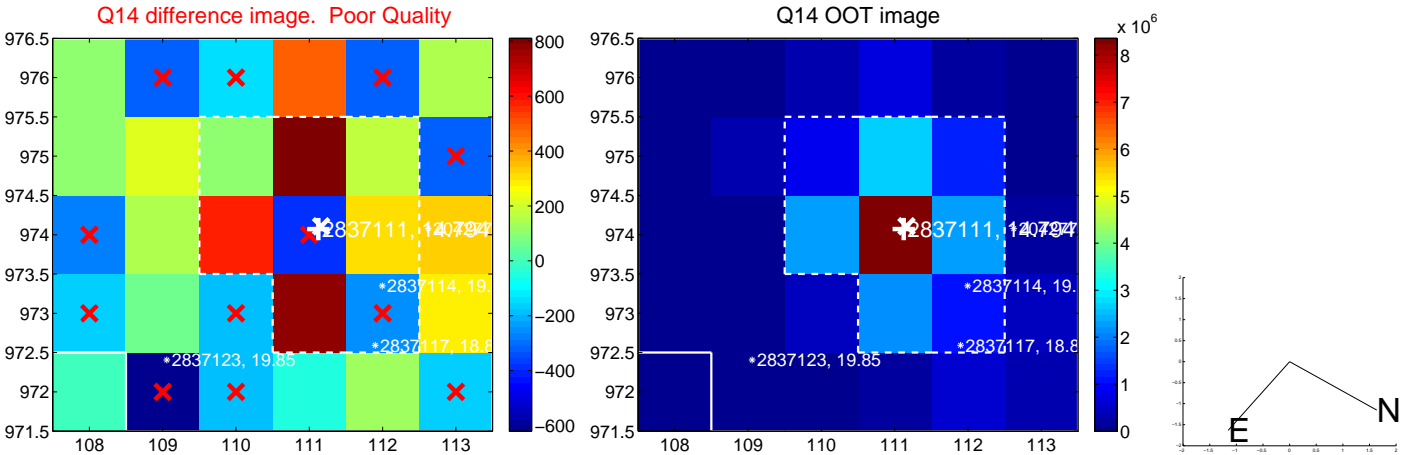
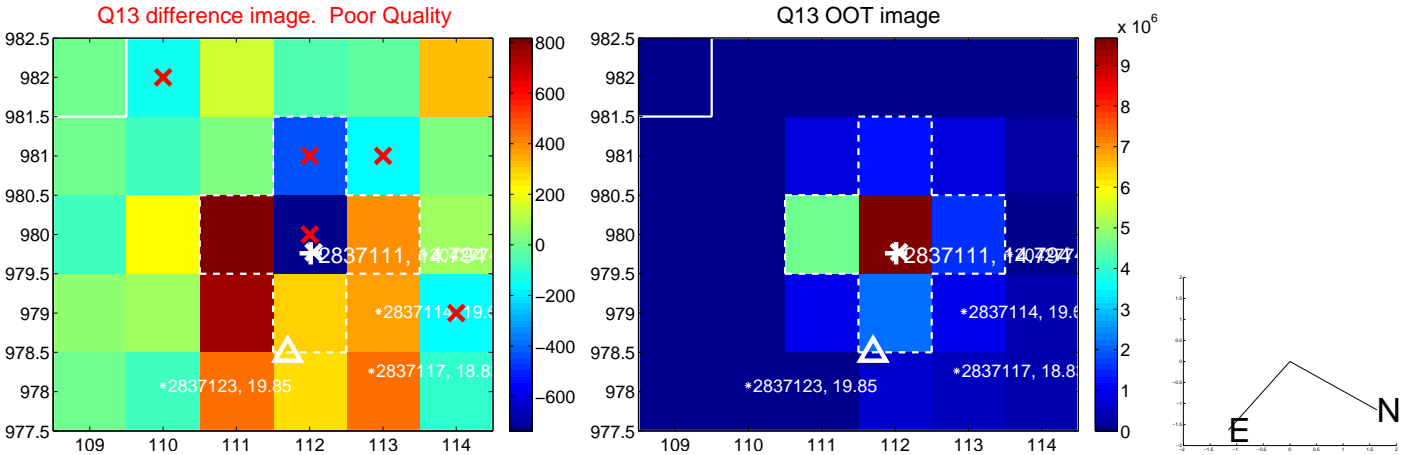
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

