

KIC 002715228

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})
002715228-01	OBS	No	0.968185	132.480627	59.9	6.465	9.7	11.9	1.11	6355	0.87	4450.81
002715228-02	OBS	No	27.245130	152.729217	735.7	1.482	9.3	9.8	1.11	6355	3.36	52.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002715228-01	OBS	FP	0.00	1	0	1	1	LPP_DV—HALO_GHOST—EPHEM_MATCH
002715228-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—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.

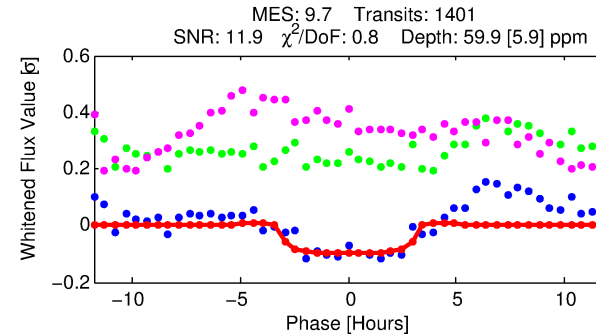
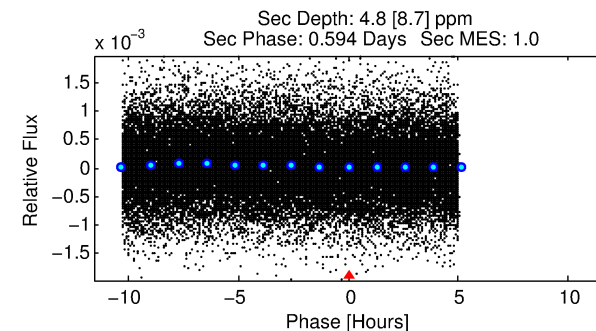
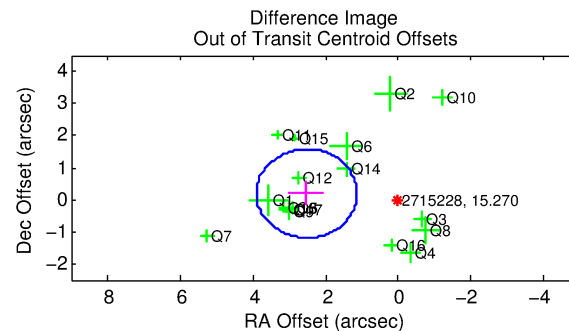
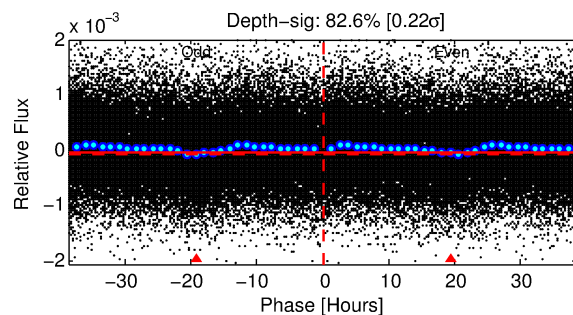
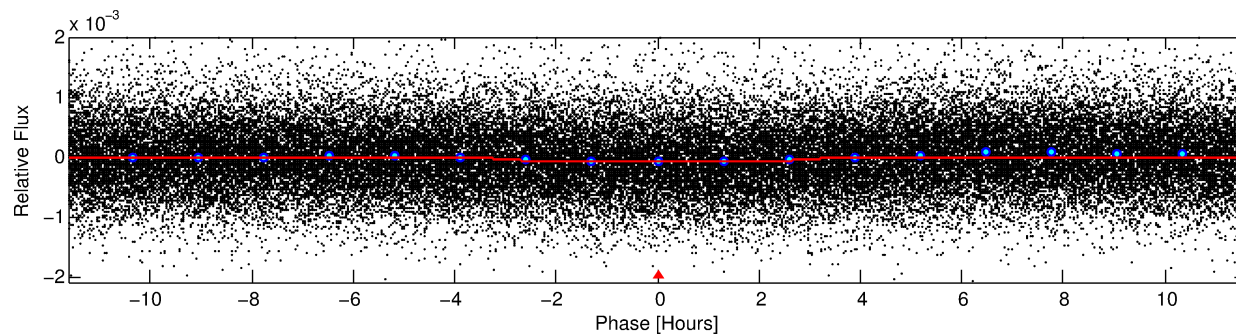
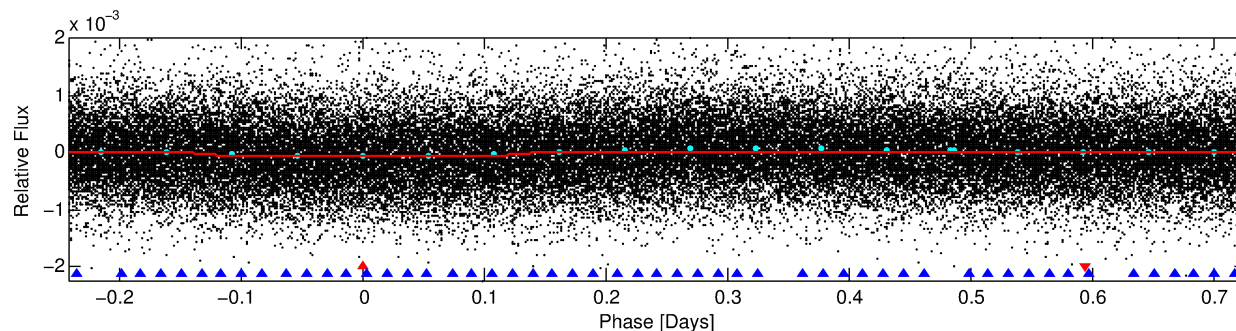
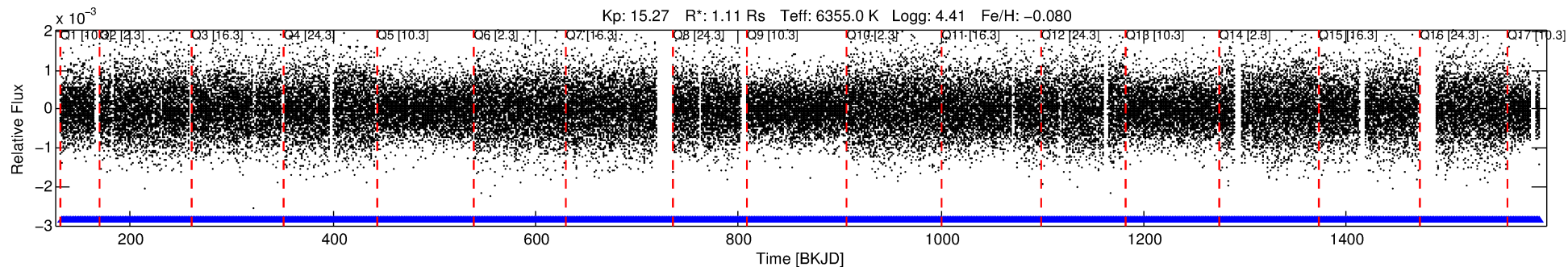
Ephemeris Match Information For 002715228-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
002715228-01	2715228	002715282-01	2715282	1:1	108.0	27	-4	15.07	15.27	0.80	Col-Anomaly	1	0.70	0.36

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 2715228 Candidate: 1 of 2 Period: 0.968 d



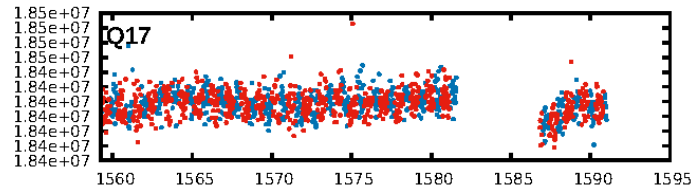
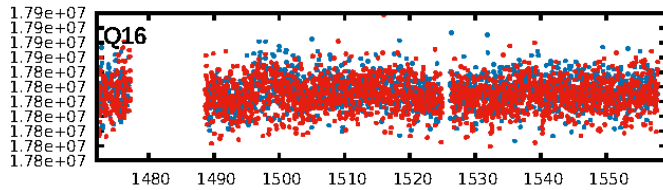
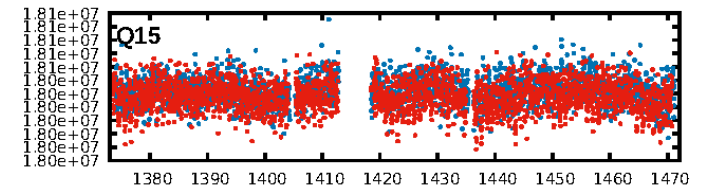
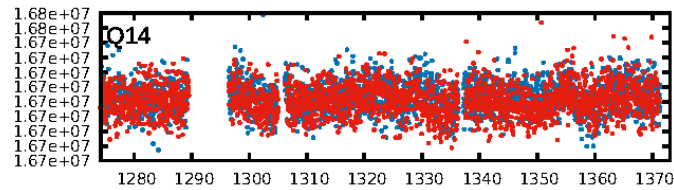
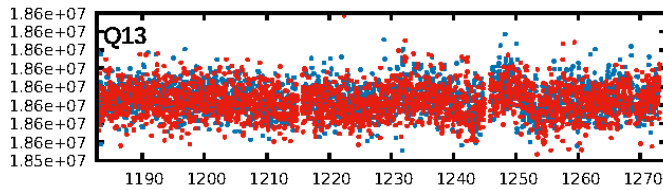
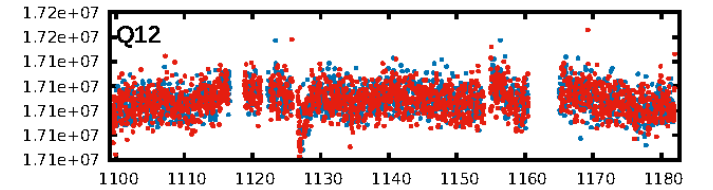
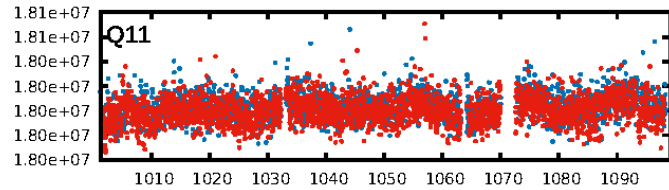
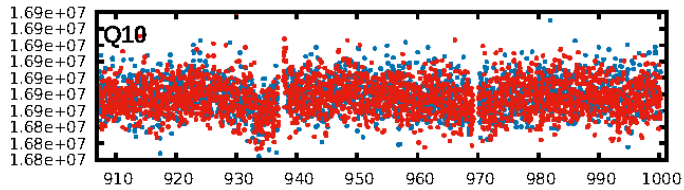
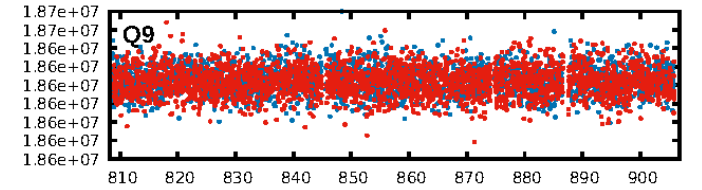
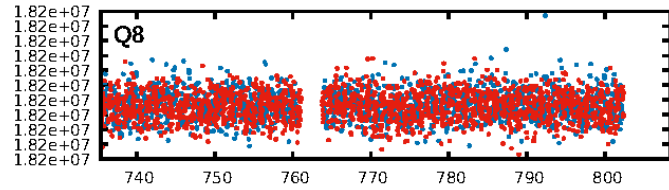
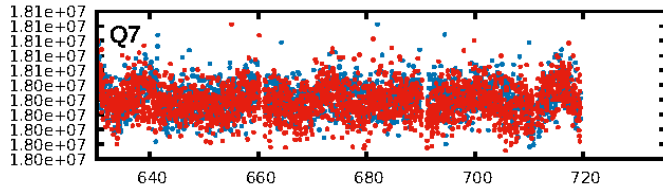
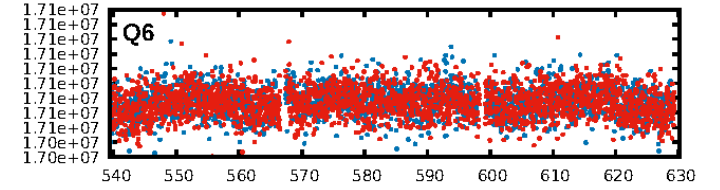
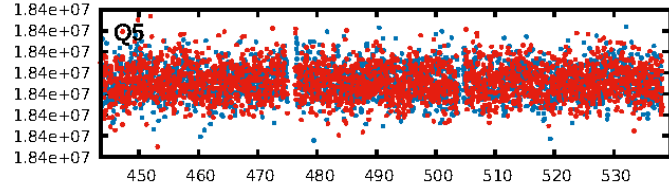
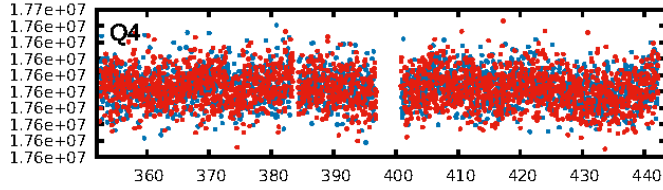
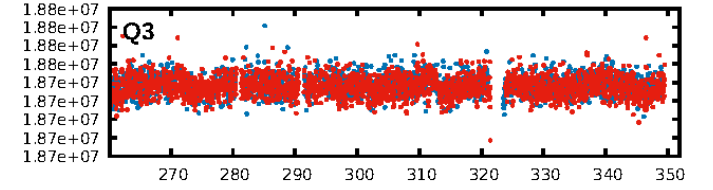
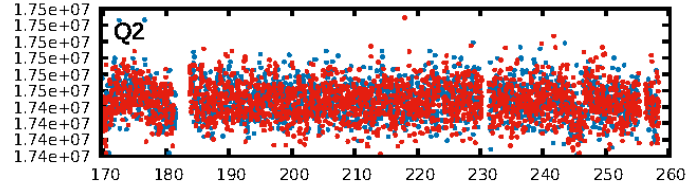
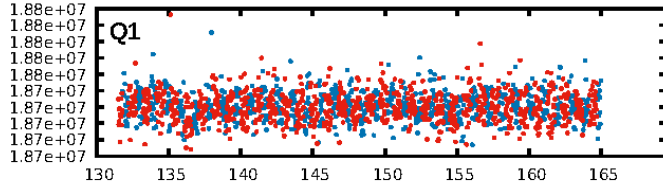
DV Fit Results:

Period = 0.96818 [0.00001] d
Epoch = 132.4806 [0.0054] BKJD
Rp/R* = 0.0072 [0.0087]
a/R* = 1.29 [3.19]
b = 0.30 [19.39]
Seff = 4450.81 [1612.70]
Teq = 2083 [189] K
Rp = 0.87 [1.08] Re
a = 0.0201 [0.0047] AU
Ag = 1.41 [4.30] [0.10 σ]
Teffp = 3510 [2661] K [0.53 σ]

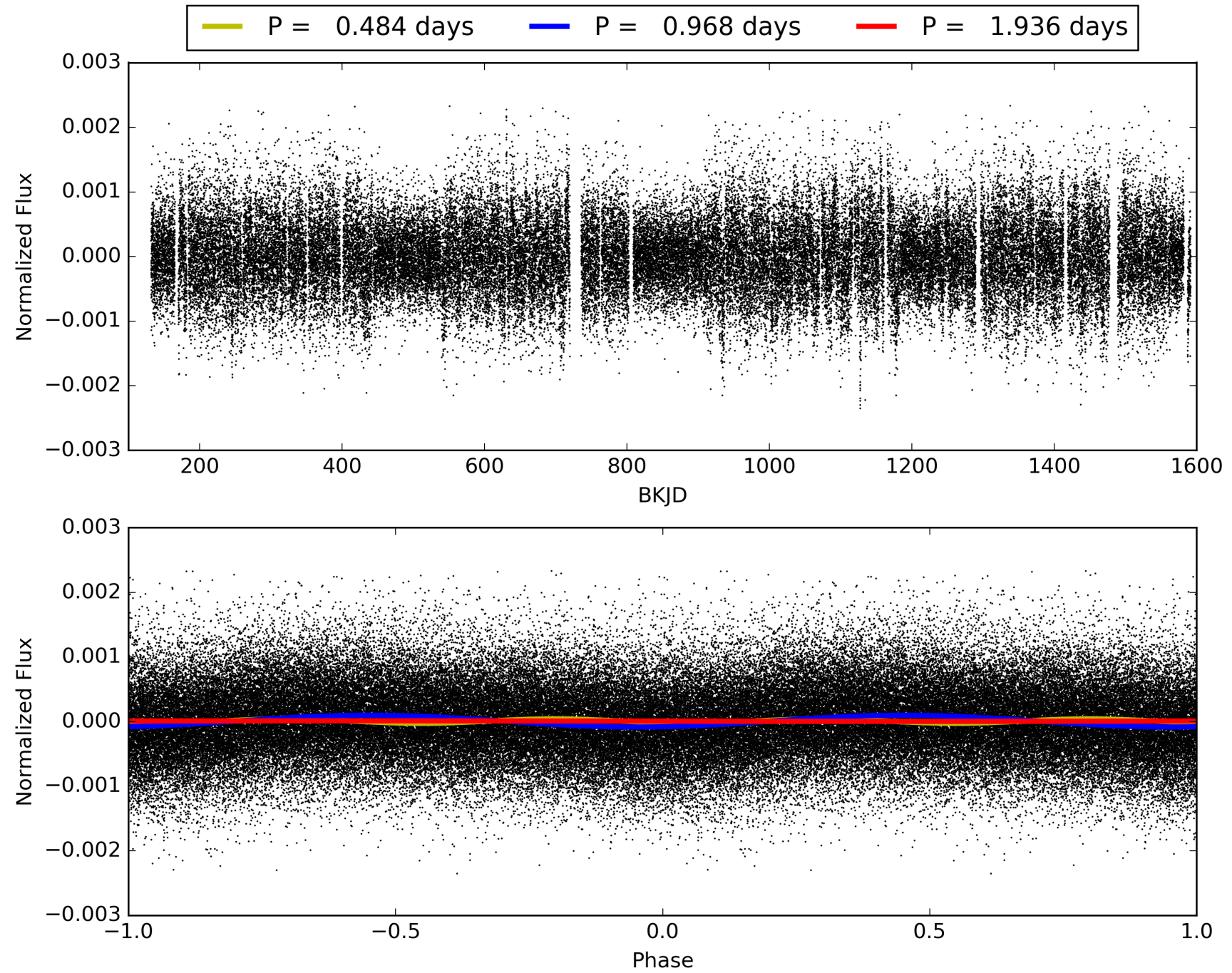
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [95.08 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.90e-20
RollingBand-fgt: 1.00 [1338/1338]
GhostDiagnostic-chr: -0.07638
Centroid-sig: 0.0%
Centroid-so: 1.842 arcsec [2.20 σ]
OotOffset-rm: 2.528 arcsec [5.48 σ]
KicOffset-rm: 2.379 arcsec [5.08 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.00 [0/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 002715228-01, PDC Light Curves

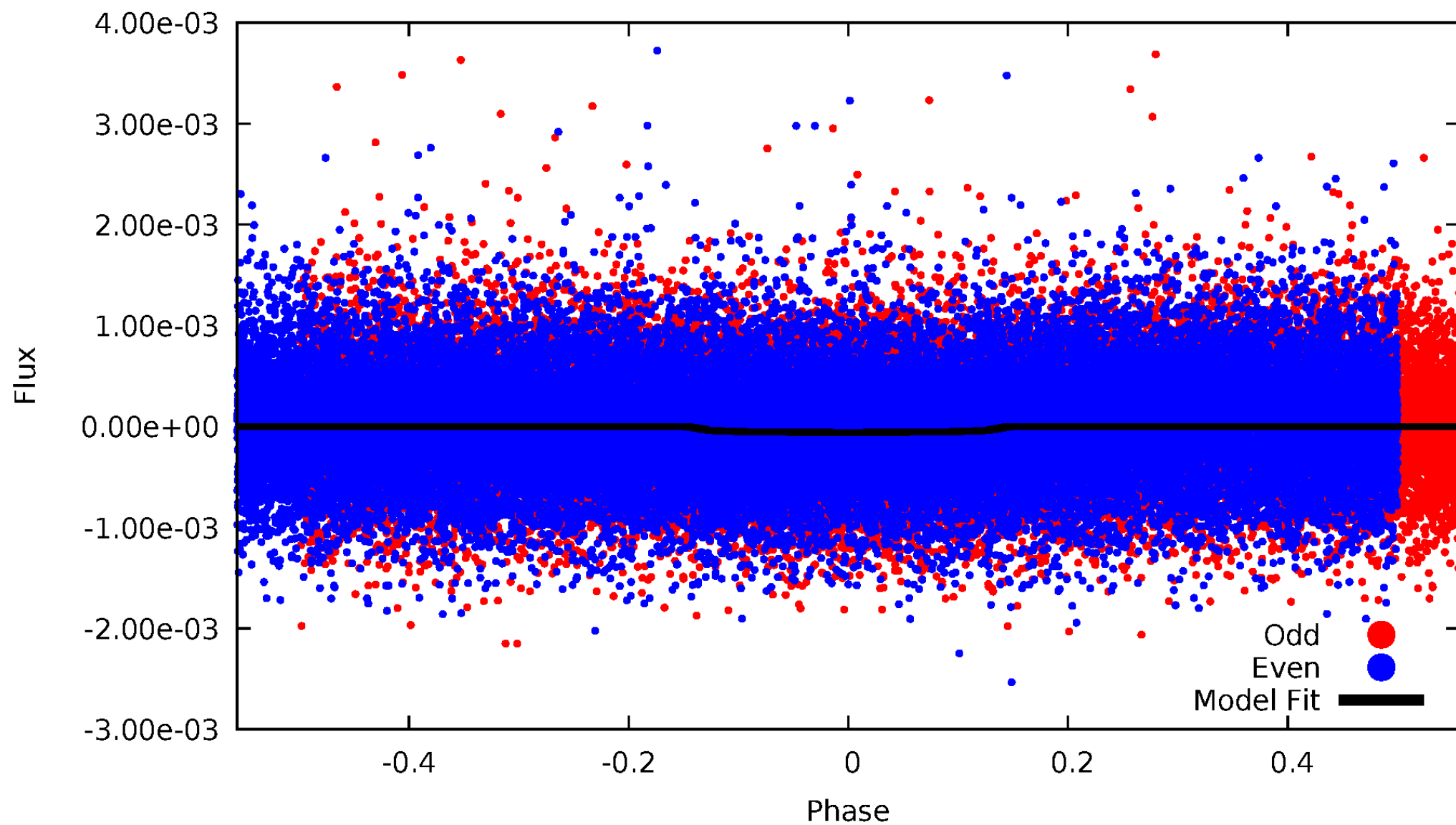


TCE 002715228-01



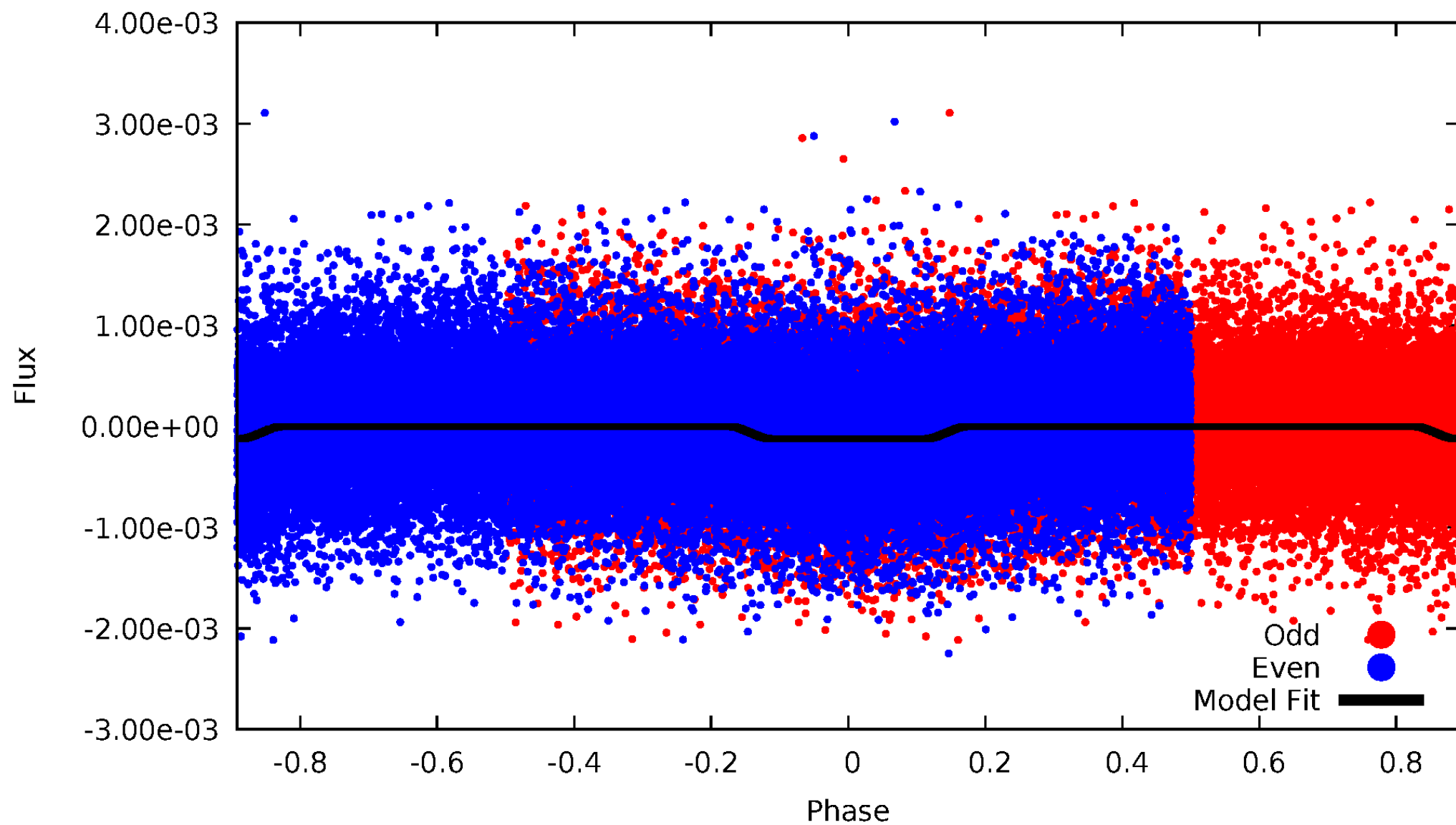
DV Odd/Even

TCE 002715228-01



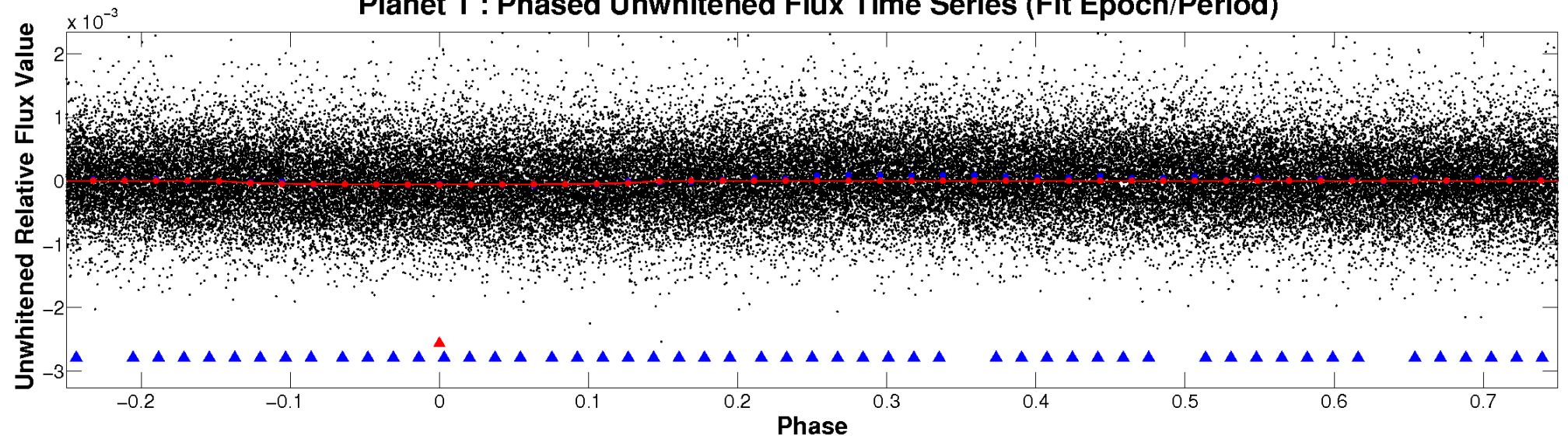
ALT Odd/Even

TCE 002715228-01

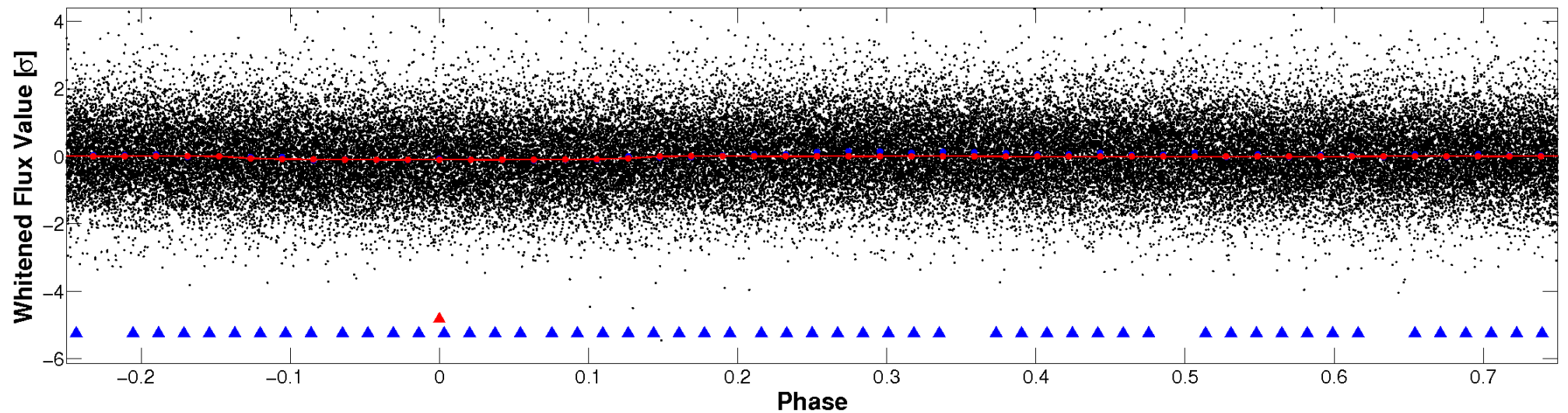


Non-Whitened Vs. Whitened Light Curve

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

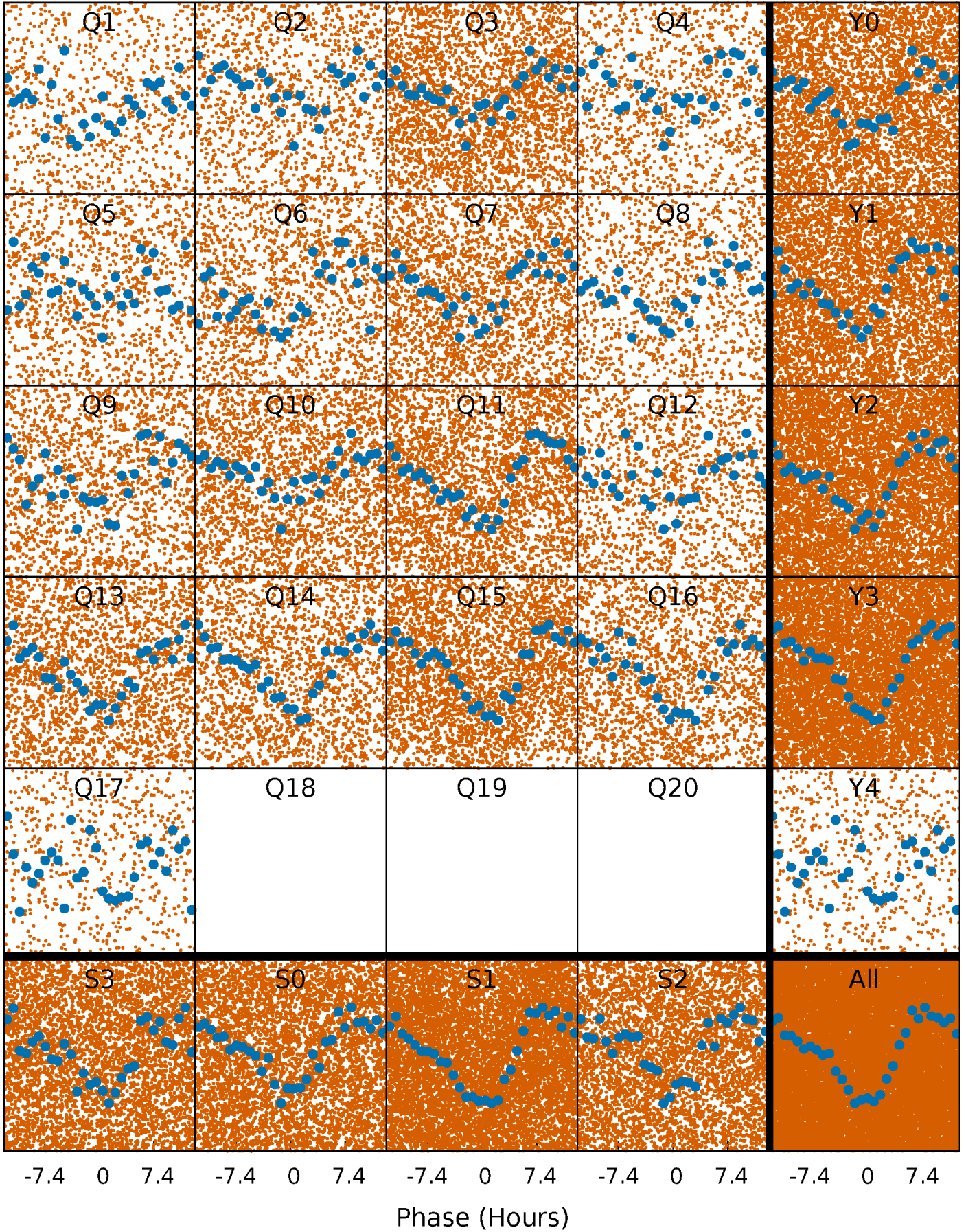


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



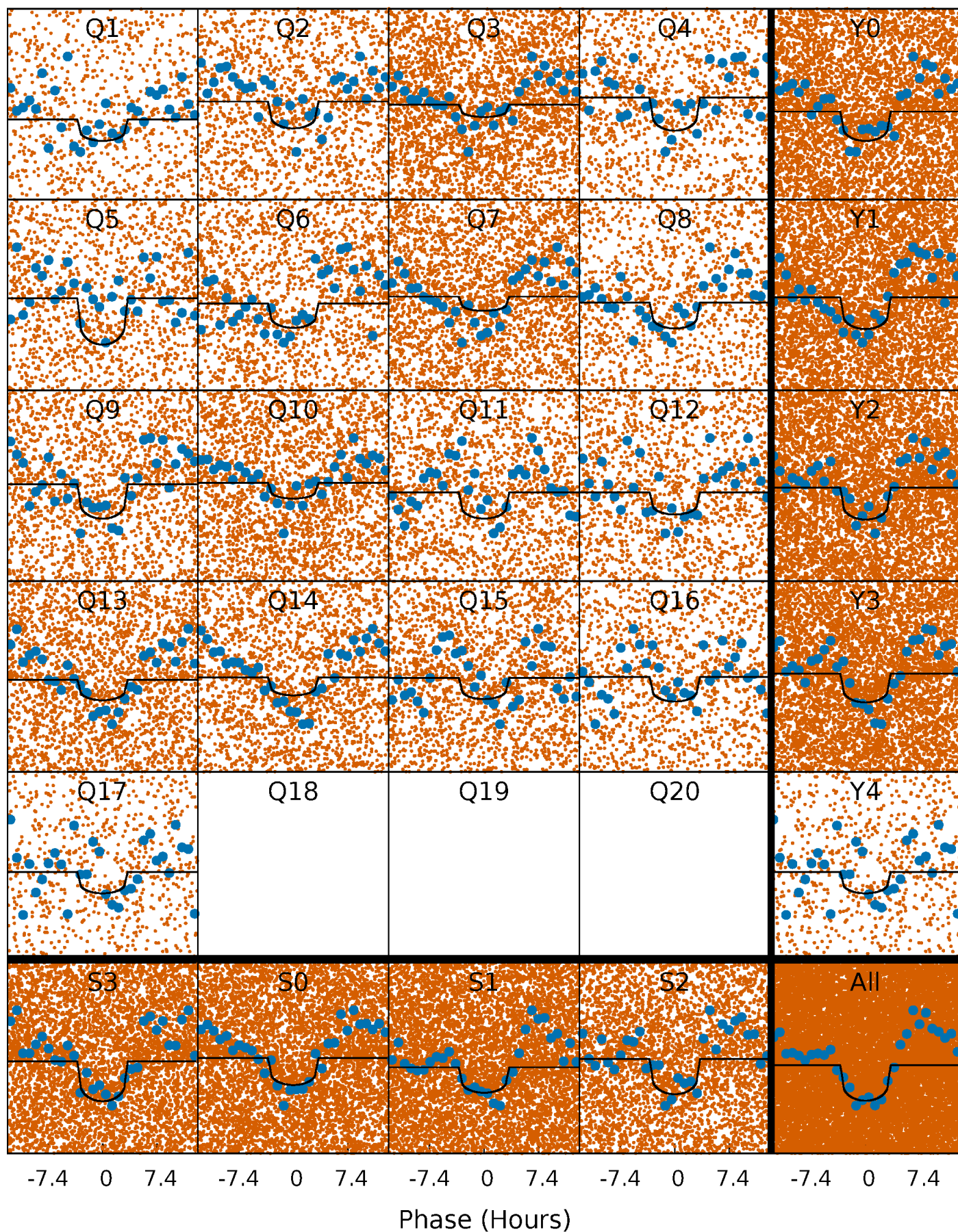
PDC Quarter-Phased Transit Curves

TCE 002715228-01 P= 0.968185 Days $T_0=132.480627$ (BKJD)



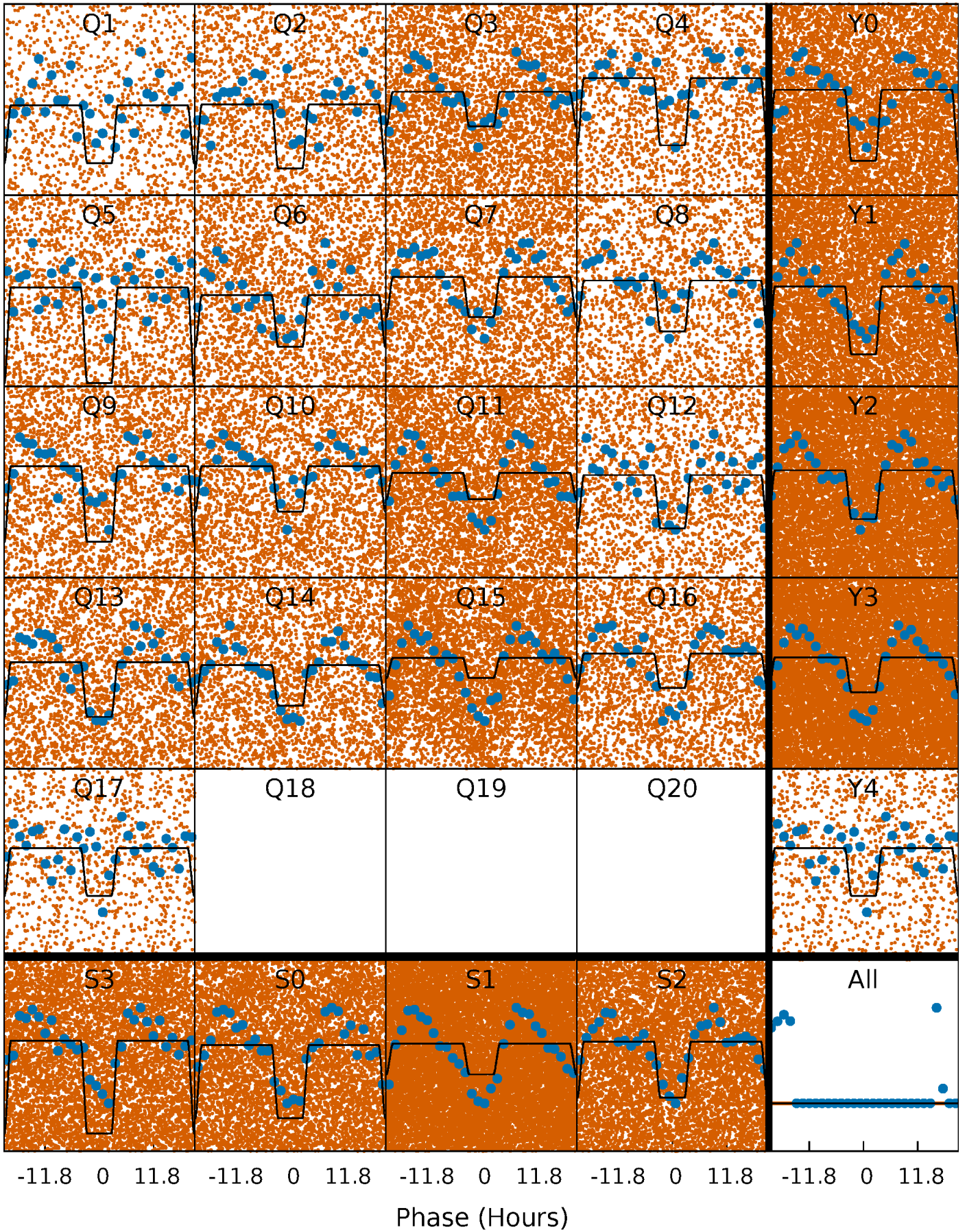
DV Quarter-Phased Transit Curves

TCE 002715228-01 P= 0.968185 Days $T_0=132.480627$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

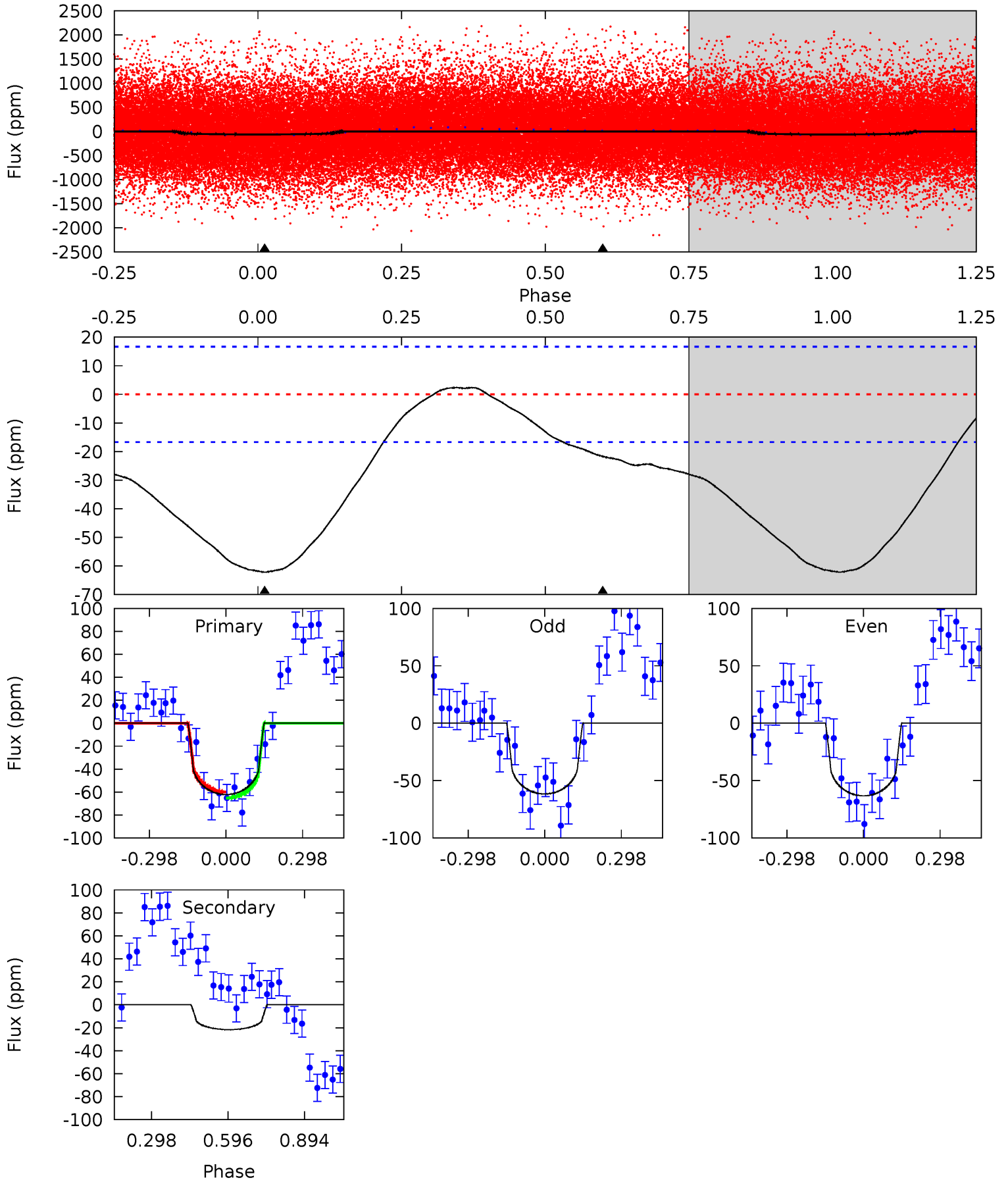
TCE 002715228-01 P= 0.968276 Days $T_0=132.396446$ (BKJD)



DV Model-Shift Uniqueness Test

002715228-01, P = 0.968185 Days, E = 131.512442 Days

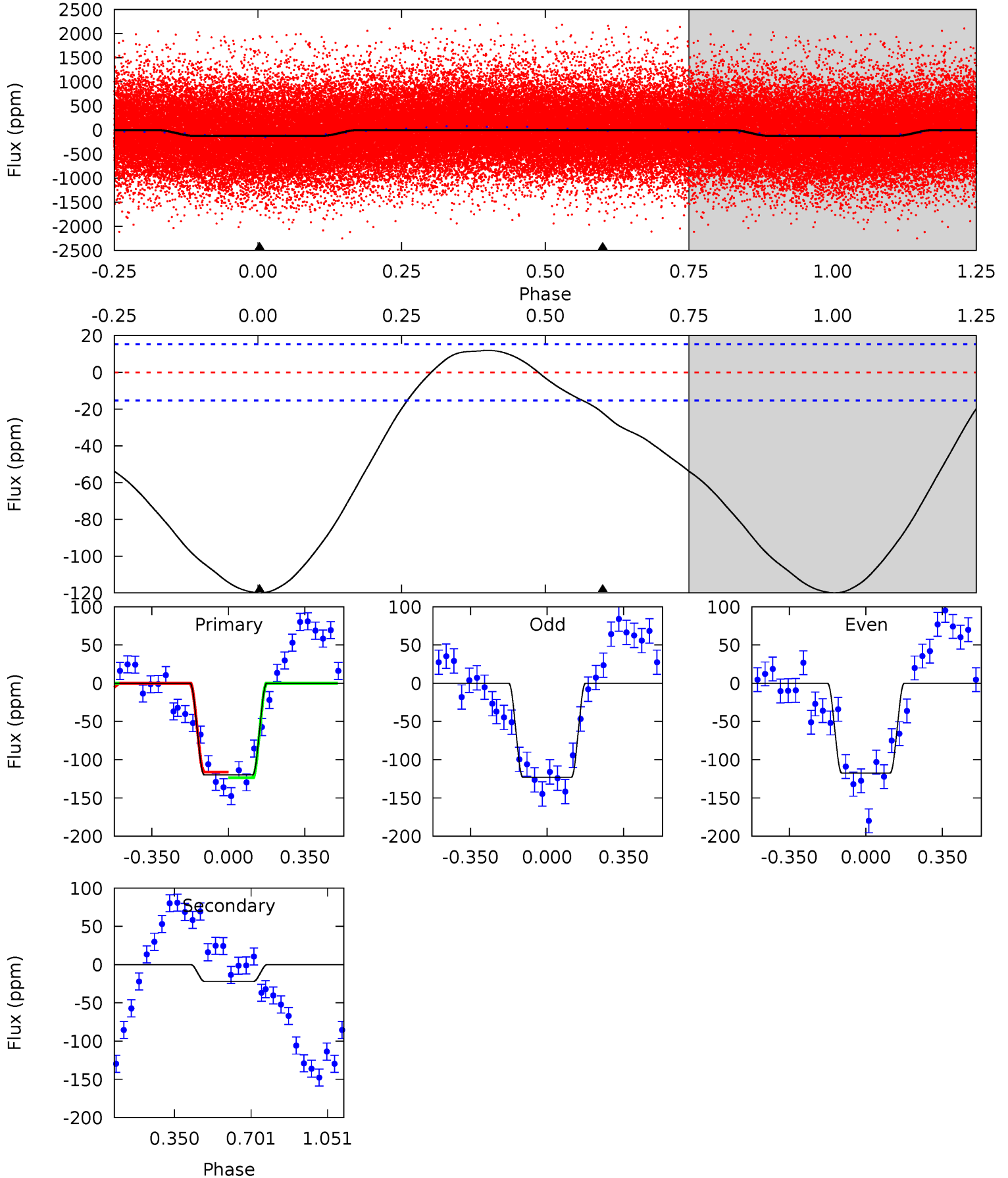
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	5.62	0	0	4.33	1.04	0.78	16.1	16.1	5.62	5.62	0.21	0.98	0.04	0.68



Alt Model-Shift Uniqueness Test

002715228-01, P = 0.968276 Days, E = 131.428170 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.7	6.20	0	0	4.29	0.93	2.56	33.7	33.7	6.20	6.20	0.79	1.16	0.09	1.05



Stellar Parameters For KIC 002715228

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6355^{+178}_{-223}	$4.410^{+0.060}_{-0.180}$	$-0.080^{+0.250}_{-0.300}$	$1.108^{+0.312}_{-0.134}$	$1.151^{+0.154}_{-0.154}$	$1.191^{+0.393}_{-0.580}$
	+3%/-4%	+1%/-4%	+312%/-375%	+28%/-12%	+13%/-13%	+33%/-49%
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 002715228-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-22 ± 4	$1.15^{+1.00}_{-0.73}$	2945^{+198}_{-137}	4562^{+2970}_{-1039}	$3.608^{+23.172}_{-2.599}$
Alt.	-22 ± 4	$1.55^{+0.96}_{-0.91}$	2956^{+200}_{-149}	4064^{+1881}_{-825}	$2.042^{+9.508}_{-1.301}$

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 $A_{obs} \gg 1.0$

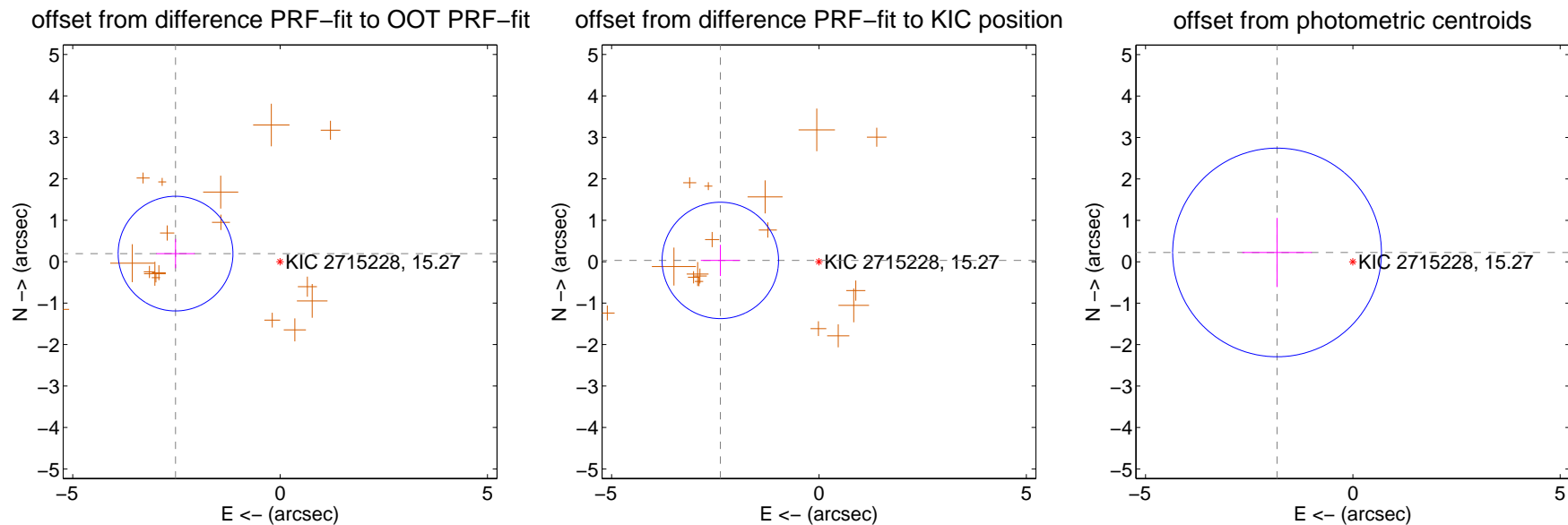
DV Centroid Data

Supplemental centroid analysis for 002715228-01. Kepler magnitude: 15.27. Transit SNR 11.93

There are 0 quarters with good PRF difference image offsets

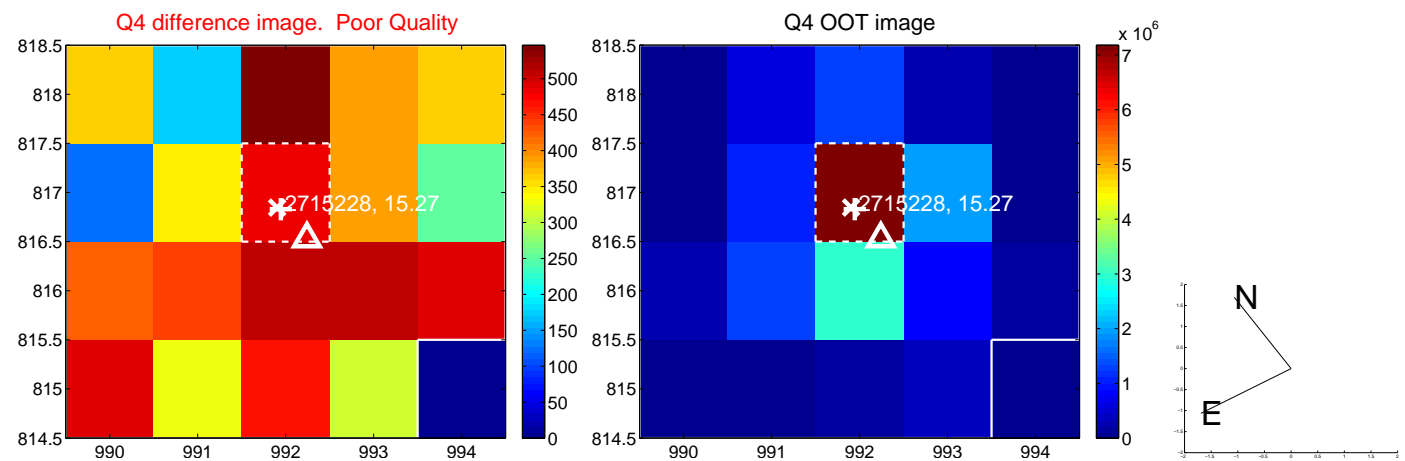
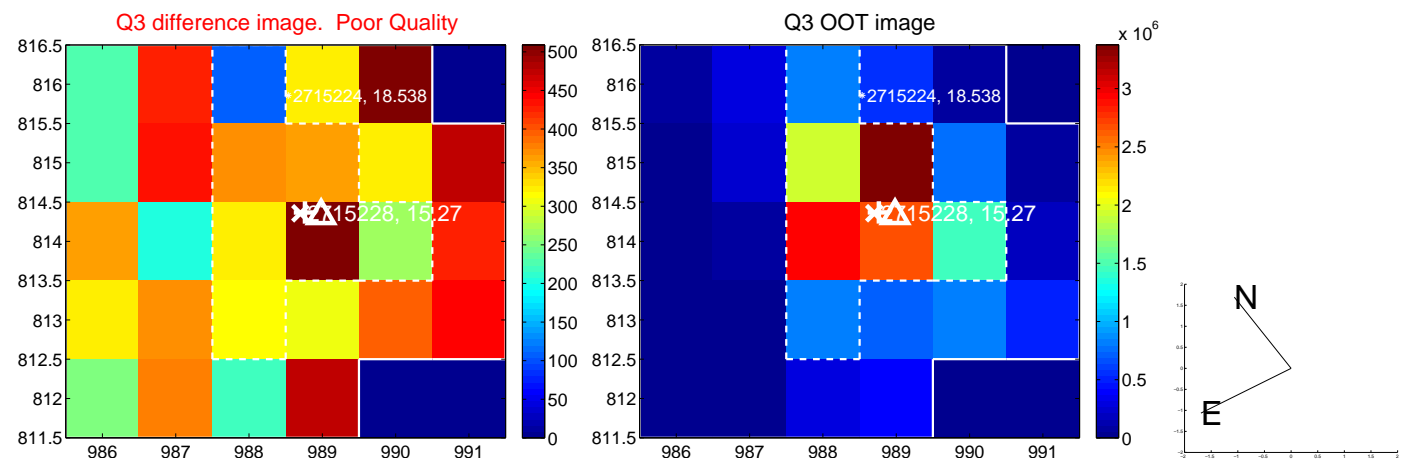
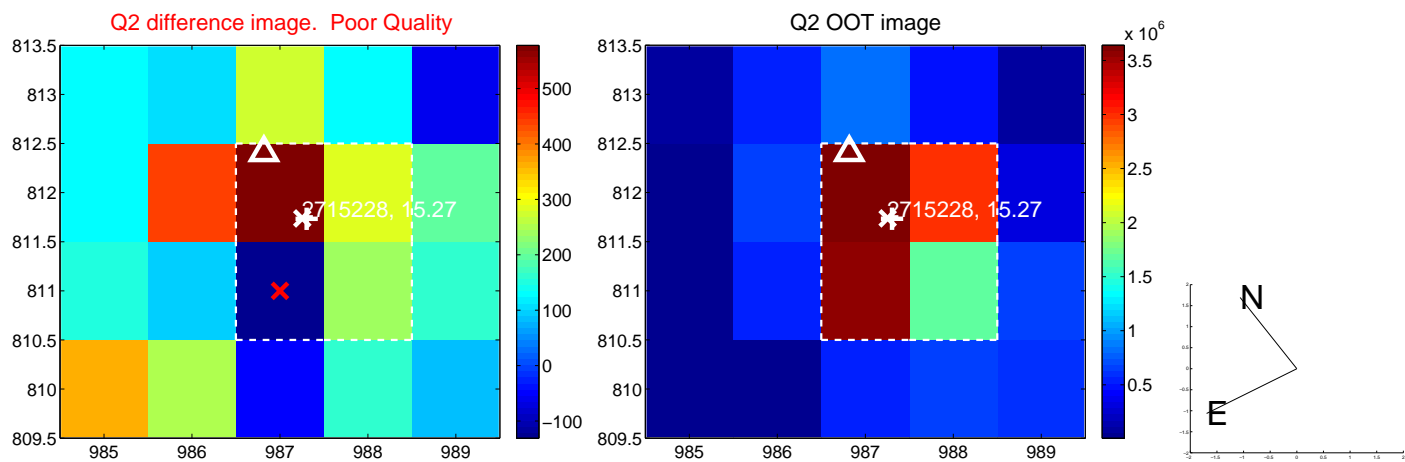
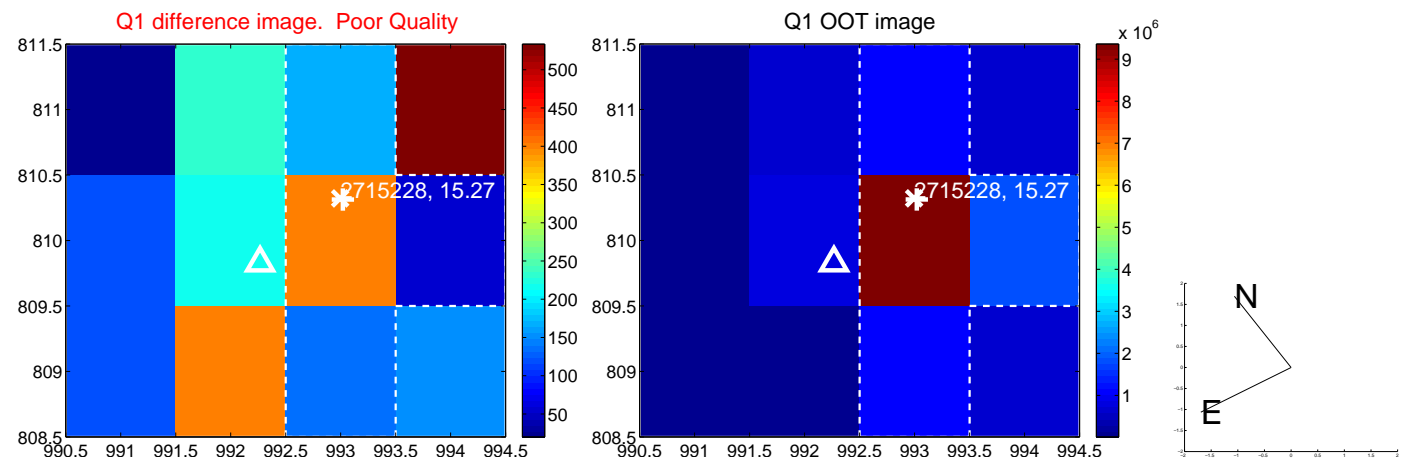
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.528 ± 0.461	5.48	2.520 ± 0.464	0.195 ± 0.353
PRF-fit source offset from KIC position	2.379 ± 0.468	5.08	2.379 ± 0.468	0.031 ± 0.376
photometric centroid source offset	1.84 ± 0.84	2.20	1.83 ± 0.84	0.22 ± 0.83

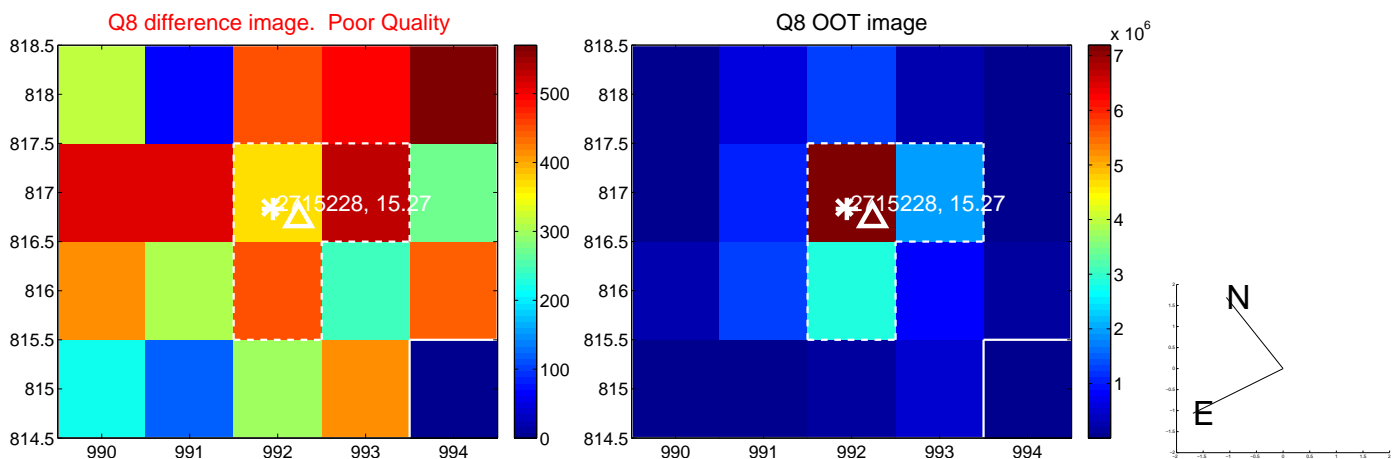
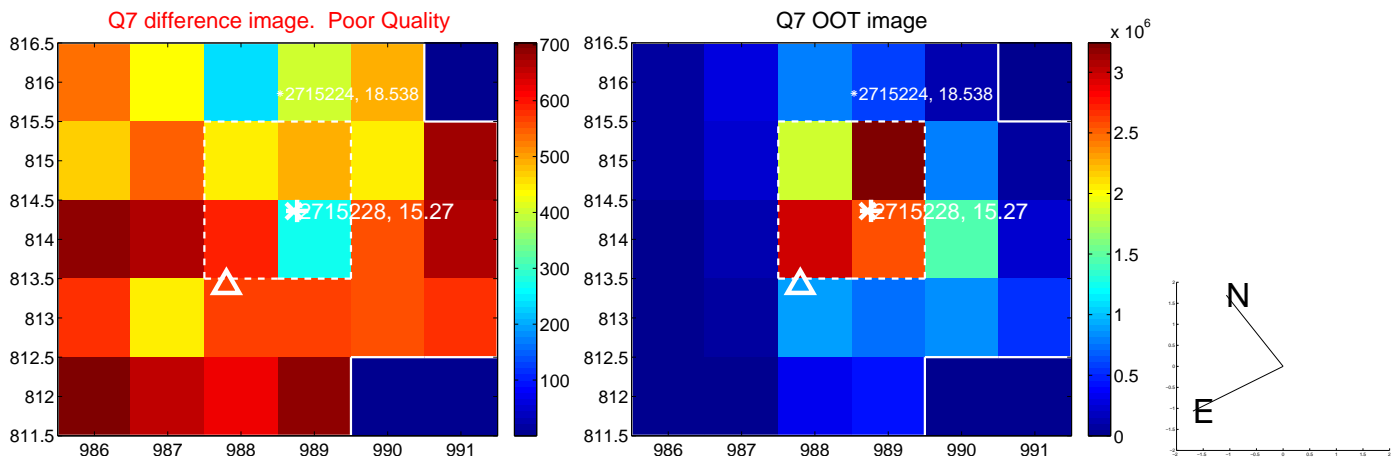
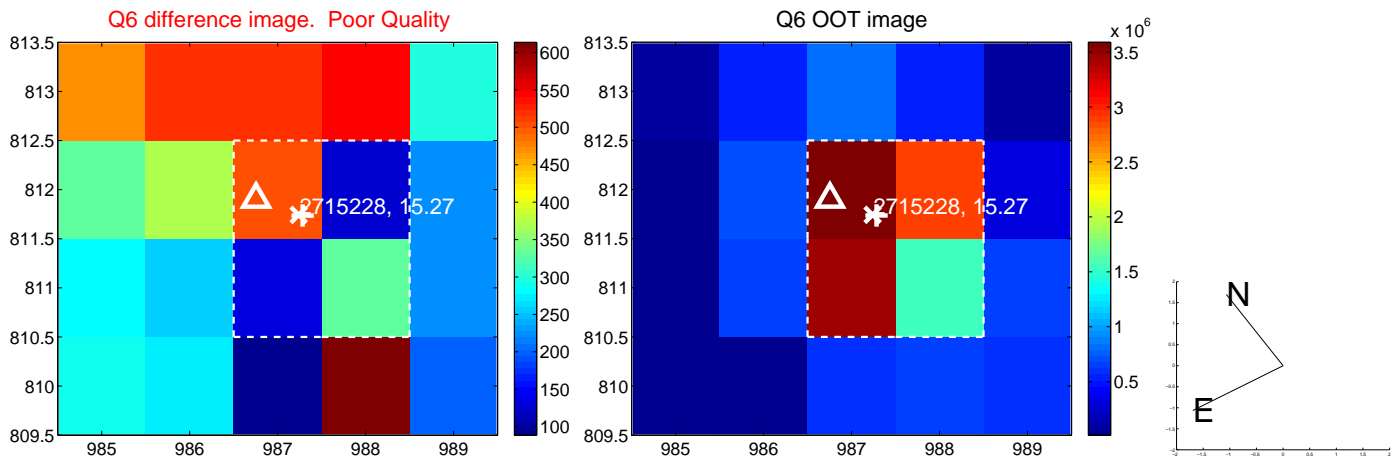
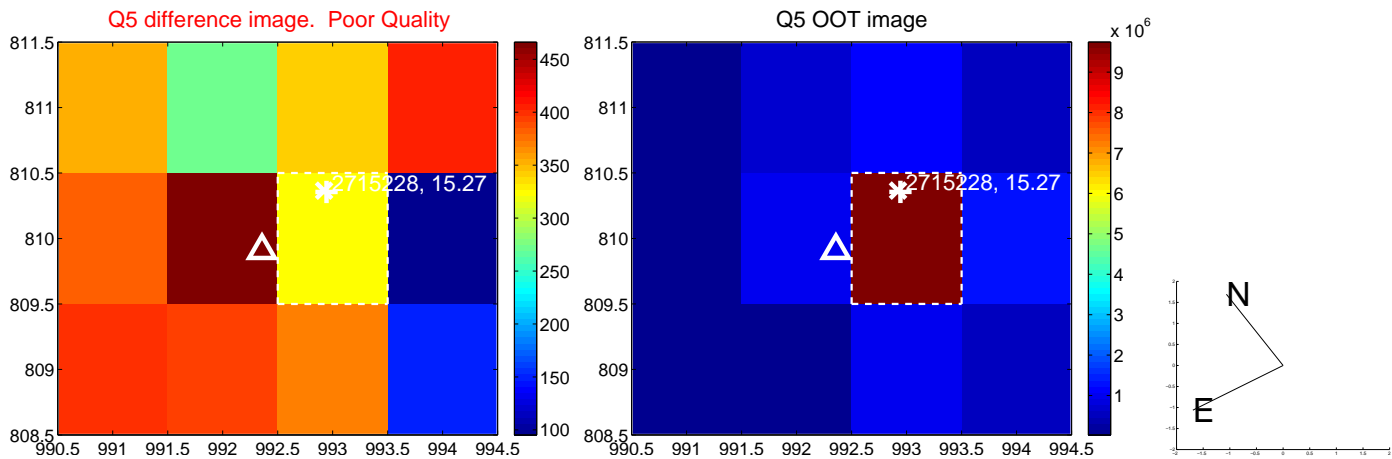


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

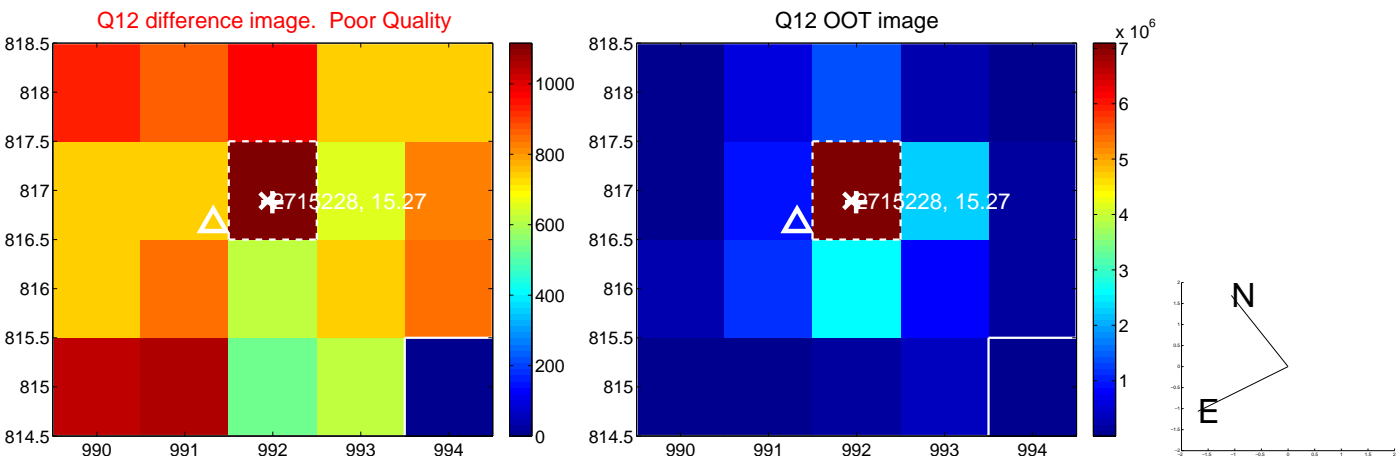
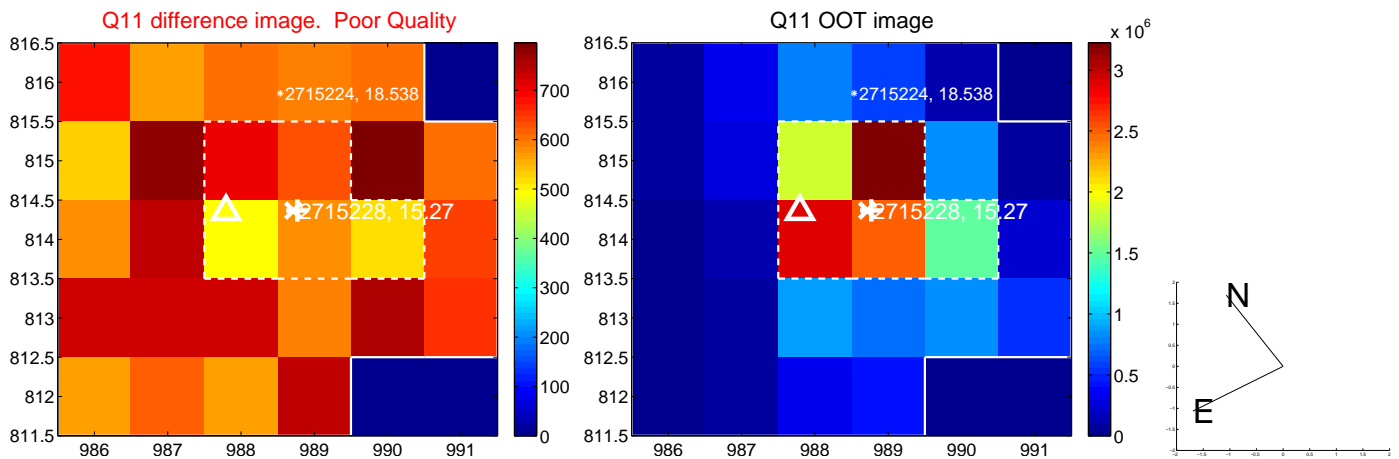
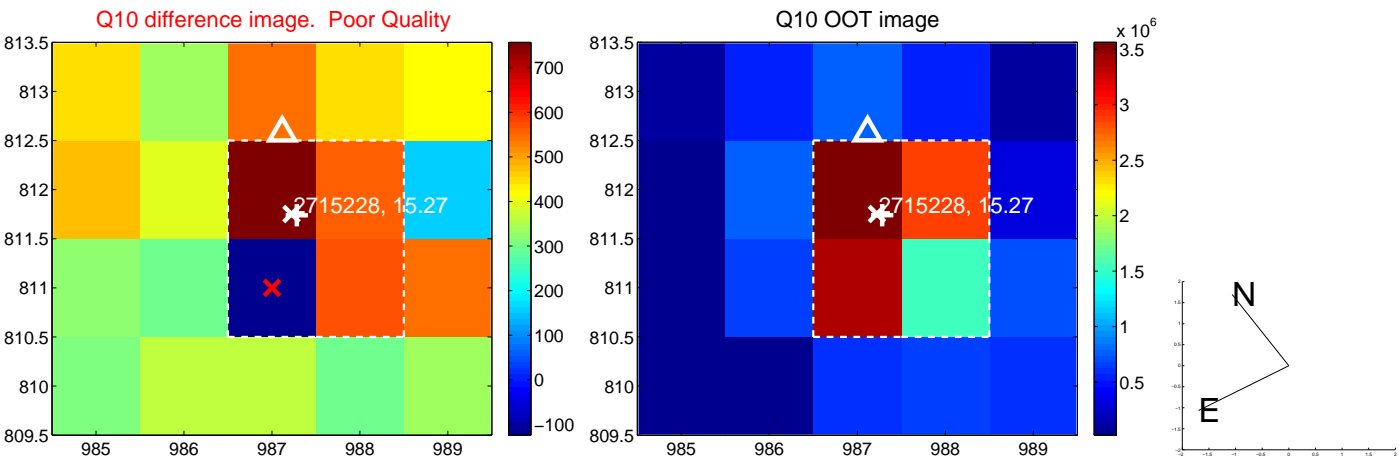
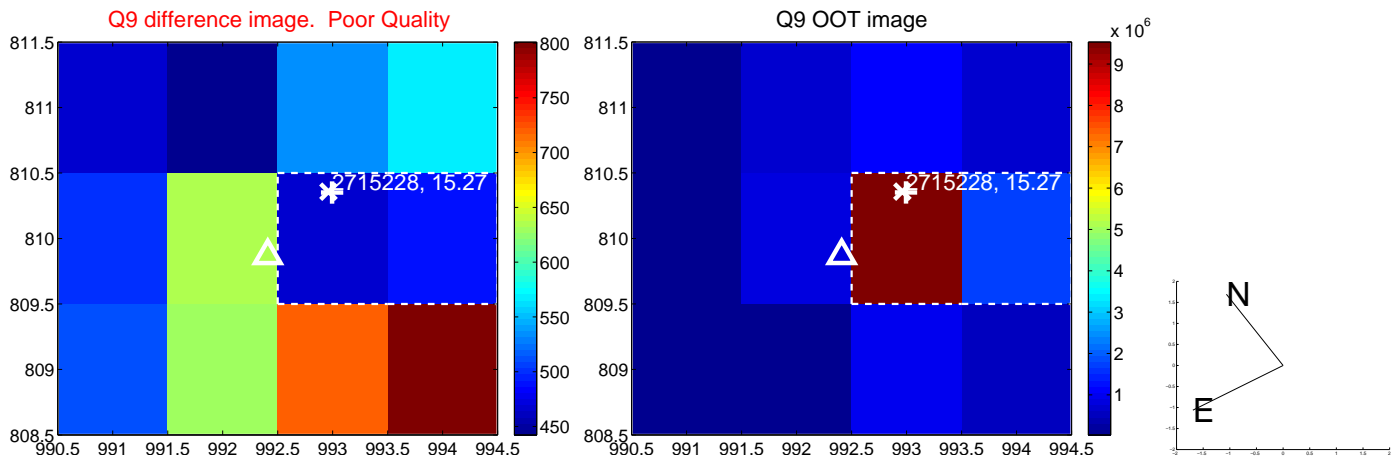
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



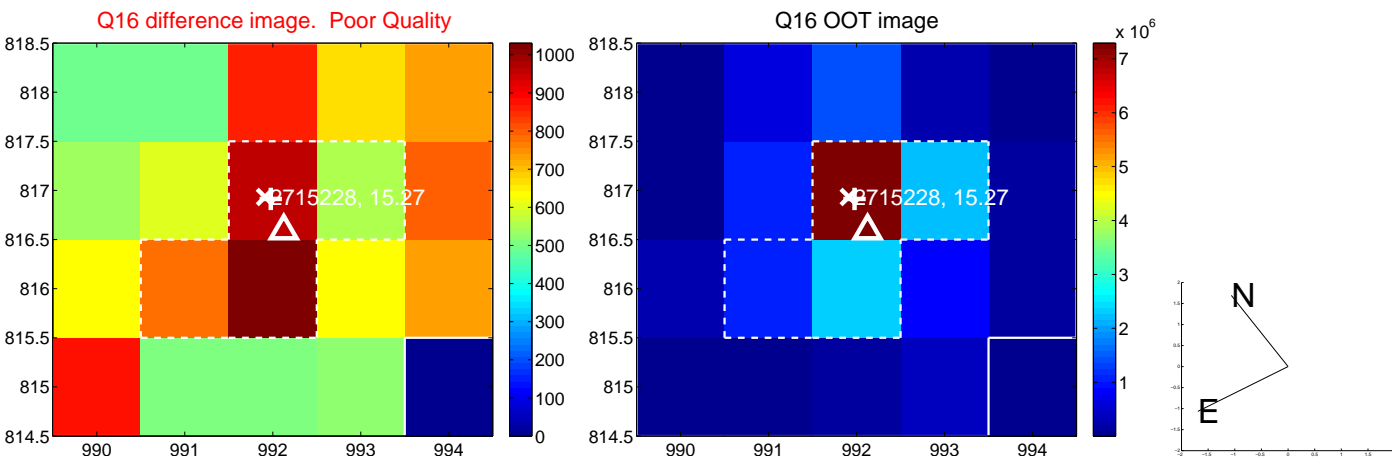
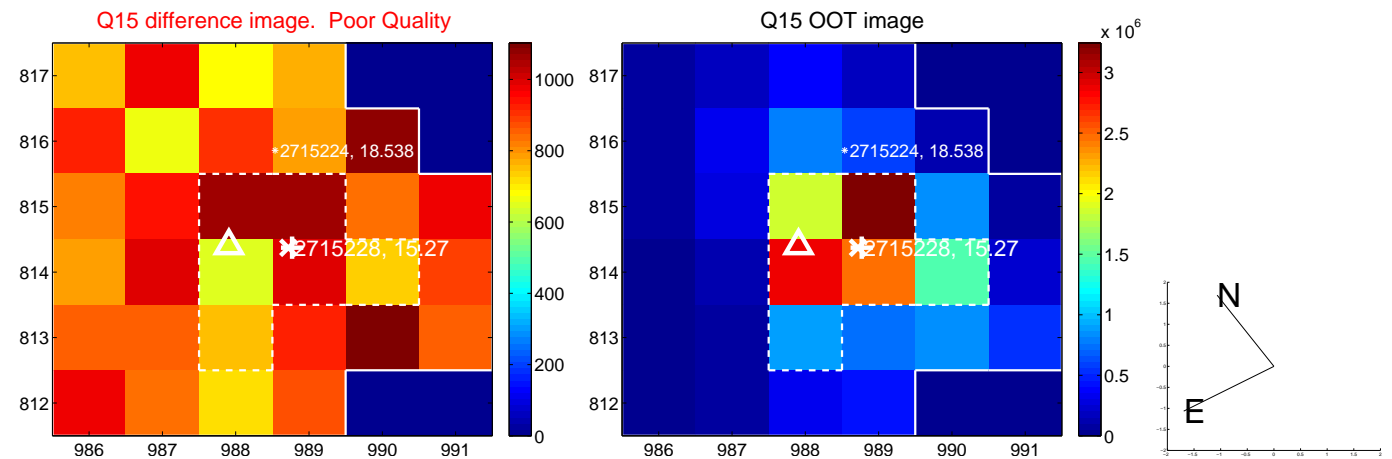
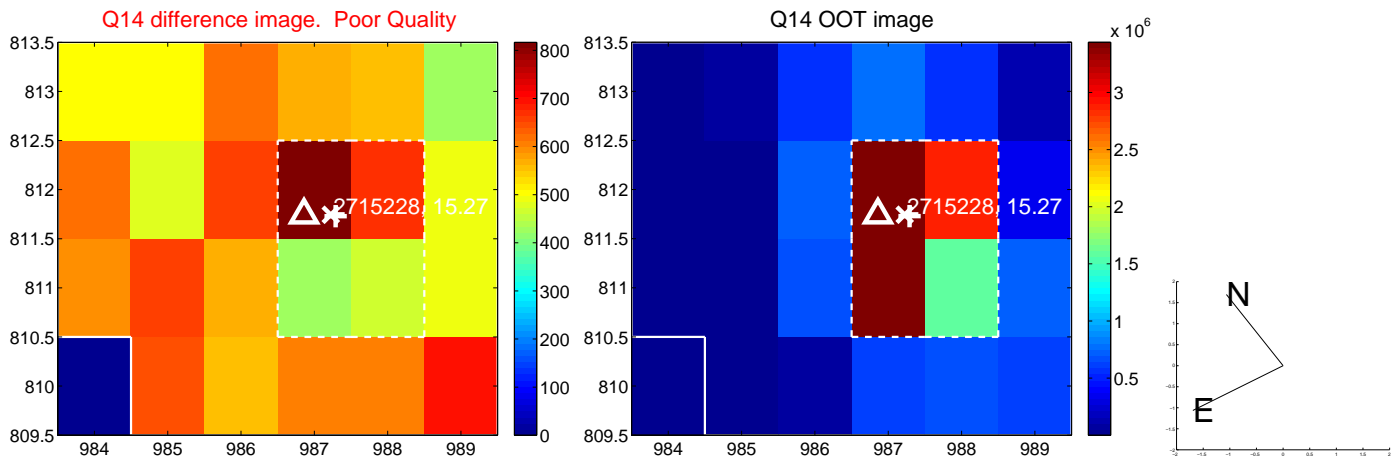
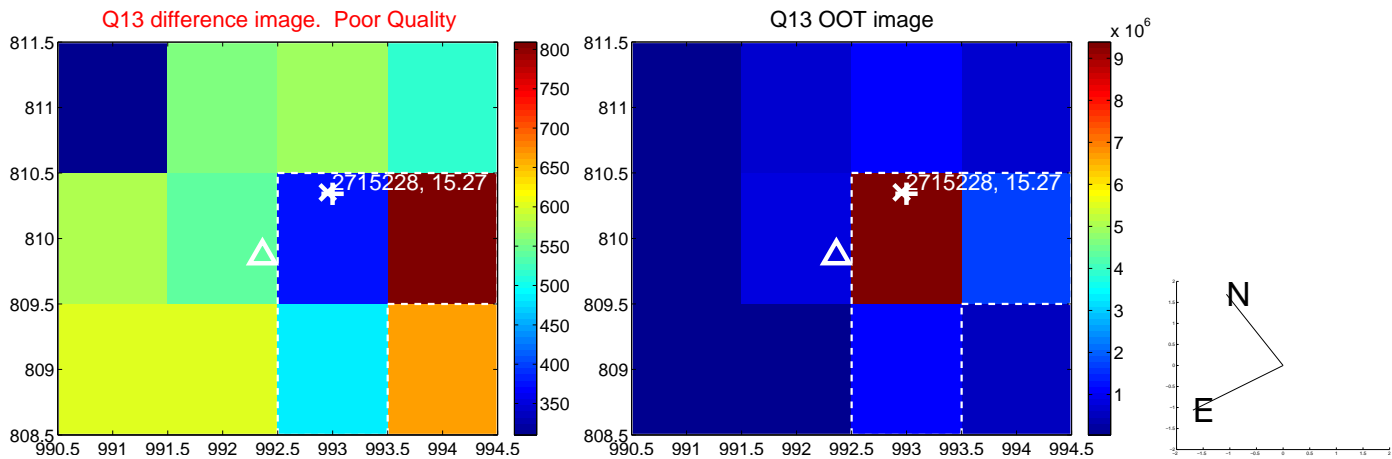
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



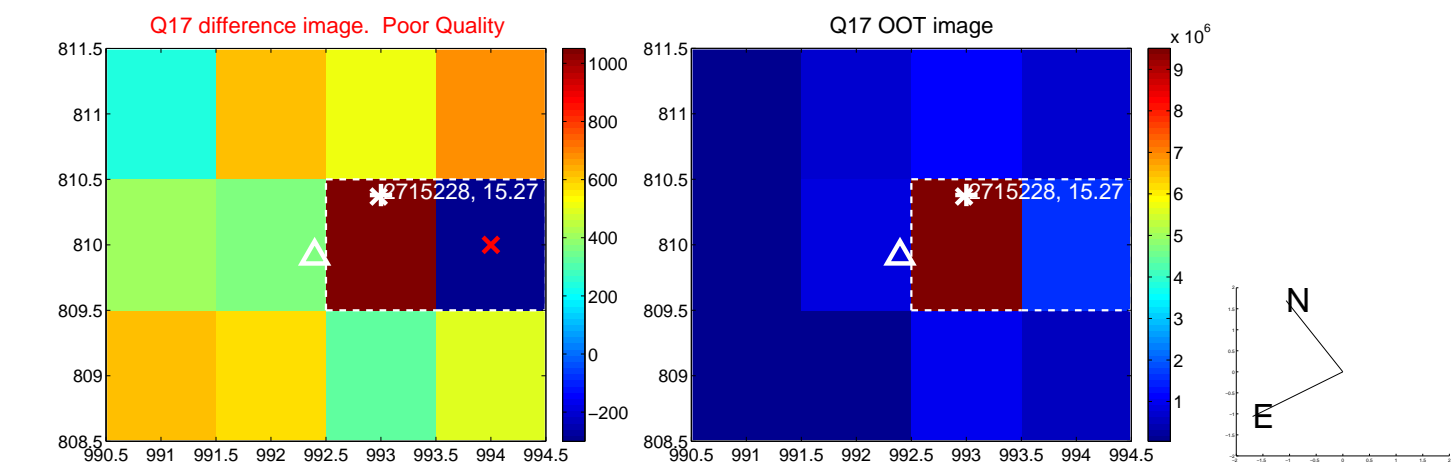
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



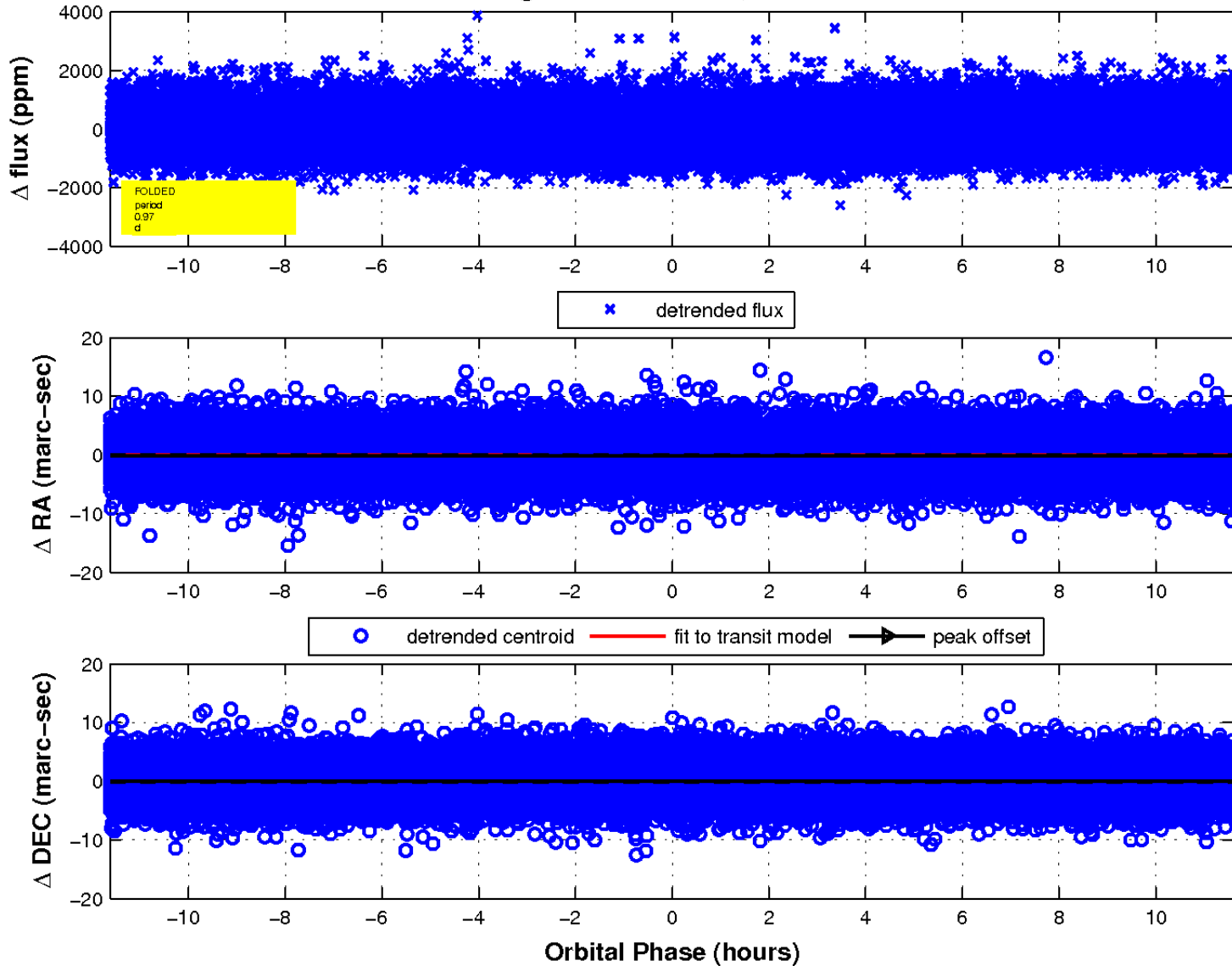
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white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

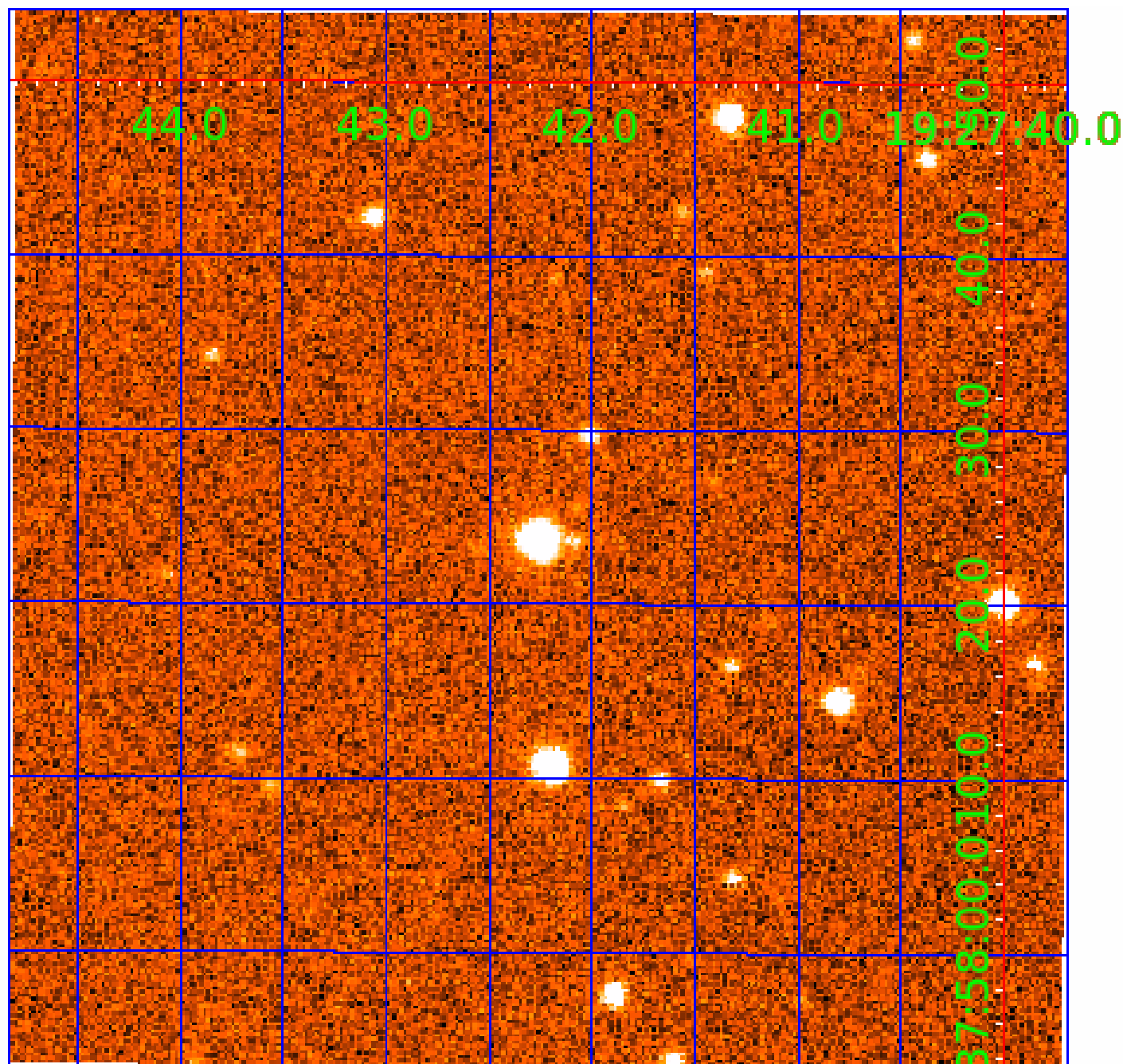


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 002715228

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})
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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002715228-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—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.

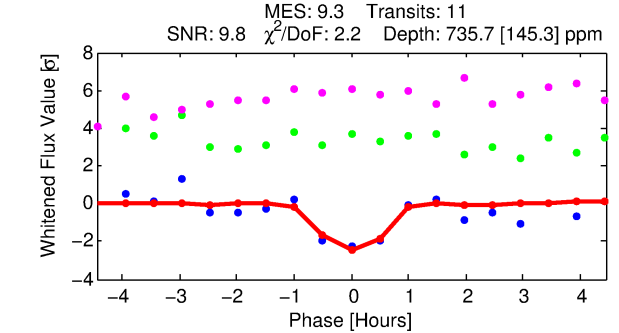
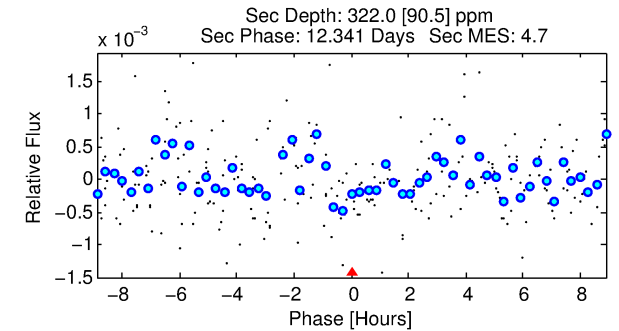
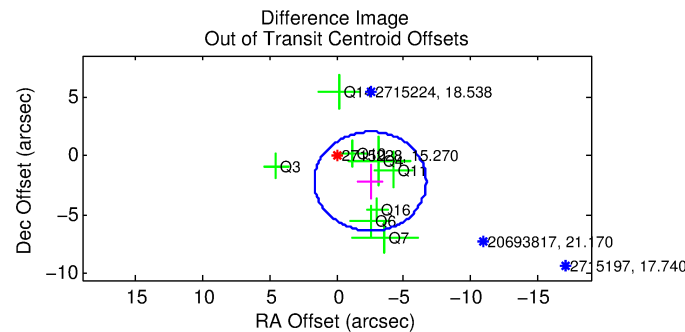
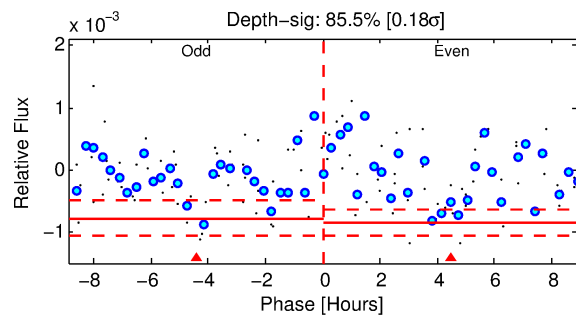
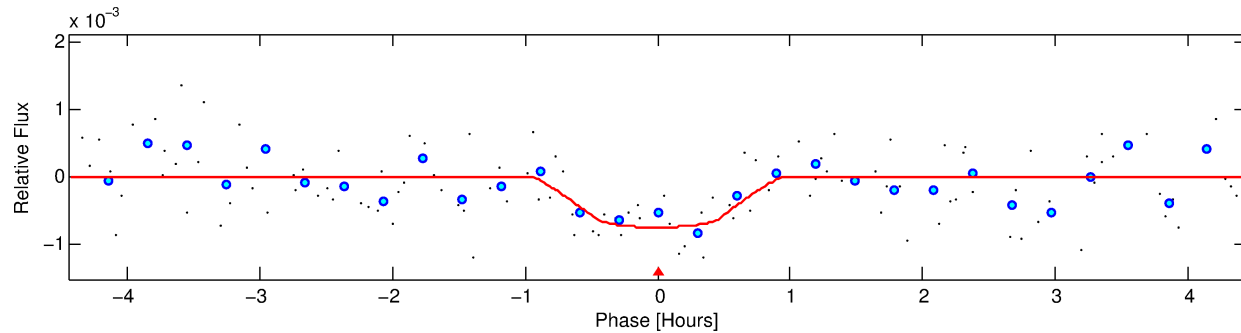
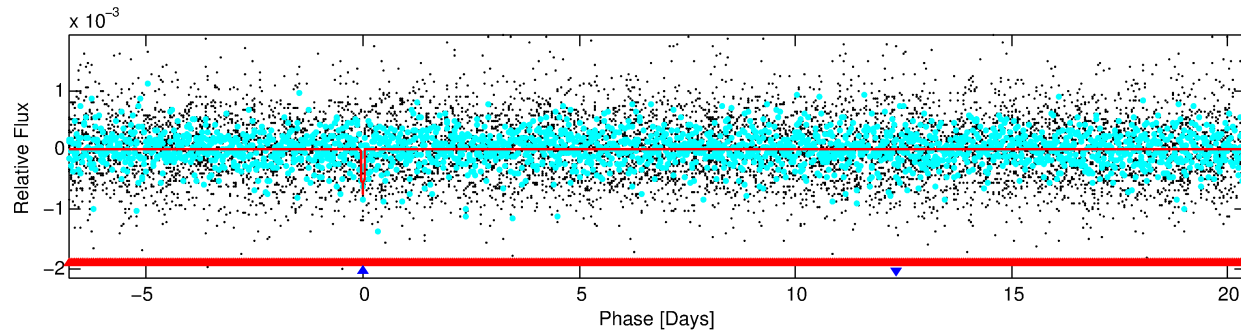
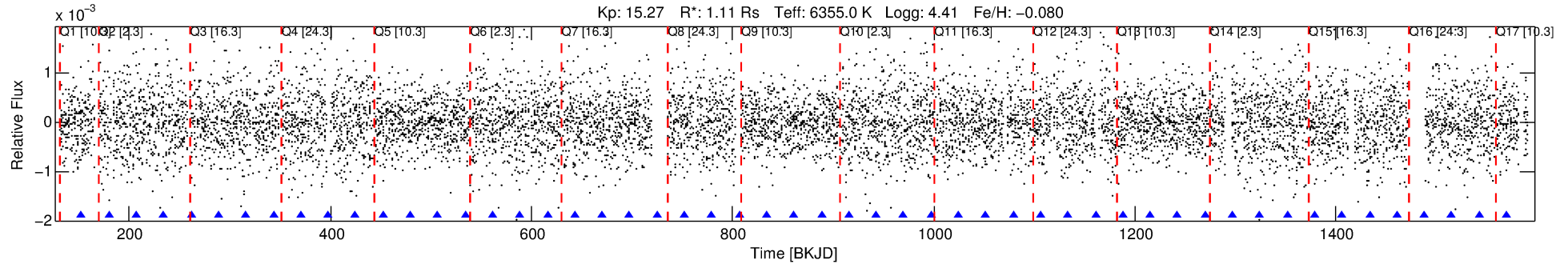
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002715228-02

No Significant Match Found

DV One-Page Summary

KIC: 2715228 Candidate: 2 of 2 Period: 27.245 d



DV Fit Results:

Period = 27.24513 [0.00026] d
Epoch = 152.7292 [0.0076] BKJD
Rp/R* = 0.0278 [0.0414]
a/R* = 87.90 [684.25]
b = 0.82 [3.26]
Seff = 52.00 [18.84]
Teq = 685 [62] K
Rp = 3.36 [5.10] Re
a = 0.1857 [0.0433] AU
Ag = 542.21 [1634.76] [0.33 σ]
Teffp = 5109 [3831] K [1.15 σ]

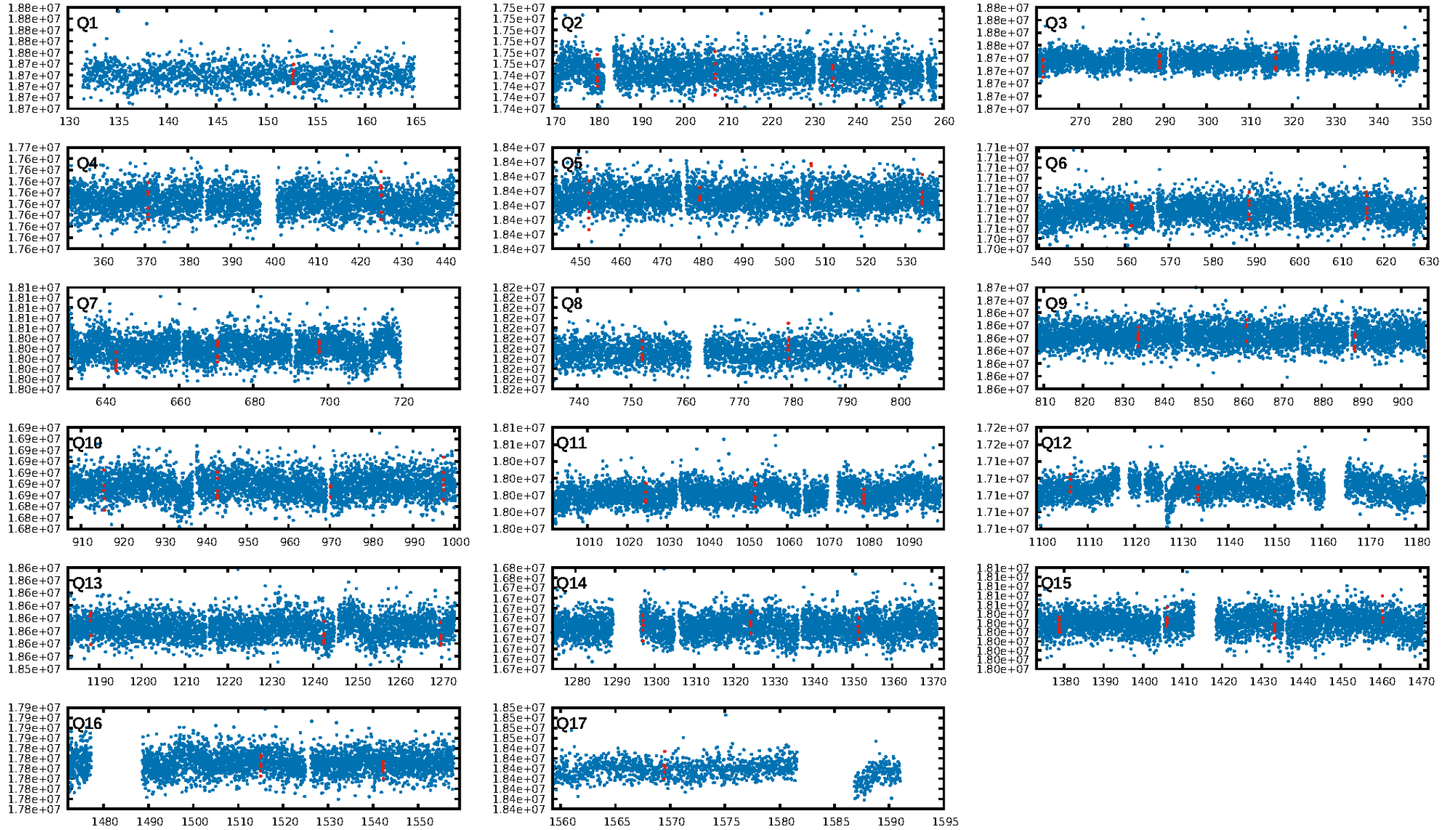
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [95.08 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 3.6%
ModelChiSquareGof-sig: 74.3%
Bootstrap-pfa: 4.96e-10
RollingBand-fgt: 1.00 [11/11]
GhostDiagnostic-chr: 0.3256
Centroid-sig: 80.4%
Centroid-so: 1.083 arcsec [1.36 σ]
OotOffset-rm: 3.317 arcsec [2.38 σ]
OotOffset-st: 3/3/2/0 [8]
KicOffset-rm: 3.531 arcsec [2.81 σ]
KicOffset-st: 3/3/2/0 [8]
DiffImageQuality-fgm: 0.00 [0/8]
DiffImageOverlap-fno: 0.41 [7/17]

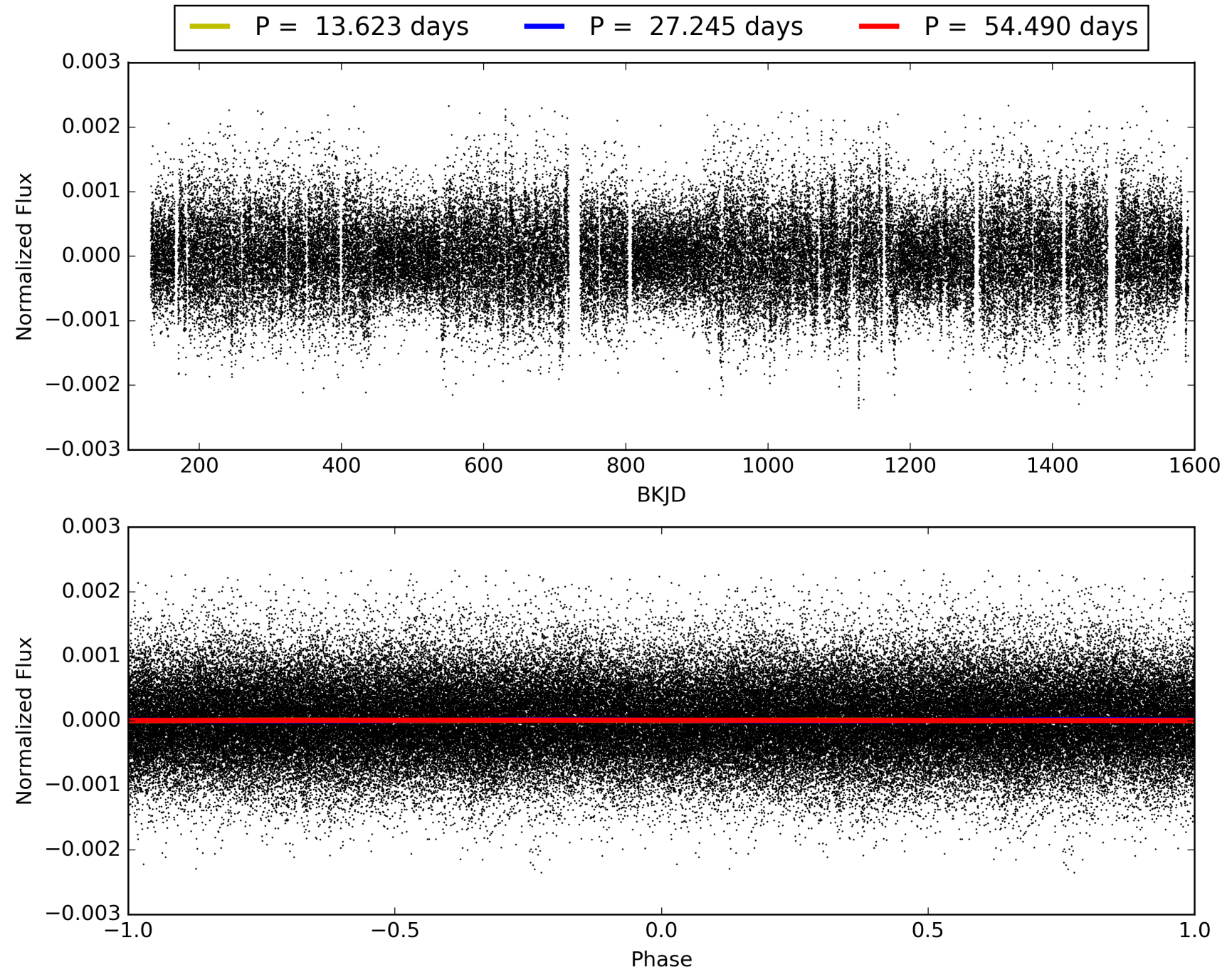
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:31:14 Z

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

TCE 002715228-02, PDC Light Curves

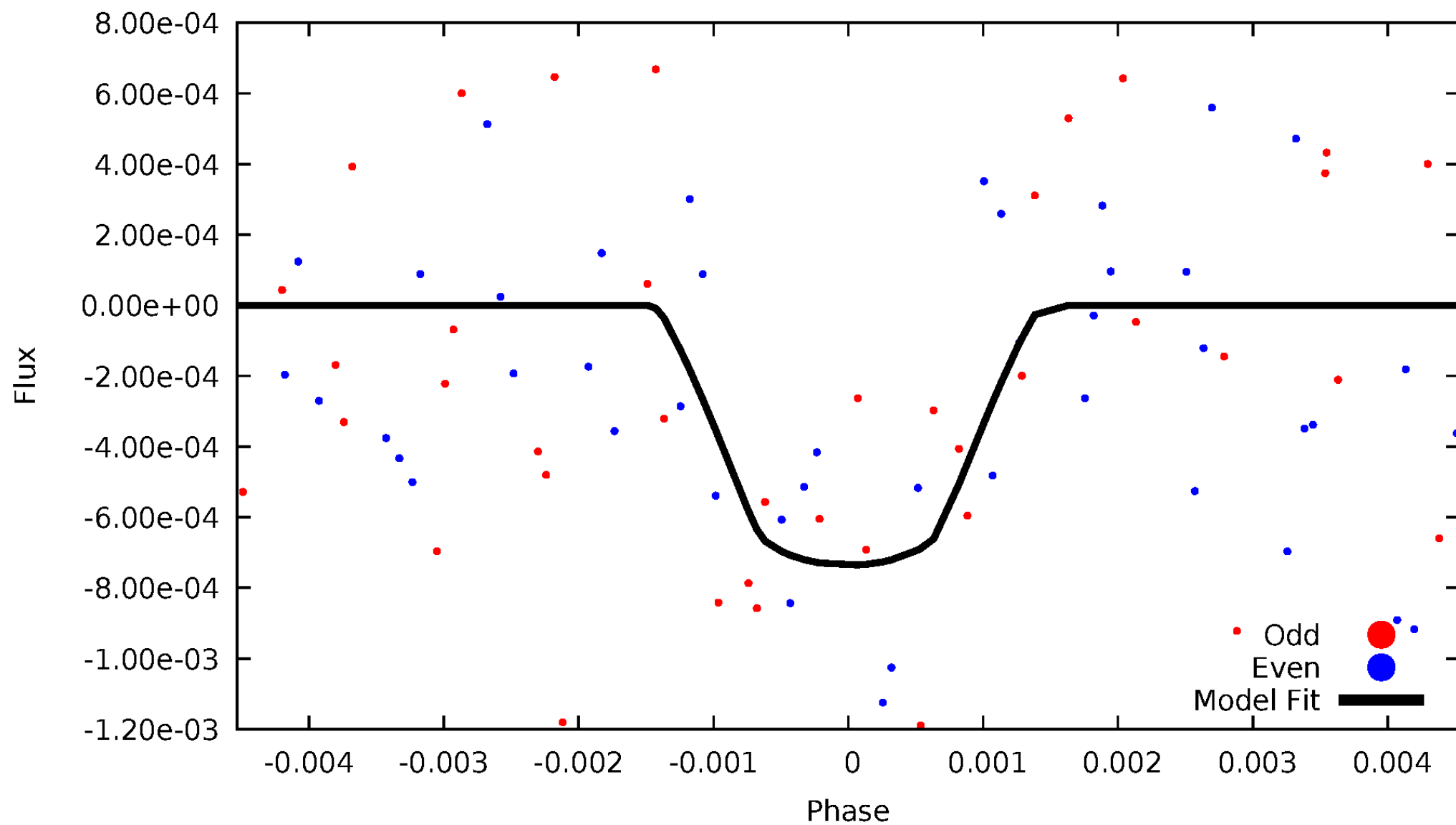


TCE 002715228-02



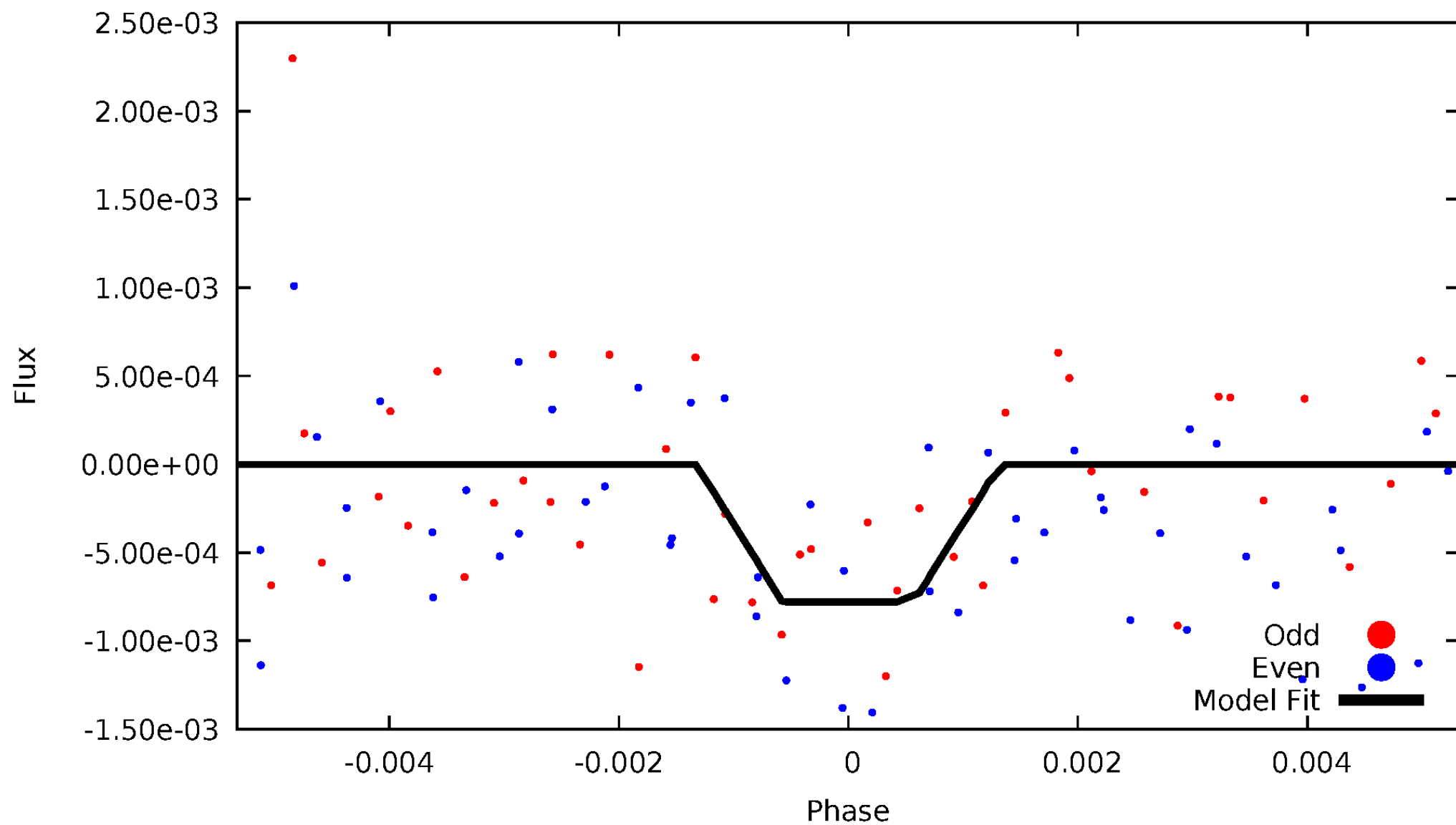
DV Odd/Even

TCE 002715228-02



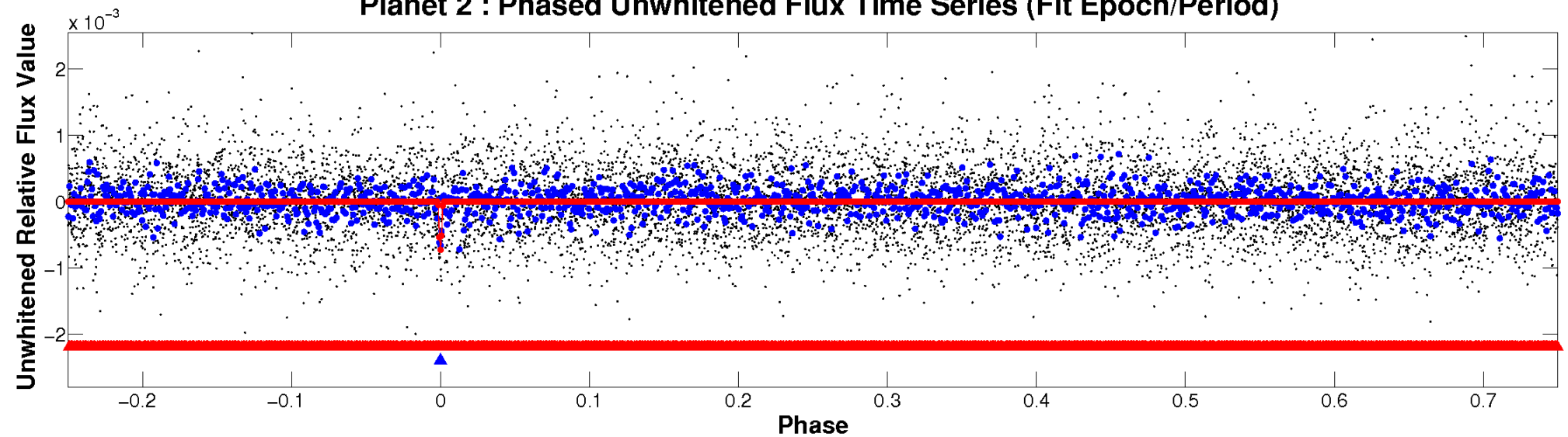
ALT Odd/Even

TCE 002715228-02

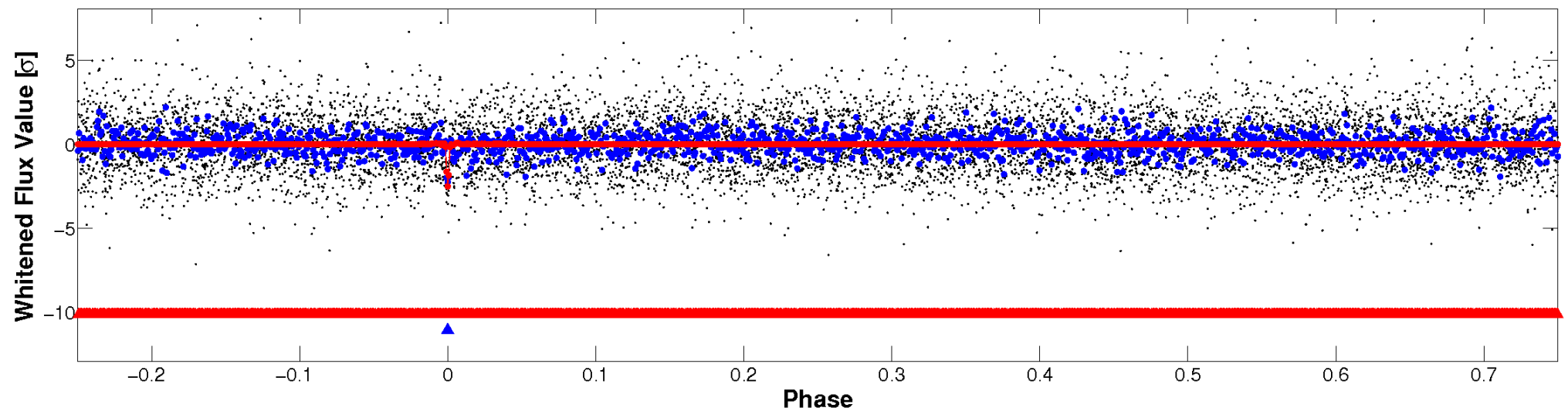


Non-Whitened Vs. Whitened Light Curve

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

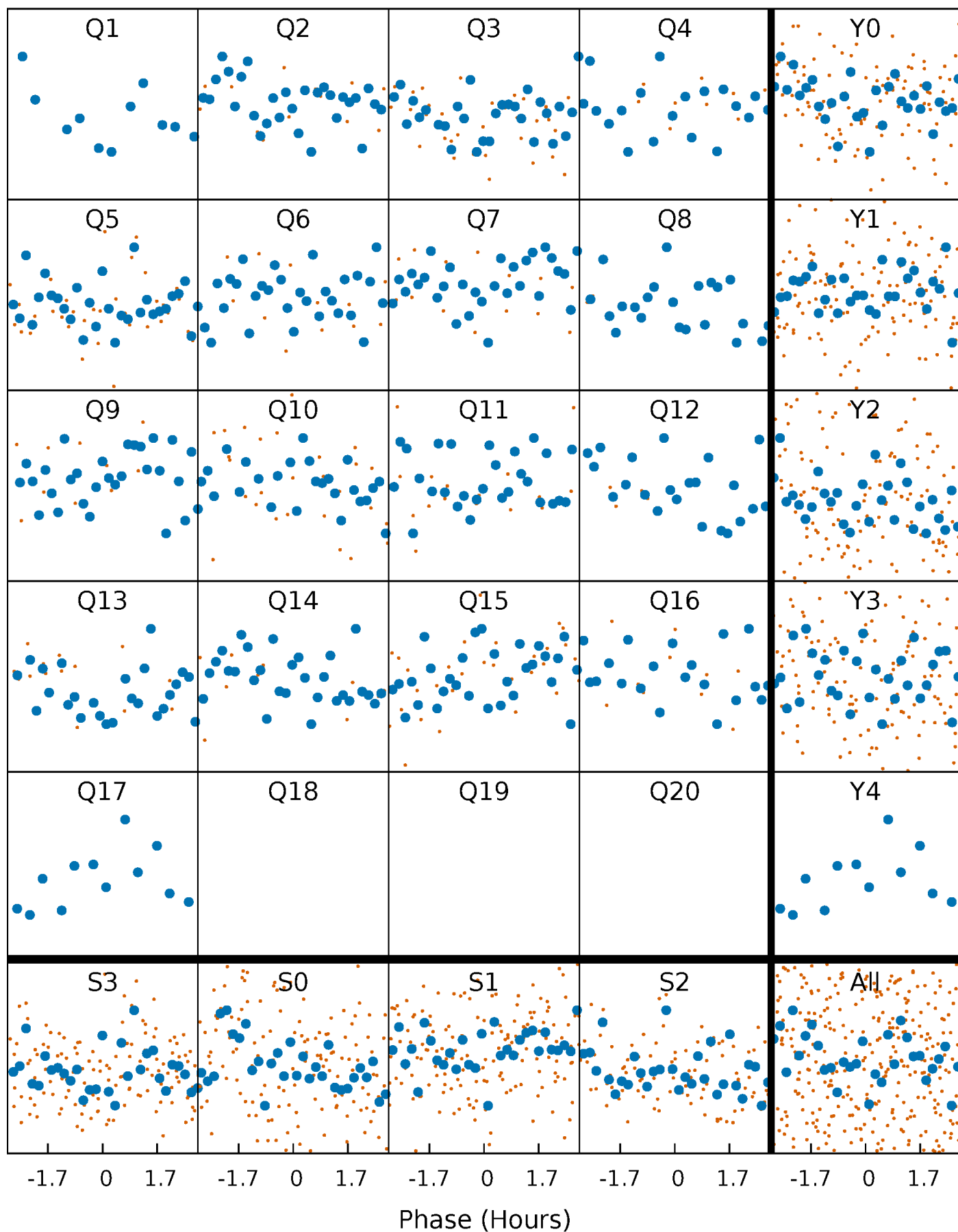


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



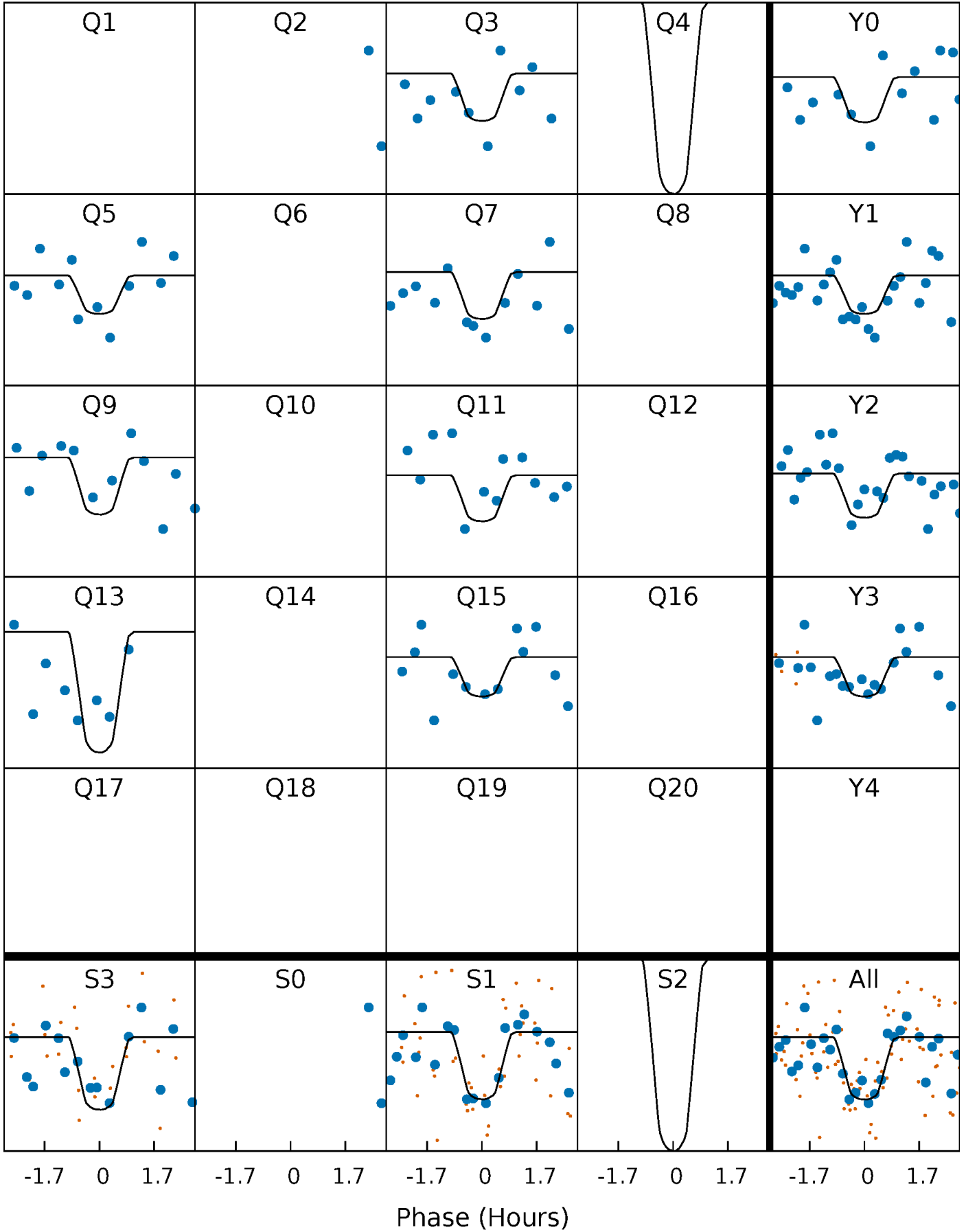
PDC Quarter-Phased Transit Curves

TCE 002715228-02 P= 27.245130 Days $T_0=152.729217$ (BKJD)



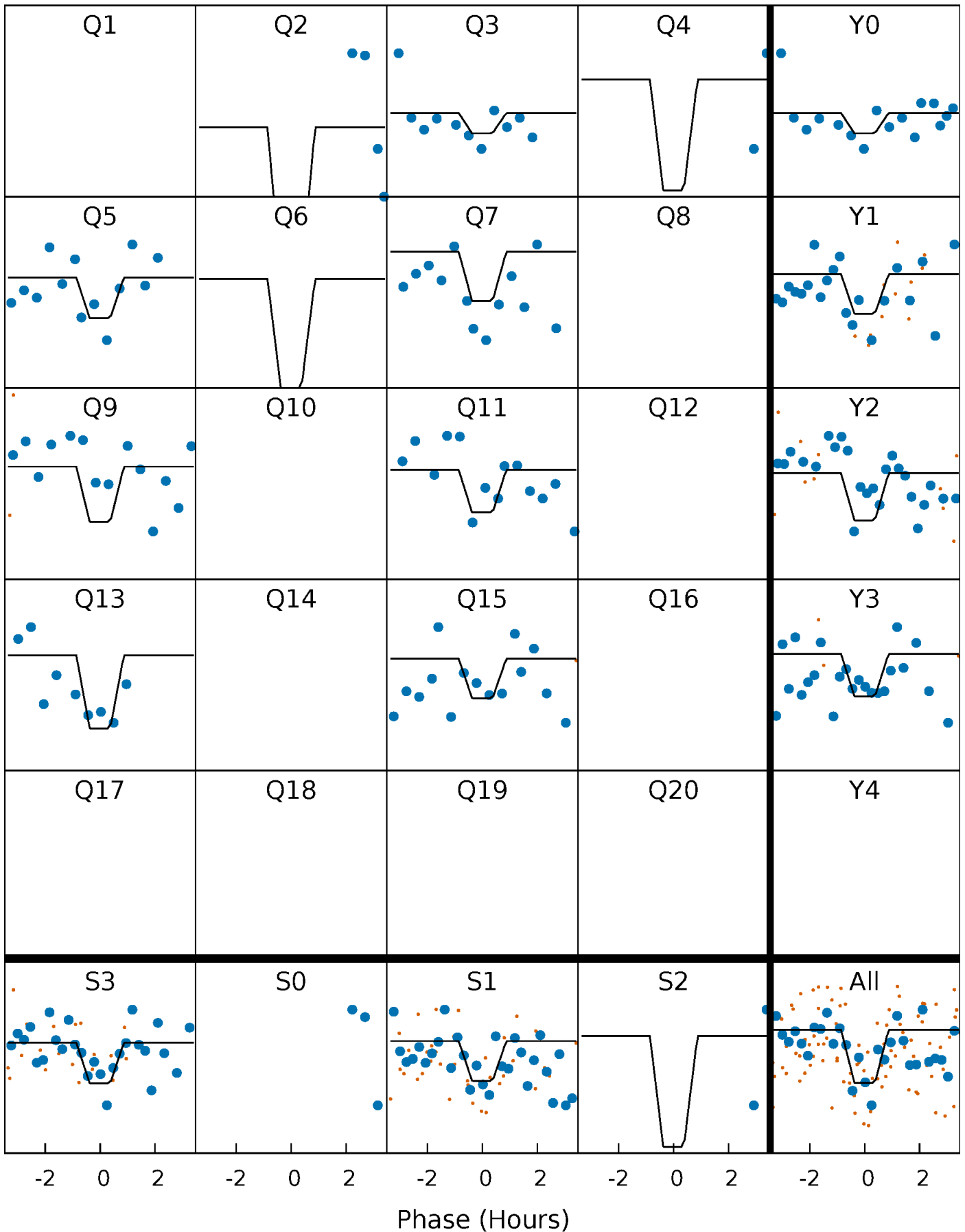
DV Quarter-Phased Transit Curves

TCE 002715228-02 P= 27.245130 Days $T_0=152.729217$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

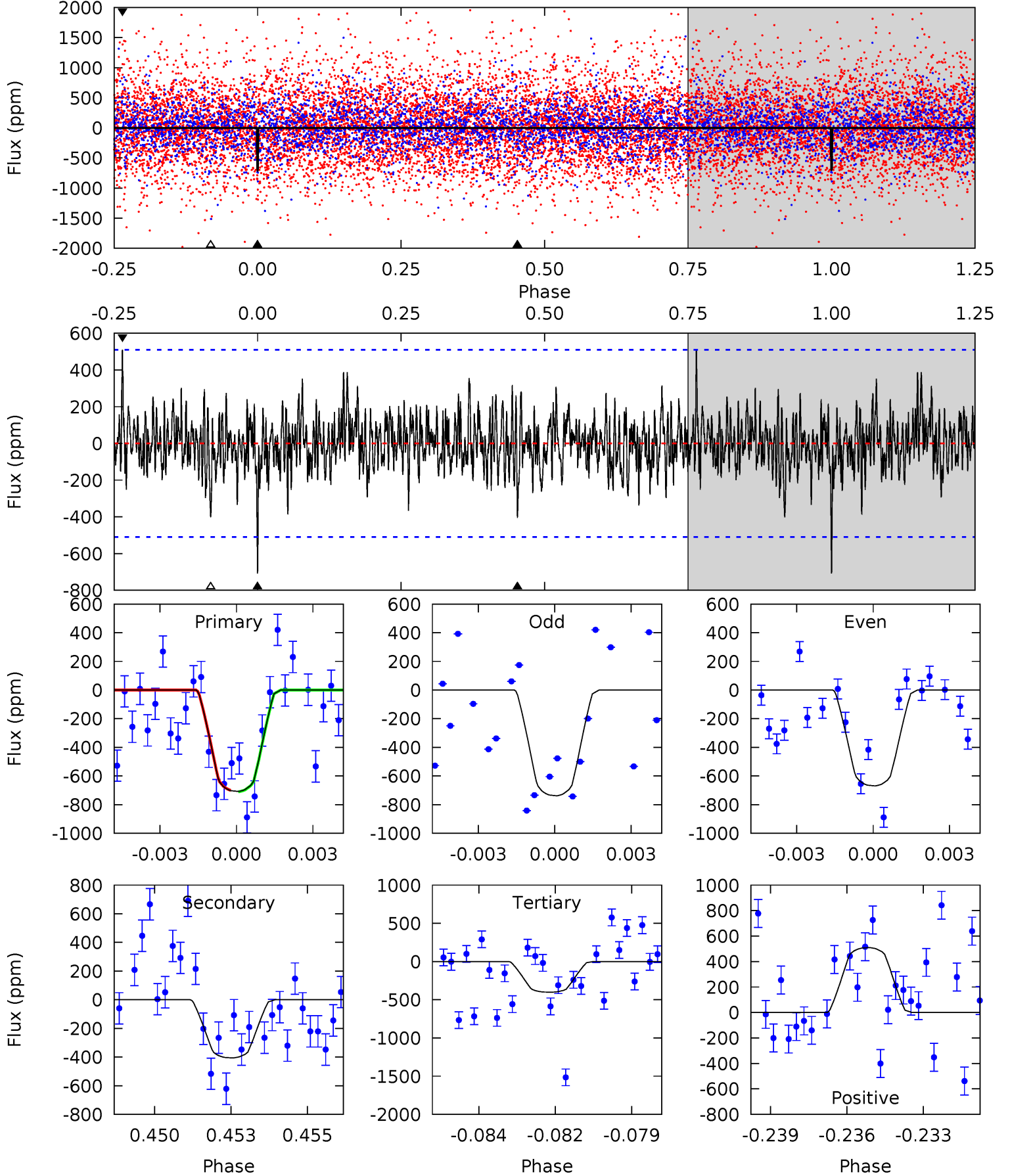
TCE 002715228-02 P= 27.244750 Days $T_0=152.739080$ (BKJD)



DV Model-Shift Uniqueness Test

002715228-02, P = 27.245130 Days, E = 125.484087 Days

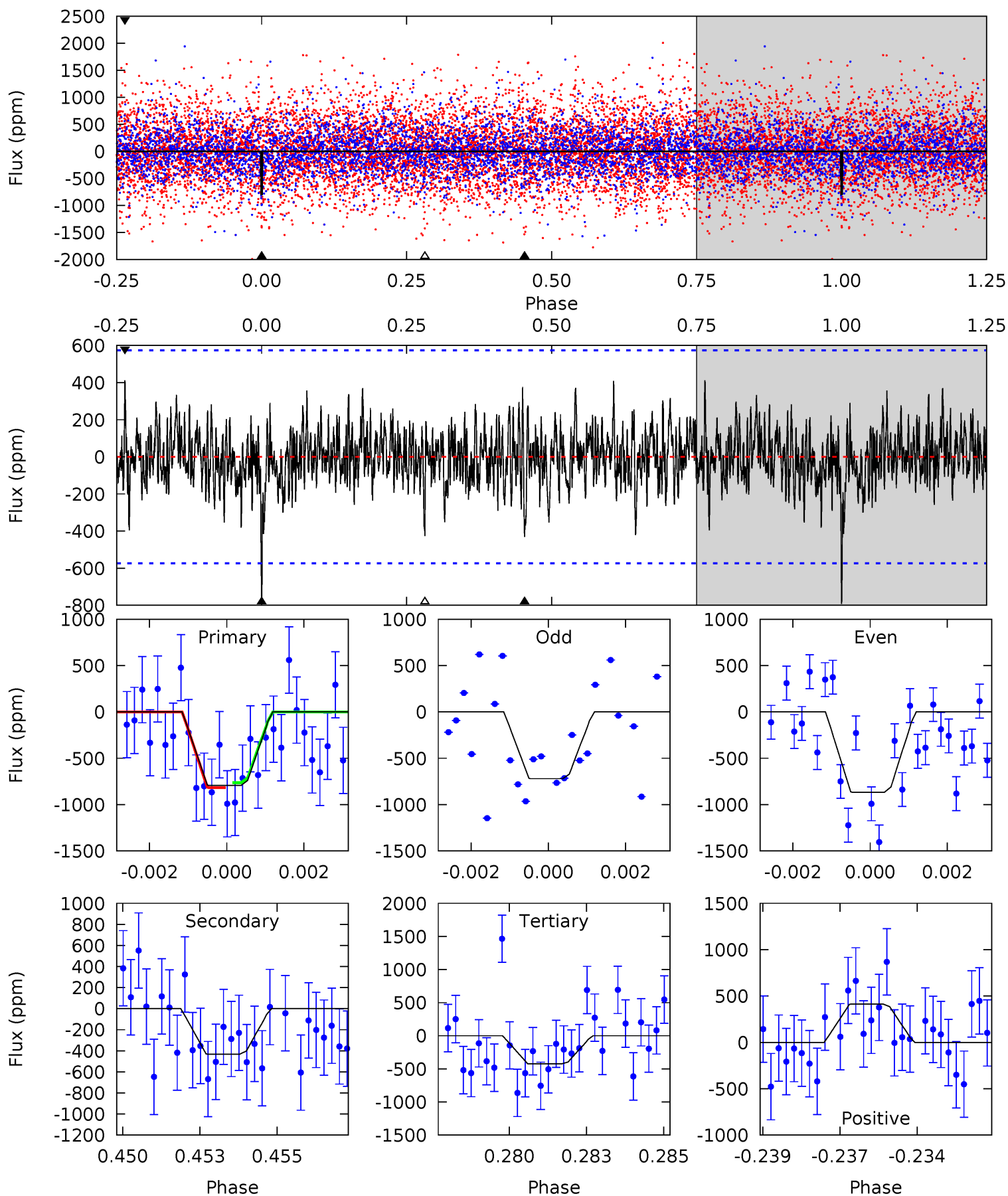
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.31	4.19	4.15	5.26	5.26	2.99	1.25	3.16	2.05	0.04	-1.07	0.36	1.03	0.42	0.05



Alt Model-Shift Uniqueness Test

002715228-02, P = 27.244750 Days, E = 125.494330 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.33	3.99	3.94	3.82	5.30	3.05	1.16	3.40	3.52	0.05	0.18	0.68	1.00	0.34	0.24



Stellar Parameters For KIC 002715228

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6355^{+178}_{-223}	$4.410^{+0.060}_{-0.180}$	$-0.080^{+0.250}_{-0.300}$	$1.108^{+0.312}_{-0.134}$	$1.151^{+0.154}_{-0.154}$	$1.191^{+0.393}_{-0.580}$
	+3%/-4%	+1%/-4%	+312%/-375%	+28%/-12%	+13%/-13%	+33%/-49%
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 002715228-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-406 ± 97	$5.36^{+4.42}_{-3.32}$	973^{+64}_{-51}	4489^{+2533}_{-853}	259^{+1440}_{-182}
Alt.	-432 ± 108	$5.18^{+4.61}_{-3.47}$	973^{+60}_{-46}	4655^{+3374}_{-985}	299^{+2405}_{-219}

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 $A_{obs} \gg 1.0$

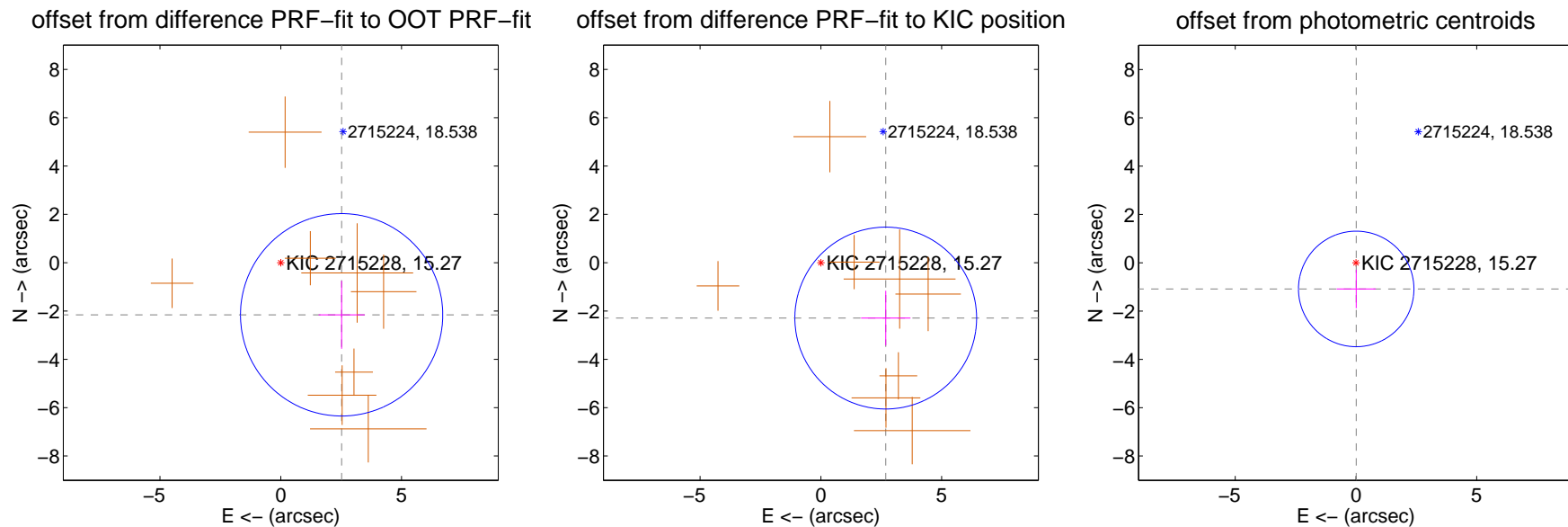
DV Centroid Data

Supplemental centroid analysis for 002715228-02. Kepler magnitude: 15.27. Transit SNR 9.83

There are 0 quarters with good PRF difference image offsets

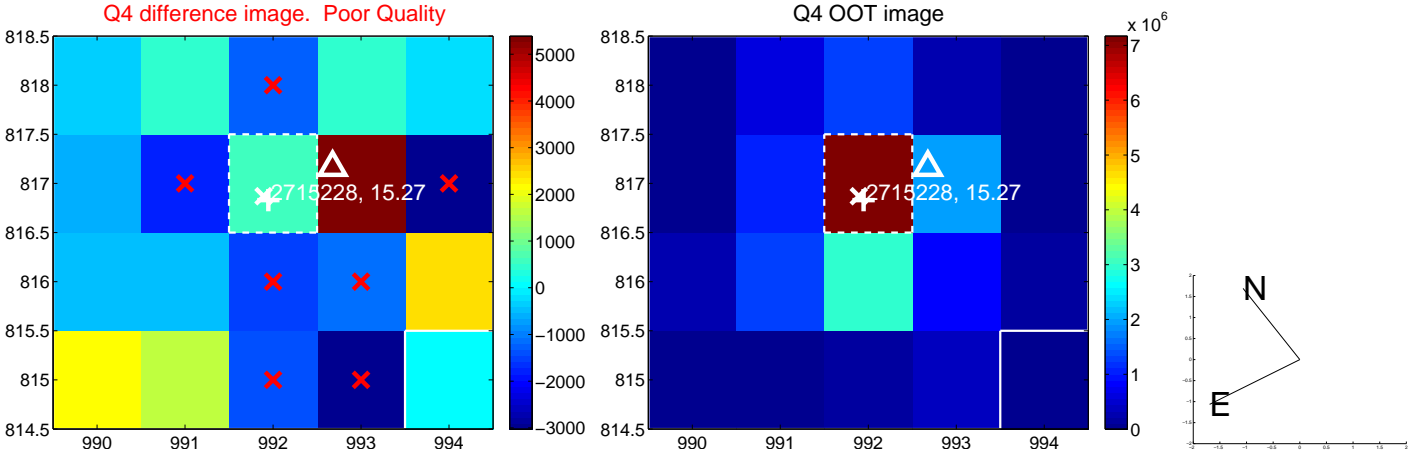
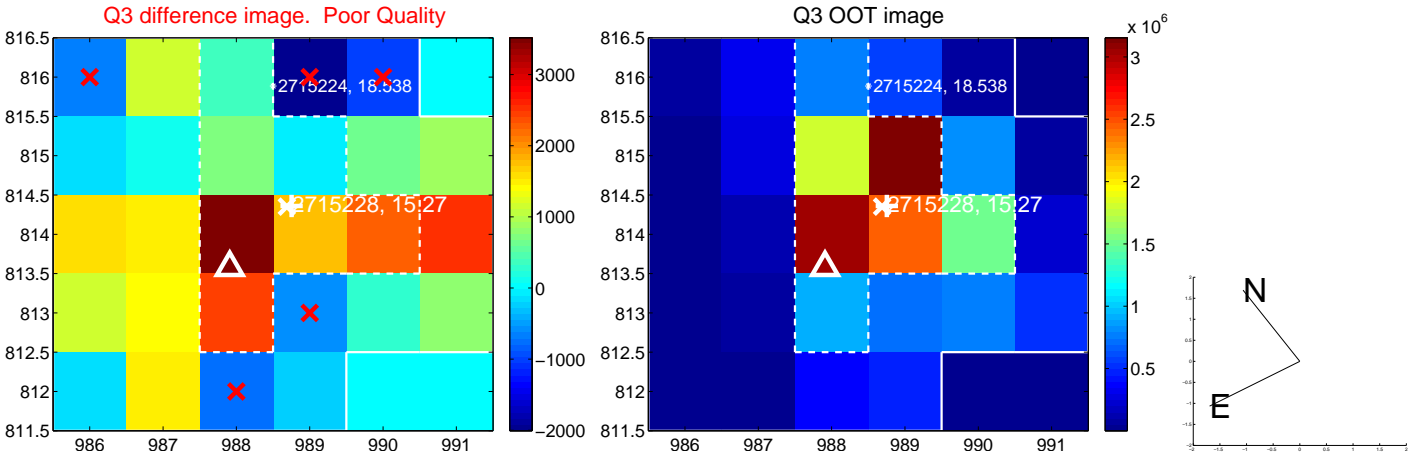
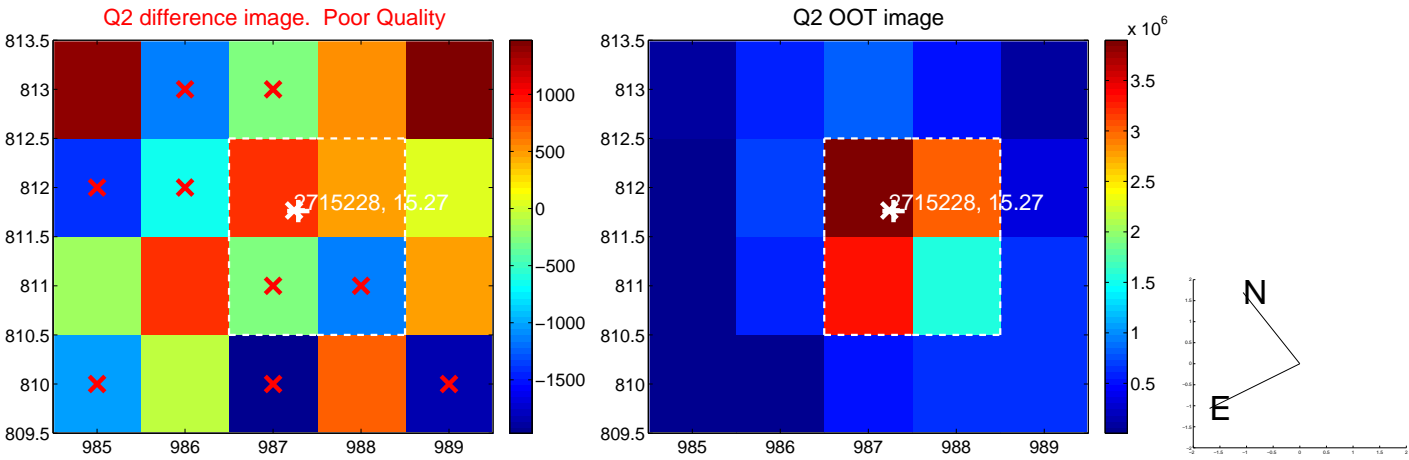
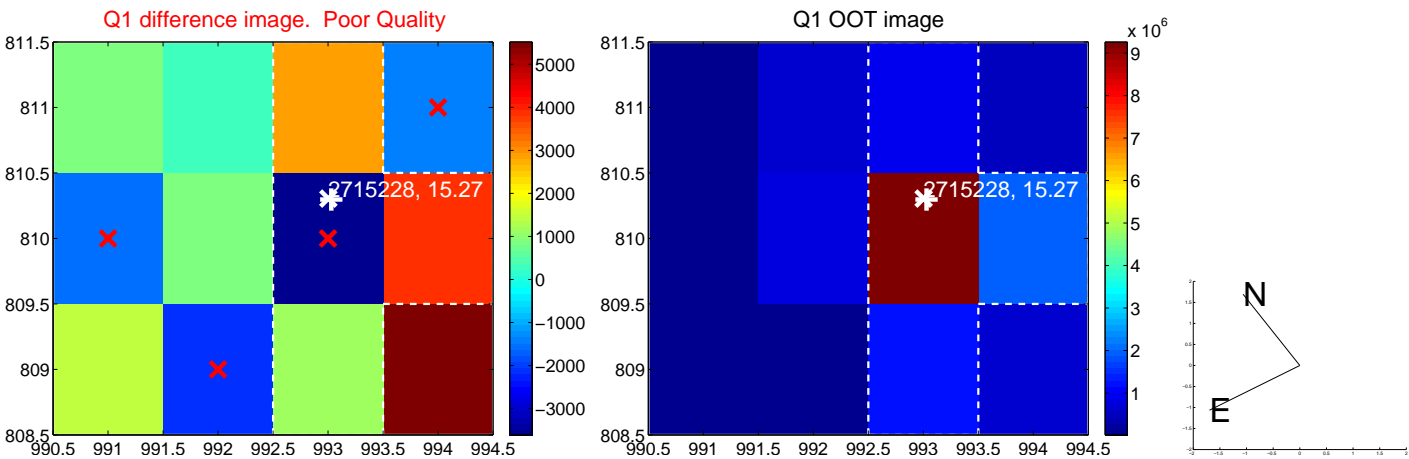
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.317 ± 1.396	2.38	-2.520 ± 0.954	-2.157 ± 1.404
PRF-fit source offset from KIC position	3.531 ± 1.254	2.81	-2.687 ± 1.023	-2.291 ± 1.131
photometric centroid source offset	1.08 ± 0.80	1.36	-0.01 ± 0.81	-1.08 ± 0.80

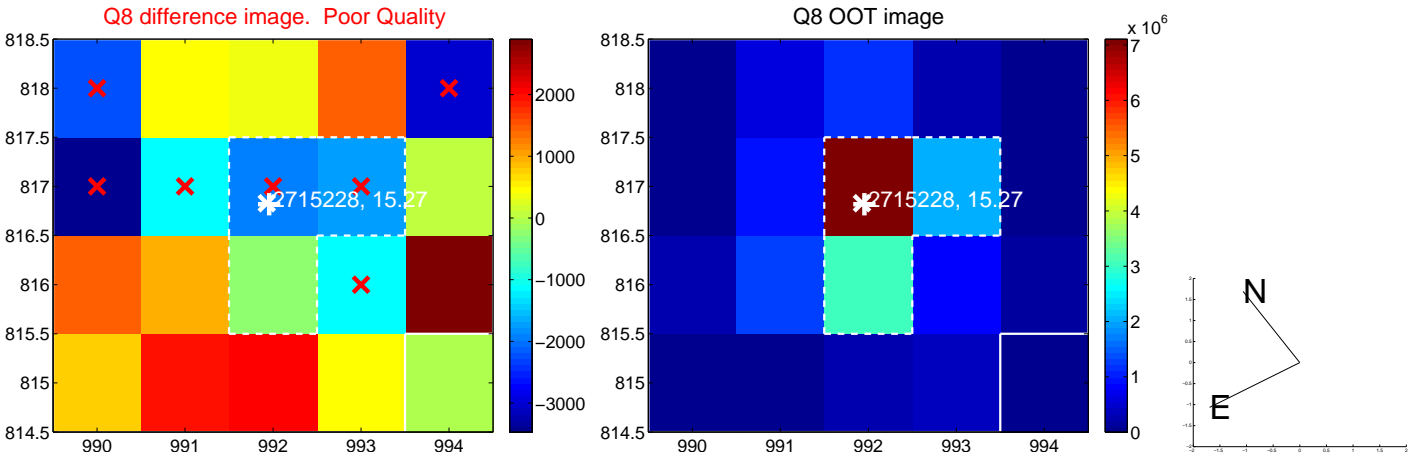
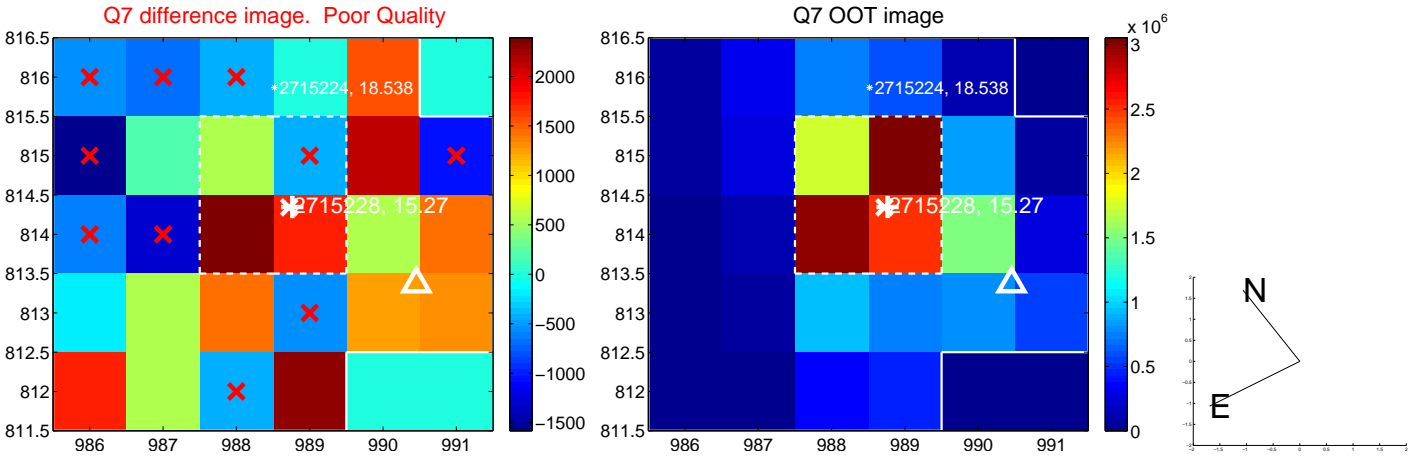
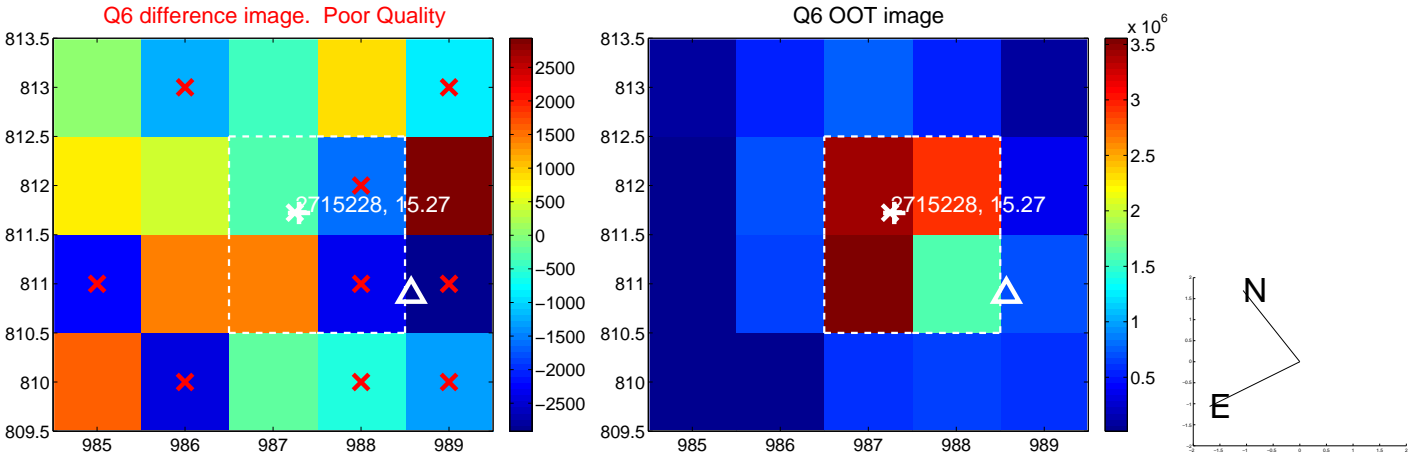
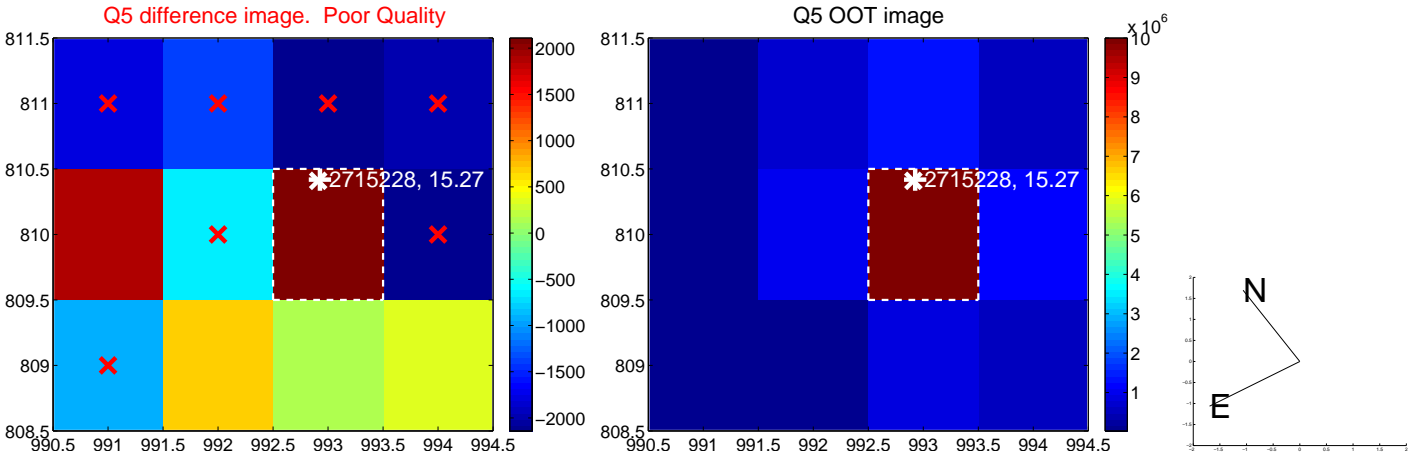


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

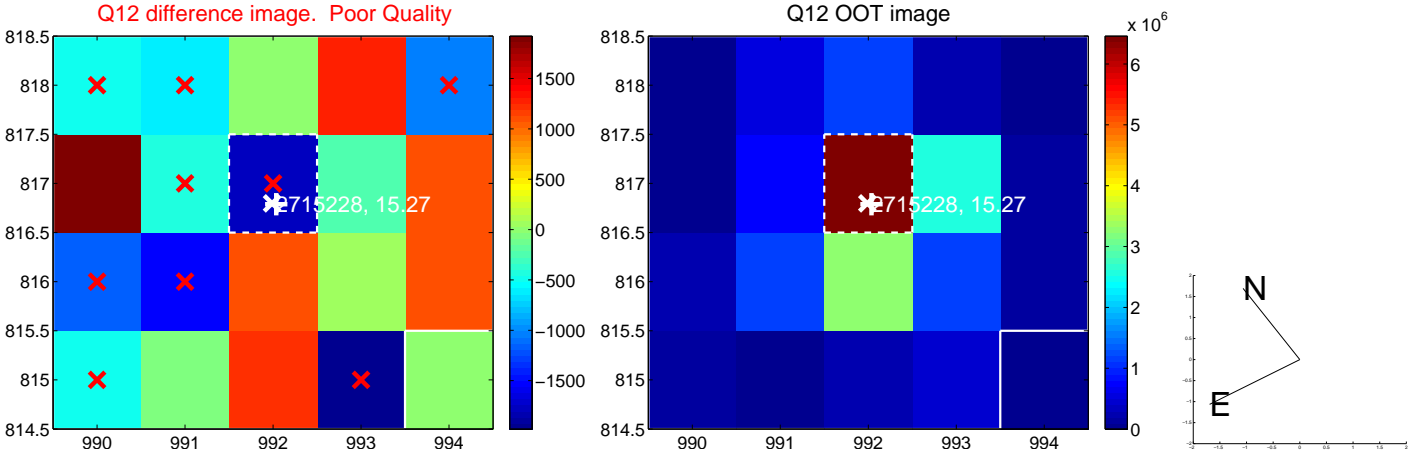
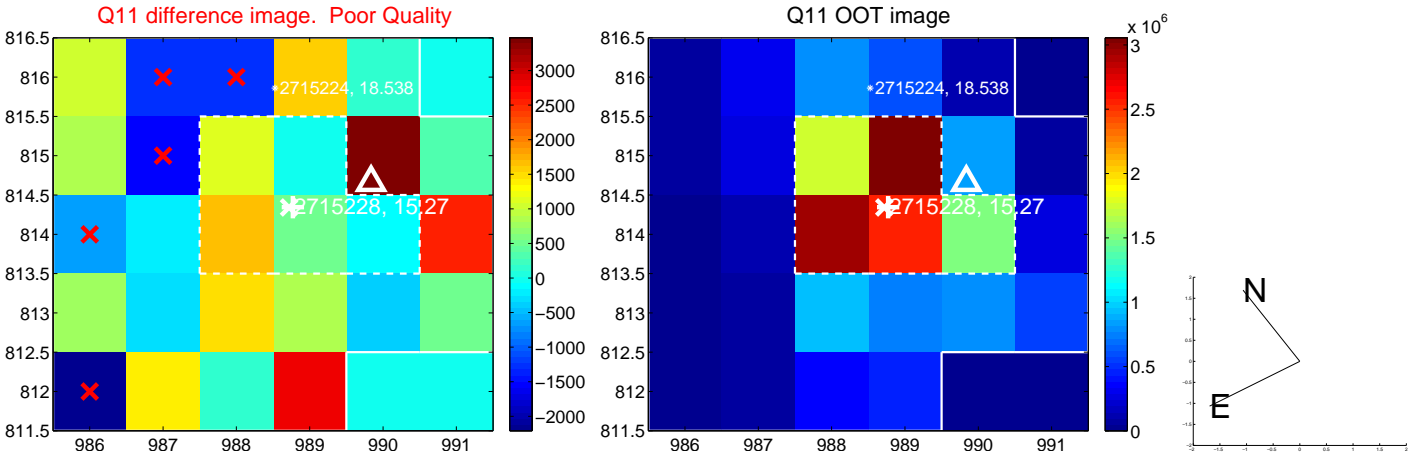
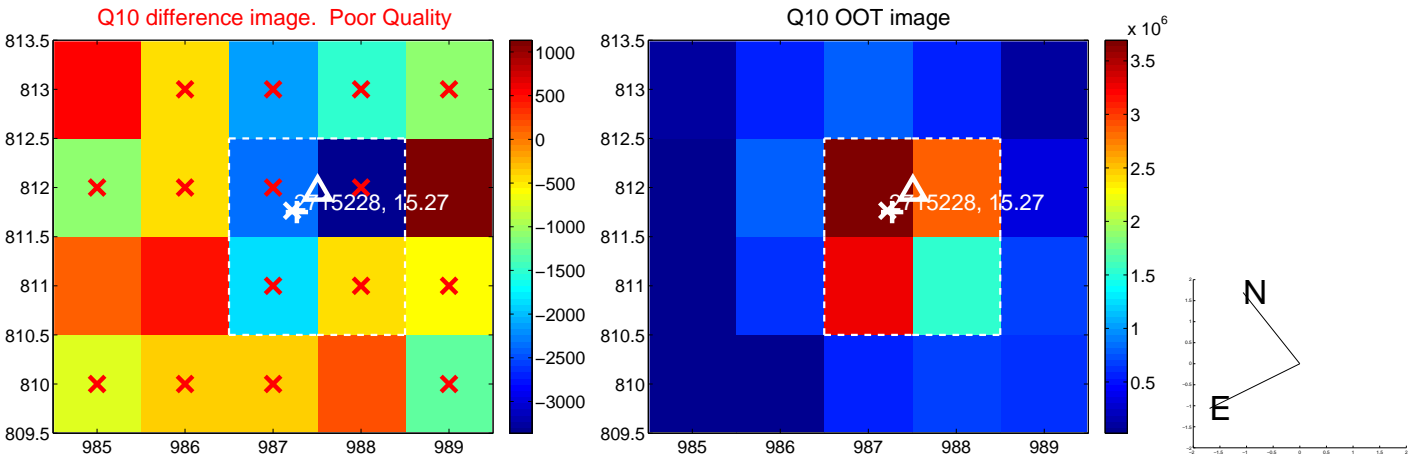
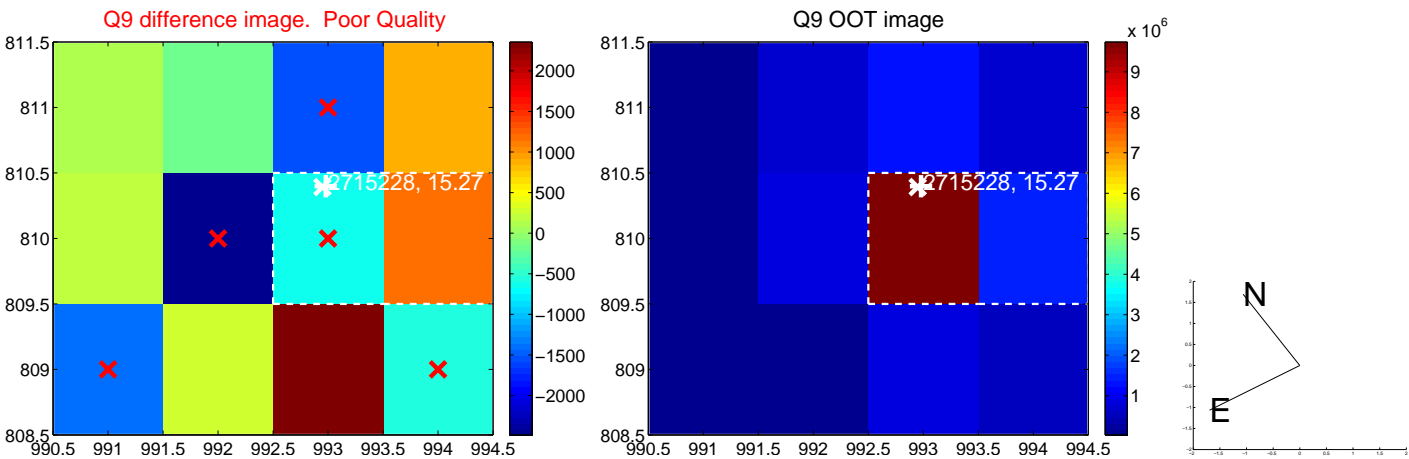
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



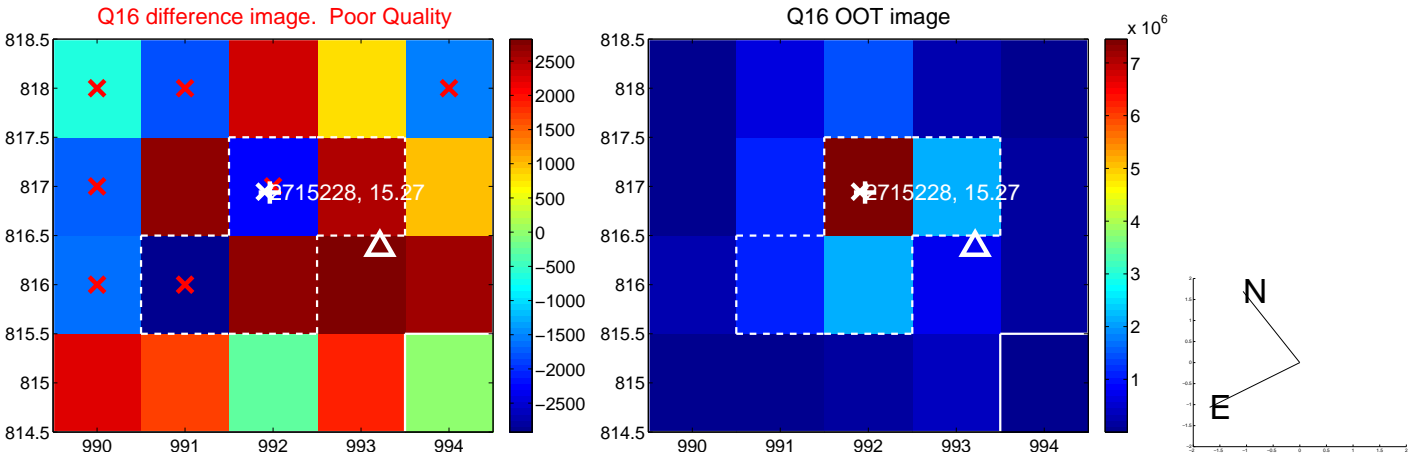
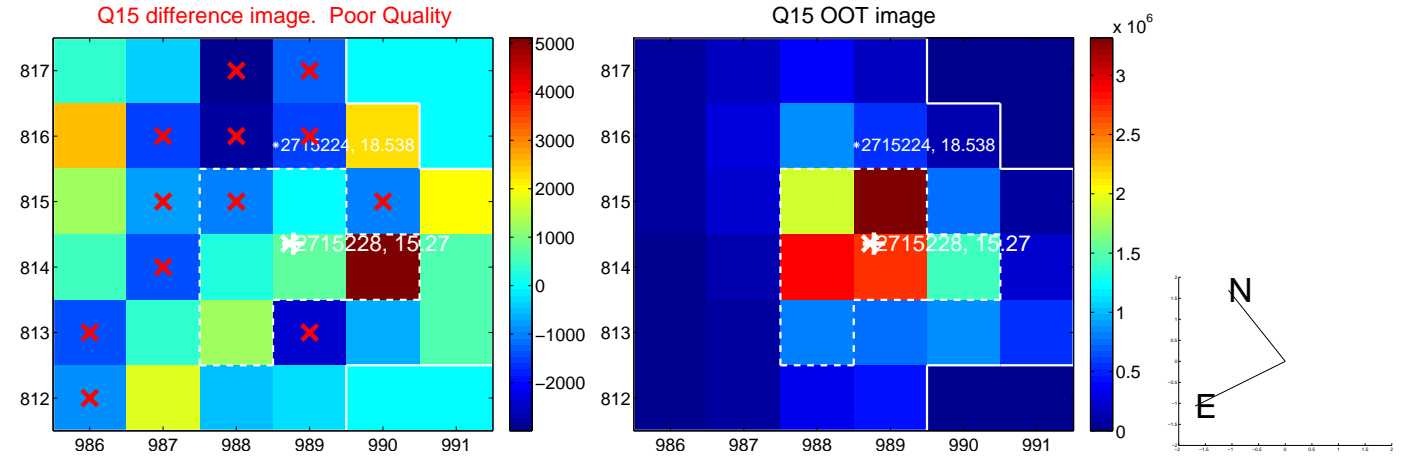
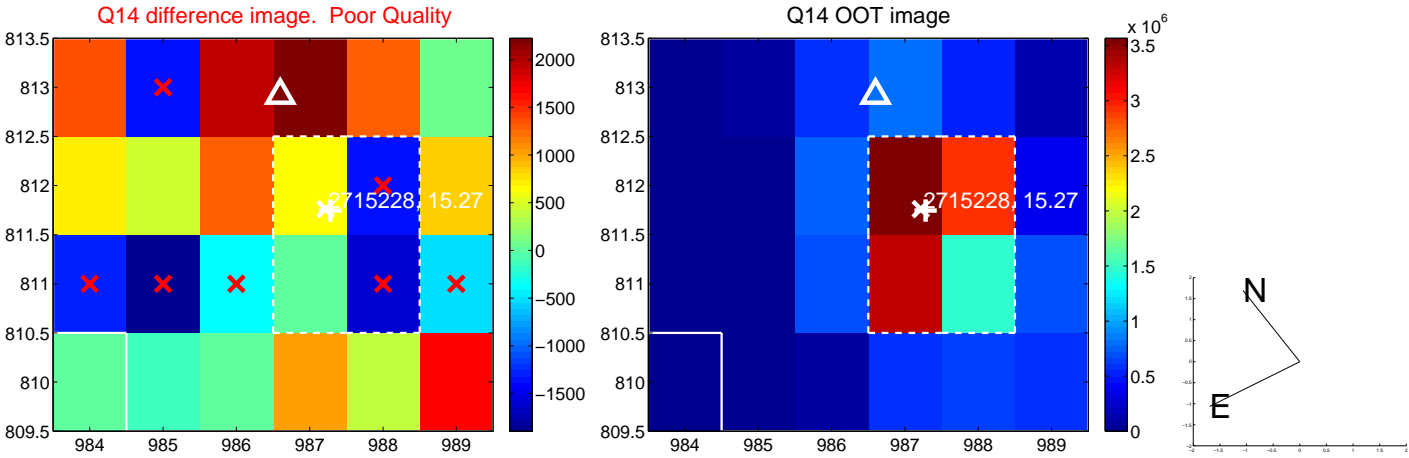
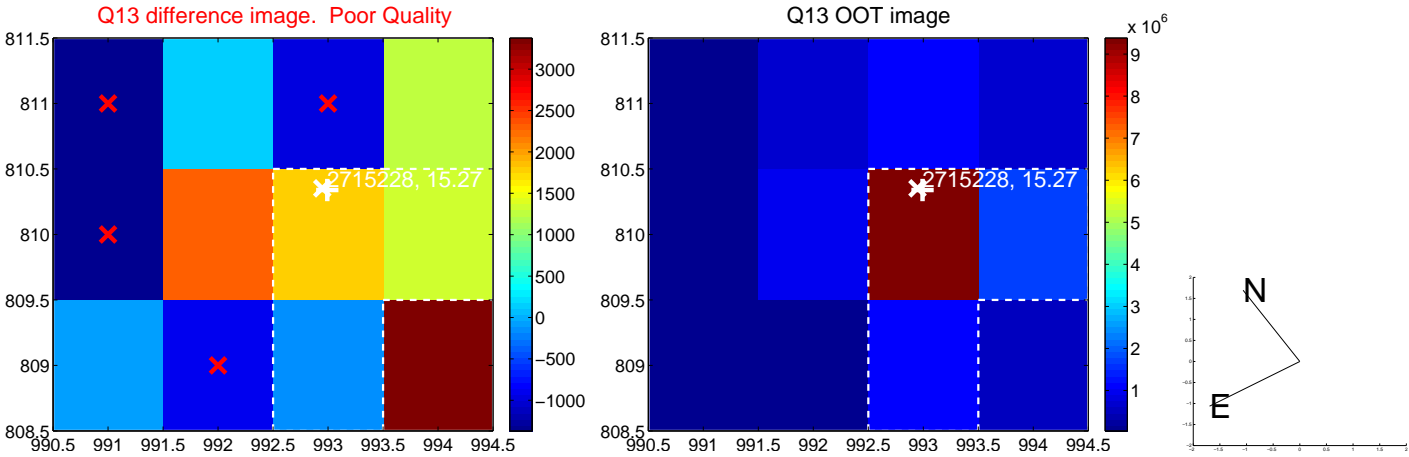
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



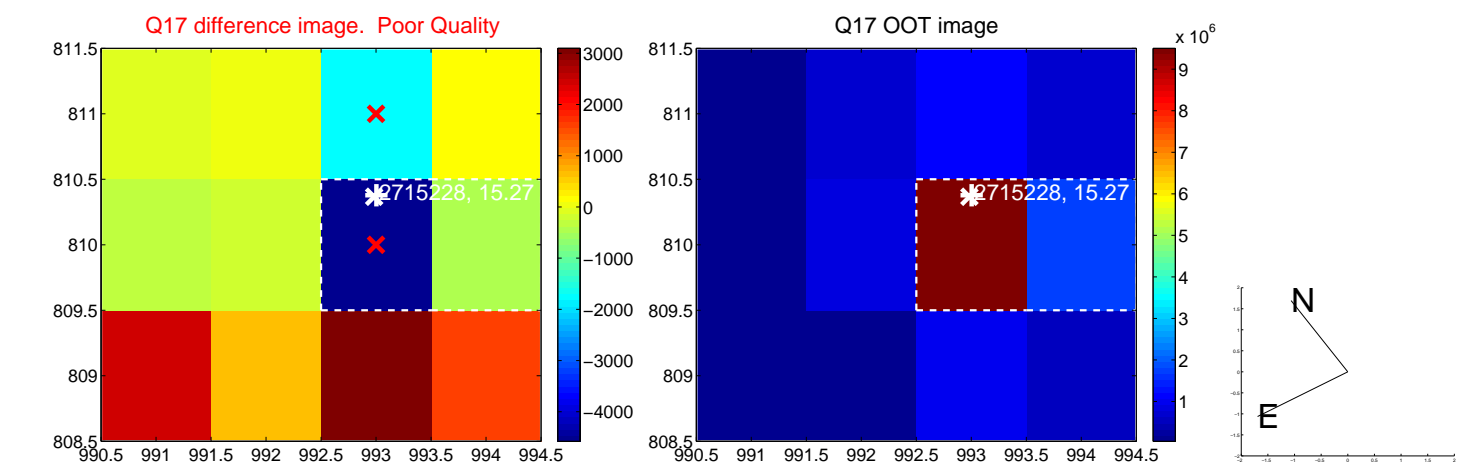
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



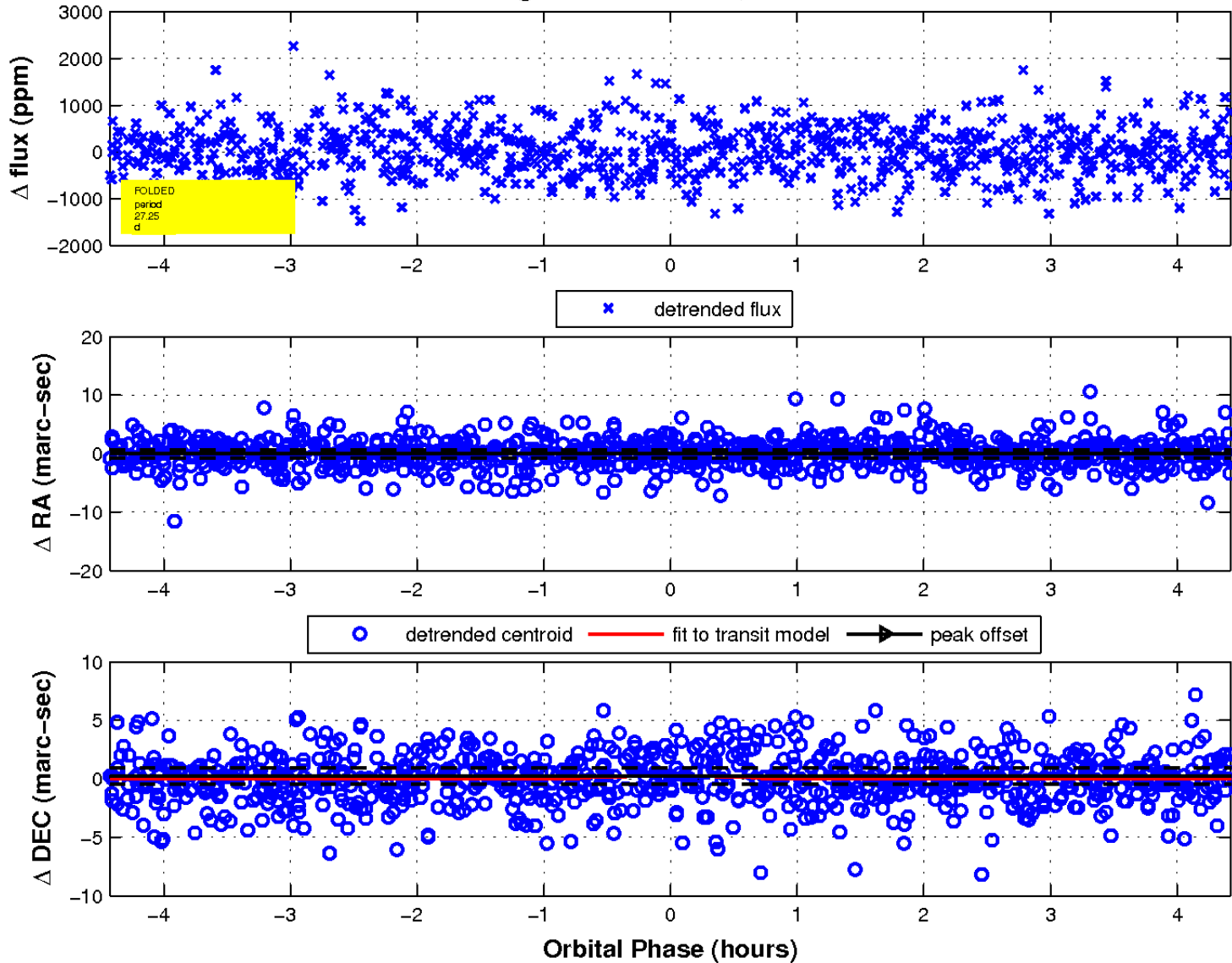
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

