

KIC 004077901

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})
004077901-01	OBS	2239.01	12.109738	140.750564	110.2	10.074	20.1	21.4	0.74	5437	1.07	50.81
004077901-02	OBS	No	12.108326	134.760468	37.9	7.475	7.3	8.0	0.74	5437	0.53	50.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004077901-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
004077901-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_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.

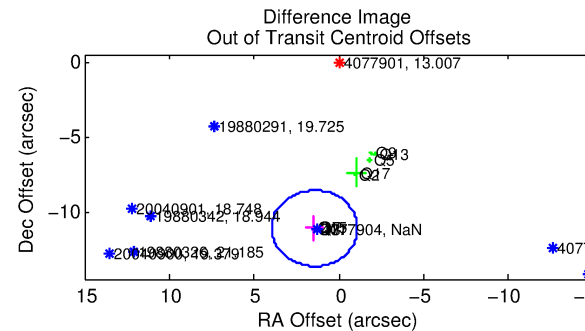
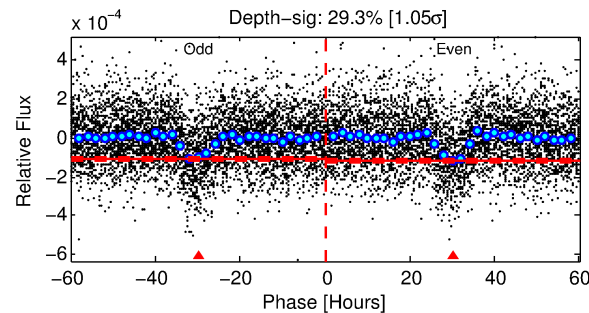
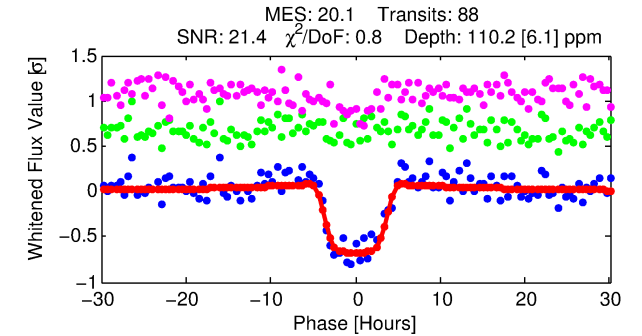
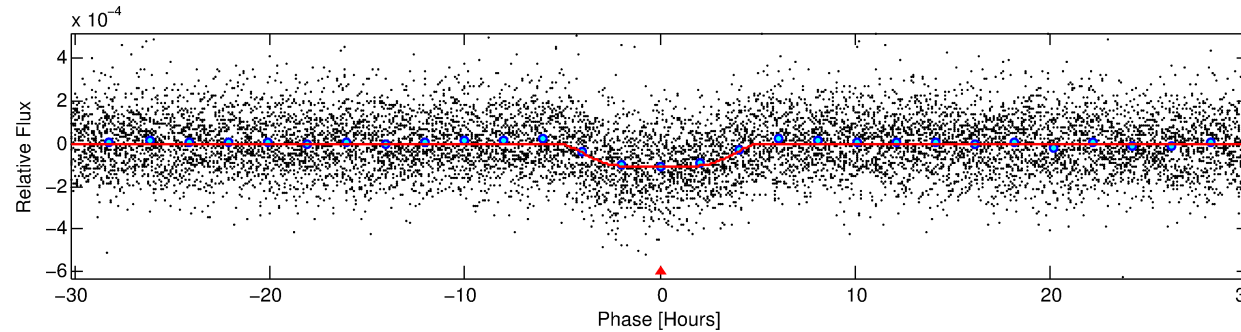
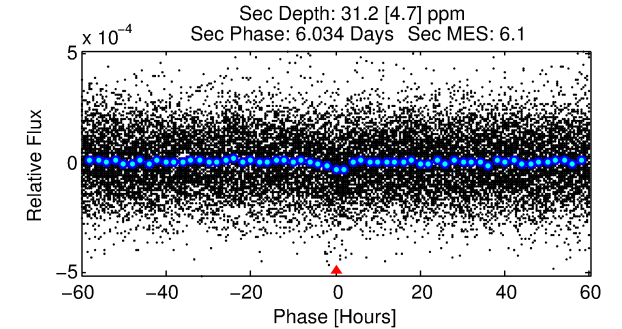
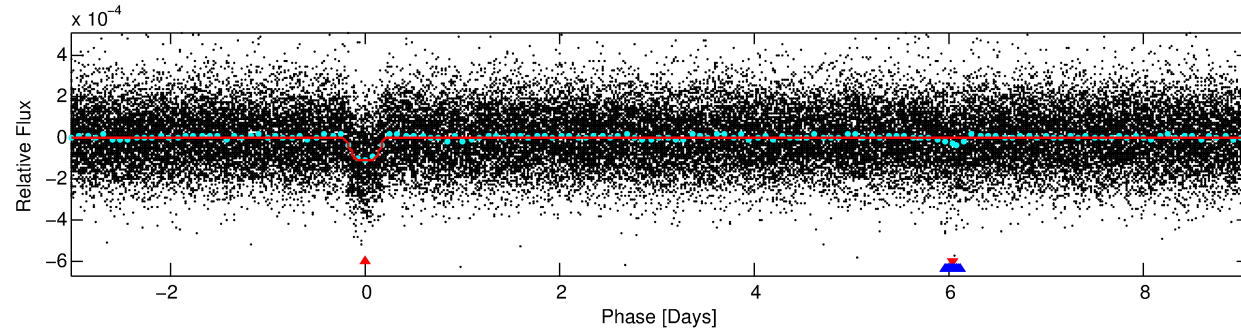
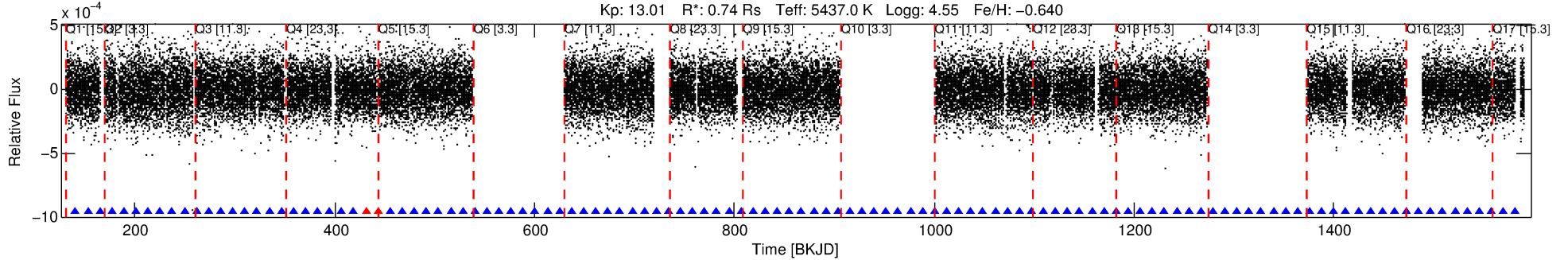
Ephemeris Match Information For 004077901-01

No Significant Match Found

DV One-Page Summary

KIC: 4077901 Candidate: 1 of 2 Period: 12.110 d
KOI: K02239.01 Corr: 0.992

Kp: 13.01 R*: 0.74 Rs Teff: 5437.0 K Logg: 4.55 Fe/H: -0.640



DV Fit Results:

Period = 12.10974 [0.00014] d
Epoch = 140.7506 [0.0095] BKJD
Rp/R* = 0.0133 [0.0005]
a/R* = 2.55 [0.22]
b = 0.98 [0.00]
Seff = 50.81 [9.92]
Teq = 681 [33] K
Rp = 1.07 [0.14] Re
a = 0.0917 [0.0096] AU
Ag = 126.04 [28.88] [4.33σ]
Teff = 3527 [183] K [15.30σ]

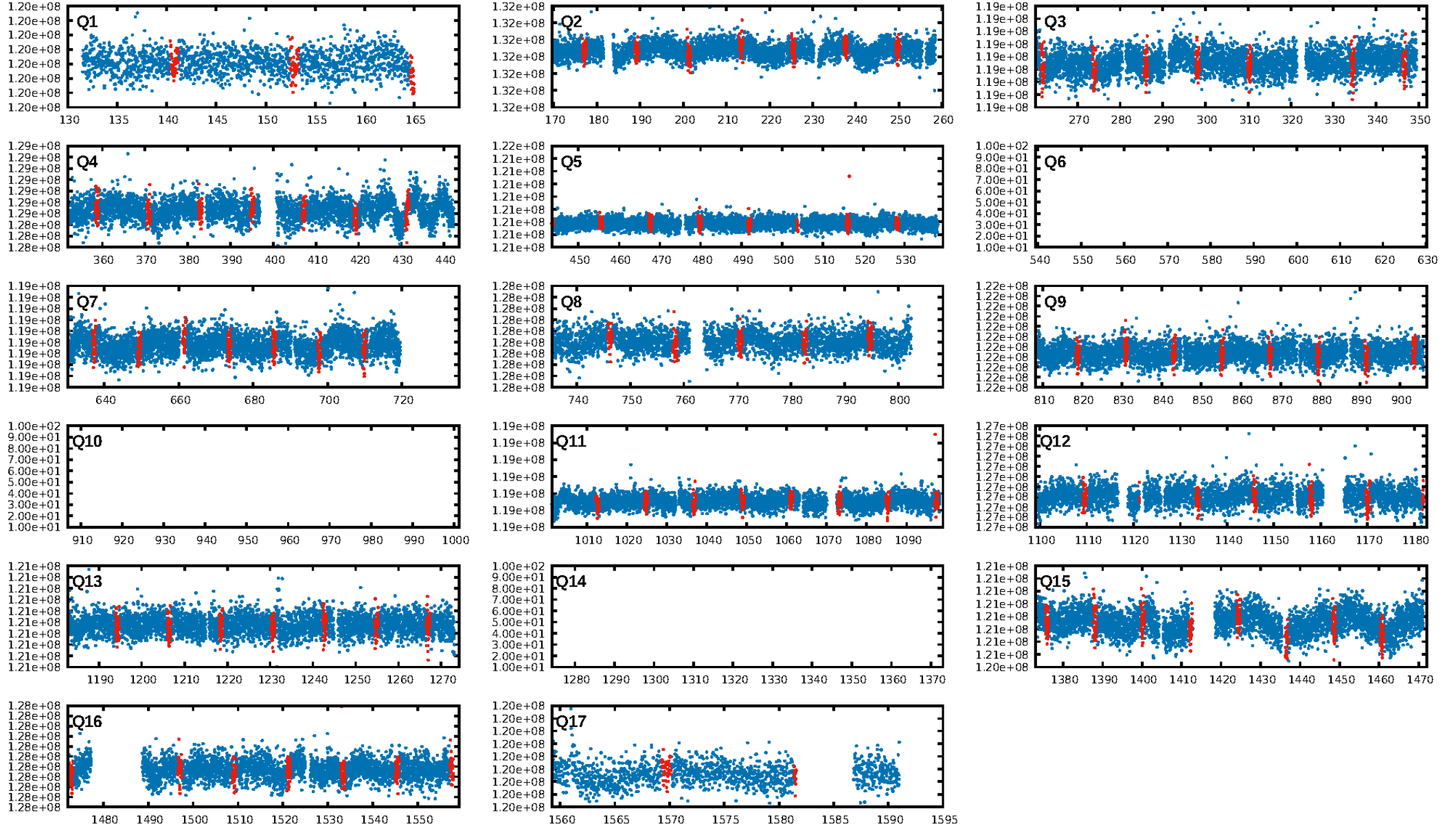
DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 8.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.54e-82
RollingBand-fgt: 0.98 [82/84]
GhostDiagnostic-chr: -0.4027
Centroid-sig: 0.0%
Centroid-so: 44.703 arcsec [41.90σ]
OotOffset-rm: 11.211 arcsec [13.30σ]
KicOffset-rm: 11.179 arcsec [13.06σ]
OotOffset-st: 1/4/0/4 [9]
KicOffset-st: 1/4/0/4 [9]
DiffImageQuality-fgm: 0.89 [8/9]
DiffImageOverlap-fno: 1.00 [14/14]

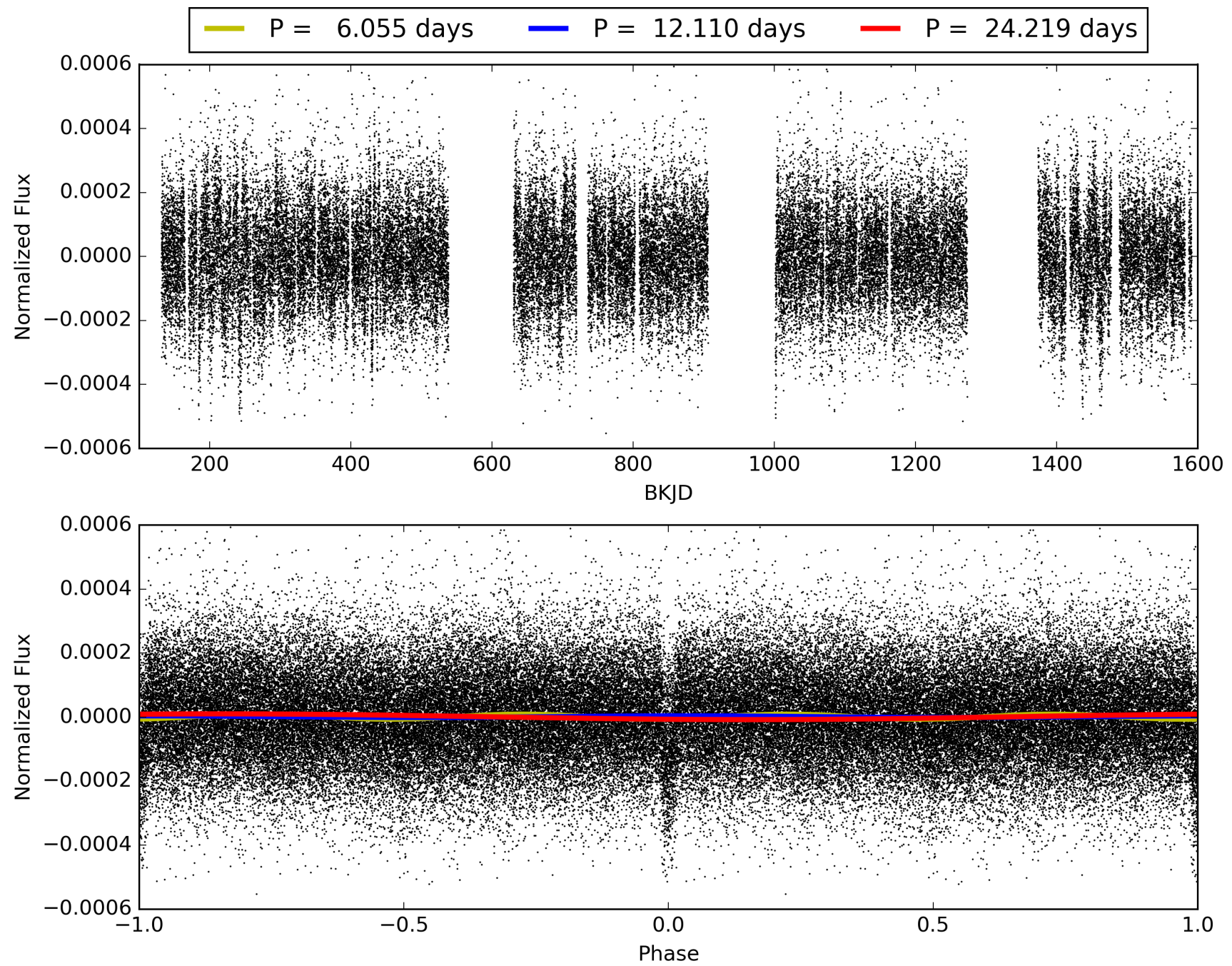
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 01:13:21 Z

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

TCE 004077901-01, PDC Light Curves

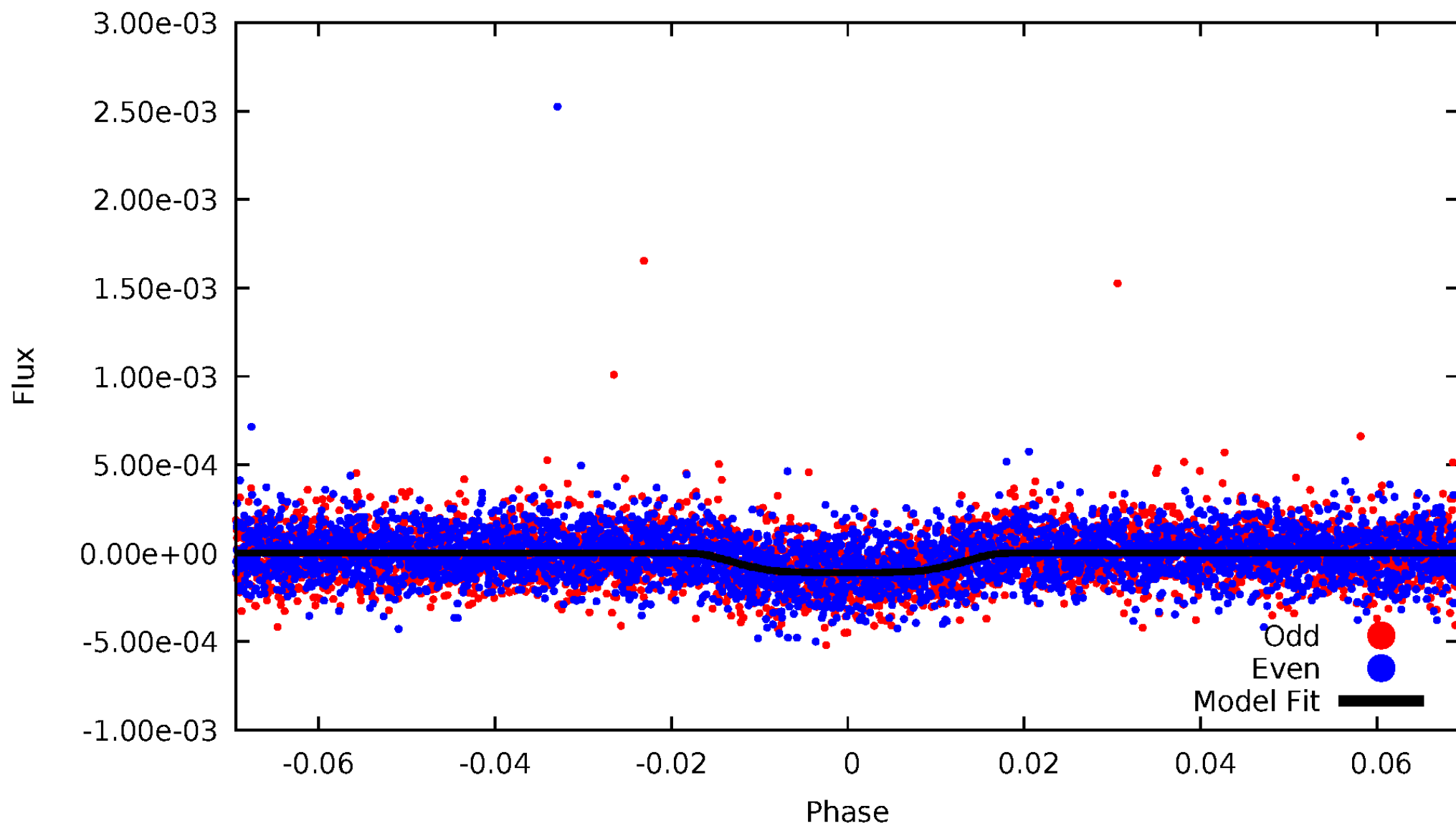


TCE 004077901-01



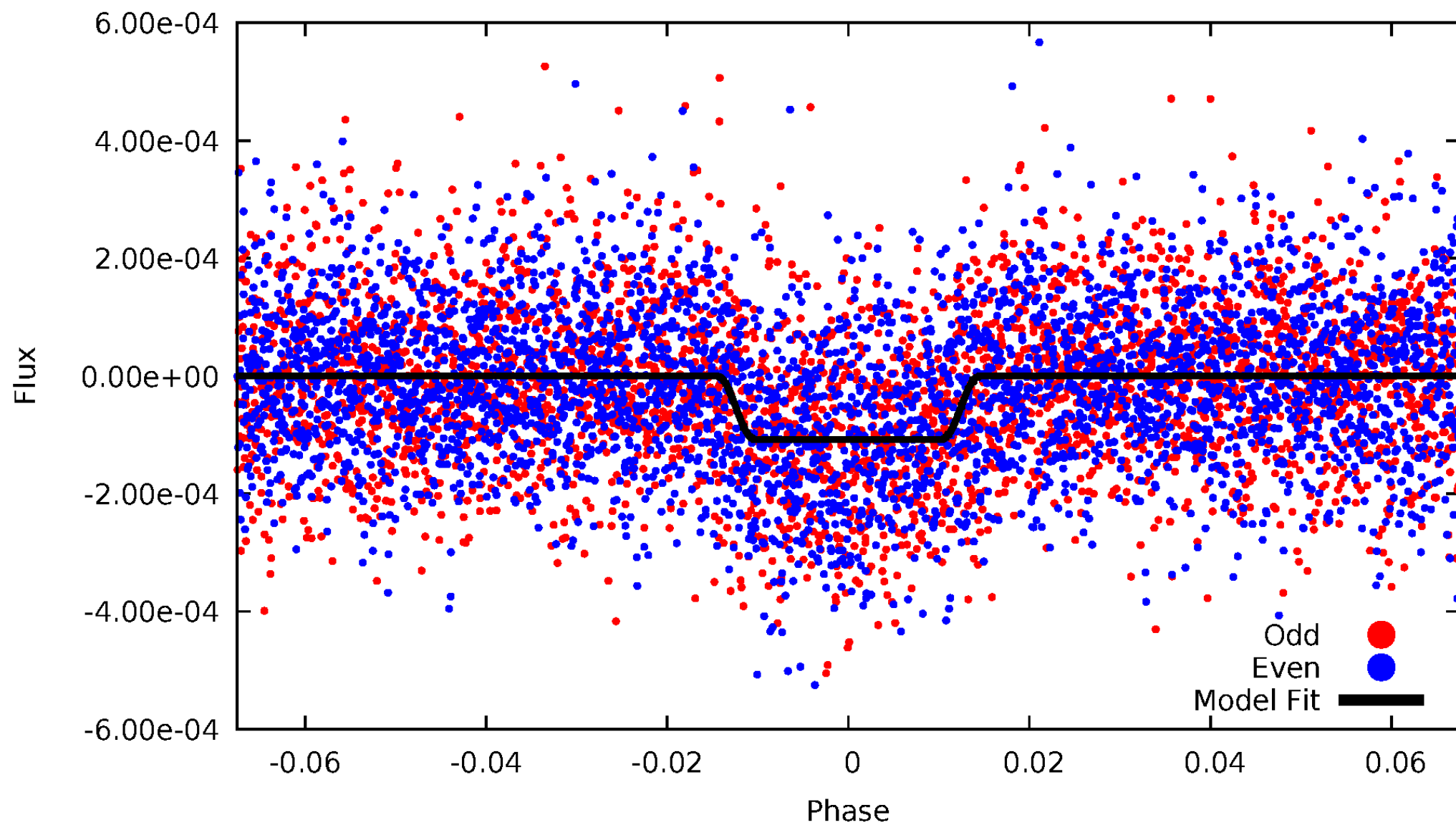
DV Odd/Even

TCE 004077901-01

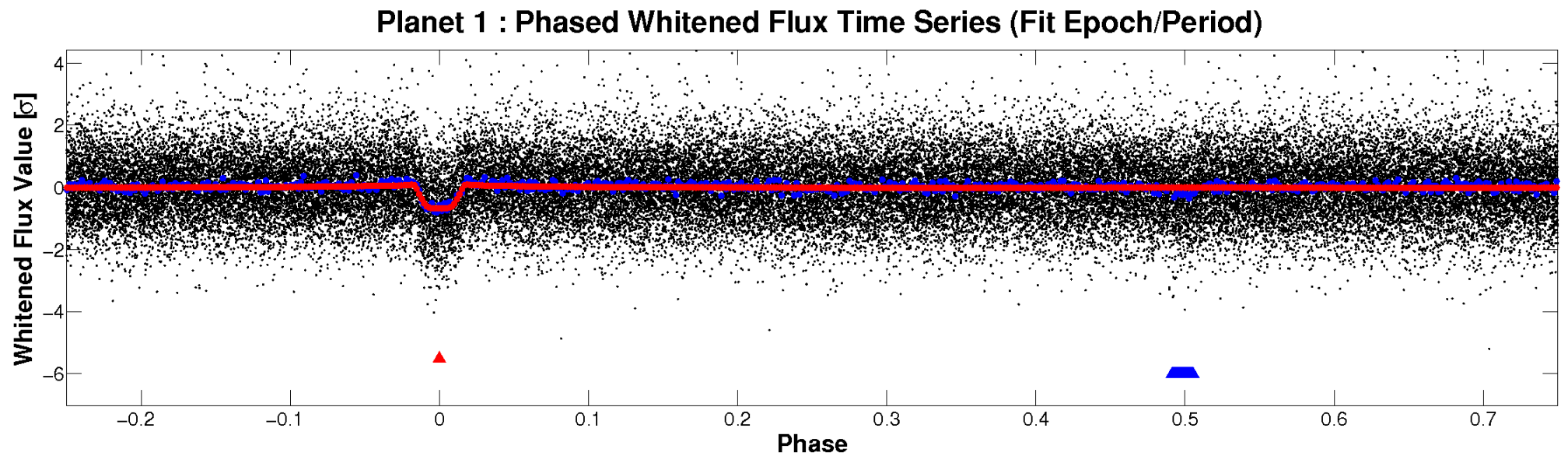
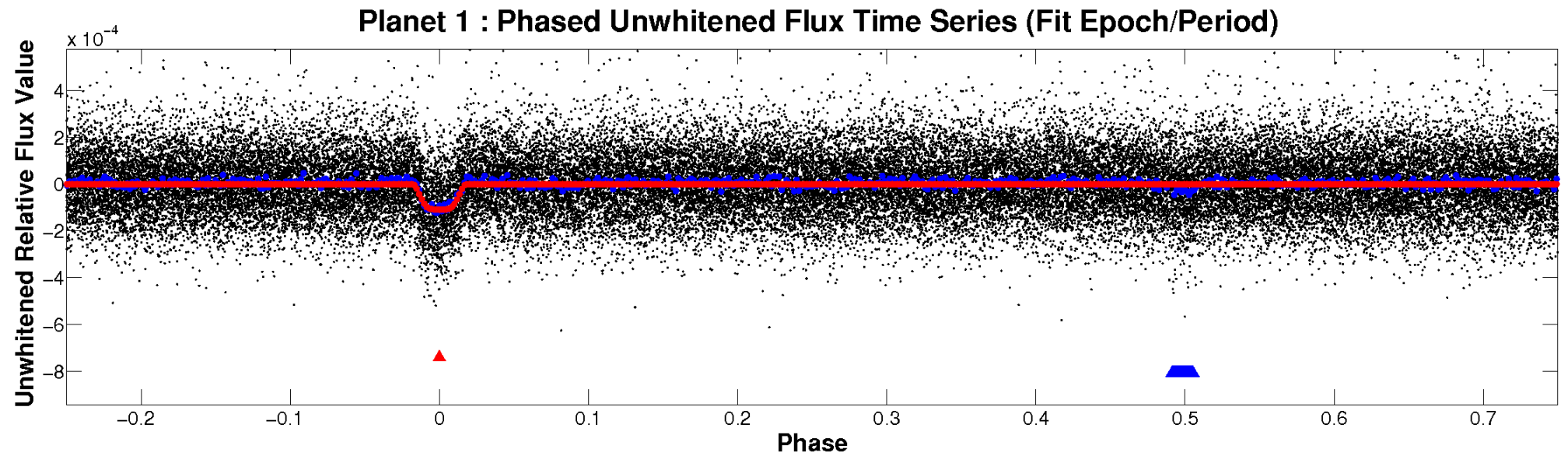


ALT Odd/Even

TCE 004077901-01

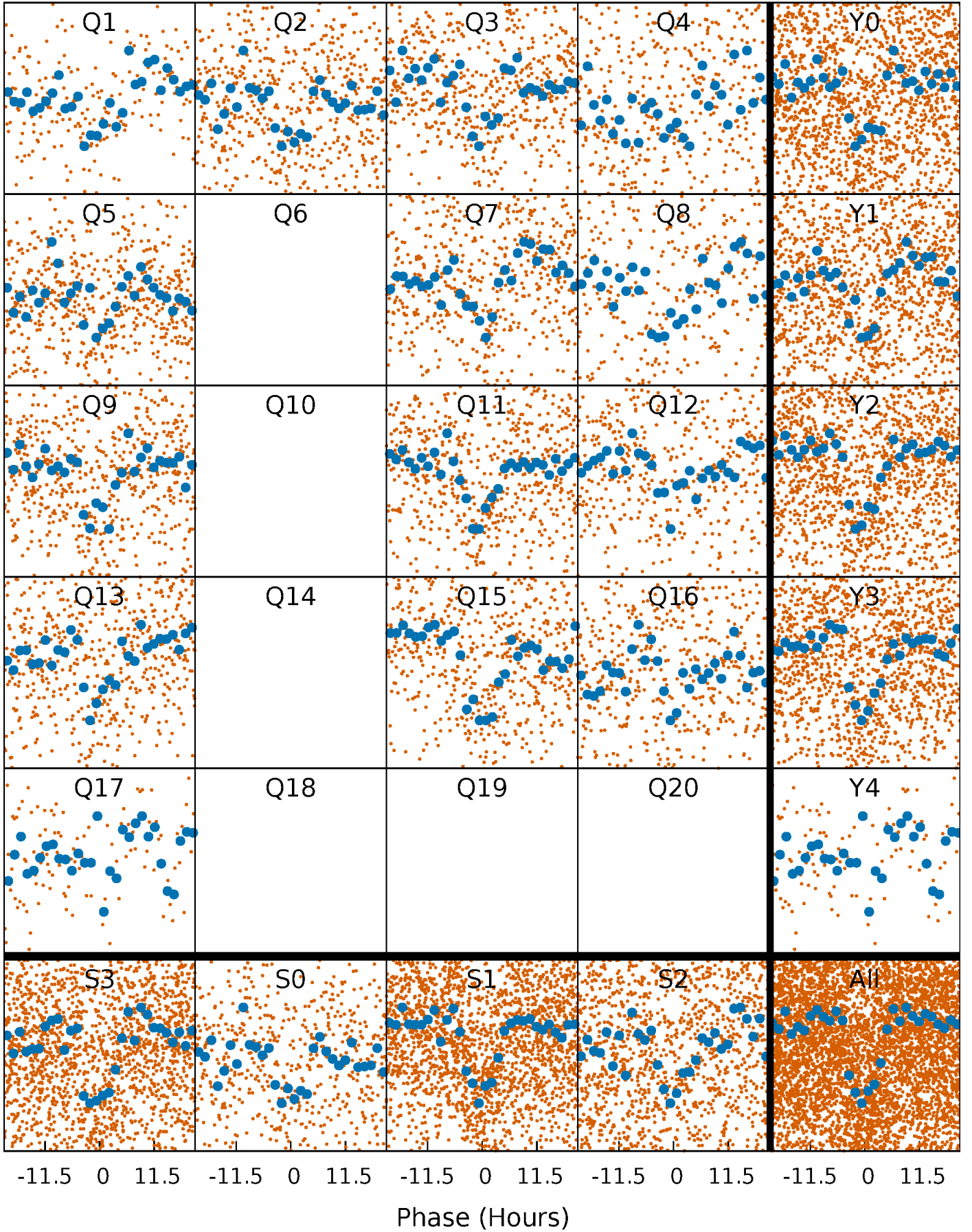


Non-Whitened Vs. Whitened Light Curve



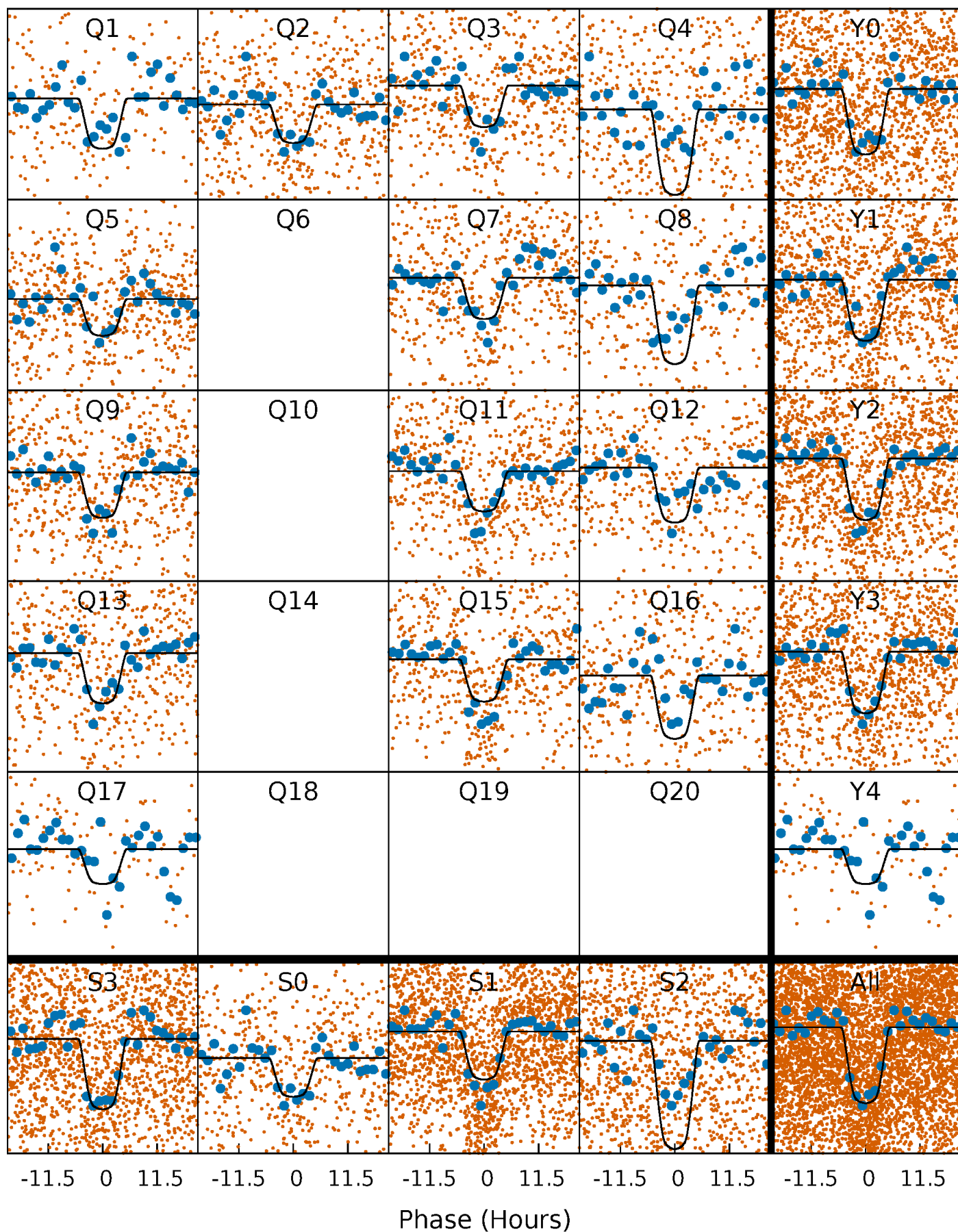
PDC Quarter-Phased Transit Curves

TCE 004077901-01 $P = 12.109738$ Days $T_0 = 140.750564$ (BKJD)



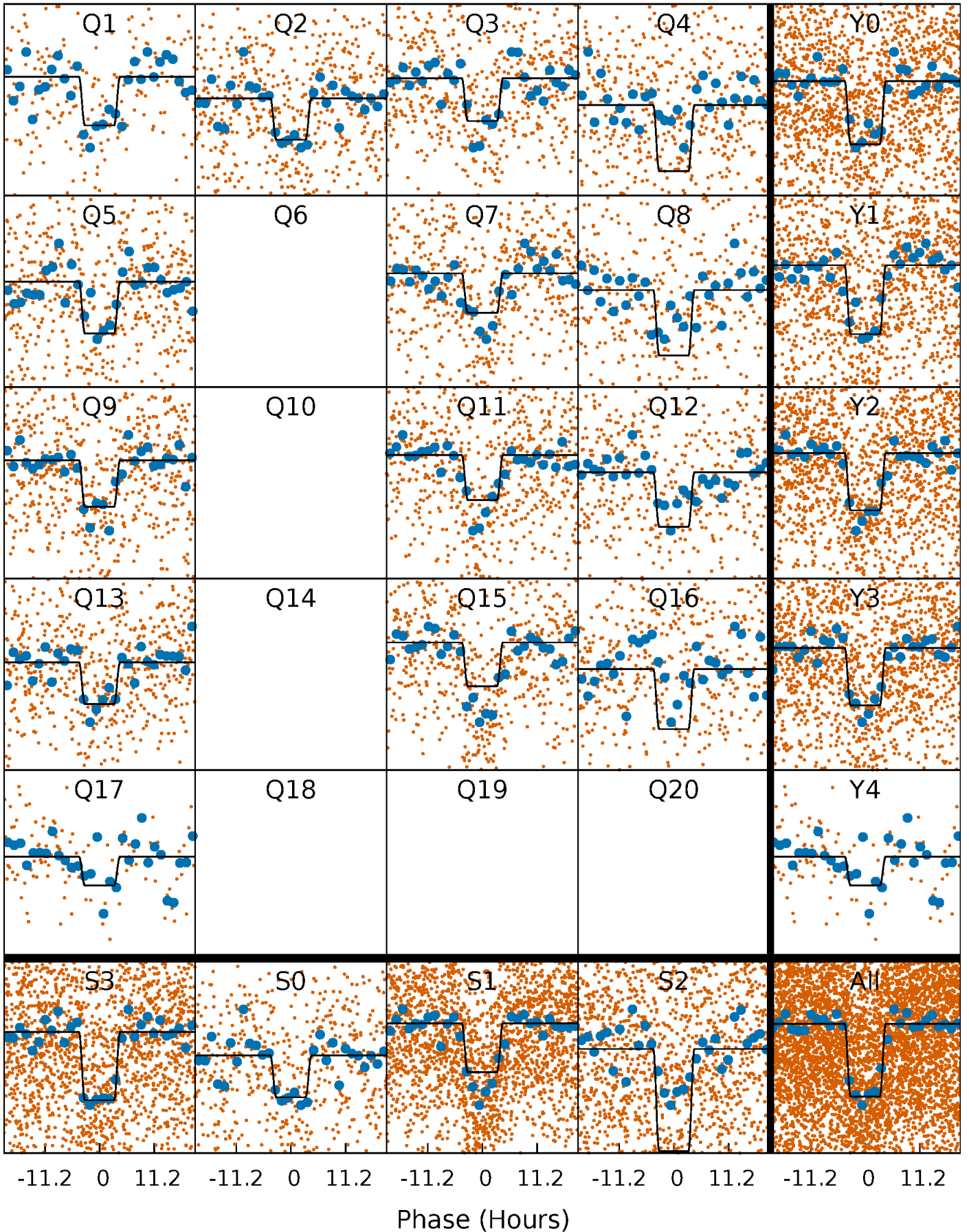
DV Quarter-Phased Transit Curves

TCE 004077901-01 P= 12.109738 Days $T_0=140.750564$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

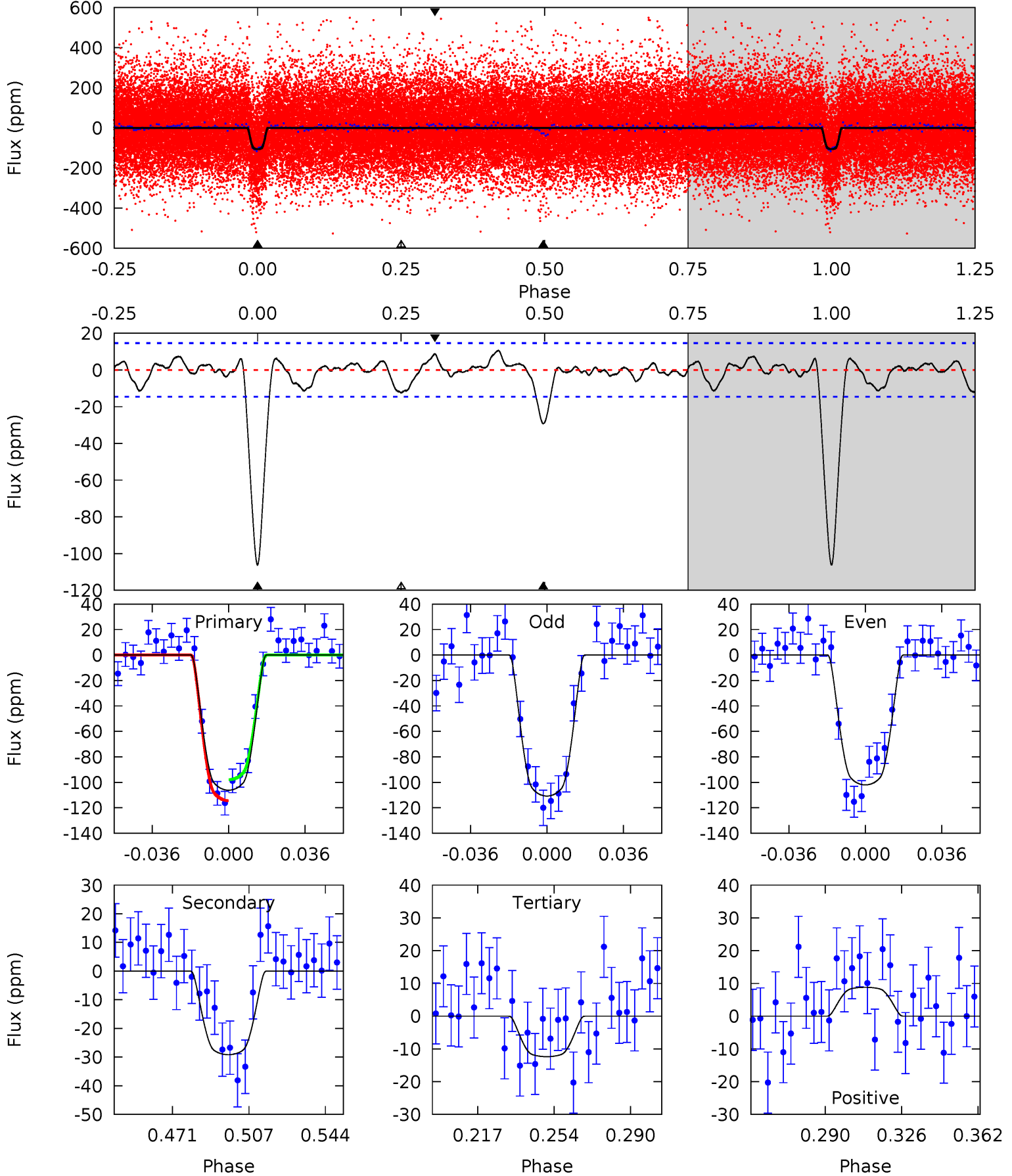
TCE 004077901-01 P= 12.109809 Days $T_0=140.743700$ (BKJD)



DV Model-Shift Uniqueness Test

004077901-01, P = 12.109738 Days, E = 128.640826 Days

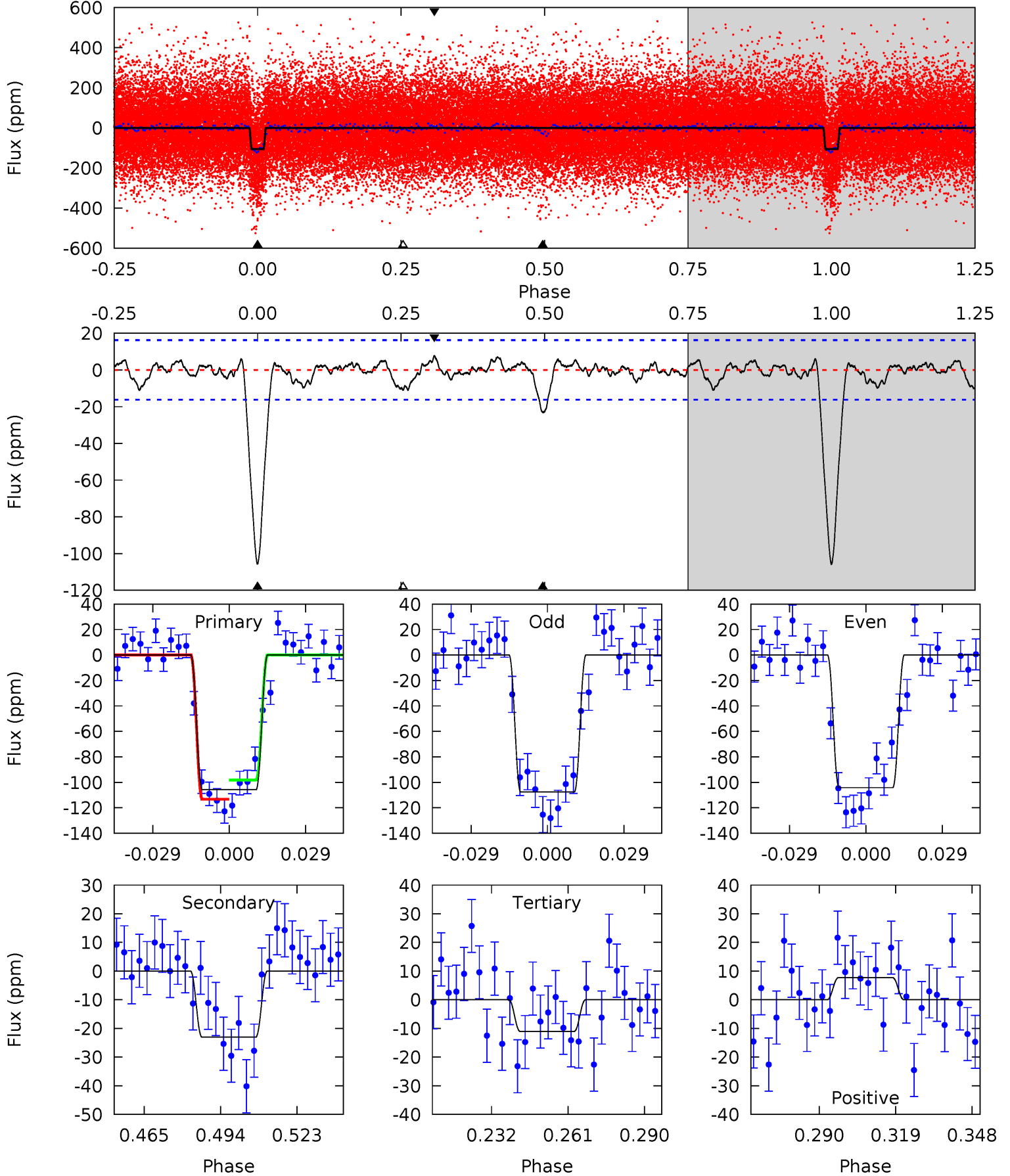
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.7	9.52	4.04	2.87	4.77	2.09	1.42	30.6	31.8	5.48	6.65	1.43	1.00	0.09	2.71



Alt Model-Shift Uniqueness Test

004077901-01, P = 12.109809 Days, E = 128.633891 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.4	6.84	3.29	2.30	4.82	2.18	1.08	28.1	29.1	3.56	4.54	0.49	0.99	0.07	2.24



Stellar Parameters For KIC 004077901

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5437^{+163}_{-163}	$4.547^{+0.085}_{-0.076}$	$-0.640^{+0.350}_{-0.300}$	$0.739^{+0.091}_{-0.082}$	$0.701^{+0.086}_{-0.040}$	$2.447^{+0.865}_{-0.585}$
	+3%/-3%	+2%/-2%	+55%/-47%	+12%/-11%	+12%/-6%	+35%/-24%
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 004077901-01 / KOI 2239.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-29 ± 3	$1.08^{+0.08}_{-0.08}$	951^{+43}_{-36}	3820^{+126}_{-116}	117^{+22}_{-19}
Alt.	-23 ± 3	$0.84^{+0.07}_{-0.07}$	948^{+41}_{-42}	3988^{+163}_{-154}	153^{+38}_{-32}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

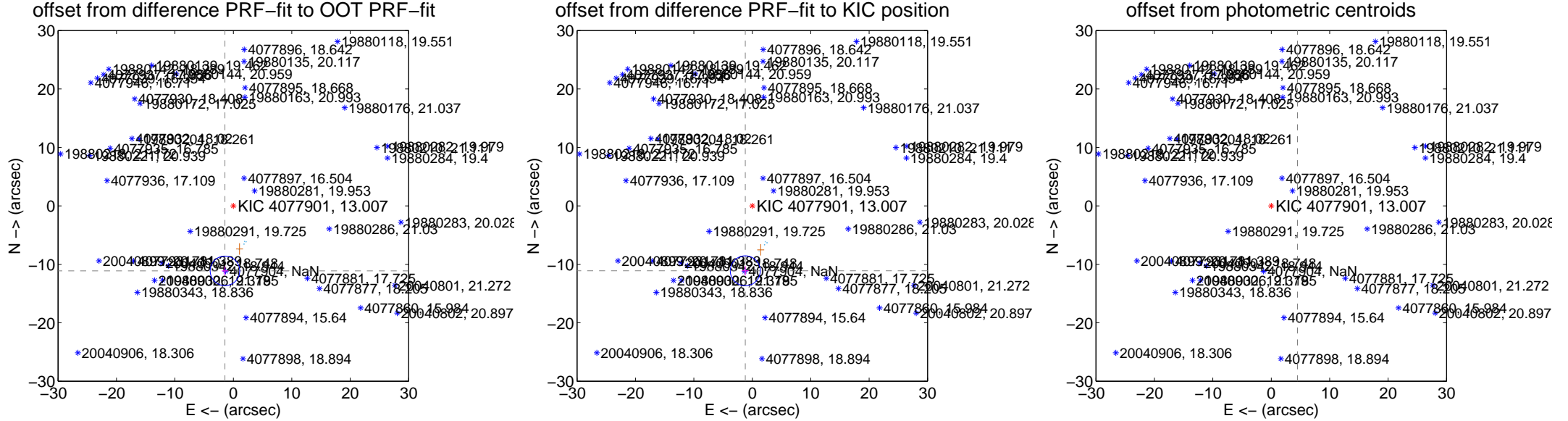
A_{obs} = Observed Albedo (Assuming $T=0$)

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

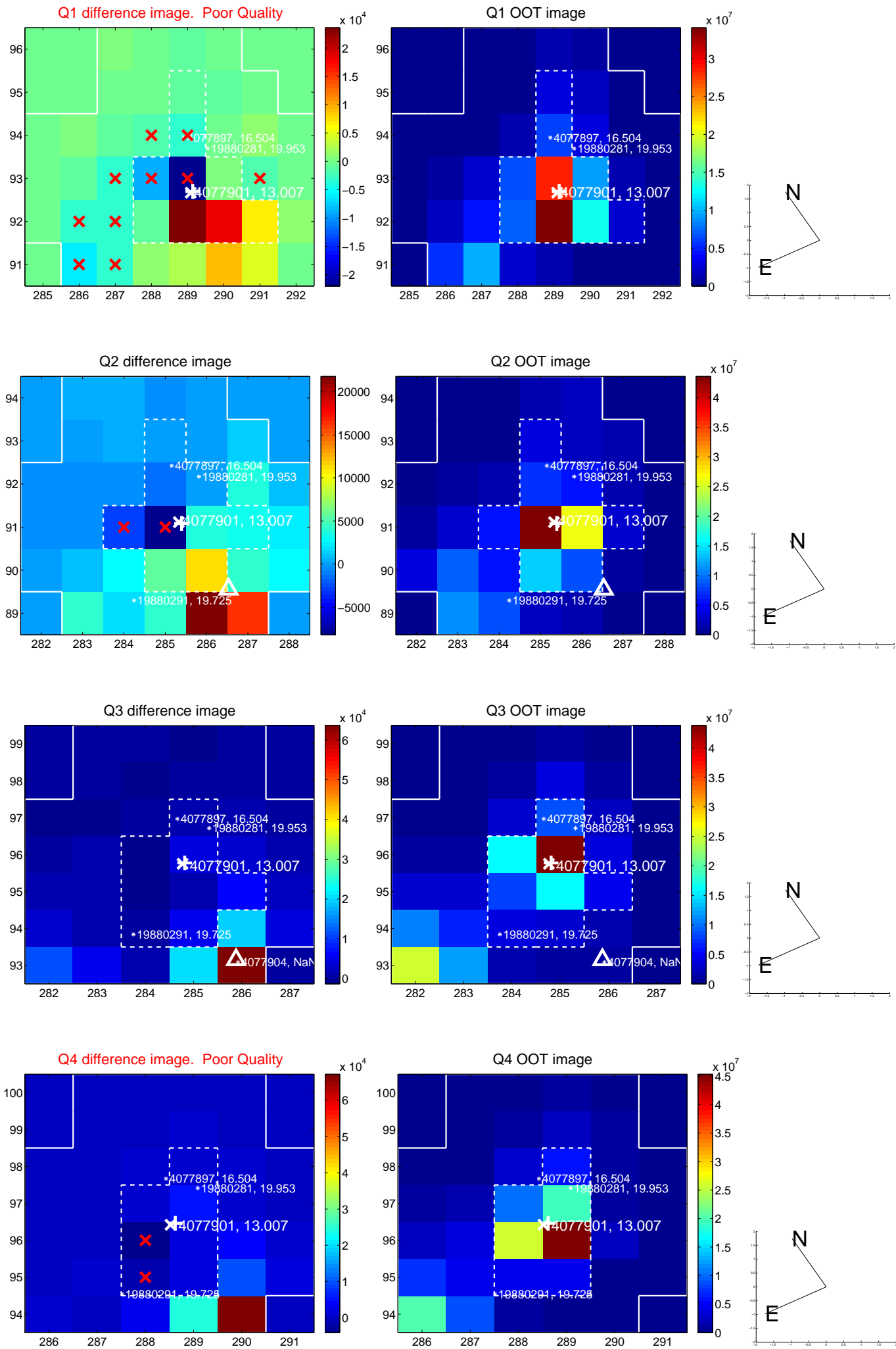
Supplemental centroid analysis for 004077901-01. Kepler magnitude: 13.01. Transit SNR 21.44
 There are 8 quarters with good PRF difference image offsets
 The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	11.211 \pm 0.843	13.30	1.435 \pm 0.540	-11.119 \pm 0.781
PRF-fit source offset from KIC position	11.179 \pm 0.856	13.06	1.203 \pm 0.591	-11.114 \pm 0.798
photometric centroid source offset	44.70 \pm 1.07	41.90	-4.50 \pm 1.65	-44.48 \pm 1.06

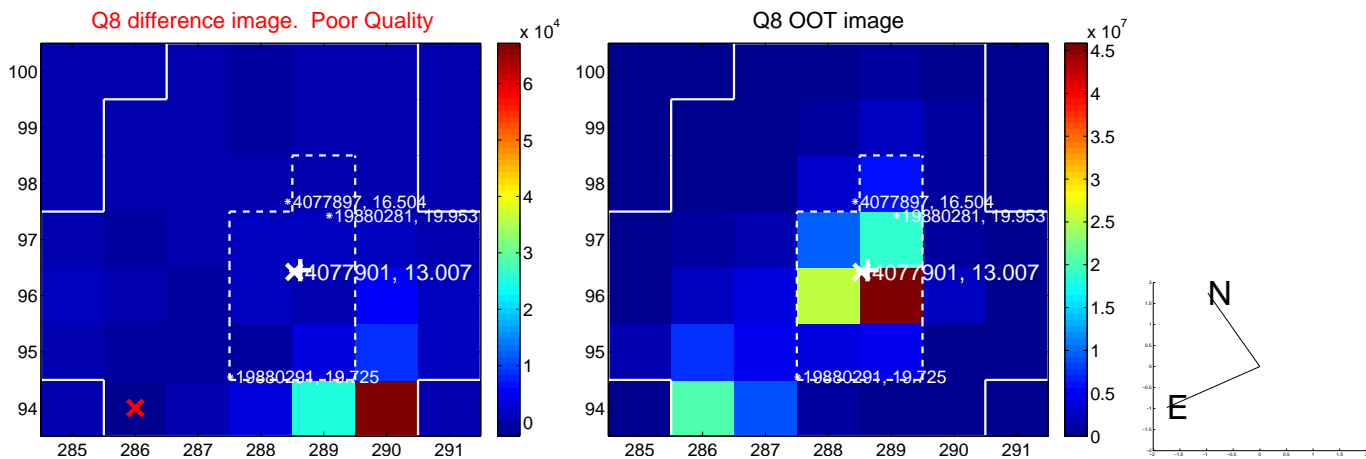
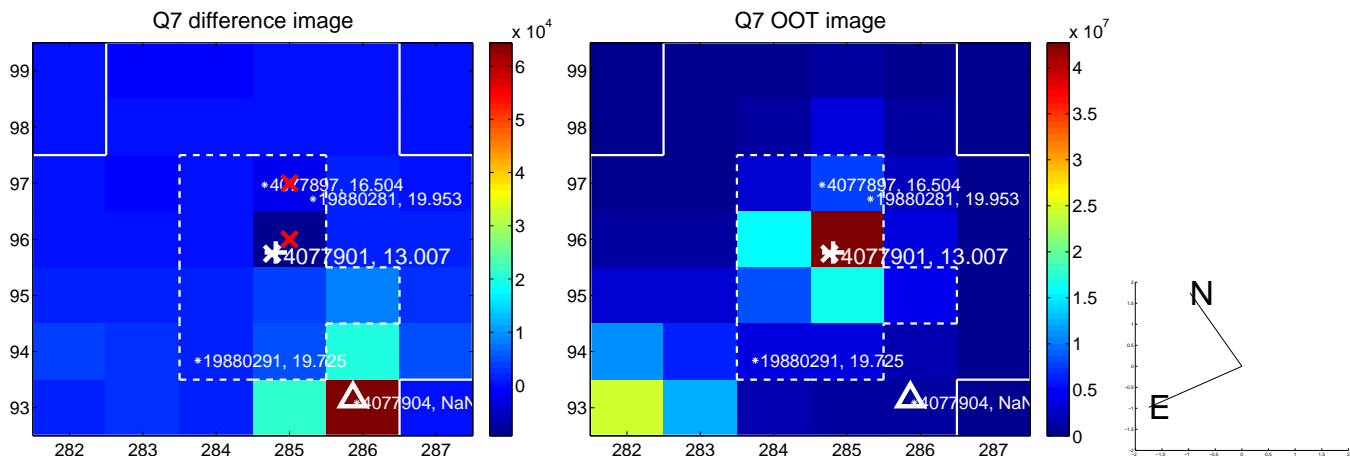
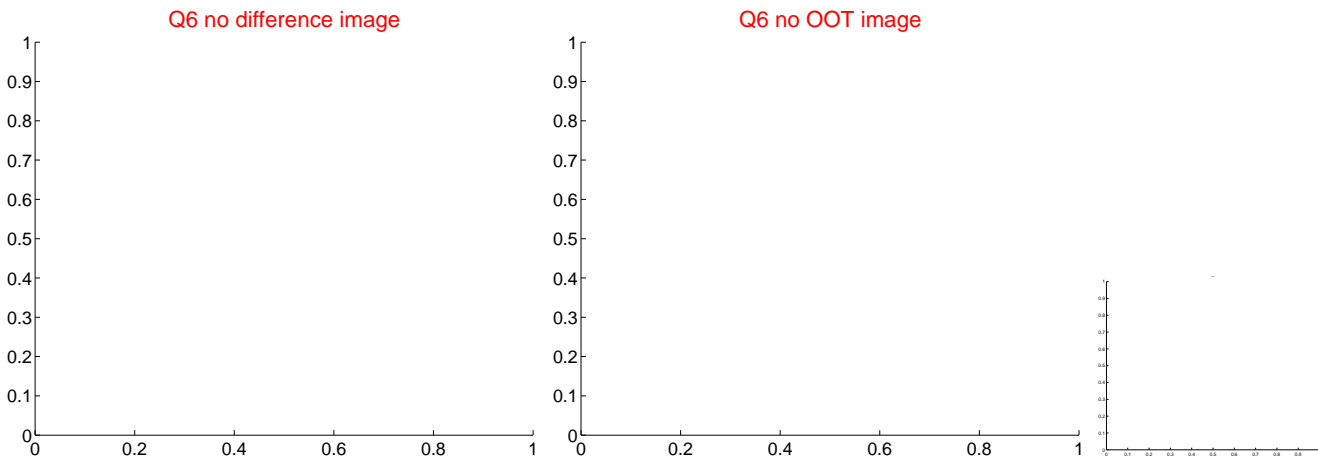
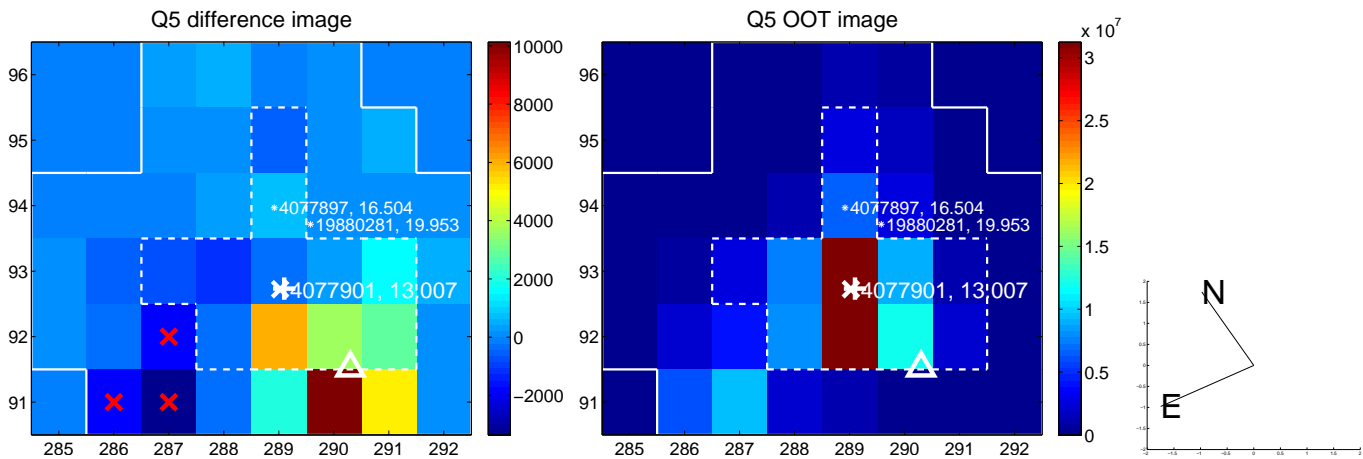


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

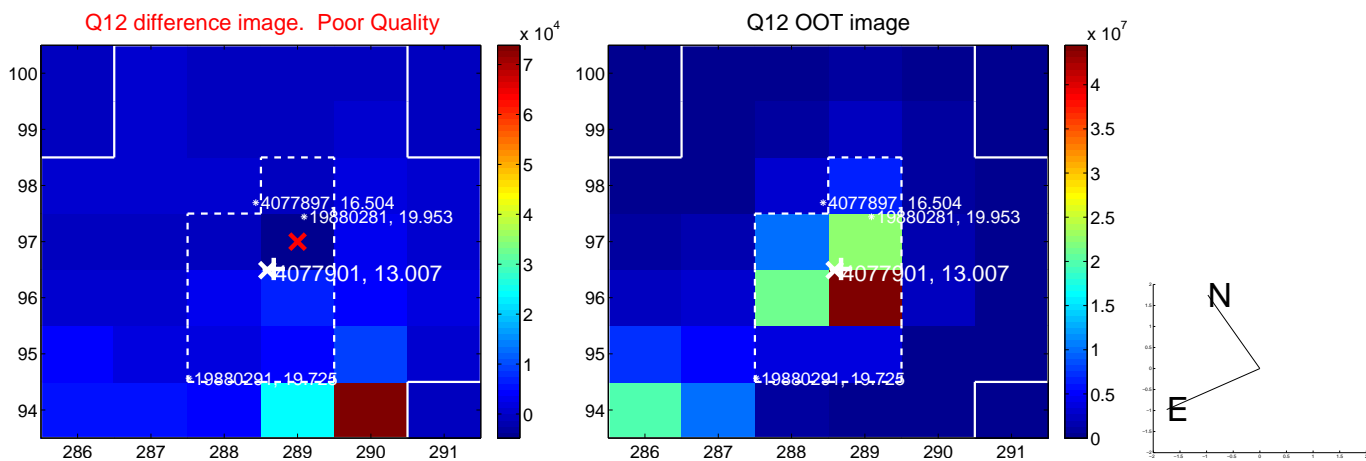
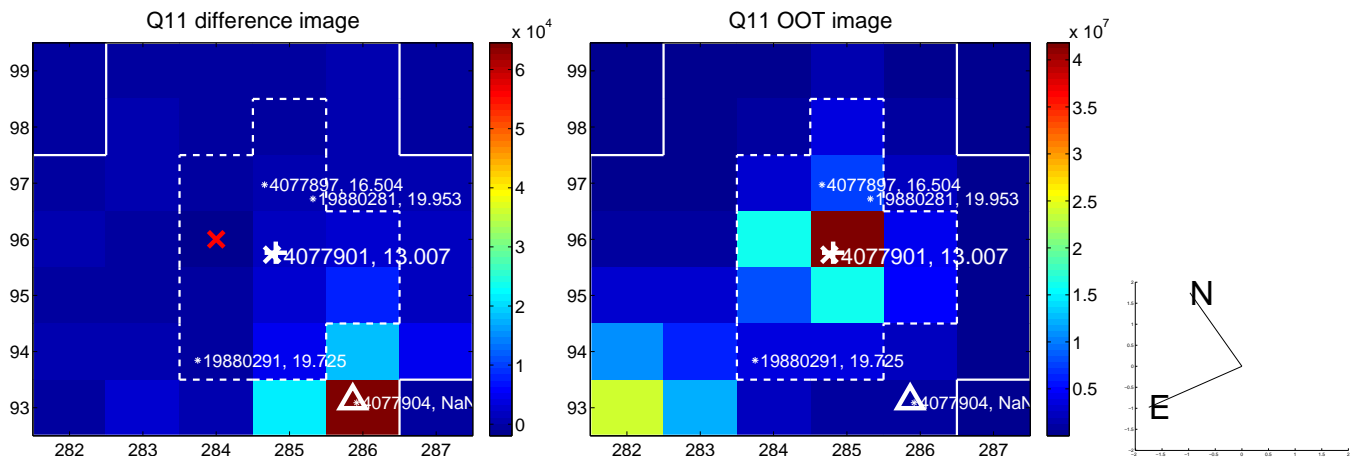
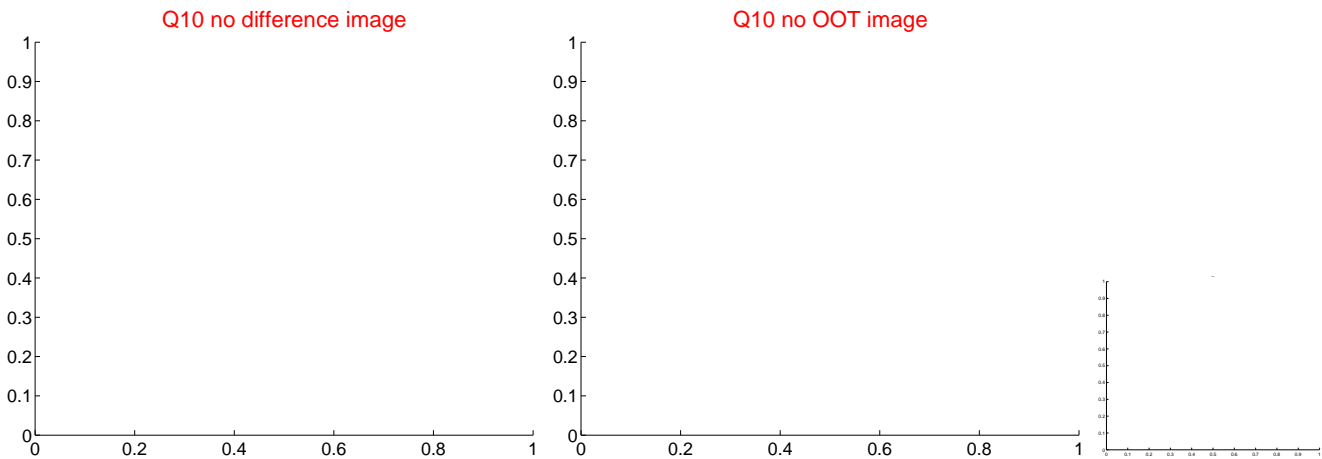
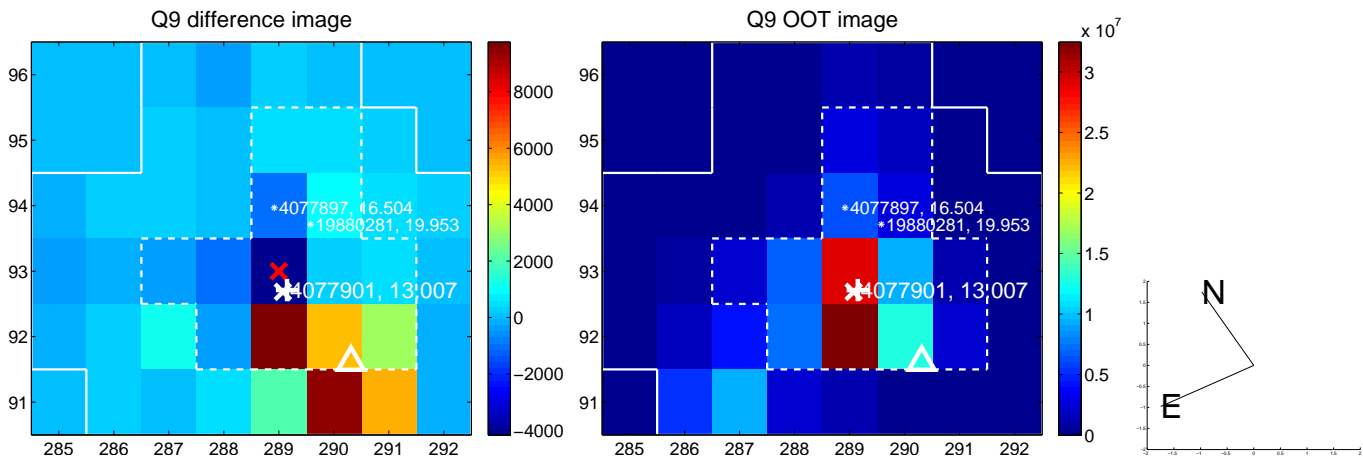
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



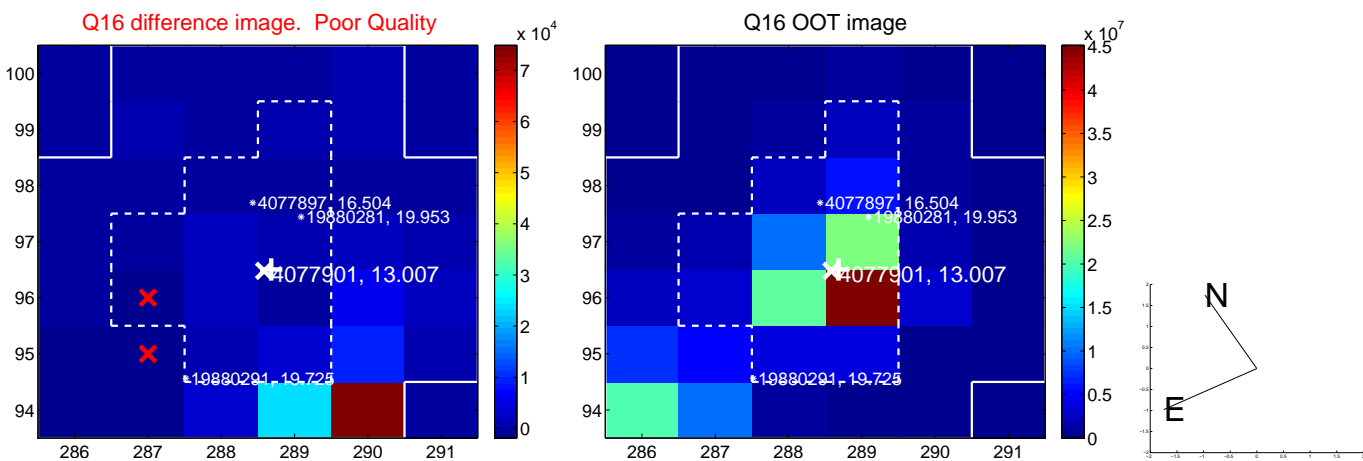
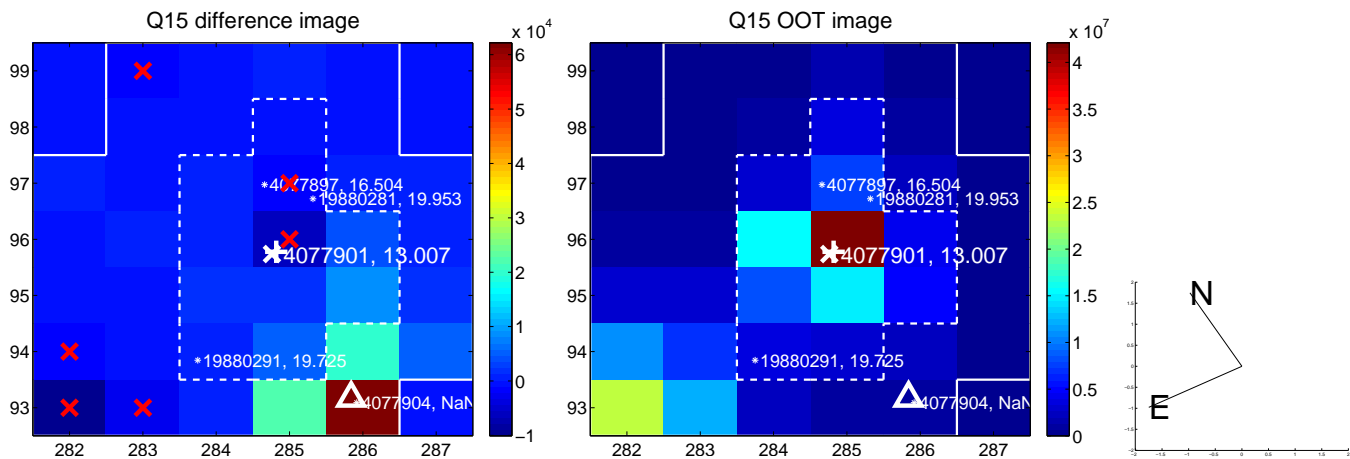
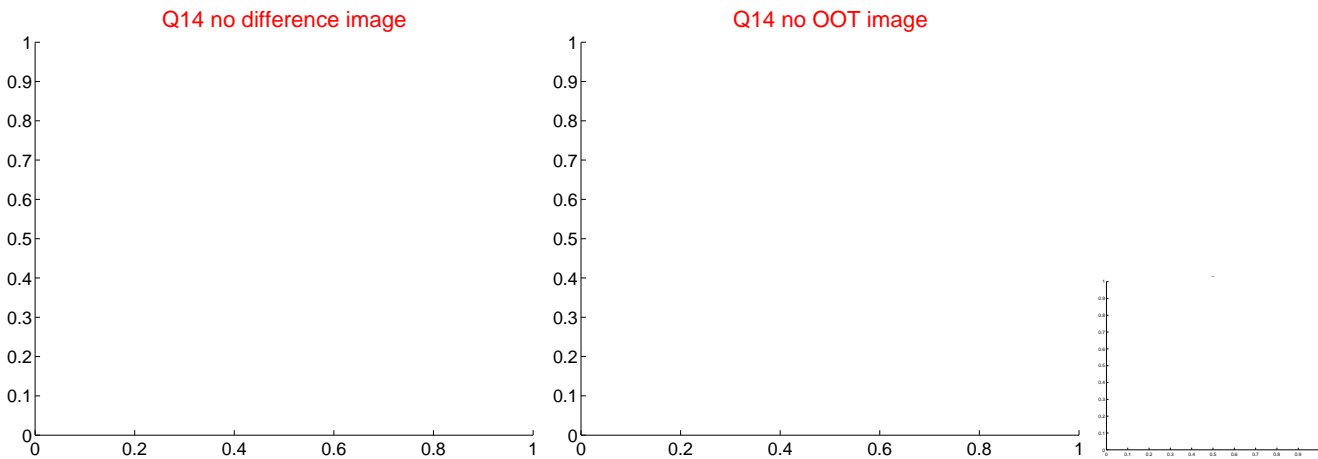
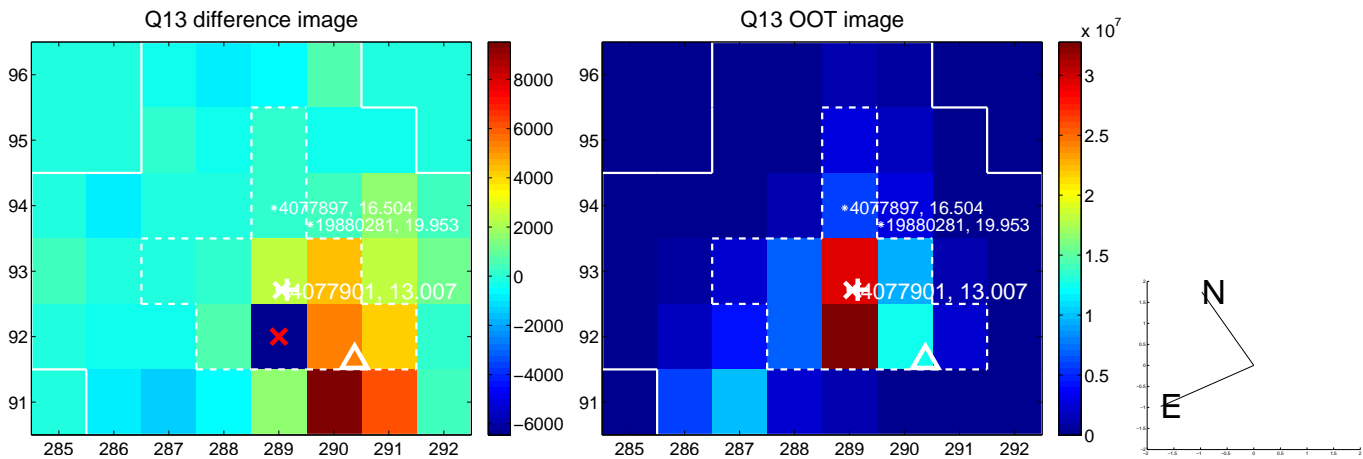
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



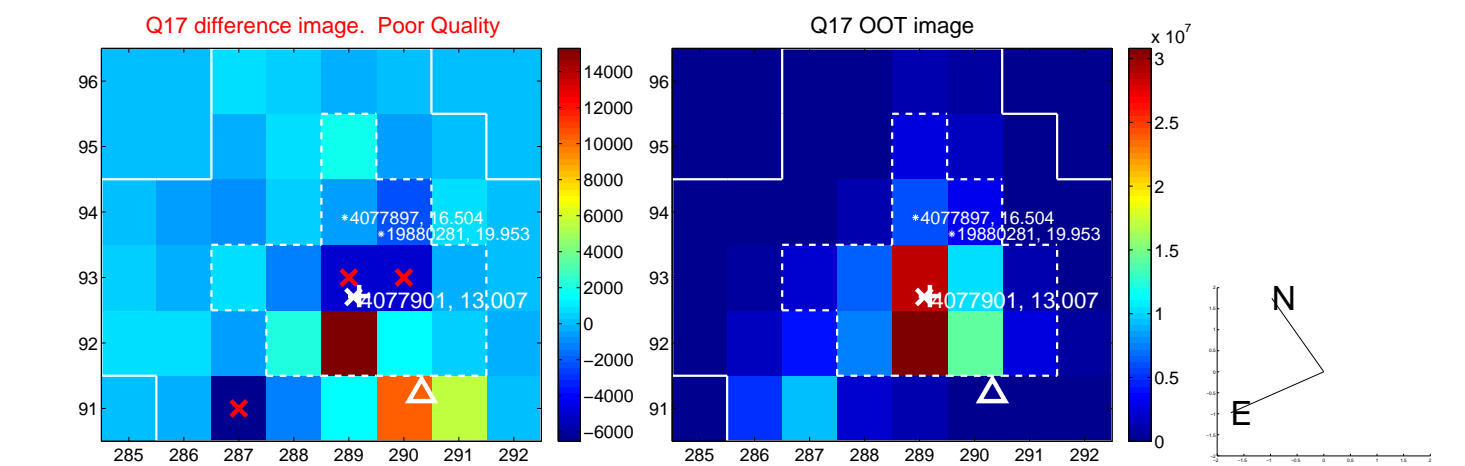
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



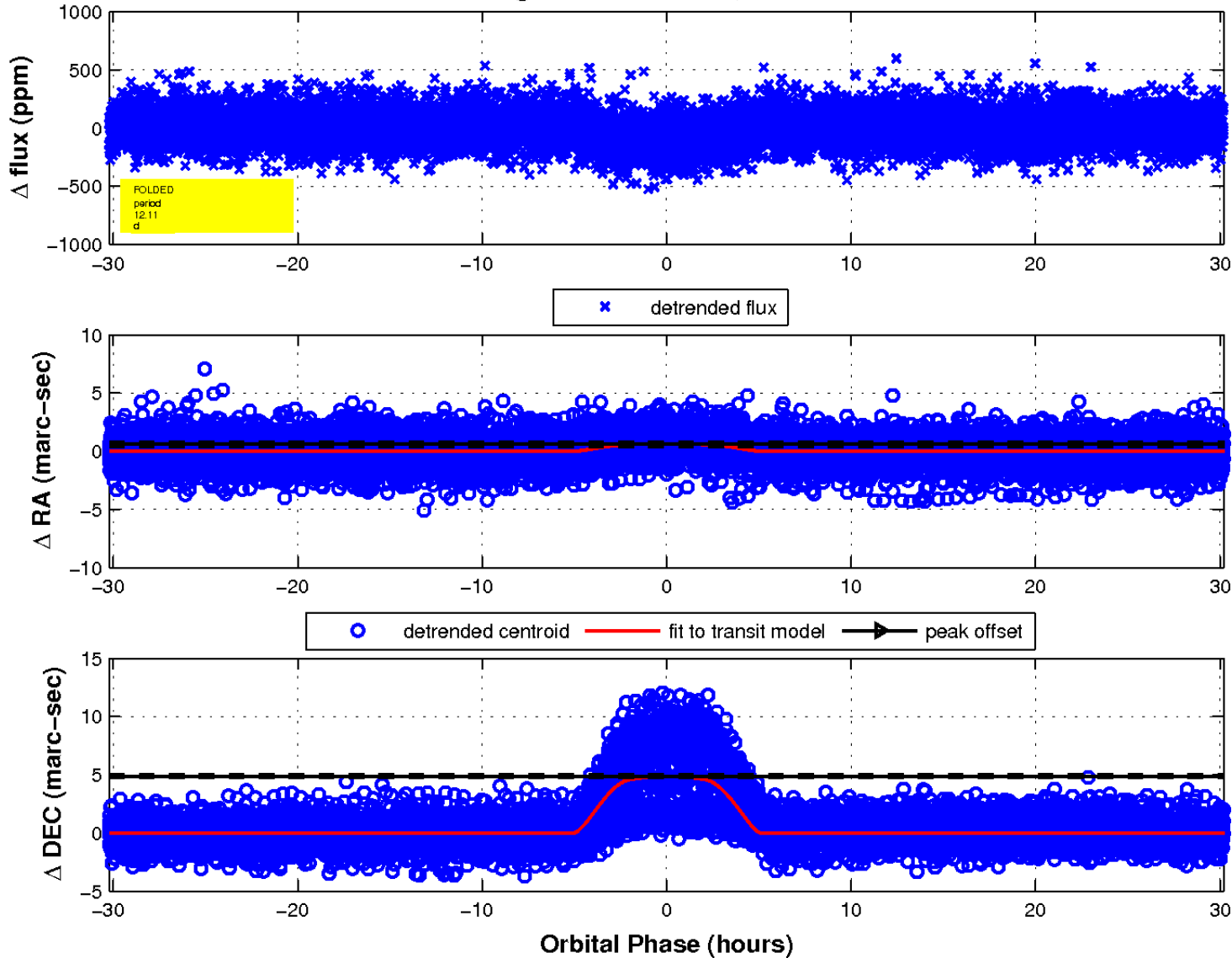
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



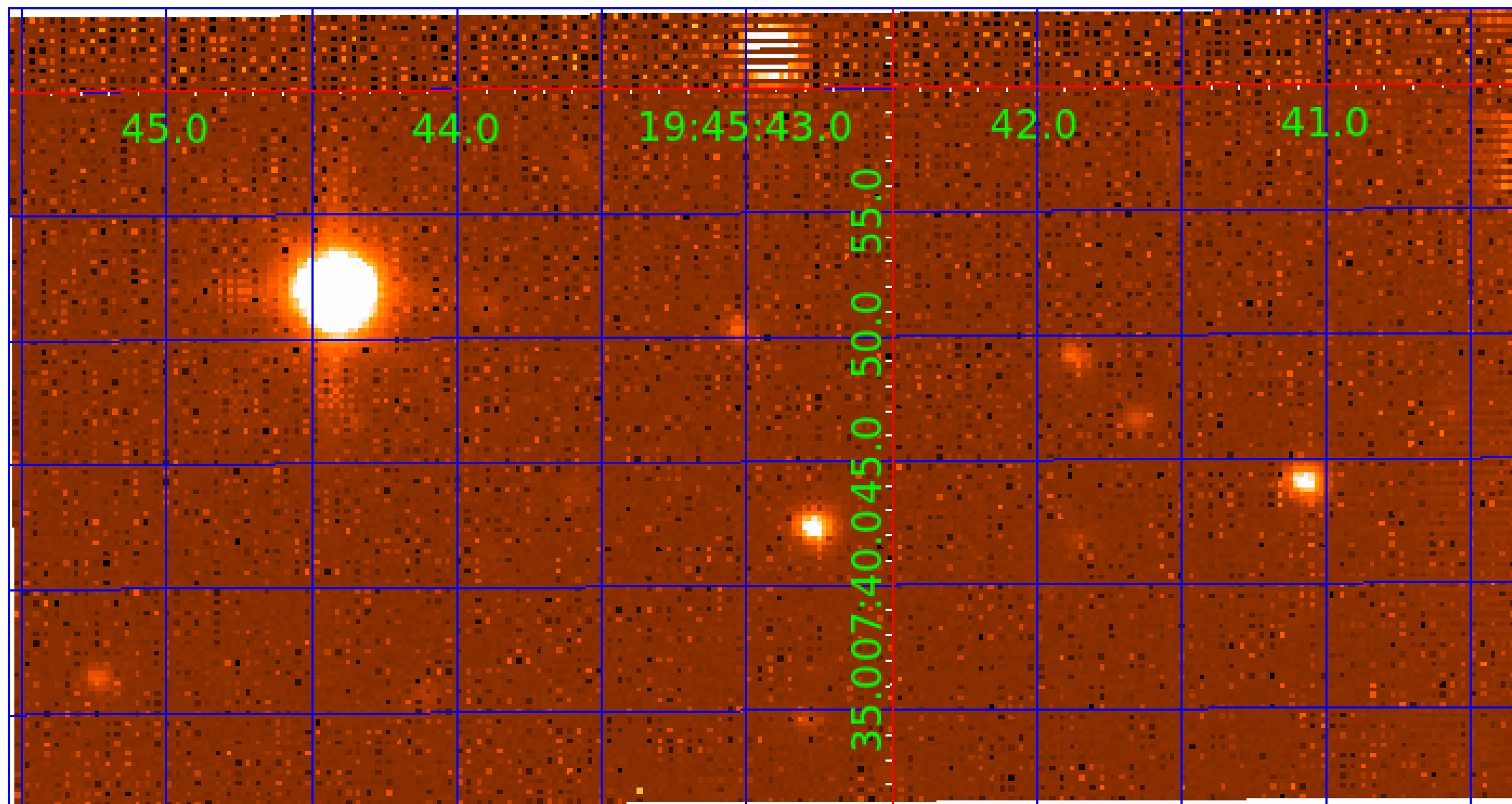
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



Right ascension

KIC 004077901

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})
004077901-01	OBS	2239.01	12.109738	140.750564	110.2	10.074	20.1	21.4	0.74	5437	1.07	50.81
004077901-02	OBS	No	12.108326	134.760468	37.9	7.475	7.3	8.0	0.74	5437	0.53	50.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004077901-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
004077901-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_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.

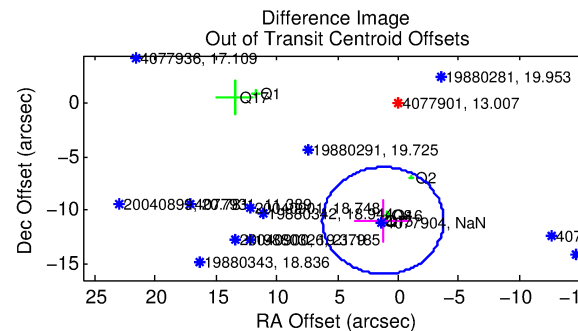
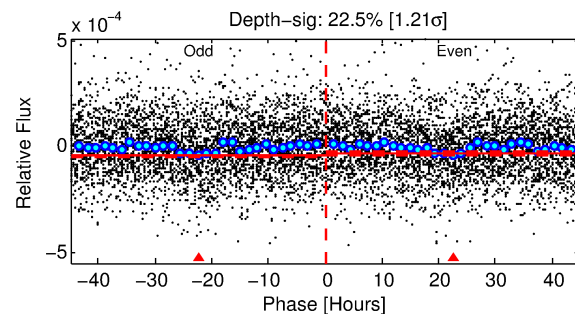
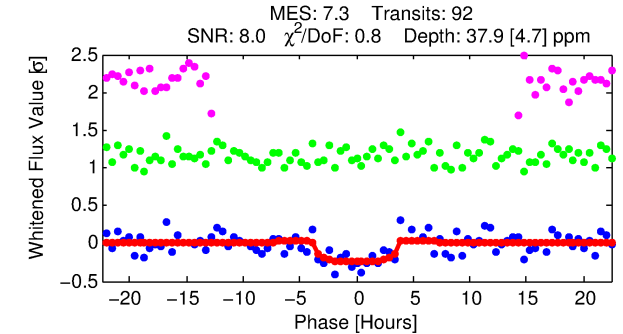
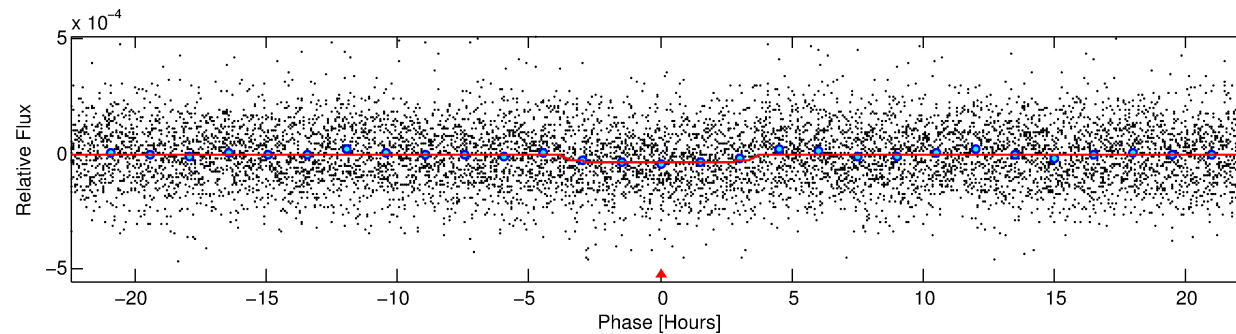
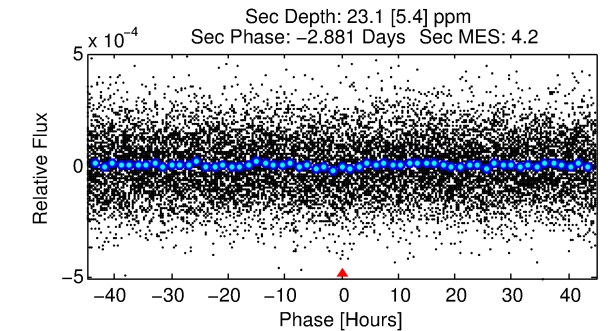
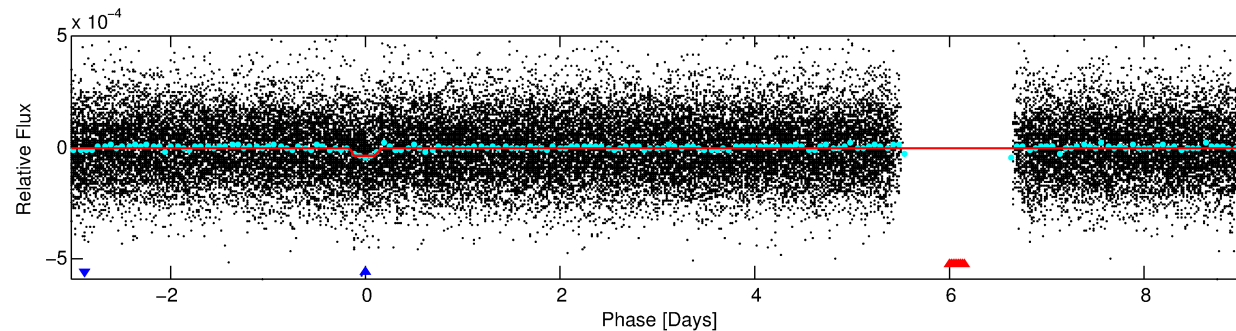
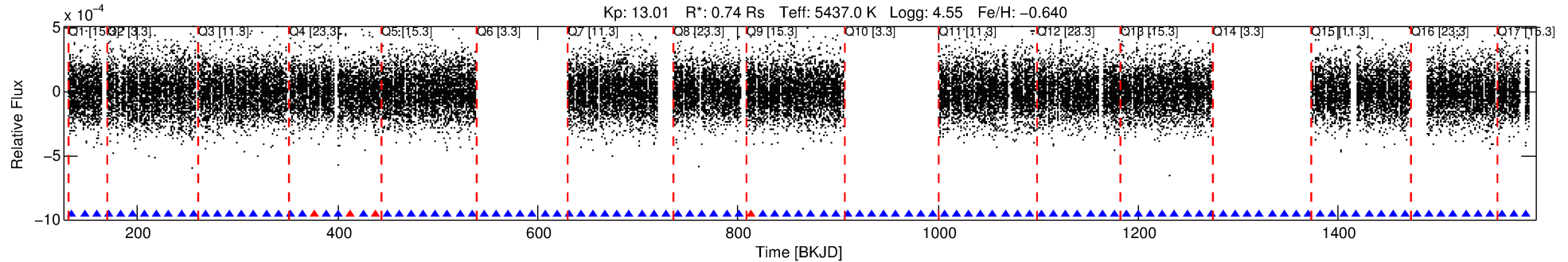
Ephemeris Match Information For 004077901-02

No Significant Match Found

DV One-Page Summary

KIC: 4077901 Candidate: 2 of 2 Period: 12.108 d
KOI: K02239 Corr: No Ephemeris Match

Kp: 13.01 R*: 0.74 Rs Teff: 5437.0 K Logg: 4.55 Fe/H: -0.640



DV Fit Results:

Period = 12.10833 [0.00022] d
Epoch = 134.7605 [0.0144] BKJD
Rp/R* = 0.0065 [0.0034]
a/R* = 6.41 [15.22]
b = 0.87 [0.71]
Seff = 50.81 [9.92]
Teq = 681 [33] K
Rp = 0.53 [0.28] Re
a = 0.0917 [0.0096] AU
Ag = 387.12 [417.13] [0.93σ]
Teffp = 4669 [1253] K [3.18σ]

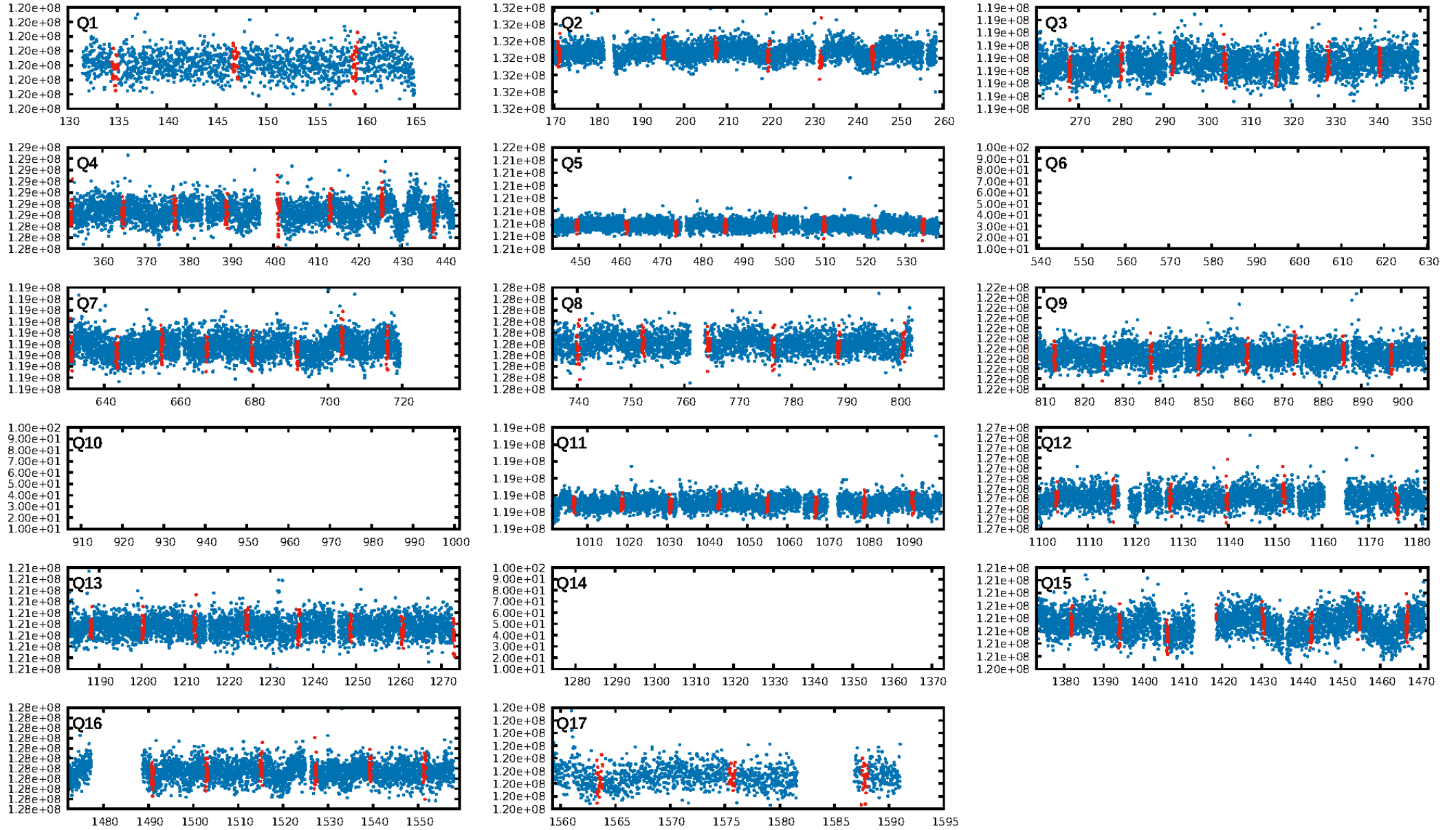
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.2% [0.00σ]
ModelChiSquare2-sig: 99.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.10e-12
RollingBand-fgt: 0.95 [82/86]
GhostDiagnostic-chr: -1.13
Centroid-sig: 0.0%
Centroid-so: 28.457 arcsec [10.24σ]
OotOffset-rm: 11.027 arcsec [6.62σ]
KicOffset-rm: 11.019 arcsec [5.88σ]
OotOffset-st: 1/2/2/2 [7]
KicOffset-st: 1/2/2/2 [7]
DiffImageQuality-fgm: 0.57 [4/7]
DiffImageOverlap-fno: 1.00 [14/14]

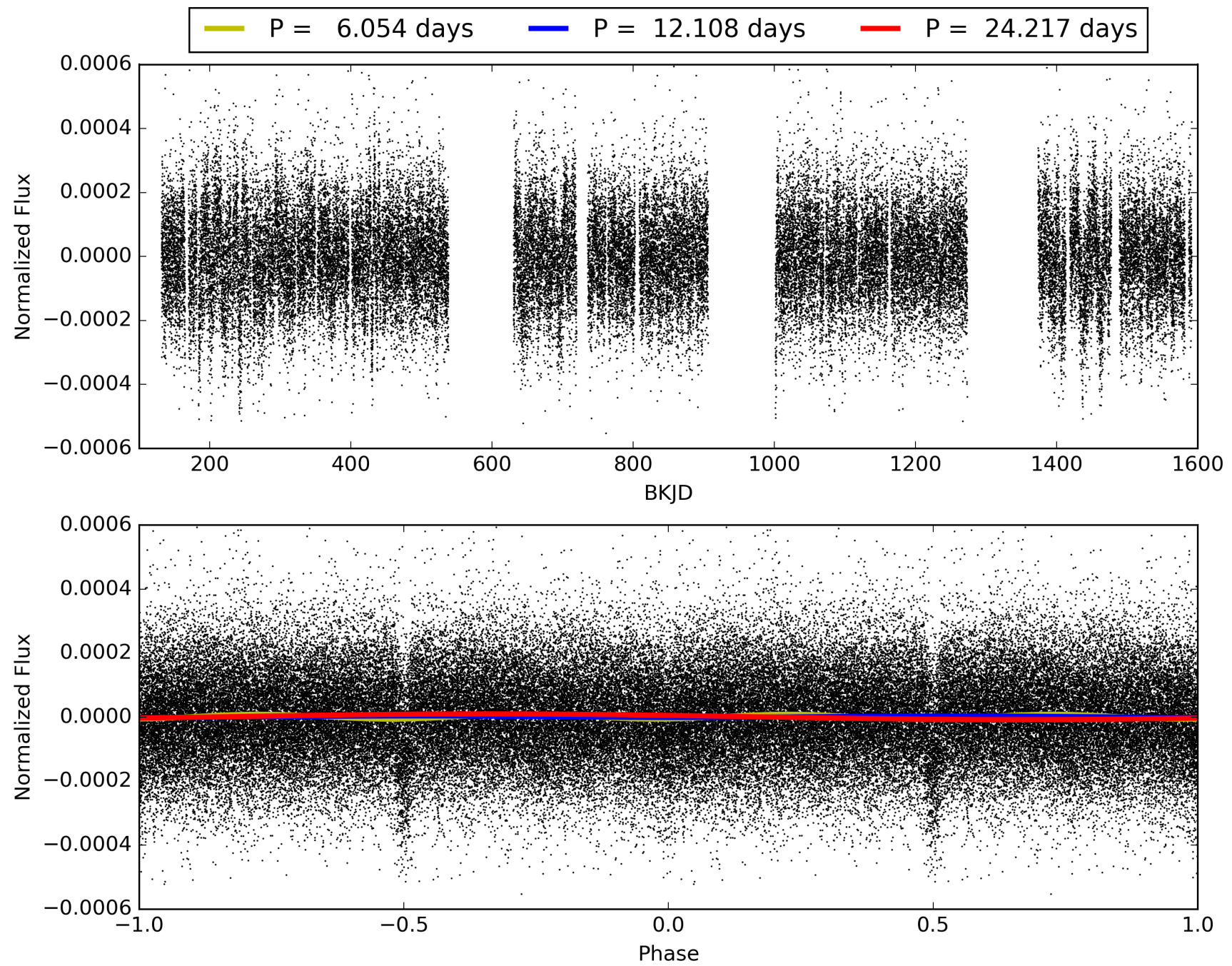
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 01:13:28 Z

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

TCE 004077901-02, PDC Light Curves

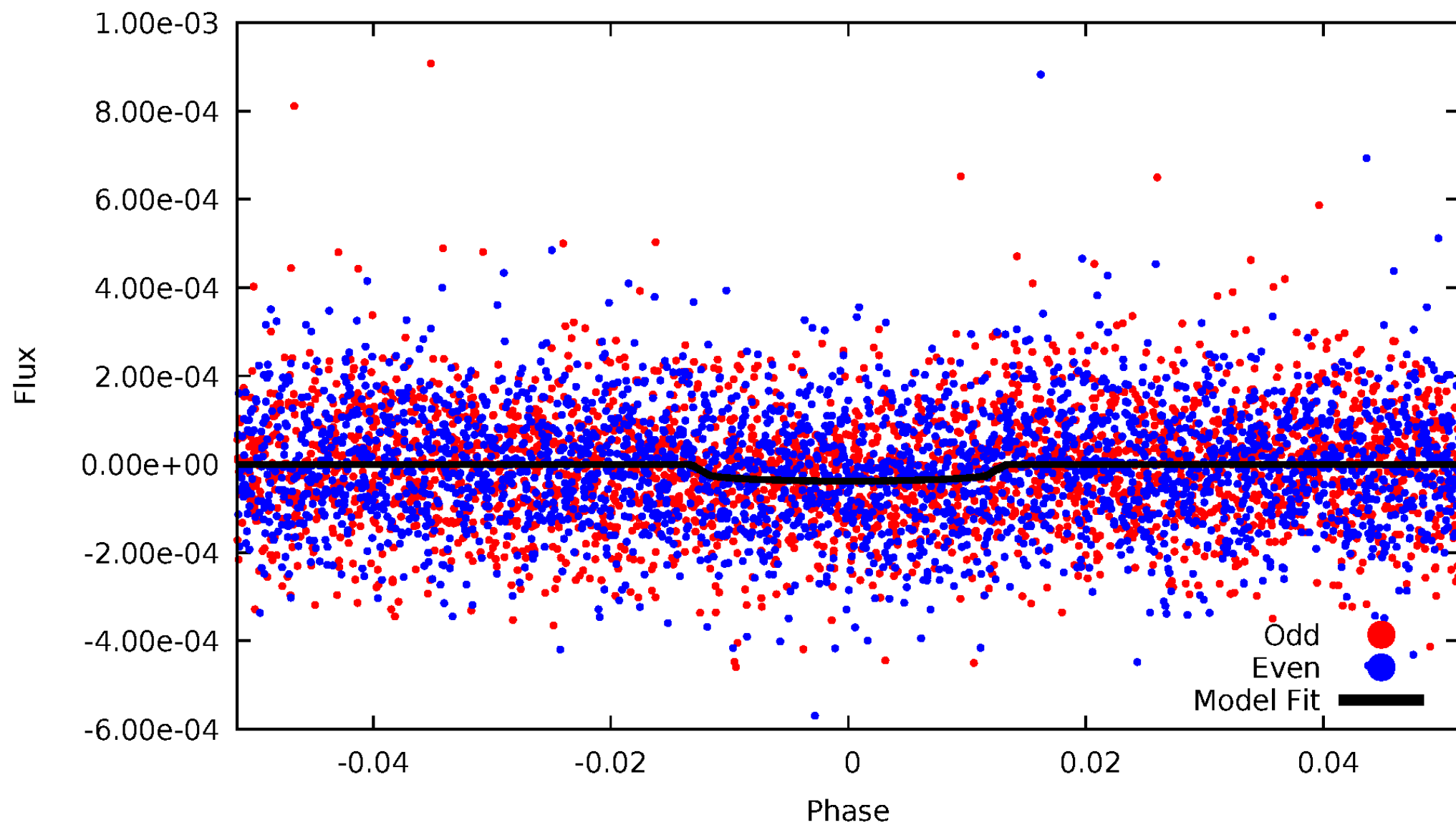


TCE 004077901-02



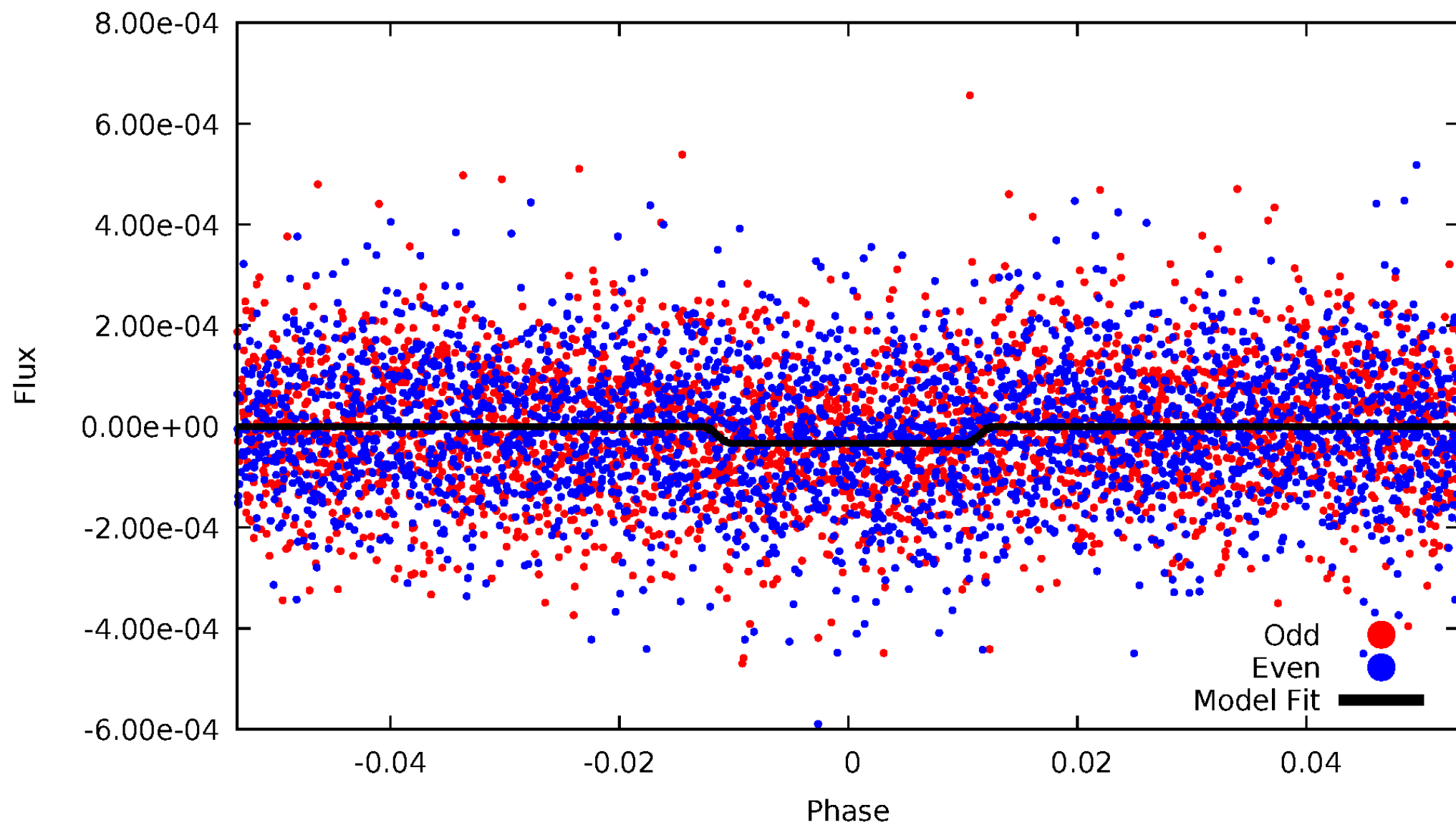
DV Odd/Even

TCE 004077901-02



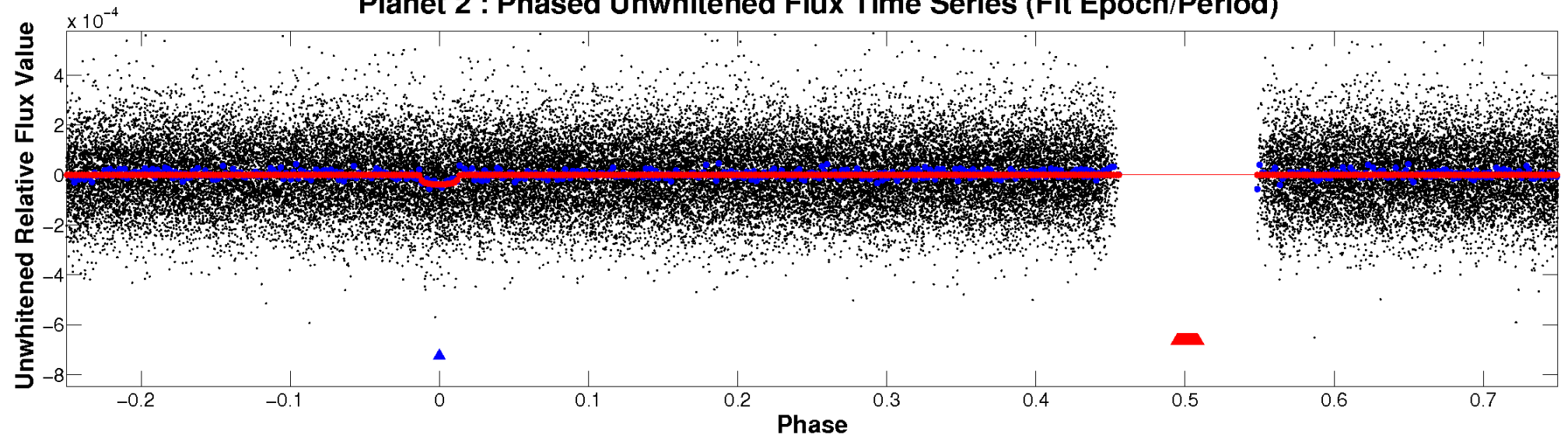
ALT Odd/Even

TCE 004077901-02

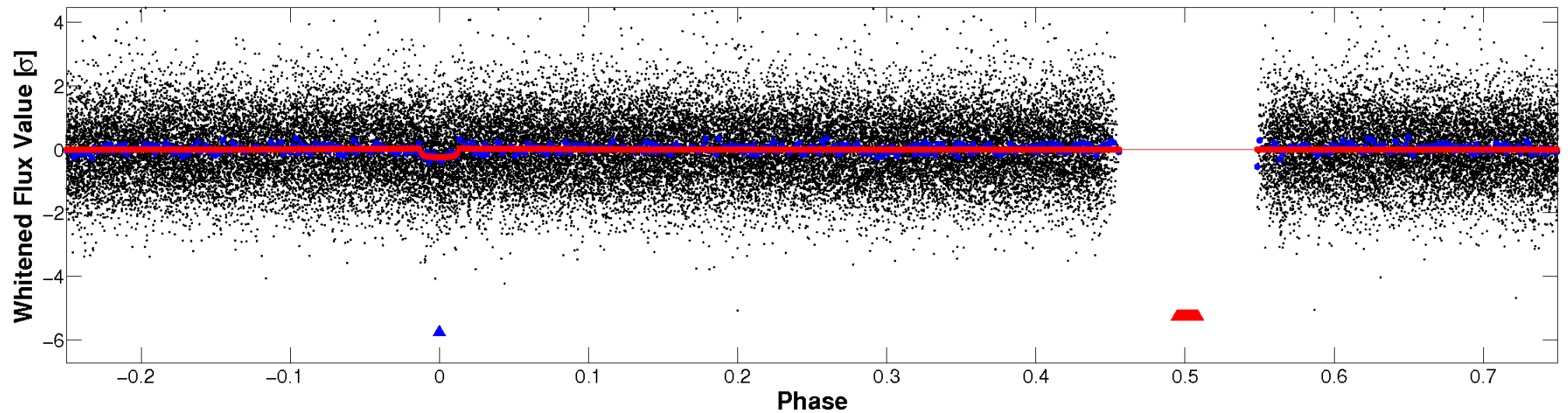


Non-Whitened Vs. Whitened Light Curve

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

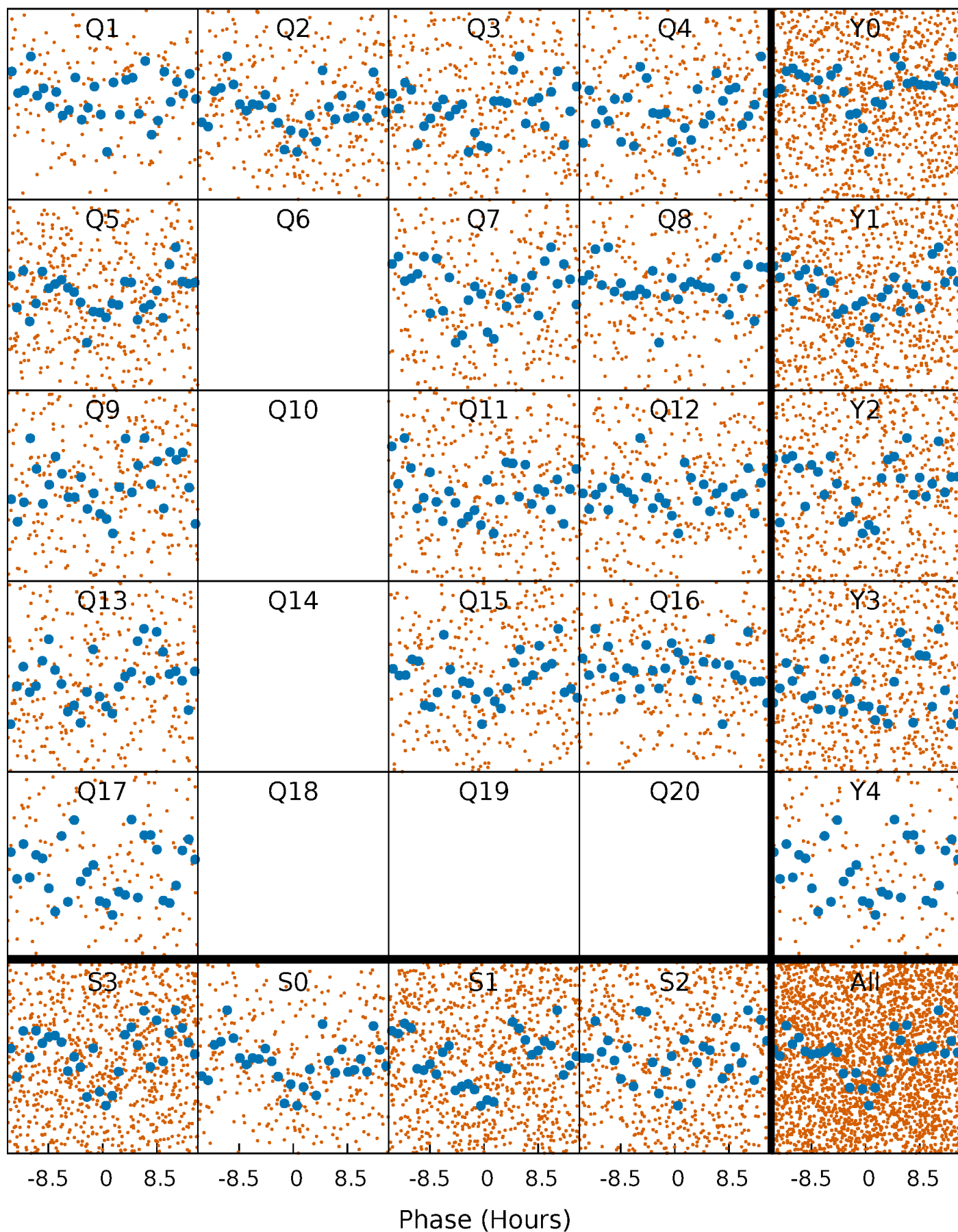


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



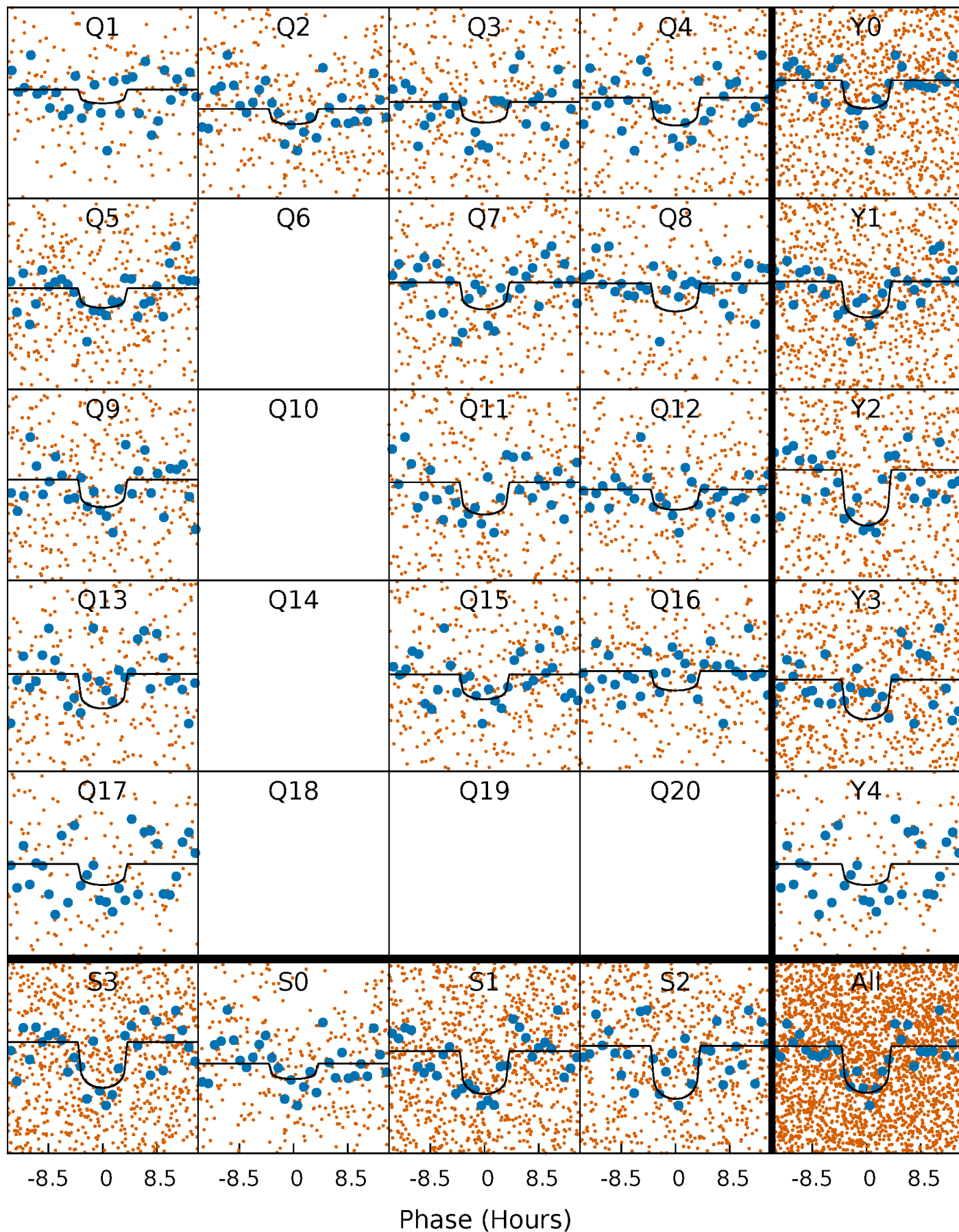
PDC Quarter-Phased Transit Curves

TCE 004077901-02 $P = 12.108326$ Days $T_0 = 134.760468$ (BKJD)



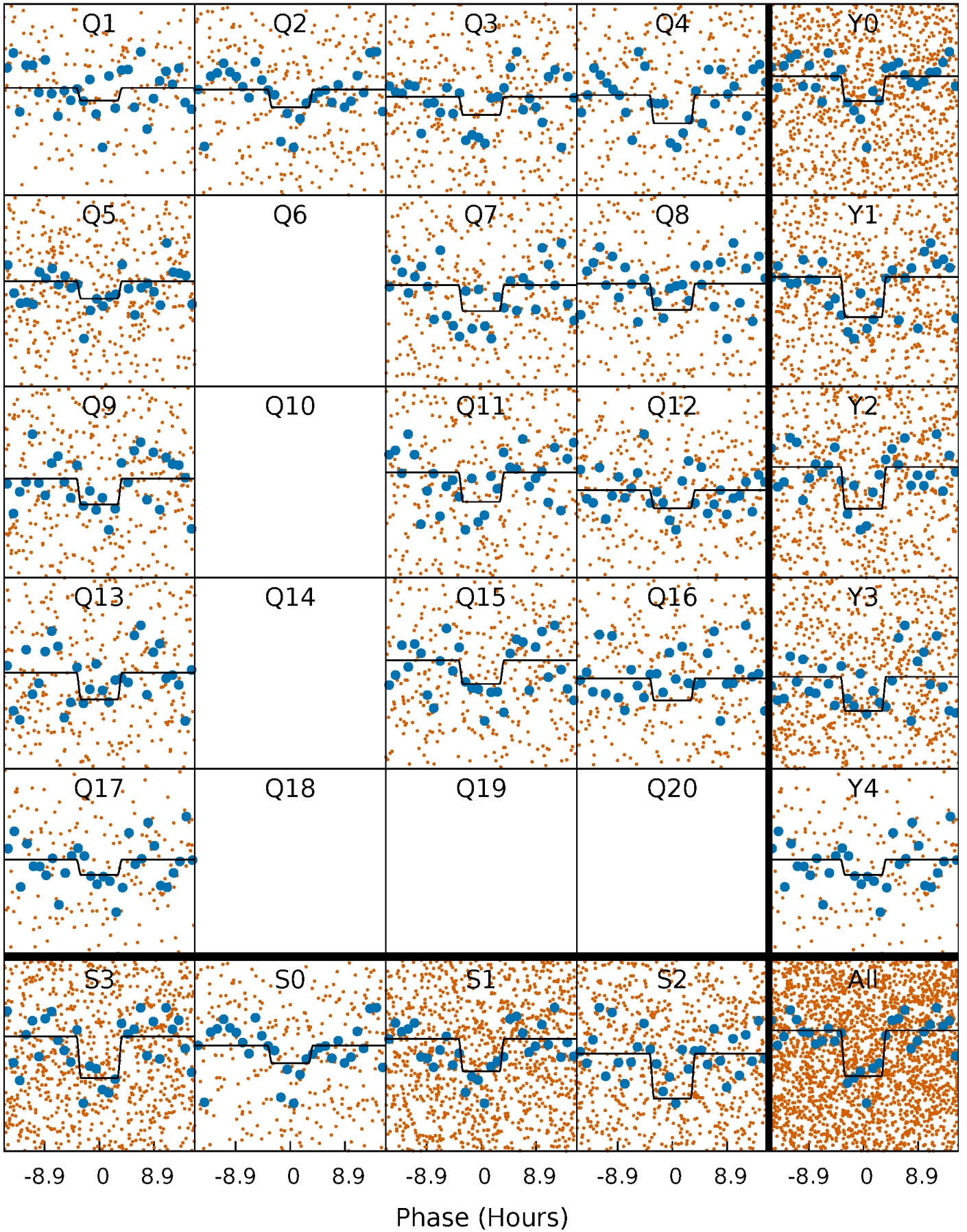
DV Quarter-Phased Transit Curves

TCE 004077901-02 P= 12.108326 Days $T_0=134.760468$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

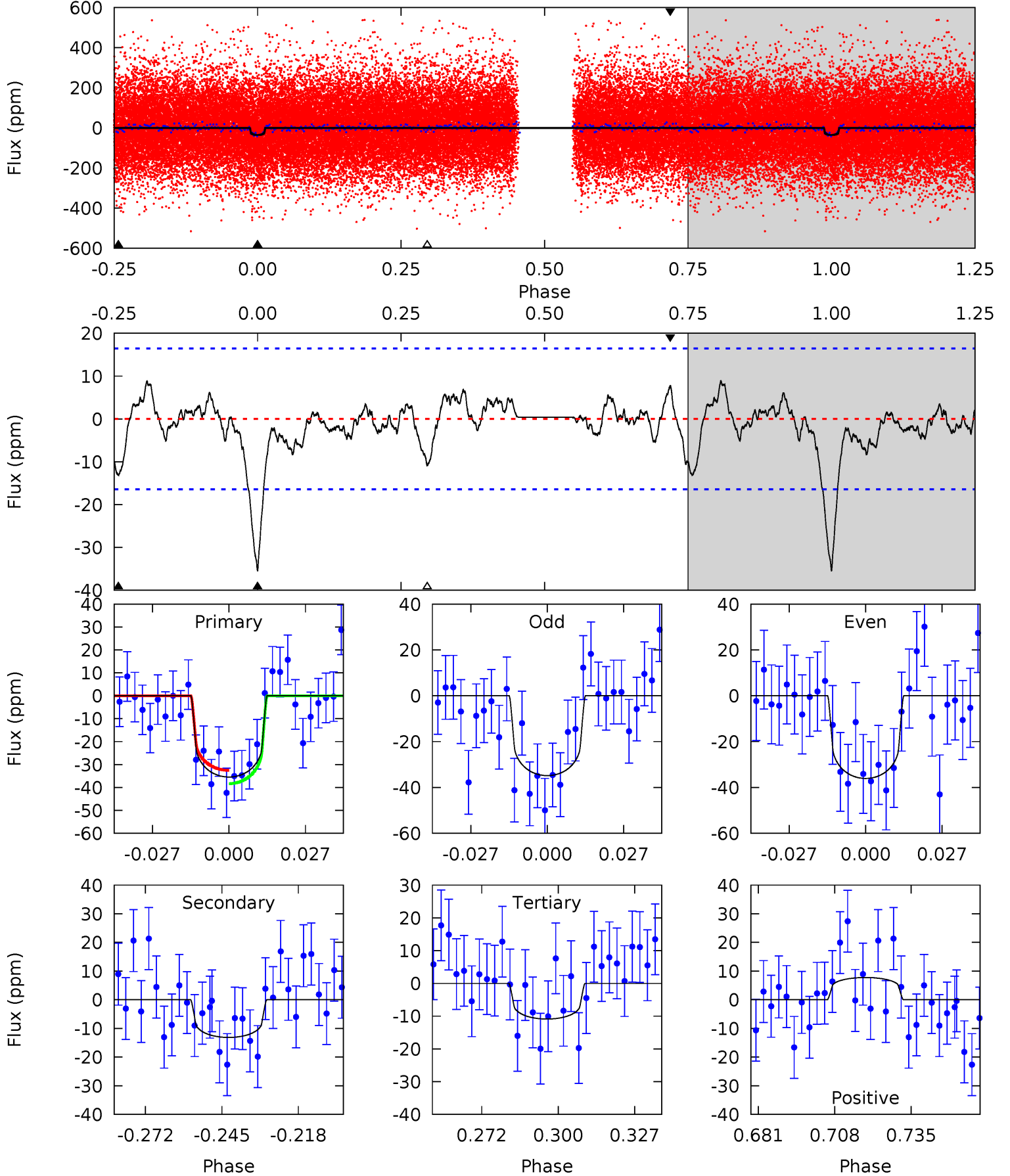
TCE 004077901-02 P= 12.108122 Days $T_0=134.763031$ (BKJD)



DV Model-Shift Uniqueness Test

004077901-02, P = 12.108326 Days, E = 122.652142 Days

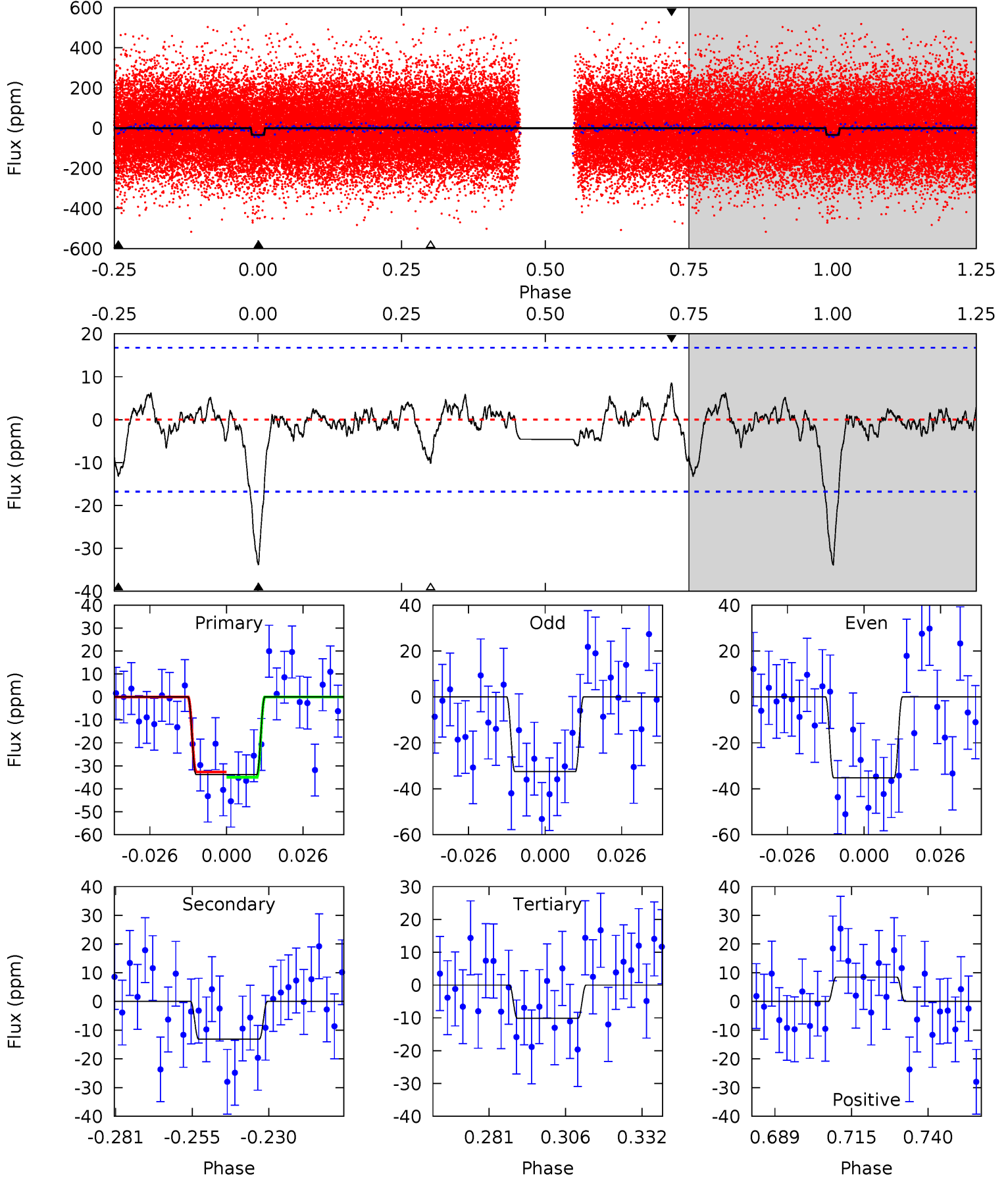
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	3.87	3.20	2.28	4.83	2.21	1.08	7.22	8.15	0.66	1.59	0.18	1.14	0.20	0.86



Alt Model-Shift Uniqueness Test

004077901-02, P = 12.108122 Days, E = 122.654909 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.77	3.78	2.94	2.46	4.84	2.23	0.84	6.83	7.31	0.85	1.33	0.40	0.93	0.20	0.33



Stellar Parameters For KIC 004077901

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5437^{+163}_{-163}	$4.547^{+0.085}_{-0.076}$	$-0.640^{+0.350}_{-0.300}$	$0.739^{+0.091}_{-0.082}$	$0.701^{+0.086}_{-0.040}$	$2.447^{+0.865}_{-0.585}$
	+3%/-3%	+2%/-2%	+55%/-47%	+12%/-11%	+12%/-6%	+35%/-24%
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 004077901-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-13 ± 3	$0.52^{+0.28}_{-0.26}$	950^{+40}_{-39}	4255^{+1517}_{-608}	223^{+668}_{-134}
Alt.	-13 ± 3	$0.47^{+0.28}_{-0.25}$	952^{+39}_{-40}	4434^{+1651}_{-706}	267^{+876}_{-163}

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 $A_{obs} \gg 1.0$

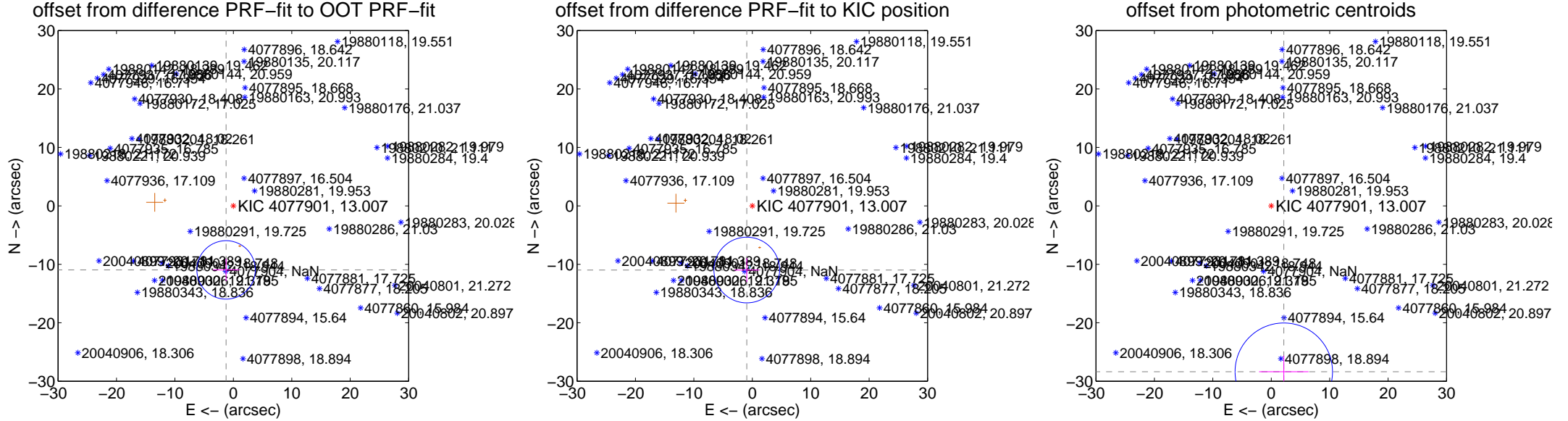
DV Centroid Data

Supplemental centroid analysis for 004077901-02. Kepler magnitude: 13.01. Transit SNR 7.99

There are 4 quarters with good PRF difference image offsets

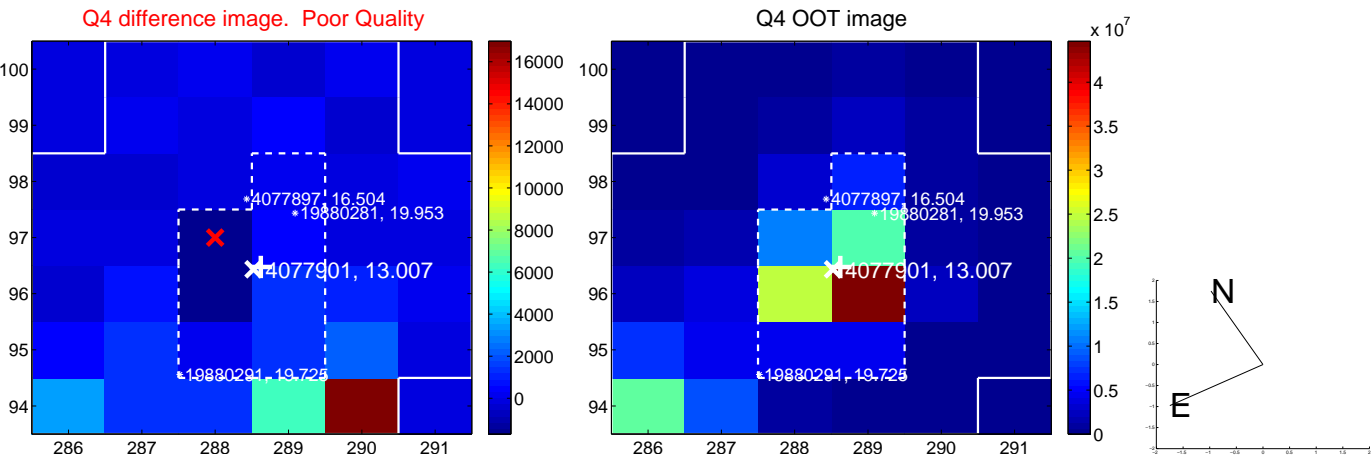
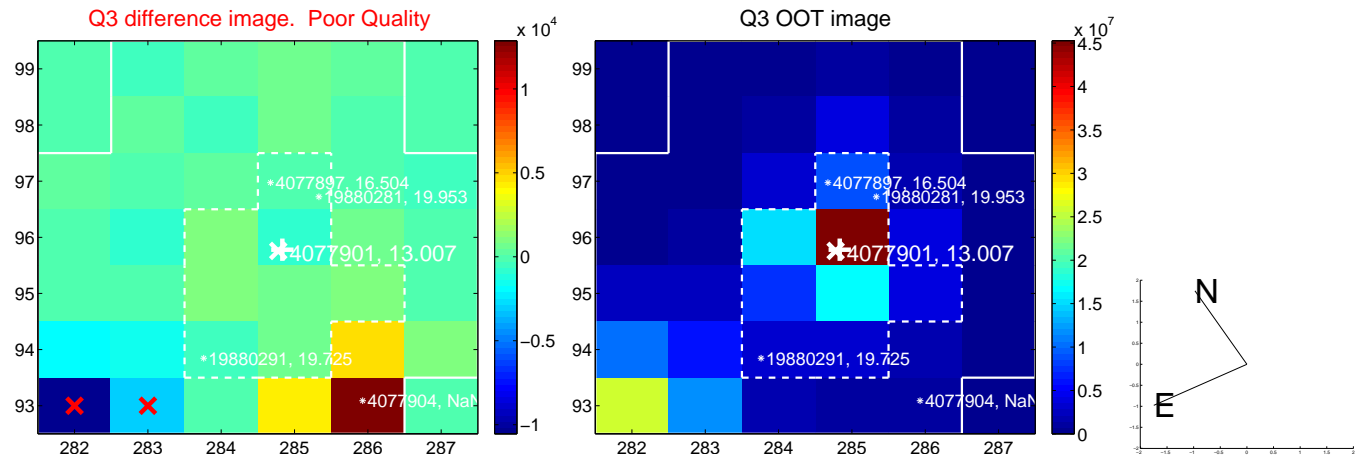
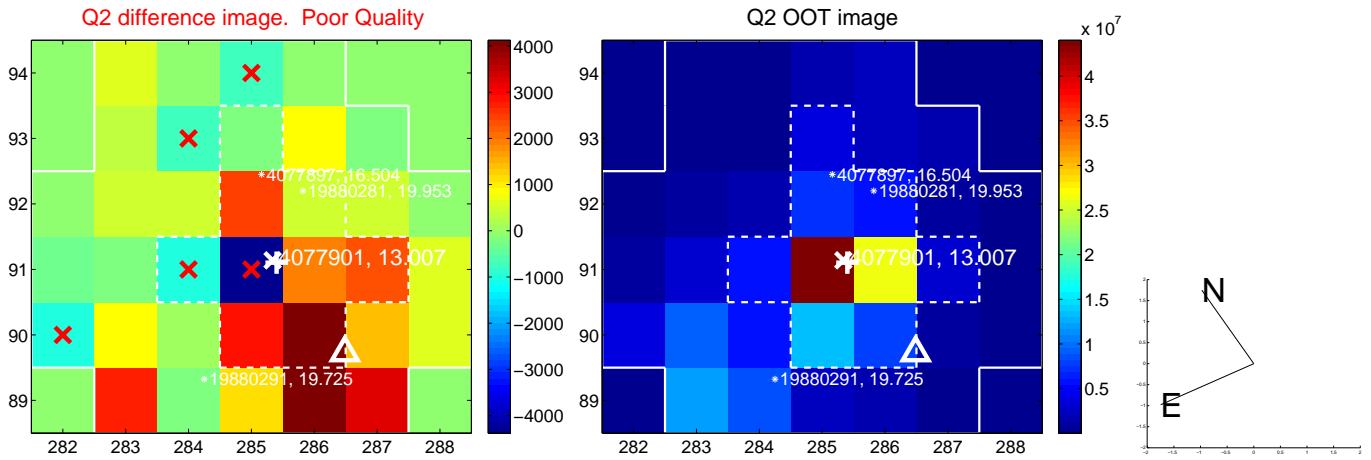
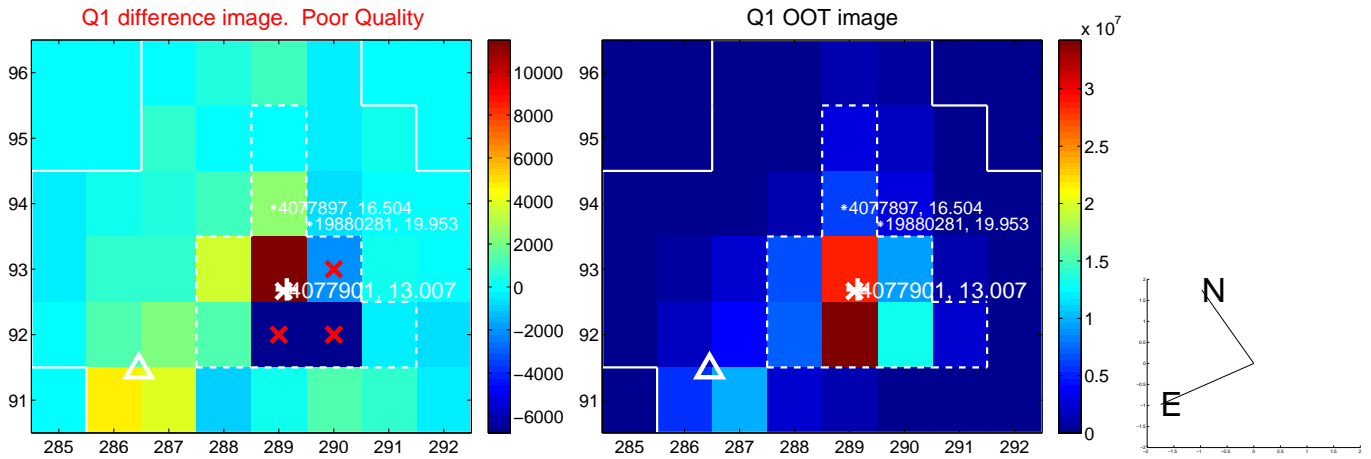
The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	11.027 ± 1.667	6.62	1.241 ± 2.254	-10.957 ± 1.905
PRF-fit source offset from KIC position	11.019 ± 1.873	5.88	0.948 ± 2.116	-10.978 ± 2.048
photometric centroid source offset	28.46 ± 2.78	10.24	-2.15 ± 4.23	-28.38 ± 2.77

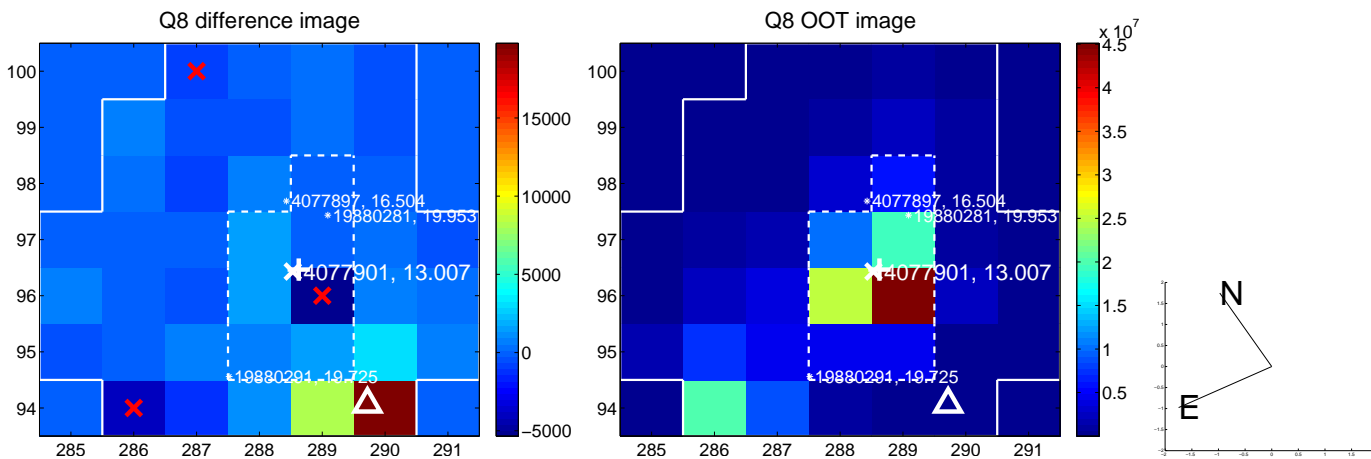
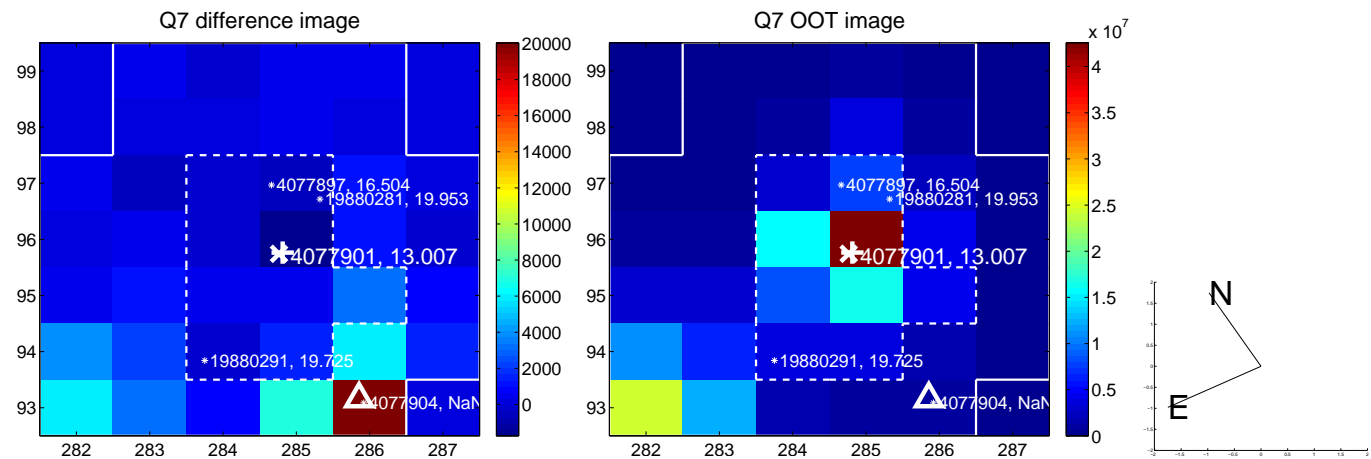
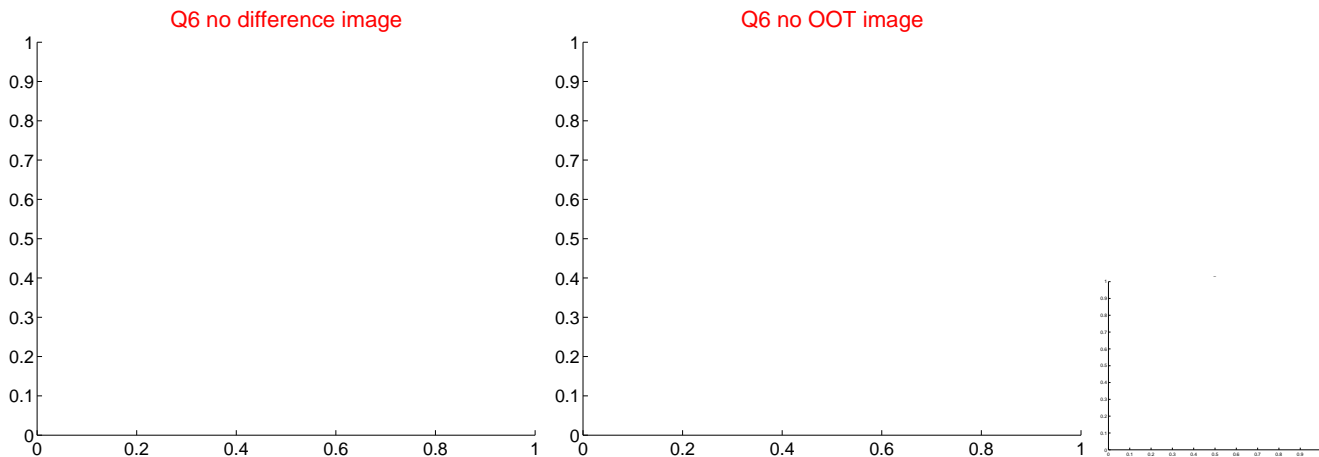
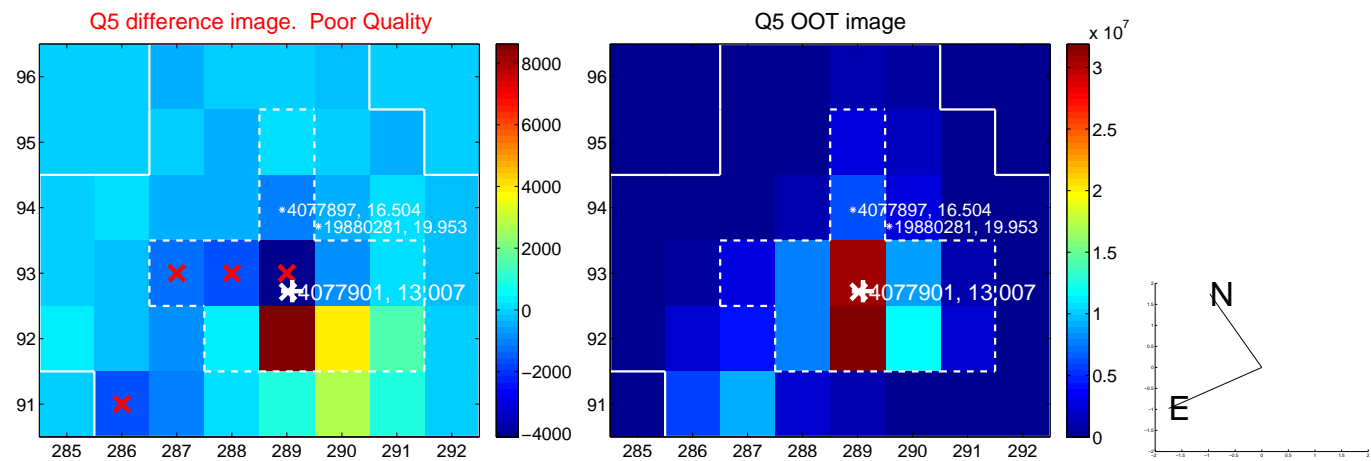


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

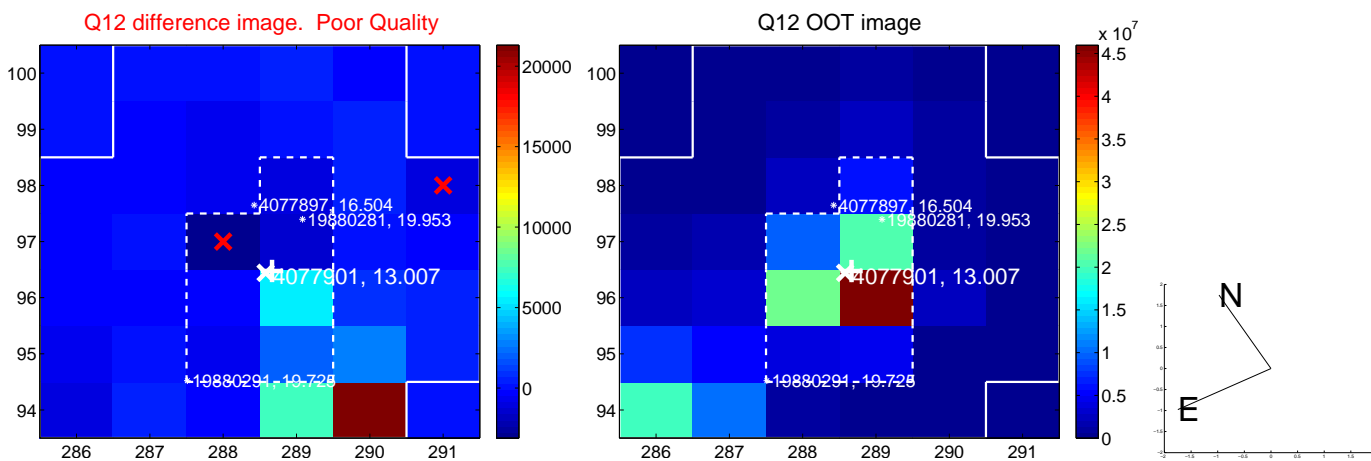
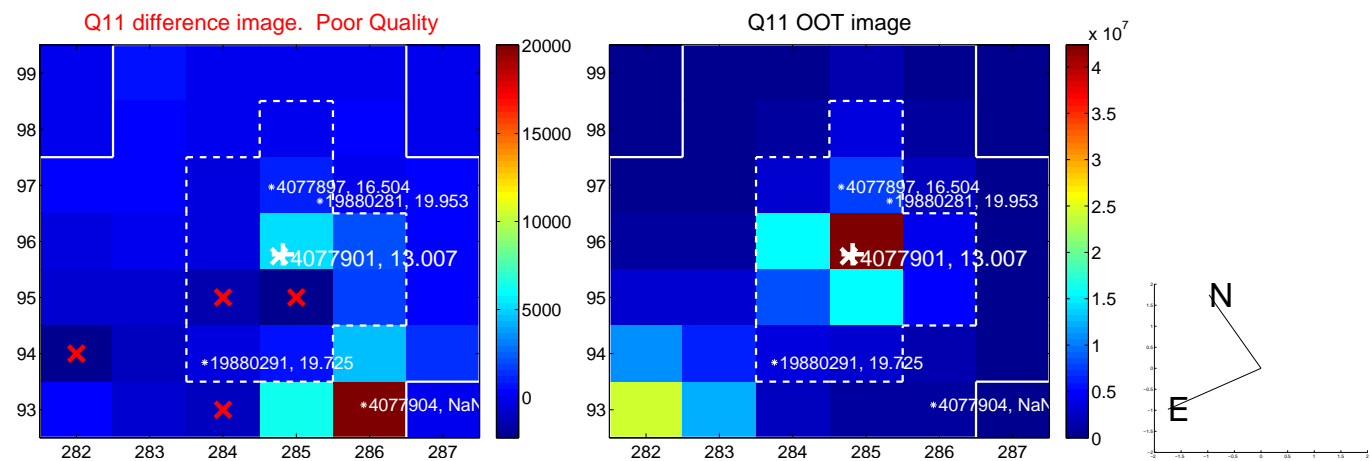
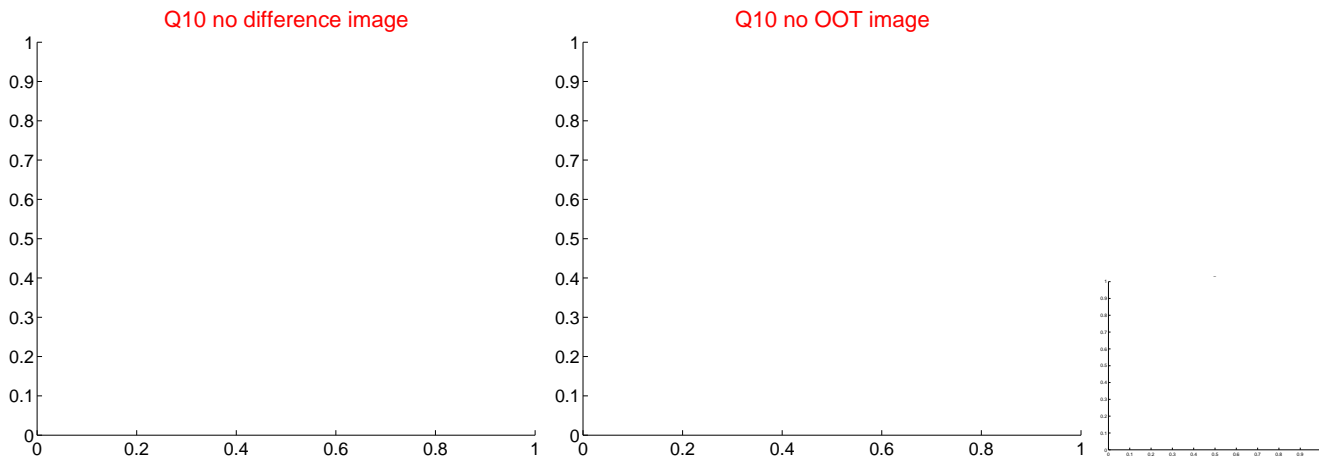
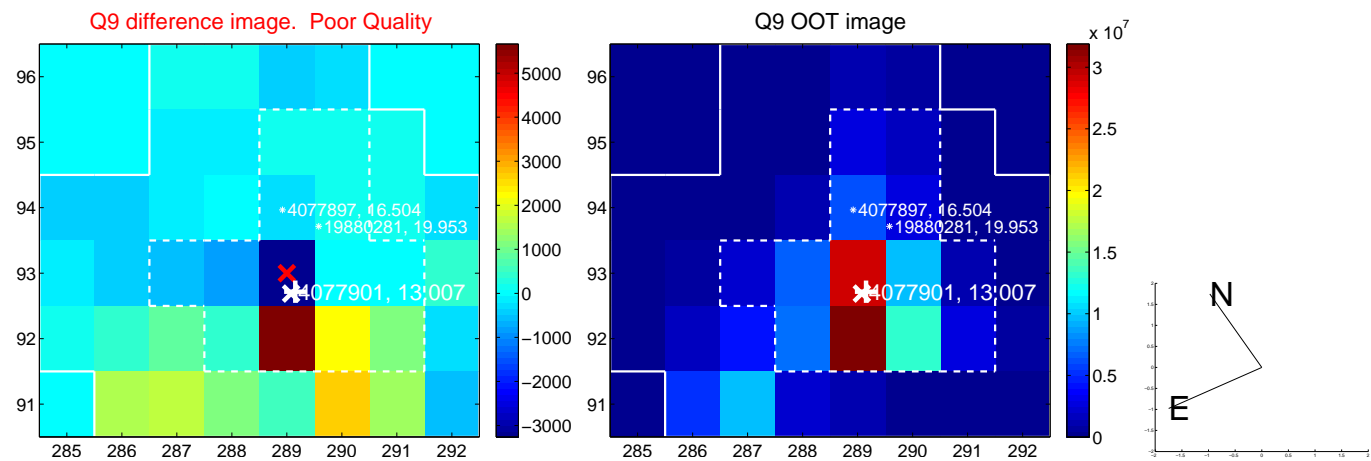
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



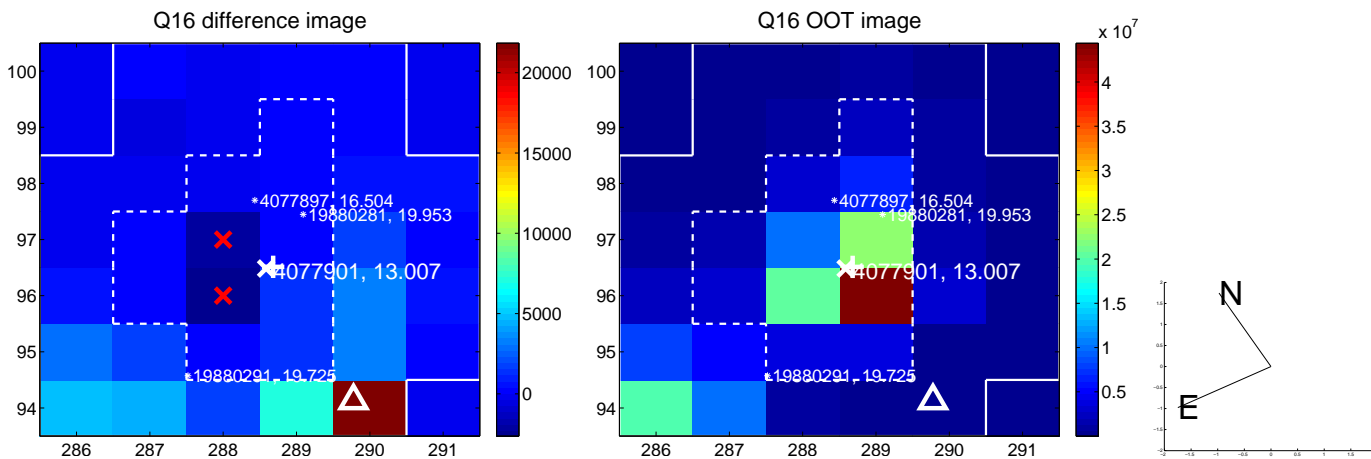
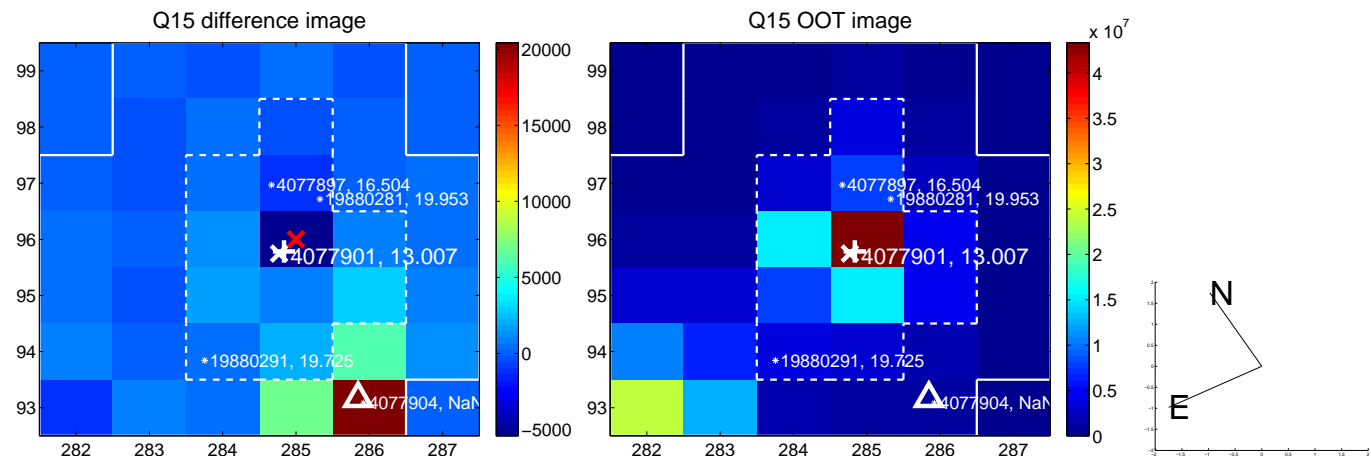
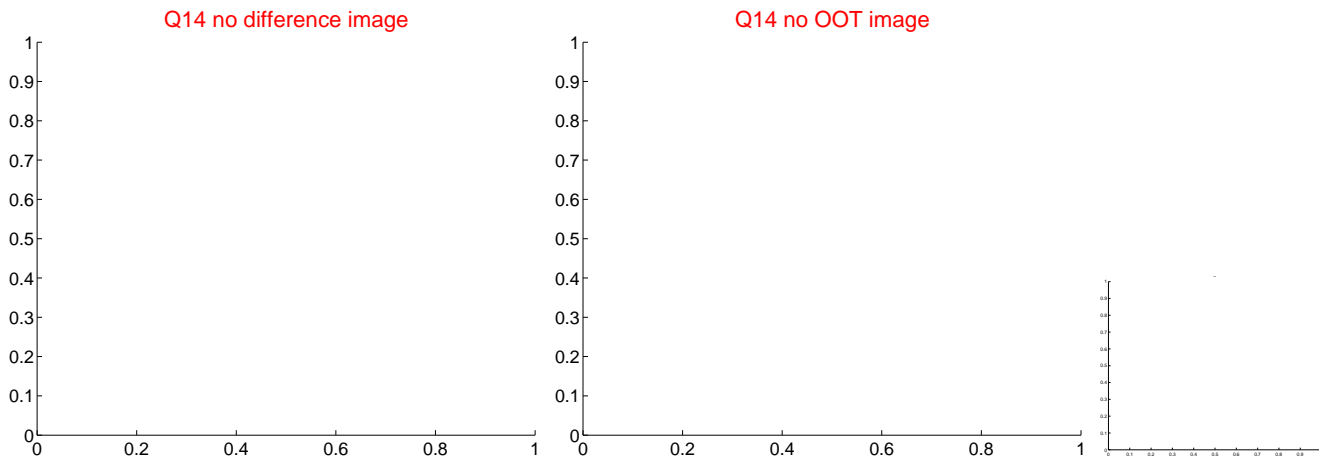
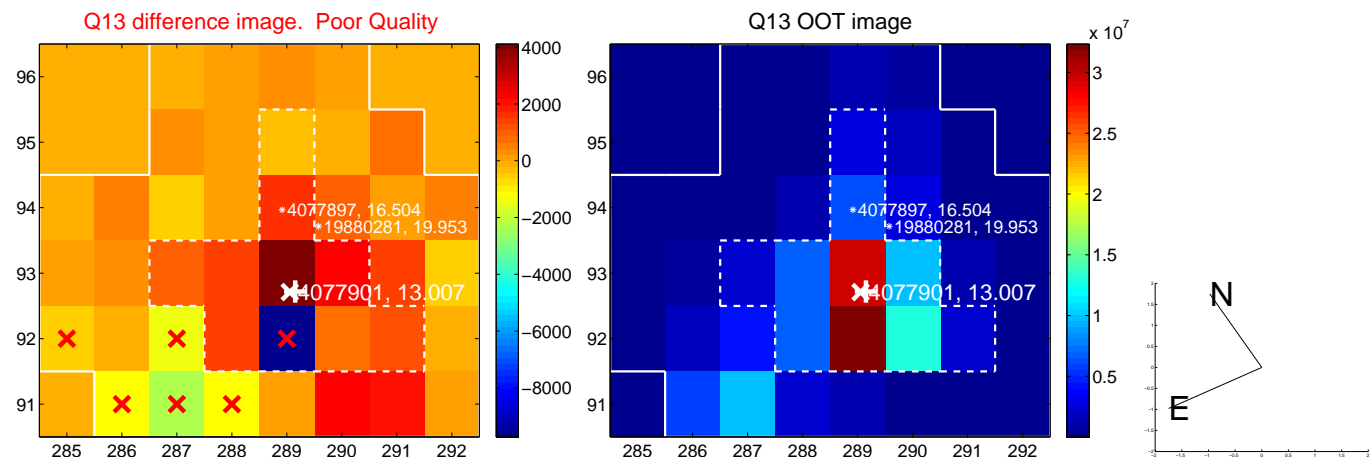
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



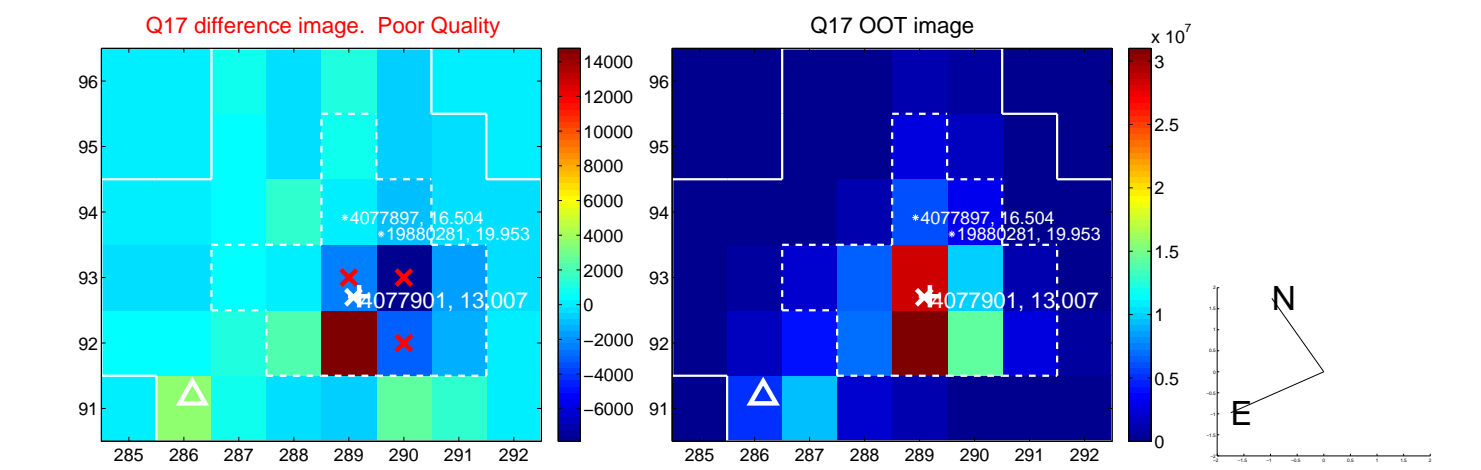
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



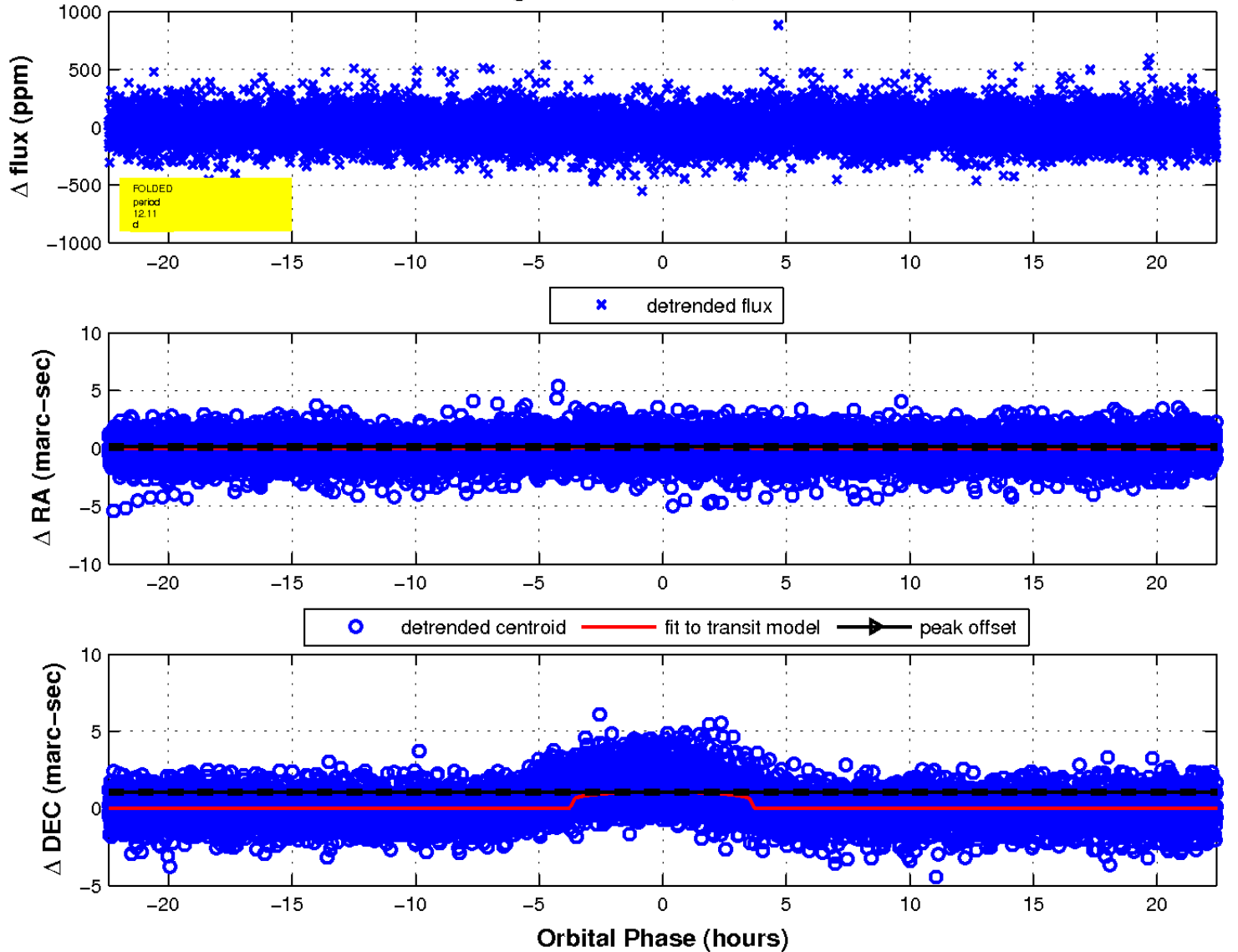
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



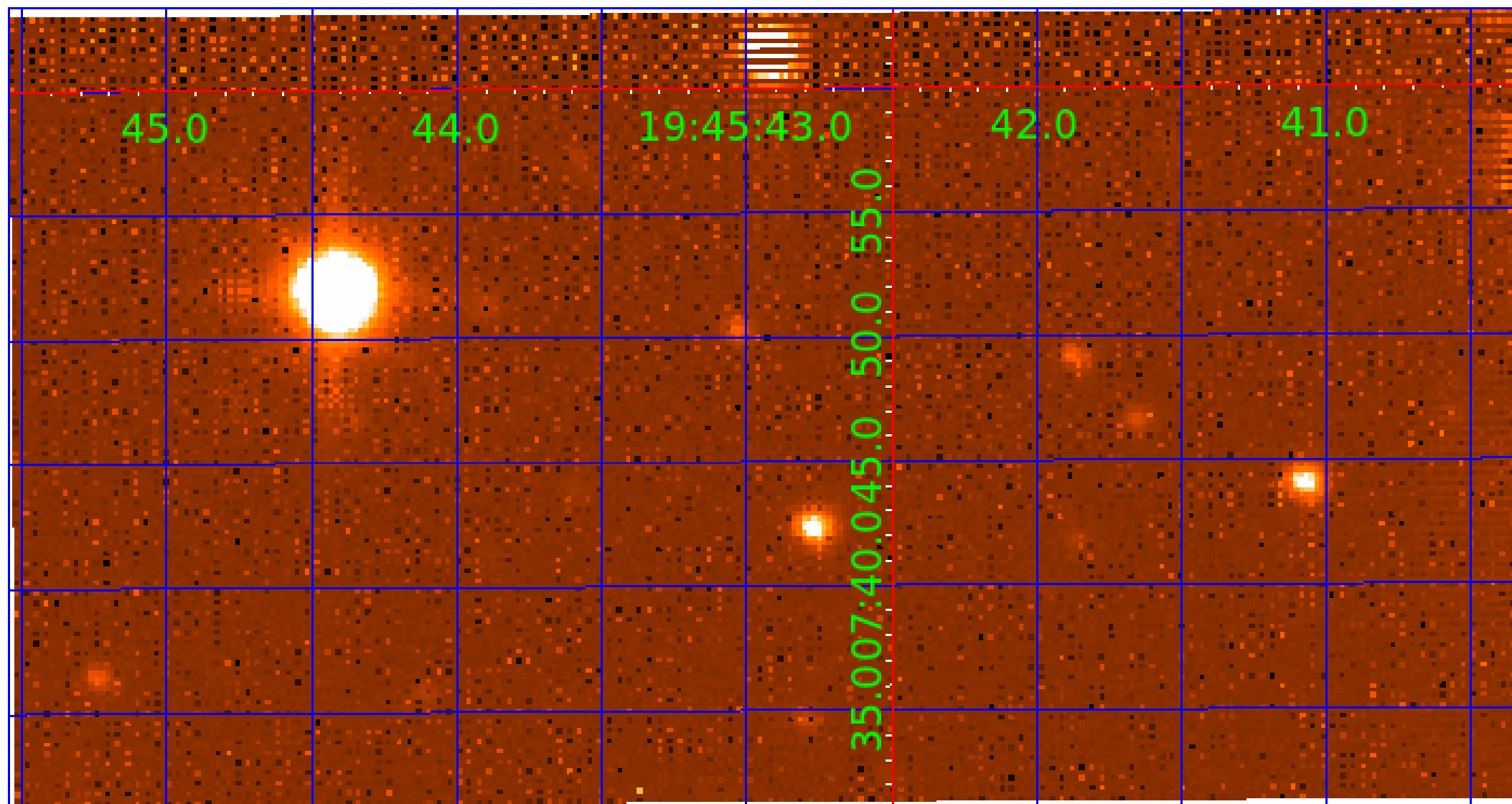
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image



Right ascension