

KIC 009115681

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})
009115681-01	OBS	1865.01	1.863949	132.182822	130.4	4.169	26.5	29.2	3.38	6689	7.55	16792.83
009115681-02	OBS	No	596.369835	377.881014	1230.4	18.656	7.6	8.4	3.38	6689	22.12	7.67

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009115681-01	OBS	FP	0.00	0	0	1	0	CENT_RESOLVED_OFFSET—HALO_GHOST
009115681-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

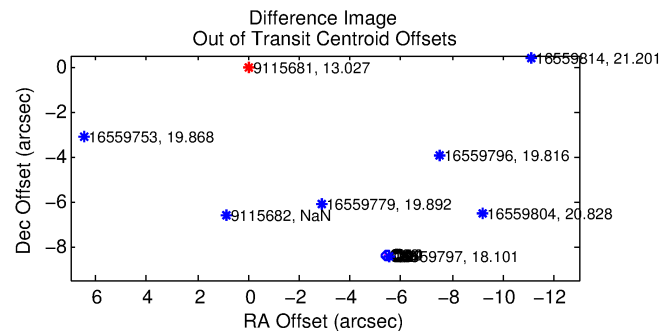
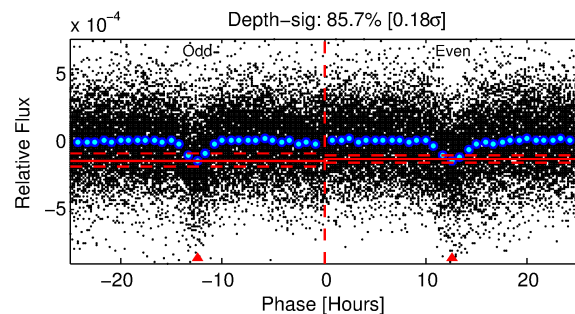
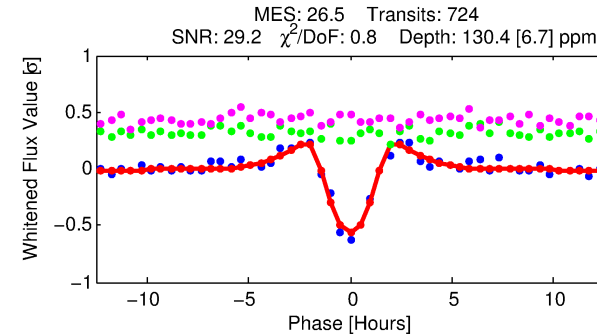
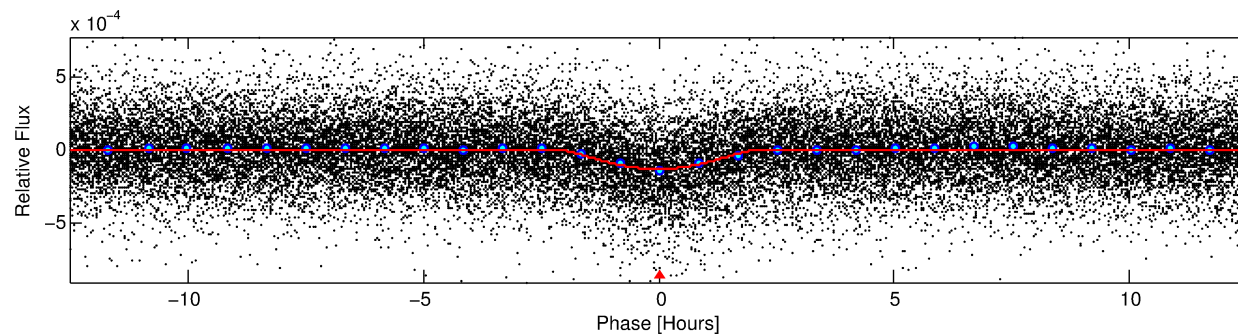
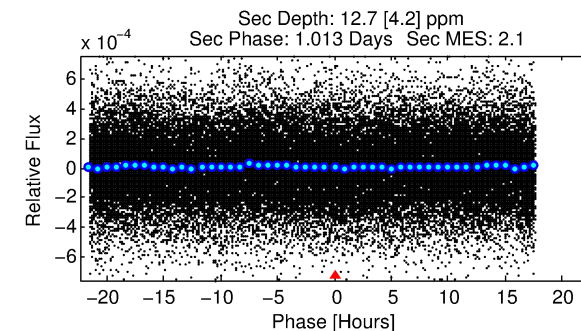
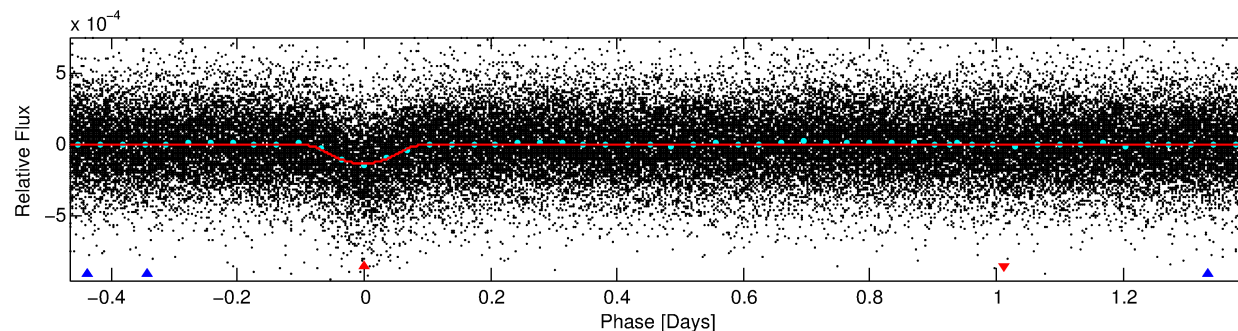
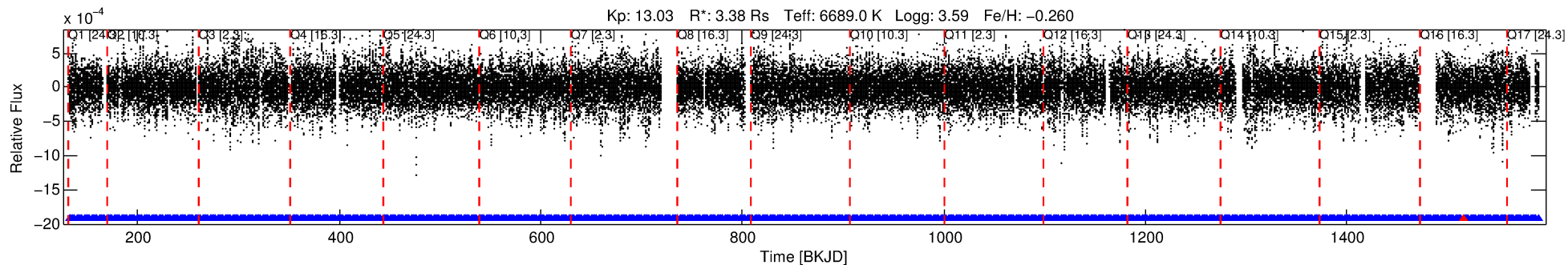
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009115681-01

No Significant Match Found

DV One-Page Summary

KIC: 9115681 Candidate: 1 of 2 Period: 1.864 d
KOI: K01865.01 Corr: 0.949



DV Fit Results:

Period = 1.86395 [0.00001] d
Epoch = 132.1828 [0.0017] BKJD
Rp/R* = 0.0205 [0.0150]
a/R* = 1.23 [0.07]
b = 1.00 [0.02]
Seff = 16792.83 [9887.56]
Teff = 2903 [427] K
Rp = 7.55 [6.24] Re
a = 0.0349 [0.0126] AU
Ag = 0.15 [0.24] [-3.53σ]
Teffp = 2791 [1054] K [-0.10σ]

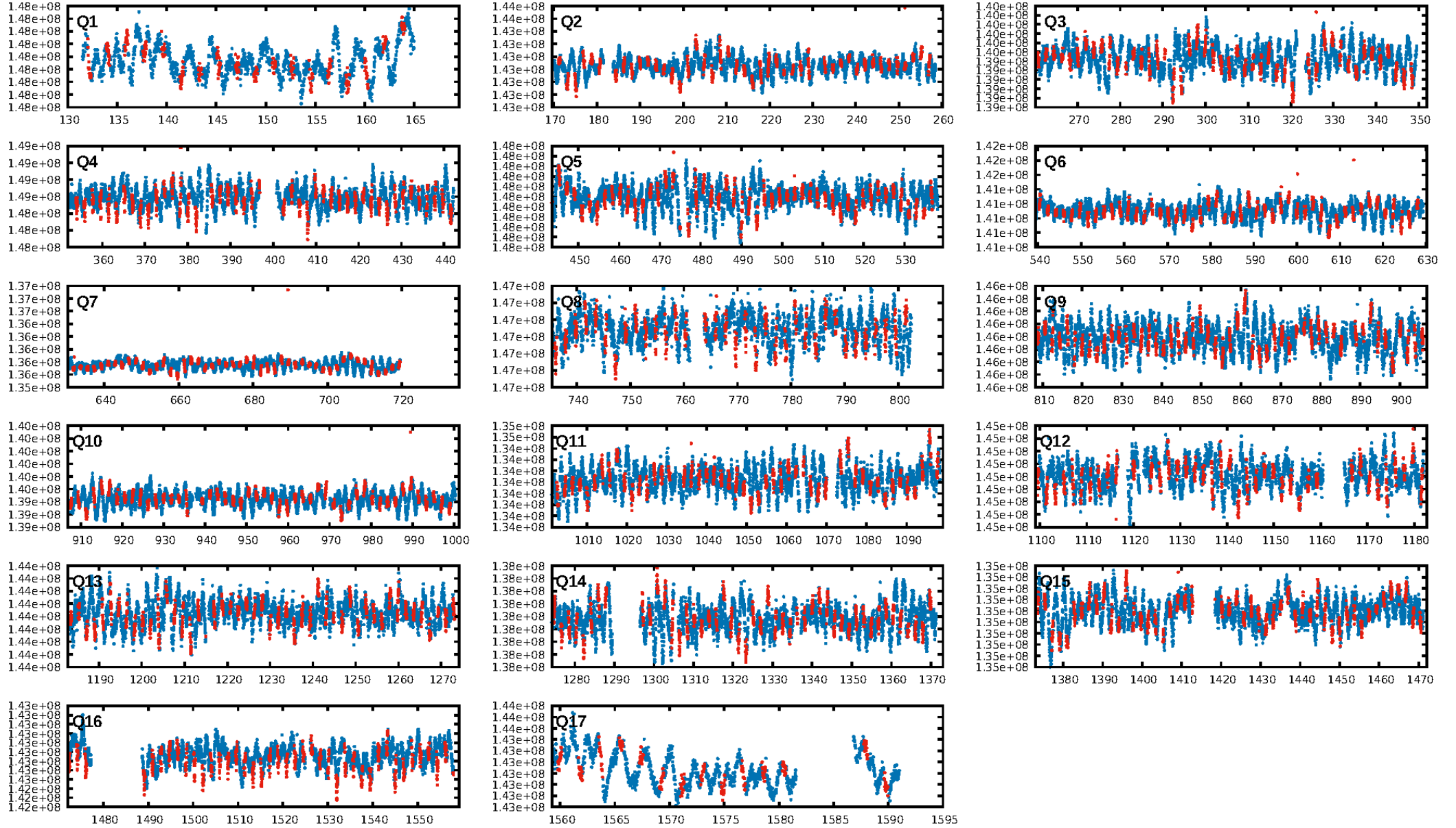
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [746.39σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 6.50e-153
RollingBand-fgt: 1.00 [691/692]
GhostDiagnostic-chr: -0.1913
Centroid-sig: 0.0%
Centroid-so: 81.253 arcsec [282.00σ]
OotOffset-rm: 10.006 arcsec [147.43σ]
KicOffset-rm: 10.010 arcsec [147.03σ]
OotOffset-st: 4/4/4/0 [12]
KicOffset-st: 4/4/4/0 [12]
DiffImageQuality-fgm: 1.00 [12/12]
DiffImageOverlap-fno: 1.00 [17/17]

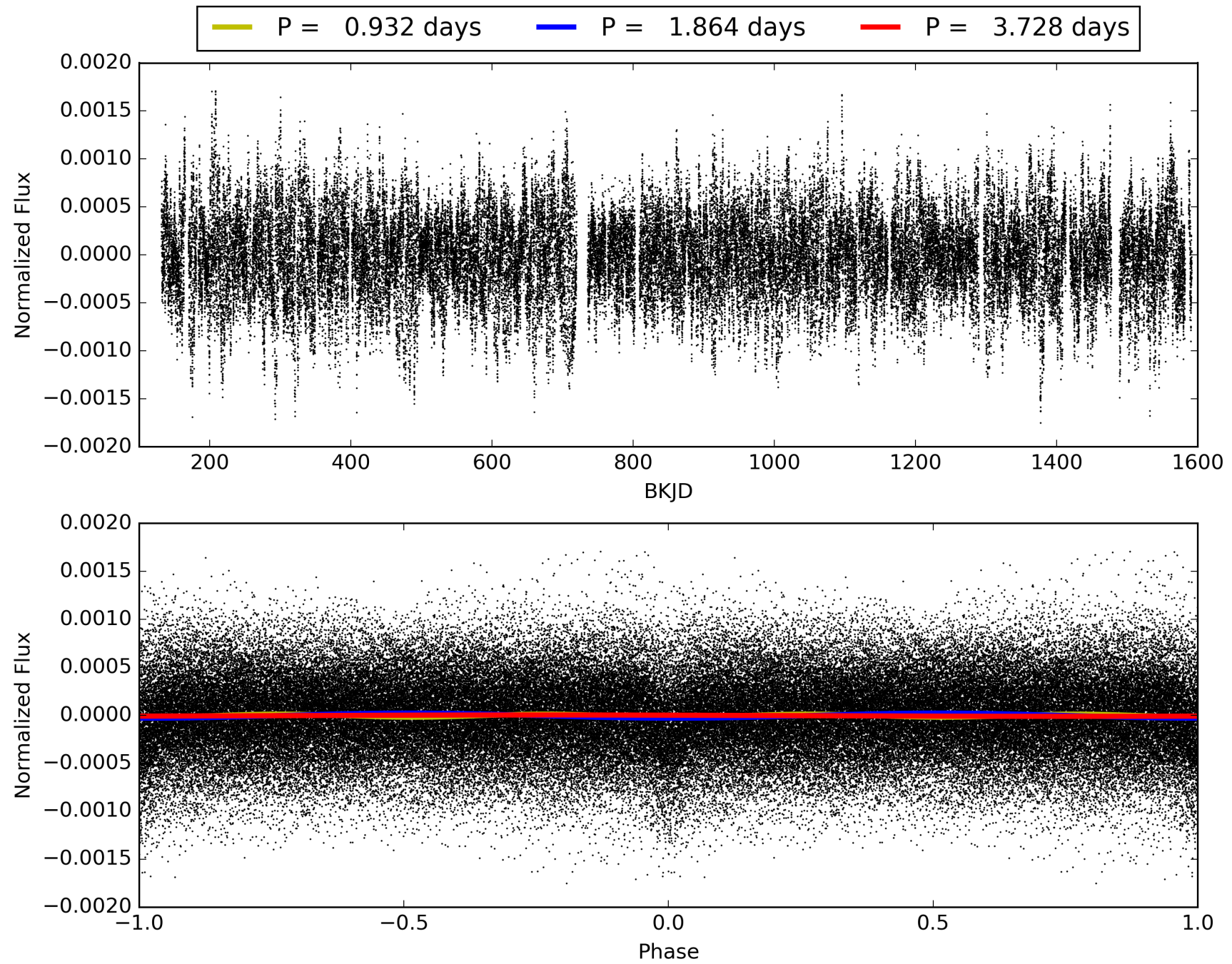
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 18:20:49 Z

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

TCE 009115681-01, PDC Light Curves

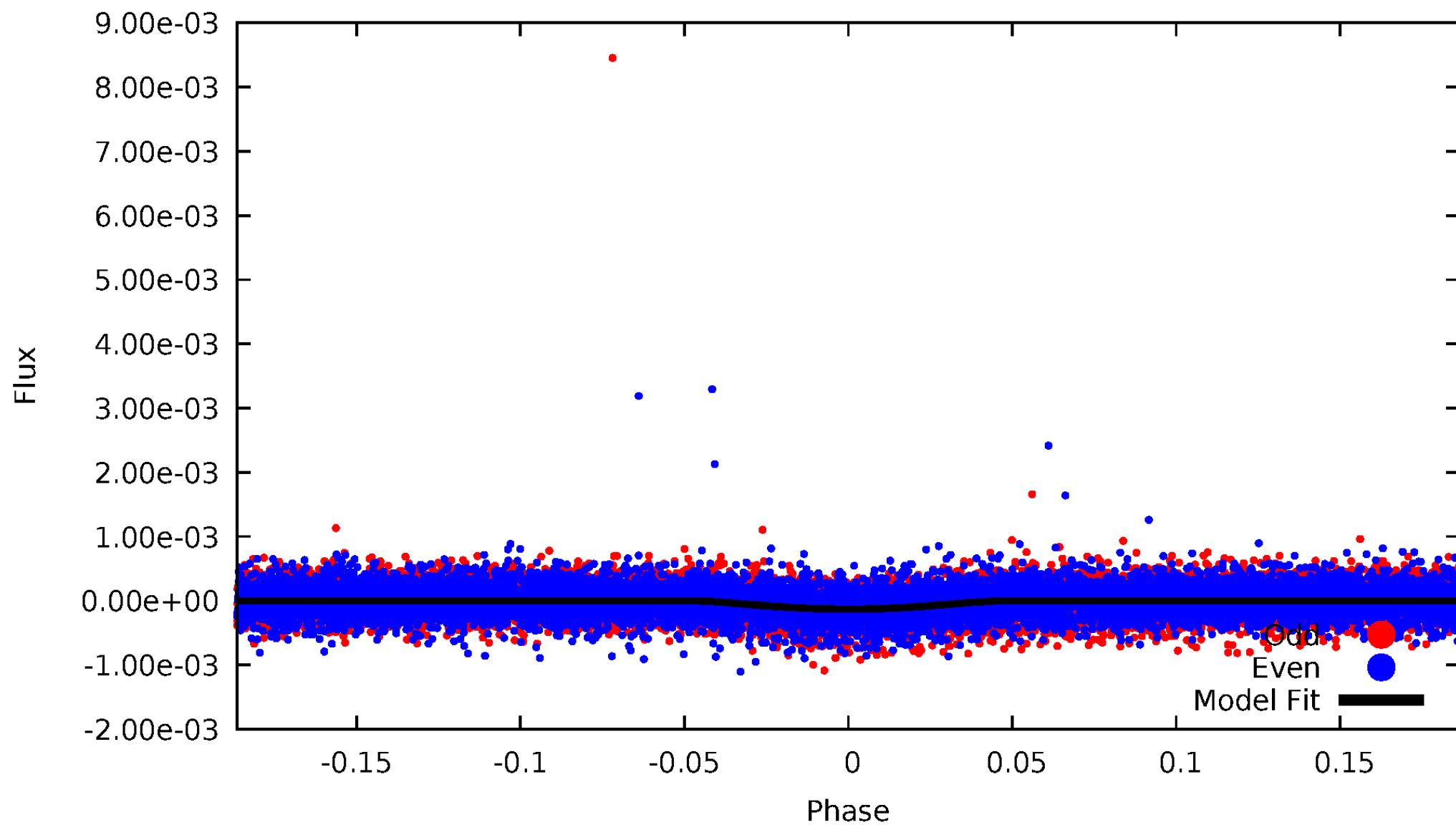


TCE 009115681-01



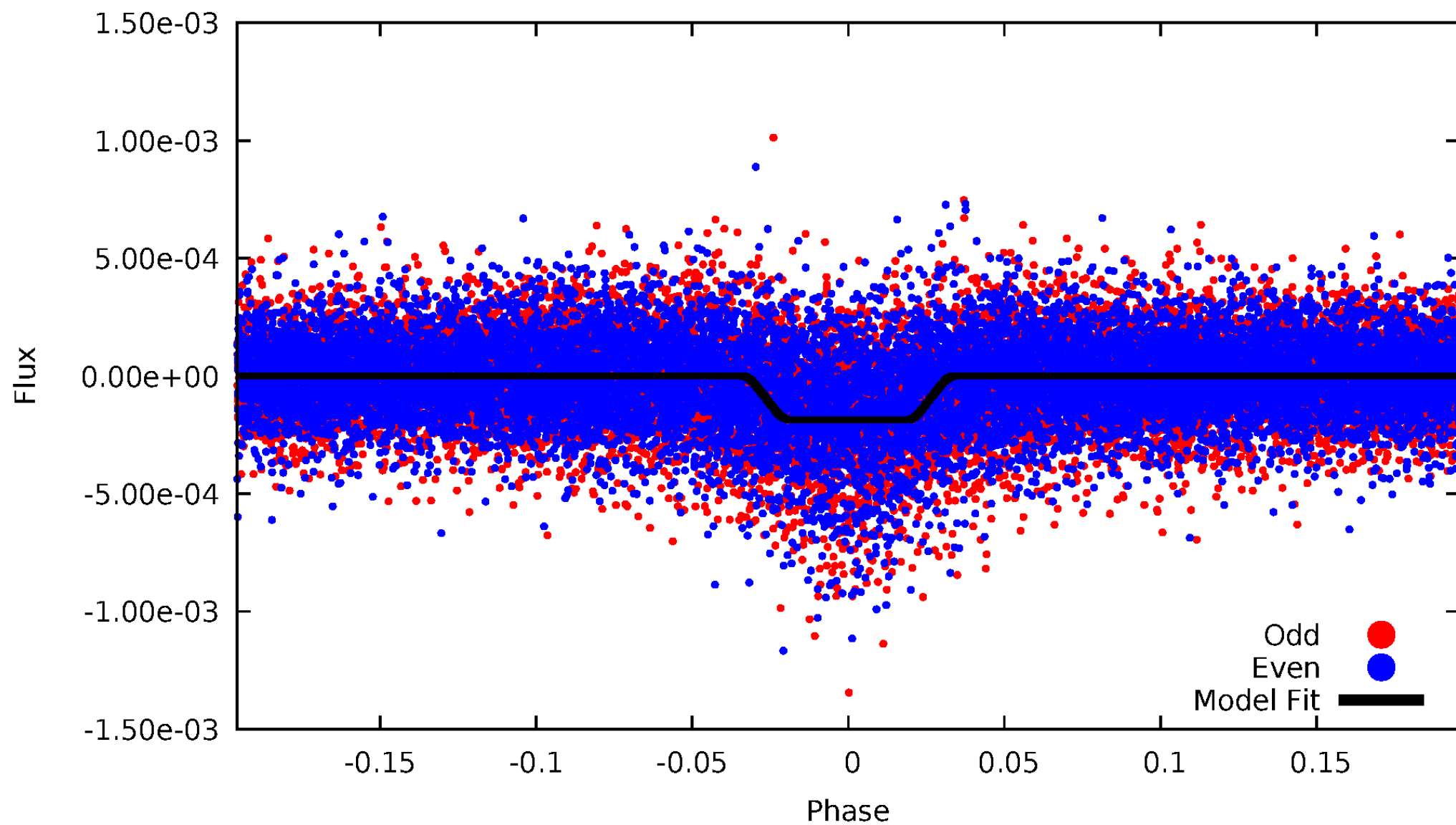
DV Odd/Even

TCE 009115681-01

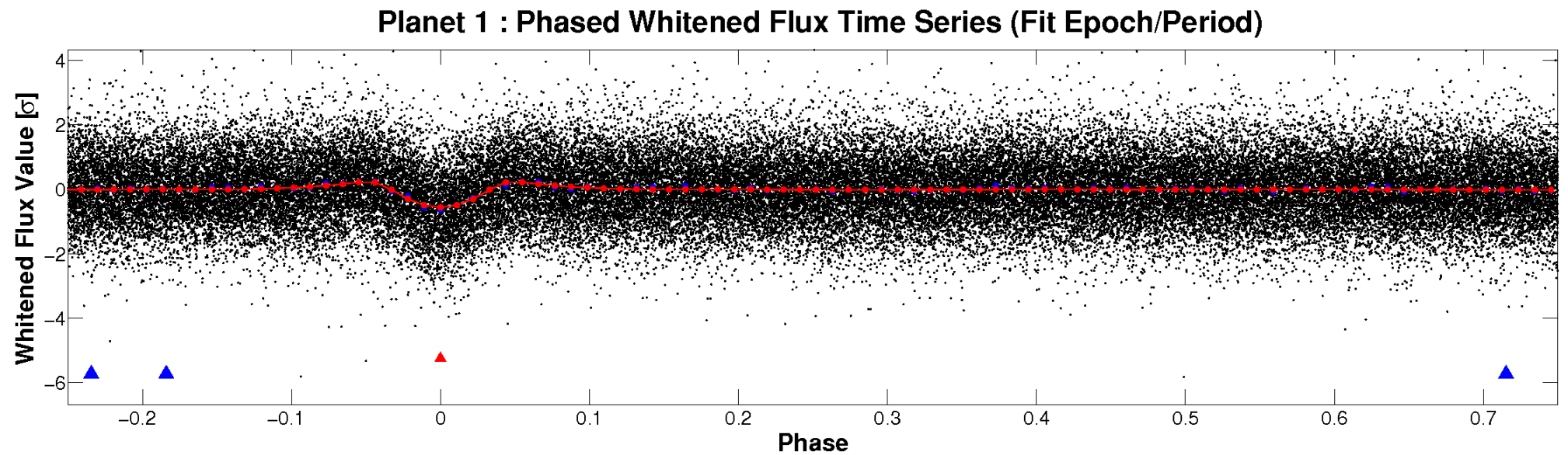
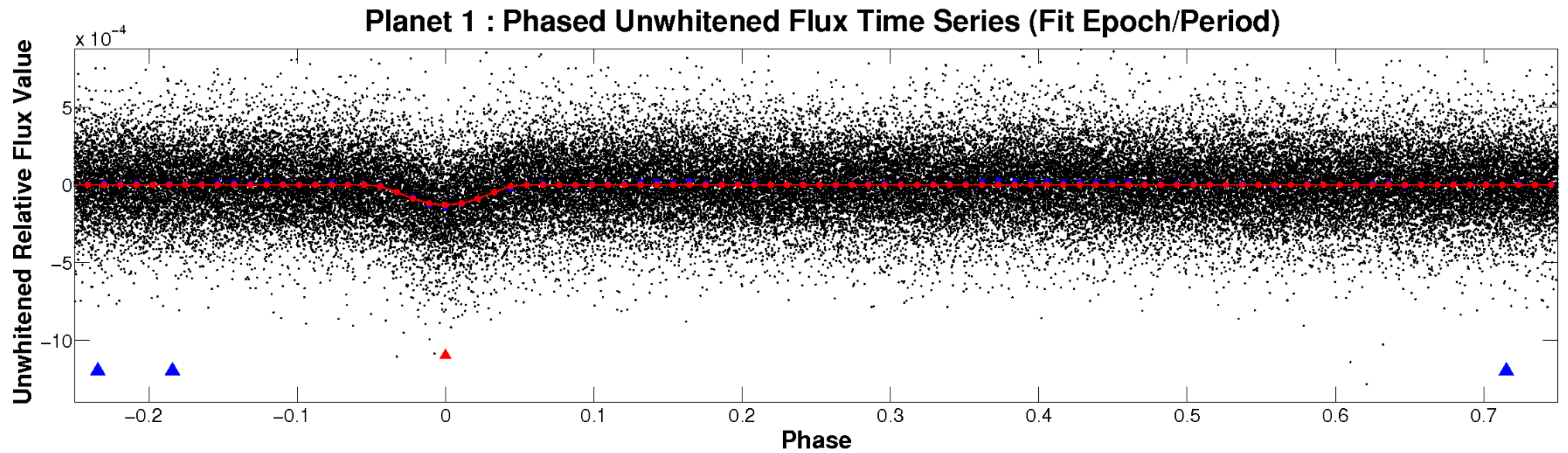


ALT Odd/Even

TCE 009115681-01

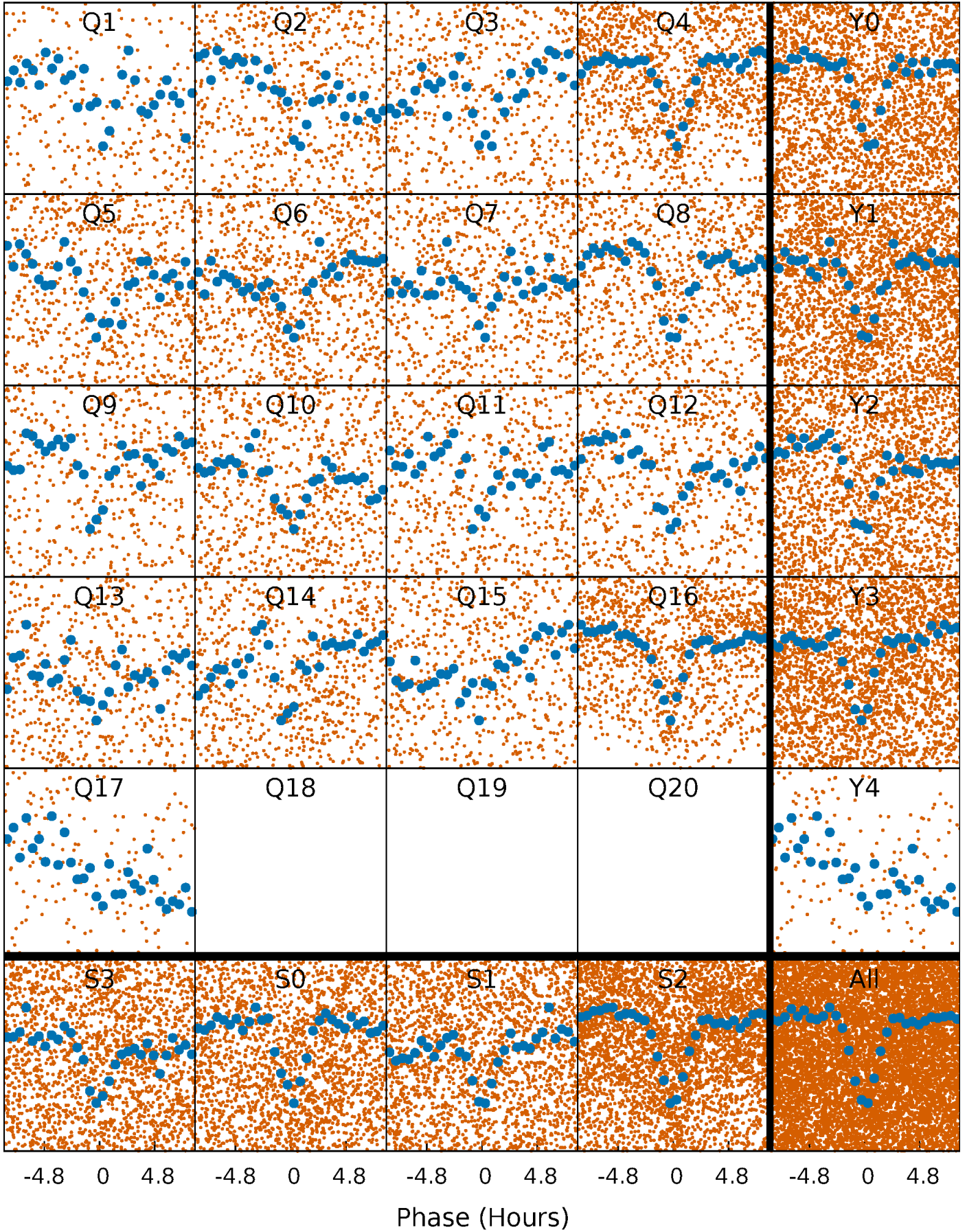


Non-Whitened Vs. Whitened Light Curve



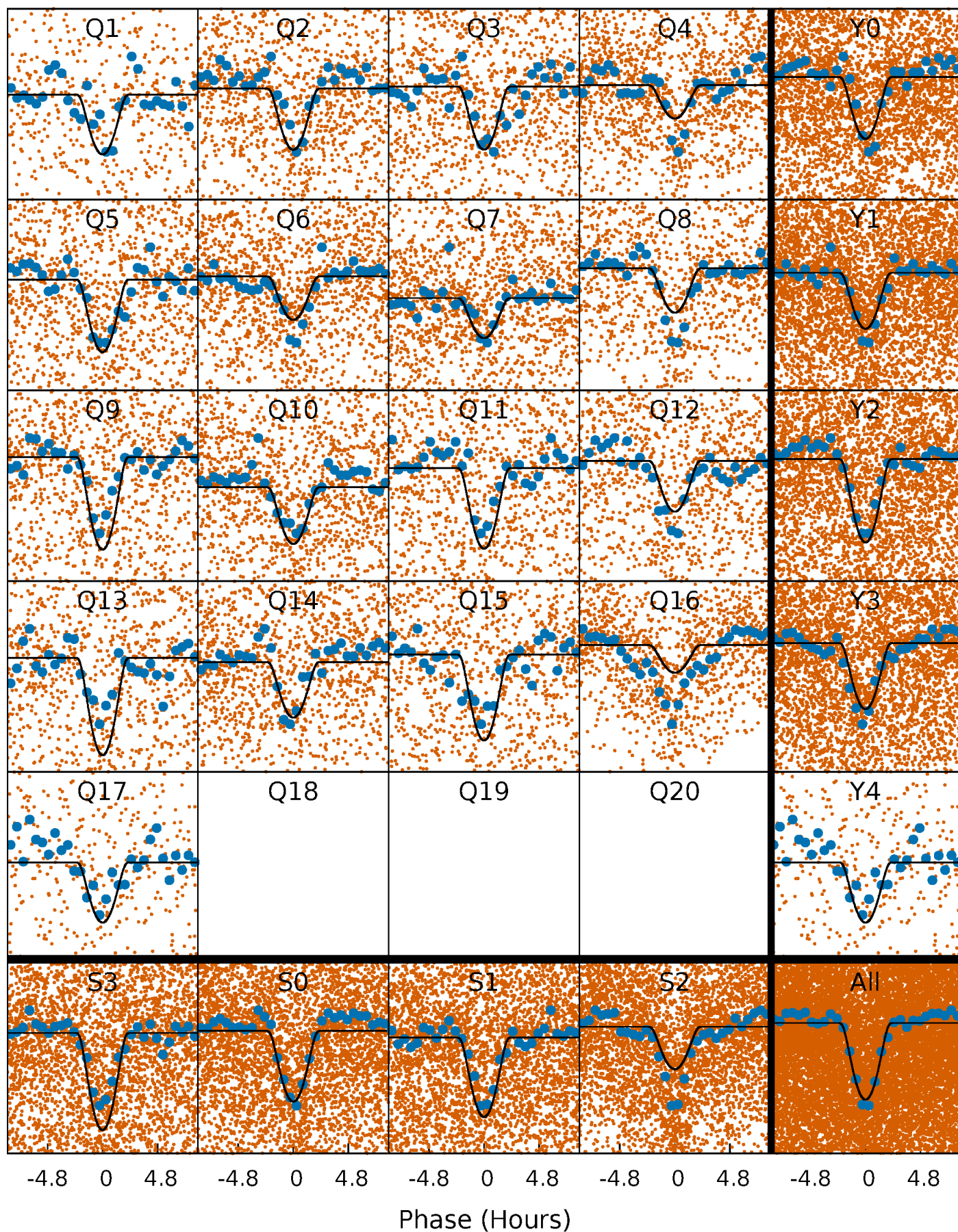
PDC Quarter-Phased Transit Curves

TCE 009115681-01 P= 1.863949 Days $T_0=132.182822$ (BKJD)



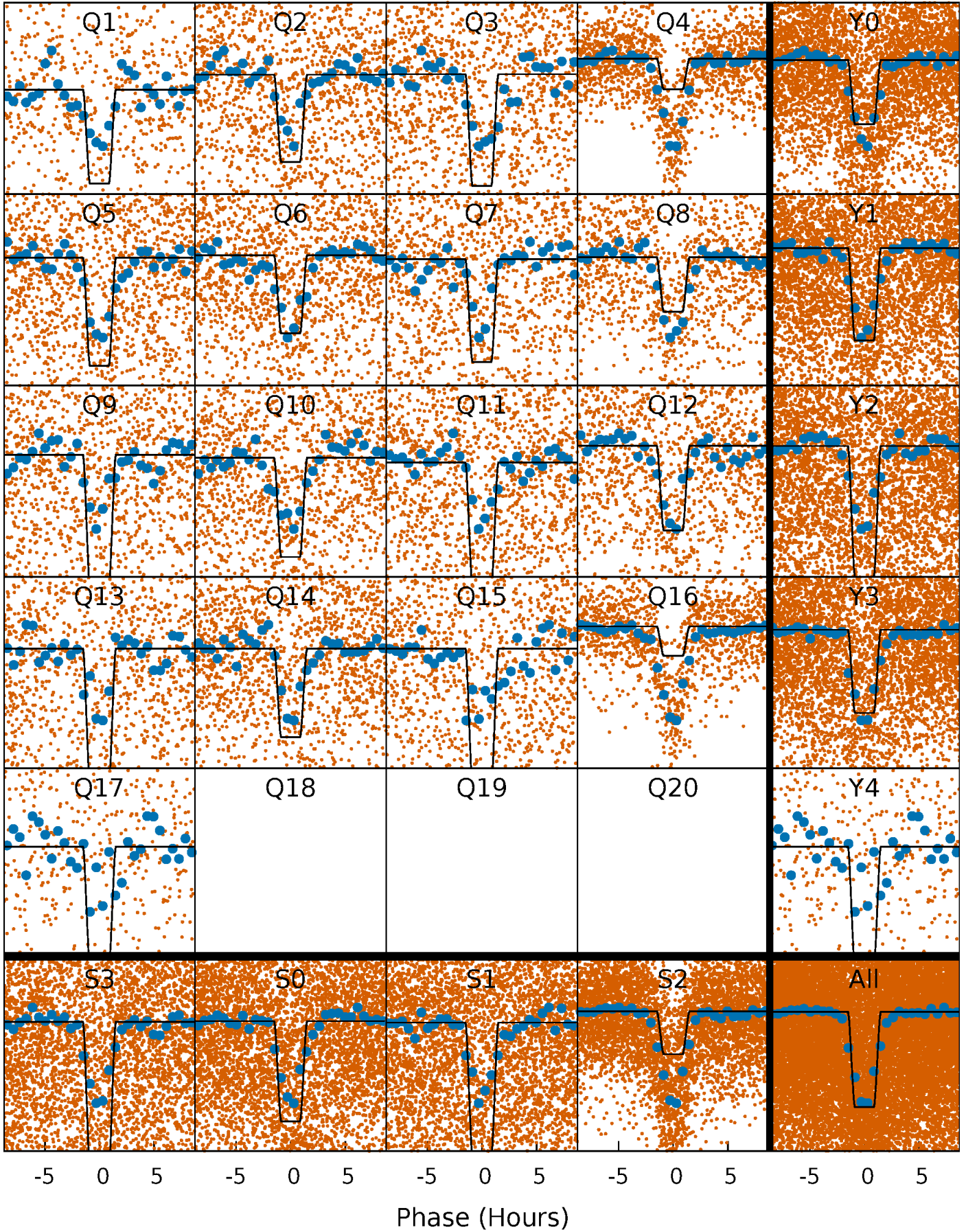
DV Quarter-Phased Transit Curves

TCE 009115681-01 P= 1.863949 Days $T_0=132.182822$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

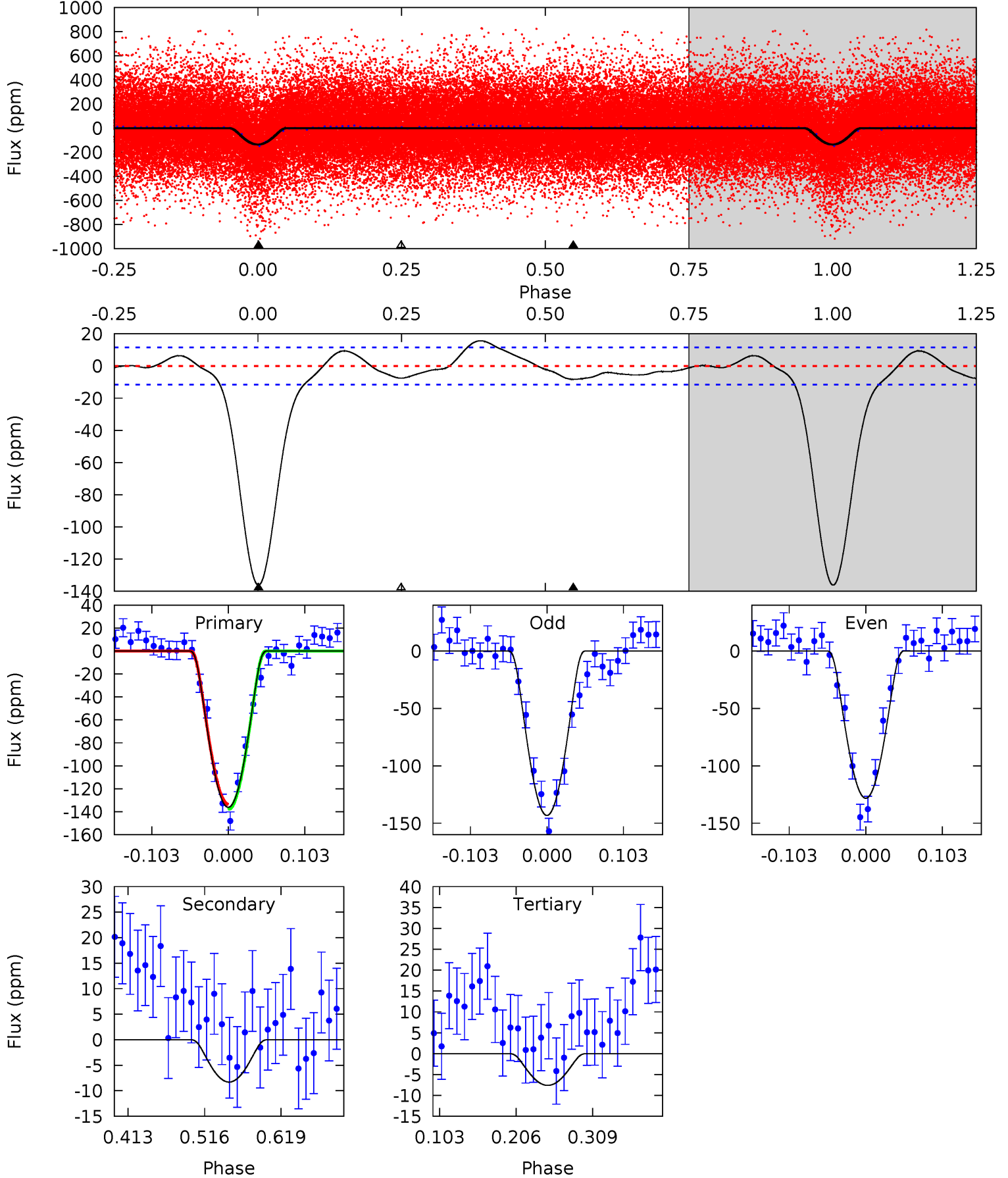
TCE 009115681-01 P= 1.863913 Days $T_0=132.196139$ (BKJD)



DV Model-Shift Uniqueness Test

009115681-01, P = 1.863949 Days, E = 130.318873 Days

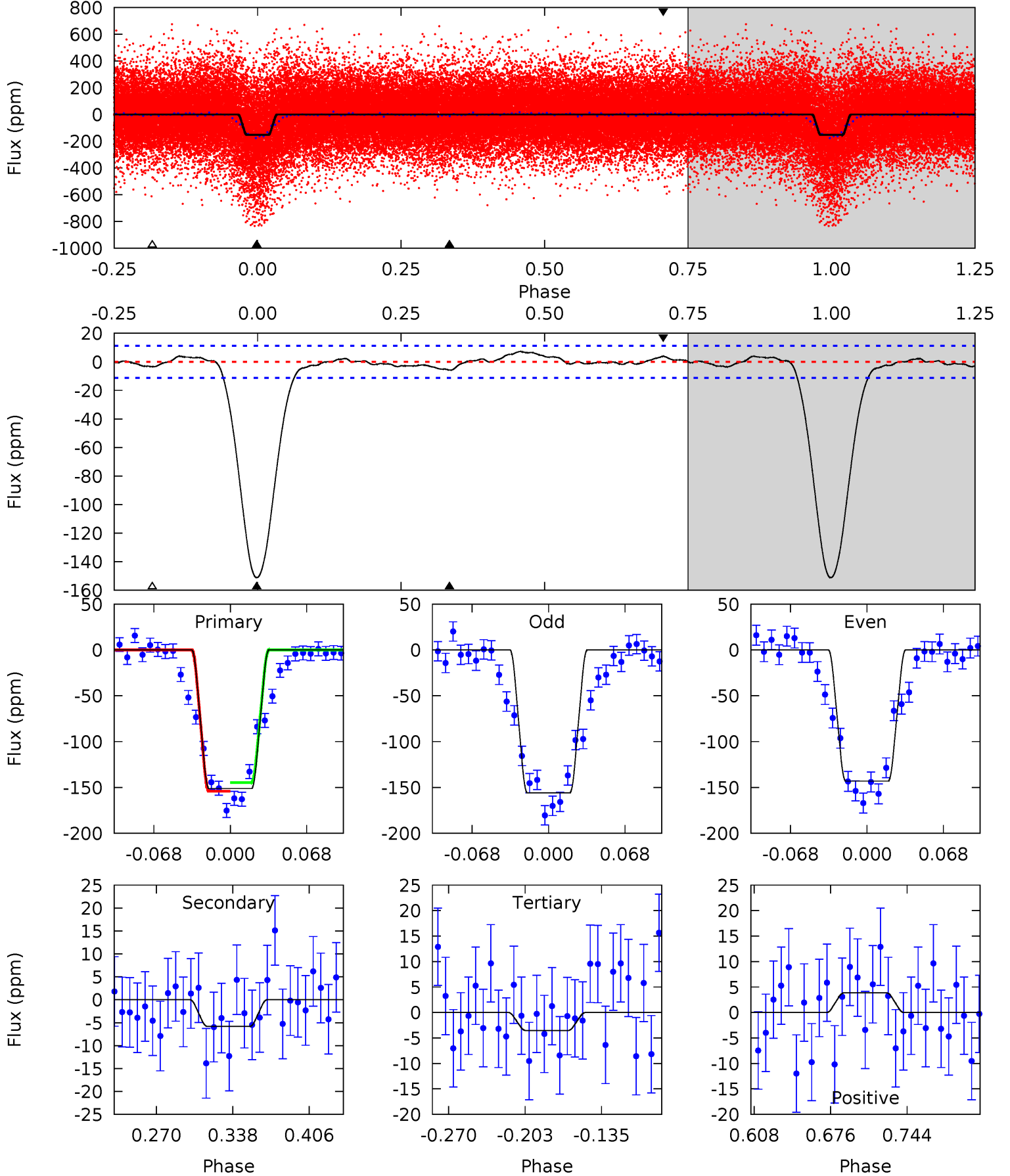
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.9	3.28	3.00	0	4.56	1.63	2.44	50.8	53.9	0.27	3.28	2.99	1.09	0.10	0.82



Alt Model-Shift Uniqueness Test

009115681-01, P = 1.863913 Days, E = 130.332226 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
62.4	2.40	1.45	1.59	4.65	1.83	1.11	61.0	60.8	0.94	0.80	2.62	1.12	0.05	1.94



Stellar Parameters For KIC 009115681

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6689^{+179}_{-219}	$3.594^{+0.336}_{-0.084}$	$-0.260^{+0.300}_{-0.250}$	$3.381^{+0.426}_{-1.278}$	$1.639^{+0.235}_{-0.382}$	$0.060^{+0.165}_{-0.013}$
	+3%/-3%	+9%/-2%	+115%/-96%	+13%/-38%	+14%/-23%	+275%/-21%
Source	PHO1	FLK73	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 009115681-01 / KOI 1865.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-8 ± 3	$7.25^{+5.35}_{-4.05}$	3954^{+238}_{-400}	-3334^{+6846}_{-328}	$0.099^{+0.449}_{-0.067}$
Alt.	-6 ± 2	$5.83^{+4.52}_{-3.55}$	3977^{+228}_{-348}	-3325^{+7215}_{-332}	$0.107^{+0.697}_{-0.077}$

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 $A_{obs} \gg 1.0$

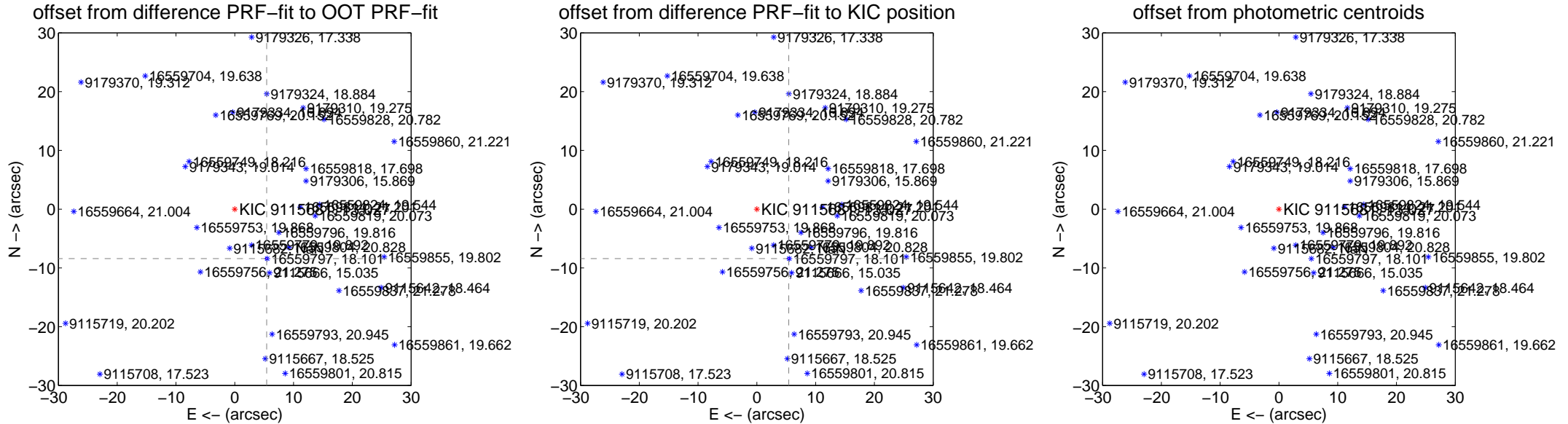
DV Centroid Data

Supplemental centroid analysis for 009115681-01. Kepler magnitude: 13.03. Transit SNR 29.23

There are 12 quarters with good PRF difference image offsets

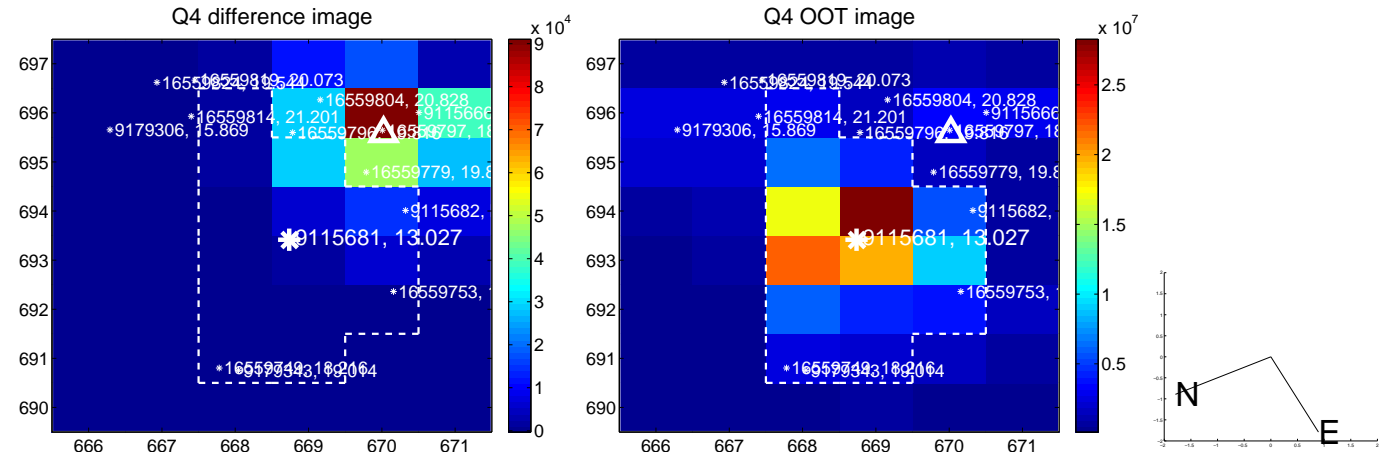
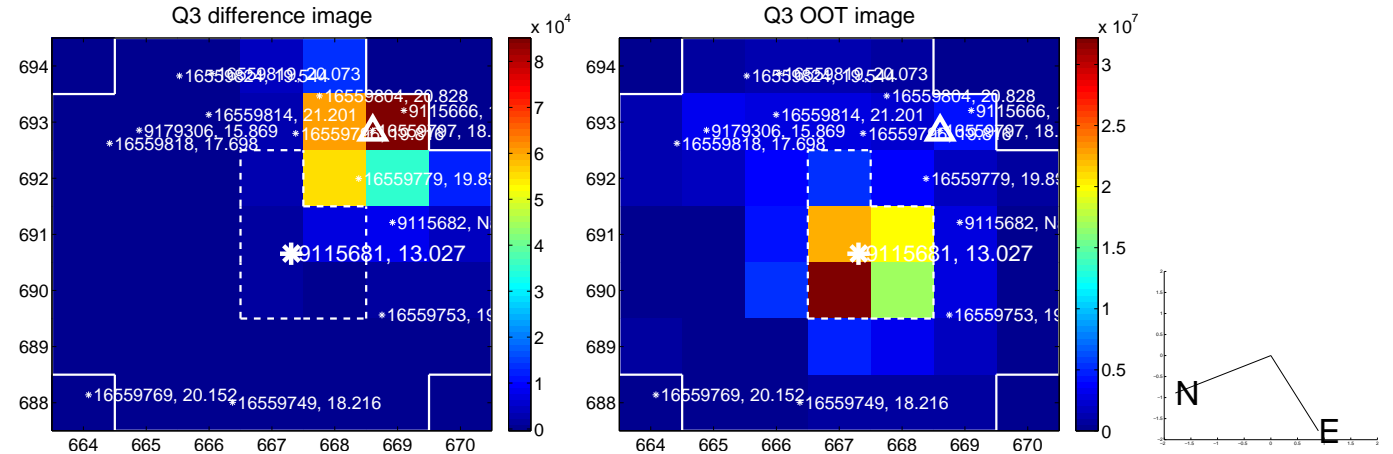
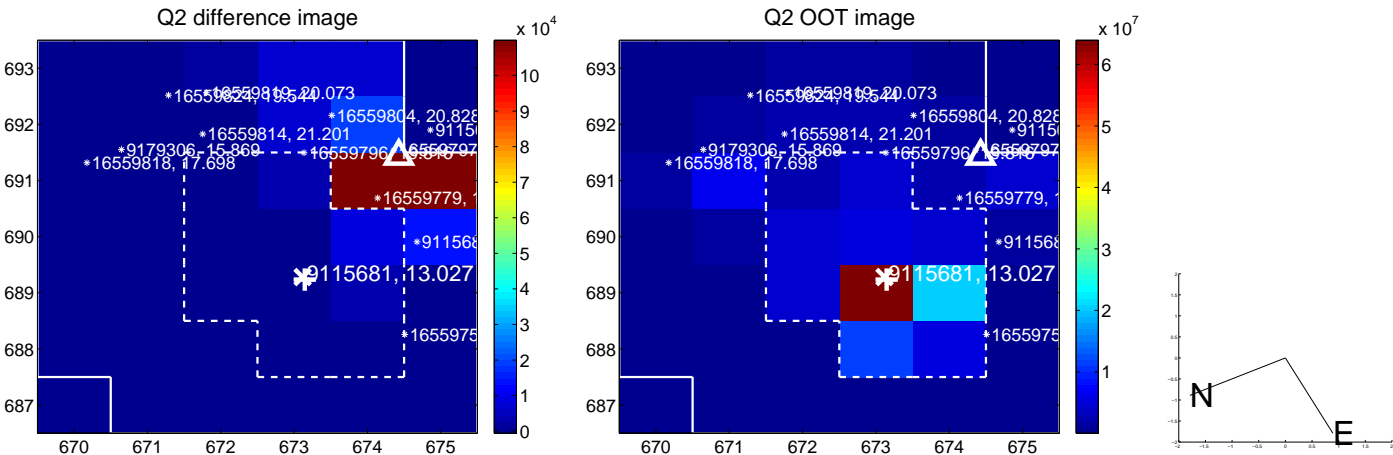
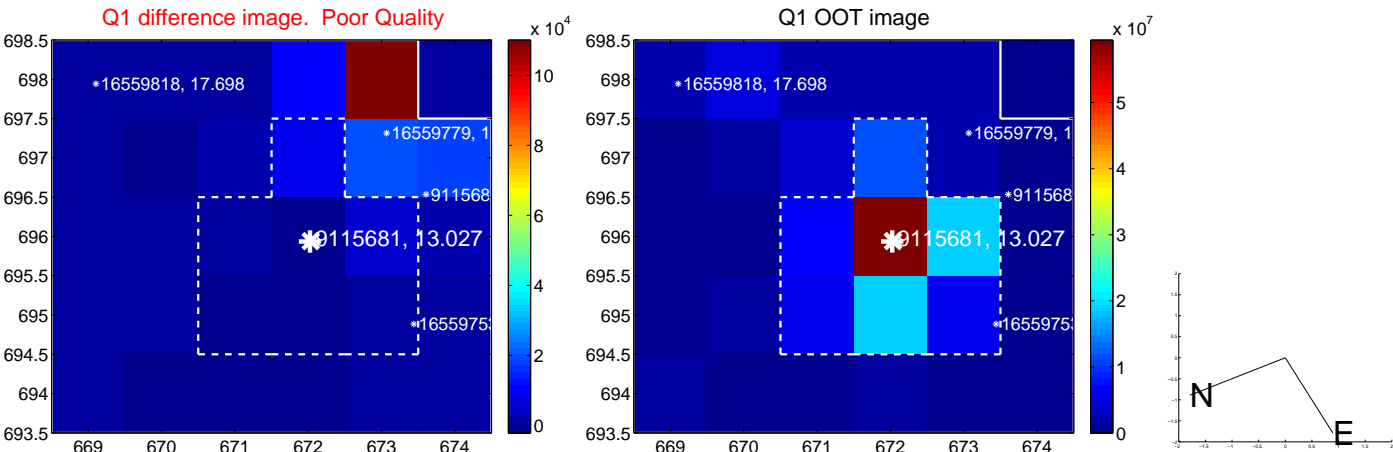
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	10.006 \pm 0.068	147.43	-5.427 \pm 0.068	-8.407 \pm 0.068
PRF-fit source offset from KIC position	10.010 \pm 0.068	147.03	-5.433 \pm 0.071	-8.407 \pm 0.067
photometric centroid source offset	81.26 \pm 0.29	281.99	-43.40 \pm 0.33	-68.70 \pm 0.27

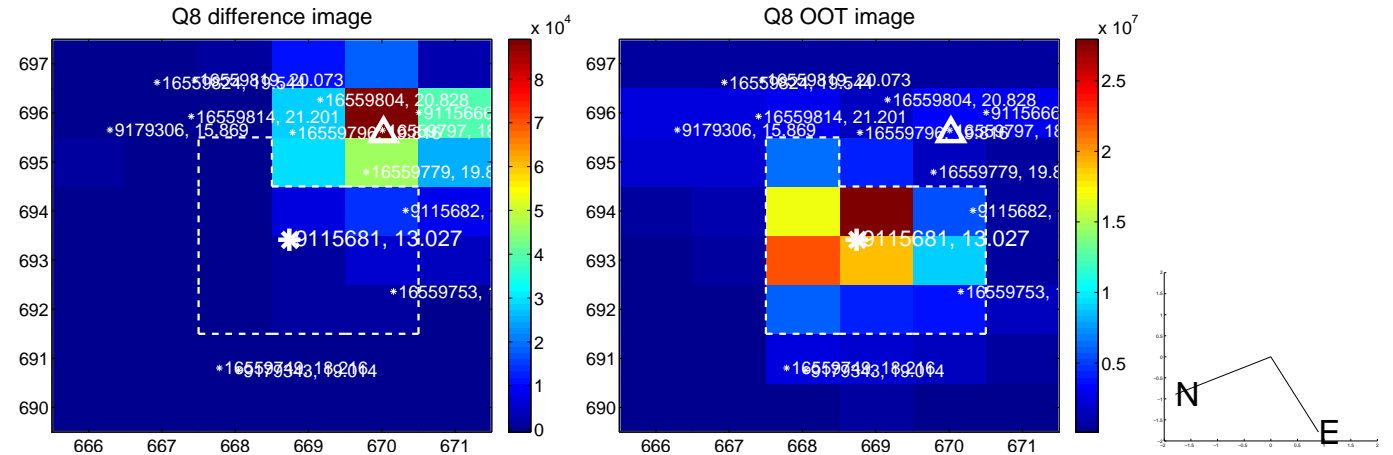
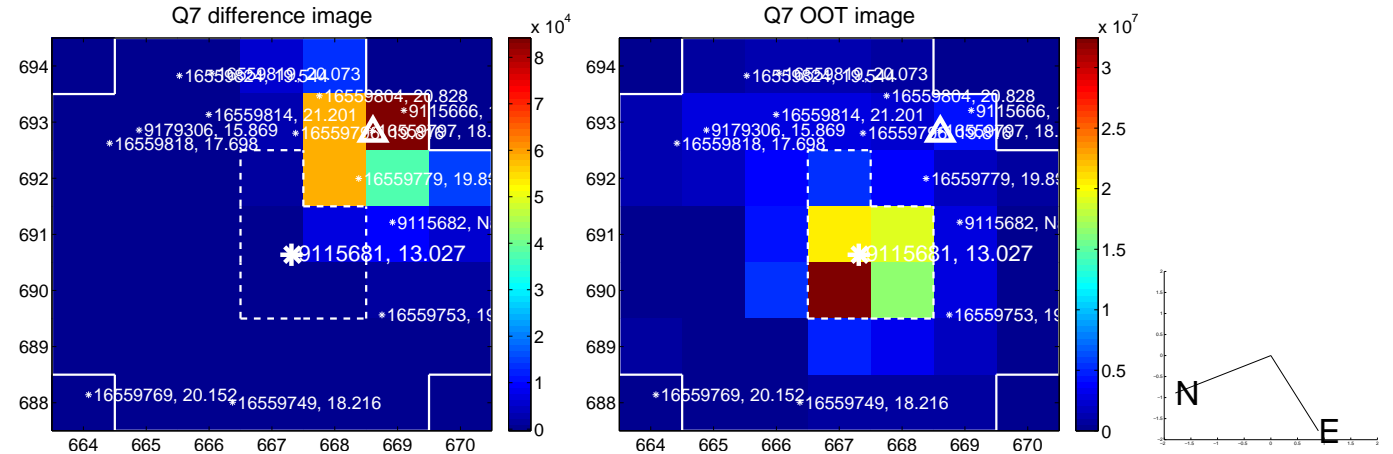
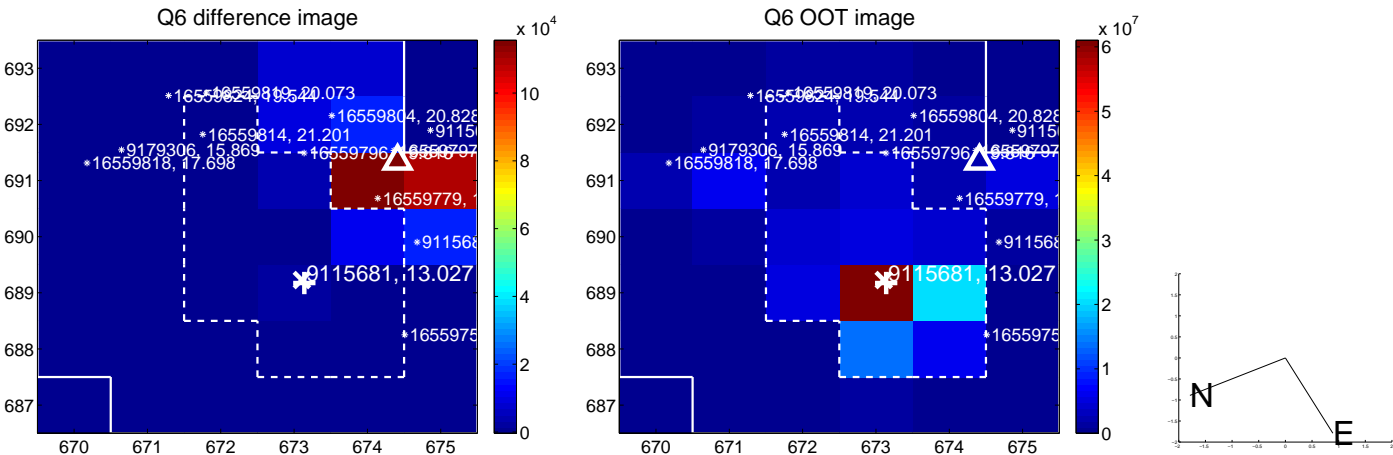
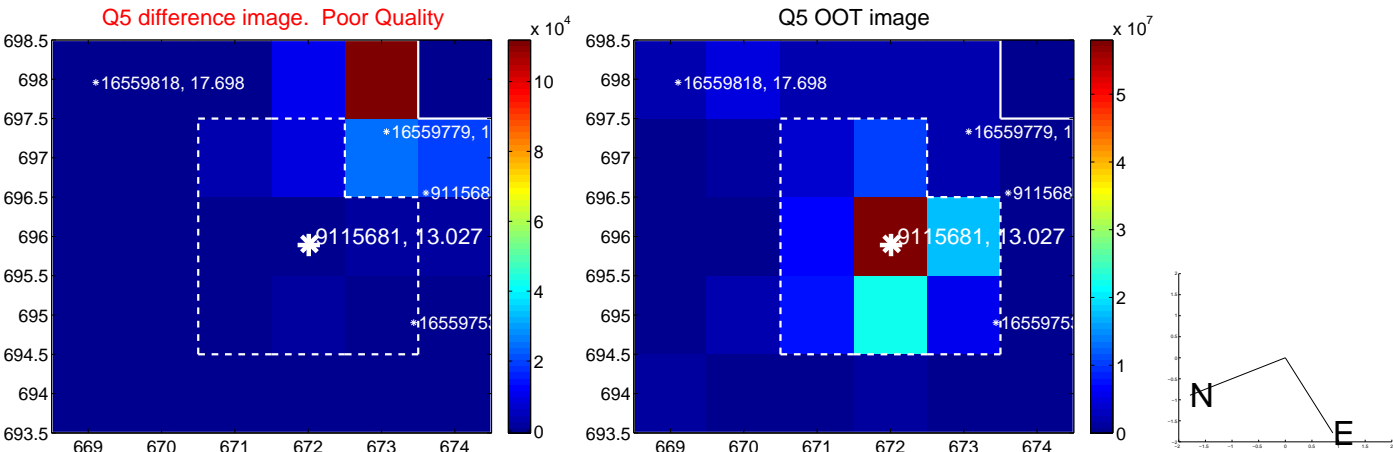


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

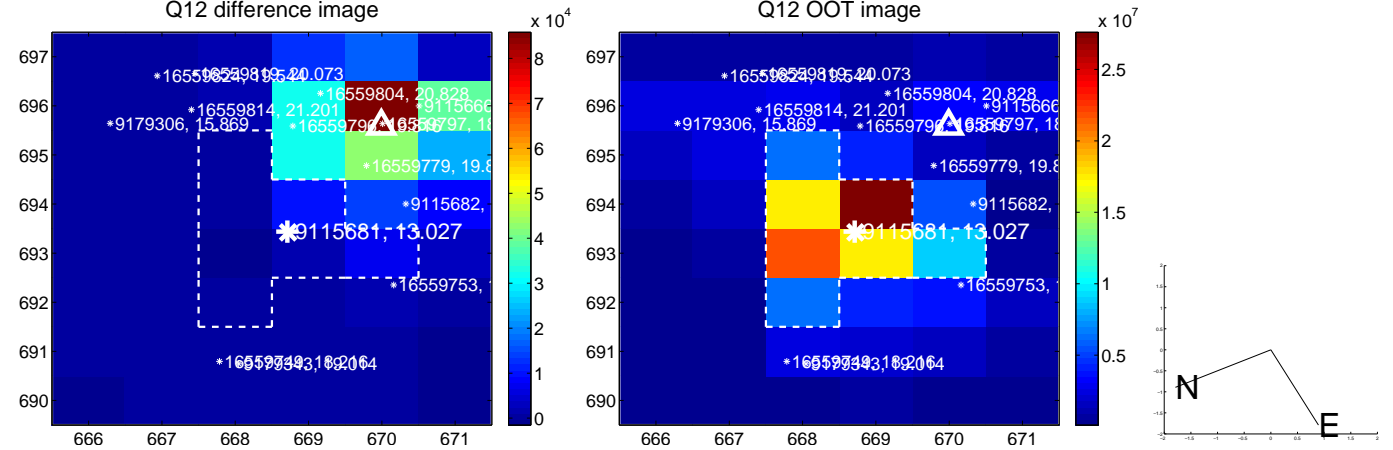
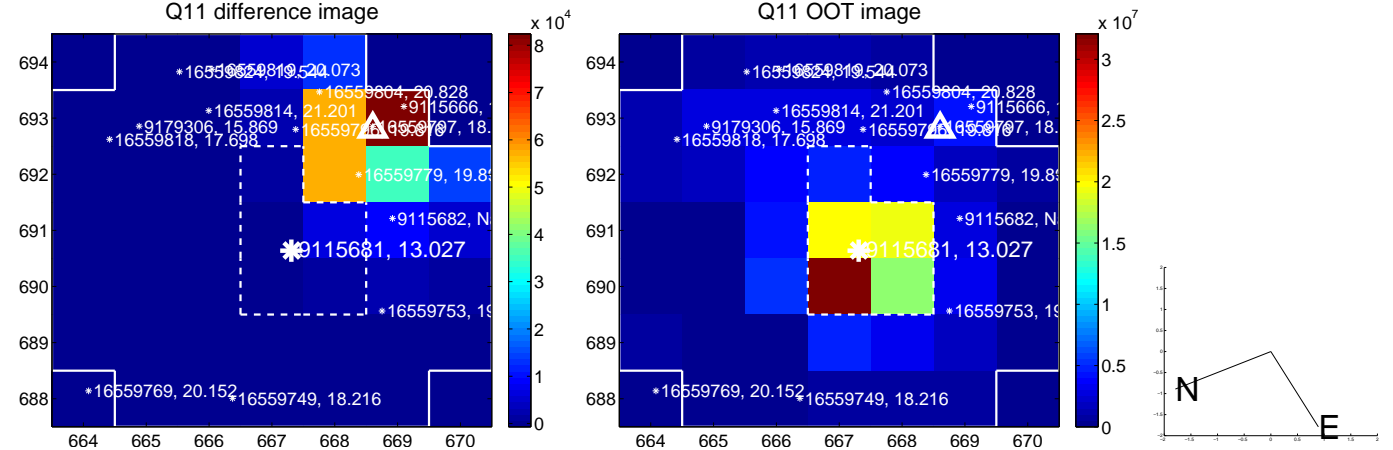
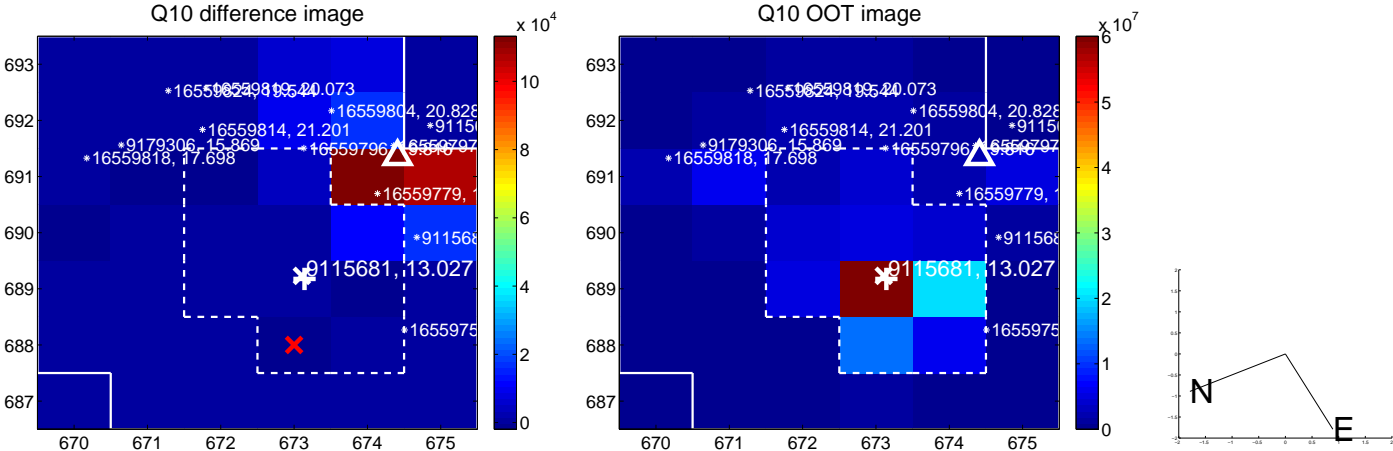
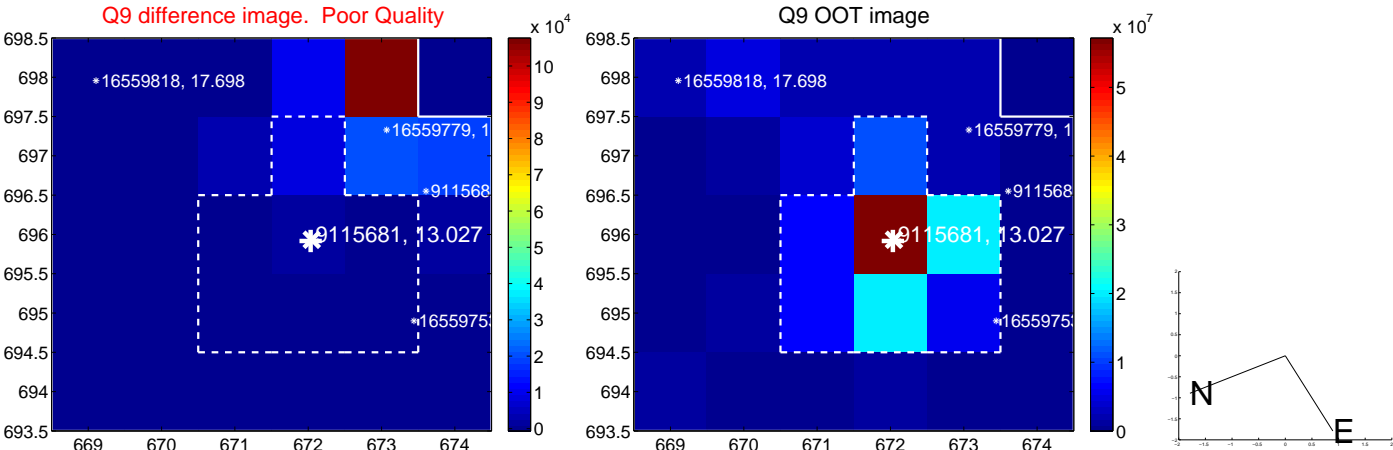
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



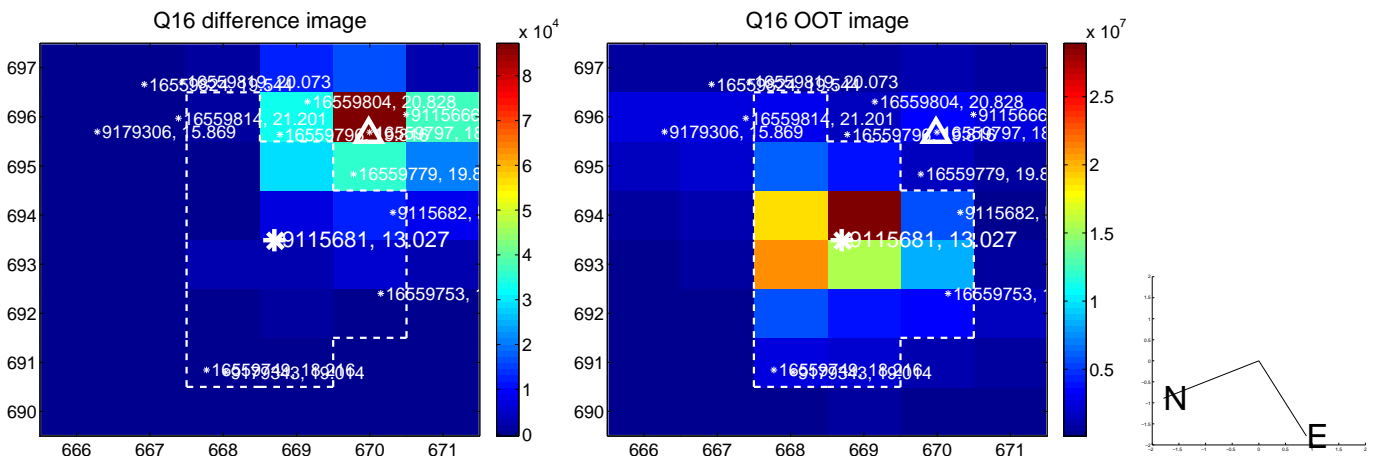
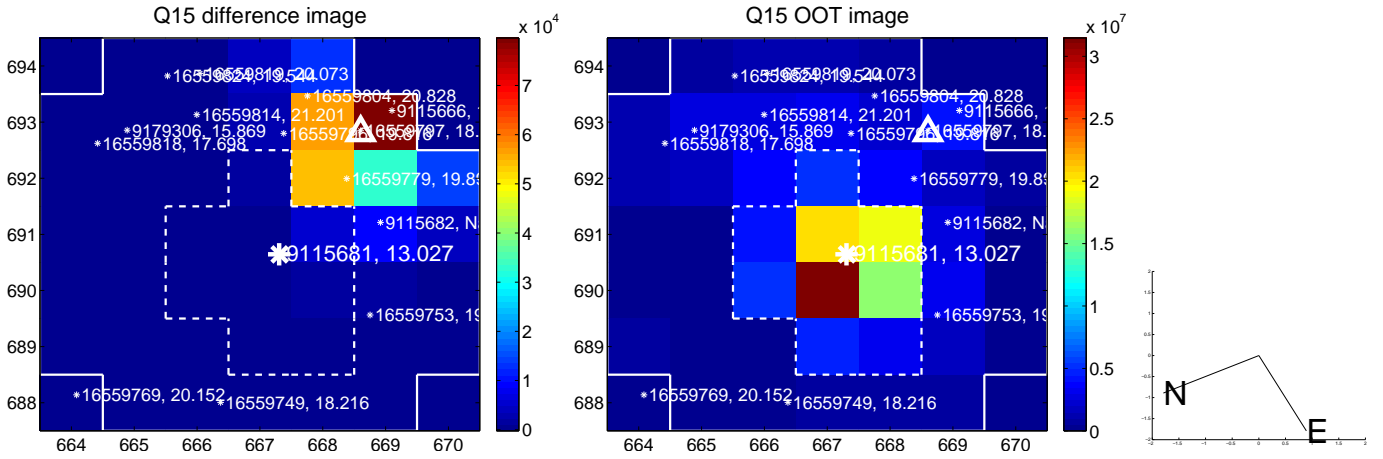
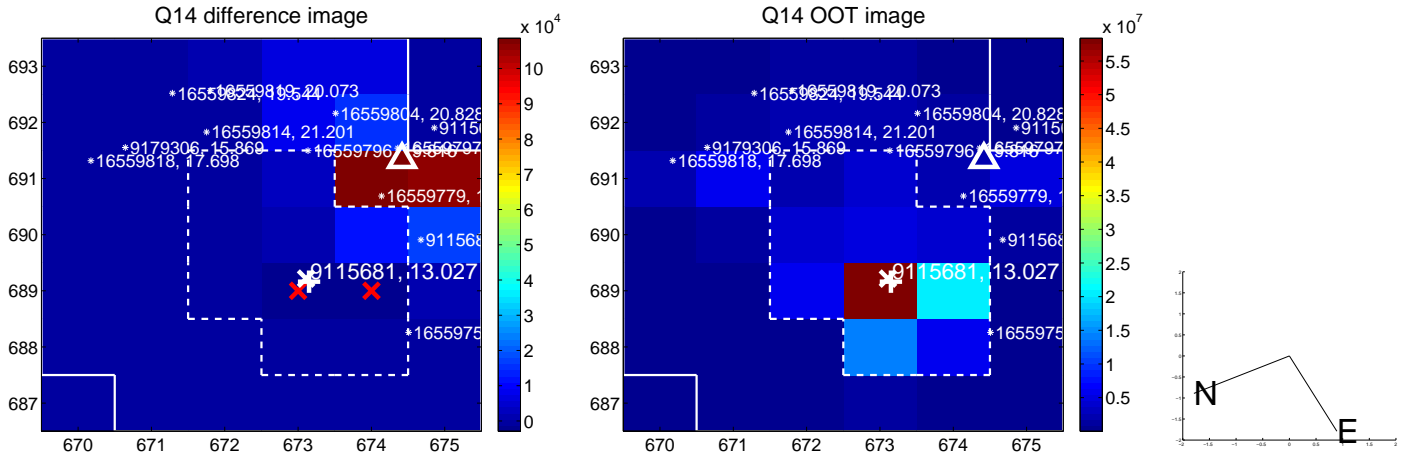
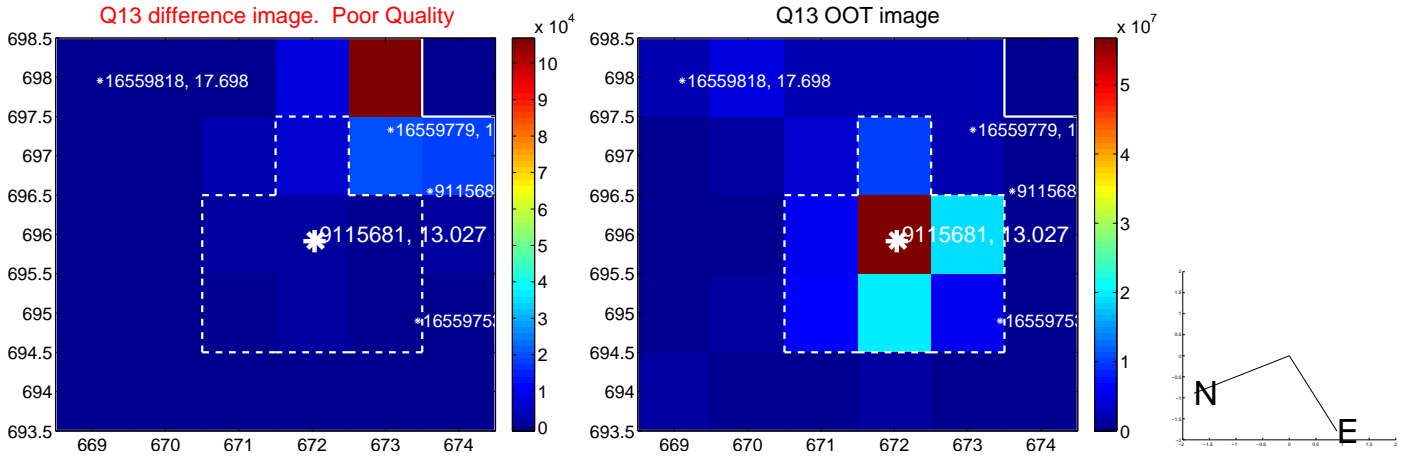
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



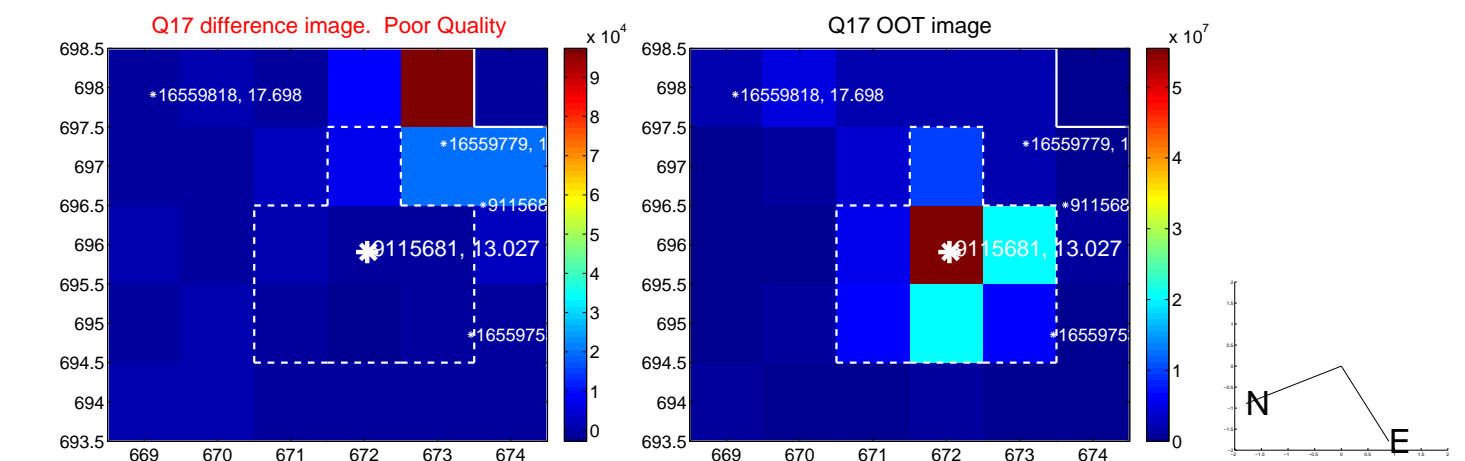
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



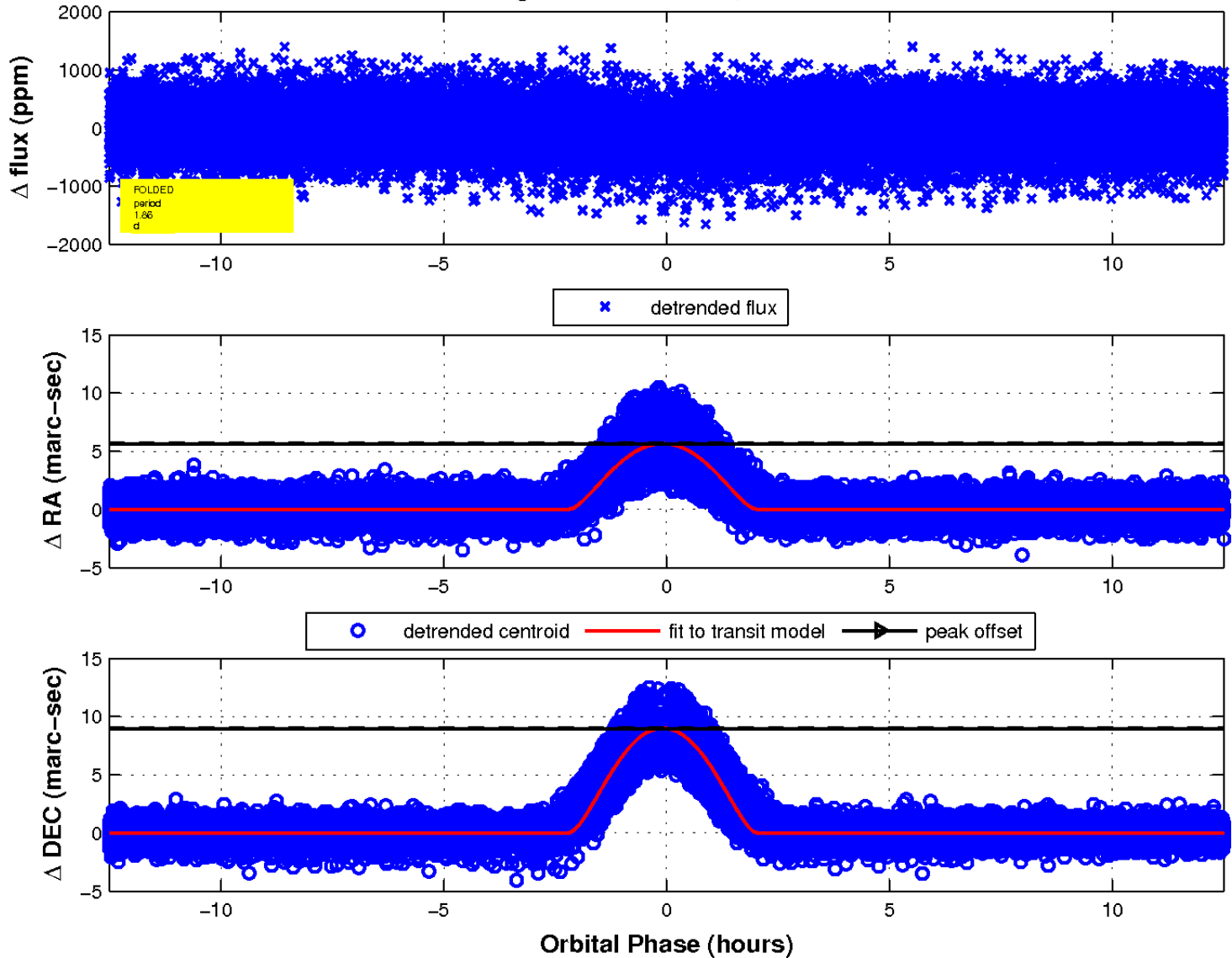
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

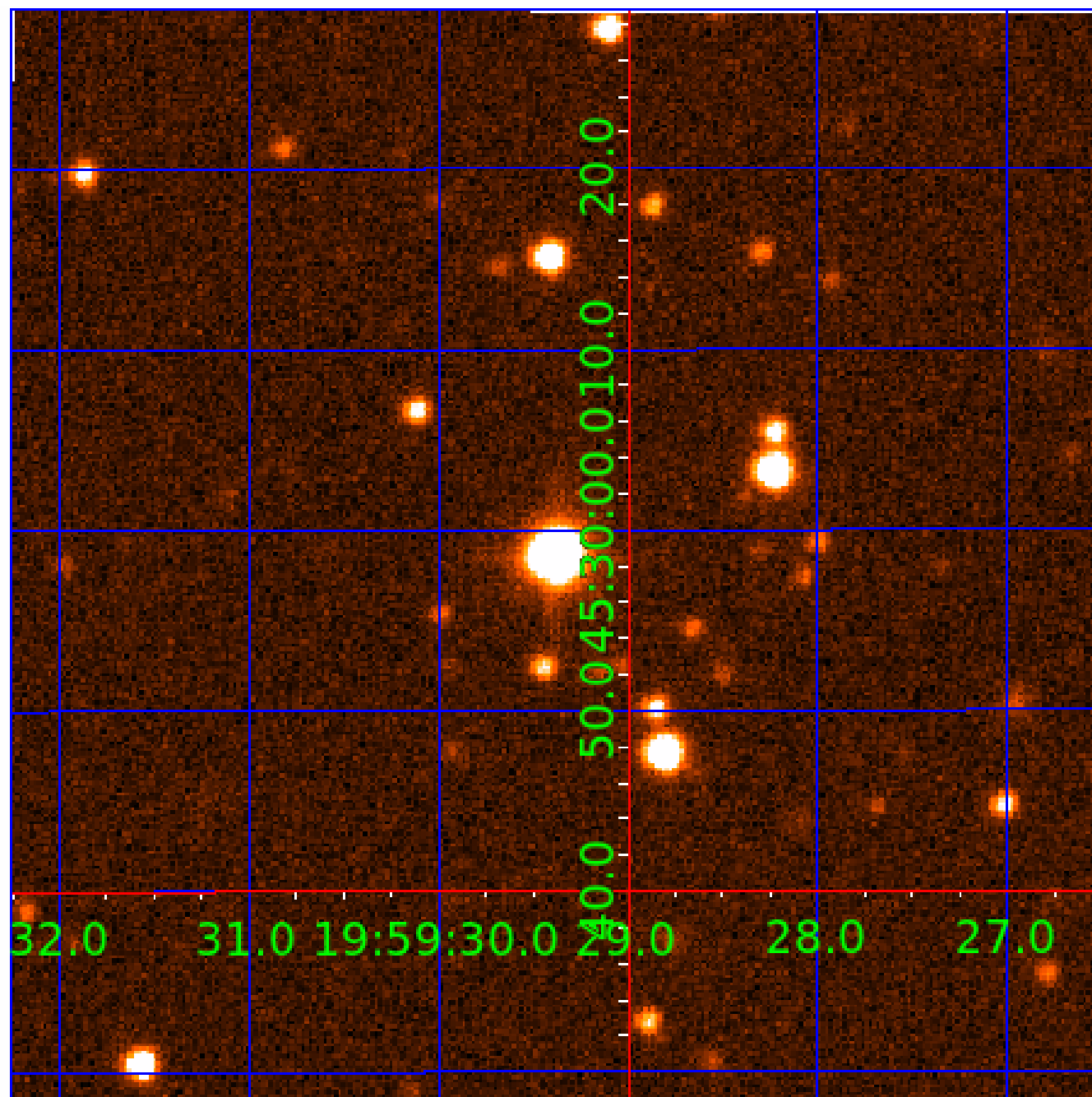


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009115681

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

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009115681-01	OBS	FP	0.00	0	0	1	0	CENT_RESOLVED_OFFSET—HALO_GHOST
009115681-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

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

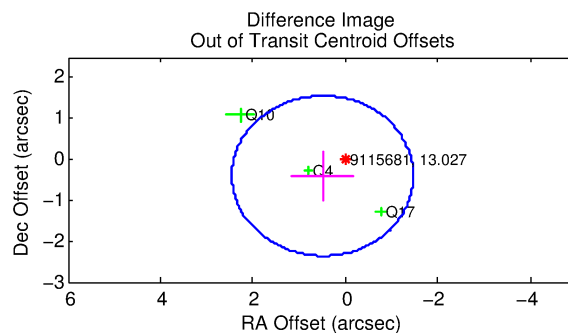
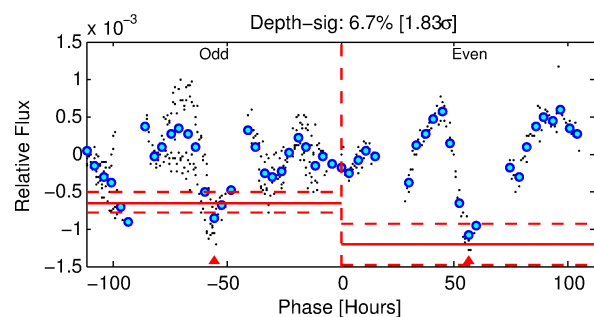
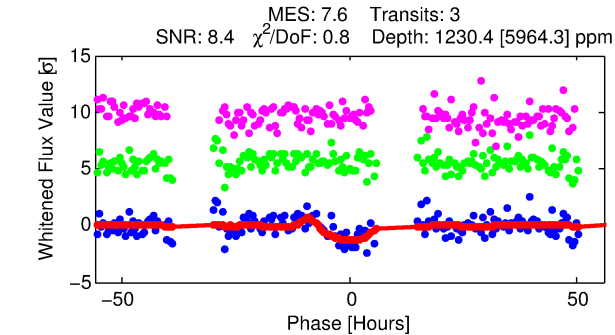
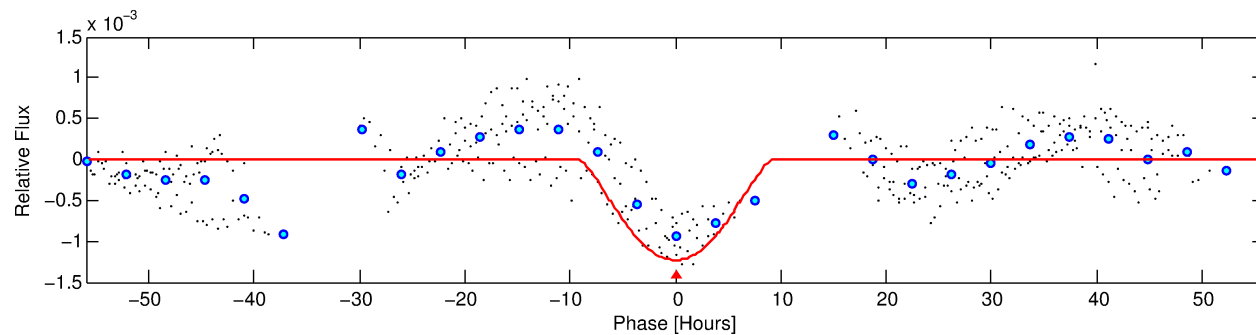
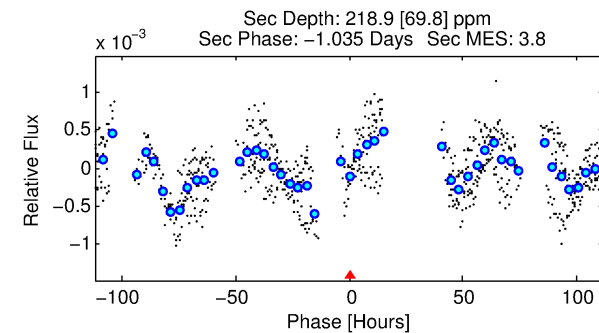
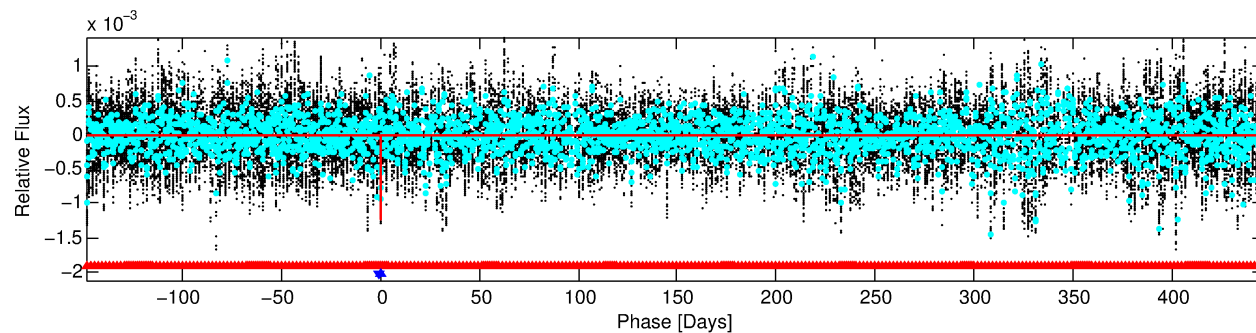
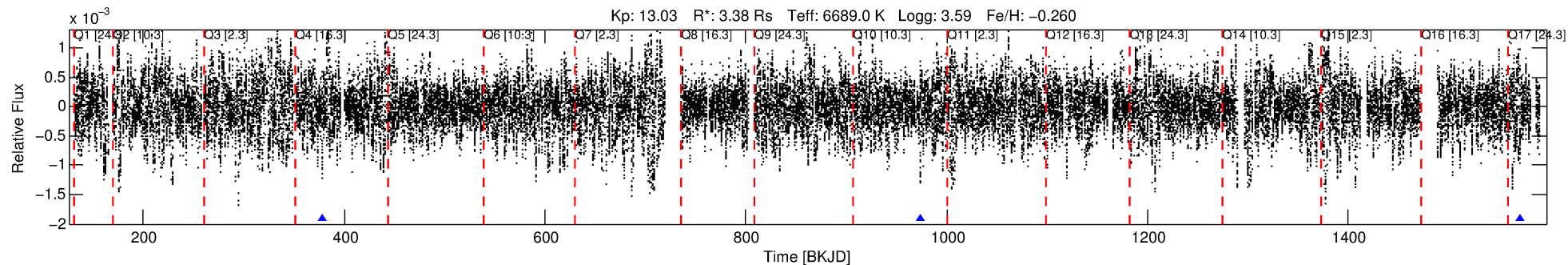
Ephemeris Match Information For 009115681-02

No Significant Match Found

DV One-Page Summary

KIC: 9115681 Candidate: 2 of 2 Period: 596.370 d
KOI: K01865 Corr: No Ephemeris Match

Kp: 13.03 R*: 3.38 Rs Teff: 6689.0 K Logg: 3.59 Fe/H: -0.260



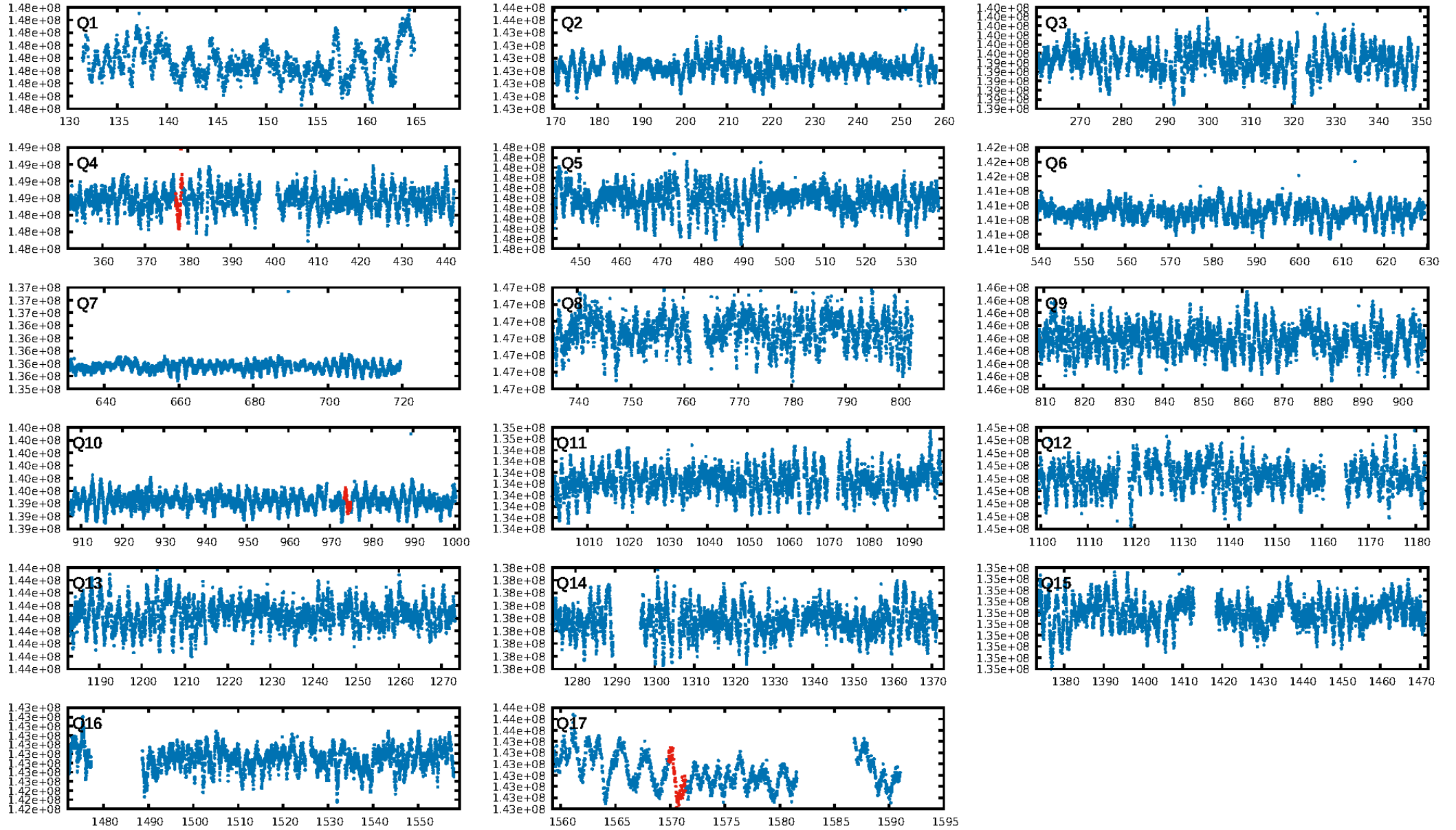
DV Fit Results:

Period = 596.36984 [0.02385] d
Epoch = 377.8810 [0.0447] BKJD
Rp/R* = 0.0600 [0.0712]
a/R* = 85.83 [25.24]
b = 1.00 [0.10]
Seff = 7.67 [4.52]
Teff = 424 [62] K
Rp = 22.12 [27.58] Re
a = 1.6346 [0.5894] AU
Ag = 657.54 [1621.48] [0.40 σ]
Teffp = 3323 [1995] K [1.45 σ]

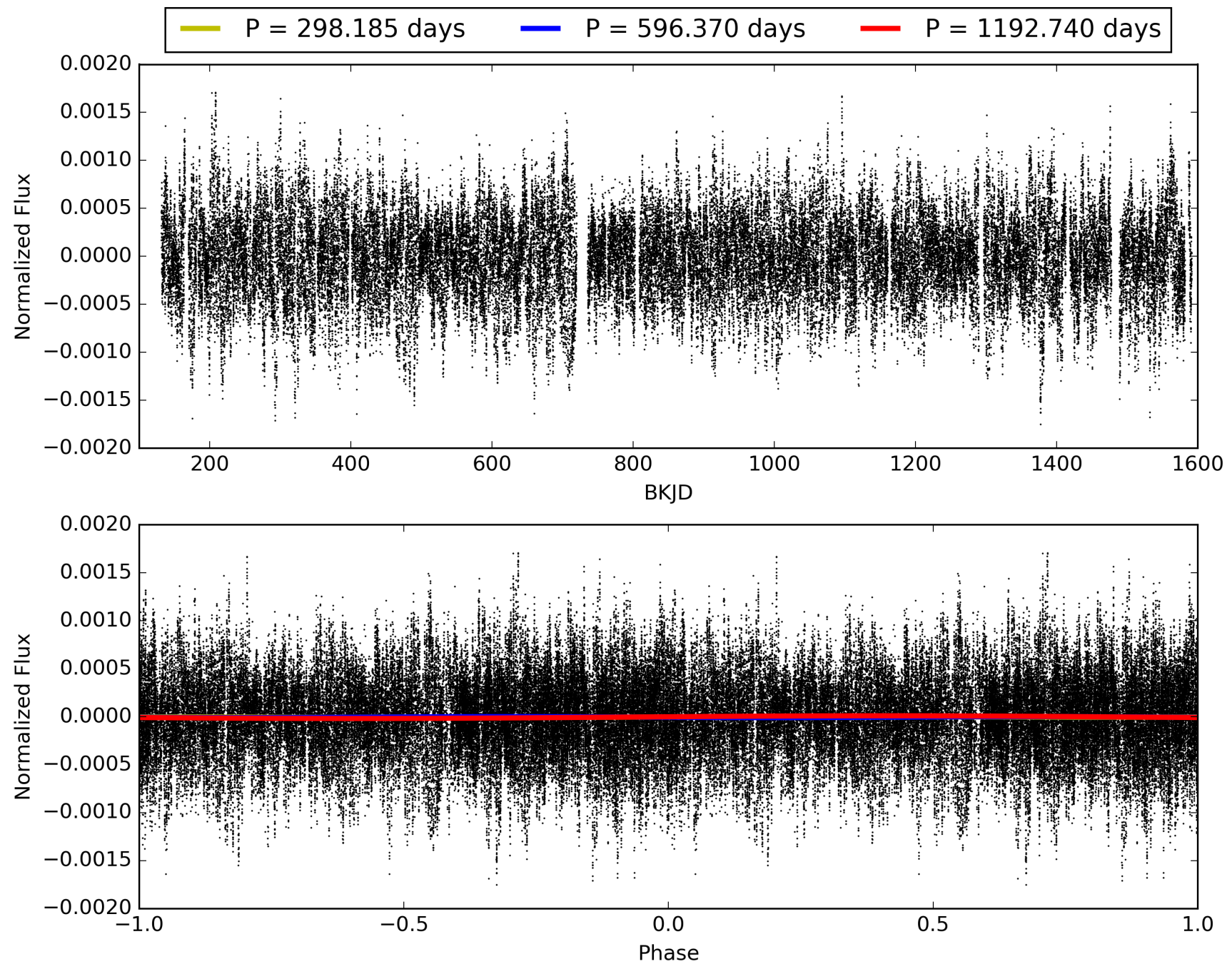
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [746.39 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 9.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 7.71e-10
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -0.6514
Centroid-sig: 15.1%
Centroid-so: 0.261 arcsec [0.73 σ]
OotOffset-rm: 0.639 arcsec [0.98 σ]
KicOffset-rm: 0.628 arcsec [0.95 σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/3]

TCE 009115681-02, PDC Light Curves

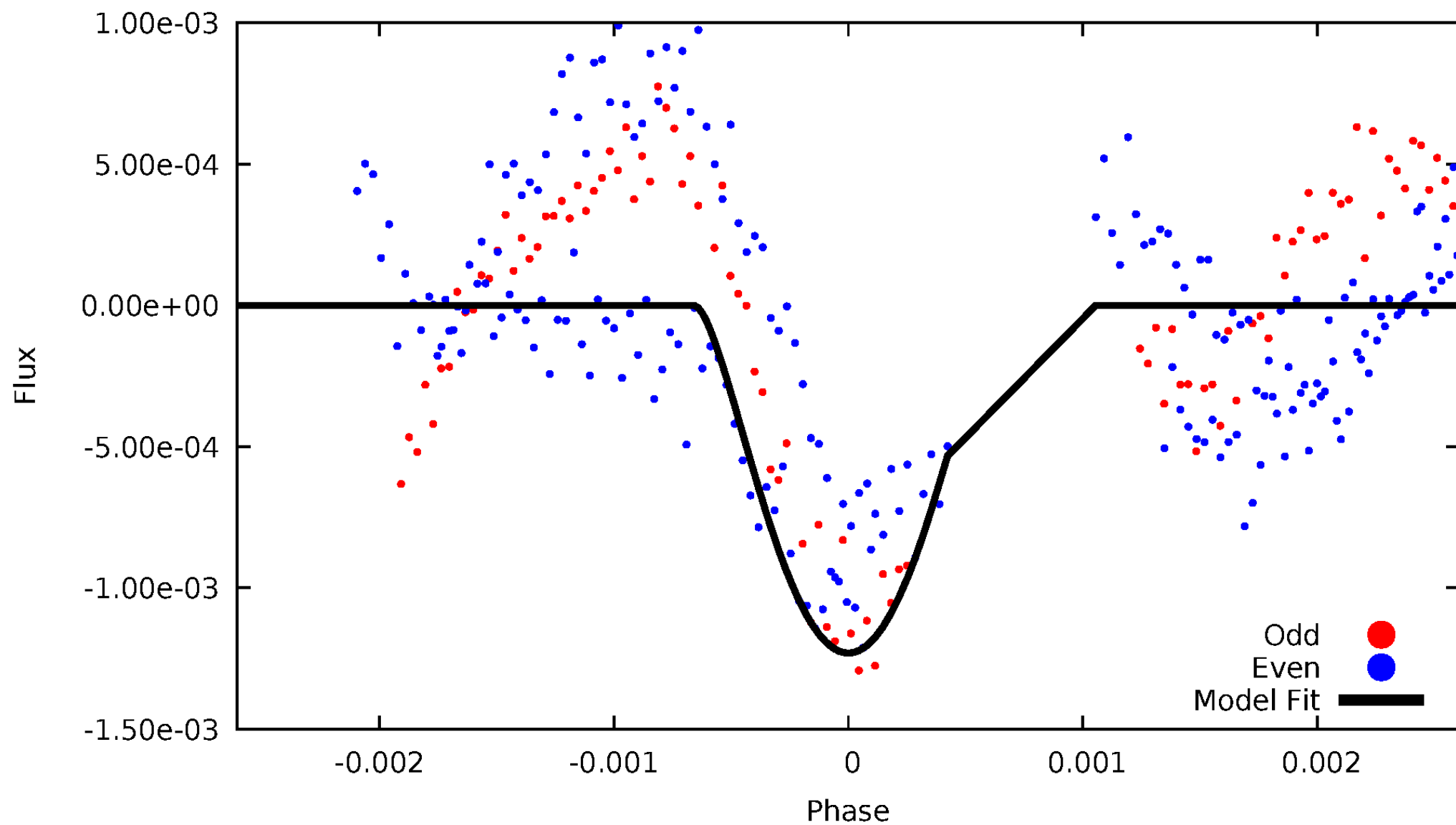


TCE 009115681-02



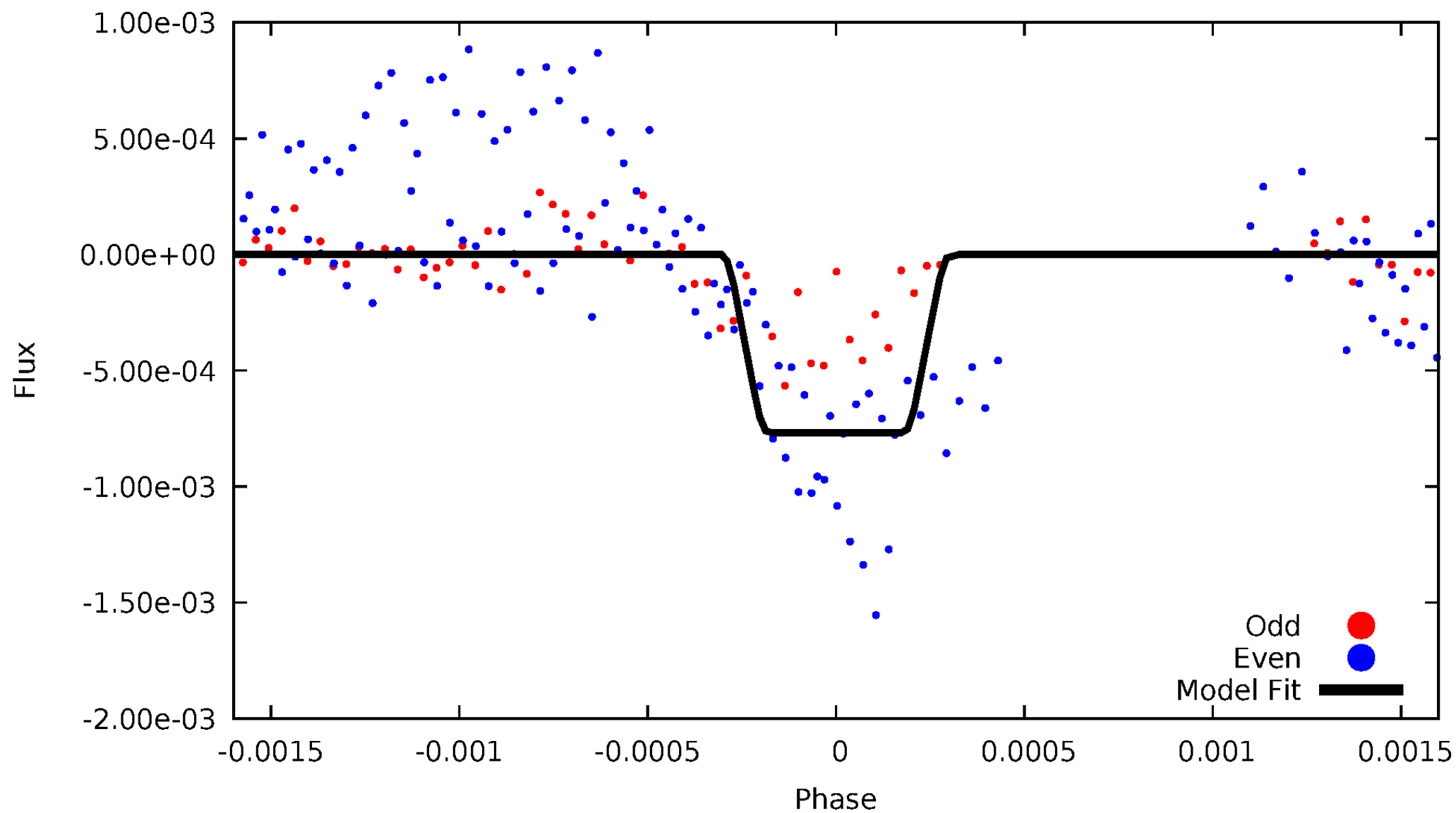
DV Odd/Even

TCE 009115681-02



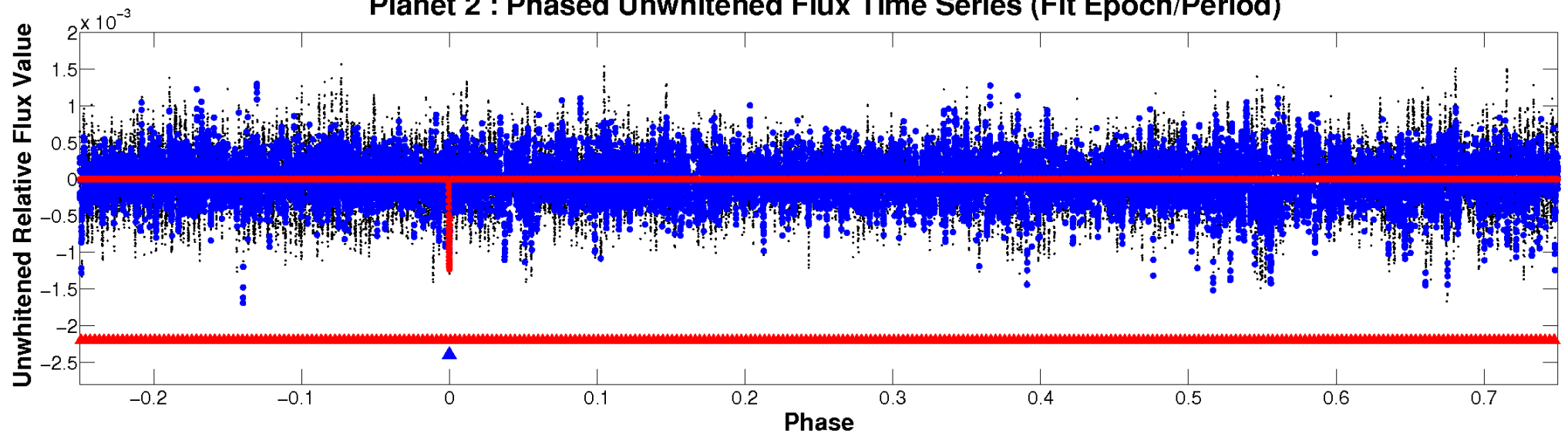
ALT Odd/Even

TCE 009115681-02

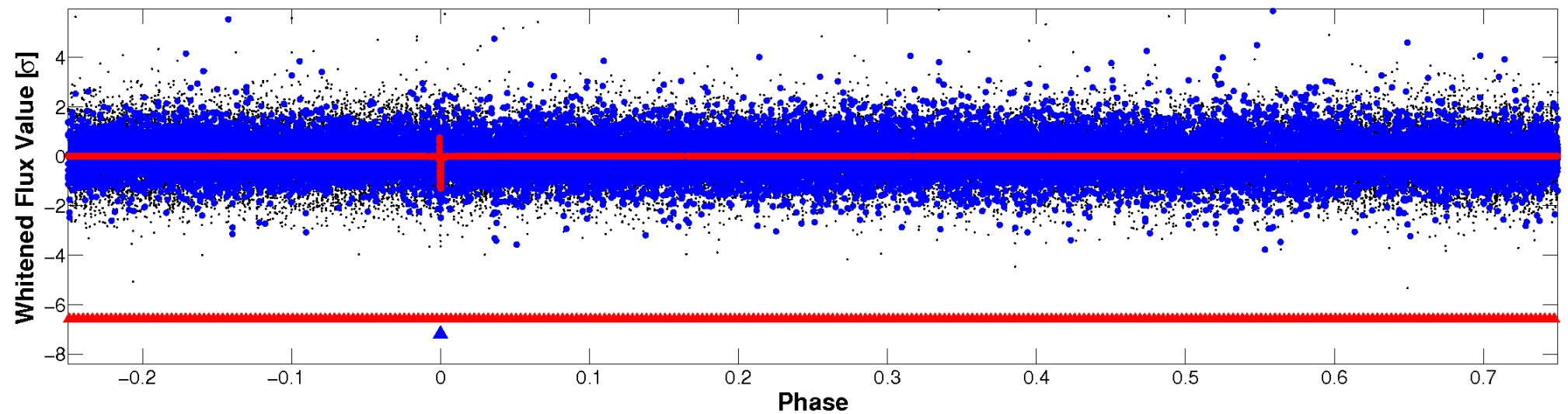


Non-Whitened Vs. Whitened Light Curve

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

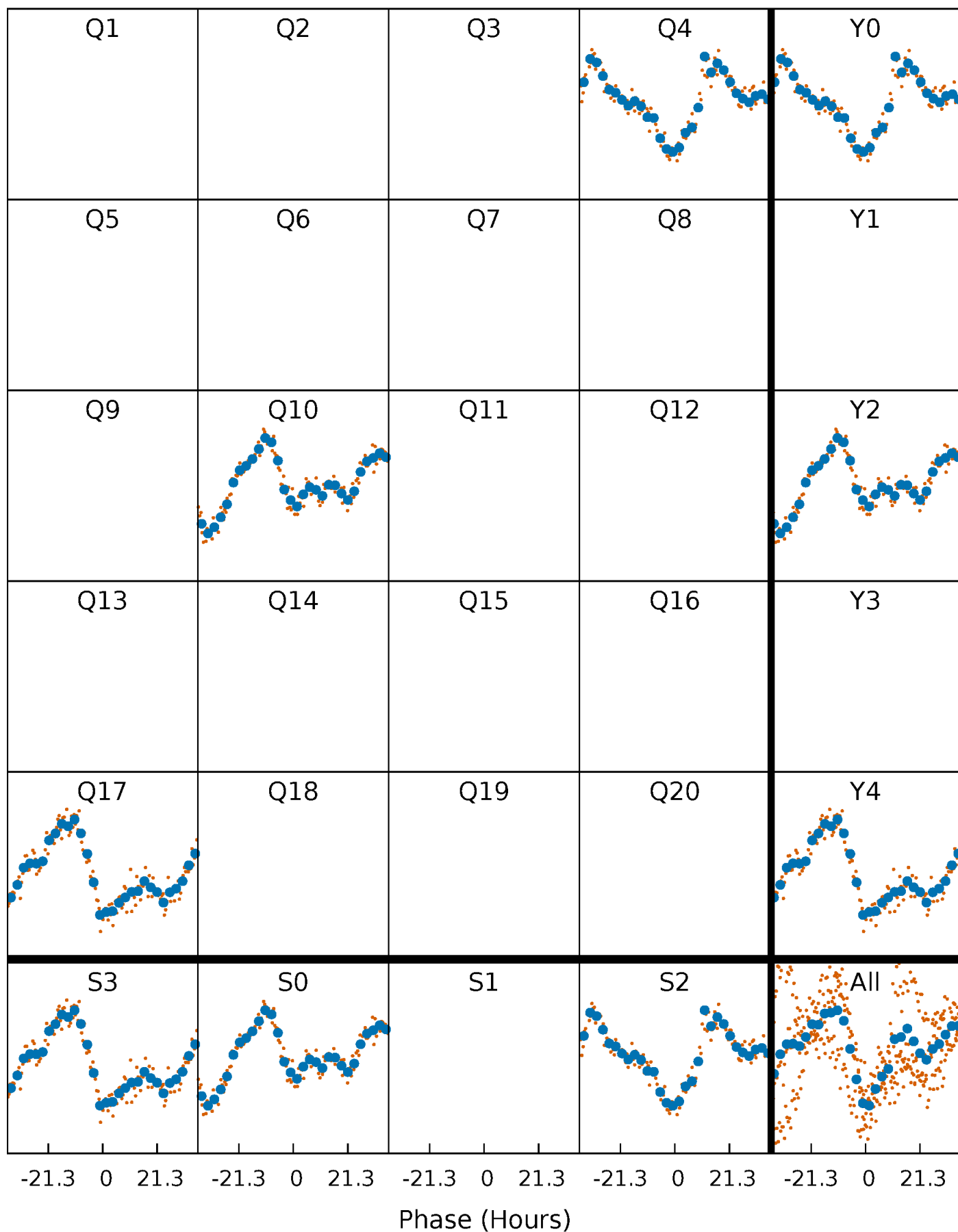


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



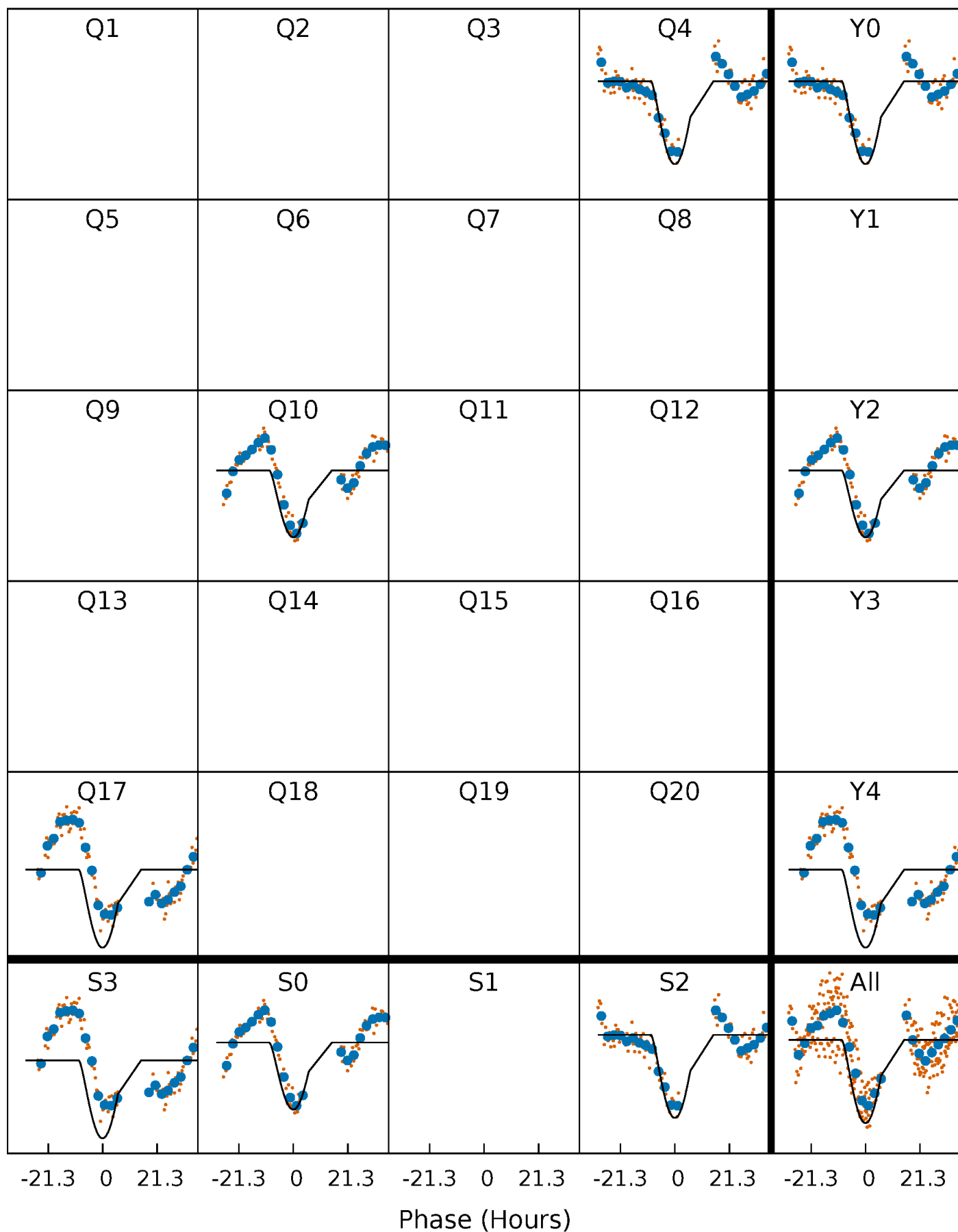
PDC Quarter-Phased Transit Curves

TCE 009115681-02 $P=596.369835$ Days $T_0=377.881014$ (BKJD)



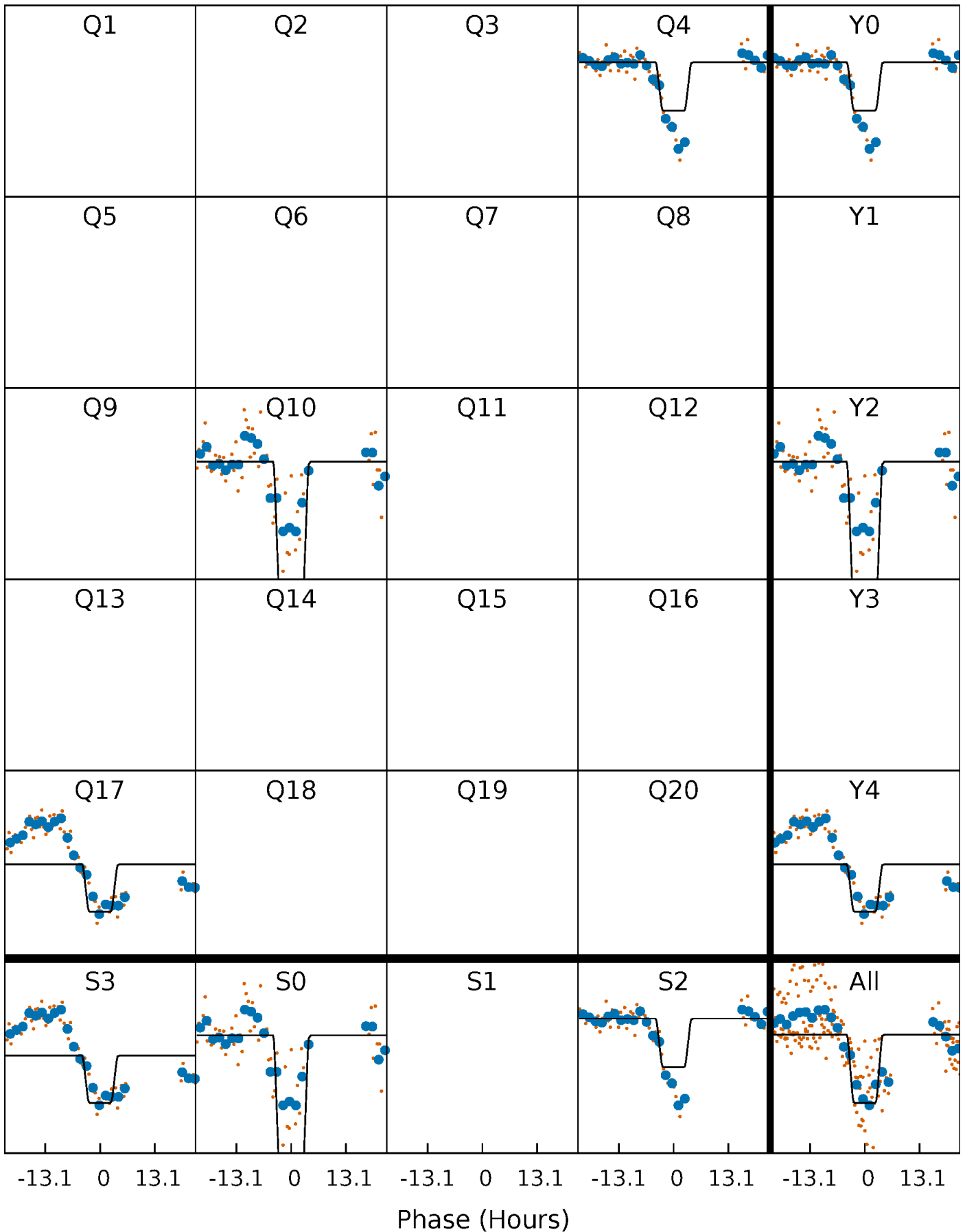
DV Quarter-Phased Transit Curves

TCE 009115681-02 $P=596.369835$ Days $T_0=377.881014$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

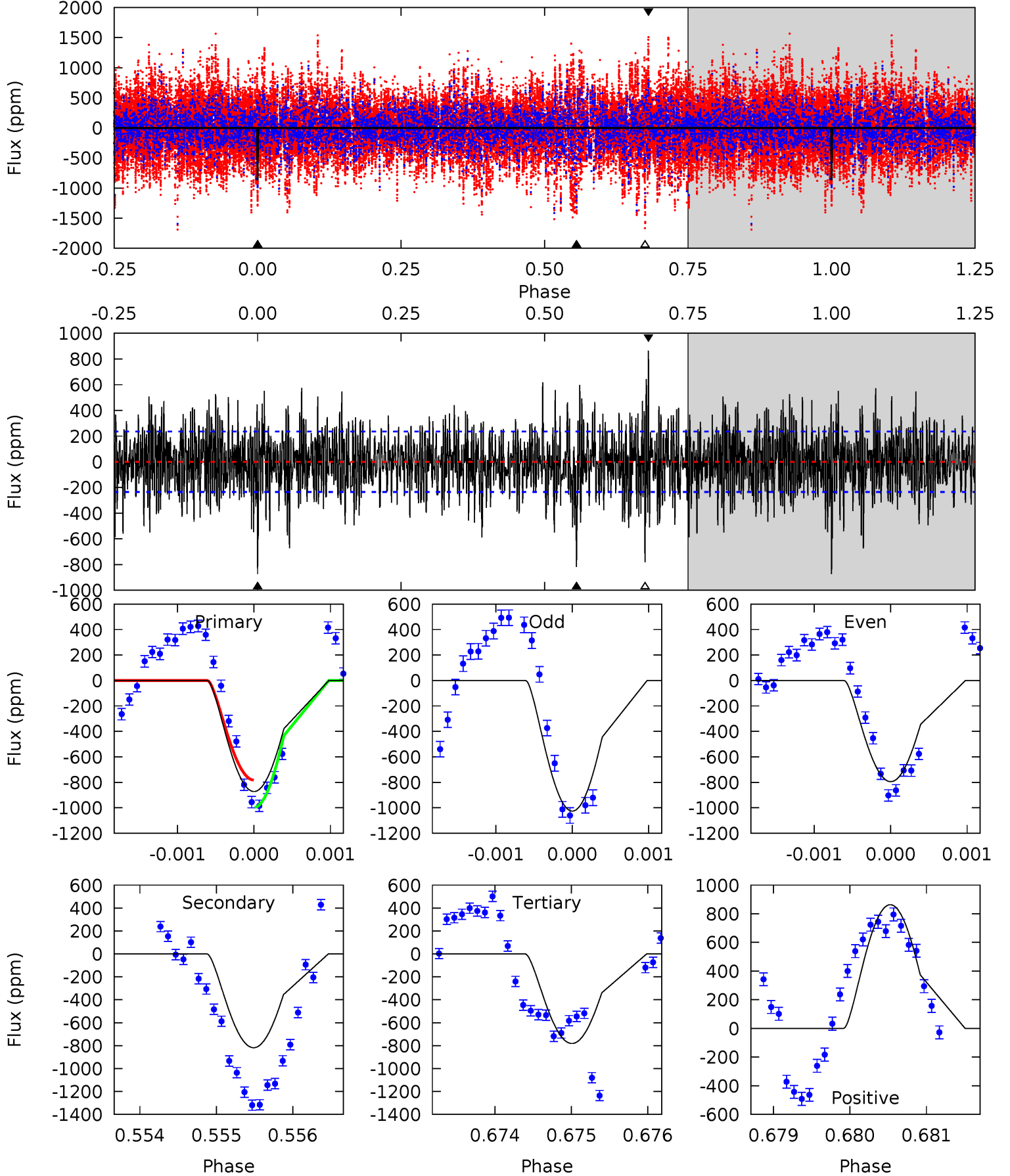
TCE 009115681-02 P=596.380693 Days $T_0=377.855044$ (BKJD)



DV Model-Shift Uniqueness Test

009115681-02, P = 596.369835 Days, E = 377.881014 Days

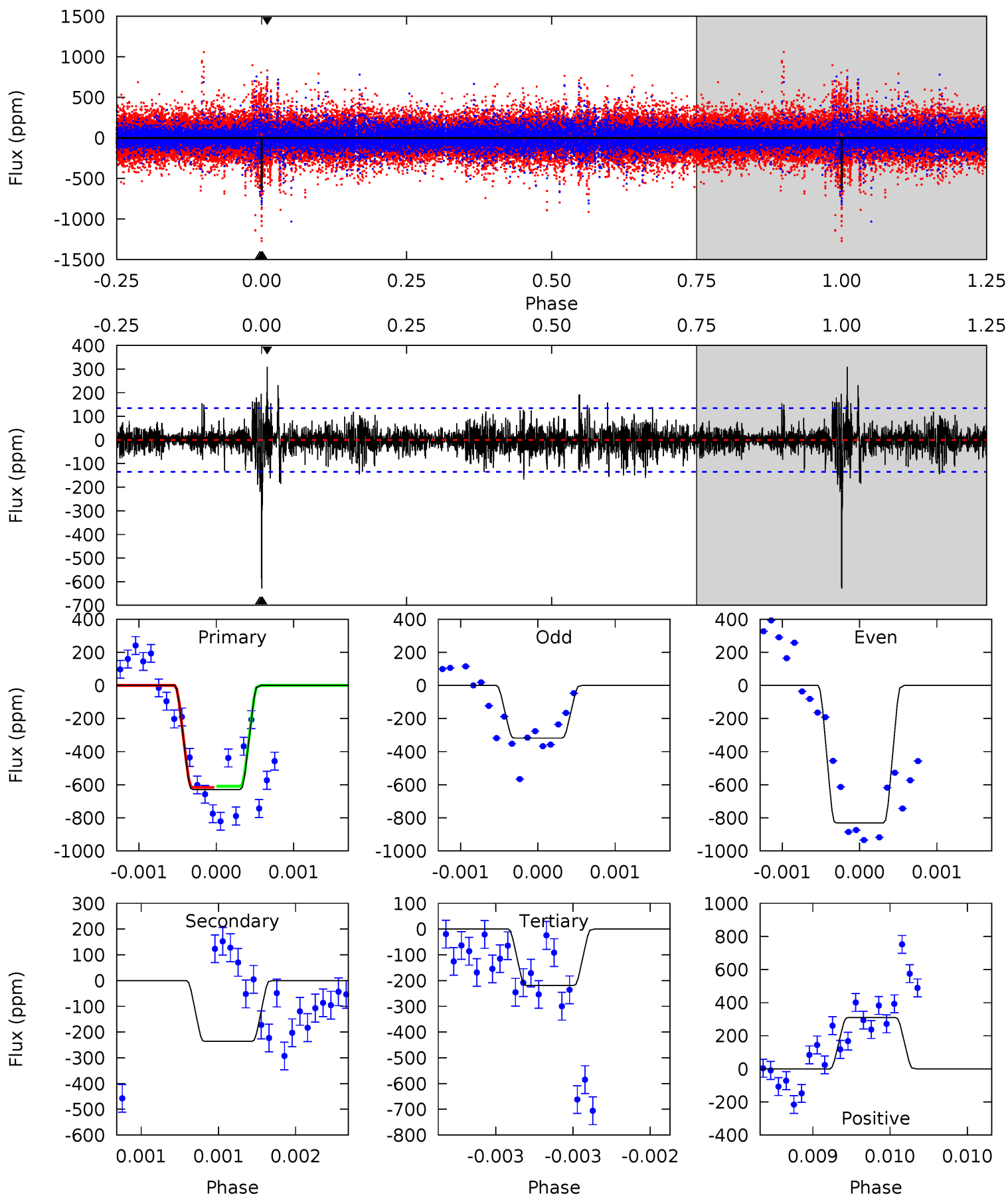
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.2	18.9	18.1	20.0	5.44	3.27	4.74	2.09	0.21	0.85	-1.04	2.55	0.88	0.50	2.32



Alt Model-Shift Uniqueness Test

009115681-02, P = 596.380693 Days, E = 377.855044 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.9	9.72	9.03	12.8	5.55	3.45	1.75	16.9	13.1	0.69	-3.04	10.4	1.06	0.33	0.14



Stellar Parameters For KIC 009115681

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6689^{+179}_{-219}	$3.594^{+0.336}_{-0.084}$	$-0.260^{+0.300}_{-0.250}$	$3.381^{+0.426}_{-1.278}$	$1.639^{+0.235}_{-0.382}$	$0.060^{+0.165}_{-0.013}$
	+3%/-3%	+9%/-2%	+115%/-96%	+13%/-38%	+14%/-23%	+275%/-21%
Source	PHO1	FLK73	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 009115681-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-818 ± 43	$26.14^{+23.12}_{-16.79}$	579^{+31}_{-56}	4281^{+2418}_{-792}	1803^{+11543}_{-1316}
Alt.	-236 ± 24	$21.51^{+20.32}_{-14.58}$	583^{+30}_{-51}	3736^{+2331}_{-683}	756^{+7057}_{-557}

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

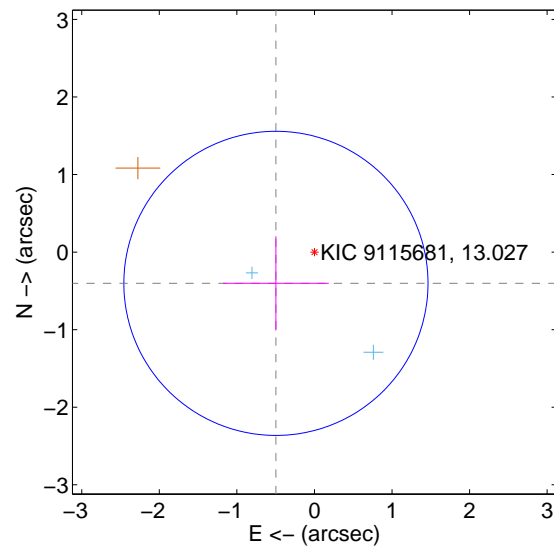
Supplemental centroid analysis for 009115681-02. Kepler magnitude: 13.03. Transit SNR 8.42

There are 2 quarters with good PRF difference image offsets

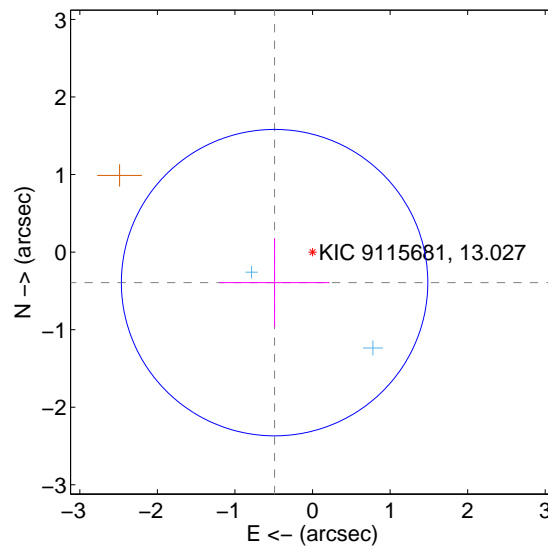
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.639 ± 0.653	0.98	0.497 ± 0.682	-0.403 ± 0.607
PRF-fit source offset from KIC position	0.628 ± 0.658	0.95	0.489 ± 0.709	-0.394 ± 0.572
photometric centroid source offset	0.26 ± 0.36	0.73	0.26 ± 0.36	0.00 ± 0.29

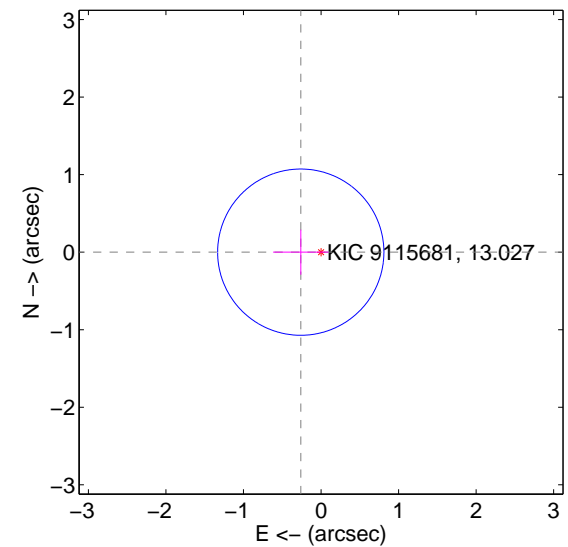
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

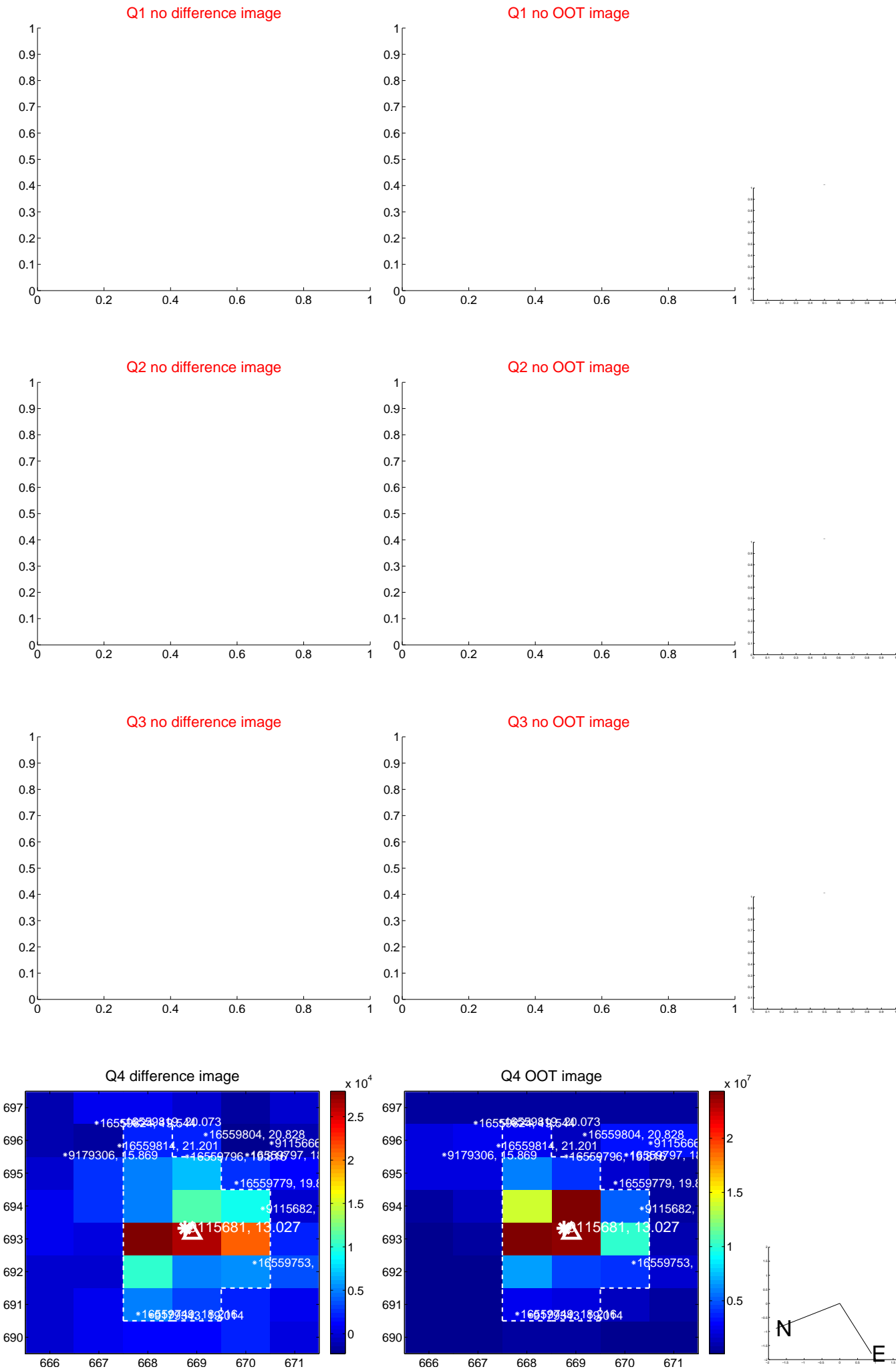


offset from photometric centroids

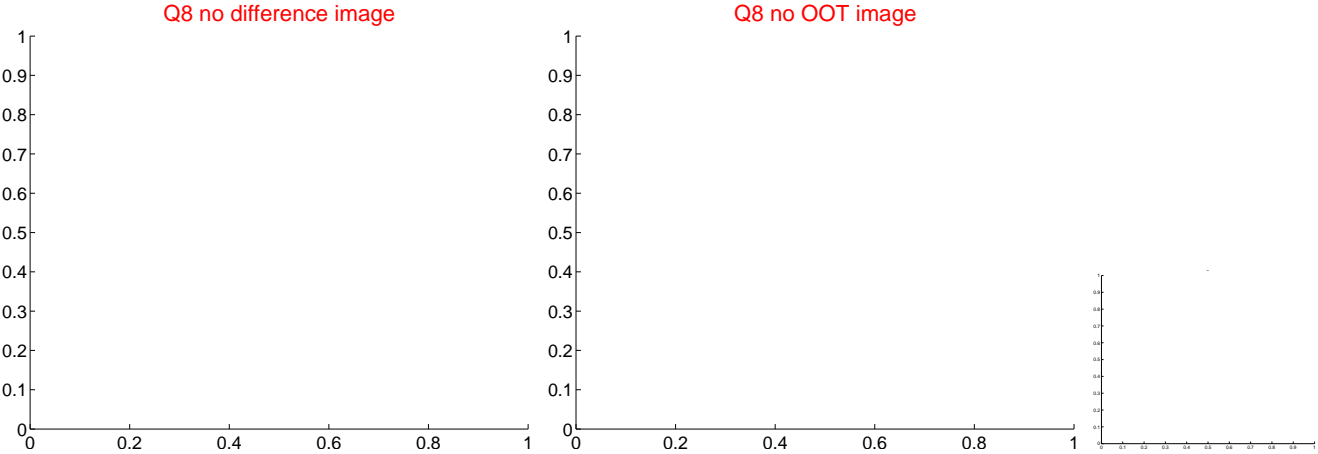
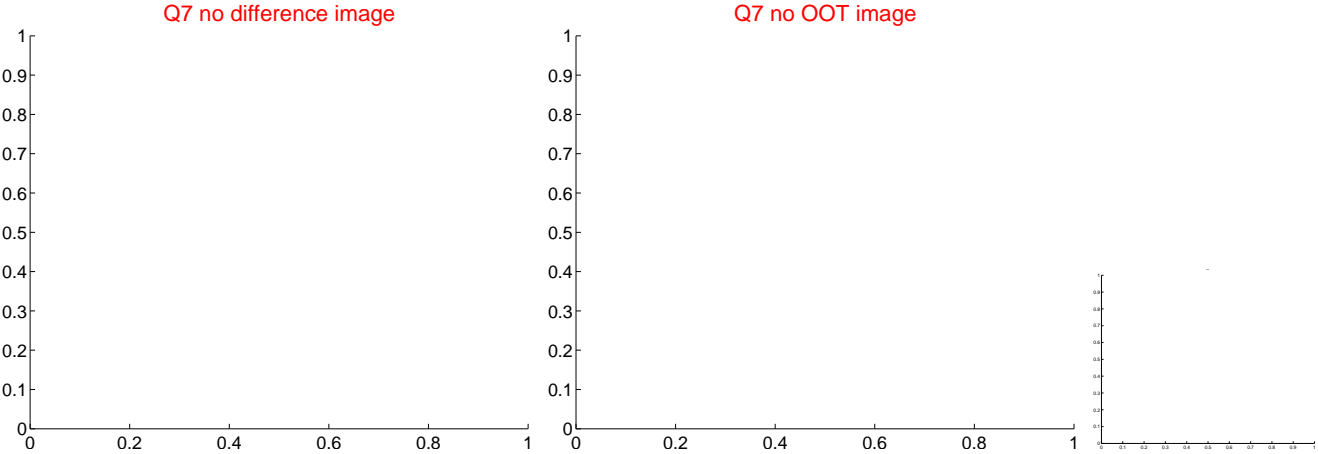
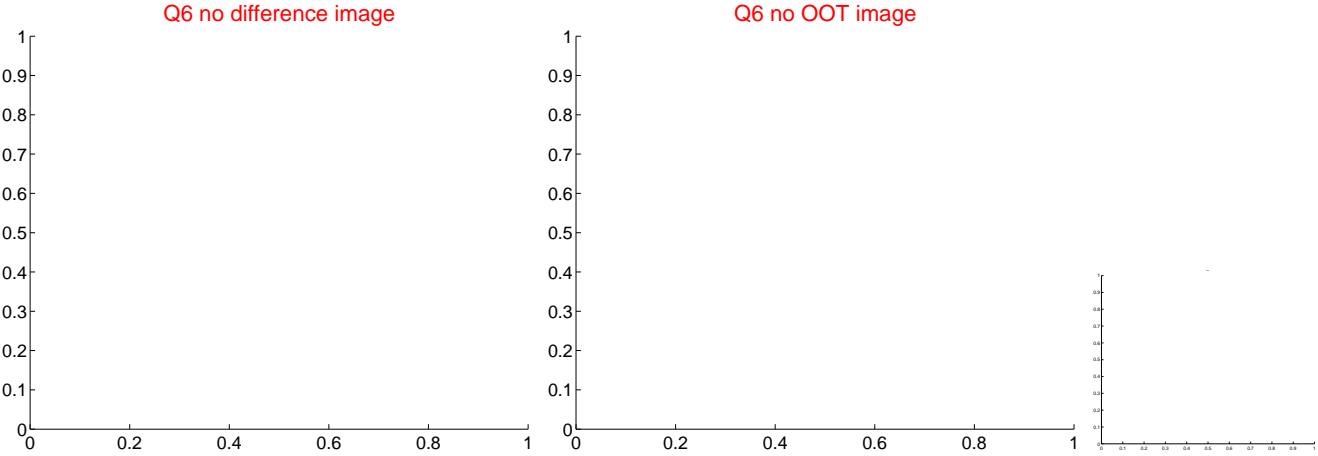
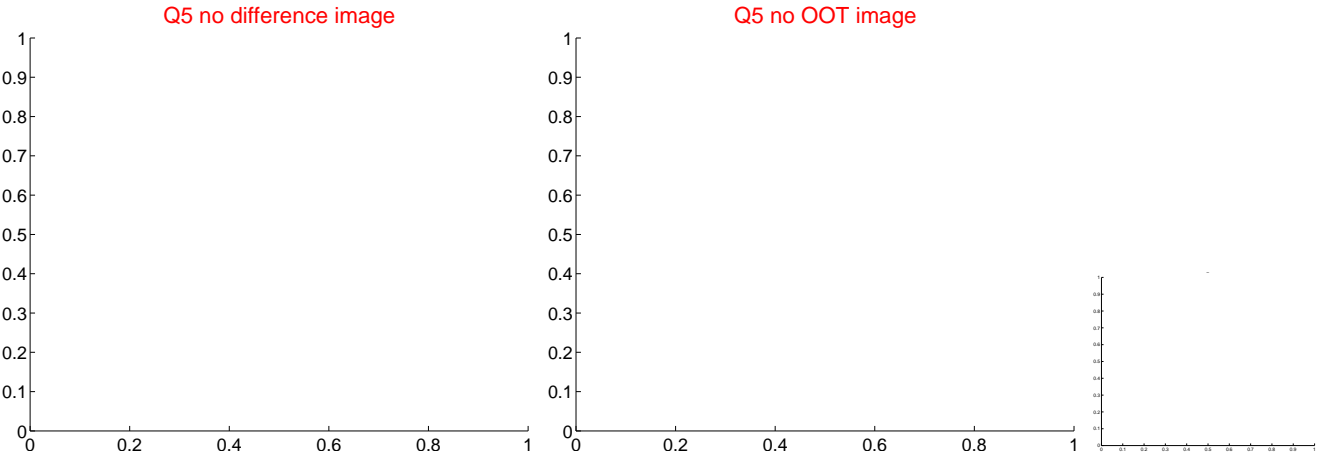


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

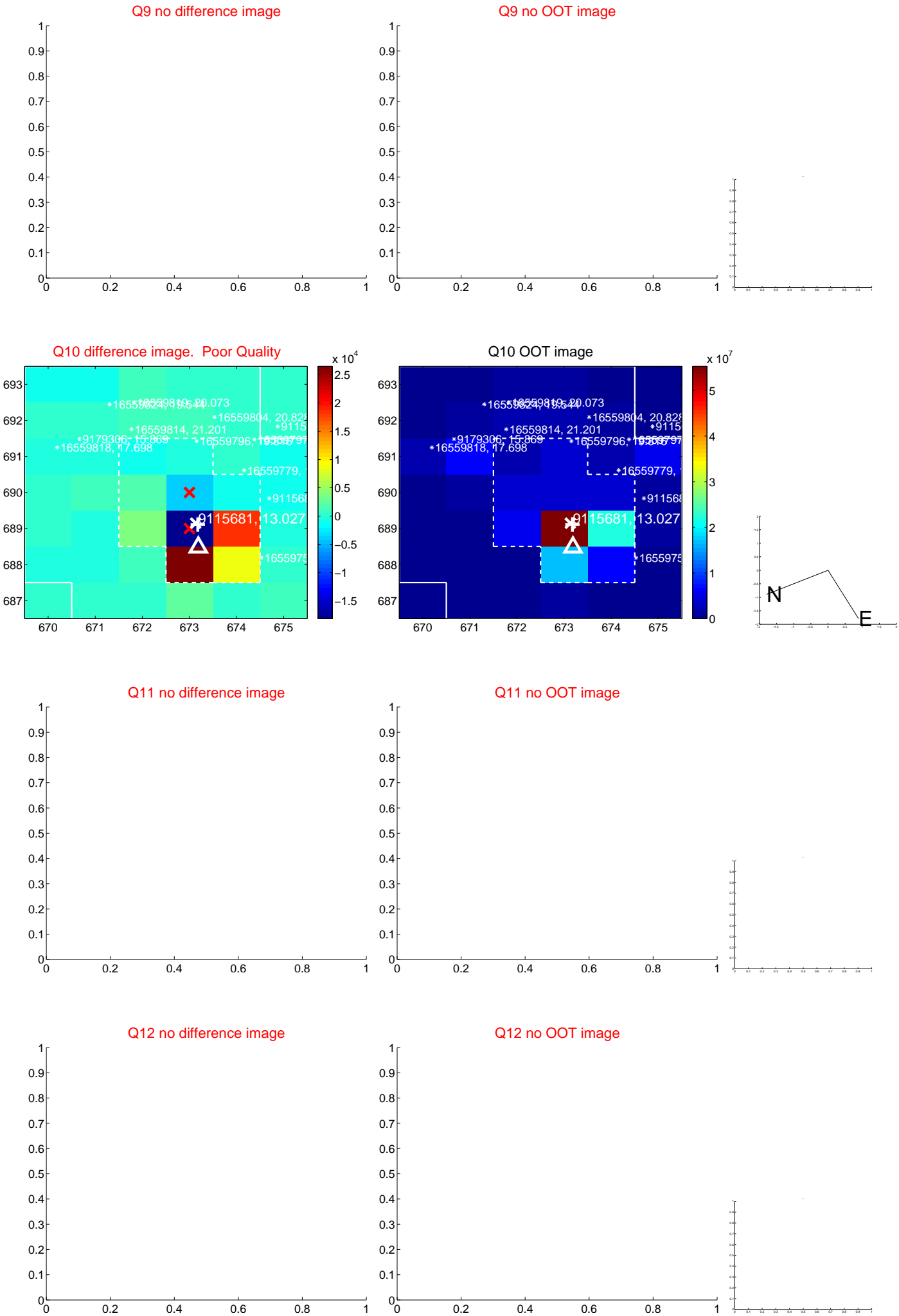
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



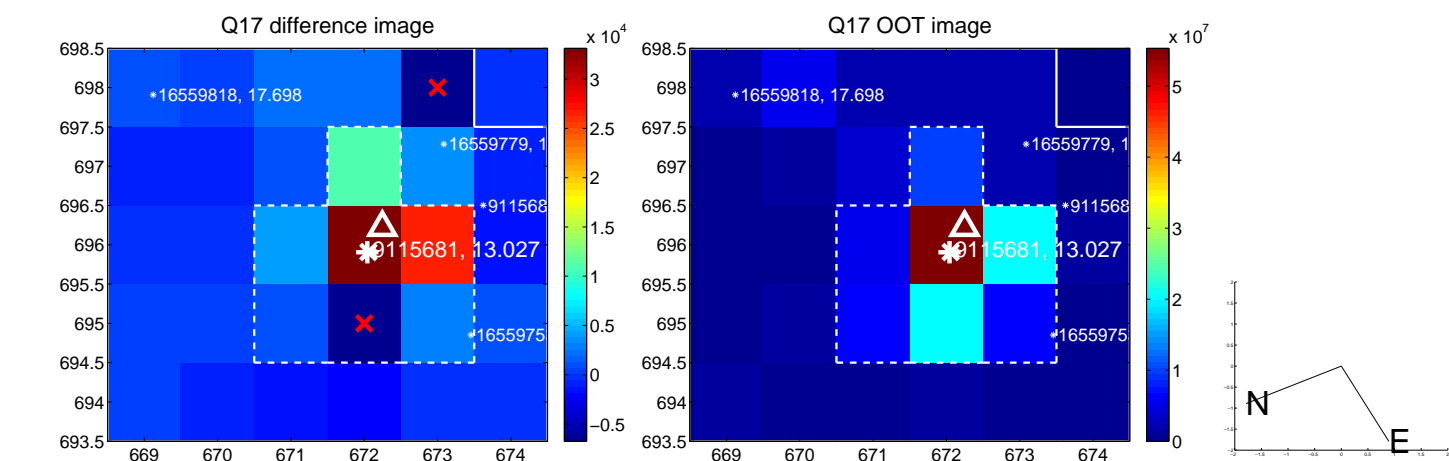
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



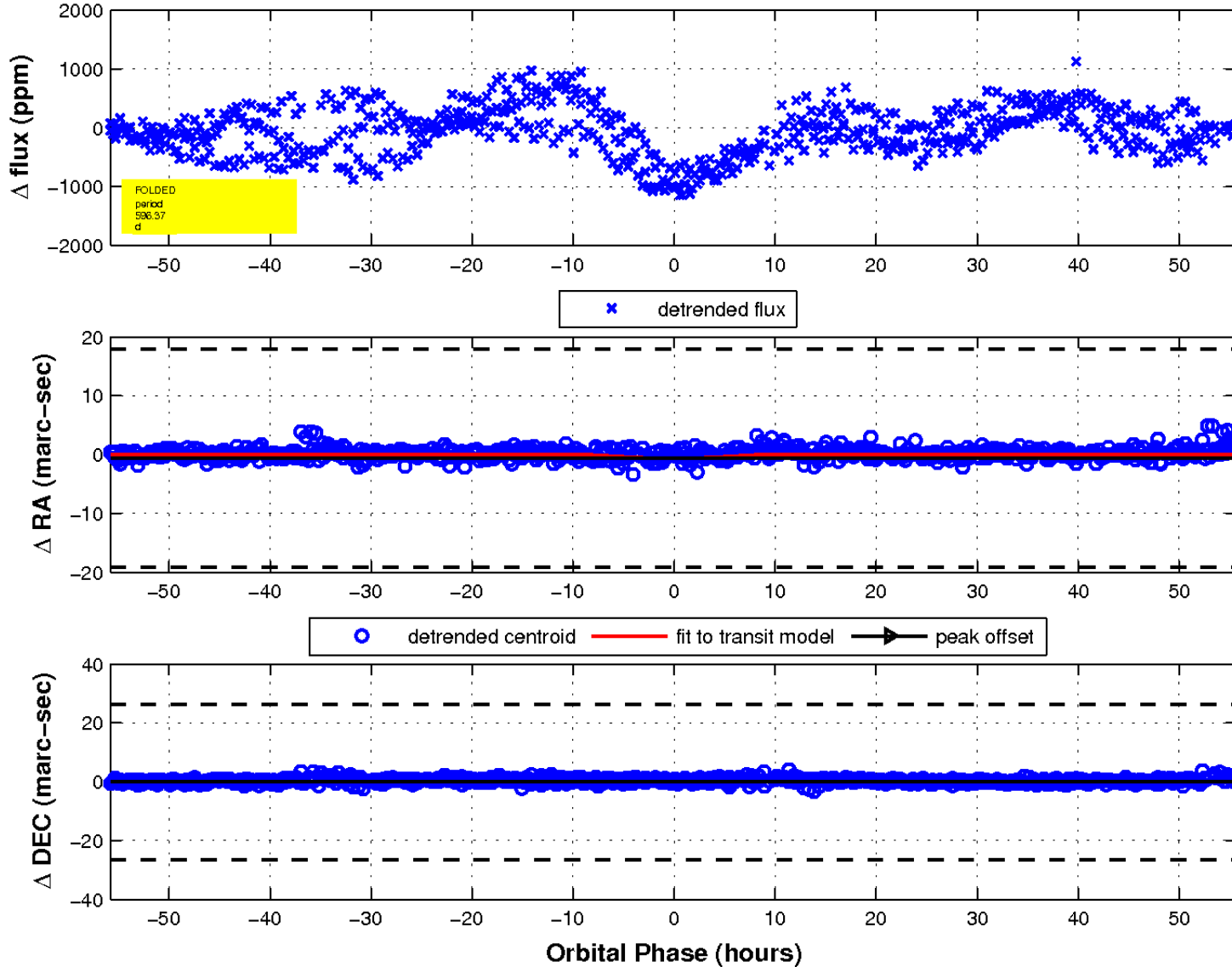
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

