

KIC 008163112

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})
008163112-01	OBS	No	0.706389	131.530867	31.8	4.075	9.1	9.1	0.85	5465	0.48	2884.98
008163112-02	OBS	No	76.486561	190.611858	549.2	1.884	7.9	8.0	0.85	5465	1.98	5.59

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008163112-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008163112-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

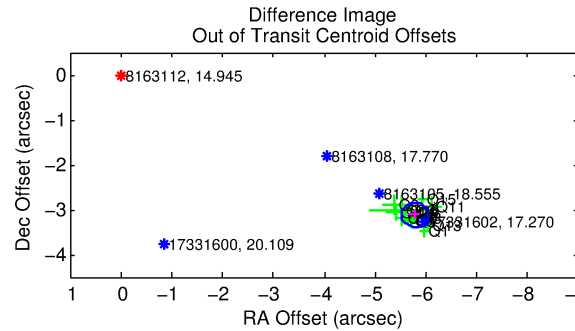
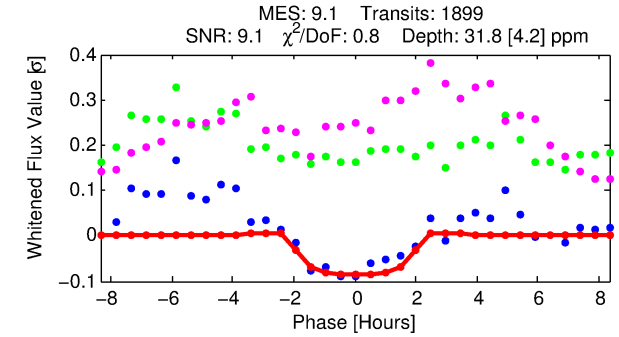
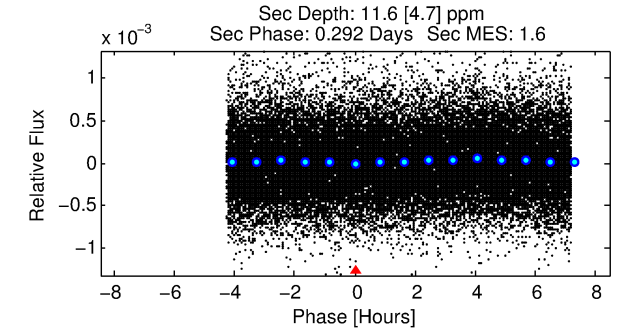
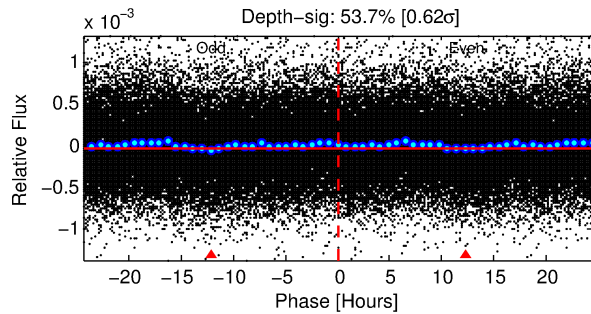
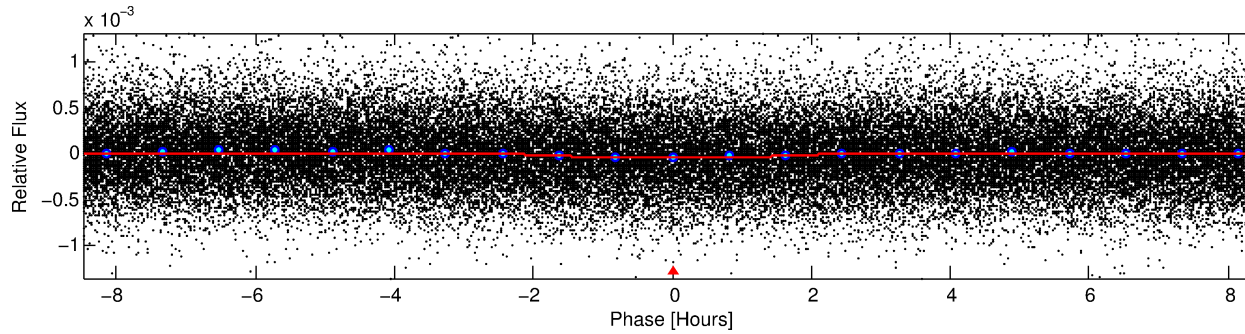
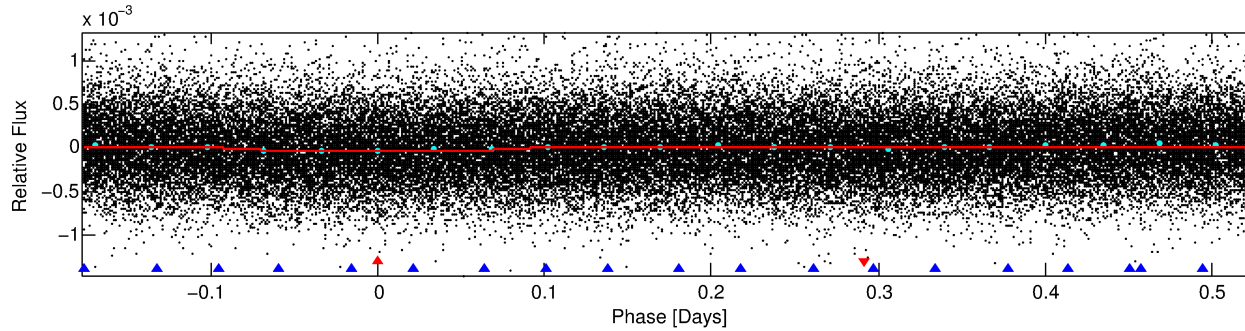
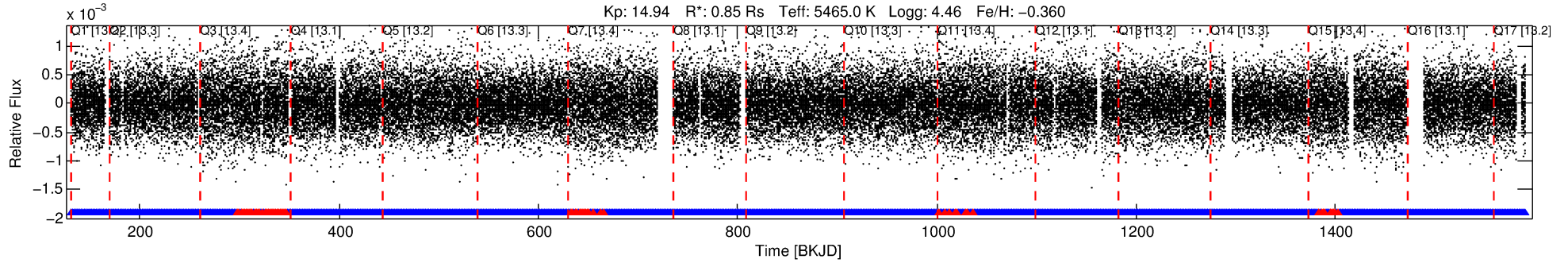
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008163112-01

No Significant Match Found

DV One-Page Summary

KIC: 8163112 Candidate: 1 of 2 Period: 0.706 d



DV Fit Results:

Period = 0.70639 [0.00001] d
Epoch = 131.5309 [0.0053] BKJD
Rp/R* = 0.0051 [0.0086]
a/R* = 1.44 [5.33]
b = 0.24 [28.68]
Seff = 2884.98 [900.38]
Teq = 1869 [146] K
Rp = 0.48 [0.80] Re
a = 0.0141 [0.0026] AU
Ag = 5.64 [19.11] [0.24 σ]
Teffp = 4453 [3759] K [0.69 σ]

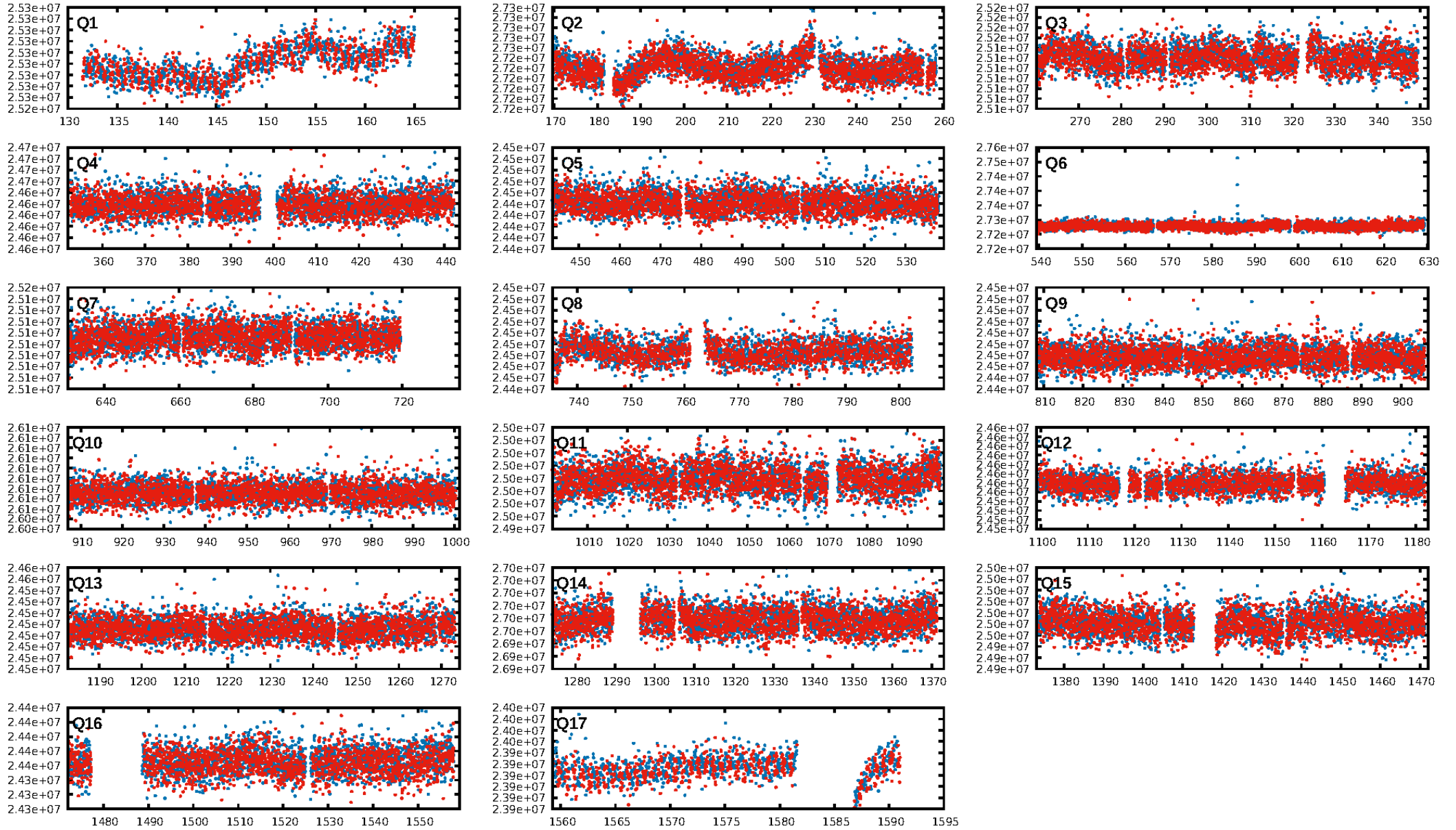
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [405.09 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.88e-17
RollingBand-fgt: 0.95 [1721/1814]
GhostDiagnostic-chr: -0.7238
Centroid-sig: 0.0%
Centroid-so: 8.857 arcsec [5.71 σ]
OotOffset-rm: 6.563 arcsec [74.23 σ]
KicOffset-rm: 6.716 arcsec [78.05 σ]
OotOffset-st: 3/4/3/5 [15]
KicOffset-st: 3/4/3/5 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 1.00 [17/17]

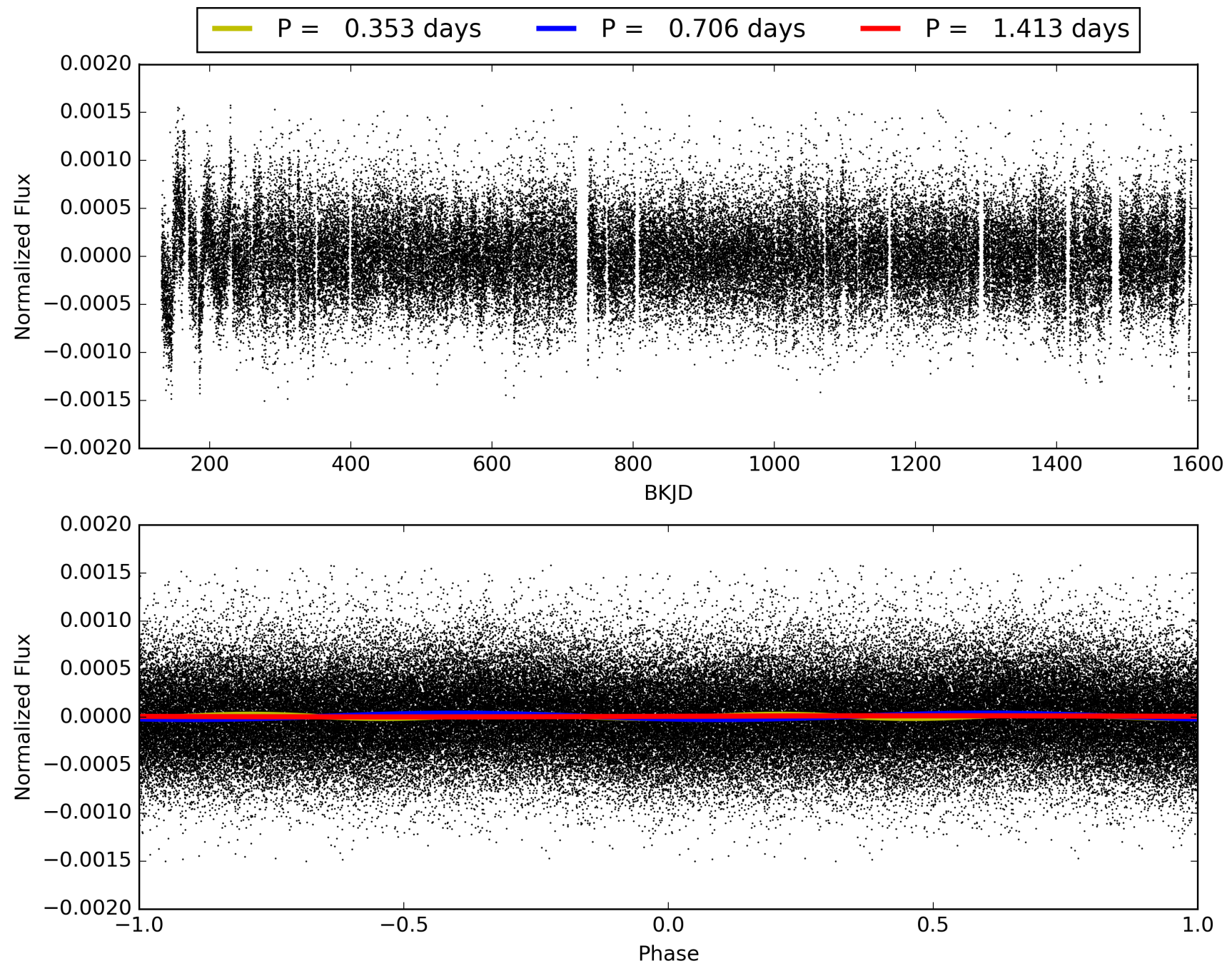
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:05:46 Z

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

TCE 008163112-01, PDC Light Curves

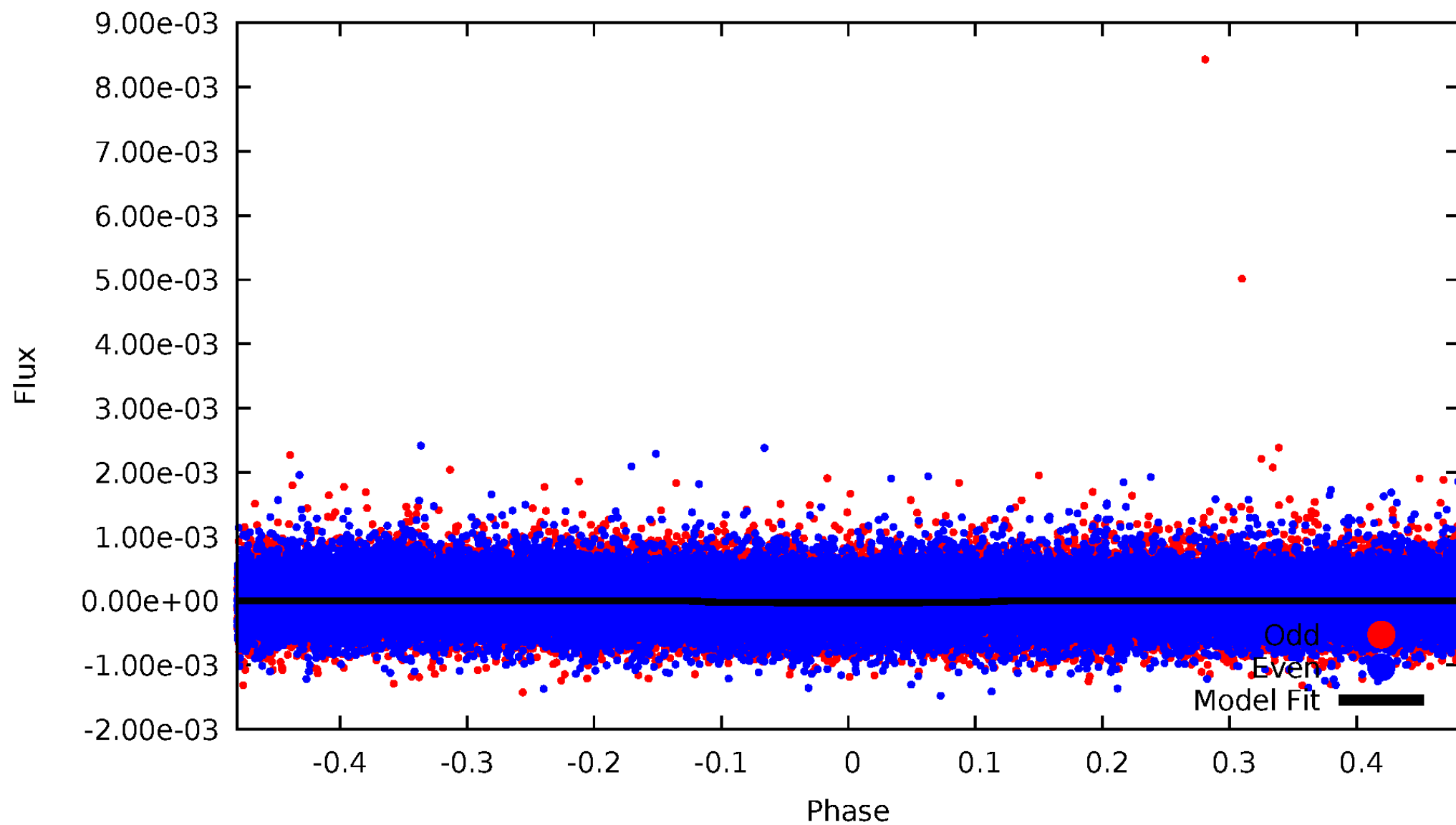


TCE 008163112-01



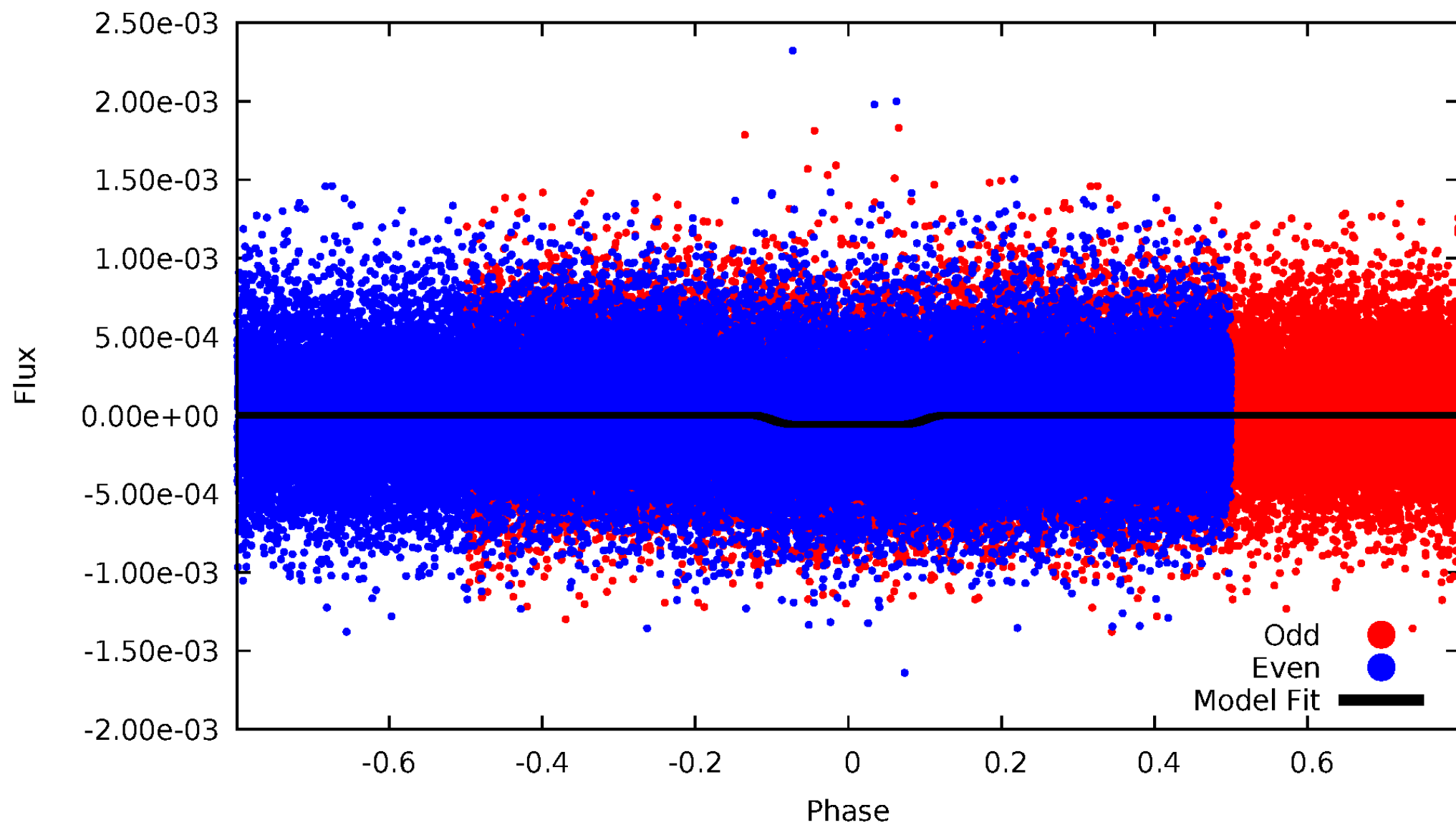
DV Odd/Even

TCE 008163112-01



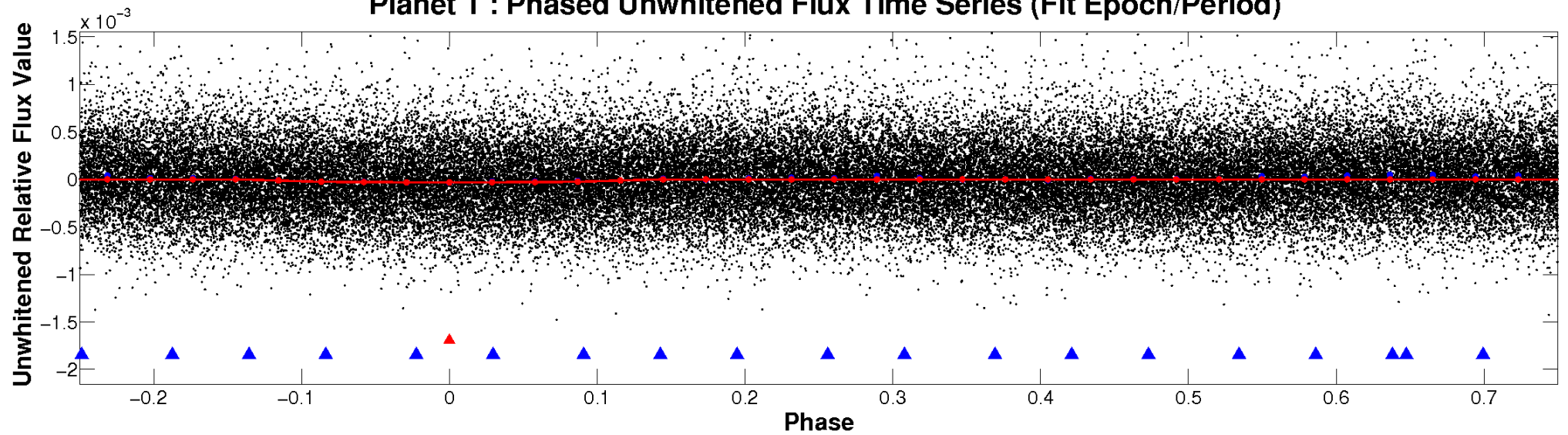
ALT Odd/Even

TCE 008163112-01

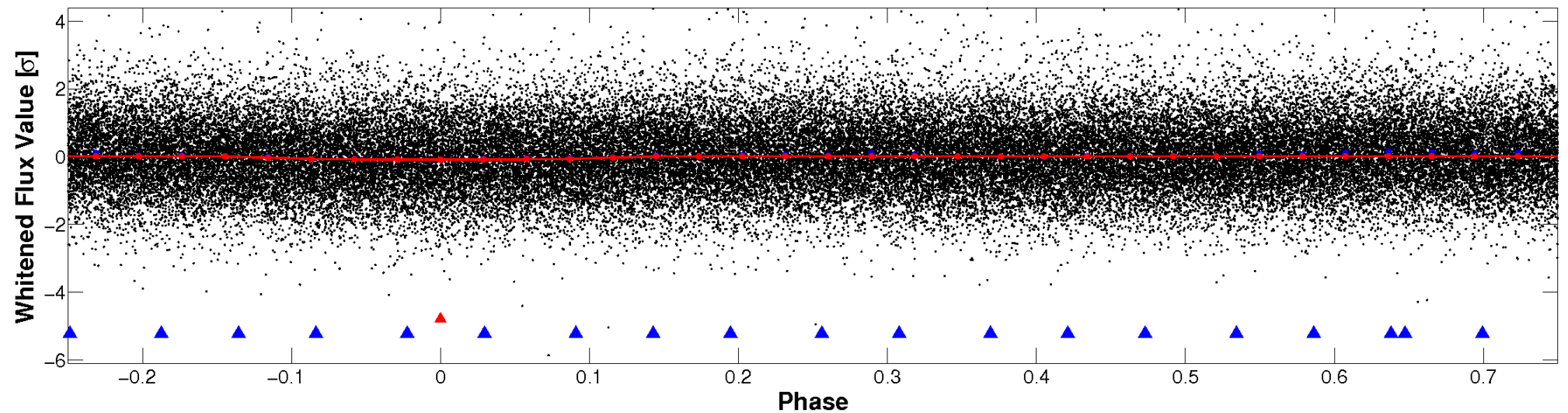


Non-Whitened Vs. Whitened Light Curve

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

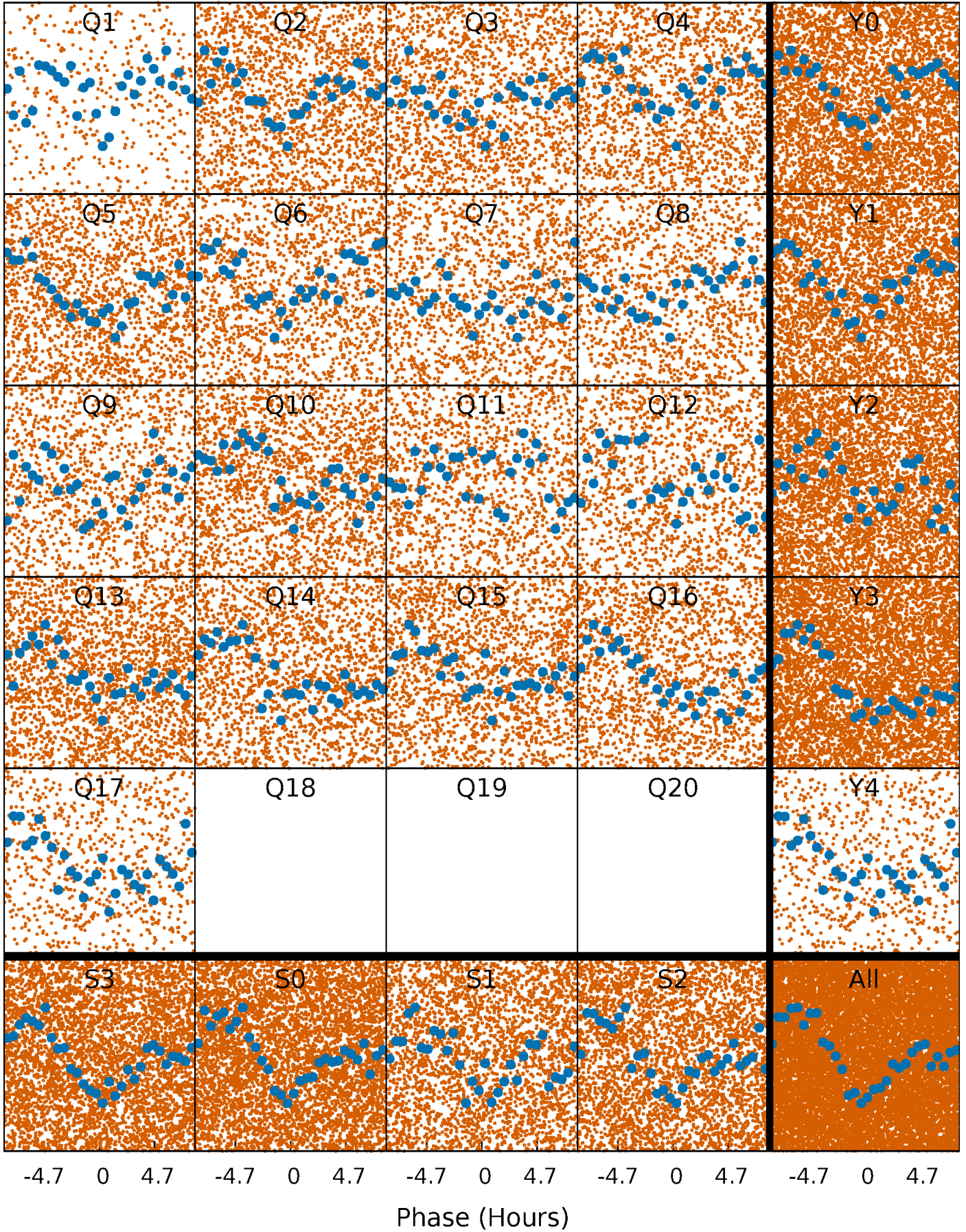


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



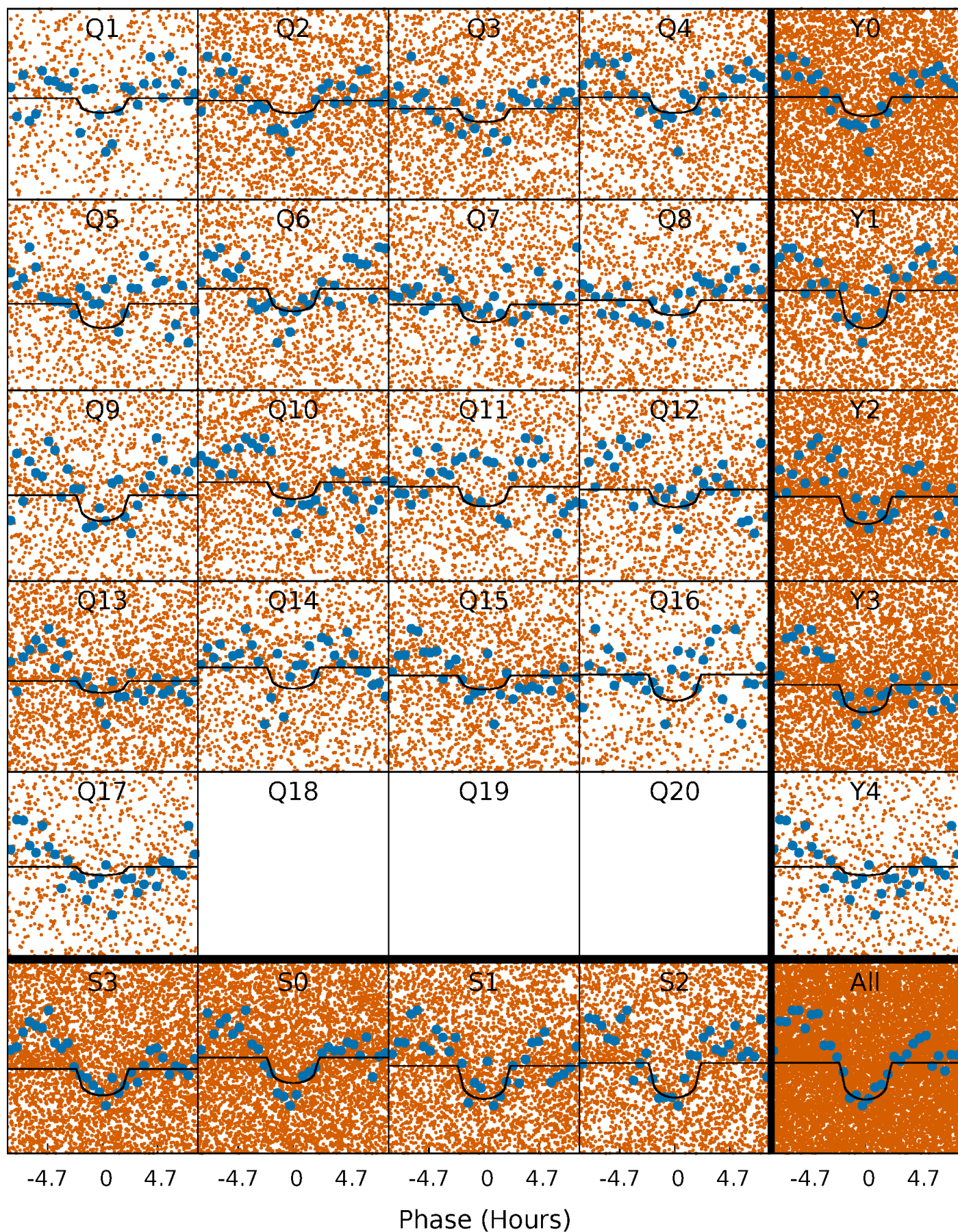
PDC Quarter-Phased Transit Curves

TCE 008163112-01 P= 0.706389 Days $T_0=131.530867$ (BKJD)



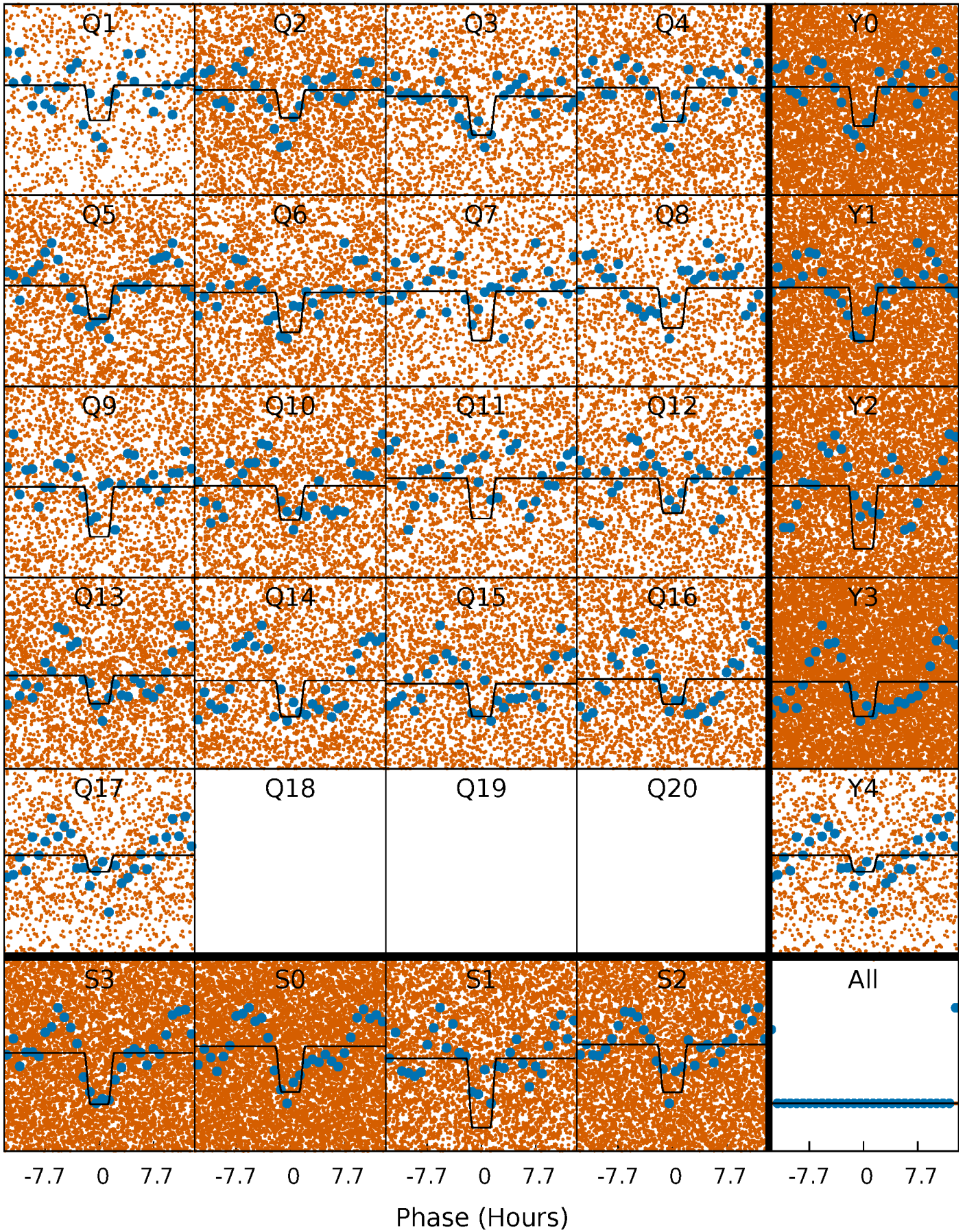
DV Quarter-Phased Transit Curves

TCE 008163112-01 P= 0.706389 Days $T_0=131.530867$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

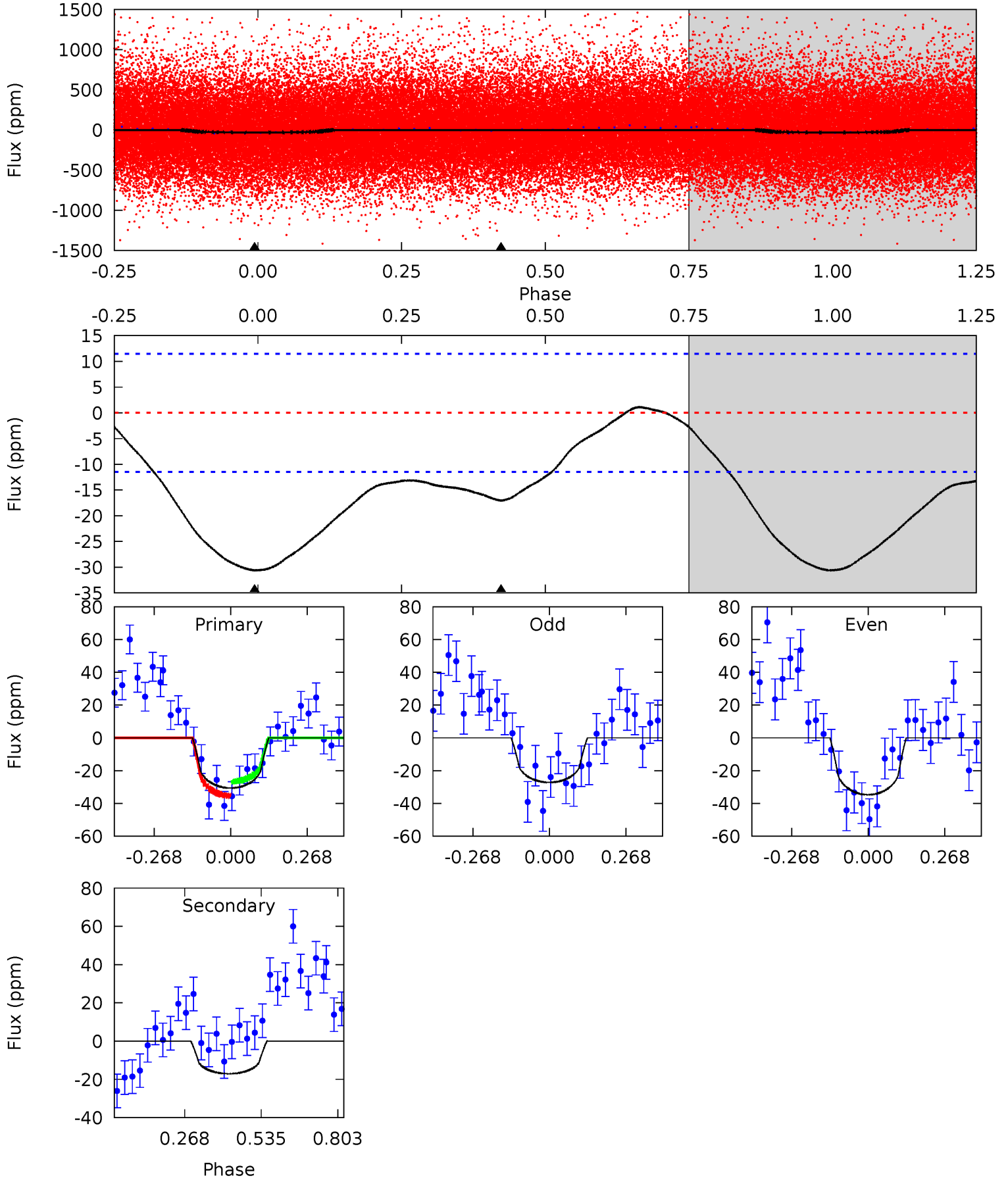
TCE 008163112-01 P= 0.706375 Days $T_0=131.550582$ (BKJD)



DV Model-Shift Uniqueness Test

008163112-01, P = 0.706389 Days, E = 130.824478 Days

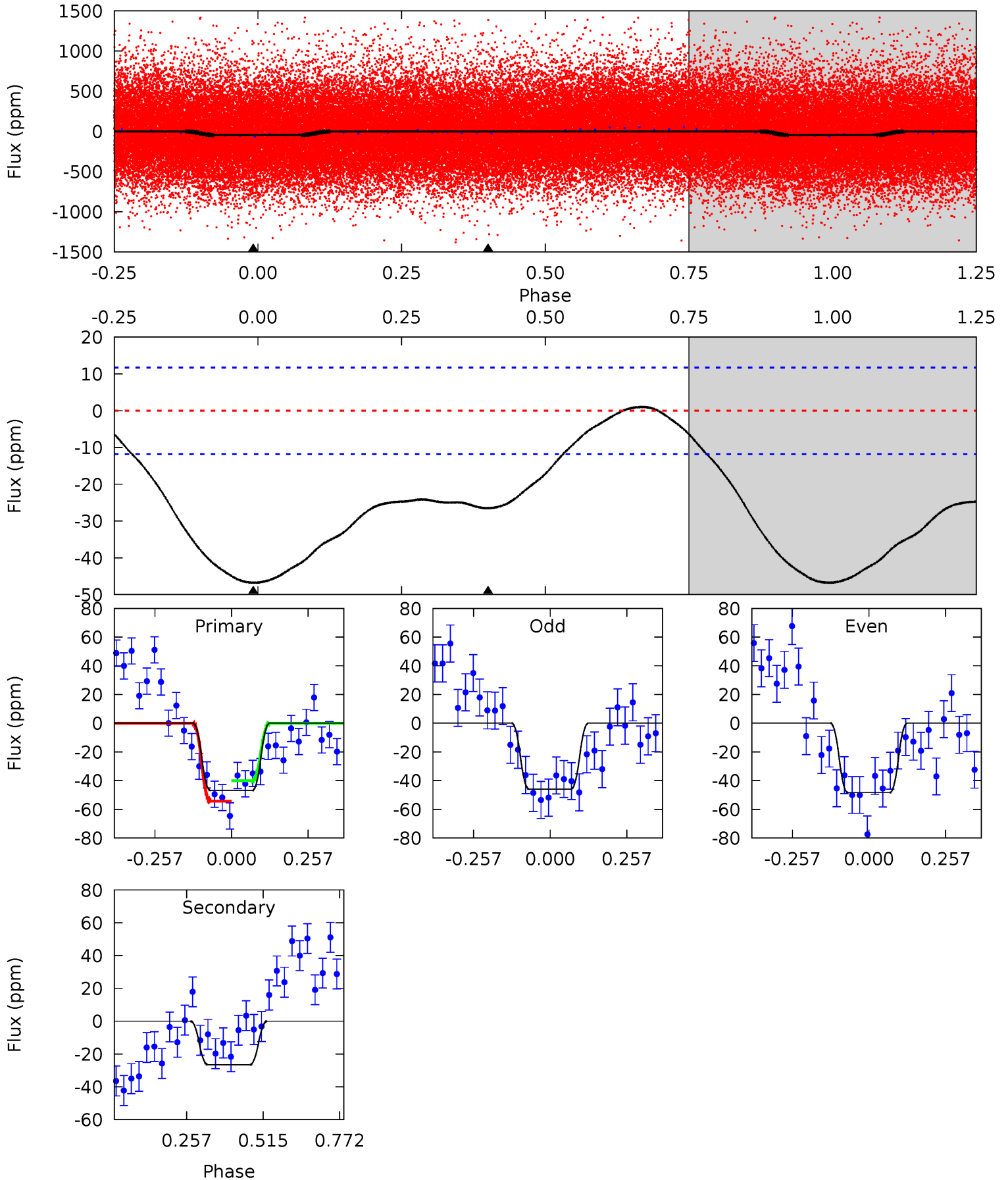
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	6.47	0	0	4.35	1.11	0.54	11.6	11.6	6.47	6.47	1.42	0.84	0.04	1.63



Alt Model-Shift Uniqueness Test

008163112-01, P = 0.706375 Days, E = 130.844207 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.4	9.85	0	0	4.36	1.13	0.79	17.4	17.4	9.85	9.85	0.46	0.93	0.02	2.63



Stellar Parameters For KIC 008163112

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5465^{+164}_{-164}	$4.458^{+0.135}_{-0.165}$	$-0.360^{+0.350}_{-0.300}$	$0.850^{+0.175}_{-0.117}$	$0.756^{+0.124}_{-0.044}$	$1.735^{+0.973}_{-0.728}$
	+3%/-3%	+3%/-4%	+97%/-83%	+21%/-14%	+16%/-6%	+56%/-42%
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 008163112-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-17 ± 3	$0.78^{+0.76}_{-0.51}$	2626^{+156}_{-143}	4022^{+2484}_{-936}	$3.025^{+24.796}_{-2.204}$
Alt.	-27 ± 3	$0.92^{+0.76}_{-0.62}$	2621^{+174}_{-142}	4144^{+2579}_{-875}	$3.525^{+27.197}_{-2.462}$

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

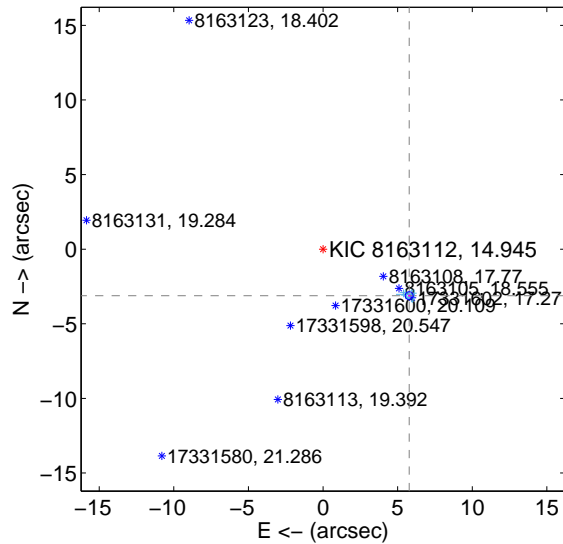
Supplemental centroid analysis for 008163112-01. Kepler magnitude: 14.95. Transit SNR 9.13

There are 15 quarters with good PRF difference image offsets

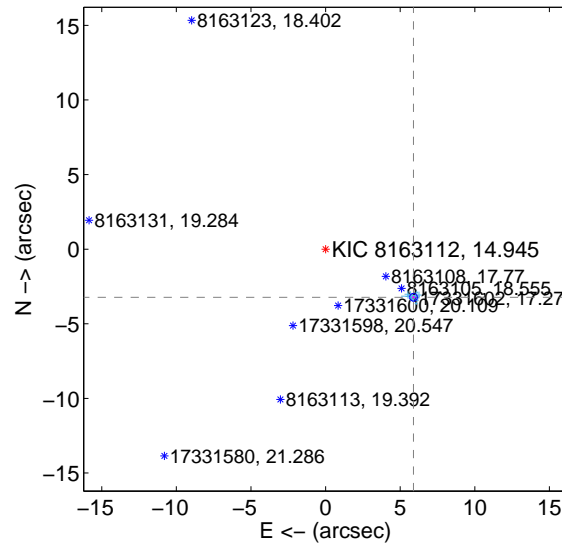
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.563 ± 0.088	74.23	-5.775 ± 0.087	-3.118 ± 0.081
PRF-fit source offset from KIC position	6.716 ± 0.086	78.05	-5.891 ± 0.085	-3.224 ± 0.081
photometric centroid source offset	8.86 ± 1.55	5.71	-2.77 ± 1.50	-8.41 ± 1.56

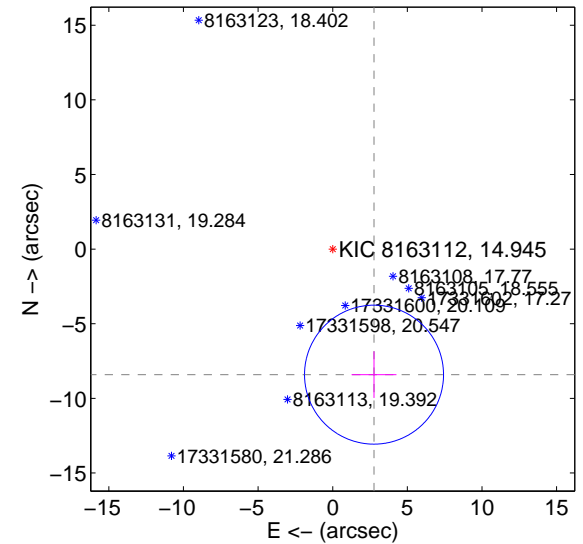
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

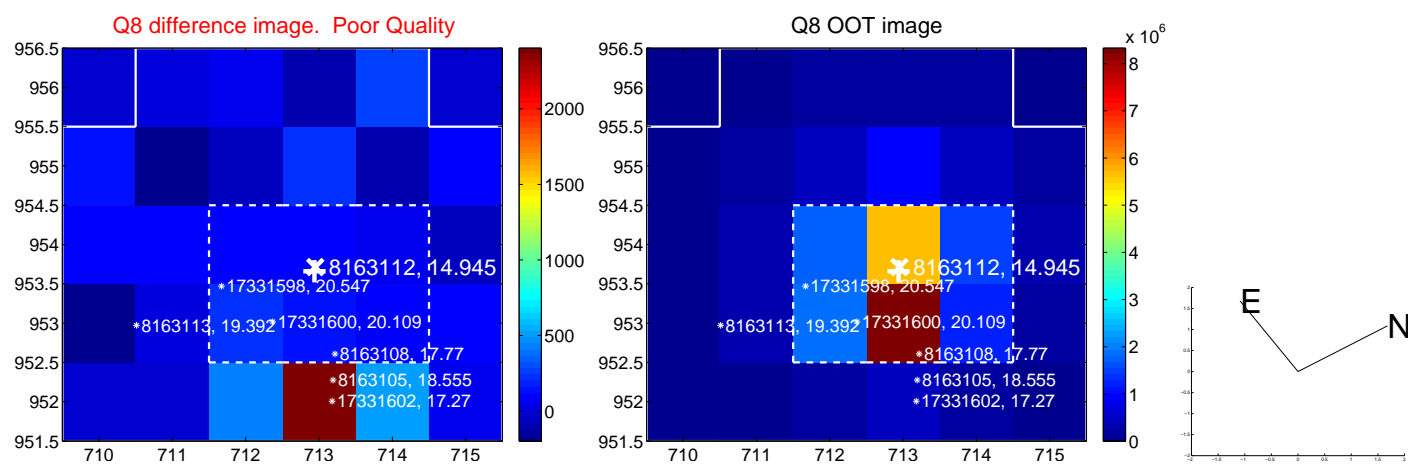
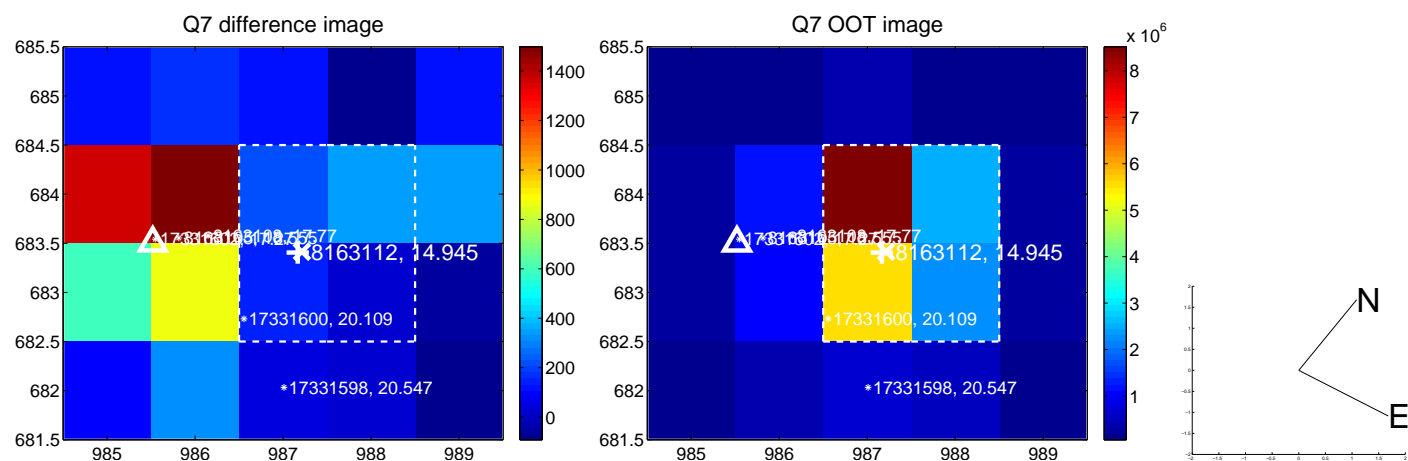
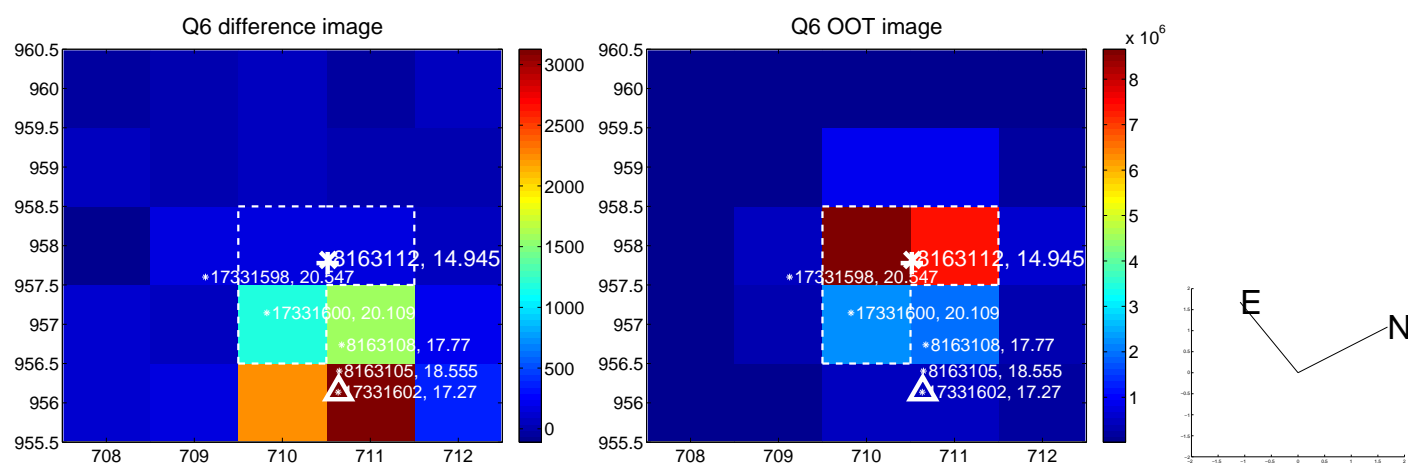
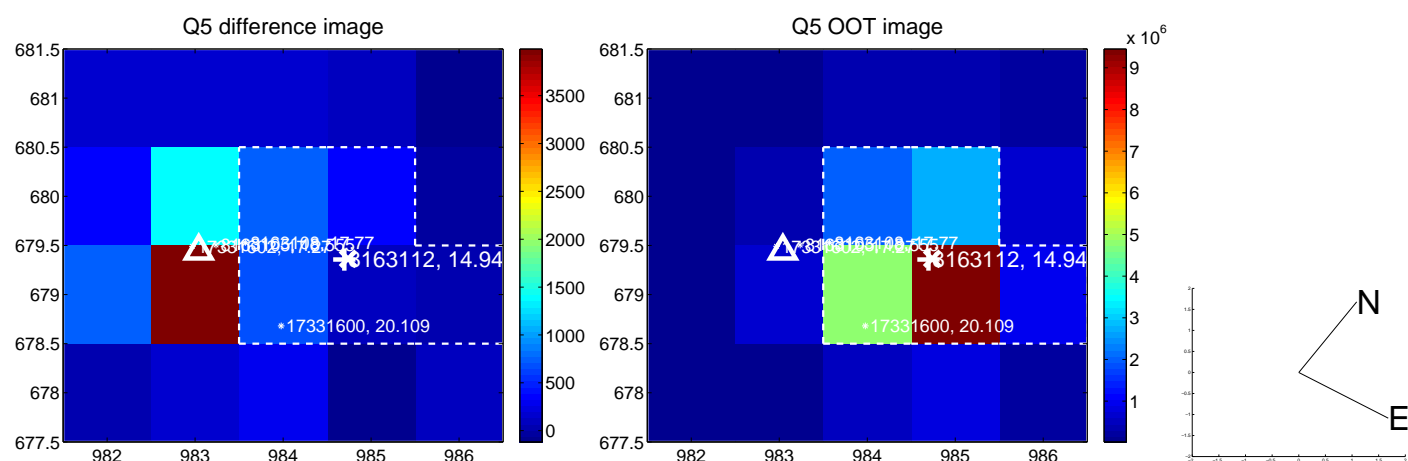


offset from photometric centroids

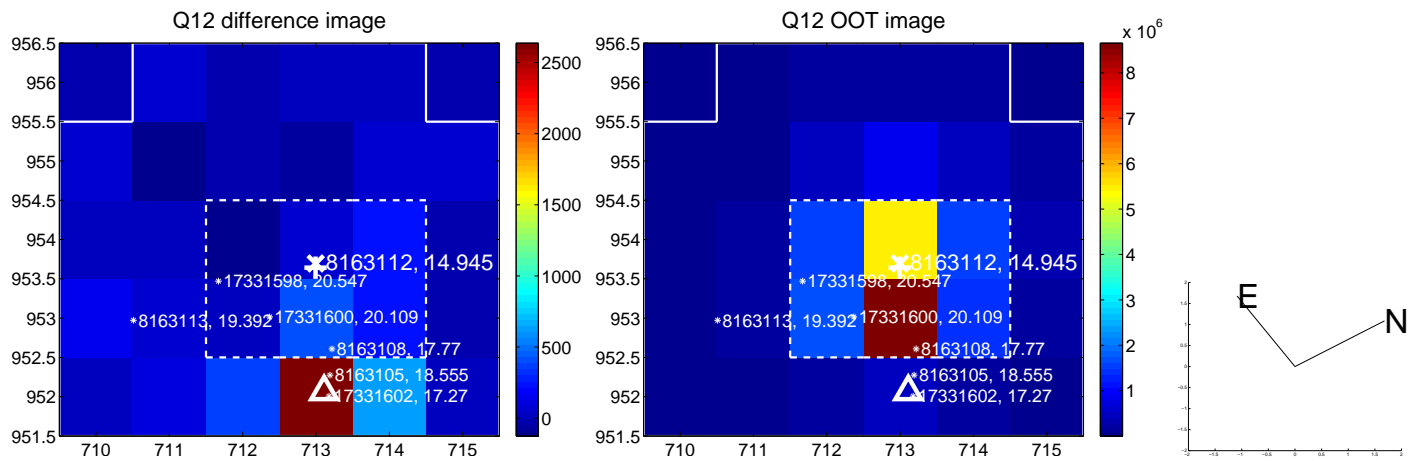
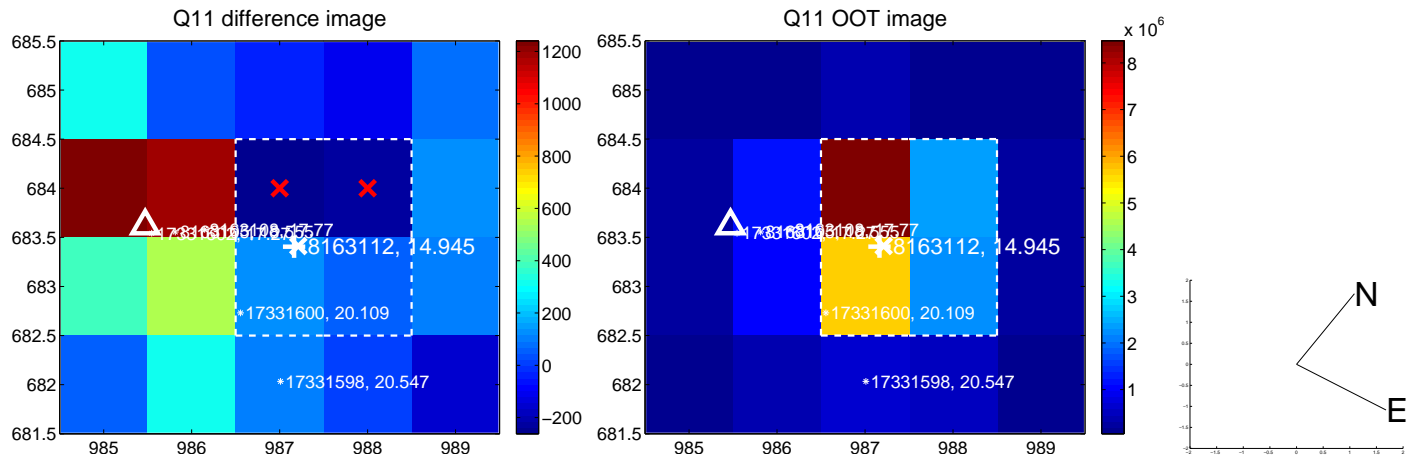
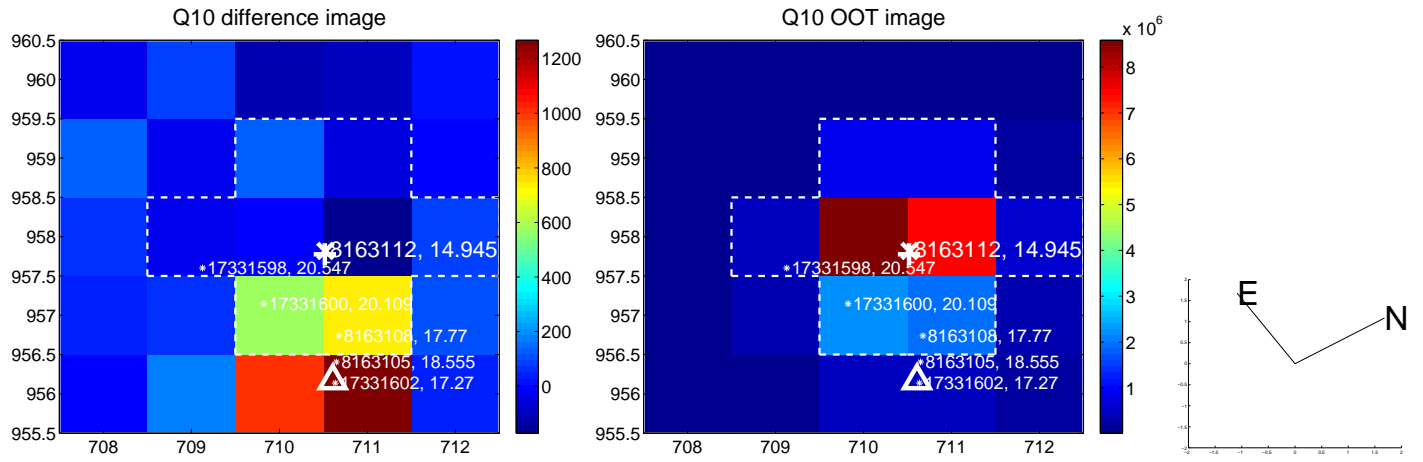
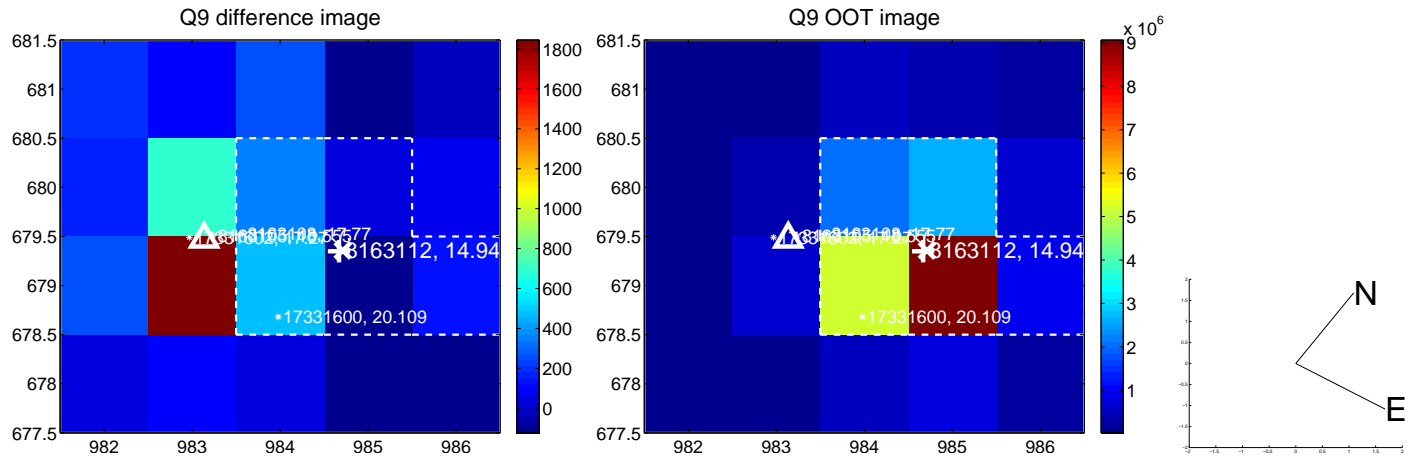


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

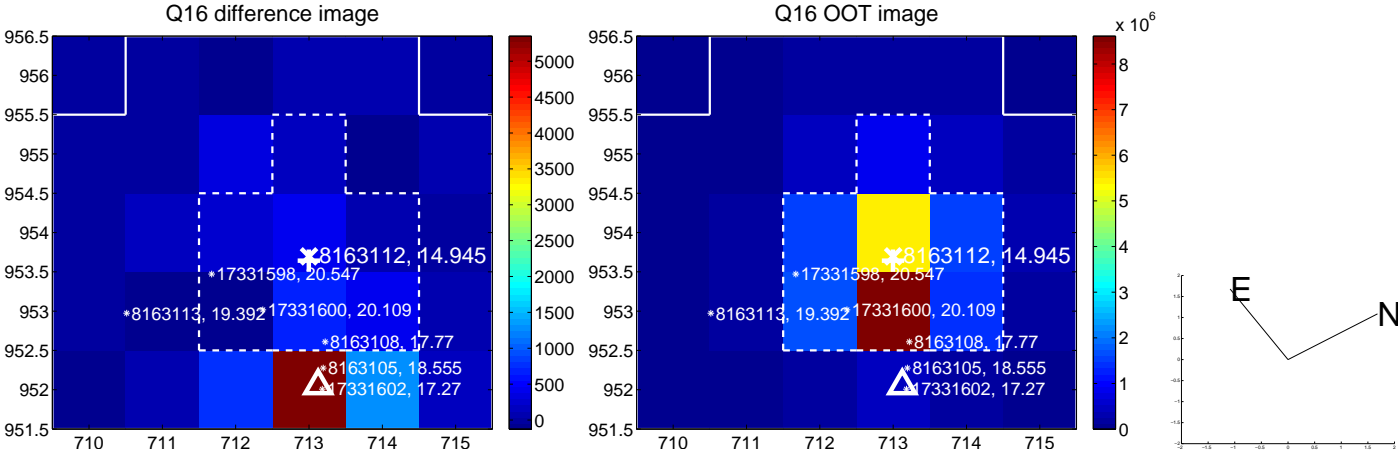
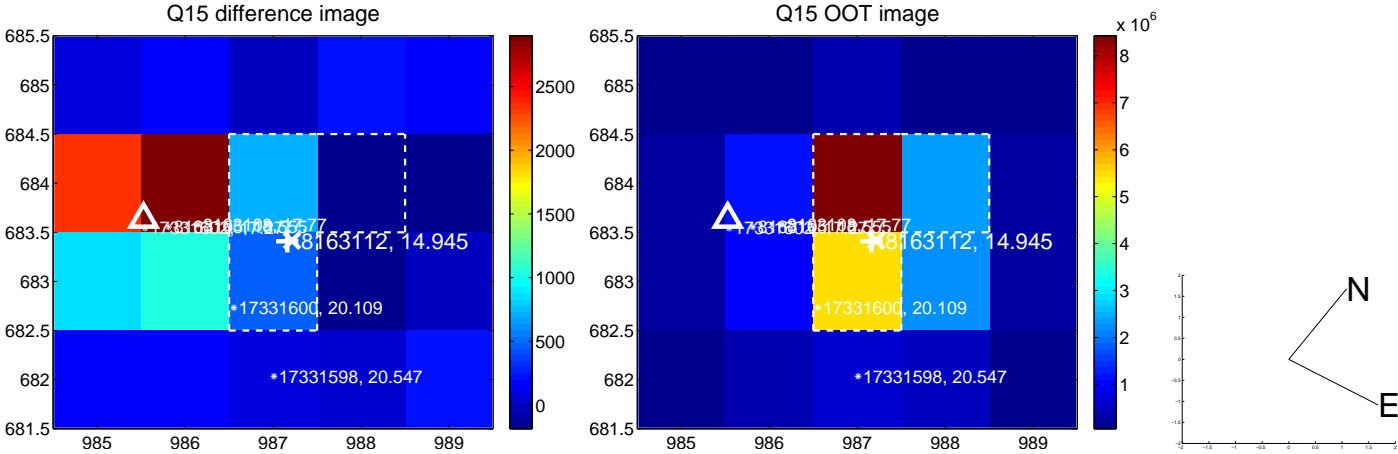
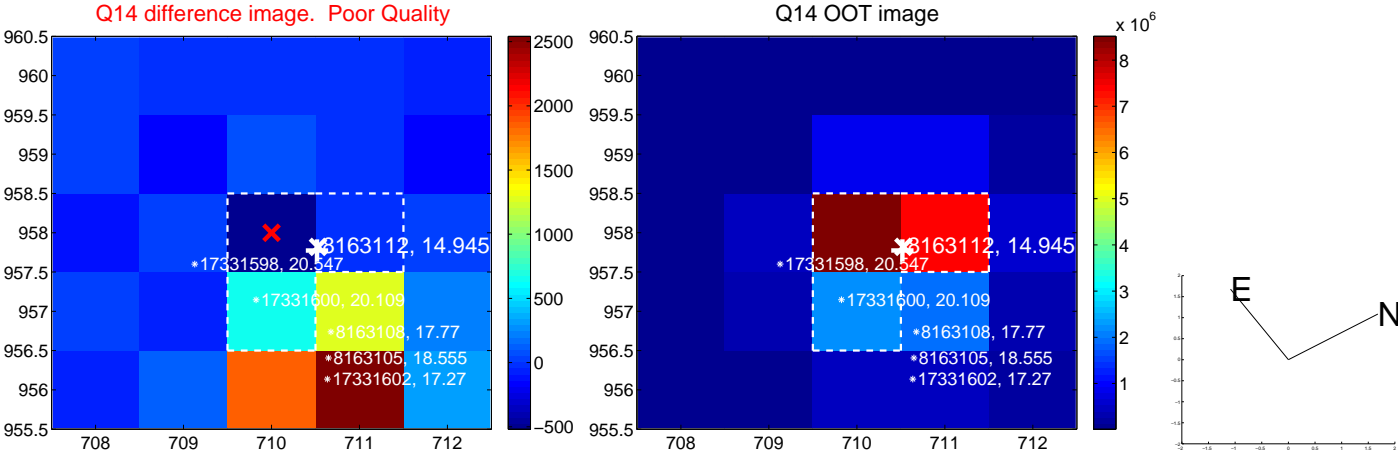
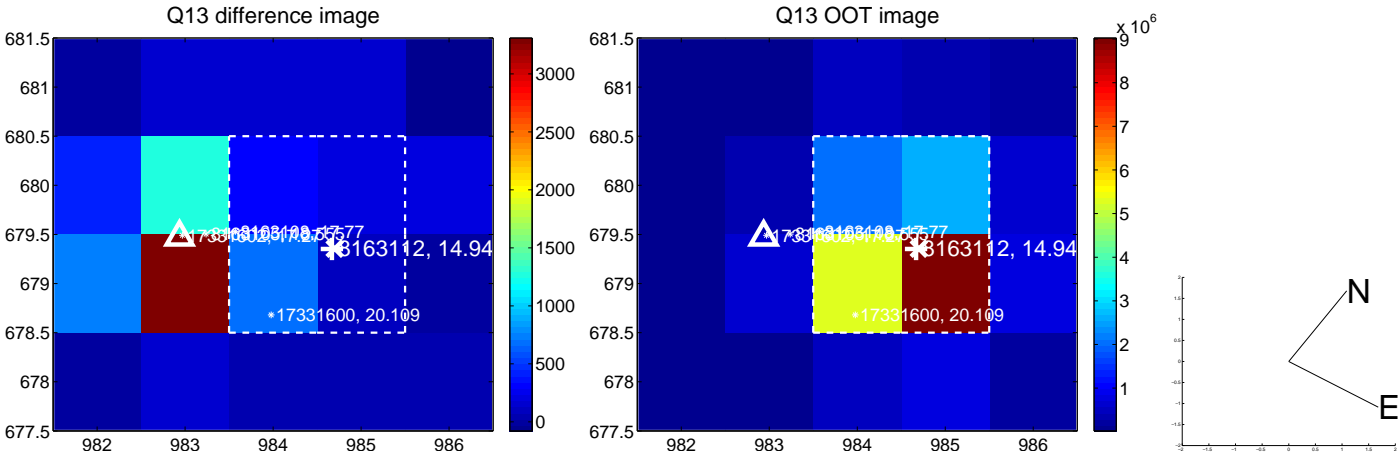
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



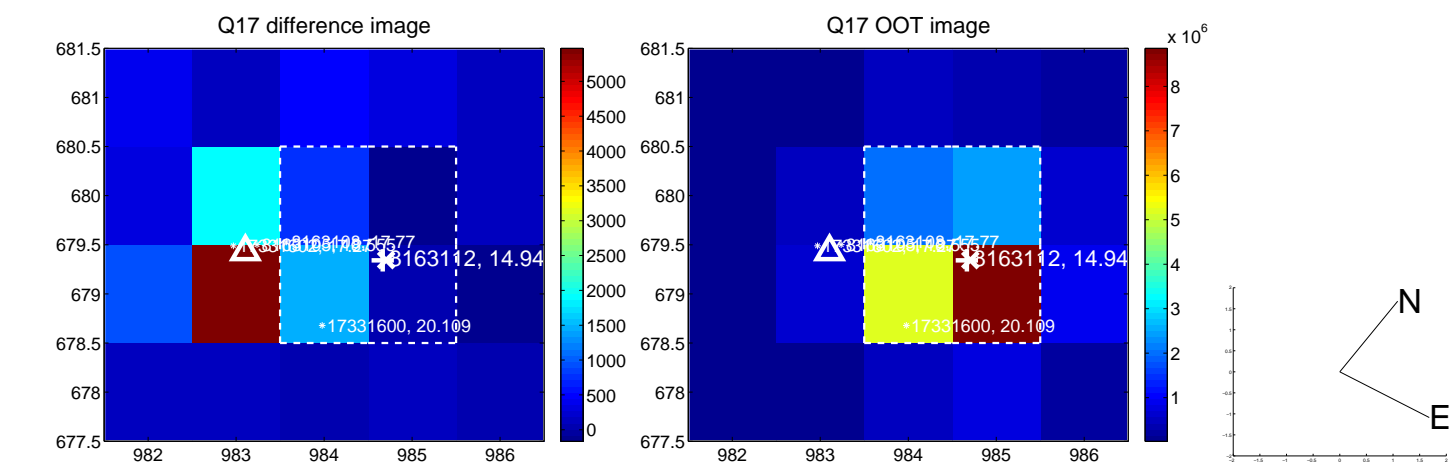
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



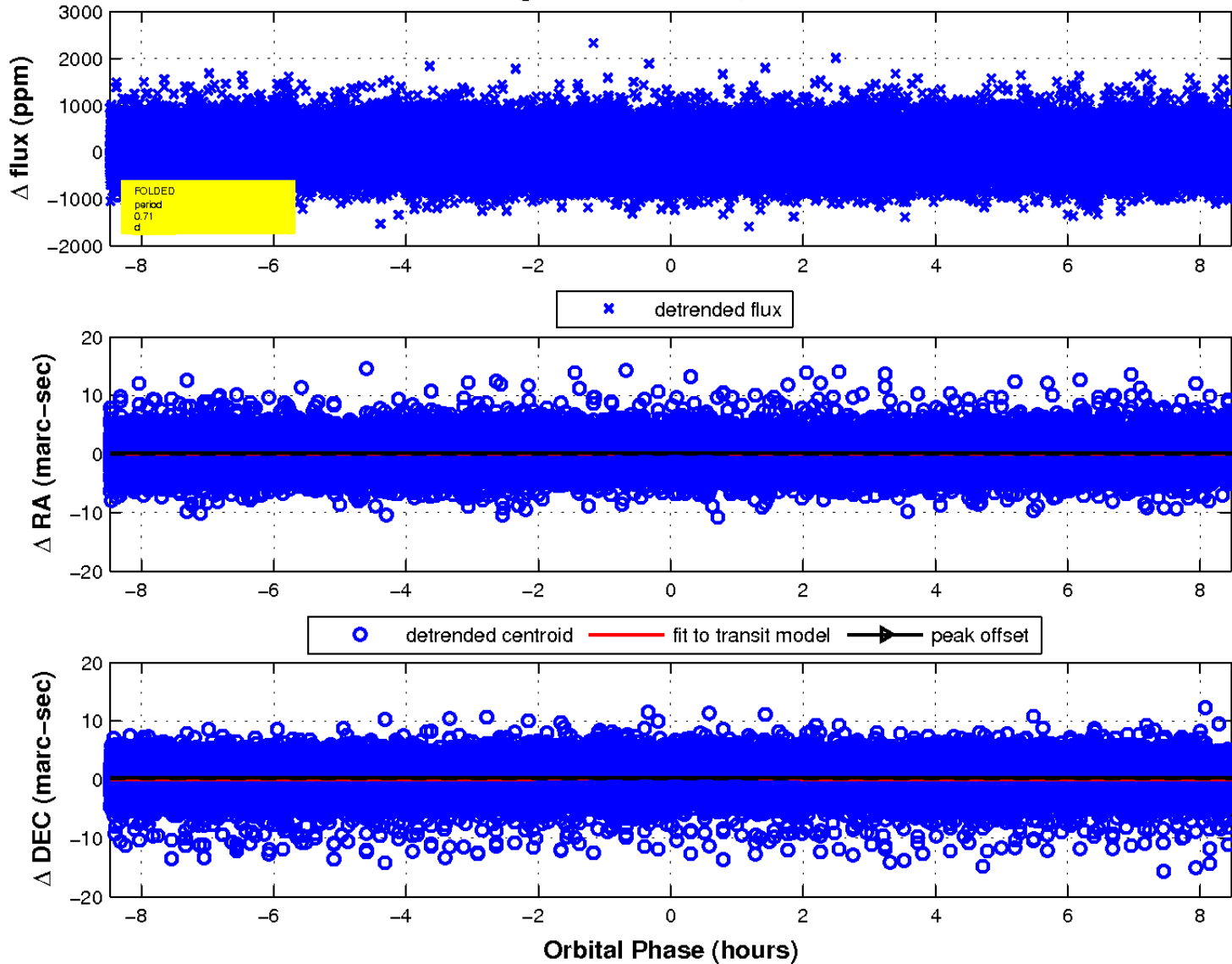
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

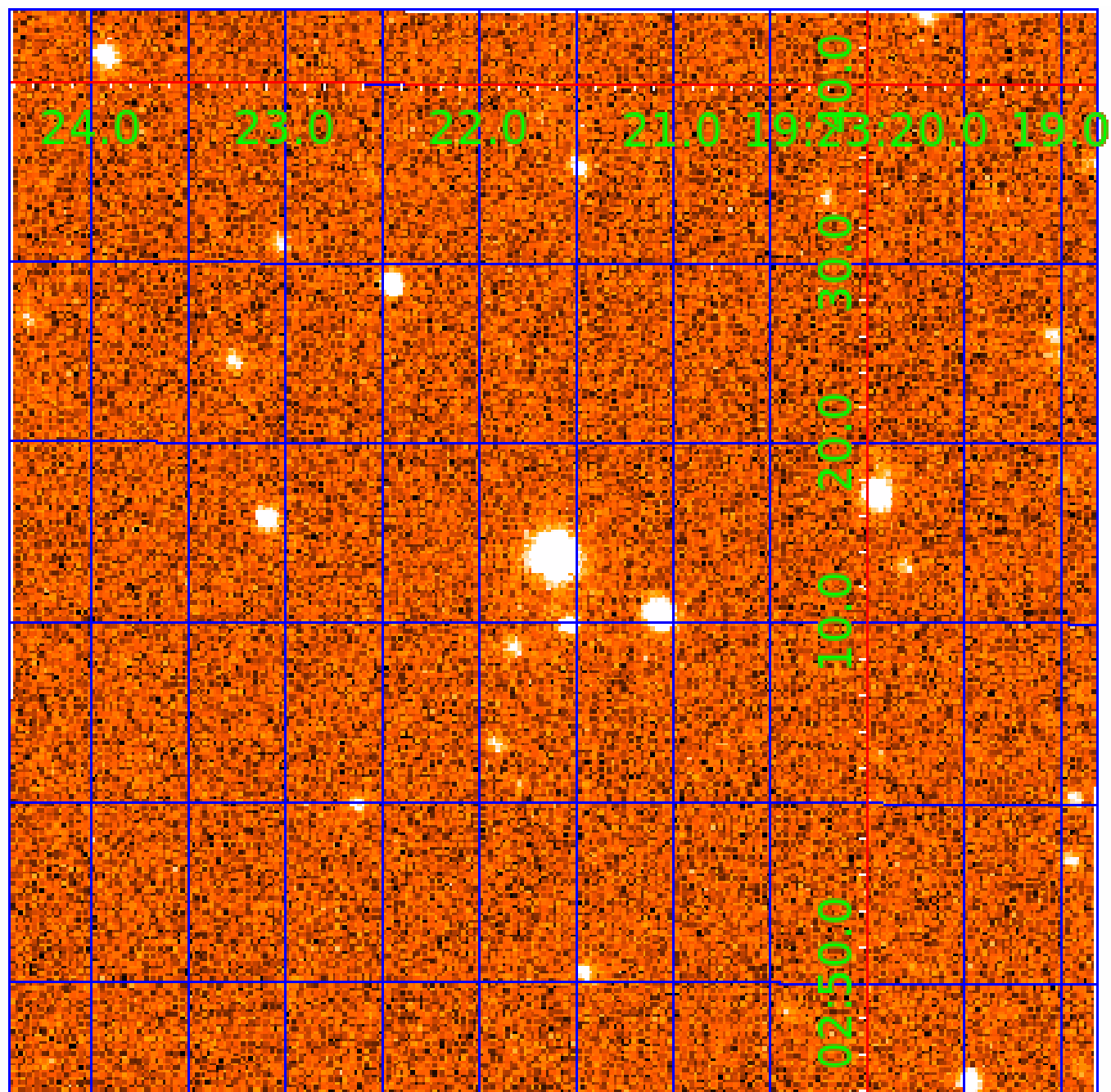


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 008163112

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})
008163112-01	OBS	No	0.706389	131.530867	31.8	4.075	9.1	9.1	0.85	5465	0.48	2884.98
008163112-02	OBS	No	76.486561	190.611858	549.2	1.884	7.9	8.0	0.85	5465	1.98	5.59

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008163112-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008163112-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

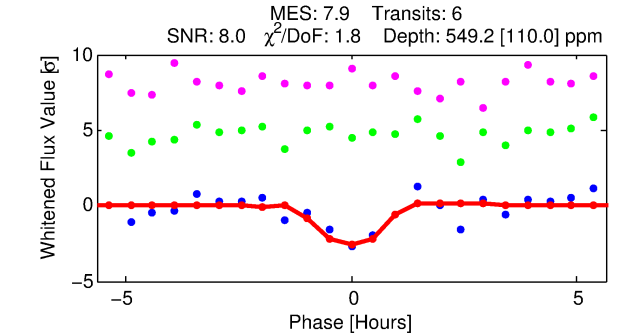
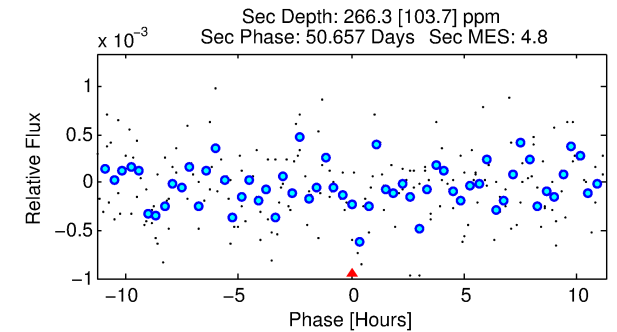
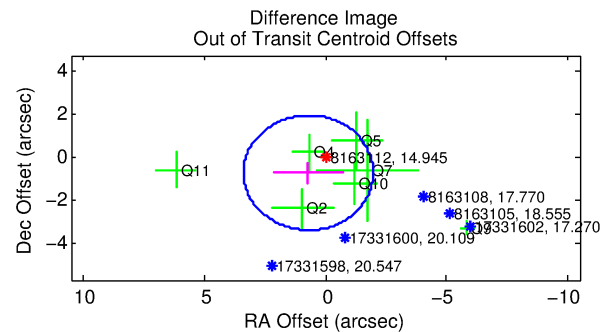
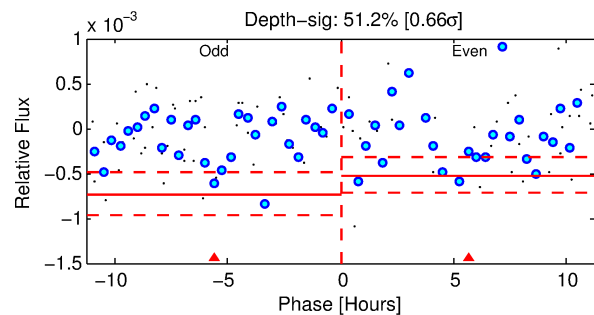
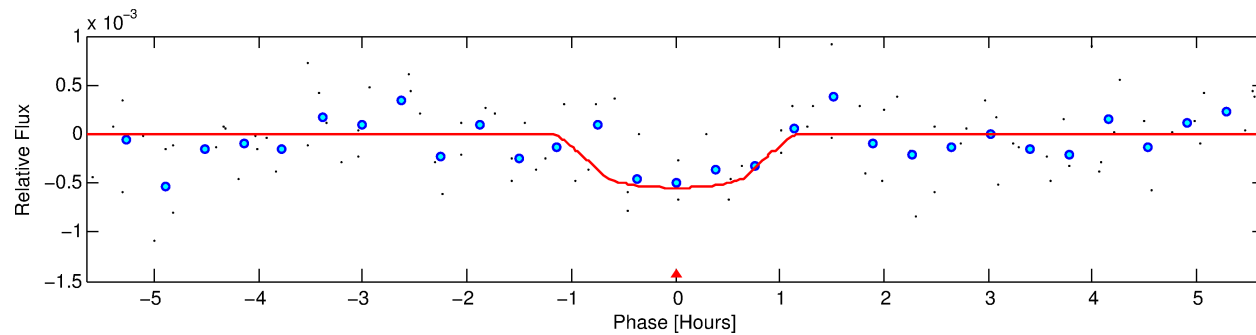
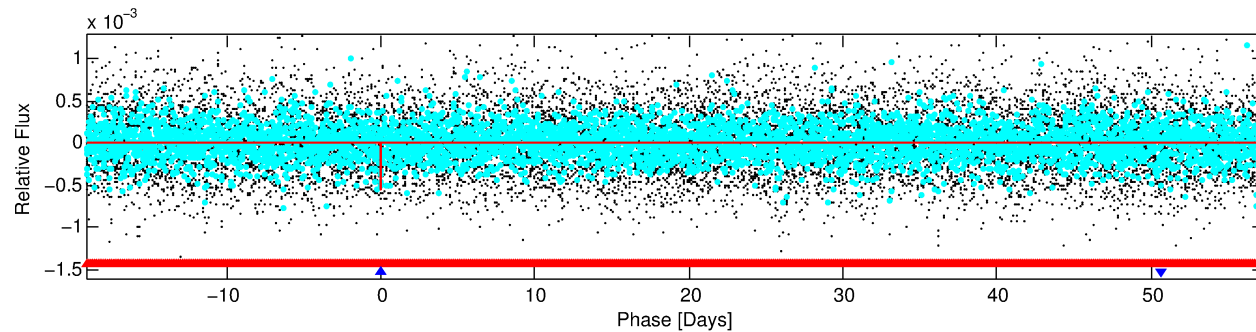
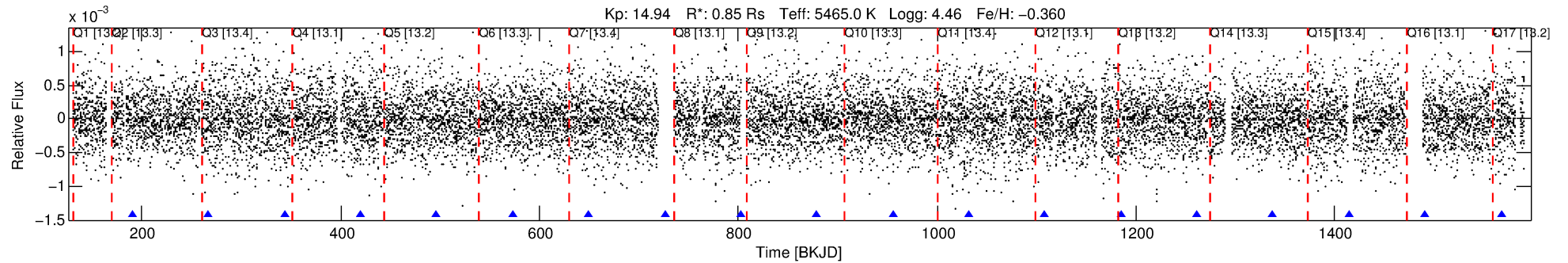
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008163112-02

No Significant Match Found

DV One-Page Summary

KIC: 8163112 Candidate: 2 of 2 Period: 76.487 d



DV Fit Results:

Period = 76.48656 [0.00117] d
Epoch = 190.6119 [0.0126] BKJD
Rp/R* = 0.0214 [0.0769]
a/R* = 308.53 [4686.78]
b = 0.23 [62.76]
Seff = 5.59 [1.74]
Teq = 392 [31] K
Rp = 1.98 [7.15] Re
a = 0.3214 [0.0600] AU
Ag = 3854.85 [27822.92] [0.14σ]
Teff = 4777 [8613] K [0.51σ]

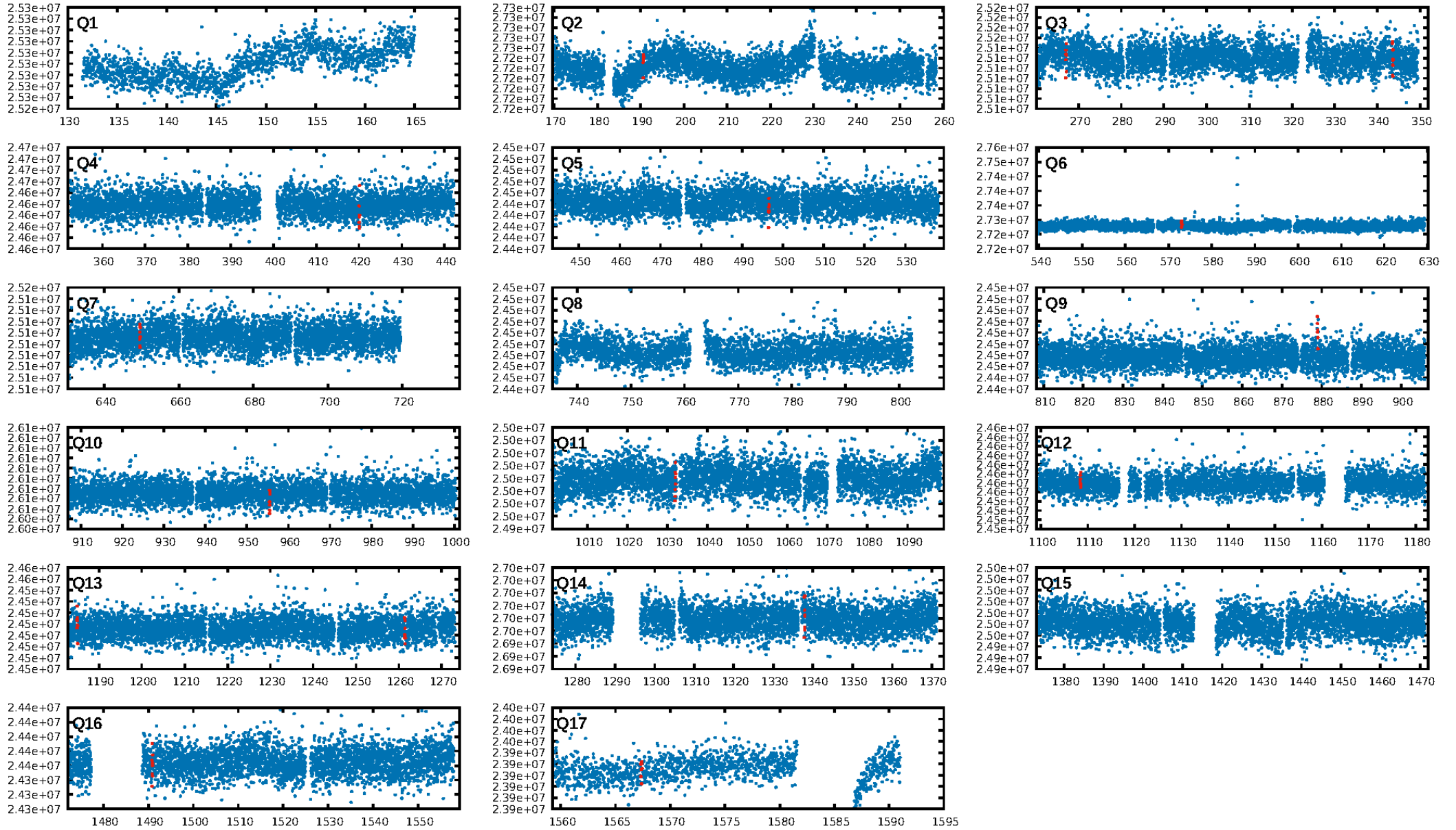
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [405.09σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.9%
ModelChiSquareGof-sig: 70.7%
Bootstrap-pfa: 6.85e-10
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -29.86
Centroid-sig: 2.2%
Centroid-so: 1.823 arcsec [1.32σ]
OotOffset-rm: 1.024 arcsec [1.15σ]
KicOffset-rm: 1.058 arcsec [1.40σ]
OotOffset-st: 2/2/1/2 [7]
KicOffset-st: 2/2/1/2 [7]
DiffImageQuality-fgm: 0.29 [2/7]
DiffImageOverlap-fno: 0.08 [1/13]

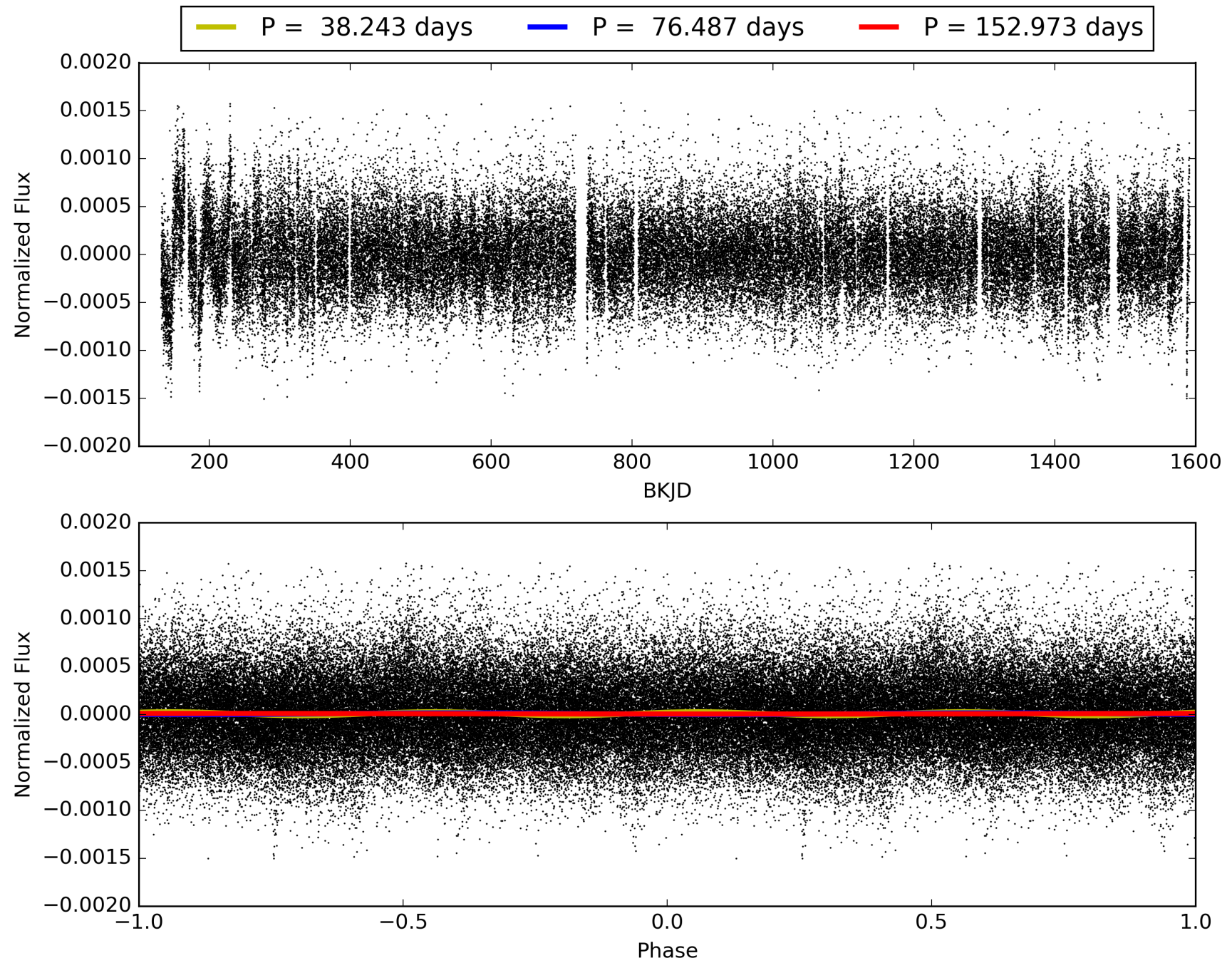
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:05:58 Z

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

TCE 008163112-02, PDC Light Curves

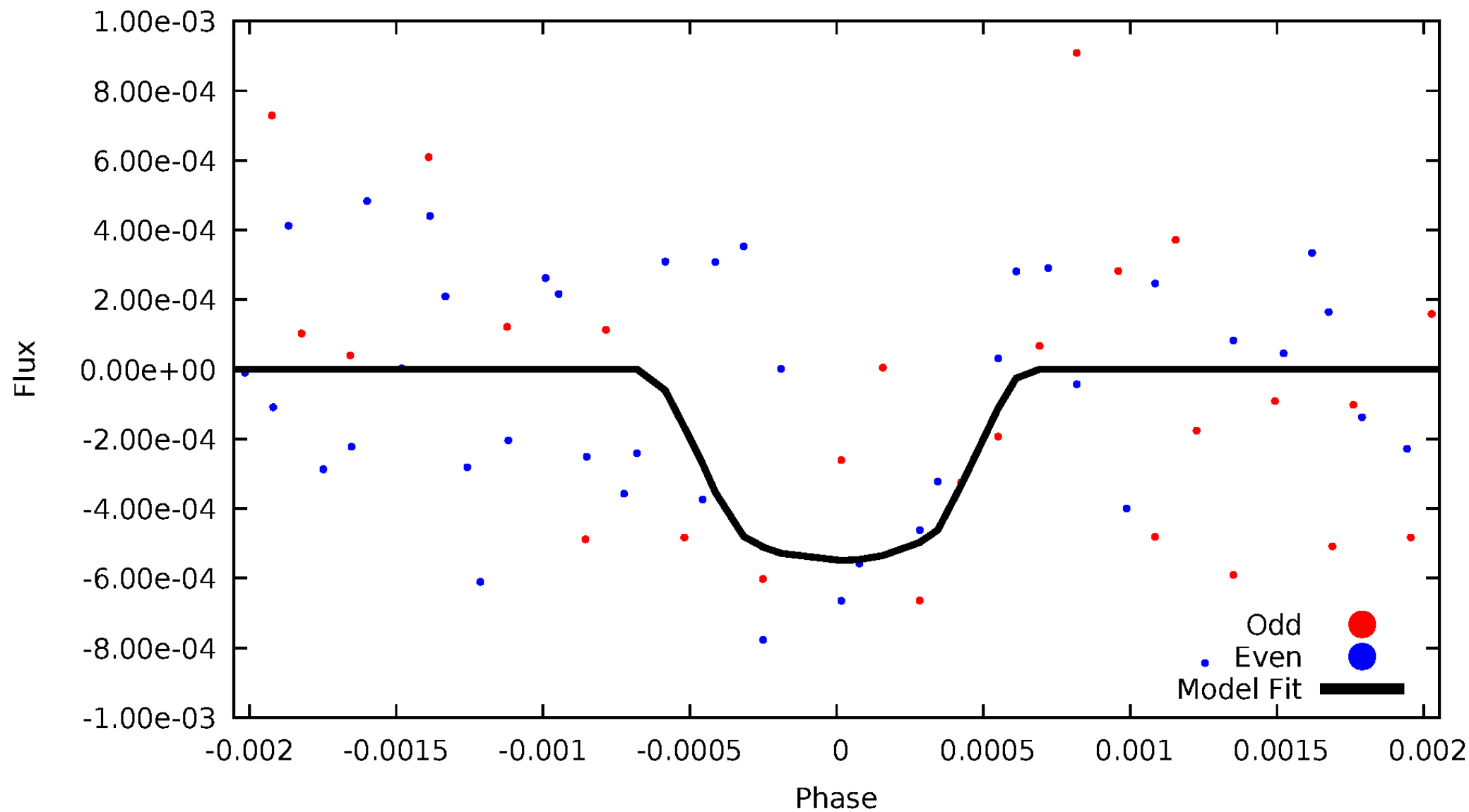


TCE 008163112-02



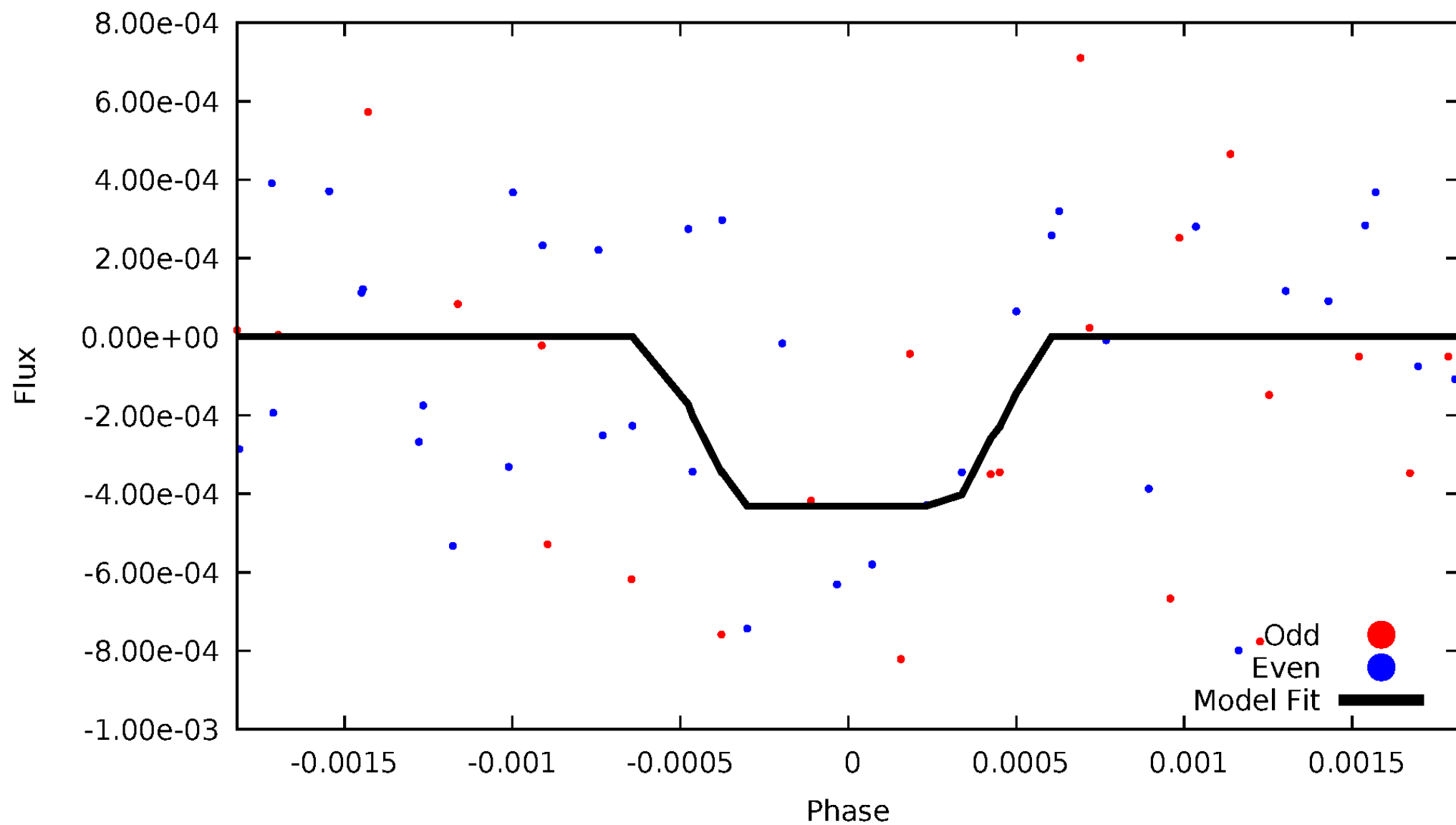
DV Odd/Even

TCE 008163112-02



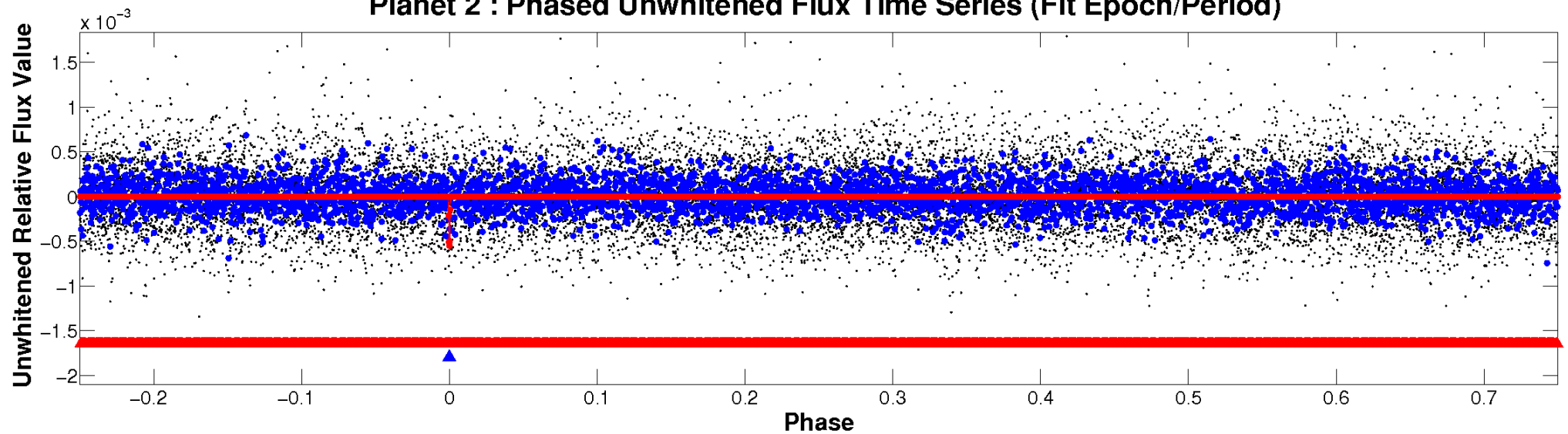
ALT Odd/Even

TCE 008163112-02

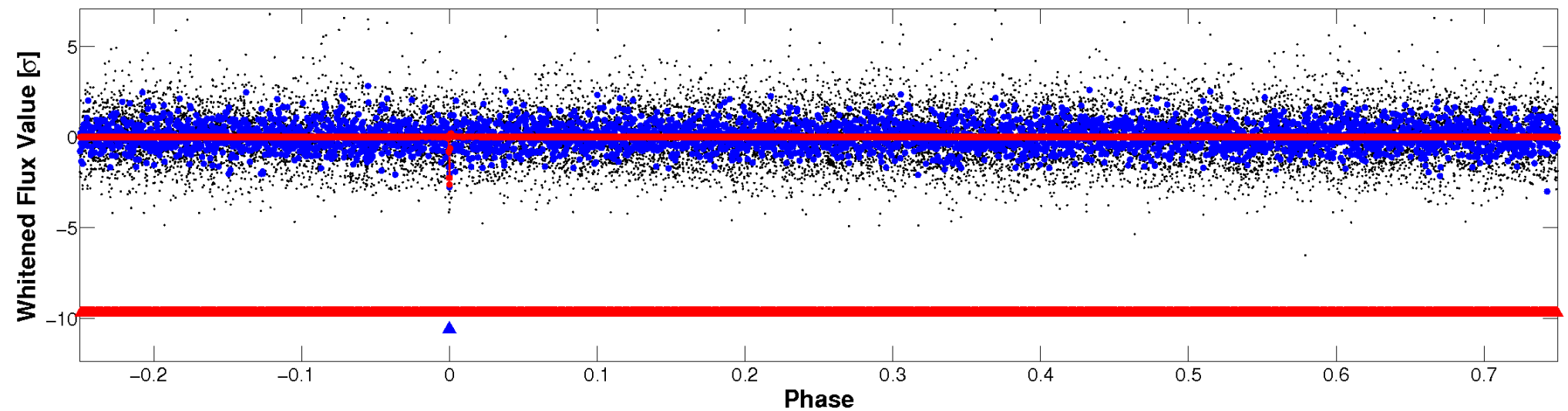


Non-Whitened Vs. Whitened Light Curve

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

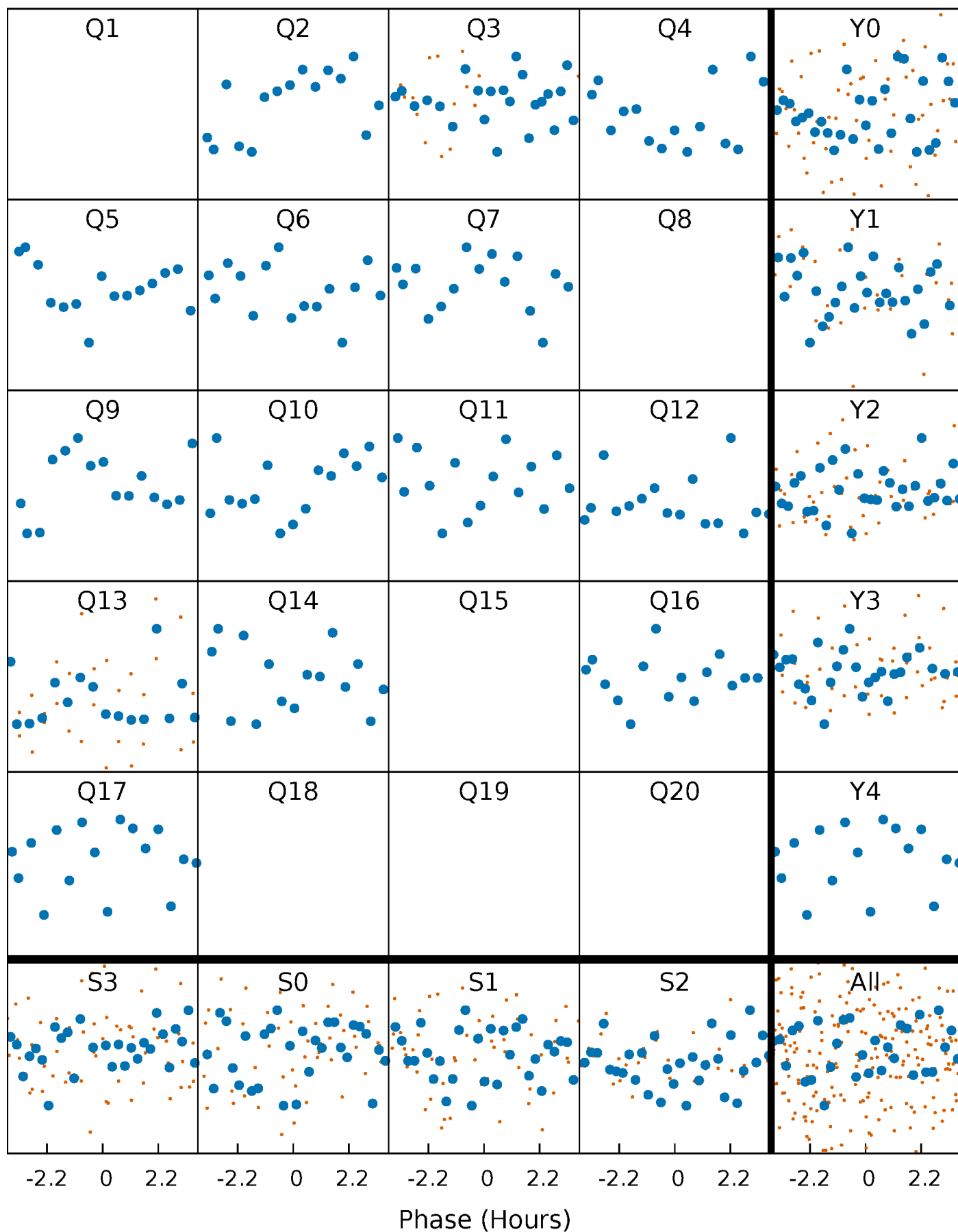


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



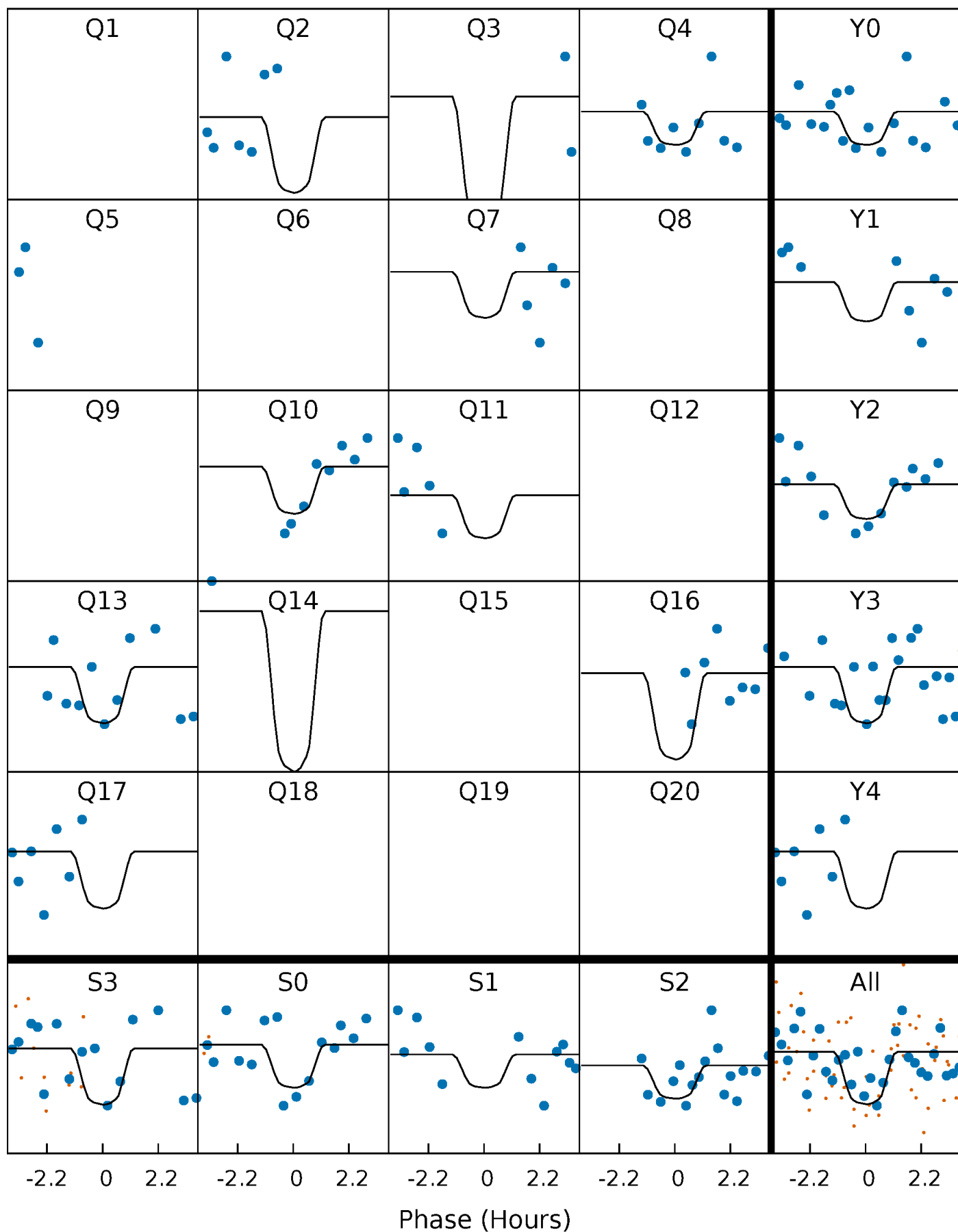
PDC Quarter-Phased Transit Curves

TCE 008163112-02 P= 76.486561 Days $T_0=190.611858$ (BKJD)



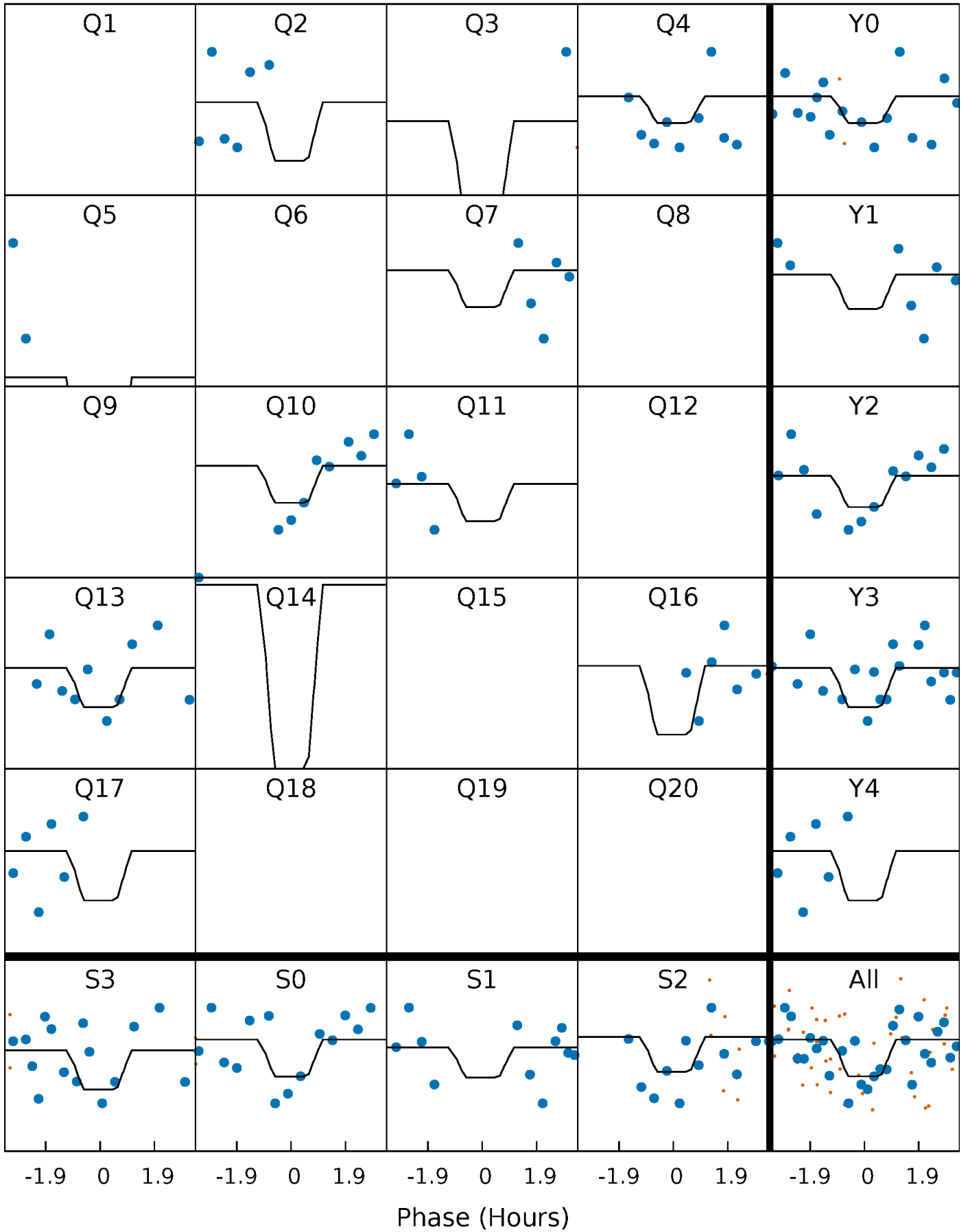
DV Quarter-Phased Transit Curves

TCE 008163112-02 P= 76.486561 Days $T_0=190.611858$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

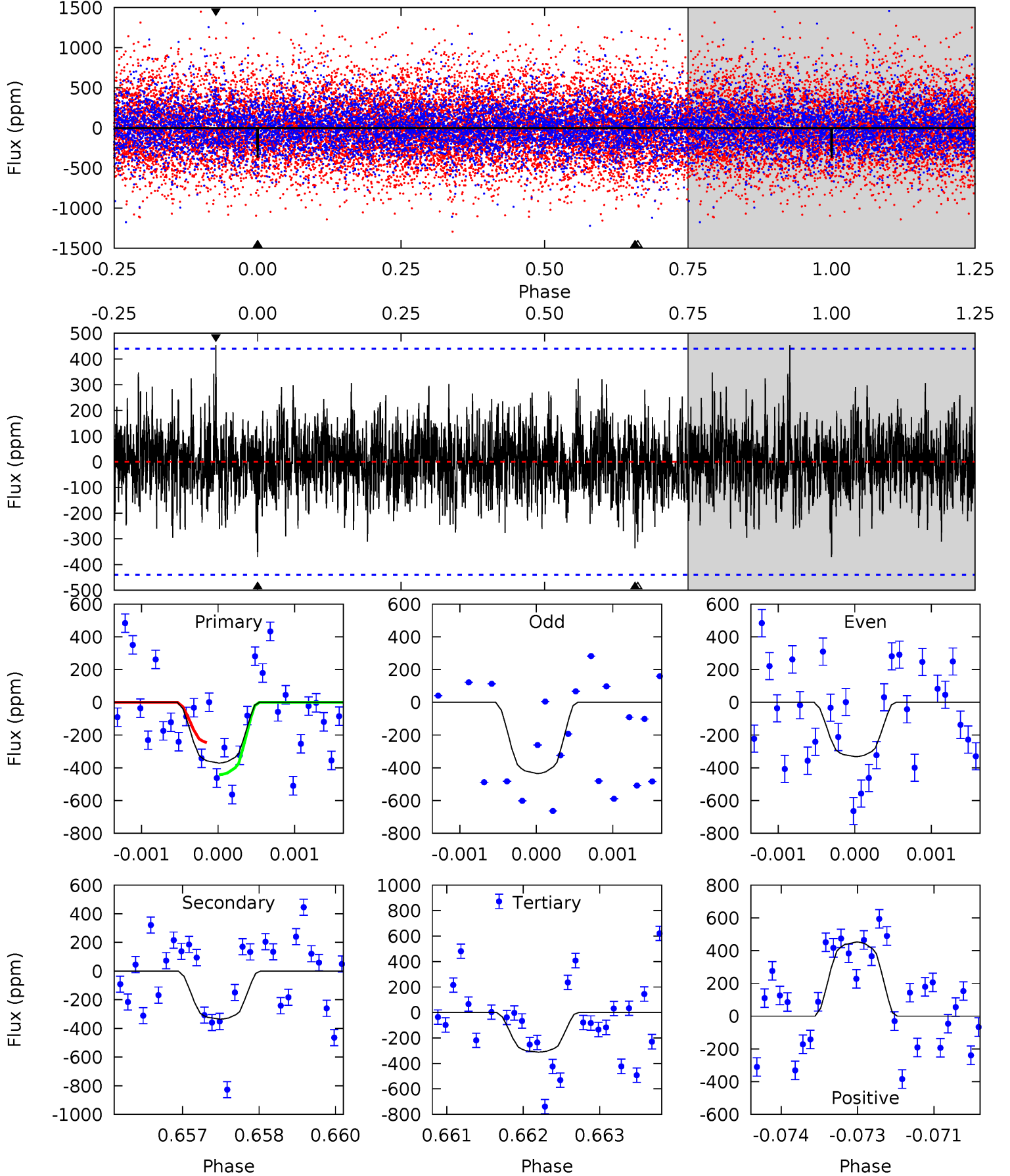
TCE 008163112-02 P= 76.485727 Days $T_0=190.624072$ (BKJD)



DV Model-Shift Uniqueness Test

008163112-02, P = 76.486561 Days, E = 114.125297 Days

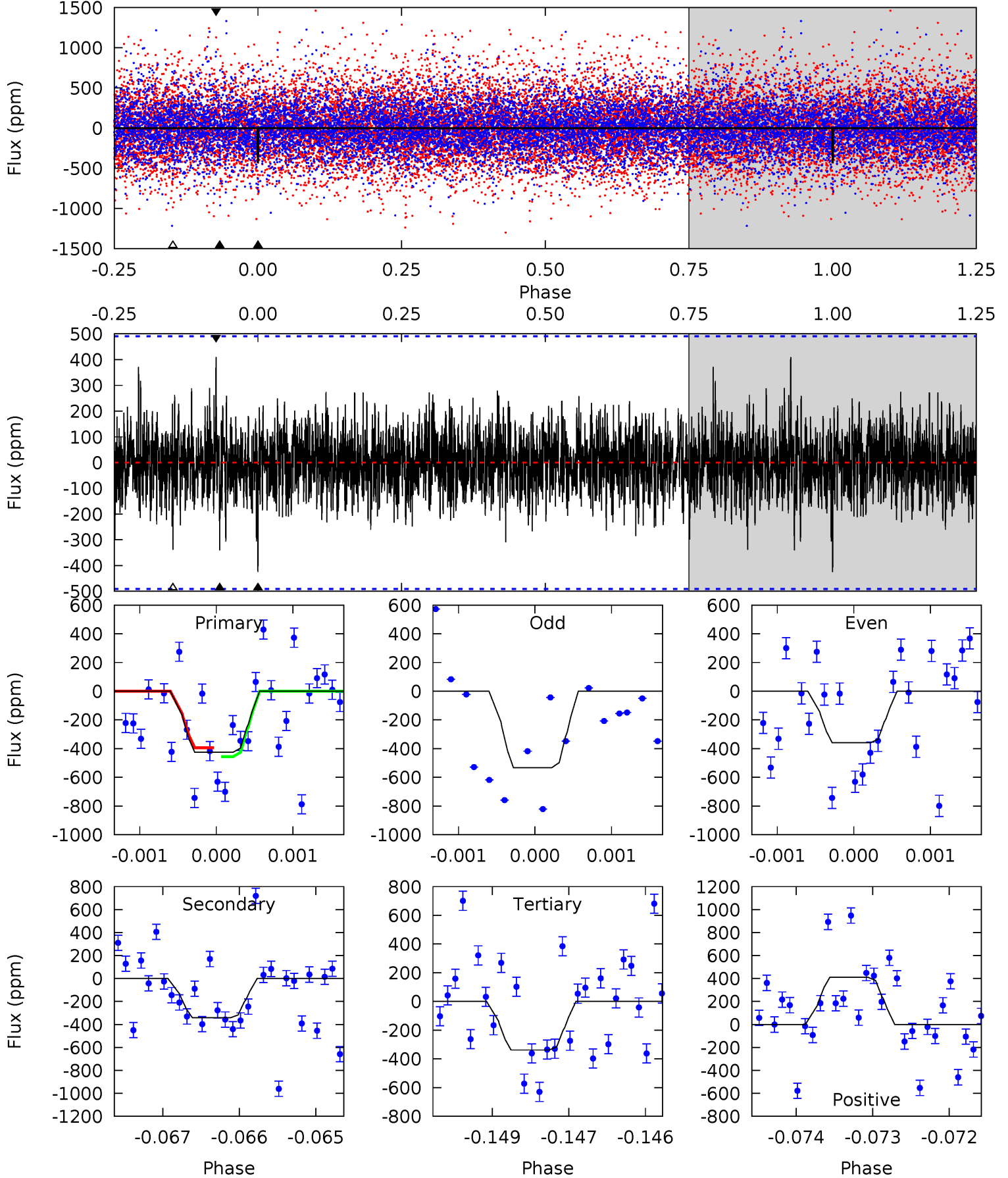
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.56	4.13	3.83	5.57	5.41	3.22	1.20	0.73	-1.01	0.30	-1.44	0.62	0.74	0.55	1.18



Alt Model-Shift Uniqueness Test

008163112-02, P = 76.485727 Days, E = 114.138345 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.72	3.78	3.75	4.55	5.44	3.27	1.05	0.97	0.17	0.03	-0.77	0.96	0.97	0.49	0.34



Stellar Parameters For KIC 008163112

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5465^{+164}_{-164}	$4.458^{+0.135}_{-0.165}$	$-0.360^{+0.350}_{-0.300}$	$0.850^{+0.175}_{-0.117}$	$0.756^{+0.124}_{-0.044}$	$1.735^{+0.973}_{-0.728}$
	+3%/-3%	+3%/-4%	+97%/-83%	+21%/-14%	+16%/-6%	+56%/-42%
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 008163112-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-336 ± 81	$5.97^{+6.20}_{-4.36}$	550^{+36}_{-29}	3411^{+2362}_{-611}	546^{+7358}_{-420}
Alt.	-341 ± 90	$5.54^{+5.67}_{-3.90}$	551^{+33}_{-31}	3491^{+2094}_{-656}	606^{+6257}_{-461}

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

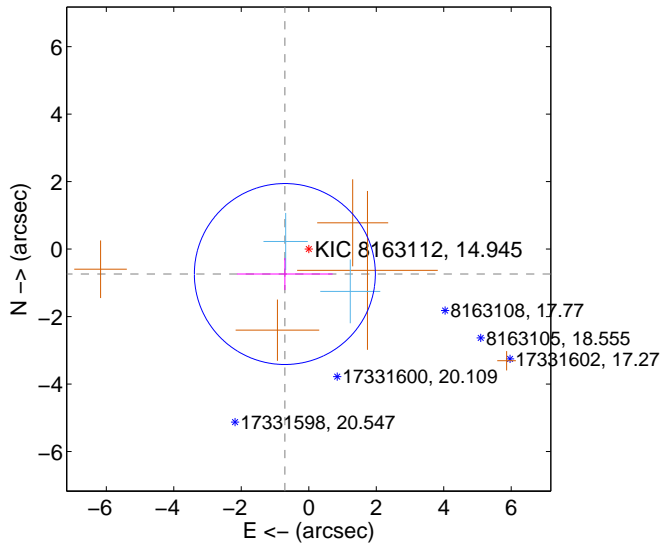
Supplemental centroid analysis for 008163112-02. Kepler magnitude: 14.95. Transit SNR 8.01

There are 2 quarters with good PRF difference image offsets

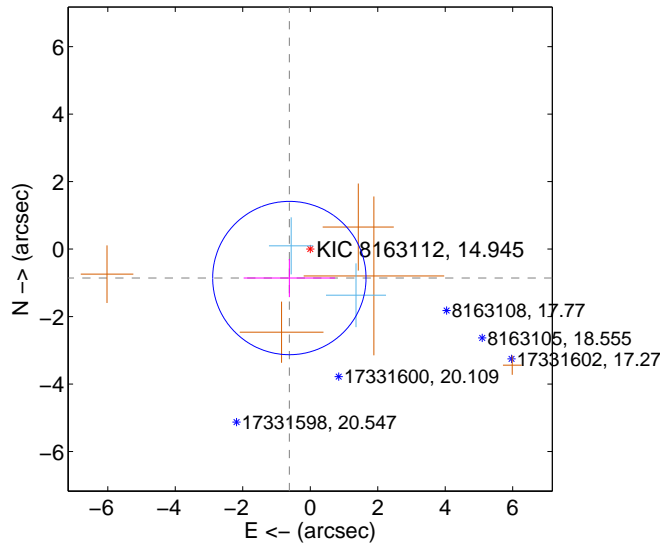
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.024 ± 0.894	1.15	0.709 ± 1.416	-0.739 ± 0.474
PRF-fit source offset from KIC position	1.058 ± 0.757	1.40	0.620 ± 1.355	-0.858 ± 0.566
photometric centroid source offset	1.82 ± 1.38	1.32	0.66 ± 1.32	1.70 ± 1.39

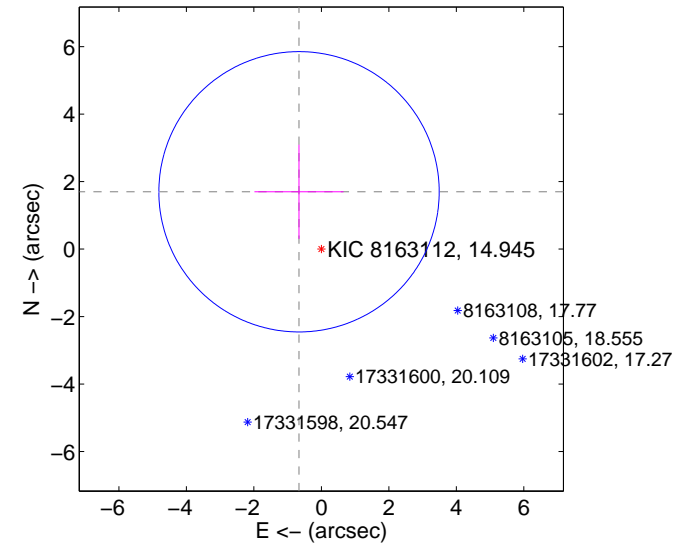
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

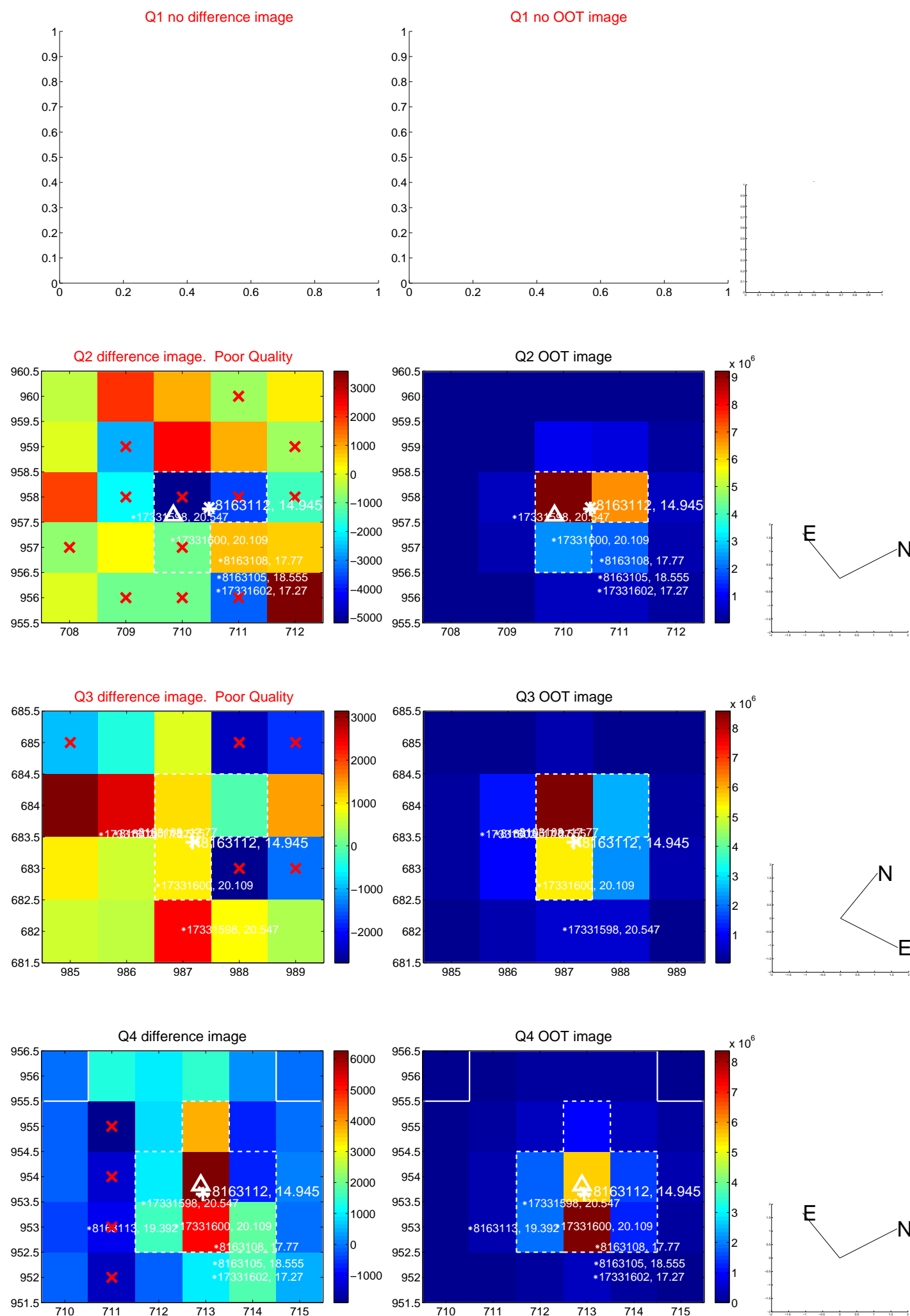


offset from photometric centroids

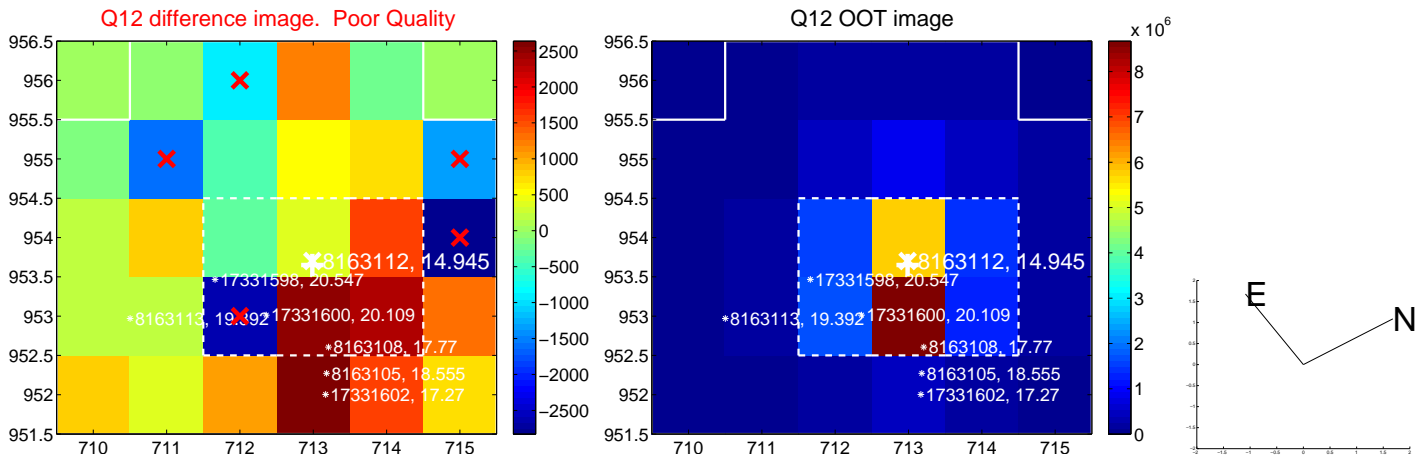
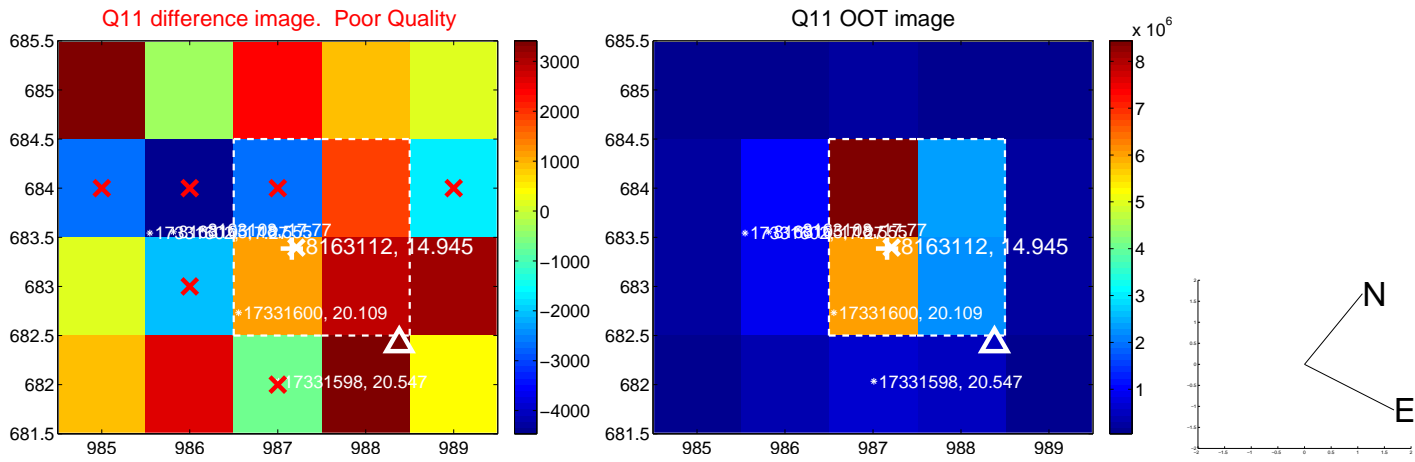
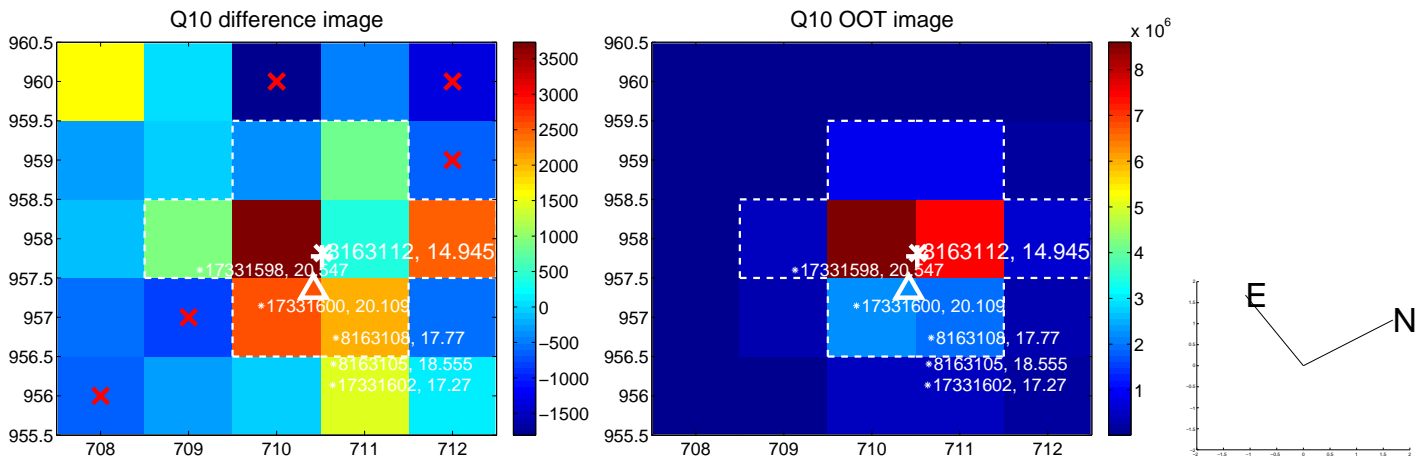
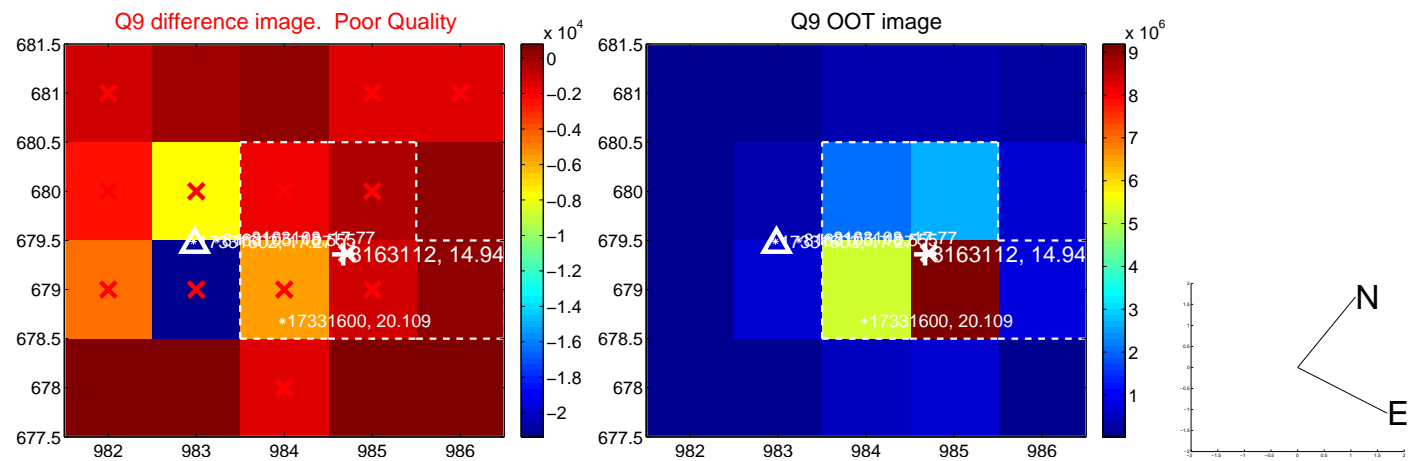


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

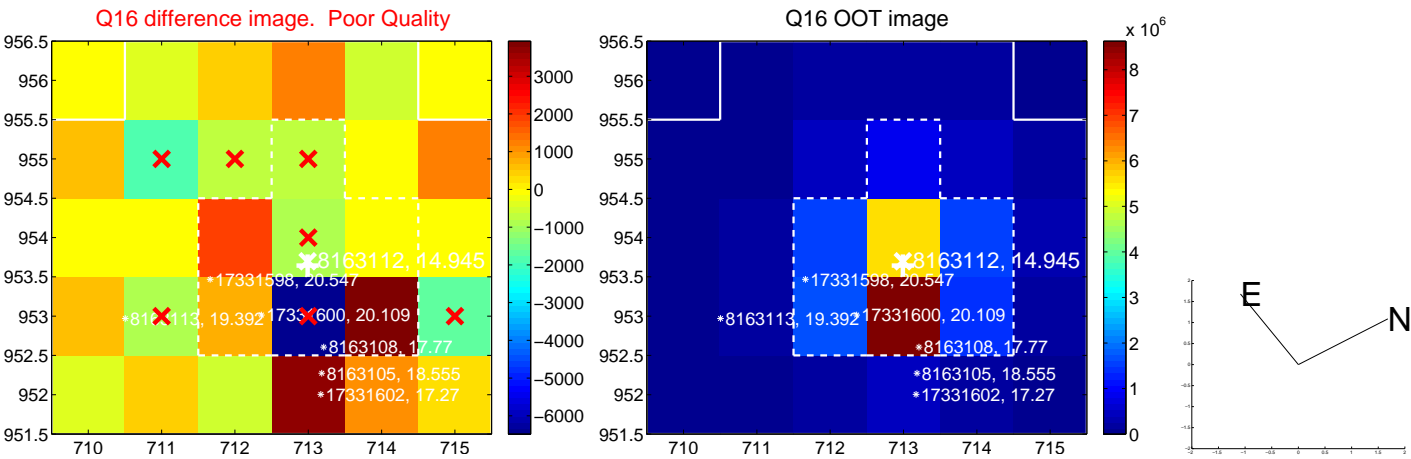
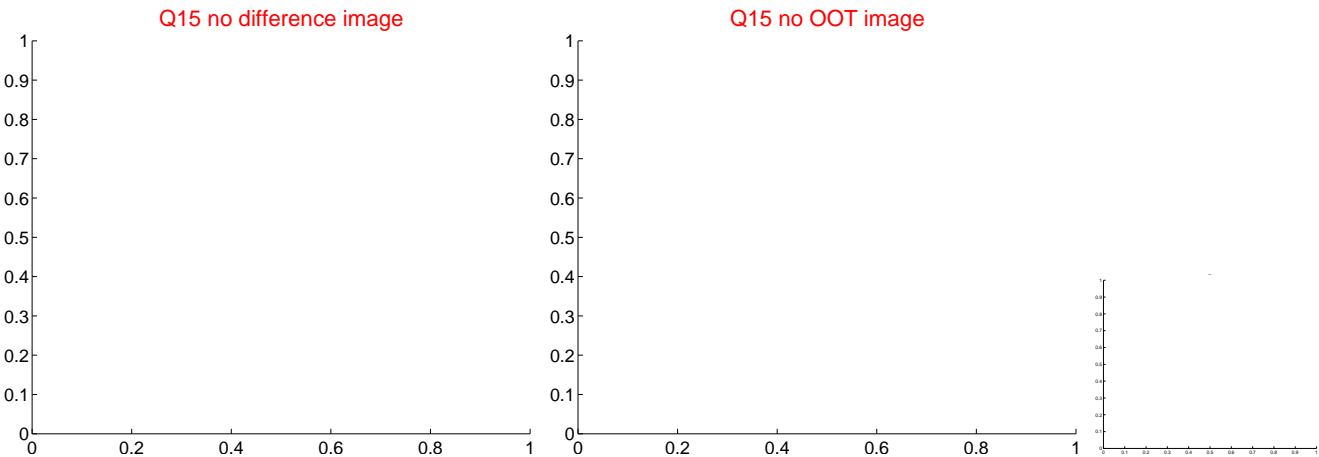
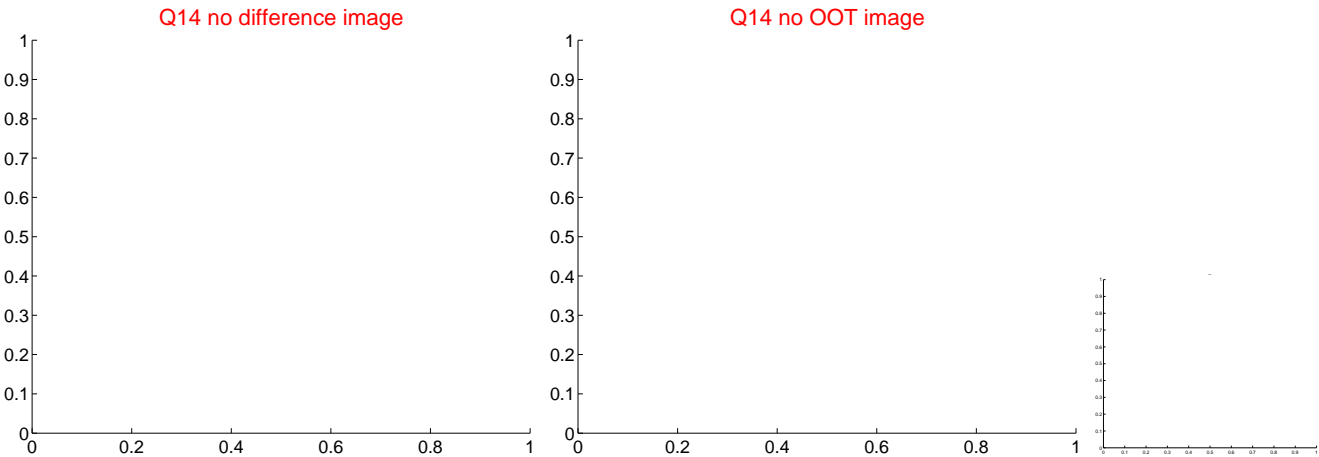
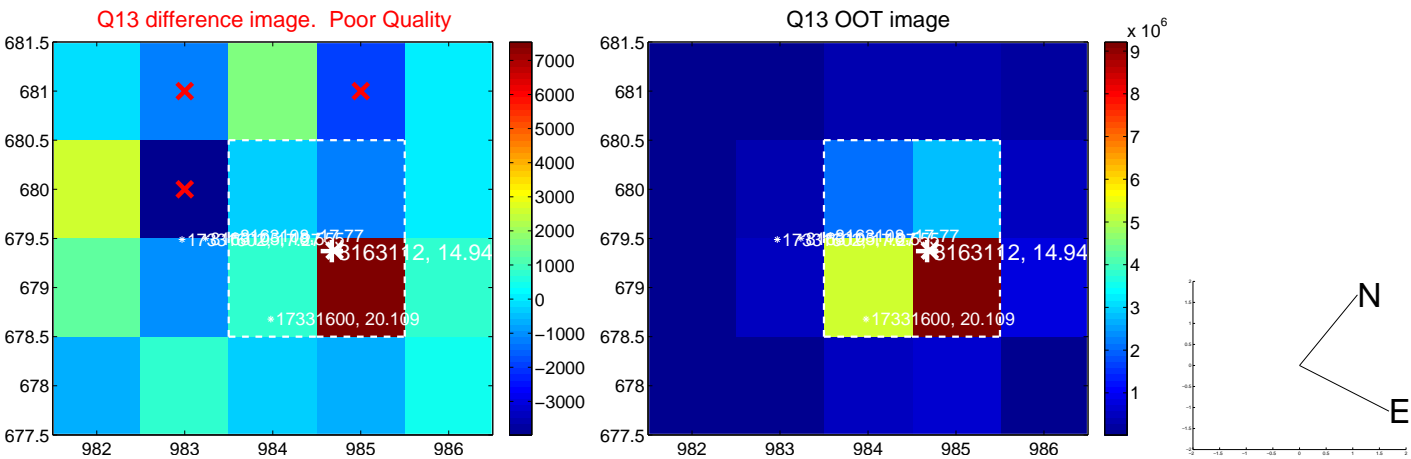
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



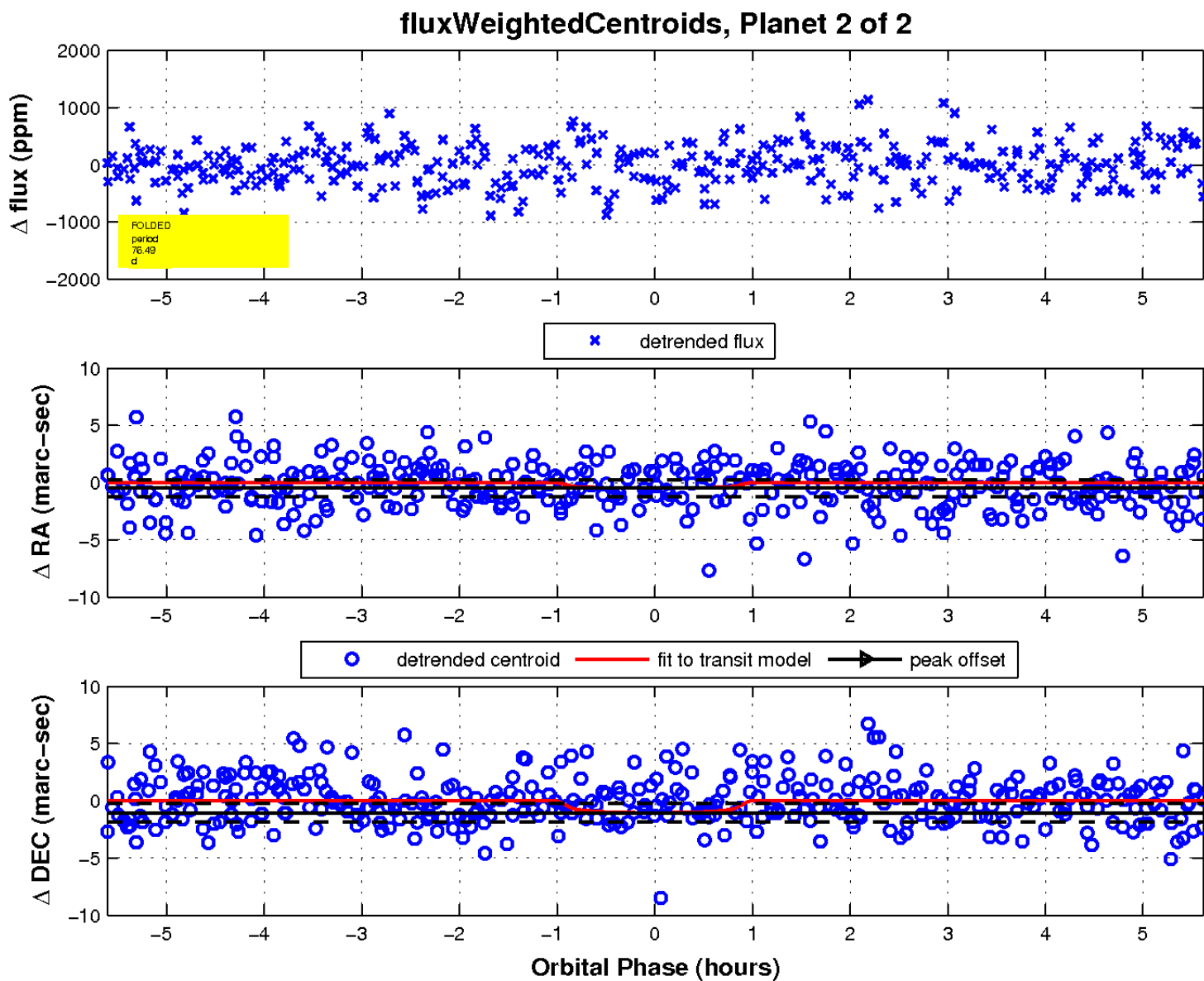
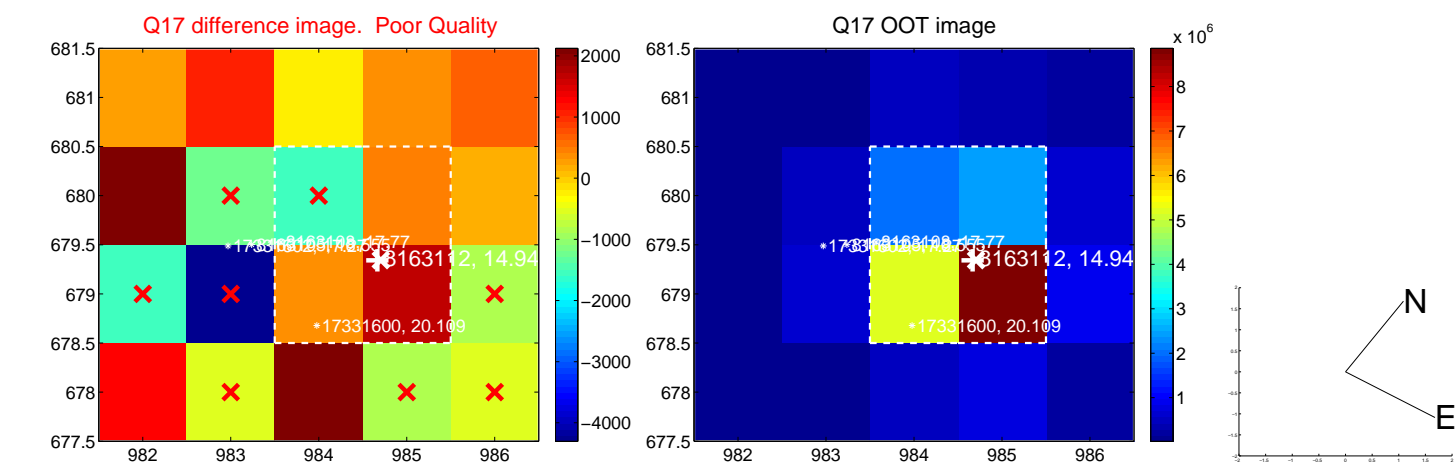
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

