

KIC 004481700

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})
004481700-01	OBS	No	0.664173	131.911710	464.5	2.232	13.0	13.8	1.73	7108	4.33	24128.92
004481700-02	OBS	No	0.664168	131.580621	431.9	2.434	13.0	14.1	1.73	7108	3.87	24129.19
004481700-03	OBS	No	0.616551	131.608393	1064.2	2.653	8.5	10.1	1.73	7108	6.55	26645.36
004481700-04	OBS	No	0.706193	131.995369	434.8	2.500	9.4	-1.0	1.73	7108	3.65	22233.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481700-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004481700-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
004481700-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004481700-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

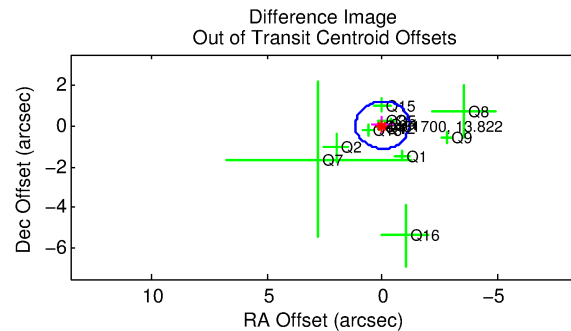
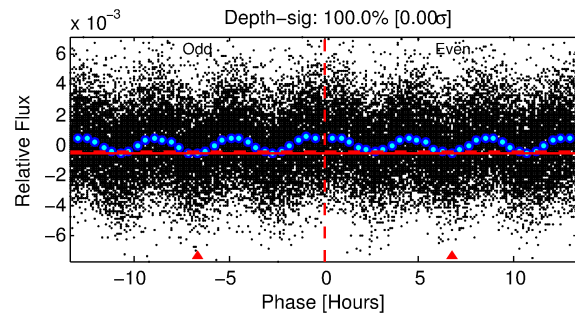
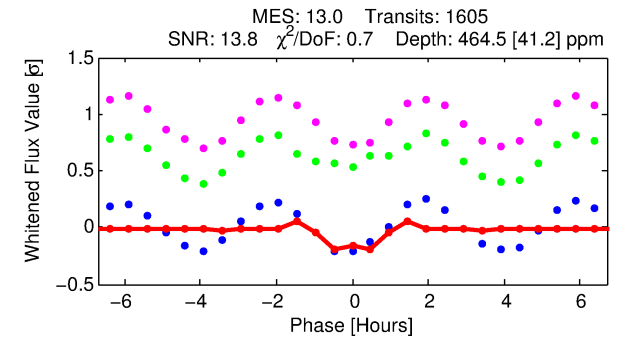
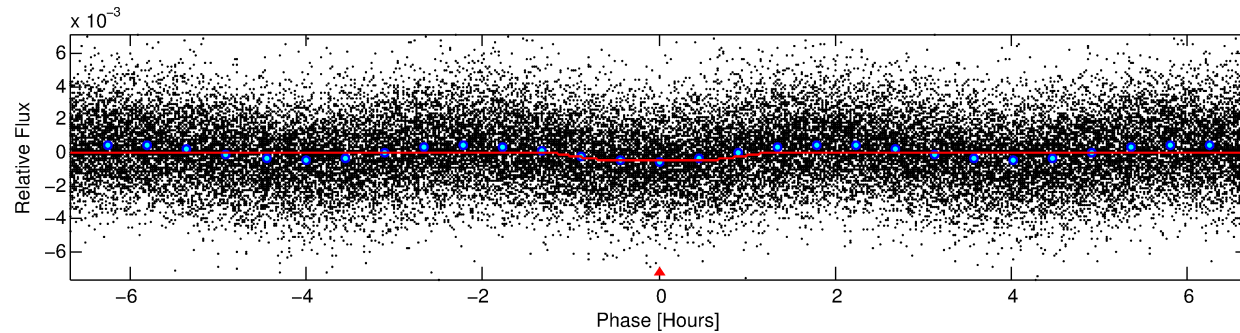
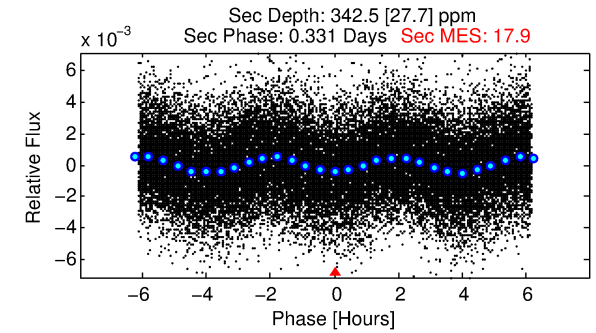
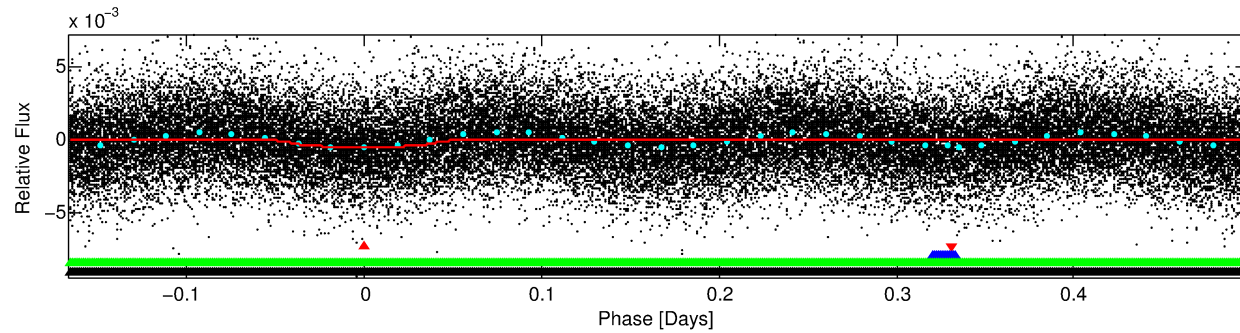
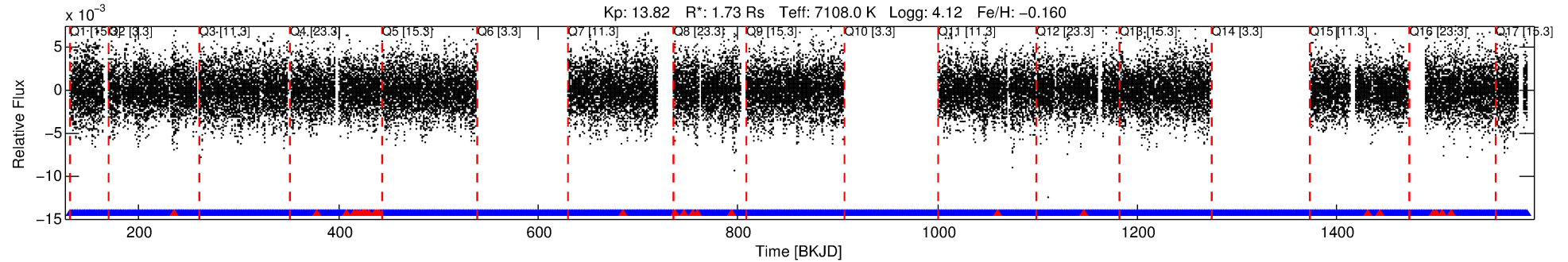
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481700-01

No Significant Match Found

DV One-Page Summary

KIC: 4481700 Candidate: 1 of 4 Period: 0.664 d



DV Fit Results:

Period = 0.66417 [0.00001] d
Epoch = 131.9117 [0.0012] BKJD
Rp/R* = 0.0230 [0.0025]
a/R* = 1.45 [0.43]
b = 0.90 [0.12]
Seff = 24128.92 [9999.93]
Teq = 3178 [329] K
Rp = 4.33 [1.50] Re
a = 0.0168 [0.0044] AU
Ag = 2.84 [1.23] [1.49σ]
Teffp = 6378 [482] K [5.48σ]

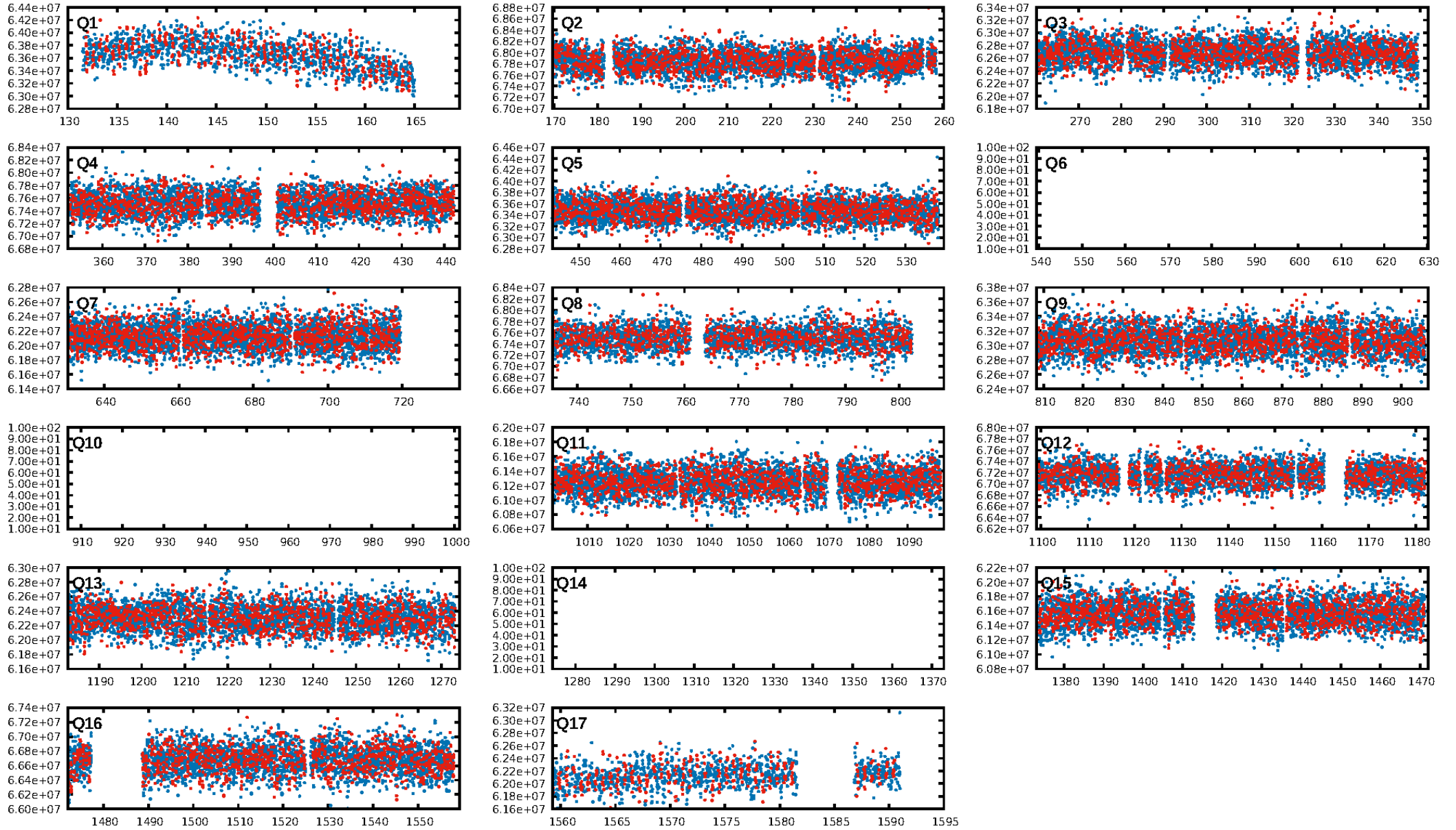
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 23.7% [0.30σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.98 [1484/1515]
GhostDiagnostic-chr: 0.6943
Centroid-sig: N/A
Centroid-so: 0.137 arcsec [1.44σ]
OotOffset-rm: 0.039 arcsec [0.10σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-rm: 0.104 arcsec [0.26σ]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 0.71 [10/14]
DiffImageOverlap-fno: 0.00 [0/14]

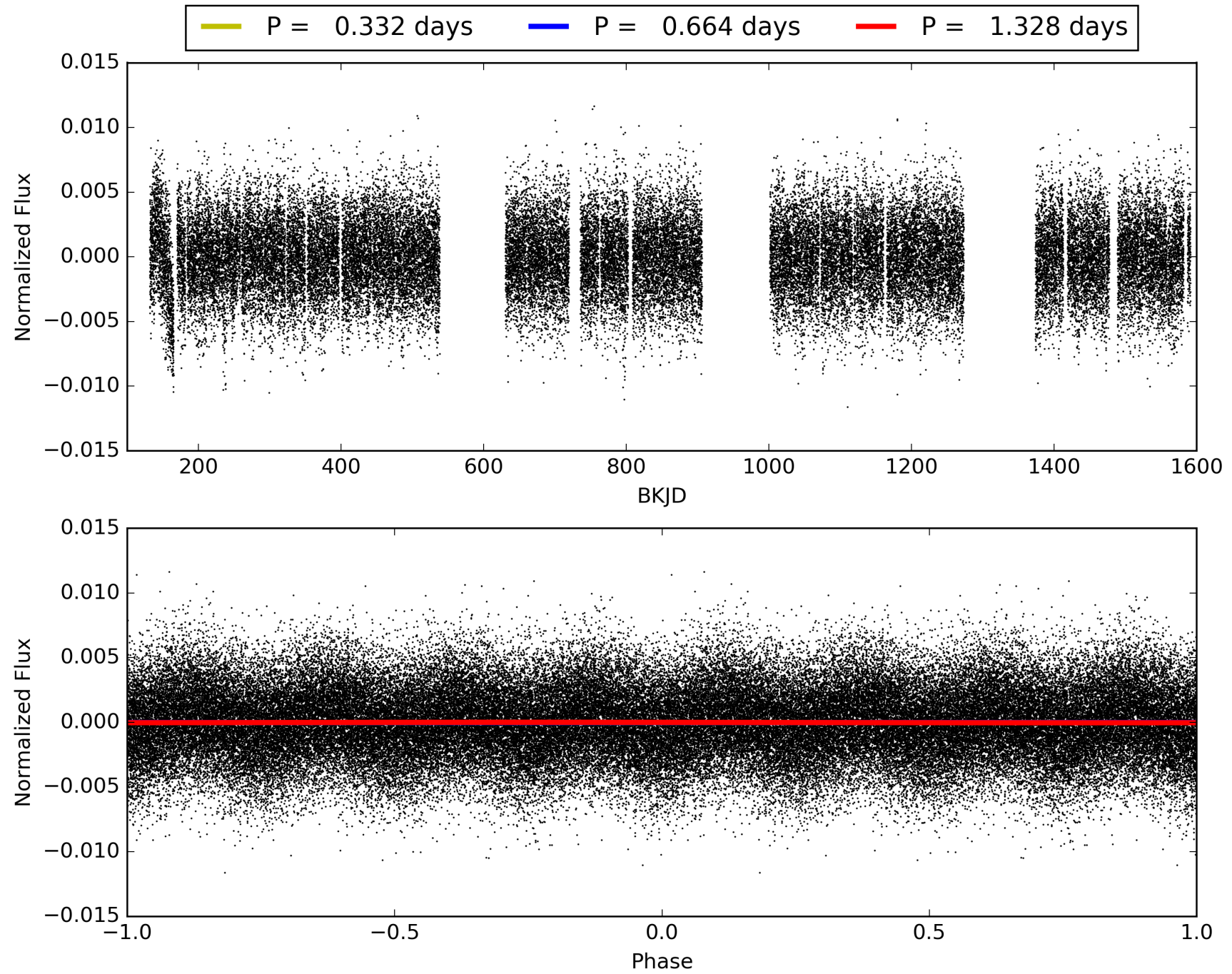
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:48:22 Z

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

TCE 004481700-01, PDC Light Curves

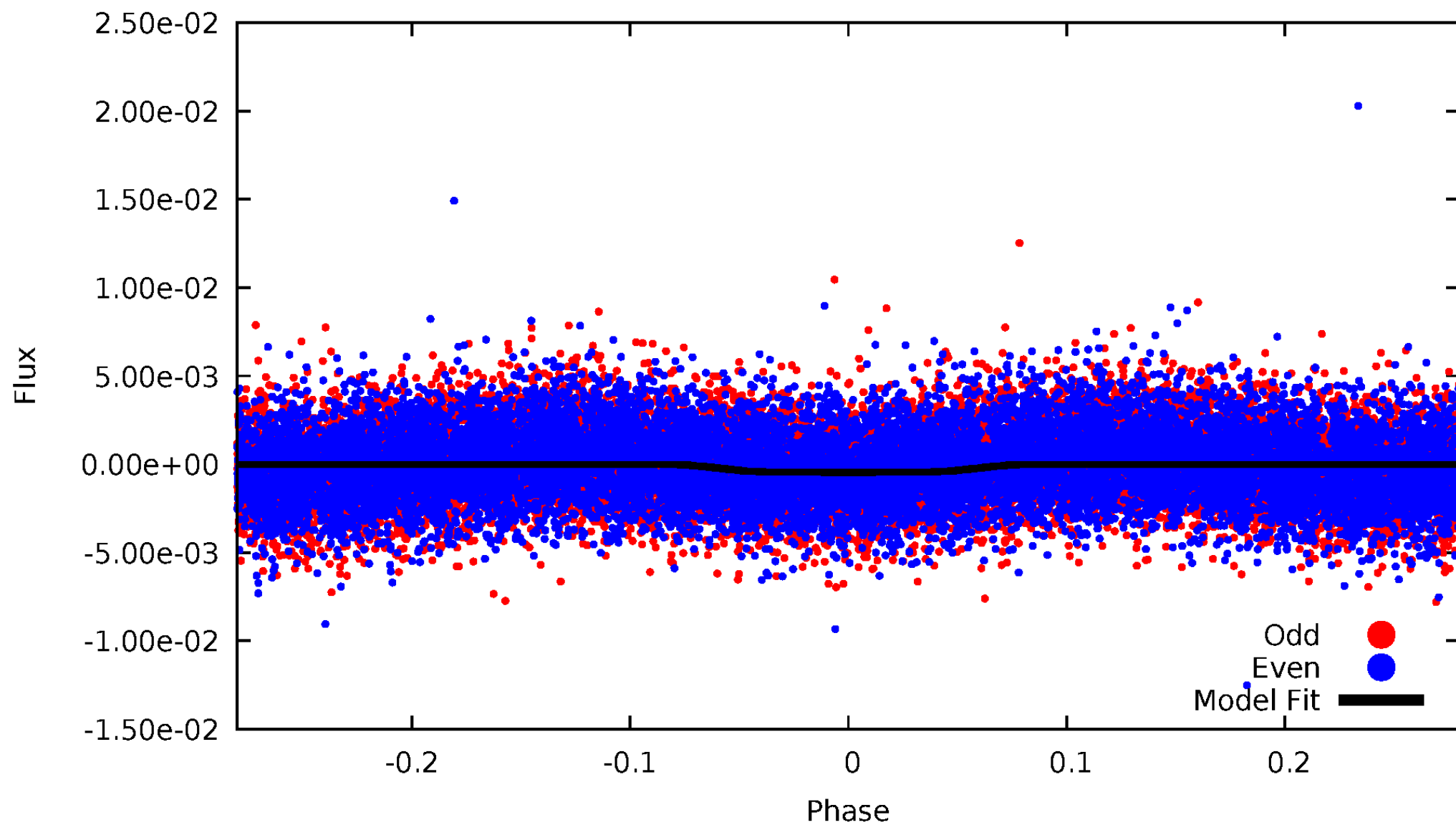


TCE 004481700-01



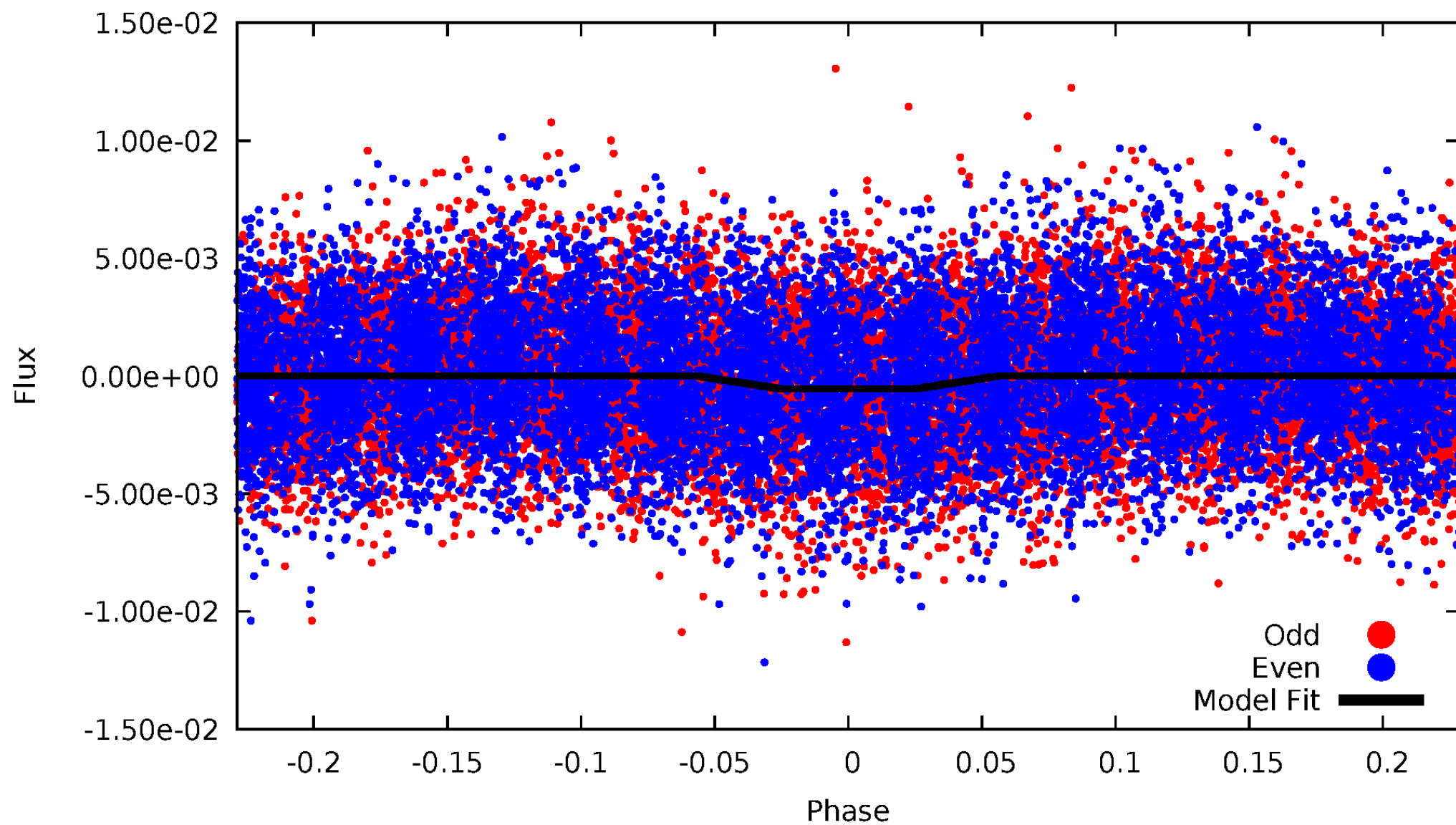
DV Odd/Even

TCE 004481700-01



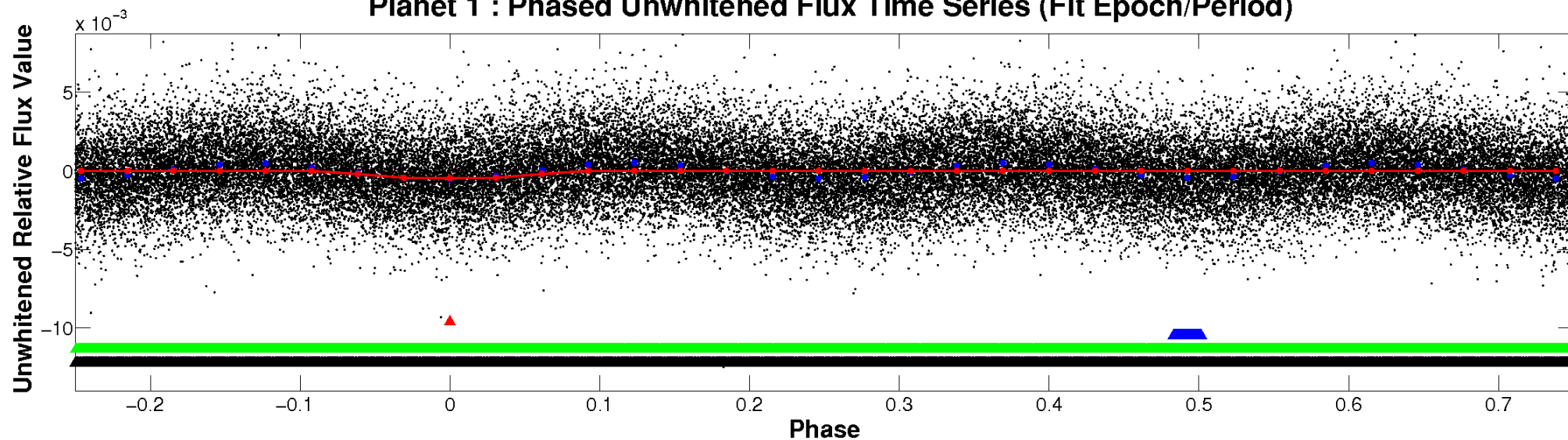
ALT Odd/Even

TCE 004481700-01

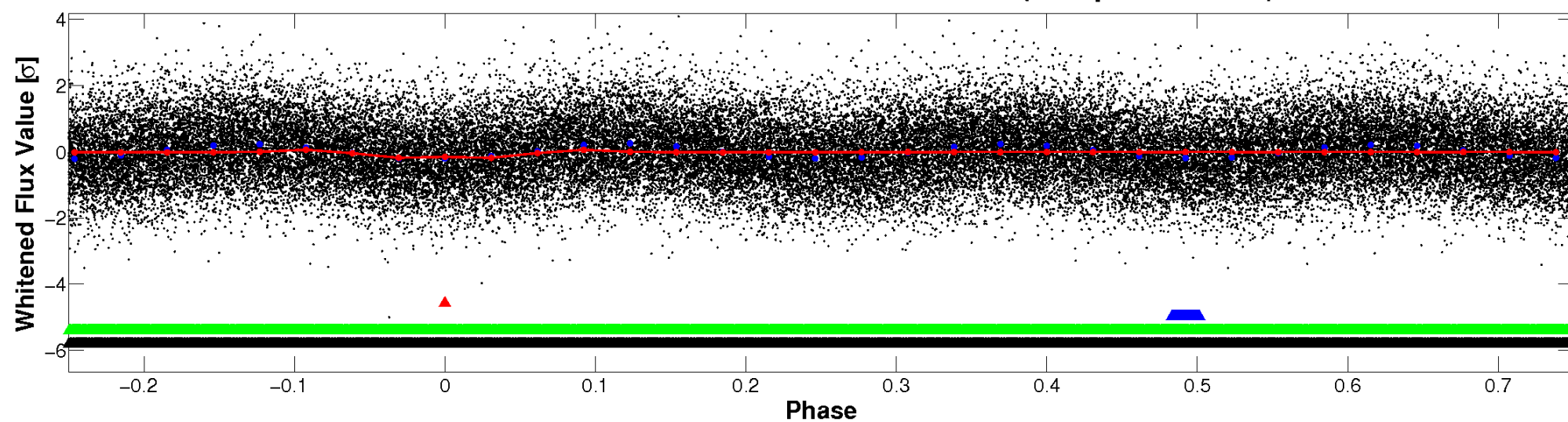


Non-Whitened Vs. Whitened Light Curve

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

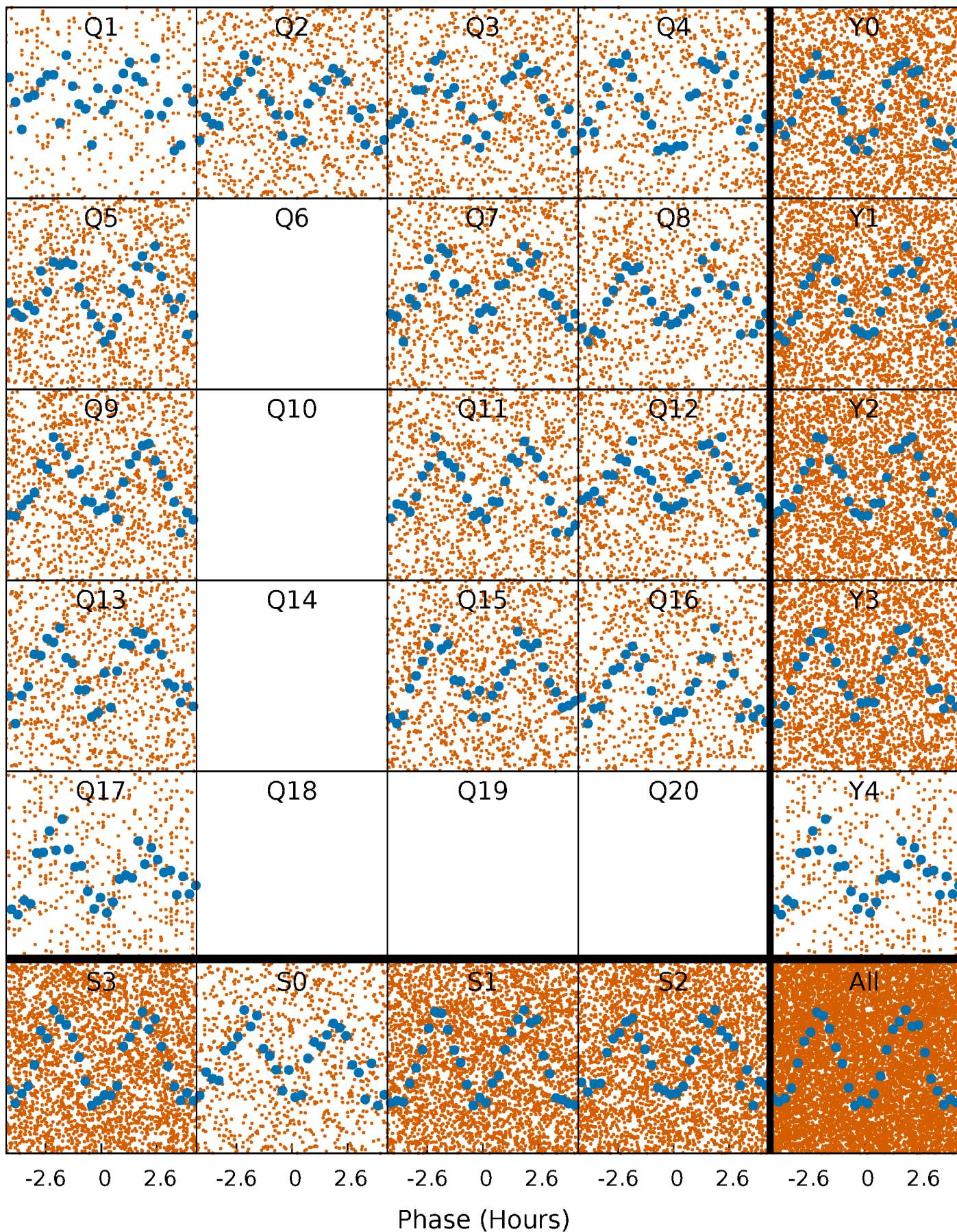


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



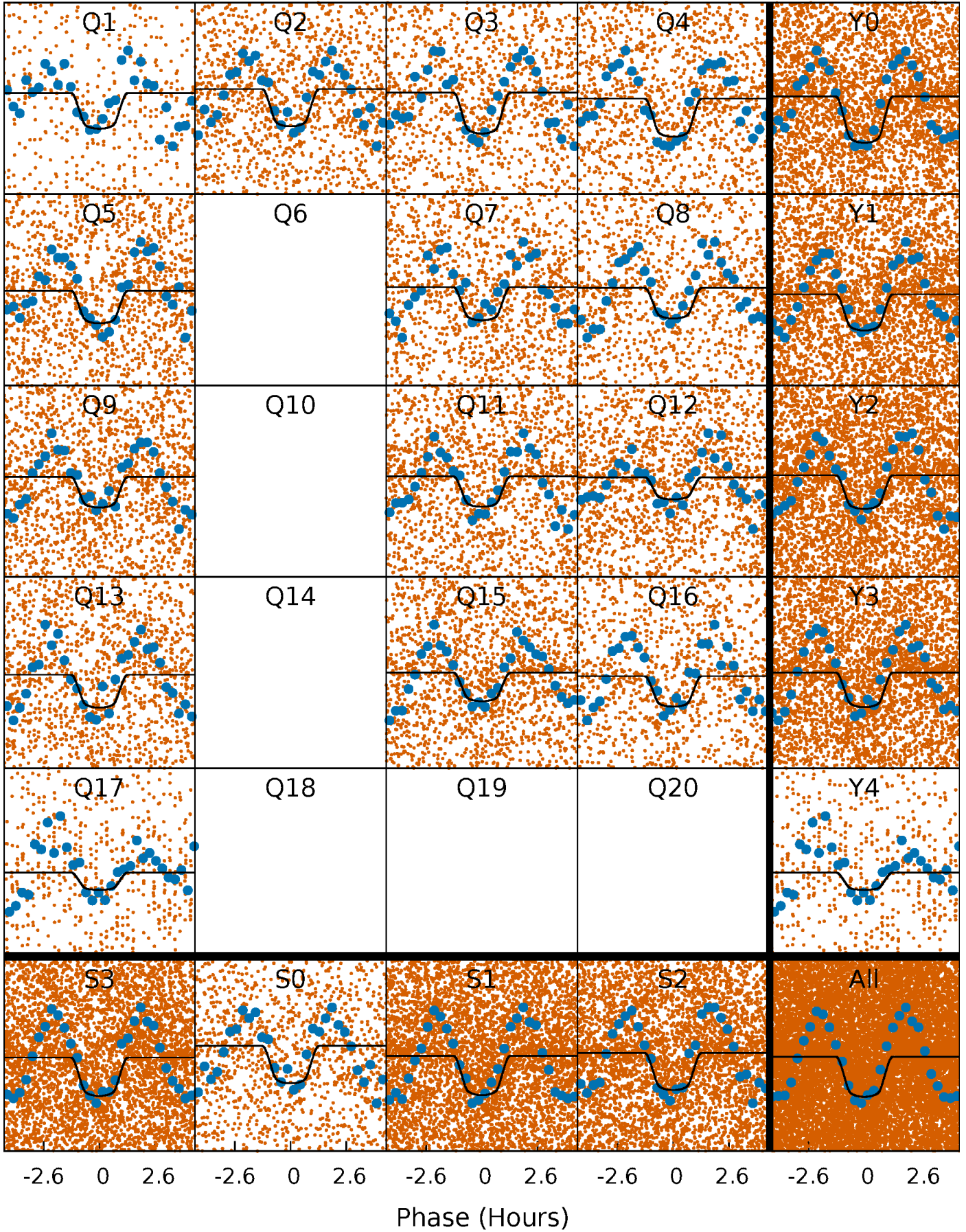
PDC Quarter-Phased Transit Curves

TCE 004481700-01 P= 0.664173 Days $T_0=131.911710$ (BKJD)



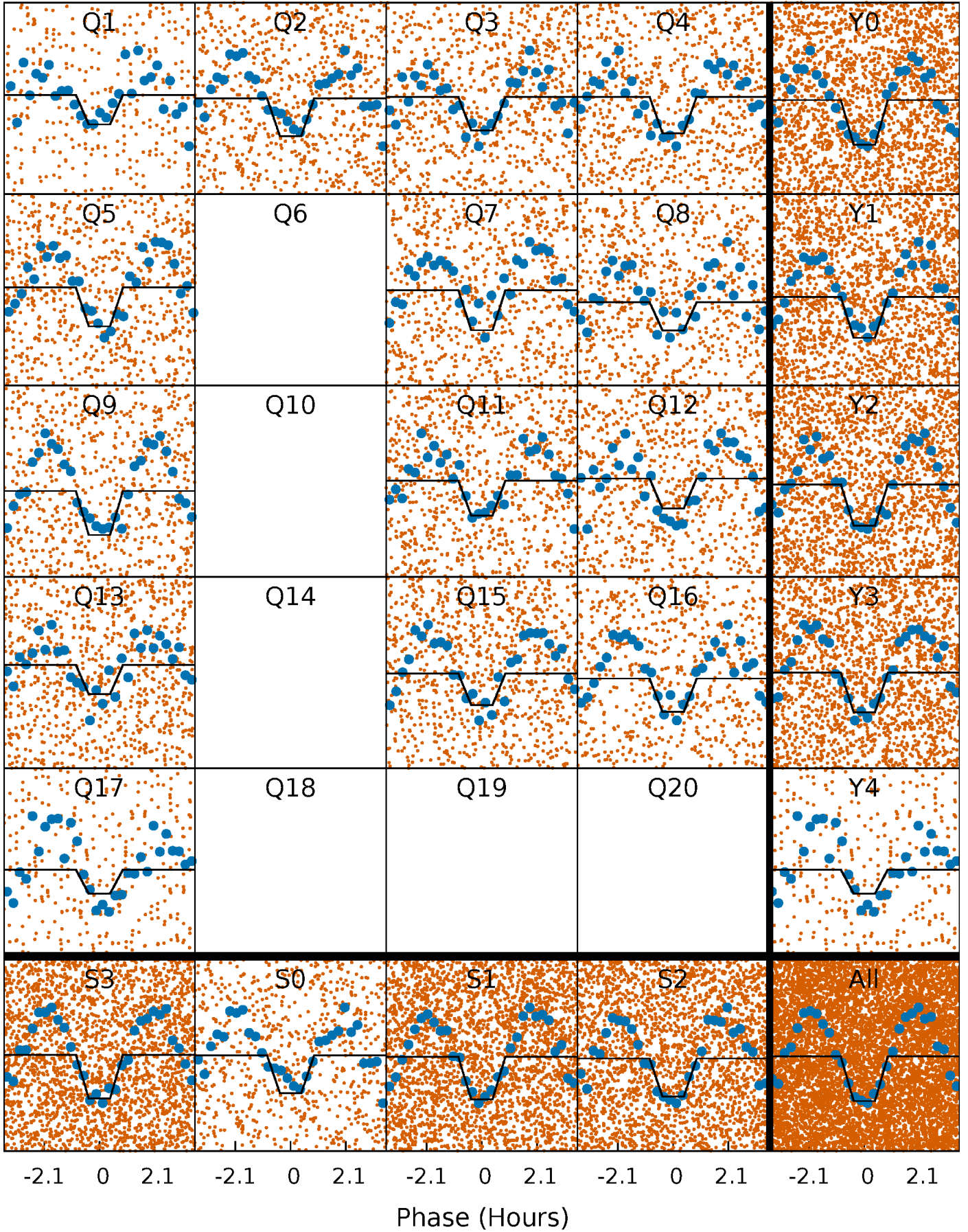
DV Quarter-Phased Transit Curves

TCE 004481700-01 P= 0.664173 Days $T_0=131.911710$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

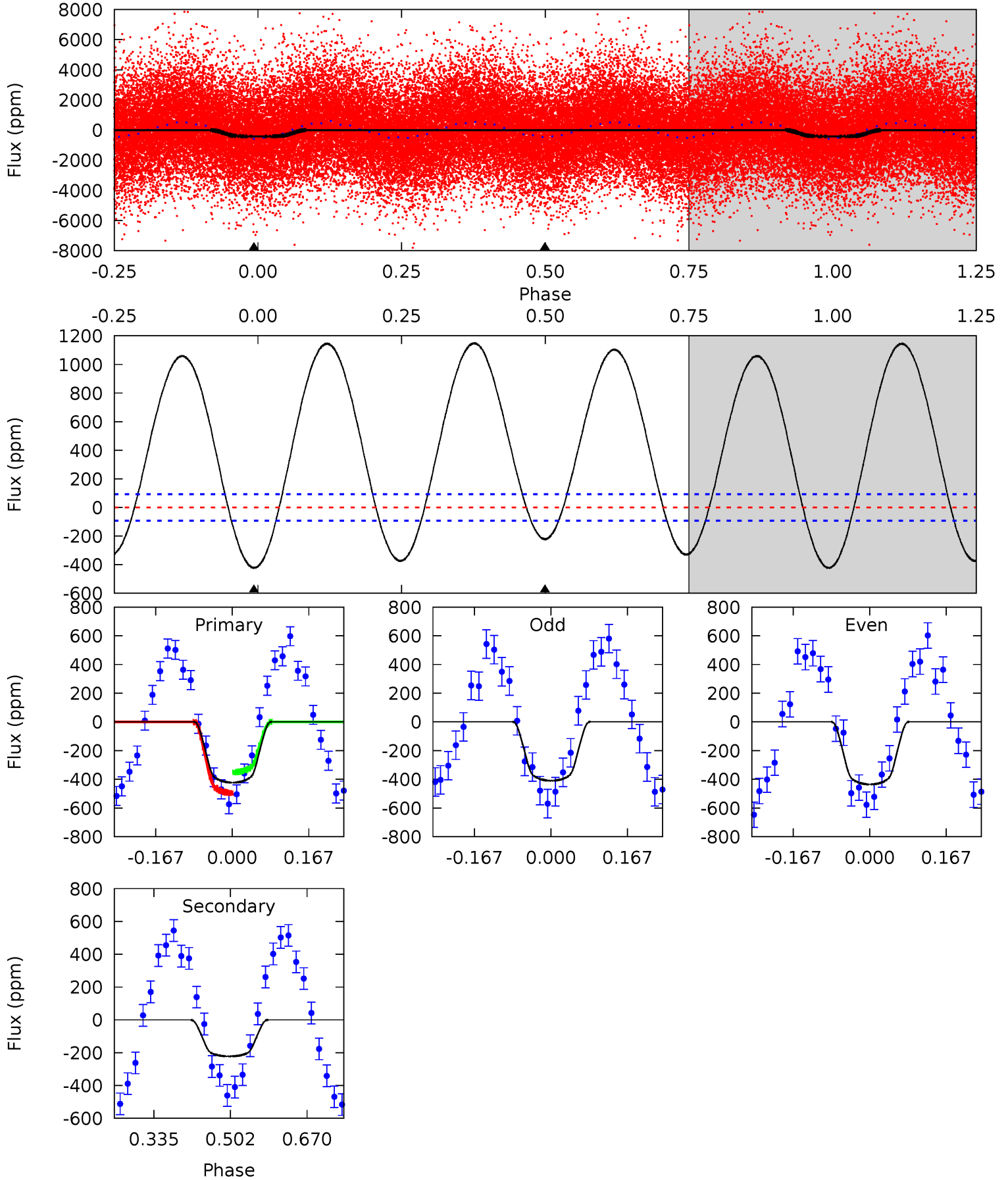
TCE 004481700-01 P= 0.664170 Days $T_0=131.911228$ (BKJD)



DV Model-Shift Uniqueness Test

004481700-01, P = 0.664173 Days, E = 131.247537 Days

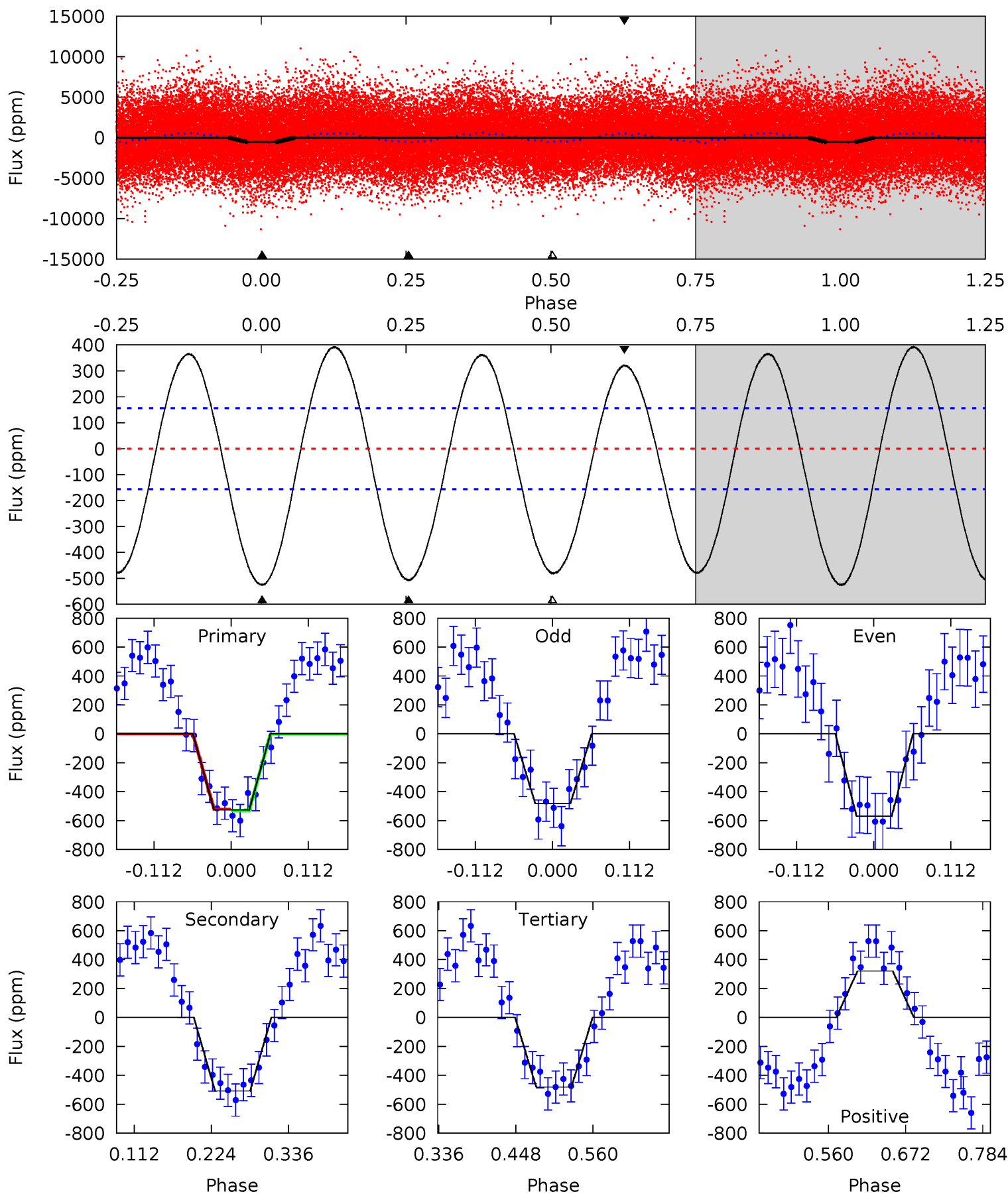
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.3	10.7	0	0	4.46	1.38	16.3	20.3	20.3	10.7	10.7	0.62	0.99	0.73	3.53



Alt Model-Shift Uniqueness Test

004481700-01, P = 0.664170 Days, E = 131.247058 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.3	14.8	14.0	9.36	4.54	1.59	8.91	1.30	5.95	0.77	5.42	1.26	1.27	0.43	0.13



Stellar Parameters For KIC 004481700

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7108^{+200}_{-342}	$4.121^{+0.157}_{-0.192}$	$-0.160^{+0.250}_{-0.350}$	$1.728^{+0.567}_{-0.426}$	$1.440^{+0.222}_{-0.247}$	$0.393^{+0.329}_{-0.193}$
	+3%/-5%	+4%/-5%	+156%/-219%	+33%/-25%	+15%/-17%	+84%/-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 004481700-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-222 ± 21	$4.40^{+0.84}_{-0.77}$	4438^{+377}_{-350}	5420^{+422}_{-401}	$1.821^{+0.773}_{-0.570}$
Alt.	-508 ± 34	$4.42^{+0.85}_{-0.73}$	4431^{+371}_{-318}	6797^{+531}_{-454}	$4.050^{+1.594}_{-1.162}$

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

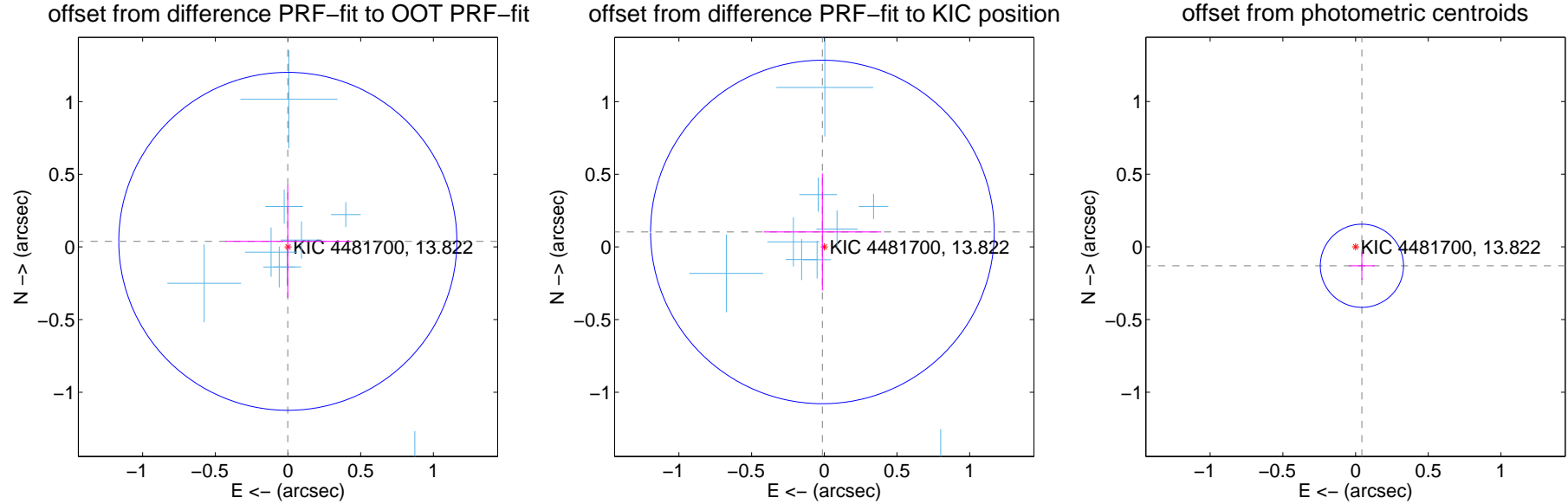
DV Centroid Data

Supplemental centroid analysis for 004481700-01. Kepler magnitude: 13.82. Transit SNR 13.82

There are 10 quarters with good PRF difference image offsets

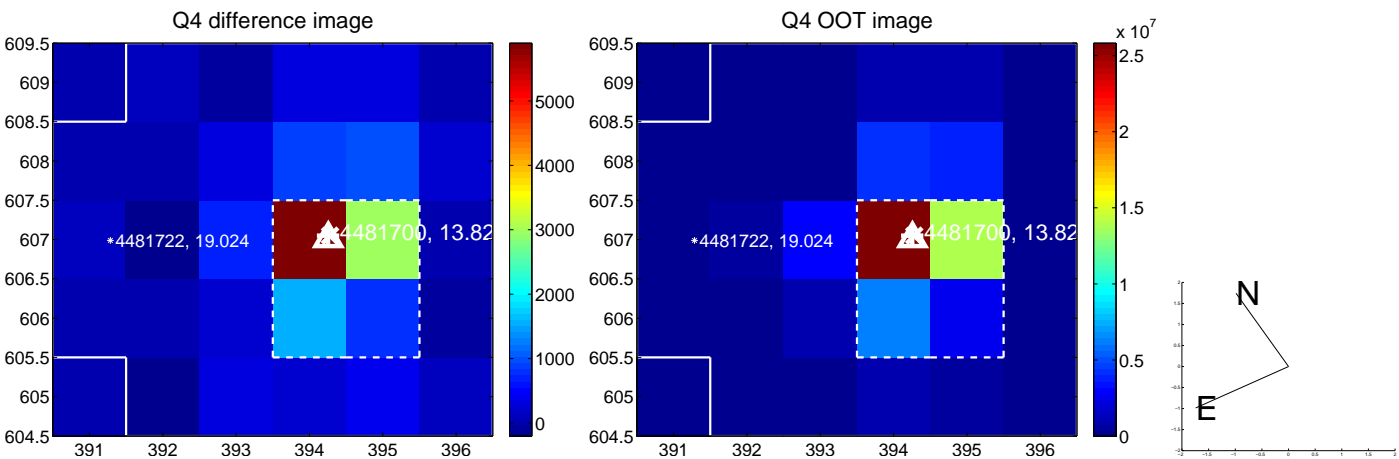
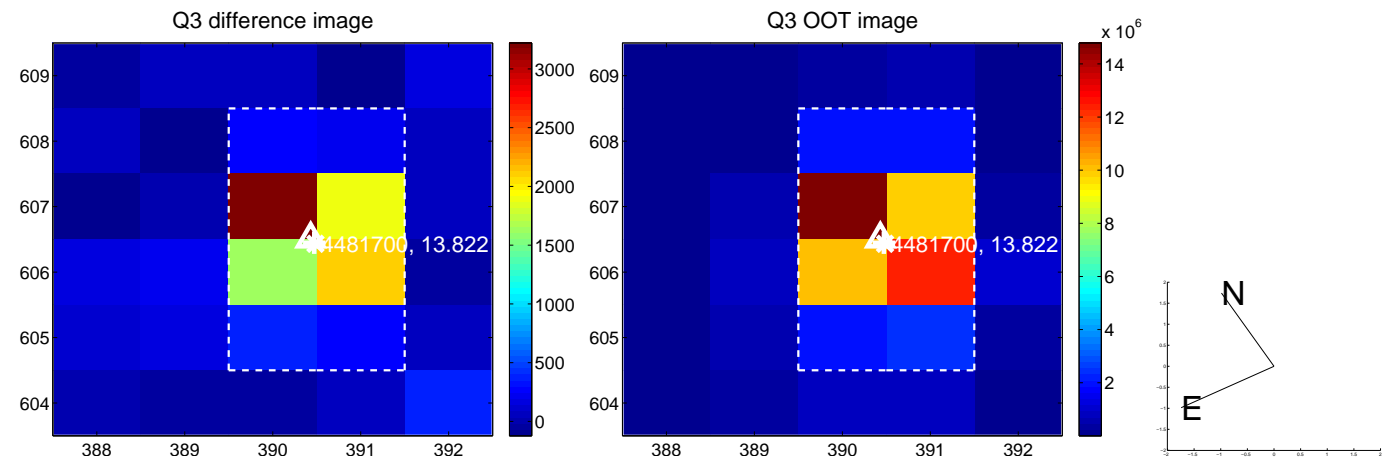
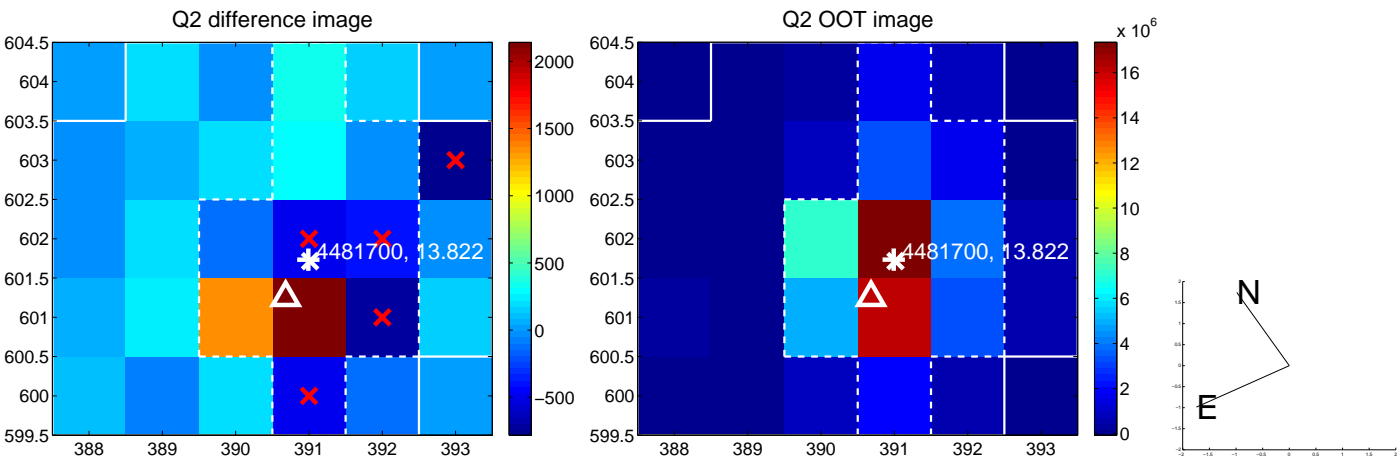
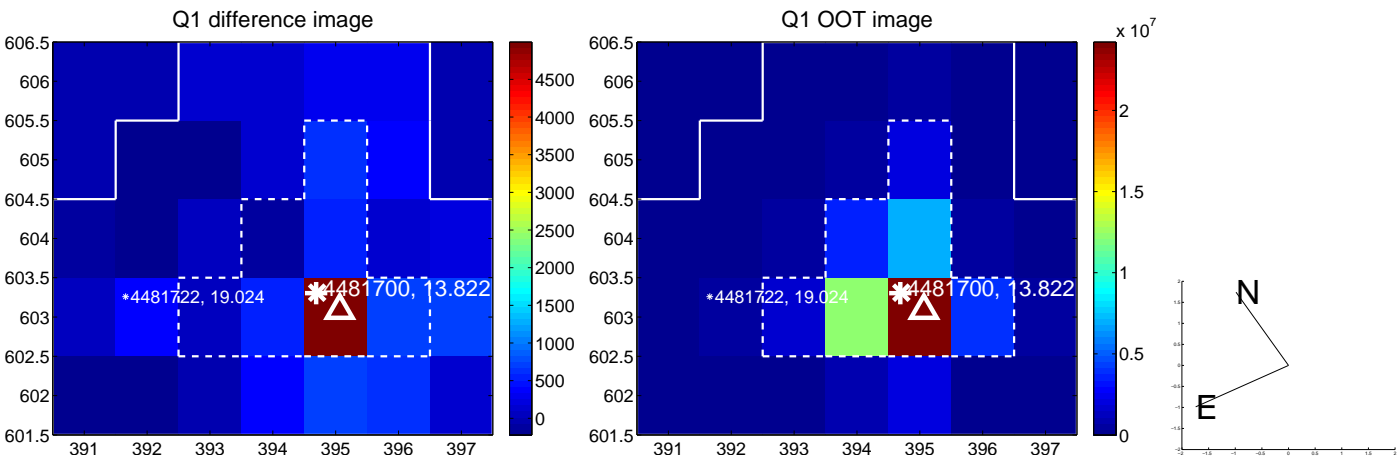
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.039 ± 0.388	0.10	0.001 ± 0.432	0.039 ± 0.388
PRF-fit source offset from KIC position	0.104 ± 0.394	0.26	0.013 ± 0.404	0.103 ± 0.402
photometric centroid source offset	0.14 ± 0.10	1.44	-0.04 ± 0.09	-0.13 ± 0.10

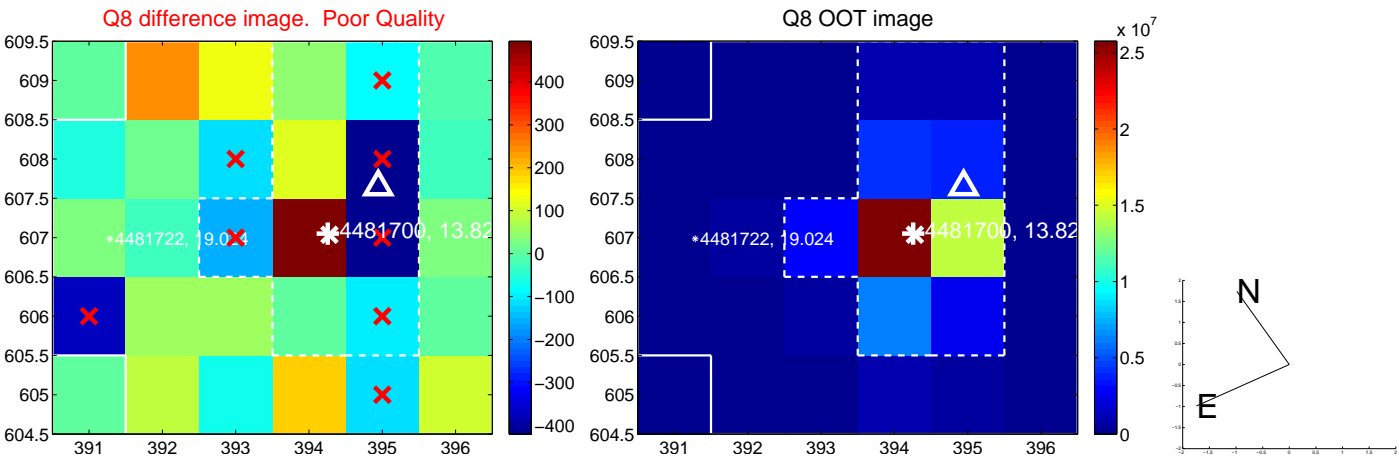
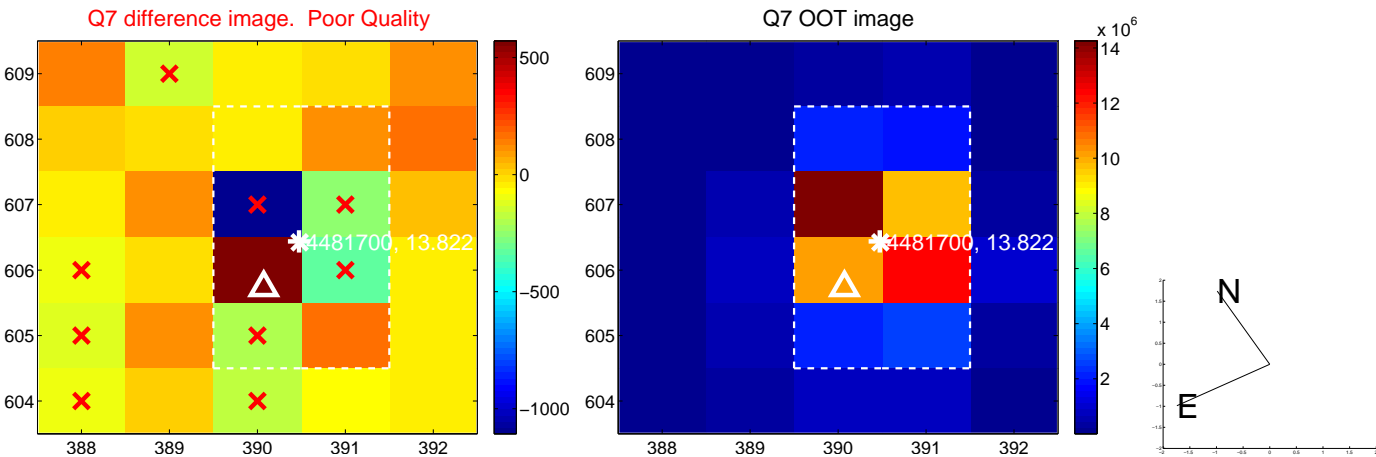
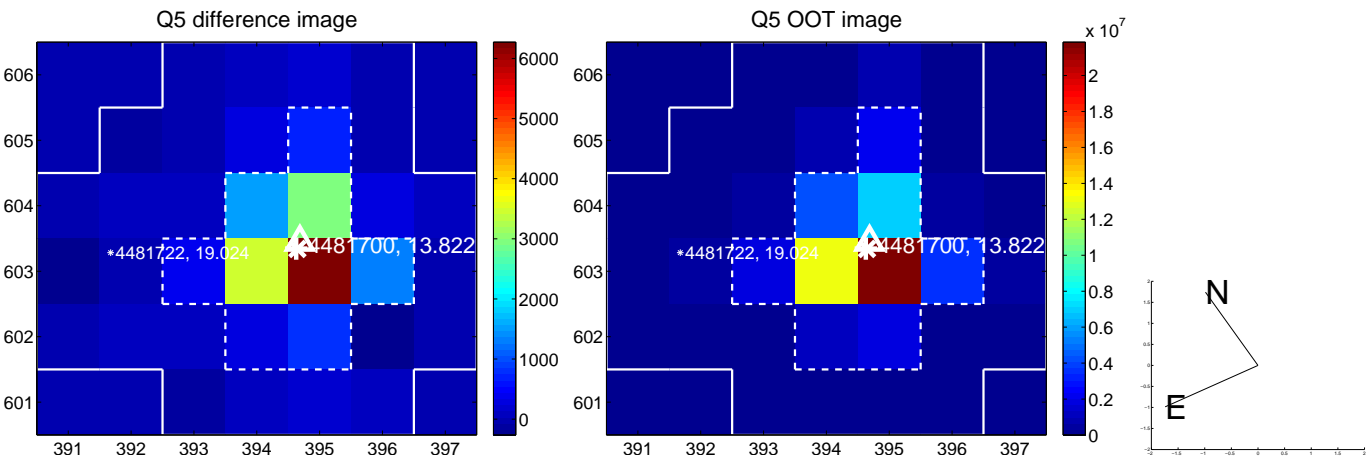


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

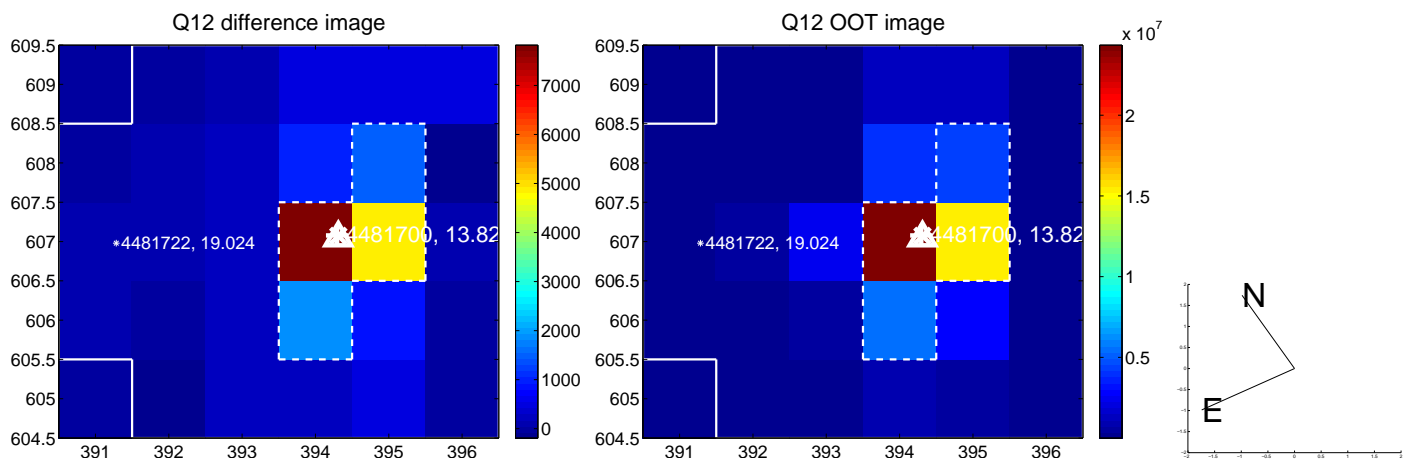
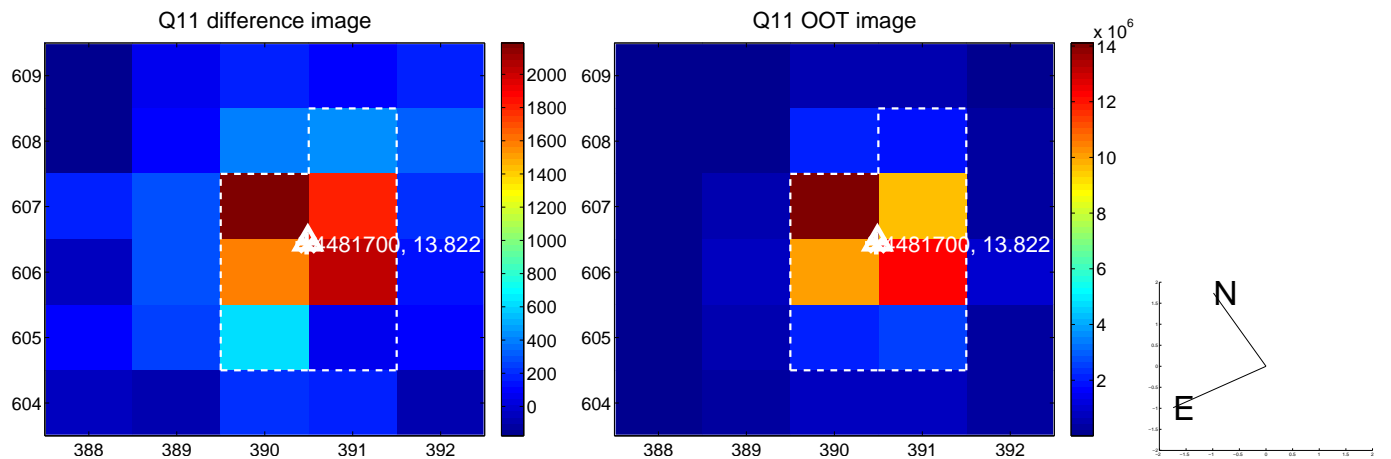
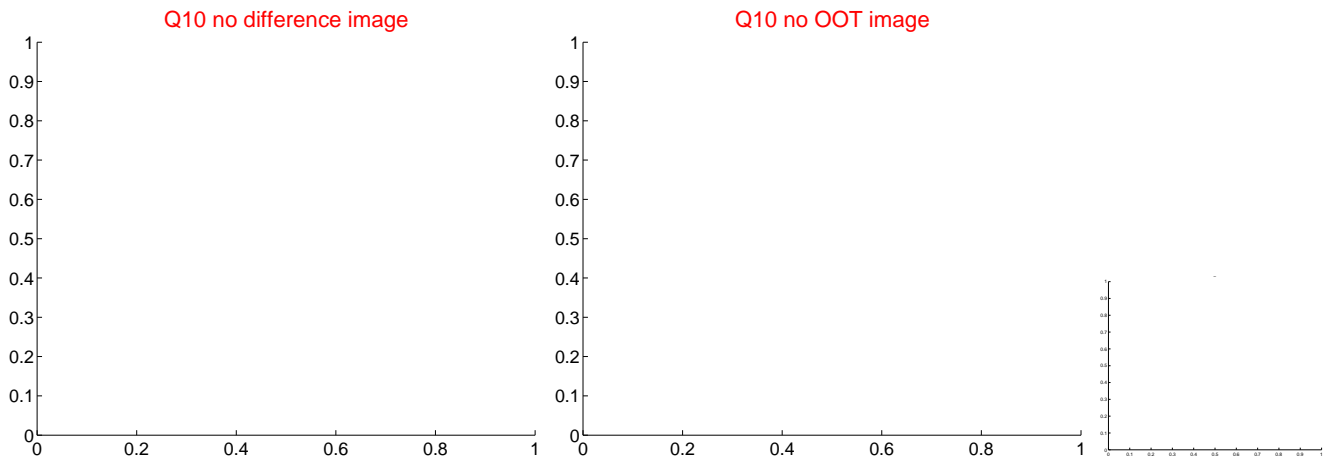
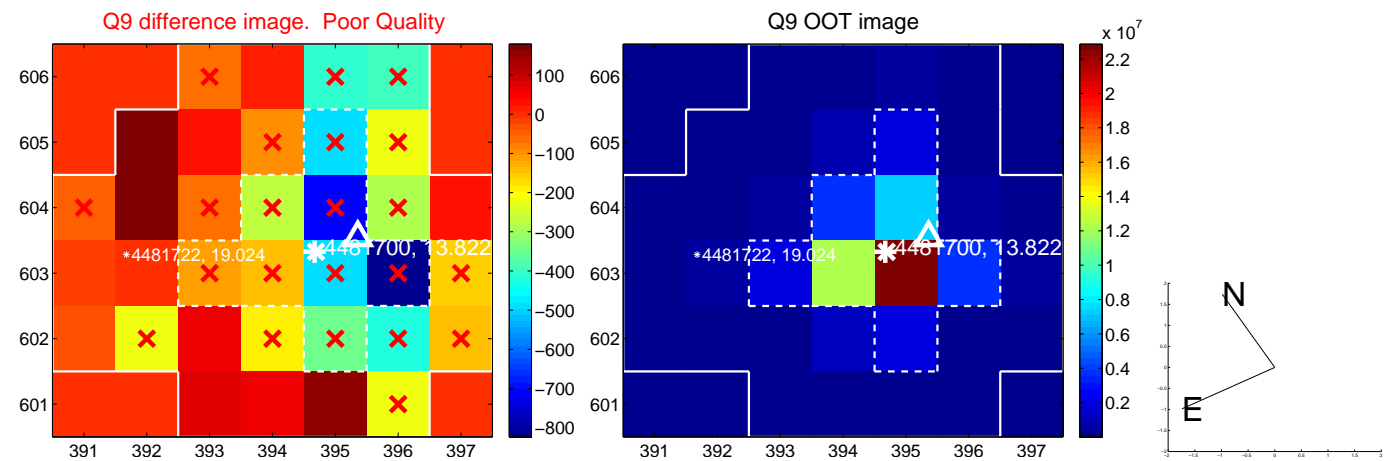
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



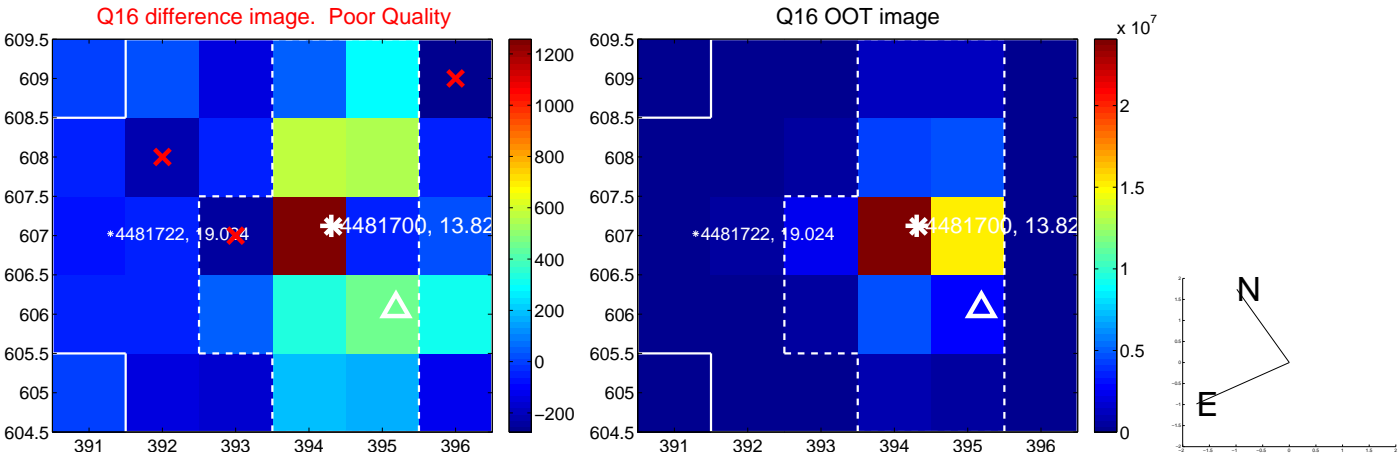
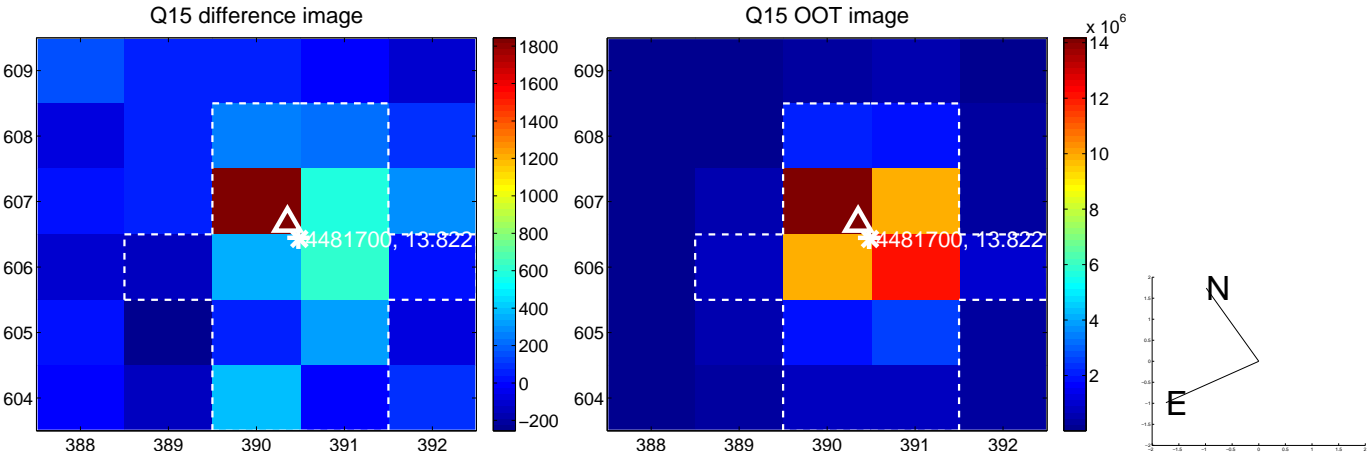
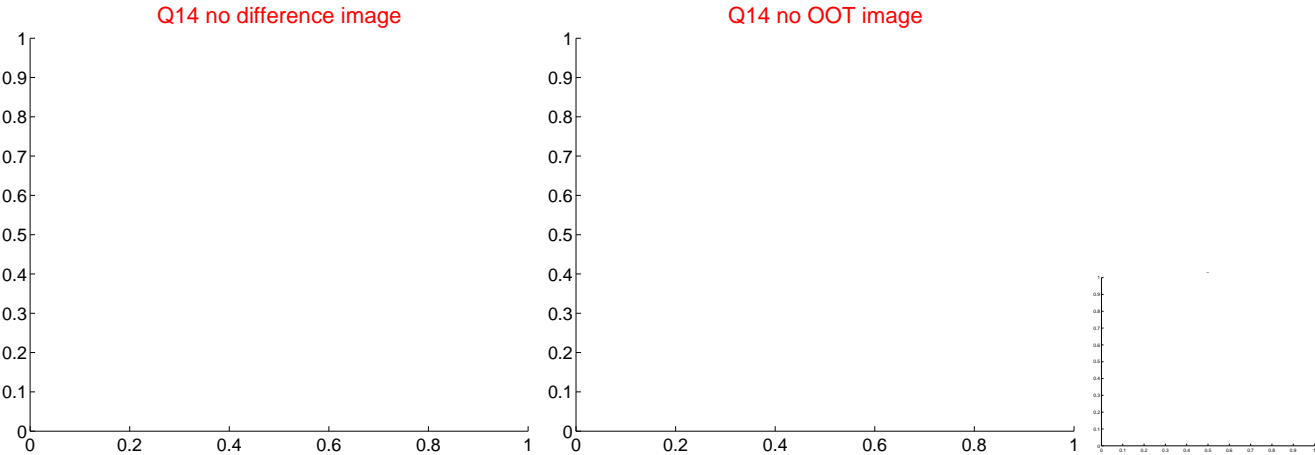
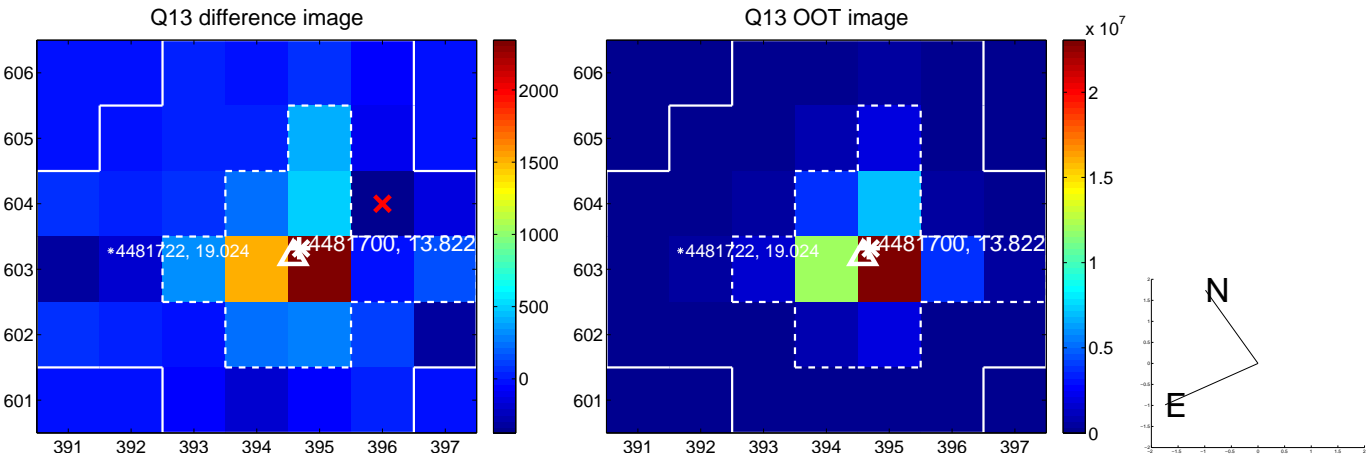
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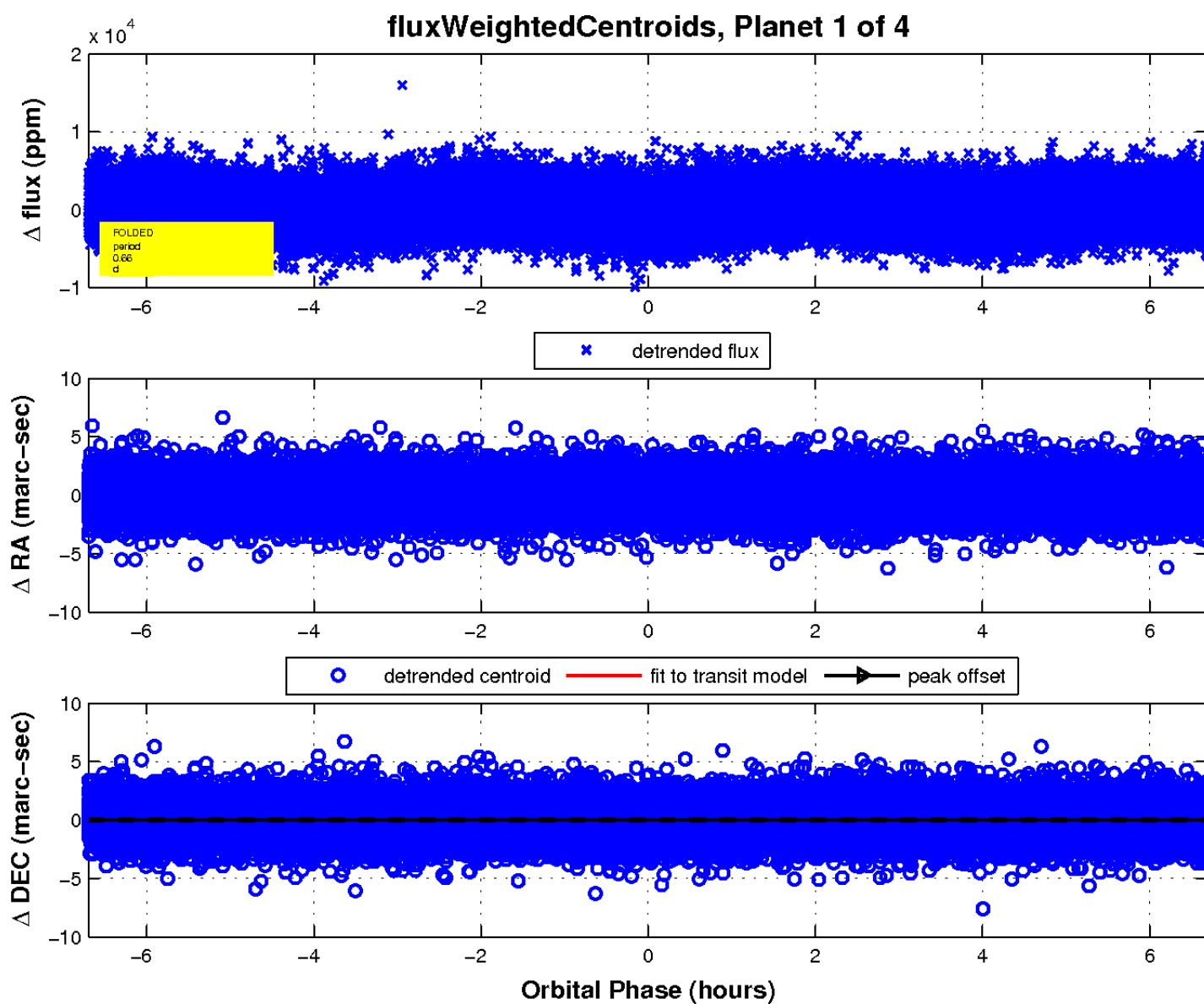
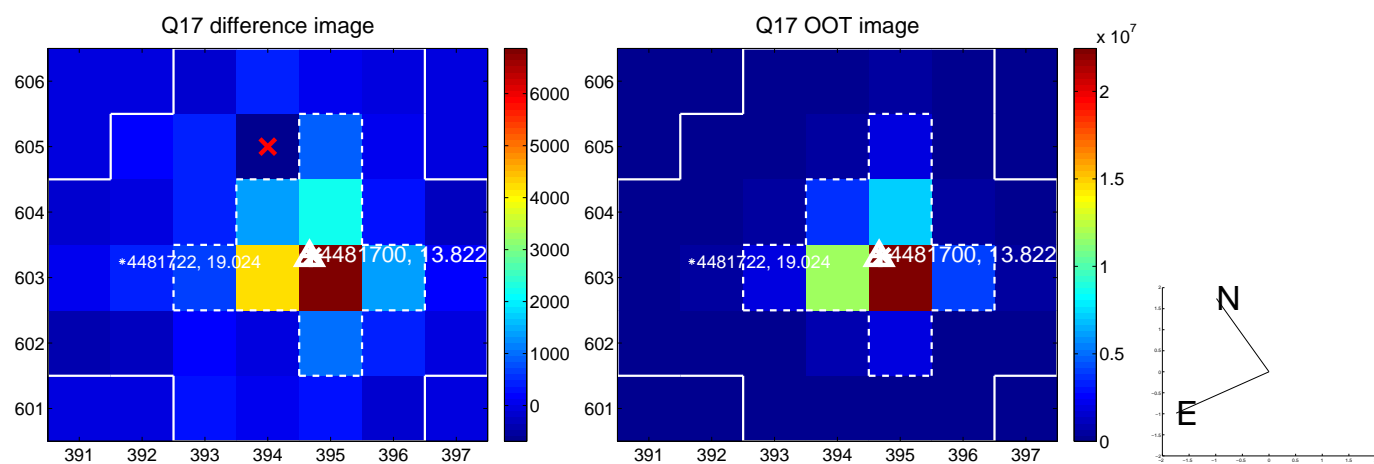
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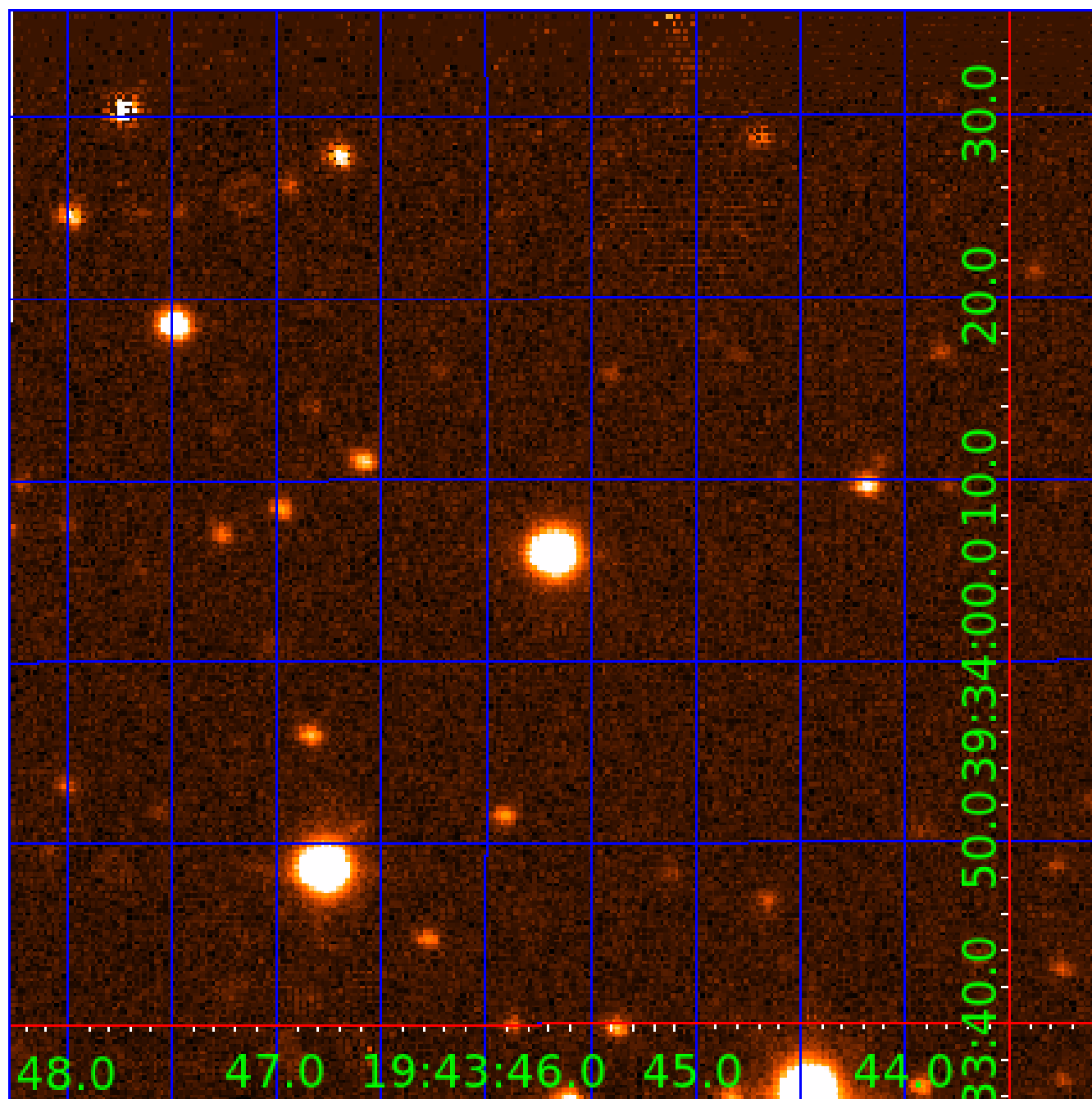


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



UKIRT Image

Declination



KIC 004481700

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})
004481700-01	OBS	No	0.664173	131.911710	464.5	2.232	13.0	13.8	1.73	7108	4.33	24128.92
004481700-02	OBS	No	0.664168	131.580621	431.9	2.434	13.0	14.1	1.73	7108	3.87	24129.19
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004481700-04	OBS	No	0.706193	131.995369	434.8	2.500	9.4	-1.0	1.73	7108	3.65	22233.88

Robovetter Results

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004481700-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
004481700-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004481700-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

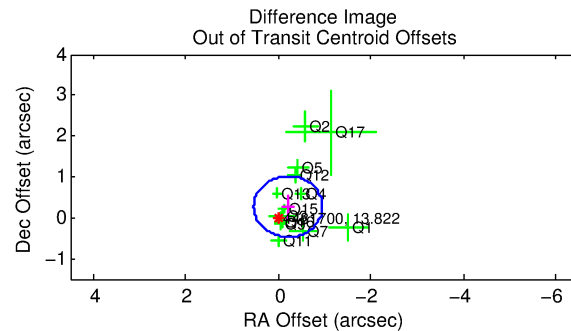
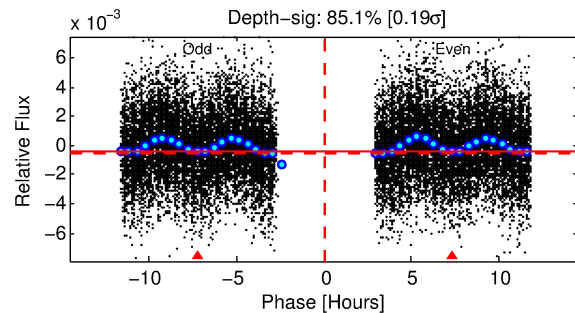
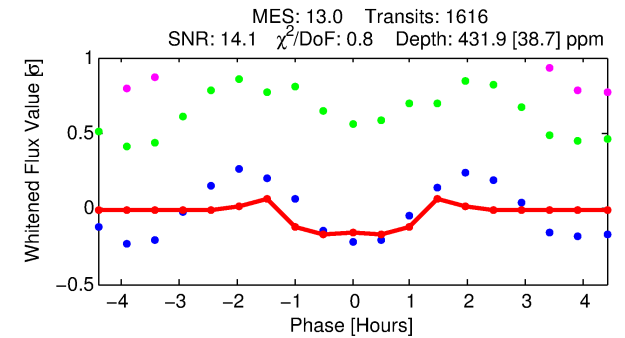
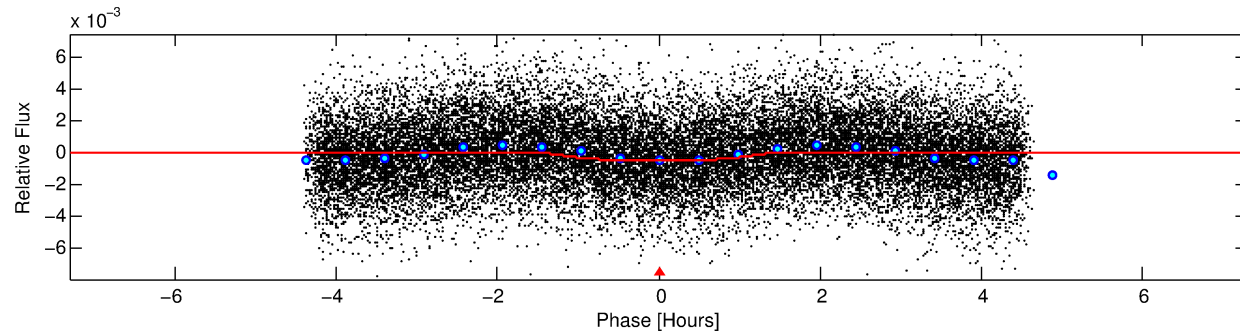
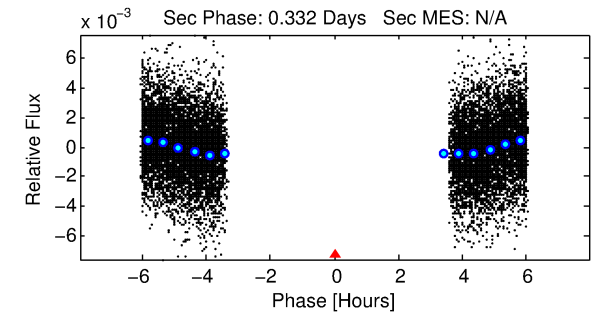
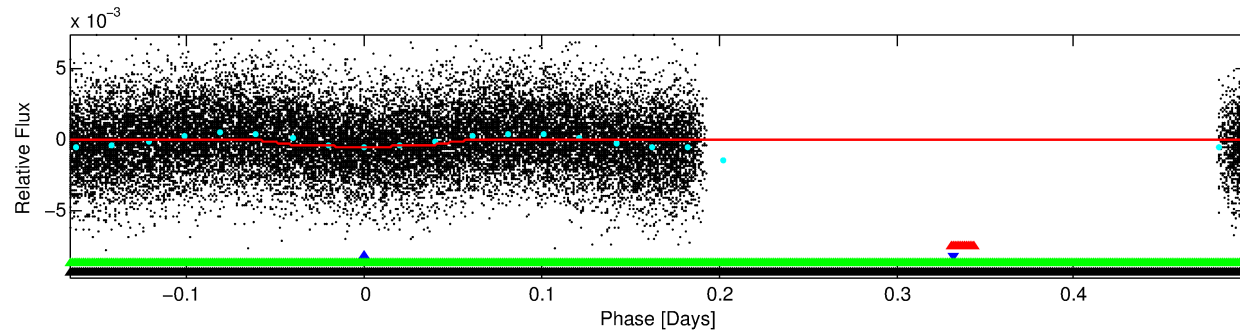
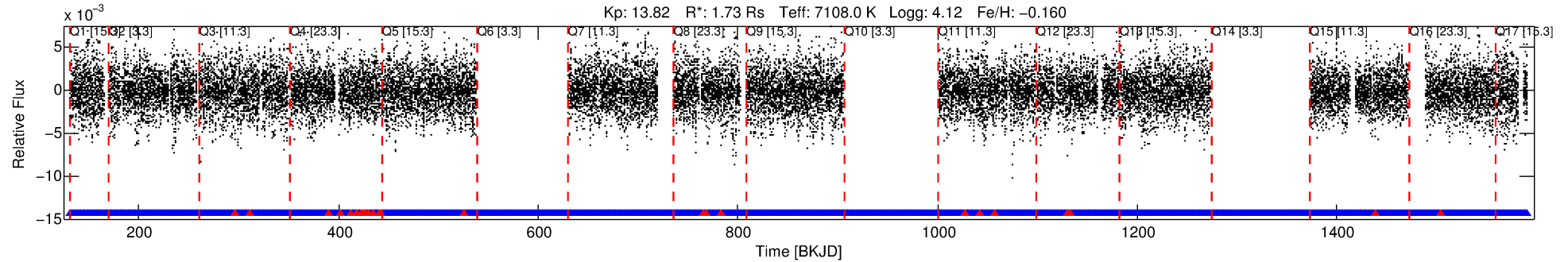
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481700-02

No Significant Match Found

DV One-Page Summary

KIC: 4481700 Candidate: 2 of 4 Period: 0.664 d



DV Fit Results:

Period = 0.66417 [0.00001] d
Epoch = 131.5806 [0.0013] BKJD
Rp/R* = 0.0205 [0.0071]
a/R* = 1.72 [2.33]
b = 0.72 [1.37]
Seff = 24129.19 [10000.04]
Teq = 3178 [329] K
Rp = 3.87 [1.84] Re
a = 0.0168 [0.0044] AU

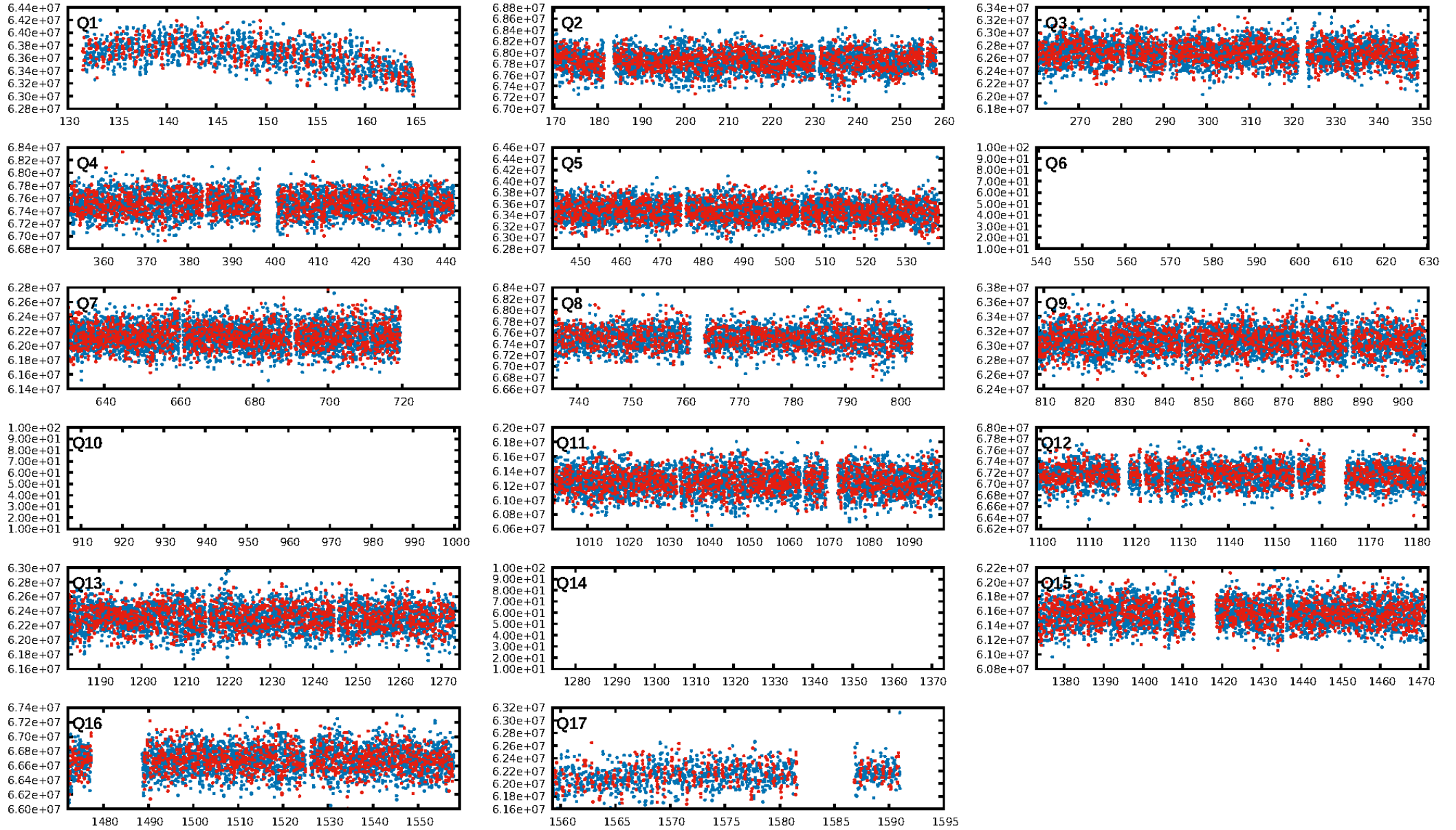
DV Diagnostic Results:

ShortPeriod-sig: 24.9% [0.32σ]
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.98 [1497/1524]
GhostDiagnostic-chr: 0.955
Centroid-sig: N/A
Centroid-so: 0.121 arcsec [1.28σ]
OotOffset-rm: 0.339 arcsec [1.37σ]
KicOffset-rm: 0.369 arcsec [1.45σ]
OotOffset-st: 1/4/3/5 [13]
KicOffset-st: 1/4/3/5 [13]
DiffImageQuality-fgm: 0.85 [11/13]
DiffImageOverlap-fno: 0.00 [0/14]

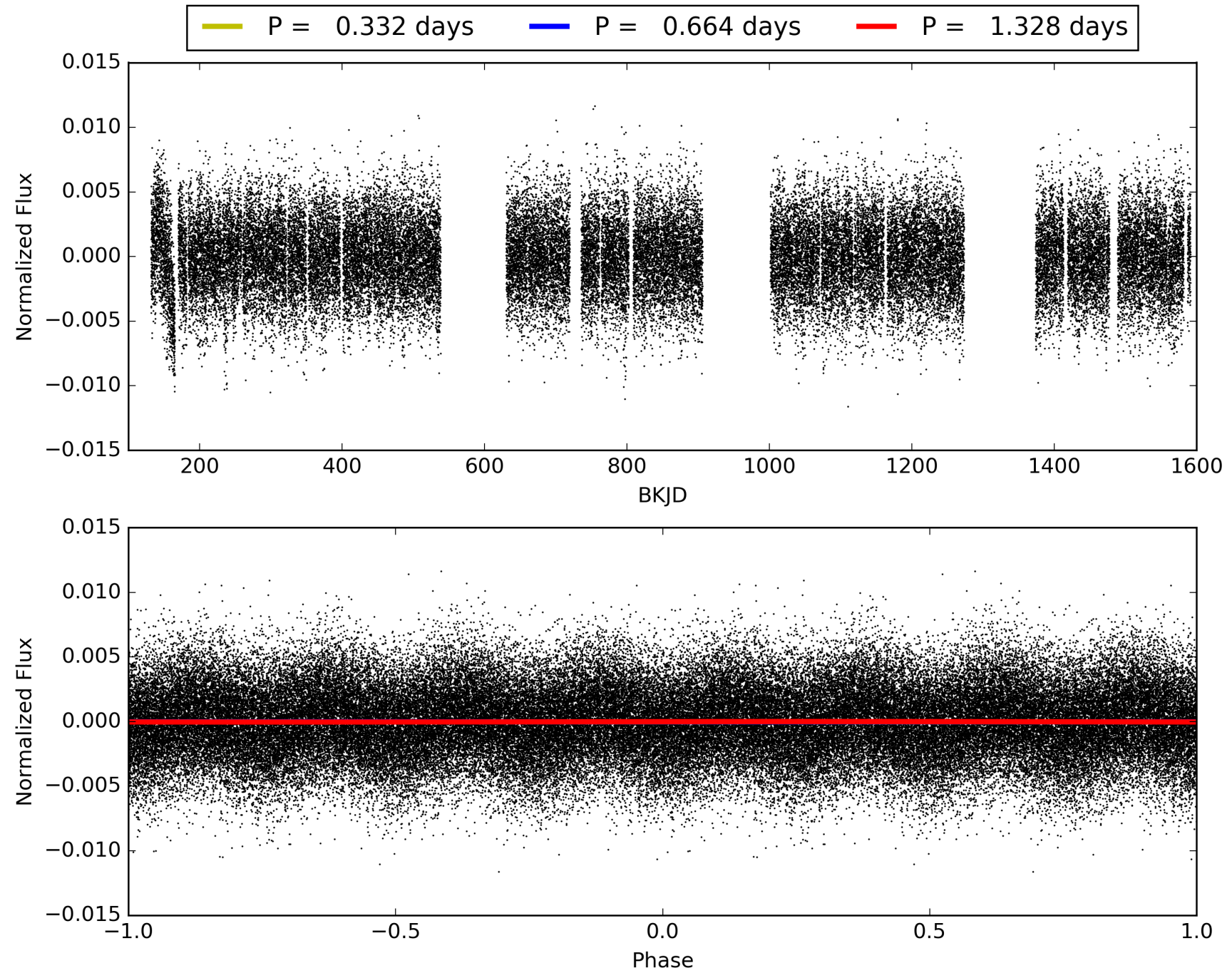
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481700-02, PDC Light Curves

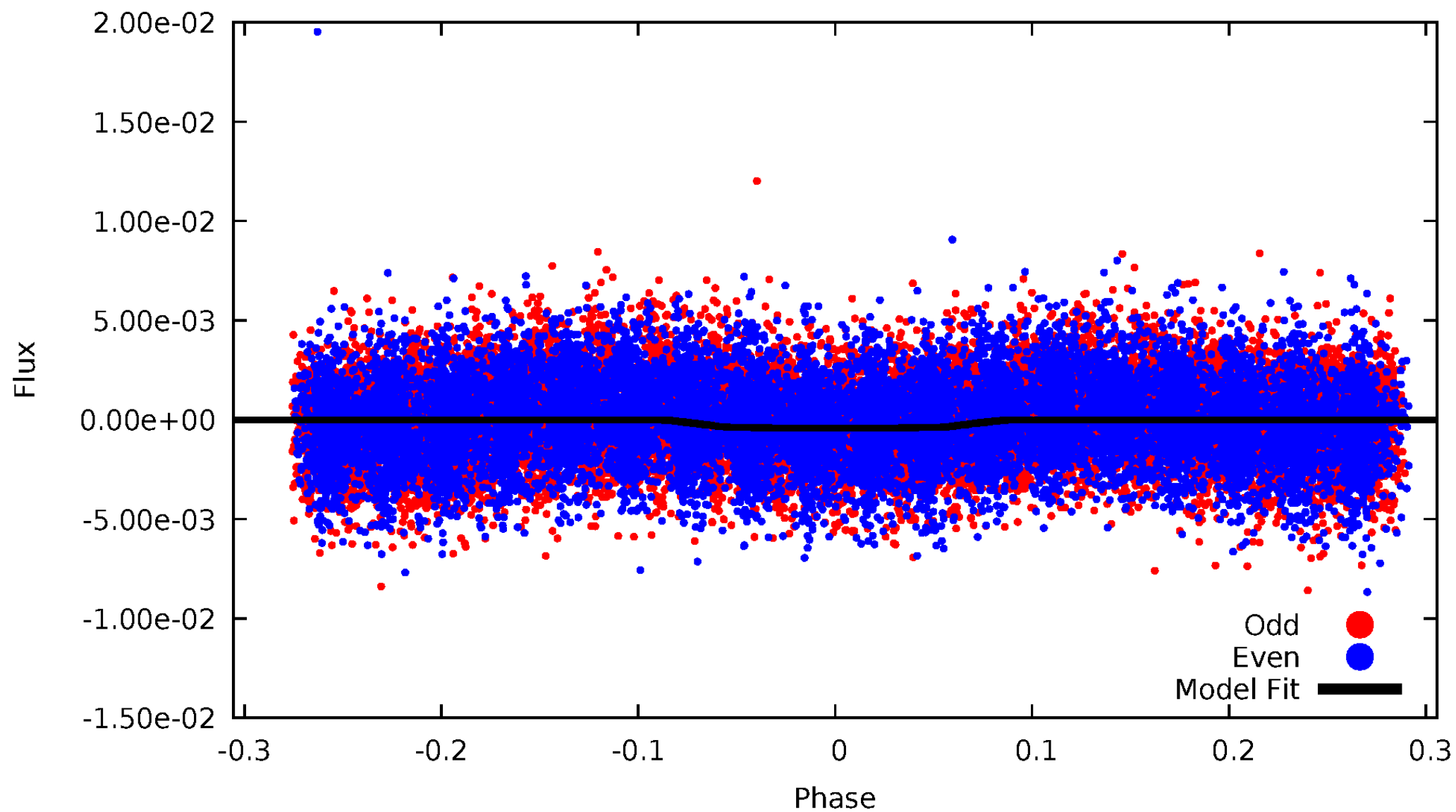


TCE 004481700-02



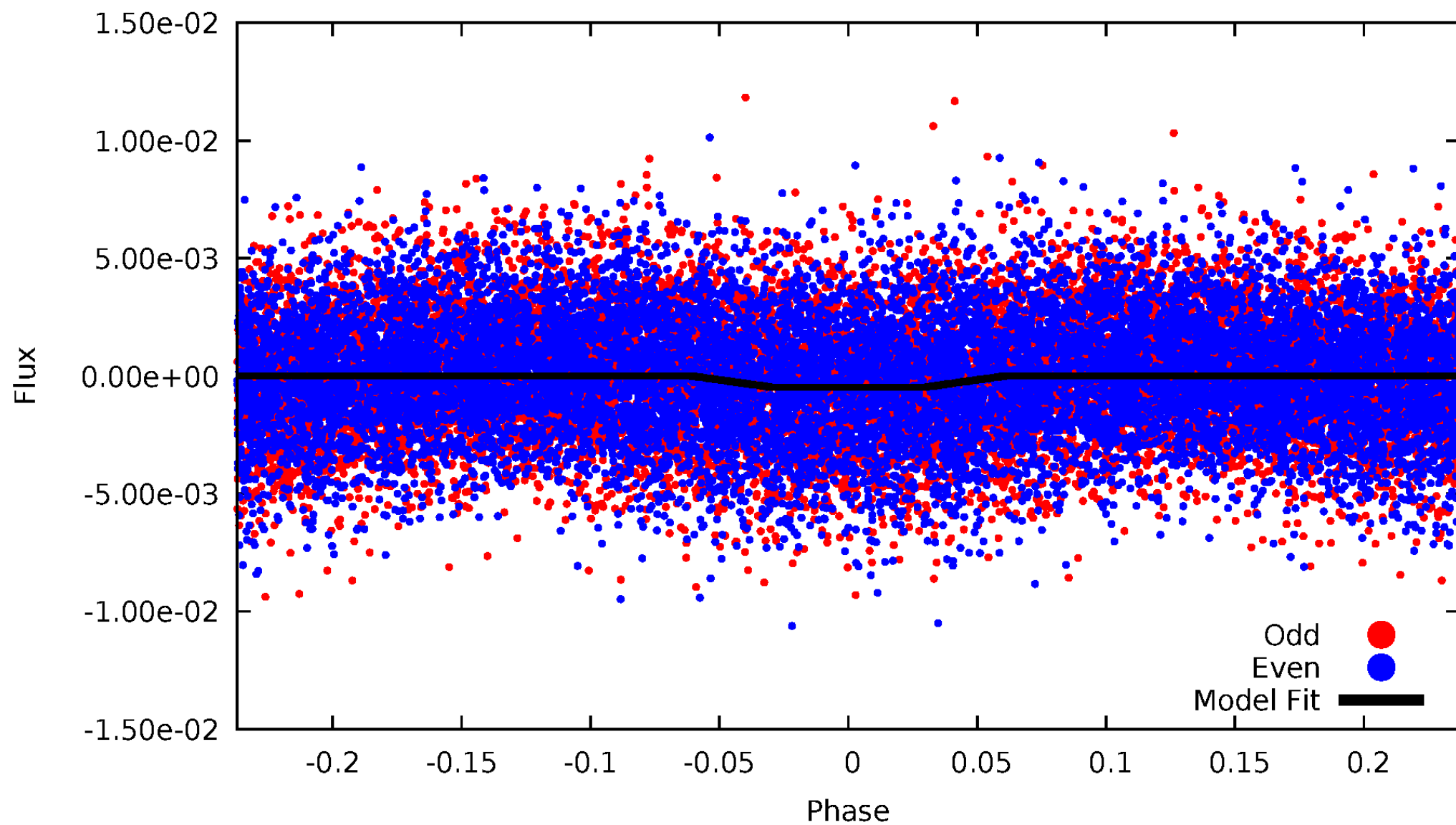
DV Odd/Even

TCE 004481700-02



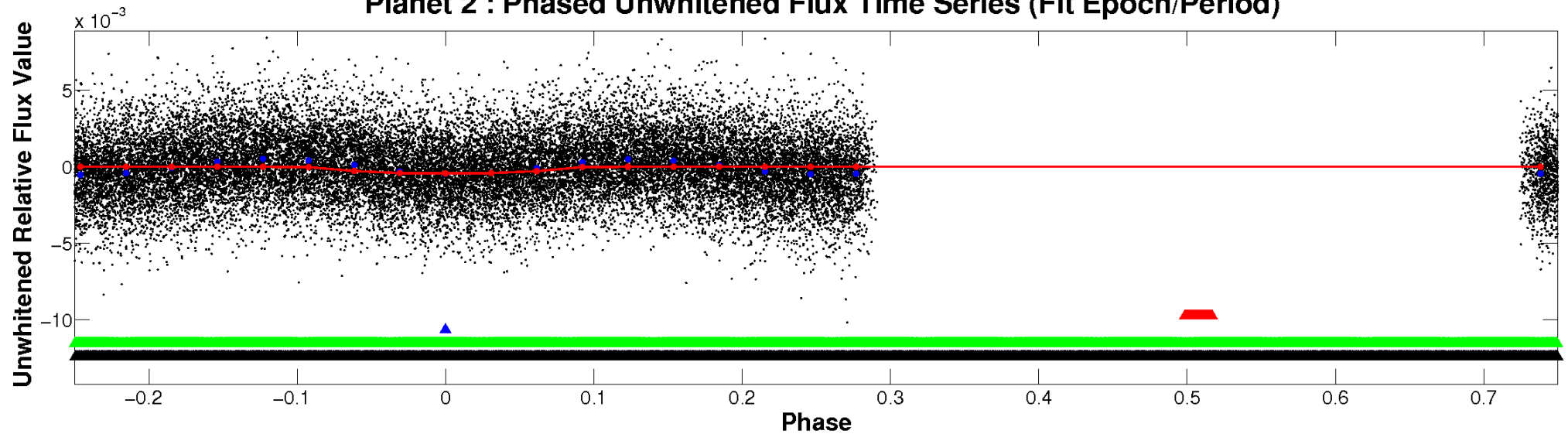
ALT Odd/Even

TCE 004481700-02

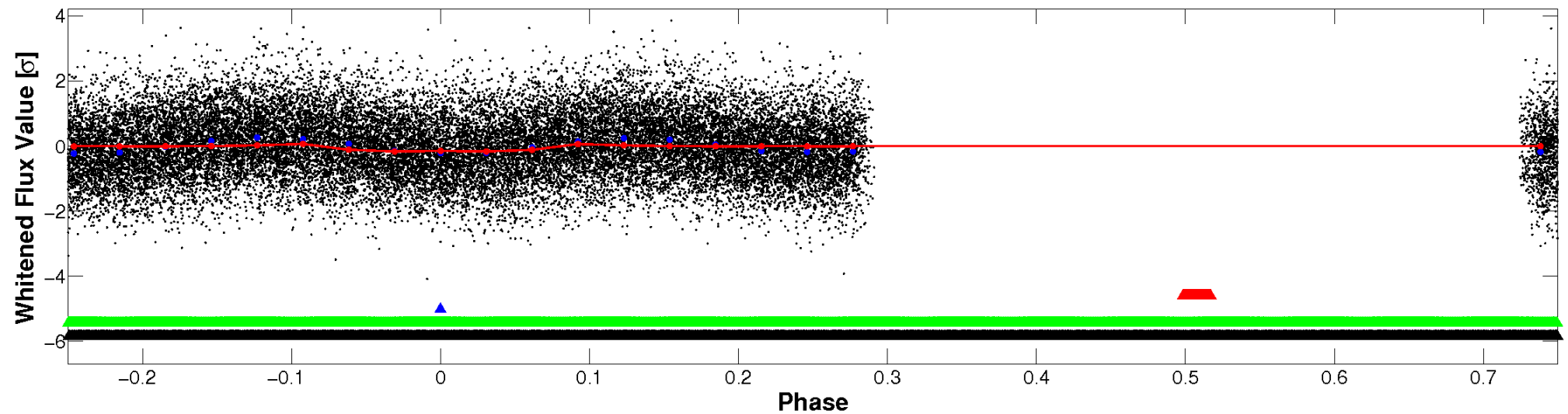


Non-Whitened Vs. Whitened Light Curve

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

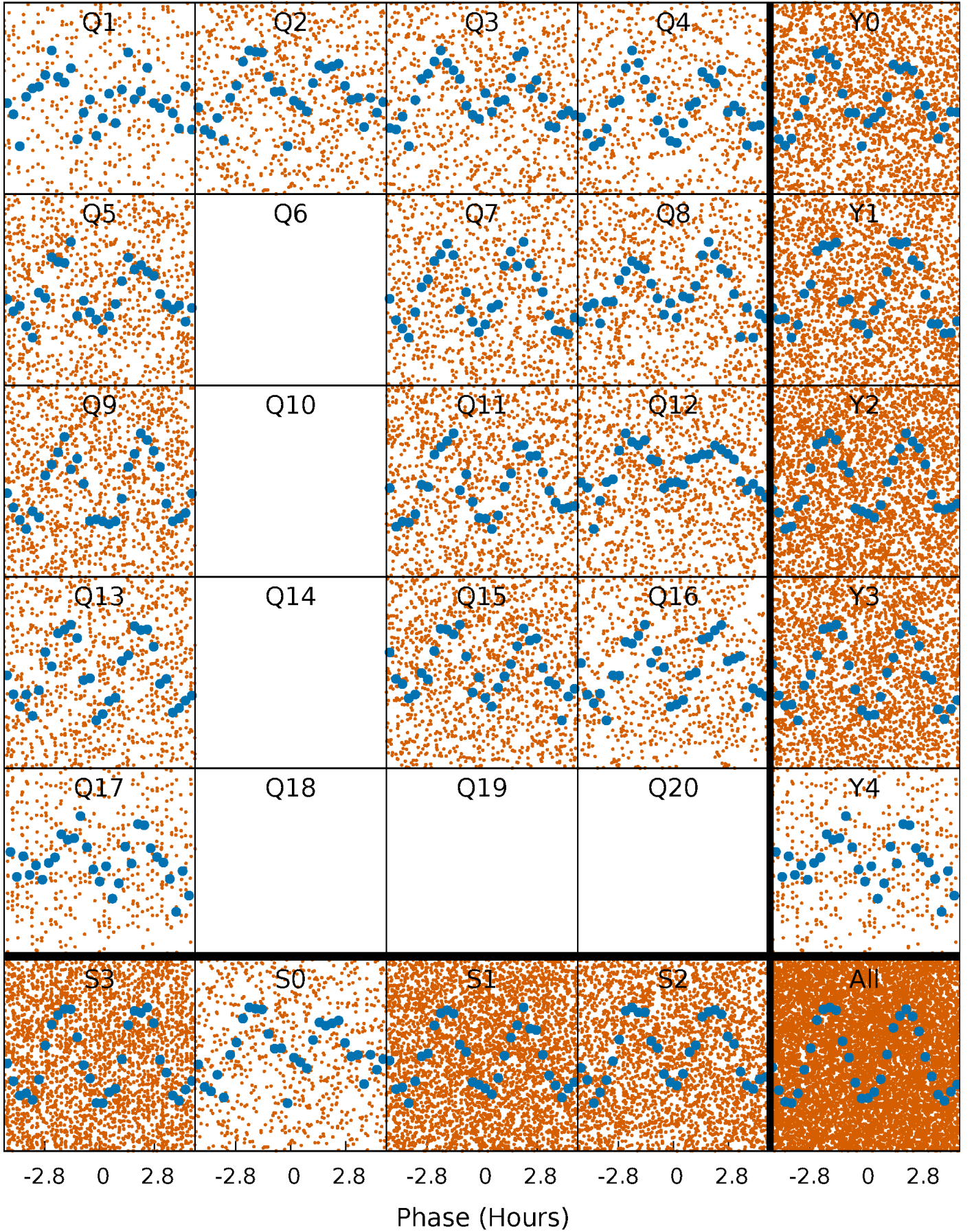


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



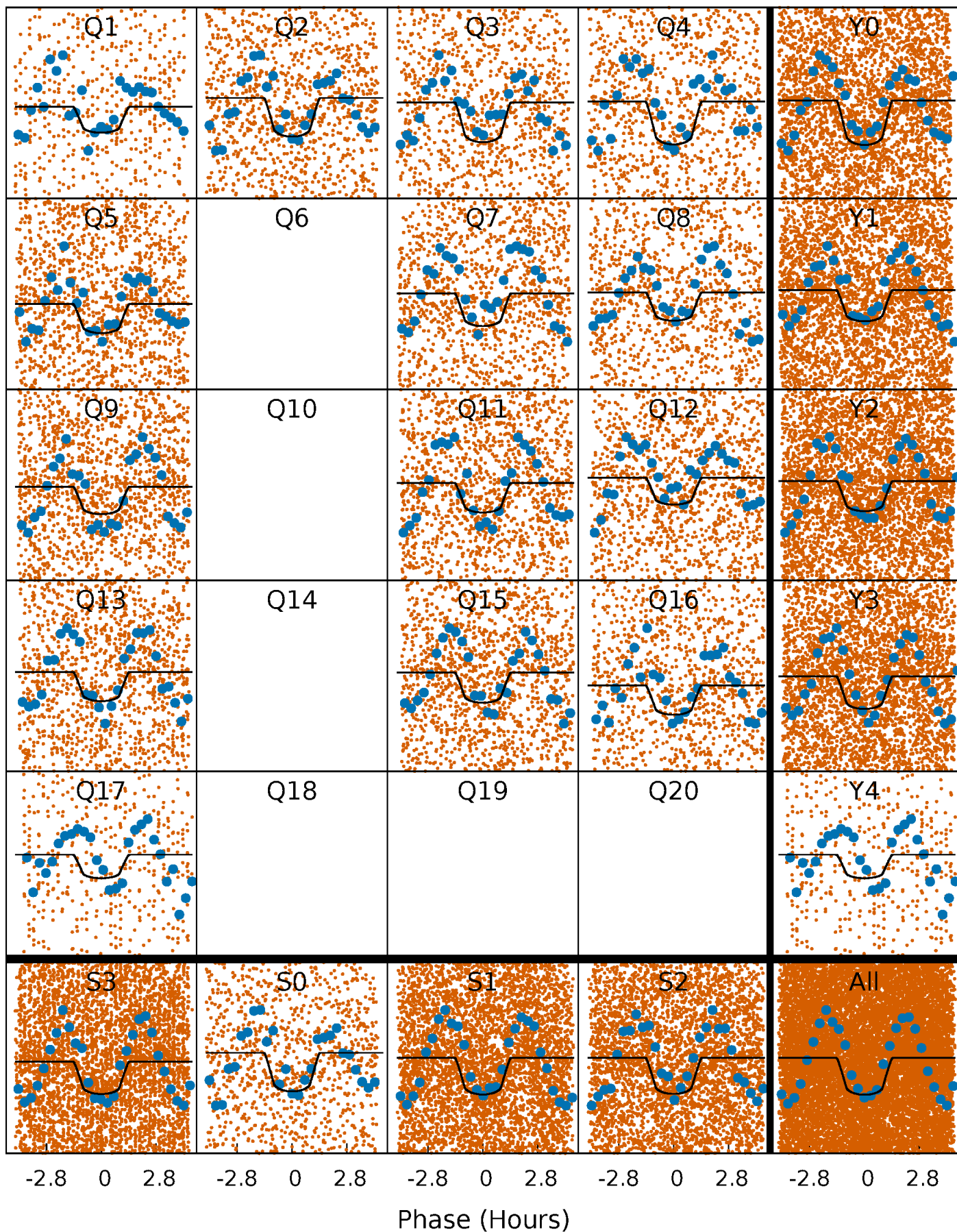
PDC Quarter-Phased Transit Curves

TCE 004481700-02 P= 0.664168 Days $T_0=131.580621$ (BKJD)



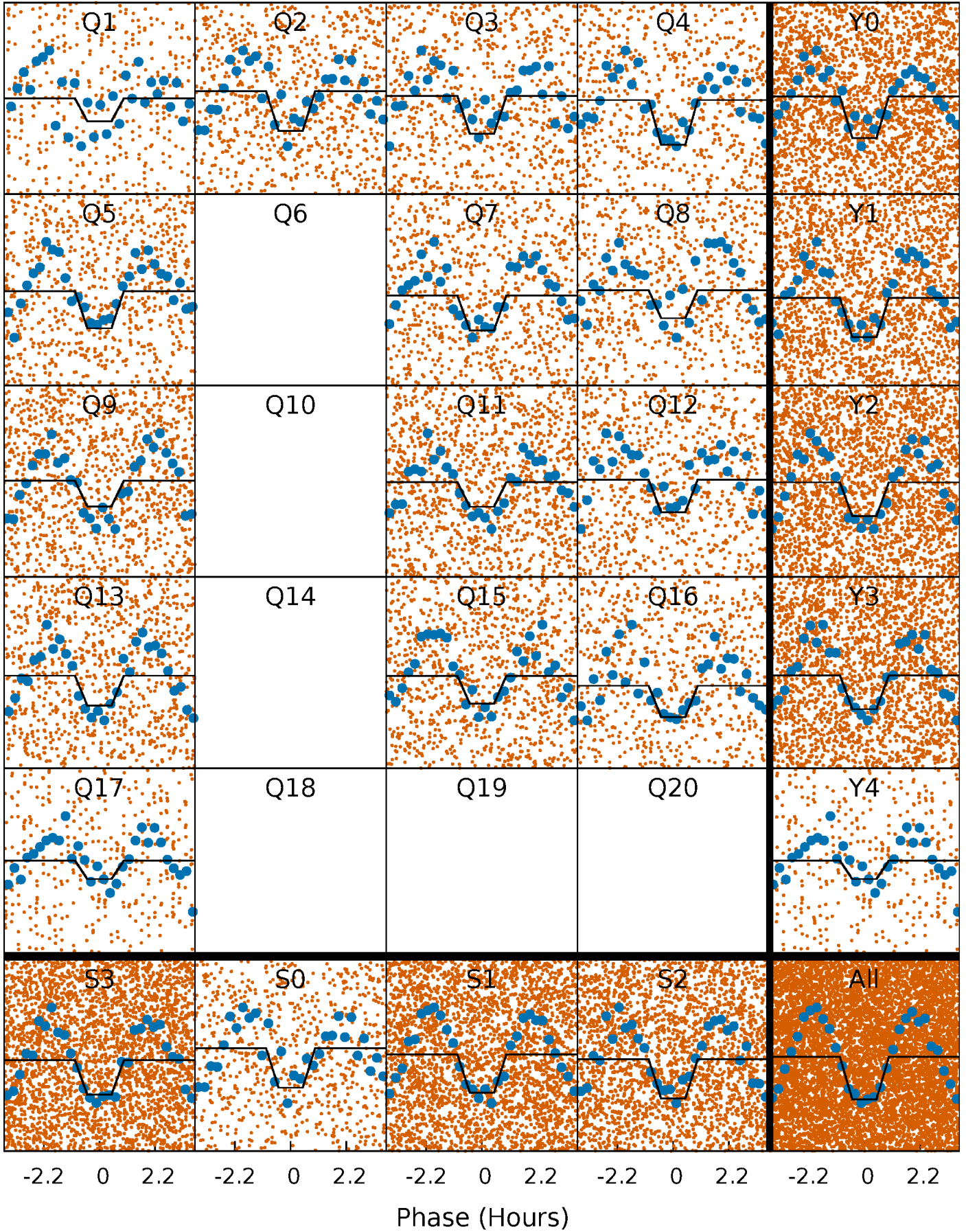
DV Quarter-Phased Transit Curves

TCE 004481700-02 P= 0.664168 Days $T_0=131.580621$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

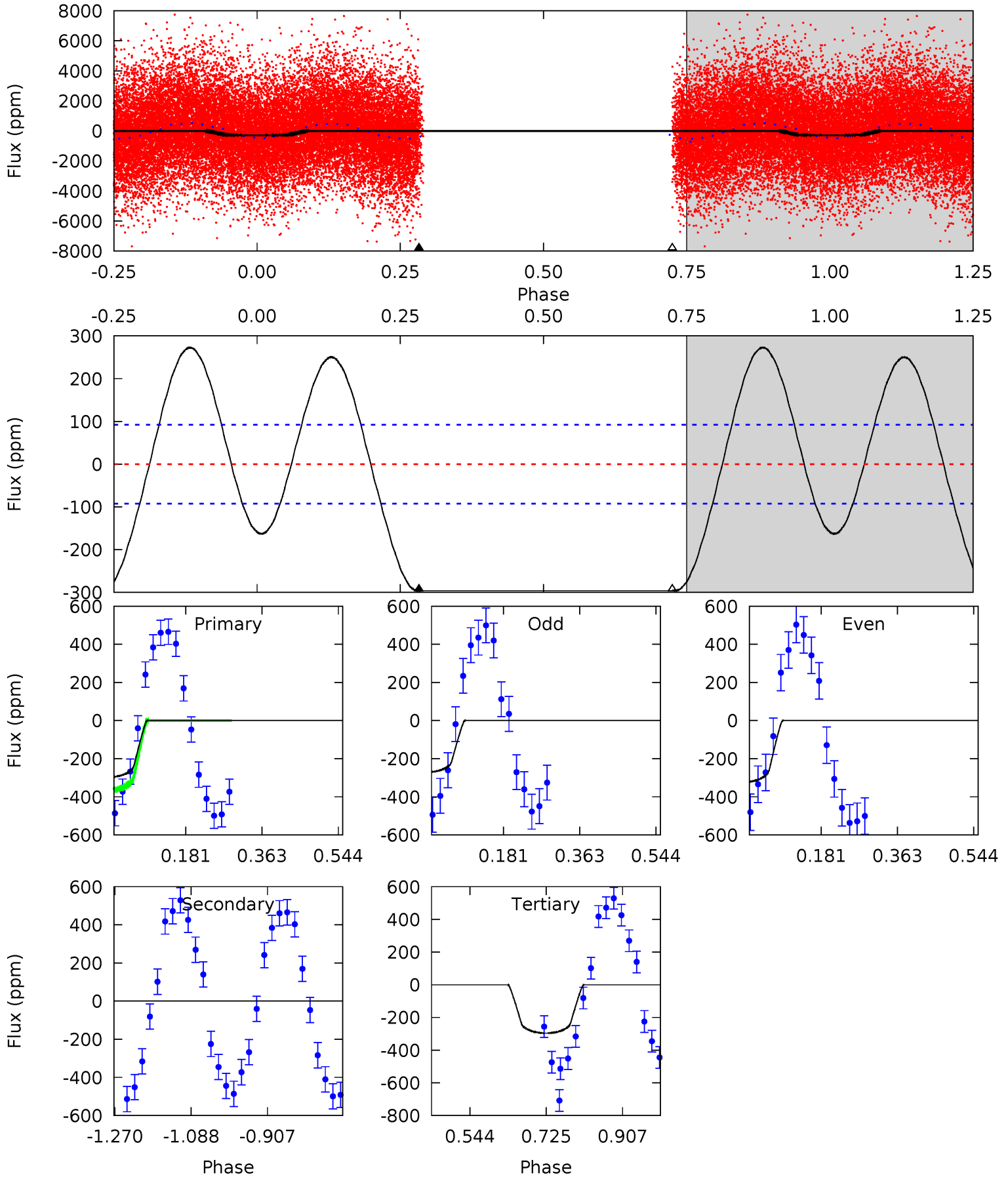
TCE 004481700-02 P= 0.664174 Days $T_0=131.578679$ (BKJD)



DV Model-Shift Uniqueness Test

004481700-02, P = 0.664168 Days, E = 130.916453 Days

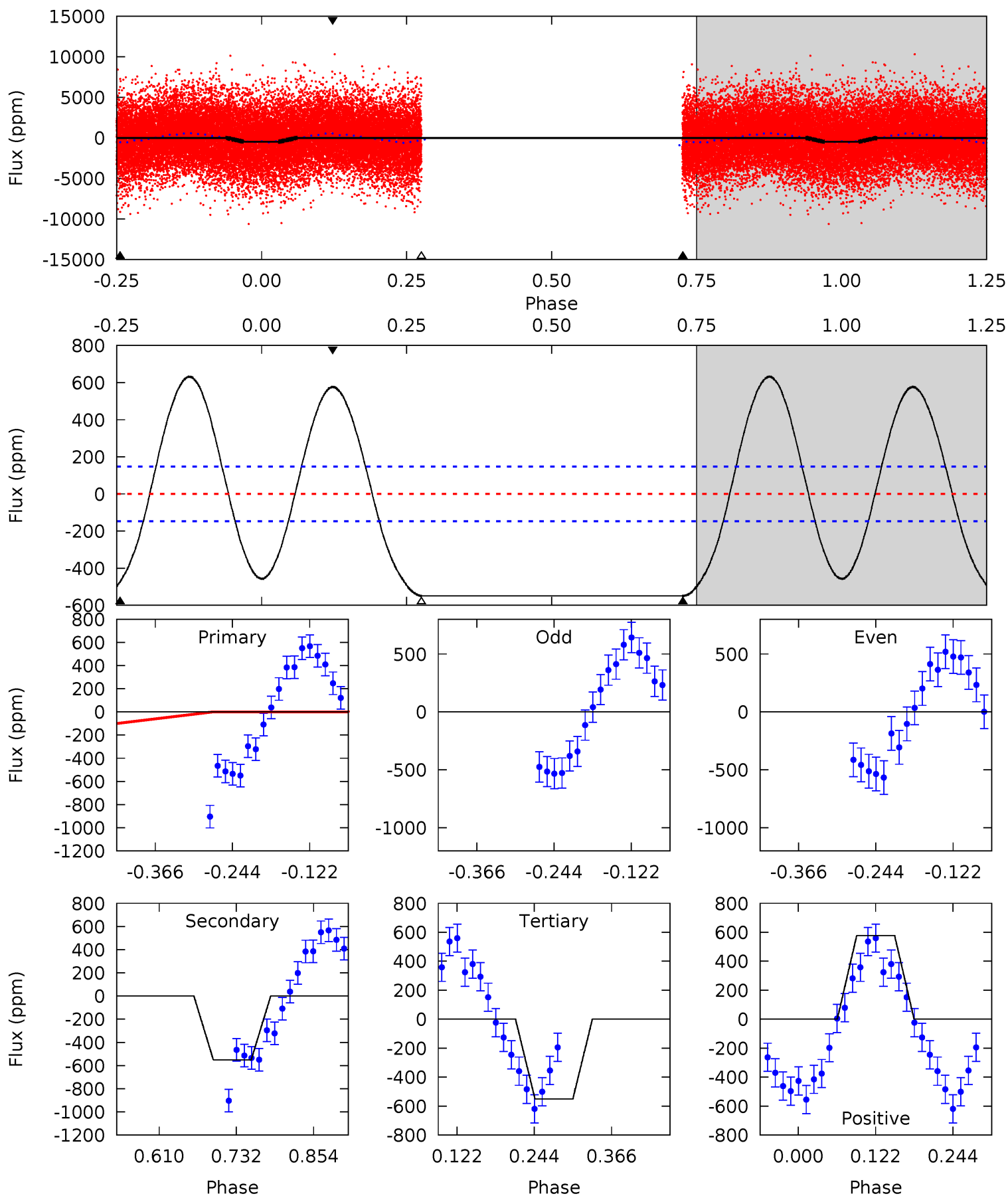
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	0	14.2	0	4.44	1.34	8.10	0.00	14.2	-14.2	0	1.24	1.21	0.48	3.46



Alt Model-Shift Uniqueness Test

004481700-02, P = 0.664174 Days, E = 130.914505 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	16.9	16.9	17.7	4.52	1.55	11.8	-2.35	-3.18	0.01	-0.82	0.33	1.42	0.53	0.18



Stellar Parameters For KIC 004481700

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7108^{+200}_{-342}	$4.121^{+0.157}_{-0.192}$	$-0.160^{+0.250}_{-0.350}$	$1.728^{+0.567}_{-0.426}$	$1.440^{+0.222}_{-0.247}$	$0.393^{+0.329}_{-0.193}$
	+3%/-5%	+4%/-5%	+156%/-219%	+33%/-25%	+15%/-17%	+84%/-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 004481700-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 21	$3.81^{+1.56}_{-1.28}$	4450^{+343}_{-344}	-3955^{+879}_{-496}	$0.011^{+0.227}_{-0.252}$
Alt.	-550 ± 33	$4.05^{+1.69}_{-1.37}$	4423^{+371}_{-311}	7312^{+2045}_{-1263}	$5.250^{+6.316}_{-2.692}$

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 $A_{obs} \gg 1.0$

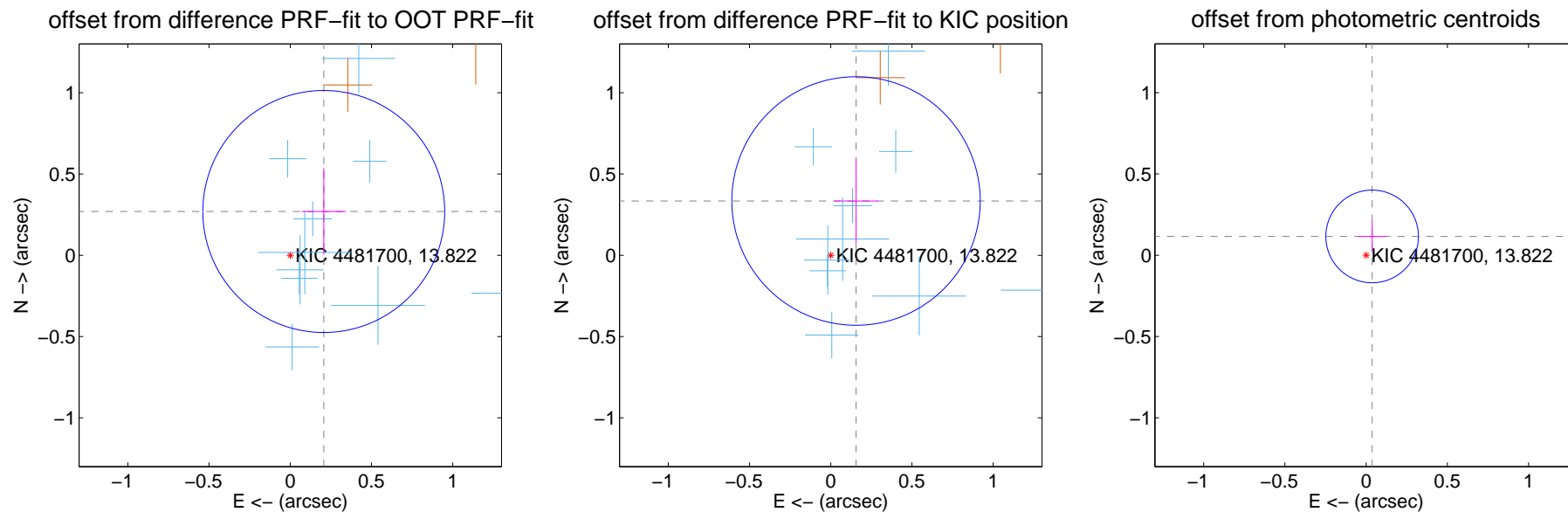
DV Centroid Data

Supplemental centroid analysis for 004481700-02. Kepler magnitude: 13.82. Transit SNR 14.13

There are 11 quarters with good PRF difference image offsets

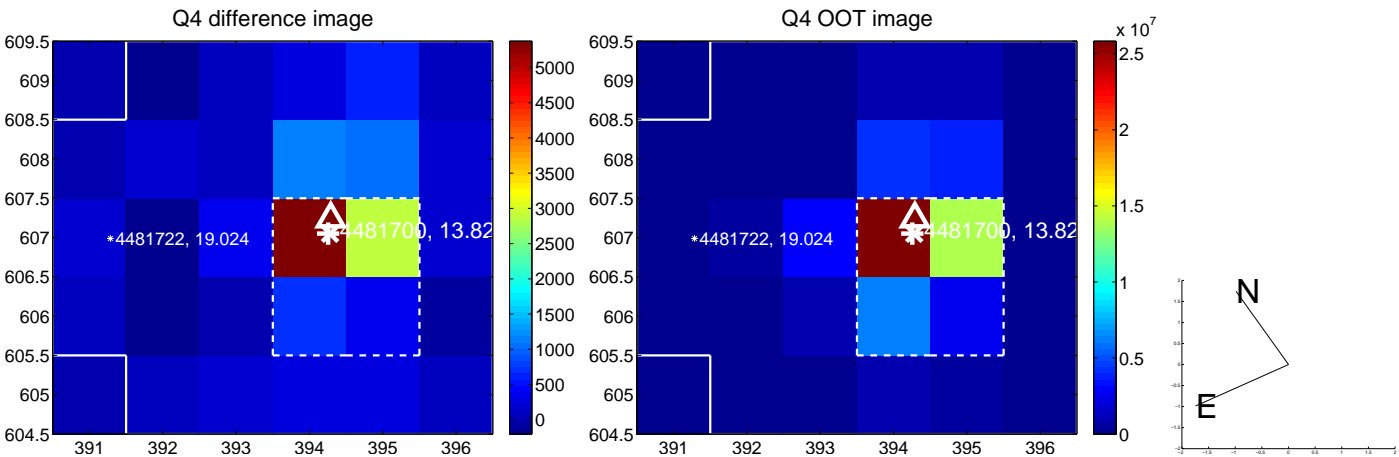
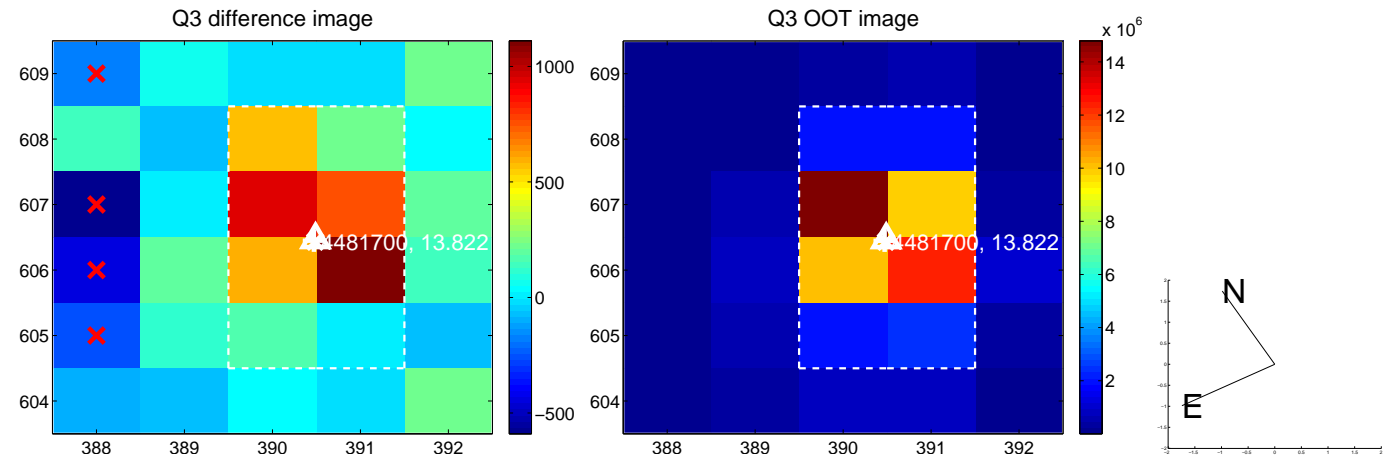
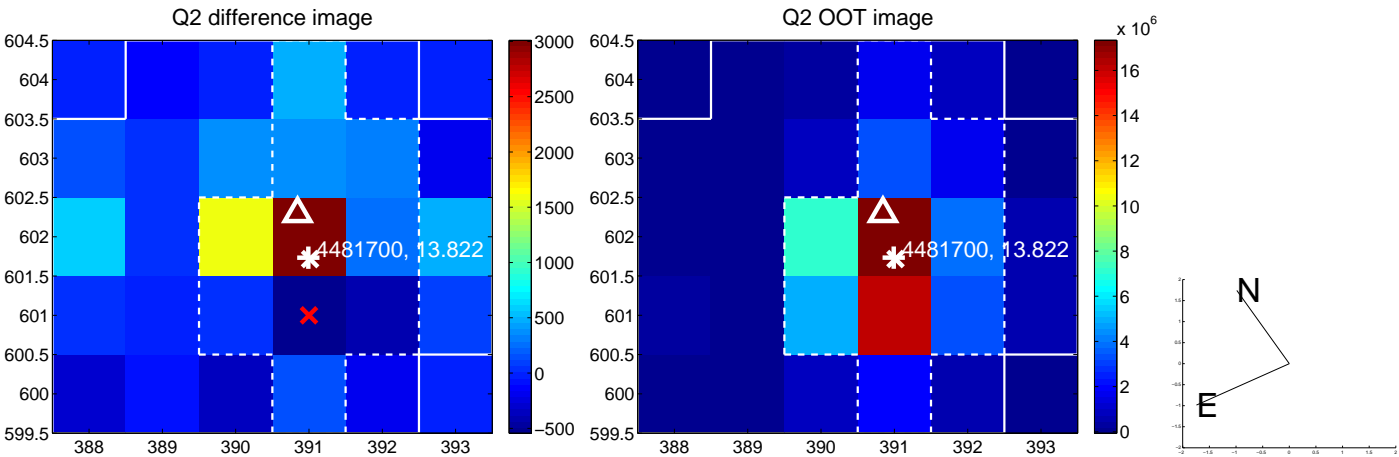
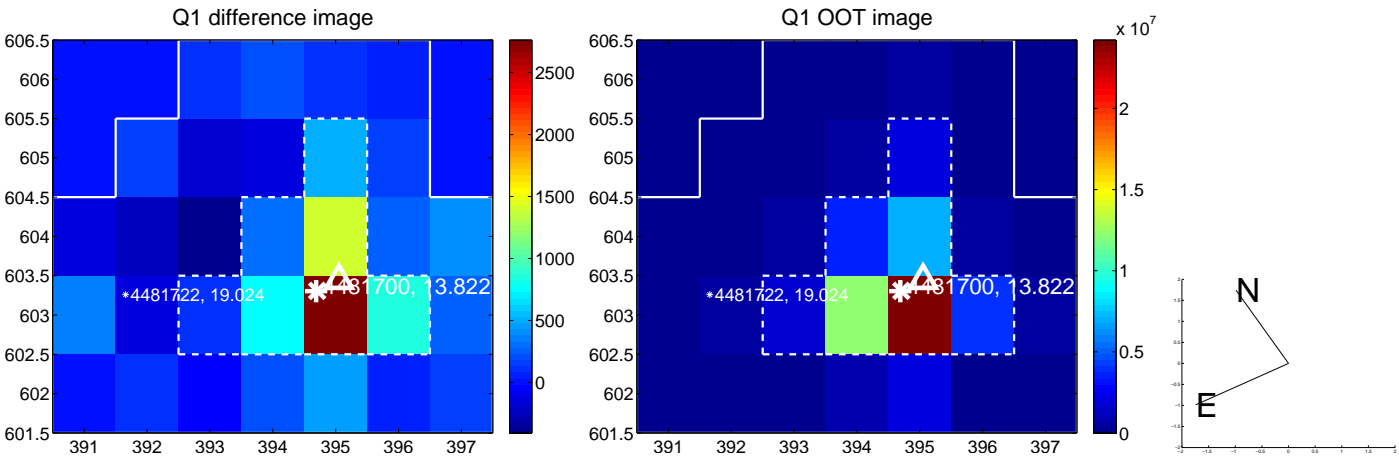
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.339 ± 0.248	1.37	-0.206 ± 0.136	0.269 ± 0.266
PRF-fit source offset from KIC position	0.369 ± 0.255	1.45	-0.156 ± 0.135	0.334 ± 0.259
photometric centroid source offset	0.12 ± 0.10	1.28	-0.04 ± 0.09	0.12 ± 0.10

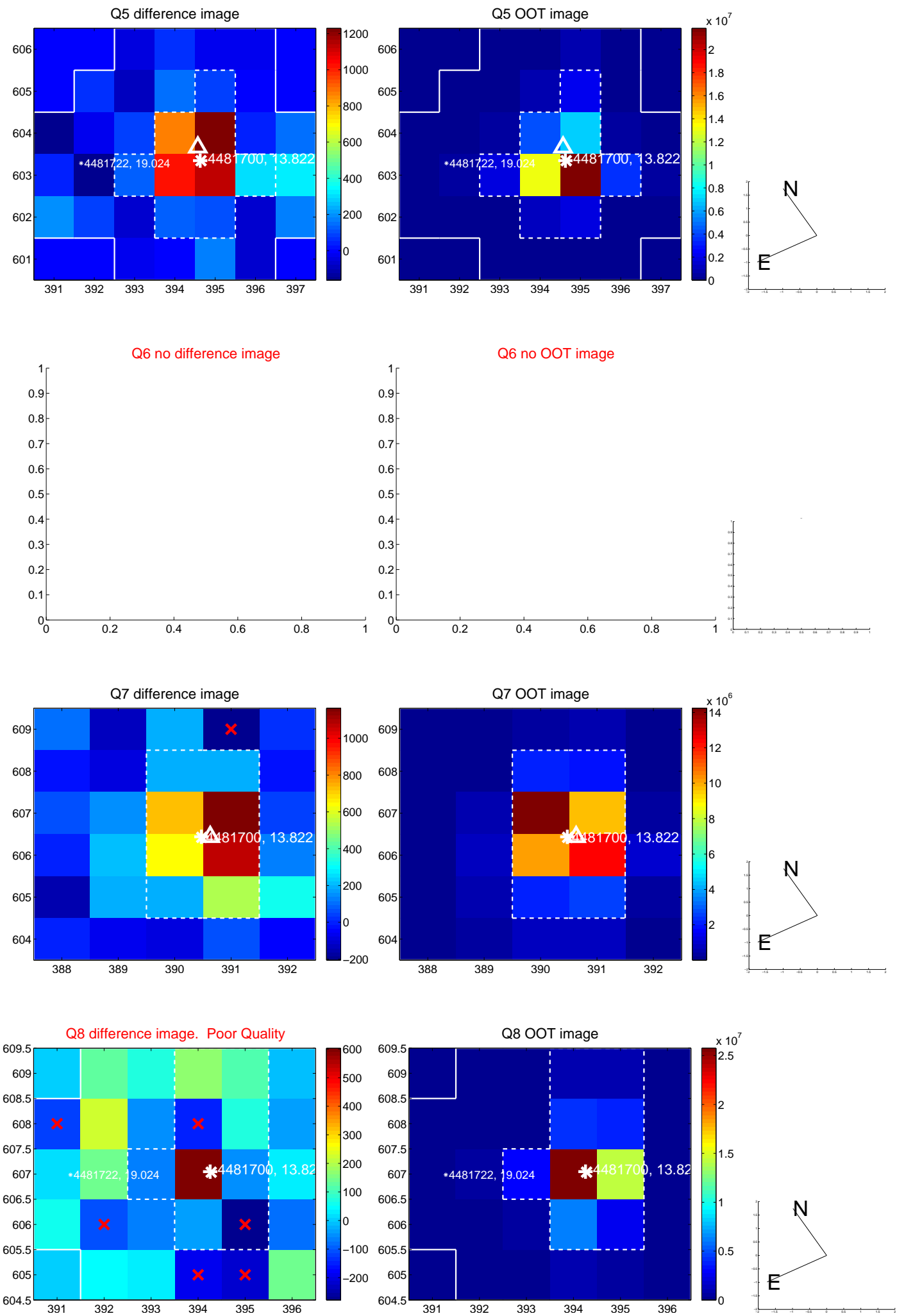


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

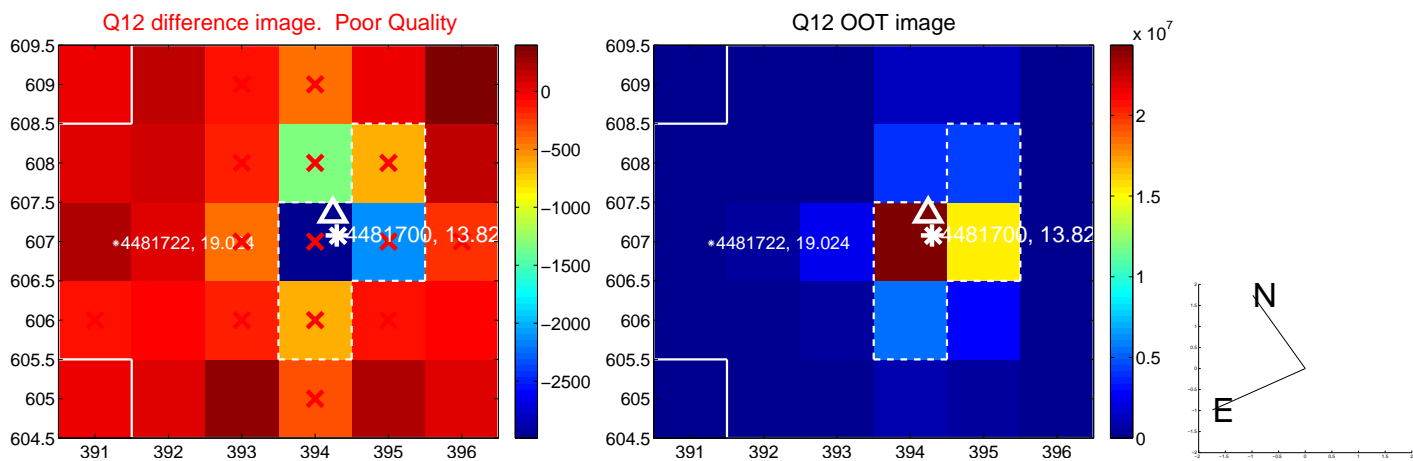
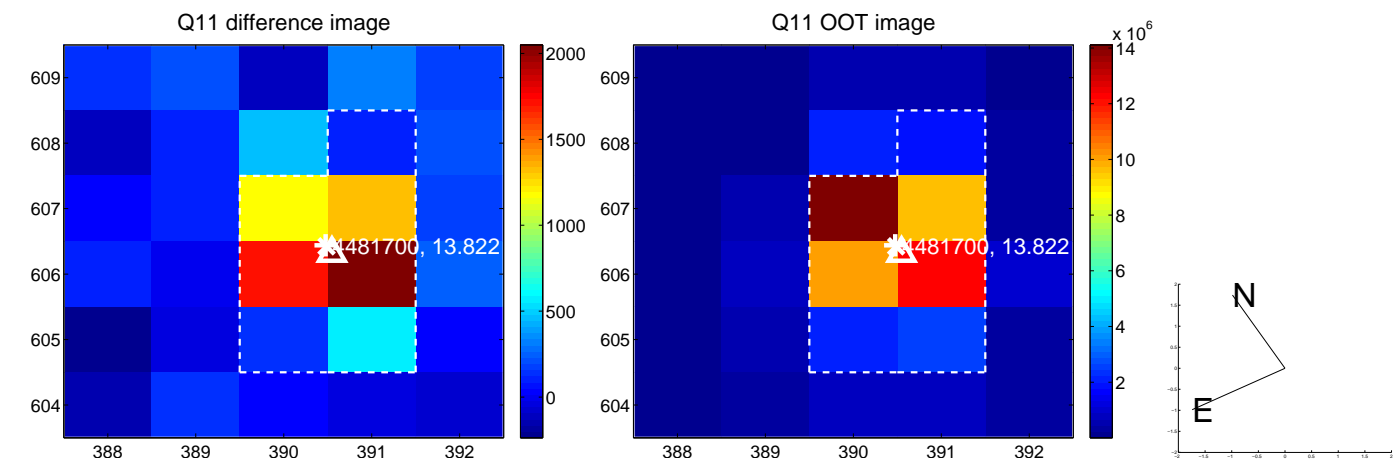
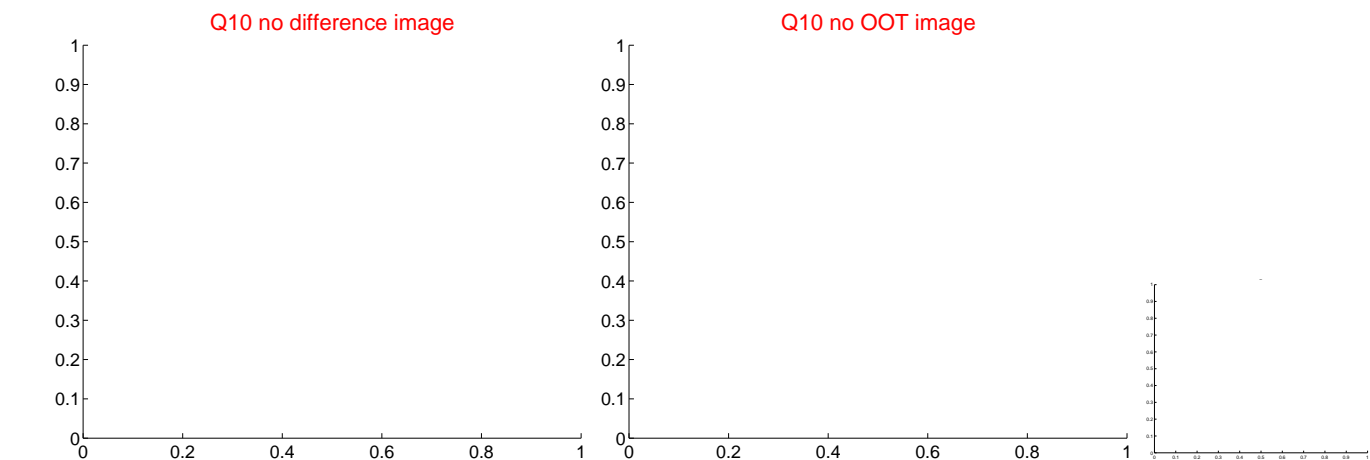
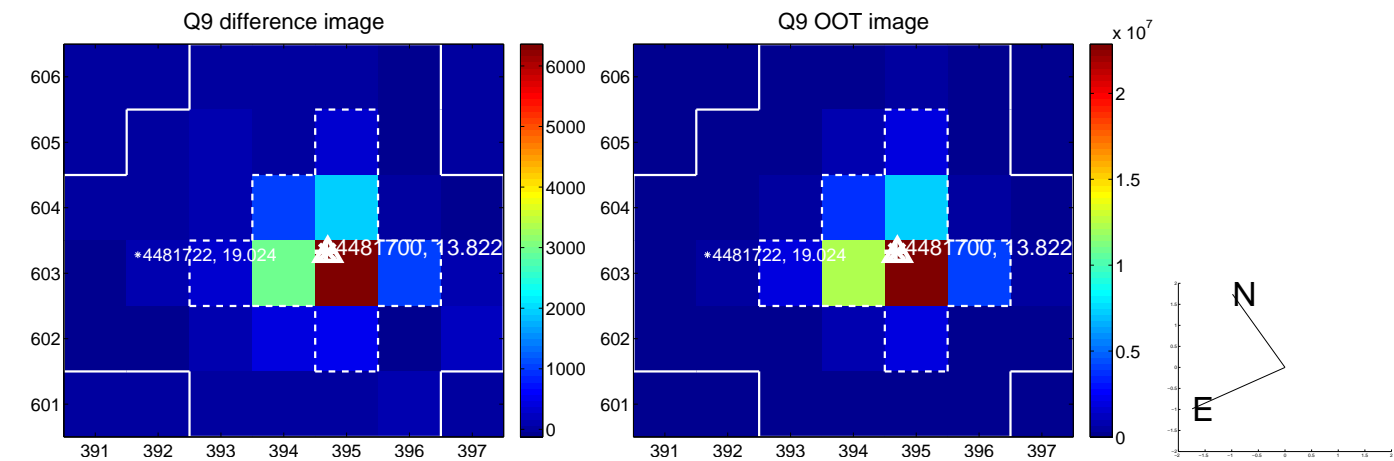
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



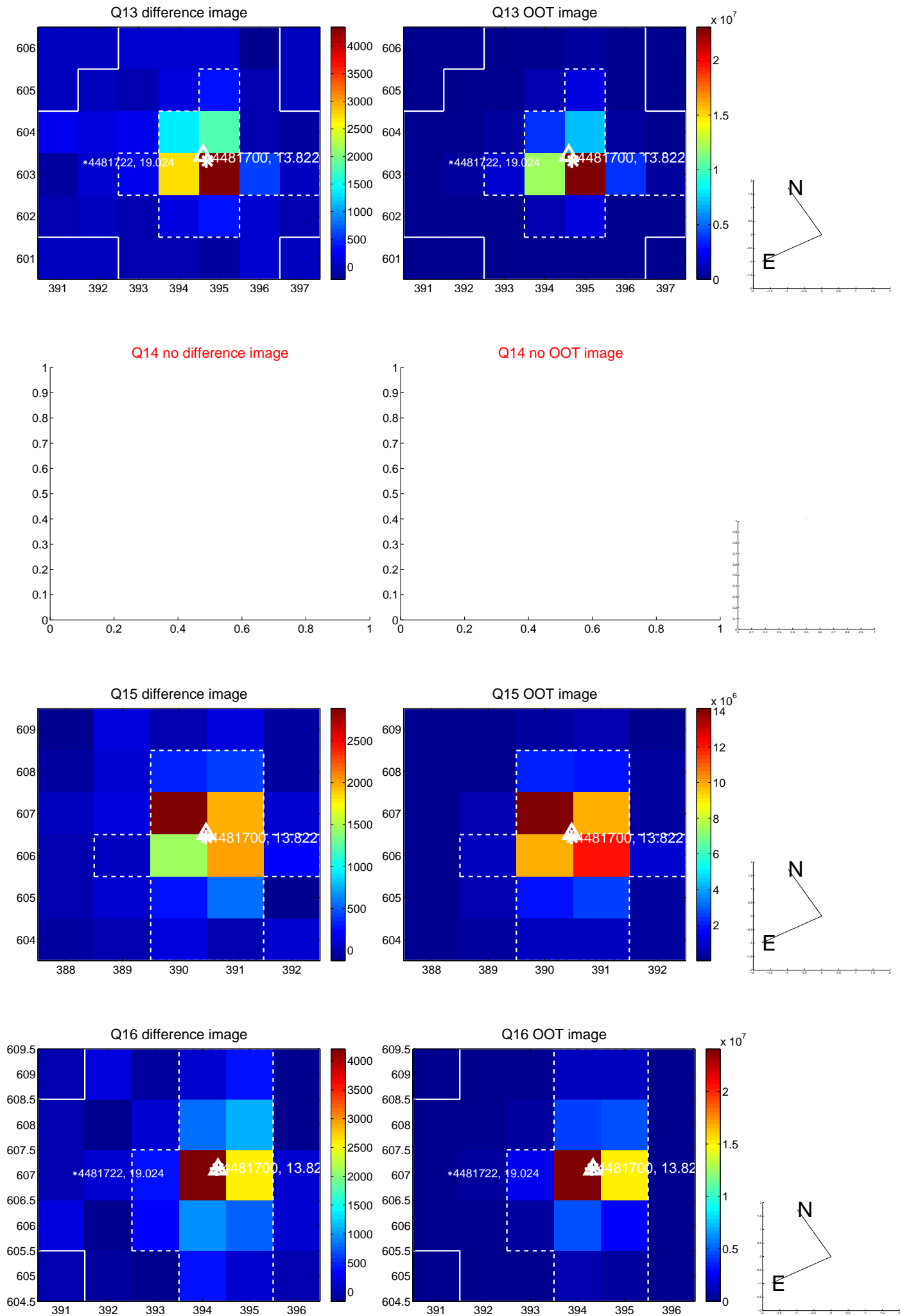
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



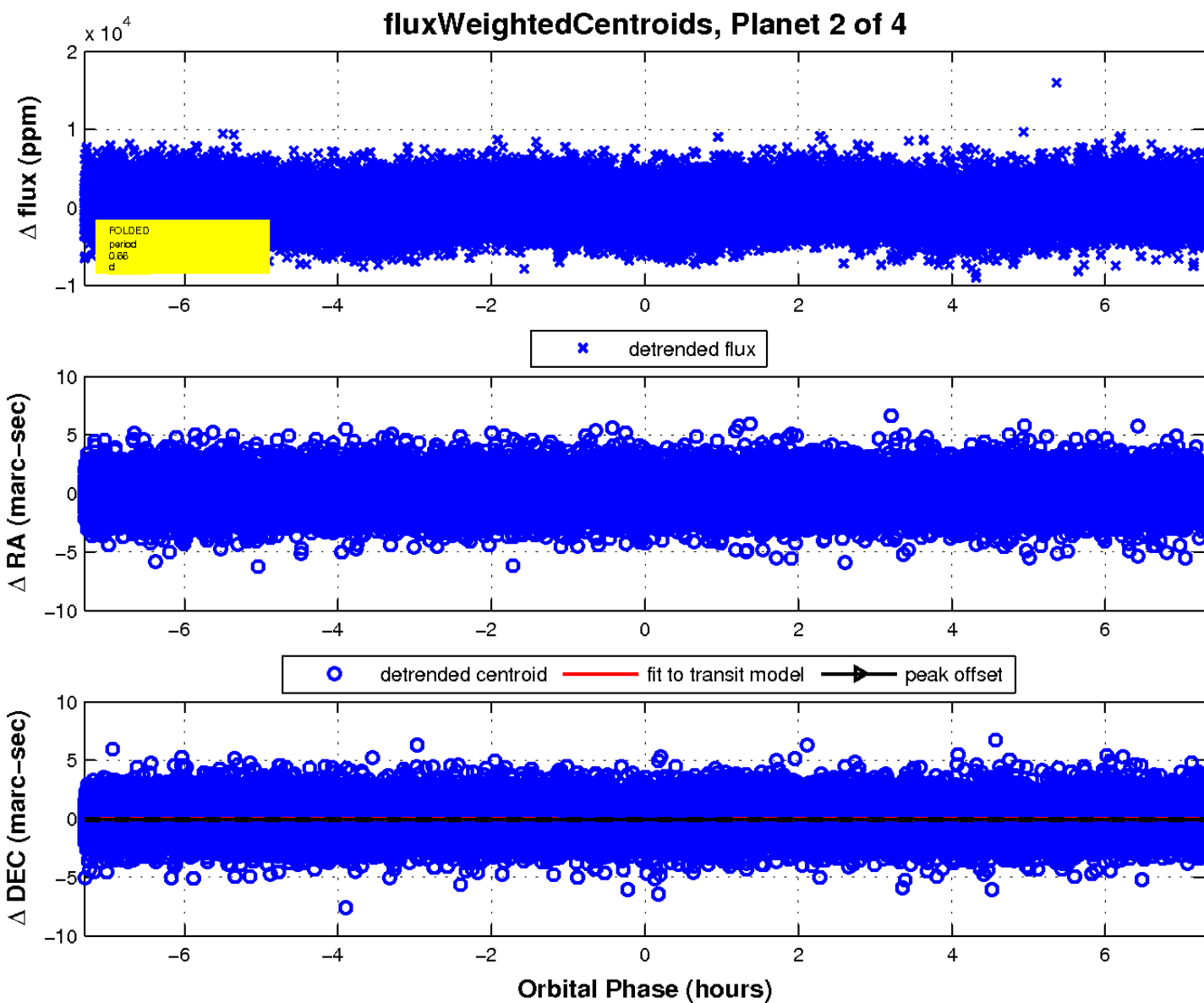
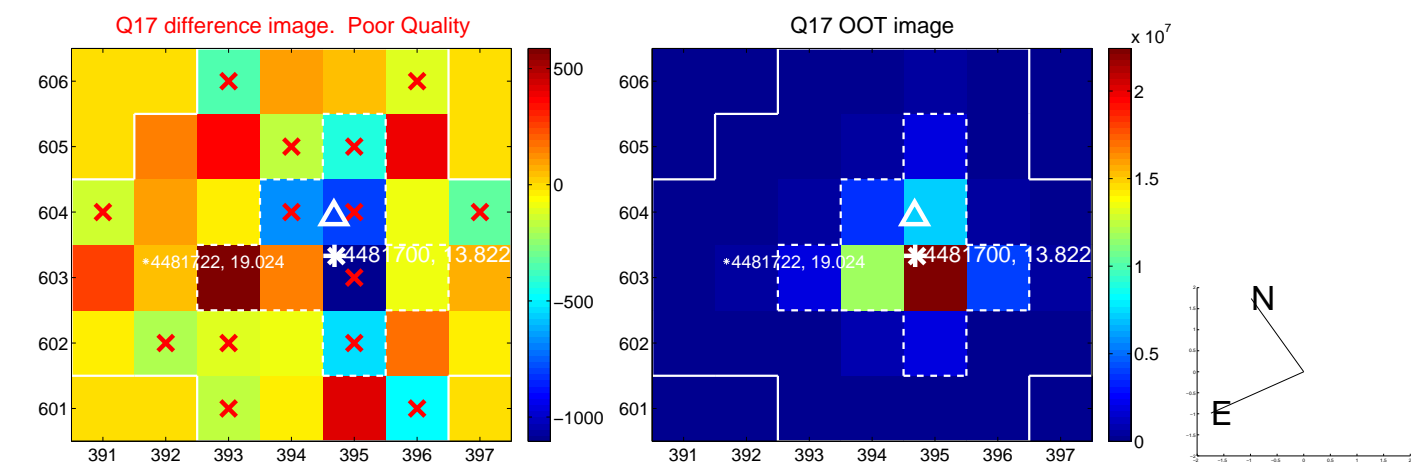
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

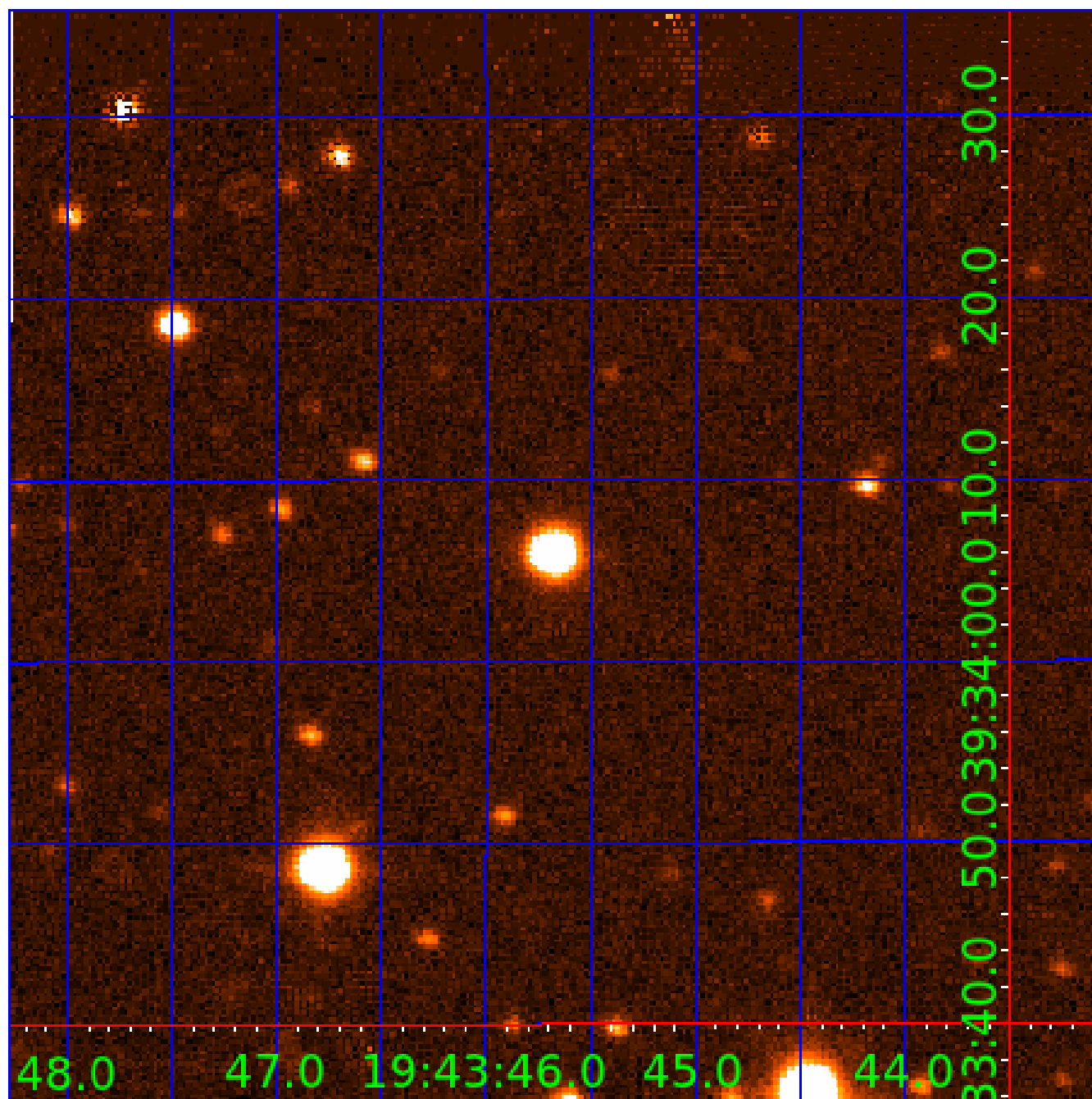


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004481700

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})
004481700-01	OBS	No	0.664173	131.911710	464.5	2.232	13.0	13.8	1.73	7108	4.33	24128.92
004481700-02	OBS	No	0.664168	131.580621	431.9	2.434	13.0	14.1	1.73	7108	3.87	24129.19
004481700-03	OBS	No	0.616551	131.608393	1064.2	2.653	8.5	10.1	1.73	7108	6.55	26645.36
004481700-04	OBS	No	0.706193	131.995369	434.8	2.500	9.4	-1.0	1.73	7108	3.65	22233.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481700-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004481700-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
004481700-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004481700-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

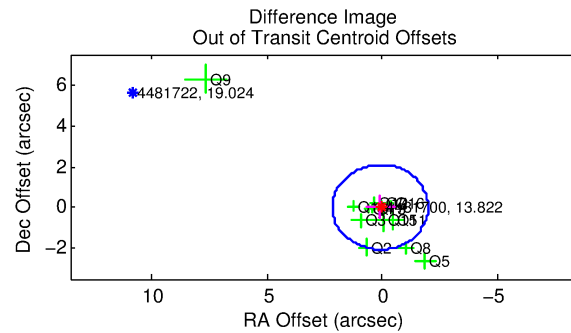
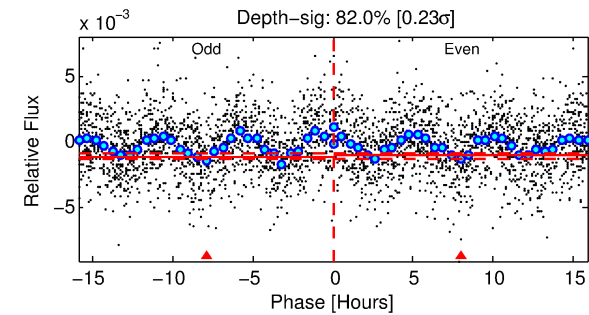
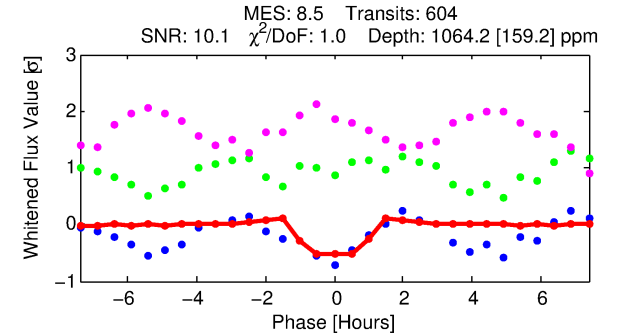
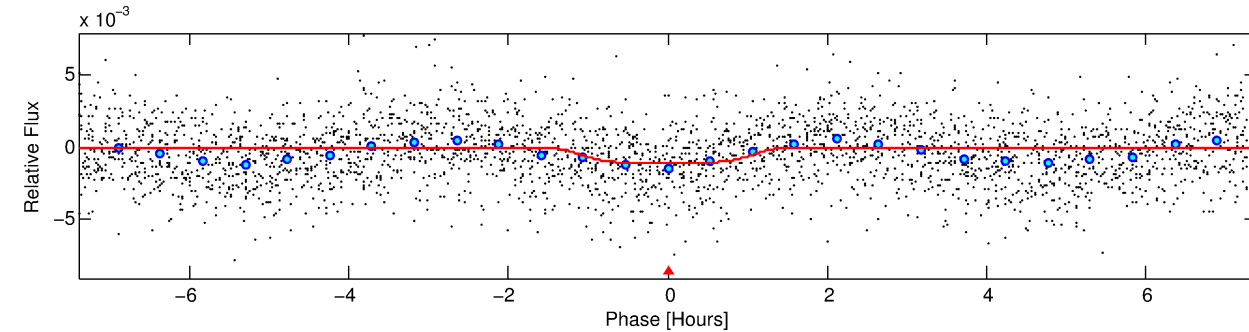
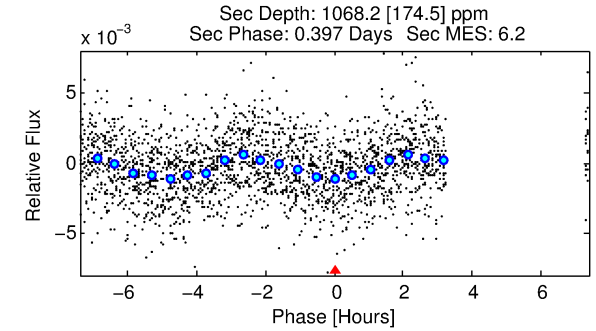
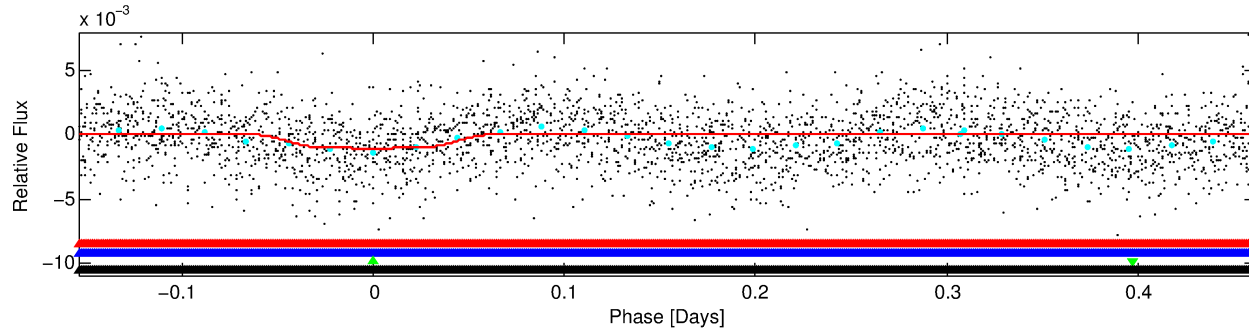
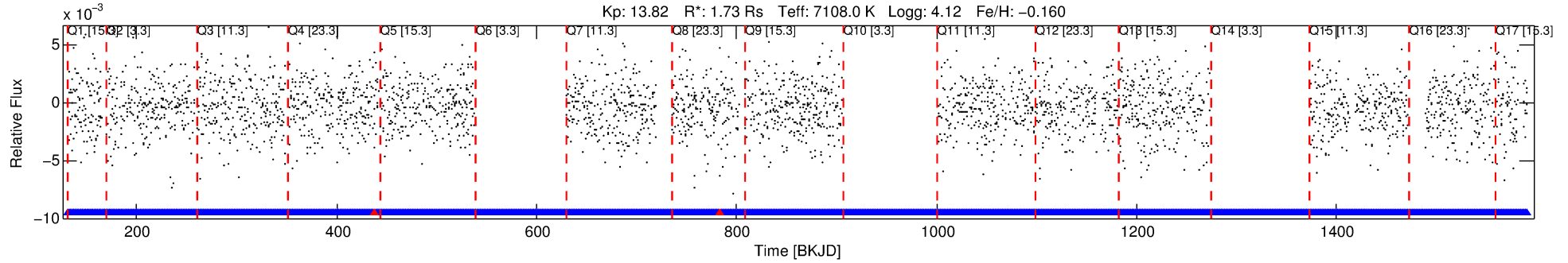
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481700-03

No Significant Match Found

DV One-Page Summary

KIC: 4481700 Candidate: 3 of 4 Period: 0.617 d



DV Fit Results:

Period = 0.61655 [0.00001] d
Epoch = 131.6084 [0.0028] BKJD
Rp/R* = 0.0348 [0.0050]
a/R* = 1.31 [0.36]
b = 0.90 [0.14]
Seff = 26645.36 [11042.84]
Teq = 3258 [338] K
Rp = 6.56 [2.35] Re
a = 0.0160 [0.0042] AU
Ag = 3.51 [1.73] [1.45σ]
Teffp = 6892 [660] K [4.90σ]

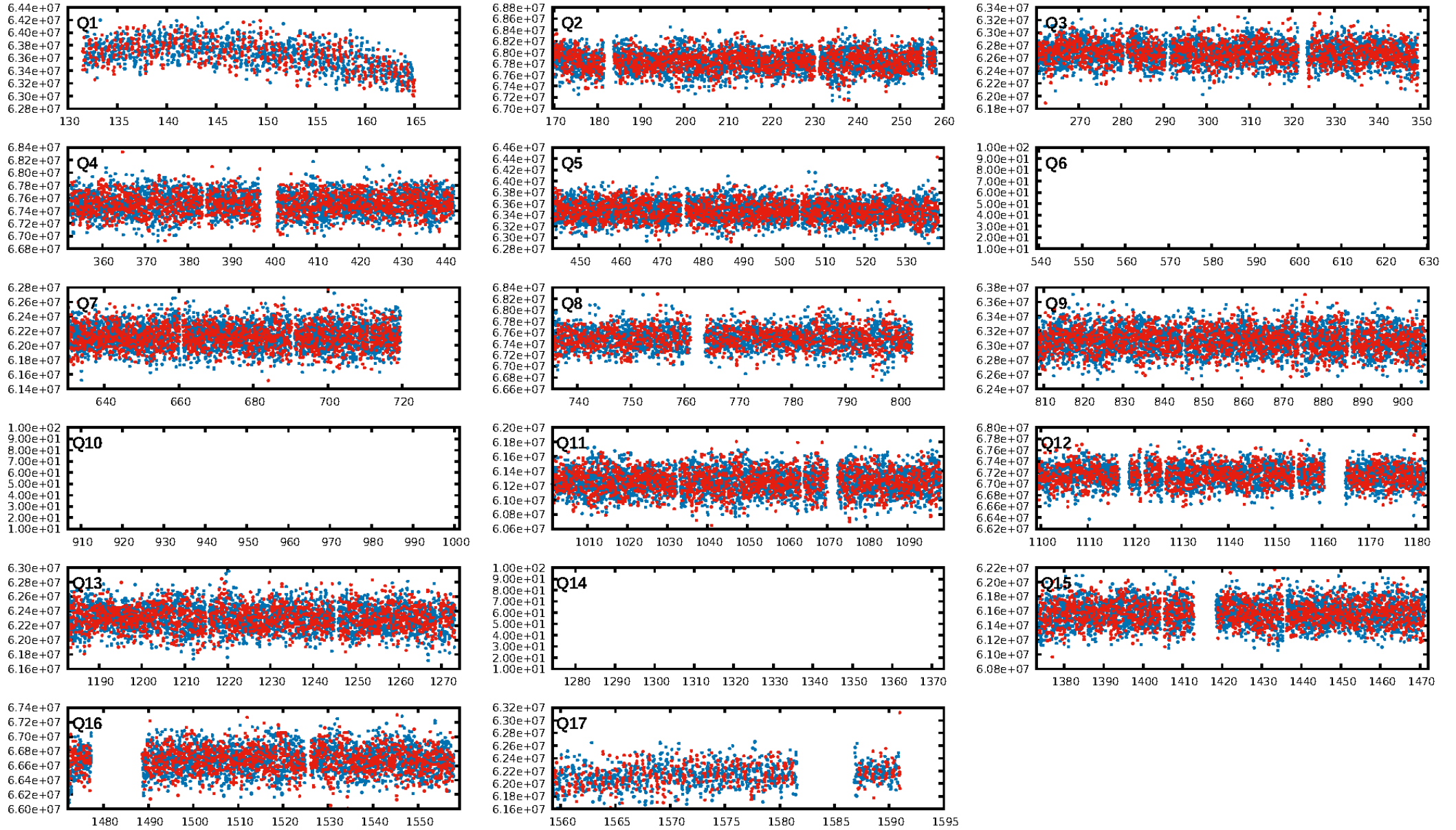
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 24.9% [0.32σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [567/569]
GhostDiagnostic-chr: -13.36
Centroid-sig: N/A
Centroid-so: 0.186 arcsec [4.95σ]
OotOffset-rm: 0.101 arcsec [0.15σ]
KicOffset-rm: 0.159 arcsec [0.23σ]
OotOffset-st: 1/4/4/4 [13]
KicOffset-st: 1/4/4/4 [13]
DiffImageQuality-fgm: 0.46 [6/13]
DiffImageOverlap-fno: 0.00 [0/14]

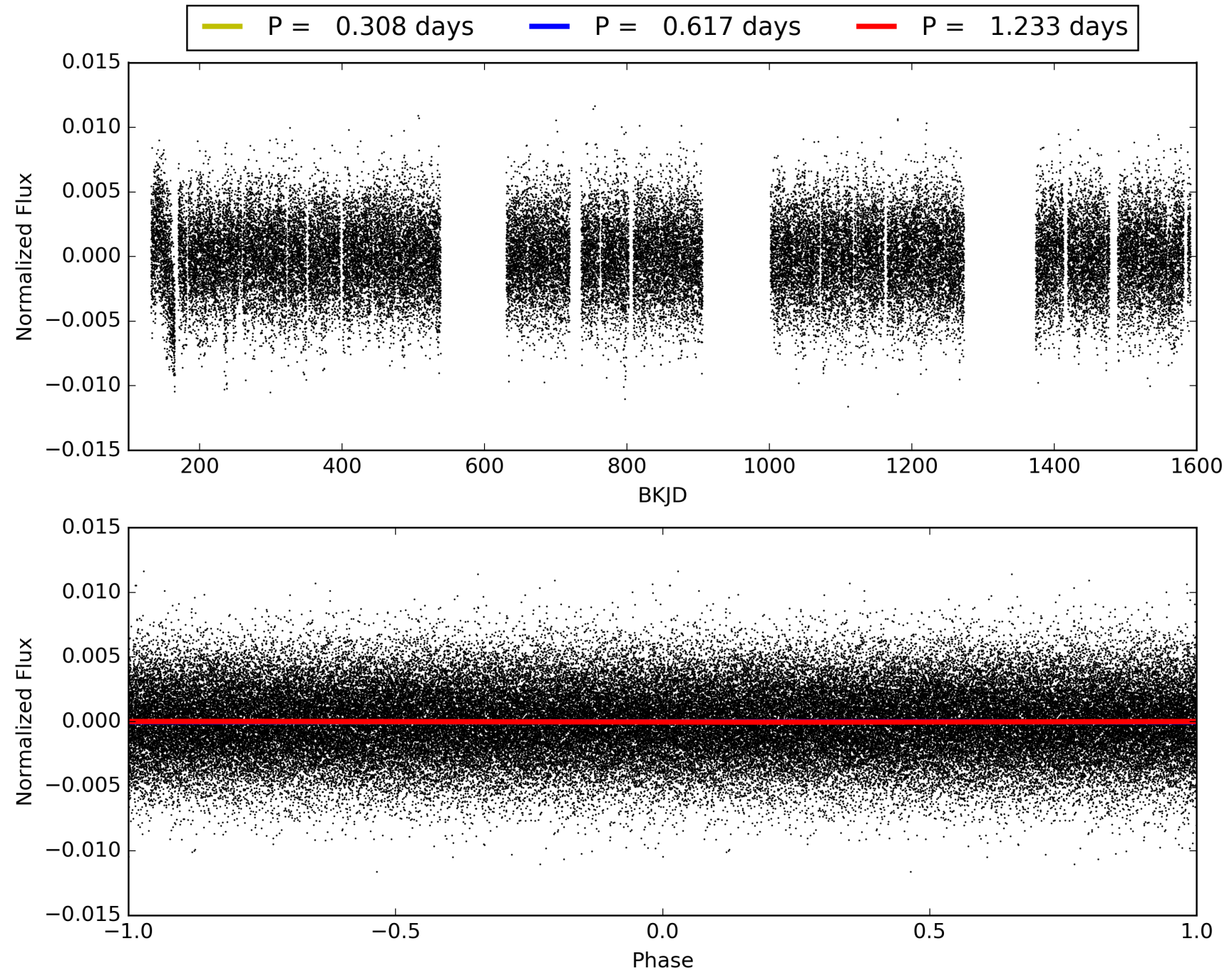
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:48:43 Z

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

TCE 004481700-03, PDC Light Curves

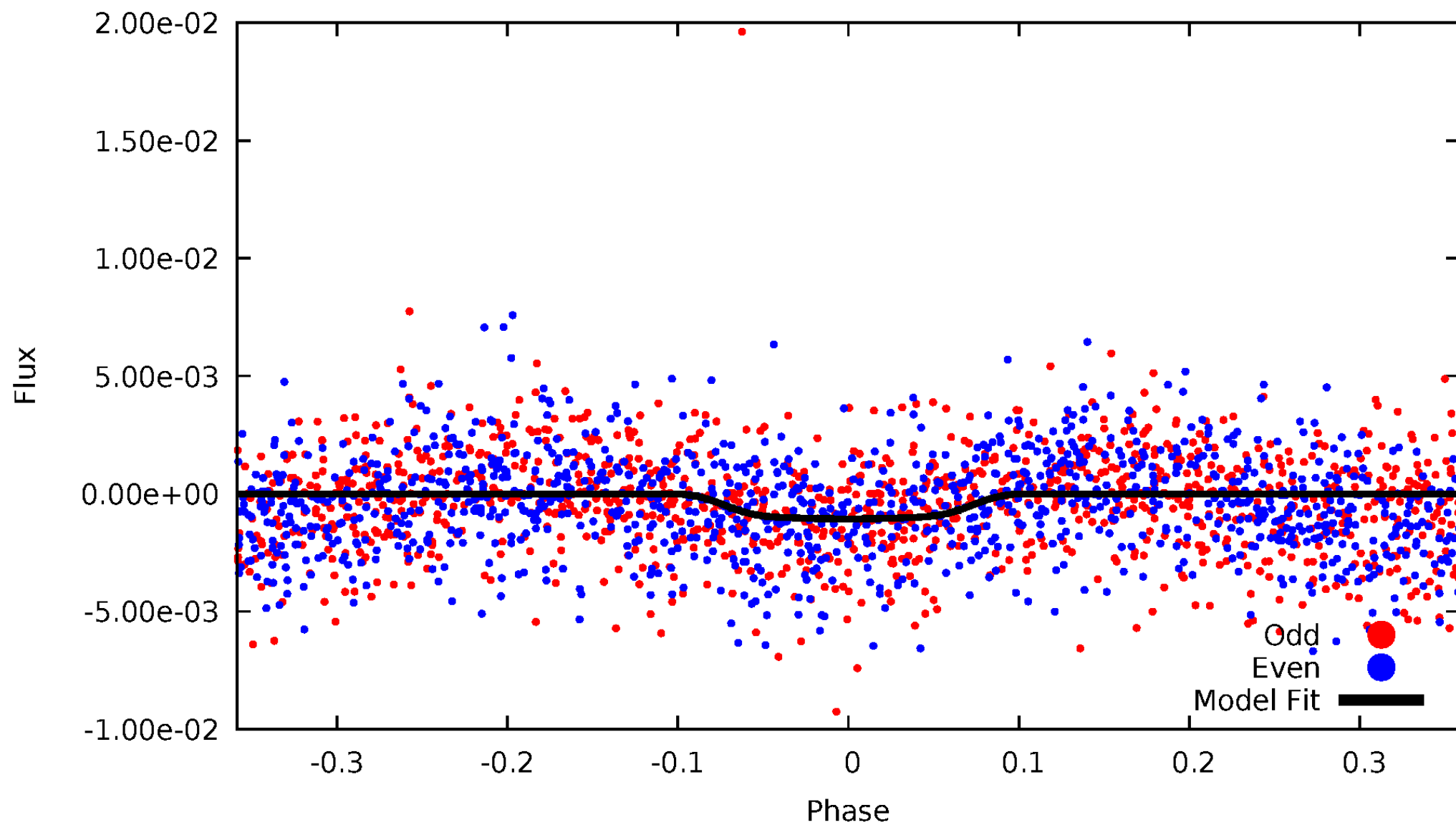


TCE 004481700-03



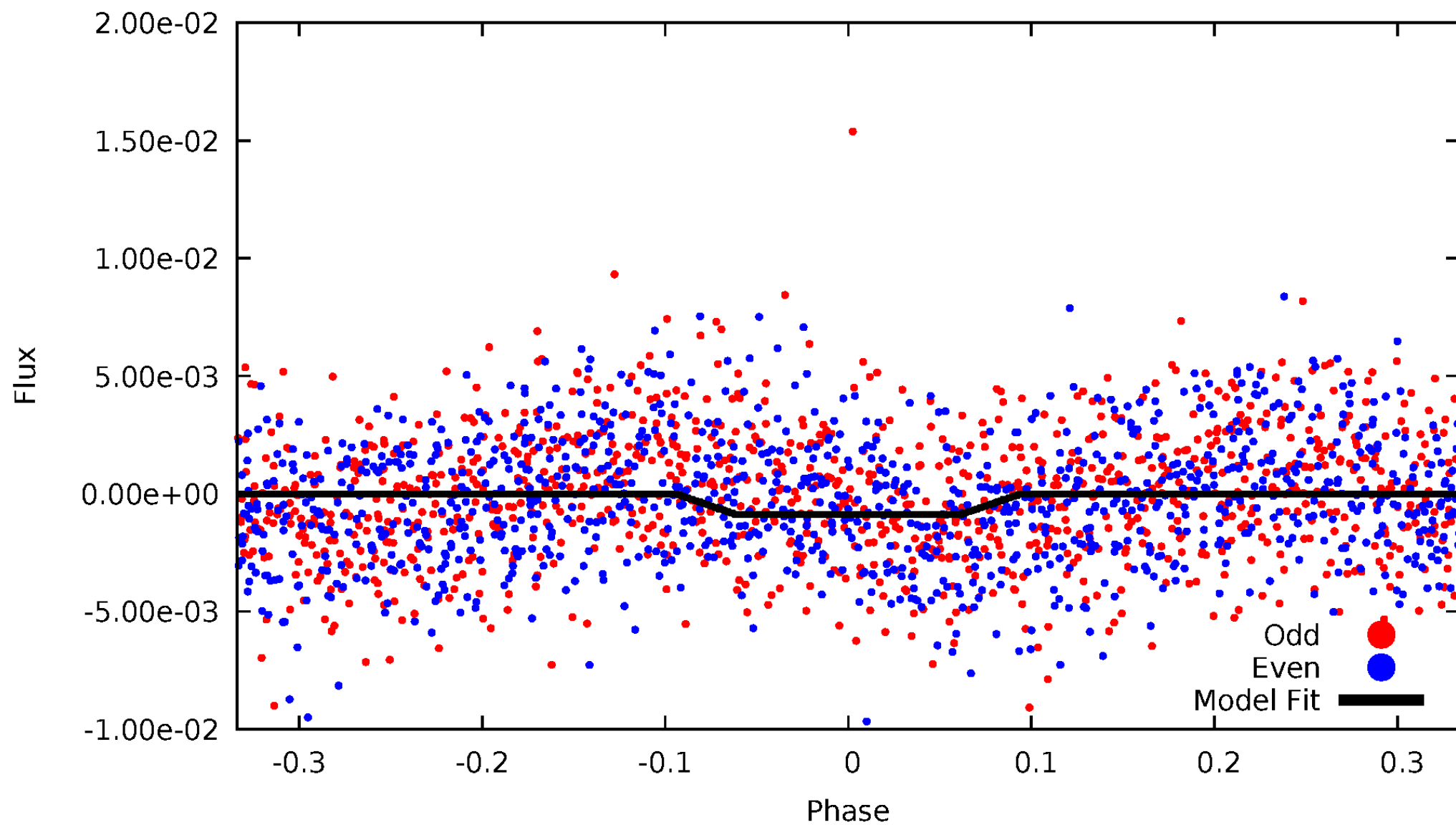
DV Odd/Even

TCE 004481700-03



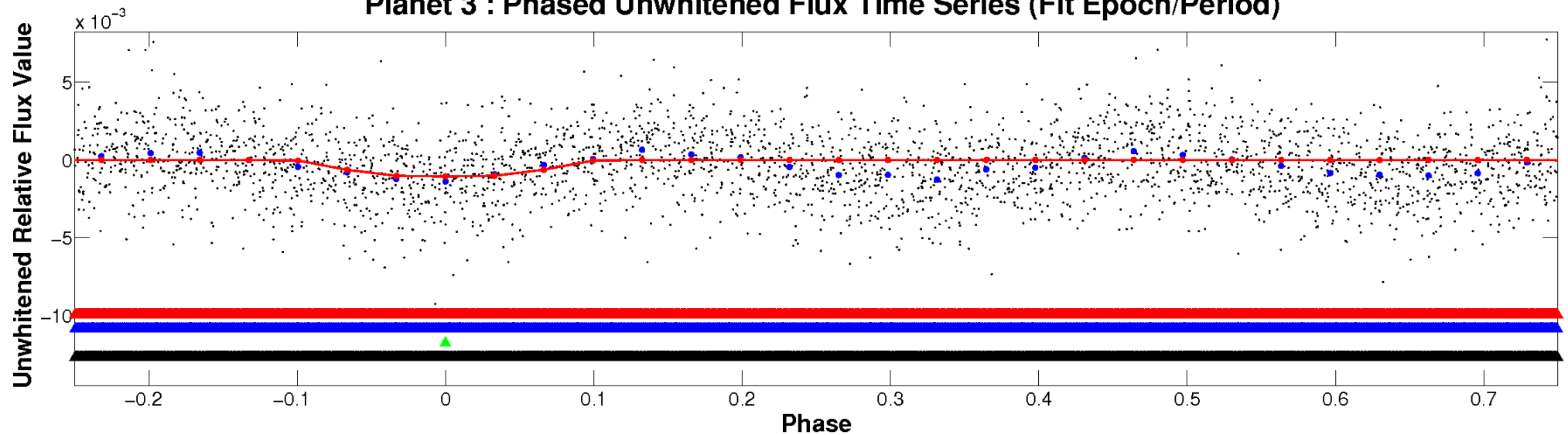
ALT Odd/Even

TCE 004481700-03

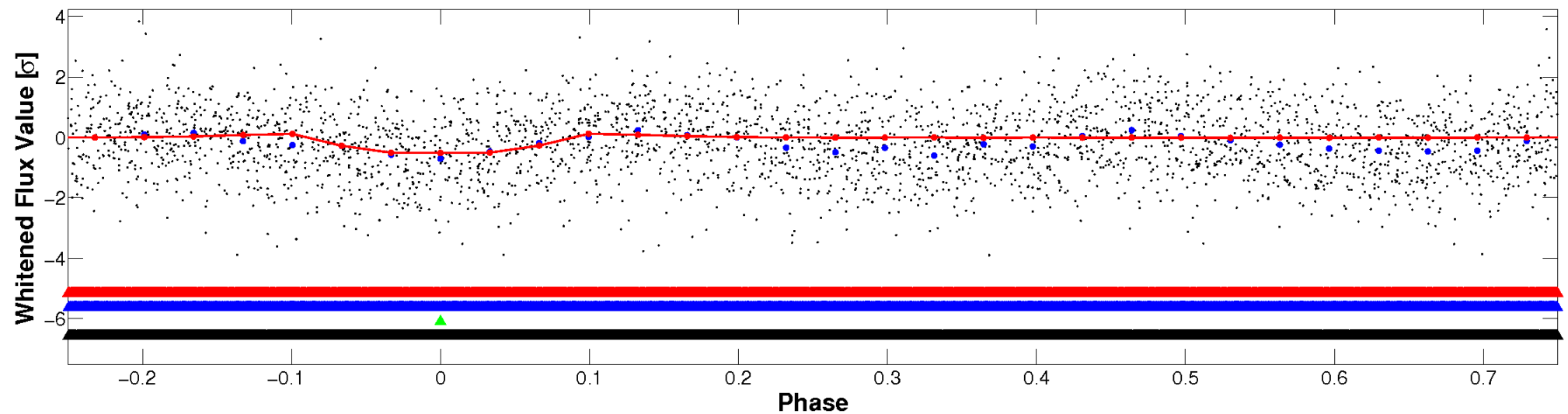


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

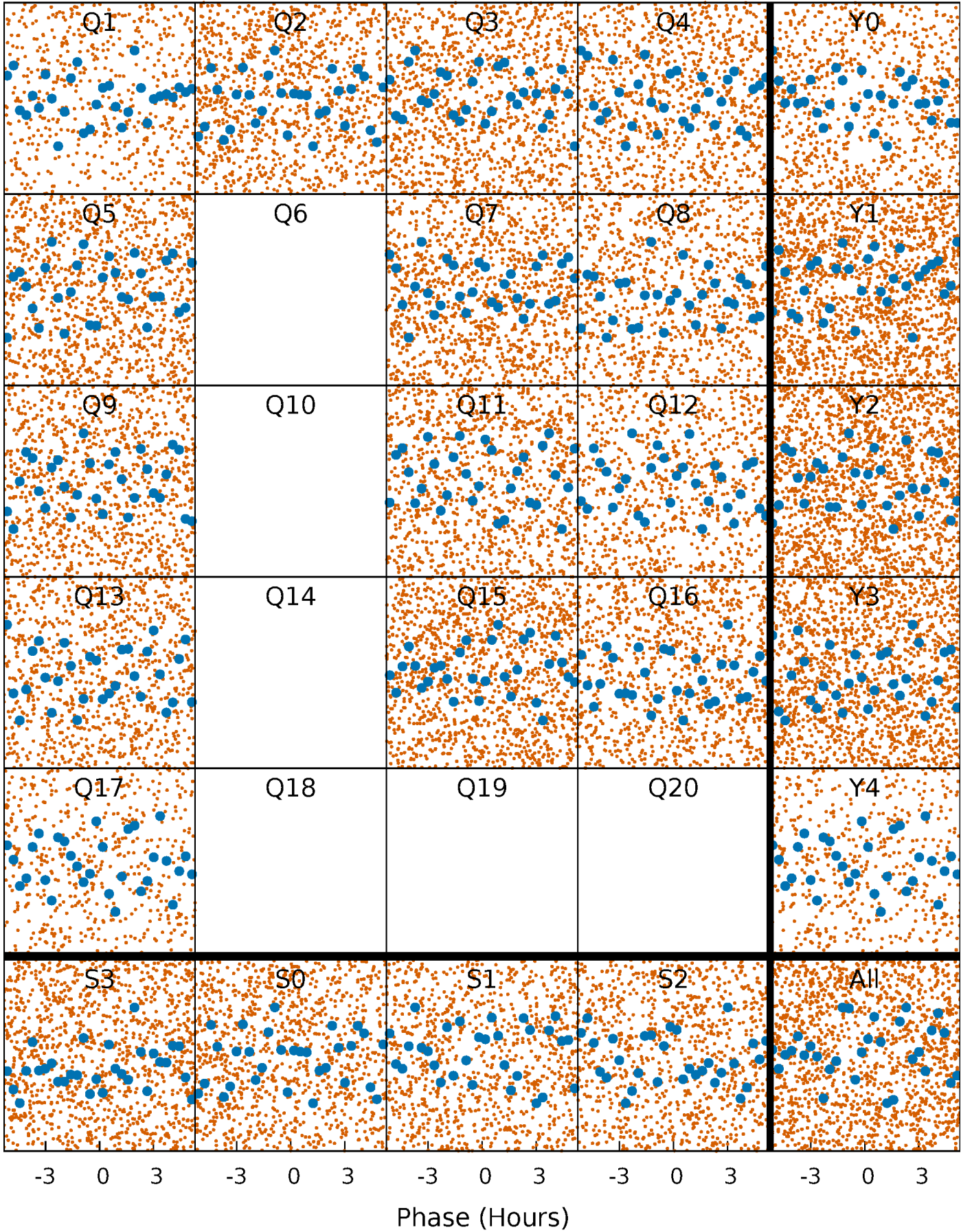


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



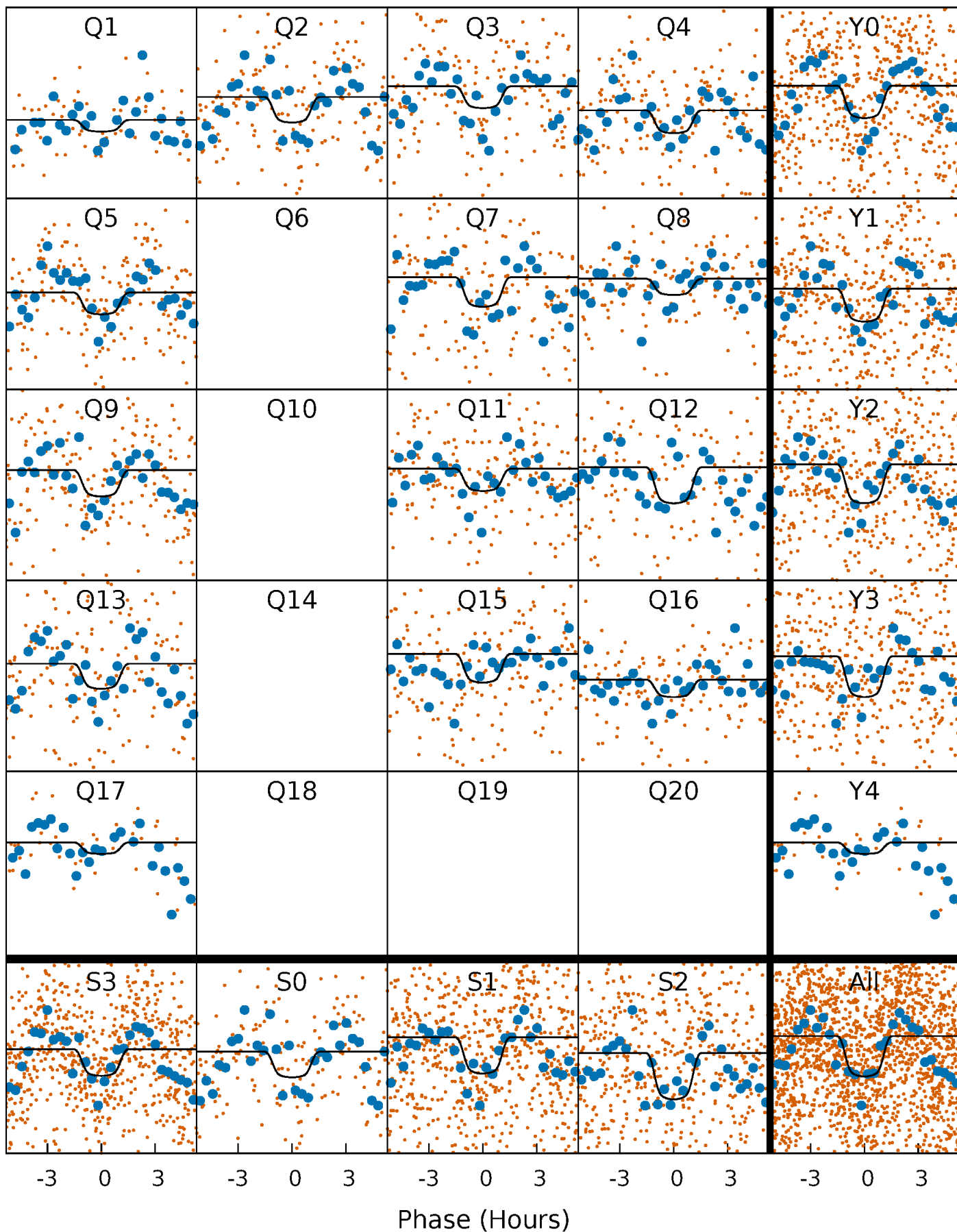
PDC Quarter-Phased Transit Curves

TCE 004481700-03 P= 0.616551 Days $T_0=131.608393$ (BKJD)



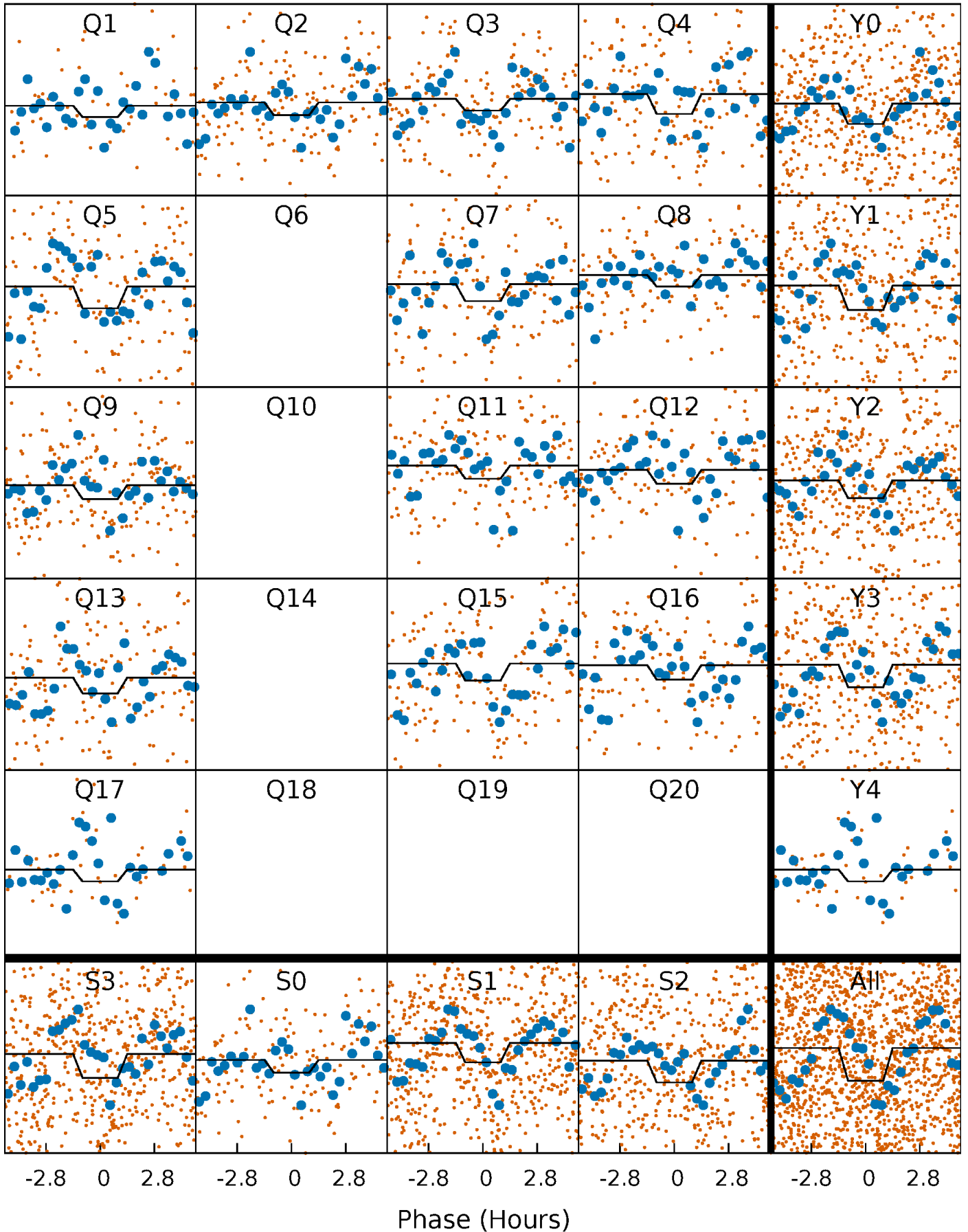
DV Quarter-Phased Transit Curves

TCE 004481700-03 P= 0.616551 Days $T_0=131.608393$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

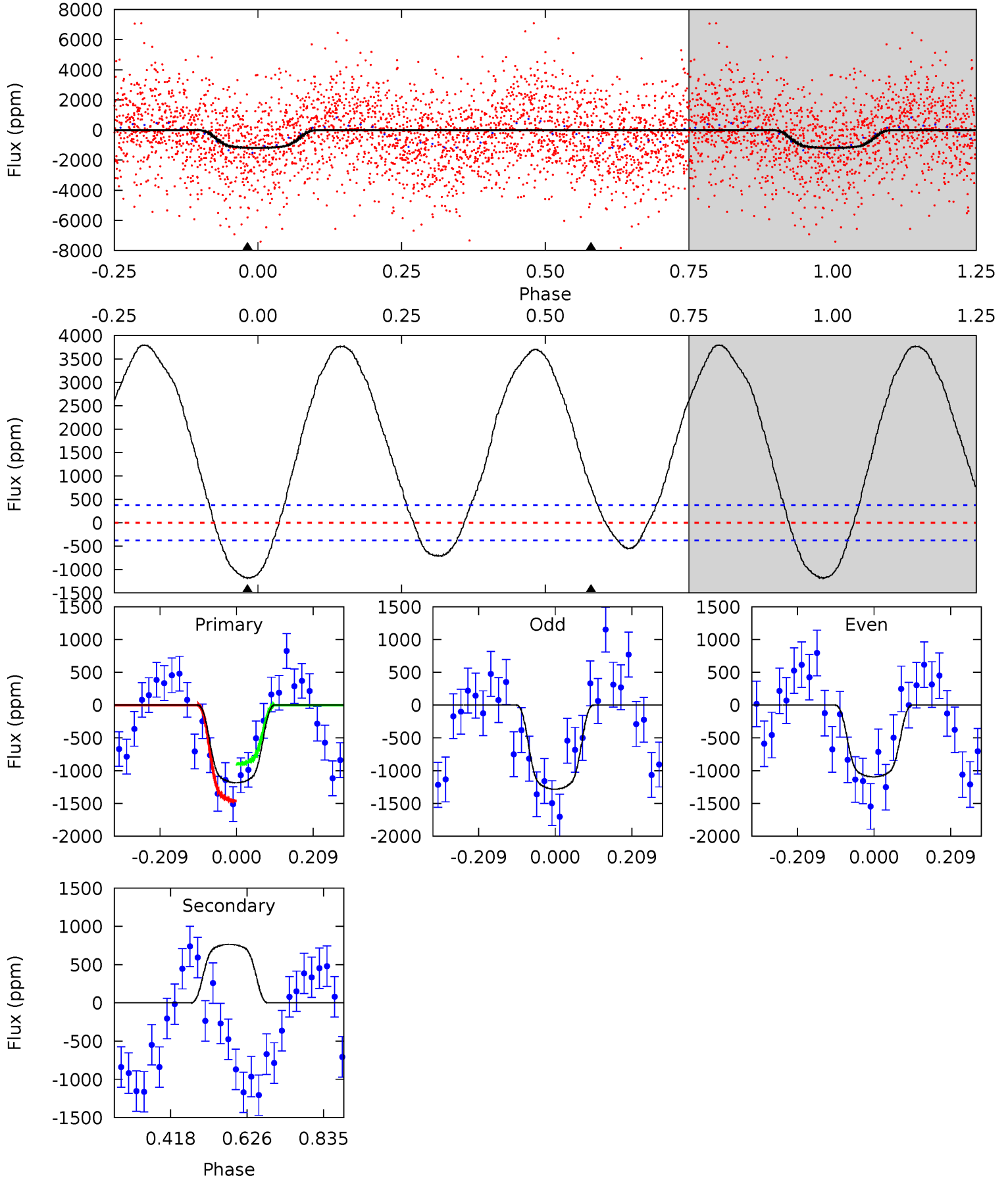
TCE 004481700-03 P= 0.616514 Days $T_0=131.592407$ (BKJD)



DV Model-Shift Uniqueness Test

004481700-03, P = 0.616551 Days, E = 131.608393 Days

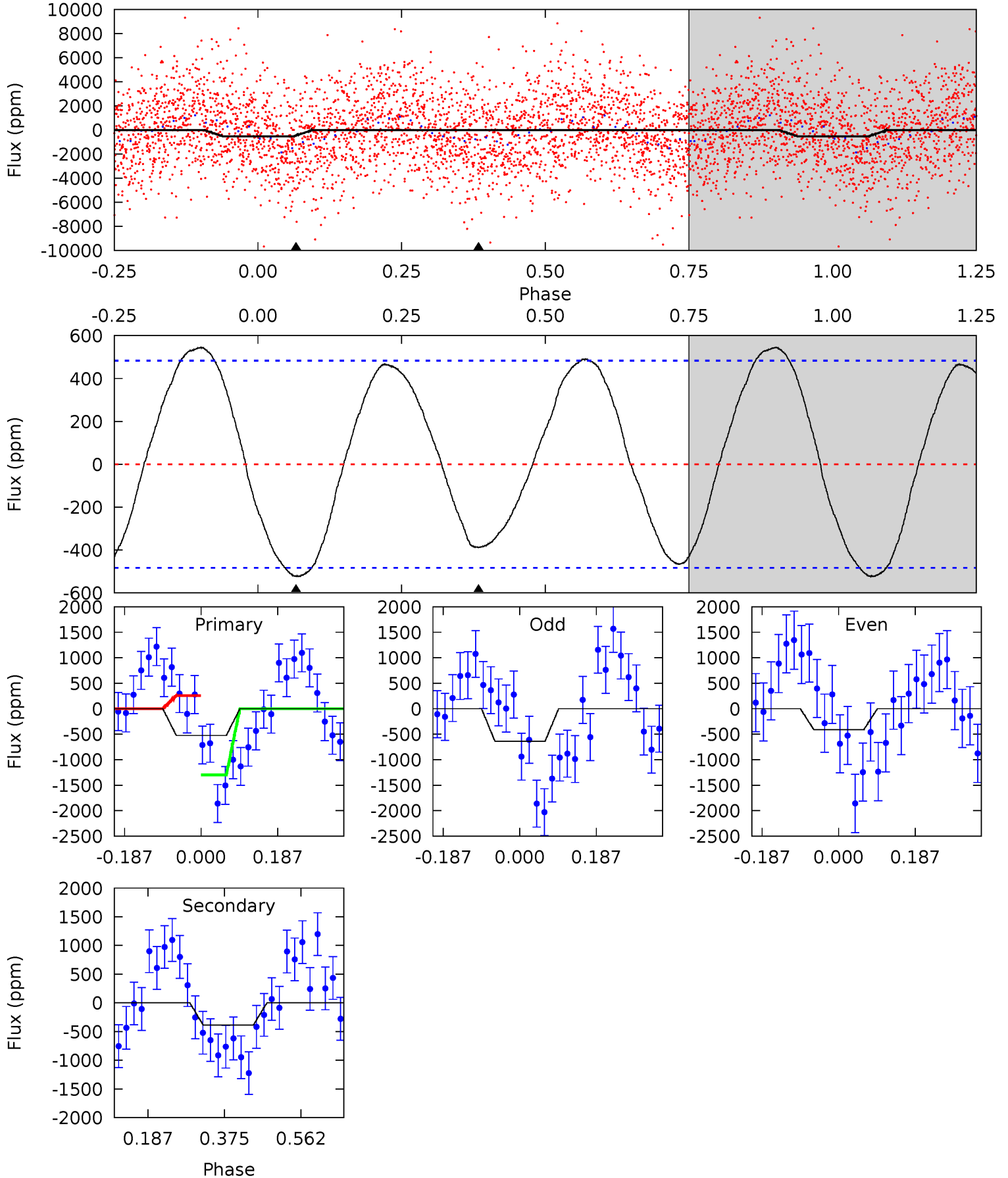
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	-8.93	0	0	4.41	1.26	13.4	13.8	13.8	-8.93	-8.93	1.11	1.28	0.76	3.66



Alt Model-Shift Uniqueness Test

004481700-03, P = 0.616514 Days, E = 131.592407 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.81	3.56	0	0	4.43	1.32	3.06	4.81	4.81	3.56	3.56	1.05	0.65	0.51	4.76



Stellar Parameters For KIC 004481700

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7108^{+200}_{-342}	$4.121^{+0.157}_{-0.192}$	$-0.160^{+0.250}_{-0.350}$	$1.728^{+0.567}_{-0.426}$	$1.440^{+0.222}_{-0.247}$	$0.393^{+0.329}_{-0.193}$
	+3%/-5%	+4%/-5%	+156%/-219%	+33%/-25%	+15%/-17%	+84%/-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 004481700-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	765 ± 86	$6.57^{+1.43}_{-1.30}$	4540^{+334}_{-351}	-6408^{+451}_{-580}	$-2.492^{+0.835}_{-1.265}$
Alt.	-388 ± 109	$5.67^{+1.37}_{-1.20}$	4552^{+356}_{-321}	5456^{+748}_{-666}	$1.723^{+1.041}_{-0.752}$

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 $A_{obs} \gg 1.0$

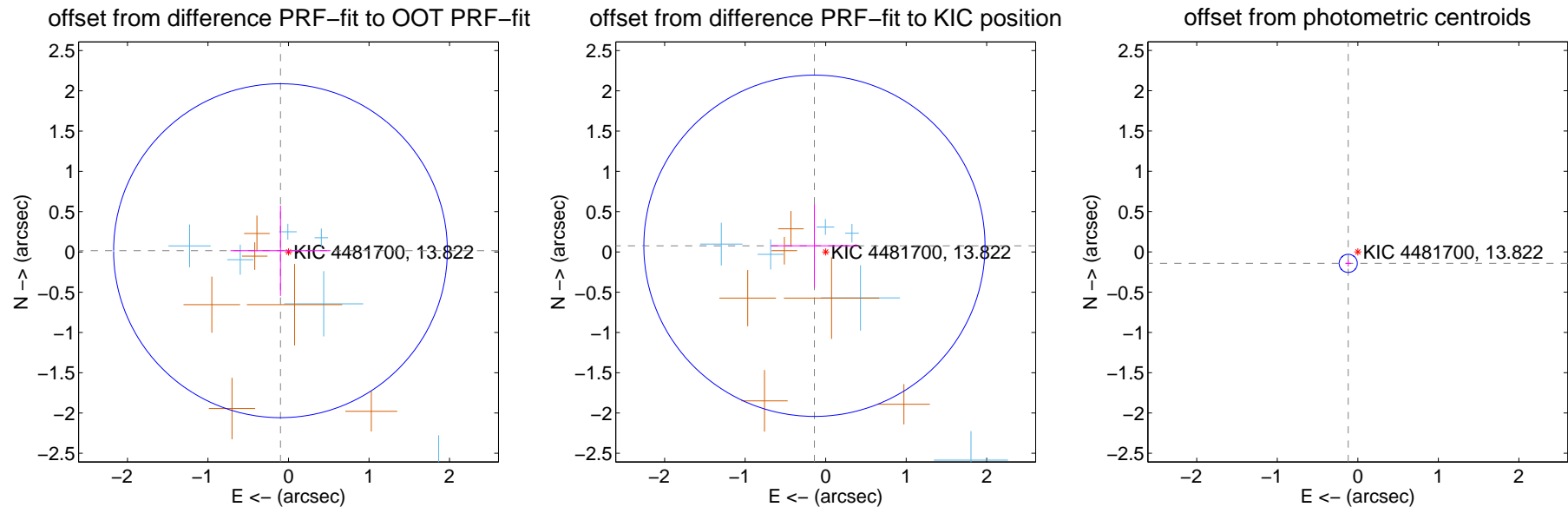
DV Centroid Data

Supplemental centroid analysis for 004481700-03. Kepler magnitude: 13.82. Transit SNR 10.12

There are 6 quarters with good PRF difference image offsets

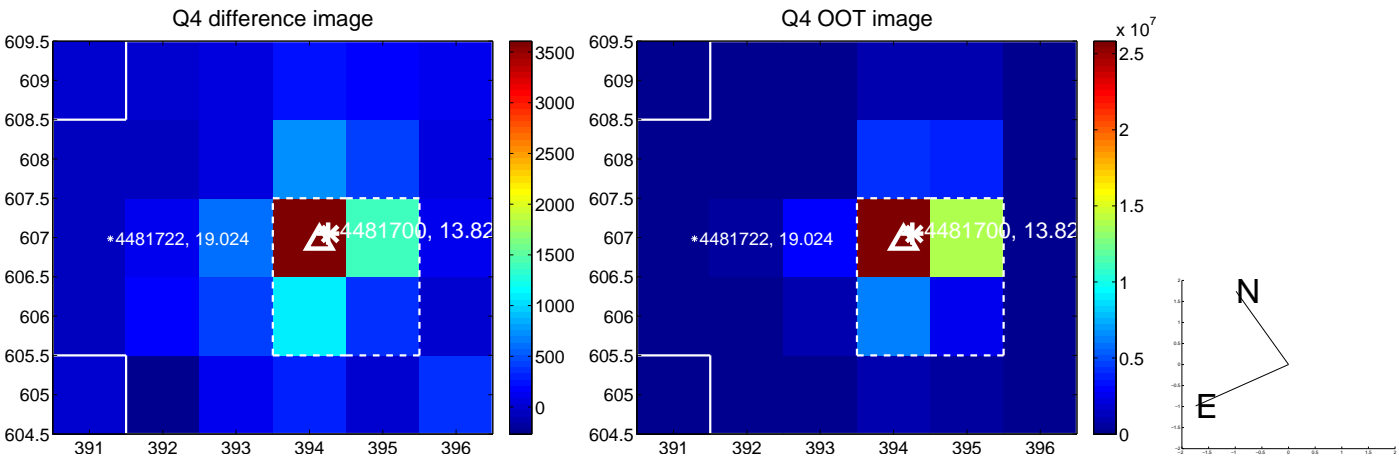
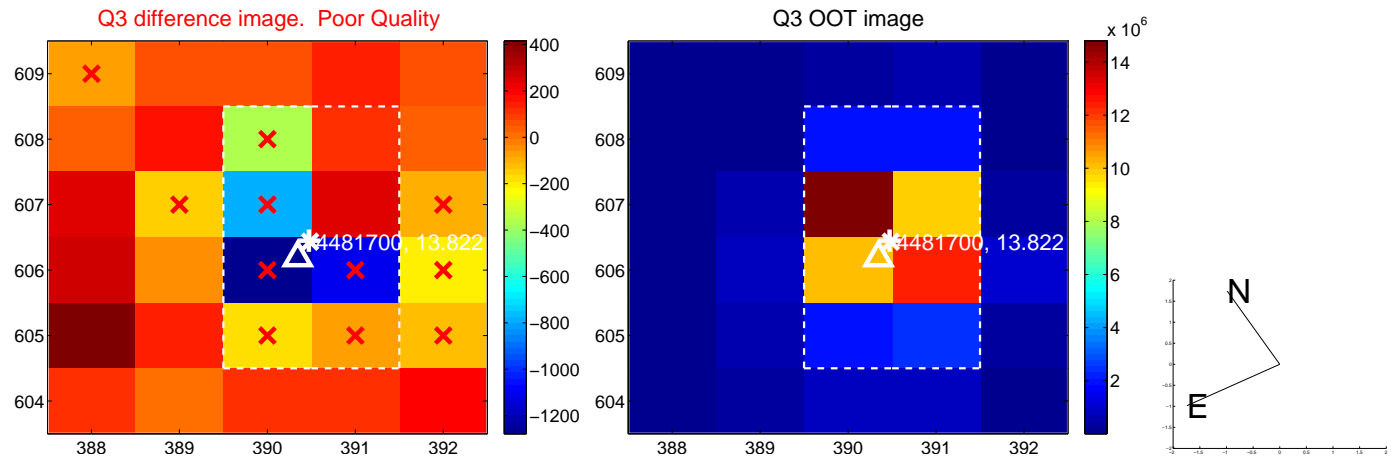
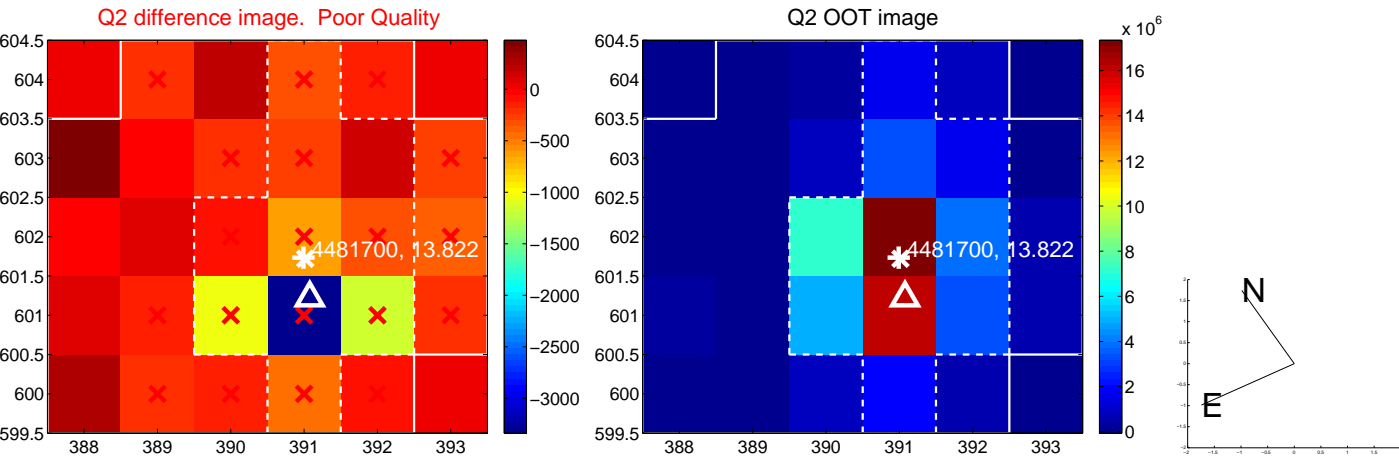
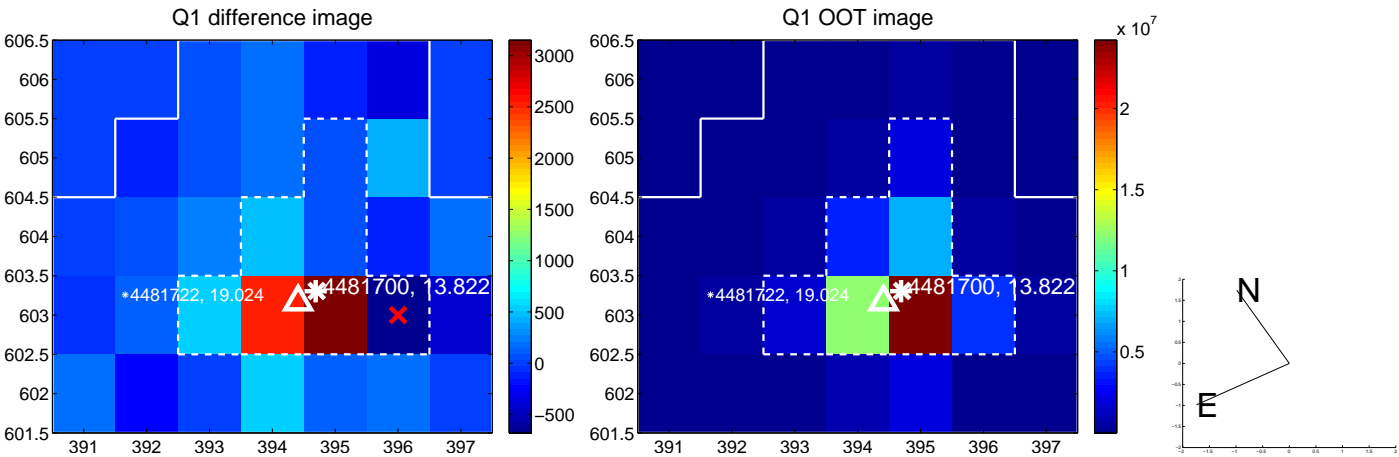
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.101 ± 0.691	0.15	0.099 ± 0.621	0.015 ± 0.562
PRF-fit source offset from KIC position	0.159 ± 0.706	0.23	0.140 ± 0.541	0.076 ± 0.517
photometric centroid source offset	0.19 ± 0.04	4.95	0.12 ± 0.04	-0.14 ± 0.04

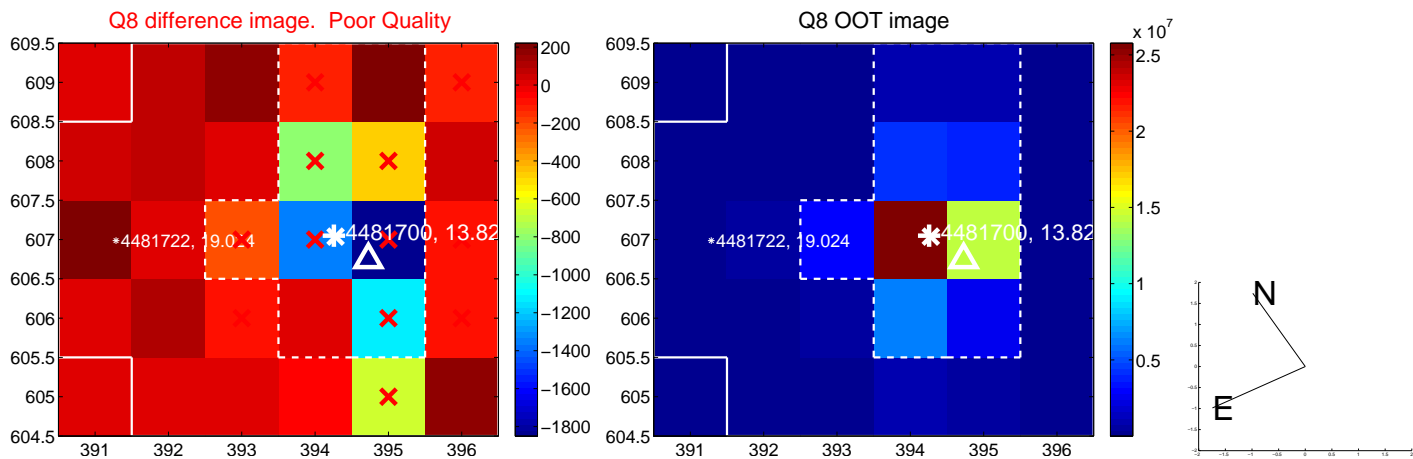
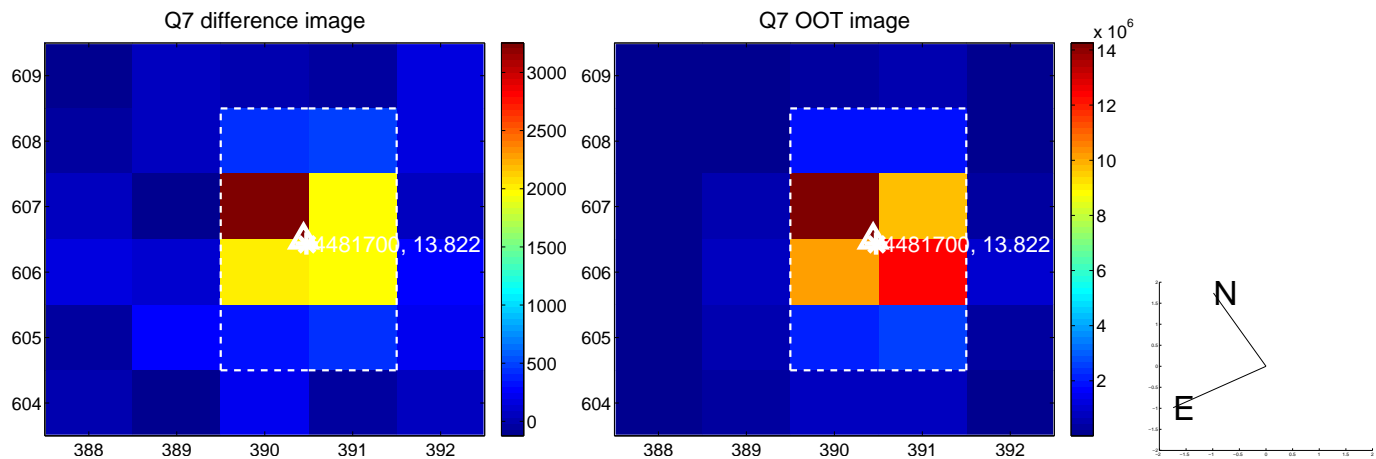
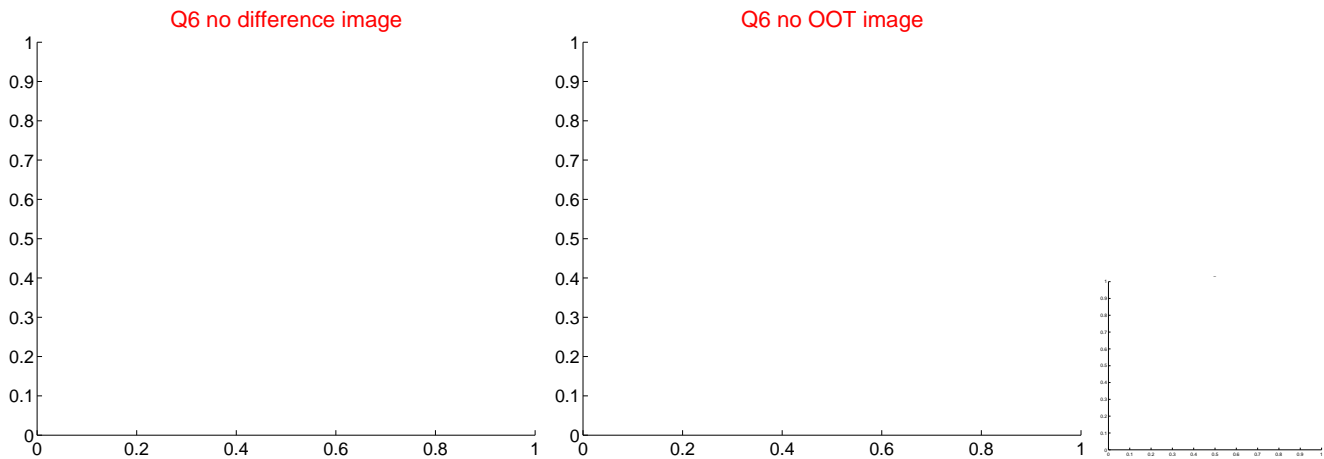
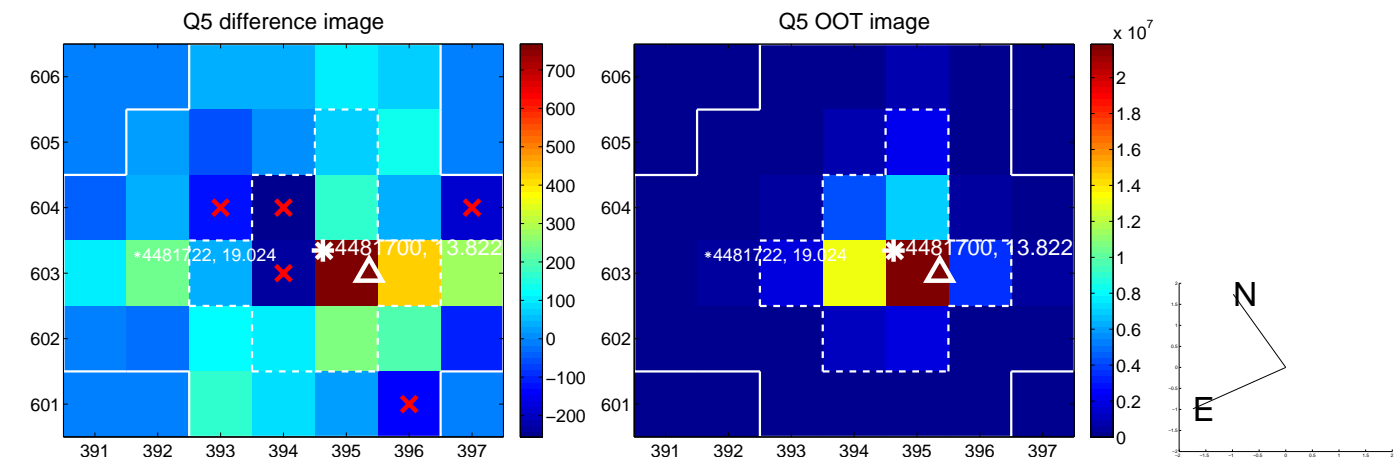


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

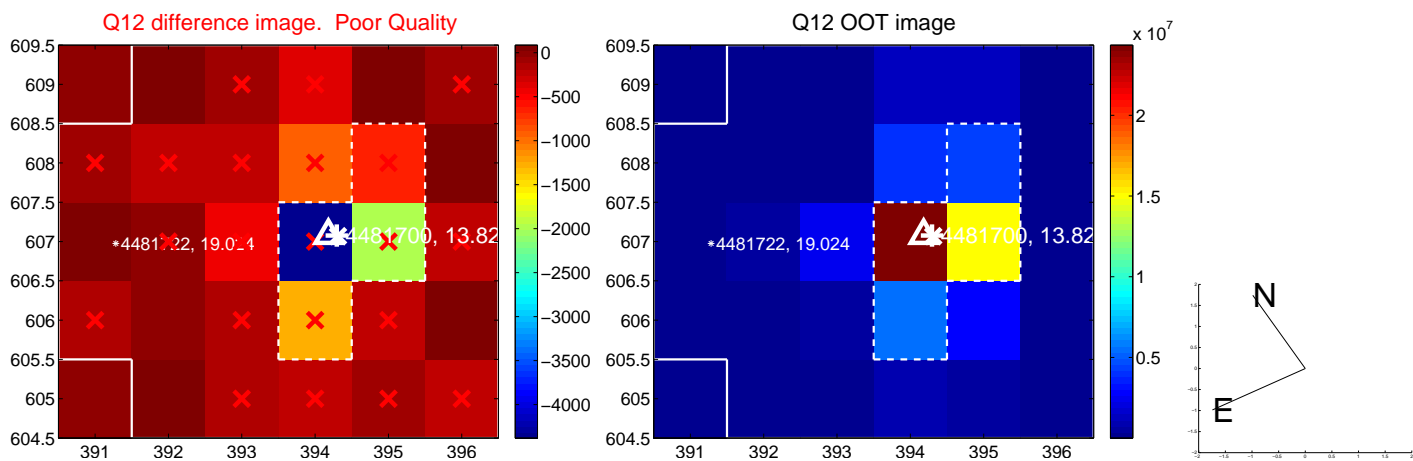
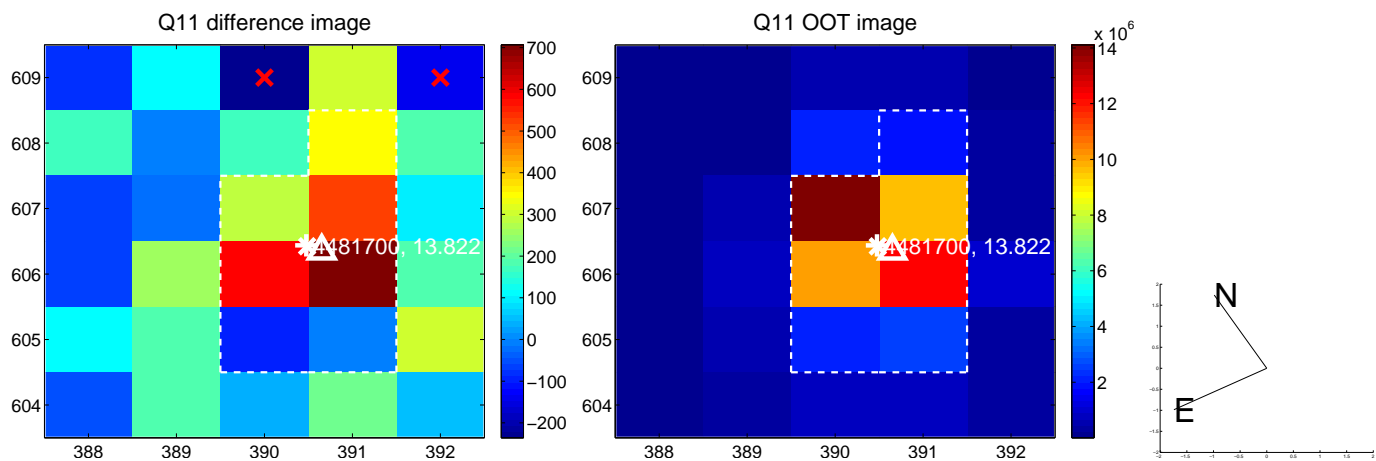
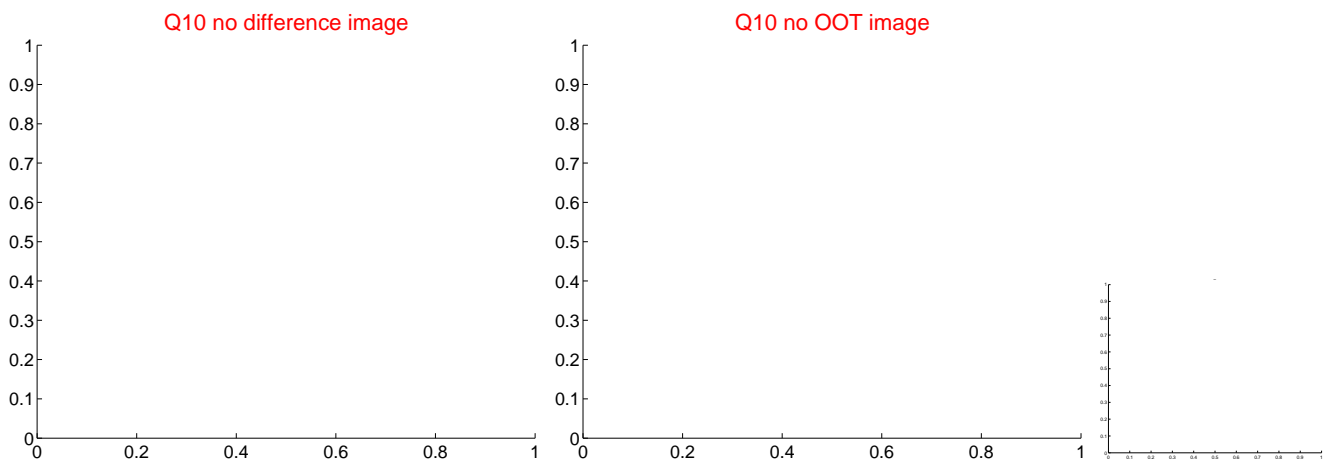
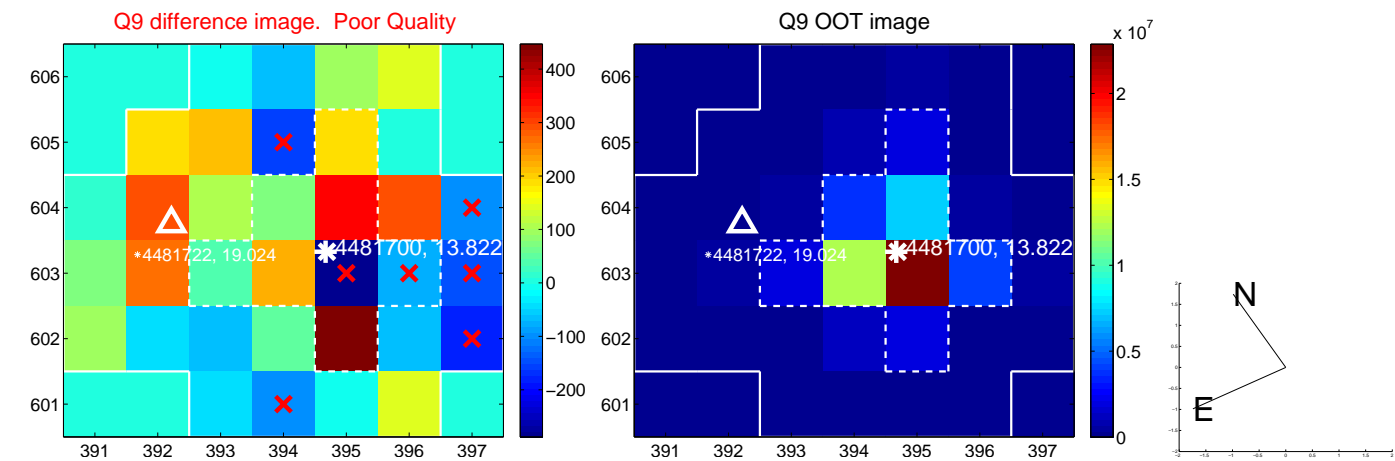
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



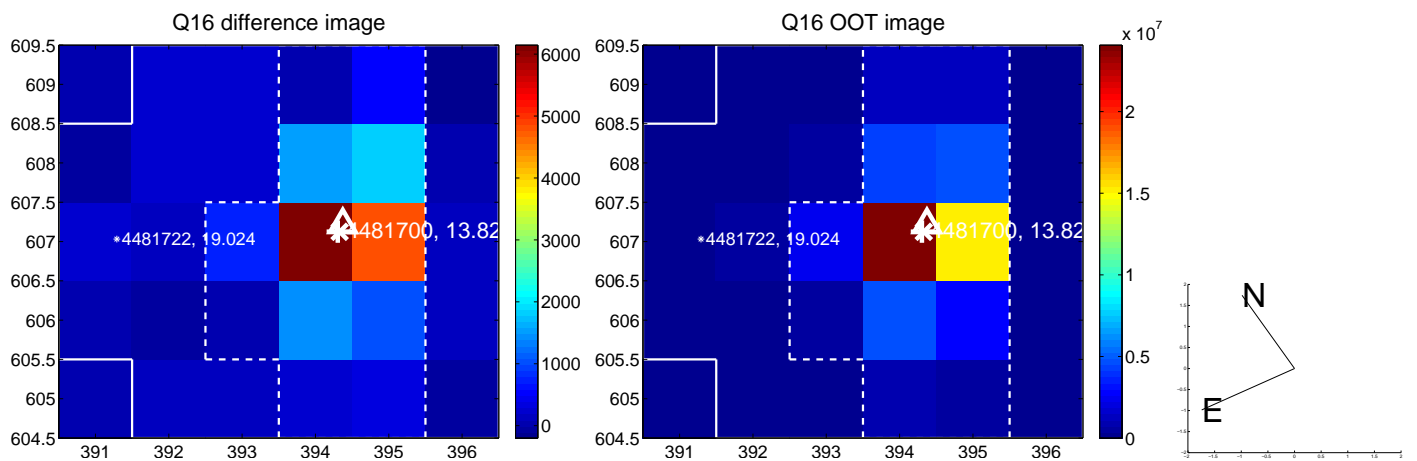
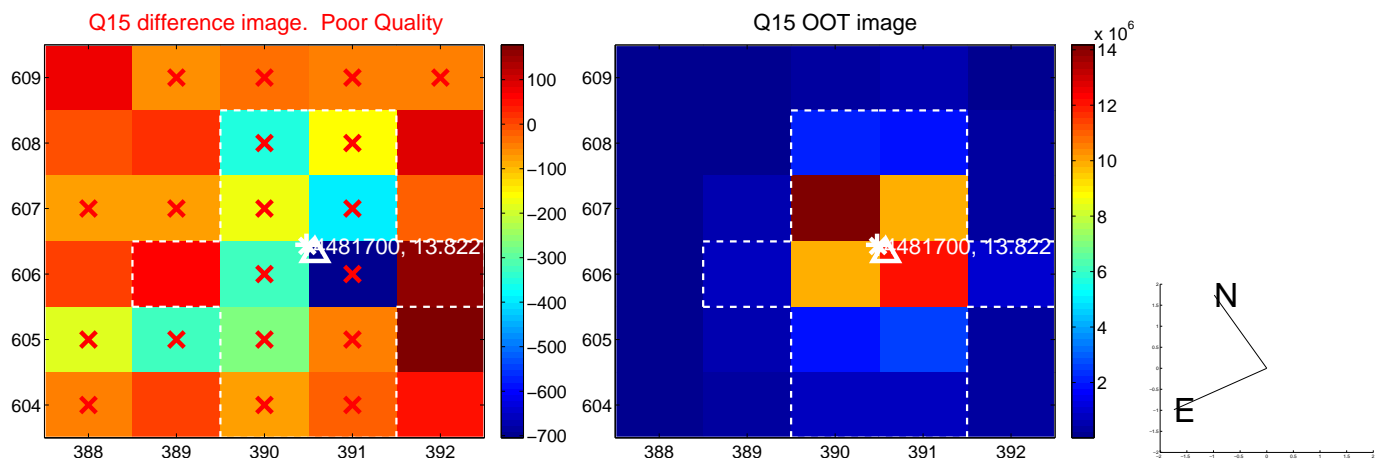
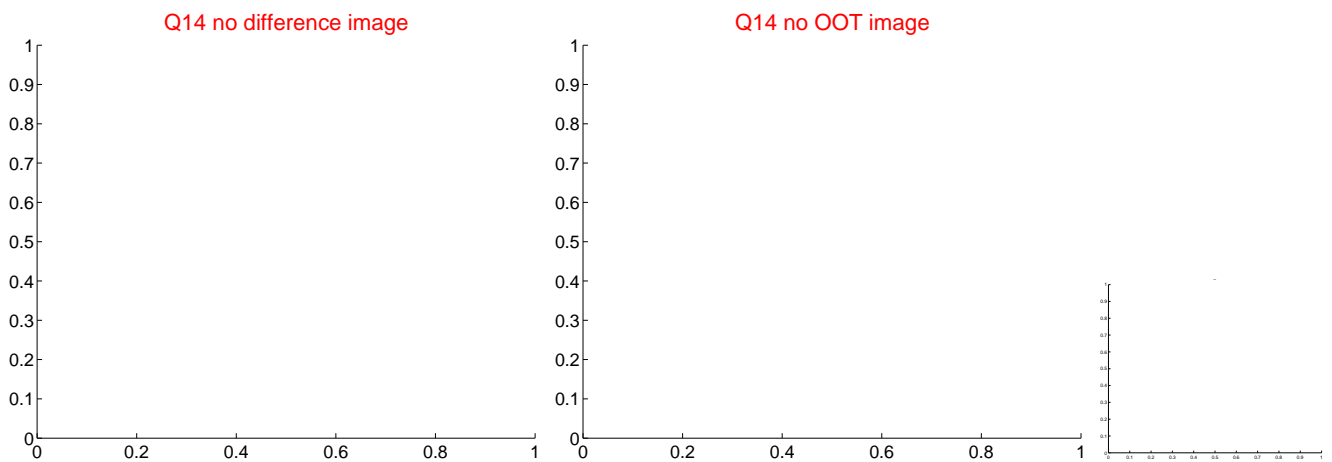
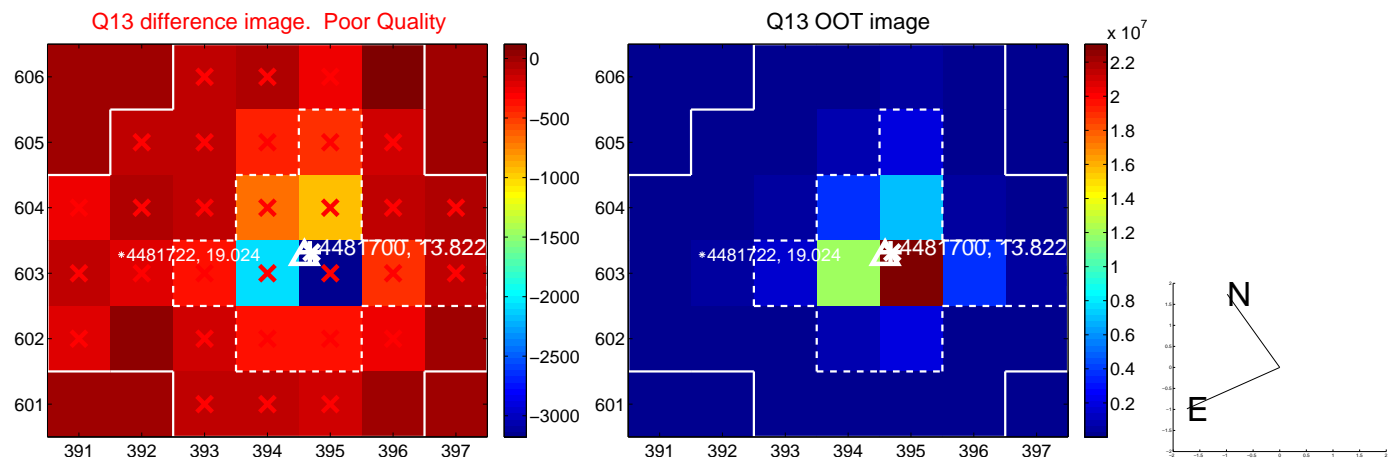
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



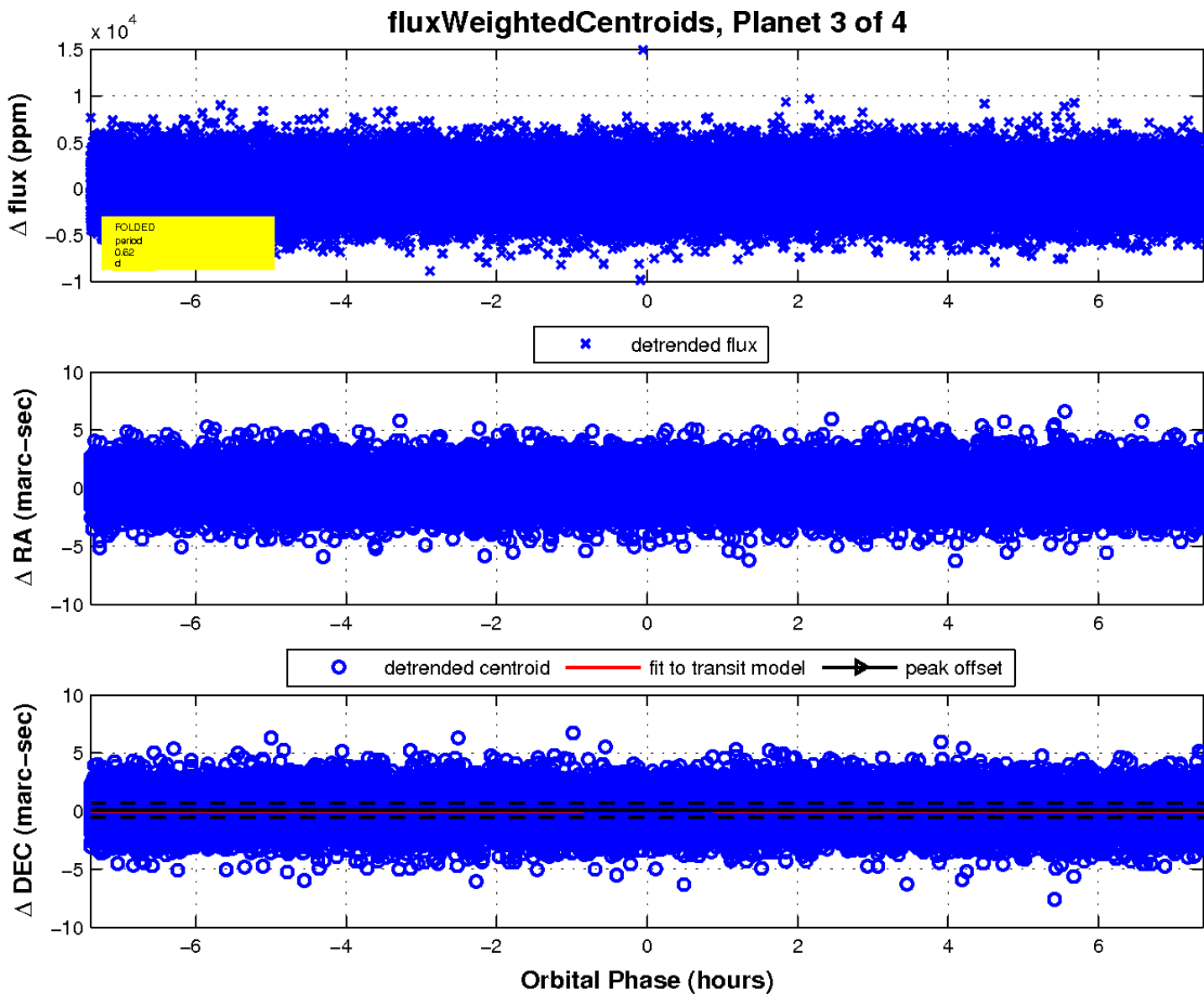
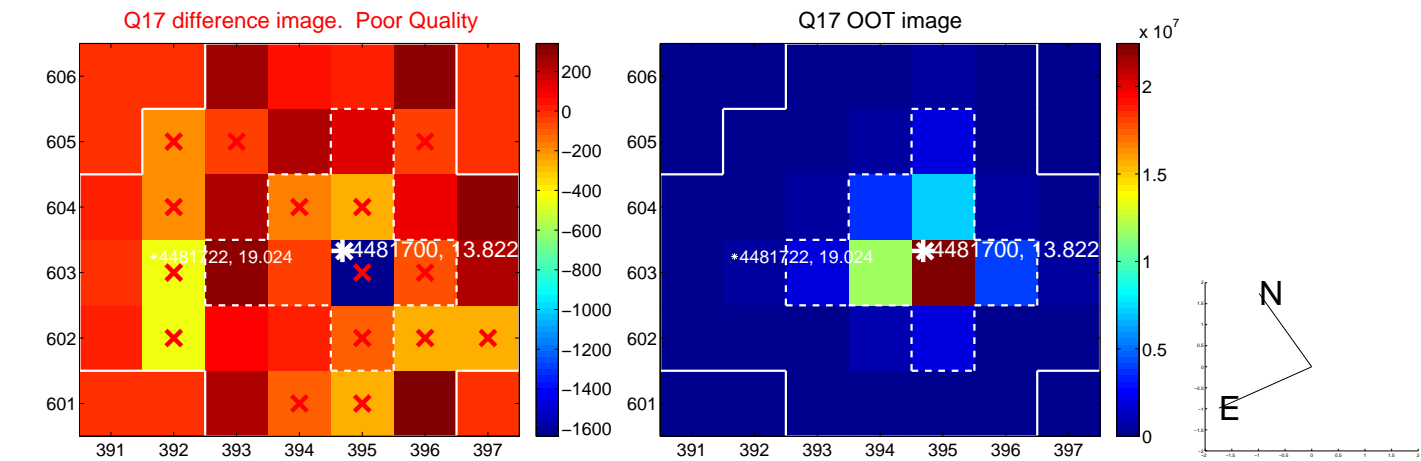
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

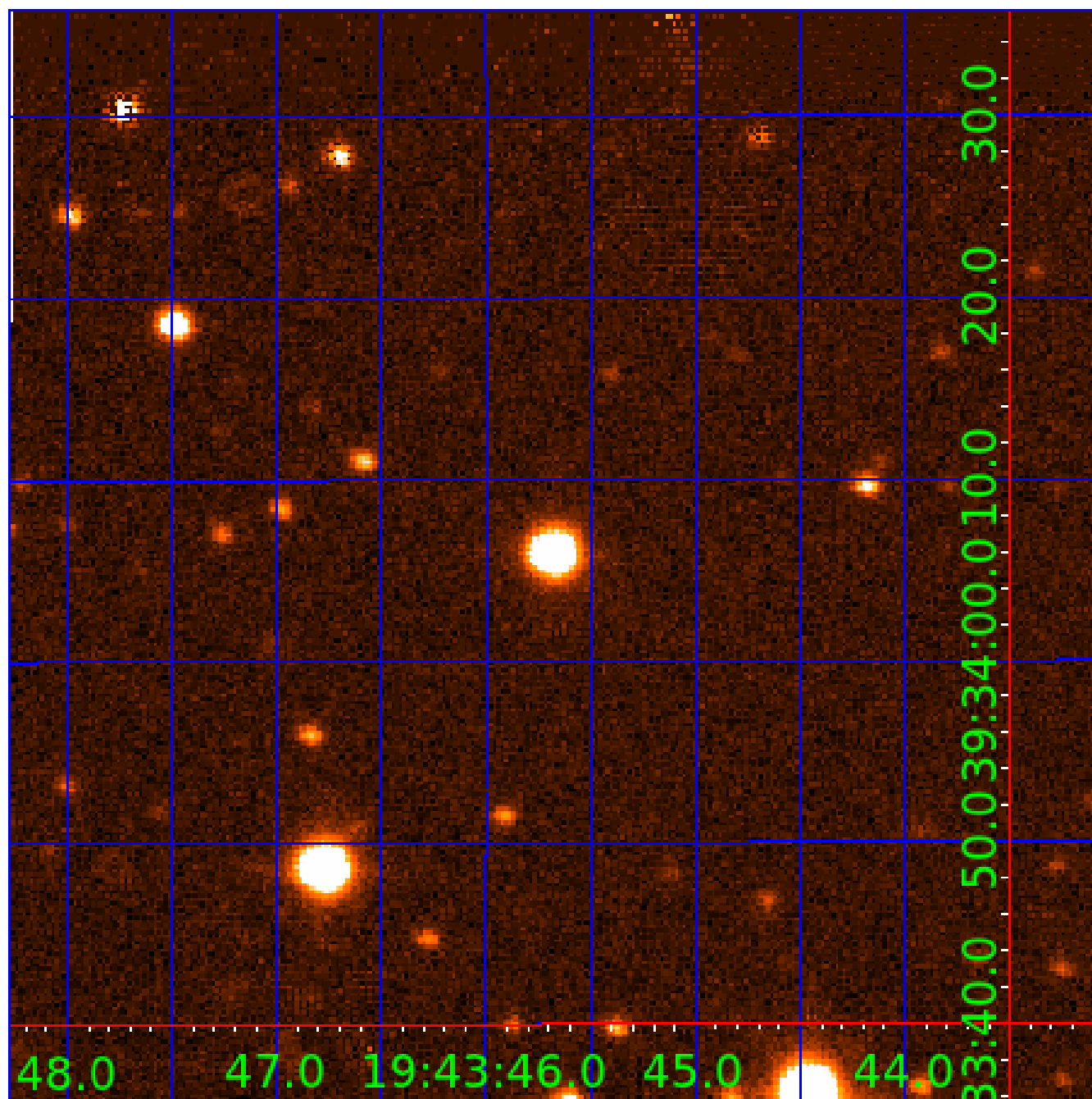


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004481700

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})
004481700-01	OBS	No	0.664173	131.911710	464.5	2.232	13.0	13.8	1.73	7108	4.33	24128.92
004481700-02	OBS	No	0.664168	131.580621	431.9	2.434	13.0	14.1	1.73	7108	3.87	24129.19
004481700-03	OBS	No	0.616551	131.608393	1064.2	2.653	8.5	10.1	1.73	7108	6.55	26645.36
004481700-04	OBS	No	0.706193	131.995369	434.8	2.500	9.4	-1.0	1.73	7108	3.65	22233.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481700-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004481700-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
004481700-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004481700-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

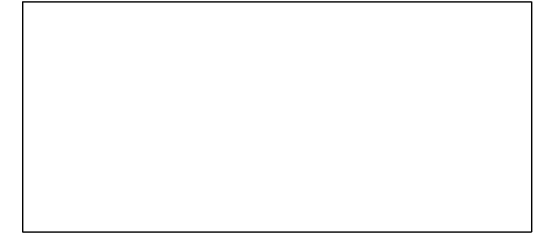
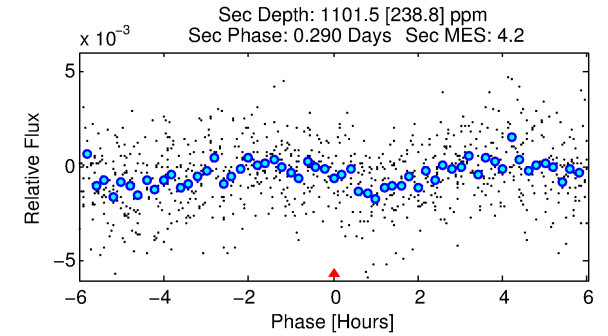
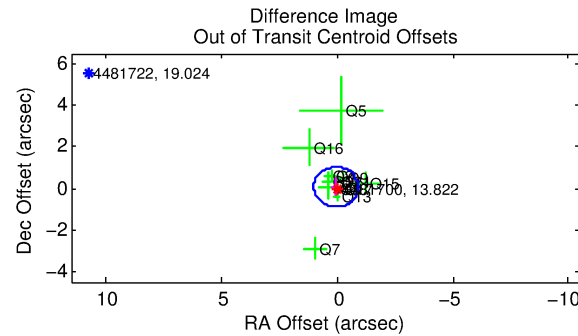
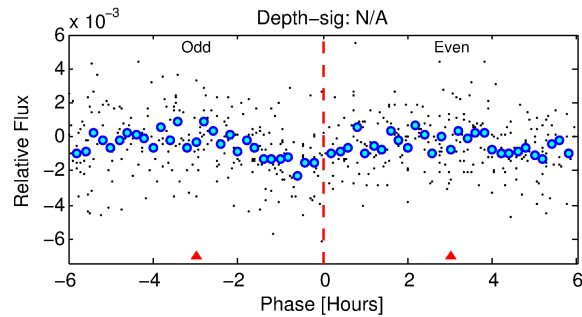
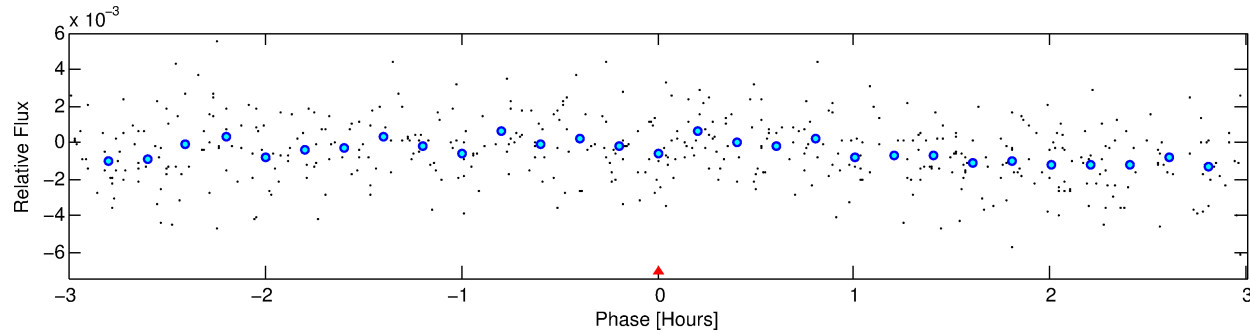
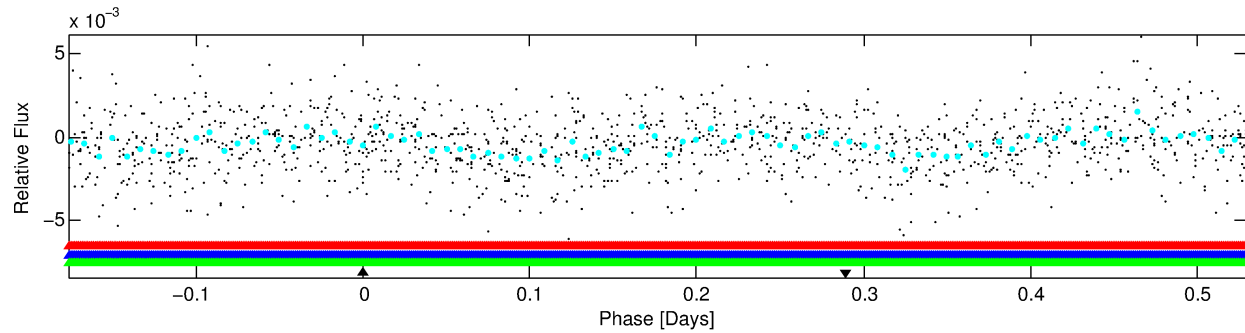
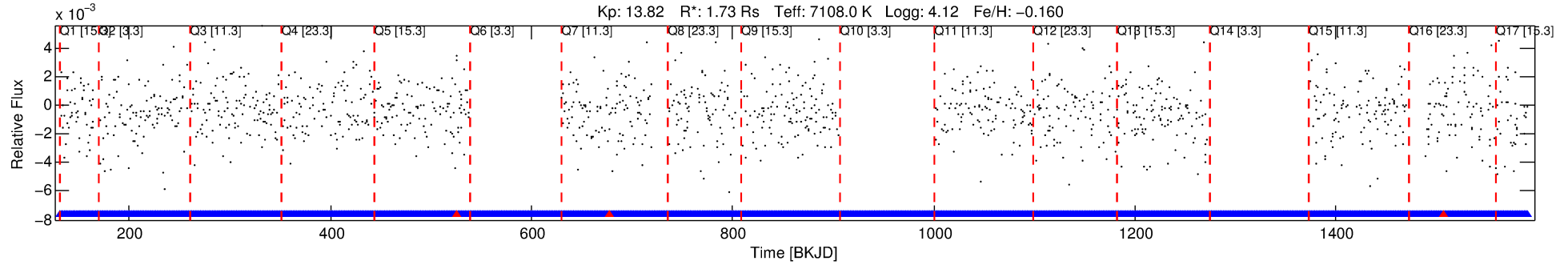
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481700-04

No Significant Match Found

DV One-Page Summary

KIC: 4481700 Candidate: 4 of 4 Period: 0.706 d



TPS TCE Results:

Period = 0.70619 d
Epoch = 131.9954 BKJD

DV fit results are unavailable

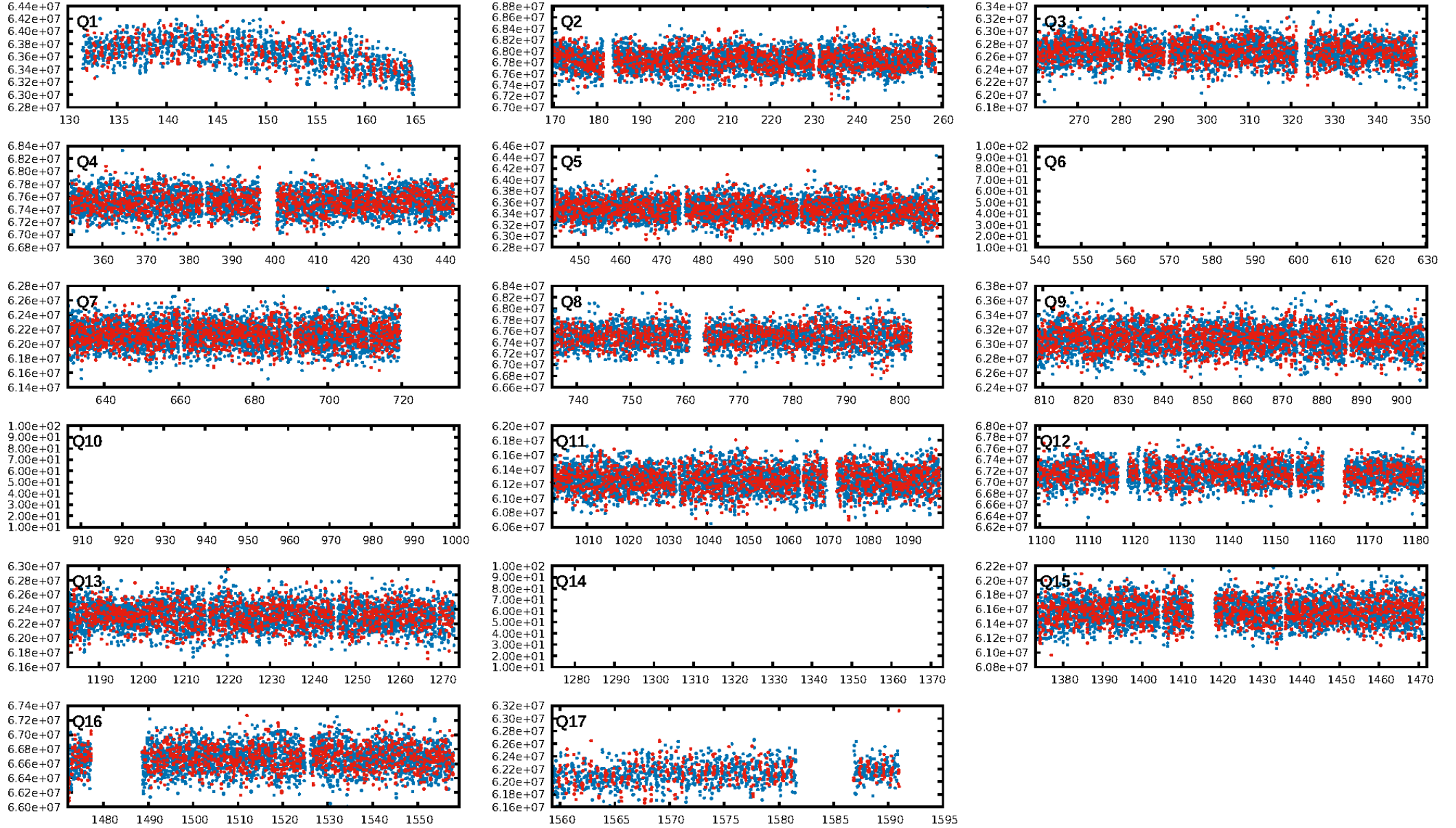
DV Diagnostic Results:

ShortPeriod-sig: 23.7% [0.30 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.98 [146/149]
GhostDiagnostic-chr: -0.7796
Centroid-sig: N/A
Centroid-so: 0.149 arcsec [1.26 σ]
OotOffset-rm: 0.095 arcsec [0.30 σ]
KicOffset-rm: 0.196 arcsec [0.60 σ]
OotOffset-st: 1/3/4/5 [13]
KicOffset-st: 1/3/4/5 [13]
DiffImageQuality-fgm: 0.62 [8/13]
DiffImageOverlap-fno: 0.00 [0/14]

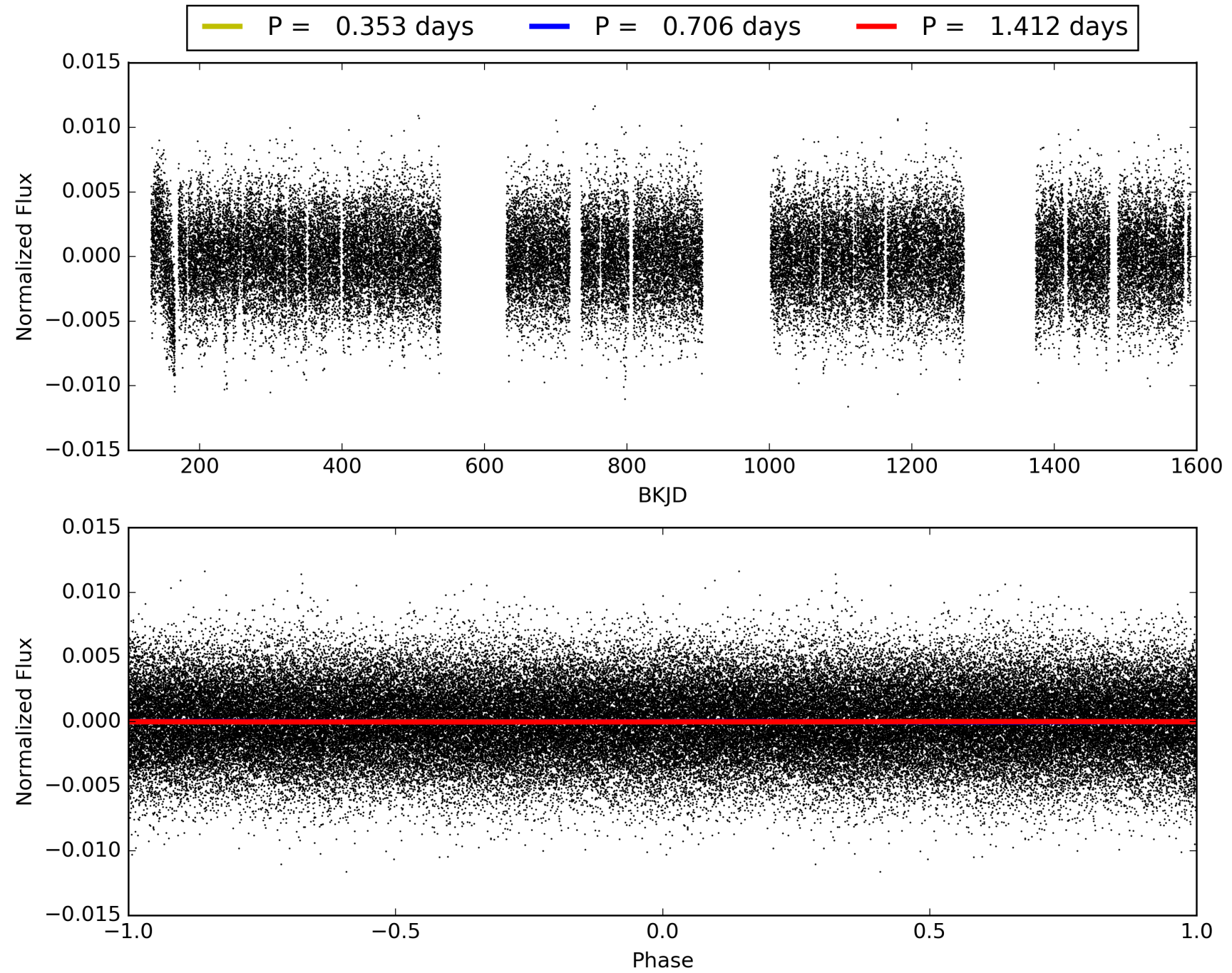
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:48:46 Z

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

TCE 004481700-04, PDC Light Curves

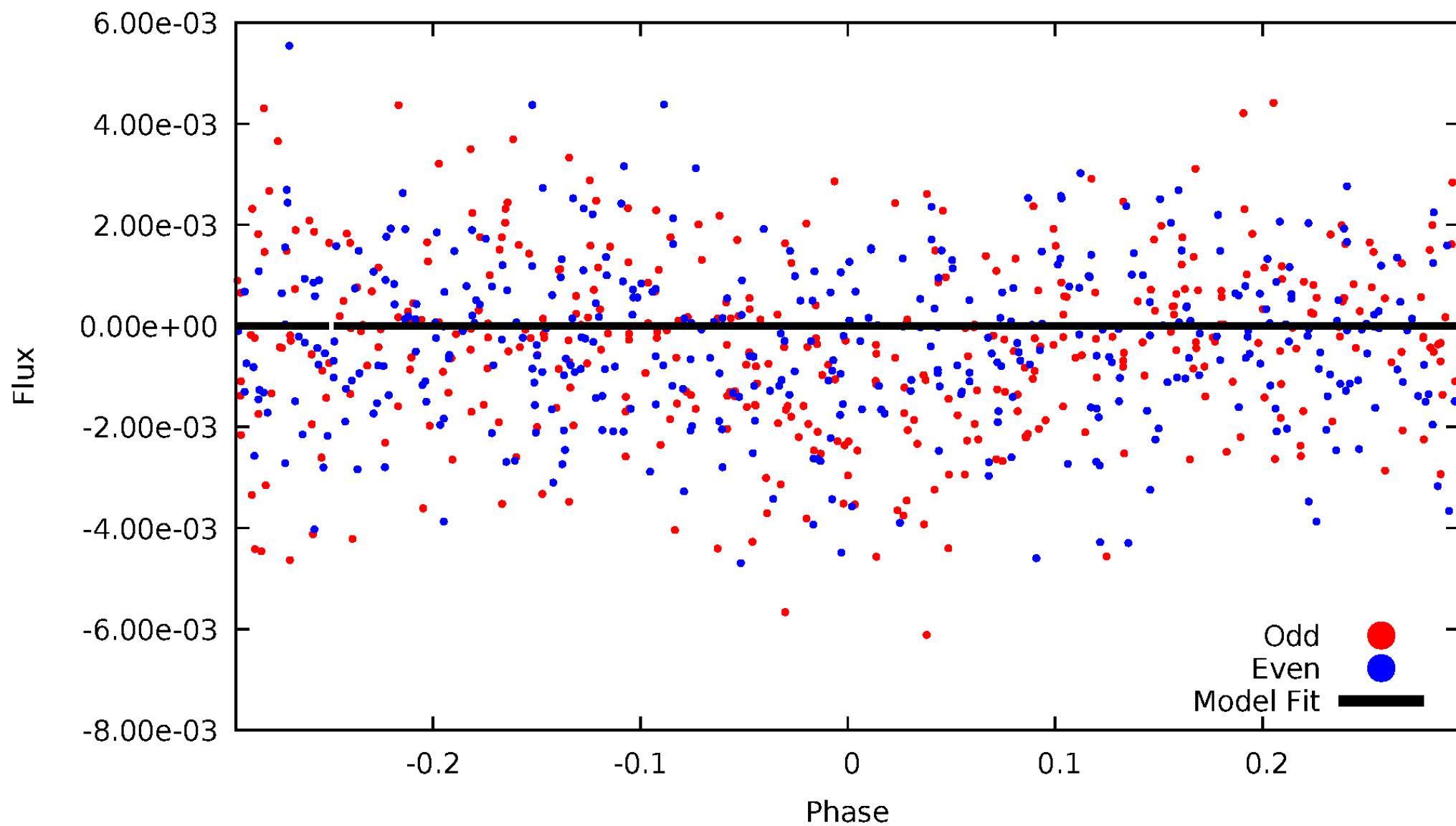


TCE 004481700-04



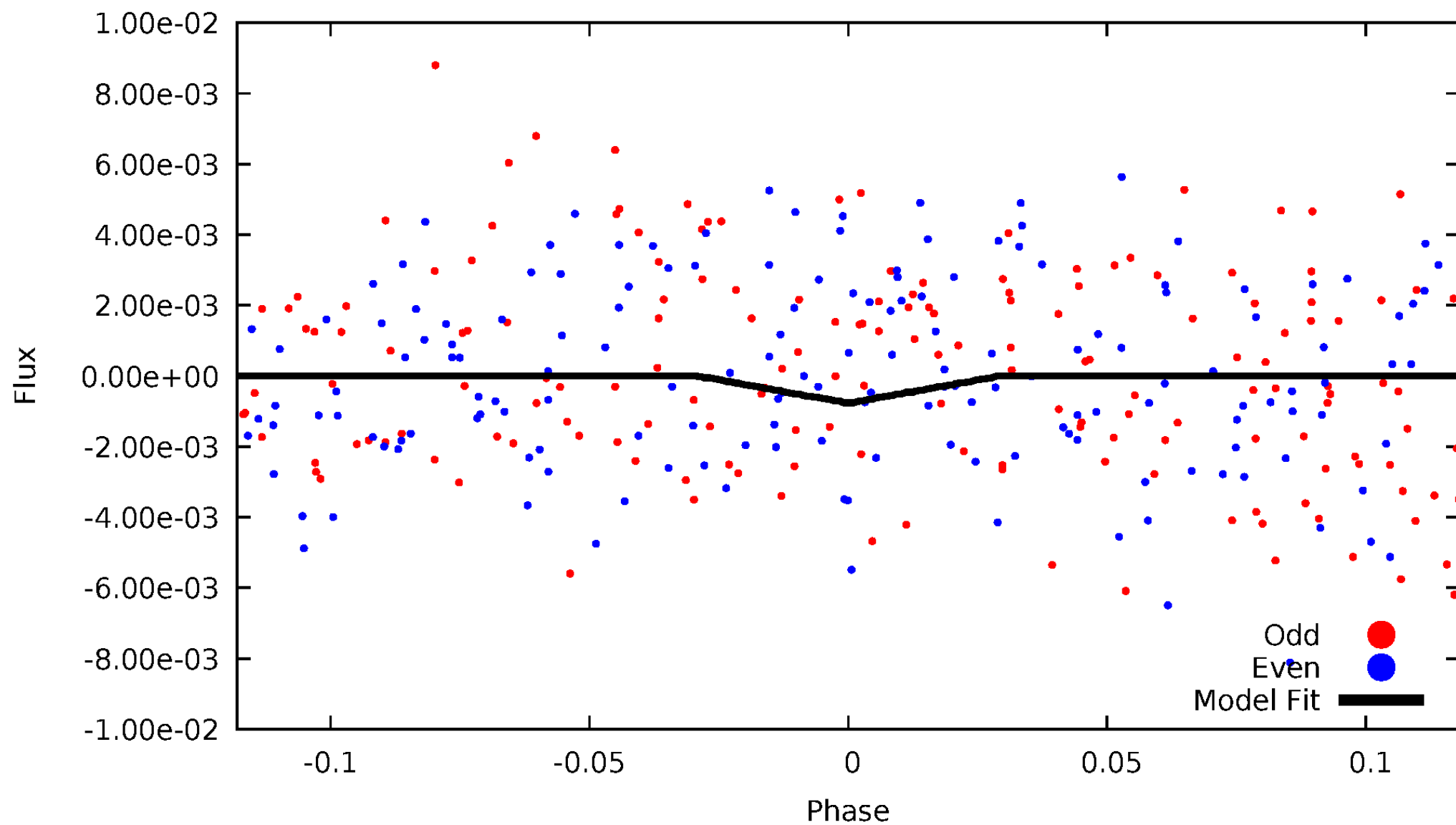
DV Odd/Even

TCE 004481700-04



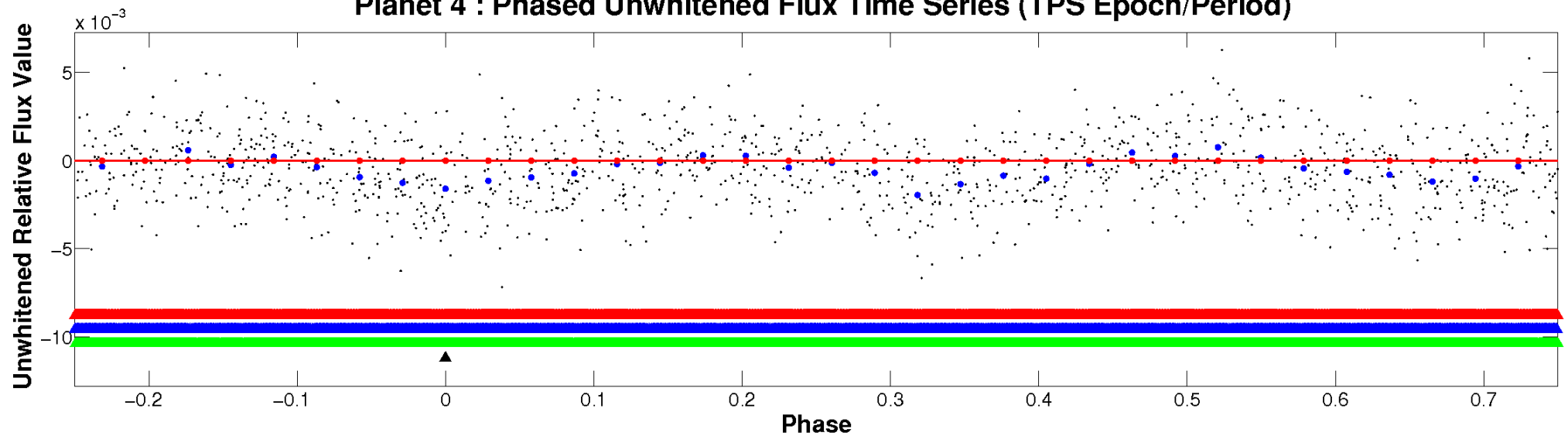
ALT Odd/Even

TCE 004481700-04

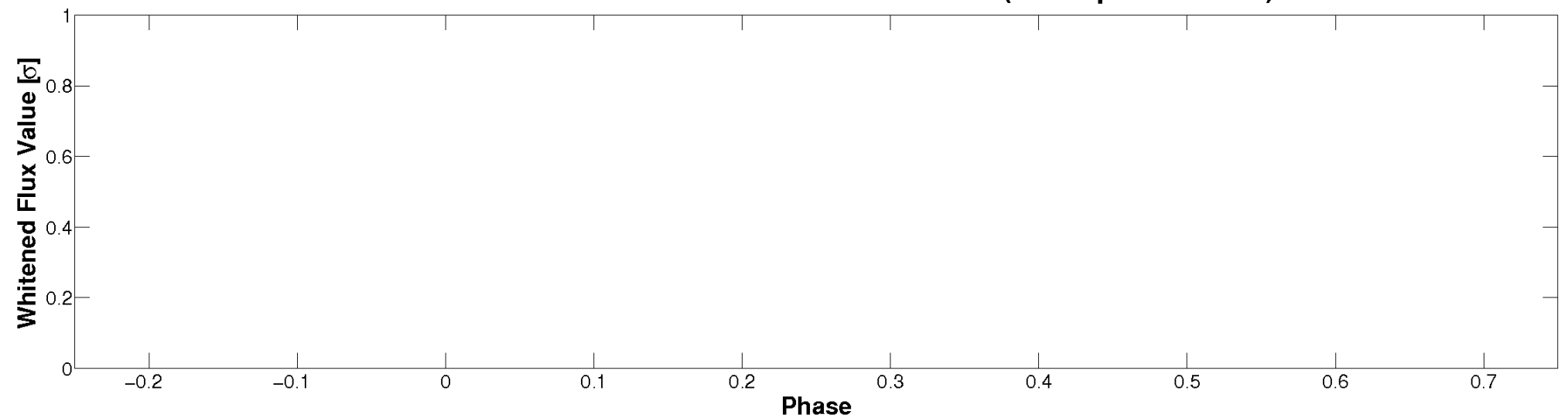


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)

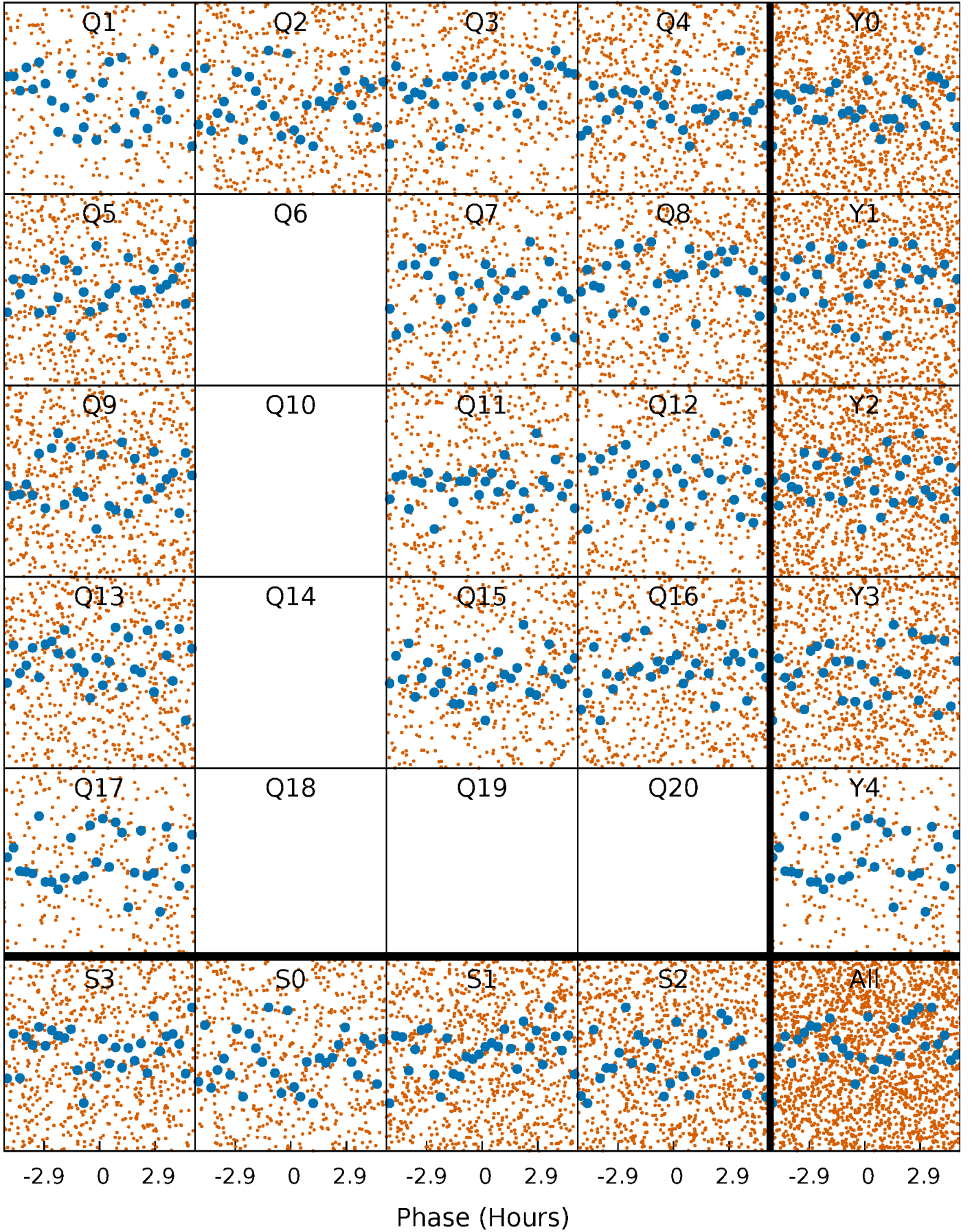


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



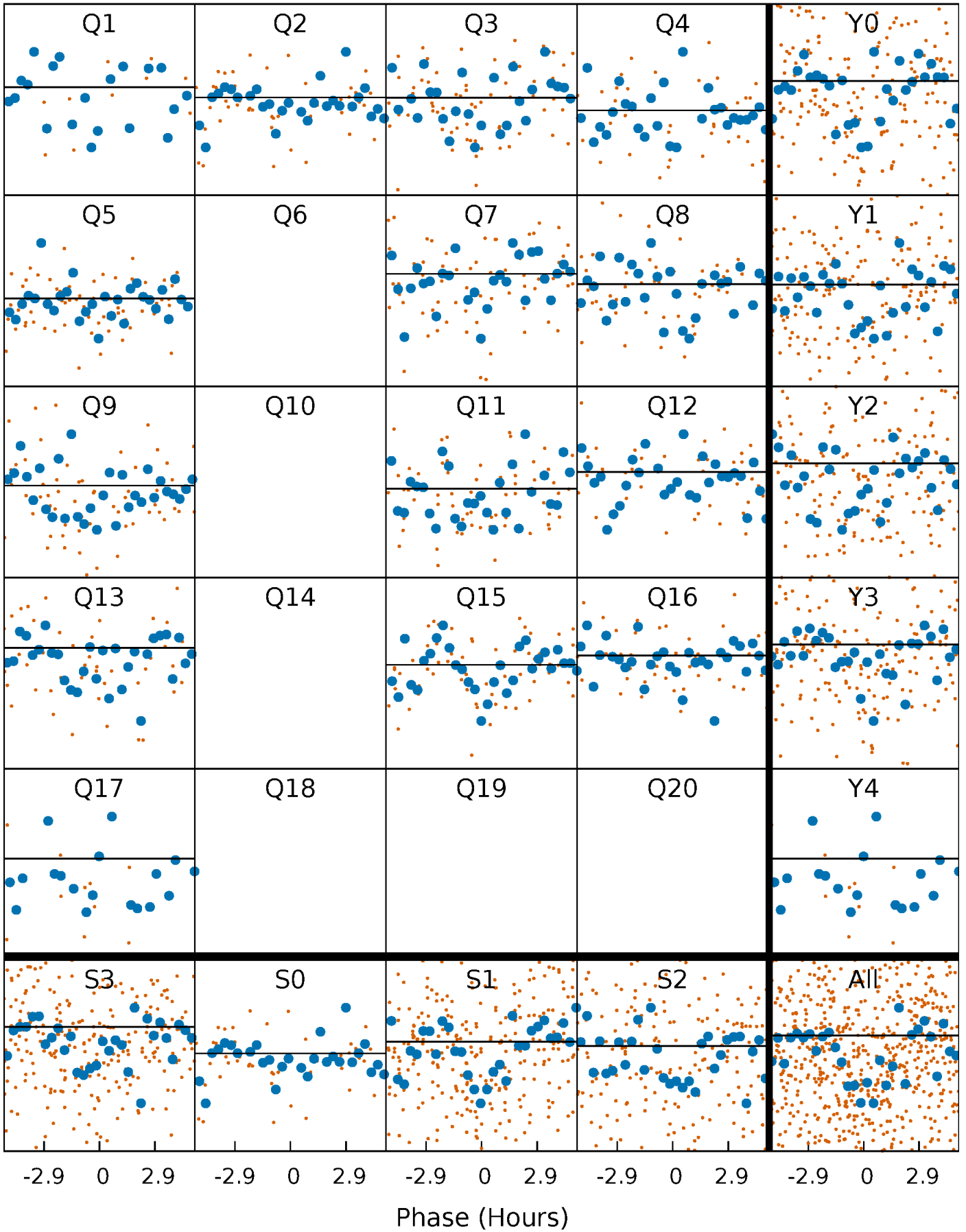
PDC Quarter-Phased Transit Curves

TCE 004481700-04 P= 0.706193 Days $T_0=131.995369$ (BKJD)



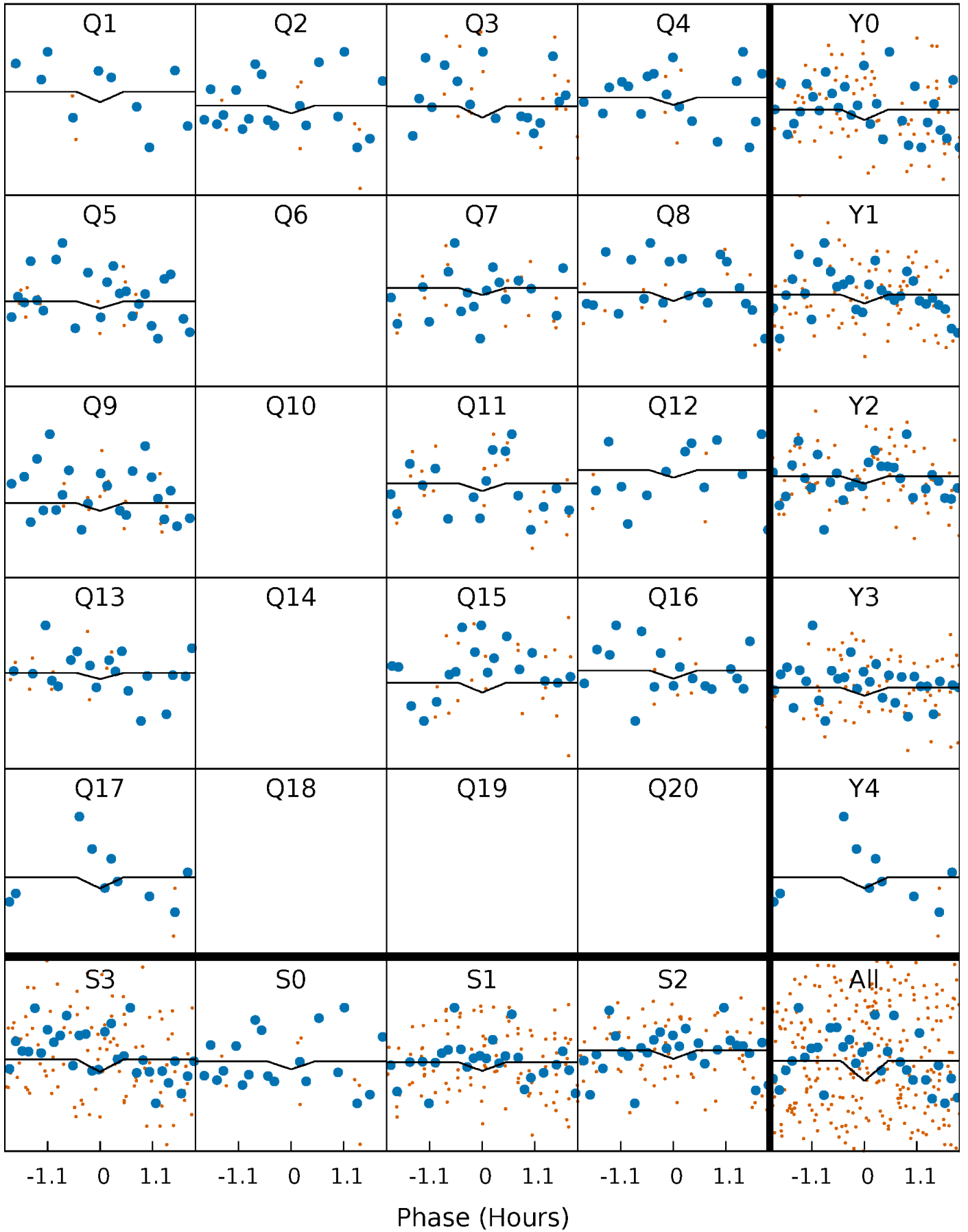
DV Quarter-Phased Transit Curves

TCE 004481700-04 P= 0.706193 Days $T_0=131.995369$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

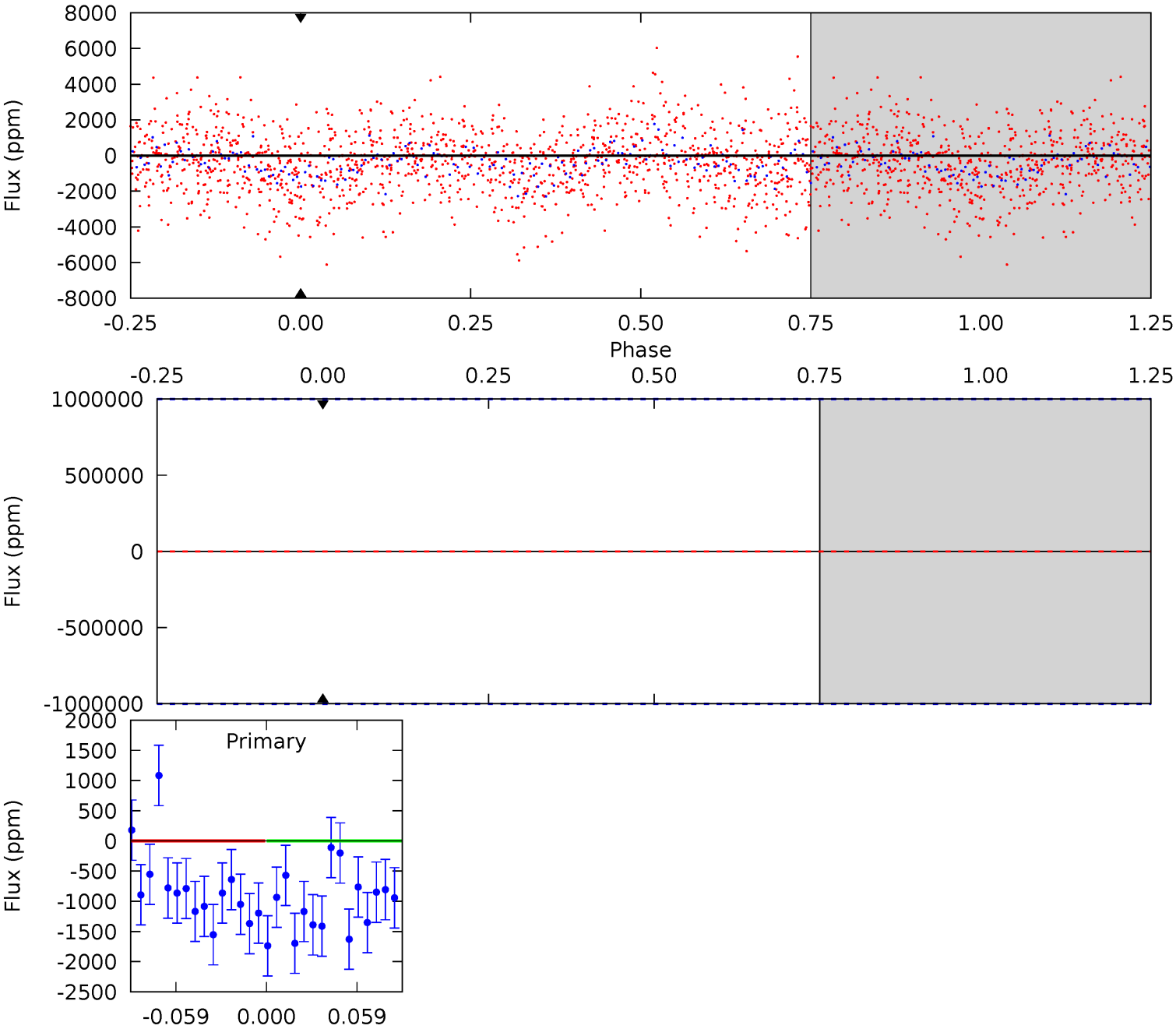
TCE 004481700-04 $P = 0.706193$ Days $T_0 = 131.898698$ (BKJD)



DV Model-Shift Uniqueness Test

004481700-04, P = 0.706193 Days, E = 131.995369 Days

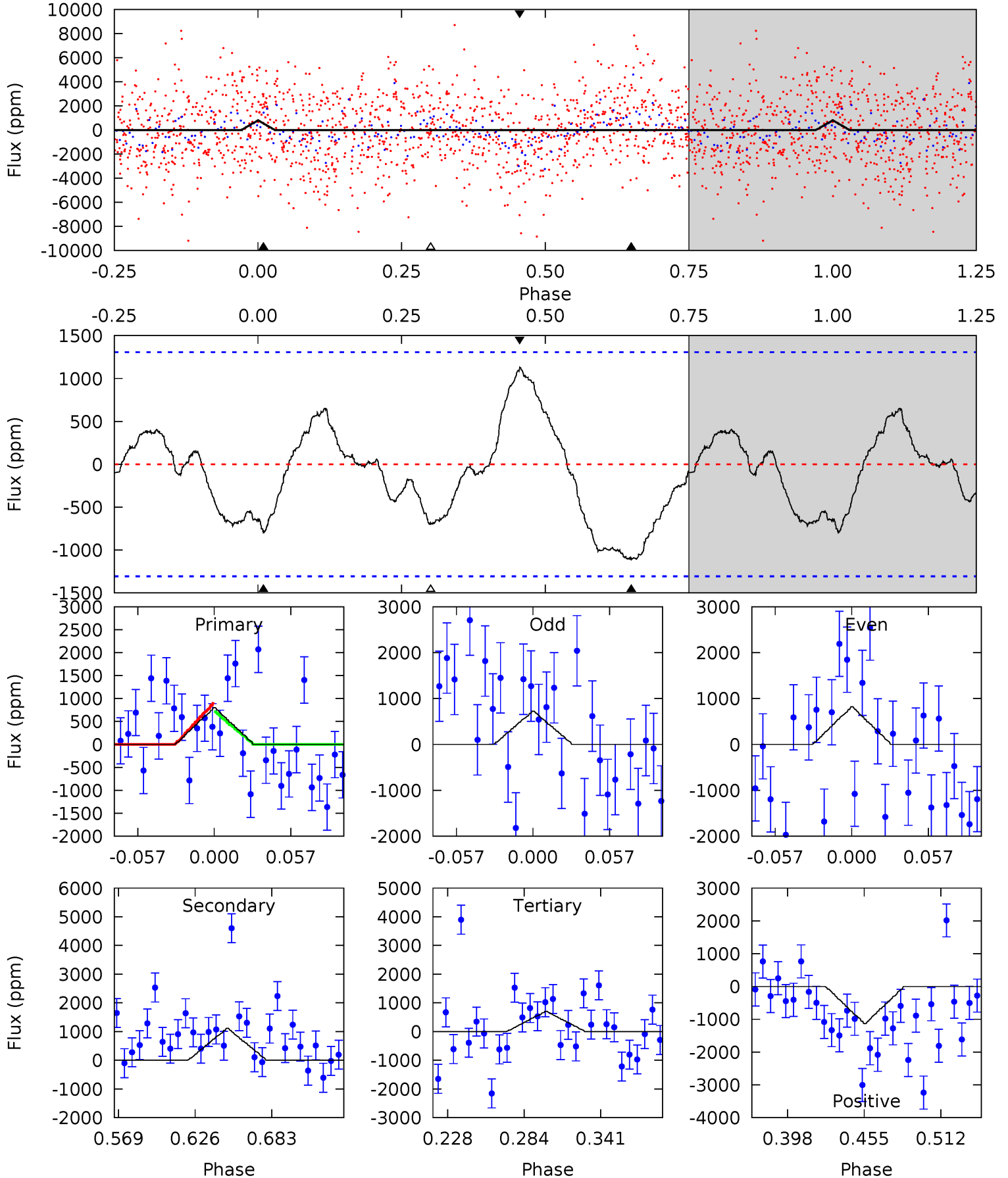
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

004481700-04, P = 0.706193 Days, E = 131.898698 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.86	3.99	2.53	4.06	4.68	1.90	1.62	0.34	-1.19	1.46	-0.07	0.17	0.12	0.50	0.37



Stellar Parameters For KIC 004481700

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7108^{+200}_{-342}	$4.121^{+0.157}_{-0.192}$	$-0.160^{+0.250}_{-0.350}$	$1.728^{+0.567}_{-0.426}$	$1.440^{+0.222}_{-0.247}$	$0.393^{+0.329}_{-0.193}$
	+3%/-5%	+4%/-5%	+156%/-219%	+33%/-25%	+15%/-17%	+84%/-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 004481700-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$14.60^{+15.17}_{-9.83}$	4348^{+339}_{-313}	-5071^{+35833}_{-22465}	$-0.770^{+139.223}_{-114.537}$
Alt.	-1113 ± 279	$14.79^{+15.17}_{-10.11}$	4347^{+391}_{-320}	4345^{+4052}_{-7622}	$0.887^{+7.287}_{-0.688}$

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

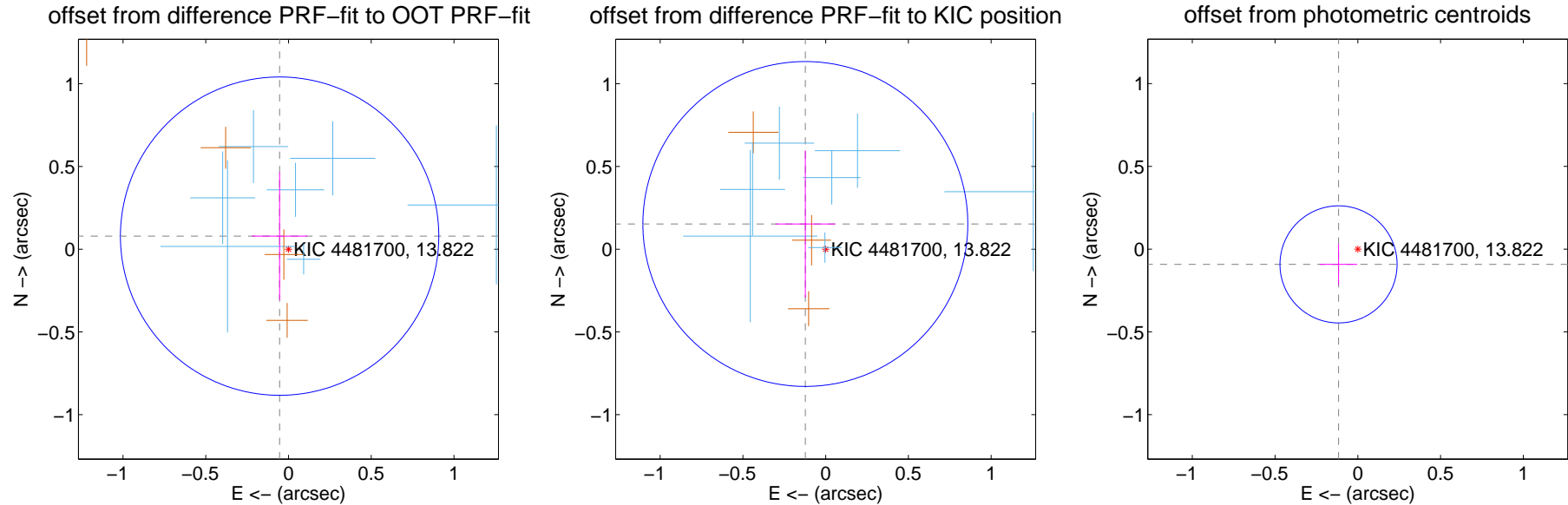
DV Centroid Data

Supplemental centroid analysis for 004481700-04. Kepler magnitude: 13.82. Transit SNR -1.00

There are 8 quarters with good PRF difference image offsets

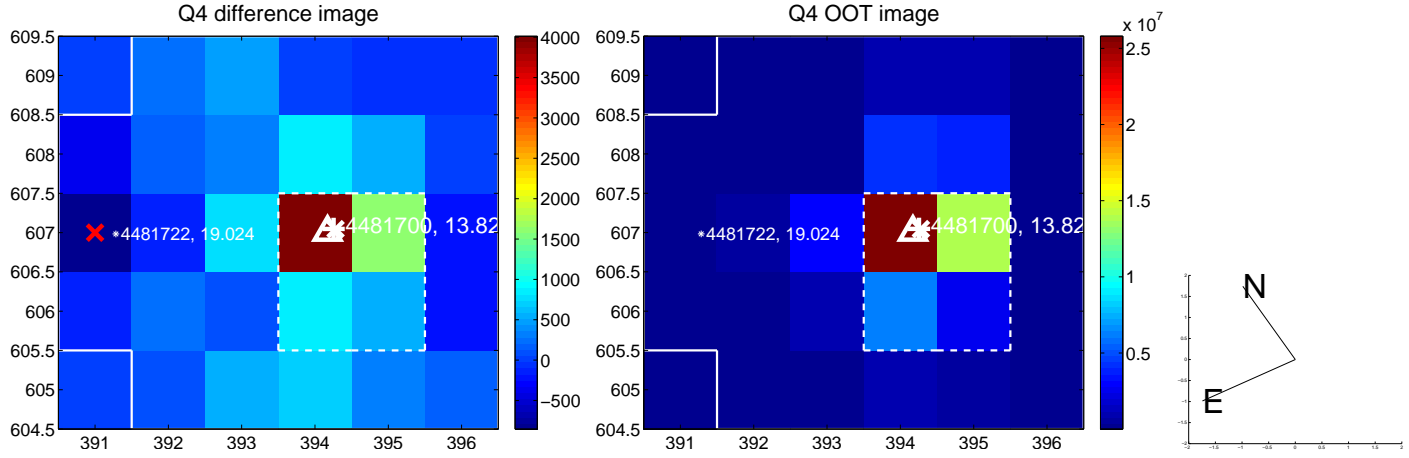
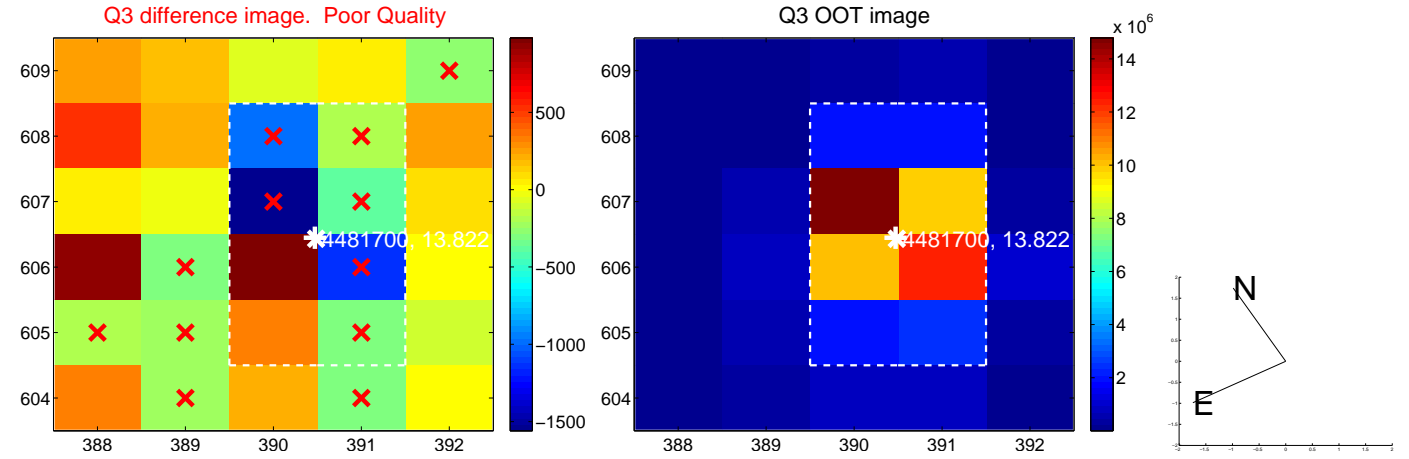
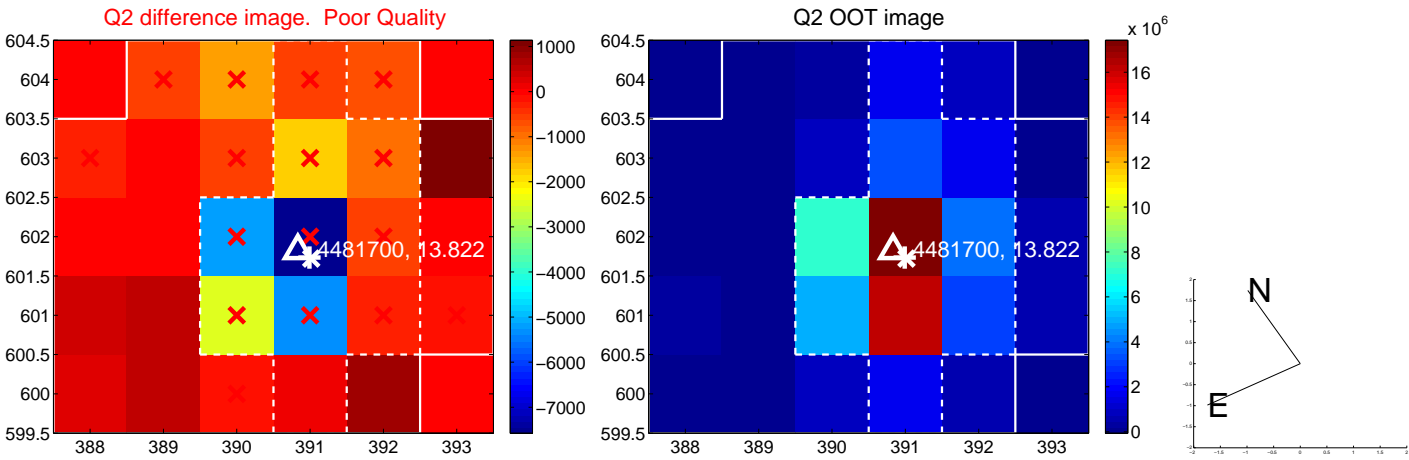
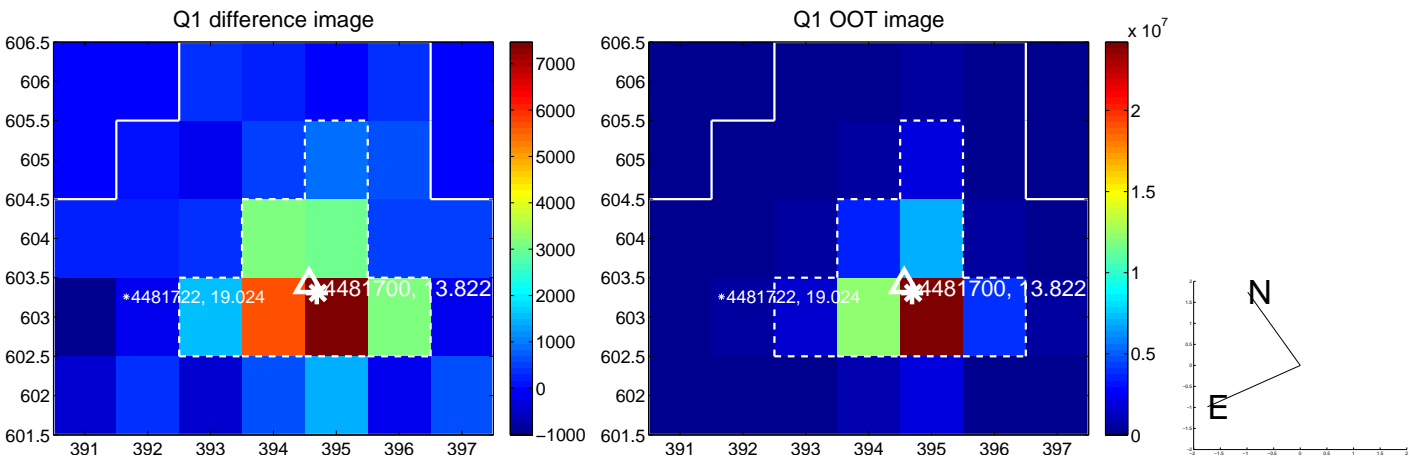
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.095 ± 0.321	0.30	0.054 ± 0.168	0.079 ± 0.385
PRF-fit source offset from KIC position	0.196 ± 0.327	0.60	0.123 ± 0.181	0.152 ± 0.445
photometric centroid source offset	0.15 ± 0.12	1.26	0.12 ± 0.11	-0.09 ± 0.12

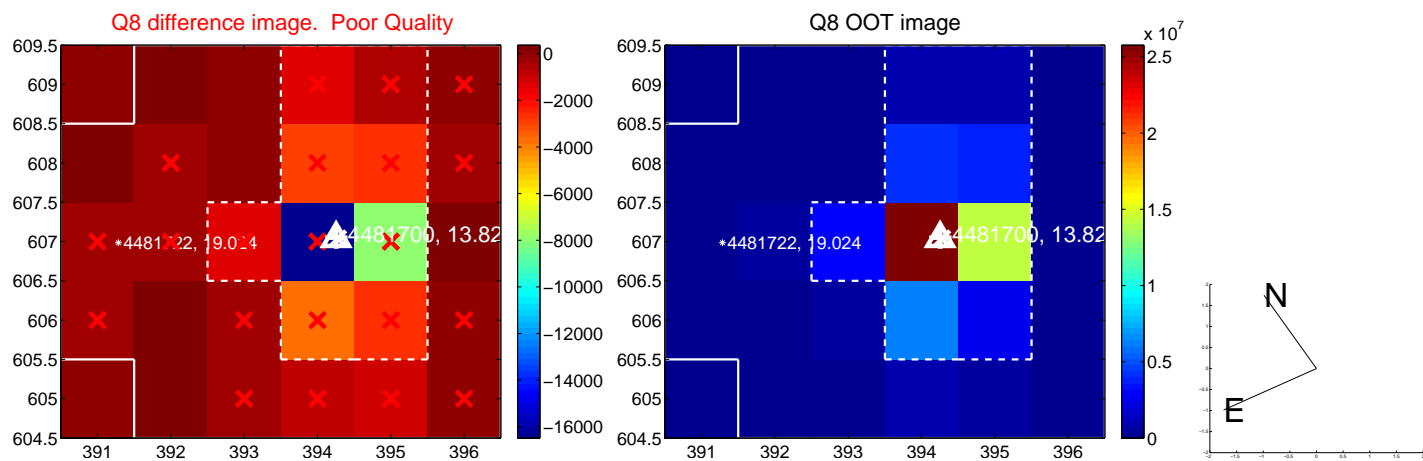
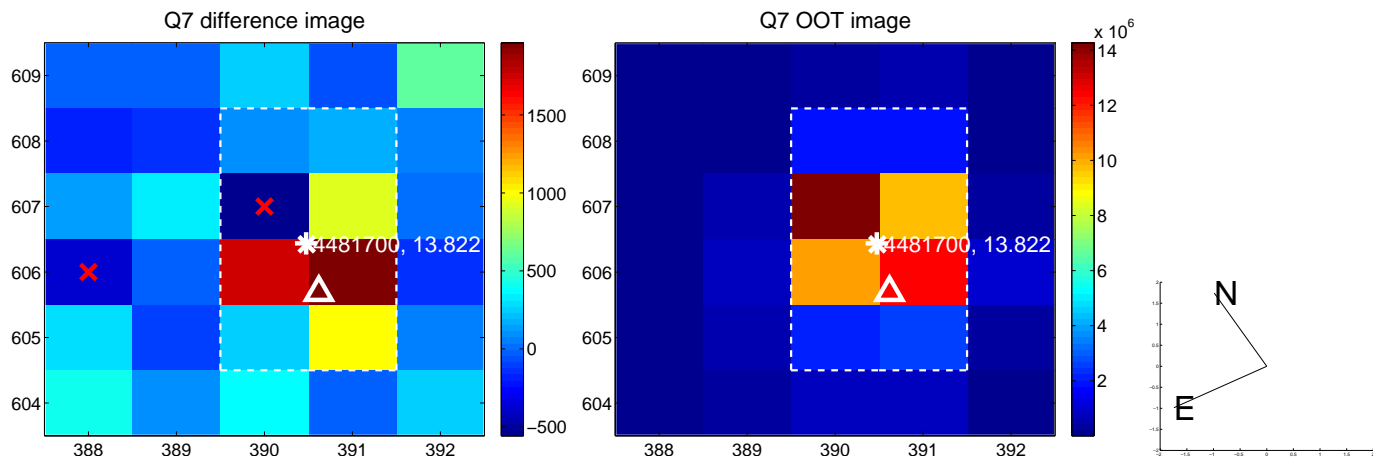
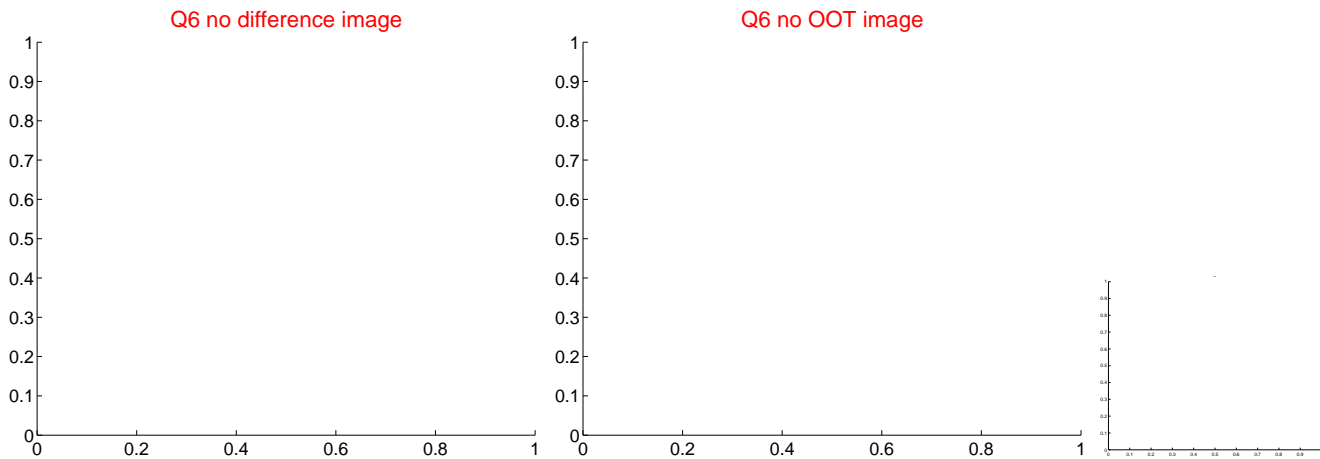
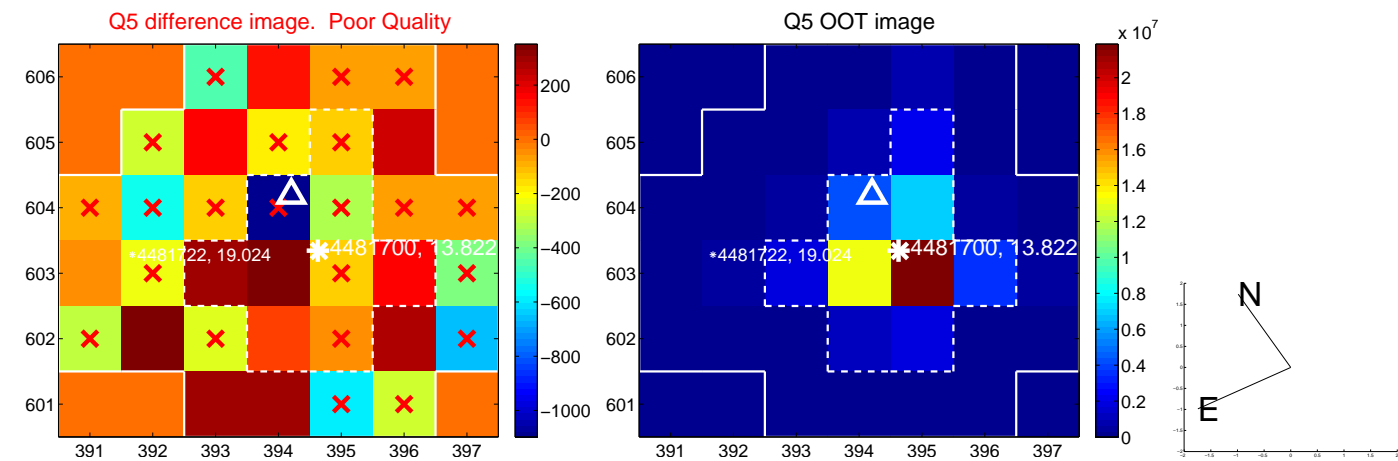


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

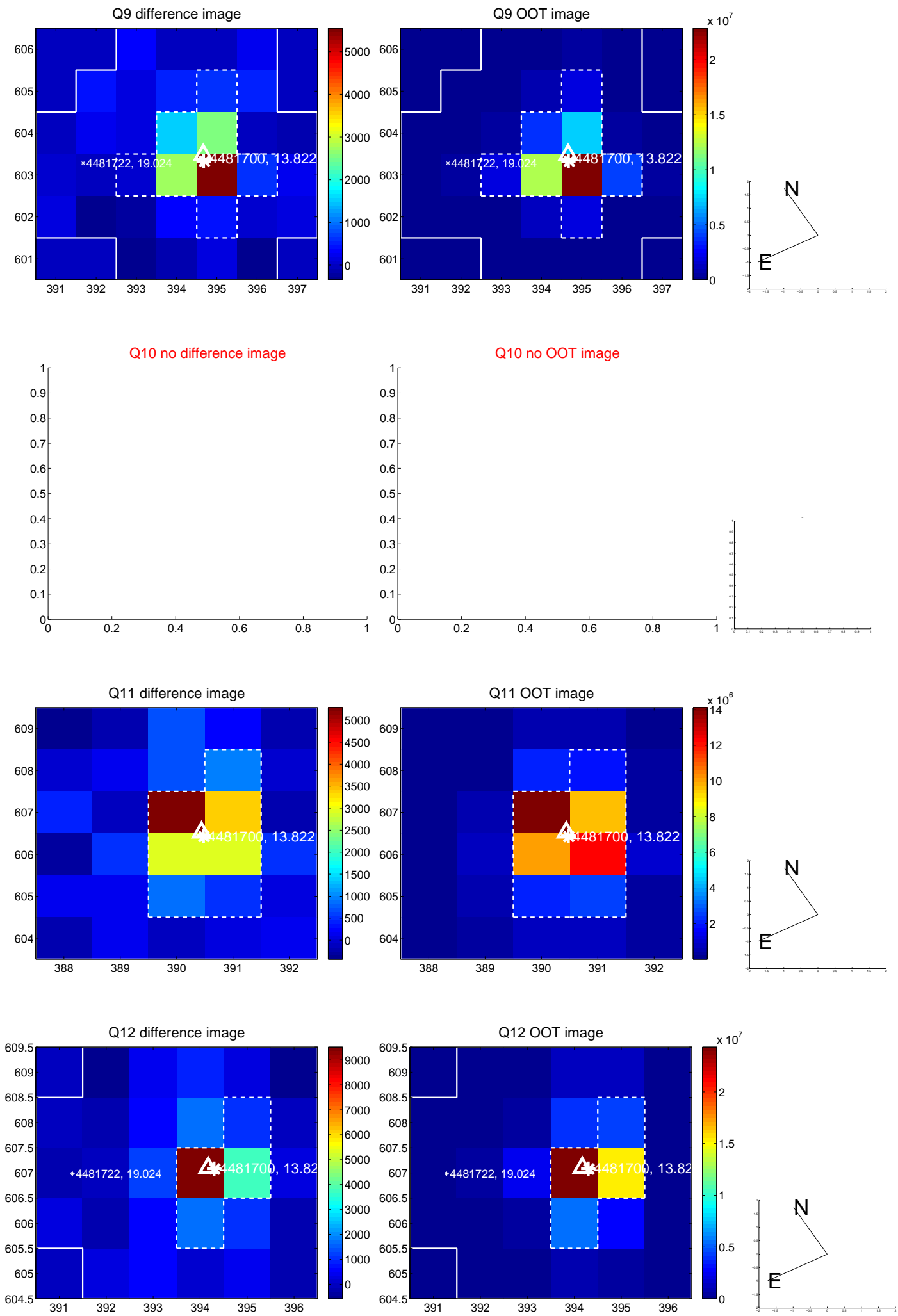
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



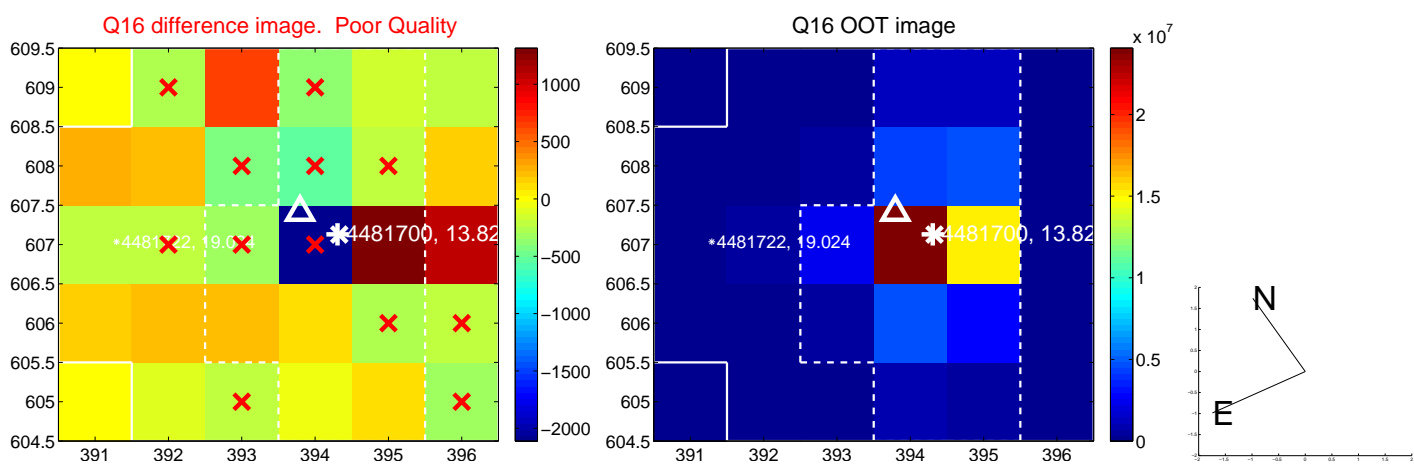
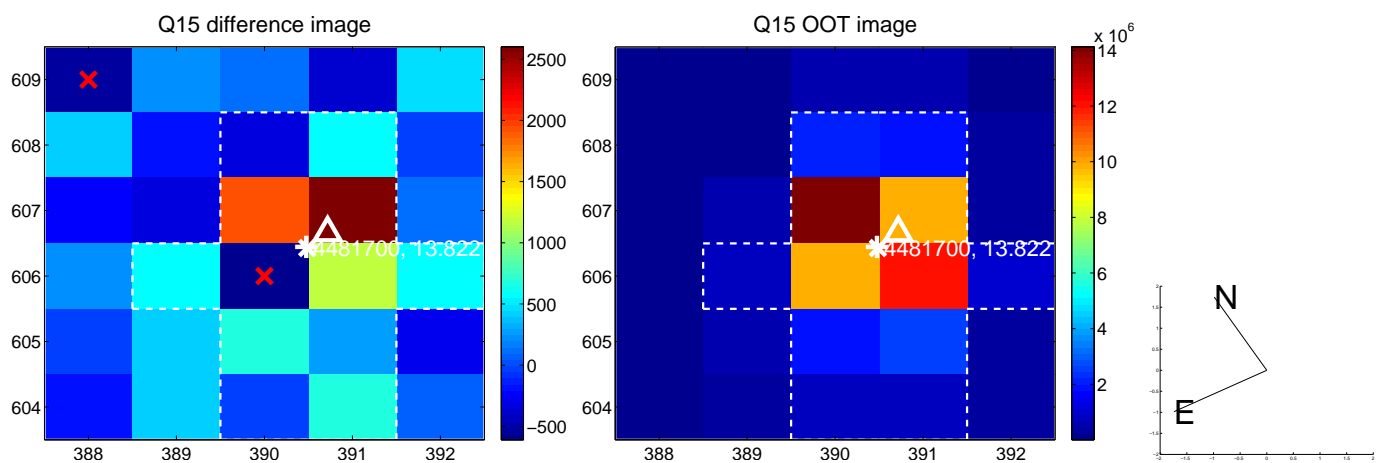
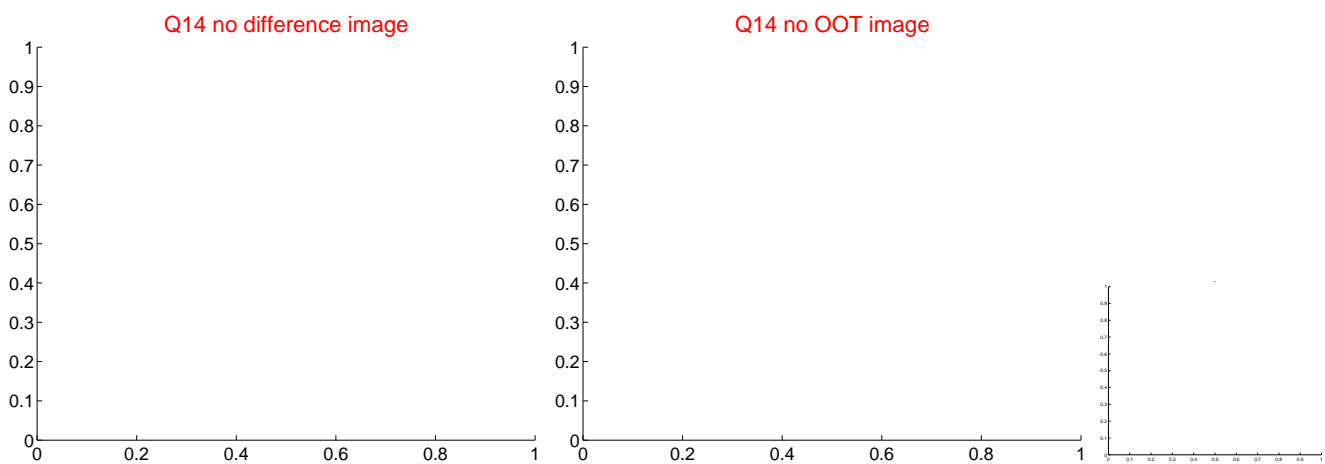
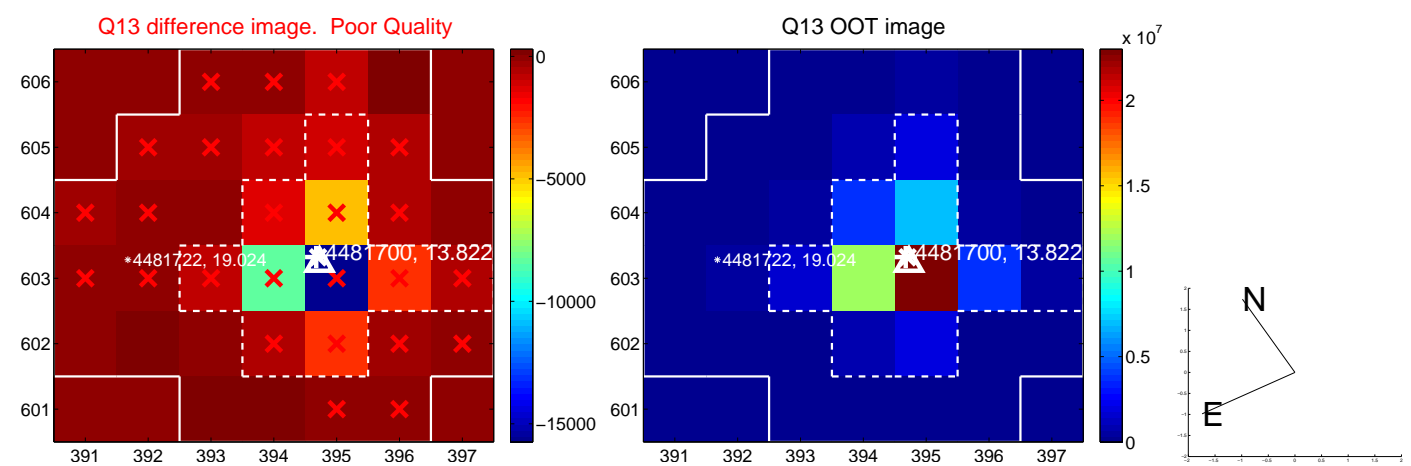
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



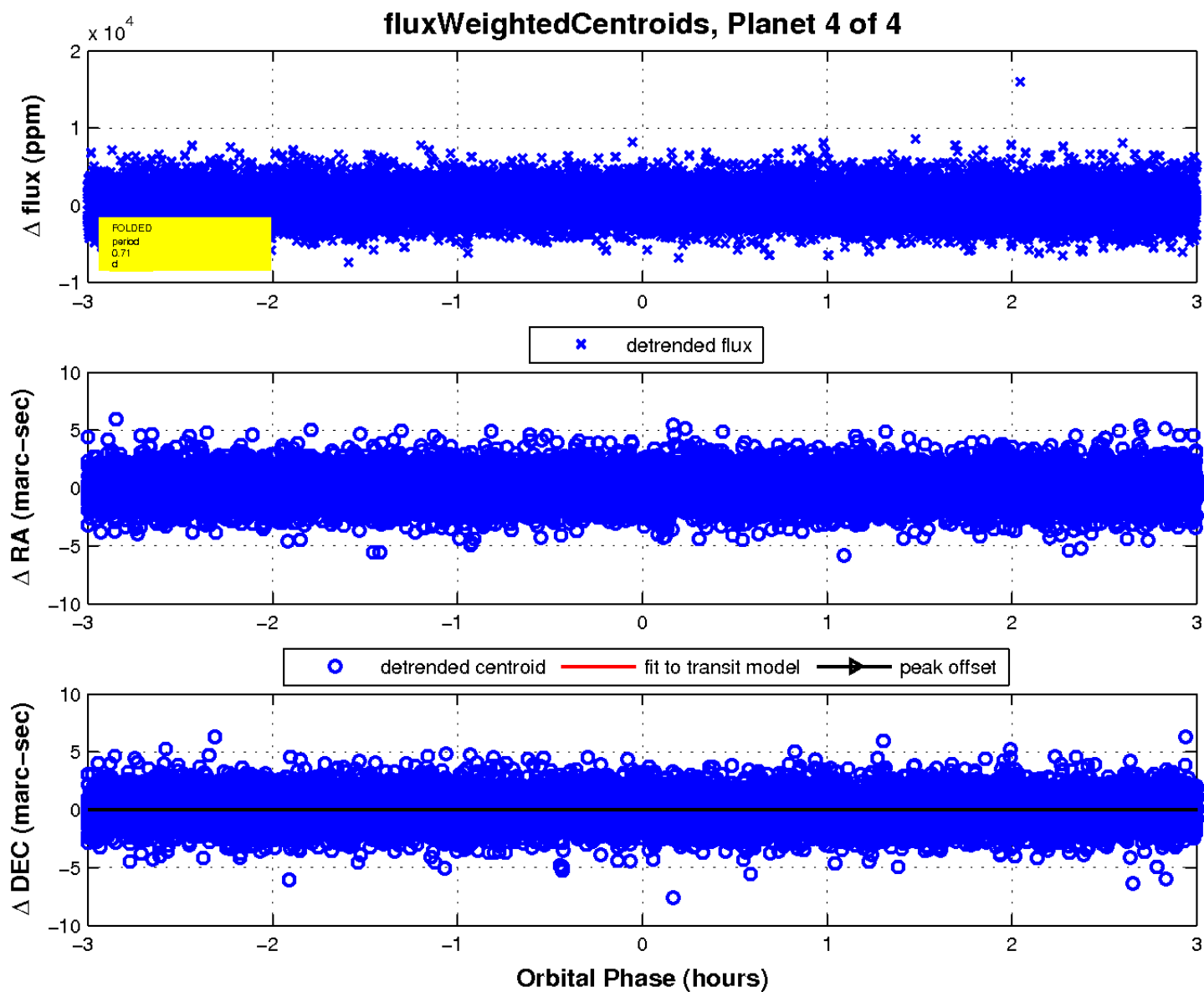
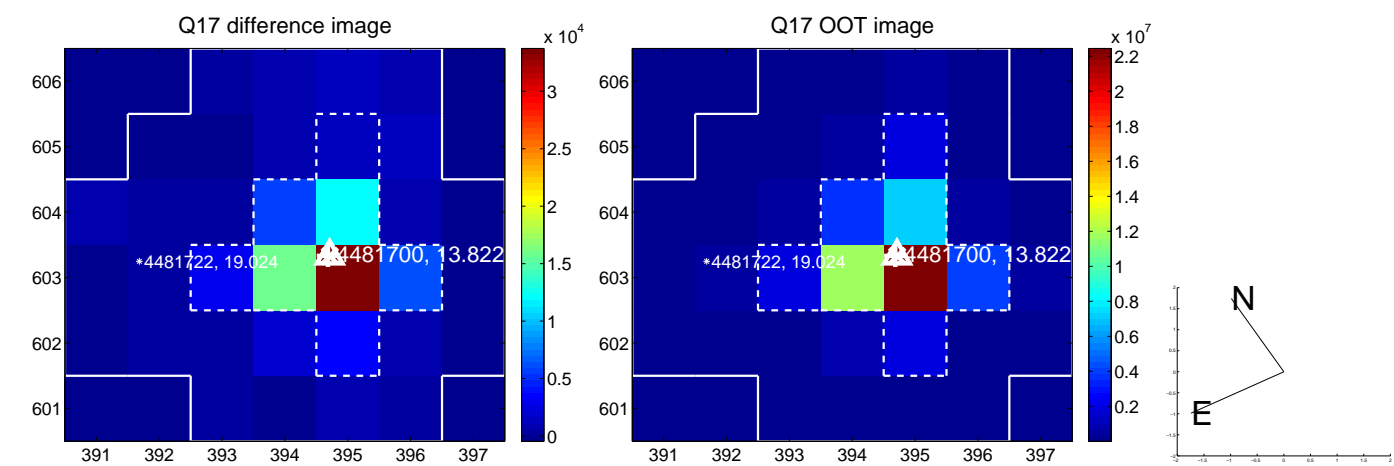
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

