

KIC 010470935

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})
010470935-01	OBS	No	0.933653	131.581200	41.1	6.373	7.5	7.2	0.49	3758	0.32	195.75
010470935-02	OBS	No	48.099305	175.920478	911.6	2.536	12.4	8.9	0.49	3758	1.67	1.02
010470935-03	OBS	No	61.763380	138.606372	1418.8	2.714	10.8	12.3	0.49	3758	3.37	0.73
010470935-04	OBS	No	30.260665	153.057643	1173.5	1.424	9.9	9.3	0.49	3758	1.69	1.89
010470935-05	OBS	No	46.884833	138.490223	609.4	4.383	9.1	9.7	0.49	3758	1.32	1.06
010470935-06	OBS	No	28.193285	151.647421	886.1	2.418	8.7	11.3	0.49	3758	1.60	2.08
010470935-07	OBS	No	43.019550	137.033651	862.4	4.285	8.1	8.7	0.49	3758	1.55	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010470935-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH
010470935-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_MEAS
010470935-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010470935-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010470935-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
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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.

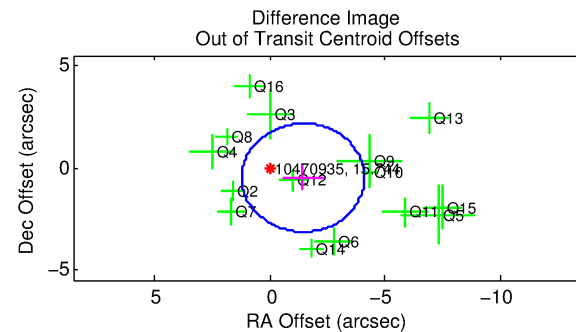
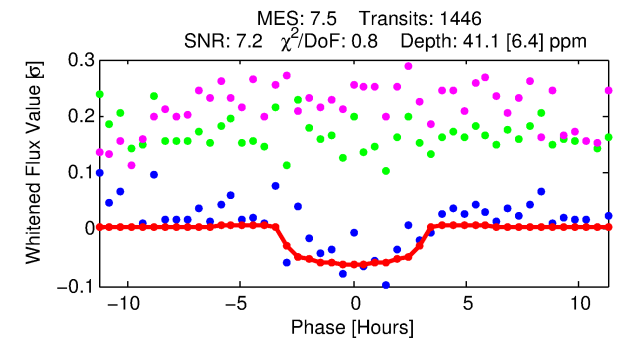
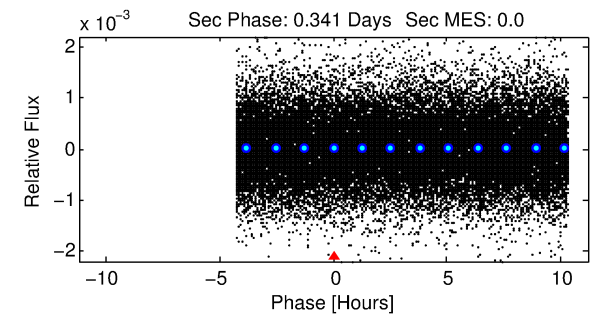
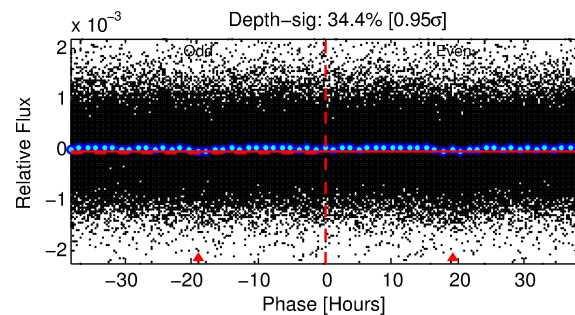
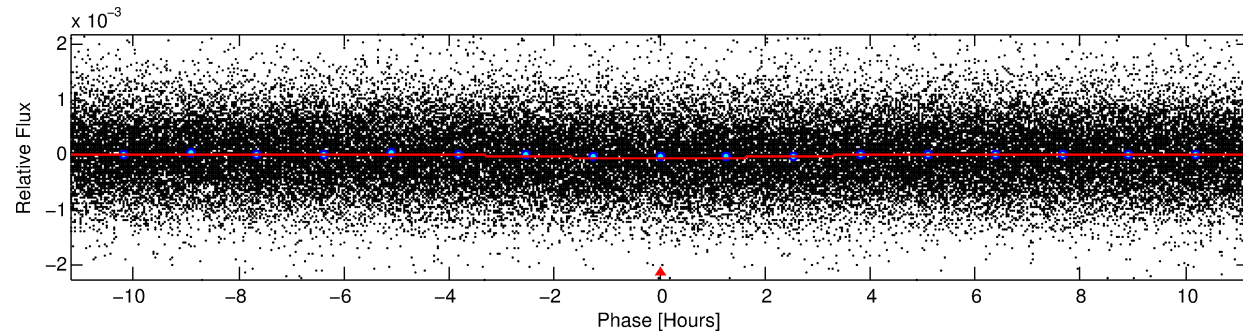
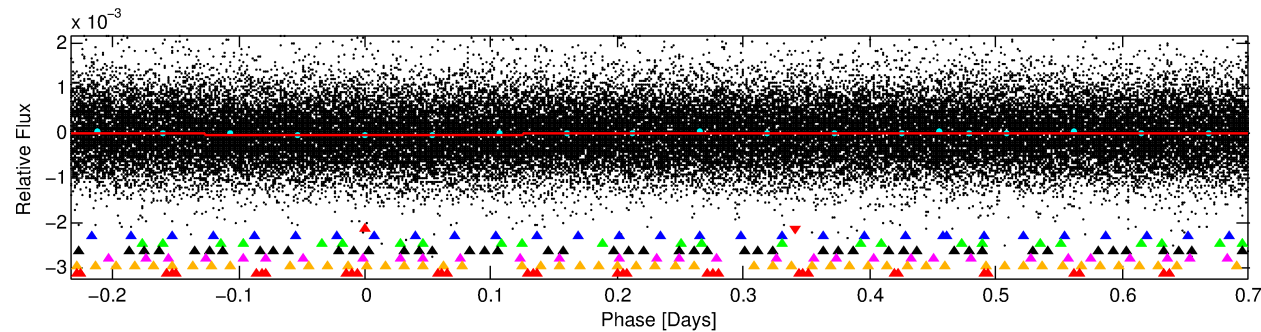
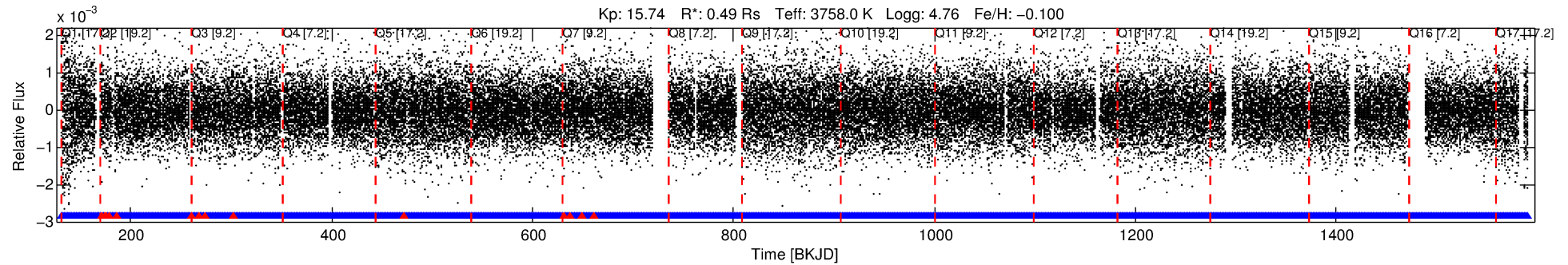
Ephemeris Match Information For 010470935-01

TCE (1)	KIC	Parent (2)	Parent KIC	P ₁ :P ₂	Dist (″)	Δ Row	Δ Col	m ₂	m ₁	D ₂ /D ₁	Mechanism	Flag	σ_P	σ_T
010470935-01	10470935	V2083-Cyg-pri	10342012	1:2	1809.7	342	-301	6.90	15.74	4837.10	Direct-PRF	0	4.13	2.02

Notes: P₁:P₂ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m₂ and m₁ are the magnitudes of the parent and child. D₂/D₁ is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 10470935 Candidate: 1 of 7 Period: 0.934 d



DV Fit Results:

Period = 0.93365 [0.00002] d
Epoch = 131.5812 [0.0090] BKJD
Rp/R* = 0.0059 [0.0182]
a/R* = 1.27 [6.82]
b = 0.26 [51.28]
Seff = 195.75 [20.09]
Teq = 954 [24] K
Rp = 0.32 [0.98] Re
a = 0.0149 [0.0008] AU
Ag = N/A
Teffp = N/A

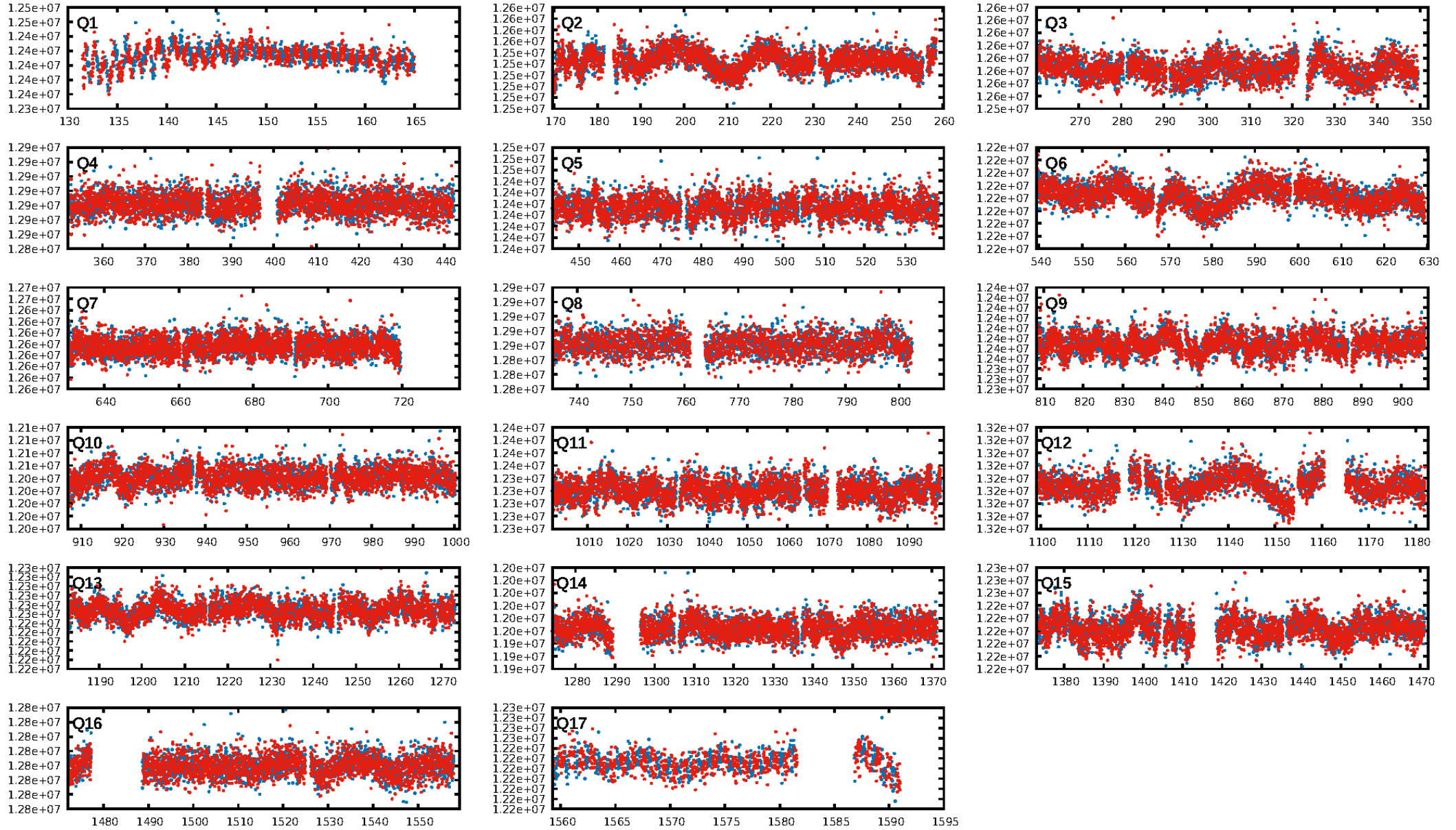
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [95.98 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.94e-12
RollingBand-fgt: 0.99 [1363/1380]
GhostDiagnostic-chr: 0.4227
Centroid-sig: 26.0%
Centroid-so: 1.983 arcsec [1.07 σ]
OotOffset-rm: 1.521 arcsec [1.72 σ]
KicOffset-rm: 1.097 arcsec [1.24 σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 0.07 [1/15]
DiffImageOverlap-fno: 1.00 [17/17]

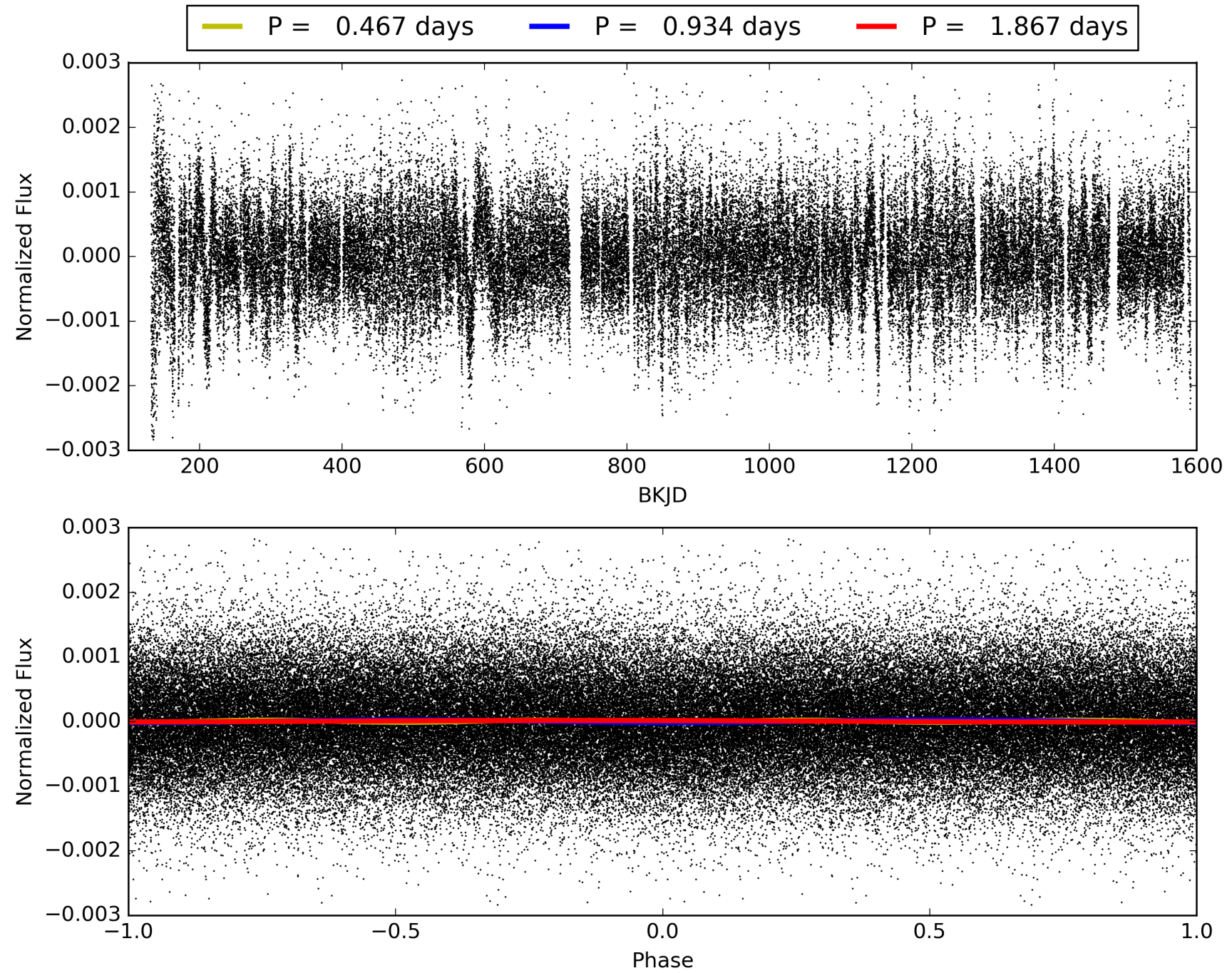
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:30:58 Z

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

TCE 010470935-01, PDC Light Curves

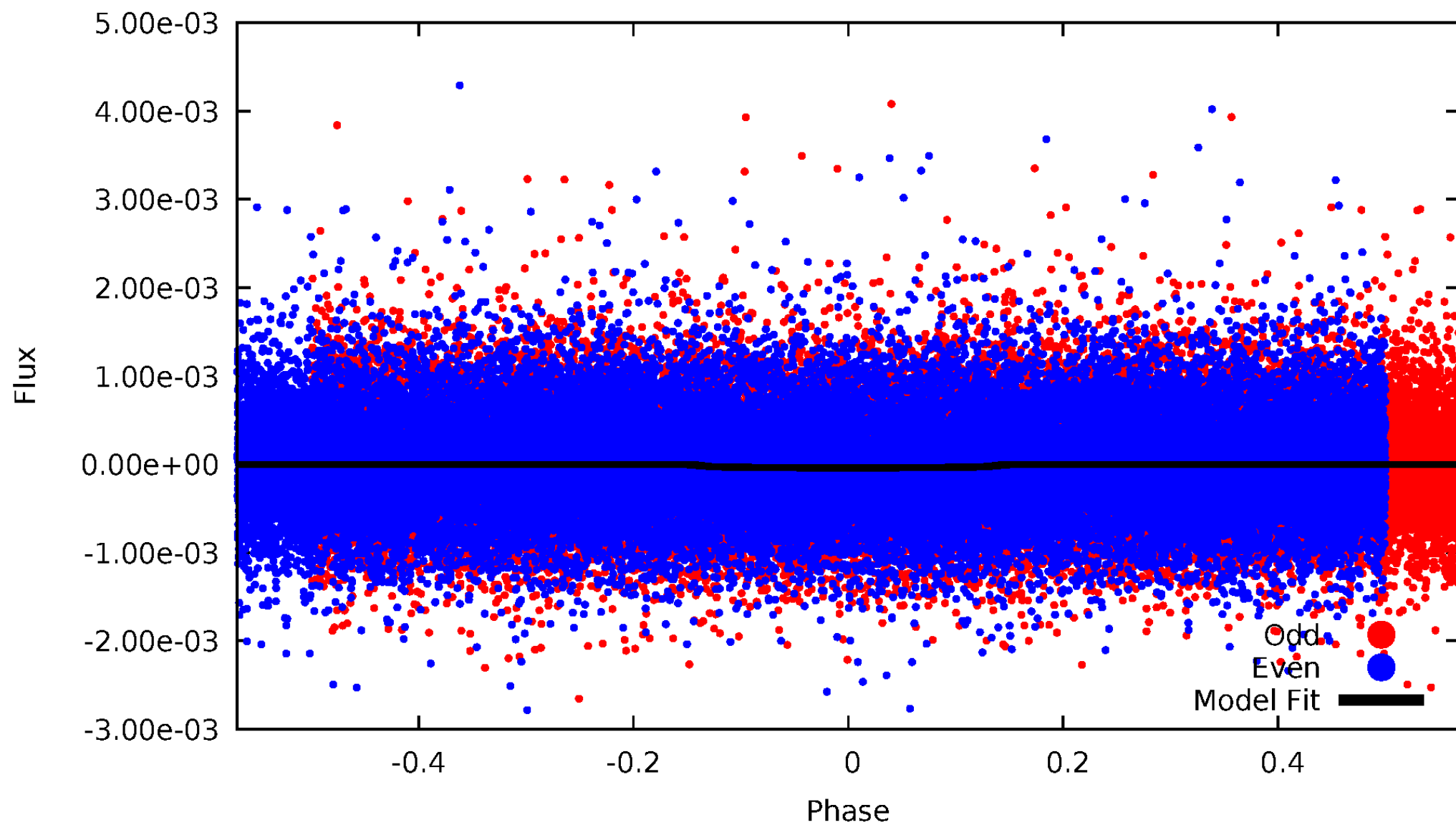


TCE 010470935-01



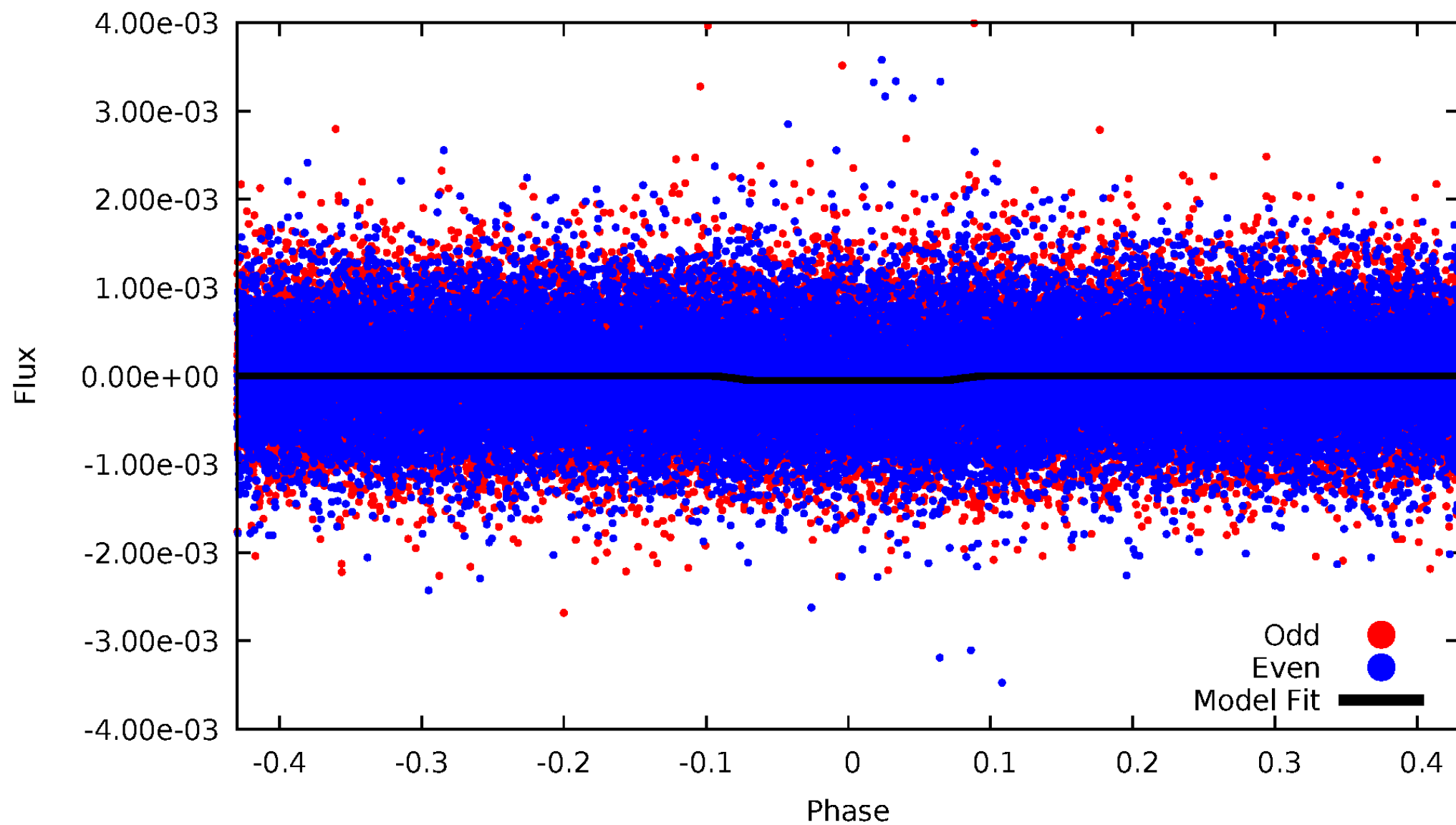
DV Odd/Even

TCE 010470935-01

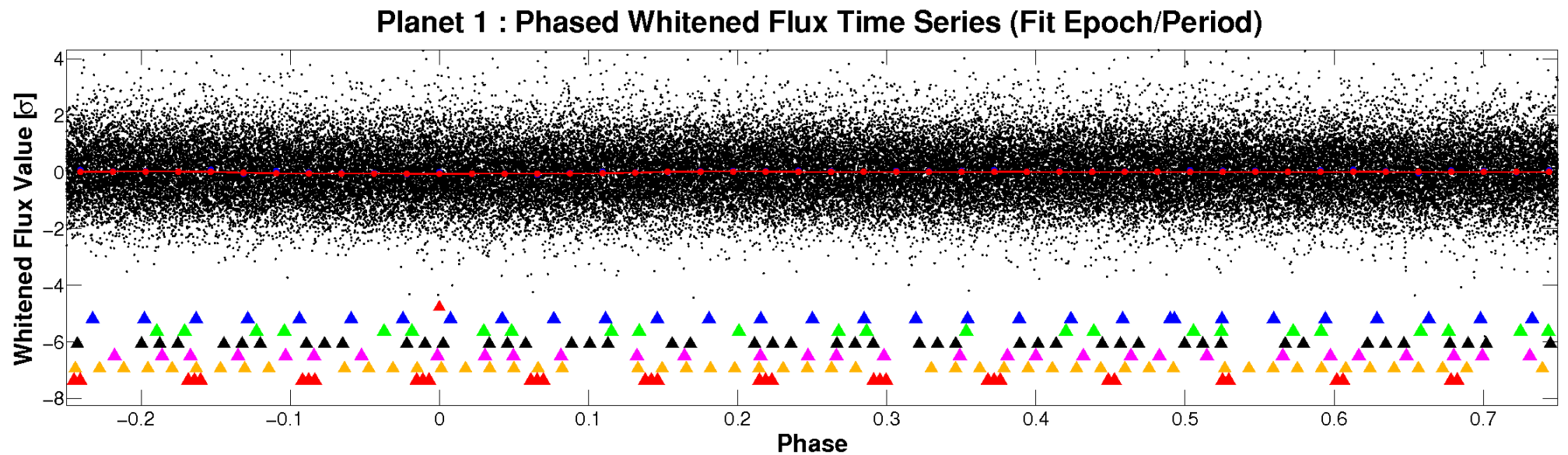
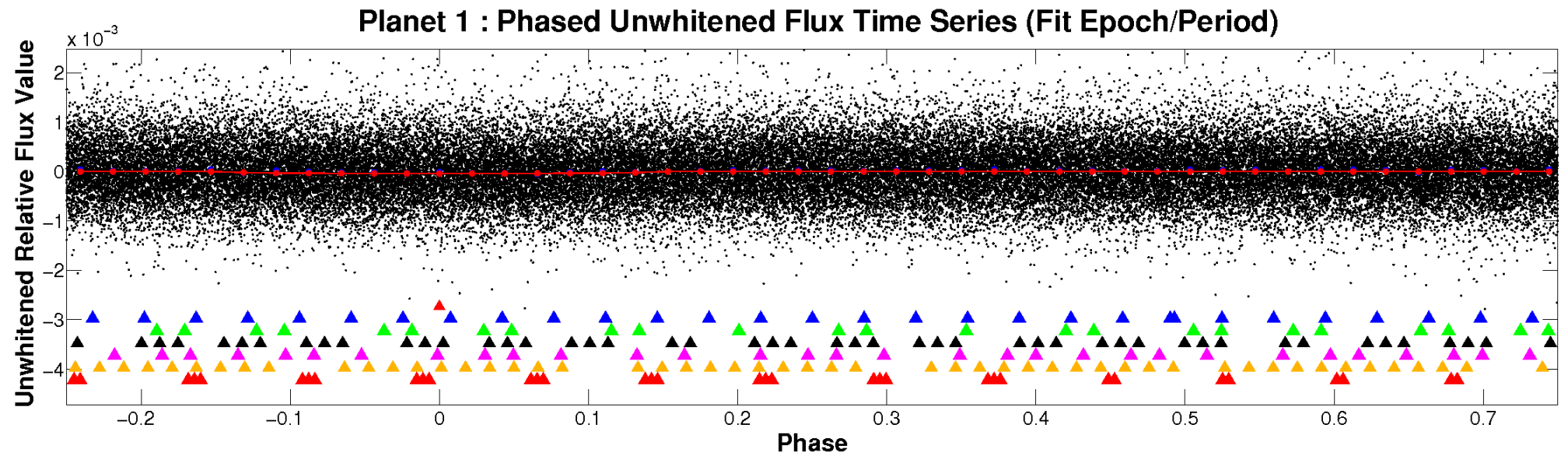


ALT Odd/Even

TCE 010470935-01

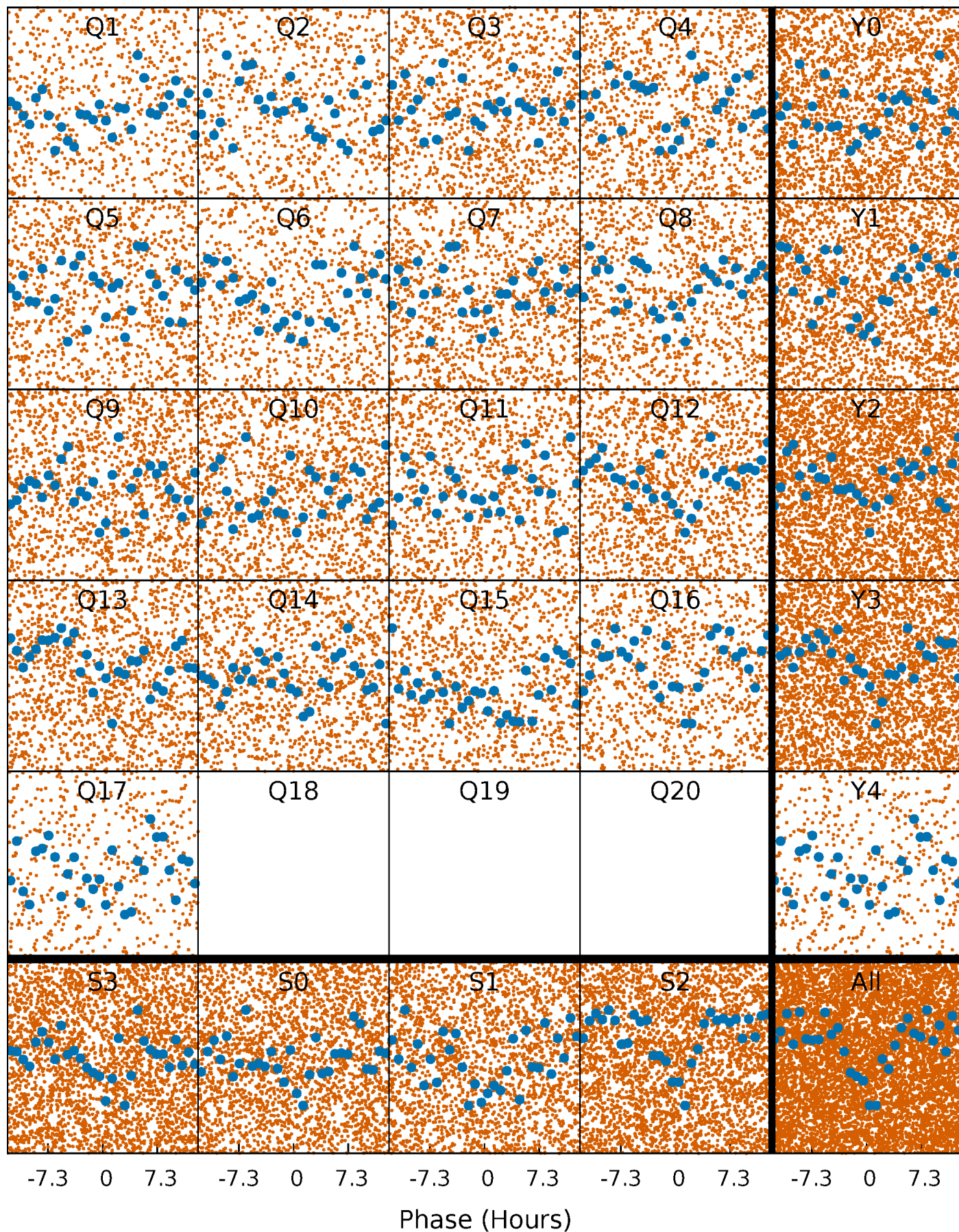


Non-Whitened Vs. Whitened Light Curve



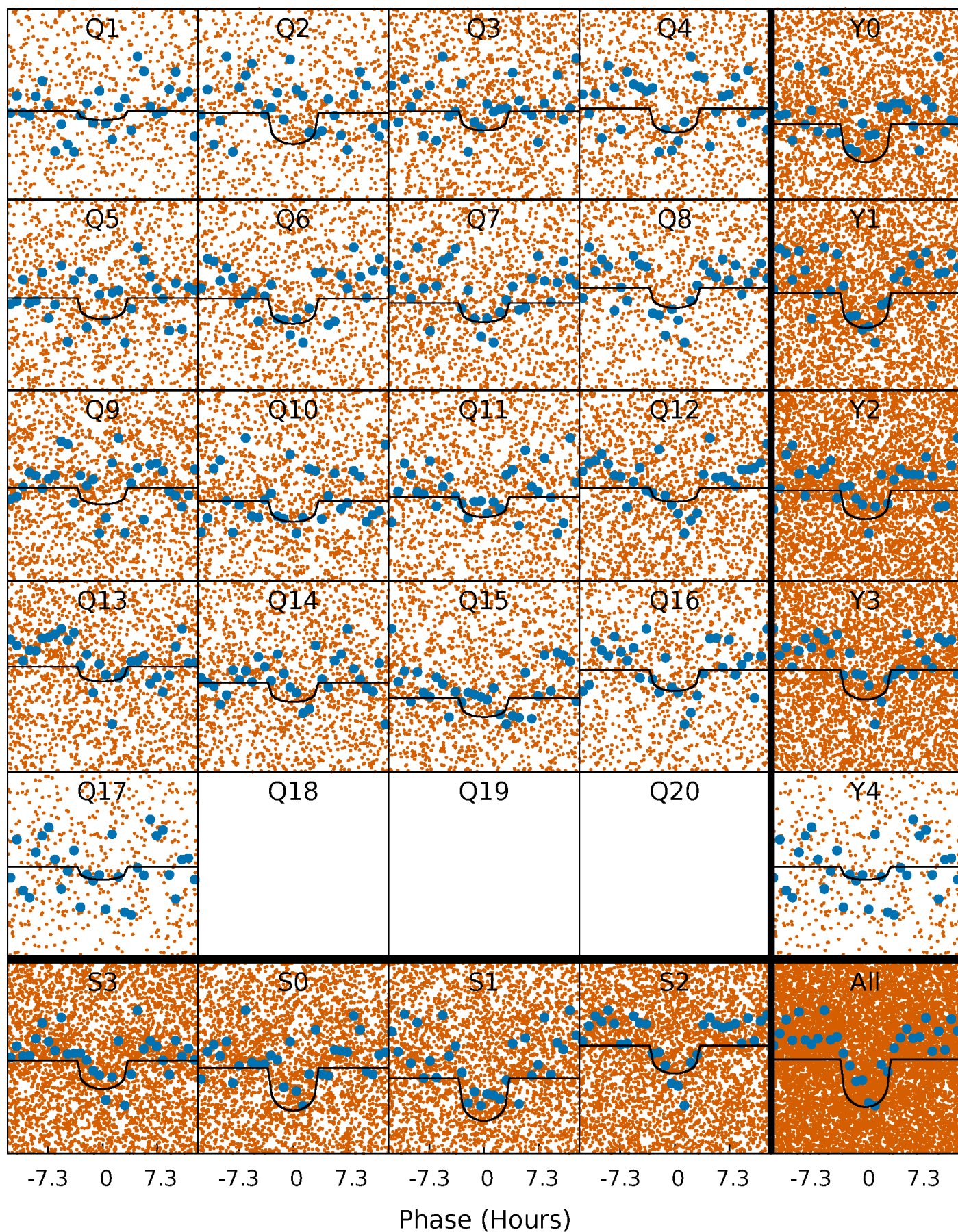
PDC Quarter-Phased Transit Curves

TCE 010470935-01 P= 0.933653 Days $T_0=131.581200$ (BKJD)



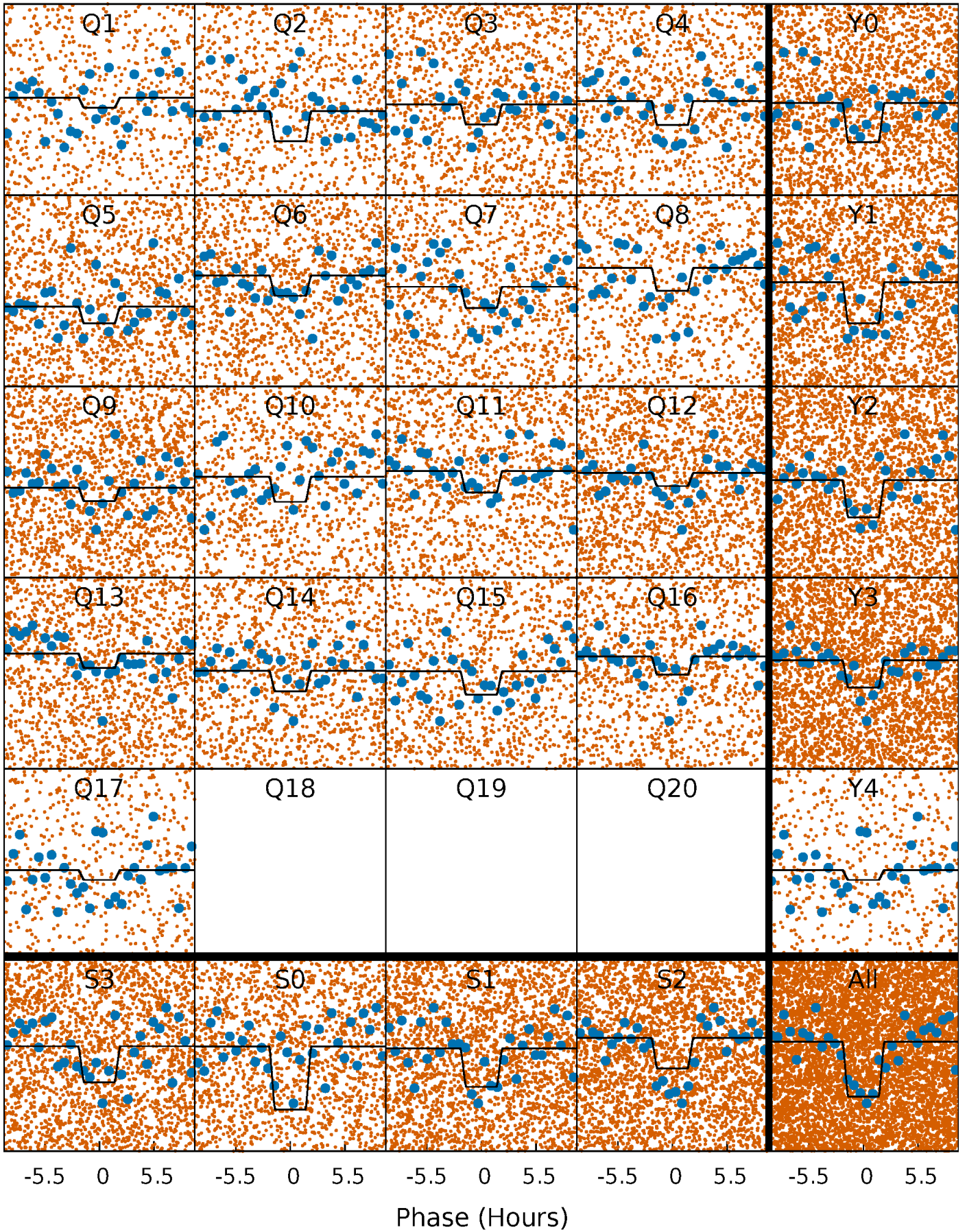
DV Quarter-Phased Transit Curves

TCE 010470935-01 P= 0.933653 Days $T_0=131.581200$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

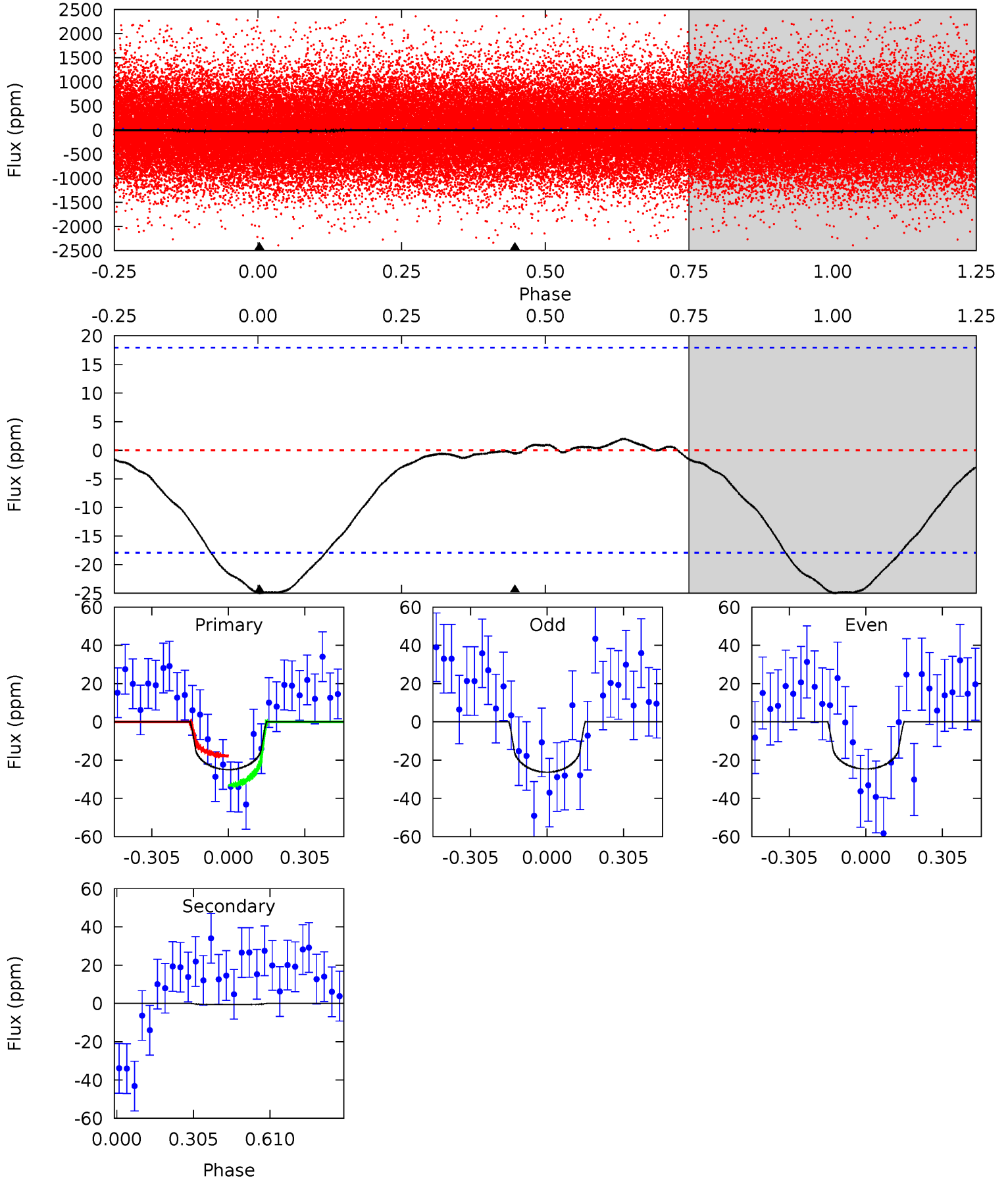
TCE 010470935-01 P= 0.933722 Days $T_0=131.533764$ (BKJD)



DV Model-Shift Uniqueness Test

010470935-01, P = 0.933653 Days, E = 130.647547 Days

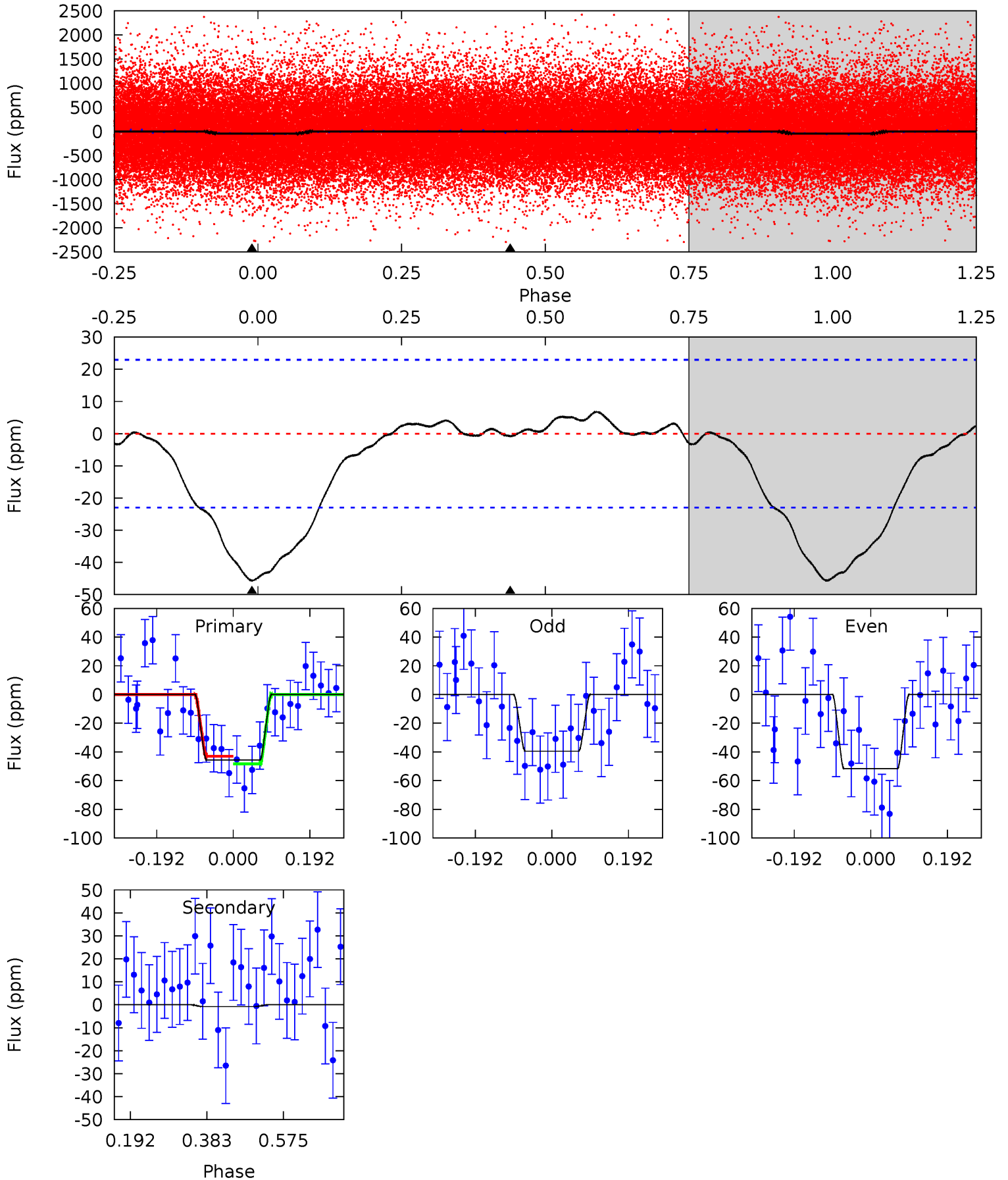
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.02	0.14	0	0	4.33	1.03	0.25	6.02	6.02	0.14	0.14	0.20	0.68	0.07	1.87



Alt Model-Shift Uniqueness Test

010470935-01, P = 0.933722 Days, E = 130.600042 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.80	0.15	0	0	4.43	1.31	0.37	8.80	8.80	0.15	0.15	1.19	0.83	0.13	0.51



Stellar Parameters For KIC 010470935

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3758^{+68}_{-68}	$4.756^{+0.036}_{-0.024}$	$-0.100^{+0.100}_{-0.100}$	$0.493^{+0.027}_{-0.035}$	$0.506^{+0.028}_{-0.031}$	$5.930^{+0.972}_{-0.620}$
	+2%/-2%	+1%/-1%	+100%/-100%	+5%/-7%	+6%/-6%	+16%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010470935-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1 ± 4	$0.79^{+0.80}_{-0.51}$	1331^{+28}_{-30}	-1930^{+4317}_{-374}	$0.073^{+1.855}_{-0.967}$
Alt.	-1 ± 5	$0.84^{+0.81}_{-0.61}$	1329^{+30}_{-29}	-1935^{+4386}_{-426}	$0.060^{+2.307}_{-1.257}$

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

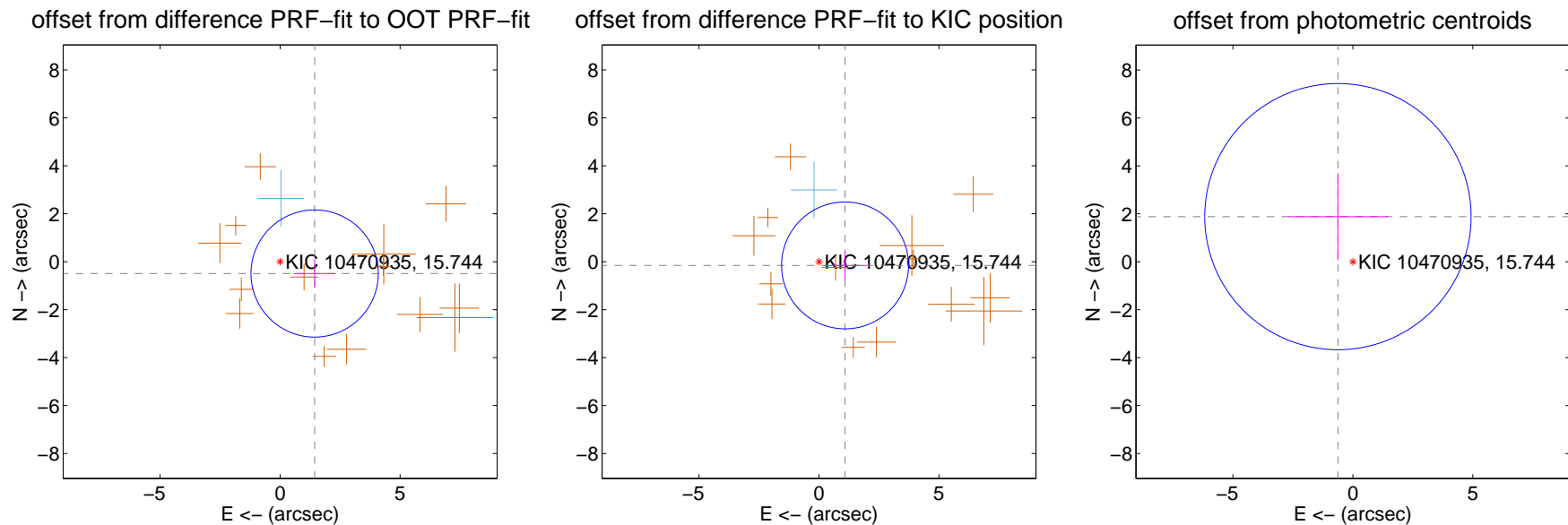
DV Centroid Data

Supplemental centroid analysis for 010470935-01. Kepler magnitude: 15.74. Transit SNR 7.24

There are 1 quarters with good PRF difference image offsets

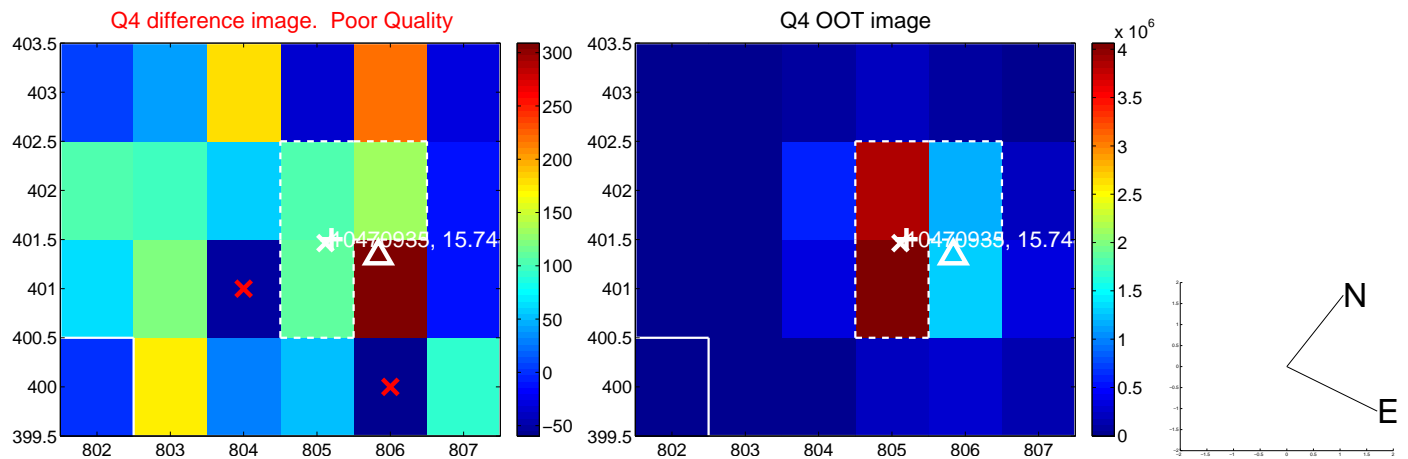
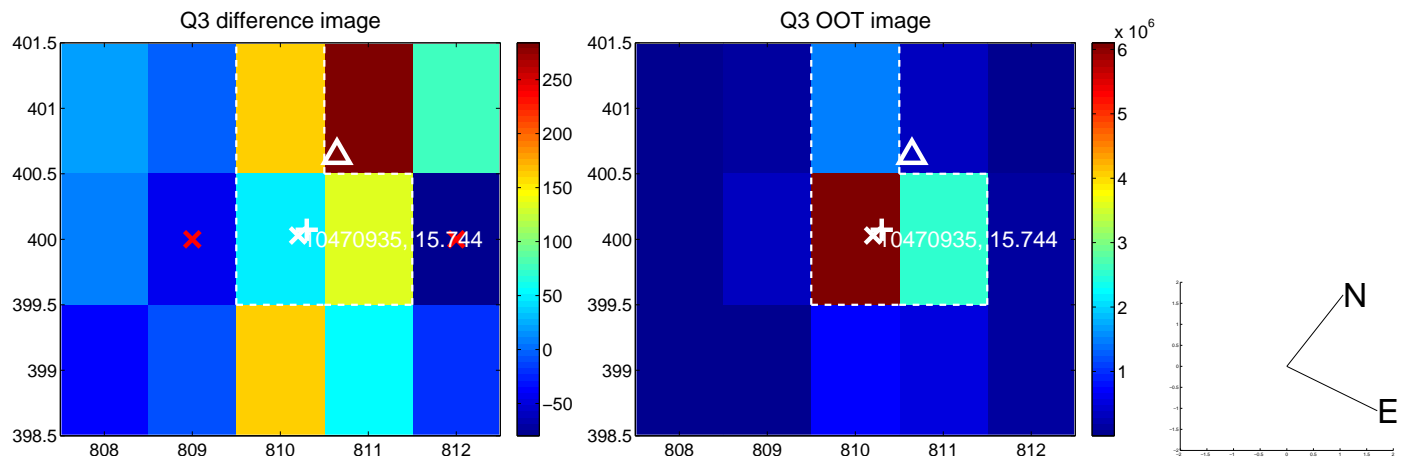
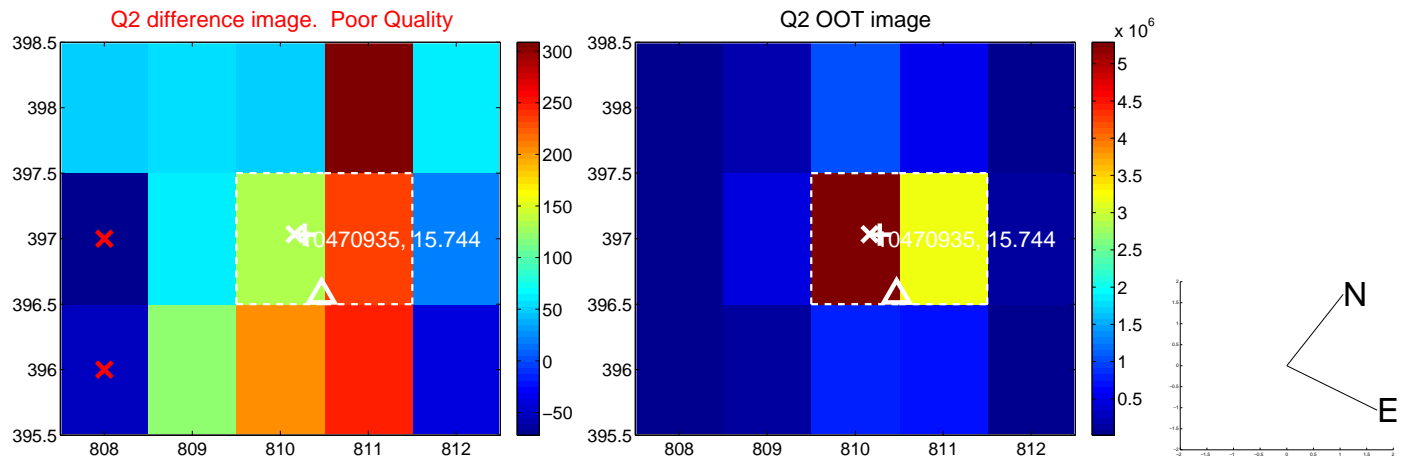
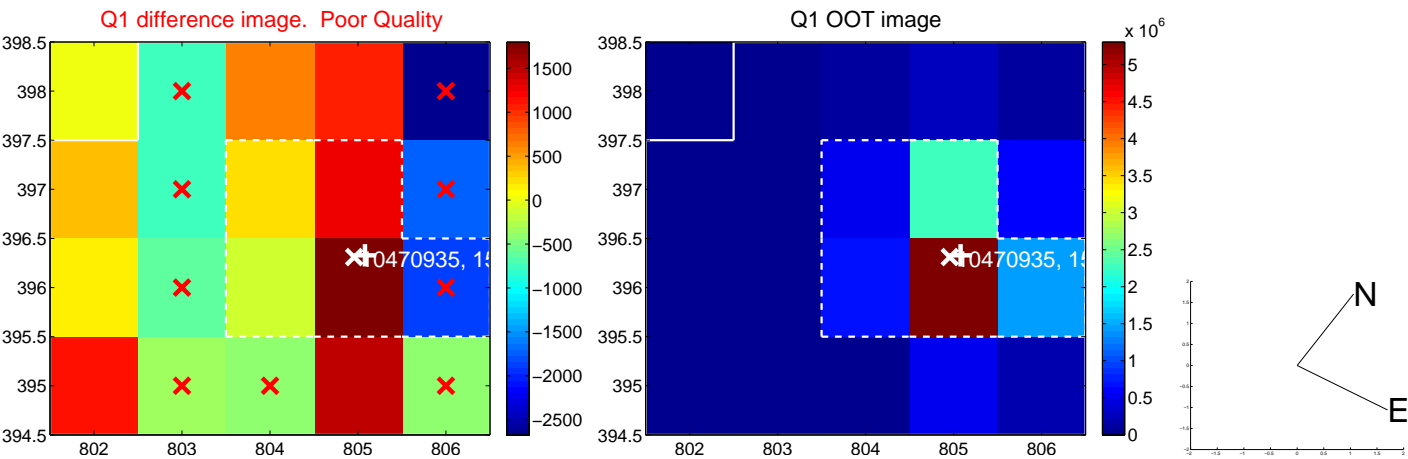
The direct PRF centroid is offset from the target star catalog position by about 0.55 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.521 ± 0.884	1.72	-1.439 ± 0.878	-0.493 ± 0.604
PRF-fit source offset from KIC position	1.097 ± 0.882	1.24	-1.086 ± 0.859	-0.155 ± 0.598
photometric centroid source offset	1.98 ± 1.85	1.07	0.62 ± 2.09	1.88 ± 1.82

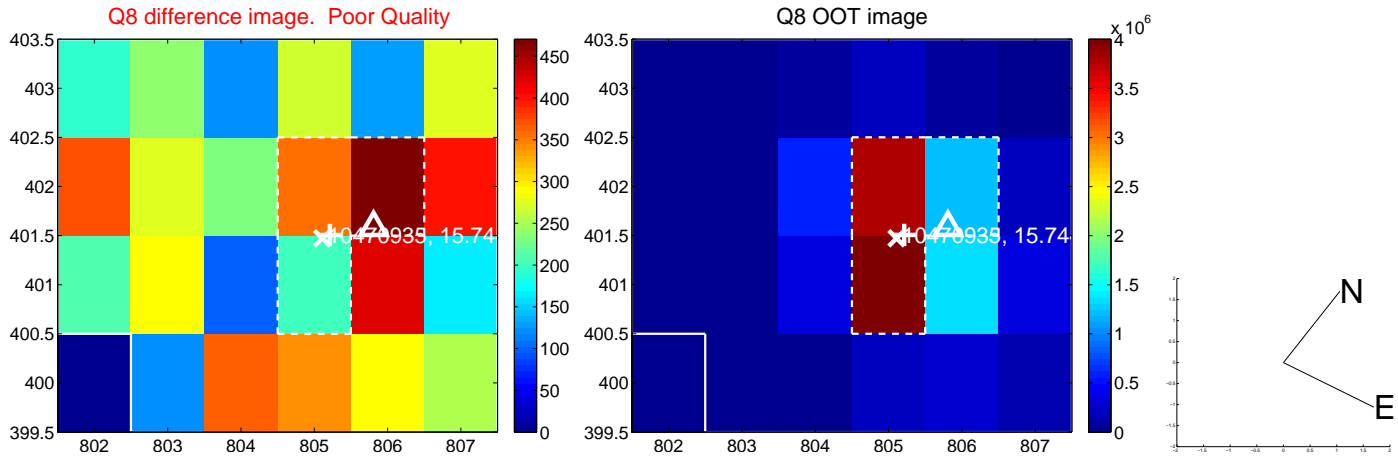
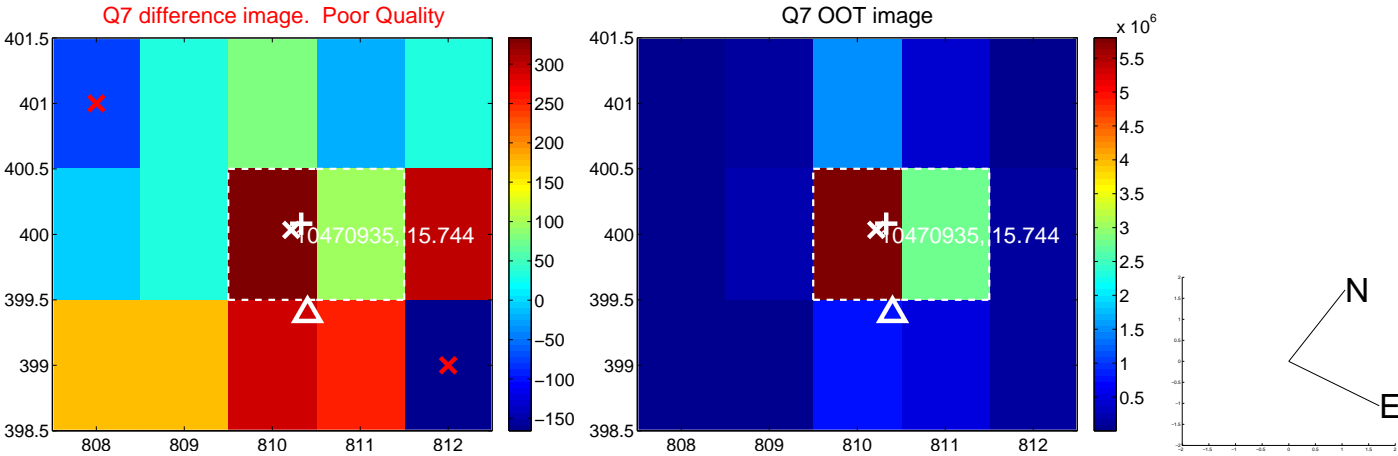
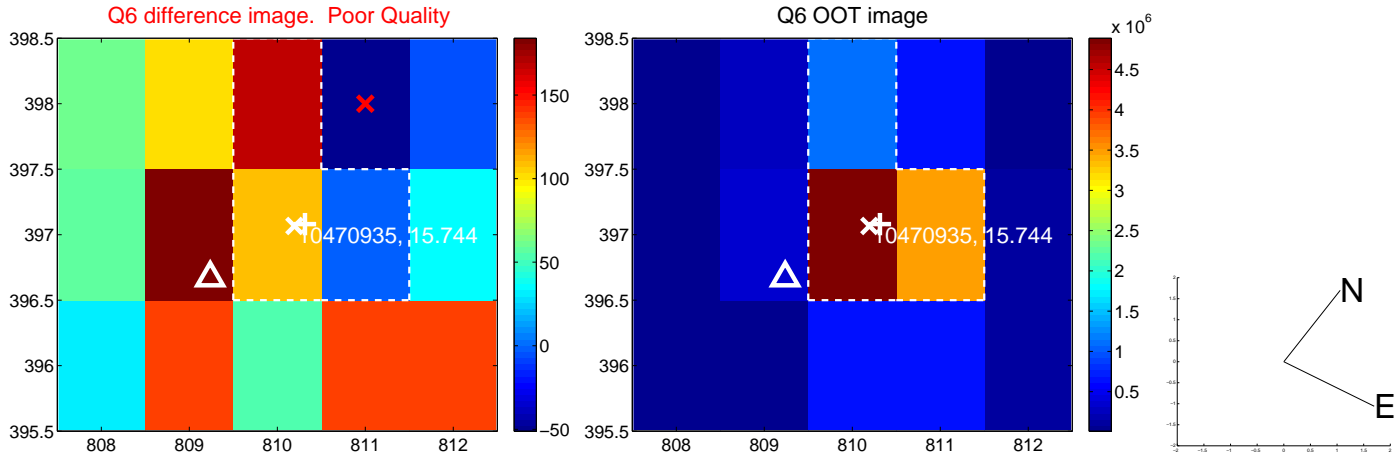
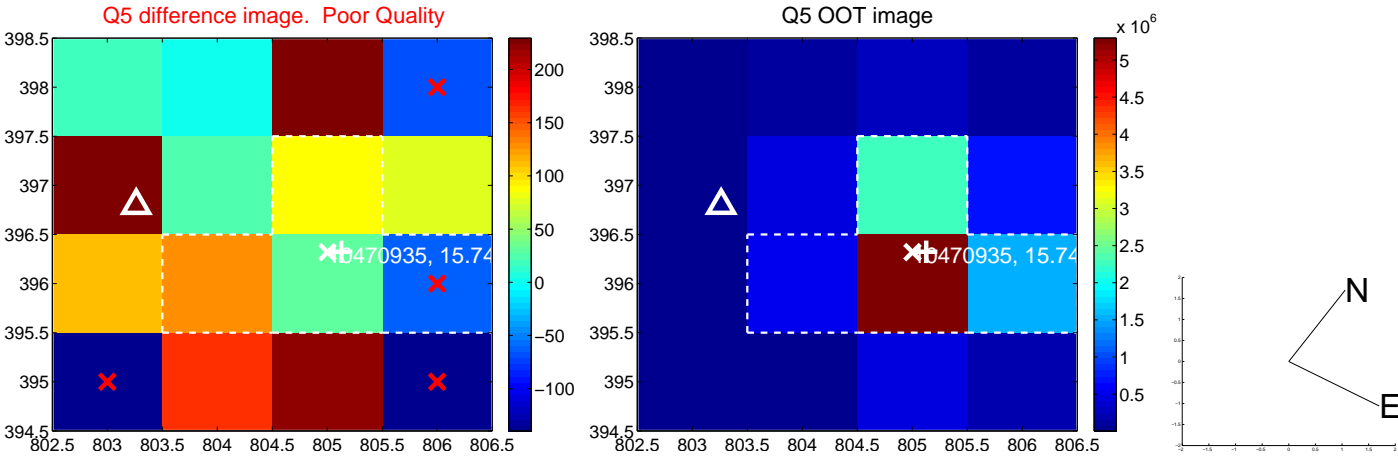


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

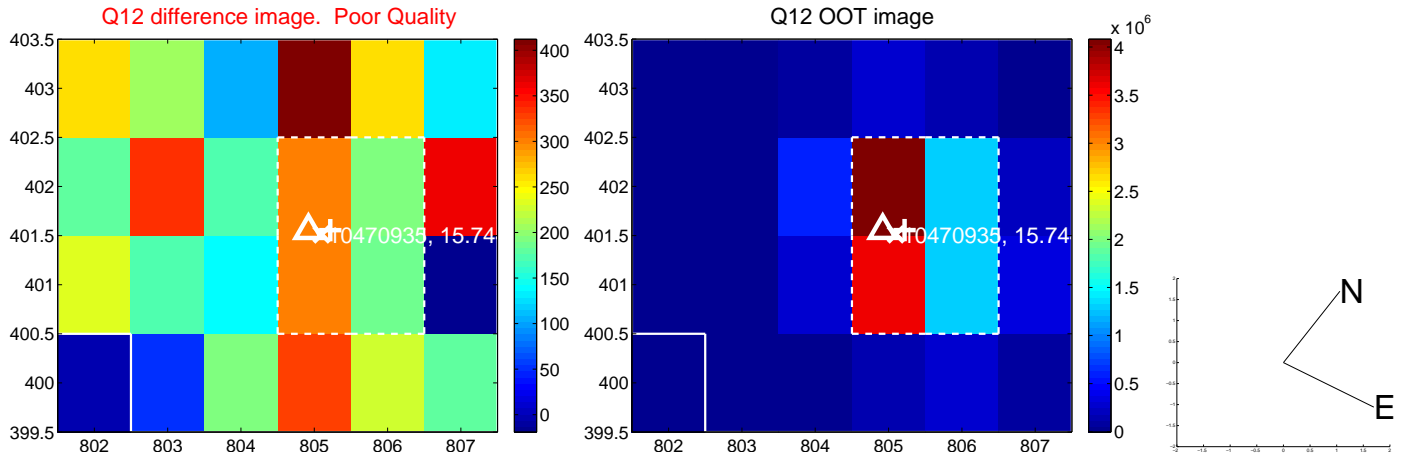
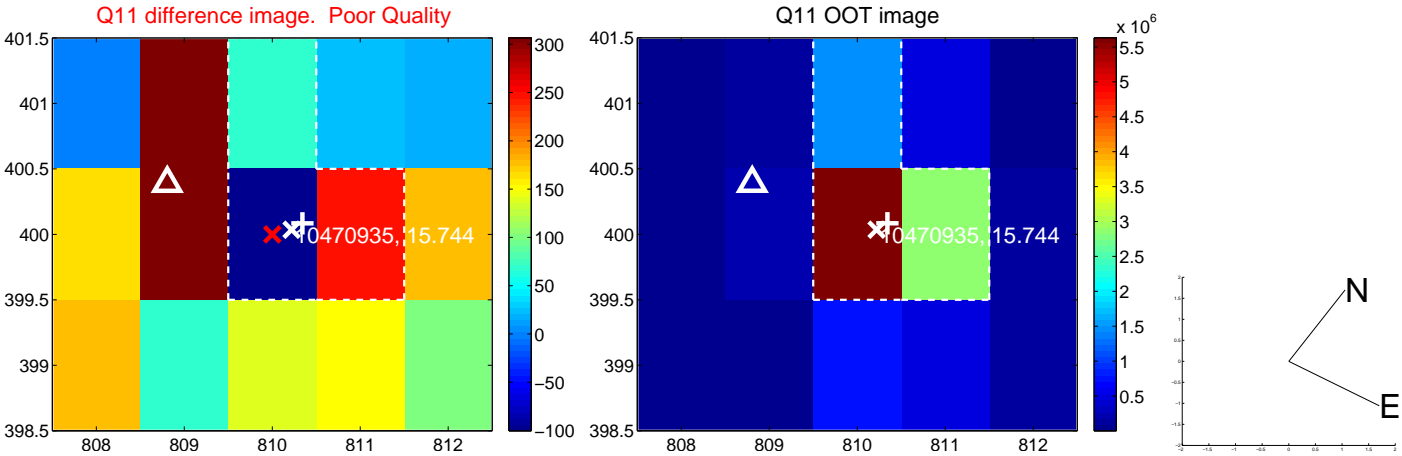
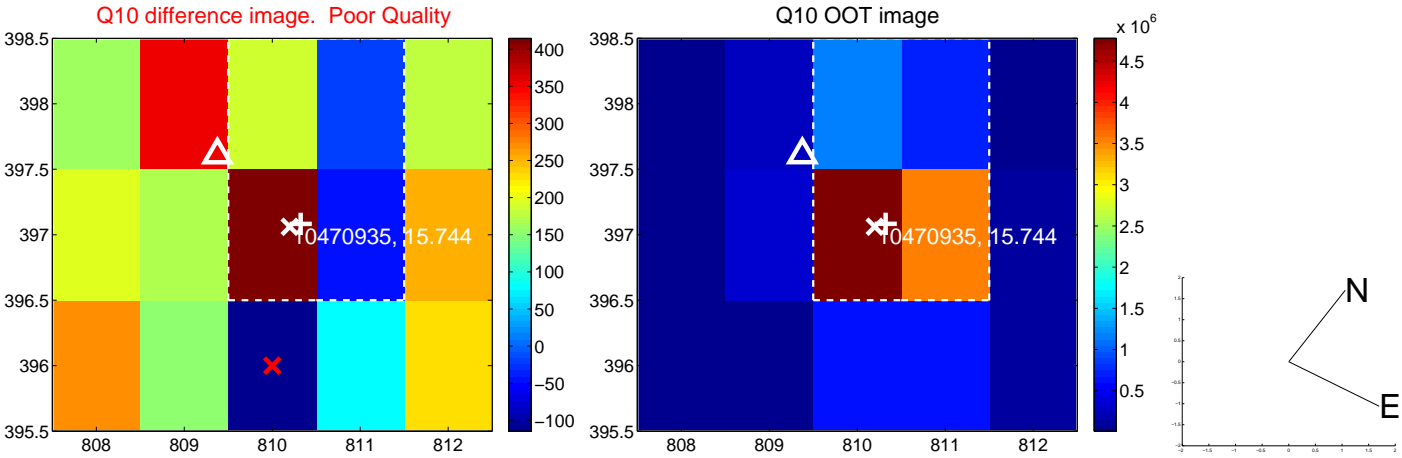
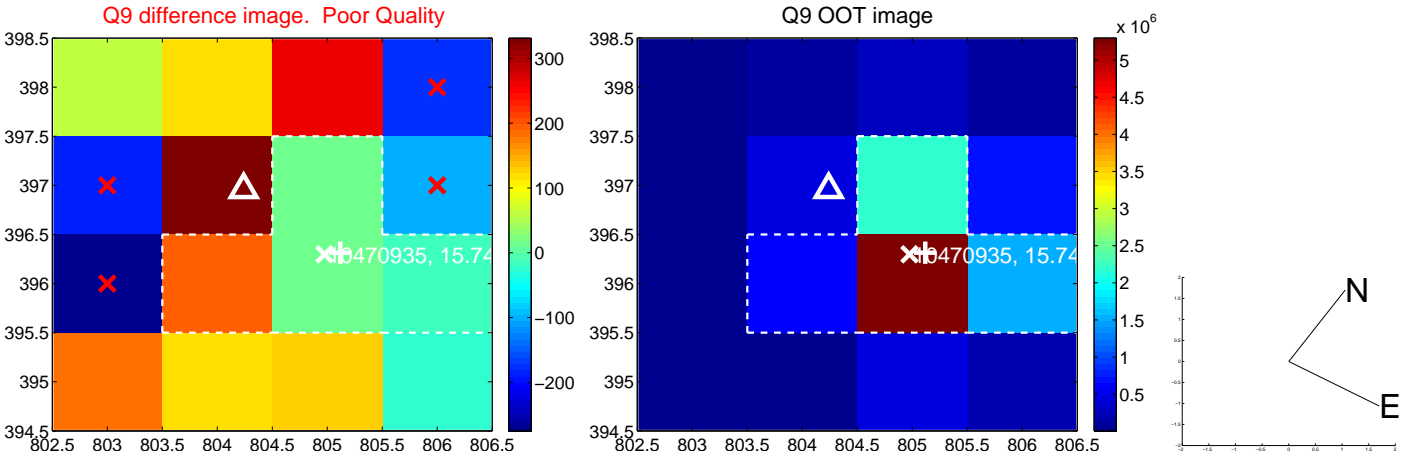
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



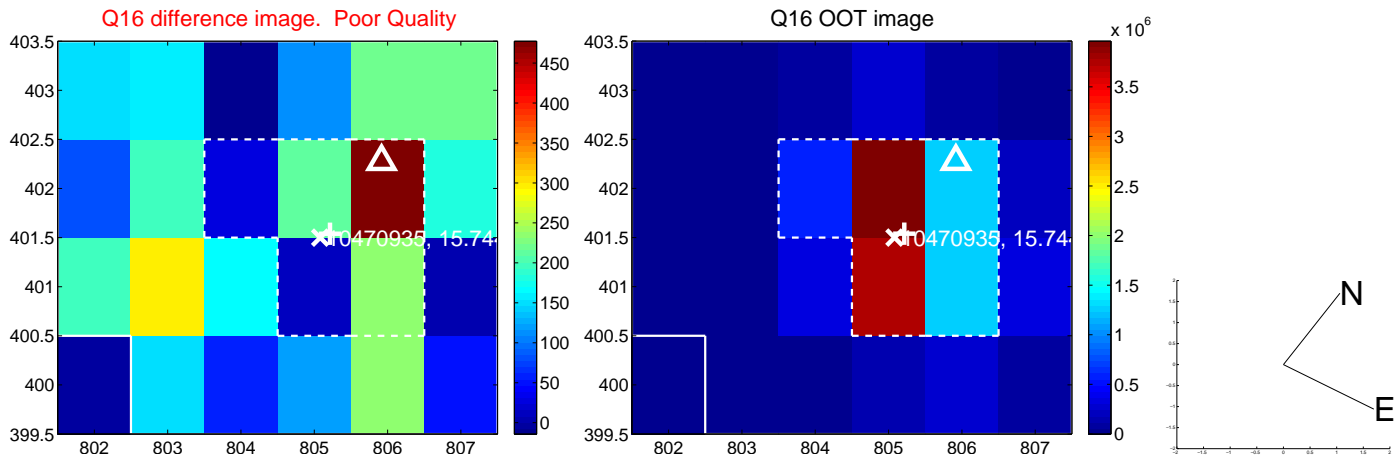
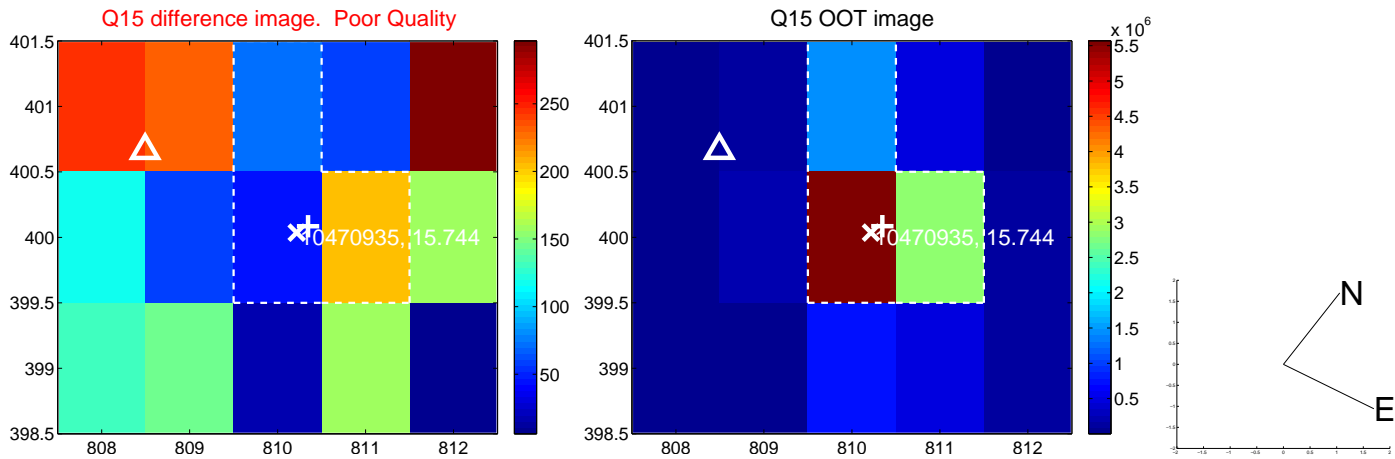
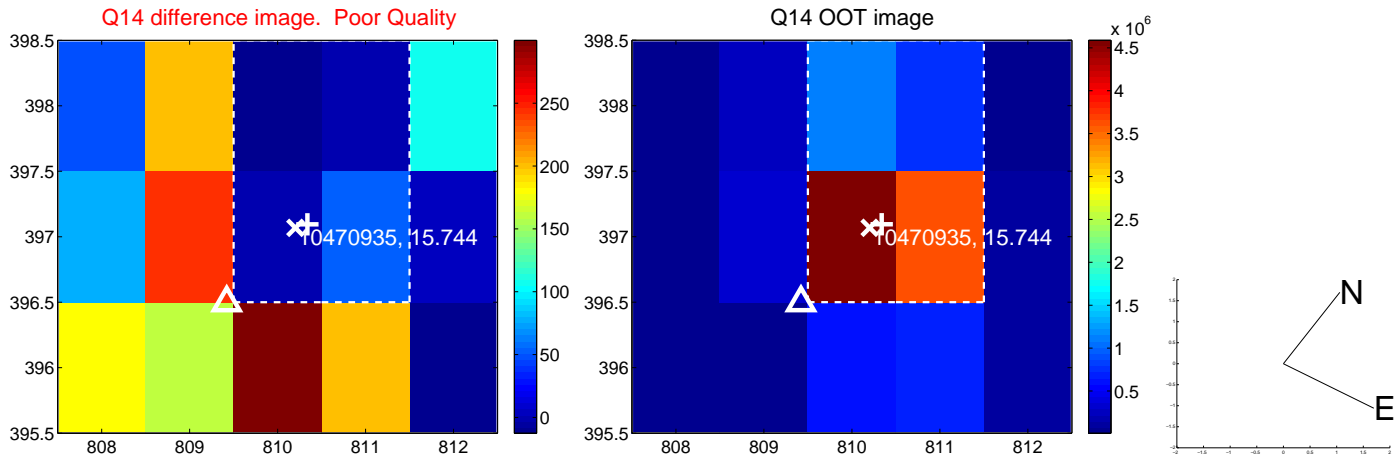
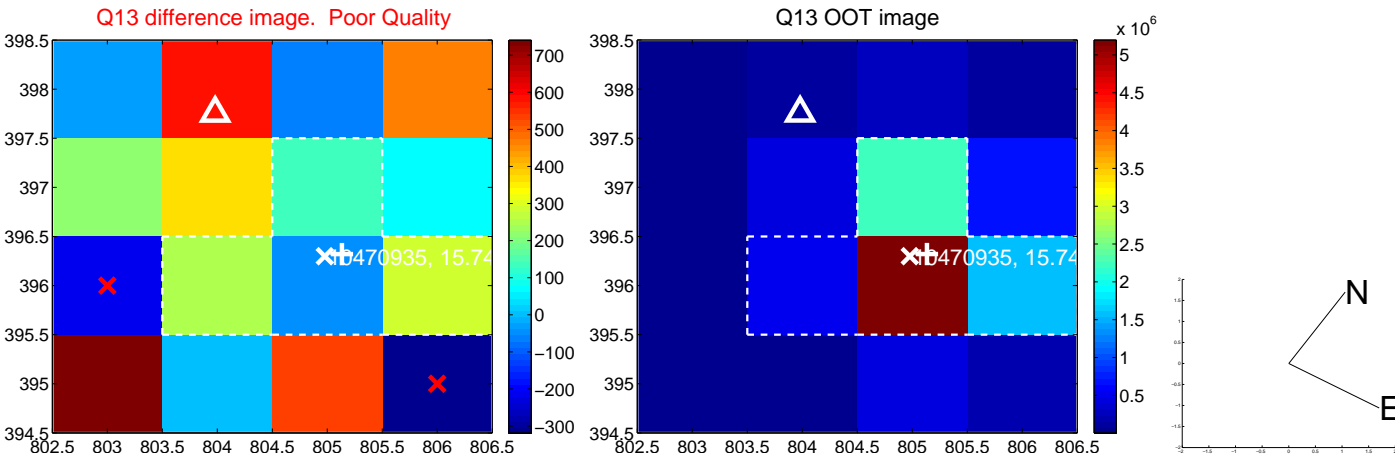
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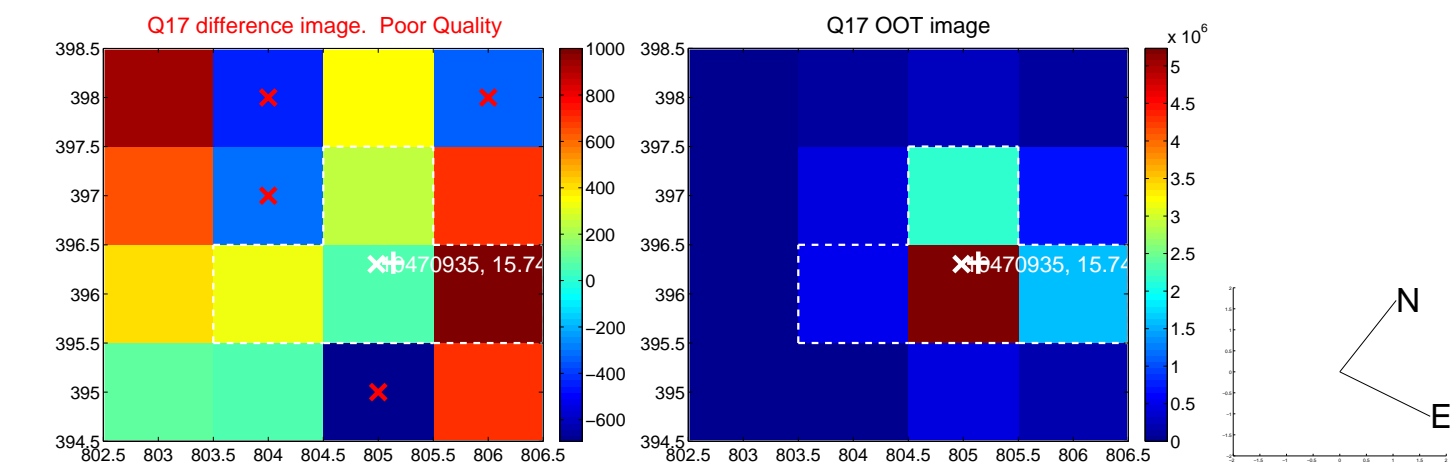
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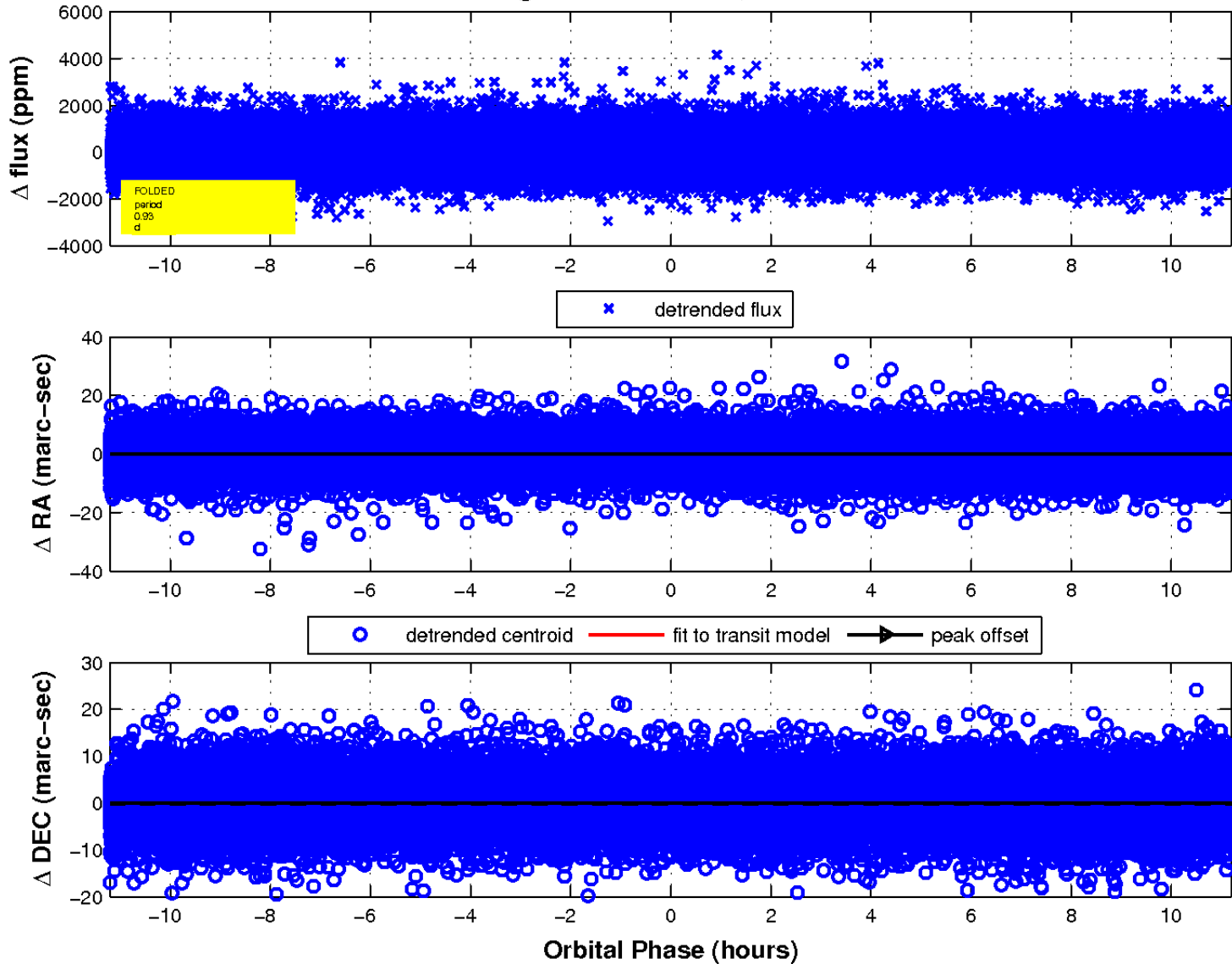
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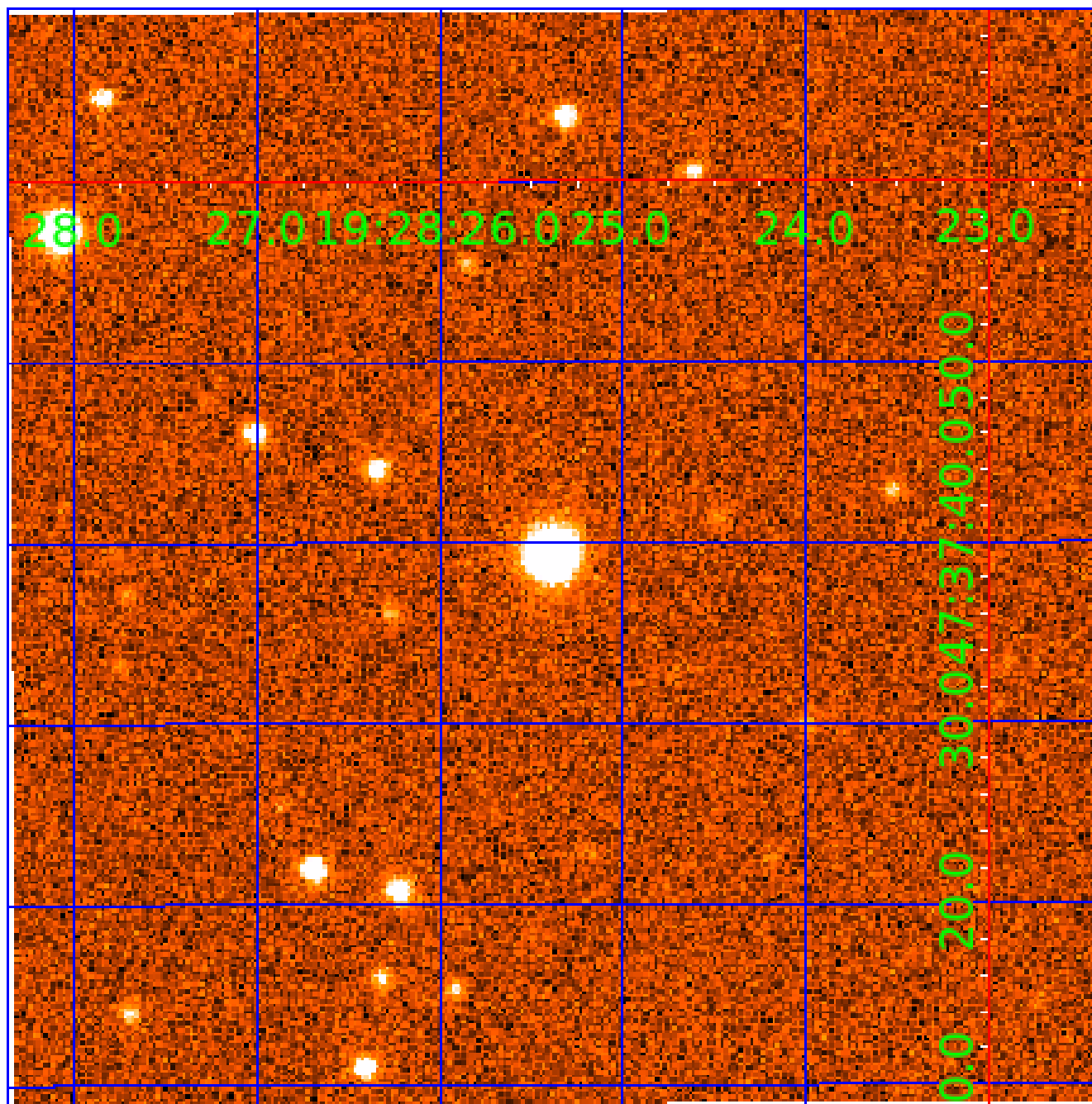


fluxWeightedCentroids, Planet 1 of 7



UKIRT Image

Declination



KIC 010470935

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010470935-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
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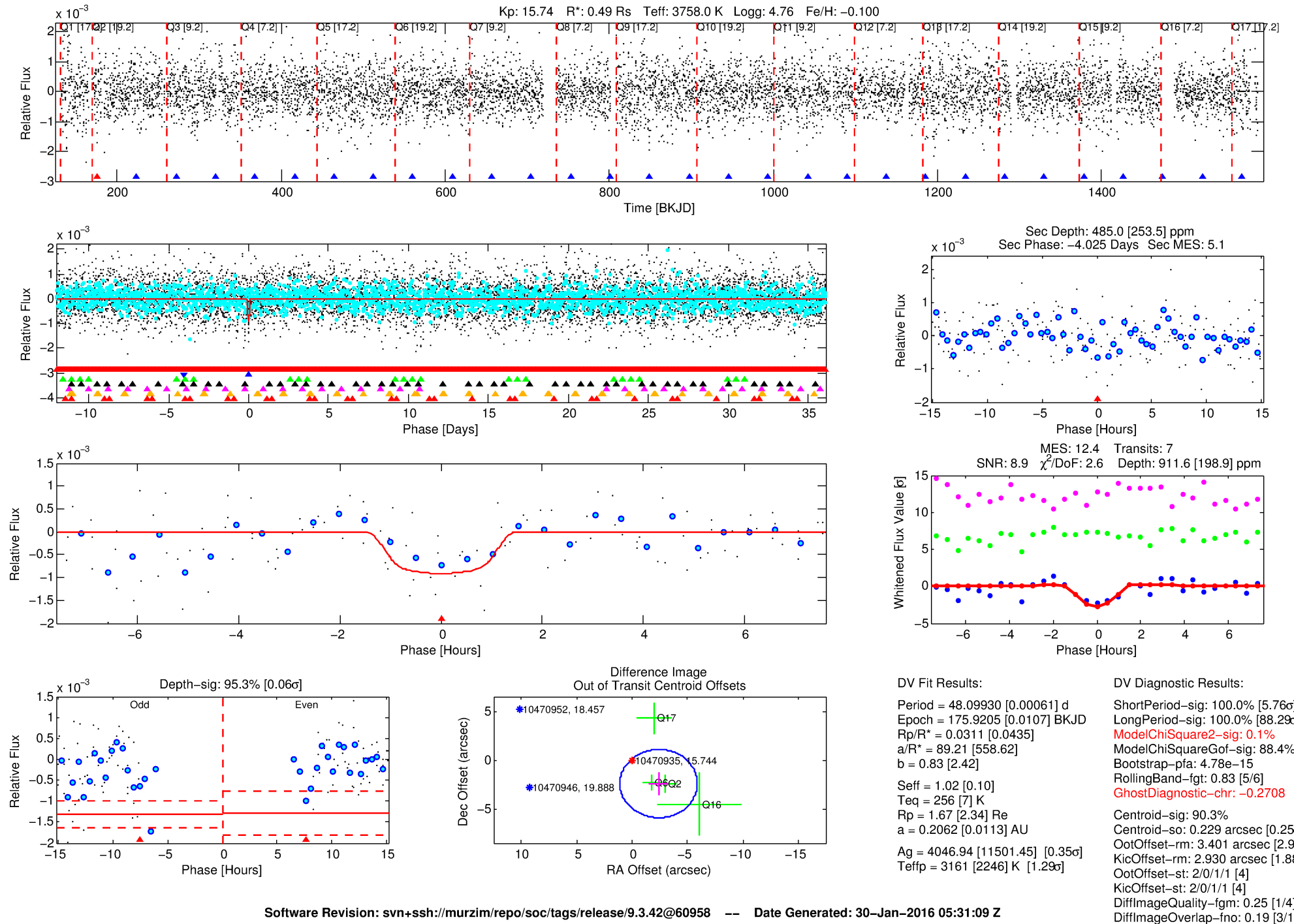
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010470935-02

No Significant Match Found

DV One-Page Summary

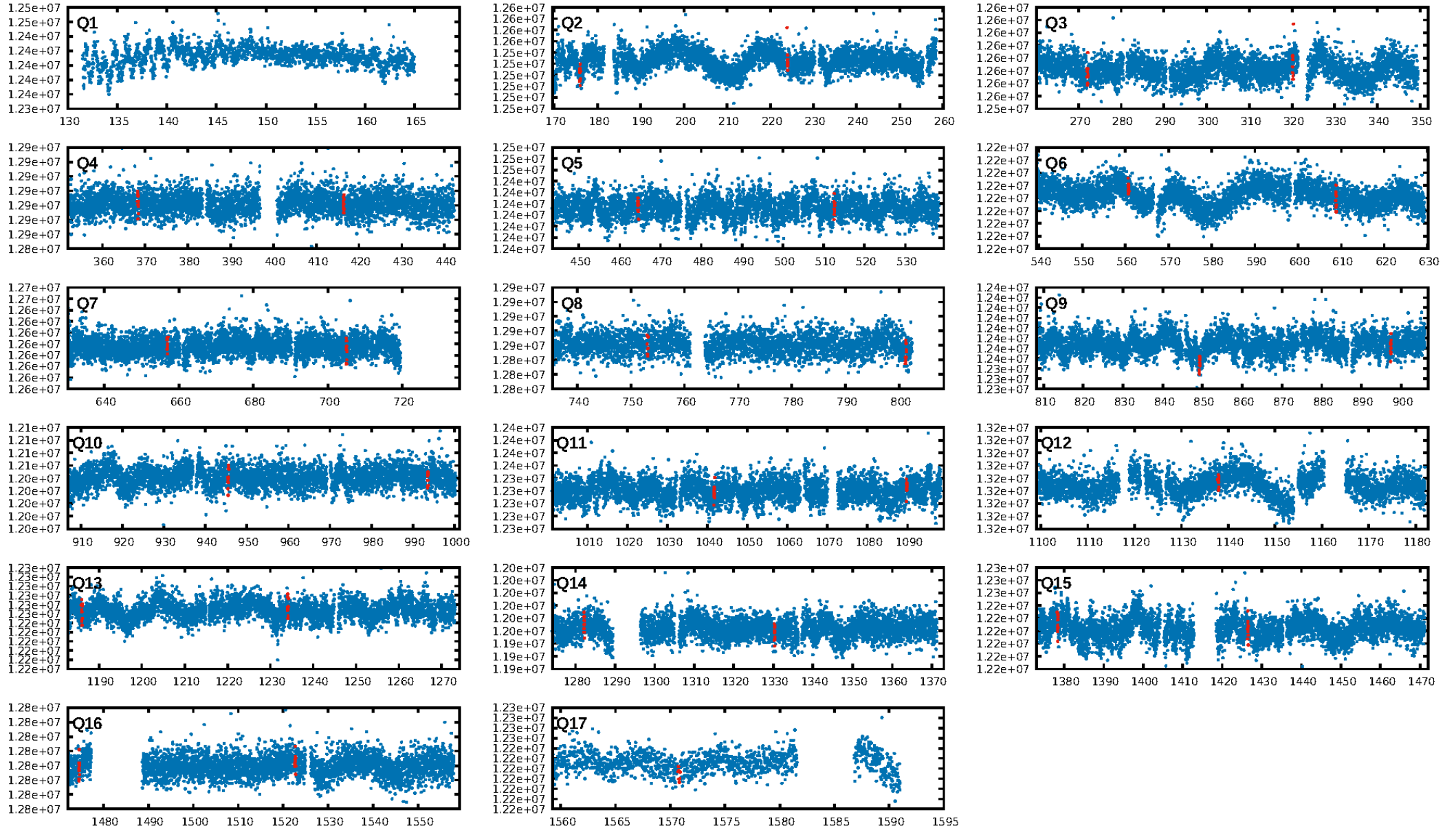
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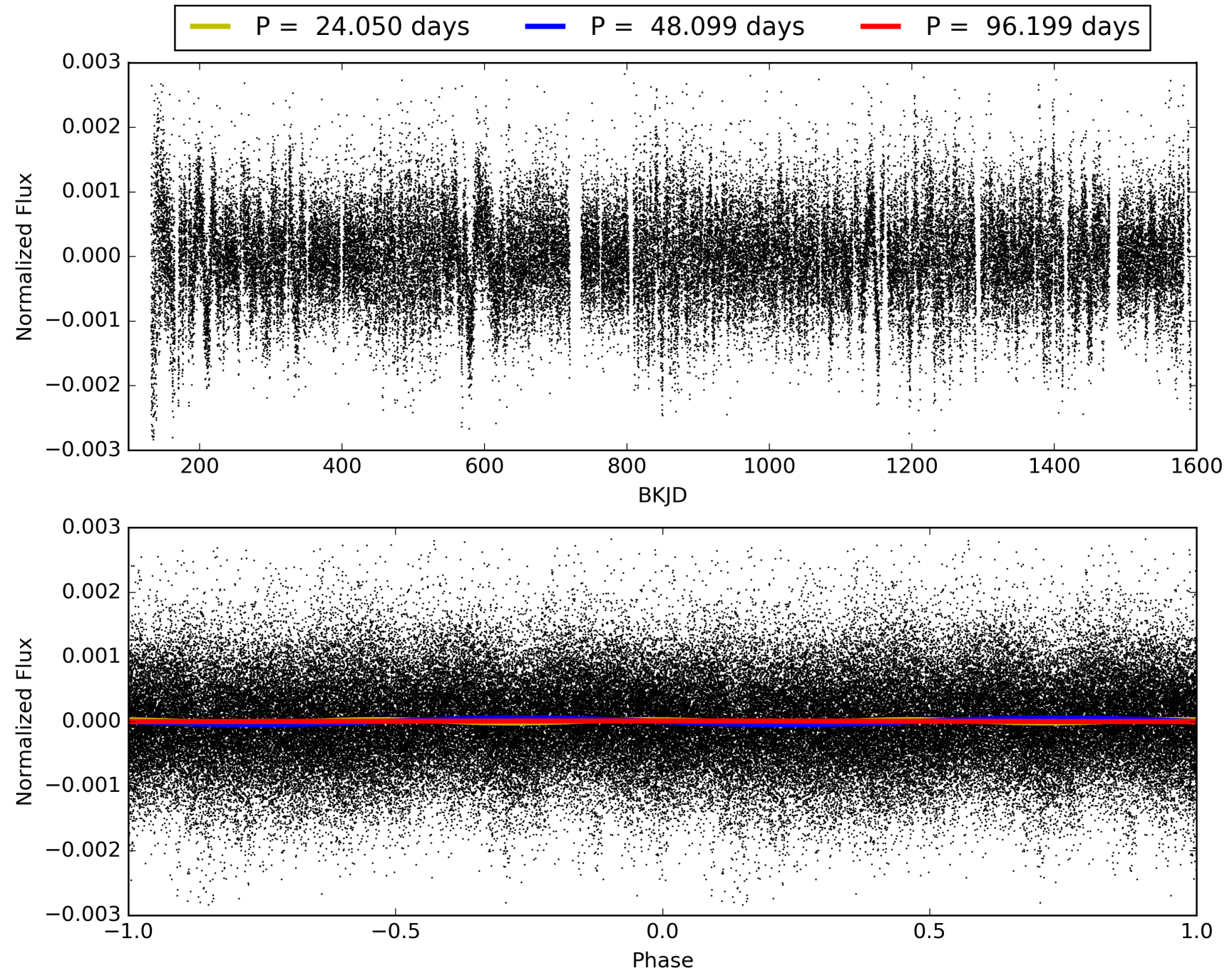
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TCE 010470935-02, PDC Light Curves

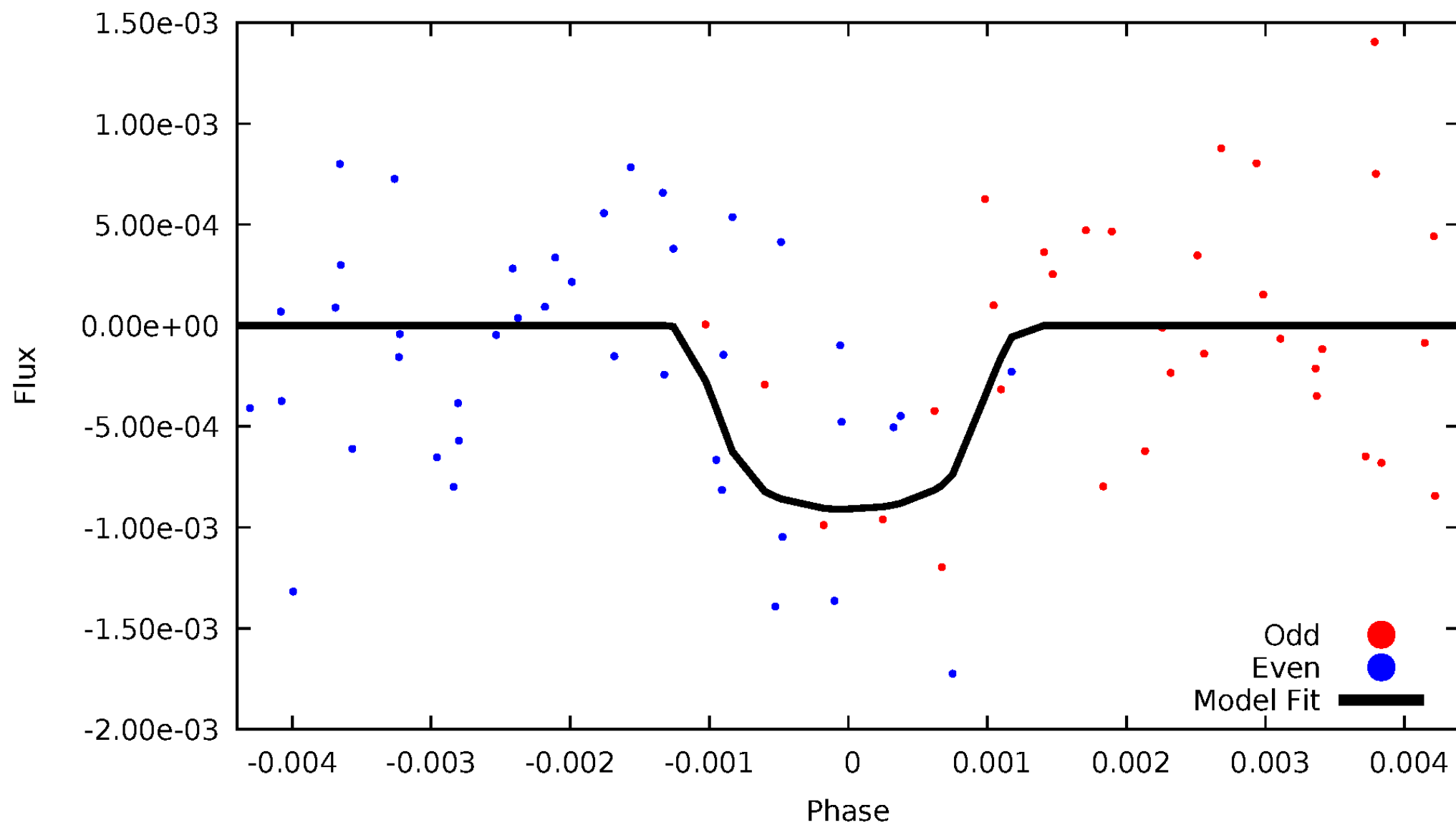


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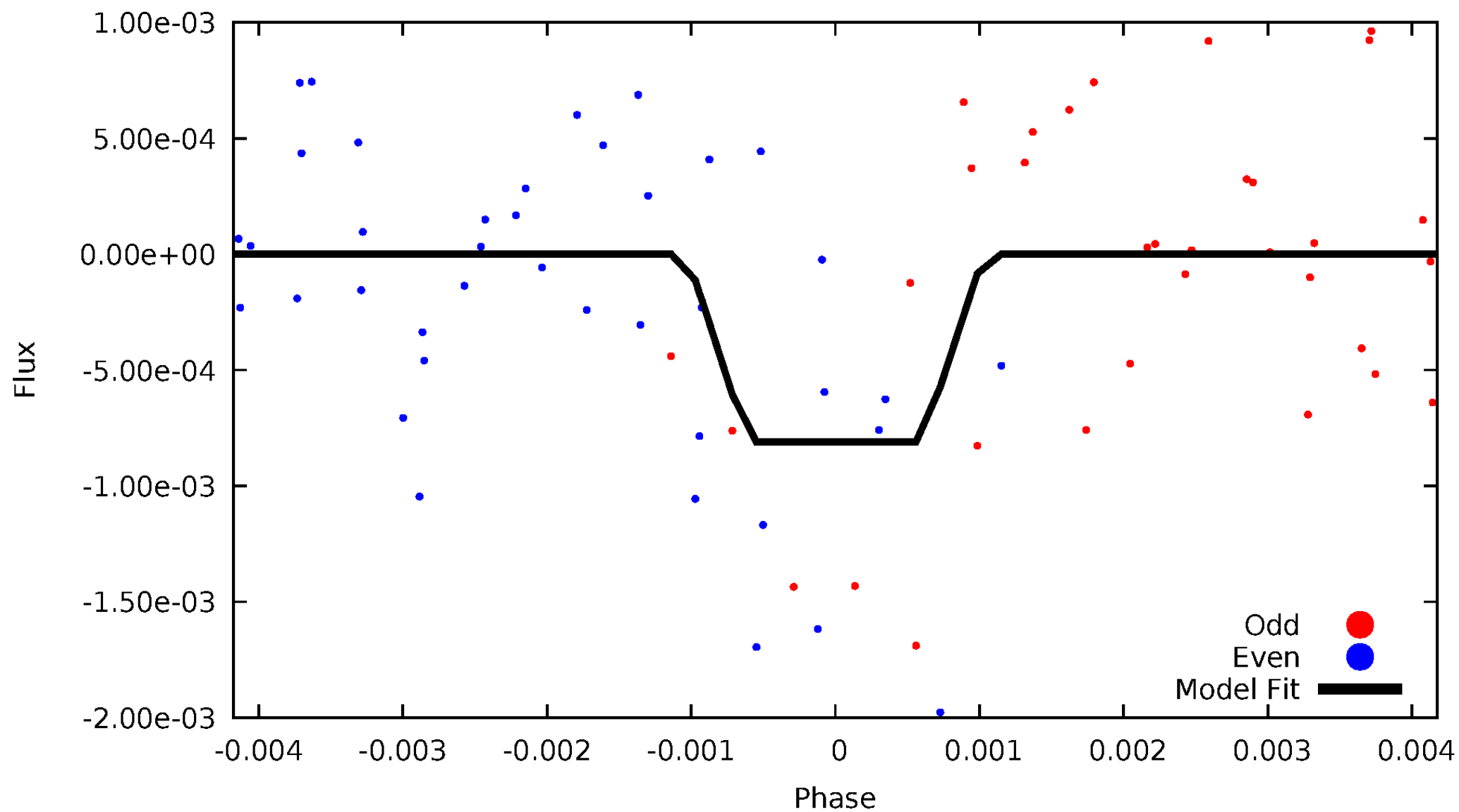
DV Odd/Even

TCE 010470935-02



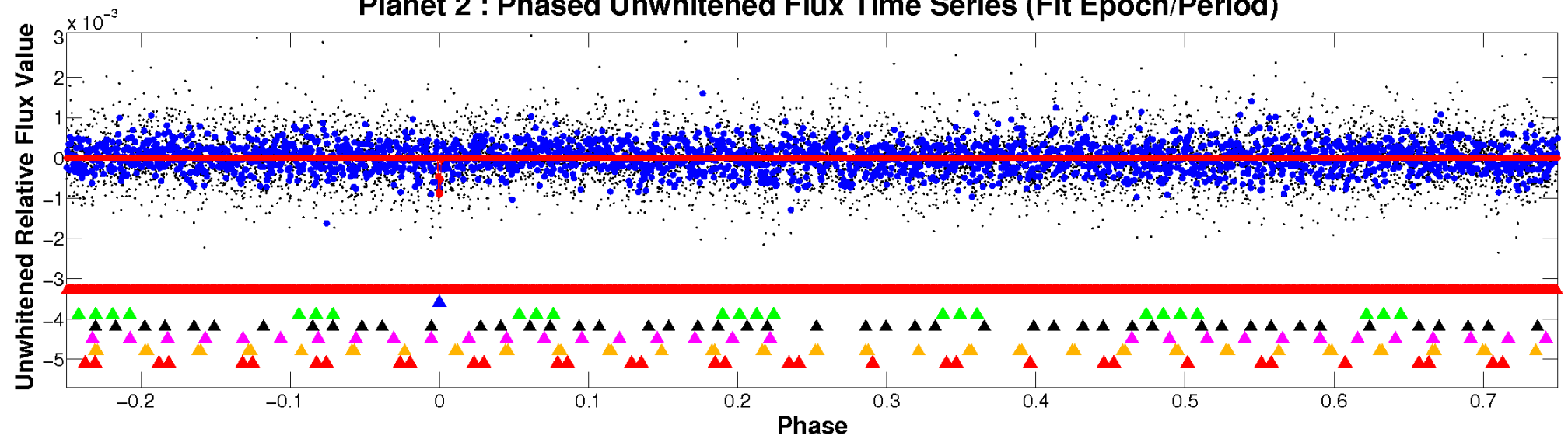
ALT Odd/Even

TCE 010470935-02

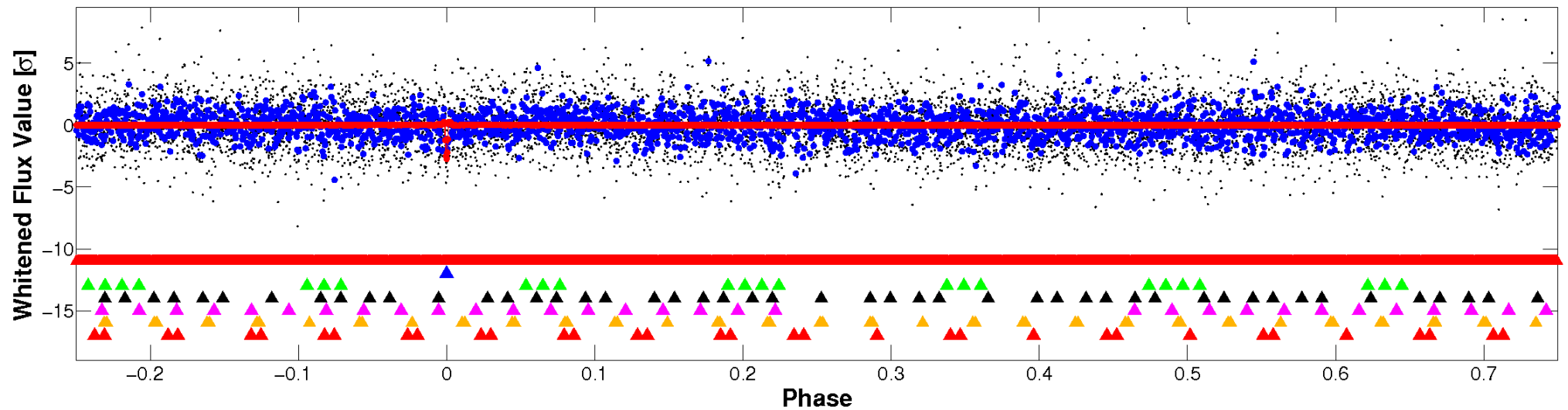


Non-Whitened Vs. Whitened Light Curve

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

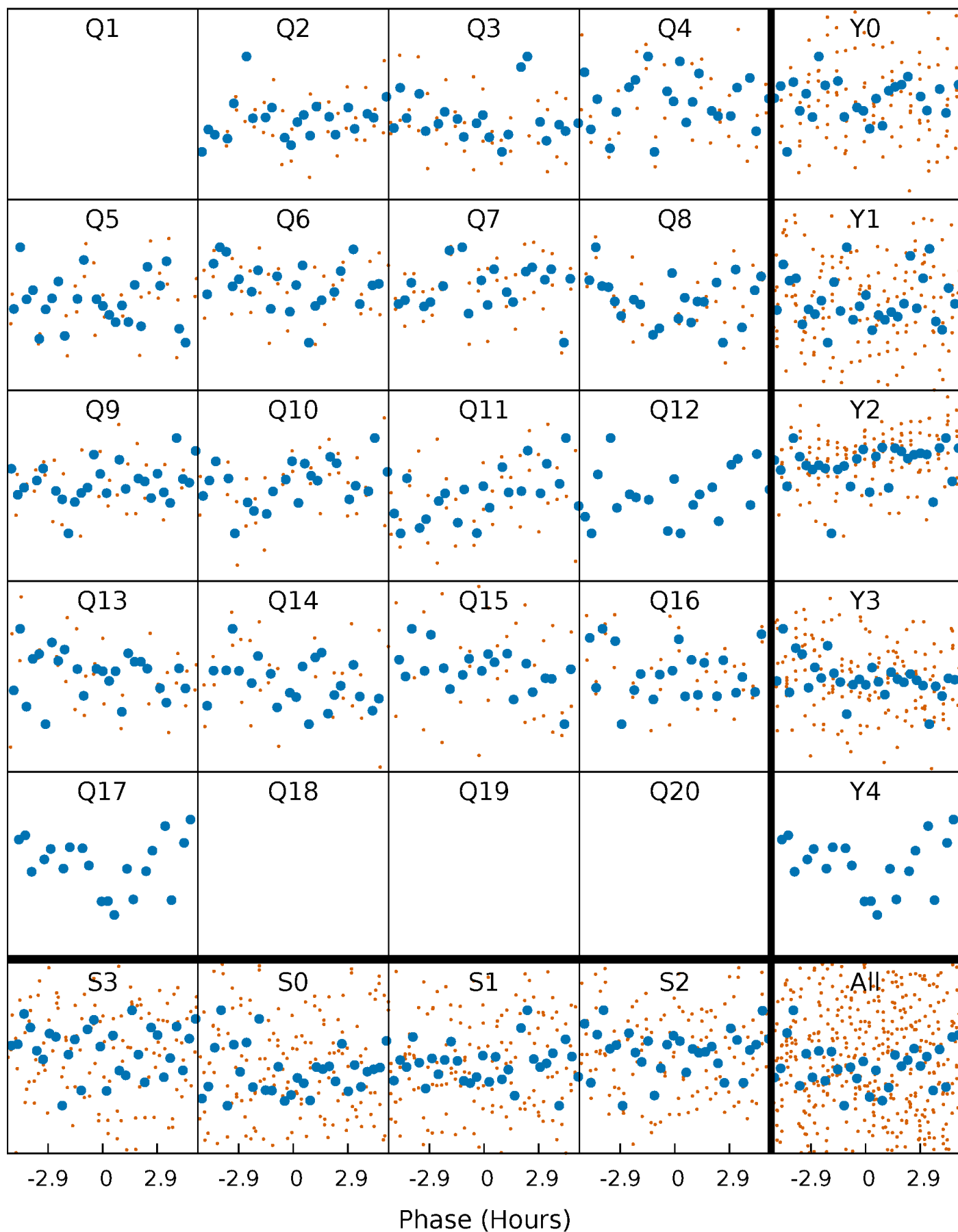


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



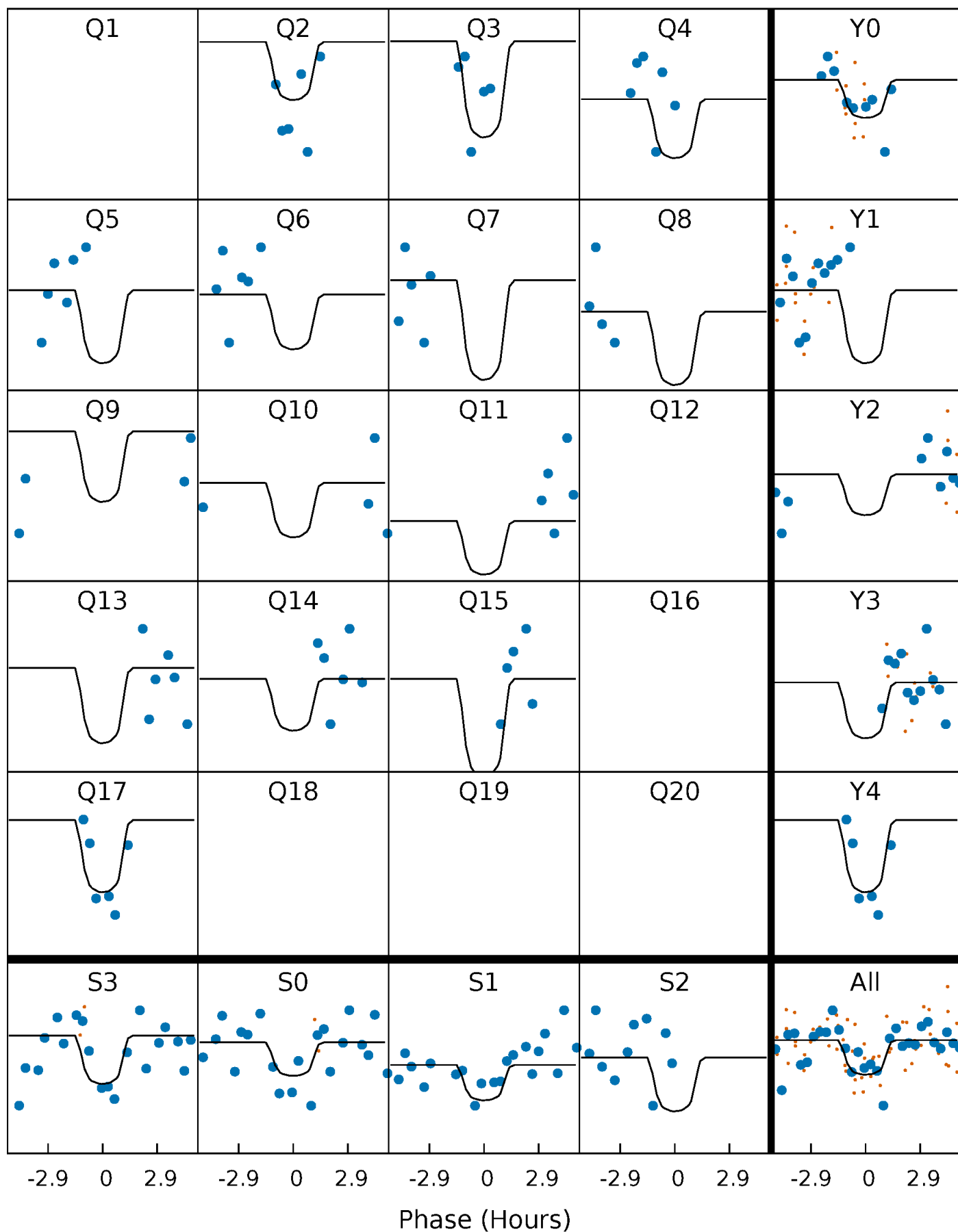
PDC Quarter-Phased Transit Curves

TCE 010470935-02 P= 48.099305 Days $T_0=175.920478$ (BKJD)



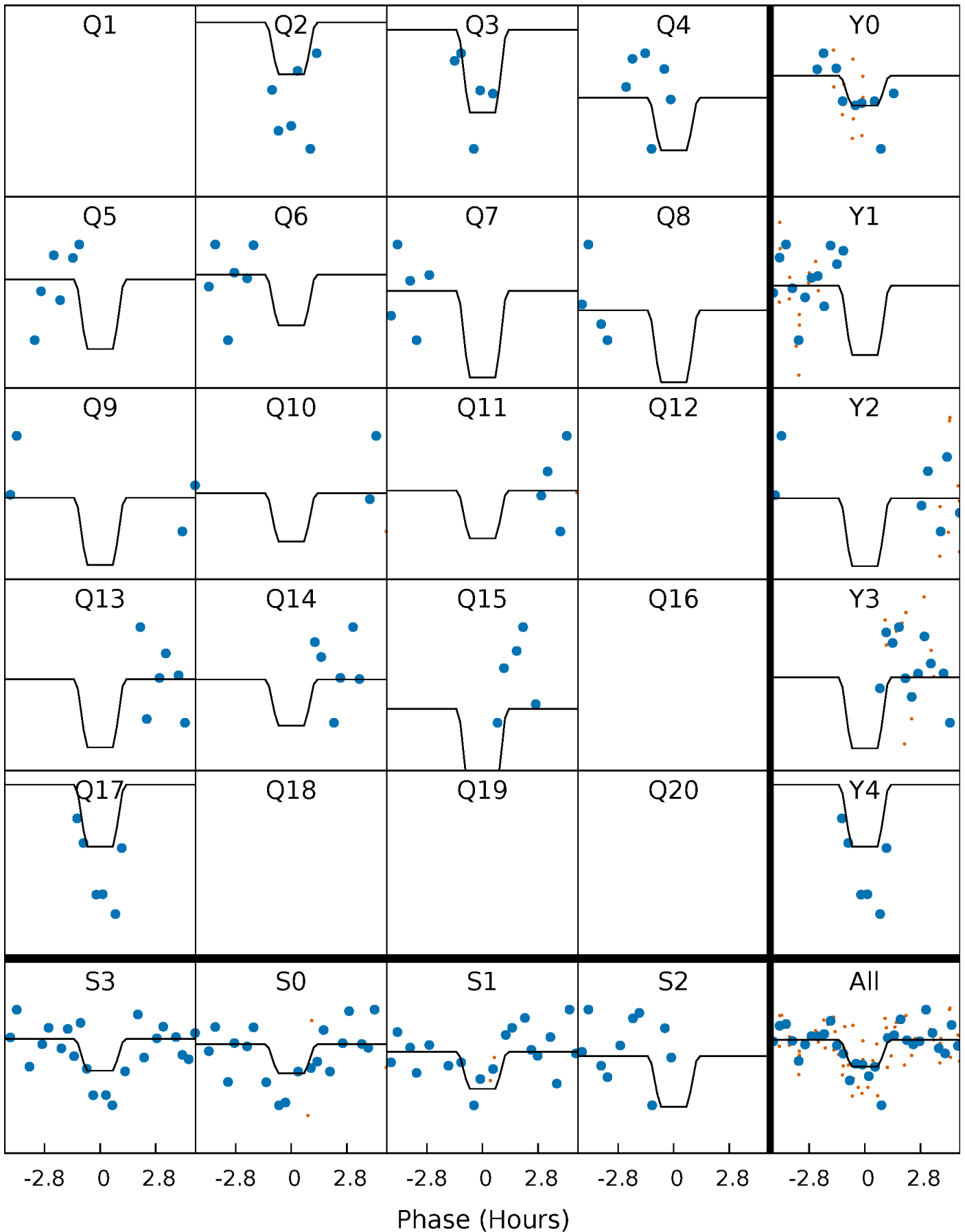
DV Quarter-Phased Transit Curves

TCE 010470935-02 $P = 48.099305$ Days $T_0 = 175.920478$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

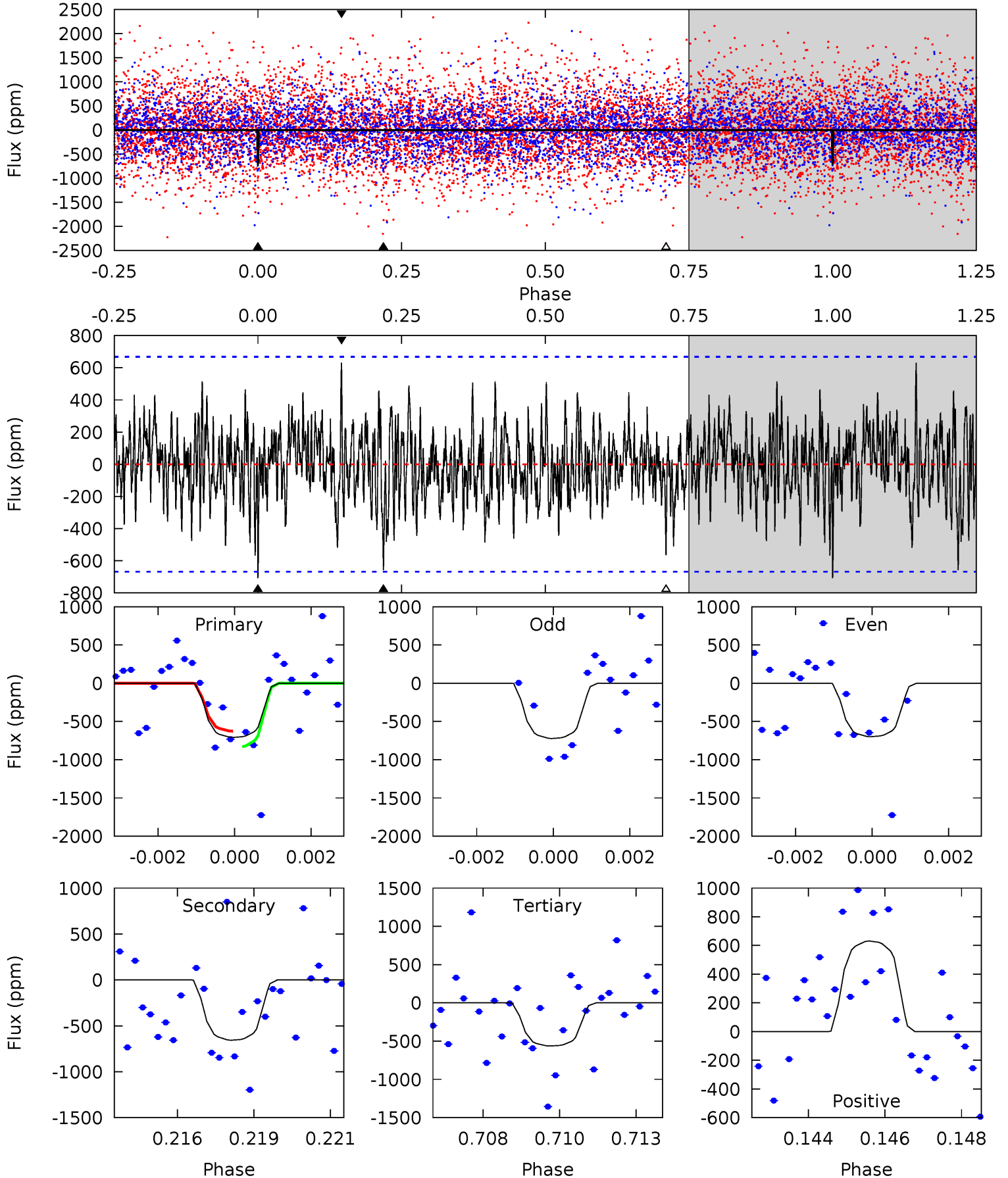
TCE 010470935-02 $P = 48.099454$ Days $T_0 = 175.921516$ (BKJD)



DV Model-Shift Uniqueness Test

010470935-02, P = 48.099305 Days, E = 127.821173 Days

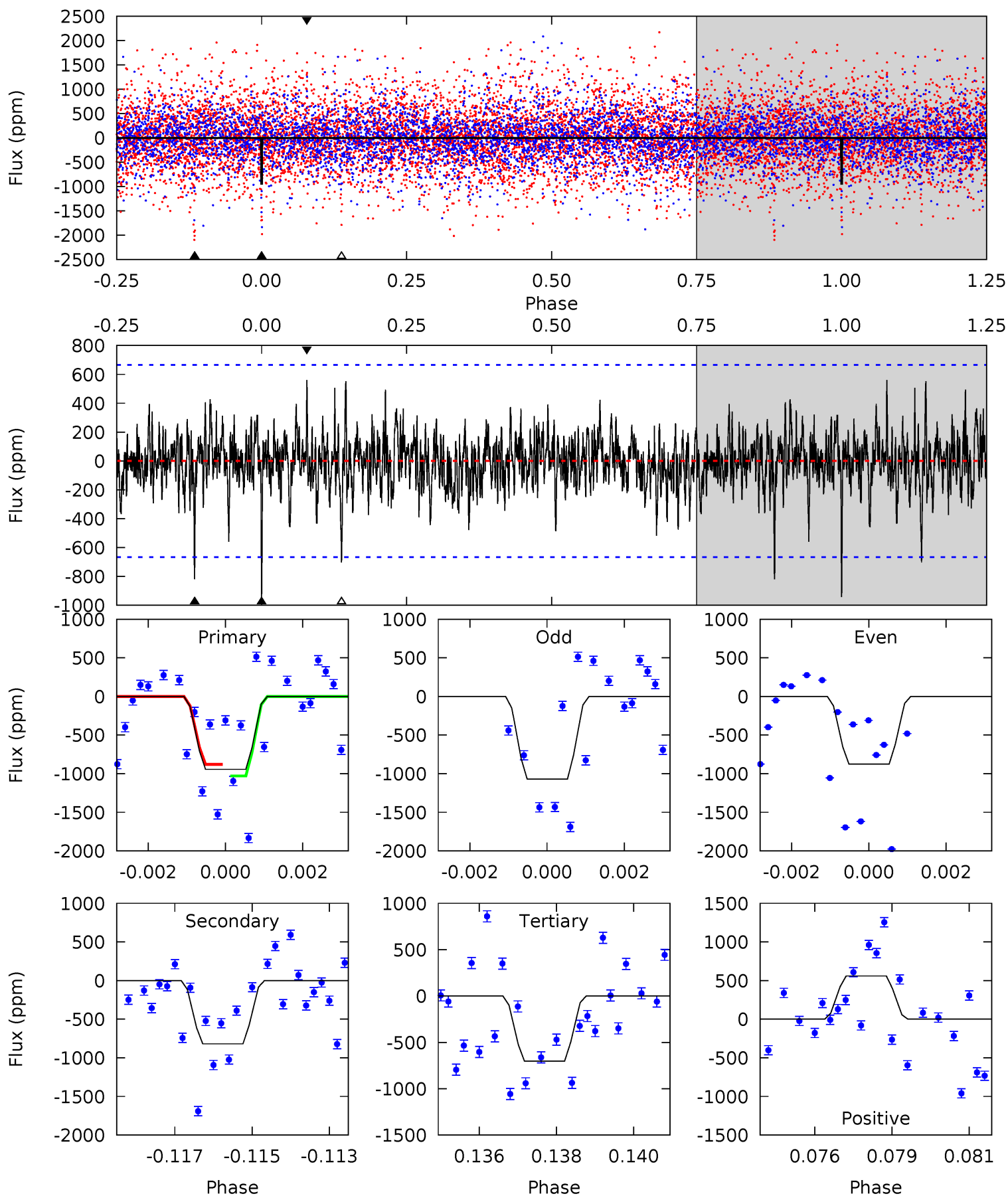
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.62	5.21	4.47	5.00	5.29	3.03	1.46	1.15	0.61	0.74	0.20	0.09	0.82	0.47	0.80



Alt Model-Shift Uniqueness Test

010470935-02, P = 48.099454 Days, E = 127.822062 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.53	6.54	5.60	4.47	5.32	3.07	1.24	1.92	3.06	0.94	2.07	0.77	0.95	0.37	0.60



Stellar Parameters For KIC 010470935

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3758^{+68}_{-68}	$4.756^{+0.036}_{-0.024}$	$-0.100^{+0.100}_{-0.100}$	$0.493^{+0.027}_{-0.035}$	$0.506^{+0.028}_{-0.031}$	$5.930^{+0.972}_{-0.620}$
	+2%/-2%	+1%/-1%	+100%/-100%	+5%/-7%	+6%/-6%	+16%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010470935-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-657 ± 126	$2.34^{+2.00}_{-1.49}$	357^{+8}_{-8}	3170^{+1279}_{-504}	2769^{+18094}_{-1999}
Alt.	-819 ± 125	$2.45^{+1.90}_{-1.62}$	357^{+8}_{-8}	3253^{+1454}_{-514}	3341^{+23405}_{-2369}

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

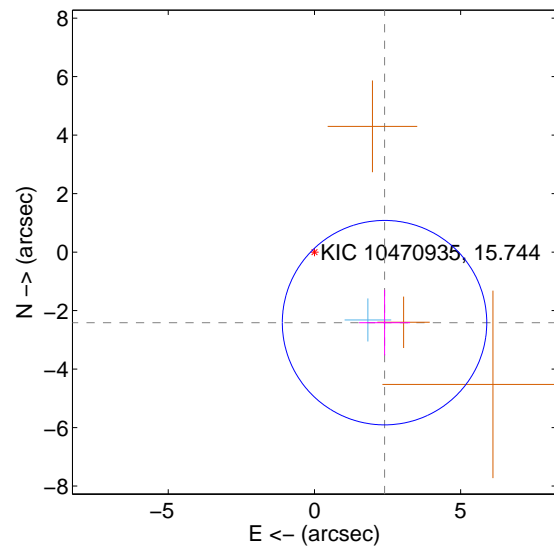
Supplemental centroid analysis for 010470935-02. Kepler magnitude: 15.74. Transit SNR 8.86

There are 1 quarters with good PRF difference image offsets

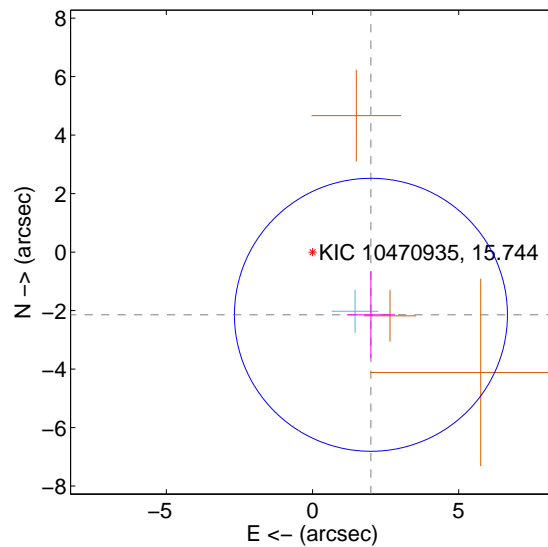
The direct PRF centroid is offset from the target star catalog position by about 0.61 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.401 ± 1.165	2.92	-2.397 ± 0.872	-2.413 ± 1.122
PRF-fit source offset from KIC position	2.930 ± 1.556	1.88	-1.997 ± 0.823	-2.144 ± 1.491
photometric centroid source offset	0.23 ± 0.93	0.25	0.09 ± 1.04	0.21 ± 0.91

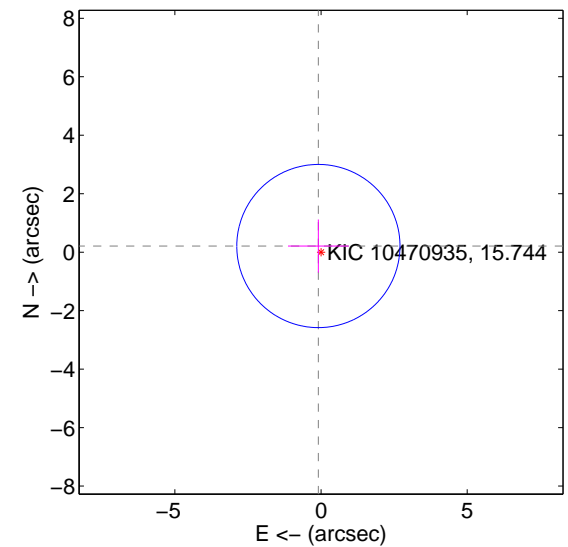
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

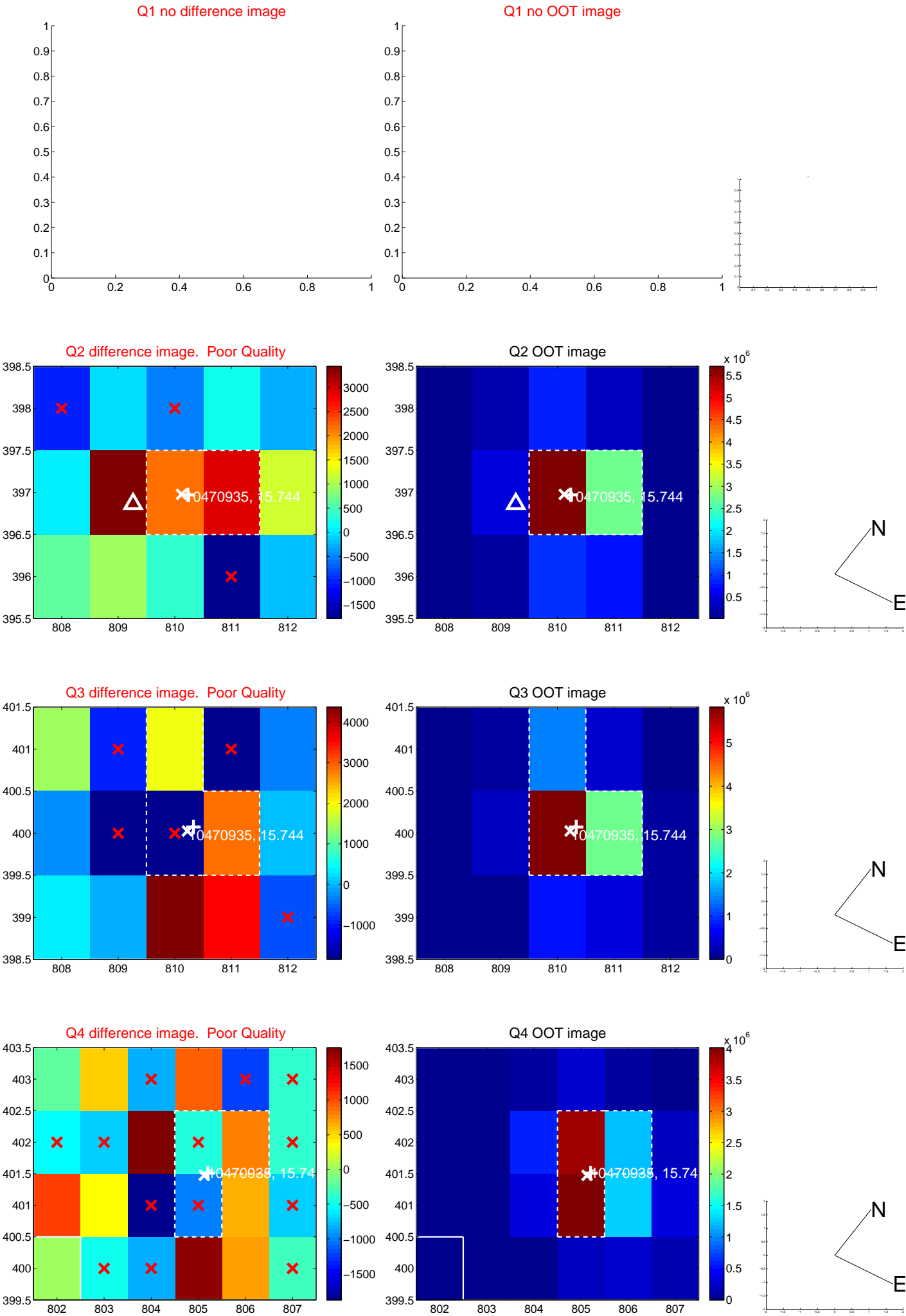


offset from photometric centroids

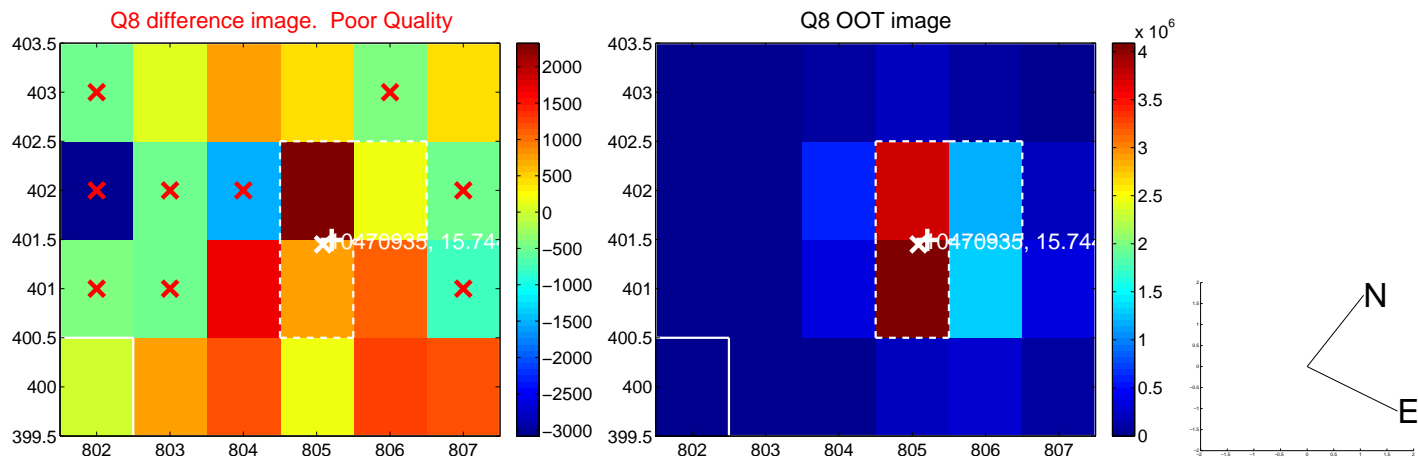
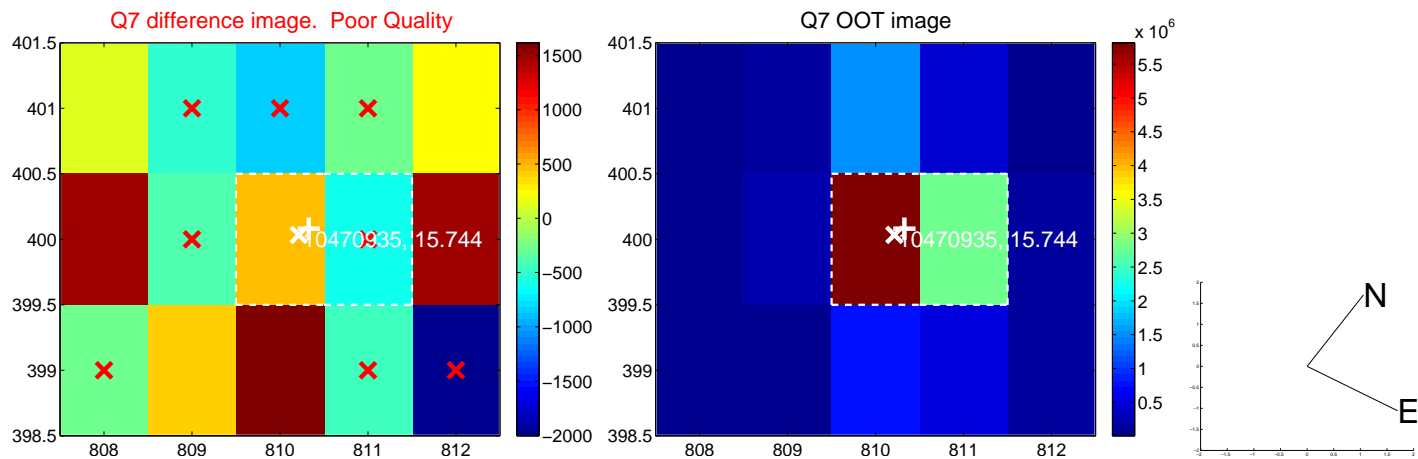
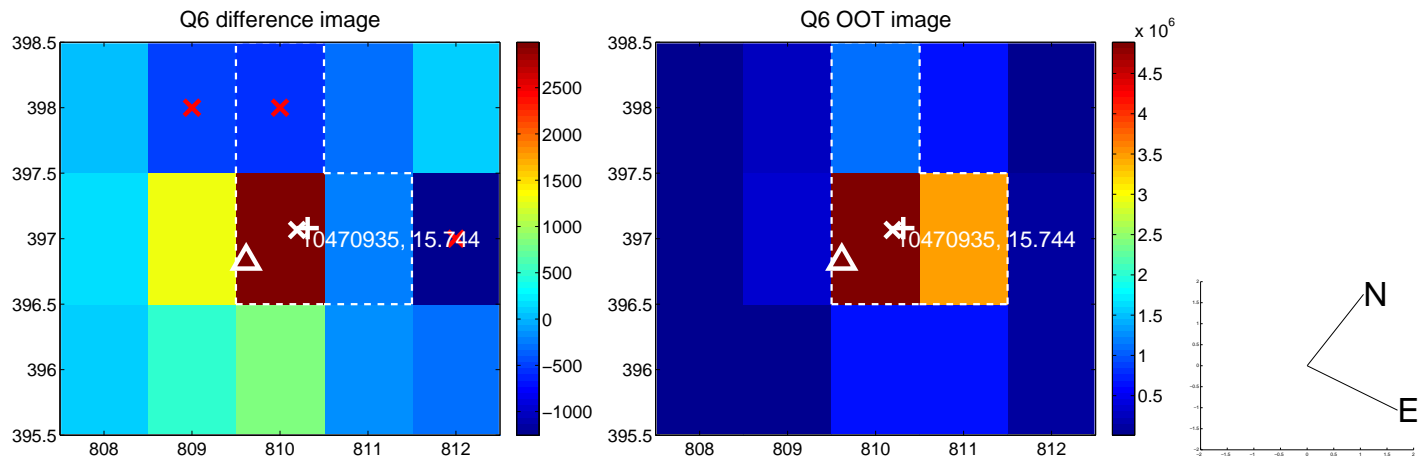
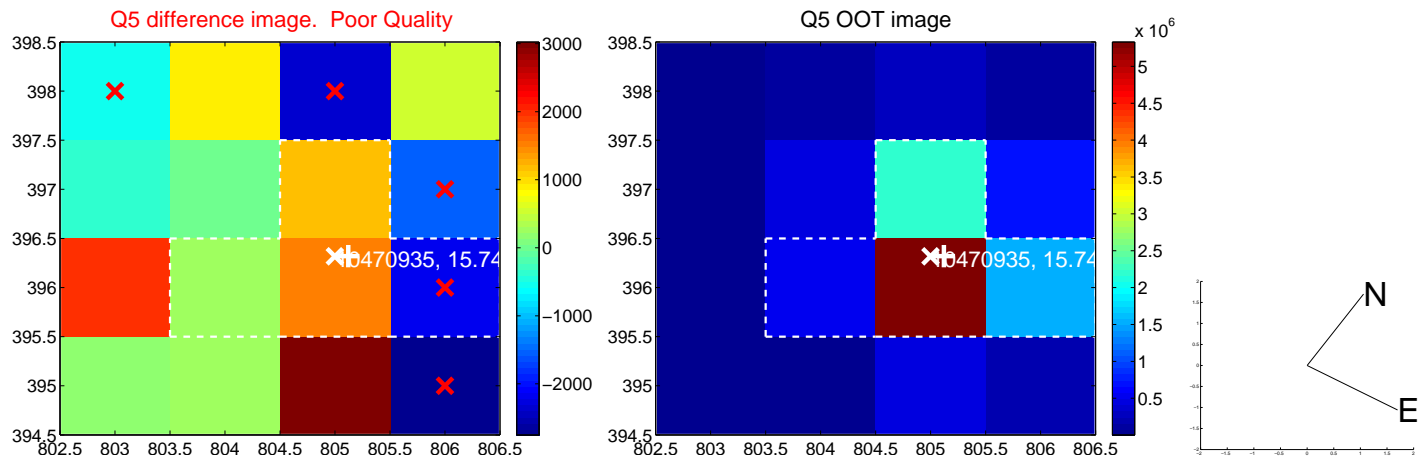


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

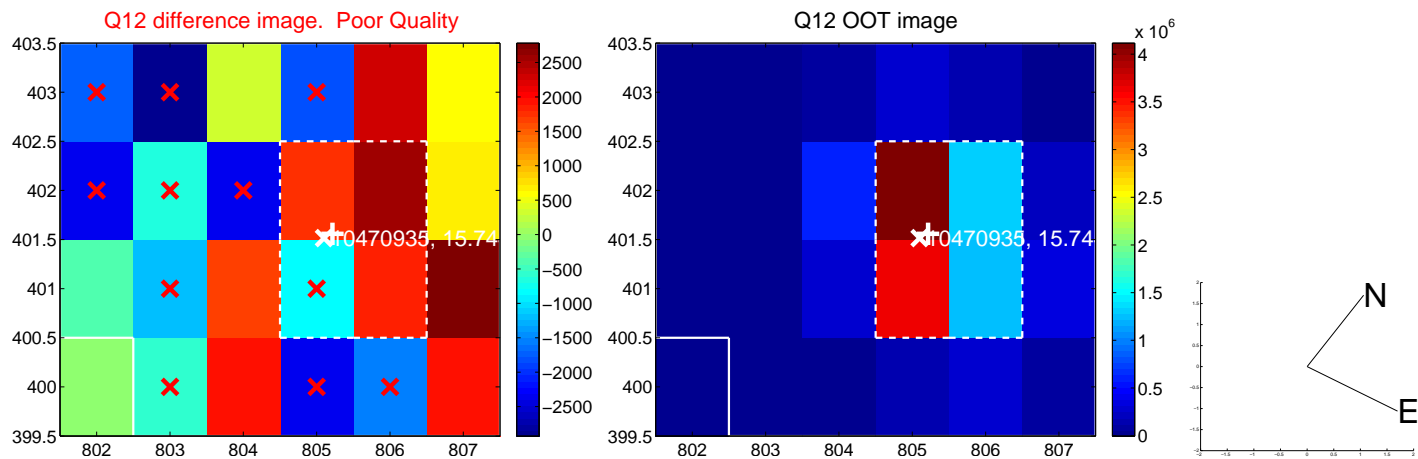
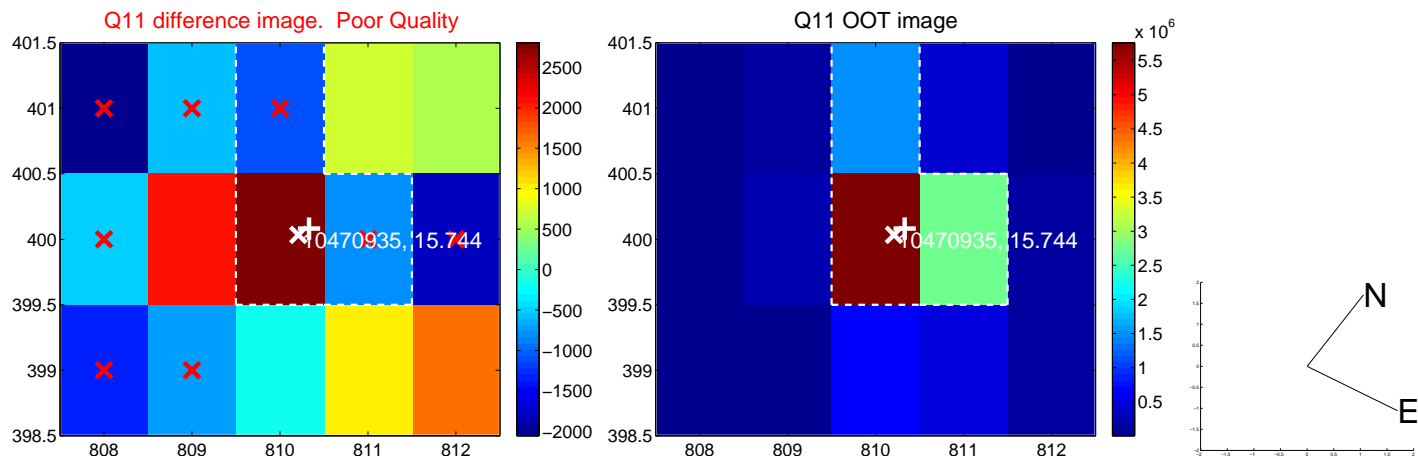
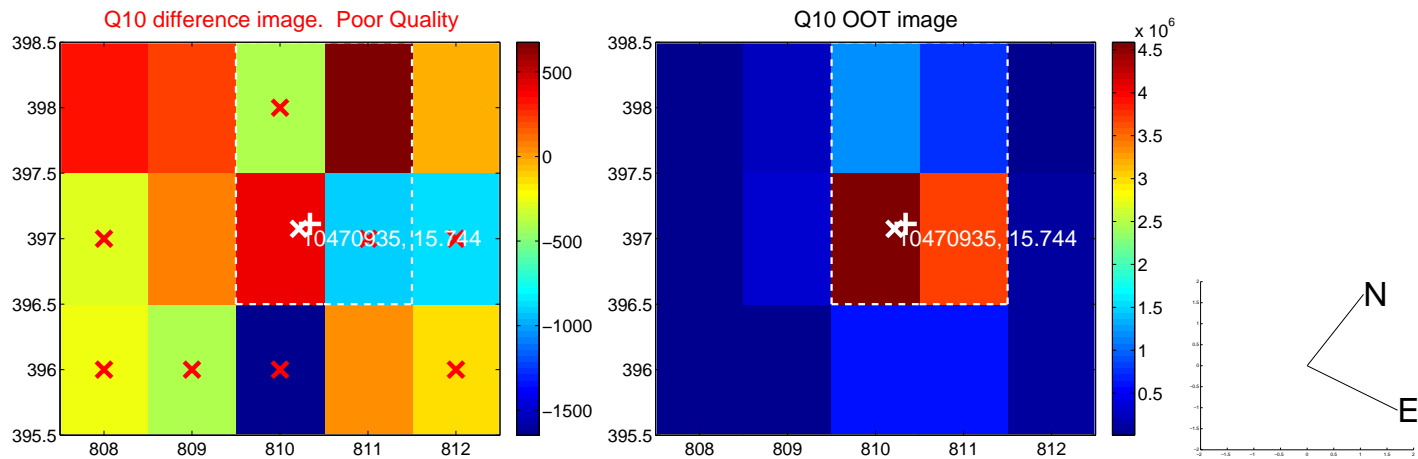
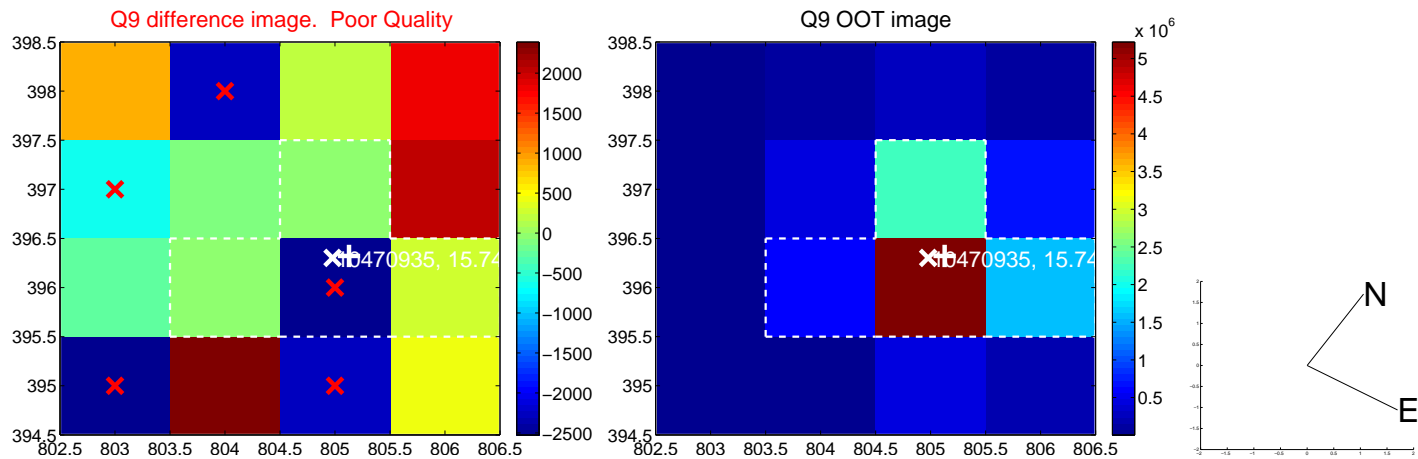
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



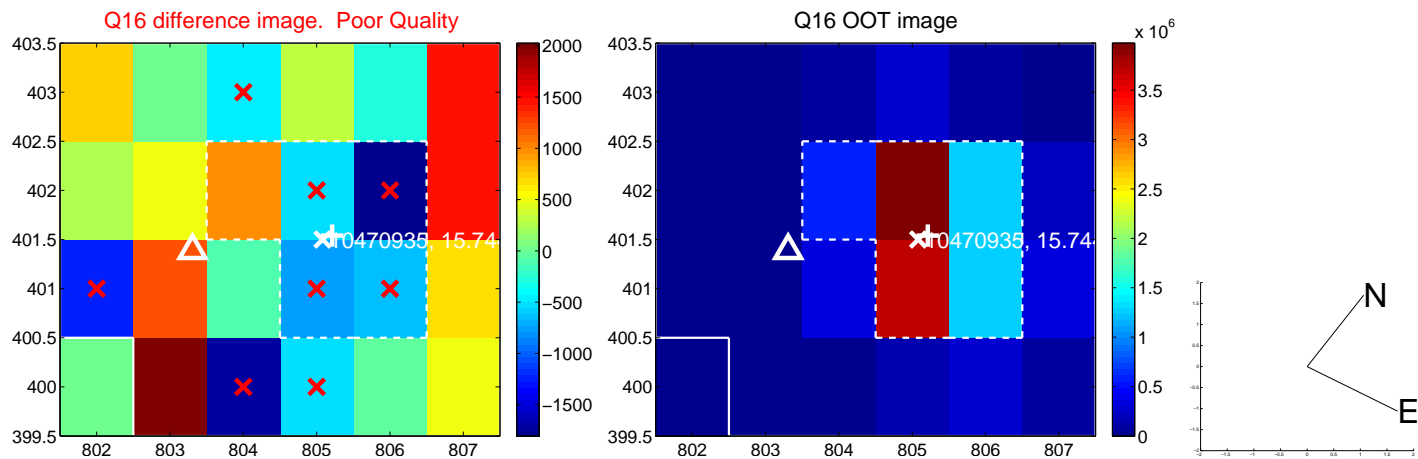
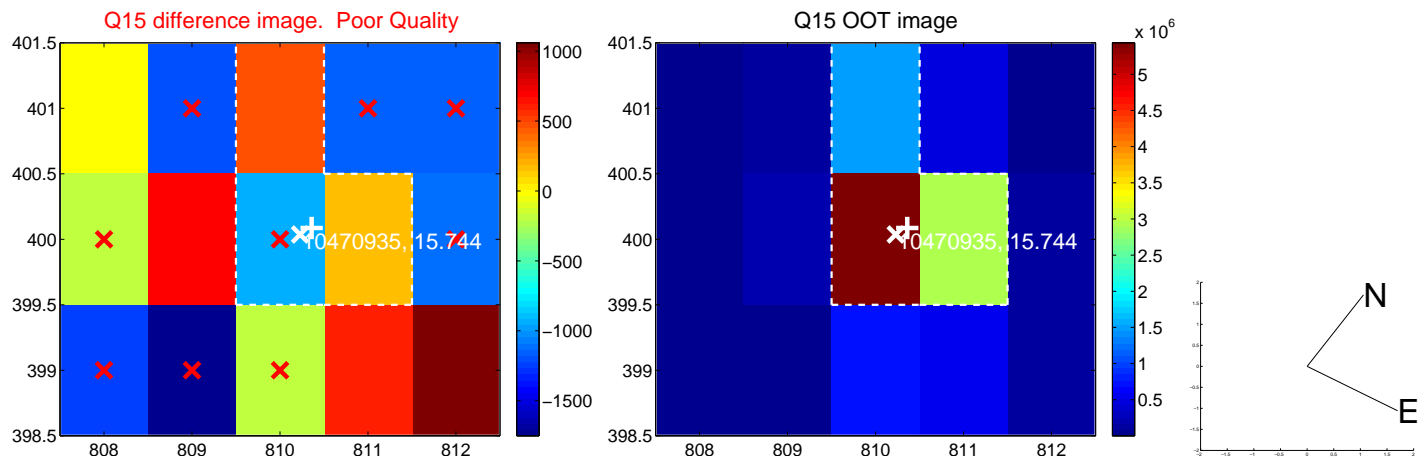
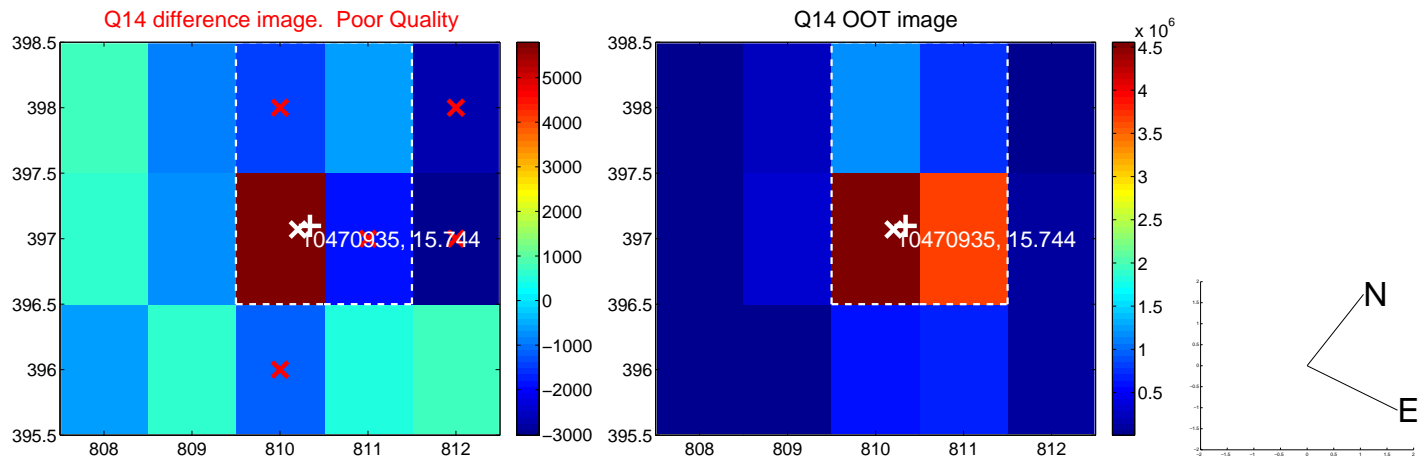
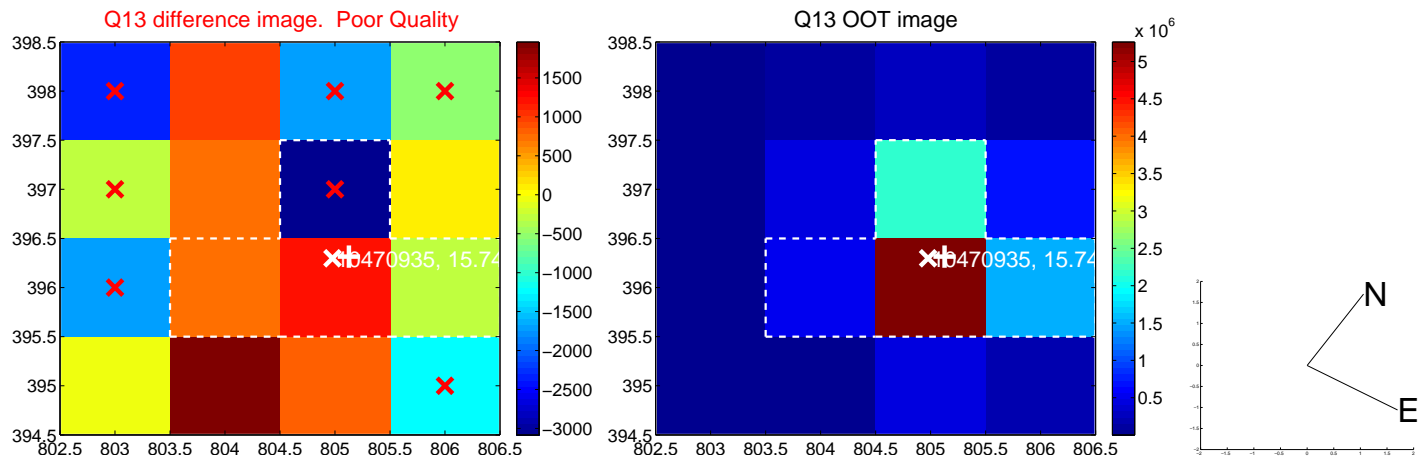
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



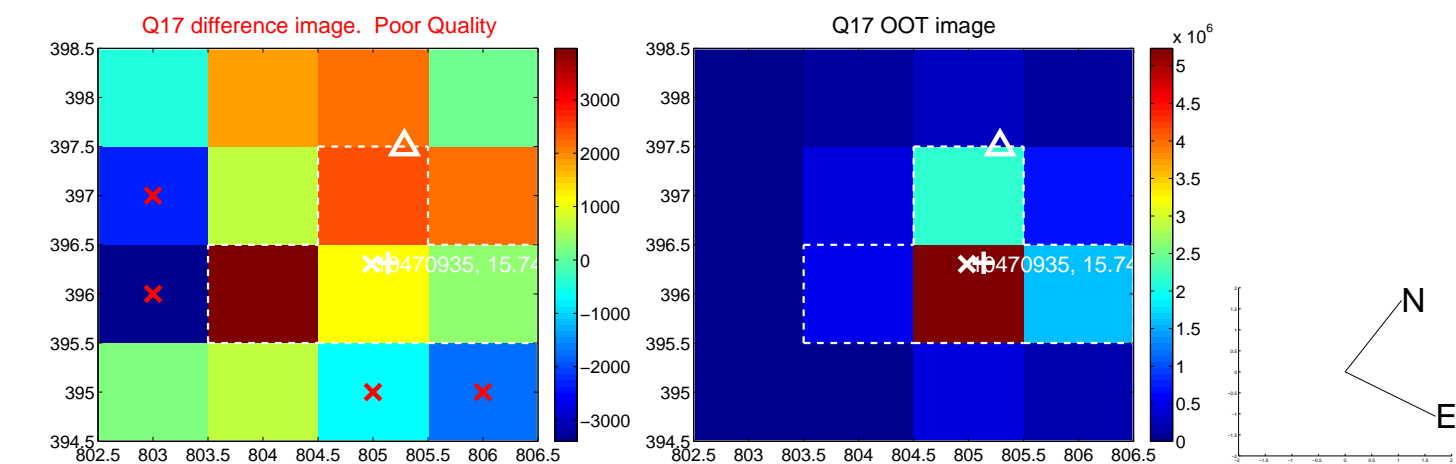
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



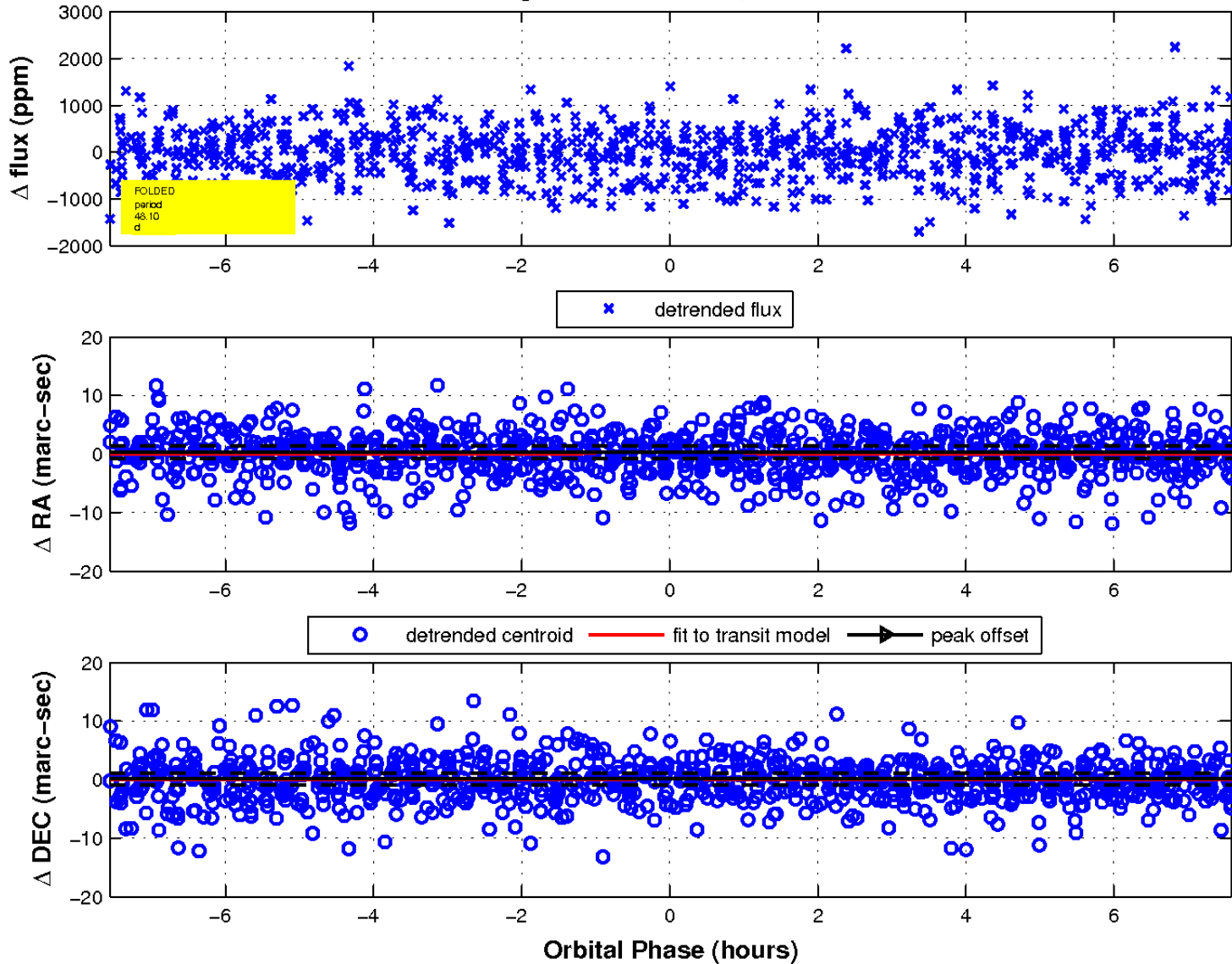
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

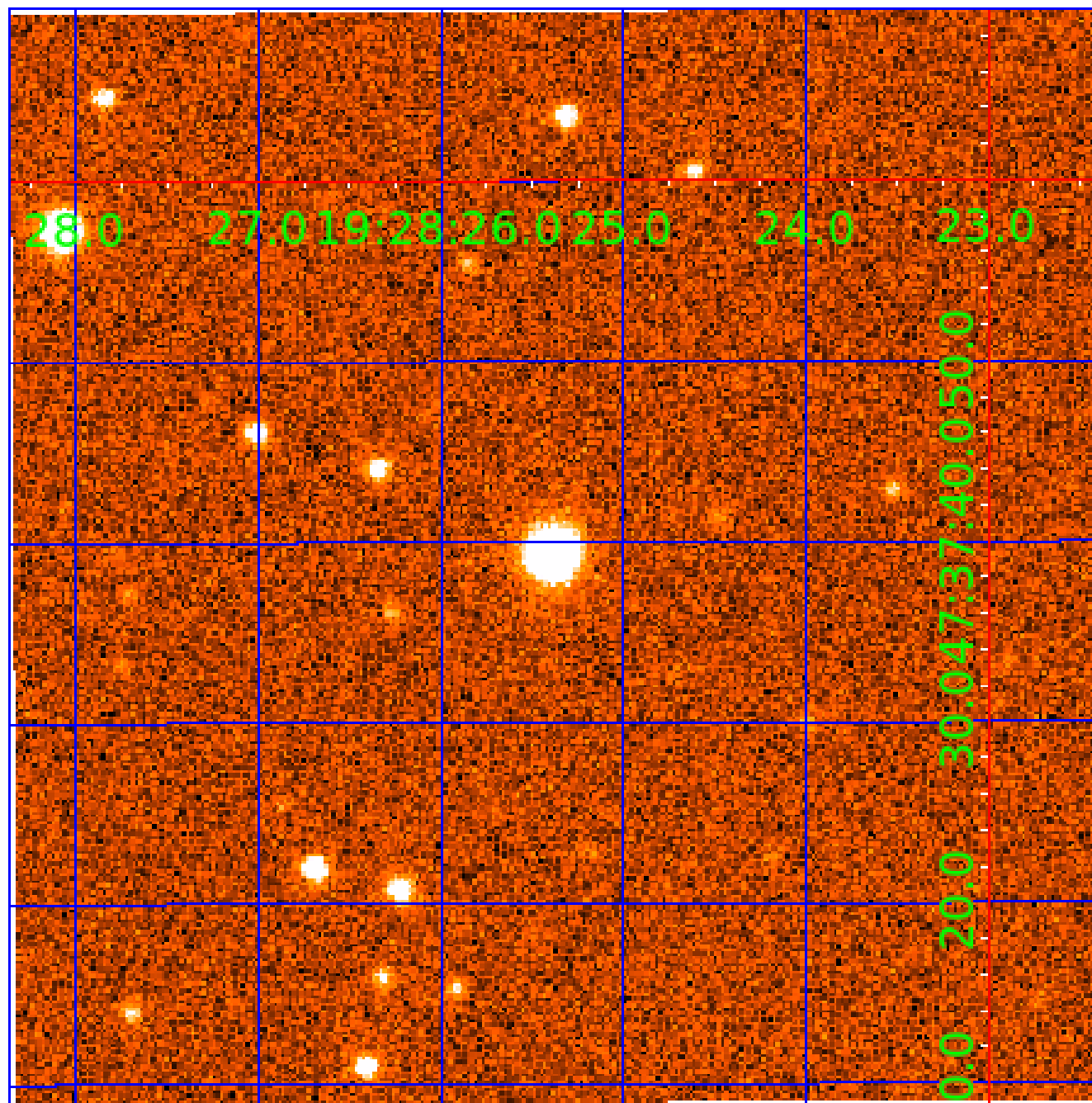


fluxWeightedCentroids, Planet 2 of 7



UKIRT Image

Declination



KIC 010470935

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})
010470935-01	OBS	No	0.933653	131.581200	41.1	6.373	7.5	7.2	0.49	3758	0.32	195.75
010470935-02	OBS	No	48.099305	175.920478	911.6	2.536	12.4	8.9	0.49	3758	1.67	1.02
010470935-03	OBS	No	61.763380	138.606372	1418.8	2.714	10.8	12.3	0.49	3758	3.37	0.73
010470935-04	OBS	No	30.260665	153.057643	1173.5	1.424	9.9	9.3	0.49	3758	1.69	1.89
010470935-05	OBS	No	46.884833	138.490223	609.4	4.383	9.1	9.7	0.49	3758	1.32	1.06
010470935-06	OBS	No	28.193285	151.647421	886.1	2.418	8.7	11.3	0.49	3758	1.60	2.08
010470935-07	OBS	No	43.019550	137.033651	862.4	4.285	8.1	8.7	0.49	3758	1.55	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010470935-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH
010470935-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_MEAS
010470935-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010470935-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010470935-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_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.

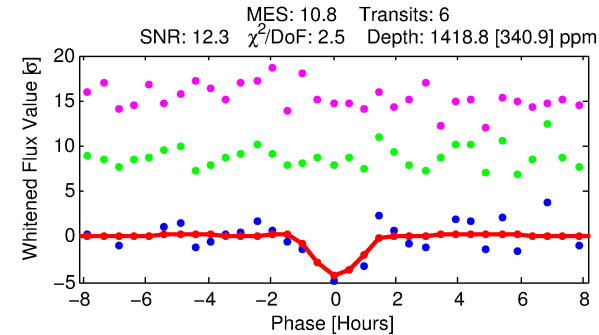
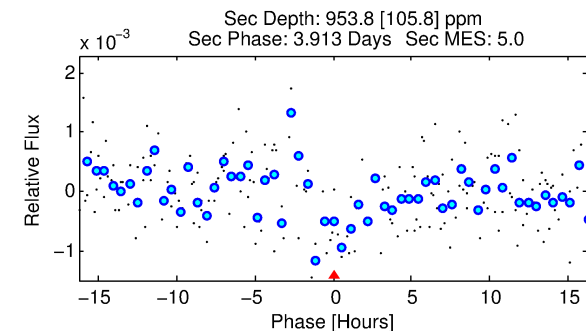
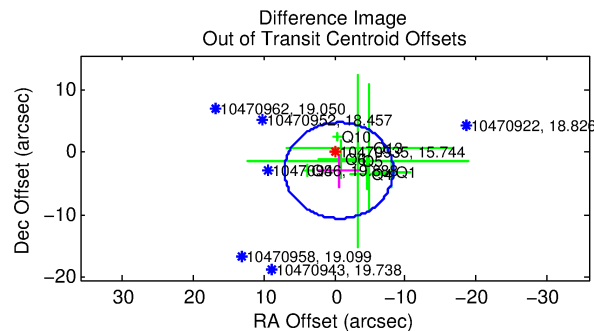
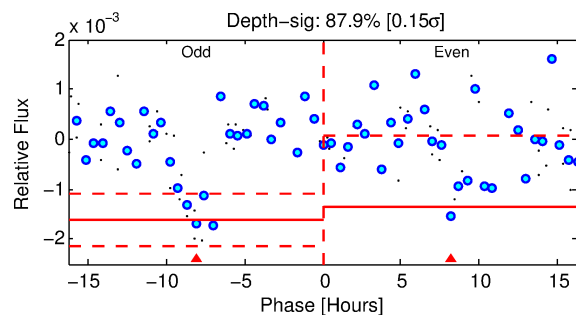
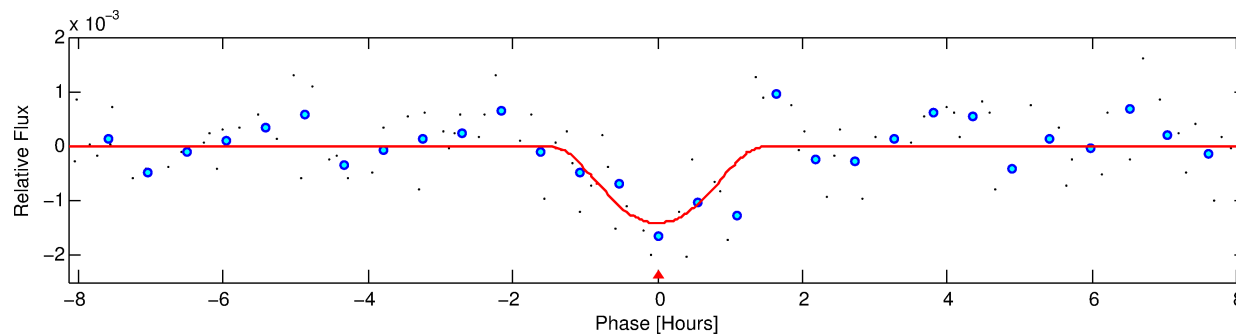
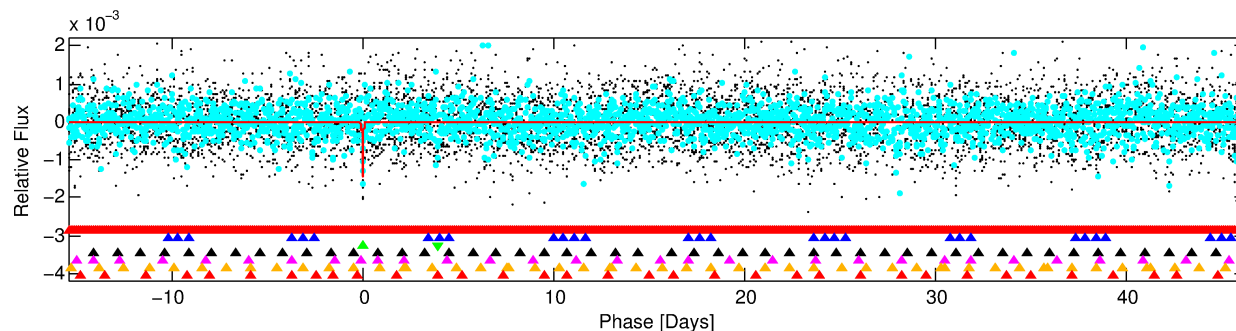
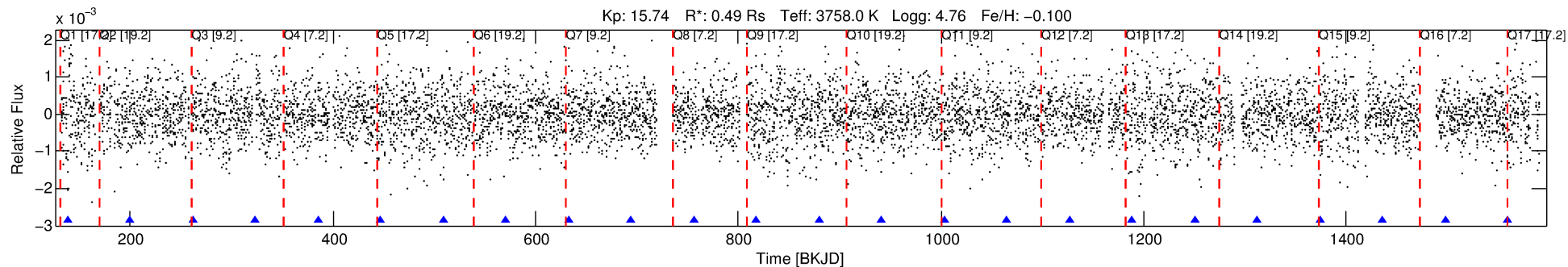
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010470935-03

No Significant Match Found

DV One-Page Summary

KIC: 10470935 Candidate: 3 of 7 Period: 61.763 d



DV Fit Results:

Period = 61.76338 [0.00083] d
Epoch = 138.6064 [0.0108] BKJD
Rp/R* = 0.0626 [0.4348]
a/R* = 66.17 [115.98]
b = 0.99 [0.67]
Seff = 0.73 [0.08]
Teq = 236 [6] K
Rp = 3.37 [23.39] Re
a = 0.2436 [0.0134] AU
Ag = 2750.09 [38225.73] [0.07 σ]
Teffp = 2640 [9176] K [0.26 σ]

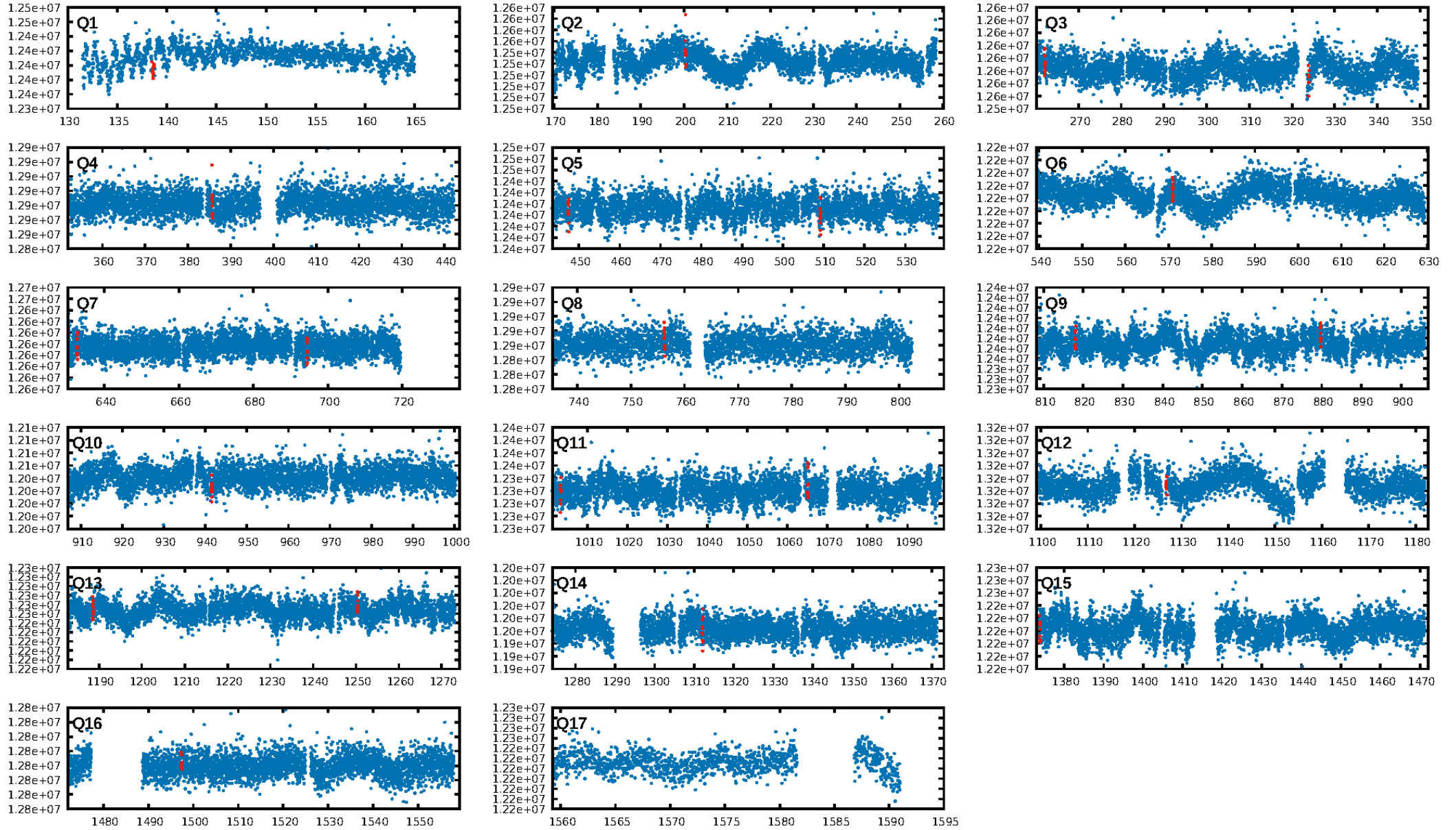
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [88.29 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 18.5%
ModelChiSquareGof-sig: 63.2%
Bootstrap-pfa: 2.39e-11
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 3.423
Centroid-sig: 82.6%
Centroid-so: 0.690 arcsec [0.76 σ]
OotOffset-rm: 3.024 arcsec [1.18 σ]
KicOffset-rm: 2.641 arcsec [1.04 σ]
OotOffset-st: 2/0/2/3 [7]
KicOffset-st: 2/0/2/3 [7]
DiffImageQuality-fgm: 0.14 [1/7]
DiffImageOverlap-fno: 0.08 [1/13]

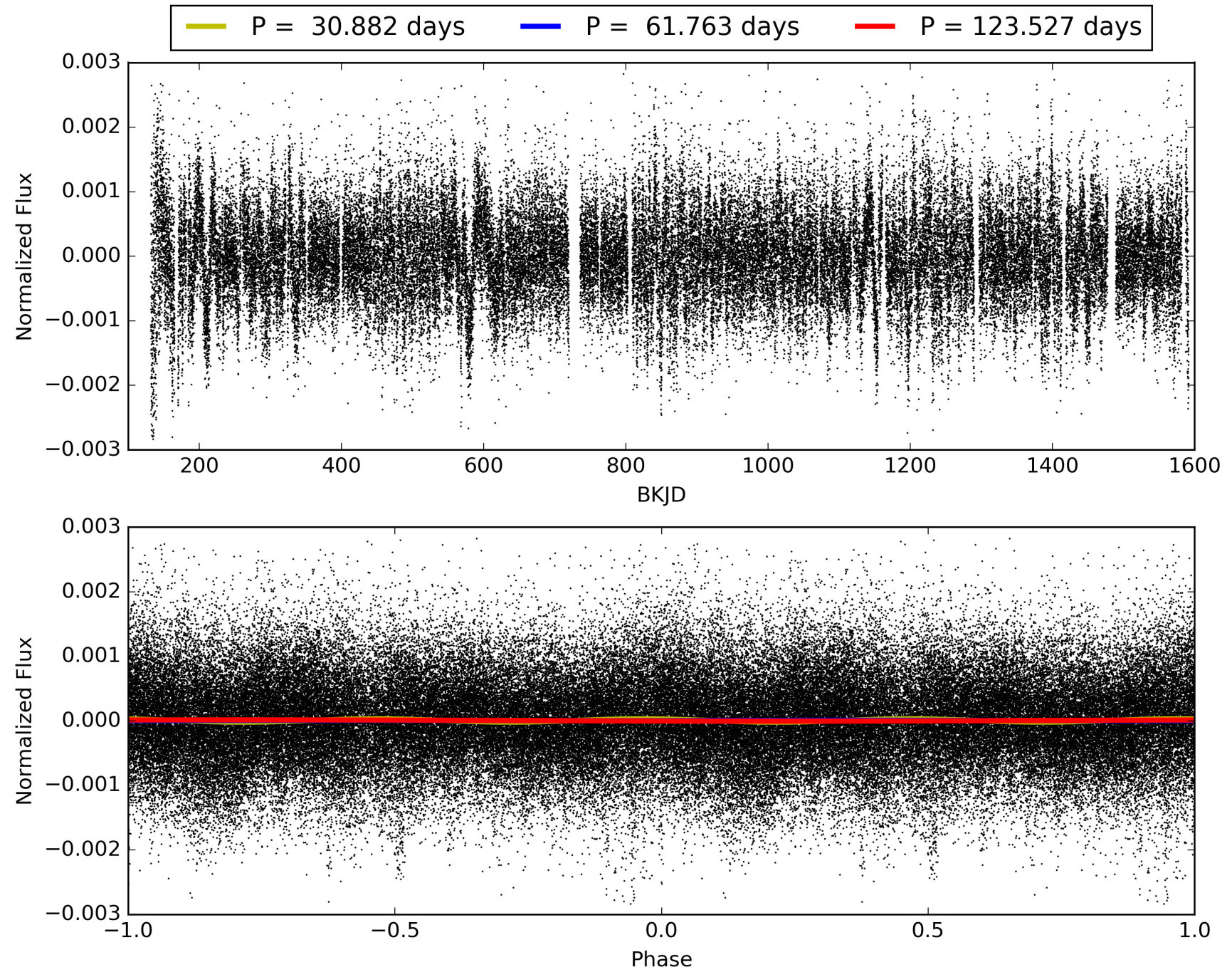
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:31:13 Z

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

TCE 010470935-03, PDC Light Curves

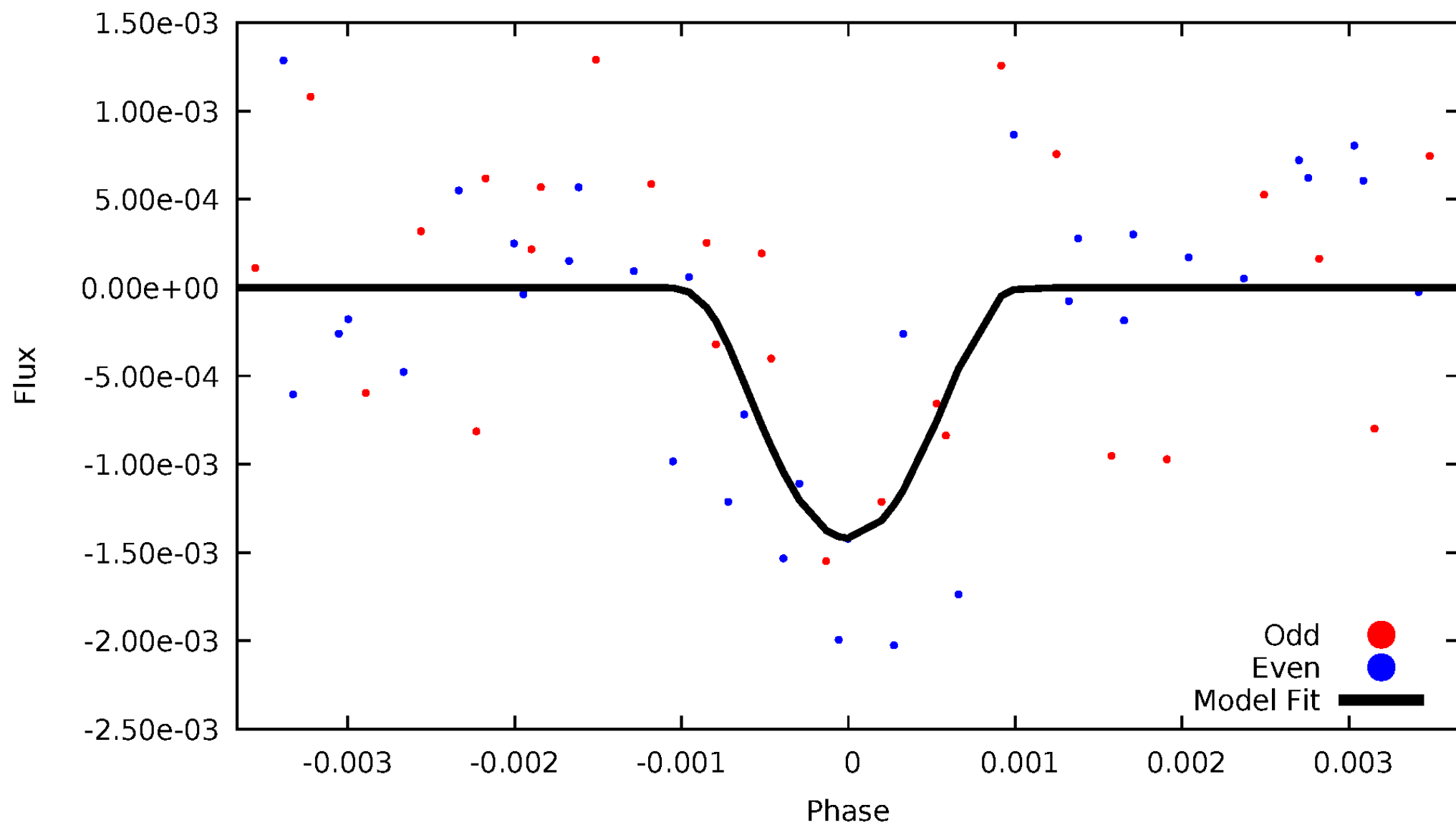


TCE 010470935-03



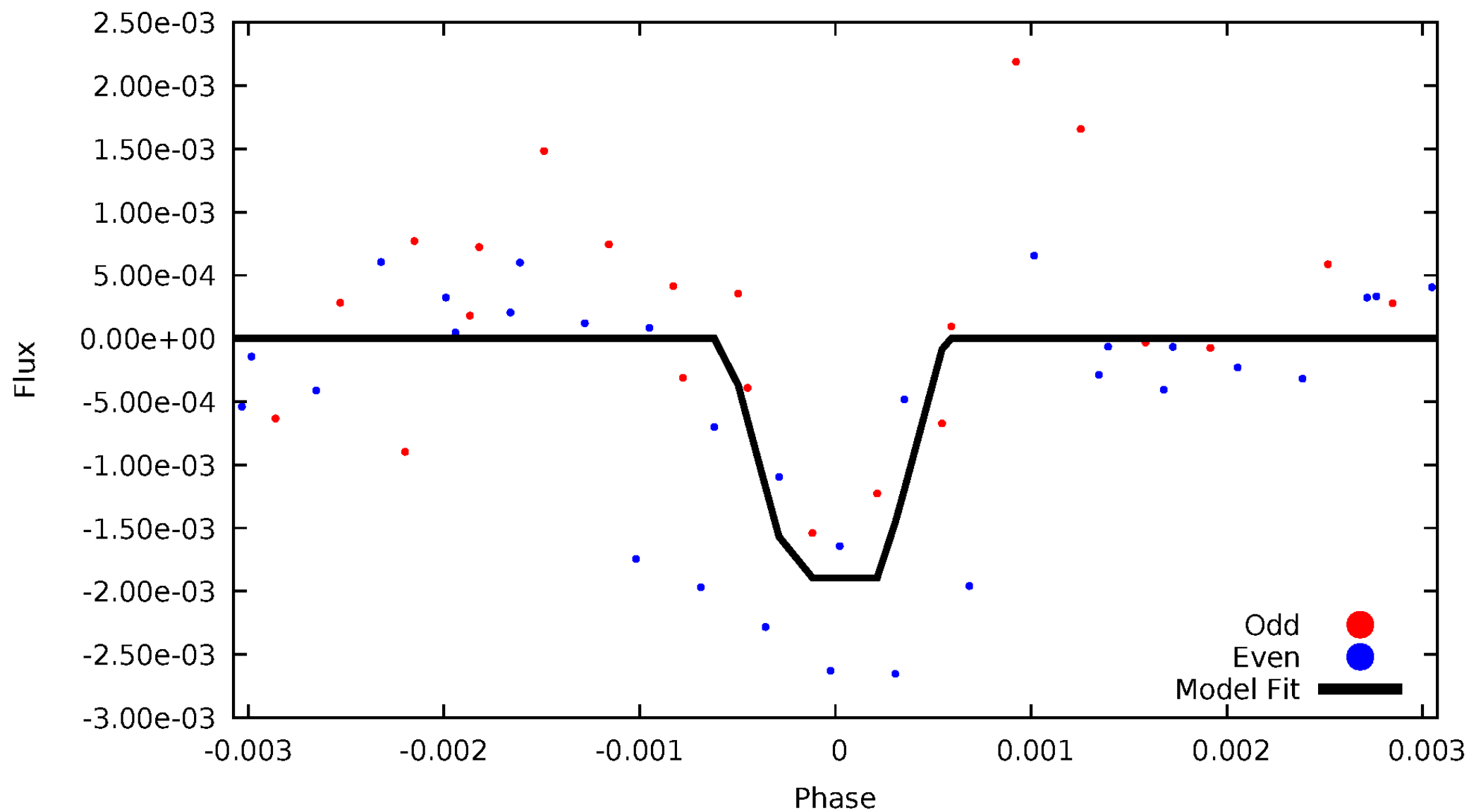
DV Odd/Even

TCE 010470935-03



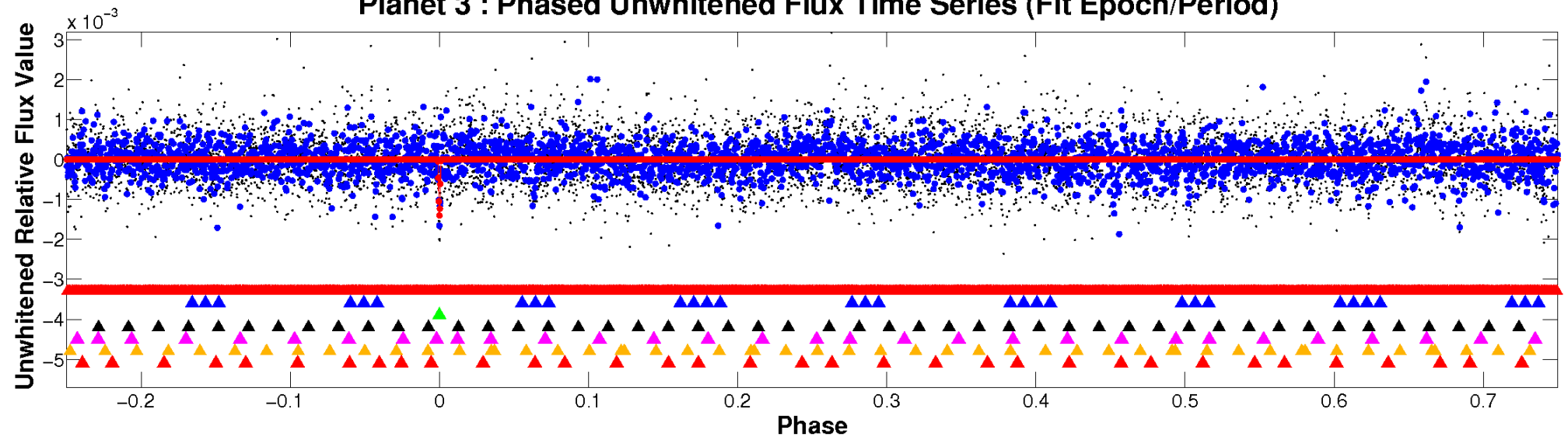
ALT Odd/Even

TCE 010470935-03

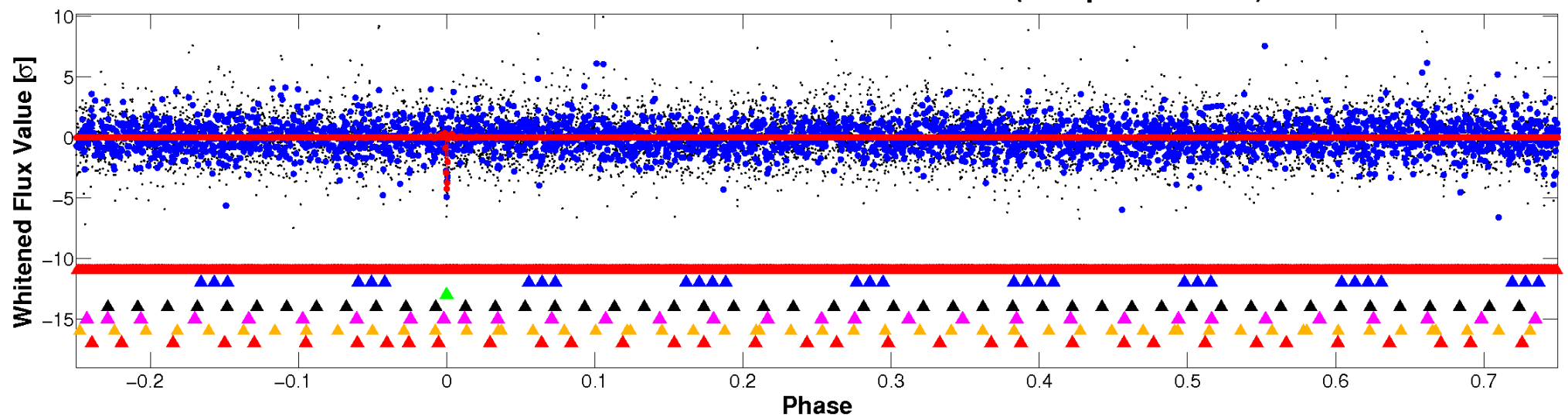


Non-Whitened Vs. Whitened Light Curve

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

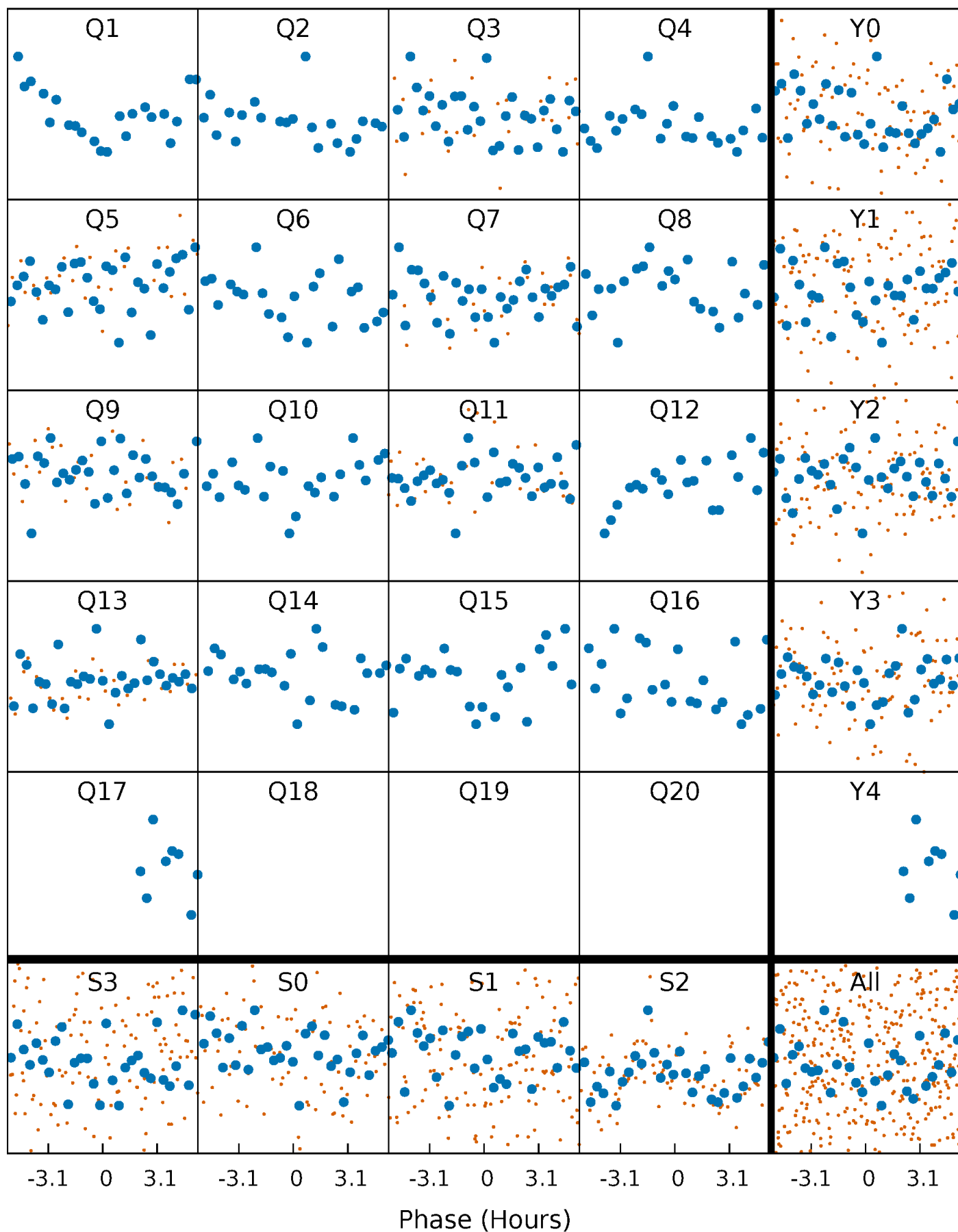


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



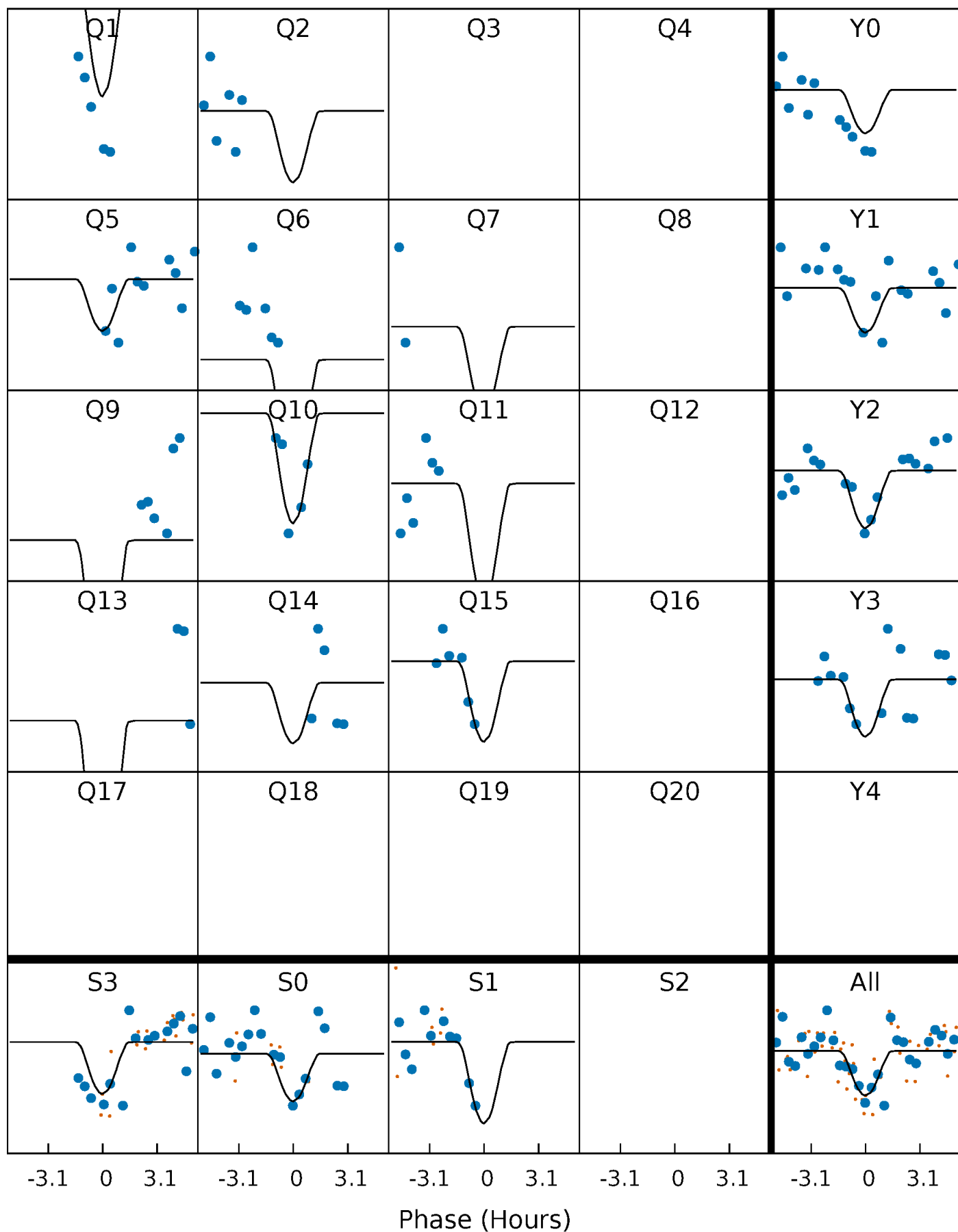
PDC Quarter-Phased Transit Curves

TCE 010470935-03 $P = 61.763380$ Days $T_0 = 138.606372$ (BKJD)



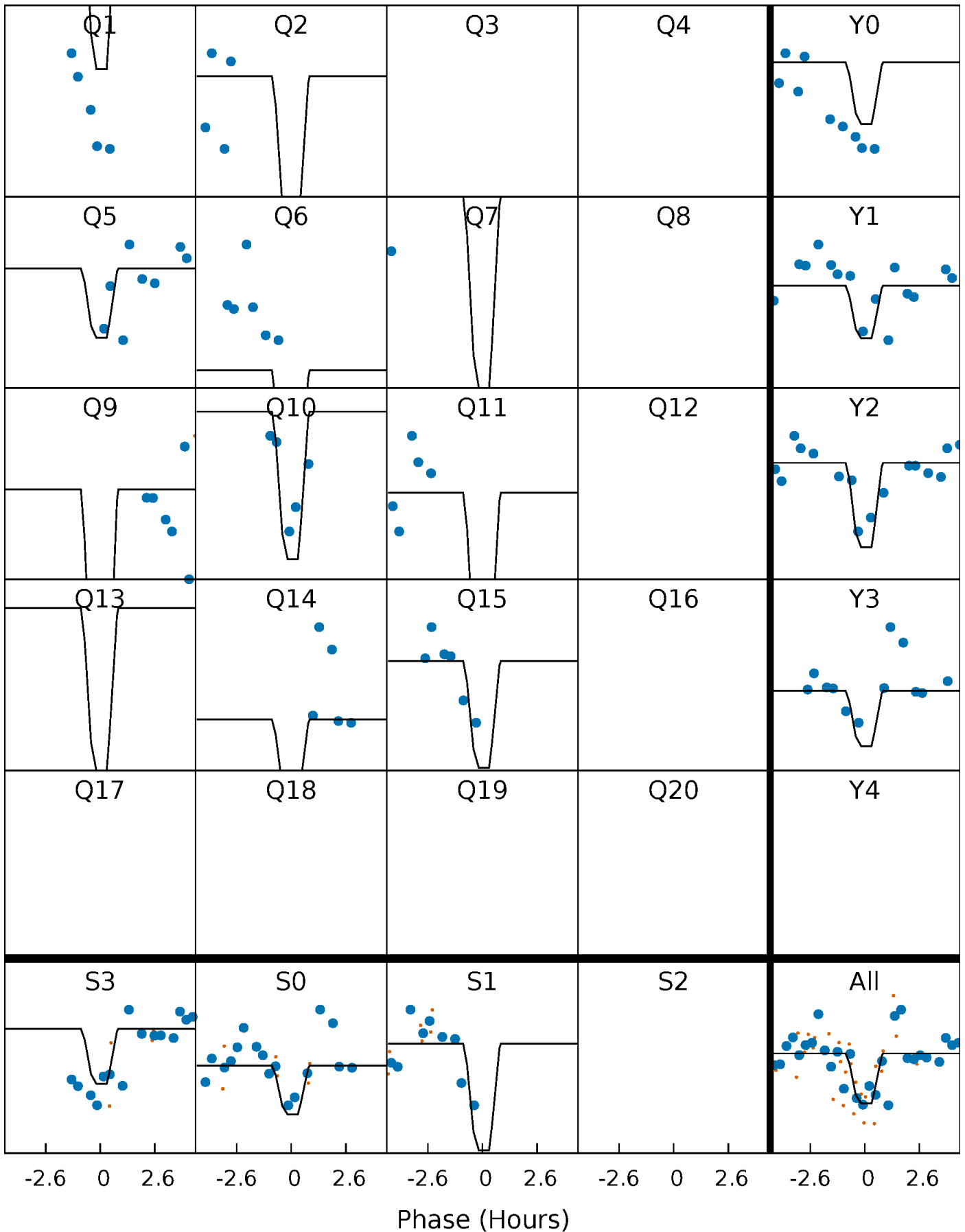
DV Quarter-Phased Transit Curves

TCE 010470935-03 P= 61.763380 Days $T_0=138.606372$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

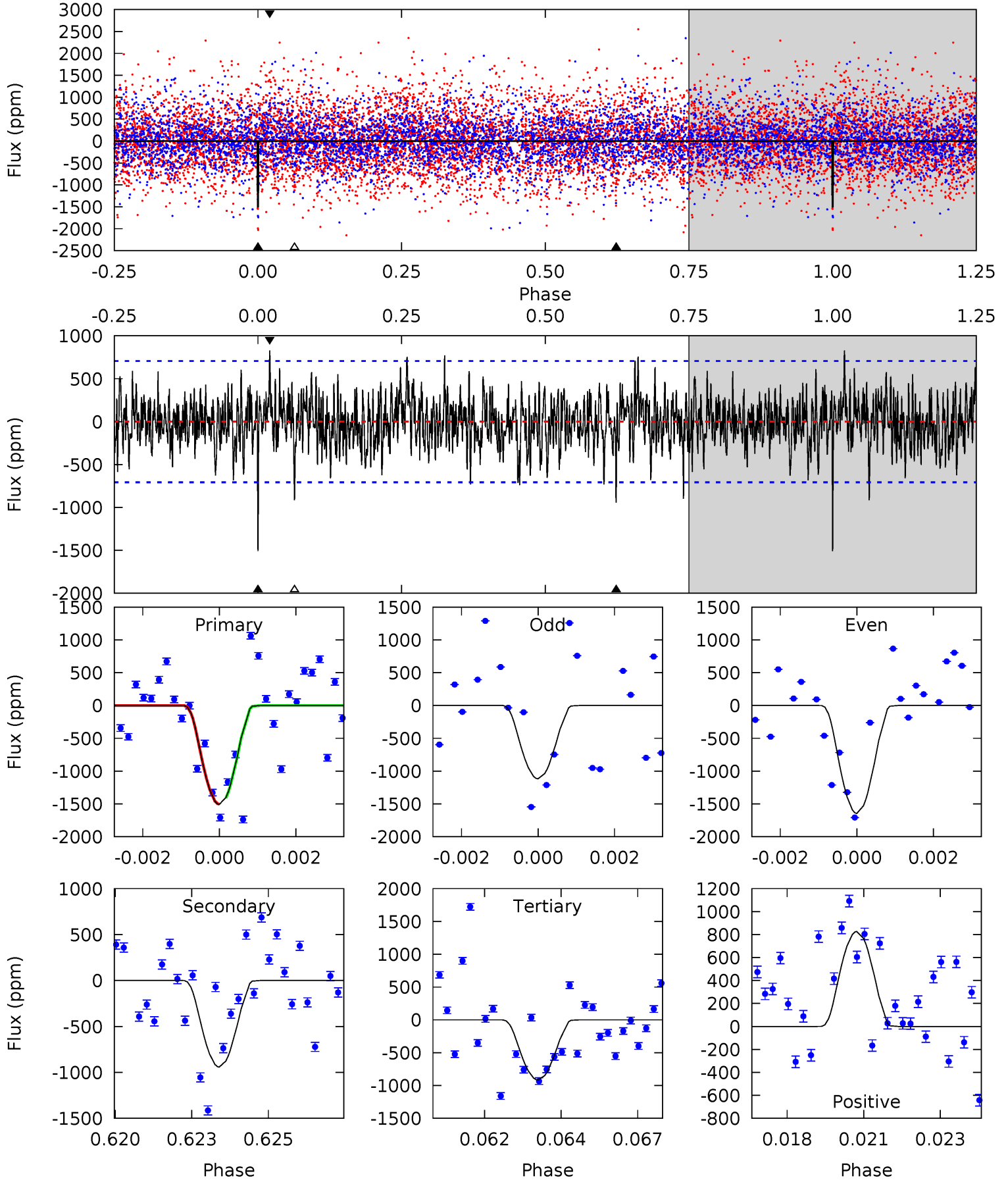
TCE 010470935-03 P= 61.763464 Days $T_0=138.604363$ (BKJD)



DV Model-Shift Uniqueness Test

010470935-03, P = 61.763380 Days, E = 76.842992 Days

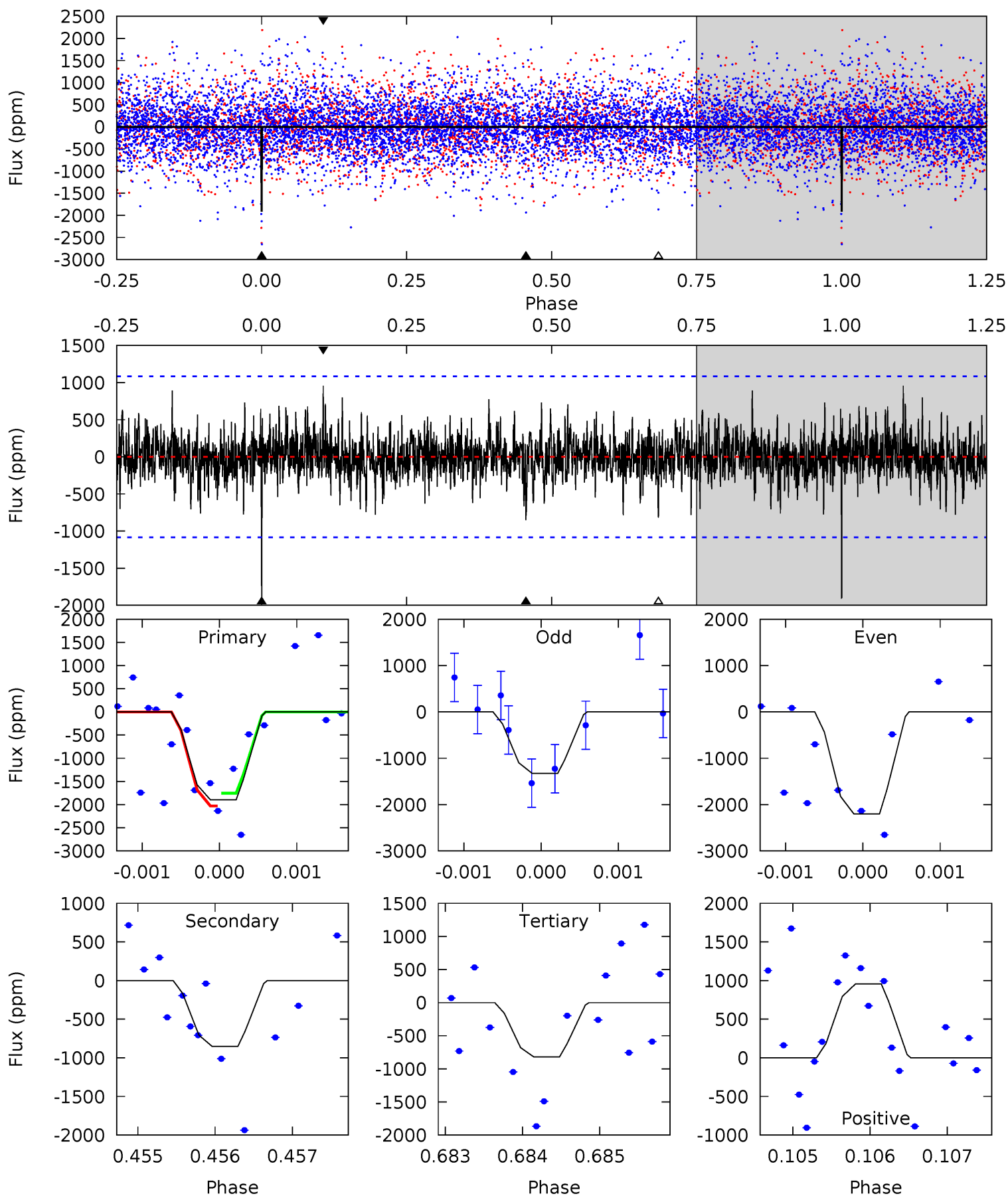
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	7.08	6.88	6.21	5.30	3.05	1.81	4.45	5.12	0.20	0.87	1.93	0.91	0.35	0.36



Alt Model-Shift Uniqueness Test

010470935-03, P = 61.763464 Days, E = 76.840899 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.54	4.28	4.12	4.81	5.45	3.29	1.14	5.42	4.73	0.16	-0.53	1.91	1.40	0.34	0.70



Stellar Parameters For KIC 010470935

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3758^{+68}_{-68}	$4.756^{+0.036}_{-0.024}$	$-0.100^{+0.100}_{-0.100}$	$0.493^{+0.027}_{-0.035}$	$0.506^{+0.028}_{-0.031}$	$5.930^{+0.972}_{-0.620}$
	+2%/-2%	+1%/-1%	+100%/-100%	+5%/-7%	+6%/-6%	+16%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010470935-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-943 ± 133	$15.32^{+18.53}_{-10.35}$	328^{+7}_{-6}	2079^{+627}_{-301}	127^{+1205}_{-101}
Alt.	-852 ± 199	$16.53^{+17.26}_{-11.10}$	329^{+7}_{-7}	2019^{+590}_{-264}	98^{+816}_{-75}

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 $A_{obs} \gg 1.0$

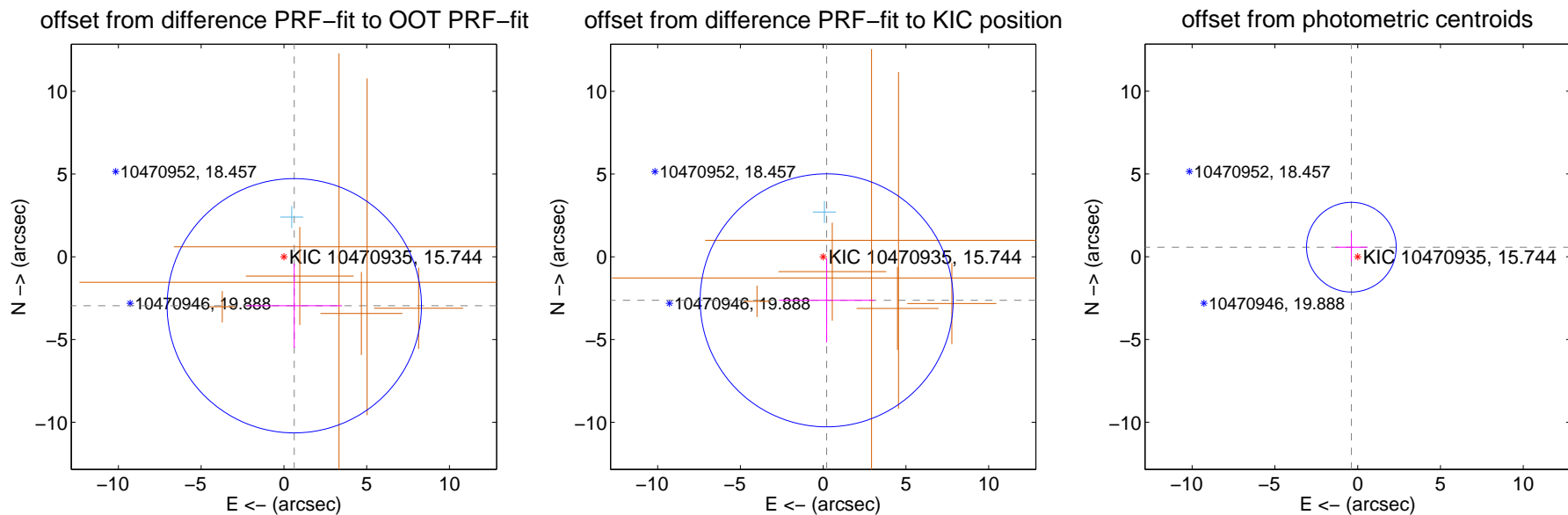
DV Centroid Data

Supplemental centroid analysis for 010470935-03. Kepler magnitude: 15.74. Transit SNR 12.29

There are 1 quarters with good PRF difference image offsets

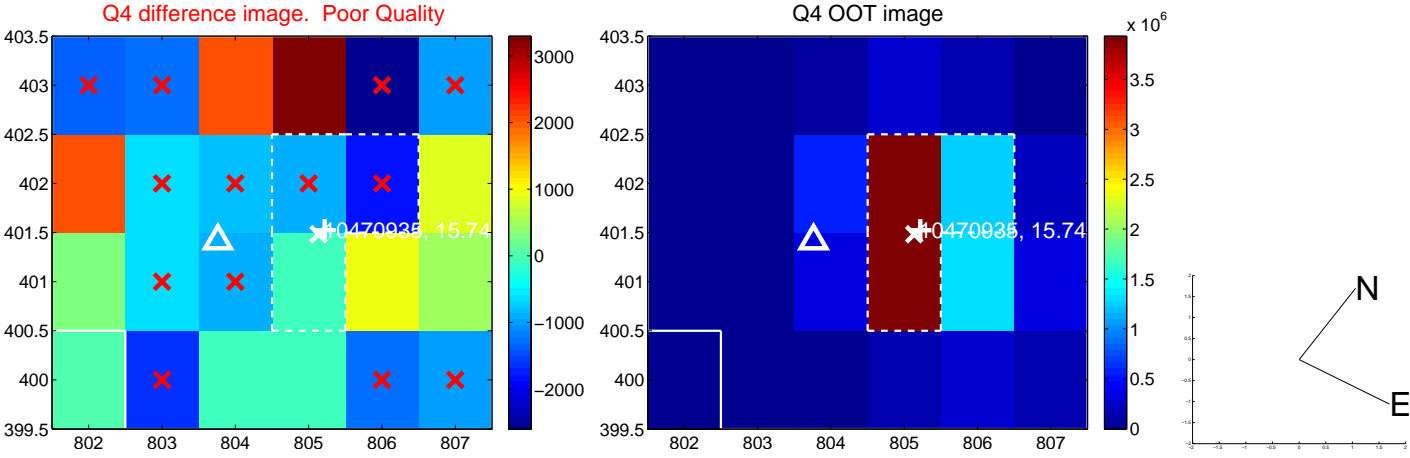
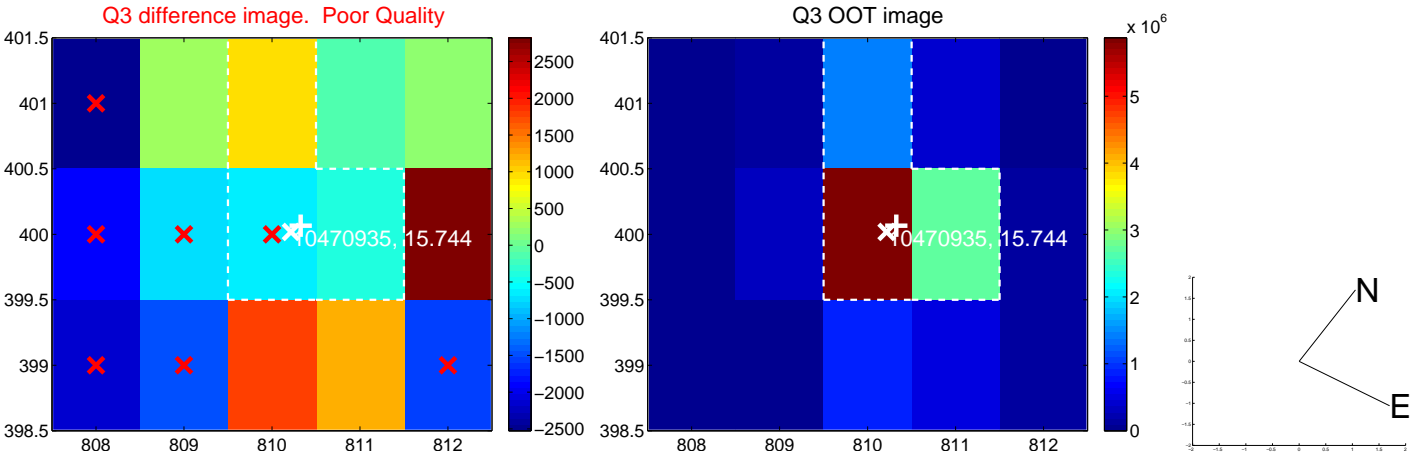
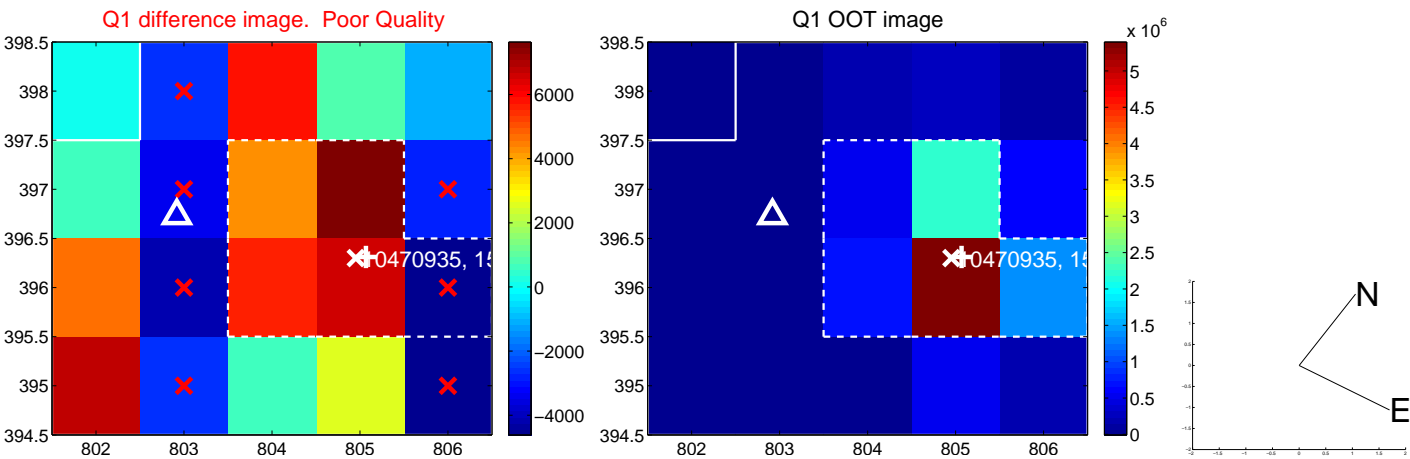
The direct PRF centroid is offset from the target star catalog position by about 0.61 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.024 ± 2.561	1.18	-0.626 ± 2.884	-2.959 ± 2.545
PRF-fit source offset from KIC position	2.641 ± 2.548	1.04	-0.211 ± 2.884	-2.632 ± 2.545
photometric centroid source offset	0.69 ± 0.90	0.76	0.38 ± 0.96	0.58 ± 0.87

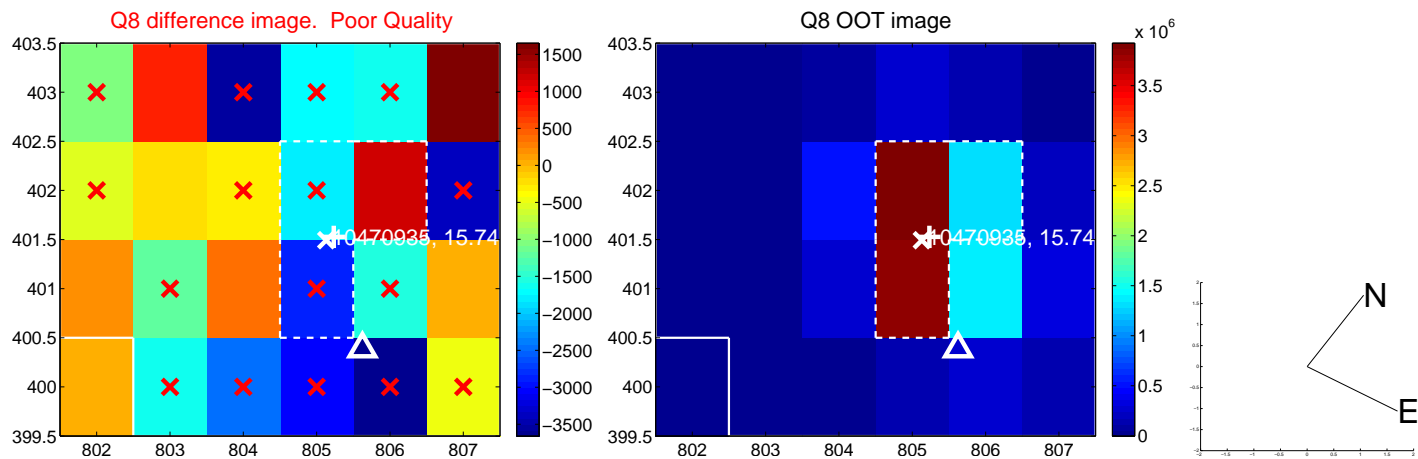
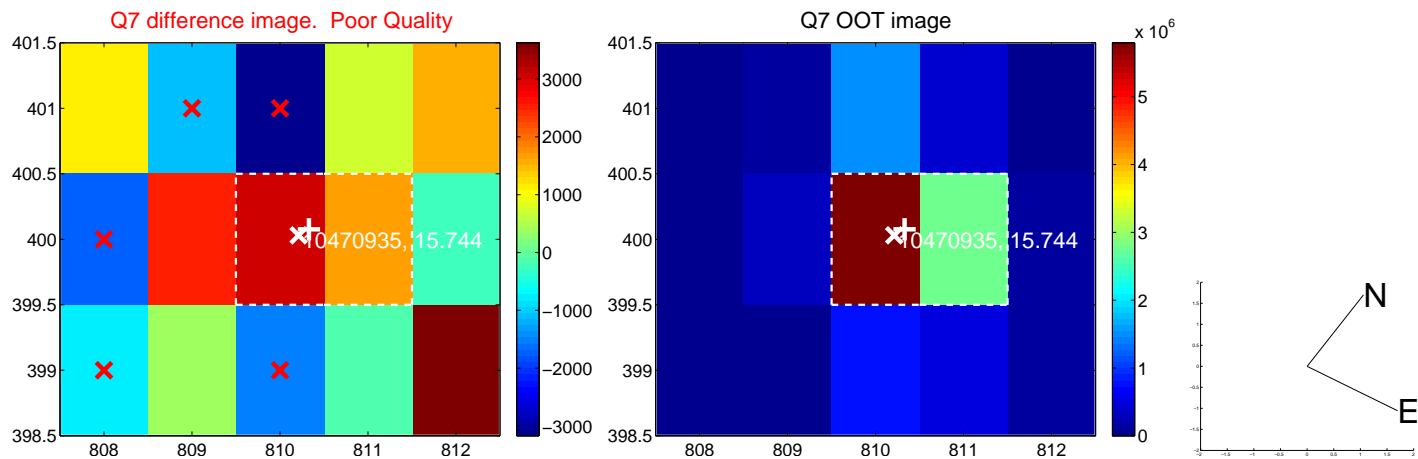
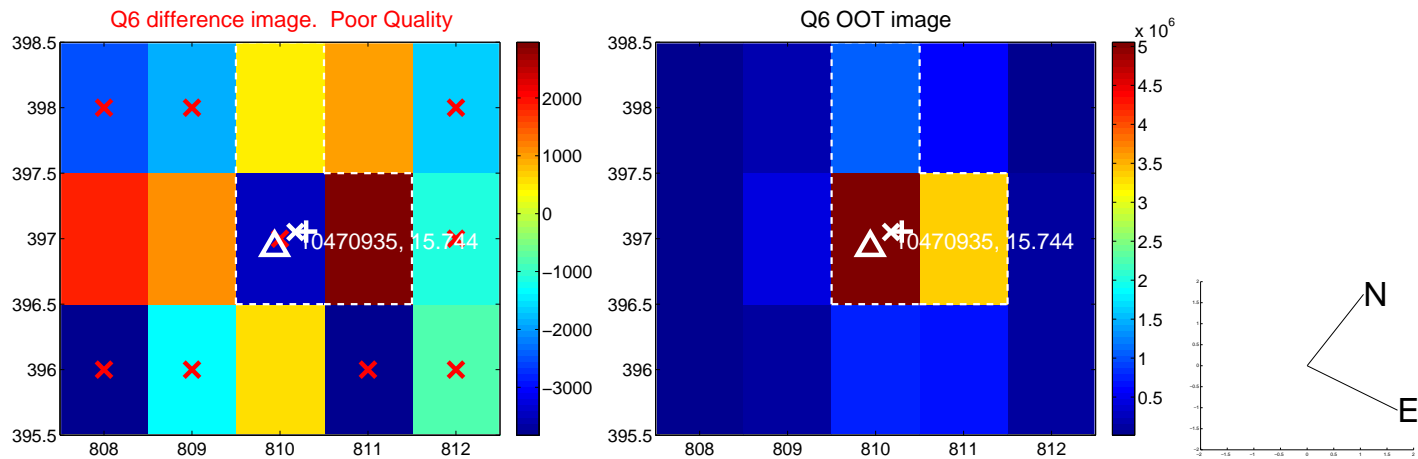
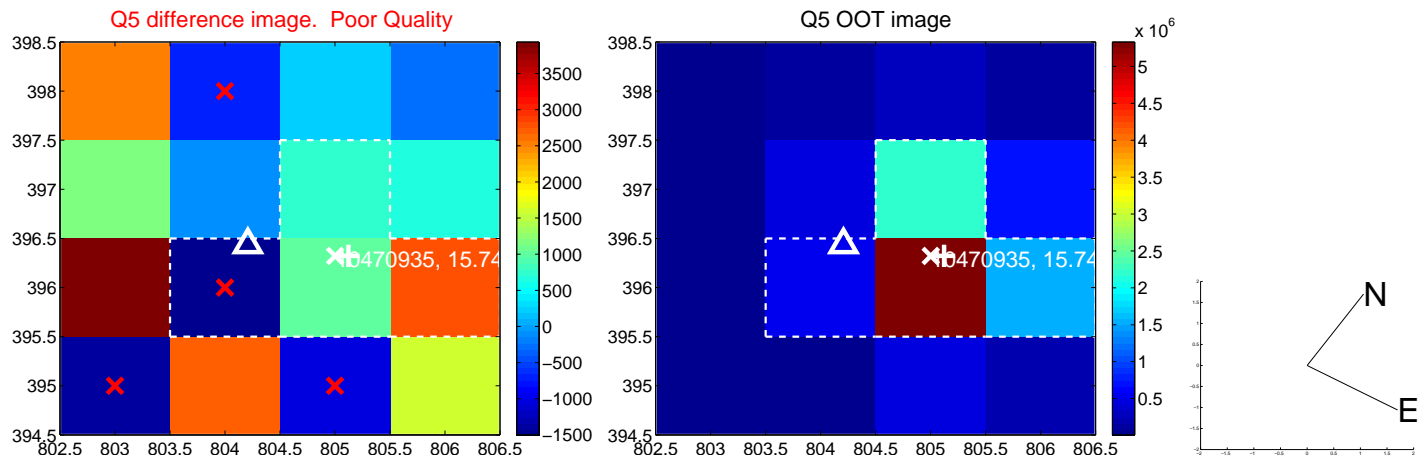


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

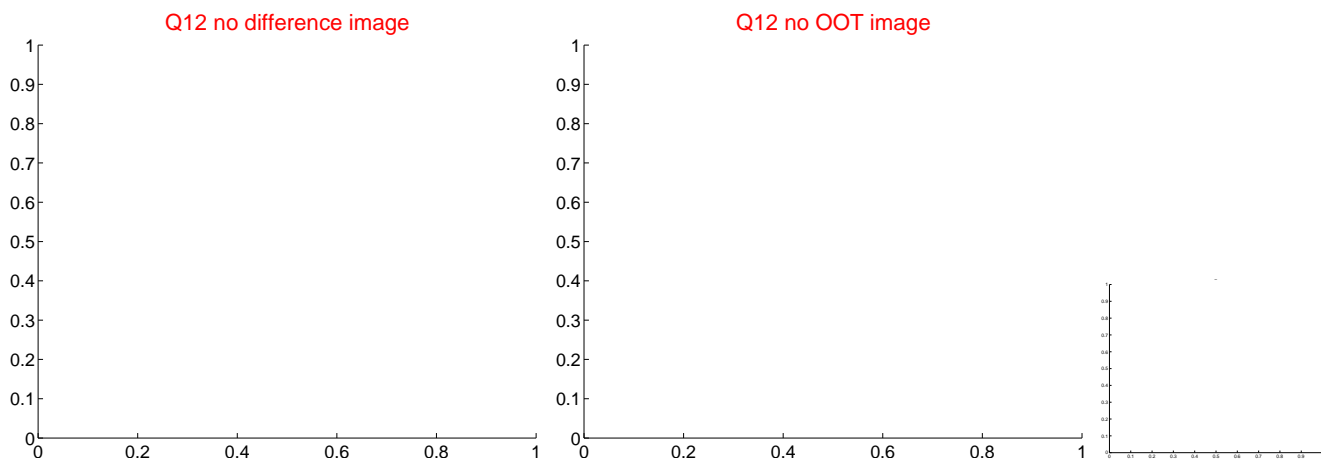
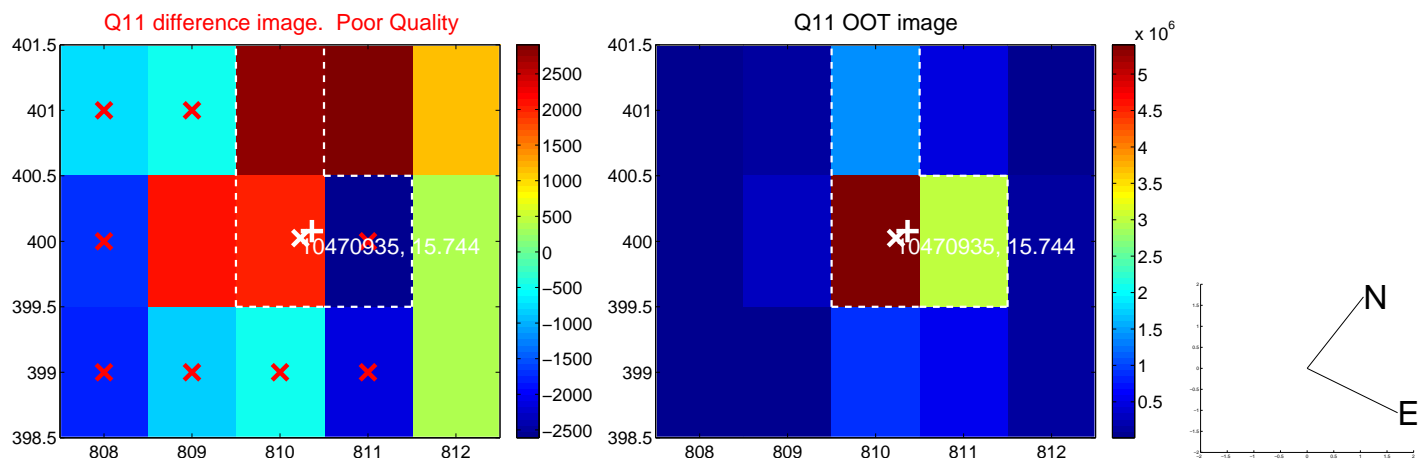
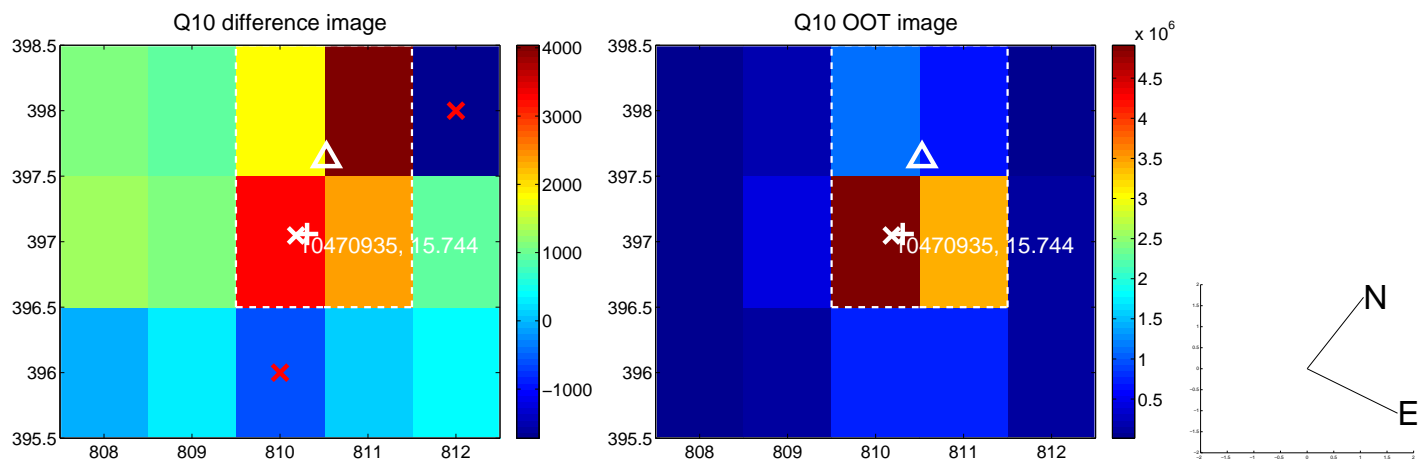
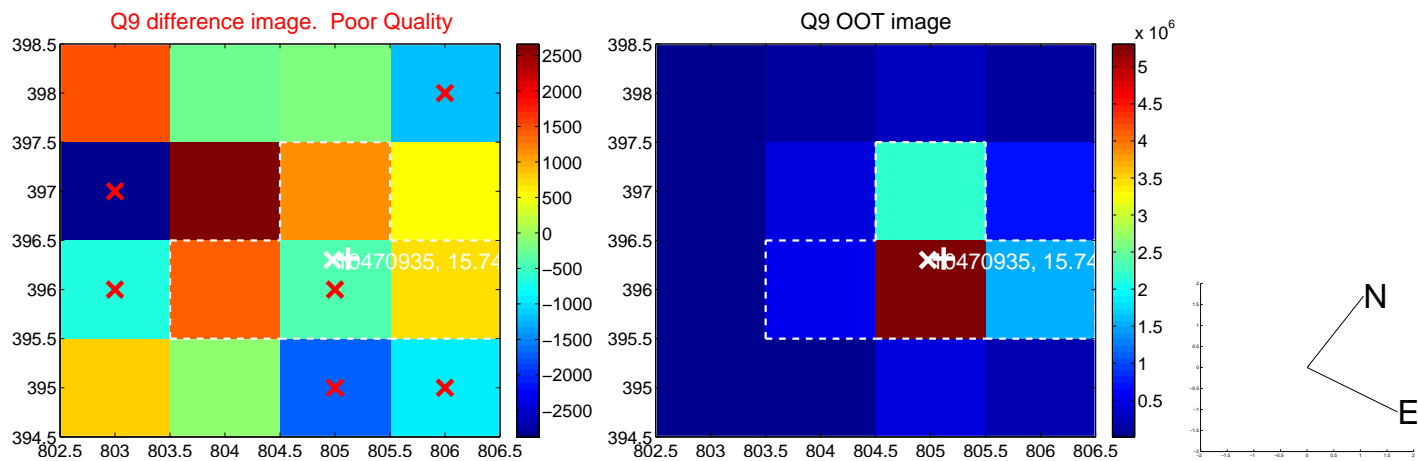
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



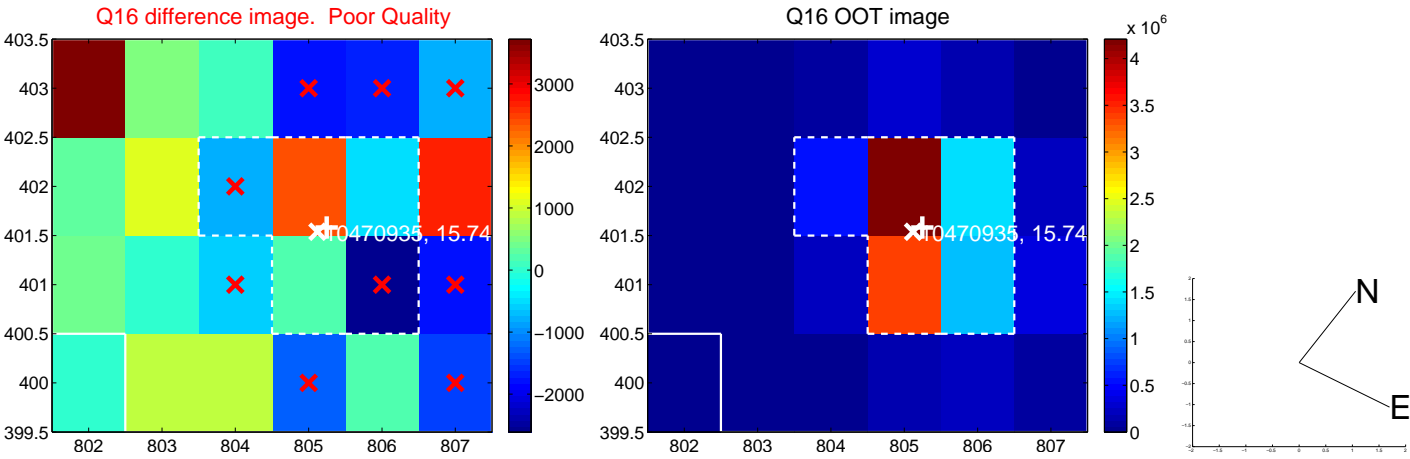
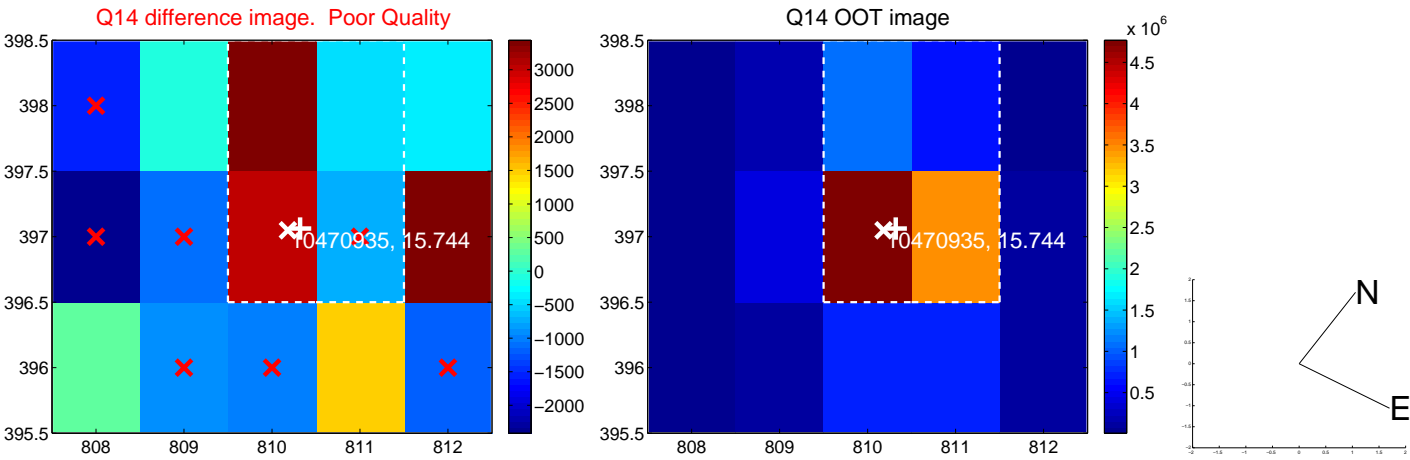
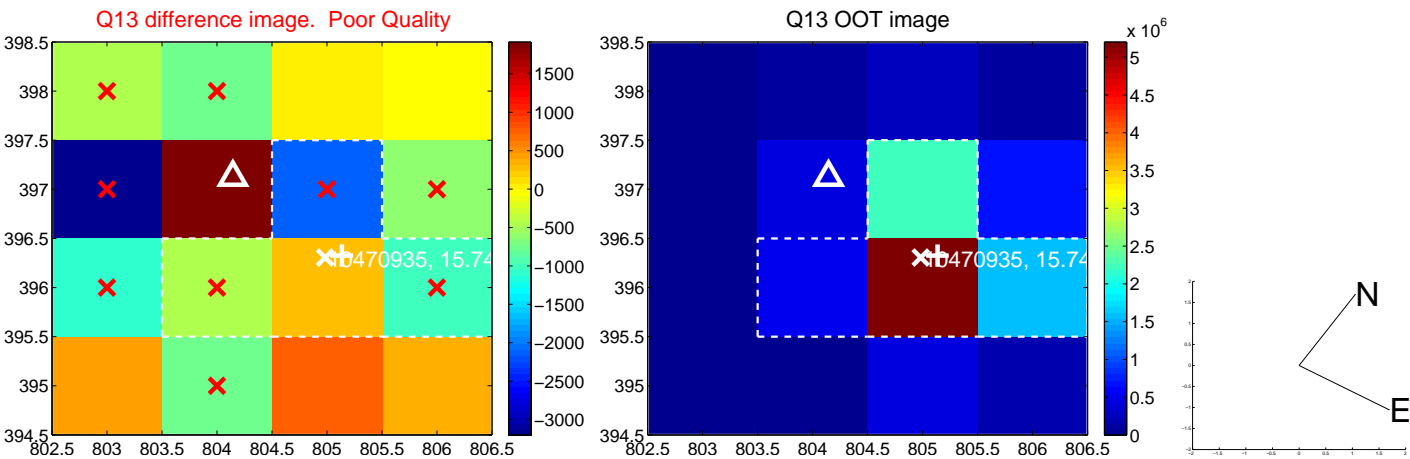
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



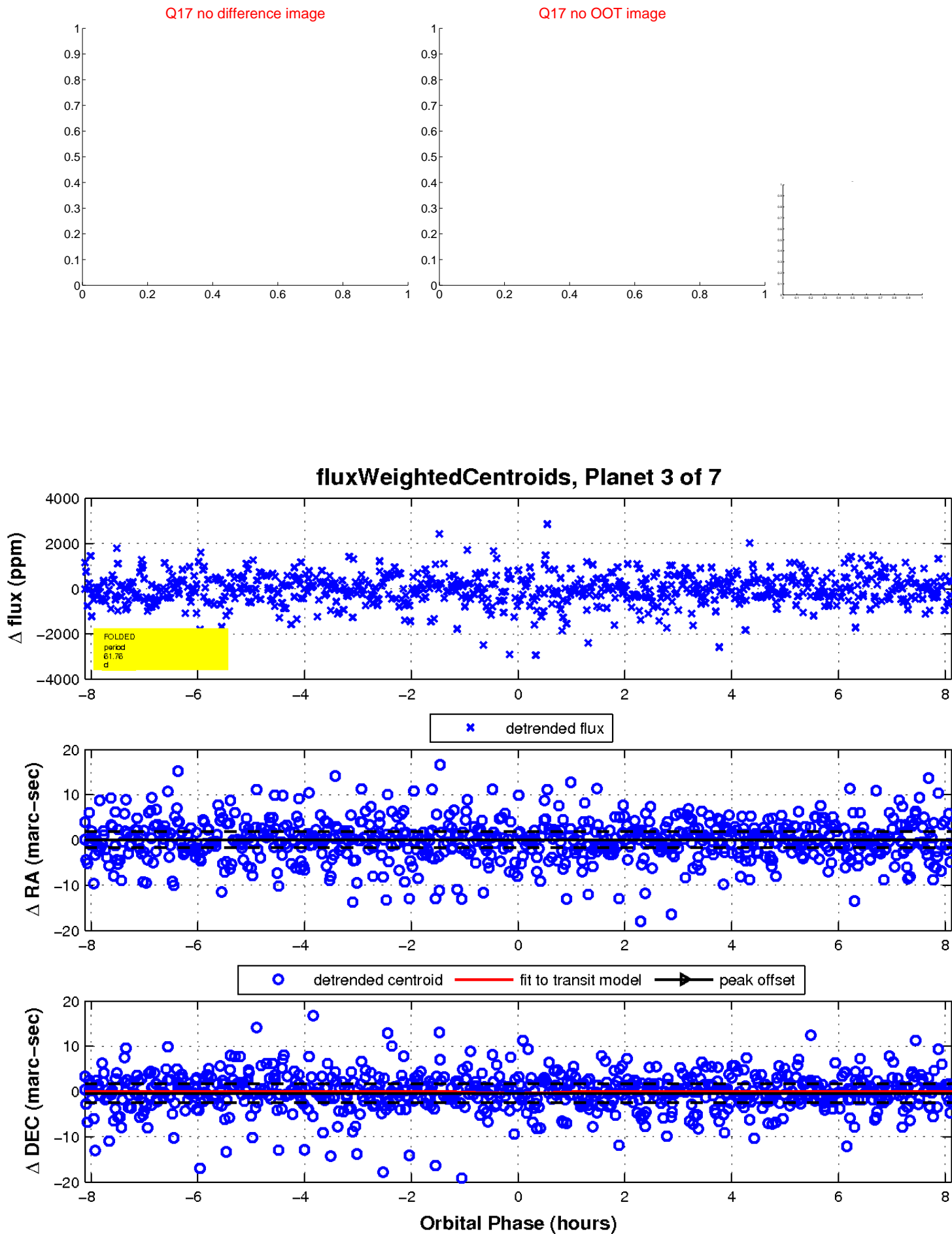
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

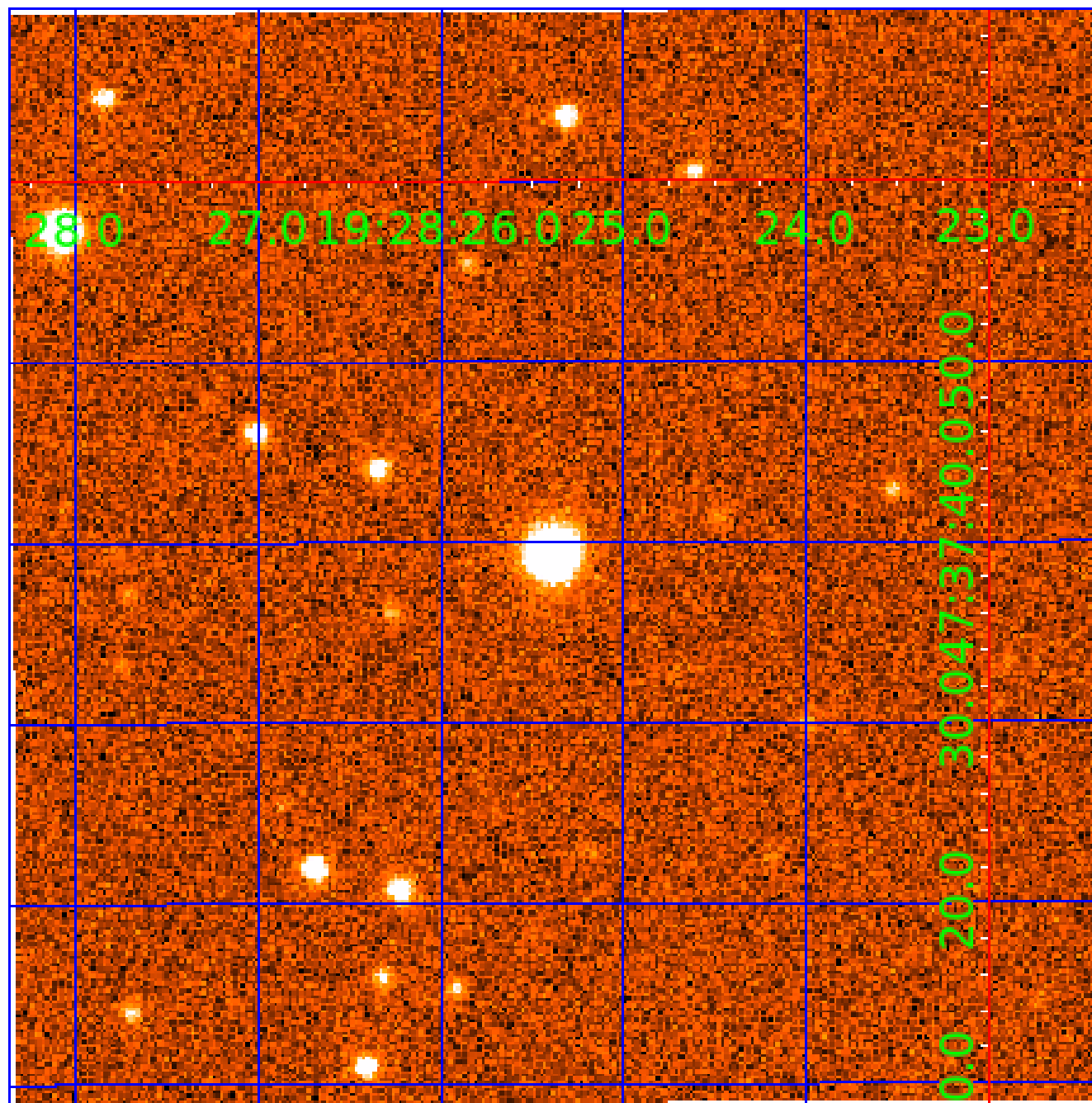


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010470935

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})
010470935-01	OBS	No	0.933653	131.581200	41.1	6.373	7.5	7.2	0.49	3758	0.32	195.75
010470935-02	OBS	No	48.099305	175.920478	911.6	2.536	12.4	8.9	0.49	3758	1.67	1.02
010470935-03	OBS	No	61.763380	138.606372	1418.8	2.714	10.8	12.3	0.49	3758	3.37	0.73
010470935-04	OBS	No	30.260665	153.057643	1173.5	1.424	9.9	9.3	0.49	3758	1.69	1.89
010470935-05	OBS	No	46.884833	138.490223	609.4	4.383	9.1	9.7	0.49	3758	1.32	1.06
010470935-06	OBS	No	28.193285	151.647421	886.1	2.418	8.7	11.3	0.49	3758	1.60	2.08
010470935-07	OBS	No	43.019550	137.033651	862.4	4.285	8.1	8.7	0.49	3758	1.55	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010470935-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH
010470935-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_MEAS
010470935-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010470935-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010470935-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_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.

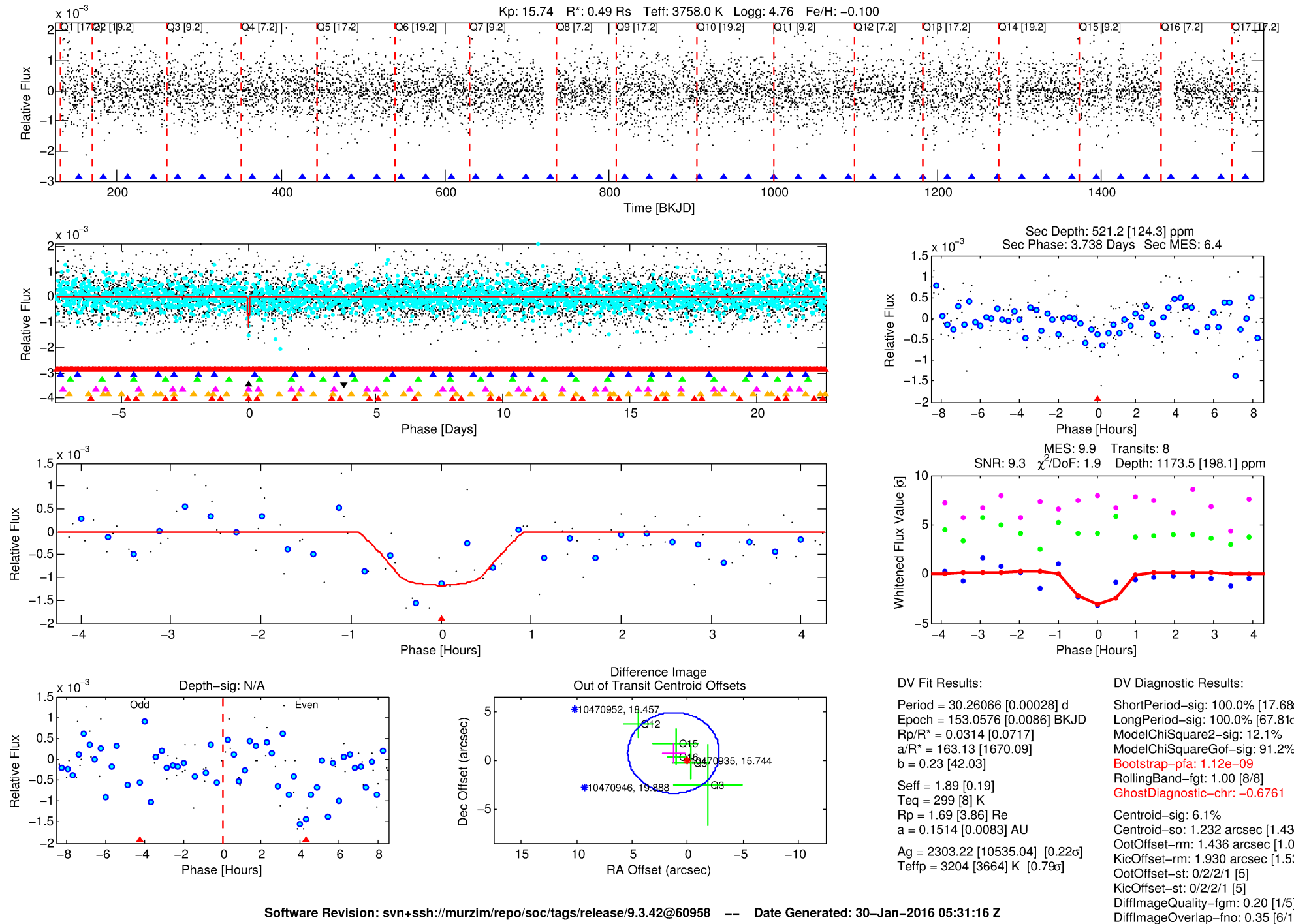
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010470935-04

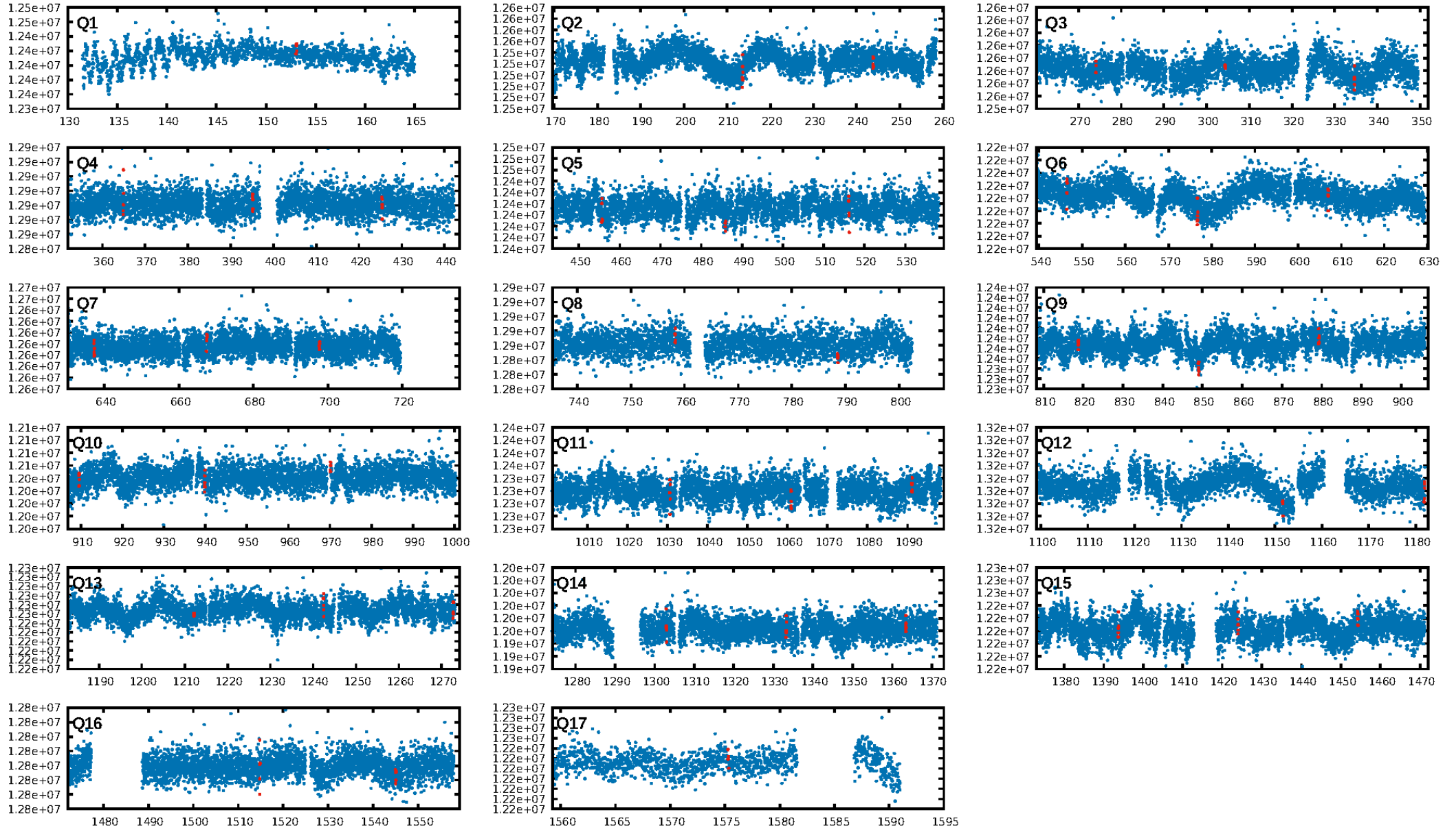
No Significant Match Found

DV One-Page Summary

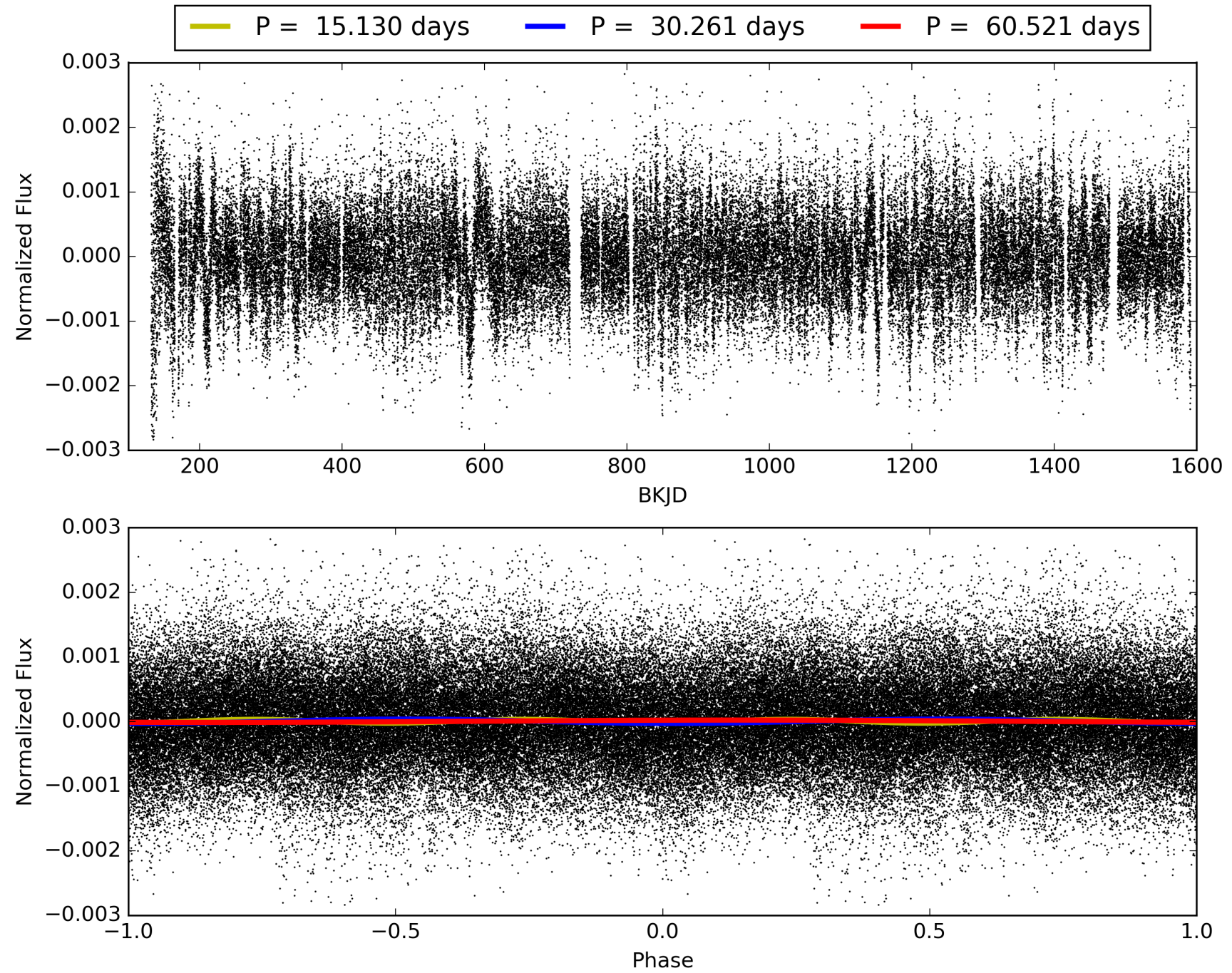
KIC: 10470935 Candidate: 4 of 7 Period: 30.261 d



TCE 010470935-04, PDC Light Curves

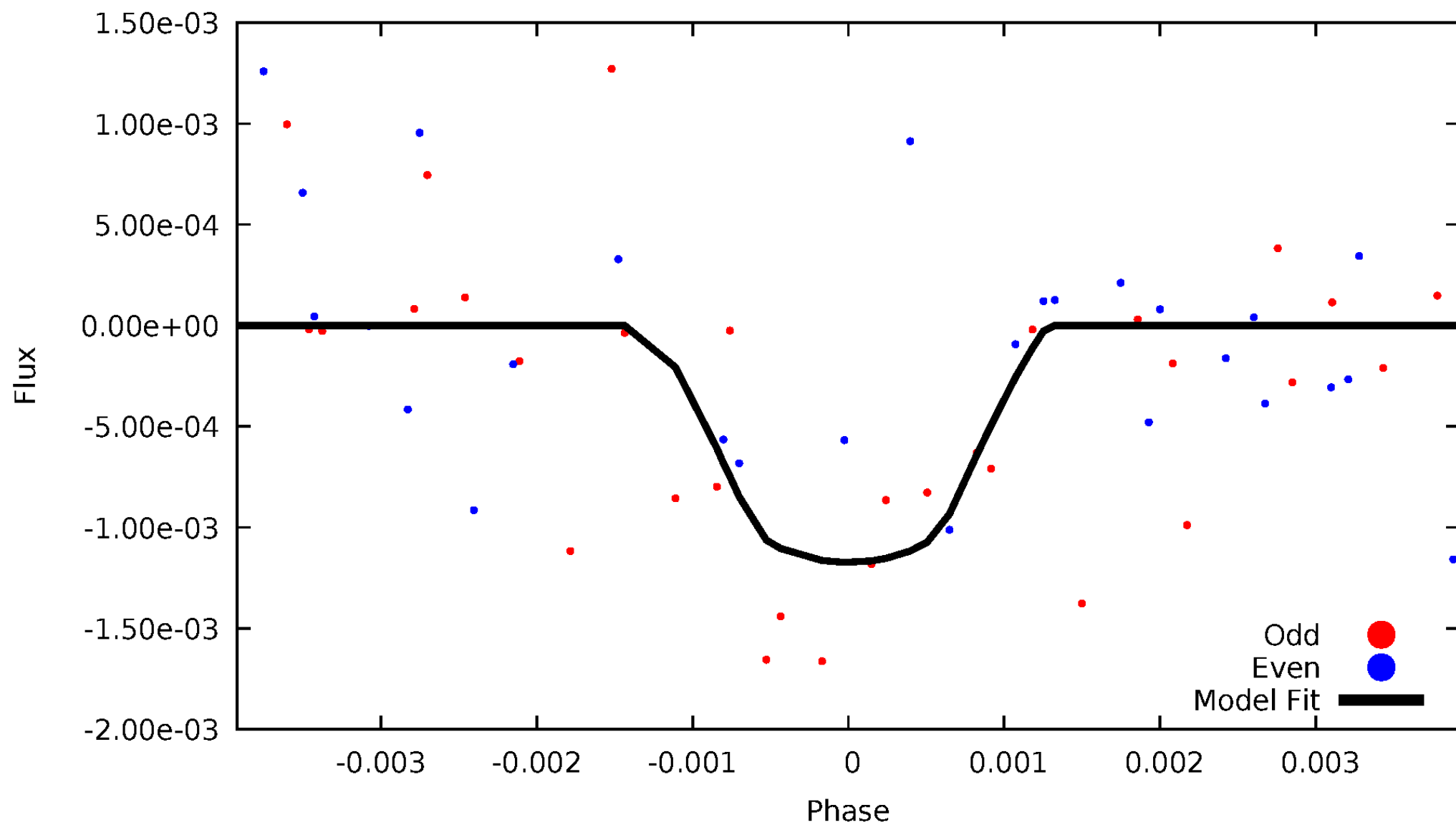


TCE 010470935-04



DV Odd/Even

TCE 010470935-04

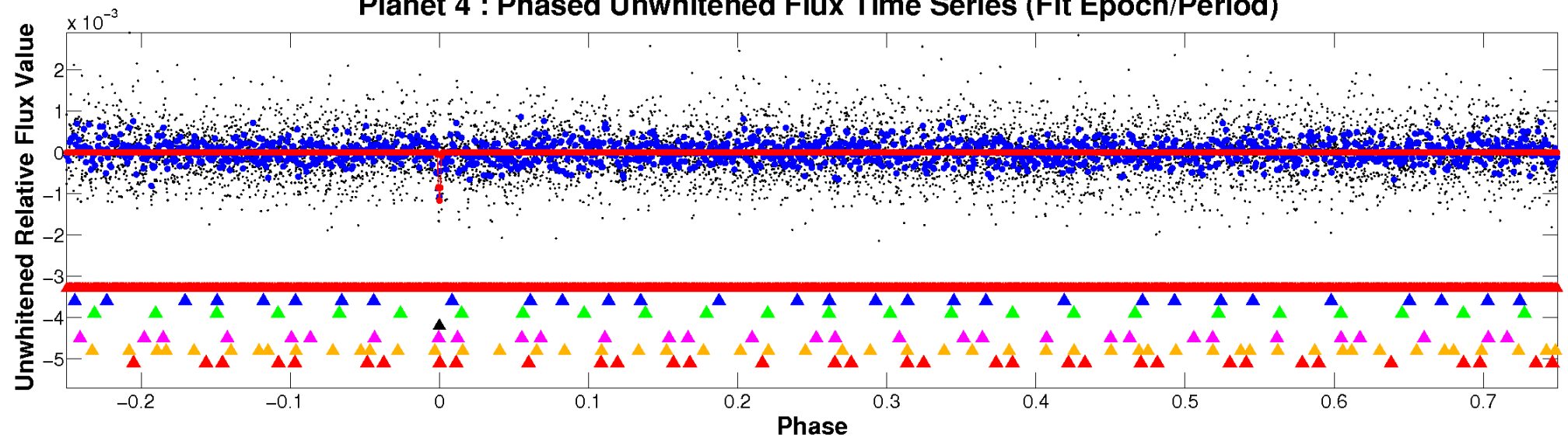


ALT Odd/Even

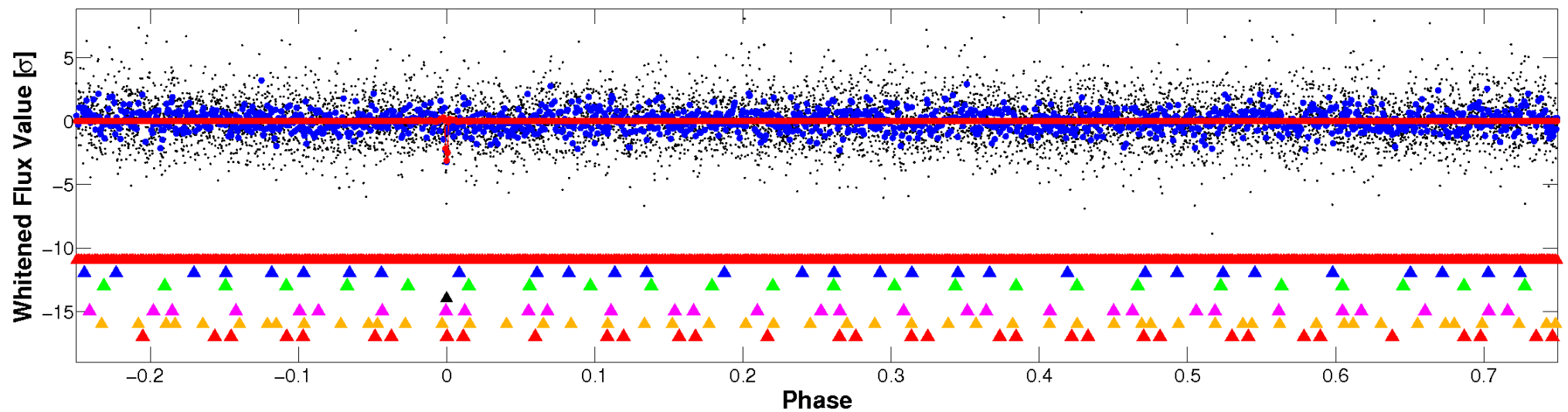
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

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

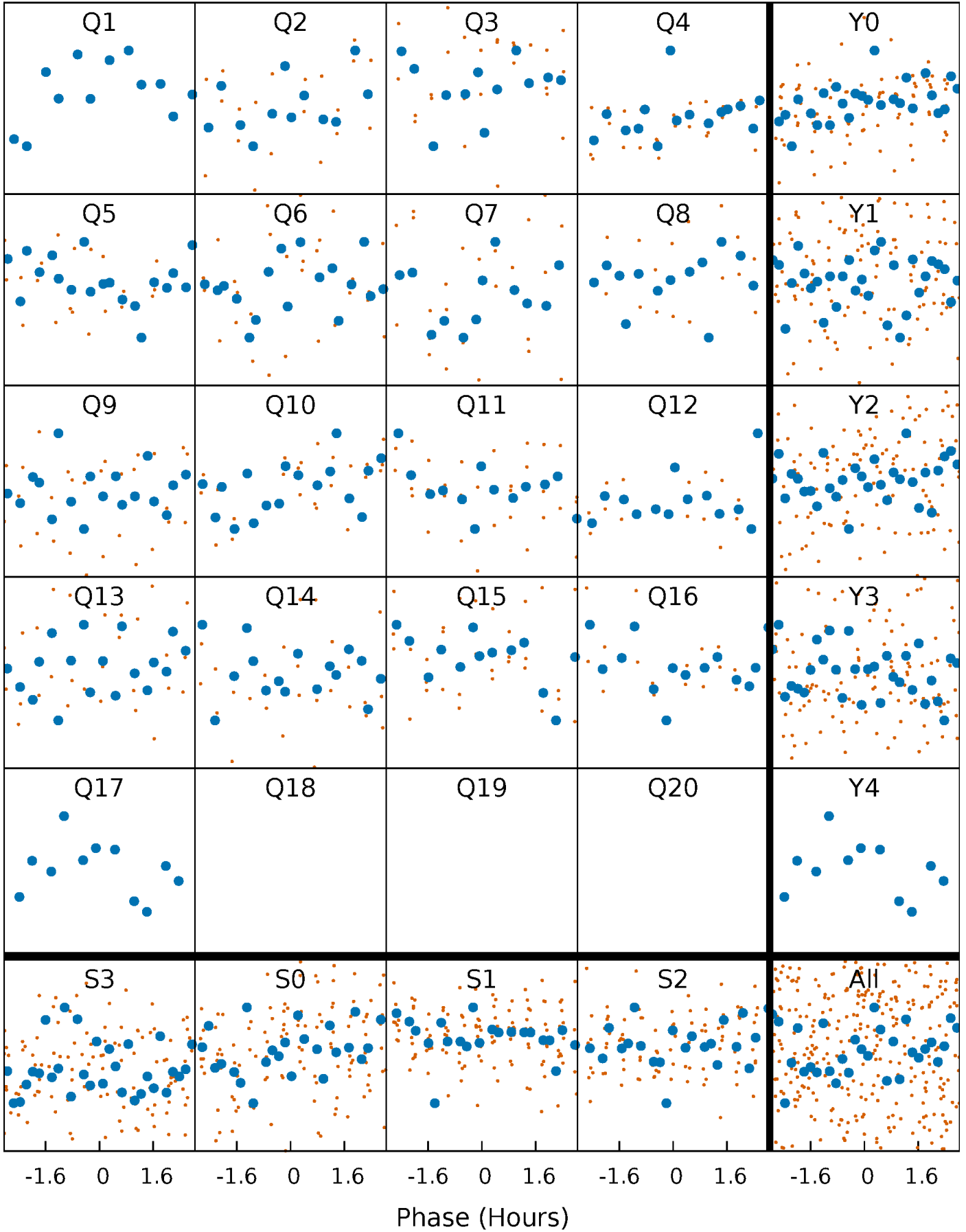


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



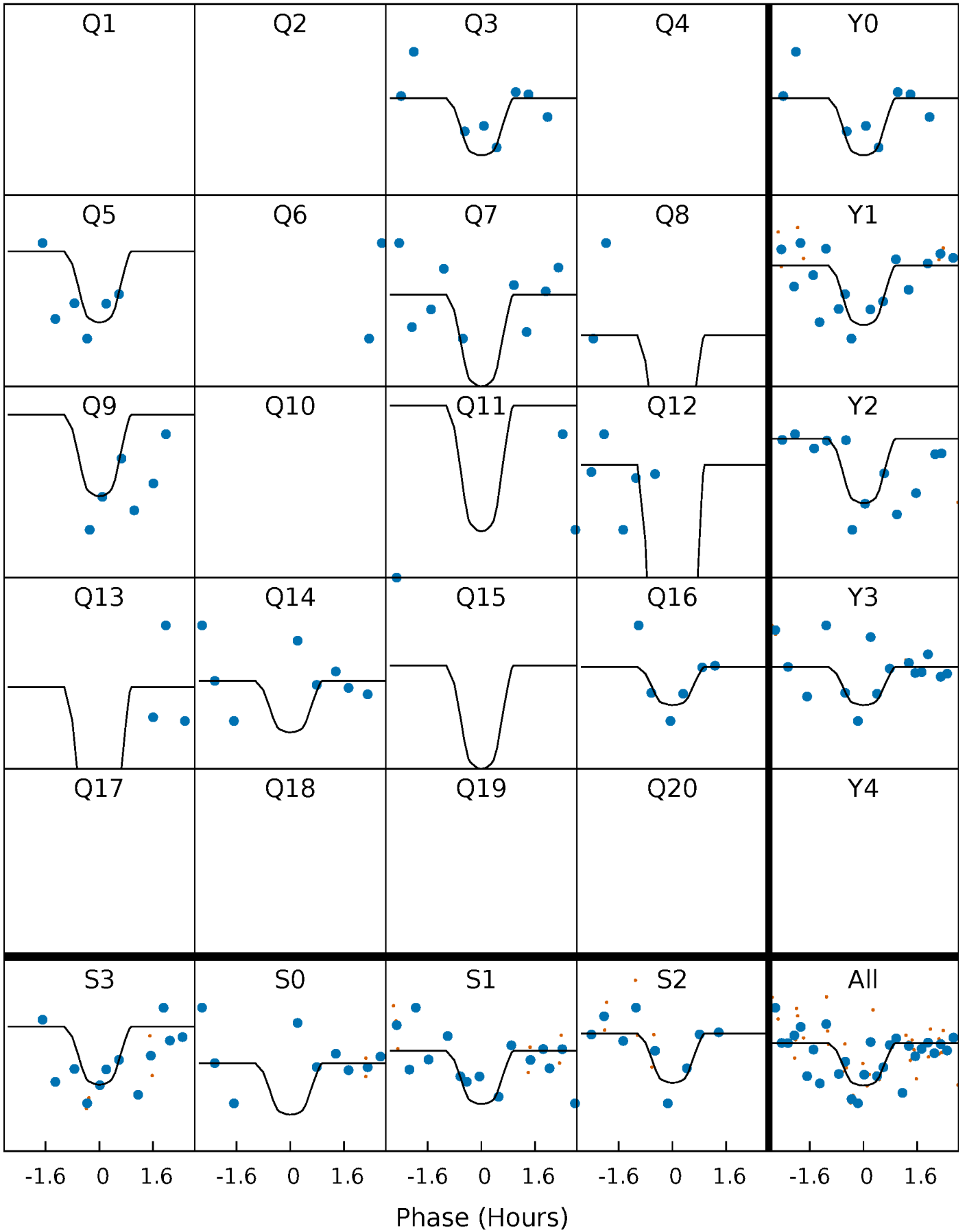
PDC Quarter-Phased Transit Curves

TCE 010470935-04 $P = 30.260665$ Days $T_0 = 153.057643$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 010470935-04 $P = 30.260665$ Days $T_0 = 153.057643$ (BKJD)

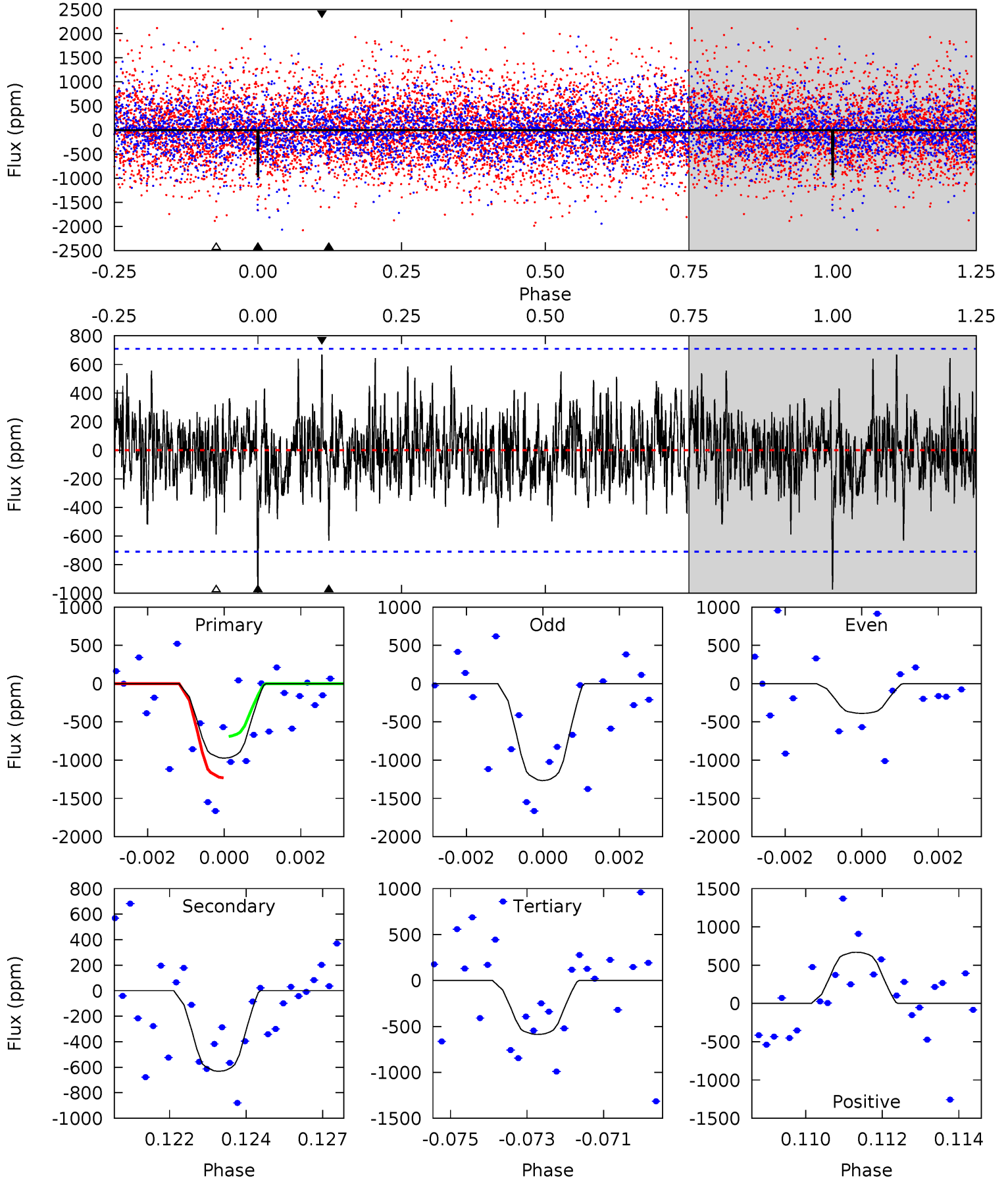


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

010470935-04, P = 30.260665 Days, E = 122.796978 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.26	4.71	4.38	4.99	5.29	3.03	1.39	2.88	2.27	0.33	-0.28	3.21	0.63	0.41	2.02



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 010470935

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3758^{+68}_{-68}	$4.756^{+0.036}_{-0.024}$	$-0.100^{+0.100}_{-0.100}$	$0.493^{+0.027}_{-0.035}$	$0.506^{+0.028}_{-0.031}$	$5.930^{+0.972}_{-0.620}$
	+2%/-2%	+1%/-1%	+100%/-100%	+5%/-7%	+6%/-6%	+16%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010470935-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-632 ± 134	$3.47^{+2.88}_{-2.44}$	417^{+9}_{-10}	2823^{+1277}_{-411}	650^{+6601}_{-461}
Alt.	N/A	N/A	N/A	N/A	N/A

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 $A_{obs} \gg 1.0$

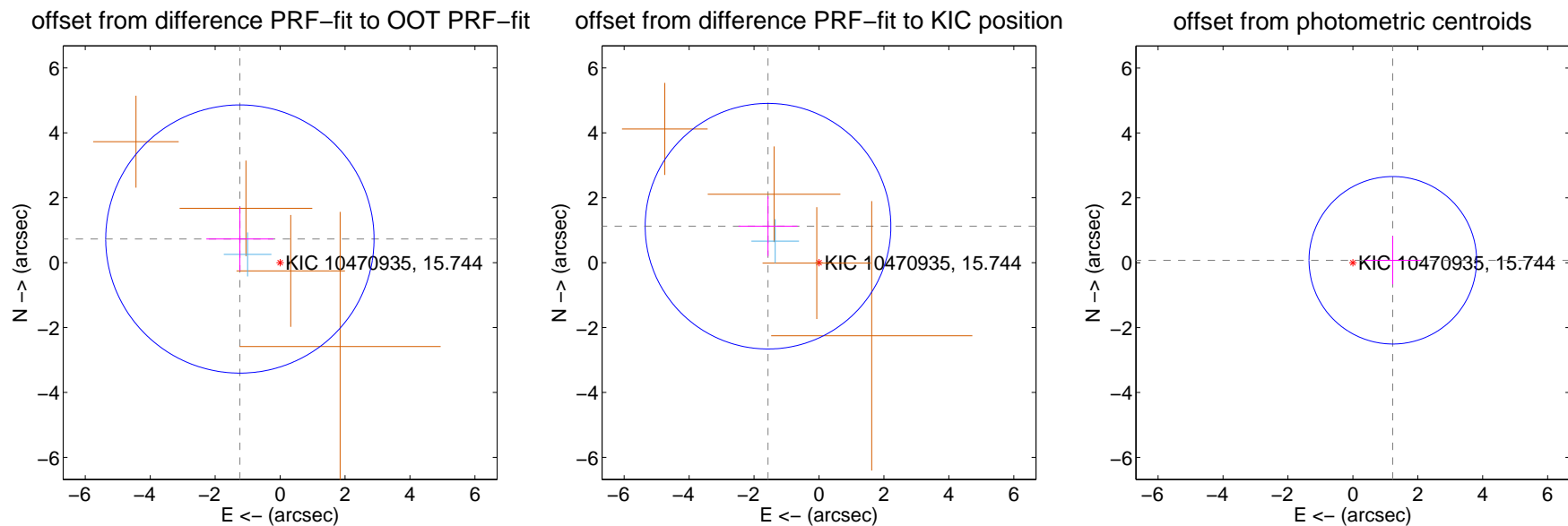
DV Centroid Data

Supplemental centroid analysis for 010470935-04. Kepler magnitude: 15.74. Transit SNR 9.29

There are 1 quarters with good PRF difference image offsets

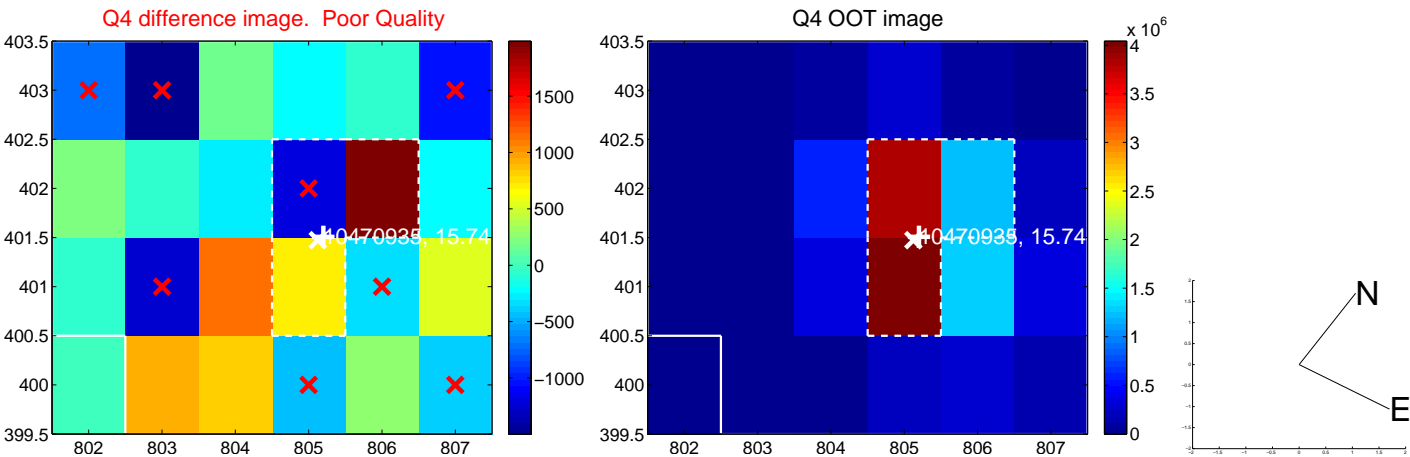
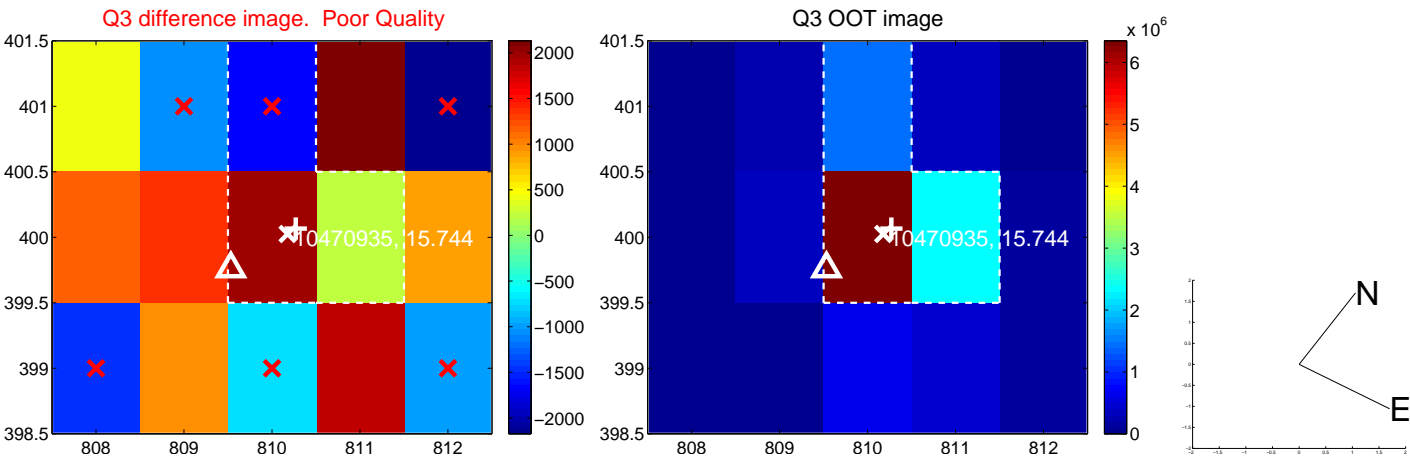
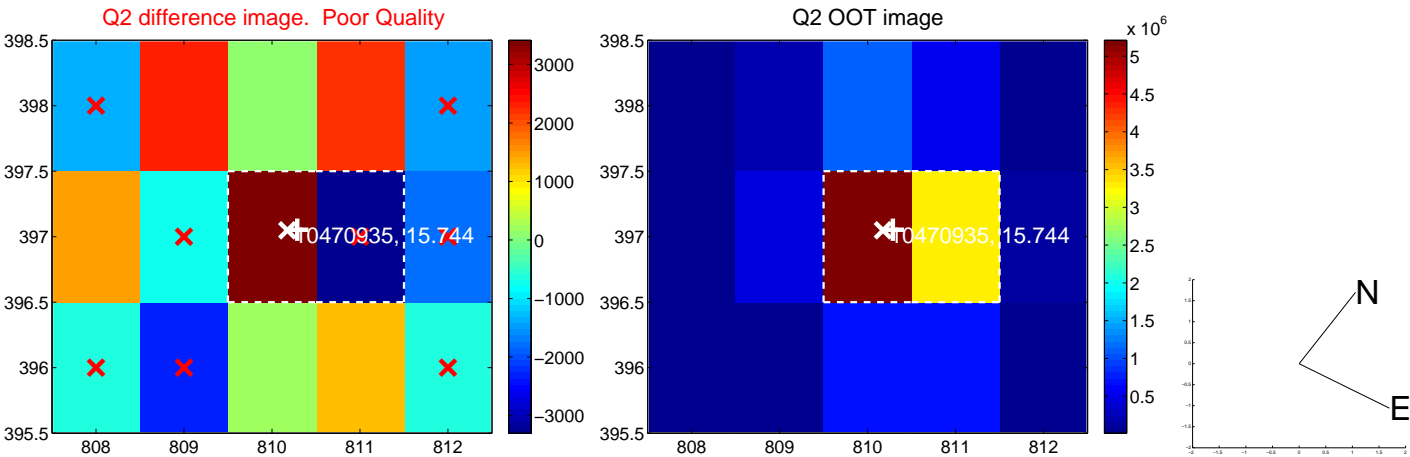
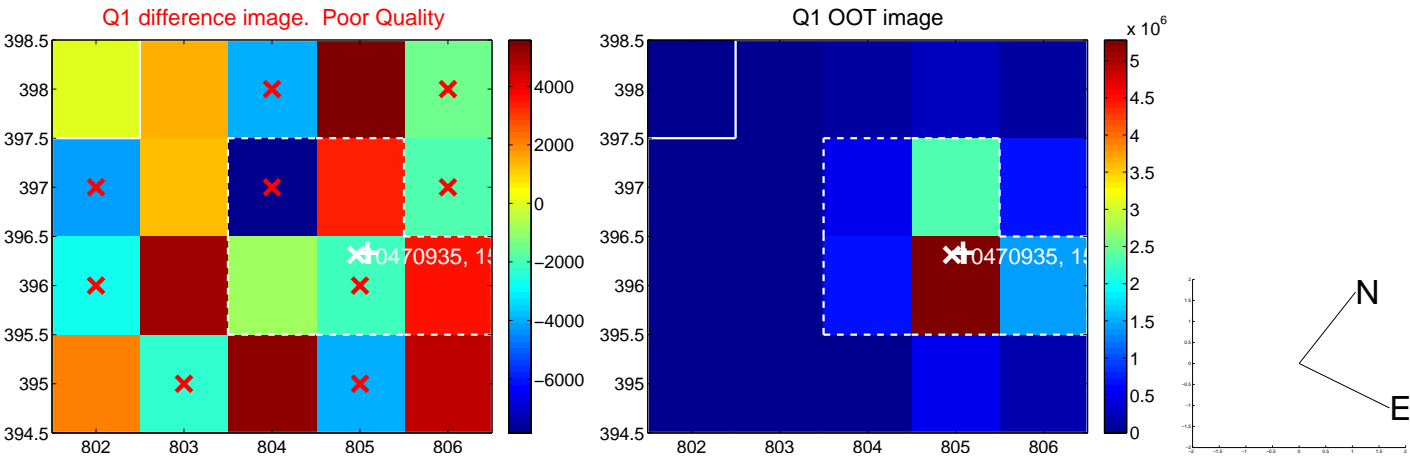
The direct PRF centroid is offset from the target star catalog position by about 0.54 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.436 ± 1.377	1.04	1.239 ± 1.034	0.728 ± 0.980
PRF-fit source offset from KIC position	1.930 ± 1.261	1.53	1.569 ± 0.907	1.123 ± 0.918
photometric centroid source offset	1.23 ± 0.86	1.43	-1.23 ± 0.86	0.08 ± 0.74

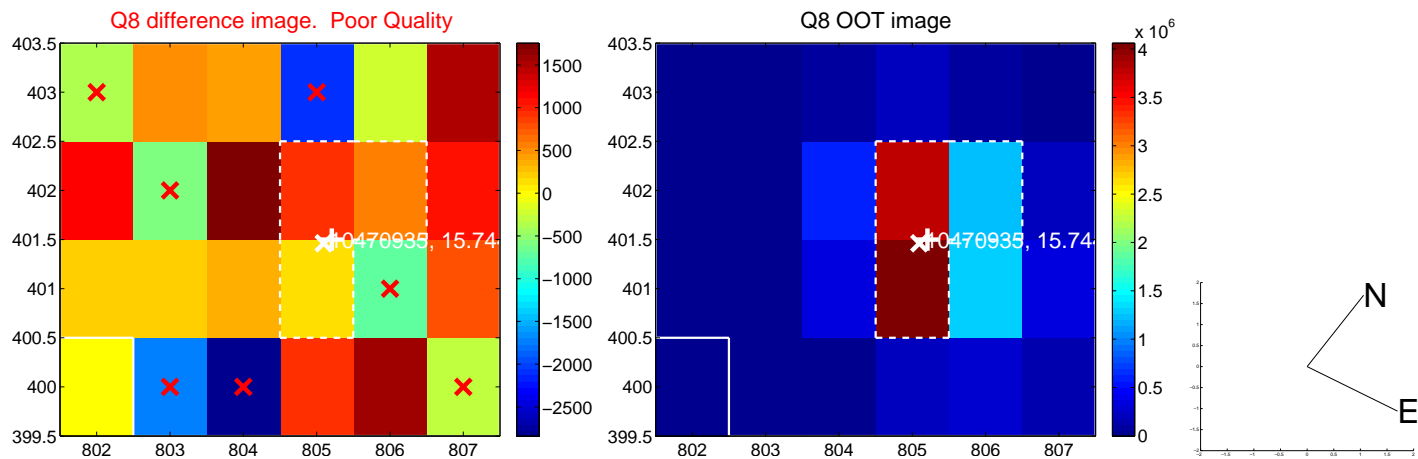
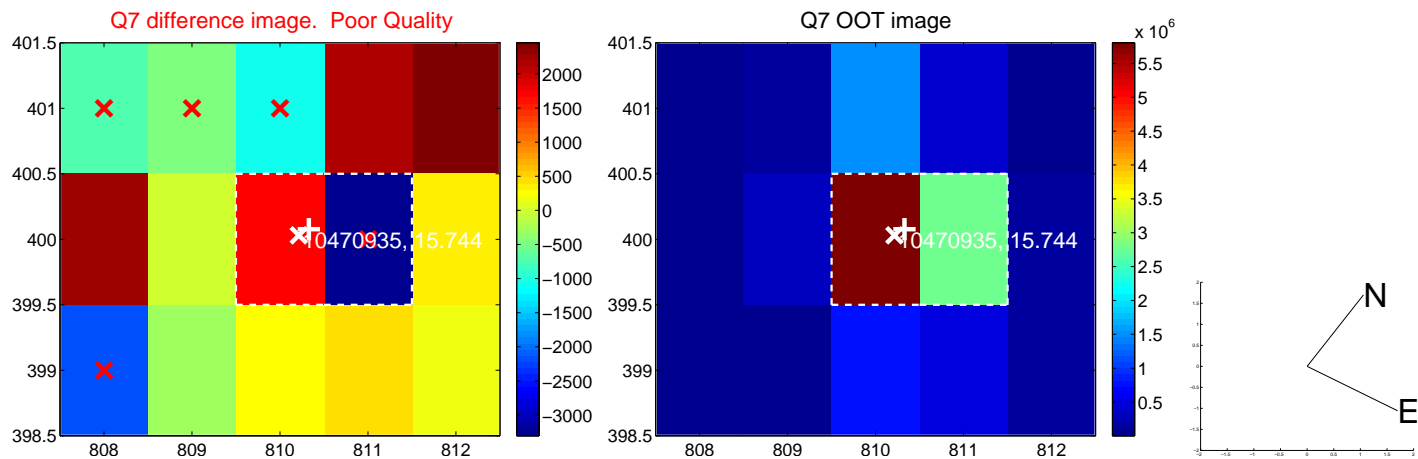
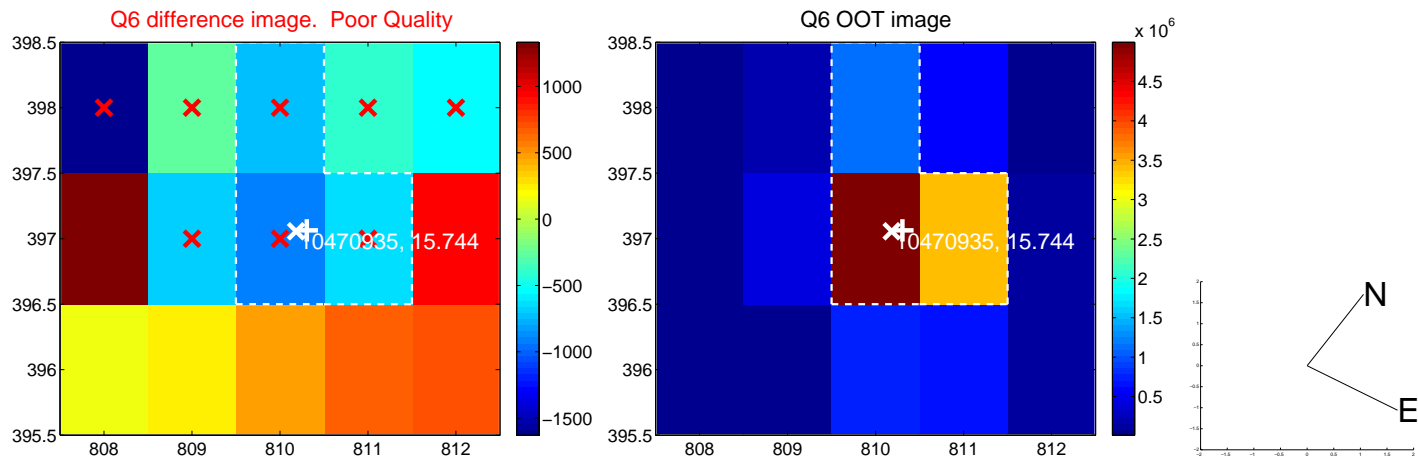
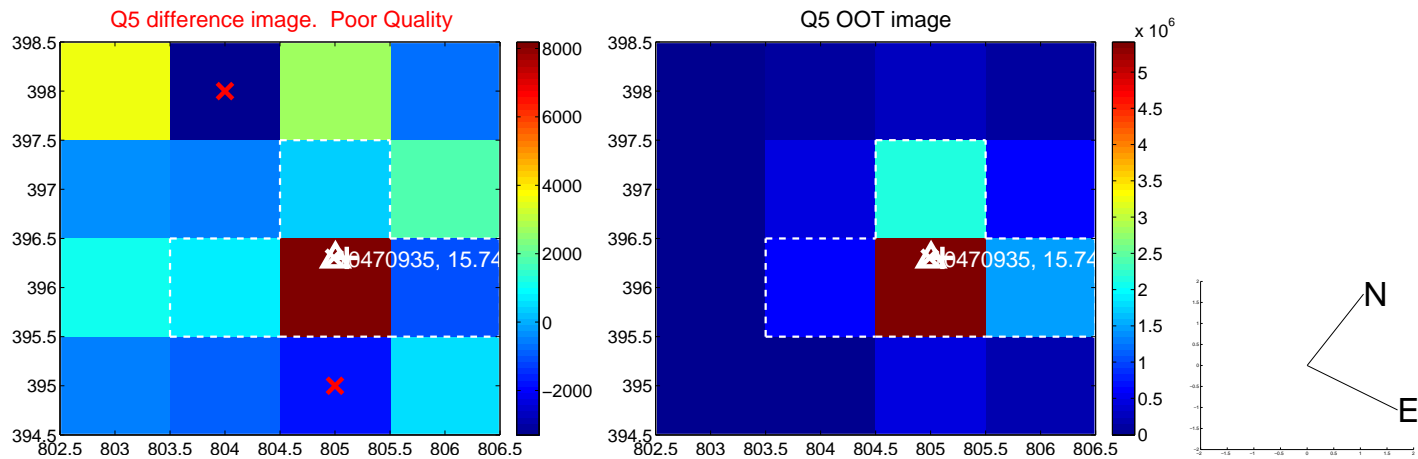


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

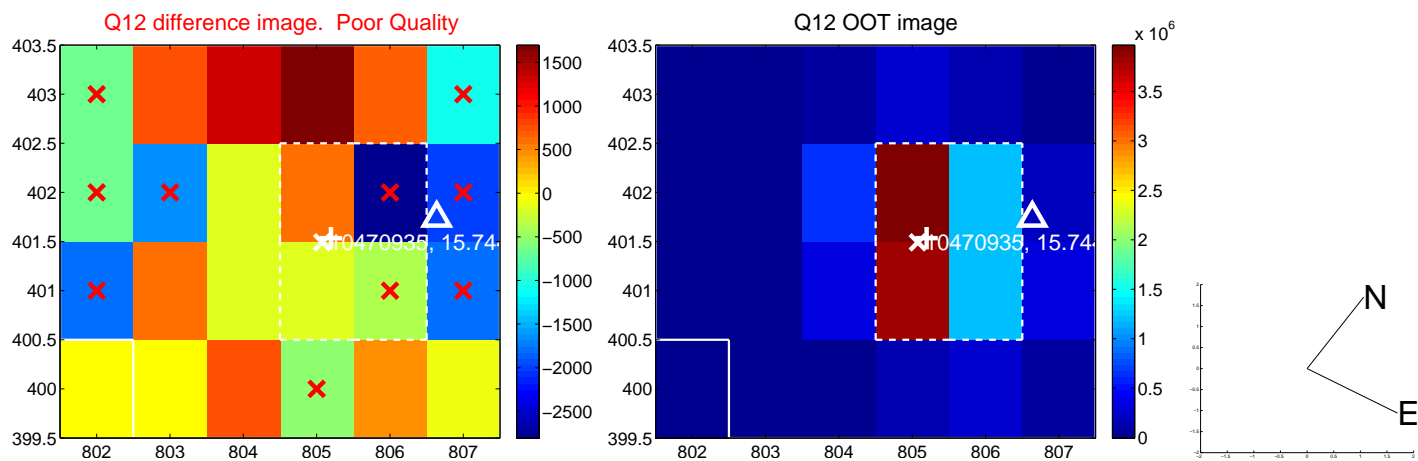
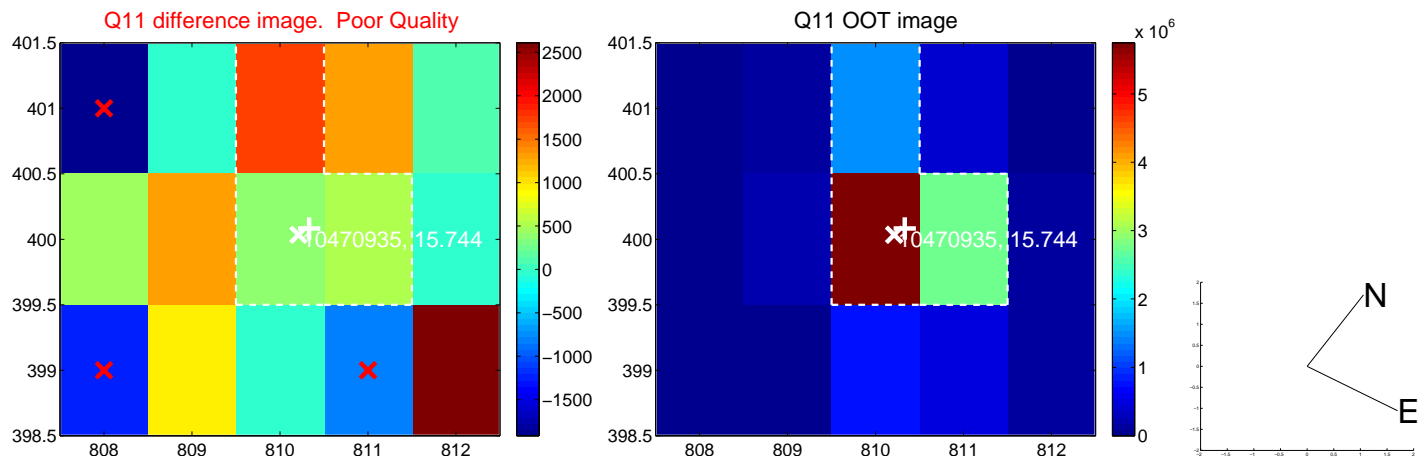
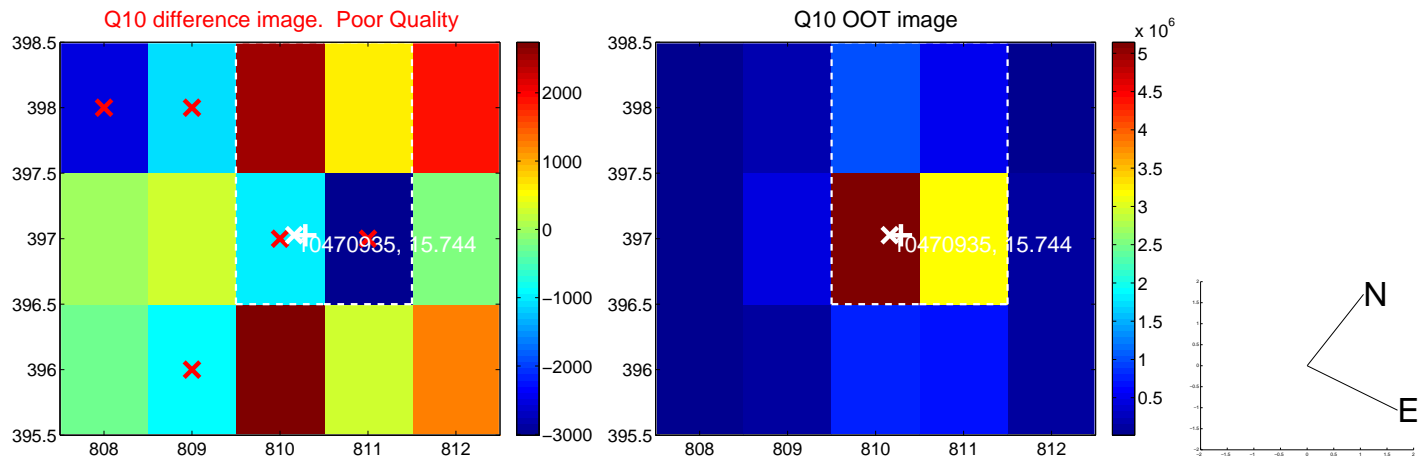
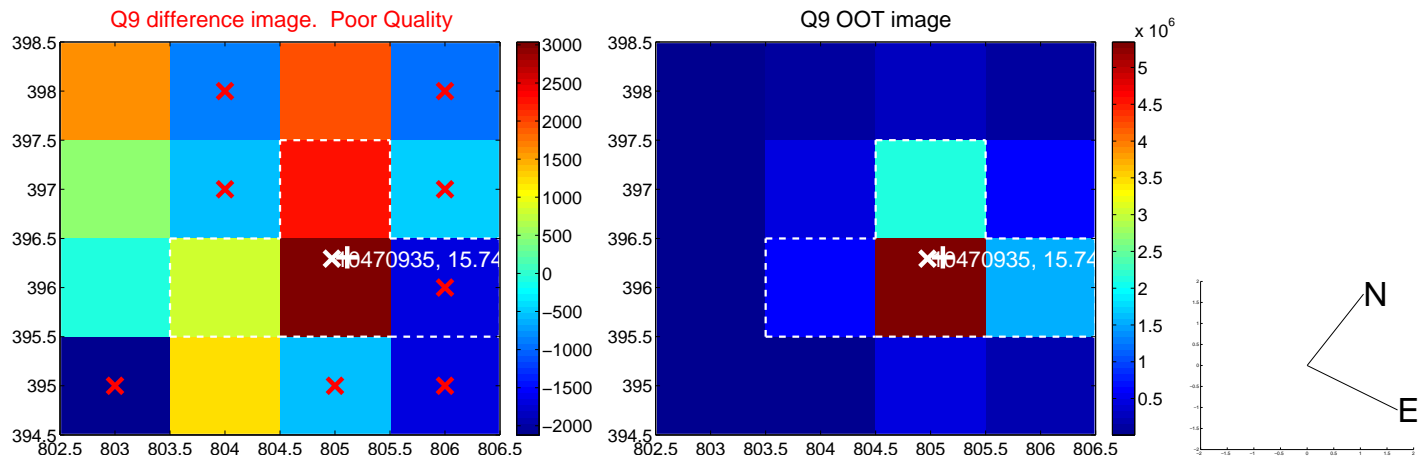
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



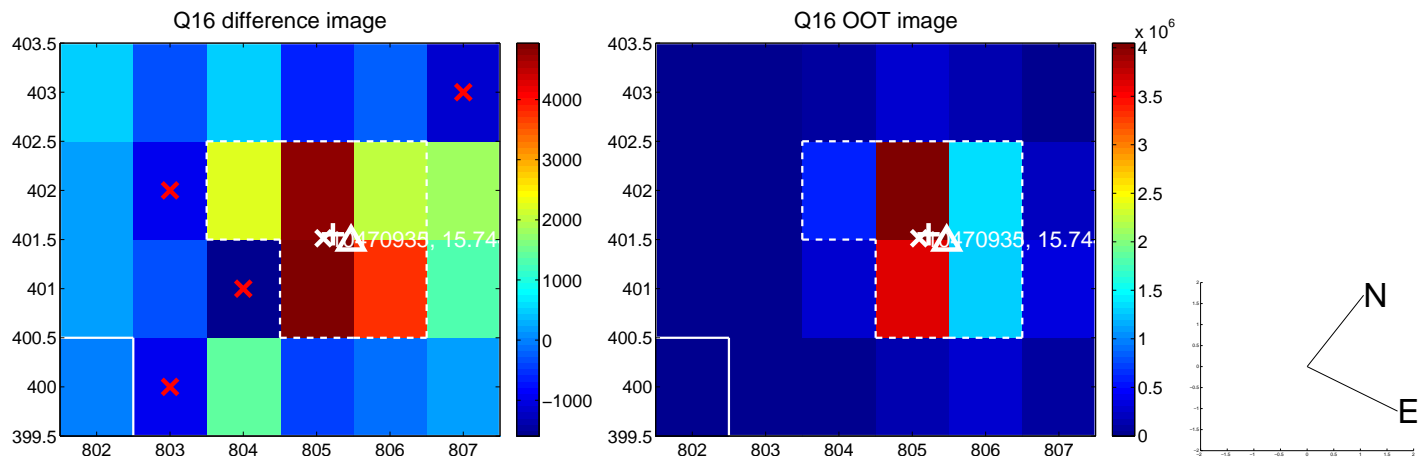
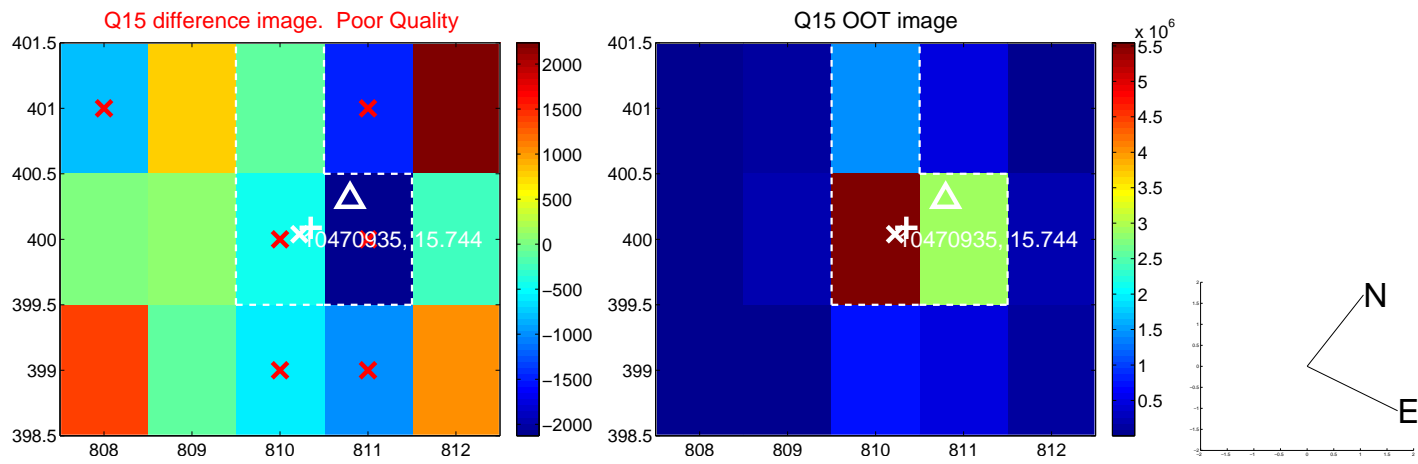
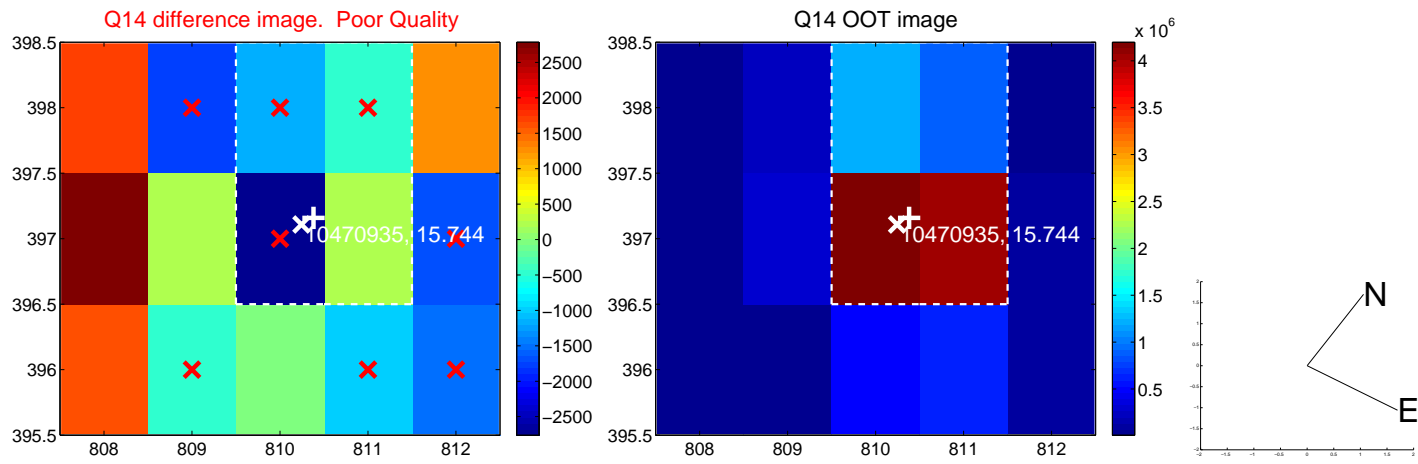
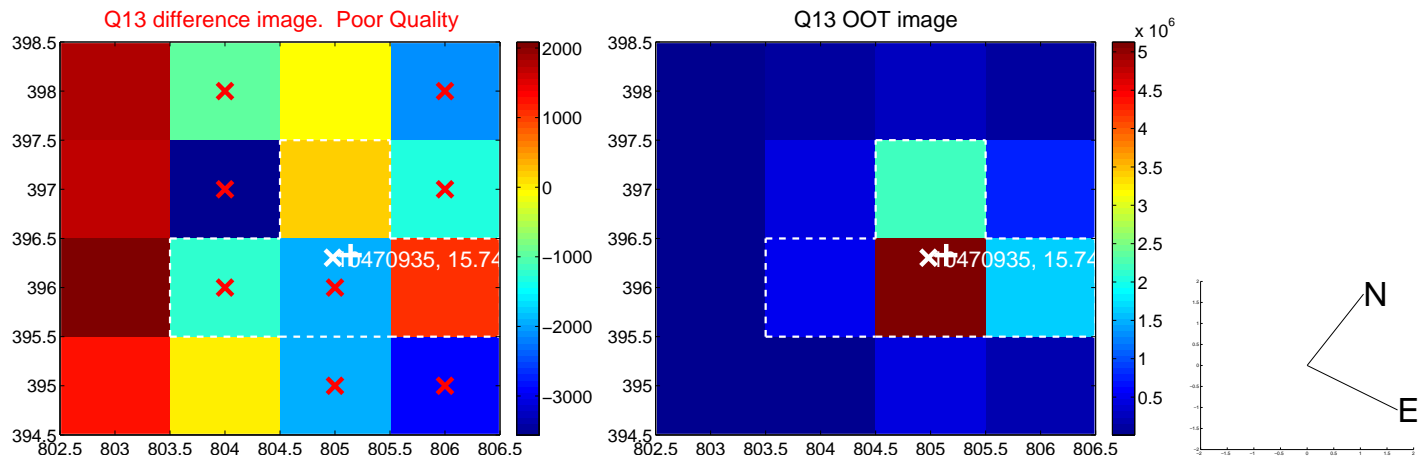
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



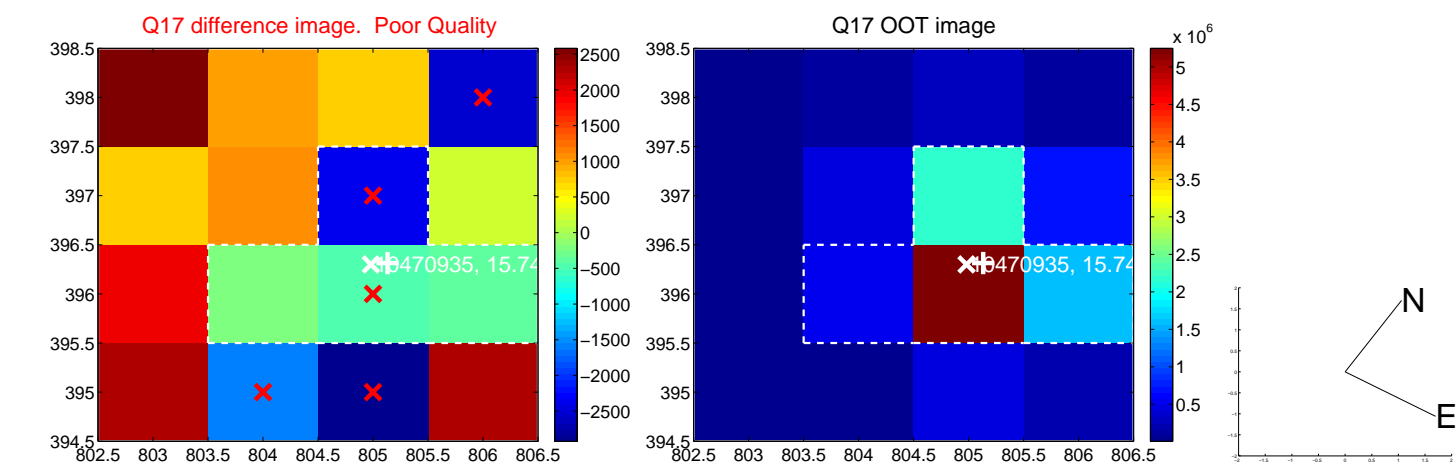
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



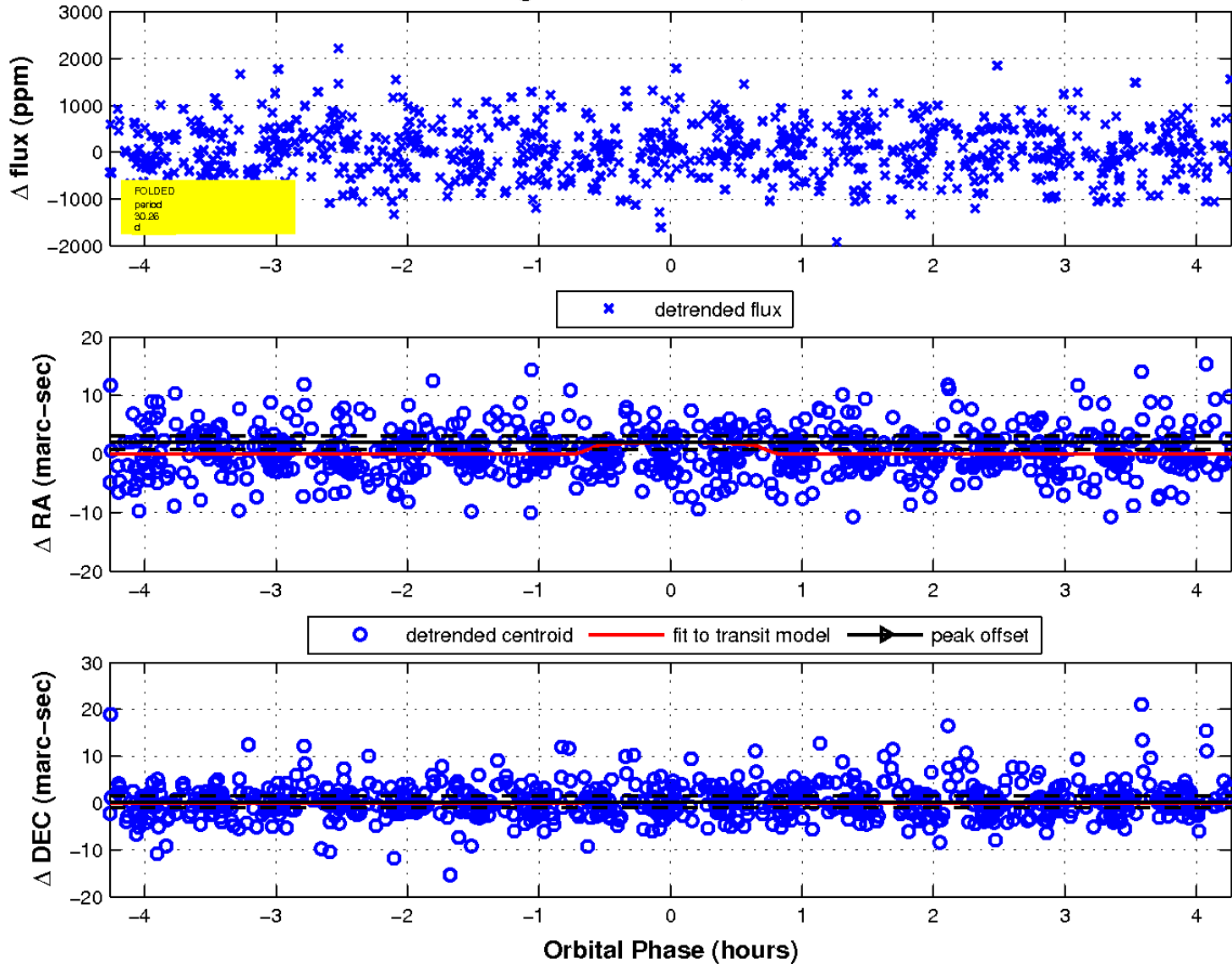
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

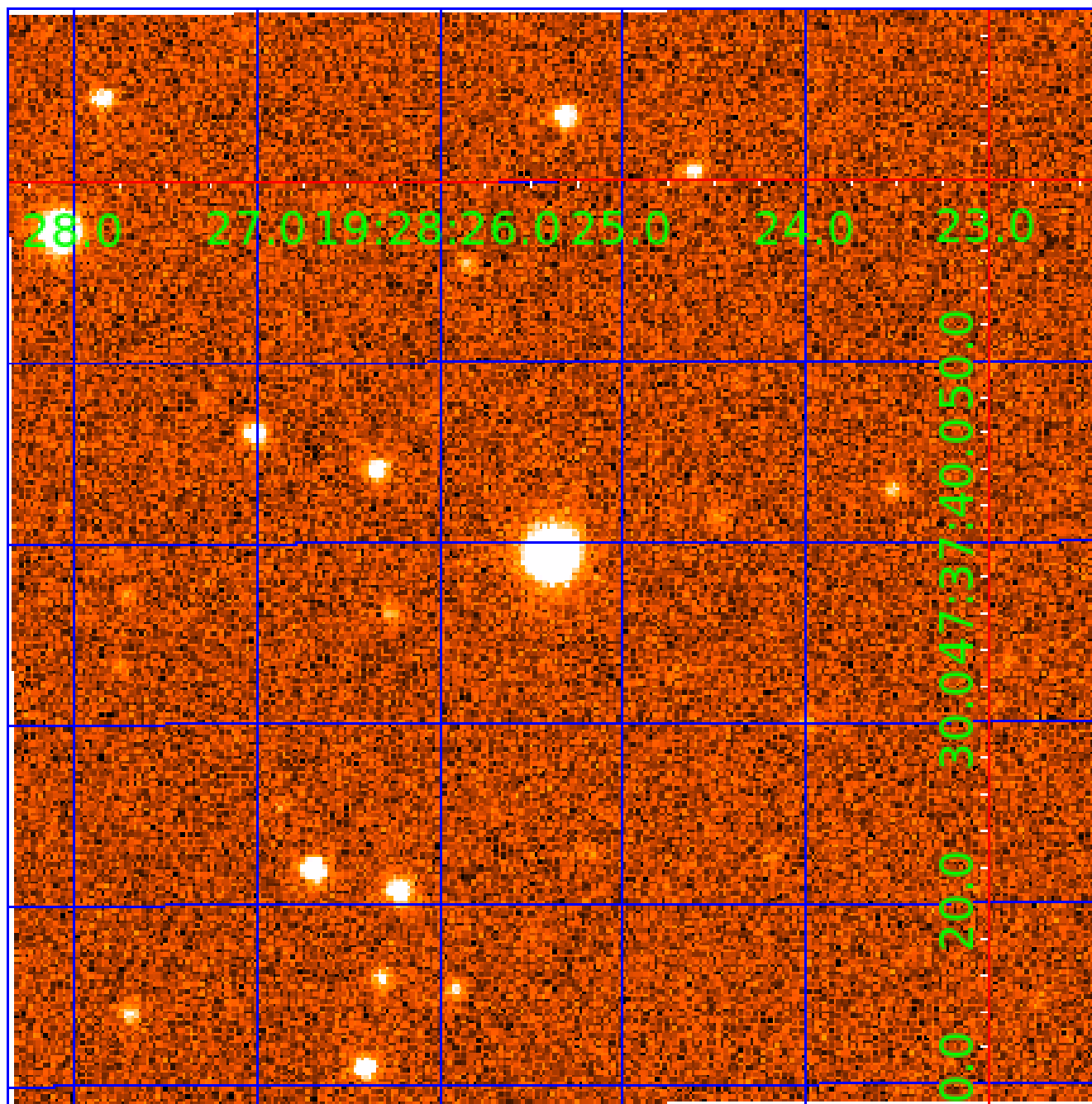


fluxWeightedCentroids, Planet 4 of 7



UKIRT Image

Declination



KIC 010470935

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})
010470935-01	OBS	No	0.933653	131.581200	41.1	6.373	7.5	7.2	0.49	3758	0.32	195.75
010470935-02	OBS	No	48.099305	175.920478	911.6	2.536	12.4	8.9	0.49	3758	1.67	1.02
010470935-03	OBS	No	61.763380	138.606372	1418.8	2.714	10.8	12.3	0.49	3758	3.37	0.73
010470935-04	OBS	No	30.260665	153.057643	1173.5	1.424	9.9	9.3	0.49	3758	1.69	1.89
010470935-05	OBS	No	46.884833	138.490223	609.4	4.383	9.1	9.7	0.49	3758	1.32	1.06
010470935-06	OBS	No	28.193285	151.647421	886.1	2.418	8.7	11.3	0.49	3758	1.60	2.08
010470935-07	OBS	No	43.019550	137.033651	862.4	4.285	8.1	8.7	0.49	3758	1.55	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010470935-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH
010470935-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_MEAS
010470935-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010470935-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010470935-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_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.

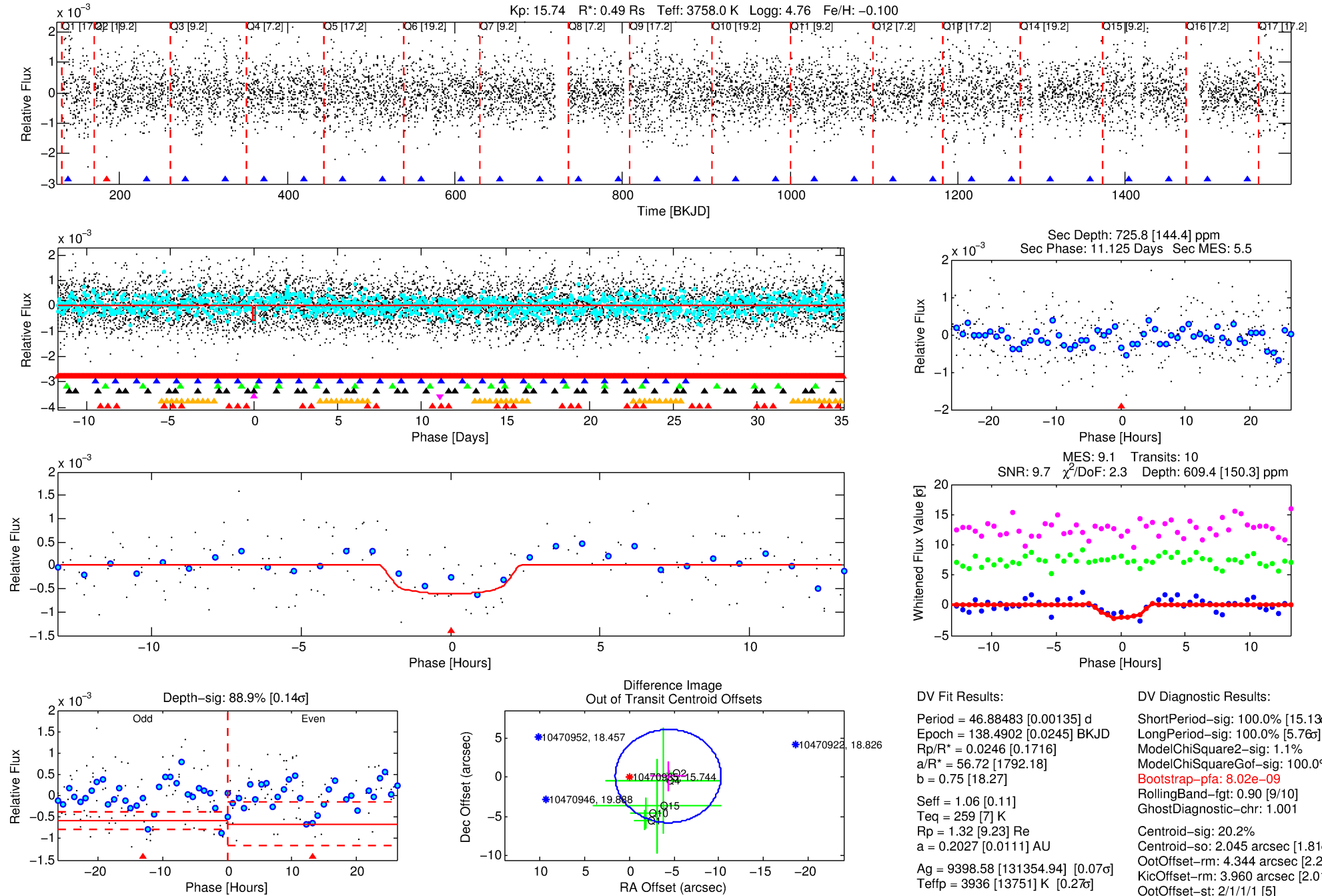
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010470935-05

No Significant Match Found

DV One-Page Summary

KIC: 10470935 Candidate: 5 of 7 Period: 46.885 d



DV Fit Results:

Period = 46.88483 [0.00135] d
Epoch = 138.4902 [0.0245] BKJD
Rp/R* = 0.0246 [0.1716]
a/R* = 56.72 [1792.18]
b = 0.75 [18.27]
Seff = 1.06 [0.11]
Teq = 259 [7] K
Rp = 1.32 [9.23] Re
a = 0.2027 [0.0111] AU
Ag = 9398.58 [131354.94] [0.07σ]
Teff = 3936 [13751] K [0.27σ]

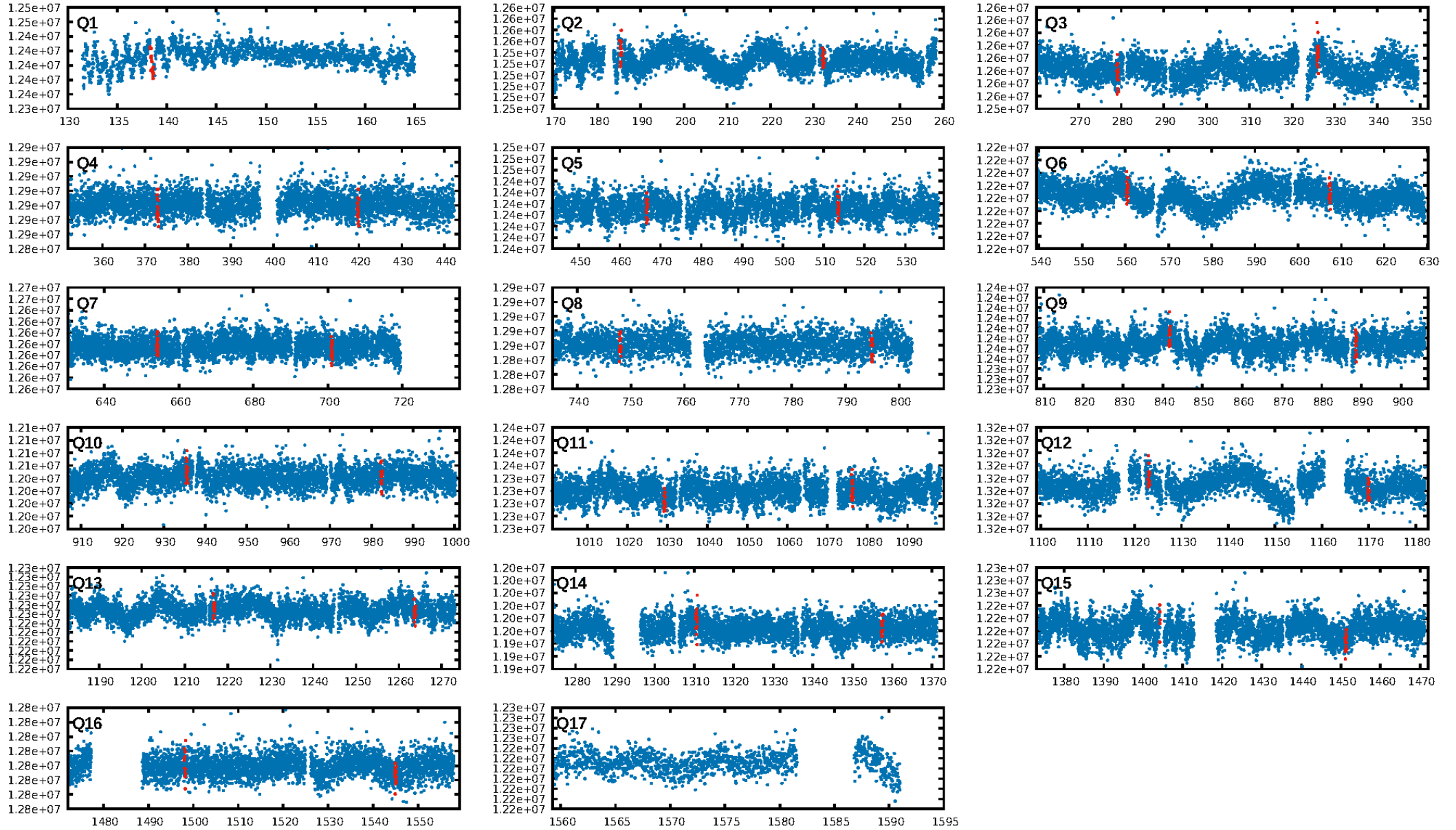
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [15.13σ]
LongPeriod-sig: 100.0% [5.76σ]
ModelChiSquare2-sig: 1.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 8.02e-09
RollingBand-fgt: 0.90 [9/10]
GhostDiagnostic-chr: 1.001
Centroid-sig: 20.2%
Centroid-so: 2.045 arcsec [1.81σ]
OotOffset-rm: 4.344 arcsec [2.20σ]
KicOffset-rm: 3.960 arcsec [2.01σ]
OotOffset-st: 2/1/1/1 [5]
KicOffset-st: 2/1/1/1 [5]
DiffImageQuality-fgm: 0.00 [0/5]
DiffImageOverlap-fno: 0.00 [0/16]

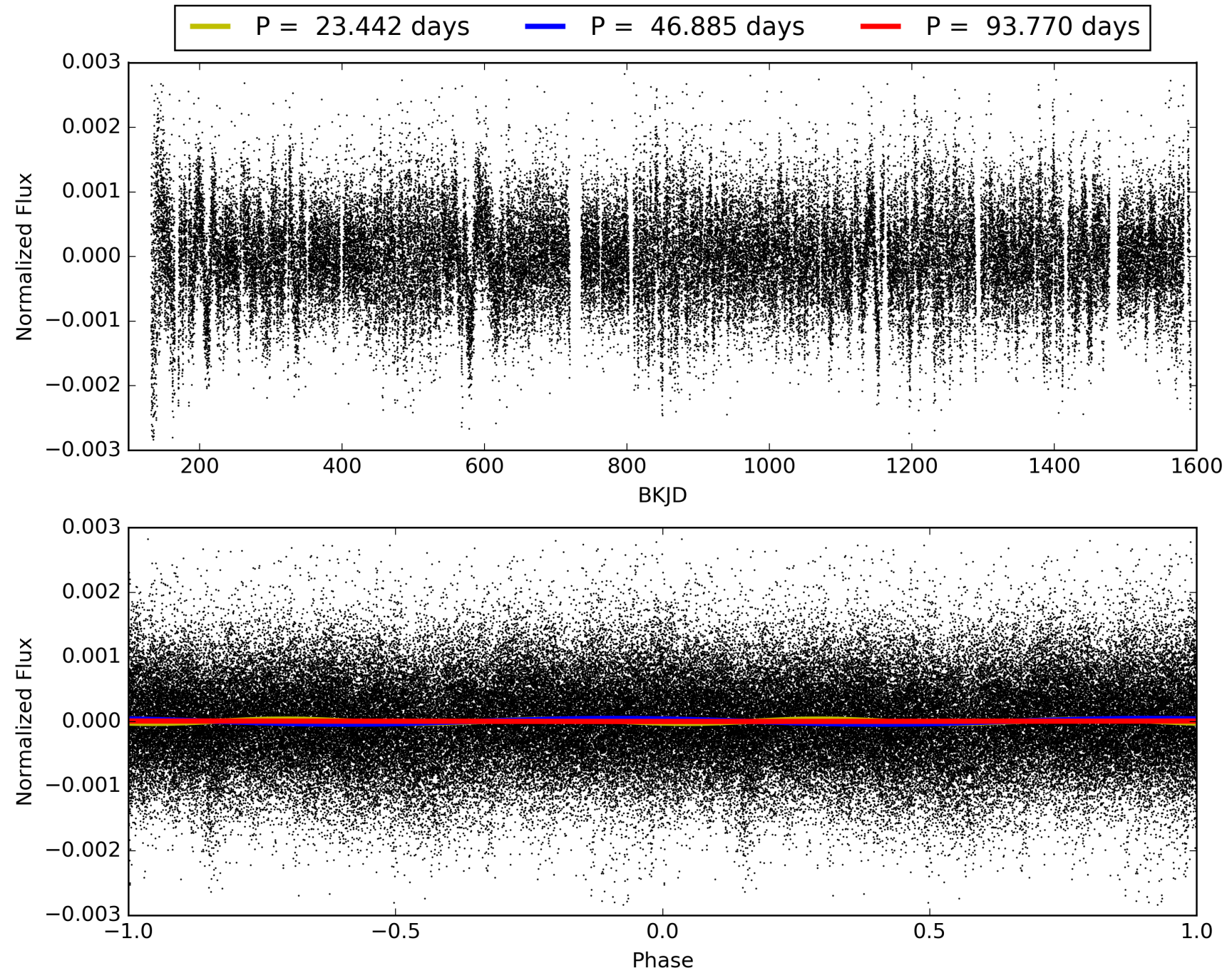
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:31:19 Z

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

TCE 010470935-05, PDC Light Curves

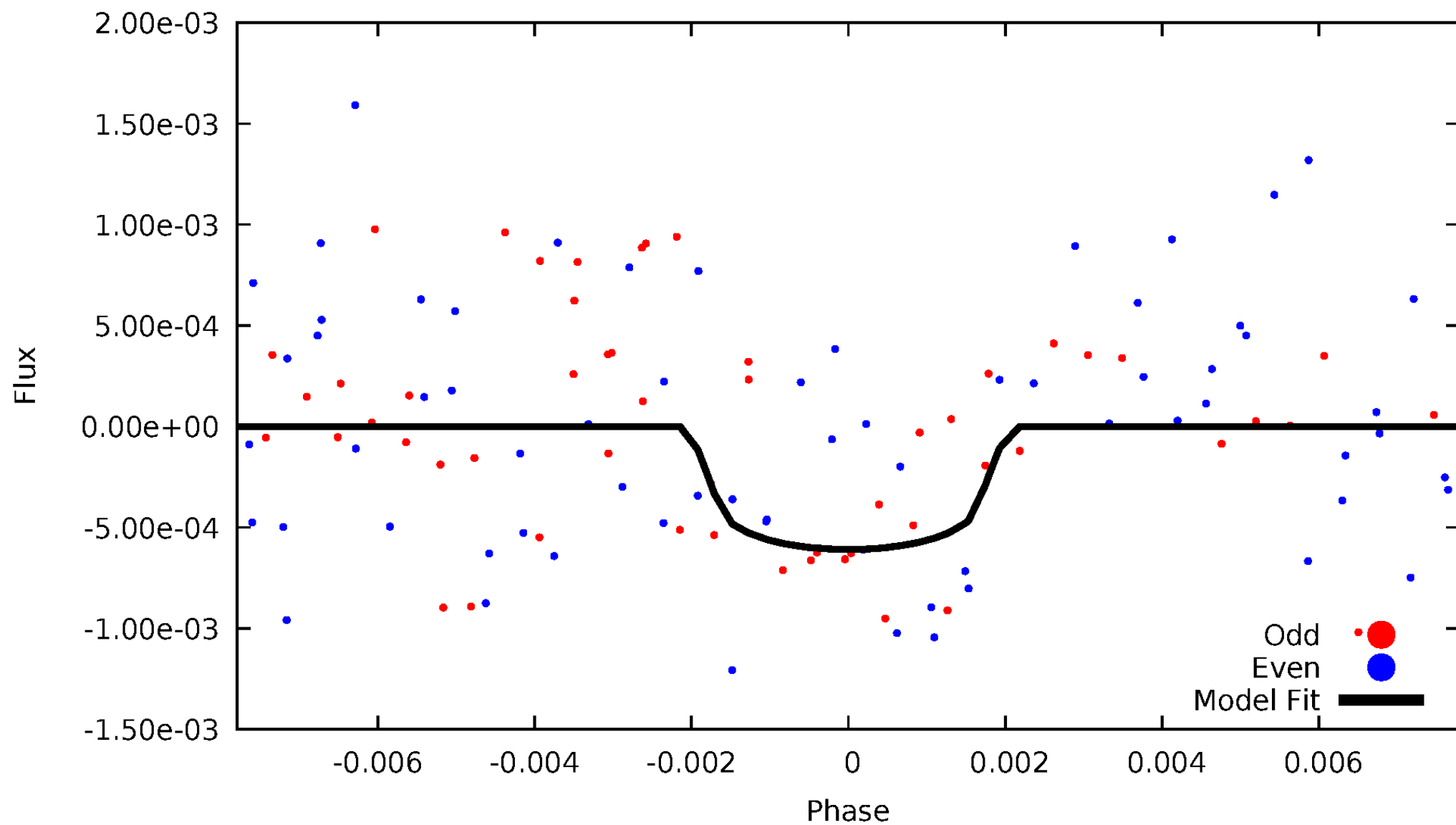


TCE 010470935-05



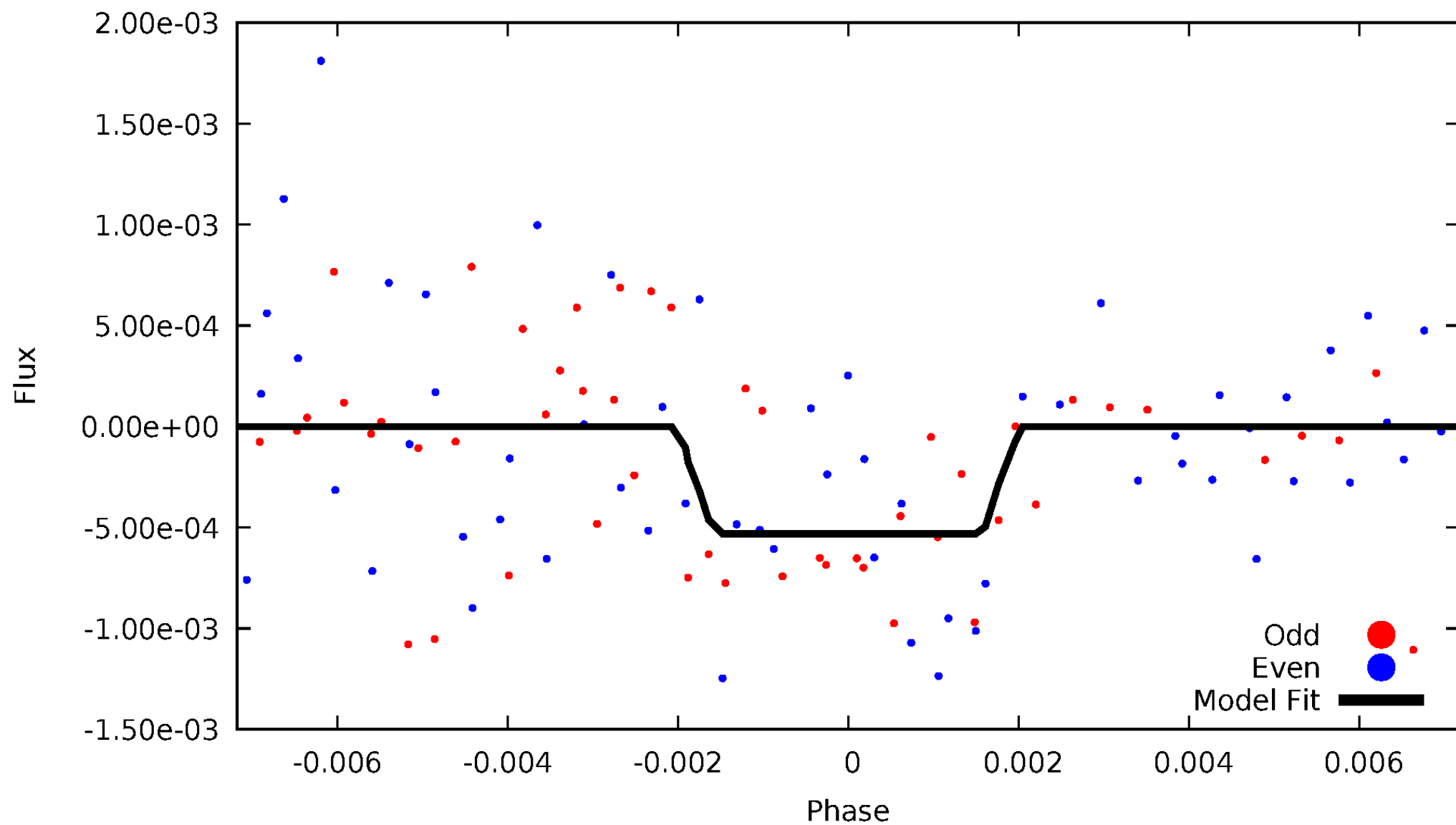
DV Odd/Even

TCE 010470935-05



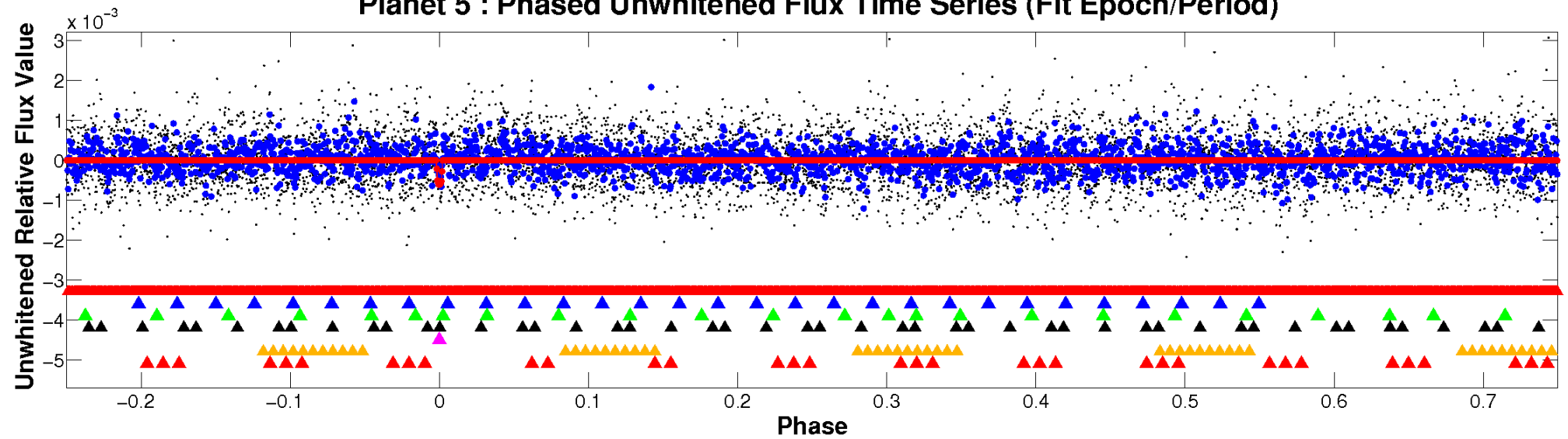
ALT Odd/Even

TCE 010470935-05

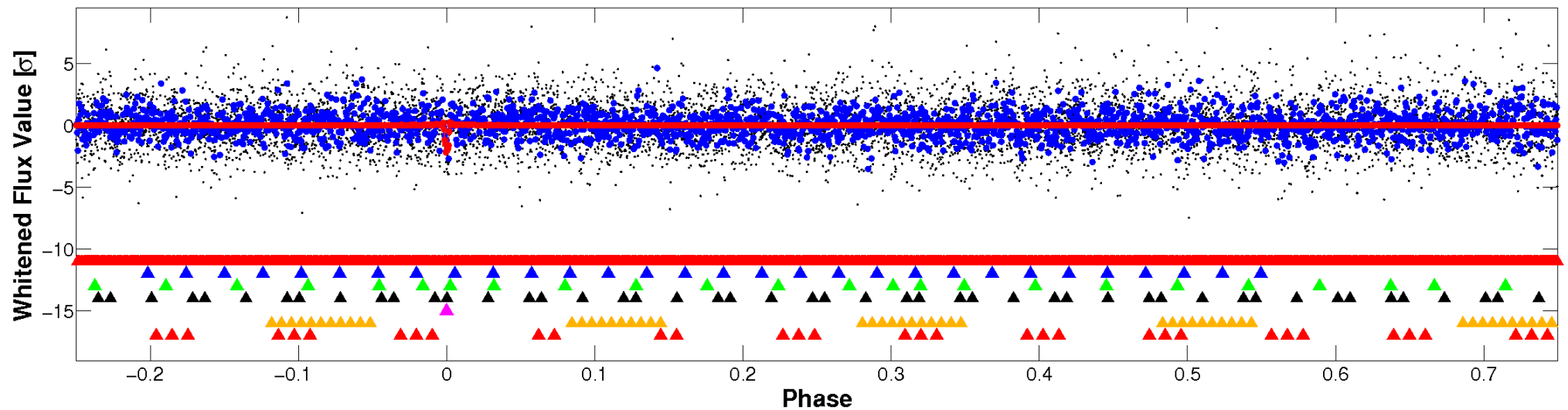


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

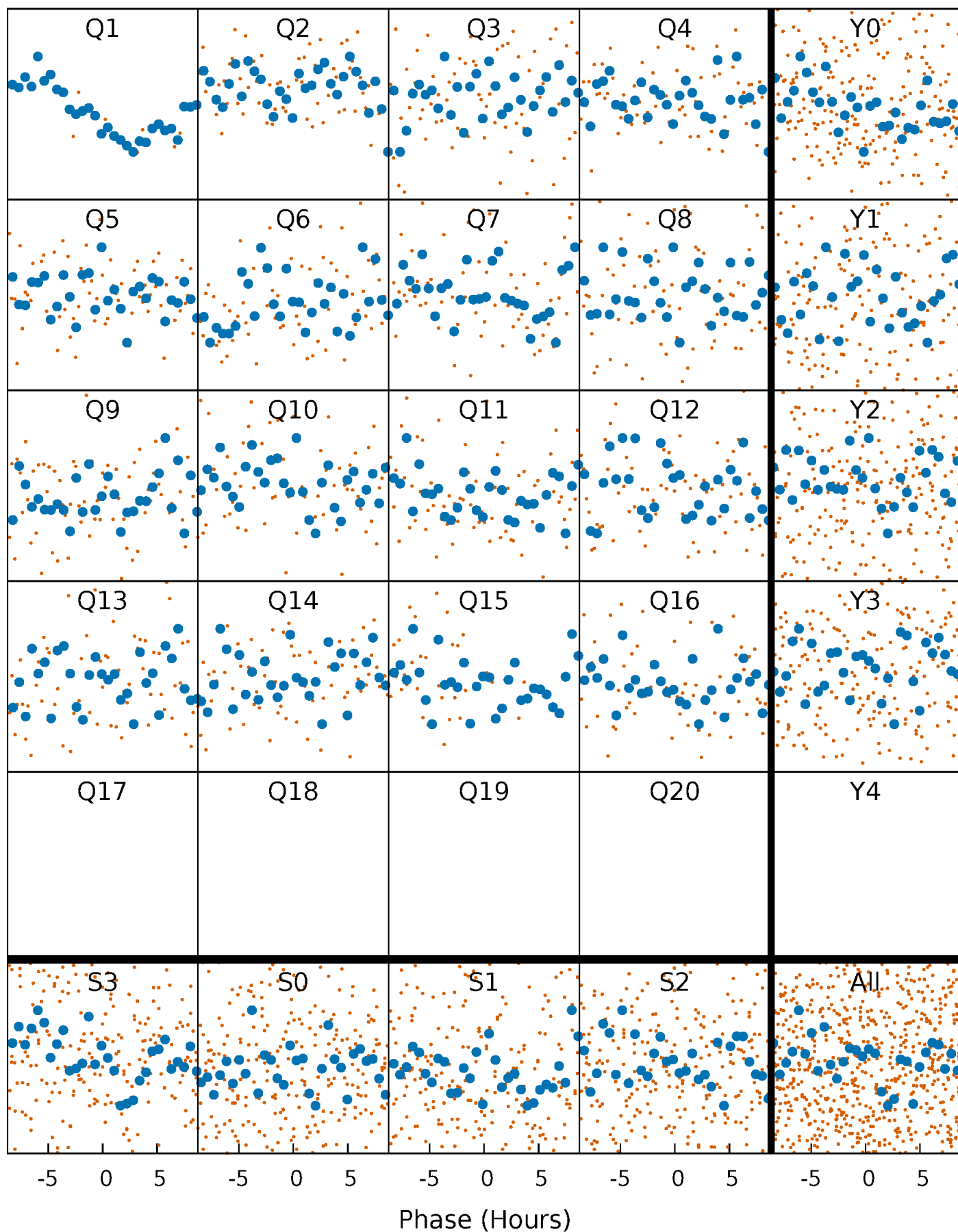


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



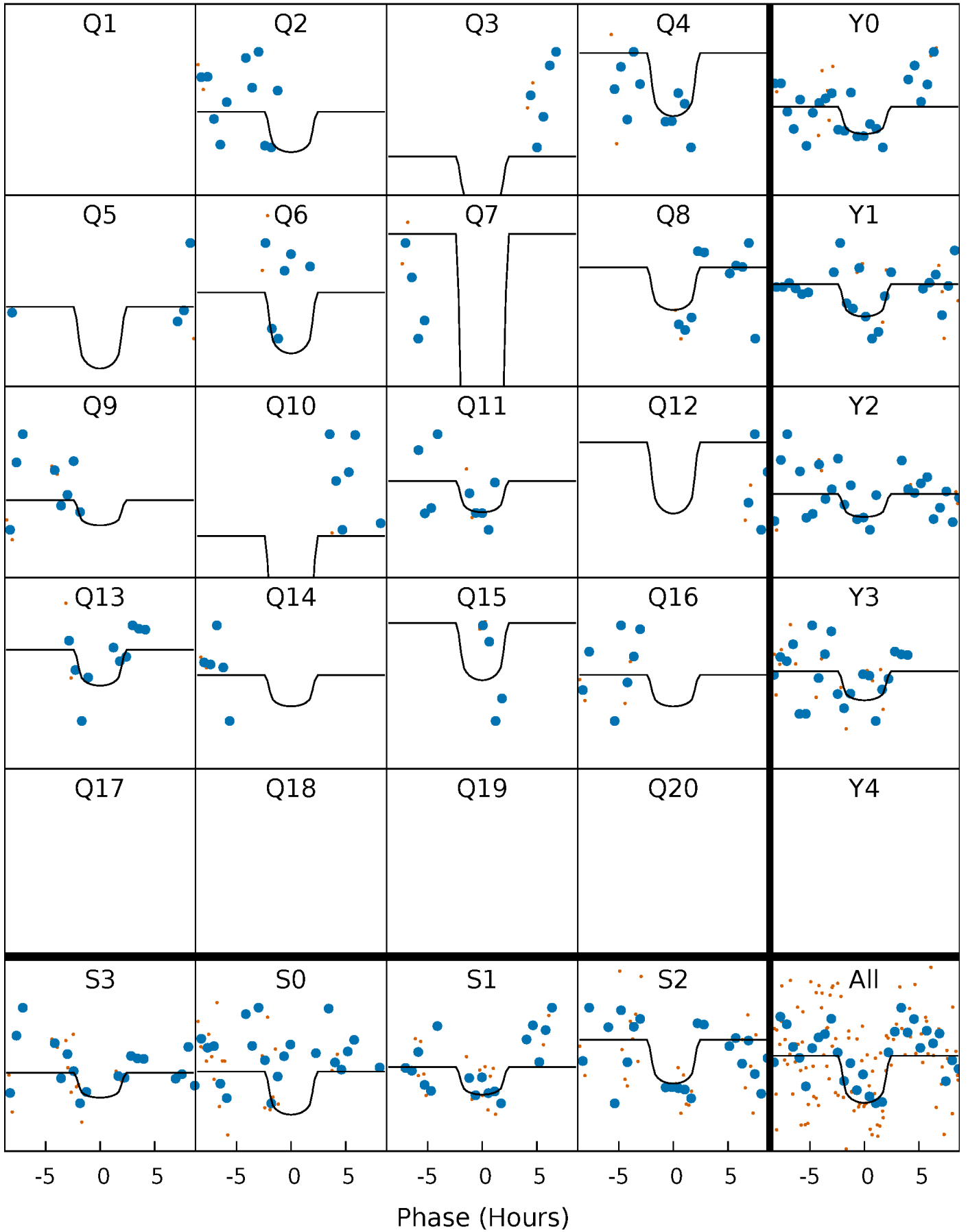
PDC Quarter-Phased Transit Curves

TCE 010470935-05 $P = 46.884833$ Days $T_0 = 138.490222$ (BKJD)



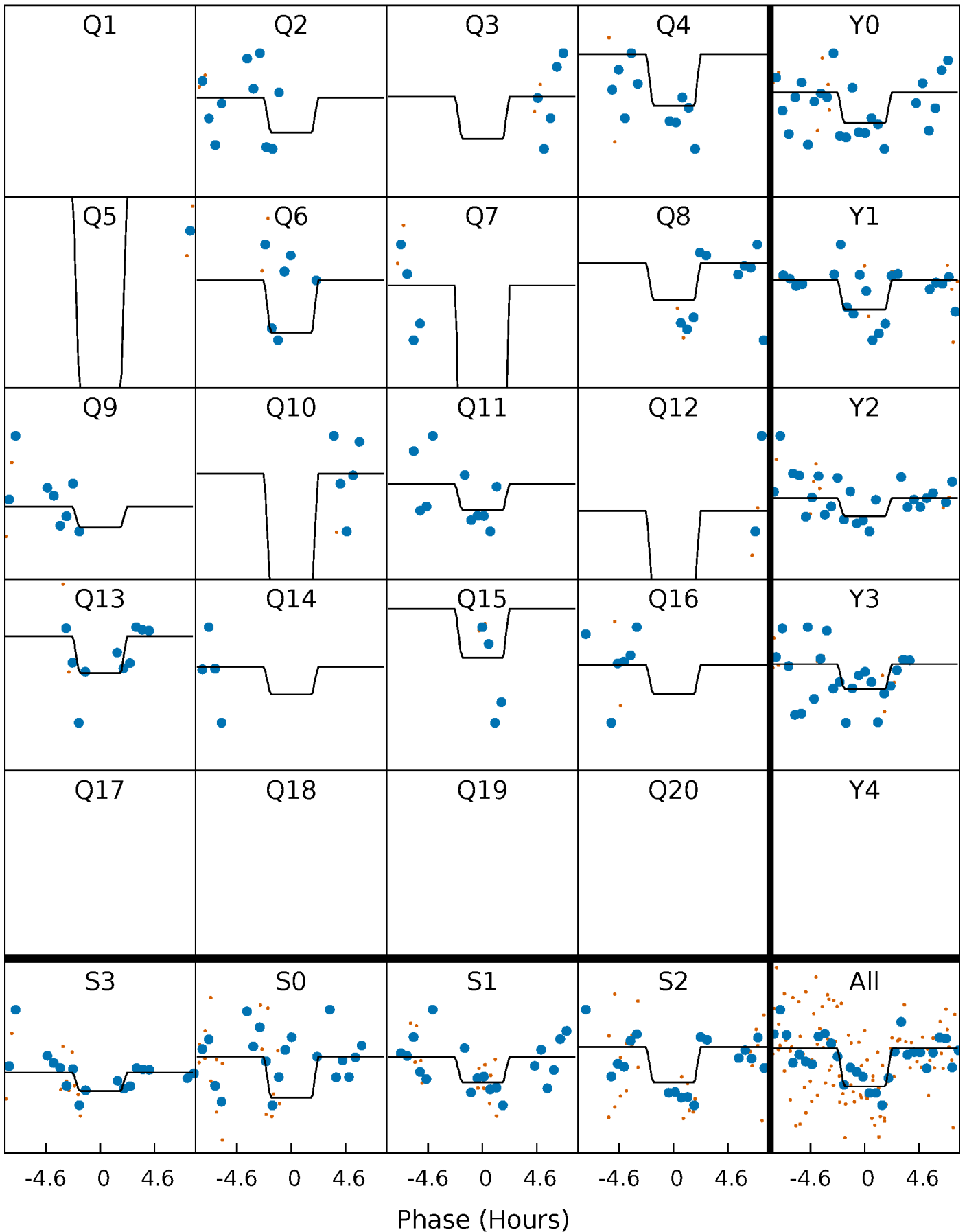
DV Quarter-Phased Transit Curves

TCE 010470935-05 P= 46.884833 Days $T_0=138.490222$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

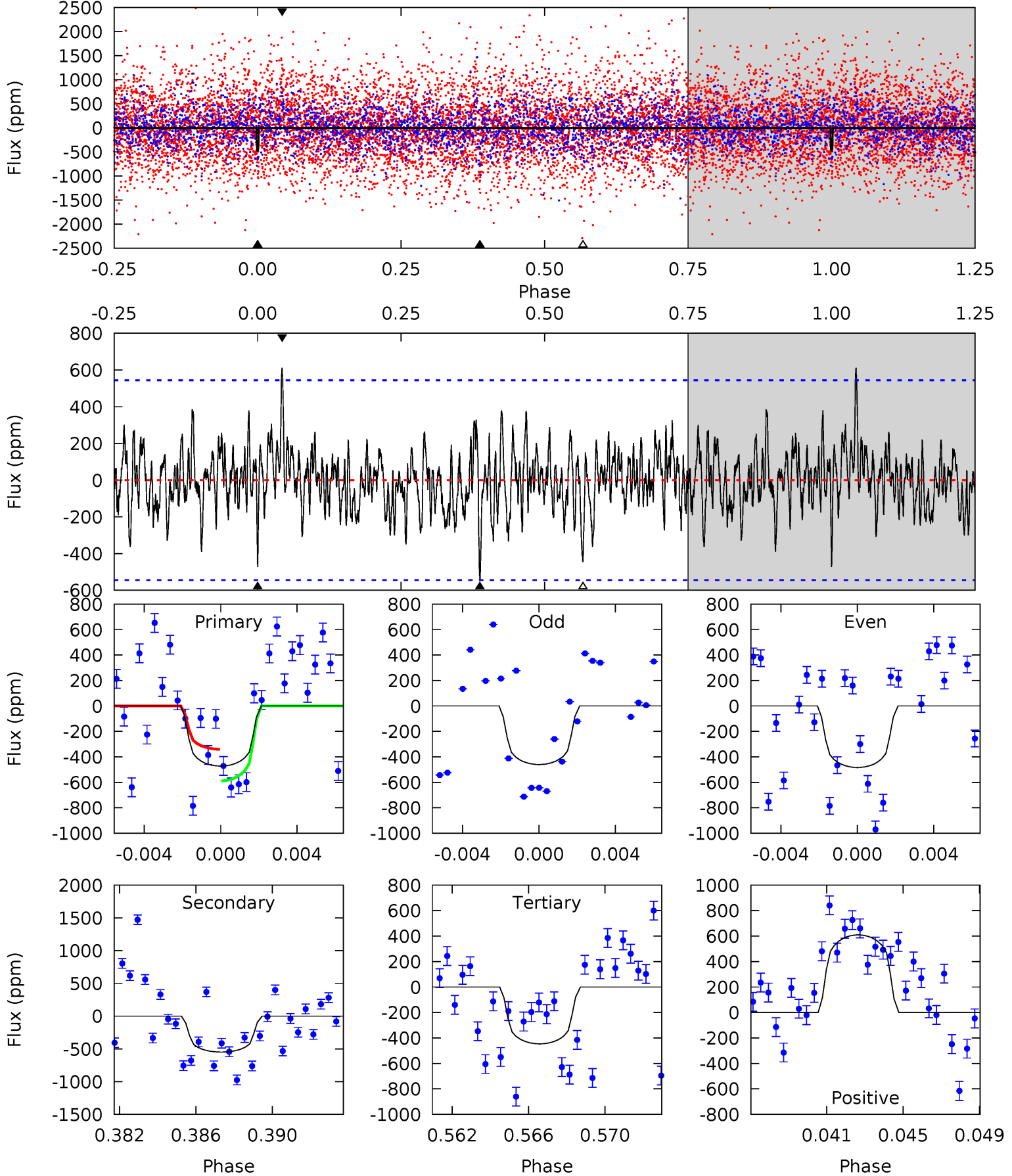
TCE 010470935-05 $P = 46.885360$ Days $T_0 = 138.477247$ (BKJD)



DV Model-Shift Uniqueness Test

010470935-05, P = 46.884833 Days, E = 91.605389 Days

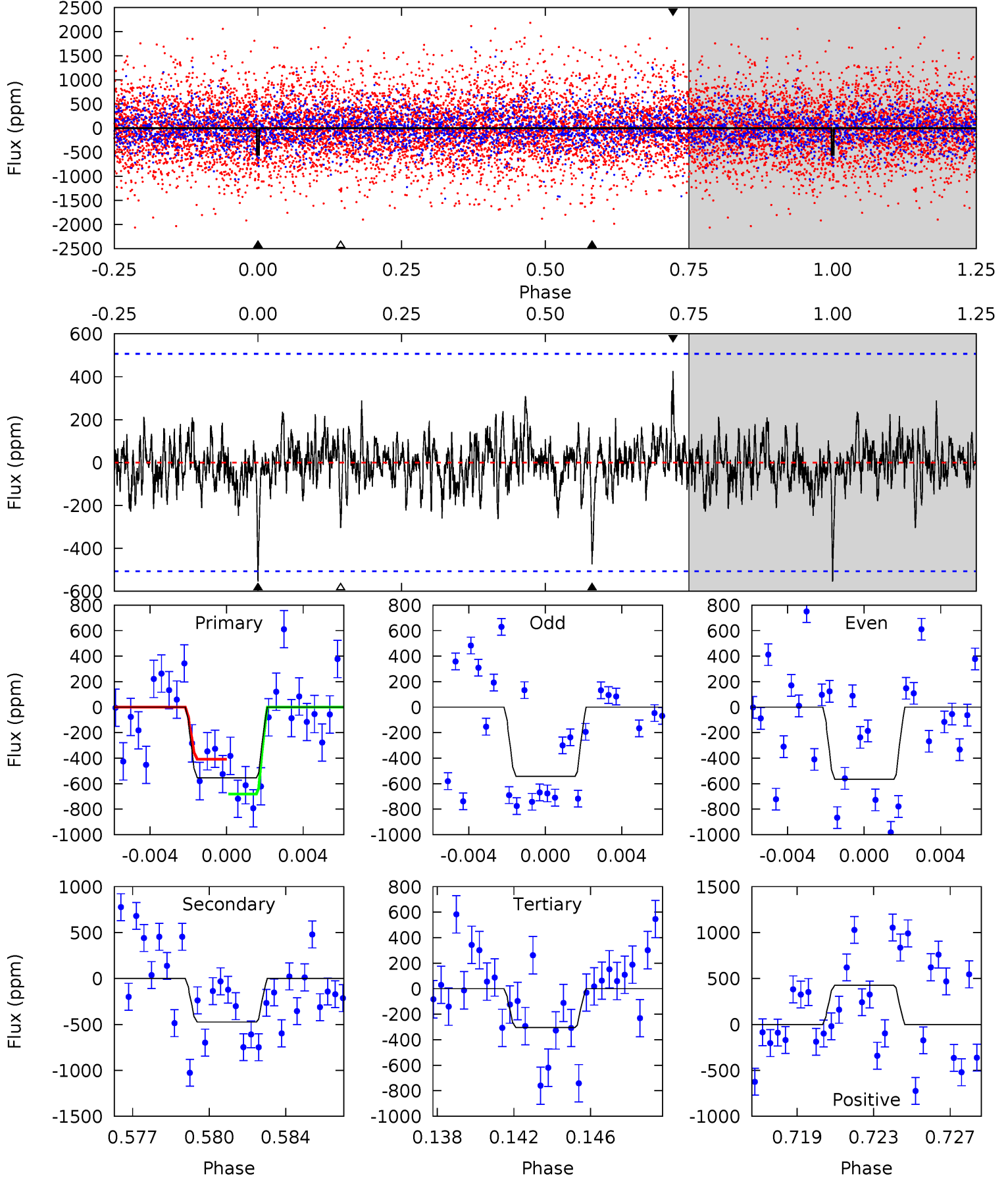
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.51	5.23	4.26	5.82	5.19	2.87	1.37	0.25	-1.31	0.97	-0.58	0.11	0.95	0.53	1.18



Alt Model-Shift Uniqueness Test

010470935-05, P = 46.885360 Days, E = 91.591887 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.69	4.87	3.13	4.38	5.21	2.89	0.93	2.56	1.31	1.74	0.50	0.12	1.02	0.43	1.41



Stellar Parameters For KIC 010470935

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3758^{+68}_{-68}	$4.756^{+0.036}_{-0.024}$	$-0.100^{+0.100}_{-0.100}$	$0.493^{+0.027}_{-0.035}$	$0.506^{+0.028}_{-0.031}$	$5.930^{+0.972}_{-0.620}$
	+2%/-2%	+1%/-1%	+100%/-100%	+5%/-7%	+6%/-6%	+16%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010470935-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-548 ± 105	$6.51^{+6.56}_{-4.37}$	360^{+7}_{-8}	2366^{+777}_{-337}	298^{+2248}_{-227}
Alt.	-474 ± 97	$6.39^{+7.02}_{-4.42}$	360^{+7}_{-8}	2337^{+825}_{-343}	263^{+2435}_{-204}

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

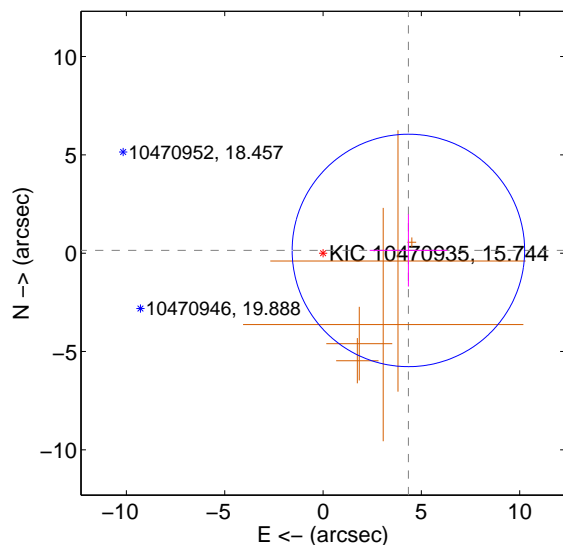
Supplemental centroid analysis for 010470935-05. Kepler magnitude: 15.74. Transit SNR 9.68

There are 0 quarters with good PRF difference image offsets

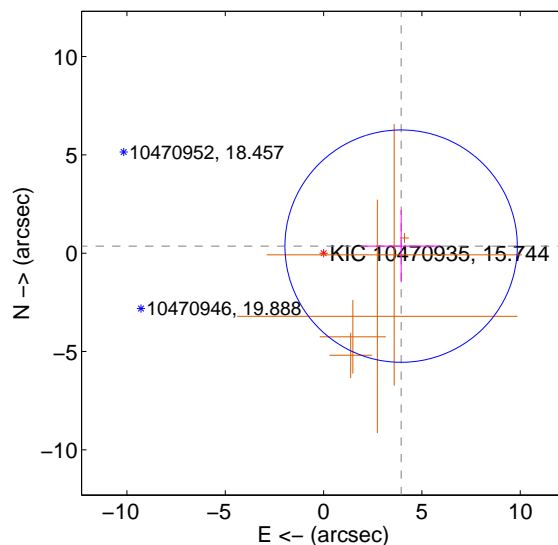
The direct PRF centroid is offset from the target star catalog position by about 0.53 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.344 ± 1.971	2.20	-4.341 ± 1.971	0.140 ± 1.838
PRF-fit source offset from KIC position	3.960 ± 1.970	2.01	-3.944 ± 1.971	0.358 ± 1.838
photometric centroid source offset	2.04 ± 1.13	1.81	1.89 ± 1.15	0.79 ± 1.03

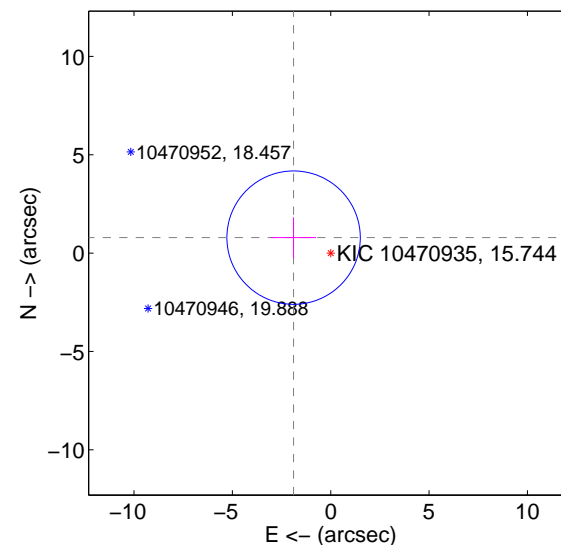
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

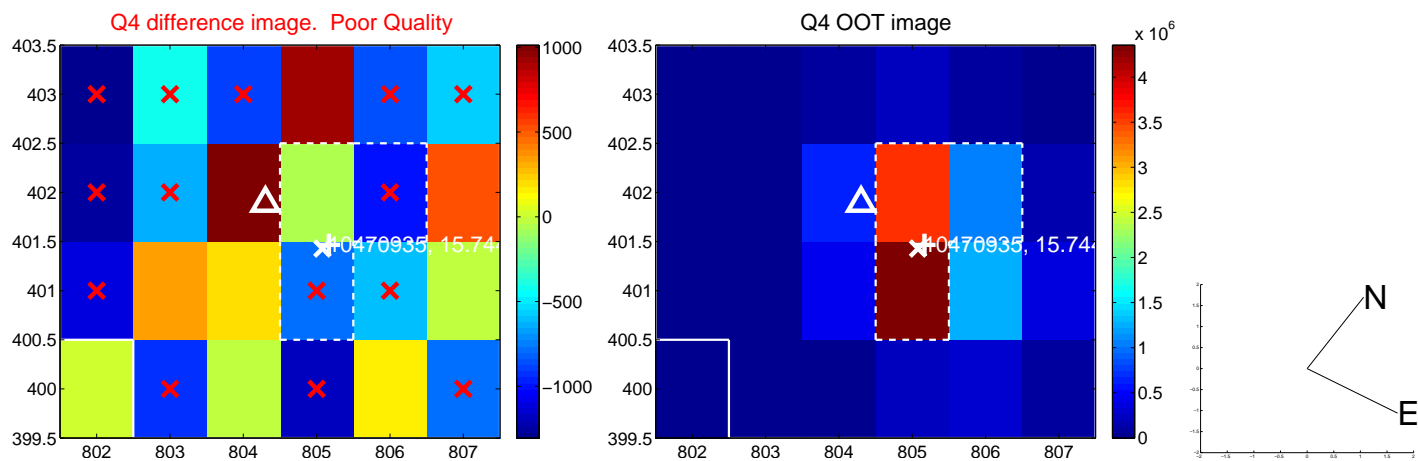
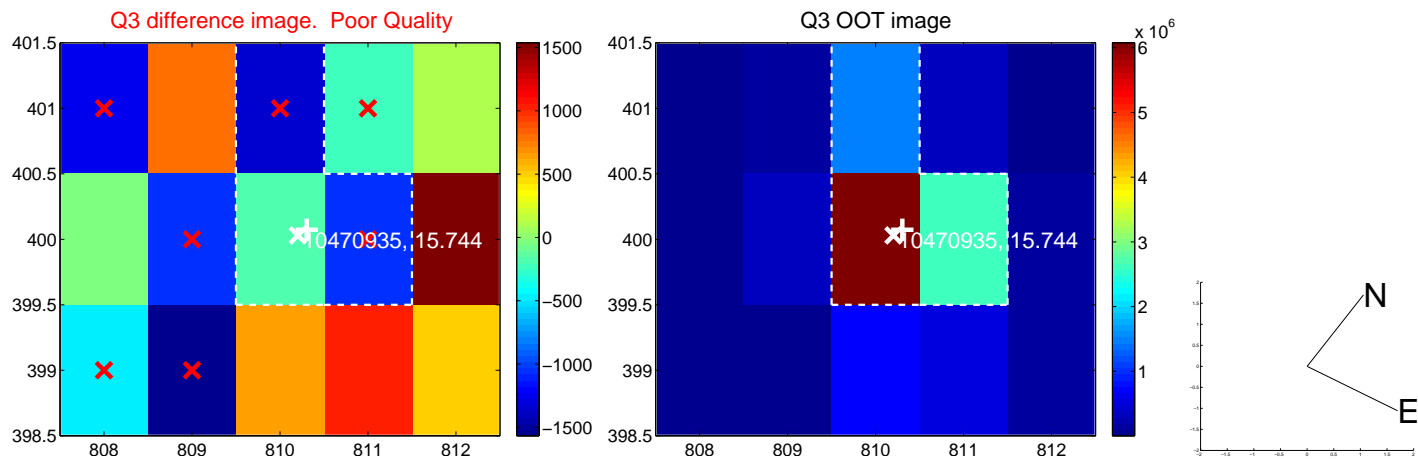
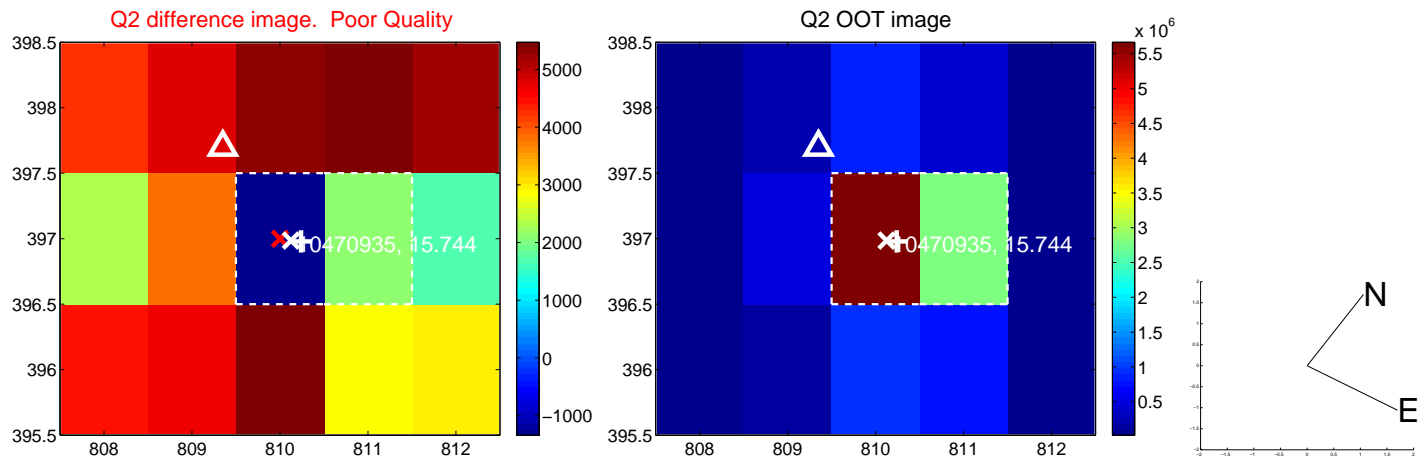
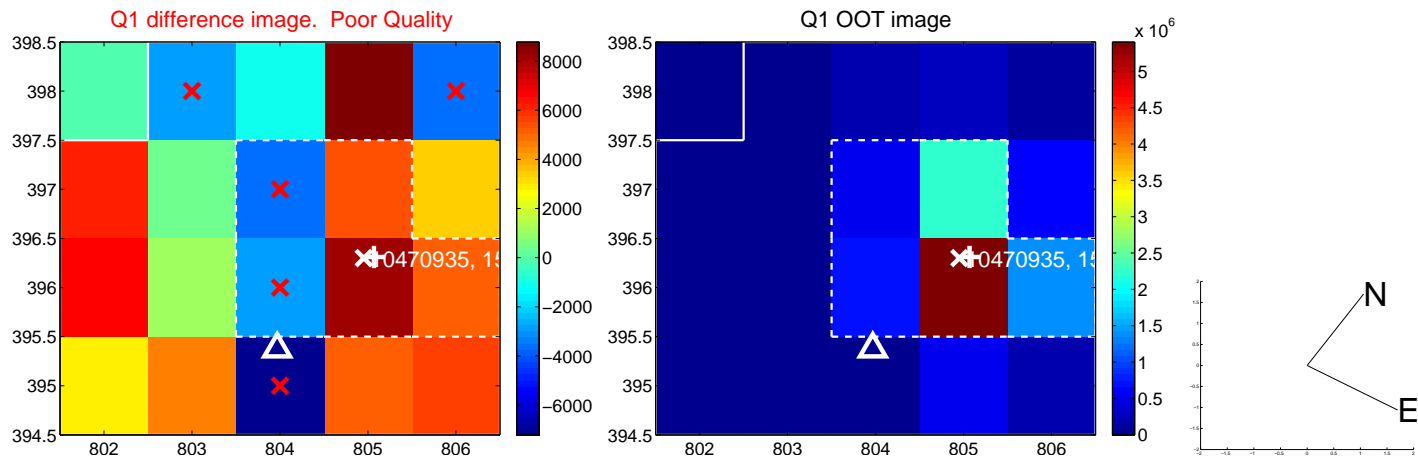


offset from photometric centroids

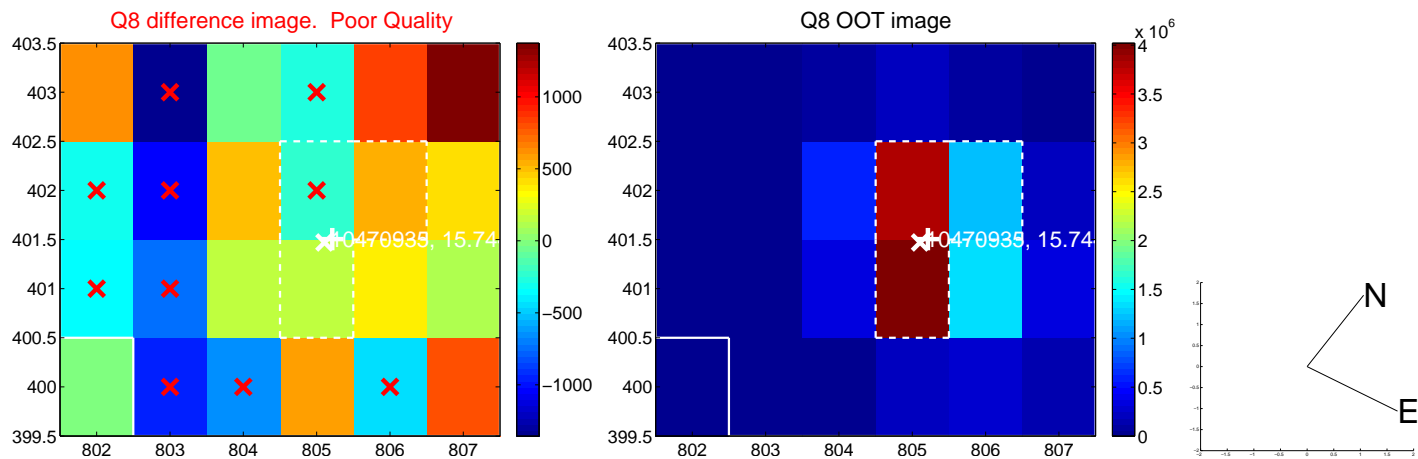
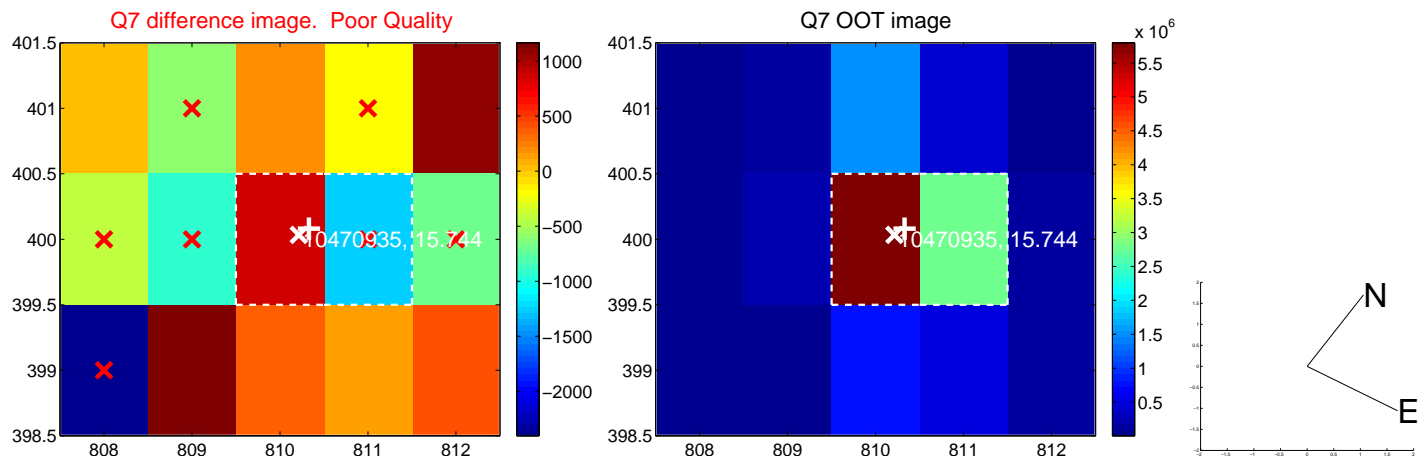
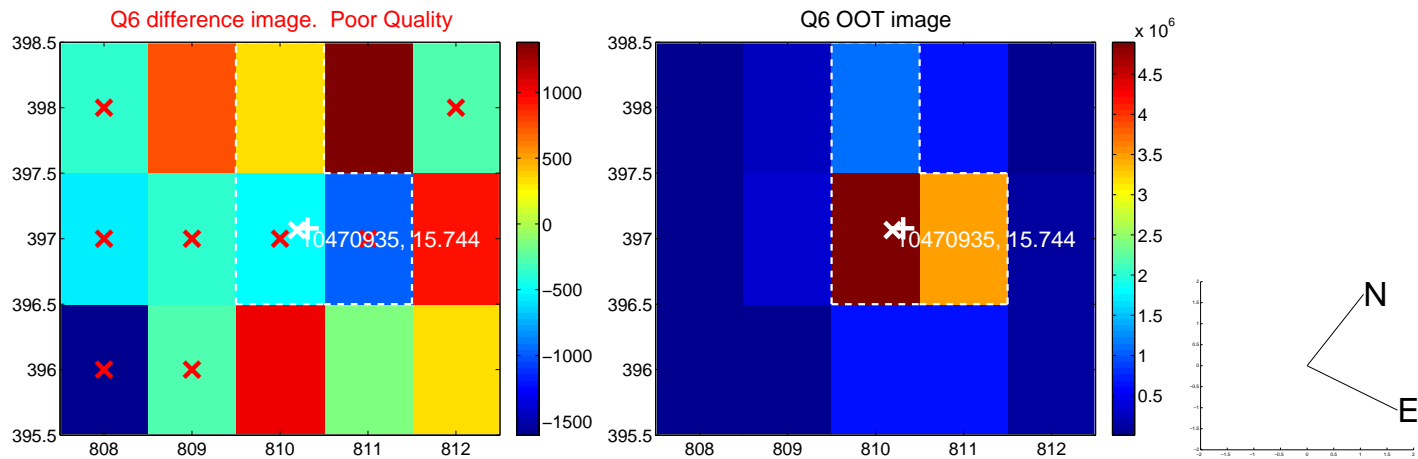
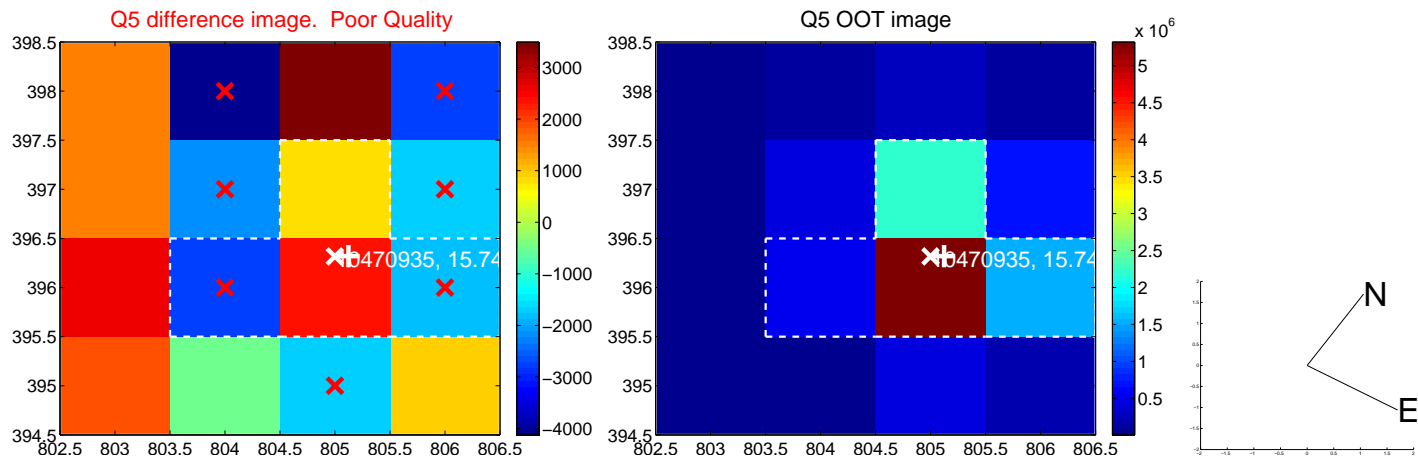


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

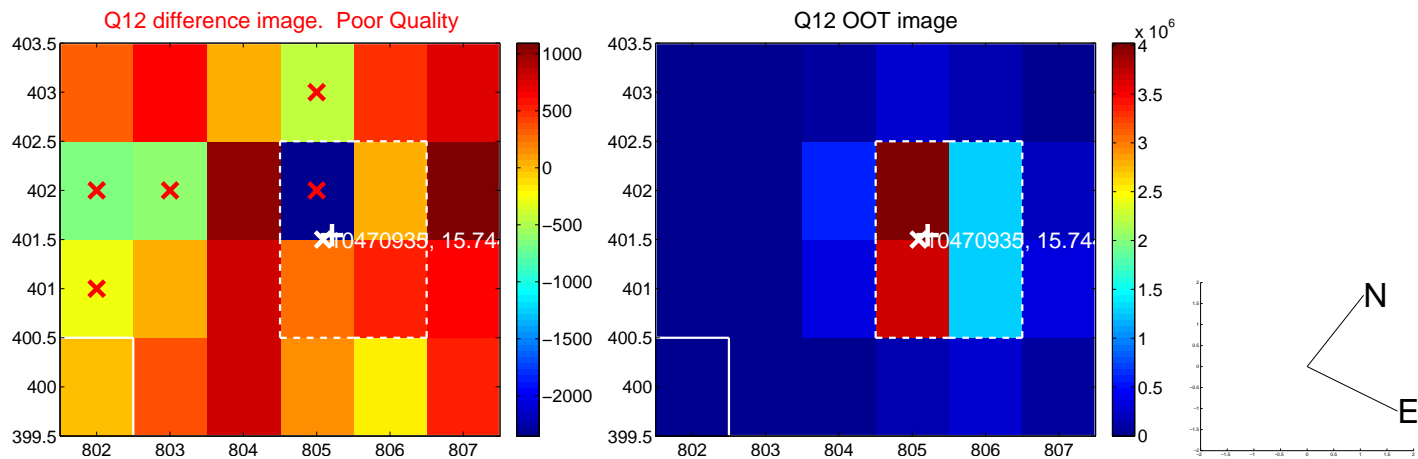
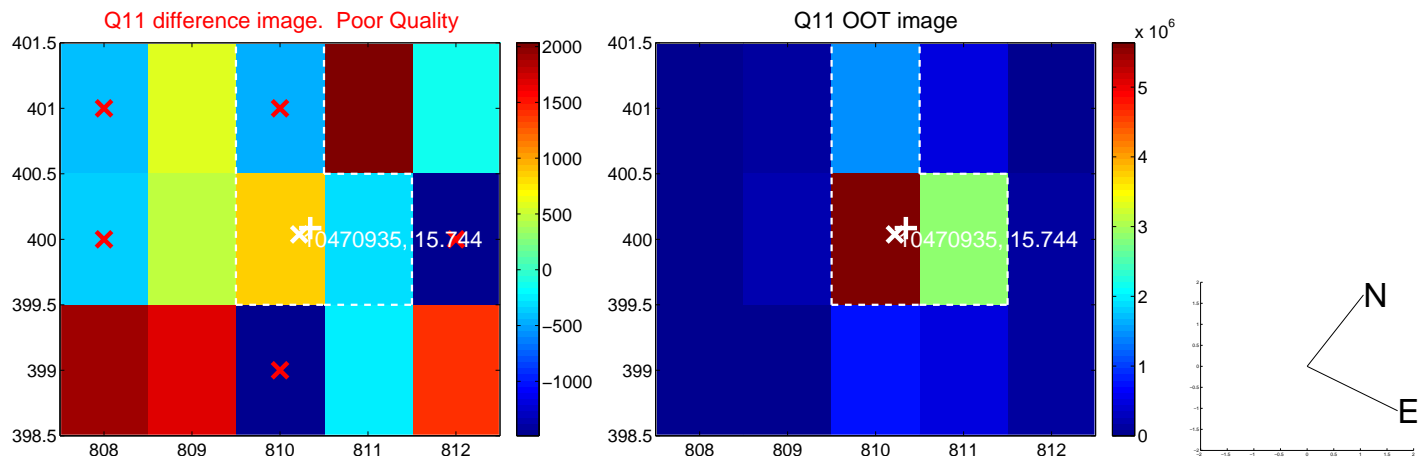
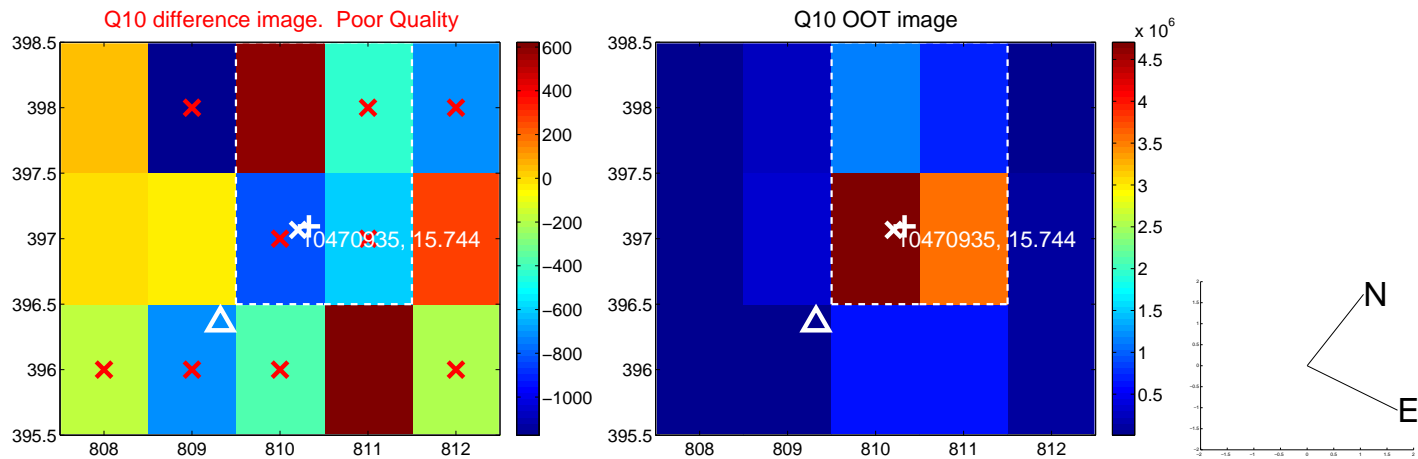
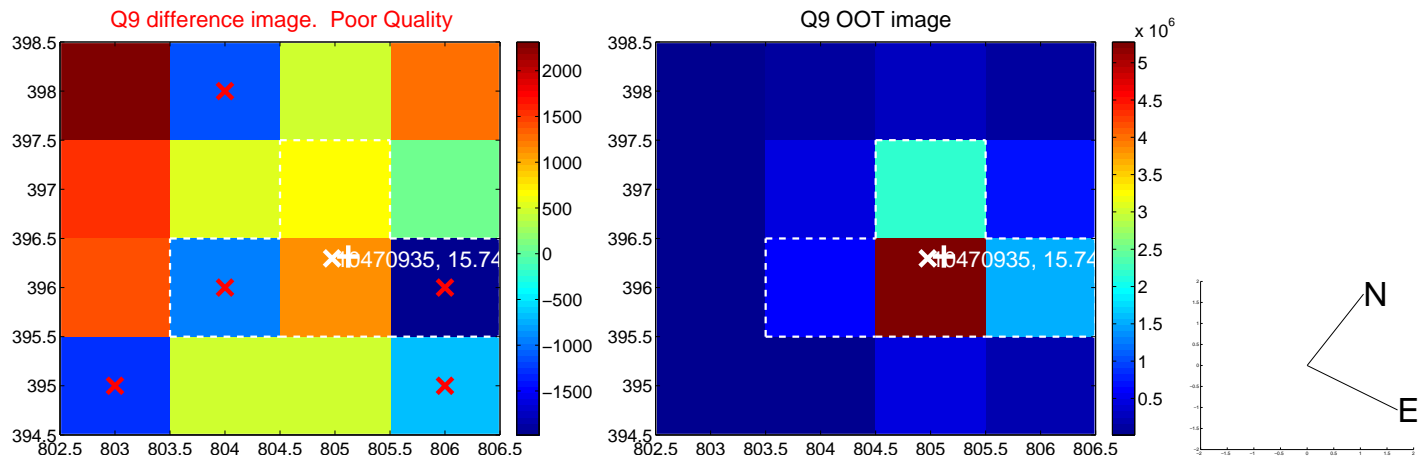
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



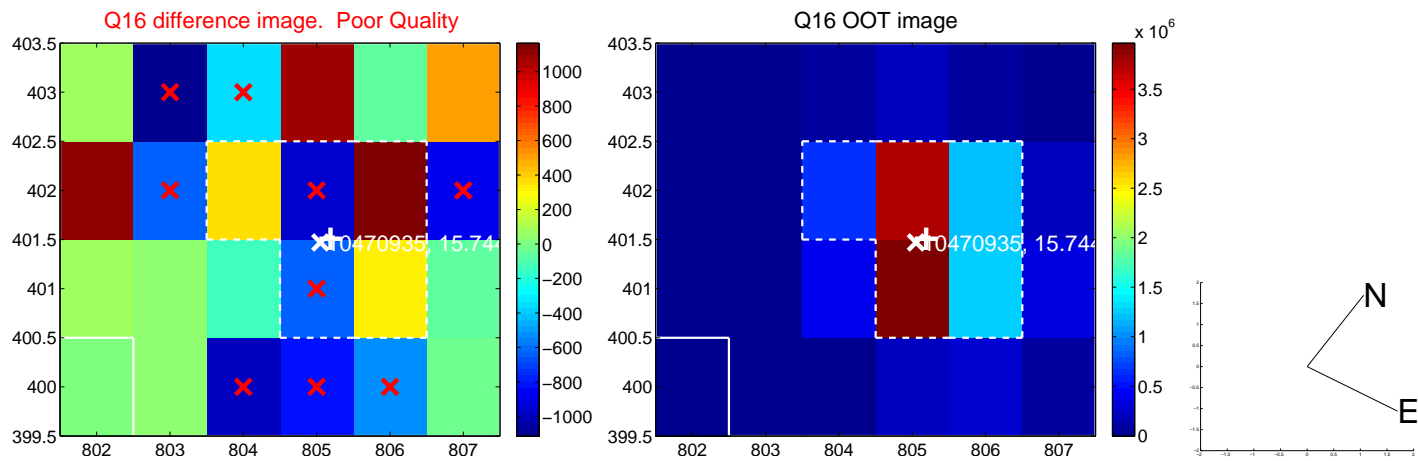
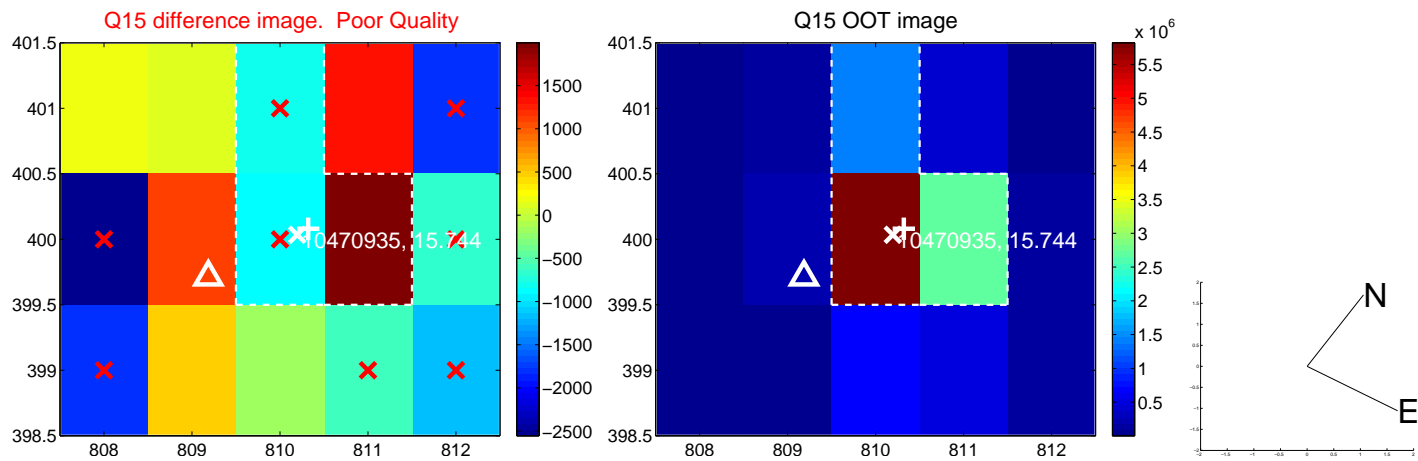
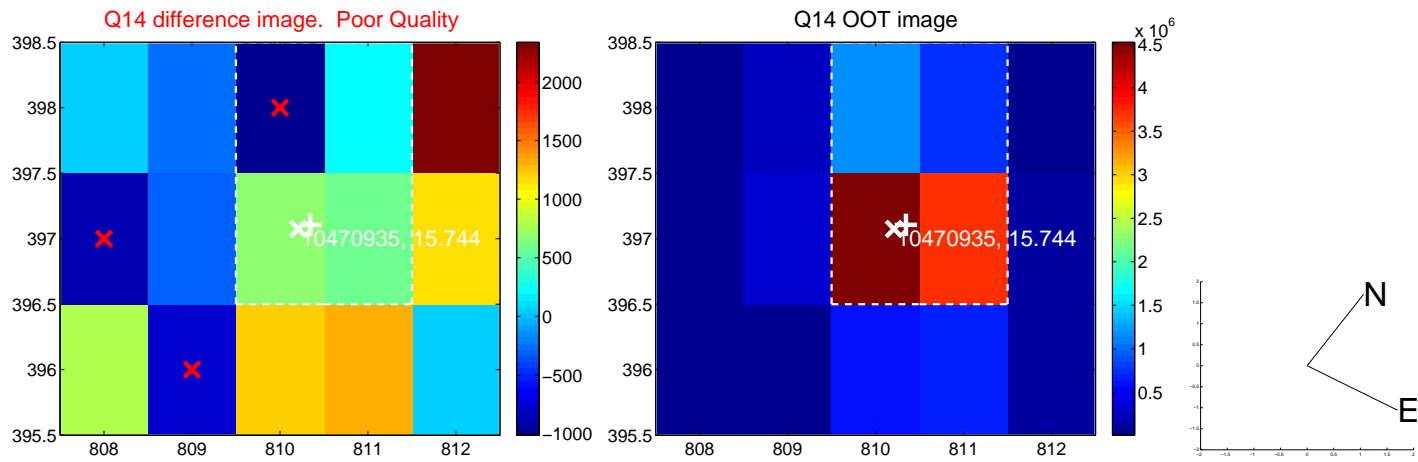
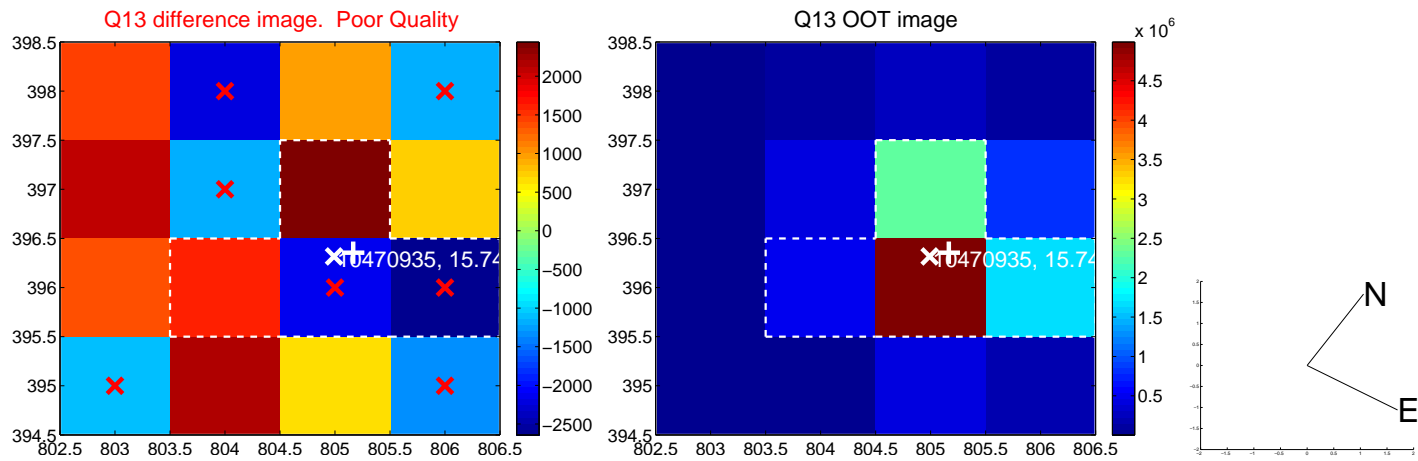
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



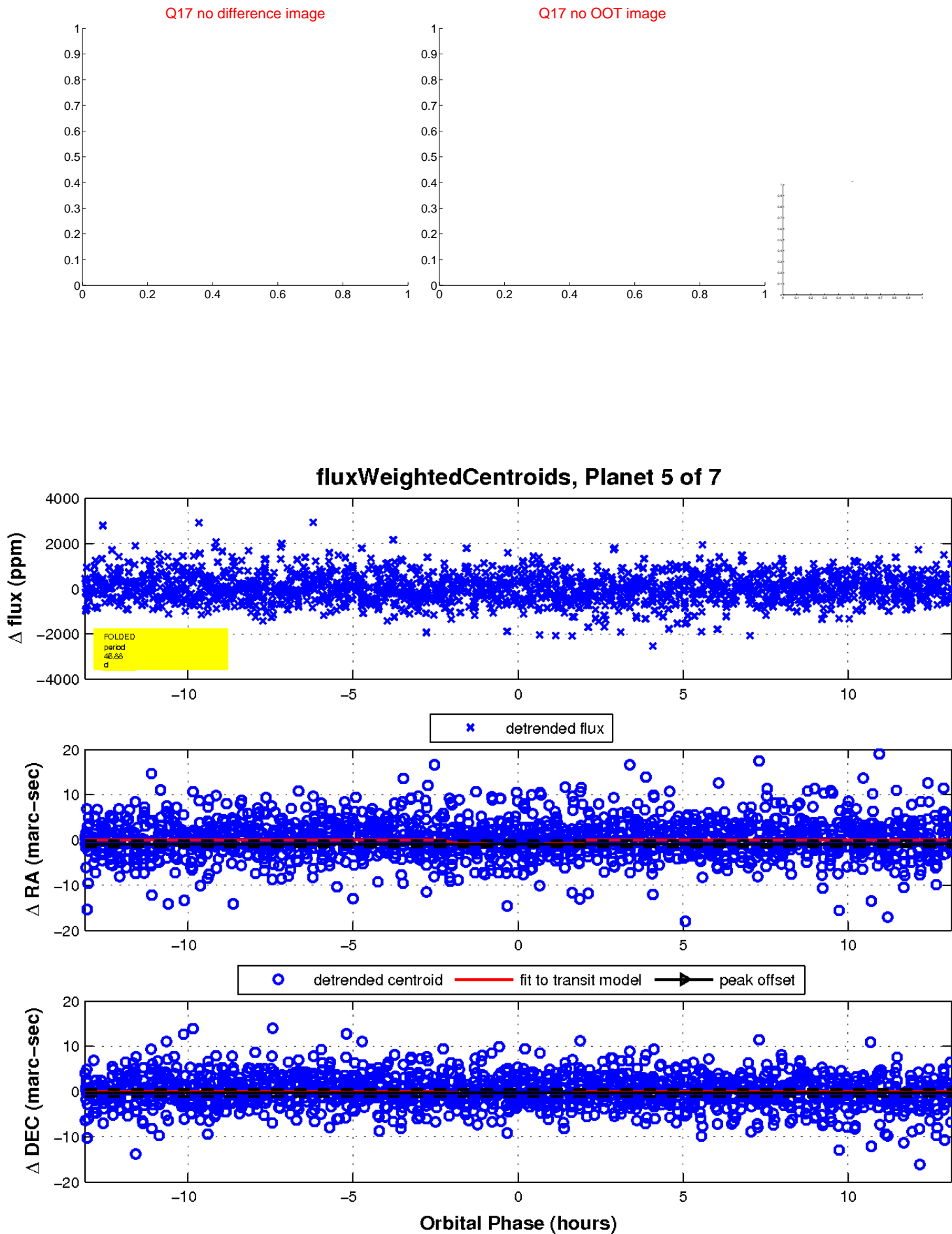
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

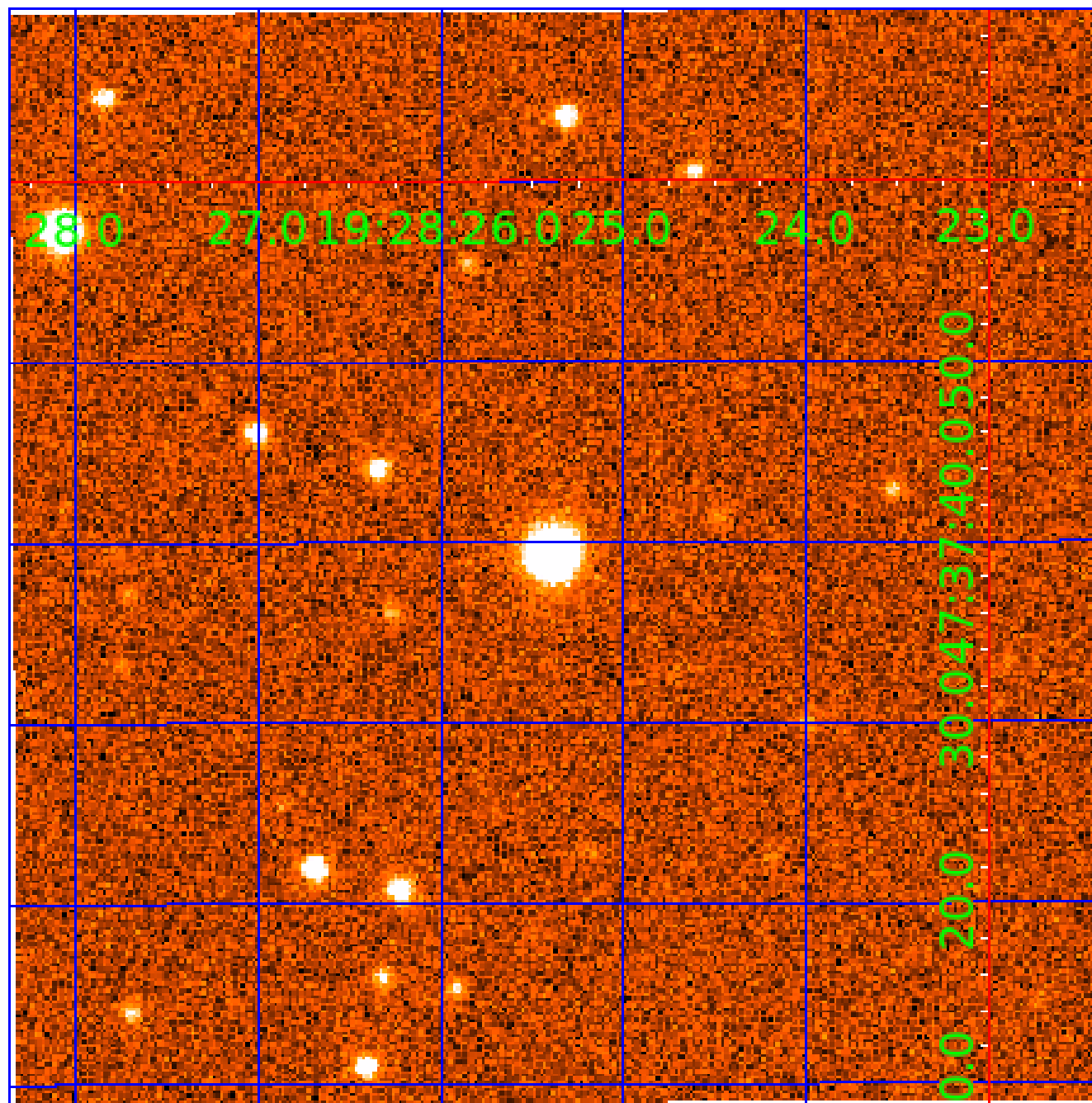


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010470935

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})
010470935-01	OBS	No	0.933653	131.581200	41.1	6.373	7.5	7.2	0.49	3758	0.32	195.75
010470935-02	OBS	No	48.099305	175.920478	911.6	2.536	12.4	8.9	0.49	3758	1.67	1.02
010470935-03	OBS	No	61.763380	138.606372	1418.8	2.714	10.8	12.3	0.49	3758	3.37	0.73
010470935-04	OBS	No	30.260665	153.057643	1173.5	1.424	9.9	9.3	0.49	3758	1.69	1.89
010470935-05	OBS	No	46.884833	138.490223	609.4	4.383	9.1	9.7	0.49	3758	1.32	1.06
010470935-06	OBS	No	28.193285	151.647421	886.1	2.418	8.7	11.3	0.49	3758	1.60	2.08
010470935-07	OBS	No	43.019550	137.033651	862.4	4.285	8.1	8.7	0.49	3758	1.55	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010470935-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH
010470935-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_MEAS
010470935-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010470935-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010470935-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_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.

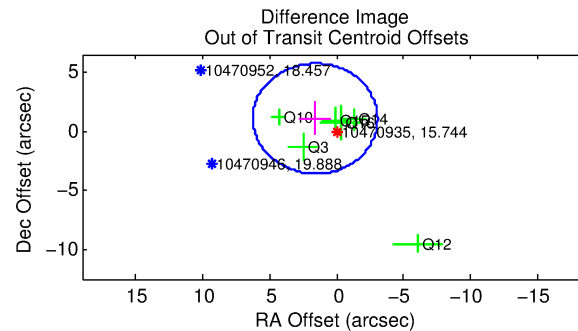
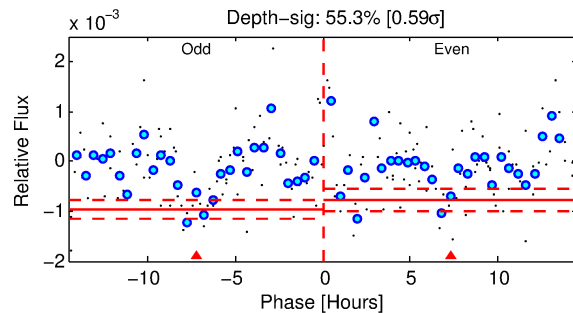
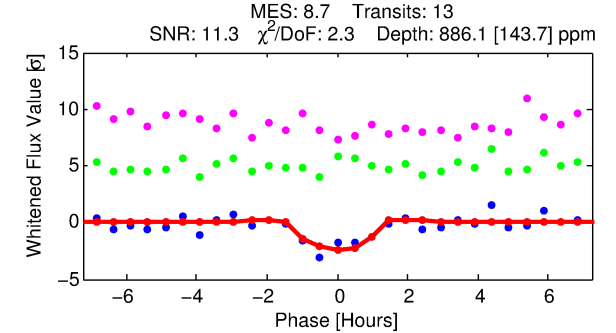
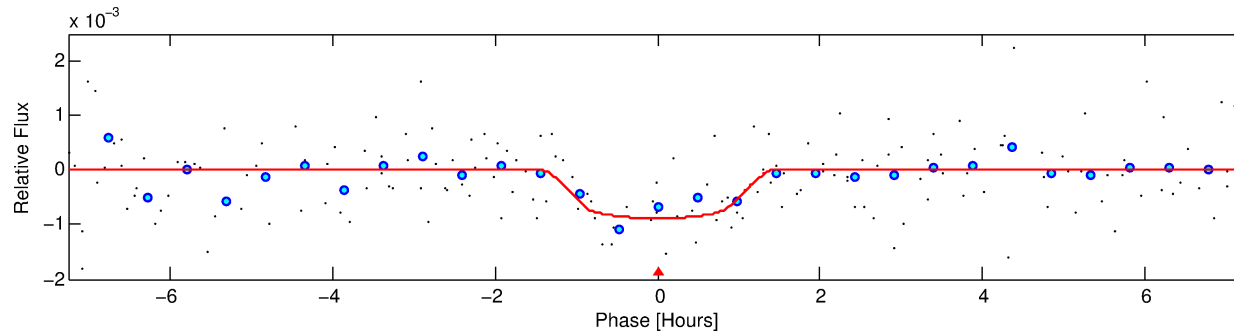
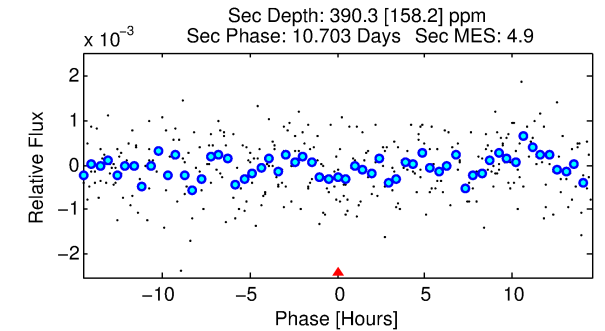
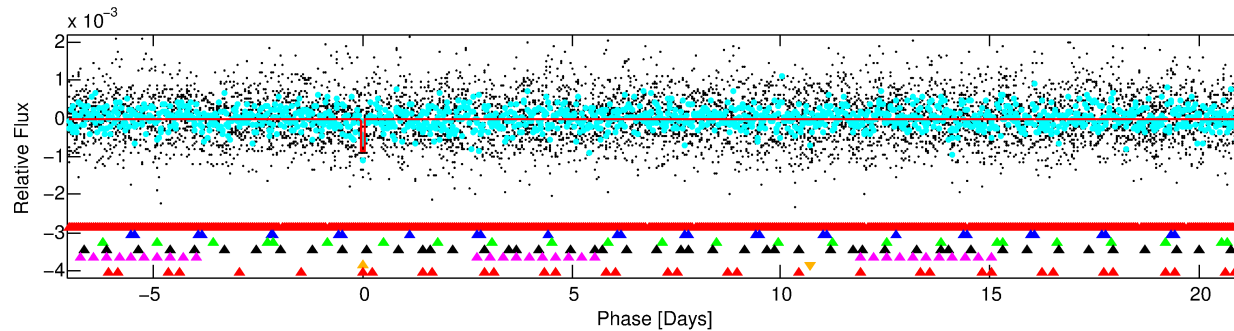
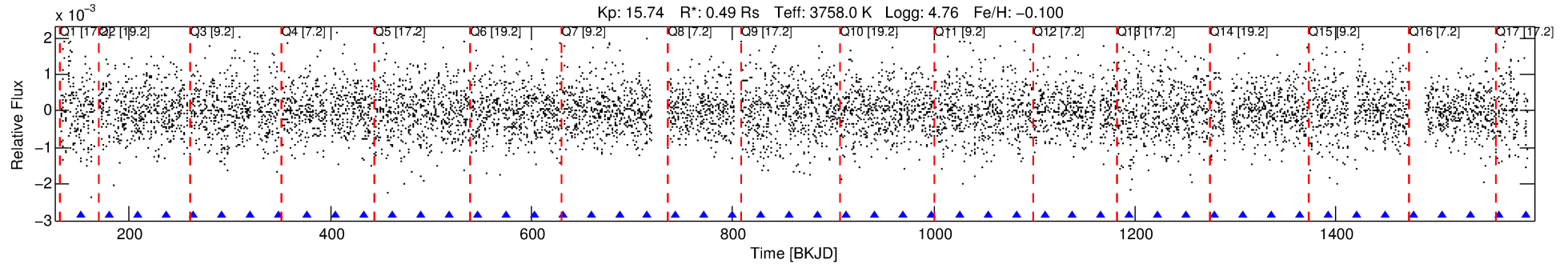
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010470935-06

No Significant Match Found

DV One-Page Summary

KIC: 10470935 Candidate: 6 of 7 Period: 28.193 d



DV Fit Results:

Period = 28.19328 [0.00036] d
Epoch = 151.6474 [0.0104] BKJD
Rp/R* = 0.0297 [0.0441]
a/R* = 62.18 [415.15]
b = 0.76 [3.79]
Seff = 2.08 [0.21]
Teq = 306 [8] K
Rp = 1.60 [2.37] Re
a = 0.1444 [0.0079] AU
Ag = 1755.06 [5259.78] [0.33σ]
Teffp = 3065 [2296] K [1.20σ]

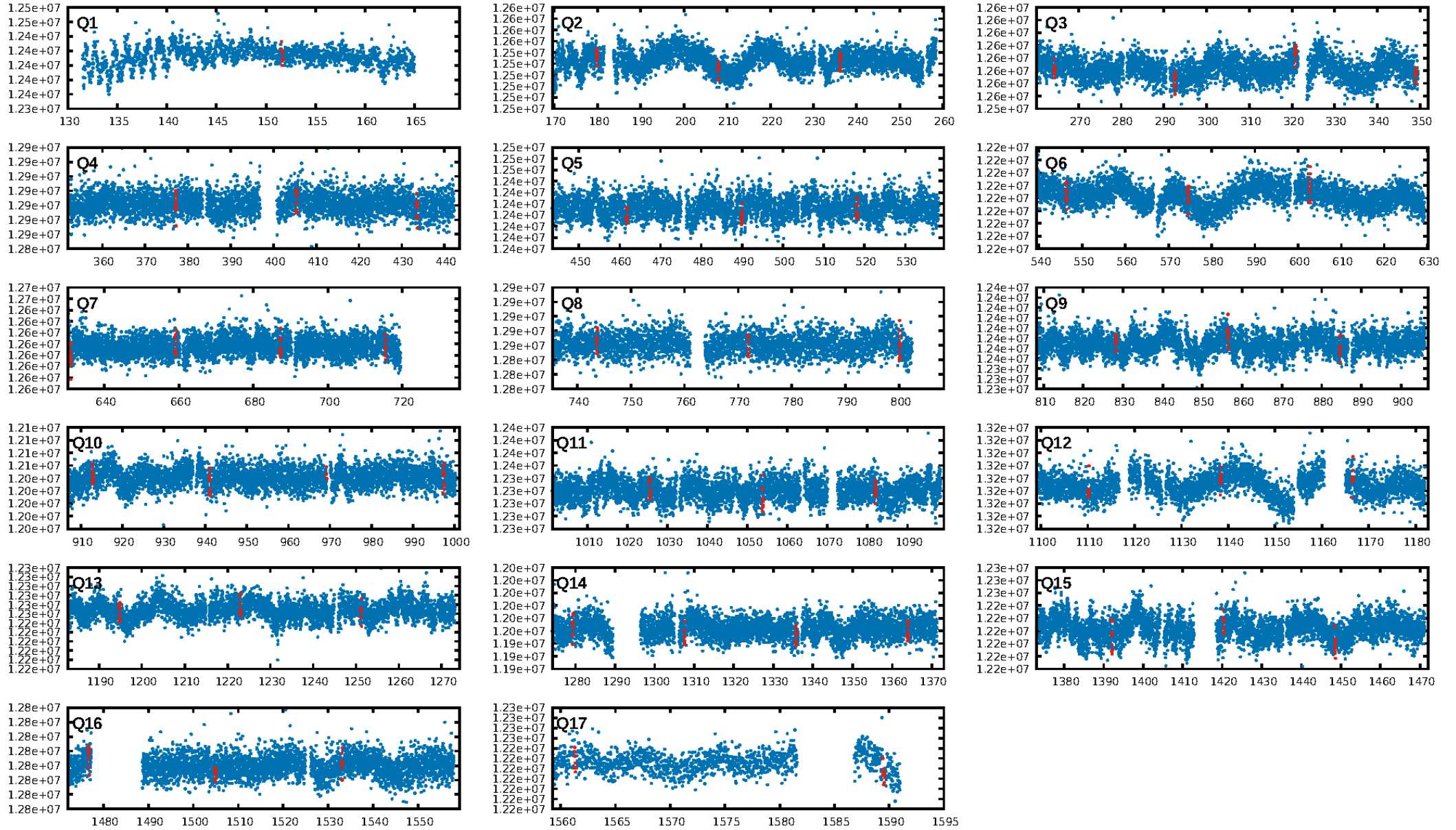
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [95.98σ]
LongPeriod-sig: 100.0% [17.68σ]
ModelChiSquare2-sig: 2.6%
ModelChiSquareGof-sig: 99.7%
Bootstrap-pfa: 2.86e-08
RollingBand-fgt: 1.00 [11/11]
GhostDiagnostic-chr: 0.7304
Centroid-sig: 1.1%
Centroid-so: 1.574 arcsec [2.12σ]
OotOffset-rm: 1.911 arcsec [1.23σ]
KicOffset-rm: 2.382 arcsec [1.59σ]
OotOffset-st: 2/2/2/0 [6]
KicOffset-st: 2/2/2/0 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 0.29 [5/17]

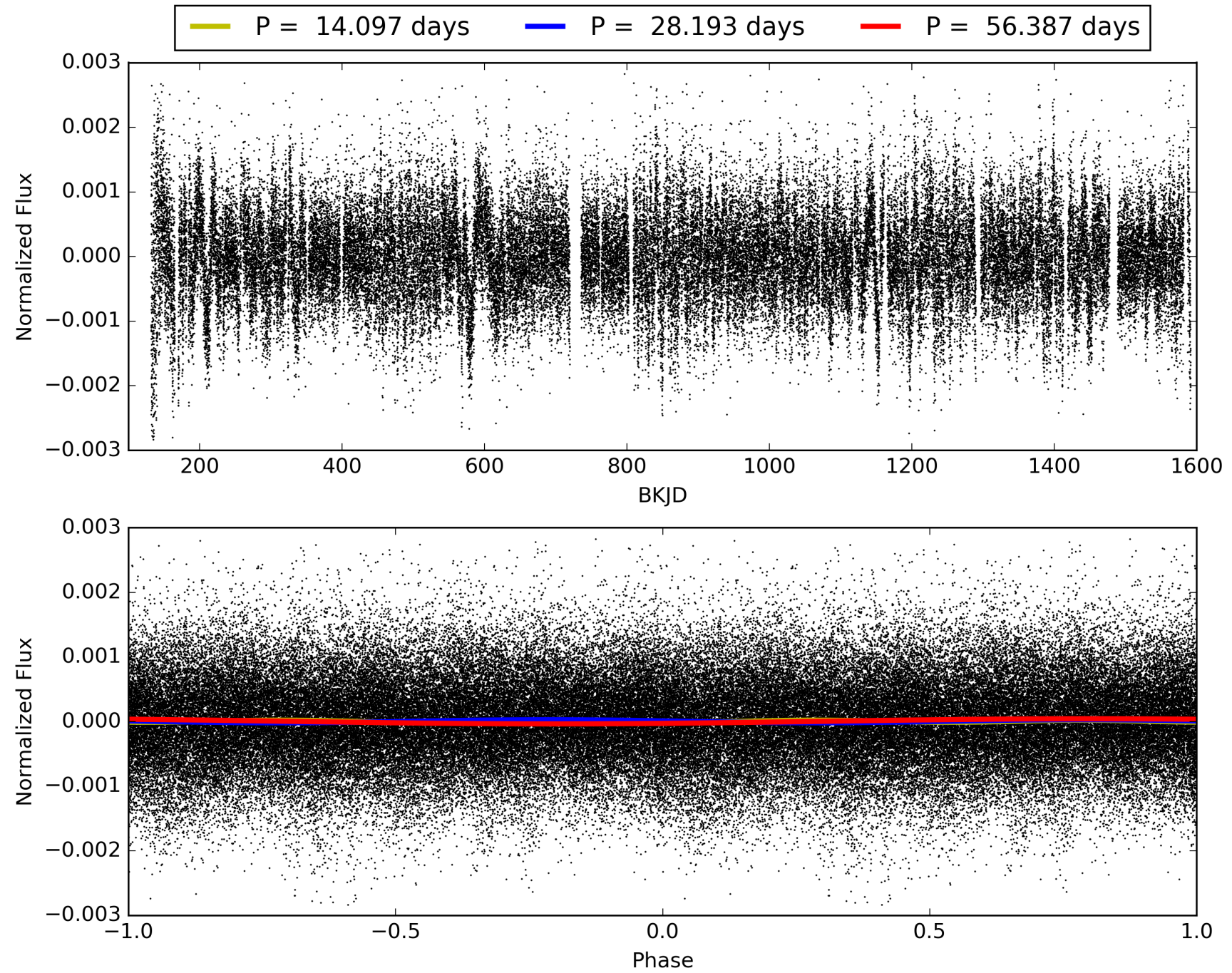
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:31:22 Z

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

TCE 010470935-06, PDC Light Curves

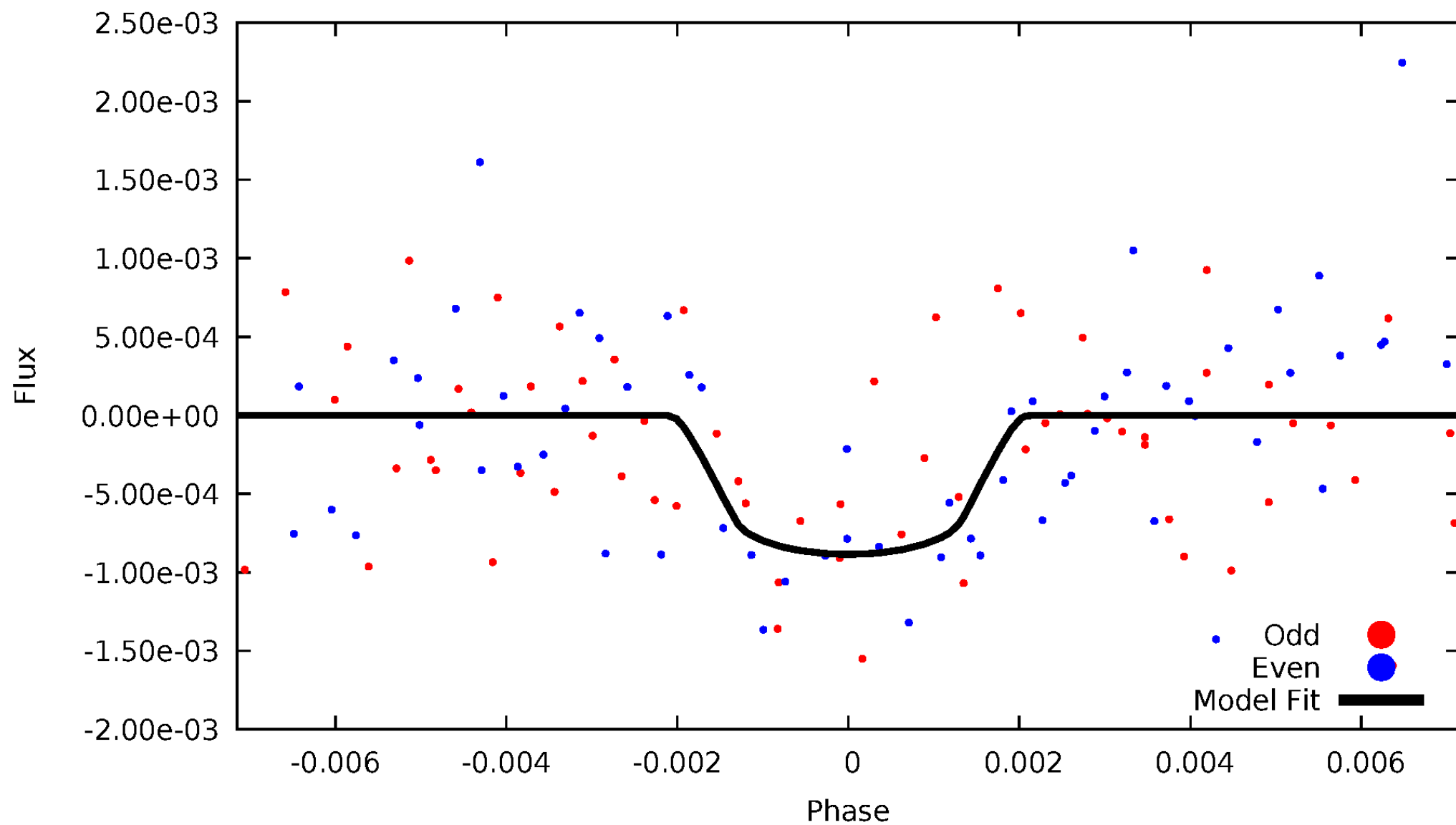


TCE 010470935-06



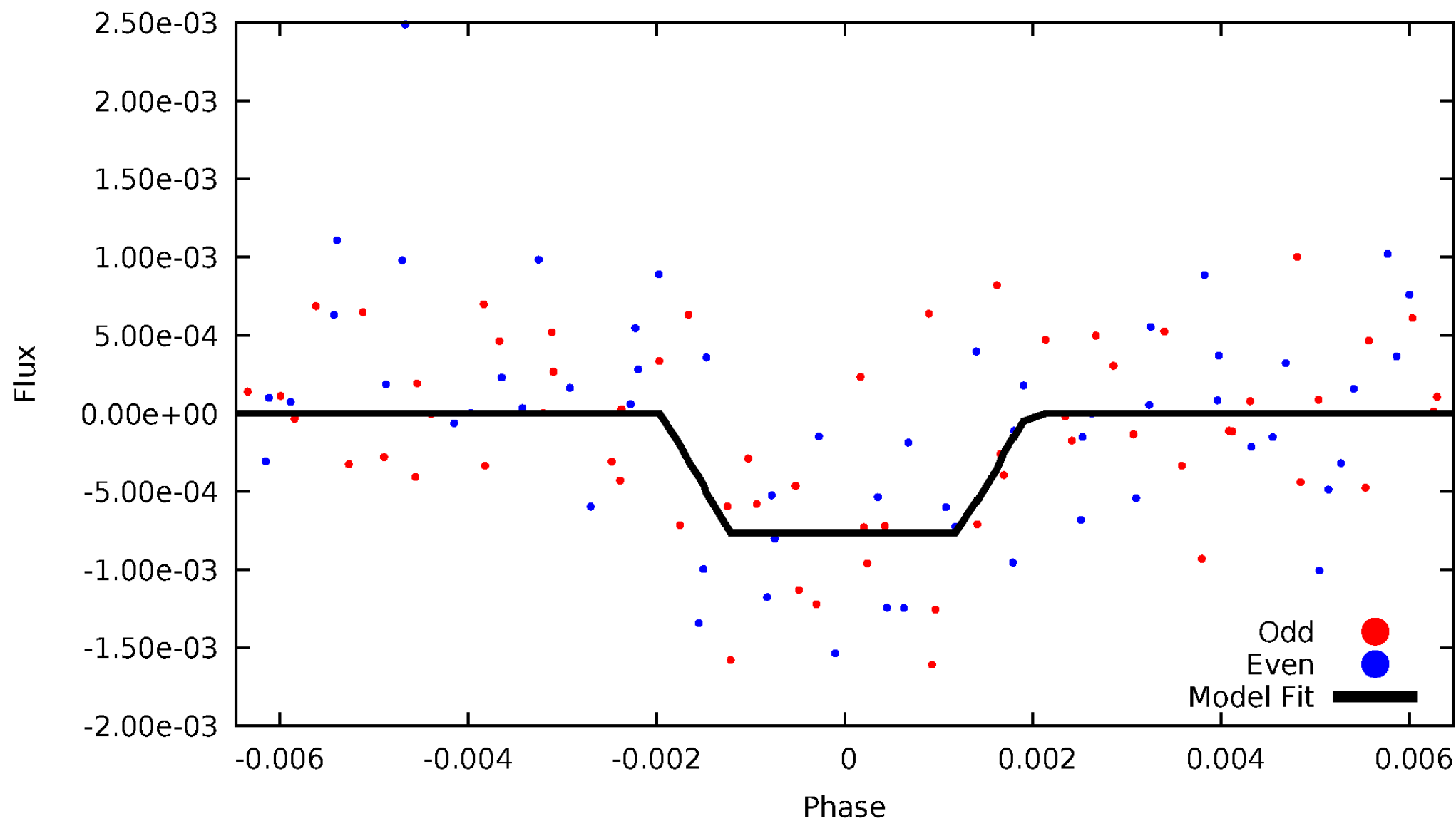
DV Odd/Even

TCE 010470935-06



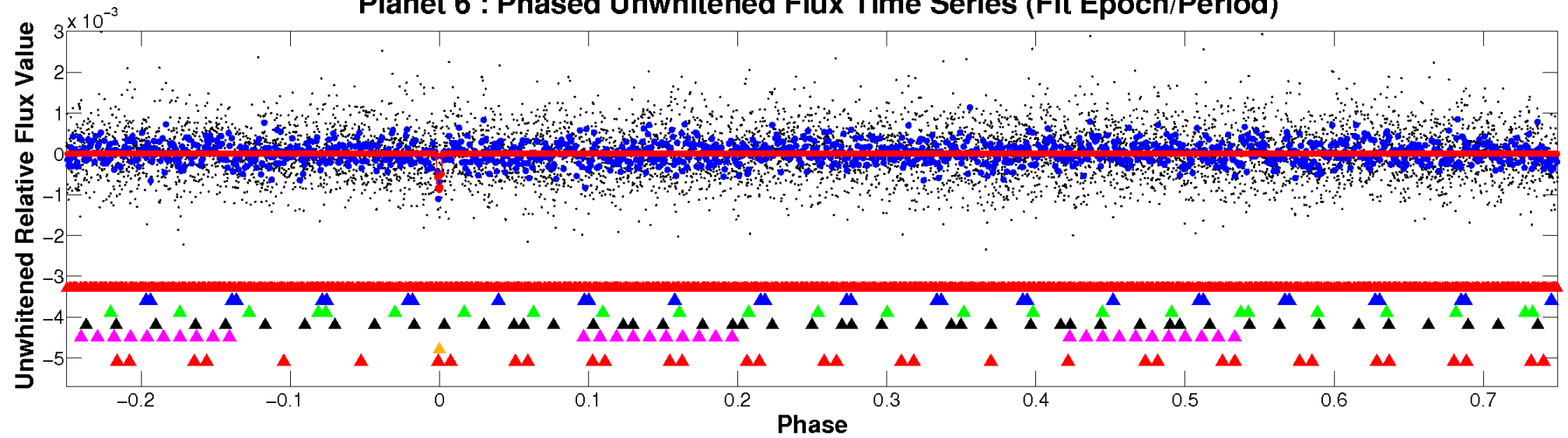
ALT Odd/Even

TCE 010470935-06

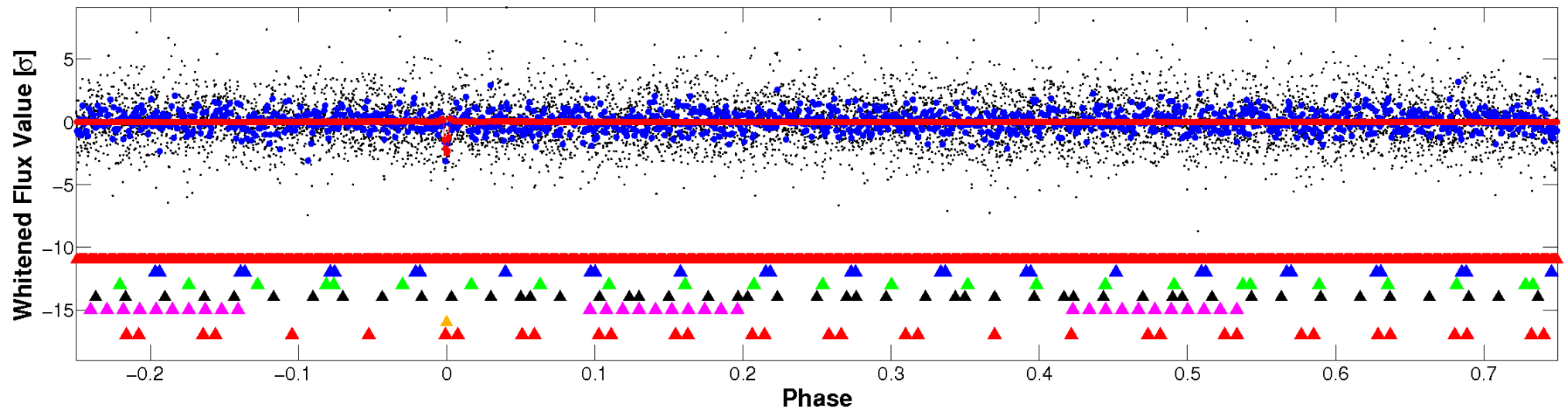


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

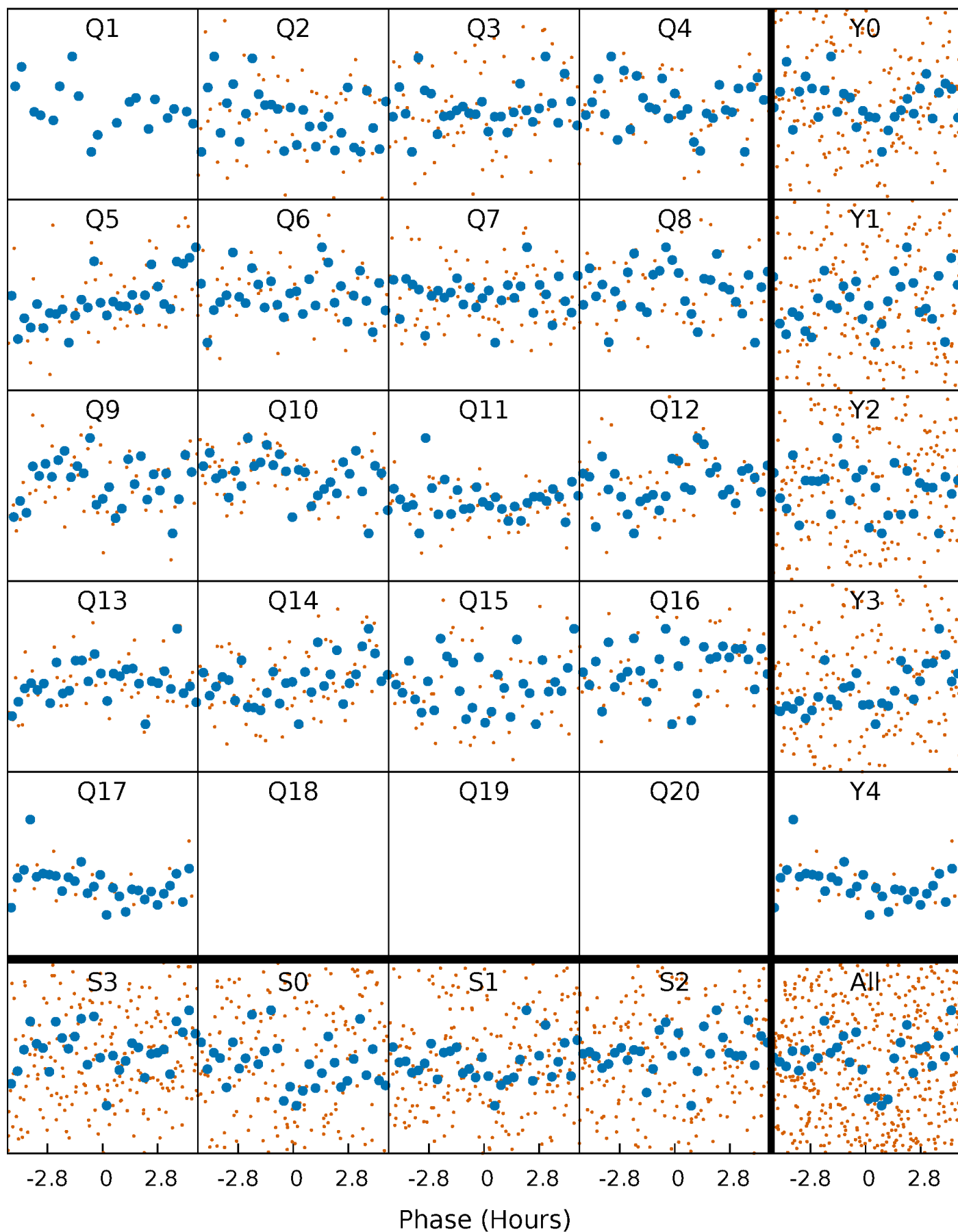


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



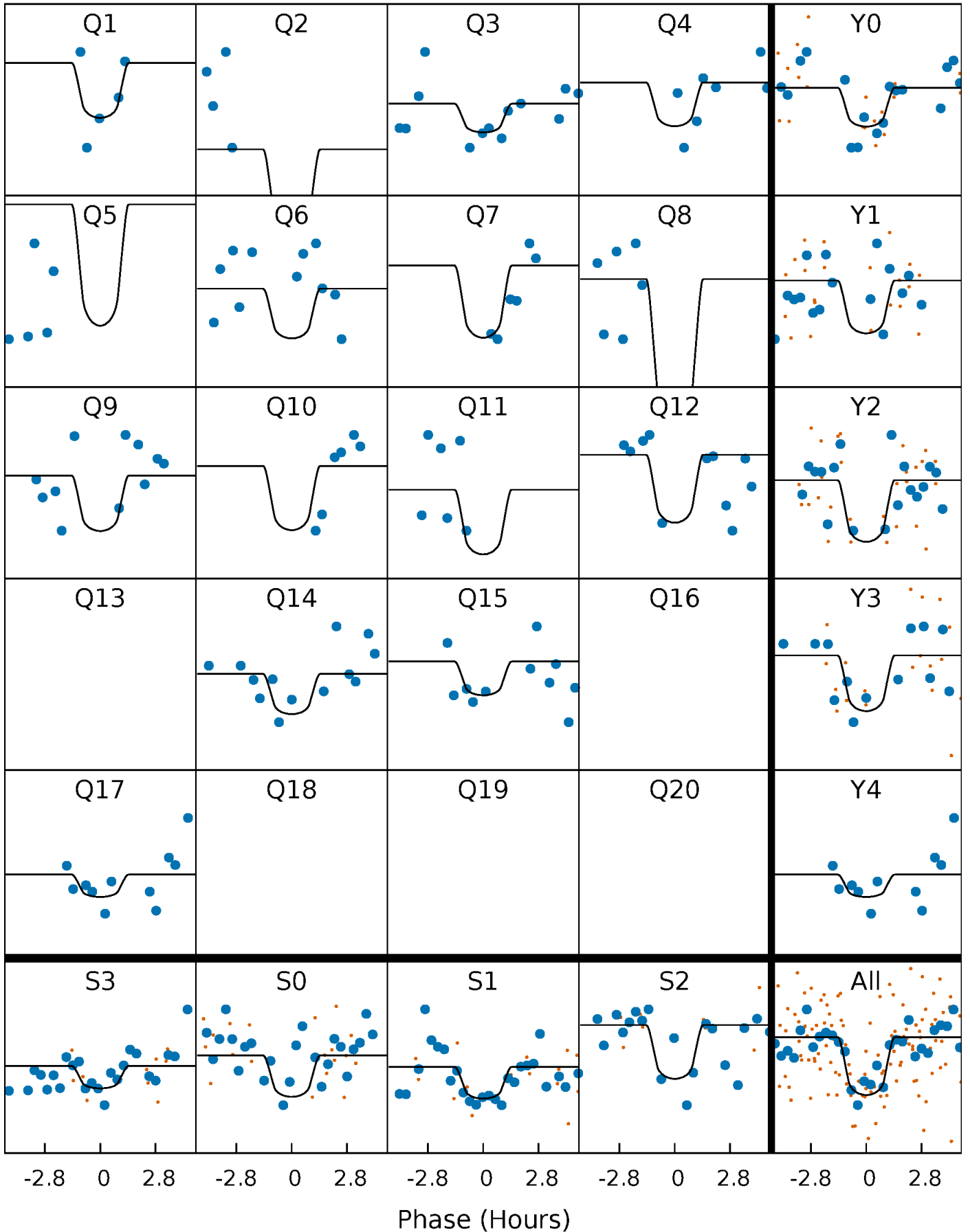
PDC Quarter-Phased Transit Curves

TCE 010470935-06 P= 28.193285 Days $T_0=151.647421$ (BKJD)



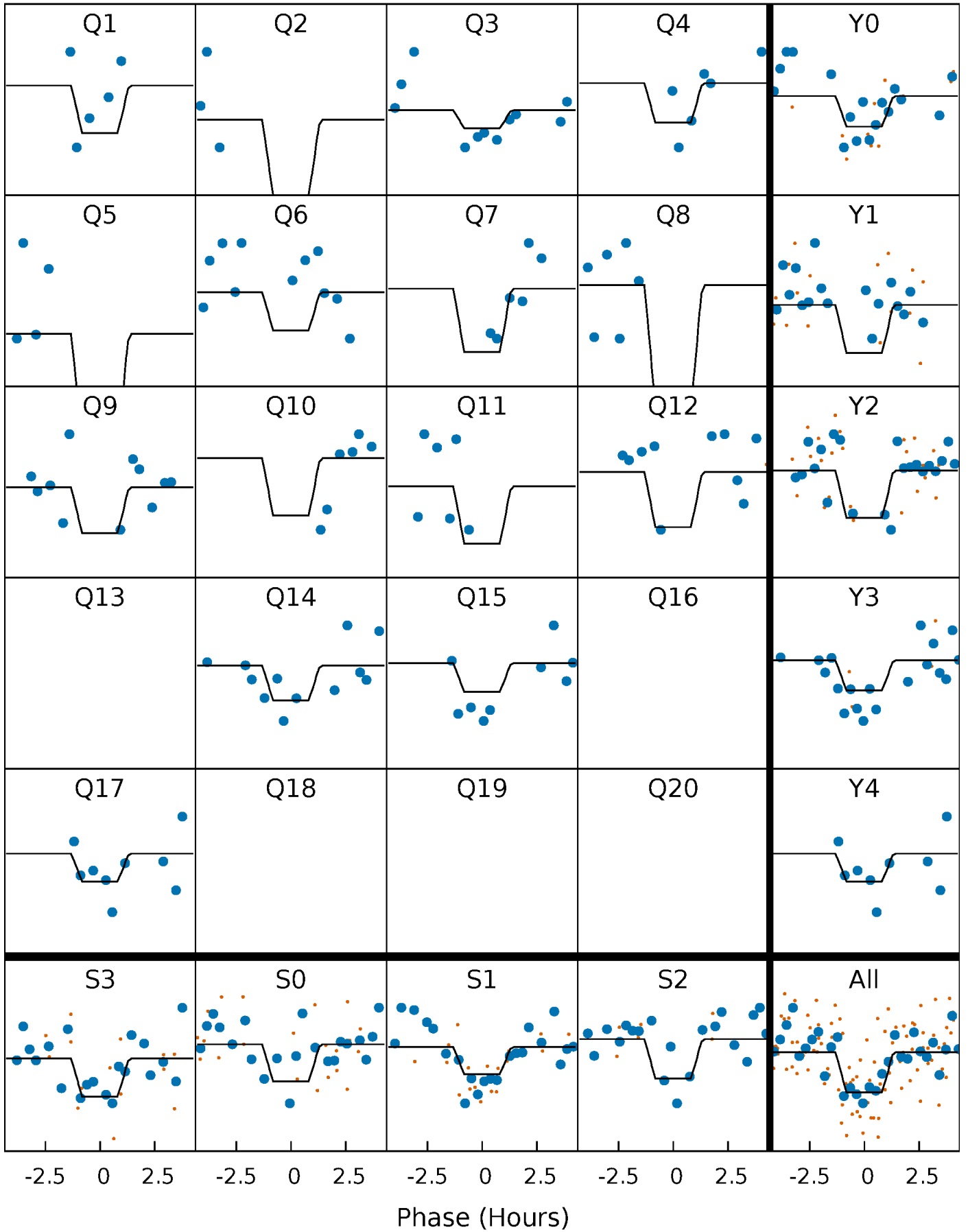
DV Quarter-Phased Transit Curves

TCE 010470935-06 P= 28.193285 Days $T_0=151.647421$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

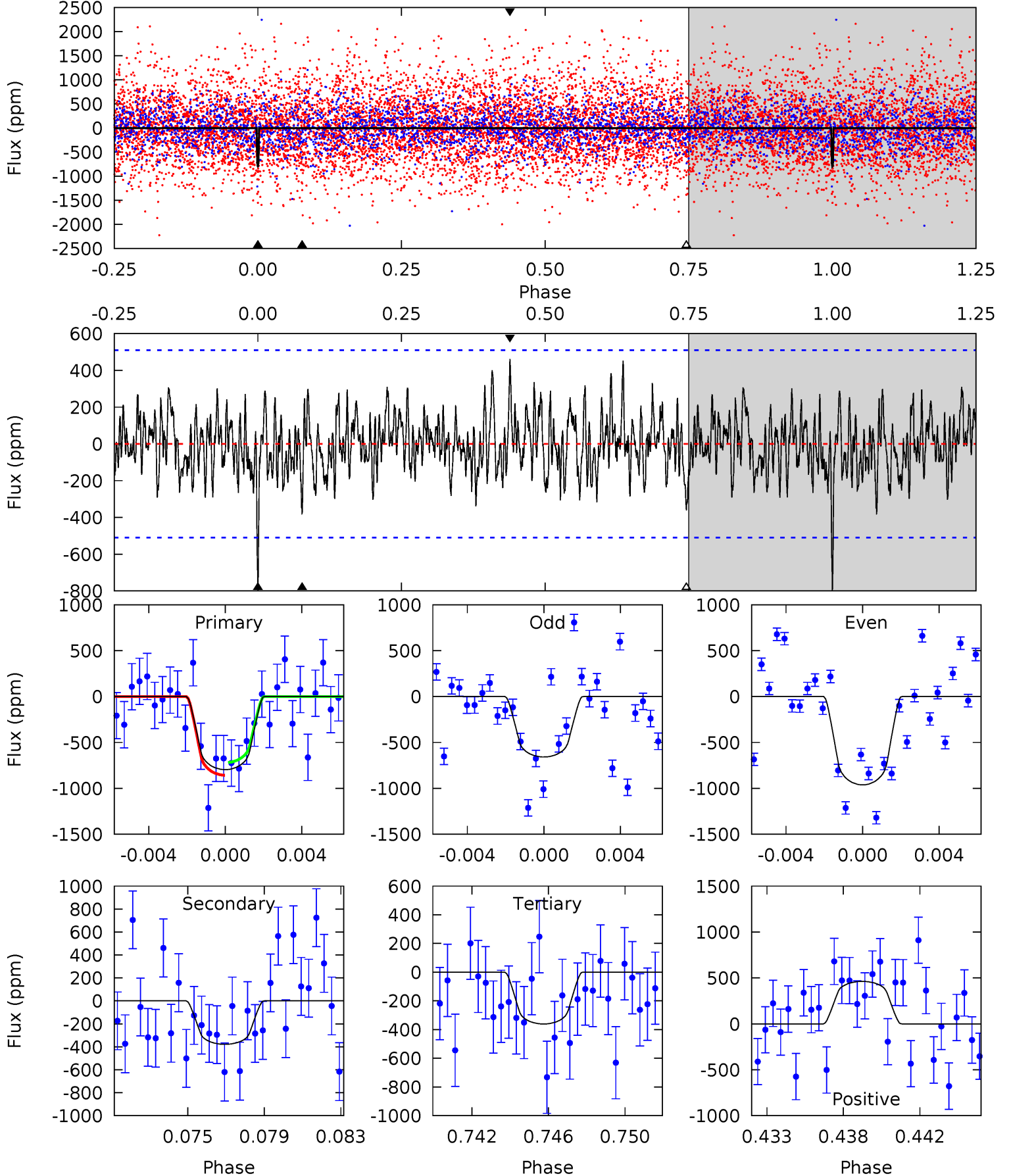
TCE 010470935-06 P= 28.192581 Days $T_0=151.661710$ (BKJD)



DV Model-Shift Uniqueness Test

010470935-06, $P = 28.193285$ Days, $E = 123.454136$ Days

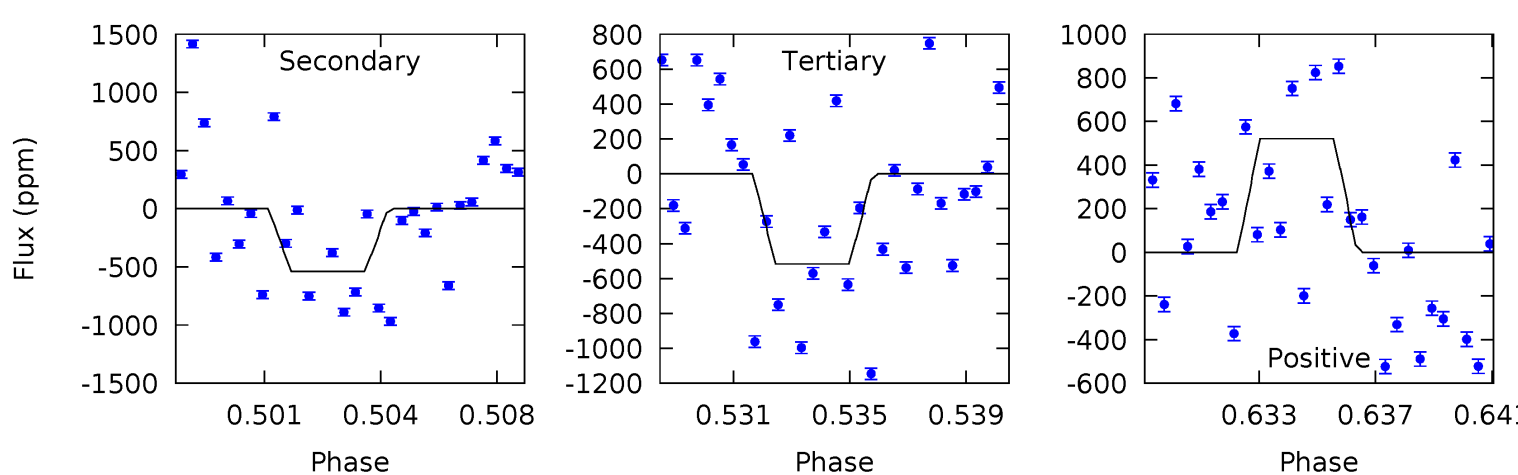
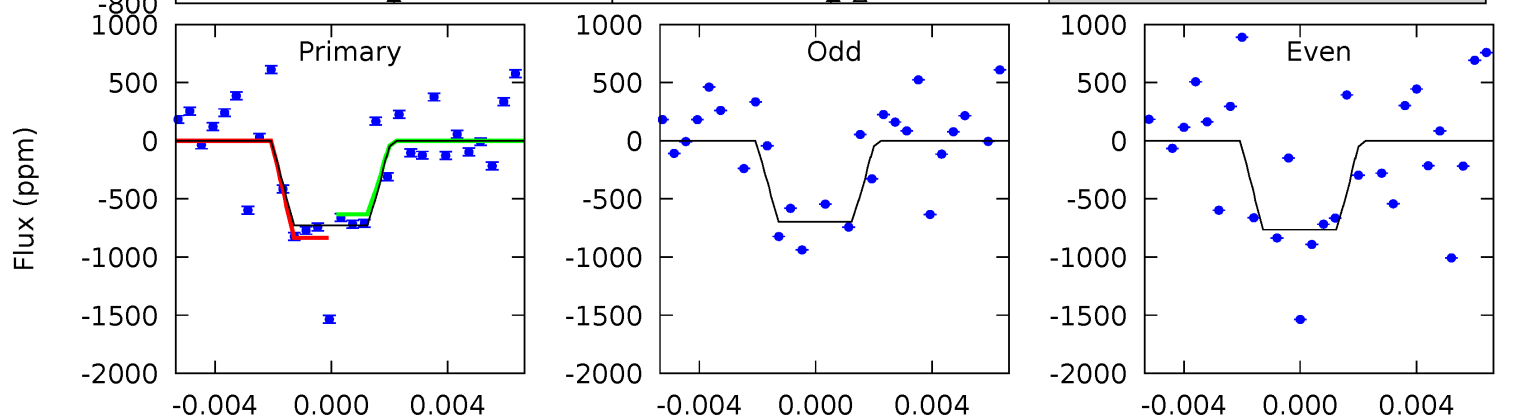
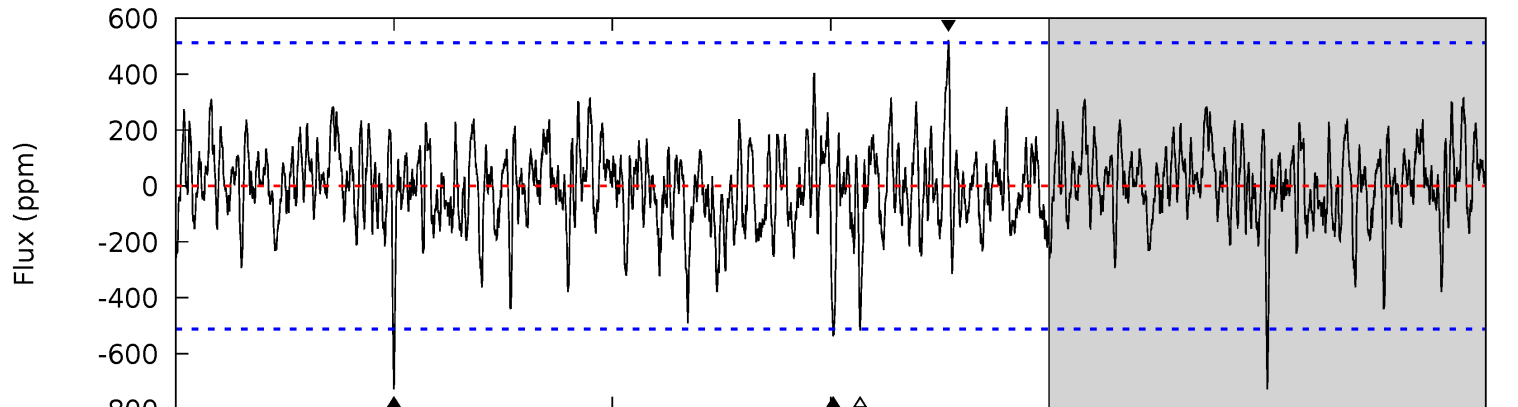
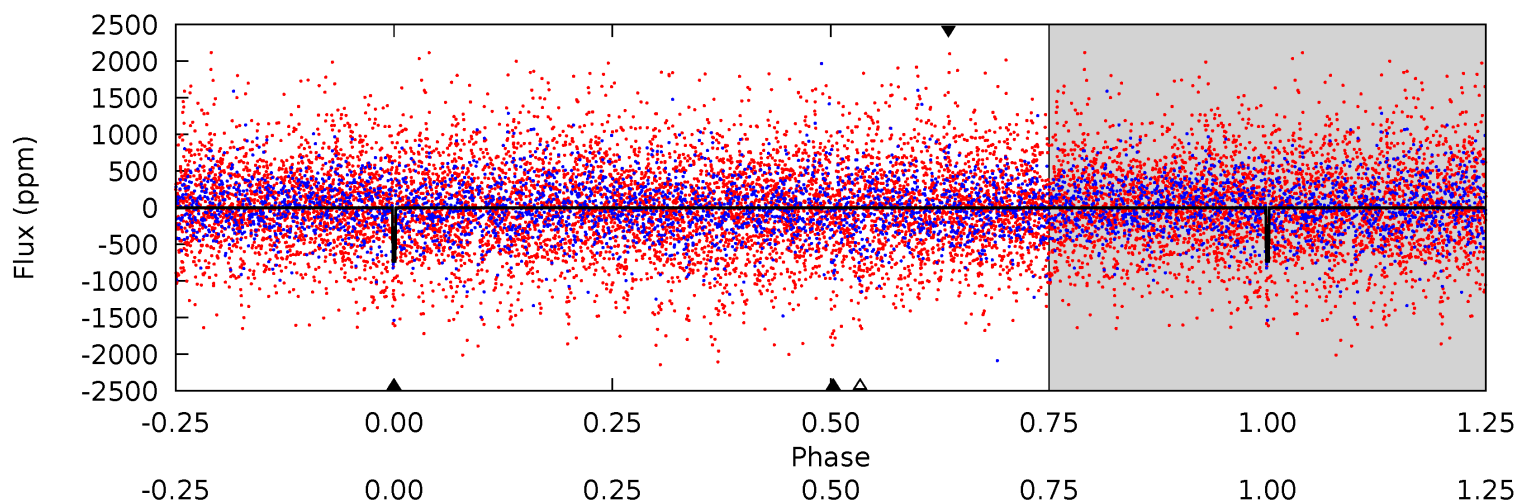
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.10	3.85	3.68	4.70	5.19	2.87	1.40	4.43	3.40	0.17	-0.85	1.55	0.86	0.37	0.71



Alt Model-Shift Uniqueness Test

010470935-06, P = 28.192581 Days, E = 123.469129 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.40	5.46	5.25	5.30	5.21	2.89	1.35	2.15	2.10	0.21	0.17	0.35	0.95	0.42	1.03



Stellar Parameters For KIC 010470935

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3758^{+68}_{-68}	$4.756^{+0.036}_{-0.024}$	$-0.100^{+0.100}_{-0.100}$	$0.493^{+0.027}_{-0.035}$	$0.506^{+0.028}_{-0.031}$	$5.930^{+0.972}_{-0.620}$
	+2%/-2%	+1%/-1%	+100%/-100%	+5%/-7%	+6%/-6%	+16%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010470935-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-378 ± 98	$2.32^{+2.09}_{-1.57}$	427^{+9}_{-9}	2927^{+1270}_{-441}	746^{+6989}_{-531}
Alt.	-538 ± 98	$2.28^{+2.08}_{-1.49}$	427^{+9}_{-9}	3106^{+1317}_{-513}	1193^{+8488}_{-867}

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

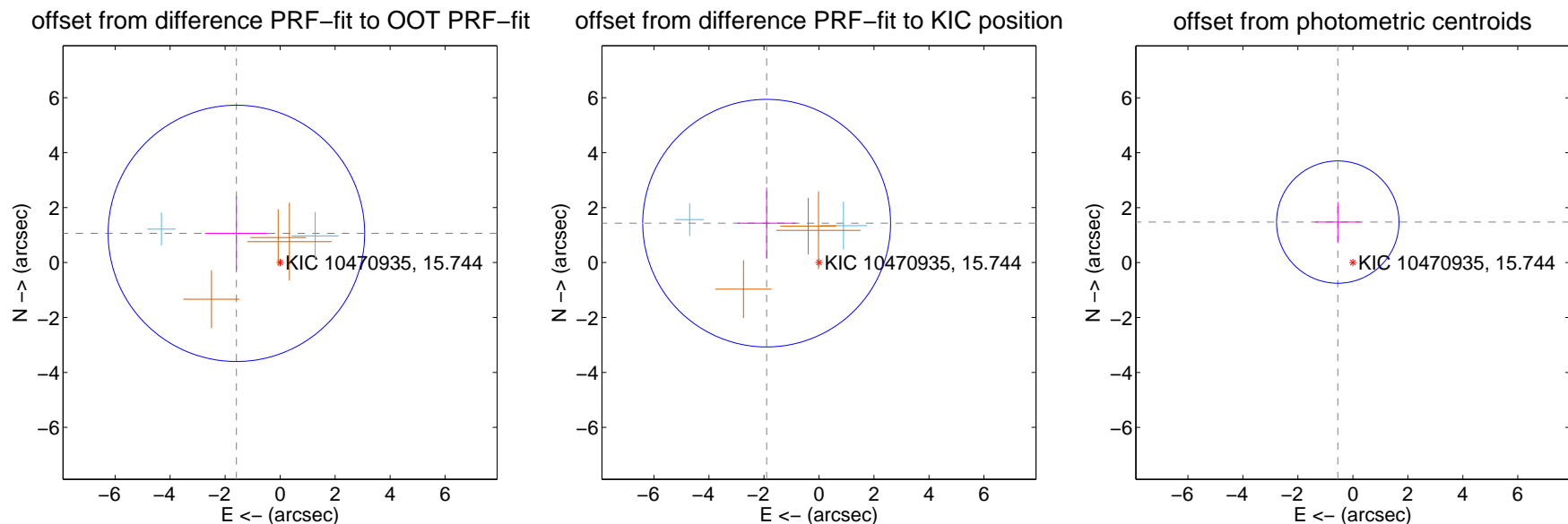
DV Centroid Data

Supplemental centroid analysis for 010470935-06. Kepler magnitude: 15.74. Transit SNR 11.26

There are 2 quarters with good PRF difference image offsets

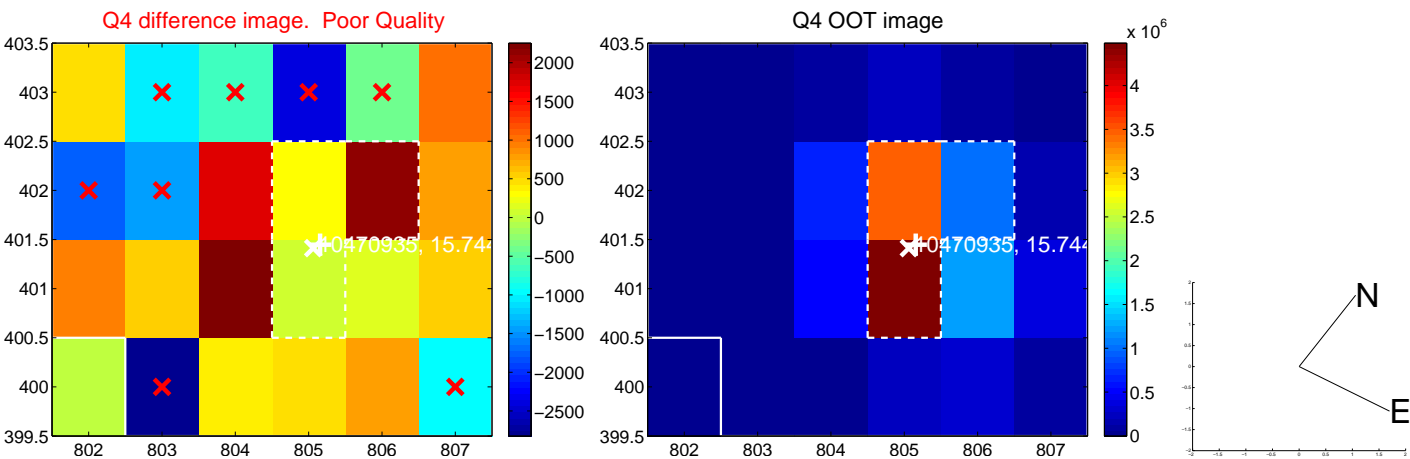
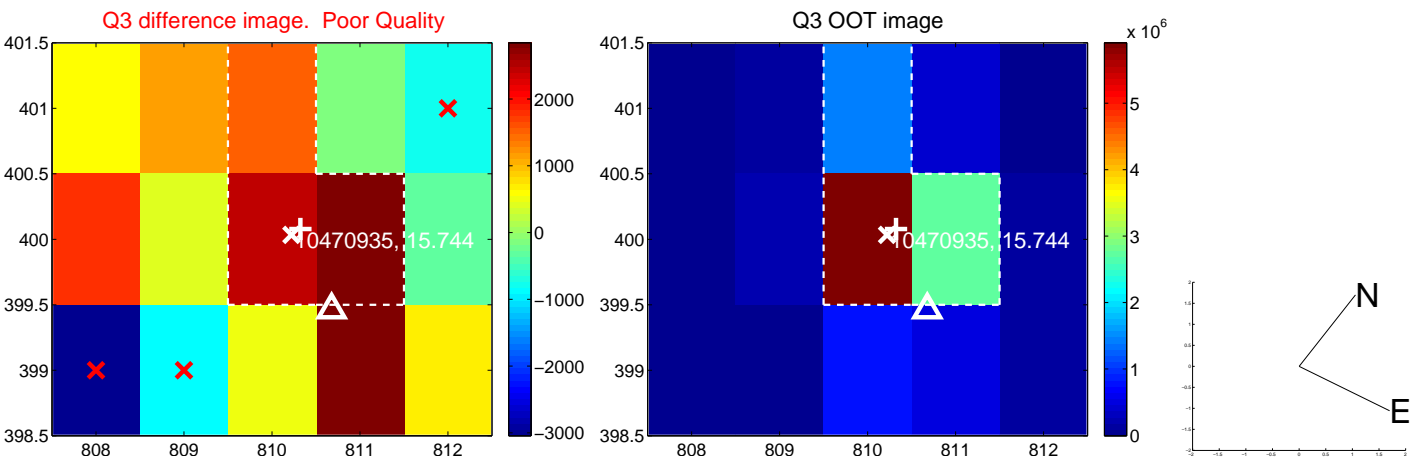
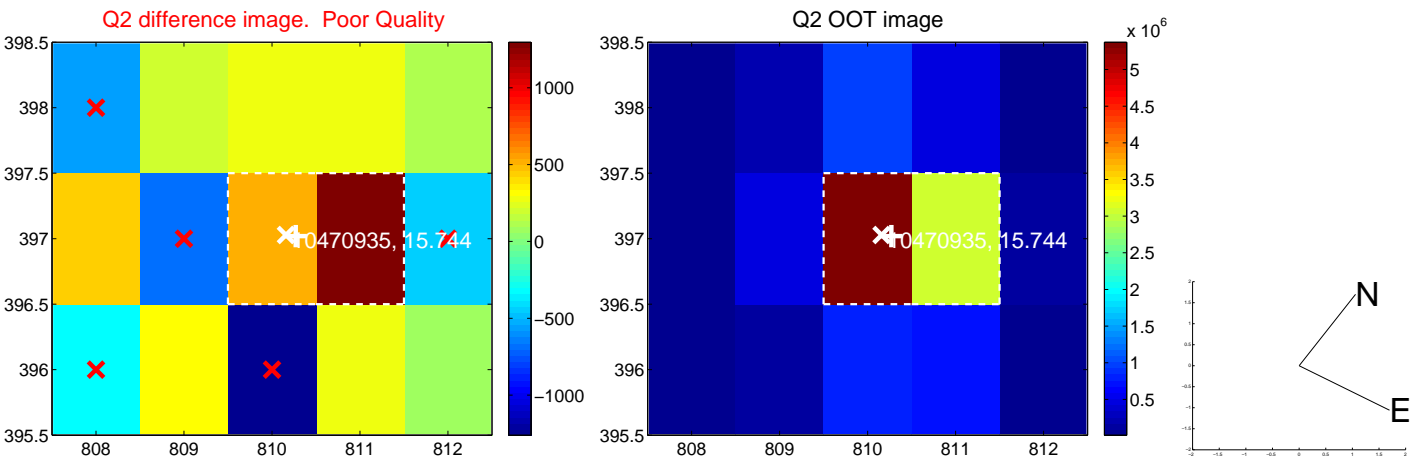
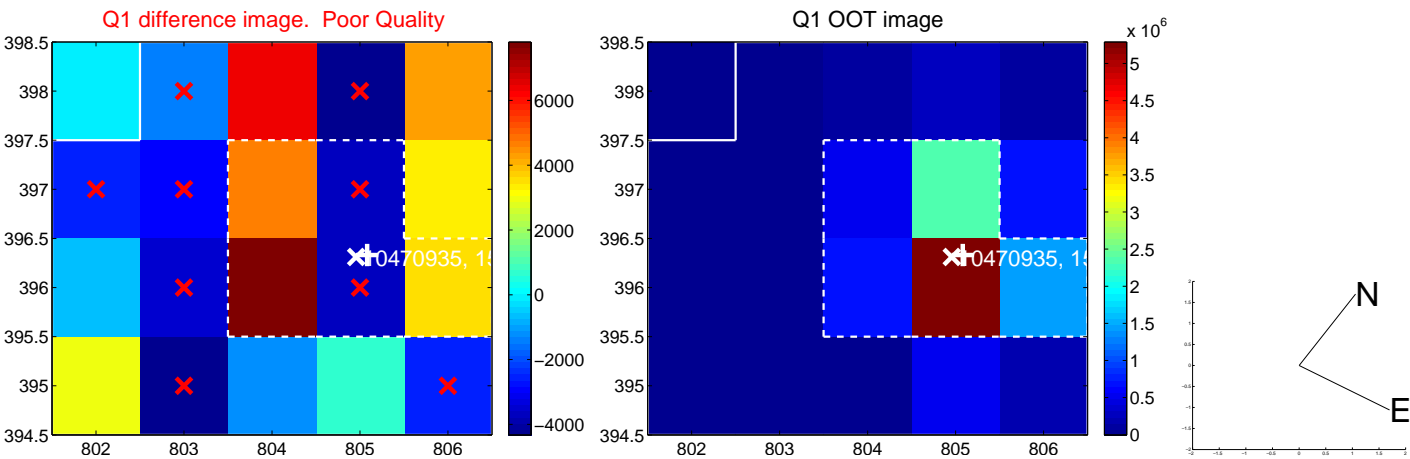
The direct PRF centroid is offset from the target star catalog position by about 0.54 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.911 ± 1.554	1.23	1.589 ± 1.134	1.061 ± 1.349
PRF-fit source offset from KIC position	2.382 ± 1.502	1.59	1.903 ± 1.064	1.433 ± 1.293
photometric centroid source offset	1.57 ± 0.74	2.12	0.55 ± 0.83	1.48 ± 0.73

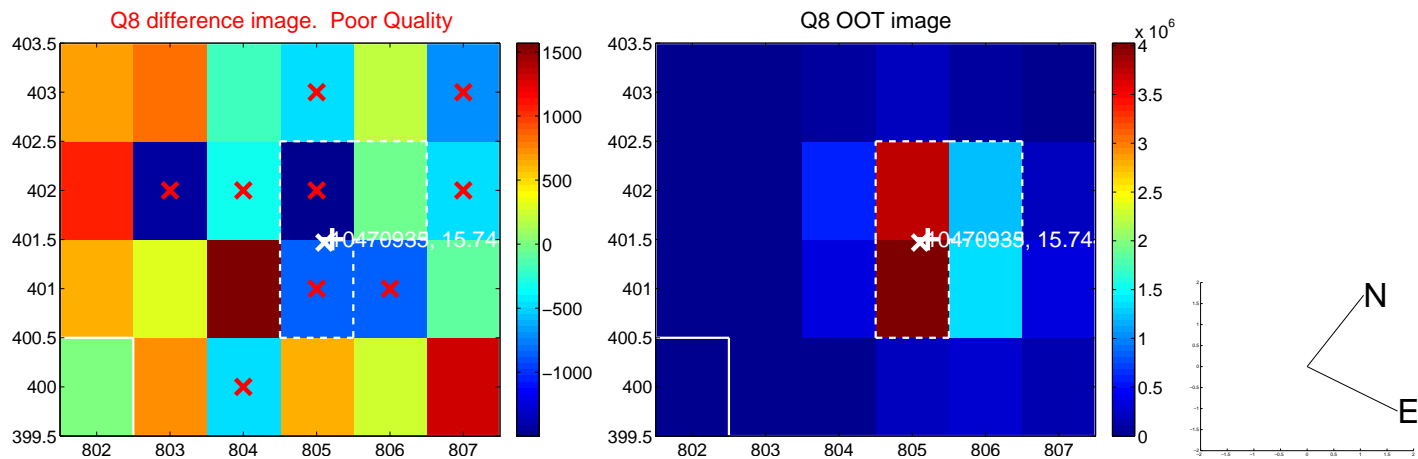
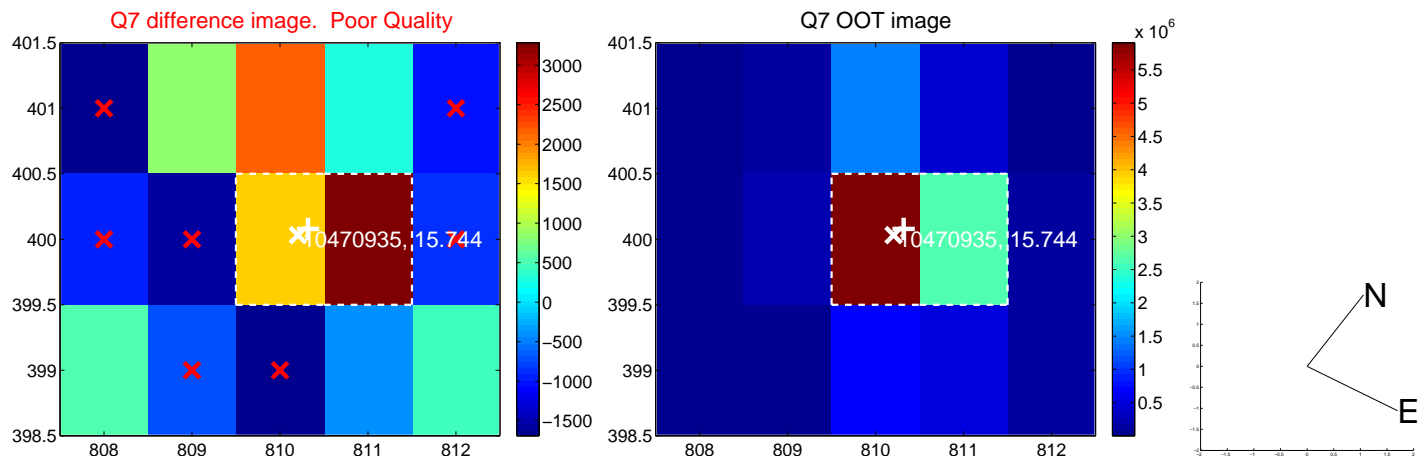
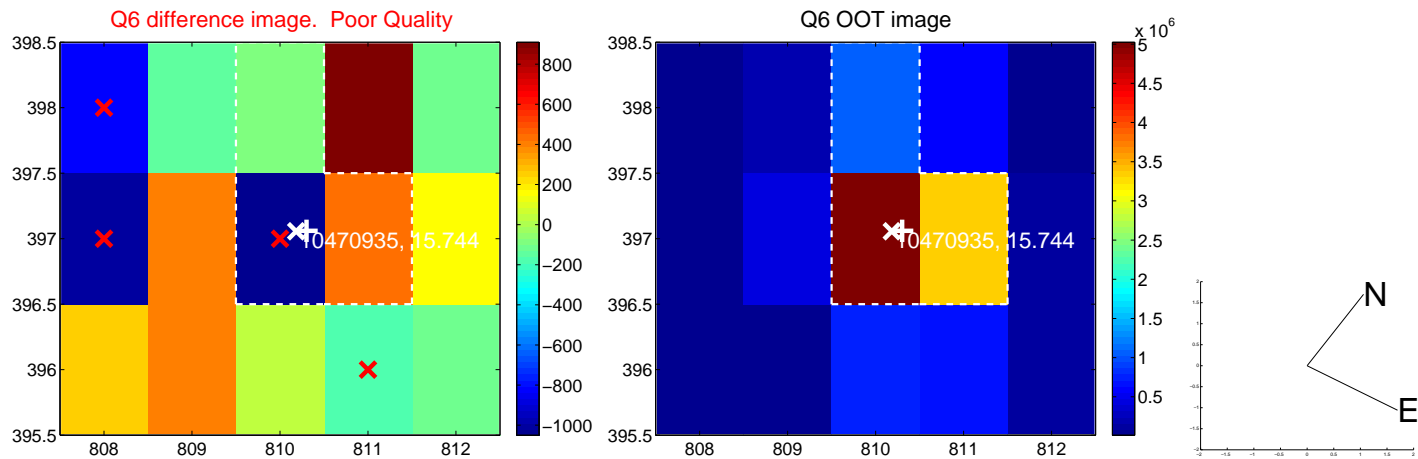
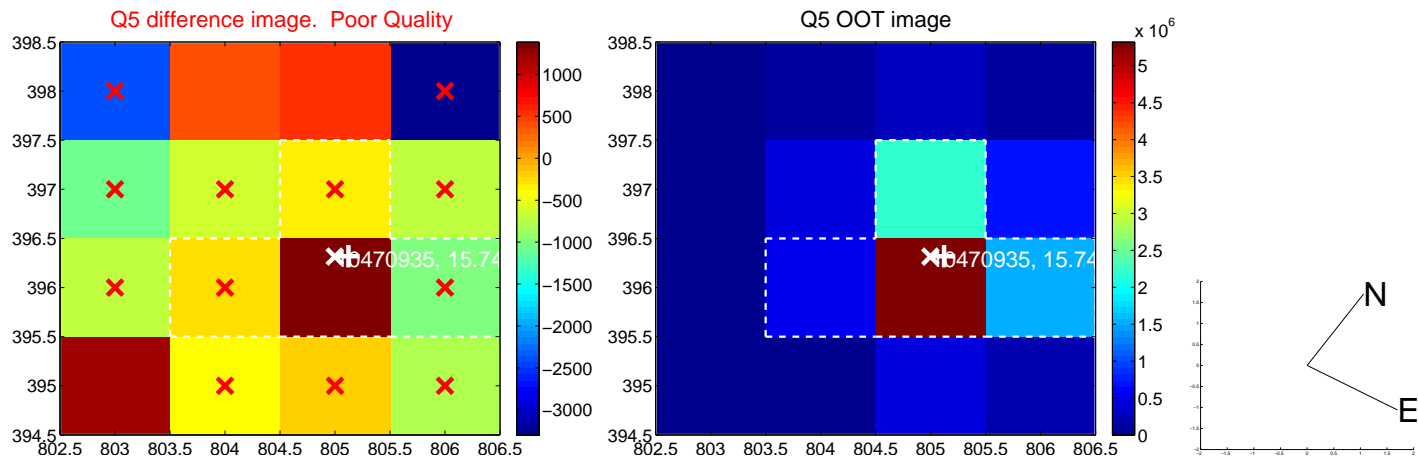


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

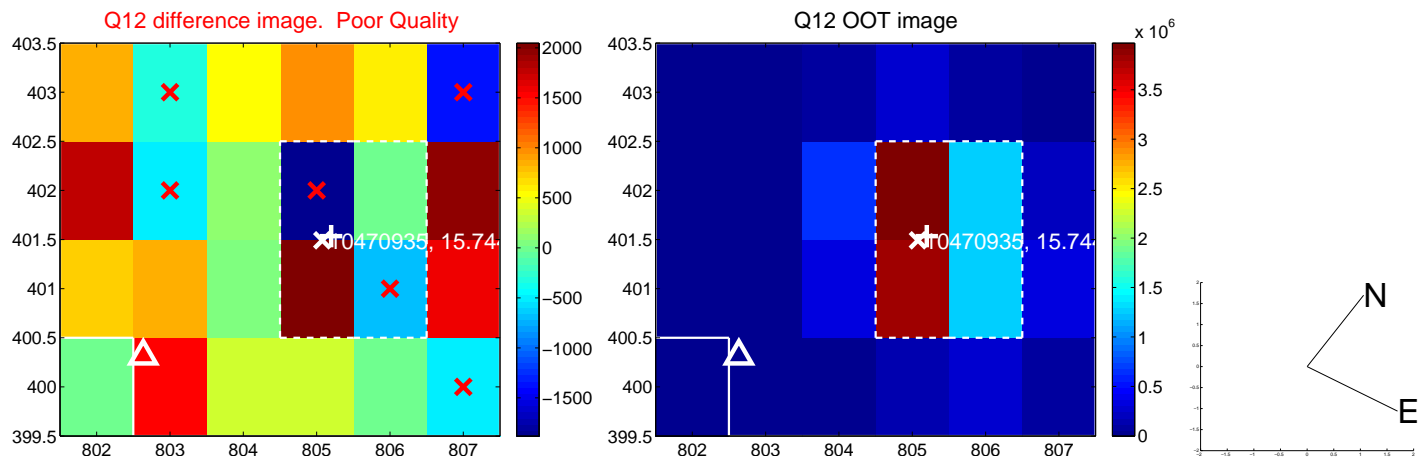
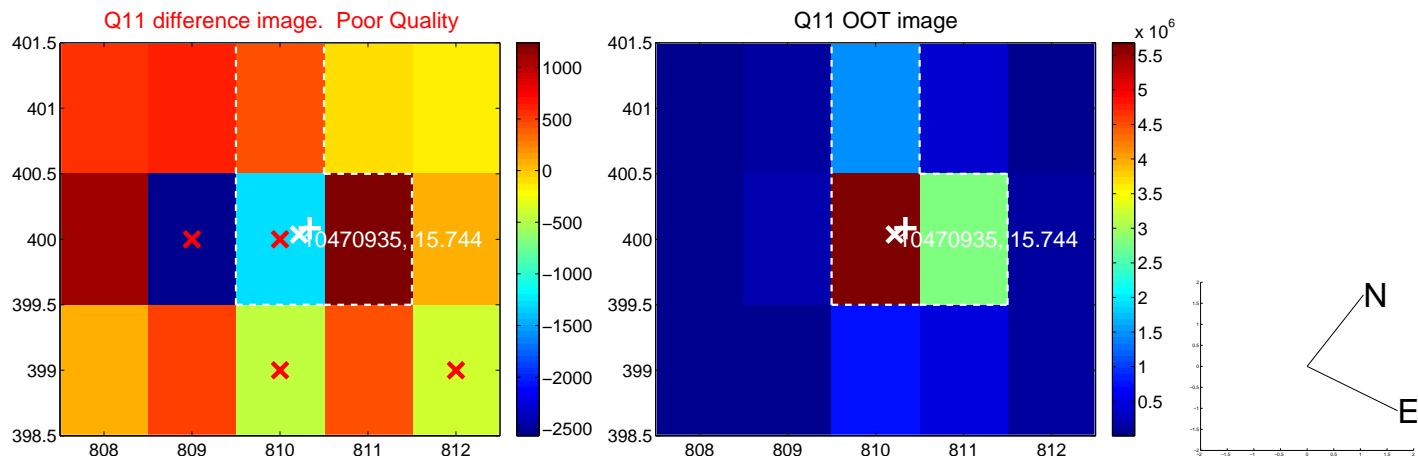
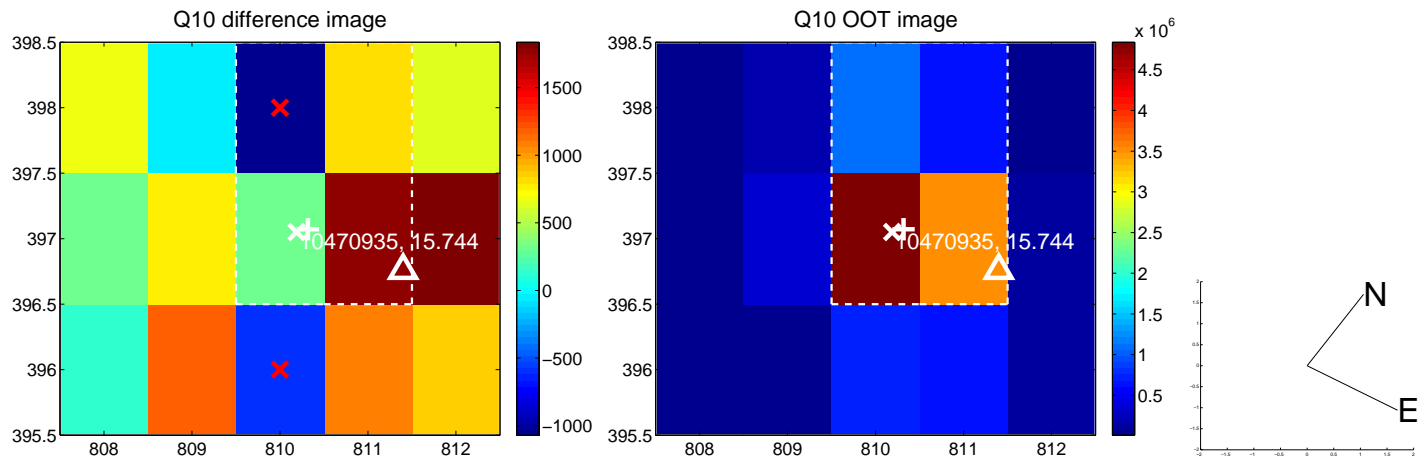
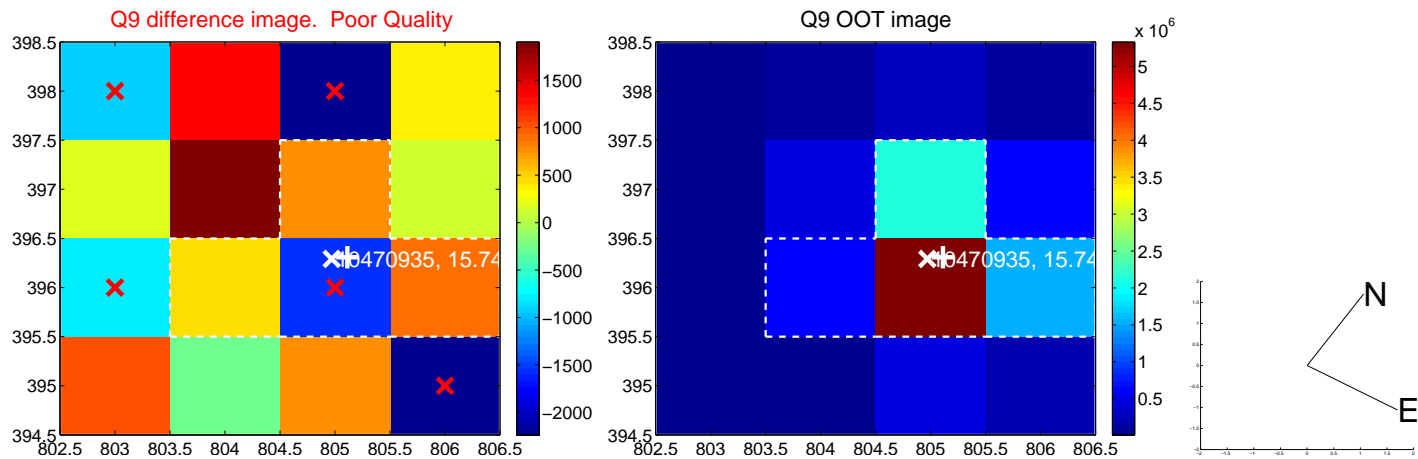
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



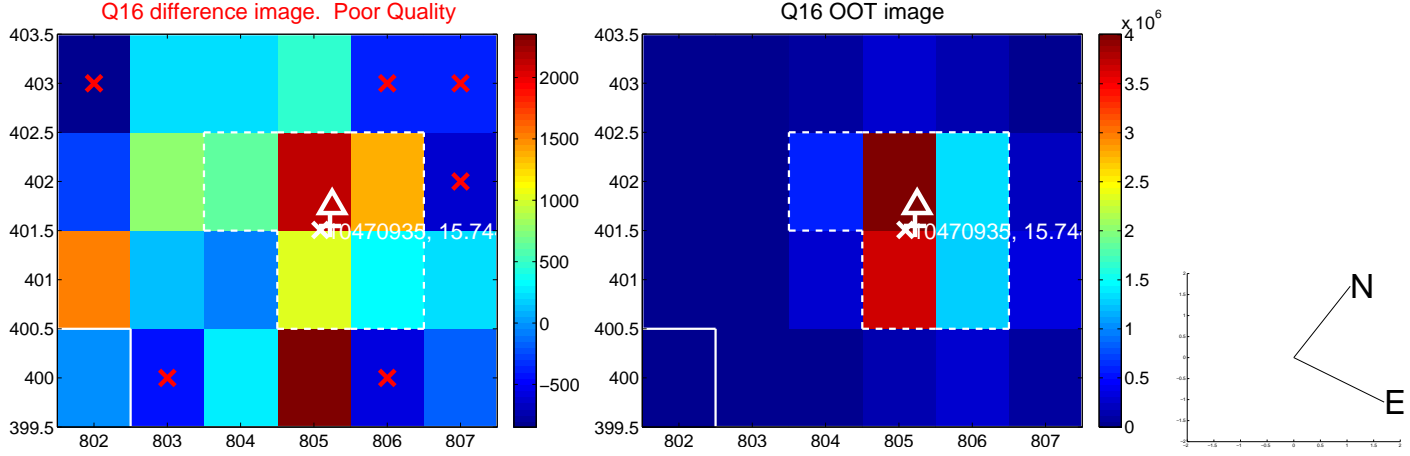
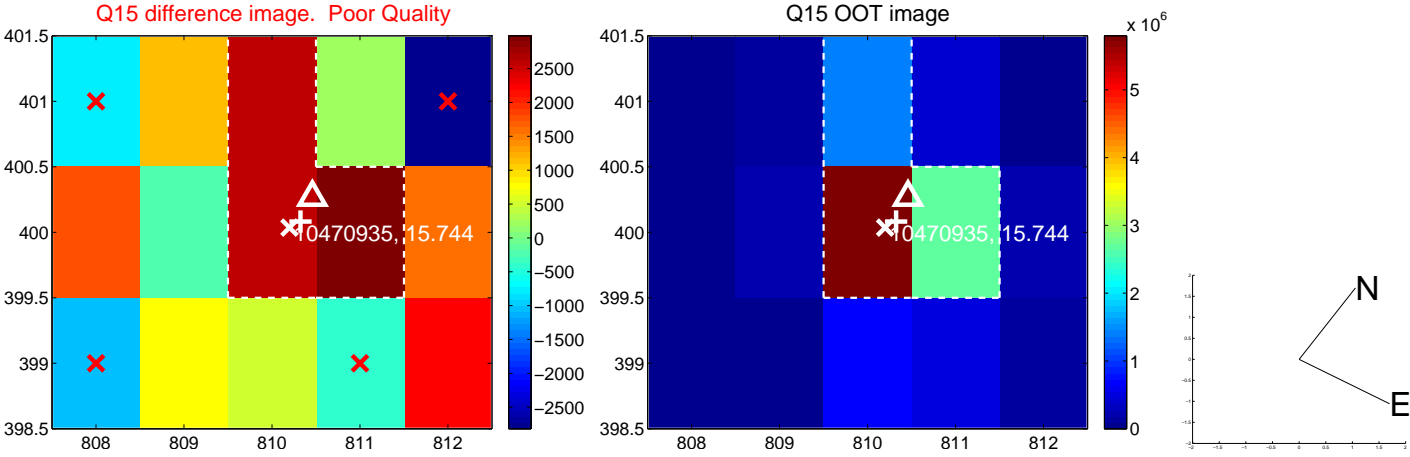
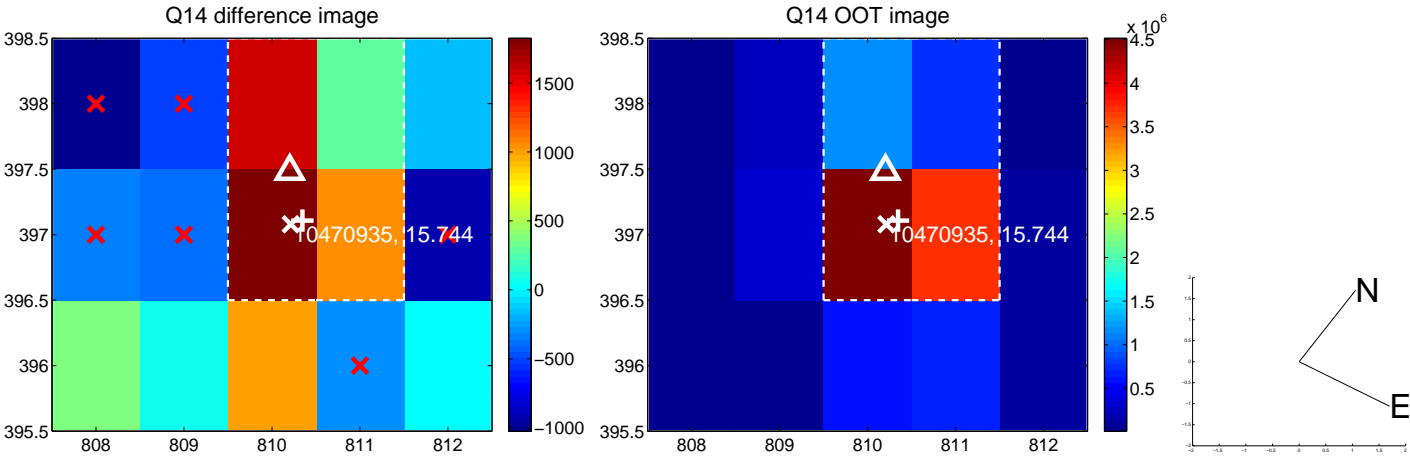
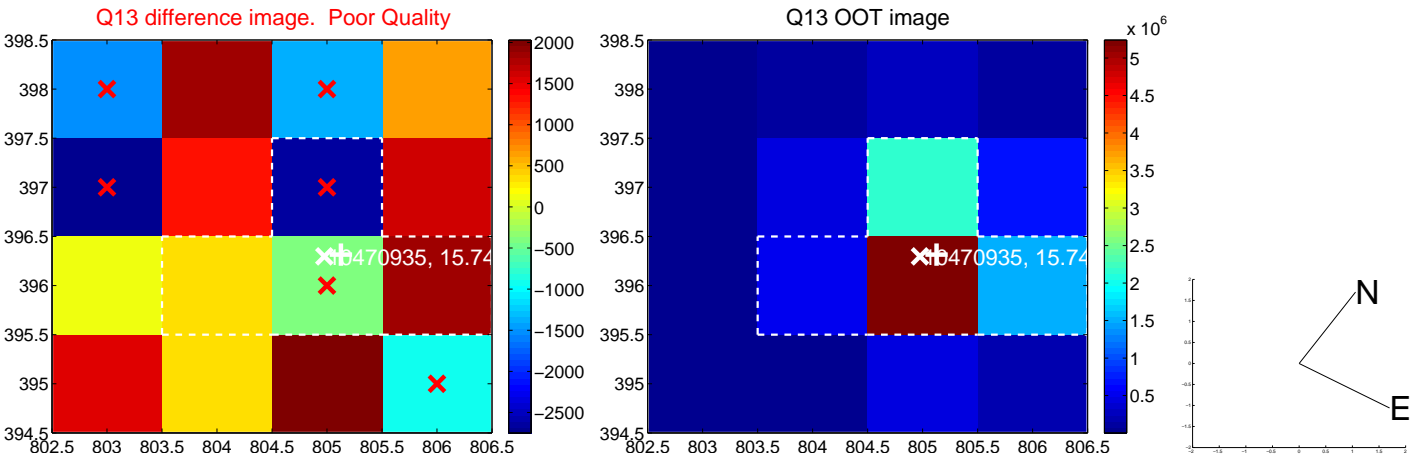
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



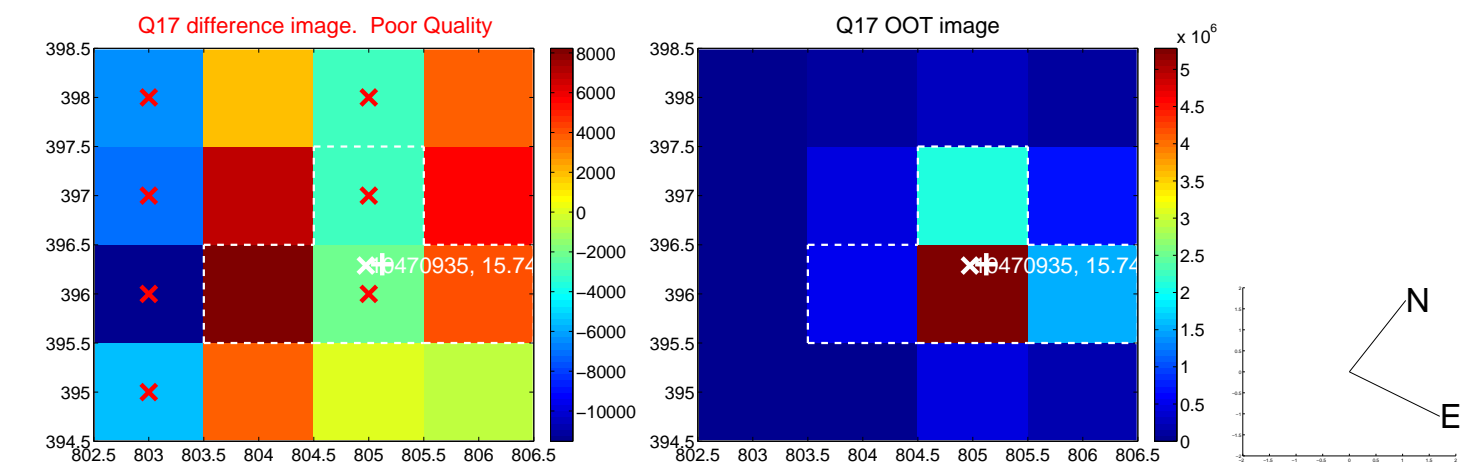
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



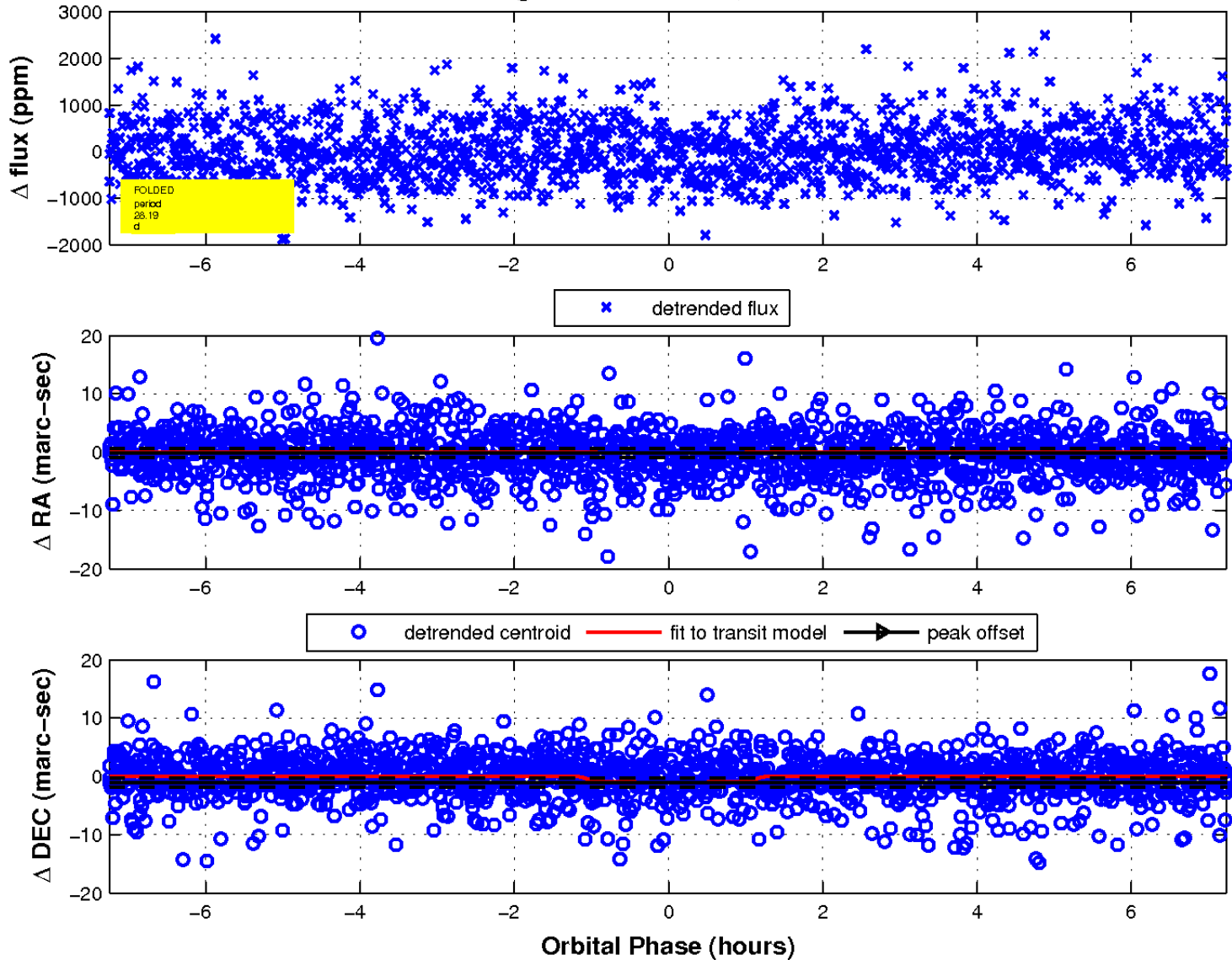
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

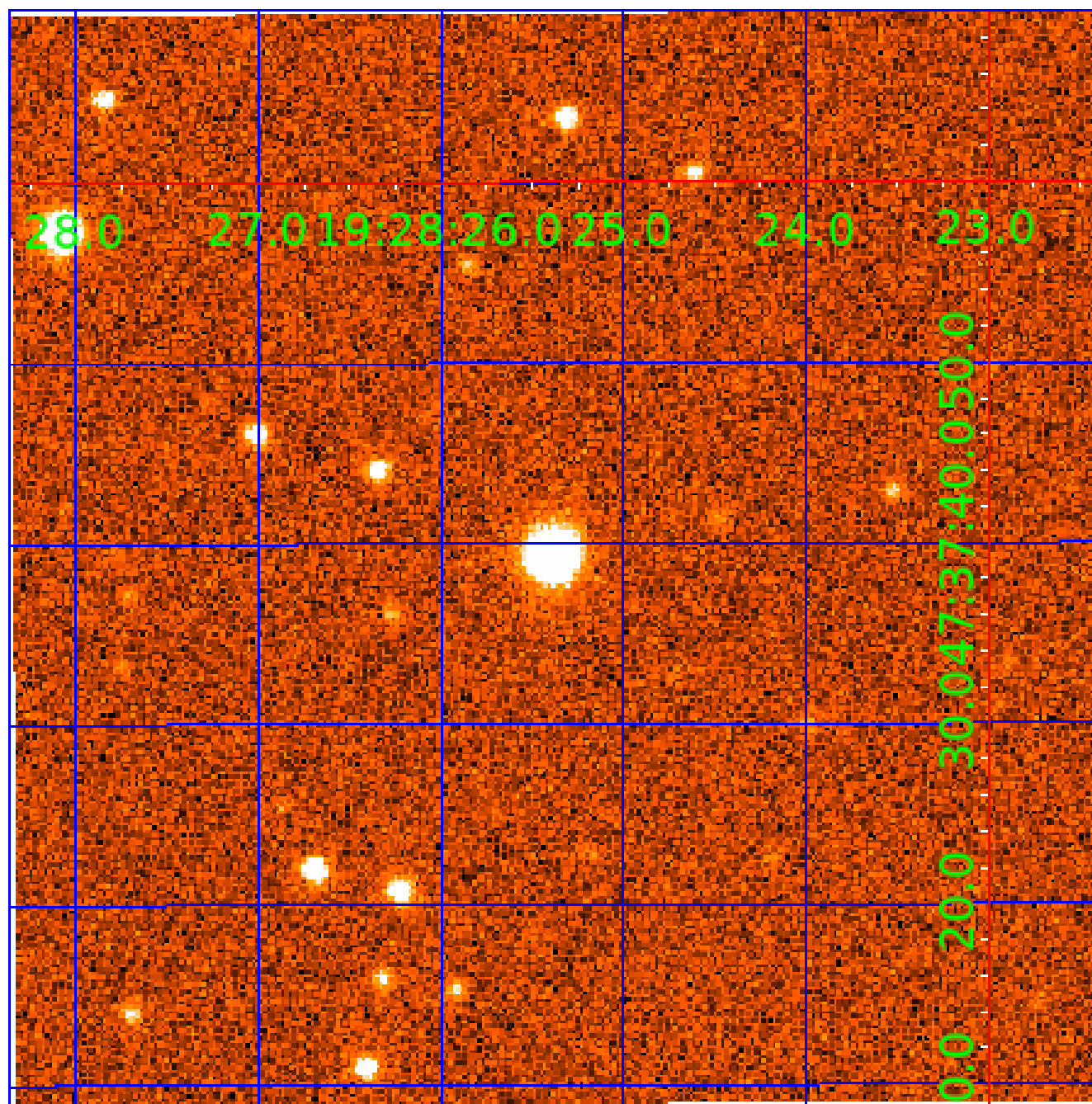


fluxWeightedCentroids, Planet 6 of 7



UKIRT Image

Declination



KIC 010470935

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})
010470935-01	OBS	No	0.933653	131.581200	41.1	6.373	7.5	7.2	0.49	3758	0.32	195.75
010470935-02	OBS	No	48.099305	175.920478	911.6	2.536	12.4	8.9	0.49	3758	1.67	1.02
010470935-03	OBS	No	61.763380	138.606372	1418.8	2.714	10.8	12.3	0.49	3758	3.37	0.73
010470935-04	OBS	No	30.260665	153.057643	1173.5	1.424	9.9	9.3	0.49	3758	1.69	1.89
010470935-05	OBS	No	46.884833	138.490223	609.4	4.383	9.1	9.7	0.49	3758	1.32	1.06
010470935-06	OBS	No	28.193285	151.647421	886.1	2.418	8.7	11.3	0.49	3758	1.60	2.08
010470935-07	OBS	No	43.019550	137.033651	862.4	4.285	8.1	8.7	0.49	3758	1.55	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010470935-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH
010470935-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_MEAS
010470935-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
010470935-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010470935-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
010470935-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_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.

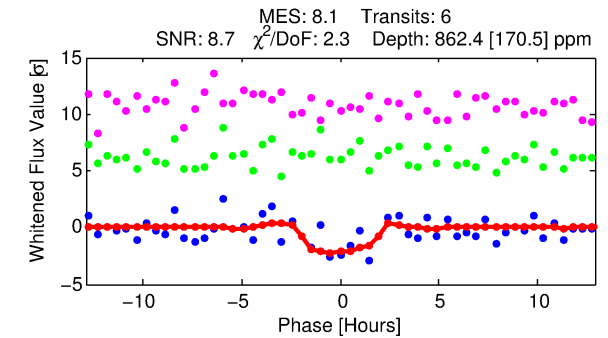
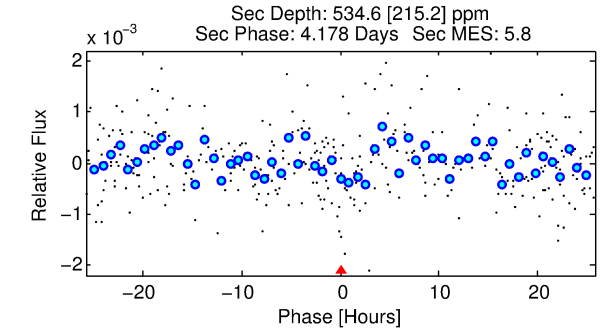
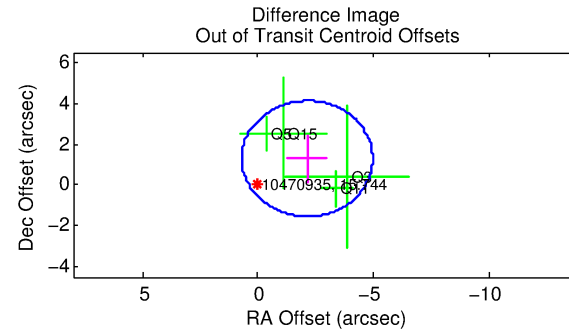
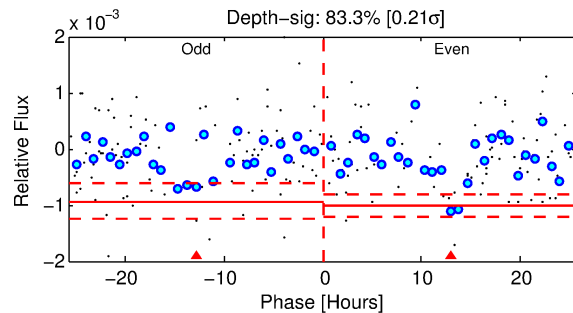
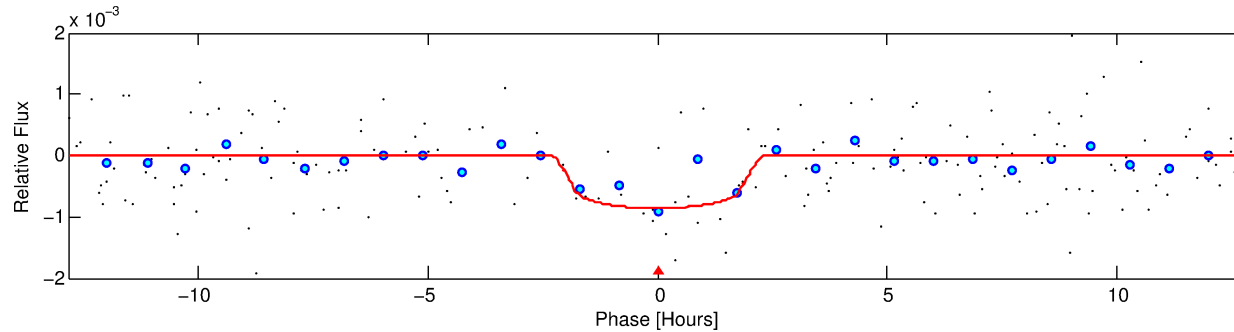
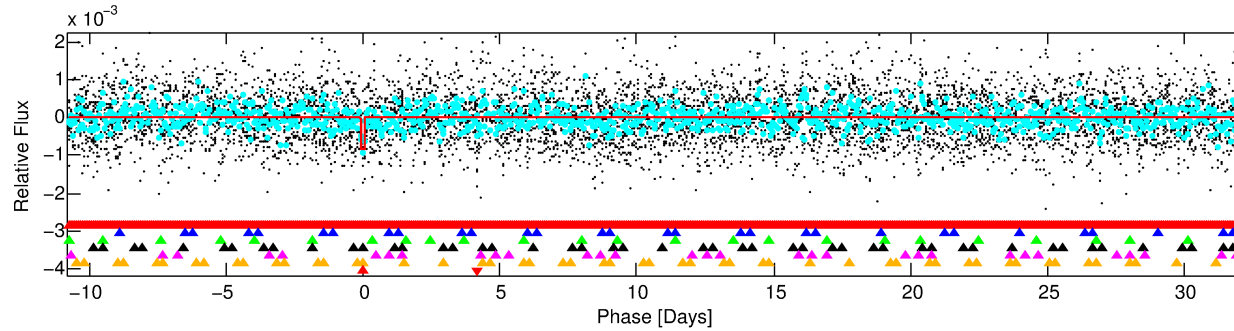
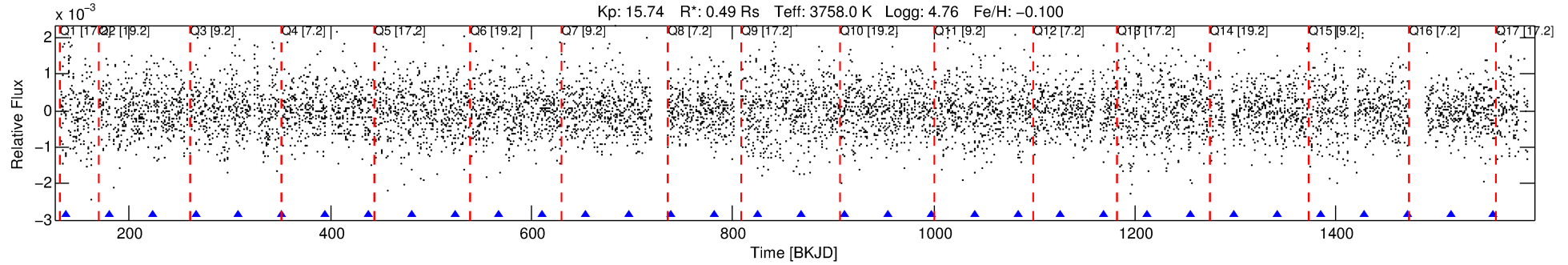
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010470935-07

No Significant Match Found

DV One-Page Summary

KIC: 10470935 Candidate: 7 of 7 Period: 43.020 d



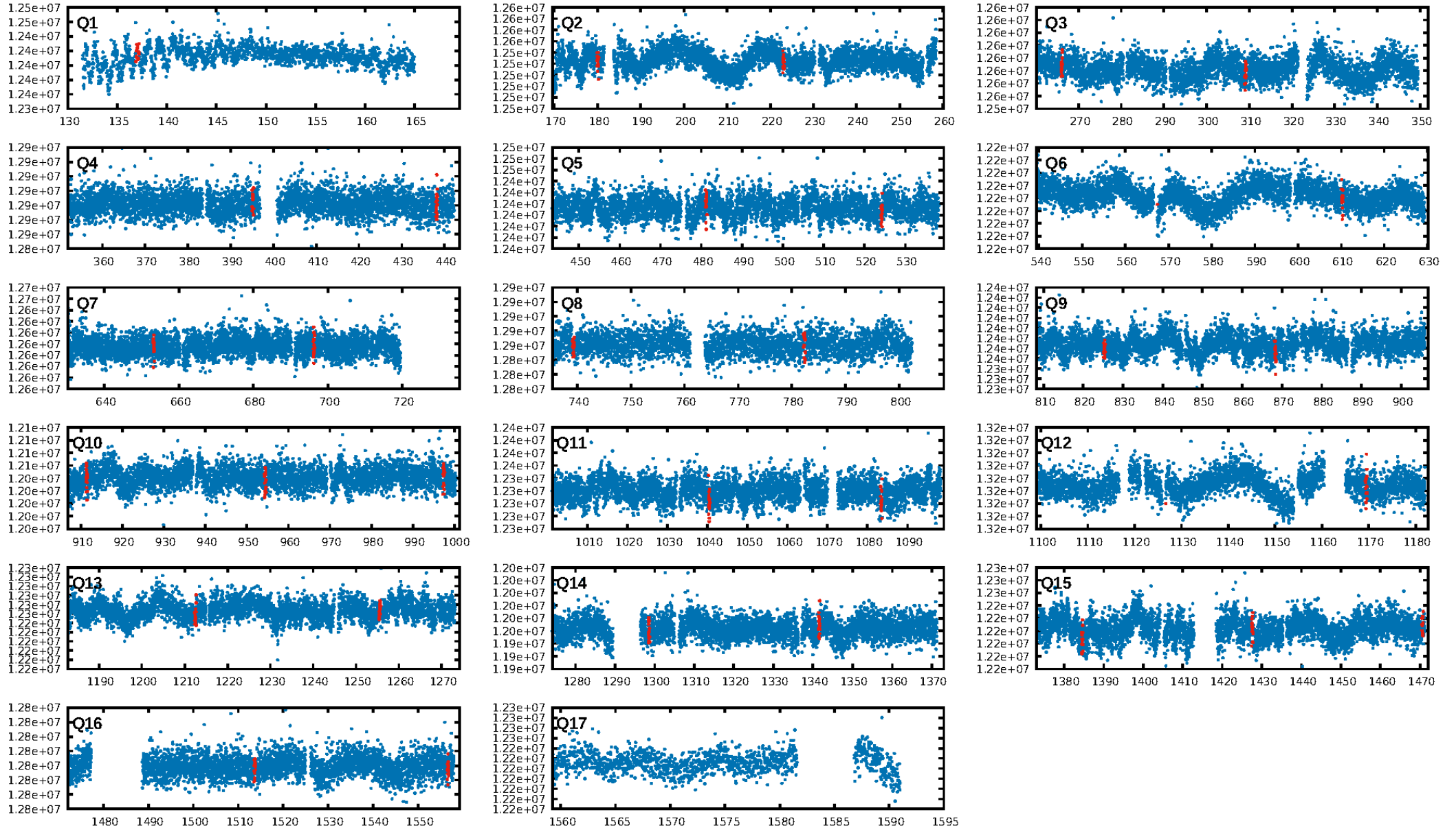
DV Fit Results:

Period = 43.01955 [0.00093] d
Epoch = 137.0337 [0.0153] BKJD
Rp/R* = 0.0287 [0.0347]
a/R* = 57.55 [312.19]
b = 0.70 [3.88]
Seff = 1.19 [0.12]
Teq = 266 [7] K
Rp = 1.55 [1.87] Re
a = 0.1914 [0.0105] AU
Ag = 4512.49 [11062.04] [0.41 σ]
Teffp = 3371 [2066] K [1.50 σ]

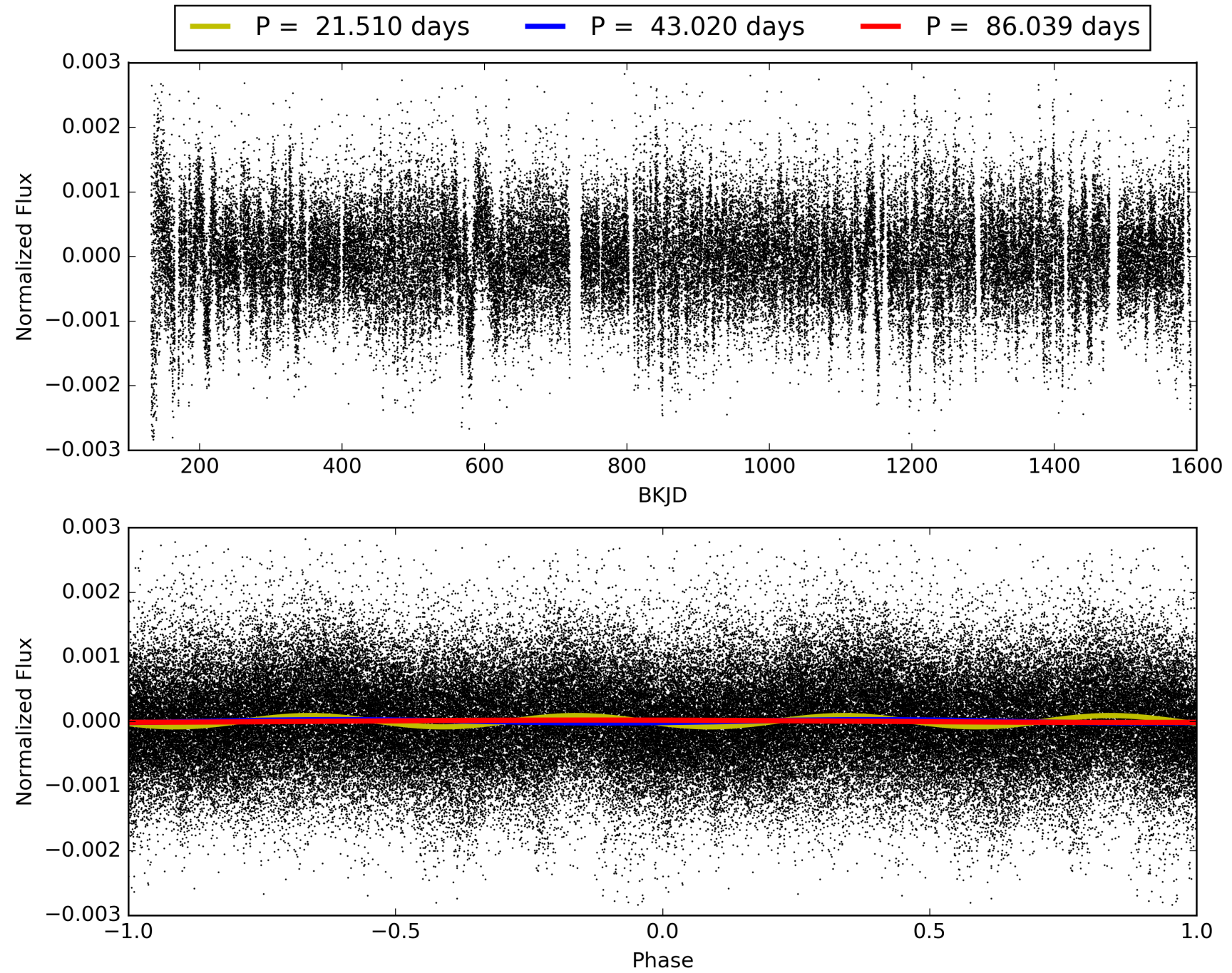
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.81 σ]
LongPeriod-sig: 100.0% [15.13 σ]
ModelChiSquare2-sig: 3.2%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: 4.51e-07
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: -0.9014
Centroid-sig: 0.0%
Centroid-so: 2.560 arcsec [3.05 σ]
OotOffset-rm: 2.485 arcsec [2.63 σ]
KicOffset-rm: 2.425 arcsec [2.42 σ]
OotOffset-st: 0/3/0/1 [4]
KicOffset-st: 0/3/0/1 [4]
DiffImageQuality-fgm: 0.00 [0/4]
DiffImageOverlap-fno: 0.00 [0/16]

TCE 010470935-07, PDC Light Curves

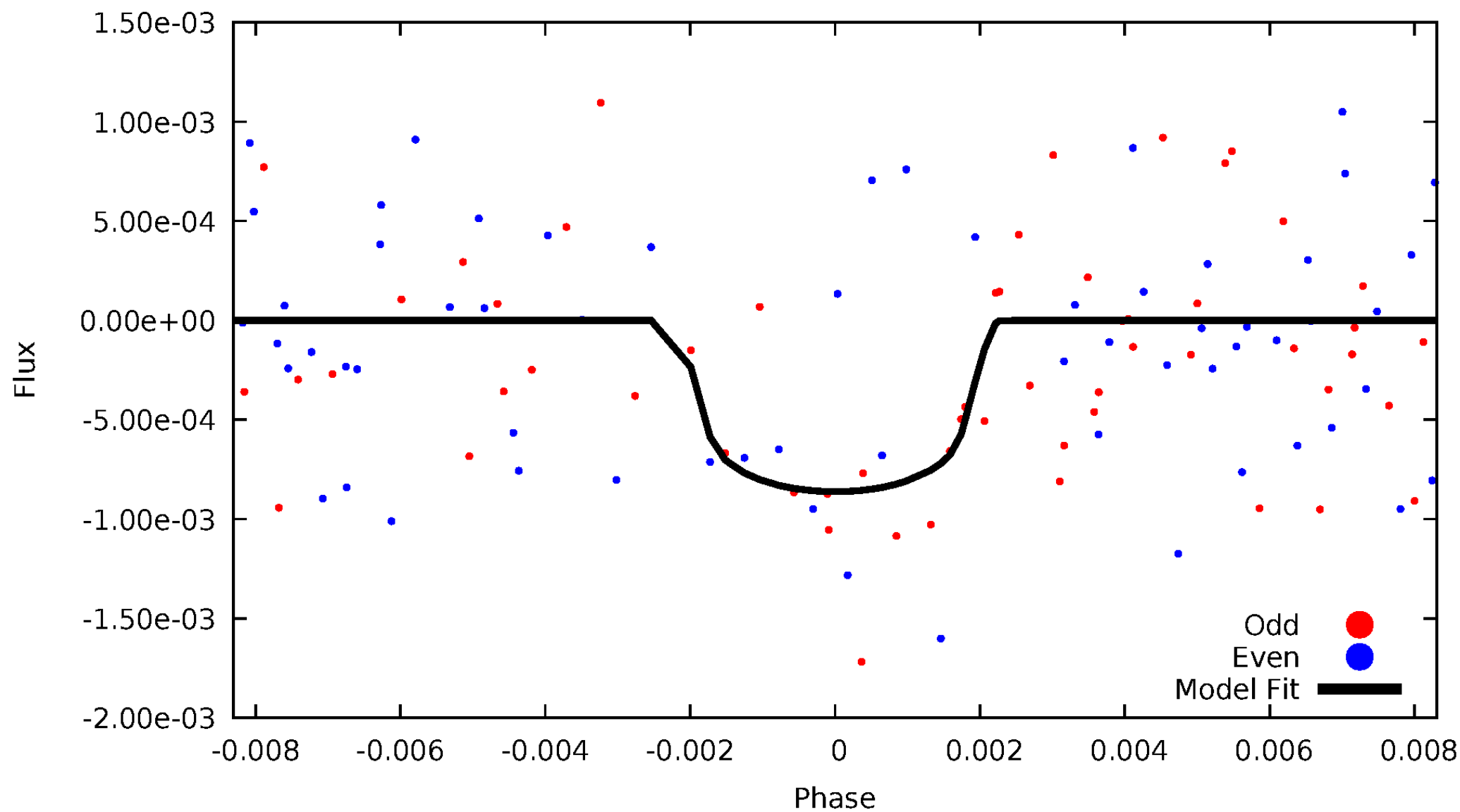


TCE 010470935-07



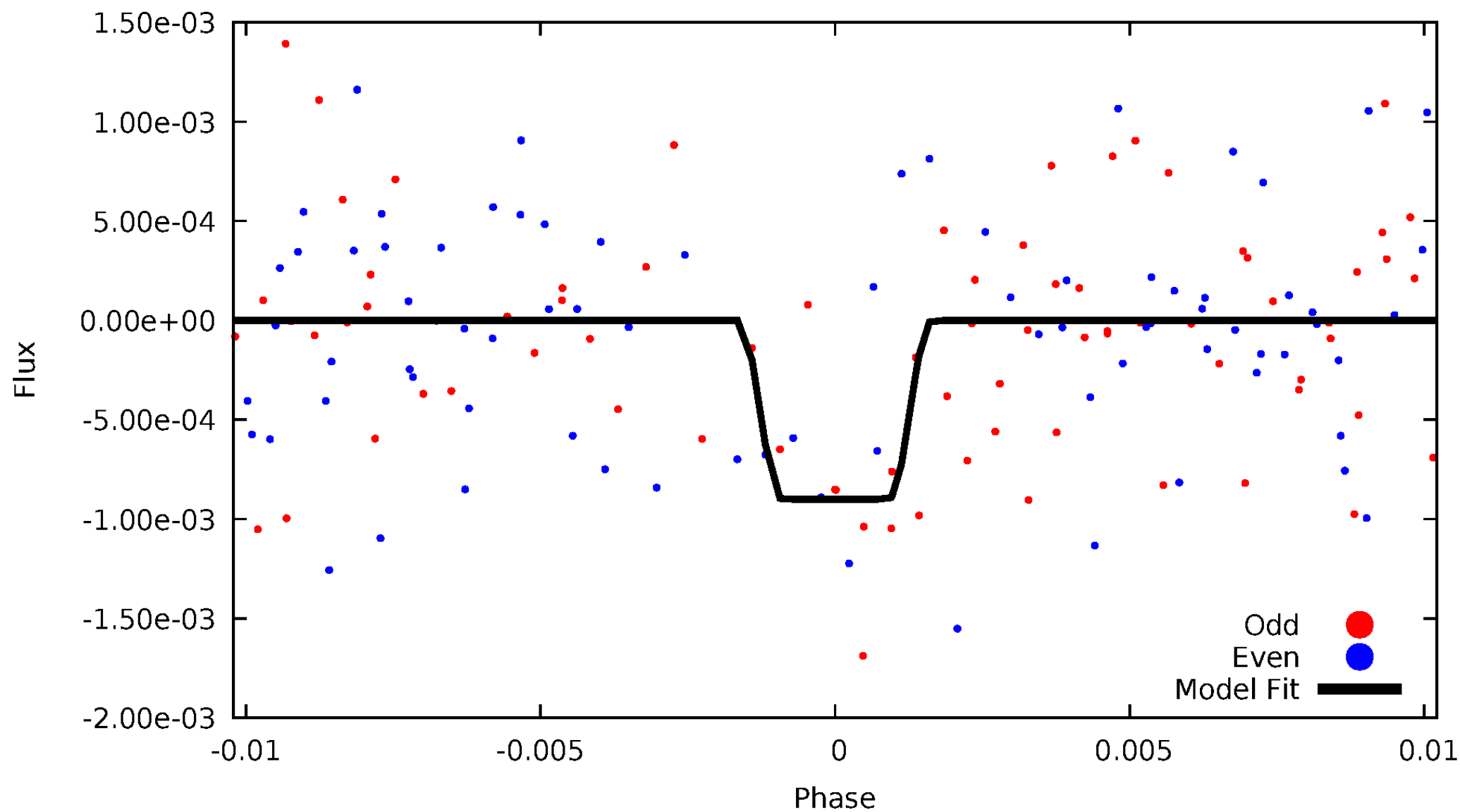
DV Odd/Even

TCE 010470935-07



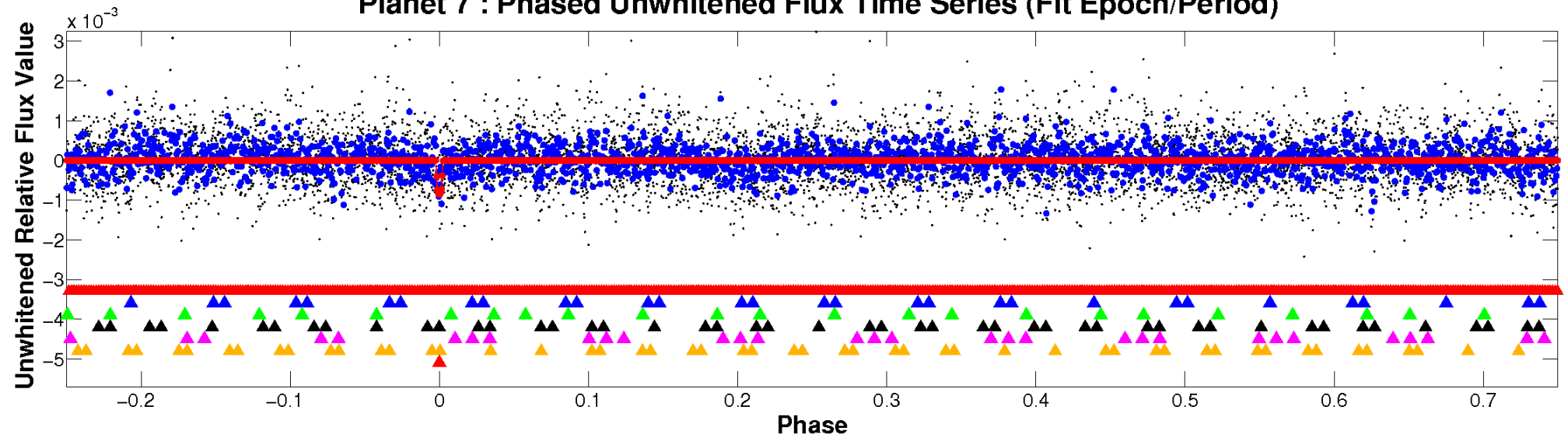
ALT Odd/Even

TCE 010470935-07

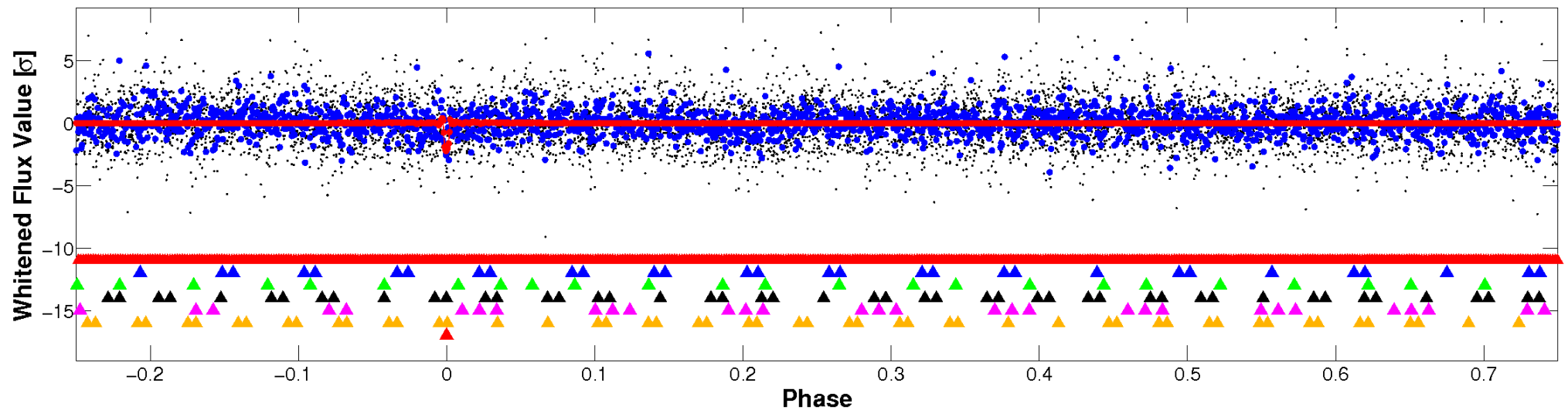


Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

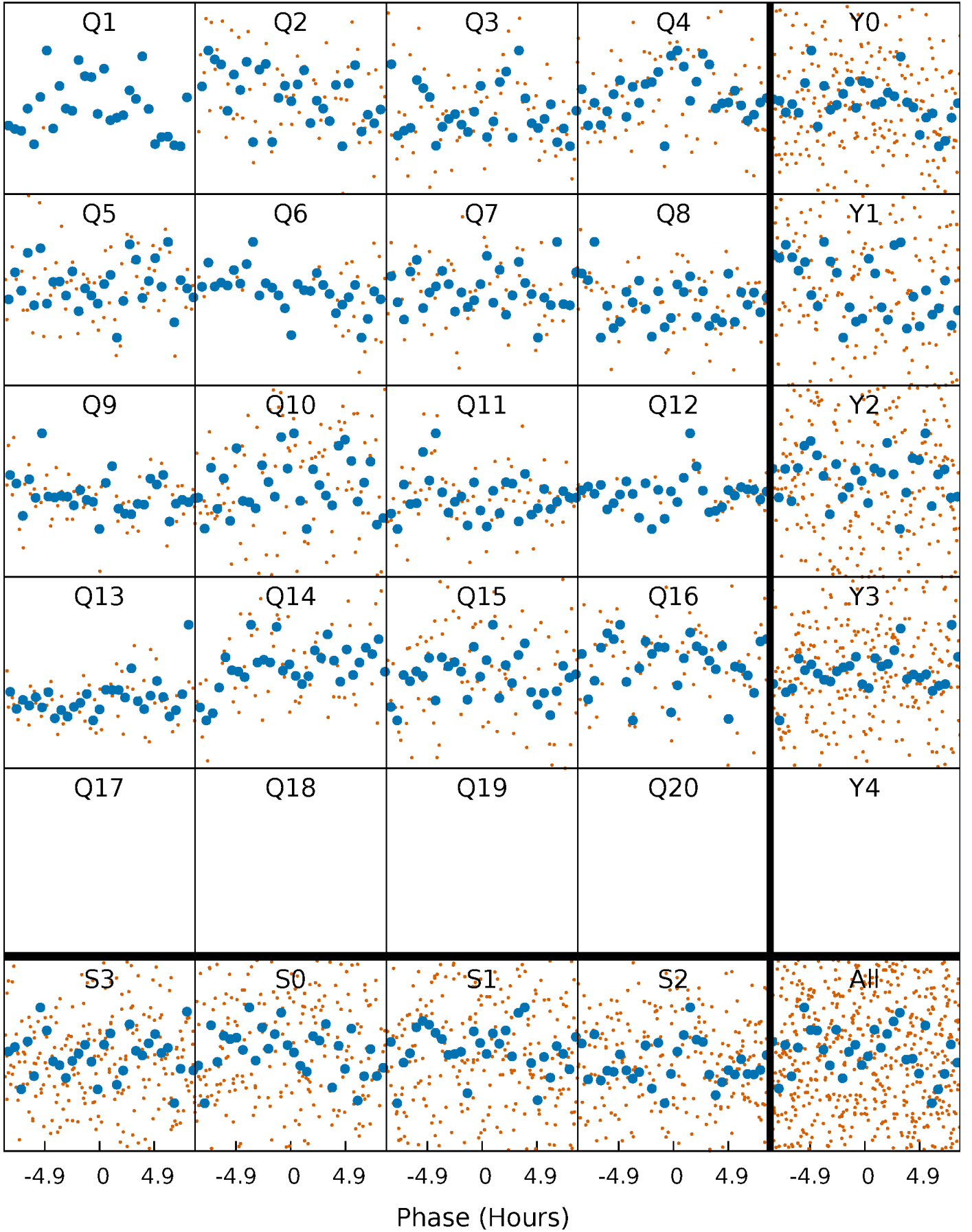


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



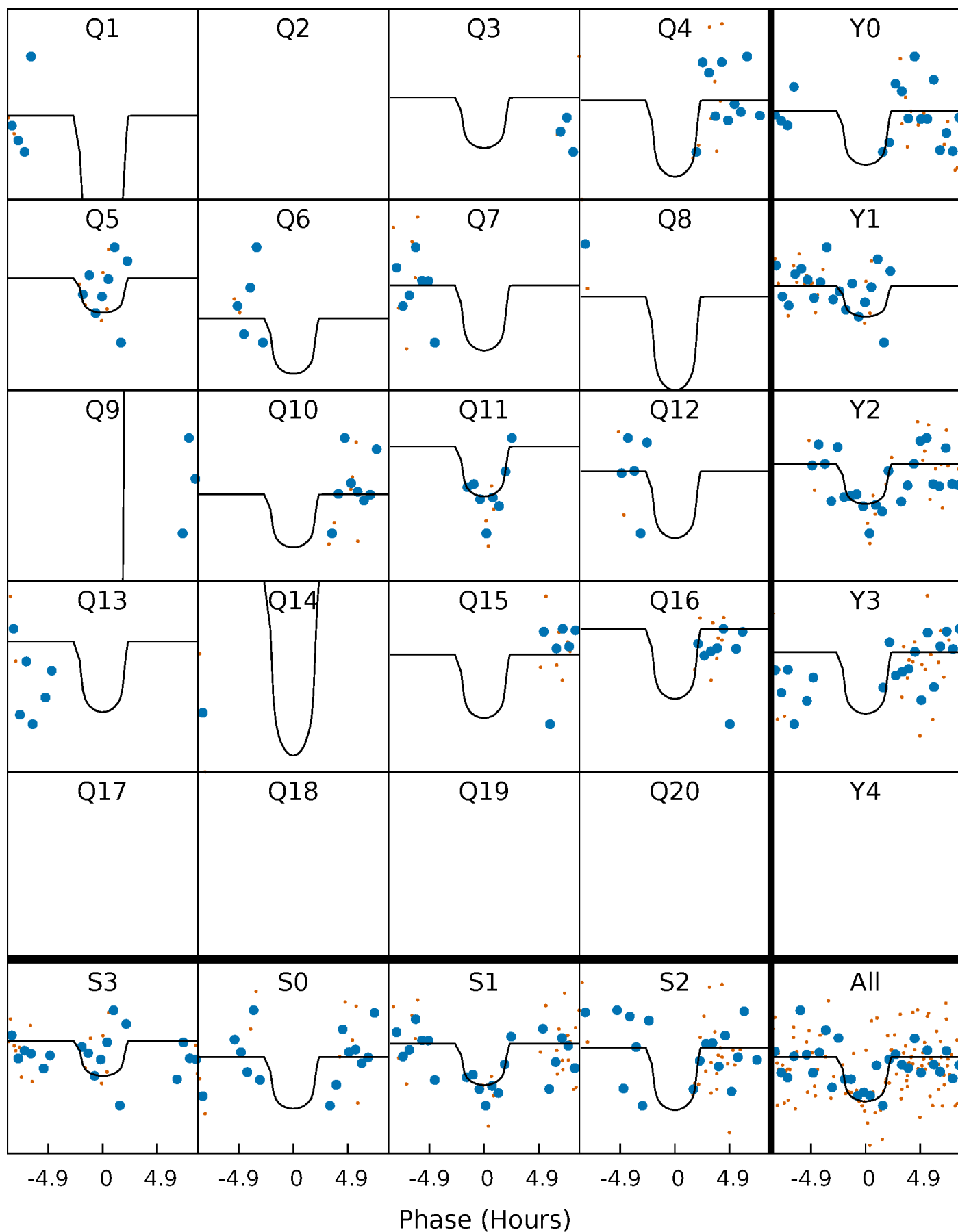
PDC Quarter-Phased Transit Curves

TCE 010470935-07 $P = 43.019550$ Days $T_0 = 137.033650$ (BKJD)



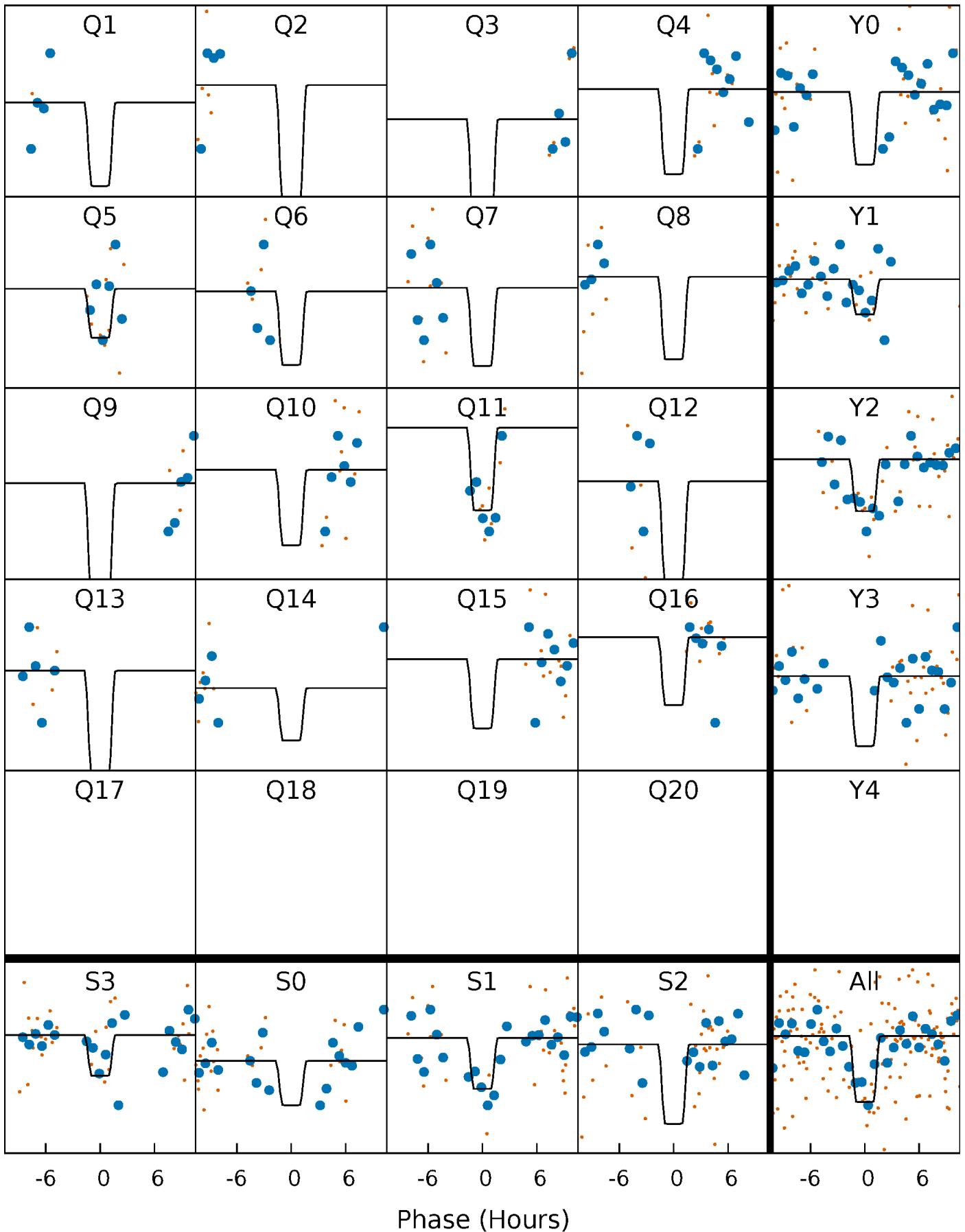
DV Quarter-Phased Transit Curves

TCE 010470935-07 P= 43.019550 Days $T_0=137.033650$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

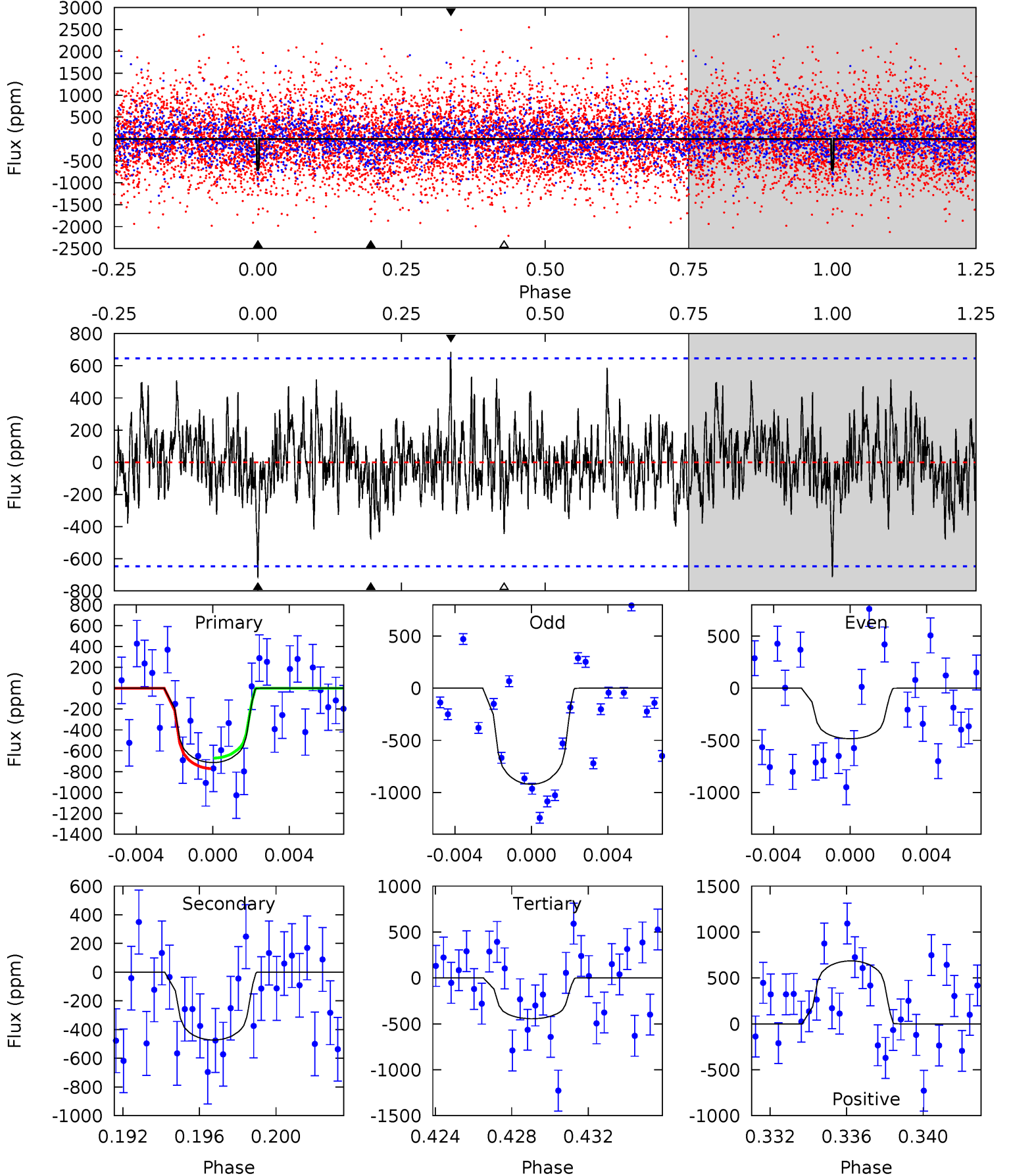
TCE 010470935-07 $P = 43.021245$ Days $T_0 = 136.993470$ (BKJD)



DV Model-Shift Uniqueness Test

010470935-07, P = 43.019550 Days, E = 94.014100 Days

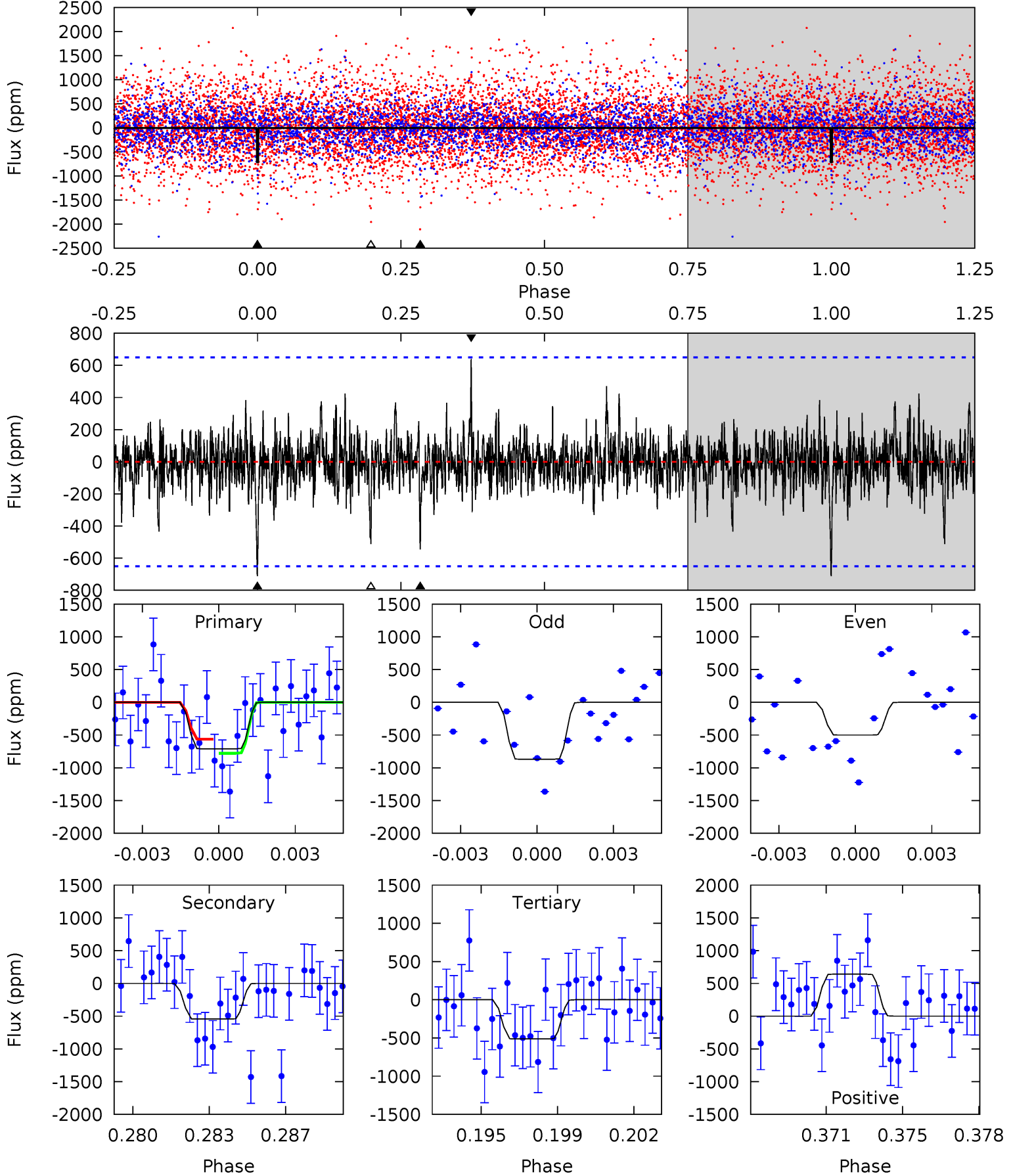
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.74	3.80	3.58	5.52	5.20	2.88	1.34	2.16	0.22	0.23	-1.71	1.79	0.89	0.49	0.39



Alt Model-Shift Uniqueness Test

010470935-07, P = 43.021245 Days, E = 93.972225 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.73	4.39	4.13	5.16	5.24	2.94	0.96	1.60	0.57	0.26	-0.77	1.49	0.76	0.47	0.79



Stellar Parameters For KIC 010470935

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3758^{+68}_{-68}	$4.756^{+0.036}_{-0.024}$	$-0.100^{+0.100}_{-0.100}$	$0.493^{+0.027}_{-0.035}$	$0.506^{+0.028}_{-0.031}$	$5.930^{+0.972}_{-0.620}$
	+2%/-2%	+1%/-1%	+100%/-100%	+5%/-7%	+6%/-6%	+16%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010470935-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-473 ± 124	$2.06^{+1.67}_{-1.35}$	372^{+8}_{-8}	3113^{+1349}_{-453}	2156^{+15396}_{-1502}
Alt.	-545 ± 124	$2.14^{+1.73}_{-1.35}$	371^{+8}_{-9}	3166^{+1263}_{-488}	2370^{+14890}_{-1666}

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

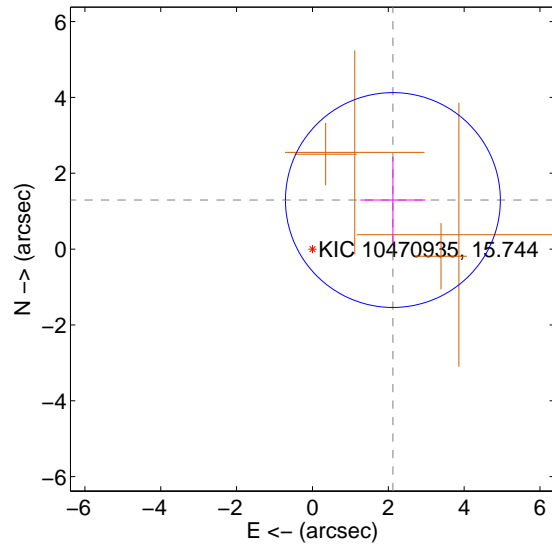
Supplemental centroid analysis for 010470935-07. Kepler magnitude: 15.74. Transit SNR 8.71

There are 0 quarters with good PRF difference image offsets

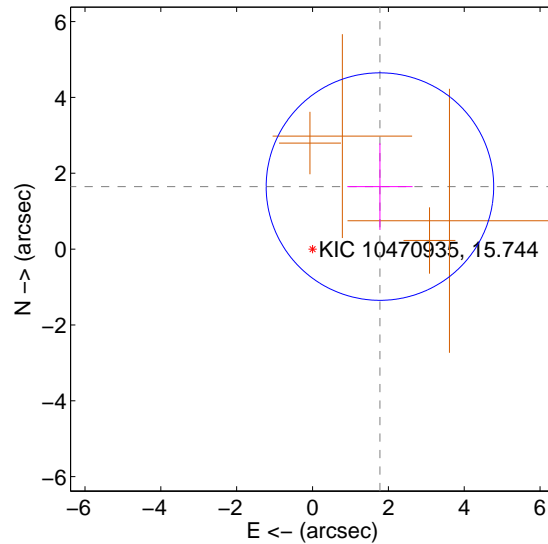
The direct PRF centroid is offset from the target star catalog position by about 0.54 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.485 ± 0.944	2.63	-2.122 ± 0.860	1.294 ± 1.142
PRF-fit source offset from KIC position	2.425 ± 1.000	2.42	-1.778 ± 0.860	1.649 ± 1.142
photometric centroid source offset	2.56 ± 0.84	3.05	-2.53 ± 0.84	0.37 ± 0.74

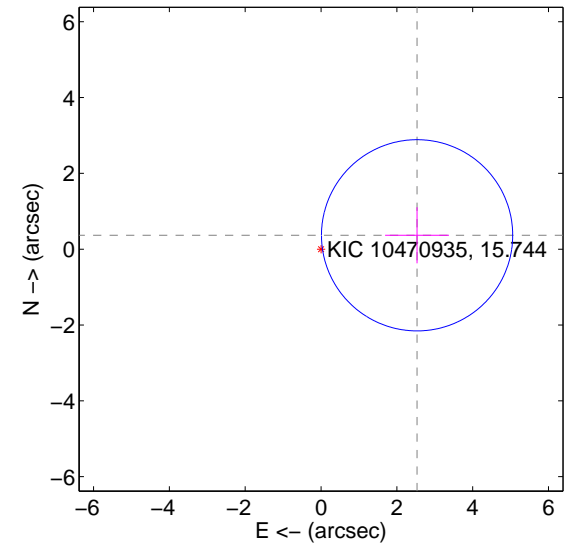
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

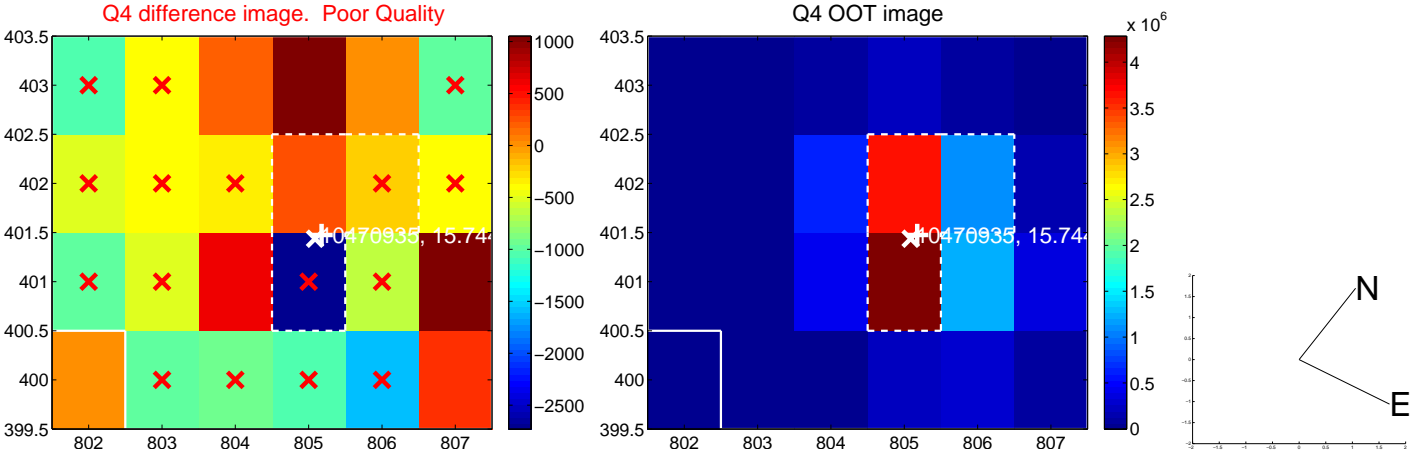
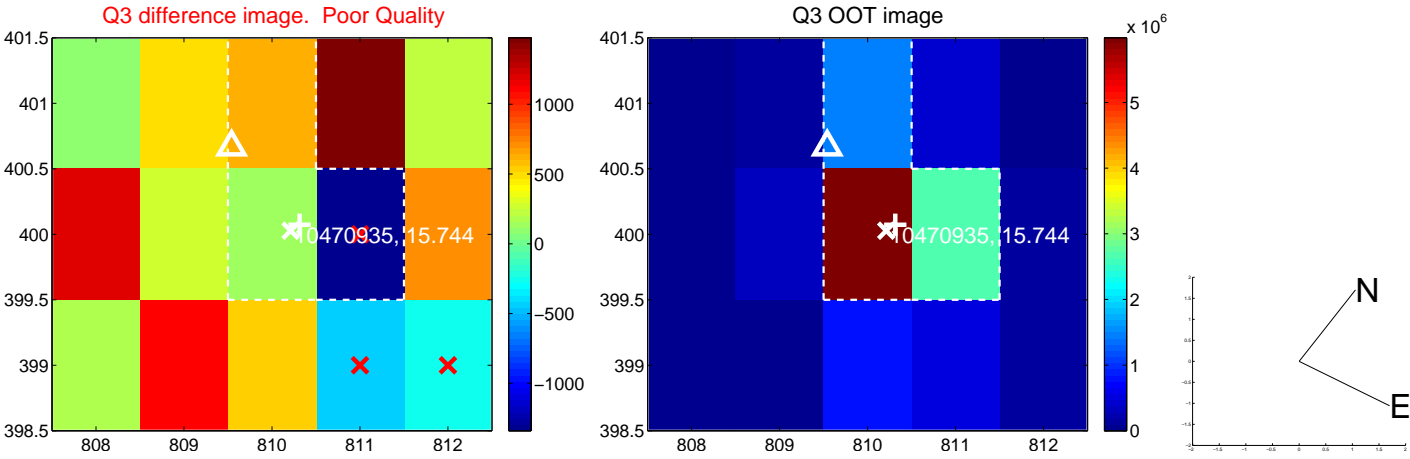
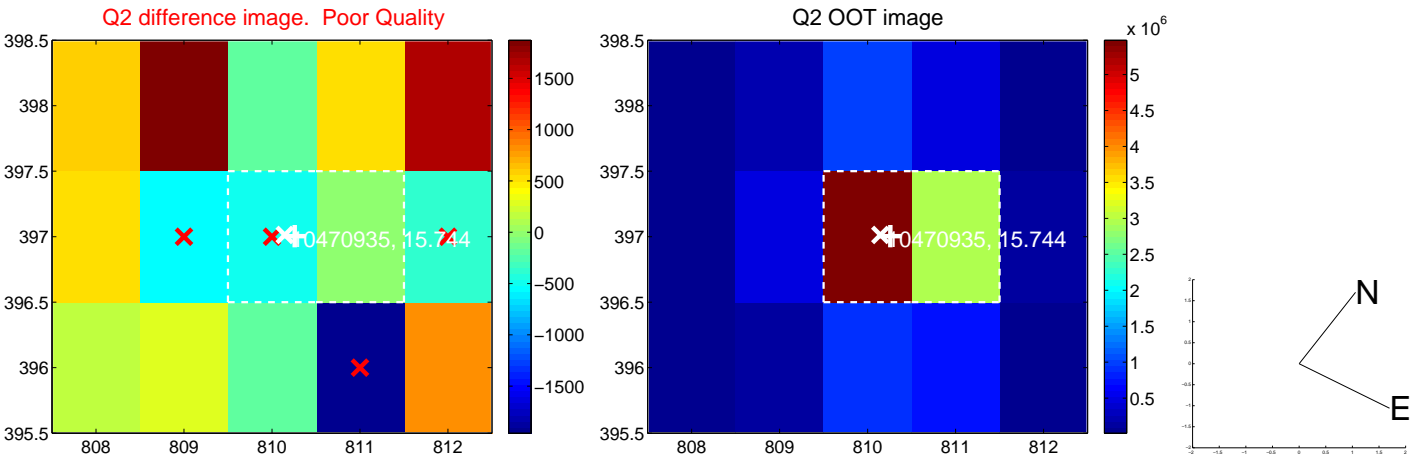
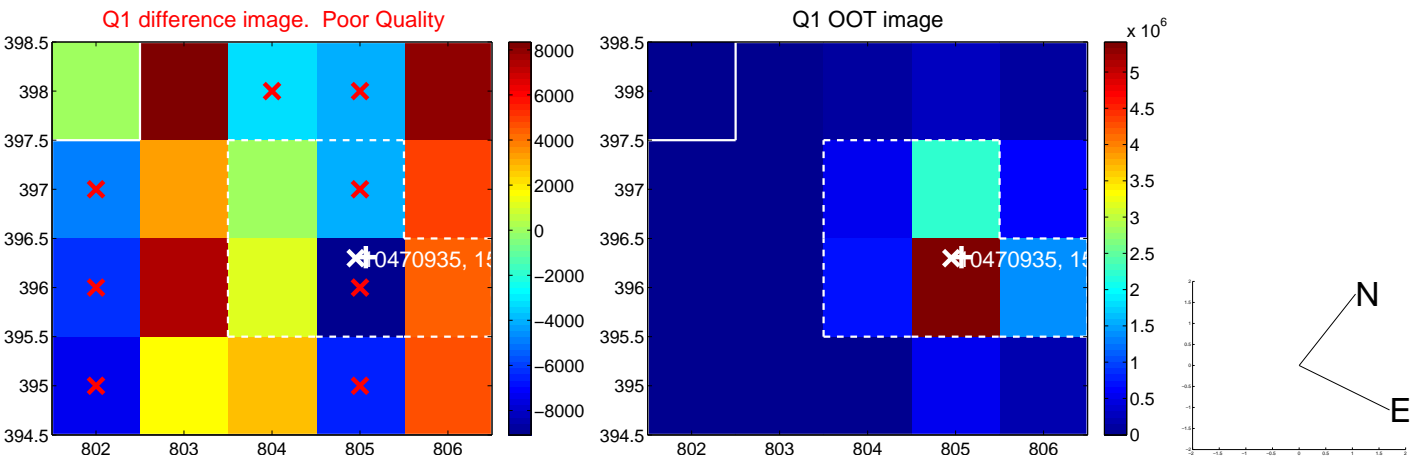


offset from photometric centroids

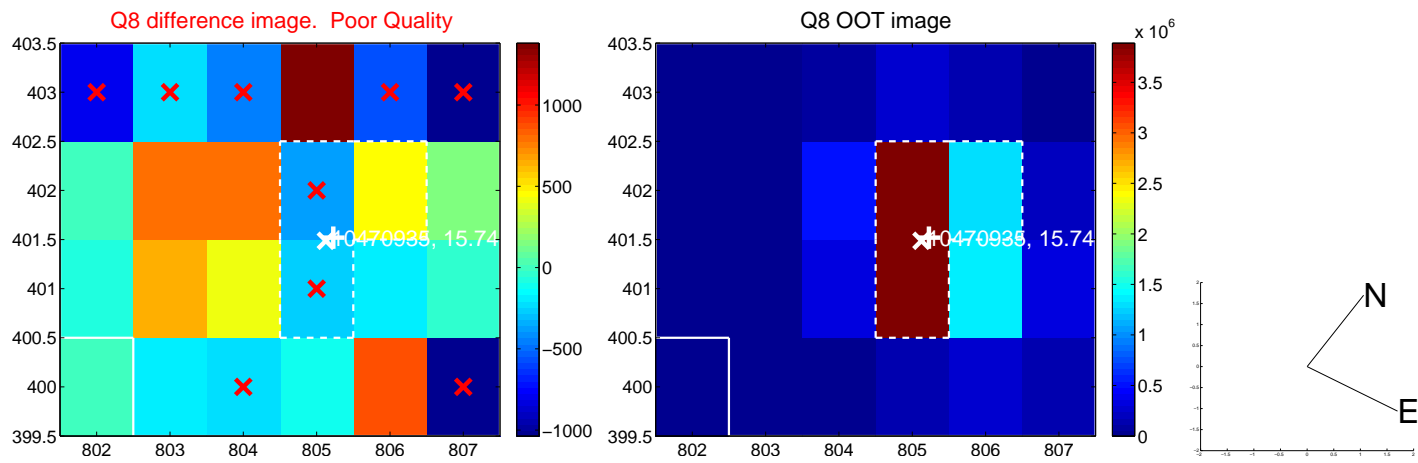
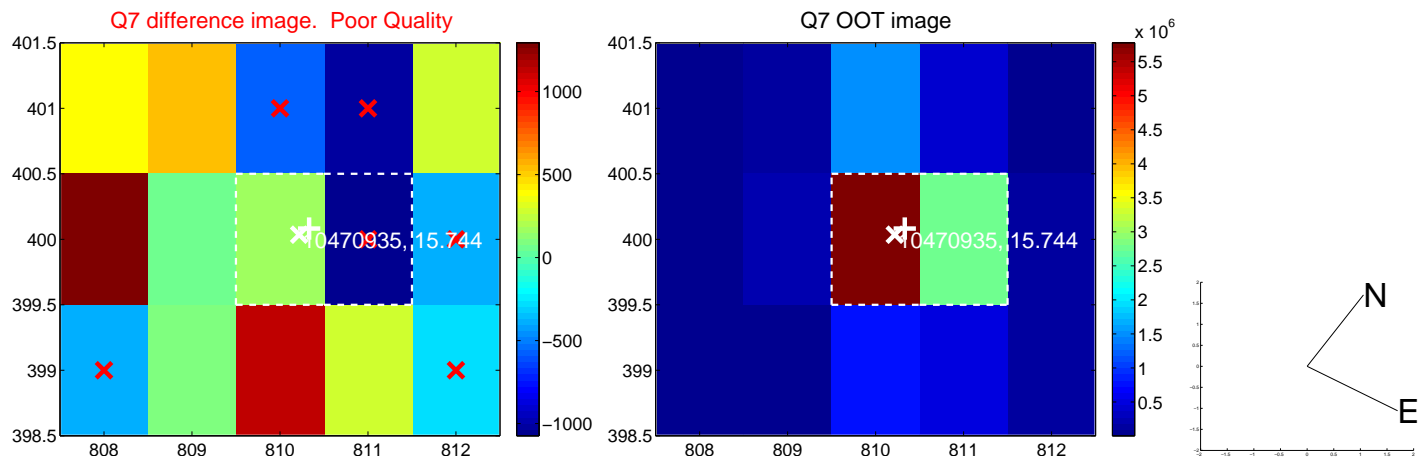
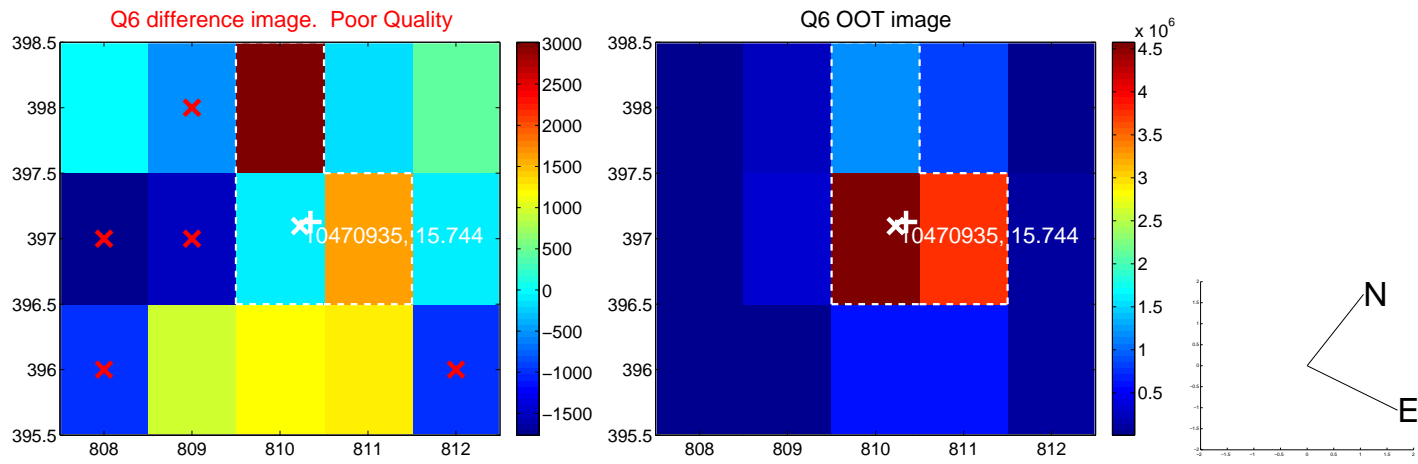
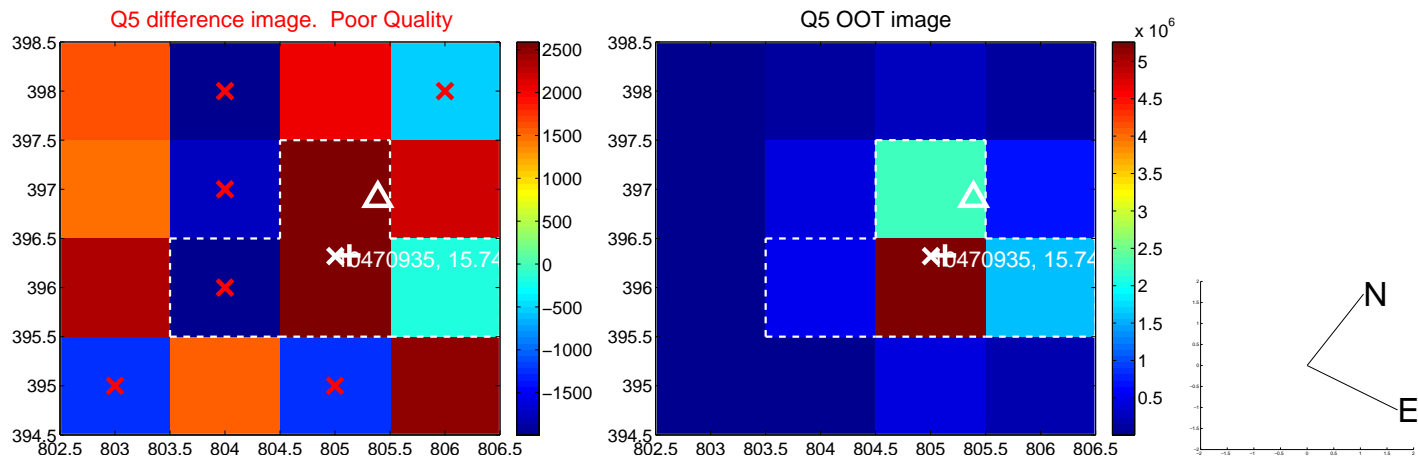


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

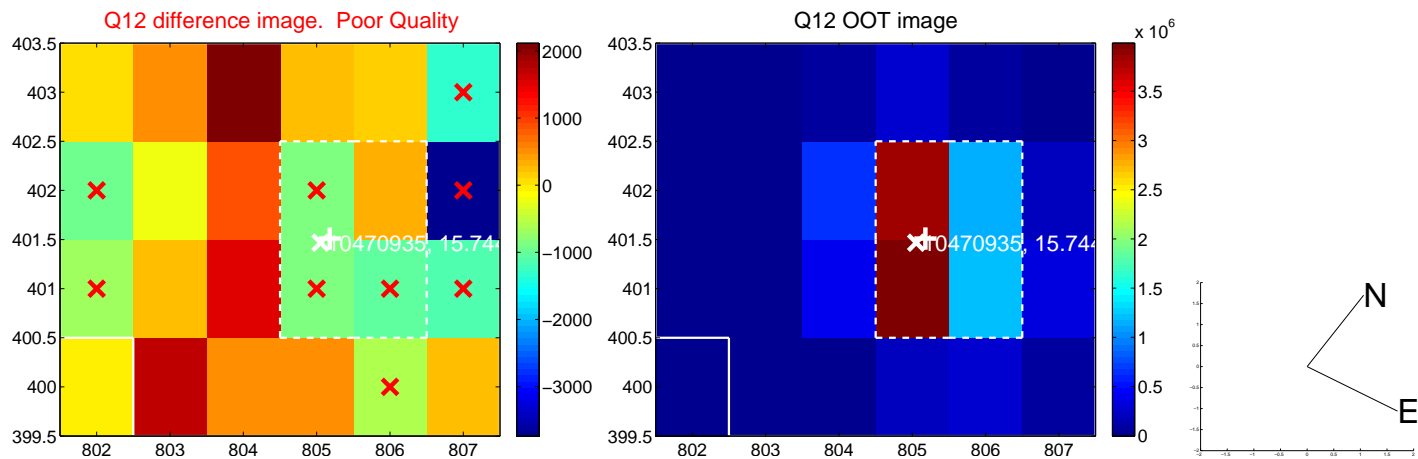
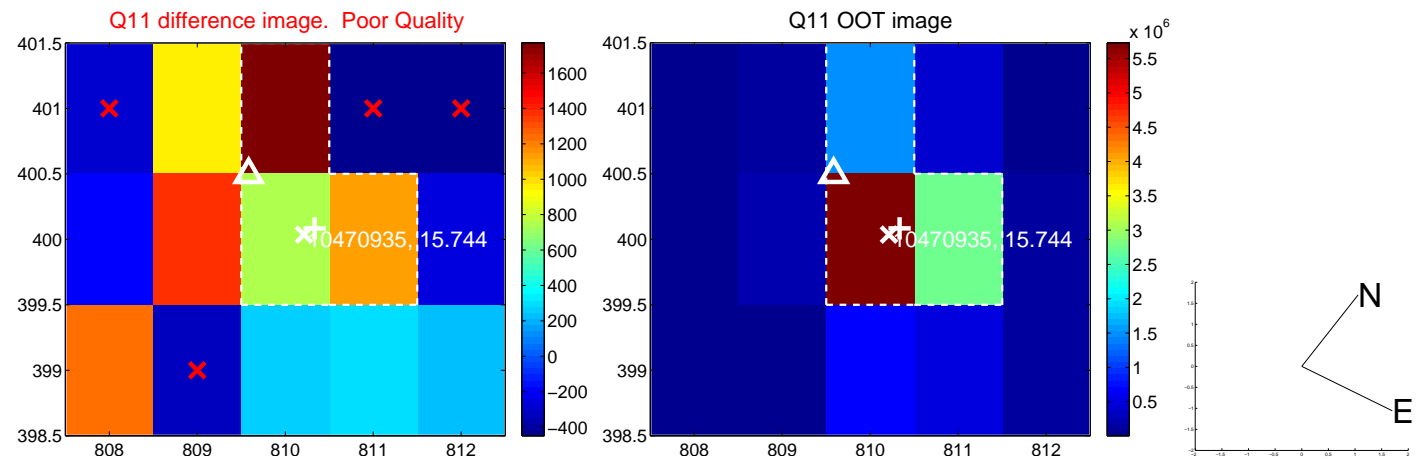
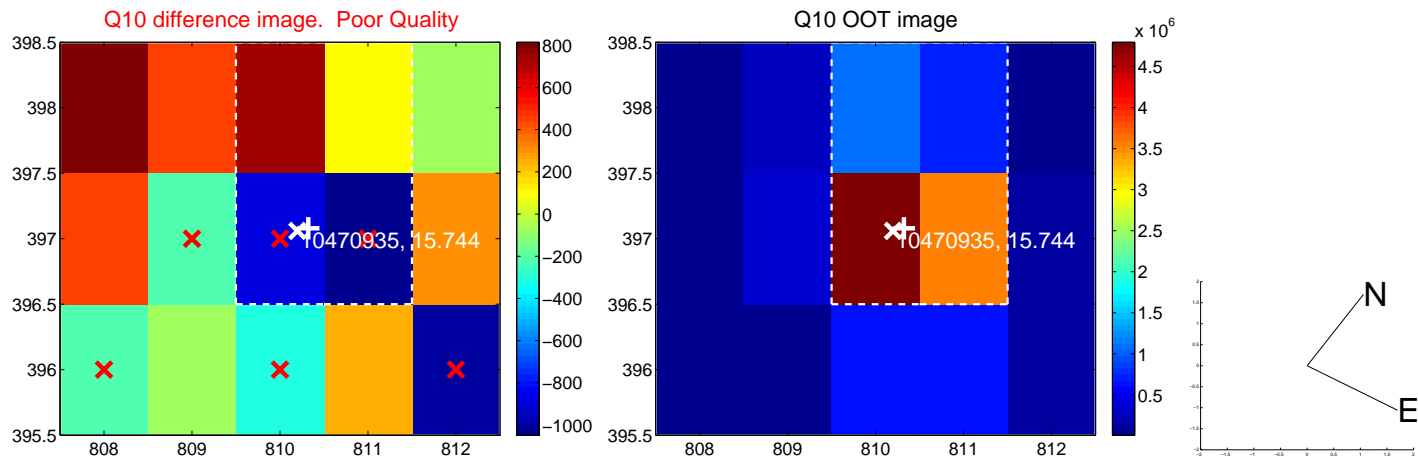
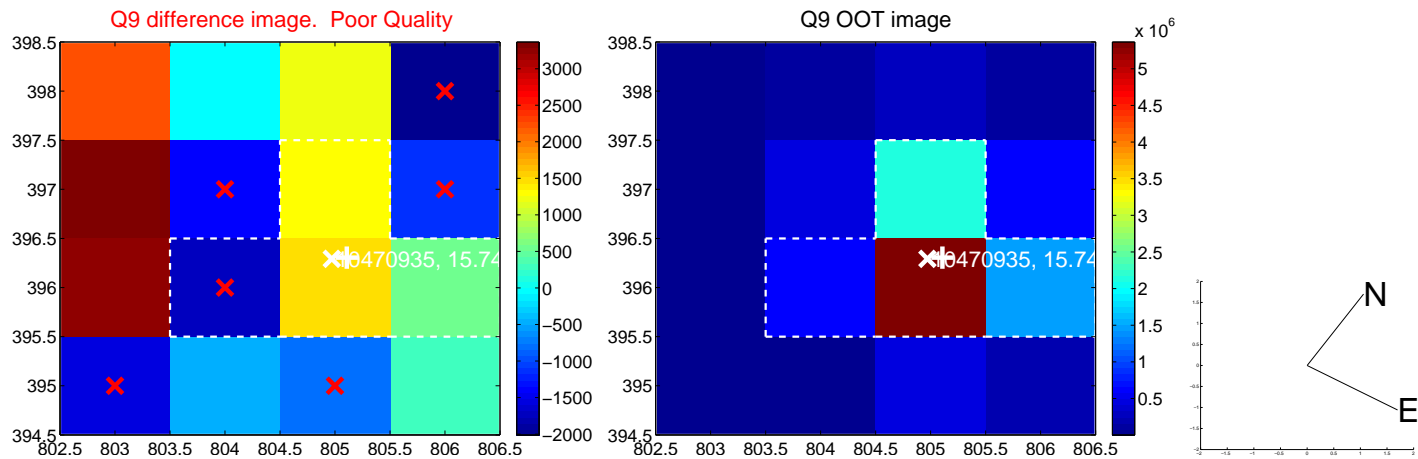
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



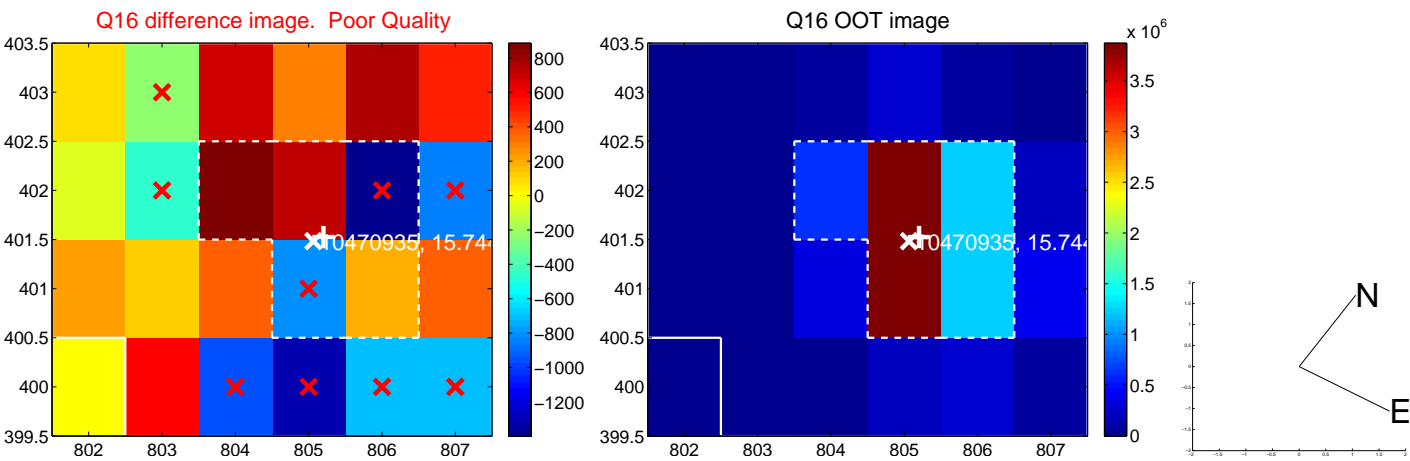
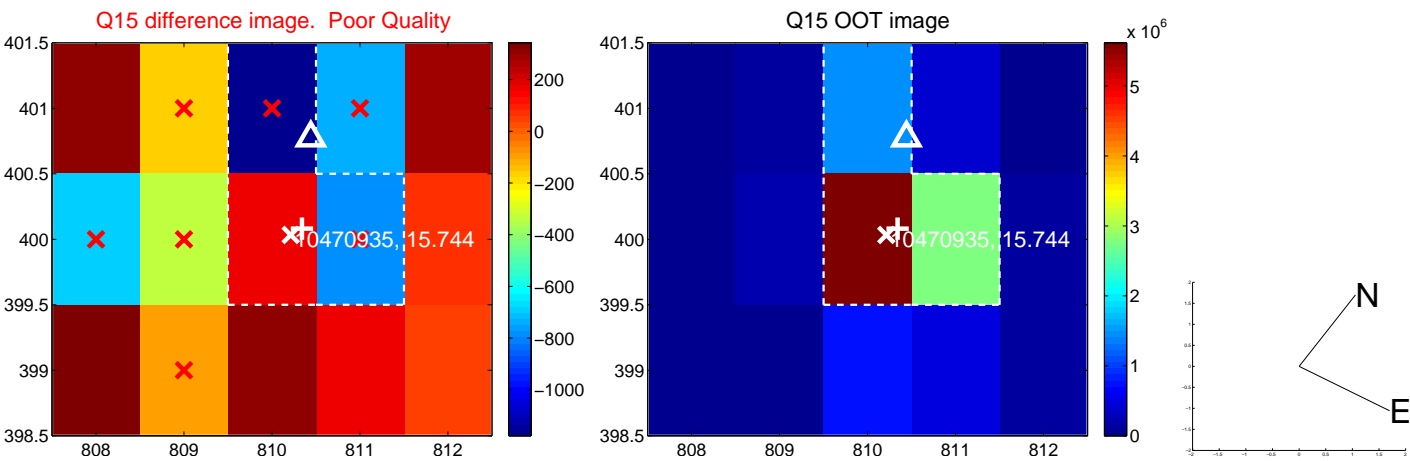
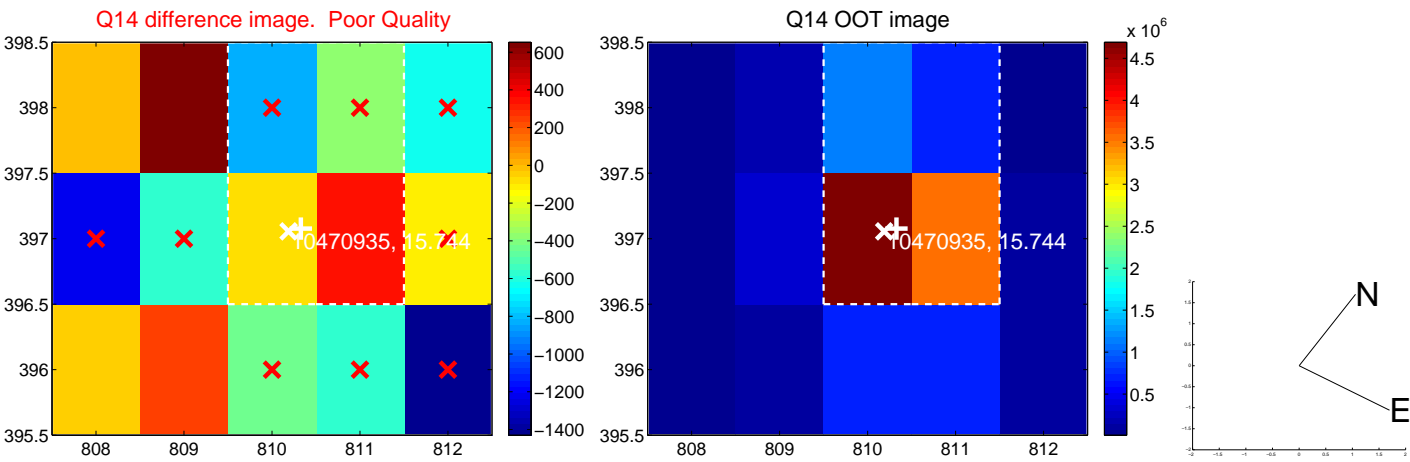
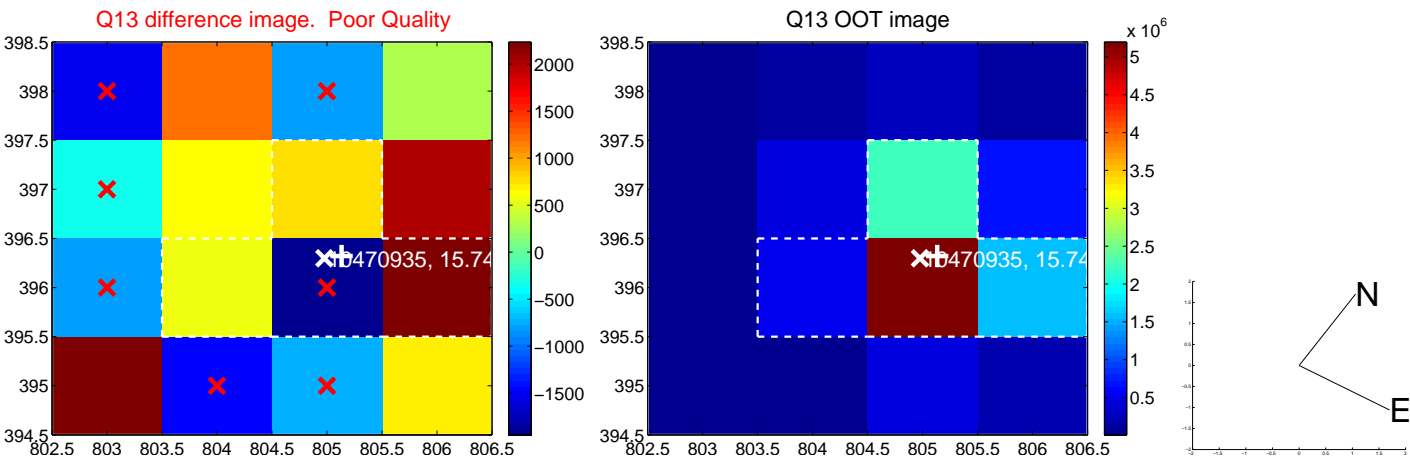
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



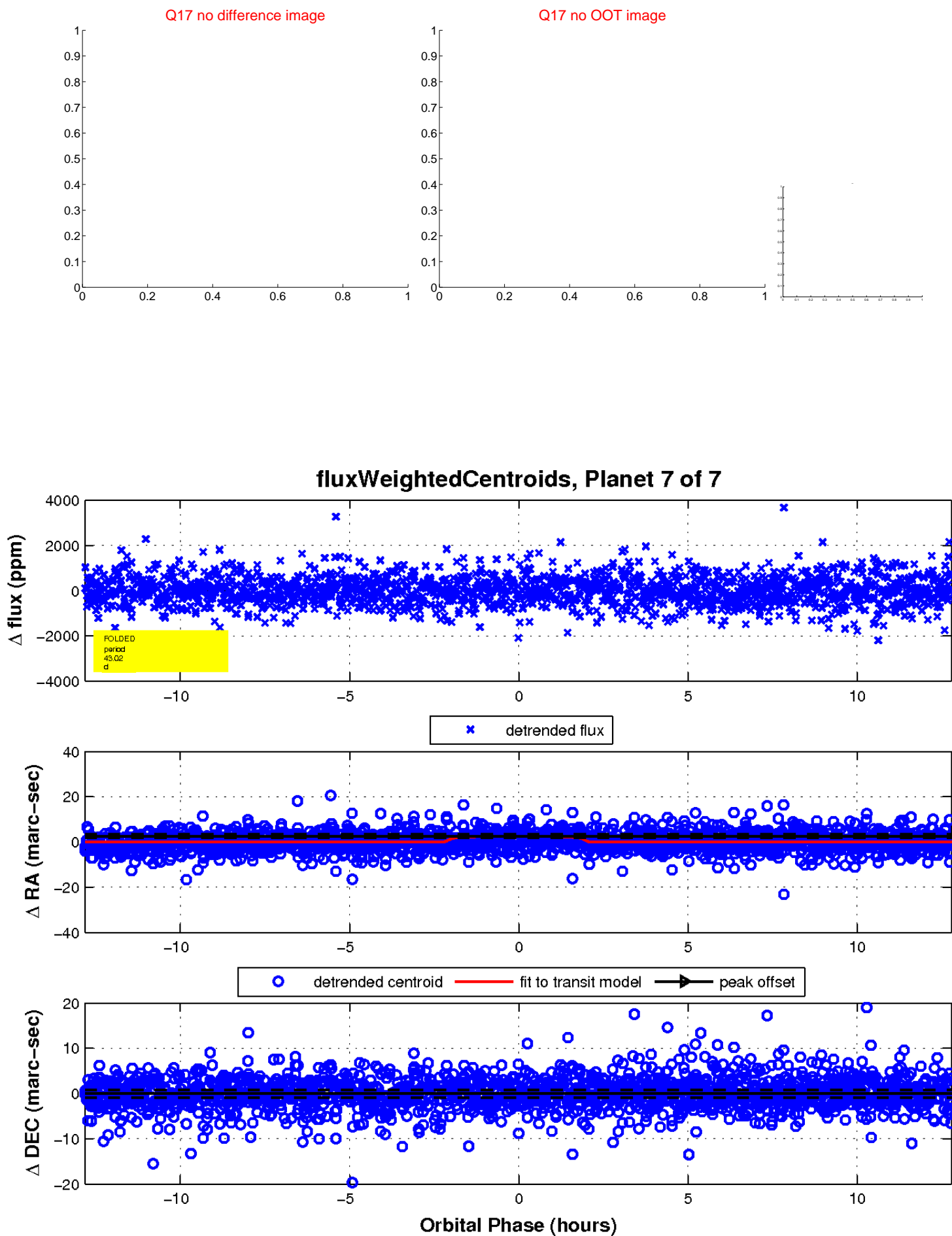
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

