

KIC 007431709

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})
007431709-01	OBS	7838.01	0.572518	131.780064	38.4	2.166	7.4	8.0	0.76	5171	0.58	2369.64
007431709-02	OBS	No	302.953799	184.994715	519.6	5.928	9.7	4.7	0.76	5171	1.98	0.55
007431709-03	OBS	No	210.344686	281.767455	623.5	5.161	7.2	6.4	0.76	5171	2.15	0.90

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007431709-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—HALO_GHOST—EPHEM_MATCH
007431709-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007431709-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—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.

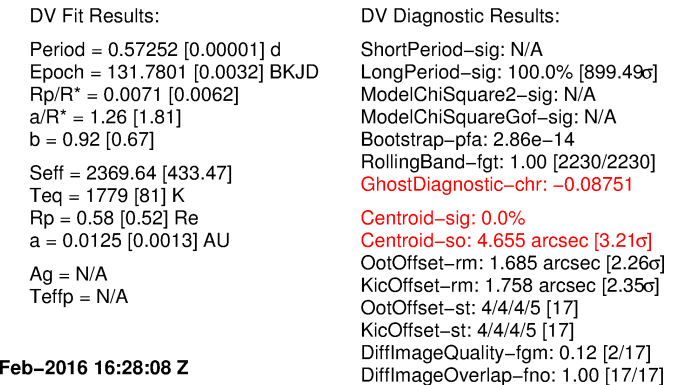
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007431709-01

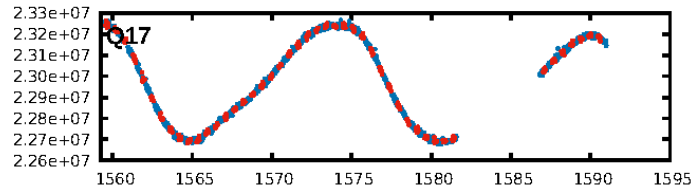
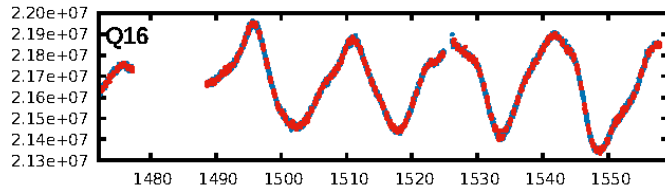
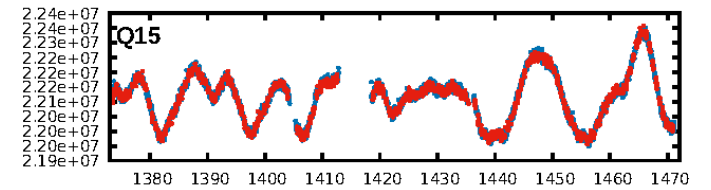
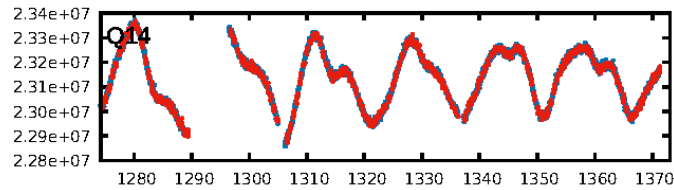
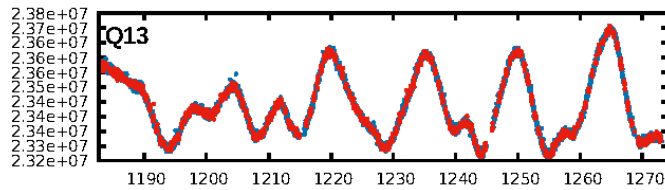
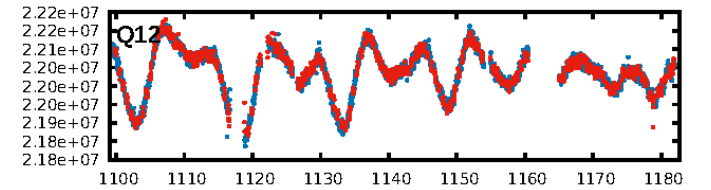
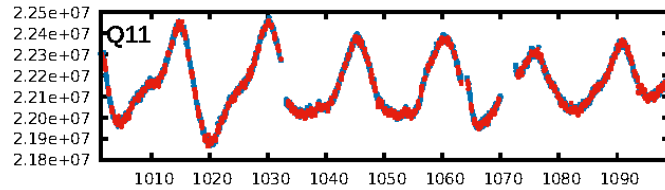
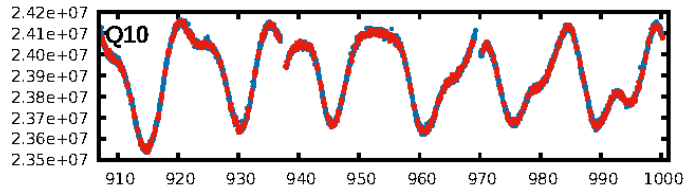
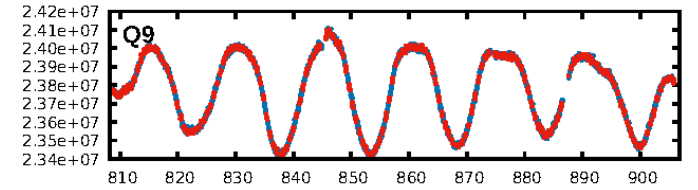
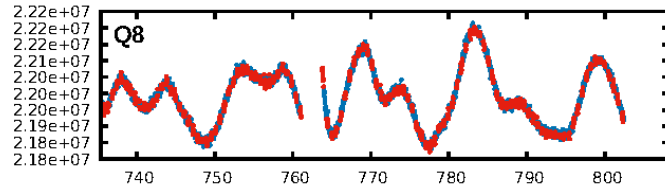
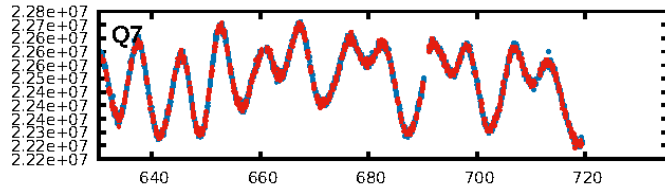
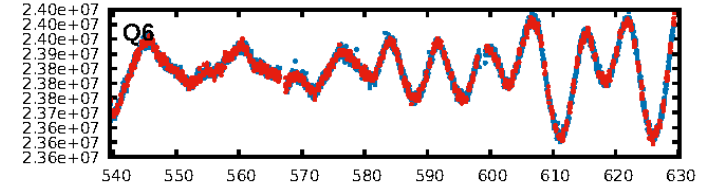
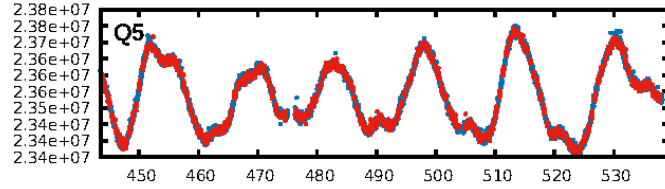
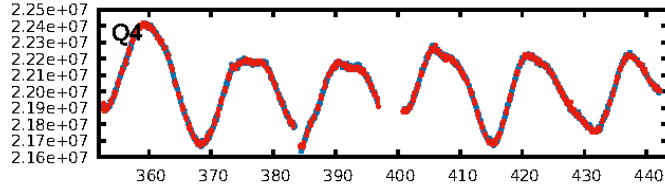
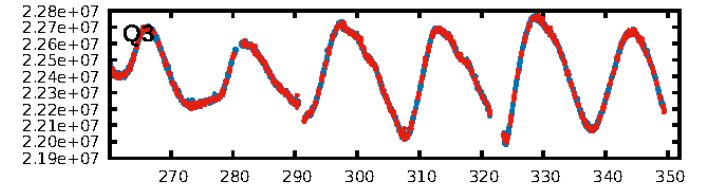
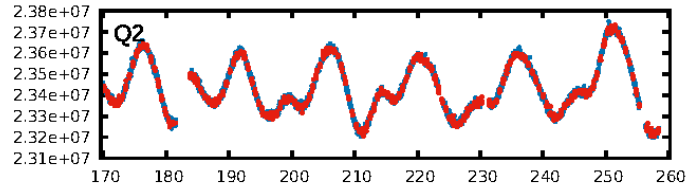
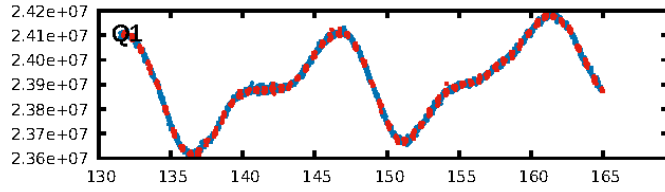
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
007431709-01	7431709	007431703-pri	7431703	1:1	65.4	8	15	12.25	15.08	7352.60	Direct-PRF	0	1.62	1.30

Notes: $P_1:P_2$ 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. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 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.

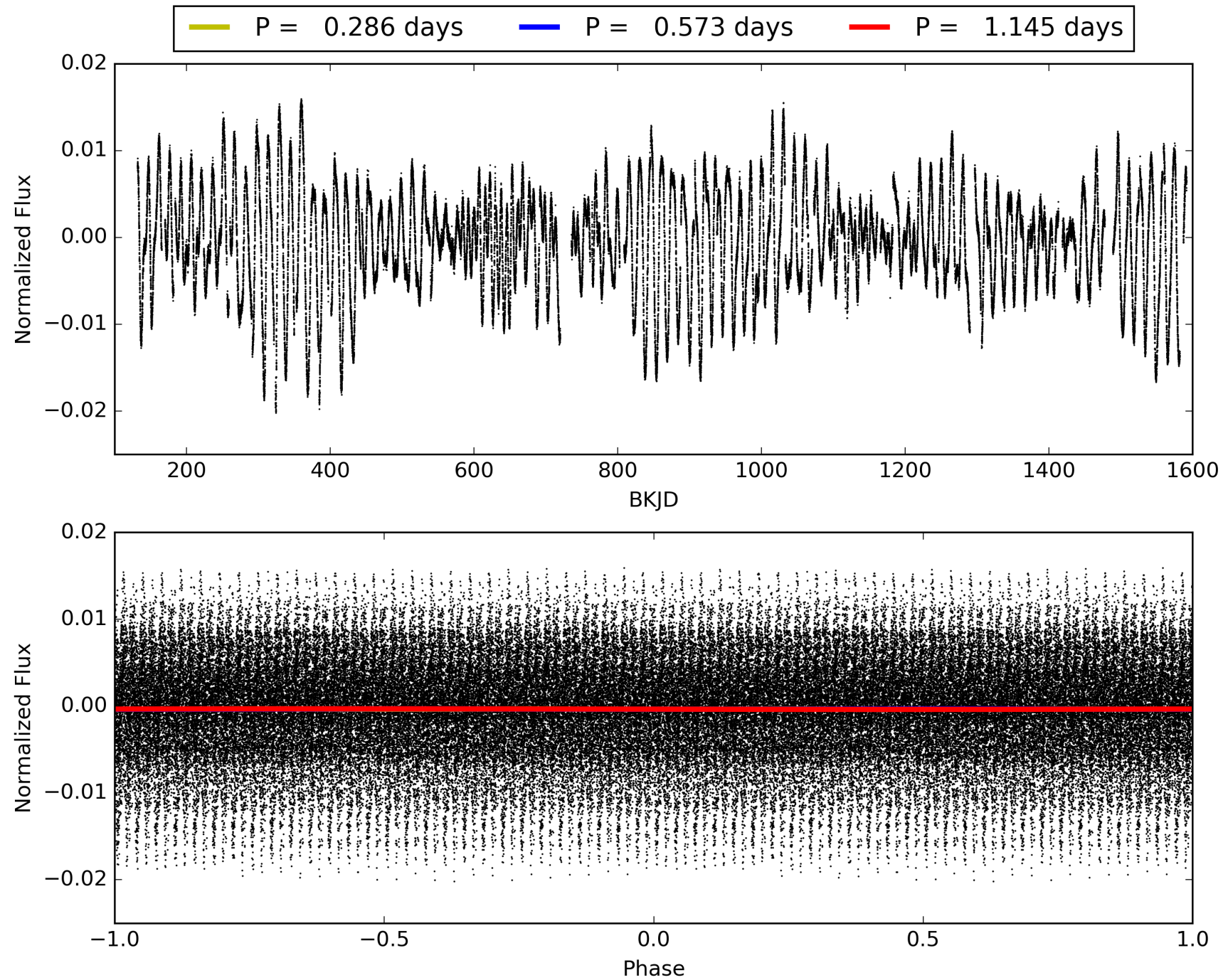
KIC: 7431709 Candidate: 1 of 3 Period: 0.573 d



TCE 007431709-01, PDC Light Curves

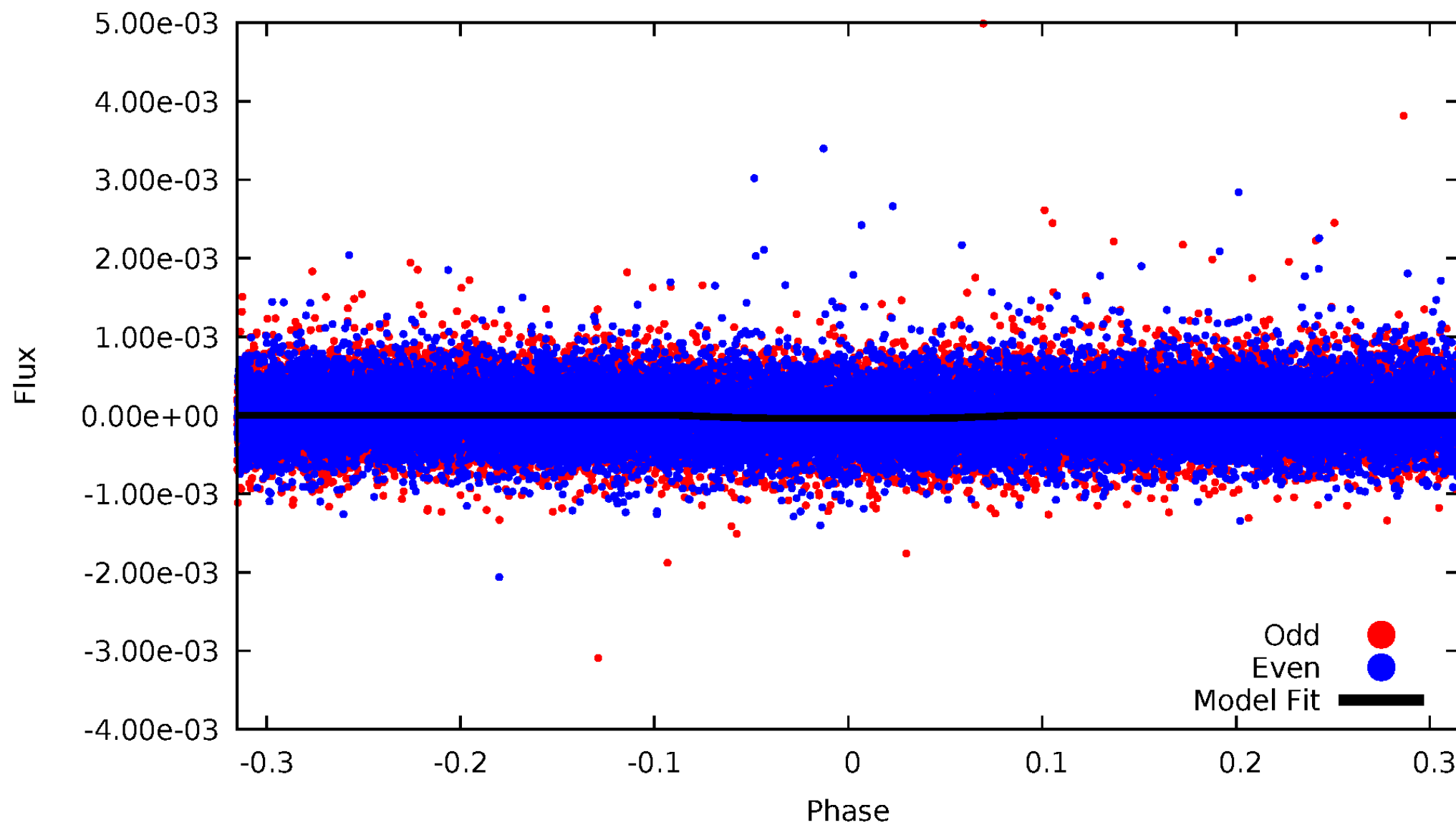


TCE 007431709-01



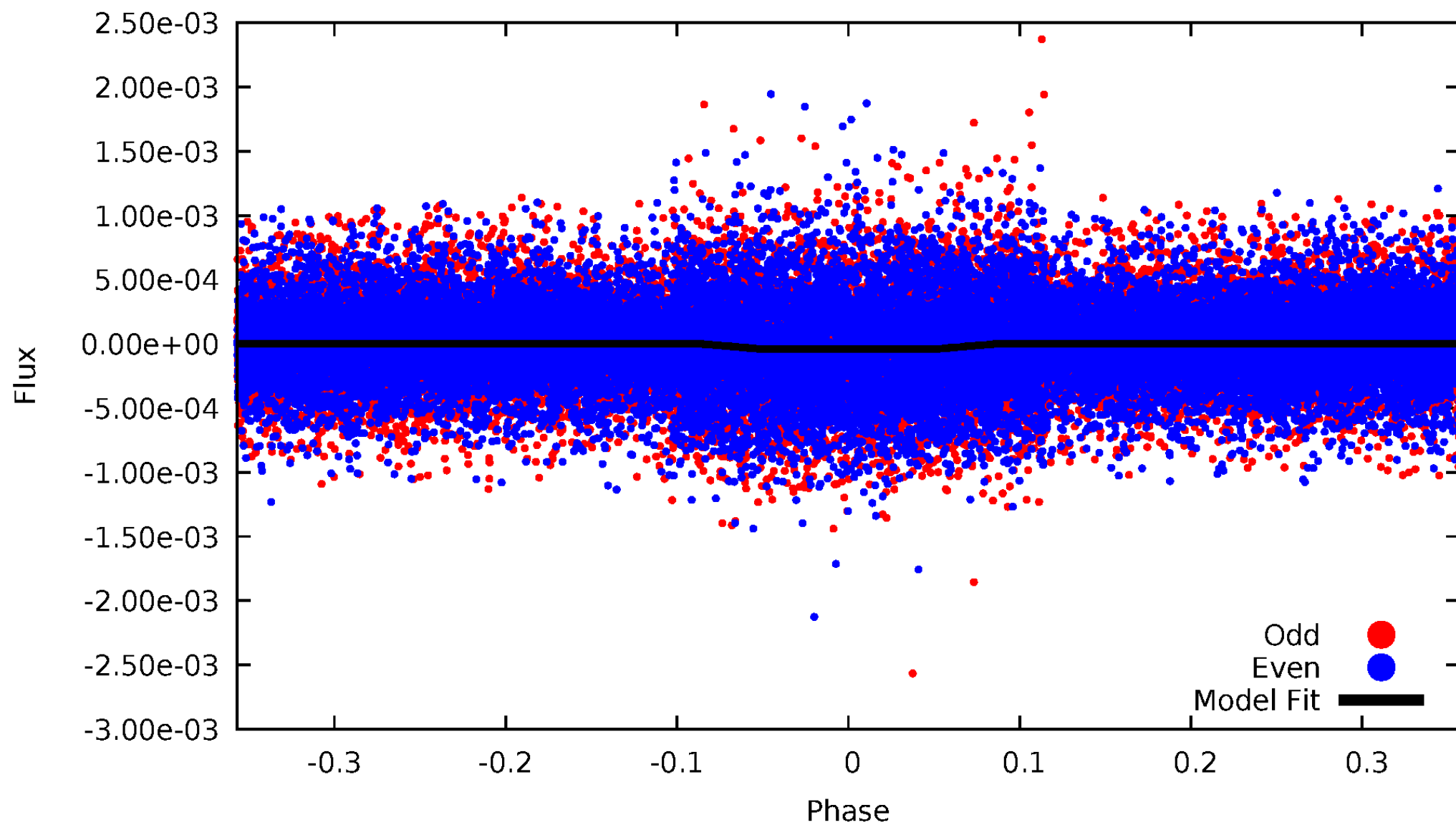
DV Odd/Even

TCE 007431709-01

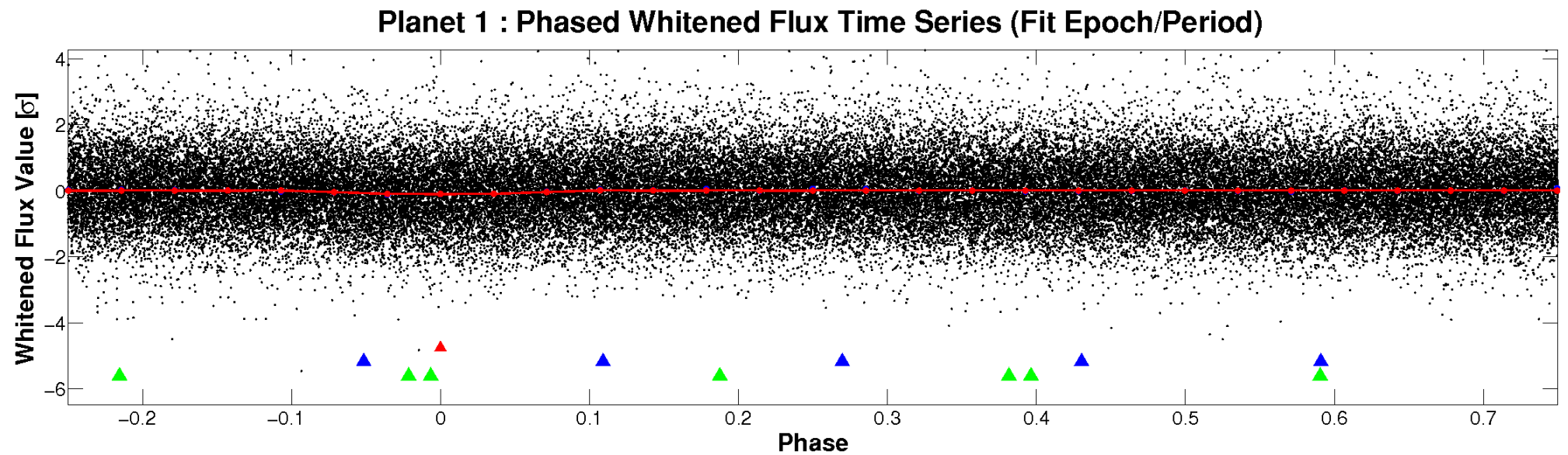
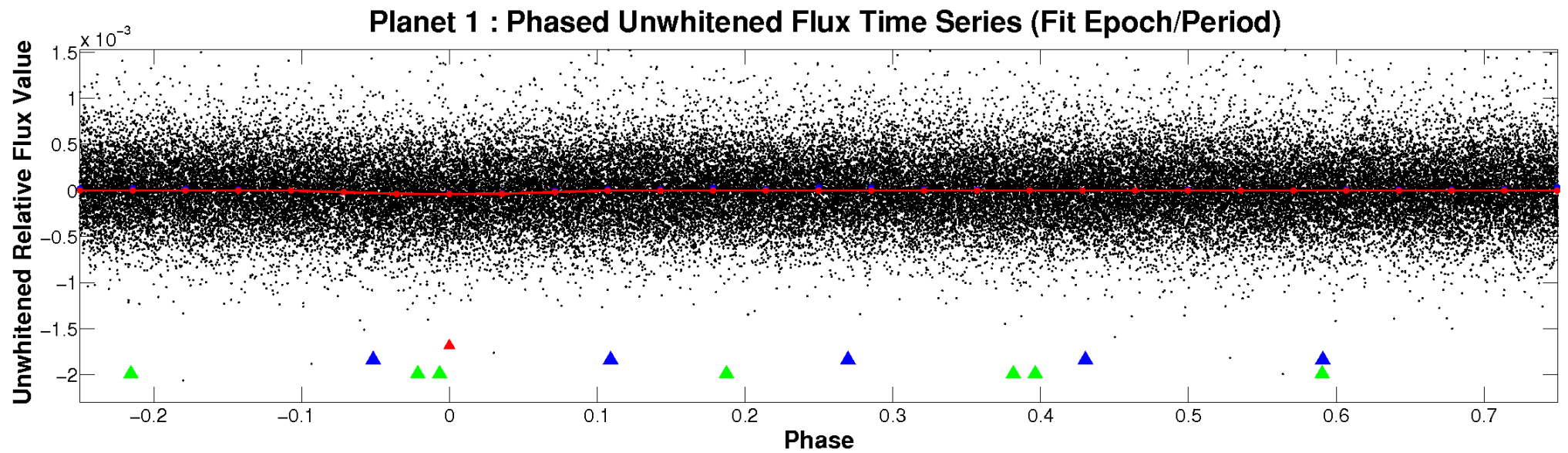


ALT Odd/Even

TCE 007431709-01

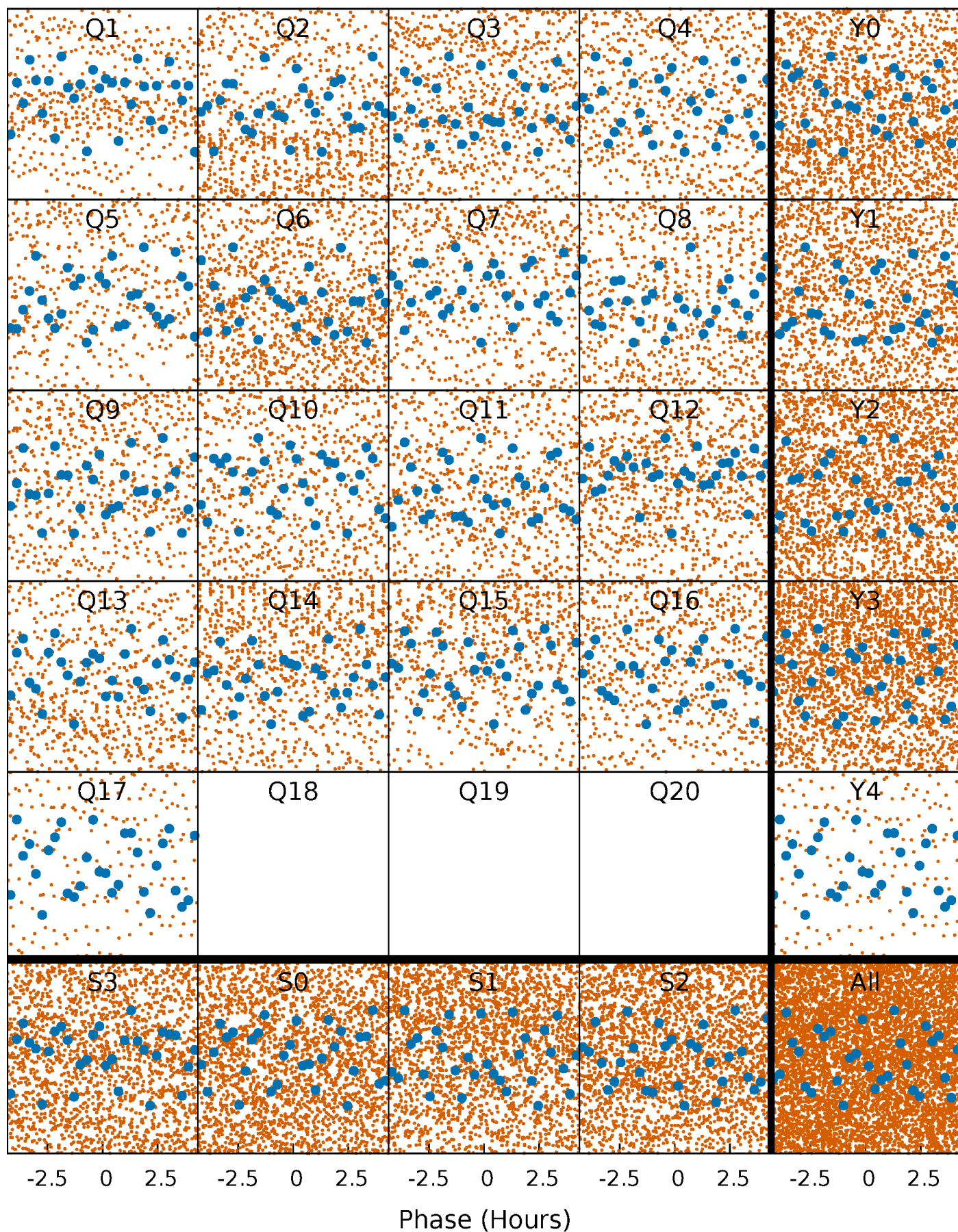


Non-Whitened Vs. Whitened Light Curve



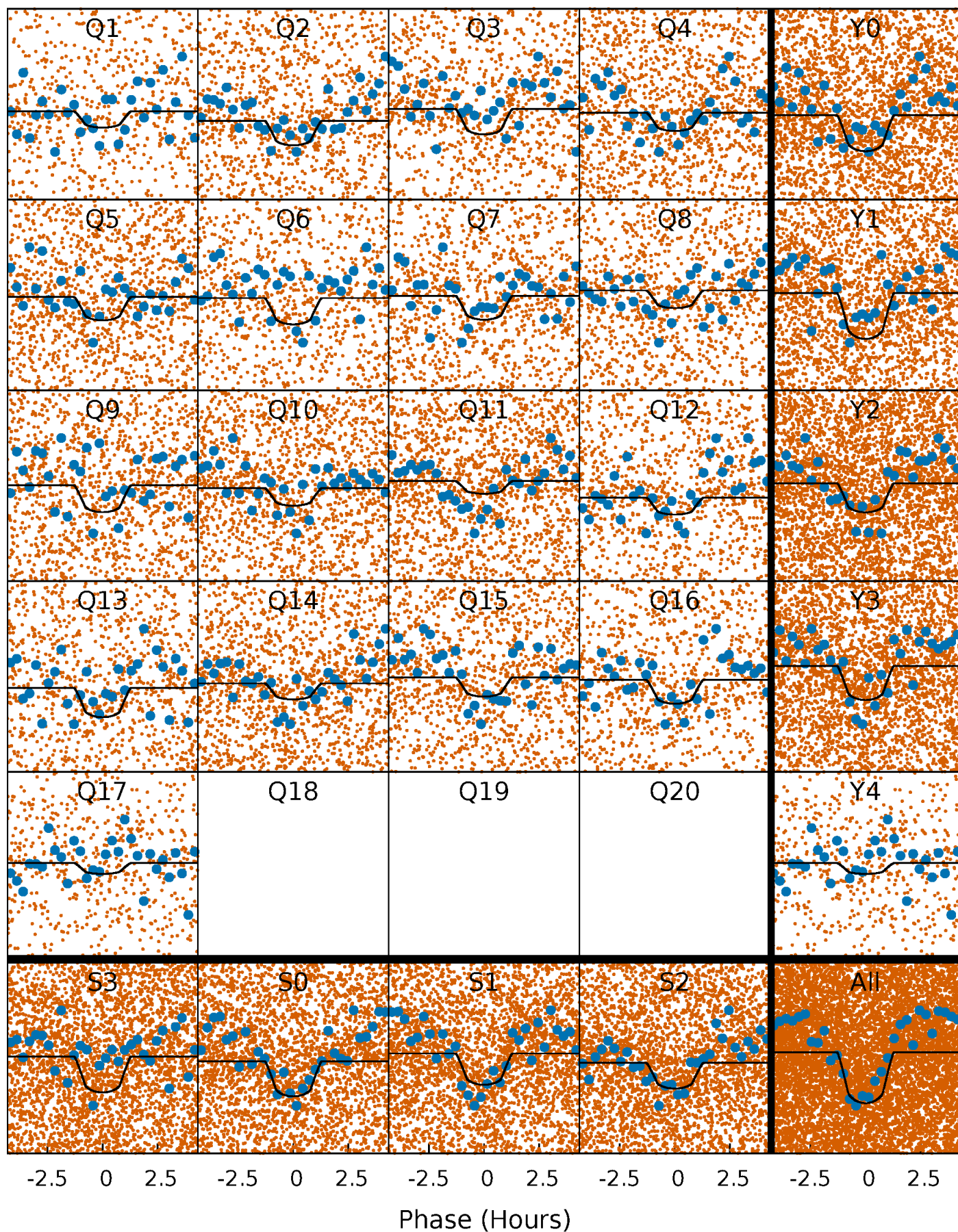
PDC Quarter-Phased Transit Curves

TCE 007431709-01 P= 0.572518 Days $T_0=131.780064$ (BKJD)



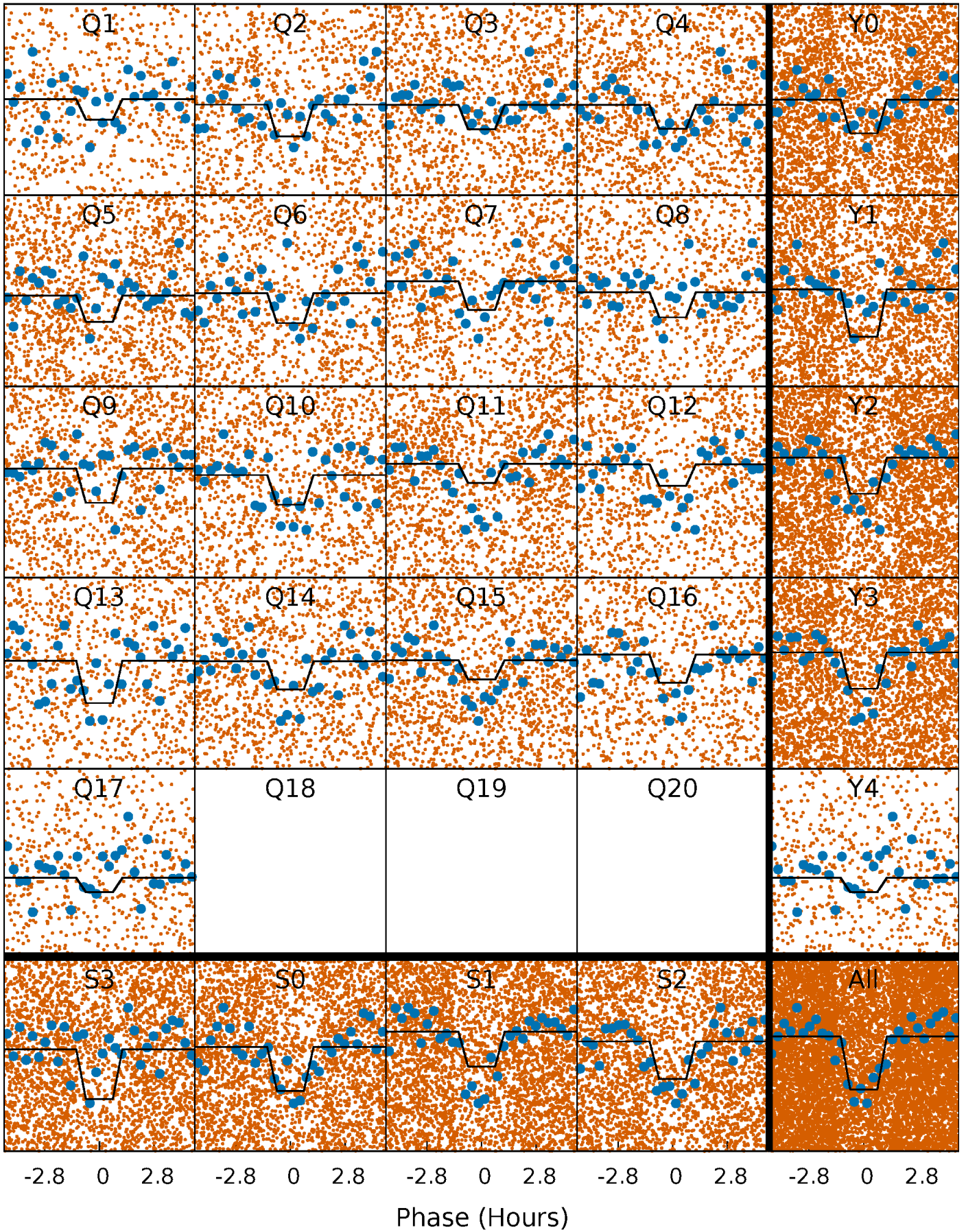
DV Quarter-Phased Transit Curves

TCE 007431709-01 P= 0.572518 Days $T_0=131.780064$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

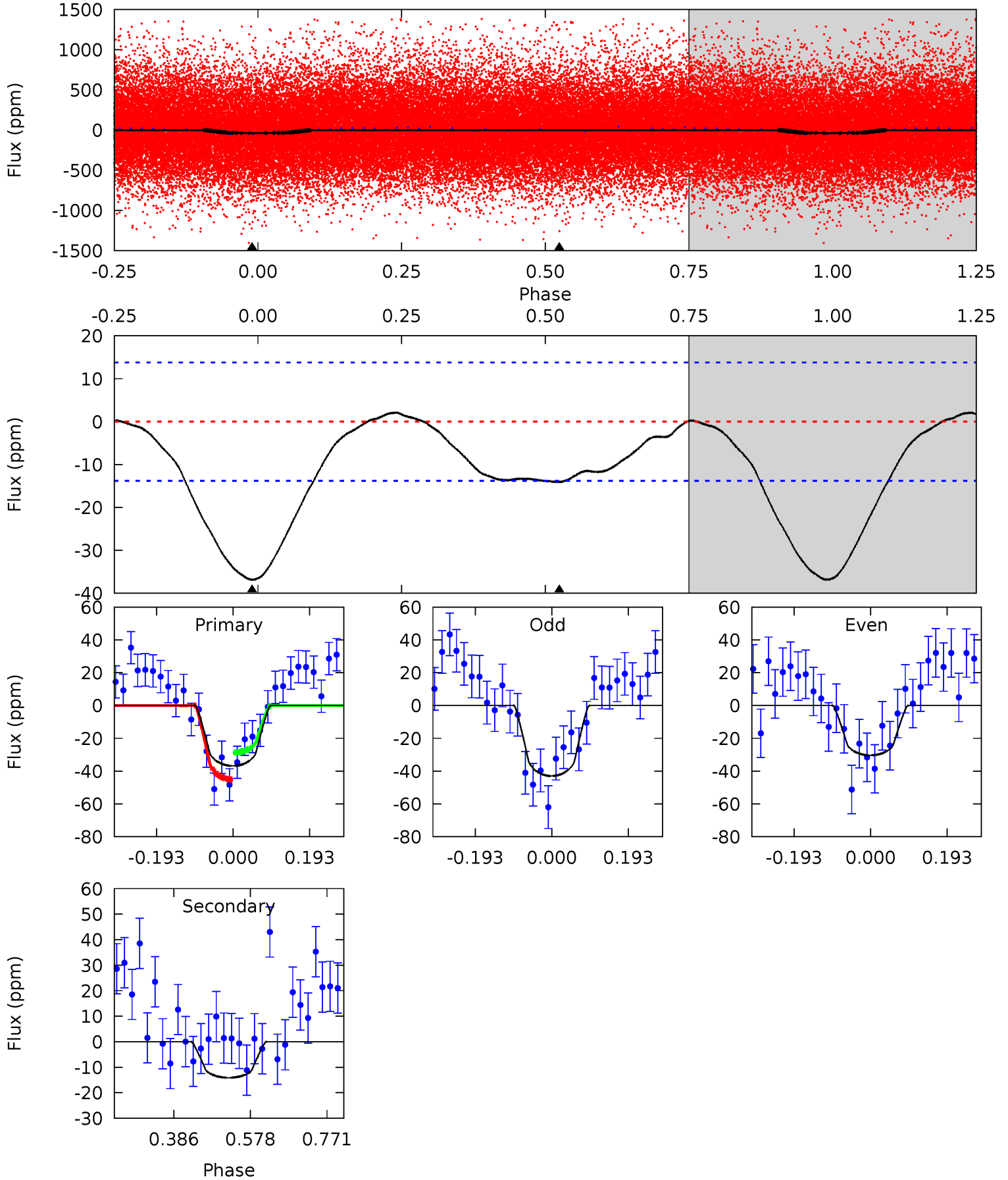
TCE 007431709-01 P= 0.572518 Days $T_0=131.775078$ (BKJD)



DV Model-Shift Uniqueness Test

007431709-01, P = 0.572518 Days, E = 131.207546 Days

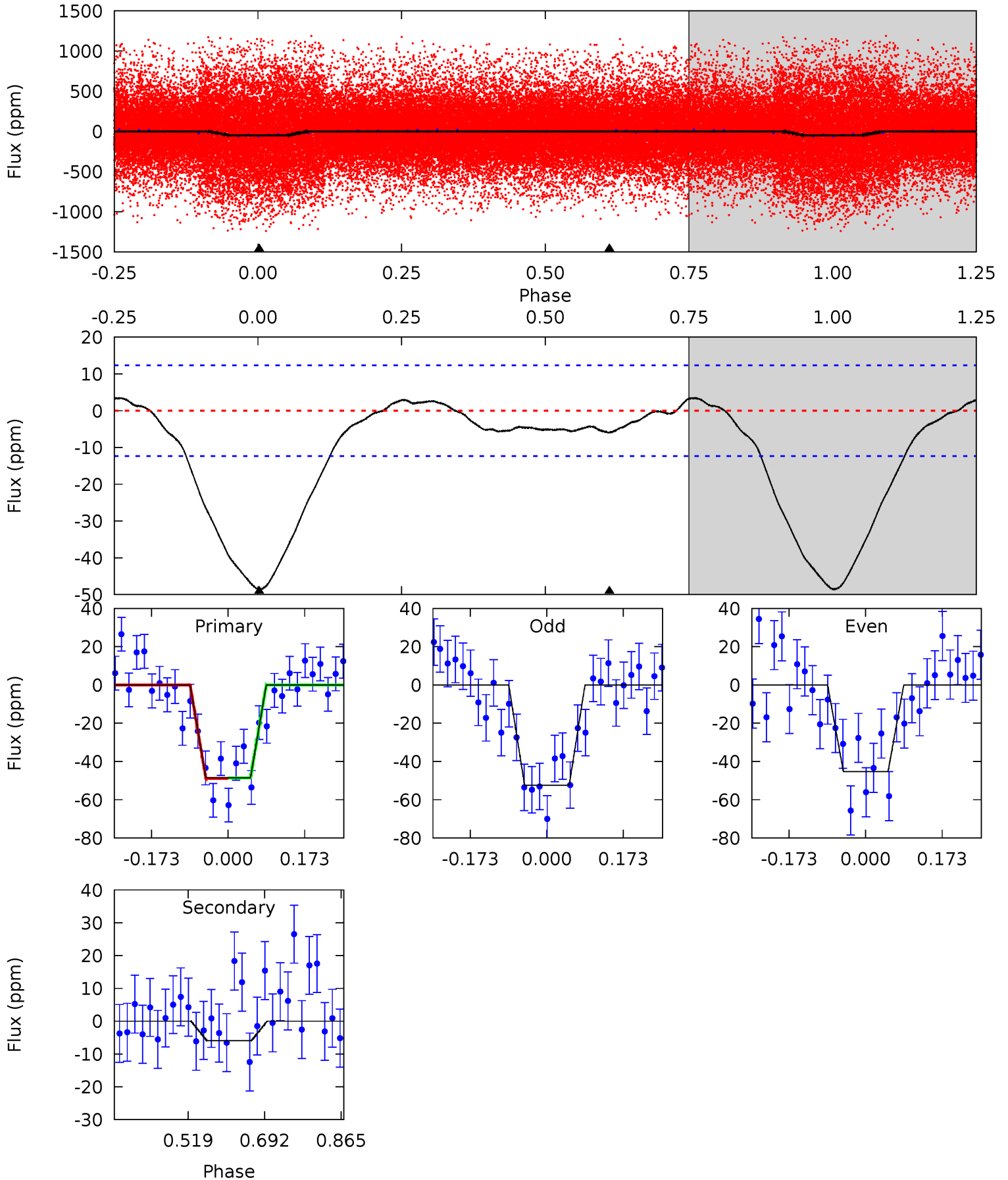
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	4.53	0	0	4.43	1.30	0.49	11.8	11.8	4.53	4.53	2.03	0.91	0.05	2.64



Alt Model-Shift Uniqueness Test

007431709-01, P = 0.572518 Days, E = 131.202560 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.5	2.14	0	0	4.45	1.36	1.00	17.5	17.5	2.14	2.14	1.28	0.92	0.07	0.05



Stellar Parameters For KIC 007431709

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5171^{+153}_{-153}	$4.576^{+0.042}_{-0.072}$	$-0.140^{+0.300}_{-0.300}$	$0.760^{+0.097}_{-0.071}$	$0.793^{+0.082}_{-0.073}$	$2.549^{+0.521}_{-0.622}$
	+3%/-3%	+1%/-2%	+214%/-214%	+13%/-9%	+10%/-9%	+20%/-24%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007431709-01 / KOI 7838.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-14 ± 3	$0.68^{+0.50}_{-0.39}$	2499^{+100}_{-88}	3747^{+1637}_{-755}	$2.567^{+12.539}_{-1.742}$
Alt.	-6 ± 3	$0.67^{+0.46}_{-0.43}$	2508^{+96}_{-99}	3210^{+1444}_{-1121}	$1.126^{+6.817}_{-0.800}$

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

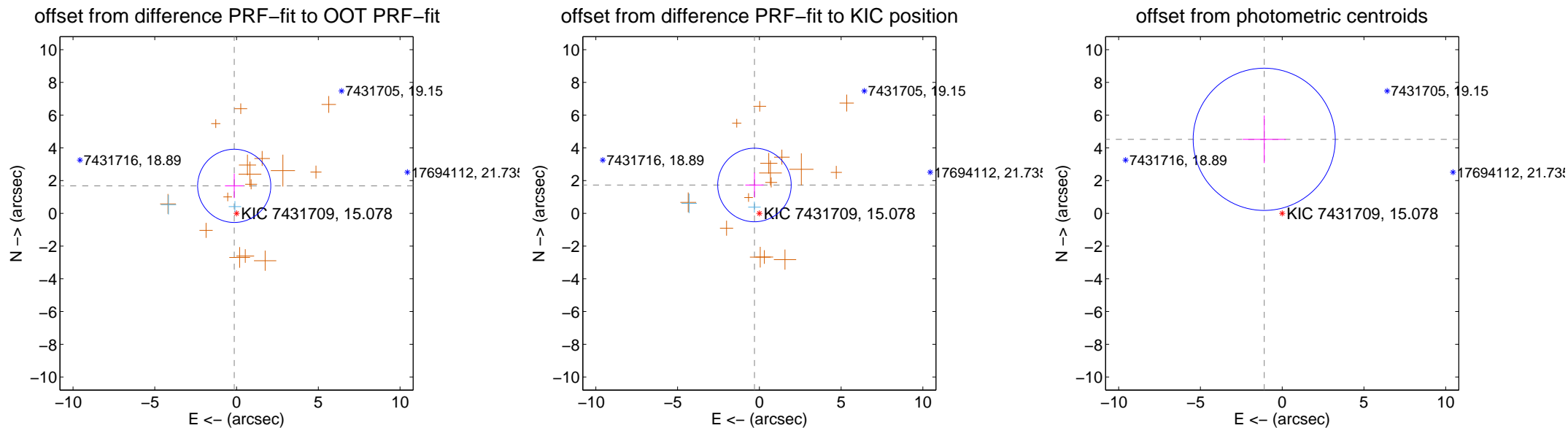
DV Centroid Data

Supplemental centroid analysis for 007431709-01. Kepler magnitude: 15.08. Transit SNR 7.98

There are 2 quarters with good PRF difference image offsets

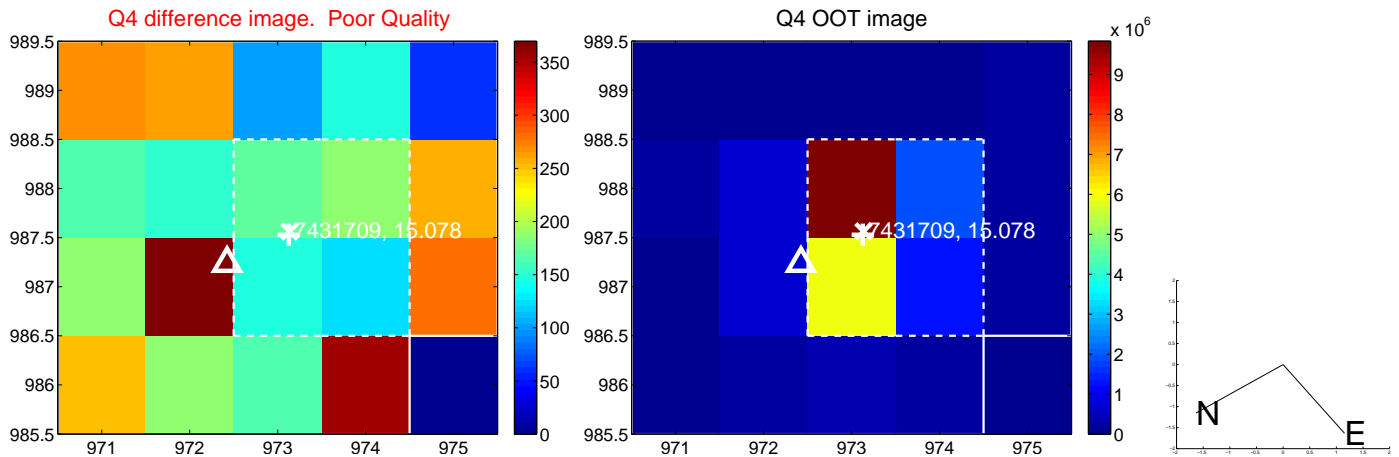
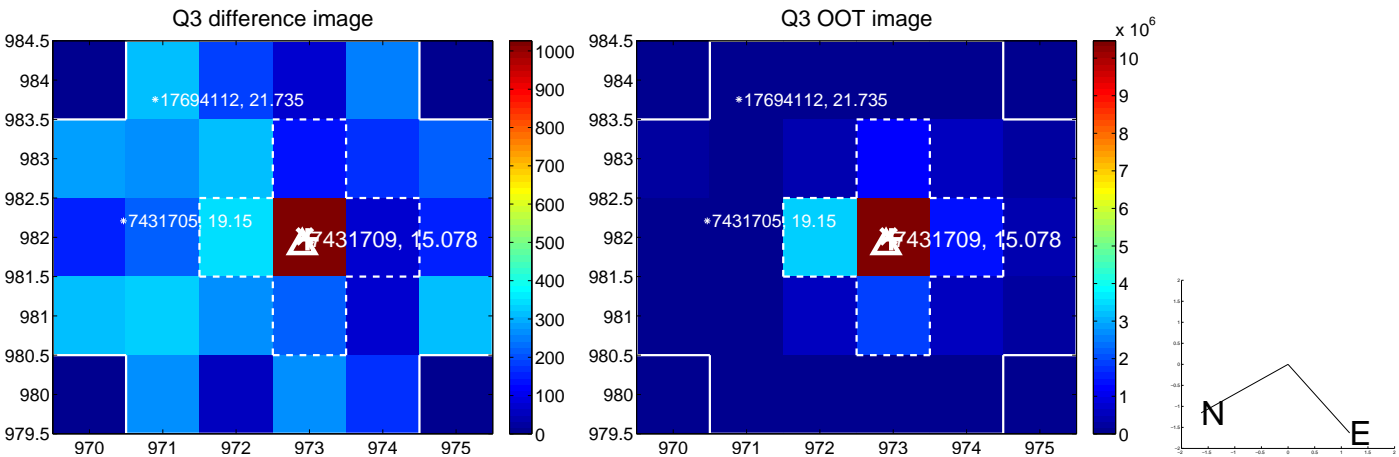
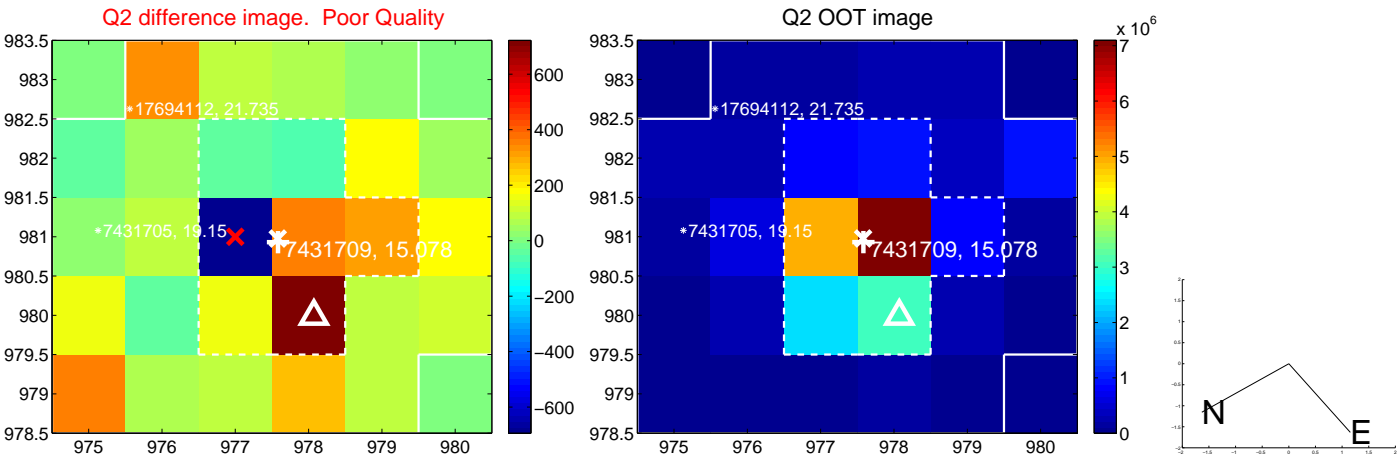
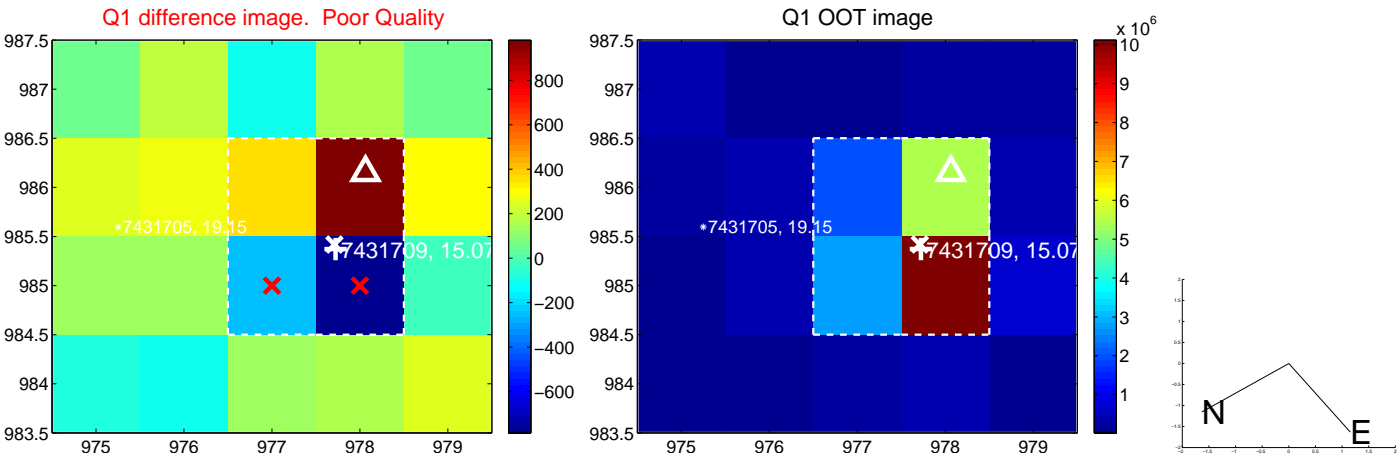
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.685 ± 0.746	2.26	0.142 ± 0.566	1.680 ± 0.747
PRF-fit source offset from KIC position	1.758 ± 0.749	2.35	0.300 ± 0.557	1.733 ± 0.754
photometric centroid source offset	4.65 ± 1.45	3.21	1.10 ± 1.32	4.52 ± 1.46

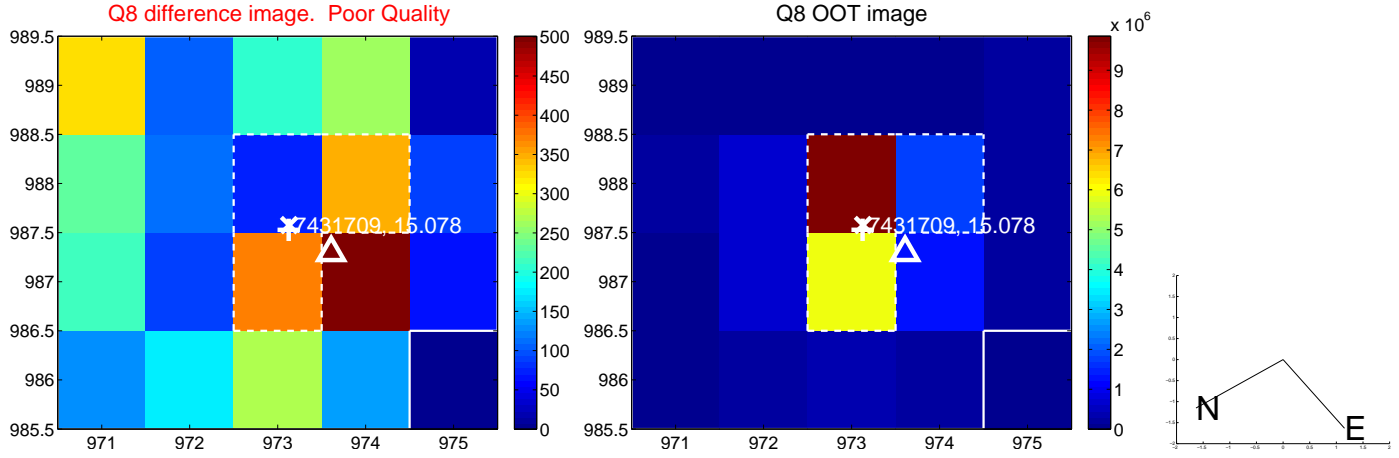
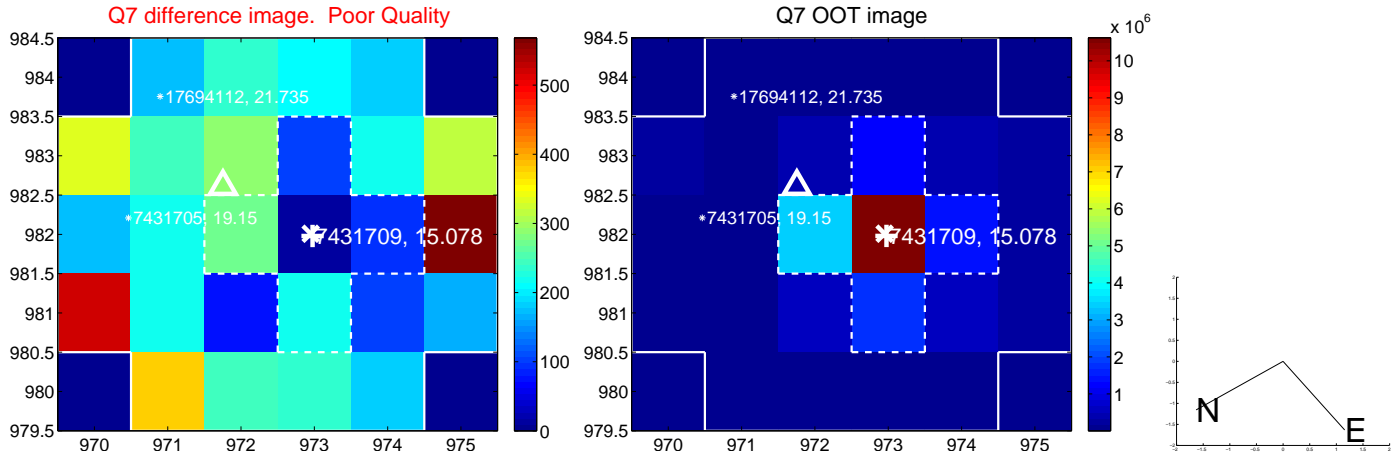
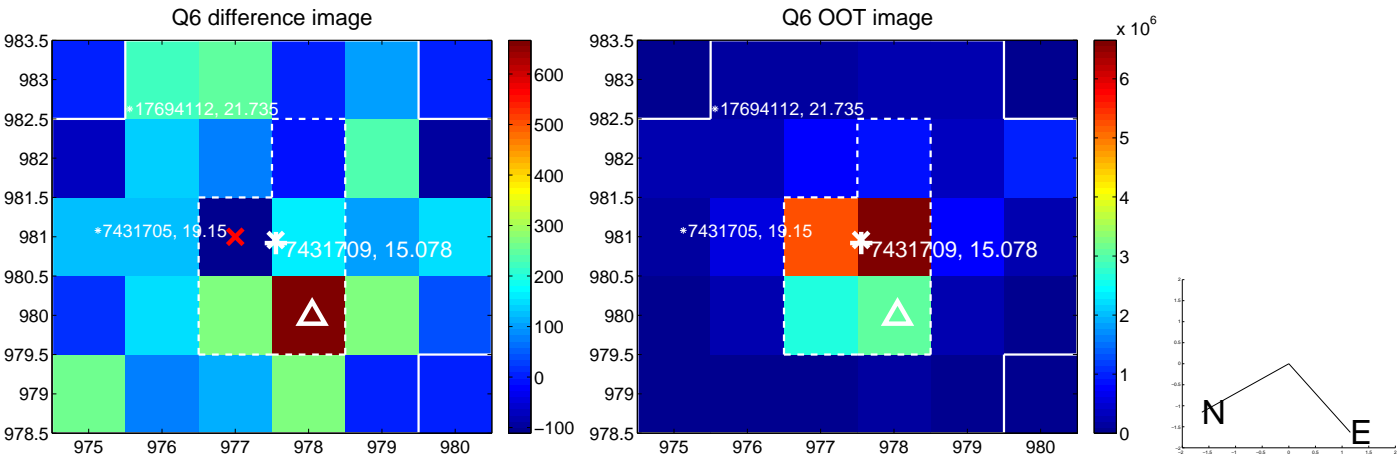
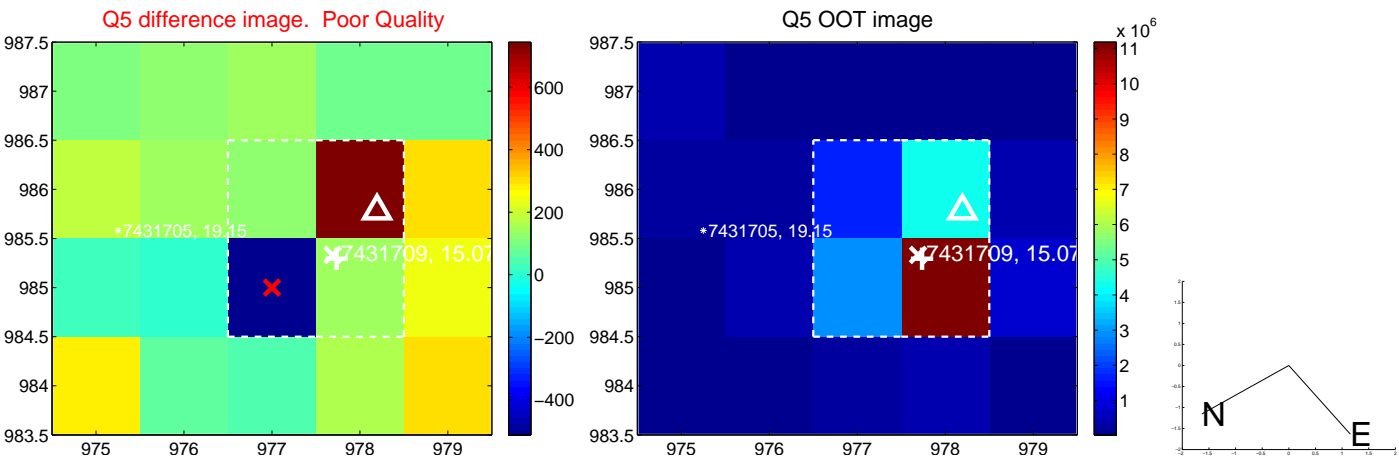


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

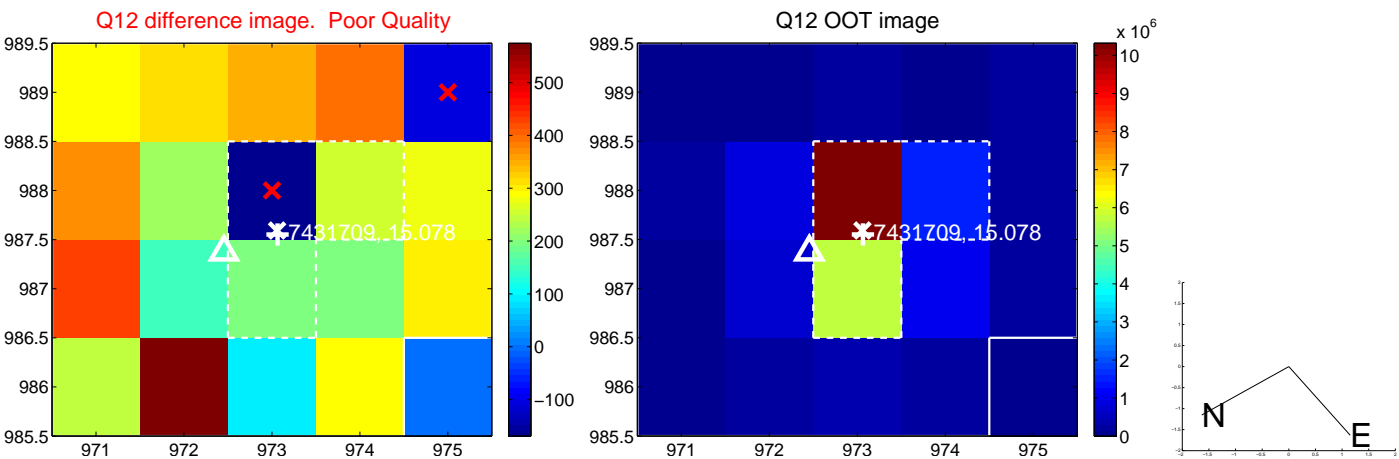
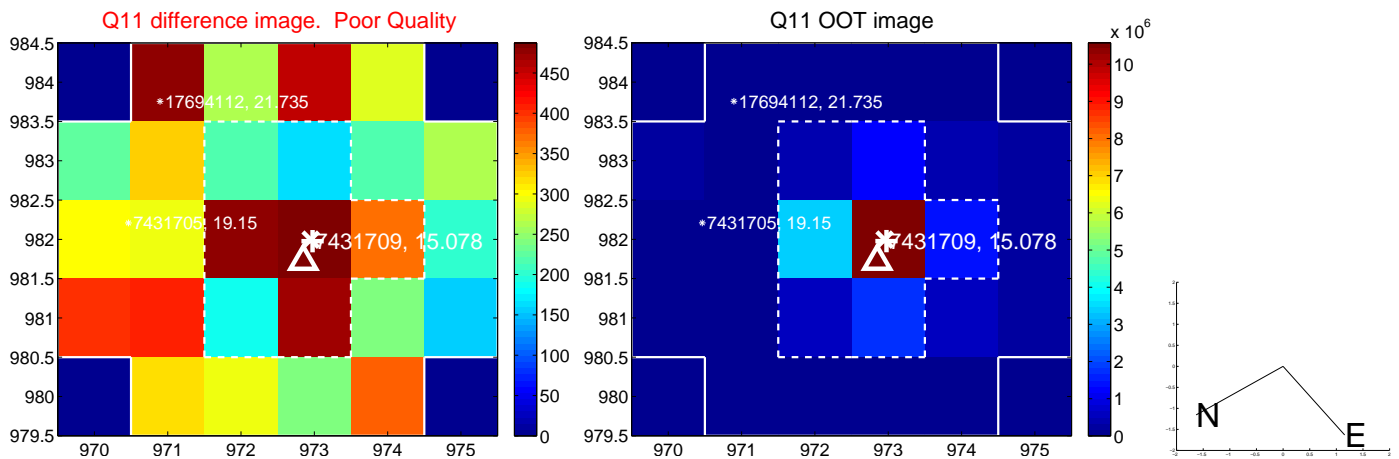
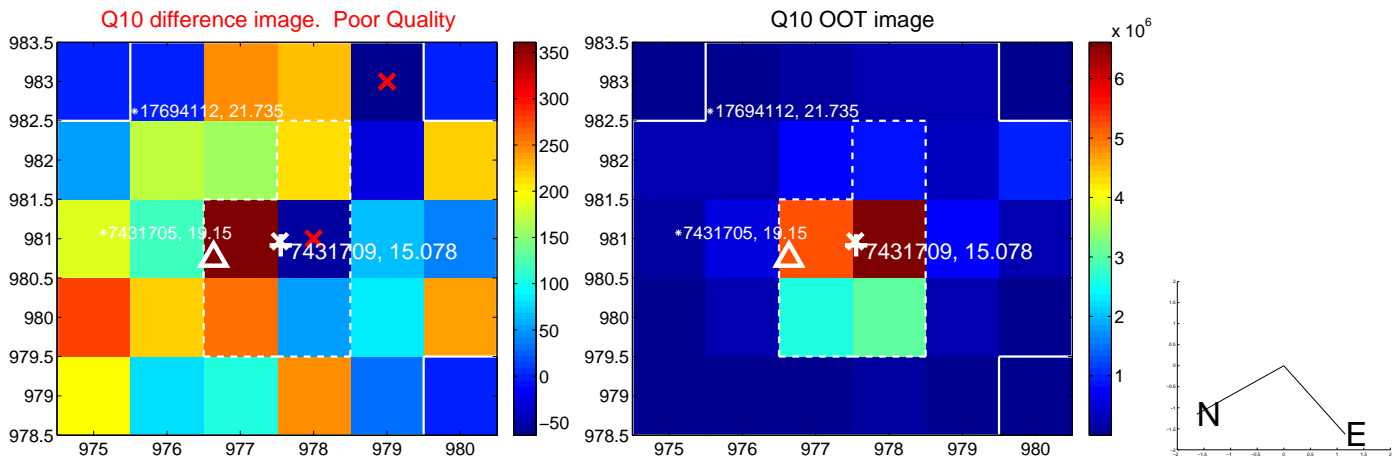
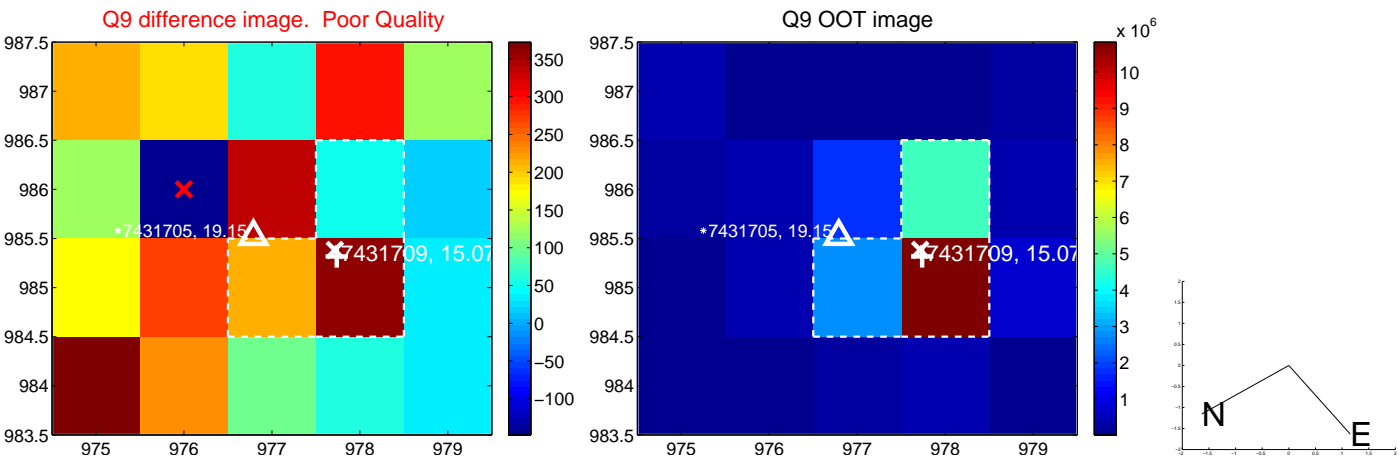
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



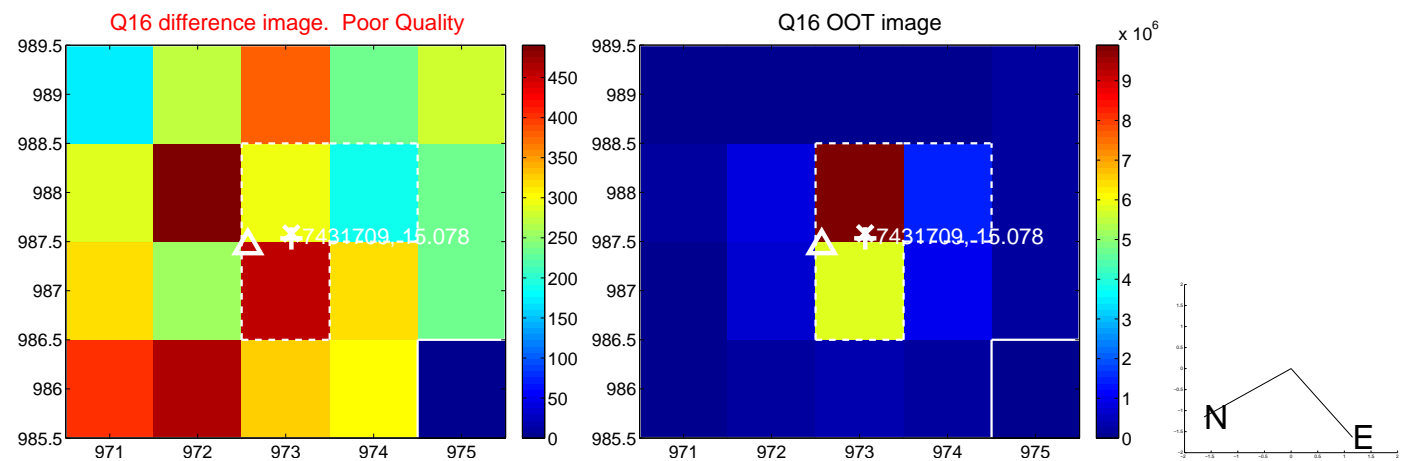
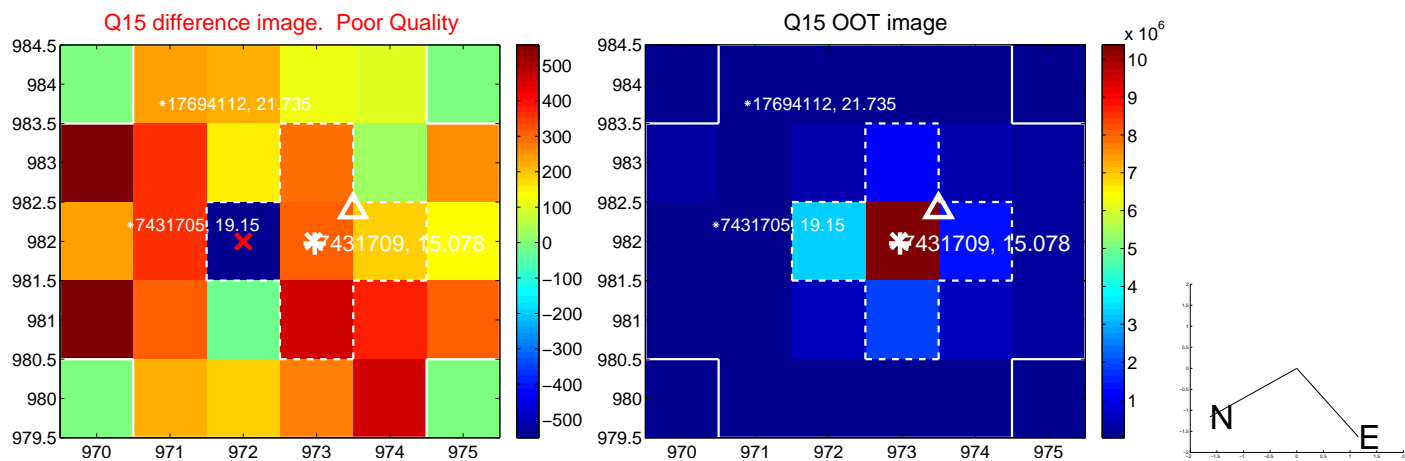
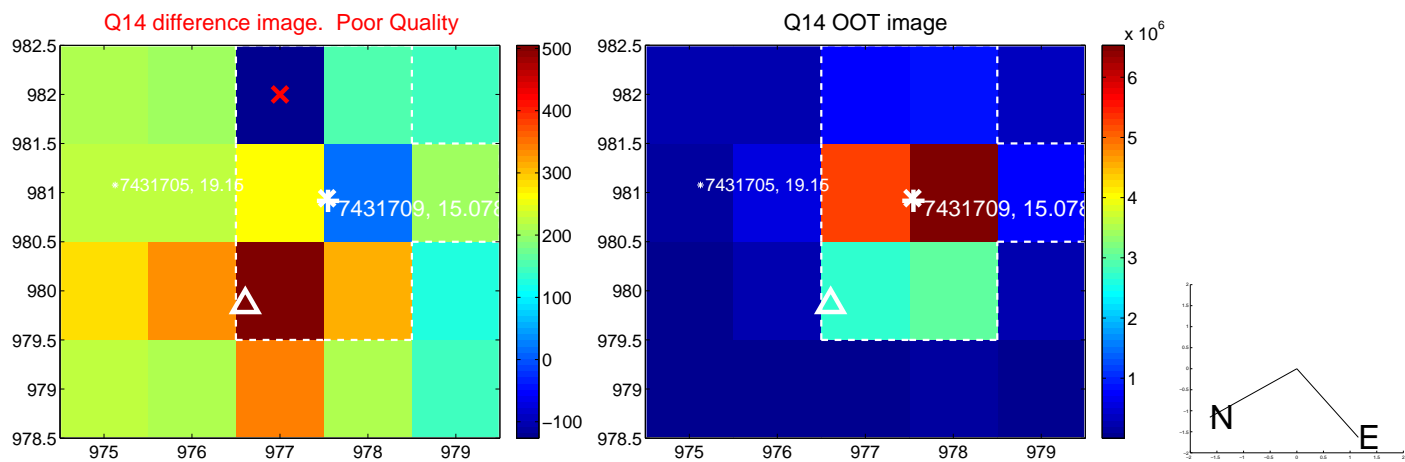
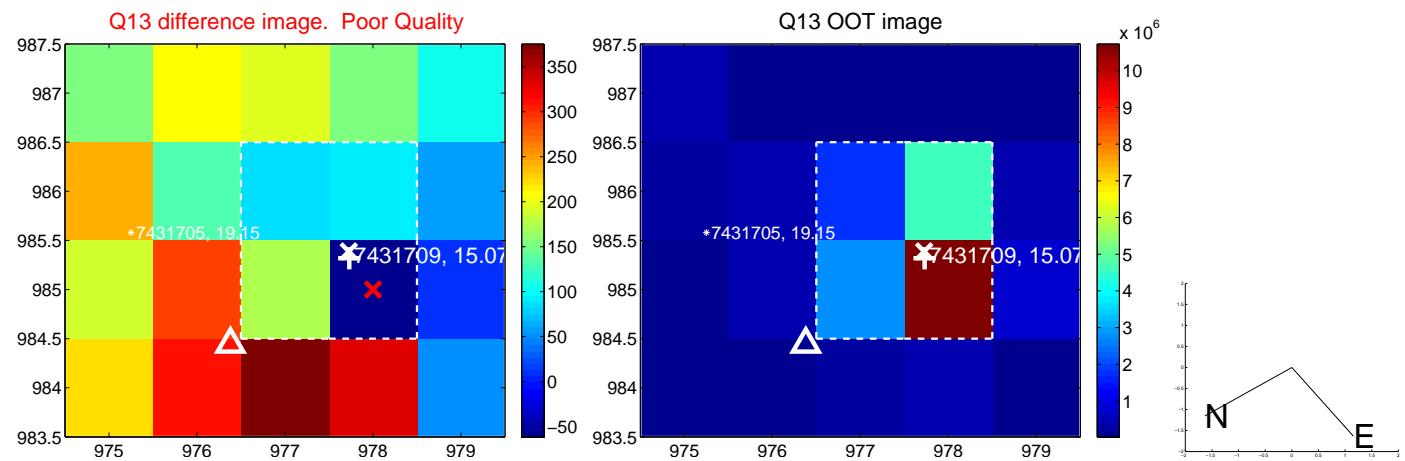
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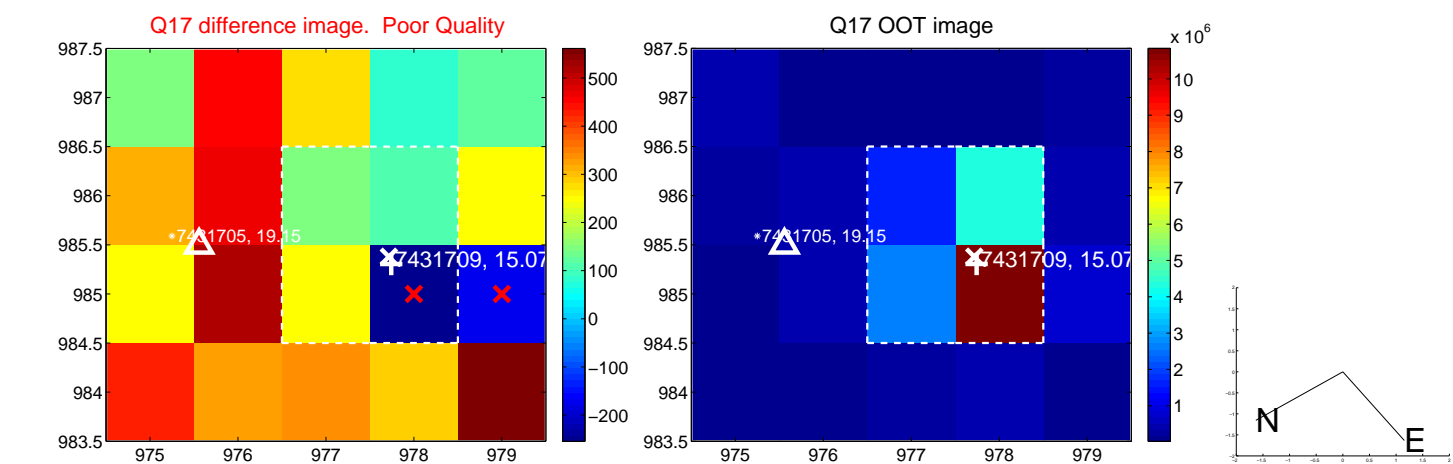
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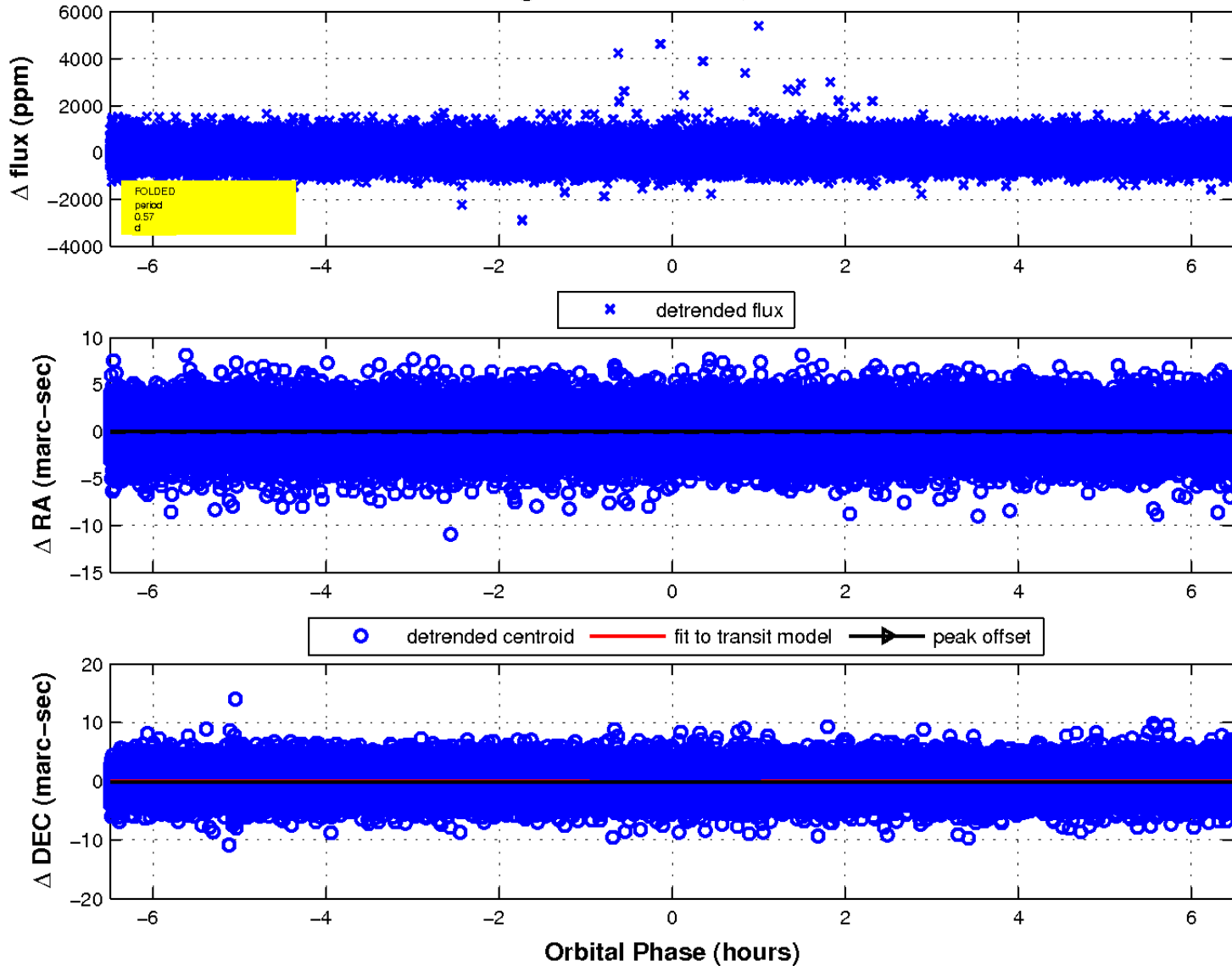
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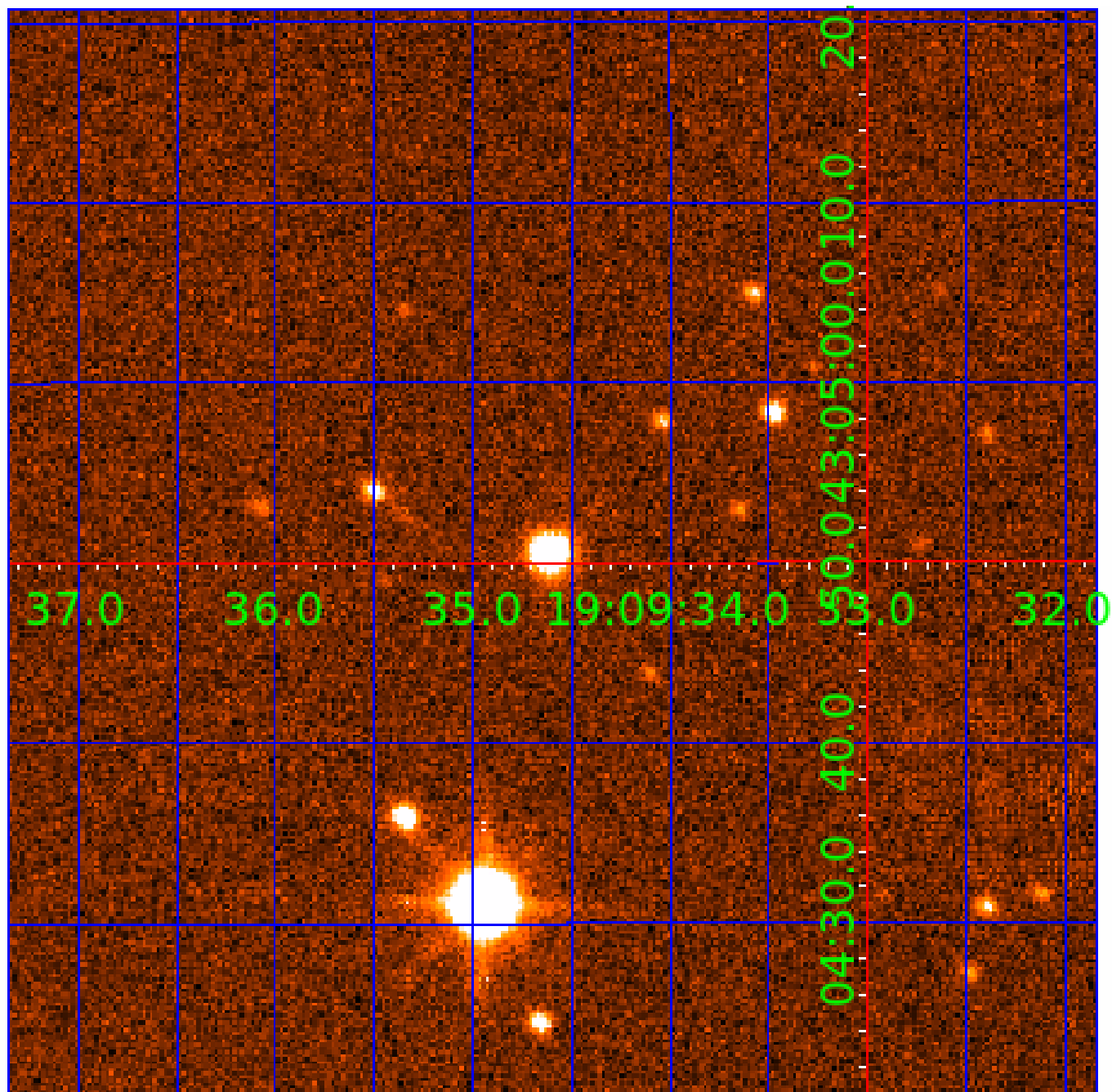


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination



KIC 007431709

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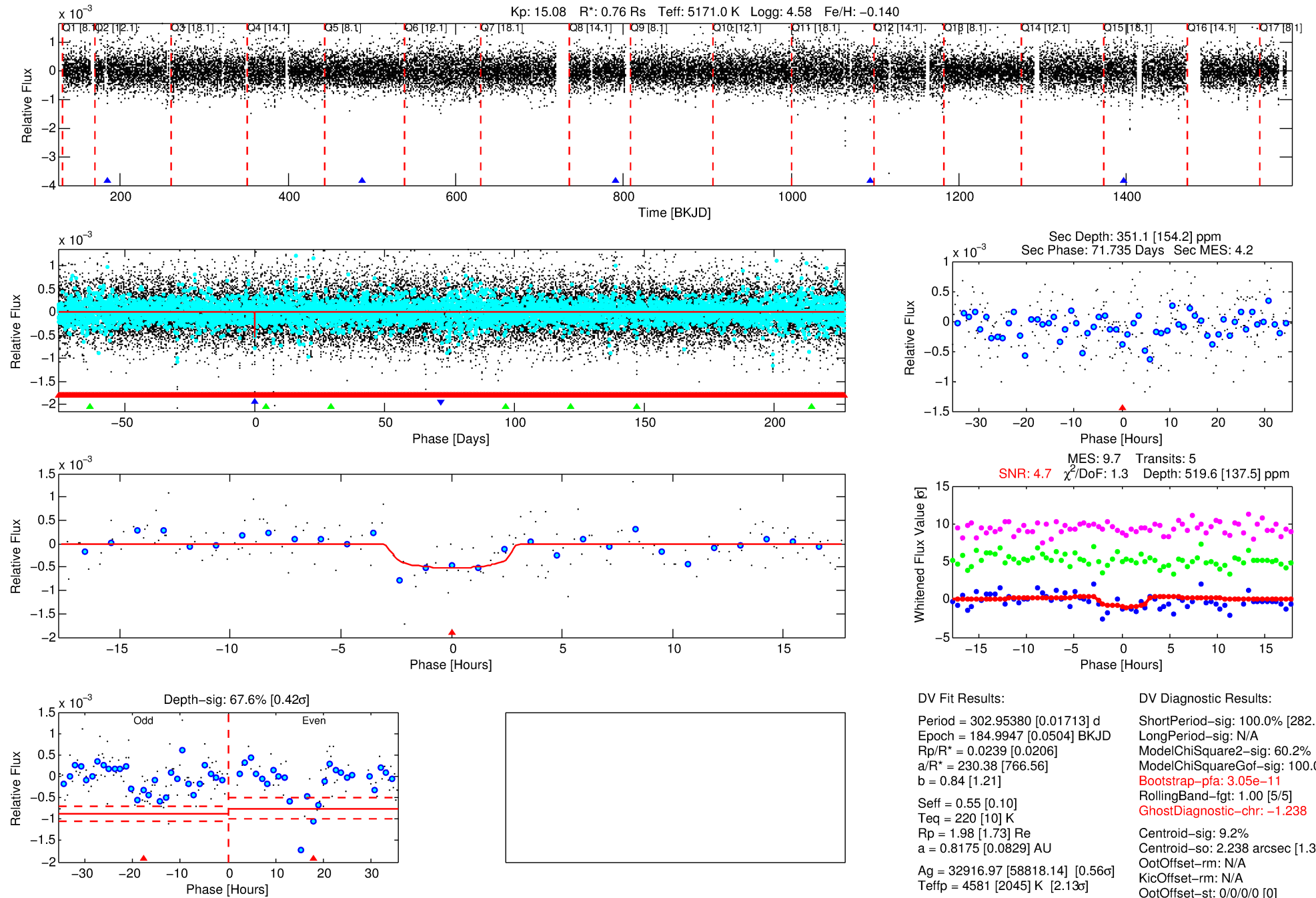
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007431709-02

No Significant Match Found

DV One-Page Summary

KIC: 7431709 Candidate: 2 of 3 Period: 302.954 d



DV Fit Results:

Period = 302.95380 [0.01713] d
Epoch = 184.9947 [0.0504] BKJD
Rp/R* = 0.0239 [0.0206]
a/R* = 230.38 [766.56]
b = 0.84 [1.21]
Seff = 0.55 [0.10]
Teq = 220 [10] K
Rp = 1.98 [1.73] Re
a = 0.8175 [0.0829] AU
Ag = 32916.97 [58818.14] [0.56 σ]
Teffp = 4581 [2045] K [2.13 σ]

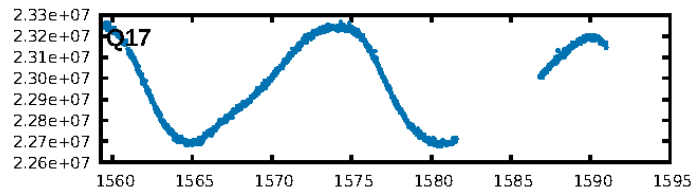
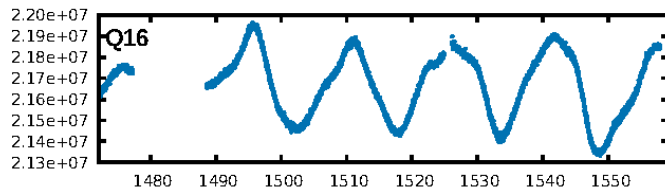
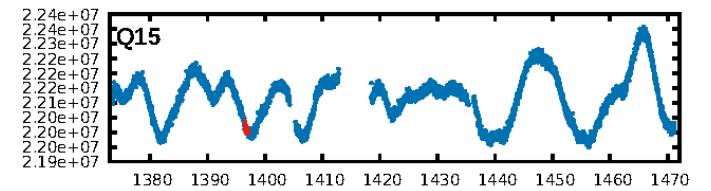
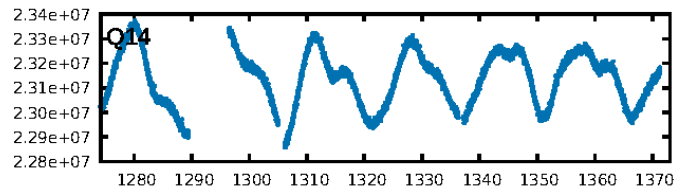
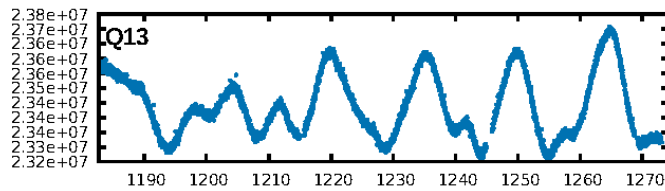
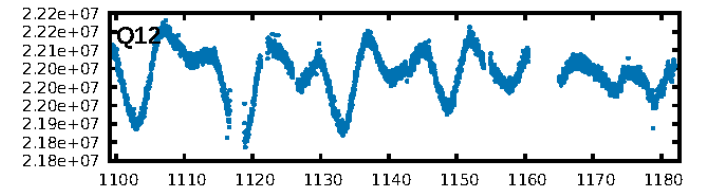
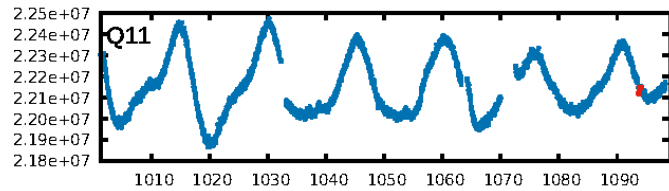
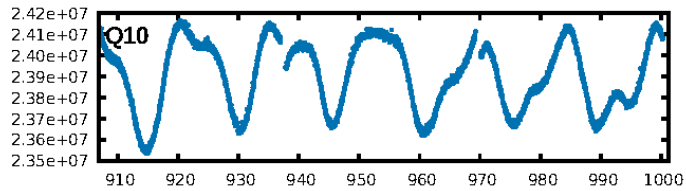
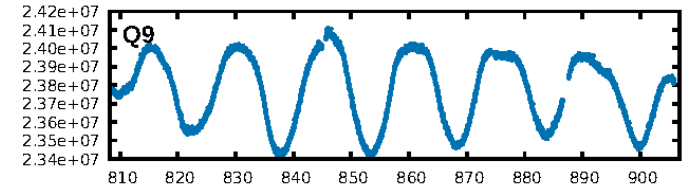
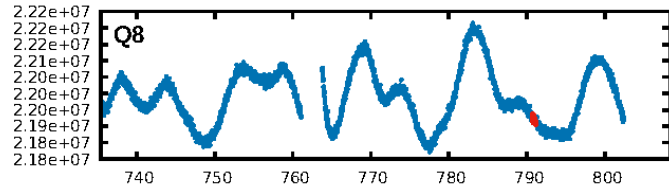
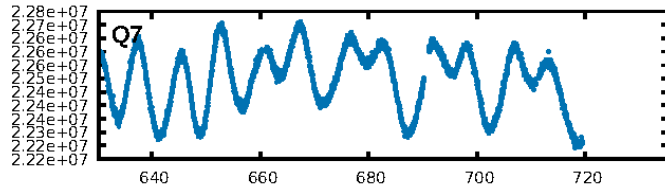
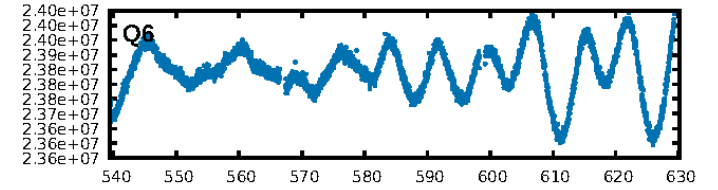
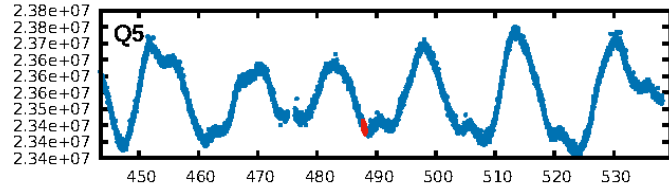
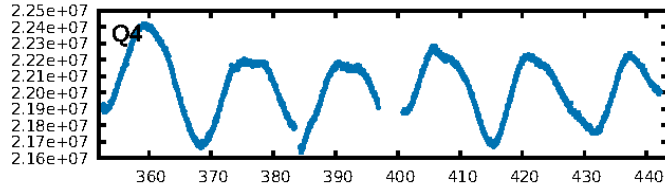
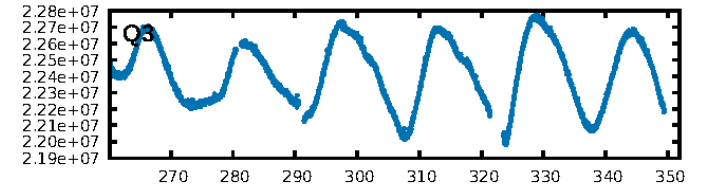
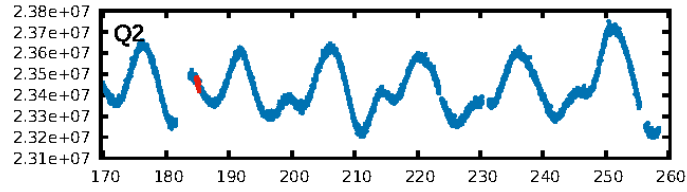
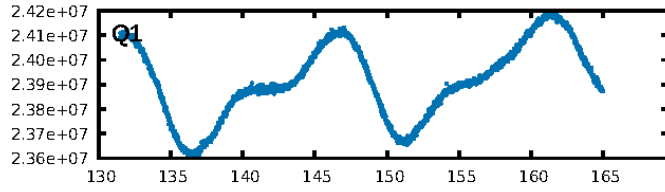
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [282.79 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 60.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.05e-11
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -1.238
Centroid-sig: 9.2%
Centroid-so: 2.238 arcsec [1.38 σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 0.00 [0/2]

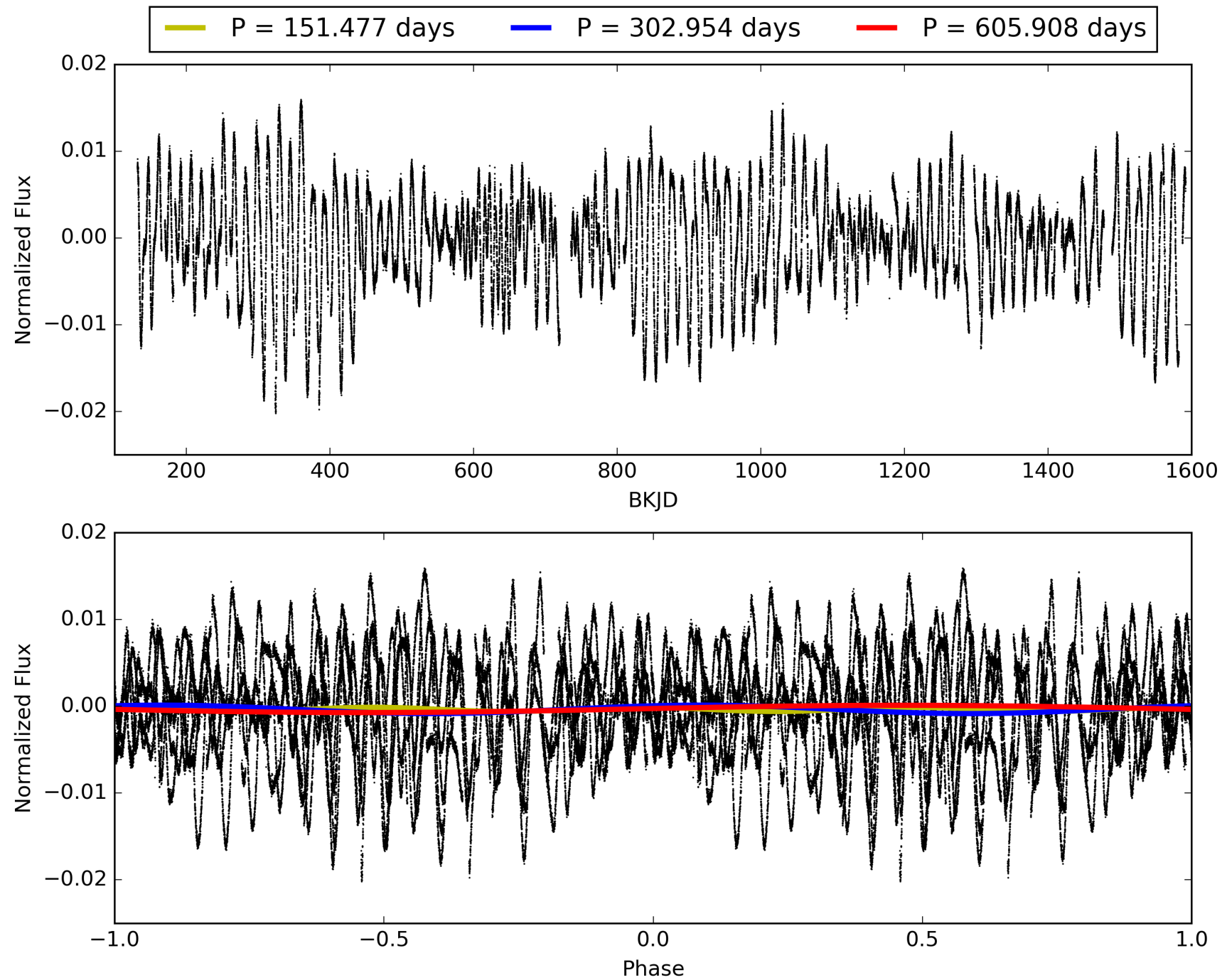
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 16:28:20 Z

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

TCE 007431709-02, PDC Light Curves

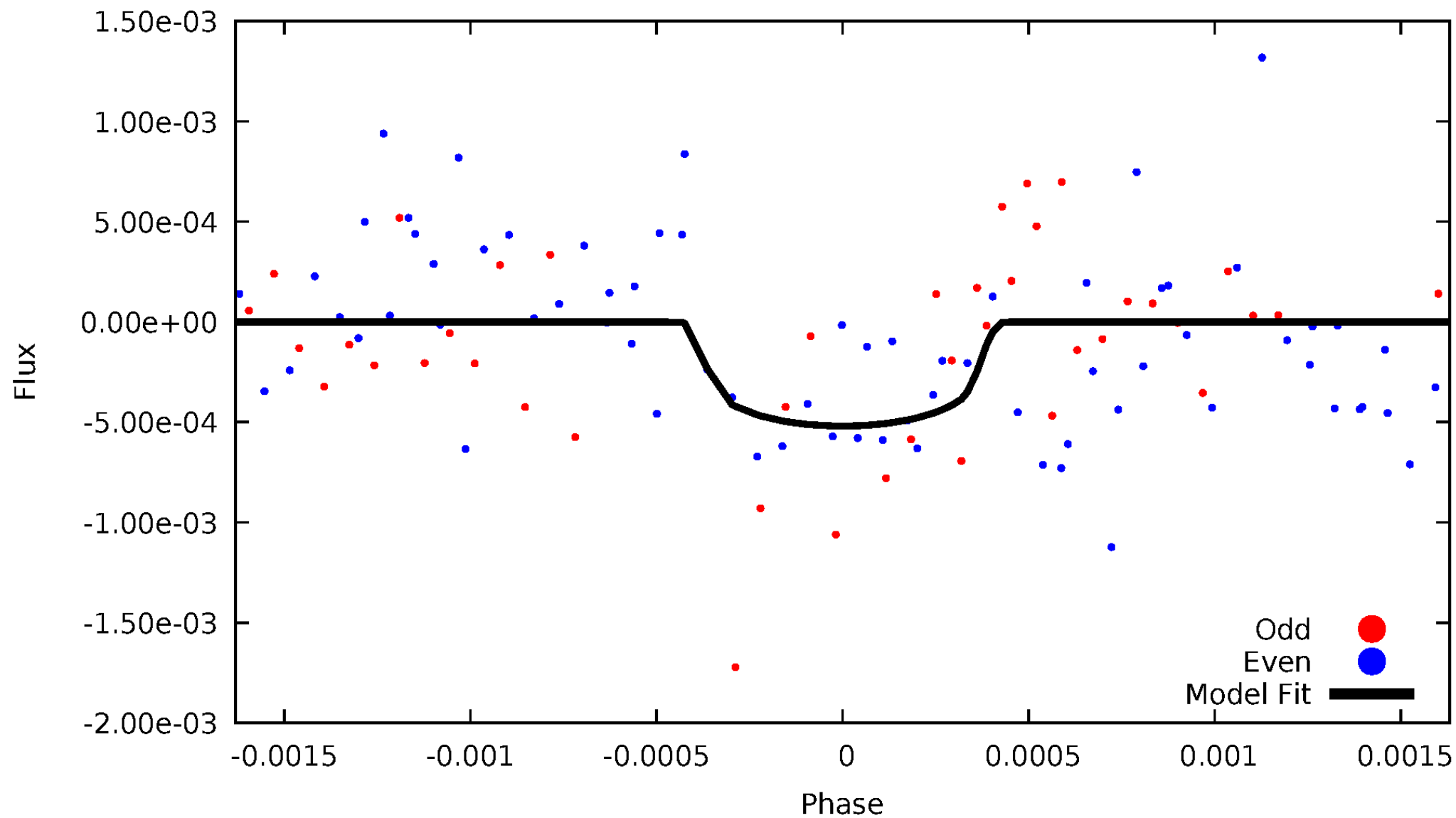


TCE 007431709-02



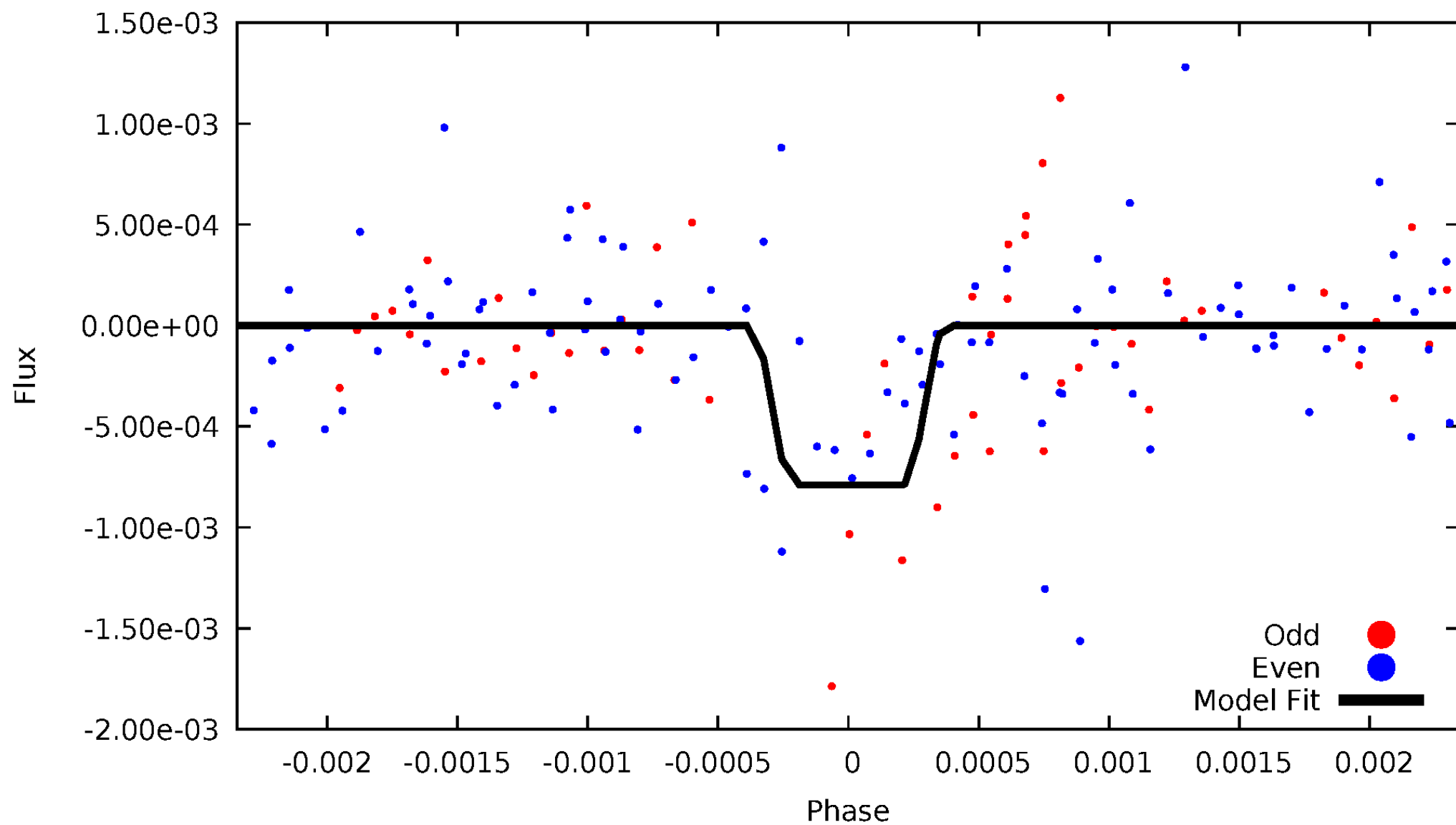
DV Odd/Even

TCE 007431709-02



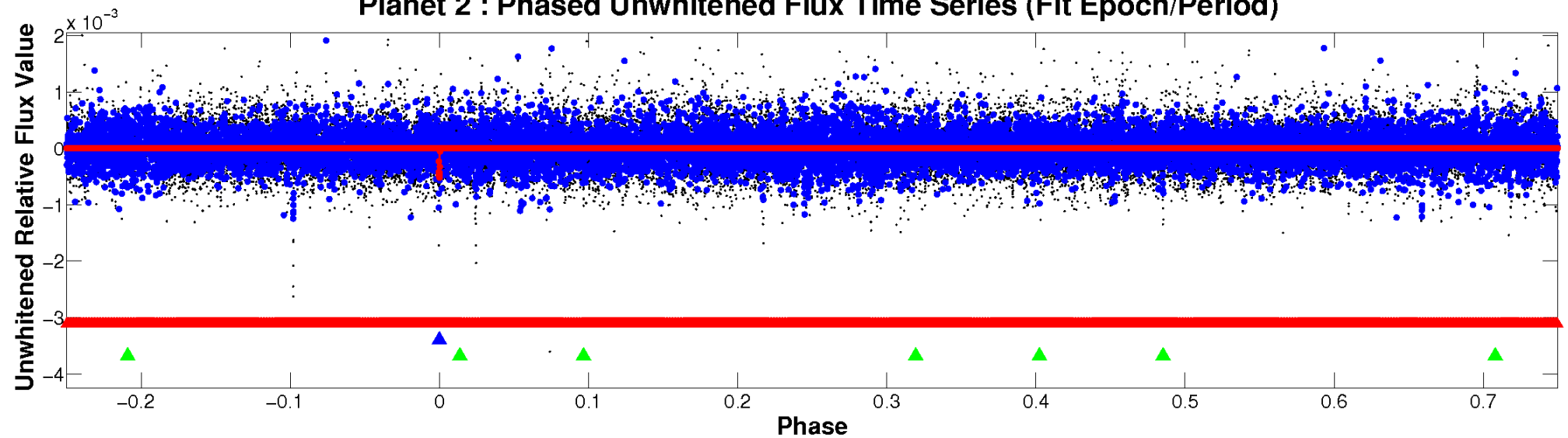
ALT Odd/Even

TCE 007431709-02

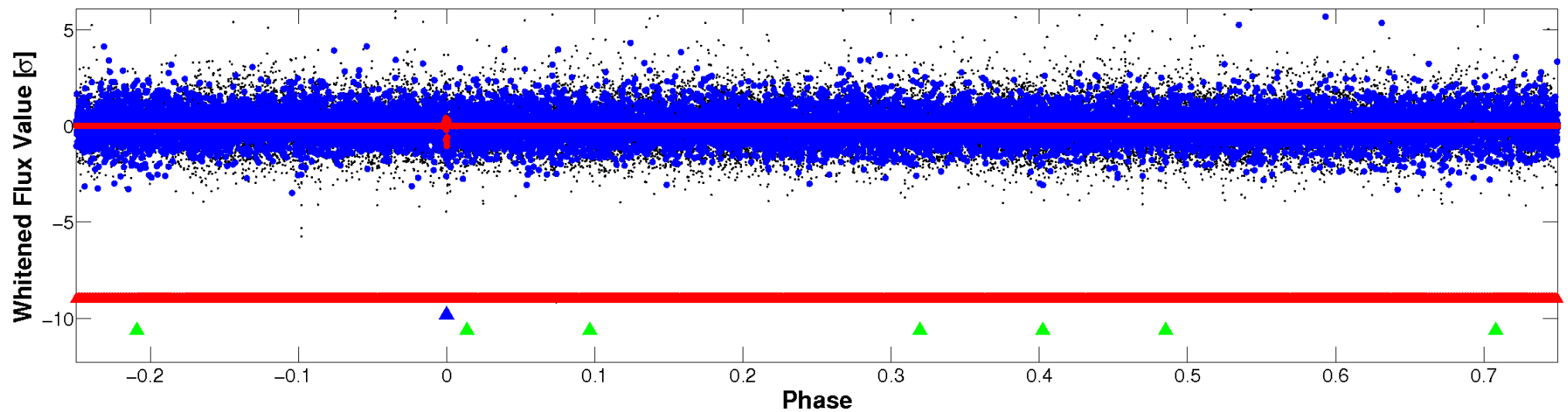


Non-Whitened Vs. Whitened Light Curve

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

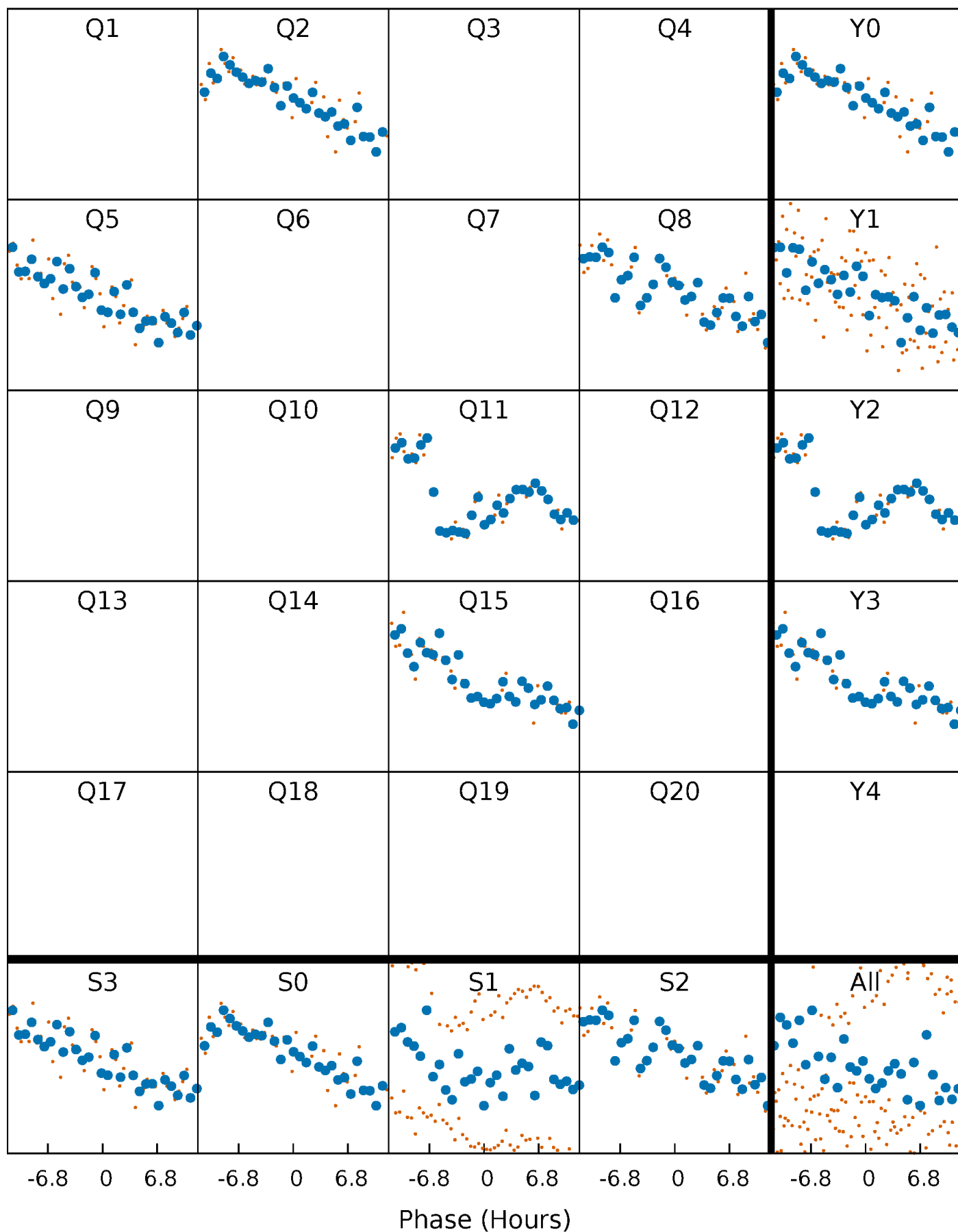


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



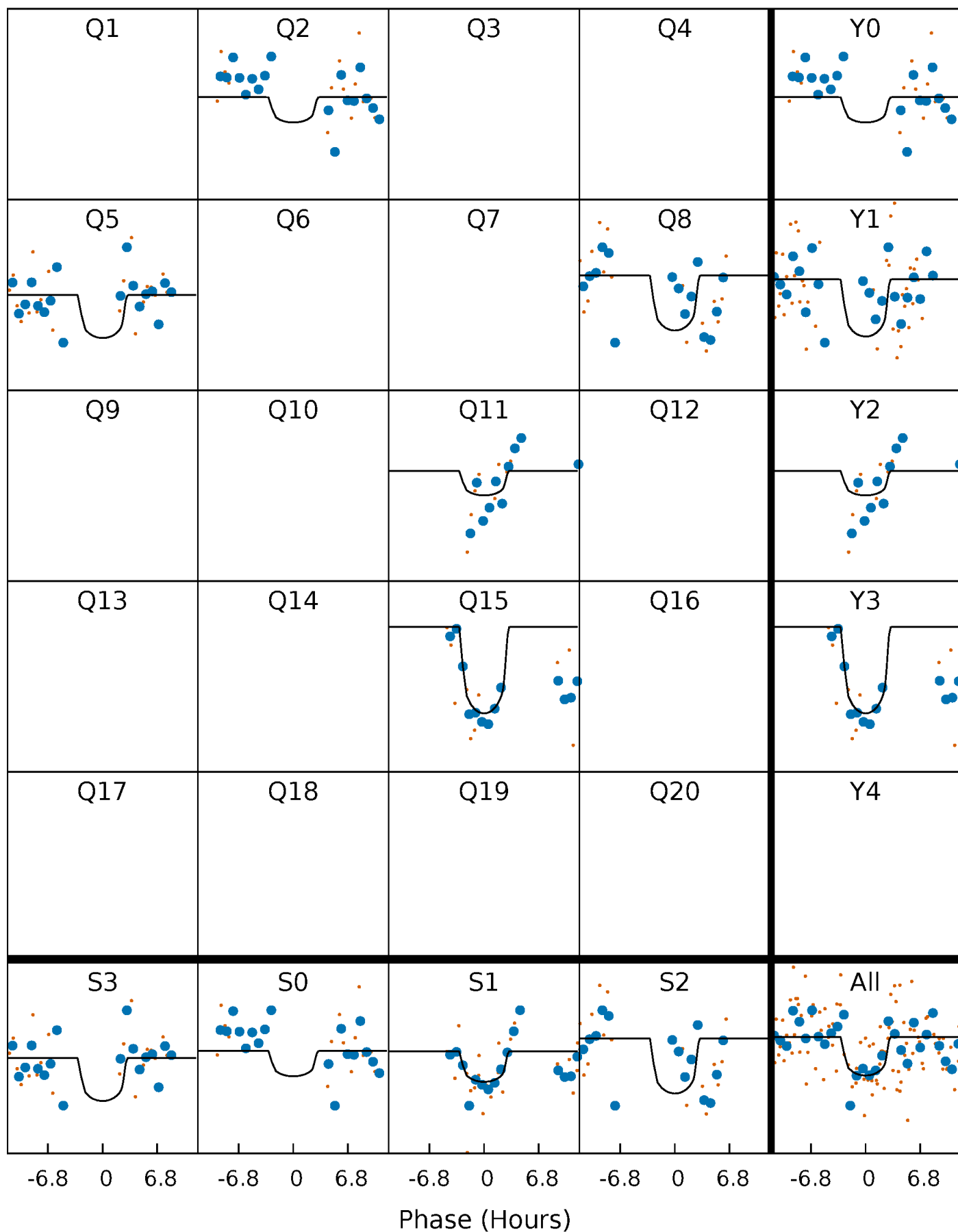
PDC Quarter-Phased Transit Curves

TCE 007431709-02 $P=302.953799$ Days $T_0=184.994715$ (BKJD)



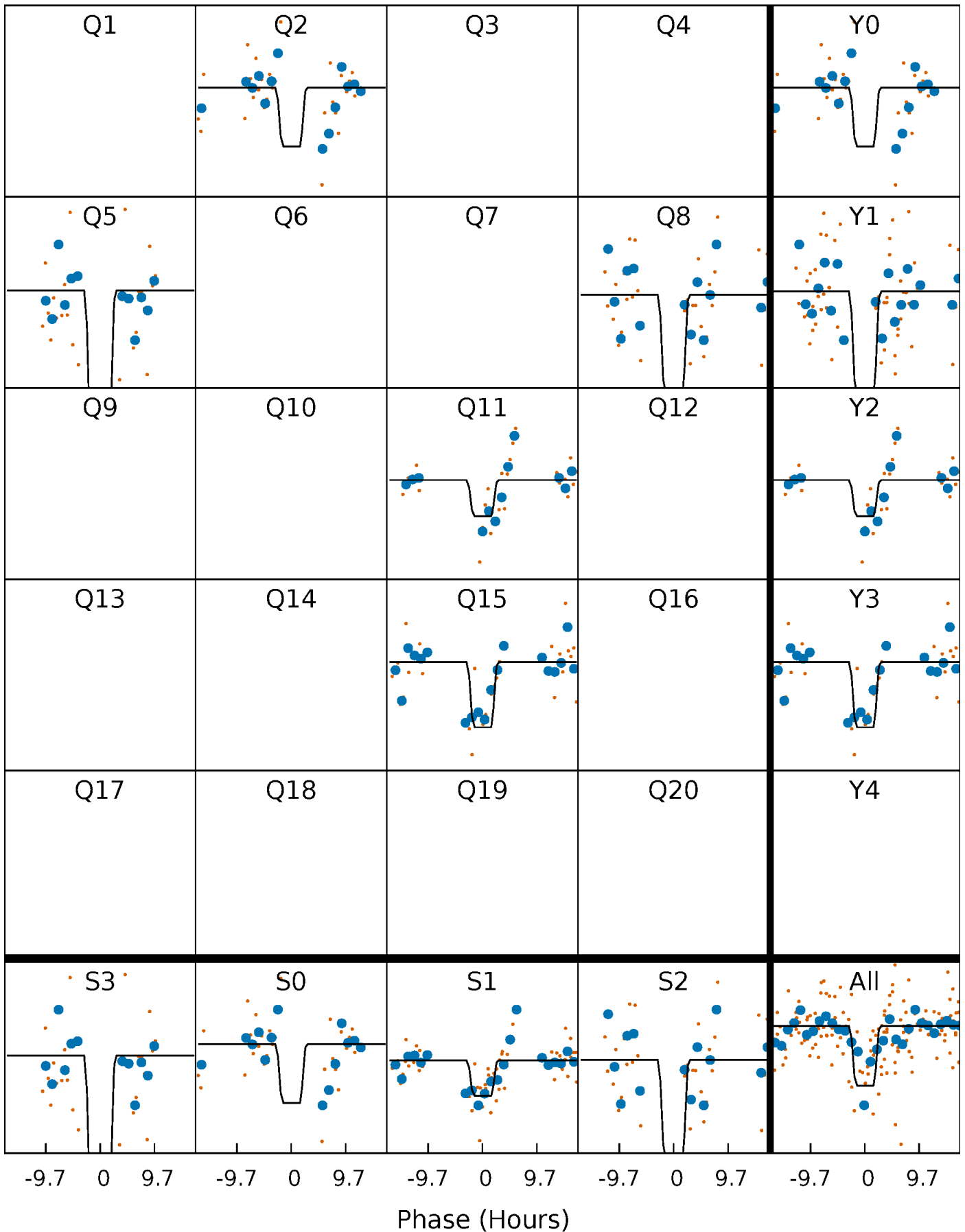
DV Quarter-Phased Transit Curves

TCE 007431709-02 P=302.953799 Days $T_0=184.994715$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

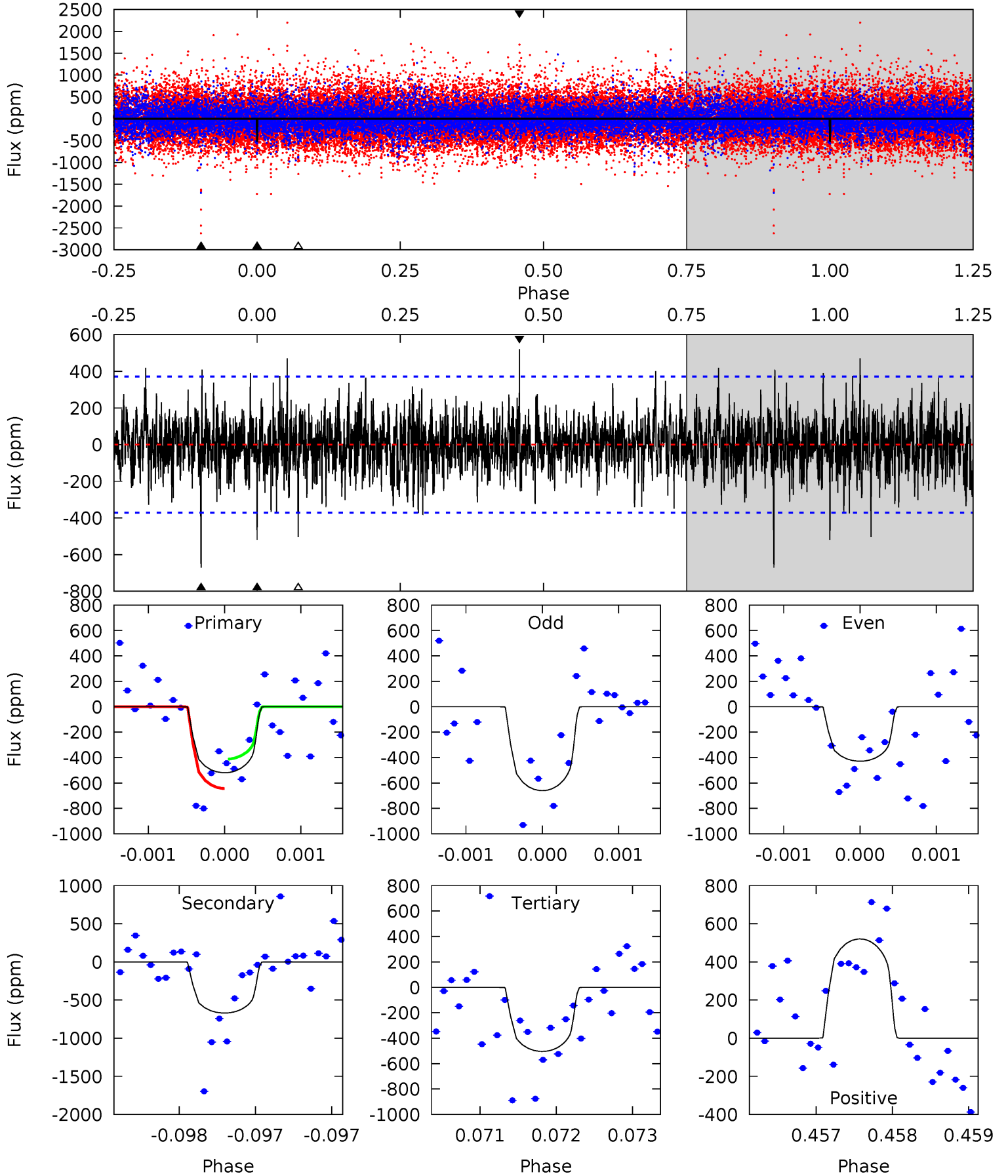
TCE 007431709-02 P=302.947961 Days $T_0=184.944253$ (BKJD)



DV Model-Shift Uniqueness Test

007431709-02, P = 302.953799 Days, E = 184.994715 Days

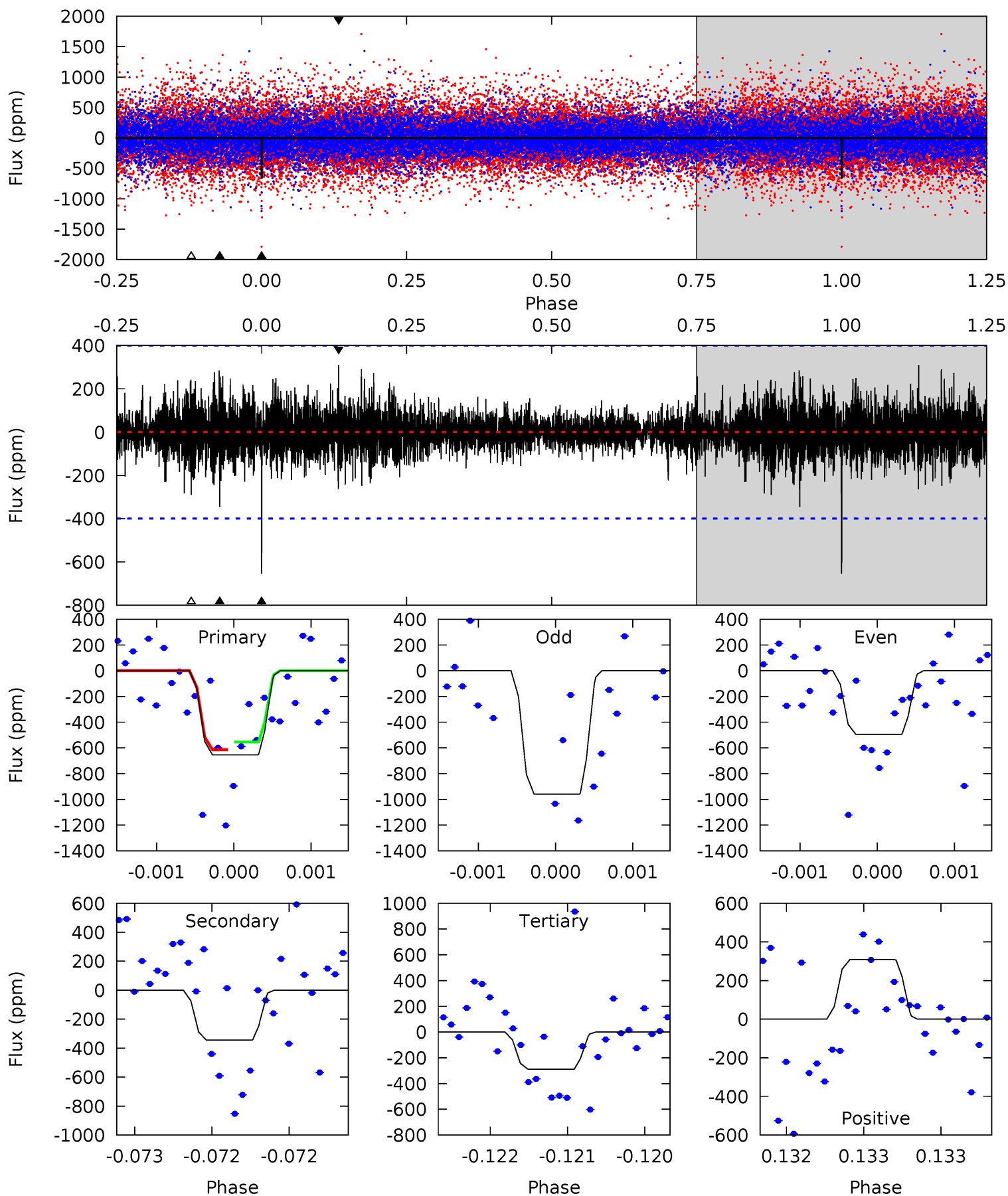
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.66	9.88	7.43	7.67	5.47	3.33	1.63	0.23	-0.01	2.45	2.21	1.67	1.02	0.44	1.67



Alt Model-Shift Uniqueness Test

007431709-02, P = 302.947961 Days, E = 184.944253 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.04	4.77	4.00	4.26	5.52	3.40	0.90	5.04	4.78	0.77	0.51	3.02	0.38	0.32	0.36



Stellar Parameters For KIC 007431709

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5171^{+153}_{-153}	$4.576^{+0.042}_{-0.072}$	$-0.140^{+0.300}_{-0.300}$	$0.760^{+0.097}_{-0.071}$	$0.793^{+0.082}_{-0.073}$	$2.549^{+0.521}_{-0.622}$
	+3%/-3%	+1%/-2%	+214%/-214%	+13%/-9%	+10%/-9%	+20%/-24%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007431709-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-671 ± 68	$2.21^{+1.75}_{-1.39}$	309^{+13}_{-11}	5116^{+3623}_{-1010}	$48951^{+325936}_{-33175}$
Alt.	-345 ± 72	$2.59^{+1.60}_{-1.52}$	310^{+12}_{-12}	4240^{+1964}_{-673}	18735^{+92930}_{-11878}

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

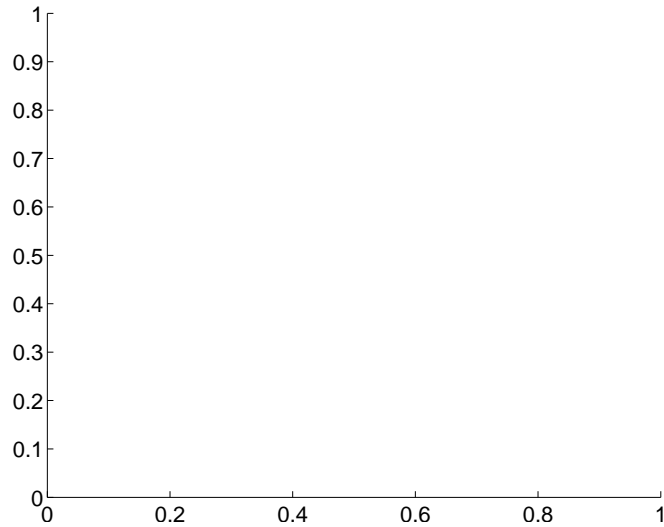
Supplemental centroid analysis for 007431709-02. Kepler magnitude: 15.08. Transit SNR 4.73

There are 0 quarters with good PRF difference image offsets

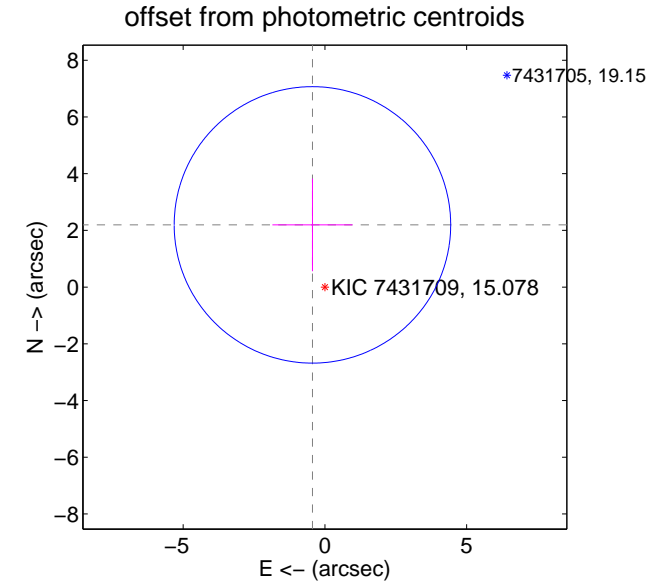
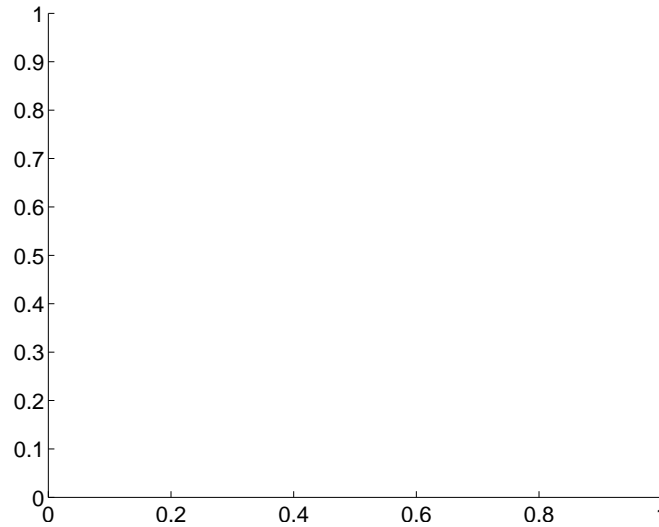
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	2.24 ± 1.63	1.38	0.44 ± 1.41	2.19 ± 1.63

There is no PRF-fit offset from OOT-fit



There is no PRF-fit offset from KIC

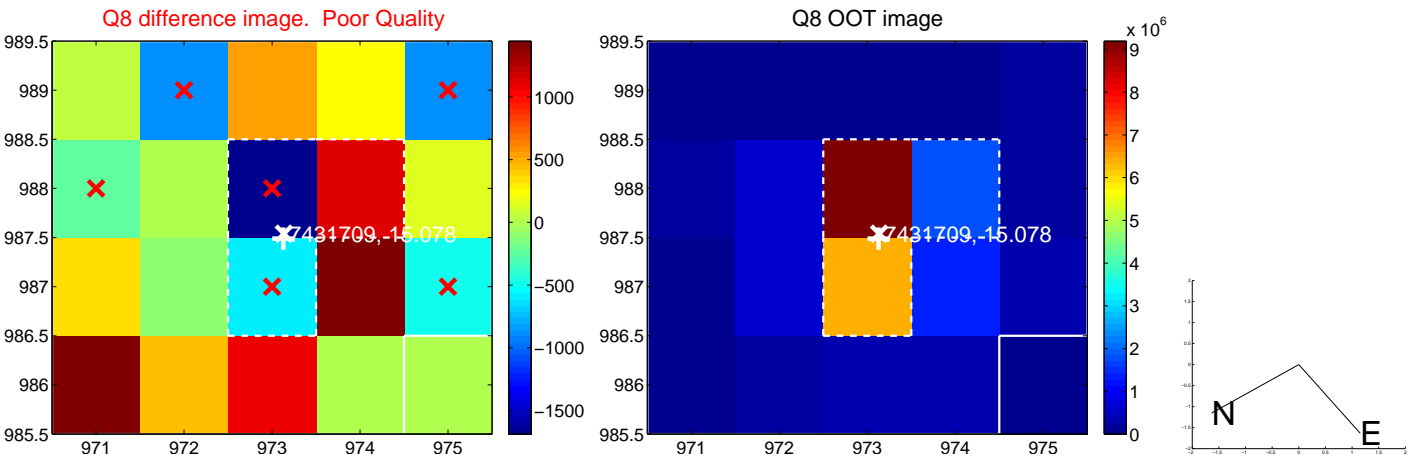
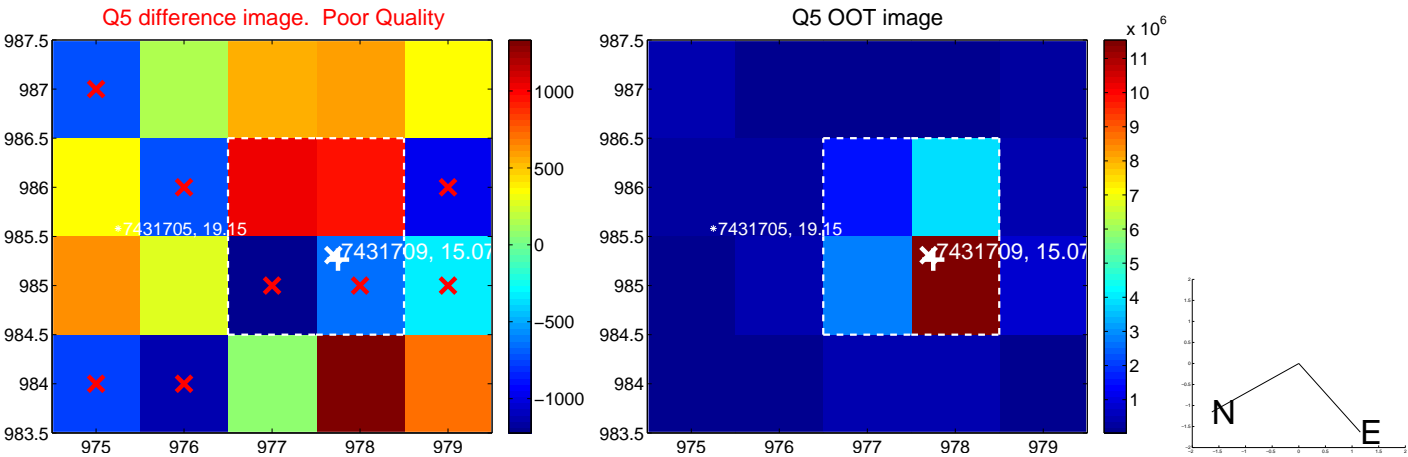


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



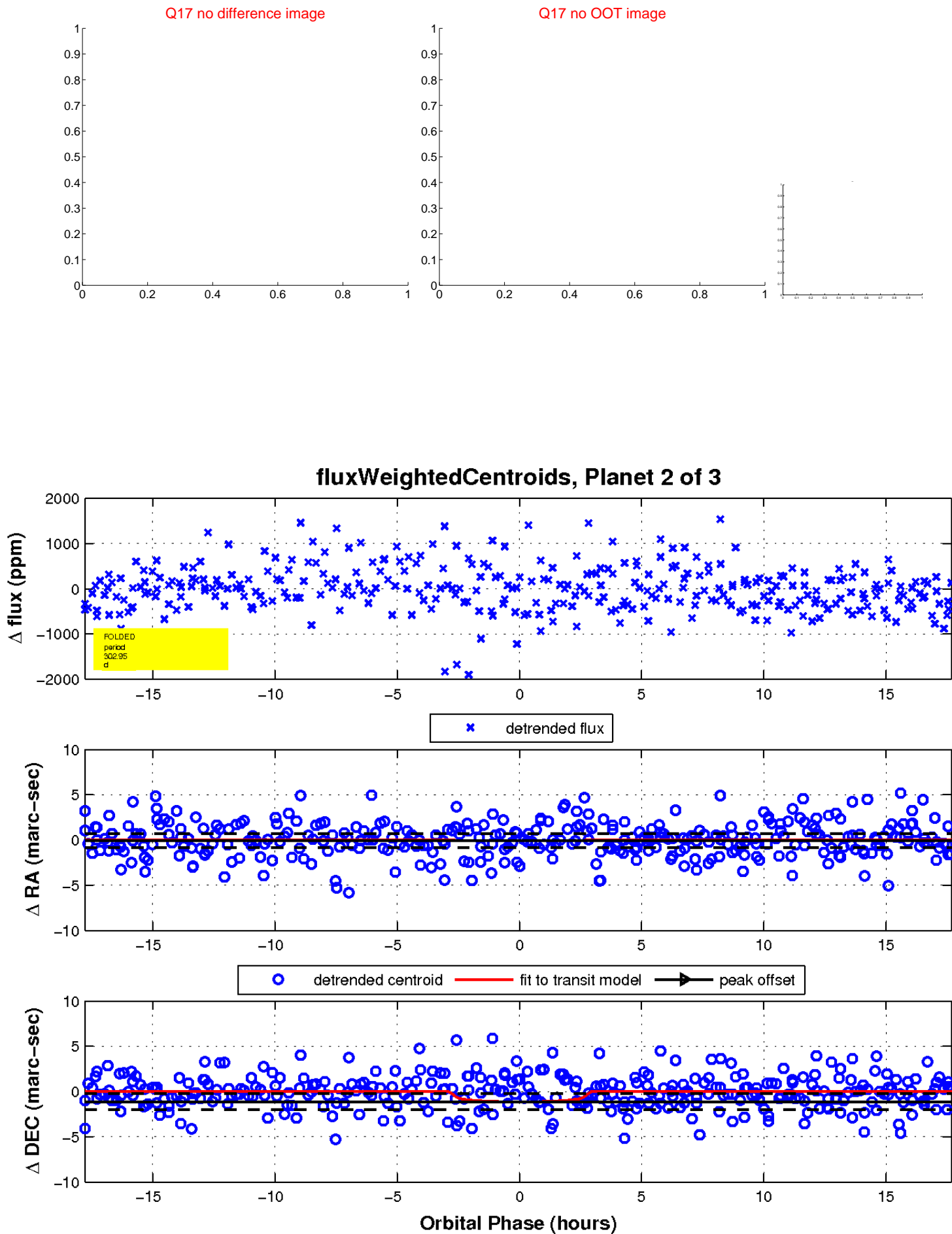
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

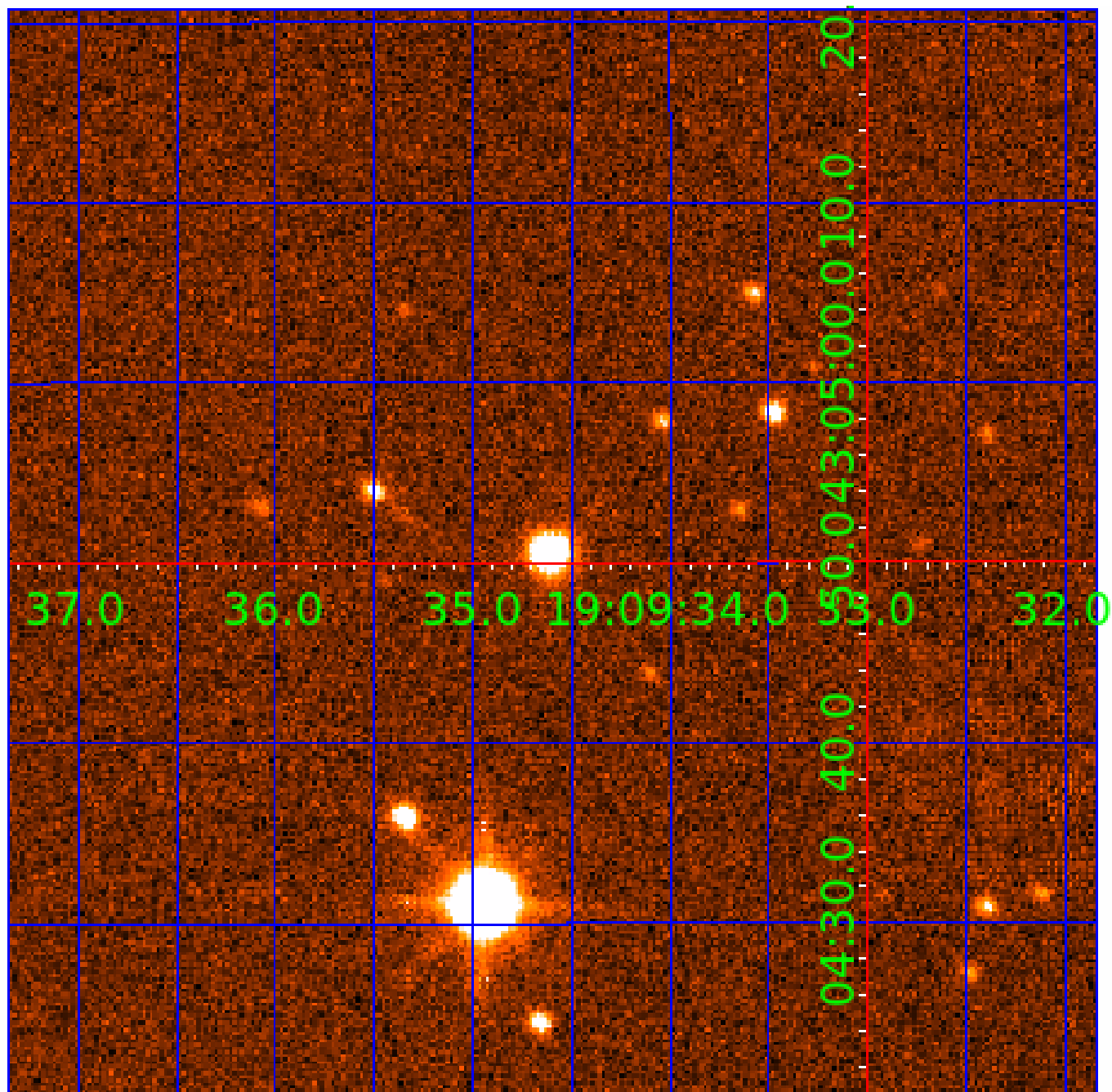


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007431709

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})
007431709-01	OBS	7838.01	0.572518	131.780064	38.4	2.166	7.4	8.0	0.76	5171	0.58	2369.64
007431709-02	OBS	No	302.953799	184.994715	519.6	5.928	9.7	4.7	0.76	5171	1.98	0.55
007431709-03	OBS	No	210.344686	281.767455	623.5	5.161	7.2	6.4	0.76	5171	2.15	0.90

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007431709-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—HALO_GHOST—EPHEM_MATCH
007431709-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007431709-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—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.

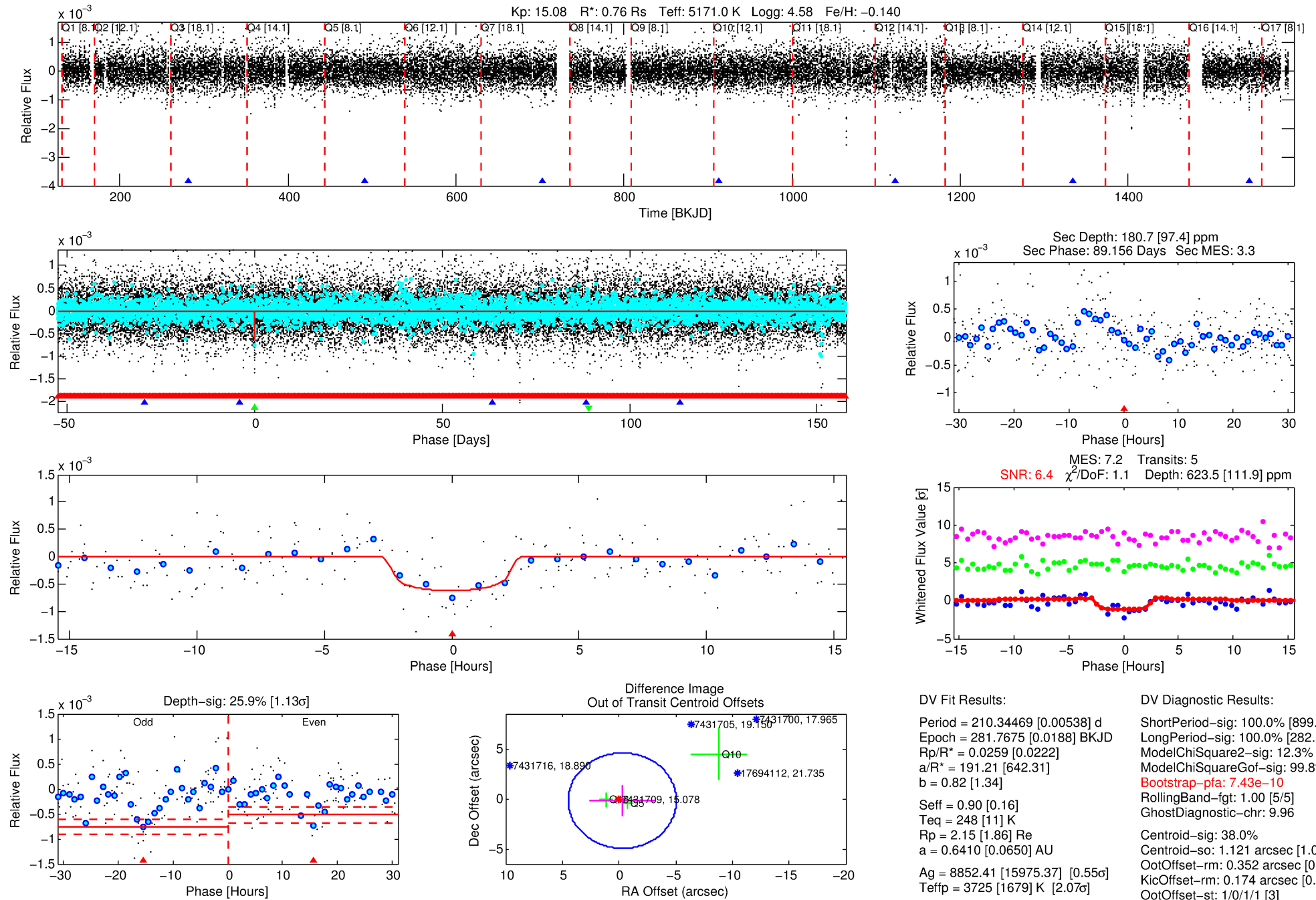
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007431709-03

No Significant Match Found

DV One-Page Summary

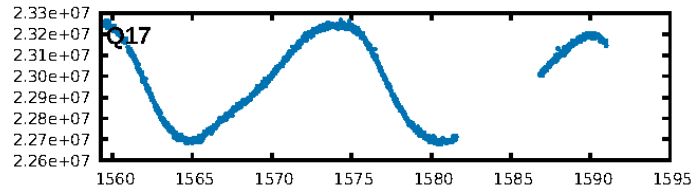
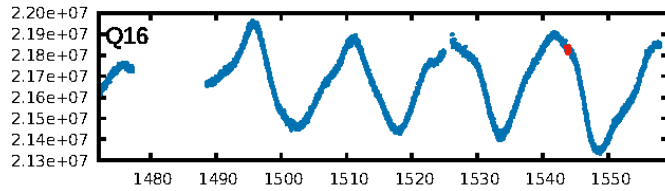
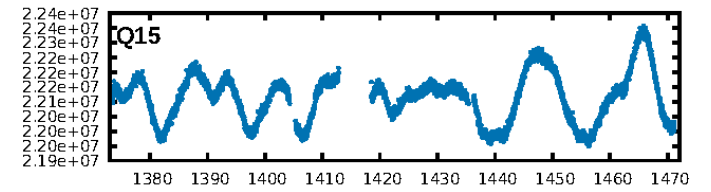
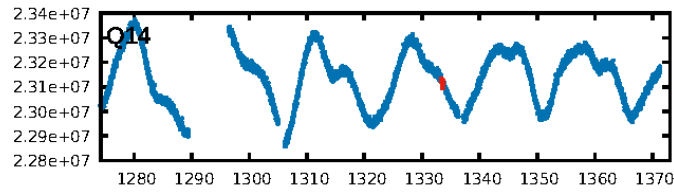
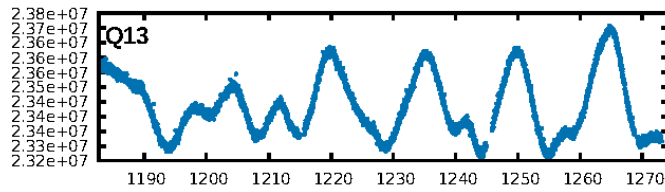
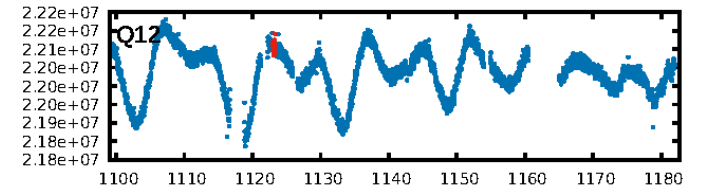
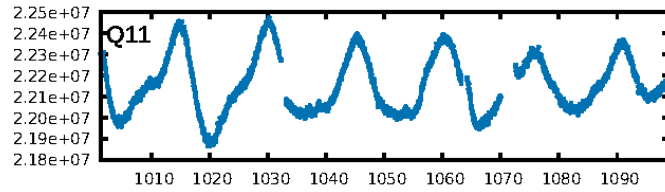
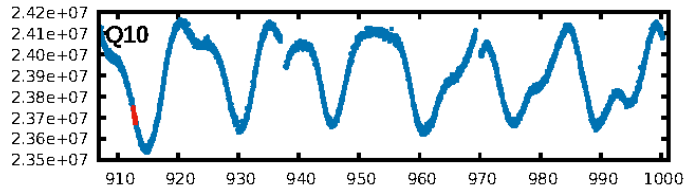
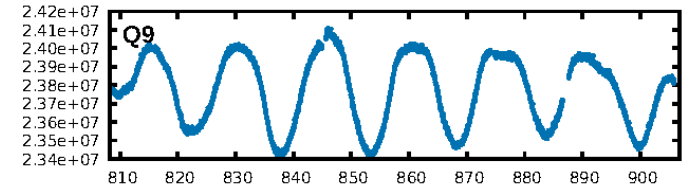
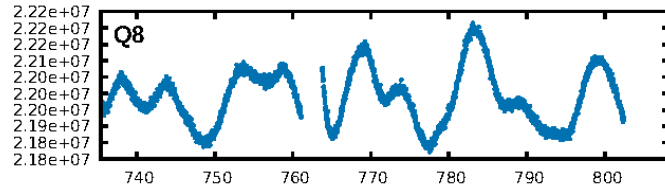
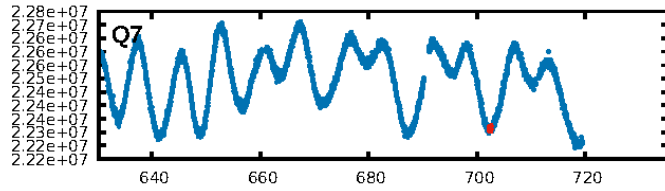
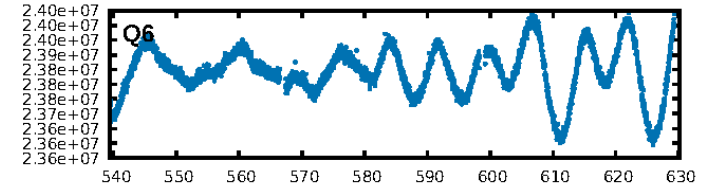
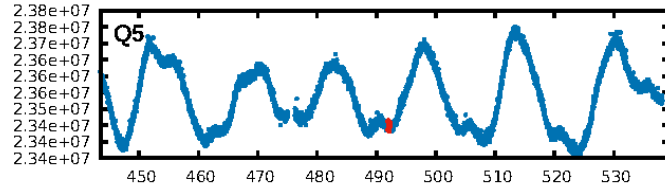
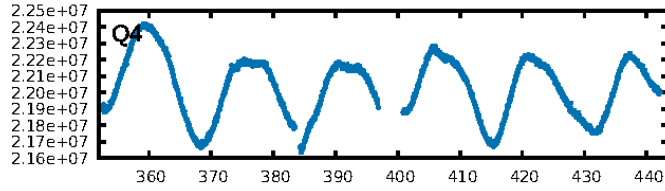
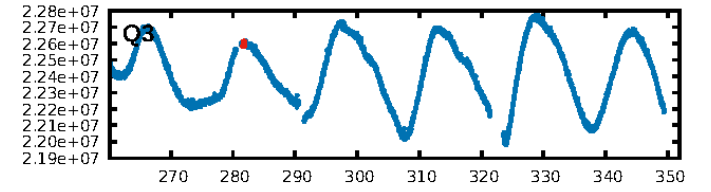
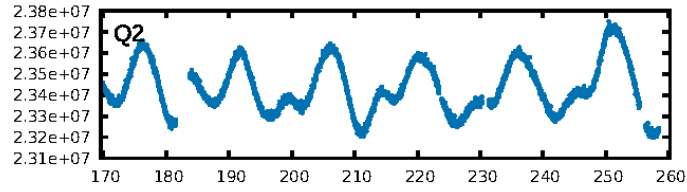
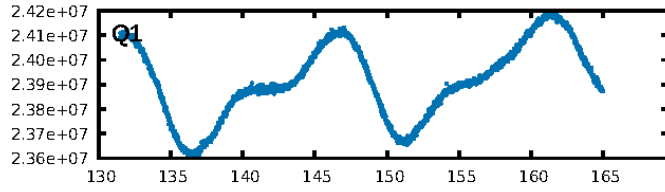
KIC: 7431709 Candidate: 3 of 3 Period: 210.345 d



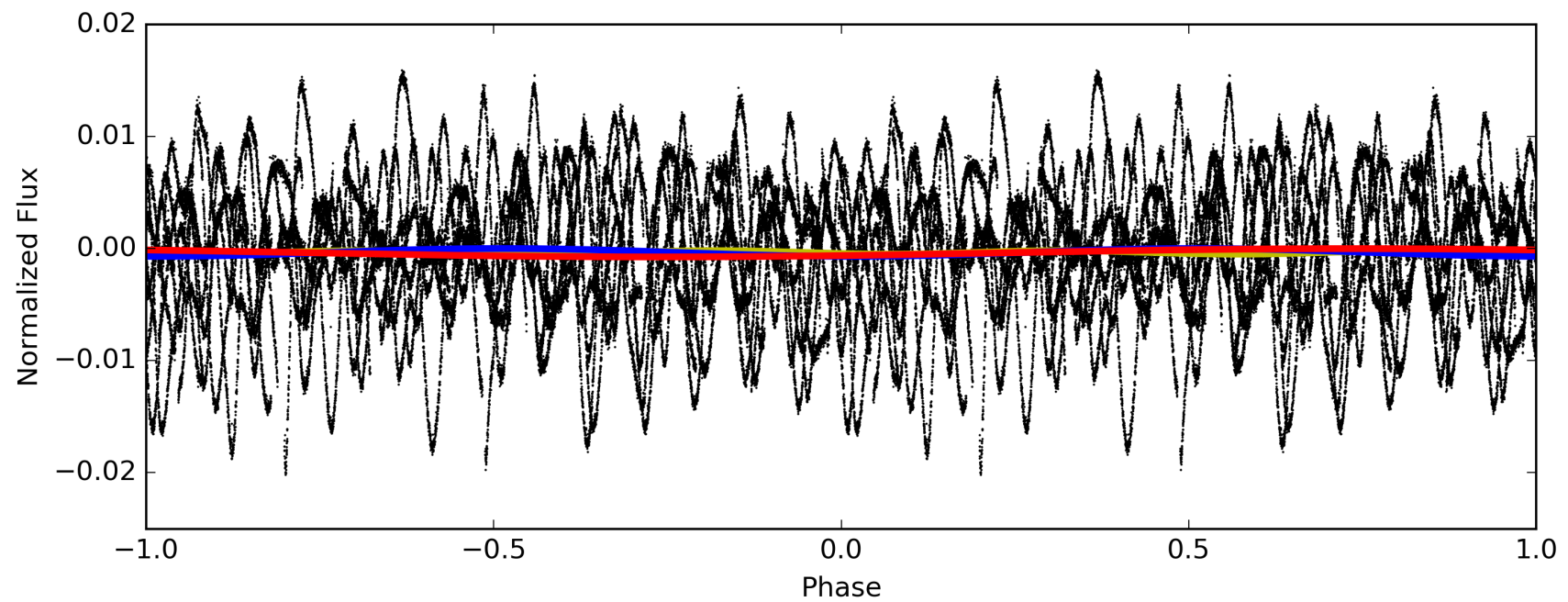
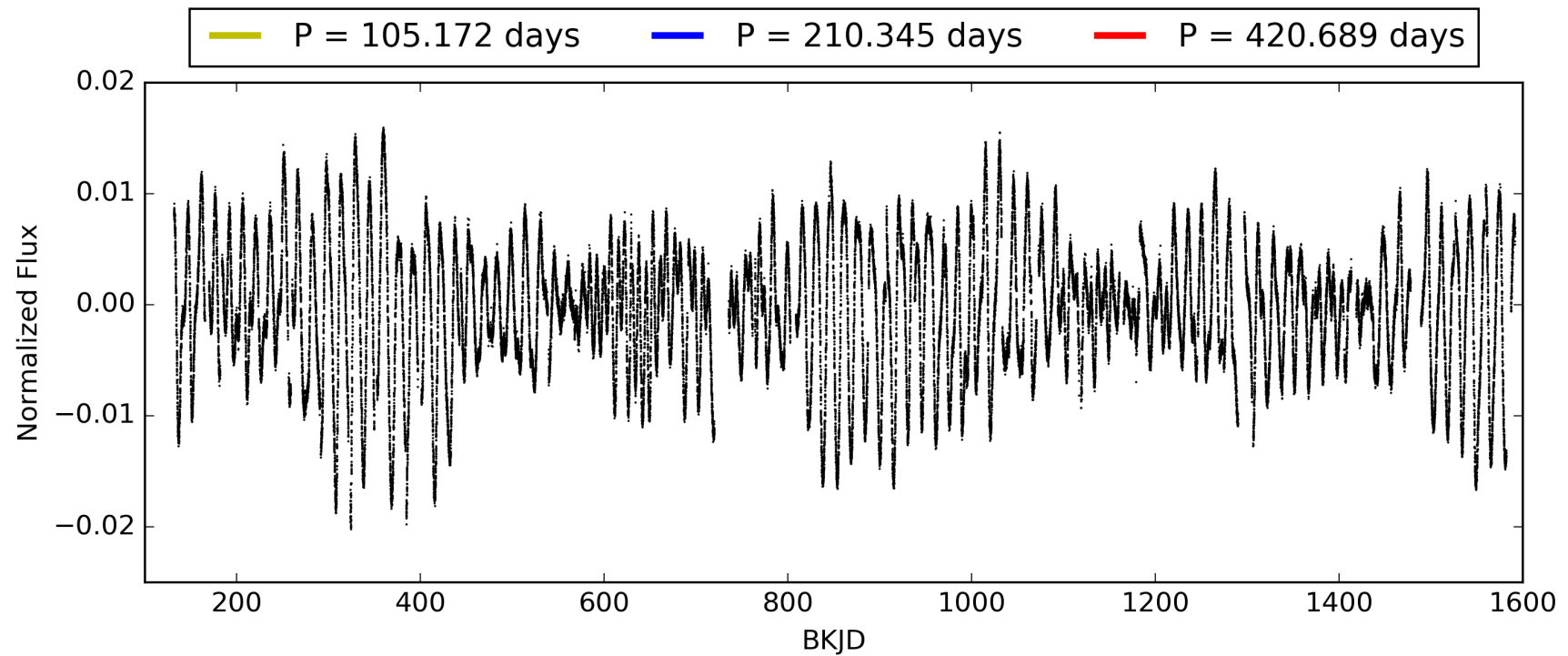
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 16:28:27 Z

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

TCE 007431709-03, PDC Light Curves

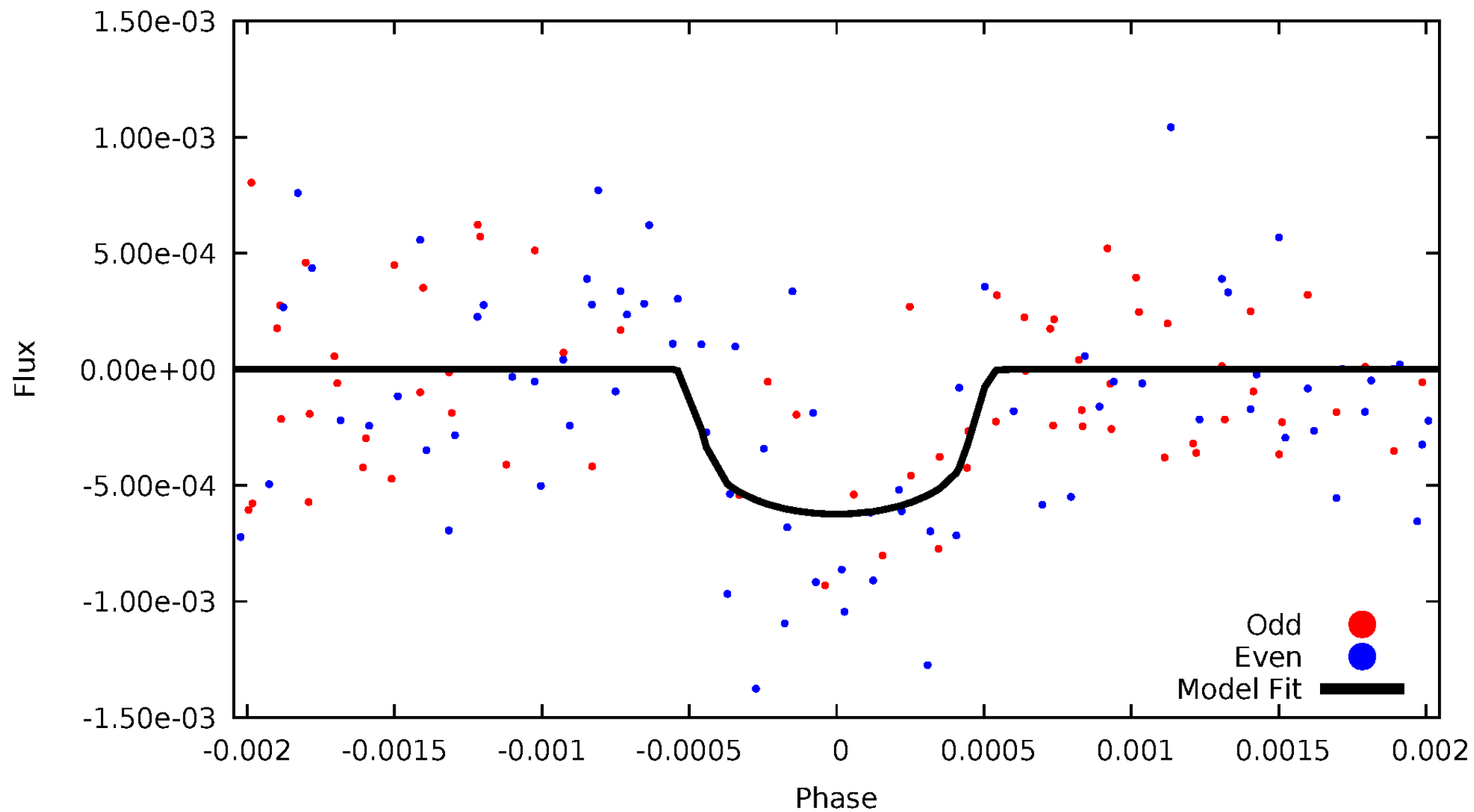


TCE 007431709-03



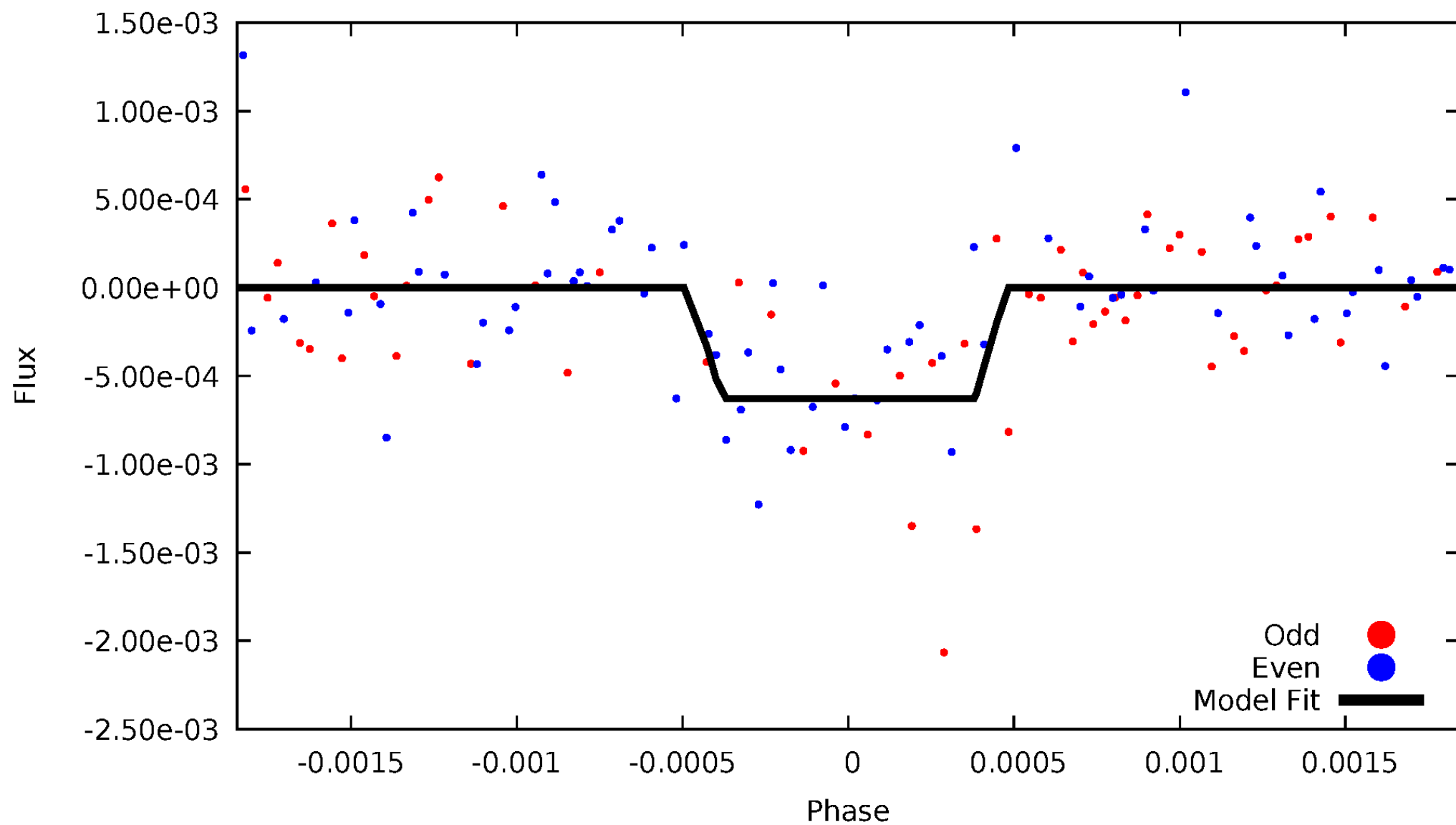
DV Odd/Even

TCE 007431709-03



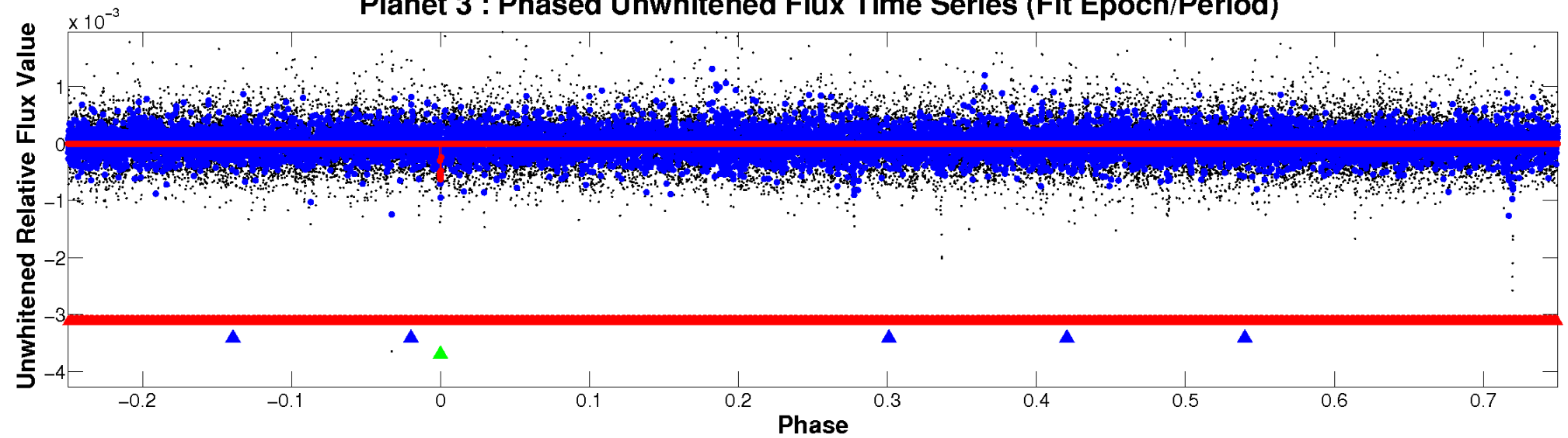
ALT Odd/Even

TCE 007431709-03

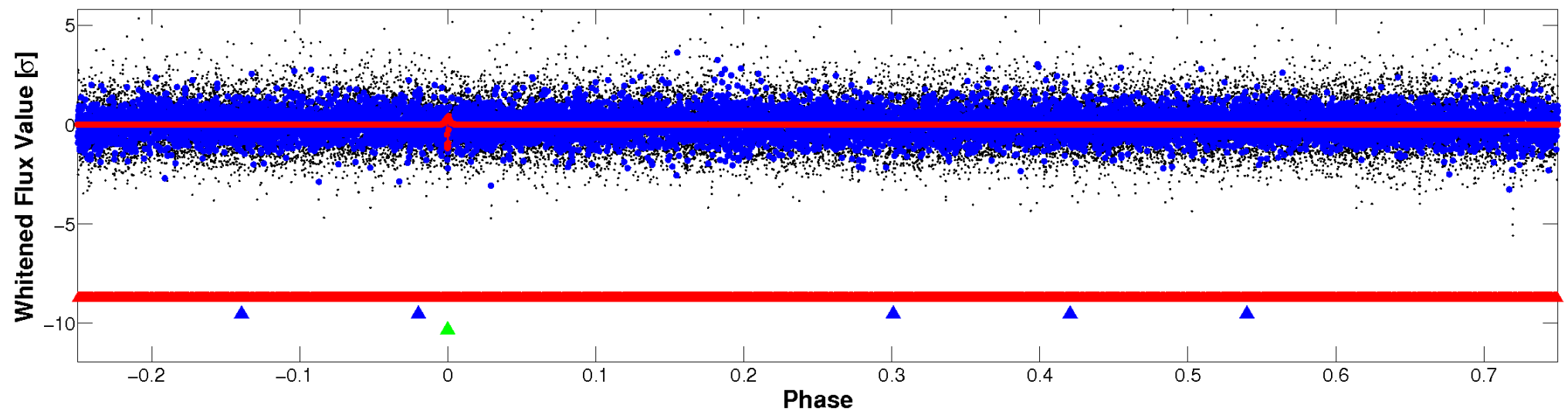


Non-Whitened Vs. Whitened Light Curve

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

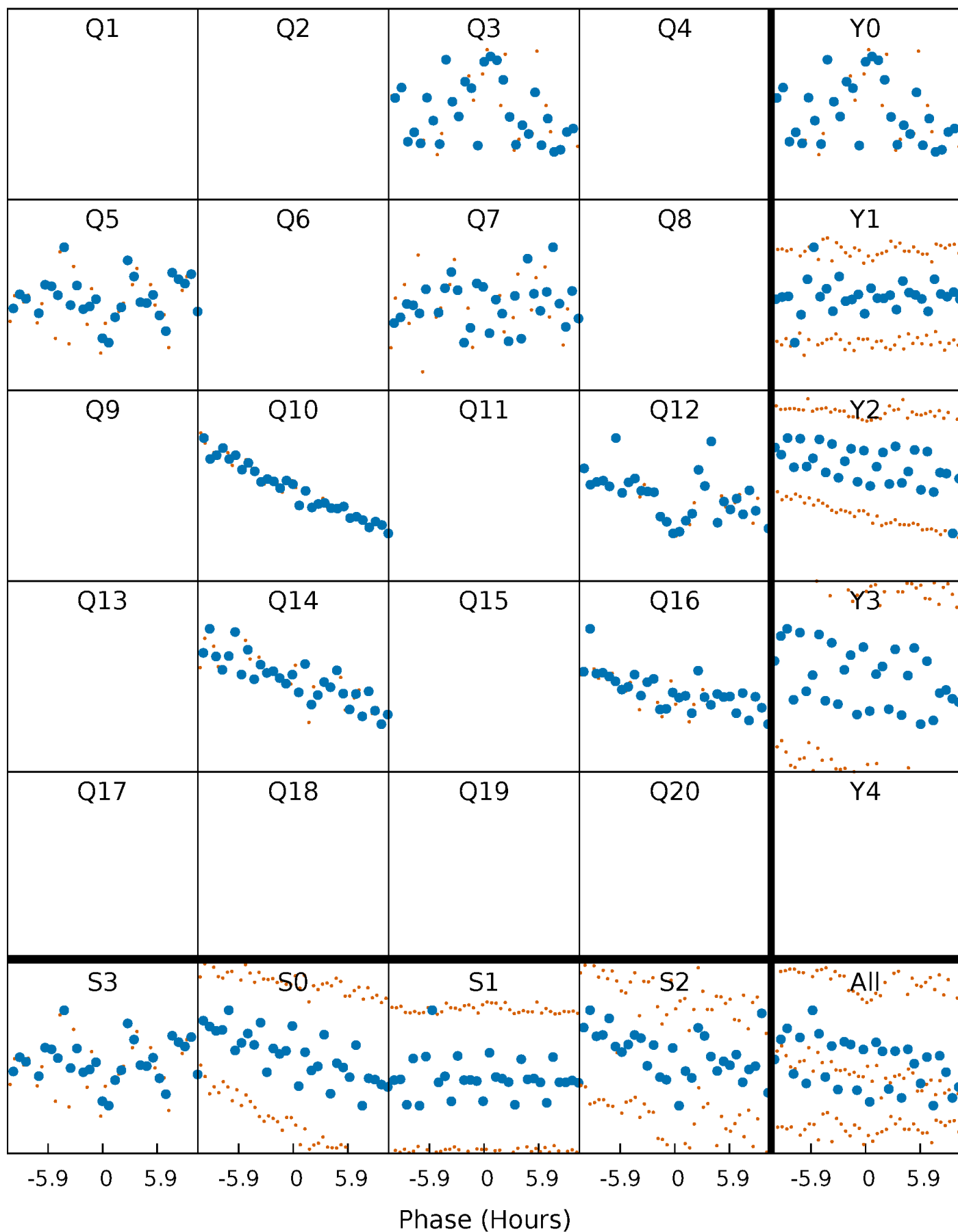


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



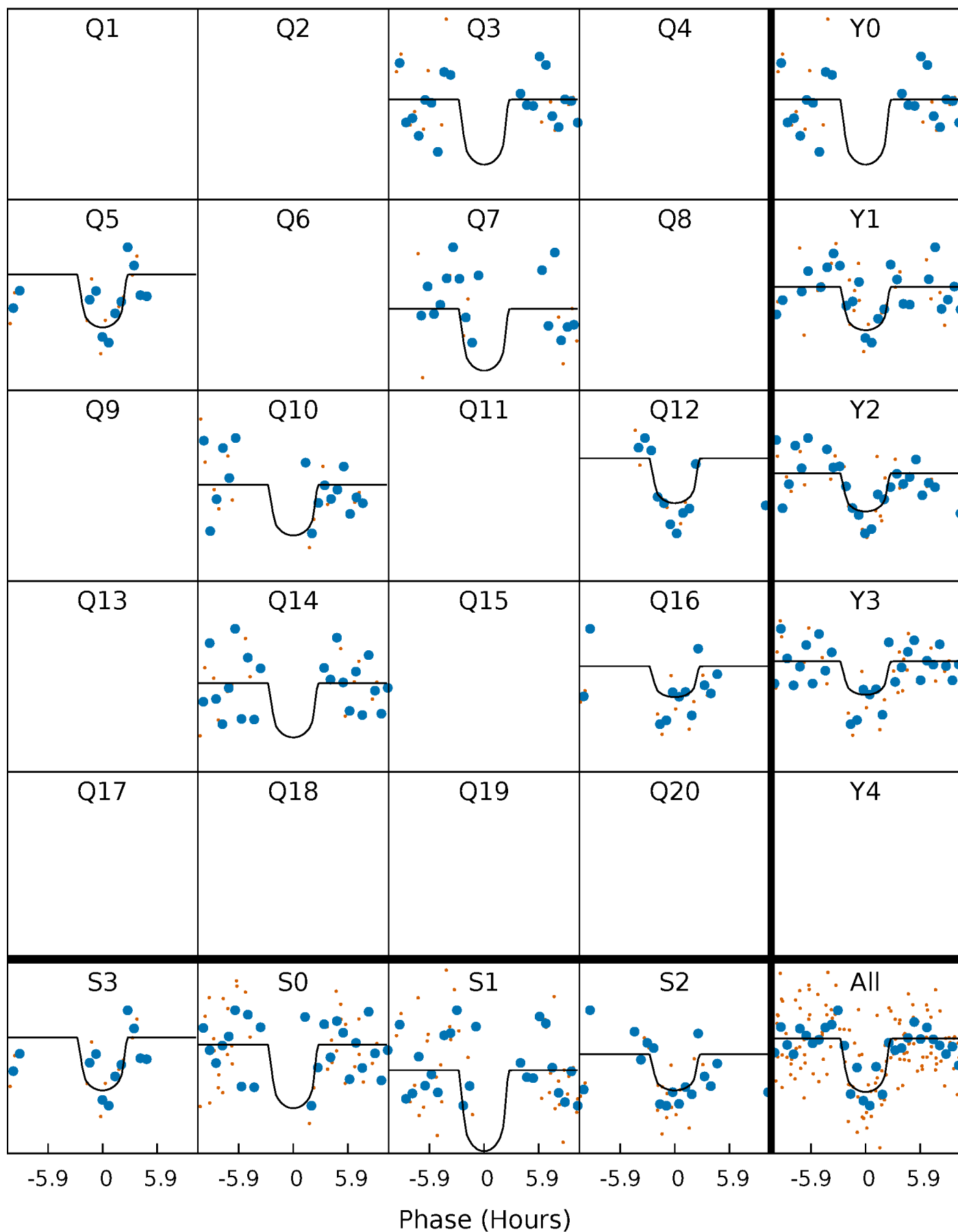
PDC Quarter-Phased Transit Curves

TCE 007431709-03 $P=210.344686$ Days $T_0=281.767455$ (BKJD)



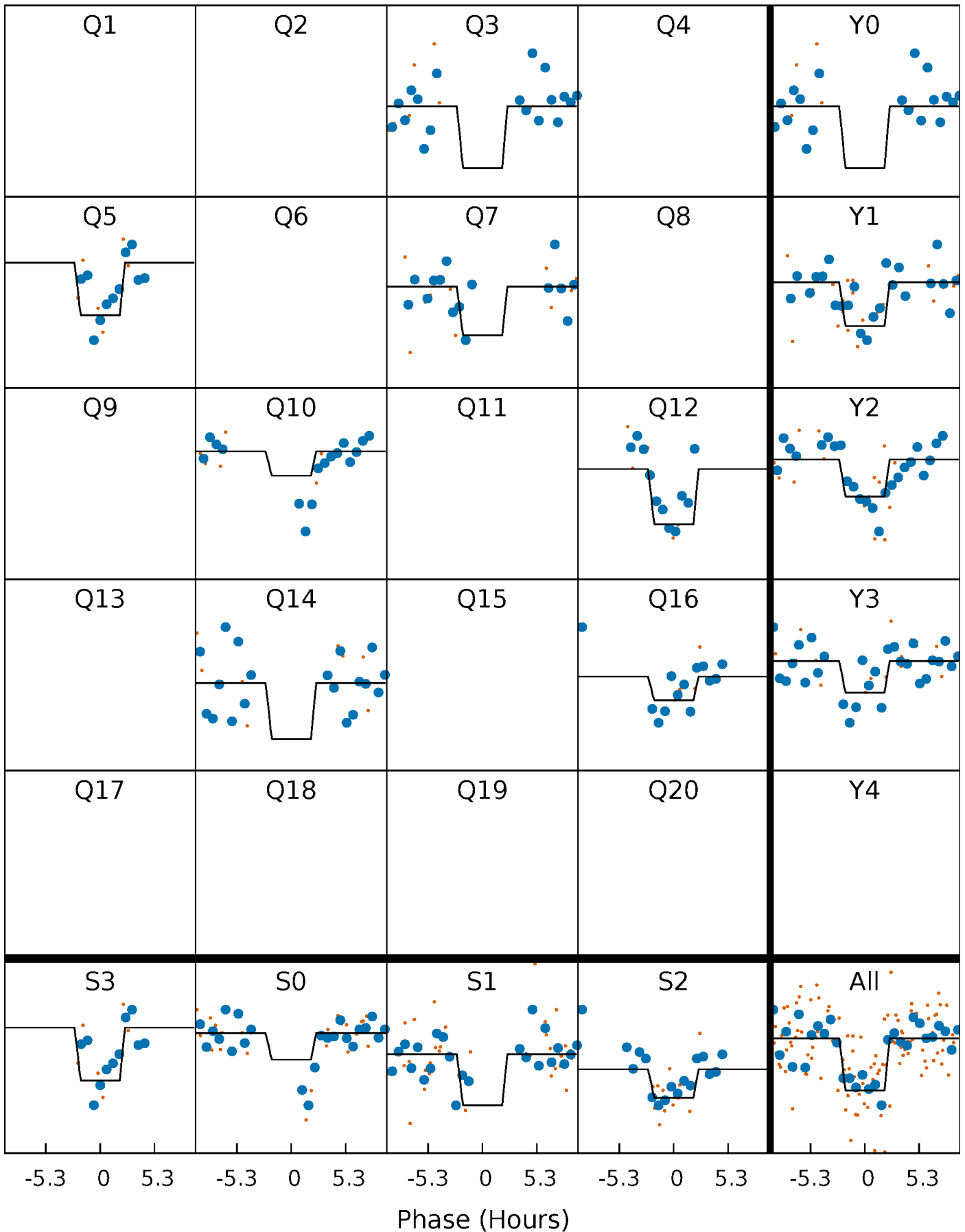
DV Quarter-Phased Transit Curves

TCE 007431709-03 P=210.344686 Days $T_0=281.767455$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

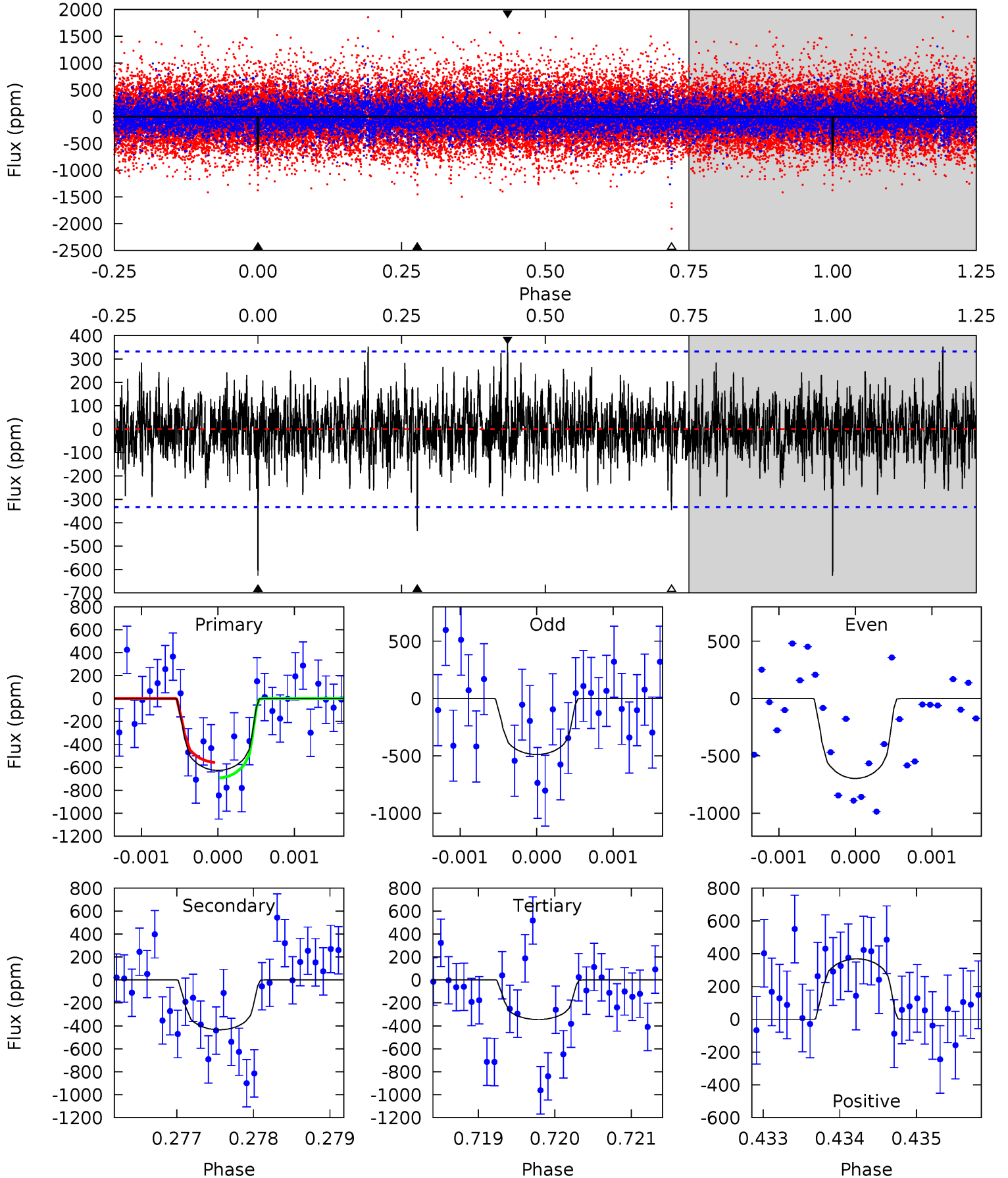
TCE 007431709-03 P=210.340500 Days $T_0=281.792000$ (BKJD)



DV Model-Shift Uniqueness Test

007431709-03, P = 210.344686 Days, E = 71.422769 Days

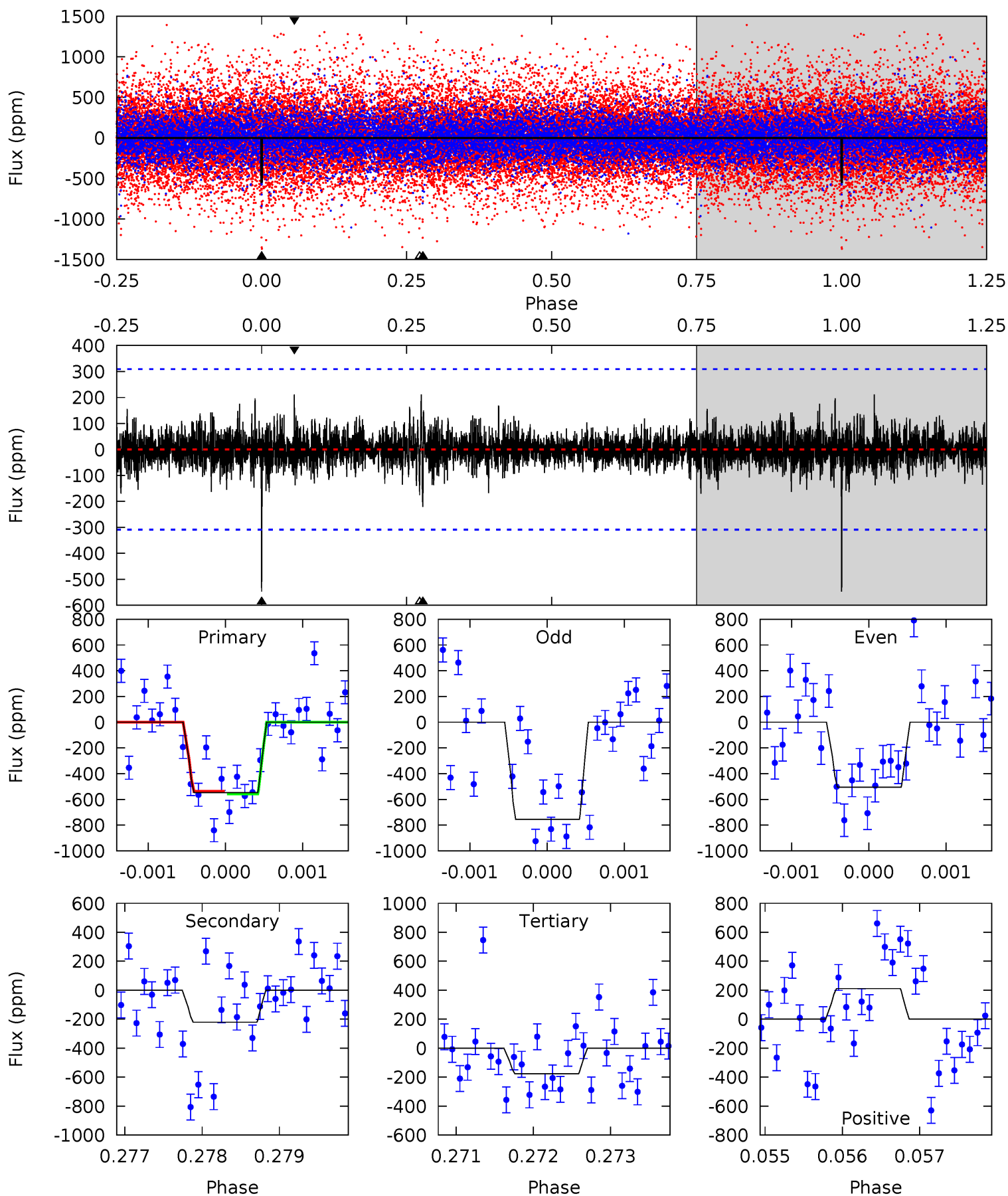
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	7.12	5.66	6.04	5.45	3.29	1.44	4.61	4.23	1.46	1.08	1.65	0.96	0.37	1.10



Alt Model-Shift Uniqueness Test

007431709-03, P = 210.340500 Days, E = 71.451500 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.69	3.91	3.12	3.75	5.47	3.32	0.79	6.57	5.94	0.79	0.17	2.19	1.54	0.28	0.17



Stellar Parameters For KIC 007431709

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5171^{+153}_{-153}	$4.576^{+0.042}_{-0.072}$	$-0.140^{+0.300}_{-0.300}$	$0.760^{+0.097}_{-0.071}$	$0.793^{+0.082}_{-0.073}$	$2.549^{+0.521}_{-0.622}$
	+3%/-3%	+1%/-2%	+214%/-214%	+13%/-9%	+10%/-9%	+20%/-24%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007431709-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-434 ± 61	$2.41^{+1.85}_{-1.48}$	350^{+14}_{-14}	4516^{+2424}_{-843}	16348^{+97179}_{-11153}
Alt.	-221 ± 56	$2.28^{+1.80}_{-1.37}$	350^{+13}_{-13}	4063^{+1799}_{-753}	9142^{+46637}_{-6495}

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

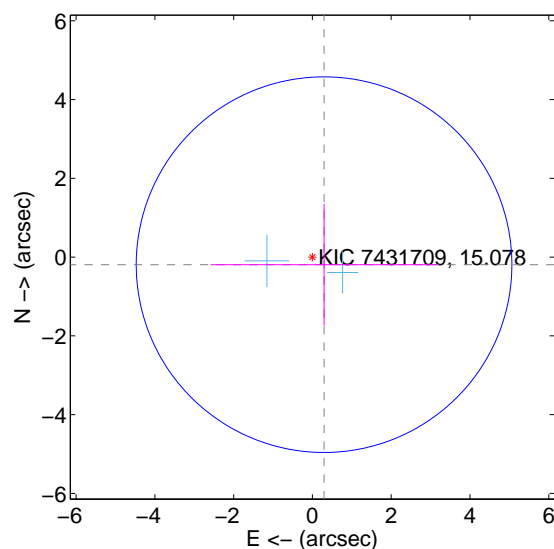
Supplemental centroid analysis for 007431709-03. Kepler magnitude: 15.08. Transit SNR 6.41

There are 2 quarters with good PRF difference image offsets

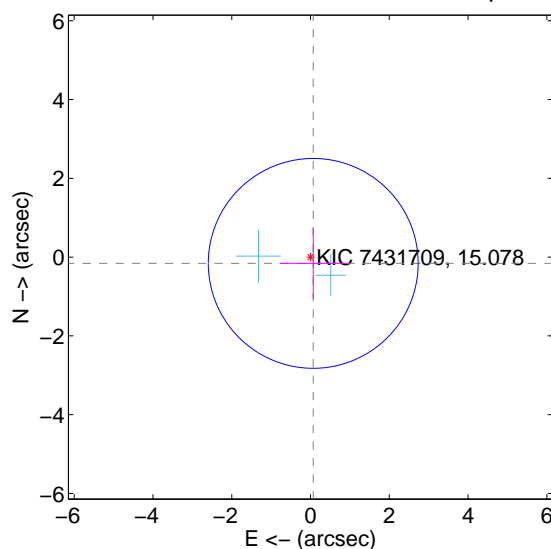
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.352 ± 1.589	0.22	-0.295 ± 2.877	-0.192 ± 1.544
PRF-fit source offset from KIC position	0.174 ± 0.888	0.20	-0.068 ± 0.849	-0.160 ± 0.895
photometric centroid source offset	1.12 ± 1.03	1.09	0.91 ± 0.98	0.66 ± 1.13

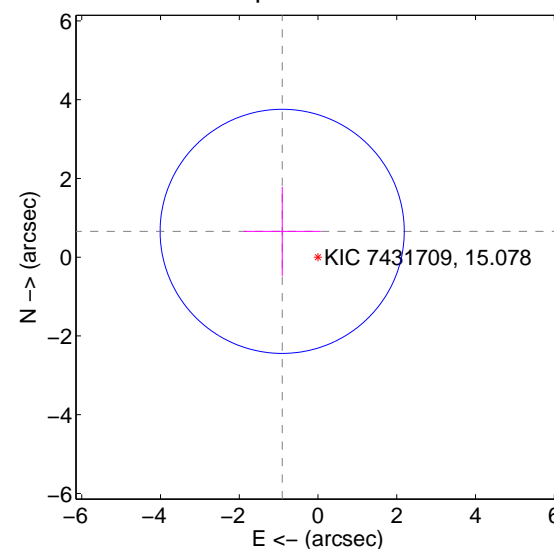
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

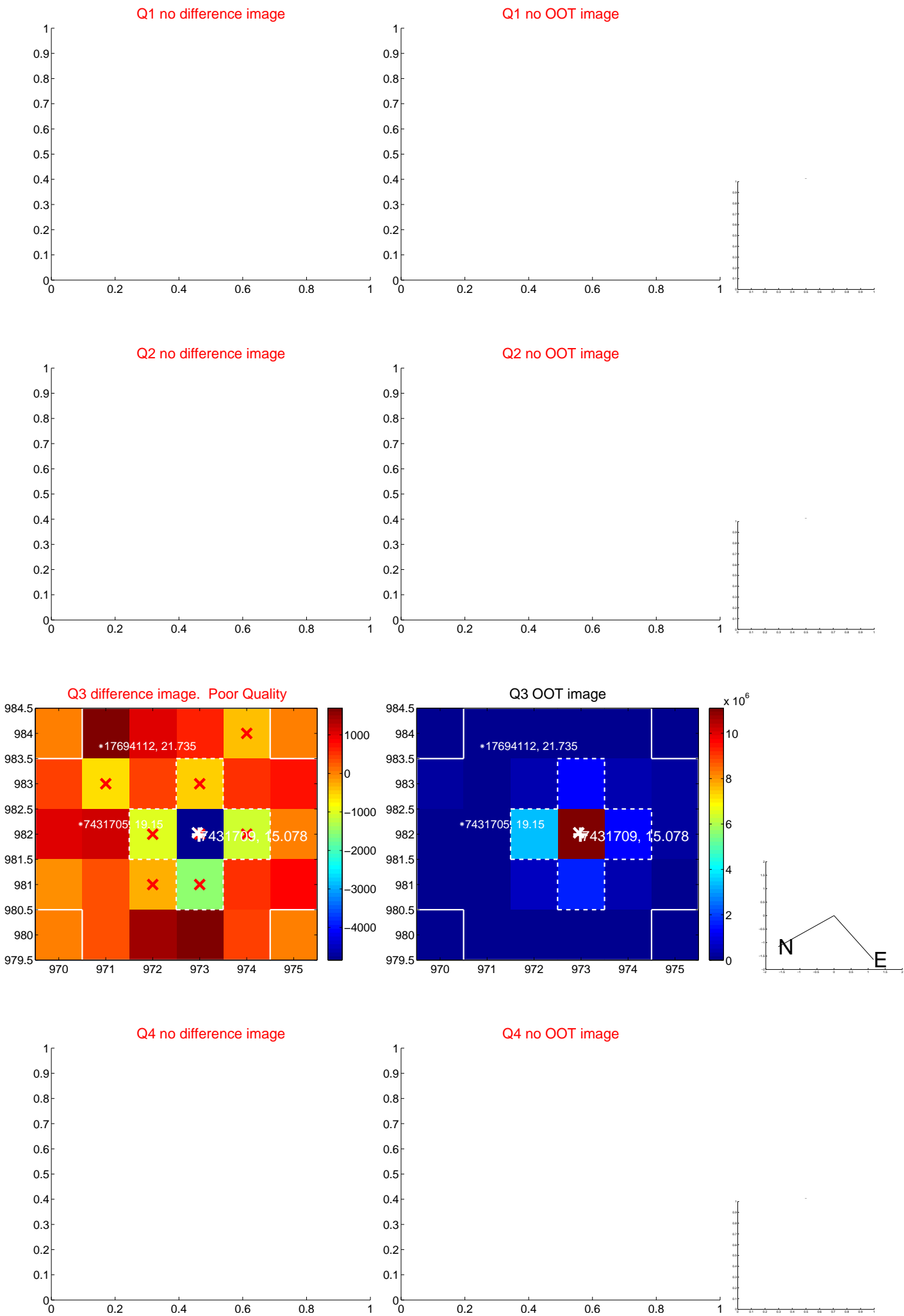


offset from photometric centroids

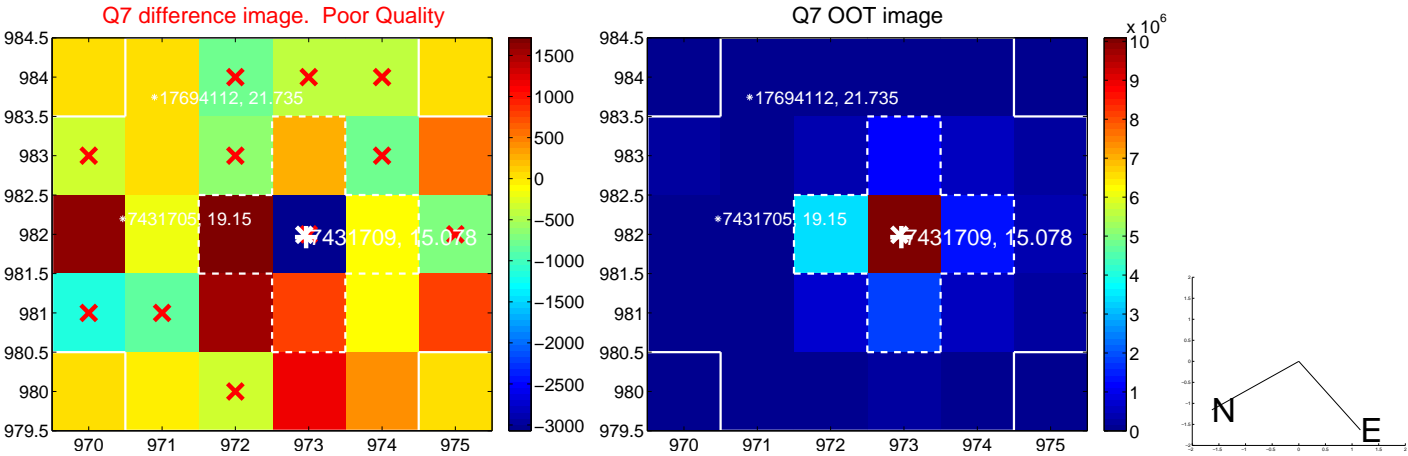
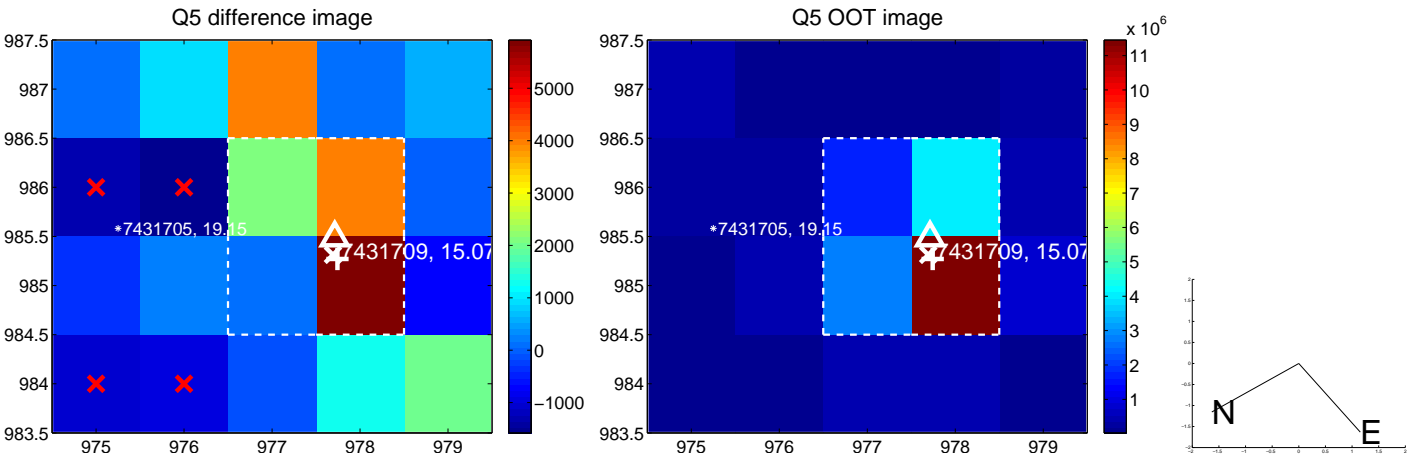


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

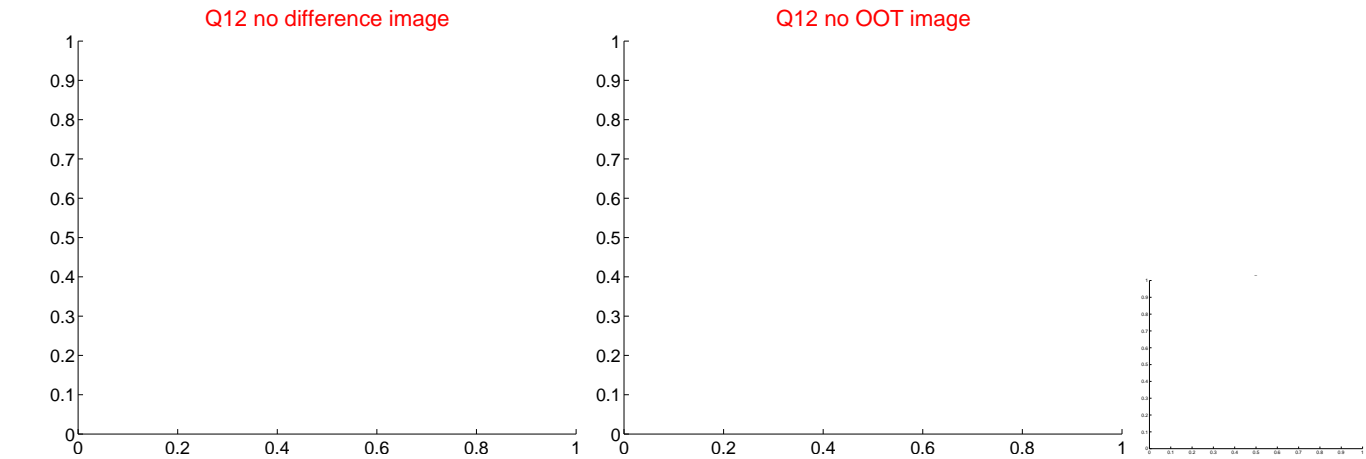
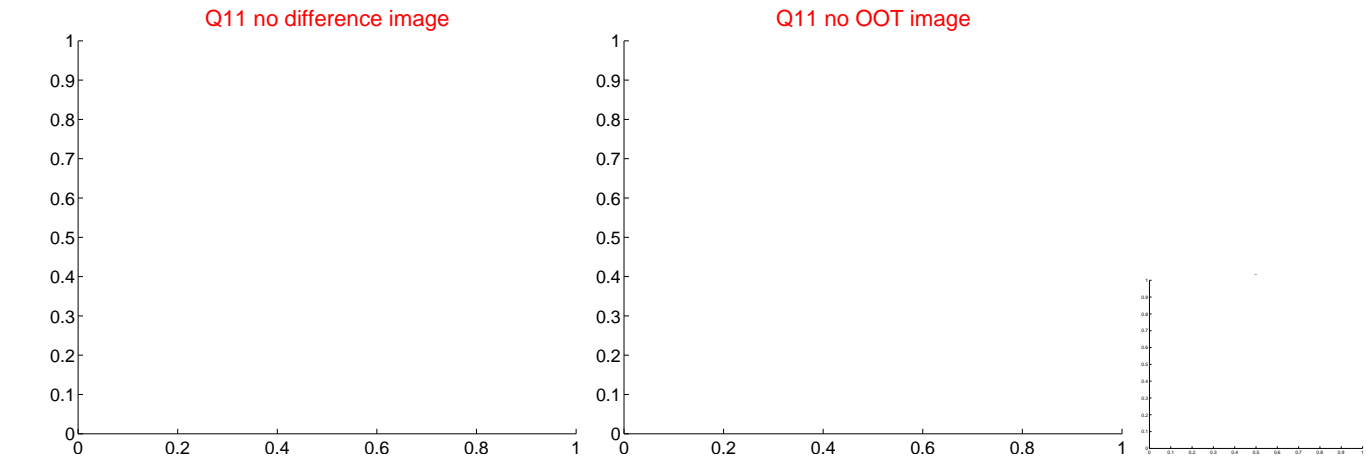
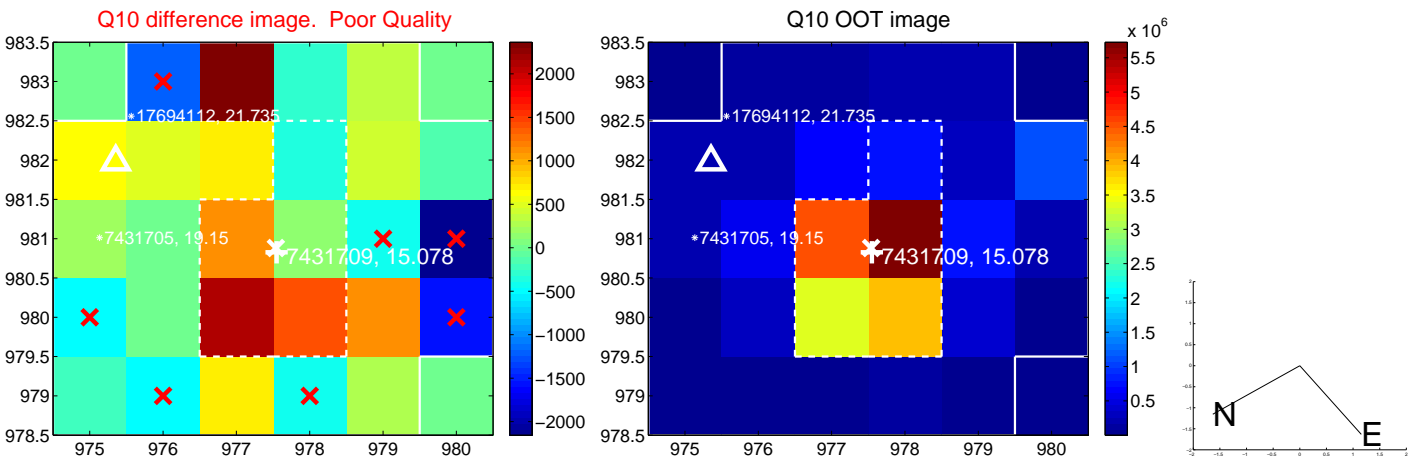
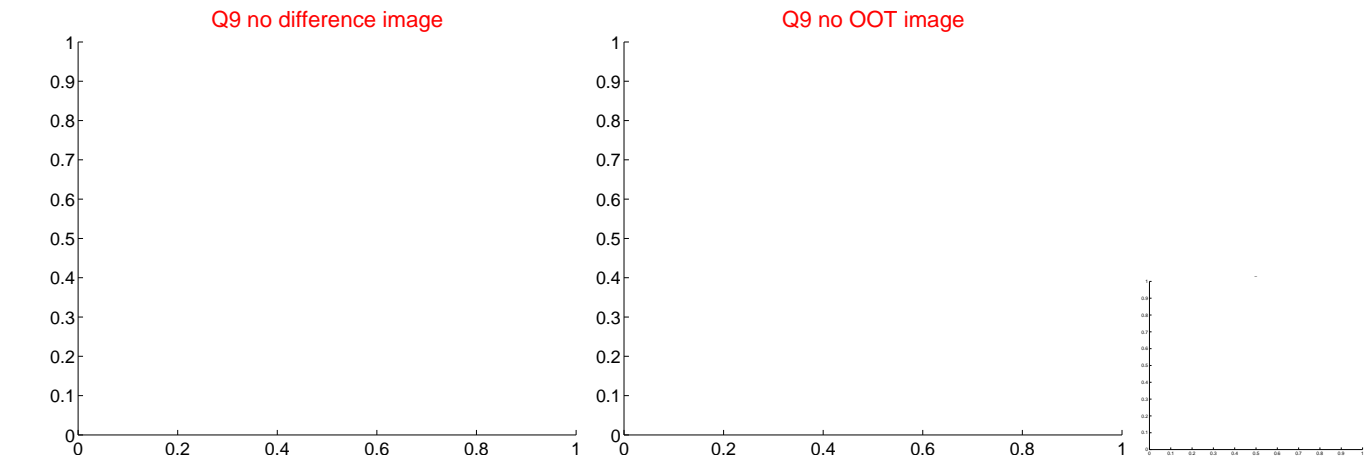
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



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



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

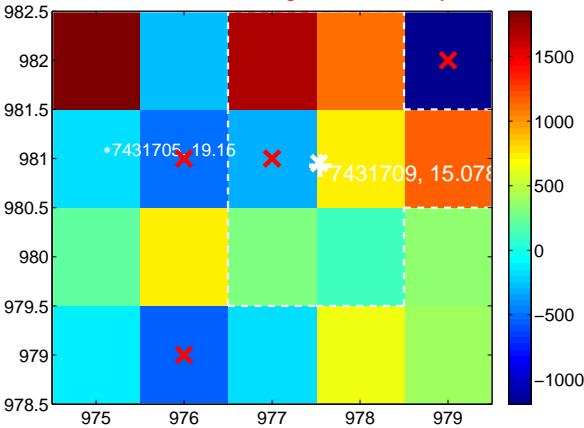
Q13 no difference image



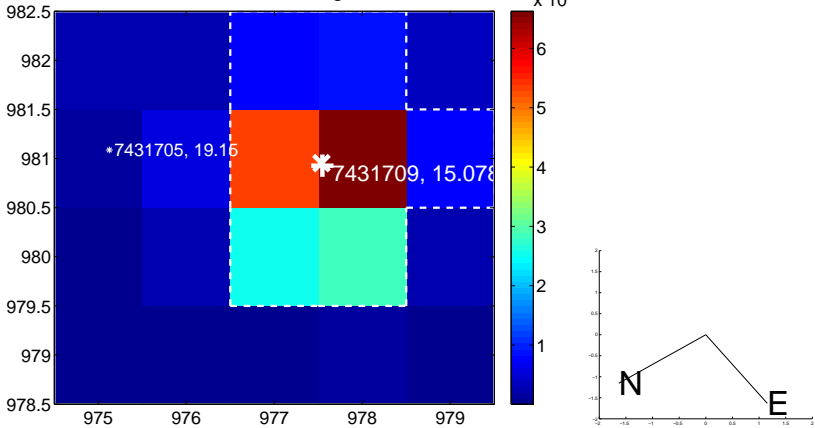
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



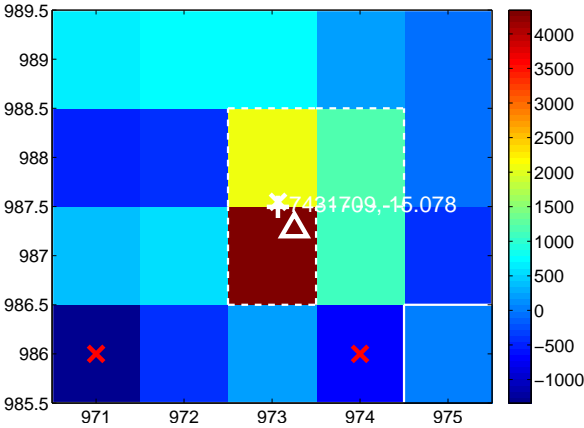
Q15 no difference image



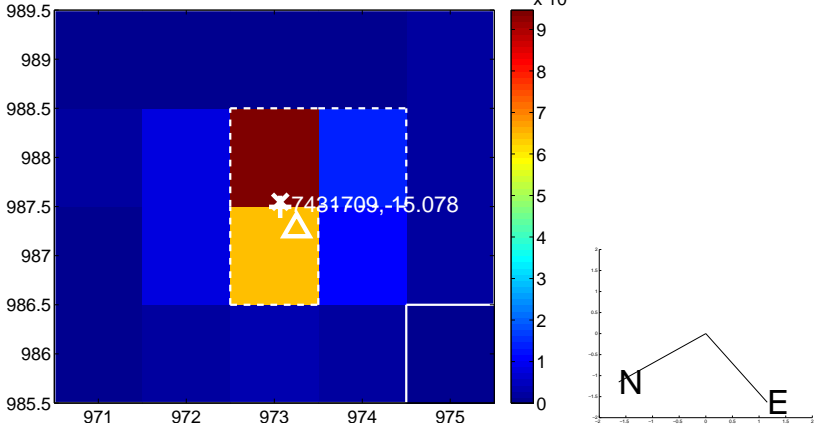
Q15 no OOT image



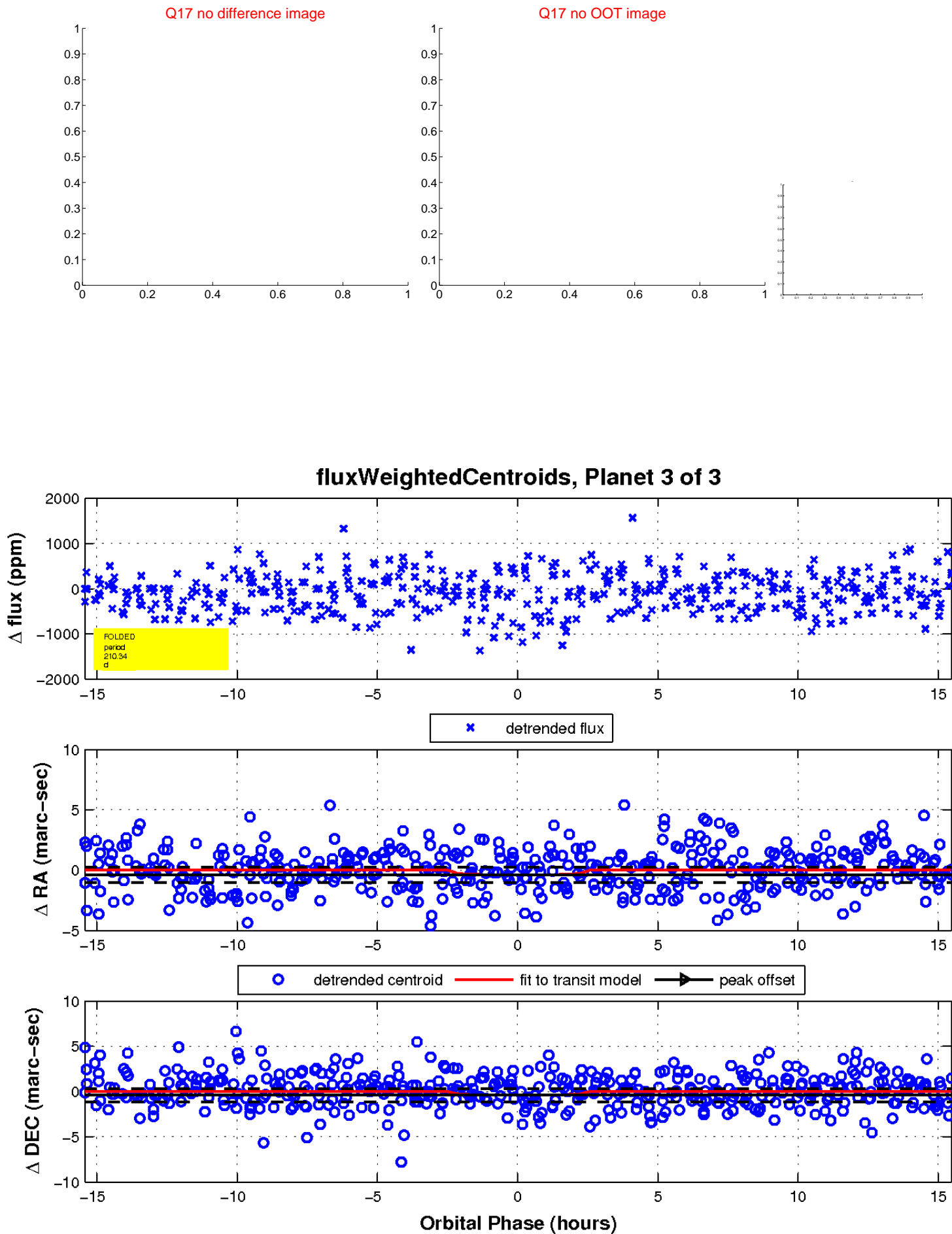
Q16 difference image



Q16 OOT image



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



UKIRT Image

Declination

