

KIC 010470309

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})
010470309-01	OBS	No	0.741154	132.001600	5.2	4.196	8.6	4.6	1.34	6449	0.32	9741.44
010470309-03	OBS	No	74.804197	182.987951	92.2	7.403	7.8	5.6	1.34	6449	1.44	20.73
010470309-04	OBS	No	102.592421	203.815217	167.2	4.212	8.1	6.0	1.34	6449	2.32	13.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010470309-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
010470309-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
010470309-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET

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

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

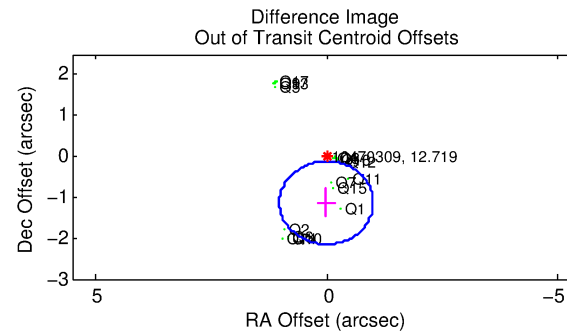
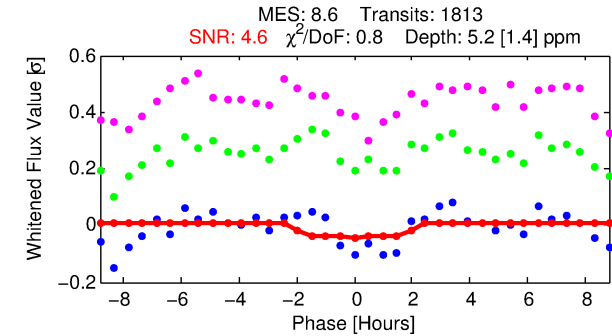
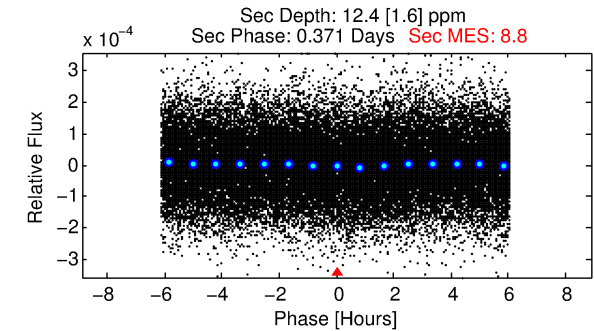
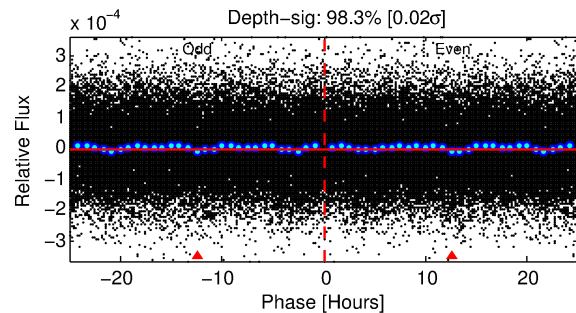
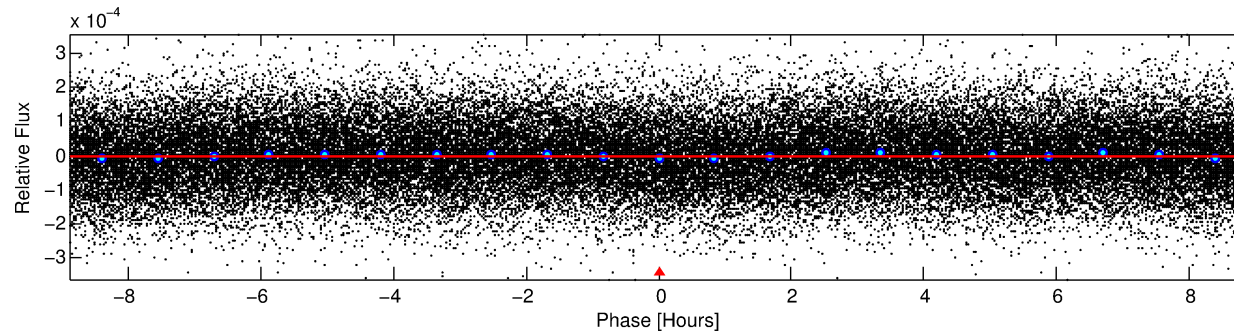
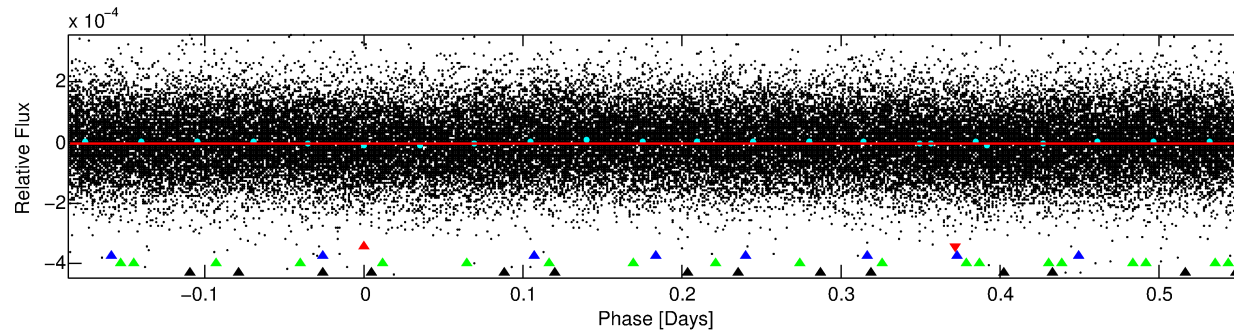
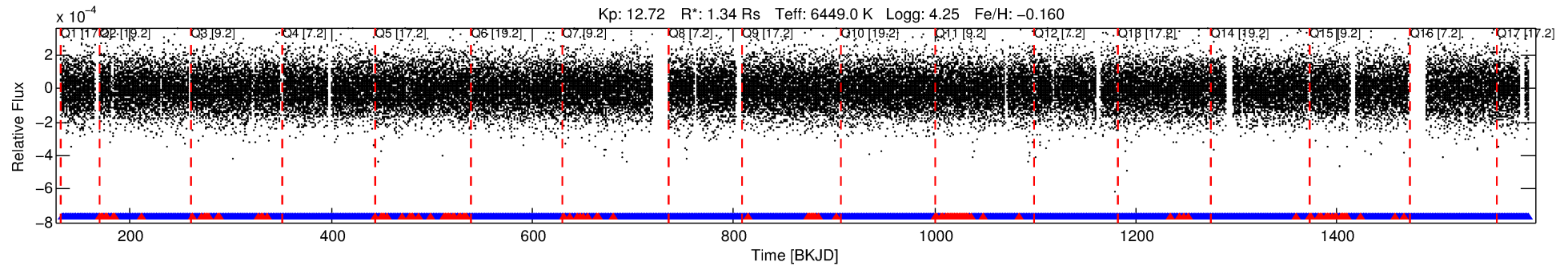
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010470309-01

No Significant Match Found

DV One-Page Summary

KIC: 10470309 Candidate: 1 of 4 Period: 0.741 d



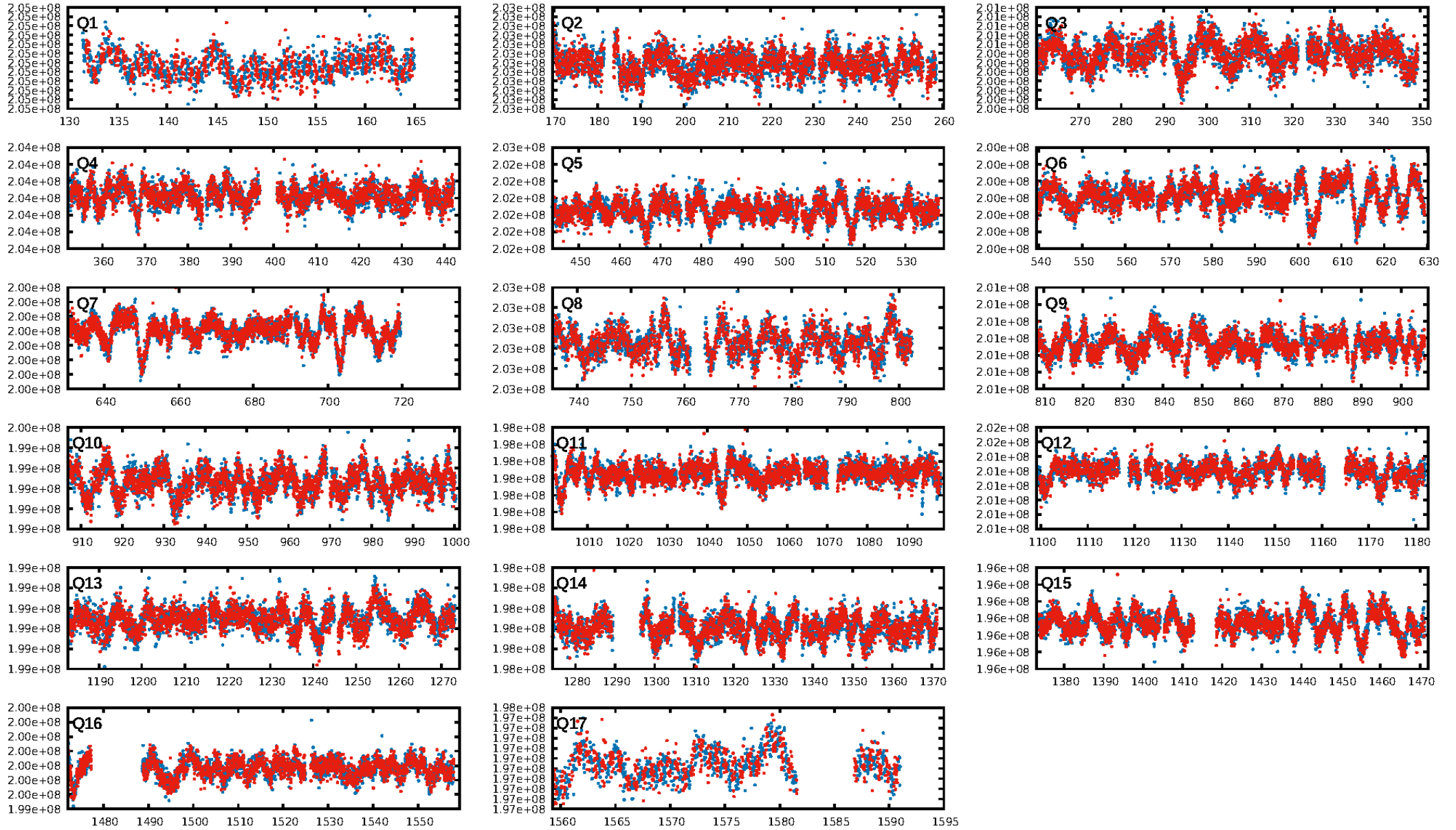
DV Fit Results:

Period = 0.74115 [0.00002] d
Epoch = 132.0016 [0.0086] BKJD
Rp/R* = 0.0022 [0.0011]
a/R* = 1.37 [1.63]
b = 0.51 [3.65]
Seff = 9741.44 [2759.90]
Teq = 2533 [179] K
Rp = 0.32 [0.17] Re
a = 0.0169 [0.0030] AU
Ag = 19.40 [19.87] [0.93σ]
Teff = 8220 [2047] K [2.77σ]

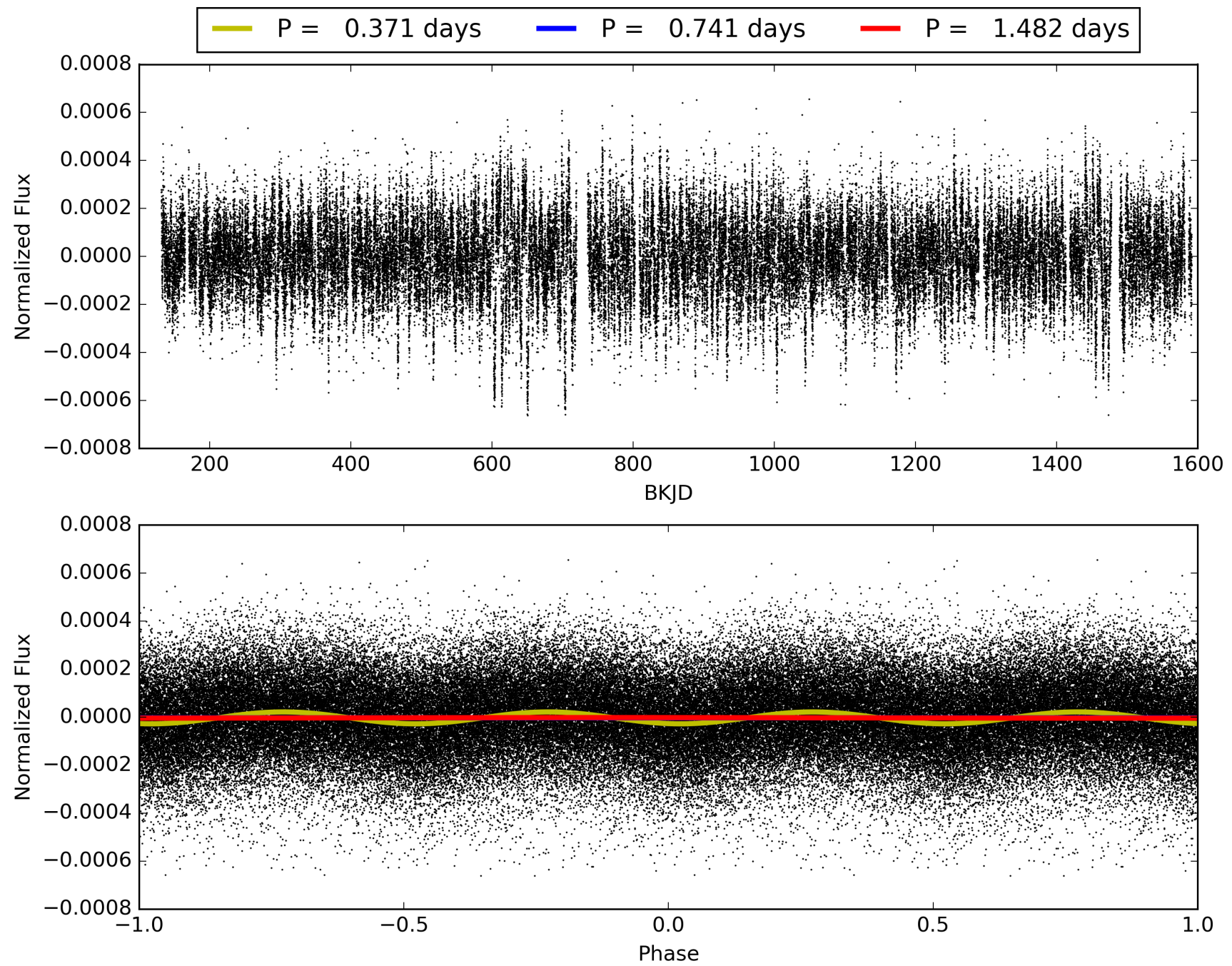
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [208.90σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.12e-12
RollingBand-fgt: 0.92 [1597/1732]
GhostDiagnostic-chr: -0.2266
Centroid-sig: 11.1%
Centroid-so: 3.117 arcsec [0.81σ]
OotOffset-rm: 1.134 arcsec [3.35σ]
KicOffset-rm: 13.280 arcsec [48.24σ]
OotOffset-st: 4/3/4/5 [16]
KicOffset-st: 4/3/4/5 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 010470309-01, PDC Light Curves

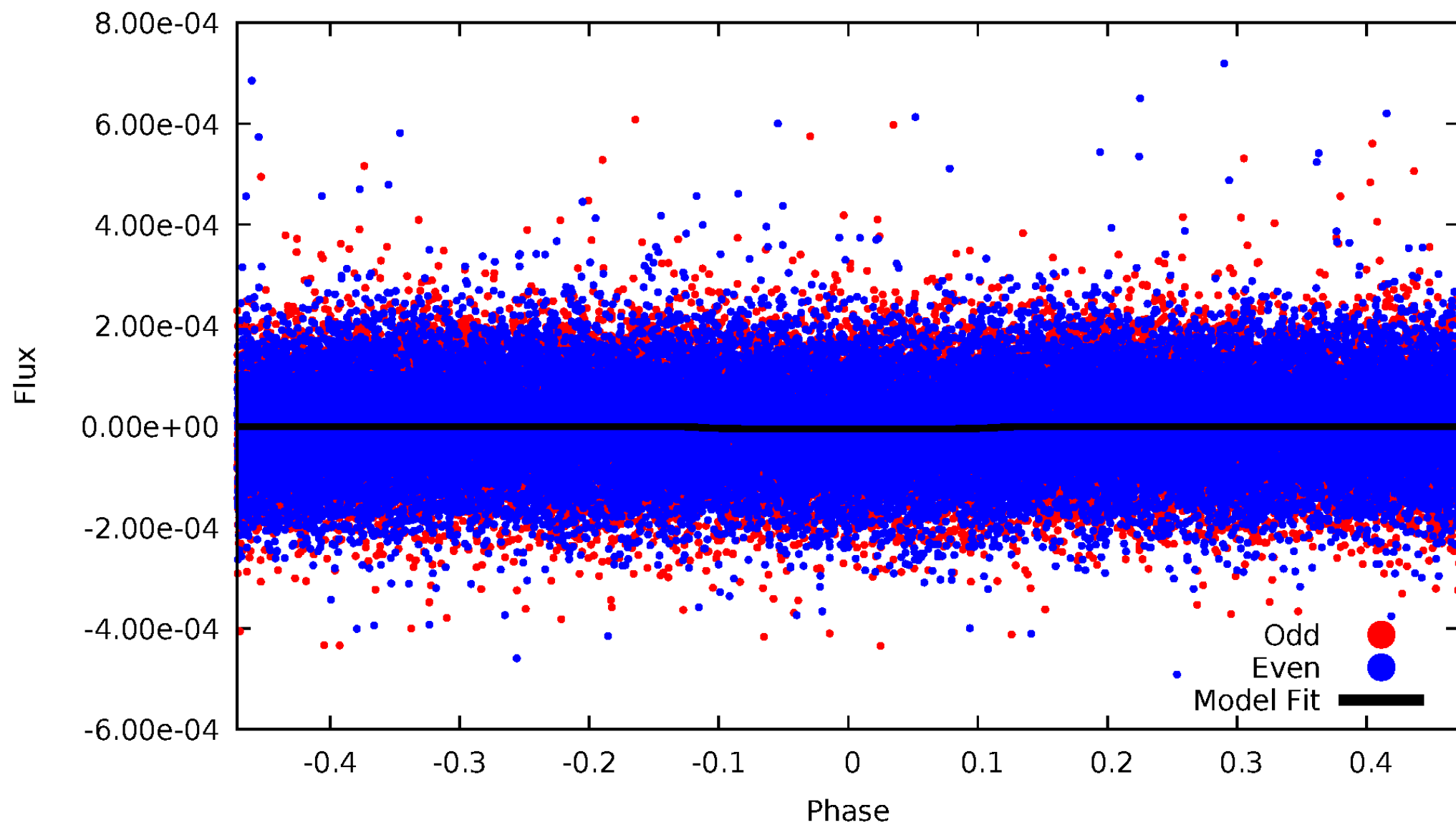


TCE 010470309-01



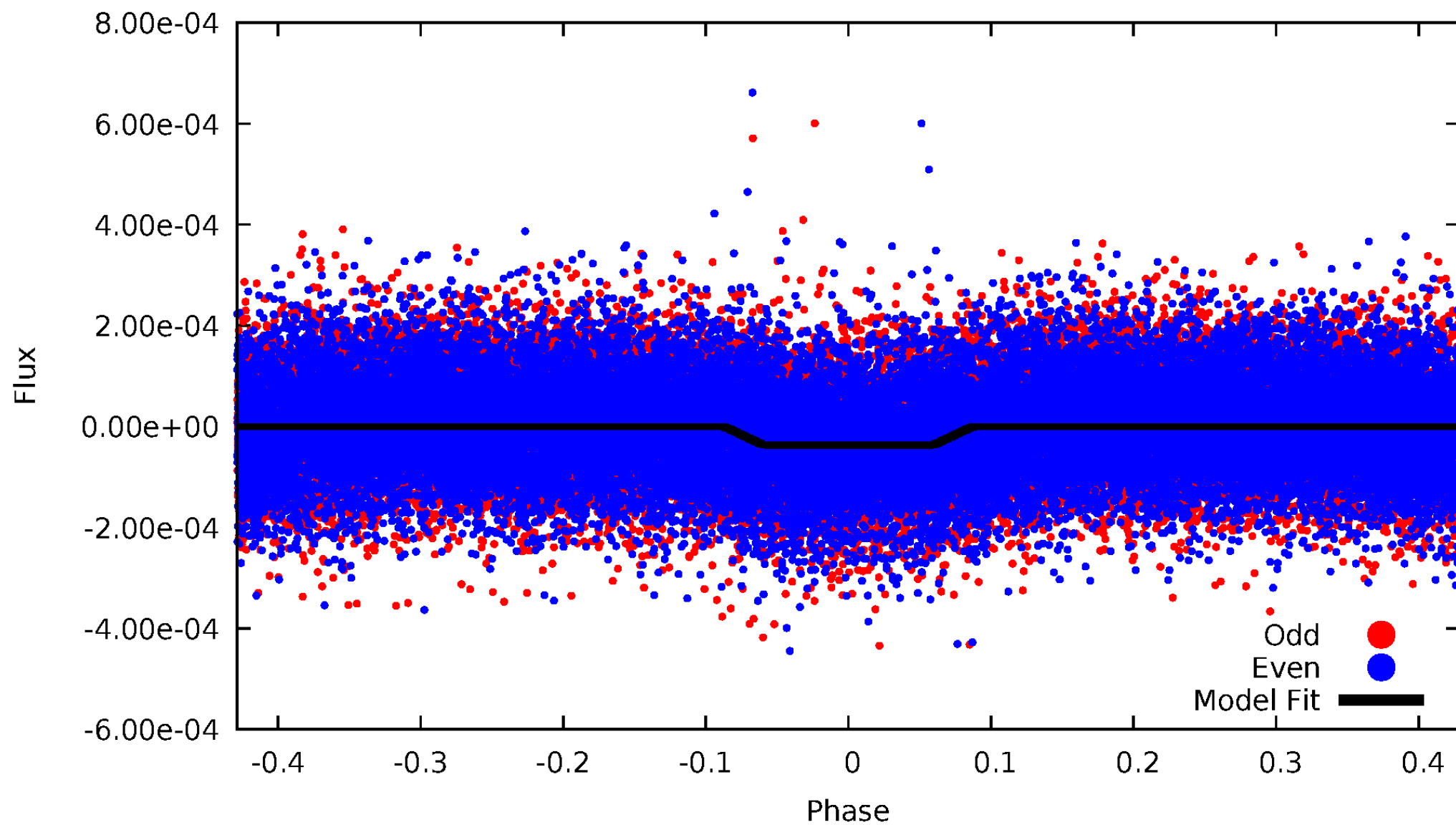
DV Odd/Even

TCE 010470309-01

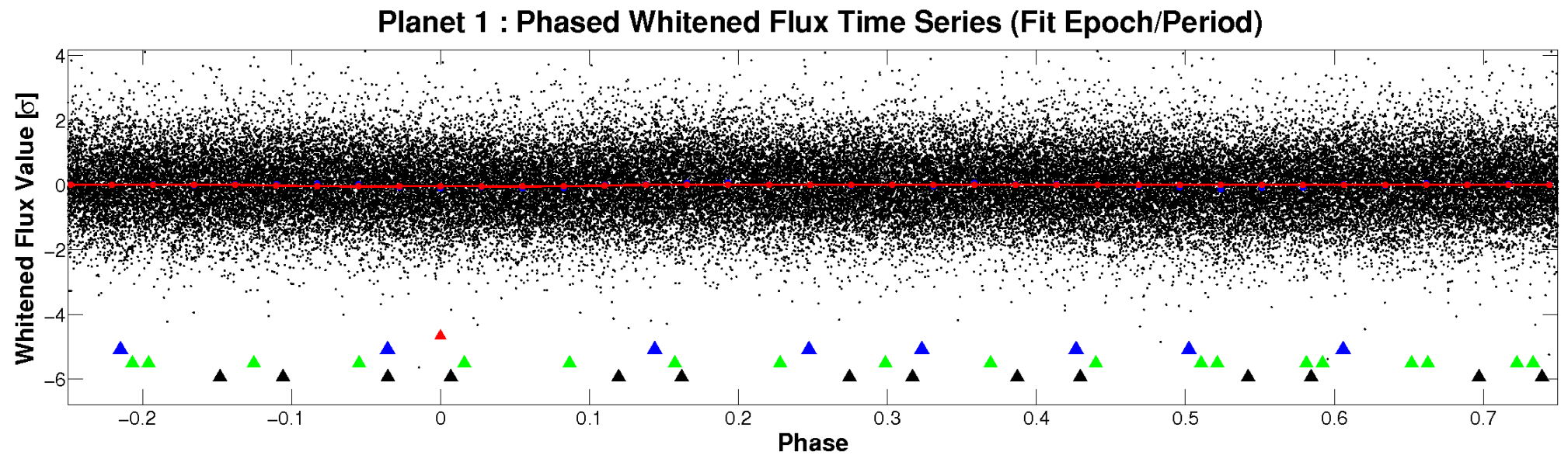
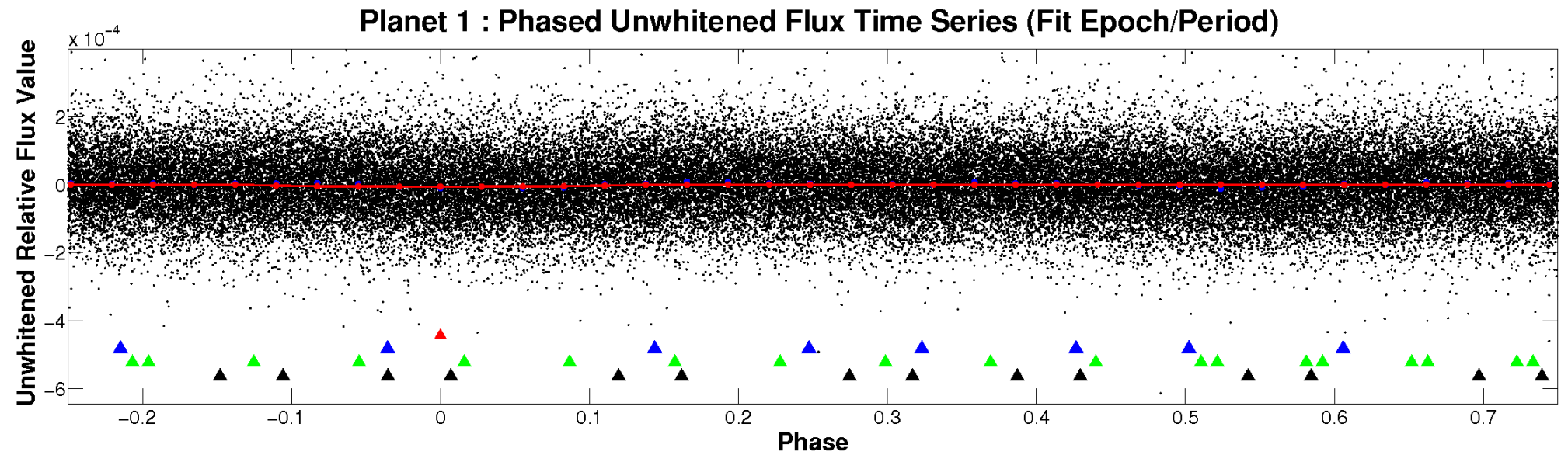


ALT Odd/Even

TCE 010470309-01

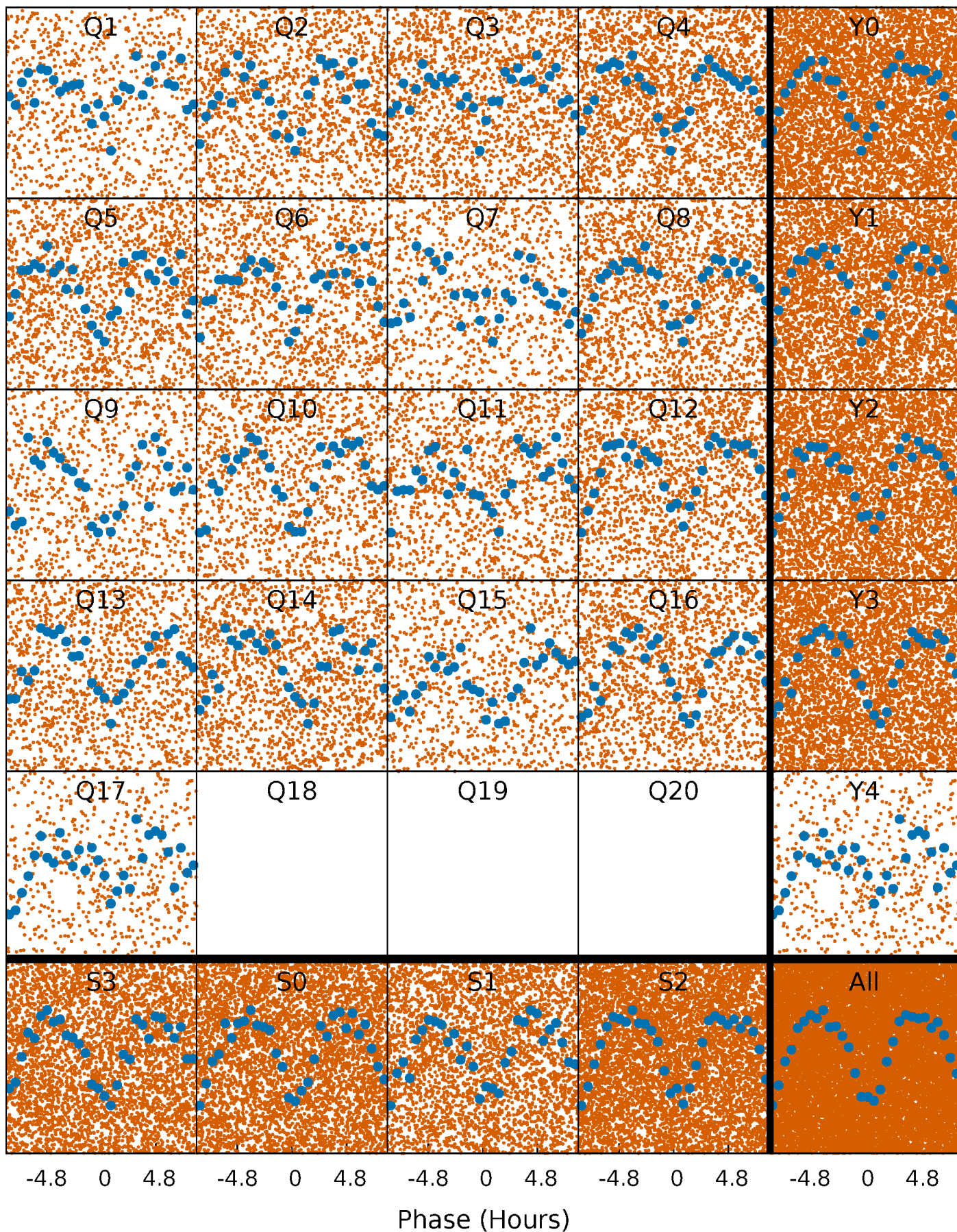


Non-Whitened Vs. Whitened Light Curve



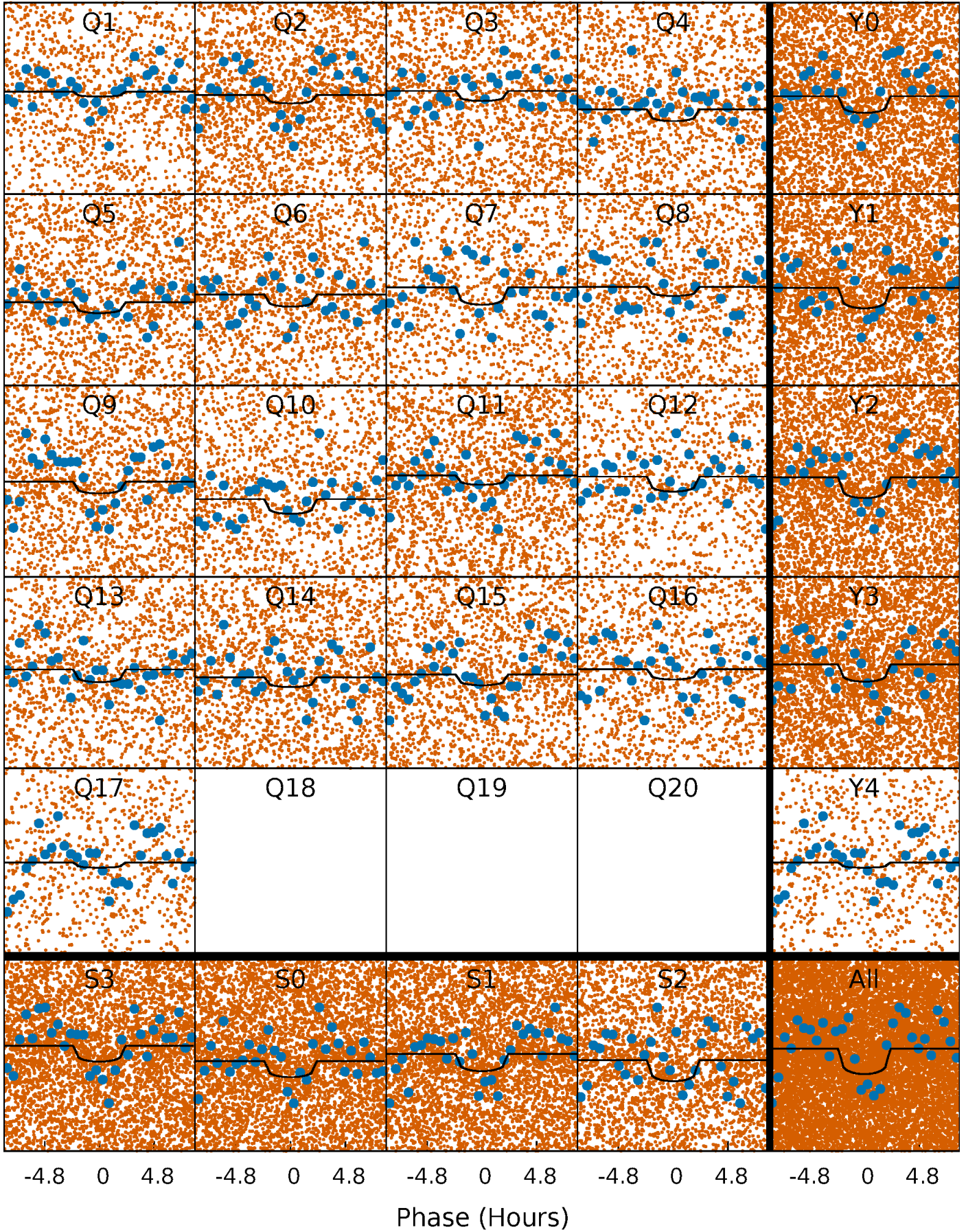
PDC Quarter-Phased Transit Curves

TCE 010470309-01 P= 0.741154 Days $T_0=132.001600$ (BKJD)



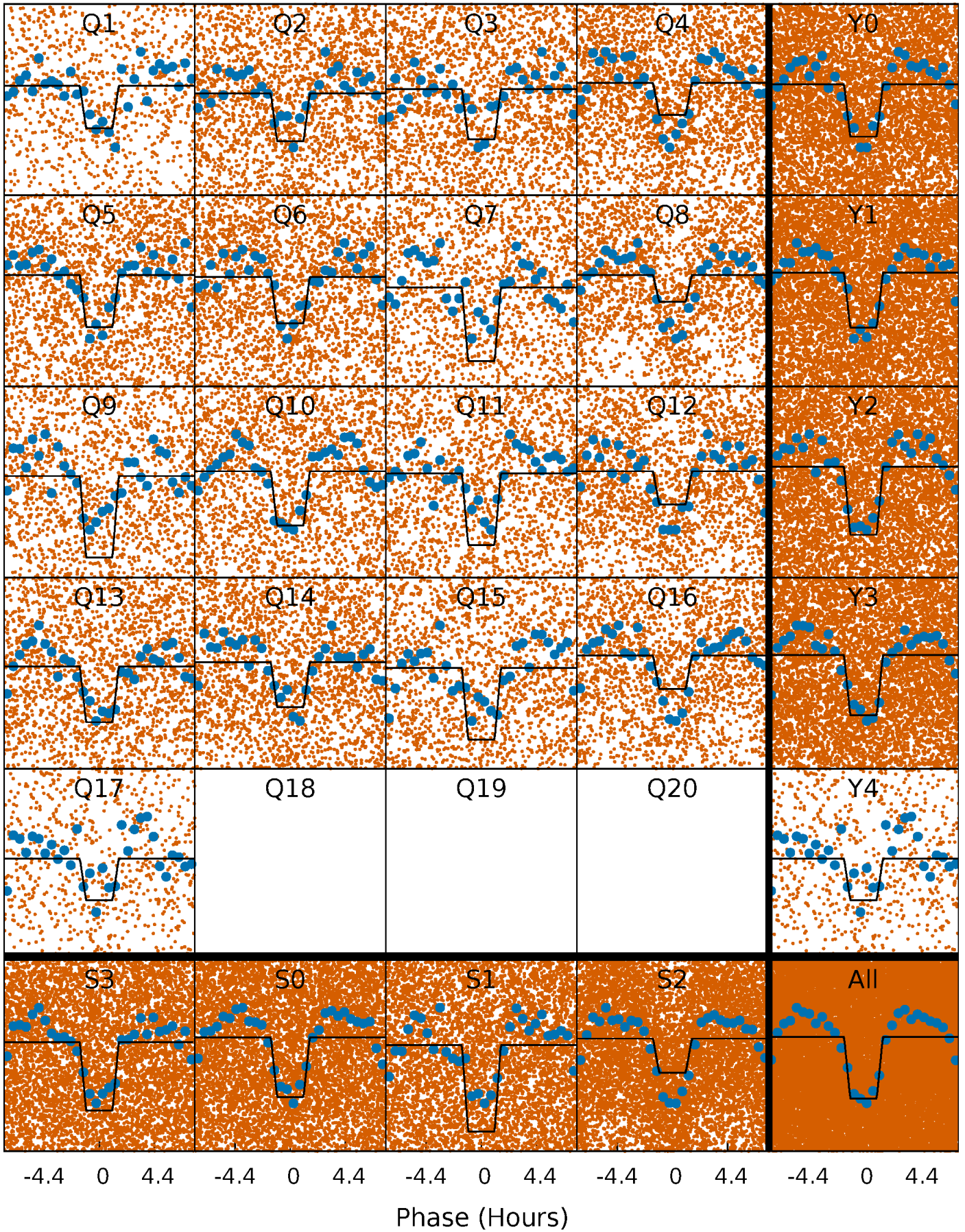
DV Quarter-Phased Transit Curves

TCE 010470309-01 P= 0.741154 Days $T_0=132.001600$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

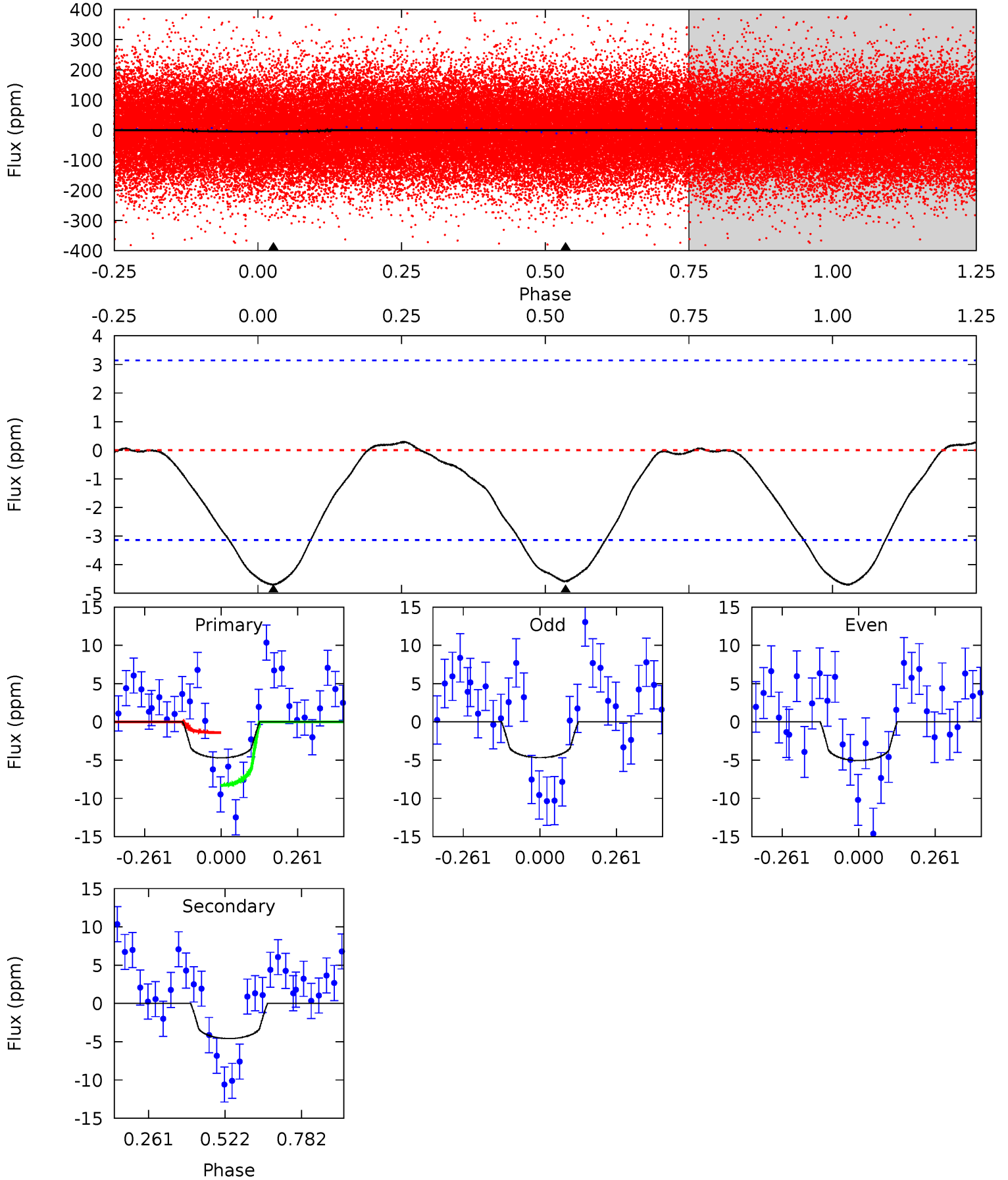
TCE 010470309-01 P= 0.741186 Days $T_0=131.990252$ (BKJD)



DV Model-Shift Uniqueness Test

010470309-01, P = 0.741154 Days, E = 131.260446 Days

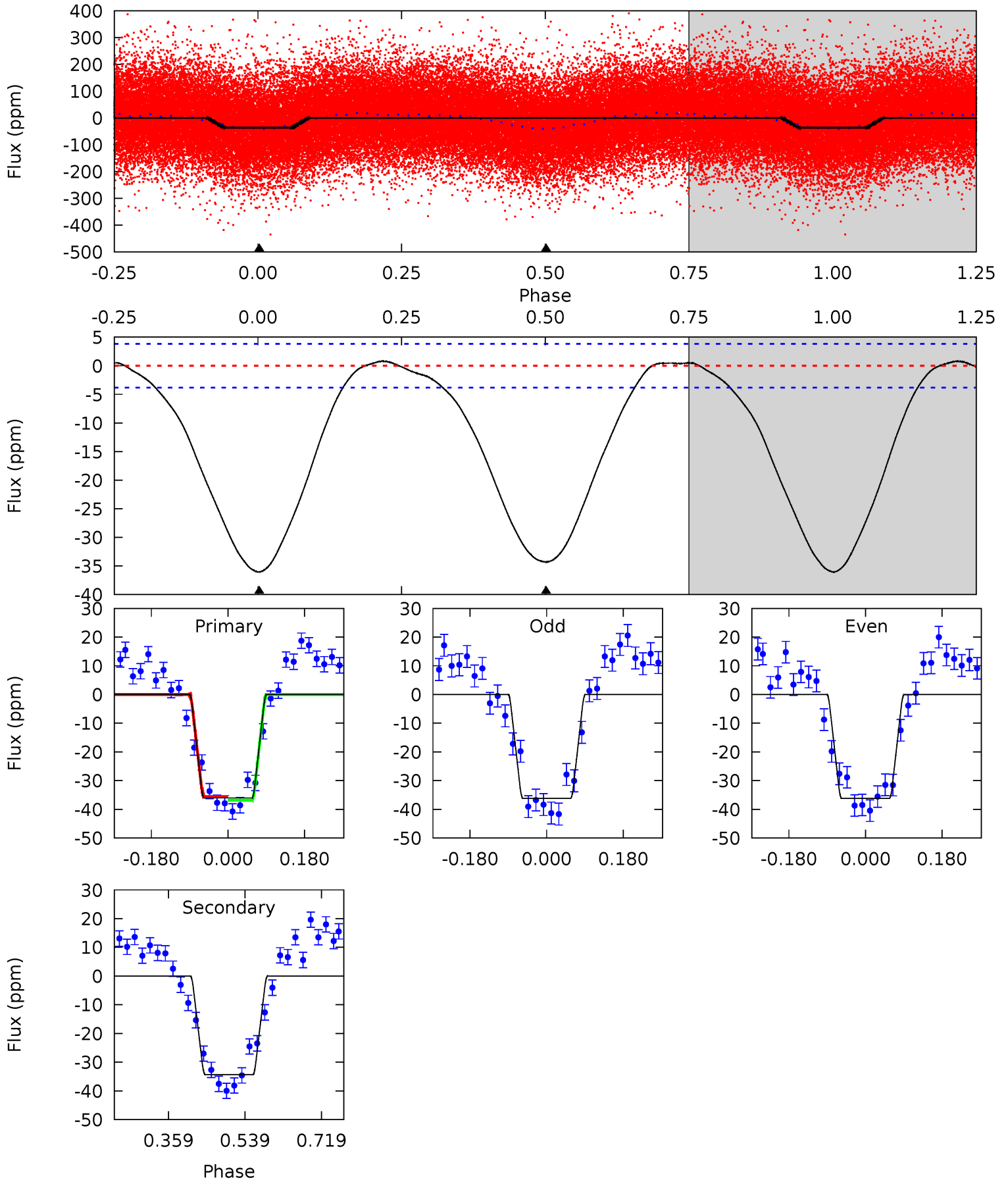
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.52	6.36	0	0	4.36	1.12	0.20	6.52	6.52	6.36	6.36	0.26	0.94	0.06	4.75



Alt Model-Shift Uniqueness Test

010470309-01, P = 0.741186 Days, E = 131.249066 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
41.7	39.7	0	0	4.44	1.34	1.47	41.7	41.7	39.7	39.7	0.02	1.01	0.02	0.73



Stellar Parameters For KIC 010470309

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6449^{+144}_{-176}	$4.252^{+0.130}_{-0.143}$	$-0.160^{+0.250}_{-0.300}$	$1.338^{+0.285}_{-0.233}$	$1.166^{+0.159}_{-0.159}$	$0.686^{+0.429}_{-0.285}$
	+2%/-3%	+3%/-3%	+156%/-188%	+21%/-17%	+14%/-14%	+63%/-42%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010470309-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-5 ± 1	$0.32^{+0.16}_{-0.15}$	3535^{+214}_{-182}	6252^{+2906}_{-1169}	$6.770^{+18.550}_{-3.765}$
Alt.	-34 ± 1	$0.89^{+0.20}_{-0.18}$	3548^{+216}_{-203}	6192^{+768}_{-510}	$6.678^{+4.107}_{-2.212}$

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 $A_{obs} \gg 1.0$

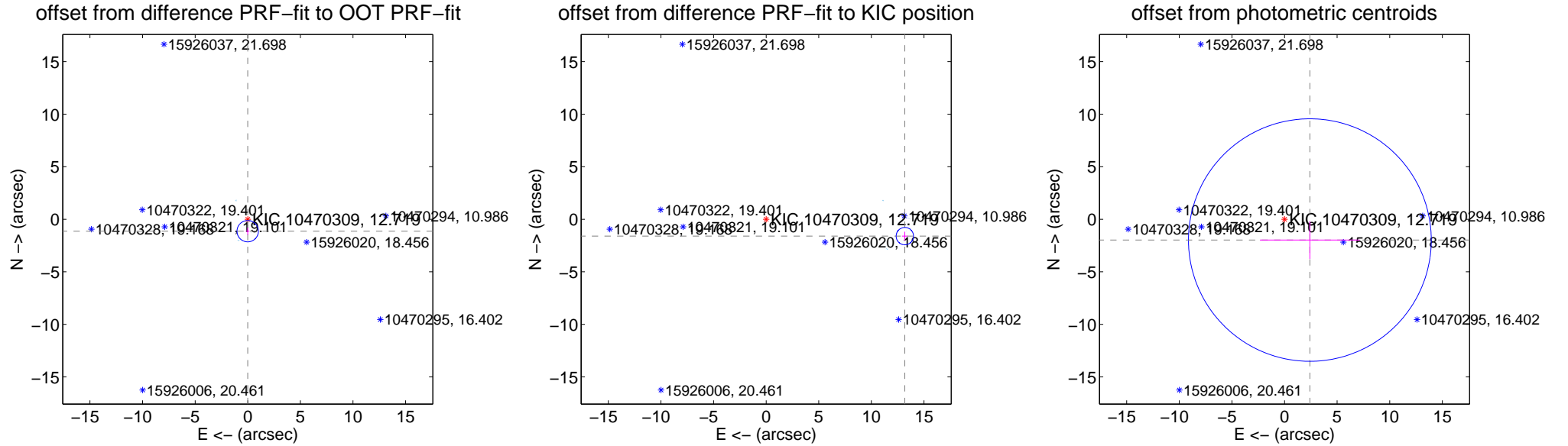
DV Centroid Data

Supplemental centroid analysis for 010470309-01. Kepler magnitude: 12.72. Transit SNR 4.58

There are 16 quarters with good PRF difference image offsets

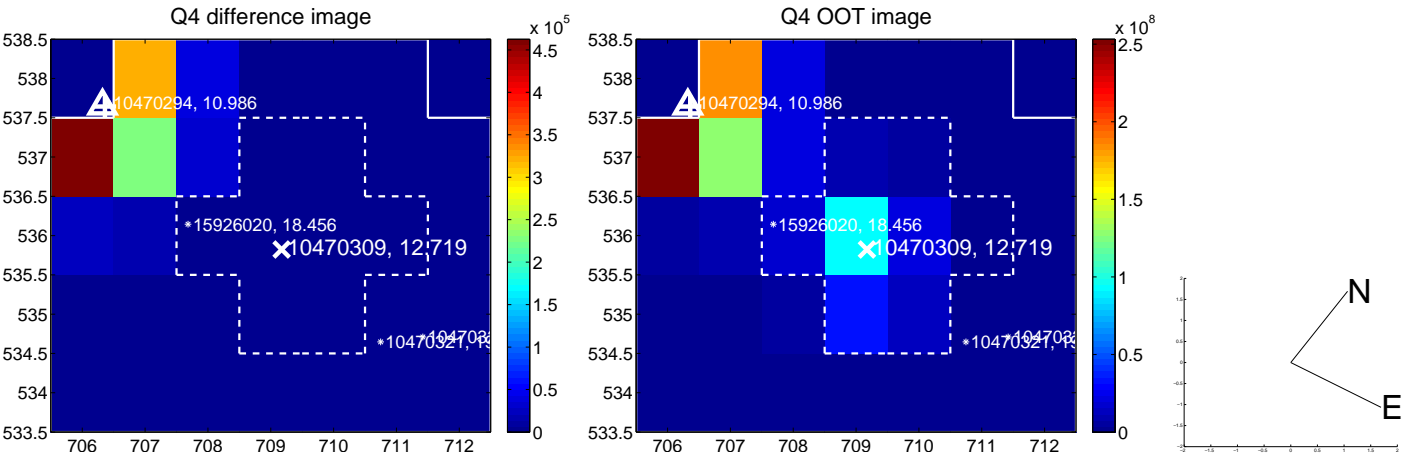
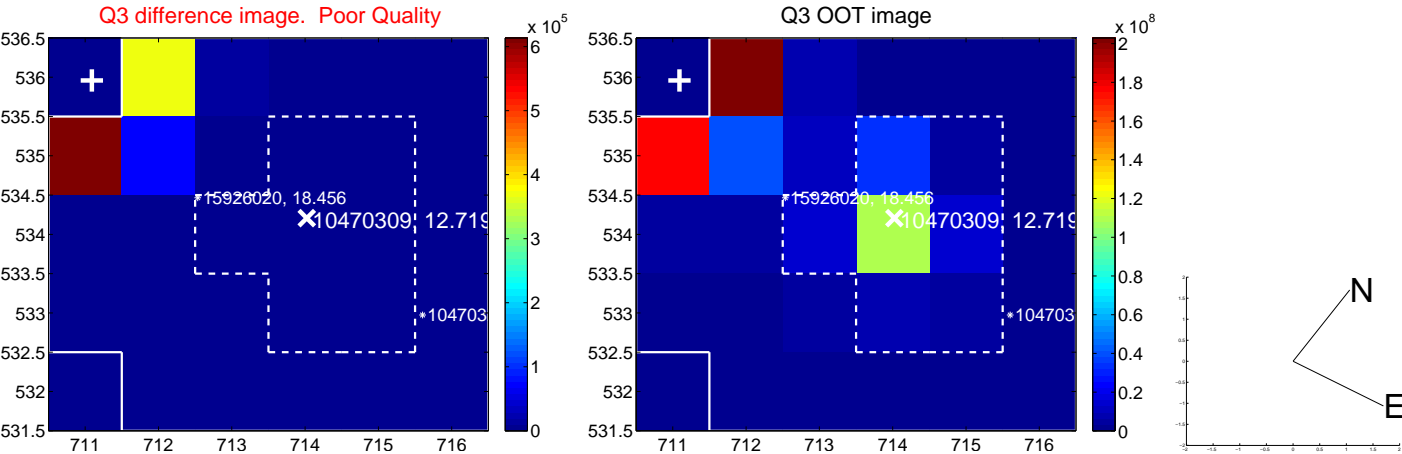
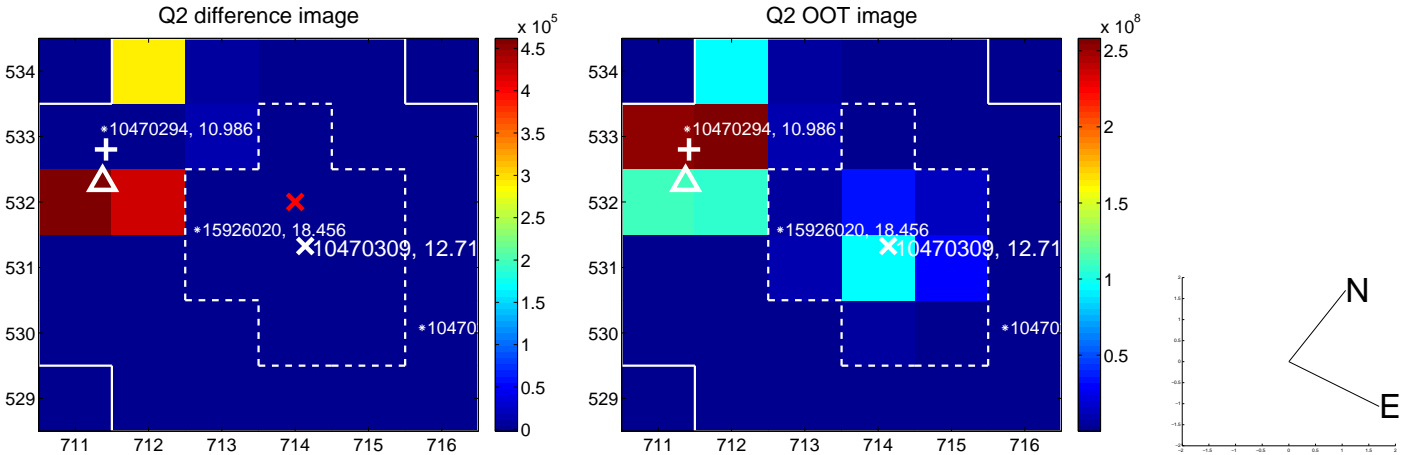
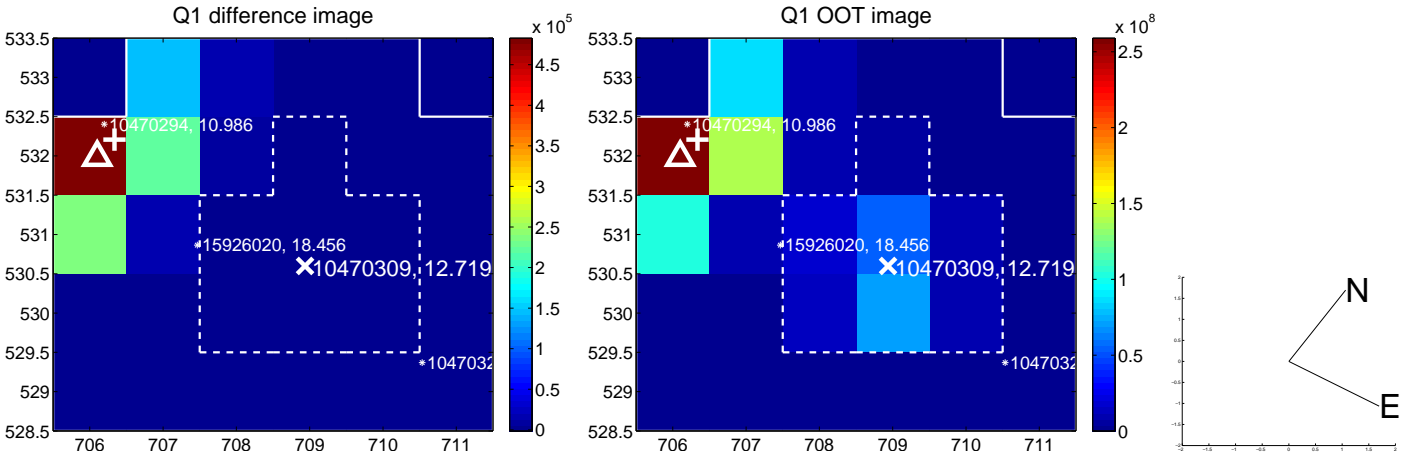
The OOT PRF centroid is offset from the target star catalog position by about 12.22 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.134 ± 0.339	3.35	0.007 ± 0.171	-1.134 ± 0.339
PRF-fit source offset from KIC position	13.280 ± 0.275	48.24	-13.182 ± 0.268	-1.605 ± 0.422
photometric centroid source offset	3.12 ± 3.85	0.81	-2.41 ± 4.75	-1.98 ± 1.79

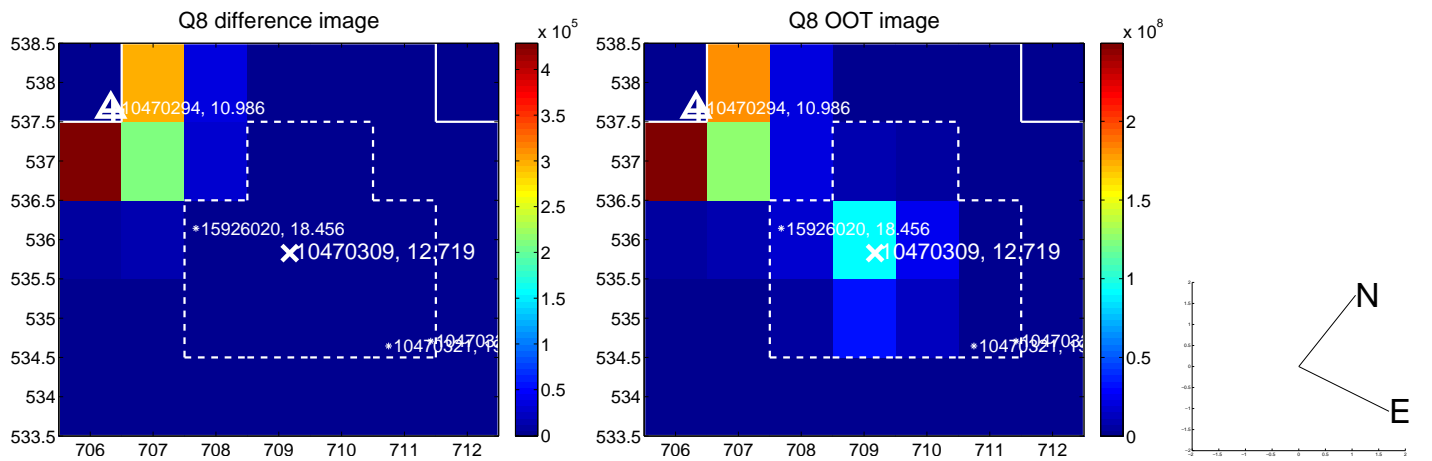
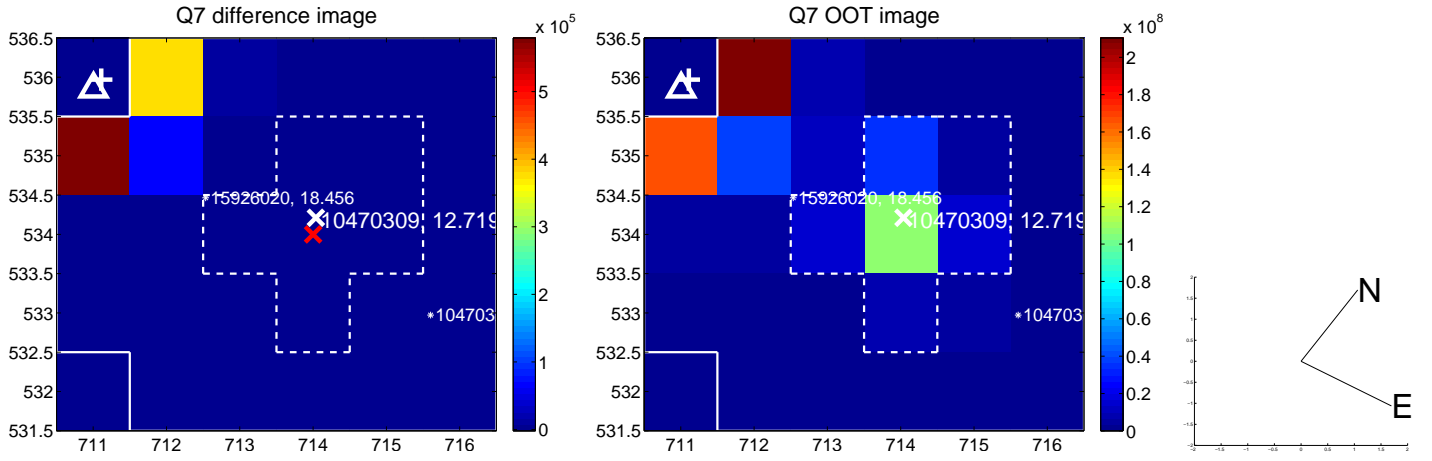
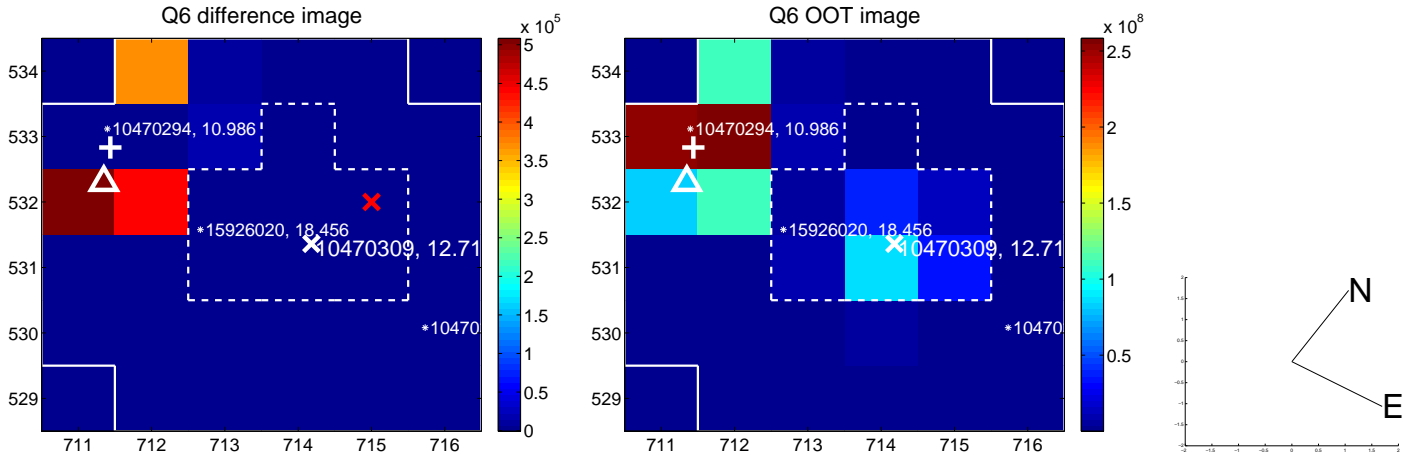
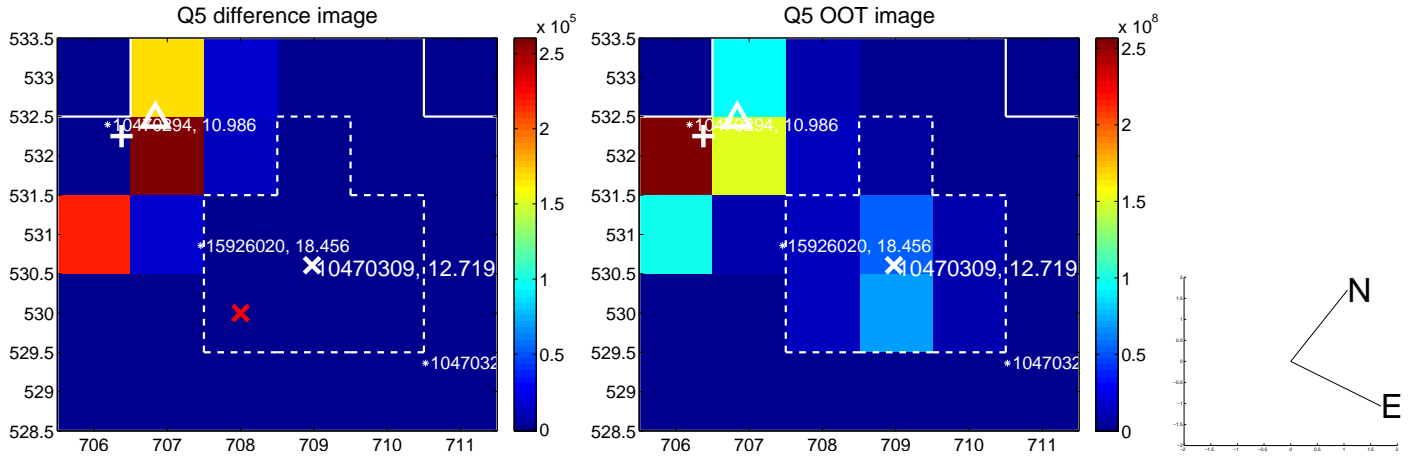


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

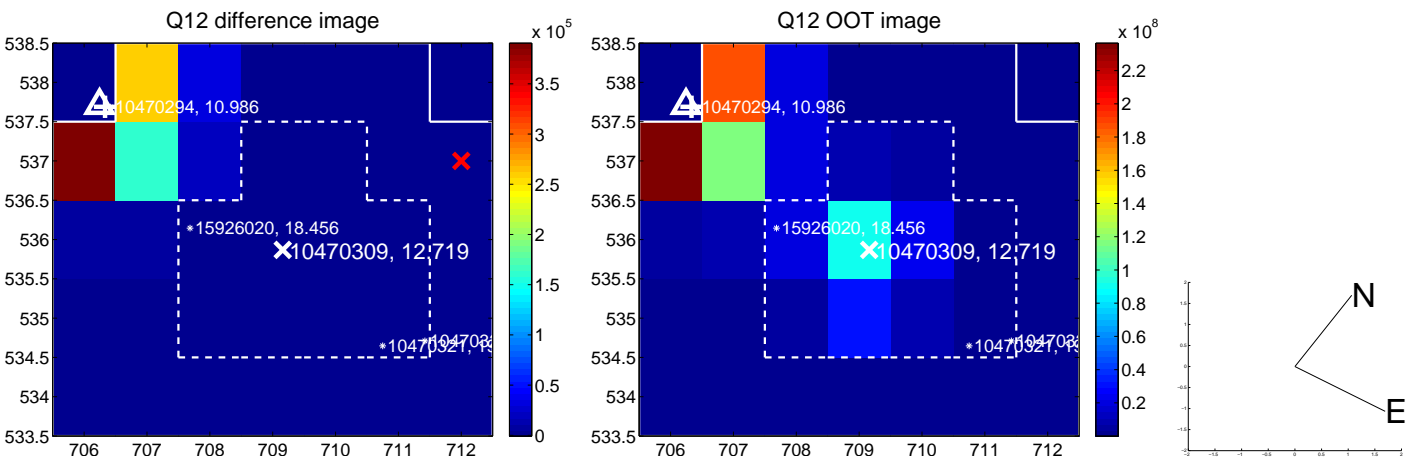
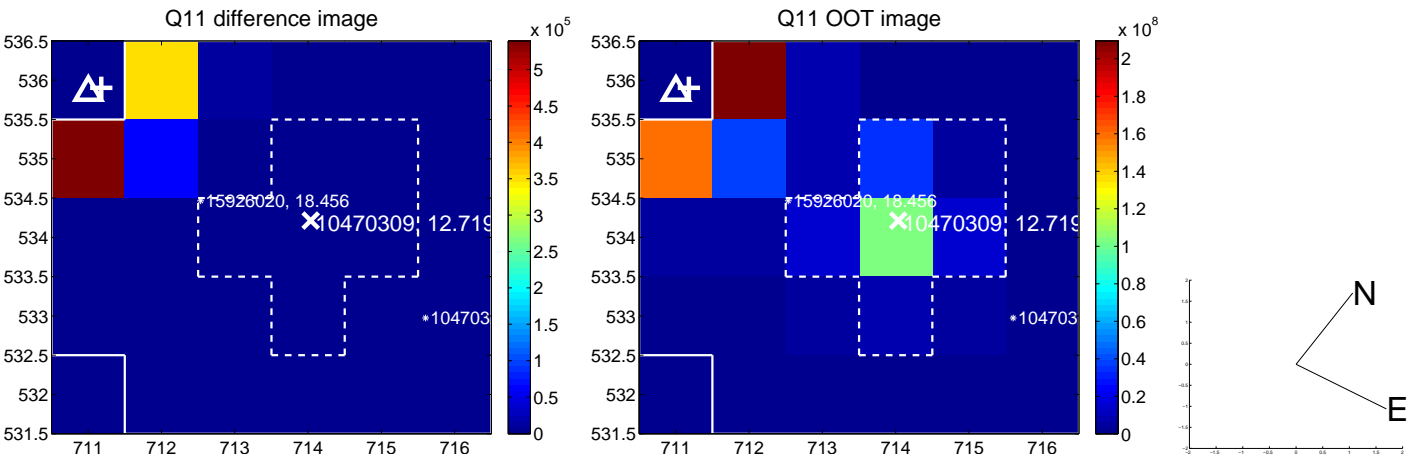
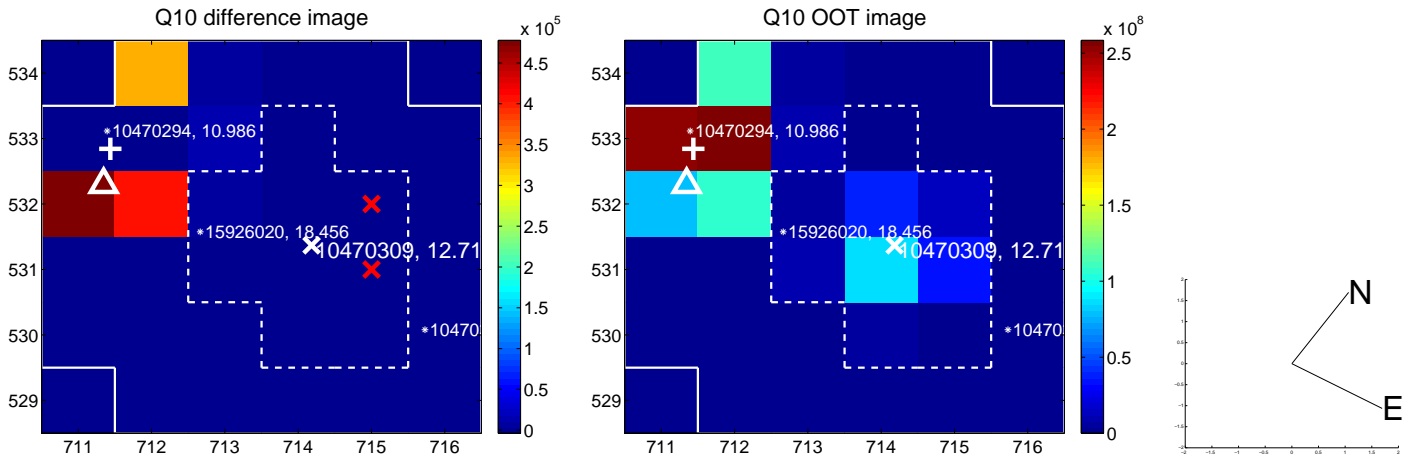
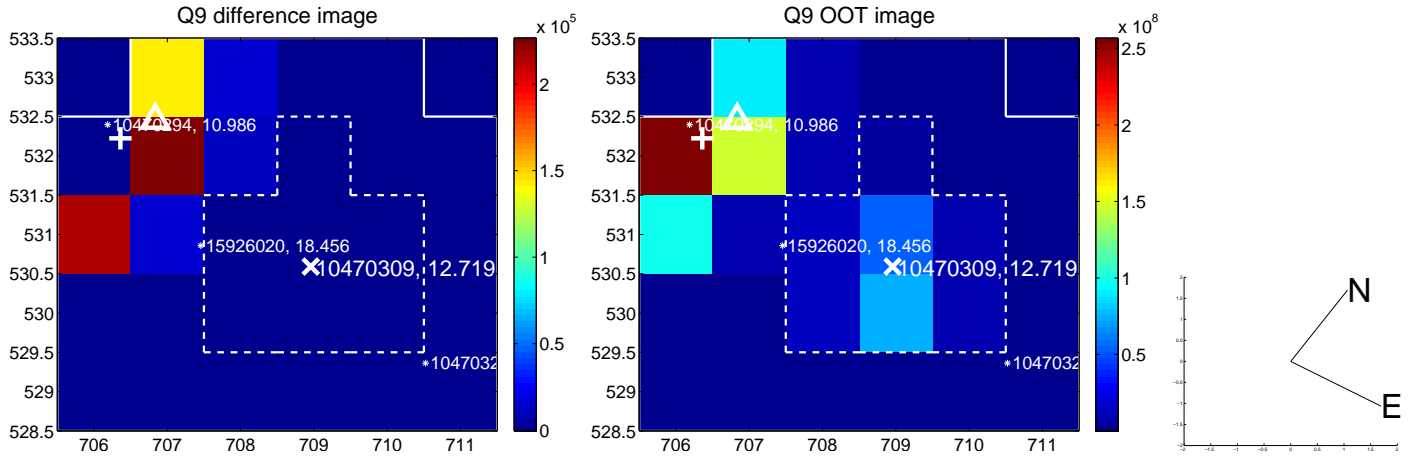
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



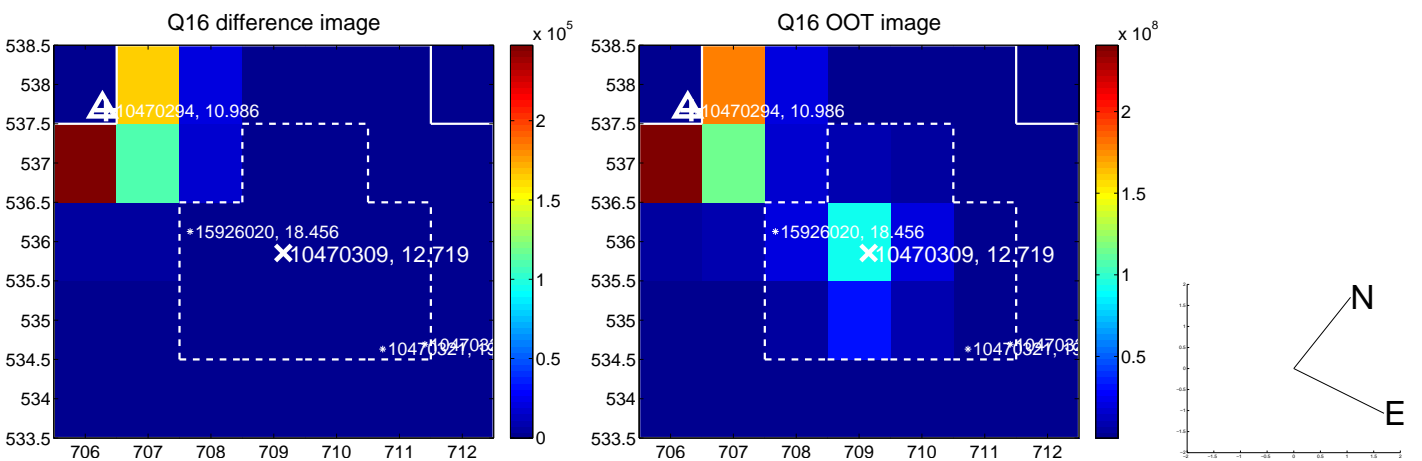
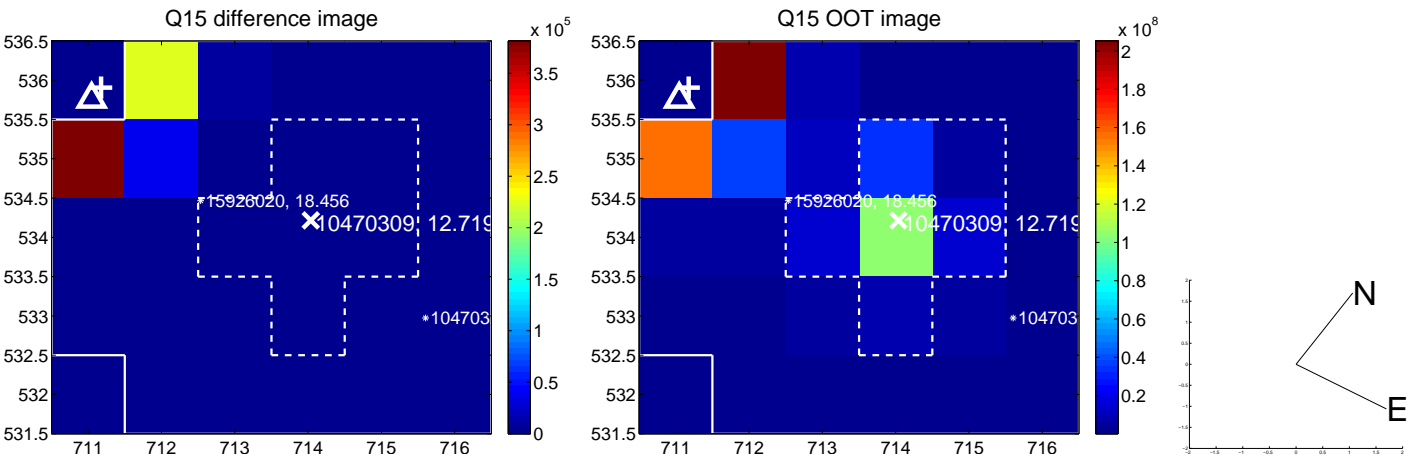
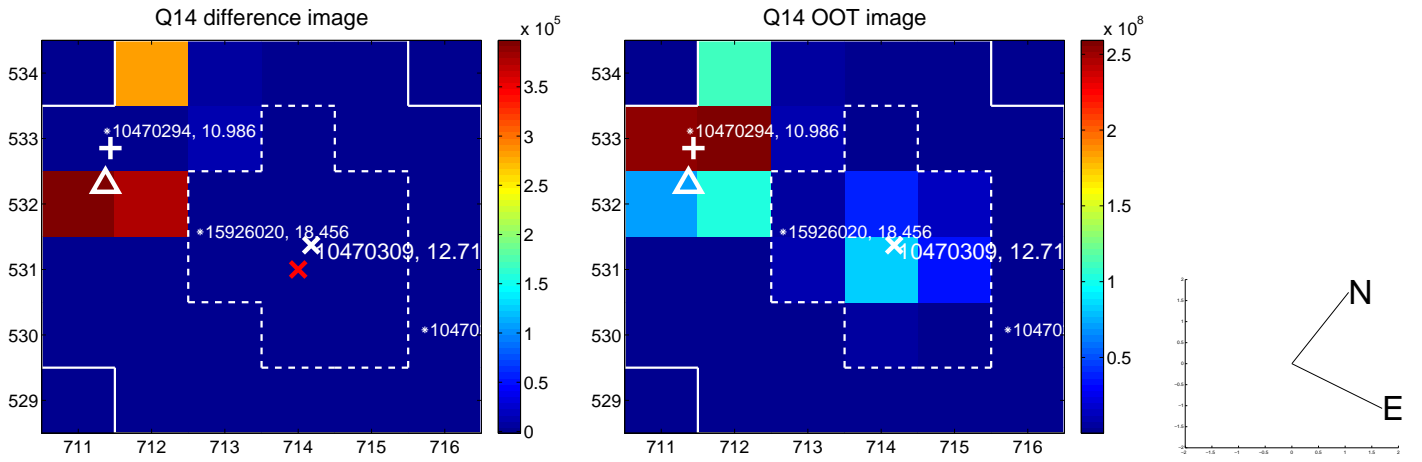
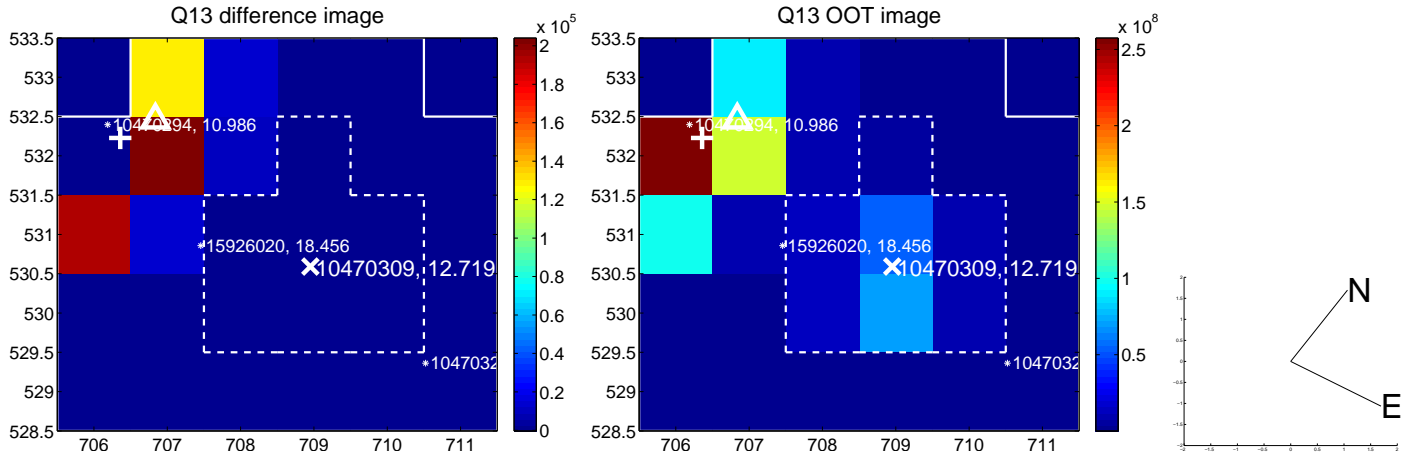
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



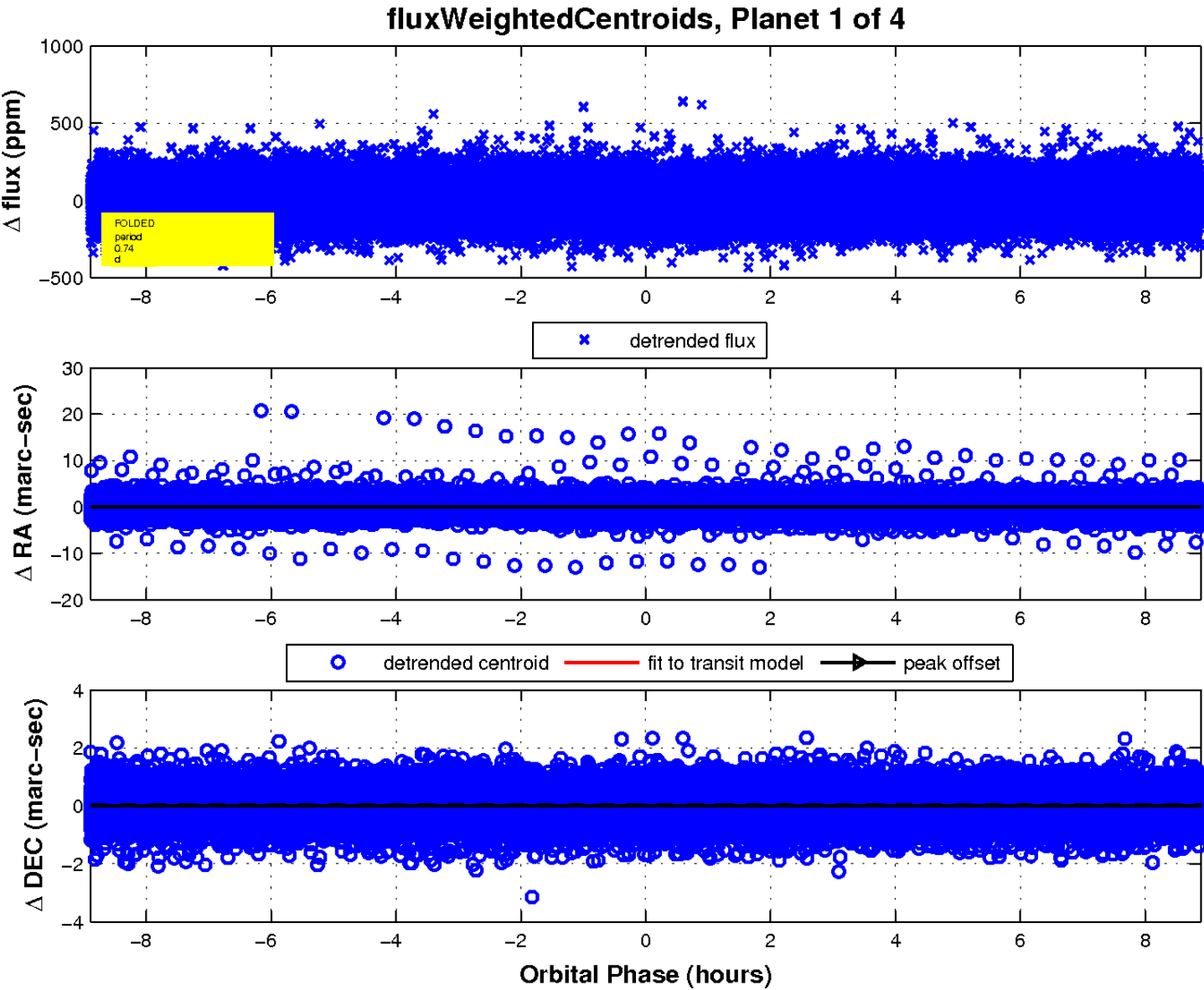
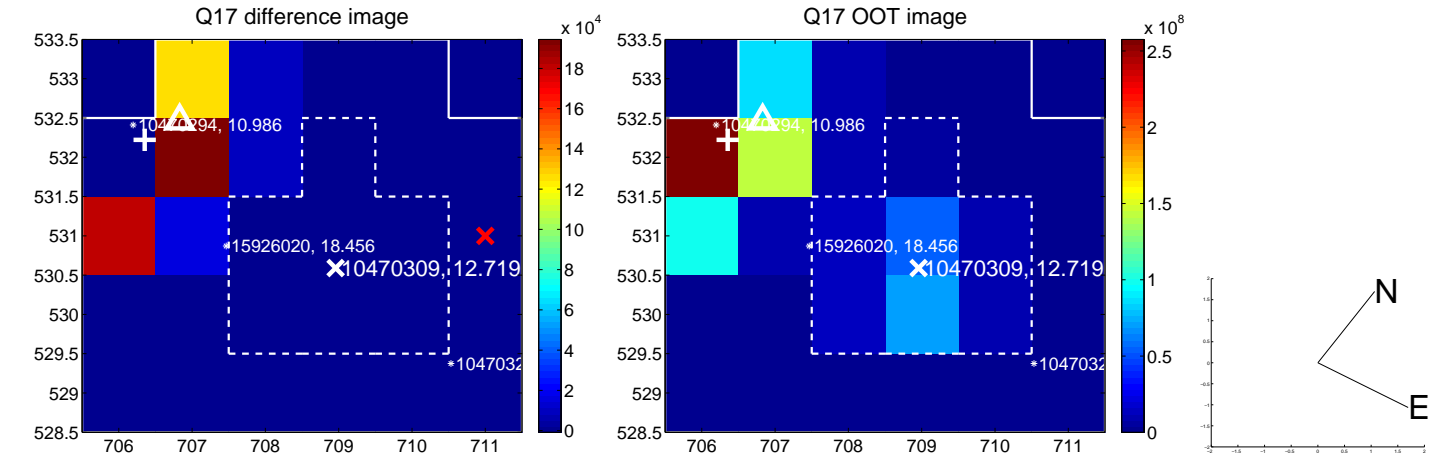
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

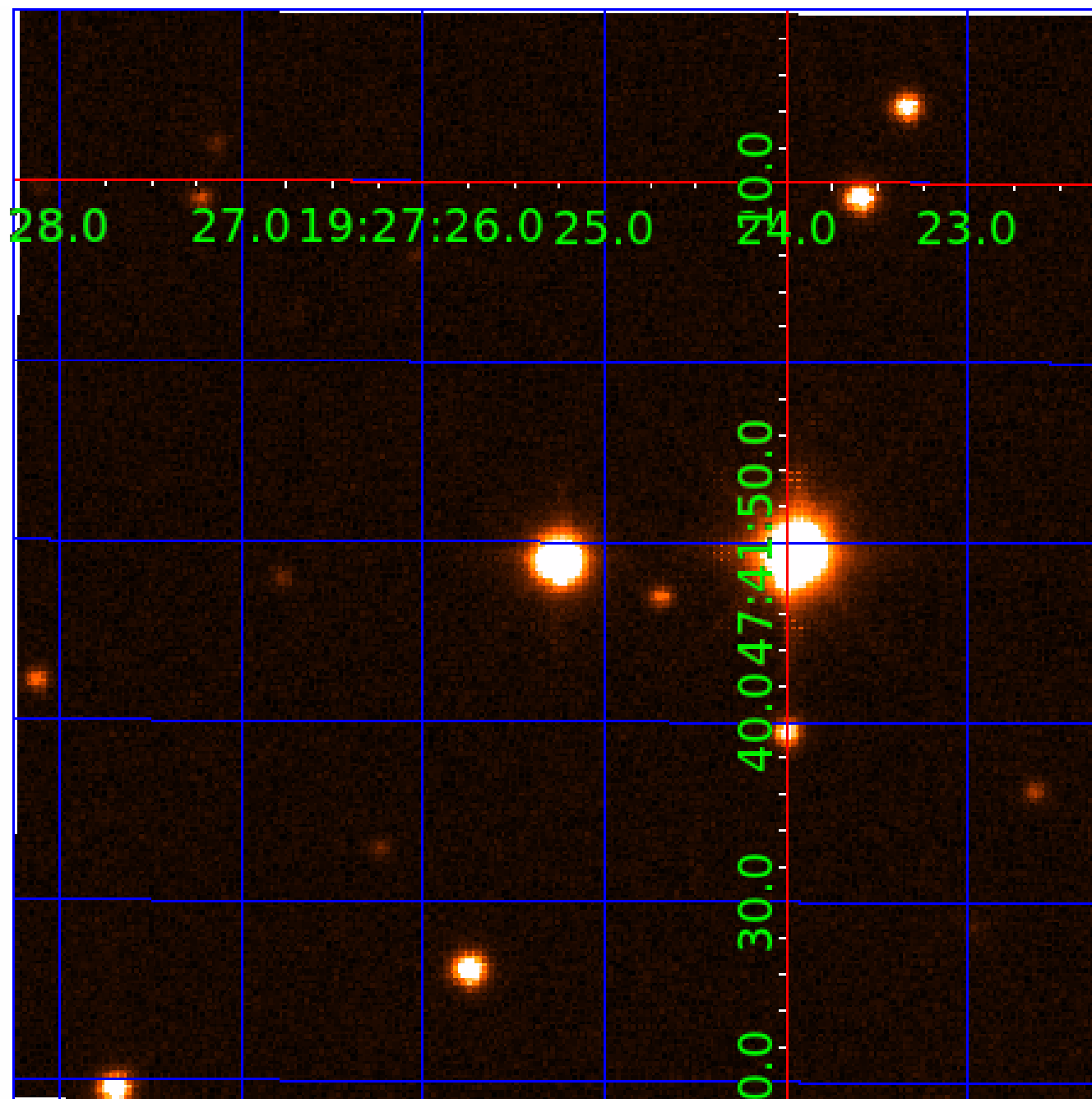


white \times : KIC target position; $+$: OOT centroid; Δ : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010470309

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})
010470309-01	OBS	No	0.741154	132.001600	5.2	4.196	8.6	4.6	1.34	6449	0.32	9741.44
010470309-03	OBS	No	74.804197	182.987951	92.2	7.403	7.8	5.6	1.34	6449	1.44	20.73
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010470309-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
010470309-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
010470309-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET

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

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

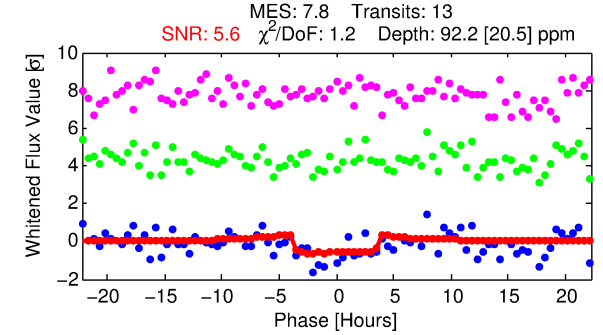
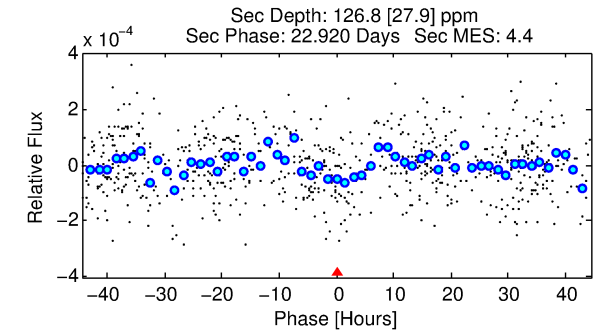
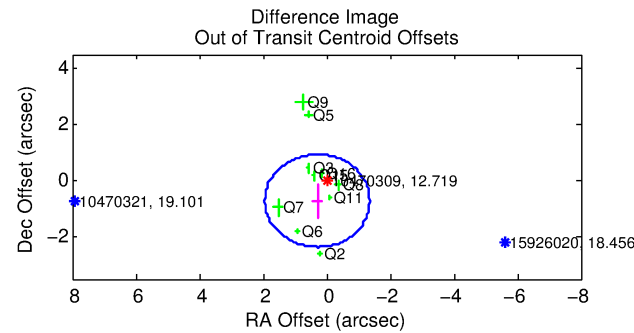
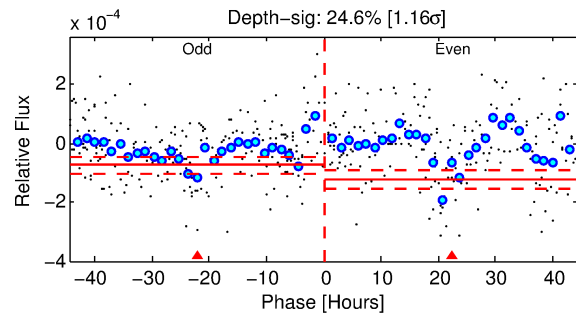
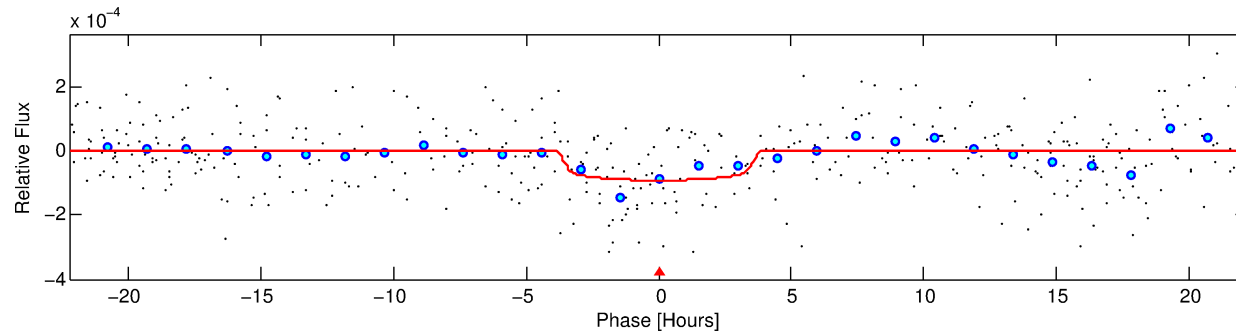
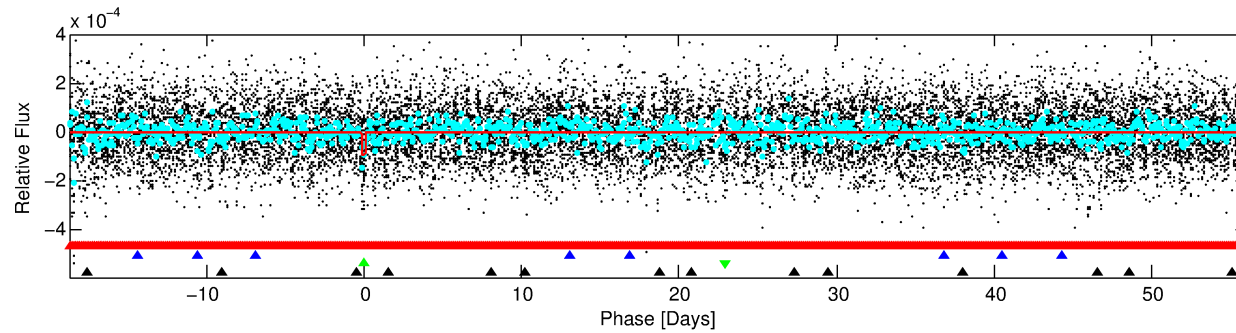
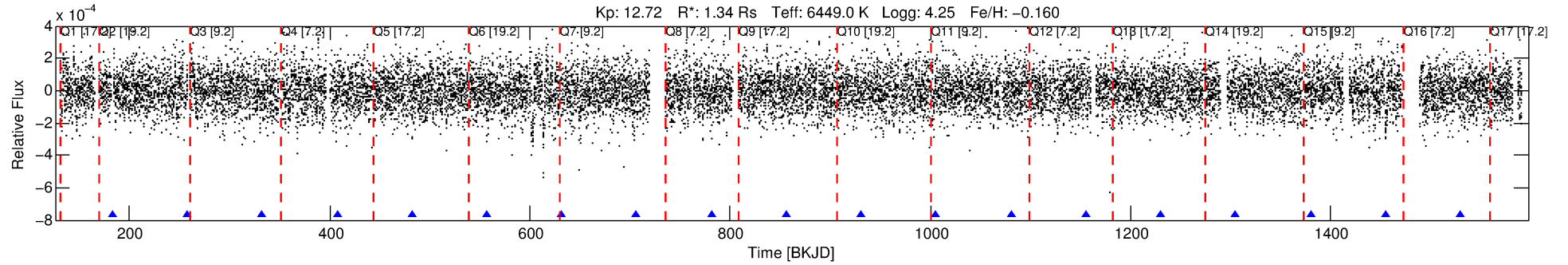
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010470309-03

No Significant Match Found

DV One-Page Summary

KIC: 10470309 Candidate: 3 of 4 Period: 74.804 d



DV Fit Results:

Period = 74.80420 [0.00186] d
Epoch = 182.9880 [0.0201] BKJD
Rp/R* = 0.0098 [0.0074]
a/R* = 44.67 [182.82]
b = 0.83 [1.55]
Seff = 20.73 [5.87]
Teq = 544 [39] K
Rp = 1.44 [1.12] Re
a = 0.3658 [0.0657] AU
Ag = 4521.69 [6947.62] [0.65 σ]
Teff = 6898 [2618] K [2.43 σ]

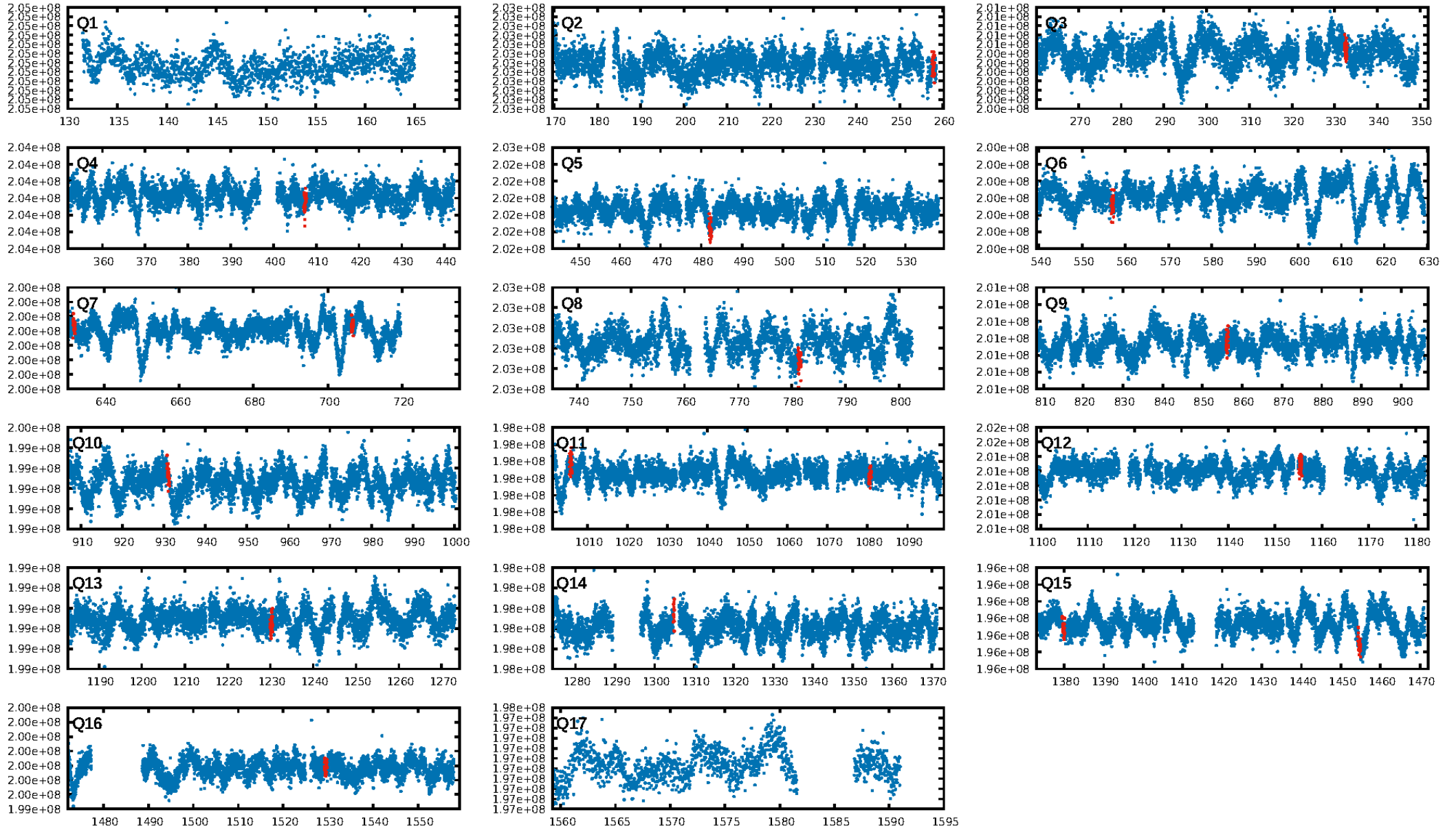
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [208.90 σ]
LongPeriod-sig: 100.0% [78.30 σ]
ModelChiSquare2-sig: 26.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 7.62e-10
RollingBand-fgt: 1.00 [13/13]
GhostDiagnostic-chr: -0.4683
Centroid-sig: 76.4%
Centroid-so: 2.642 arcsec [1.02 σ]
OotOffset-rm: 0.774 arcsec [1.41 σ]
OotOffset-st: 2/4/2/2 [10]
KicOffset-st: 2/4/2/2 [10]
DiffImageQuality-fgm: 0.60 [6/10]
DiffImageOverlap-fno: 0.00 [0/13]

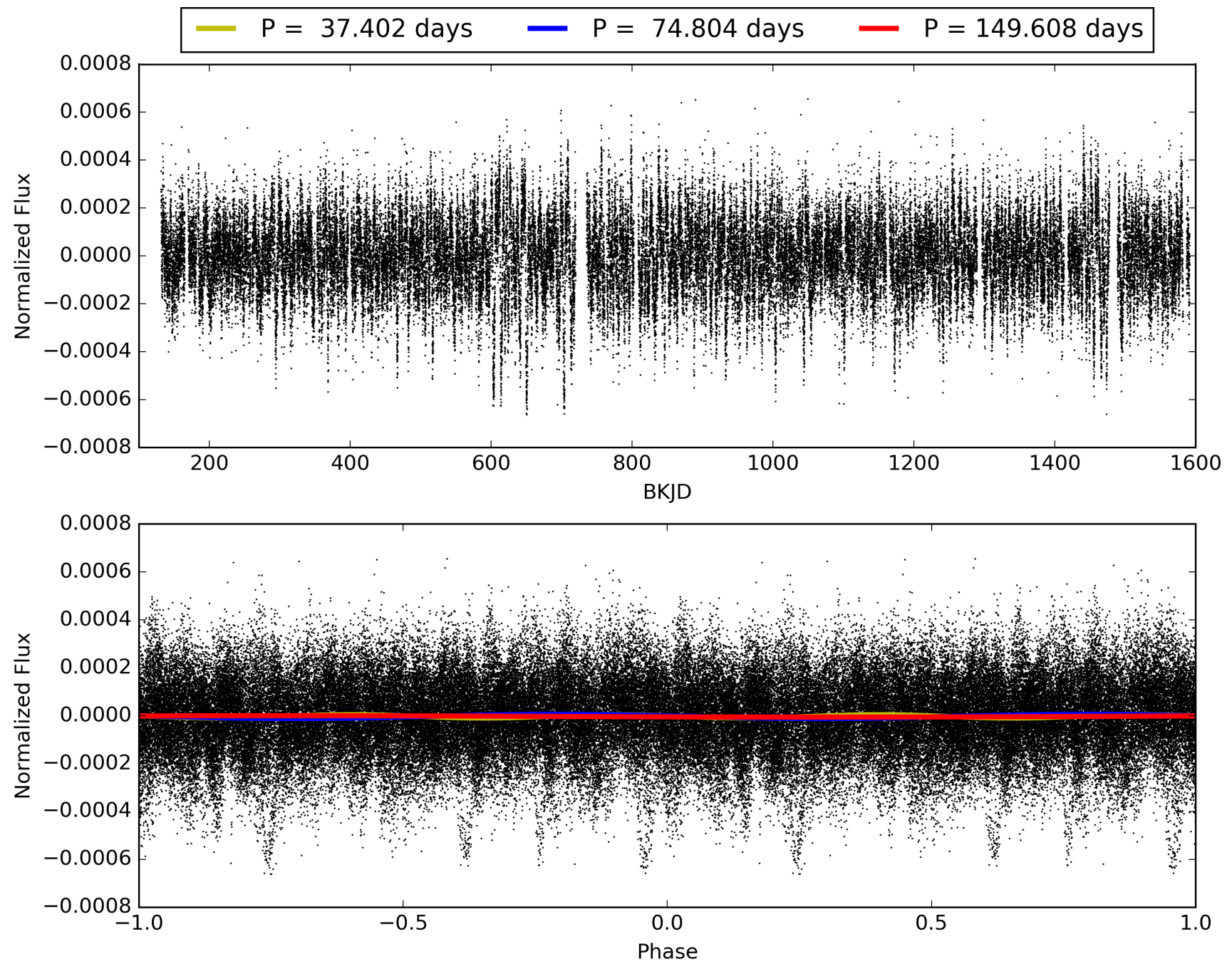
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:45:19 Z

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

TCE 010470309-03, PDC Light Curves

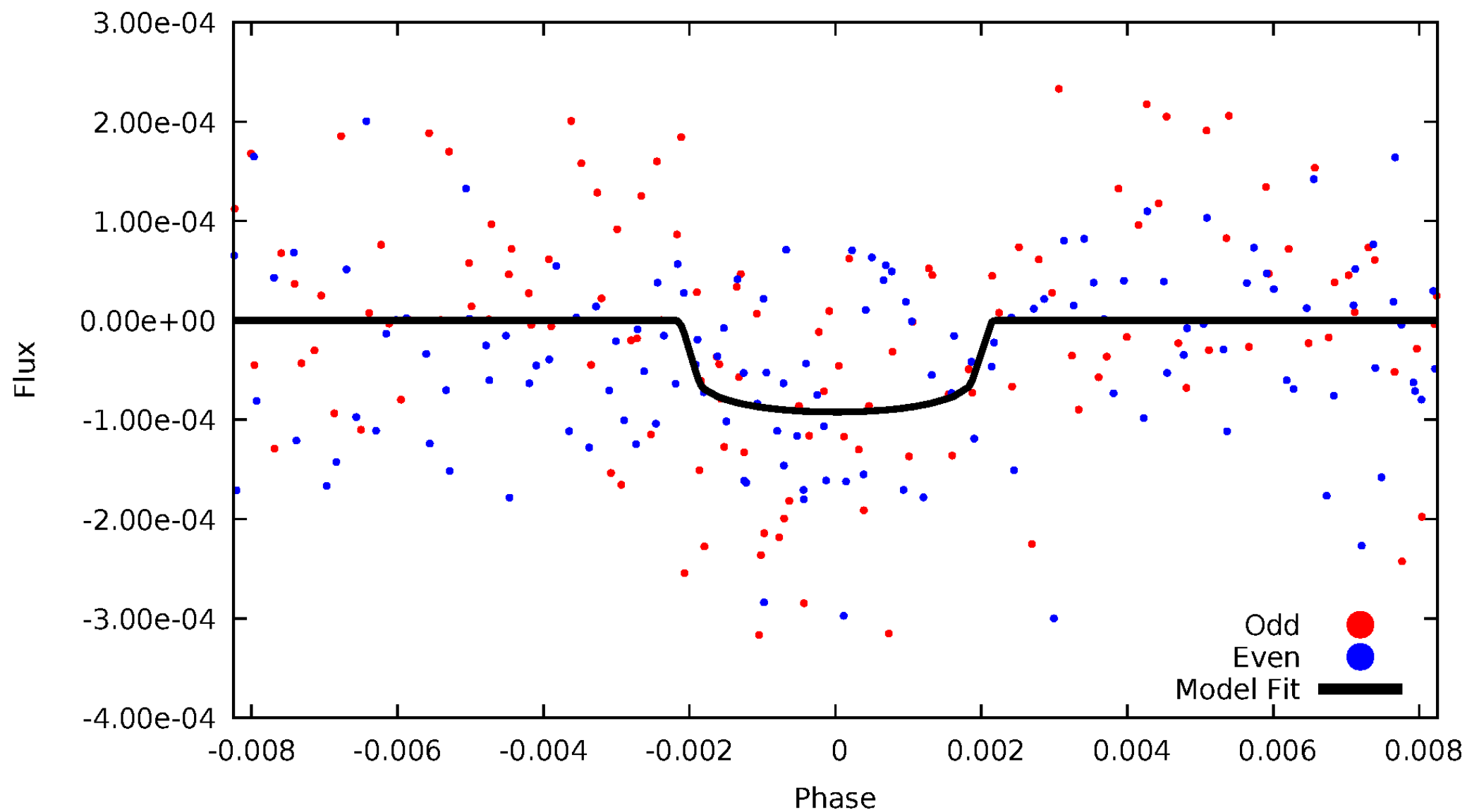


TCE 010470309-03



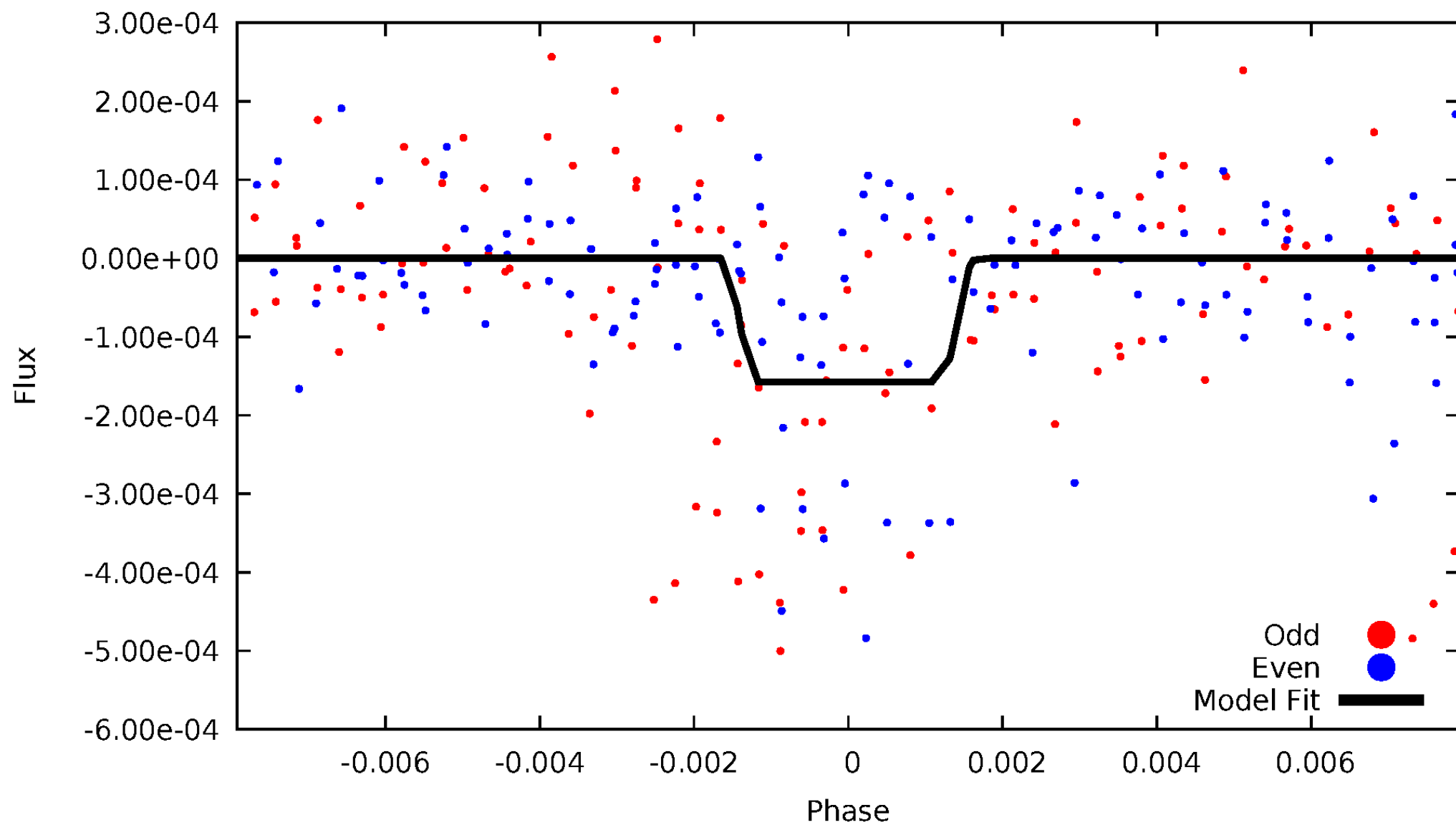
DV Odd/Even

TCE 010470309-03

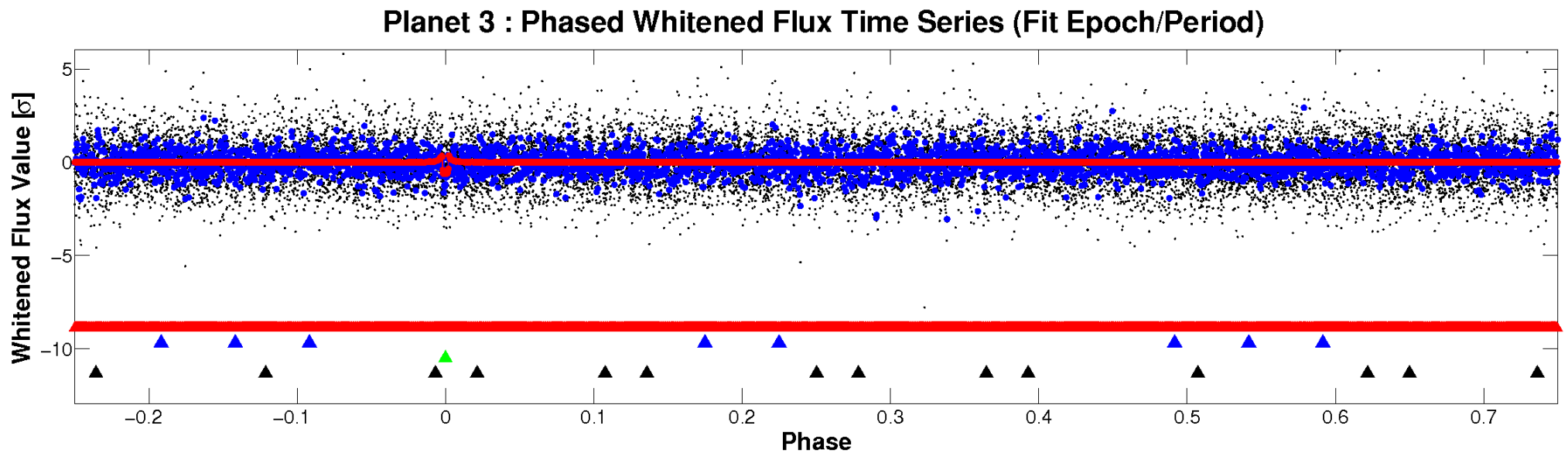
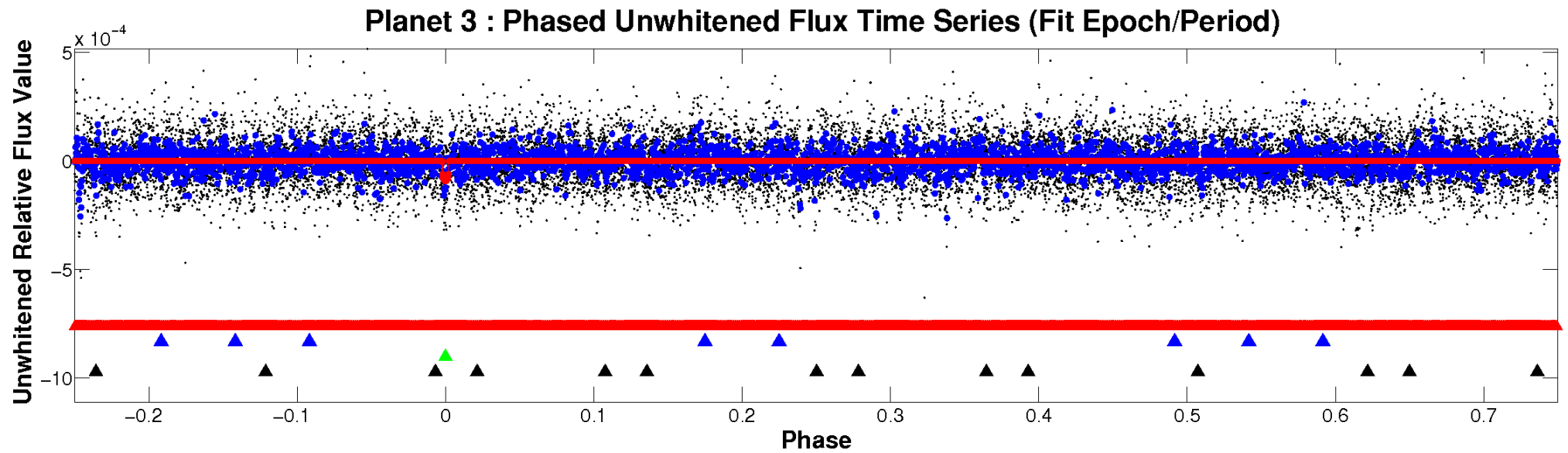


ALT Odd/Even

TCE 010470309-03

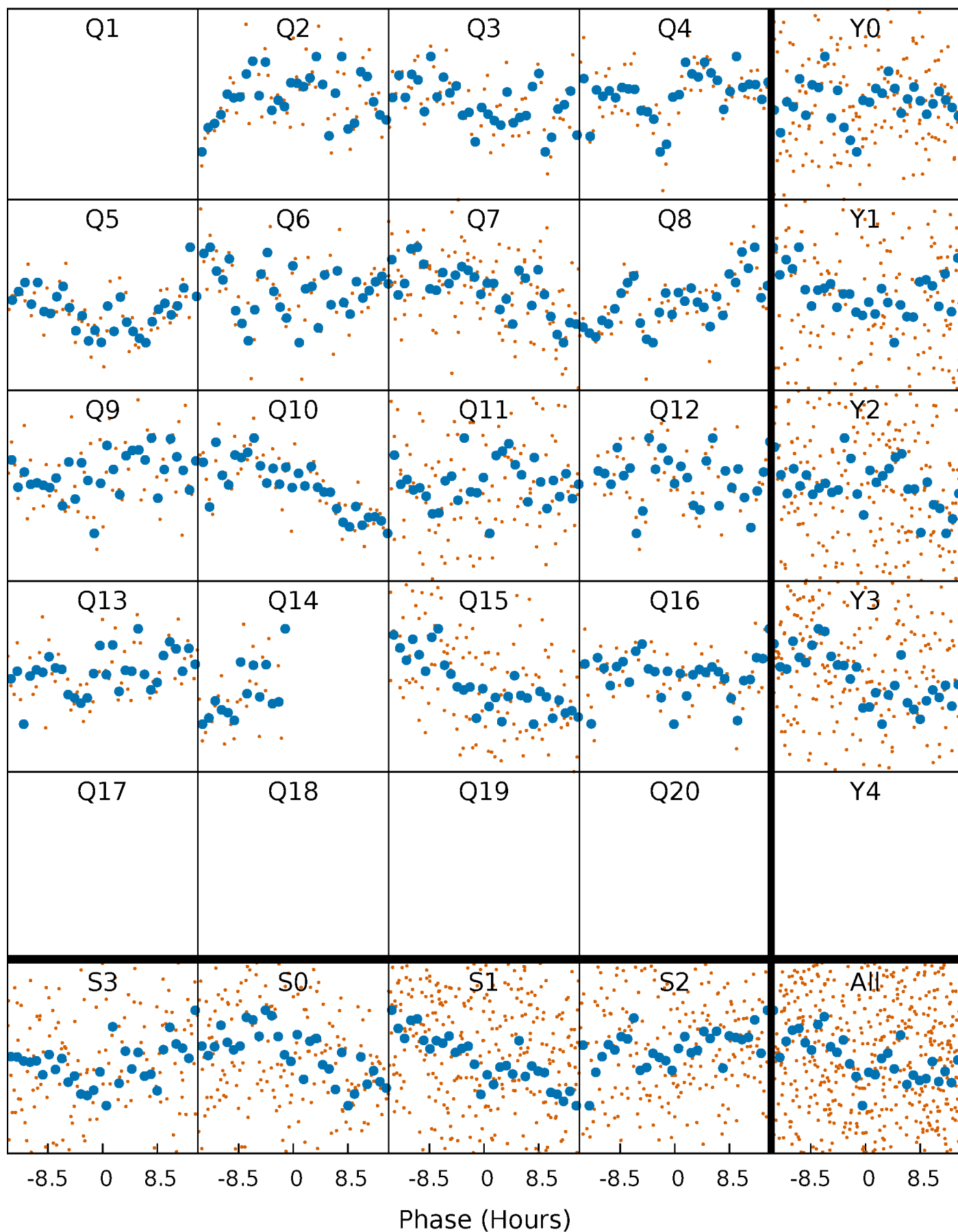


Non-Whitened Vs. Whitened Light Curve



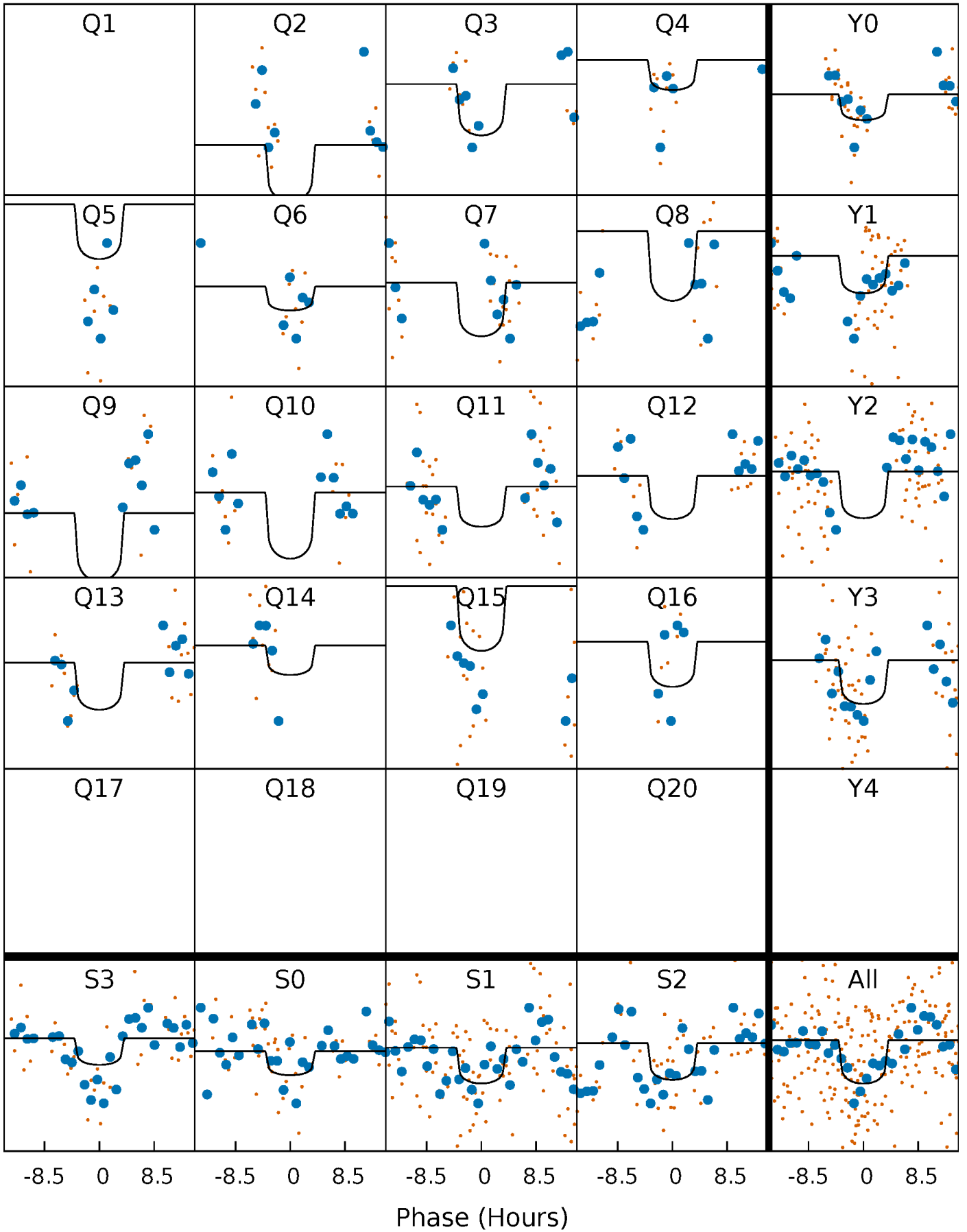
PDC Quarter-Phased Transit Curves

TCE 010470309-03 $P = 74.804197$ Days $T_0 = 182.987951$ (BKJD)



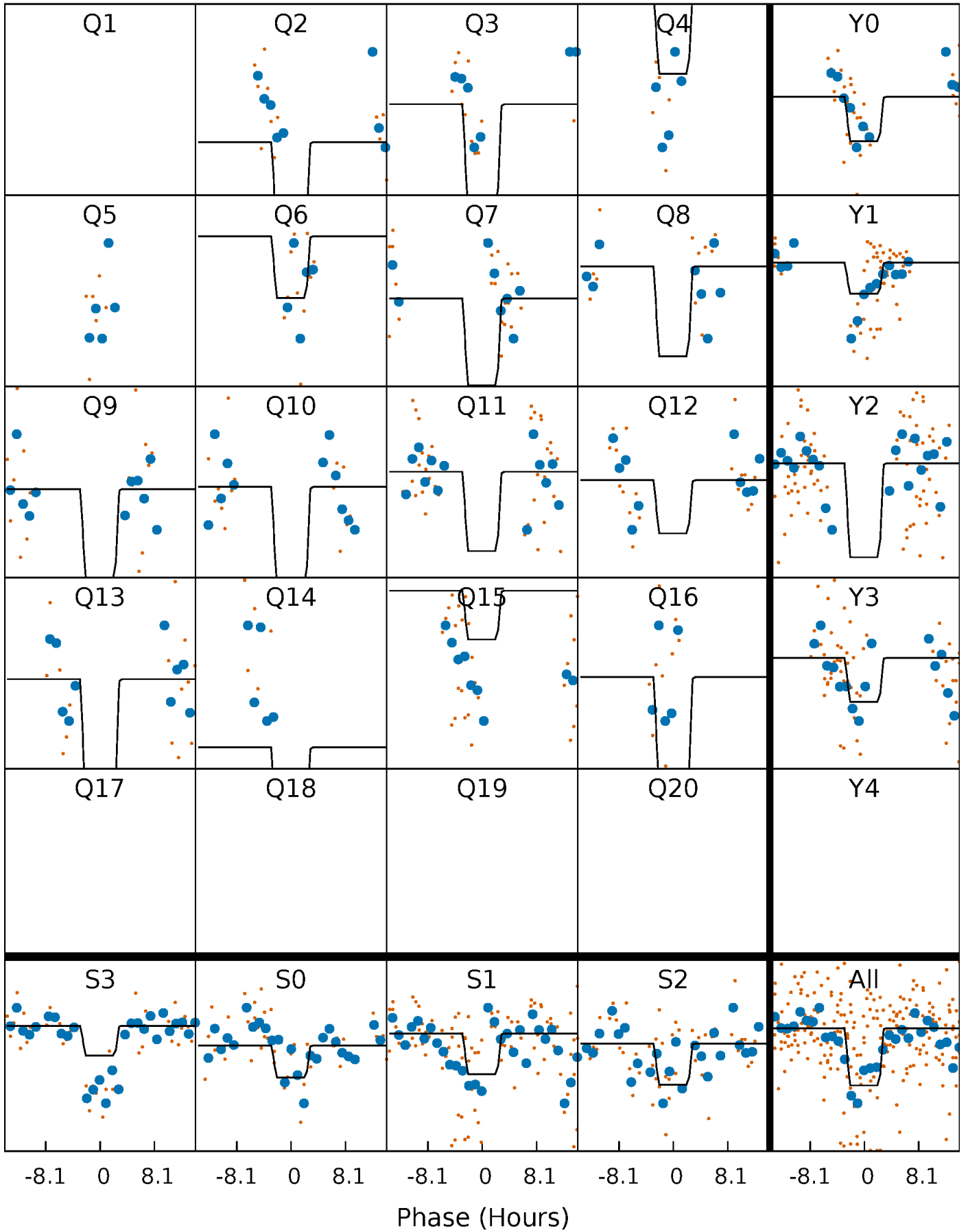
DV Quarter-Phased Transit Curves

TCE 010470309-03 P= 74.804197 Days $T_0=182.987951$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

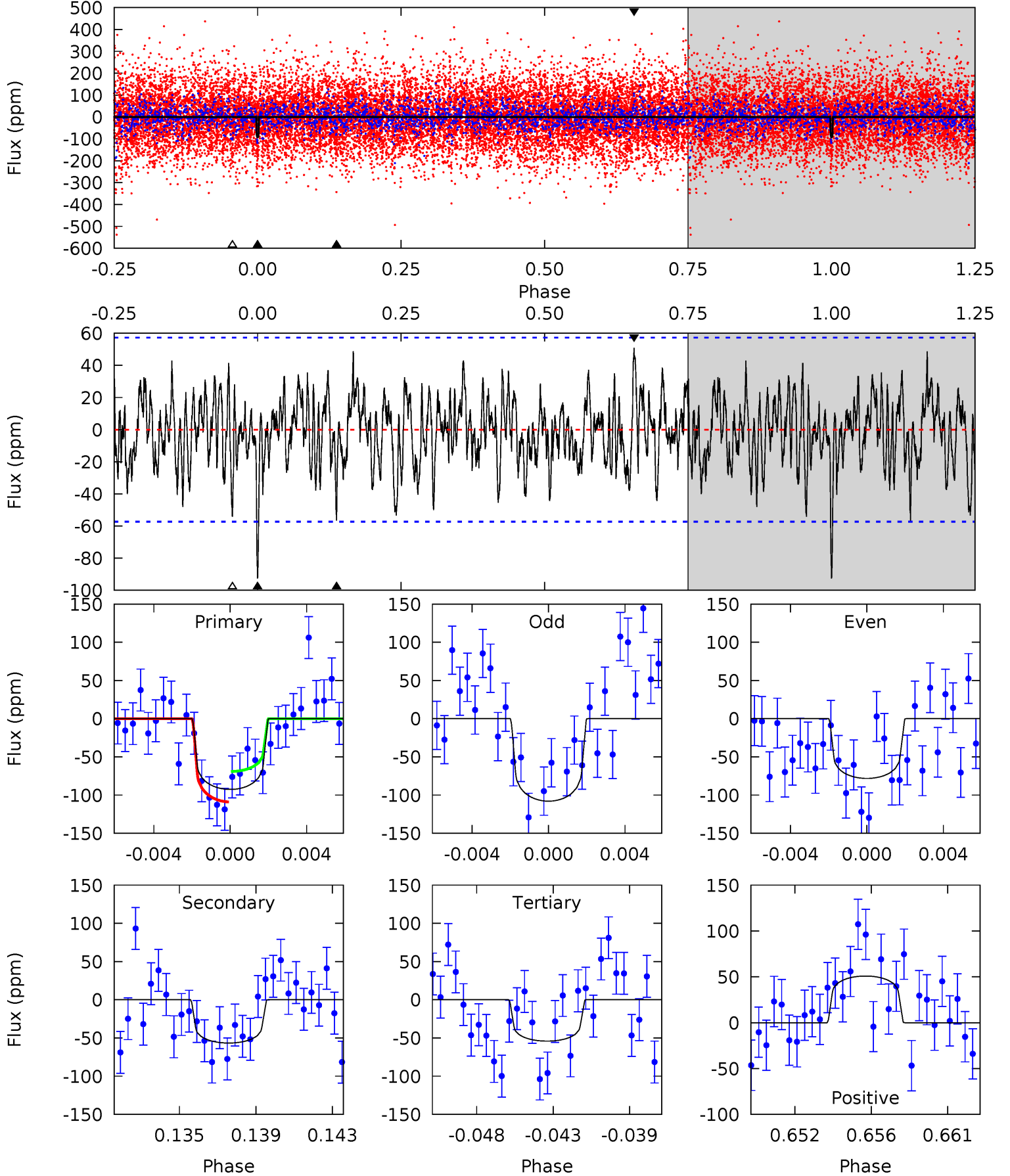
TCE 010470309-03 $P = 74.807458$ Days $T_0 = 182.966259$ (BKJD)



DV Model-Shift Uniqueness Test

010470309-03, P = 74.804197 Days, E = 108.183754 Days

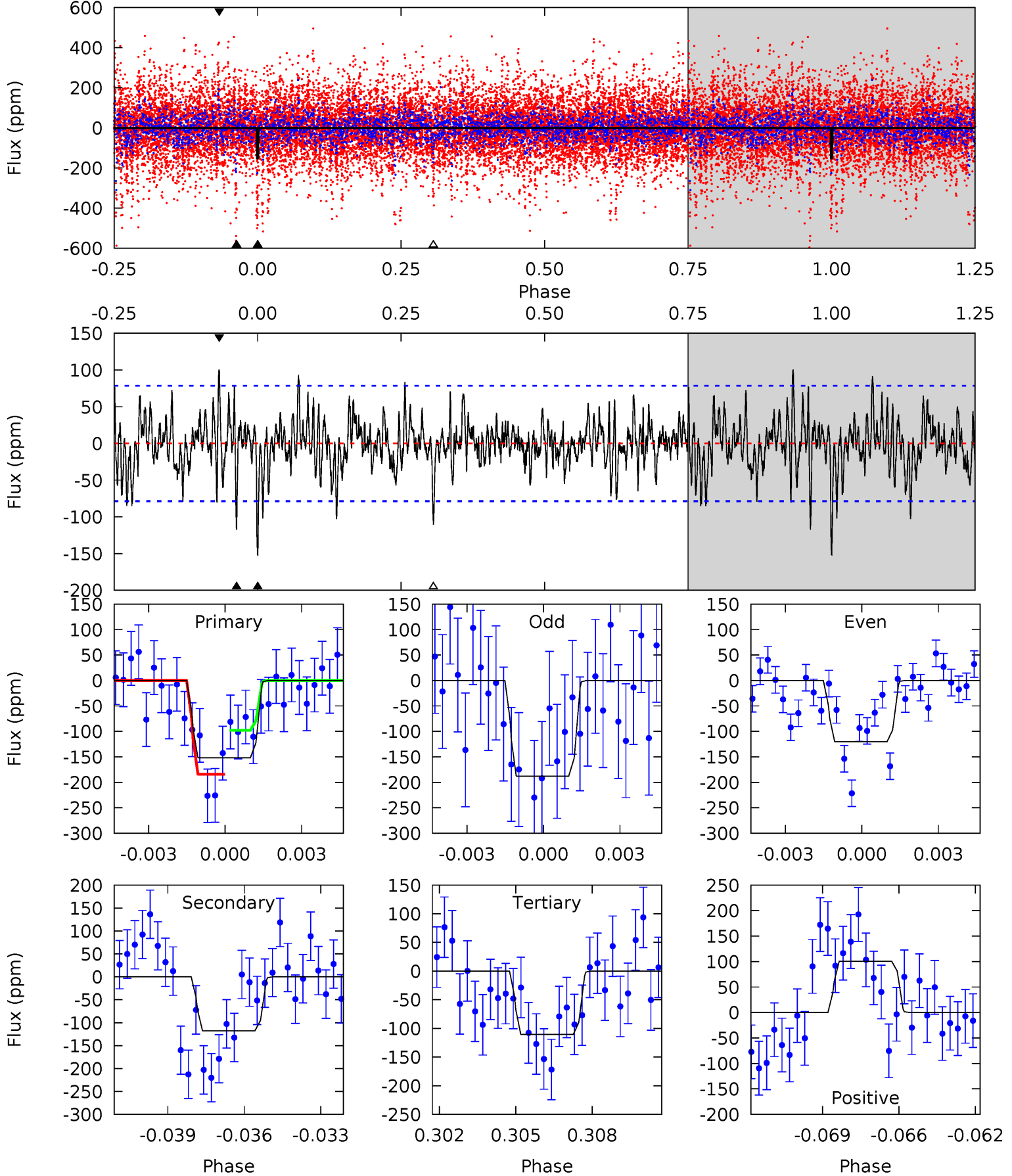
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.37	5.12	4.89	4.60	5.18	2.85	1.61	3.48	3.77	0.23	0.52	1.35	1.08	0.35	1.77



Alt Model-Shift Uniqueness Test

010470309-03, P = 74.807458 Days, E = 108.158801 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	7.84	7.37	6.71	5.24	2.94	1.86	2.74	3.41	0.47	1.13	2.24	0.83	0.40	2.80



Stellar Parameters For KIC 010470309

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6449^{+144}_{-176}	$4.252^{+0.130}_{-0.143}$	$-0.160^{+0.250}_{-0.300}$	$1.338^{+0.285}_{-0.233}$	$1.166^{+0.159}_{-0.159}$	$0.686^{+0.429}_{-0.285}$
	+2%/-3%	+3%/-3%	+156%/-188%	+21%/-17%	+14%/-14%	+63%/-42%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010470309-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-57 ± 11	$1.52^{+1.06}_{-0.91}$	761^{+47}_{-42}	5517^{+3576}_{-1103}	1846^{+8915}_{-1235}
Alt.	-118 ± 15	$1.84^{+1.12}_{-0.92}$	763^{+44}_{-44}	5914^{+3039}_{-1007}	2466^{+8148}_{-1487}

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 $A_{obs} \gg 1.0$

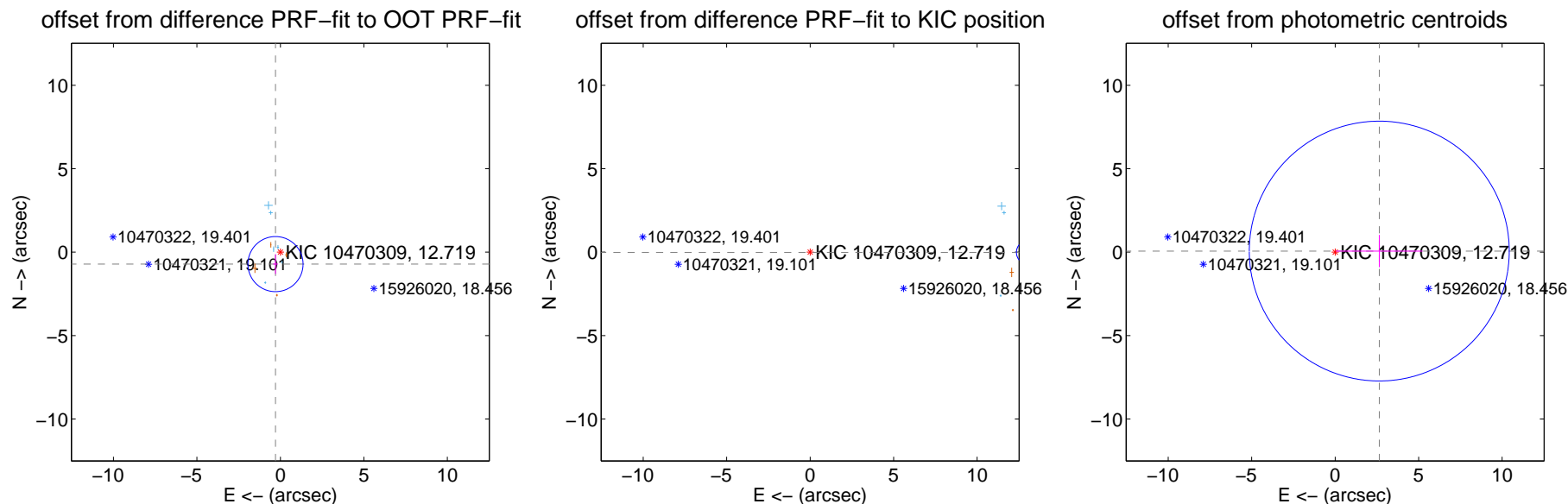
DV Centroid Data

Supplemental centroid analysis for 010470309-03. Kepler magnitude: 12.72. Transit SNR 5.58

There are 6 quarters with good PRF difference image offsets

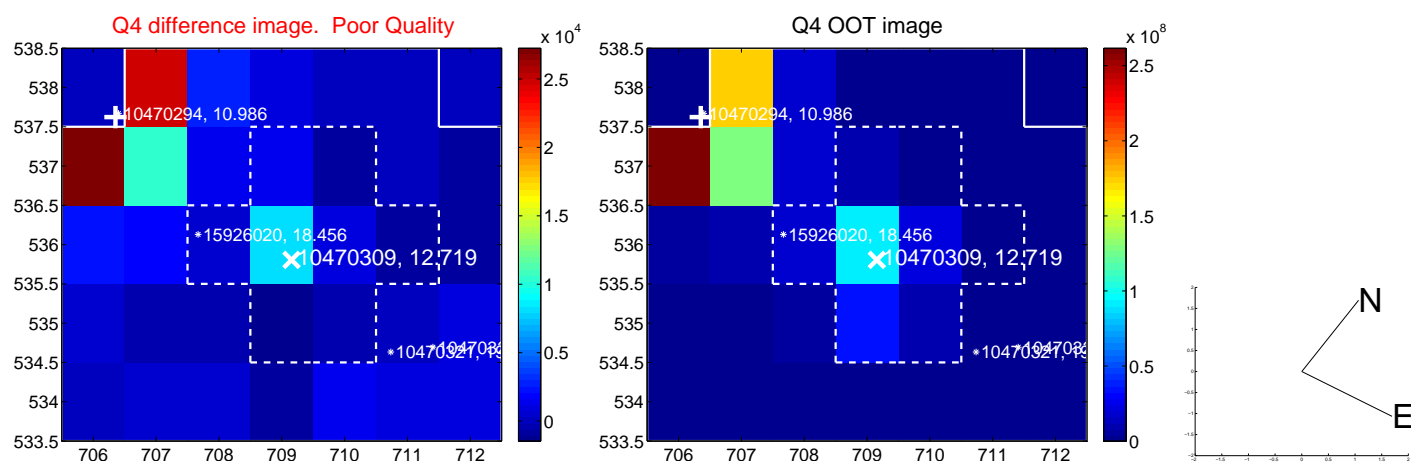
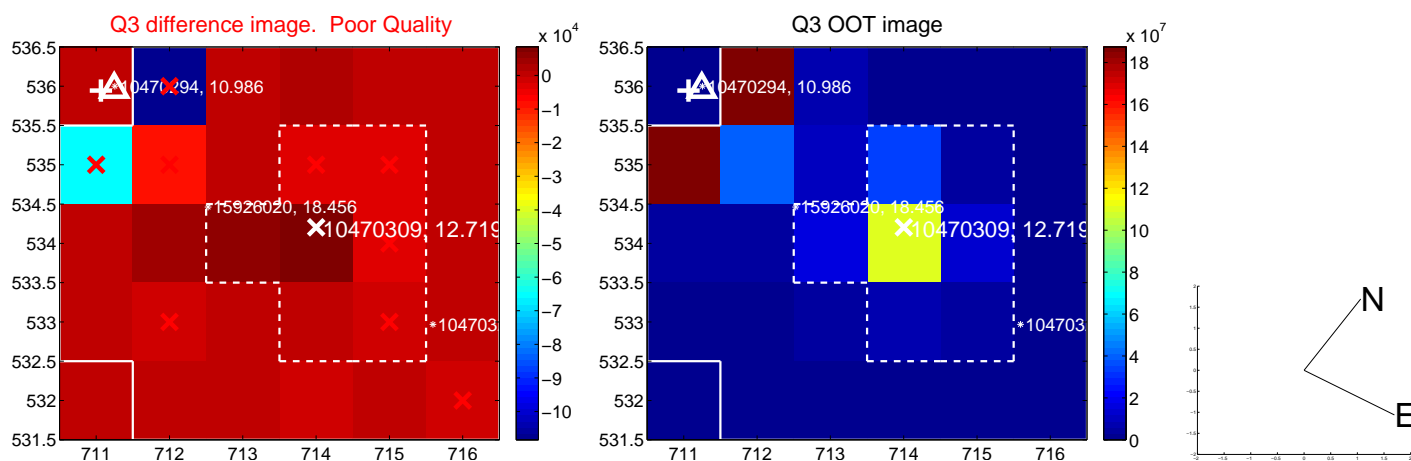
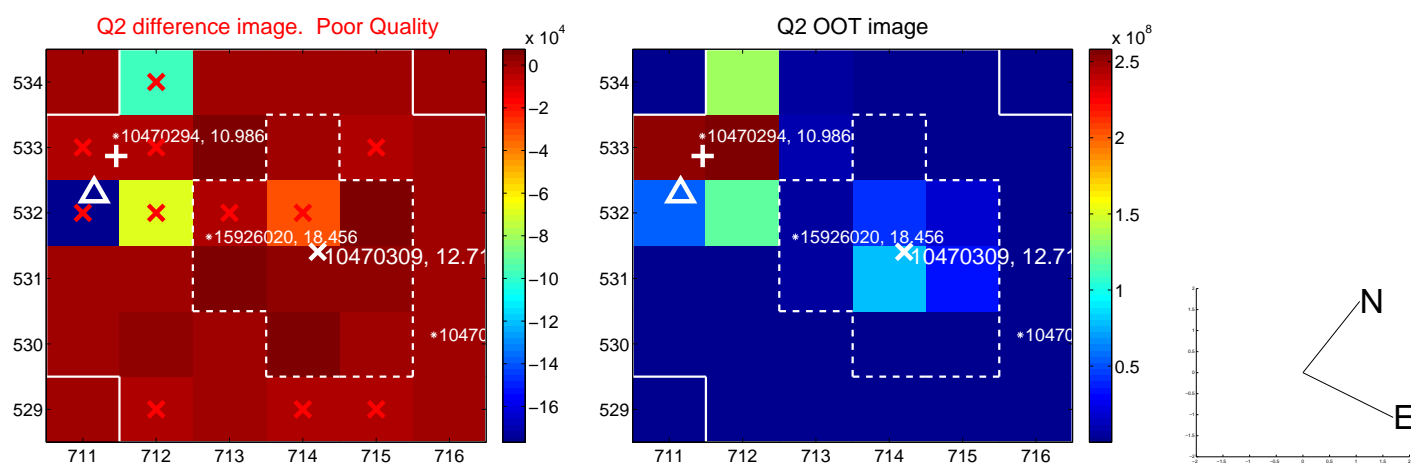
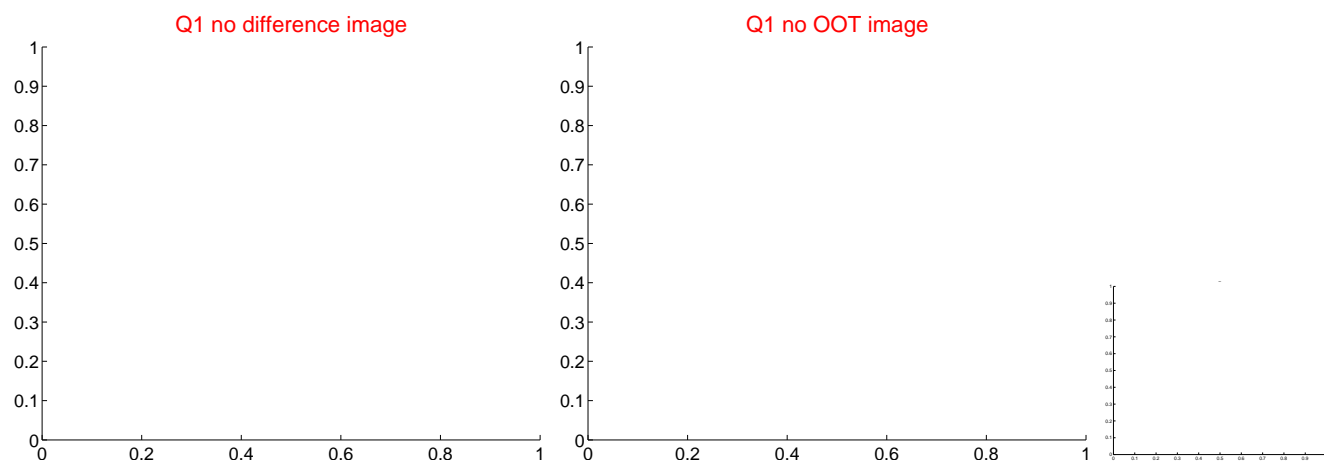
The OOT PRF centroid is offset from the target star catalog position by about 13.32 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.774 ± 0.550	1.41	0.294 ± 0.144	-0.716 ± 0.592
PRF-fit source offset from KIC position	13.076 ± 0.241	54.32	-13.076 ± 0.241	-0.014 ± 0.634
photometric centroid source offset	2.64 ± 2.59	1.02	-2.64 ± 2.60	0.07 ± 0.97

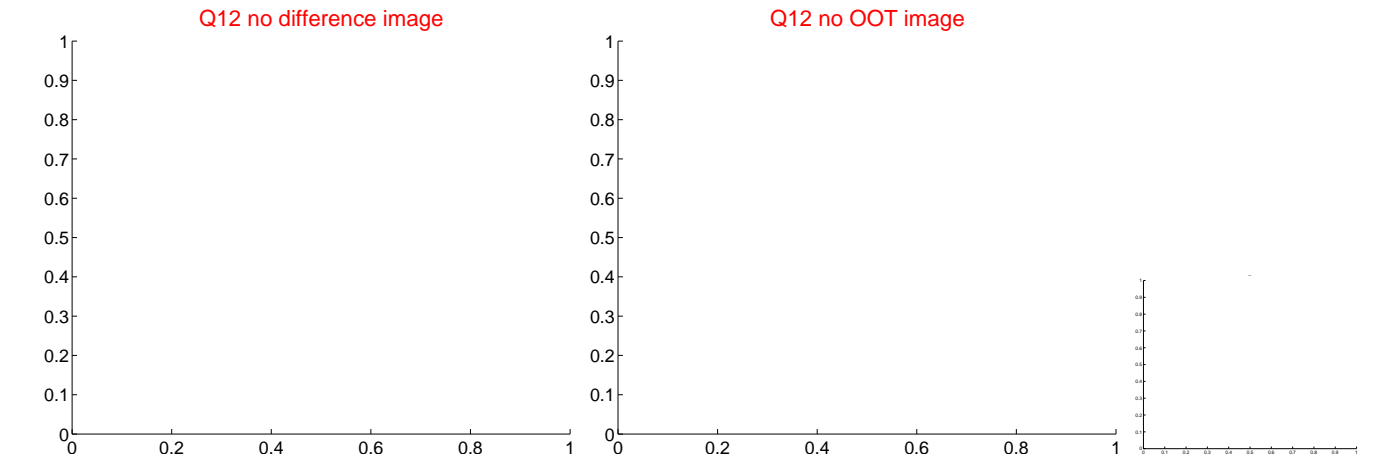
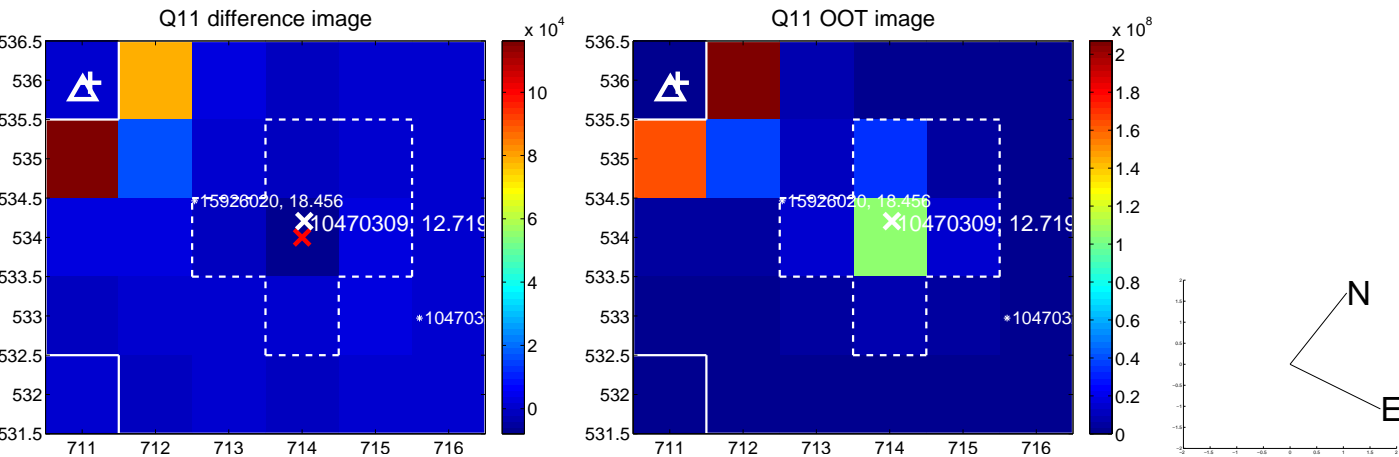
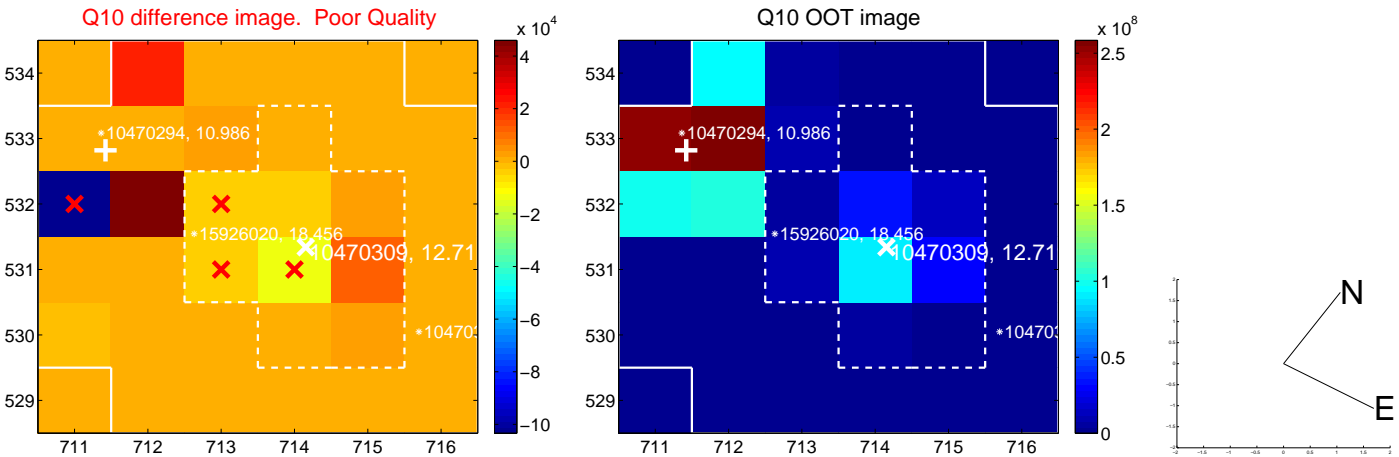
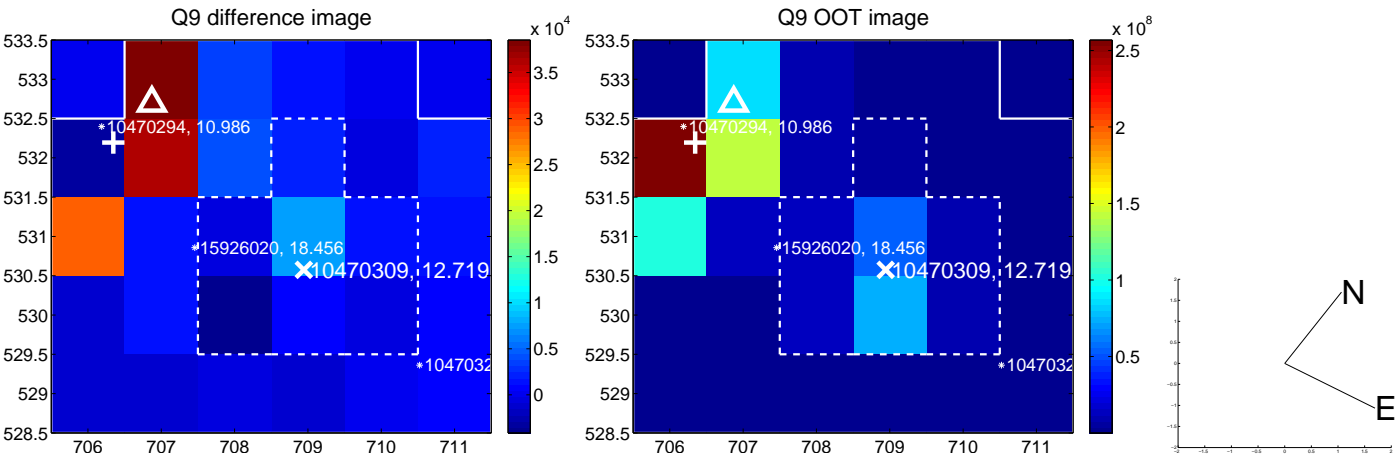


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

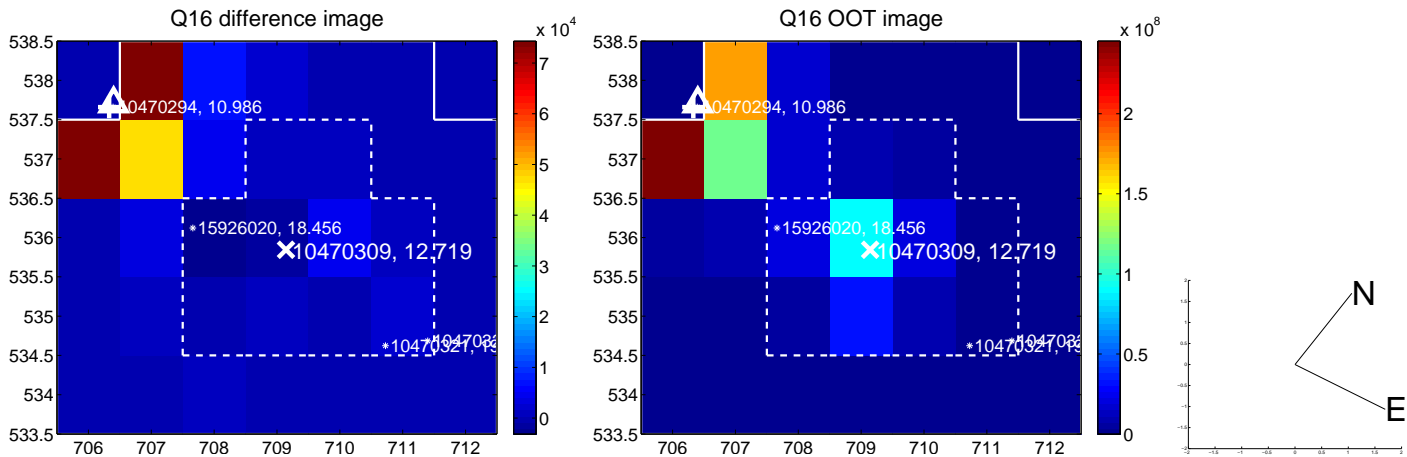
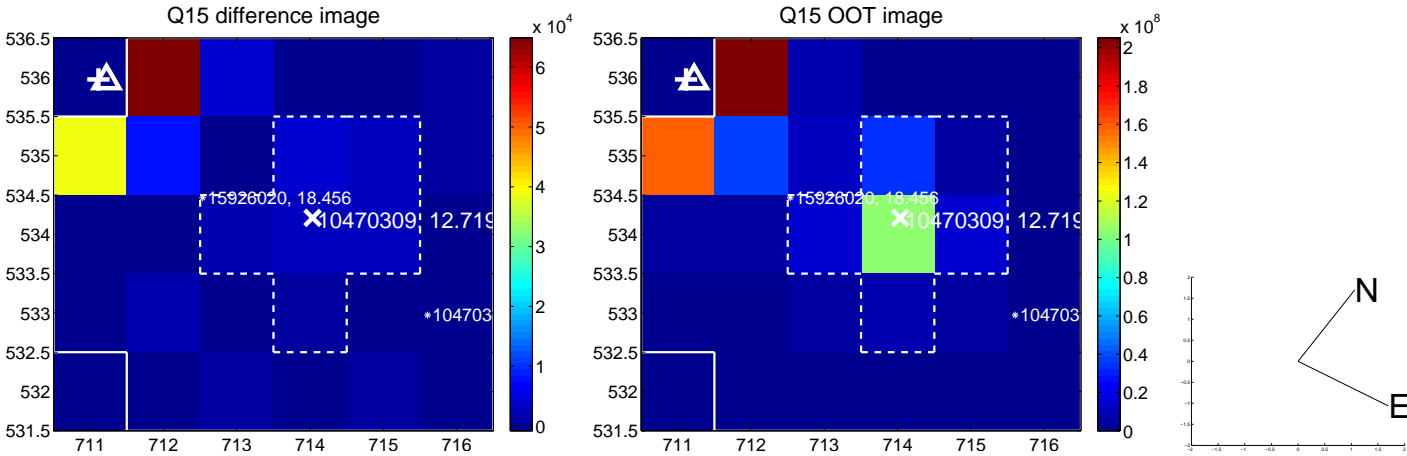
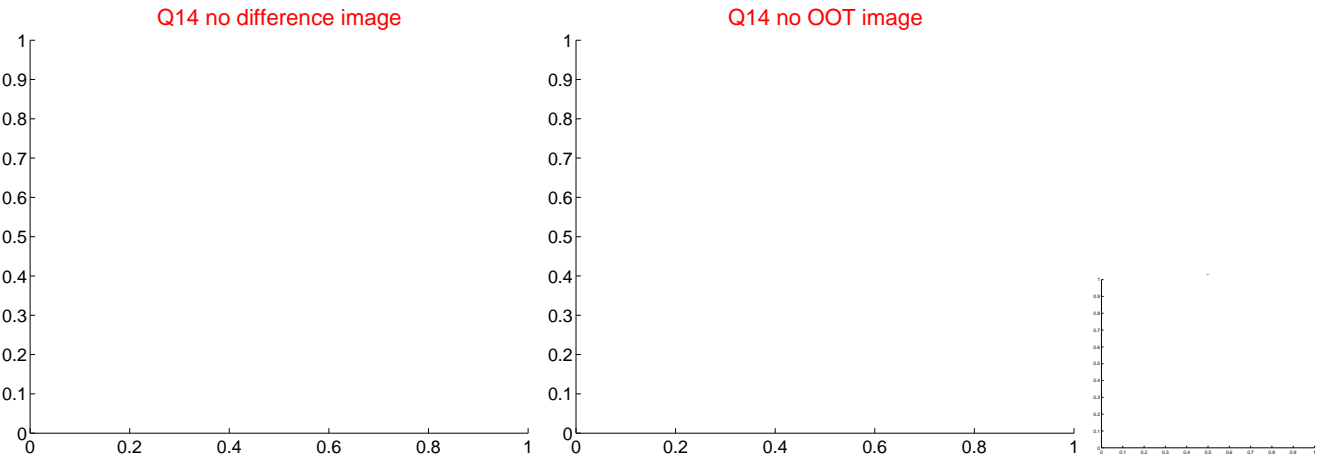
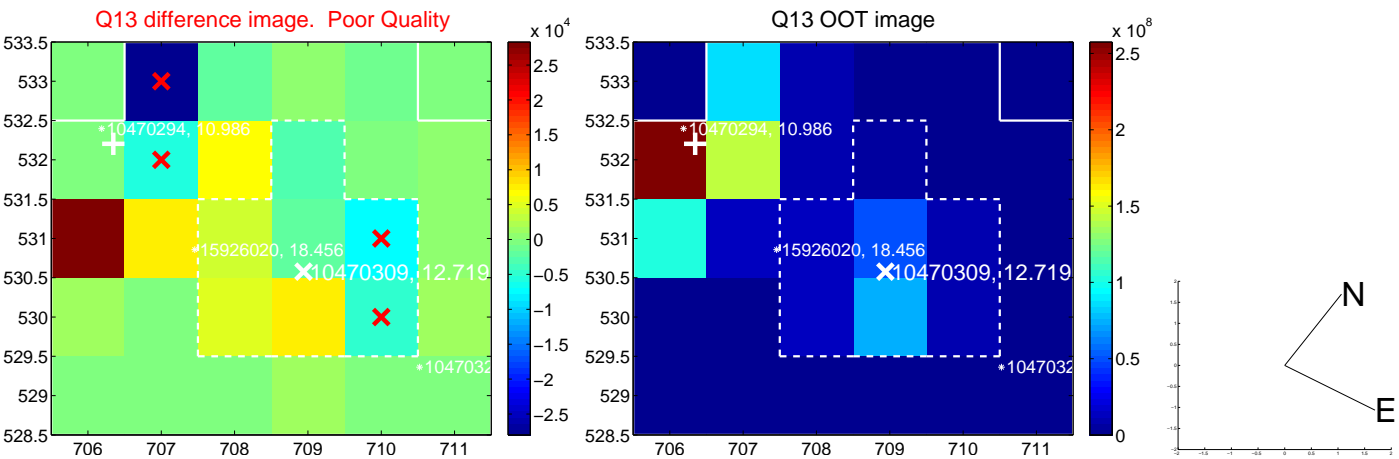
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



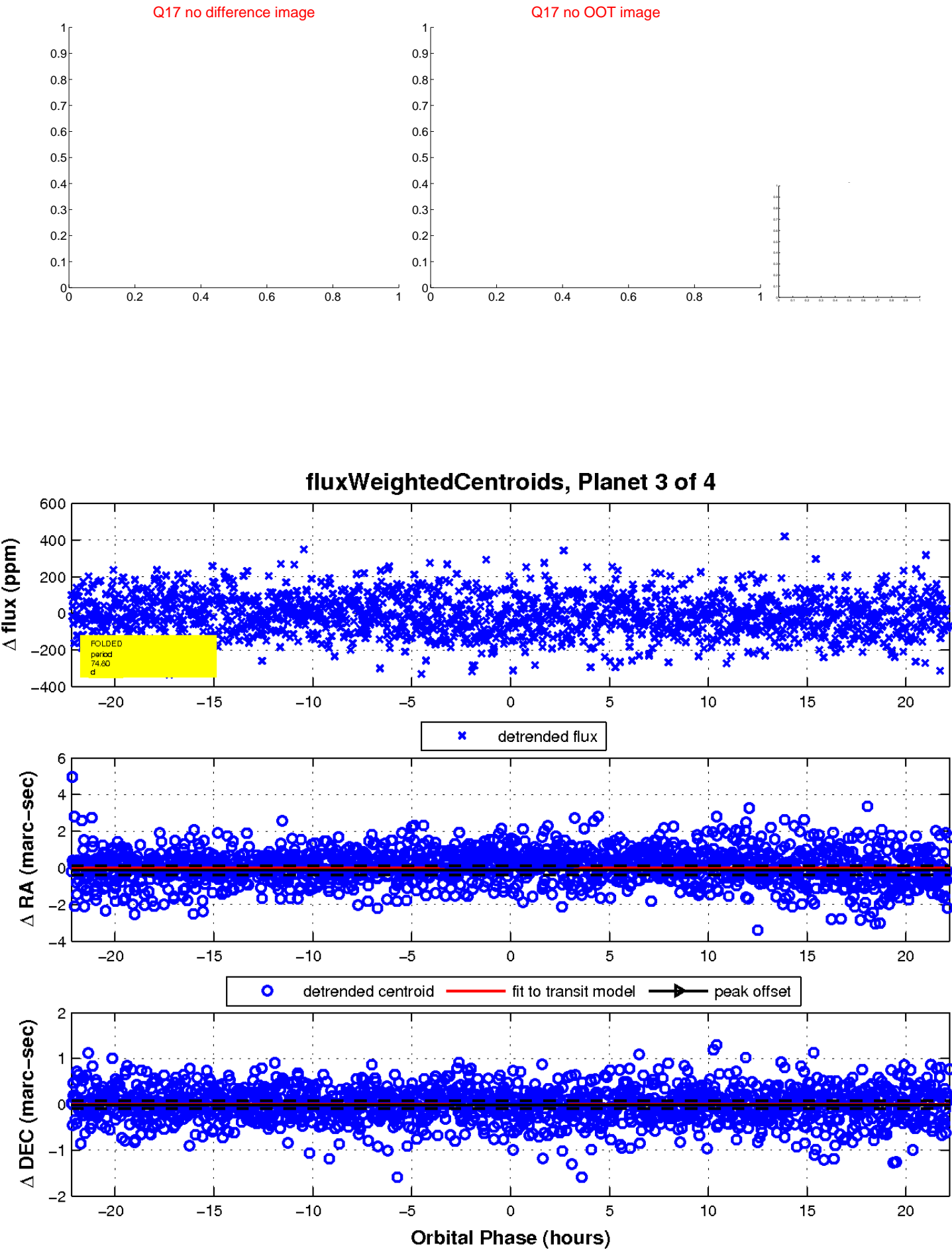
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

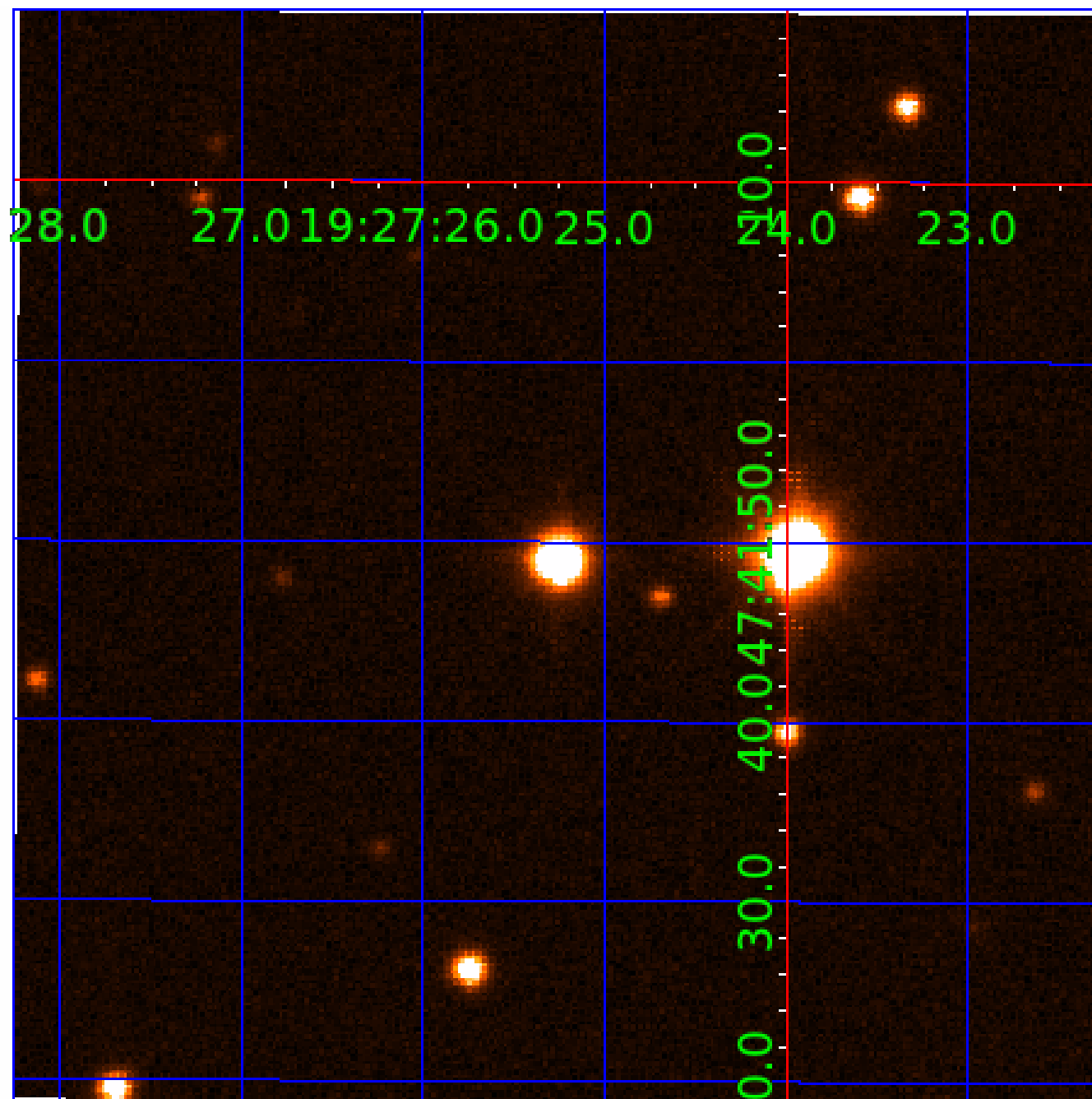


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010470309

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})
010470309-01	OBS	No	0.741154	132.001600	5.2	4.196	8.6	4.6	1.34	6449	0.32	9741.44
010470309-03	OBS	No	74.804197	182.987951	92.2	7.403	7.8	5.6	1.34	6449	1.44	20.73
010470309-04	OBS	No	102.592421	203.815217	167.2	4.212	8.1	6.0	1.34	6449	2.32	13.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010470309-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
010470309-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
010470309-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET

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

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

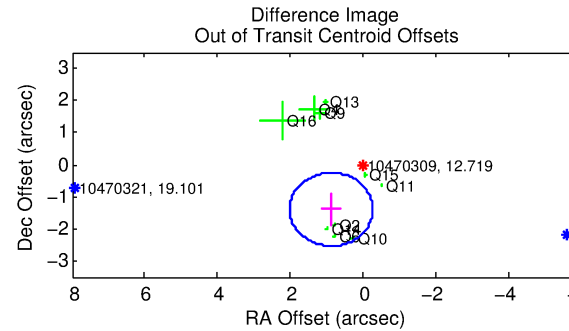
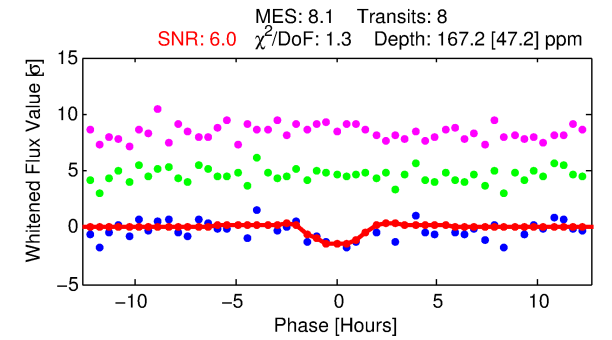
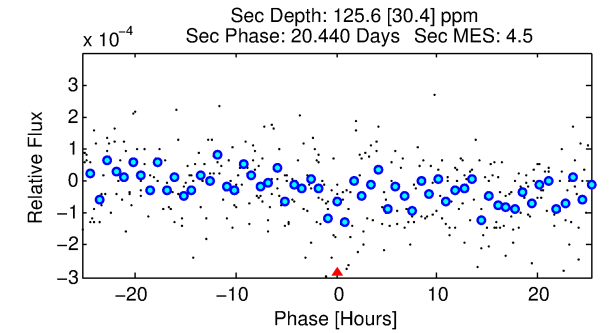
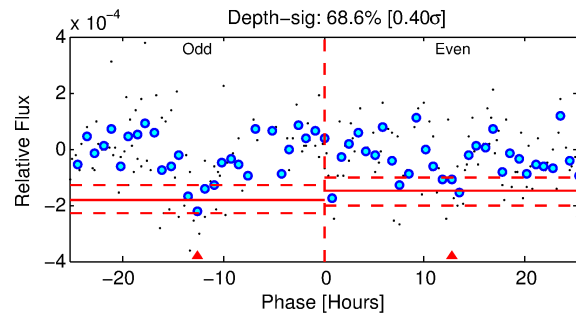
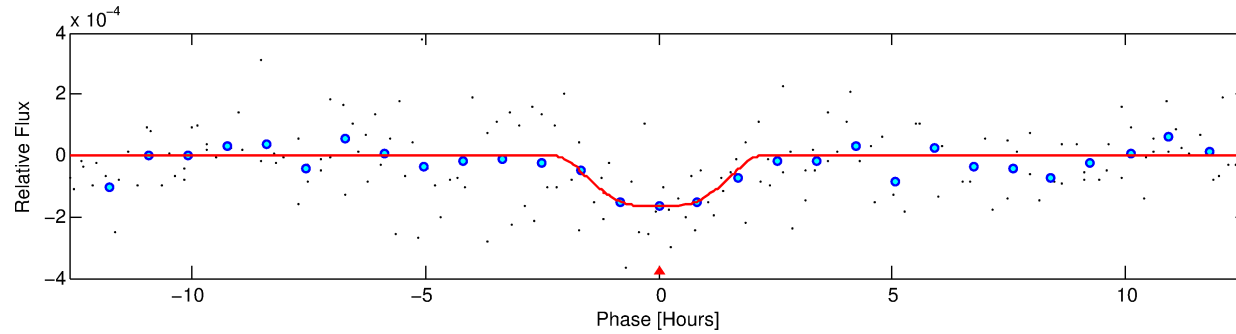
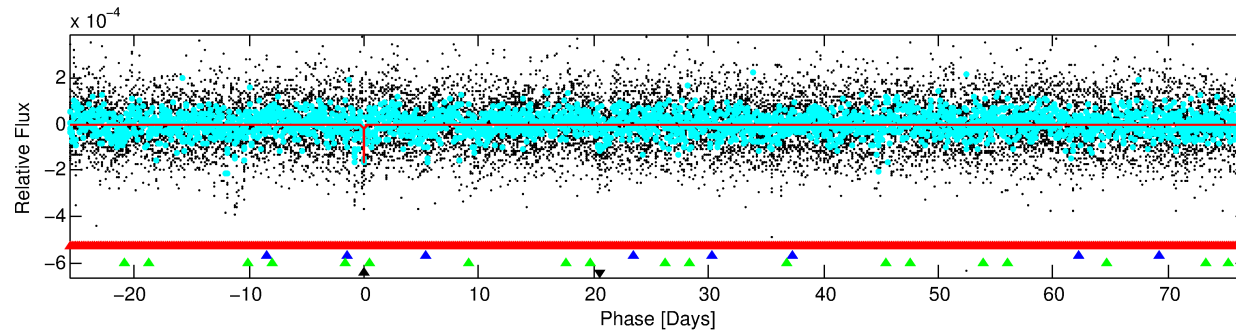
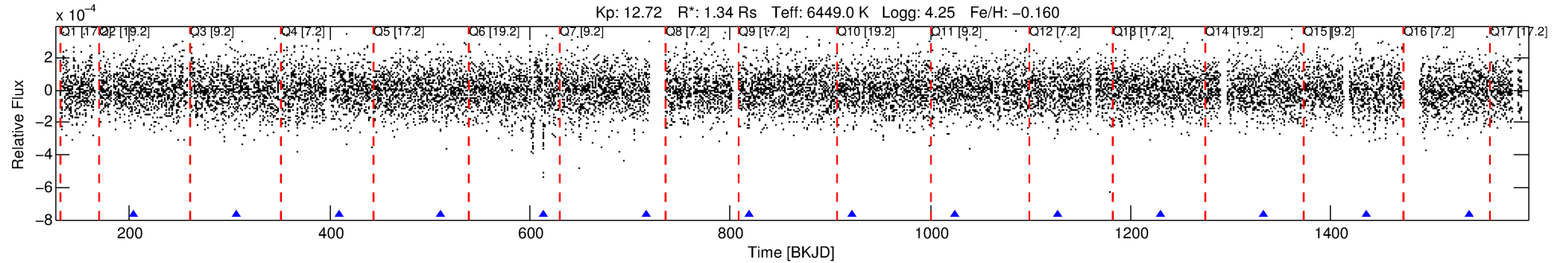
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010470309-04

No Significant Match Found

DV One-Page Summary

KIC: 10470309 Candidate: 4 of 4 Period: 102.592 d



DV Fit Results:

Period = 102.59242 [0.00230] d
Epoch = 203.8152 [0.0198] BKJD
Rp/R* = 0.0159 [0.0030]
a/R* = 48.36 [18.59]
b = 0.98 [0.02]
Seff = 13.60 [3.85]
Teq = 490 [35] K
Rp = 2.32 [0.66] Re
a = 0.4516 [0.0810] AU
Ag = 2610.78 [1353.57] [1.93 σ]
Teff = 5412 [624] K [7.88 σ]

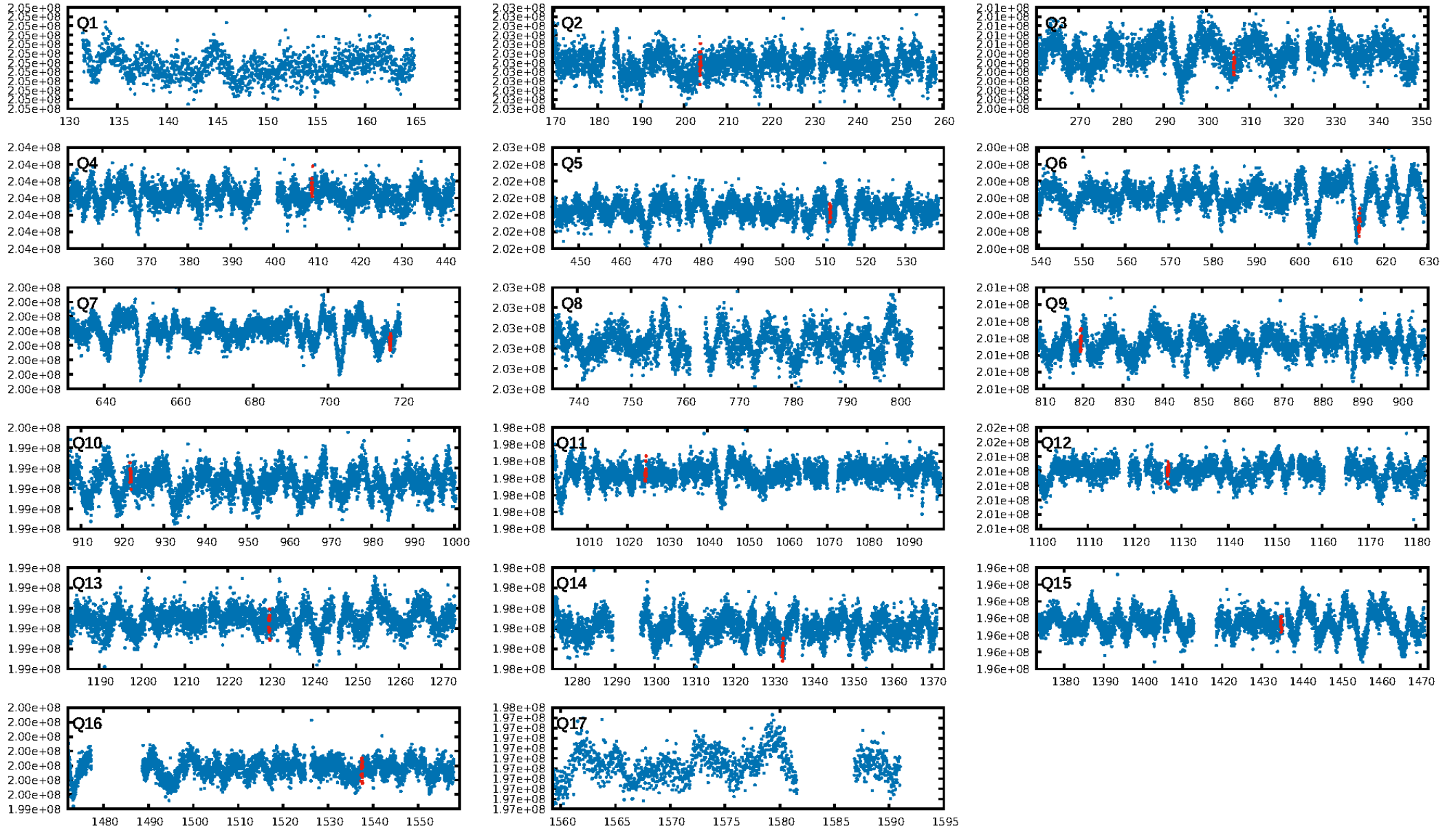
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [78.30 σ]
LongPeriod-sig: 100.0% [262.58 σ]
ModelChiSquare2-sig: 72.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 8.06e-11
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: -0.4336
Centroid-sig: 0.9%
Centroid-so: 2.952 arcsec [1.65 σ]
OotOffset-rm: 1.650 arcsec [4.33 σ]
KicOffset-rm: 11.624 arcsec [36.55 σ]
OotOffset-st: 4/2/2/2 [10]
KicOffset-st: 4/2/2/2 [10]
DiffImageQuality-fgm: 0.40 [4/10]
DiffImageOverlap-fno: 0.00 [0/13]

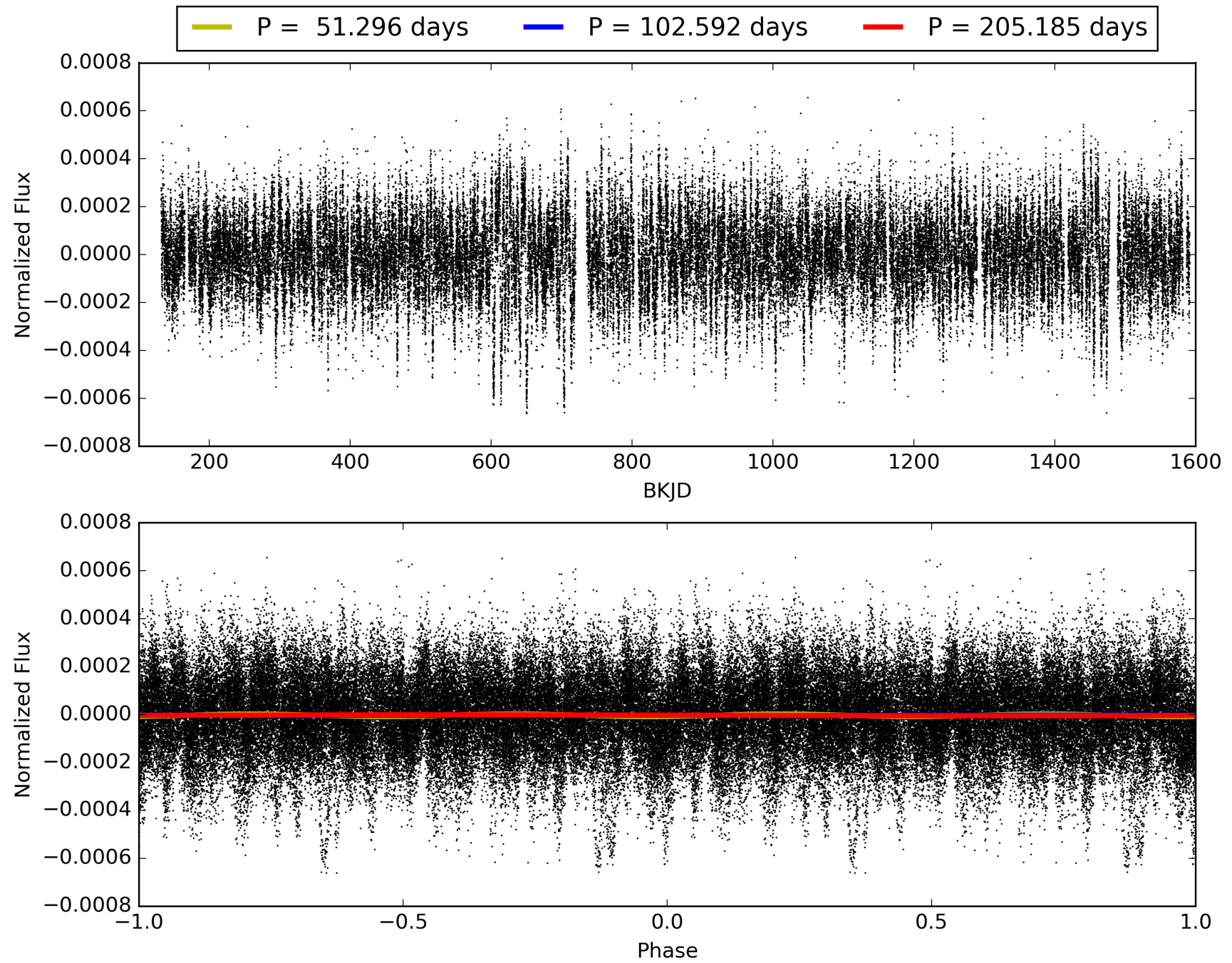
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:45:23 Z

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

TCE 010470309-04, PDC Light Curves

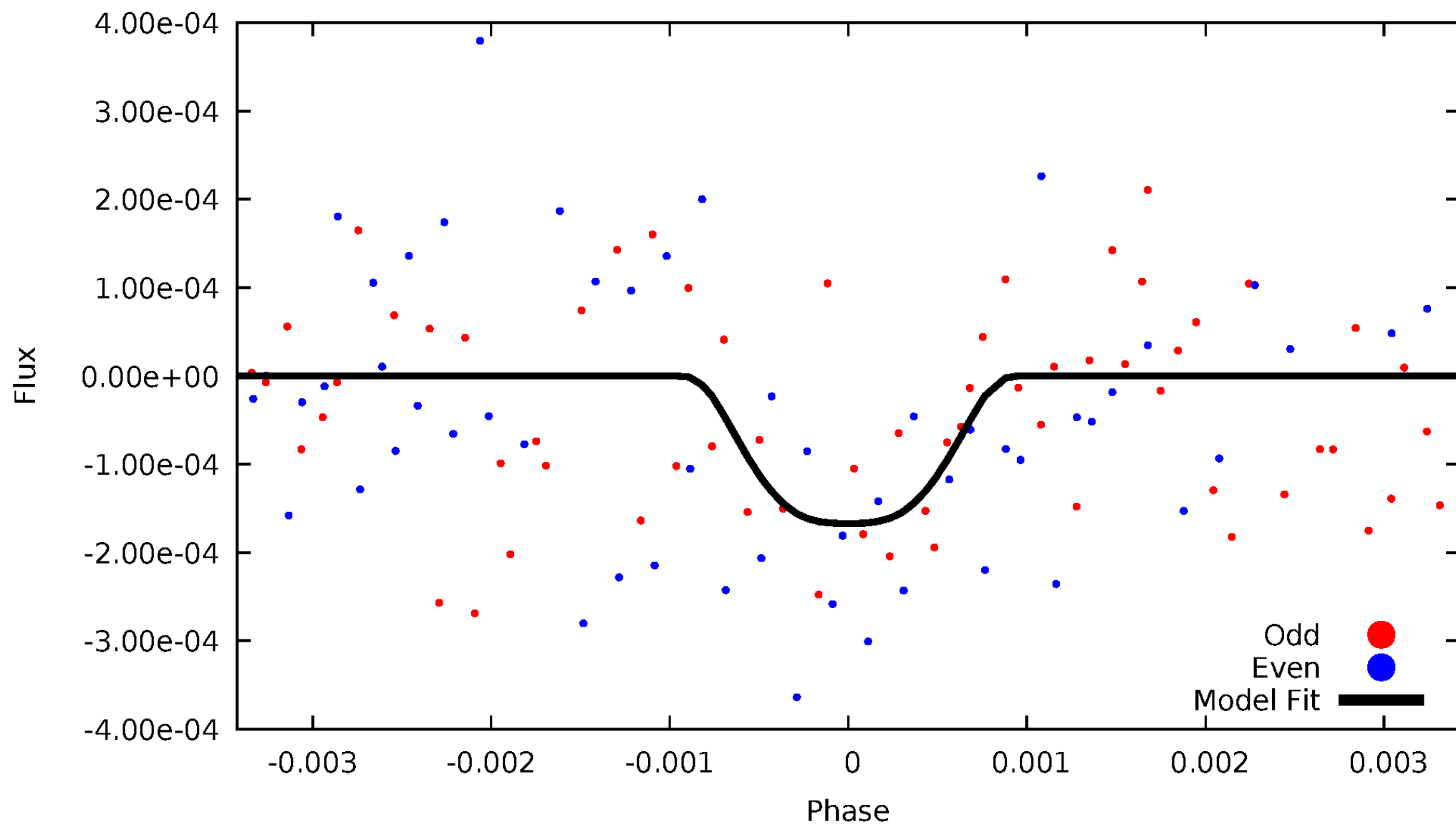


TCE 010470309-04



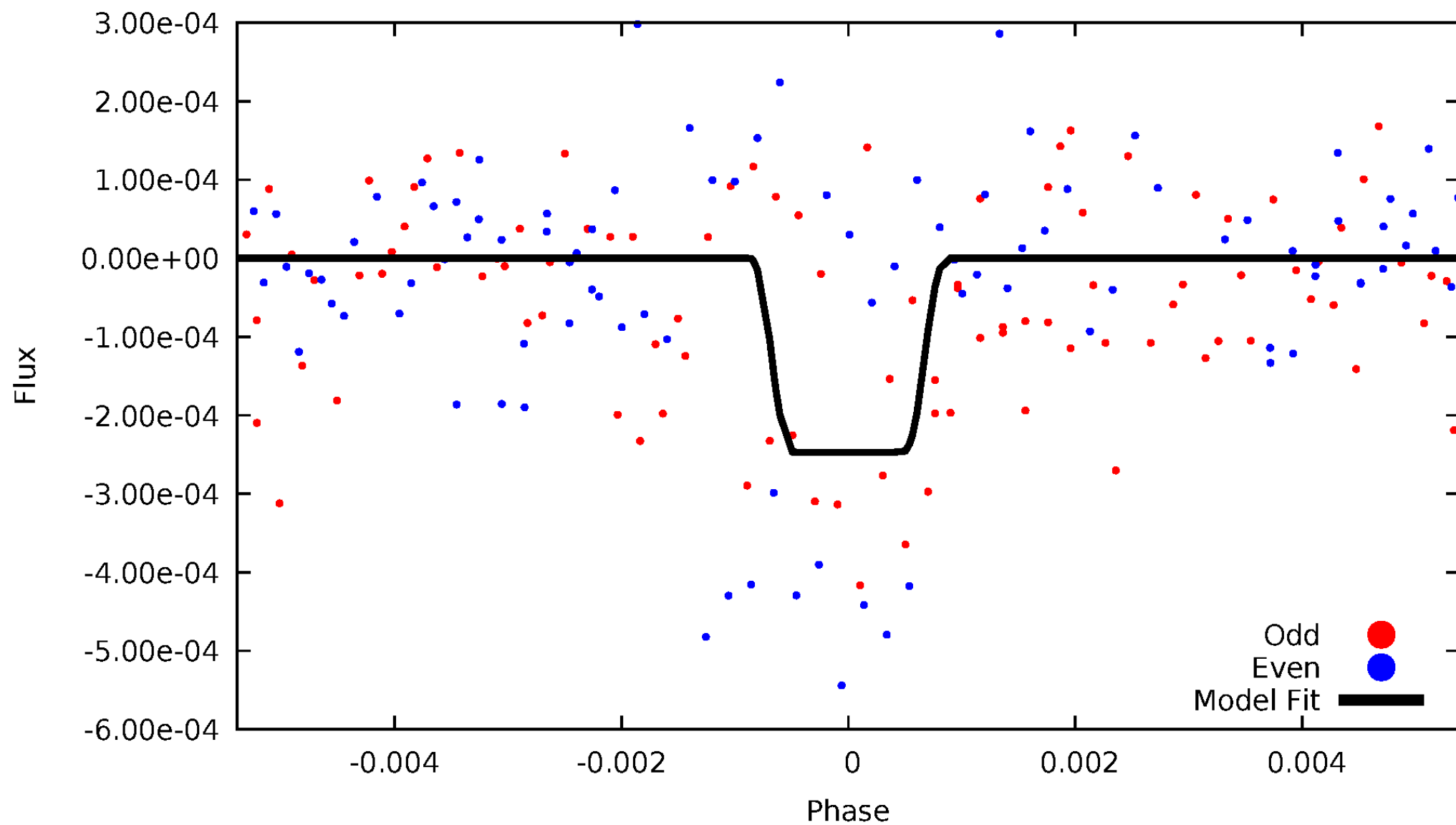
DV Odd/Even

TCE 010470309-04



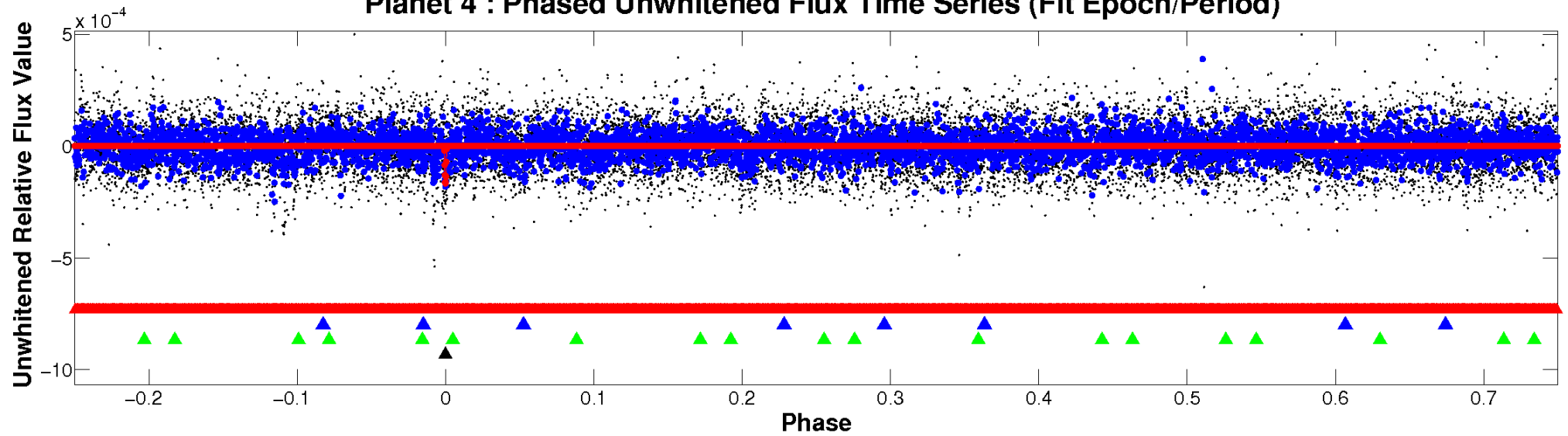
ALT Odd/Even

TCE 010470309-04

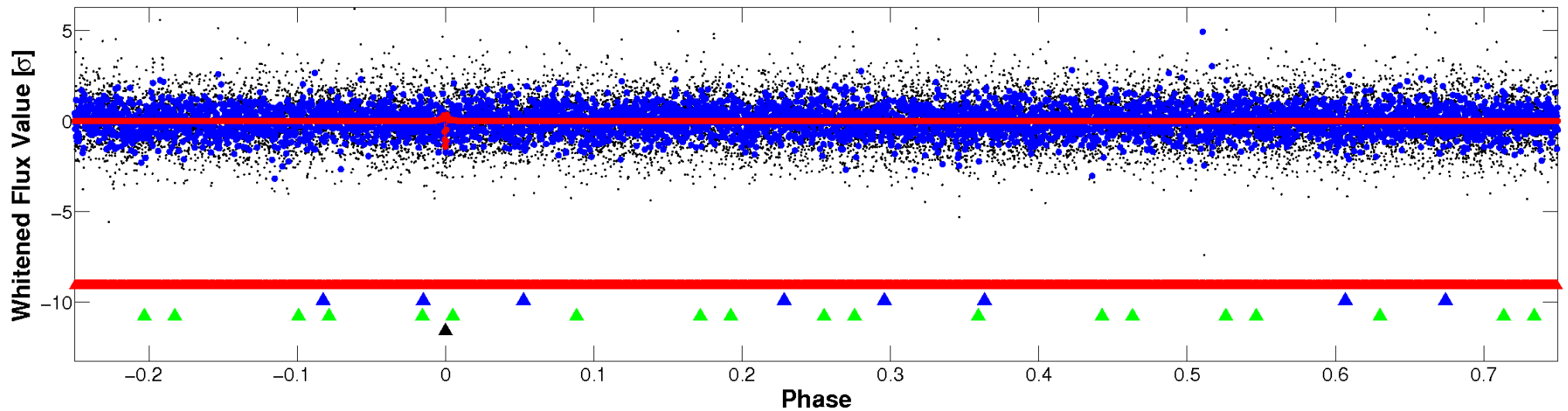


Non-Whitened Vs. Whitened Light Curve

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

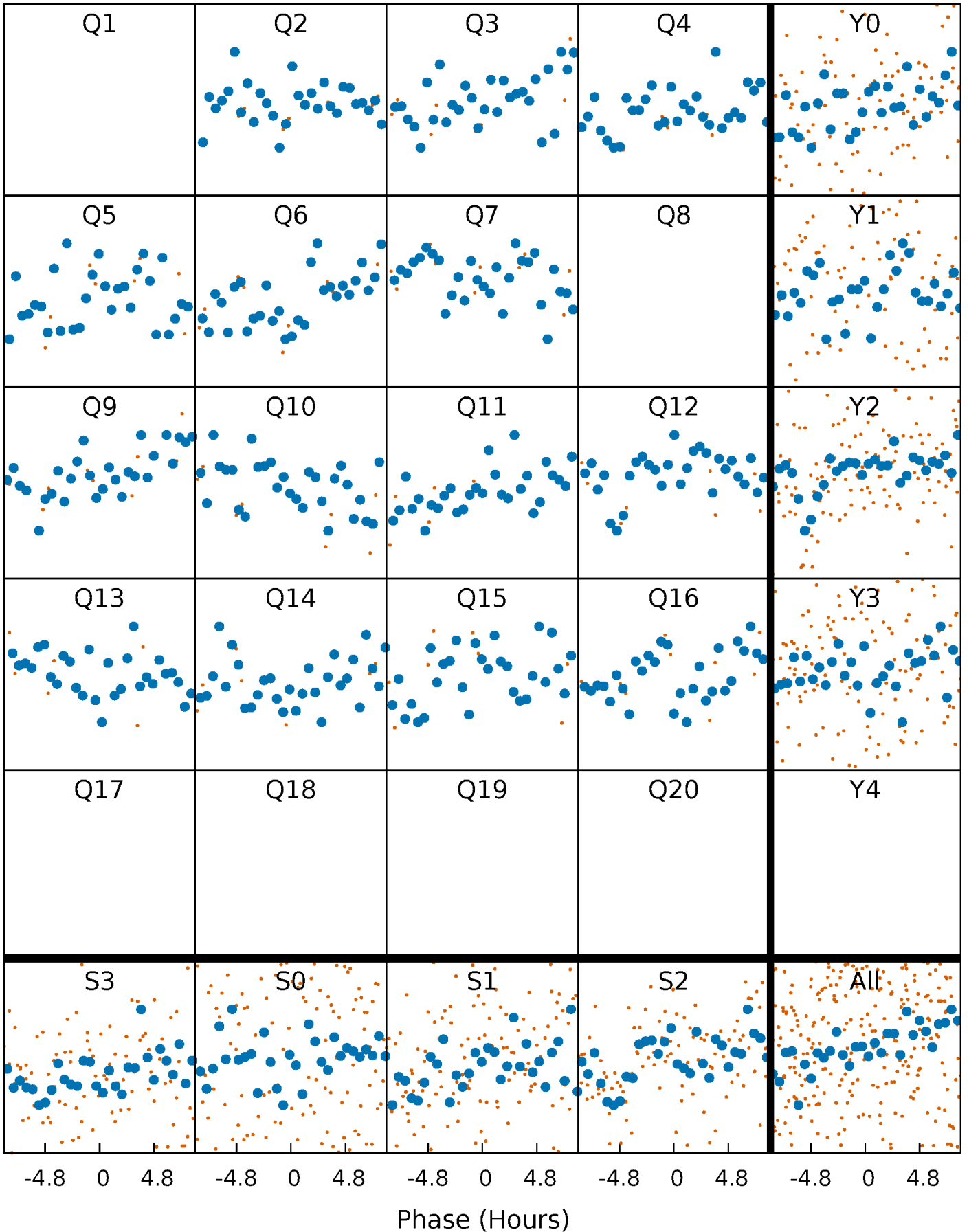


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



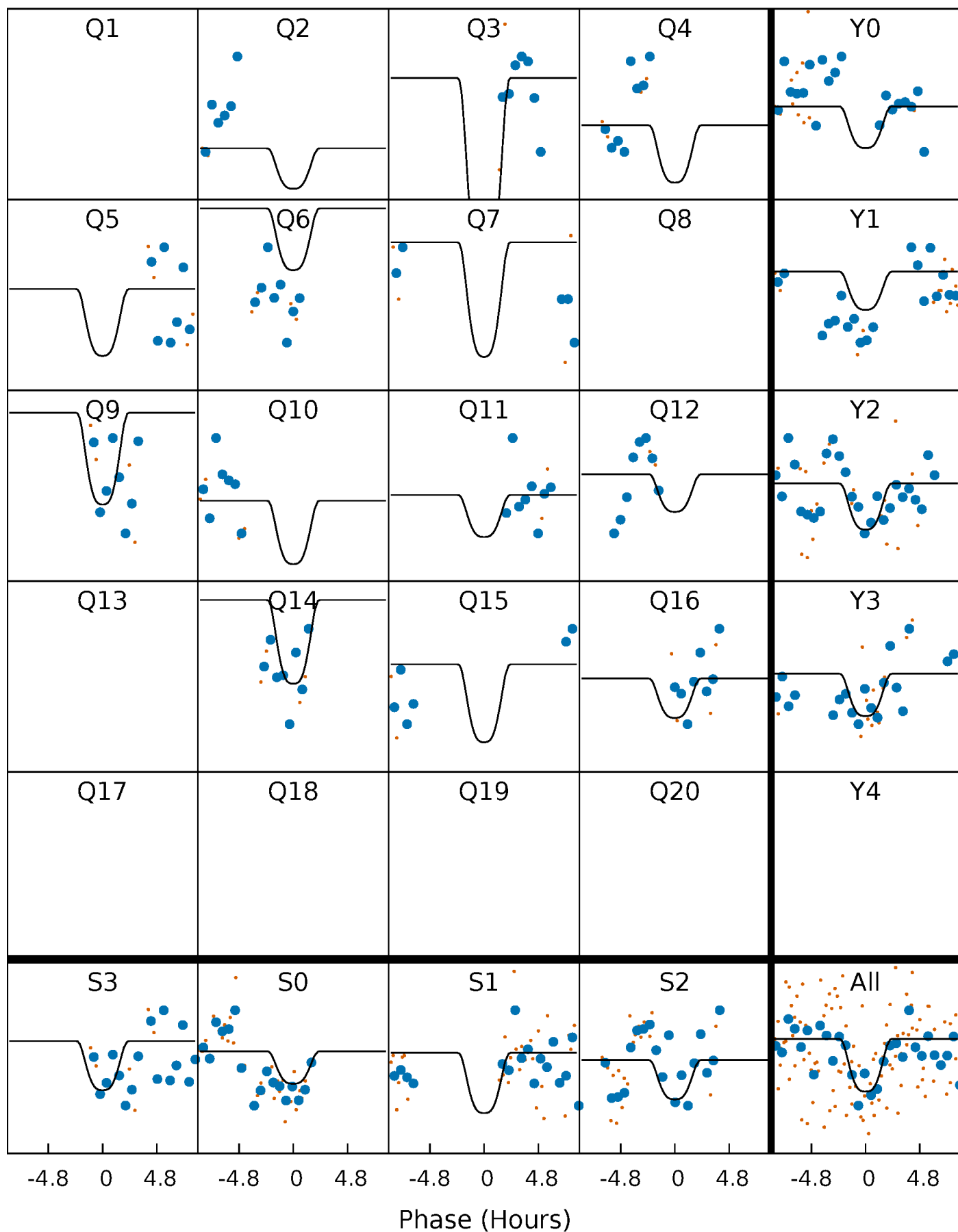
PDC Quarter-Phased Transit Curves

TCE 010470309-04 $P=102.592421$ Days $T_0=203.815217$ (BKJD)



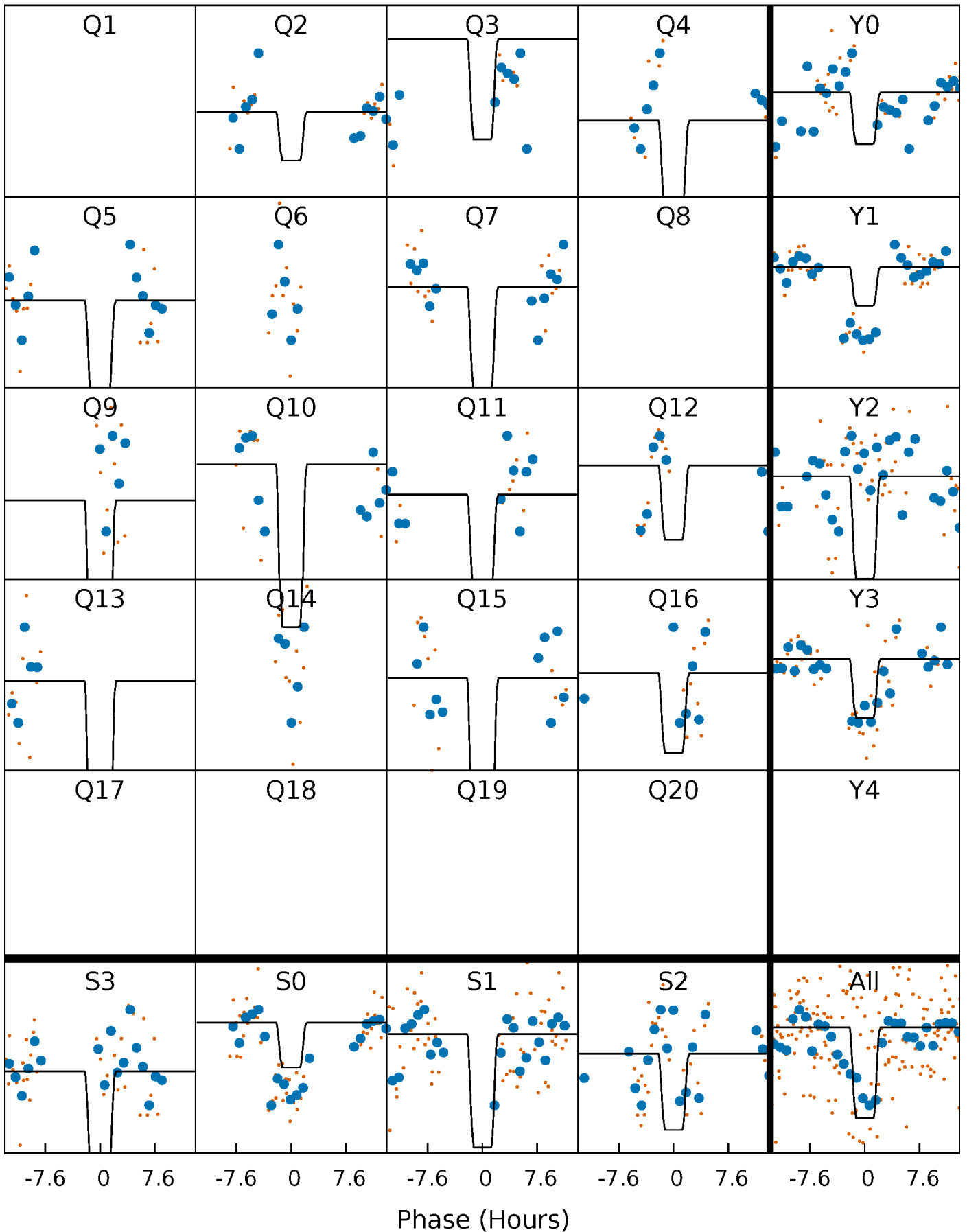
DV Quarter-Phased Transit Curves

TCE 010470309-04 P=102.592421 Days $T_0=203.815217$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

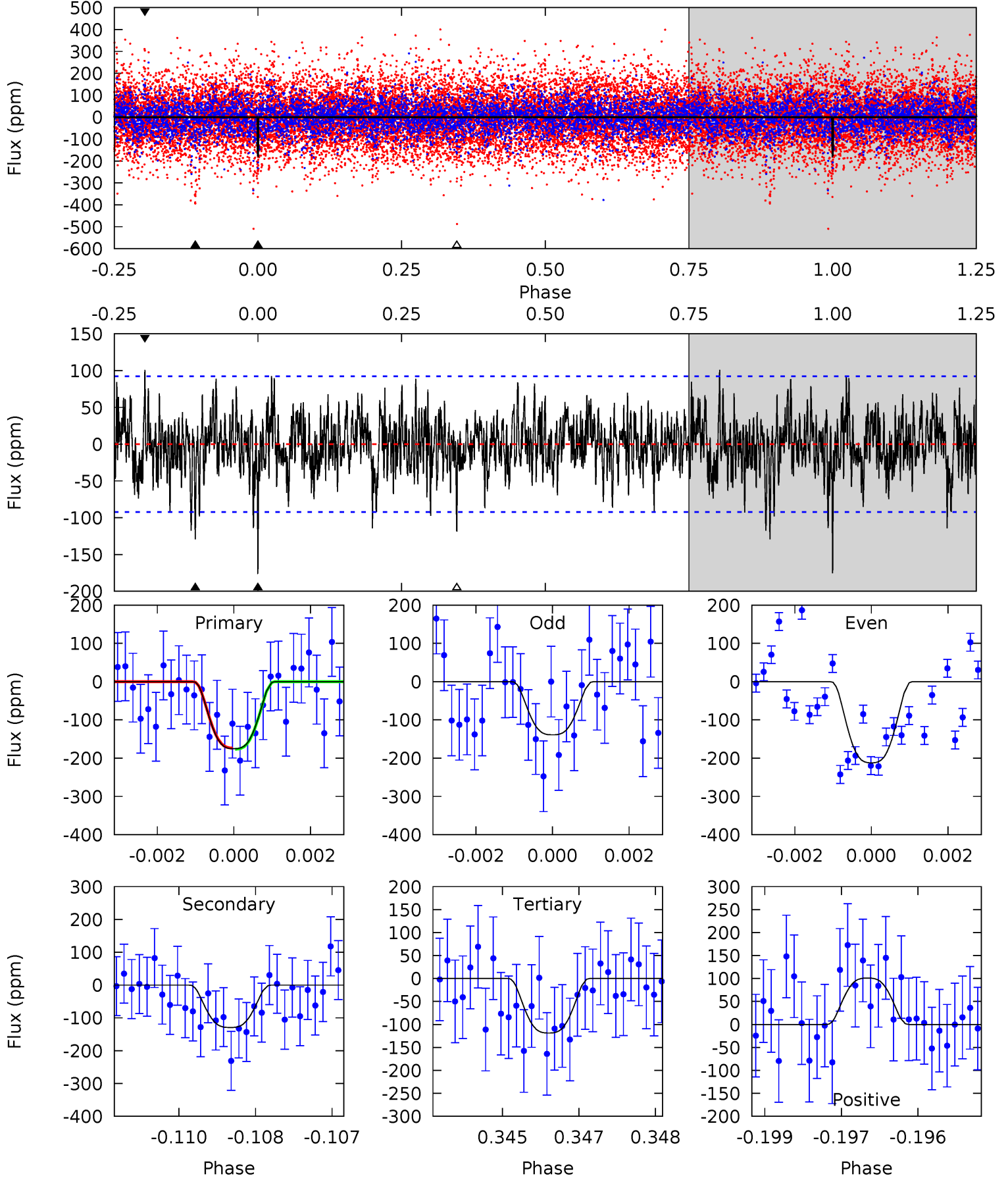
TCE 010470309-04 P=102.591805 Days $T_0=203.794275$ (BKJD)



DV Model-Shift Uniqueness Test

010470309-04, P = 102.592421 Days, E = 101.222796 Days

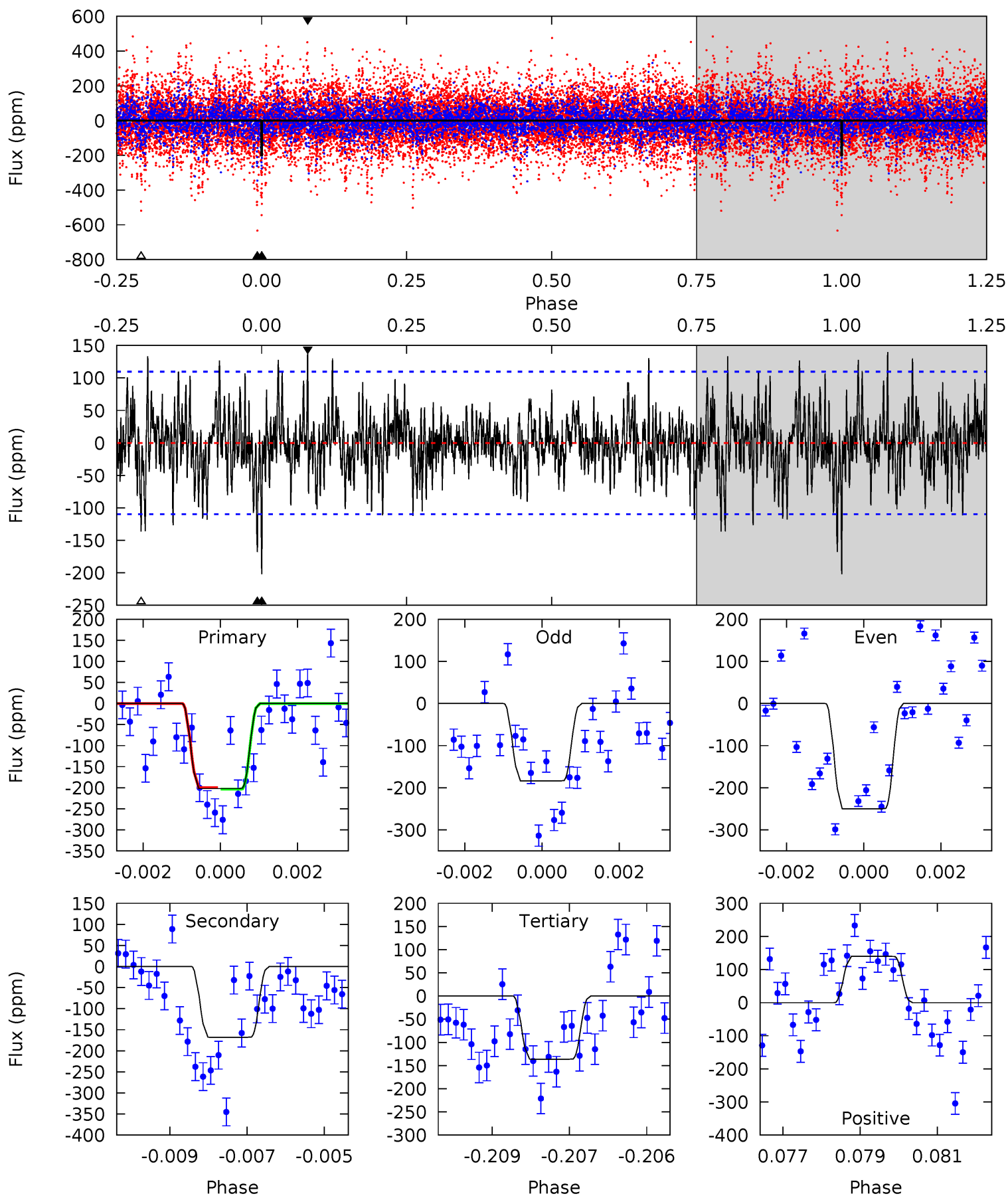
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	7.50	6.89	5.86	5.35	3.13	1.80	3.28	4.31	0.62	1.65	2.11	1.29	0.37	0.09



Alt Model-Shift Uniqueness Test

010470309-04, P = 102.591805 Days, E = 101.202470 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.85	8.19	6.65	6.82	5.35	3.13	1.81	3.20	3.03	1.54	1.37	1.61	33.2	0.41	0.09



Stellar Parameters For KIC 010470309

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6449^{+144}_{-176}	$4.252^{+0.130}_{-0.143}$	$-0.160^{+0.250}_{-0.300}$	$1.338^{+0.285}_{-0.233}$	$1.166^{+0.159}_{-0.159}$	$0.686^{+0.429}_{-0.285}$
	+2%/-3%	+3%/-3%	+156%/-188%	+21%/-17%	+14%/-14%	+63%/-42%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010470309-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-129 ± 17	$2.31^{+0.57}_{-0.50}$	686^{+37}_{-39}	5485^{+598}_{-442}	2678^{+1713}_{-962}
Alt.	-168 ± 21	$2.29^{+0.57}_{-0.48}$	683^{+42}_{-39}	5826^{+705}_{-478}	3513^{+2296}_{-1164}

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

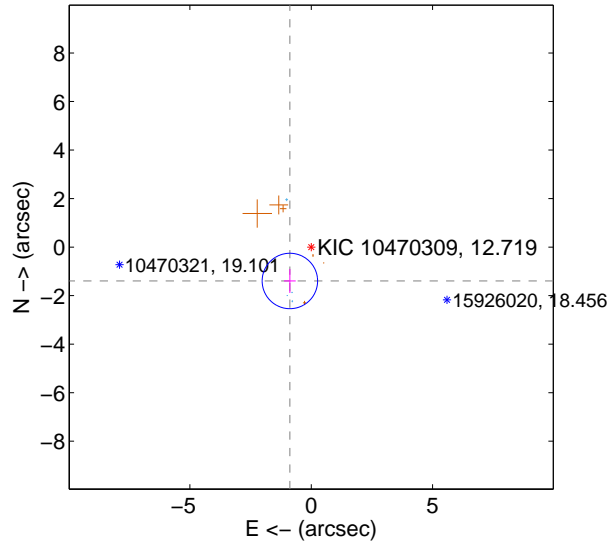
Supplemental centroid analysis for 010470309-04. Kepler magnitude: 12.72. Transit SNR 6.02

There are 4 quarters with good PRF difference image offsets

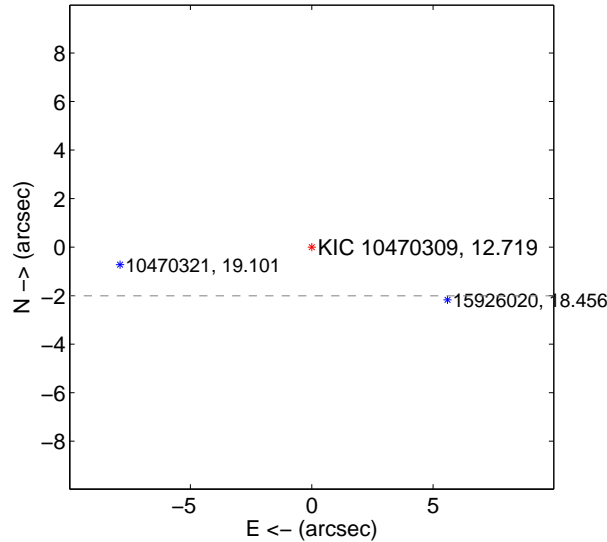
The OOT PRF centroid is offset from the target star catalog position by about 13.29 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.650 ± 0.381	4.33	0.880 ± 0.242	-1.396 ± 0.493
PRF-fit source offset from KIC position	11.624 ± 0.318	36.55	-11.449 ± 0.266	-2.008 ± 0.673
photometric centroid source offset	2.95 ± 1.79	1.65	-2.46 ± 2.06	-1.62 ± 0.86

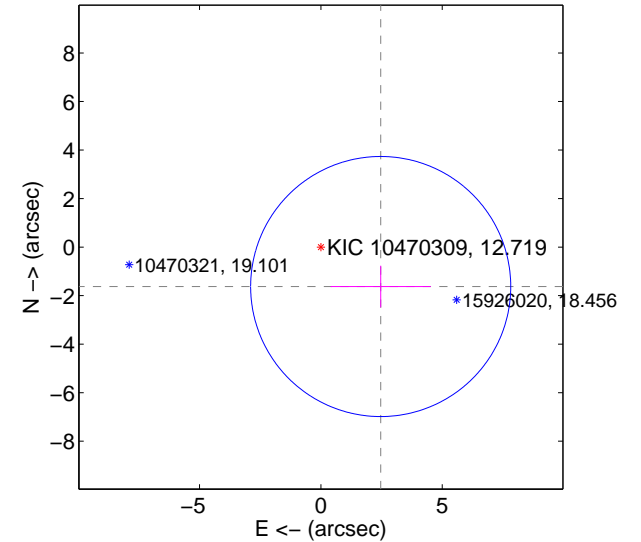
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

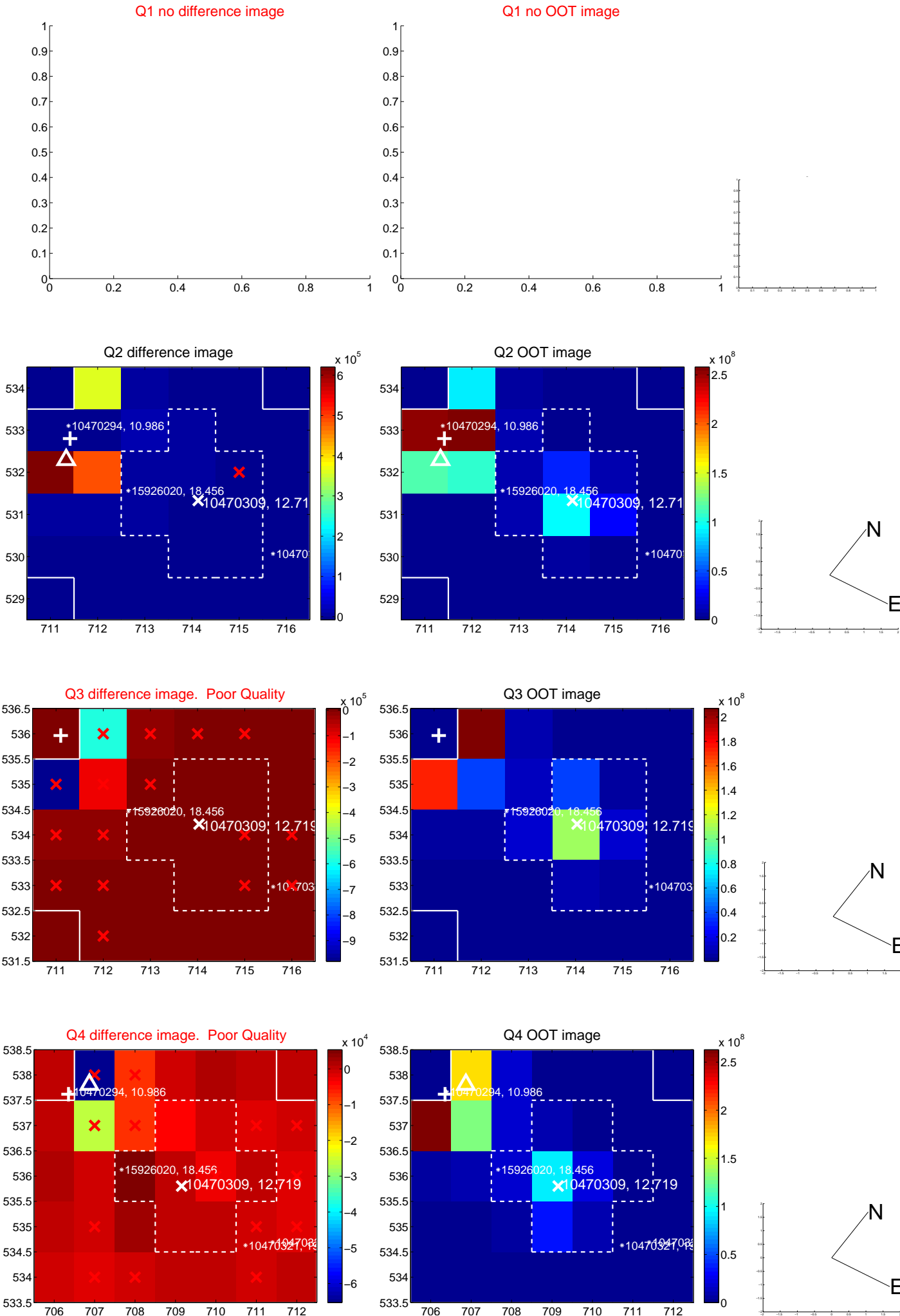


offset from photometric centroids

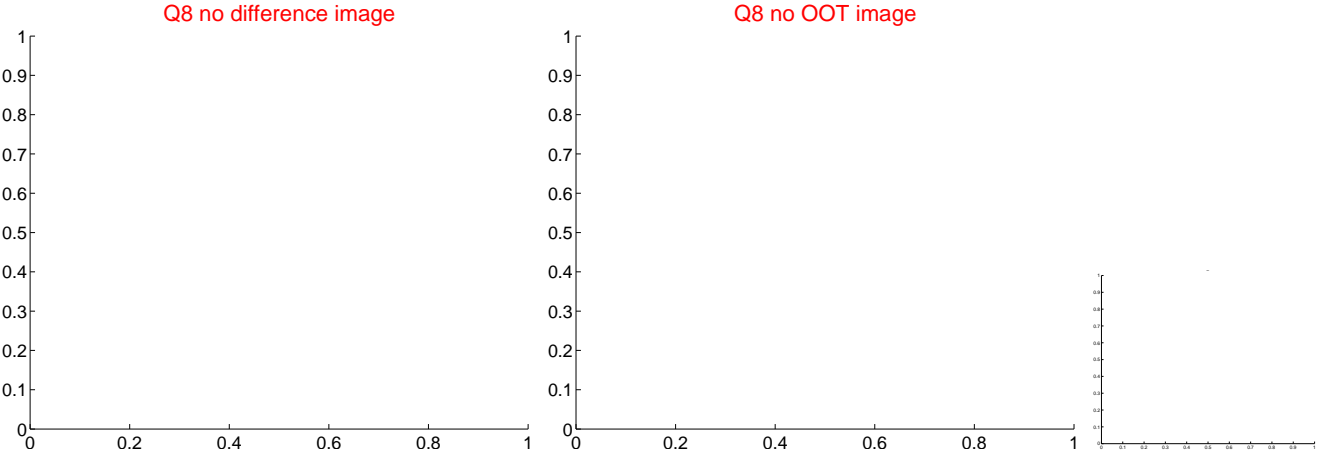
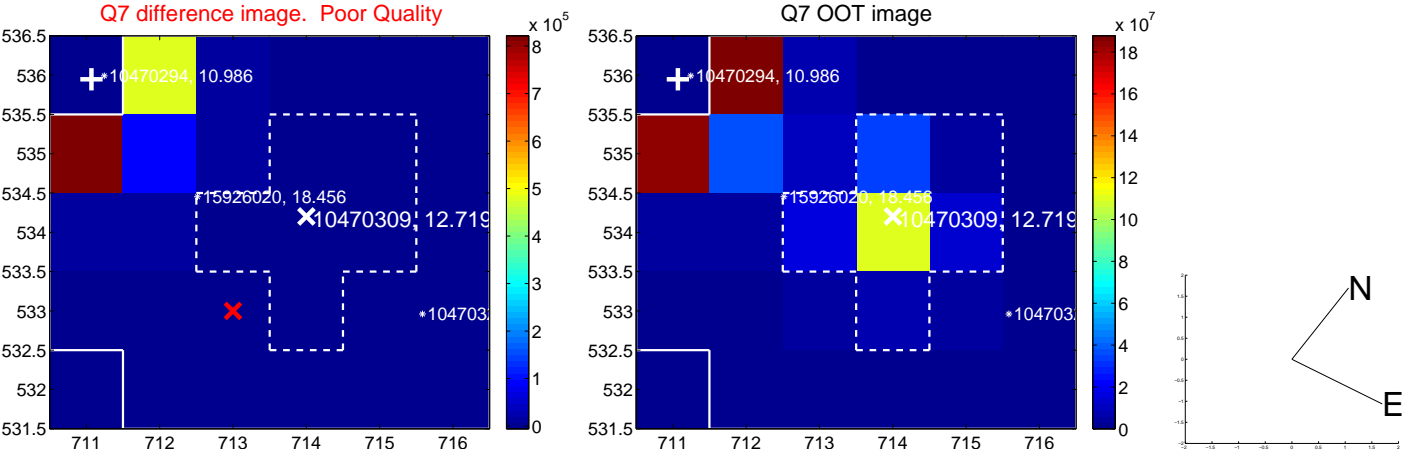
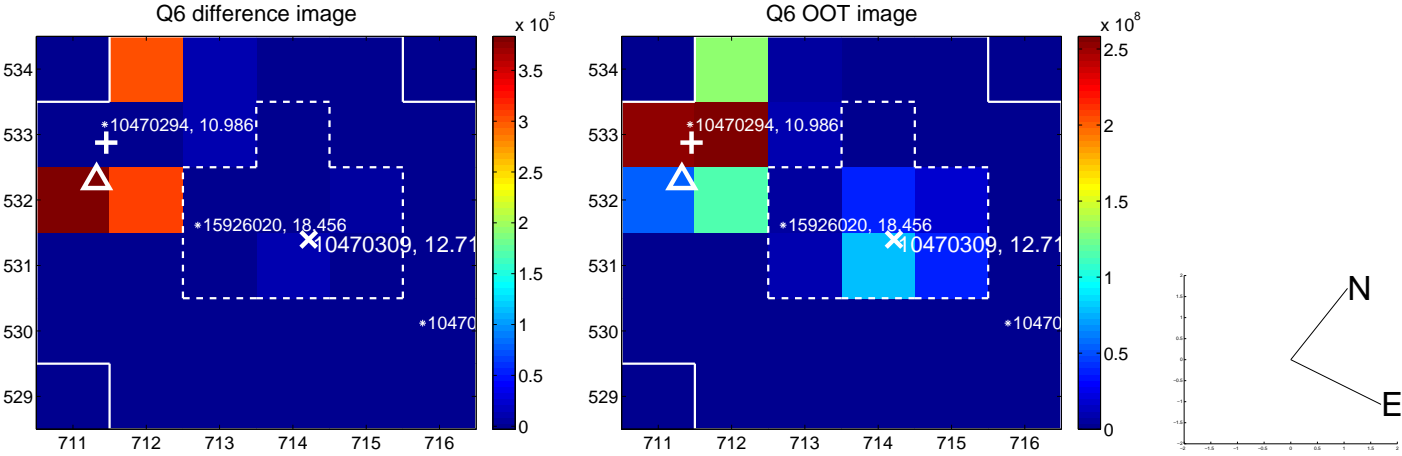
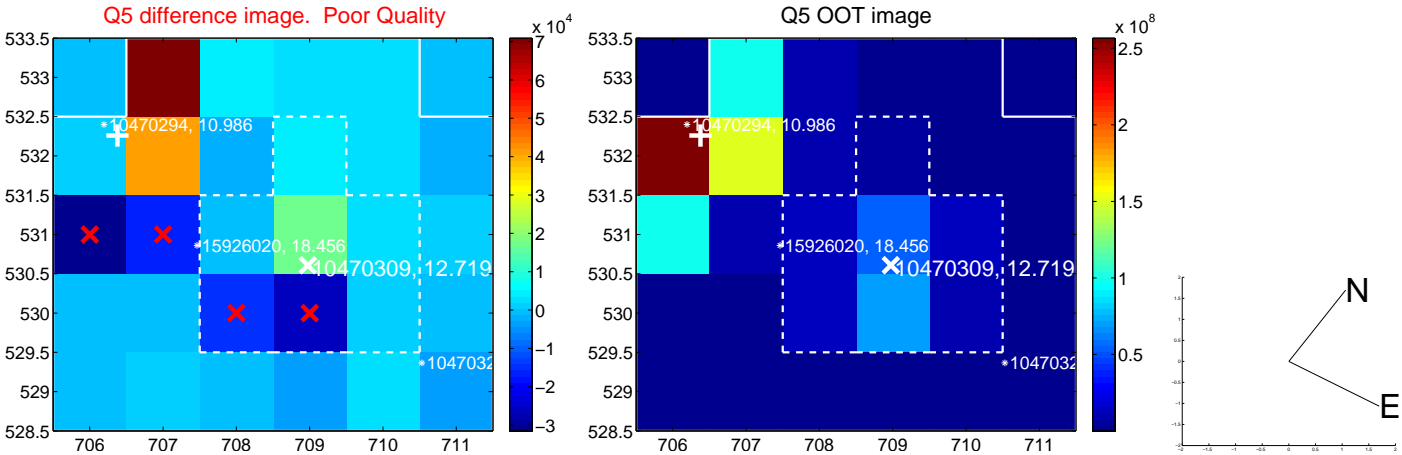


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

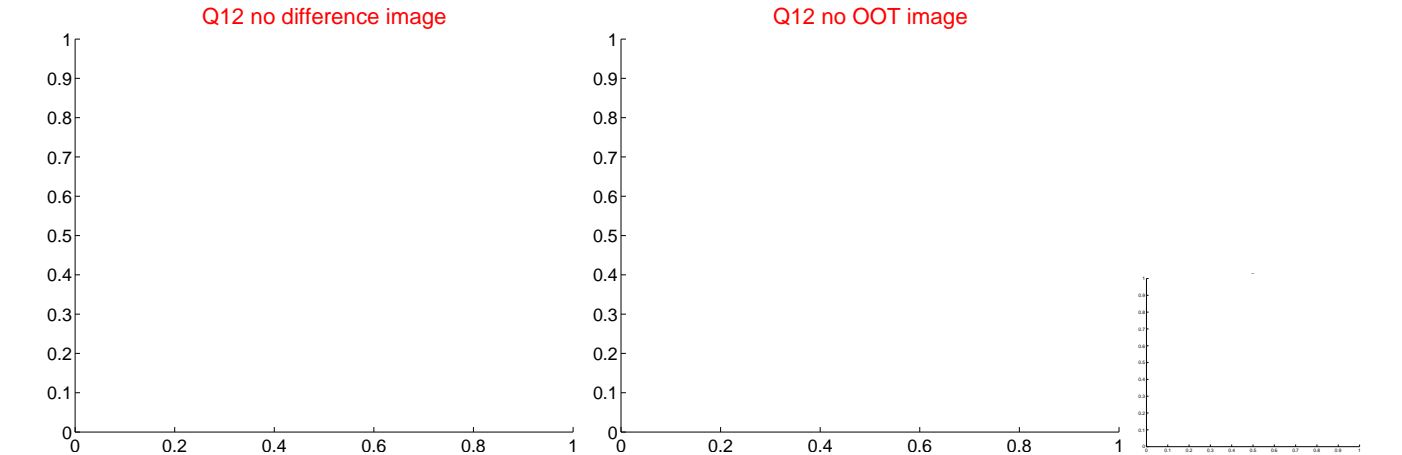
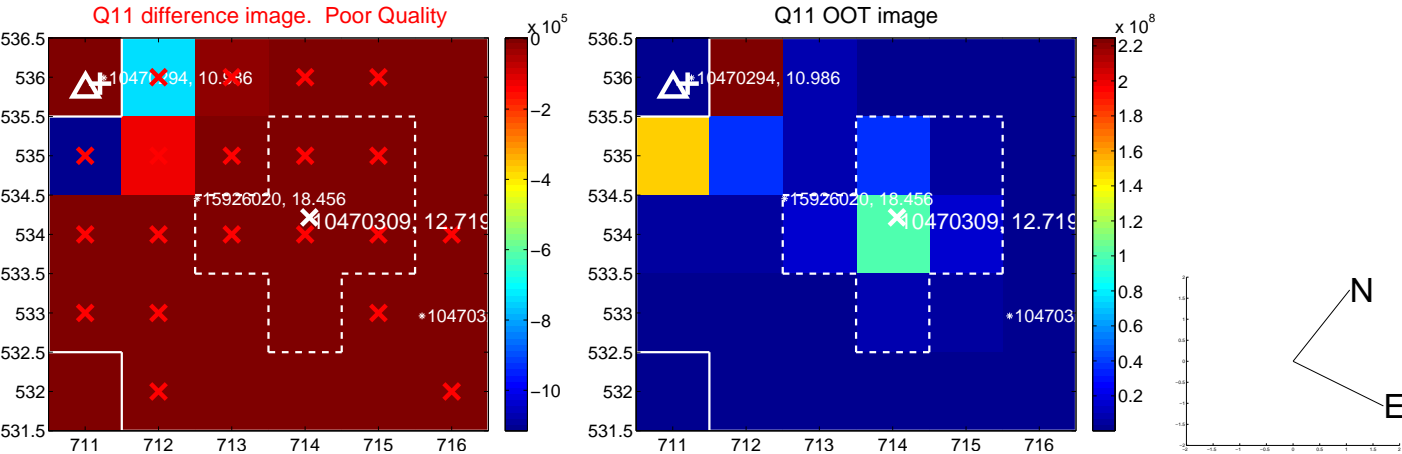
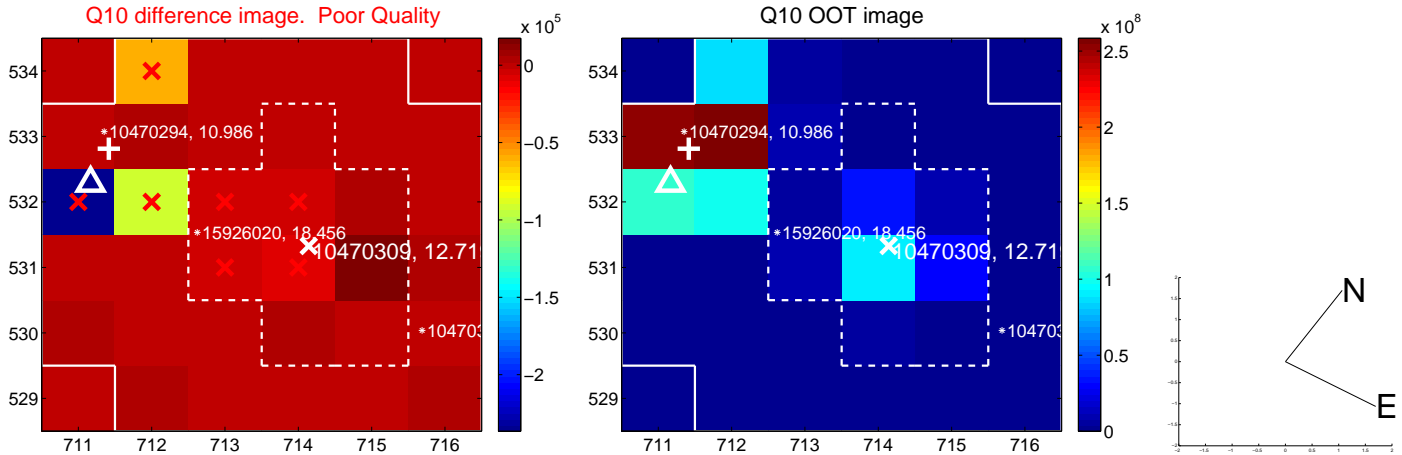
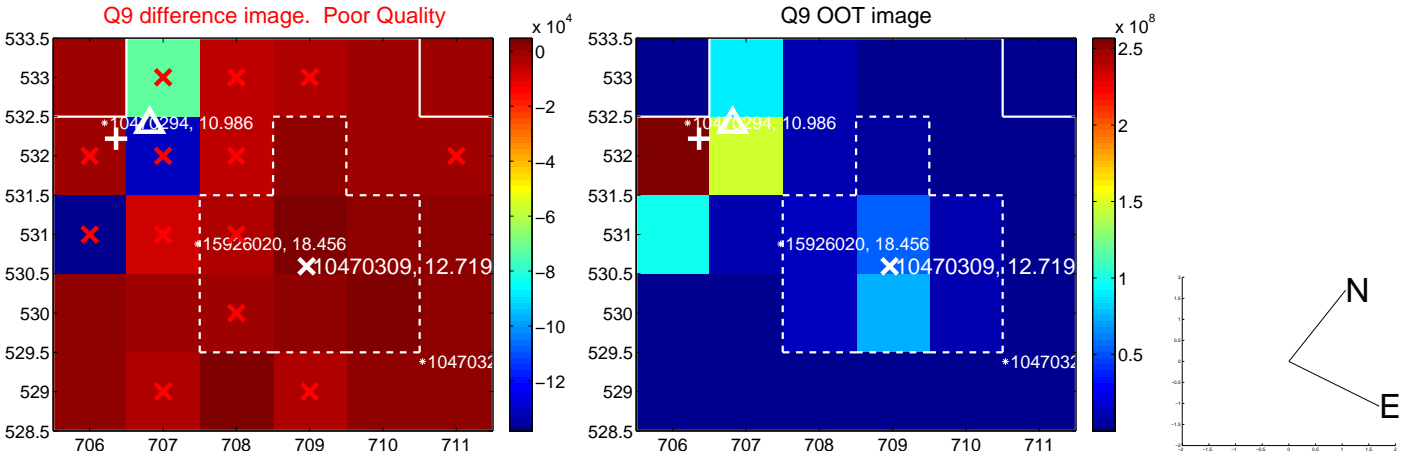
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



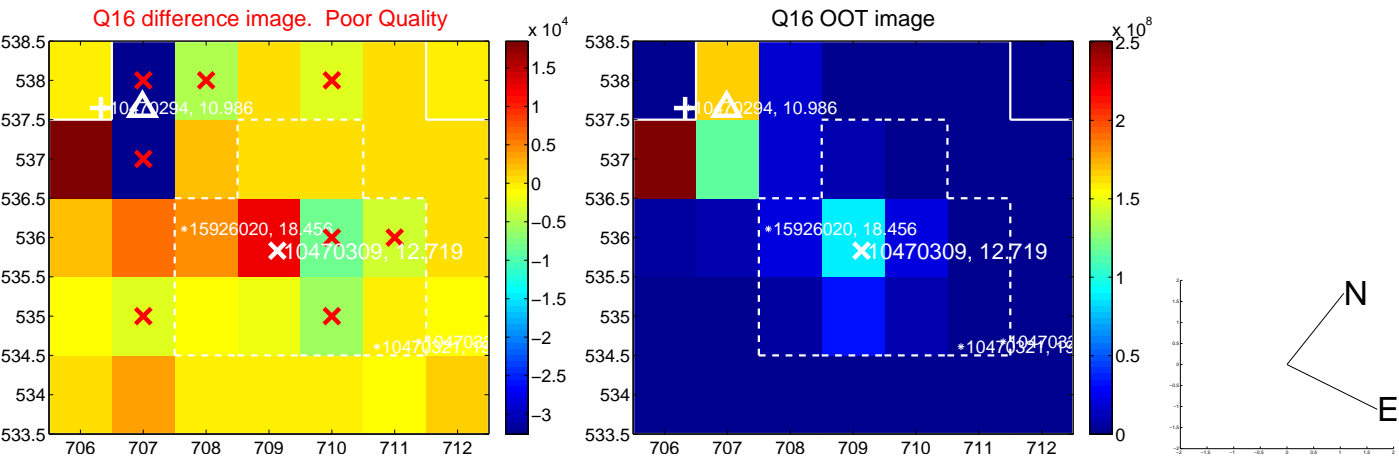
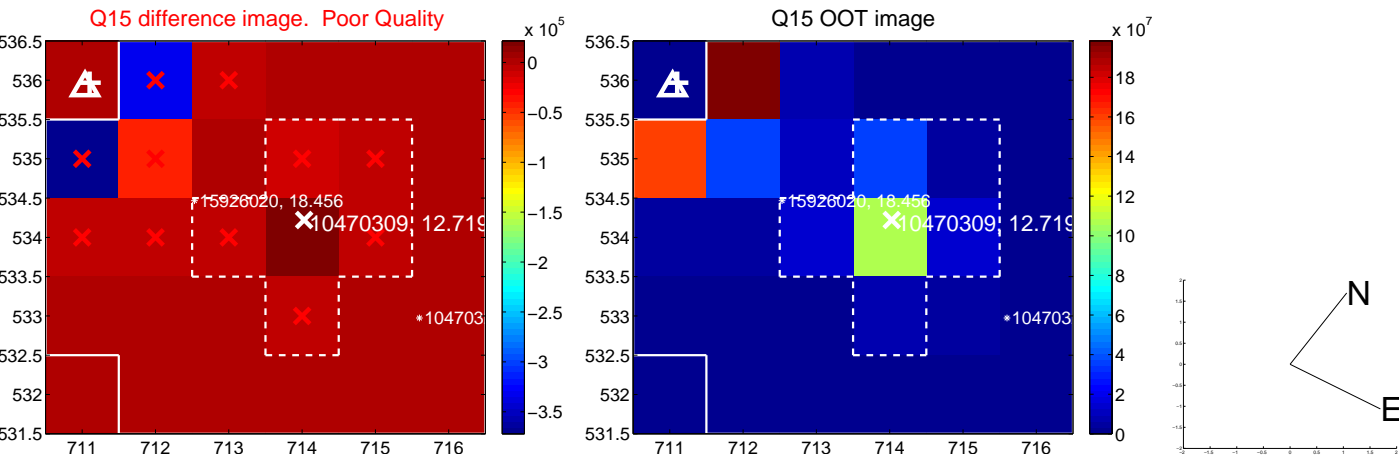
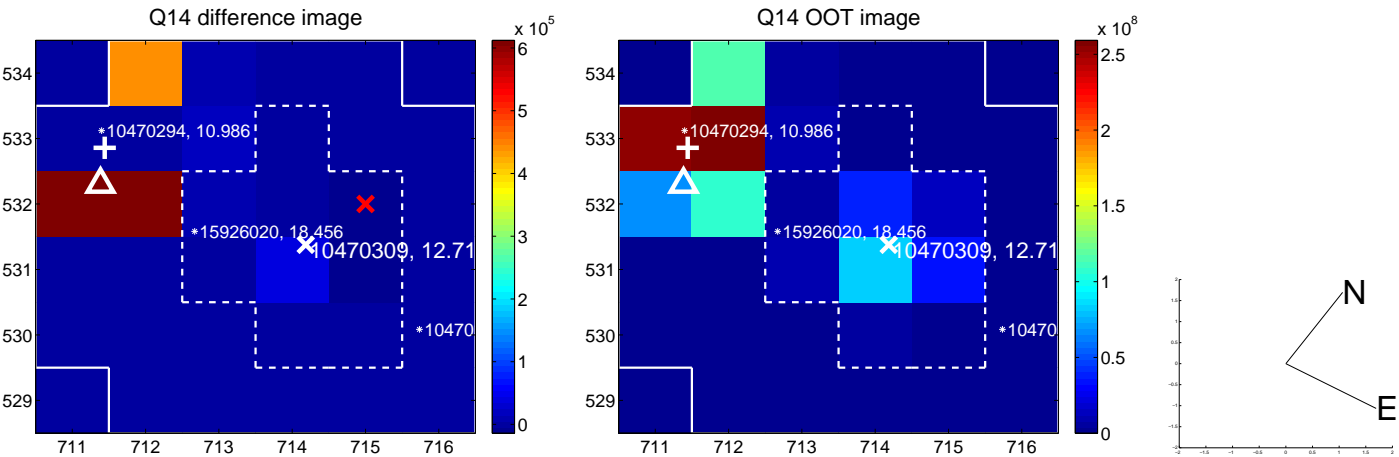
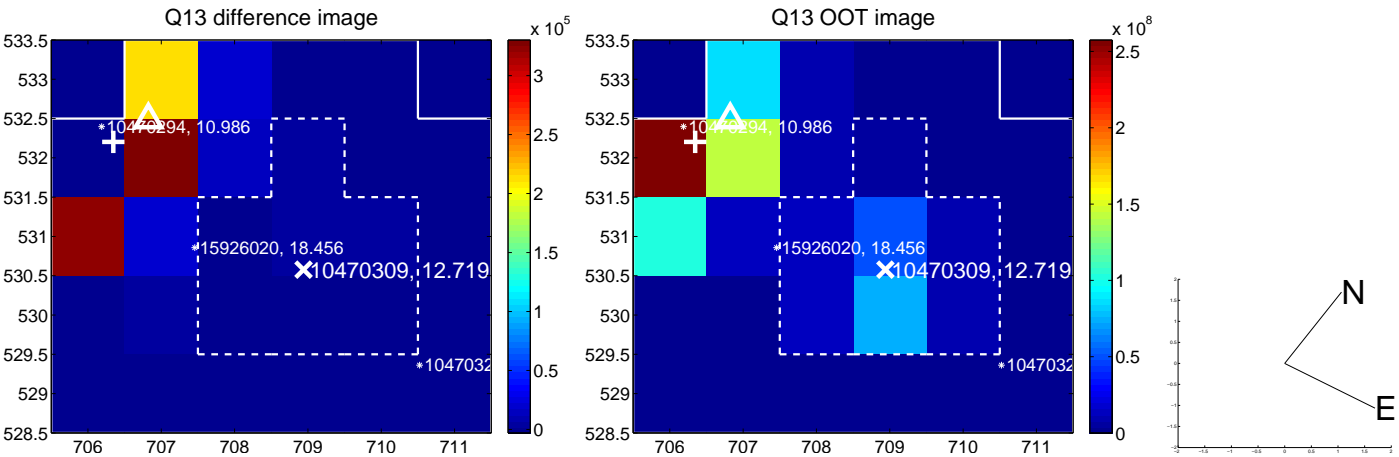
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



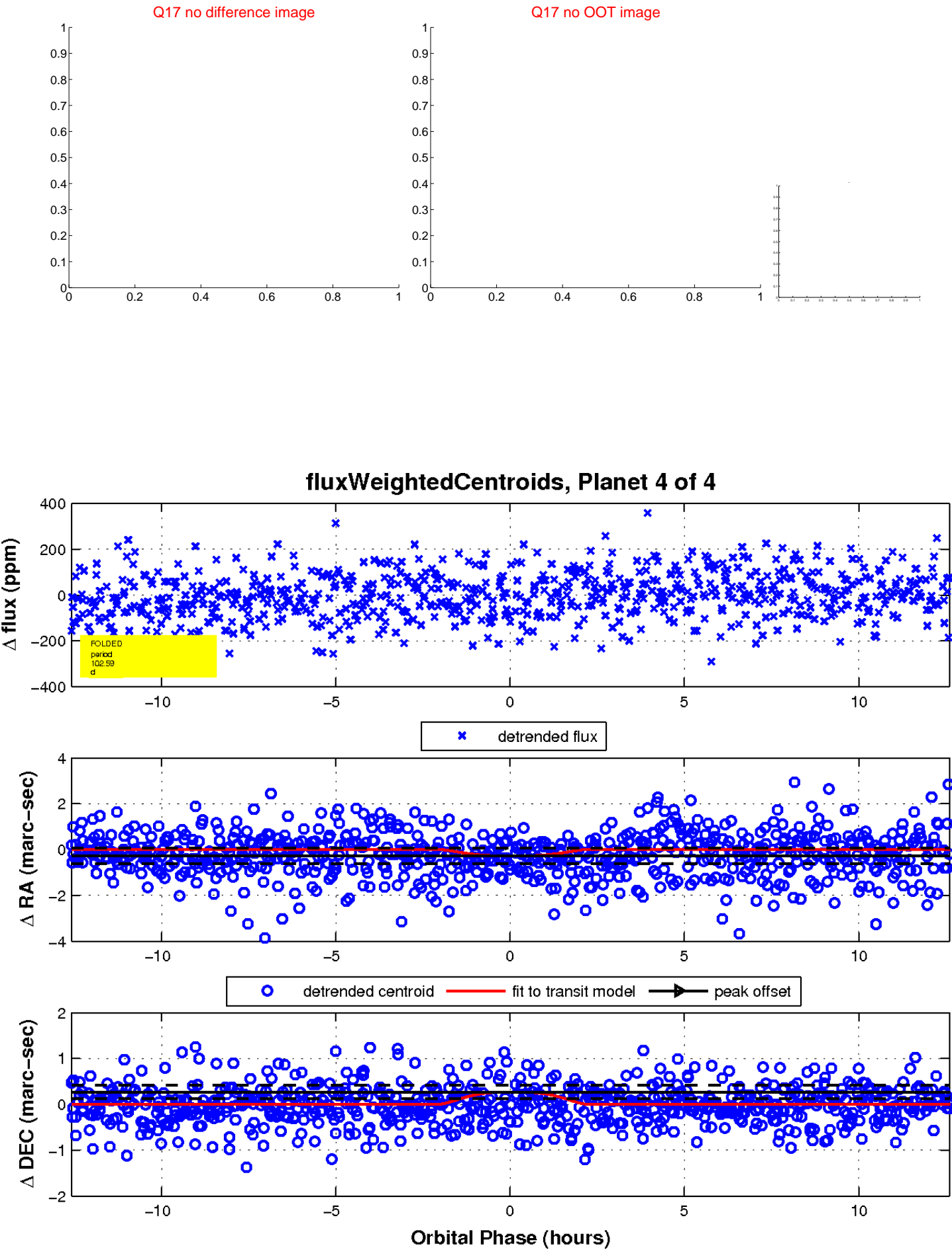
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

