

KIC 004074640

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})
004074640-01	OBS	No	2.553966	133.392161	47.2	2.744	9.7	4.4	1.16	6651	0.92	1587.78
004074640-02	OBS	No	2.553867	133.752622	66.3	7.590	9.8	6.8	1.16	6651	1.10	1587.86
004074640-03	OBS	No	5.072026	134.587970	114.5	5.006	7.8	7.2	1.16	6651	1.43	636.07
004074640-04	OBS	No	5.071818	133.870150	114.2	6.169	7.4	6.4	1.16	6651	1.45	636.10
004074640-05	OBS	No	279.605531	271.019287	886.8	7.151	7.7	7.3	1.16	6651	4.04	3.03
004074640-06	OBS	No	5.072165	135.733937	116.6	6.038	7.5	6.5	1.16	6651	1.48	636.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004074640-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004074640-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
004074640-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT
004074640-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
004074640-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004074640-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD

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

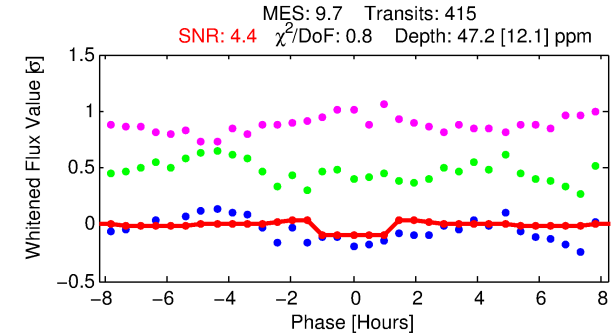
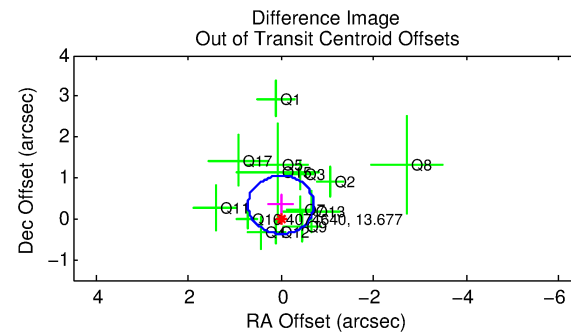
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

Ephemeris Match Information For 004074640-01

No Significant Match Found

KIC: 4074640 Candidate: 1 of 6 Period: 2.554 d

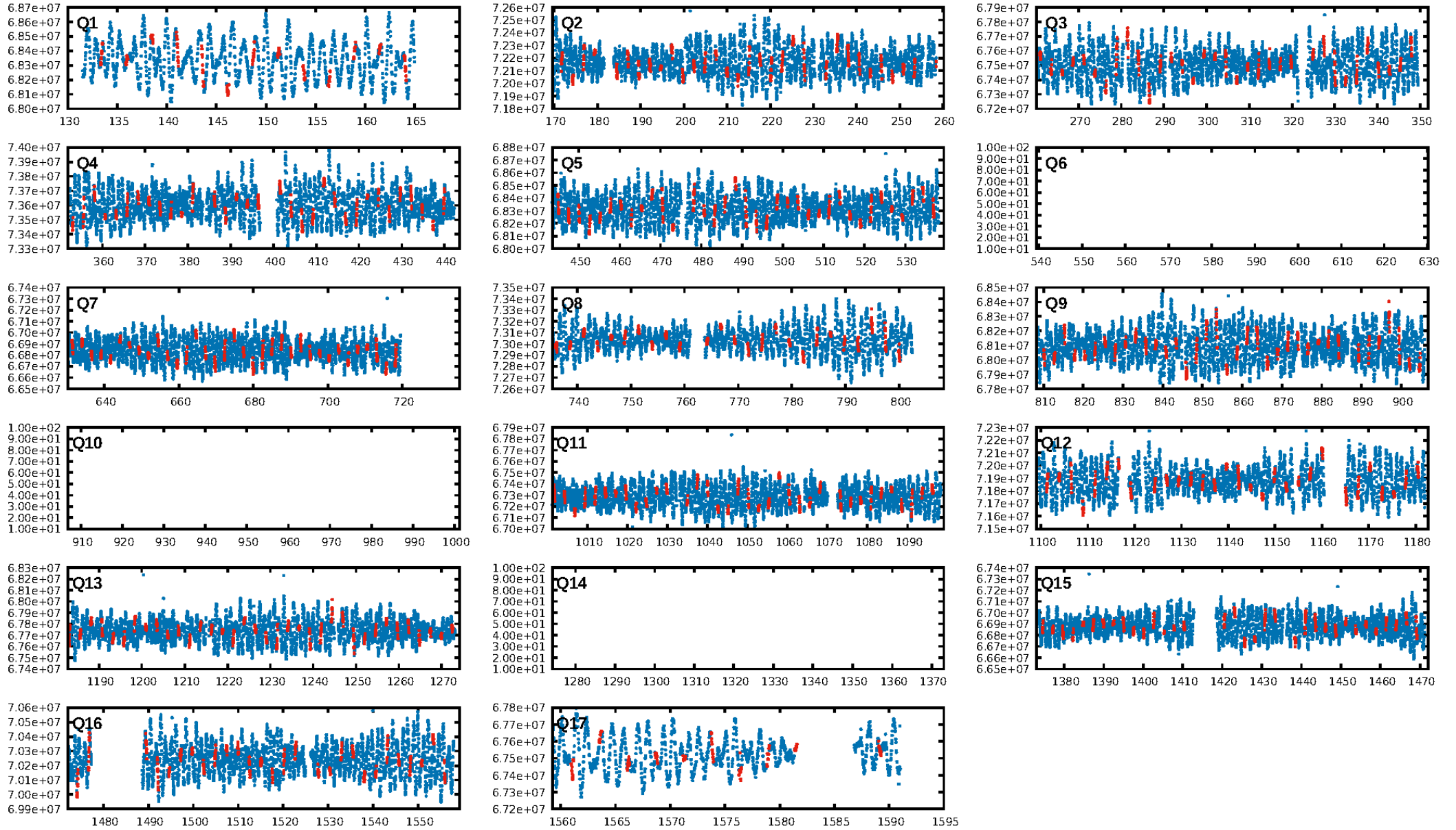


ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [8.95σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.04e-17
RollingBand-fgt: 0.94 [367/392]
GhostDiagnostic-chr: 1.518

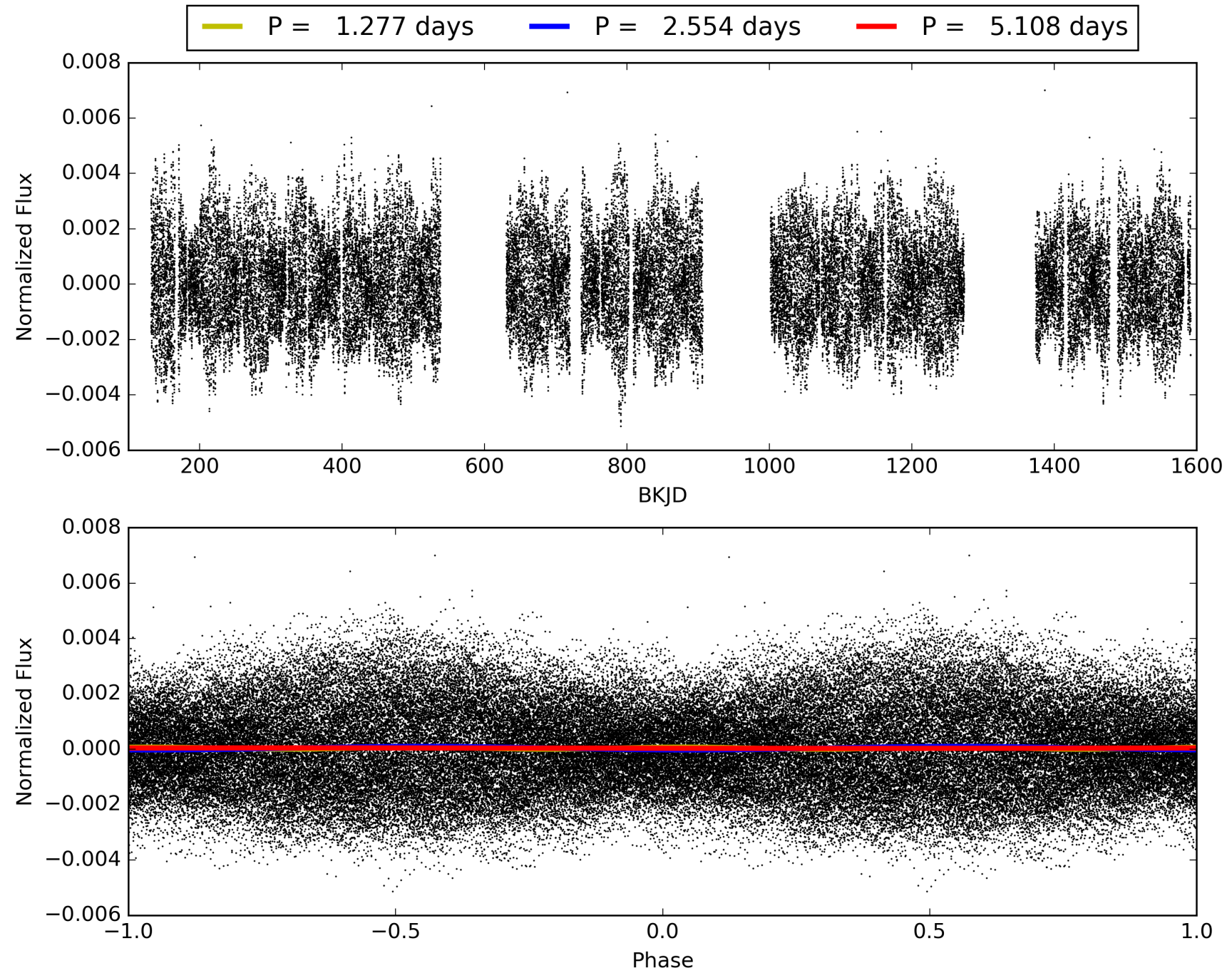
Centroid-sig: 0.2%

Centroid-so: 2.459 arcsec [1.70σ]
OotOffset-rm: 0.341 arcsec [1.44σ]
KicOffset-rm: 0.346 arcsec [1.40σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 0.93 [13/14]
DiffImageOverlap-fno: 0.00 [0/14]

TCE 004074640-01, PDC Light Curves

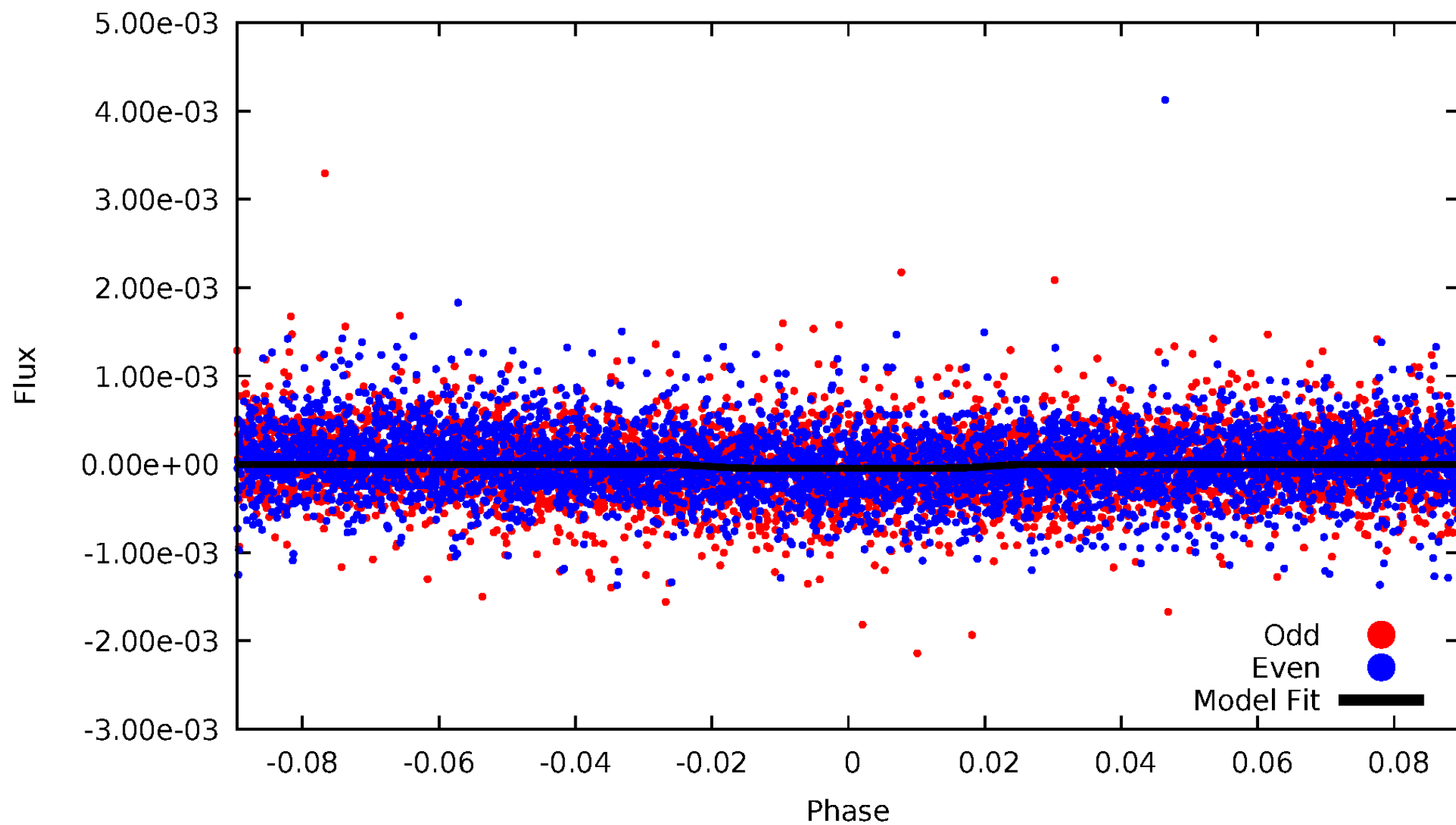


TCE 004074640-01



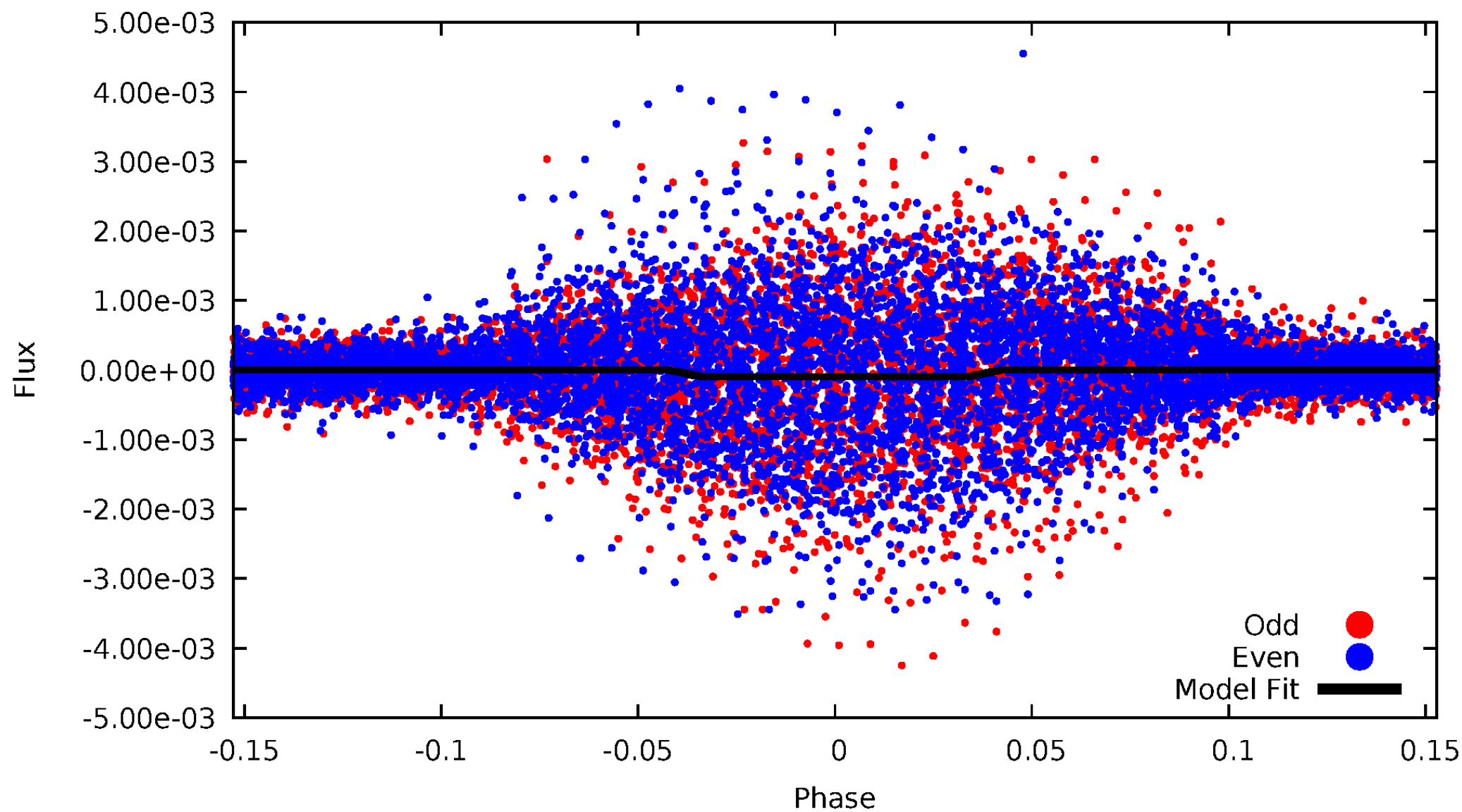
DV Odd/Even

TCE 004074640-01



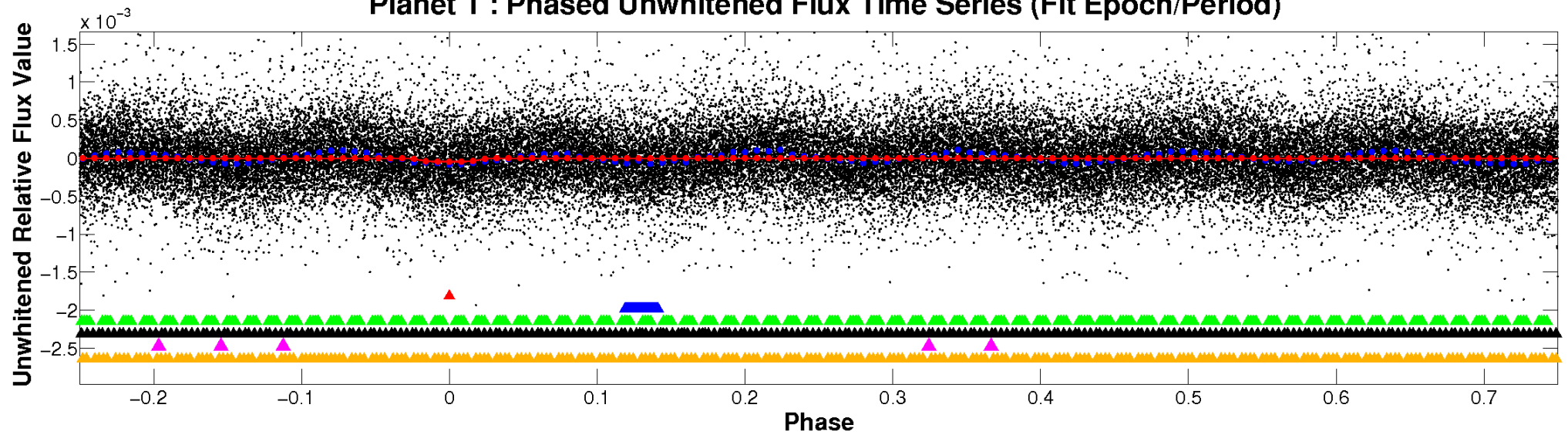
ALT Odd/Even

TCE 004074640-01

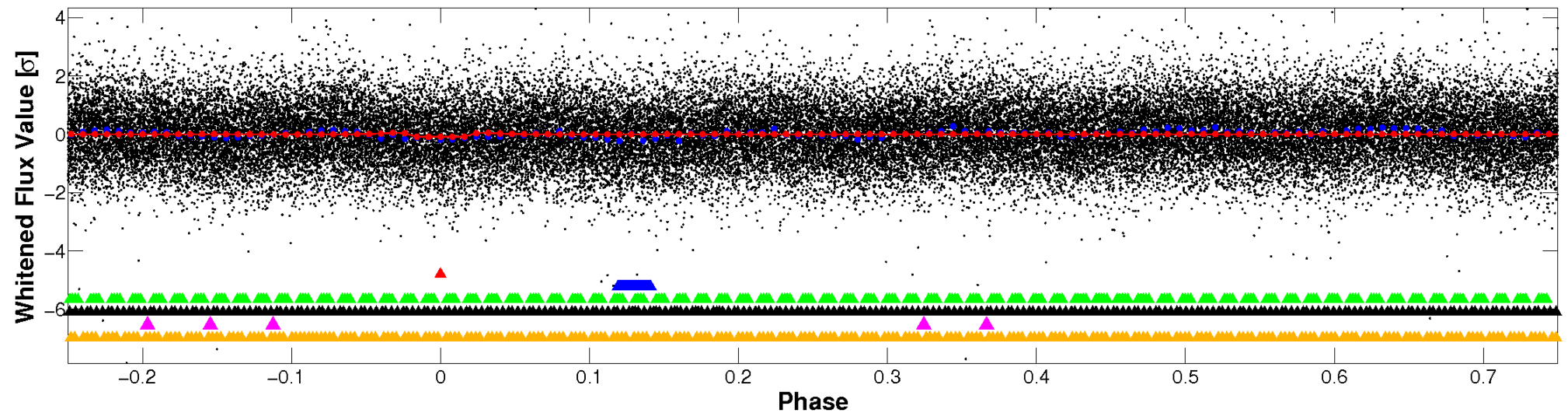


Non-Whitened Vs. Whitened Light Curve

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

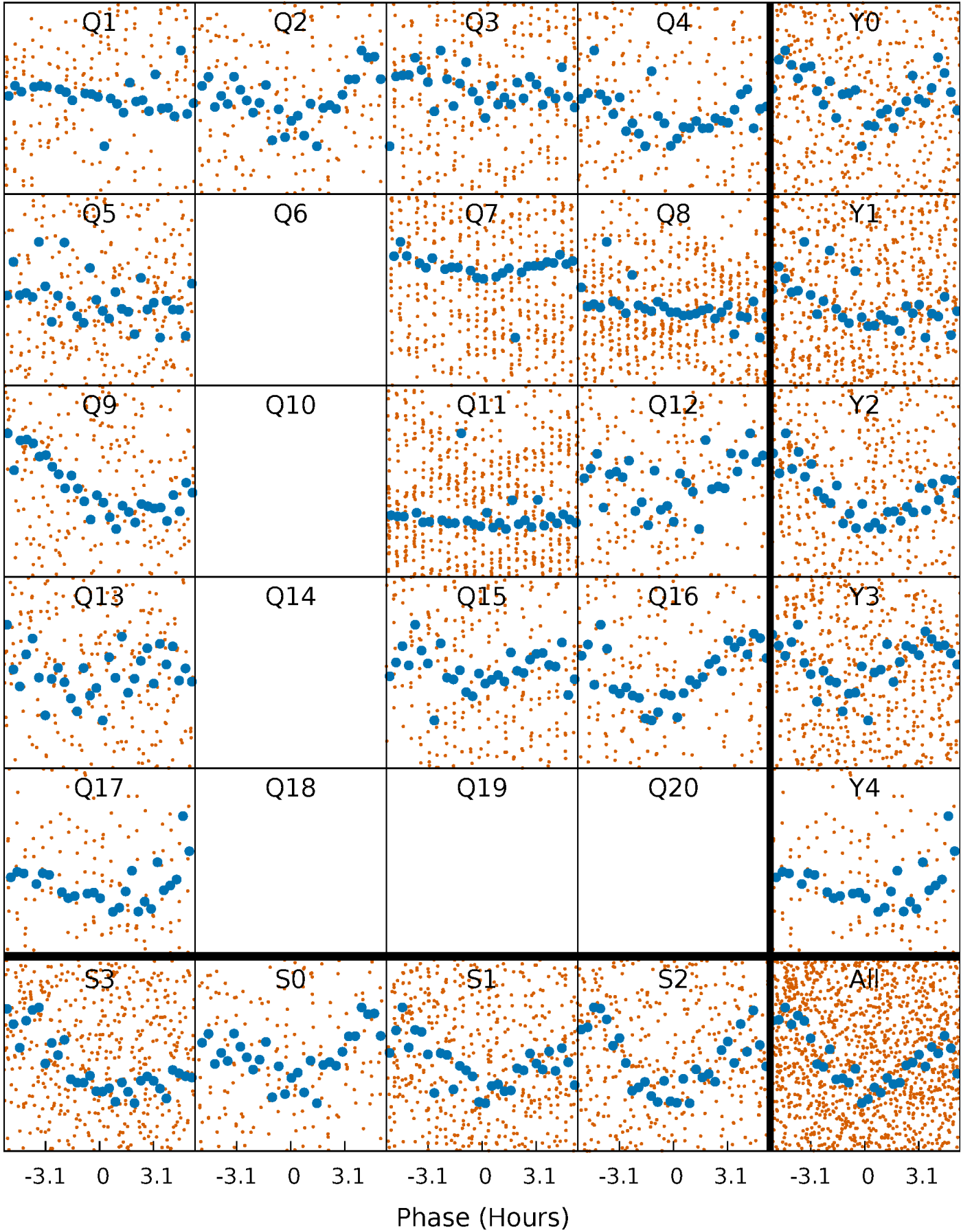


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



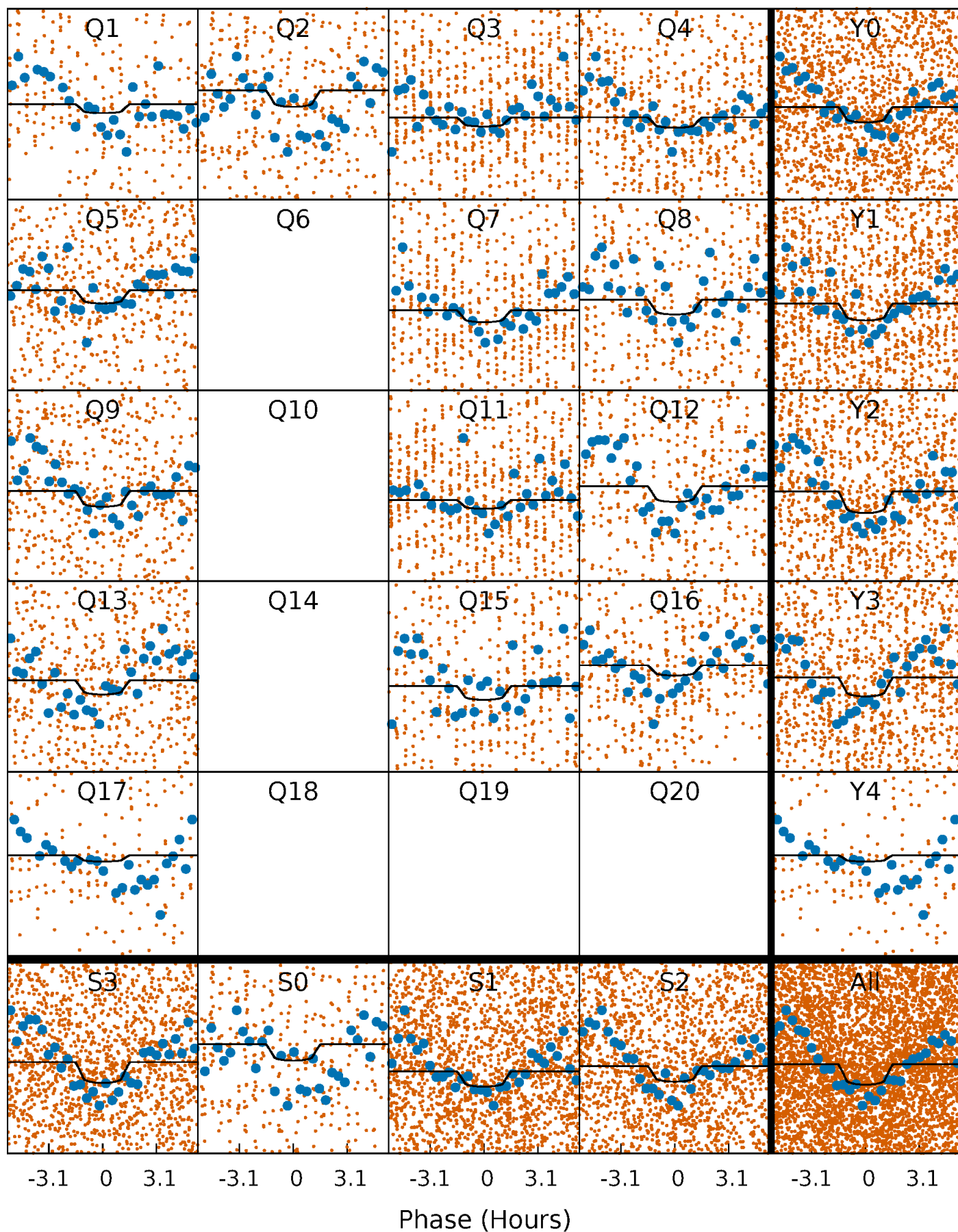
PDC Quarter-Phased Transit Curves

TCE 004074640-01 P= 2.553966 Days $T_0=133.392161$ (BKJD)



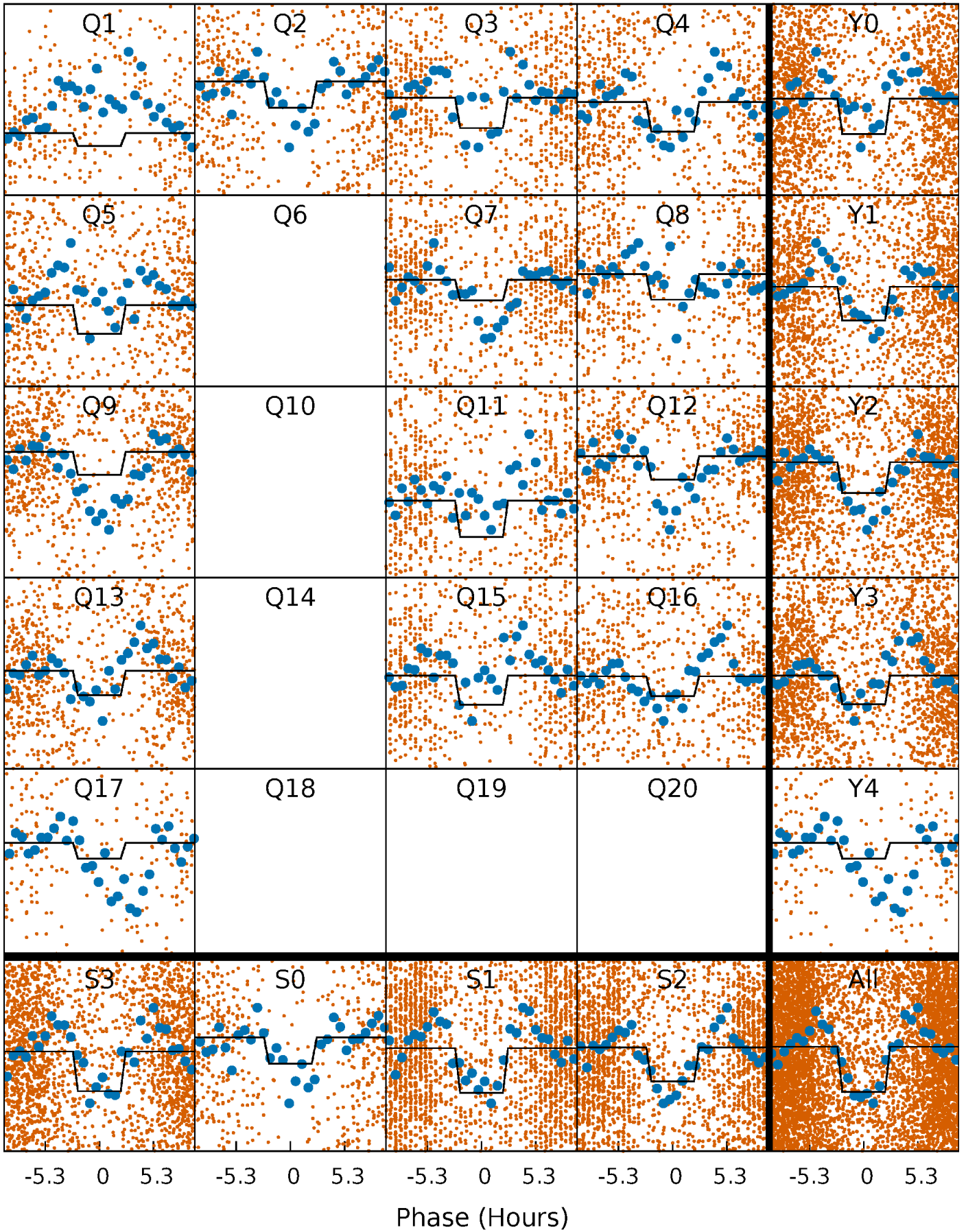
DV Quarter-Phased Transit Curves

TCE 004074640-01 P= 2.553966 Days $T_0=133.392161$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

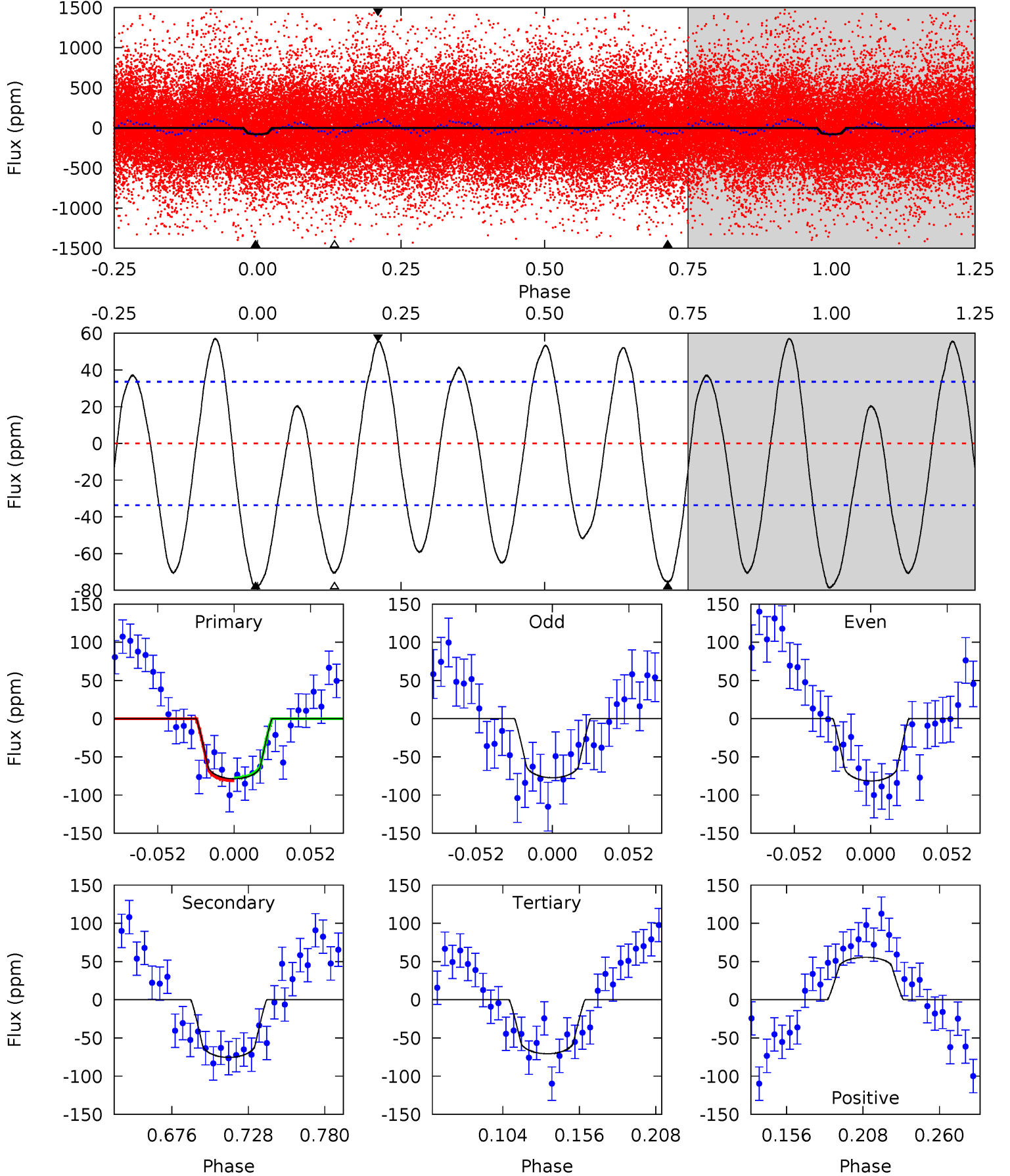
TCE 004074640-01 P= 2.553926 Days $T_0=133.391704$ (BKJD)



DV Model-Shift Uniqueness Test

004074640-01, P = 2.553966 Days, E = 130.838195 Days

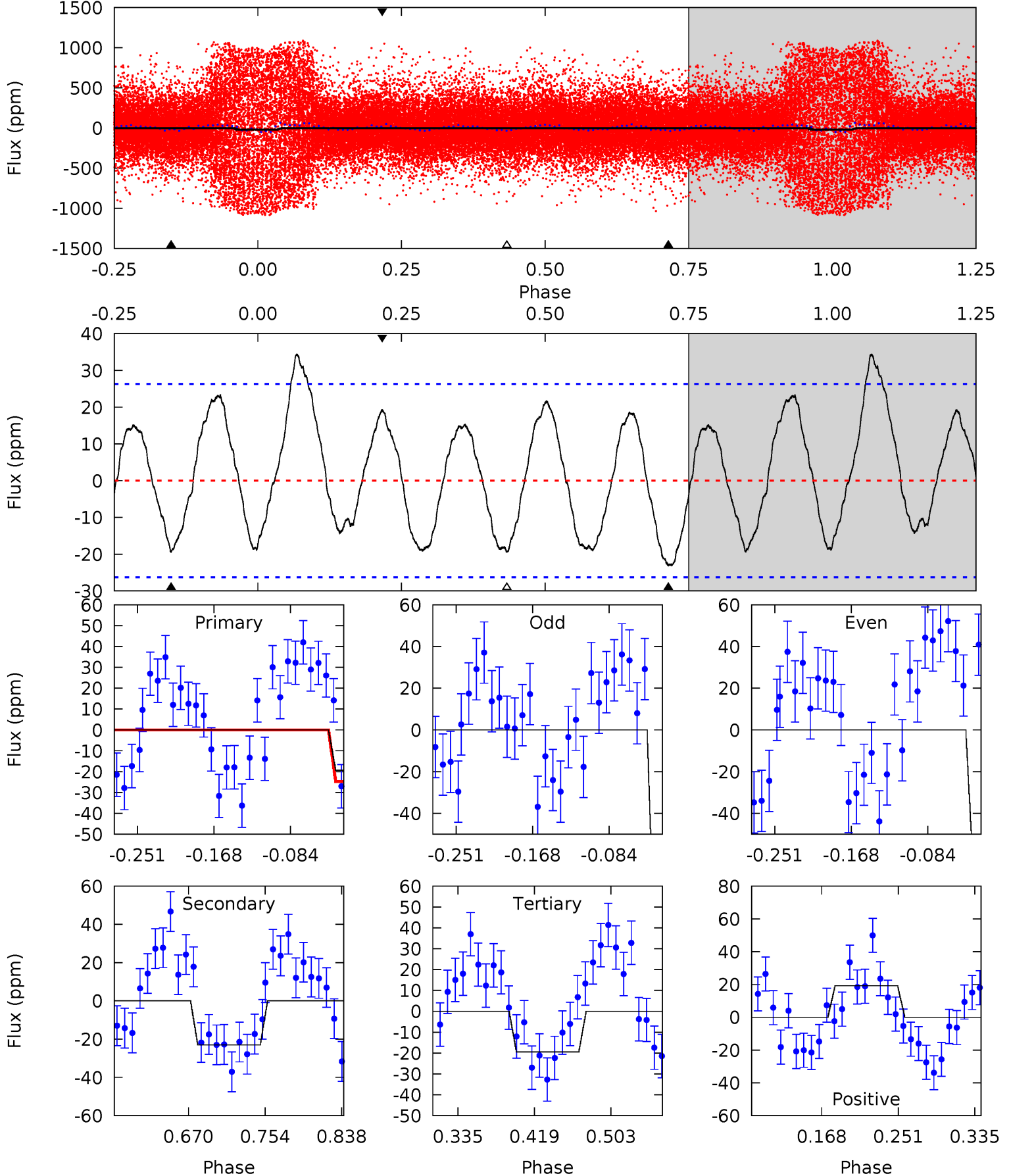
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	10.5	9.88	7.76	4.70	1.94	5.53	1.12	3.24	0.66	2.78	0.29	0.94	0.42	0.26



Alt Model-Shift Uniqueness Test

004074640-01, P = 2.553926 Days, E = 130.837778 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.39	4.03	3.40	3.36	4.60	1.73	2.47	-0.01	0.03	0.63	0.67	3.91	1.92	0.60	0



Stellar Parameters For KIC 004074640

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6651^{+159}_{-218}	$4.379^{+0.067}_{-0.202}$	$-0.220^{+0.250}_{-0.300}$	$1.164^{+0.387}_{-0.129}$	$1.187^{+0.182}_{-0.165}$	$1.061^{+0.293}_{-0.547}$
	+2%/-3%	+2%/-5%	+114%/-136%	+33%/-11%	+15%/-14%	+28%/-52%
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 004074640-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-75 ± 7	$1.01^{+0.55}_{-0.46}$	2282^{+177}_{-110}	7140^{+3369}_{-1419}	61^{+142}_{-36}
Alt.	-23 ± 6	$1.29^{+0.50}_{-0.54}$	2286^{+148}_{-113}	4738^{+1270}_{-597}	11^{+20}_{-6}

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

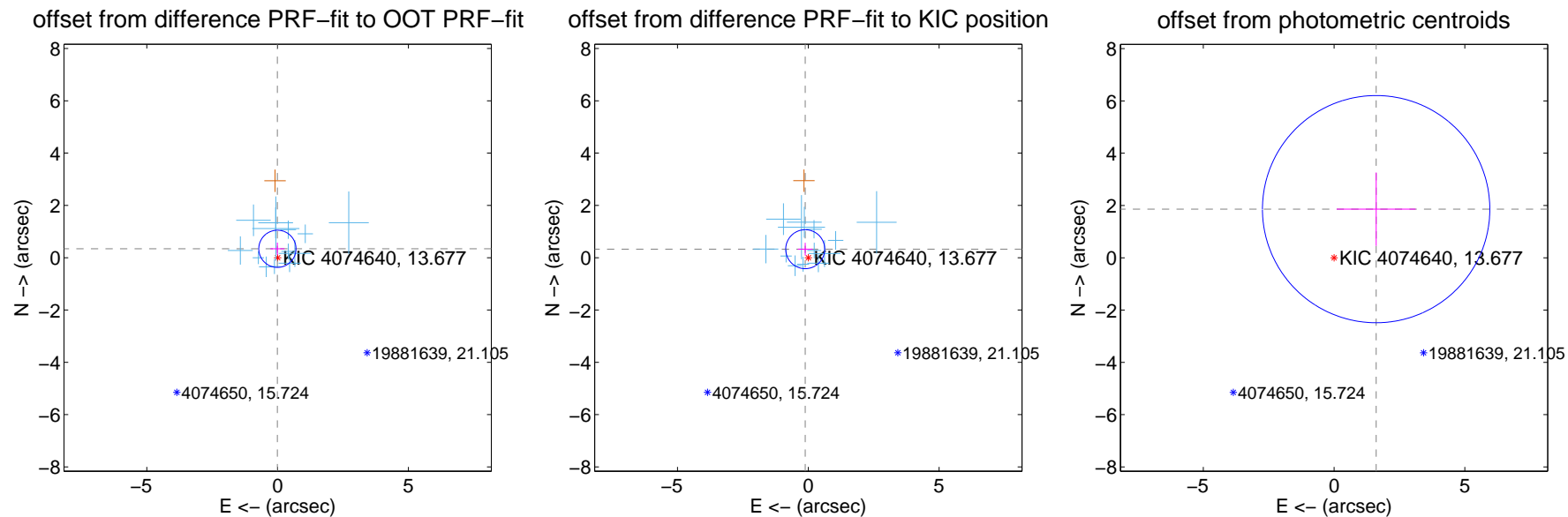
DV Centroid Data

Supplemental centroid analysis for 004074640-01. Kepler magnitude: 13.68. Transit SNR 4.41

There are 13 quarters with good PRF difference image offsets

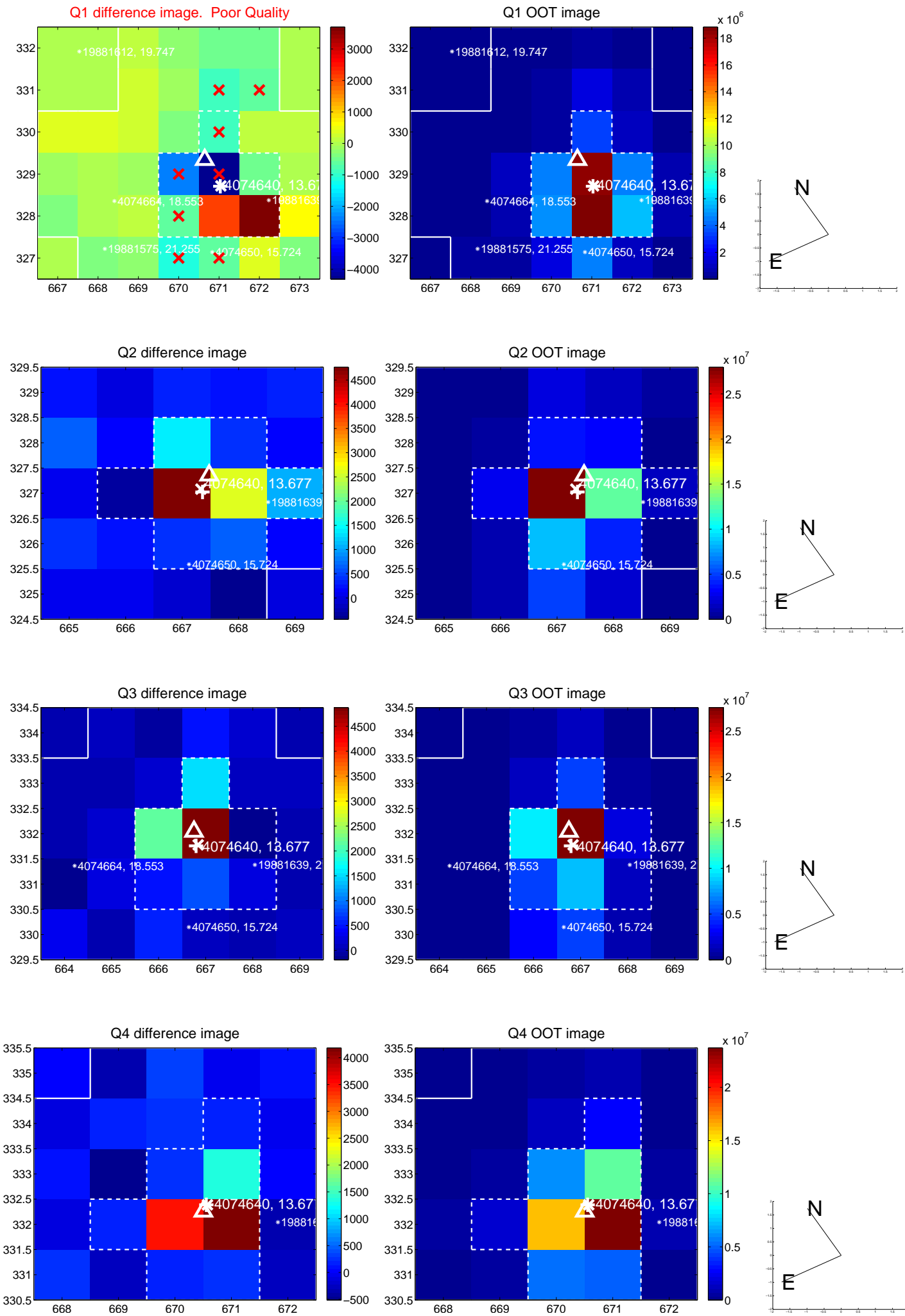
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.341 ± 0.237	1.44	0.008 ± 0.268	0.341 ± 0.238
PRF-fit source offset from KIC position	0.346 ± 0.248	1.40	0.117 ± 0.277	0.326 ± 0.244
photometric centroid source offset	2.46 ± 1.45	1.70	-1.61 ± 1.51	1.86 ± 1.40

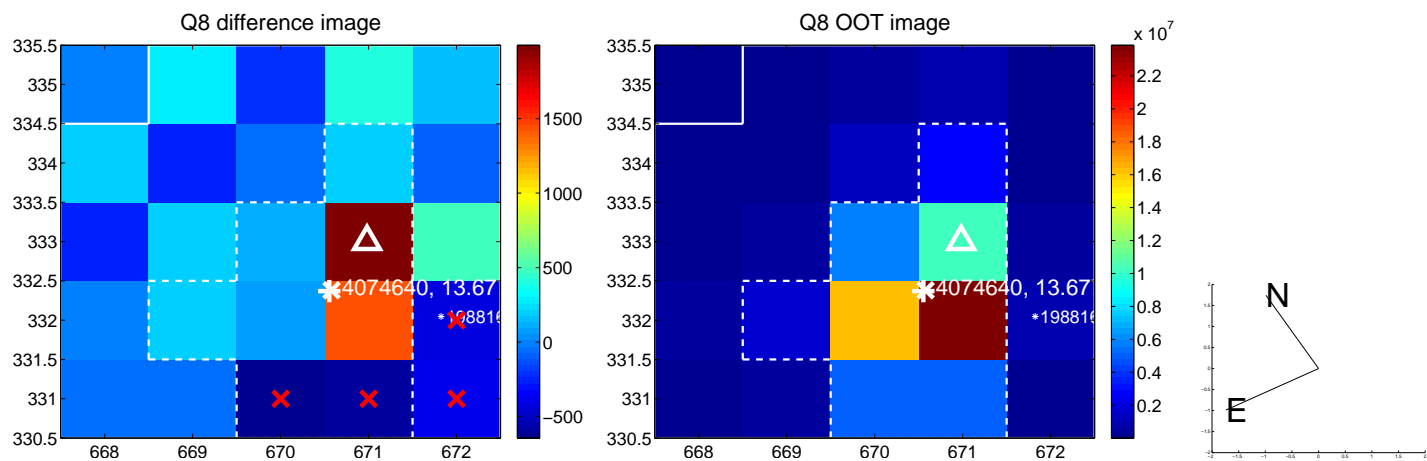
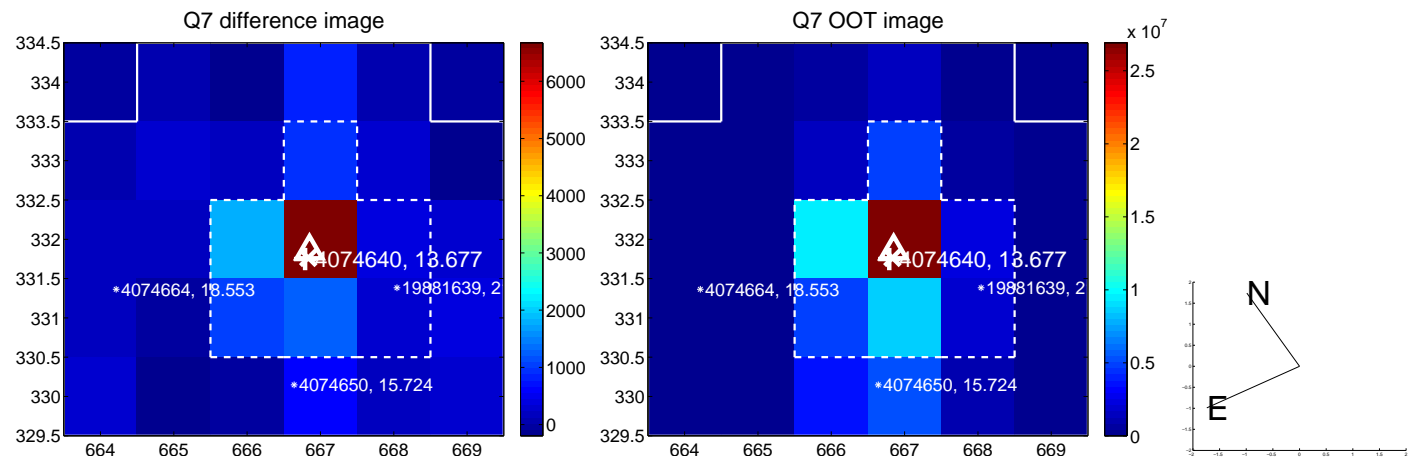
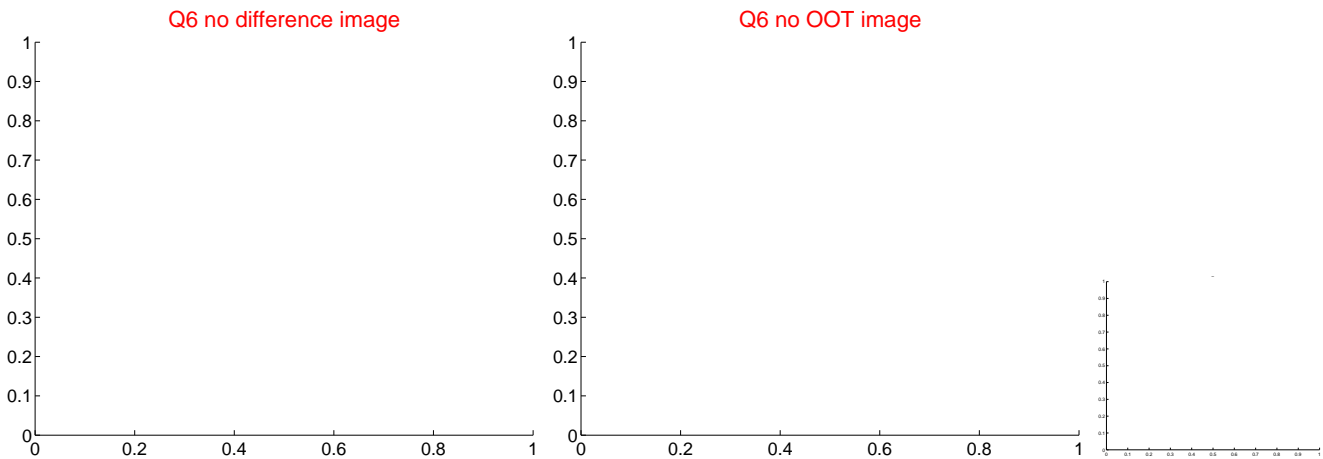
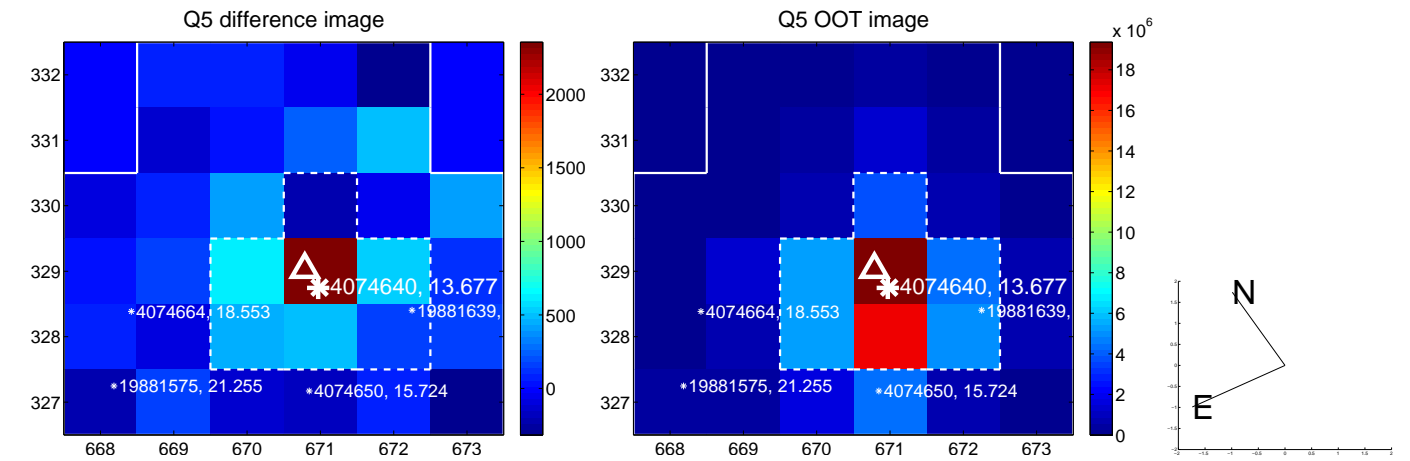


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

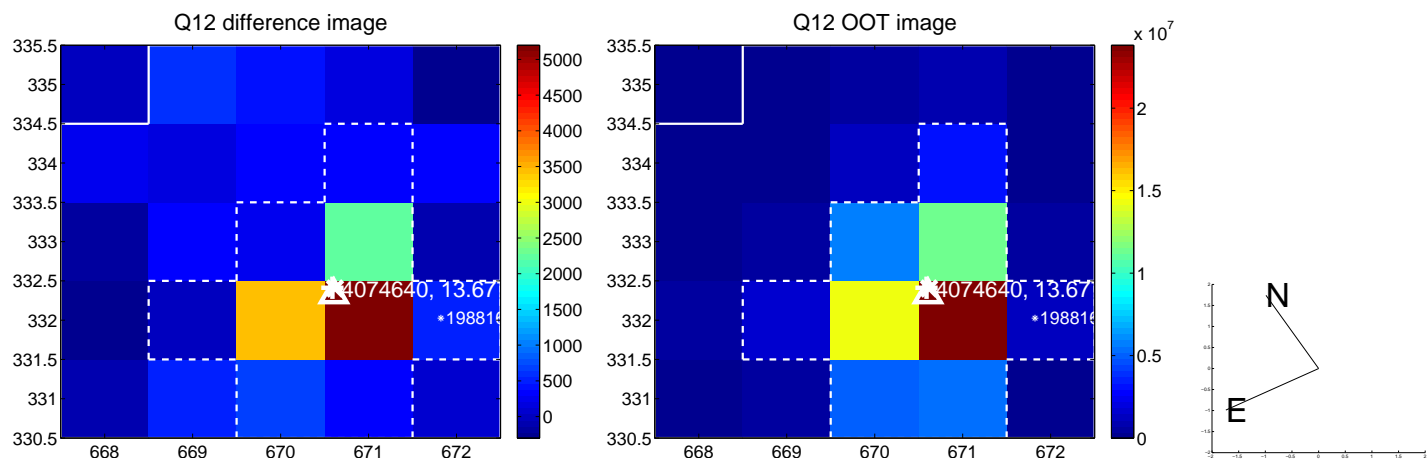
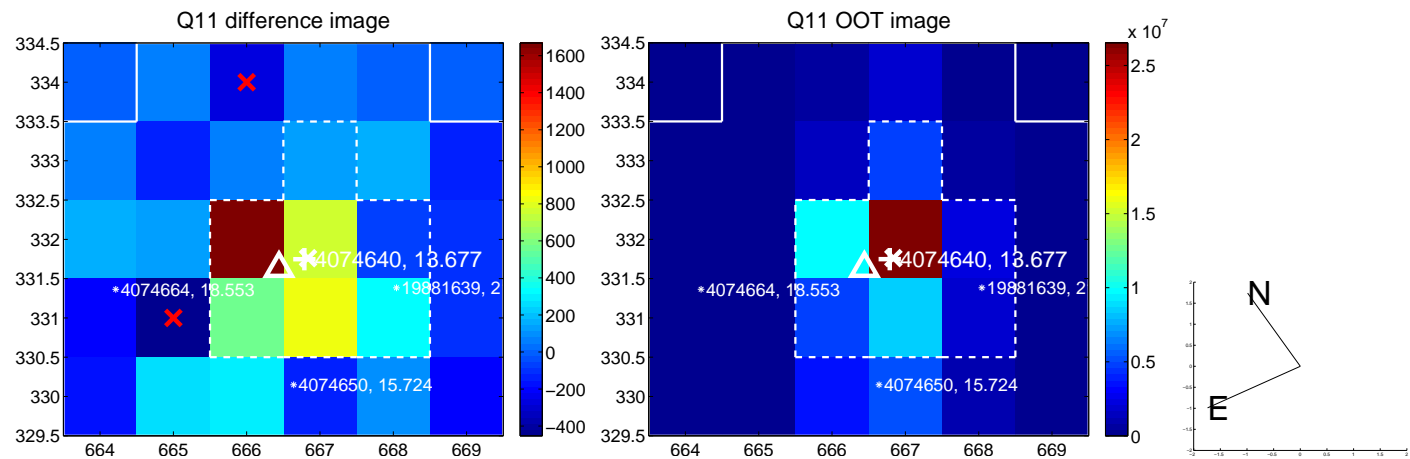
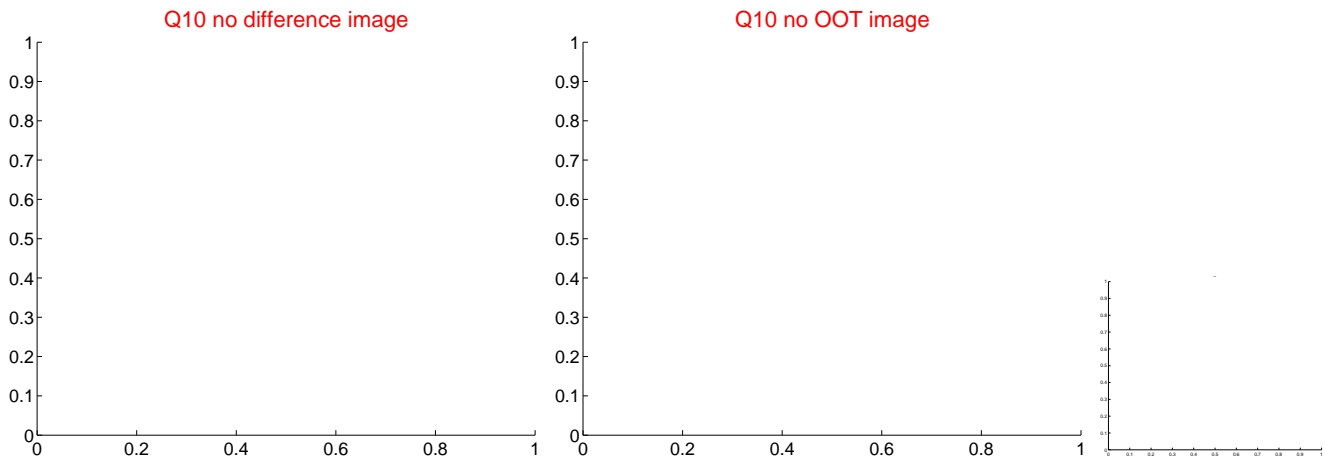
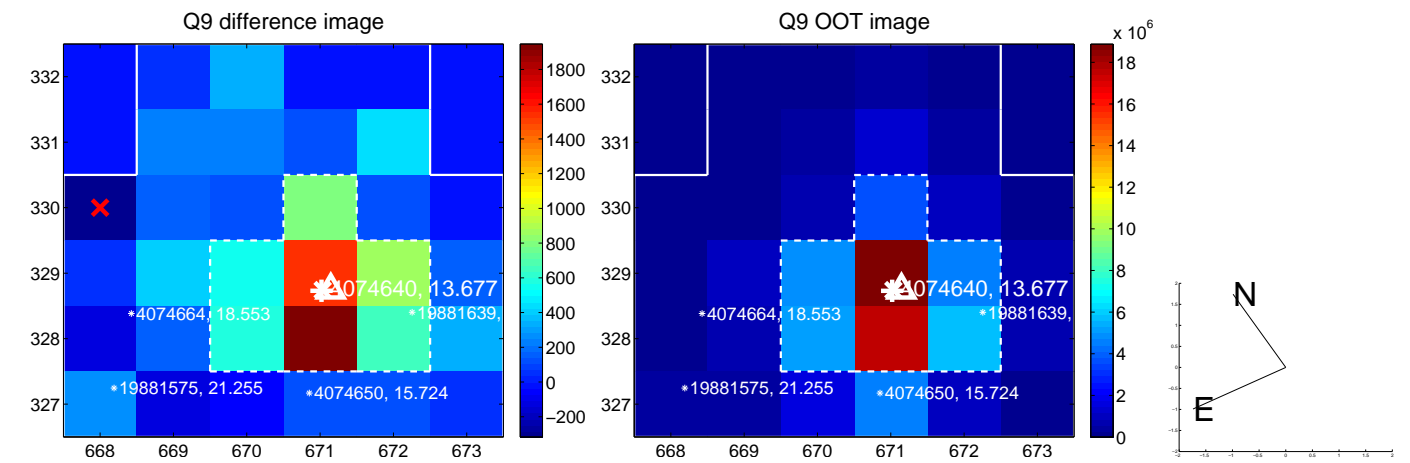
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



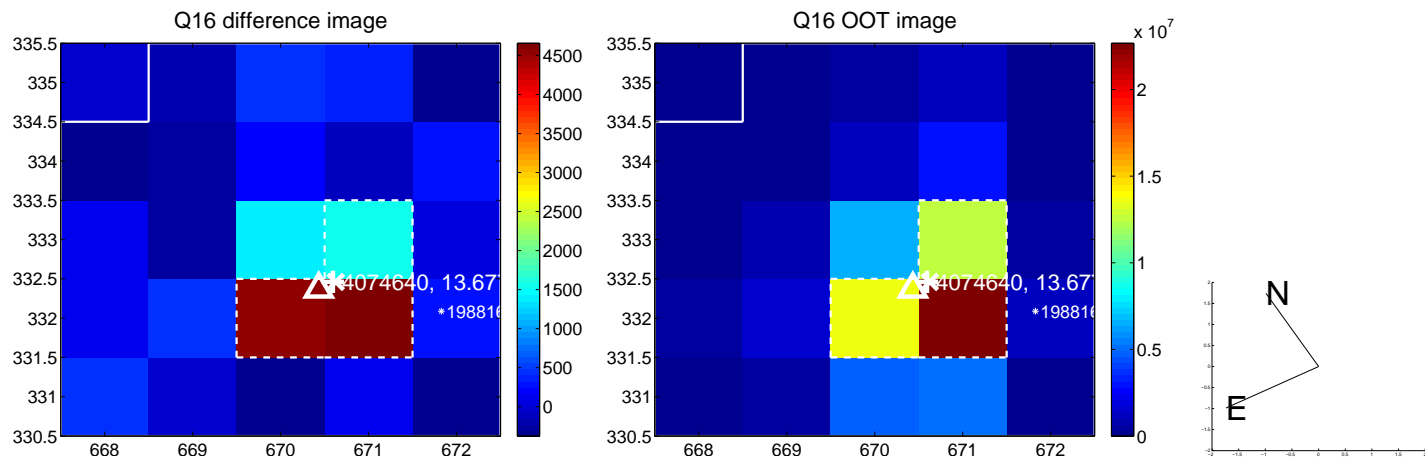
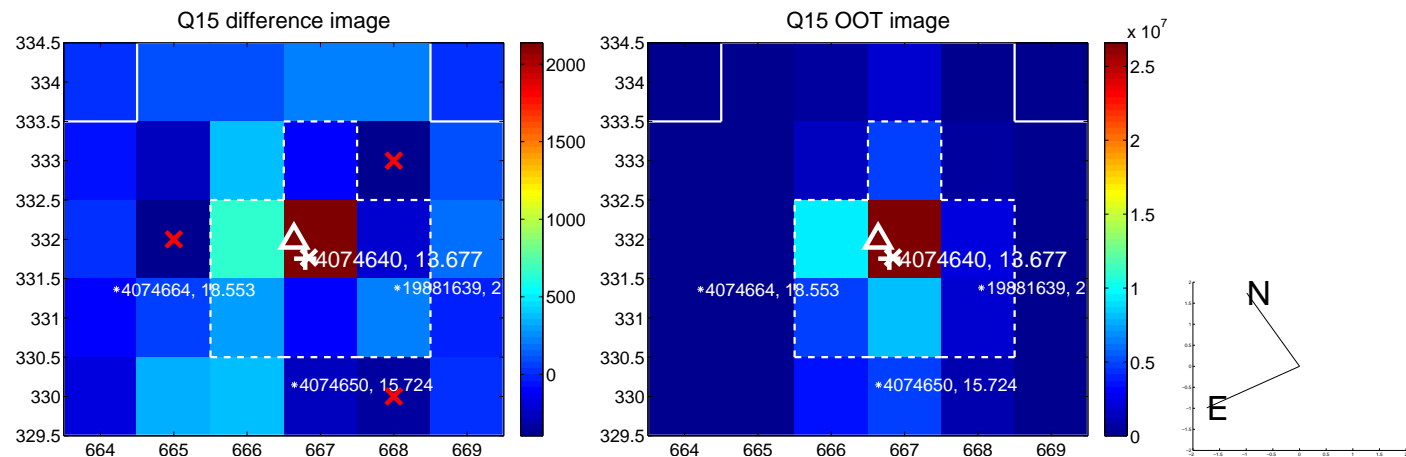
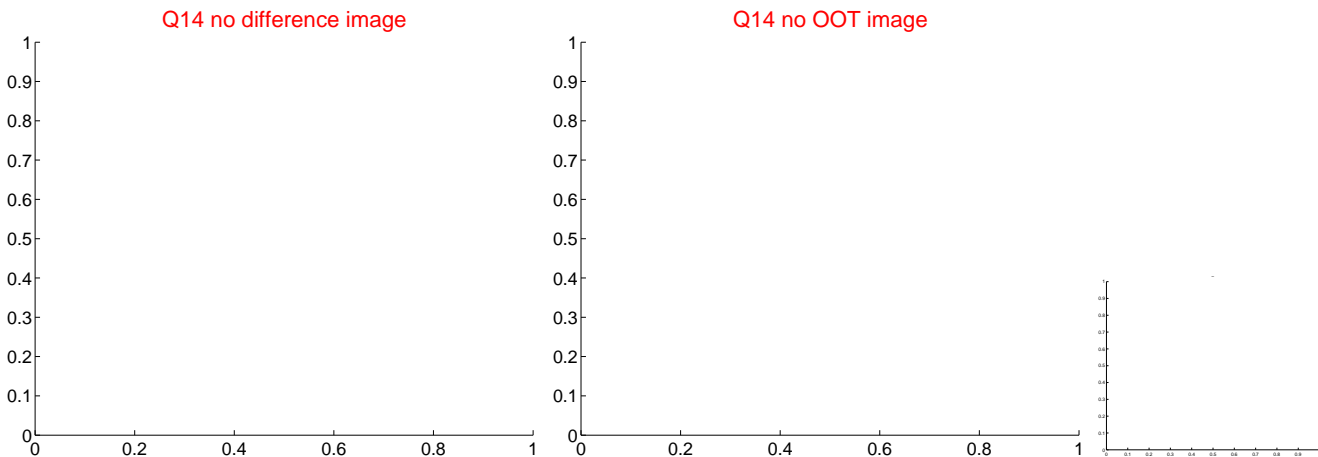
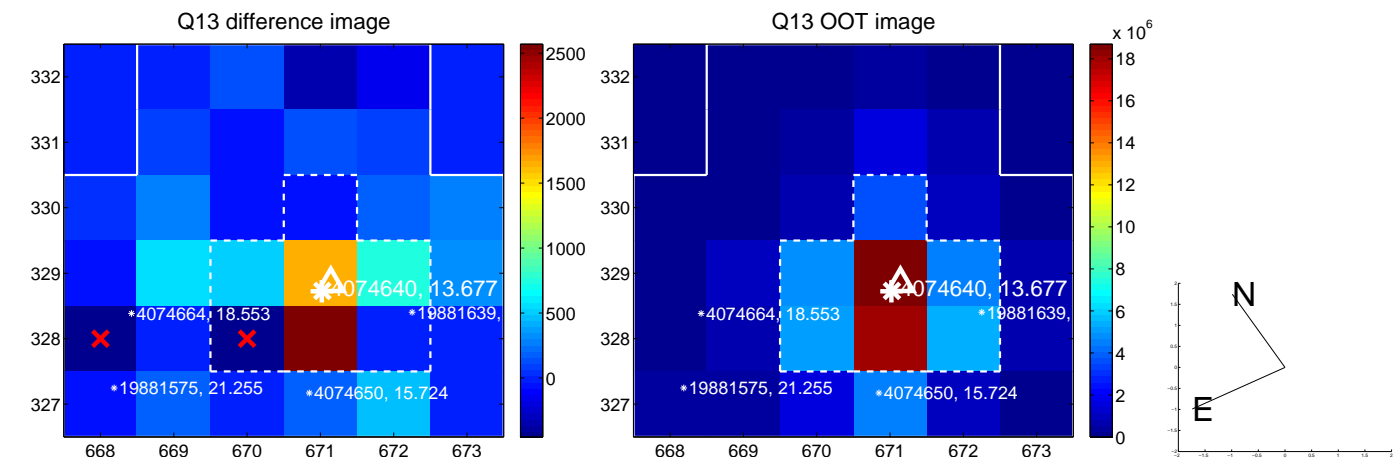
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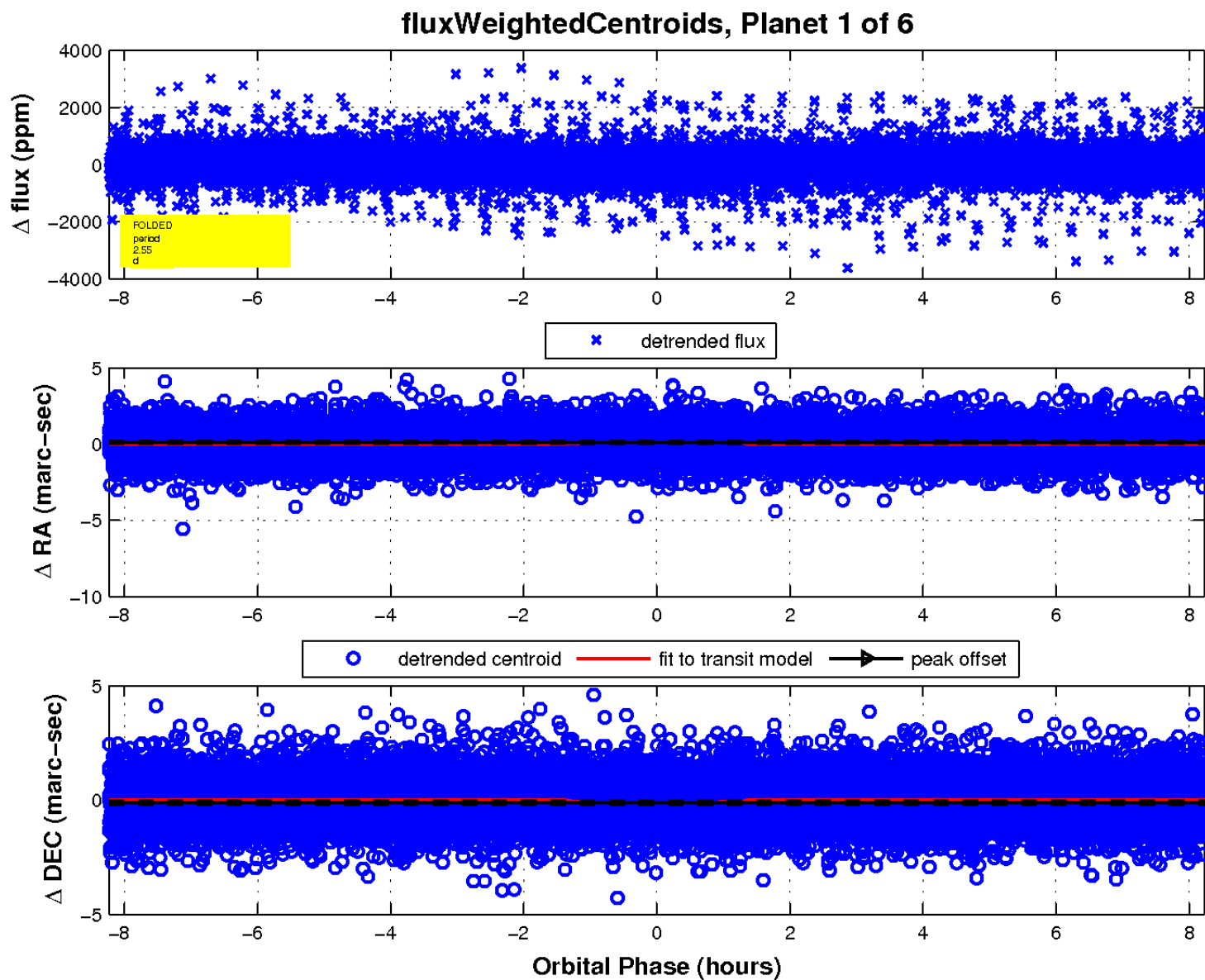
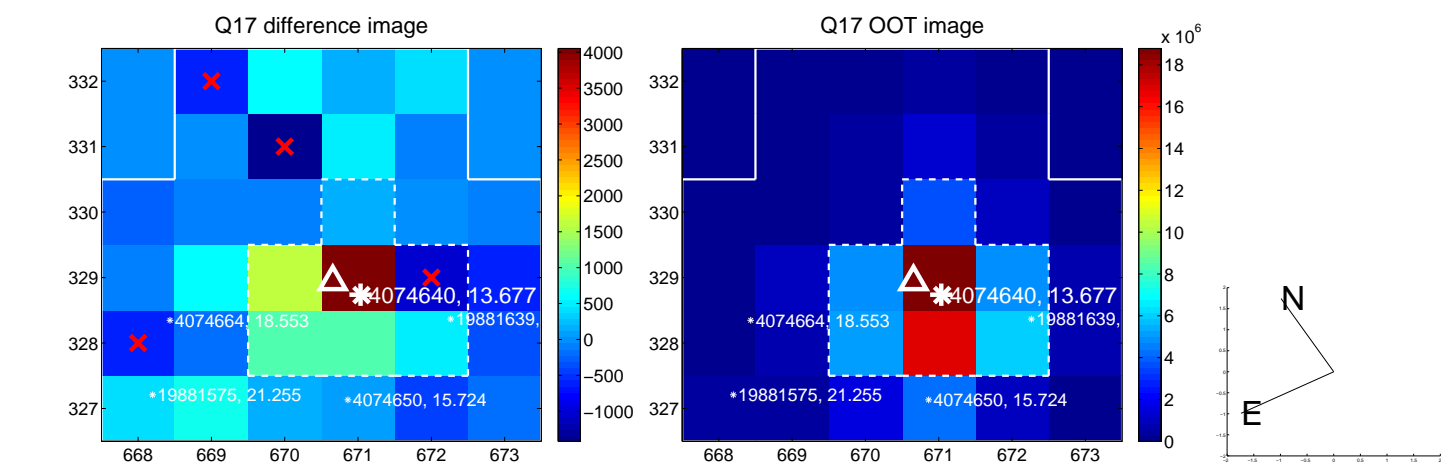
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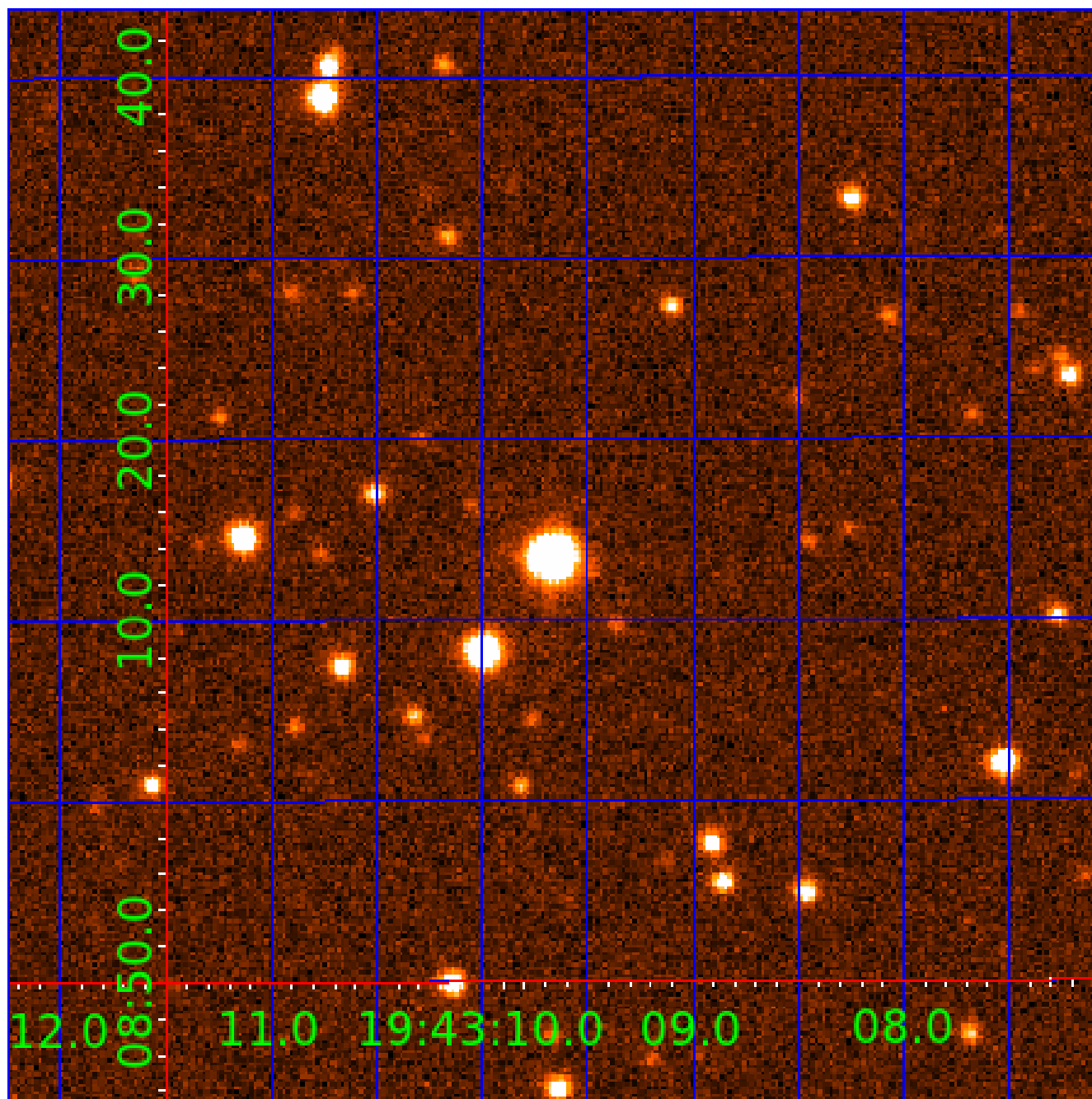


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004074640

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})
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Robovetter Results

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004074640-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
004074640-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT
004074640-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
004074640-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004074640-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD

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

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

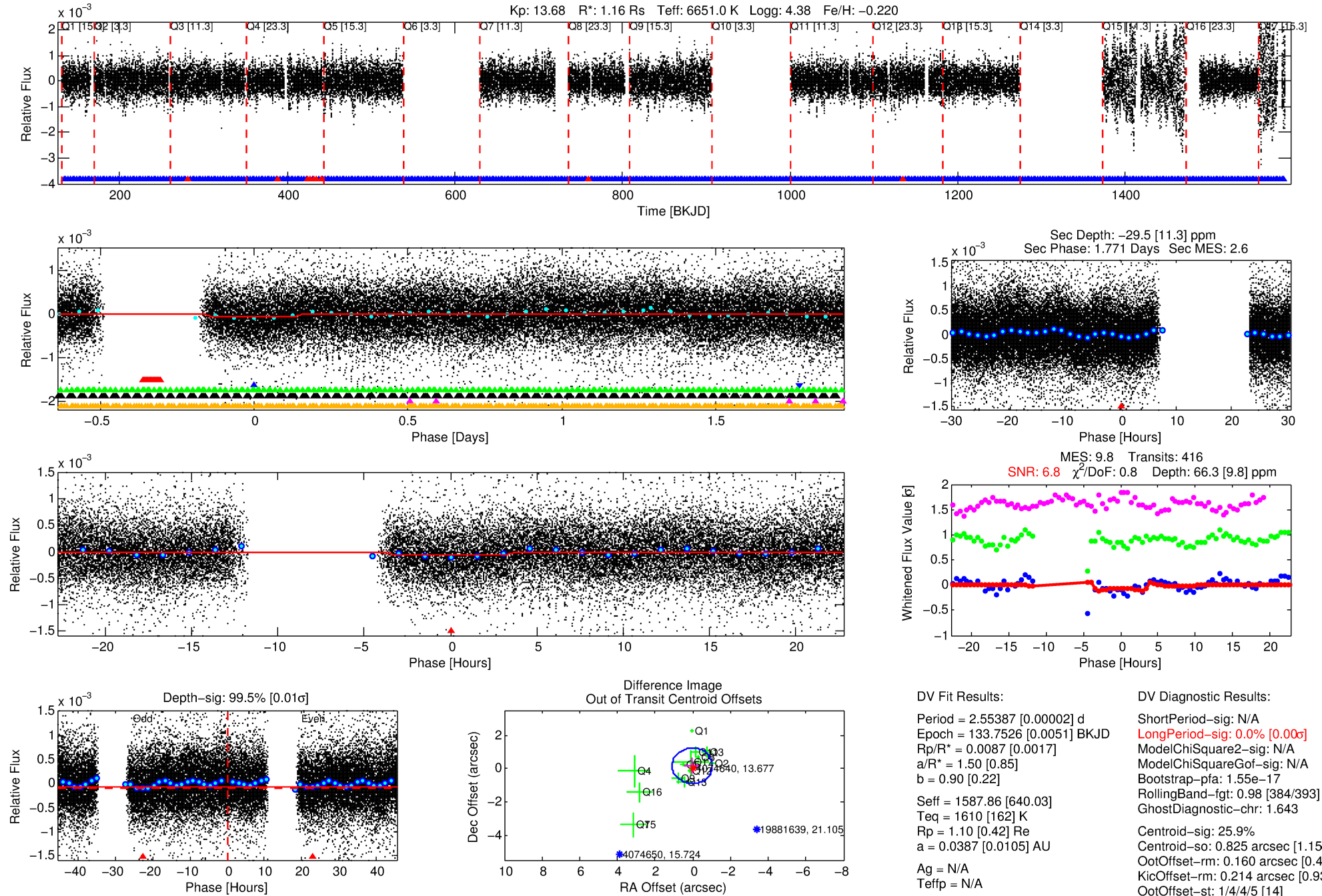
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004074640-02

No Significant Match Found

DV One-Page Summary

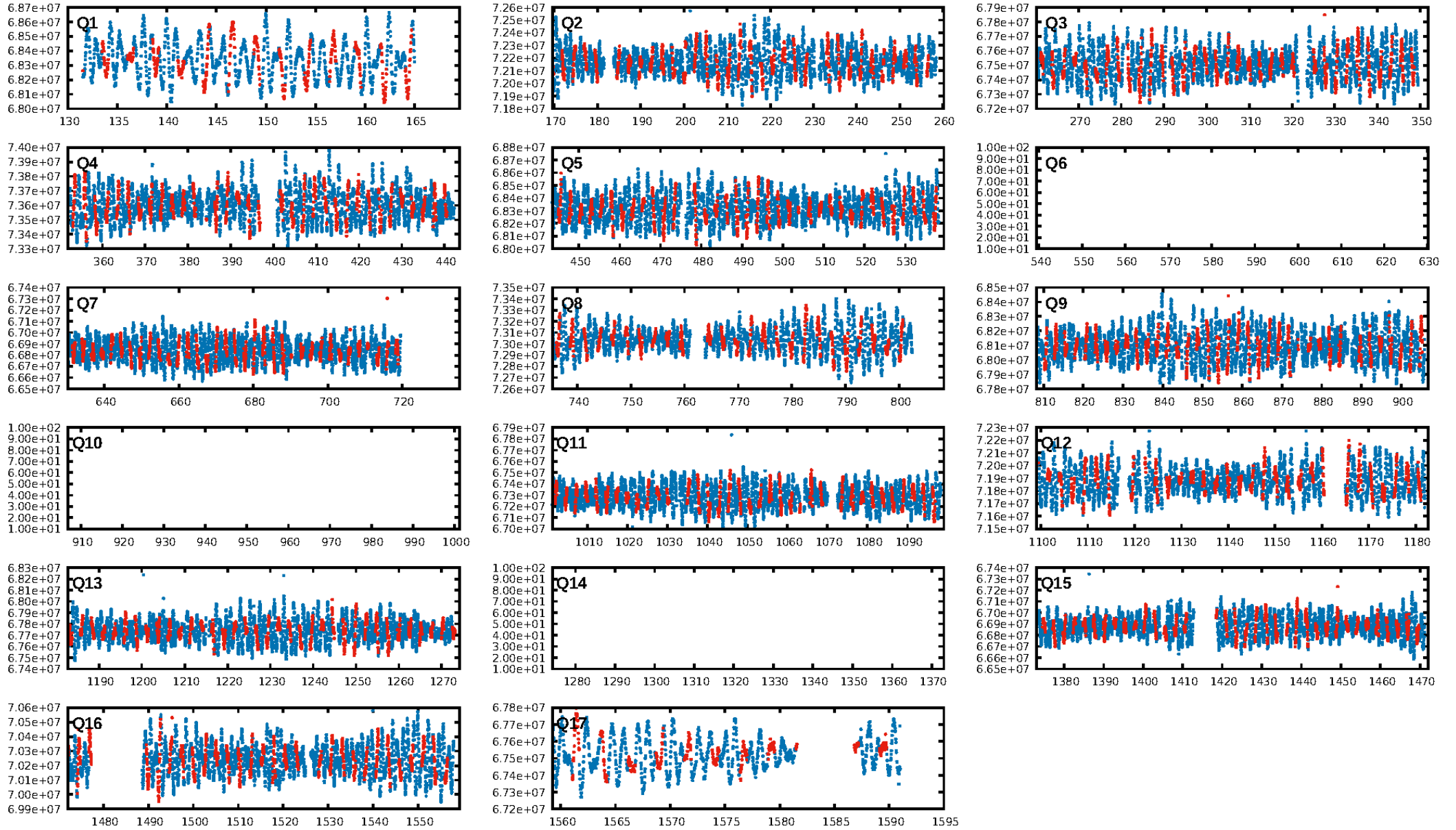
KIC: 4074640 Candidate: 2 of 6 Period: 2.554 d



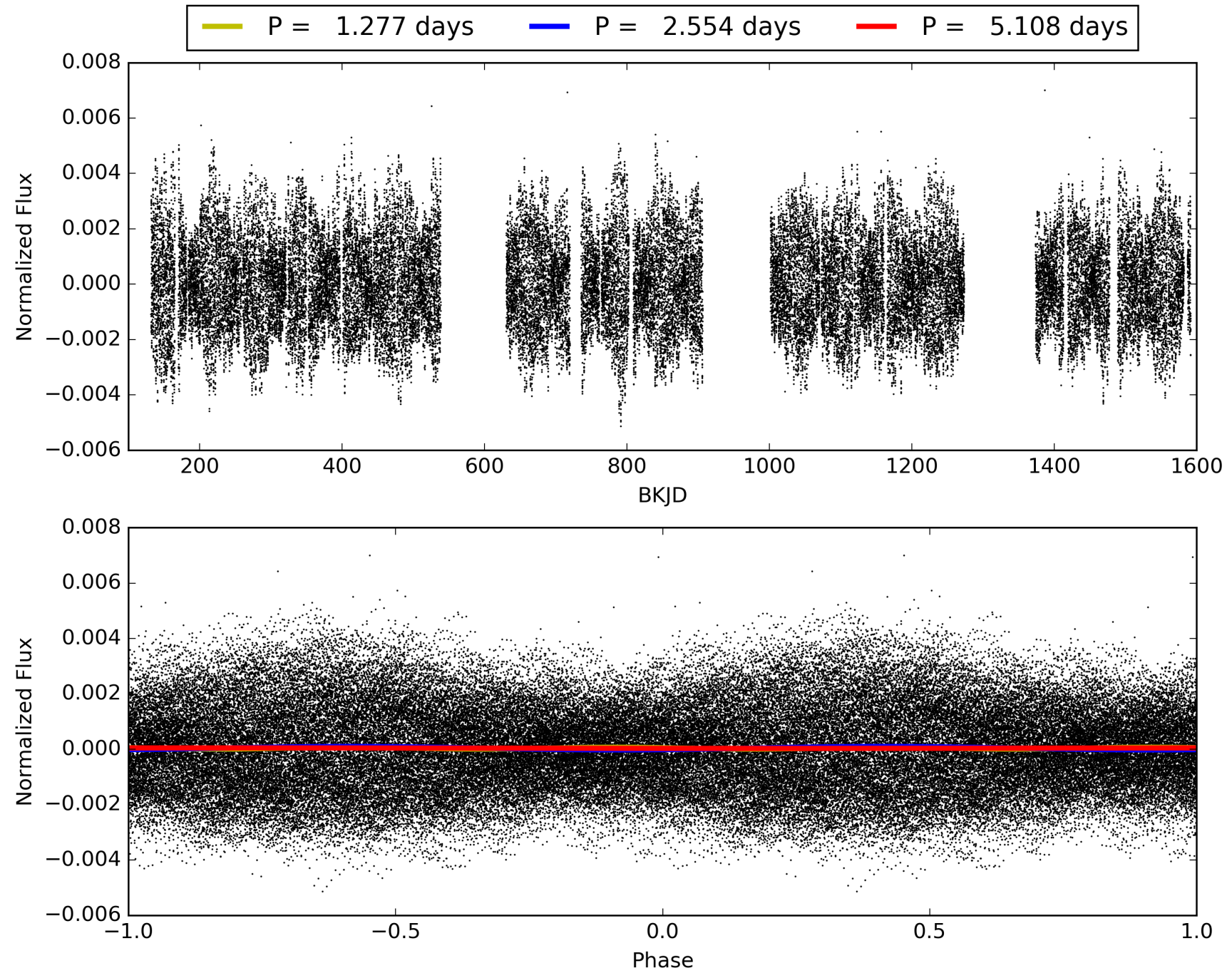
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:27:13 Z

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

TCE 004074640-02, PDC Light Curves

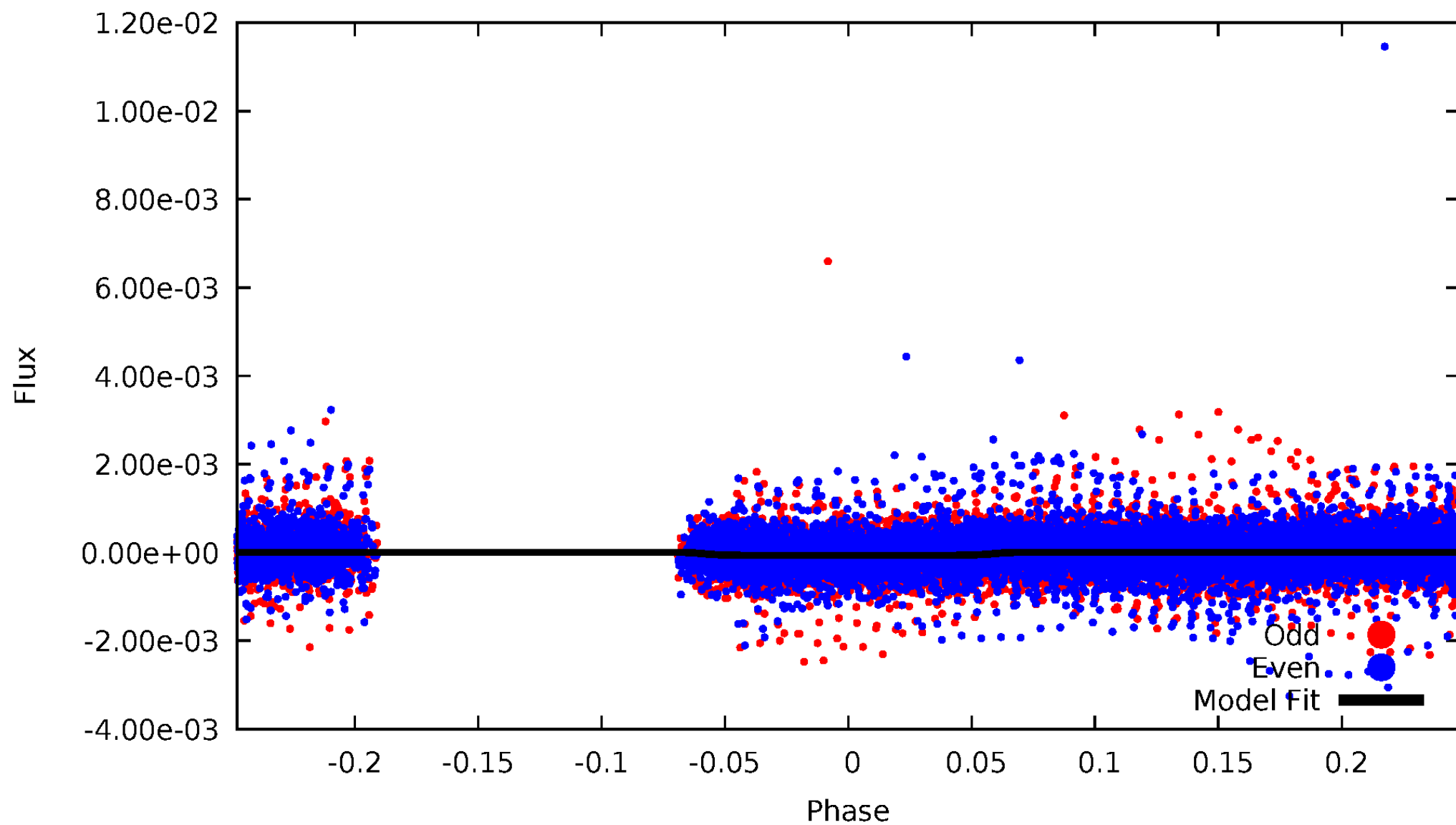


TCE 004074640-02



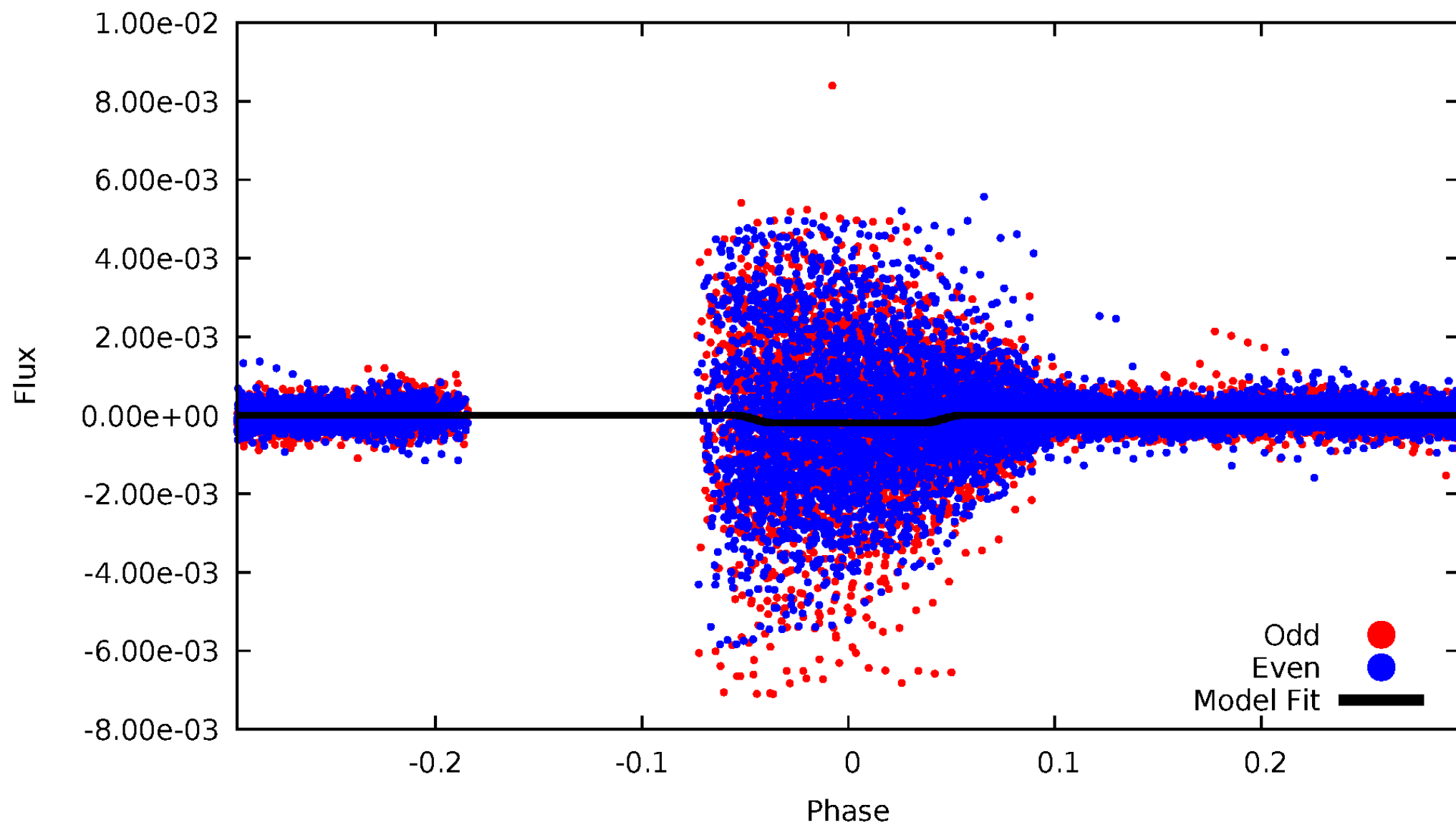
DV Odd/Even

TCE 004074640-02



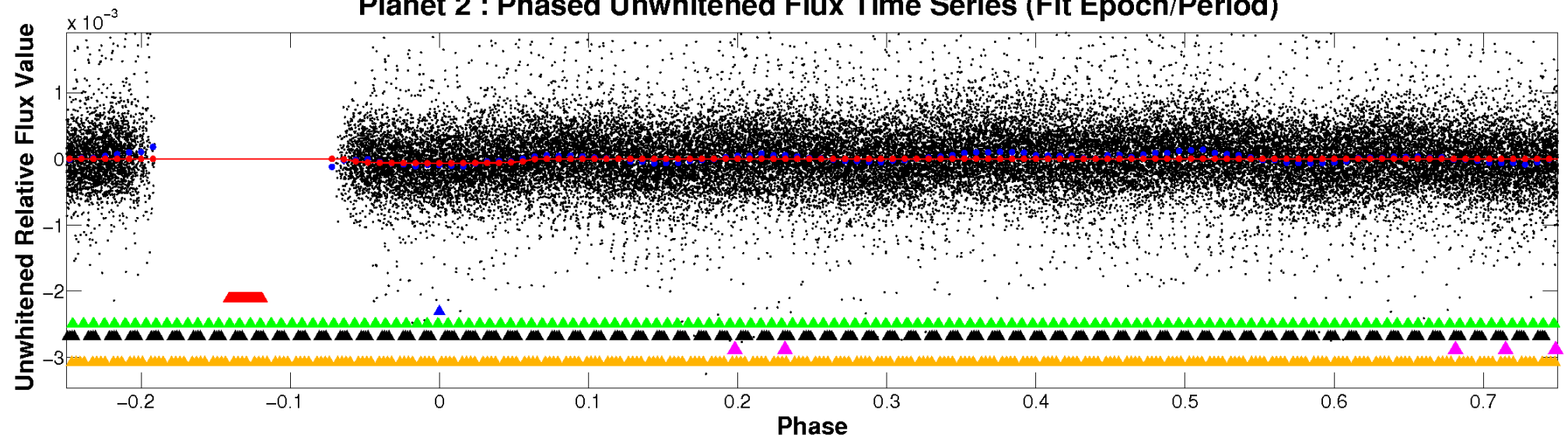
ALT Odd/Even

TCE 004074640-02

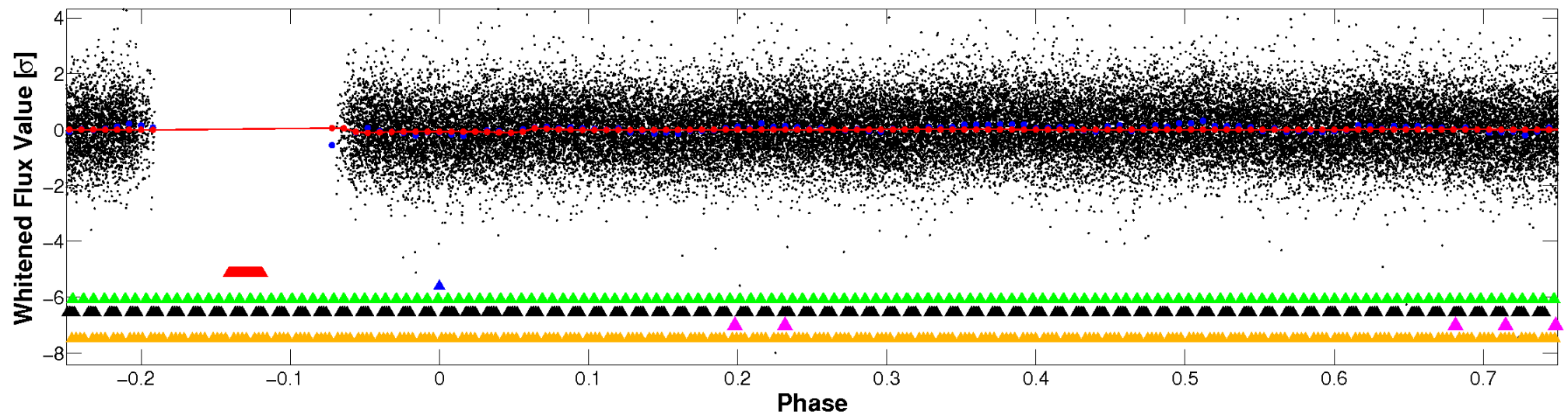


Non-Whitened Vs. Whitened Light Curve

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

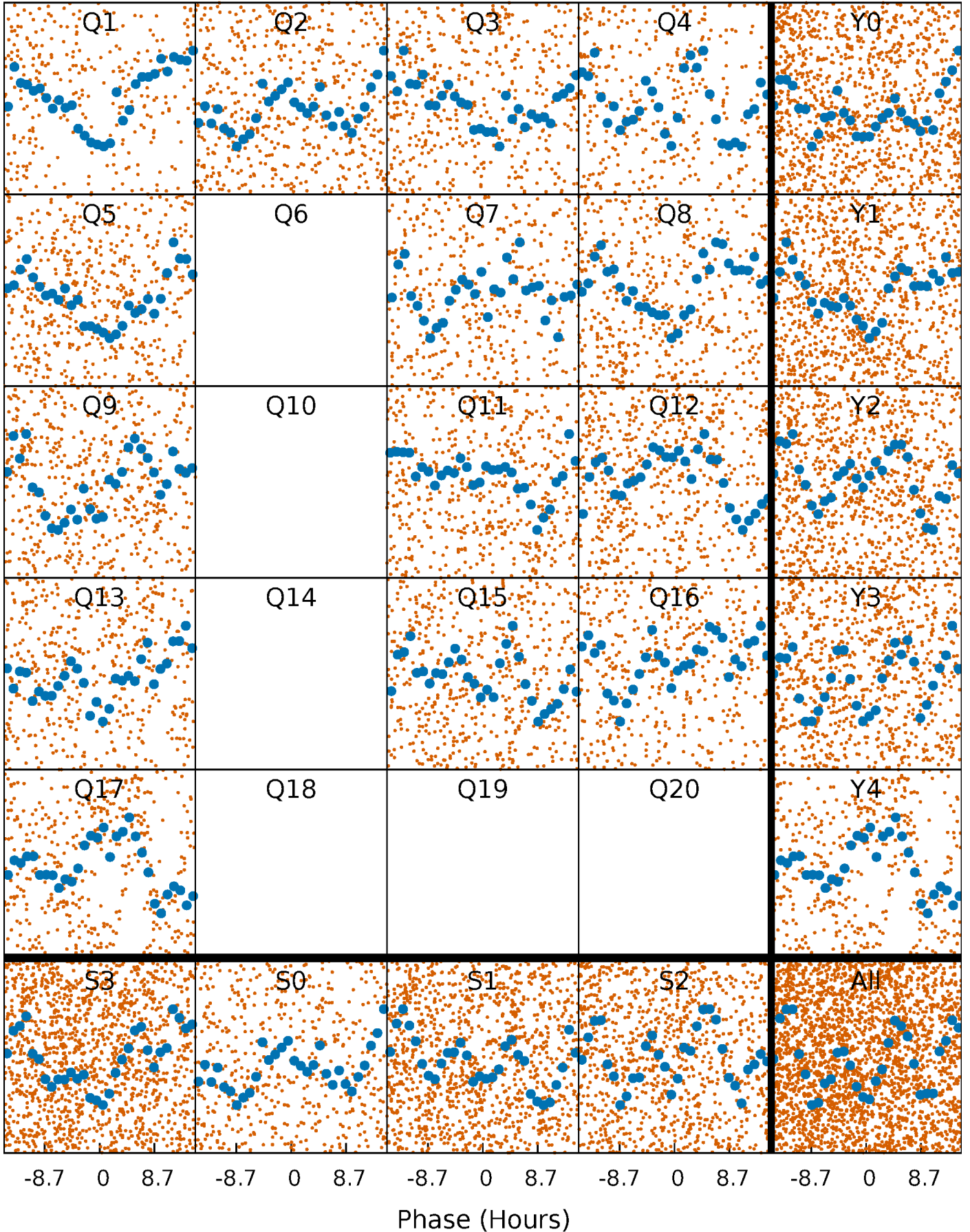


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



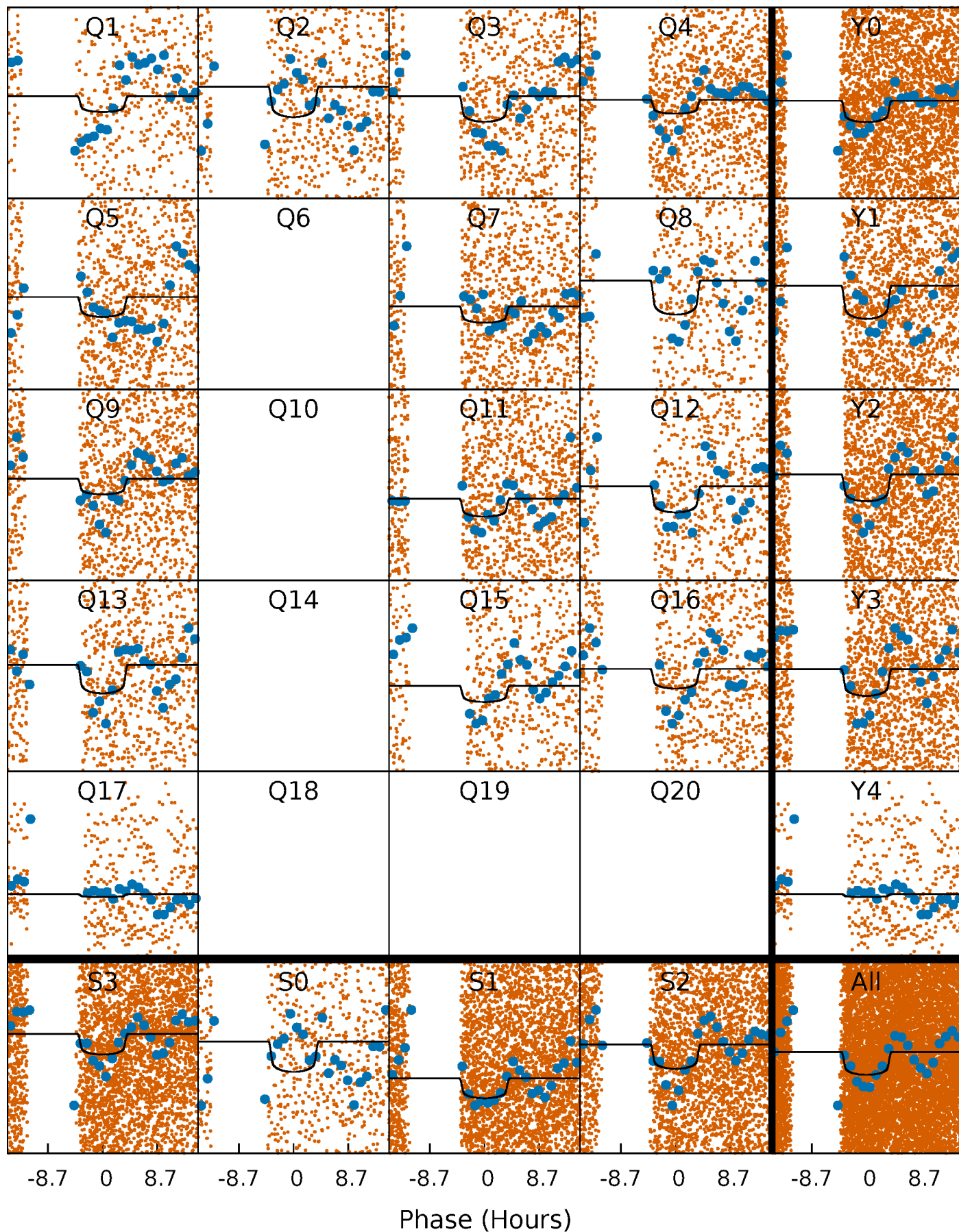
PDC Quarter-Phased Transit Curves

TCE 004074640-02 $P = 2.553867$ Days $T_0 = 133.752622$ (BKJD)



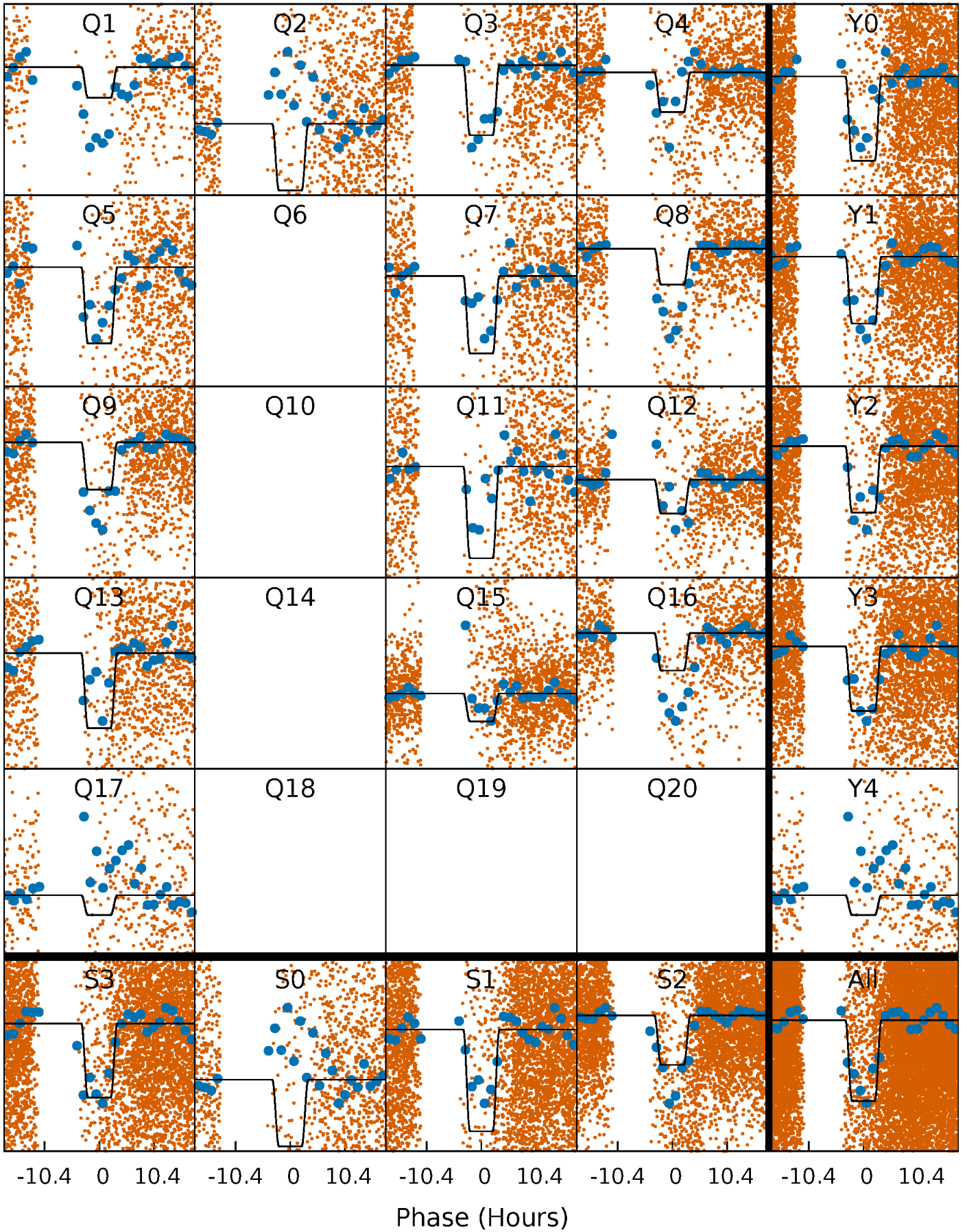
DV Quarter-Phased Transit Curves

TCE 004074640-02 P= 2.553867 Days $T_0=133.752622$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

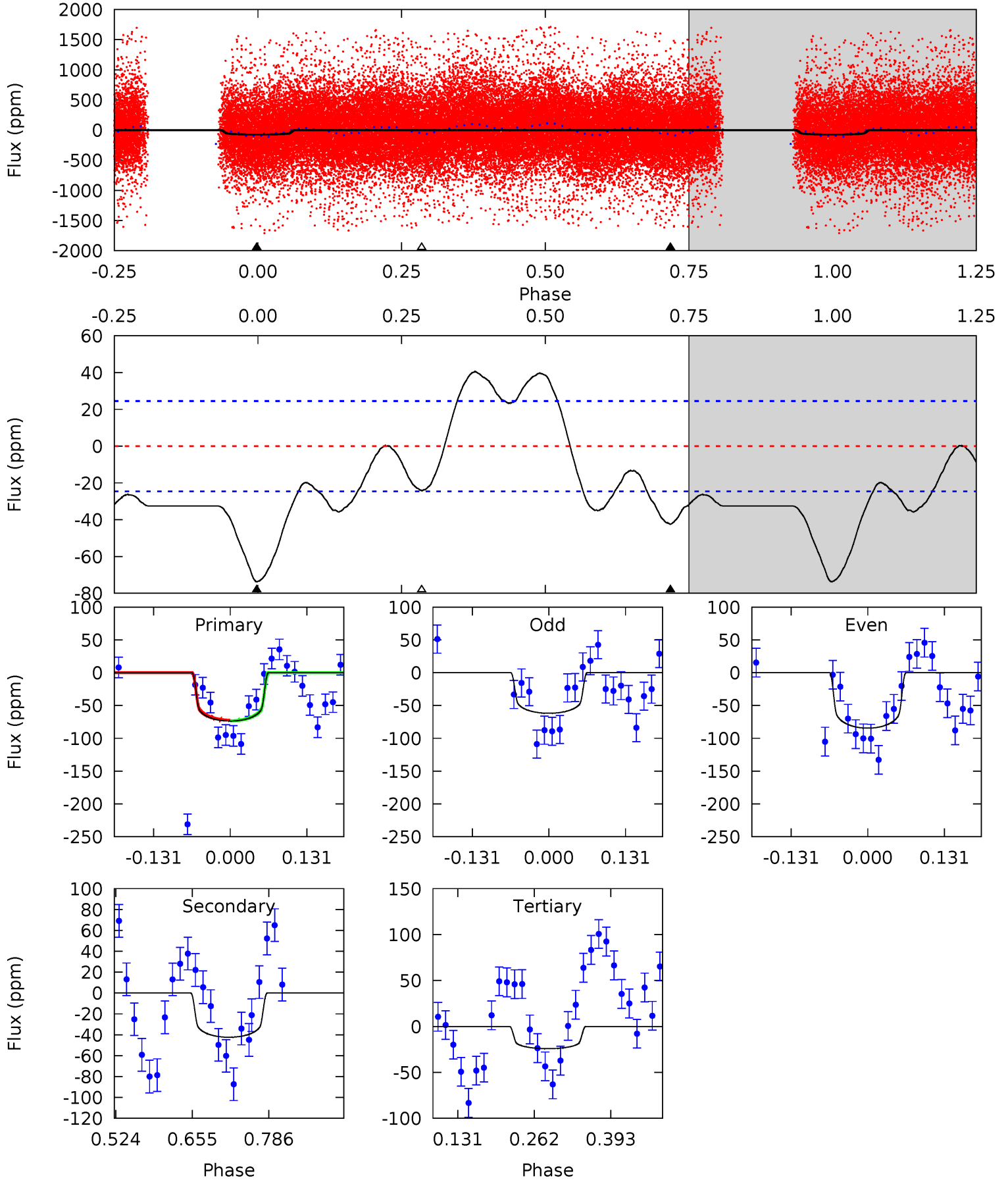
TCE 004074640-02 P= 2.553816 Days $T_0=133.762891$ (BKJD)



DV Model-Shift Uniqueness Test

004074640-02, P = 2.553867 Days, E = 131.198755 Days

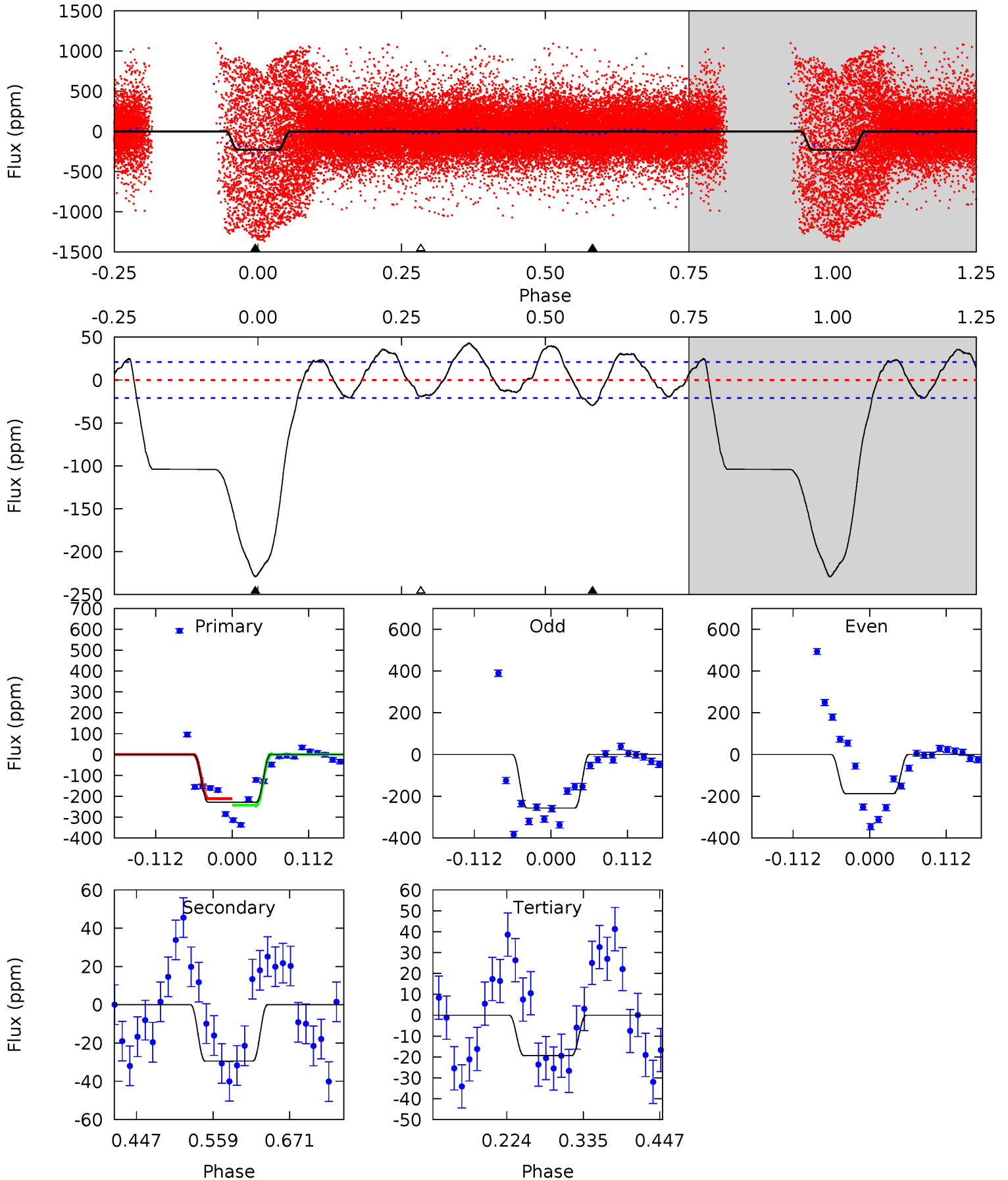
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.5	7.78	4.44	0	4.51	1.51	4.70	9.09	13.5	3.34	7.78	2.09	1.20	0.35	0.10



Alt Model-Shift Uniqueness Test

004074640-02, P = 2.553816 Days, E = 131.209075 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
49.5	6.36	4.18	0	4.54	1.59	4.55	45.3	49.5	2.18	6.36	7.37	0.89	0.16	0



Stellar Parameters For KIC 004074640

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6651^{+159}_{-218}	$4.379^{+0.067}_{-0.202}$	$-0.220^{+0.250}_{-0.300}$	$1.164^{+0.387}_{-0.129}$	$1.187^{+0.182}_{-0.165}$	$1.061^{+0.293}_{-0.547}$
	+2%/-3%	+2%/-5%	+114%/-136%	+33%/-11%	+15%/-14%	+28%/-52%
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 004074640-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-42 ± 5	$1.16^{+0.29}_{-0.24}$	2287^{+156}_{-122}	5694^{+659}_{-482}	26^{+15}_{-9}
Alt.	-29 ± 5	$1.84^{+0.34}_{-0.26}$	2268^{+158}_{-110}	4281^{+276}_{-234}	$7.001^{+2.853}_{-2.130}$

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

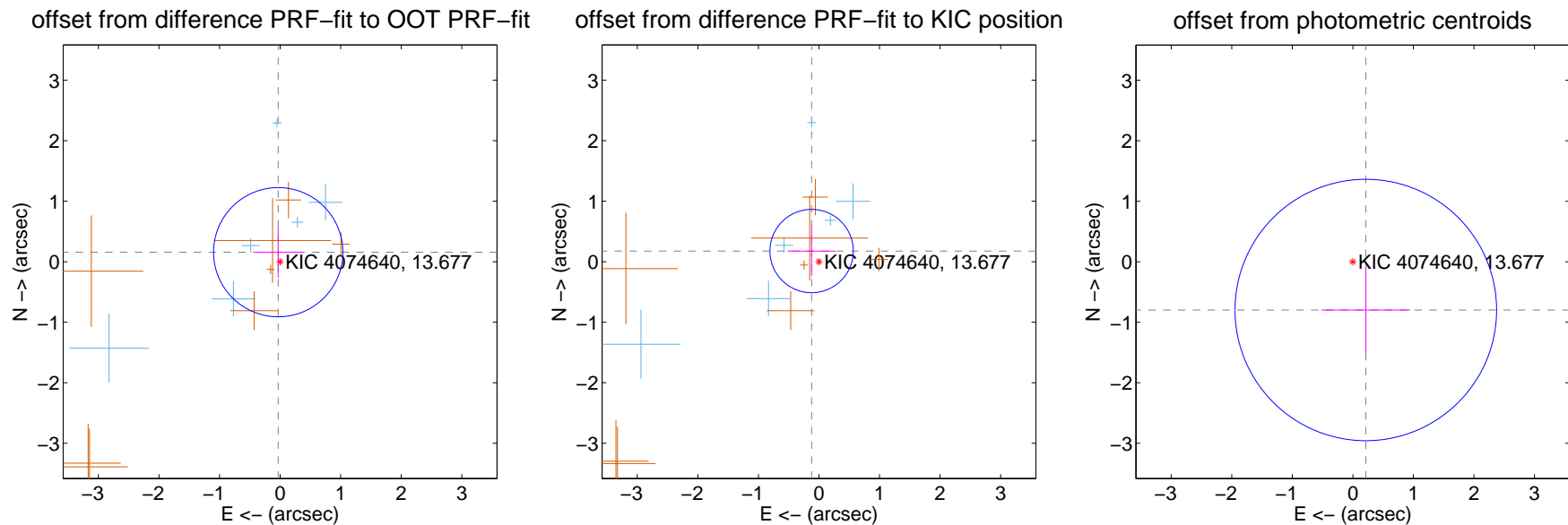
DV Centroid Data

Supplemental centroid analysis for 004074640-02. Kepler magnitude: 13.68. Transit SNR 6.78

There are 6 quarters with good PRF difference image offsets

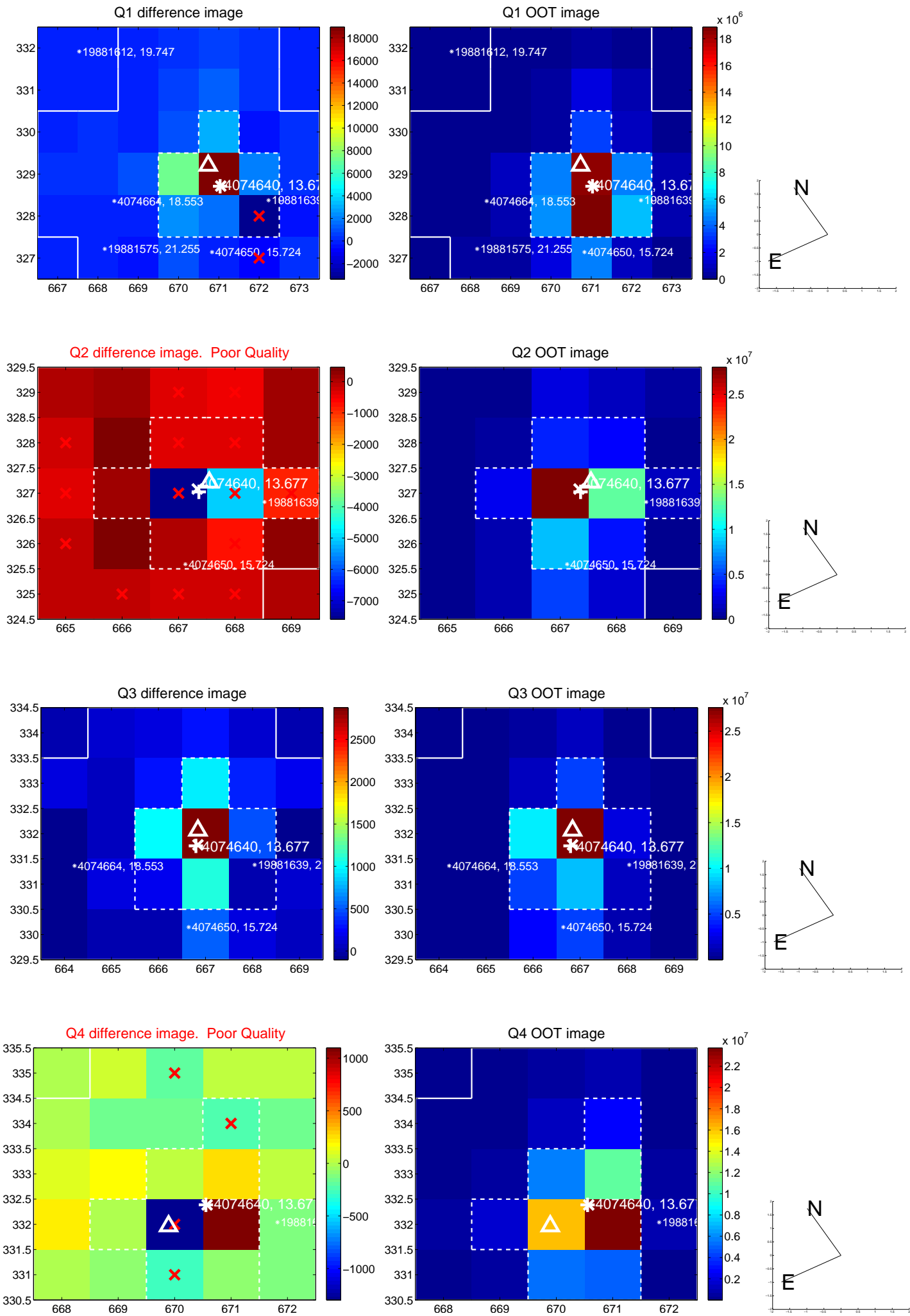
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.160 ± 0.356	0.45	0.031 ± 0.398	0.157 ± 0.420
PRF-fit source offset from KIC position	0.214 ± 0.229	0.93	0.122 ± 0.397	0.176 ± 0.411
photometric centroid source offset	0.83 ± 0.72	1.15	-0.21 ± 0.73	-0.80 ± 0.72

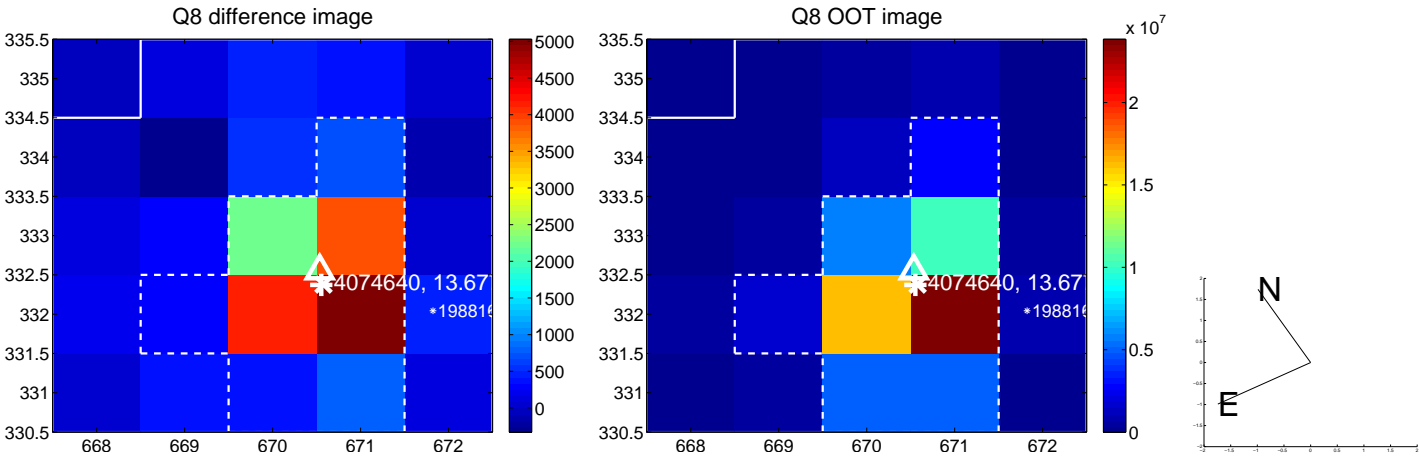
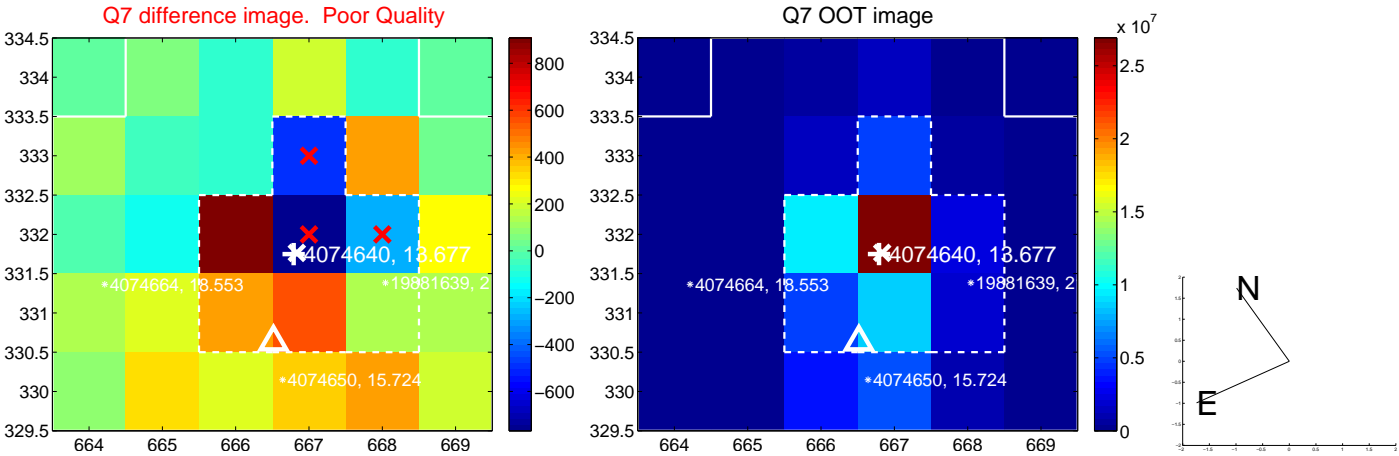
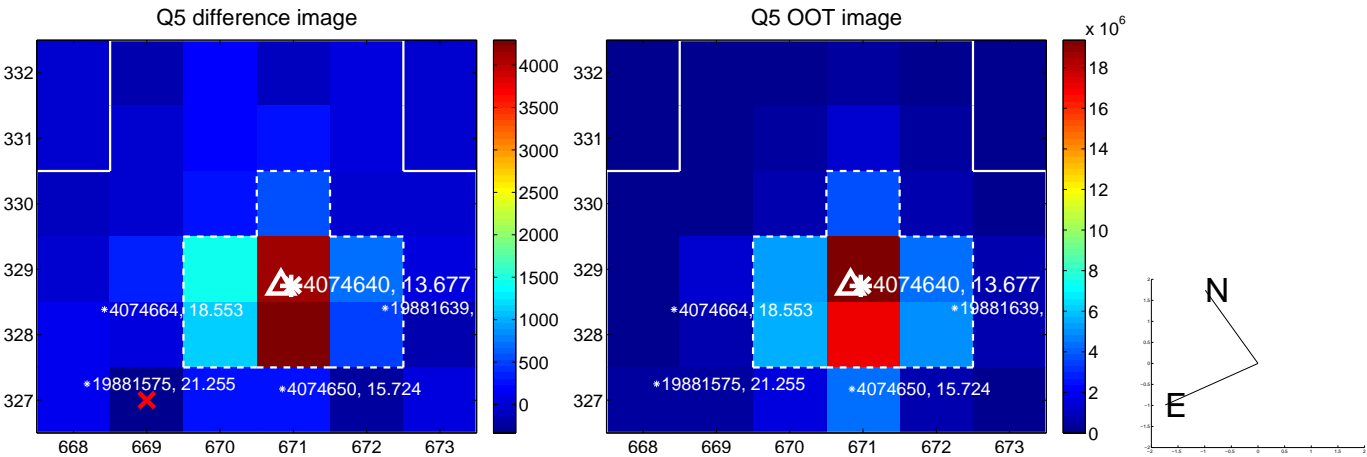


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

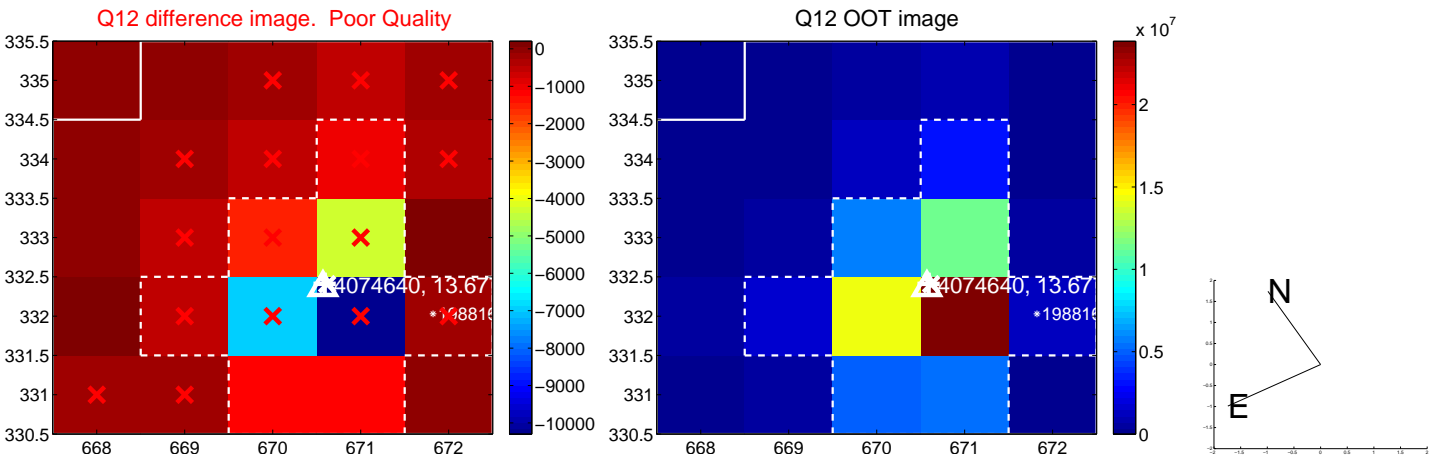
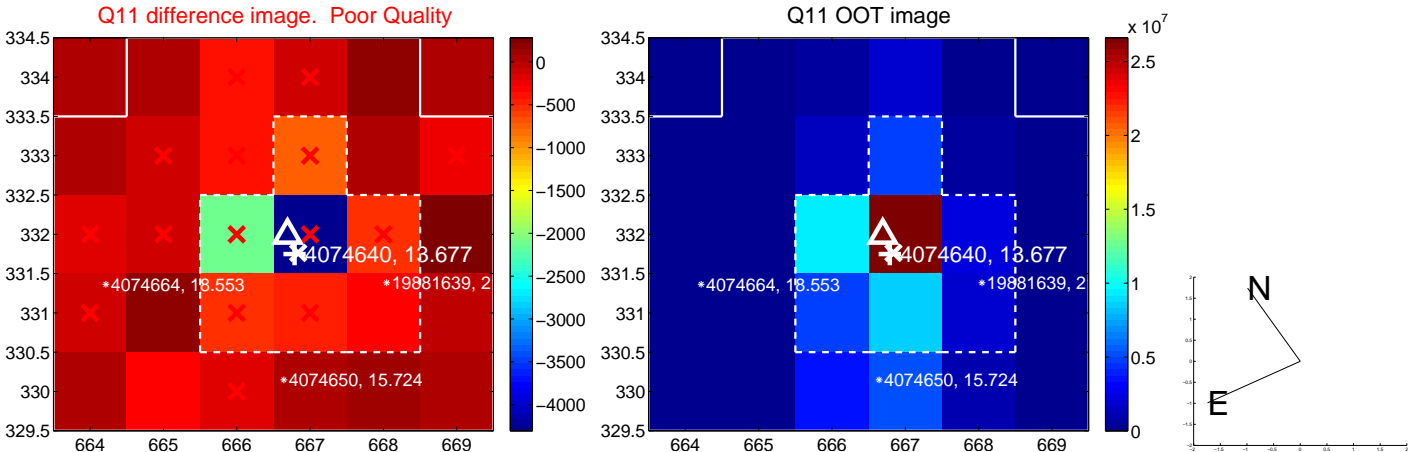
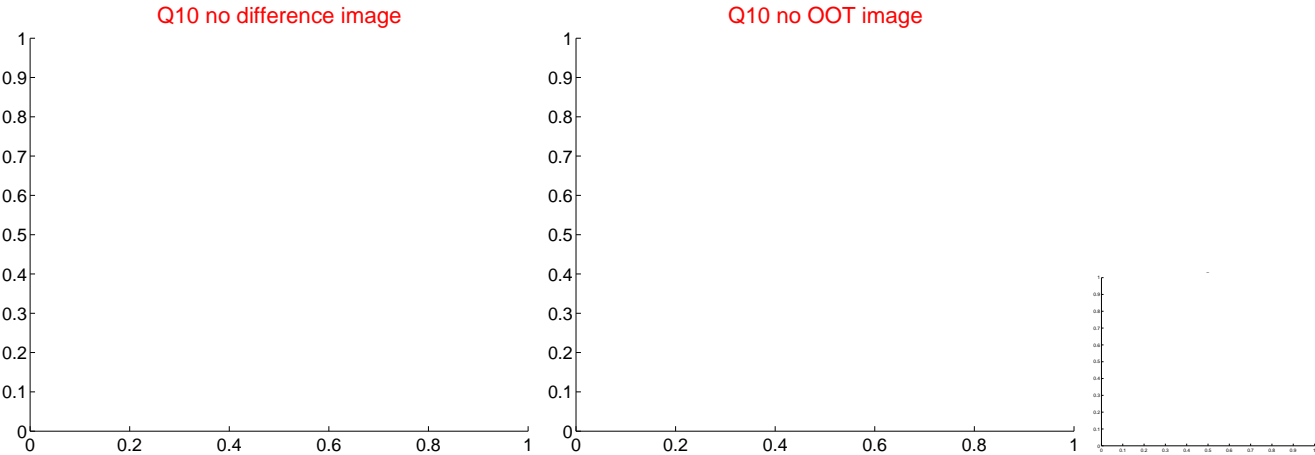
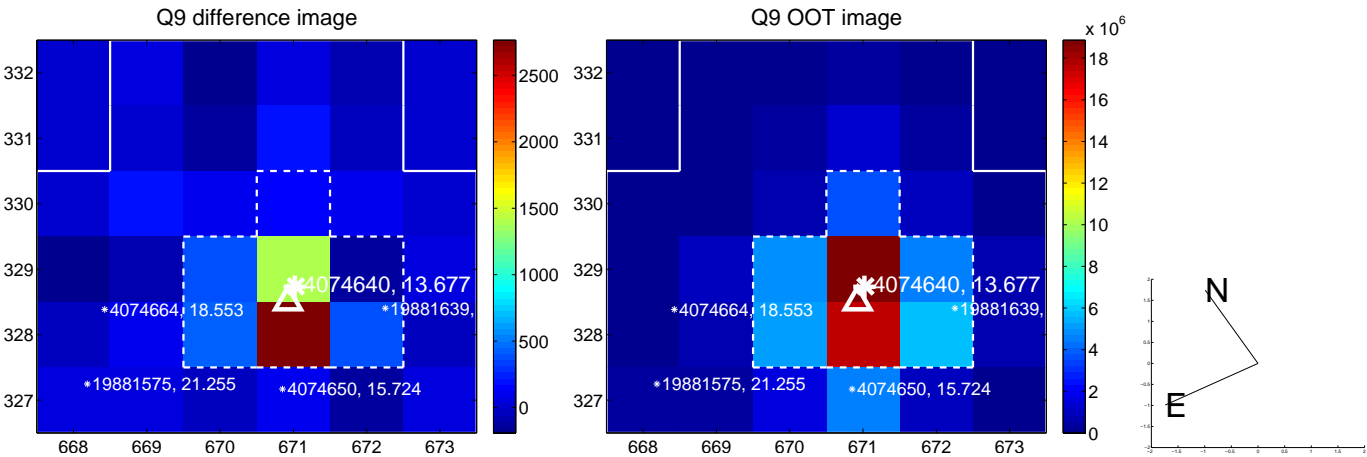
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



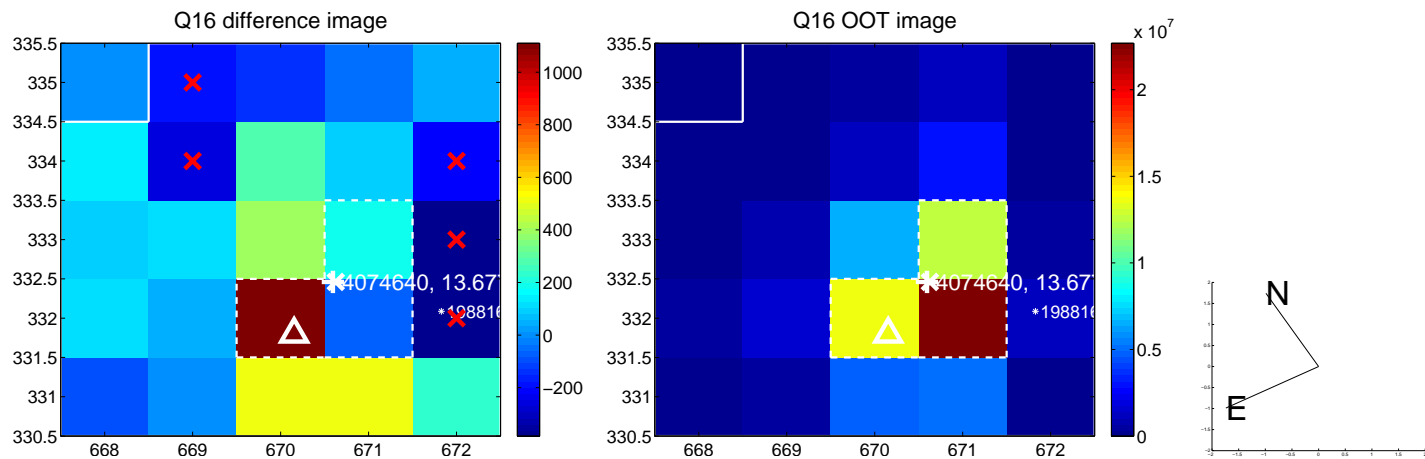
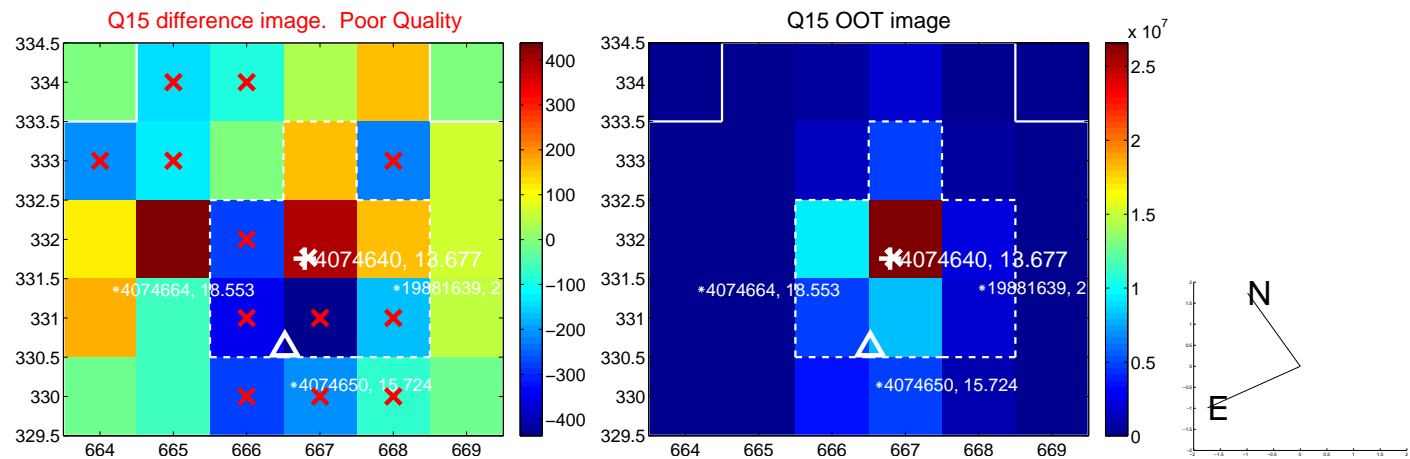
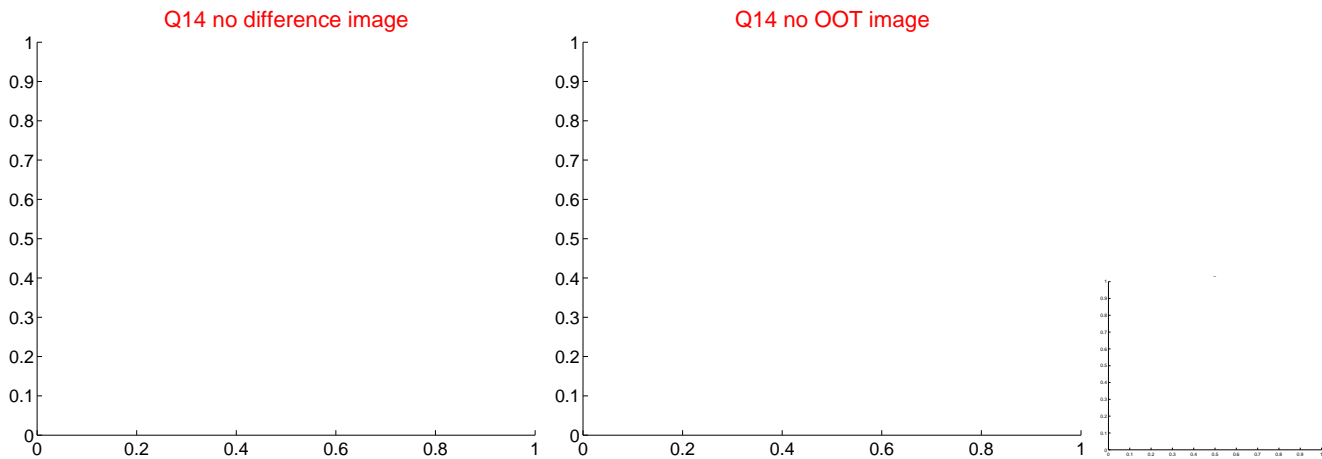
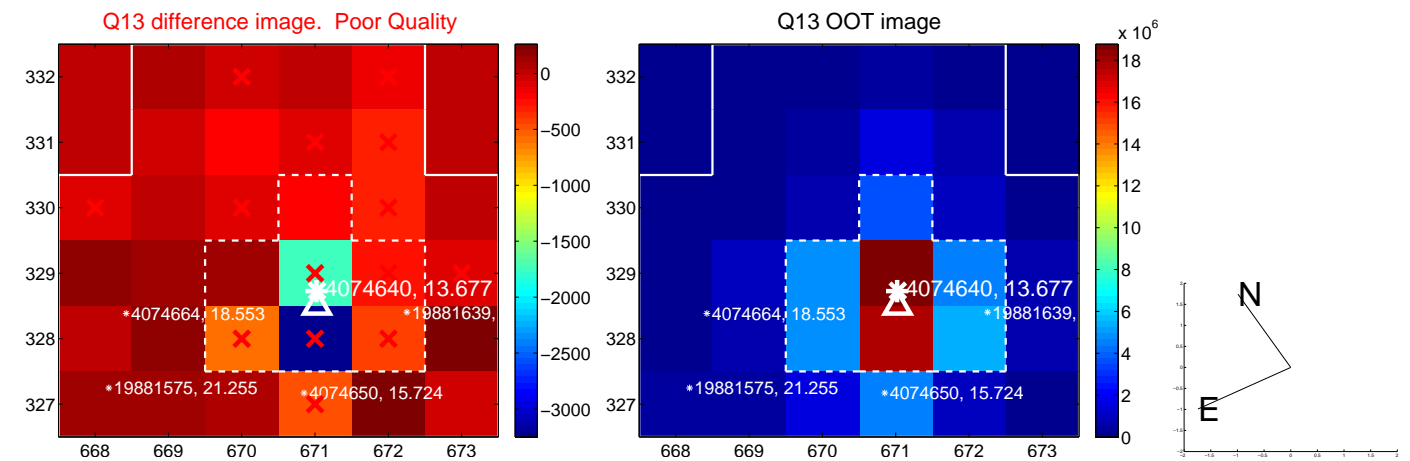
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



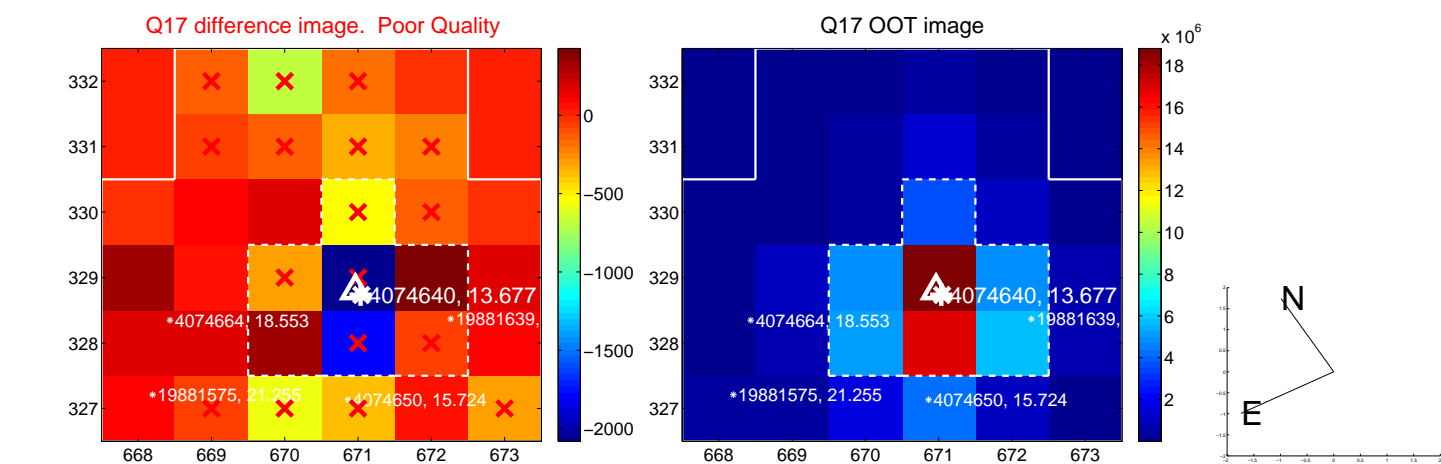
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



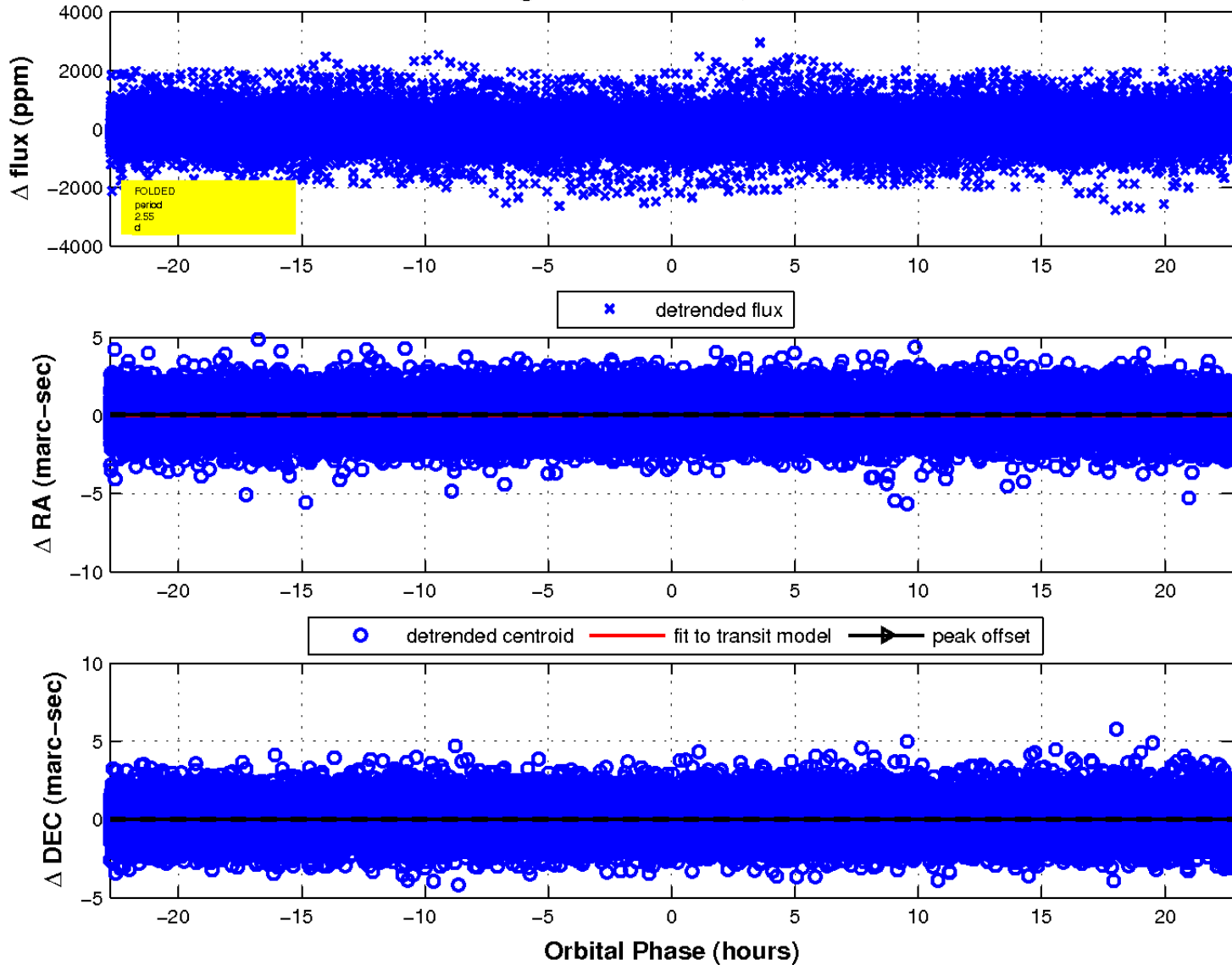
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



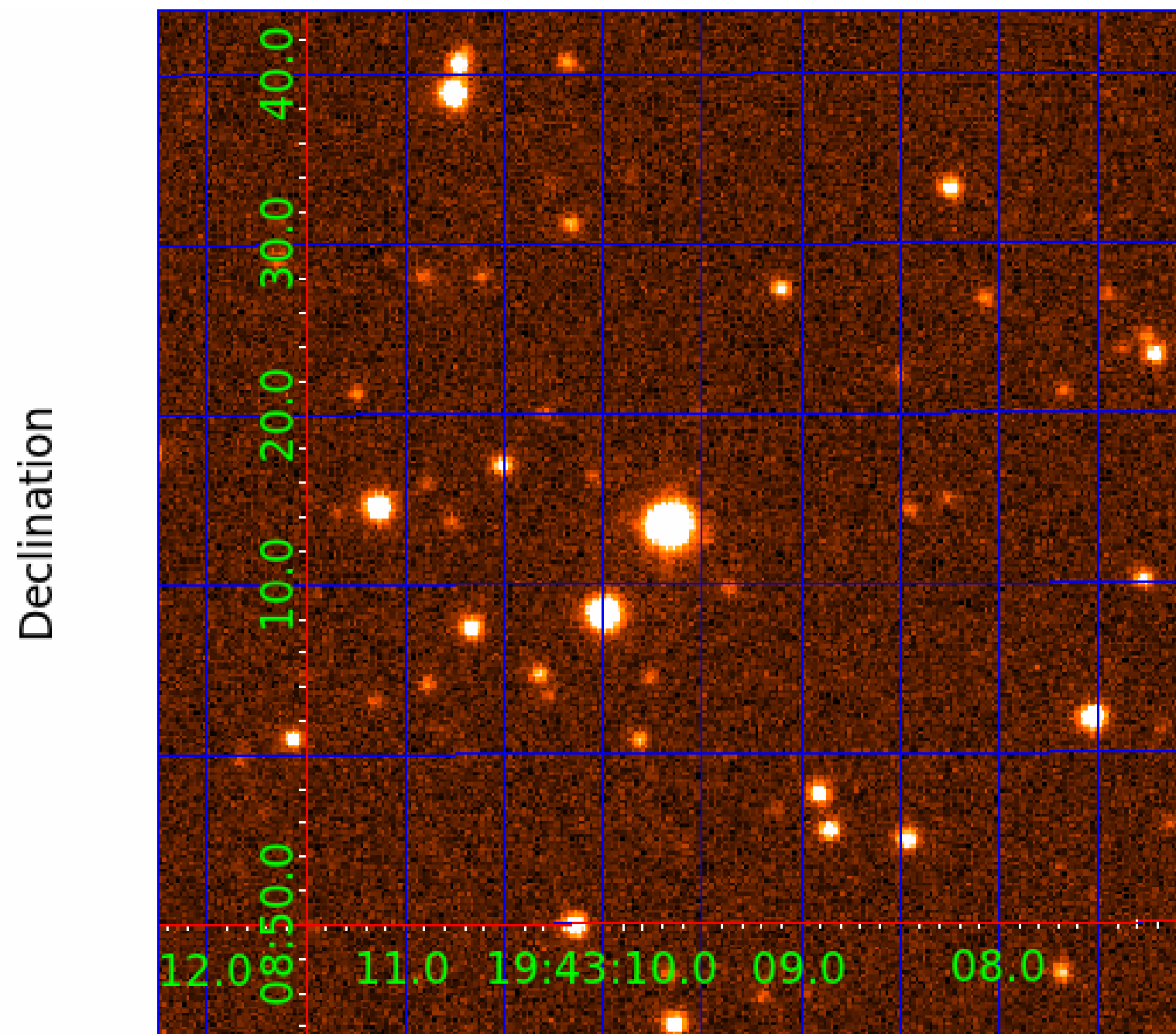
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 6



UKIRT Image



KIC 004074640

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})
004074640-01	OBS	No	2.553966	133.392161	47.2	2.744	9.7	4.4	1.16	6651	0.92	1587.78
004074640-02	OBS	No	2.553867	133.752622	66.3	7.590	9.8	6.8	1.16	6651	1.10	1587.86
004074640-03	OBS	No	5.072026	134.587970	114.5	5.006	7.8	7.2	1.16	6651	1.43	636.07
004074640-04	OBS	No	5.071818	133.870150	114.2	6.169	7.4	6.4	1.16	6651	1.45	636.10
004074640-05	OBS	No	279.605531	271.019287	886.8	7.151	7.7	7.3	1.16	6651	4.04	3.03
004074640-06	OBS	No	5.072165	135.733937	116.6	6.038	7.5	6.5	1.16	6651	1.48	636.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004074640-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004074640-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
004074640-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT
004074640-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
004074640-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004074640-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD

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

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

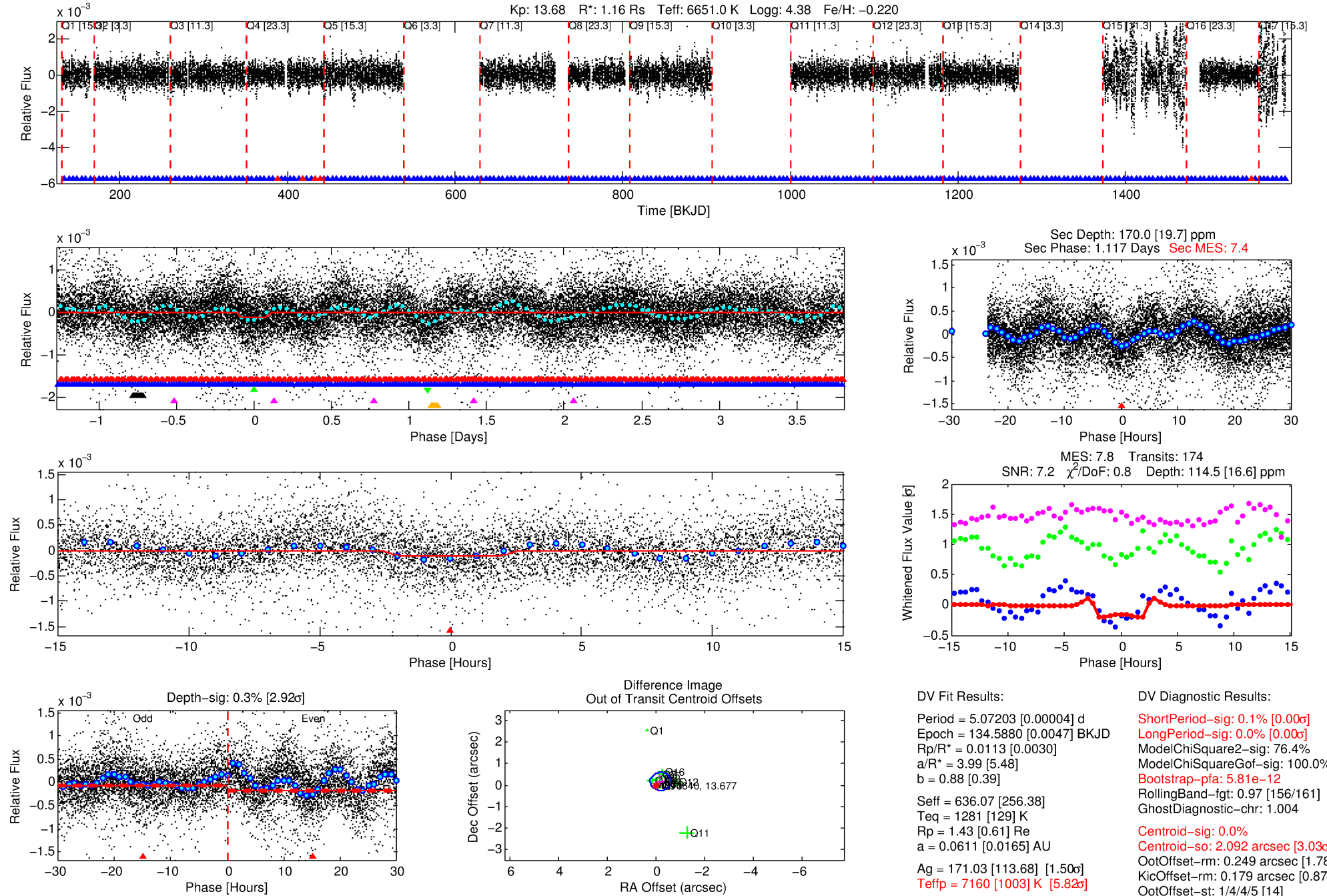
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004074640-03

No Significant Match Found

DV One-Page Summary

KIC: 4074640 Candidate: 3 of 6 Period: 5.072 d



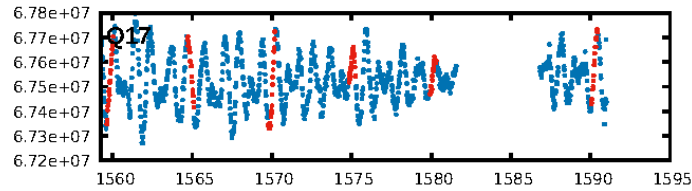
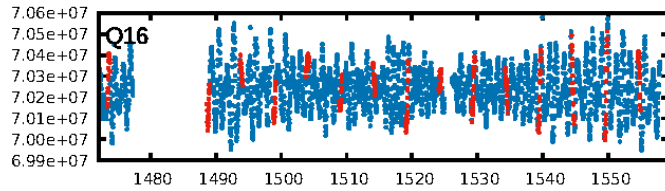
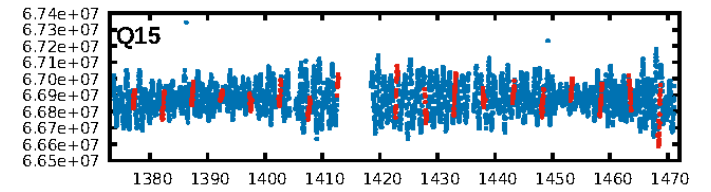
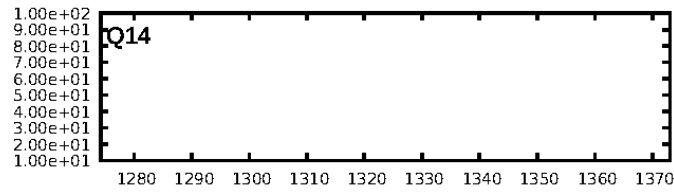
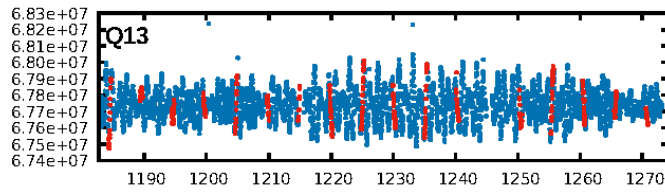
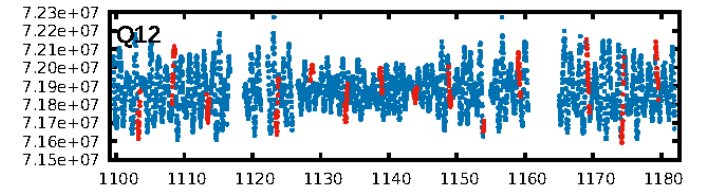
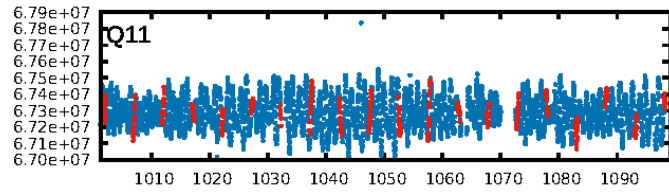
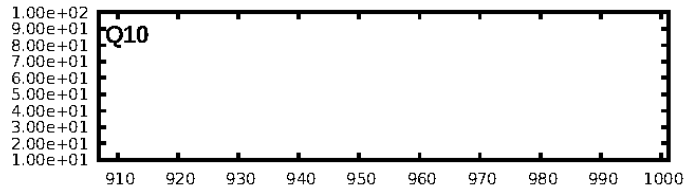
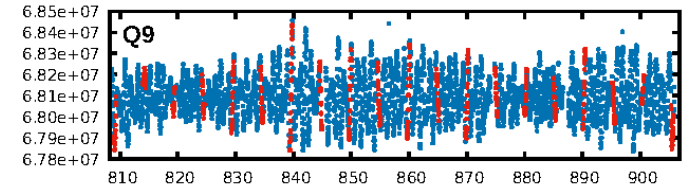
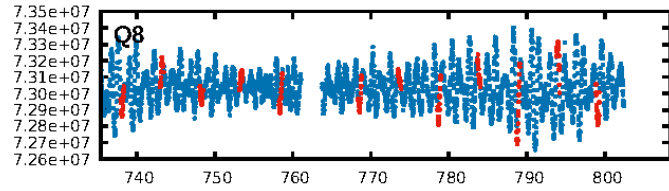
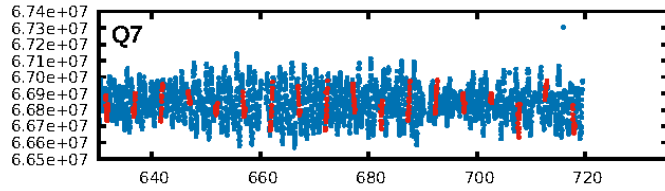
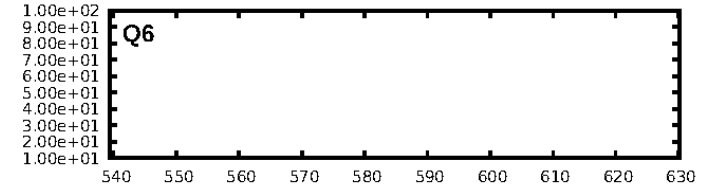
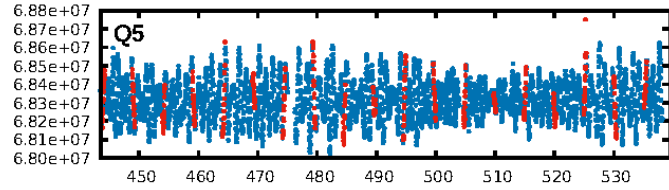
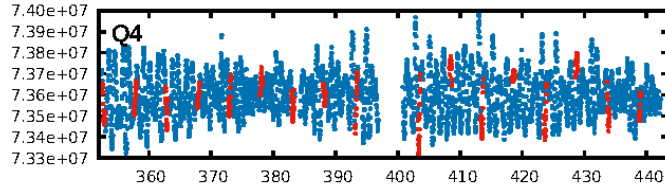
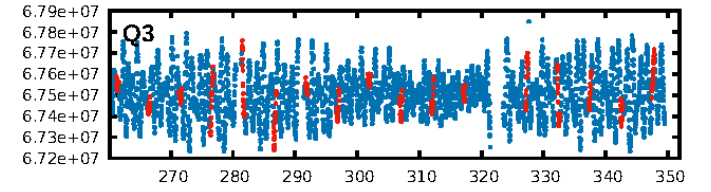
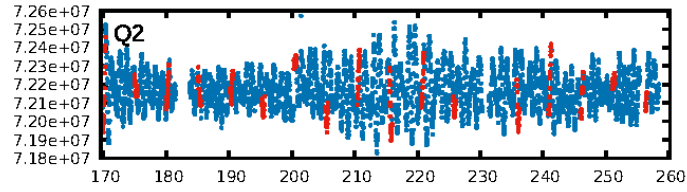
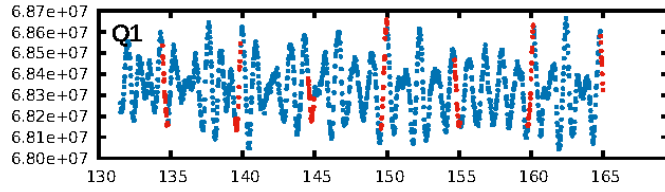
DV Fit Results:

Period = 5.07203 [0.00004] d
Epoch = 134.5880 [0.0047] BKJD
Rp/R* = 0.0113 [0.0030]
a/R* = 3.99 [5.48]
b = 0.88 [0.39]
Seff = 636.07 [256.38]
Teff = 1281 [129] K
Rp = 1.43 [0.61] Re
a = 0.0611 [0.0165] AU
Ag = 171.03 [113.68] [1.50 σ]
Teffp = 7160 [1003] K [5.82 σ]

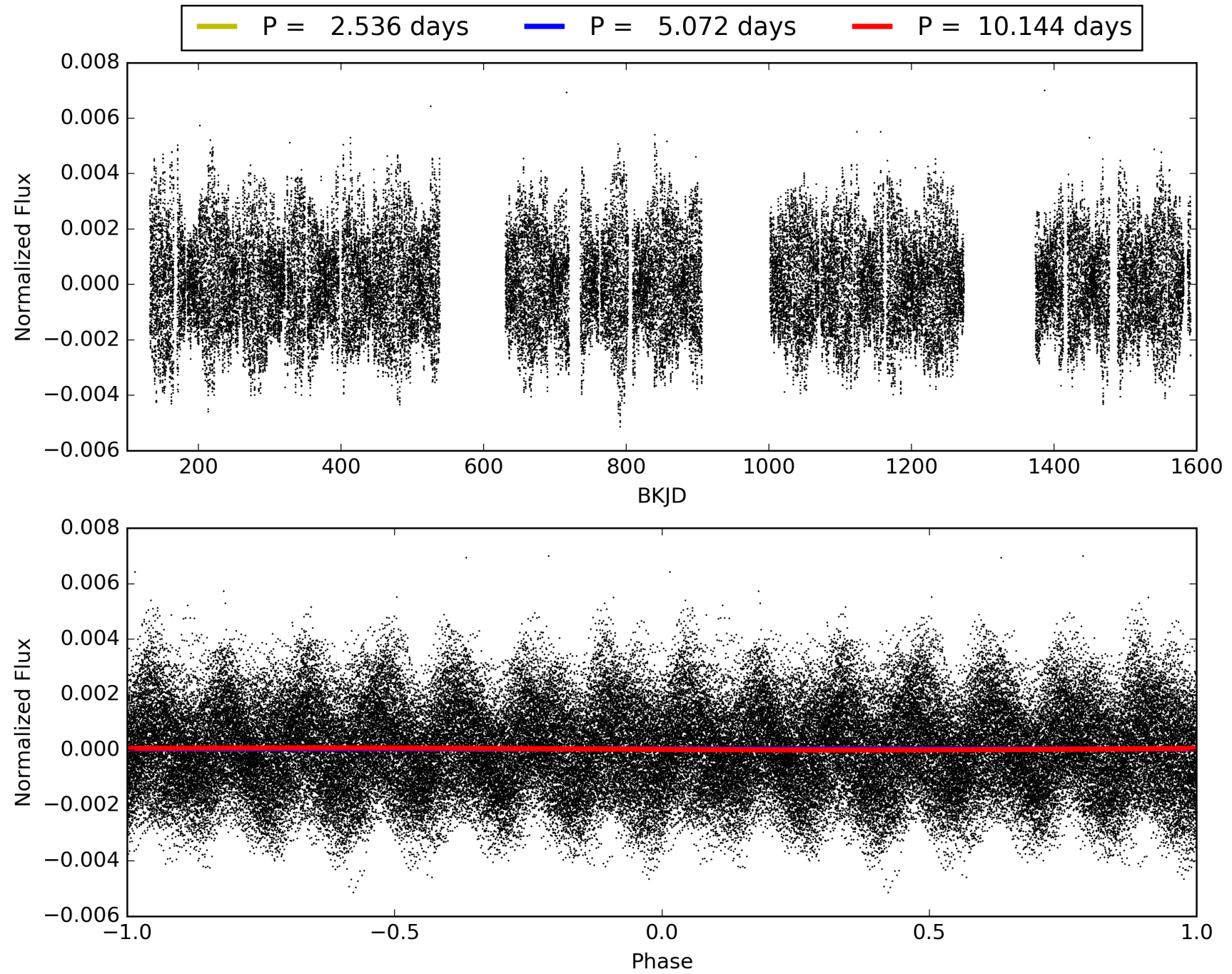
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00 σ]
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: 76.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.81e-12
RollingBand-fgt: 0.97 [156/161]
GhostDiagnostic-chr: 1.004
Centroid-sig: 0.0%
Centroid-so: 2.092 arcsec [3.03 σ]
OotOffset-rm: 0.249 arcsec [1.78 σ]
KicOffset-rm: 0.179 arcsec [0.87 σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 0.79 [11/14]
DiffImageOverlap-fno: 0.71 [10/14]

TCE 004074640-03, PDC Light Curves

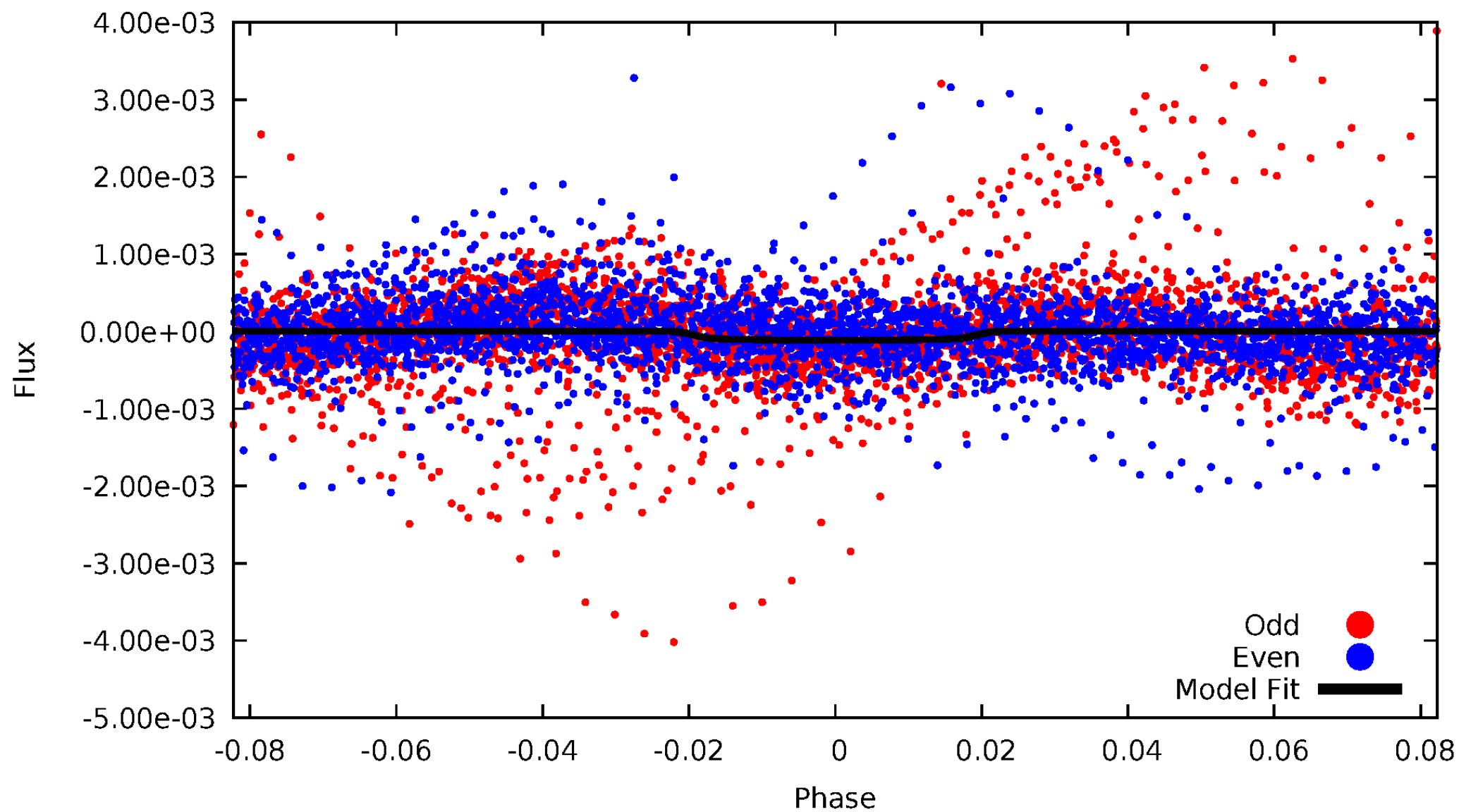


TCE 004074640-03



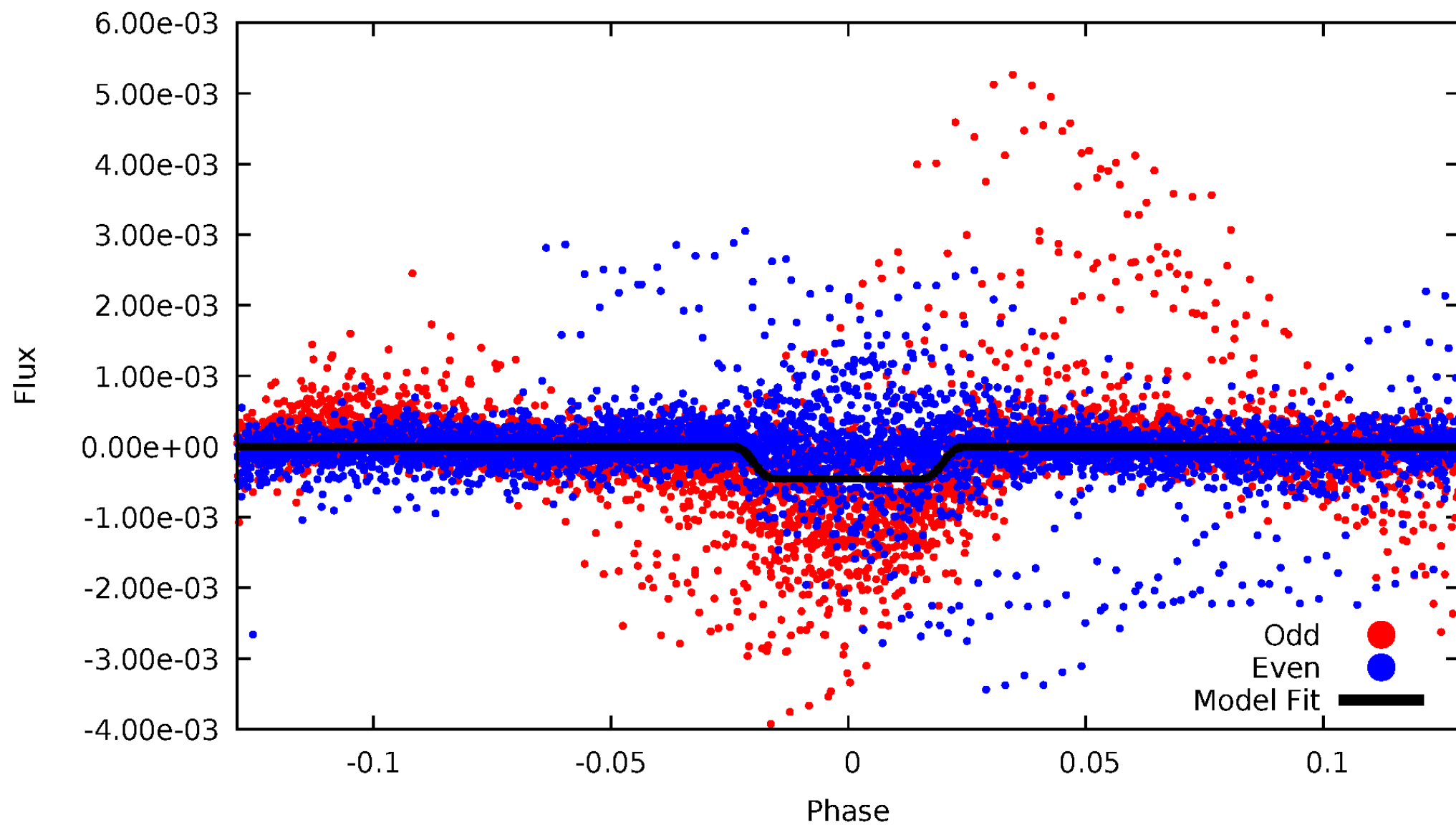
DV Odd/Even

TCE 004074640-03



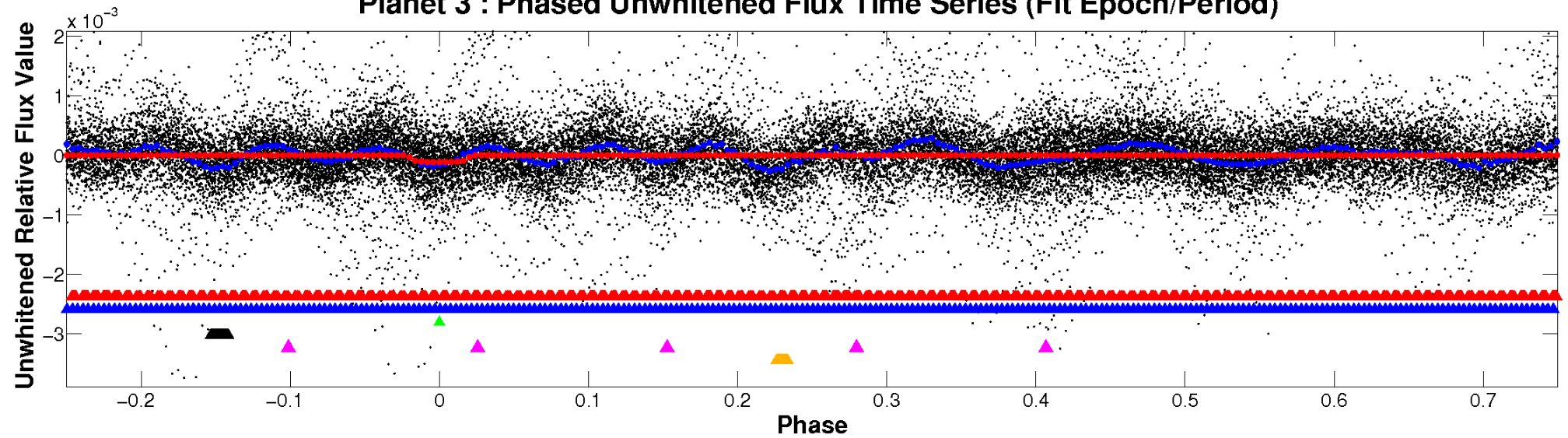
ALT Odd/Even

TCE 004074640-03

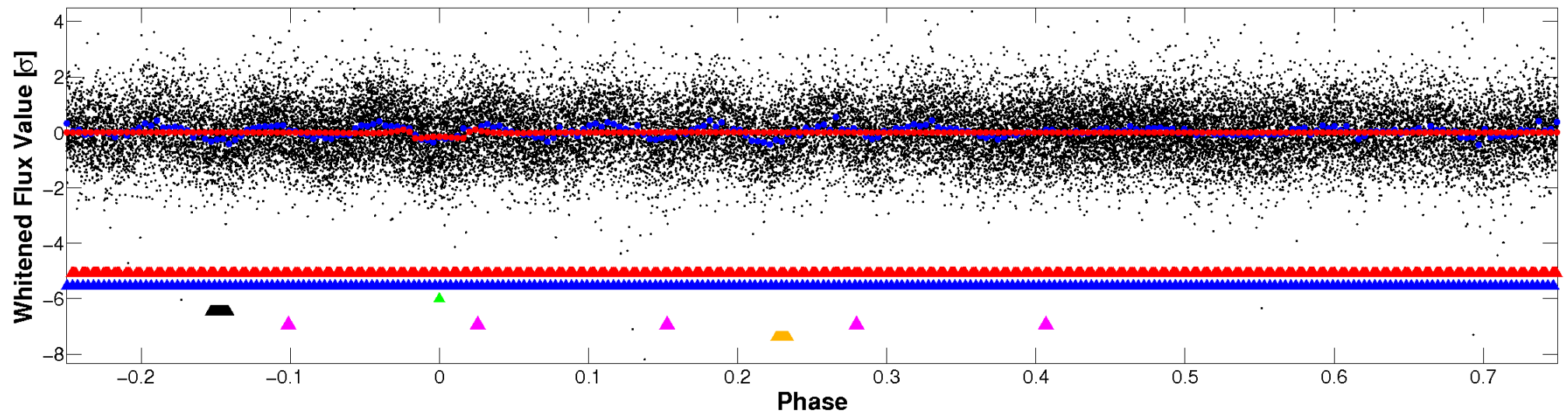


Non-Whitened Vs. Whitened Light Curve

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

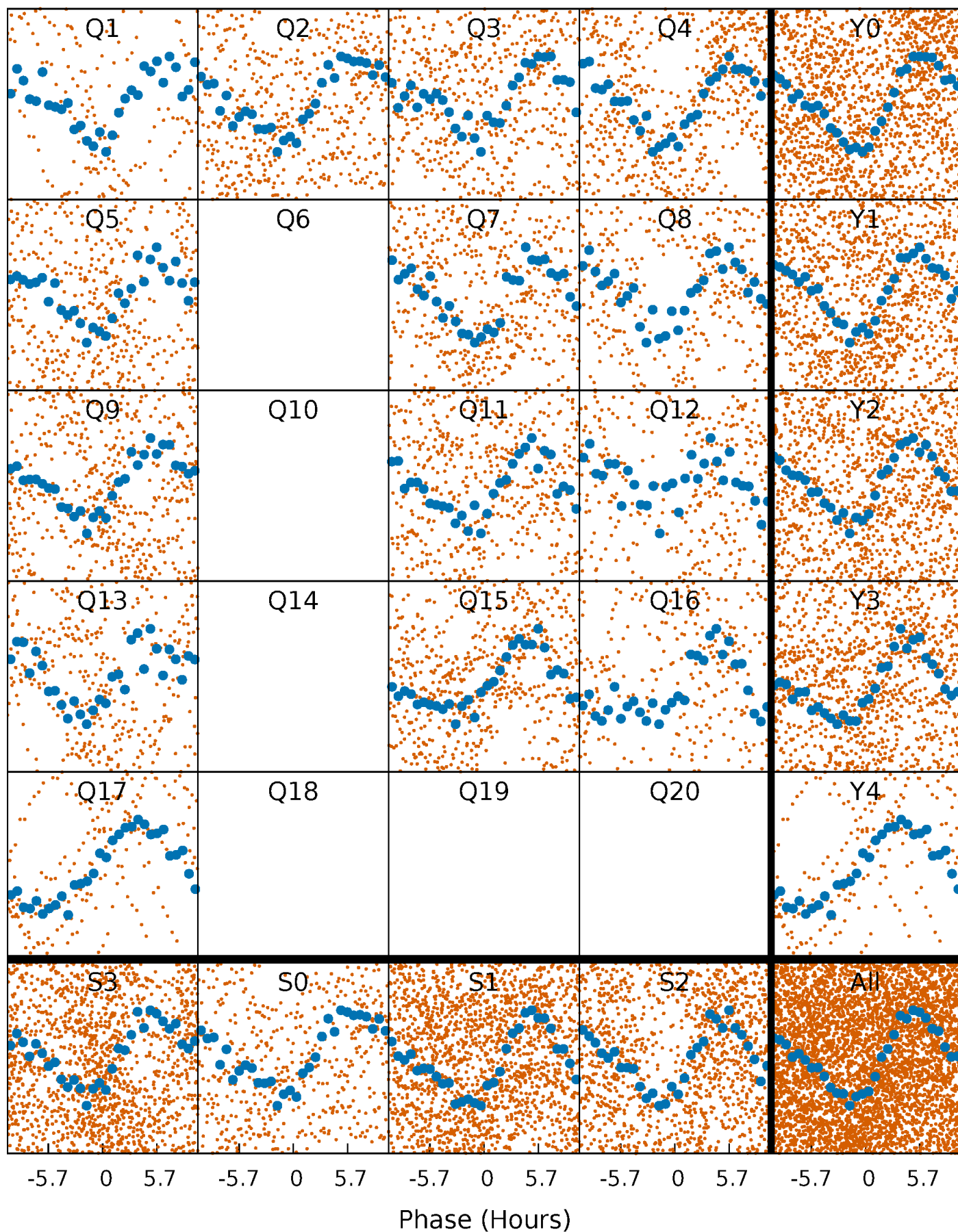


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



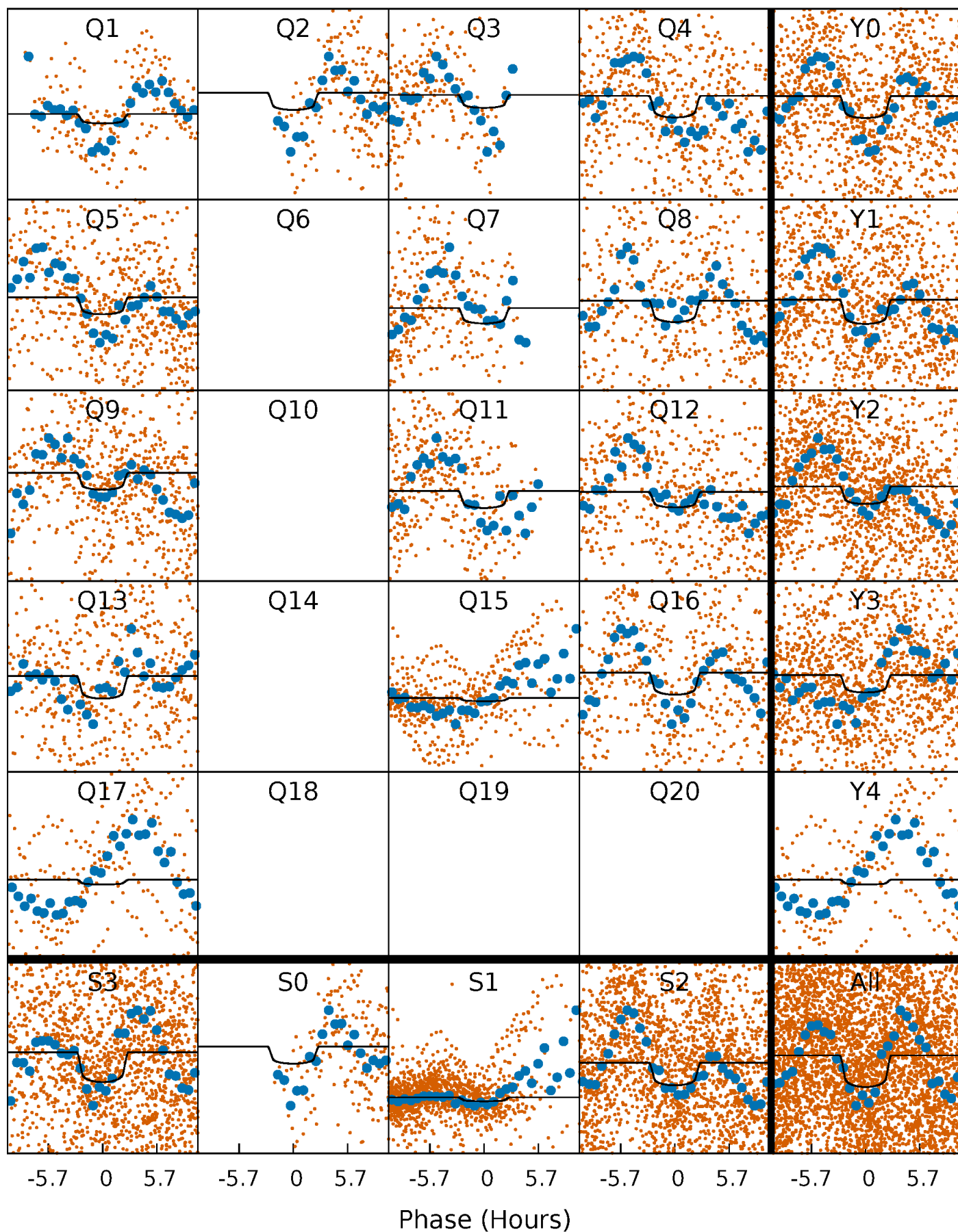
PDC Quarter-Phased Transit Curves

TCE 004074640-03 P= 5.072026 Days $T_0=134.587971$ (BKJD)



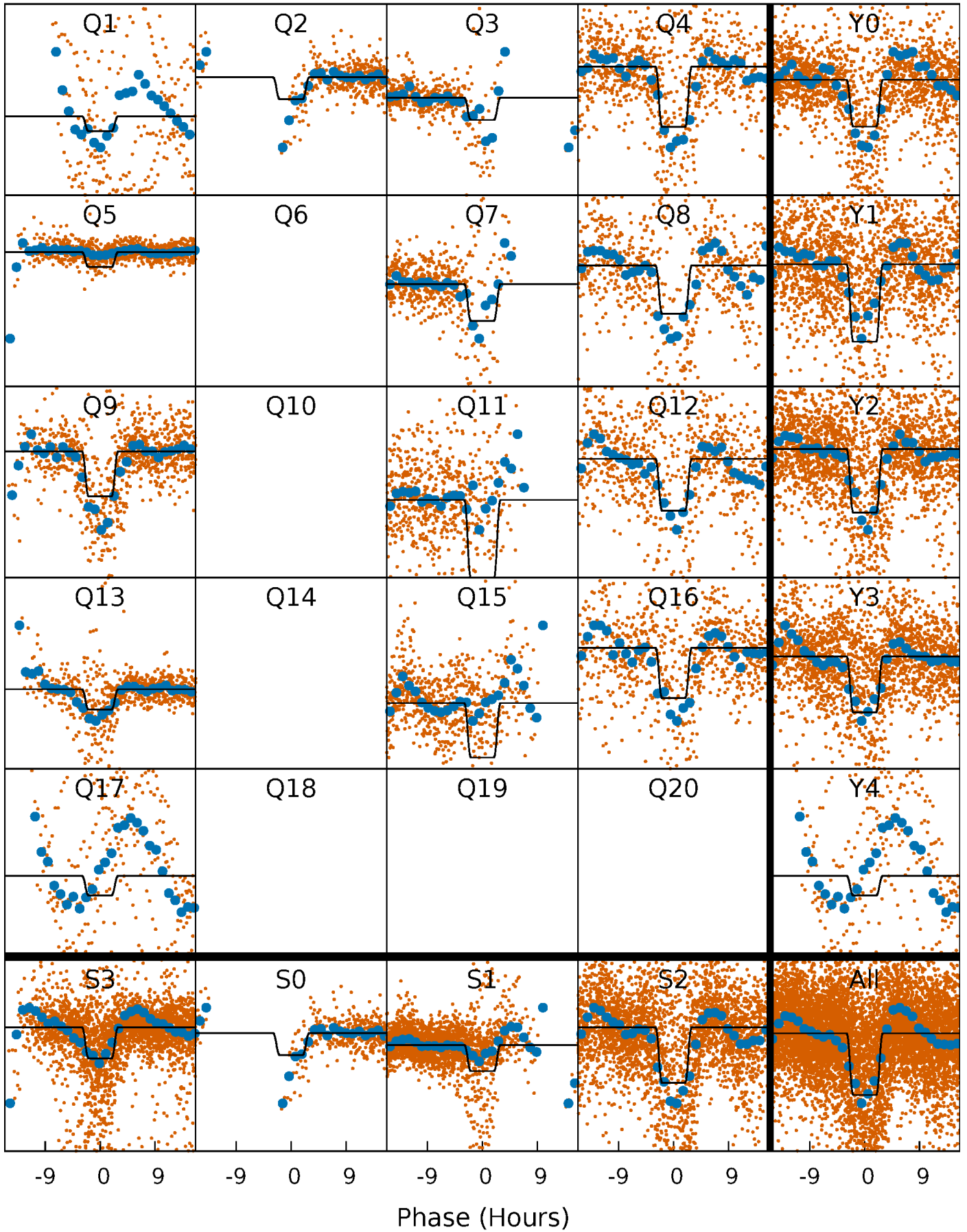
DV Quarter-Phased Transit Curves

TCE 004074640-03 P= 5.072026 Days $T_0=134.587971$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

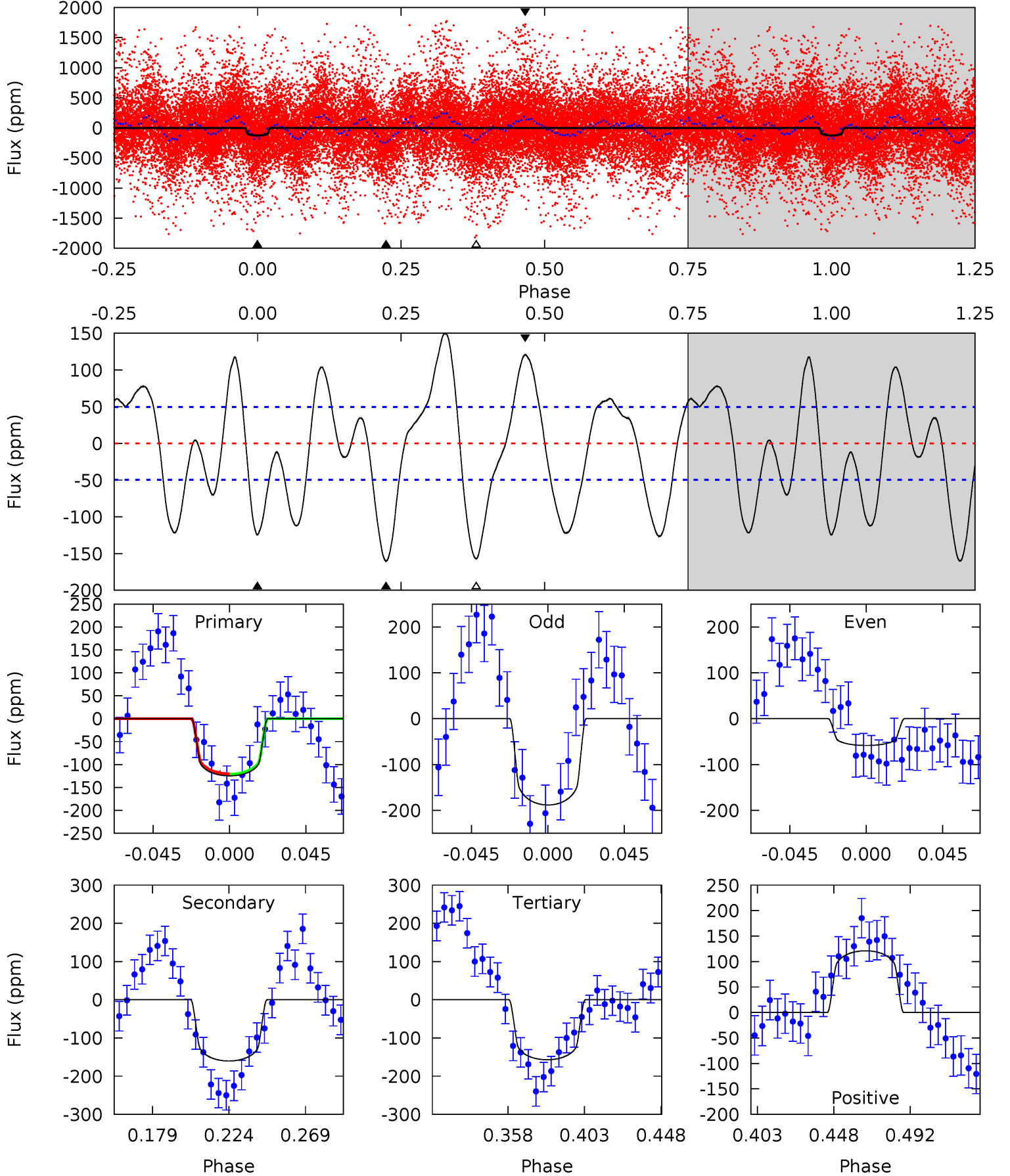
TCE 004074640-03 P= 5.071884 Days $T_0=134.573417$ (BKJD)



DV Model-Shift Uniqueness Test

004074640-03, P = 5.072026 Days, E = 129.515945 Days

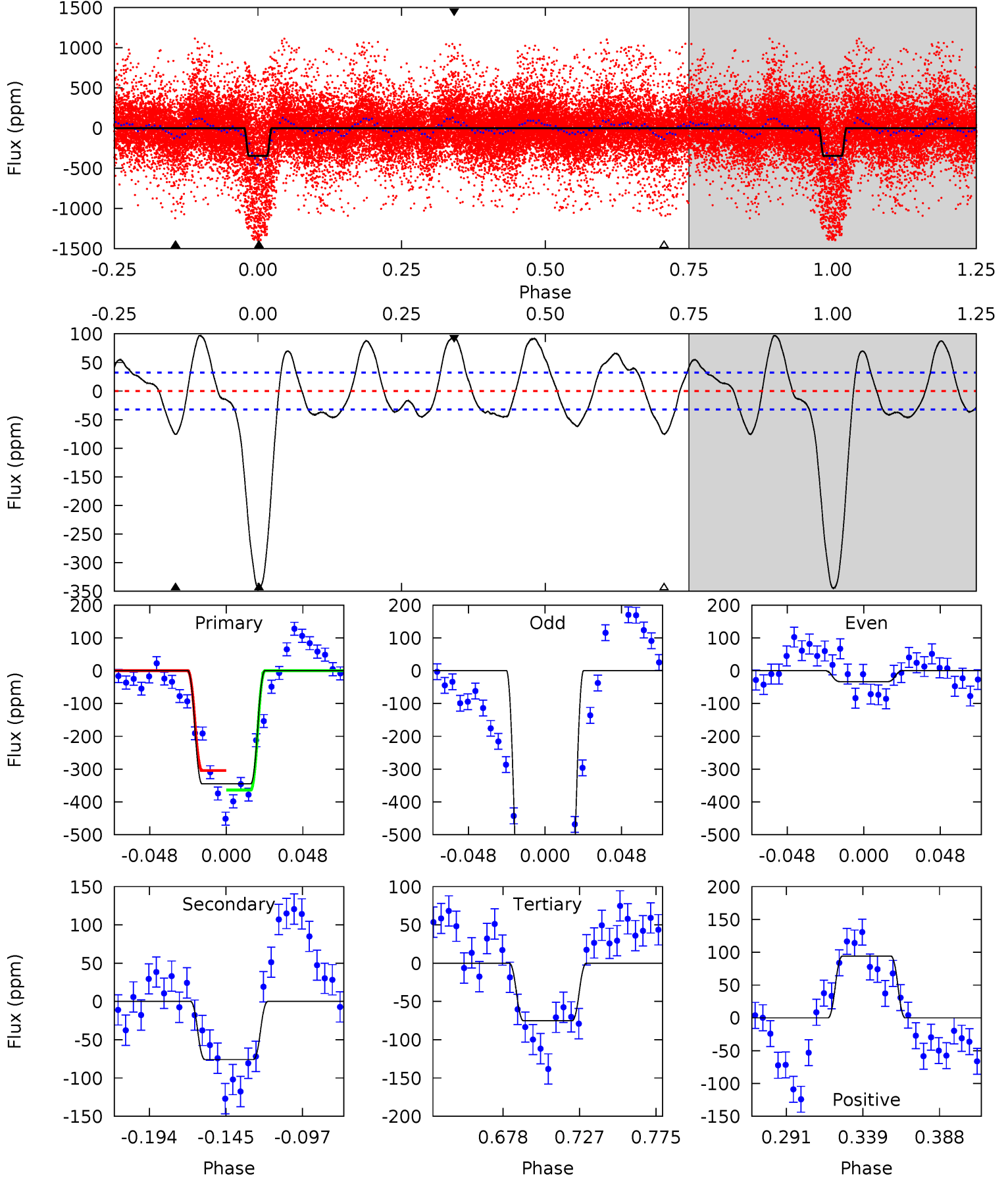
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	15.3	15.0	11.6	4.73	2.01	7.20	-3.08	0.35	0.31	3.73	6.22	1.52	0.48	0.05



Alt Model-Shift Uniqueness Test

004074640-03, P = 5.071884 Days, E = 129.501533 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
50.4	11.1	11.0	13.7	4.71	1.97	6.70	39.4	36.6	0.09	-2.65	53.8	1.54	0.22	0



Stellar Parameters For KIC 004074640

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6651^{+159}_{-218}	$4.379^{+0.067}_{-0.202}$	$-0.220^{+0.250}_{-0.300}$	$1.164^{+0.387}_{-0.129}$	$1.187^{+0.182}_{-0.165}$	$1.061^{+0.293}_{-0.547}$
	+2%/-3%	+2%/-5%	+114%/-136%	+33%/-11%	+15%/-14%	+28%/-52%
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 004074640-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-160 ± 10	$1.49^{+0.45}_{-0.44}$	1823^{+130}_{-102}	7086^{+1557}_{-874}	149^{+144}_{-63}
Alt.	-76 ± 7	$2.81^{+0.54}_{-0.51}$	1813^{+143}_{-86}	4439^{+260}_{-260}	20^{+8}_{-6}

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 $A_{obs} \gg 1.0$

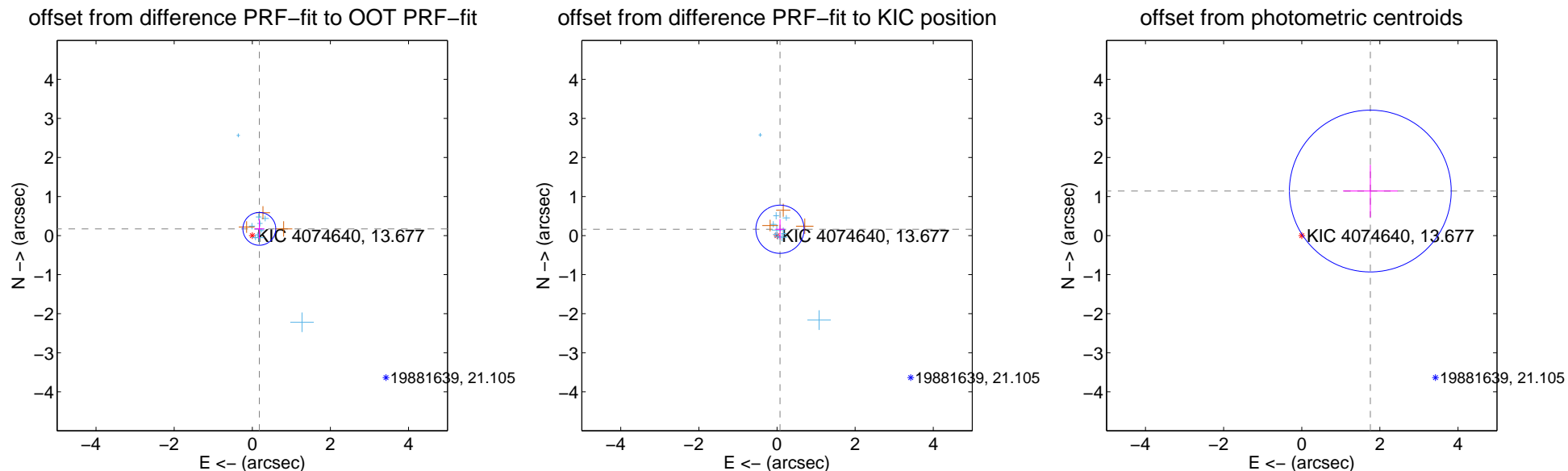
DV Centroid Data

Supplemental centroid analysis for 004074640-03. Kepler magnitude: 13.68. Transit SNR 7.21

There are 11 quarters with good PRF difference image offsets

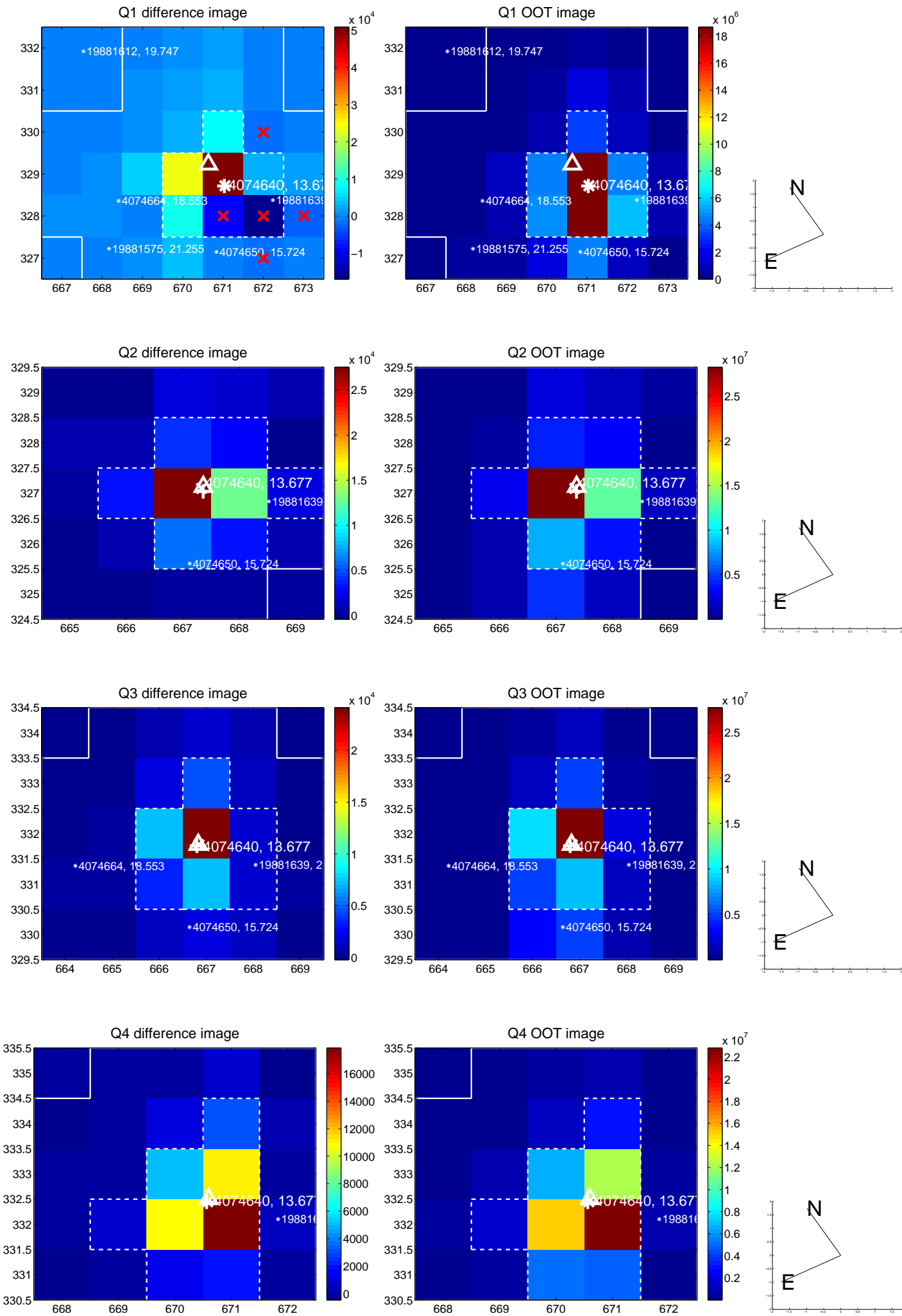
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.249 ± 0.140	1.78	-0.180 ± 0.123	0.172 ± 0.258
PRF-fit source offset from KIC position	0.179 ± 0.206	0.87	-0.076 ± 0.118	0.162 ± 0.257
photometric centroid source offset	2.09 ± 0.69	3.03	-1.75 ± 0.70	1.14 ± 0.67

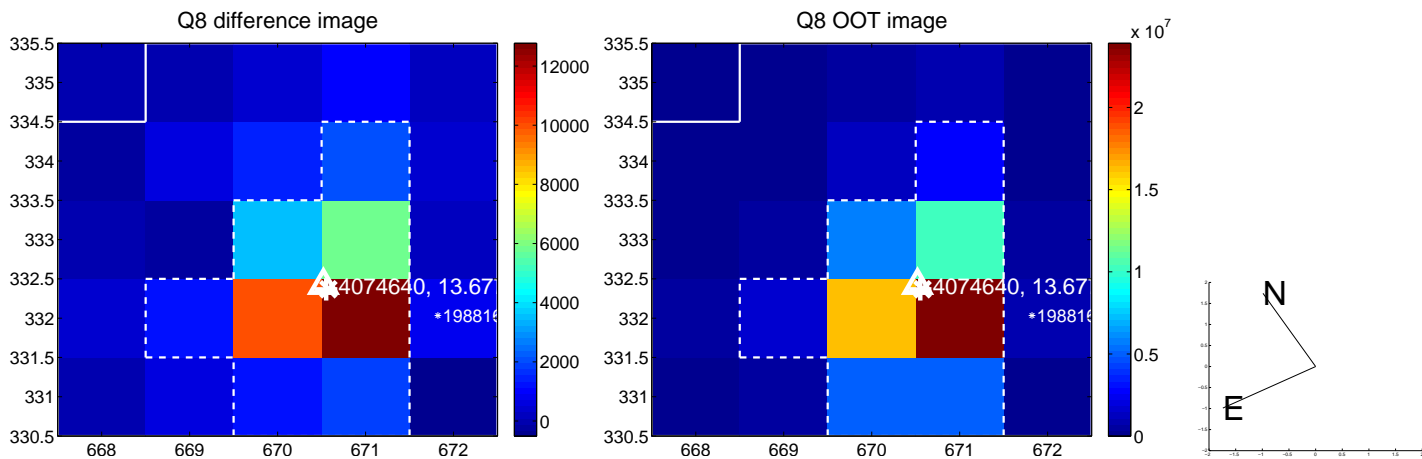
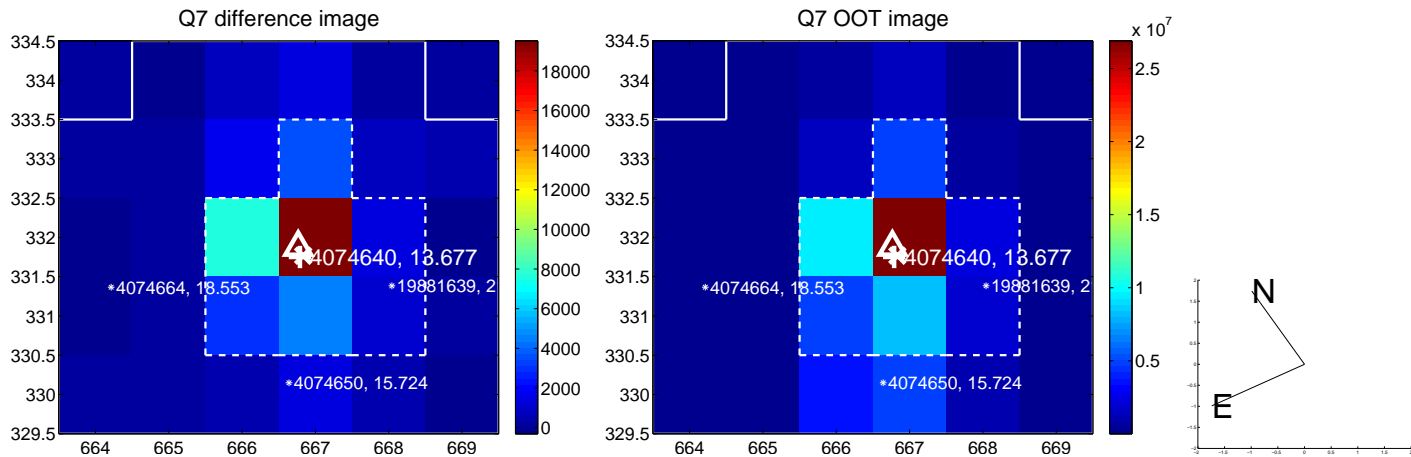
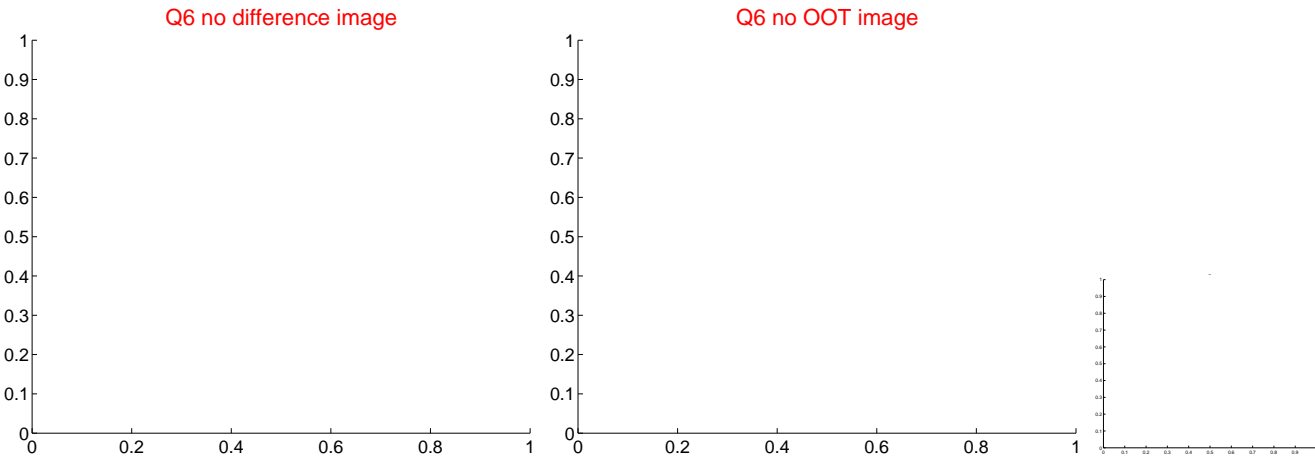
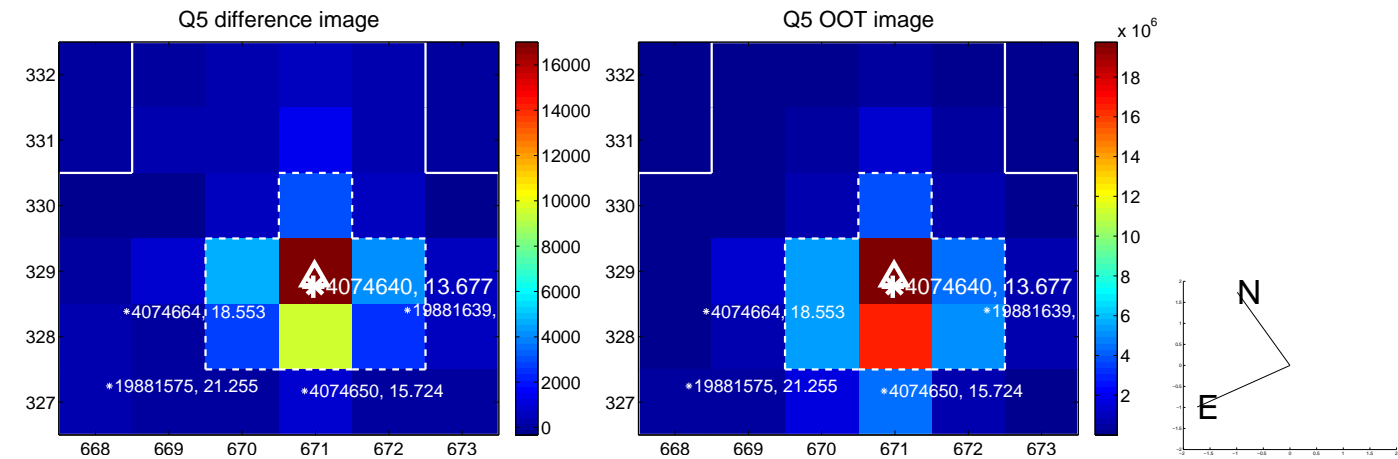


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

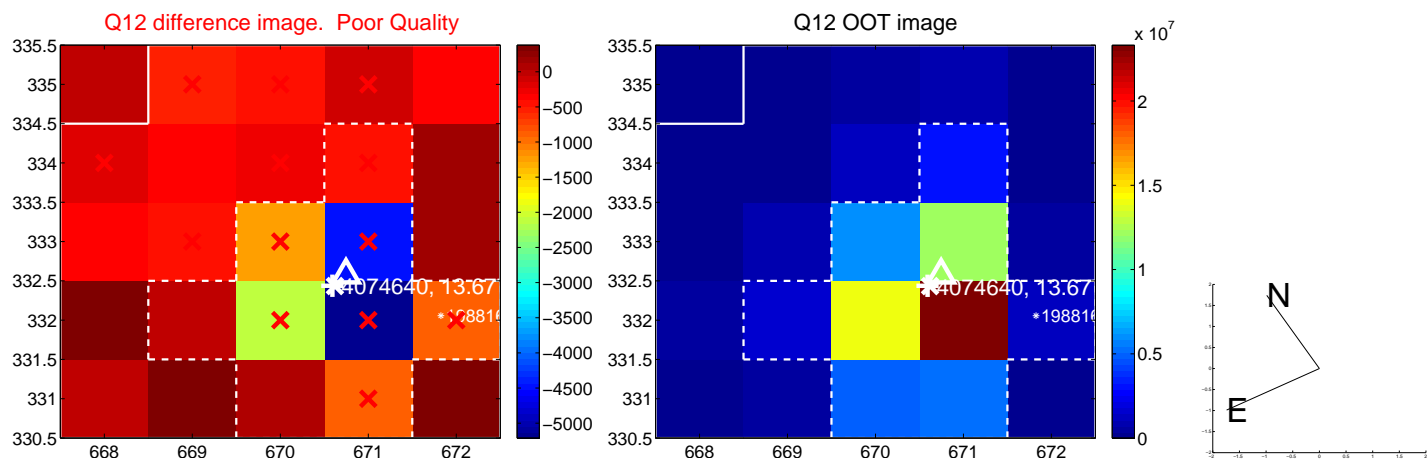
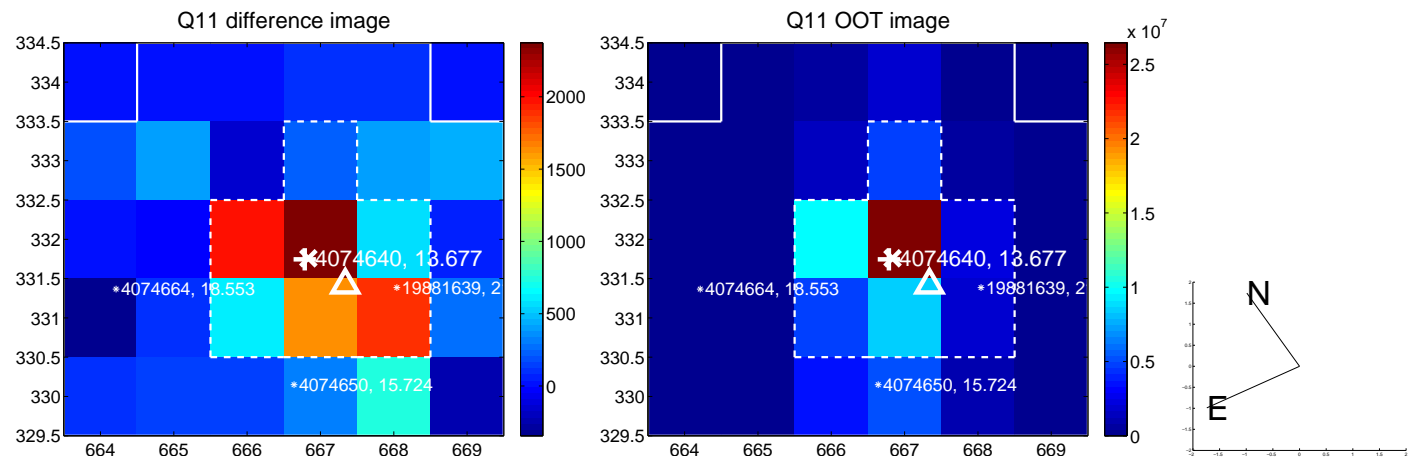
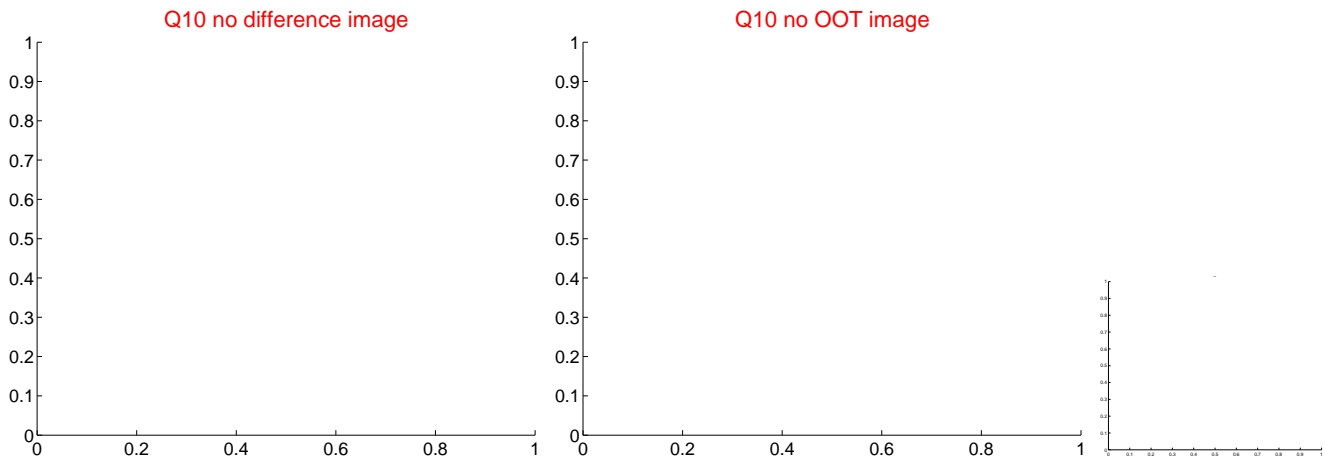
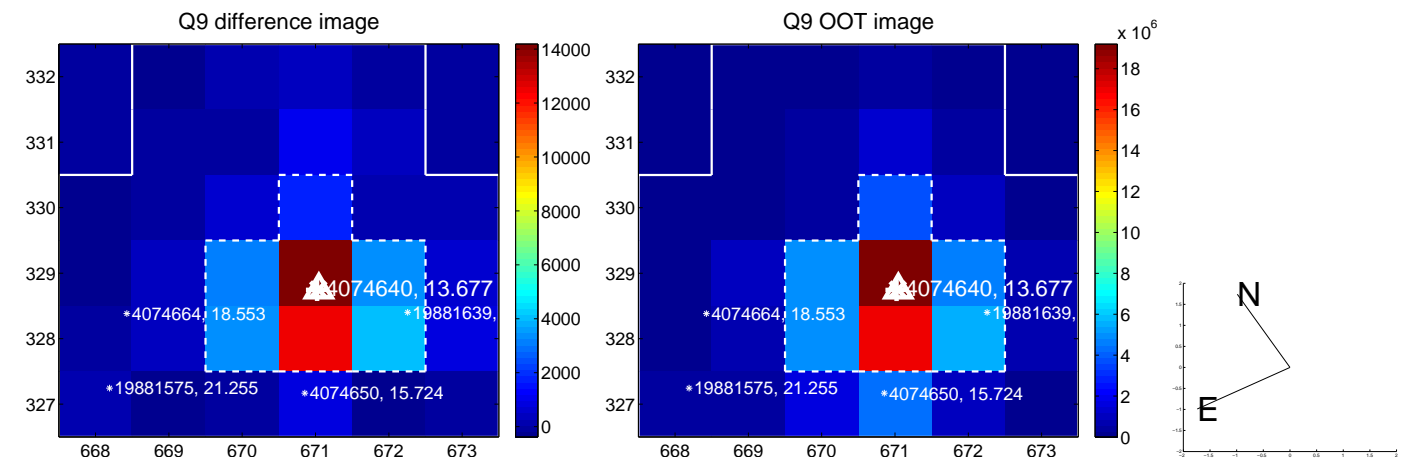
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



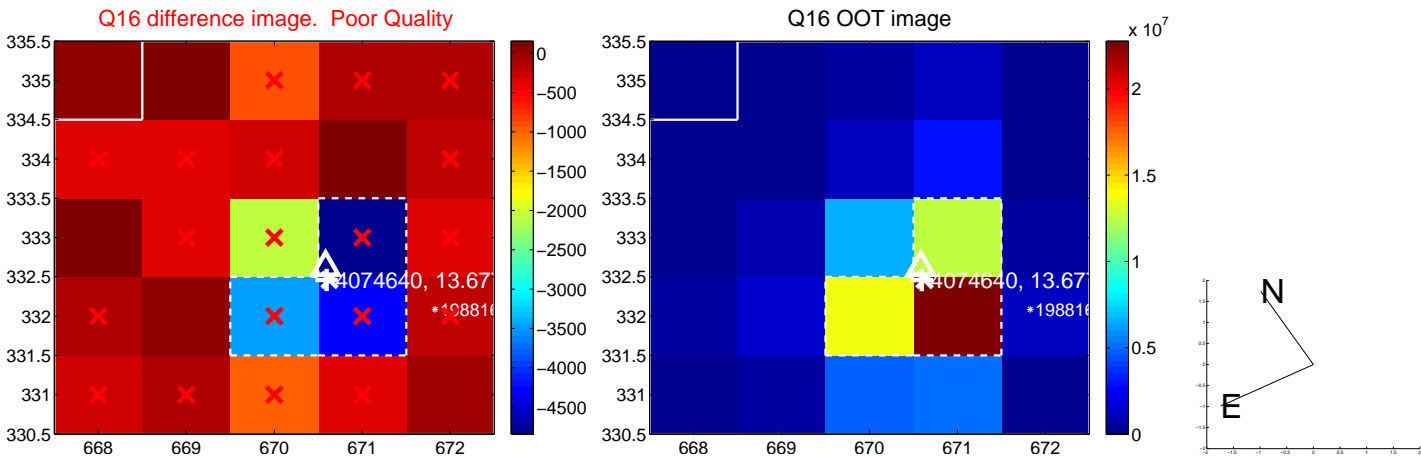
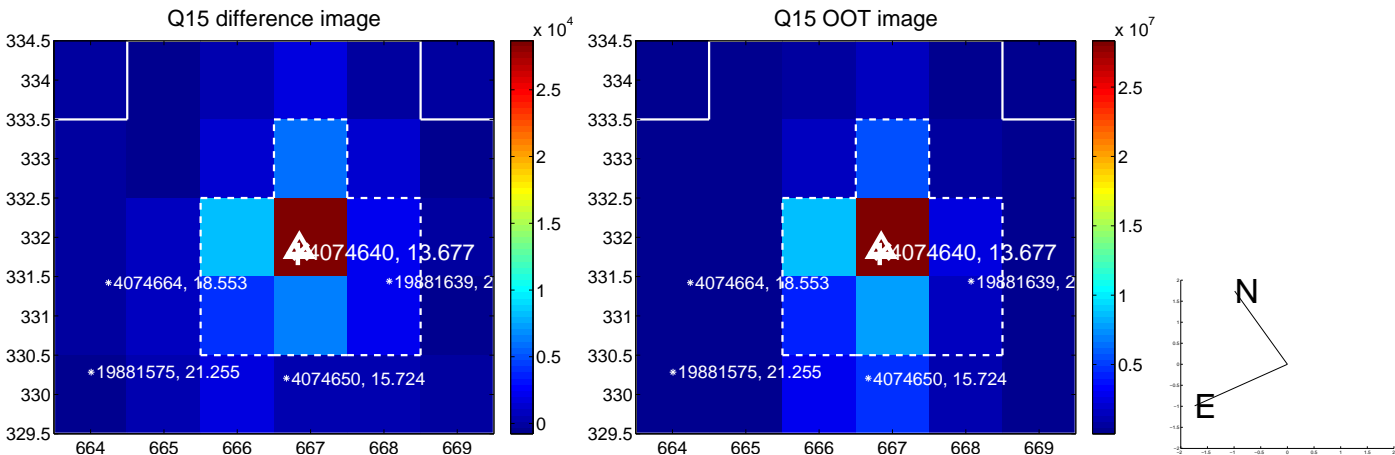
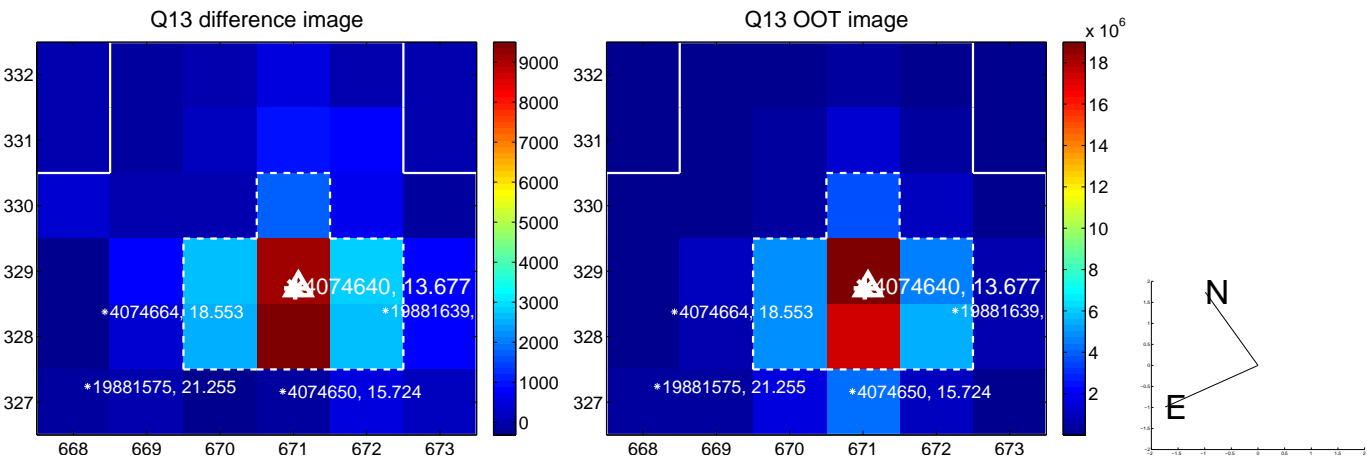
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



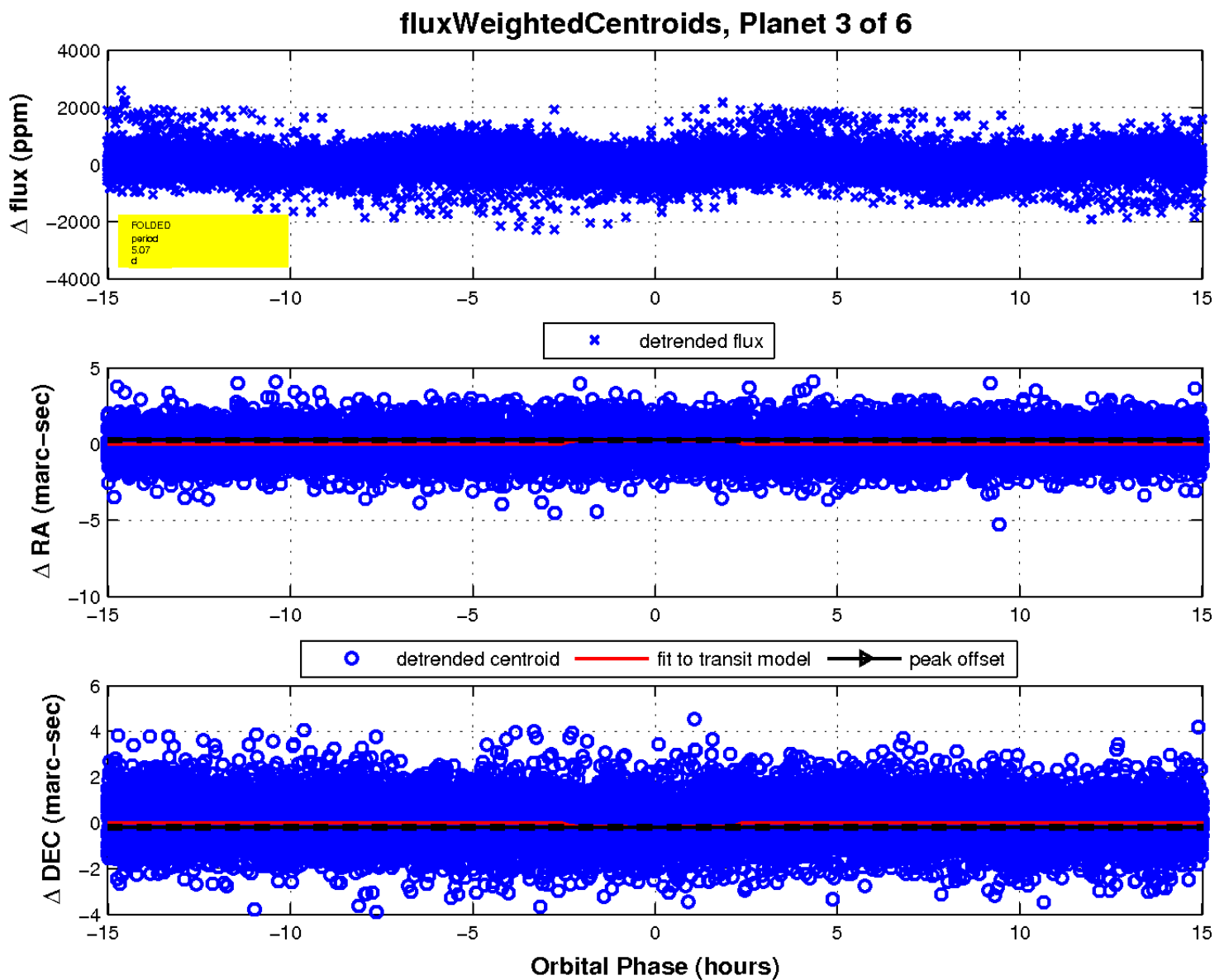
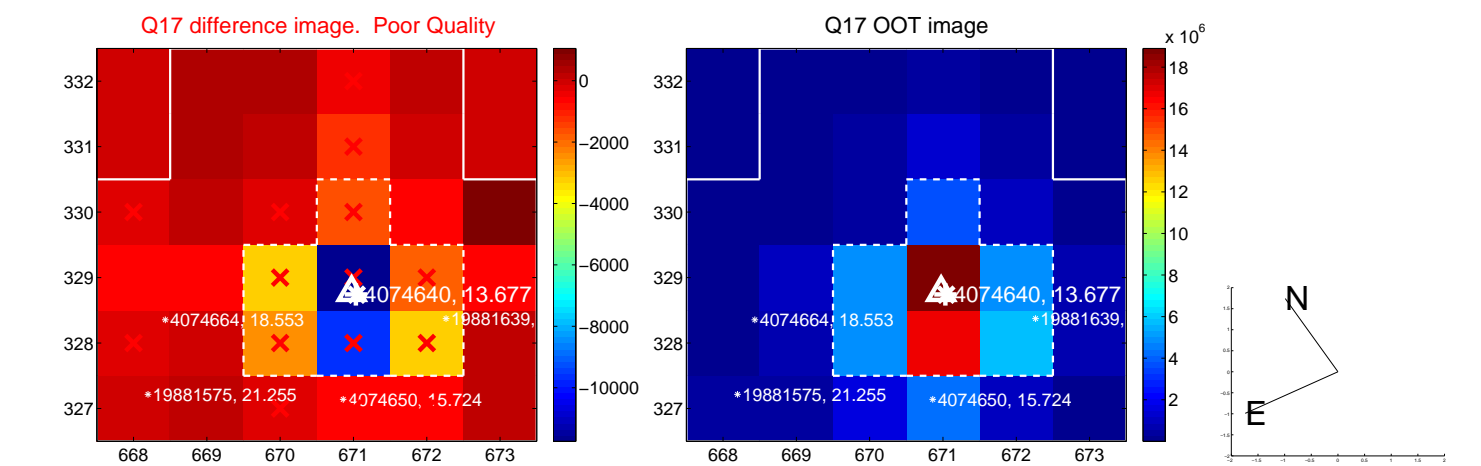
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



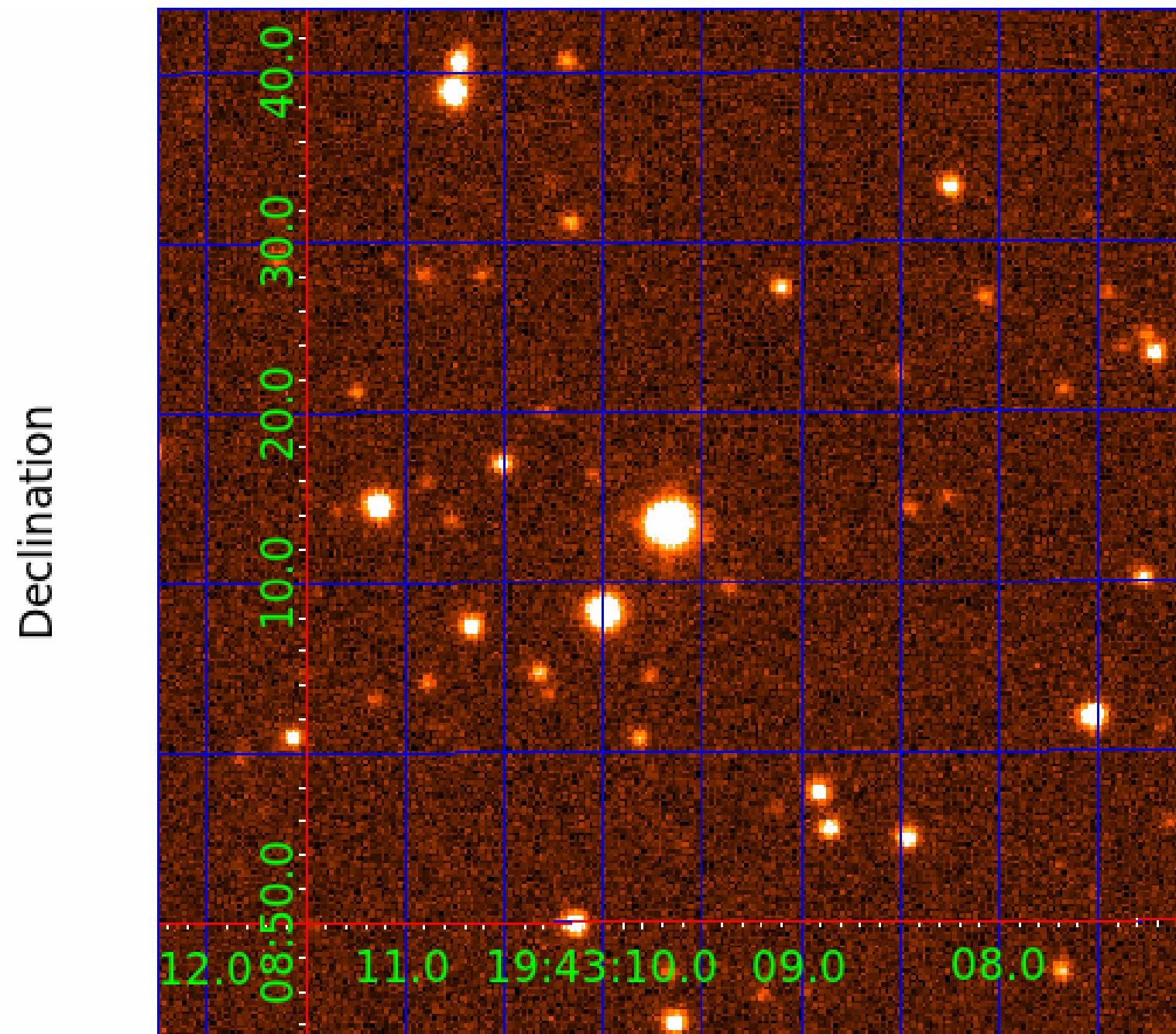
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 004074640

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})
004074640-01	OBS	No	2.553966	133.392161	47.2	2.744	9.7	4.4	1.16	6651	0.92	1587.78
004074640-02	OBS	No	2.553867	133.752622	66.3	7.590	9.8	6.8	1.16	6651	1.10	1587.86
004074640-03	OBS	No	5.072026	134.587970	114.5	5.006	7.8	7.2	1.16	6651	1.43	636.07
004074640-04	OBS	No	5.071818	133.870150	114.2	6.169	7.4	6.4	1.16	6651	1.45	636.10
004074640-05	OBS	No	279.605531	271.019287	886.8	7.151	7.7	7.3	1.16	6651	4.04	3.03
004074640-06	OBS	No	5.072165	135.733937	116.6	6.038	7.5	6.5	1.16	6651	1.48	636.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004074640-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004074640-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
004074640-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT
004074640-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
004074640-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004074640-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD

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

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

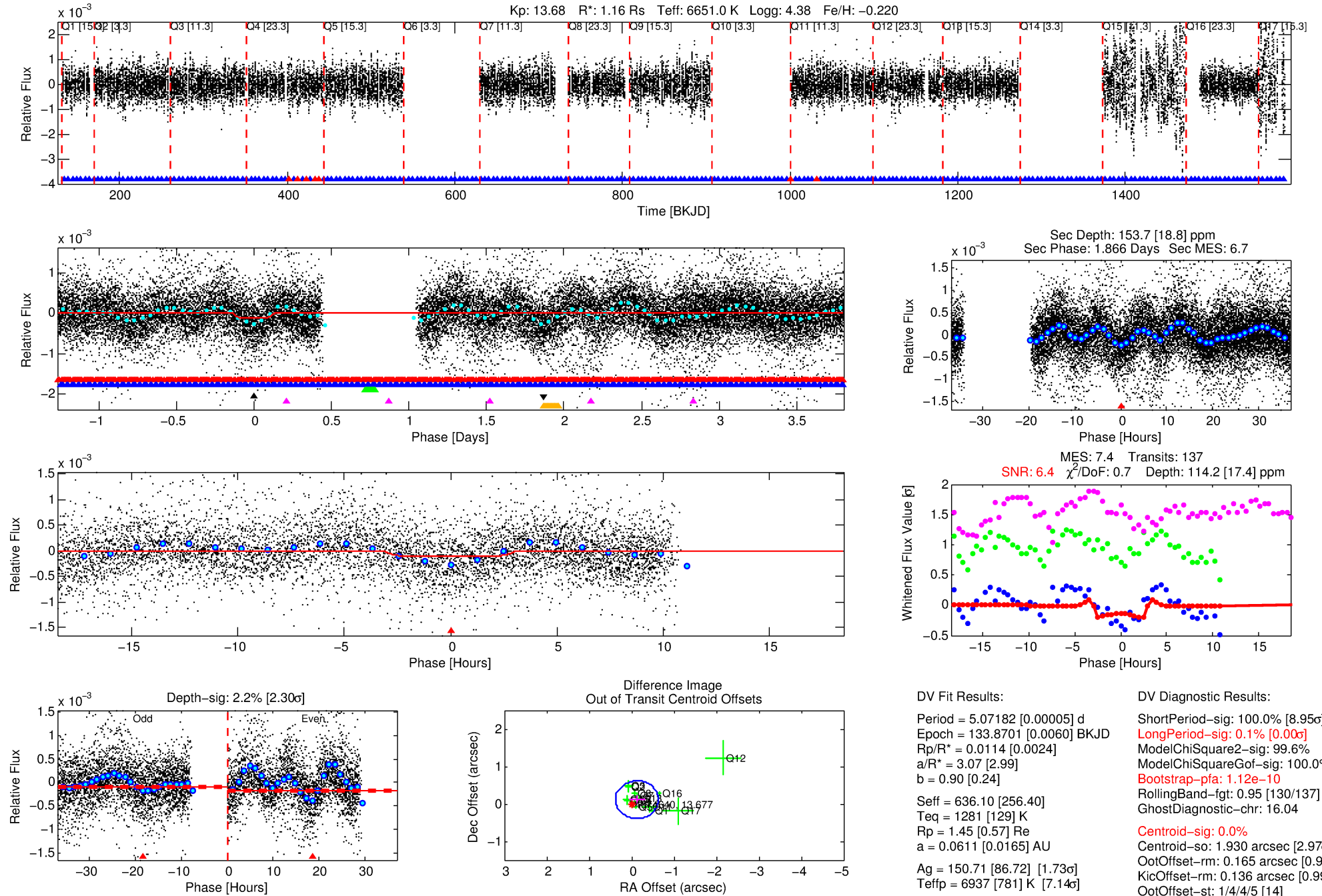
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004074640-04

No Significant Match Found

DV One-Page Summary

KIC: 4074640 Candidate: 4 of 6 Period: 5.072 d



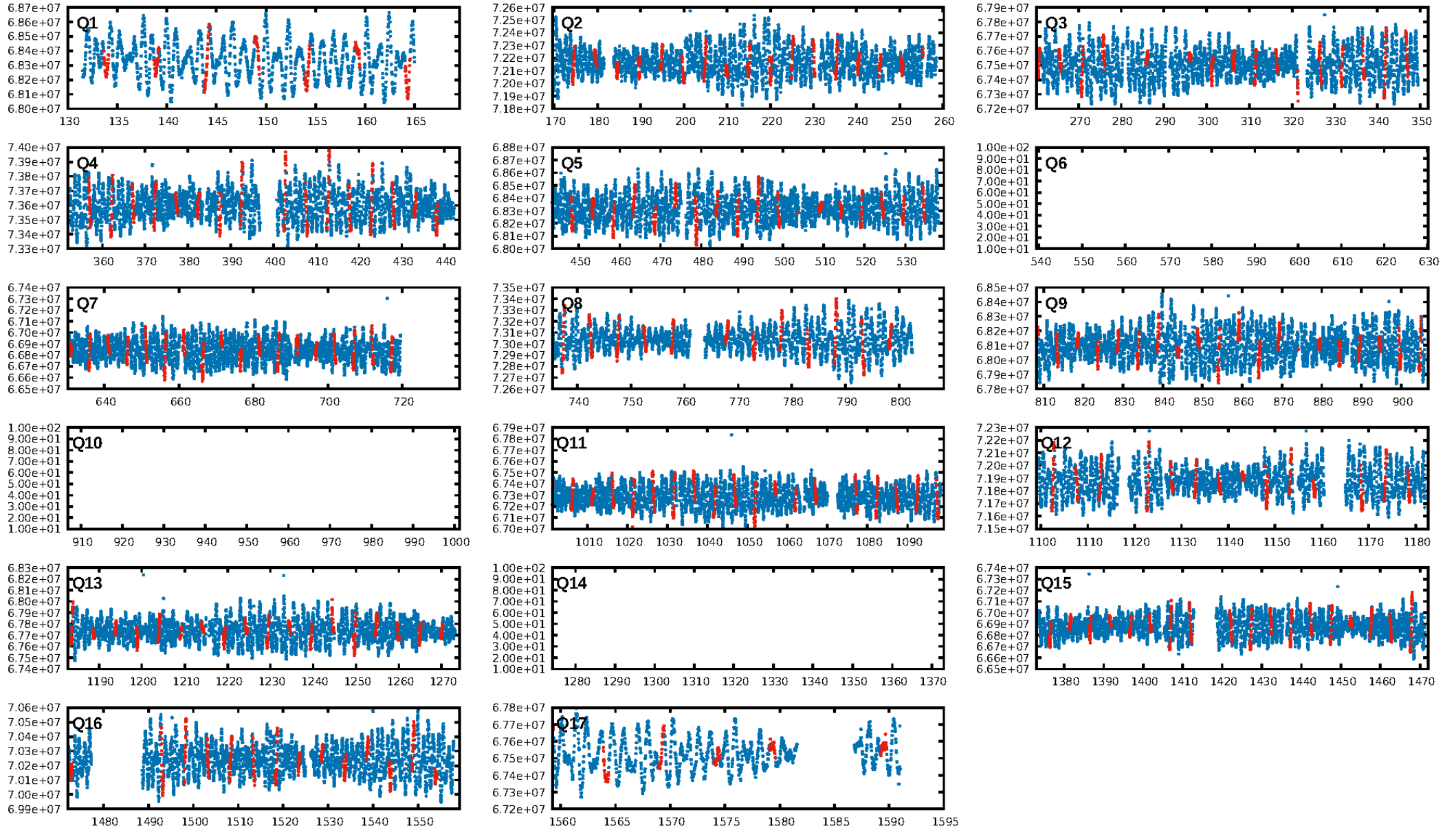
DV Fit Results:

Period = 5.07182 [0.00005] d
Epoch = 133.8701 [0.0060] BKJD
Rp/R* = 0.0114 [0.0024]
a/R* = 3.07 [2.99]
b = 0.90 [0.24]
Seff = 636.10 [256.40]
Teq = 1281 [129] K
Rp = 1.45 [0.57] Re
a = 0.0611 [0.0165] AU
Ag = 150.71 [86.72] [1.73 σ]
Teffp = 6937 [781] K [7.14 σ]

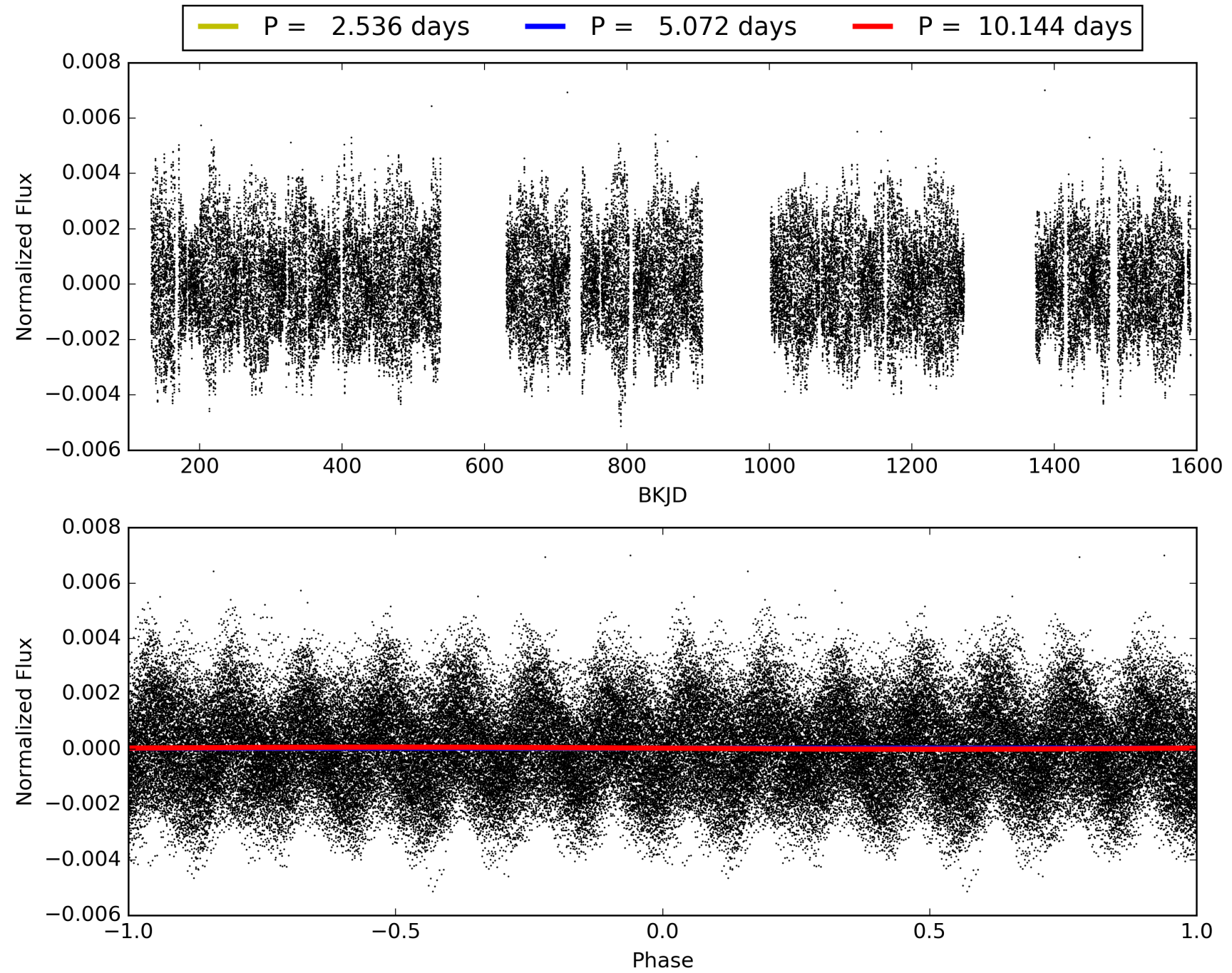
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.95 σ]
LongPeriod-sig: 0.1% [0.00 σ]
ModelChiSquare2-sig: 99.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.12e-10
RollingBand-fgt: 0.95 [130/137]
GhostDiagnostic-chr: 16.04
Centroid-sig: 0.0%
Centroid-so: 1.930 arcsec [2.97 σ]
OotOffset-rm: 0.165 arcsec [0.98 σ]
KicOffset-rm: 0.136 arcsec [0.99 σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 0.57 [8/14]

TCE 004074640-04, PDC Light Curves

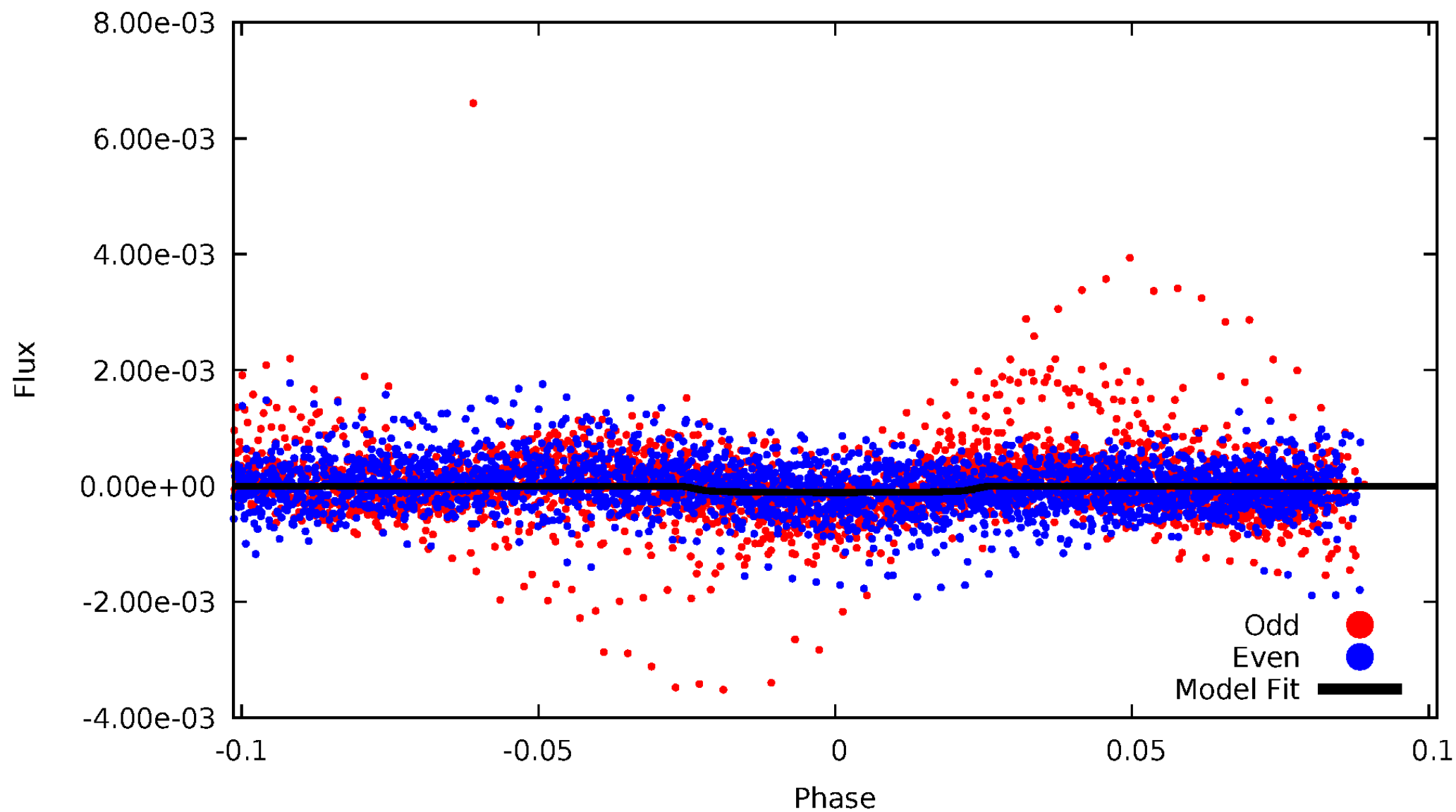


TCE 004074640-04



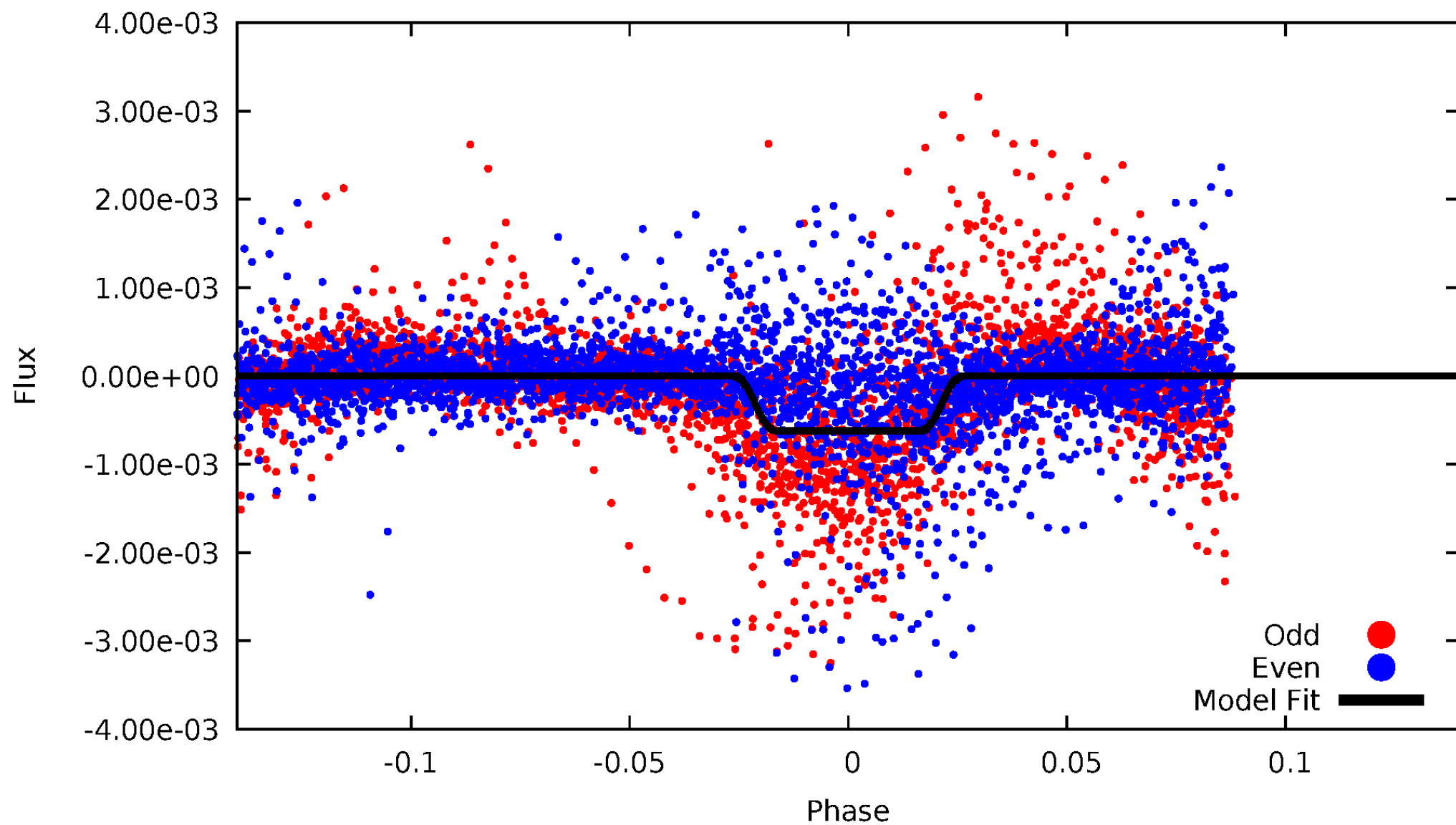
DV Odd/Even

TCE 004074640-04



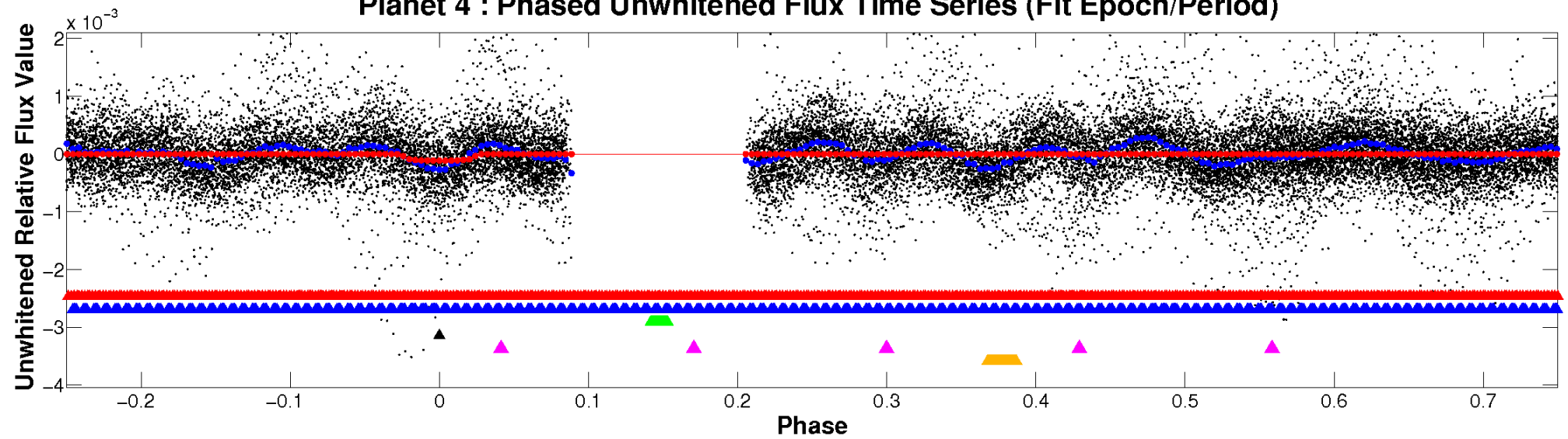
ALT Odd/Even

TCE 004074640-04

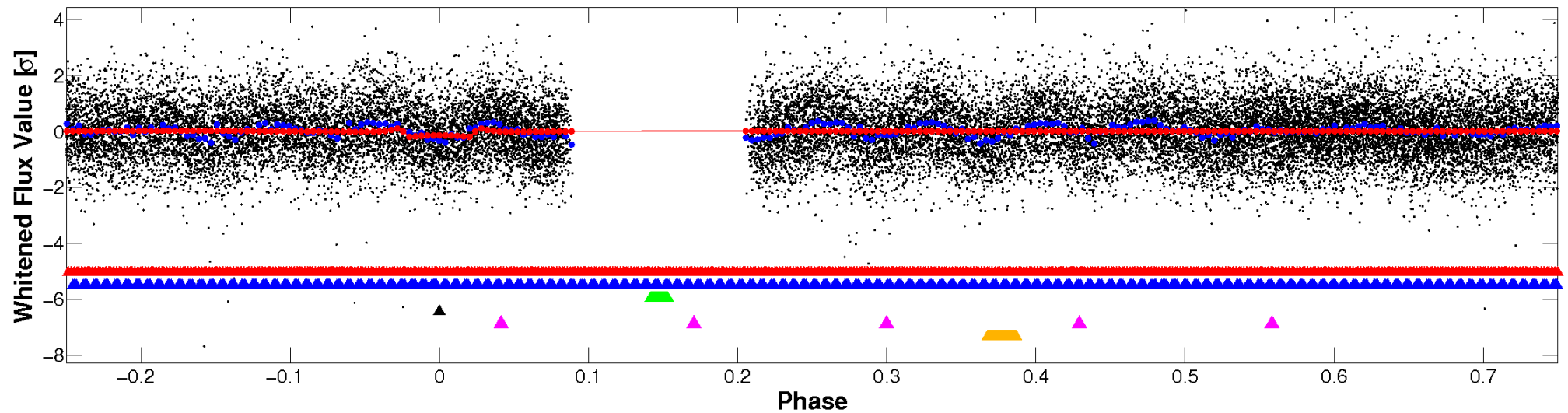


Non-Whitened Vs. Whitened Light Curve

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

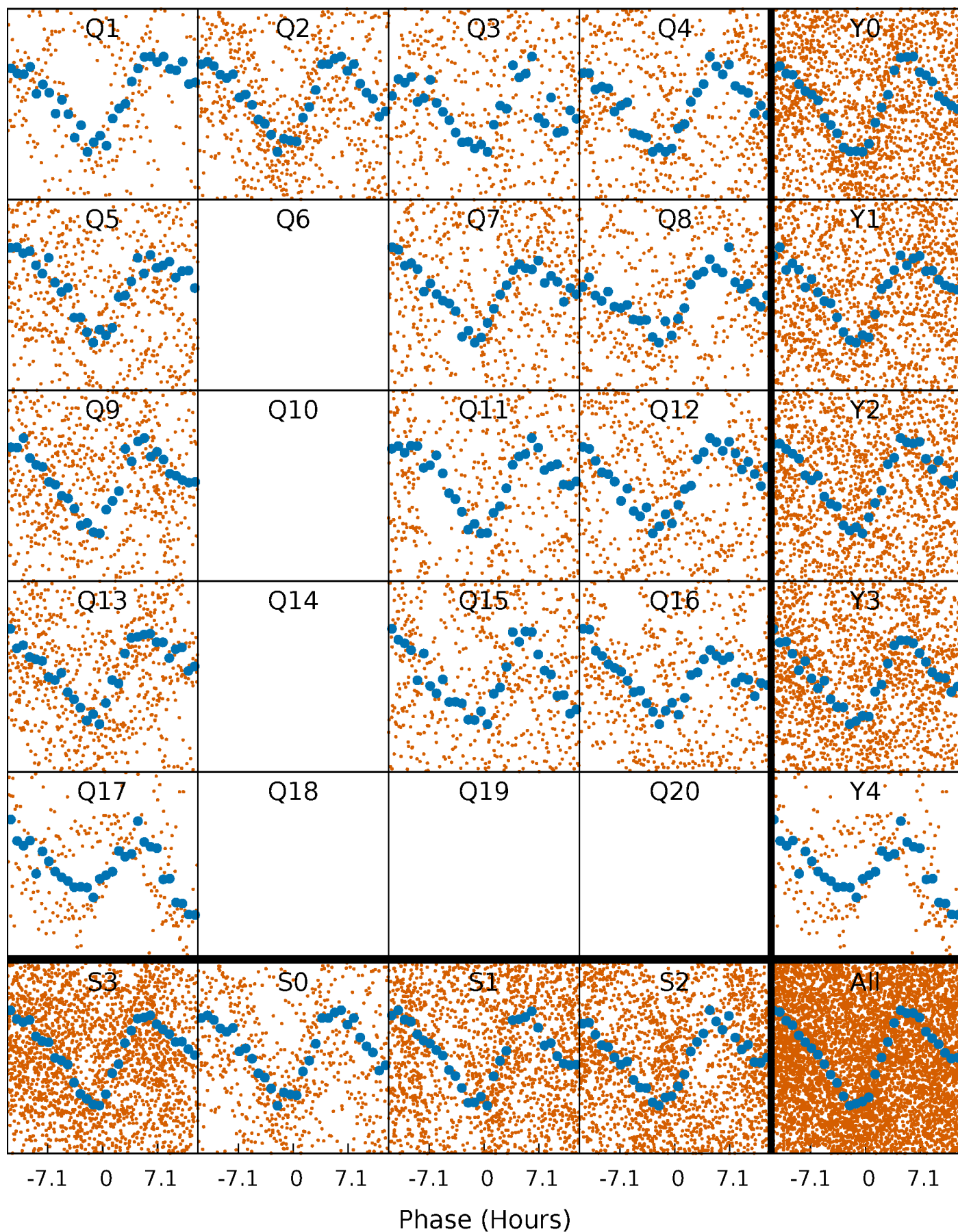


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



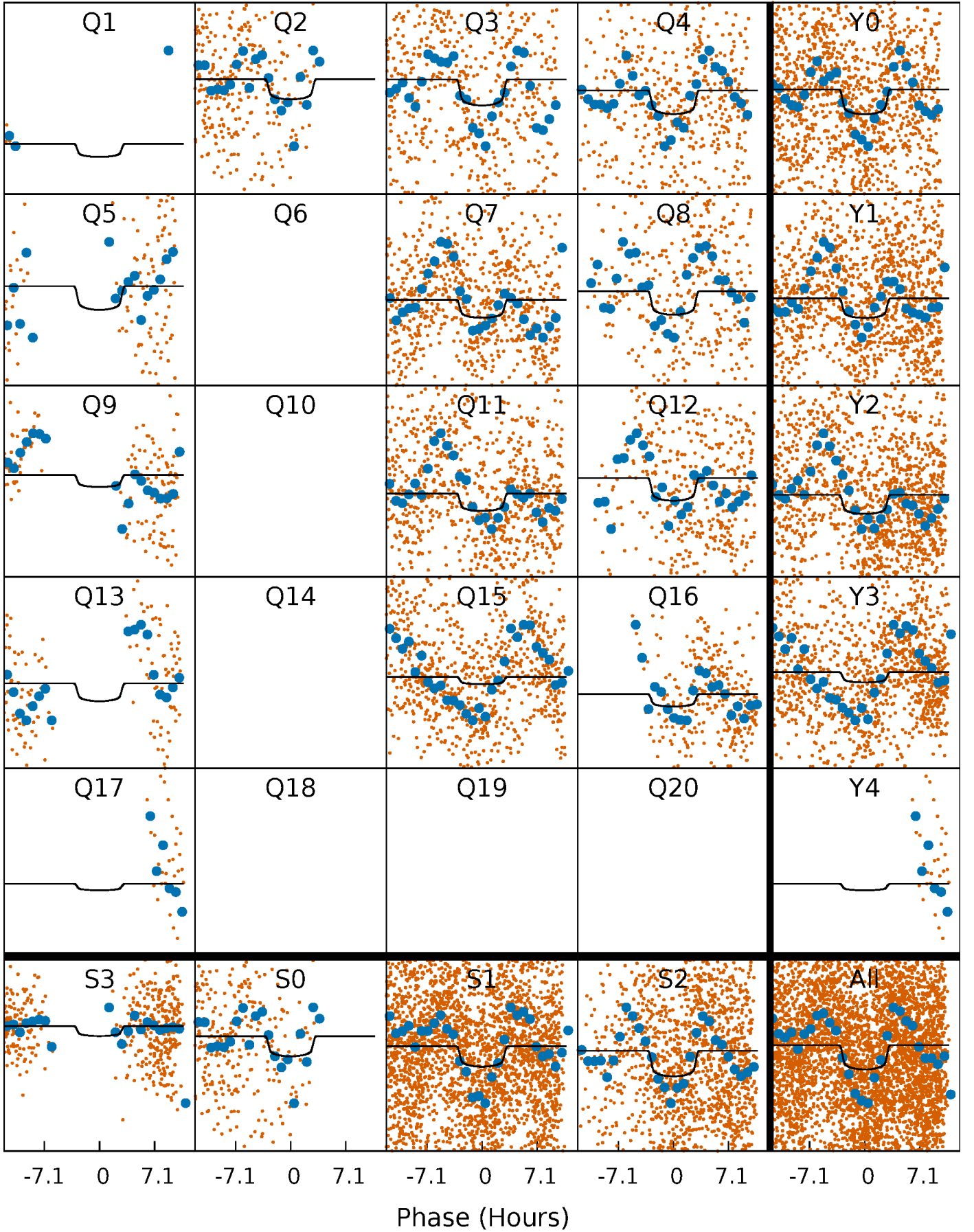
PDC Quarter-Phased Transit Curves

TCE 004074640-04 P= 5.071818 Days $T_0=133.870150$ (BKJD)



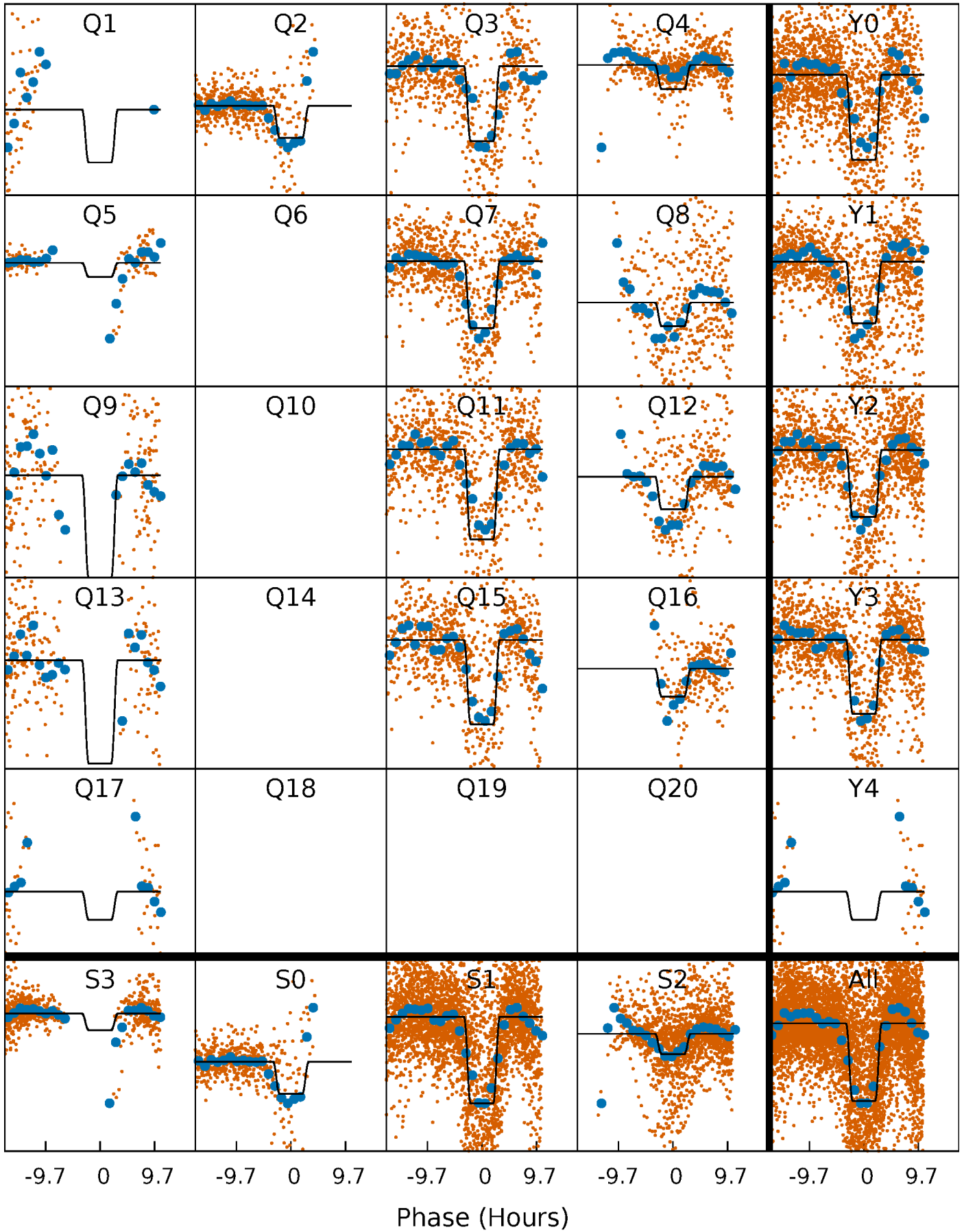
DV Quarter-Phased Transit Curves

TCE 004074640-04 P= 5.071818 Days $T_0=133.870150$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

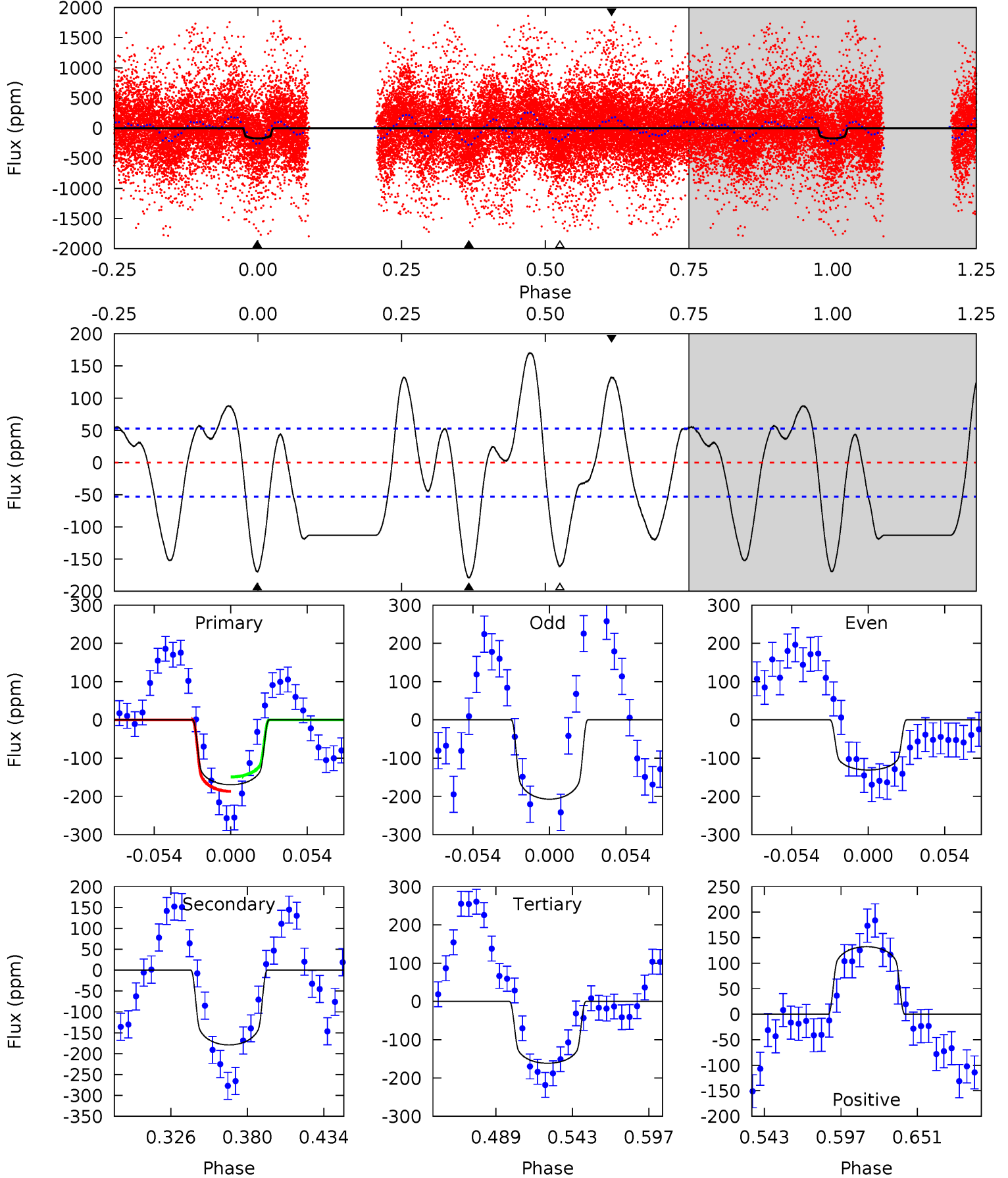
TCE 004074640-04 $P = 5.071973$ Days $T_0 = 133.830144$ (BKJD)



DV Model-Shift Uniqueness Test

004074640-04, P = 5.071818 Days, E = 128.798332 Days

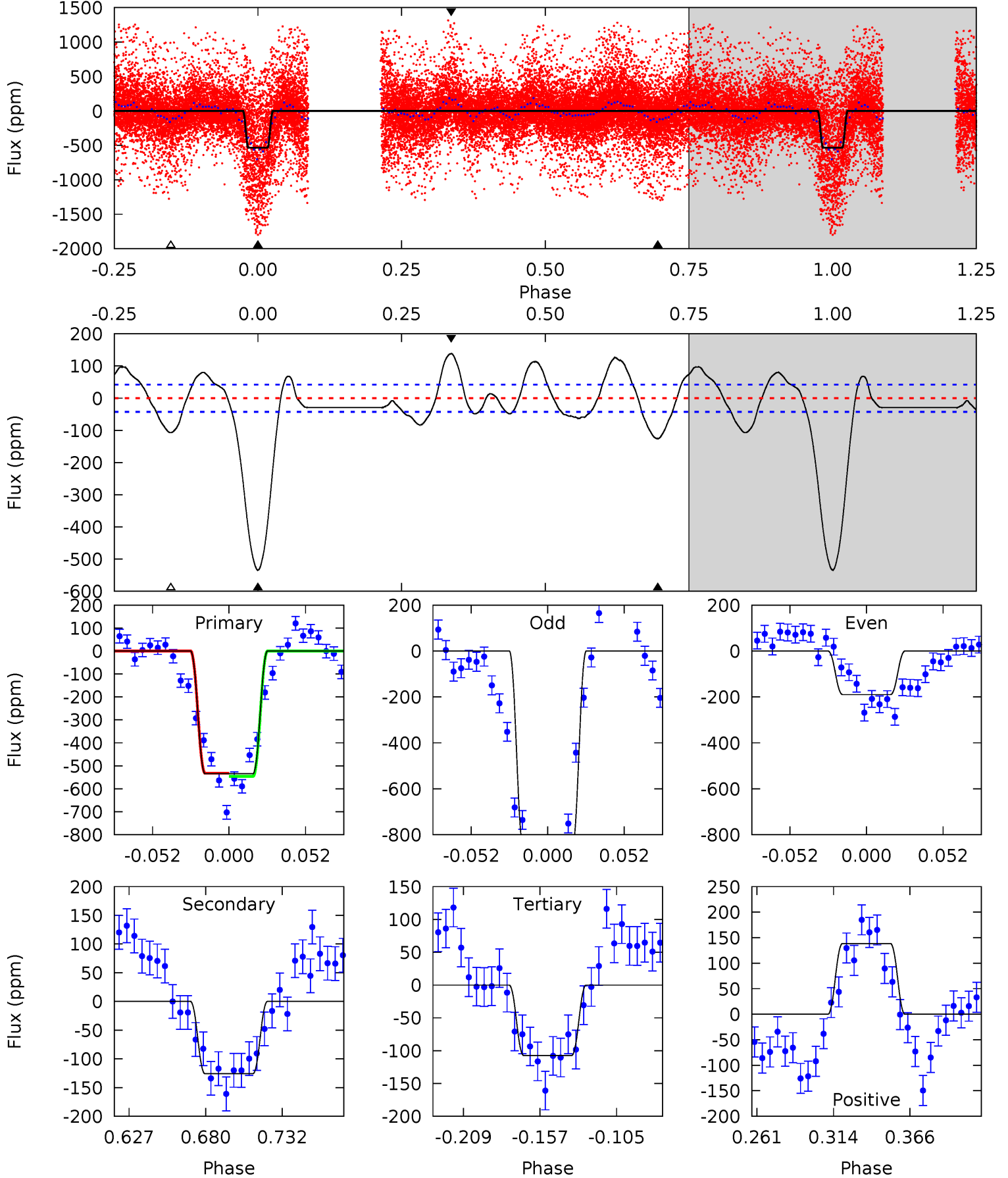
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	15.9	14.3	11.7	4.69	1.92	7.28	0.71	3.29	1.56	4.15	3.36	1.09	0.49	1.68



Alt Model-Shift Uniqueness Test

004074640-04, P = 5.071973 Days, E = 128.758171 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
59.4	14.0	11.9	15.4	4.70	1.94	7.13	47.4	44.0	2.06	-1.41	38.0	1.03	0.21	0.76



Stellar Parameters For KIC 004074640

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6651^{+159}_{-218}	$4.379^{+0.067}_{-0.202}$	$-0.220^{+0.250}_{-0.300}$	$1.164^{+0.387}_{-0.129}$	$1.187^{+0.182}_{-0.165}$	$1.061^{+0.293}_{-0.547}$
	+2%/-3%	+2%/-5%	+114%/-136%	+33%/-11%	+15%/-14%	+28%/-52%
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 004074640-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-179 ± 11	$1.51^{+0.42}_{-0.33}$	1815^{+139}_{-87}	7181^{+1122}_{-730}	159^{+96}_{-60}
Alt.	-126 ± 9	$3.26^{+0.56}_{-0.41}$	1810^{+132}_{-86}	4578^{+228}_{-182}	24^{+7}_{-6}

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 $A_{obs} \gg 1.0$

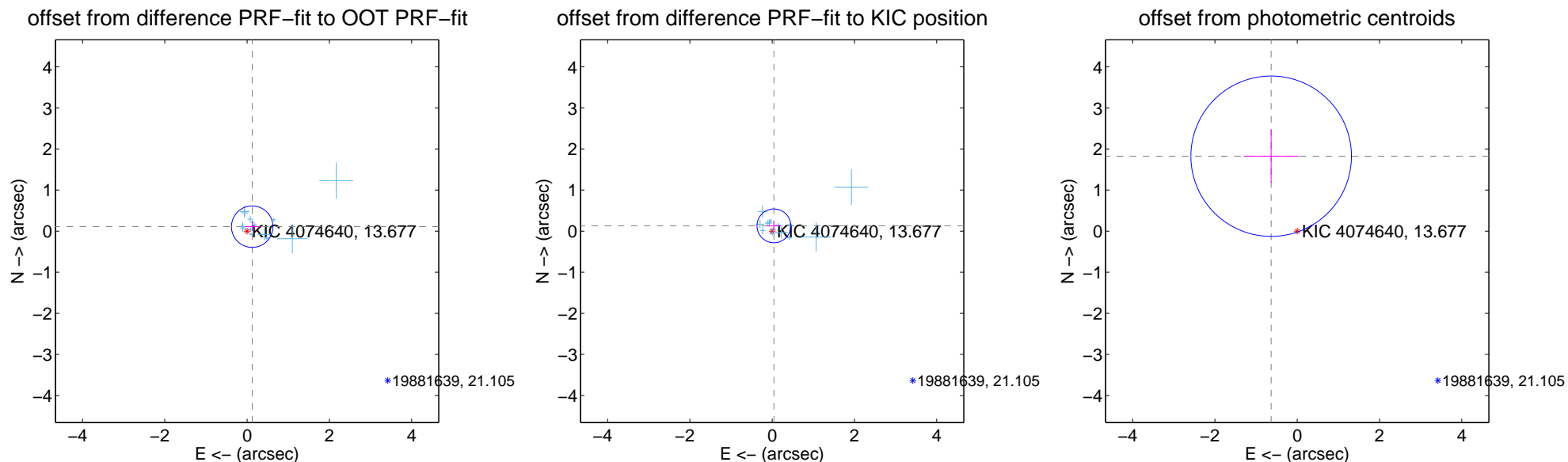
DV Centroid Data

Supplemental centroid analysis for 004074640-04. Kepler magnitude: 13.68. Transit SNR 6.43

There are 14 quarters with good PRF difference image offsets

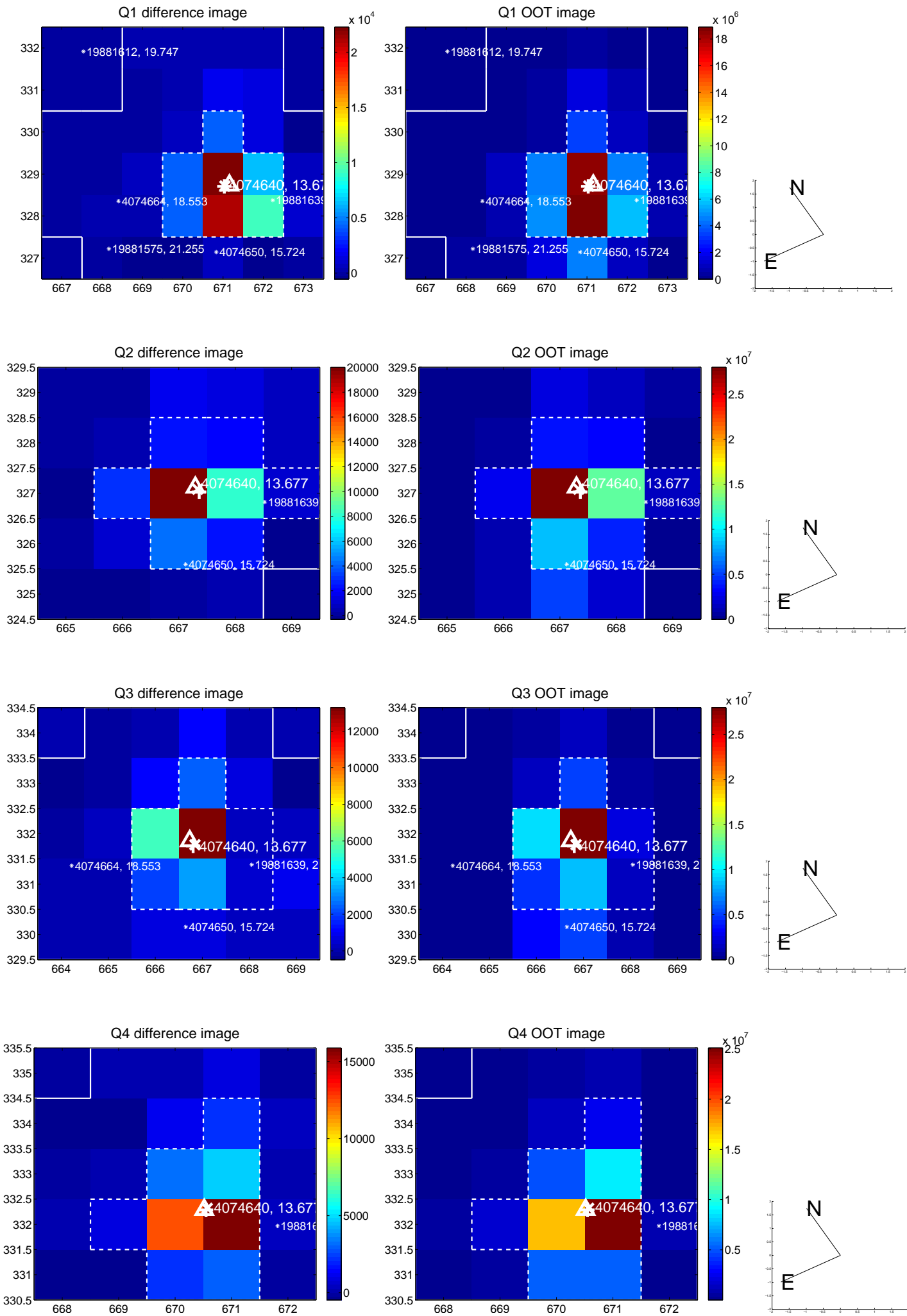
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.165 ± 0.168	0.98	-0.124 ± 0.174	0.109 ± 0.108
PRF-fit source offset from KIC position	0.136 ± 0.137	0.99	-0.043 ± 0.174	0.129 ± 0.112
photometric centroid source offset	1.93 ± 0.65	2.97	0.63 ± 0.67	1.82 ± 0.65

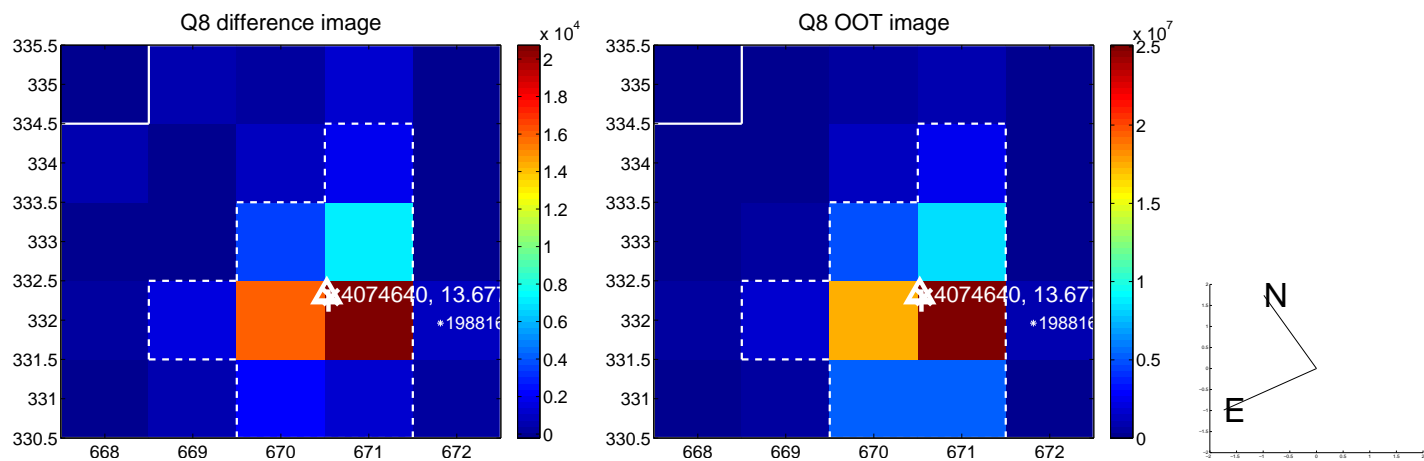
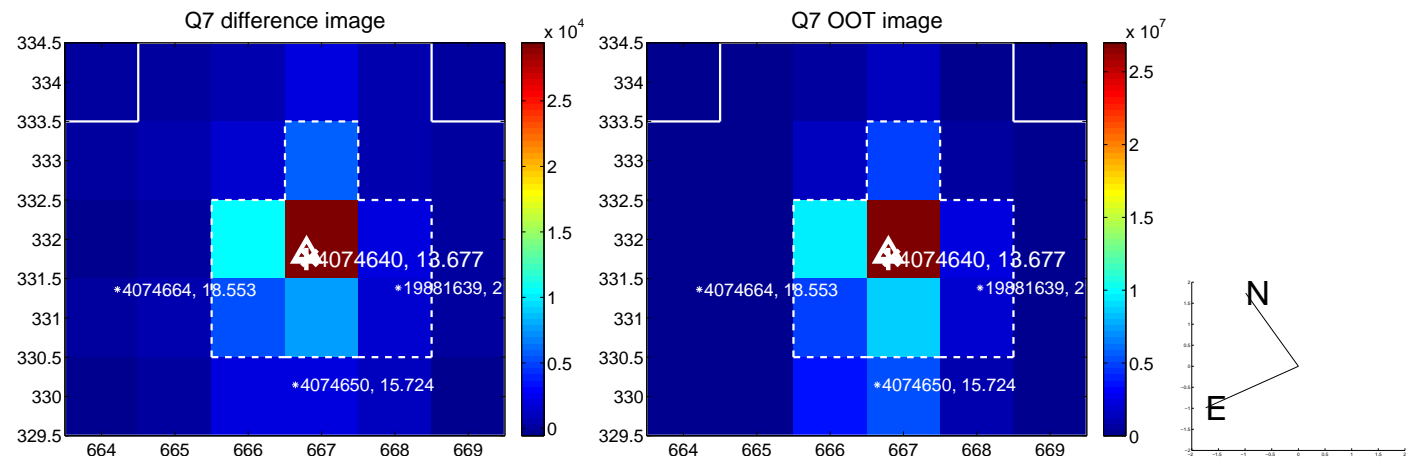
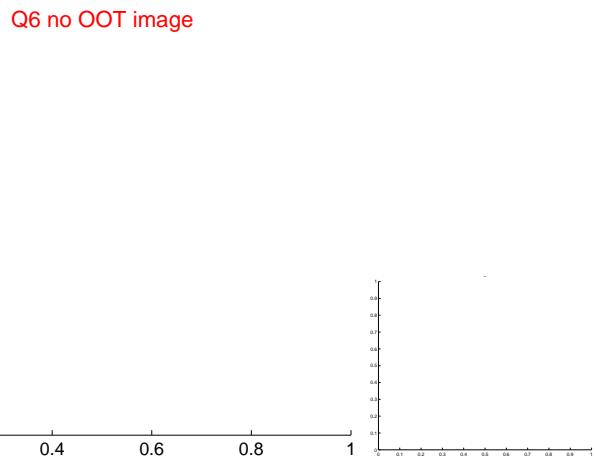
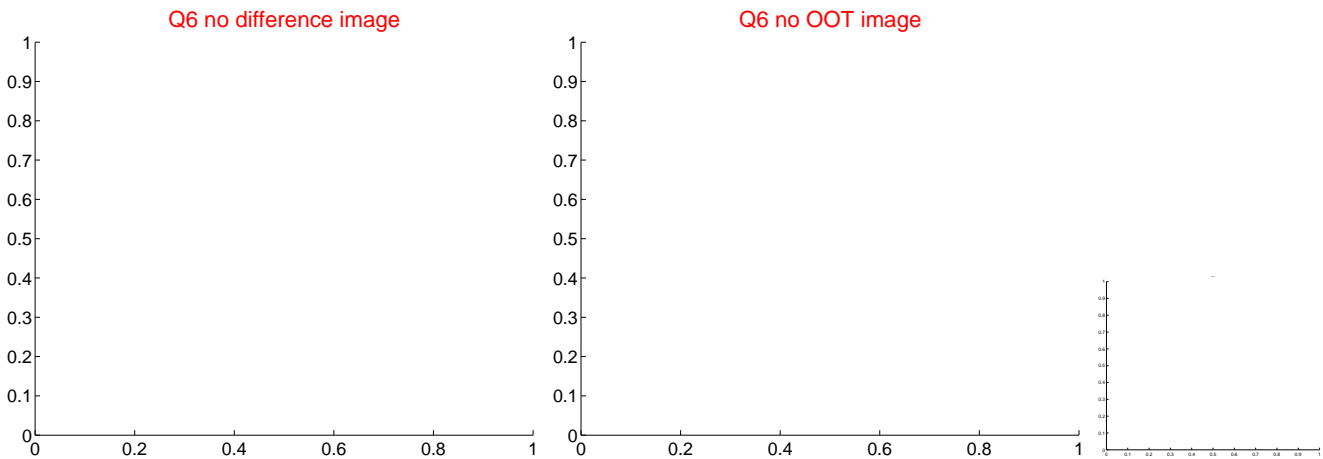
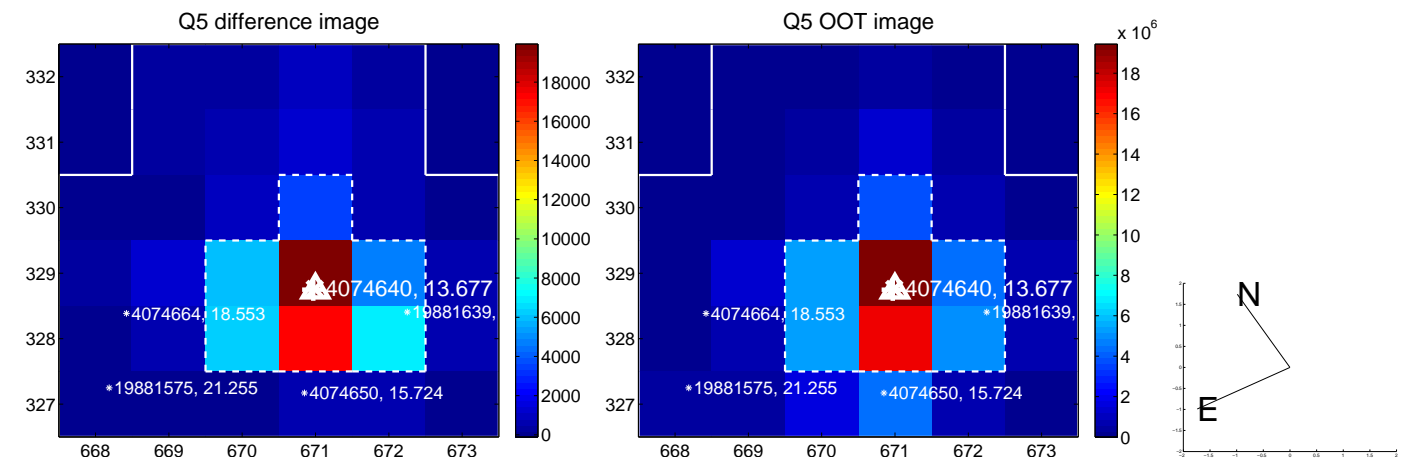


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

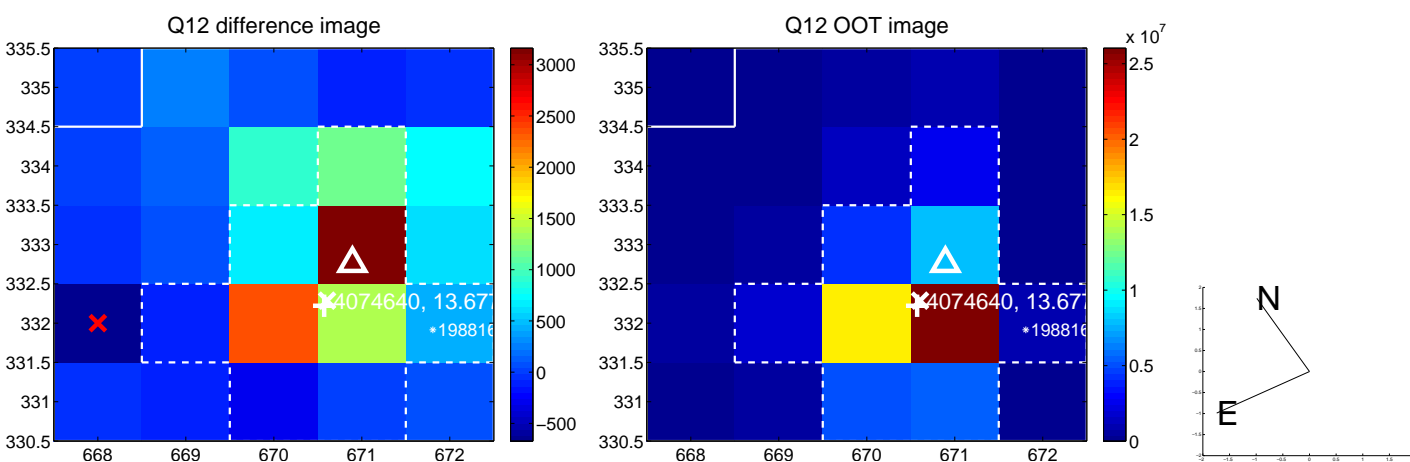
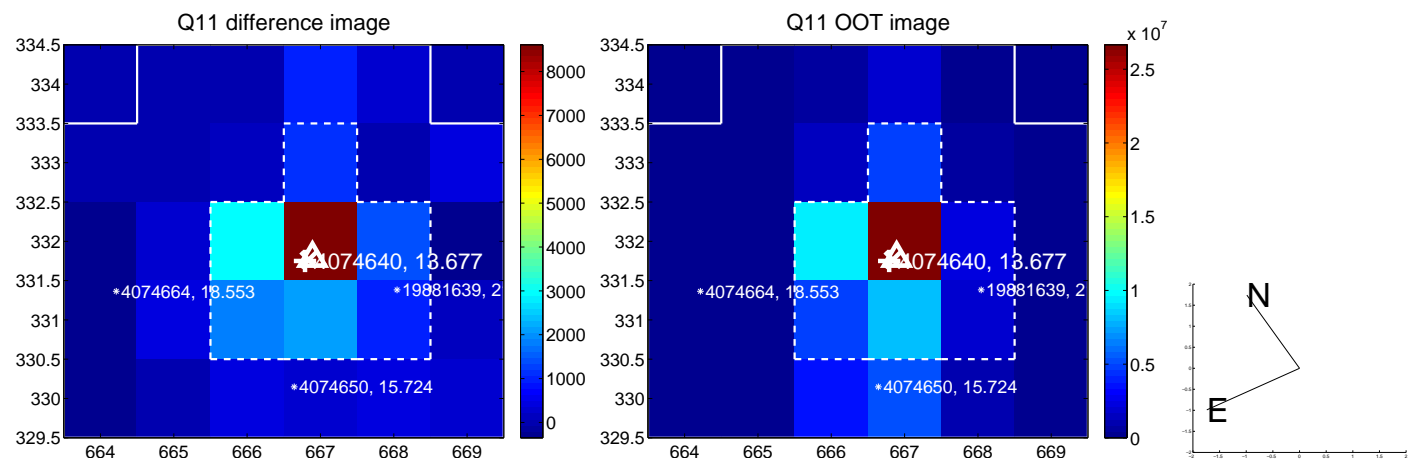
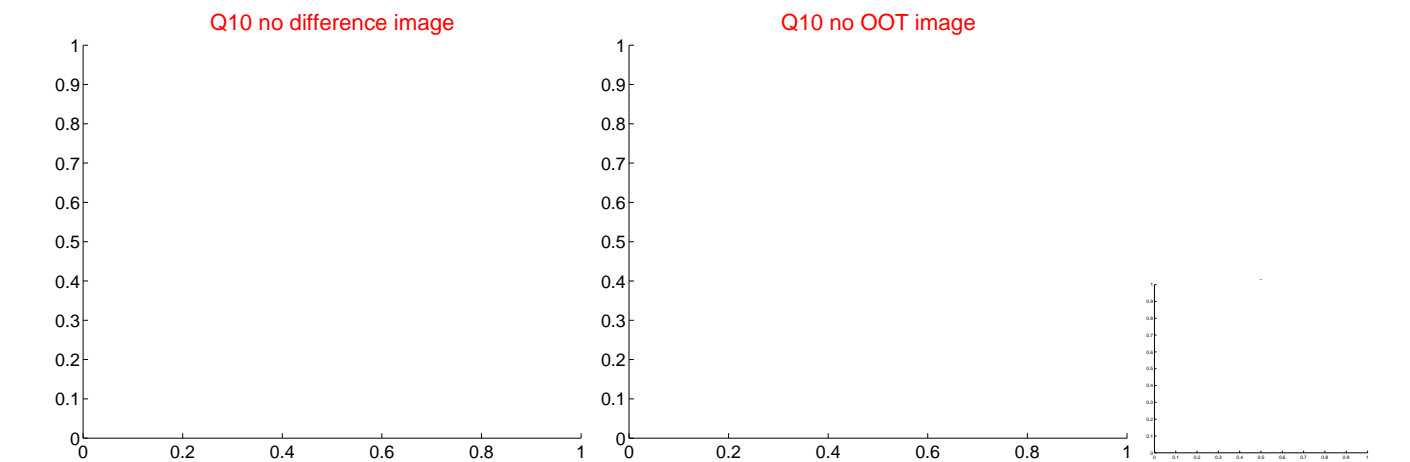
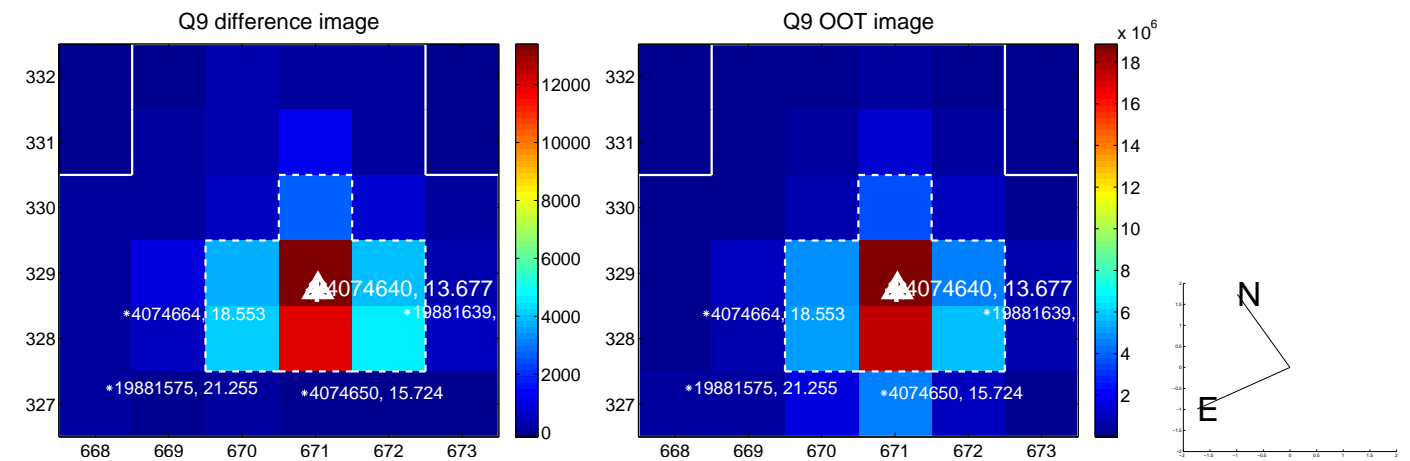
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



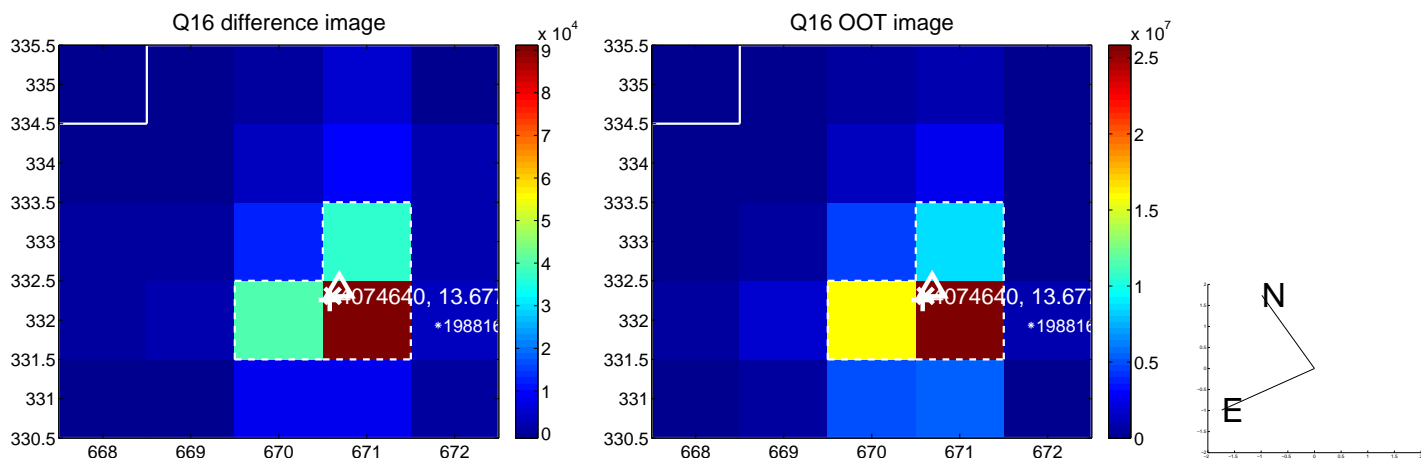
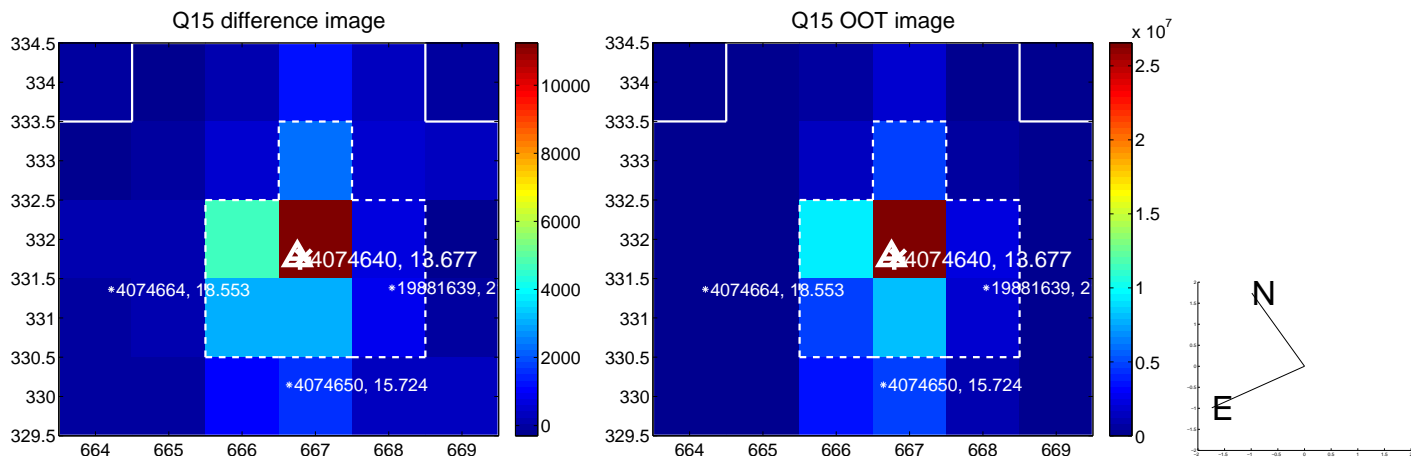
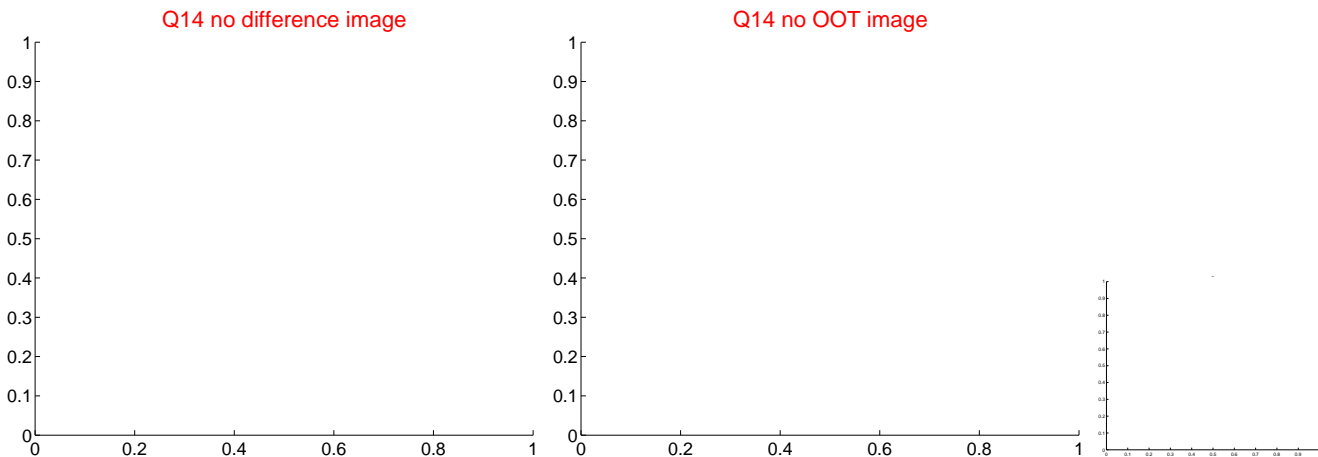
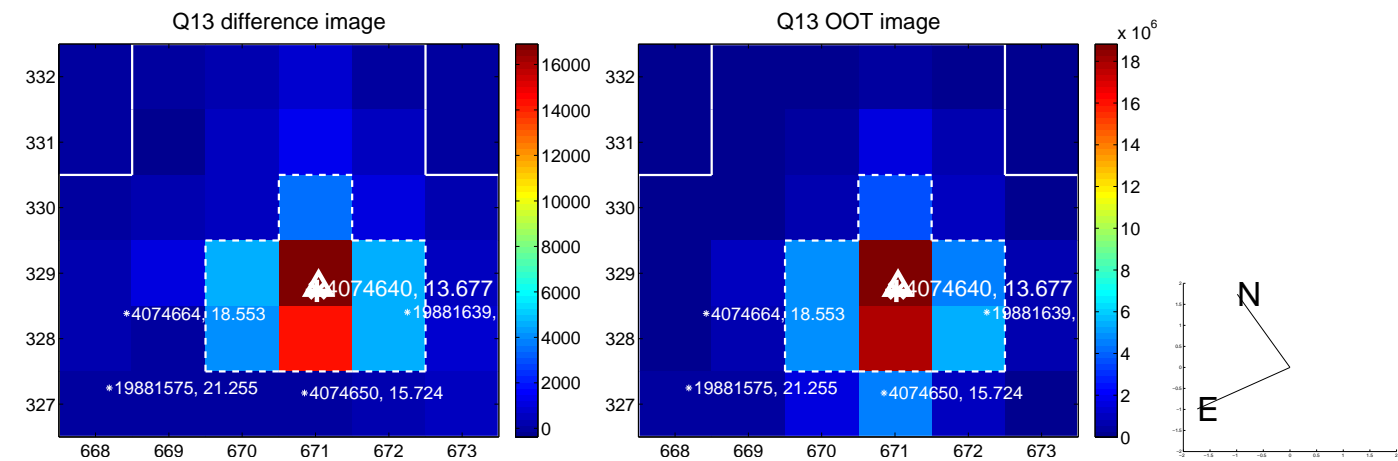
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



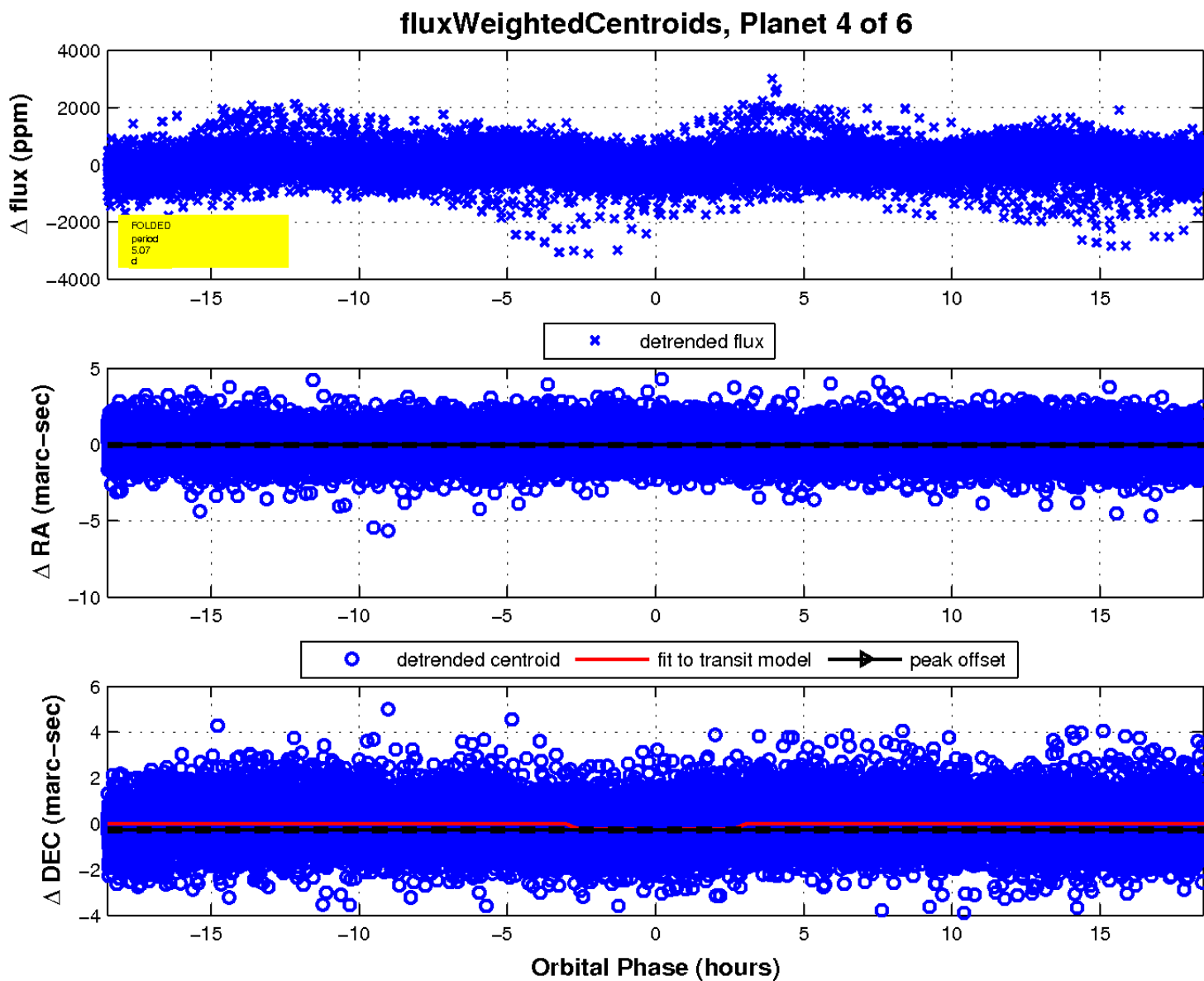
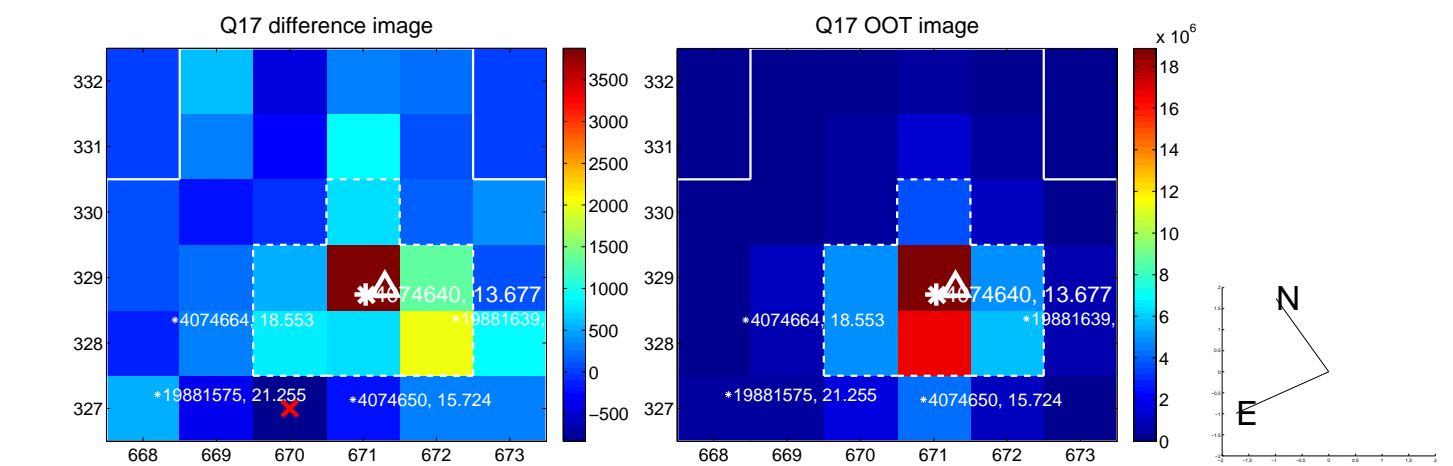
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

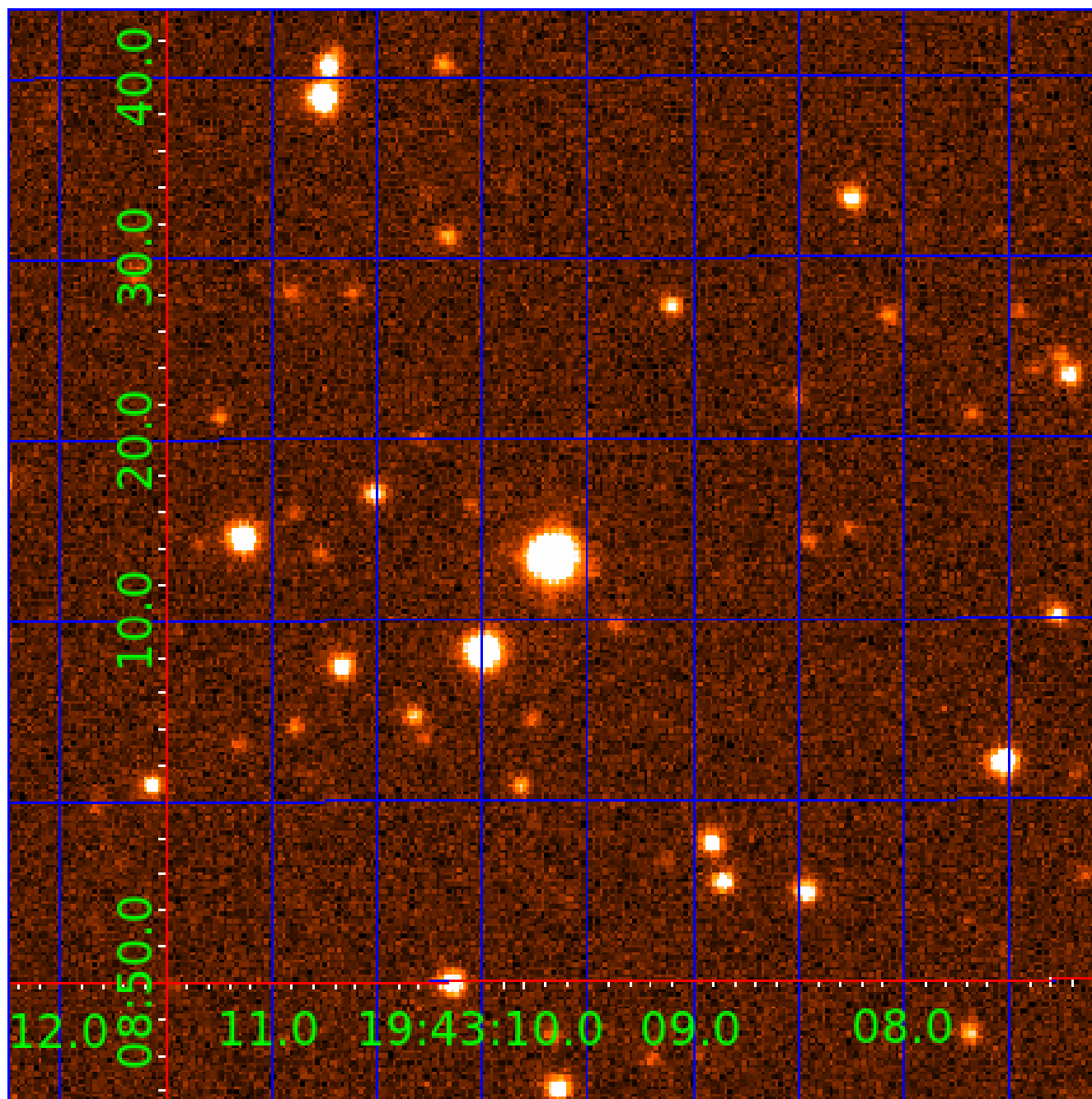


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004074640

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})
004074640-01	OBS	No	2.553966	133.392161	47.2	2.744	9.7	4.4	1.16	6651	0.92	1587.78
004074640-02	OBS	No	2.553867	133.752622	66.3	7.590	9.8	6.8	1.16	6651	1.10	1587.86
004074640-03	OBS	No	5.072026	134.587970	114.5	5.006	7.8	7.2	1.16	6651	1.43	636.07
004074640-04	OBS	No	5.071818	133.870150	114.2	6.169	7.4	6.4	1.16	6651	1.45	636.10
004074640-05	OBS	No	279.605531	271.019287	886.8	7.151	7.7	7.3	1.16	6651	4.04	3.03
004074640-06	OBS	No	5.072165	135.733937	116.6	6.038	7.5	6.5	1.16	6651	1.48	636.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004074640-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004074640-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
004074640-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT
004074640-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
004074640-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004074640-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD

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

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

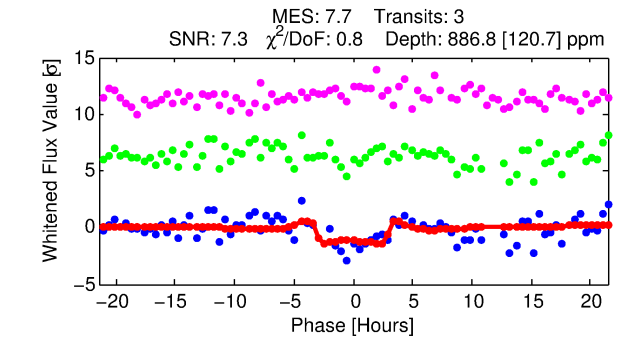
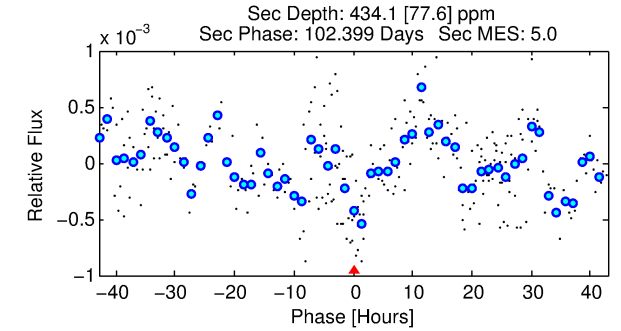
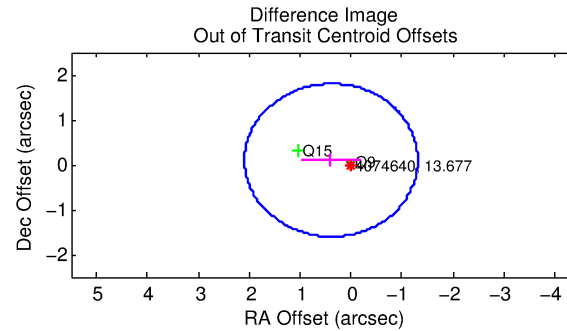
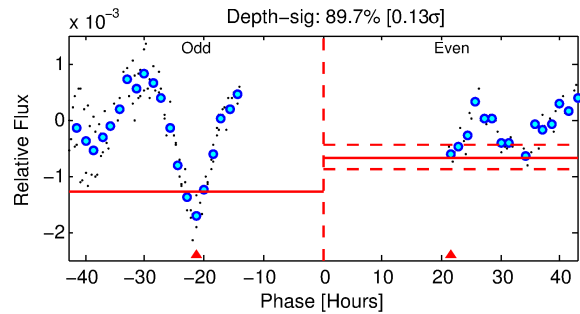
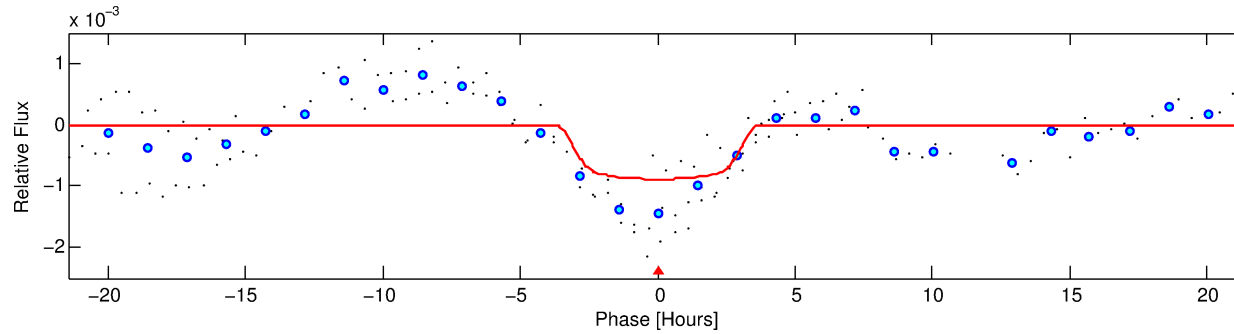
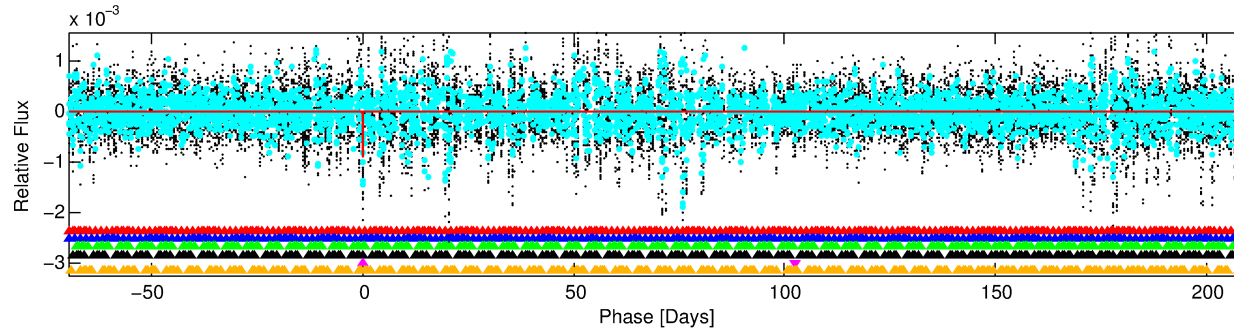
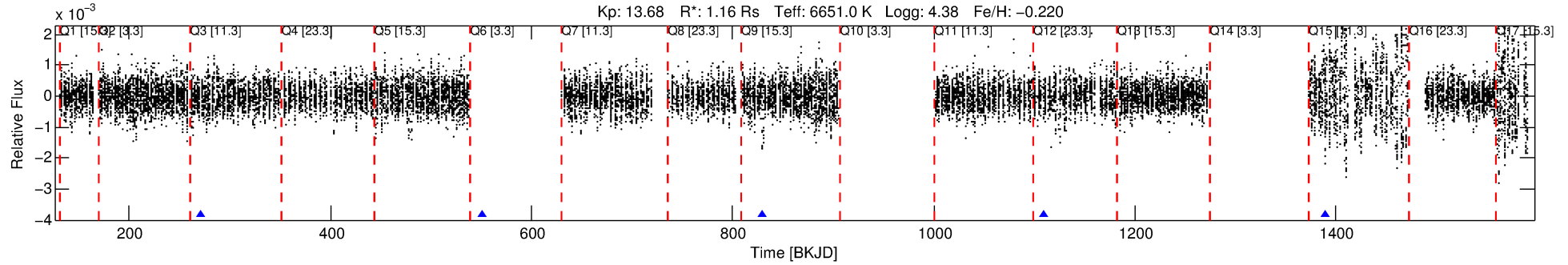
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004074640-05

No Significant Match Found

DV One-Page Summary

KIC: 4074640 Candidate: 5 of 6 Period: 279.606 d



DV Fit Results:

Period = 279.60553 [0.00626] d
Epoch = 271.0193 [0.0194] BKJD
Rp/R* = 0.0318 [0.0028]
a/R* = 151.00 [41.34]
b = 0.90 [0.06]
Seff = 3.03 [1.22]
Teq = 336 [34] K
Rp = 4.04 [1.39] Re
a = 0.8852 [0.2394] AU
Ag = 11455.89 [5232.38] [2.19 σ]
Teffp = 5382 [382] K [13.16 σ]

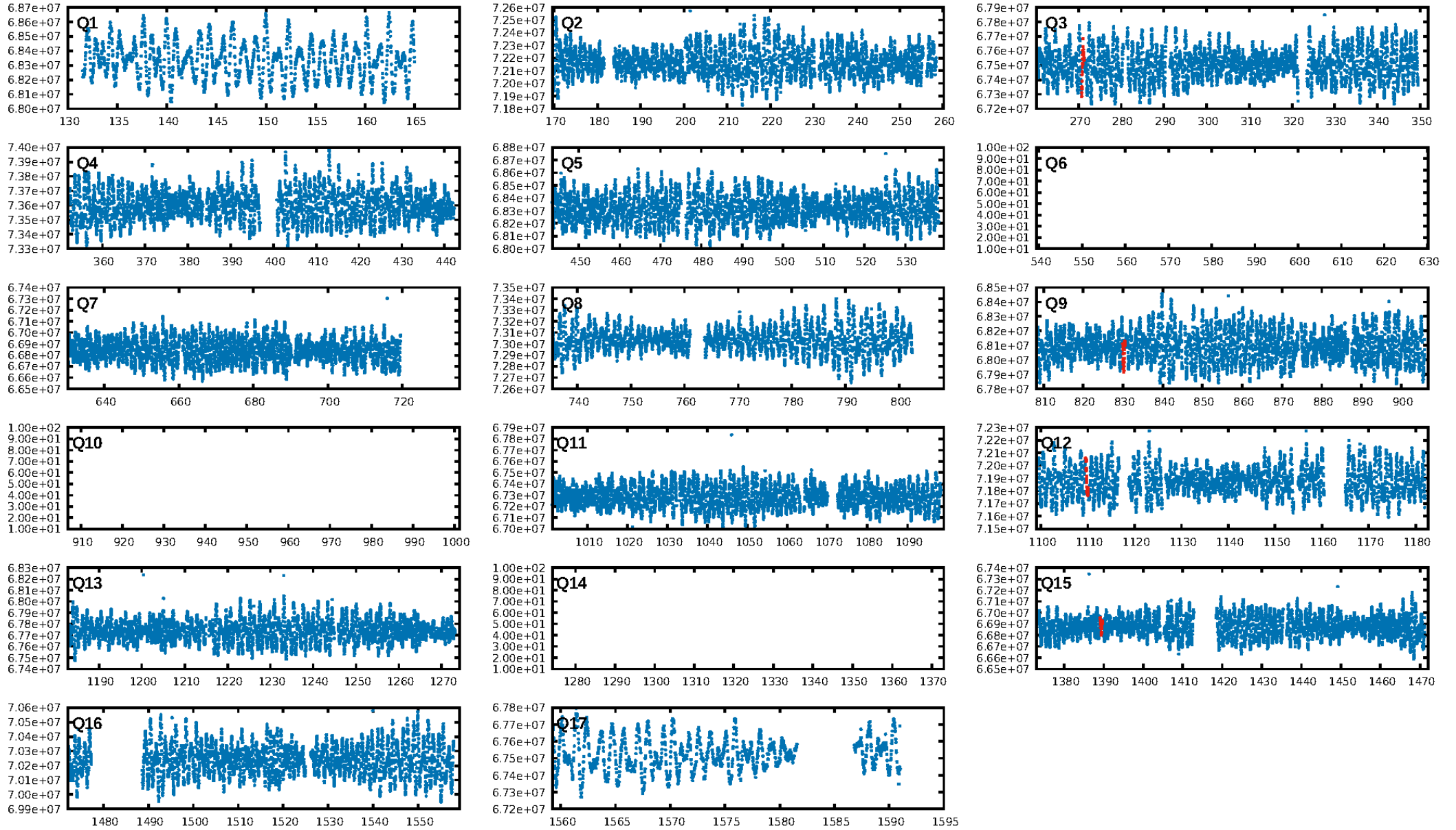
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [703.99 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 64.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.65e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.463
Centroid-sig: 76.9%
Centroid-so: 0.557 arcsec [0.89 σ]
OotOffset-rm: 0.402 arcsec [0.71 σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-rm: 0.538 arcsec [0.81 σ]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 0.00 [0/2]

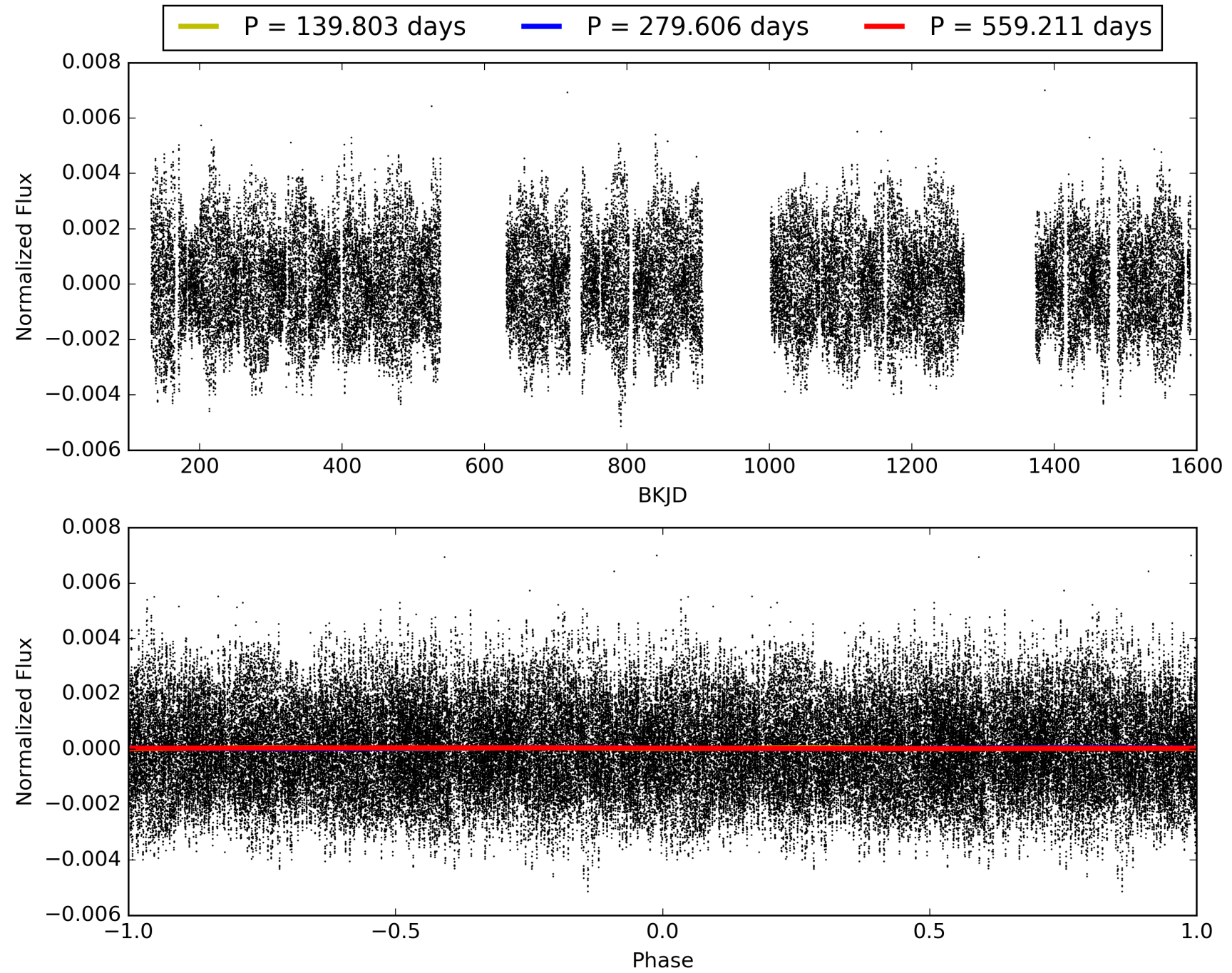
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:27:50 Z

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

TCE 004074640-05, PDC Light Curves

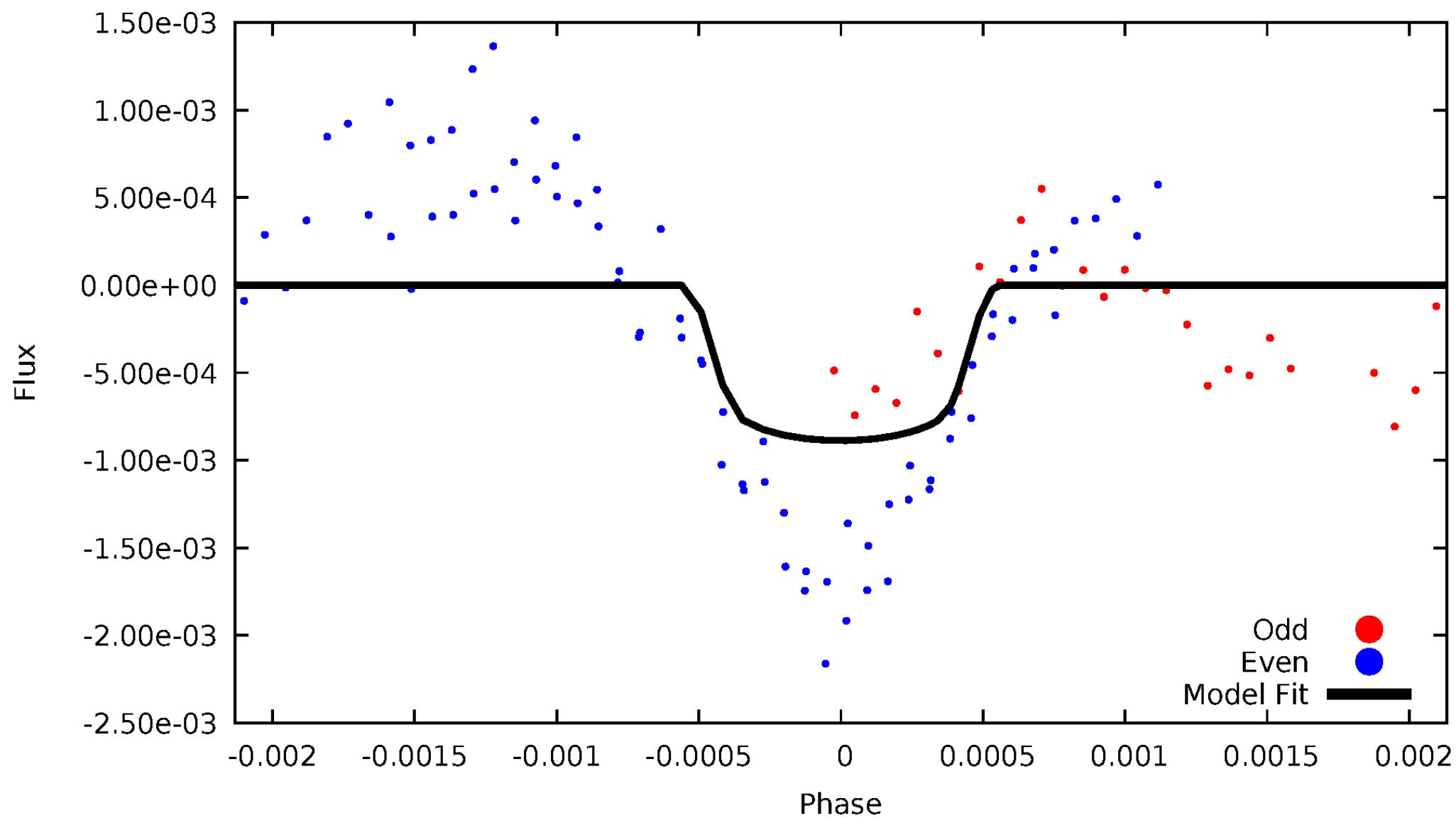


TCE 004074640-05



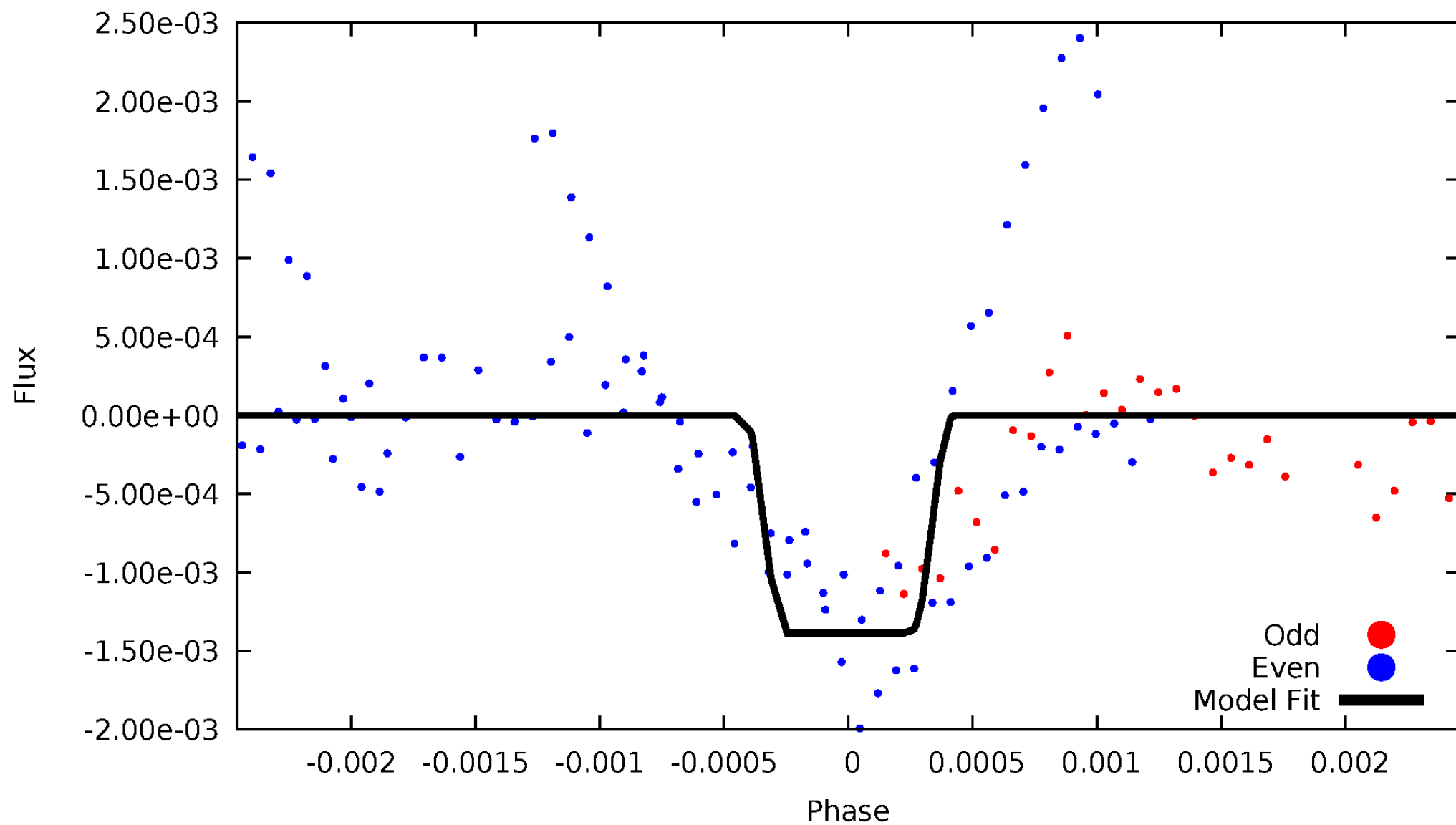
DV Odd/Even

TCE 004074640-05



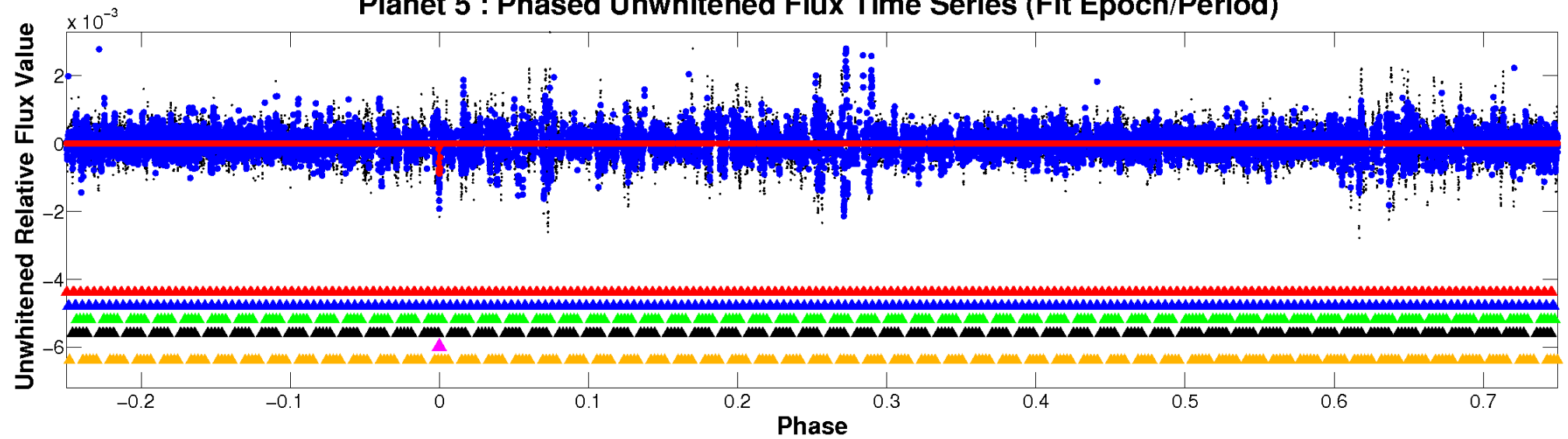
ALT Odd/Even

TCE 004074640-05

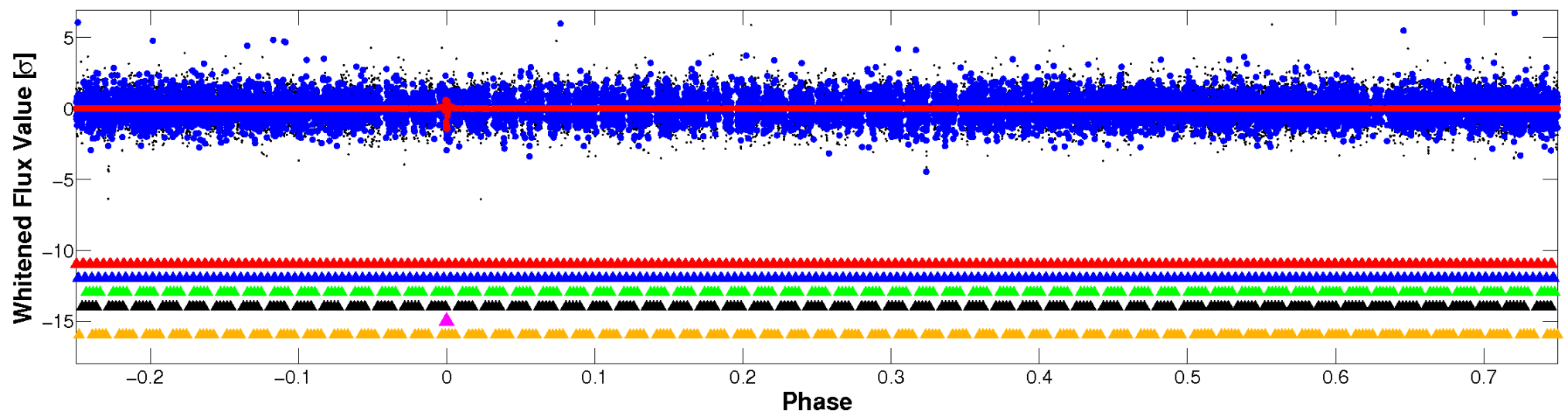


Non-Whitened Vs. Whitened Light Curve

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

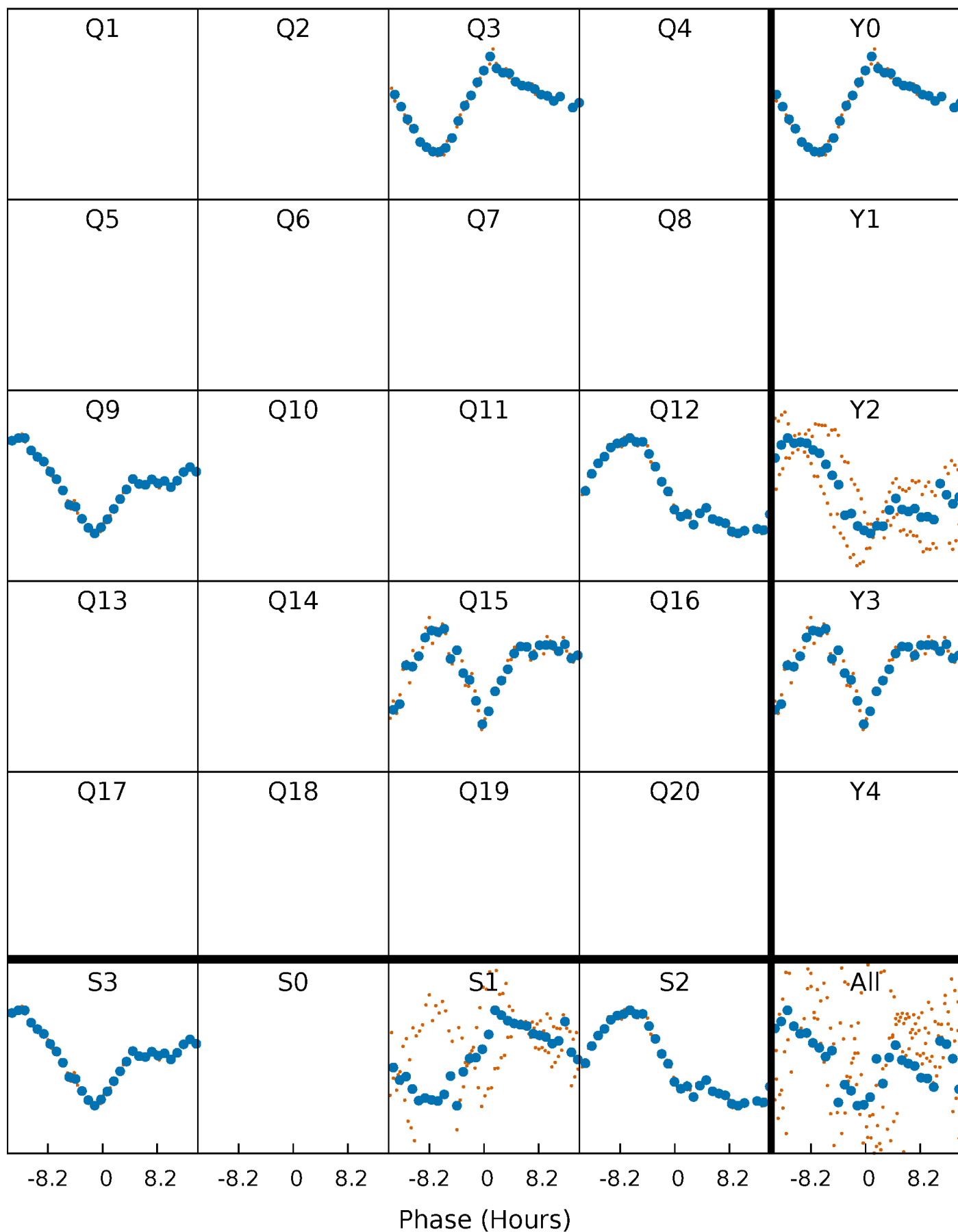


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



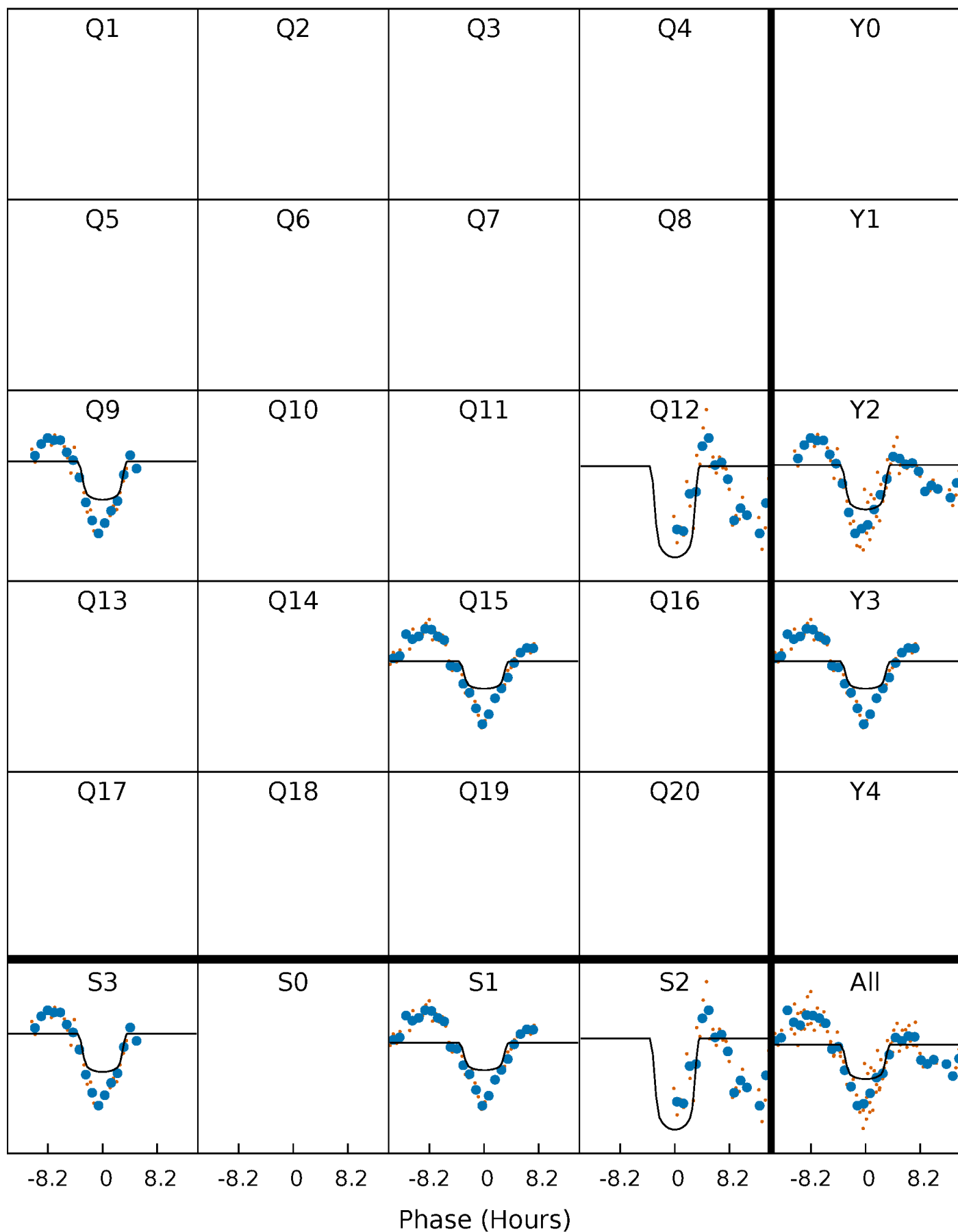
PDC Quarter-Phased Transit Curves

TCE 004074640-05 $P=279.605531$ Days $T_0=271.019287$ (BKJD)



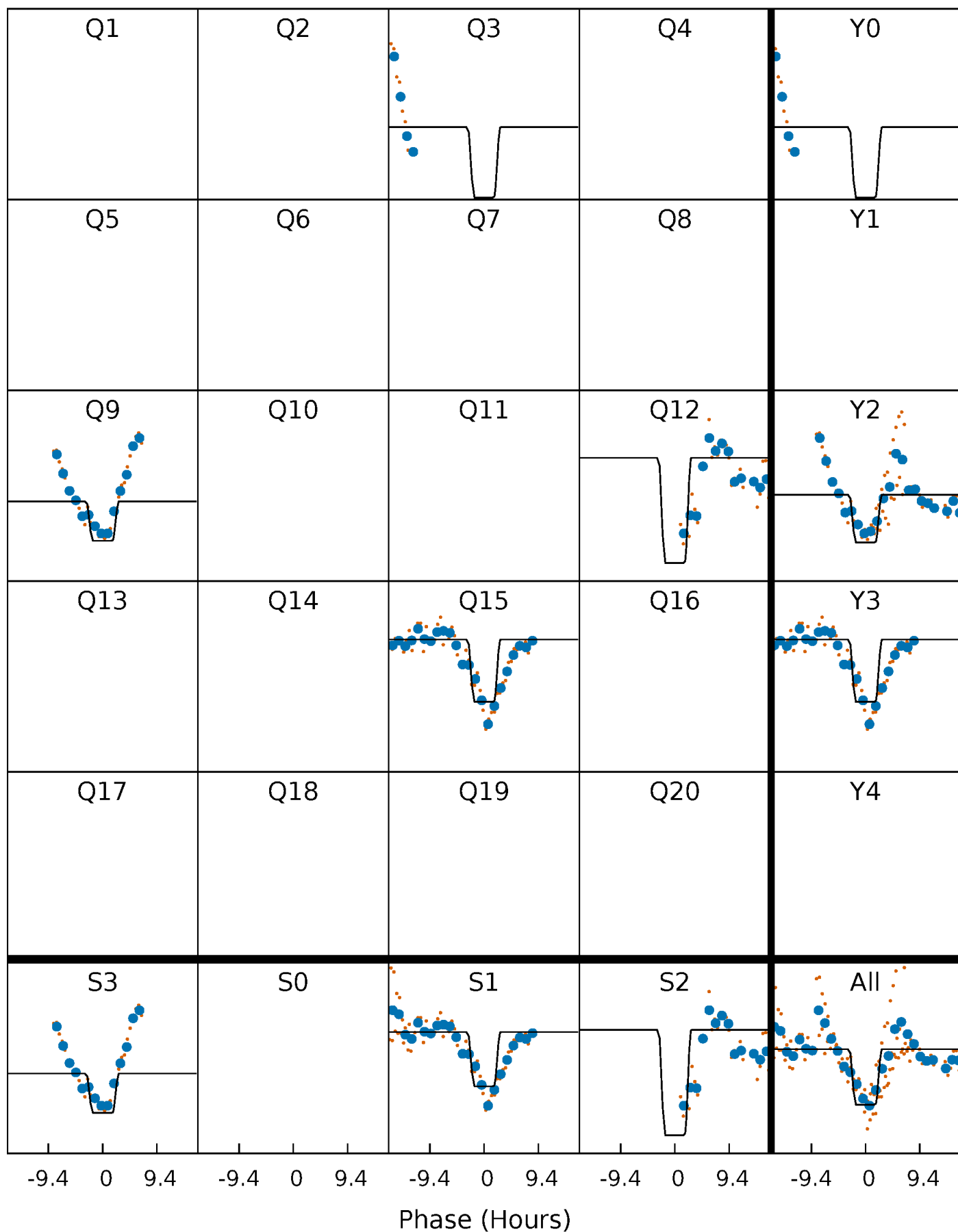
DV Quarter-Phased Transit Curves

TCE 004074640-05 $P=279.605531$ Days $T_0=271.019287$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

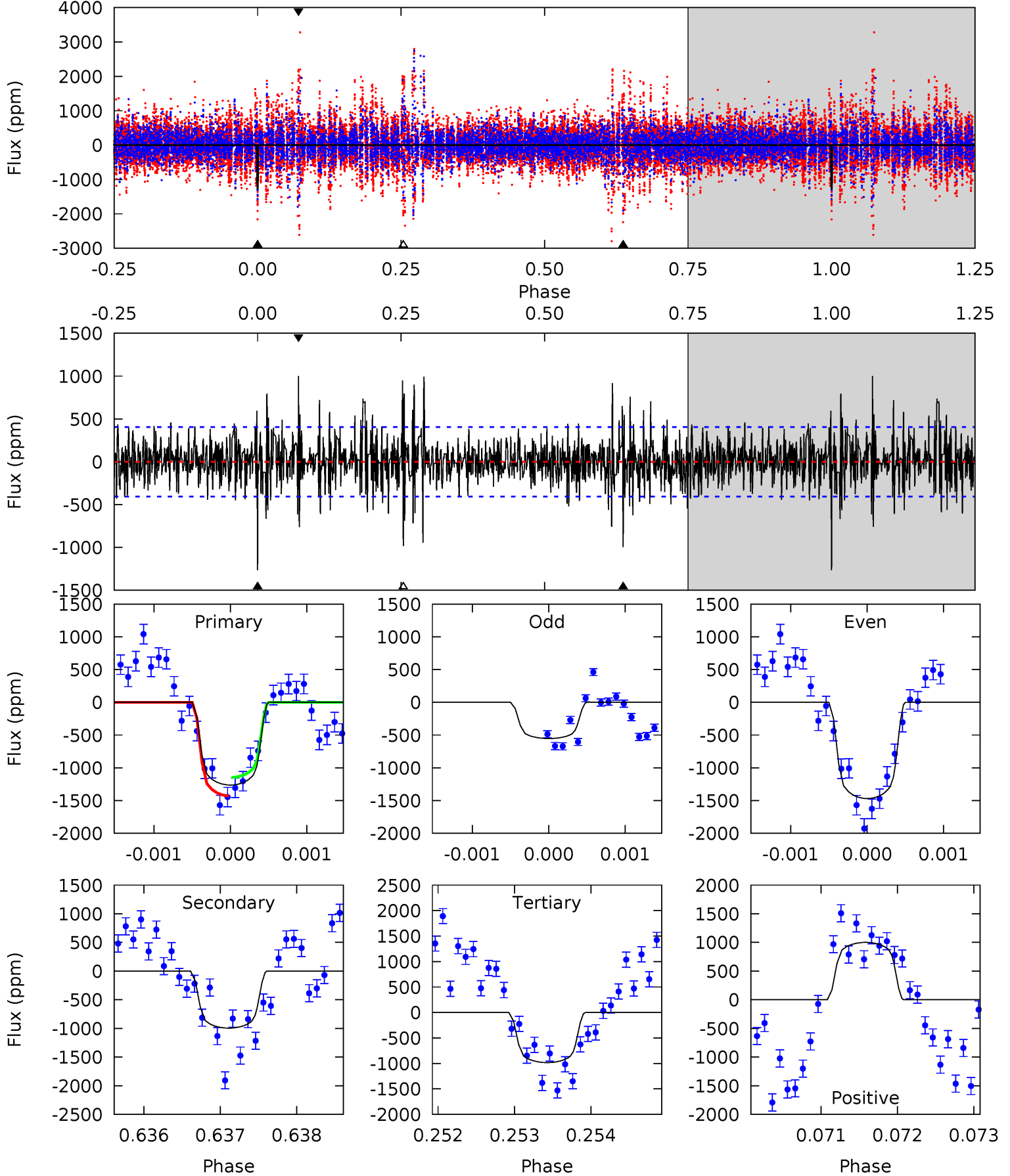
TCE 004074640-05 $P=279.626457$ Days $T_0=270.907678$ (BKJD)



DV Model-Shift Uniqueness Test

004074640-05, $P = 279.605531$ Days, $E = 271.019287$ Days

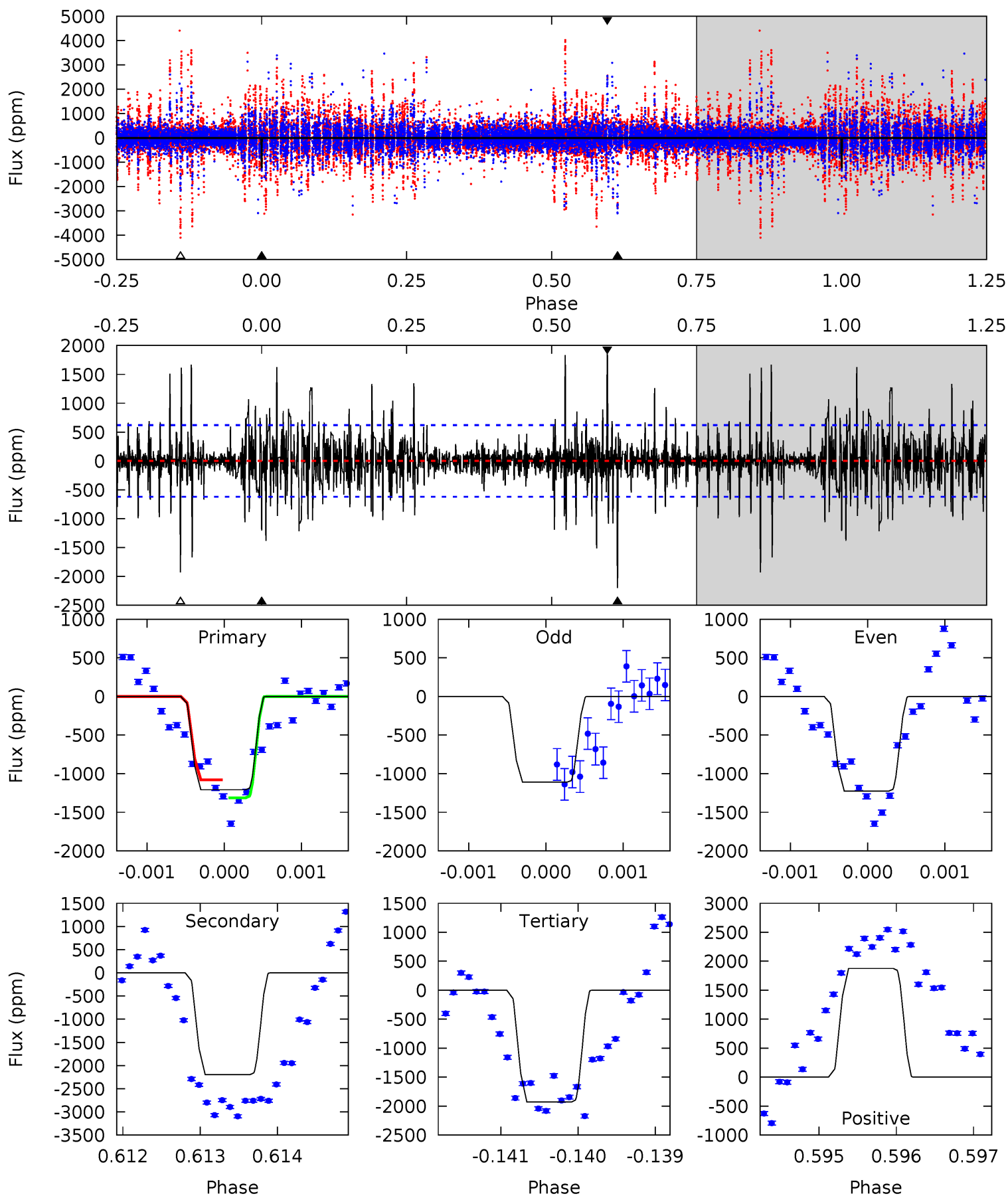
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	13.3	13.2	13.4	5.43	3.26	2.72	3.75	3.51	0.16	-0.08	5.17	0.85	0.44	1.88



Alt Model-Shift Uniqueness Test

004074640-05, P = 279.626457 Days, E = 270.907678 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	19.4	17.0	16.6	5.49	3.35	2.84	-6.36	-5.90	2.37	2.84	0.46	1.07	0.46	1.02



Stellar Parameters For KIC 004074640

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6651^{+159}_{-218}	$4.379^{+0.067}_{-0.202}$	$-0.220^{+0.250}_{-0.300}$	$1.164^{+0.387}_{-0.129}$	$1.187^{+0.182}_{-0.165}$	$1.061^{+0.293}_{-0.547}$
	+2%/-3%	+2%/-5%	+114%/-136%	+33%/-11%	+15%/-14%	+28%/-52%
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 004074640-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-995 ± 75	$4.14^{+0.75}_{-0.54}$	476^{+34}_{-22}	6629^{+401}_{-374}	24709^{+7332}_{-6581}
Alt.	-2197 ± 113	$4.83^{+0.87}_{-0.55}$	475^{+34}_{-22}	7523^{+467}_{-397}	39530^{+11000}_{-10055}

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

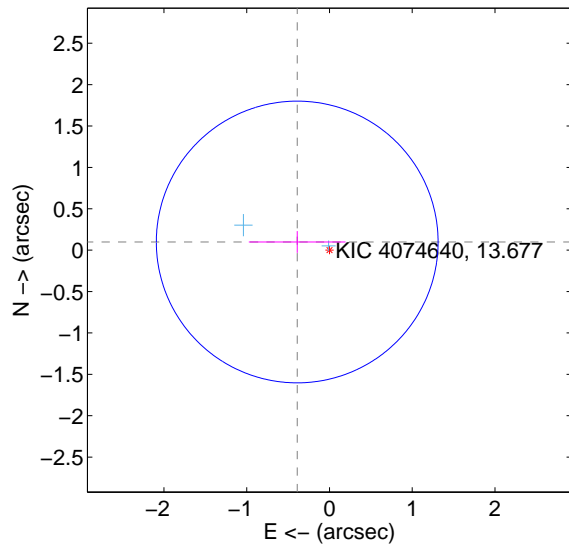
Supplemental centroid analysis for 004074640-05. Kepler magnitude: 13.68. Transit SNR 7.35

There are 2 quarters with good PRF difference image offsets

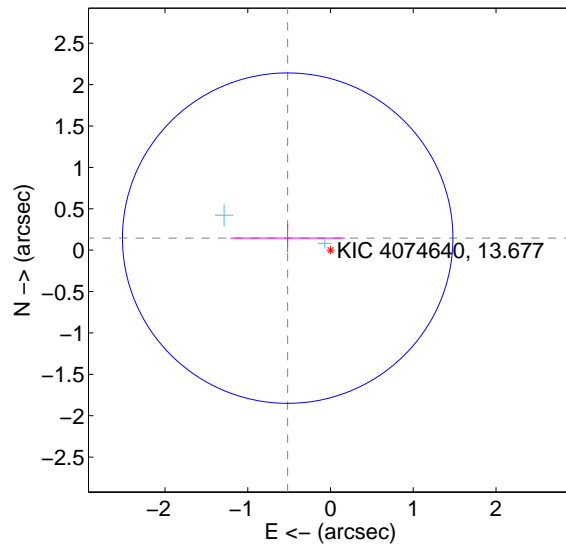
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.402 ± 0.567	0.71	0.390 ± 0.584	0.099 ± 0.132
PRF-fit source offset from KIC position	0.538 ± 0.665	0.81	0.517 ± 0.689	0.145 ± 0.169
photometric centroid source offset	0.56 ± 0.63	0.89	0.17 ± 0.62	-0.53 ± 0.63

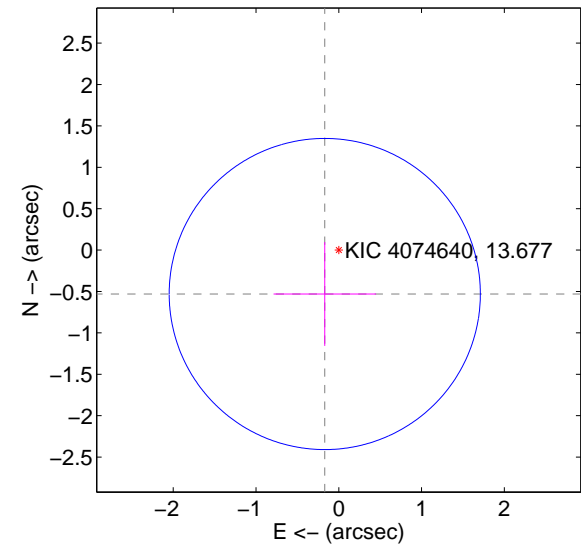
offset from difference PRF-fit to OOT PRF-fit



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.

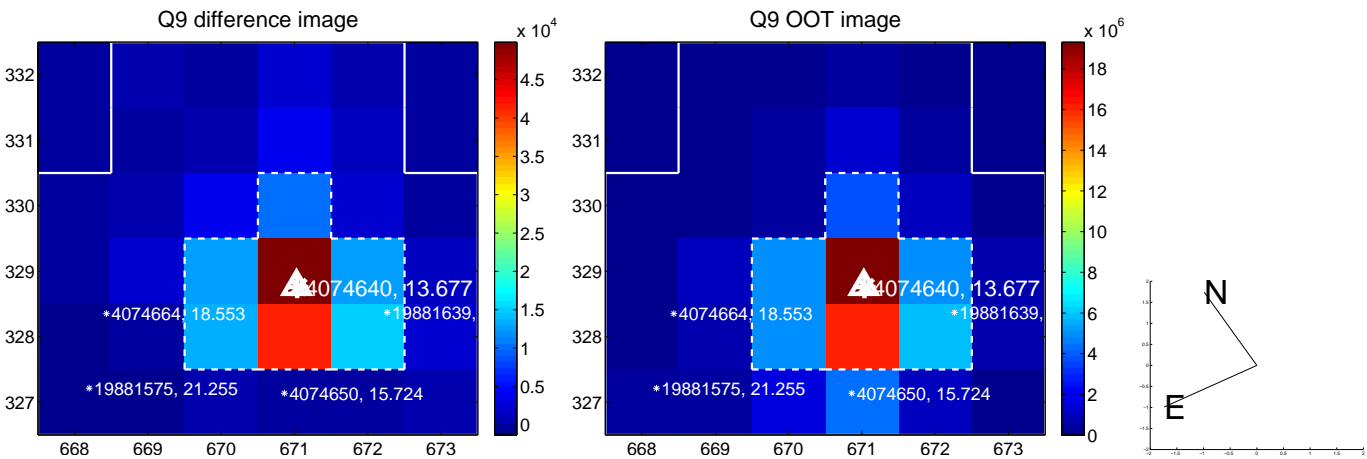
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.

Q13 no difference image



Q13 no OOT image



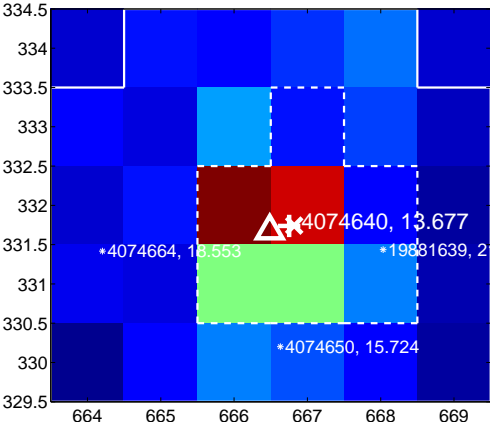
Q14 no difference image



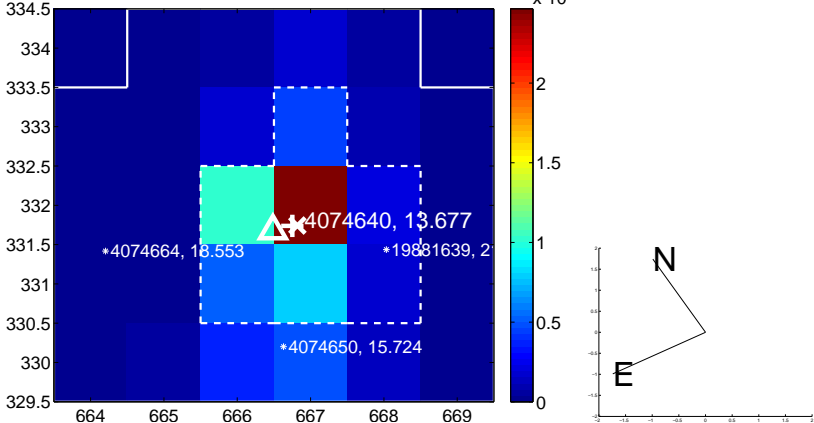
Q14 no OOT image



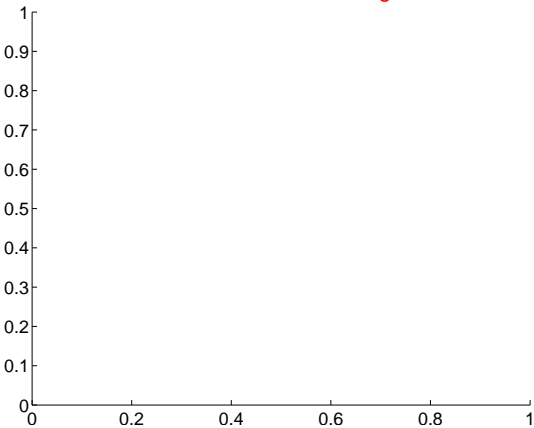
Q15 difference image



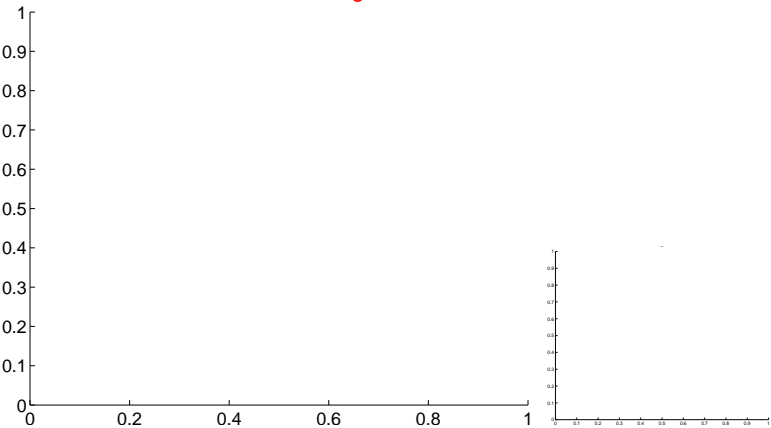
Q15 OOT image



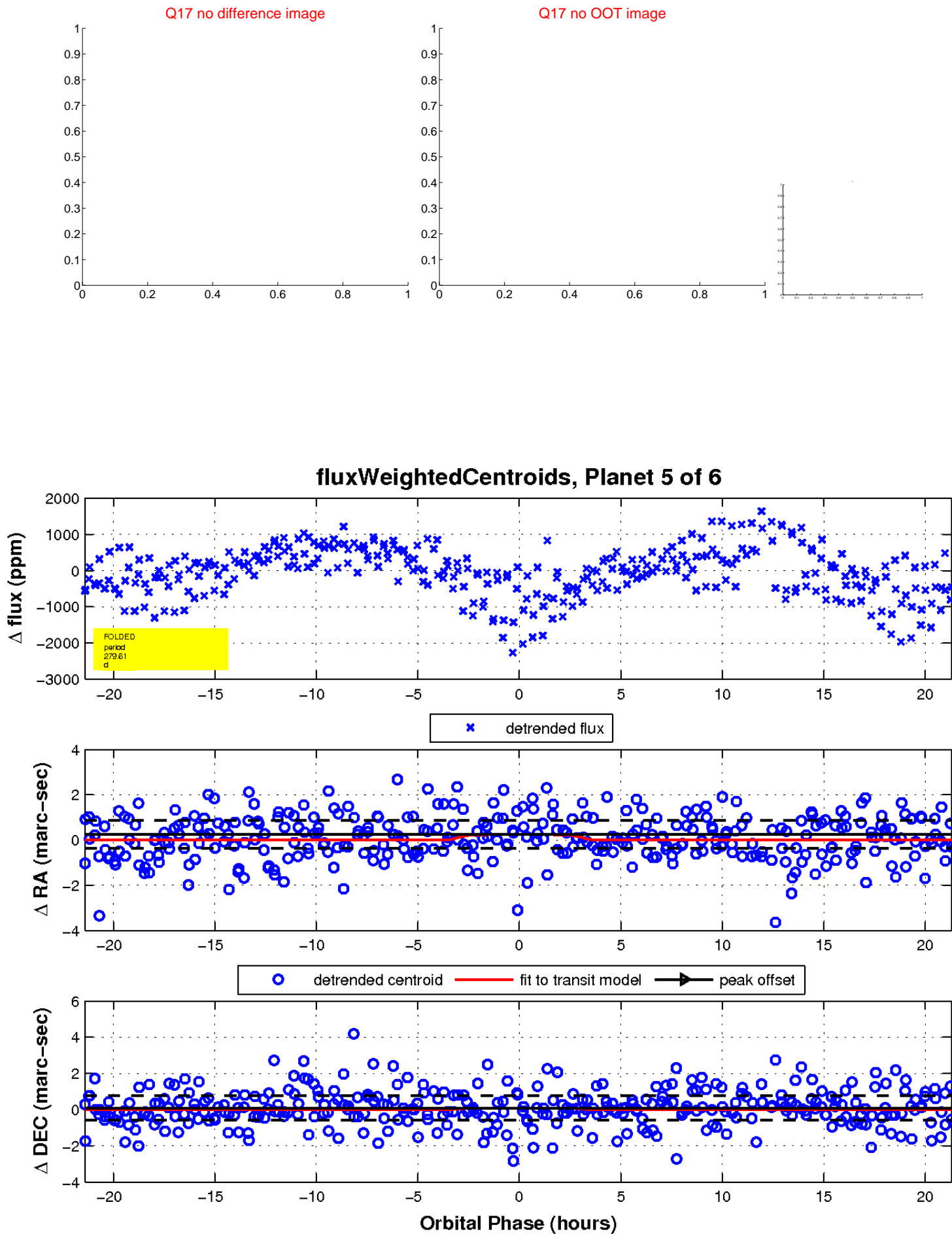
Q16 no difference image



Q16 no OOT image

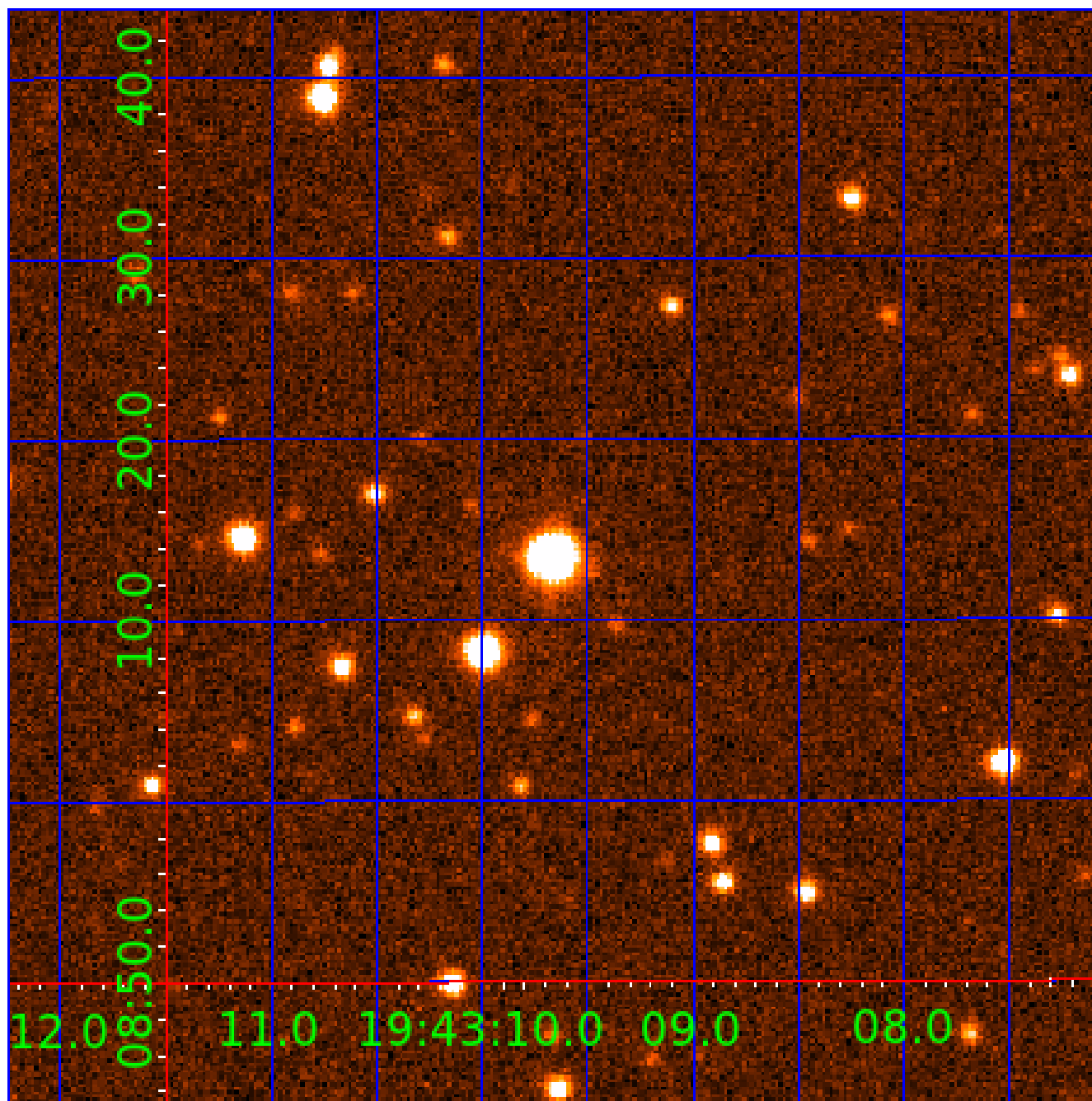


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004074640

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})
004074640-01	OBS	No	2.553966	133.392161	47.2	2.744	9.7	4.4	1.16	6651	0.92	1587.78
004074640-02	OBS	No	2.553867	133.752622	66.3	7.590	9.8	6.8	1.16	6651	1.10	1587.86
004074640-03	OBS	No	5.072026	134.587970	114.5	5.006	7.8	7.2	1.16	6651	1.43	636.07
004074640-04	OBS	No	5.071818	133.870150	114.2	6.169	7.4	6.4	1.16	6651	1.45	636.10
004074640-05	OBS	No	279.605531	271.019287	886.8	7.151	7.7	7.3	1.16	6651	4.04	3.03
004074640-06	OBS	No	5.072165	135.733937	116.6	6.038	7.5	6.5	1.16	6651	1.48	636.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004074640-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004074640-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
004074640-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT
004074640-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
004074640-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004074640-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD

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

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

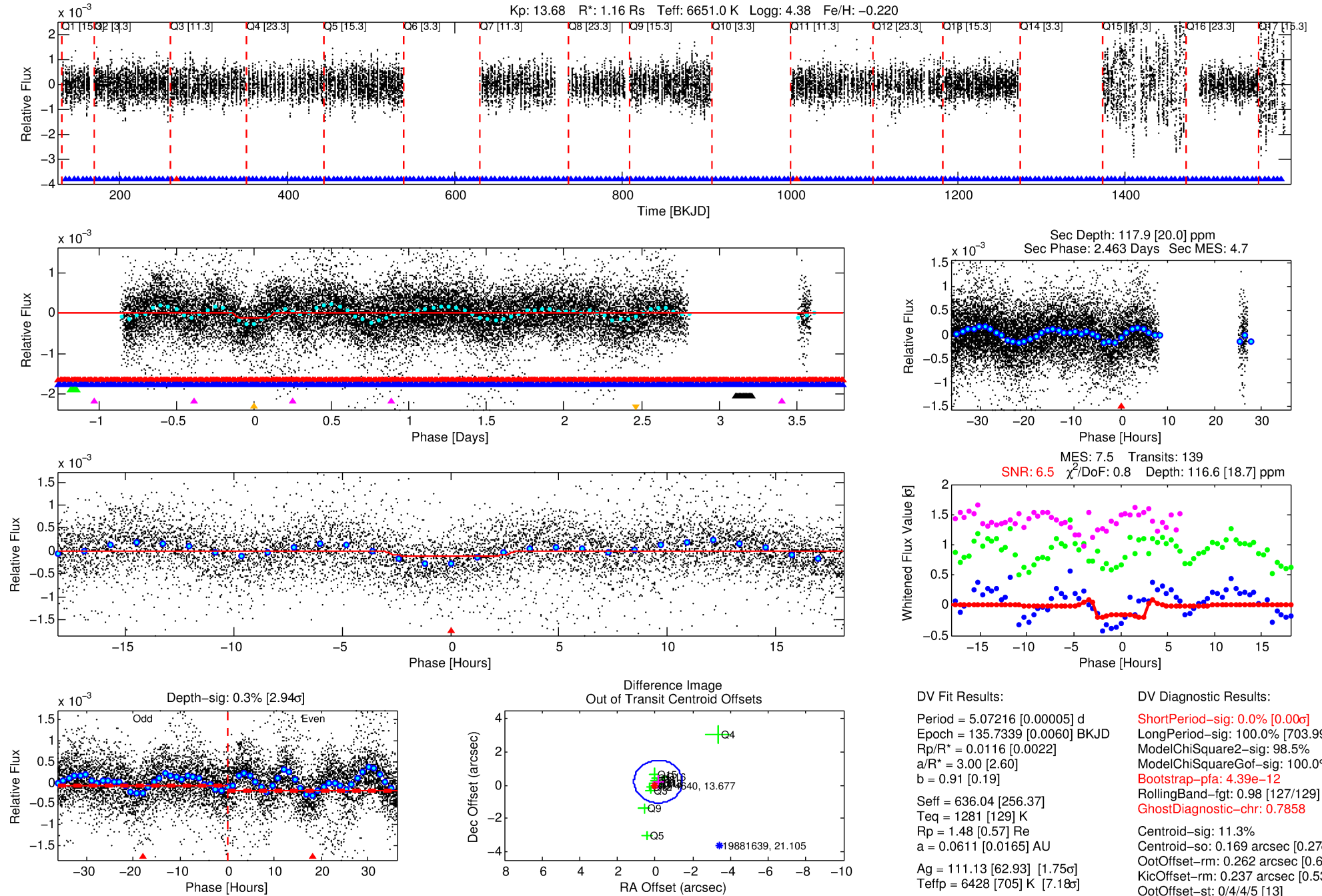
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004074640-06

No Significant Match Found

DV One-Page Summary

KIC: 4074640 Candidate: 6 of 6 Period: 5.072 d



DV Fit Results:

Period = 5.07216 [0.00005] d
Epoch = 135.7339 [0.0060] BKJD
Rp/R* = 0.0116 [0.0022]
a/R* = 3.00 [2.60]
b = 0.91 [0.19]
Seff = 636.04 [256.37]
Teq = 1281 [129] K
Rp = 1.48 [0.57] Re
a = 0.0611 [0.0165] AU
Ag = 111.13 [62.93] [1.75 σ]
Teffp = 6428 [705] K [7.18 σ]

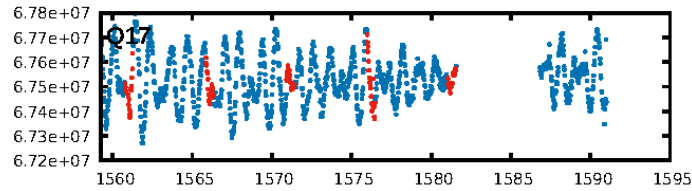
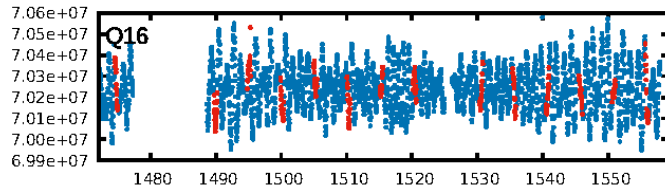
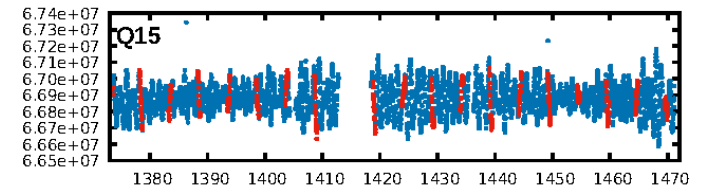
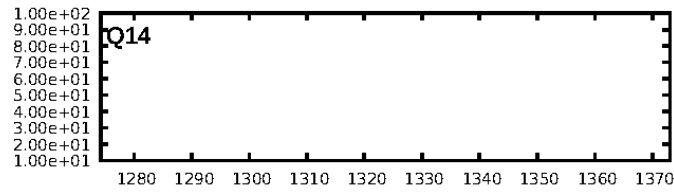
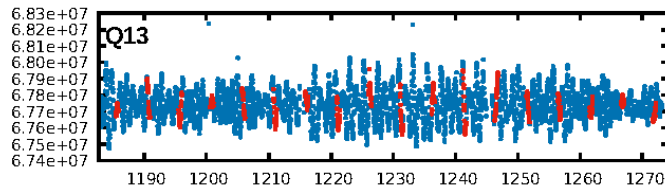
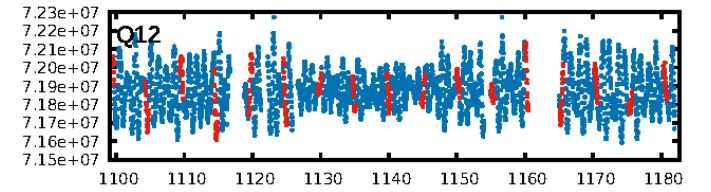
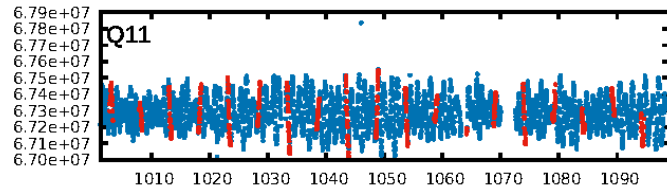
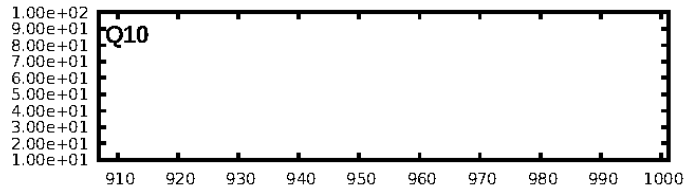
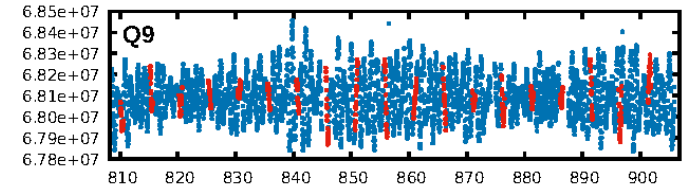
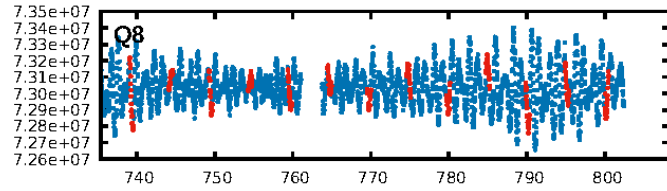
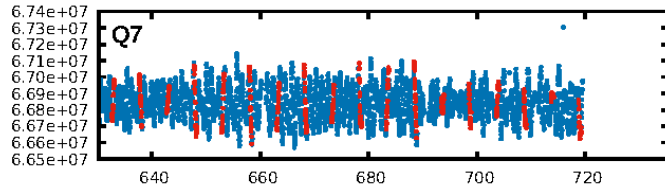
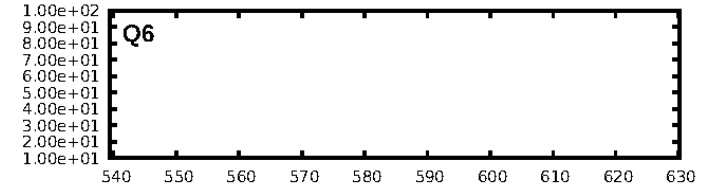
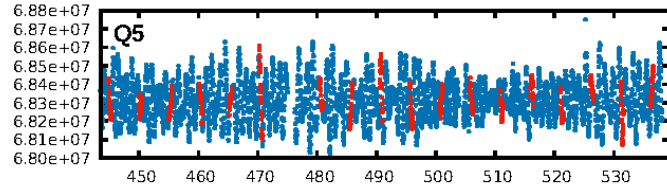
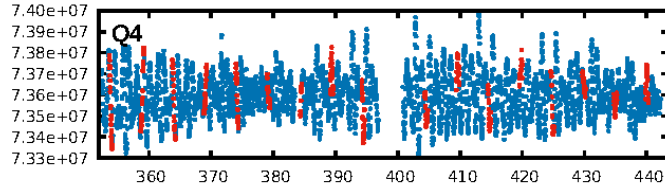
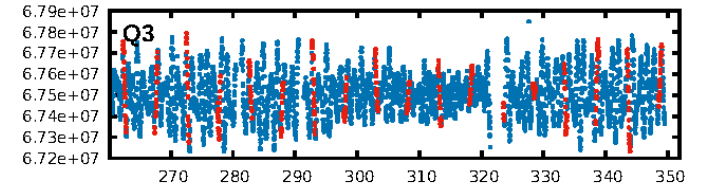
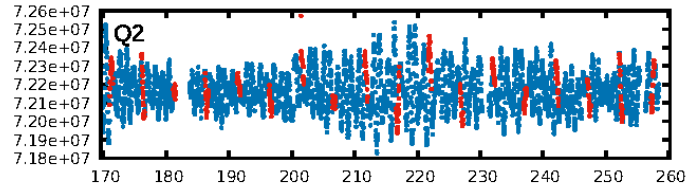
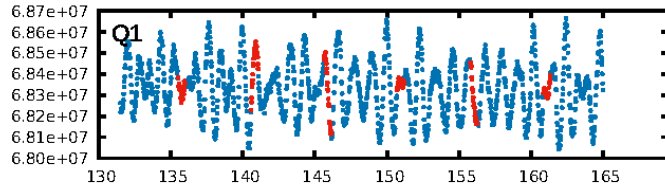
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: 100.0% [703.99 σ]
ModelChiSquare2-sig: 98.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.39e-12
RollingBand-fgt: 0.98 [127/129]
GhostDiagnostic-chr: 0.7858
Centroid-sig: 11.3%
Centroid-so: 0.169 arcsec [0.27 σ]
OotOffset-rm: 0.262 arcsec [0.61 σ]
KicOffset-rm: 0.237 arcsec [0.53 σ]
OotOffset-st: 0/4/4/5 [13]
KicOffset-st: 0/4/4/5 [13]
DiffImageQuality-fgm: 0.77 [10/13]
DiffImageOverlap-fno: 0.36 [5/14]

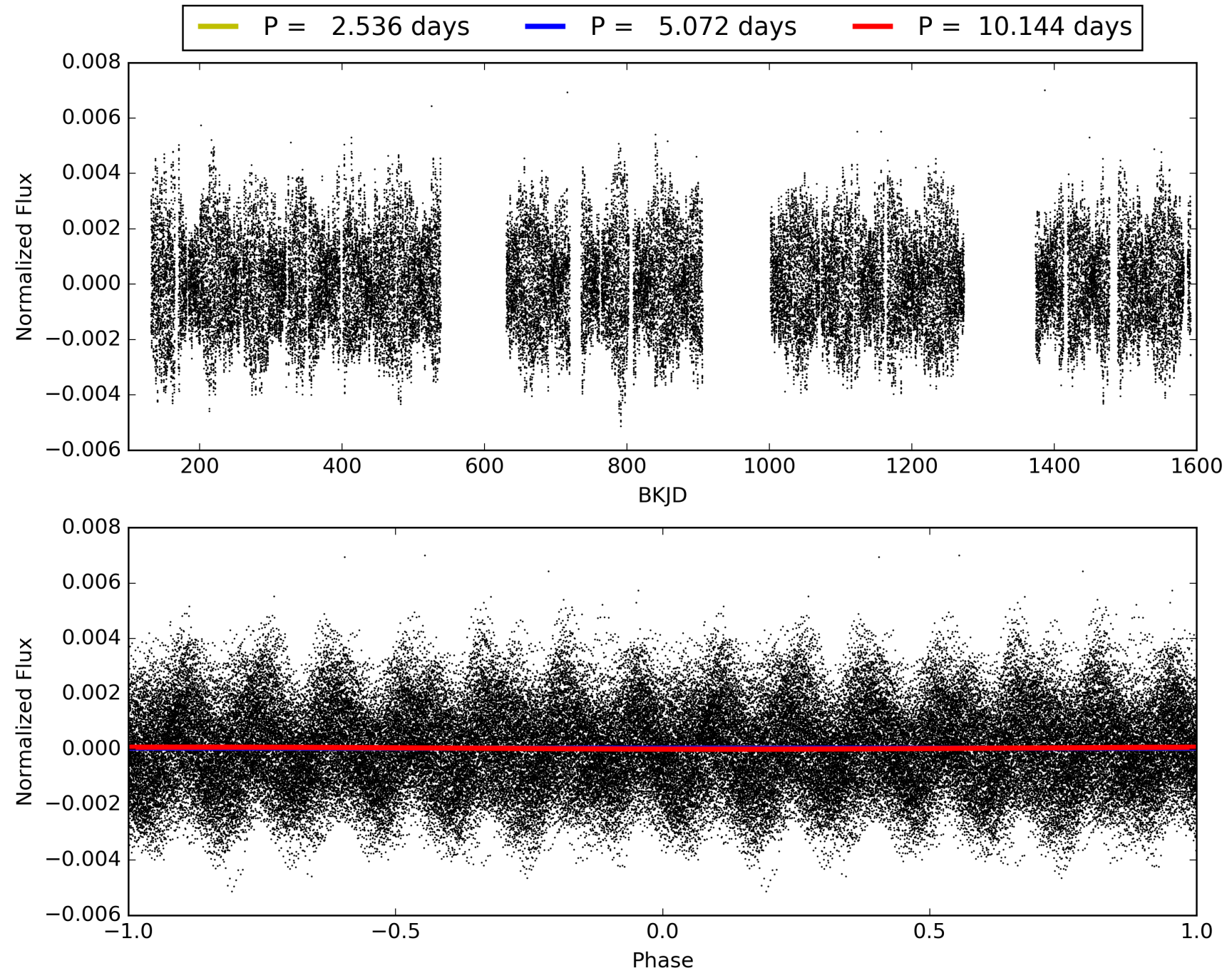
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:27:58 Z

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

TCE 004074640-06, PDC Light Curves

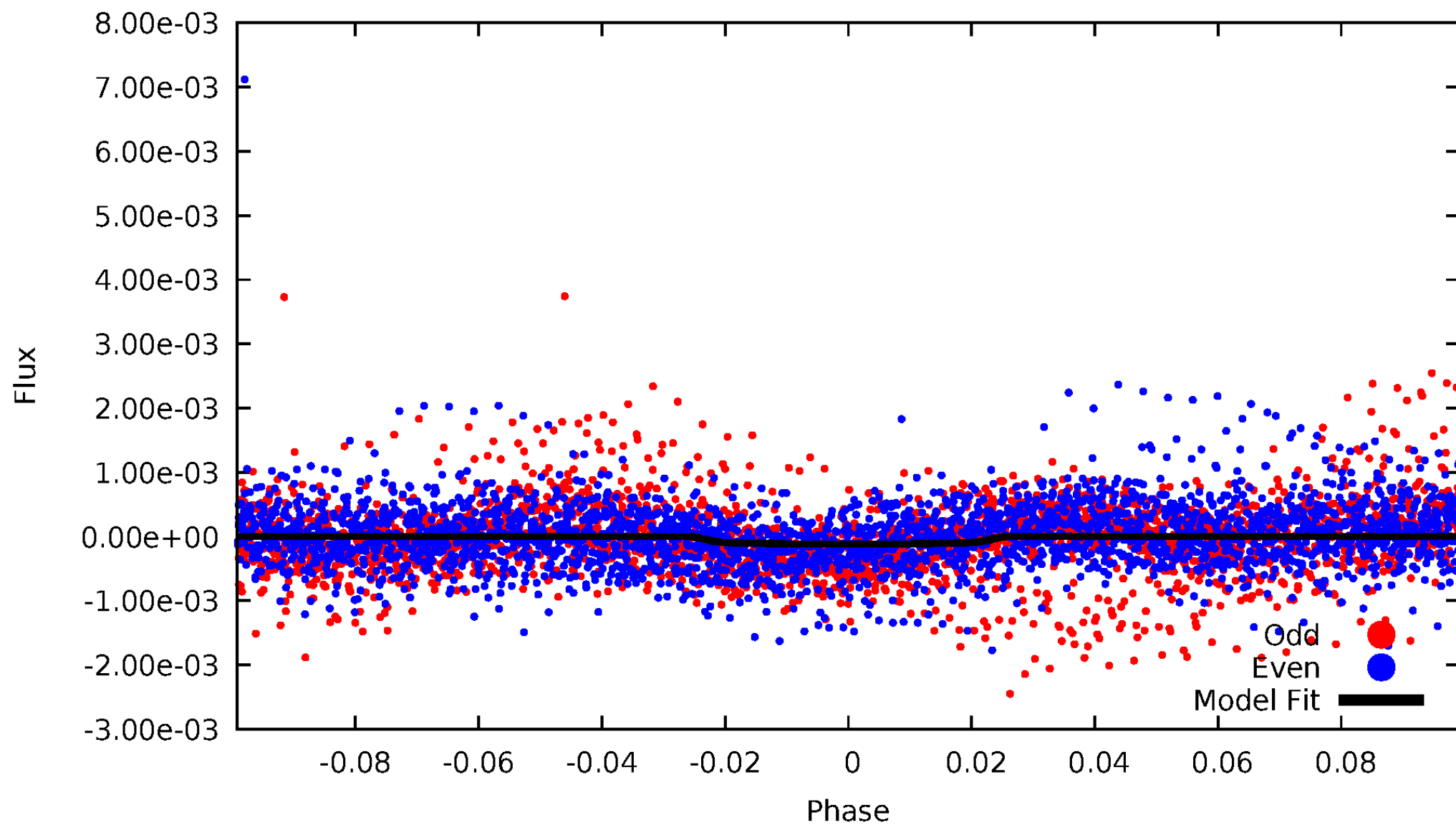


TCE 004074640-06



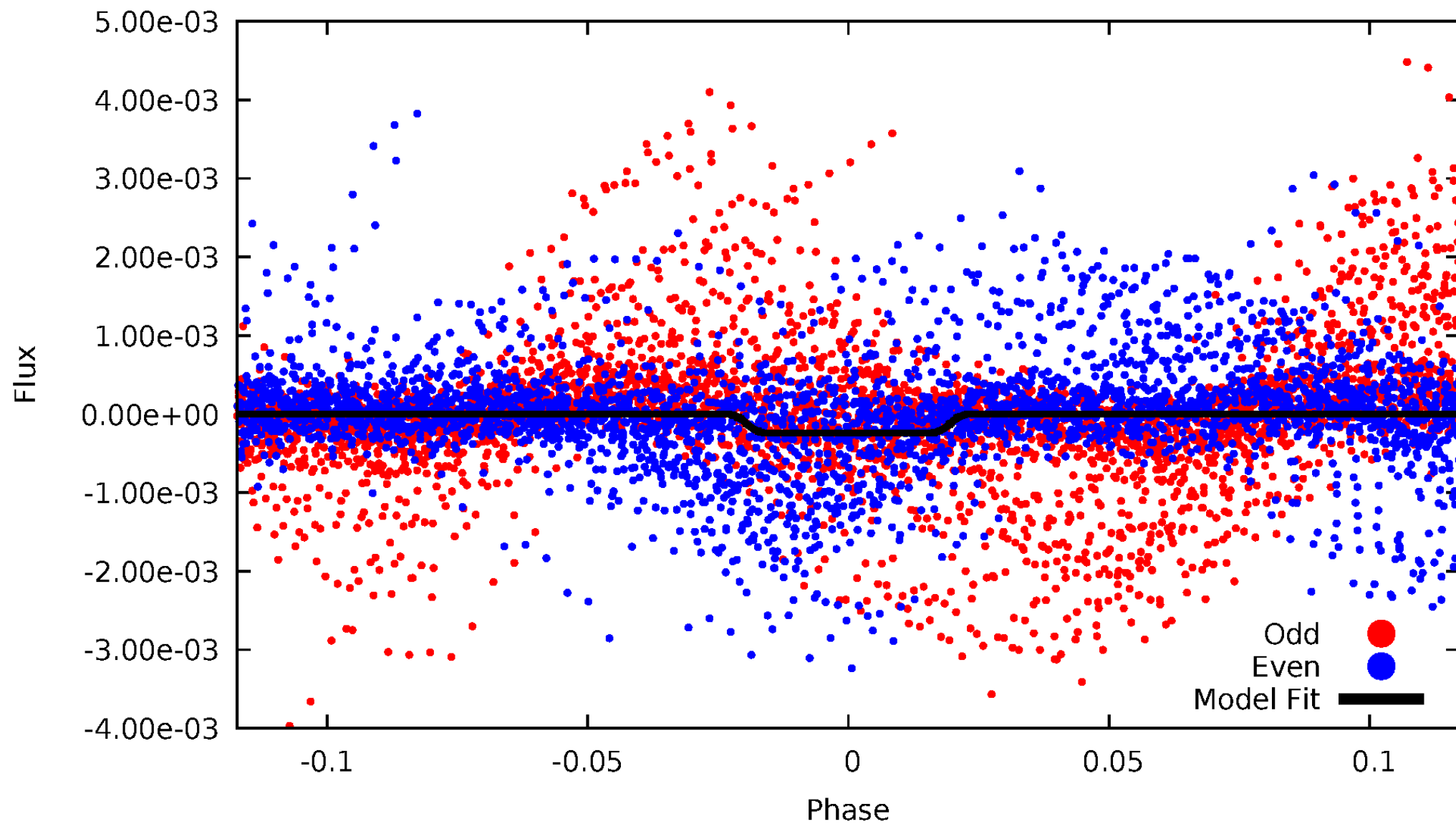
DV Odd/Even

TCE 004074640-06



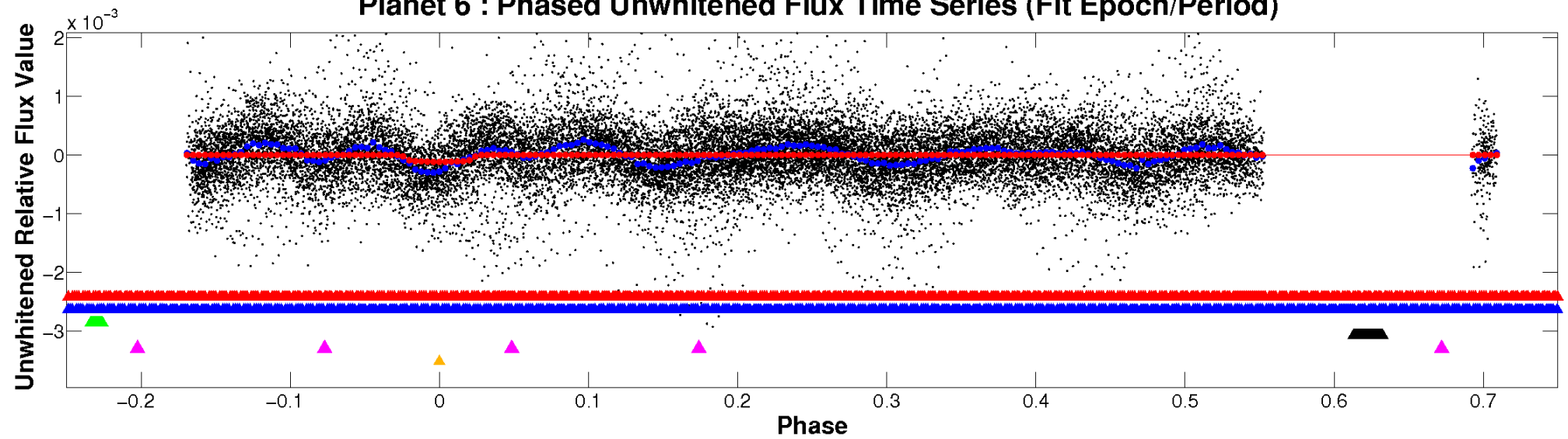
ALT Odd/Even

TCE 004074640-06

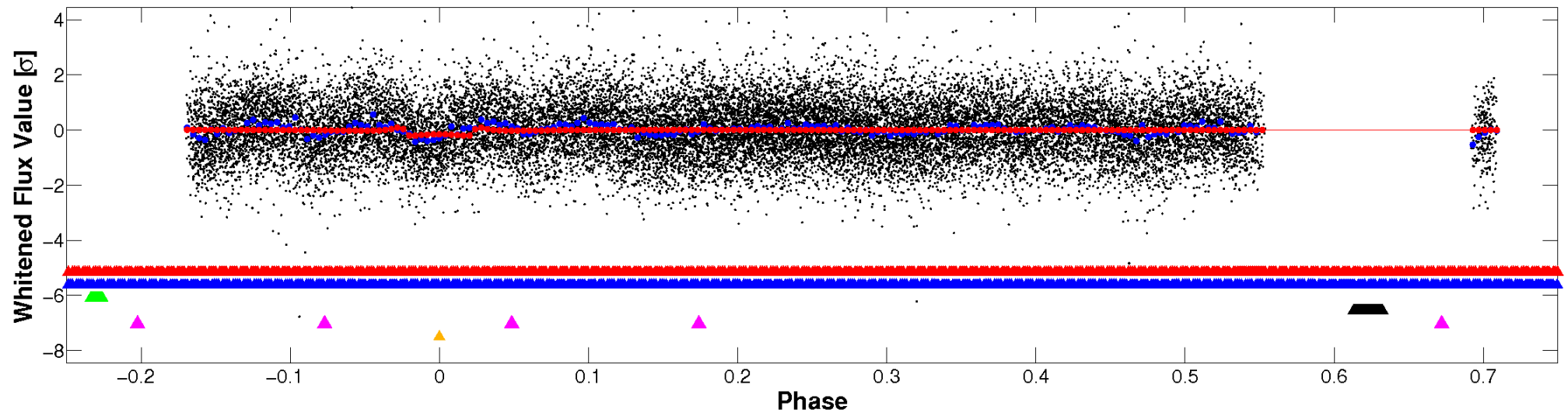


Non-Whitened Vs. Whitened Light Curve

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

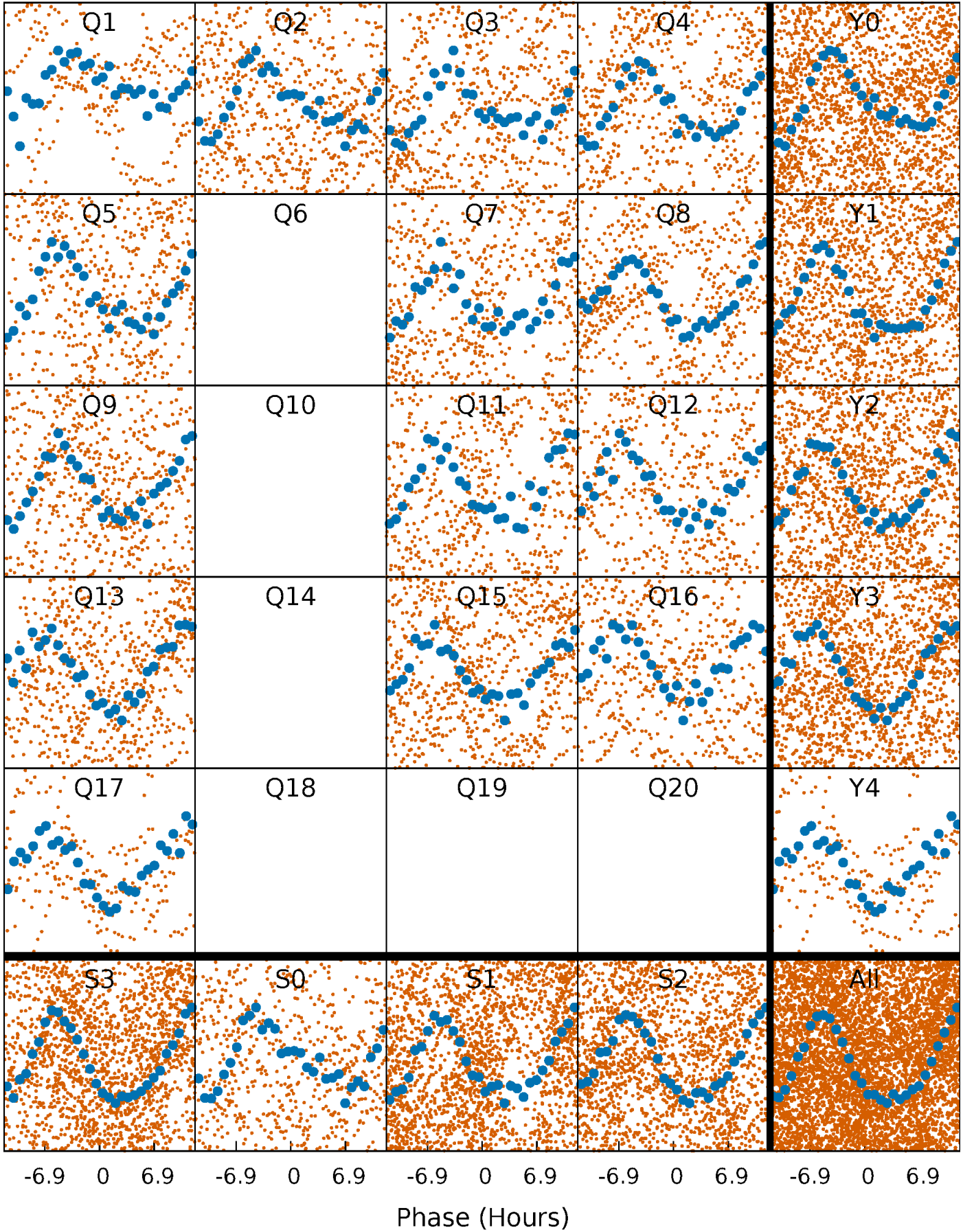


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



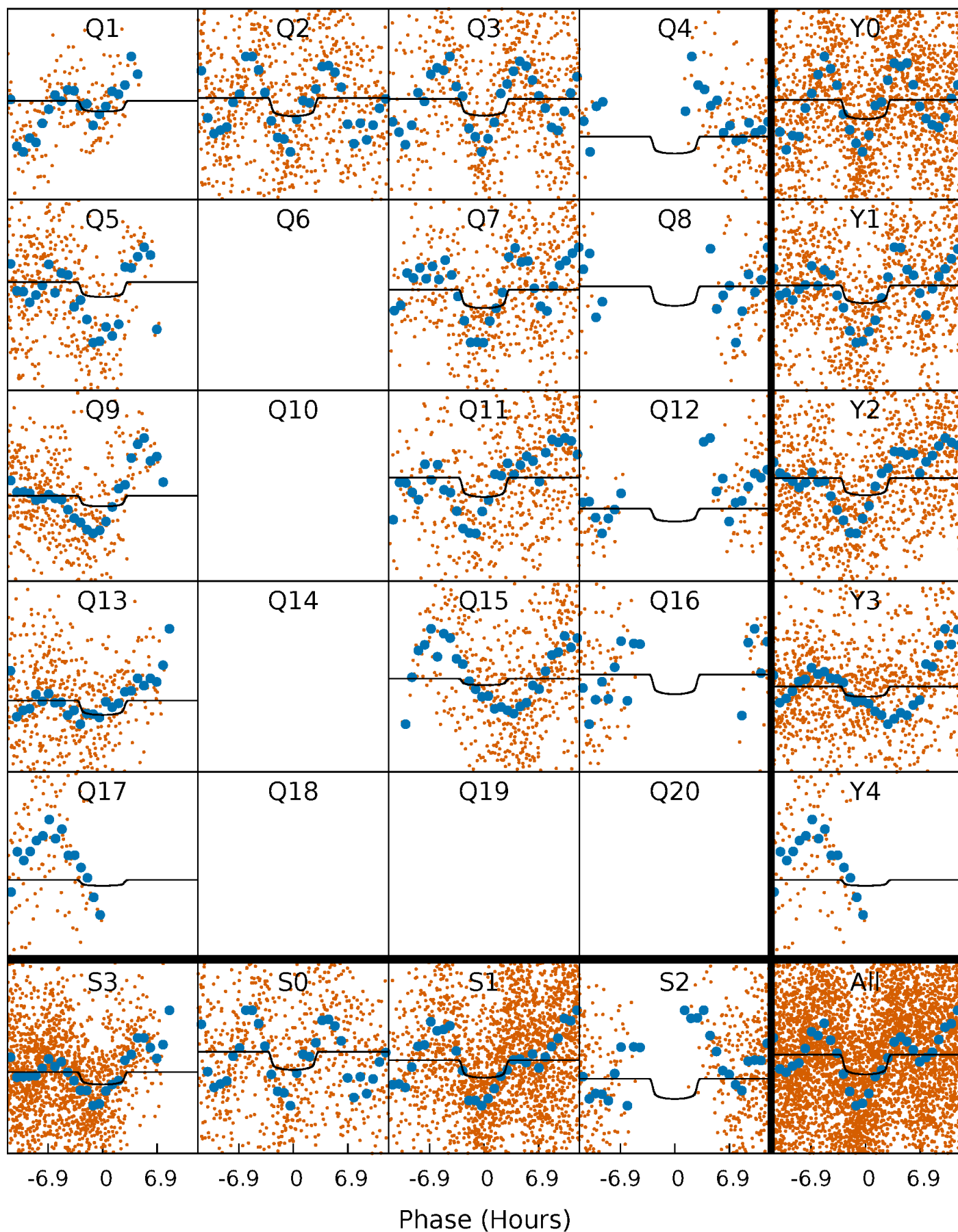
PDC Quarter-Phased Transit Curves

TCE 004074640-06 $P = 5.072165$ Days $T_0 = 135.733937$ (BKJD)



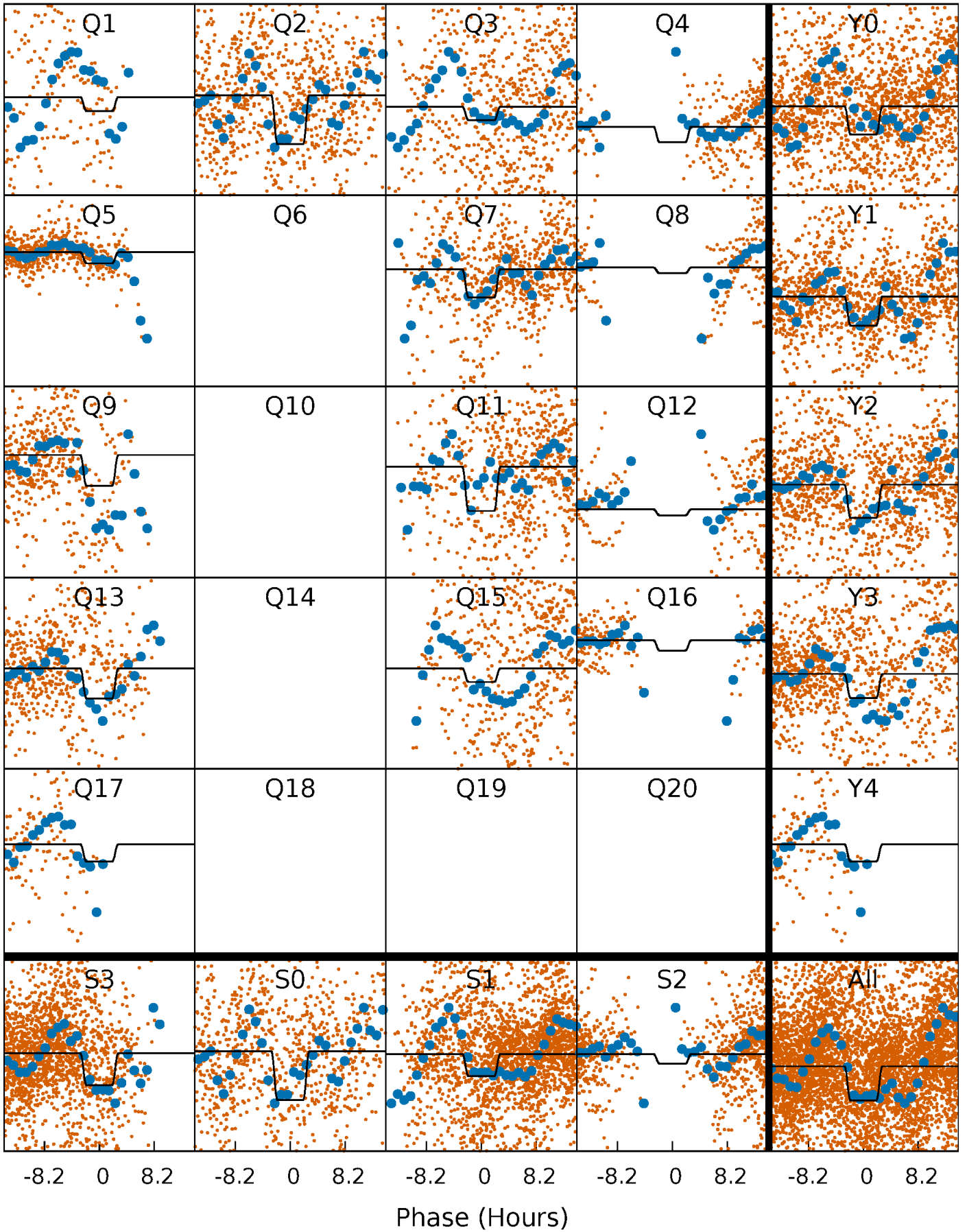
DV Quarter-Phased Transit Curves

TCE 004074640-06 P= 5.072165 Days $T_0=135.733937$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

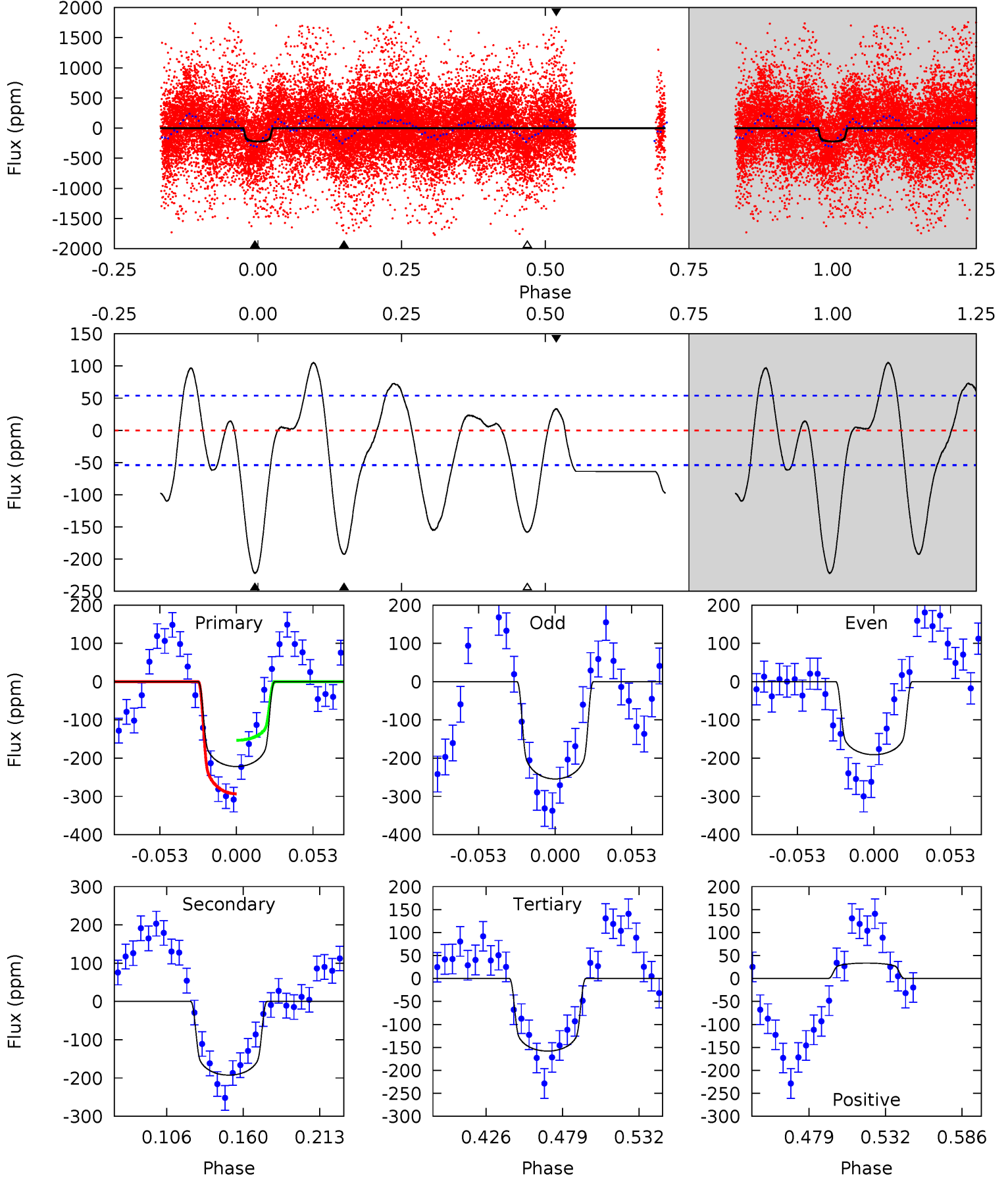
TCE 004074640-06 P= 5.072050 Days $T_0=135.756462$ (BKJD)



DV Model-Shift Uniqueness Test

004074640-06, P = 5.072165 Days, E = 130.661772 Days

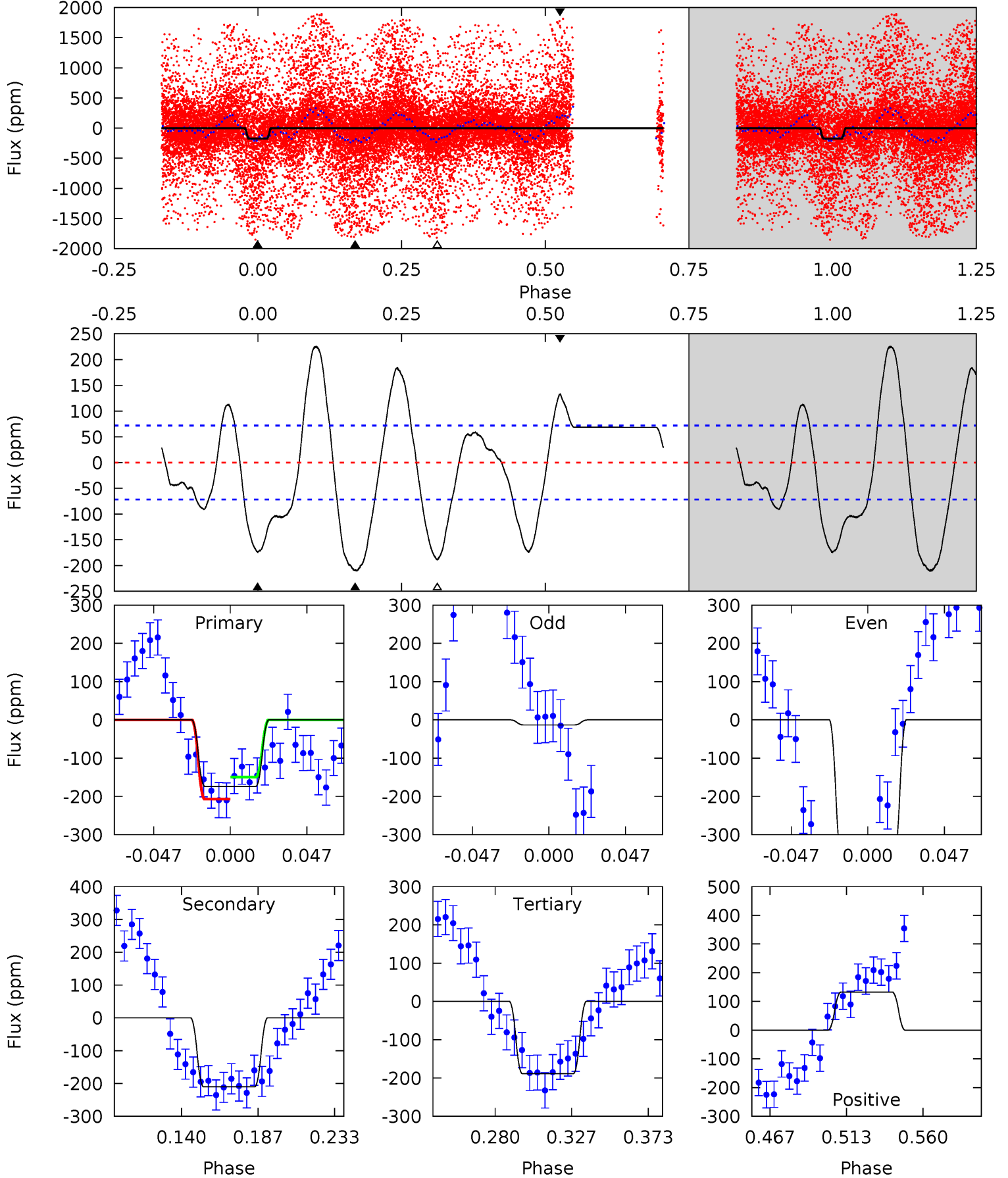
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.3	16.7	13.7	2.91	4.70	1.93	6.09	5.54	16.4	2.99	13.8	2.78	1.02	0.32	6.10



Alt Model-Shift Uniqueness Test

004074640-06, P = 5.072050 Days, E = 130.684412 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	13.8	12.4	8.73	4.72	1.99	6.98	-0.97	2.68	1.42	5.07	11.5	1.40	0.52	2.01



Stellar Parameters For KIC 004074640

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6651^{+159}_{-218}	$4.379^{+0.067}_{-0.202}$	$-0.220^{+0.250}_{-0.300}$	$1.164^{+0.387}_{-0.129}$	$1.187^{+0.182}_{-0.165}$	$1.061^{+0.293}_{-0.547}$
	+2%/-3%	+2%/-5%	+114%/-136%	+33%/-11%	+15%/-14%	+28%/-52%
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 004074640-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-192 ± 12	$1.52^{+0.36}_{-0.35}$	1810^{+129}_{-91}	7374^{+1038}_{-794}	171^{+103}_{-60}
Alt.	-210 ± 15	$2.07^{+0.42}_{-0.35}$	1821^{+131}_{-92}	6381^{+556}_{-455}	99^{+45}_{-29}

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 $A_{obs} \gg 1.0$

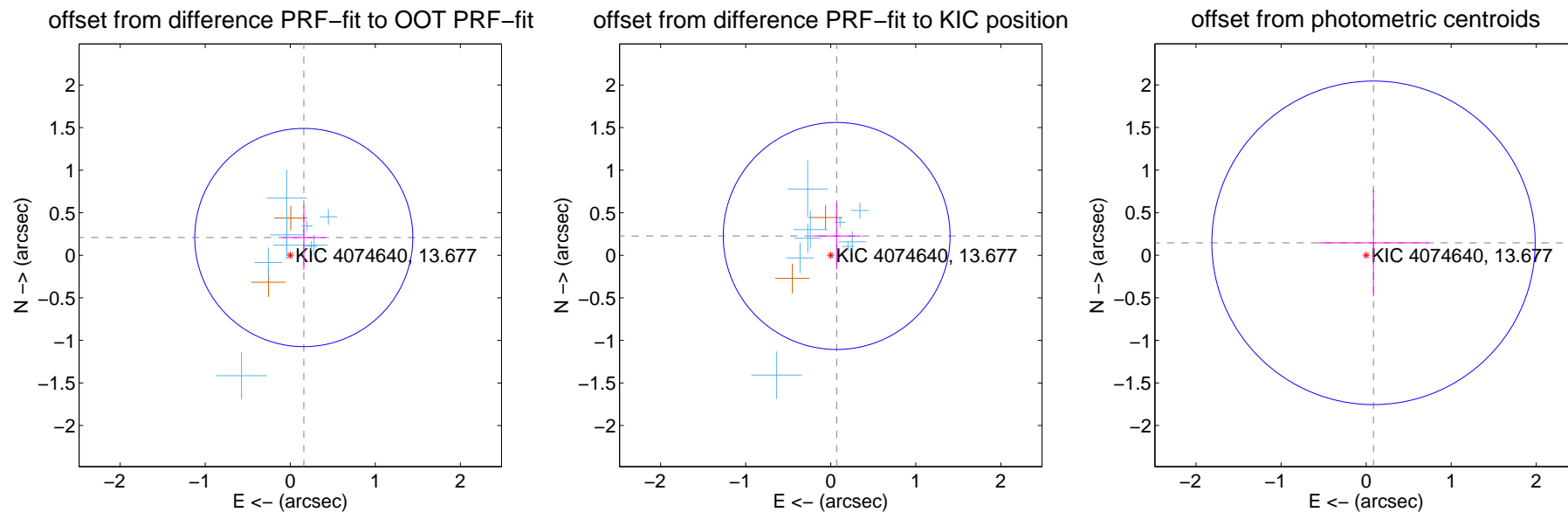
DV Centroid Data

Supplemental centroid analysis for 004074640-06. Kepler magnitude: 13.68. Transit SNR 6.51

There are 10 quarters with good PRF difference image offsets

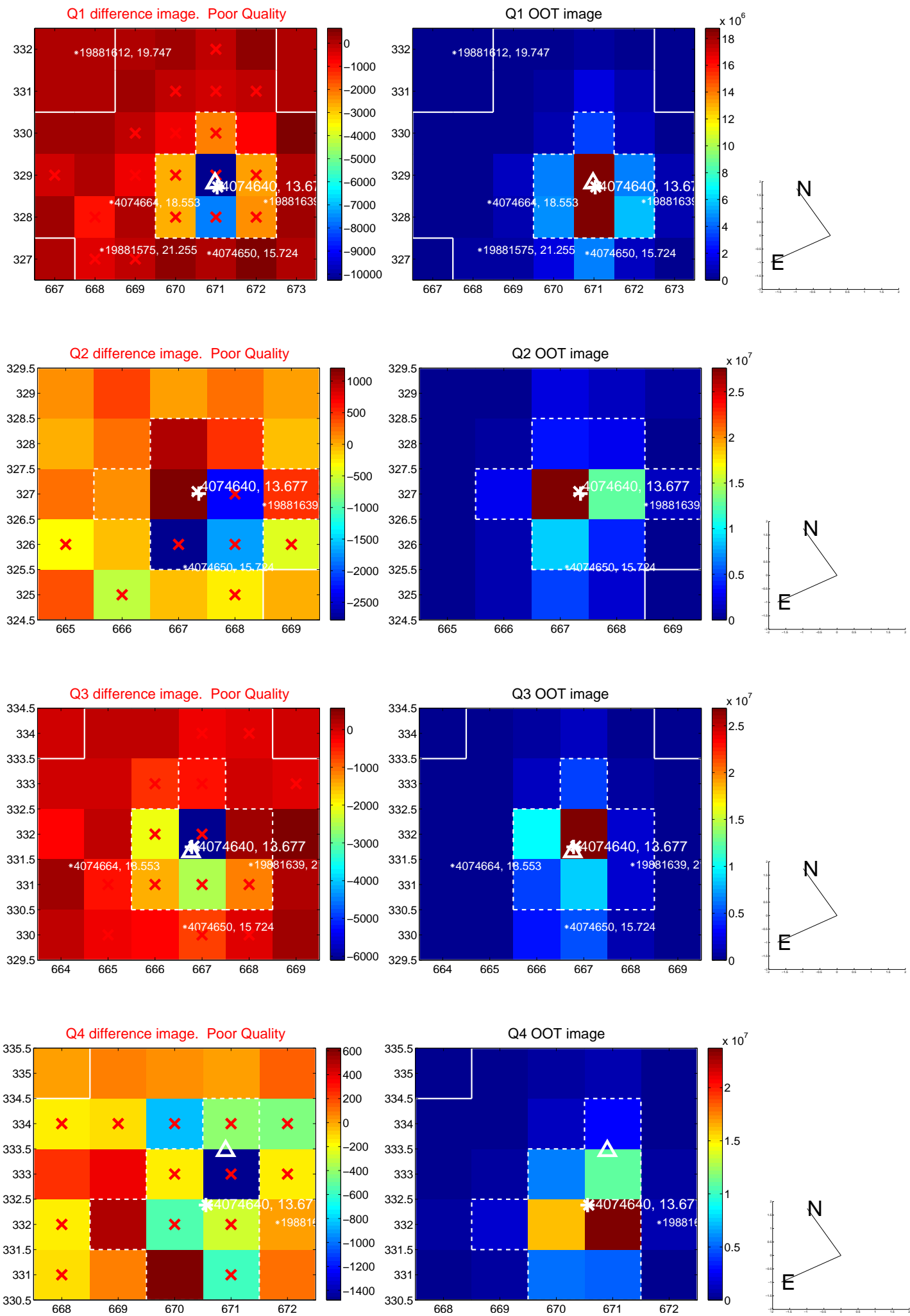
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.262 ± 0.427	0.61	-0.159 ± 0.251	0.208 ± 0.379
PRF-fit source offset from KIC position	0.237 ± 0.444	0.53	-0.070 ± 0.286	0.227 ± 0.394
photometric centroid source offset	0.17 ± 0.63	0.27	-0.09 ± 0.65	0.15 ± 0.63

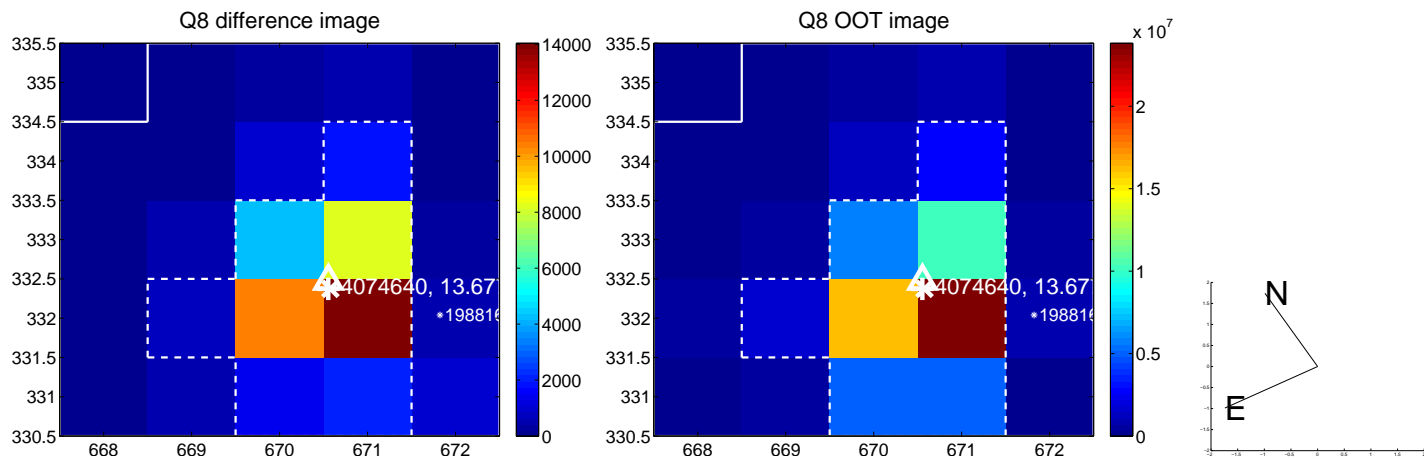
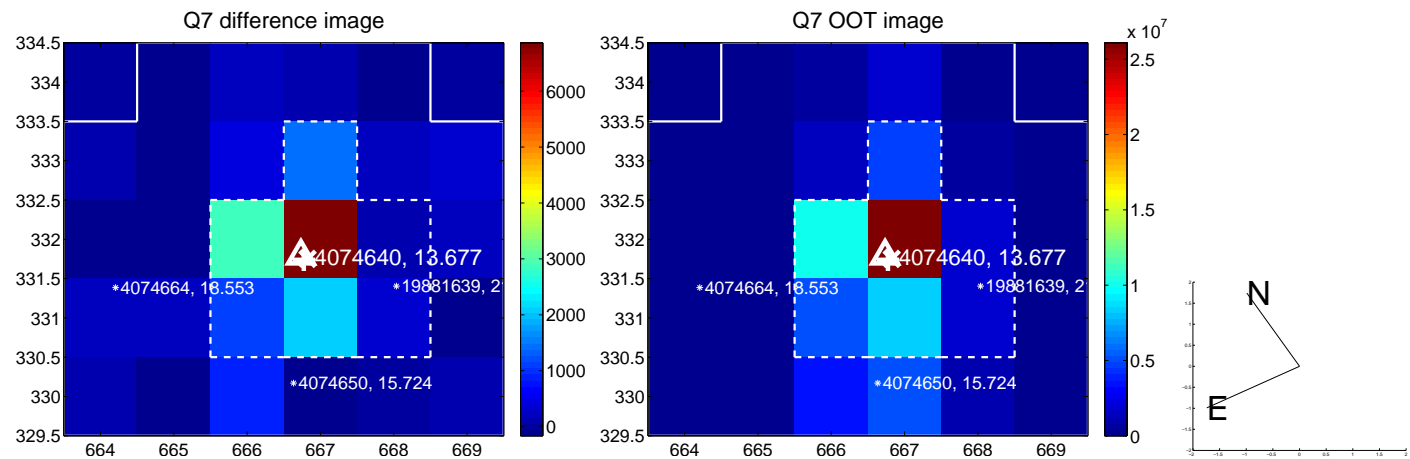
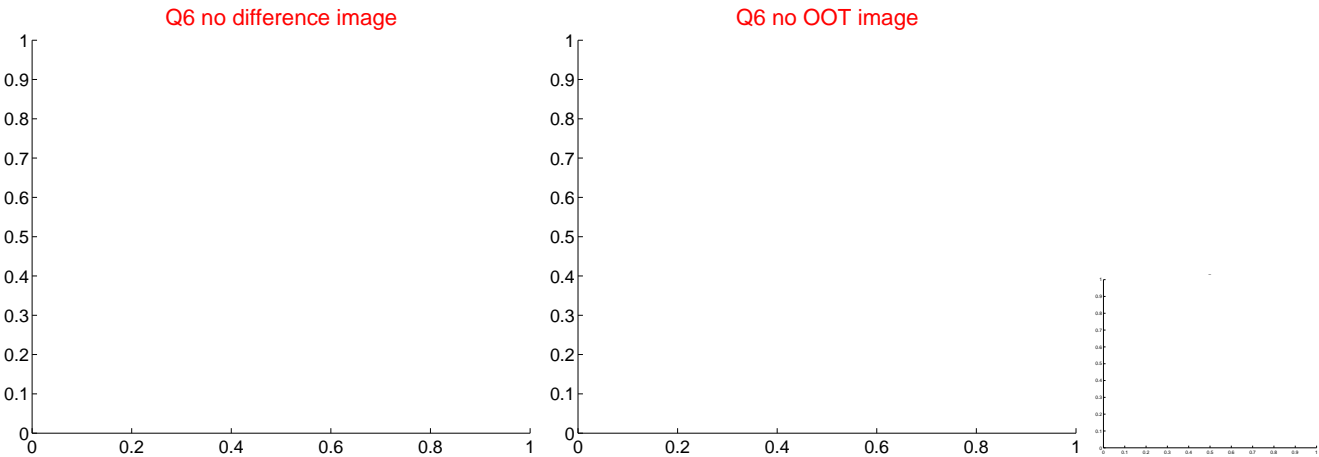
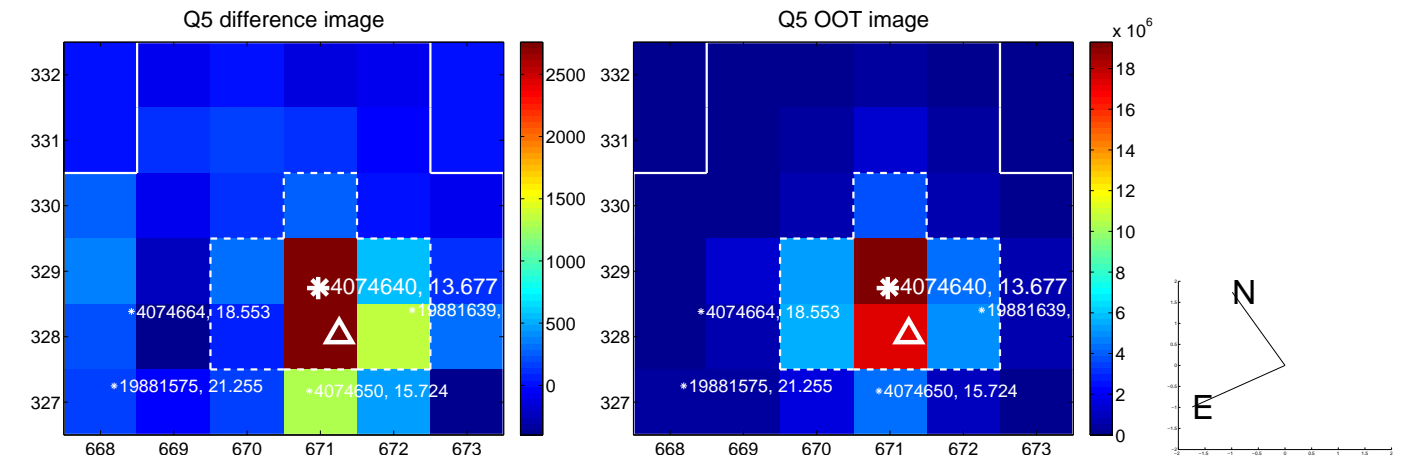


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

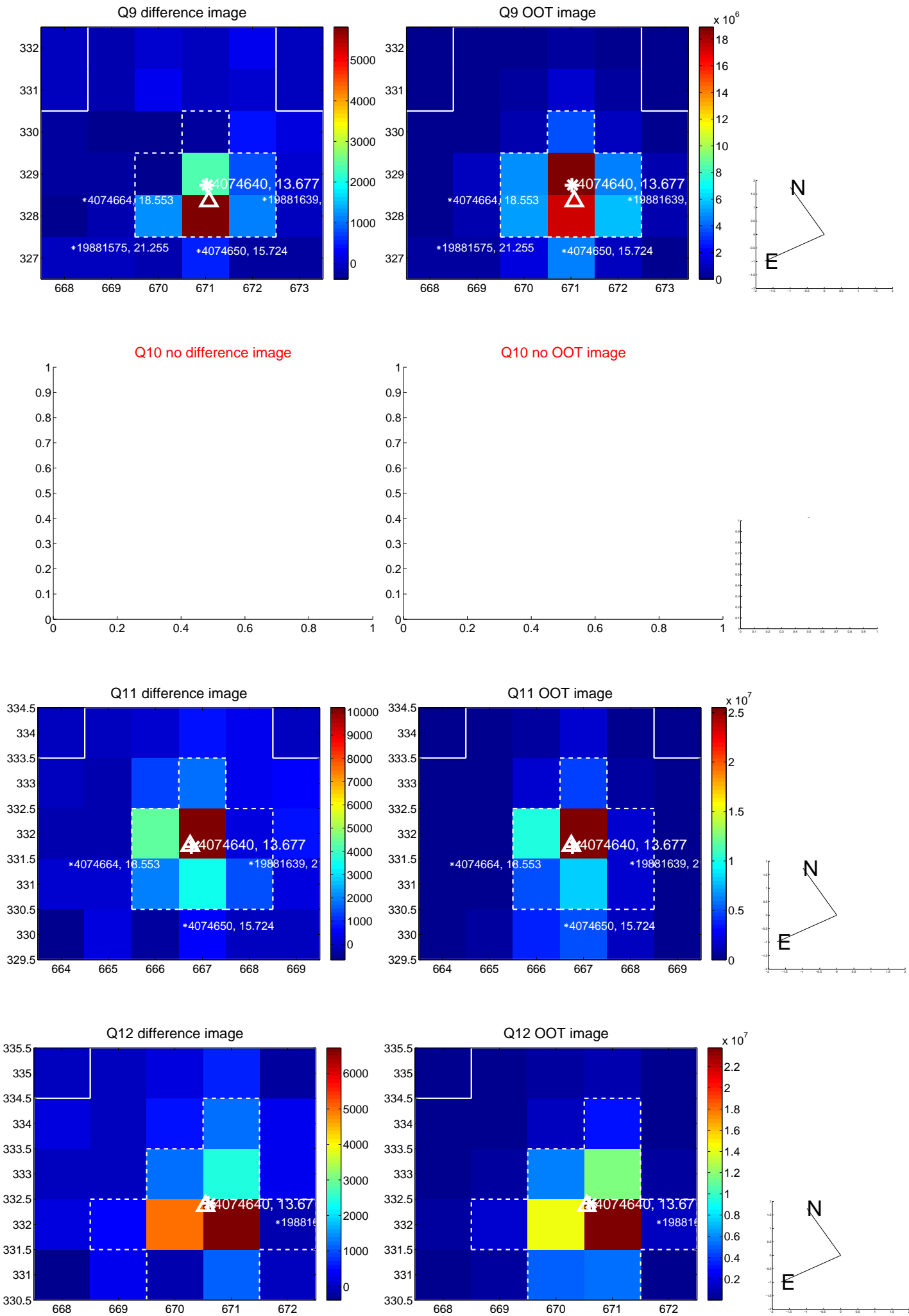
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



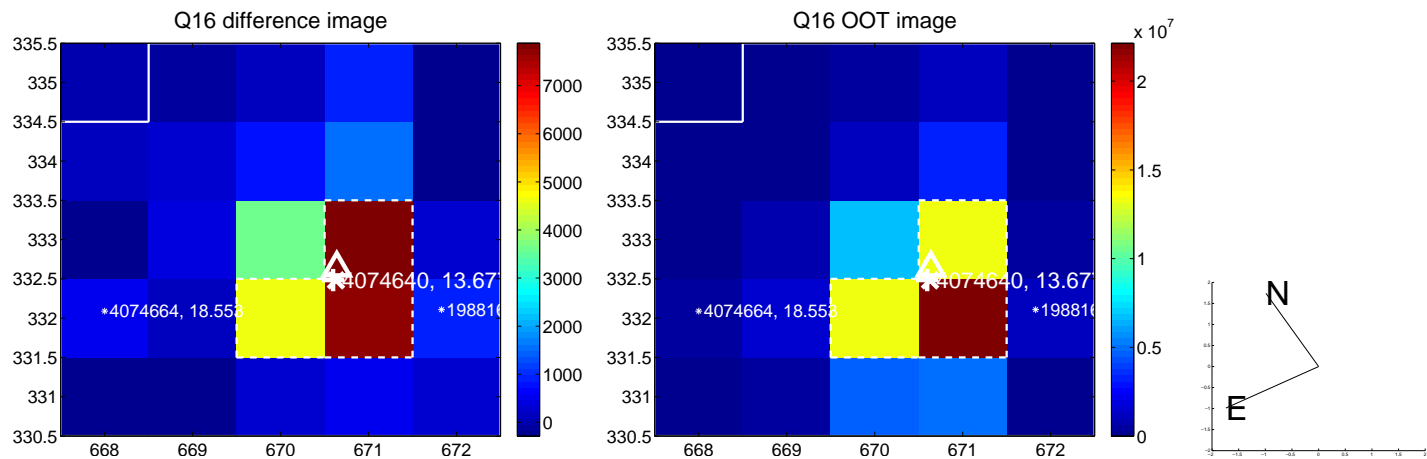
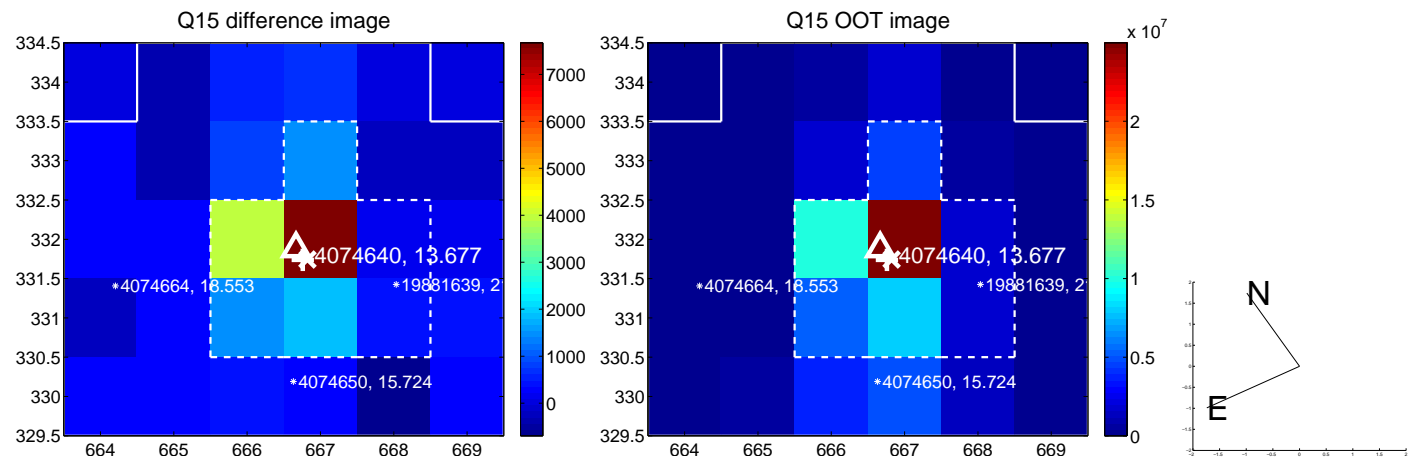
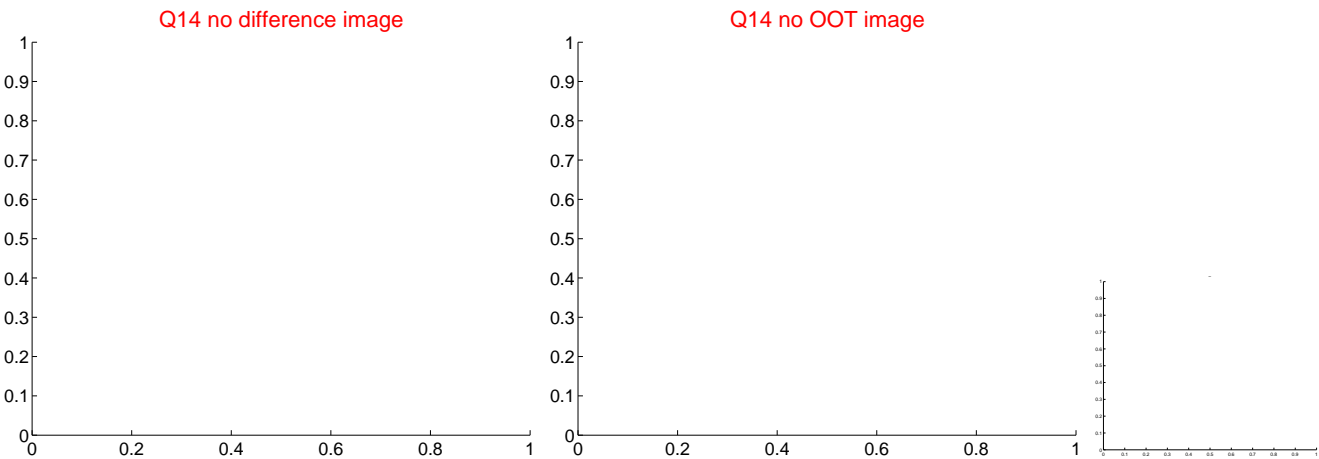
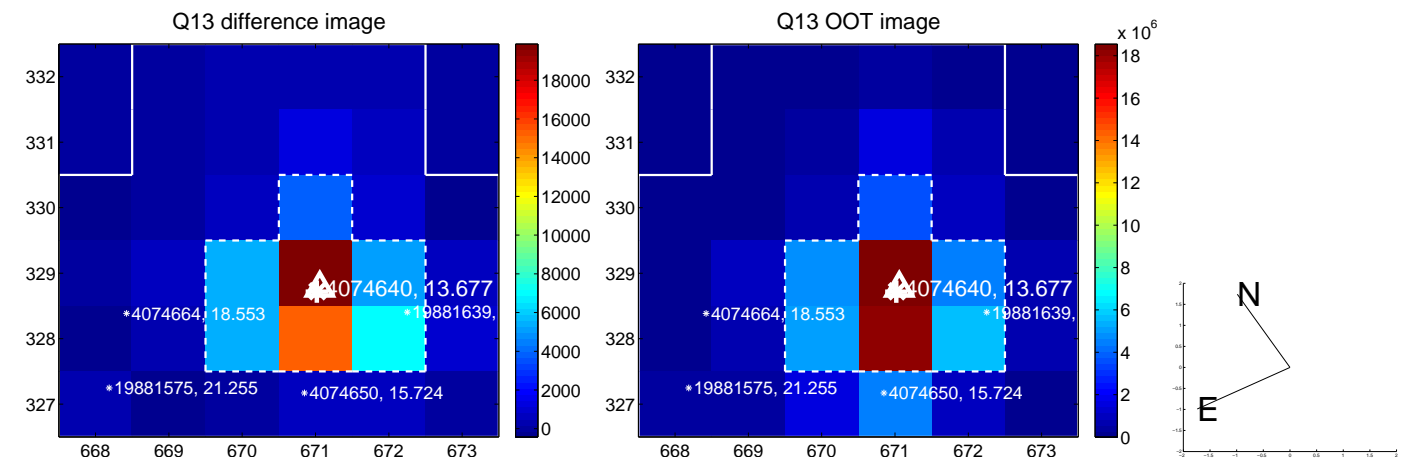
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



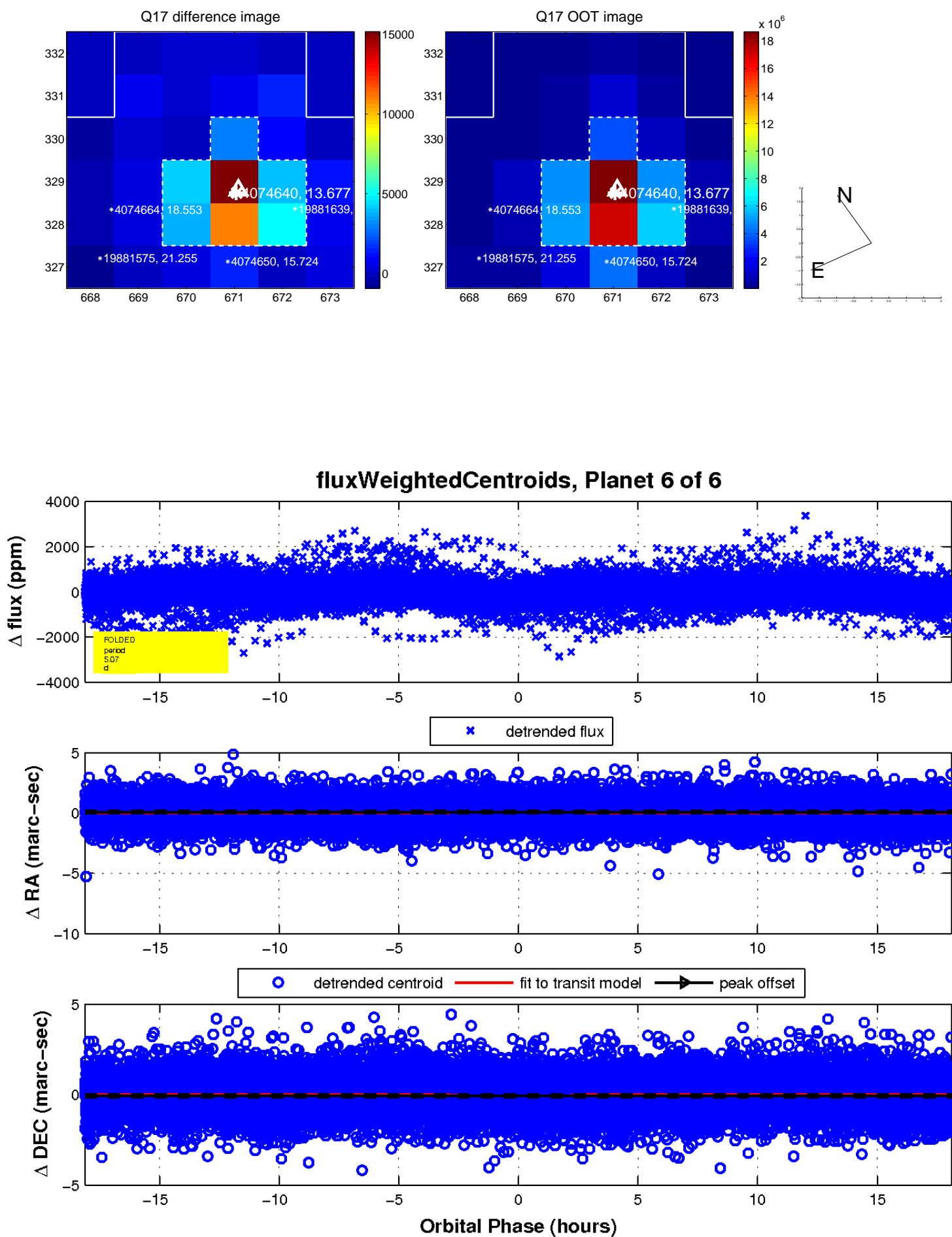
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

