

KIC 008038609

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})
008038609-01	OBS	No	1.395068	131.913390	105.1	8.865	11.1	13.0	3.61	7776	3.72	44819.14
008038609-02	OBS	No	123.257322	190.010233	5300.4	9.911	29.0	16.6	3.61	7776	47.11	113.90
008038609-04	OBS	No	404.411488	365.577043	5470.7	36.648	11.8	8.7	3.61	7776	31.26	23.36
008038609-05	OBS	No	2.226478	132.047519	924.3	22.212	10.7	15.6	3.61	7776	16.53	24030.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008038609-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
008038609-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008038609-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED
008038609-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

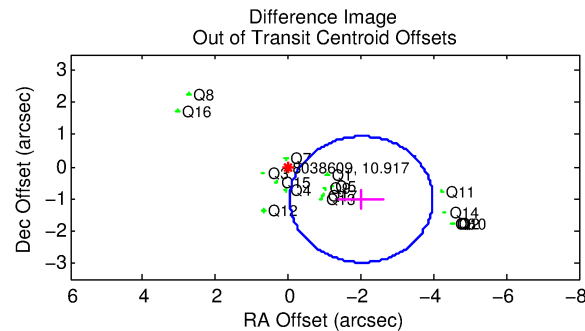
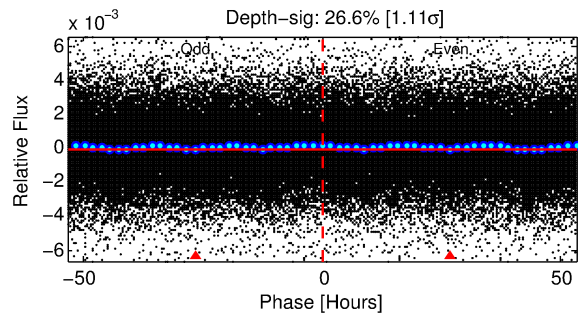
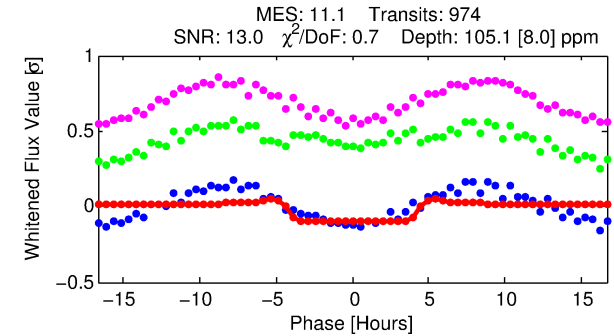
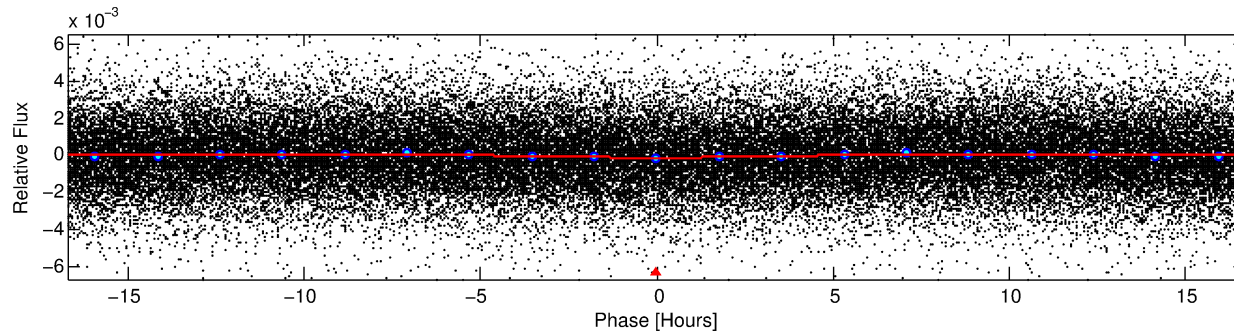
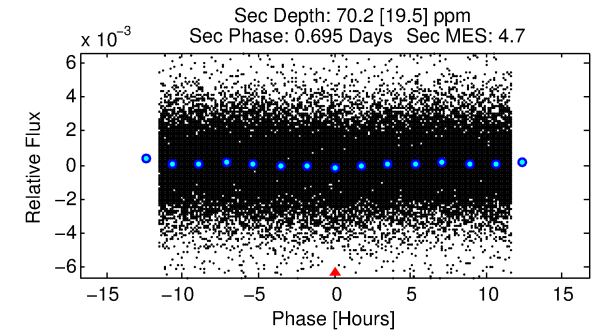
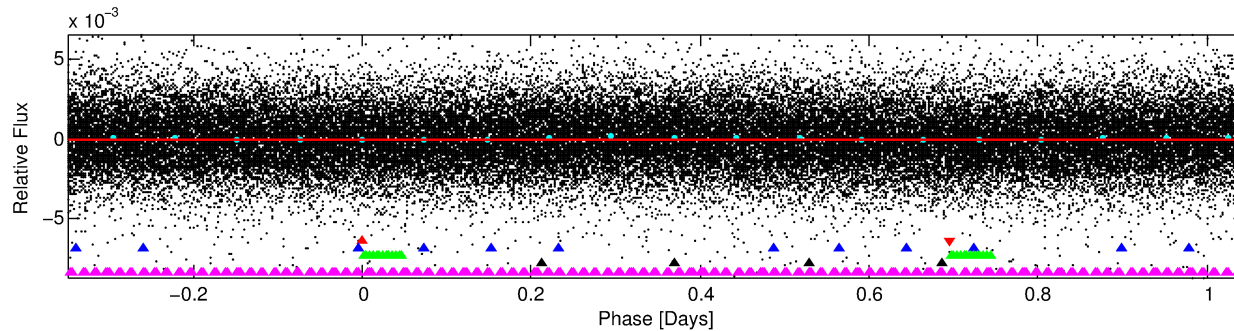
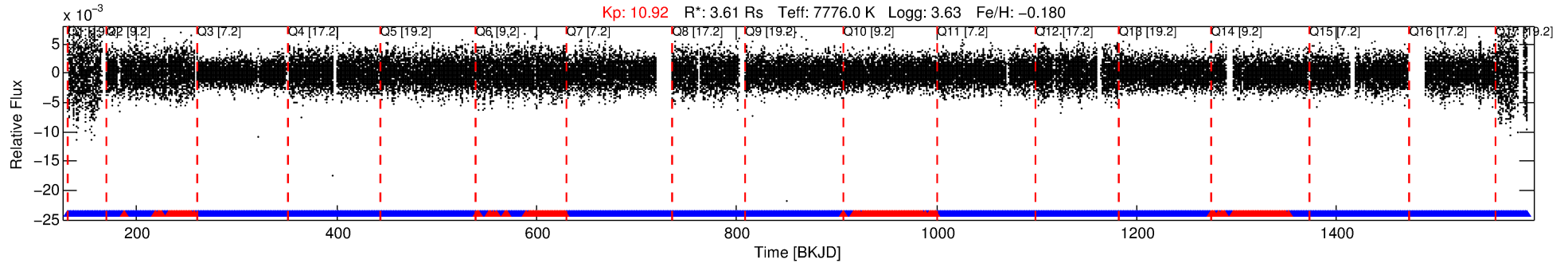
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008038609-01

No Significant Match Found

DV One-Page Summary

KIC: 8038609 Candidate: 1 of 5 Period: 1.395 d



DV Fit Results:

Period = 1.39507 [0.00001] d
Epoch = 131.9134 [0.0055] BKJD
 $R_p/R^* = 0.0095$ [0.0121]
 $a/R^* = 1.37$ [4.38]
 $b = 0.02$ [435.41]
 $S_{\text{eff}} = 44819.14$ [36501.58]
 $T_{\text{eq}} = 3710$ [755] K
 $R_p = 3.72$ [5.10] R_e
 $a = 0.0309$ [0.0150] AU
 $A_g = 2.65$ [7.17] [0.23σ]
 $T_{\text{effp}} = 7321$ [4736] K [0.75σ]

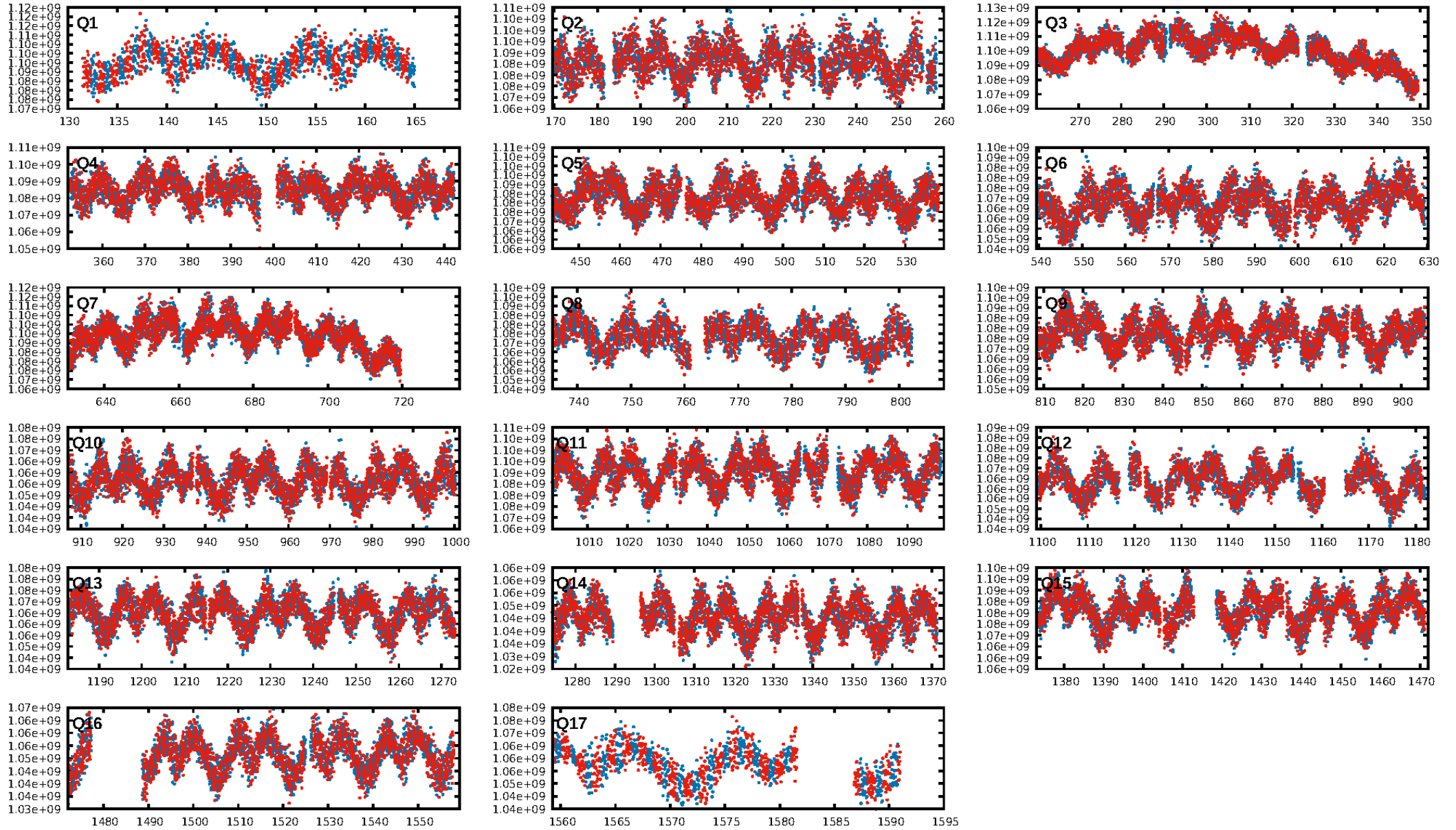
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 59.6% [0.83σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.82 [766/929]
GhostDiagnostic-chr: 1.069
Centroid-sig: 4.1%
Centroid-so: 0.464 arcsec [2.28σ]
OotOffset-rm: 2.252 arcsec [3.44σ]
KicOffset-rm: 2.215 arcsec [3.96σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.76 [13/17]
DiffImageOverlap-fno: 0.00 [0/17]

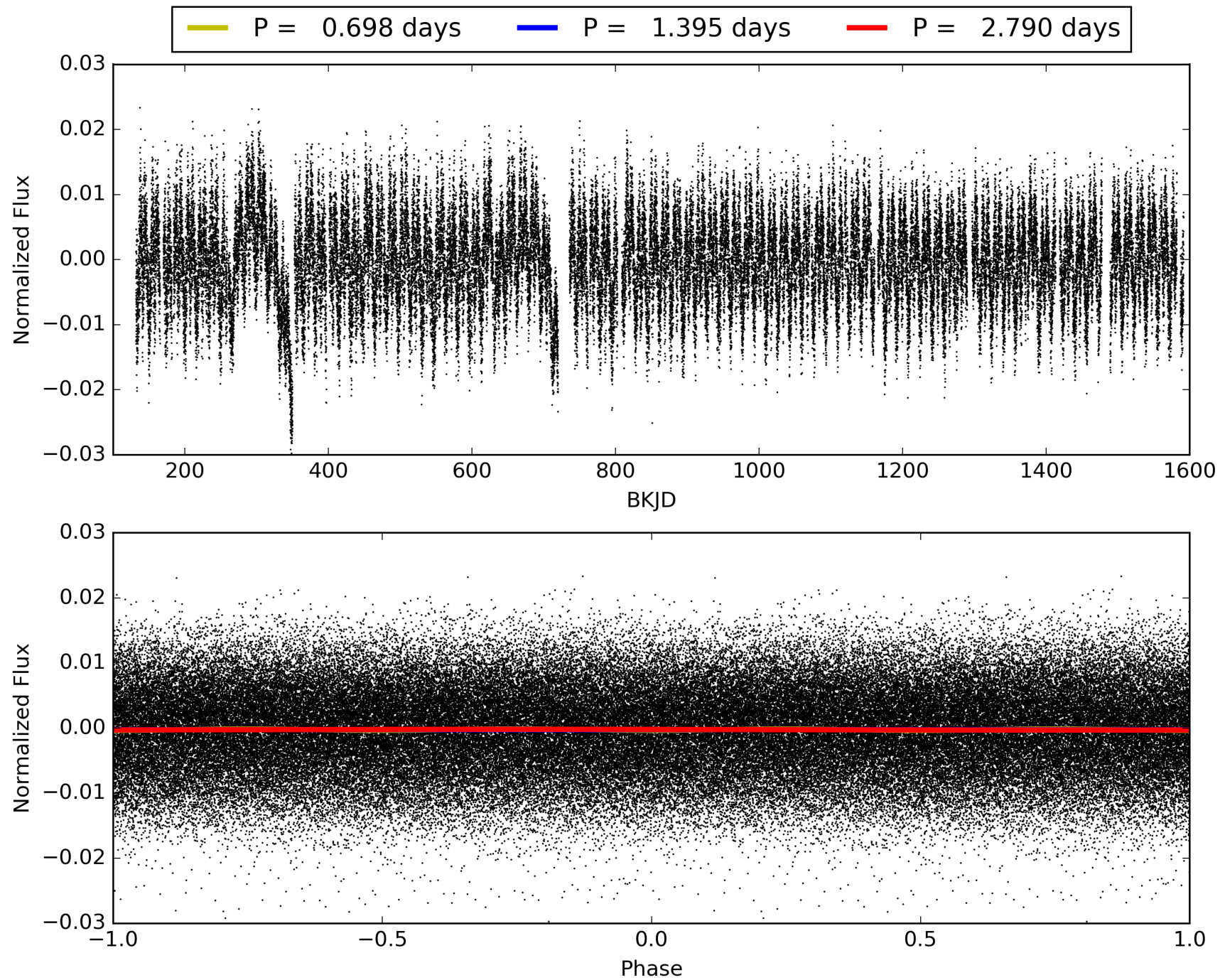
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:13:15 Z

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

TCE 008038609-01, PDC Light Curves

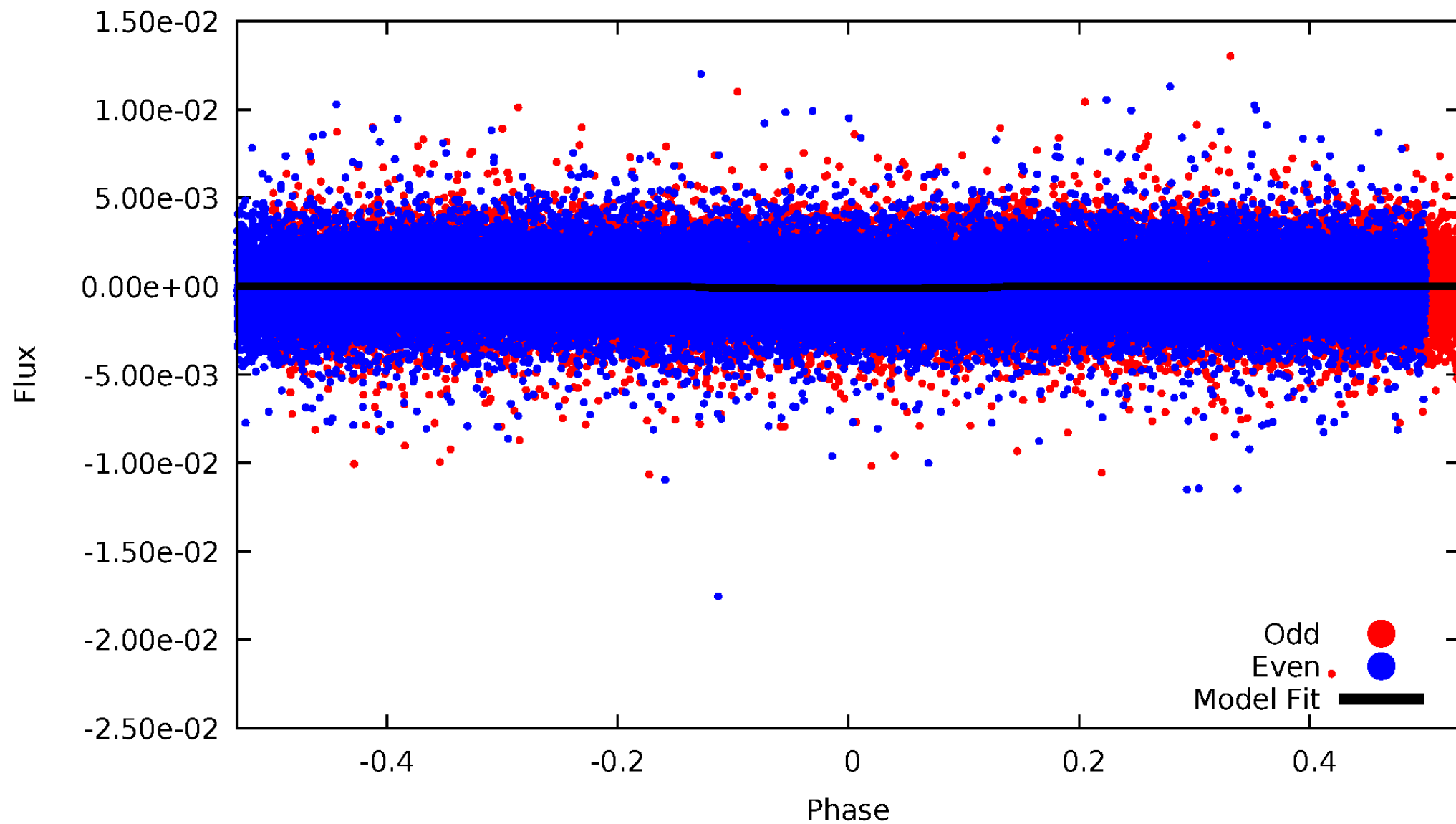


TCE 008038609-01



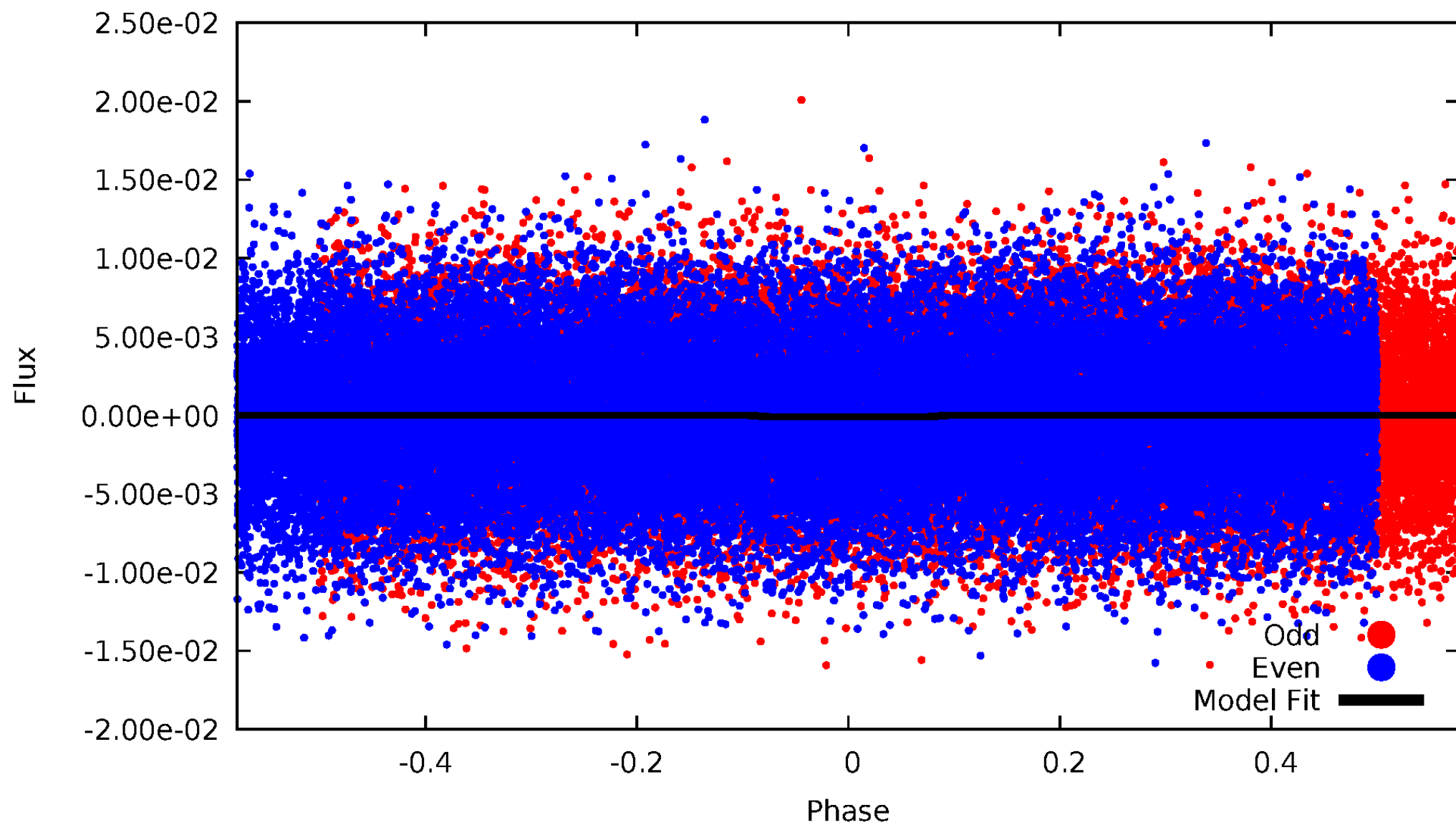
DV Odd/Even

TCE 008038609-01

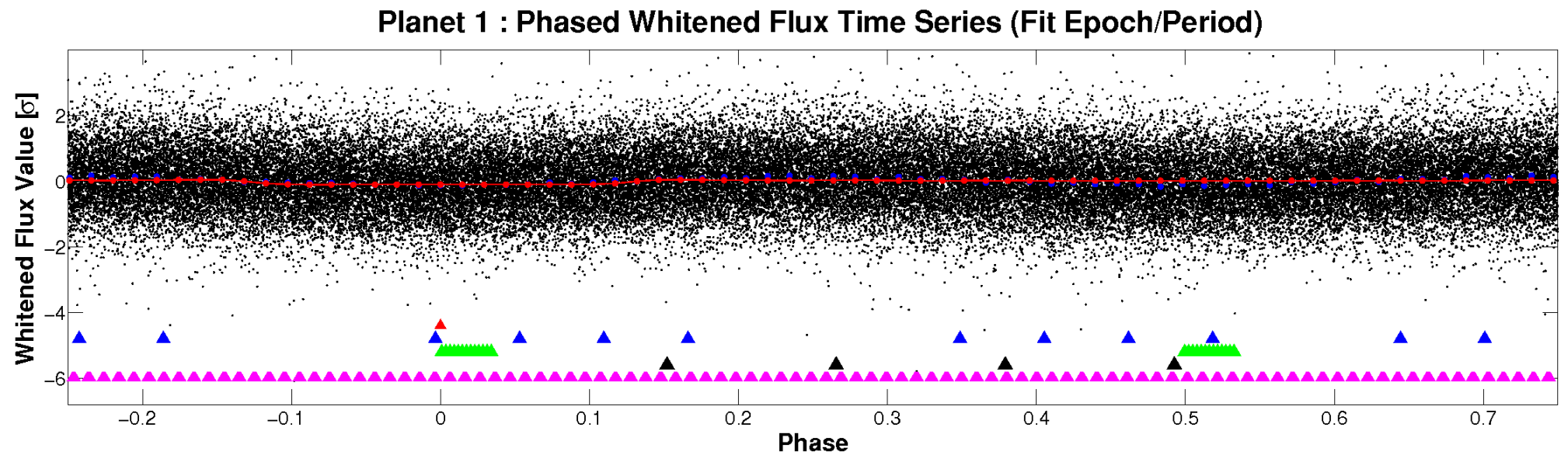
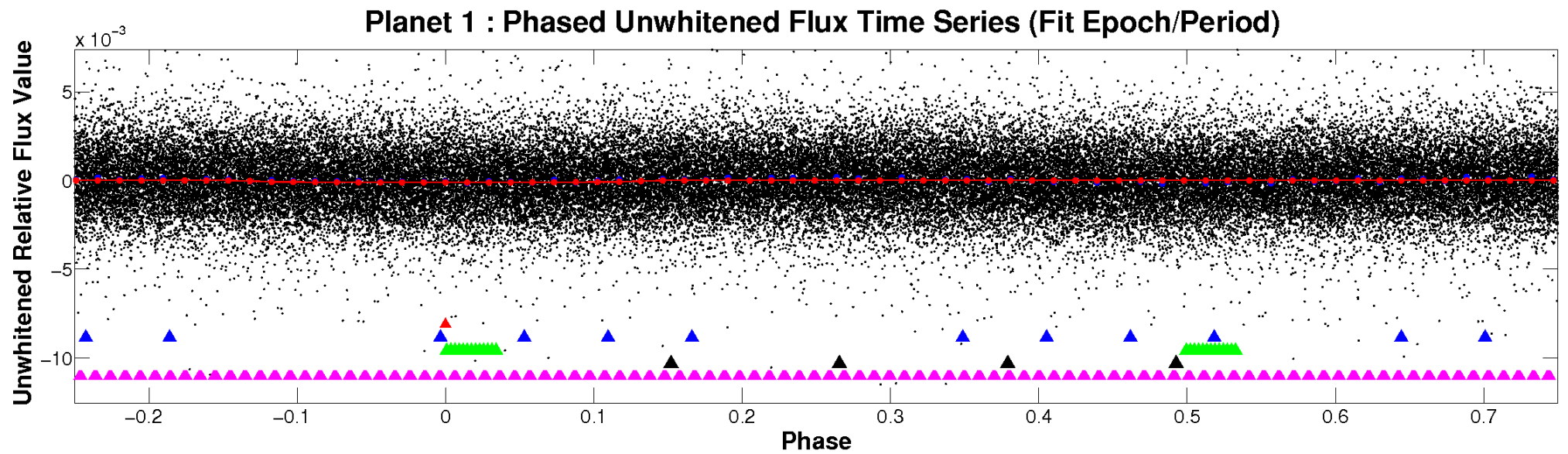


ALT Odd/Even

TCE 008038609-01

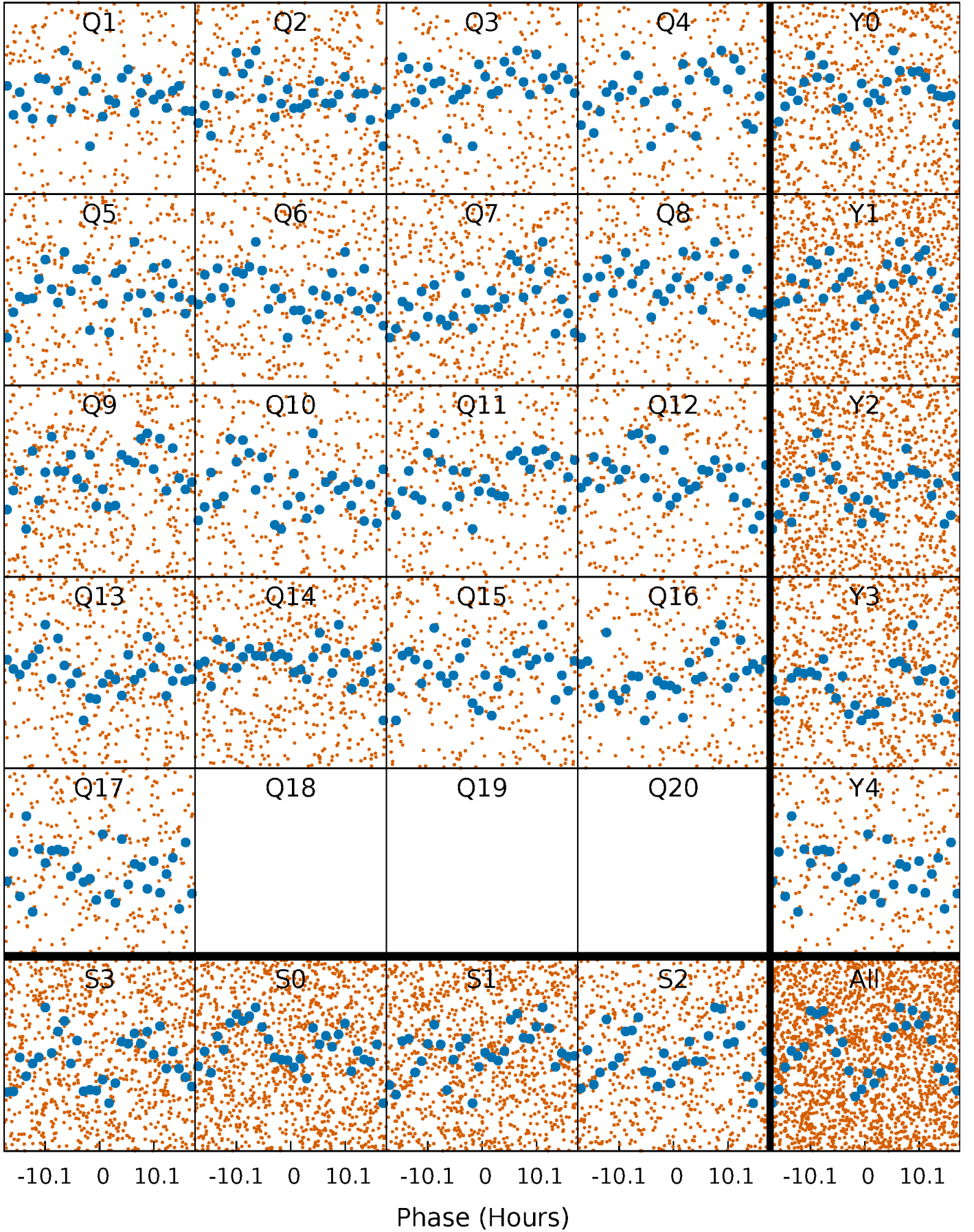


Non-Whitened Vs. Whitened Light Curve



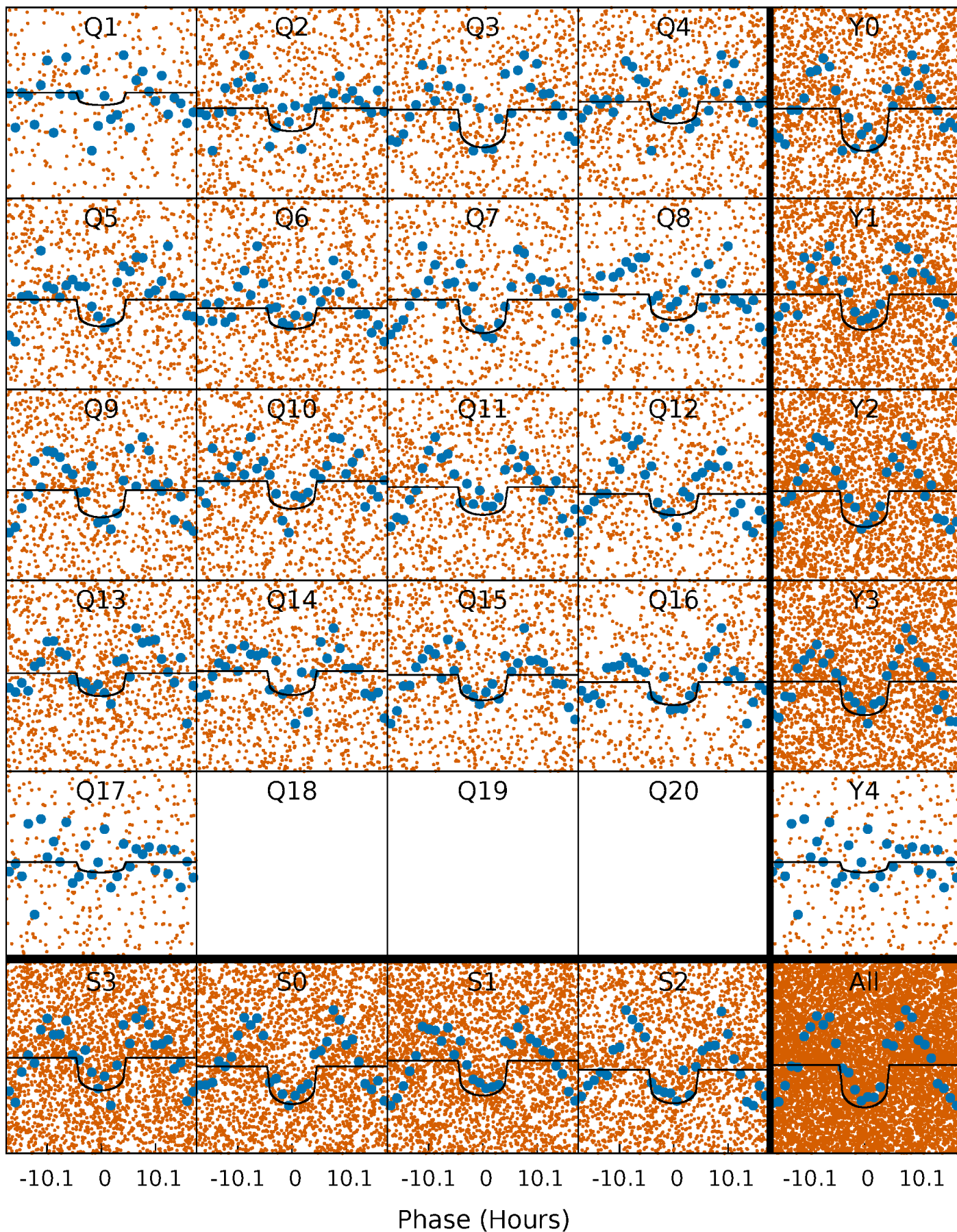
PDC Quarter-Phased Transit Curves

TCE 008038609-01 P= 1.395068 Days $T_0=131.913390$ (BKJD)



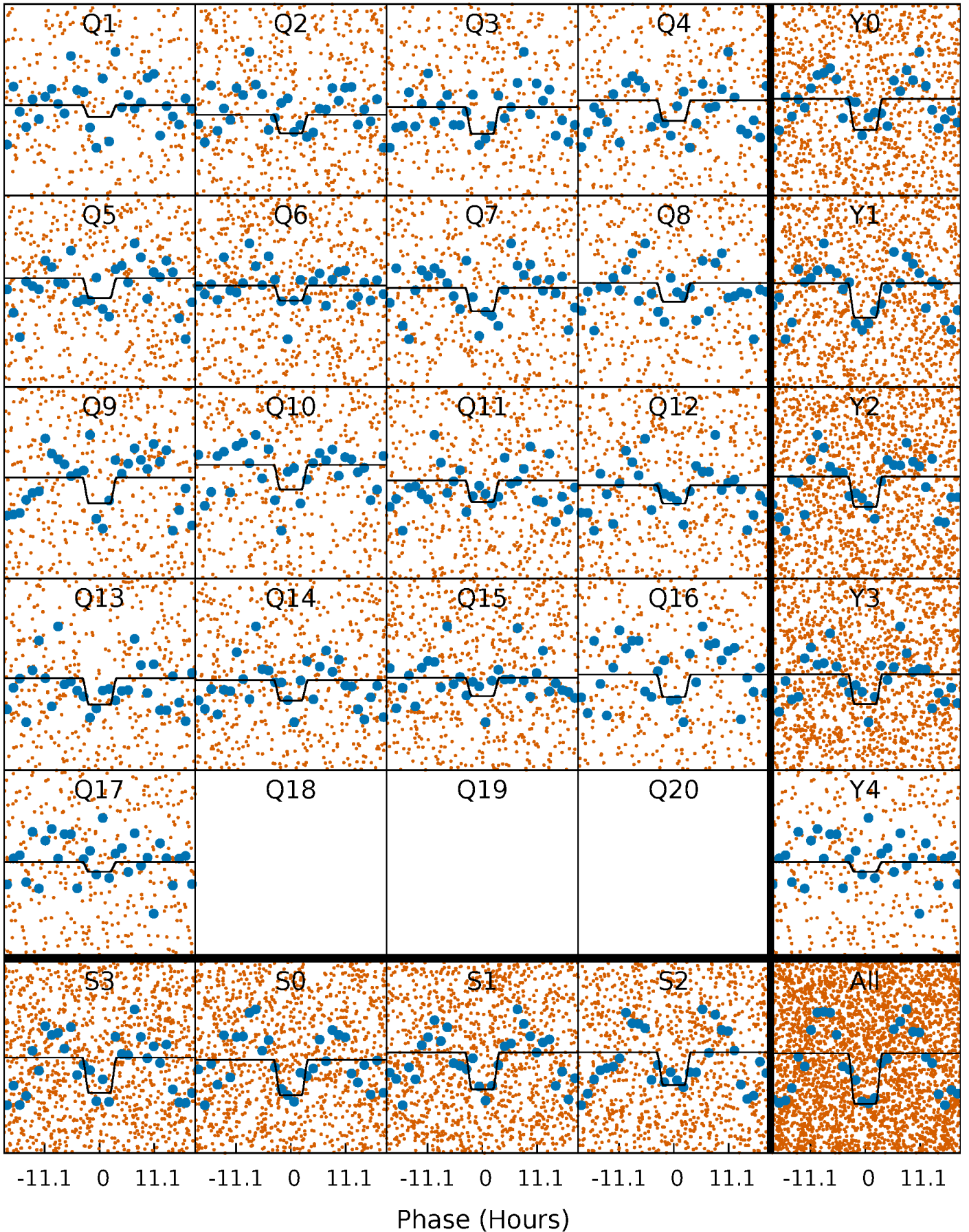
DV Quarter-Phased Transit Curves

TCE 008038609-01 P= 1.395068 Days $T_0=131.913390$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

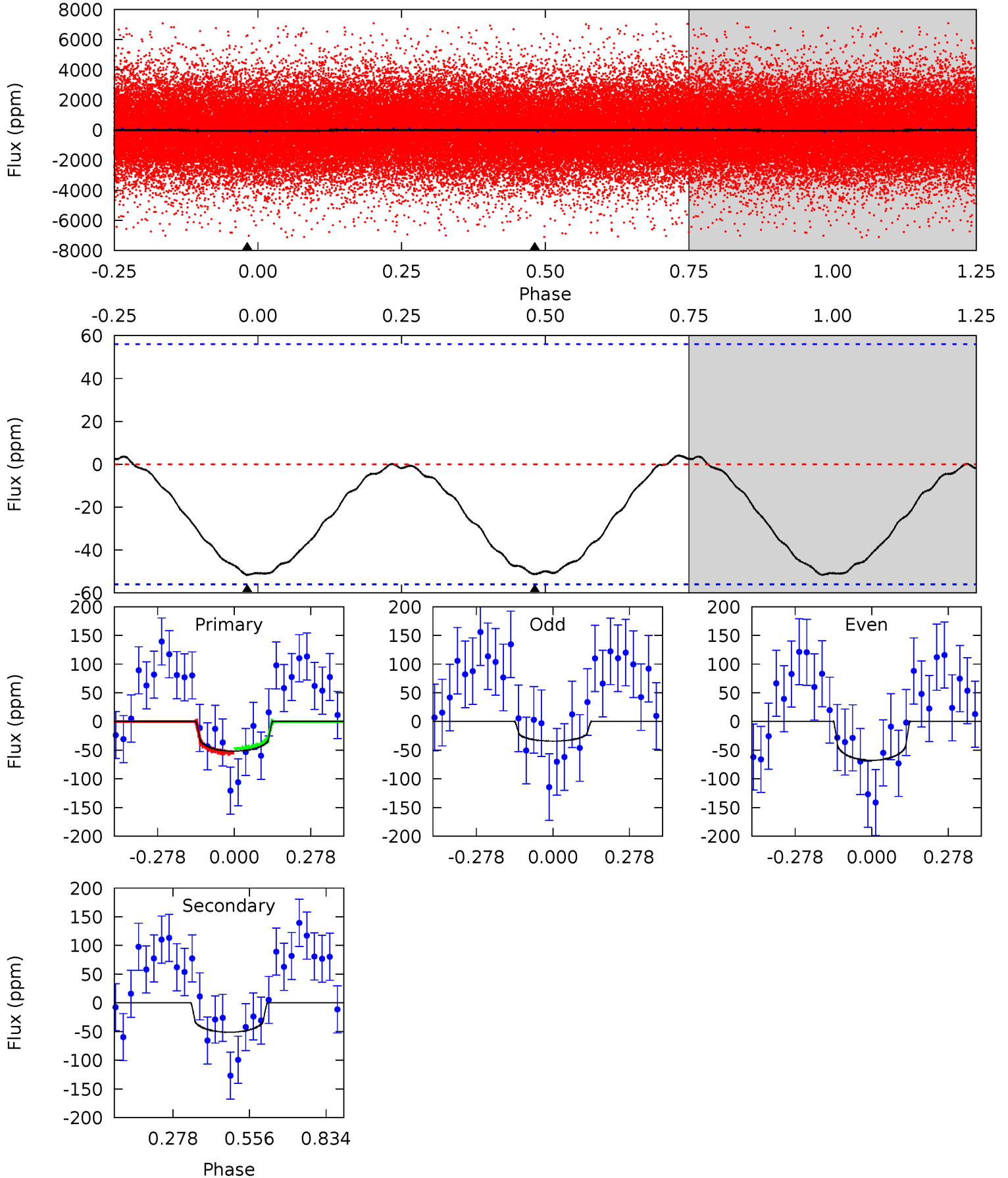
TCE 008038609-01 P= 1.395056 Days $T_0=131.924774$ (BKJD)



DV Model-Shift Uniqueness Test

008038609-01, P = 1.395068 Days, E = 130.518322 Days

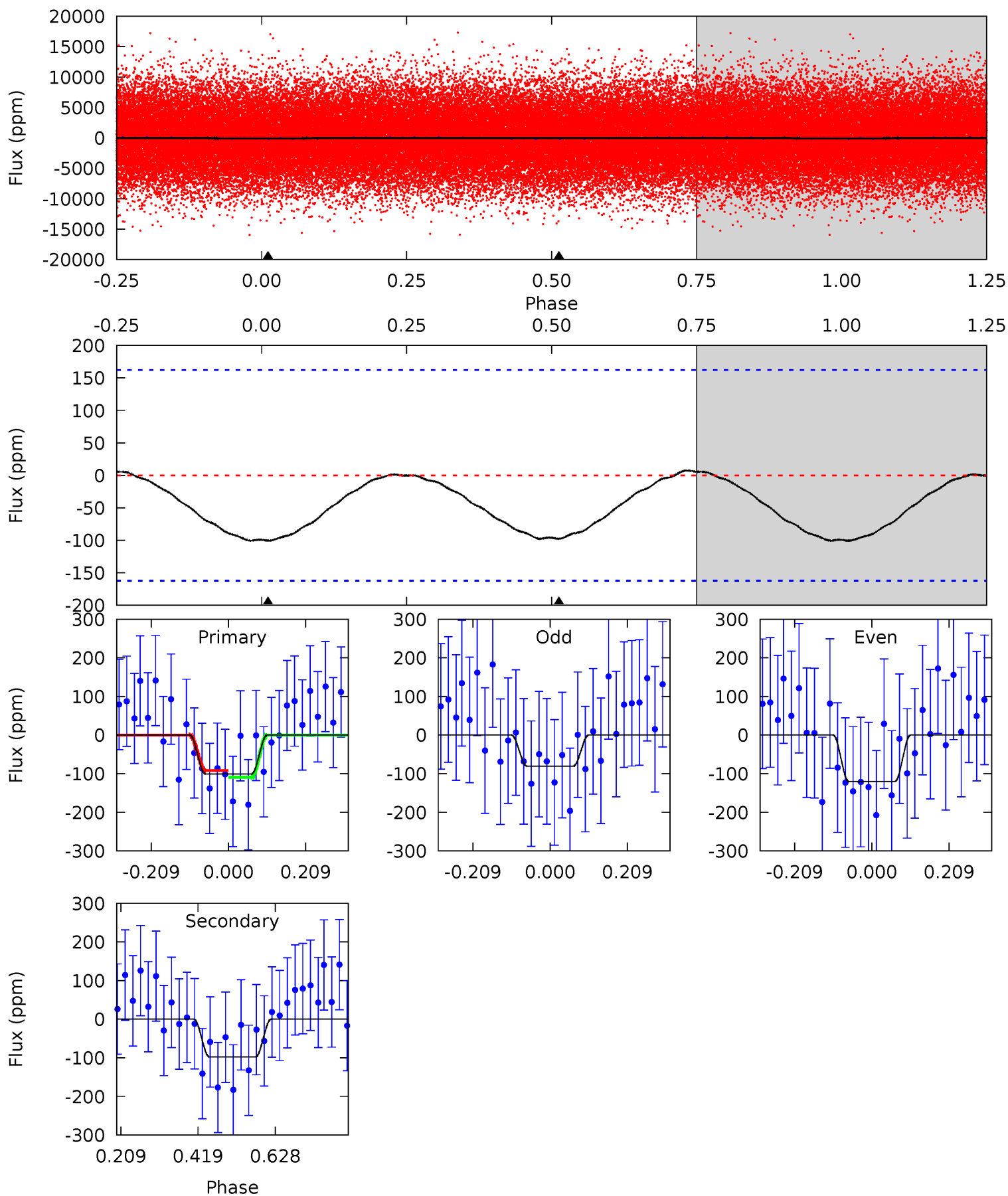
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.00	3.97	0	0	4.35	1.08	0.19	4.00	4.00	3.97	3.97	1.31	0.88	0.07	0.30



Alt Model-Shift Uniqueness Test

008038609-01, P = 1.395056 Days, E = 130.529718 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.73	2.65	0	0	4.41	1.25	0.14	2.73	2.73	2.65	2.65	0.54	0.97	0.07	0.24



Stellar Parameters For KIC 008038609

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7776^{+216}_{-324}	$3.627^{+0.476}_{-0.084}$	$-0.180^{+0.200}_{-0.300}$	$3.610^{+0.617}_{-1.726}$	$2.017^{+0.317}_{-0.514}$	$0.060^{+0.314}_{-0.017}$
	+3%/-4%	+13%/-2%	+111%/-167%	+17%/-48%	+16%/-25%	+519%/-28%
Source	KIC0	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 008038609-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-51 ± 13	$4.59^{+4.14}_{-2.97}$	5007^{+327}_{-601}	5279^{+4655}_{-2229}	$1.258^{+8.831}_{-0.916}$
Alt.	-98 ± 37	$4.86^{+4.23}_{-3.21}$	4961^{+393}_{-621}	6007^{+6343}_{-1977}	$2.042^{+14.545}_{-1.499}$

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

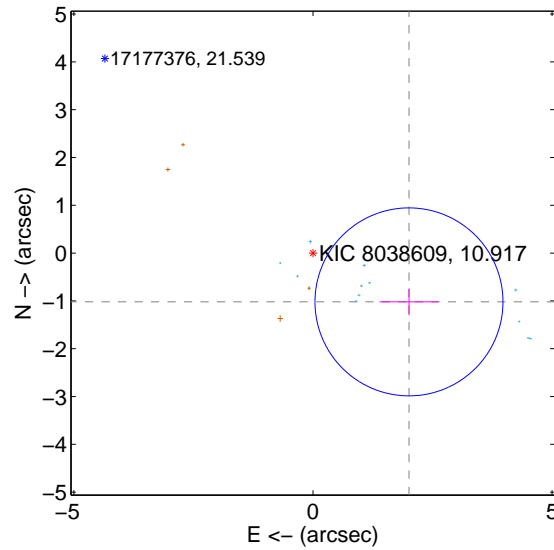
Supplemental centroid analysis for 008038609-01. **Kepler magnitude: 10.92.** Transit SNR 13.02

There are 13 quarters with good PRF difference image offsets

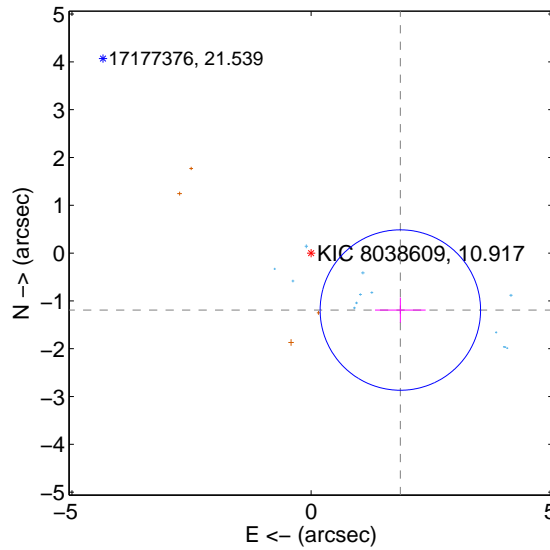
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.252 ± 0.655	3.44	-2.008 ± 0.618	-1.020 ± 0.279
PRF-fit source offset from KIC position	2.215 ± 0.559	3.96	-1.868 ± 0.529	-1.191 ± 0.261
photometric centroid source offset	0.46 ± 0.20	2.28	-0.29 ± 0.25	-0.37 ± 0.17

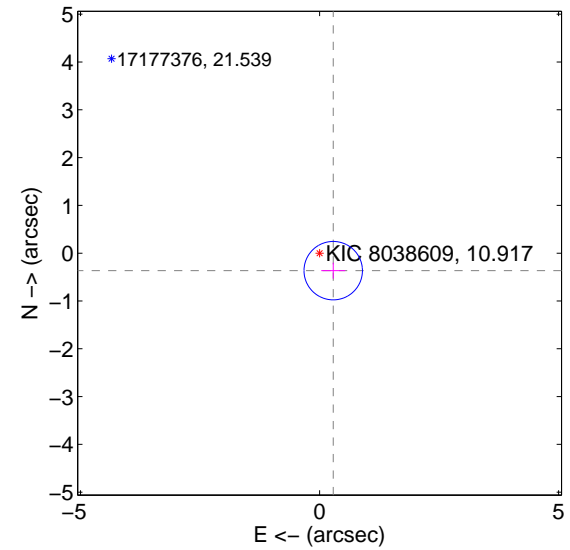
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

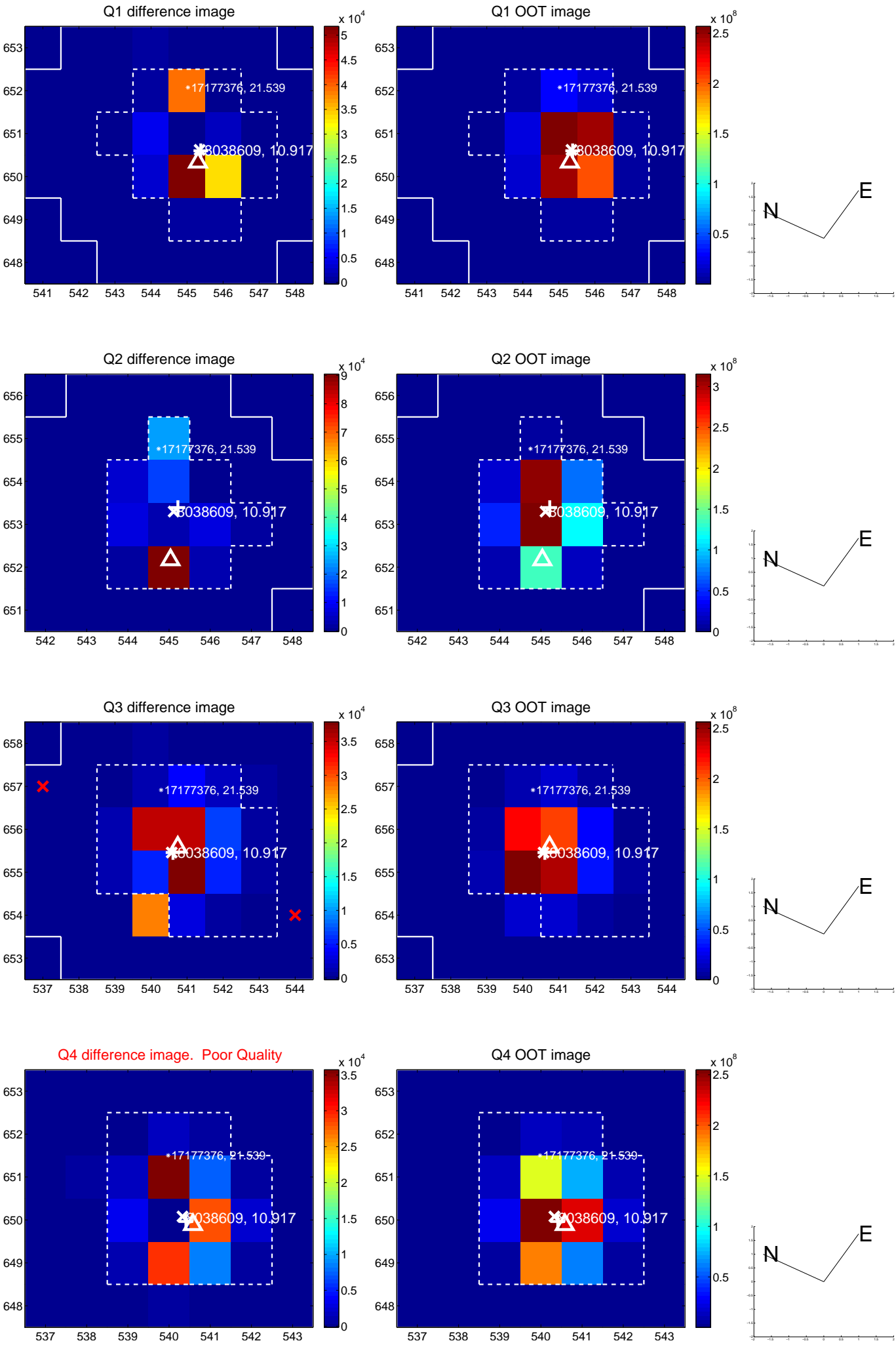


offset from photometric centroids

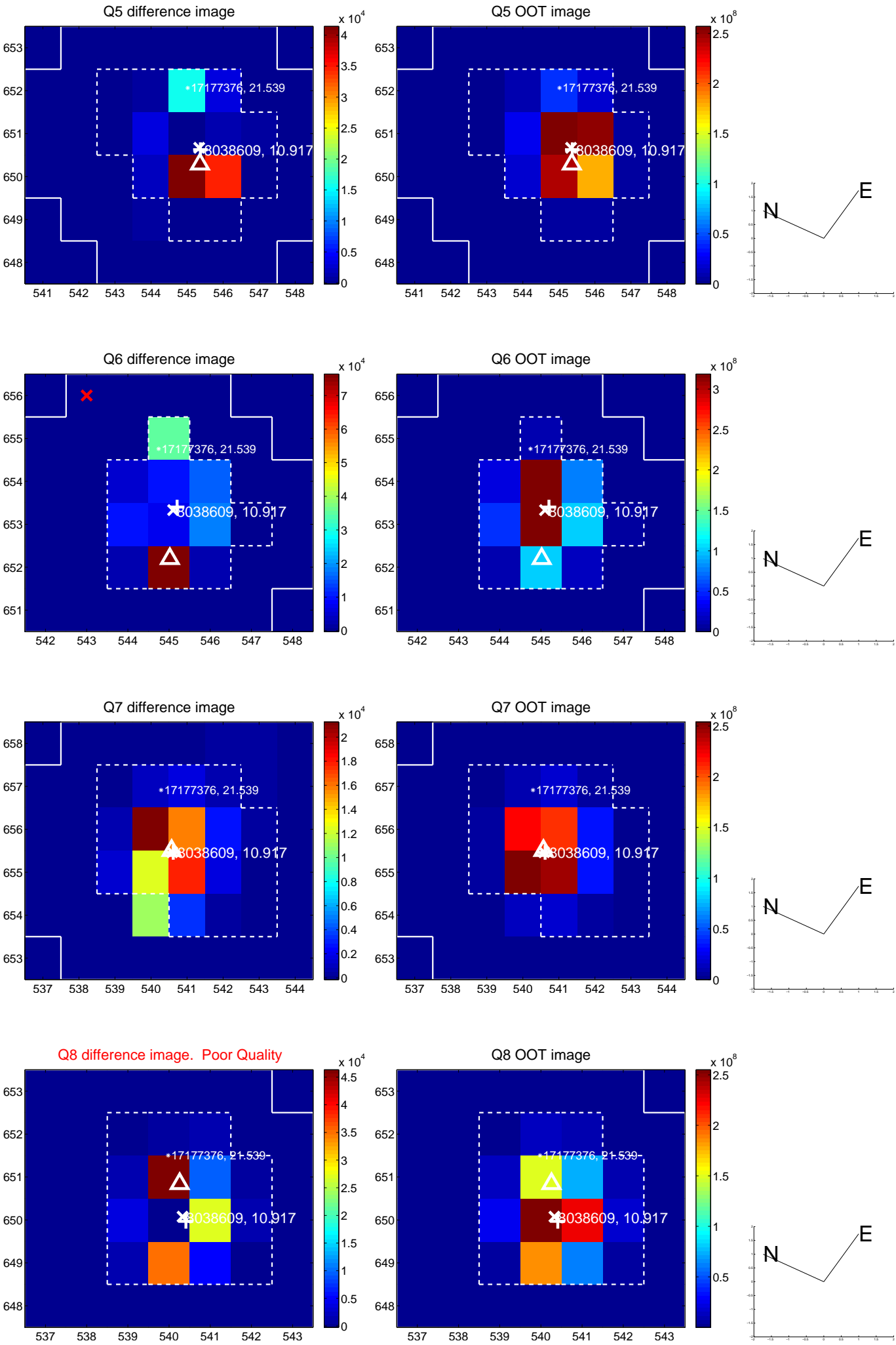


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

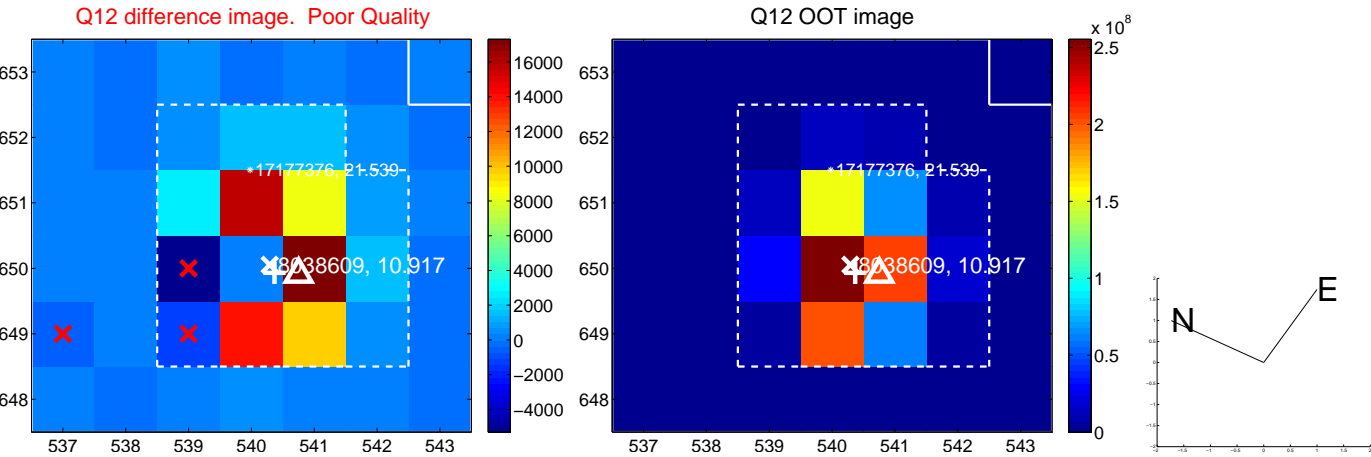
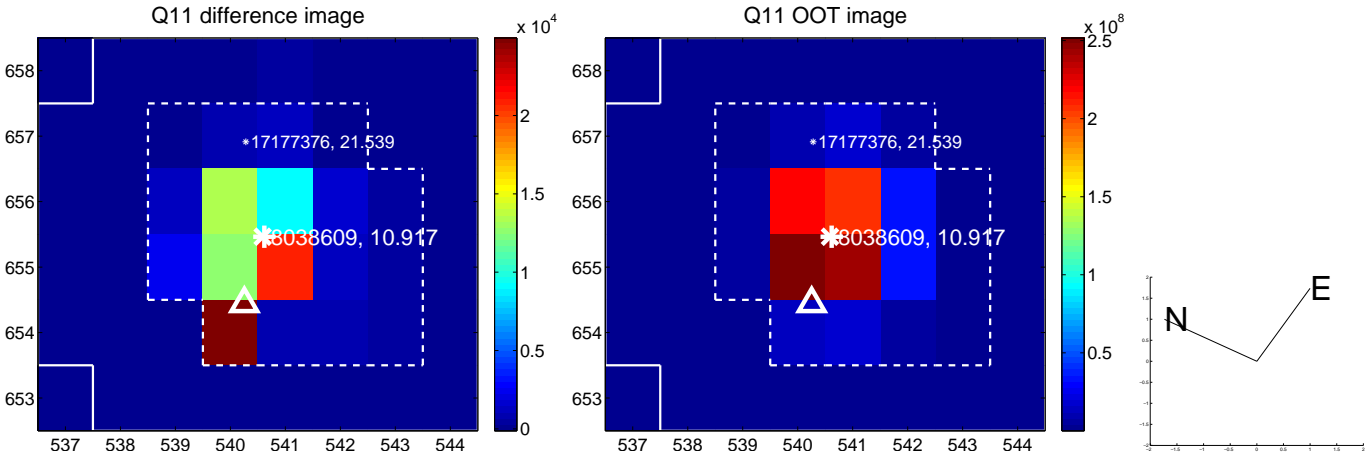
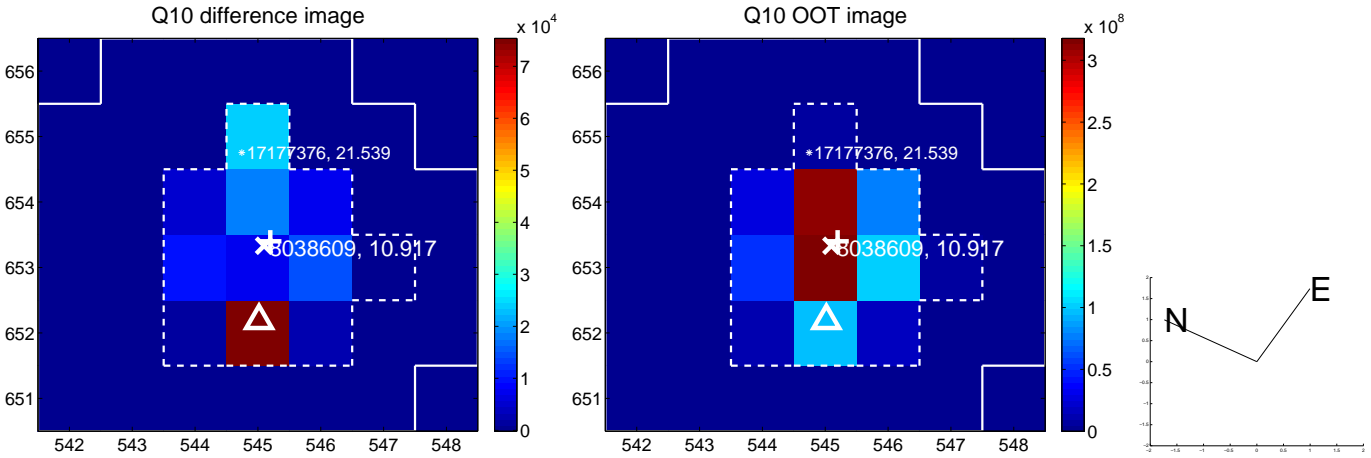
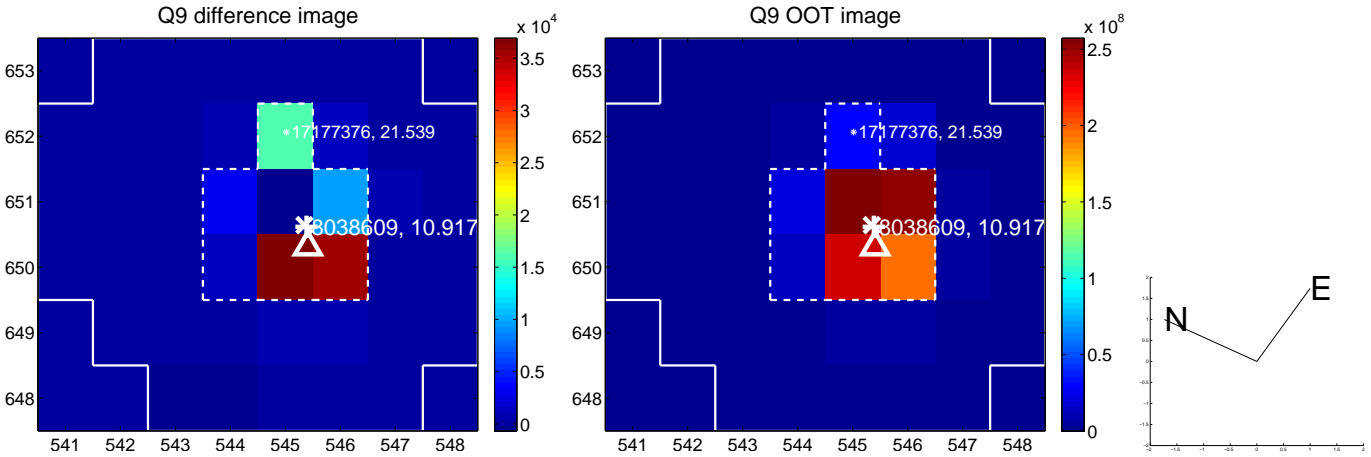
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



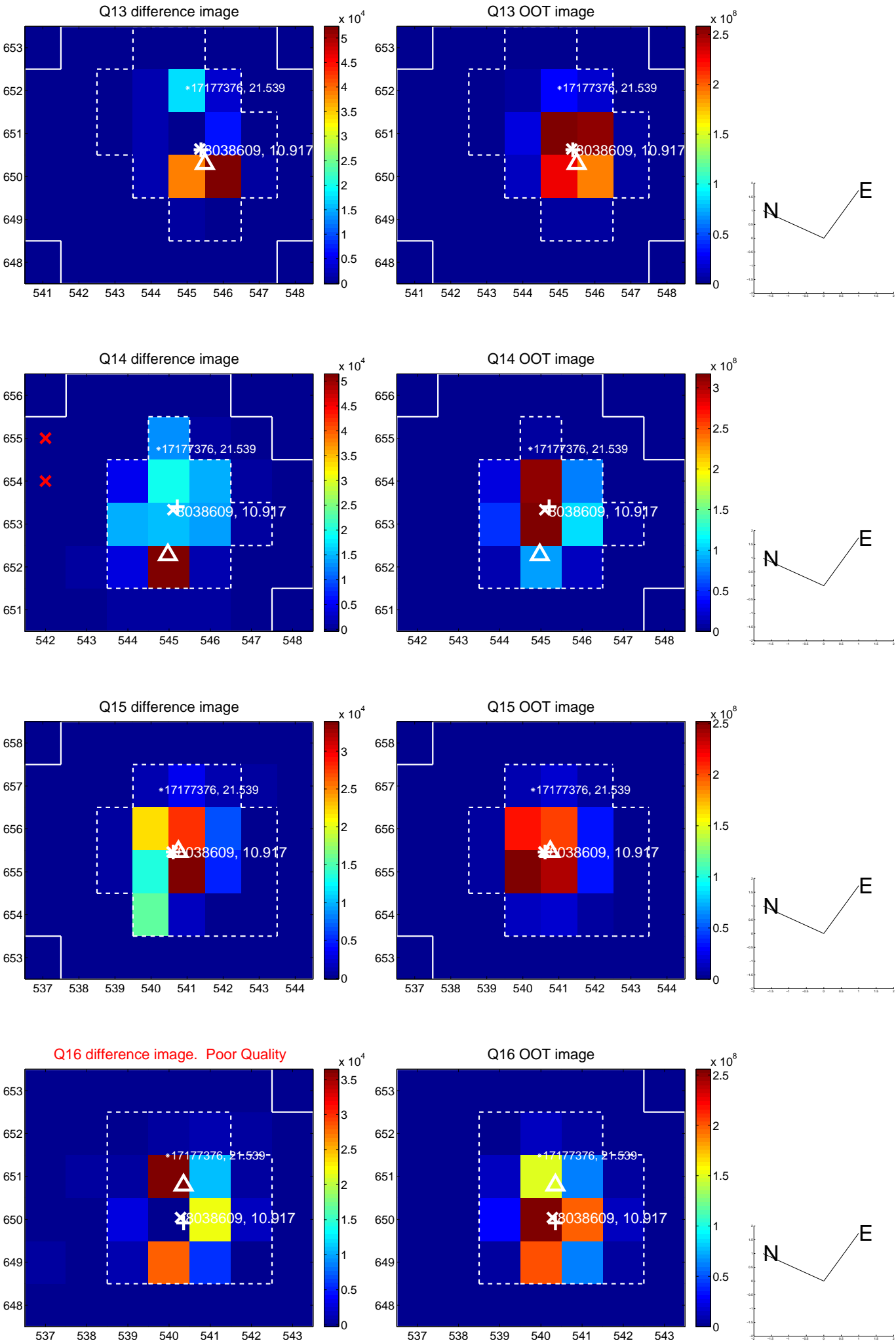
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



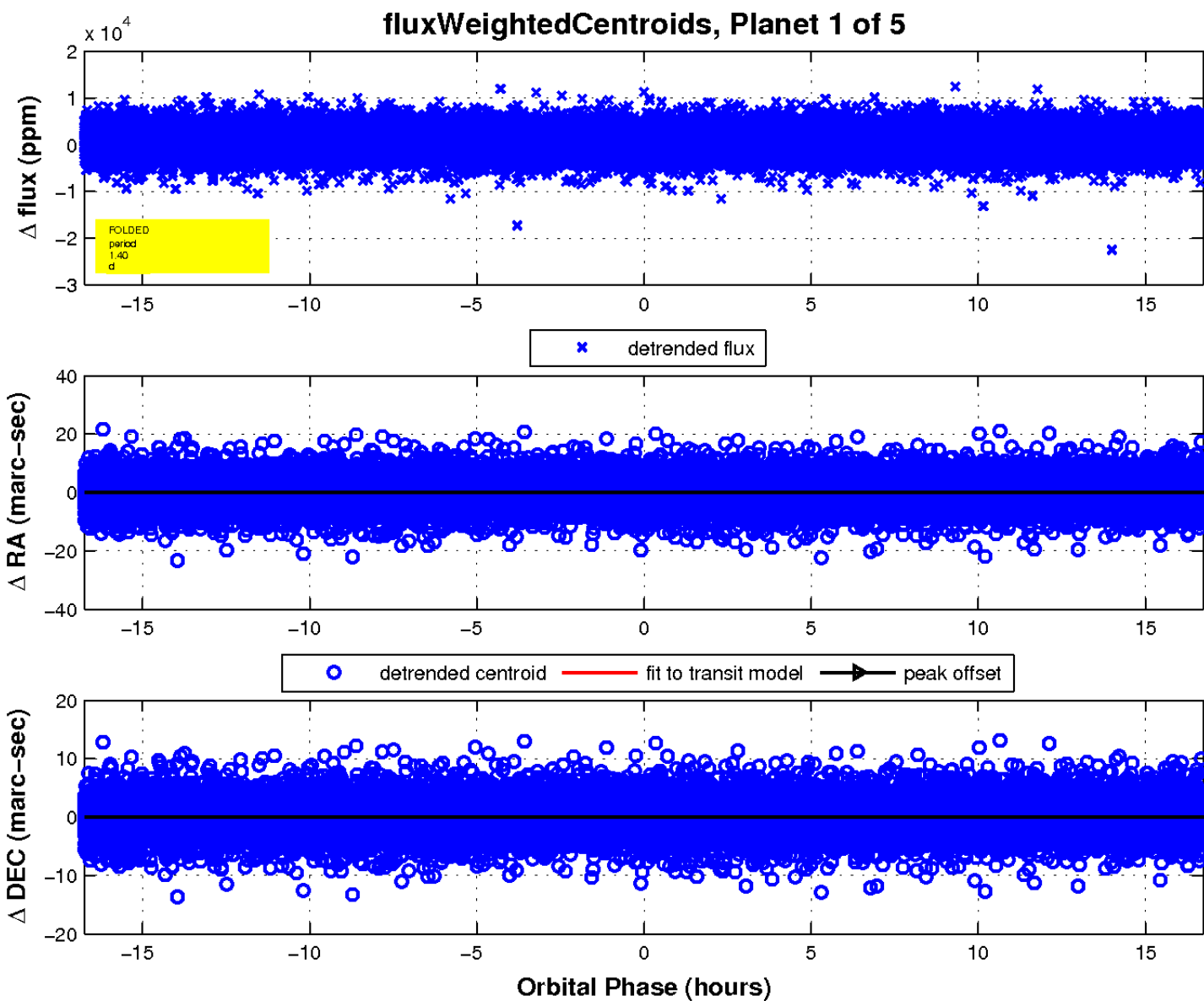
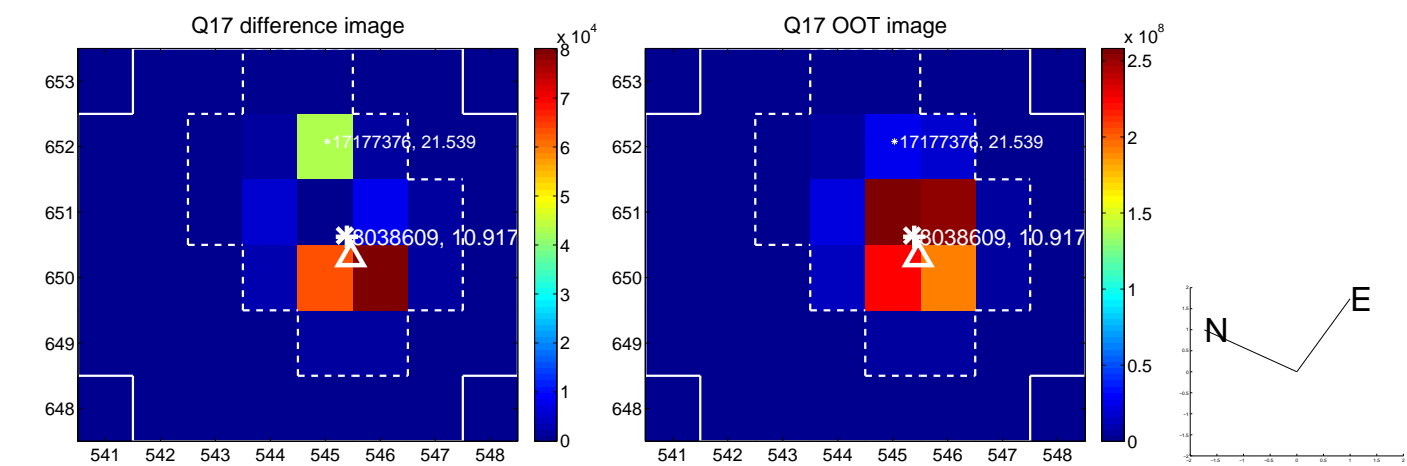
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



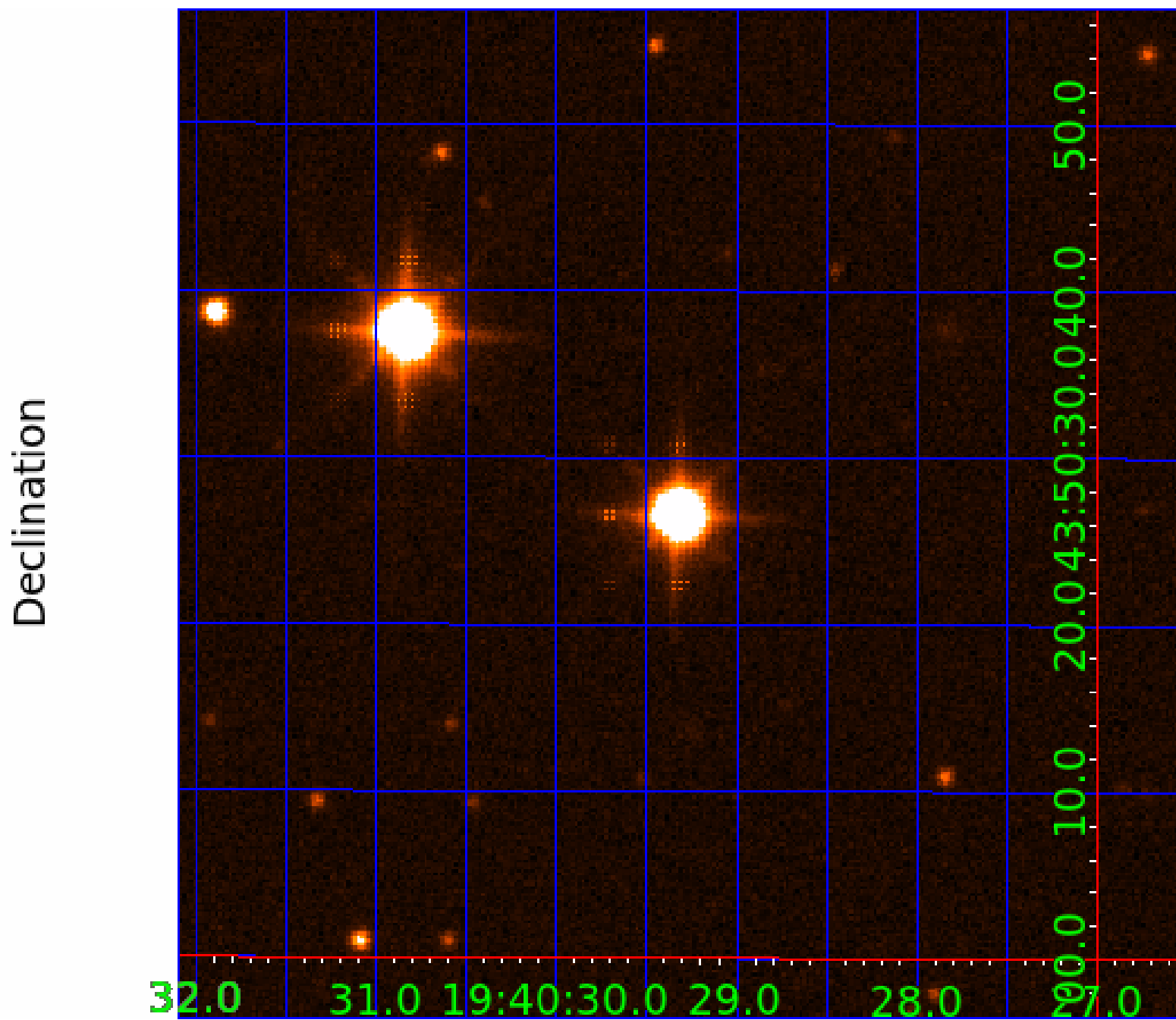
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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UKIRT Image



KIC 008038609

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})
008038609-01	OBS	No	1.395068	131.913390	105.1	8.865	11.1	13.0	3.61	7776	3.72	44819.14
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008038609-05	OBS	No	2.226478	132.047519	924.3	22.212	10.7	15.6	3.61	7776	16.53	24030.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008038609-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
008038609-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008038609-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED
008038609-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

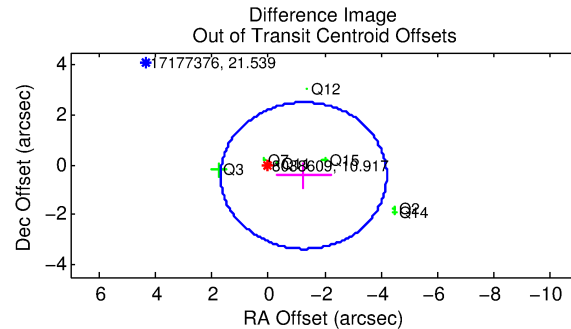
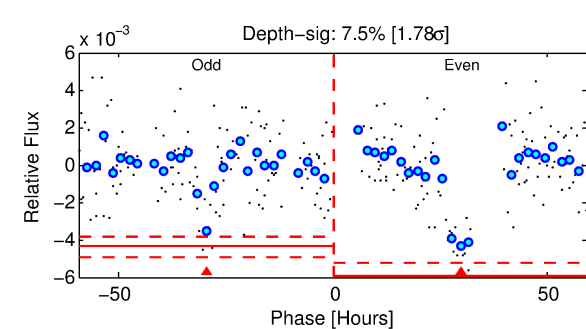
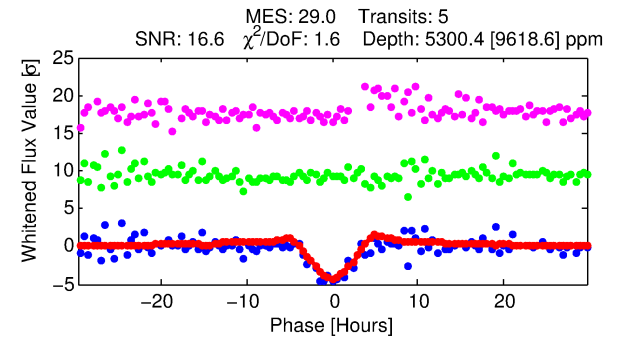
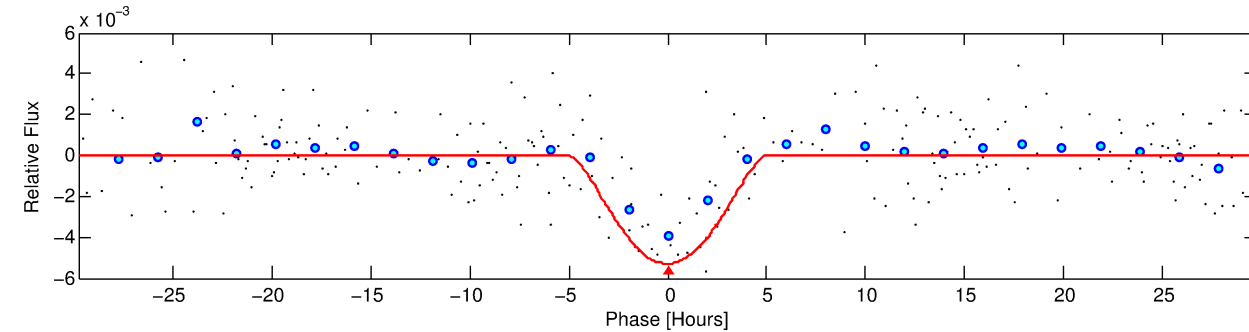
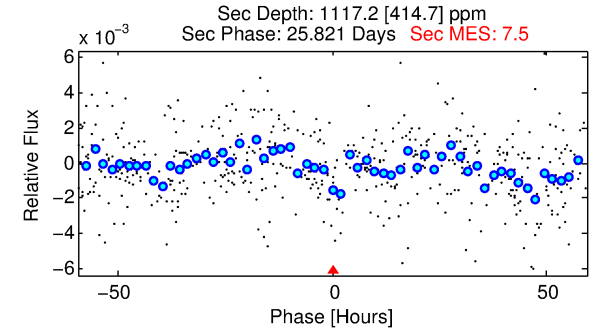
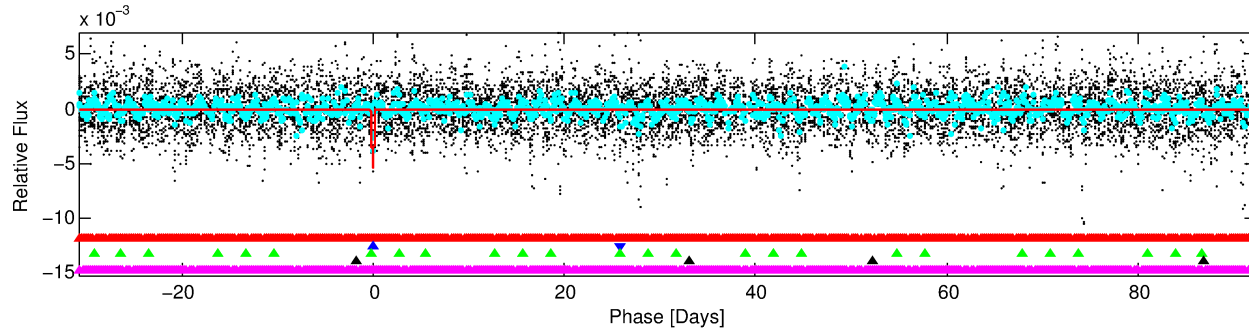
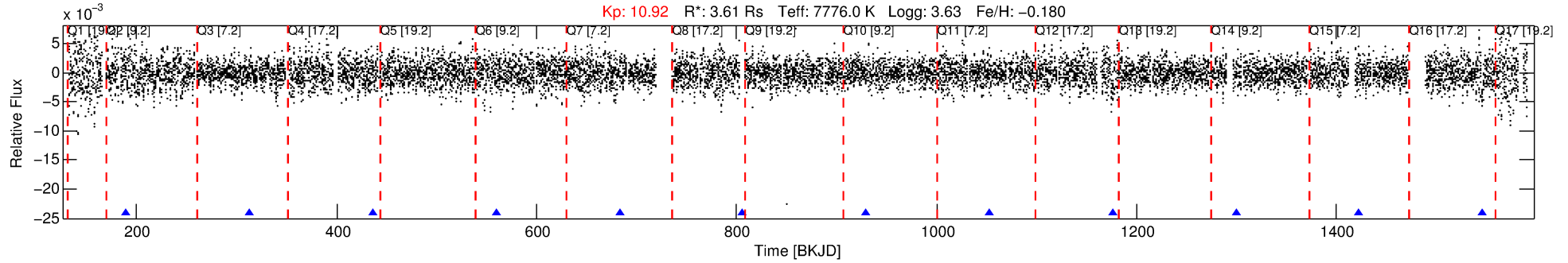
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008038609-02

No Significant Match Found

DV One-Page Summary

KIC: 8038609 Candidate: 2 of 5 Period: 123.257 d



DV Fit Results:

Period = 123.25732 [0.00199] d
Epoch = 190.0102 [0.0139] BKJD
Rp/R* = 0.1196 [0.3443]
a/R* = 47.84 [25.86]
b = 1.00 [0.34]
Seff = 113.90 [92.76]
Teq = 833 [170] K
Rp = 47.11 [137.50] Re
a = 0.6122 [0.2968] AU
Ag = 103.82 [604.83] [0.17σ]
Teffp = 4111 [5934] K [0.55σ]

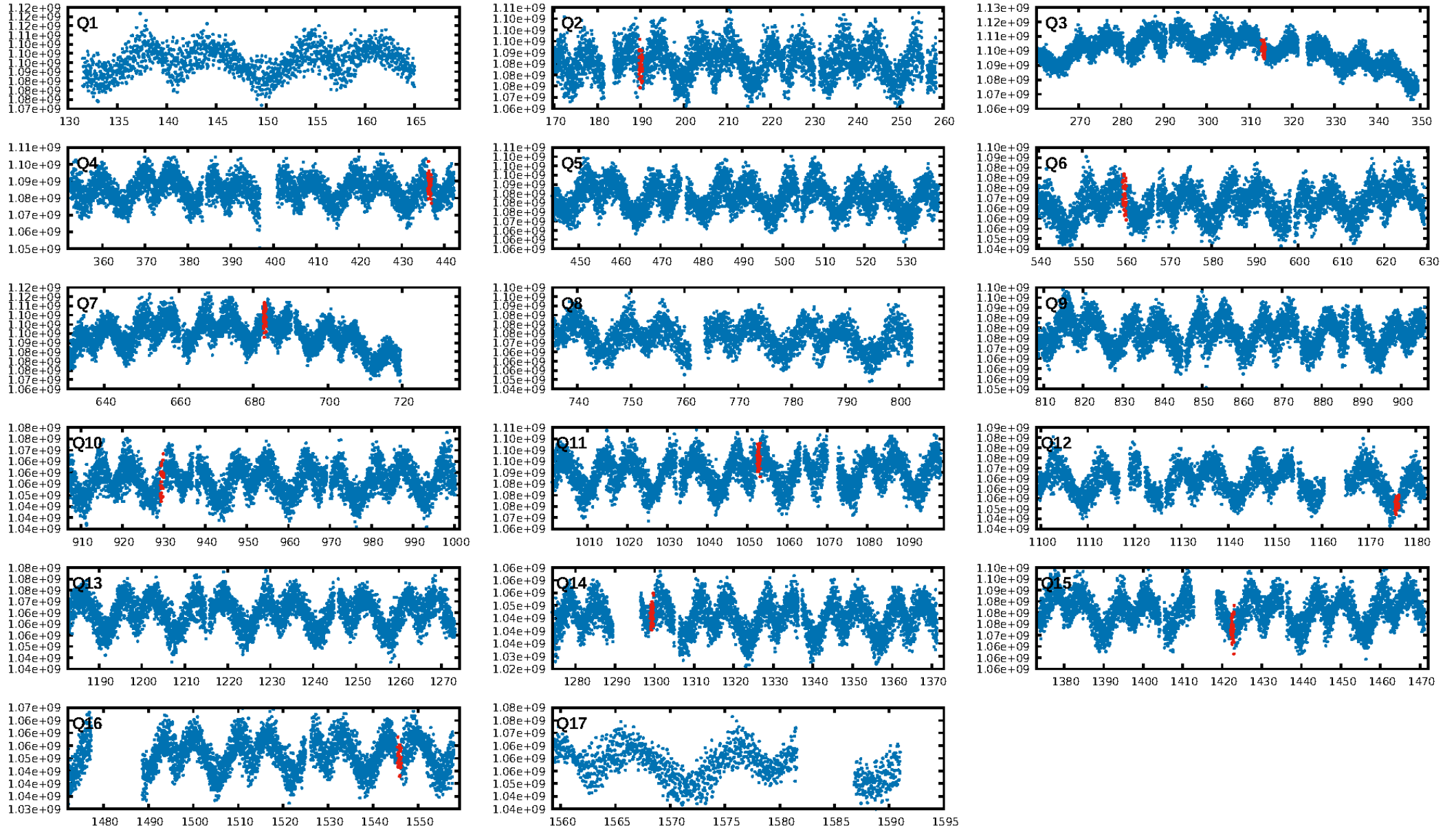
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [15.75σ]
LongPeriod-sig: 100.0% [177.74σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.5699
Centroid-sig: 16.4%
Centroid-so: 0.175 arcsec [4.19σ]
OotOffset-rm: 1.336 arcsec [1.36σ]
KicOffset-rm: 1.313 arcsec [2.14σ]
OotOffset-st: 2/4/1/0 [7]
KicOffset-st: 2/4/1/0 [7]
DiffImageQuality-fgm: 0.57 [4/7]
DiffImageOverlap-fno: 0.00 [0/8]

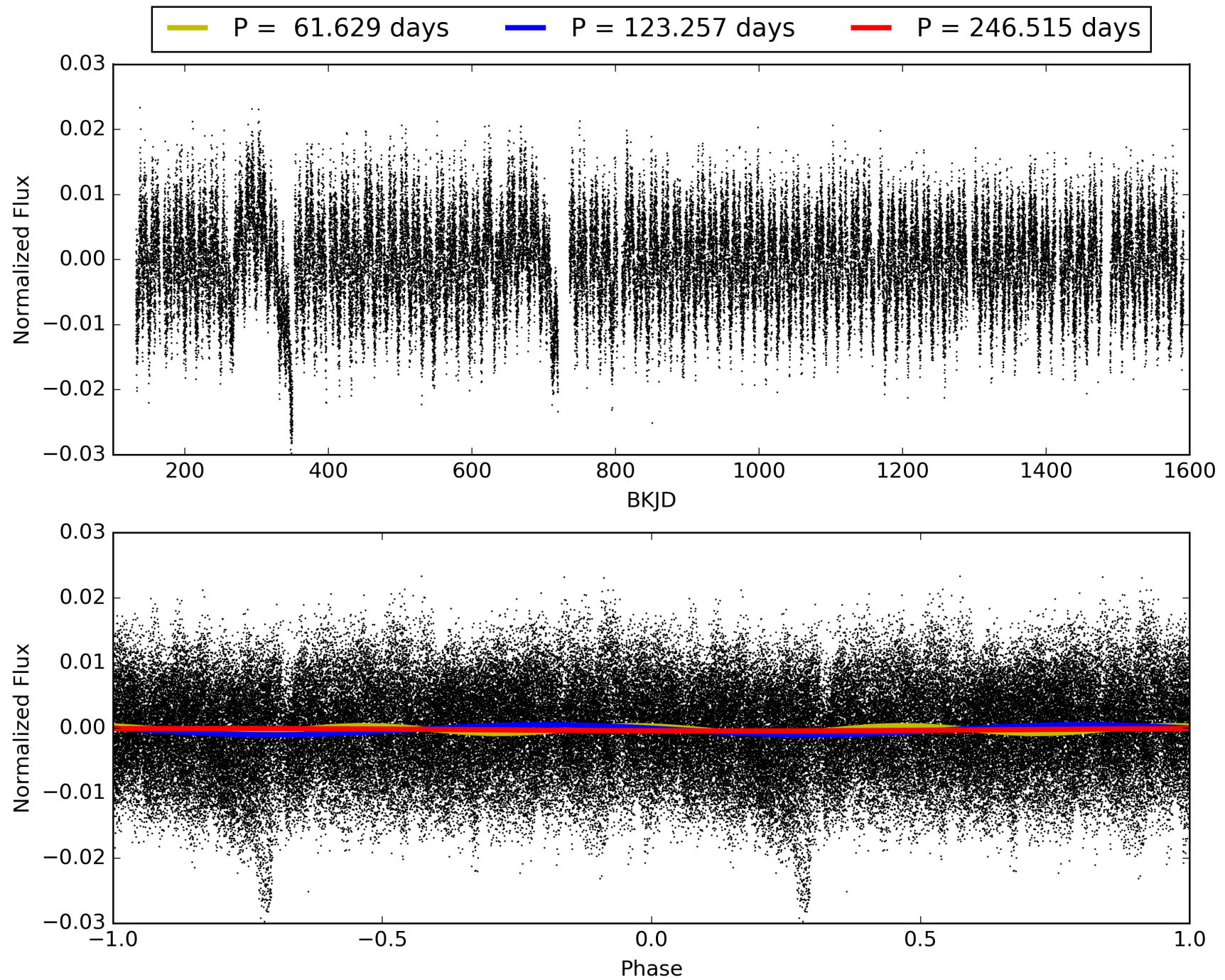
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:13:26 Z

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

TCE 008038609-02, PDC Light Curves

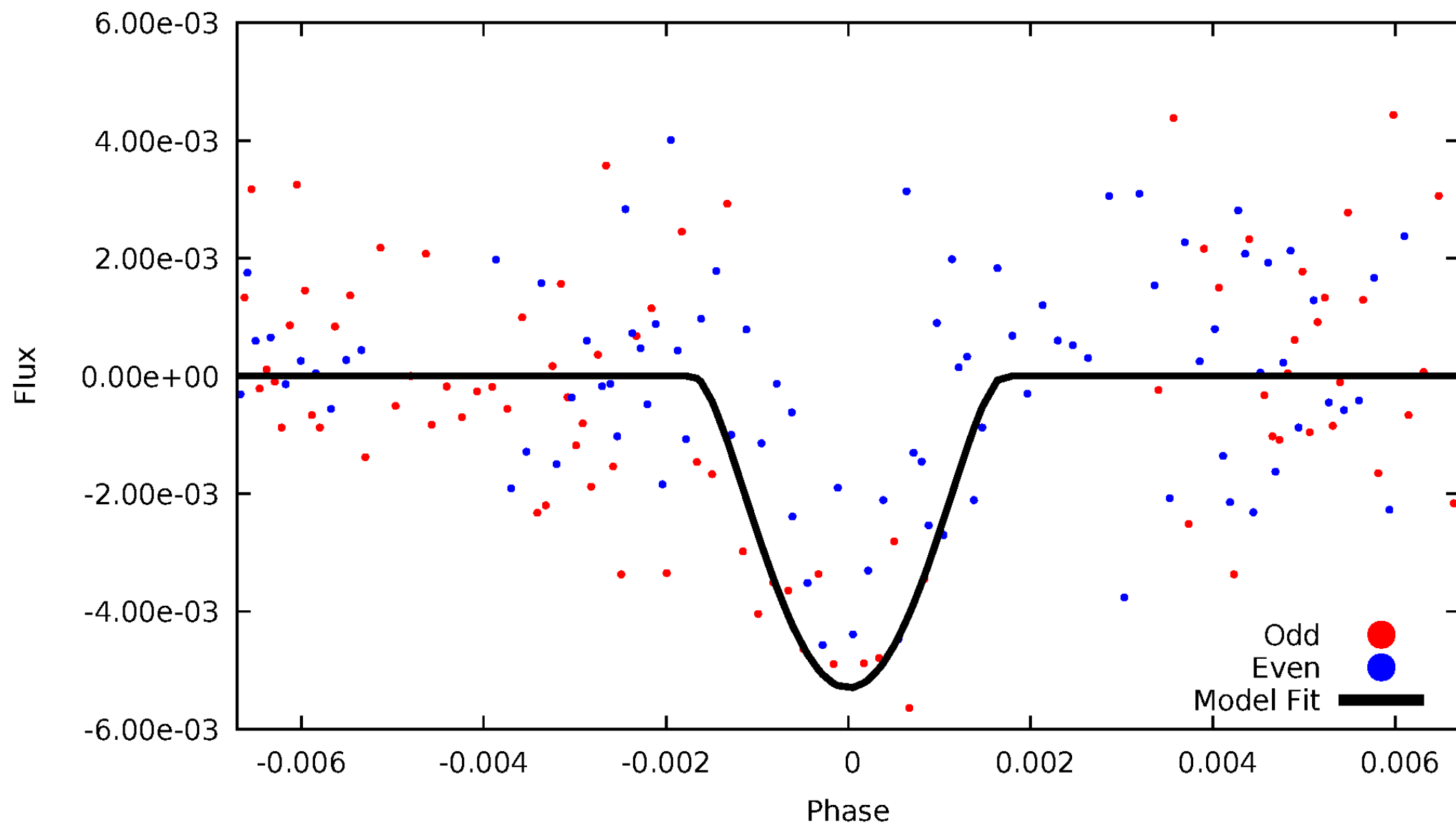


TCE 008038609-02



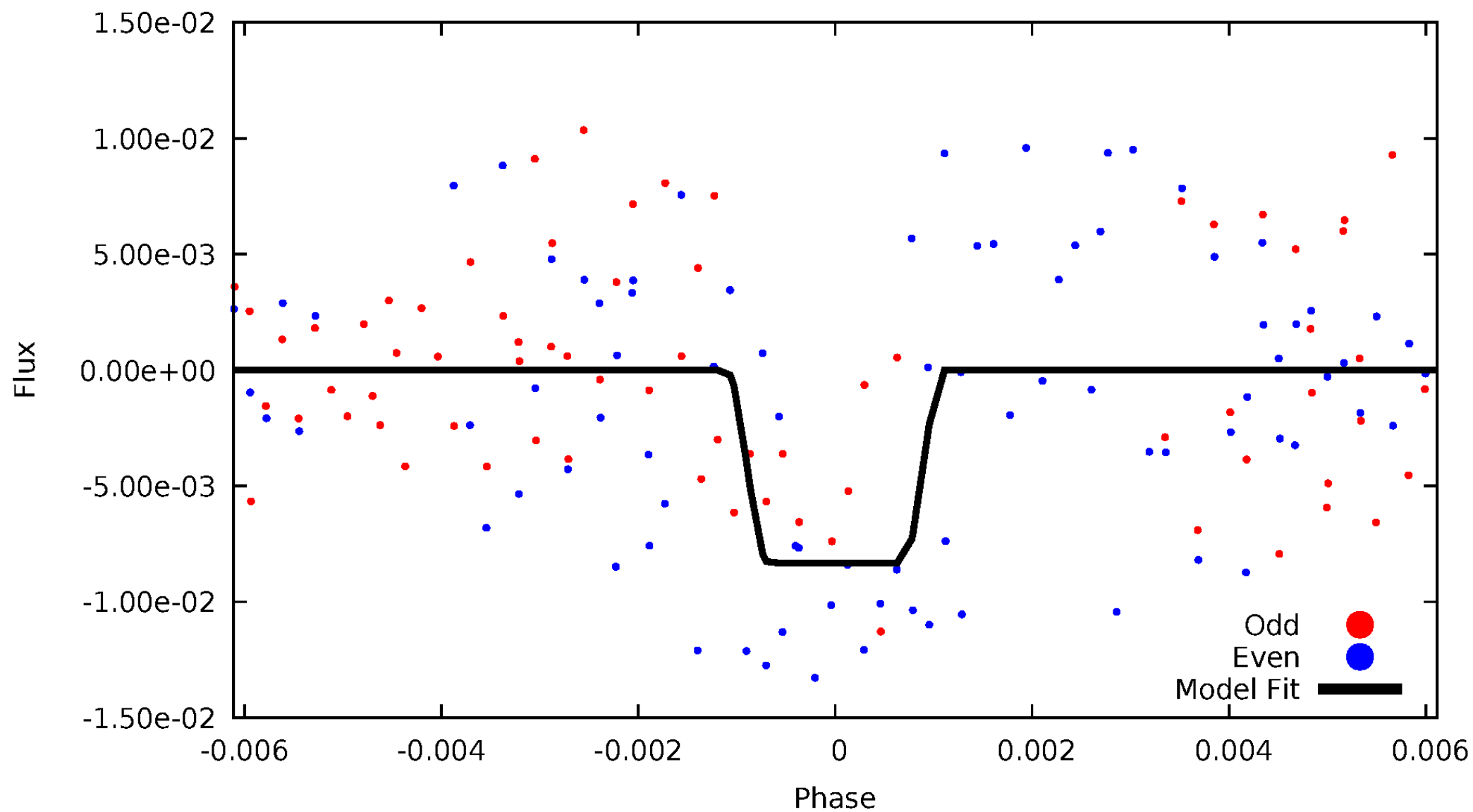
DV Odd/Even

TCE 008038609-02



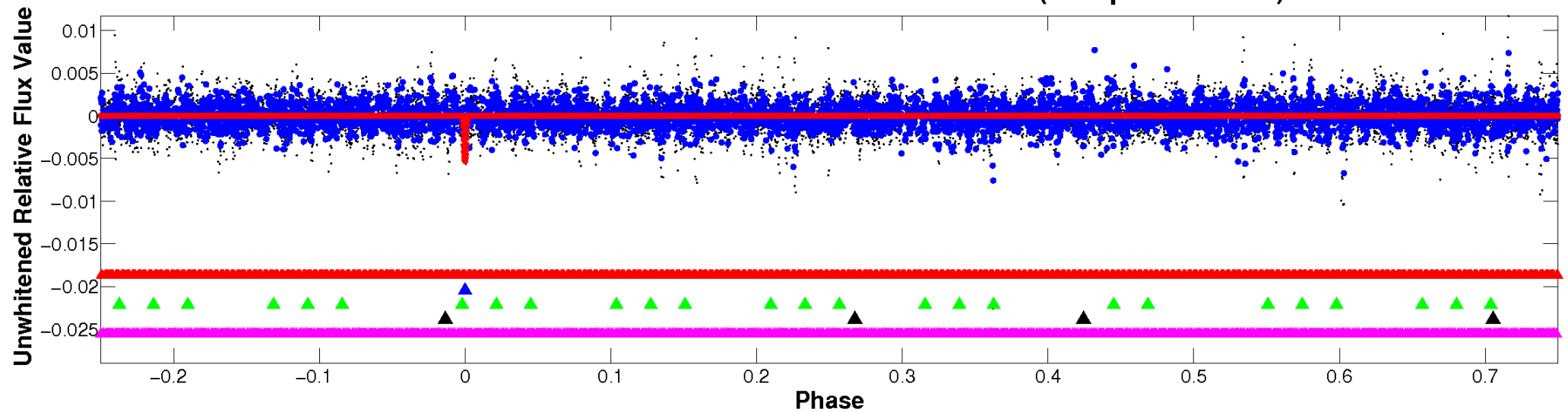
ALT Odd/Even

TCE 008038609-02

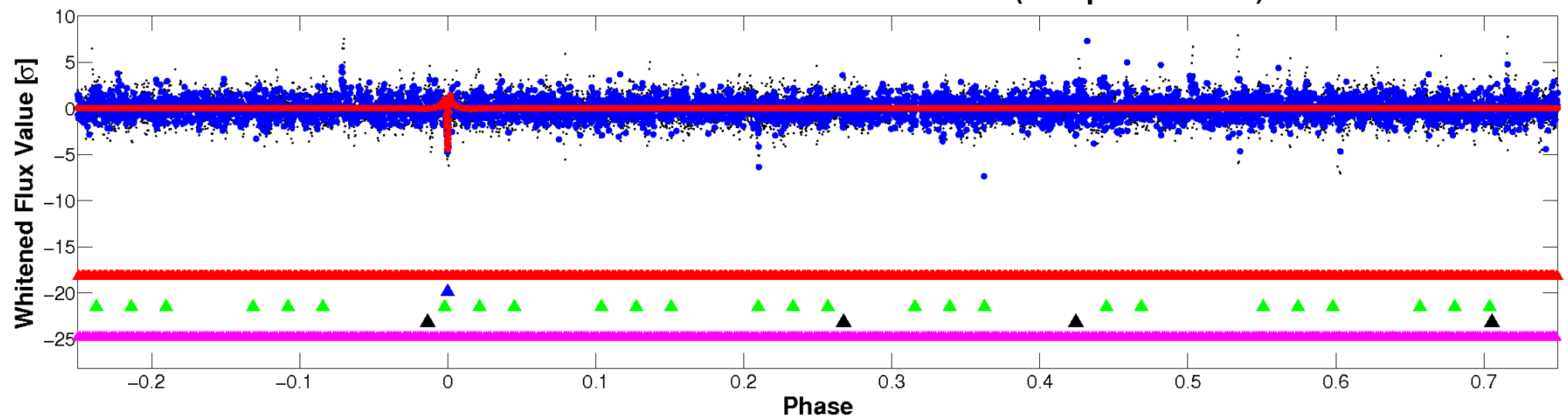


Non-Whitened Vs. Whitened Light Curve

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

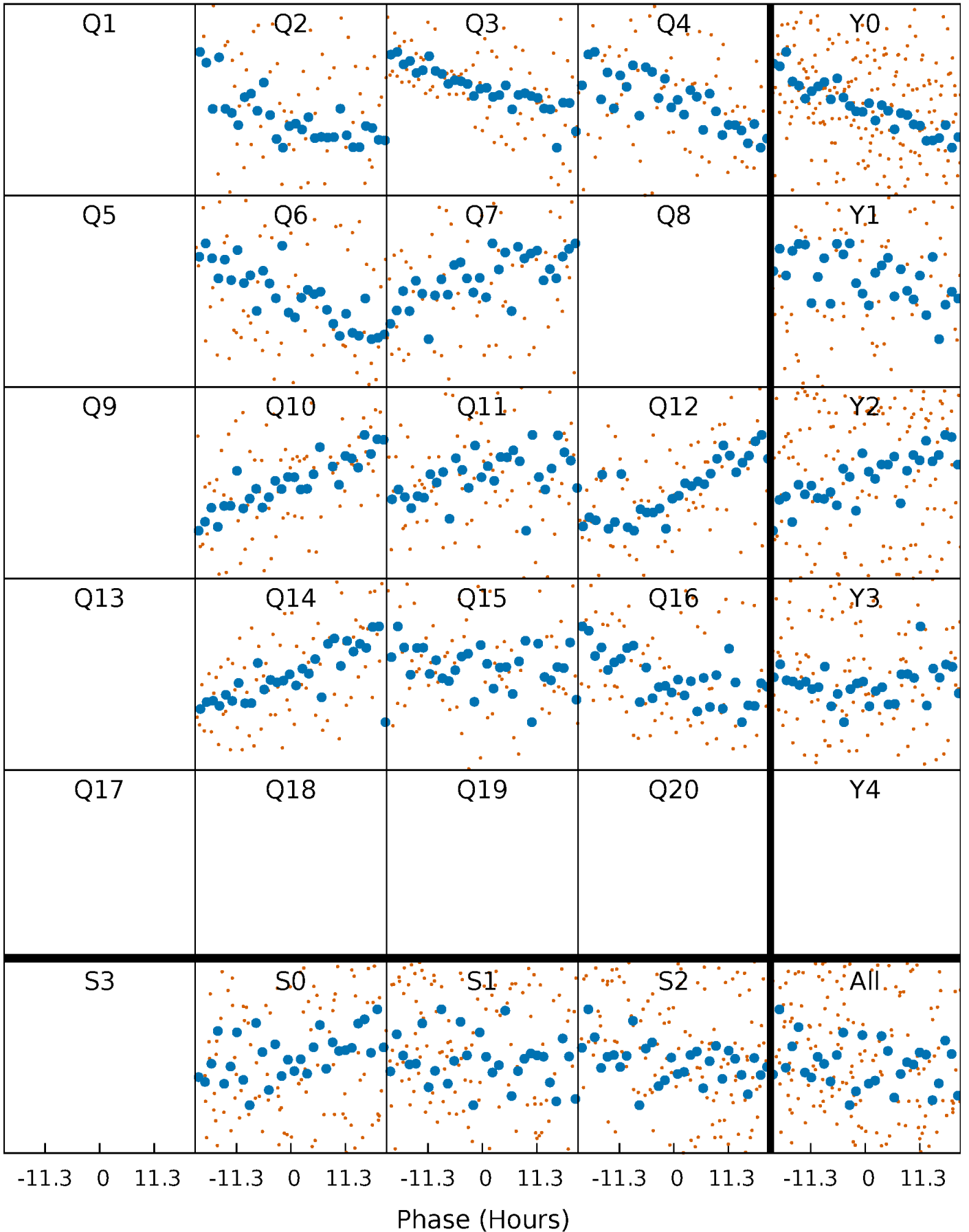


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



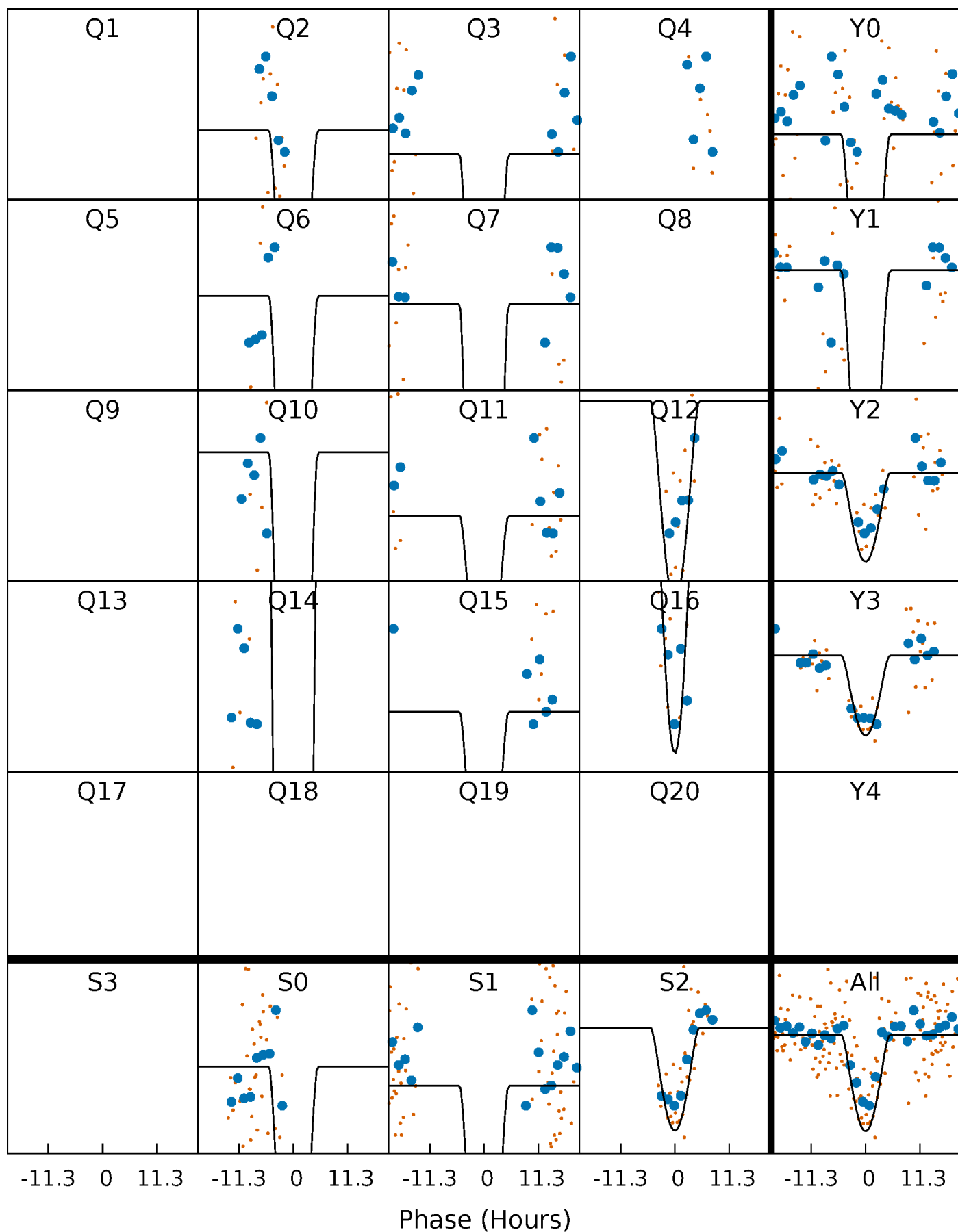
PDC Quarter-Phased Transit Curves

TCE 008038609-02 P=123.257322 Days $T_0=190.010233$ (BKJD)



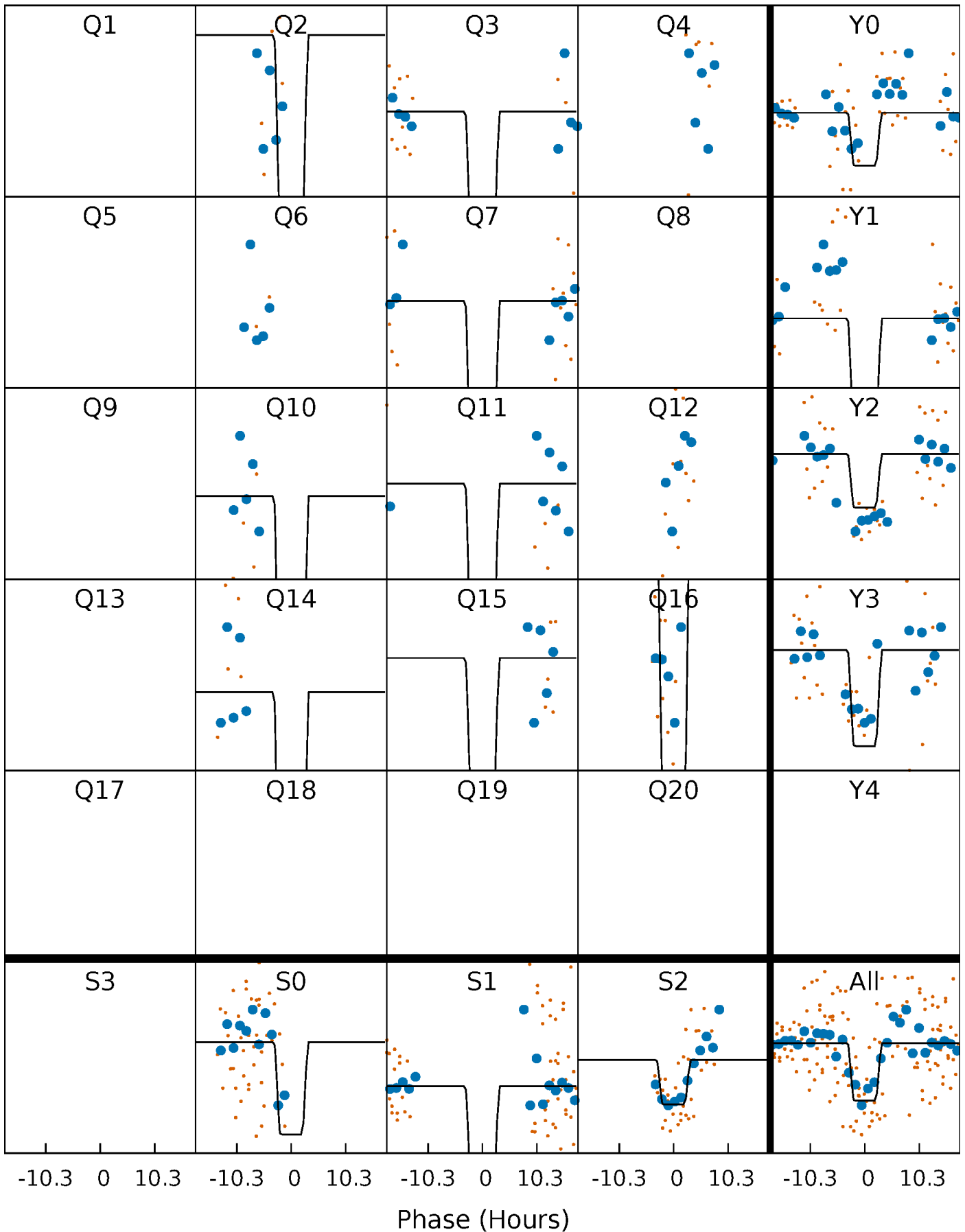
DV Quarter-Phased Transit Curves

TCE 008038609-02 P=123.257322 Days $T_0=190.010233$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

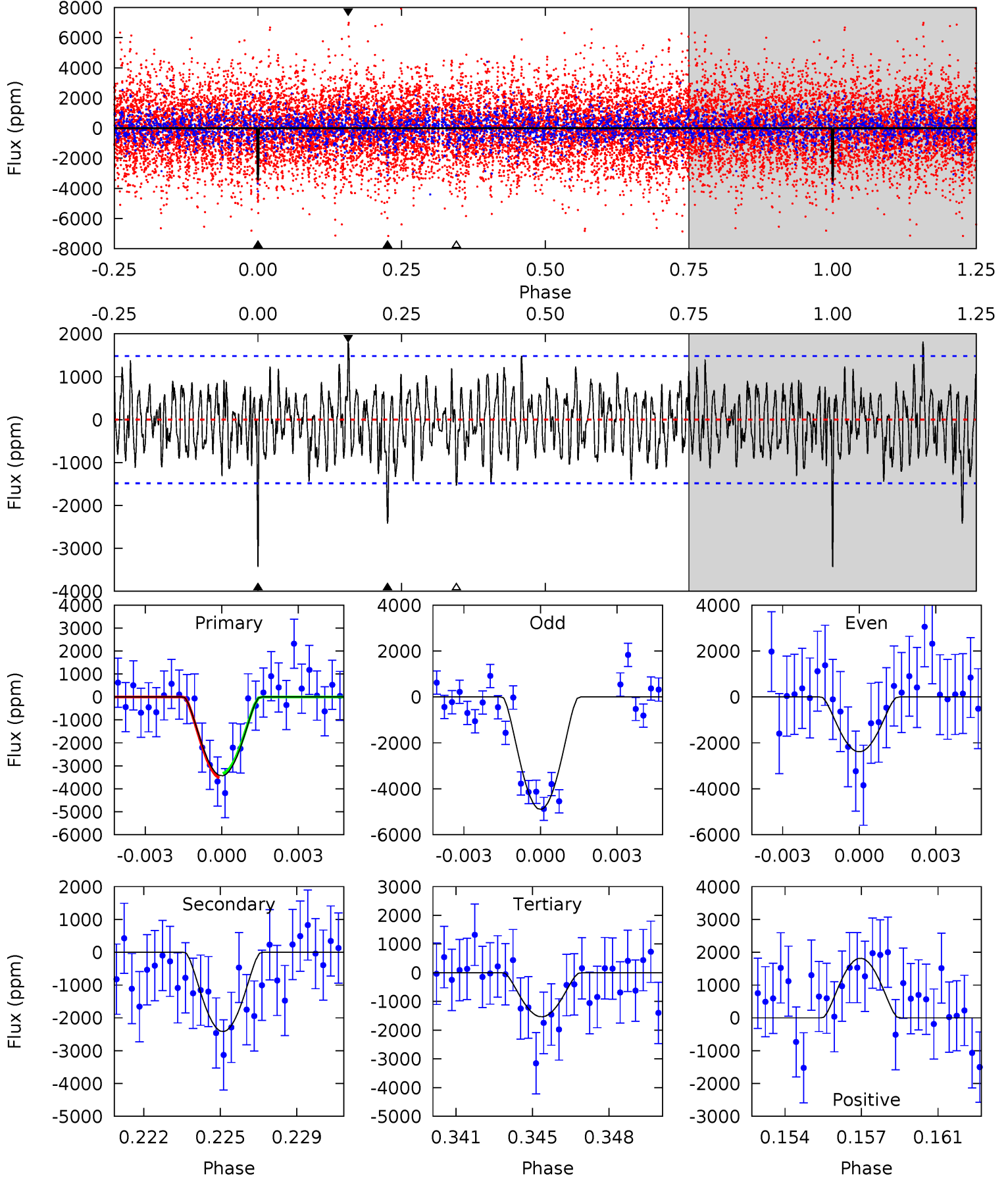
TCE 008038609-02 P=123.262045 Days $T_0=189.983583$ (BKJD)



DV Model-Shift Uniqueness Test

008038609-02, P = 123.257322 Days, E = 66.752911 Days

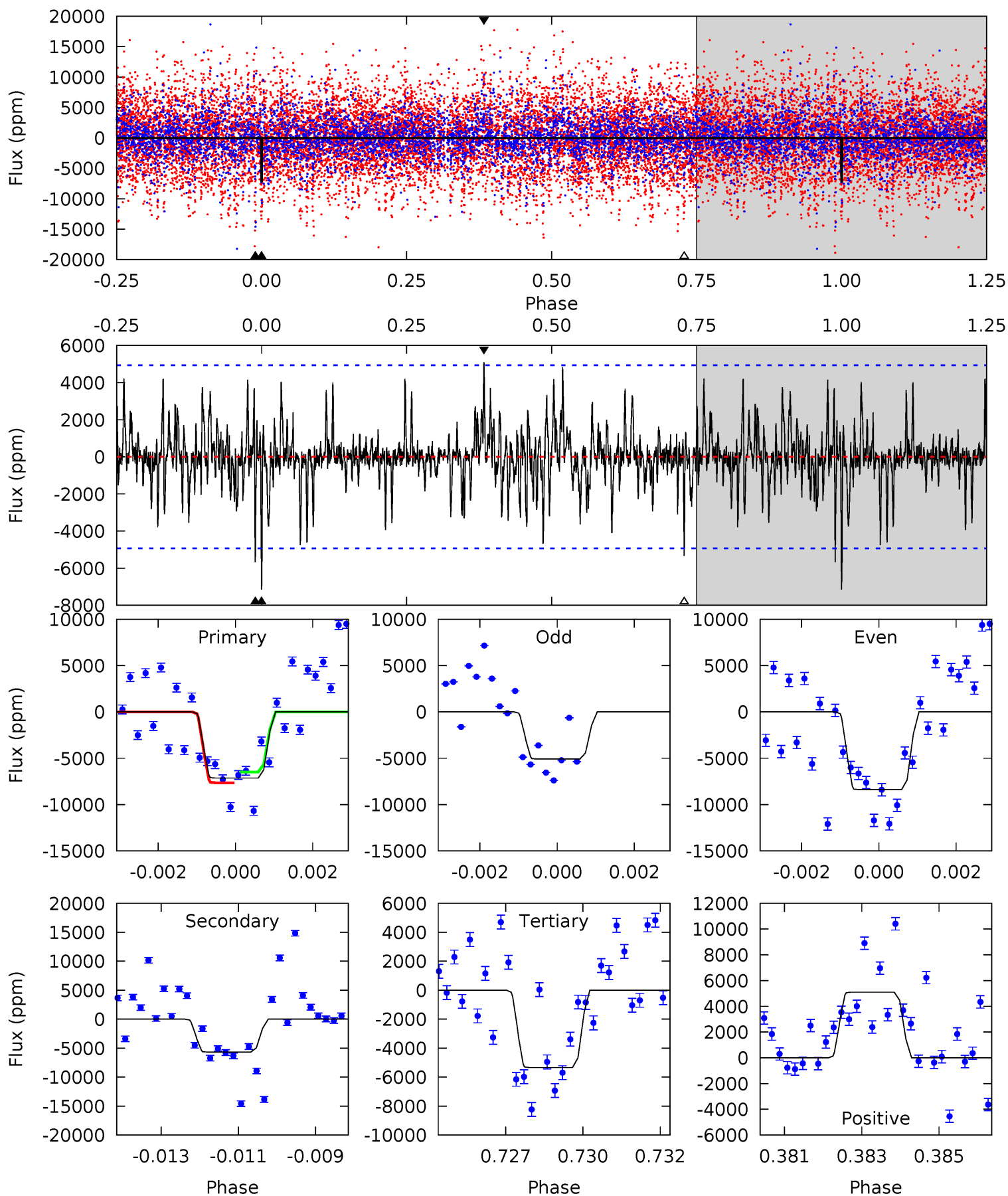
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	8.52	5.41	6.40	5.23	2.93	1.99	6.69	5.70	3.12	2.12	4.31	-0.66	0.35	0.35



Alt Model-Shift Uniqueness Test

008038609-02, P = 123.262045 Days, E = 66.721538 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.69	6.11	5.75	5.49	5.31	3.07	1.36	1.94	2.20	0.36	0.62	1.72	0.76	0.42	0.63



Stellar Parameters For KIC 008038609

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7776^{+216}_{-324}	$3.627^{+0.476}_{-0.084}$	$-0.180^{+0.200}_{-0.300}$	$3.610^{+0.617}_{-1.726}$	$2.017^{+0.317}_{-0.514}$	$0.060^{+0.314}_{-0.017}$
	+3%/-4%	+13%/-2%	+111%/-167%	+17%/-48%	+16%/-25%	+519%/-28%
Source	KIC0	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 008038609-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2418 ± 284	$96.22^{+99.41}_{-66.51}$	1118^{+82}_{-137}	3655^{+2029}_{-707}	55^{+524}_{-42}
Alt.	-5672 ± 928	$92.25^{+99.24}_{-65.29}$	1116^{+78}_{-145}	4234^{+3668}_{-856}	138^{+1567}_{-105}

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

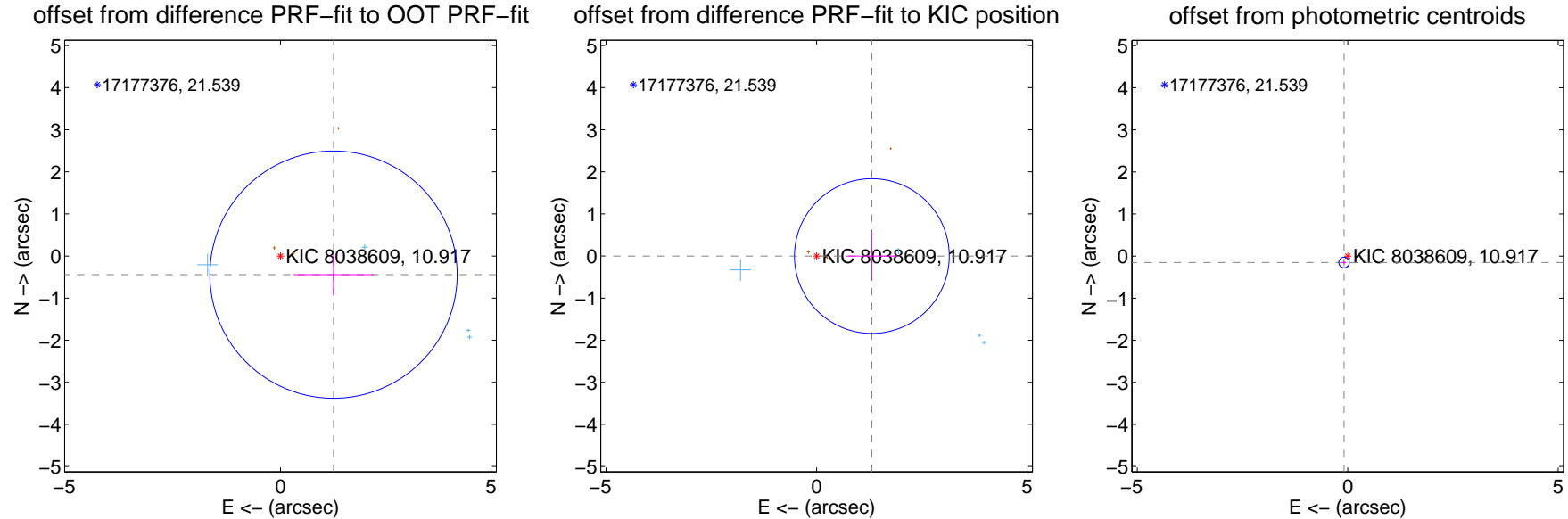
DV Centroid Data

Supplemental centroid analysis for 008038609-02. **Kepler magnitude: 10.92.** Transit SNR 16.62

There are 4 quarters with good PRF difference image offsets

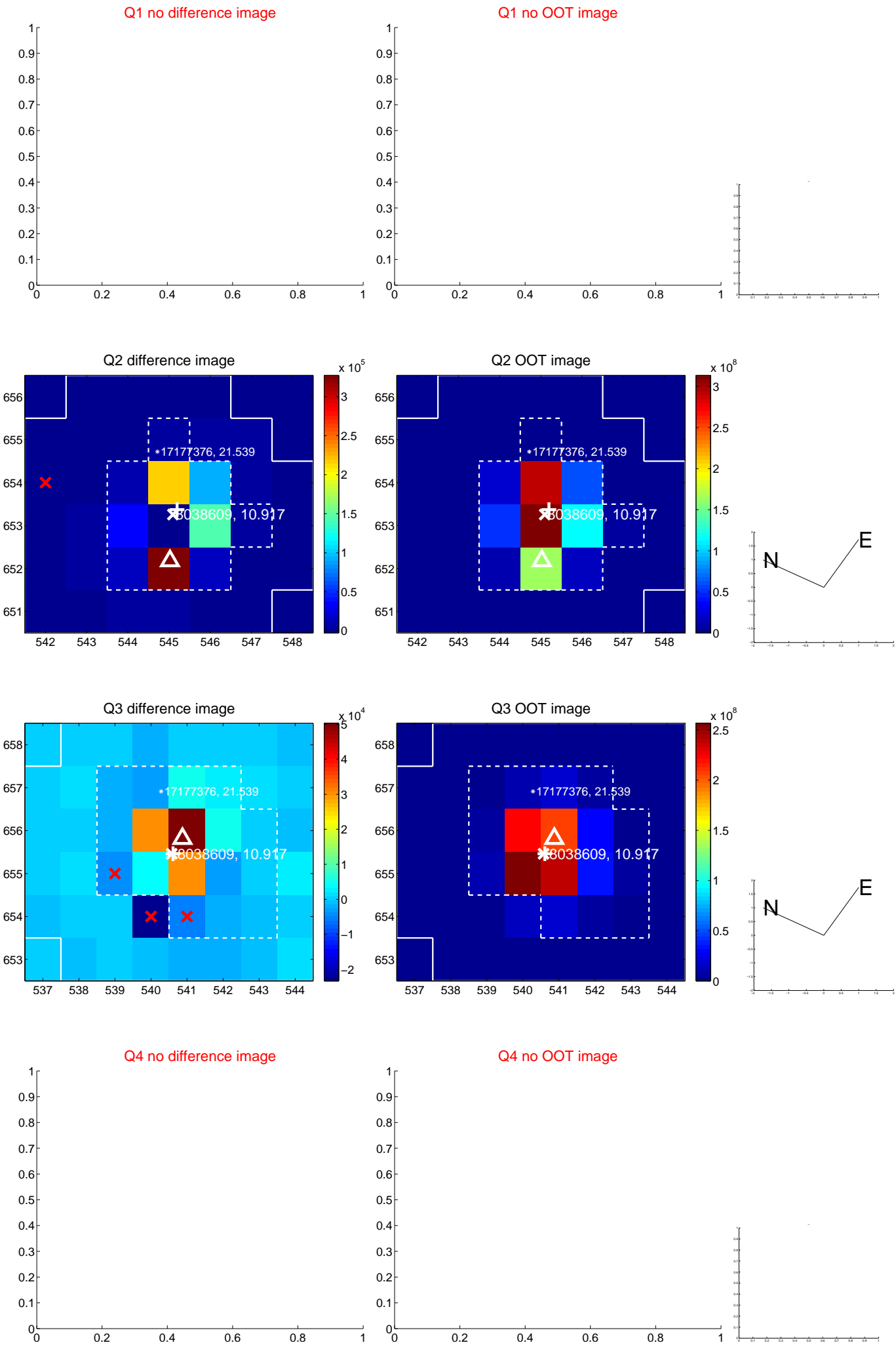
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.336 ± 0.979	1.36	-1.261 ± 0.954	-0.442 ± 0.494
PRF-fit source offset from KIC position	1.313 ± 0.613	2.14	-1.313 ± 0.612	-0.001 ± 0.584
photometric centroid source offset	0.17 ± 0.04	4.19	0.09 ± 0.05	-0.15 ± 0.04

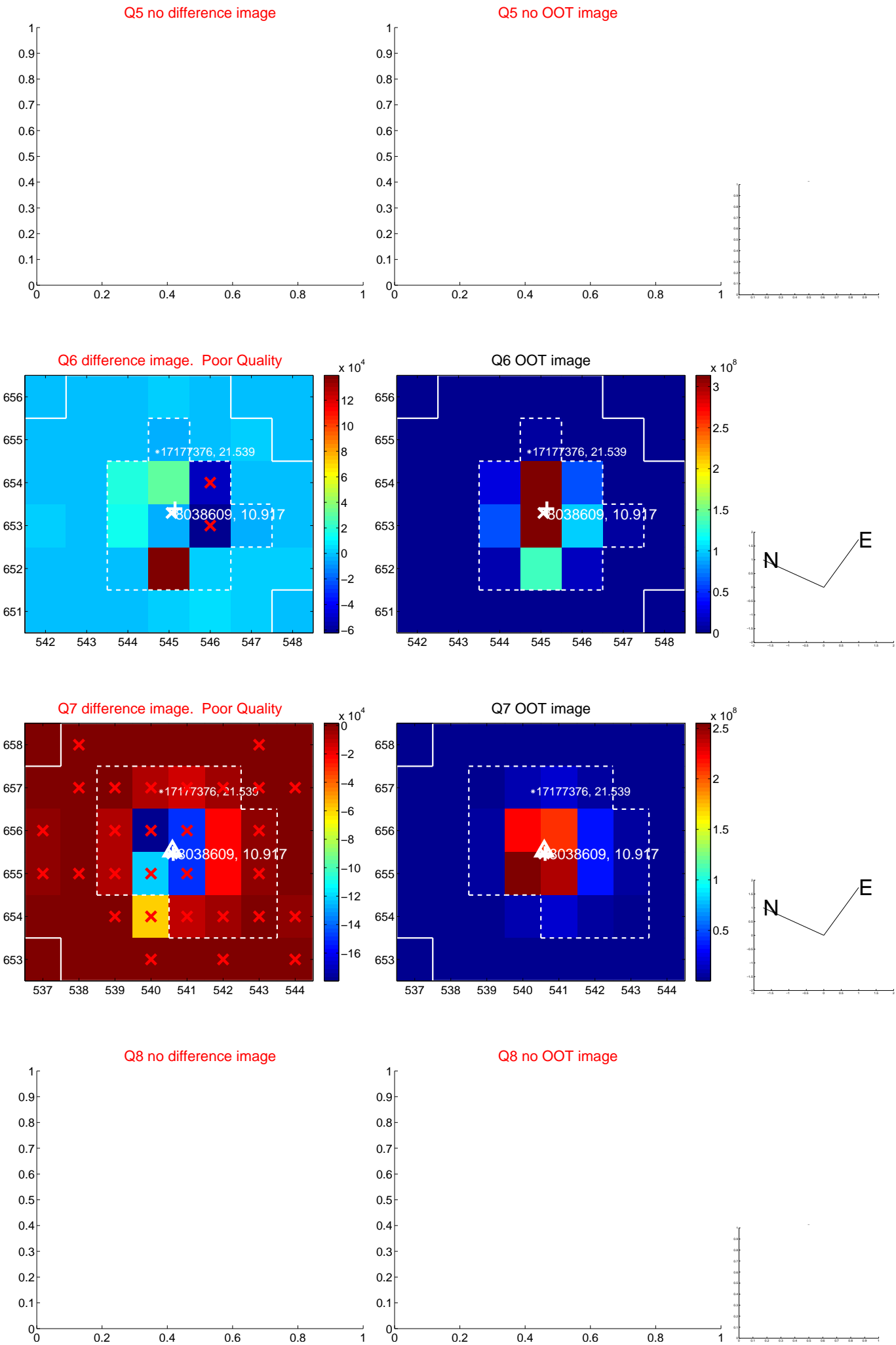


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

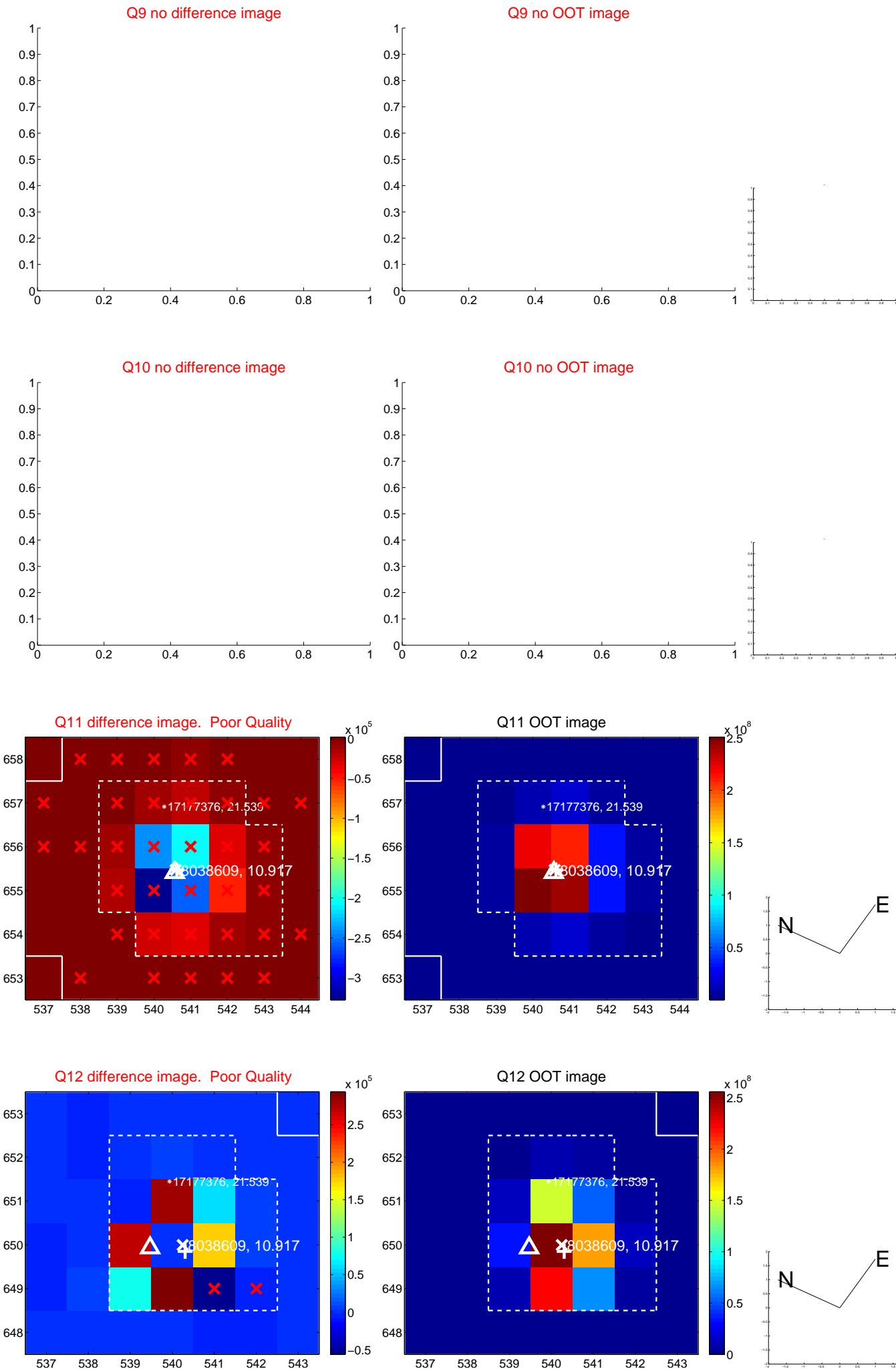
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



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

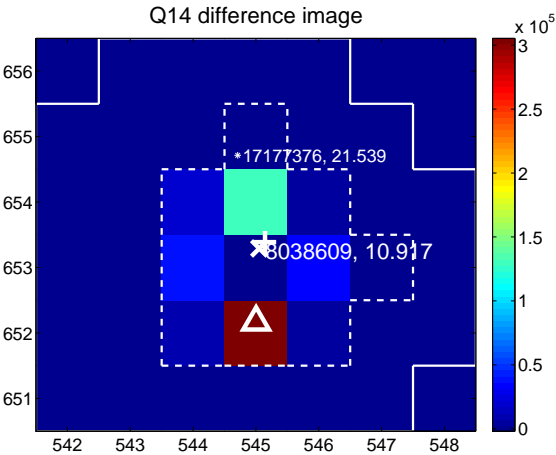
Q13 no difference image



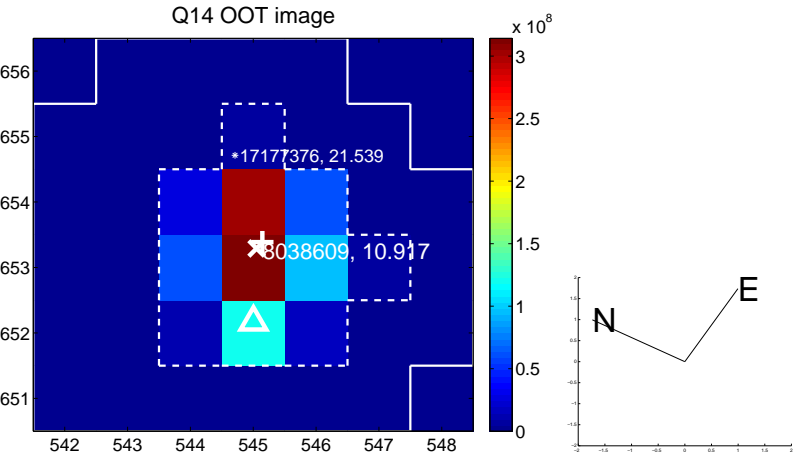
Q13 no OOT image



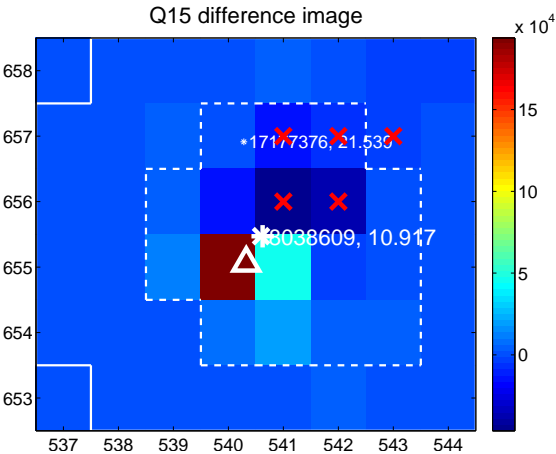
Q14 difference image



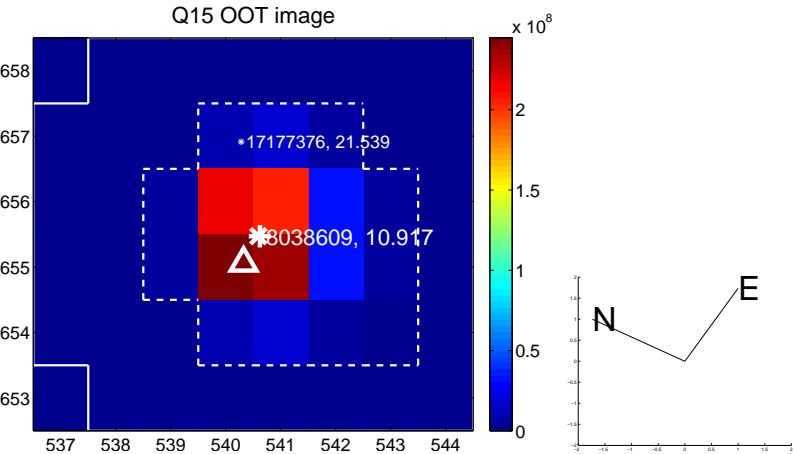
Q14 OOT image



Q15 difference image



Q15 OOT image



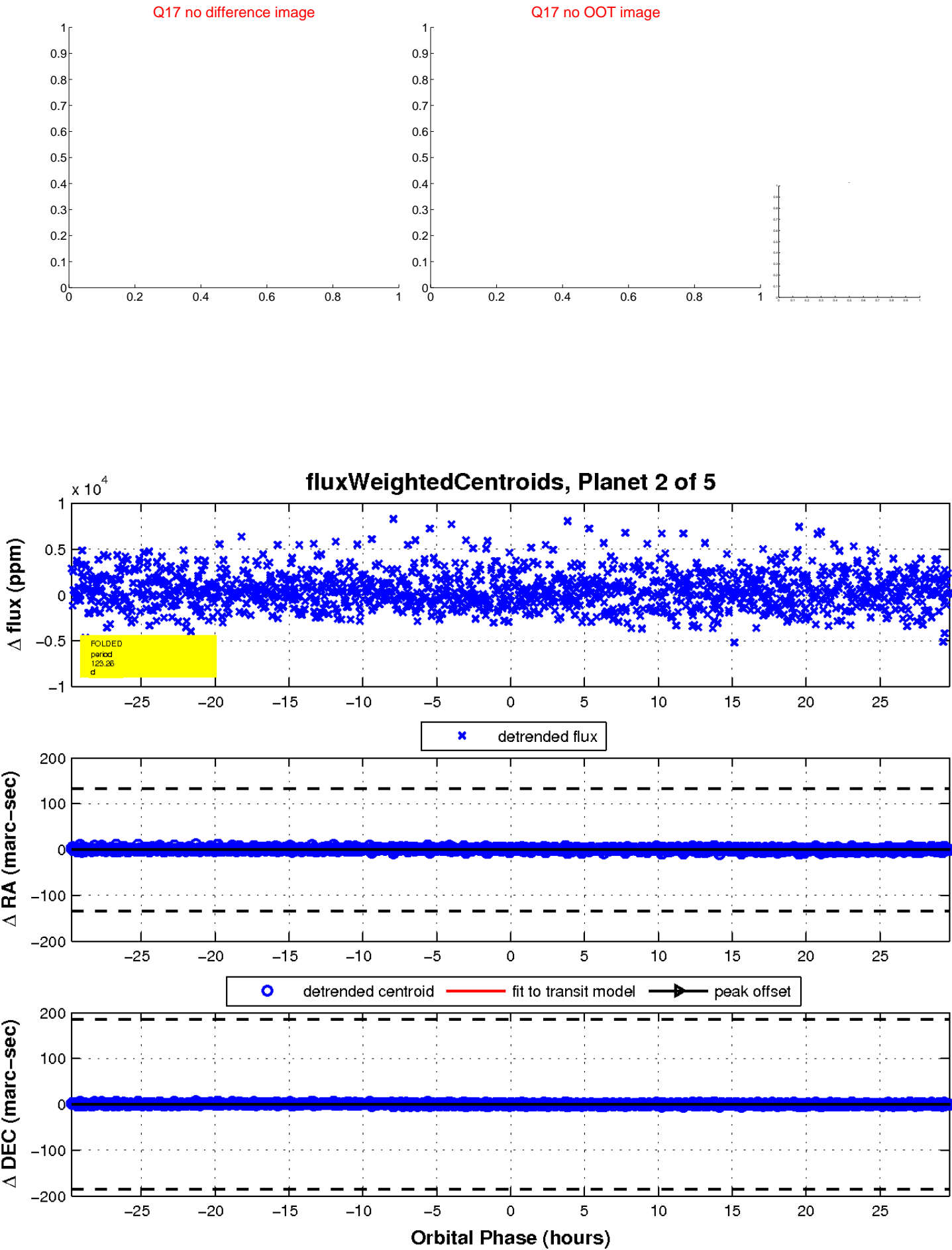
Q16 no difference image



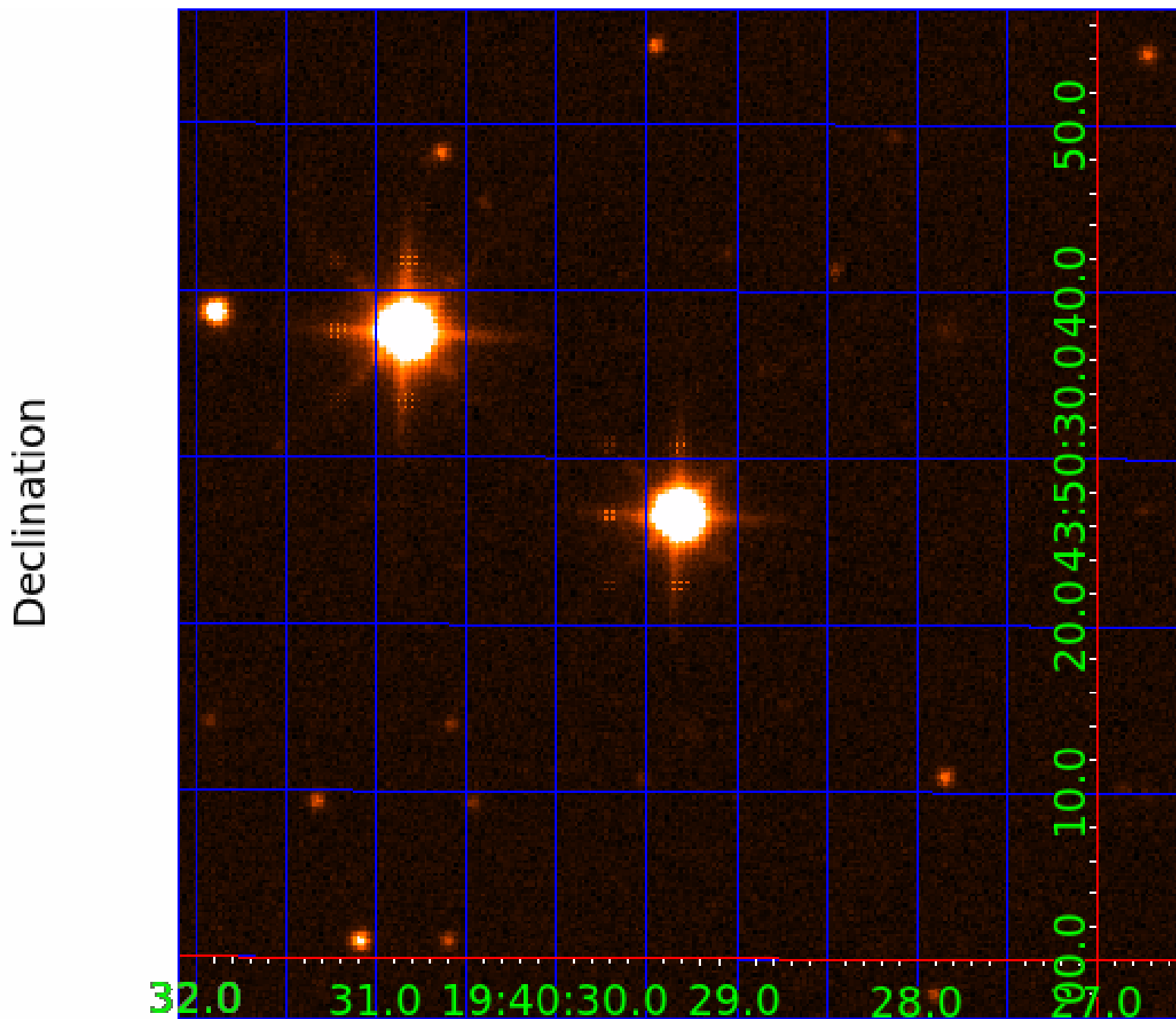
Q16 no OOT image



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



UKIRT Image



KIC 008038609

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})
008038609-01	OBS	No	1.395068	131.913390	105.1	8.865	11.1	13.0	3.61	7776	3.72	44819.14
008038609-02	OBS	No	123.257322	190.010233	5300.4	9.911	29.0	16.6	3.61	7776	47.11	113.90
008038609-04	OBS	No	404.411488	365.577043	5470.7	36.648	11.8	8.7	3.61	7776	31.26	23.36
008038609-05	OBS	No	2.226478	132.047519	924.3	22.212	10.7	15.6	3.61	7776	16.53	24030.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008038609-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
008038609-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008038609-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED
008038609-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

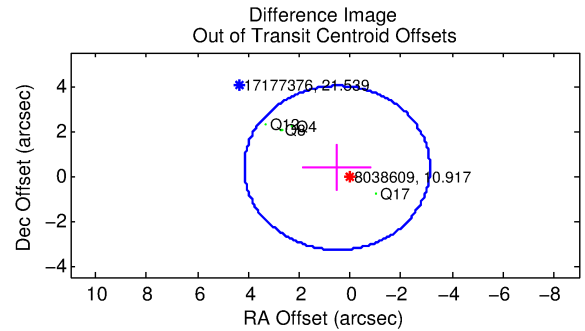
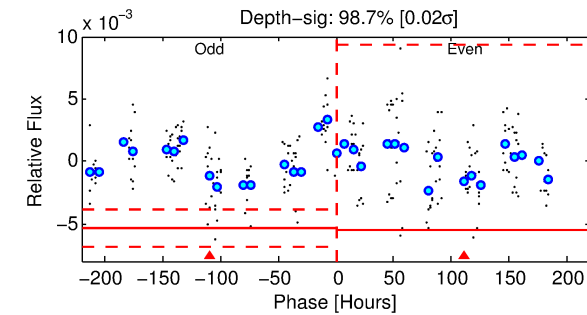
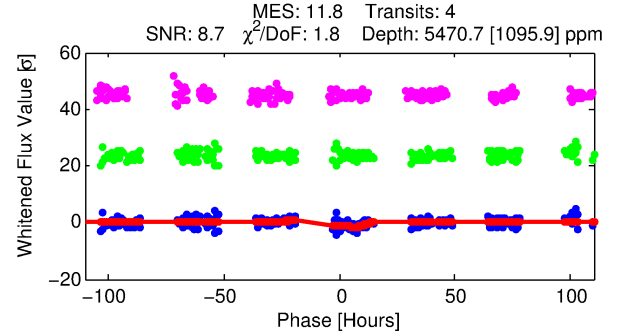
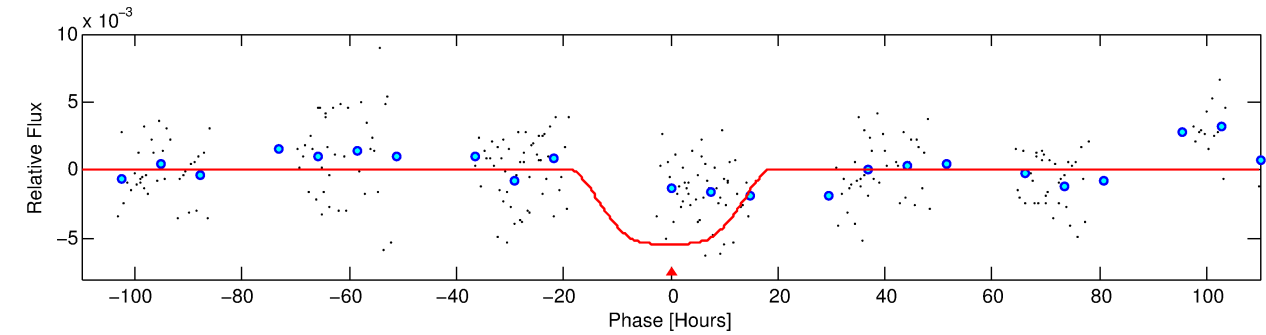
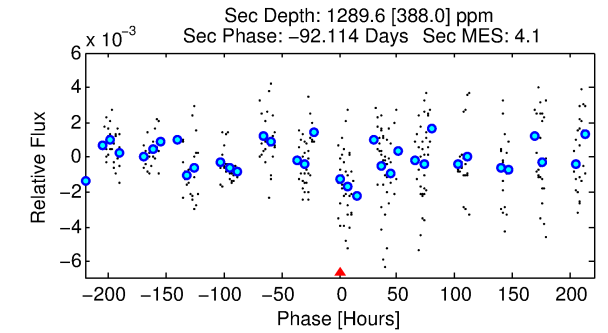
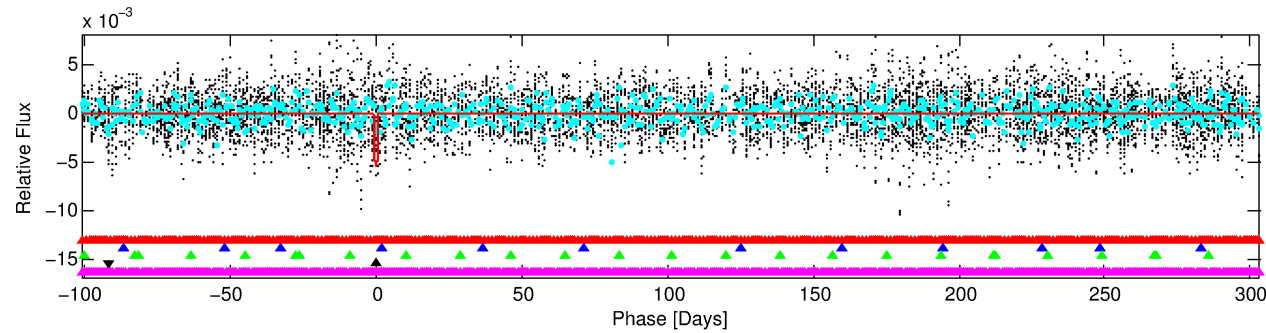
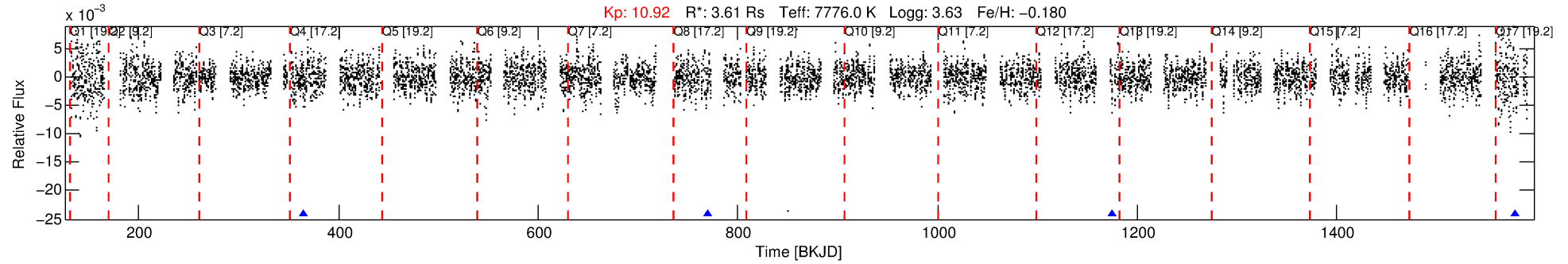
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008038609-04

No Significant Match Found

DV One-Page Summary

KIC: 8038609 Candidate: 4 of 5 Period: 404.411 d



DV Fit Results:

Period = 404.41149 [0.10236] d
Epoch = 365.5770 [0.2871] BKJD
 R_p/R^* = 0.0794 [0.0099]
 a/R^* = 50.81 [13.16]
 b = 0.90 [0.05]
 S_{eff} = 23.36 [19.03]
 T_{eq} = 561 [114] K
 R_p = 31.26 [15.44] R_e
 a = 1.3518 [0.6554] AU
 A_g = 1326.84 [1177.90] [1.13 σ]
 T_{eff} = 5231 [555] K [8.24 σ]

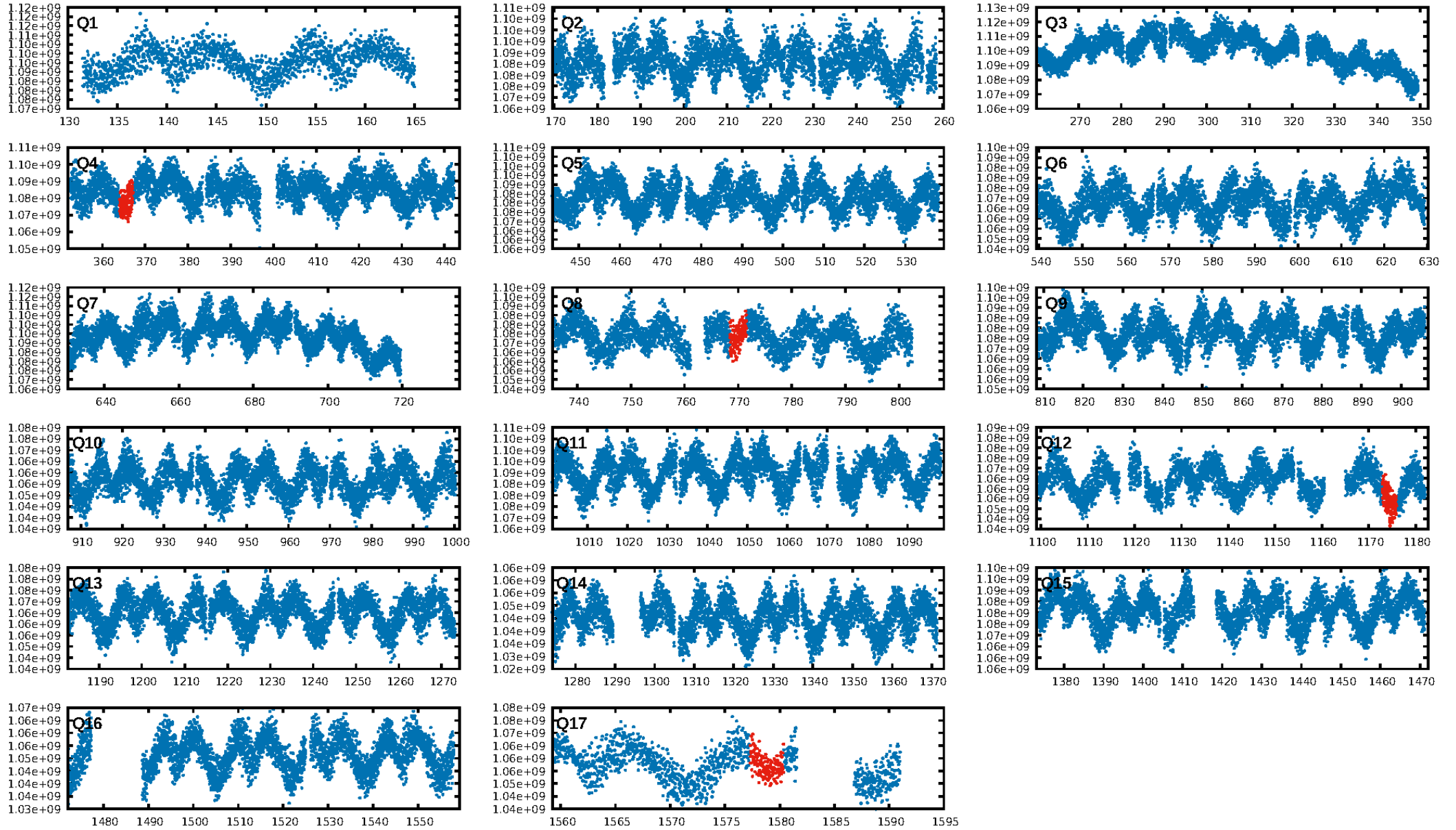
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [177.74 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 14.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 4.283
Centroid-sig: 19.0%
Centroid-so: 0.117 arcsec [2.45 σ]
OotOffset-rm: 0.621 arcsec [0.51 σ]
KicOffset-rm: 0.448 arcsec [0.37 σ]
OotOffset-st: 0/0/3/1 [4]
KicOffset-st: 0/0/3/1 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 0.00 [0/4]

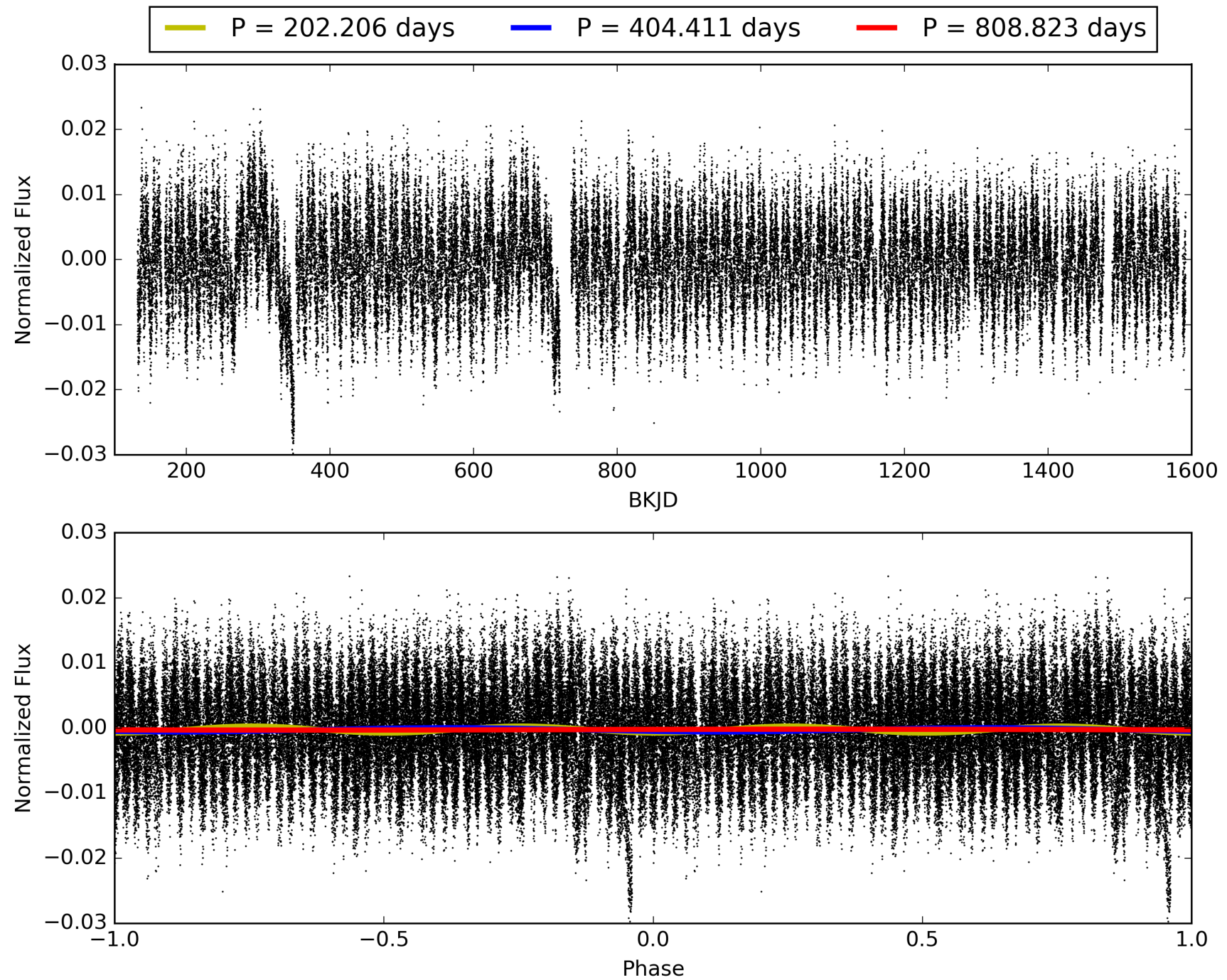
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:13:40 Z

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

TCE 008038609-04, PDC Light Curves

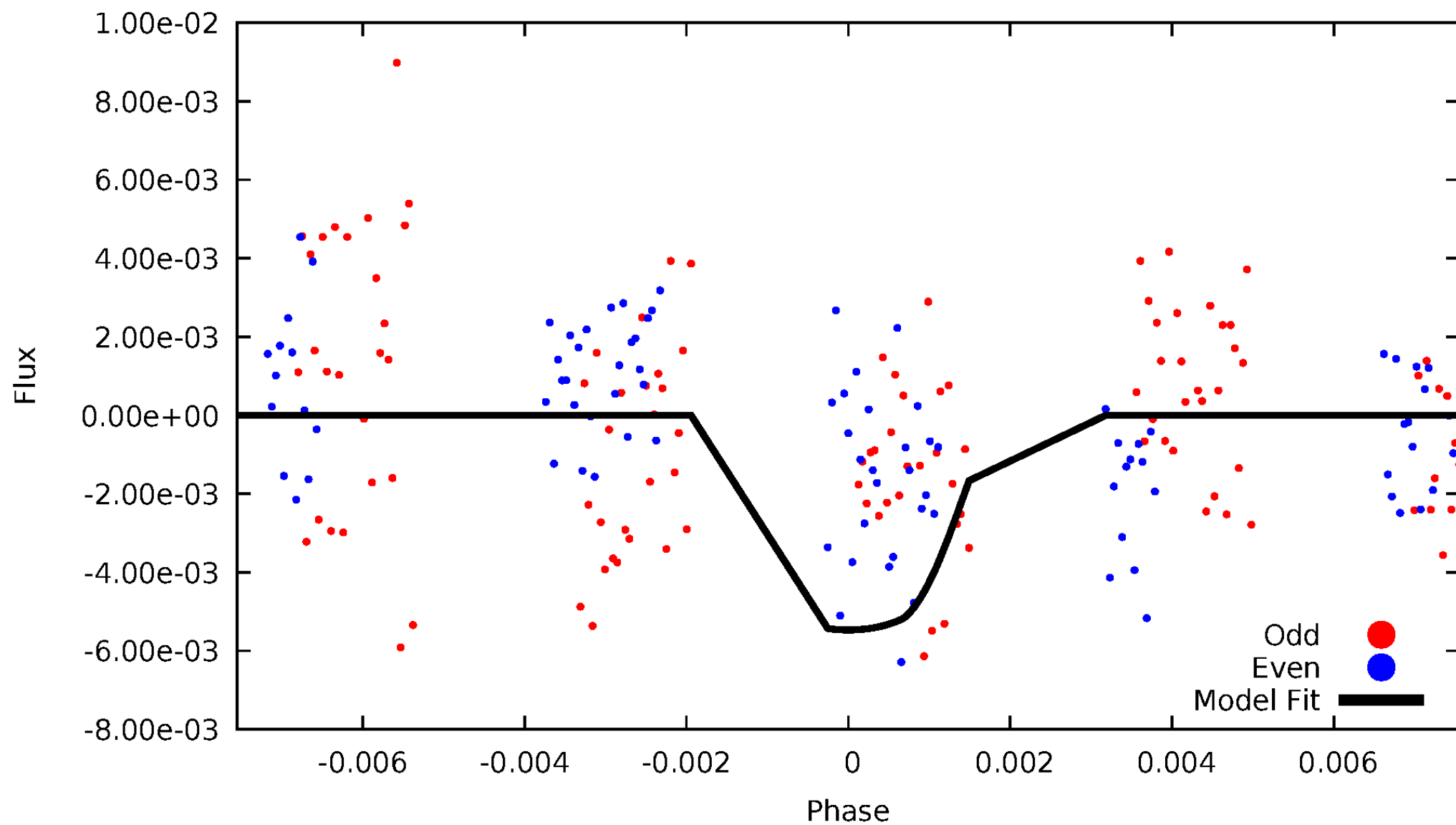


TCE 008038609-04



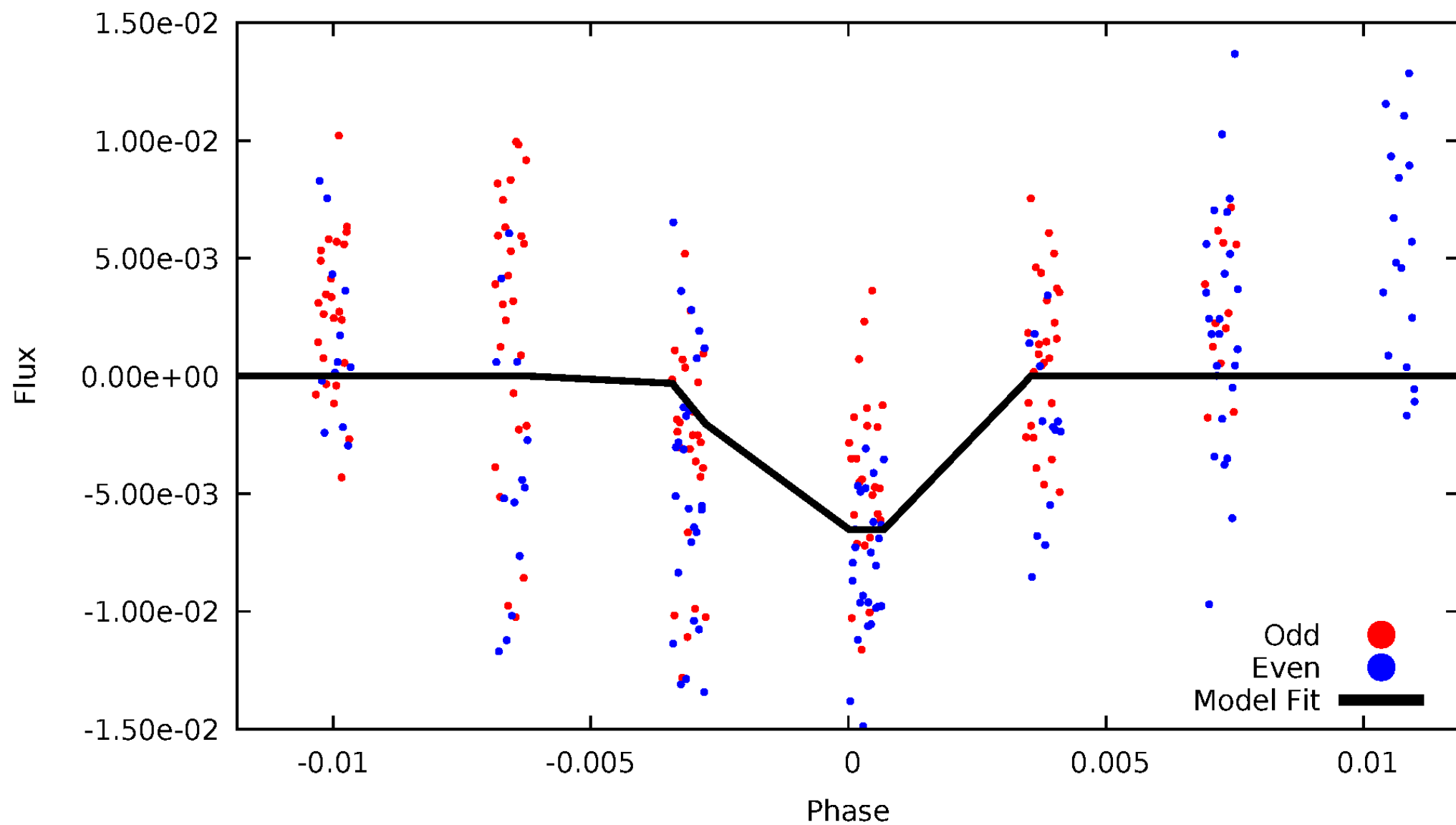
DV Odd/Even

TCE 008038609-04



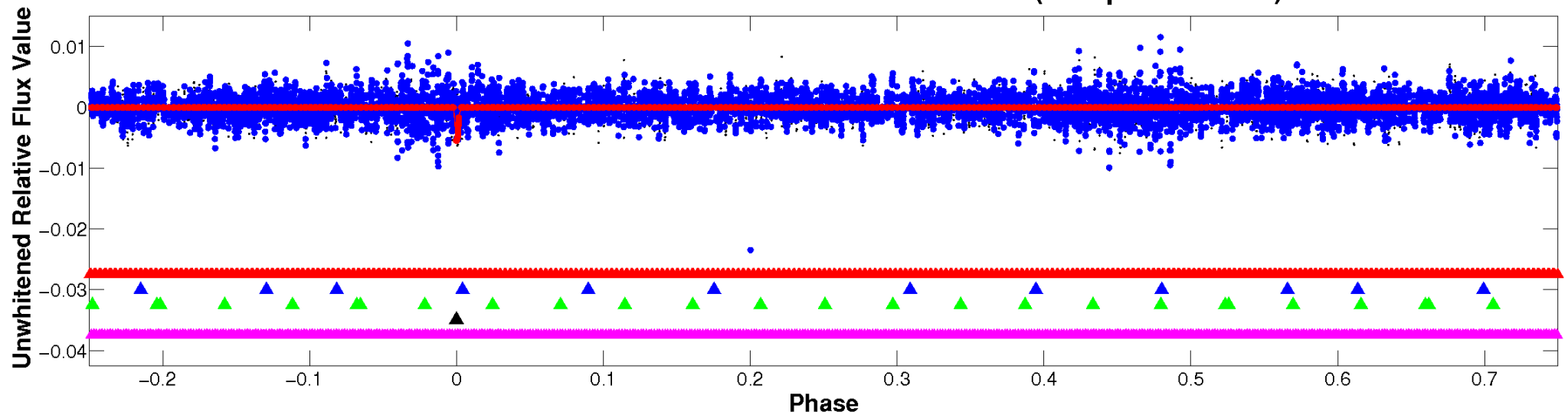
ALT Odd/Even

TCE 008038609-04

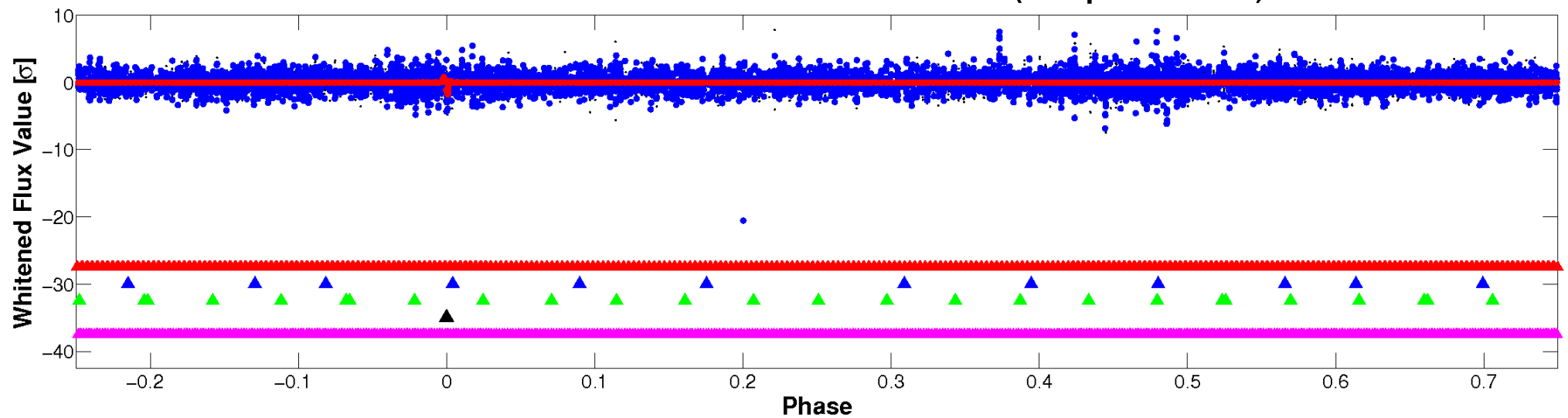


Non-Whitened Vs. Whitened Light Curve

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

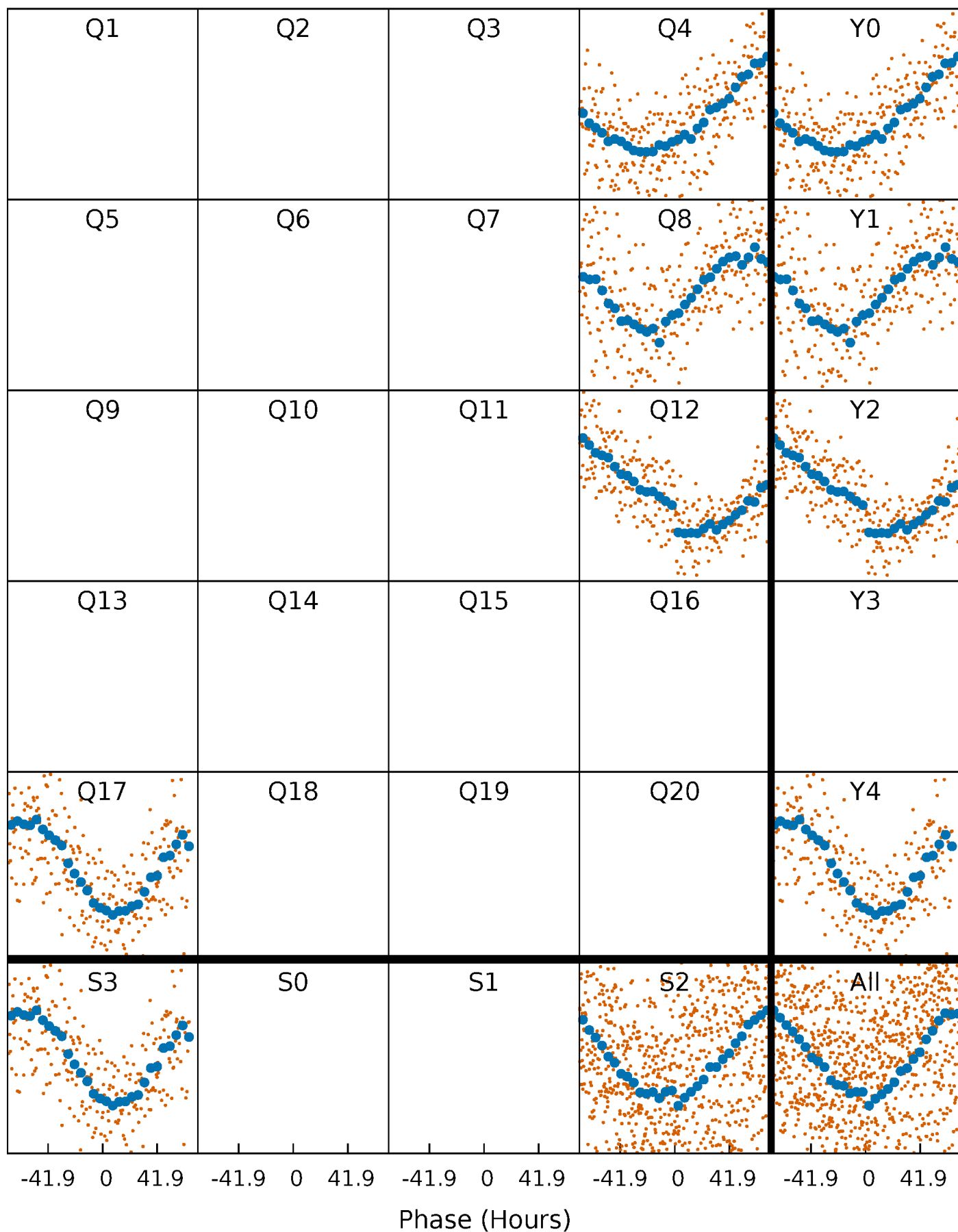


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



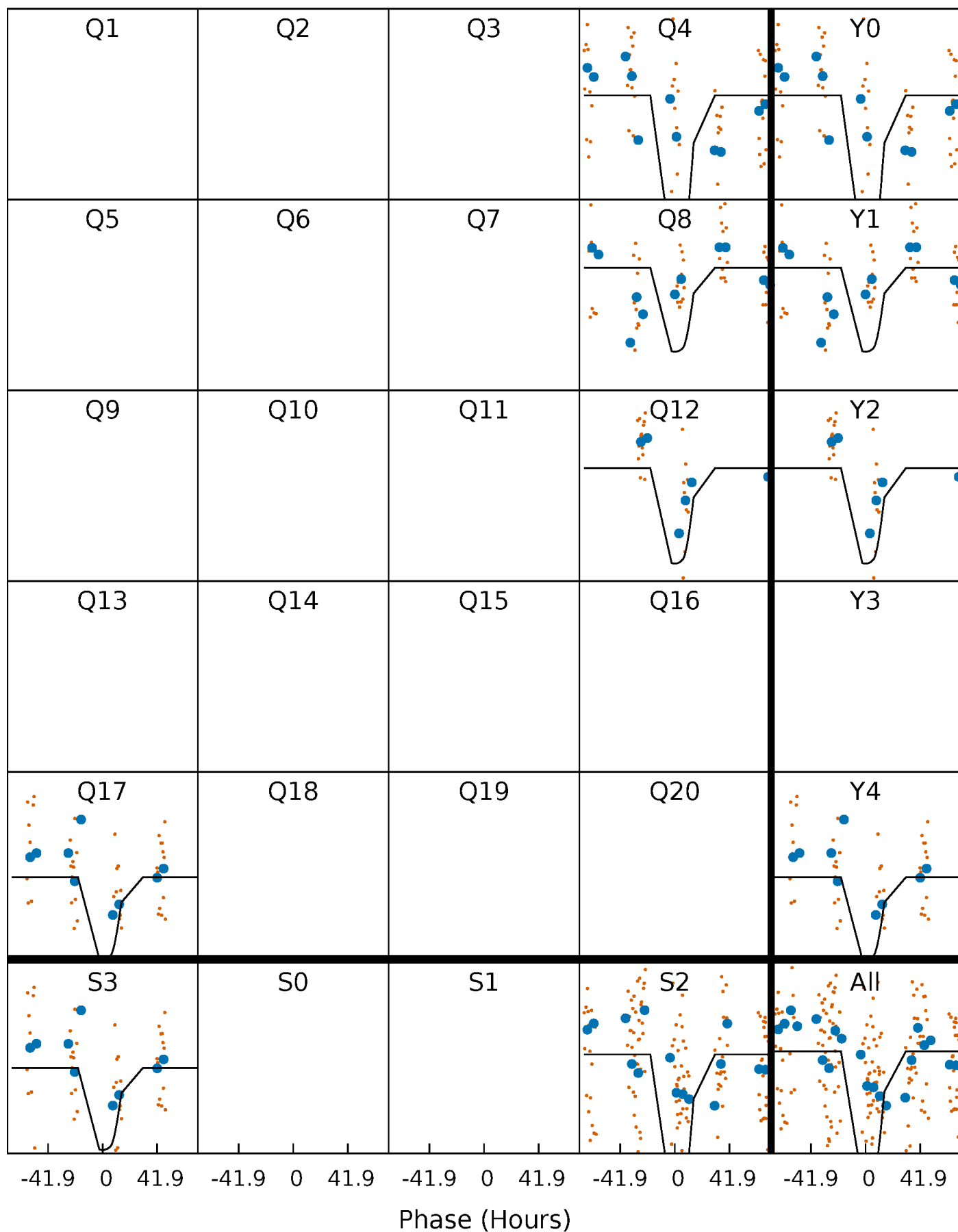
PDC Quarter-Phased Transit Curves

TCE 008038609-04 P=404.411488 Days $T_0=365.577043$ (BKJD)



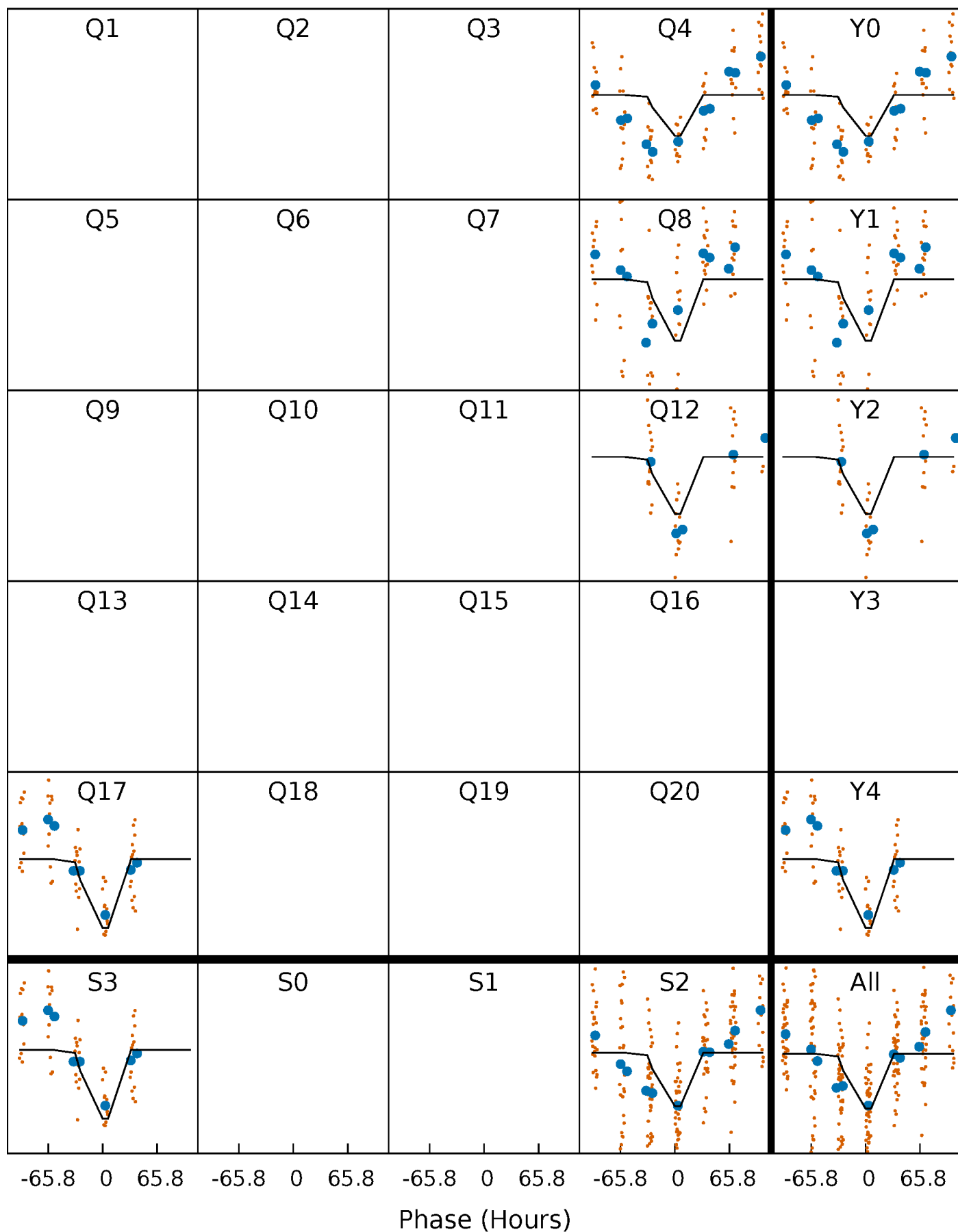
DV Quarter-Phased Transit Curves

TCE 008038609-04 $P=404.411488$ Days $T_0=365.577043$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

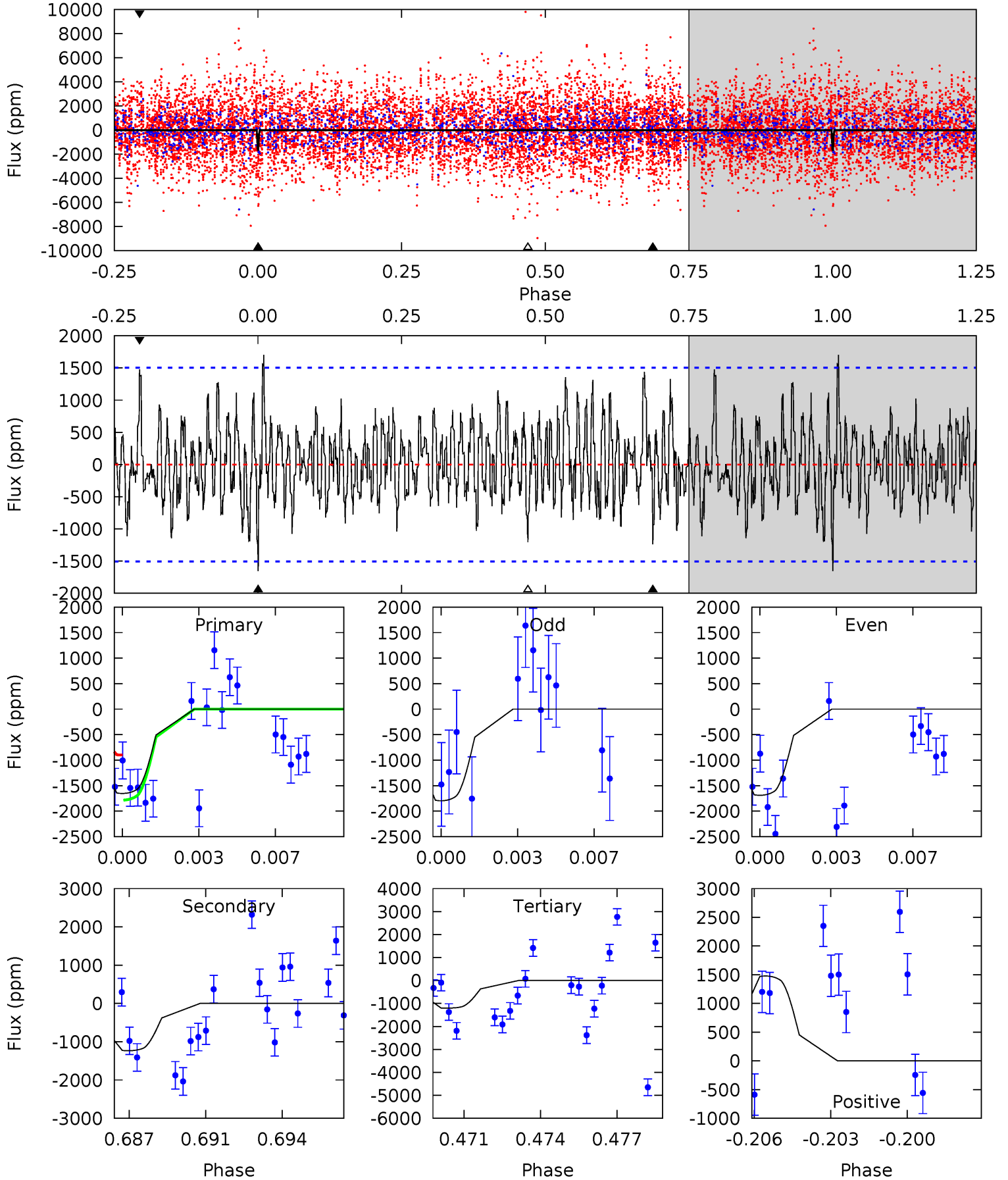
TCE 008038609-04 P=404.574268 Days $T_0=365.440986$ (BKJD)



DV Model-Shift Uniqueness Test

008038609-04, P = 404.411488 Days, E = 365.577043 Days

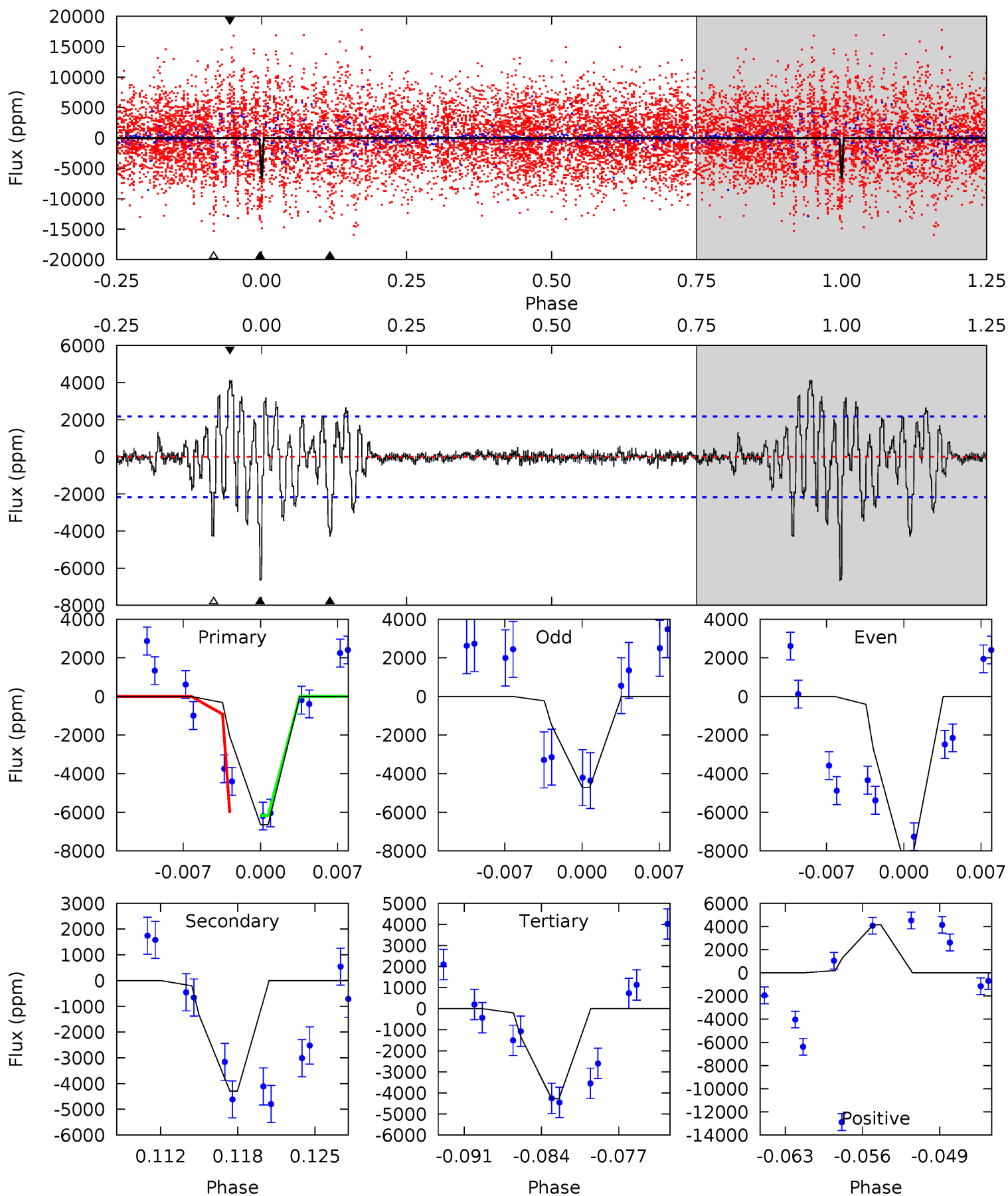
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.74	4.29	4.19	5.14	5.23	2.93	1.70	1.56	0.60	0.11	-0.85	0.19	1.08	0.51	0.84



Alt Model-Shift Uniqueness Test

008038609-04, P = 404.574268 Days, E = 365.440986 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.5	10.0	9.98	9.70	5.10	2.70	2.17	5.56	5.84	0.06	0.34	4.62	0.96	0.38	0.17



Stellar Parameters For KIC 008038609

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7776^{+216}_{-324}	$3.627^{+0.476}_{-0.084}$	$-0.180^{+0.200}_{-0.300}$	$3.610^{+0.617}_{-1.726}$	$2.017^{+0.317}_{-0.514}$	$0.060^{+0.314}_{-0.017}$
	+3%/-4%	+13%/-2%	+111%/-167%	+17%/-48%	+16%/-25%	+519%/-28%
Source	KIC0	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 008038609-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1235 ± 288	$29.02^{+6.26}_{-8.39}$	755^{+53}_{-99}	5118^{+457}_{-388}	1531^{+1295}_{-586}
Alt.	-4297 ± 428	$29.69^{+6.94}_{-7.72}$	756^{+54}_{-88}	6875^{+591}_{-536}	4963^{+3750}_{-1588}

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

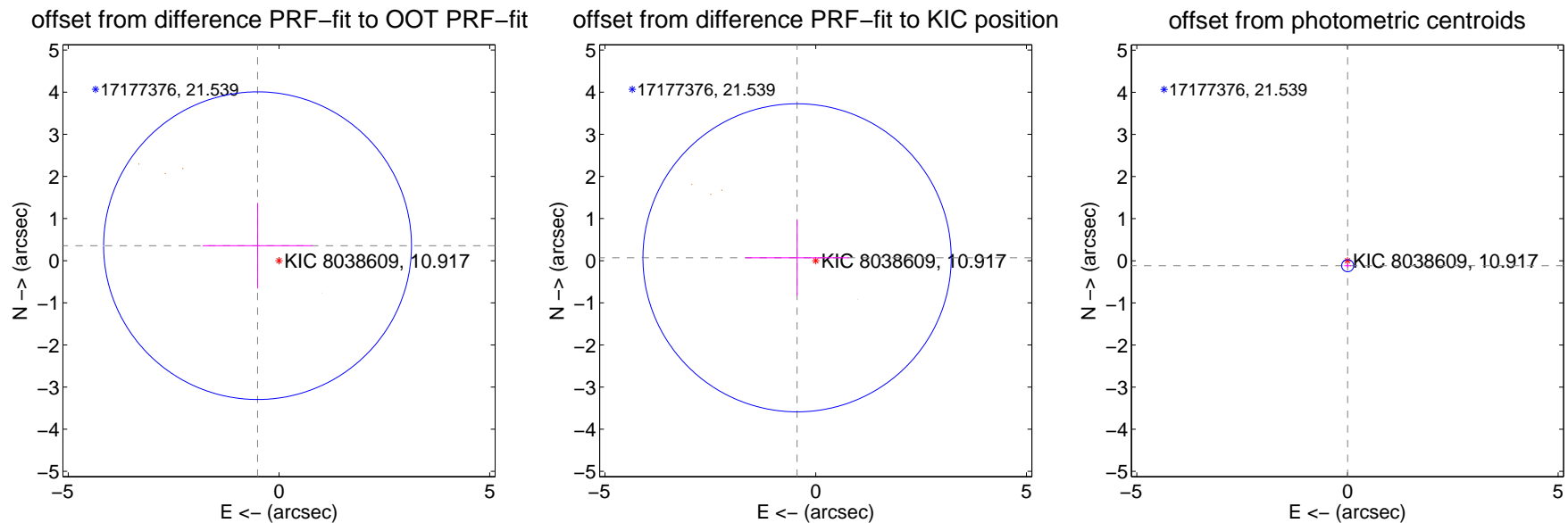
DV Centroid Data

Supplemental centroid analysis for 008038609-04. **Kepler magnitude: 10.92.** Transit SNR 8.70

There are 1 quarters with good PRF difference image offsets

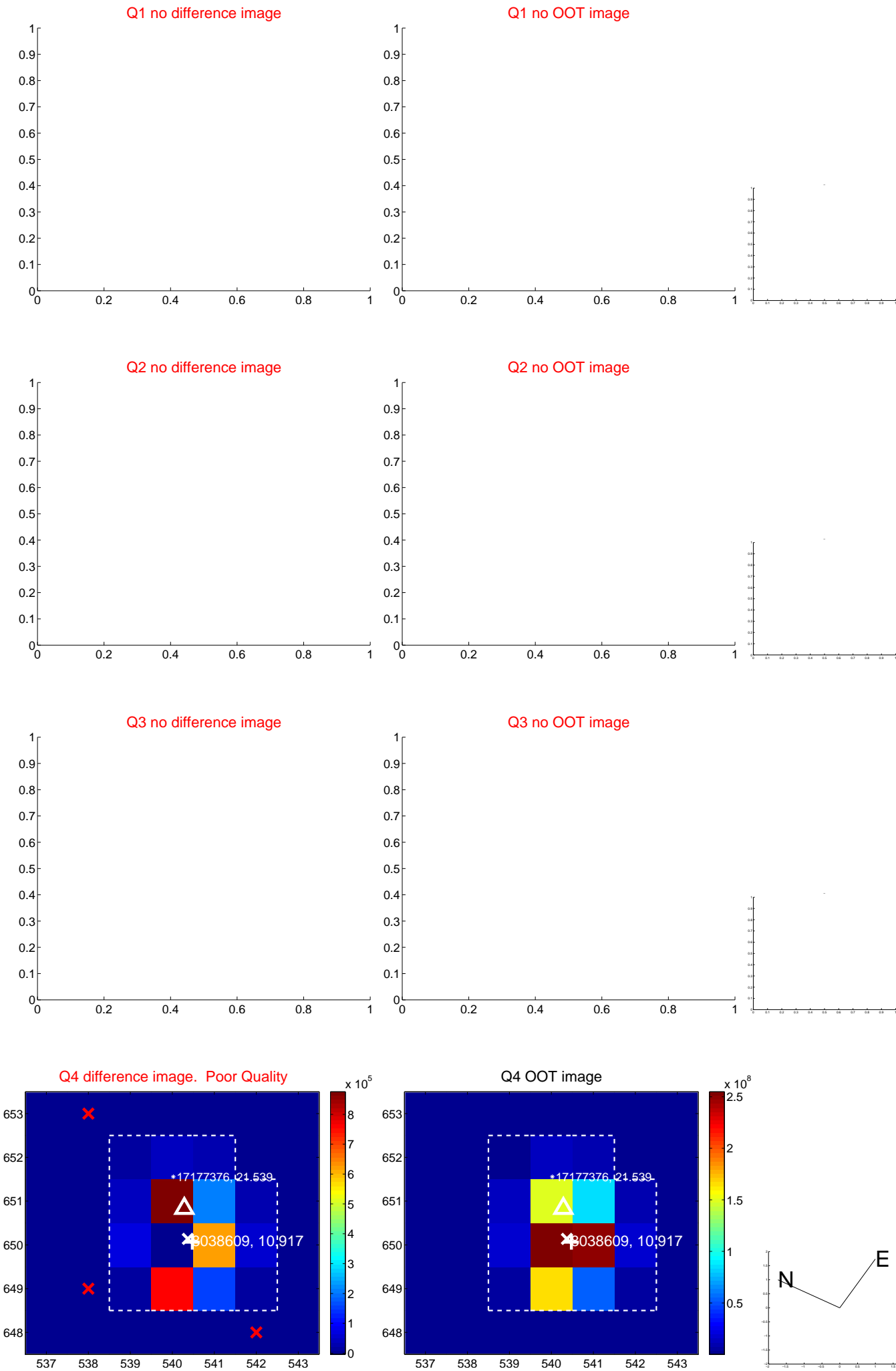
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.621 ± 1.217	0.51	0.508 ± 1.305	0.356 ± 1.016
PRF-fit source offset from KIC position	0.448 ± 1.219	0.37	0.442 ± 1.225	0.069 ± 0.898
photometric centroid source offset	0.12 ± 0.05	2.45	-0.00 ± 0.08	-0.12 ± 0.05

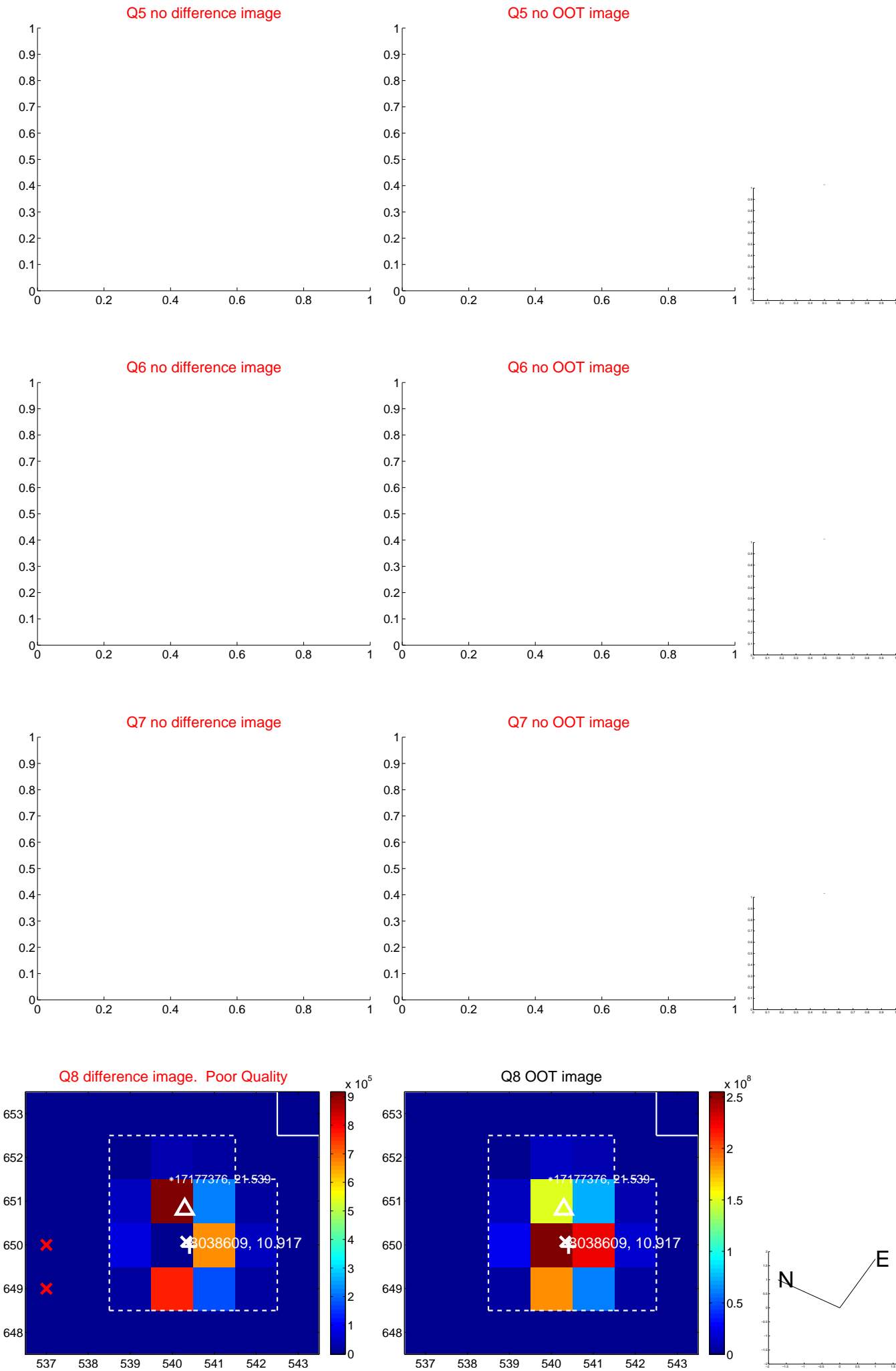


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

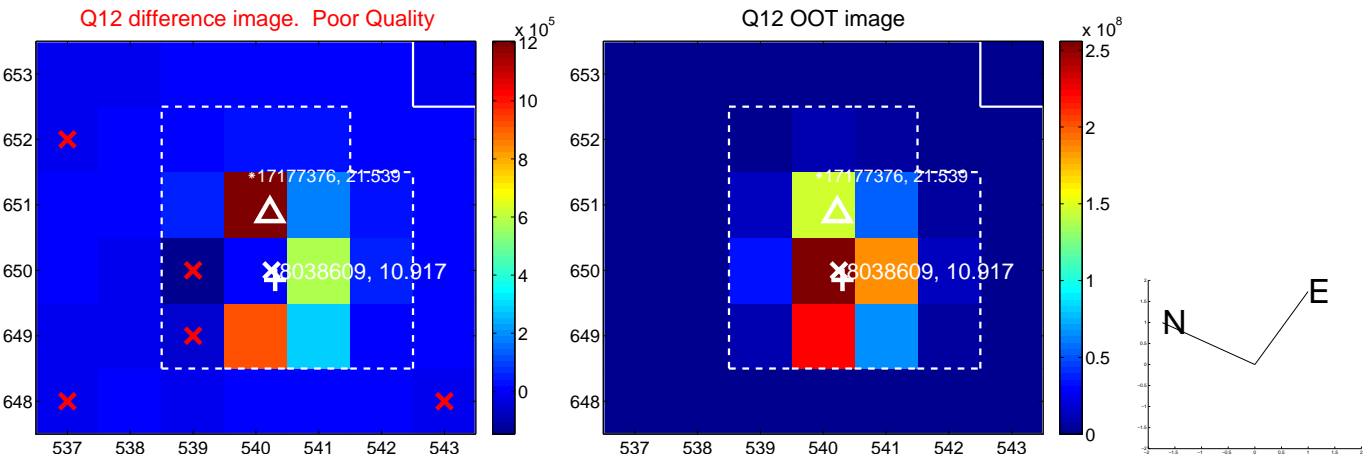
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



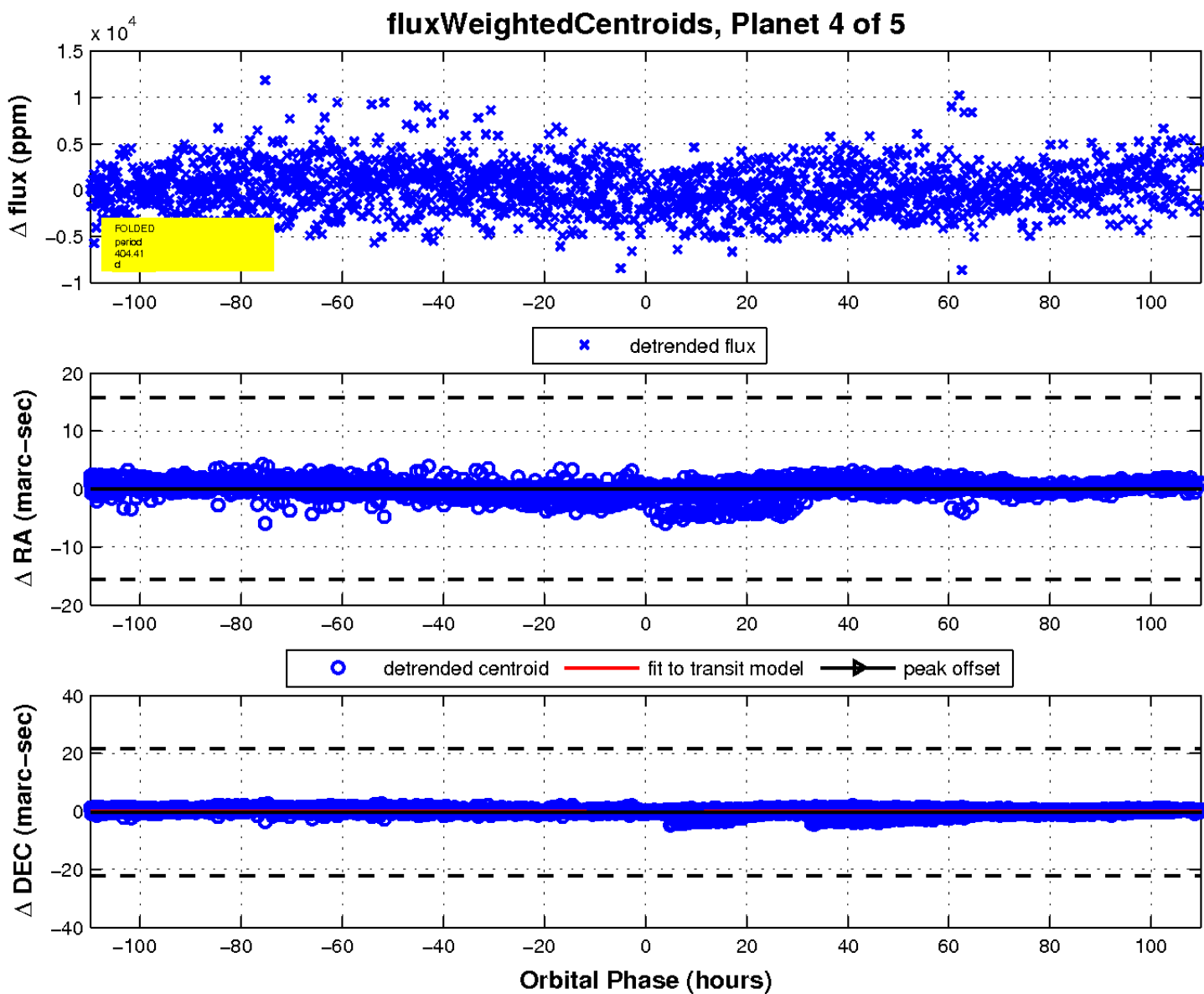
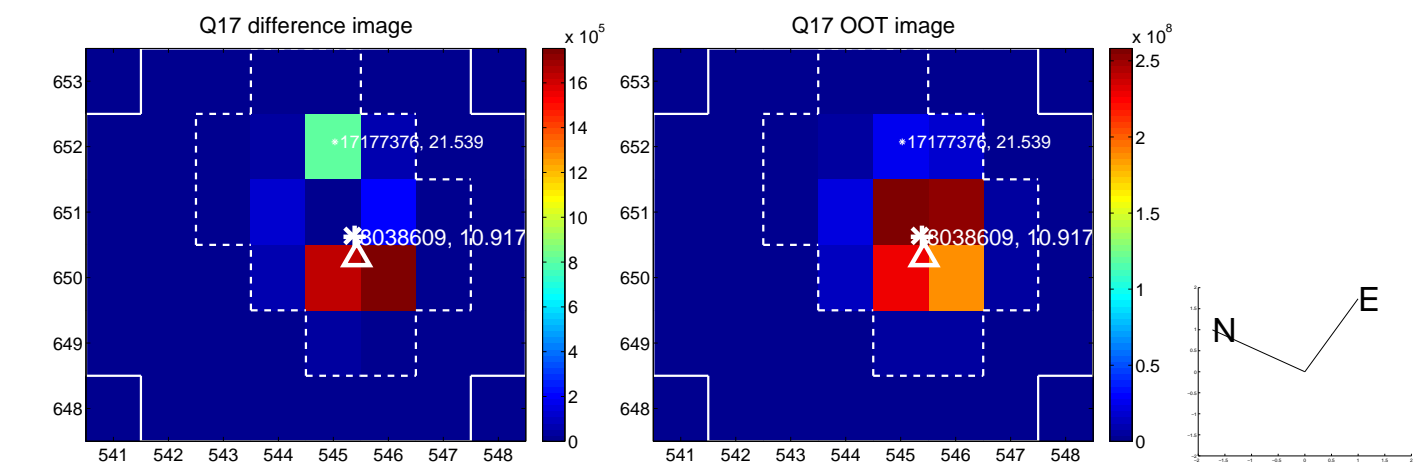
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



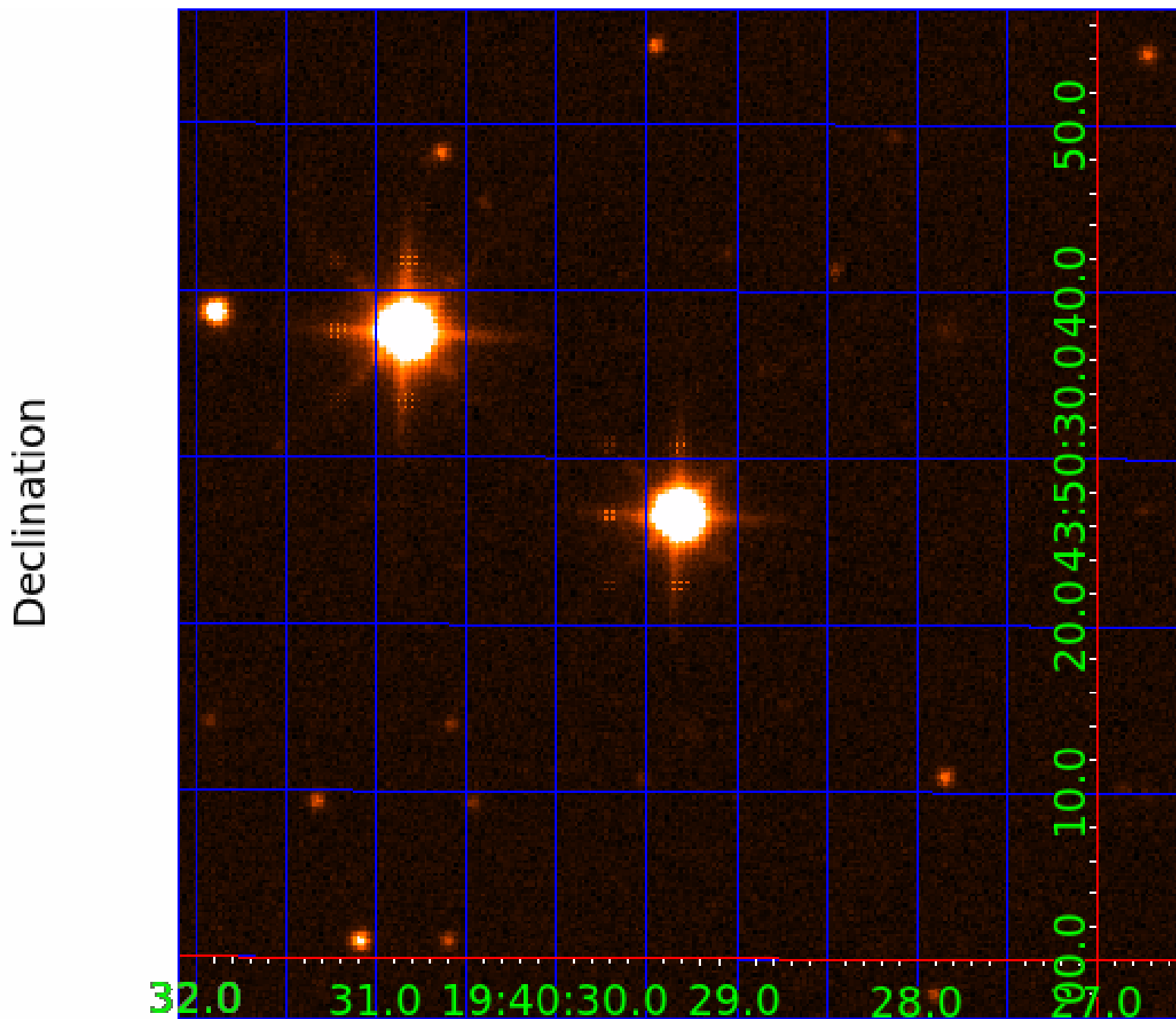
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 008038609

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})
008038609-01	OBS	No	1.395068	131.913390	105.1	8.865	11.1	13.0	3.61	7776	3.72	44819.14
008038609-02	OBS	No	123.257322	190.010233	5300.4	9.911	29.0	16.6	3.61	7776	47.11	113.90
008038609-04	OBS	No	404.411488	365.577043	5470.7	36.648	11.8	8.7	3.61	7776	31.26	23.36
008038609-05	OBS	No	2.226478	132.047519	924.3	22.212	10.7	15.6	3.61	7776	16.53	24030.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008038609-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
008038609-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_SATURATED
008038609-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED
008038609-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

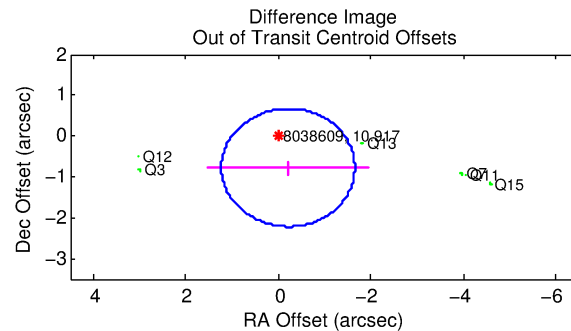
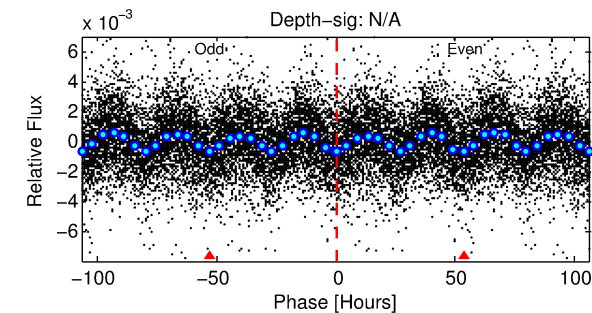
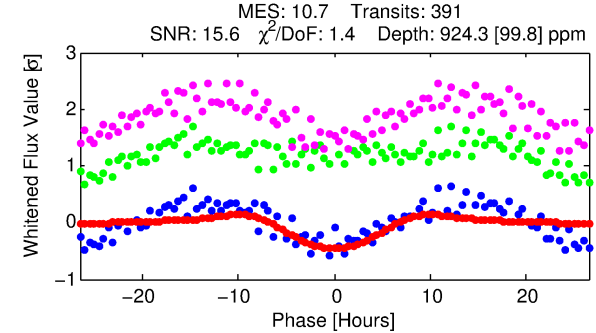
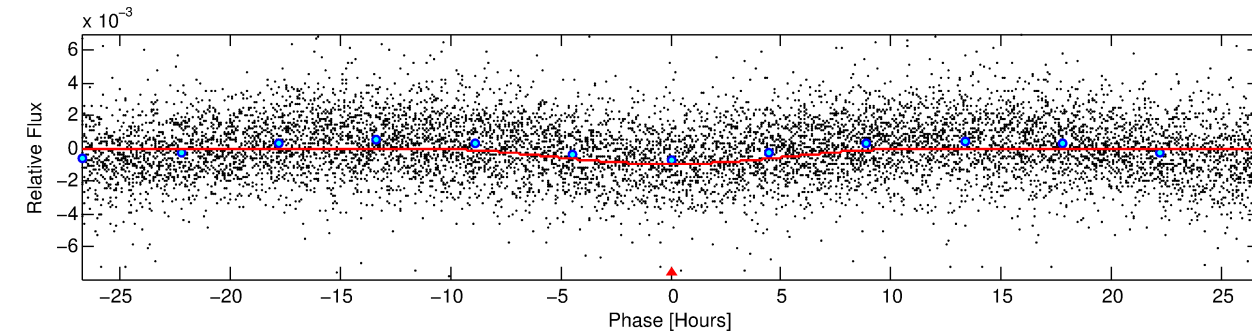
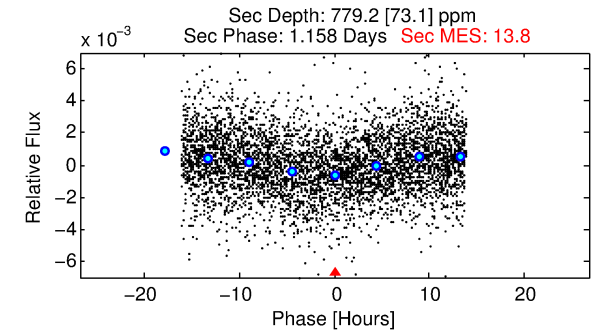
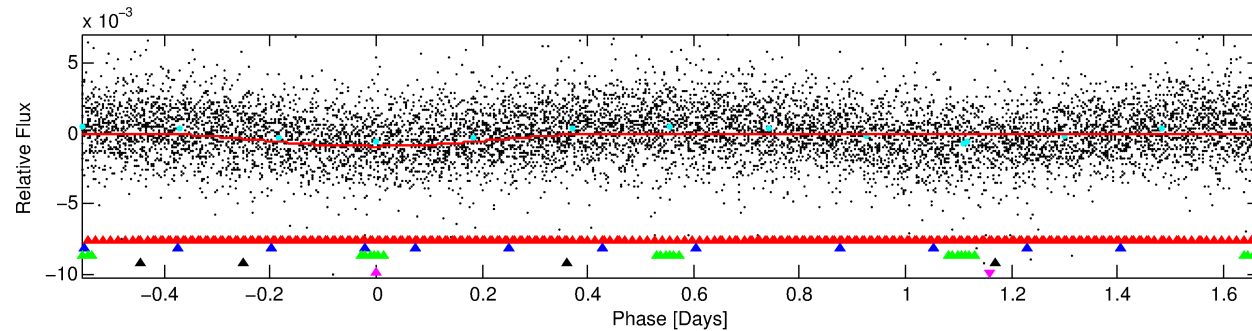
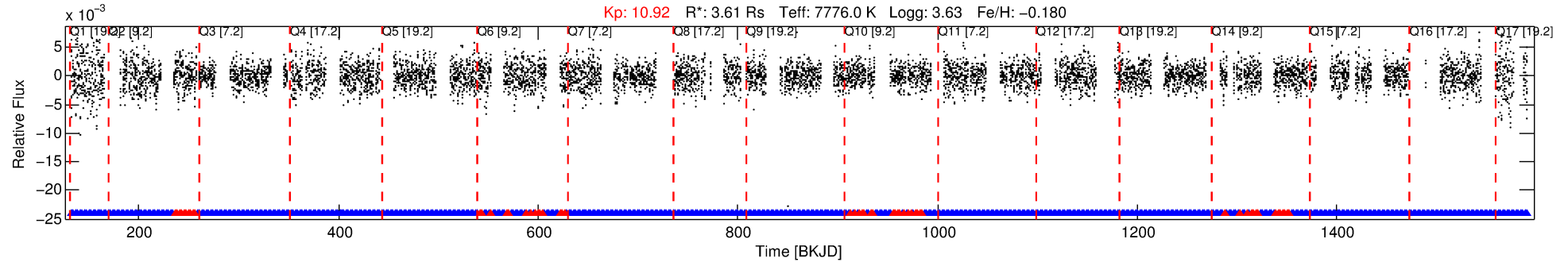
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008038609-05

No Significant Match Found

DV One-Page Summary

KIC: 8038609 Candidate: 5 of 5 Period: 2.226 d



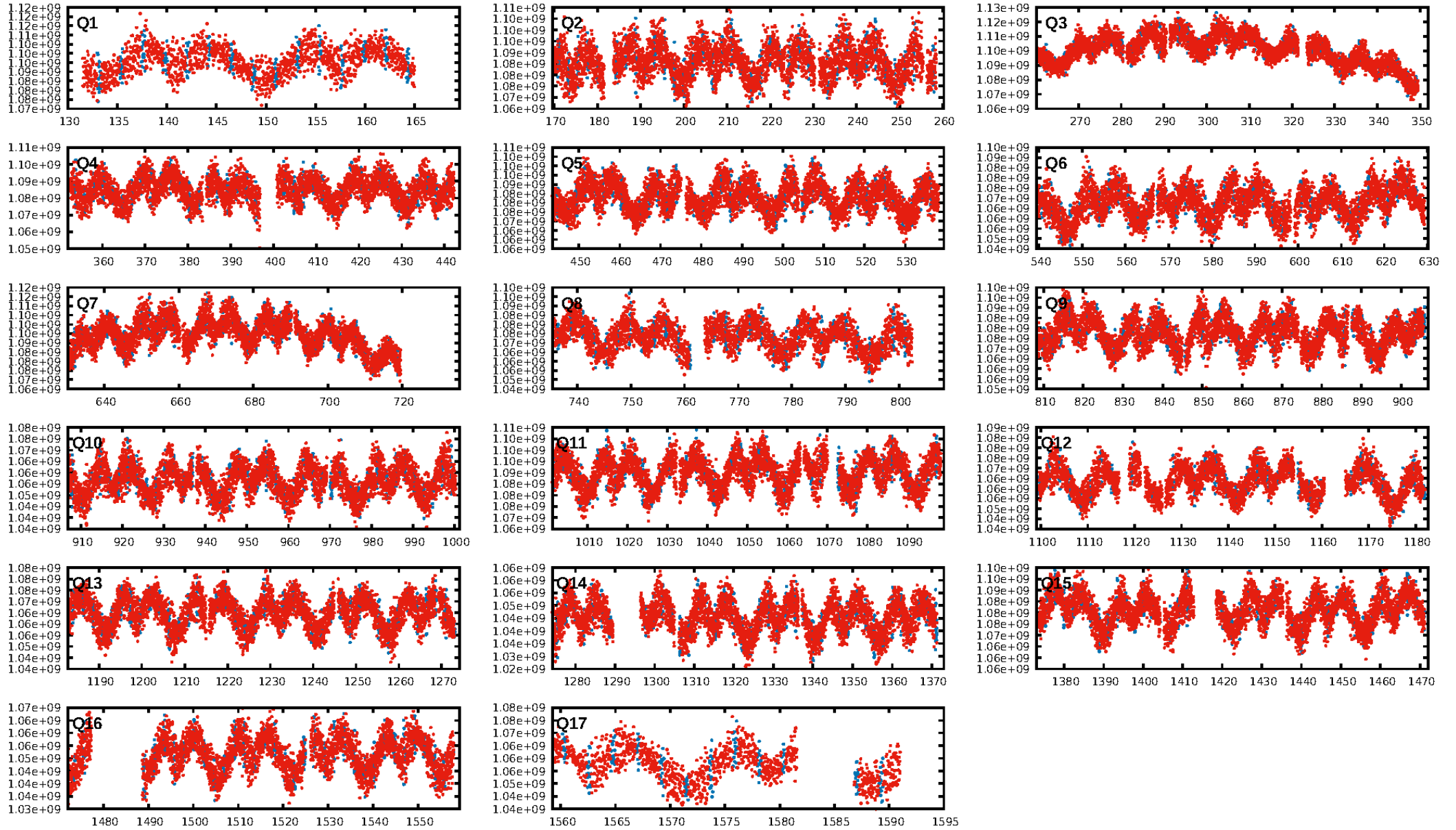
DV Fit Results:

Period = 2.22648 [0.00008] d
Epoch = 132.0475 [0.0282] BKJD
Rp/R* = 0.0420 [0.0206]
a/R* = 1.05 [0.02]
b = 0.98 [0.04]
Seff = 24030.70 [19571.07]
Teq = 3175 [646] K
Rp = 16.53 [11.33] Re
a = 0.0421 [0.0204] AU
Ag = 2.79 [3.53] [0.51σ]
Teffp = 6342 [1586] K [1.85σ]

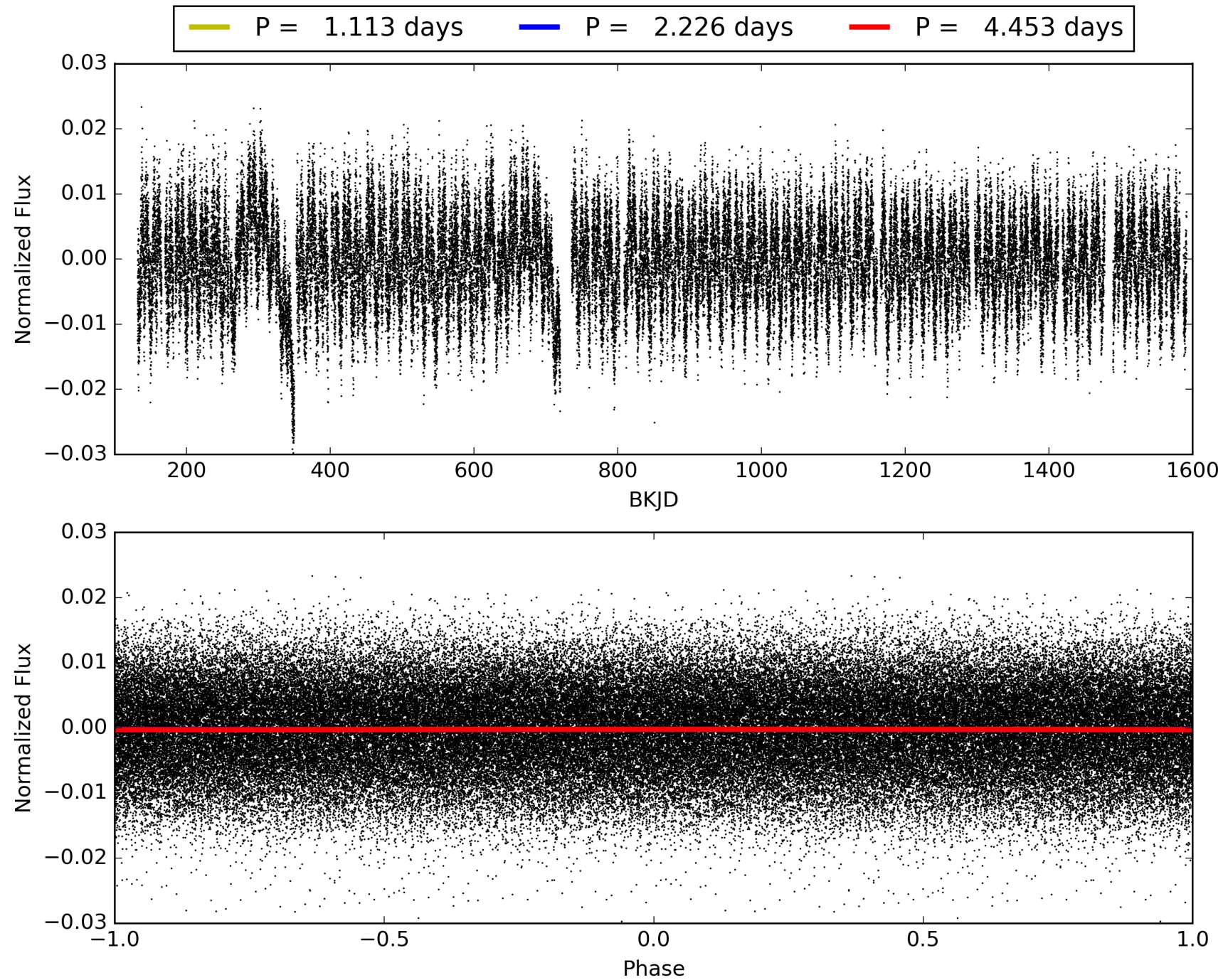
DV Diagnostic Results:

ShortPeriod-sig: 59.6% [0.83σ]
LongPeriod-sig: 100.0% [12.01σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.85 [311/367]
GhostDiagnostic-chr: -1.881
Centroid-sig: 0.0%
Centroid-so: 0.270 arcsec [7.50σ]
OotOffset-rm: 0.803 arcsec [1.67σ]
OotOffset-st: 0/4/1/1 [6]
KicOffset-rm: 1.058 arcsec [2.26σ]
KicOffset-st: 0/4/1/1 [6]
DiffImageQuality-fgm: 0.50 [3/6]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 008038609-05, PDC Light Curves

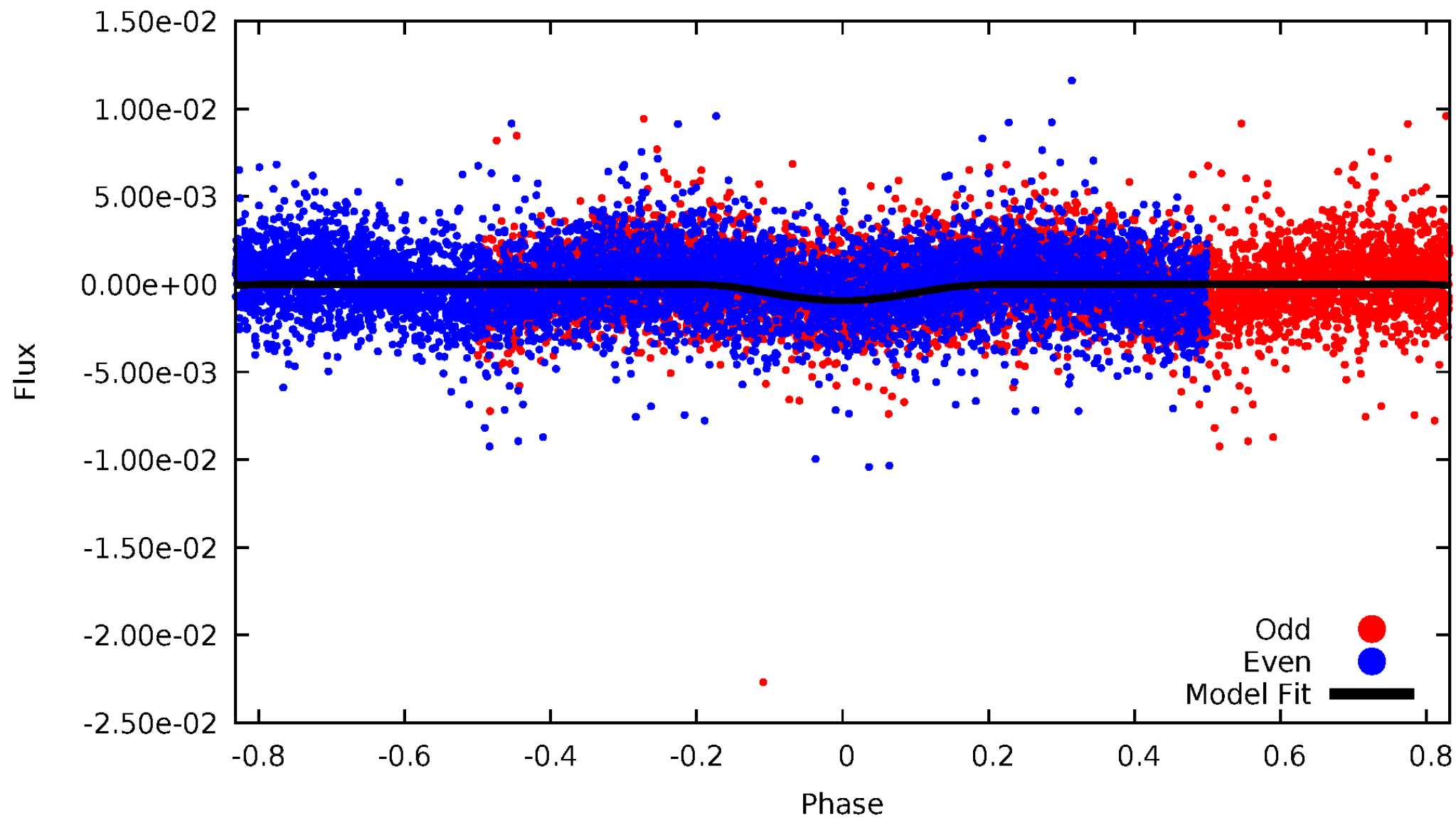


TCE 008038609-05



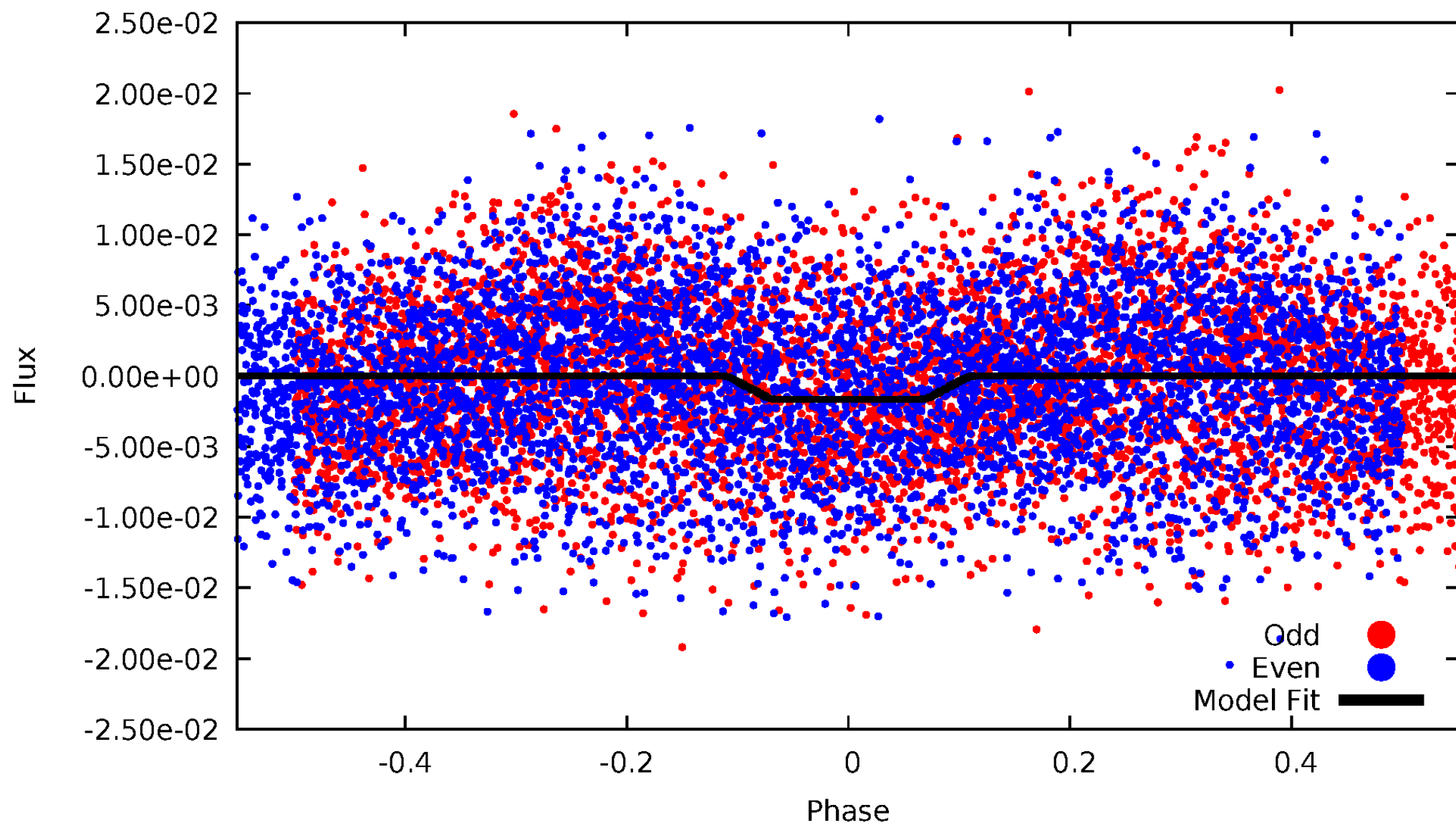
DV Odd/Even

TCE 008038609-05



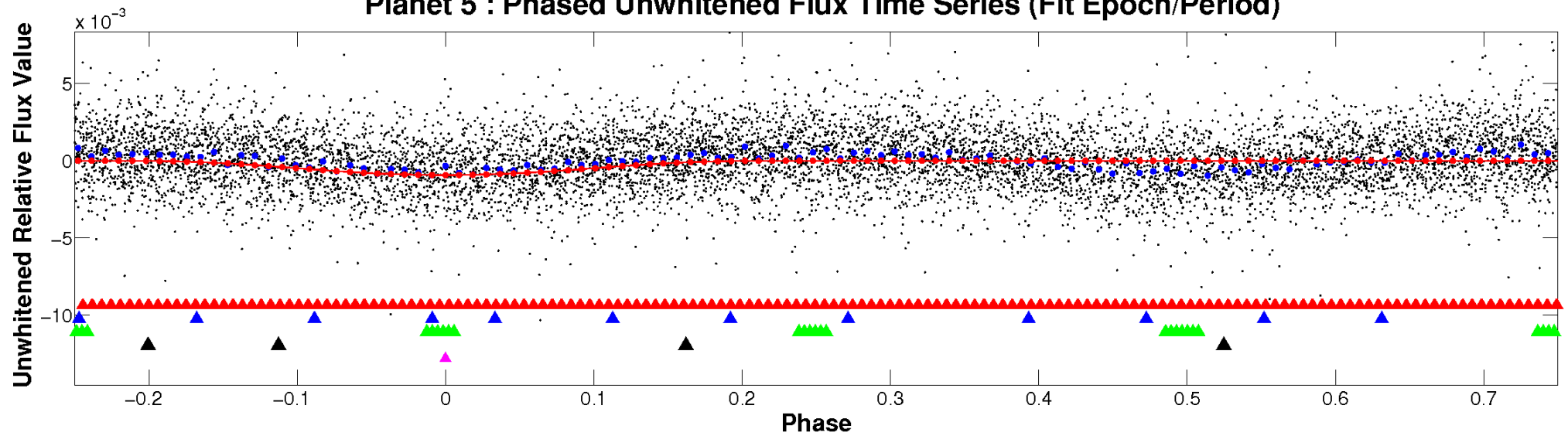
ALT Odd/Even

TCE 008038609-05

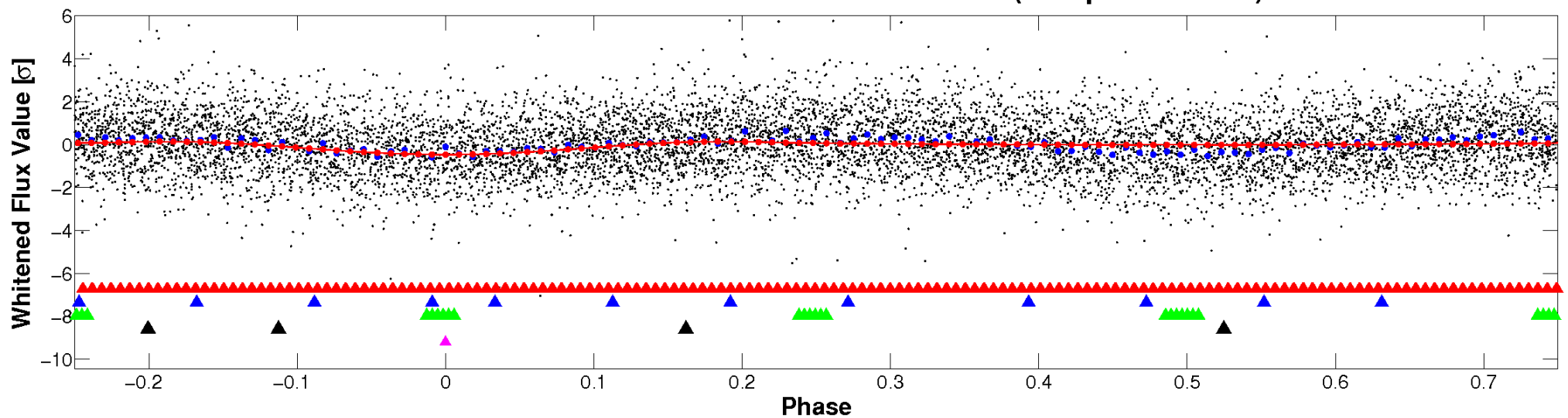


Non-Whitened Vs. Whitened Light Curve

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

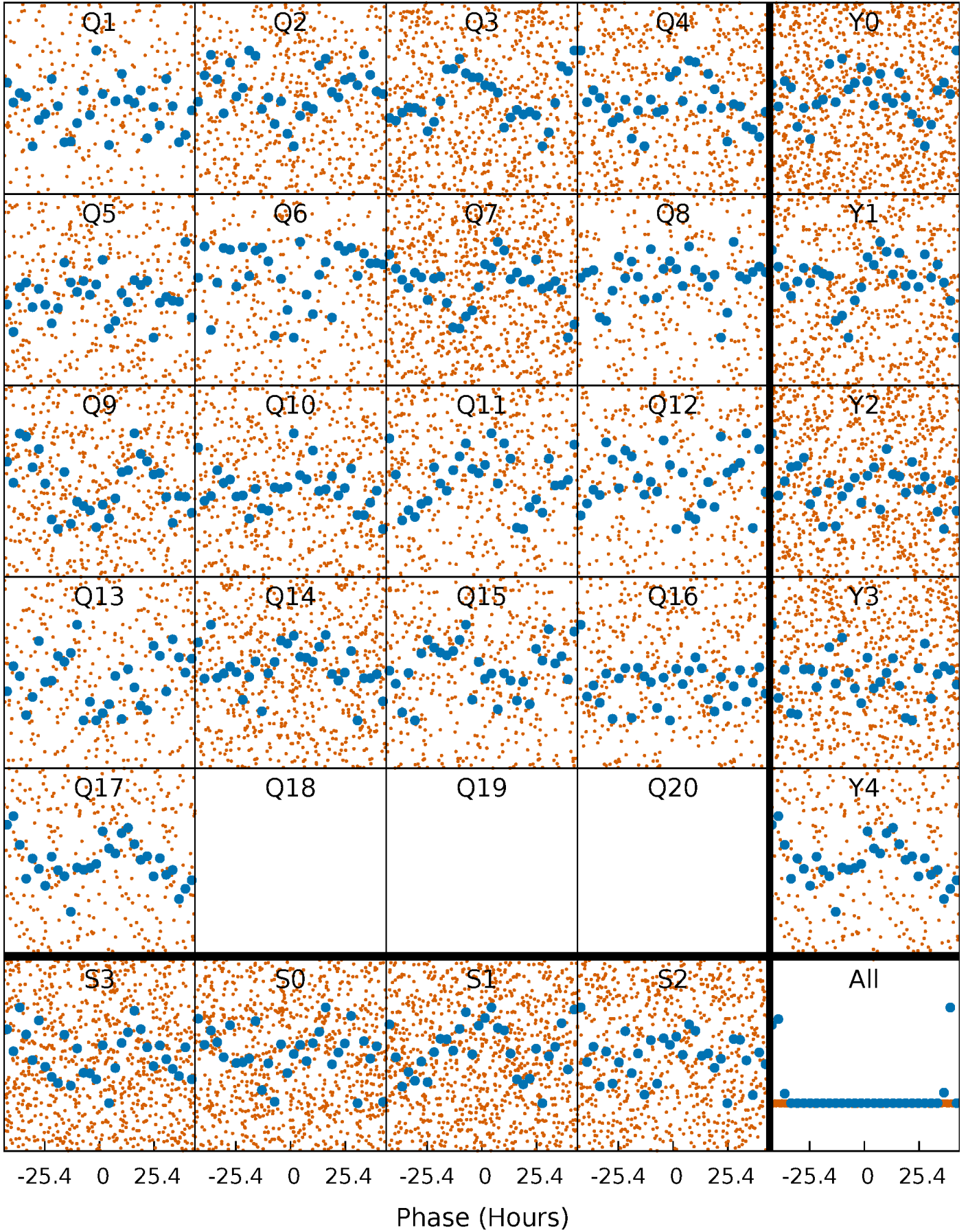


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



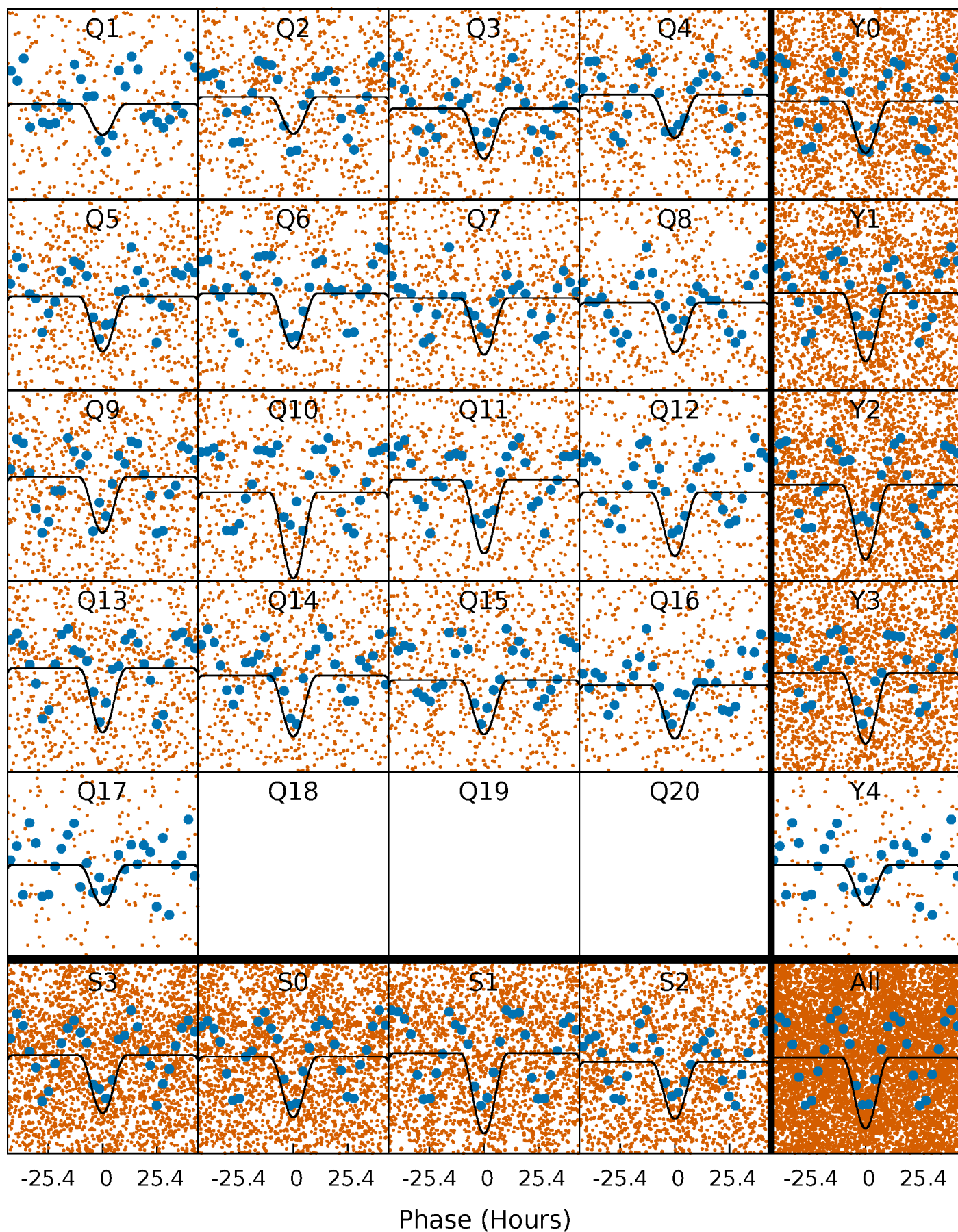
PDC Quarter-Phased Transit Curves

TCE 008038609-05 P= 2.226478 Days $T_0=132.047519$ (BKJD)



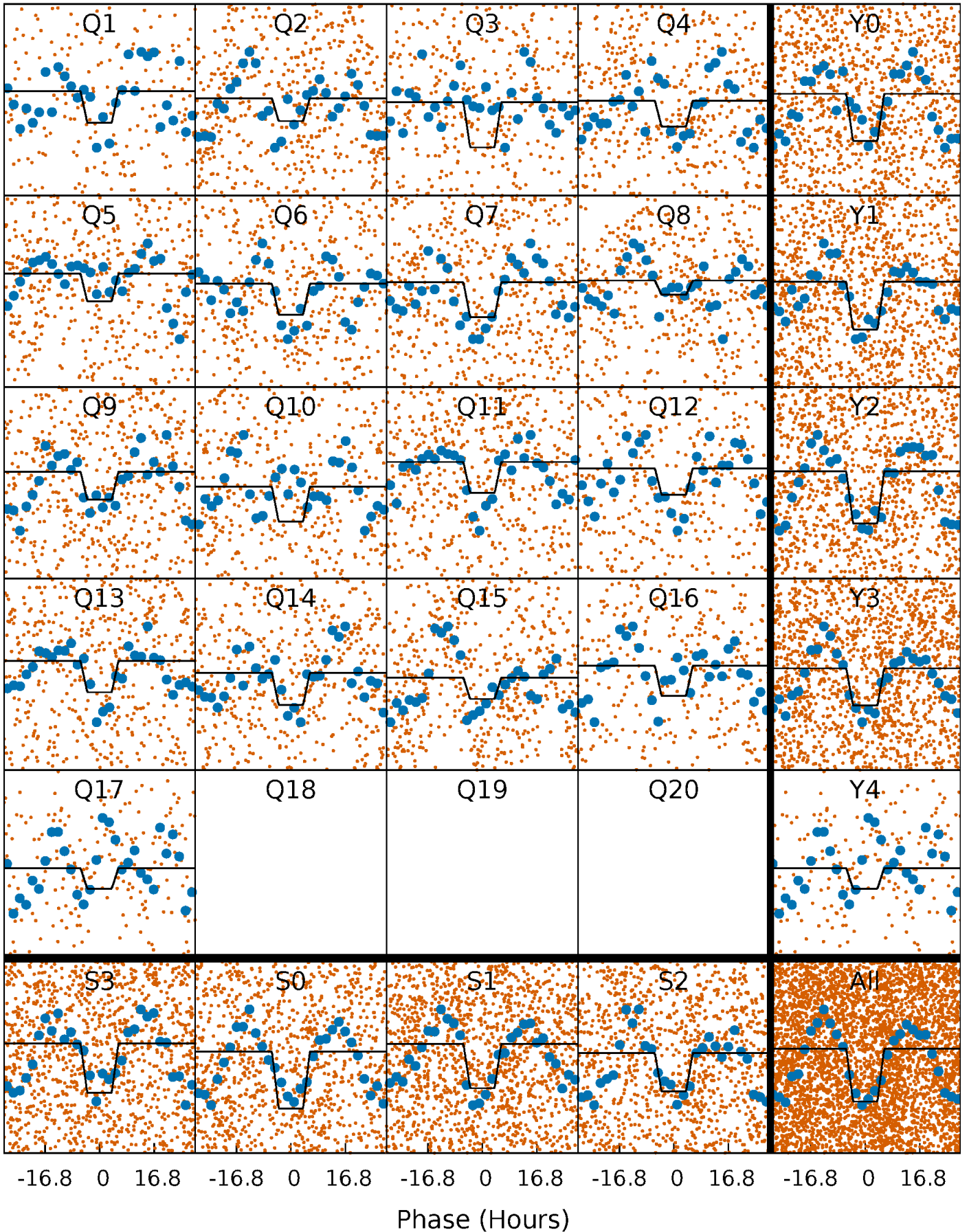
DV Quarter-Phased Transit Curves

TCE 008038609-05 $P = 2.226478$ Days $T_0 = 132.047519$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

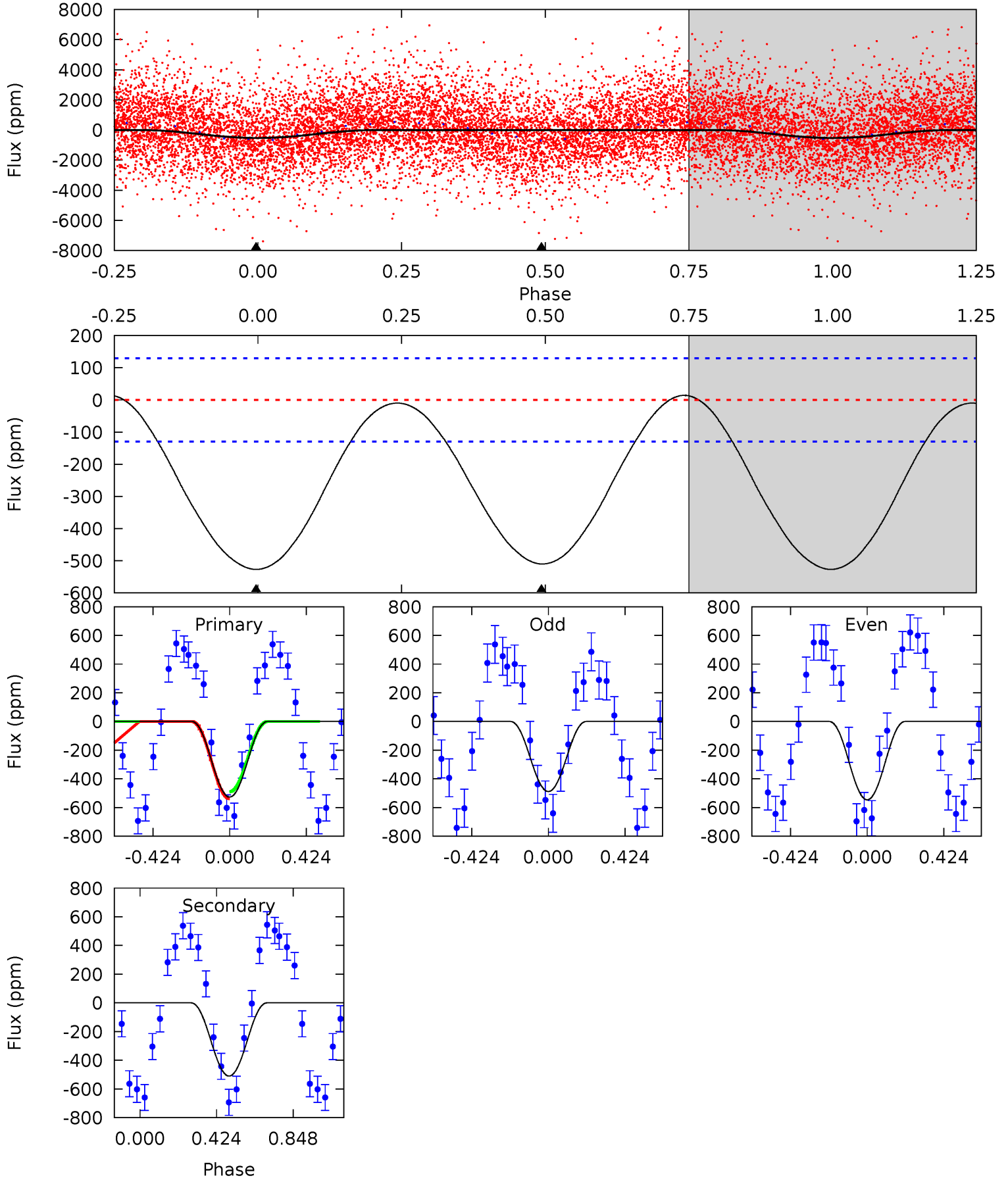
TCE 008038609-05 $P = 2.226368$ Days $T_0 = 132.068462$ (BKJD)



DV Model-Shift Uniqueness Test

008038609-05, P = 2.226478 Days, E = 132.047519 Days

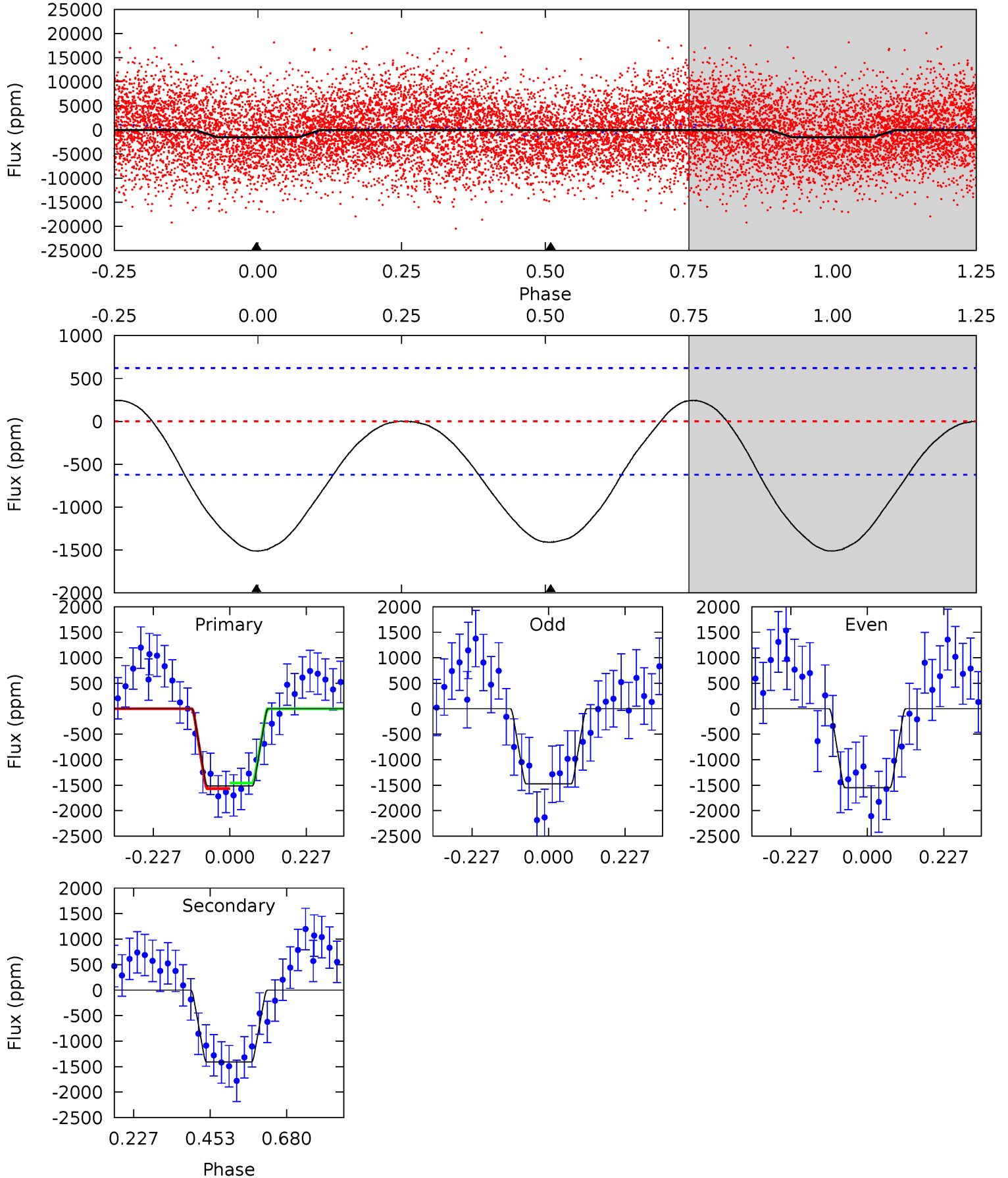
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.3	16.8	0	0	4.25	0.80	0.39	17.3	17.3	16.8	16.8	0.98	-51.6	0.03	0.86



Alt Model-Shift Uniqueness Test

008038609-05, P = 2.226368 Days, E = 132.068462 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	9.96	0	0	4.39	1.21	0.84	10.7	10.7	9.96	9.96	0.27	0.70	0.14	0.42



Stellar Parameters For KIC 008038609

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7776^{+216}_{-324}	$3.627^{+0.476}_{-0.084}$	$-0.180^{+0.200}_{-0.300}$	$3.610^{+0.617}_{-1.726}$	$2.017^{+0.317}_{-0.514}$	$0.060^{+0.314}_{-0.017}$
	+3%/-4%	+13%/-2%	+111%/-167%	+17%/-48%	+16%/-25%	+519%/-28%
Source	KIC0	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 008038609-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-510 ± 30	$14.84^{+8.94}_{-7.20}$	4273^{+319}_{-557}	5303^{+2386}_{-961}	$2.228^{+6.453}_{-1.325}$
Alt.	-1410 ± 142	$13.74^{+8.60}_{-6.95}$	4220^{+349}_{-503}	7432^{+4200}_{-1584}	$7.234^{+22.568}_{-4.290}$

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

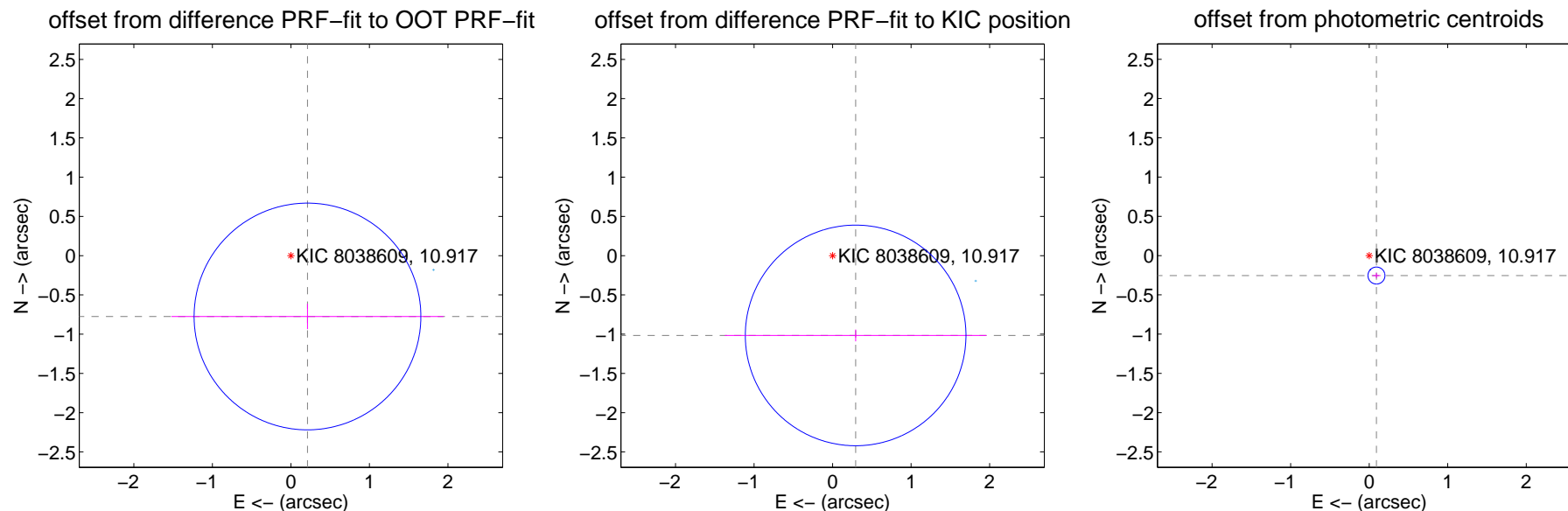
DV Centroid Data

Supplemental centroid analysis for 008038609-05. **Kepler magnitude: 10.92.** Transit SNR 15.56

There are 3 quarters with good PRF difference image offsets

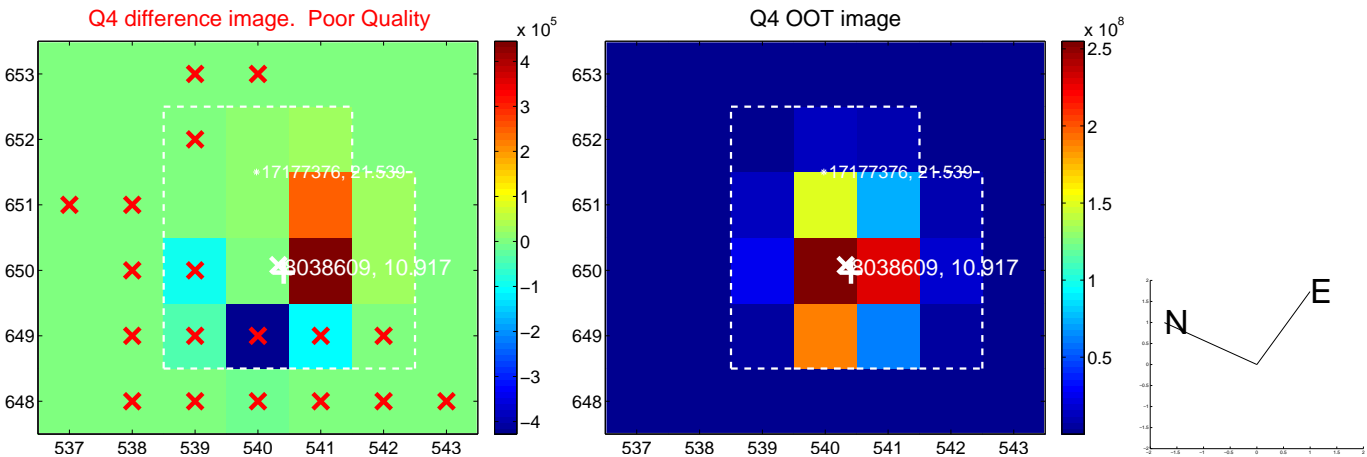
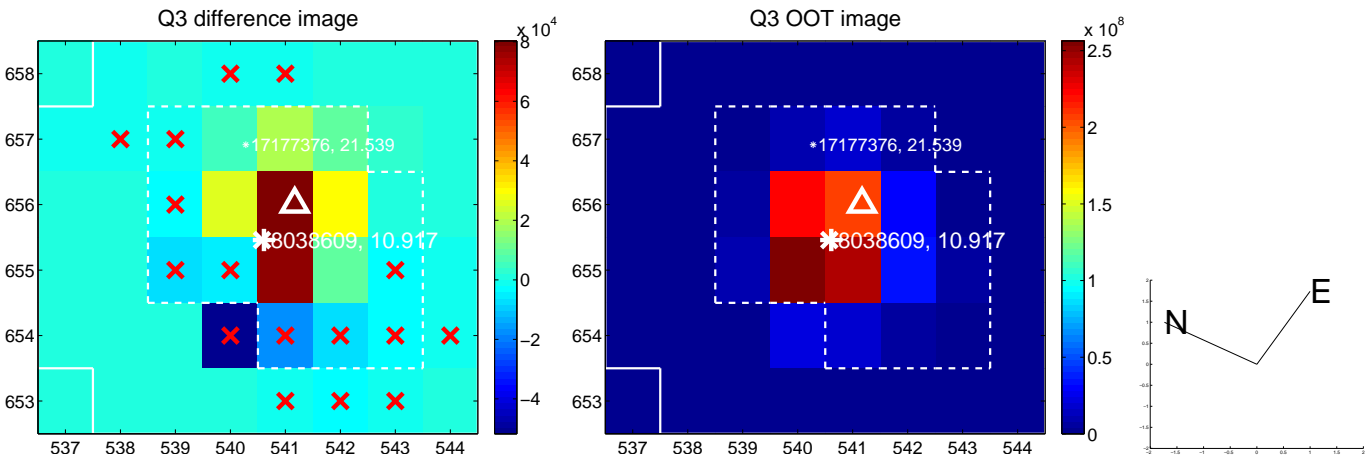
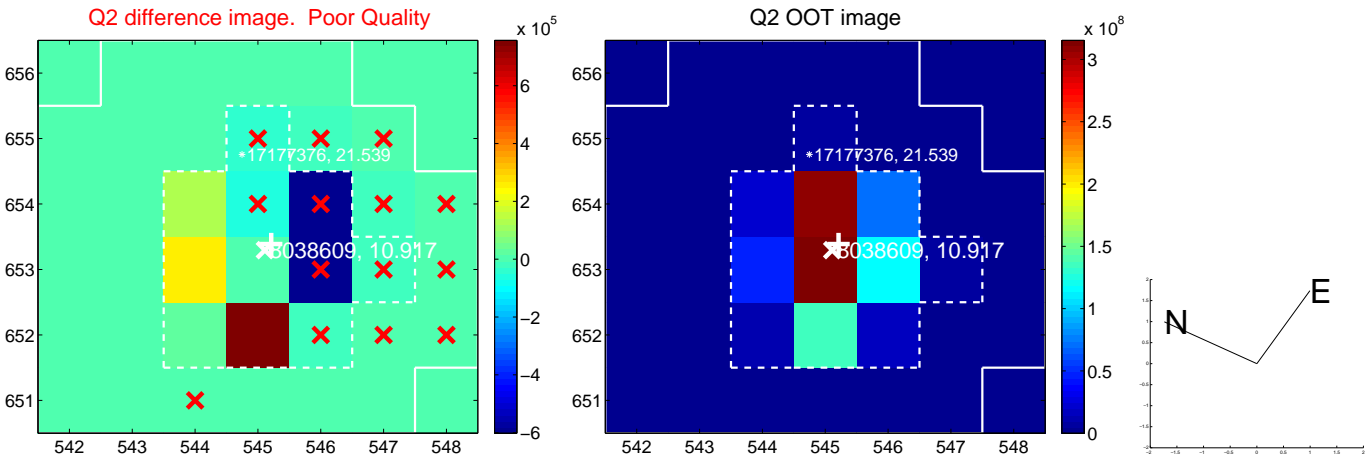
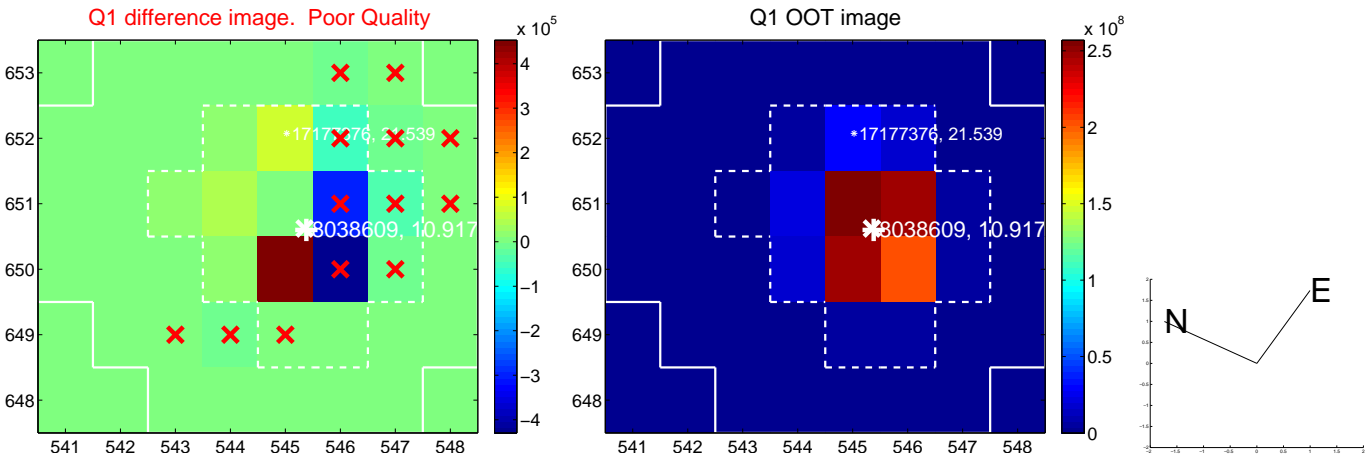
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.803 ± 0.481	1.67	-0.211 ± 1.732	-0.775 ± 0.162
PRF-fit source offset from KIC position	1.058 ± 0.468	2.26	-0.294 ± 1.666	-1.016 ± 0.075
photometric centroid source offset	0.27 ± 0.04	7.50	-0.09 ± 0.05	-0.25 ± 0.03

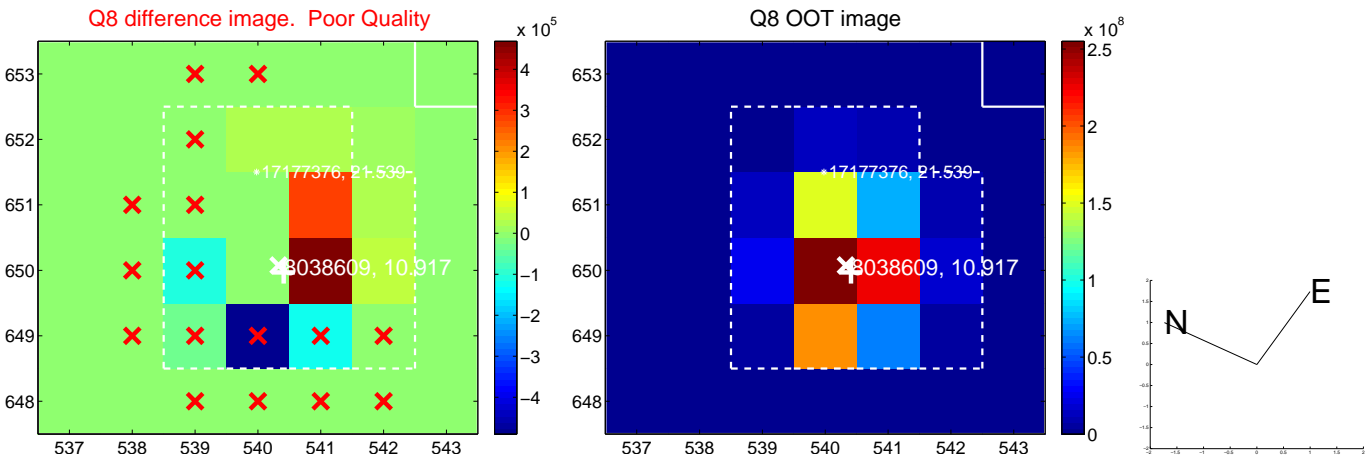
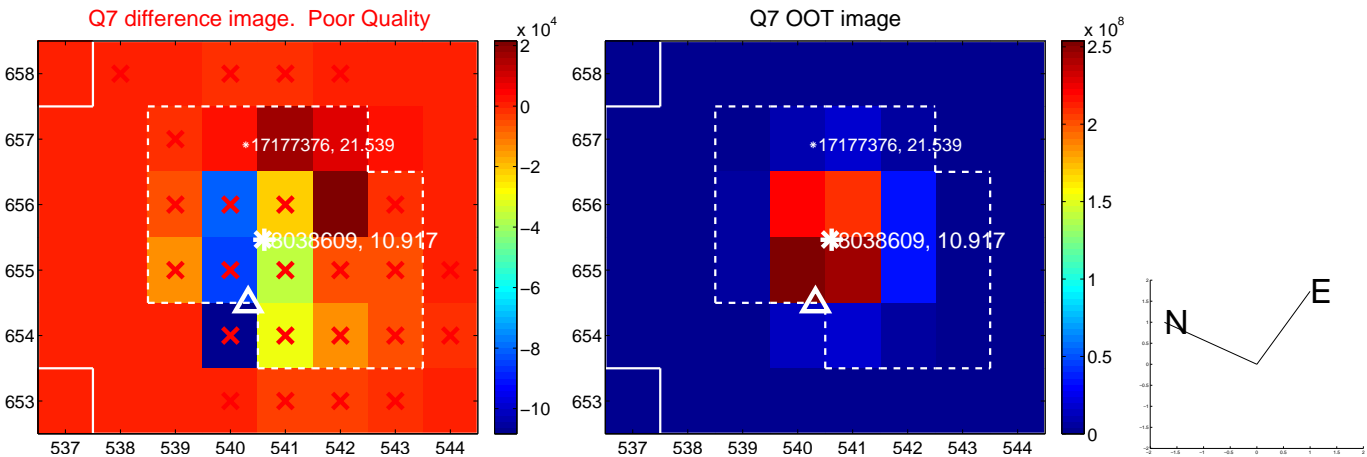
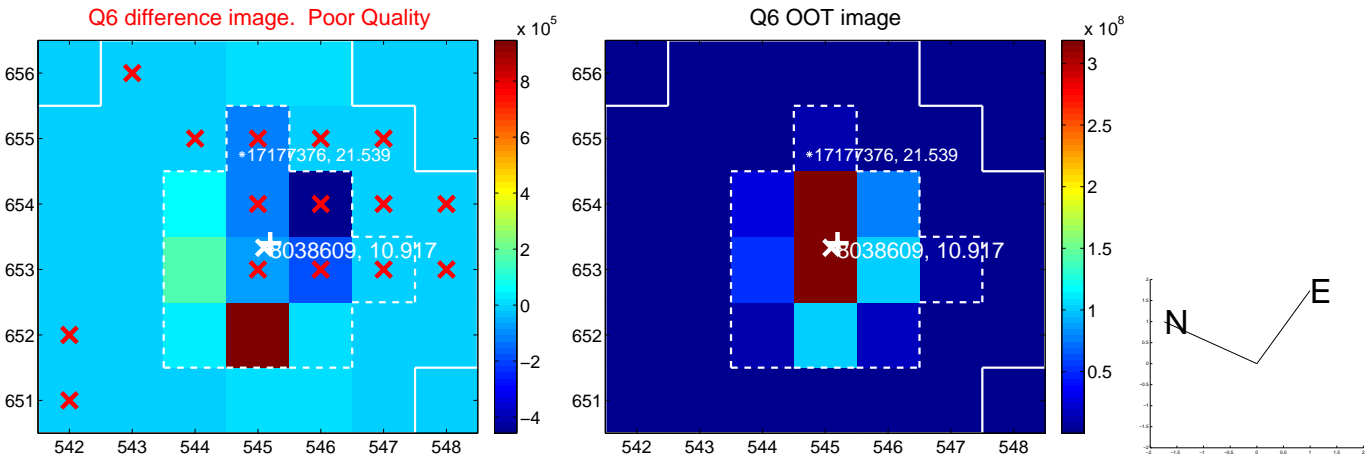
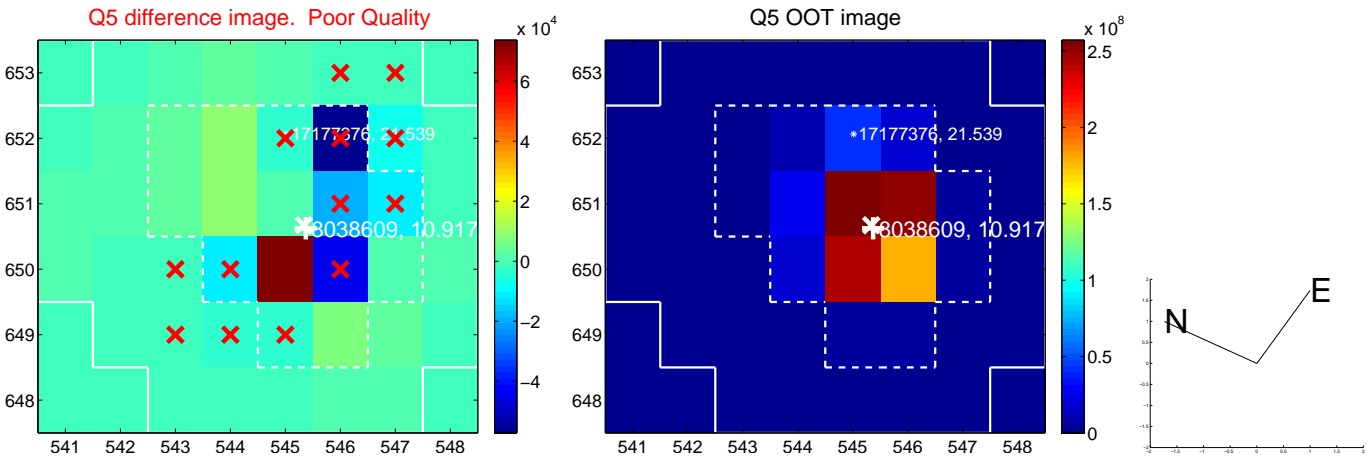


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

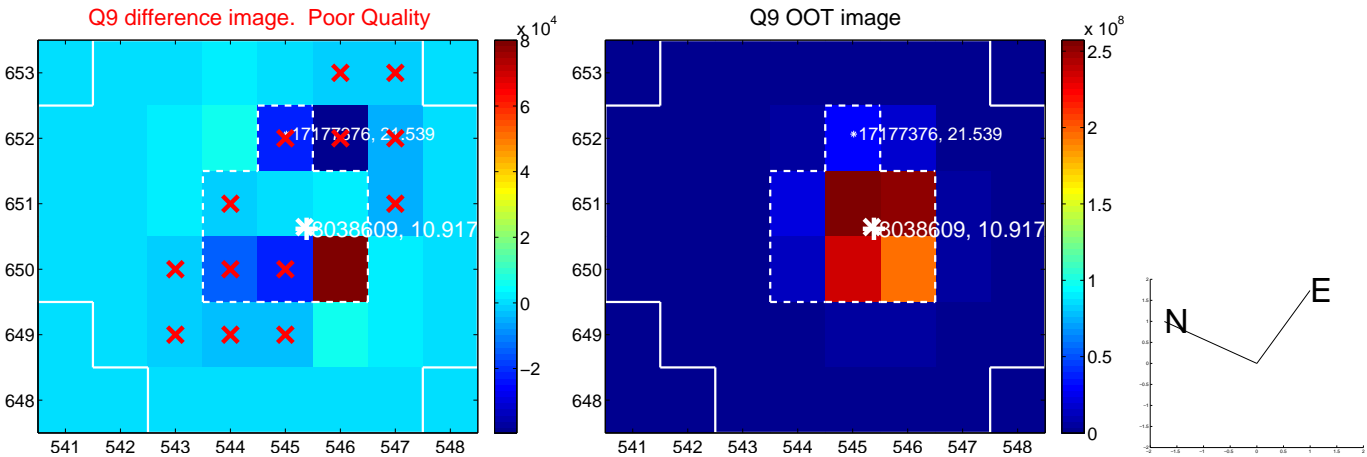
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



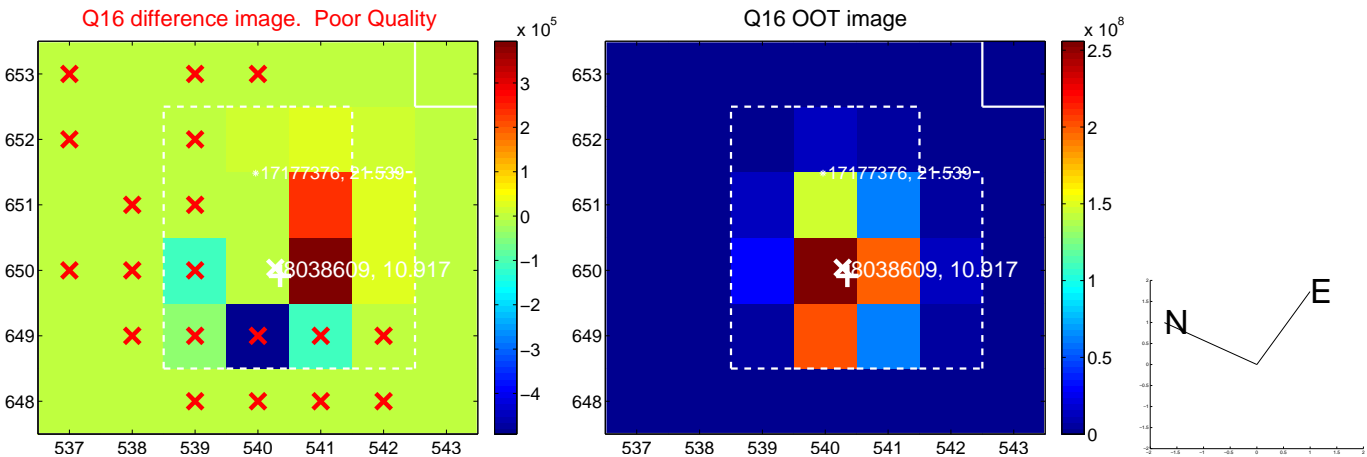
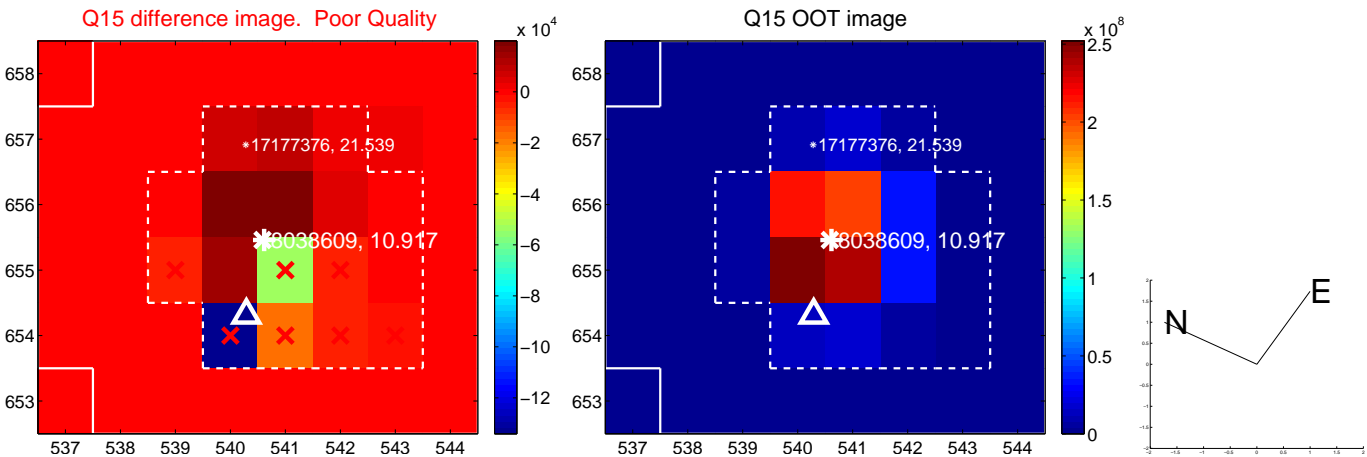
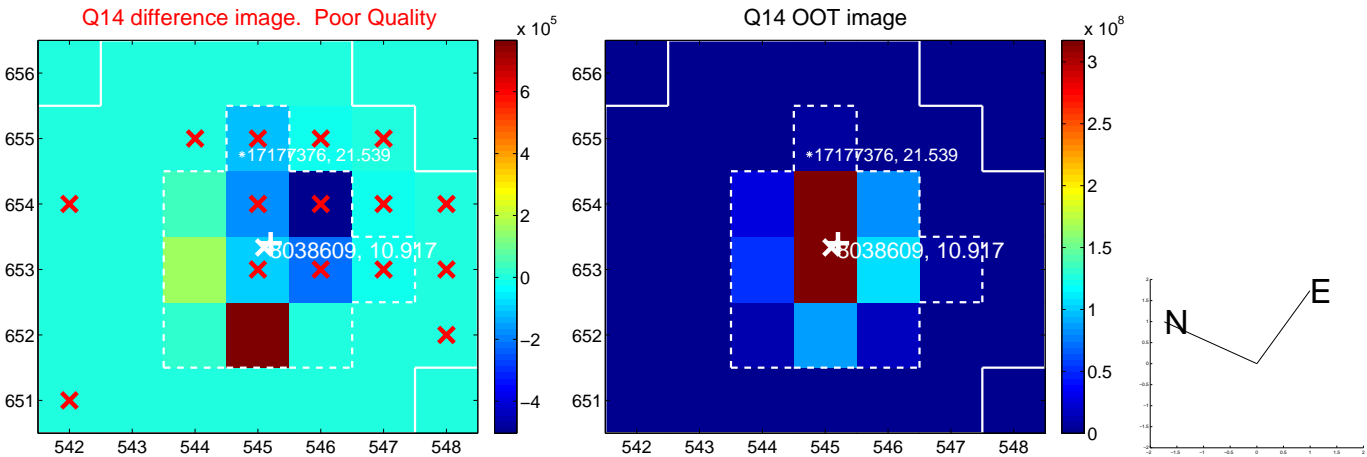
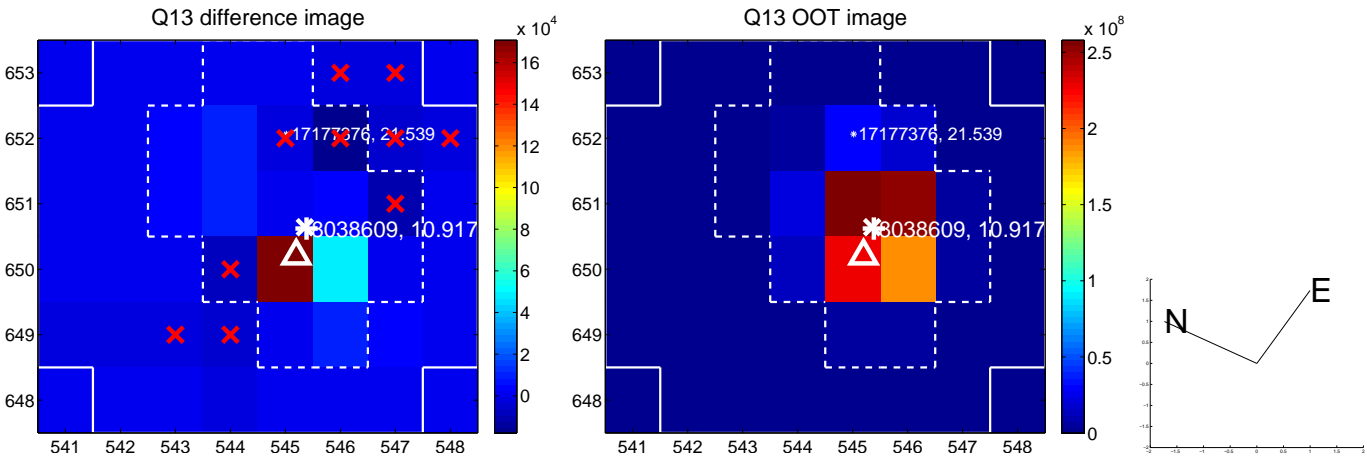
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



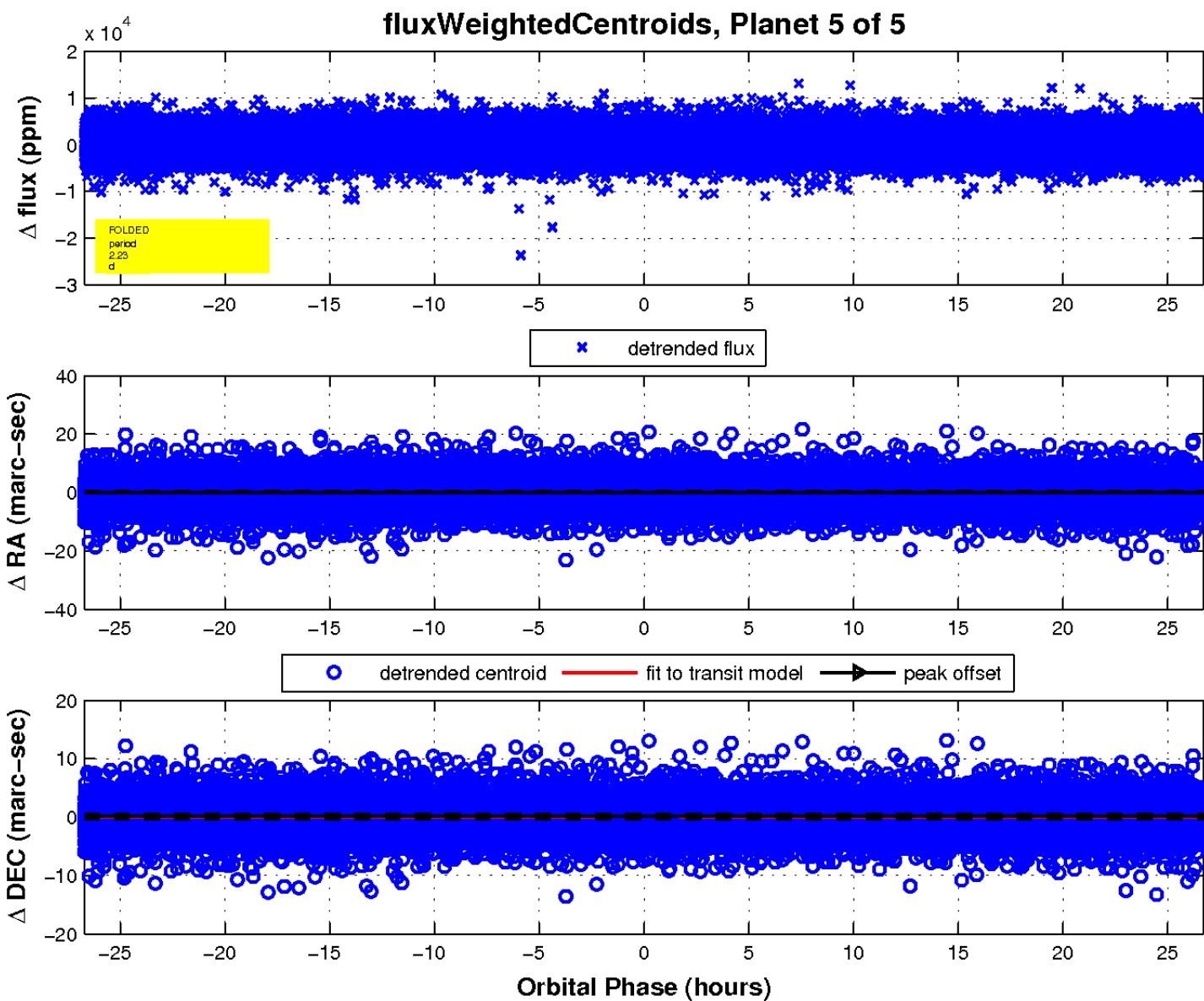
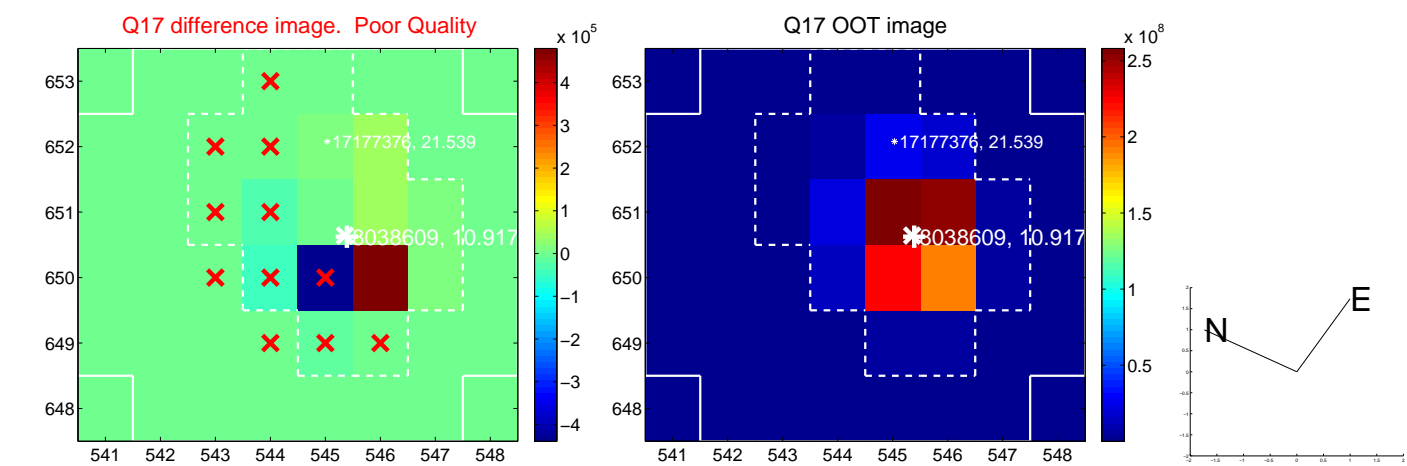
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

