

KIC 010989032

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})
010989032-01	OBS	7397.01	2.305089	133.705368	2722.1	1.019	119.2	133.3	2.18	8851	13.28	13613.98
010989032-02	OBS	No	2.305071	132.563600	64.9	10.483	19.4	11.0	2.18	8851	1.83	13614.13
010989032-03	OBS	No	2.303547	132.957207	1.3	8.941	7.7	0.0	2.18	8851	0.27	13626.14
010989032-04	OBS	No	2.305430	133.162707	172.6	5.000	8.4	-1.0	2.18	8851	2.91	13611.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010989032-01	OBS	FP	0.00	1	0	0	0	MOD_NONUNIQ_ALT
010989032-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
010989032-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010989032-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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.

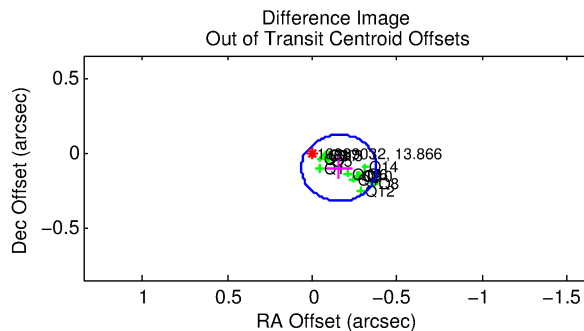
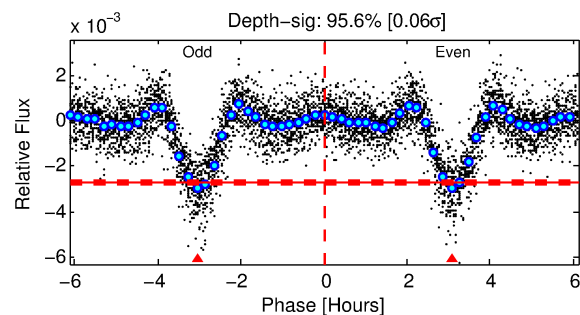
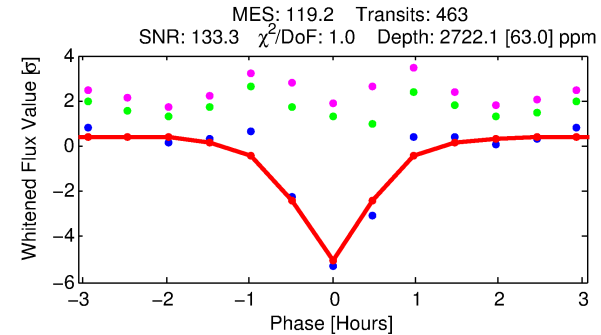
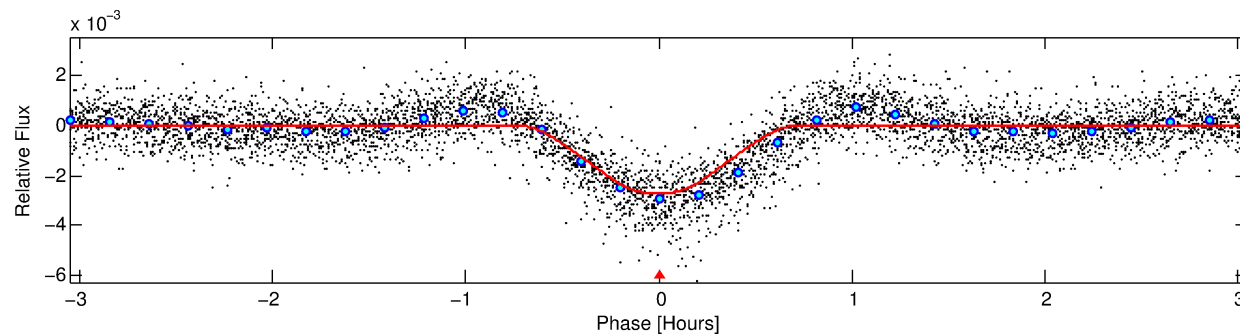
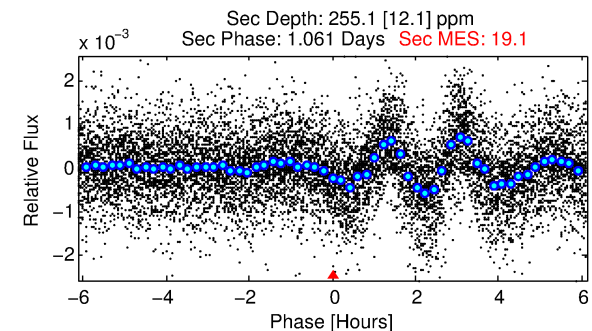
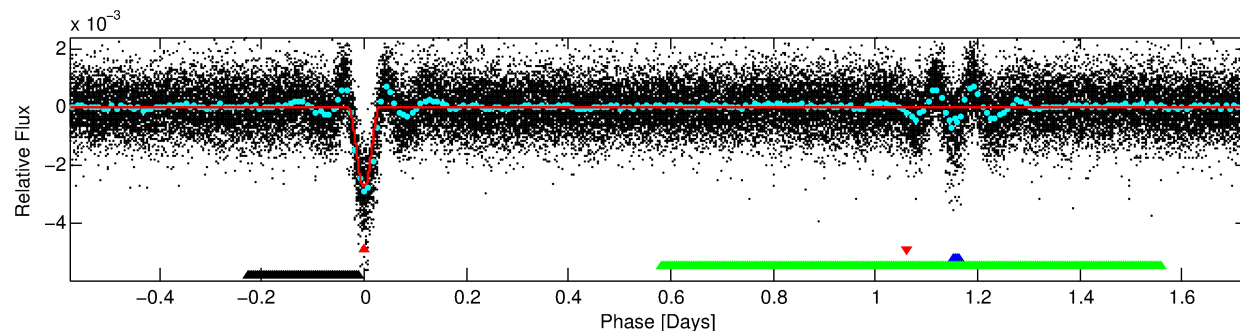
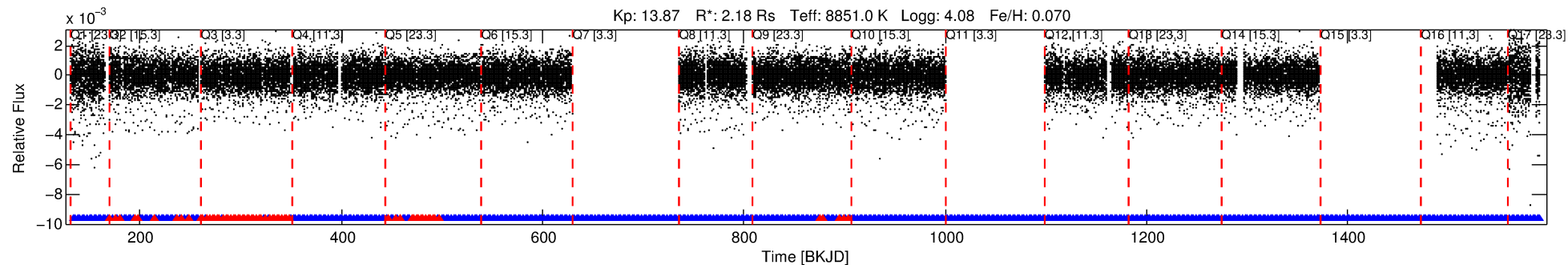
Ephemeris Match Information For 010989032-01

No Significant Match Found

DV One-Page Summary

KIC: 10989032 Candidate: 1 of 4 Period: 2.305 d
KOI: K07397 Corr: No Ephemeris Match

Kp: 13.87 R*: 2.18 Rs Teff: 8851.0 K Logg: 4.08 Fe/H: 0.070



DV Fit Results:

Period = 2.30509 [0.00000] d
Epoch = 133.7054 [0.0002] BKJD
Rp/R* = 0.0559 [0.0020]
a/R* = 9.62 [1.66]
b = 0.90 [0.04]
Seff = 13613.98 [4872.13]
Teq = 2754 [246] K
Rp = 13.28 [3.76] Re
a = 0.0438 [0.0097] AU
Ag = 1.52 [0.48] [1.09σ]
Teffp = 4732 [248] K [5.66σ]

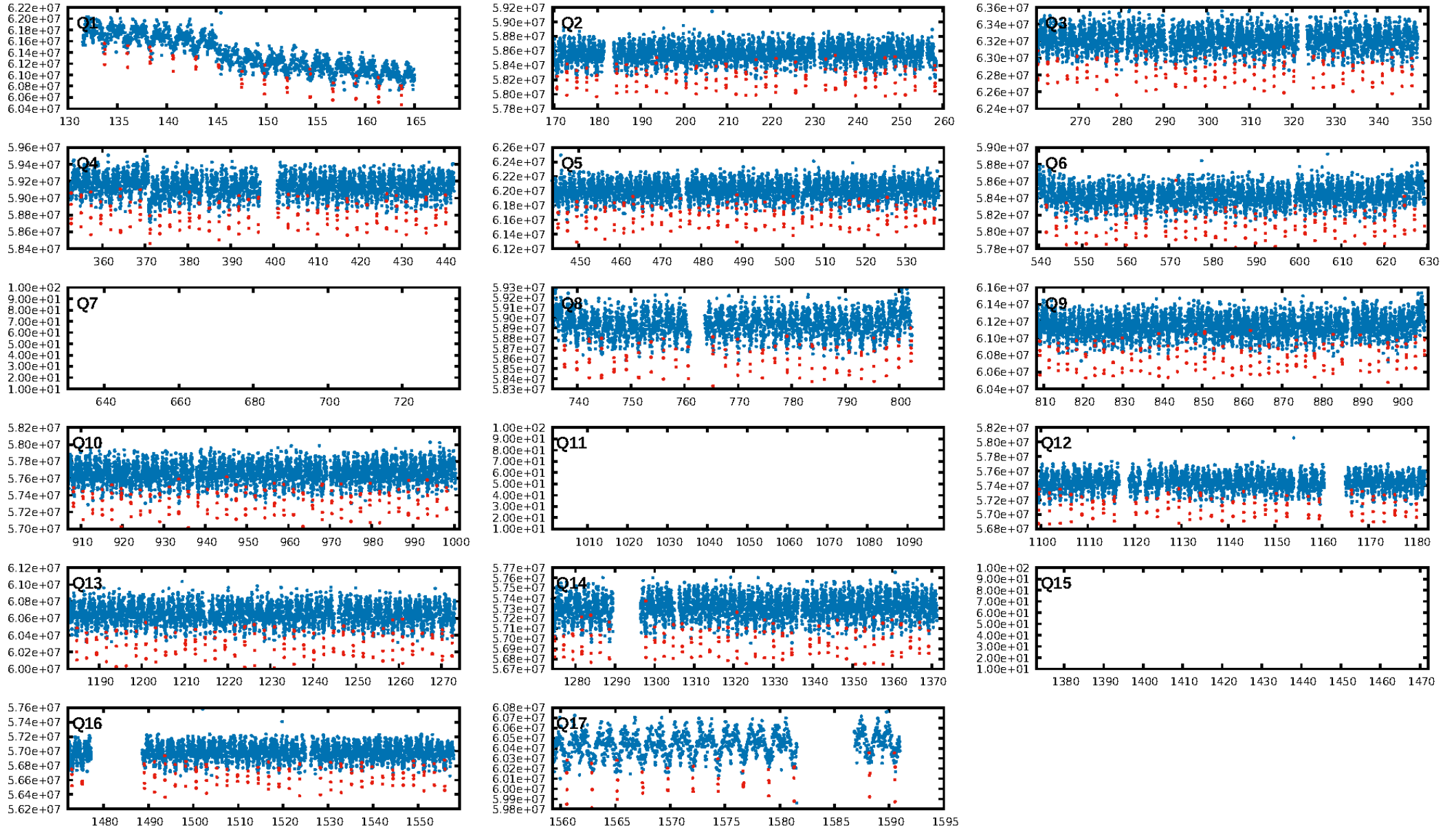
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.85 [373/437]
GhostDiagnostic-chr: 3.108
Centroid-sig: 0.0%
Centroid-so: 0.565 arcsec [10.80σ]
OotOffset-rm: 0.188 arcsec [2.54σ]
KicOffset-rm: 0.066 arcsec [0.95σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 0.00 [0/14]

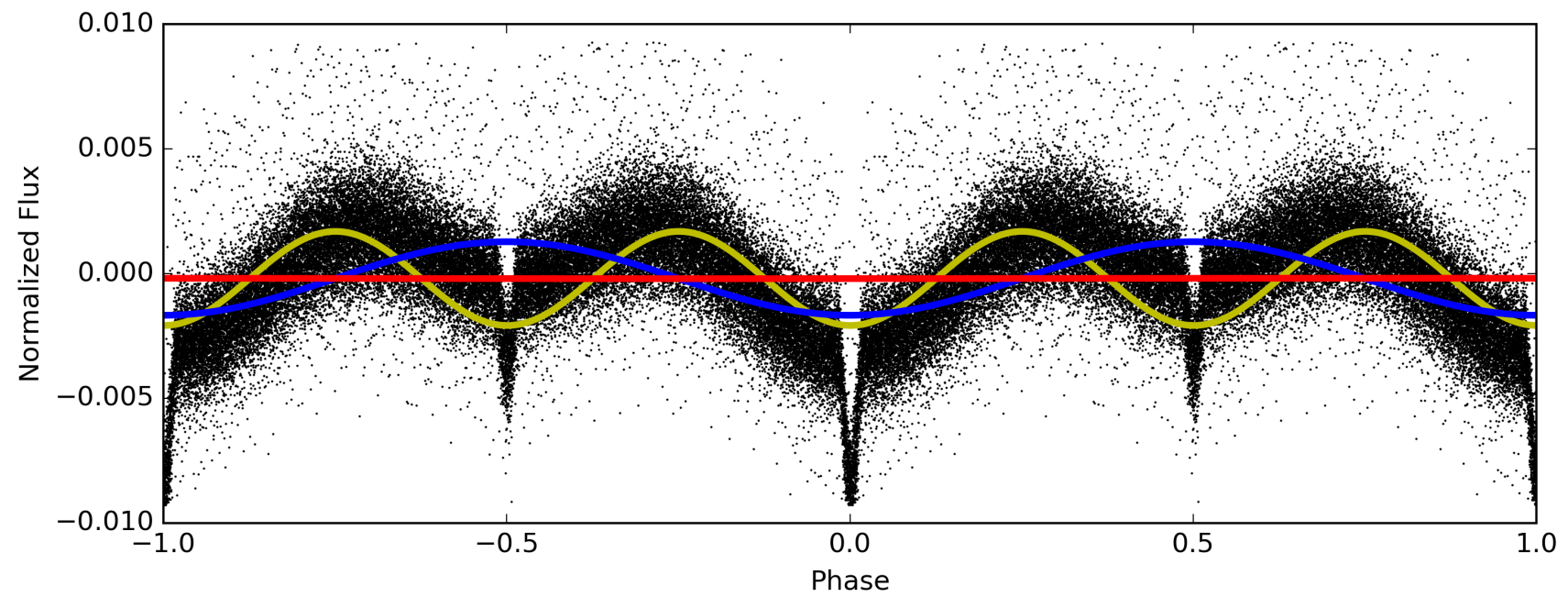
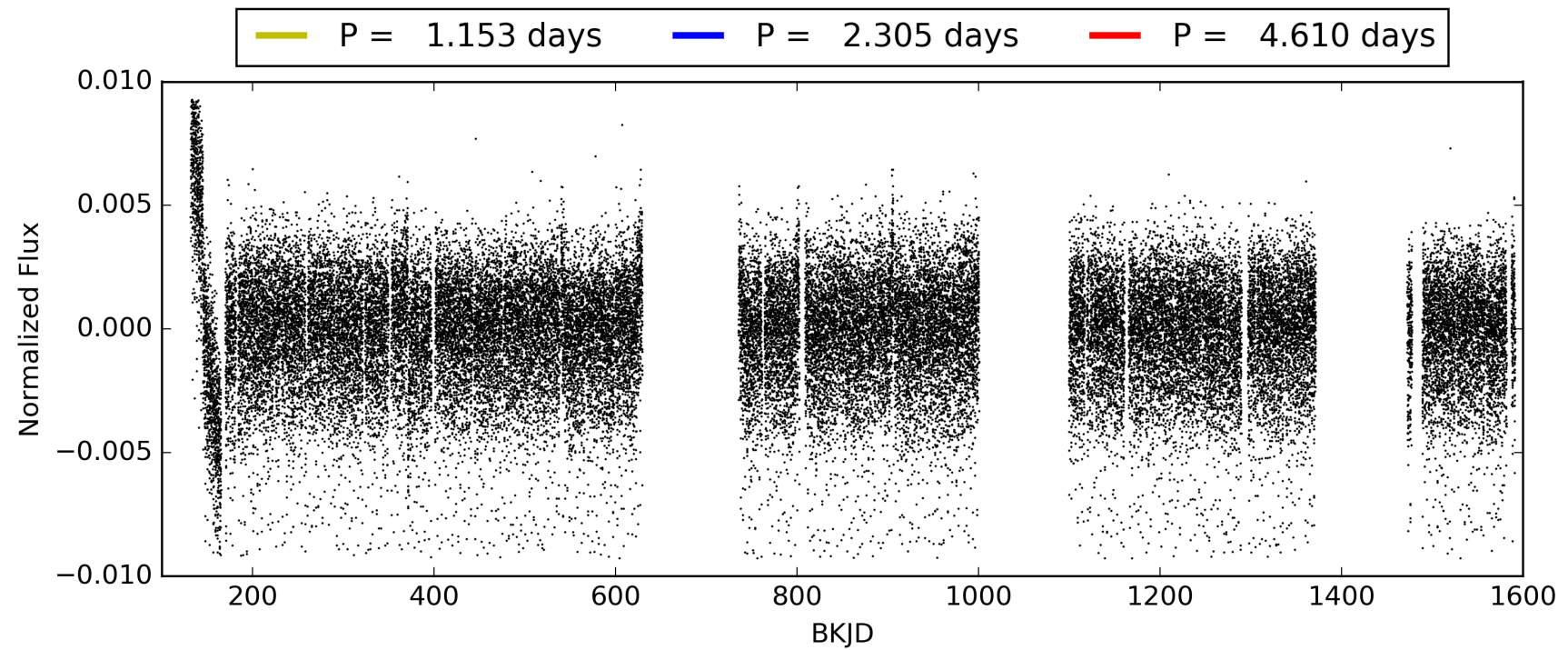
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:22:15 Z

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

TCE 010989032-01, PDC Light Curves

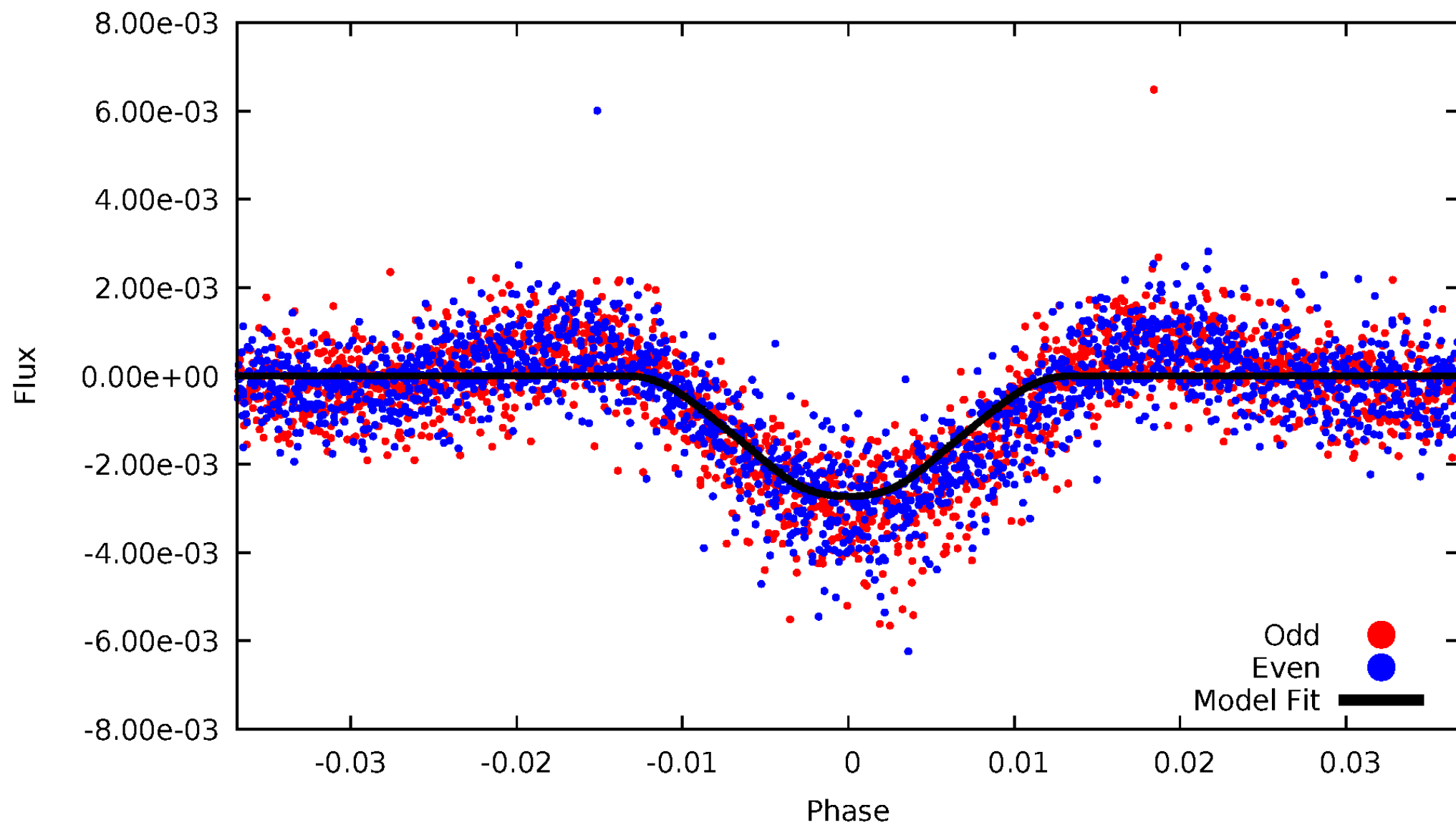


TCE 010989032-01



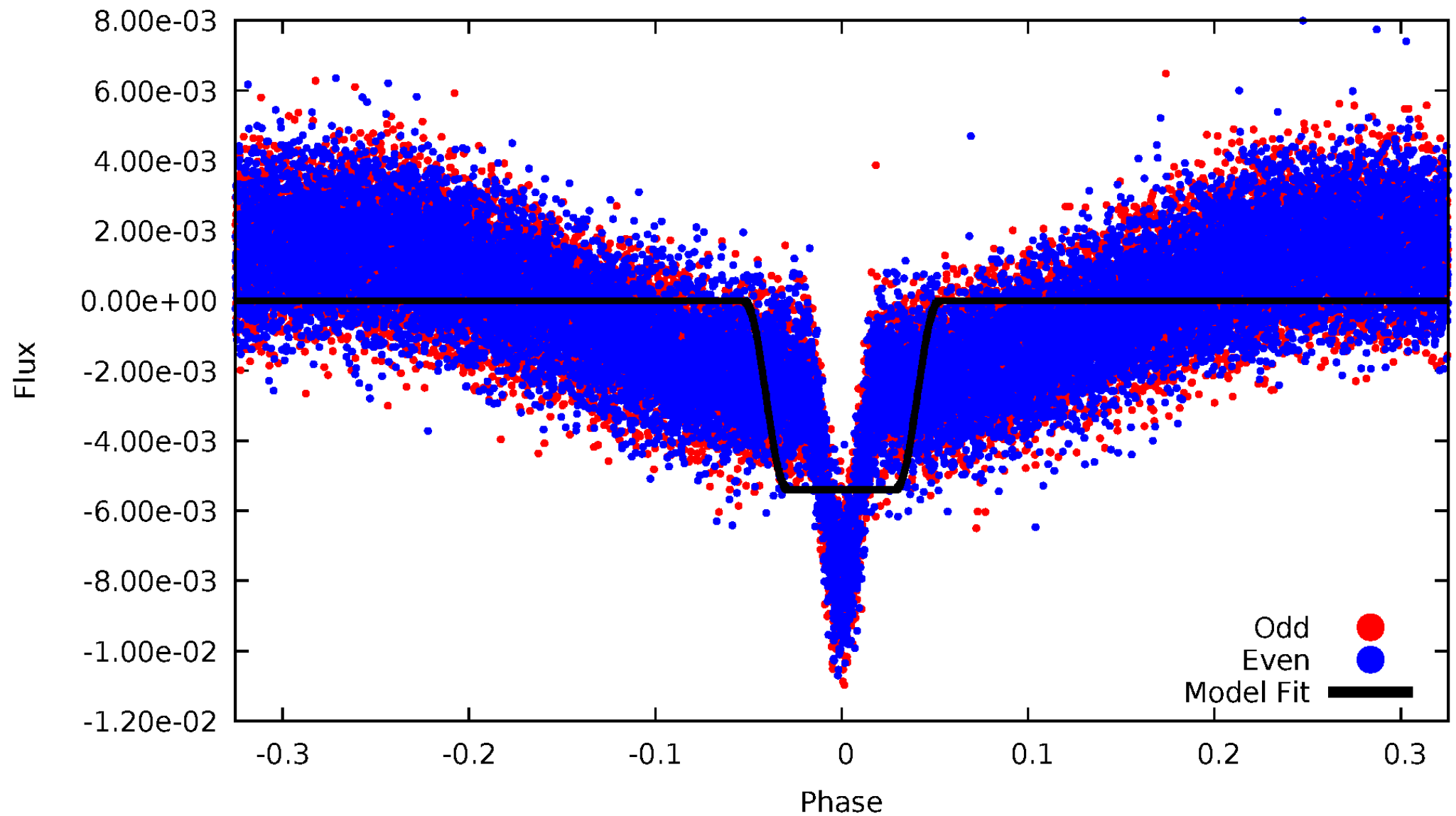
DV Odd/Even

TCE 010989032-01

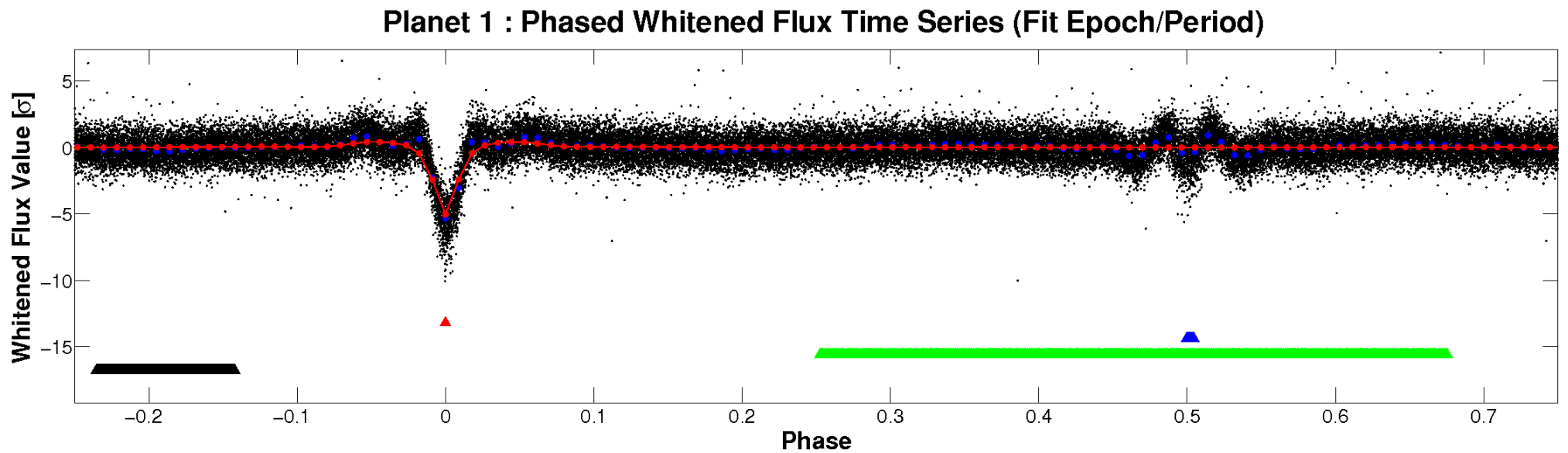
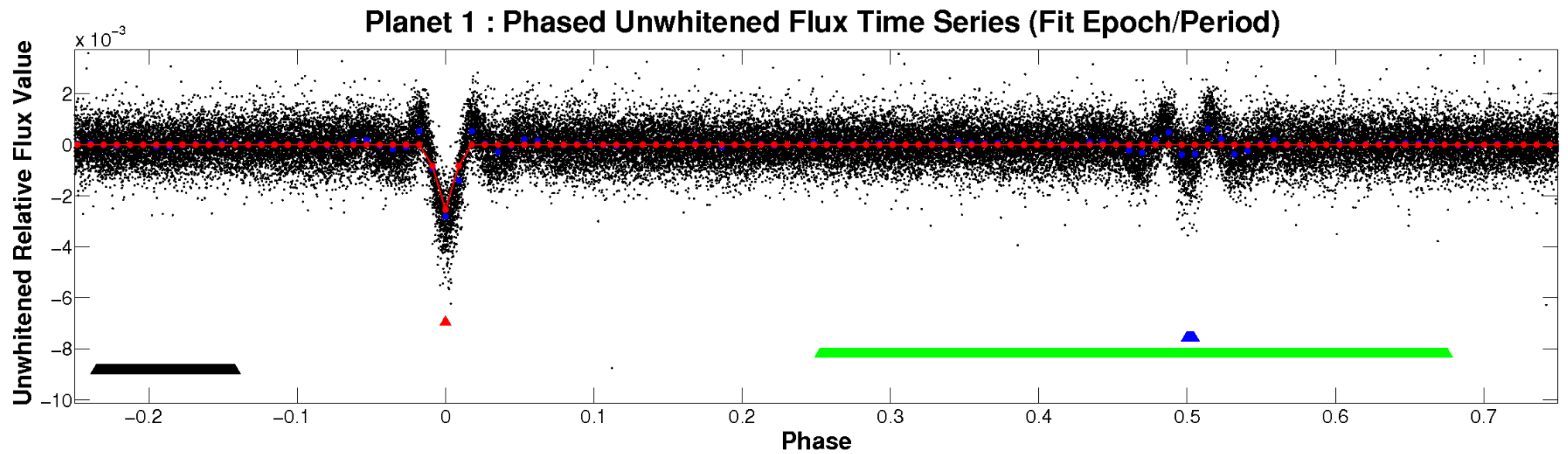


ALT Odd/Even

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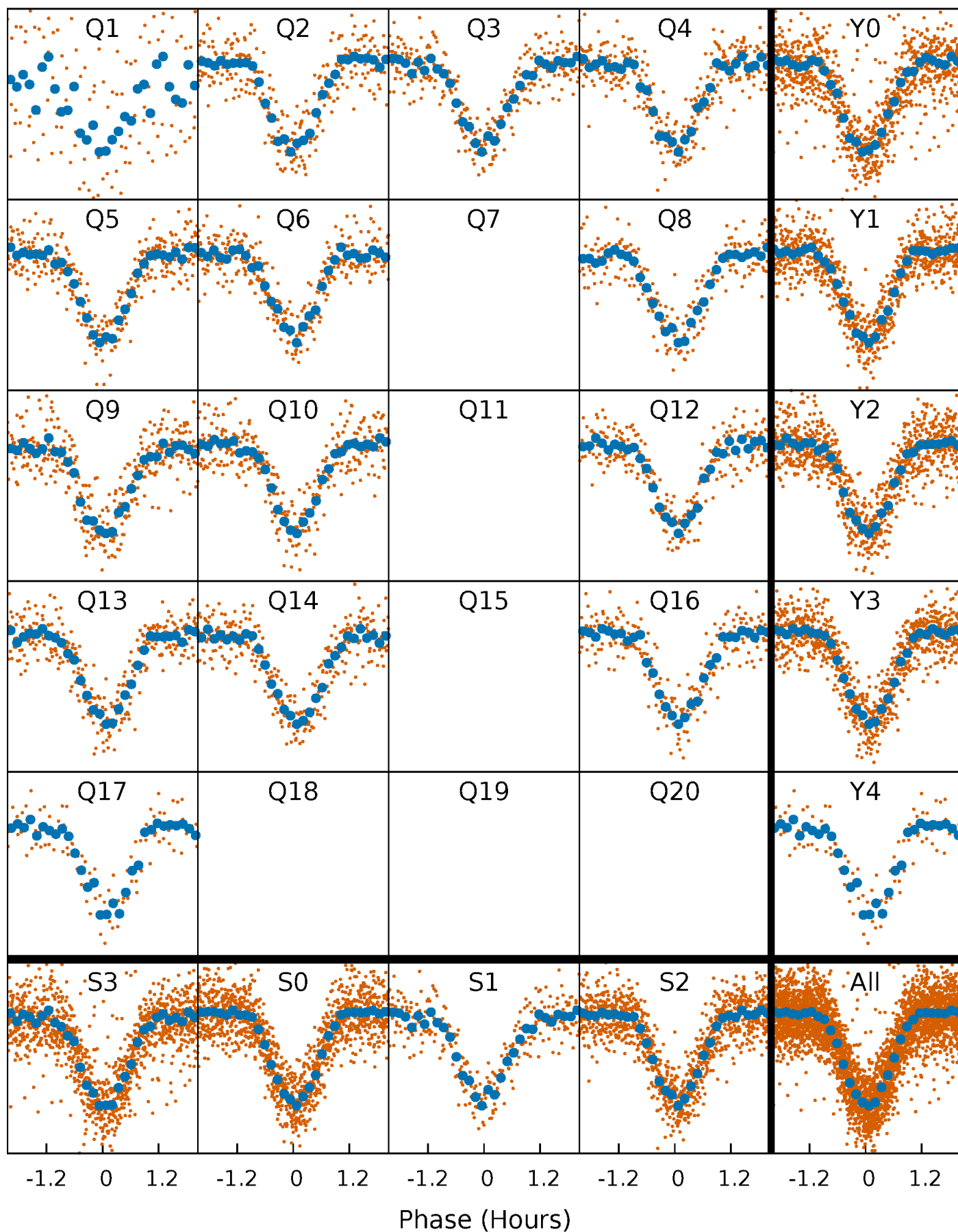


Non-Whitened Vs. Whitened Light Curve



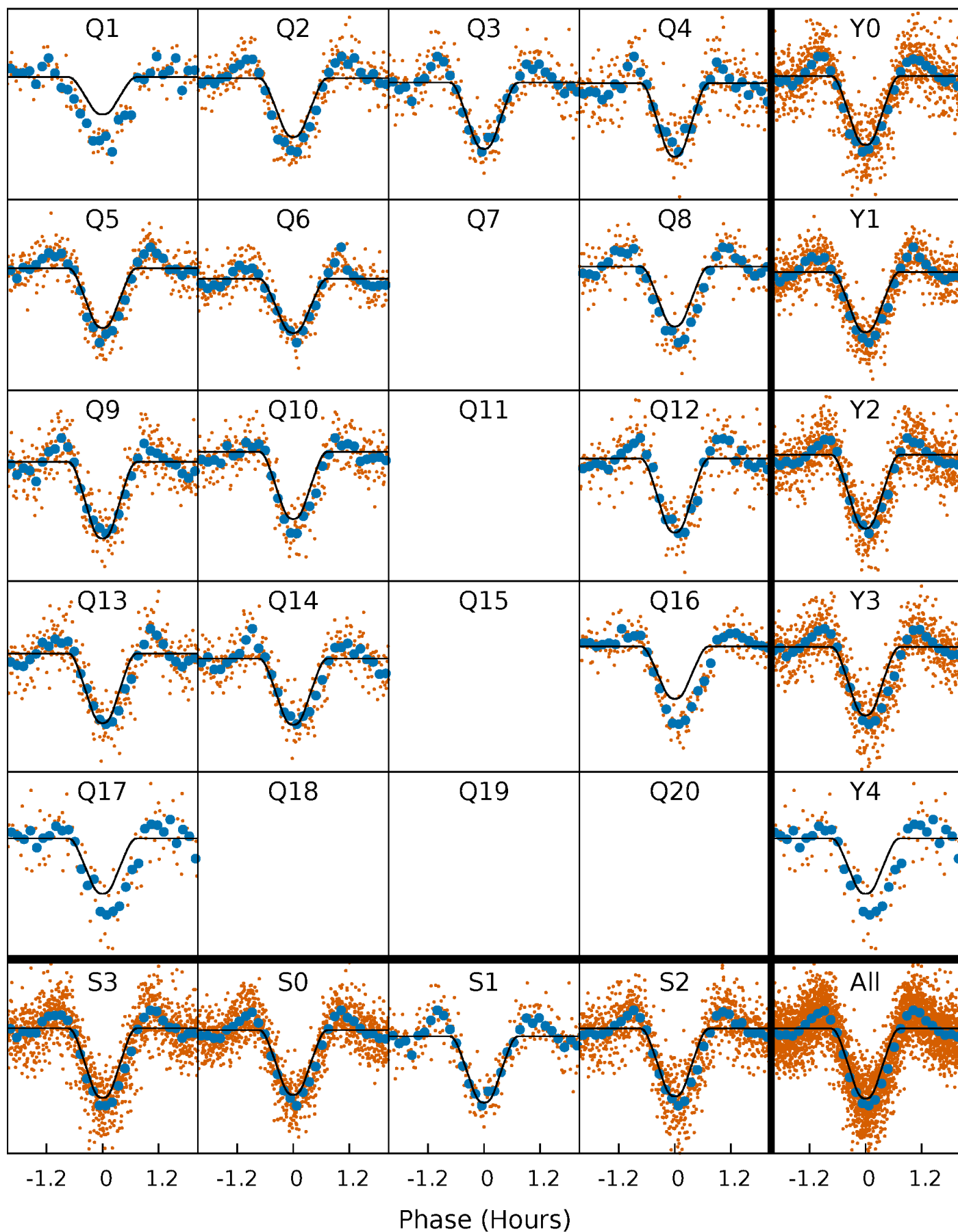
PDC Quarter-Phased Transit Curves

TCE 010989032-01 P= 2.305089 Days $T_0=133.705368$ (BKJD)



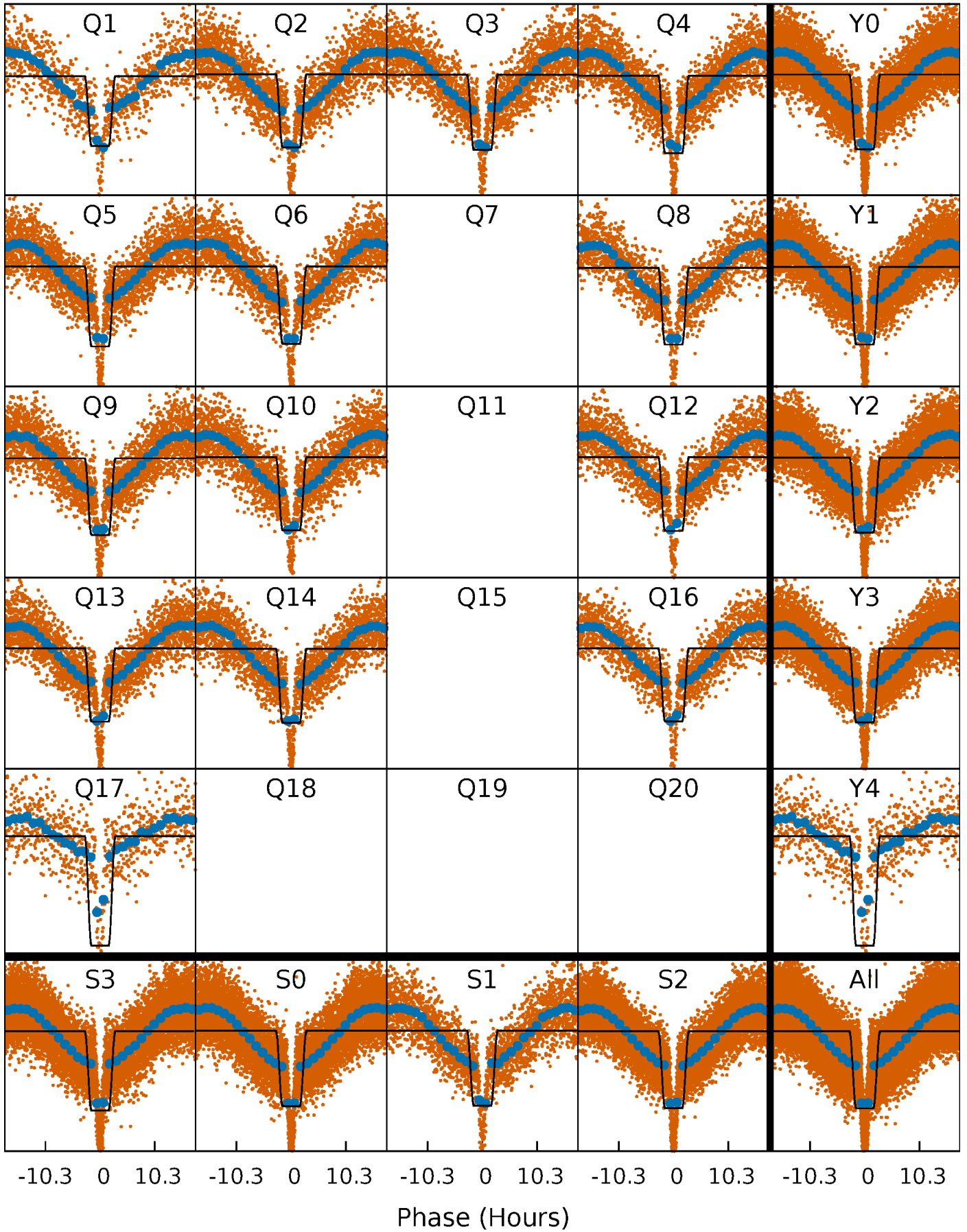
DV Quarter-Phased Transit Curves

TCE 010989032-01 P= 2.305089 Days $T_0=133.705368$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

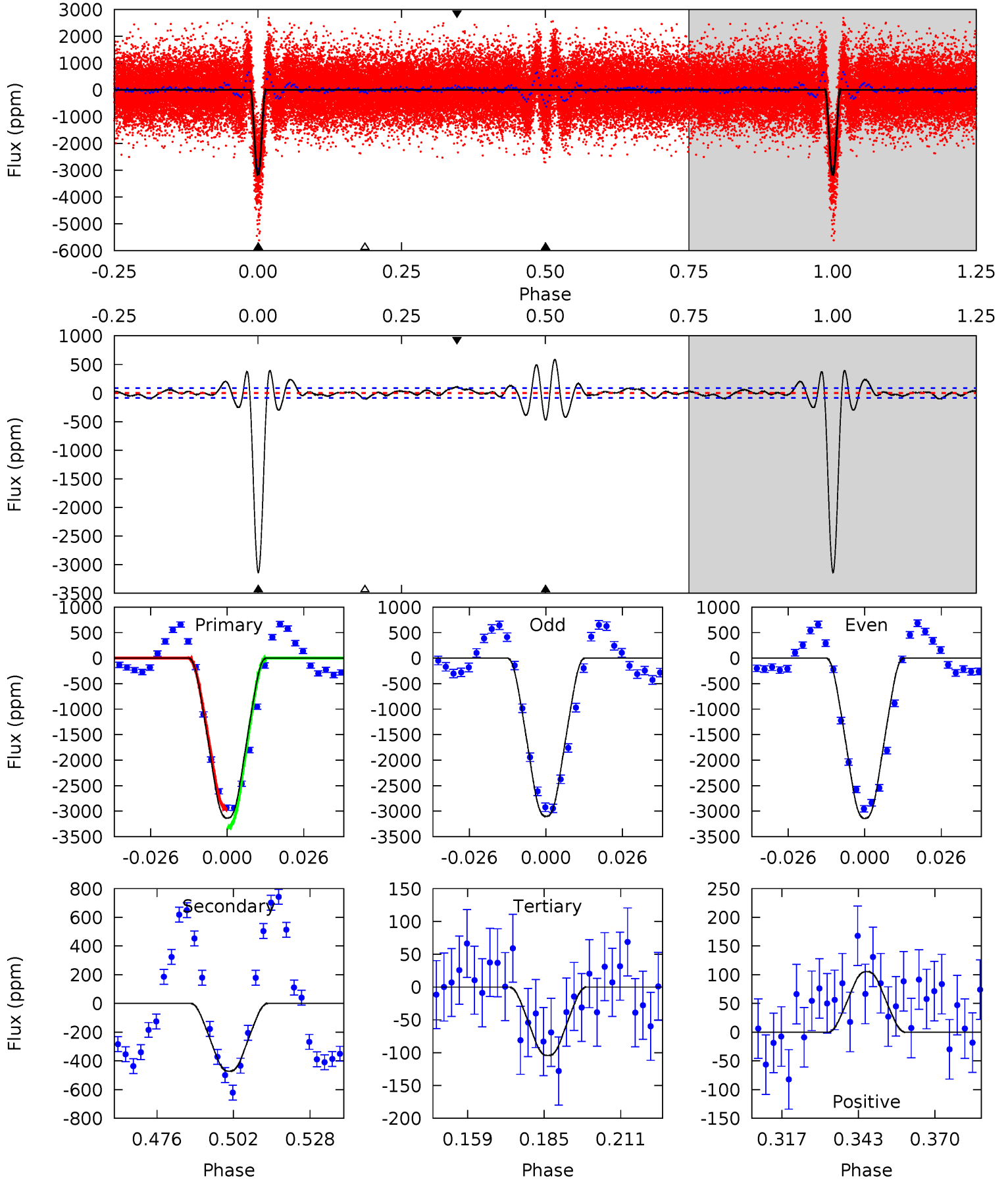
TCE 010989032-01 P= 2.305103 Days $T_0=133.703206$ (BKJD)



DV Model-Shift Uniqueness Test

010989032-01, P = 2.305089 Days, E = 131.400279 Days

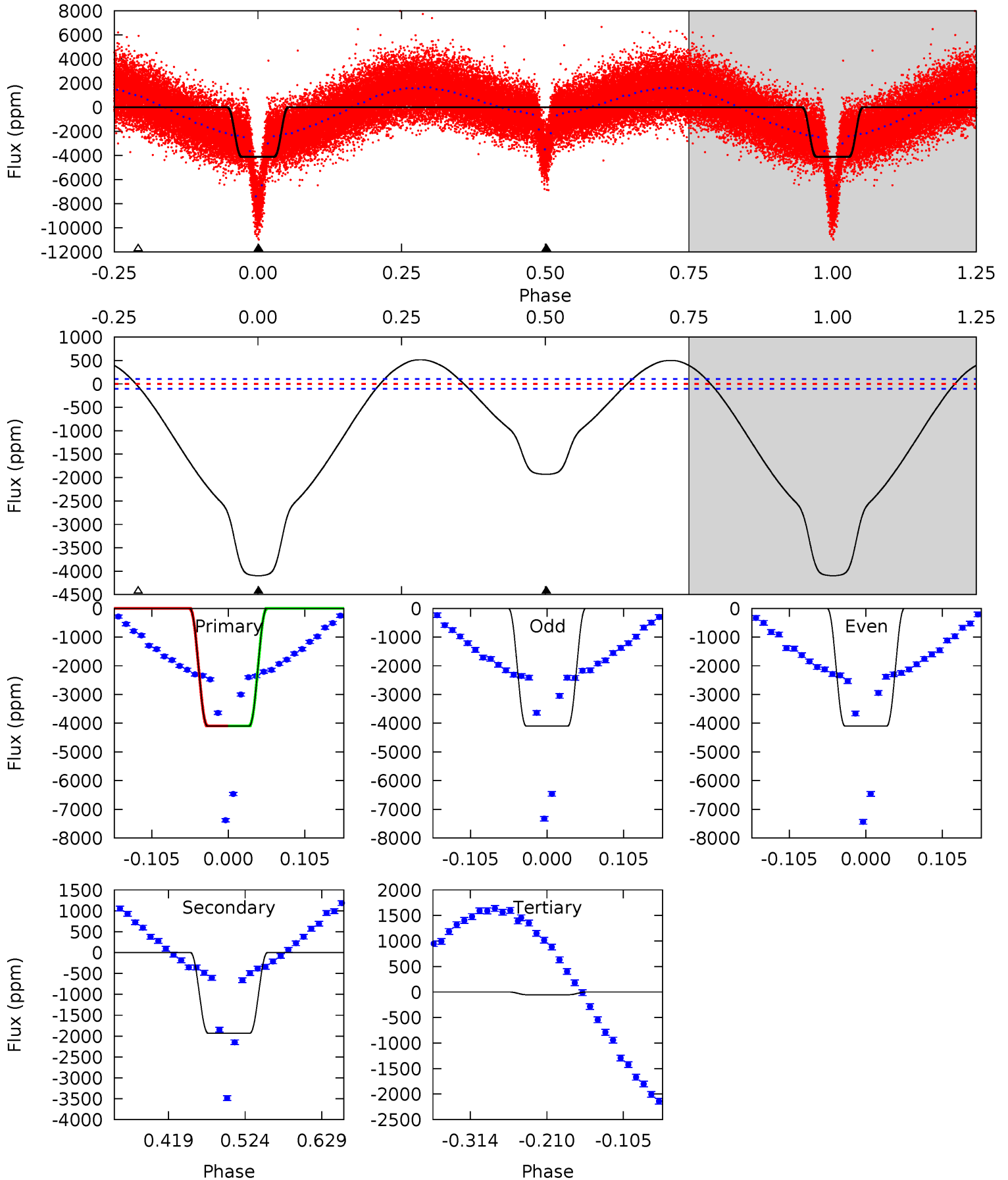
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
179.1	27.0	5.96	6.02	4.84	2.22	5.37	173.1	173.0	21.0	20.9	1.08	1.03	0.16	10.1



Alt Model-Shift Uniqueness Test

010989032-01, P = 2.305103 Days, E = 131.398103 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
177.8	83.8	2.33	0	4.55	1.62	30.1	175.5	177.8	81.5	83.8	0.04	0.98	0.11	0.01



Stellar Parameters For KIC 010989032

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8851^{+246}_{-422}	$4.085^{+0.155}_{-0.155}$	$0.070^{+0.200}_{-0.600}$	$2.178^{+0.612}_{-0.551}$	$2.106^{+0.349}_{-0.523}$	$0.287^{+0.240}_{-0.129}$
	+3%/-5%	+4%/-4%	+286%/-857%	+28%/-25%	+17%/-25%	+84%/-45%
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 010989032-01 / KOI 7397.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-472 ± 18	$13.36^{+2.01}_{-1.92}$	3844^{+263}_{-262}	5157^{+160}_{-181}	$2.763^{+0.807}_{-0.594}$
Alt.	-1931 ± 23	$17.41^{+2.78}_{-2.52}$	3820^{+291}_{-265}	6448^{+182}_{-264}	$6.680^{+1.895}_{-1.518}$

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 $A_{obs} \gg 1.0$

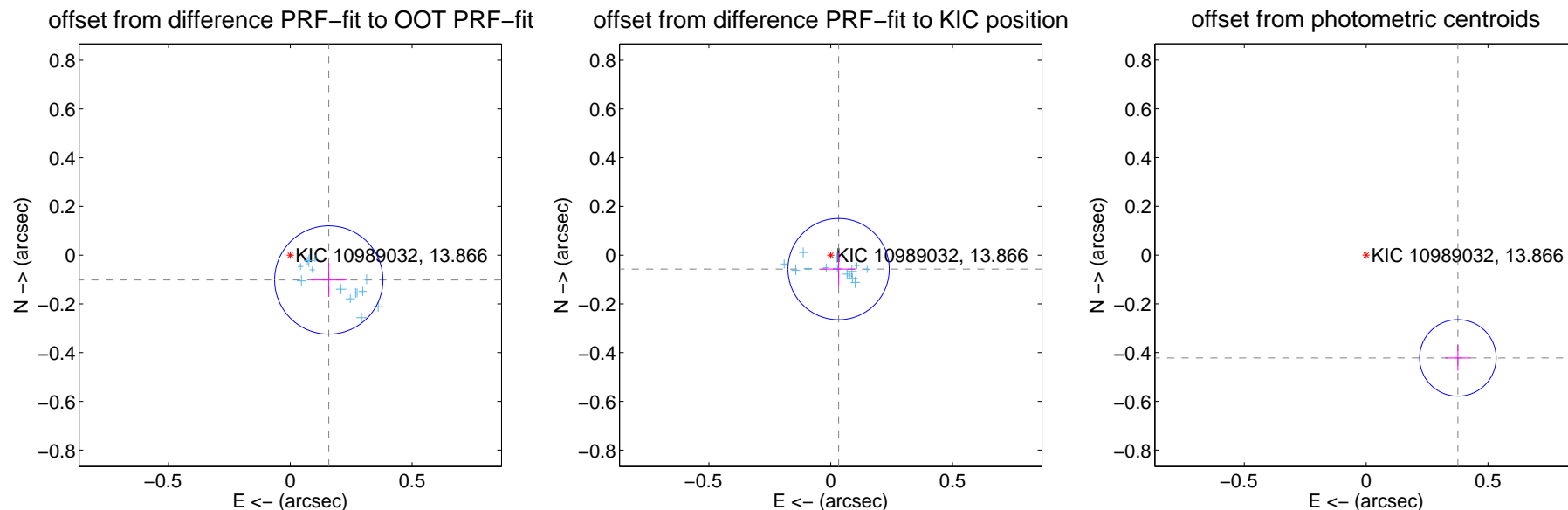
DV Centroid Data

Supplemental centroid analysis for 010989032-01. Kepler magnitude: 13.87. Transit SNR 133.26

There are 14 quarters with good PRF difference image offsets

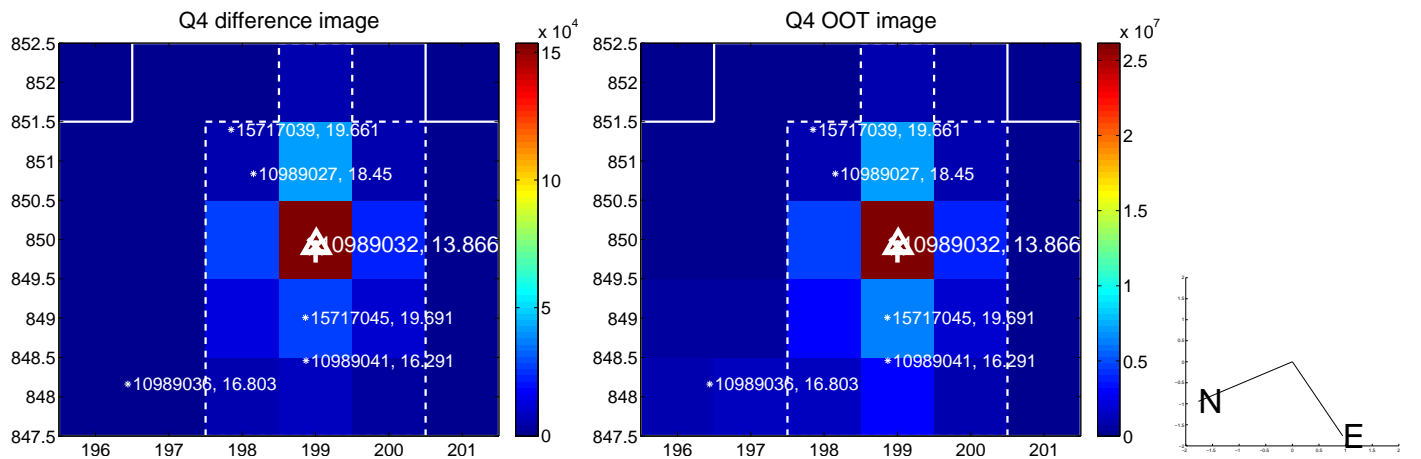
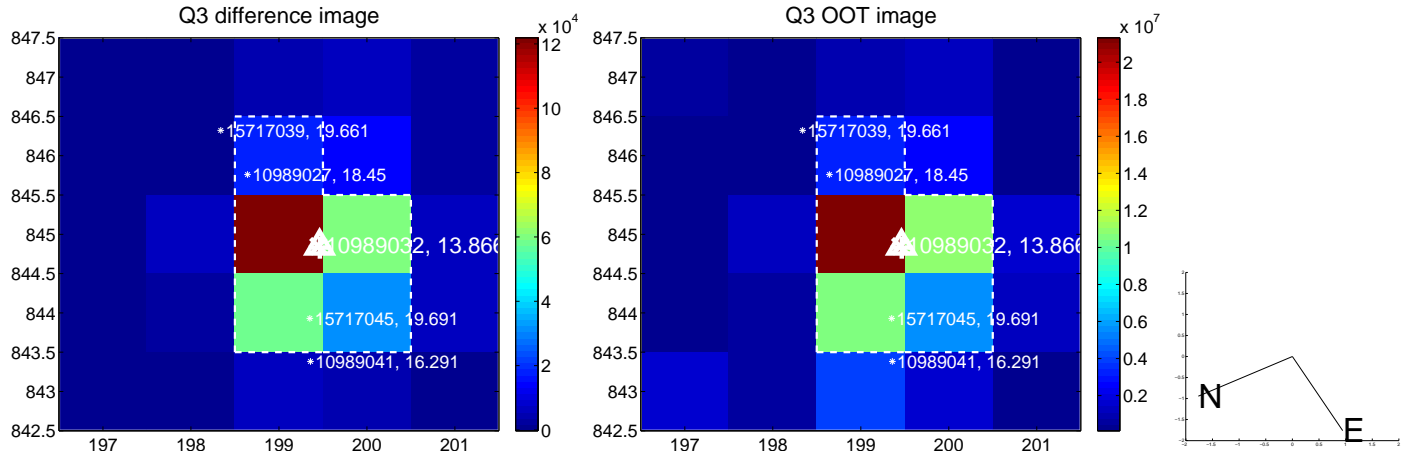
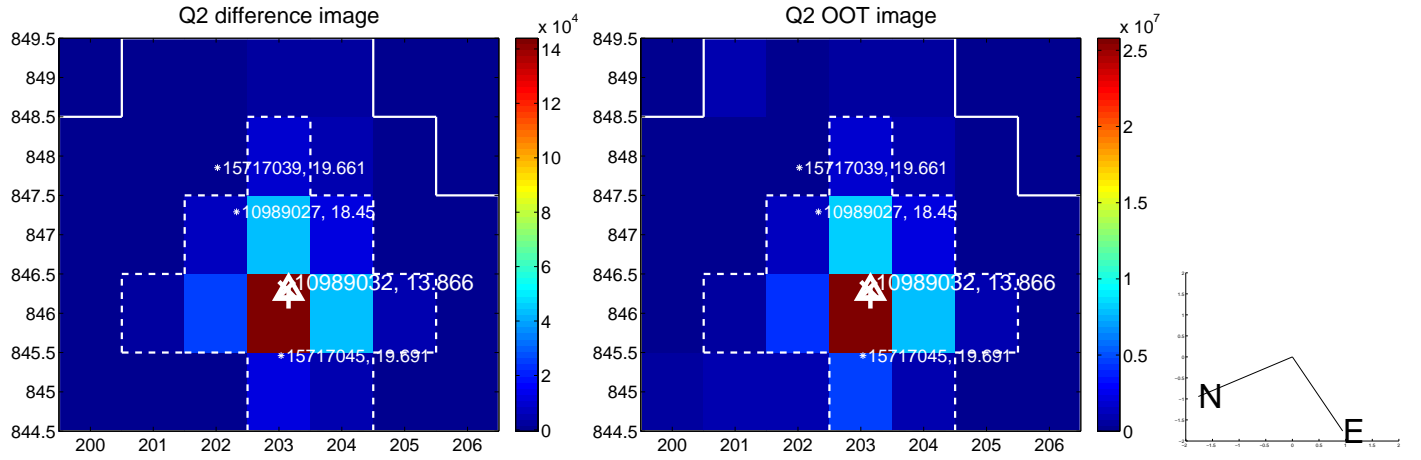
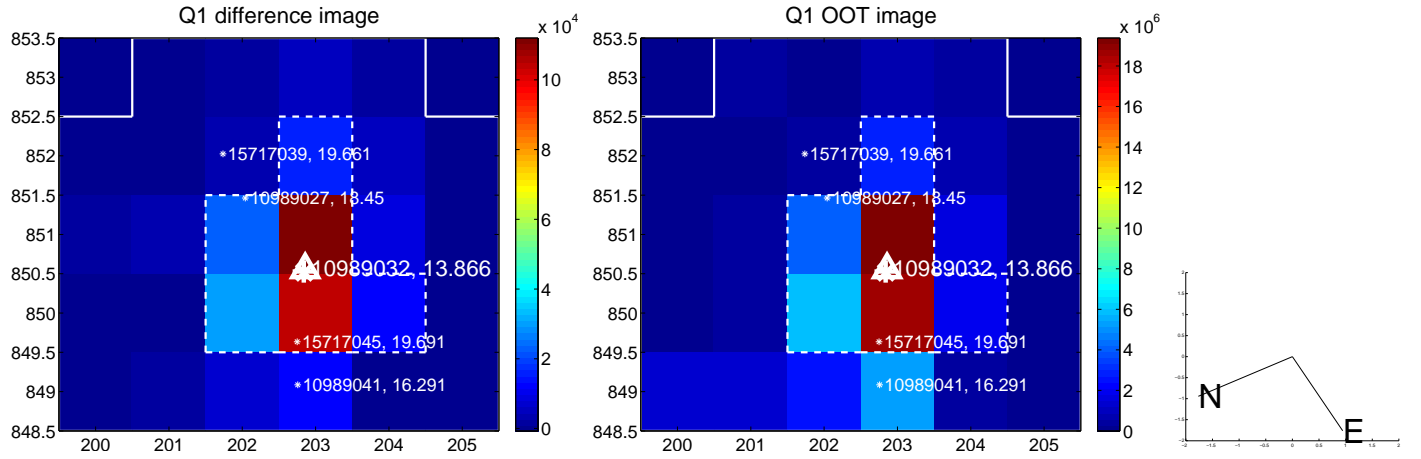
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.188 ± 0.074	2.54	-0.158 ± 0.072	-0.102 ± 0.069
PRF-fit source offset from KIC position	0.066 ± 0.069	0.95	-0.032 ± 0.072	-0.057 ± 0.067
photometric centroid source offset	0.57 ± 0.05	10.80	-0.38 ± 0.05	-0.42 ± 0.05

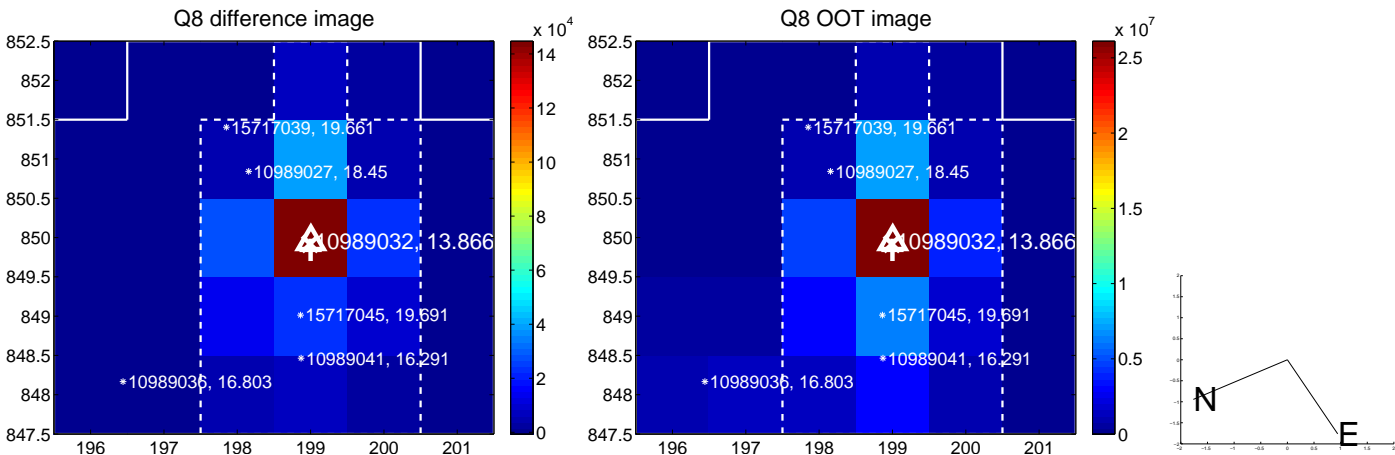
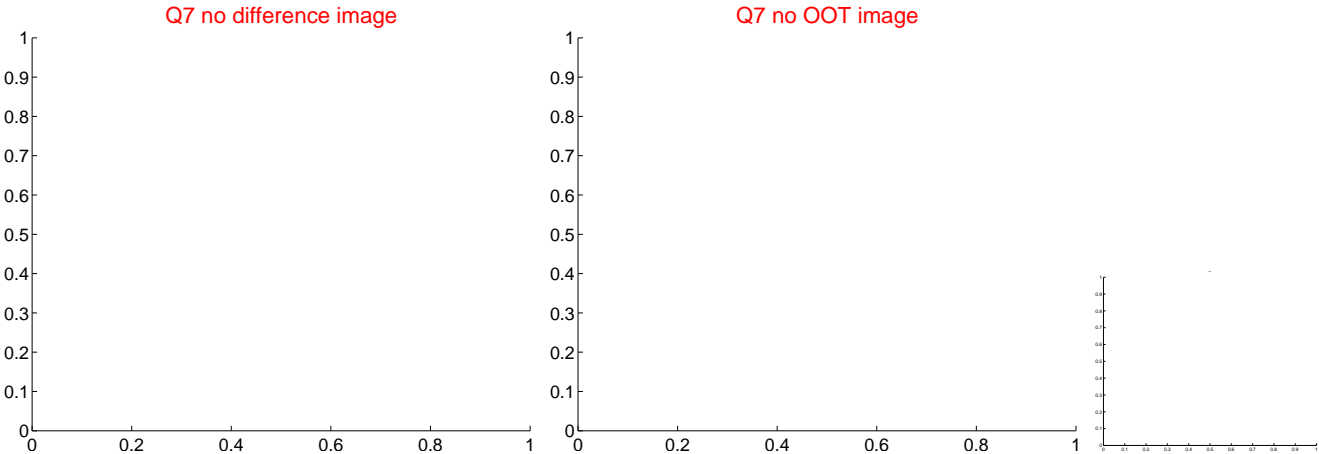
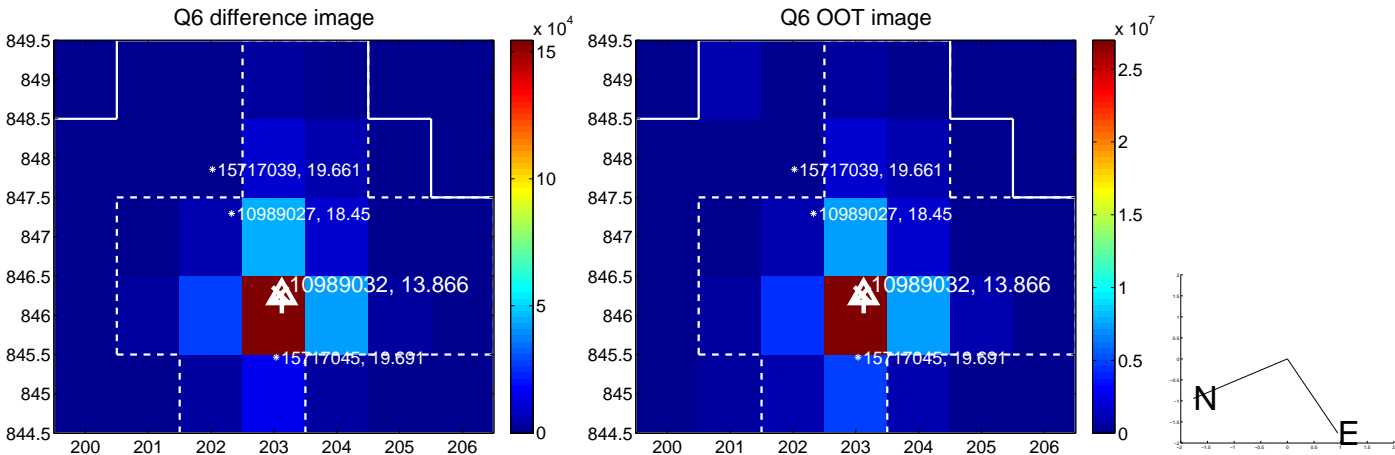
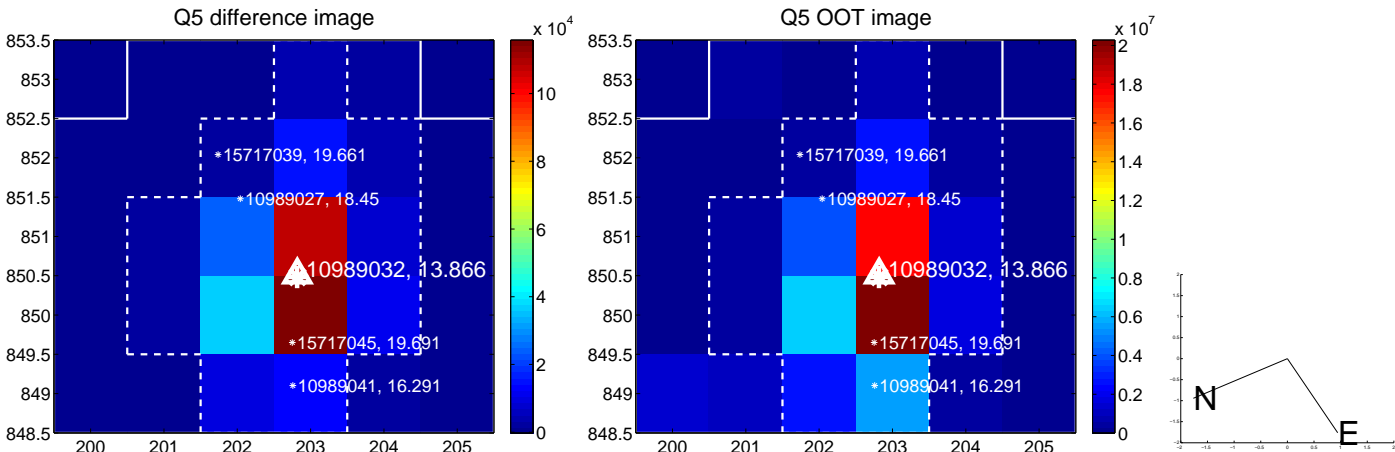


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

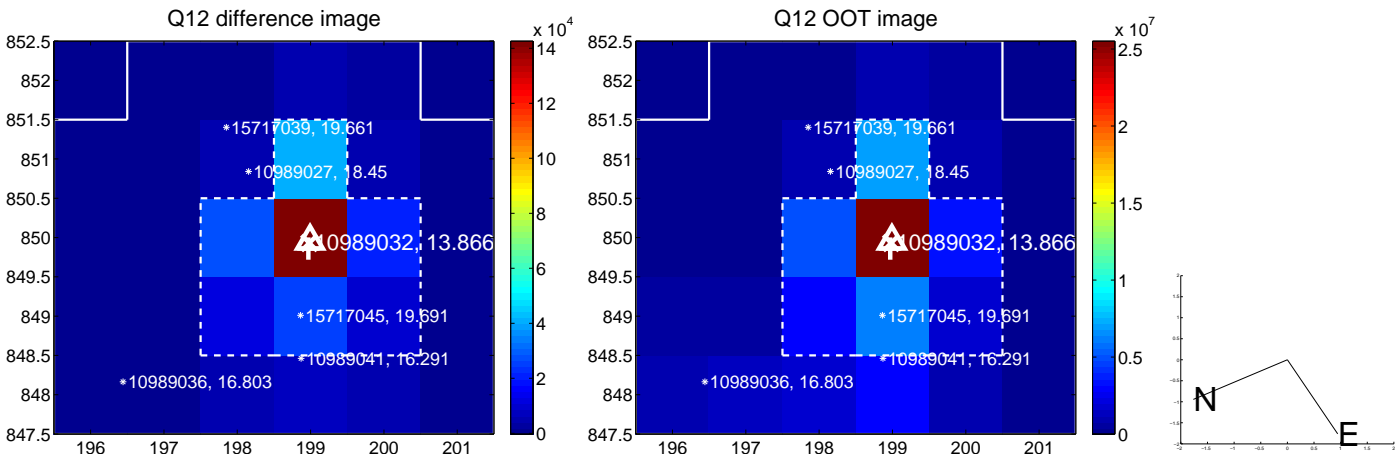
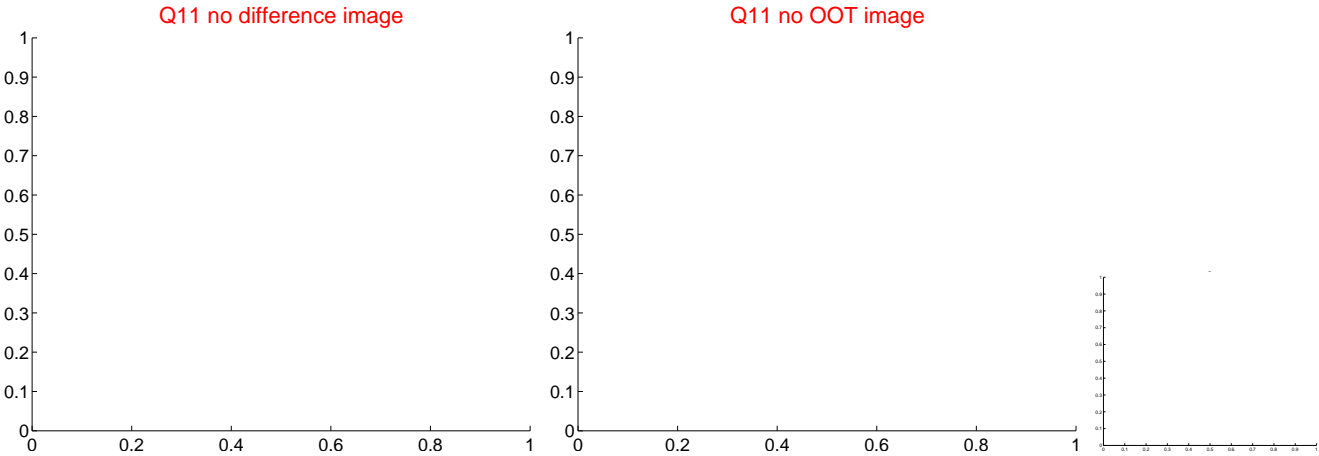
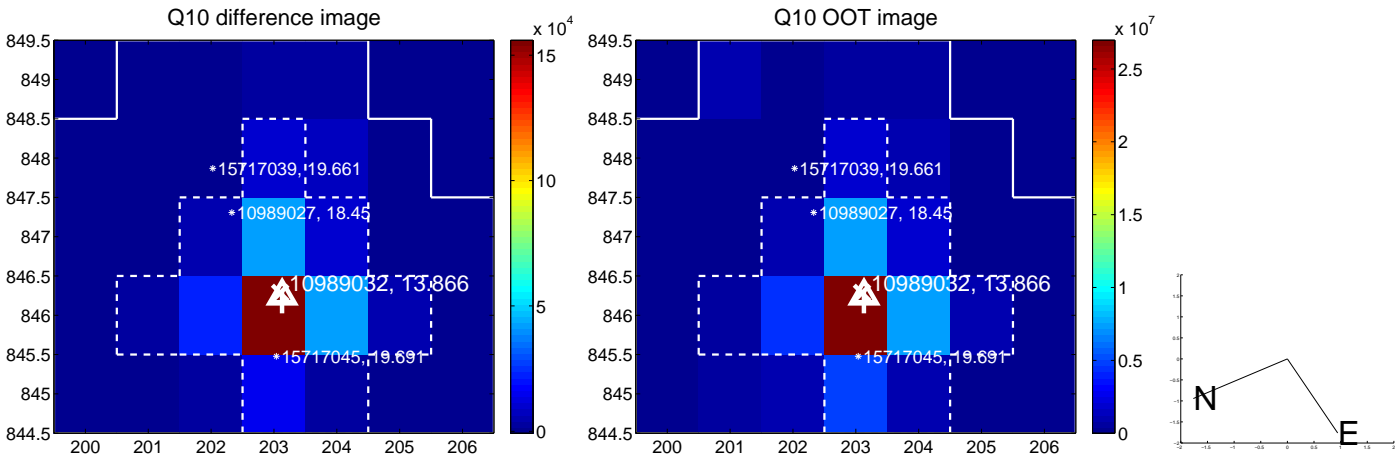
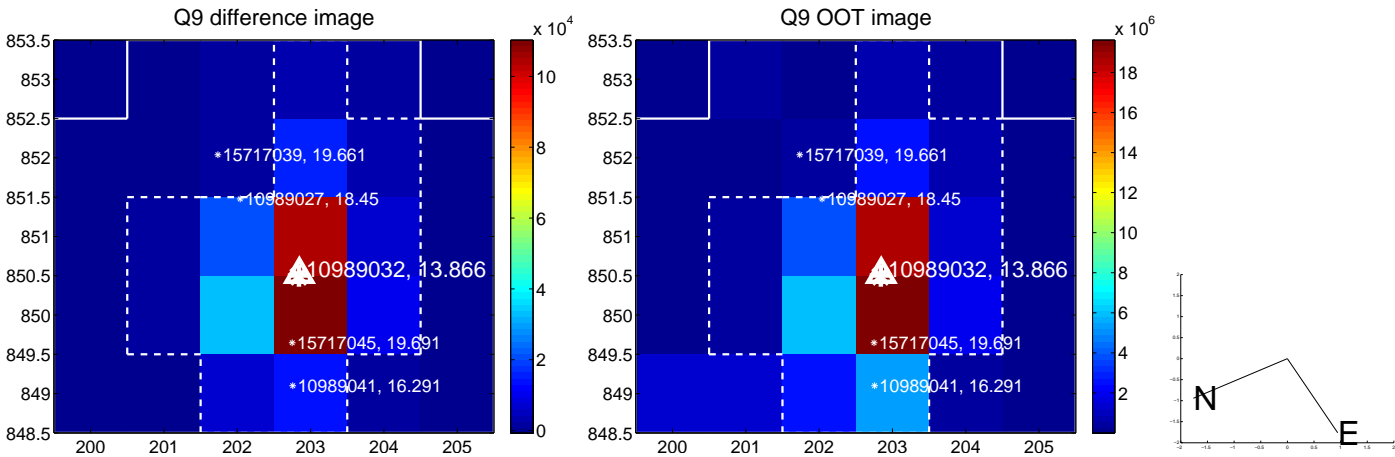
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



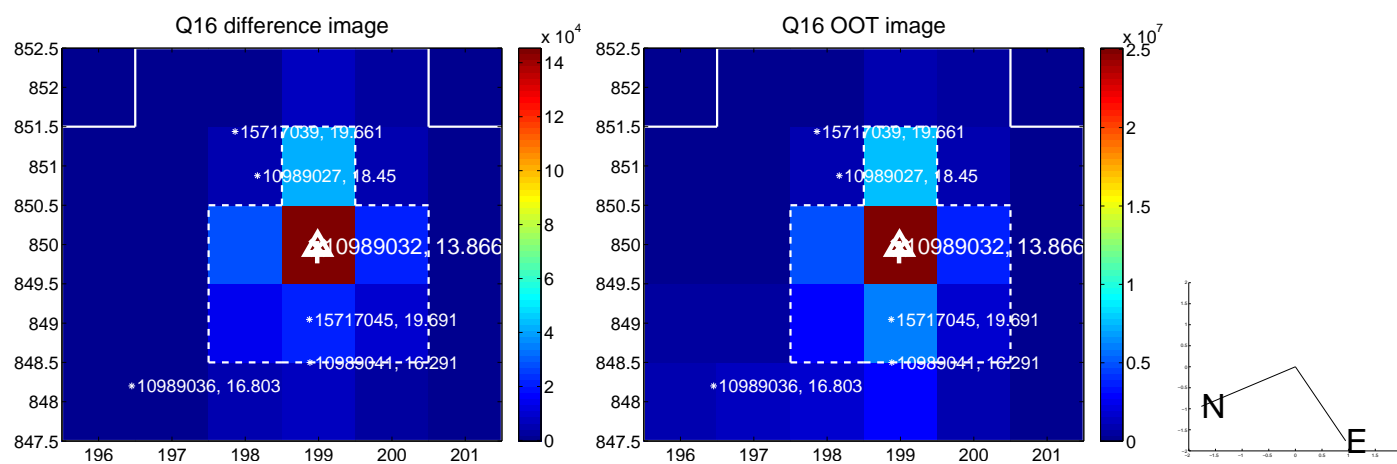
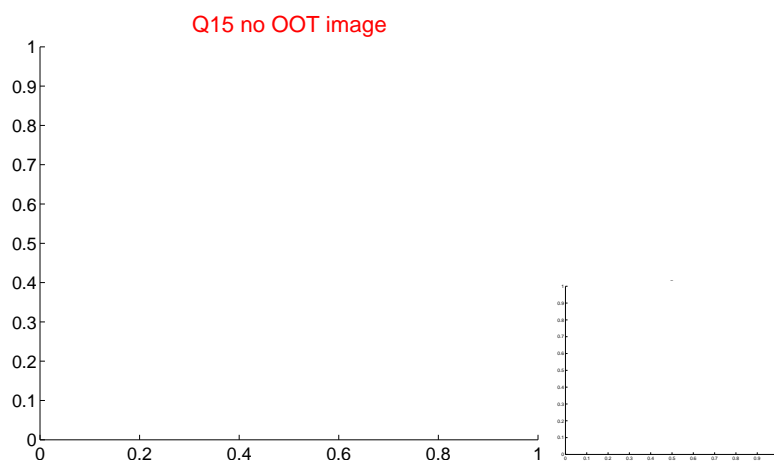
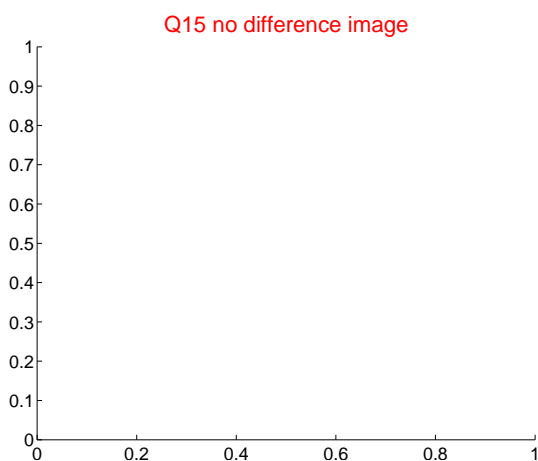
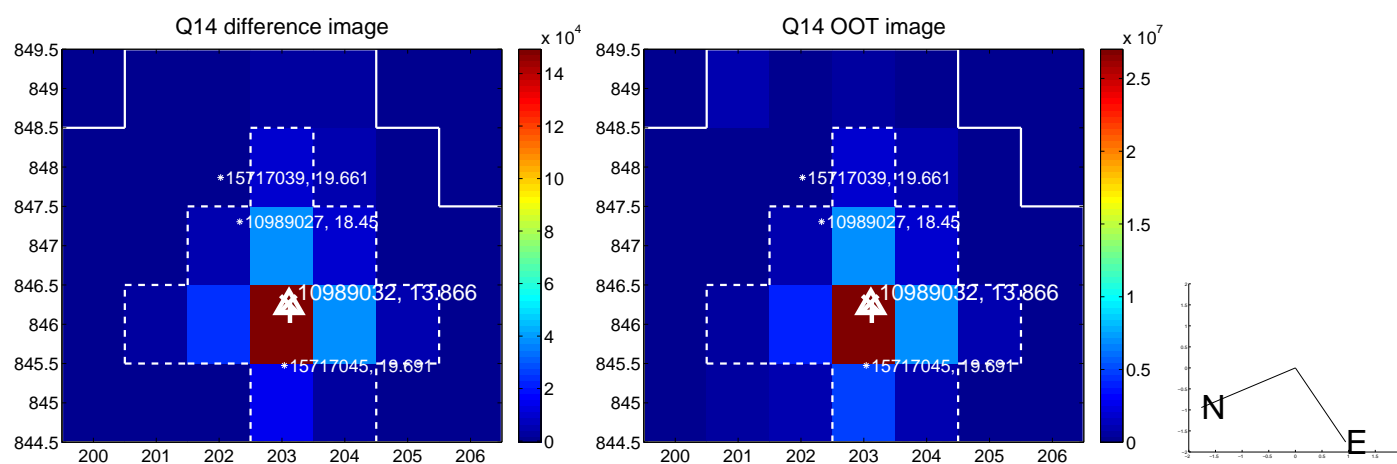
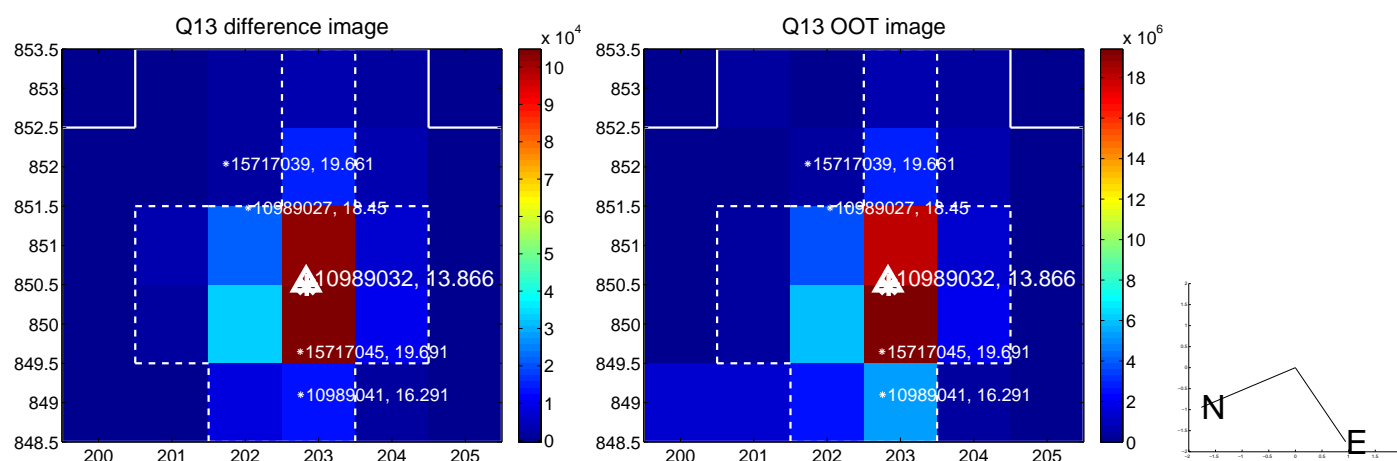
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



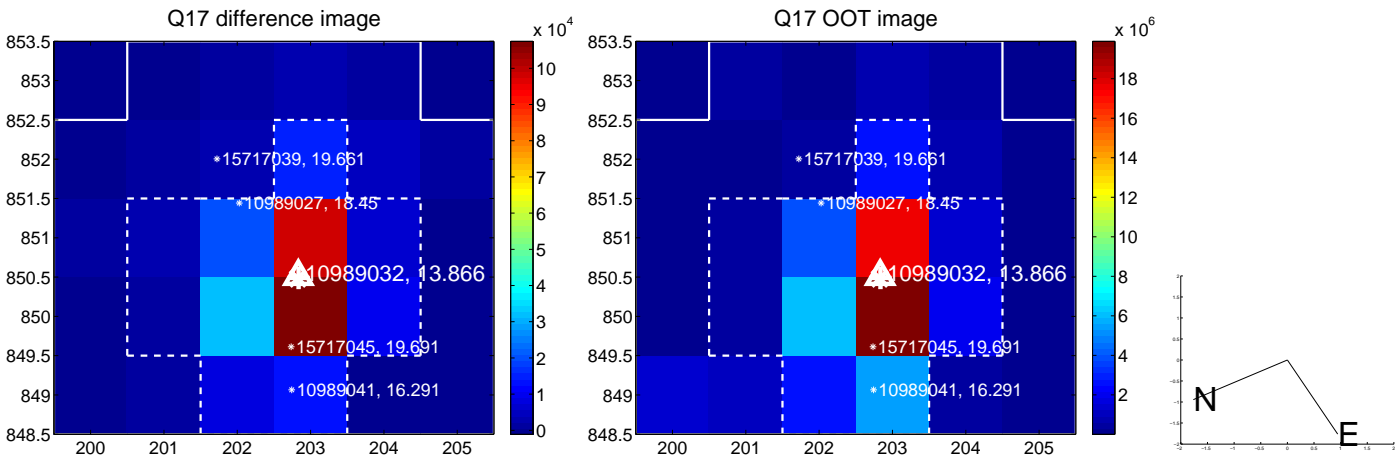
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



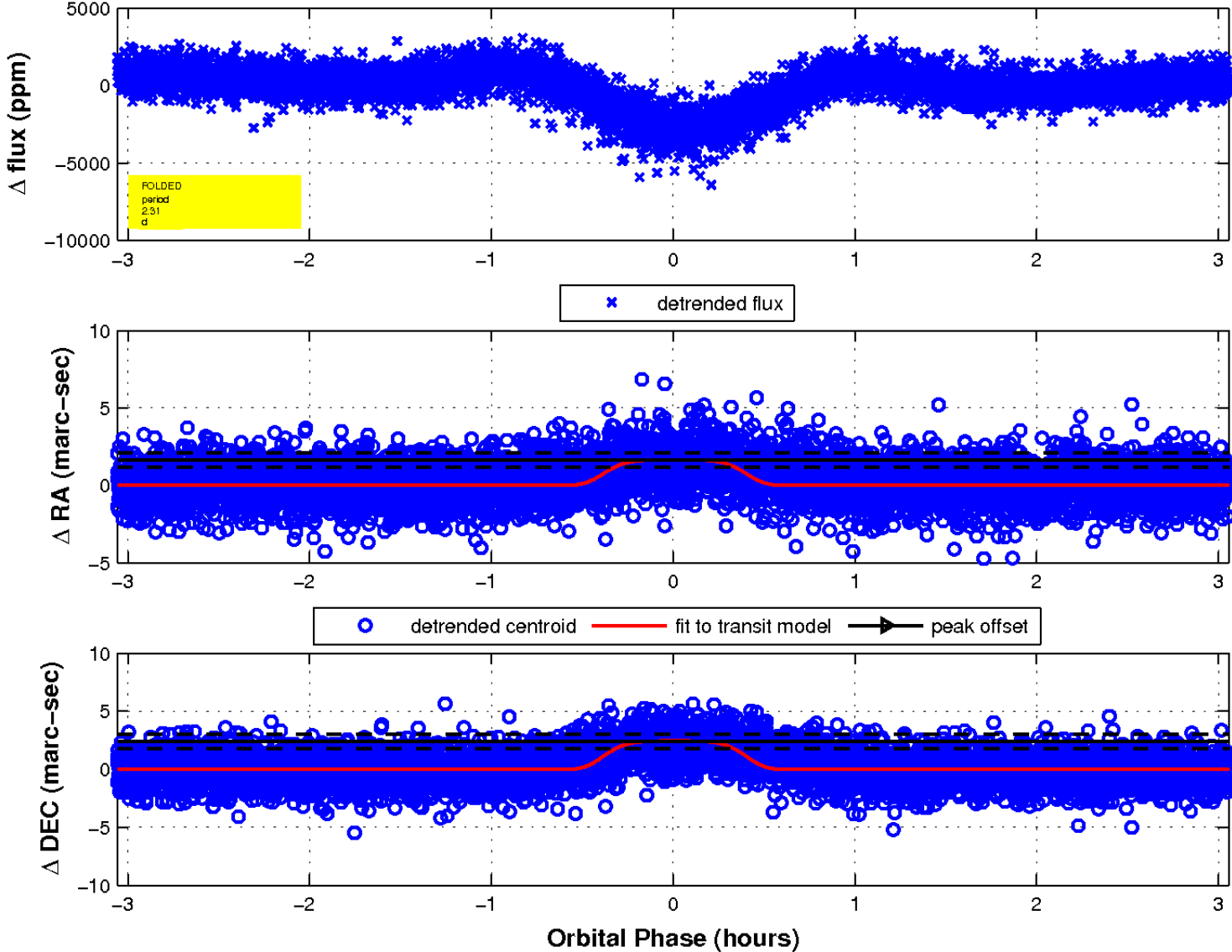
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

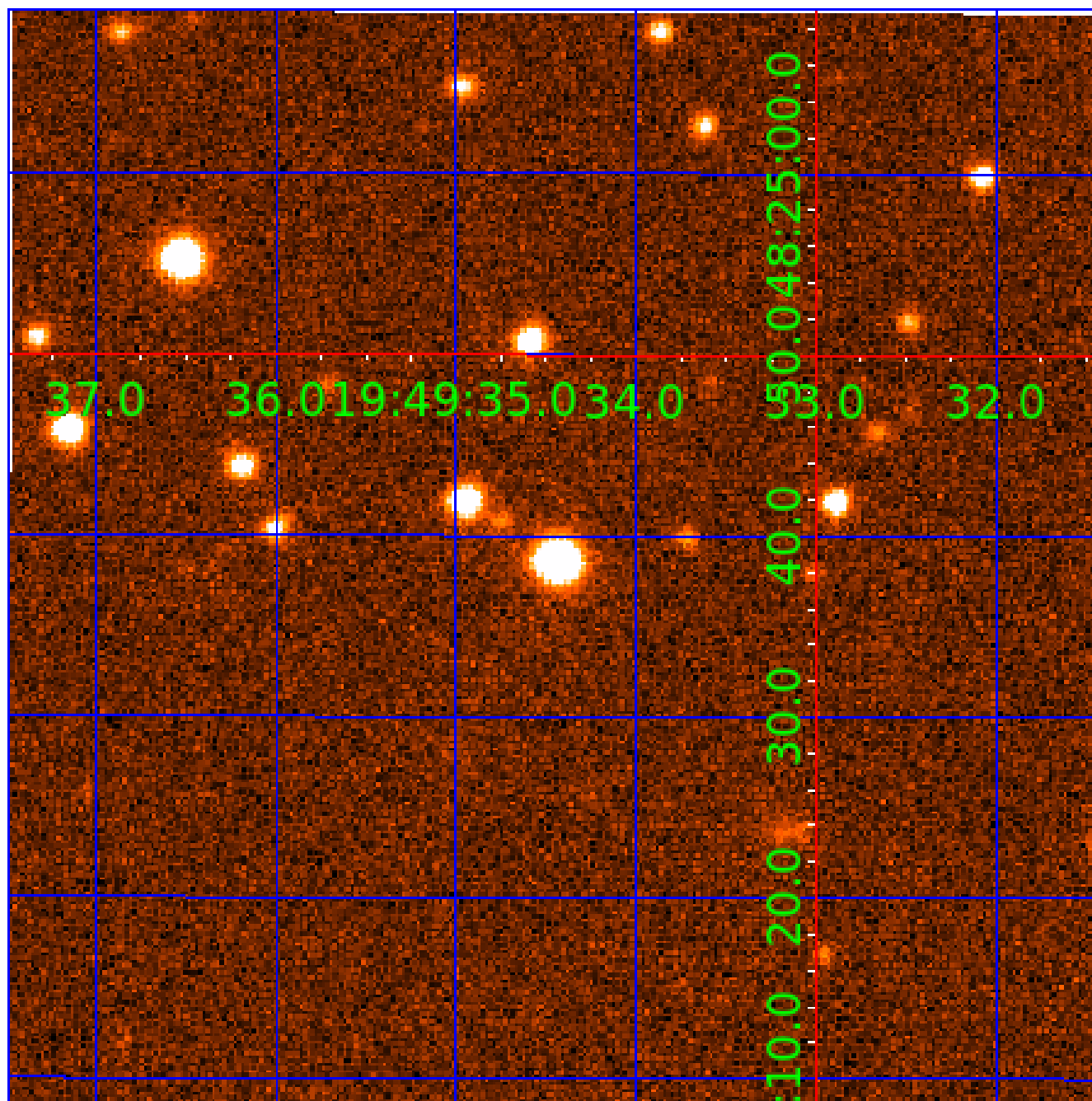


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 010989032

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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010989032-02	OBS	No	2.305071	132.563600	64.9	10.483	19.4	11.0	2.18	8851	1.83	13614.13
010989032-03	OBS	No	2.303547	132.957207	1.3	8.941	7.7	0.0	2.18	8851	0.27	13626.14
010989032-04	OBS	No	2.305430	133.162707	172.6	5.000	8.4	-1.0	2.18	8851	2.91	13611.30

Robovetter Results

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010989032-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
010989032-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010989032-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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.

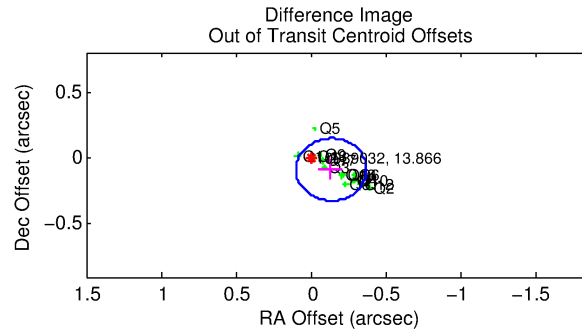
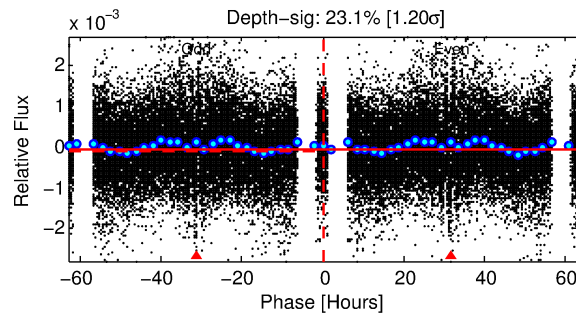
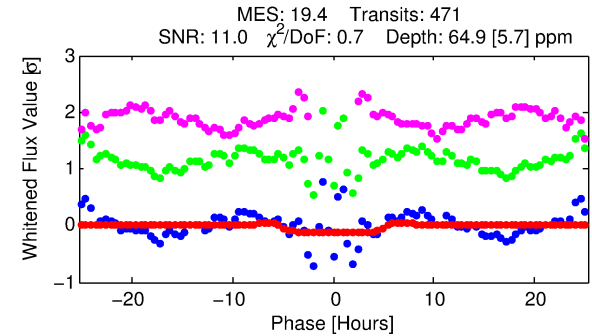
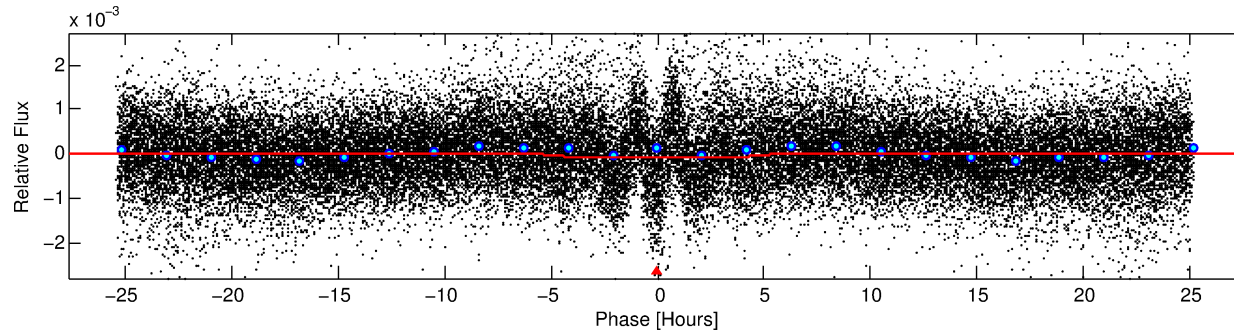
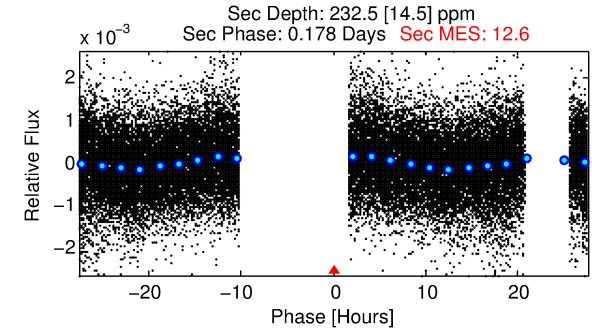
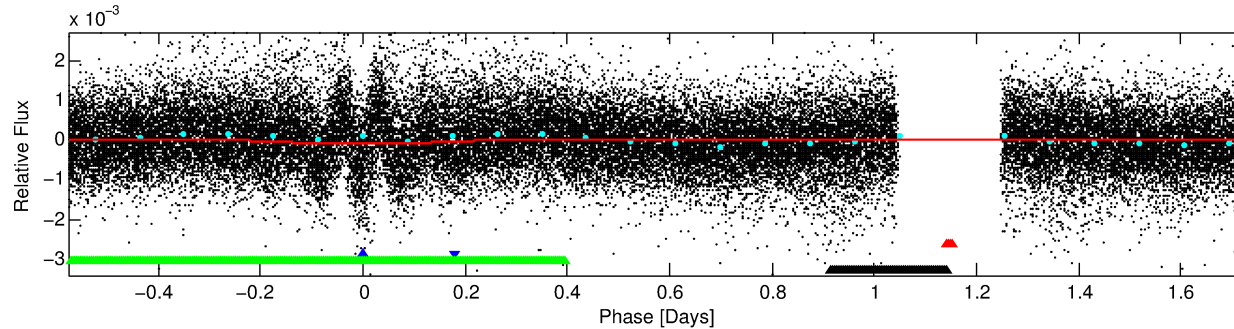
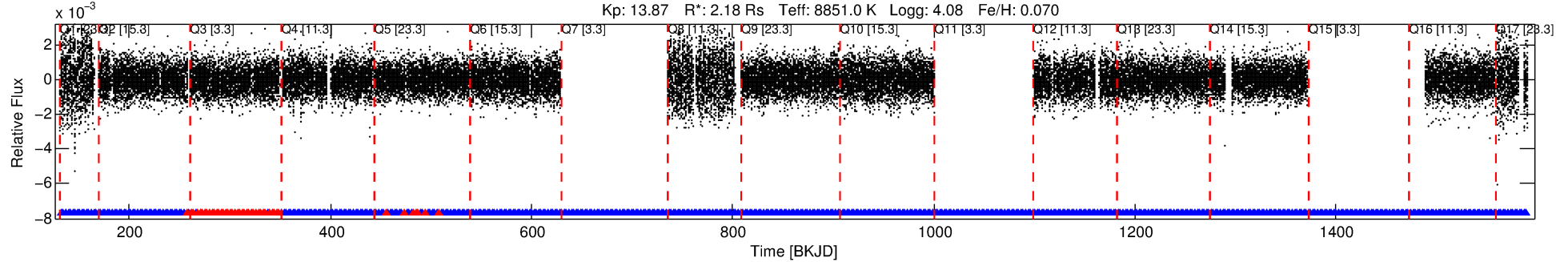
Ephemeris Match Information For 010989032-02

No Significant Match Found

DV One-Page Summary

KIC: 10989032 Candidate: 2 of 4 Period: 2.305 d
KOI: K07397 Corr: No Ephemeris Match

Kp: 13.87 R*: 2.18 Rs Teff: 8851.0 K Logg: 4.08 Fe/H: 0.070



DV Fit Results:

Period = 2.30507 [0.00003] d
Epoch = 132.5636 [0.0096] BKJD
Rp/R* = 0.0077 [0.0050]
a/R* = 1.64 [4.26]
b = 0.50 [6.25]
Seff = 13614.13 [4872.18]
Teq = 2754 [246] K
Rp = 1.83 [1.30] Re
a = 0.0438 [0.0097] AU
Ag = 73.41 [98.69] [0.73σ]
Teff = 12465 [4125] K [2.35σ]

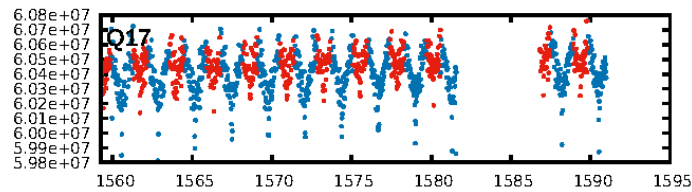
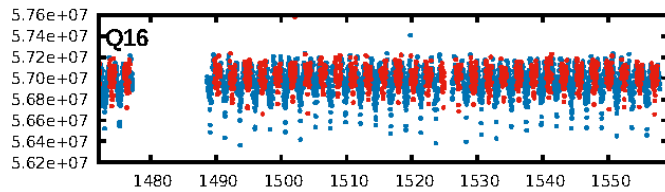
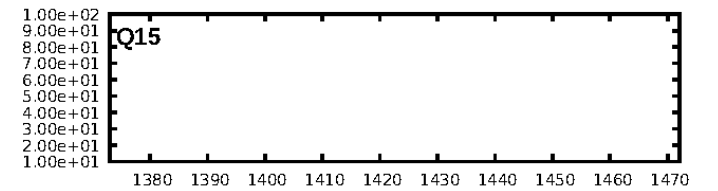
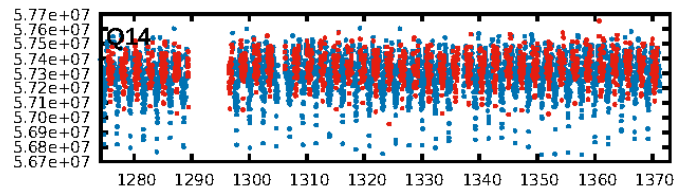
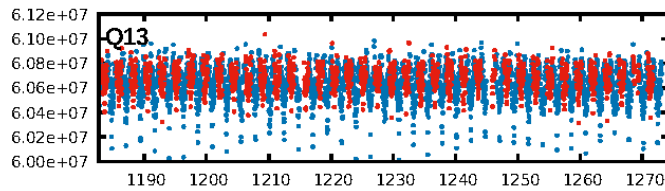
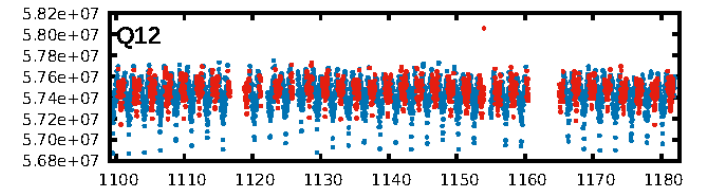
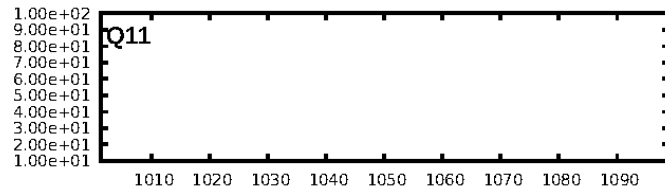
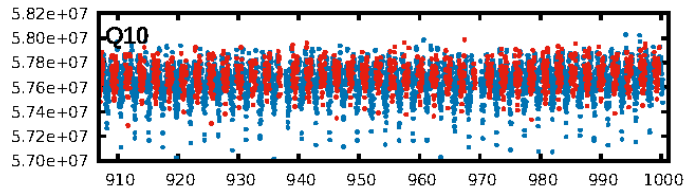
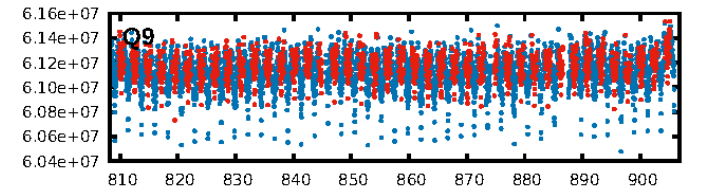
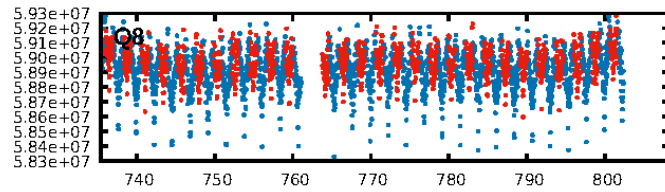
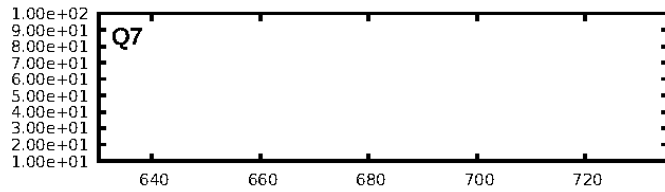
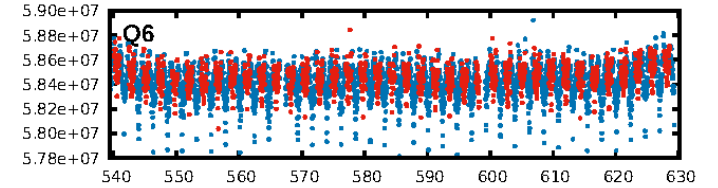
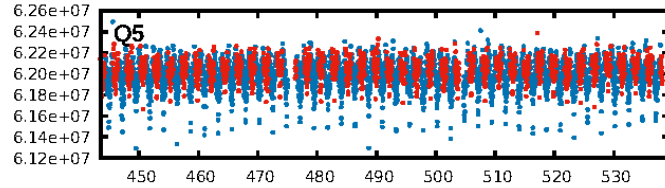
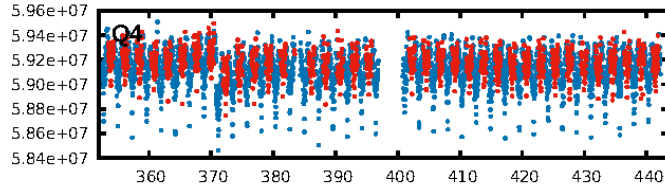
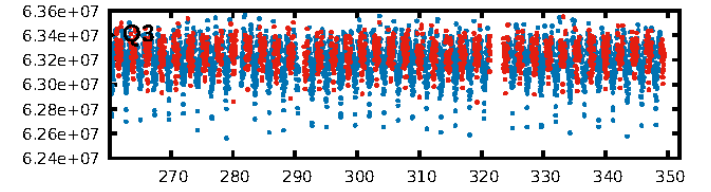
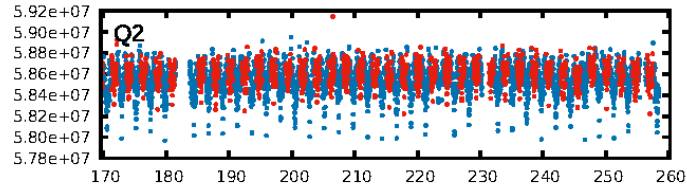
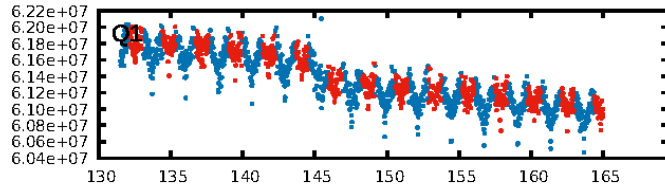
DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00σ]
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.55e-138
RollingBand-fgt: 0.90 [399/444]
GhostDiagnostic-chr: -10.35
Centroid-sig: 7.9%
Centroid-so: 1.539 arcsec [2.30σ]
OotOffset-rm: 0.163 arcsec [2.06σ]
KicOffset-rm: 0.047 arcsec [0.68σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 0.00 [0/14]

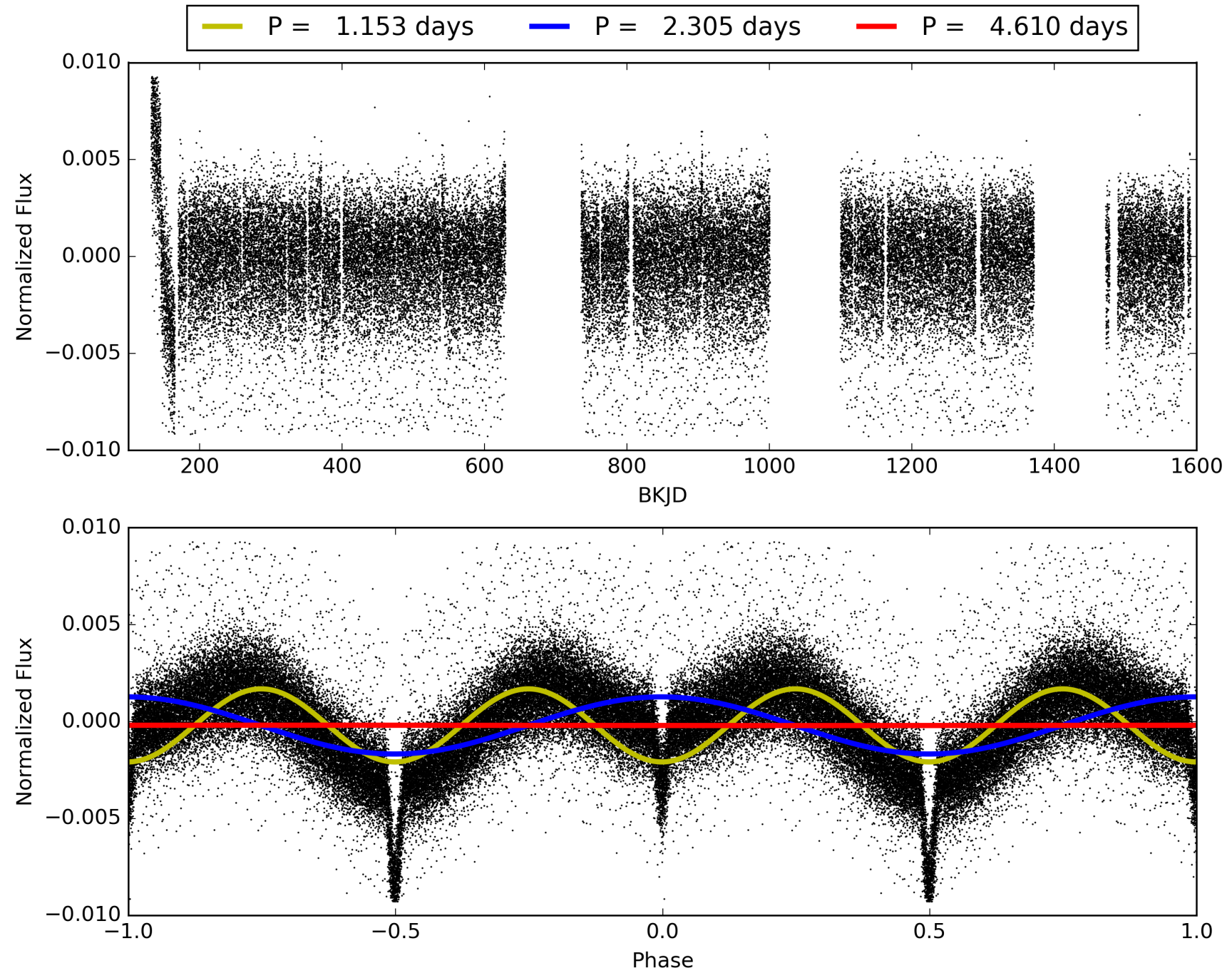
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:22:24 Z

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

TCE 010989032-02, PDC Light Curves

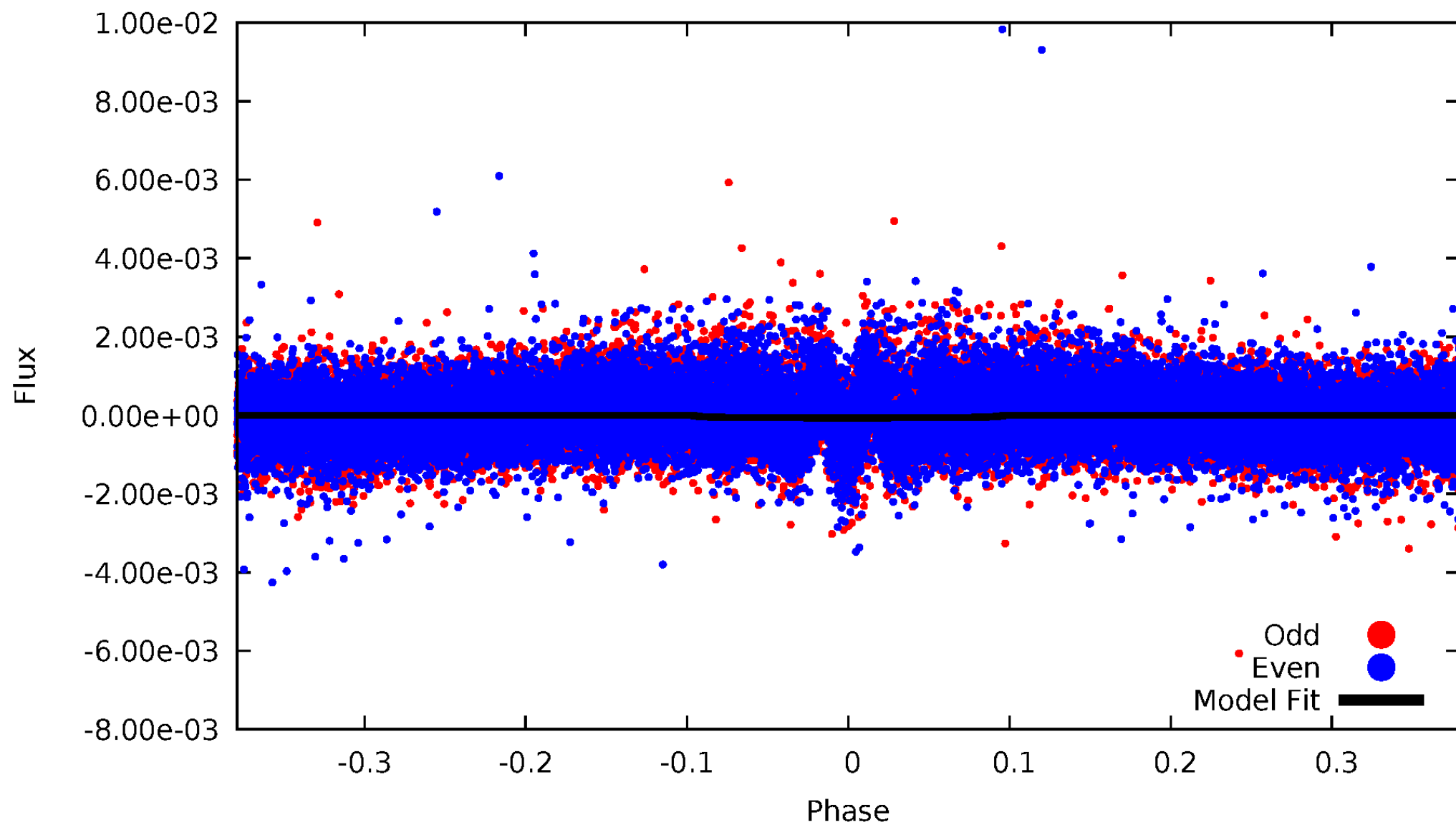


TCE 010989032-02



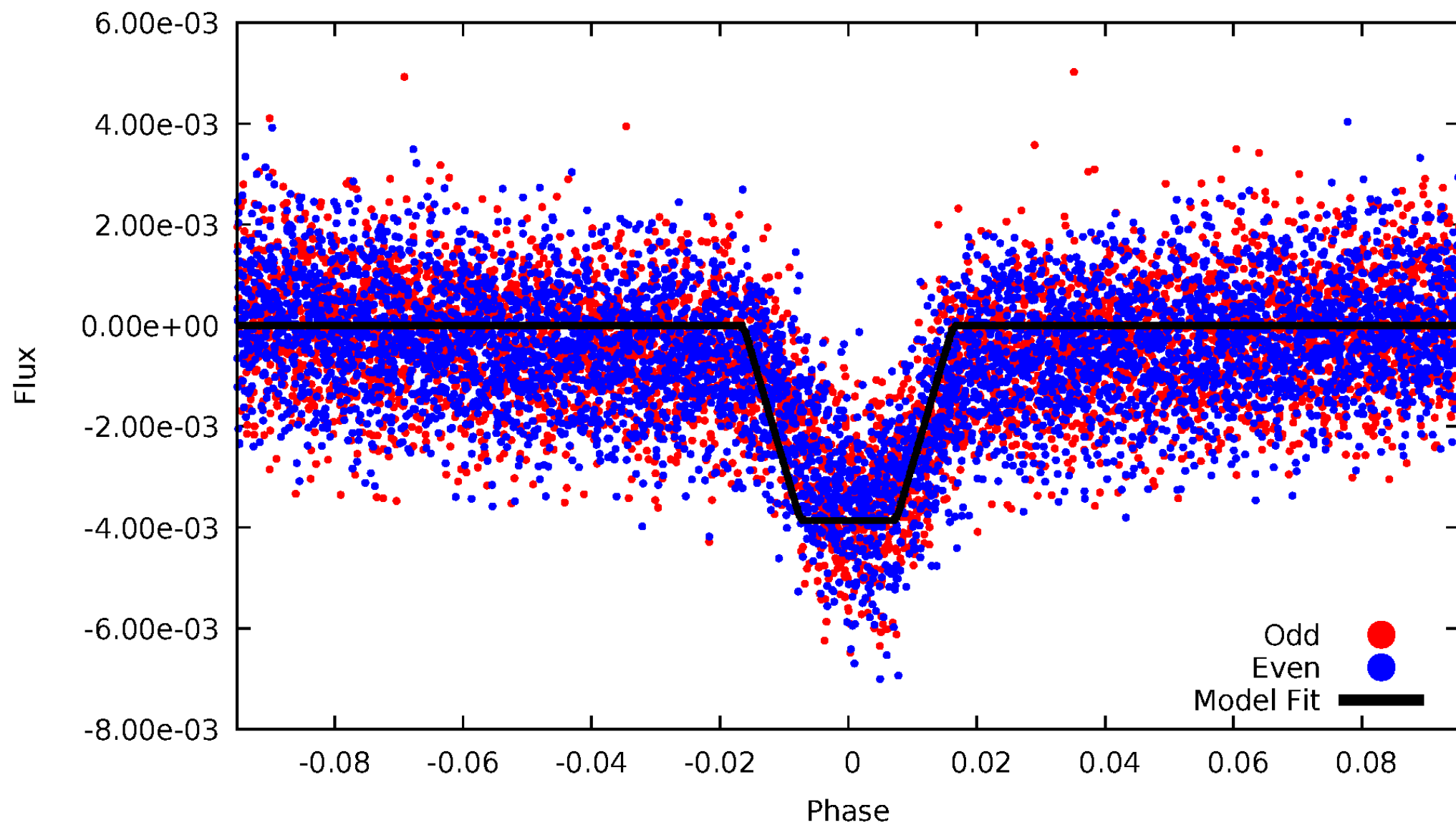
DV Odd/Even

TCE 010989032-02



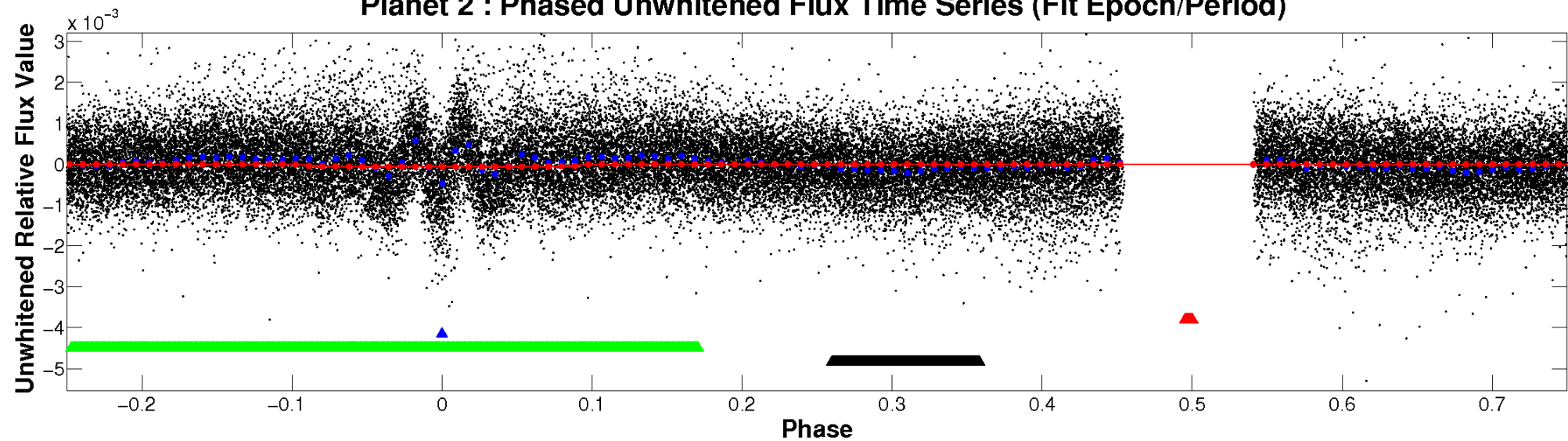
ALT Odd/Even

TCE 010989032-02

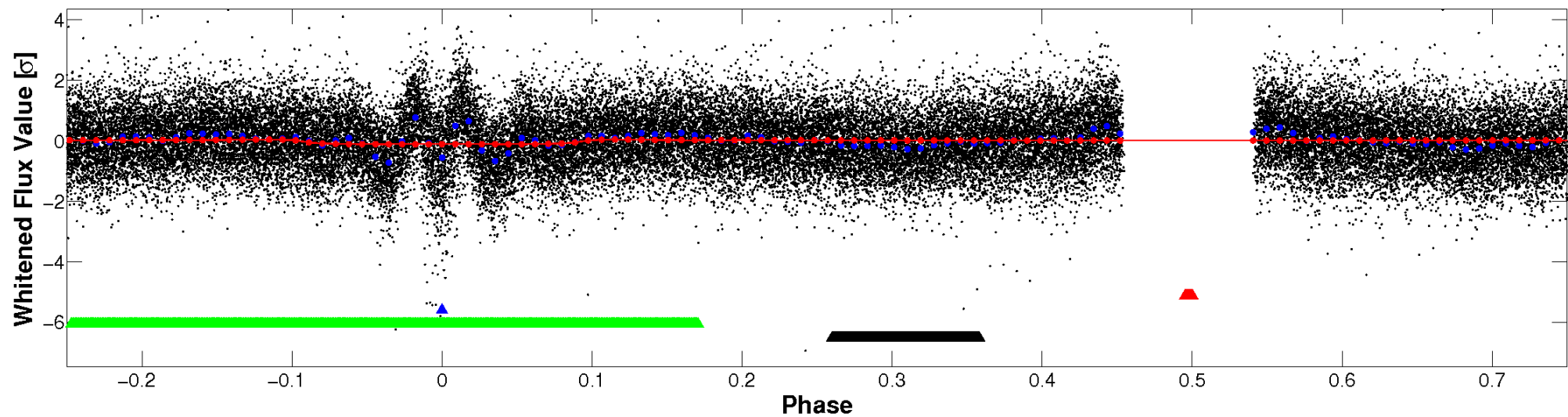


Non-Whitened Vs. Whitened Light Curve

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

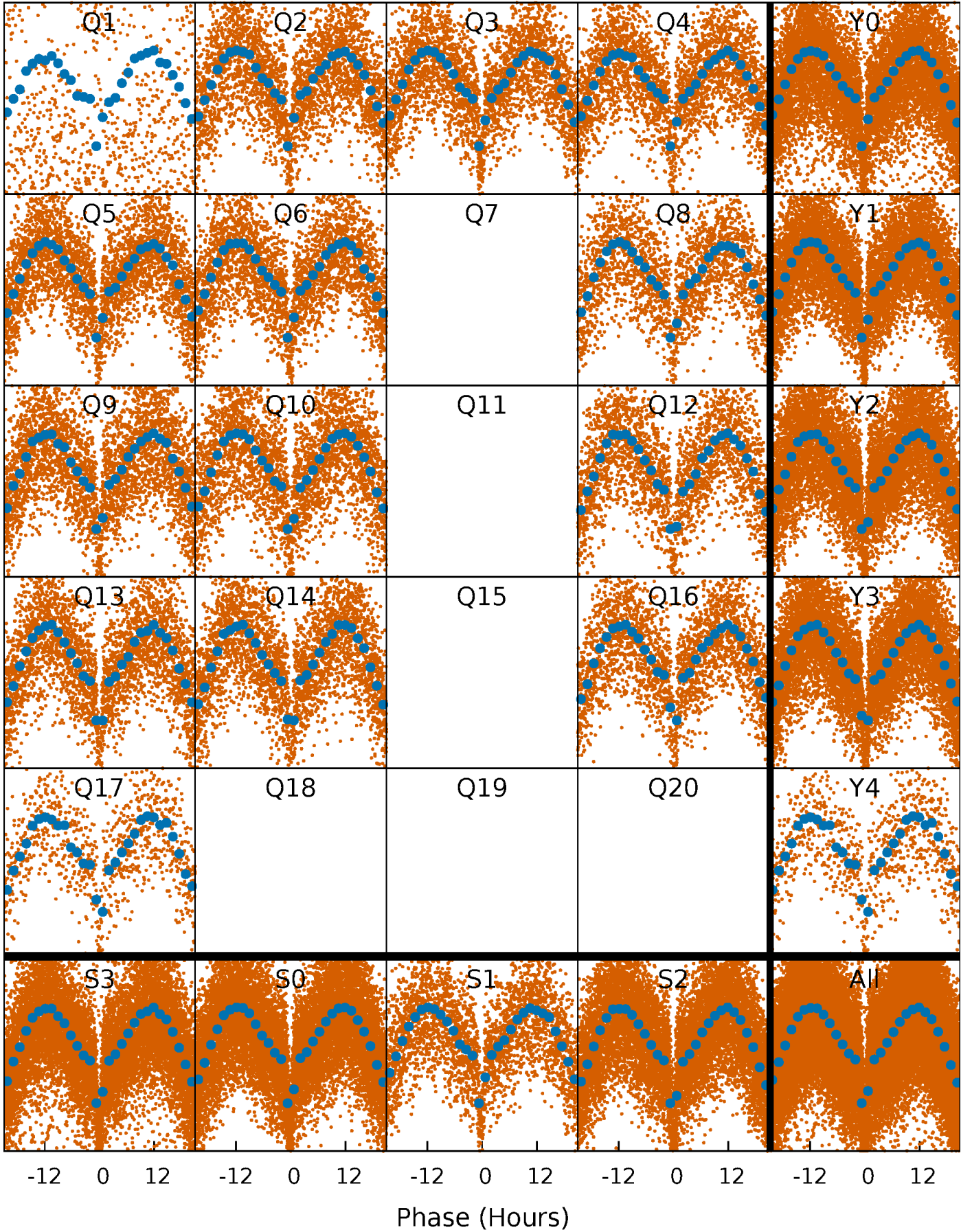


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



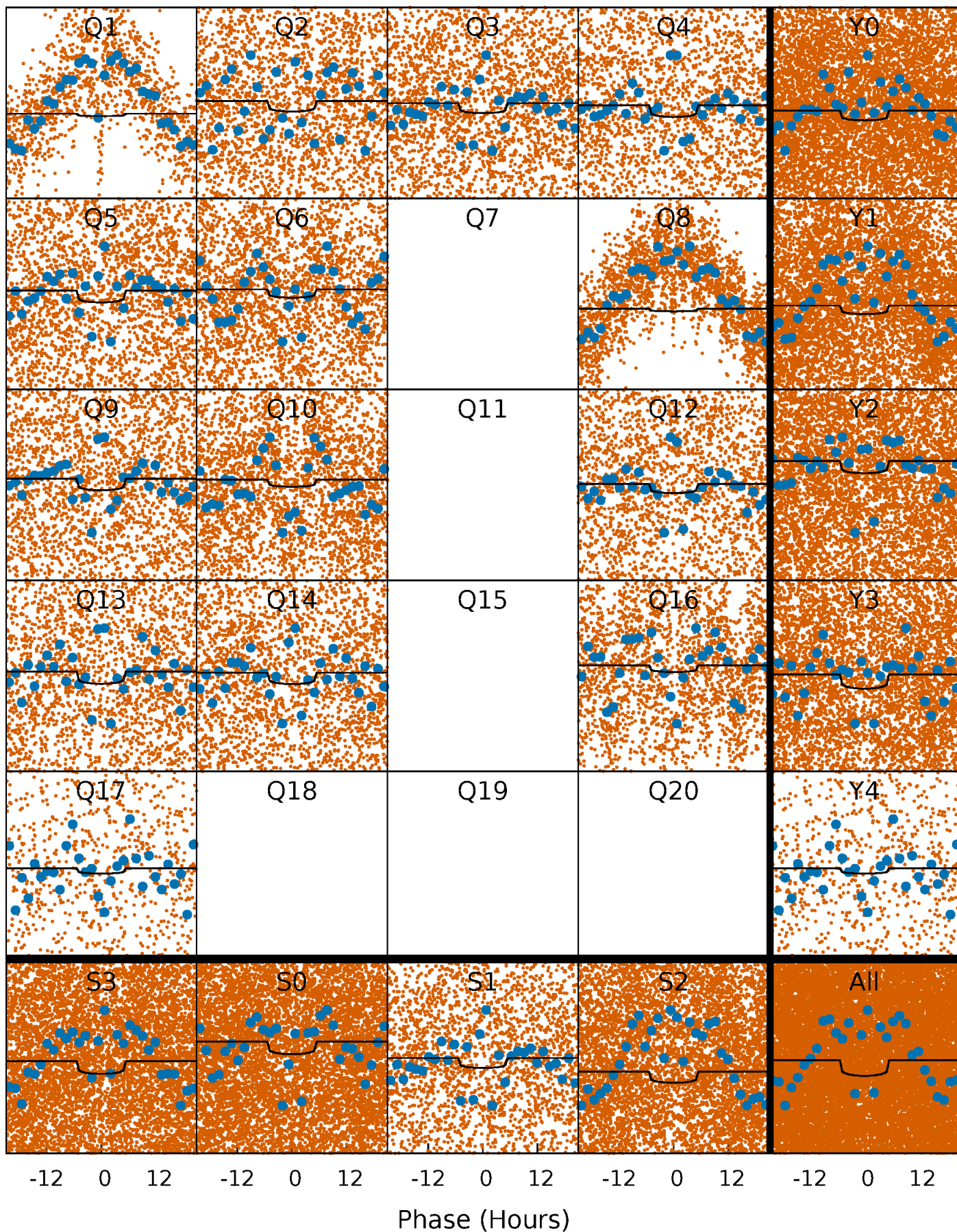
PDC Quarter-Phased Transit Curves

TCE 010989032-02 $P = 2.305071$ Days $T_0 = 132.563600$ (BKJD)



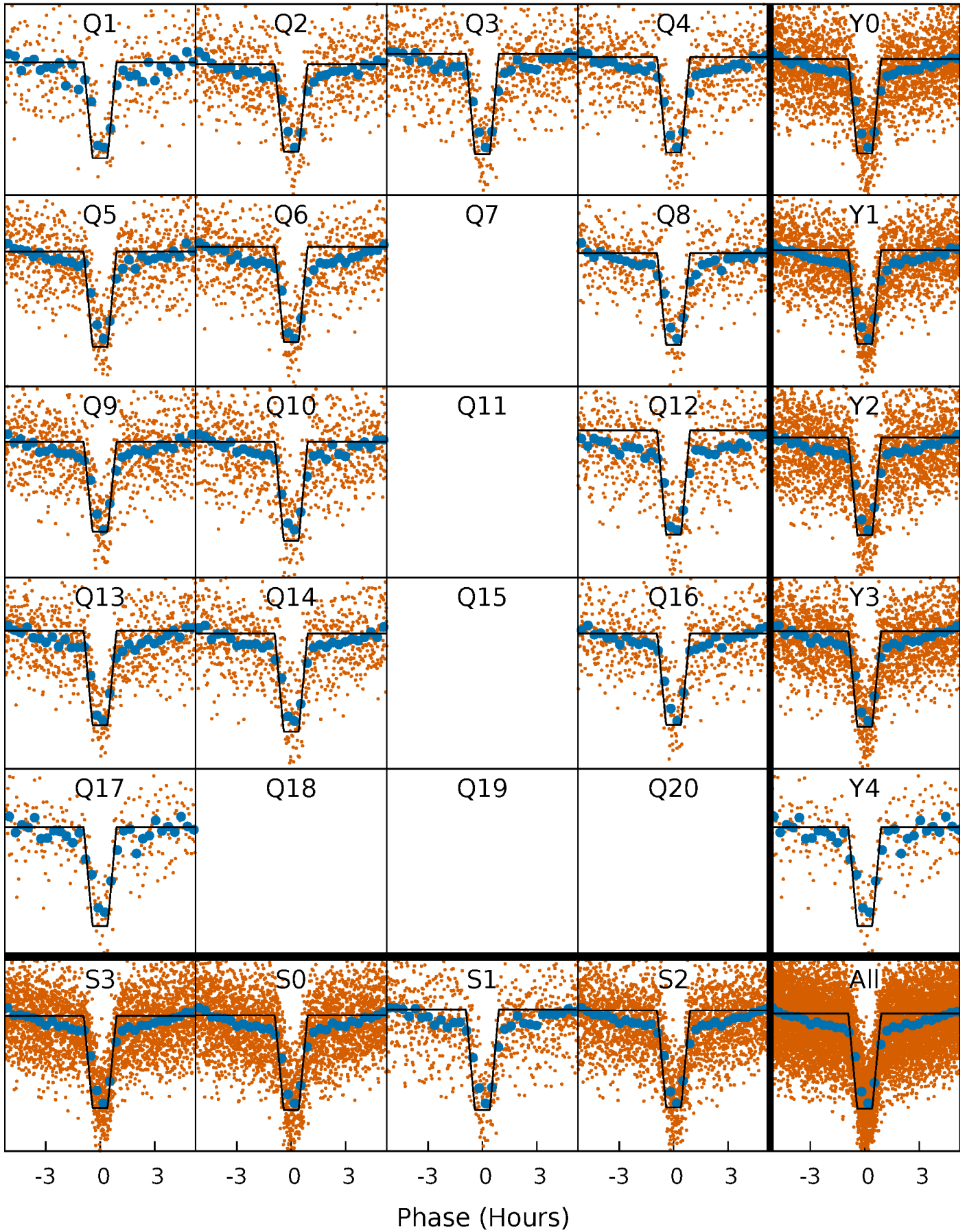
DV Quarter-Phased Transit Curves

TCE 010989032-02 P= 2.305071 Days $T_0=132.563600$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

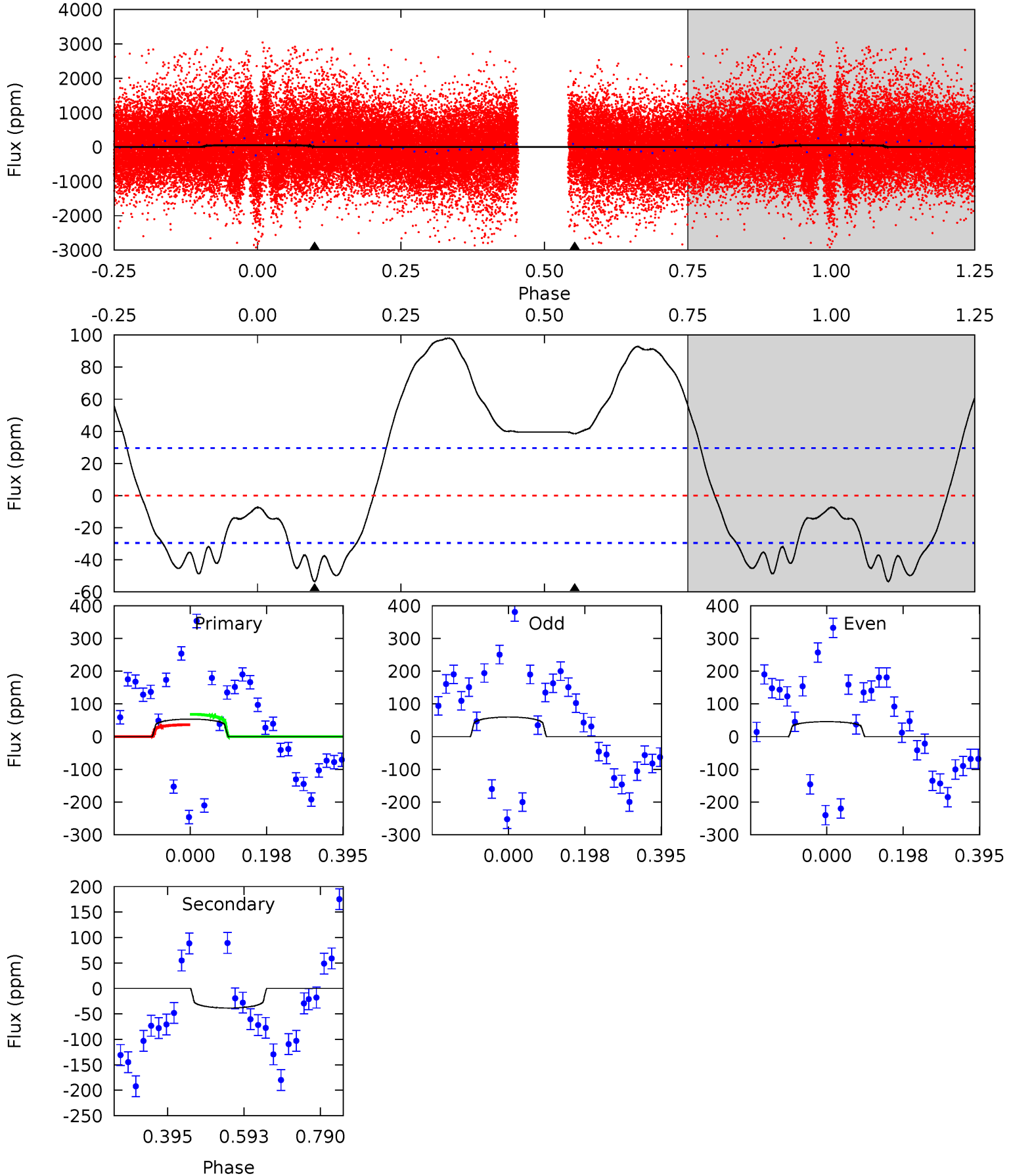
TCE 010989032-02 P= 2.305103 Days $T_0=132.545470$ (BKJD)



DV Model-Shift Uniqueness Test

010989032-02, P = 2.305071 Days, E = 130.258529 Days

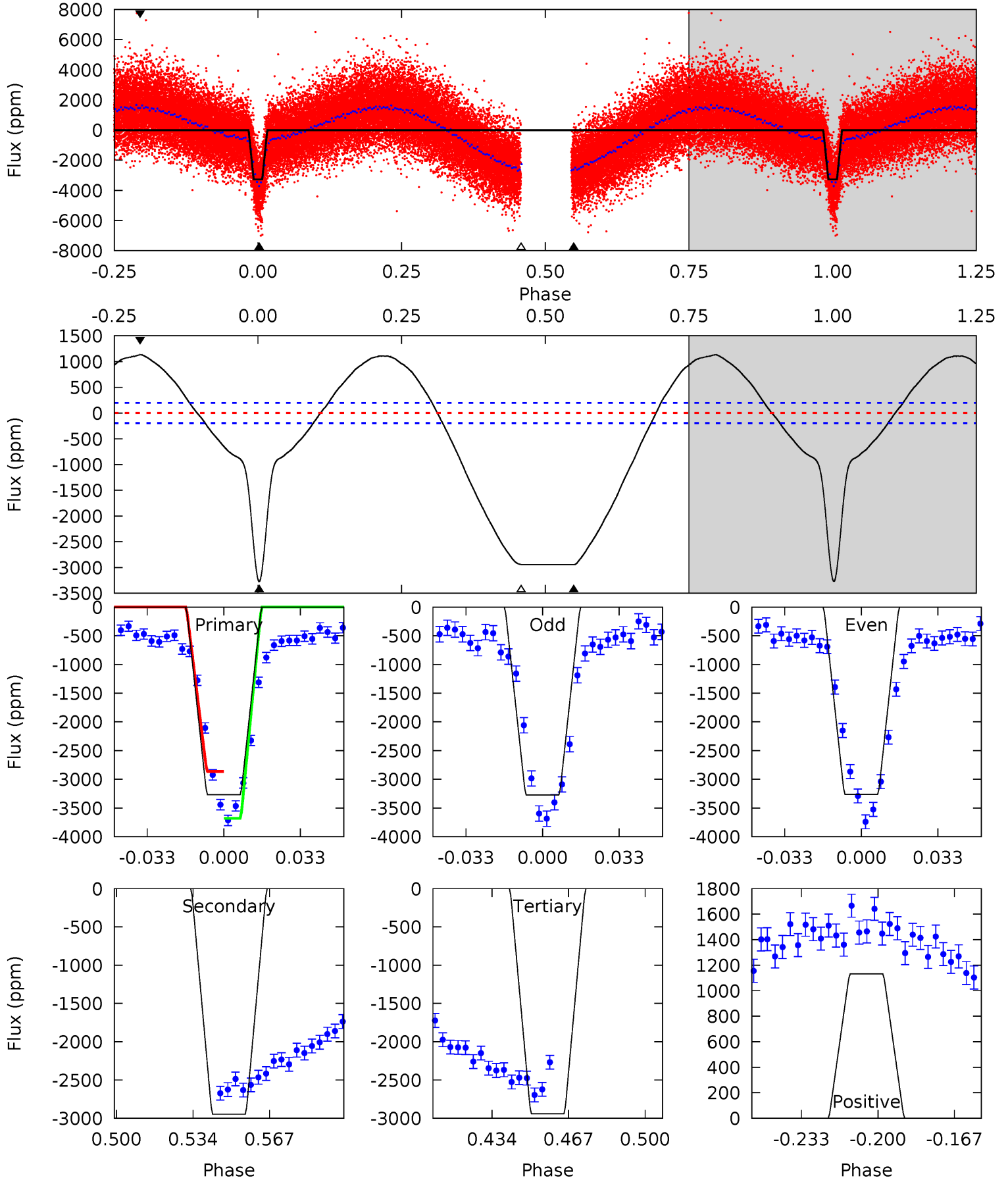
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.00	-5.76	0	0	4.42	1.29	8.31	8.00	8.00	-5.76	-5.76	1.06	-1.00	0.65	2.52



Alt Model-Shift Uniqueness Test

010989032-02, P = 2.305103 Days, E = 130.240367 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
80.4	72.5	72.3	27.8	4.79	2.13	27.5	8.09	52.6	0.15	44.7	0.15	1.00	0.26	10.4



Stellar Parameters For KIC 010989032

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8851^{+246}_{-422}	$4.085^{+0.155}_{-0.155}$	$0.070^{+0.200}_{-0.600}$	$2.178^{+0.612}_{-0.551}$	$2.106^{+0.349}_{-0.523}$	$0.287^{+0.240}_{-0.129}$
	+3%/-5%	+4%/-4%	+286%/-857%	+28%/-25%	+17%/-25%	+84%/-45%
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 010989032-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	39 ± 7	$1.96^{+1.27}_{-1.07}$	3835^{+271}_{-294}	-7361^{+1596}_{-5050}	$-10.449^{+6.662}_{-37.555}$
Alt.	-2947 ± 41	$14.65^{+2.78}_{-2.27}$	3807^{+289}_{-292}	8001^{+513}_{-522}	14^{+5}_{-4}

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 $A_{obs} \gg 1.0$

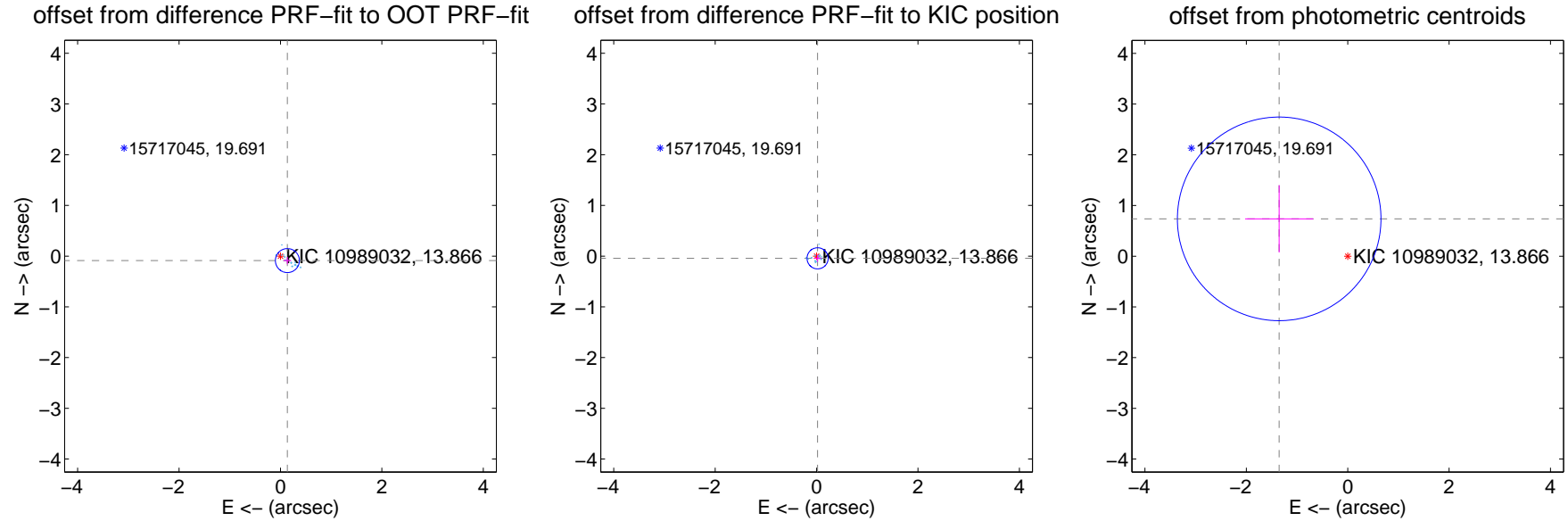
DV Centroid Data

Supplemental centroid analysis for 010989032-02. Kepler magnitude: 13.87. Transit SNR 10.97

There are 14 quarters with good PRF difference image offsets

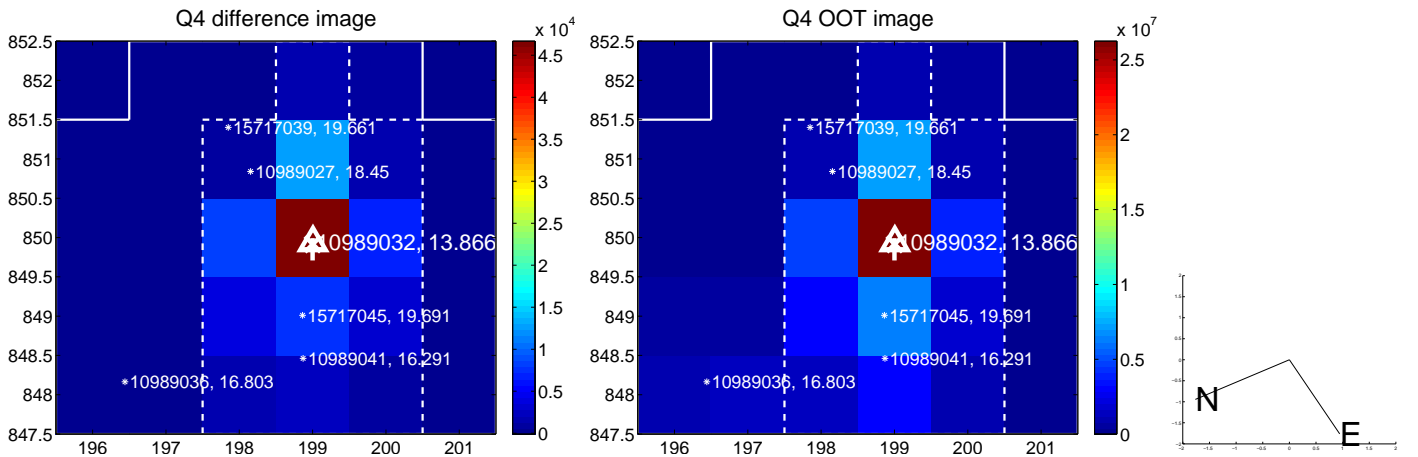
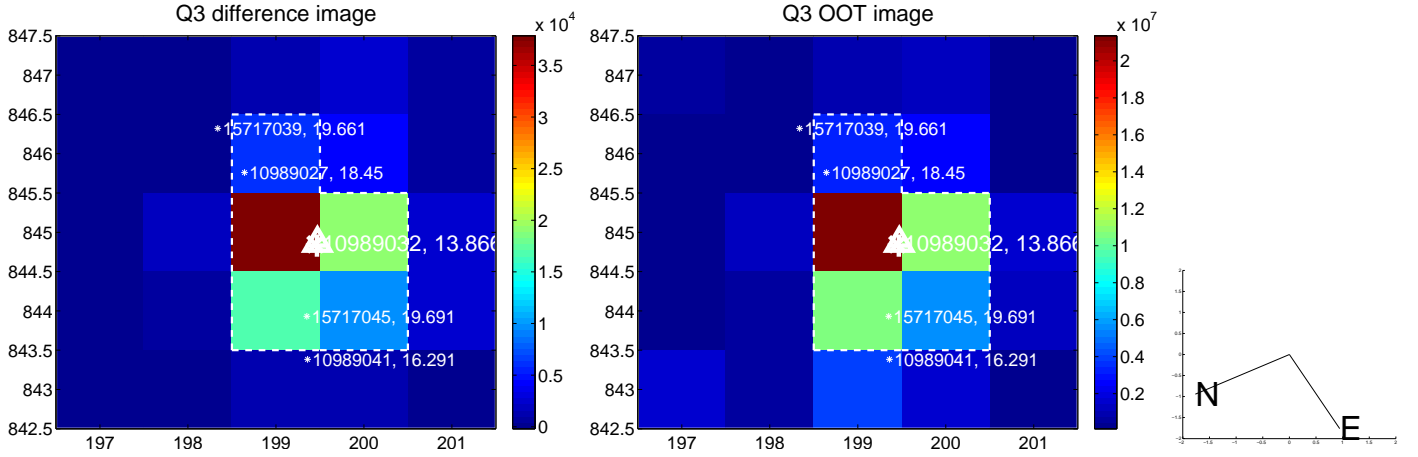
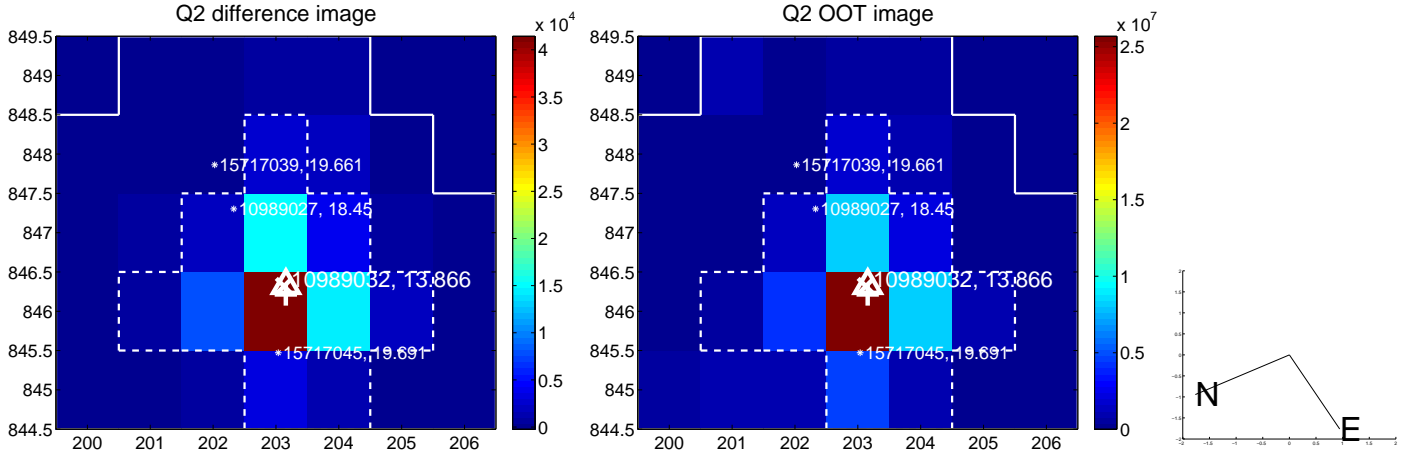
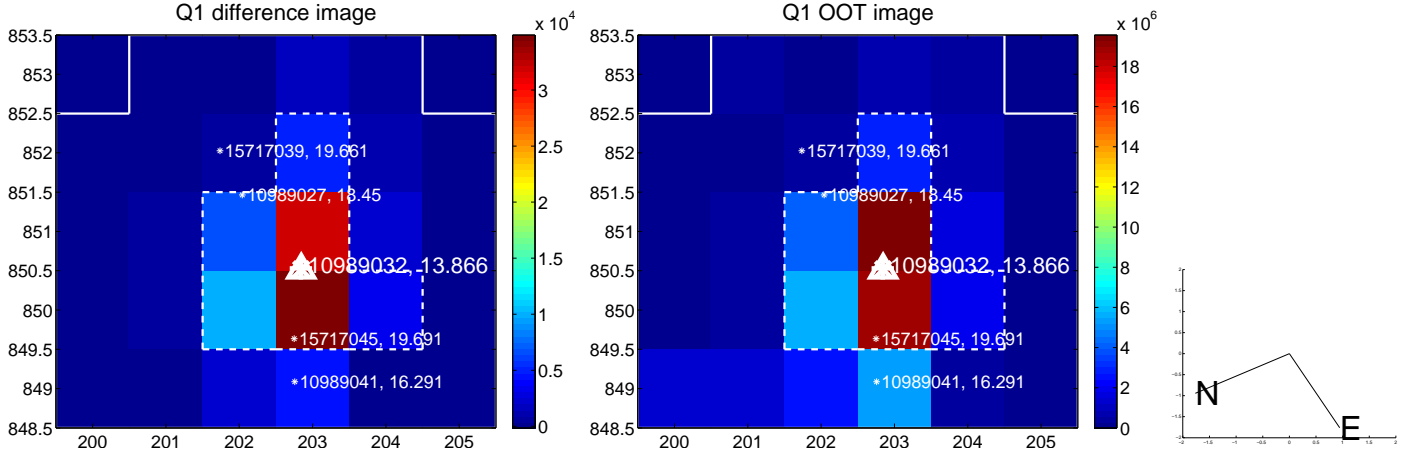
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.163 ± 0.079	2.06	-0.137 ± 0.075	-0.088 ± 0.073
PRF-fit source offset from KIC position	0.047 ± 0.069	0.68	-0.020 ± 0.071	-0.043 ± 0.070
photometric centroid source offset	1.54 ± 0.67	2.30	1.35 ± 0.67	0.74 ± 0.66

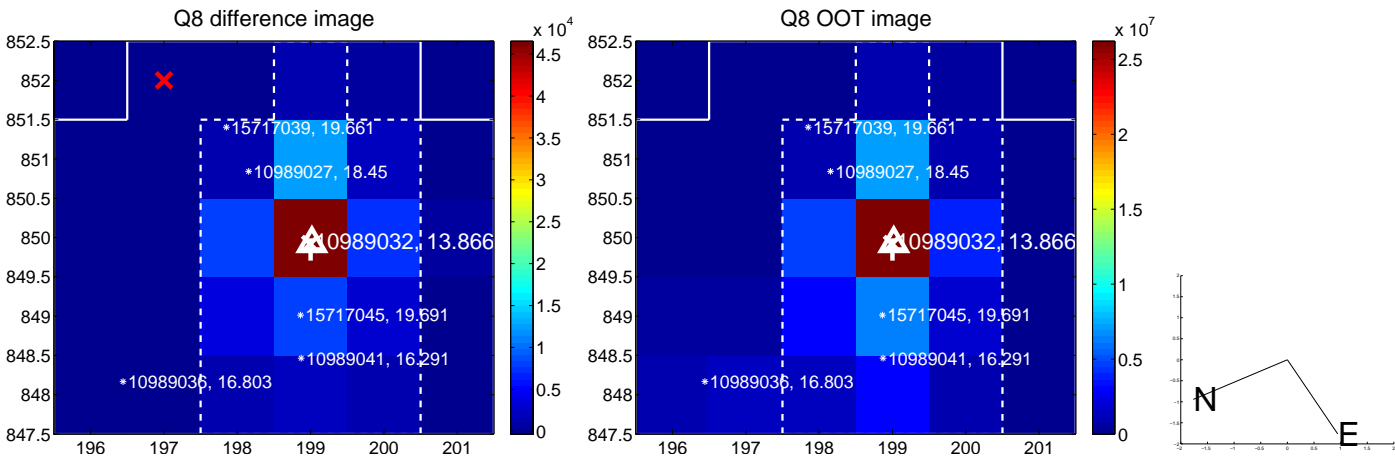
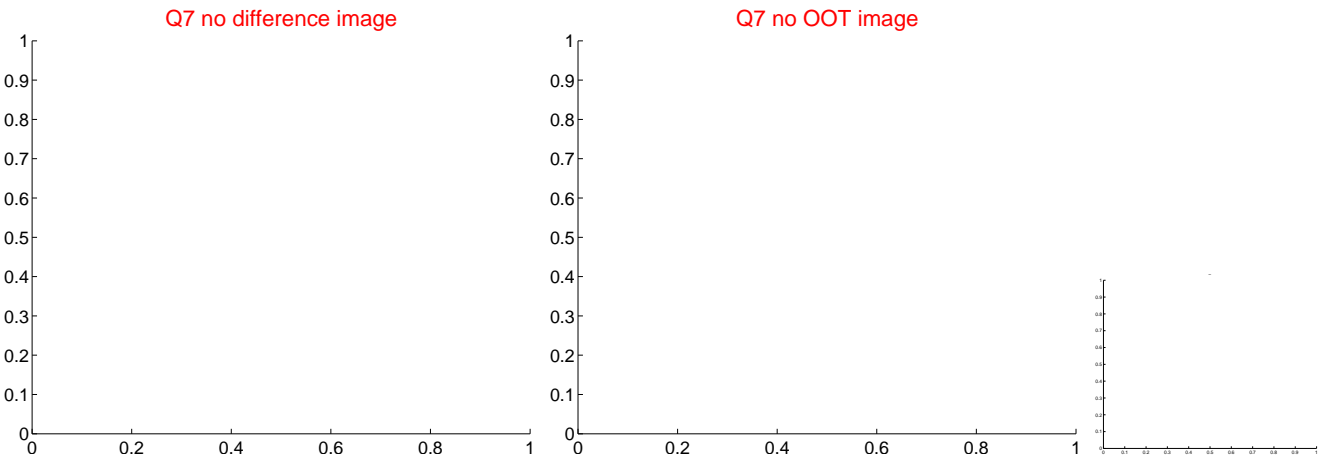
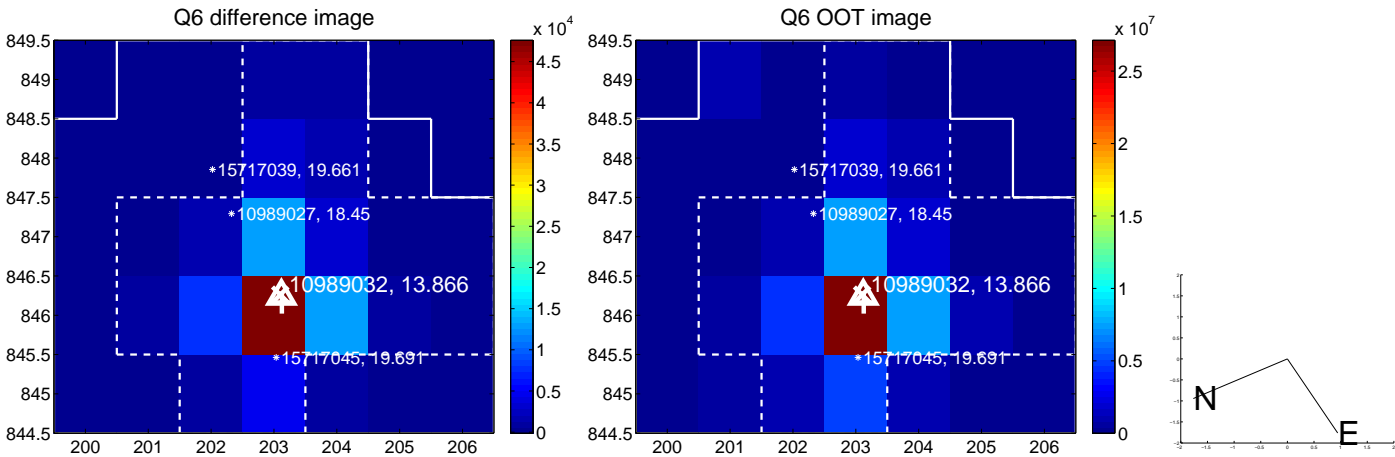
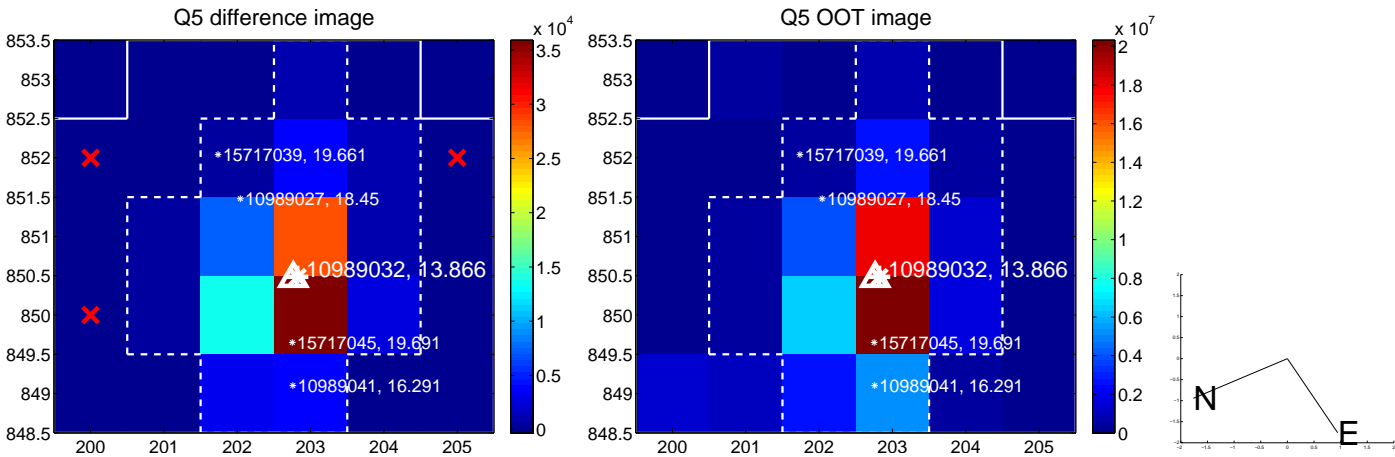


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

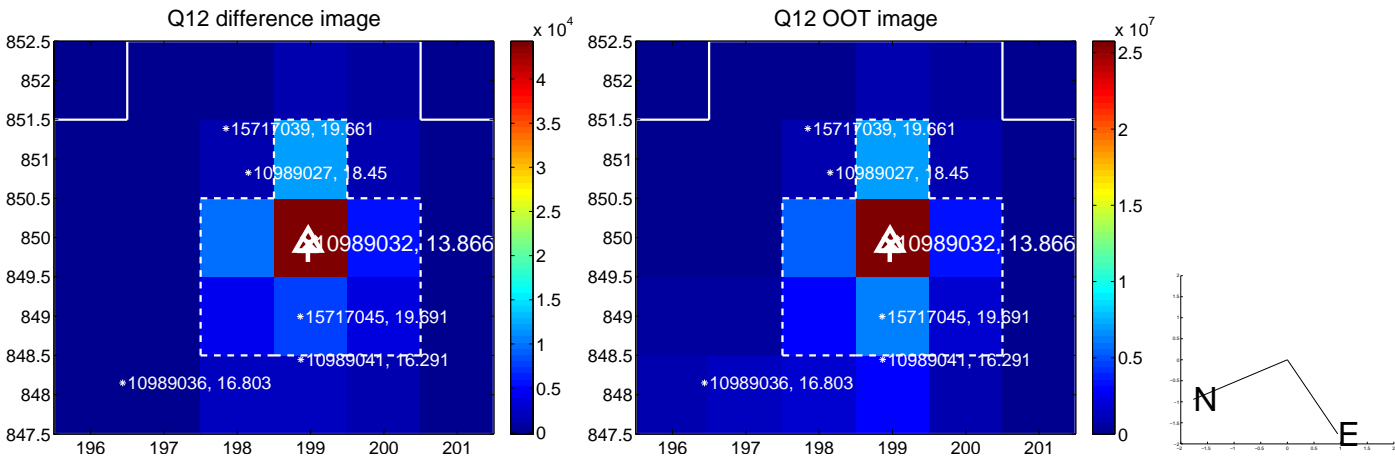
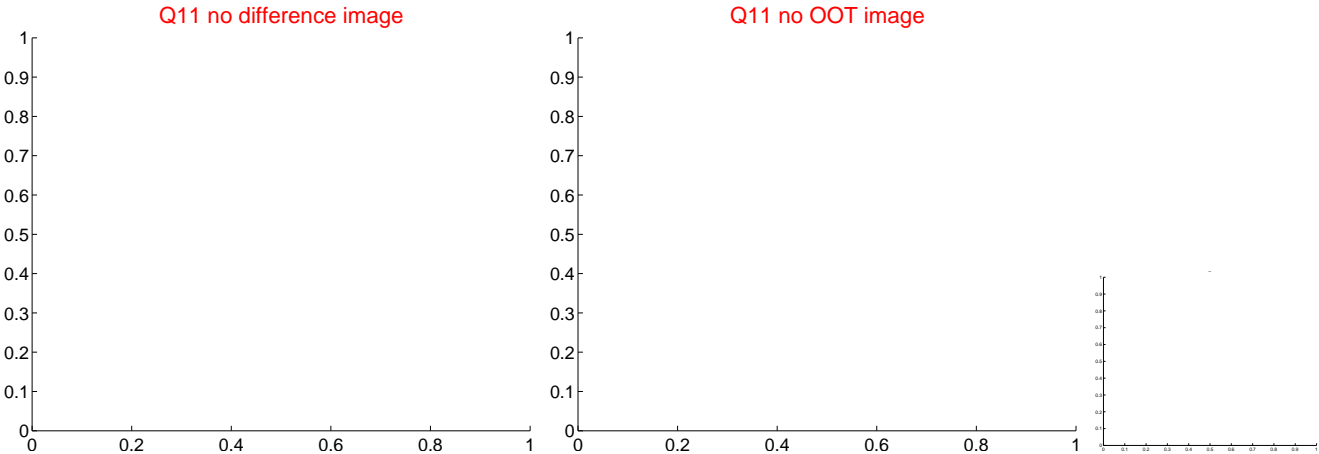
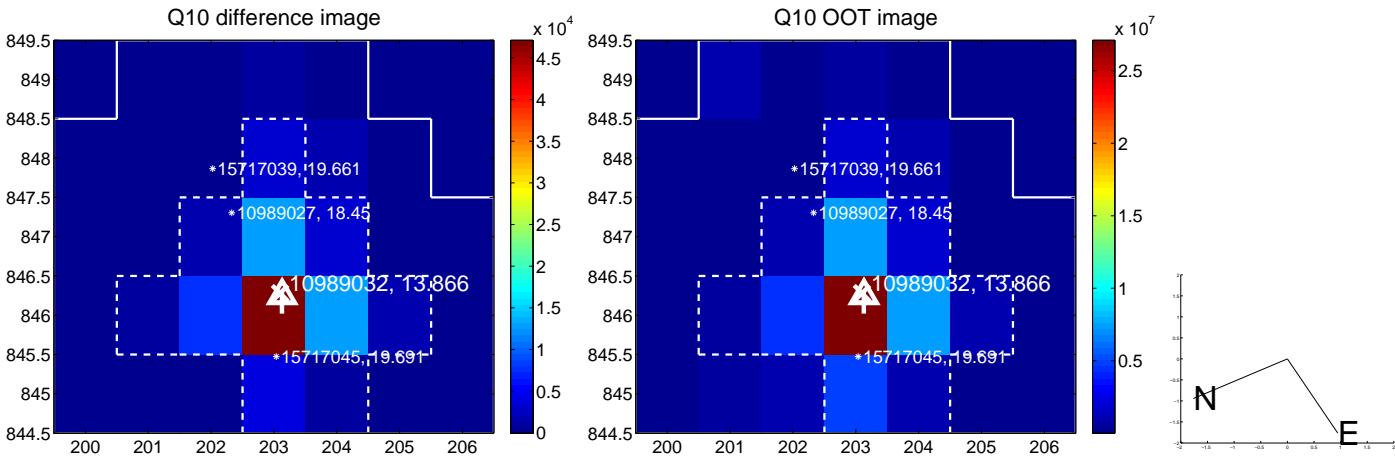
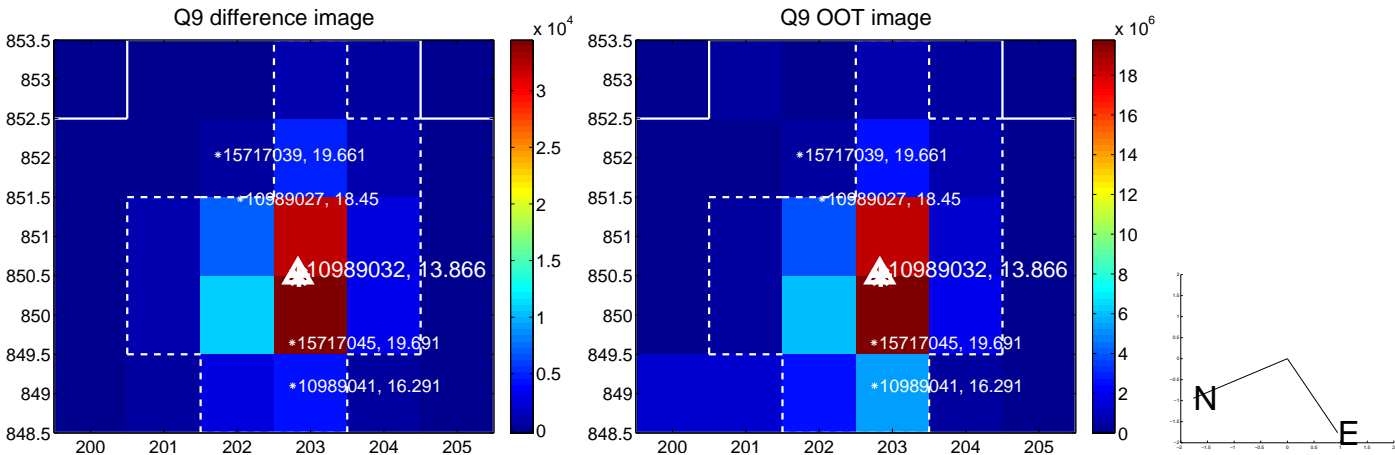
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



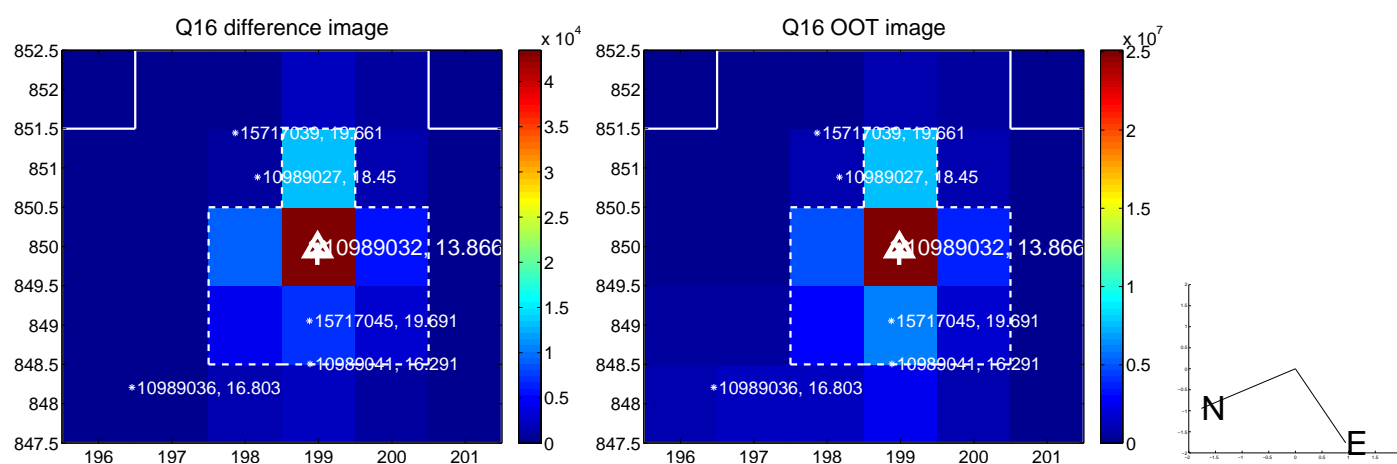
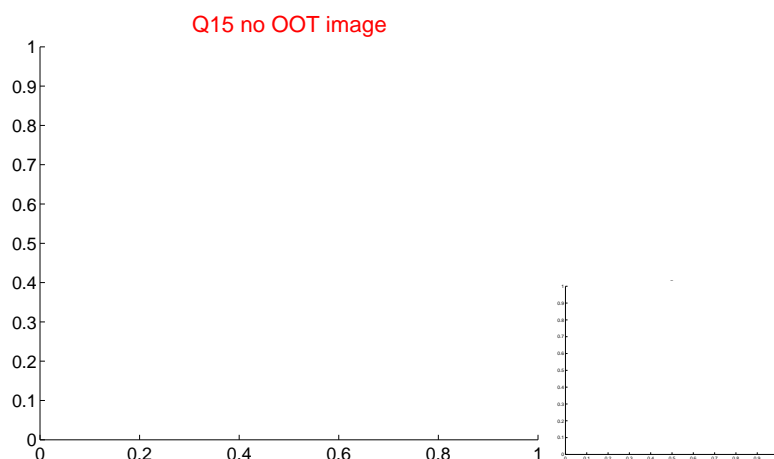
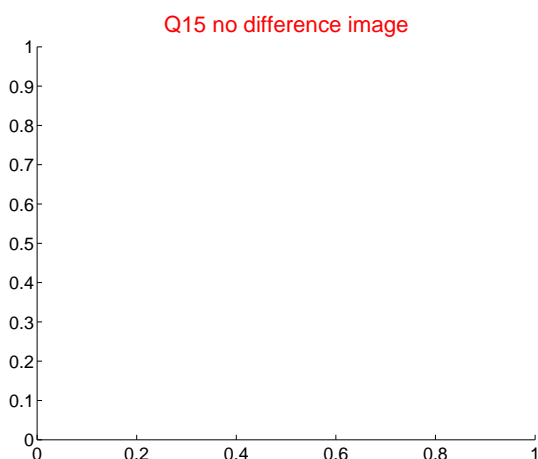
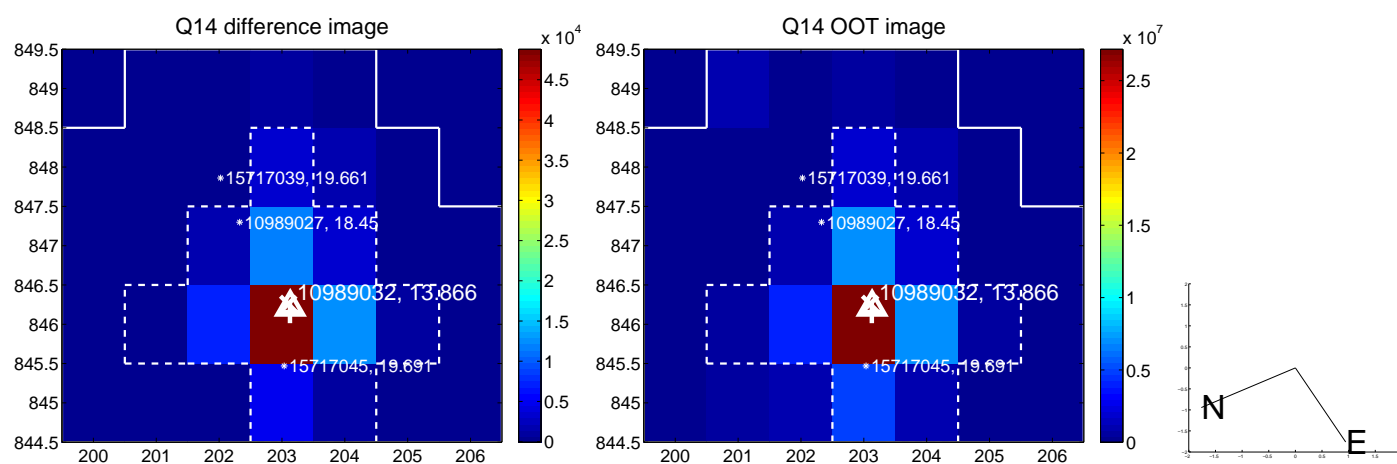
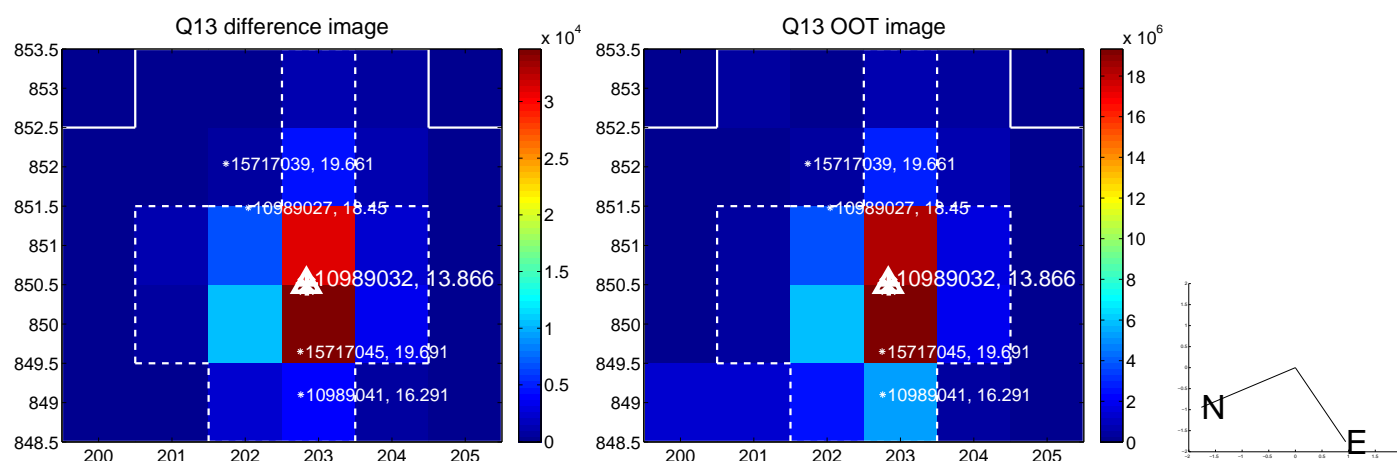
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



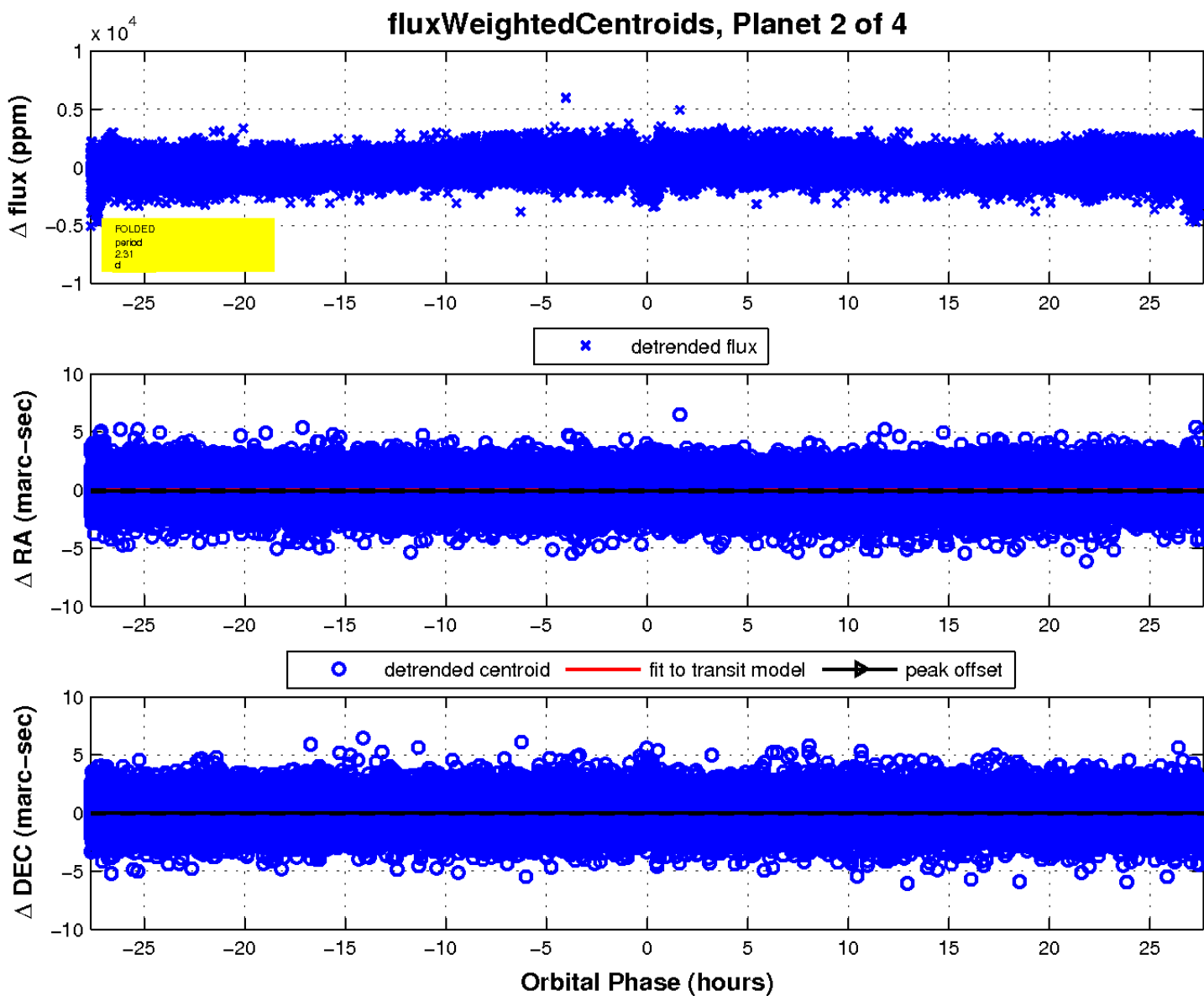
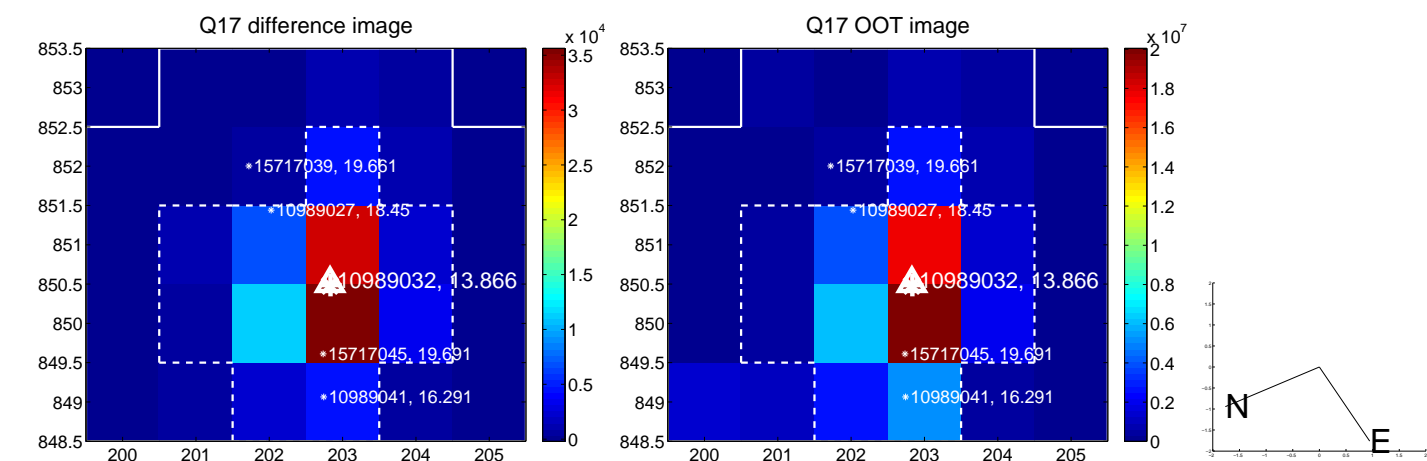
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

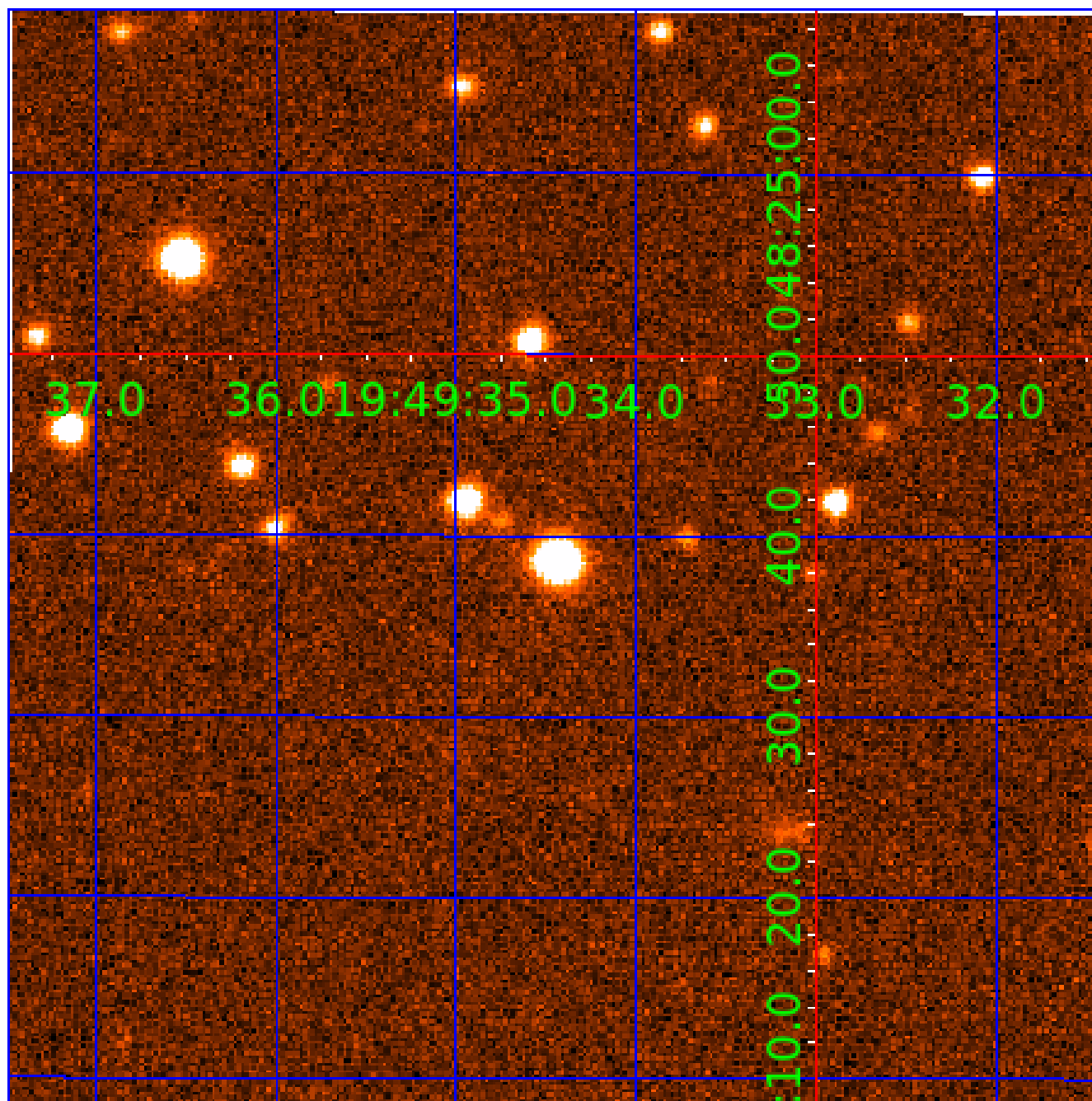


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010989032

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})
010989032-01	OBS	7397.01	2.305089	133.705368	2722.1	1.019	119.2	133.3	2.18	8851	13.28	13613.98
010989032-02	OBS	No	2.305071	132.563600	64.9	10.483	19.4	11.0	2.18	8851	1.83	13614.13
010989032-03	OBS	No	2.303547	132.957207	1.3	8.941	7.7	0.0	2.18	8851	0.27	13626.14
010989032-04	OBS	No	2.305430	133.162707	172.6	5.000	8.4	-1.0	2.18	8851	2.91	13611.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010989032-01	OBS	FP	0.00	1	0	0	0	MOD_NONUNIQ_ALT
010989032-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
010989032-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010989032-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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 010989032-03

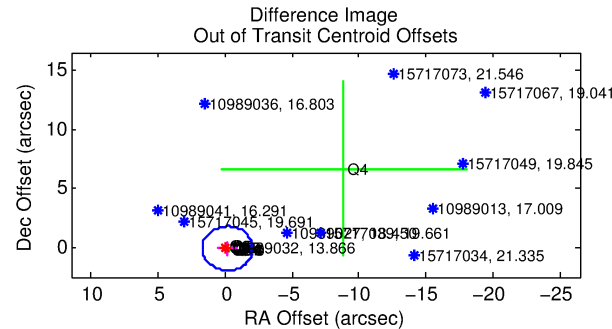
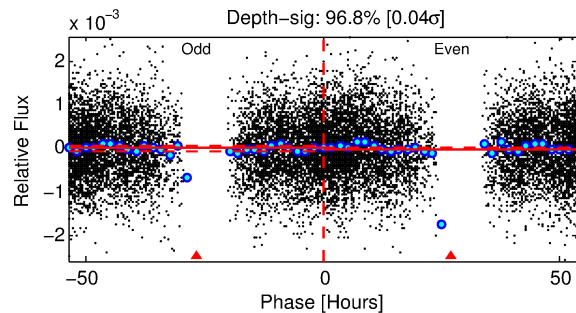
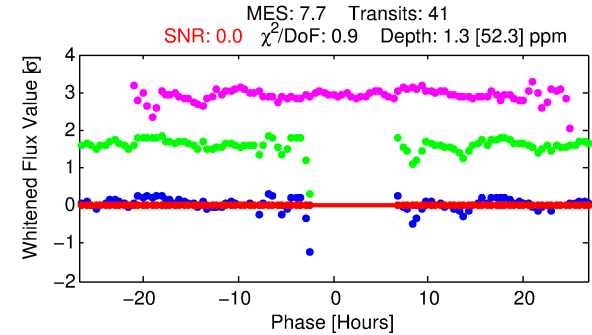
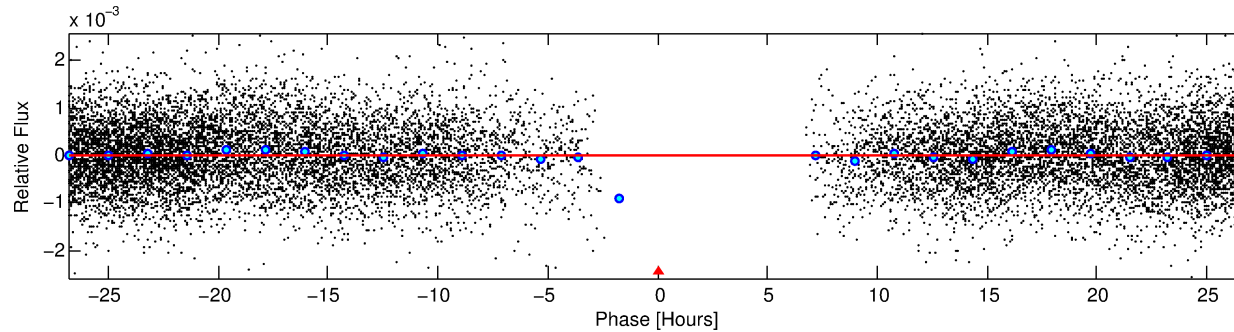
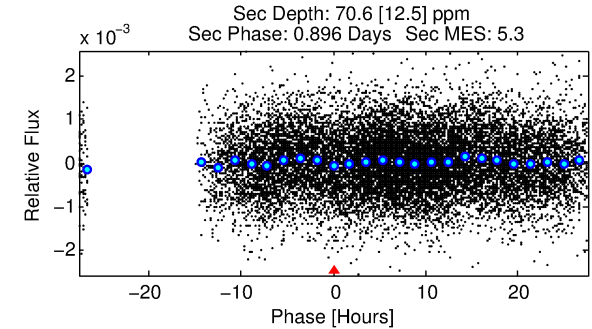
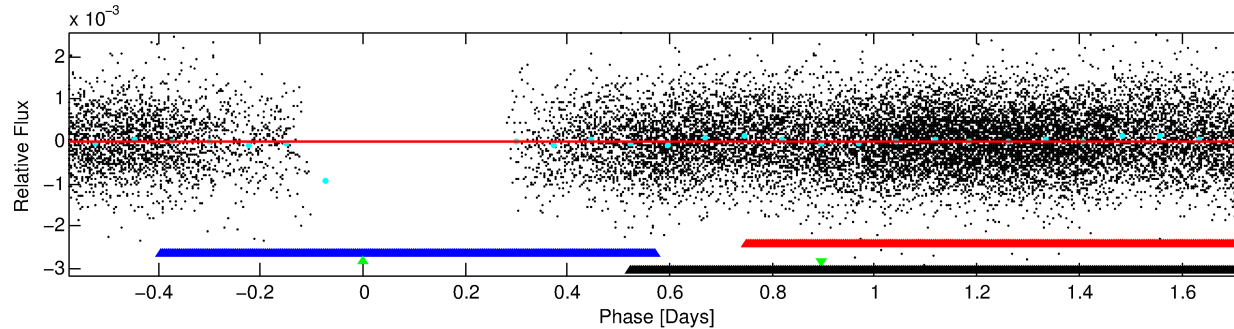
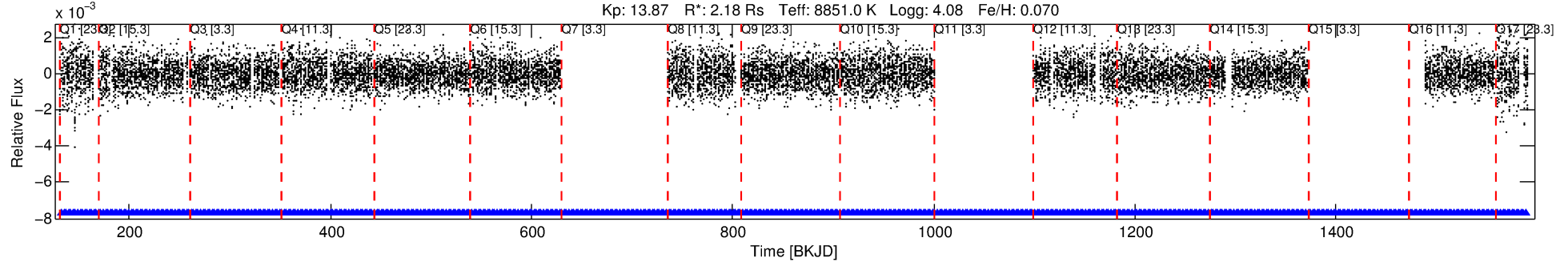
No Significant Match Found

DV One-Page Summary

KIC: 10989032 Candidate: 3 of 4 Period: 2.304 d

KOI: K07397 Corr: No Ephemeris Match

Kp: 13.87 R*: 2.18 Rs Teff: 8851.0 K Logg: 4.08 Fe/H: 0.070



DV Fit Results:

Period = 2.30355 [0.00814] d
Epoch = 132.9572 [3.2457] BKJD
Rp/R* = 0.0011 [0.0261]
a/R* = 1.79 [98.99]
b = 0.56 [98.97]
Seff = 13626.14 [4876.90]
Teff = 2755 [247] K
Rp = 0.26 [6.19] Re
a = 0.0438 [0.0097] AU
Ag = 1061.01 [49662.57] [0.02σ]
Teffp = 24310 [284482] K [0.08σ]

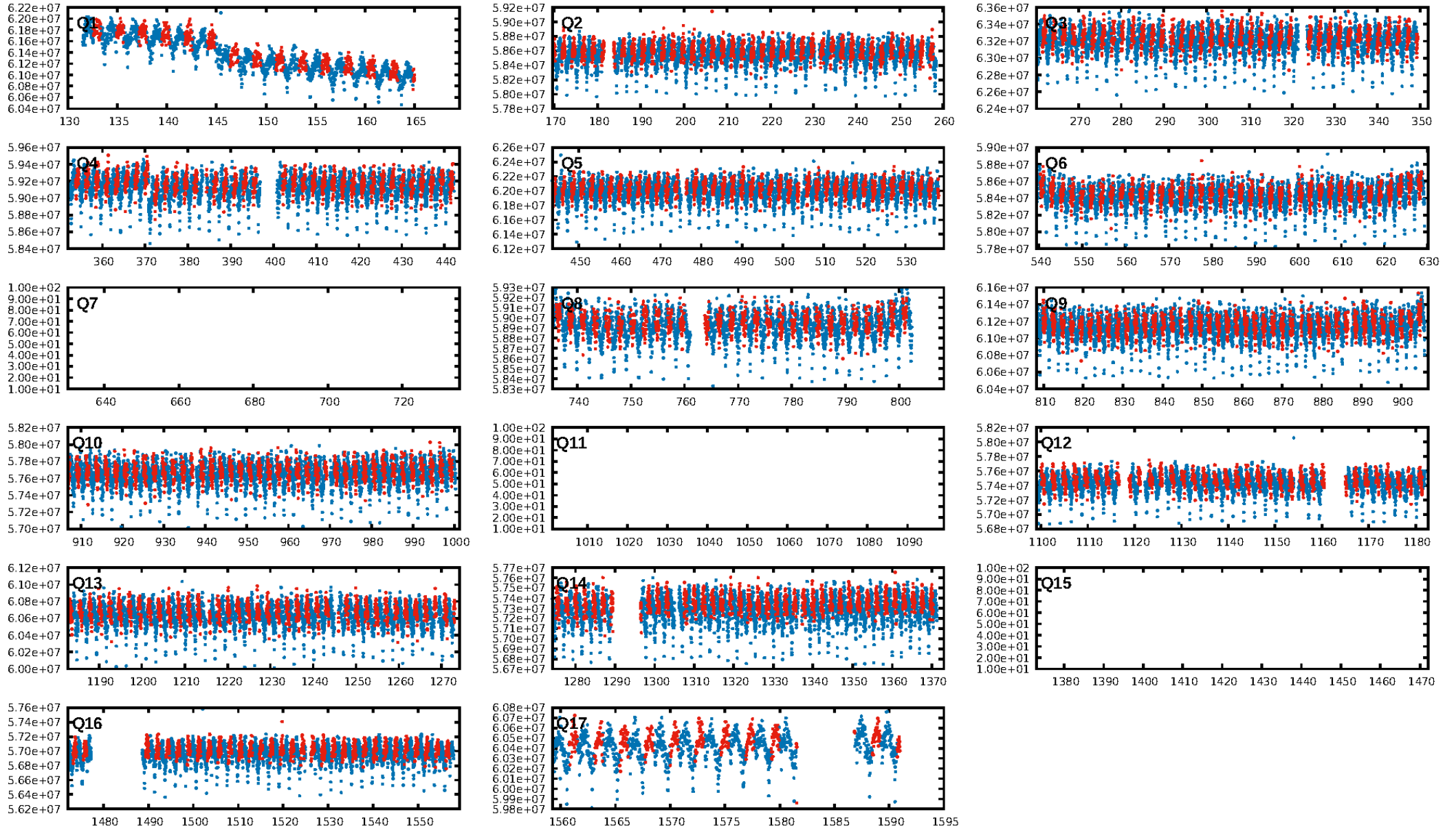
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.2% [0.00σ]
ModelChiSquare2-sig: 96.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.33e-25
RollingBand-fgt: 1.00 [30/30]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: 0.194 arcsec [0.31σ]
KicOffset-rm: 0.063 arcsec [0.11σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.36 [5/14]
DiffImageOverlap-fno: 0.00 [0/14]

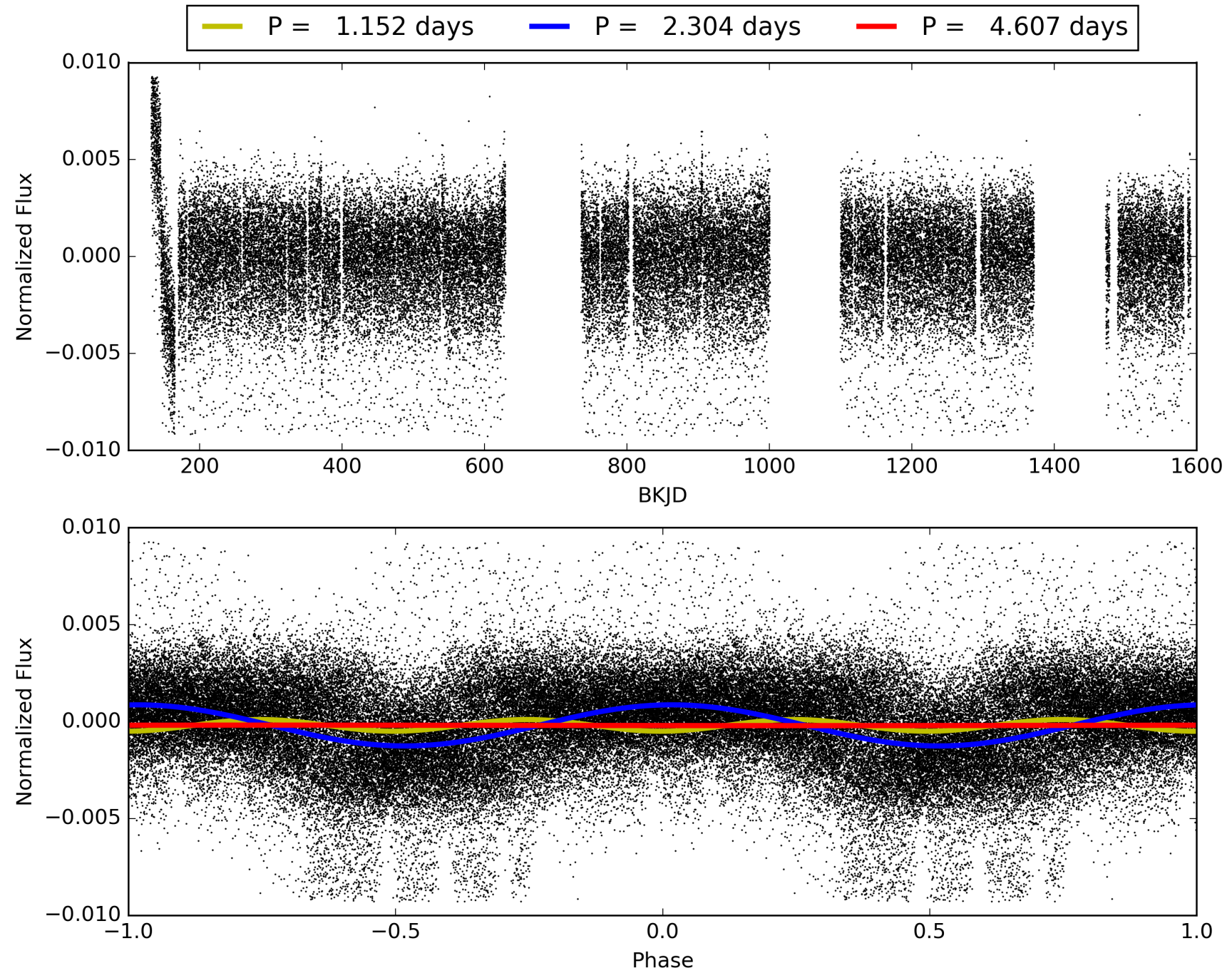
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:22:35 Z

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

TCE 010989032-03, PDC Light Curves

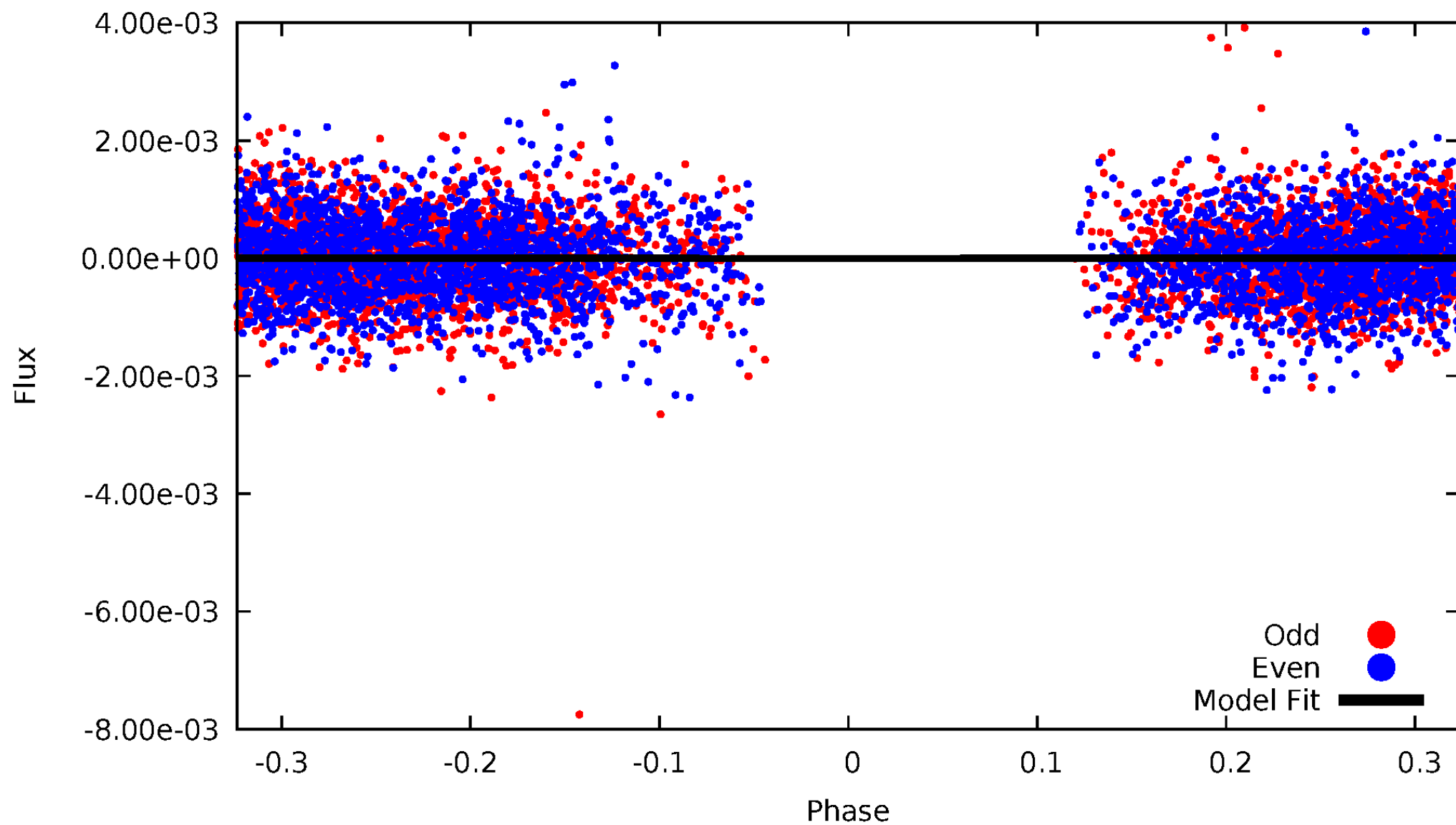


TCE 010989032-03



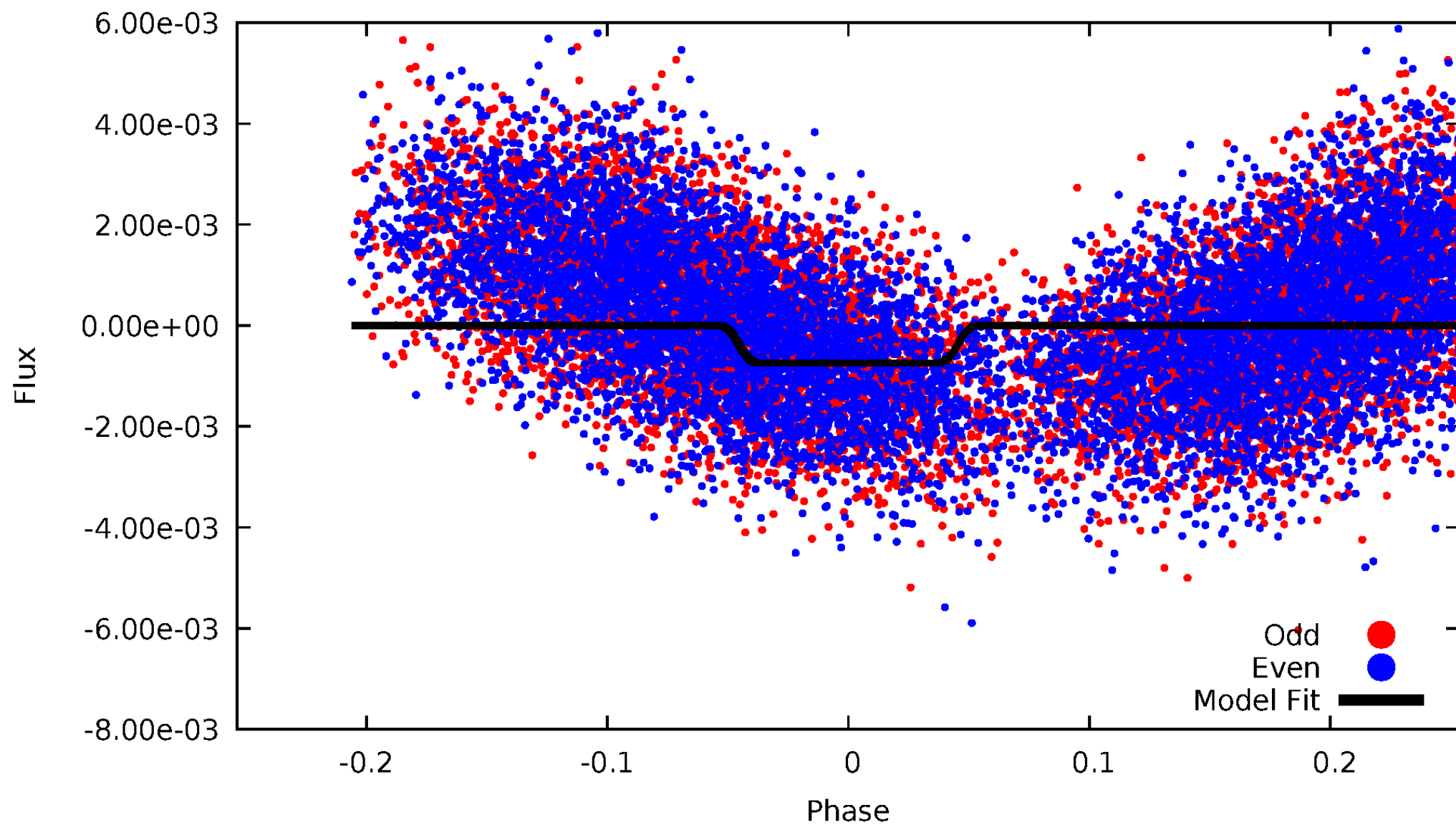
DV Odd/Even

TCE 010989032-03



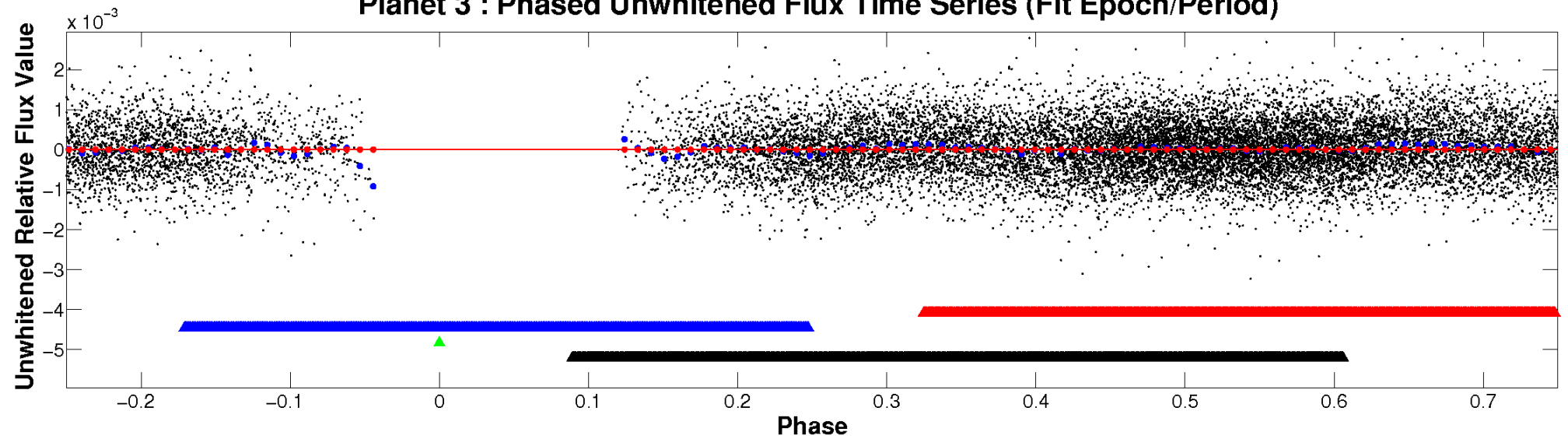
ALT Odd/Even

TCE 010989032-03

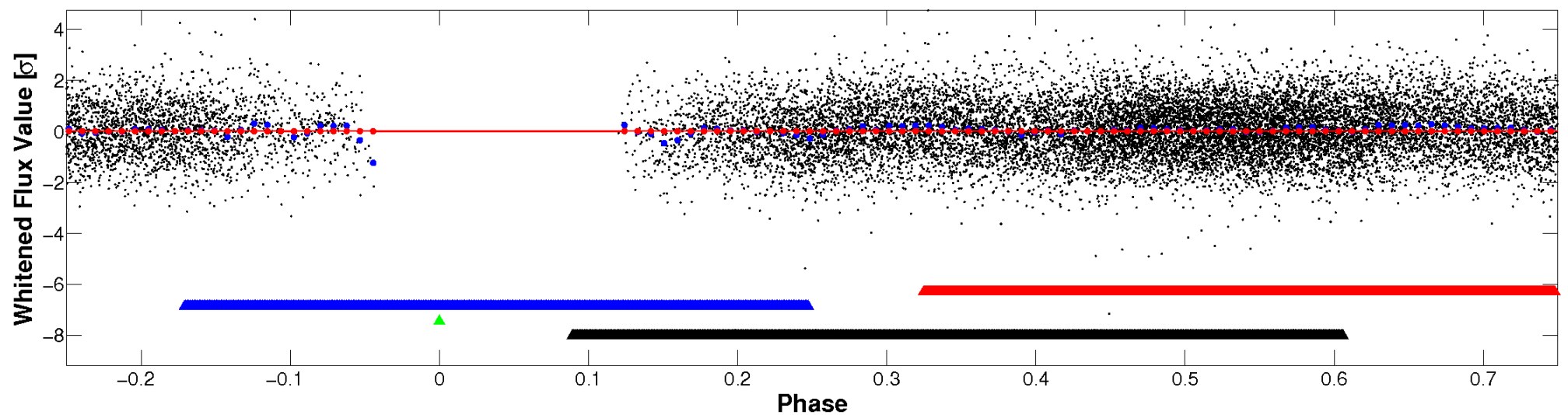


Non-Whitened Vs. Whitened Light Curve

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

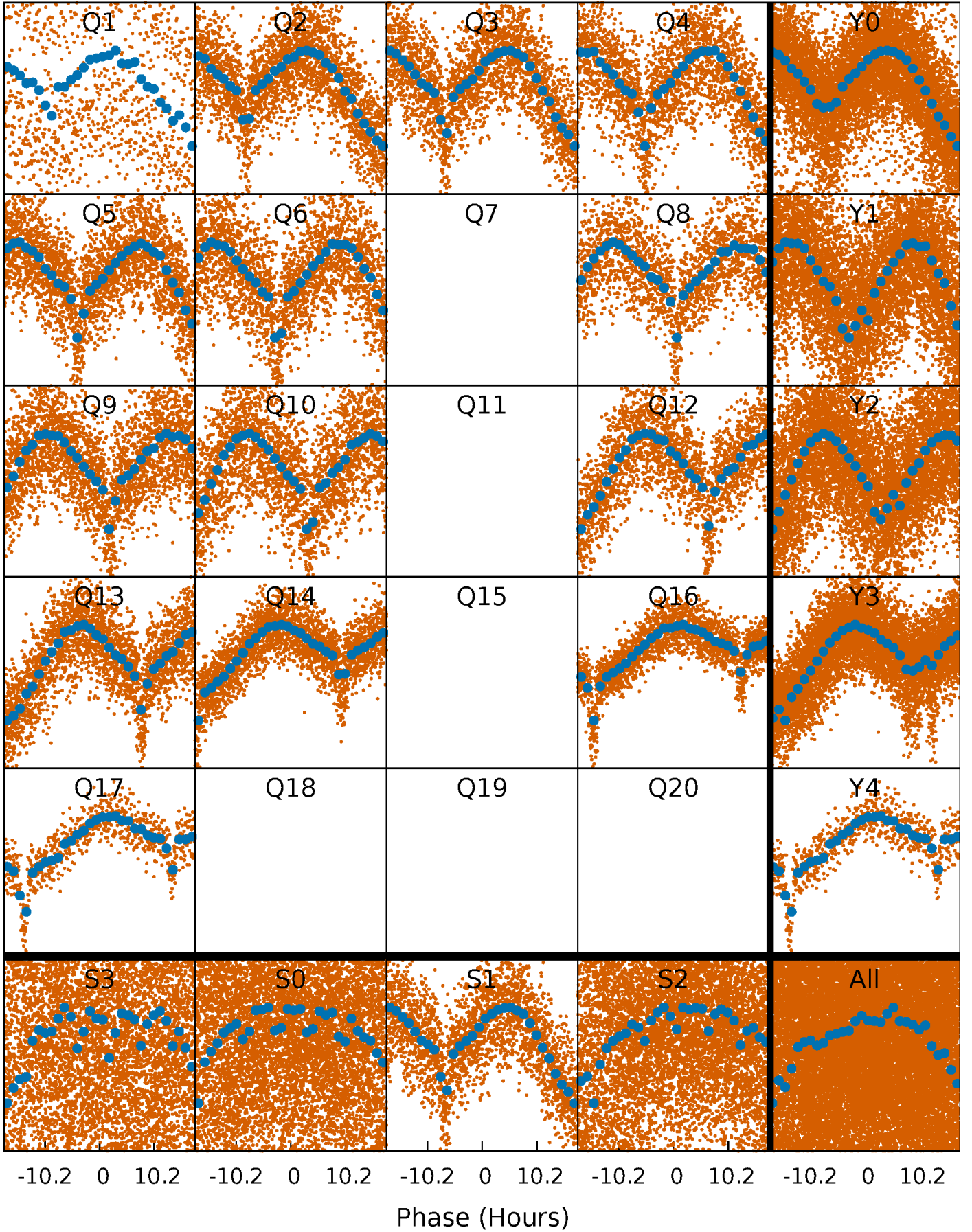


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



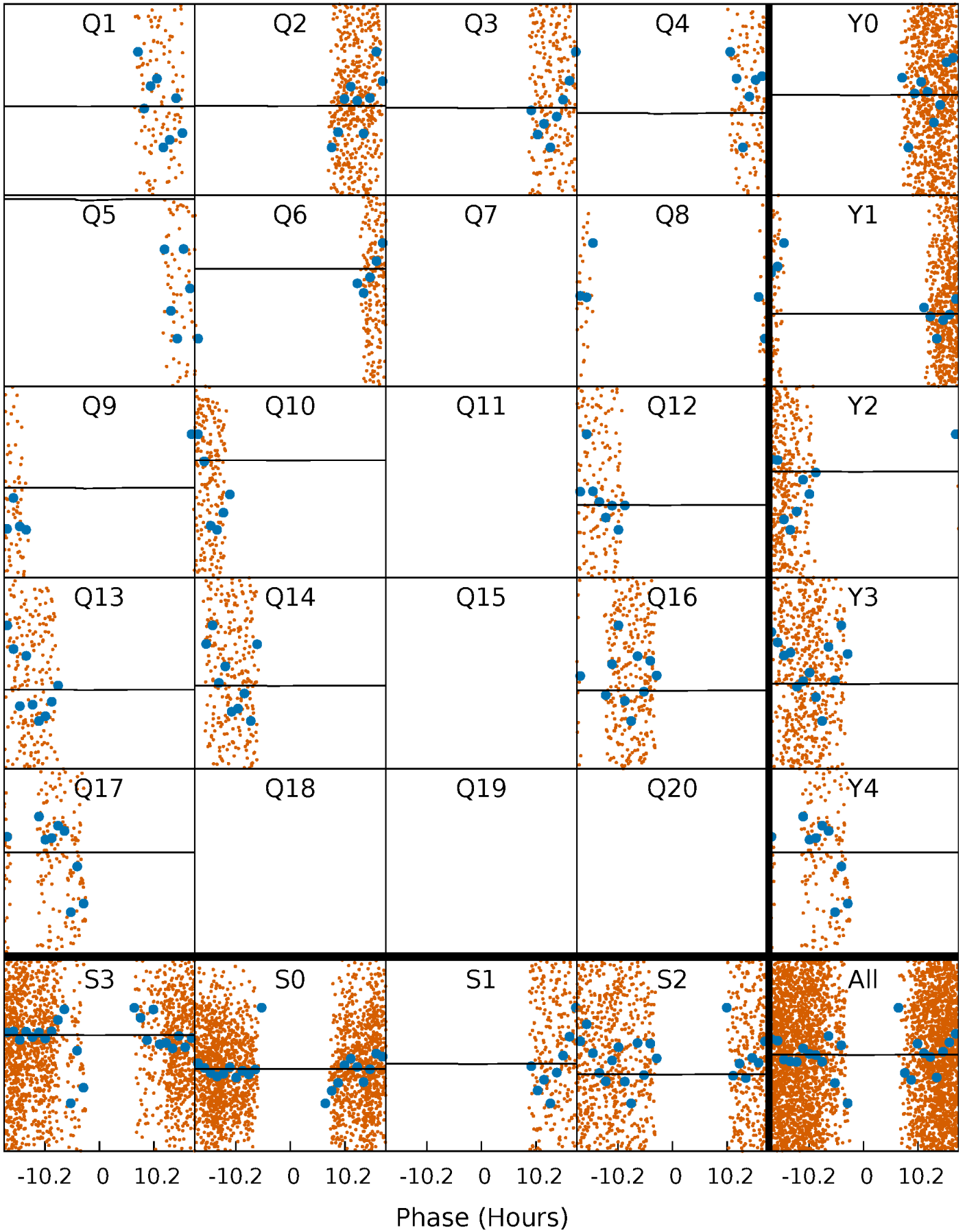
PDC Quarter-Phased Transit Curves

TCE 010989032-03 $P = 2.303547$ Days $T_0 = 132.957207$ (BKJD)



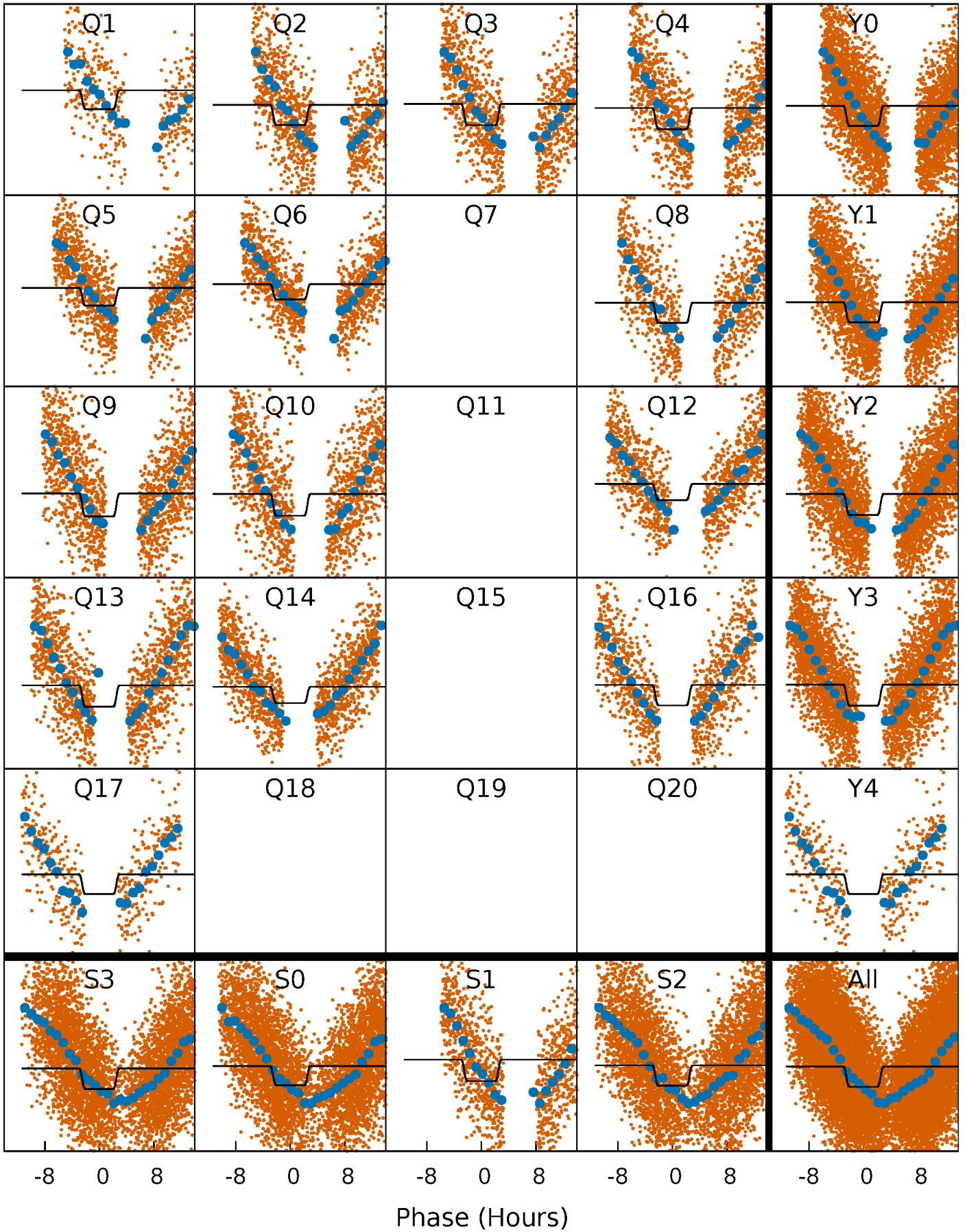
DV Quarter-Phased Transit Curves

TCE 010989032-03 P= 2.303547 Days $T_0=132.957207$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

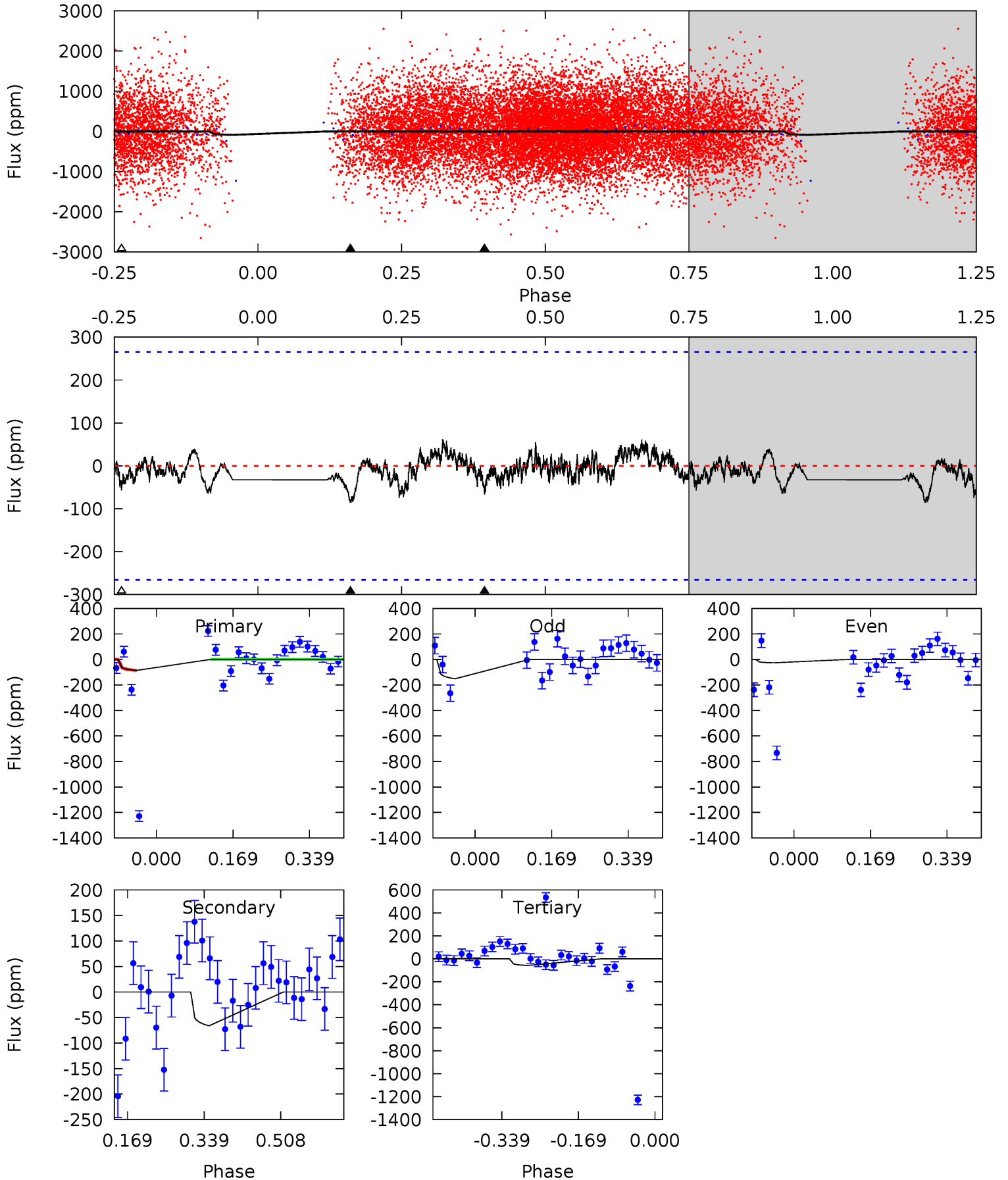
TCE 010989032-03 P= 2.305496 Days $T_0=133.438527$ (BKJD)



DV Model-Shift Uniqueness Test

010989032-03, P = 2.303547 Days, E = 130.653660 Days

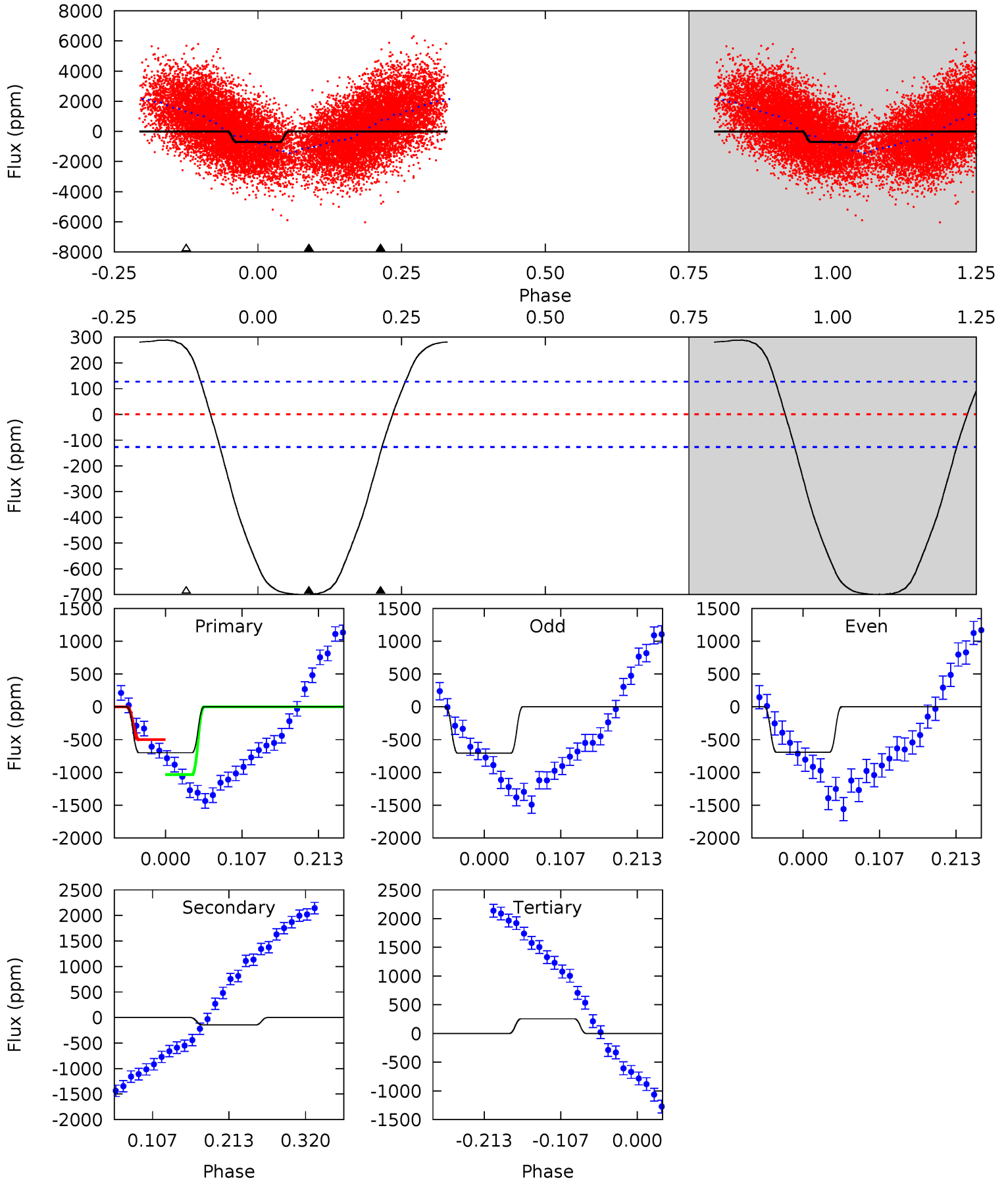
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.44	1.11	0.96	0	4.45	1.37	0.39	0.48	1.44	0.14	1.11	1.04	0	0.42	0



Alt Model-Shift Uniqueness Test

010989032-03, P = 2.305496 Days, E = 131.133031 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.1	5.20	-9.16	0	4.55	1.61	9.11	34.2	25.1	14.4	5.20	0.27	1.14	0.29	10.1



Stellar Parameters For KIC 010989032

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8851^{+246}_{-422}	$4.085^{+0.155}_{-0.155}$	$0.070^{+0.200}_{-0.600}$	$2.178^{+0.612}_{-0.551}$	$2.106^{+0.349}_{-0.523}$	$0.287^{+0.240}_{-0.129}$
	+3%/-5%	+4%/-4%	+286%/-857%	+28%/-25%	+17%/-25%	+84%/-45%
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 010989032-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-66 ± 60	$4.07^{+4.51}_{-2.87}$	3829^{+286}_{-273}	5195^{+6289}_{-8411}	$3.026^{+36.797}_{-2.916}$
Alt.	-145 ± 28	$7.44^{+6.09}_{-4.80}$	3813^{+283}_{-285}	5018^{+3822}_{-1207}	$2.680^{+16.564}_{-1.857}$

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

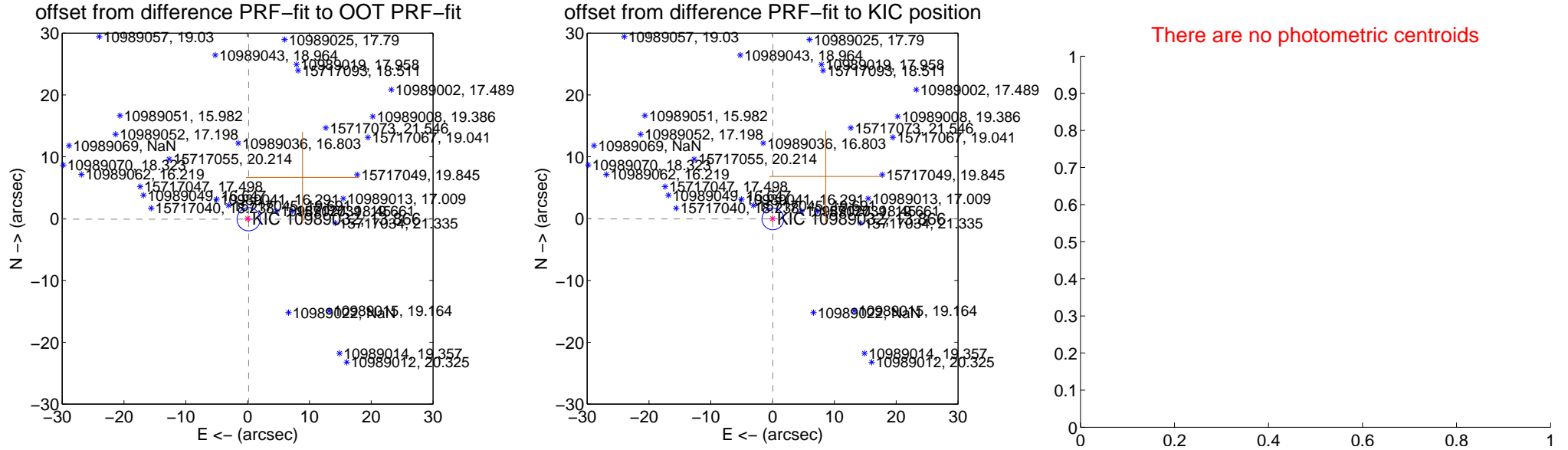
DV Centroid Data

Supplemental centroid analysis for 010989032-03. Kepler magnitude: 13.87. Transit SNR 0.02

There are 5 quarters with good PRF difference image offsets

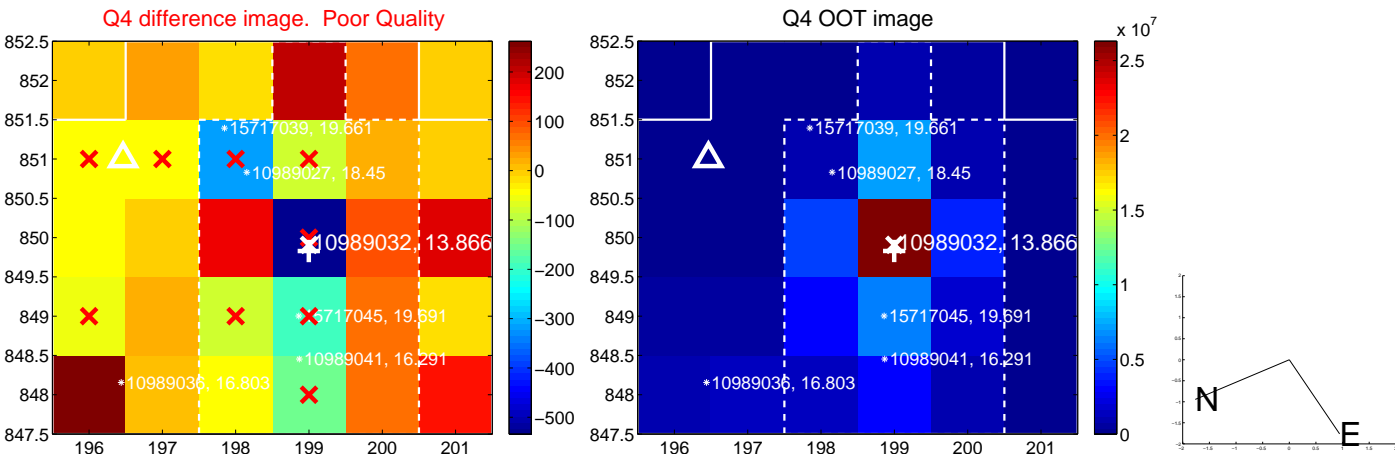
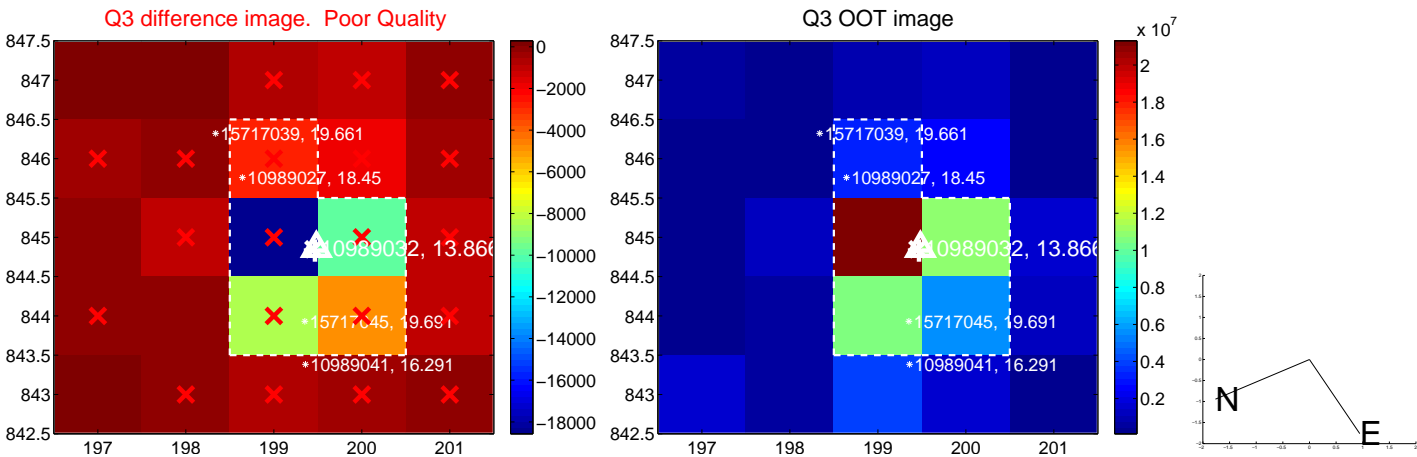
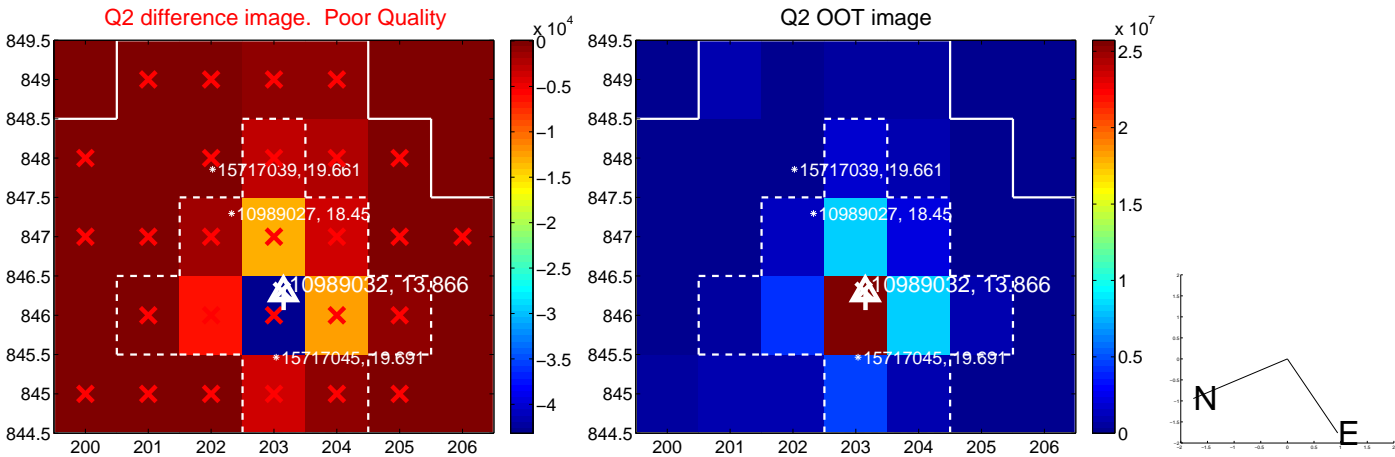
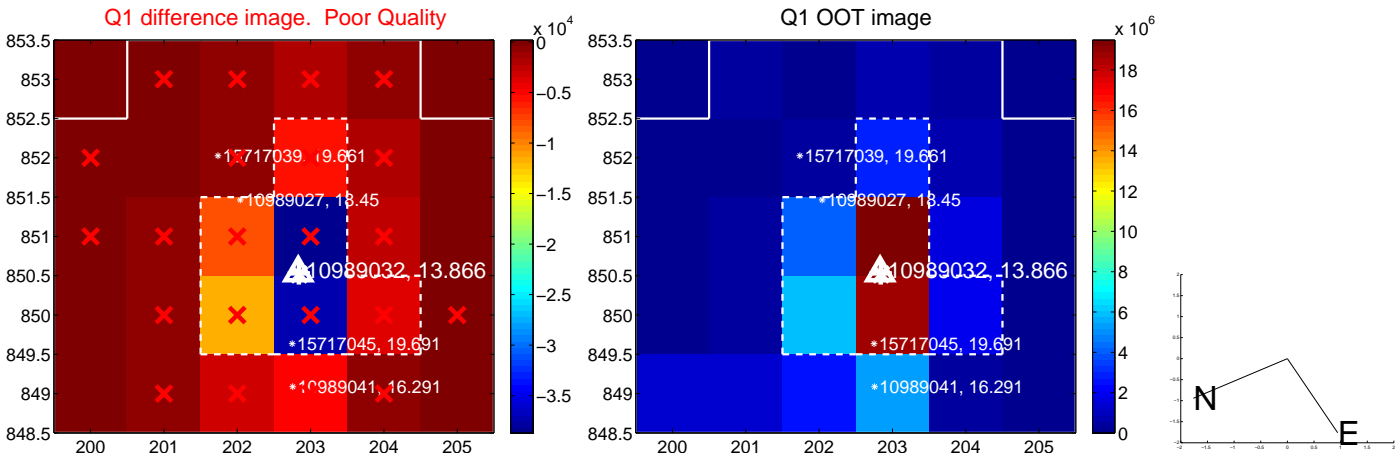
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.194 ± 0.625	0.31	-0.167 ± 0.655	-0.098 ± 0.530
PRF-fit source offset from KIC position	0.063 ± 0.587	0.11	-0.041 ± 0.655	-0.048 ± 0.530
photometric centroid source offset	—	—	—	—

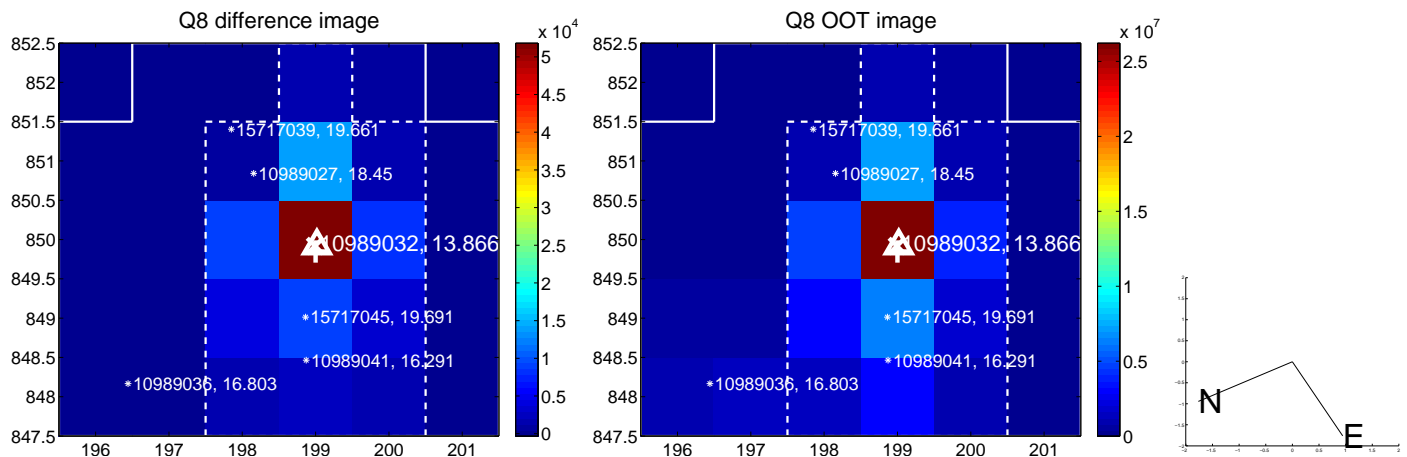
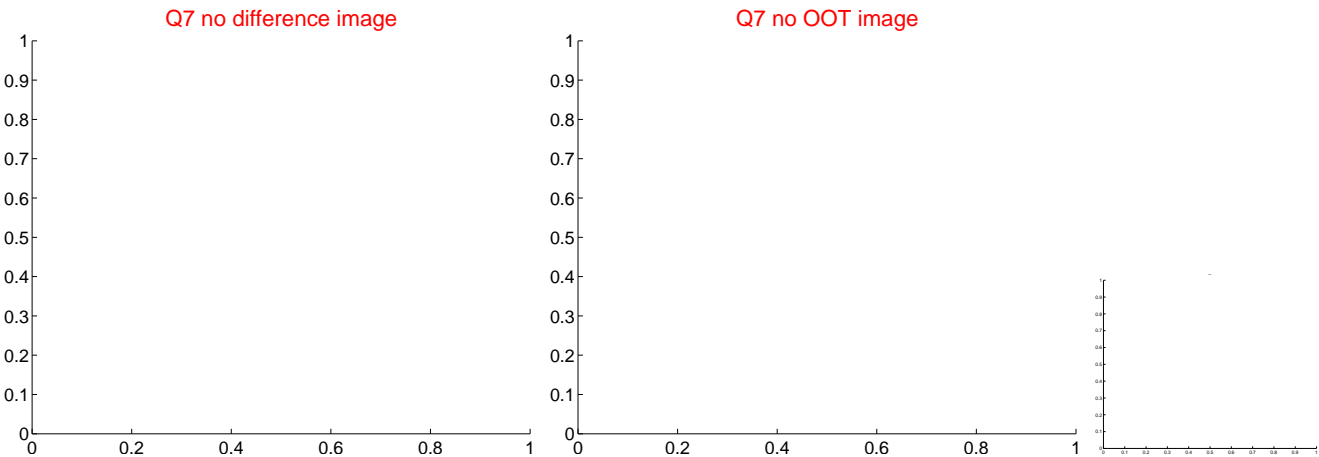
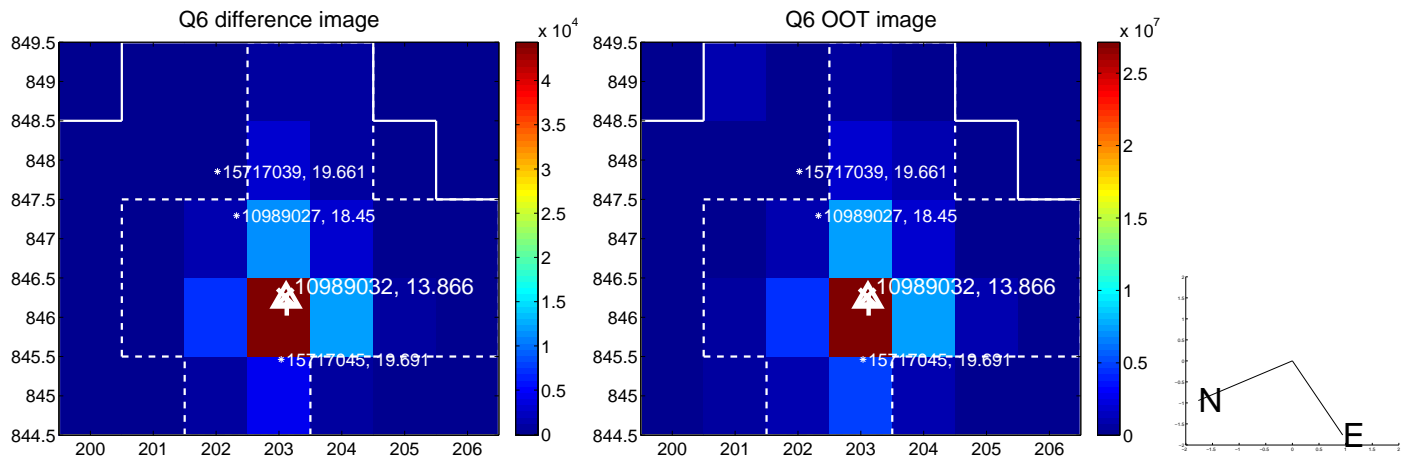
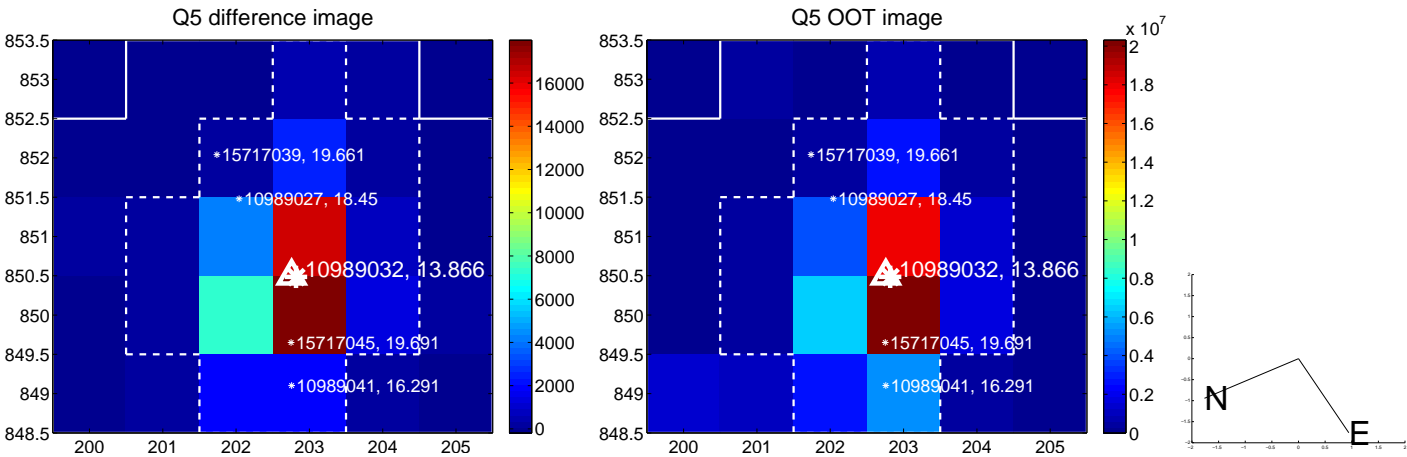


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

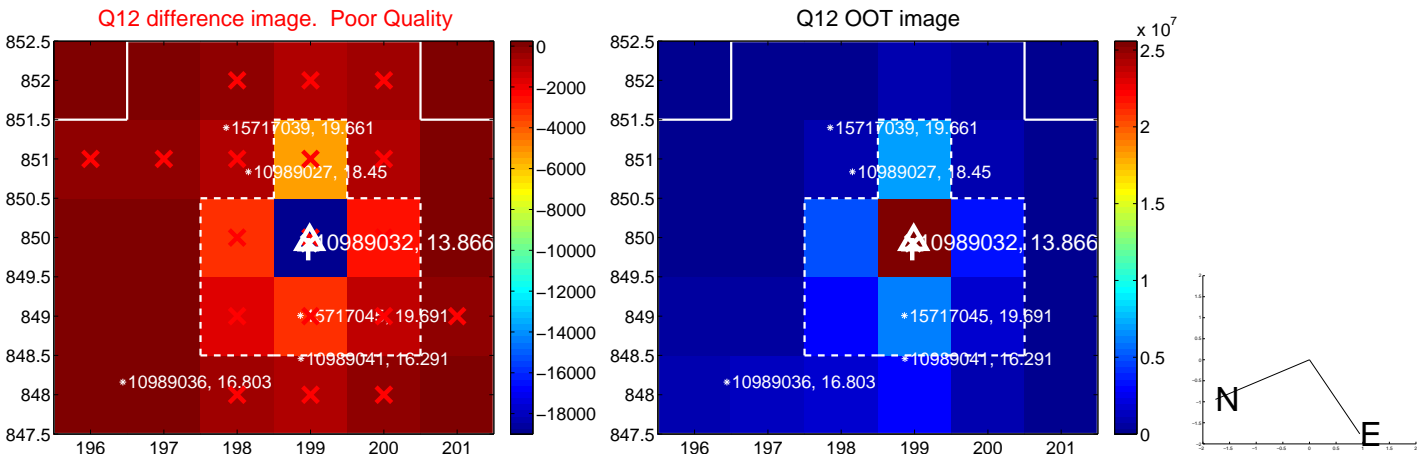
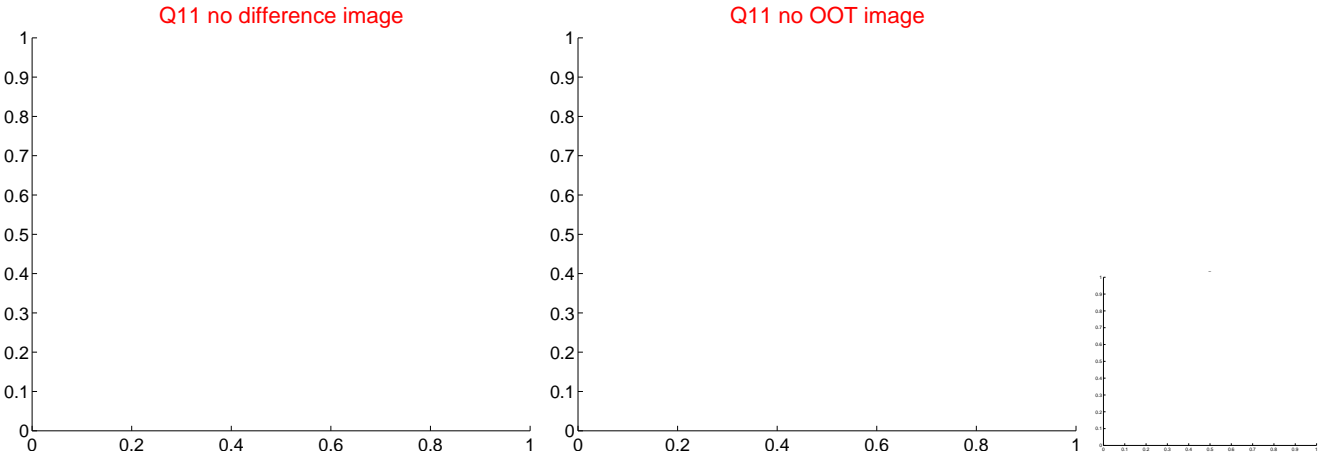
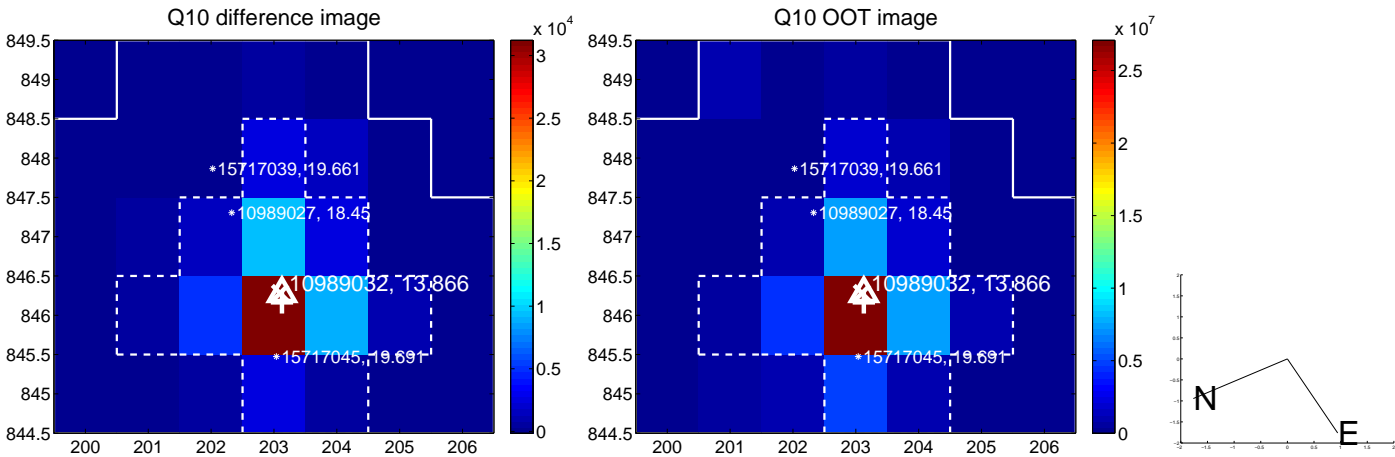
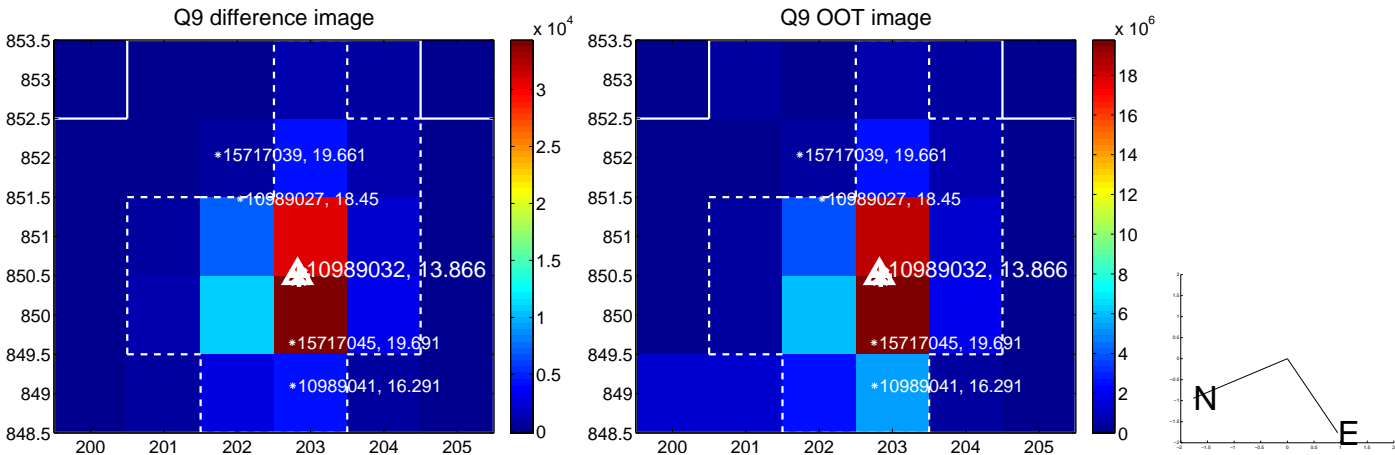
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



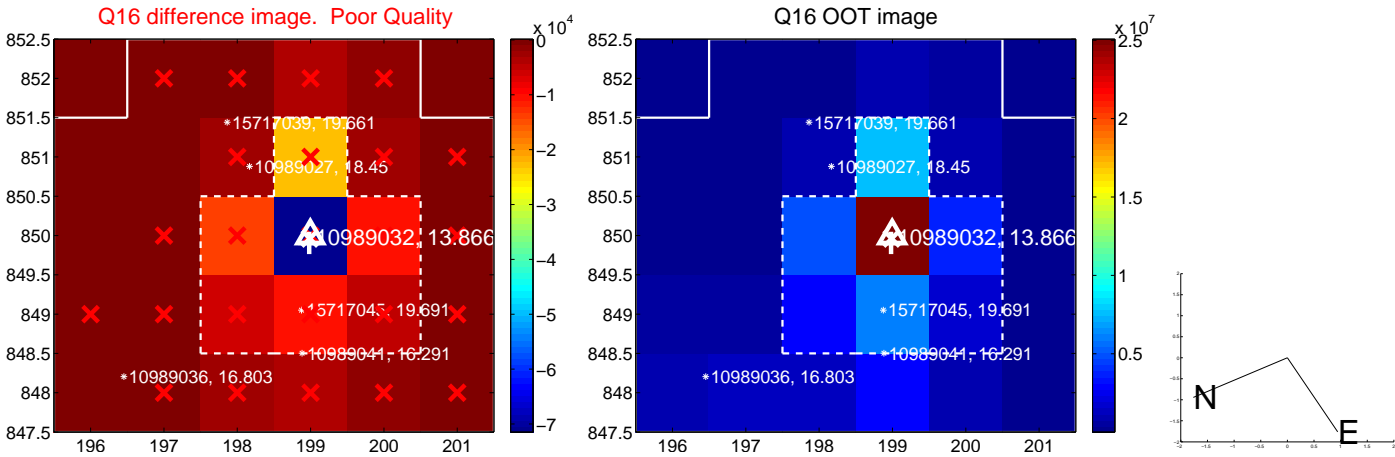
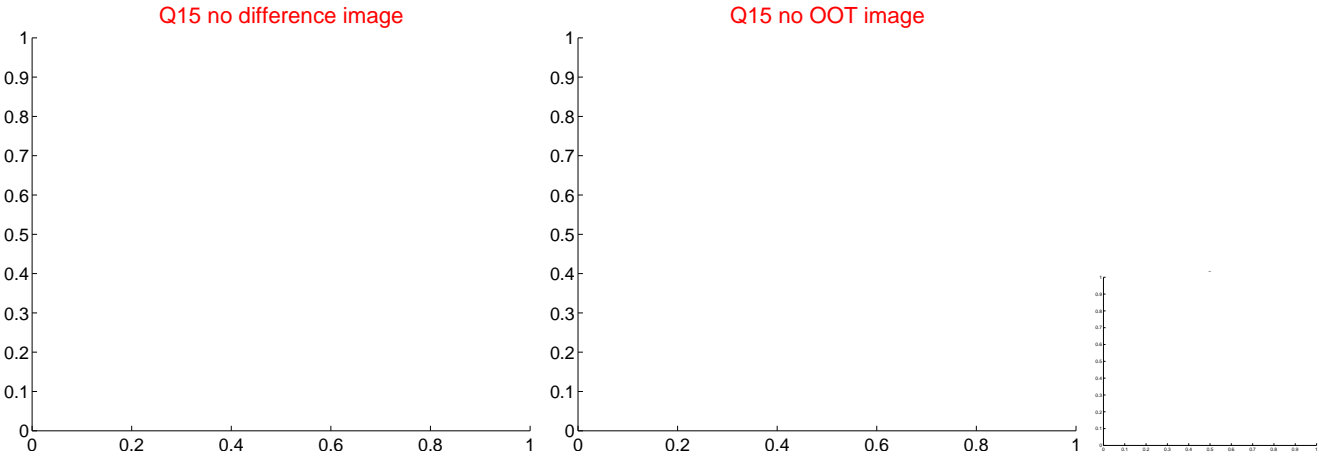
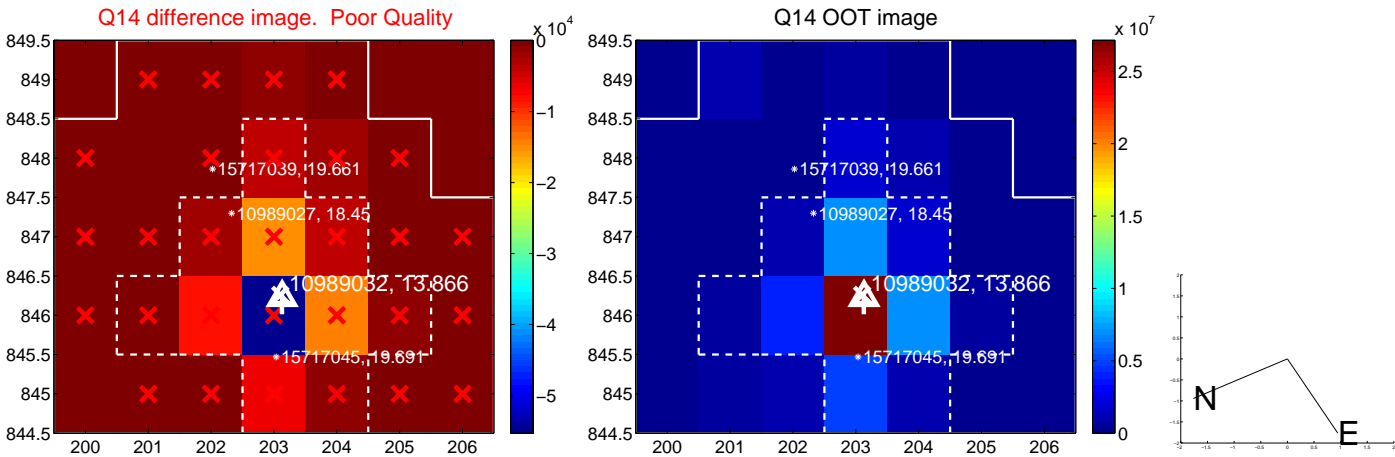
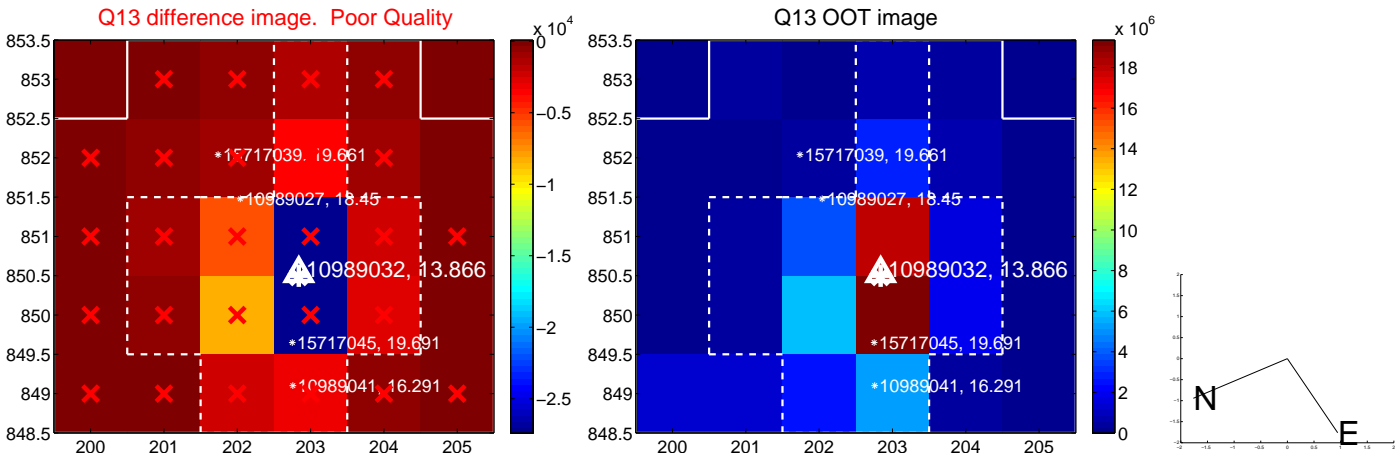
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



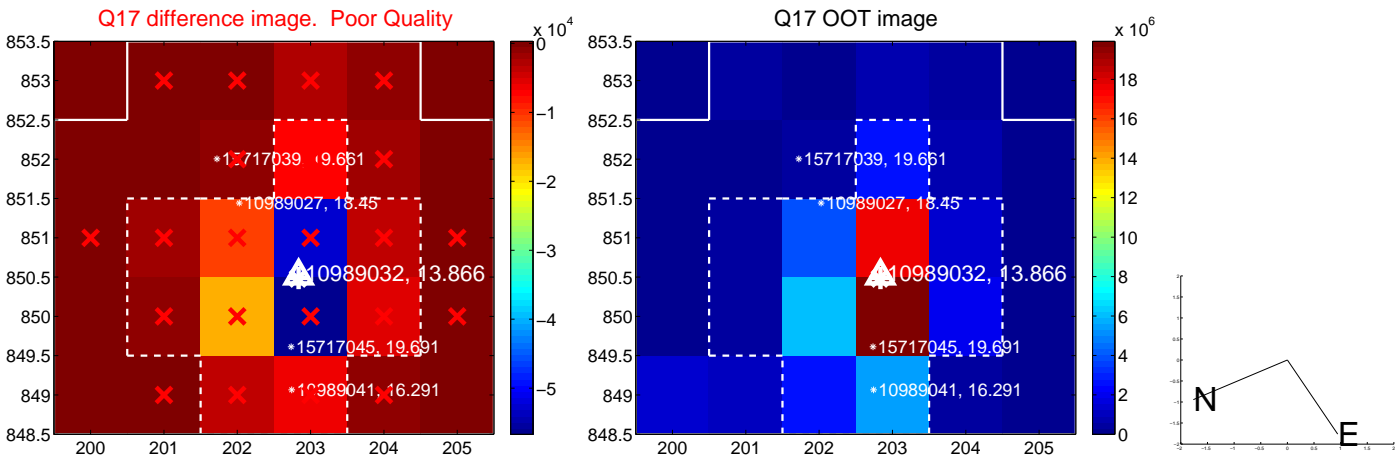
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



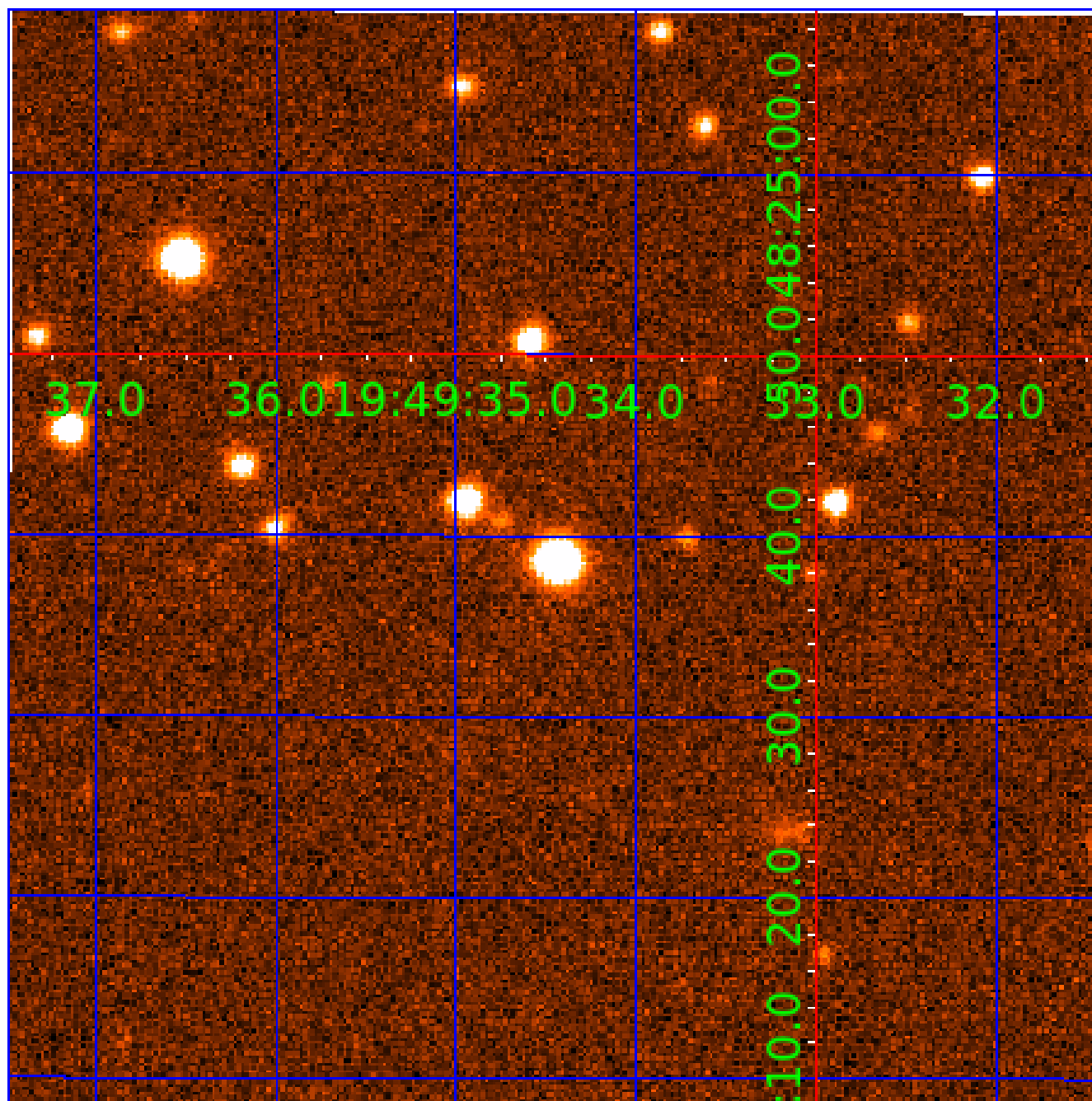
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



KIC 010989032

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})
010989032-01	OBS	7397.01	2.305089	133.705368	2722.1	1.019	119.2	133.3	2.18	8851	13.28	13613.98
010989032-02	OBS	No	2.305071	132.563600	64.9	10.483	19.4	11.0	2.18	8851	1.83	13614.13
010989032-03	OBS	No	2.303547	132.957207	1.3	8.941	7.7	0.0	2.18	8851	0.27	13626.14
010989032-04	OBS	No	2.305430	133.162707	172.6	5.000	8.4	-1.0	2.18	8851	2.91	13611.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010989032-01	OBS	FP	0.00	1	0	0	0	MOD_NONUNIQ_ALT
010989032-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
010989032-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010989032-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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 010989032-04

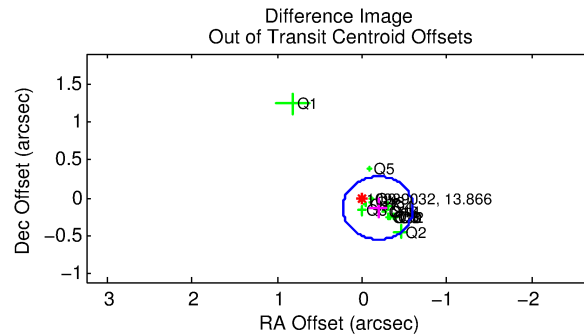
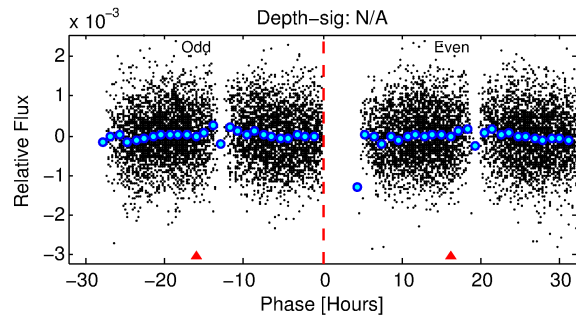
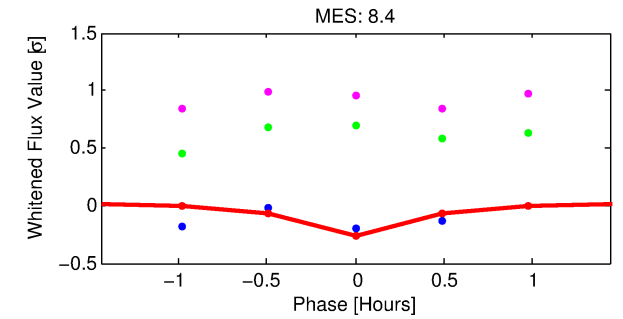
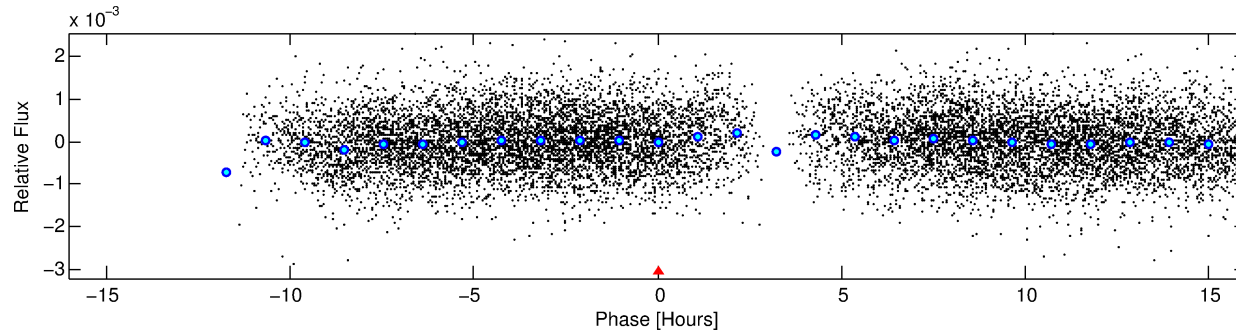
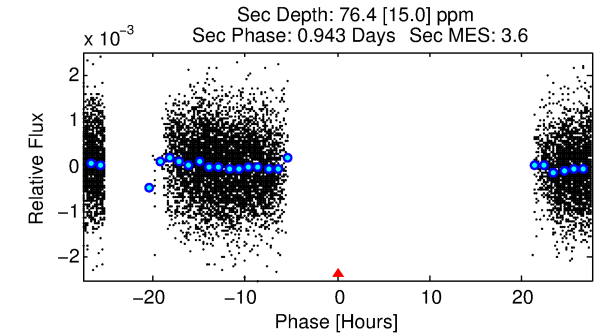
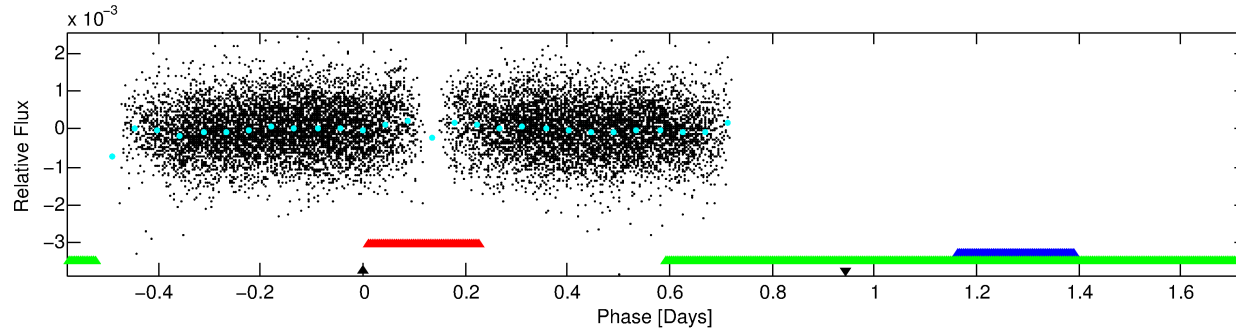
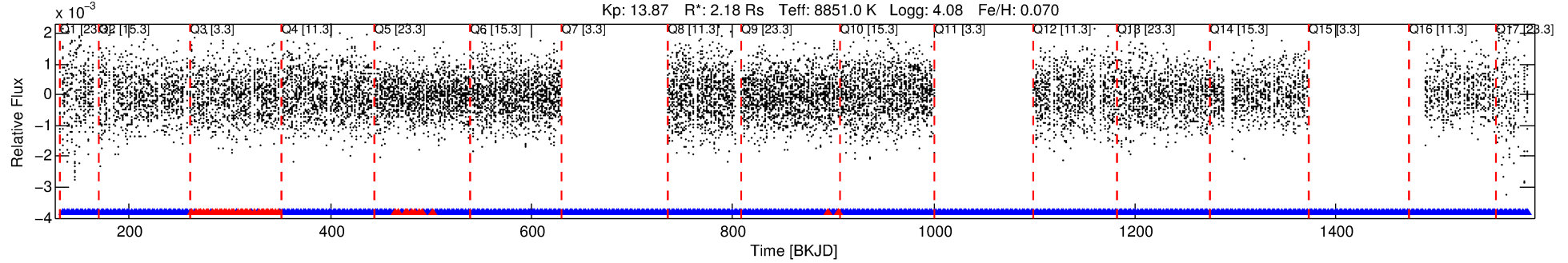
No Significant Match Found

DV One-Page Summary

KIC: 10989032 Candidate: 4 of 4 Period: 2.305 d

KOI: K07397 Corr: No Ephemeris Match

Kp: 13.87 R*: 2.18 Rs Teff: 8851.0 K Logg: 4.08 Fe/H: 0.070



TPS TCE Results:

Period = 2.30543 d

Epoch = 133.1627 BKJD

DV fit results are unavailable

DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]

LongPeriod-sig: N/A

ModelChiSquare2-sig: N/A

ModelChiSquareGof-sig: N/A

Bootstrap-pfa: 2.06e-29

RollingBand-fgt: 0.90 [396/440]

GhostDiagnostic-chr: 0.505

Centroid-sig: 30.4%

Centroid-so: 0.595 arcsec [6.16σ]

OotOffset-rm: 0.231 arcsec [1.68σ]

KicOffset-rm: 0.118 arcsec [0.93σ]

OotOffset-st: 4/1/4/5 [14]

KicOffset-st: 4/1/4/5 [14]

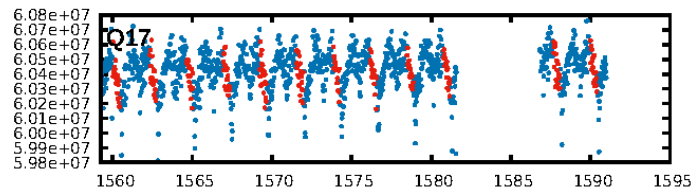
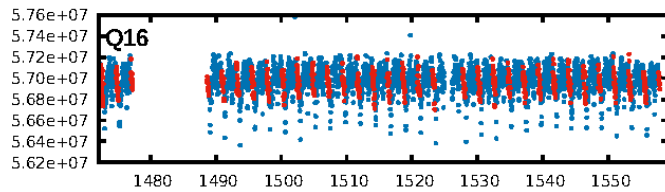
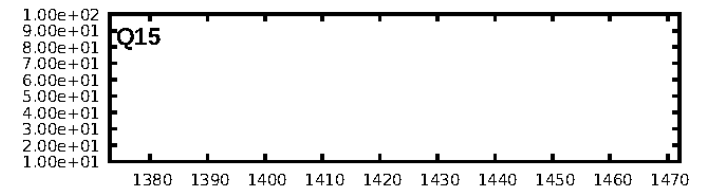
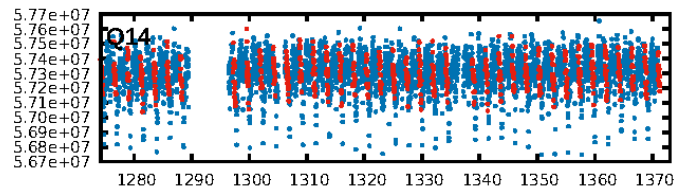
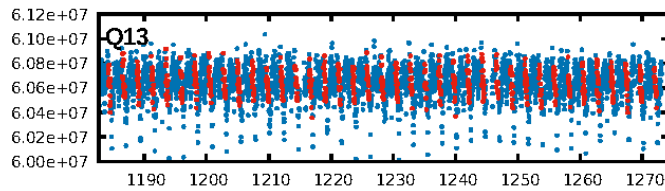
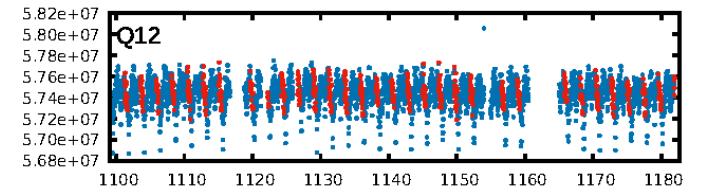
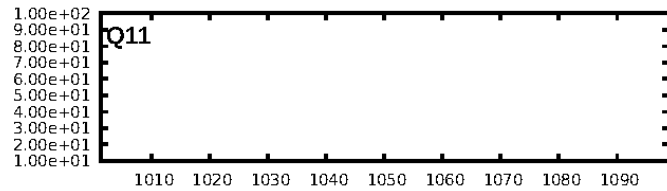
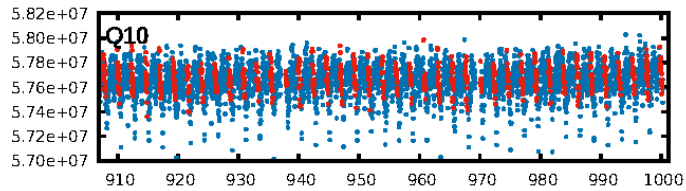
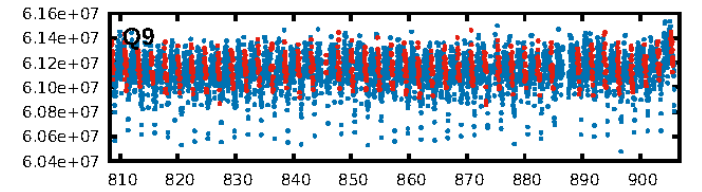
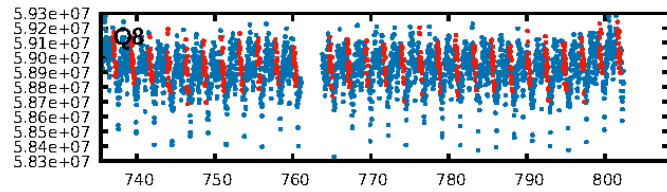
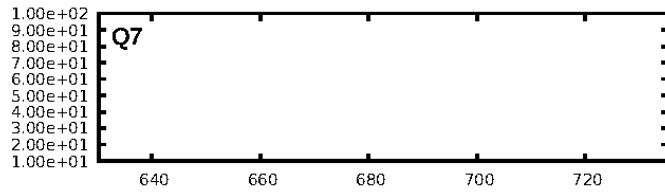
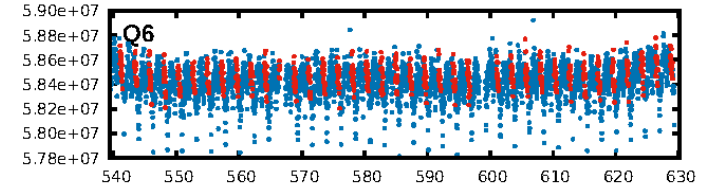
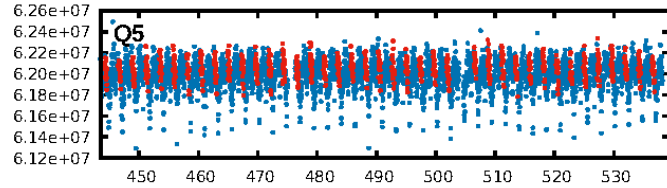
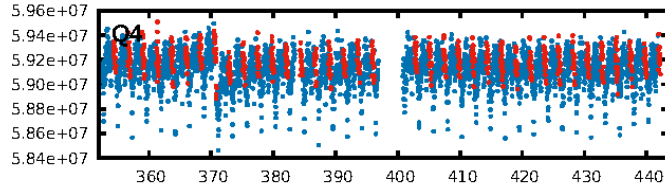
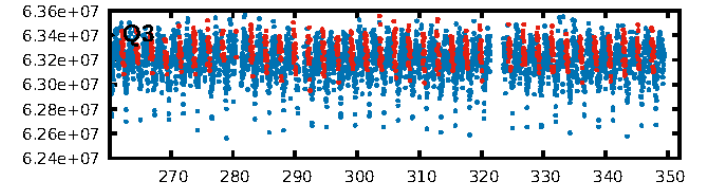
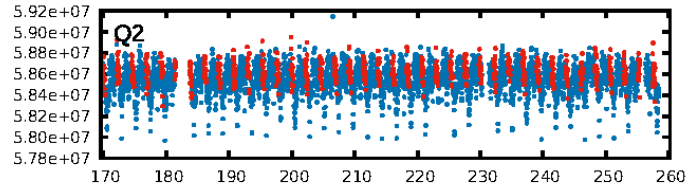
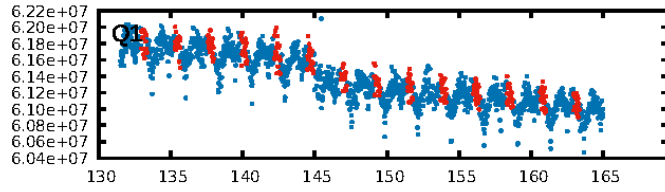
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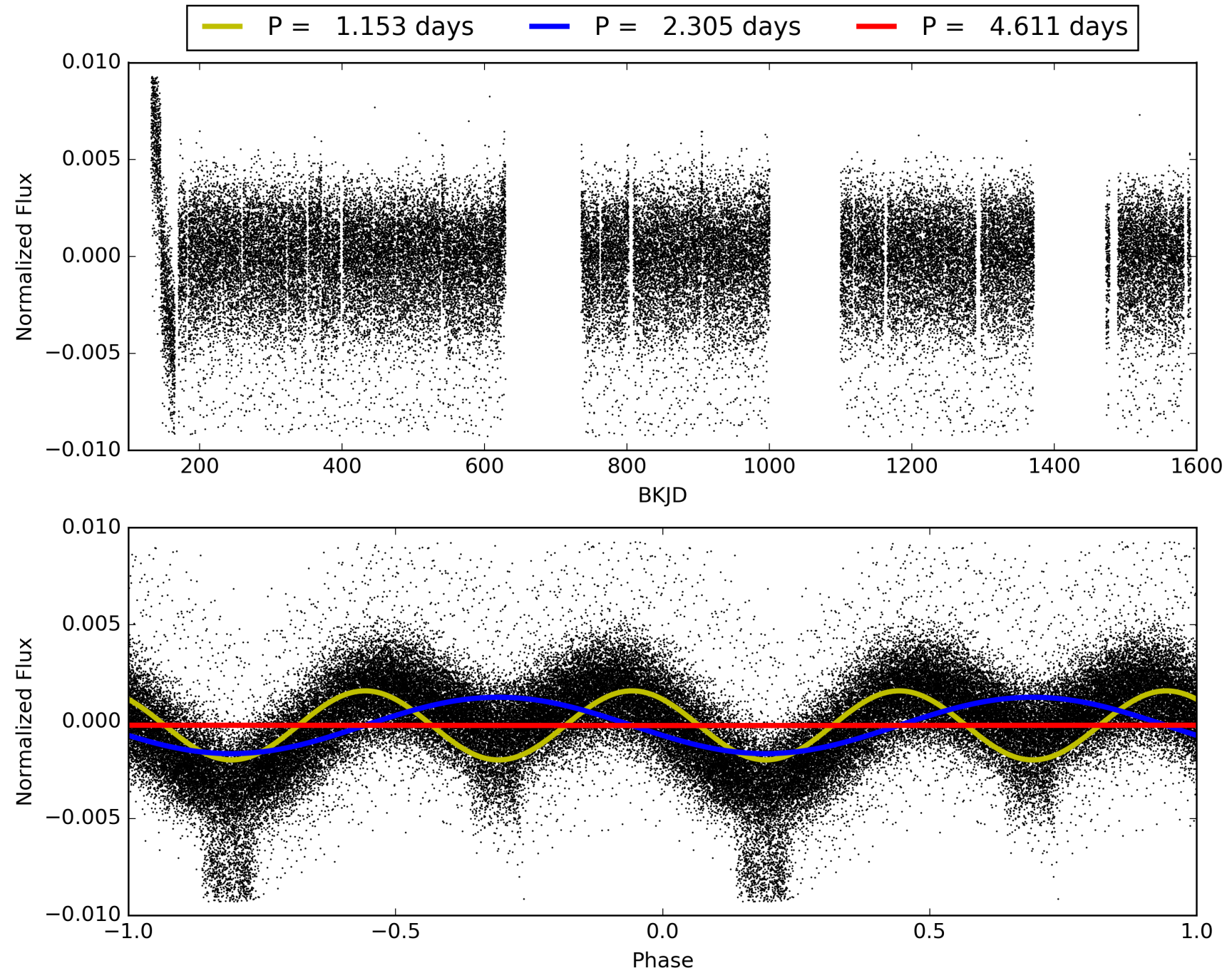
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010989032-04, PDC Light Curves

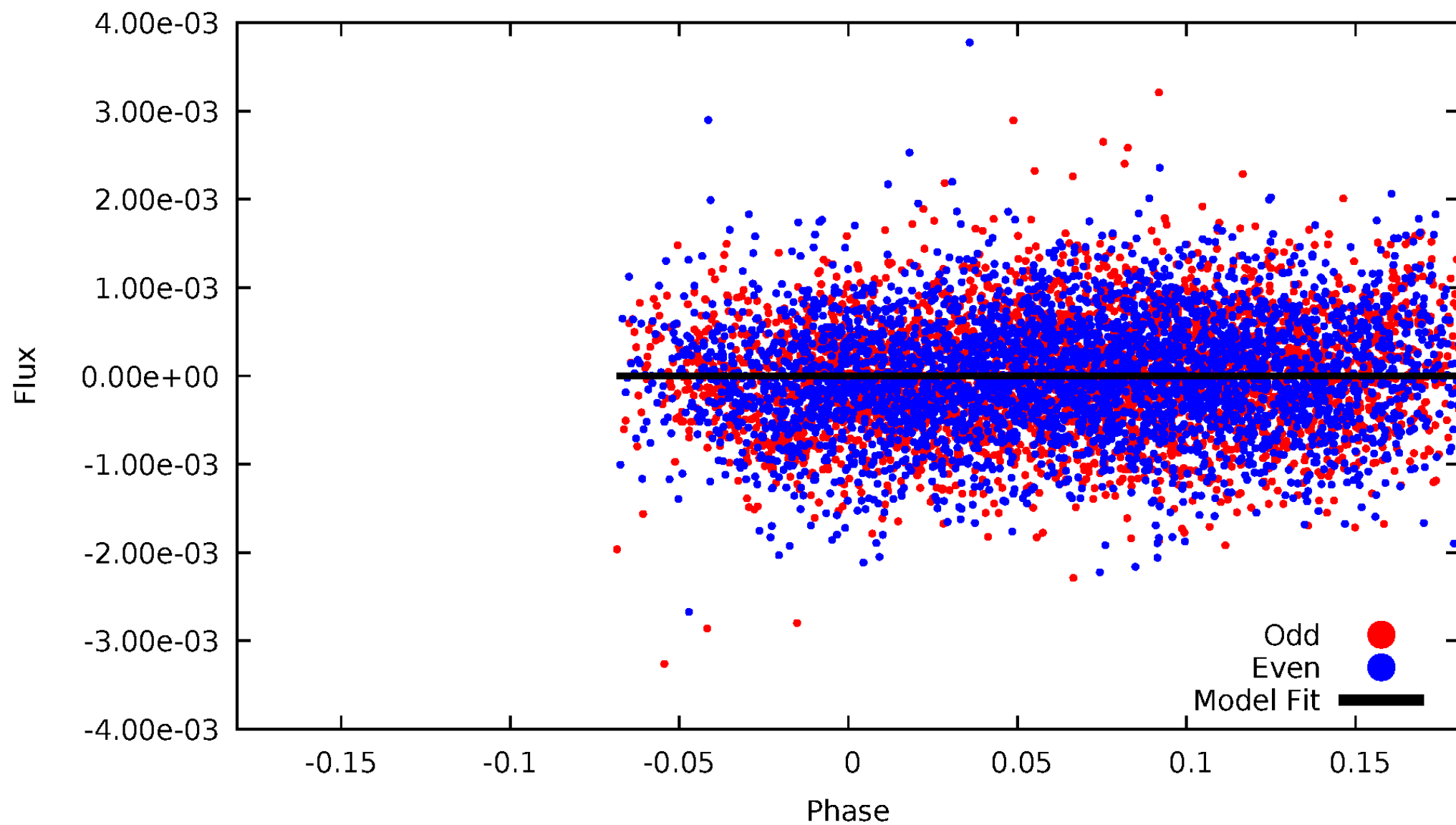


TCE 010989032-04



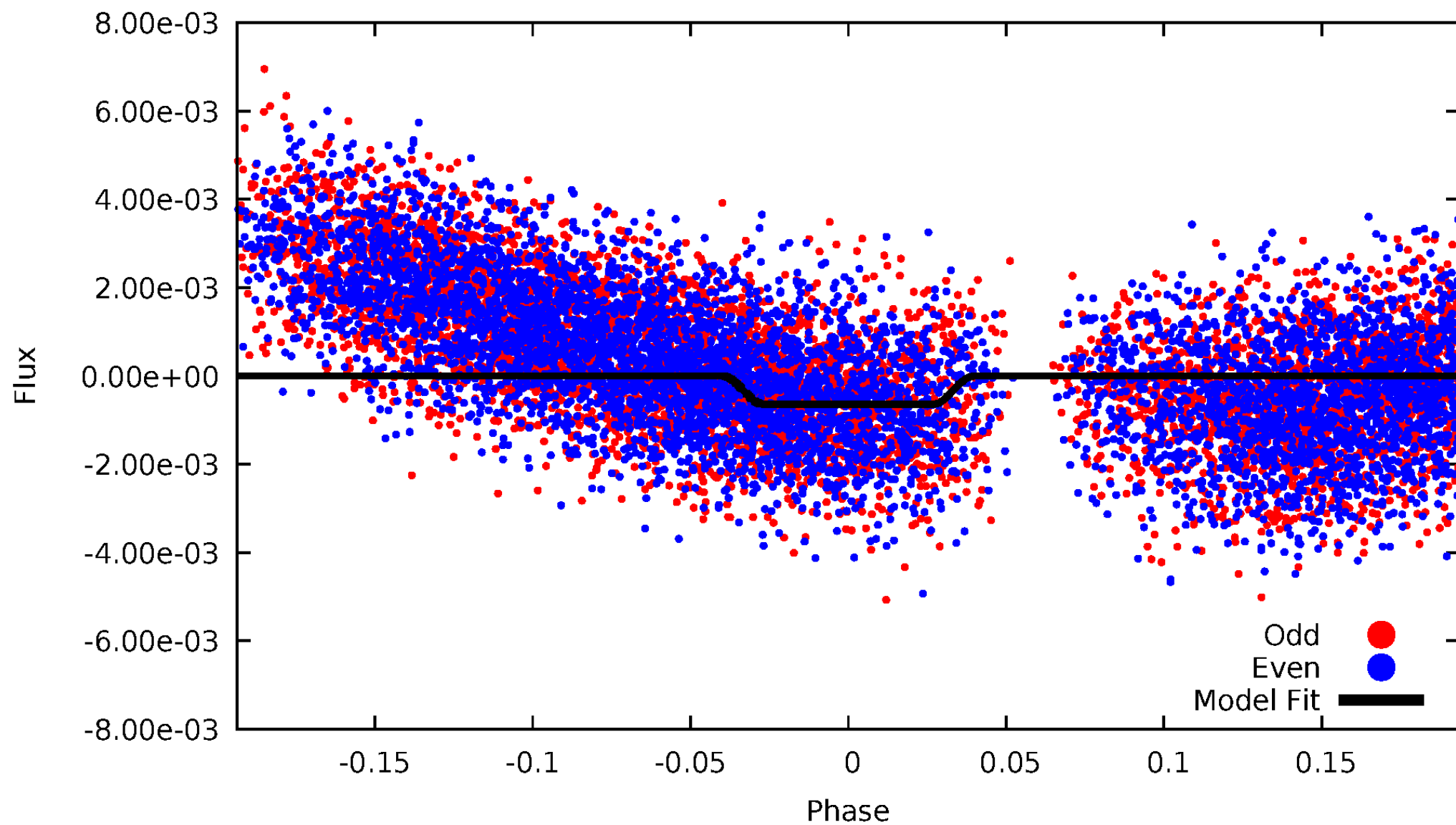
DV Odd/Even

TCE 010989032-04



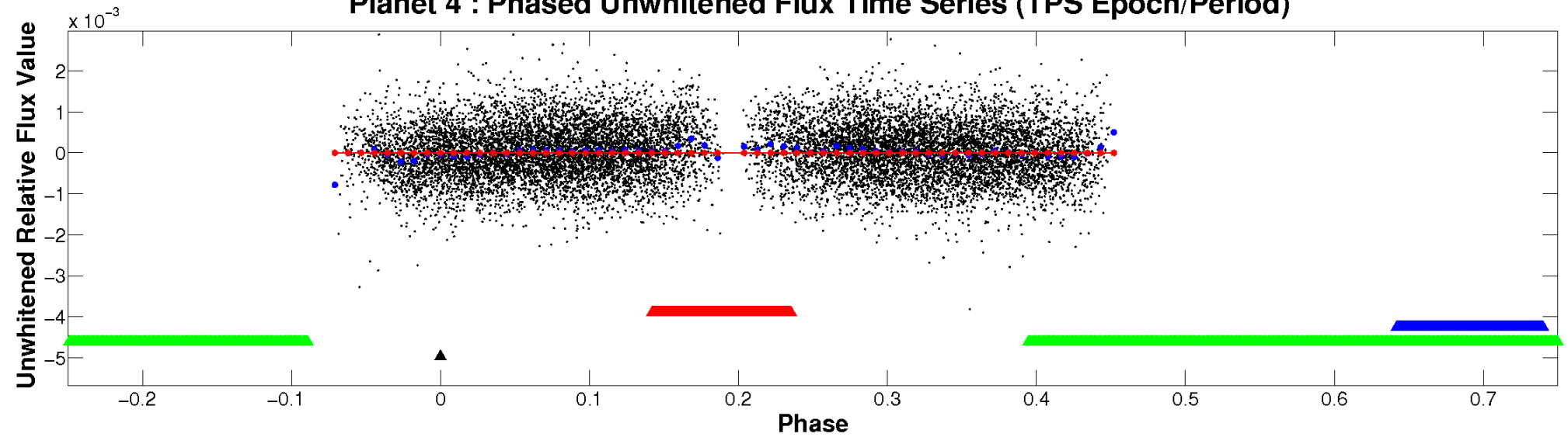
ALT Odd/Even

TCE 010989032-04

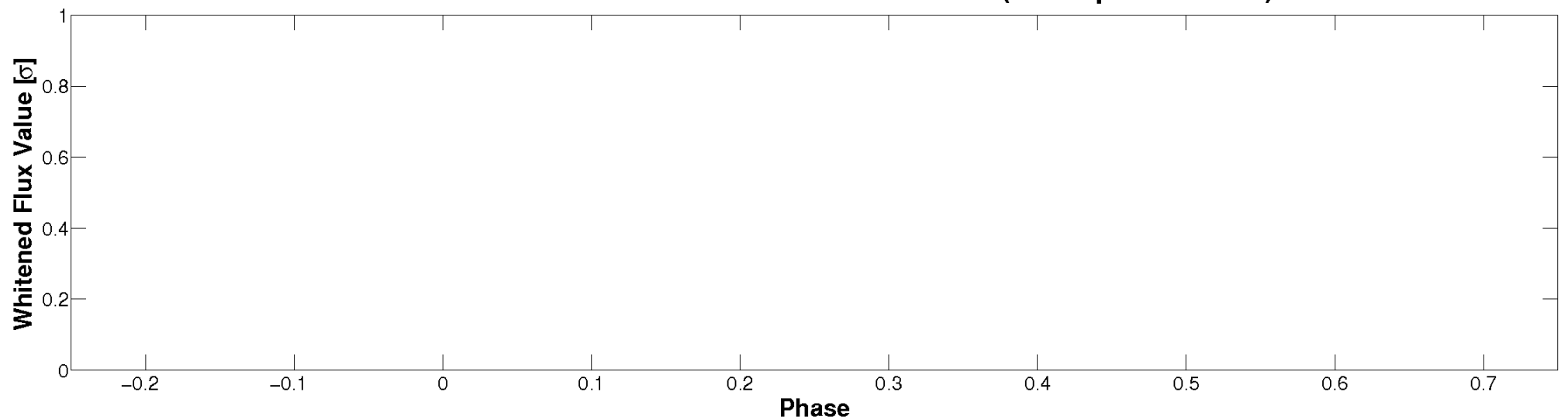


Non-Whitened Vs. Whitened Light Curve

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

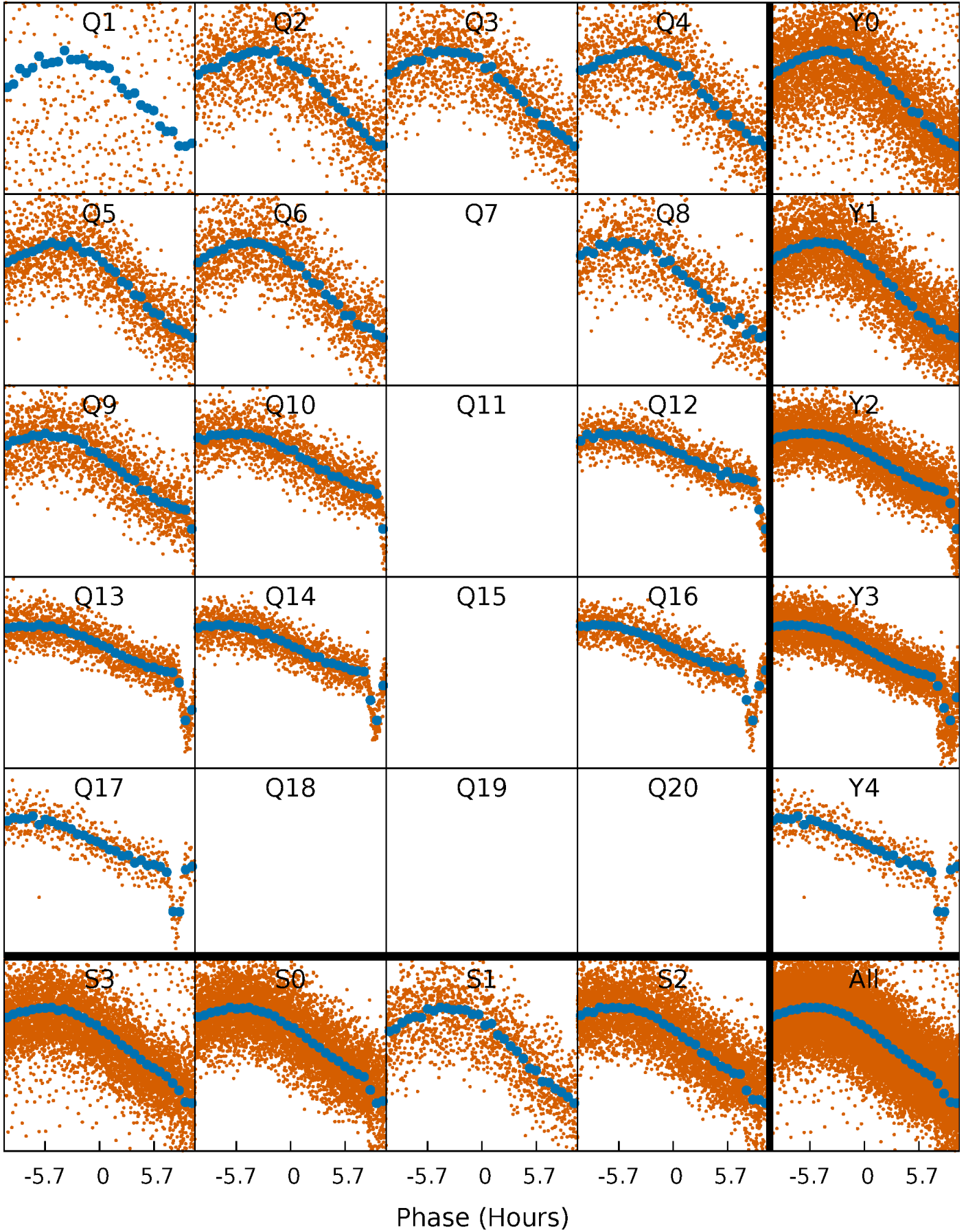


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



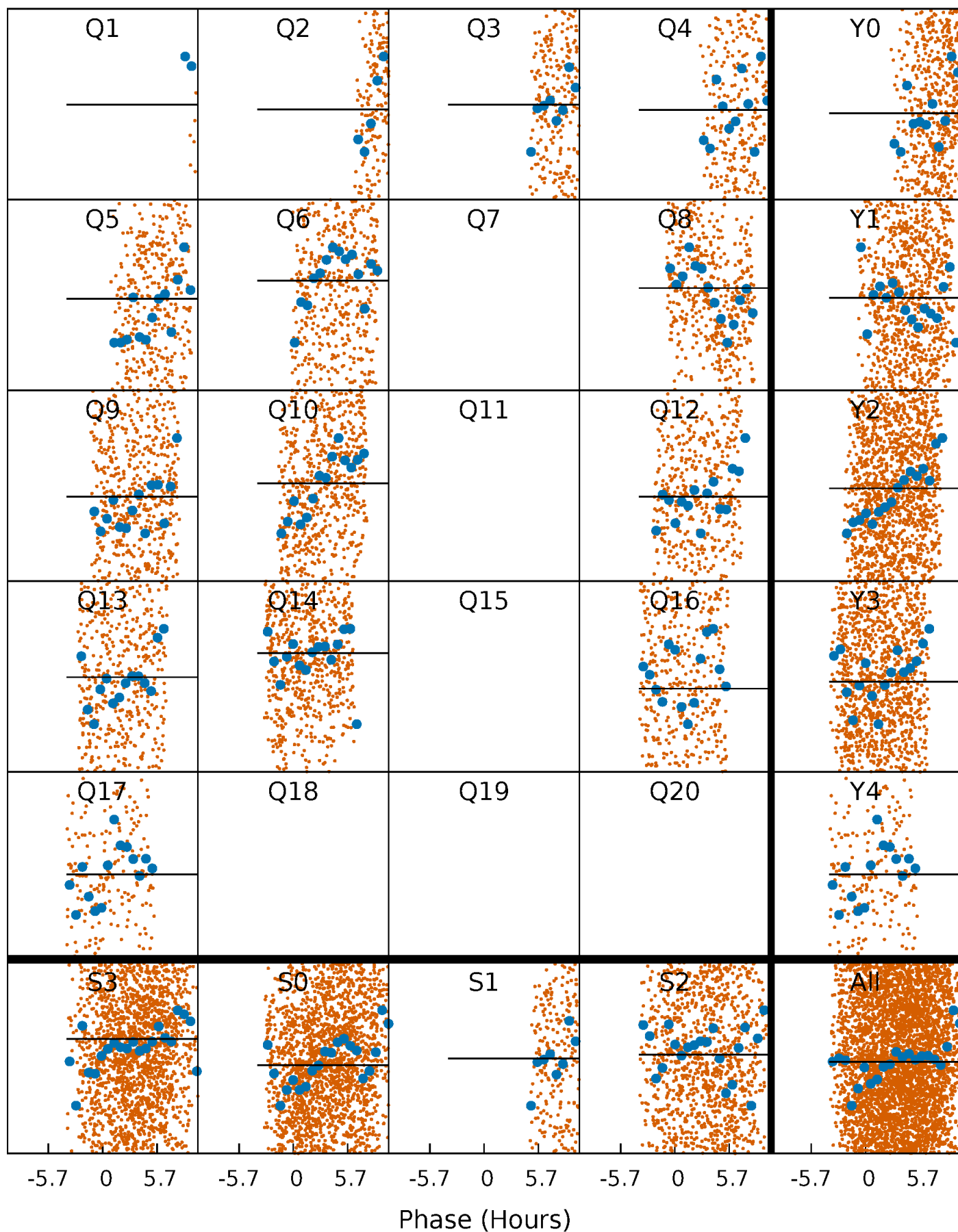
PDC Quarter-Phased Transit Curves

TCE 010989032-04 P= 2.305430 Days $T_0=133.162707$ (BKJD)



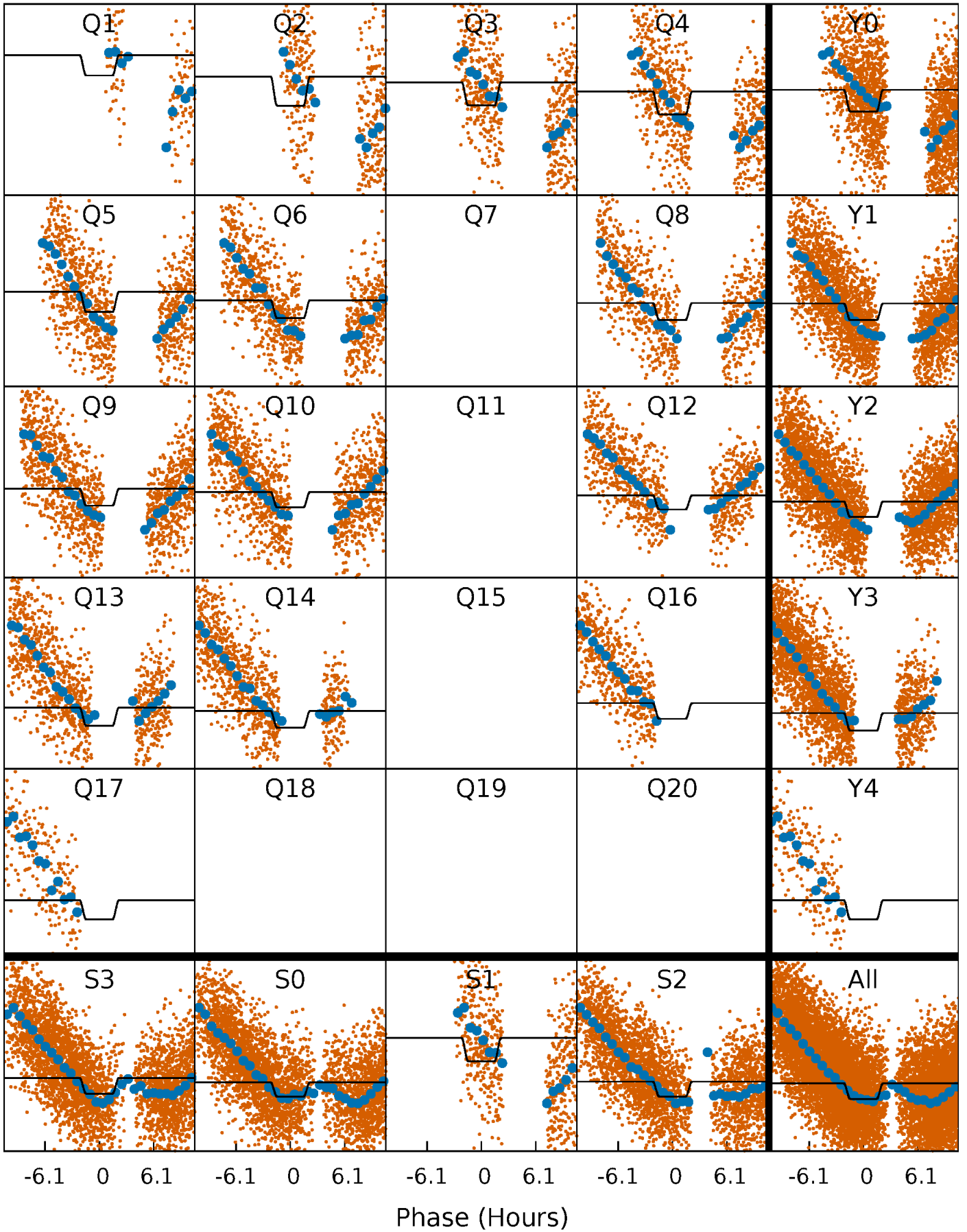
DV Quarter-Phased Transit Curves

TCE 010989032-04 $P = 2.305430$ Days $T_0 = 133.162707$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

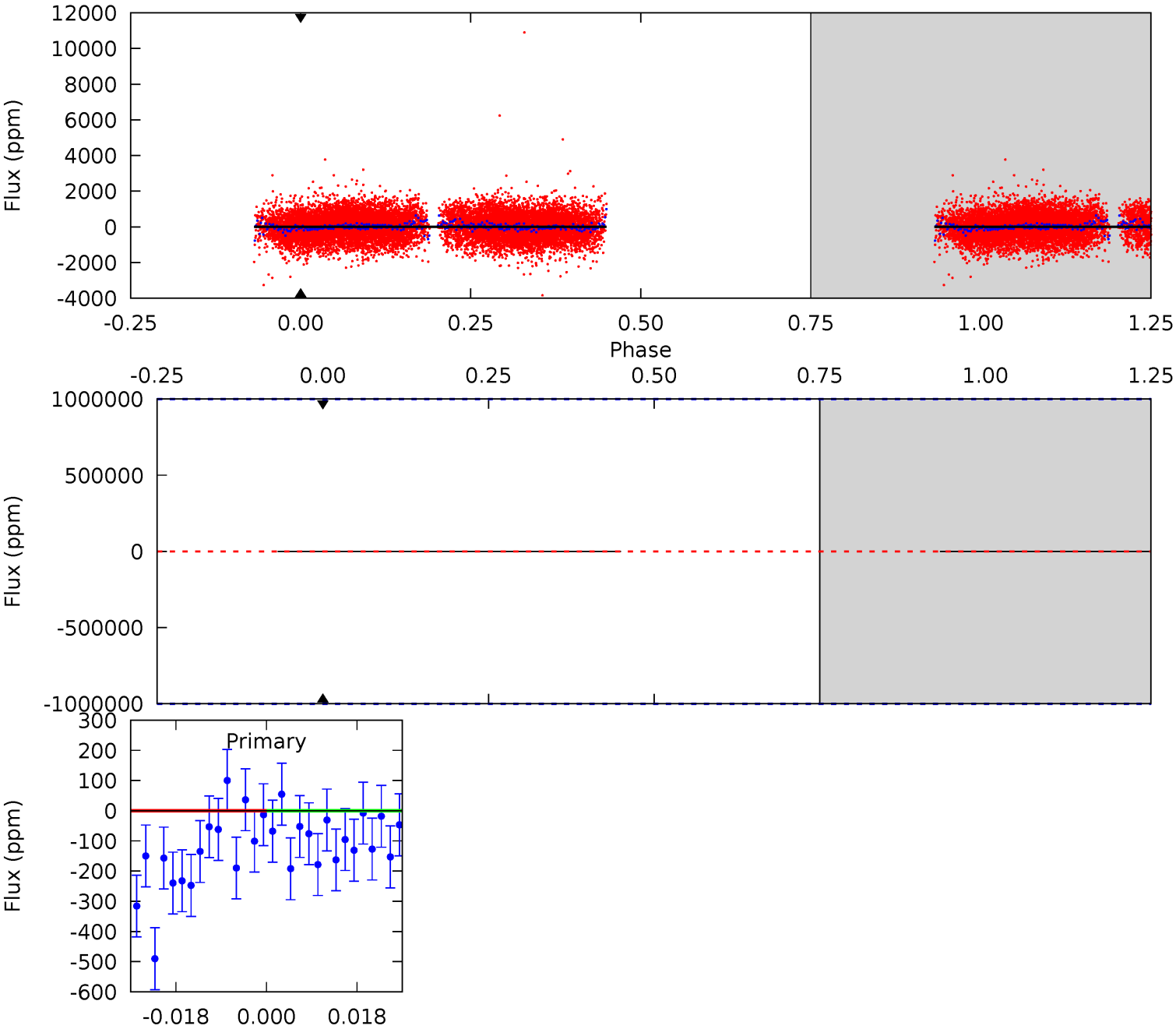
TCE 010989032-04 P= 2.305430 Days $T_0=133.479423$ (BKJD)



DV Model-Shift Uniqueness Test

010989032-04, P = 2.305430 Days, E = 130.857277 Days

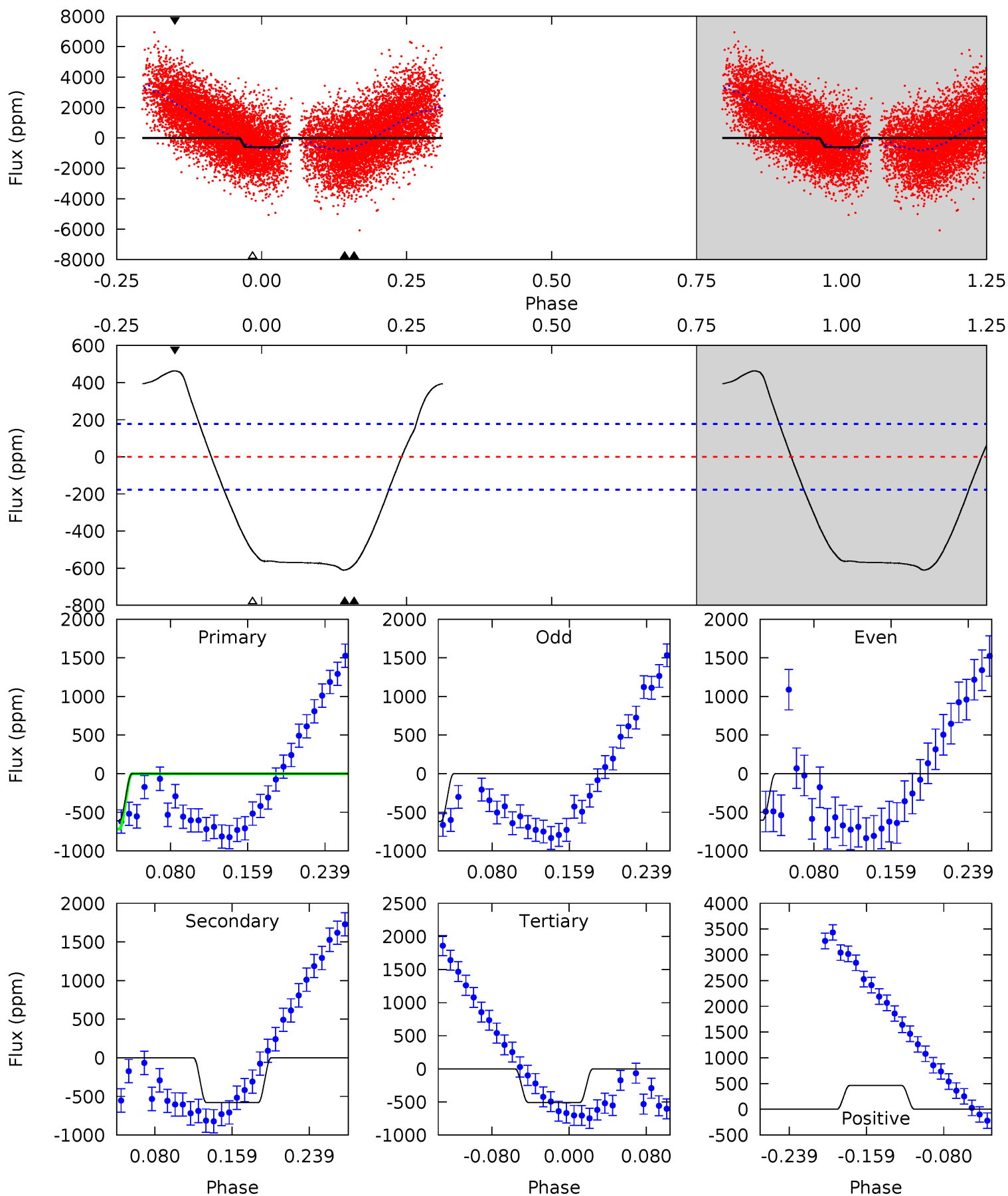
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

010989032-04, P = 2.305430 Days, E = 131.173993 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	15.1	13.2	12.1	4.61	1.75	9.27	2.70	3.86	1.90	3.05	0.18	0.88	0.43	2.97



Stellar Parameters For KIC 010989032

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8851^{+246}_{-422}	$4.085^{+0.155}_{-0.155}$	$0.070^{+0.200}_{-0.600}$	$2.178^{+0.612}_{-0.551}$	$2.106^{+0.349}_{-0.523}$	$0.287^{+0.240}_{-0.129}$
	+3%/-5%	+4%/-4%	+286%/-857%	+28%/-25%	+17%/-25%	+84%/-45%
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 010989032-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$16.86^{+17.64}_{-11.40}$	3825^{+278}_{-284}	-7278^{+64840}_{-55847}	$-9.271^{+543.851}_{-698.223}$
Alt.	-580 ± 38	$18.23^{+21.14}_{-12.30}$	3830^{+265}_{-269}	4630^{+4038}_{-1655}	$1.799^{+15.941}_{-1.402}$

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

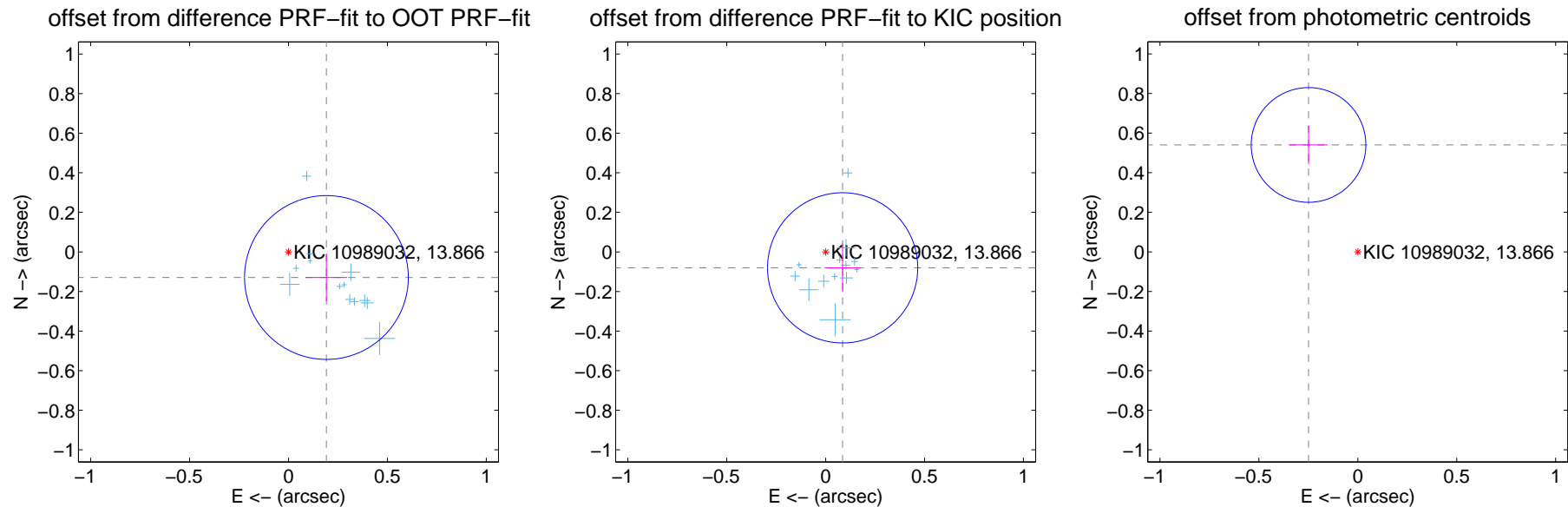
DV Centroid Data

Supplemental centroid analysis for 010989032-04. Kepler magnitude: 13.87. Transit SNR -1.00

There are 14 quarters with good PRF difference image offsets

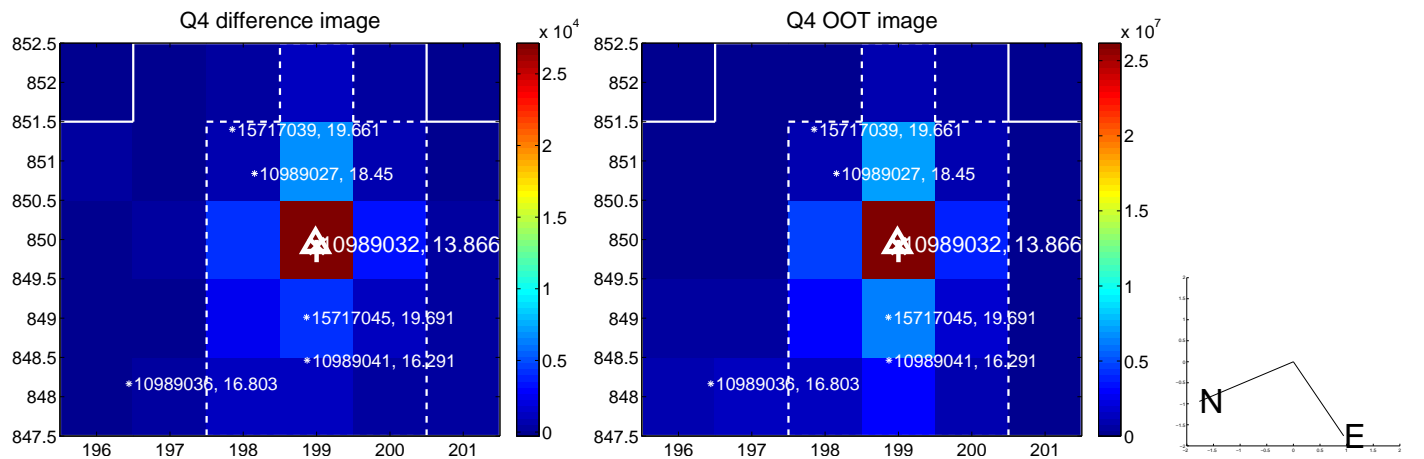
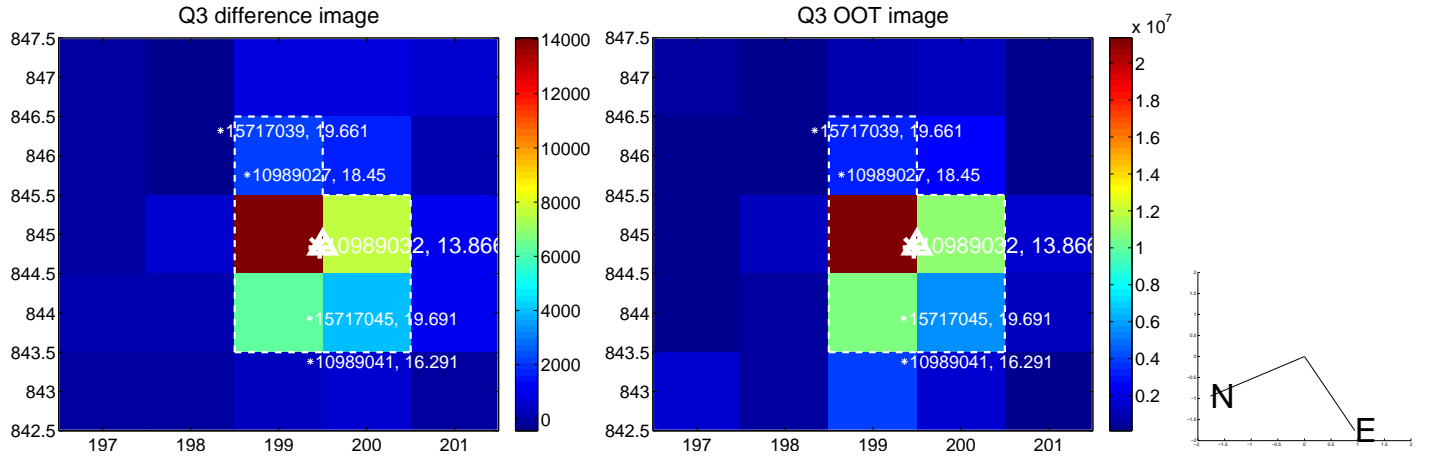
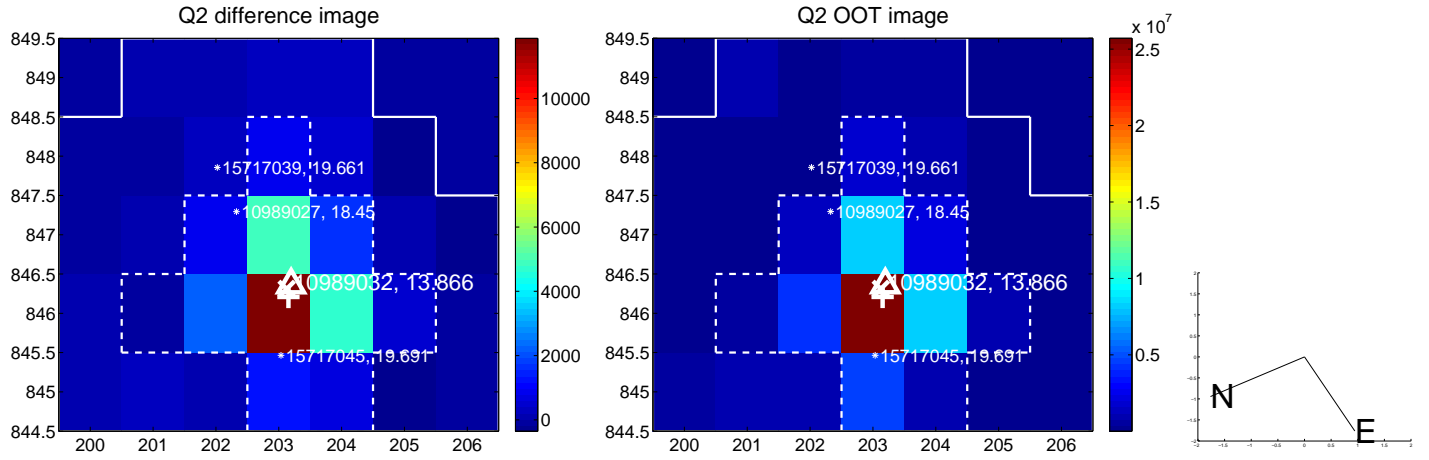
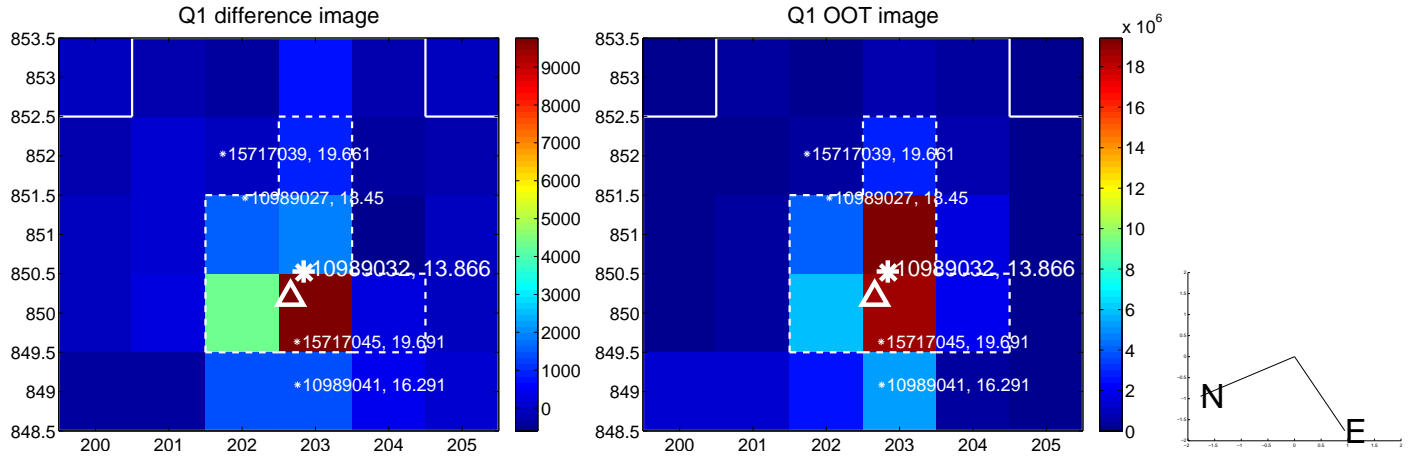
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.231 ± 0.138	1.68	-0.192 ± 0.105	-0.129 ± 0.121
PRF-fit source offset from KIC position	0.118 ± 0.127	0.93	-0.086 ± 0.090	-0.080 ± 0.122
photometric centroid source offset	0.59 ± 0.10	6.16	0.25 ± 0.10	0.54 ± 0.10

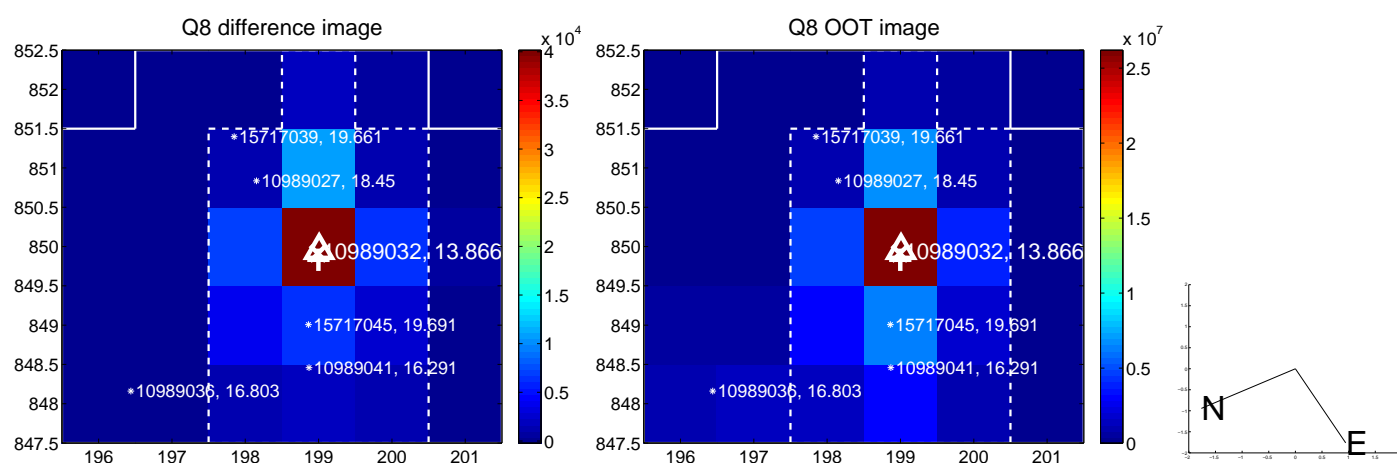
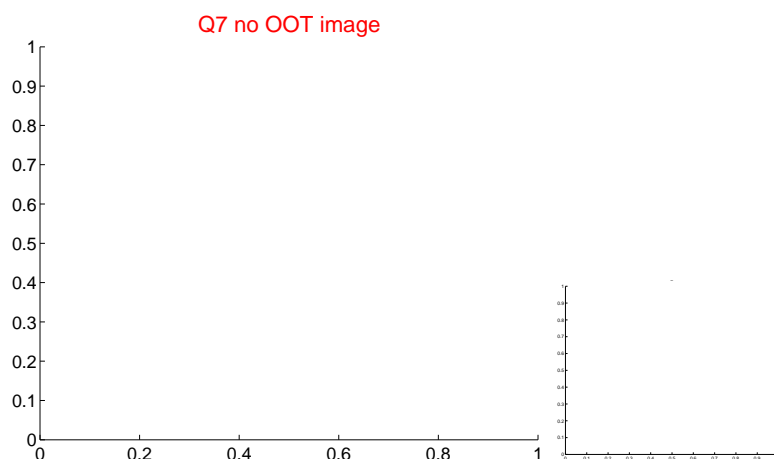
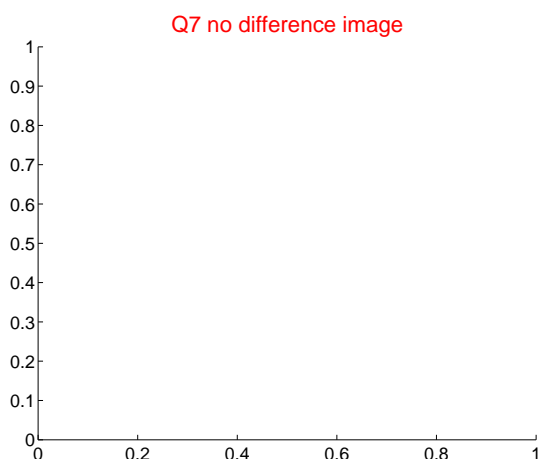
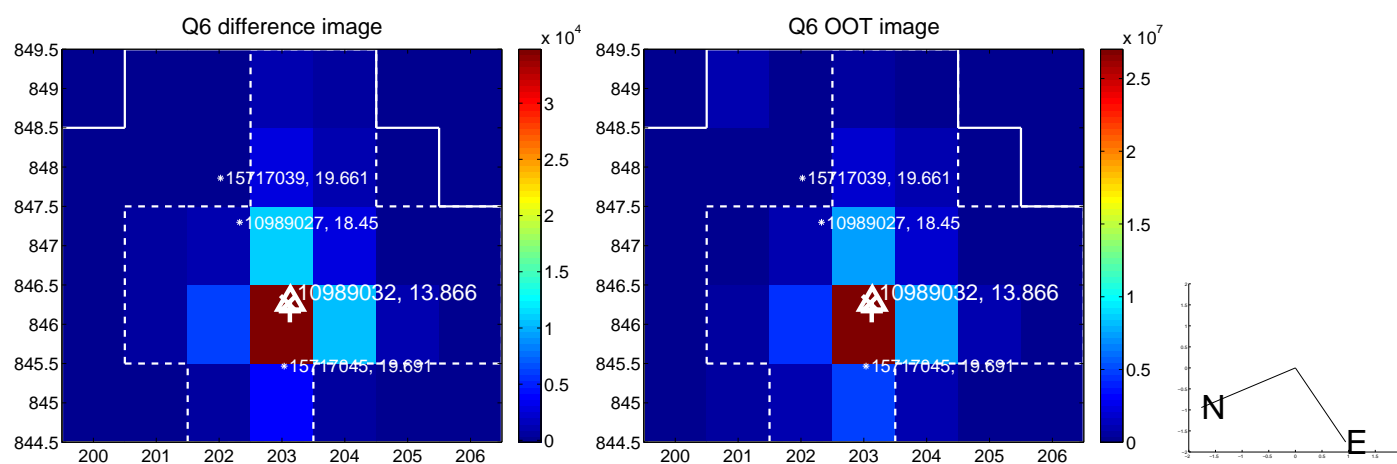
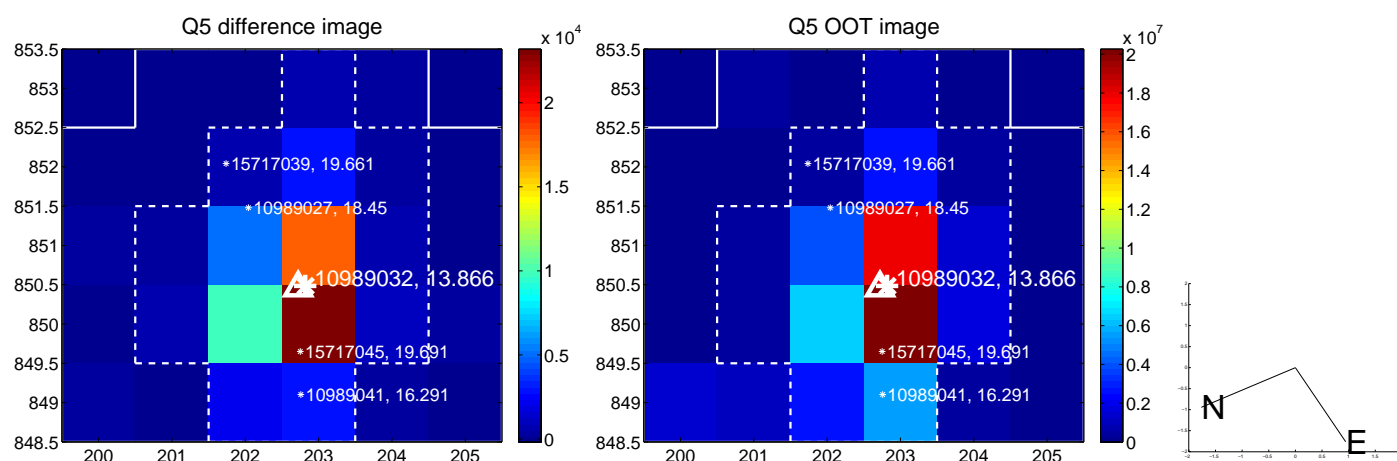


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

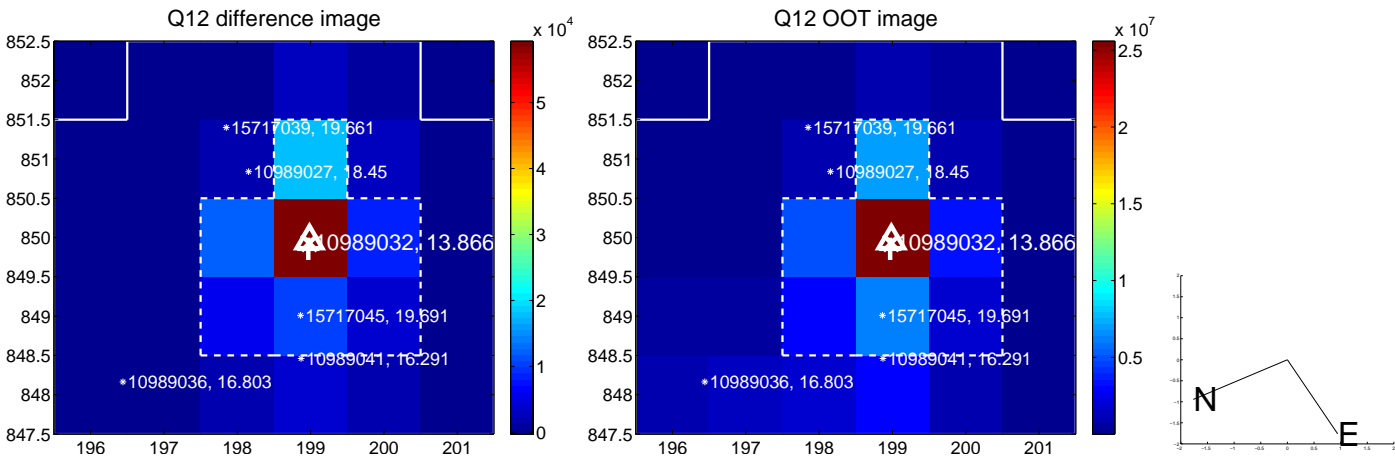
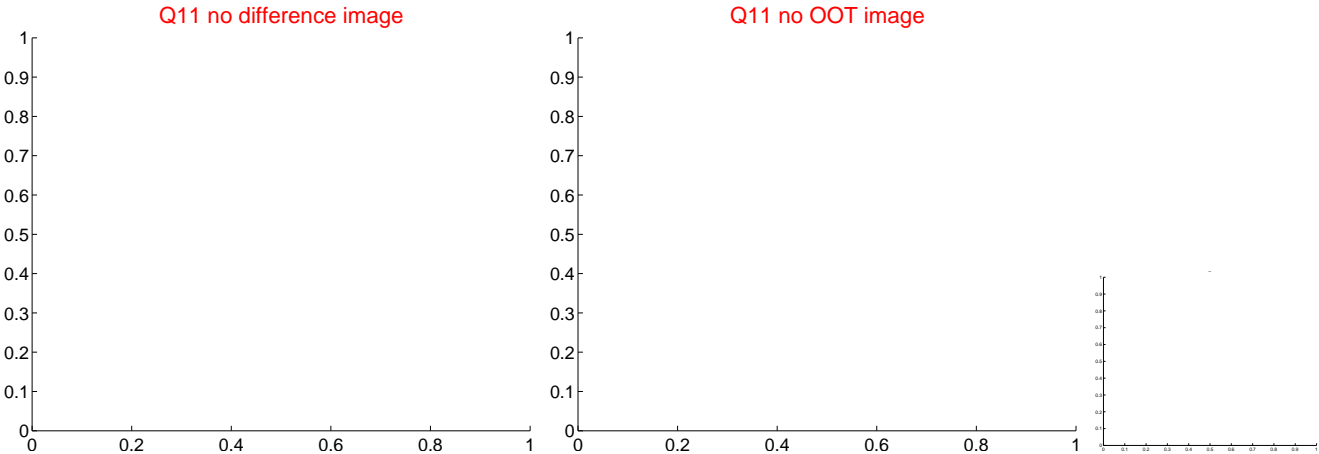
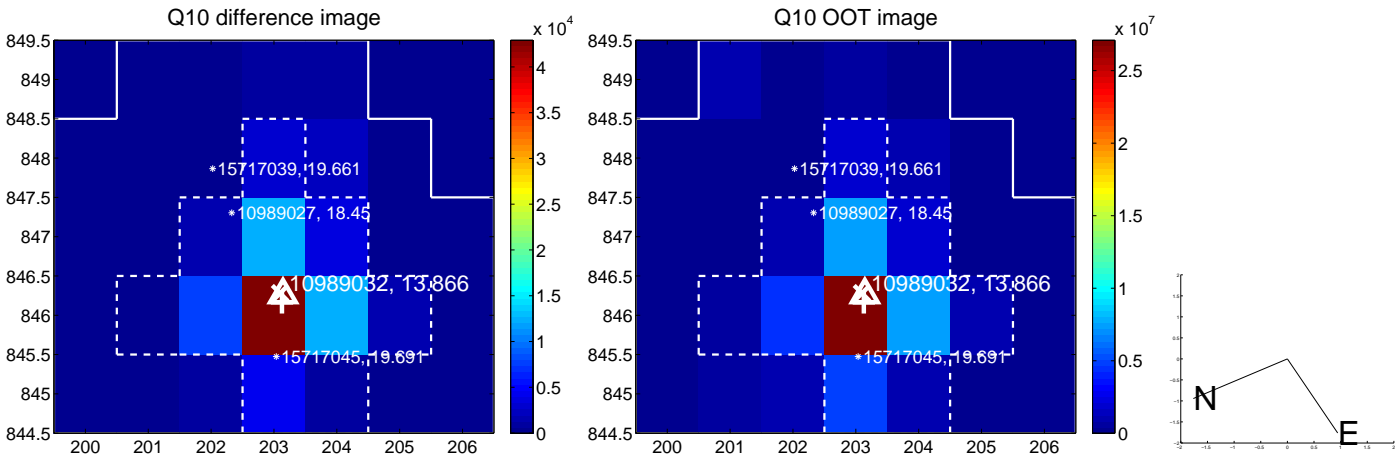
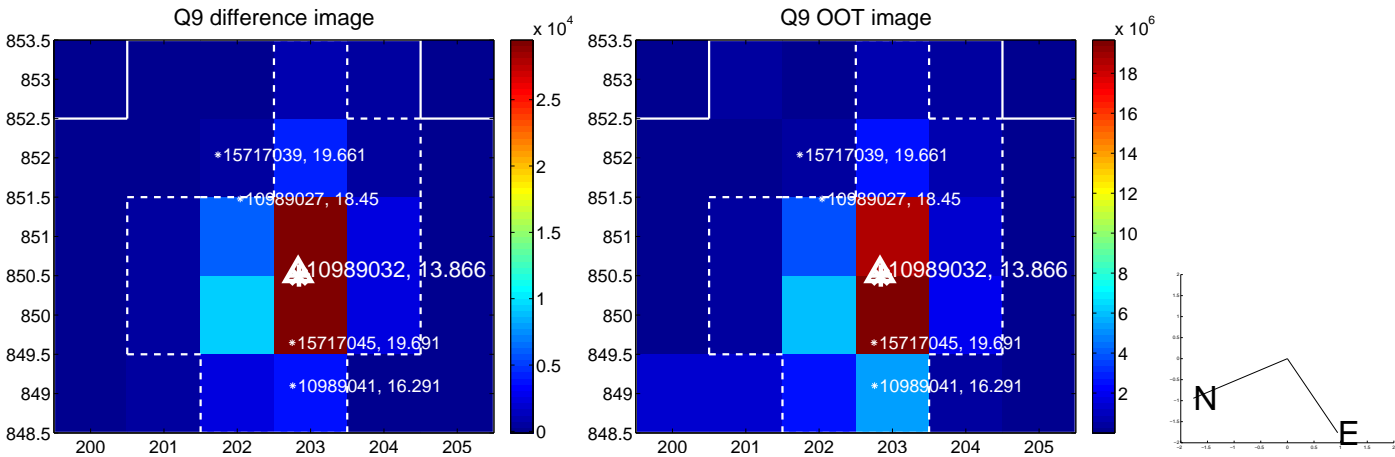
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



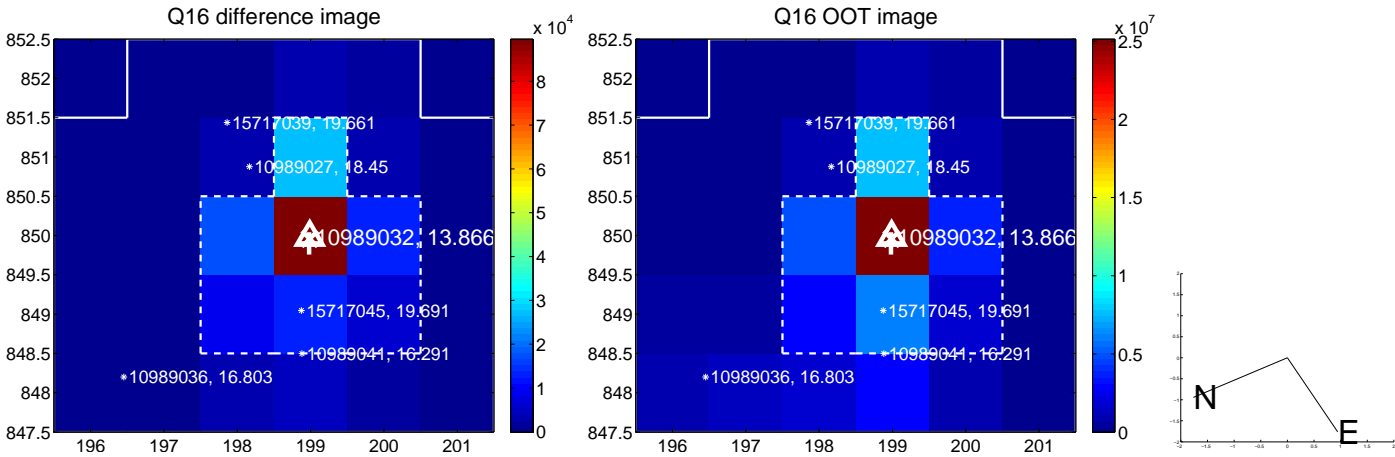
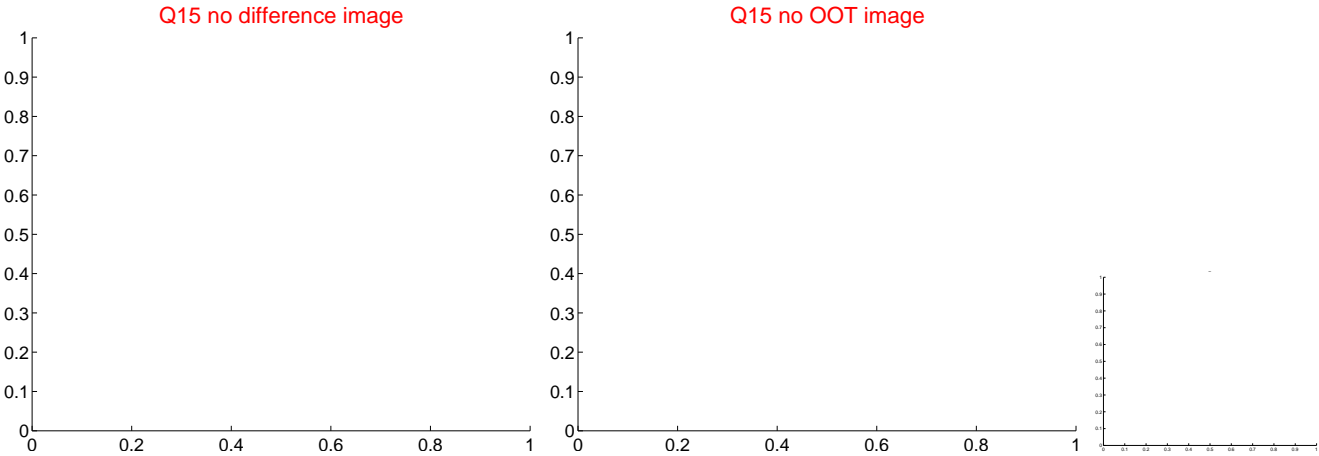
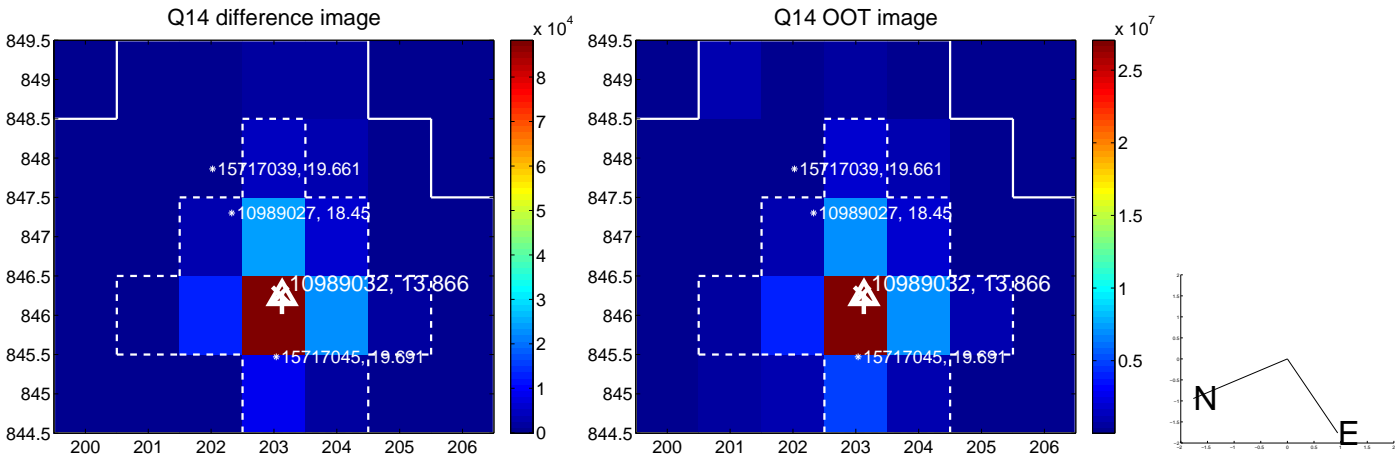
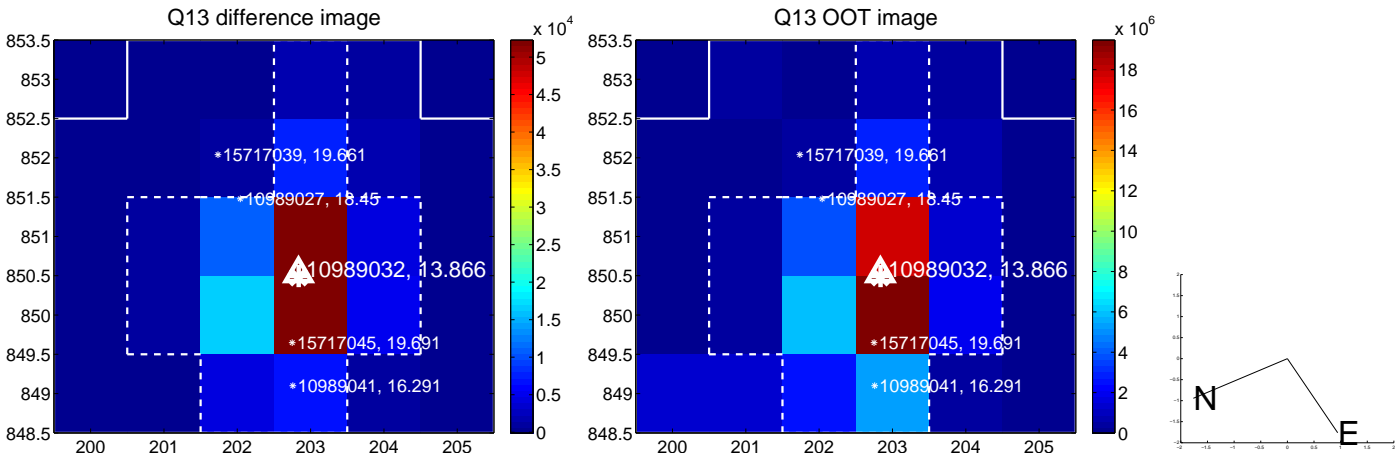
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



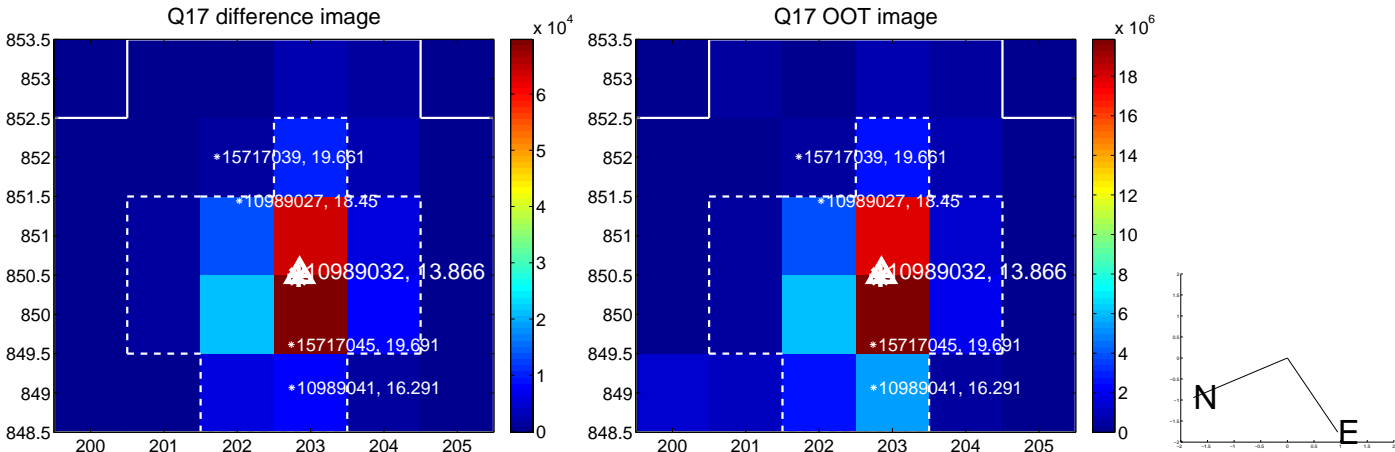
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



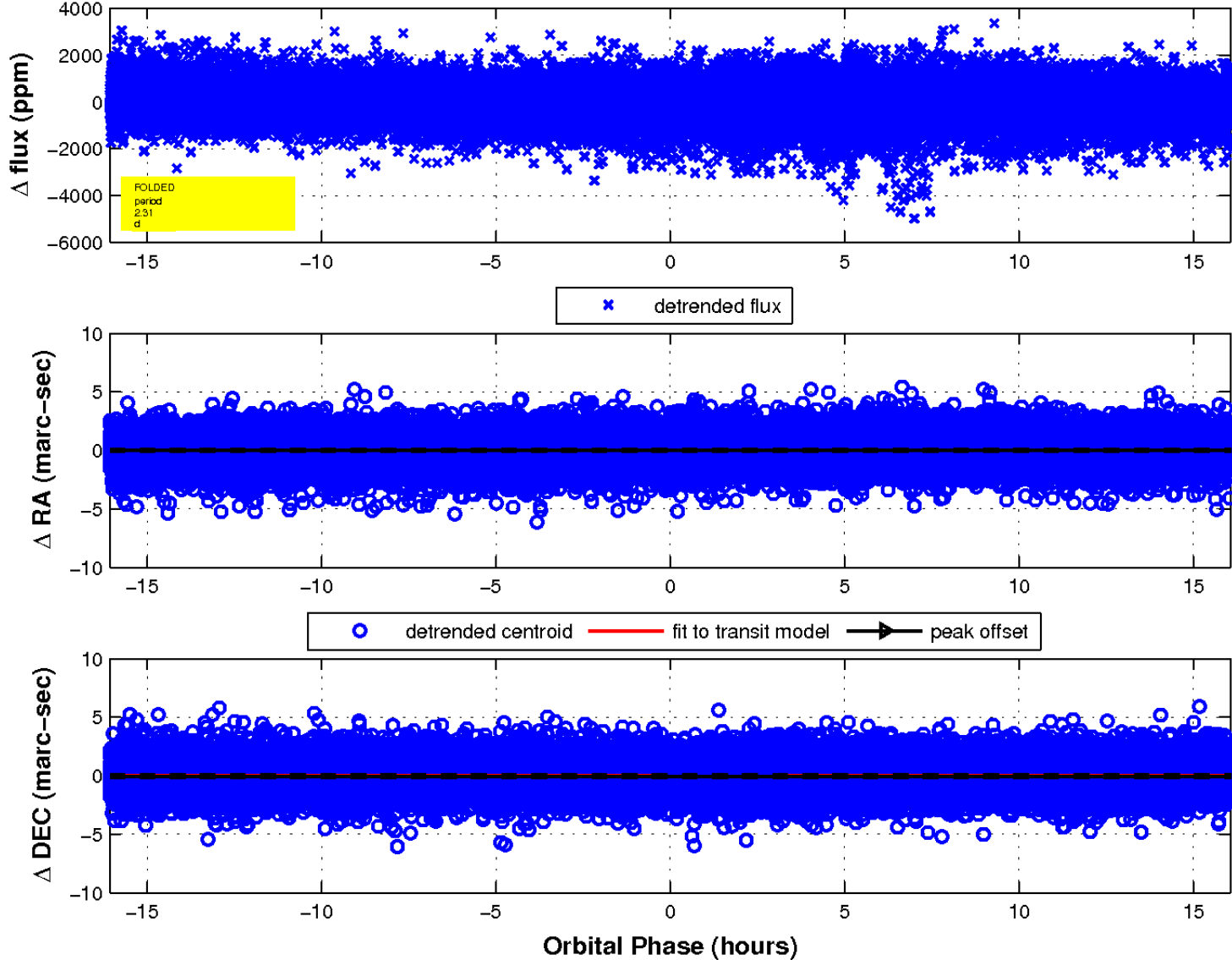
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

