

KIC 006224312

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})
006224312-01	OBS	No	0.860944	131.592441	121.5	3.739	9.1	8.9	1.49	7136	1.90	13209.03
006224312-02	OBS	No	0.860966	131.991240	110.9	4.787	10.4	11.2	1.49	7136	1.59	13208.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006224312-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006224312-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD

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

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

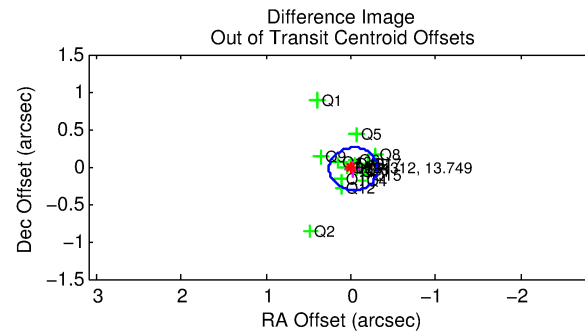
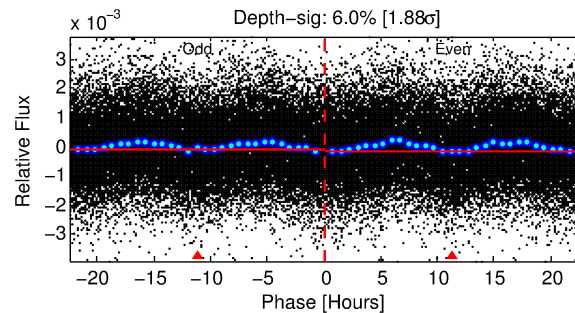
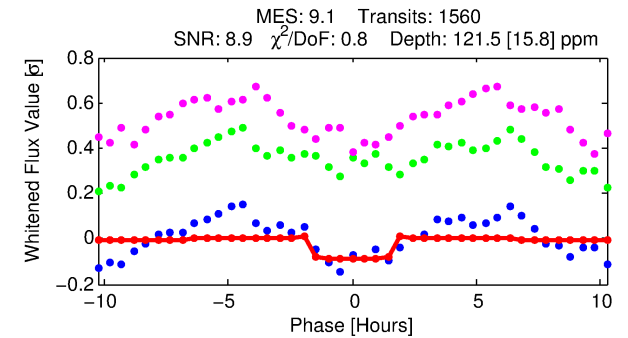
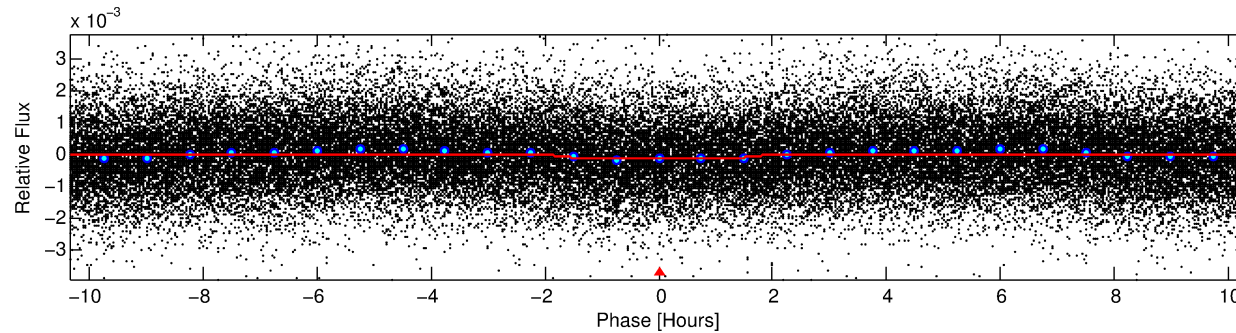
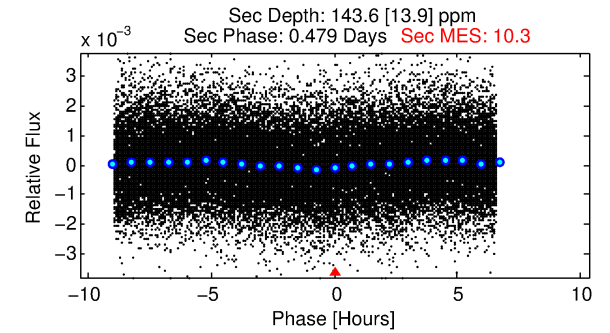
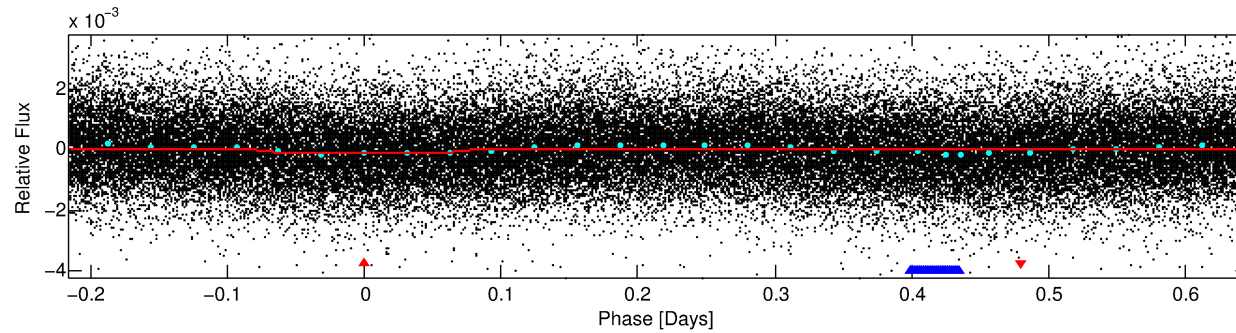
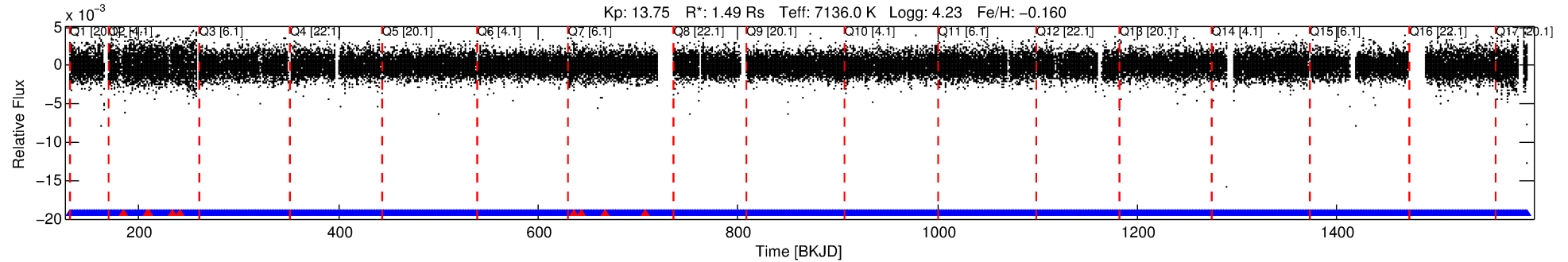
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006224312-01

No Significant Match Found

DV One-Page Summary

KIC: 6224312 Candidate: 1 of 2 Period: 0.861 d



DV Fit Results:

Period = 0.86094 [0.00001] d
Epoch = 131.5924 [0.0029] BKJD
Rp/R* = 0.0117 [0.0028]
a/R* = 1.25 [0.65]
b = 0.90 [0.32]
Seff = 13209.03 [5548.24]
Teq = 2734 [287] K
Rp = 1.90 [0.79] Re
a = 0.0198 [0.0054] AU
Ag = 8.54 [5.35] [1.41σ]
Teffp = 7225 [951] K [4.52σ]

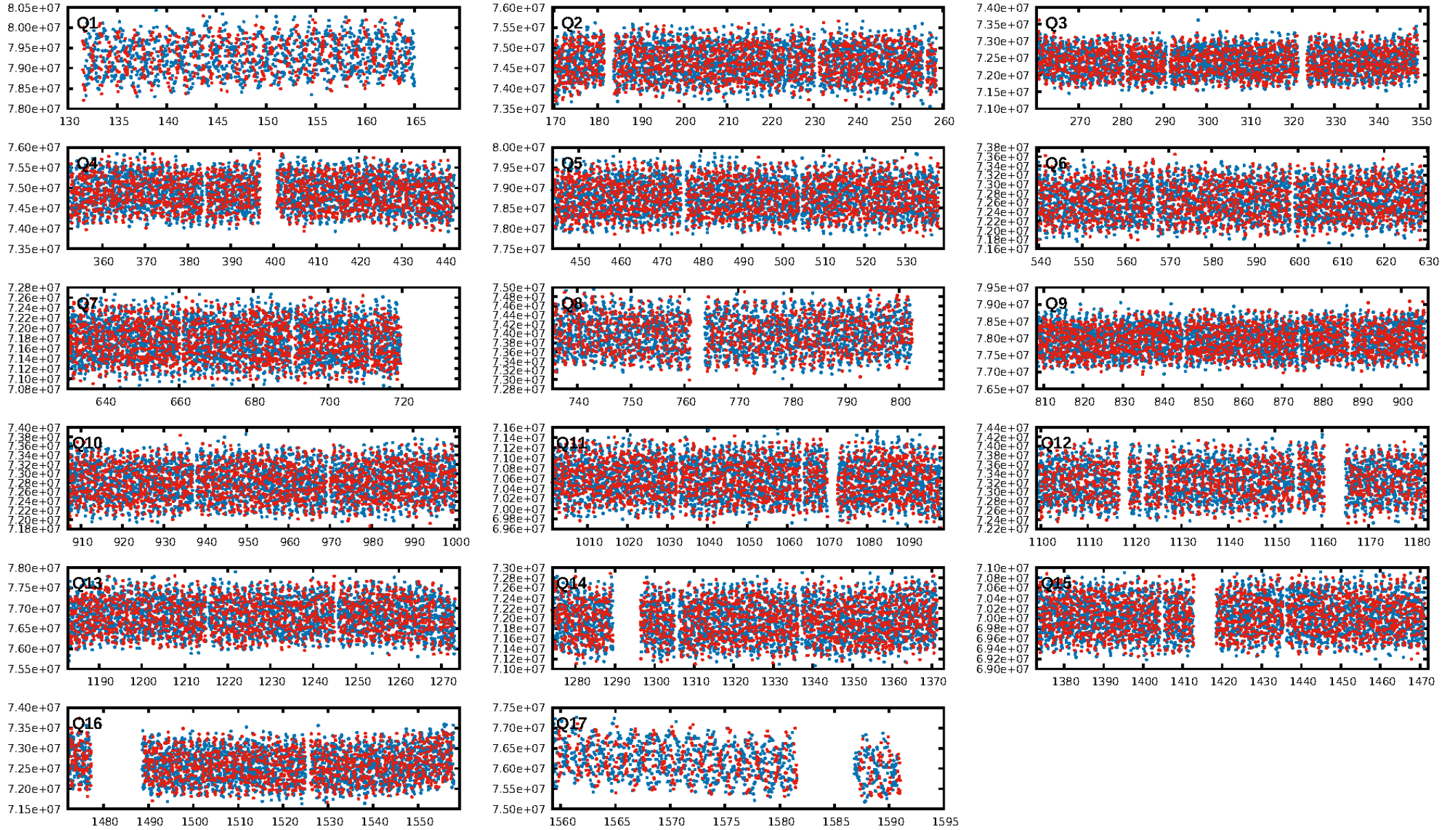
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [1481/1490]
GhostDiagnostic-chr: 3.137
Centroid-sig: 0.0%
Centroid-so: 0.681 arcsec [2.14σ]
OotOffset-rm: 0.039 arcsec [0.41σ]
KicOffset-rm: 0.175 arcsec [1.98σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

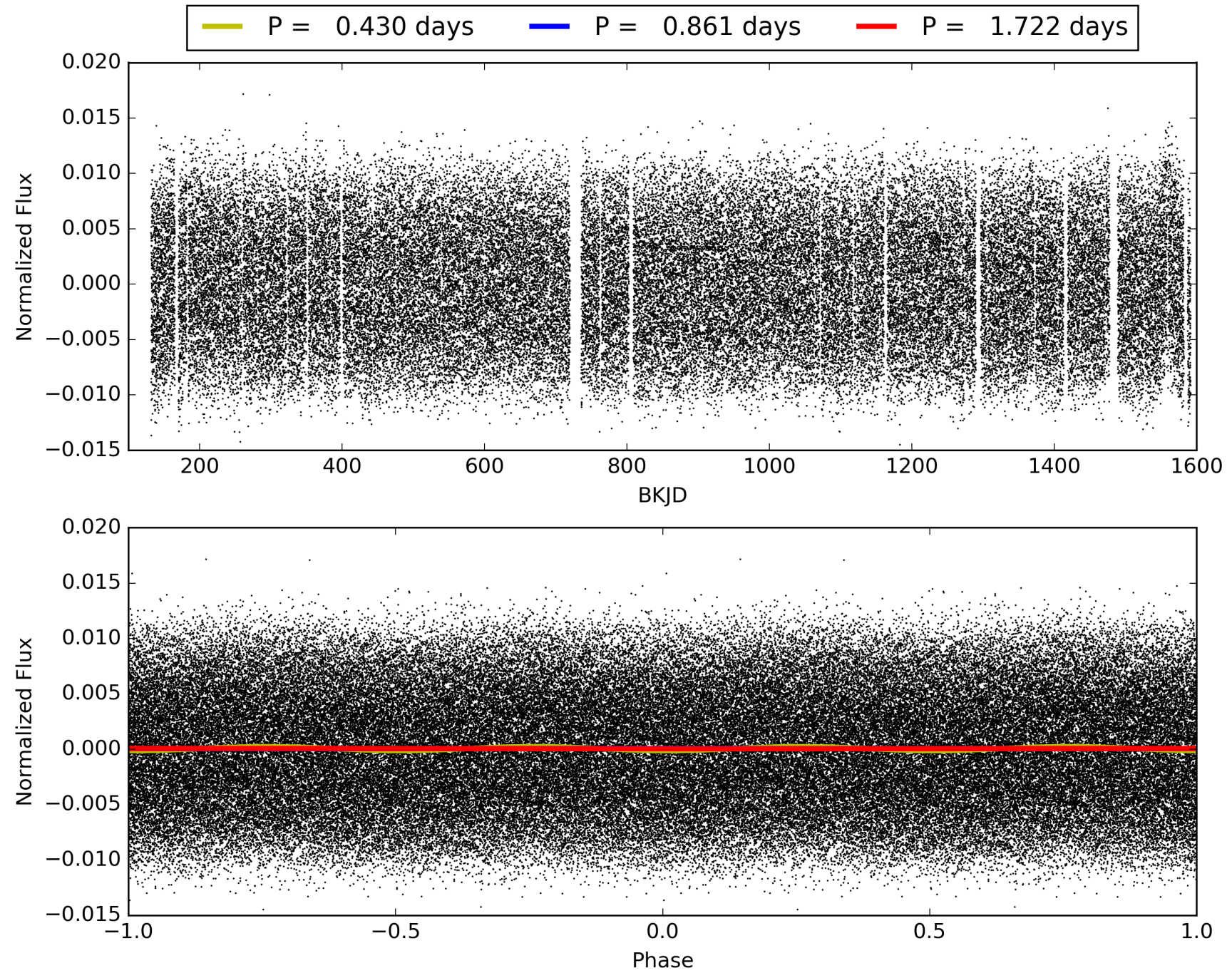
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 10:22:14 Z

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

TCE 006224312-01, PDC Light Curves

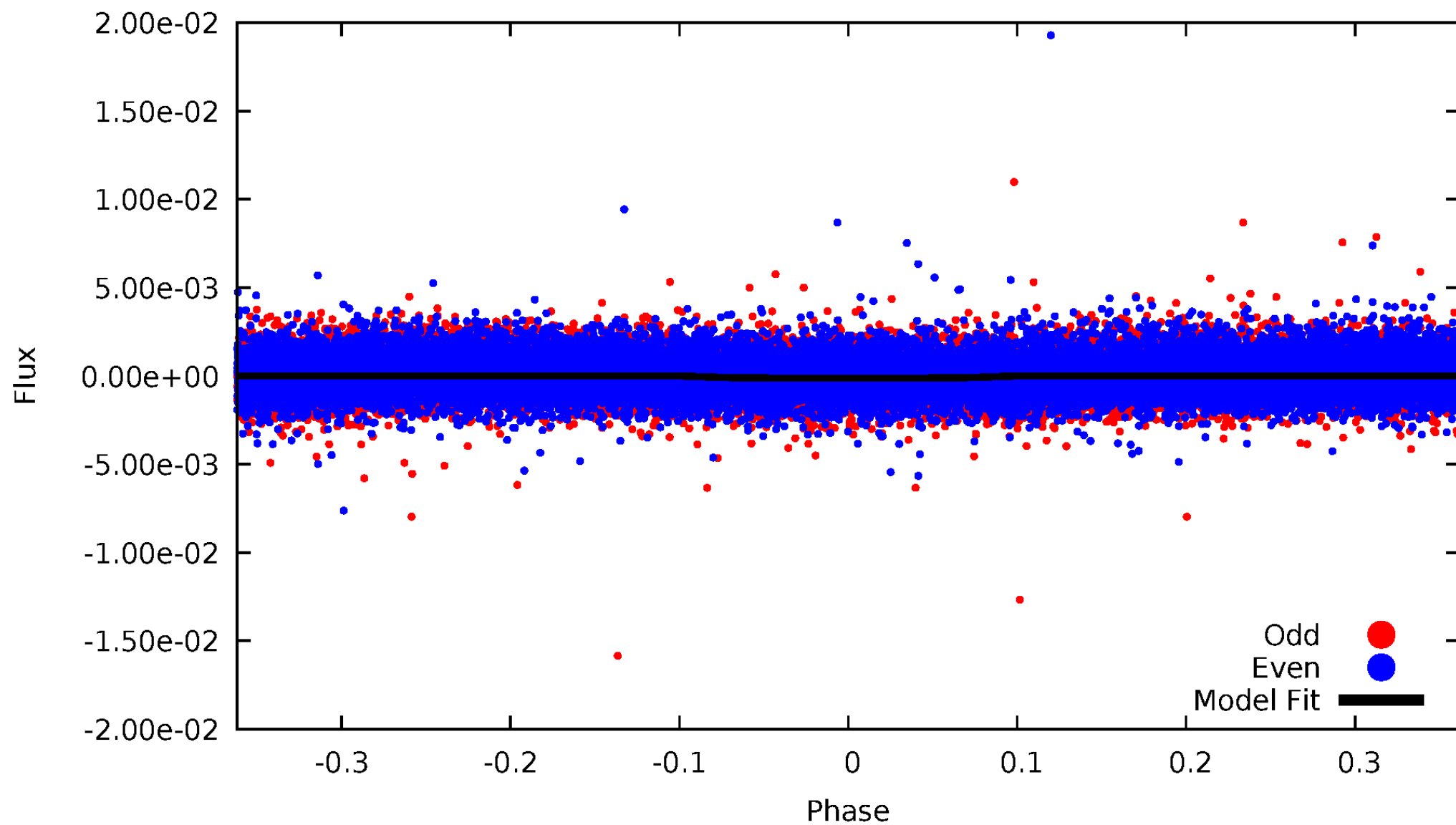


TCE 006224312-01



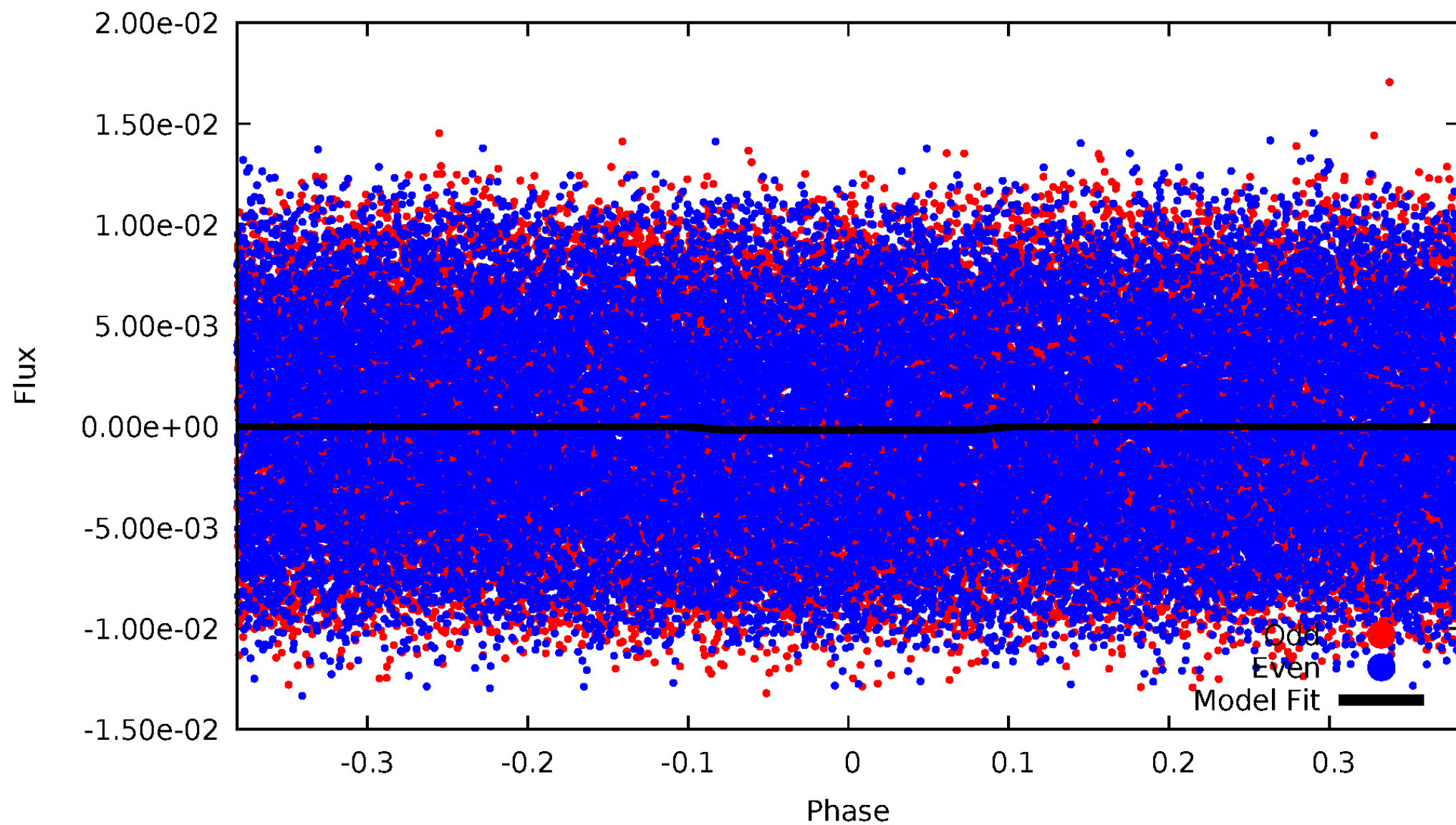
DV Odd/Even

TCE 006224312-01

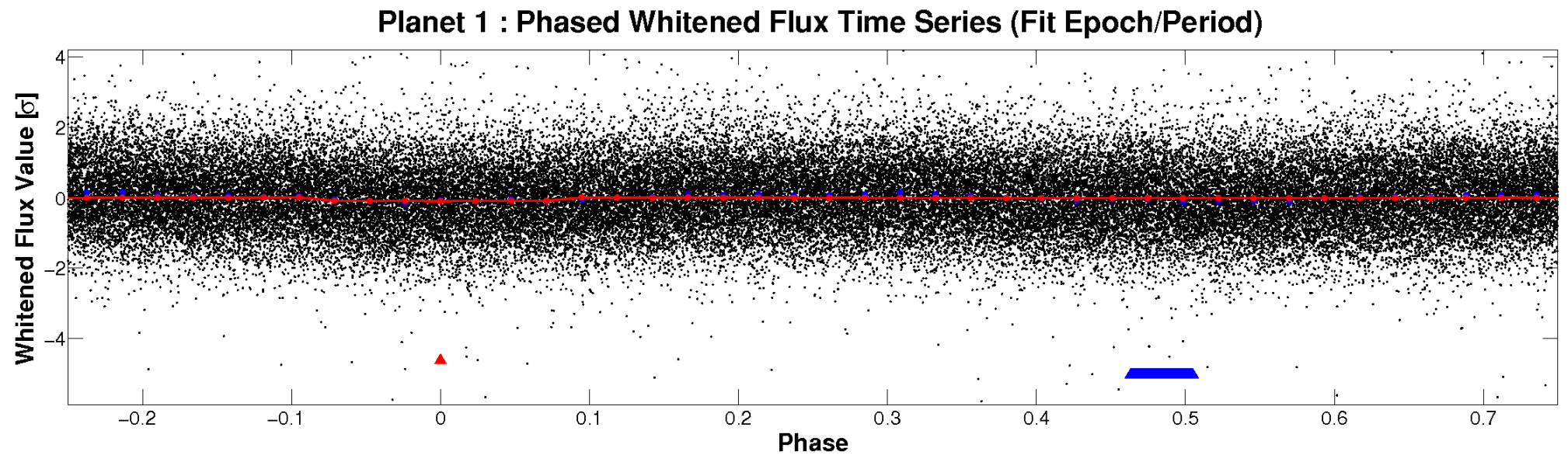
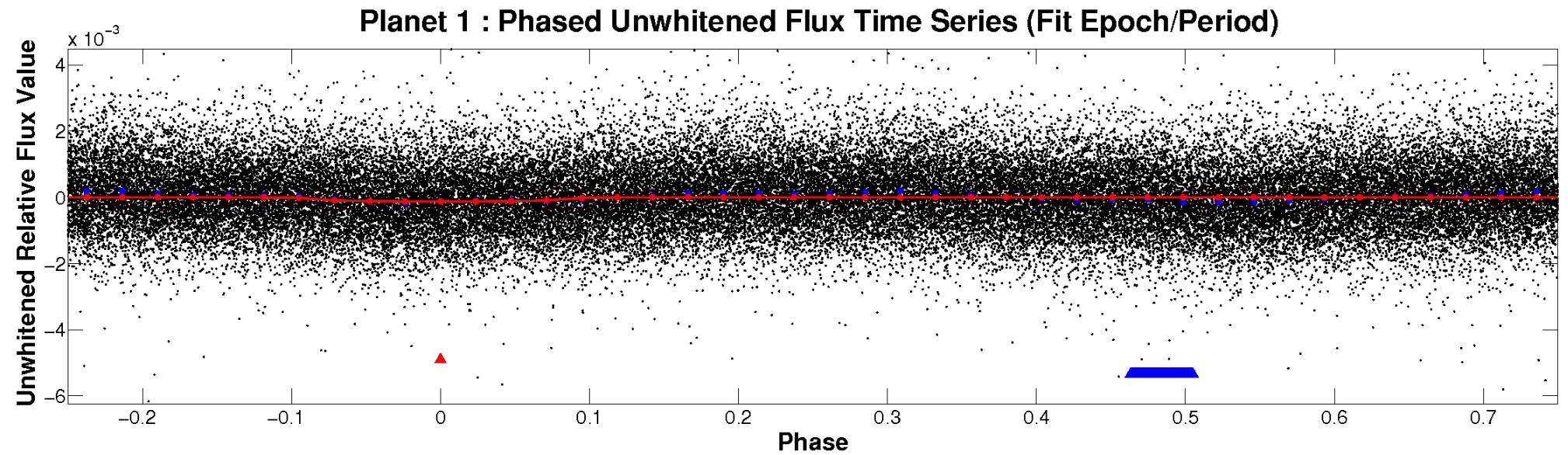


ALT Odd/Even

TCE 006224312-01

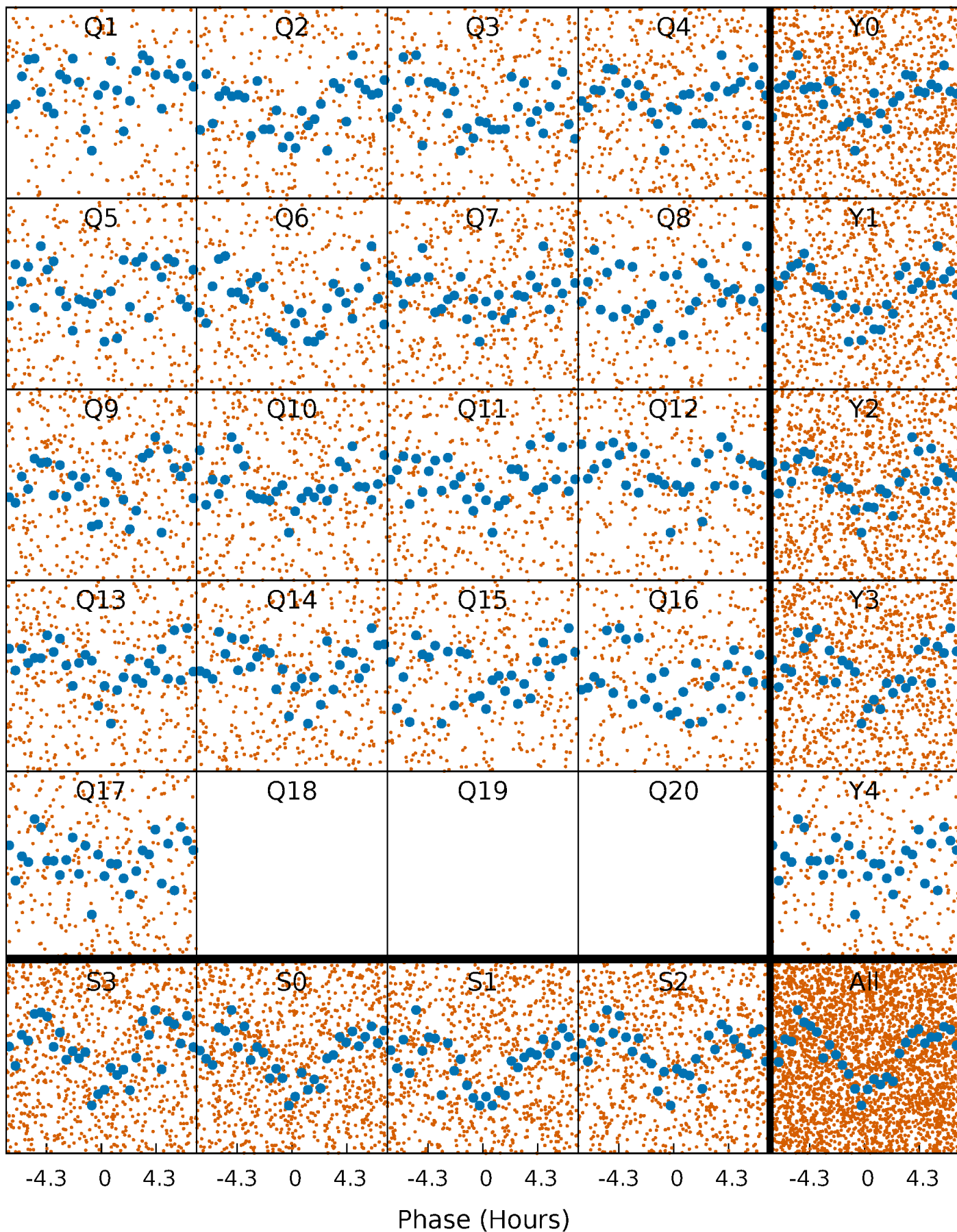


Non-Whitened Vs. Whitened Light Curve



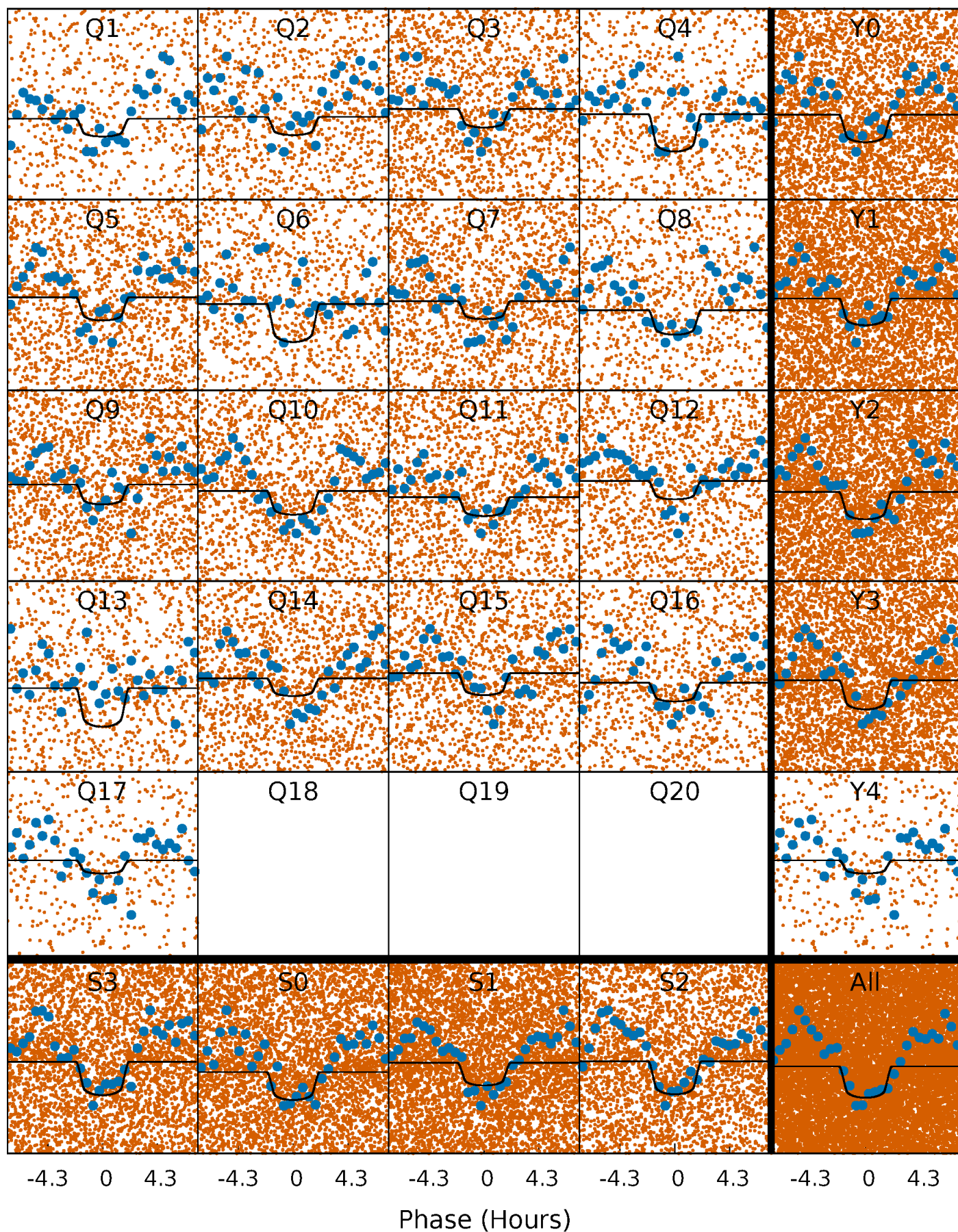
PDC Quarter-Phased Transit Curves

TCE 006224312-01 P= 0.860944 Days $T_0=131.592441$ (BKJD)



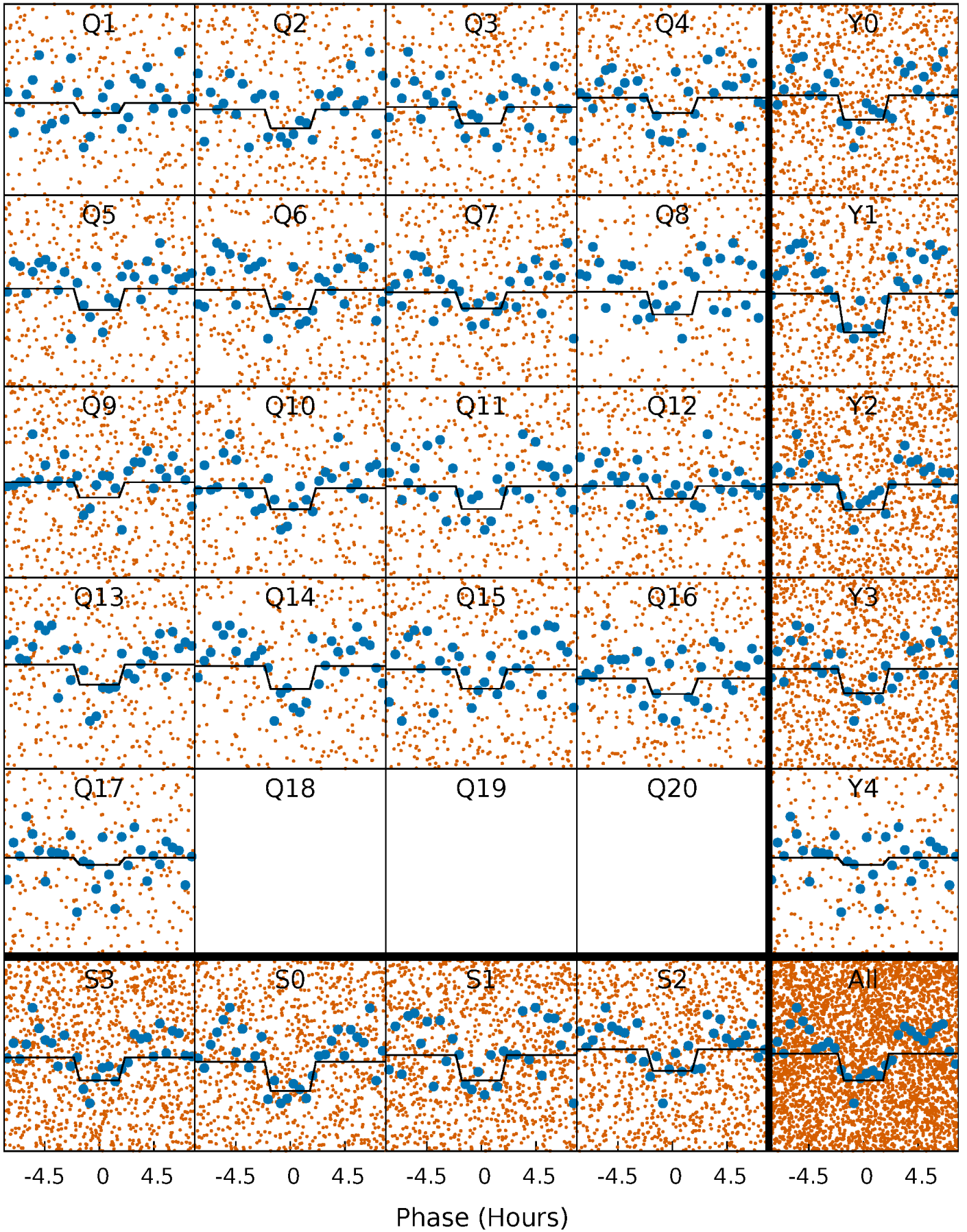
DV Quarter-Phased Transit Curves

TCE 006224312-01 P= 0.860944 Days $T_0=131.592441$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

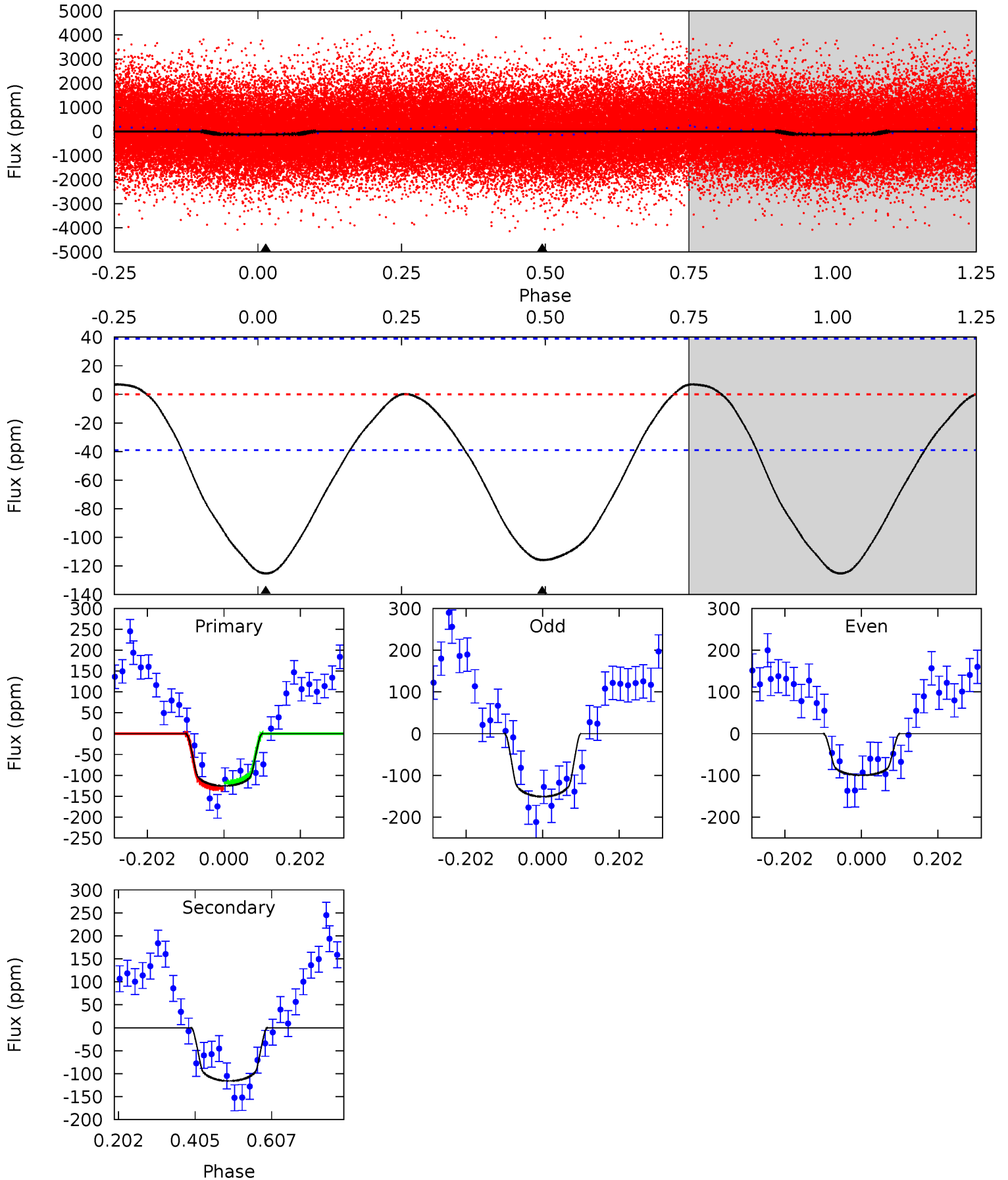
TCE 006224312-01 P= 0.860971 Days $T_0=131.588365$ (BKJD)



DV Model-Shift Uniqueness Test

006224312-01, P = 0.860944 Days, E = 130.731497 Days

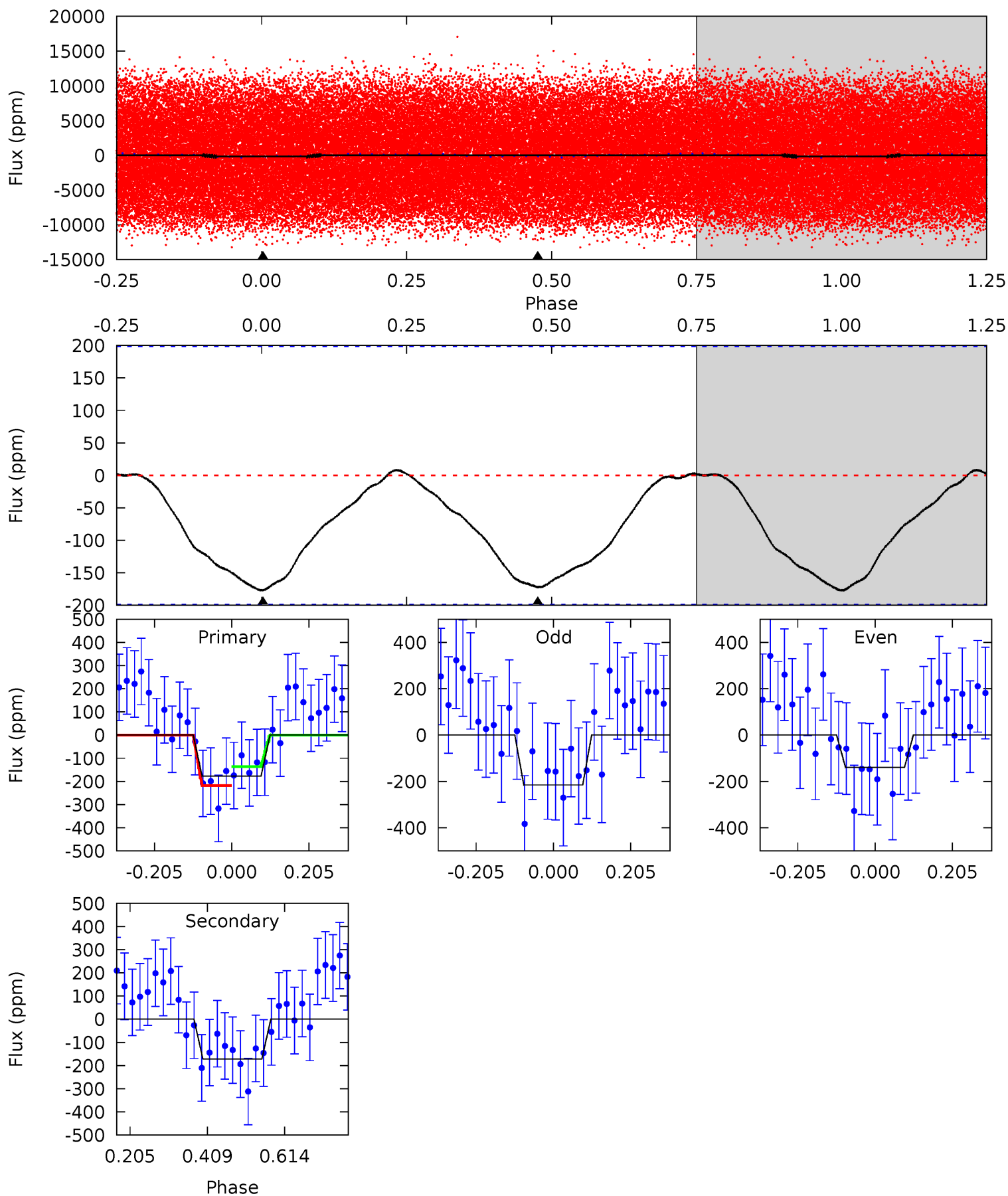
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	13.1	0	0	4.41	1.27	0.56	14.2	14.2	13.1	13.1	2.92	1.04	0.05	0.76



Alt Model-Shift Uniqueness Test

006224312-01, P = 0.860971 Days, E = 130.727394 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.93	3.82	0	0	4.41	1.27	0.09	3.93	3.93	3.82	3.82	0.84	1.14	0.04	0.90



Stellar Parameters For KIC 006224312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7136^{+200}_{-314}	$4.234^{+0.093}_{-0.201}$	$-0.160^{+0.250}_{-0.350}$	$1.490^{+0.501}_{-0.231}$	$1.395^{+0.218}_{-0.218}$	$0.593^{+0.298}_{-0.316}$
	+3%/-4%	+2%/-5%	+156%/-219%	+34%/-16%	+16%/-16%	+50%/-53%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 006224312-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-116 ± 9	$1.94^{+0.61}_{-0.51}$	3867^{+270}_{-237}	6699^{+1330}_{-815}	$6.487^{+5.130}_{-2.719}$
Alt.	-172 ± 45	$2.23^{+0.57}_{-0.55}$	3857^{+292}_{-223}	6928^{+1278}_{-877}	$7.331^{+5.632}_{-3.114}$

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 $A_{obs} \gg 1.0$

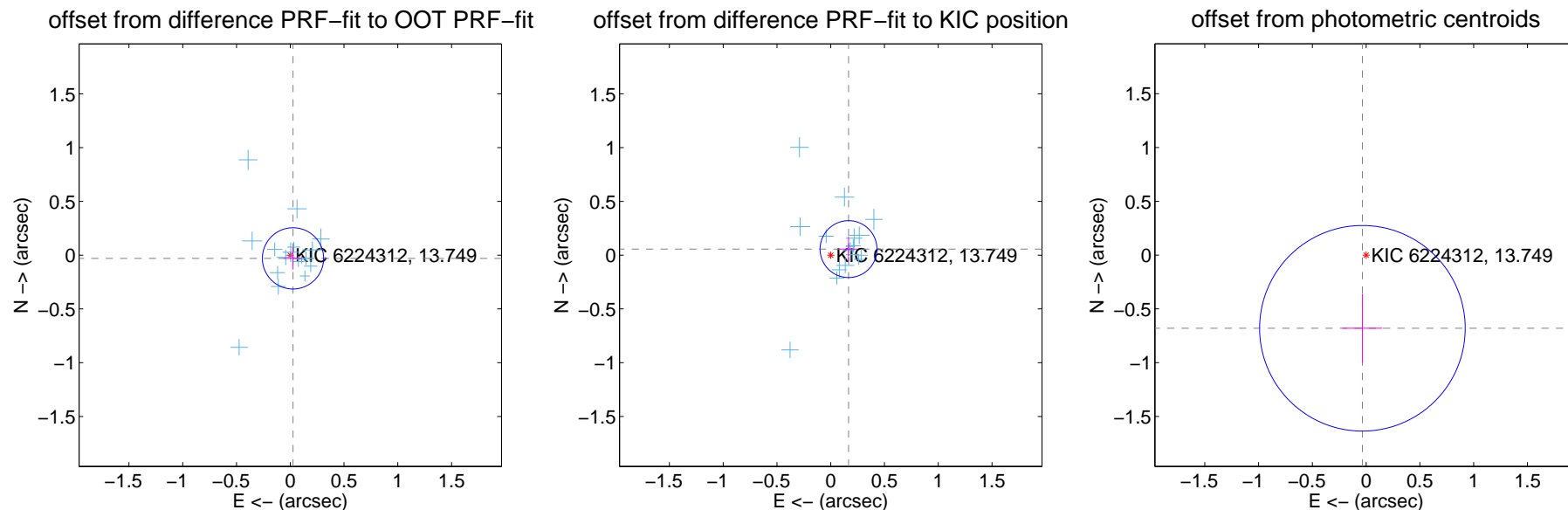
DV Centroid Data

Supplemental centroid analysis for 006224312-01. Kepler magnitude: 13.75. Transit SNR 8.92

There are 17 quarters with good PRF difference image offsets

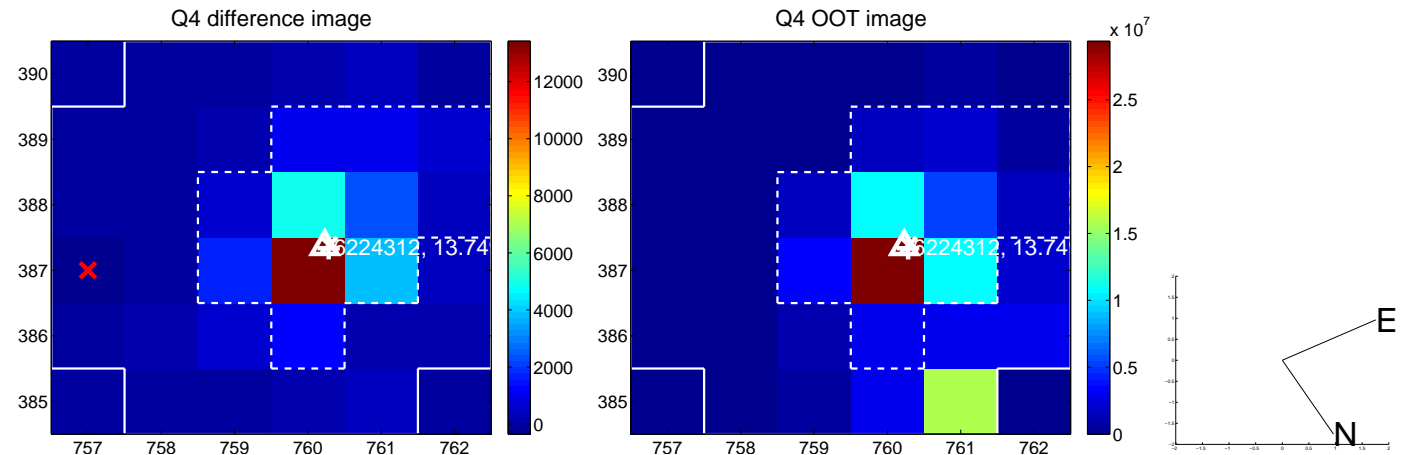
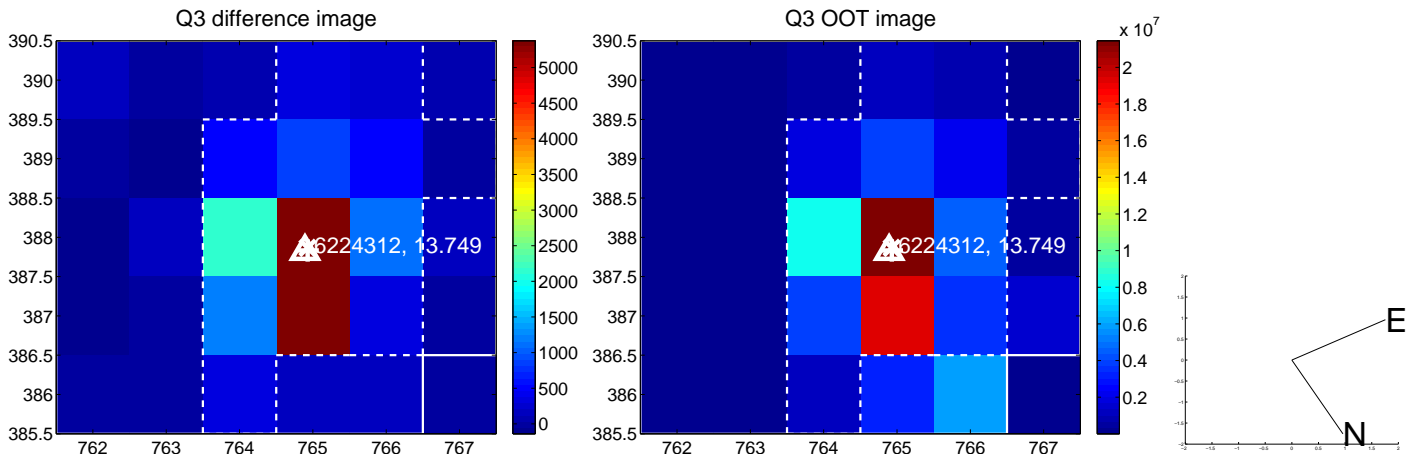
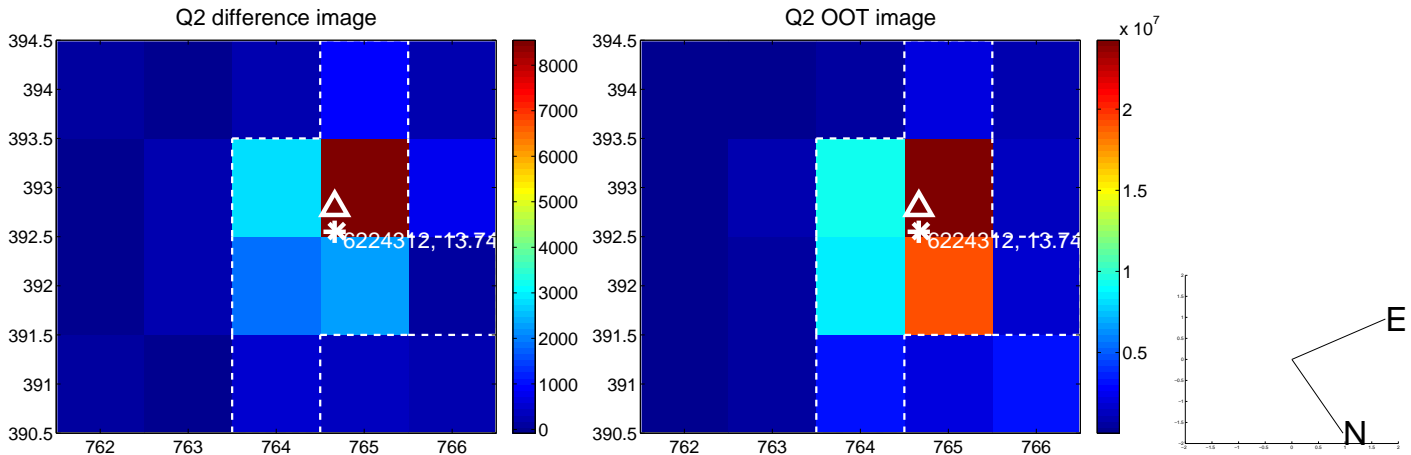
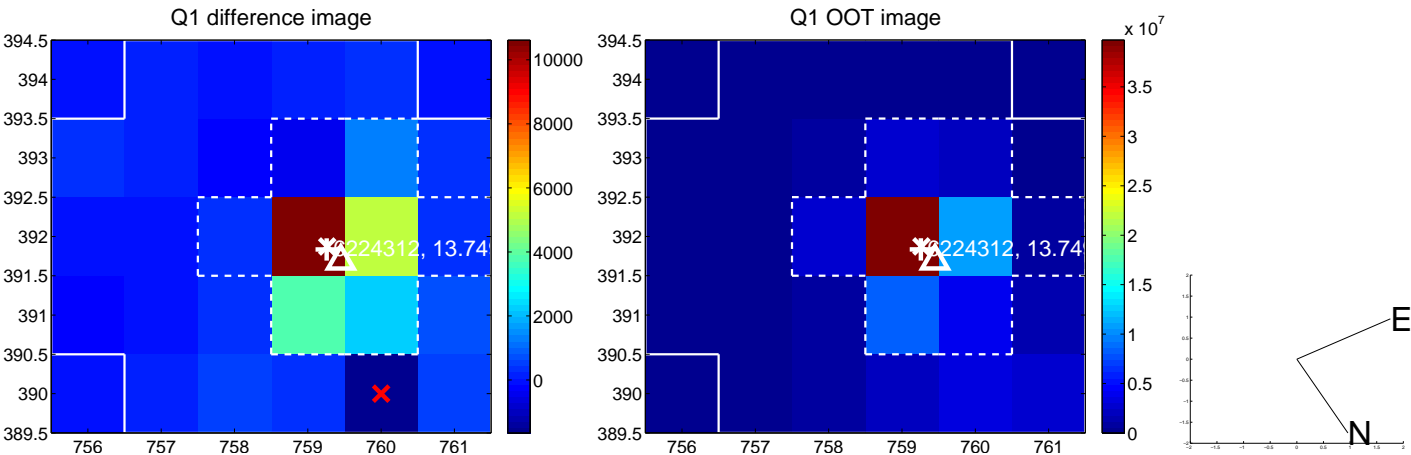
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.039 ± 0.095	0.41	-0.025 ± 0.084	-0.030 ± 0.104
PRF-fit source offset from KIC position	0.175 ± 0.088	1.98	-0.166 ± 0.084	0.056 ± 0.115
photometric centroid source offset	0.68 ± 0.32	2.14	0.03 ± 0.18	-0.68 ± 0.32

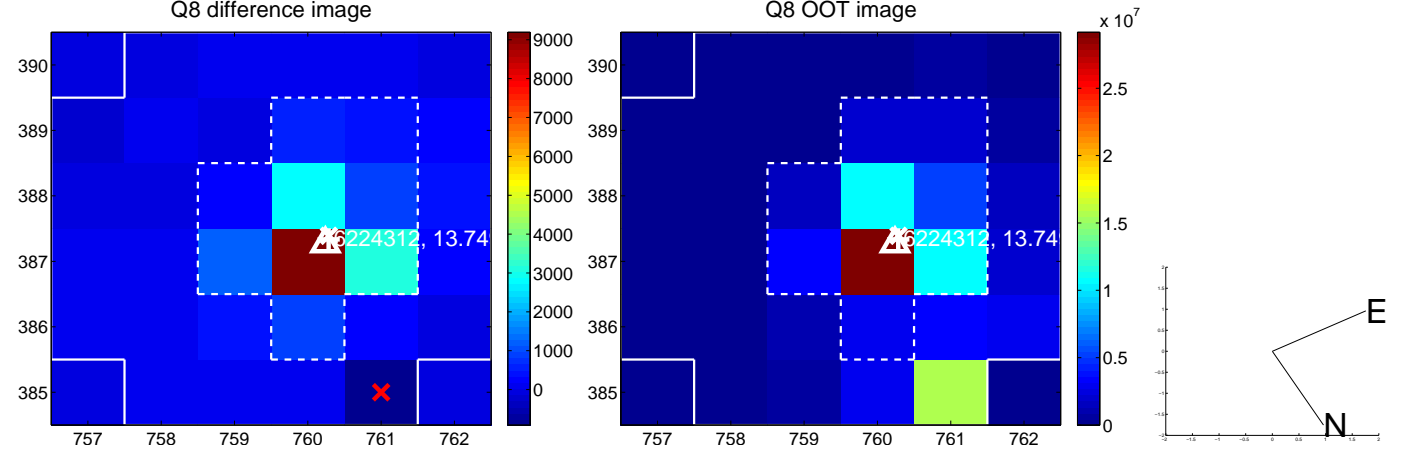
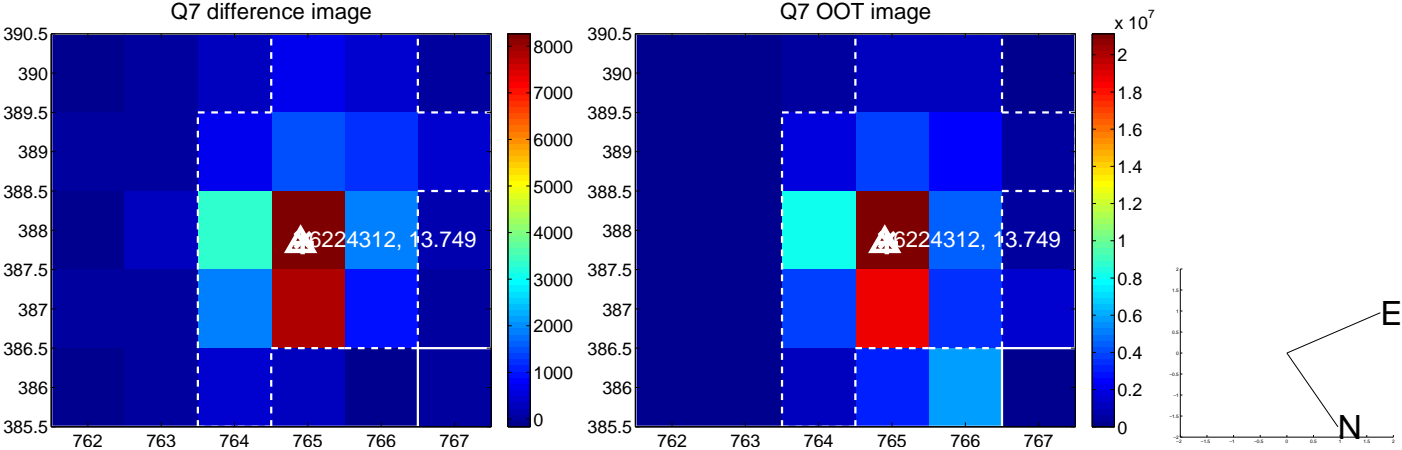
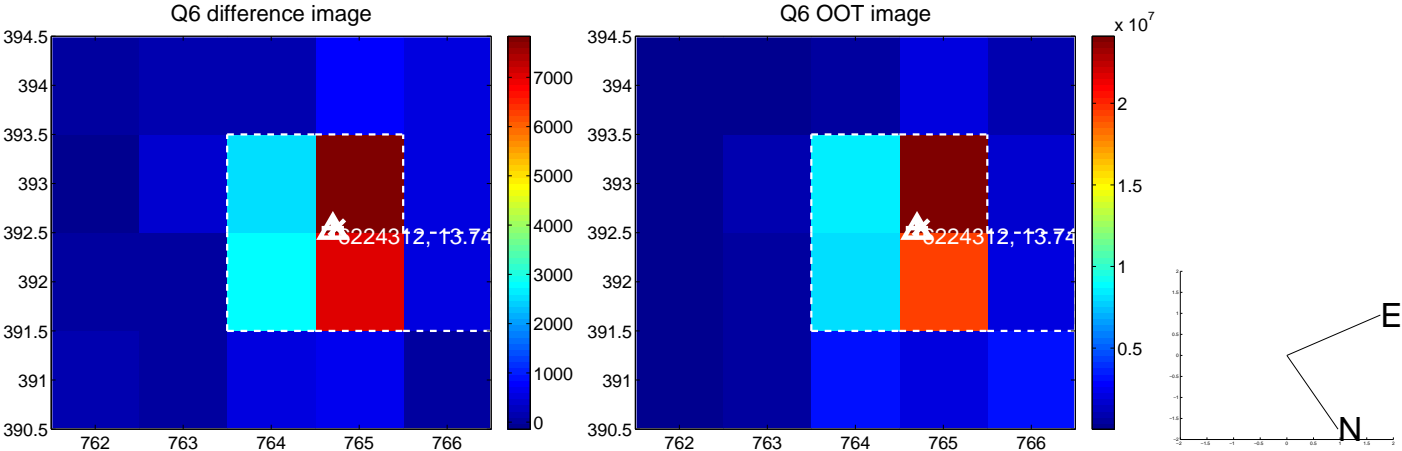
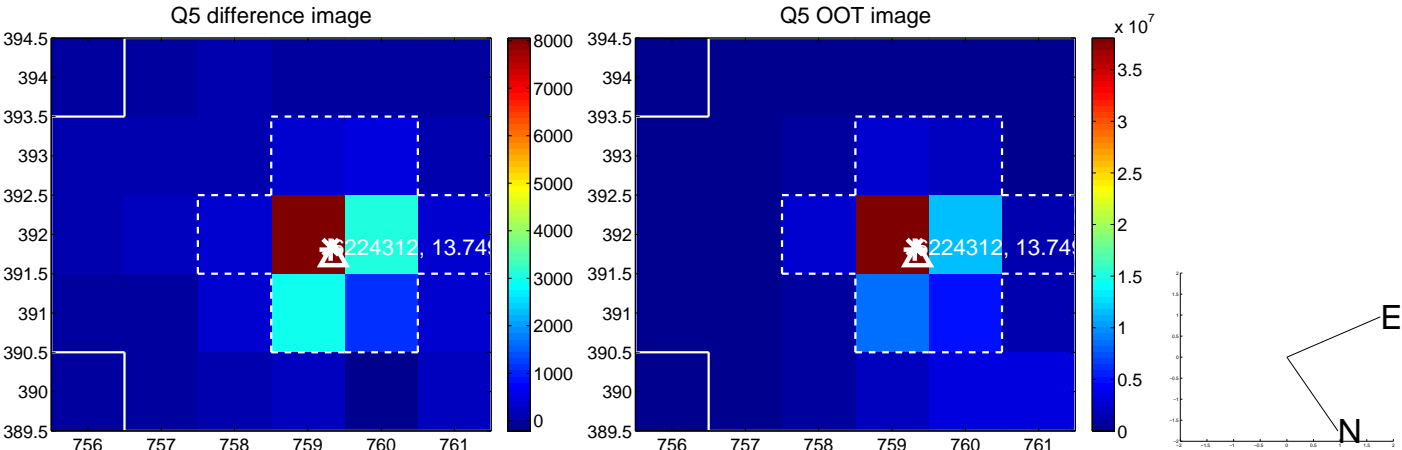


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

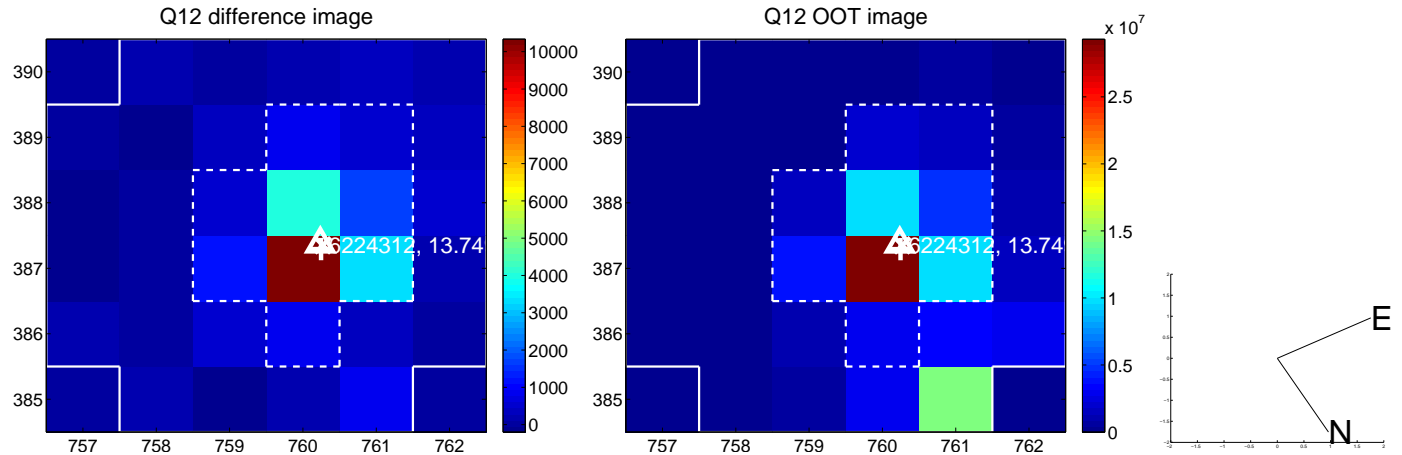
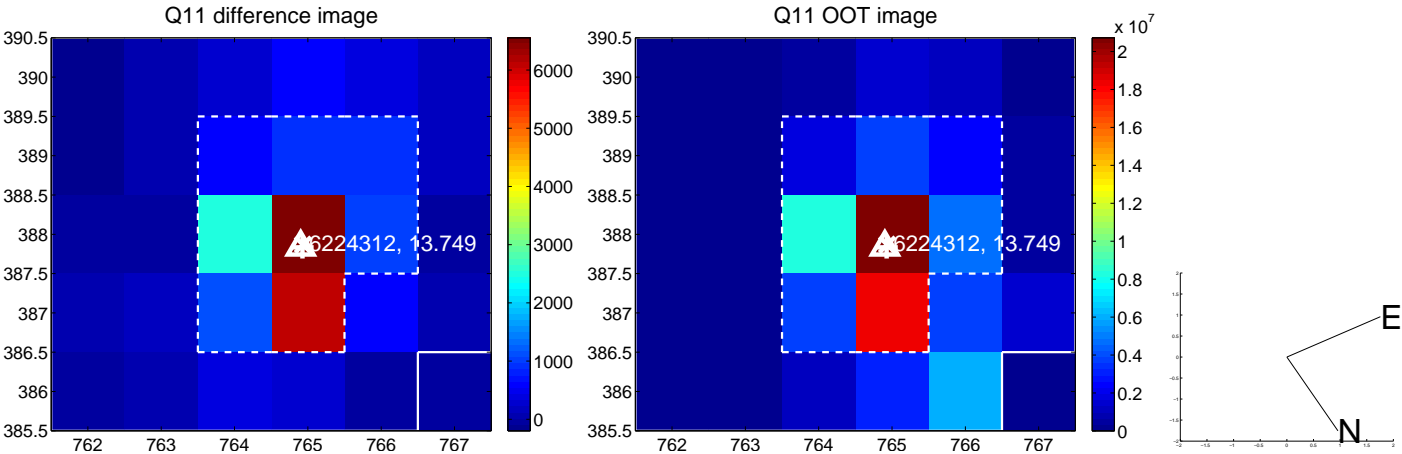
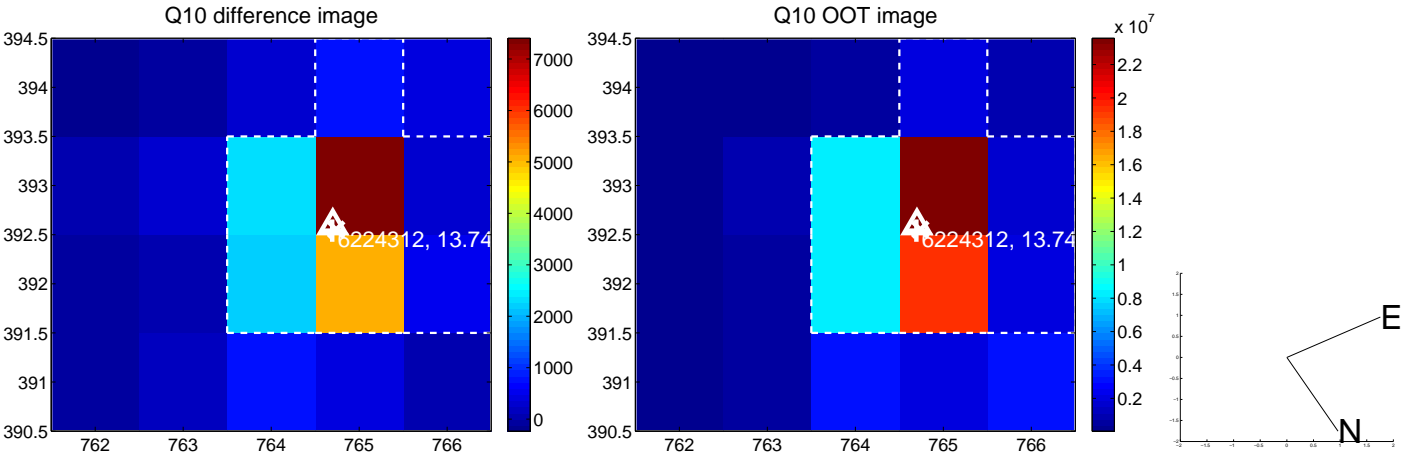
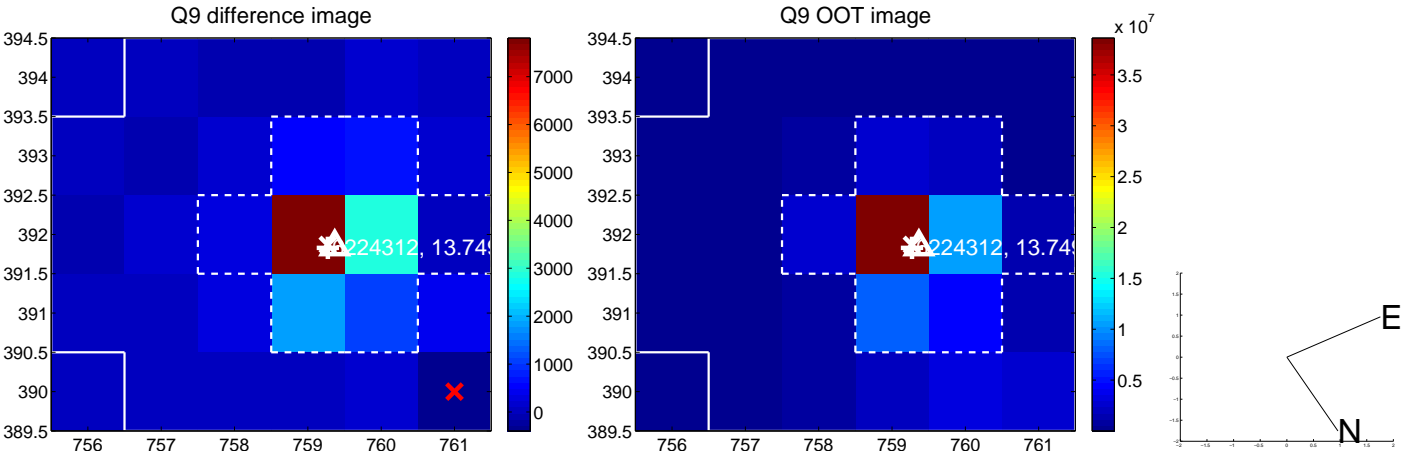
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



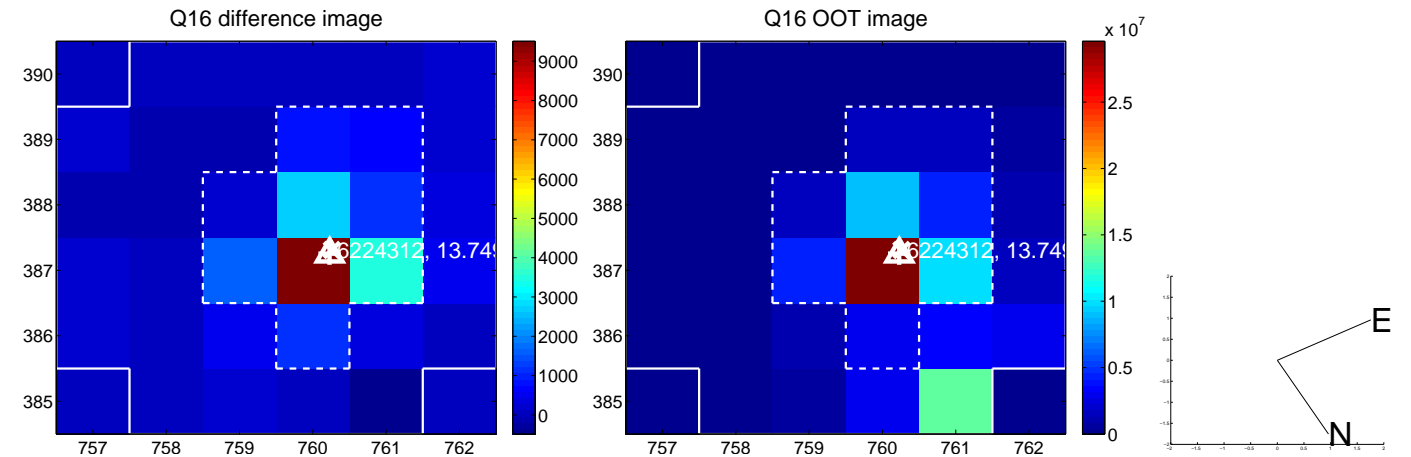
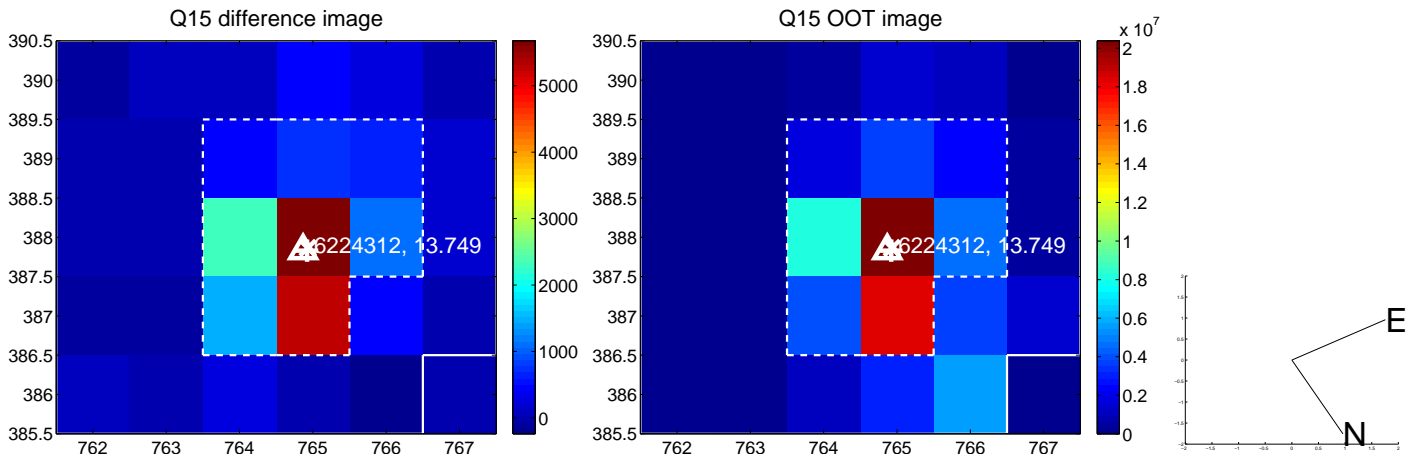
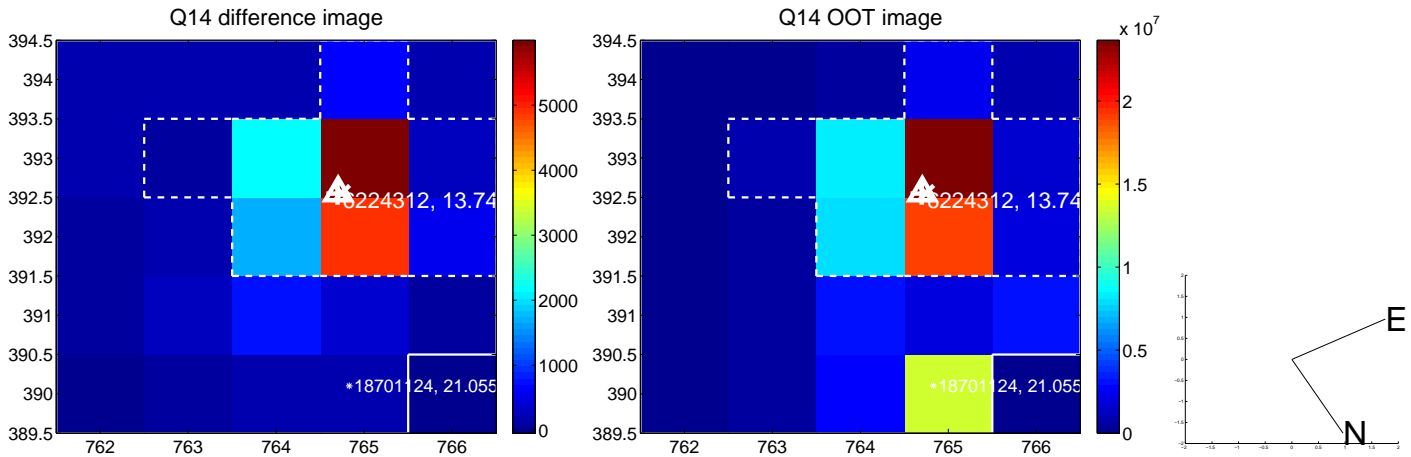
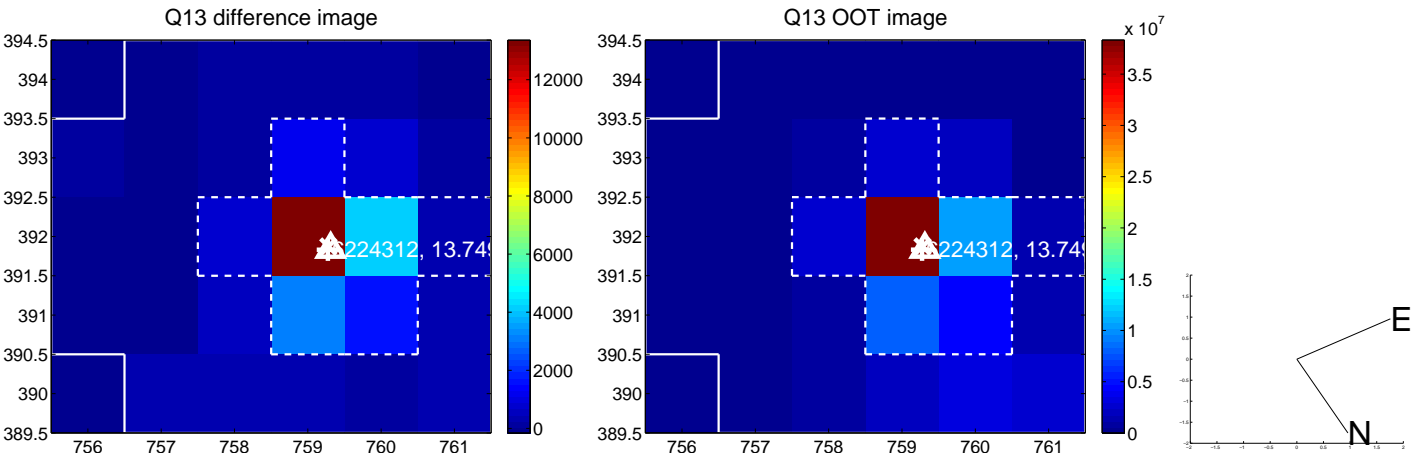
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



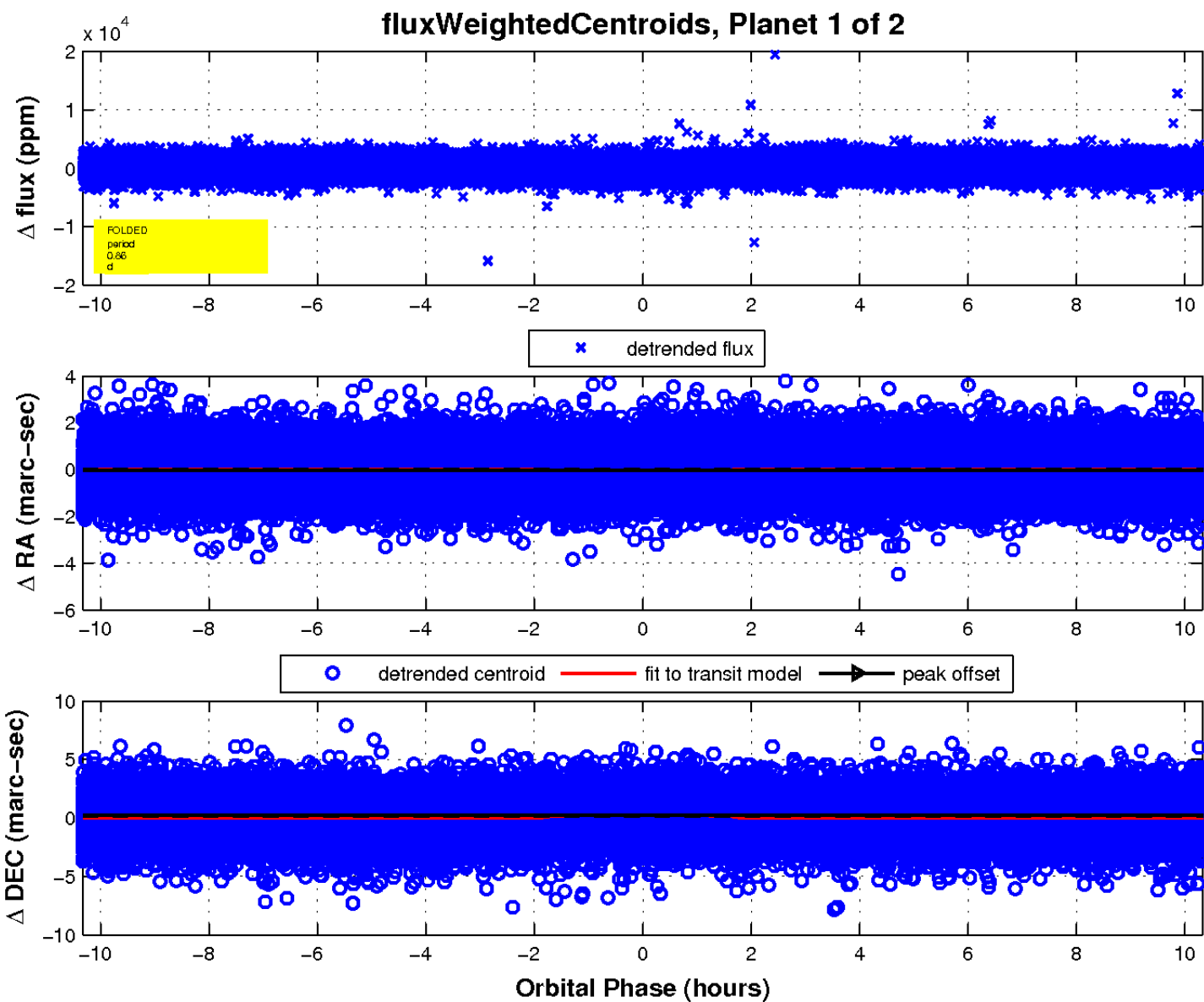
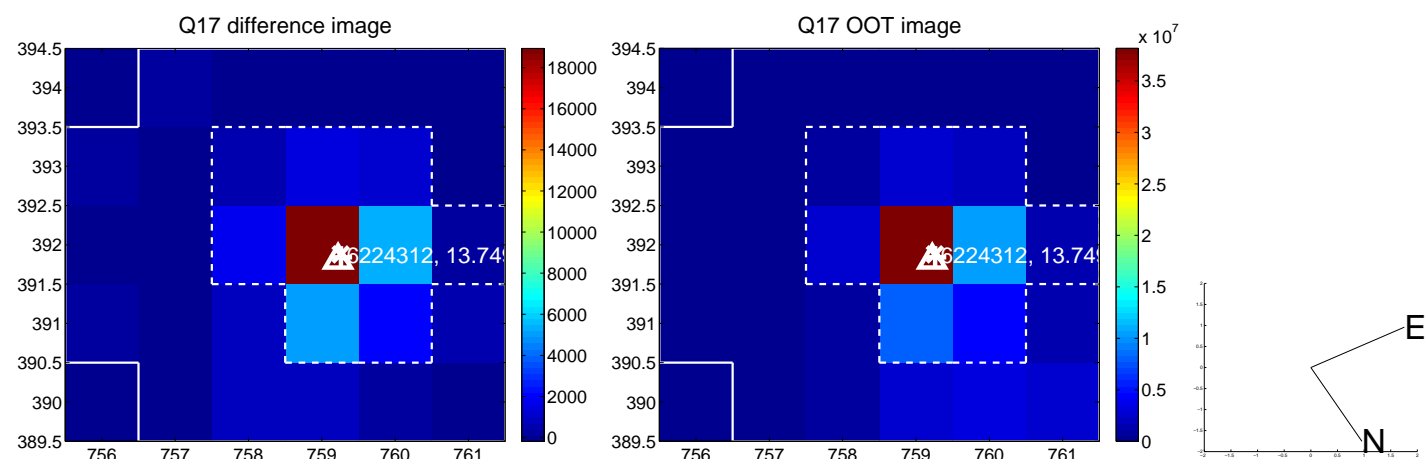
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

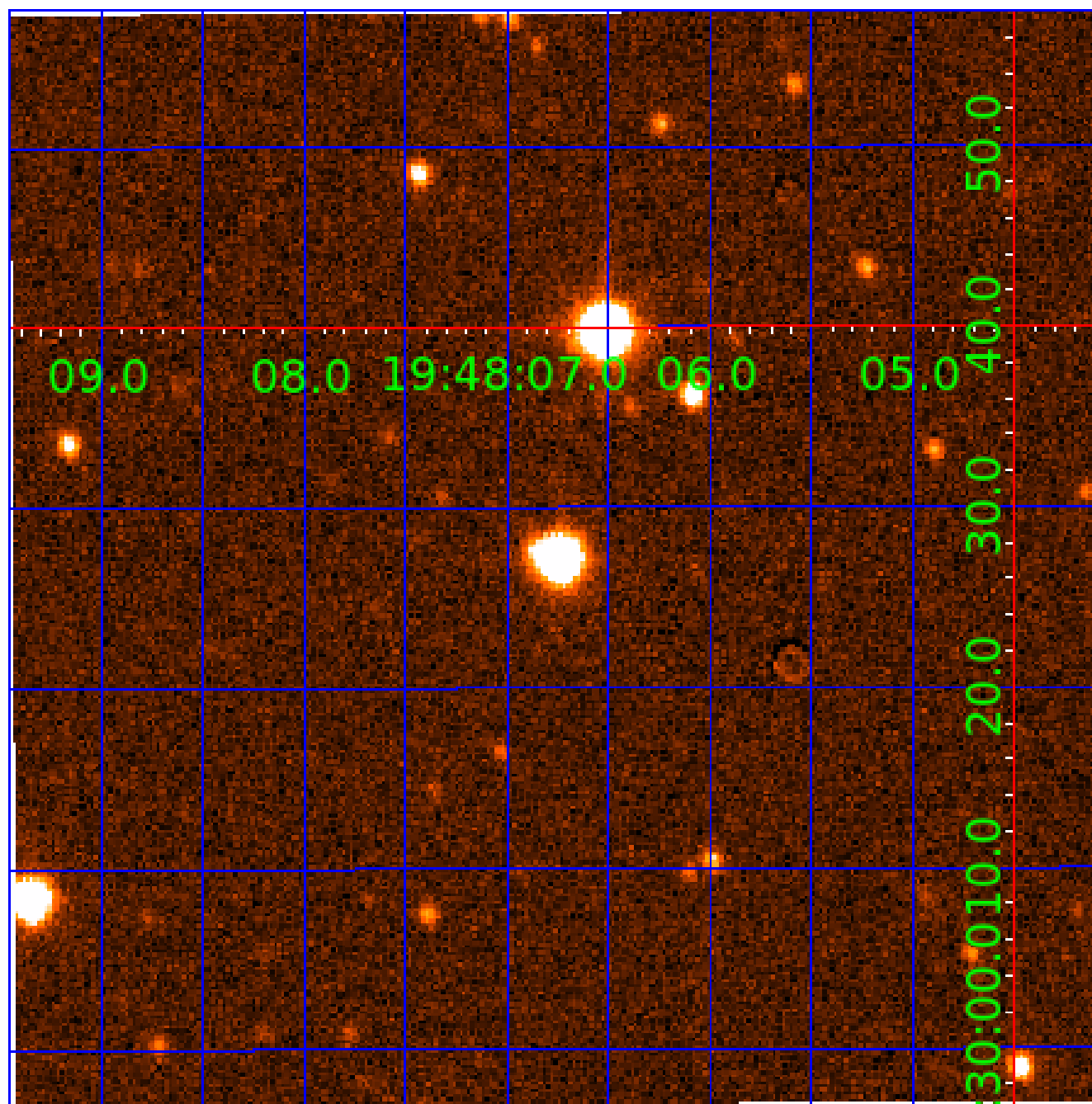


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006224312

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})
006224312-01	OBS	No	0.860944	131.592441	121.5	3.739	9.1	8.9	1.49	7136	1.90	13209.03
006224312-02	OBS	No	0.860966	131.991240	110.9	4.787	10.4	11.2	1.49	7136	1.59	13208.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006224312-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006224312-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD

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

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

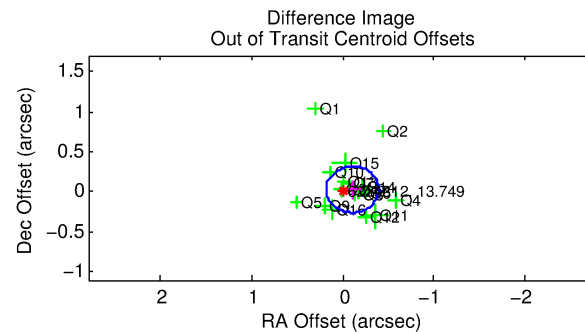
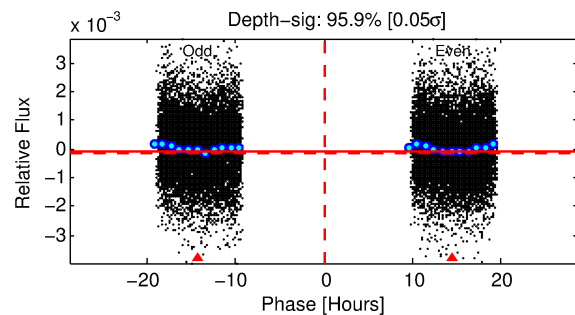
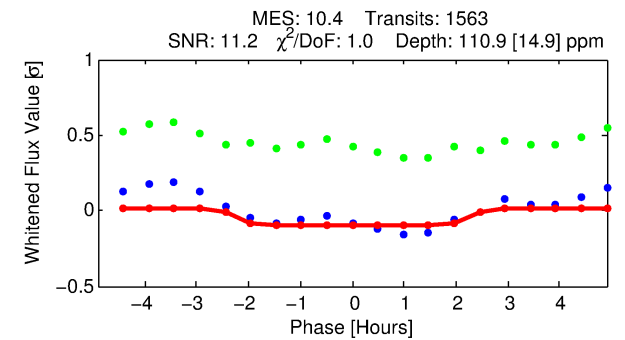
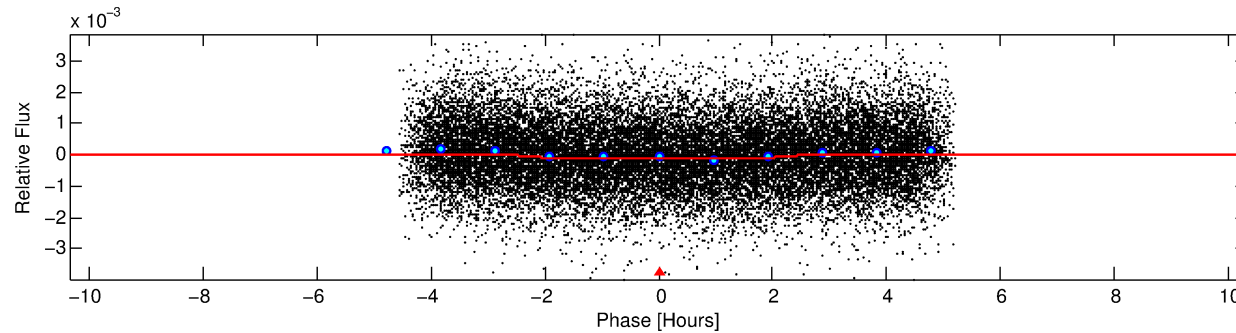
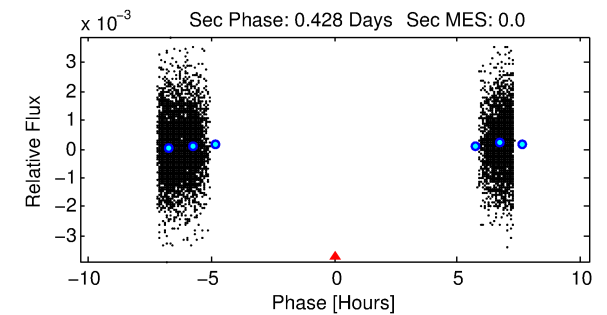
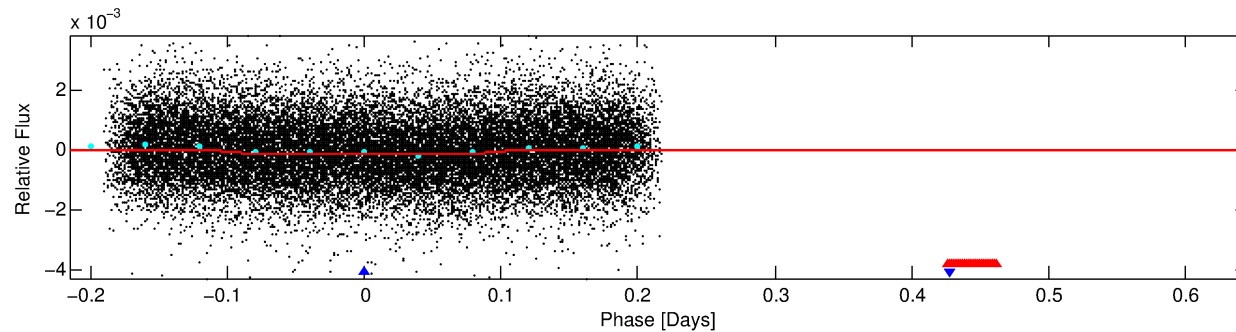
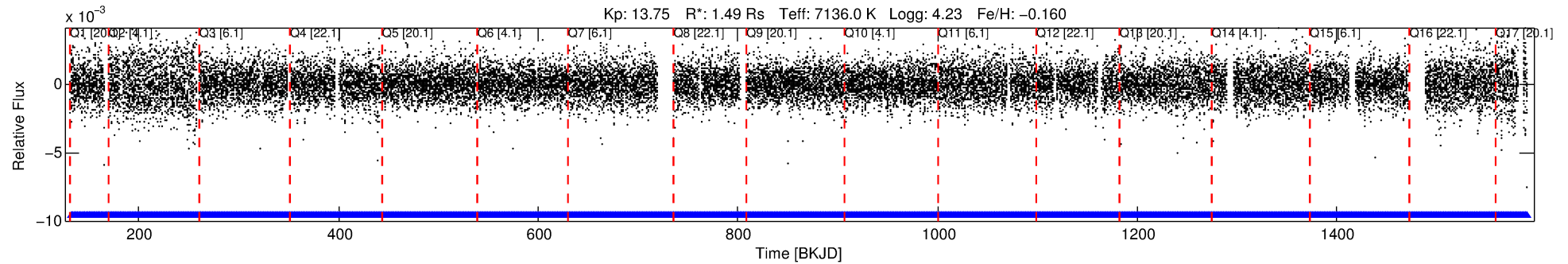
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006224312-02

No Significant Match Found

DV One-Page Summary

KIC: 6224312 Candidate: 2 of 2 Period: 0.861 d



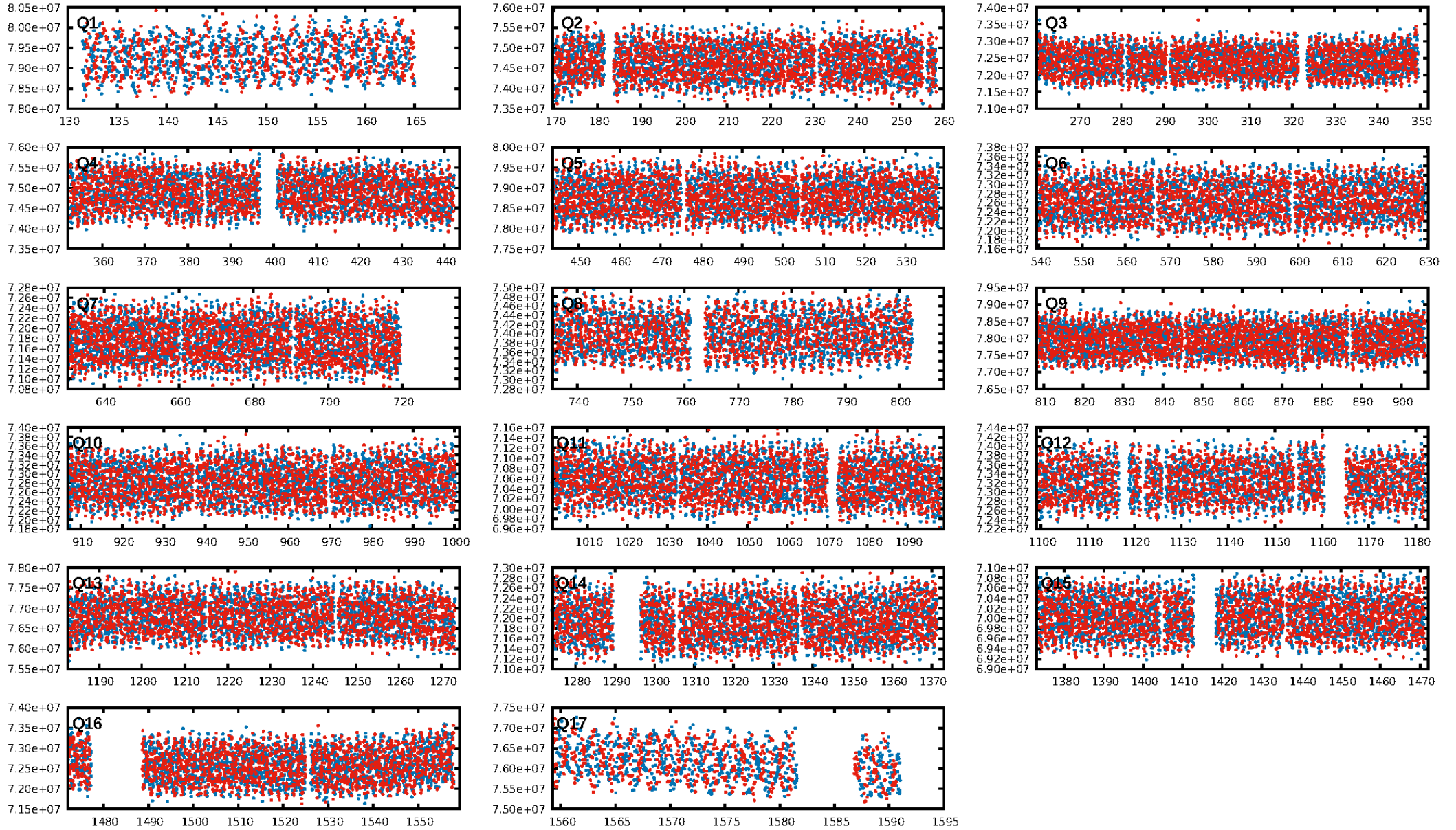
DV Fit Results:

Period = 0.86097 [0.00001] d
Epoch = 131.9912 [0.0038] BKJD
Rp/R* = 0.0098 [0.0089]
a/R* = 1.51 [4.52]
b = 0.10 [52.76]
Seff = 13208.60 [5548.06]
Teq = 2734 [287] K
Rp = 1.59 [1.55] Re
a = 0.0198 [0.0054] AU
Ag = N/A
Teffp = N/A

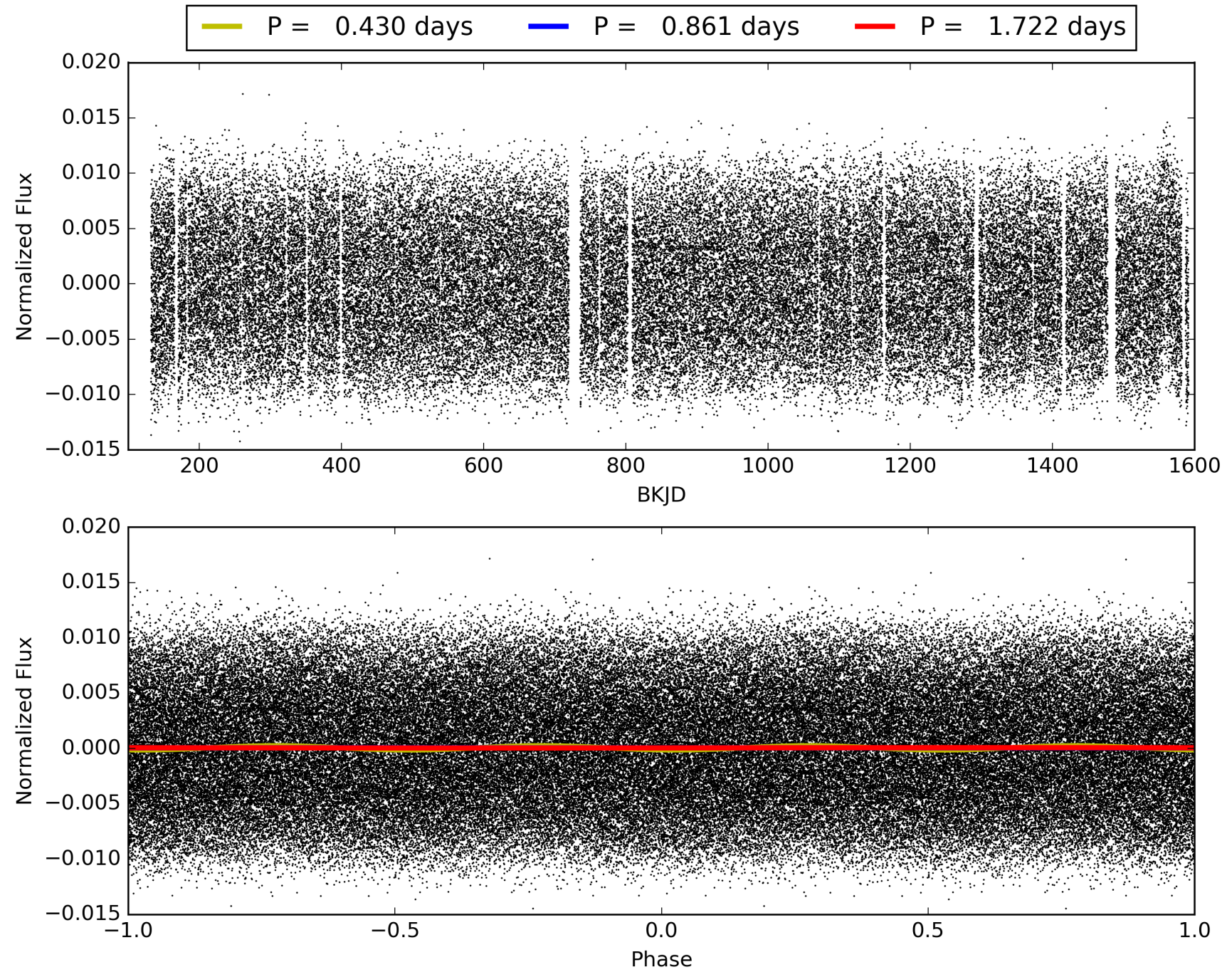
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1493/1493]
GhostDiagnostic-chr: 1.263
Centroid-sig: 0.0%
Centroid-so: 0.756 arcsec [2.54σ]
OotOffset-rm: 0.110 arcsec [1.14σ]
KicOffset-rm: 0.259 arcsec [2.75σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 006224312-02, PDC Light Curves

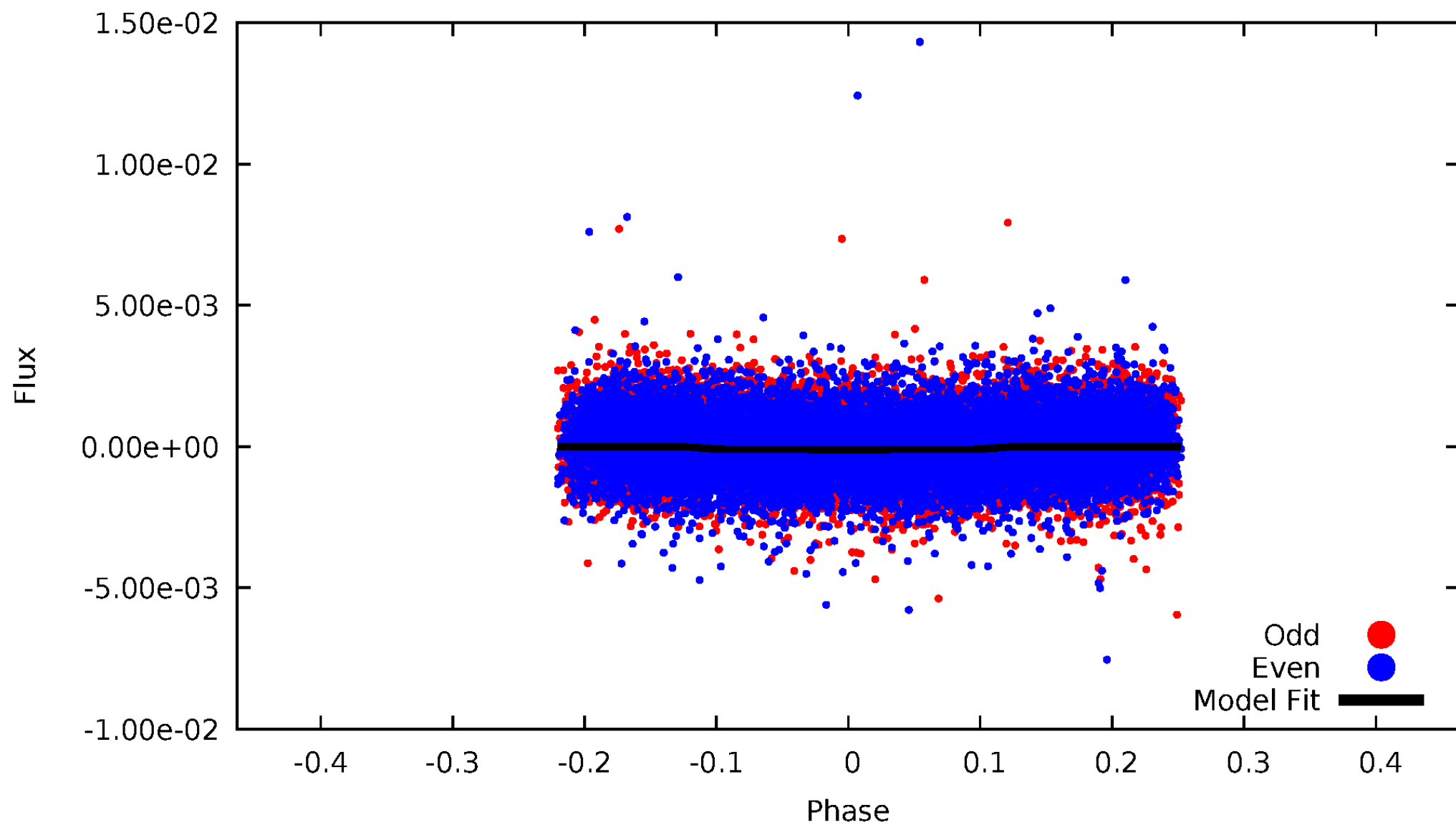


TCE 006224312-02



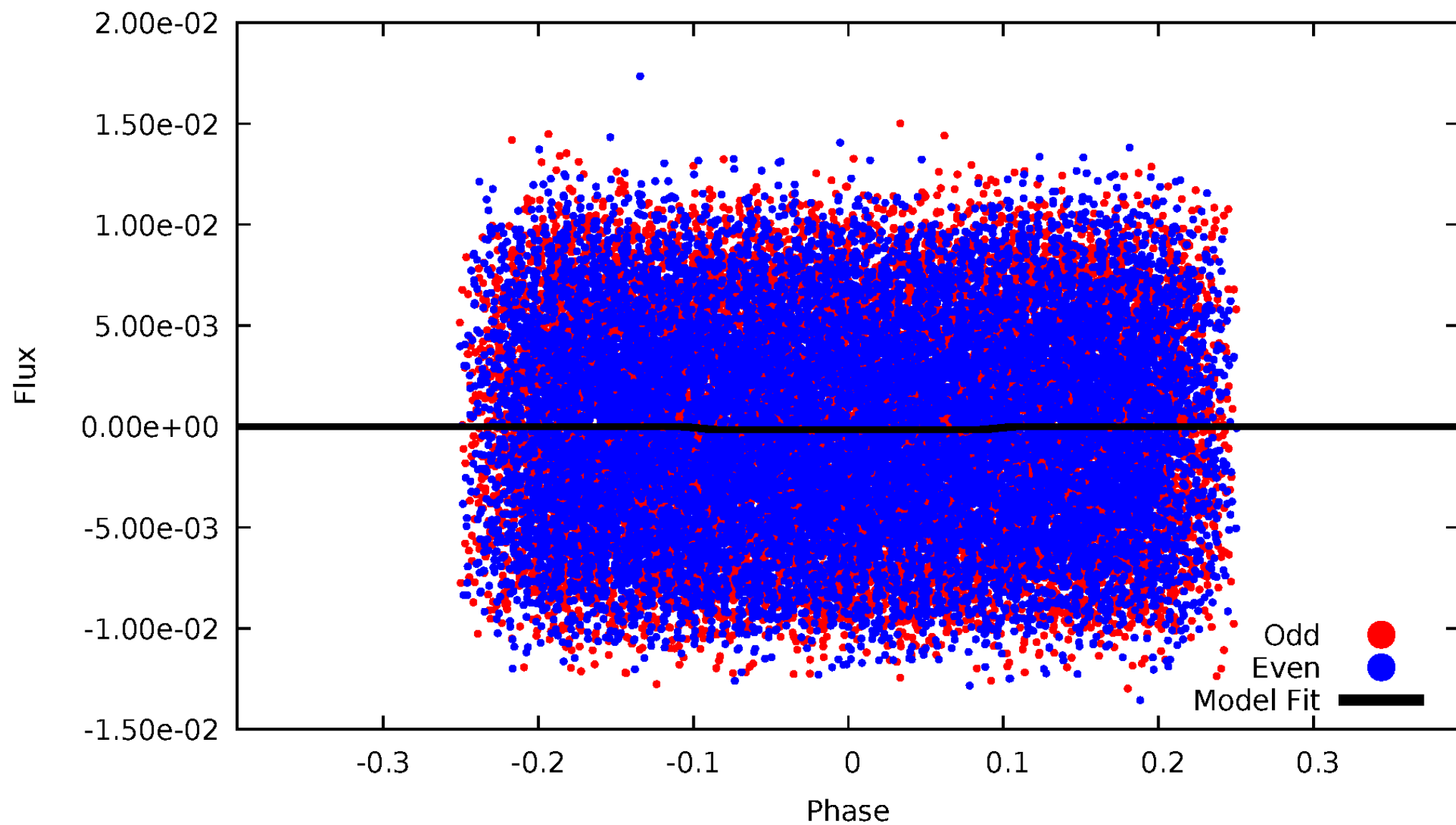
DV Odd/Even

TCE 006224312-02



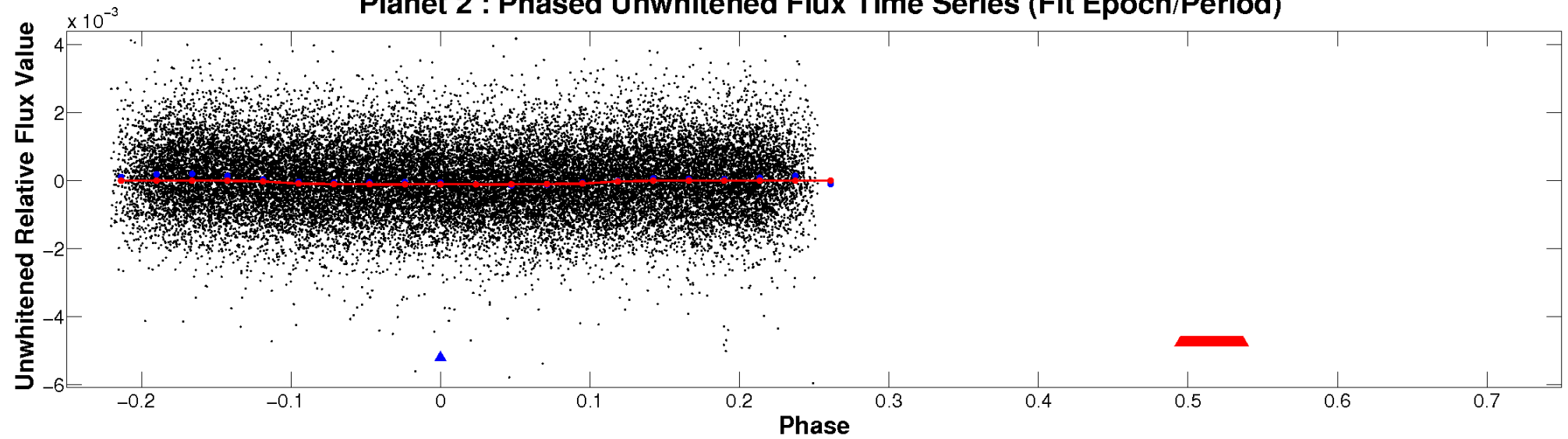
ALT Odd/Even

TCE 006224312-02

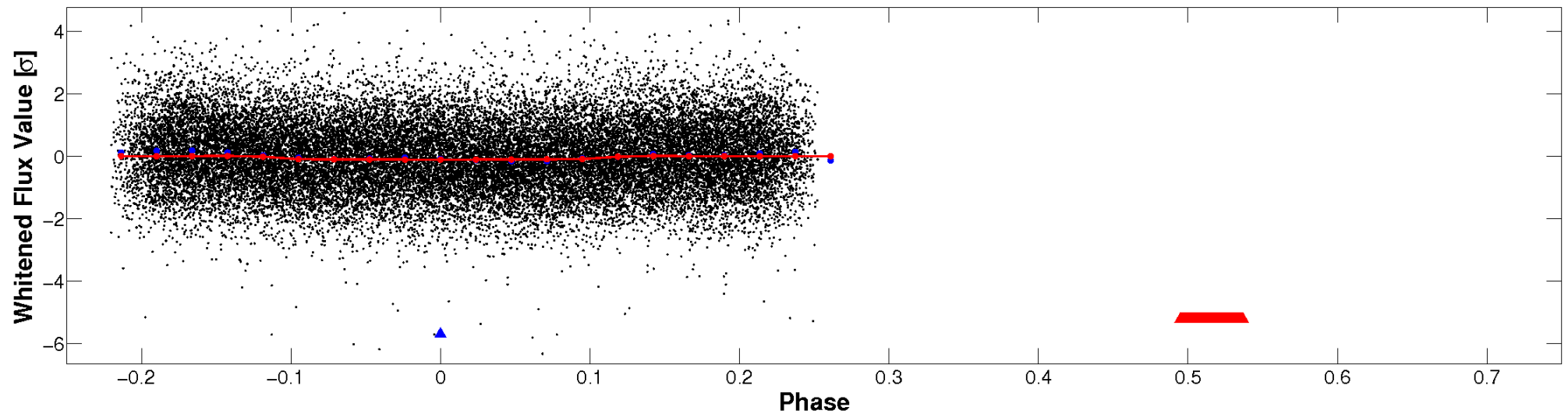


Non-Whitened Vs. Whitened Light Curve

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

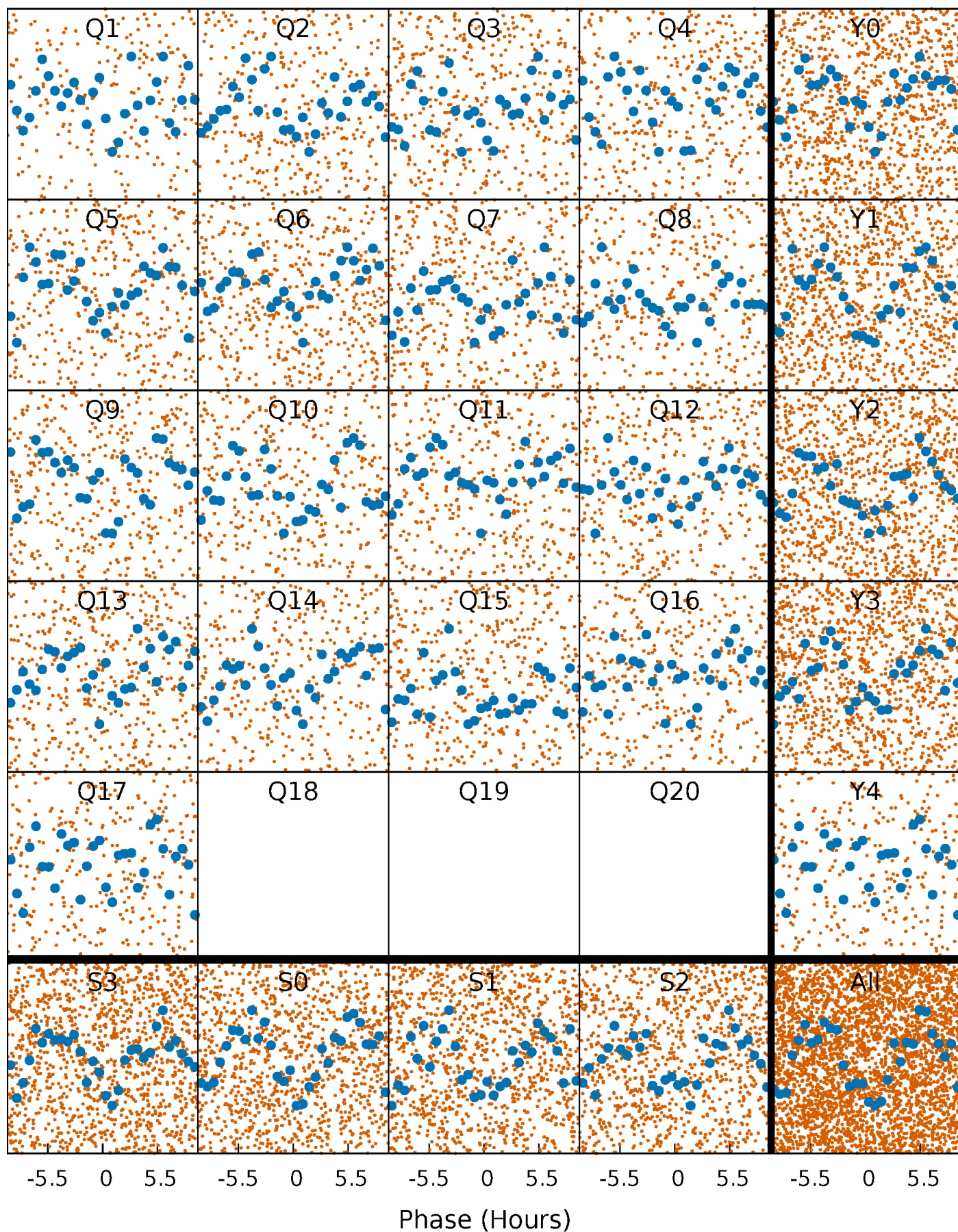


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



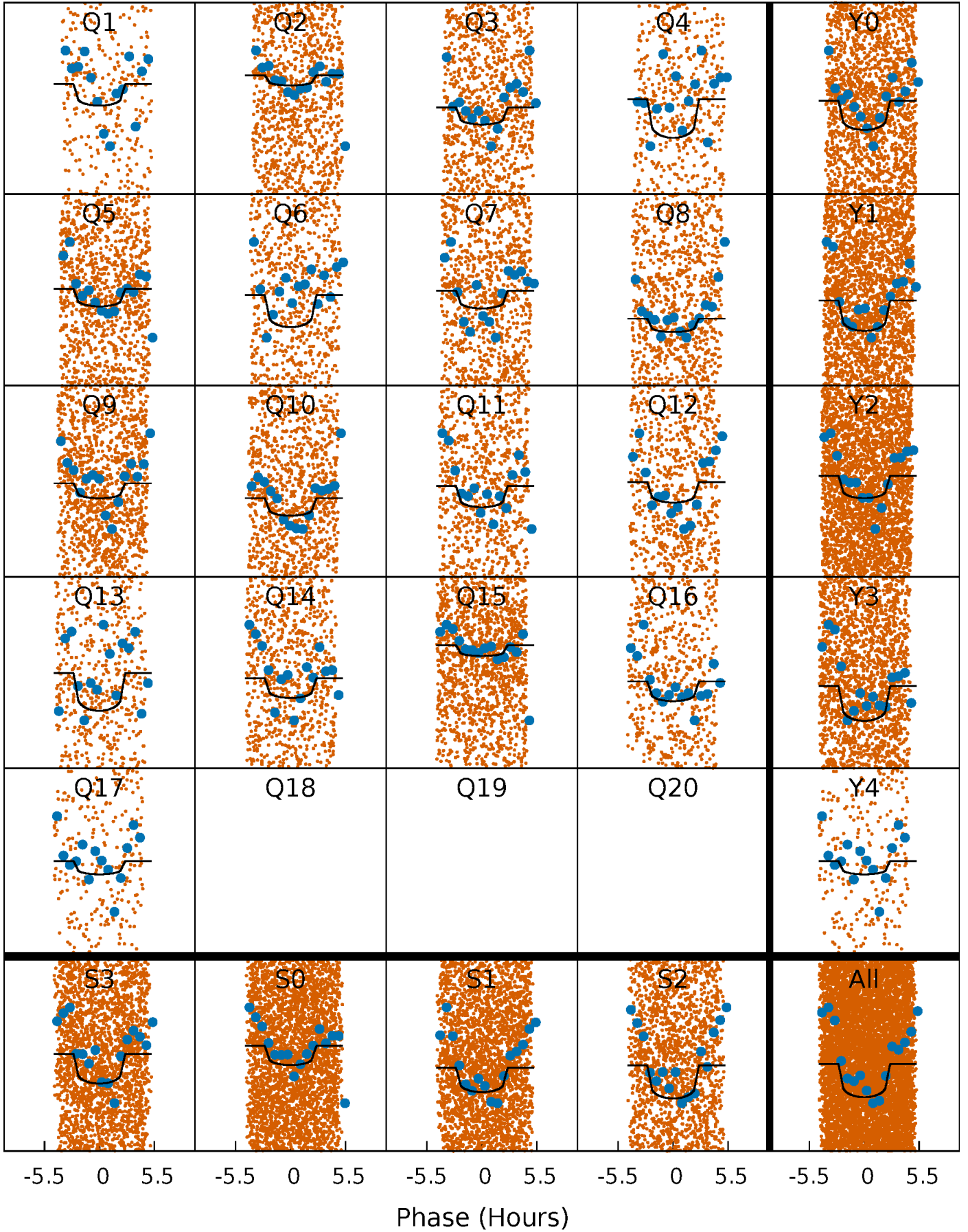
PDC Quarter-Phased Transit Curves

TCE 006224312-02 P= 0.860966 Days $T_0=131.991241$ (BKJD)



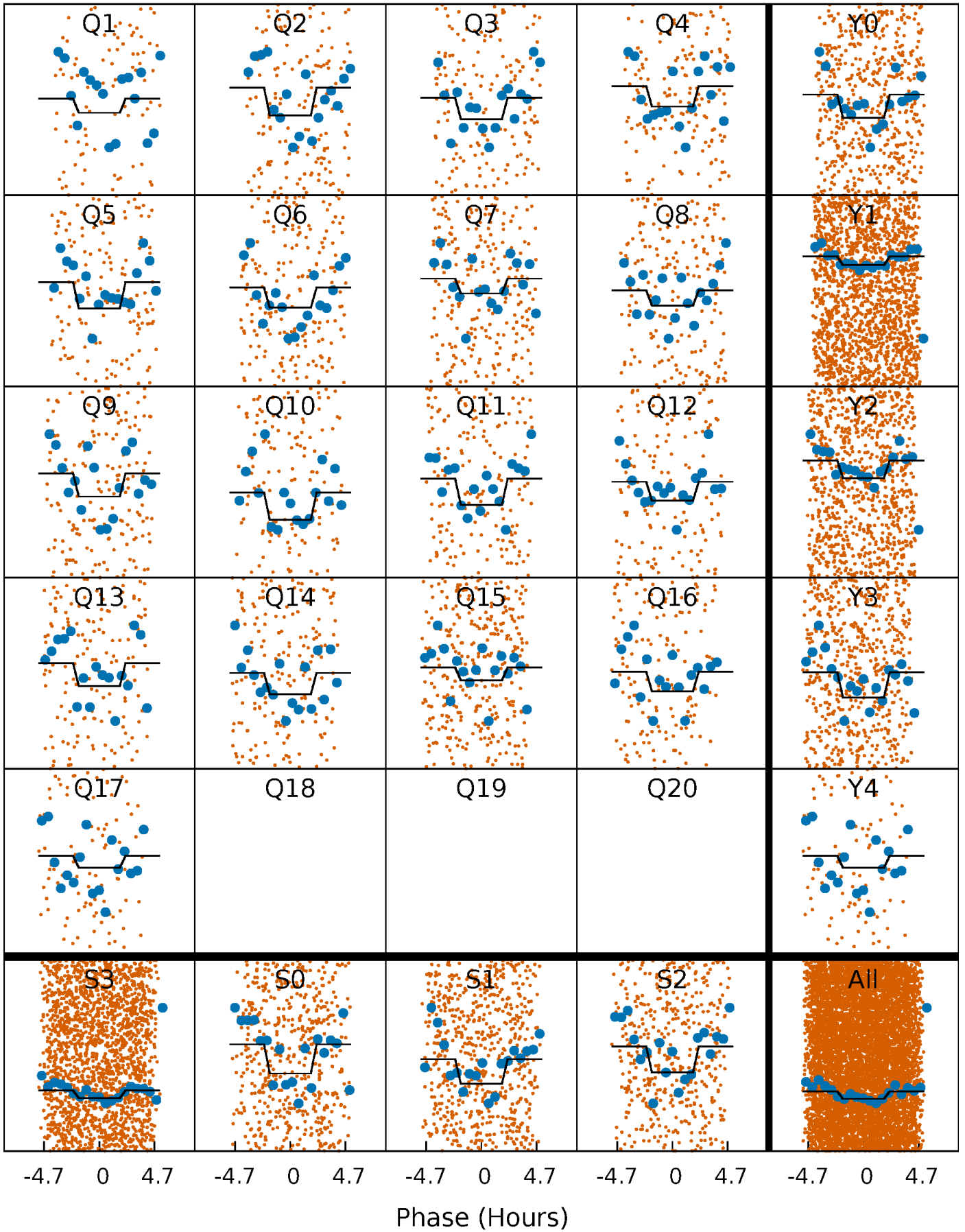
DV Quarter-Phased Transit Curves

TCE 006224312-02 $P = 0.860966$ Days $T_0 = 131.991241$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

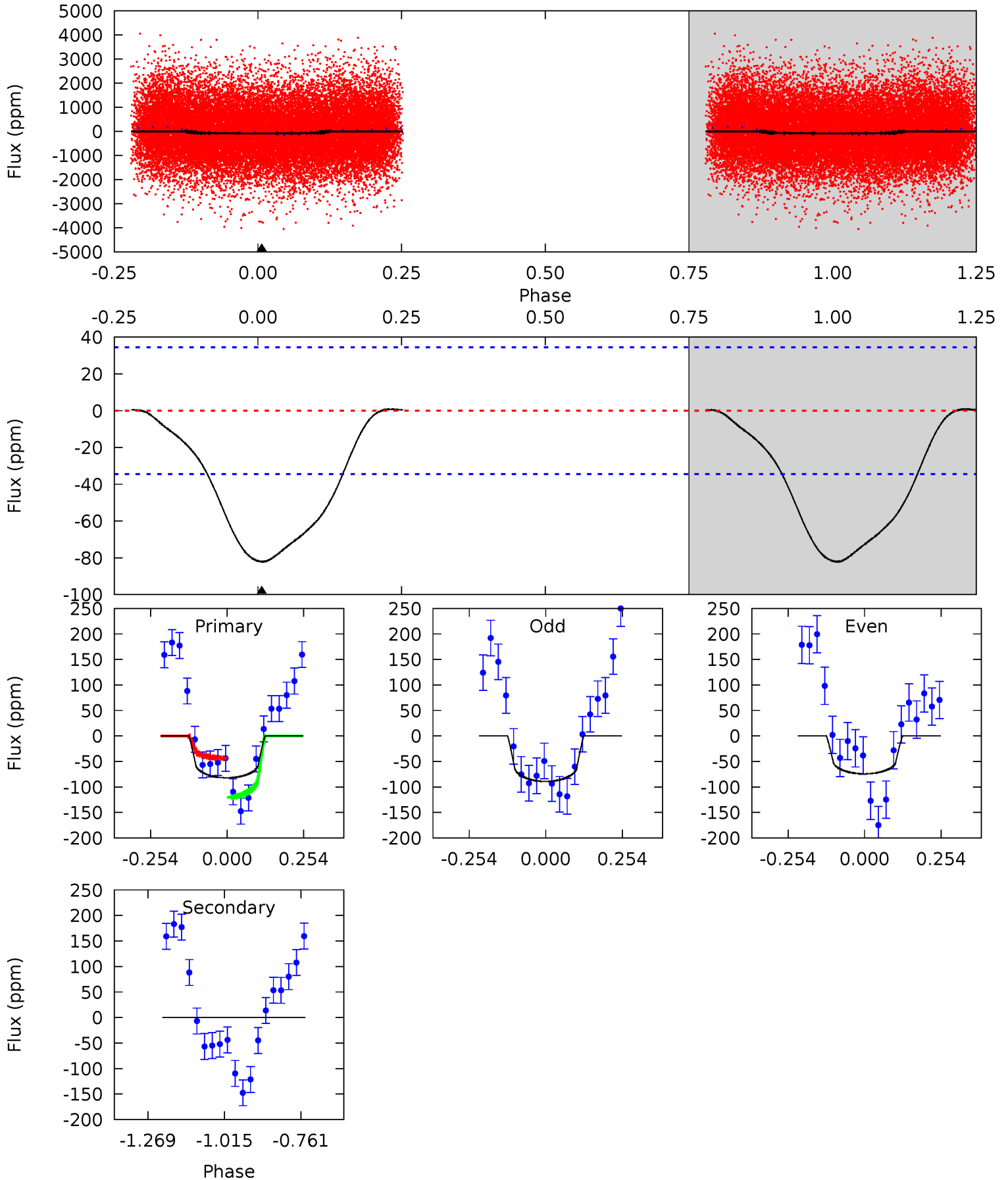
TCE 006224312-02 P= 0.860980 Days $T_0=131.992699$ (BKJD)



DV Model-Shift Uniqueness Test

006224312-02, P = 0.860966 Days, E = 131.130275 Days

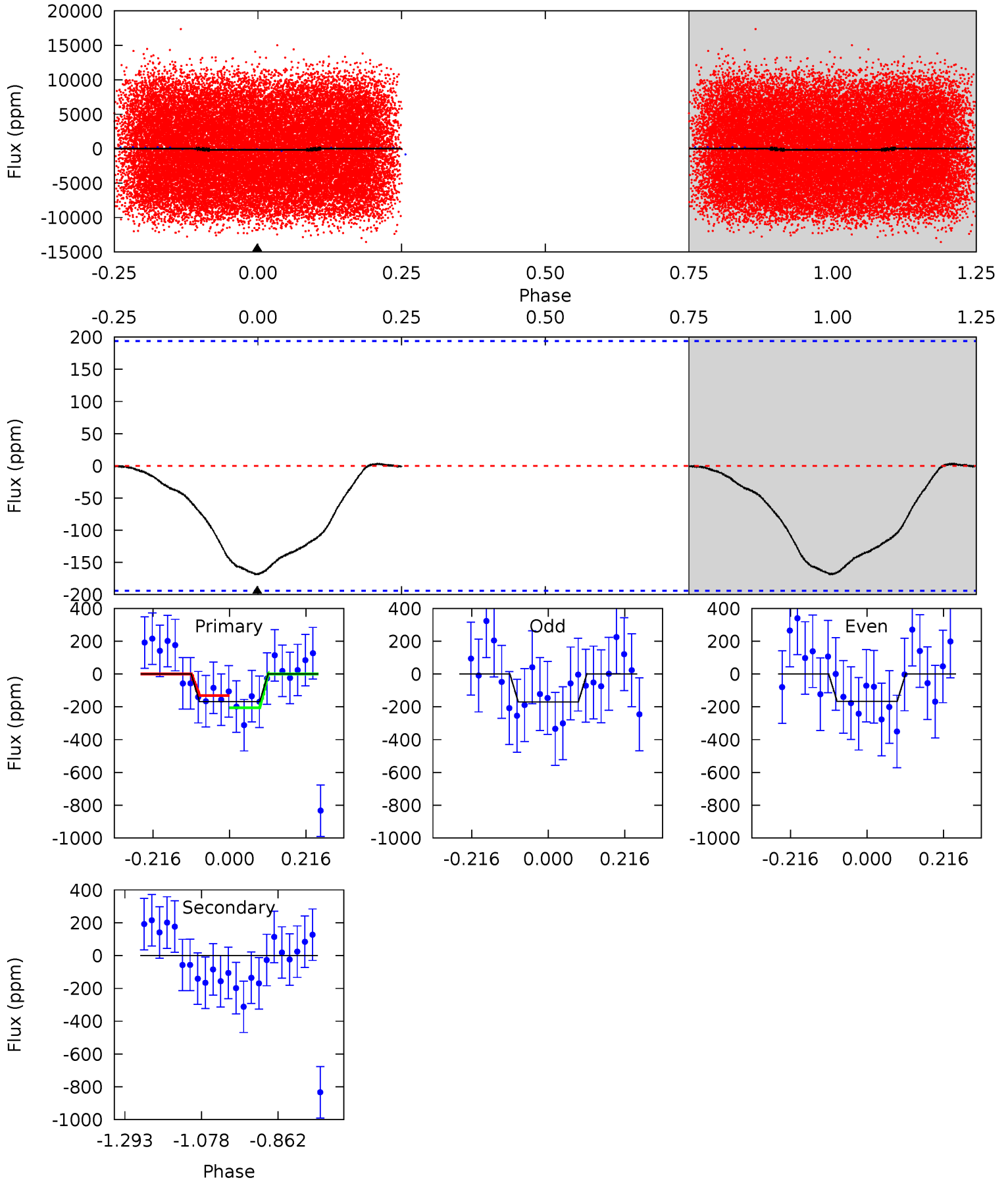
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	0	0	0	4.37	1.14	0.11	10.4	10.4	0	0	0.95	1.20	0.01	5.04



Alt Model-Shift Uniqueness Test

006224312-02, P = 0.860980 Days, E = 131.131719 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.83	0	0	0	4.40	1.24	0.09	3.83	3.83	0	0	0.04	1.00	0.02	0.84



Stellar Parameters For KIC 006224312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7136^{+200}_{-314}	$4.234^{+0.093}_{-0.201}$	$-0.160^{+0.250}_{-0.350}$	$1.490^{+0.501}_{-0.231}$	$1.395^{+0.218}_{-0.218}$	$0.593^{+0.298}_{-0.316}$
	+3%/-4%	+2%/-5%	+156%/-219%	+34%/-16%	+16%/-16%	+50%/-53%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 006224312-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 8	$1.91^{+1.45}_{-1.17}$	3859^{+296}_{-232}	-3623^{+7480}_{-911}	$-0.010^{+0.763}_{-0.776}$
Alt.	0 ± 44	$2.32^{+1.53}_{-1.35}$	3862^{+285}_{-225}	-3546^{+8861}_{-1901}	$0.036^{+2.740}_{-2.505}$

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 $A_{obs} \gg 1.0$

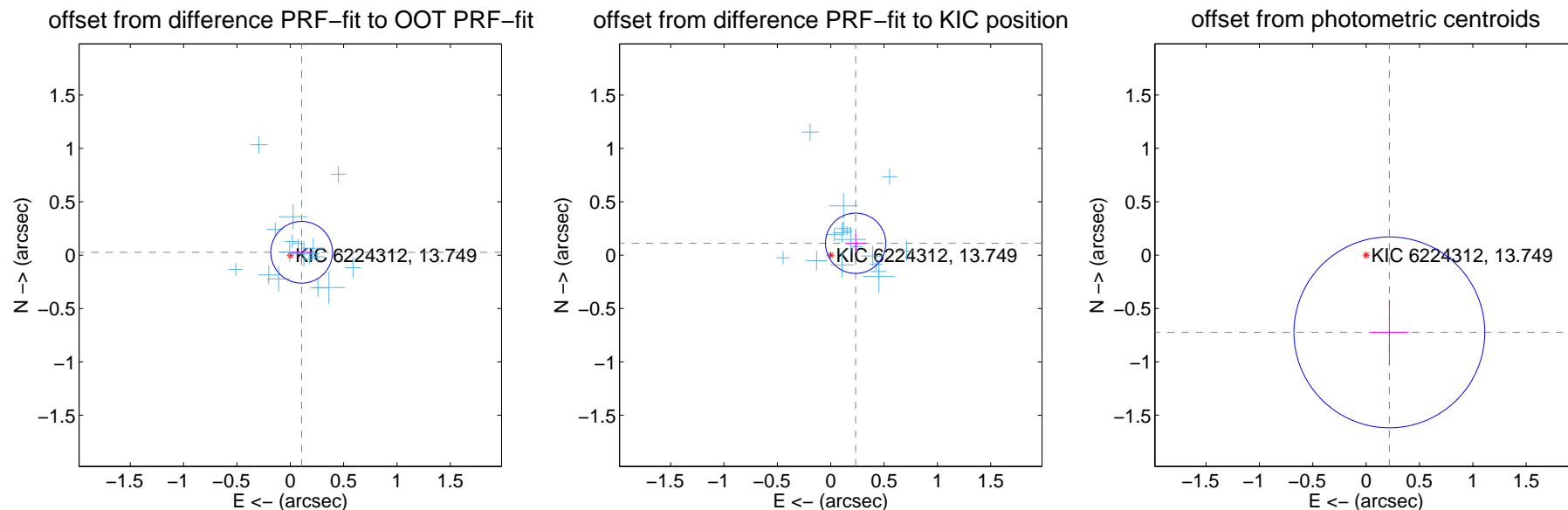
DV Centroid Data

Supplemental centroid analysis for 006224312-02. Kepler magnitude: 13.75. Transit SNR 11.17

There are 17 quarters with good PRF difference image offsets

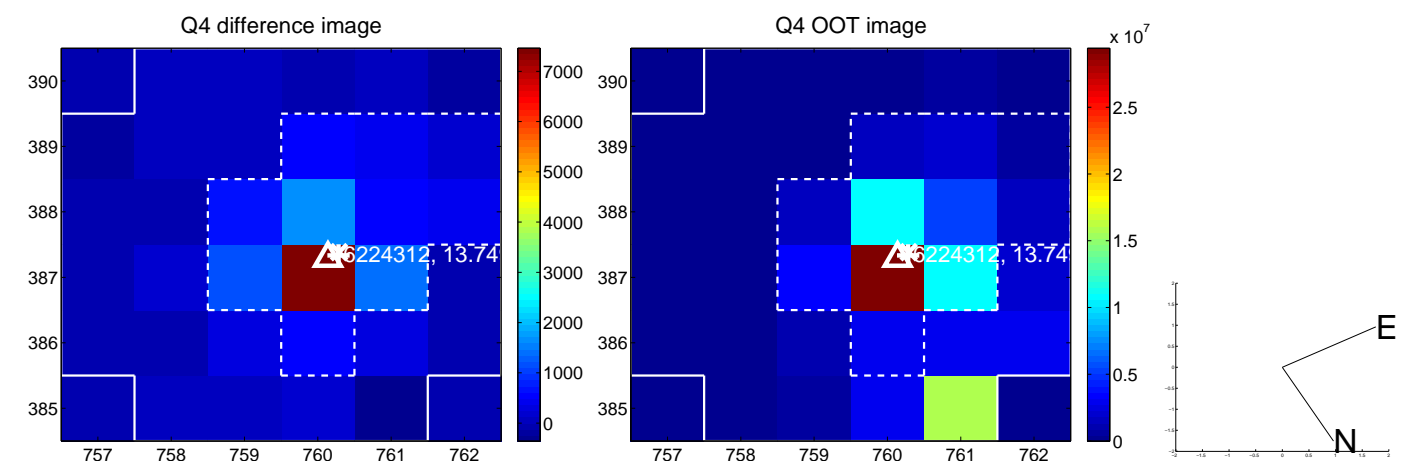
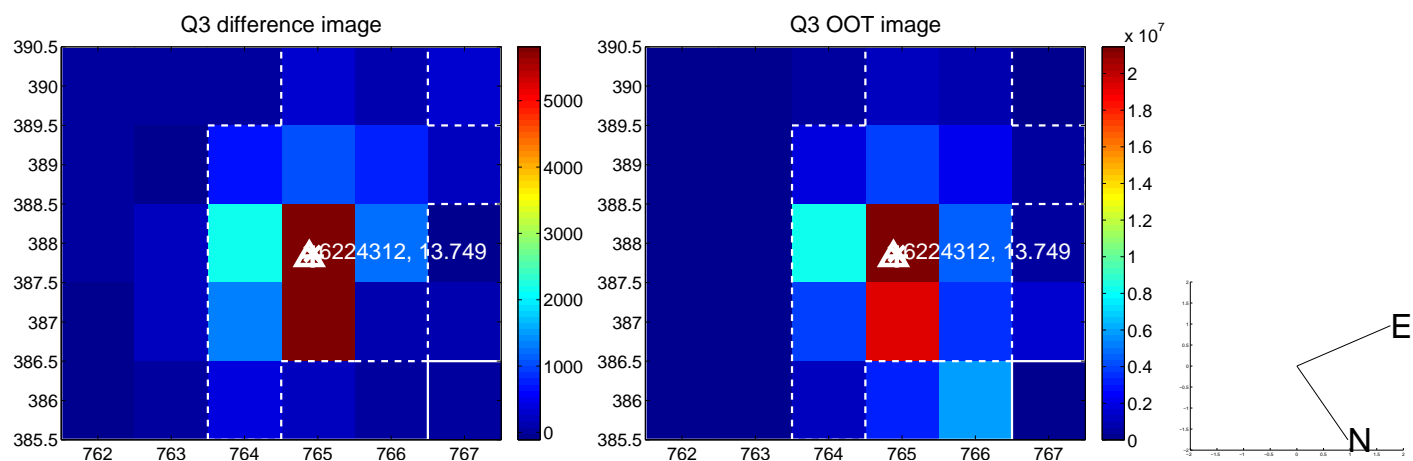
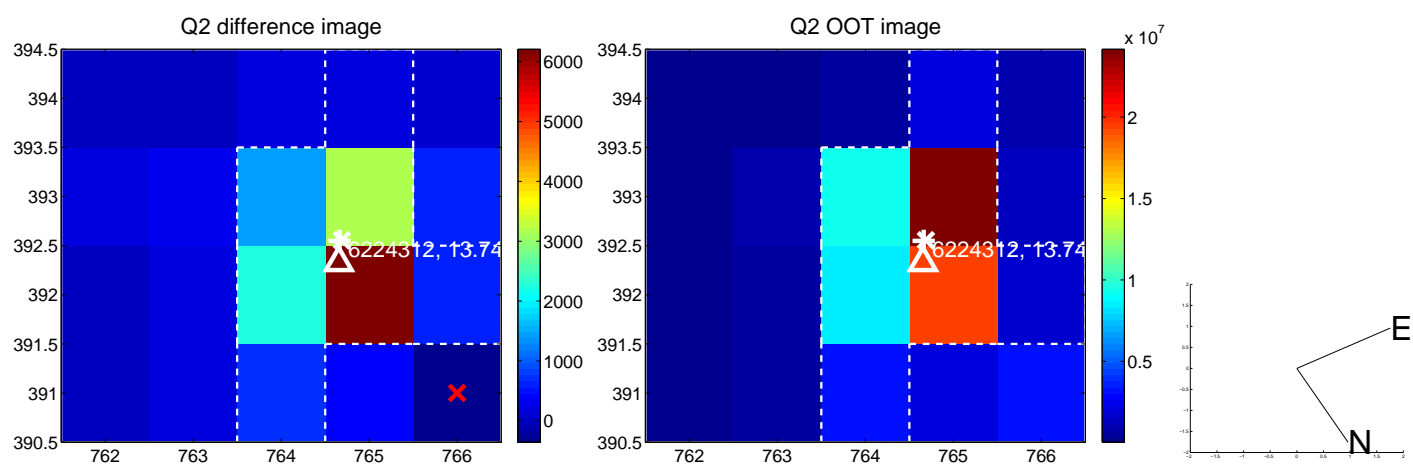
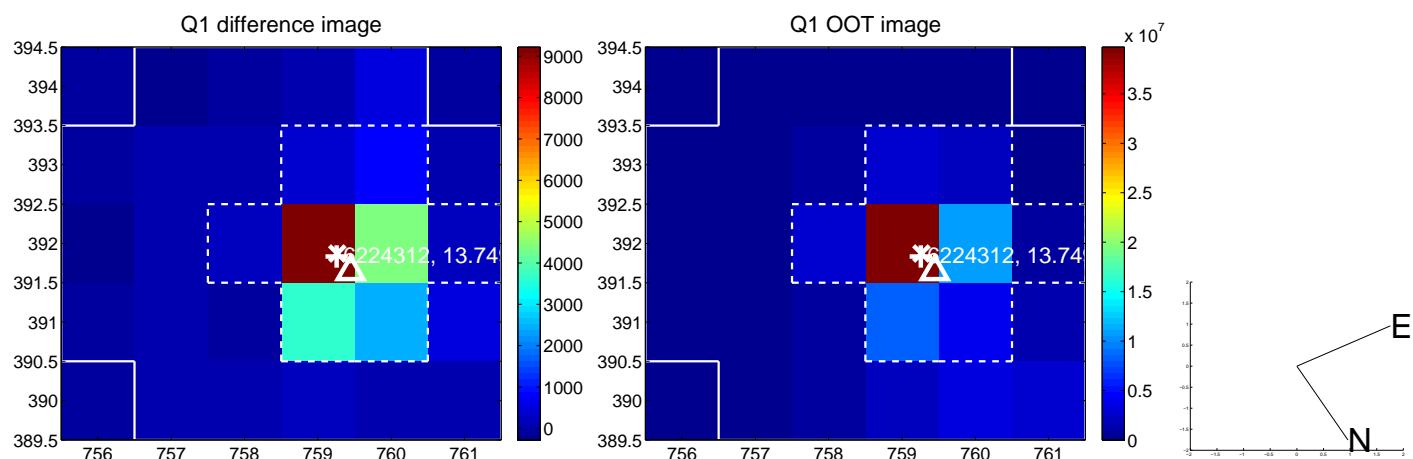
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.110 ± 0.096	1.14	-0.107 ± 0.097	0.027 ± 0.109
PRF-fit source offset from KIC position	0.259 ± 0.094	2.75	-0.233 ± 0.096	0.111 ± 0.085
photometric centroid source offset	0.76 ± 0.30	2.54	-0.22 ± 0.18	-0.72 ± 0.31

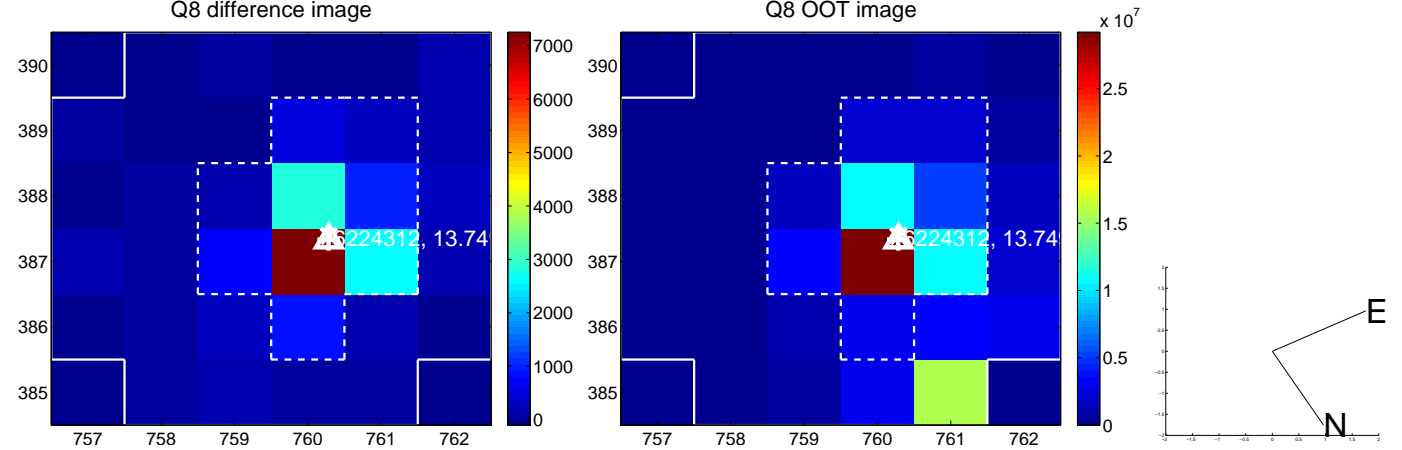
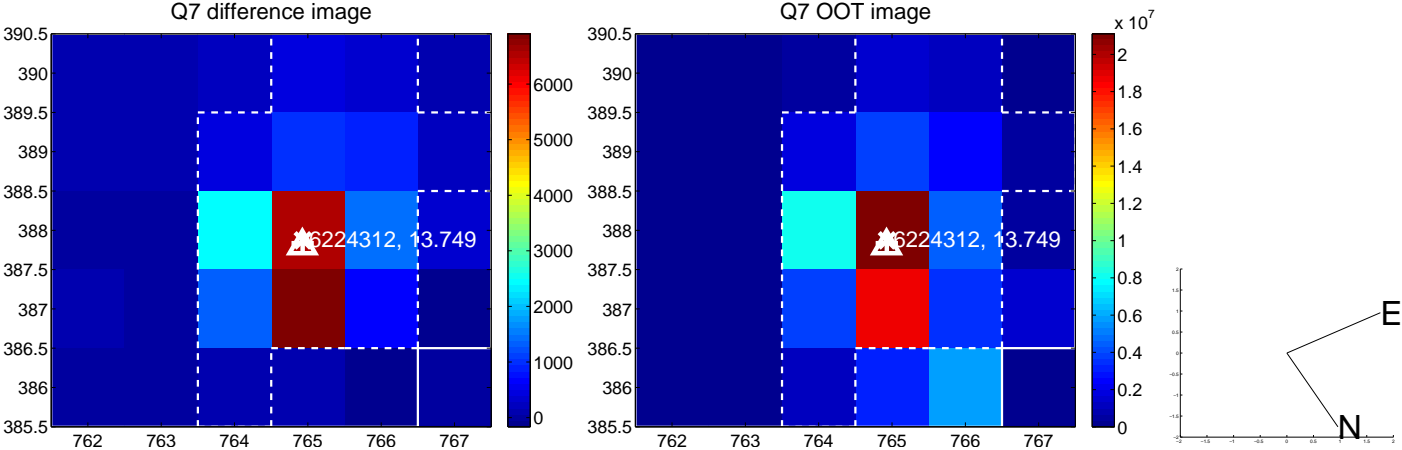
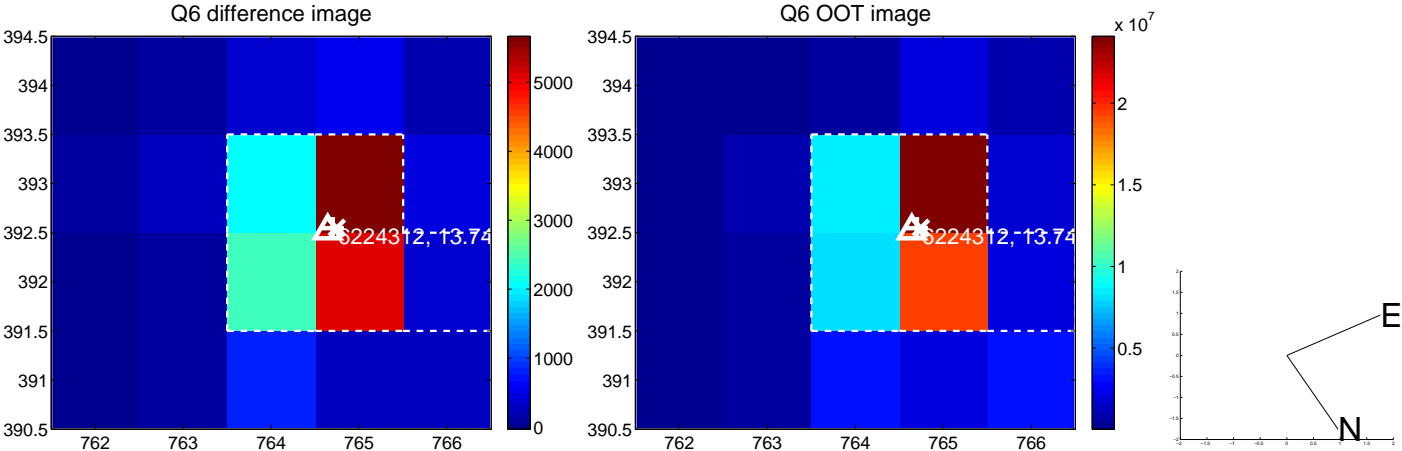
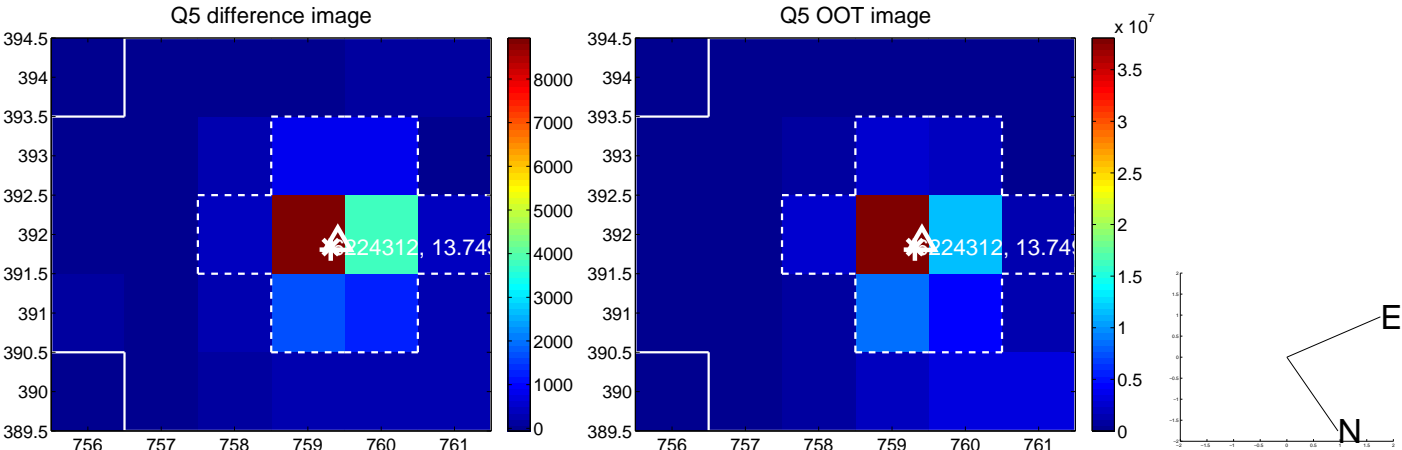


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

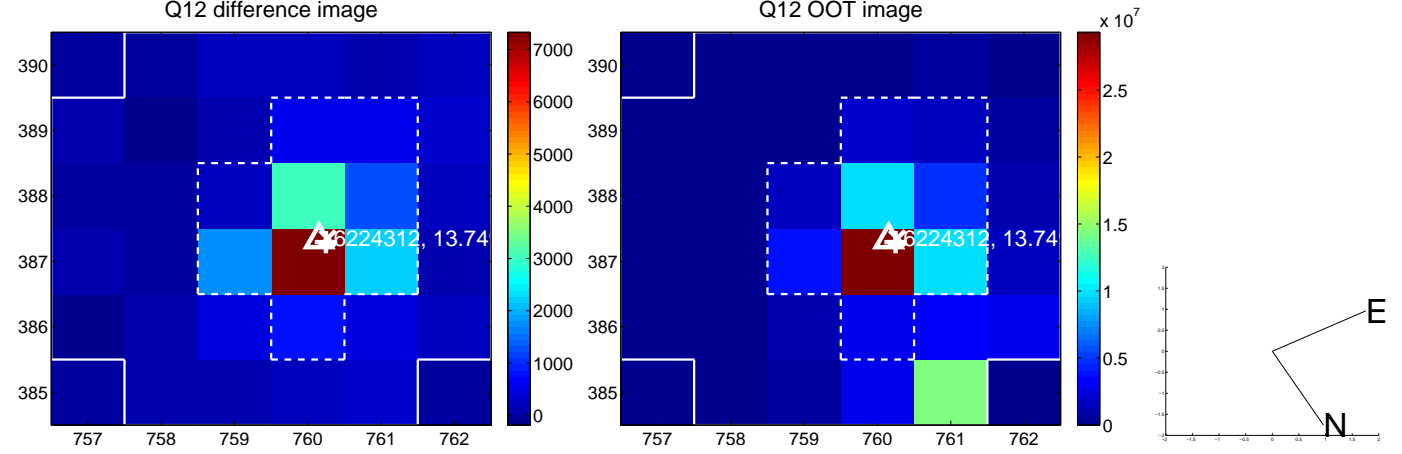
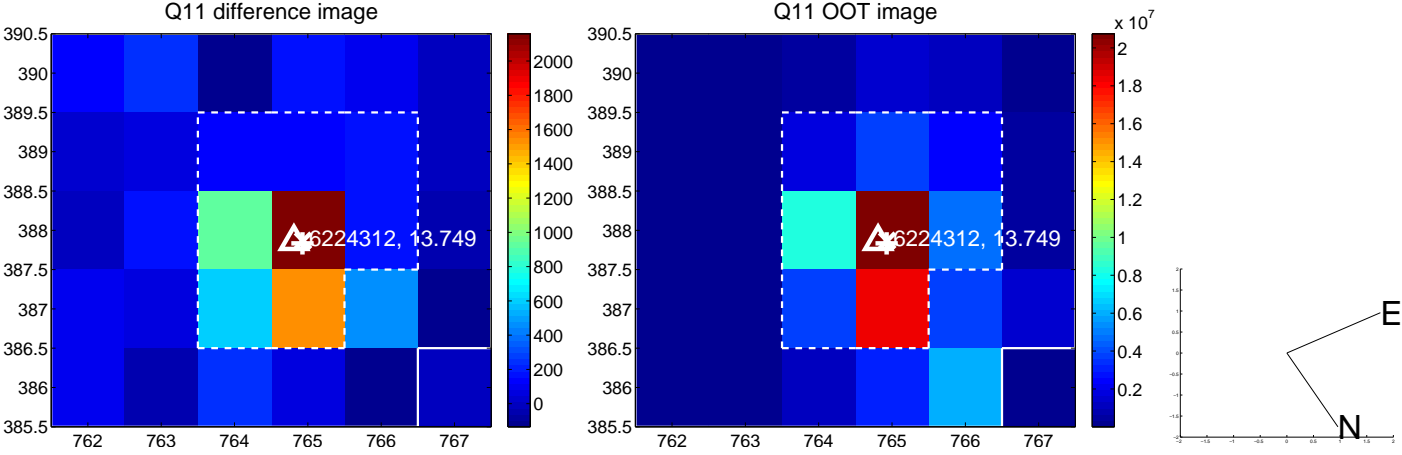
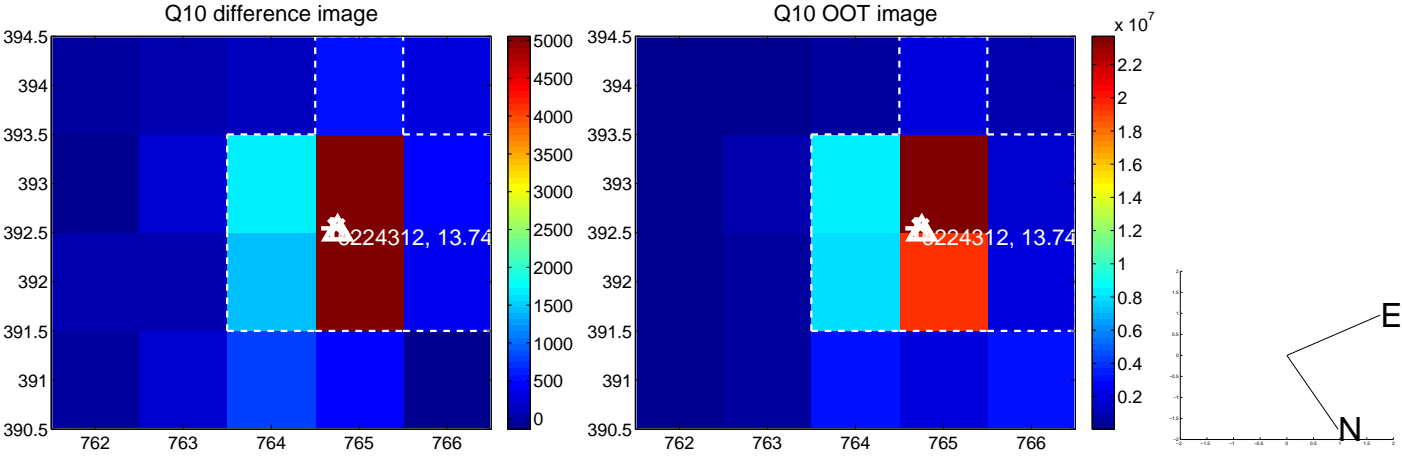
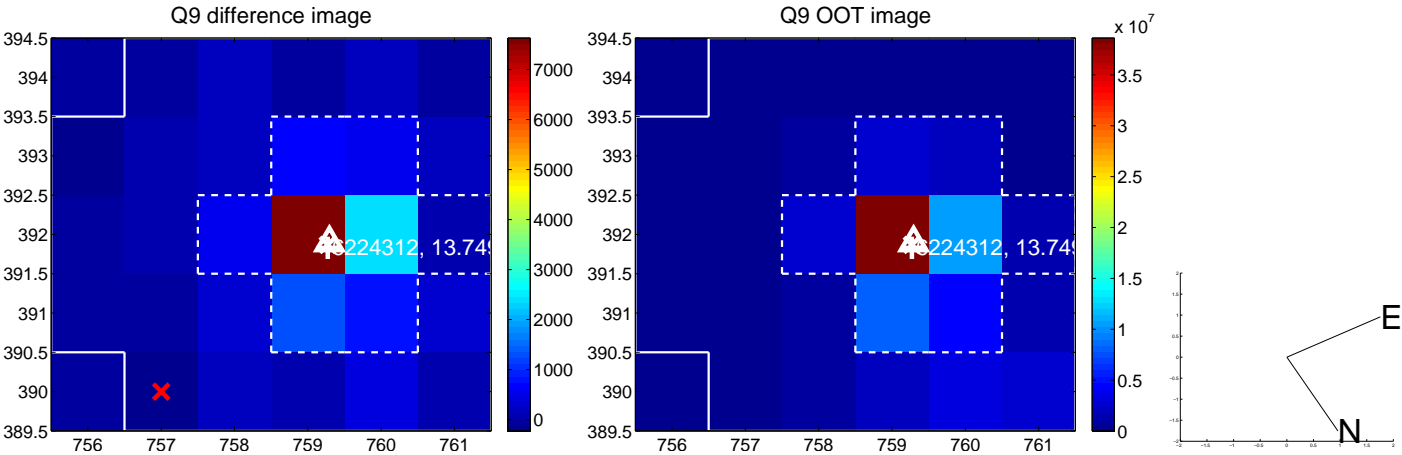
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



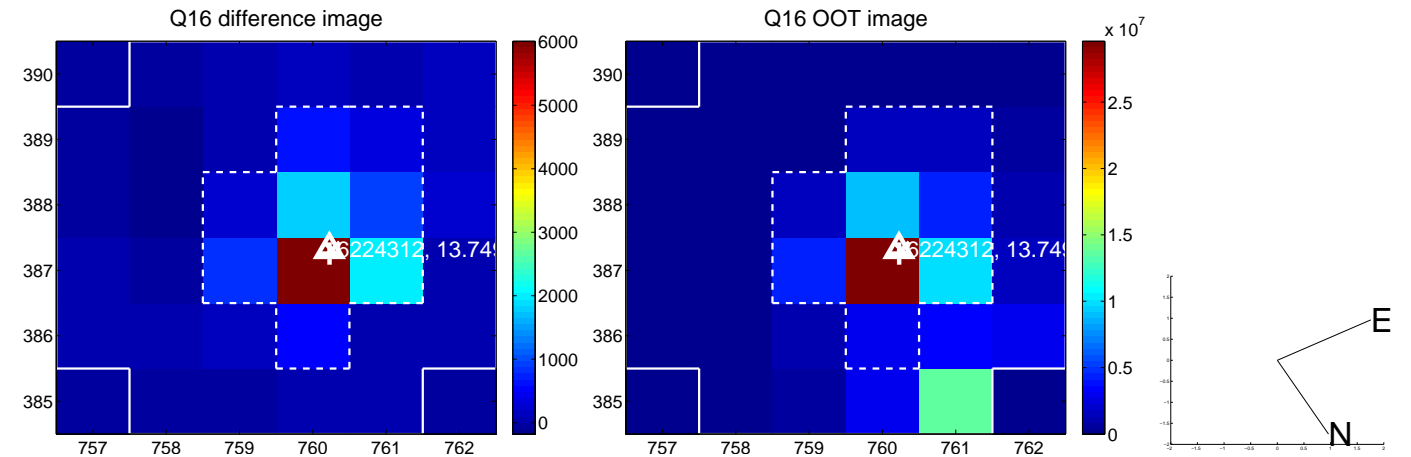
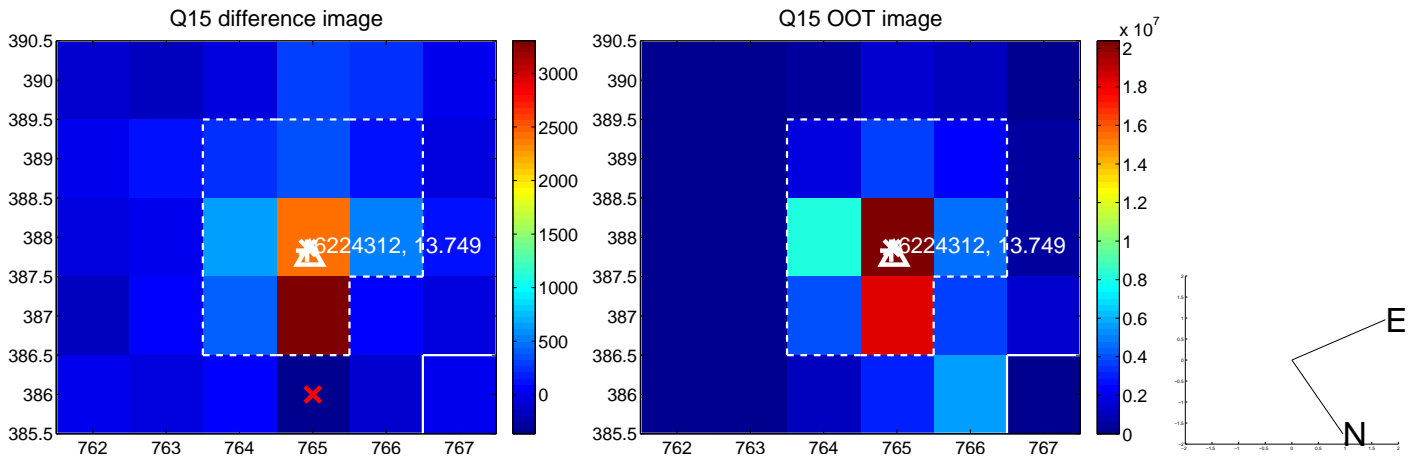
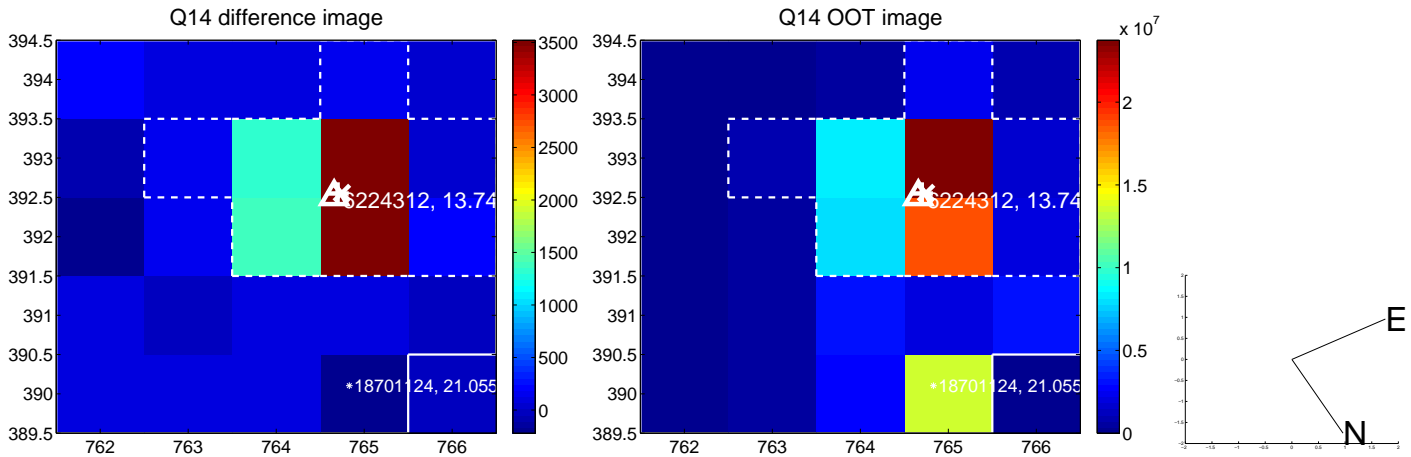
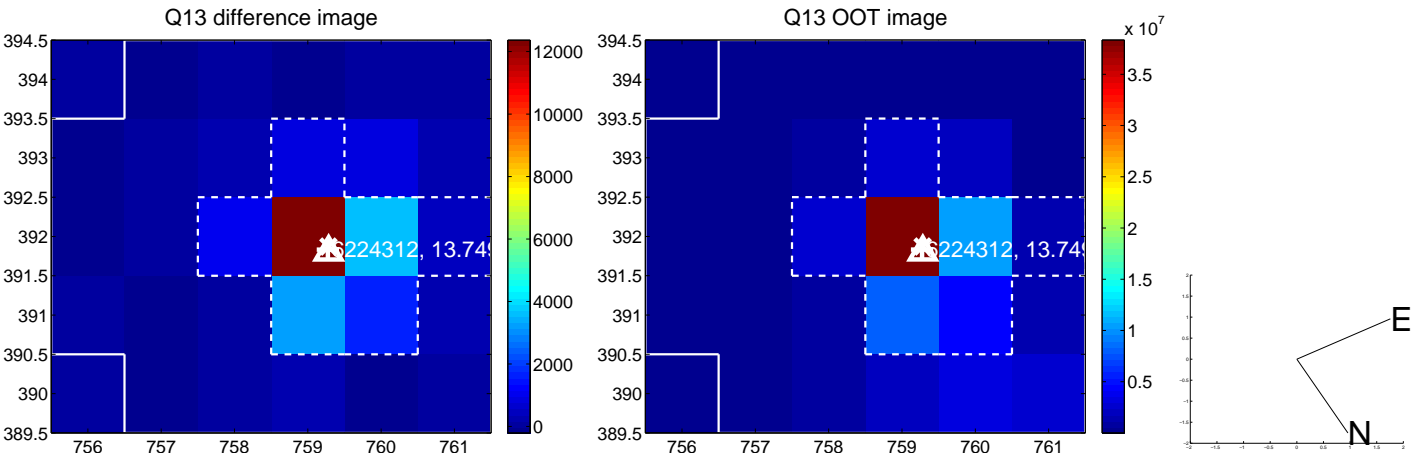
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



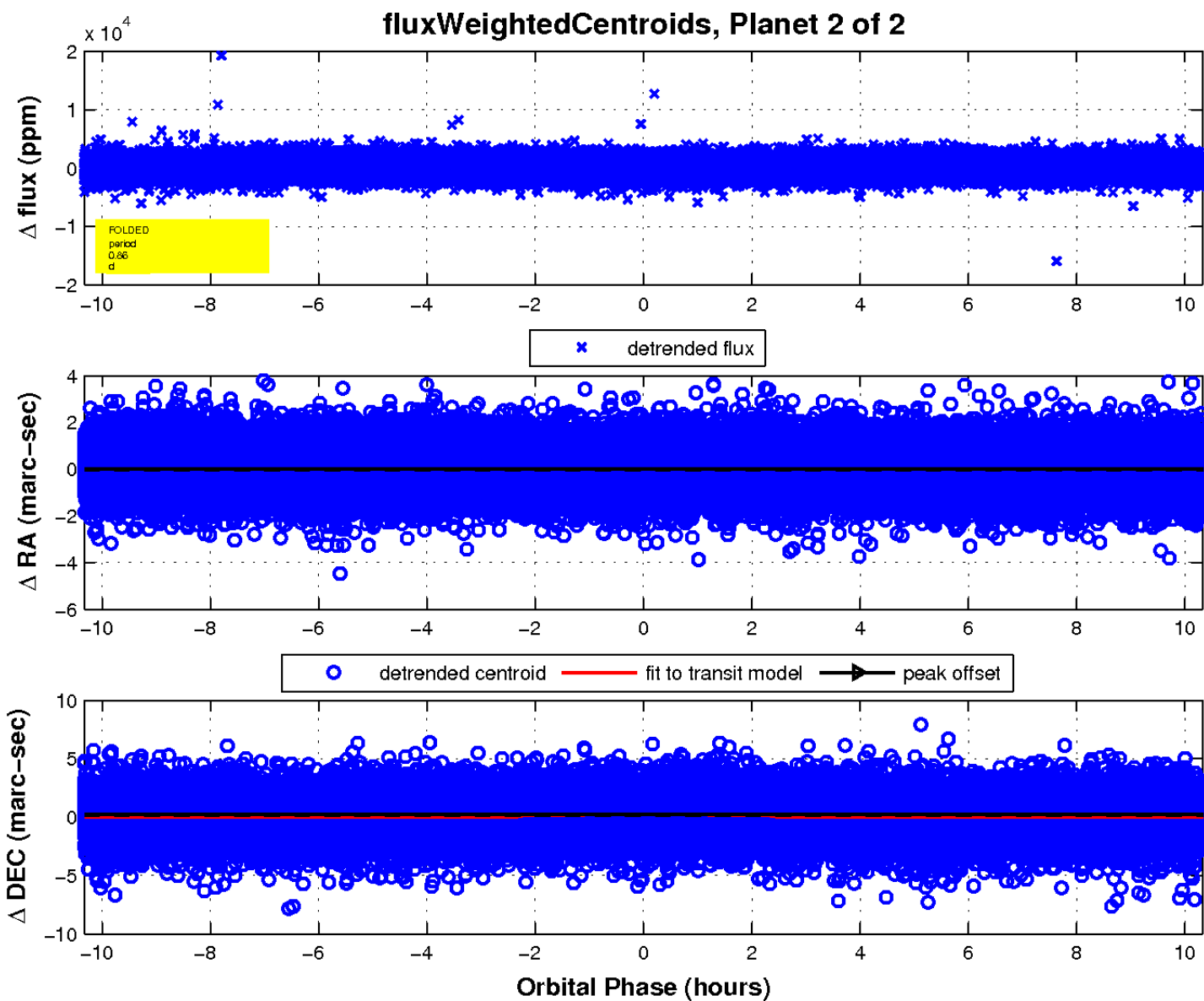
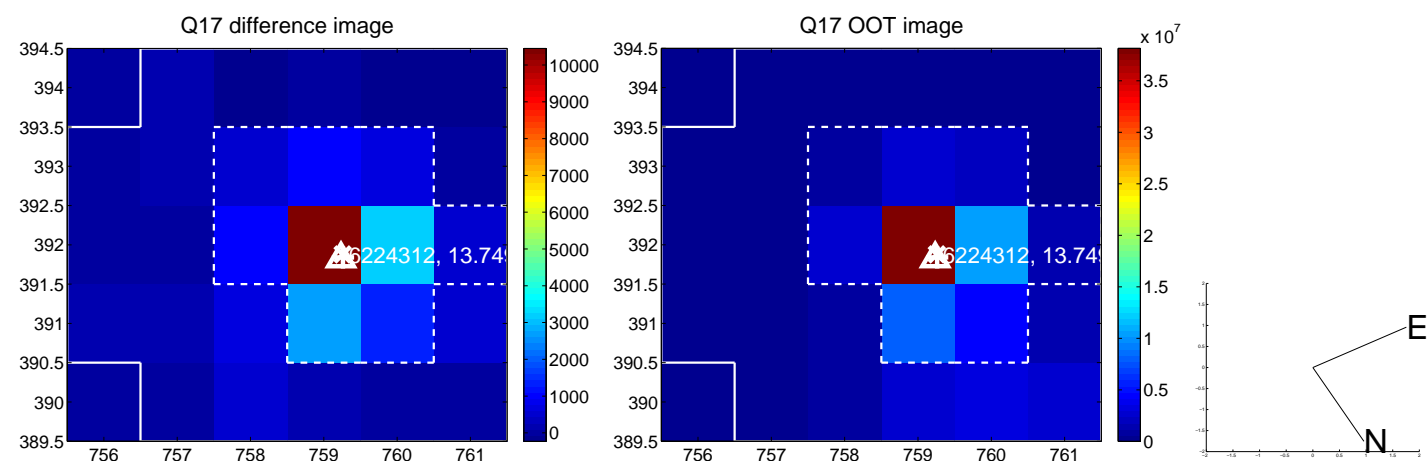
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

