

KIC 006311520

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})
006311520-01	OBS	4115.01	0.941840	131.811922	54.4	6.884	16.6	7.9	1.14	6419	0.85	5545.05
006311520-02	OBS	No	21.489227	132.299785	948.5	1.810	15.7	9.5	1.14	6419	4.04	85.69
006311520-03	OBS	No	20.349459	136.972434	1277.5	0.608	11.8	8.1	1.14	6419	4.38	92.14
006311520-04	OBS	No	51.805447	148.281875	393.4	1.992	9.9	7.0	1.14	6419	2.76	26.51
006311520-05	OBS	No	87.610207	191.579582	1050.7	1.706	11.8	9.4	1.14	6419	3.79	13.16
006311520-06	OBS	No	25.690329	137.362268	418.2	2.749	8.0	4.7	1.14	6419	2.73	67.53

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006311520-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT
006311520-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
006311520-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
006311520-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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.

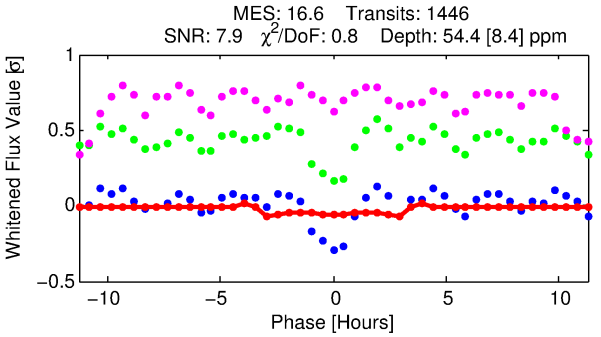
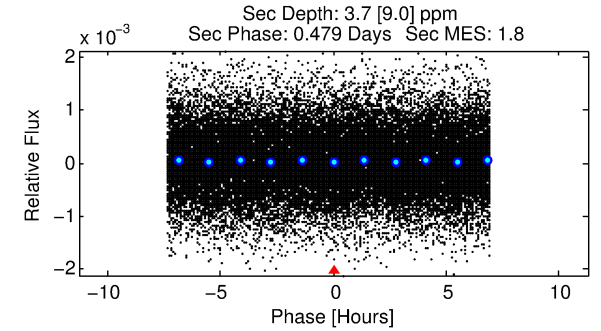
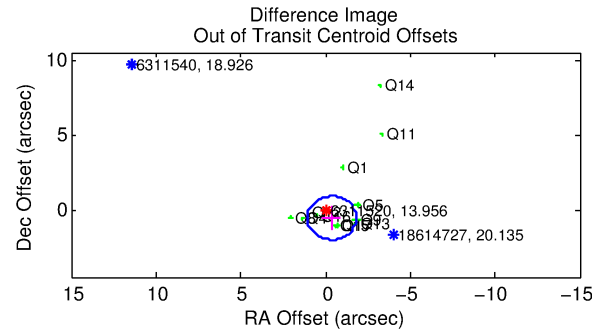
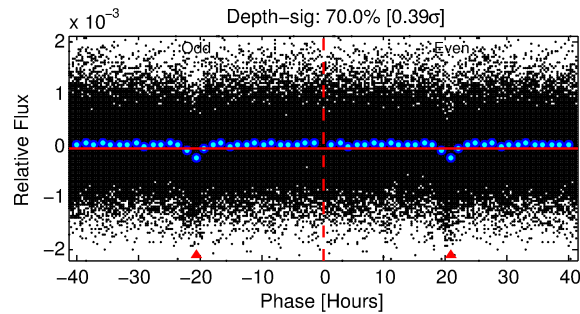
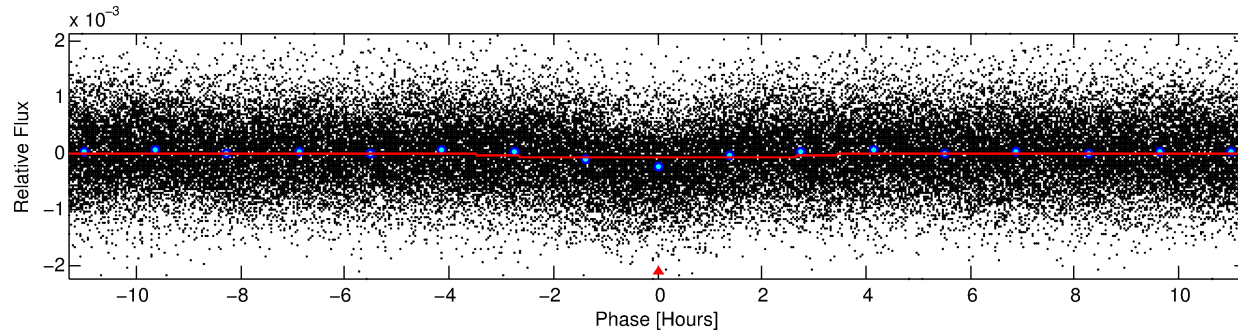
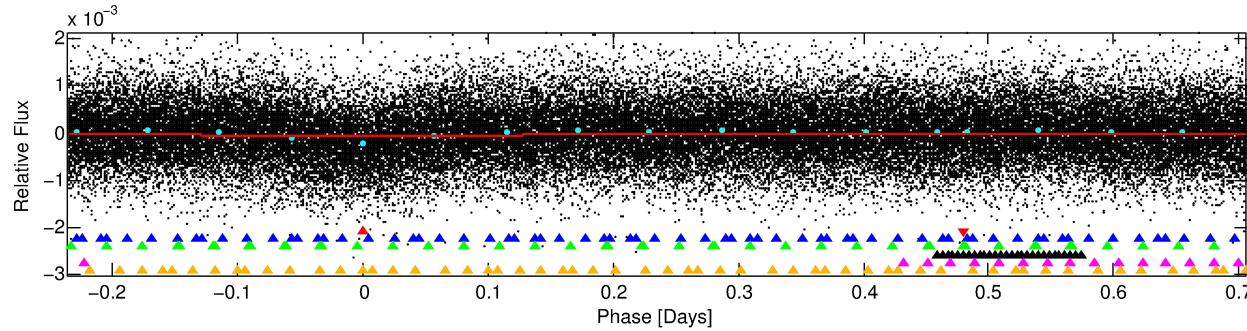
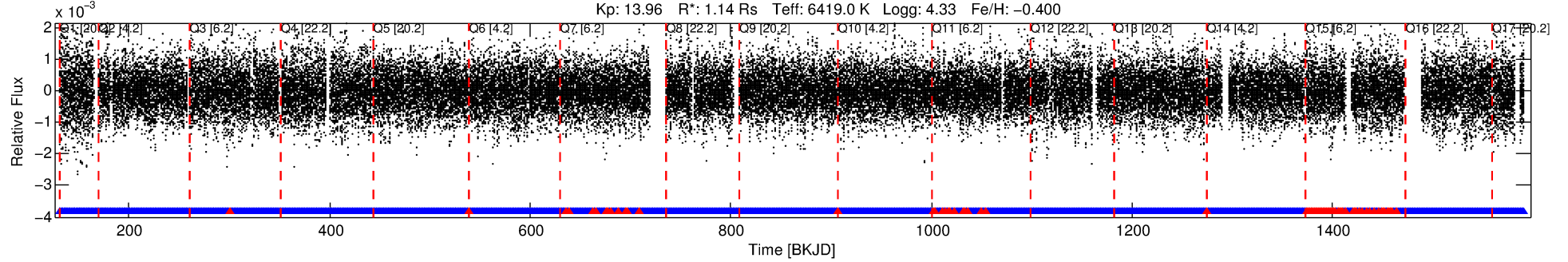
Ephemeris Match Information For 006311520-01

No Significant Match Found

DV One-Page Summary

KIC: 6311520 Candidate: 1 of 6 Period: 0.942 d
KOI: K04115.01 Corr: 0.927

Kp: 13.96 R*: 1.14 Rs Teff: 6419.0 K Logg: 4.33 Fe/H: -0.400



DV Fit Results:

Period = 0.94184 [0.00002] d
Epoch = 131.8119 [0.0036] BKJD
Rp/R* = 0.0068 [0.0070]
a/R* = 1.22 [2.18]
b = 0.25 [20.50]
Seff = 5545.05 [2021.44]
Teq = 2200 [201] K
Rp = 0.85 [0.90] Re
a = 0.0189 [0.0045] AU
Ag = 1.02 [3.23] [0.01σ]
Teffp = 3416 [2695] K [0.45σ]

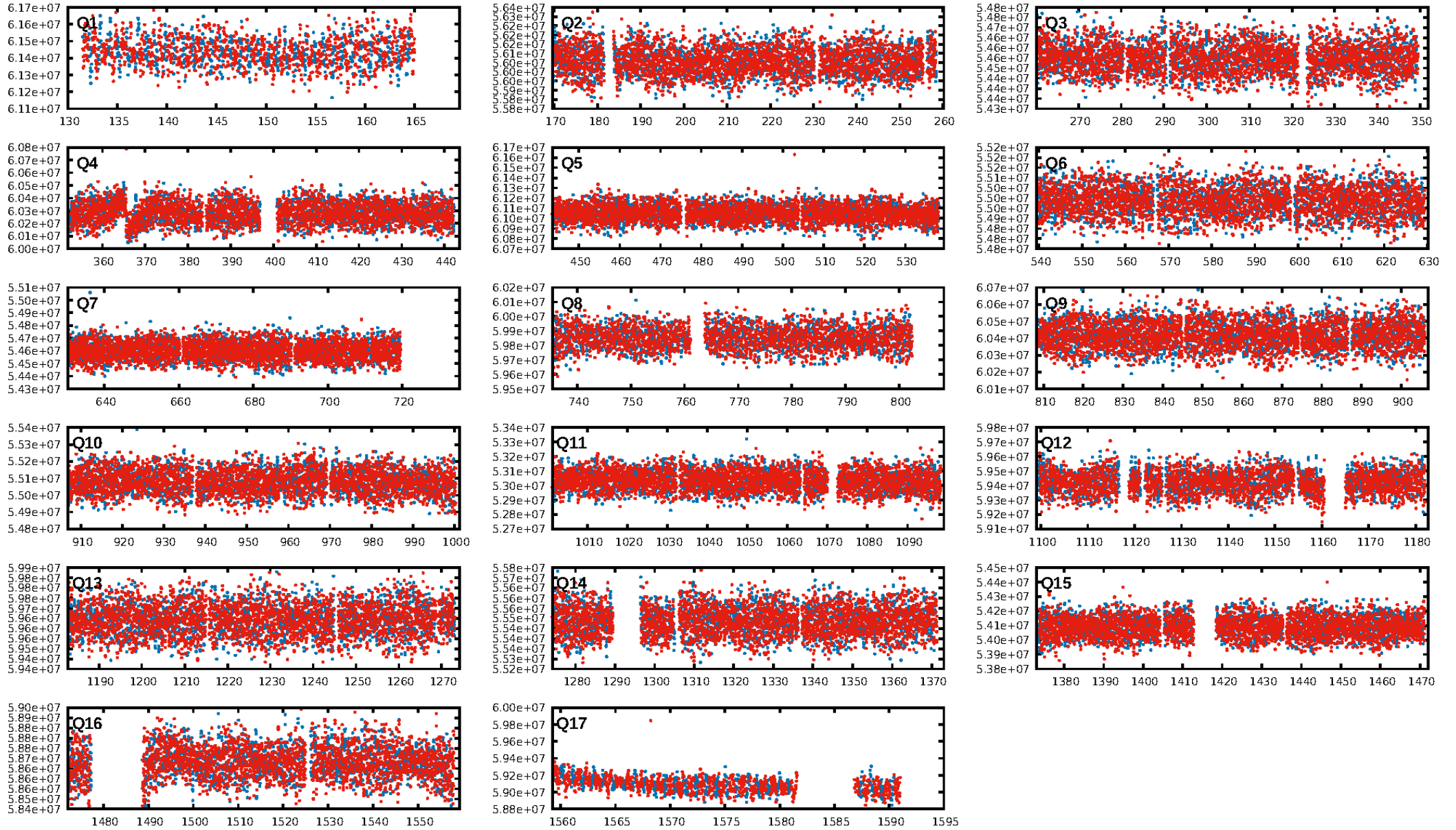
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [67.40σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.25e-32
RollingBand-fgt: 0.94 [1293/1381]
GhostDiagnostic-chr: 1.03
Centroid-sig: 0.0%
Centroid-so: 1.551 arcsec [3.22σ]
OotOffset-rm: 0.665 arcsec [1.37σ]
KicOffset-rm: 0.791 arcsec [1.27σ]
OotOffset-st: 1/2/4/5 [12]
KicOffset-st: 1/2/4/5 [12]
DiffImageQuality-fgm: 0.58 [7/12]
DiffImageOverlap-fno: 1.00 [17/17]

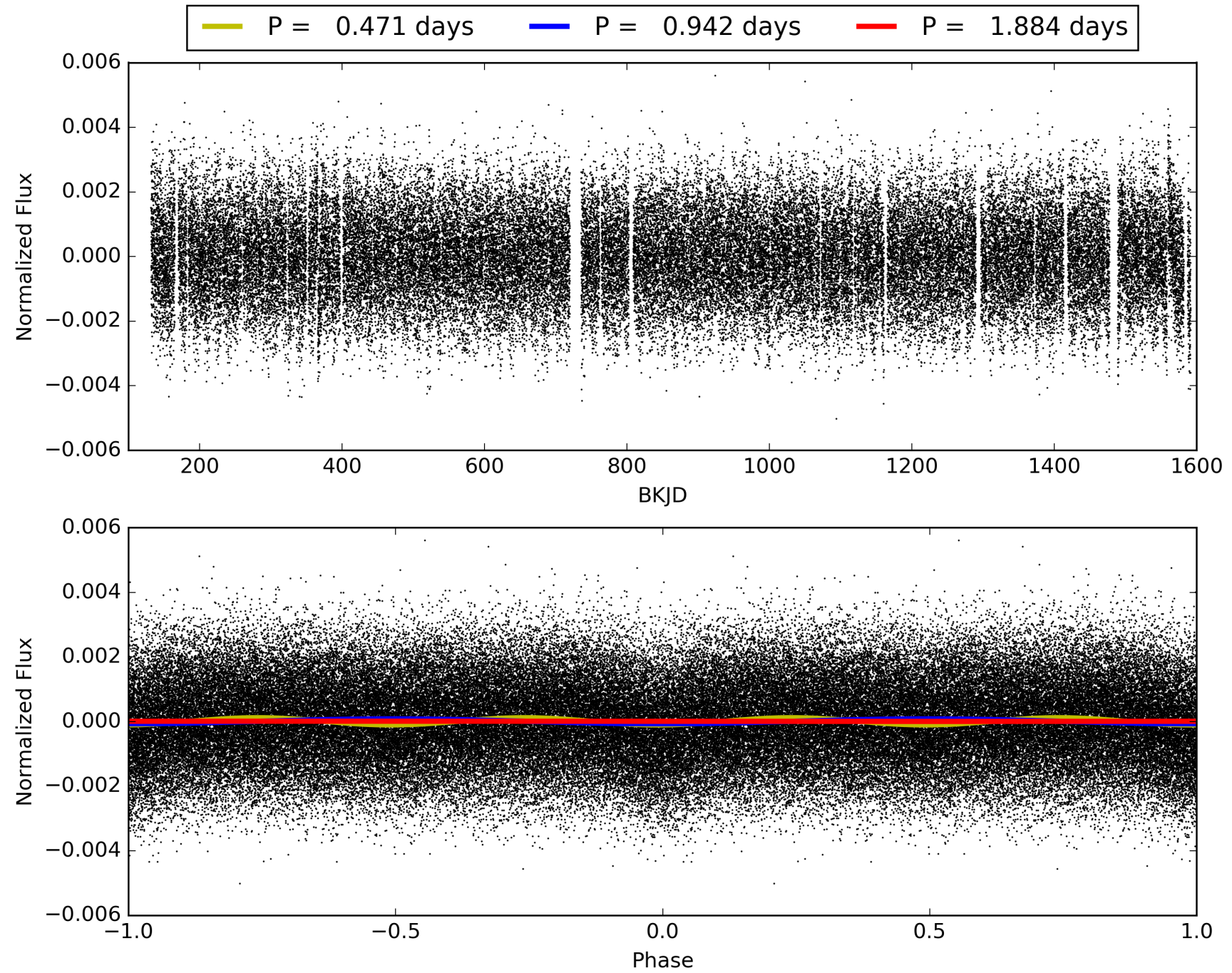
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:31:40 Z

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

TCE 006311520-01, PDC Light Curves

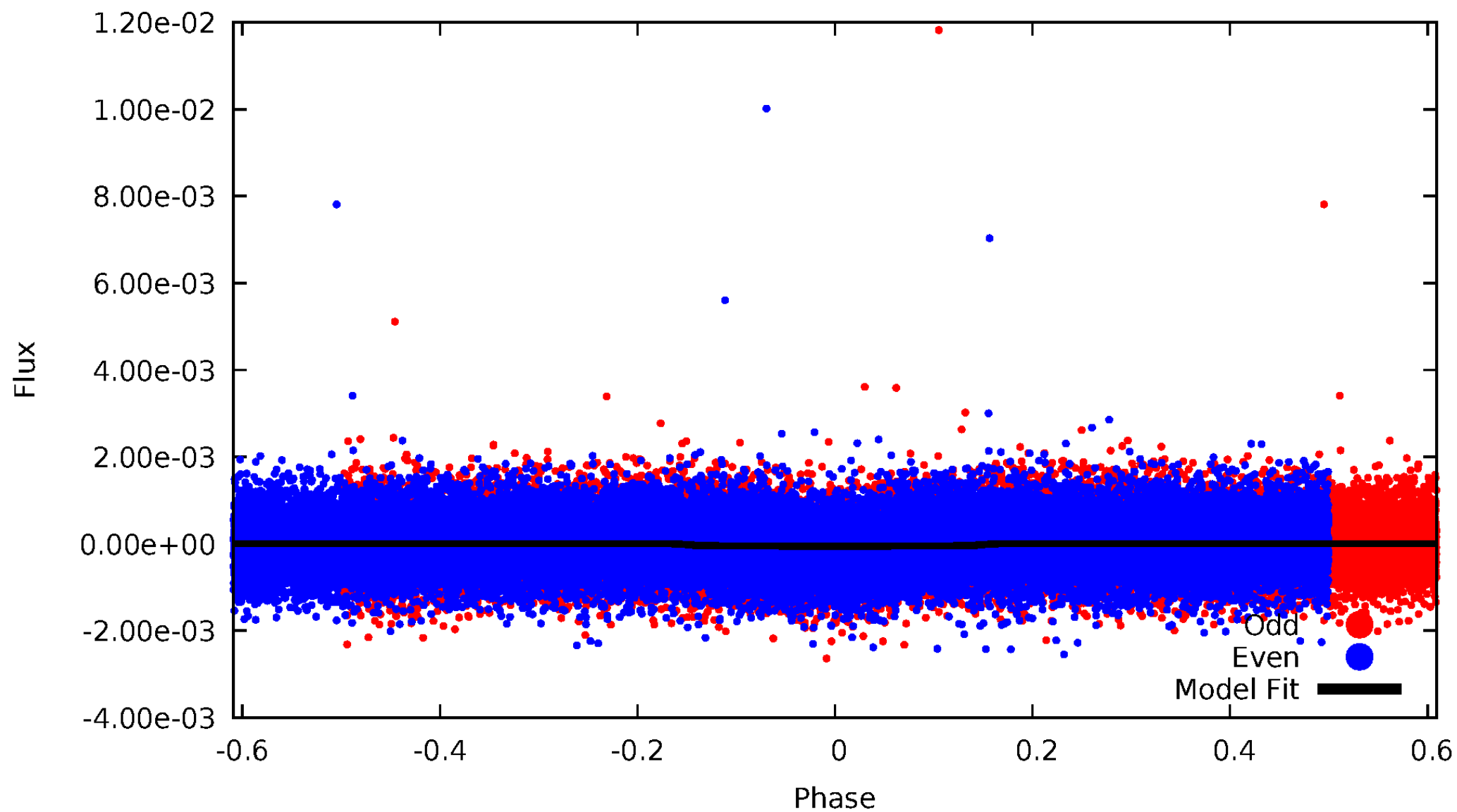


TCE 006311520-01



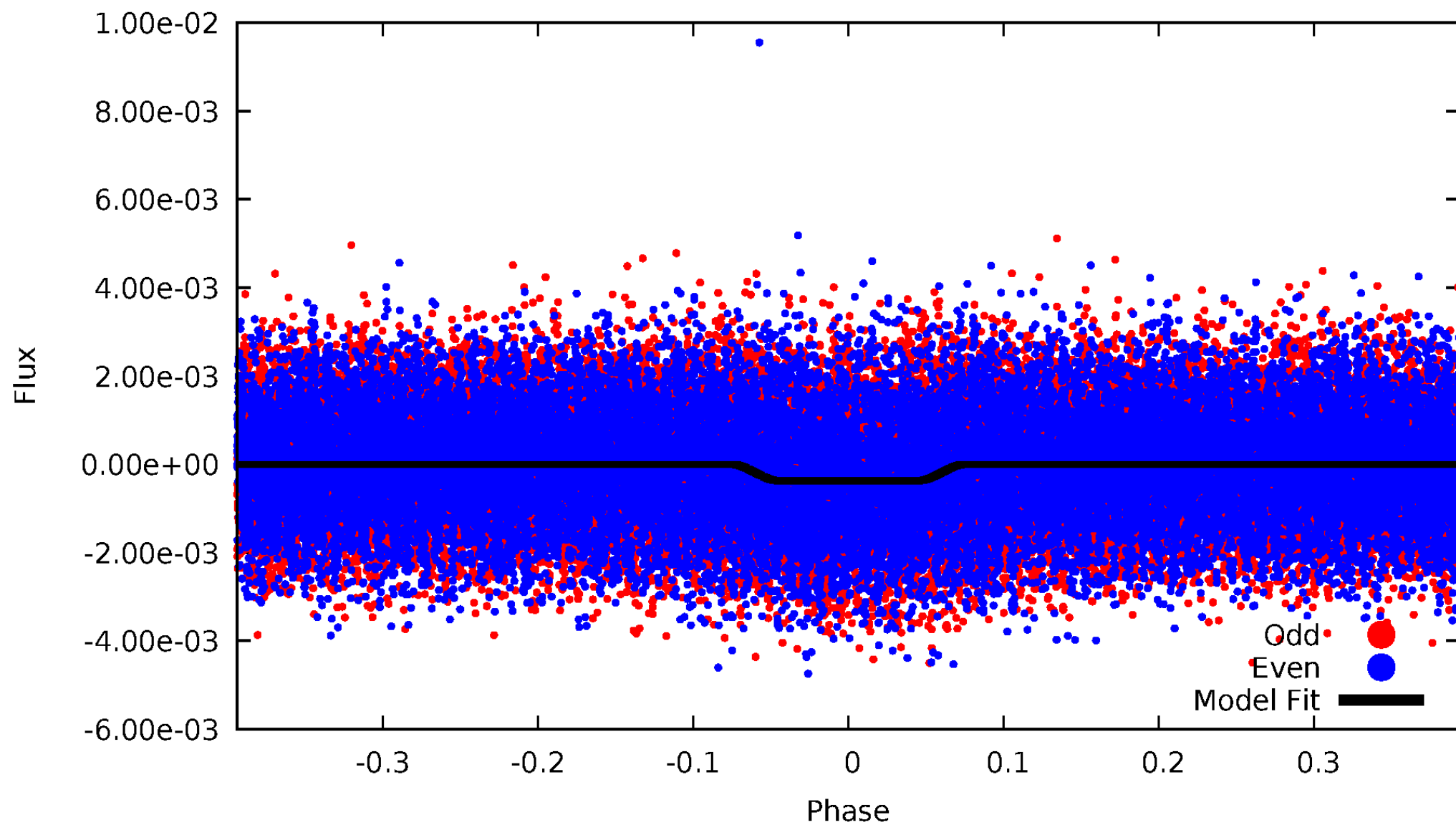
DV Odd/Even

TCE 006311520-01



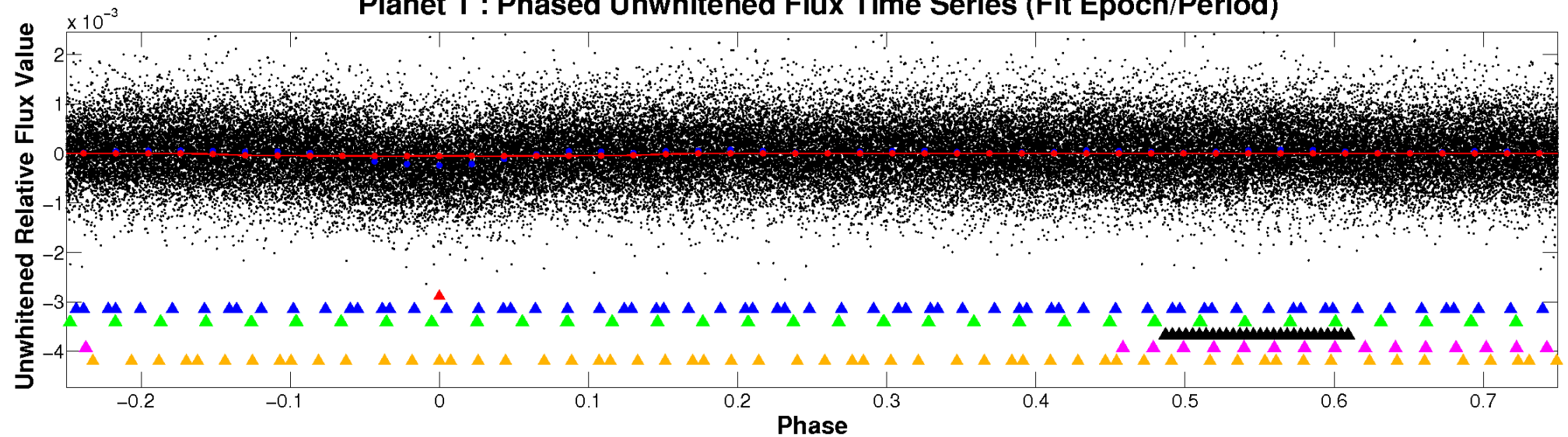
ALT Odd/Even

TCE 006311520-01

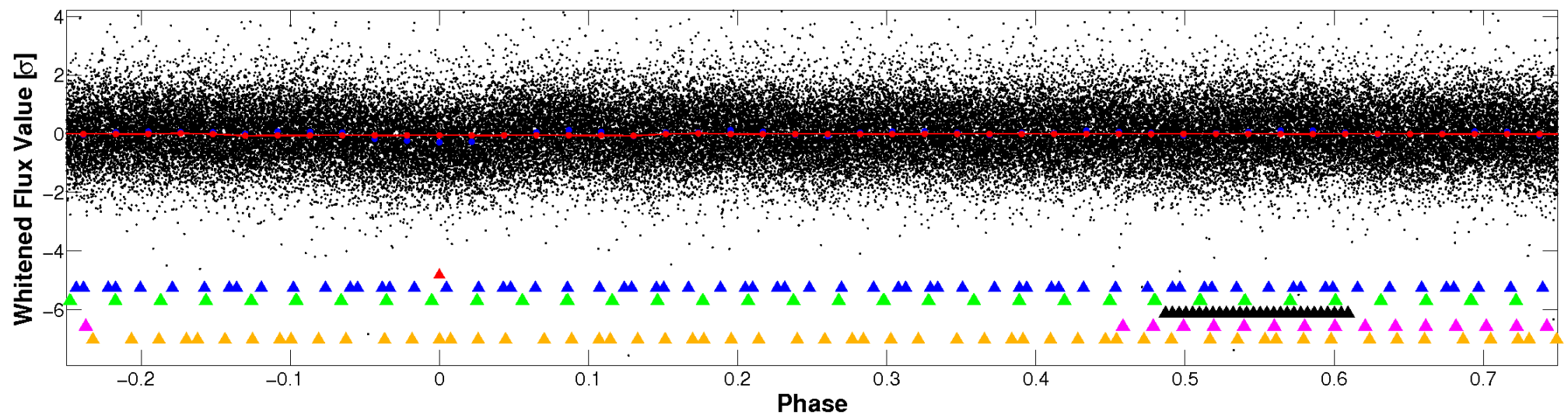


Non-Whitened Vs. Whitened Light Curve

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

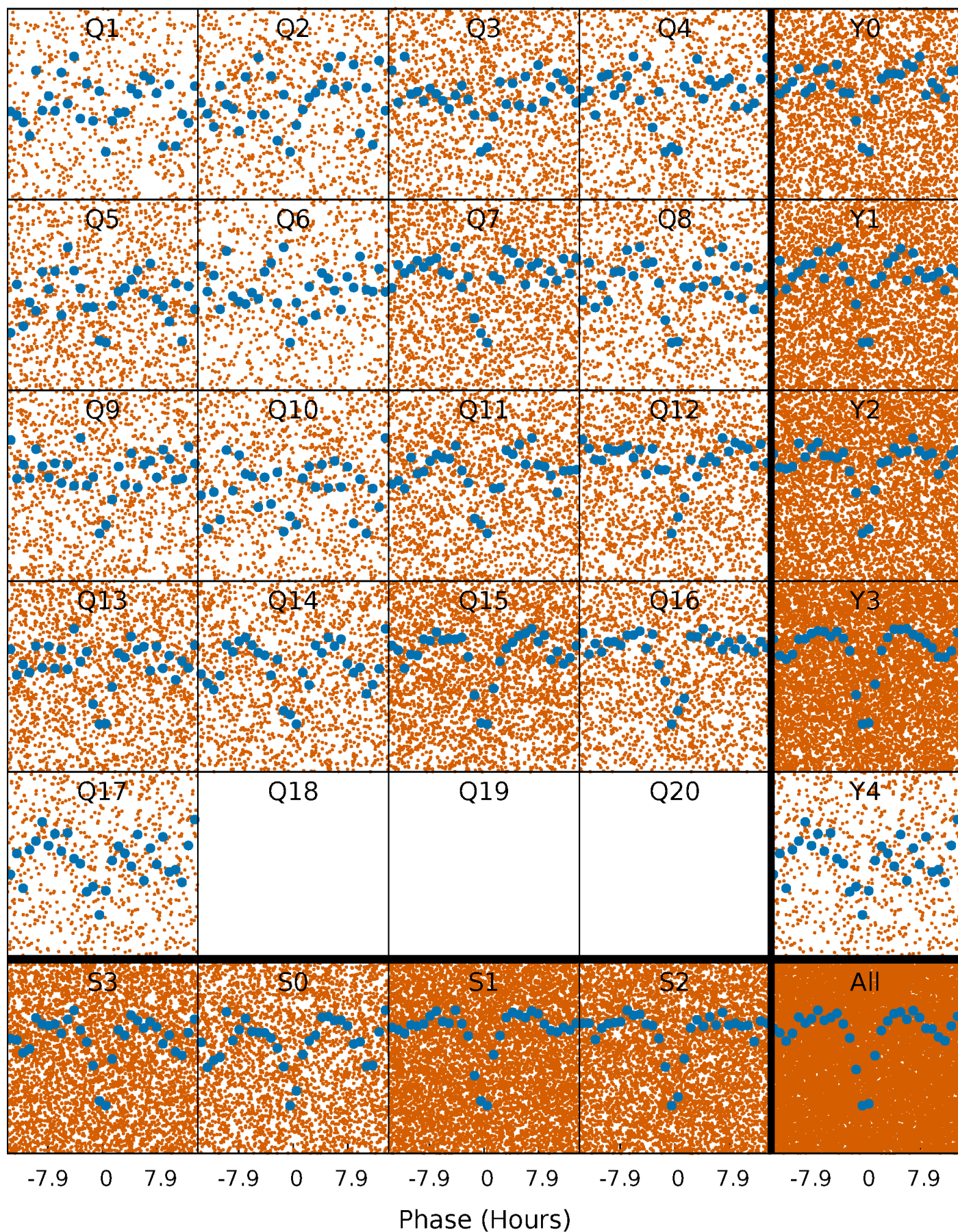


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



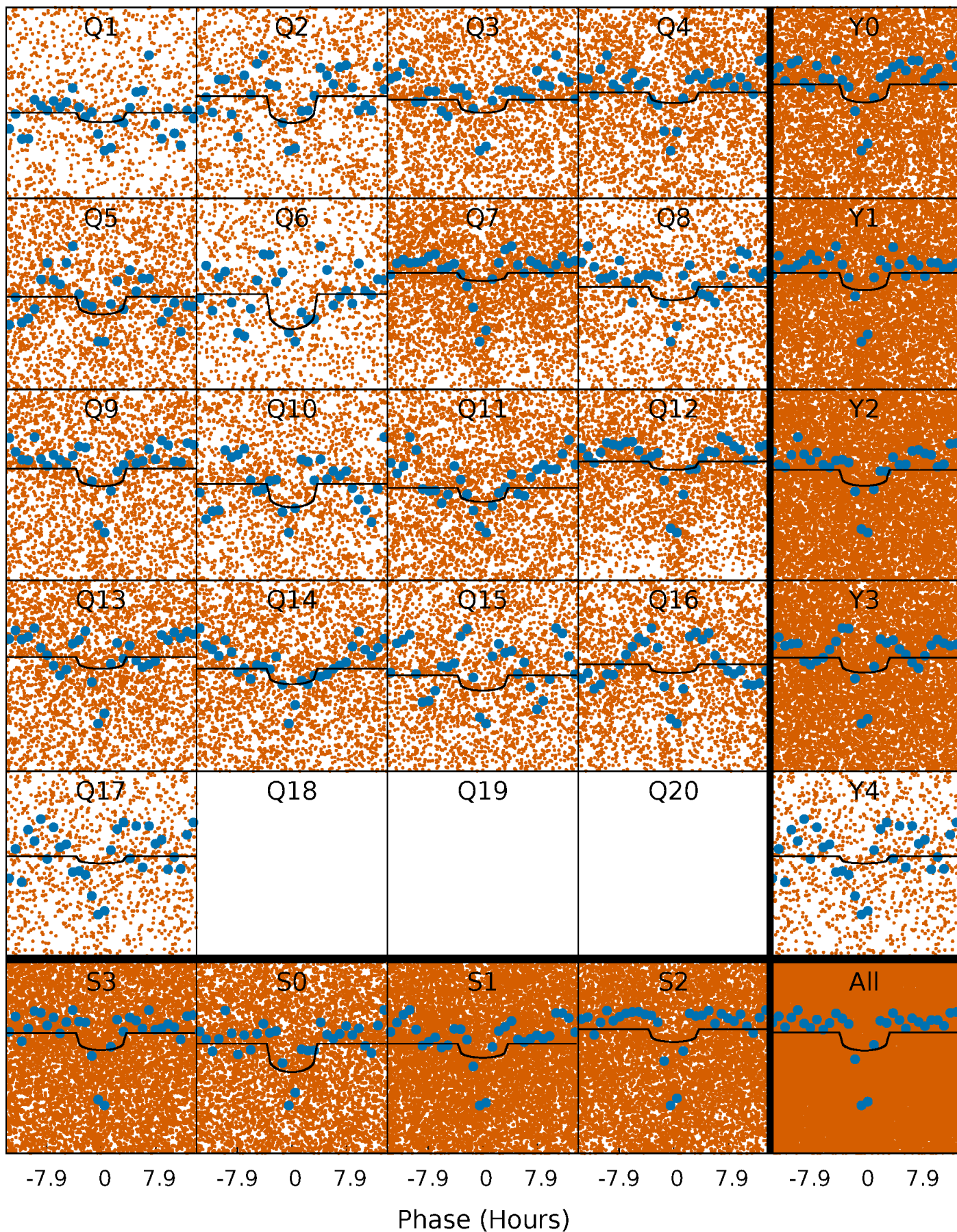
PDC Quarter-Phased Transit Curves

TCE 006311520-01 P= 0.941840 Days $T_0=131.811922$ (BKJD)



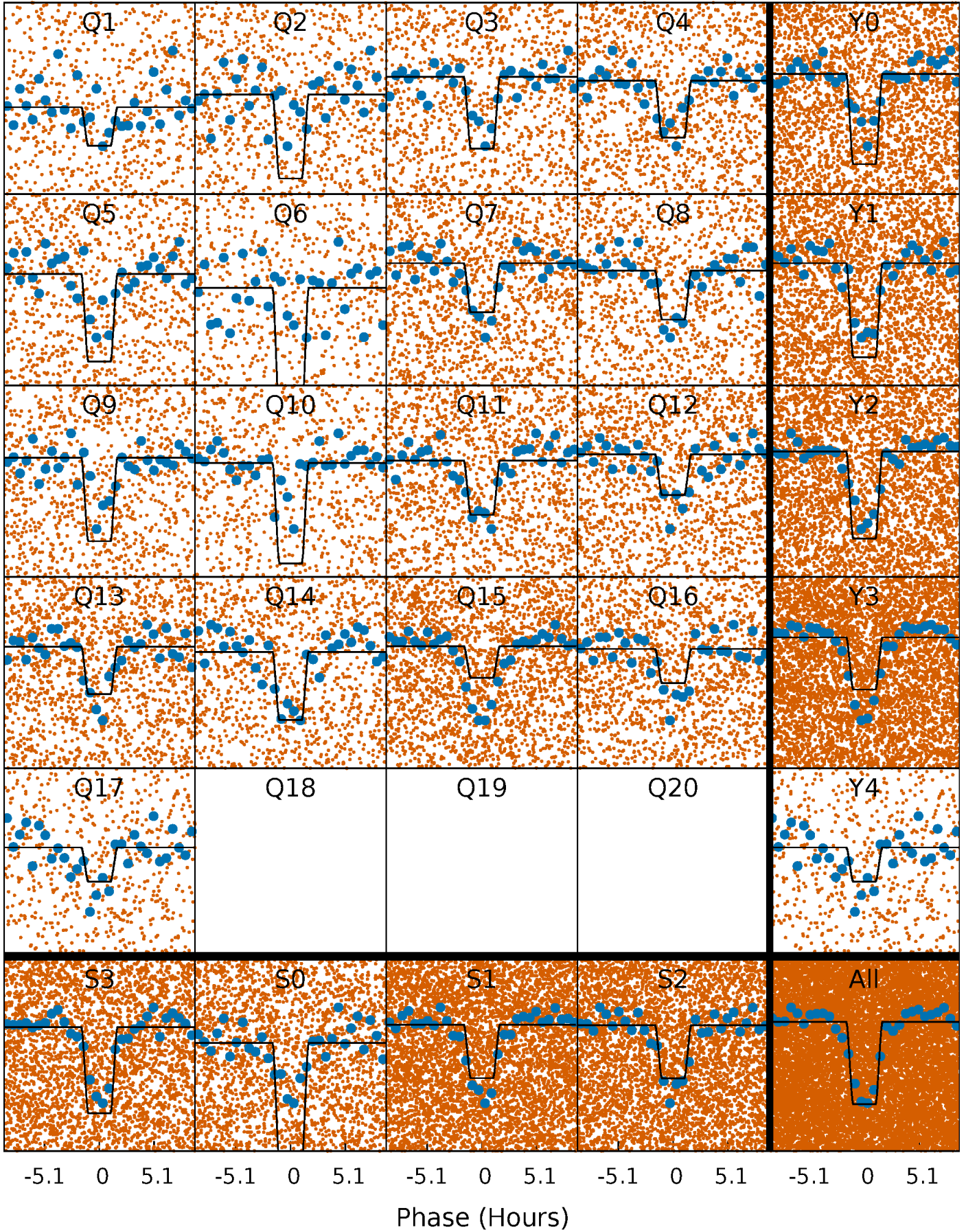
DV Quarter-Phased Transit Curves

TCE 006311520-01 P= 0.941840 Days $T_0=131.811922$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

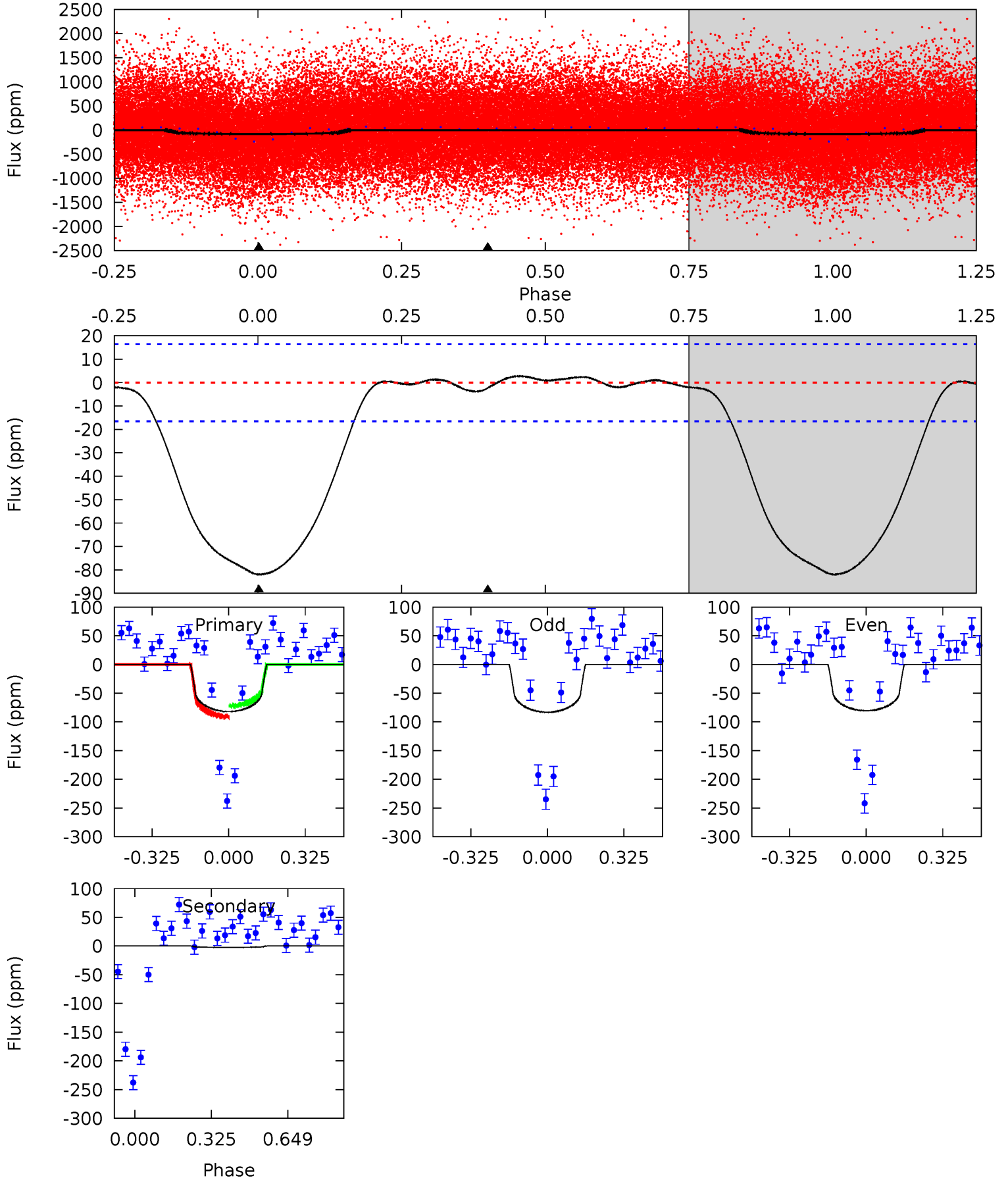
TCE 006311520-01 P= 0.941849 Days $T_0=131.796651$ (BKJD)



DV Model-Shift Uniqueness Test

006311520-01, P = 0.941840 Days, E = 130.870082 Days

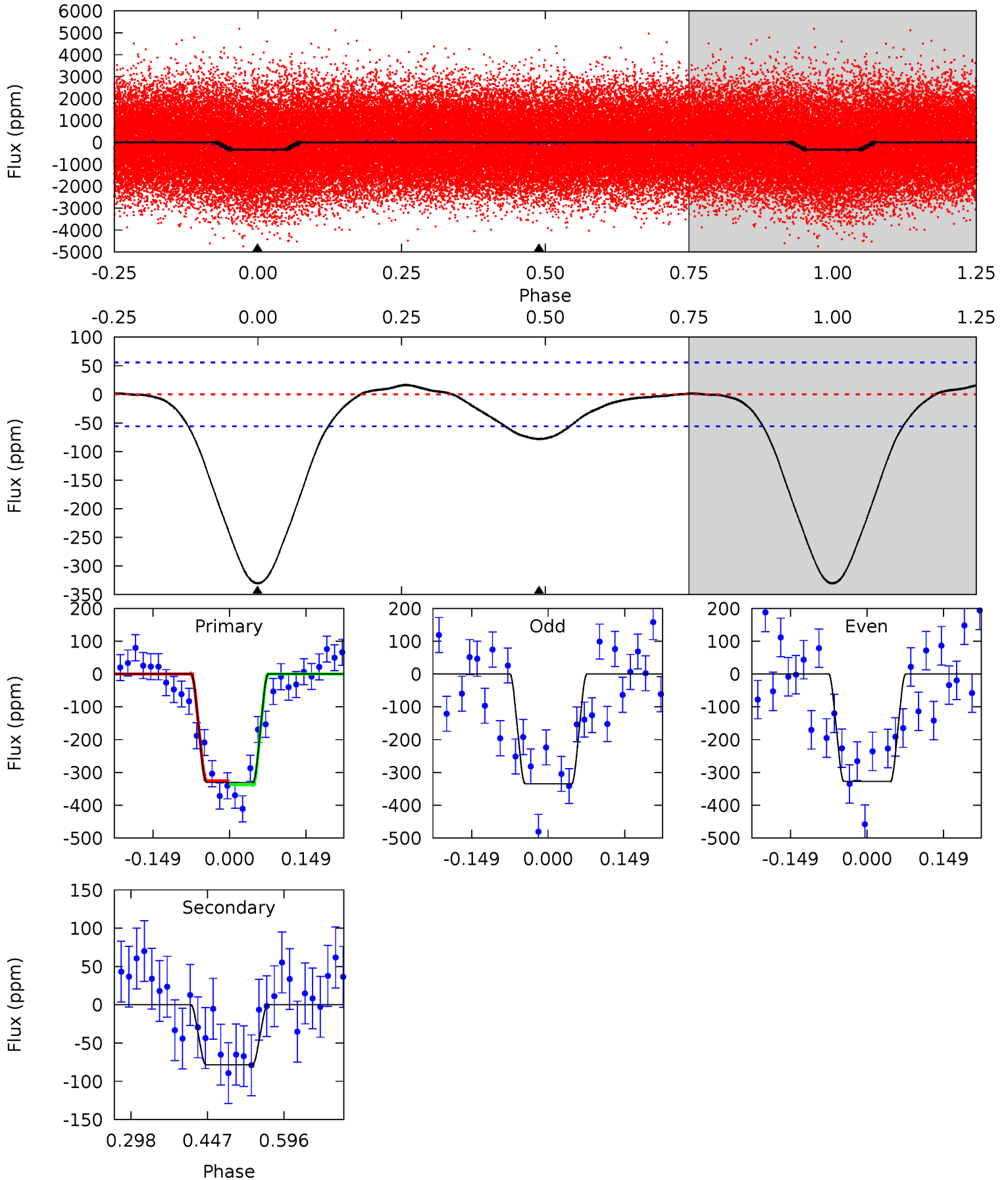
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.4	0.59	0	0	4.31	0.99	0.24	21.4	21.4	0.59	0.59	0.34	1.01	0.03	2.38



Alt Model-Shift Uniqueness Test

006311520-01, P = 0.941849 Days, E = 130.854802 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.6	6.29	0	0	4.48	1.44	0.65	26.6	26.6	6.29	6.29	0.27	0.99	0.05	0.50



Stellar Parameters For KIC 006311520

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6419^{+177}_{-199}	$4.330^{+0.124}_{-0.186}$	$-0.400^{+0.300}_{-0.300}$	$1.142^{+0.325}_{-0.175}$	$1.013^{+0.156}_{-0.114}$	$0.958^{+0.541}_{-0.467}$
	+3%/-3%	+3%/-4%	+75%/-75%	+28%/-15%	+15%/-11%	+56%/-49%
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 006311520-01 / KOI 4115.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2 ± 4	$1.00^{+0.84}_{-0.63}$	3104^{+234}_{-178}	1811^{+2831}_{-5378}	$0.303^{+2.713}_{-0.633}$
Alt.	-78 ± 12	$2.39^{+0.99}_{-0.80}$	3094^{+205}_{-170}	4432^{+941}_{-588}	$2.727^{+3.442}_{-1.396}$

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

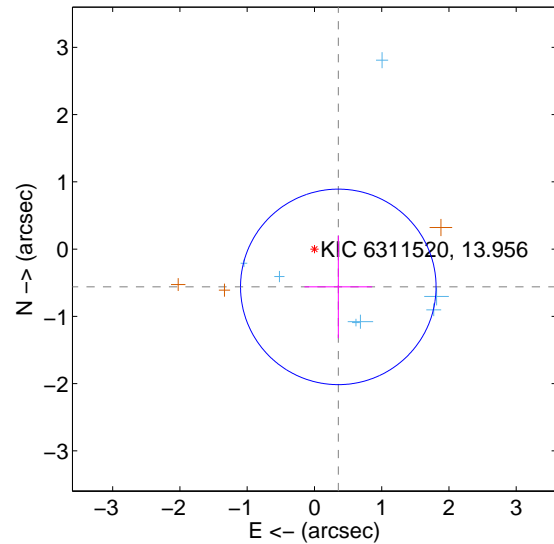
Supplemental centroid analysis for 006311520-01. Kepler magnitude: 13.96. Transit SNR 7.91

There are 7 quarters with good PRF difference image offsets

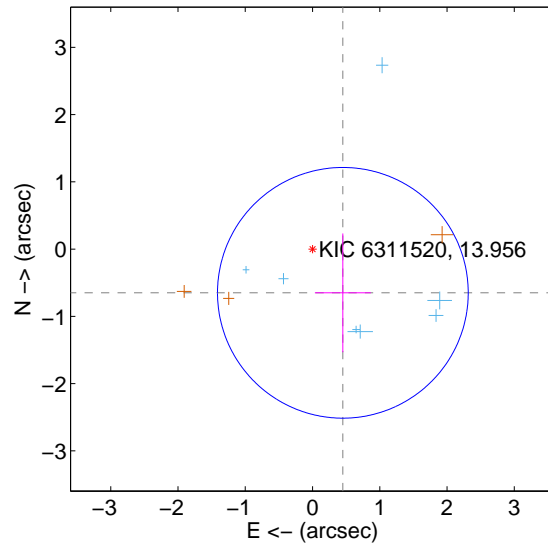
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.665 ± 0.485	1.37	-0.355 ± 0.503	-0.562 ± 0.762
PRF-fit source offset from KIC position	0.791 ± 0.621	1.27	-0.451 ± 0.417	-0.650 ± 0.883
photometric centroid source offset	1.55 ± 0.48	3.22	-1.41 ± 0.49	0.64 ± 0.45

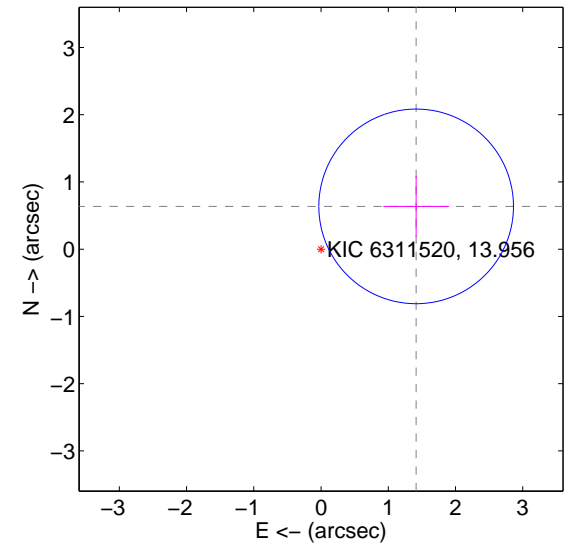
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

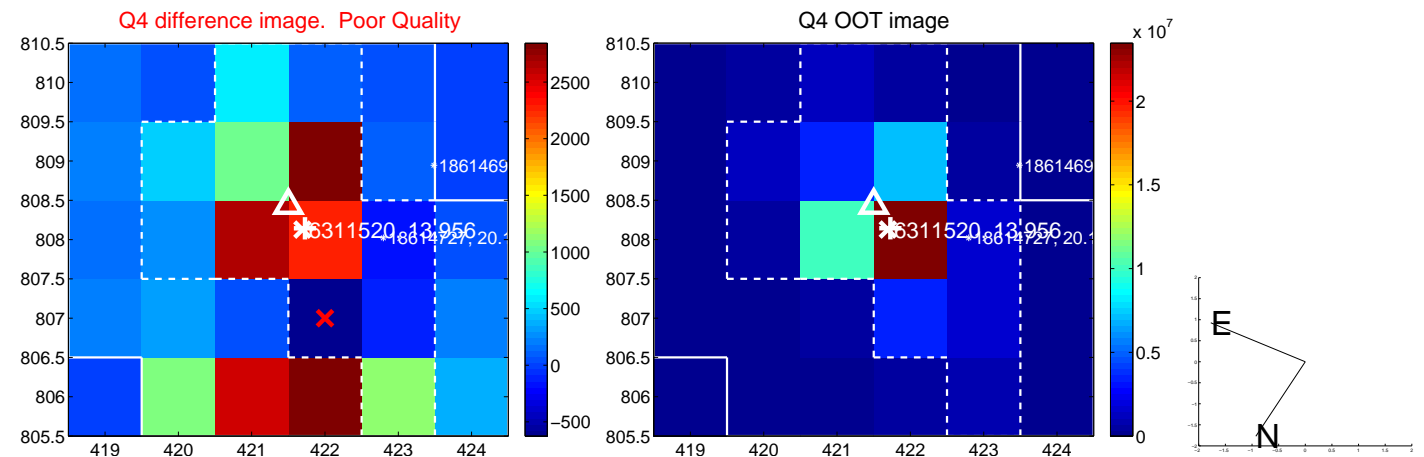
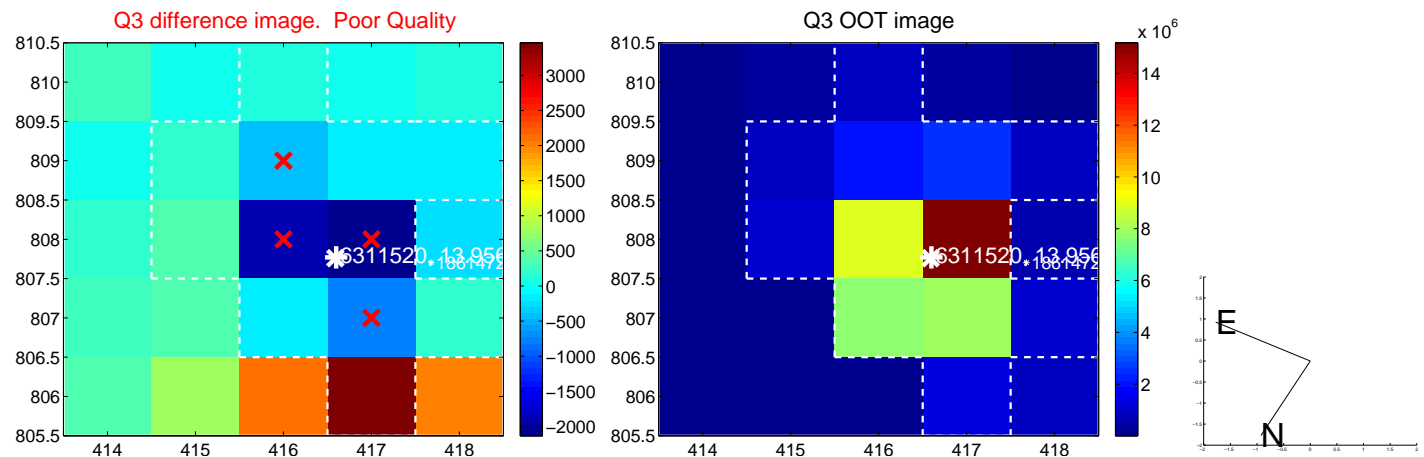
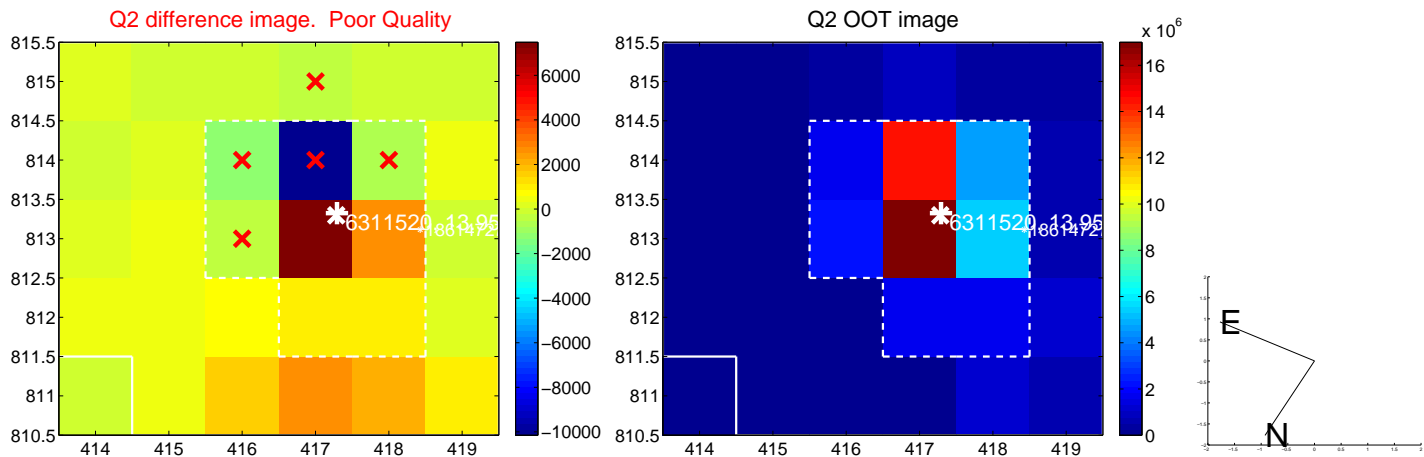
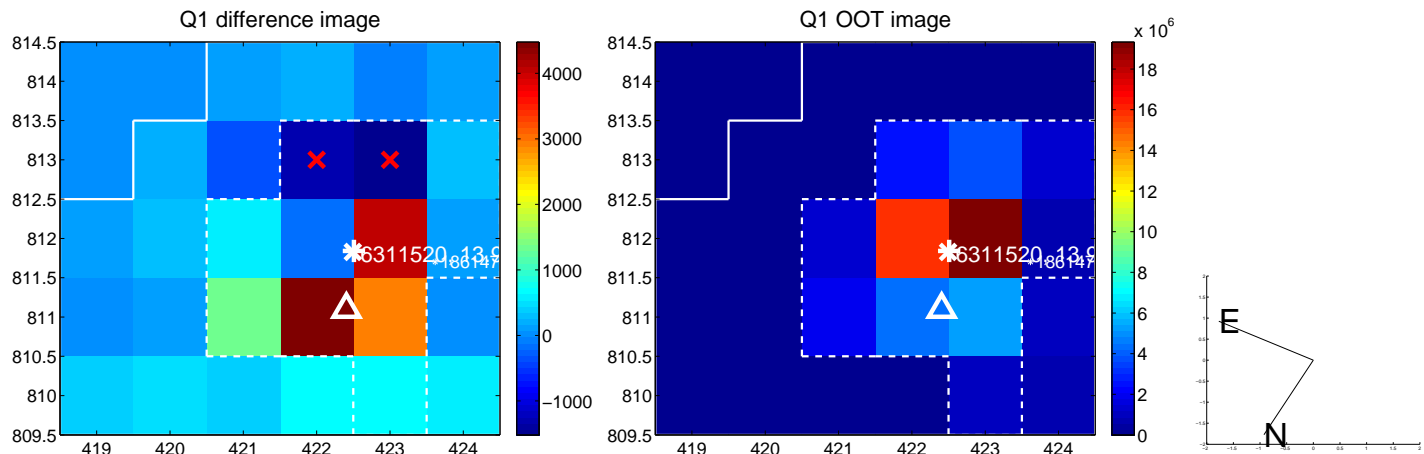


offset from photometric centroids

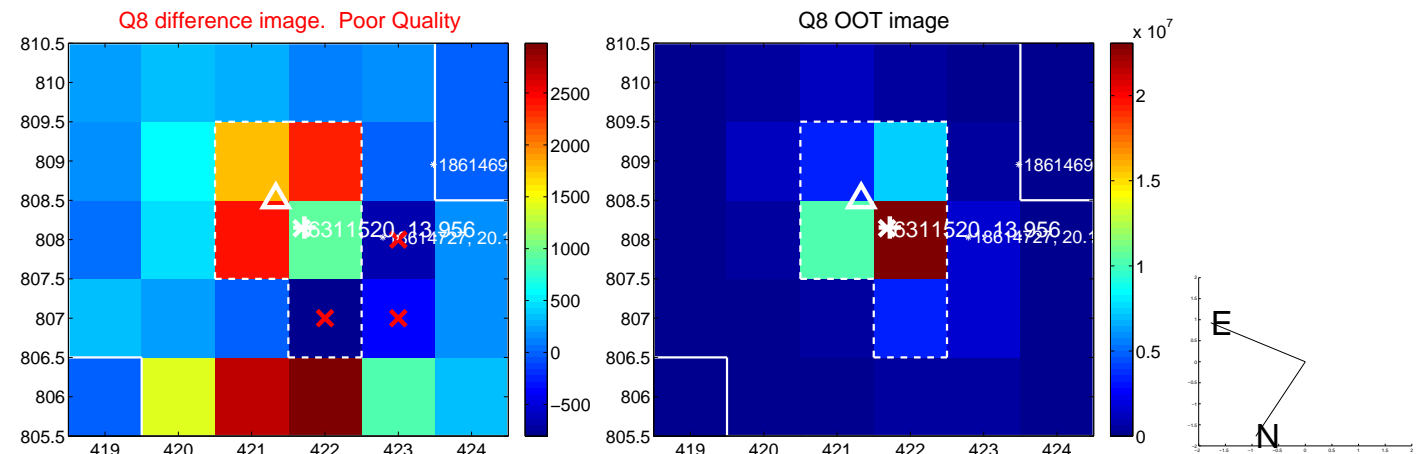
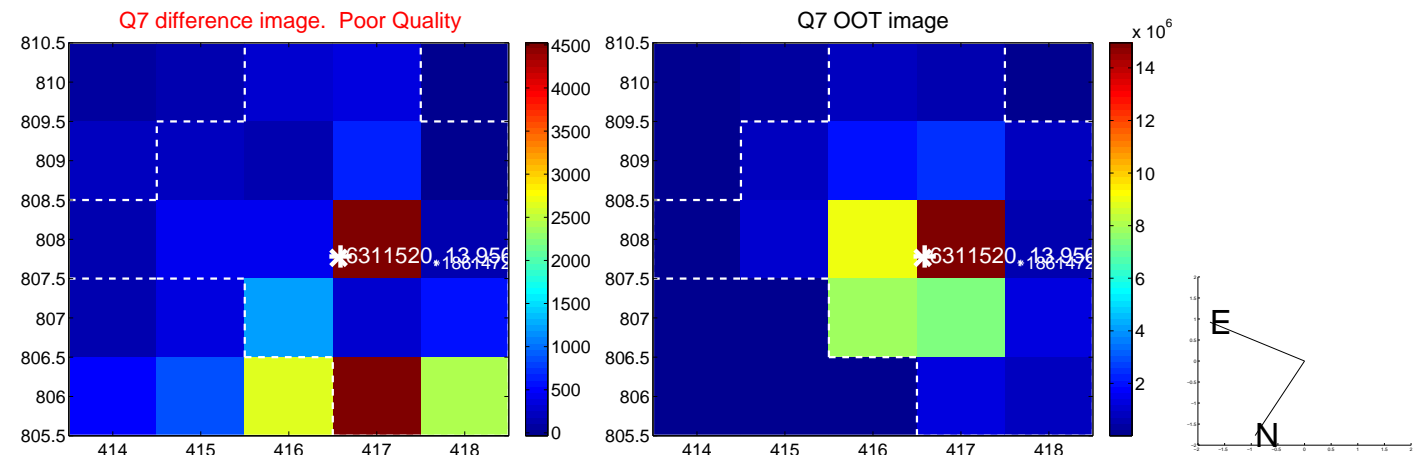
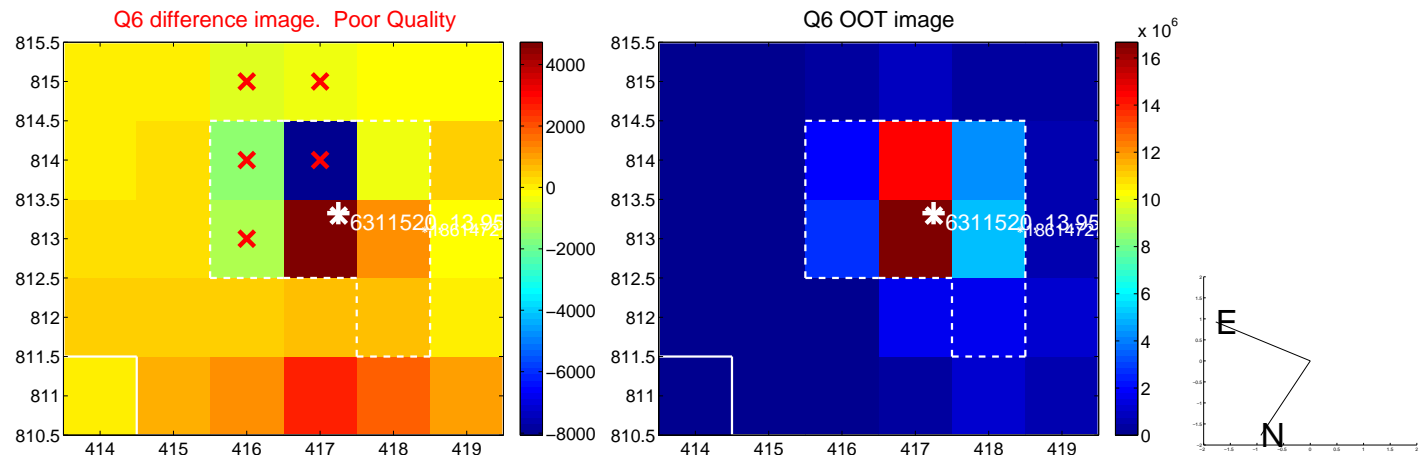
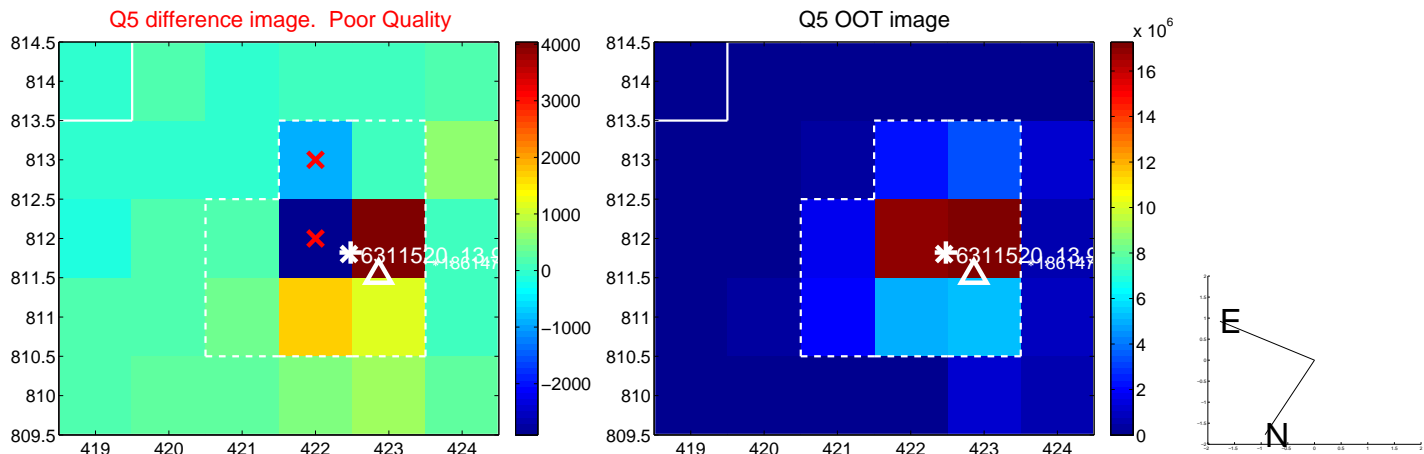


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

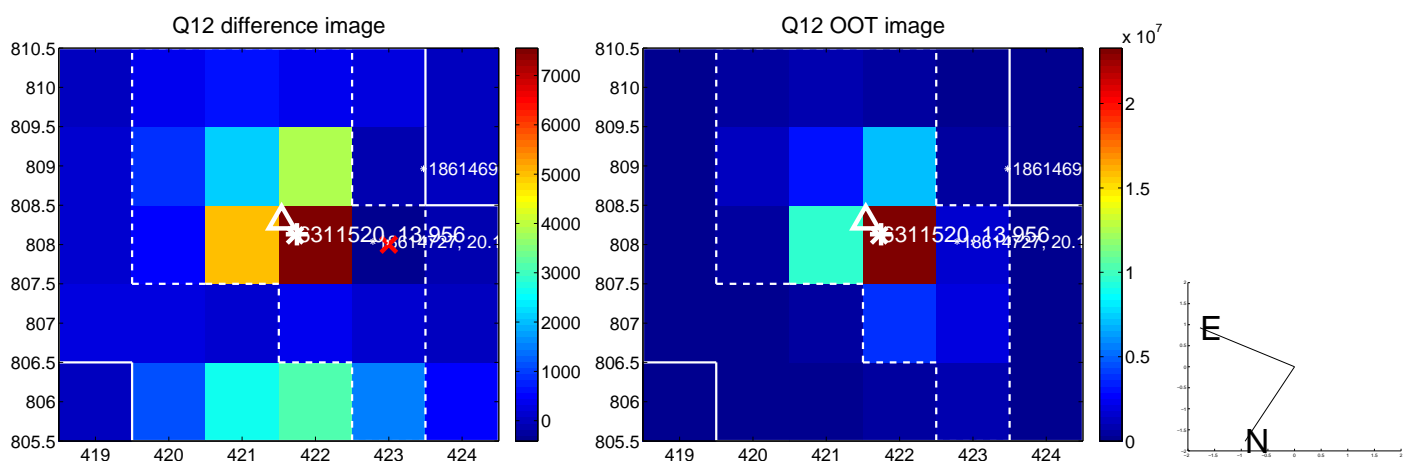
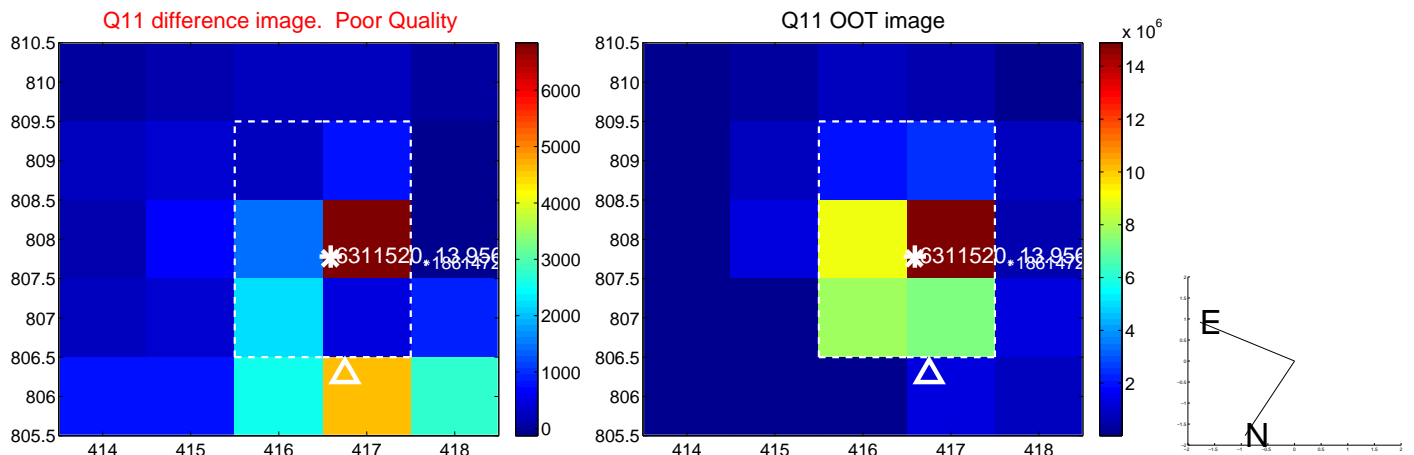
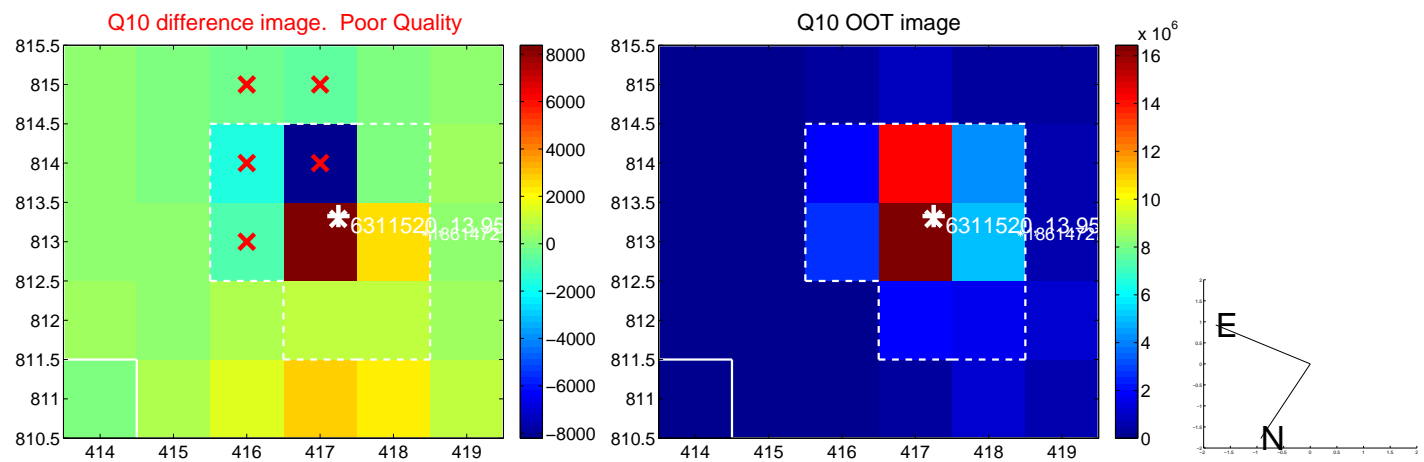
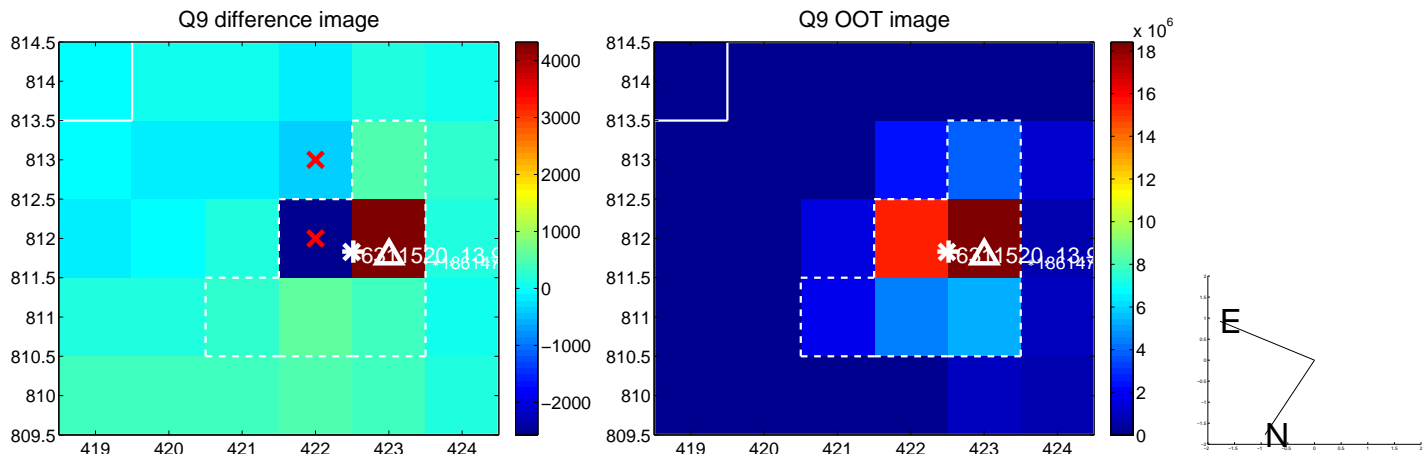
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



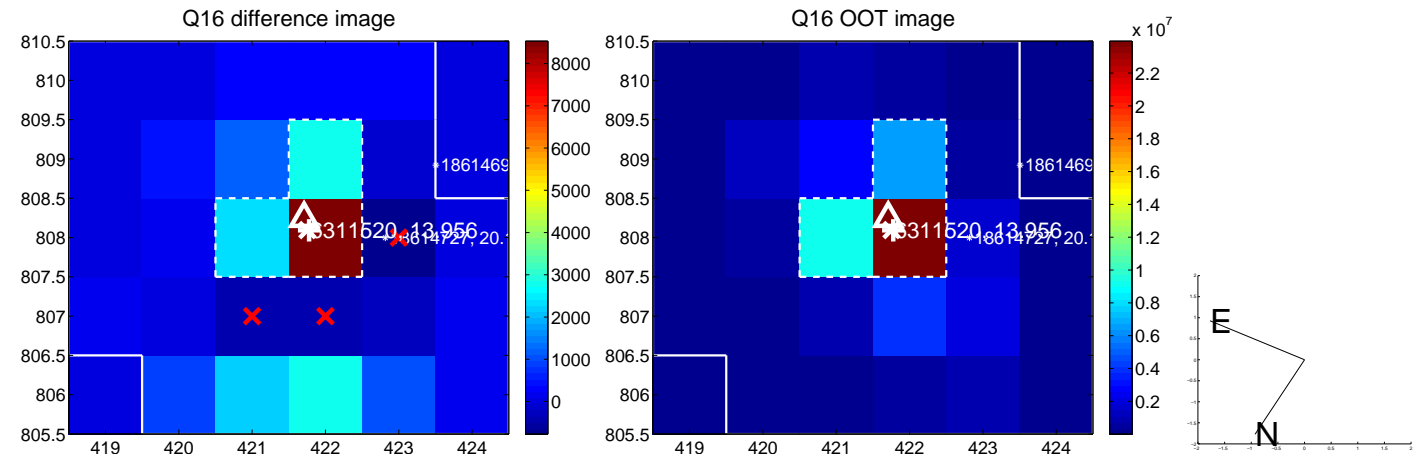
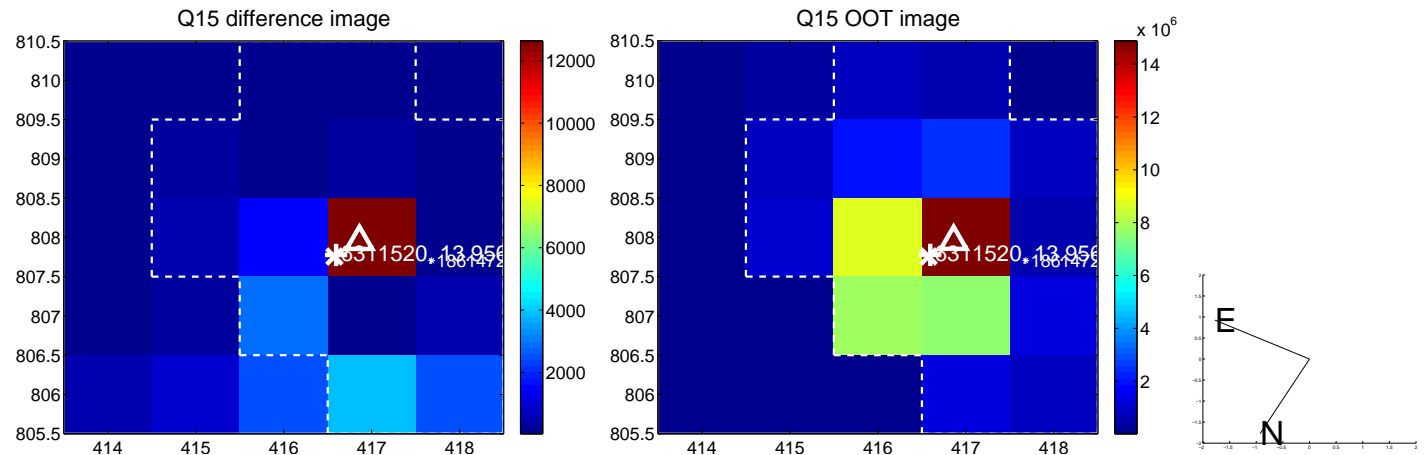
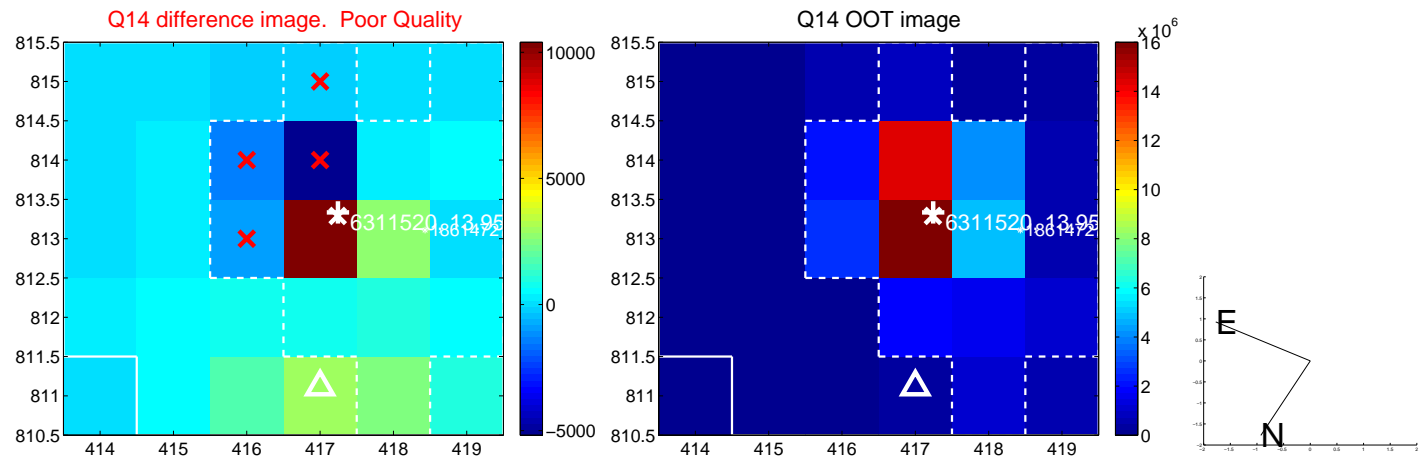
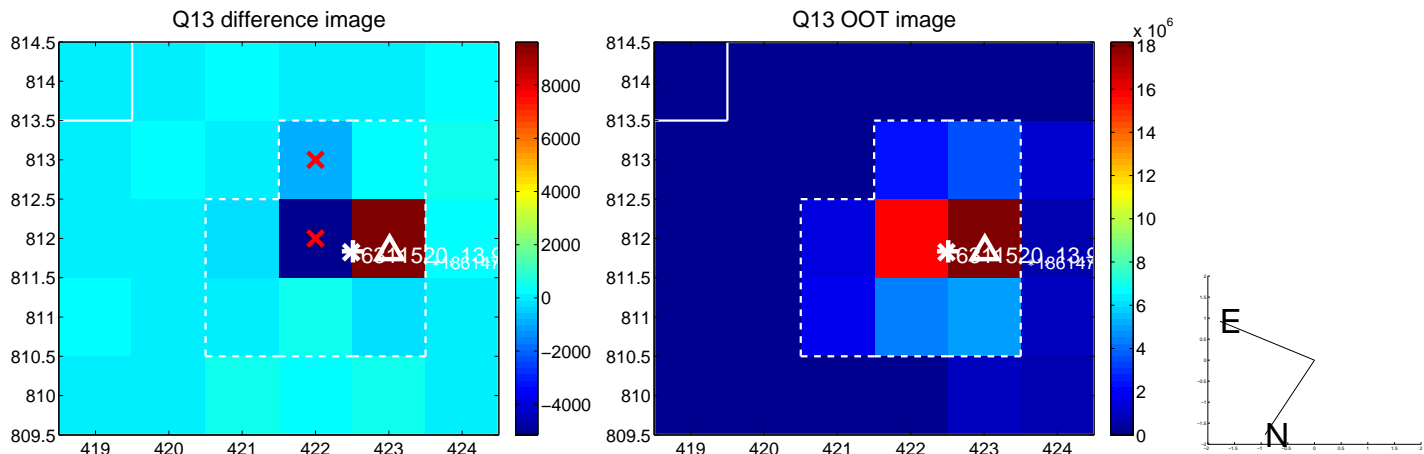
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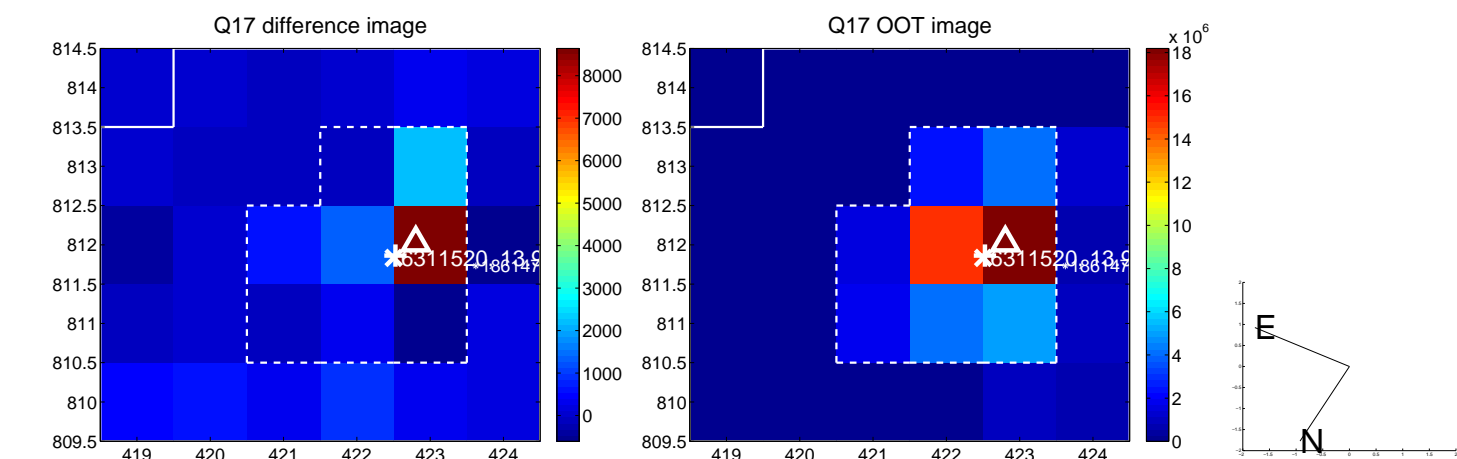
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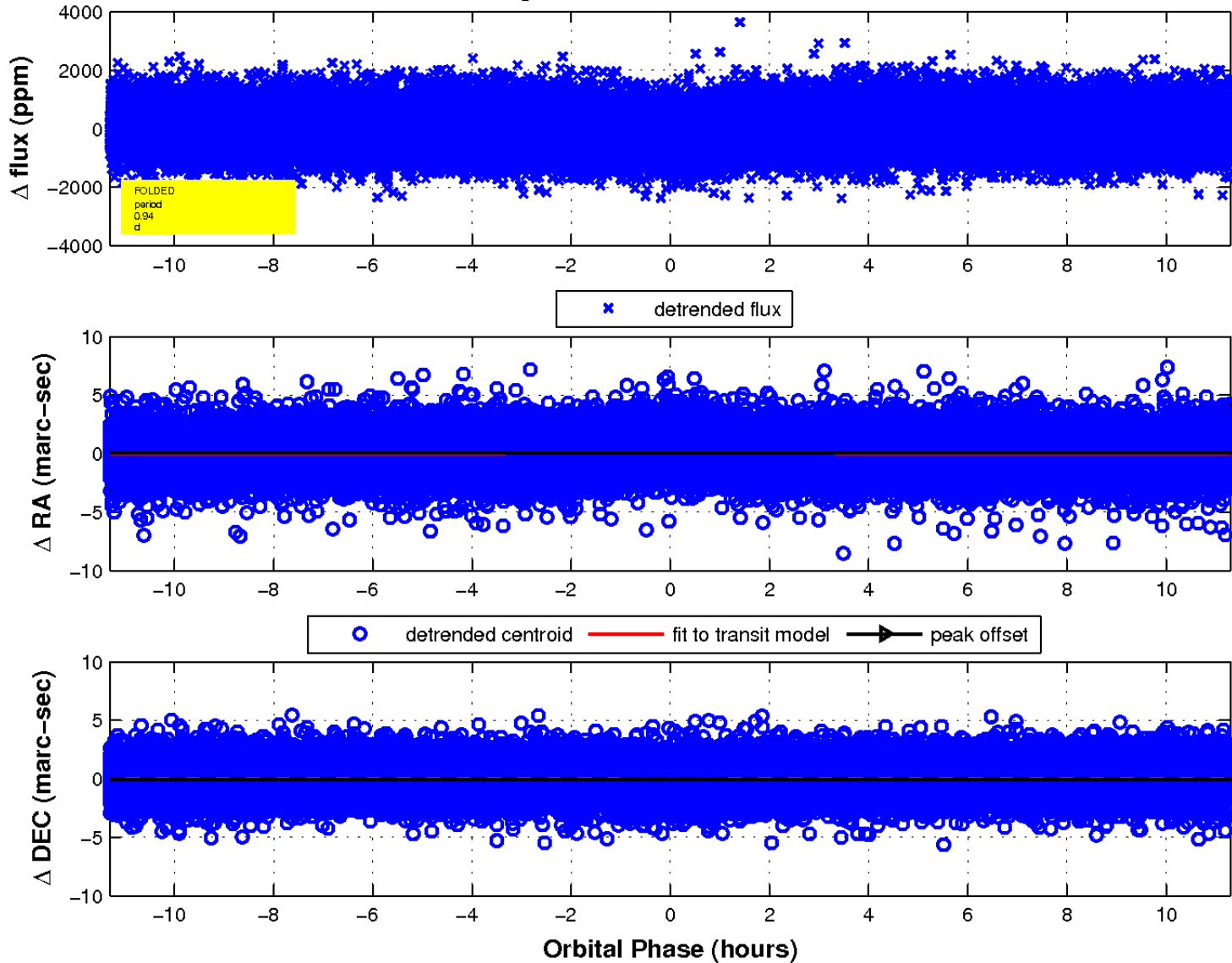
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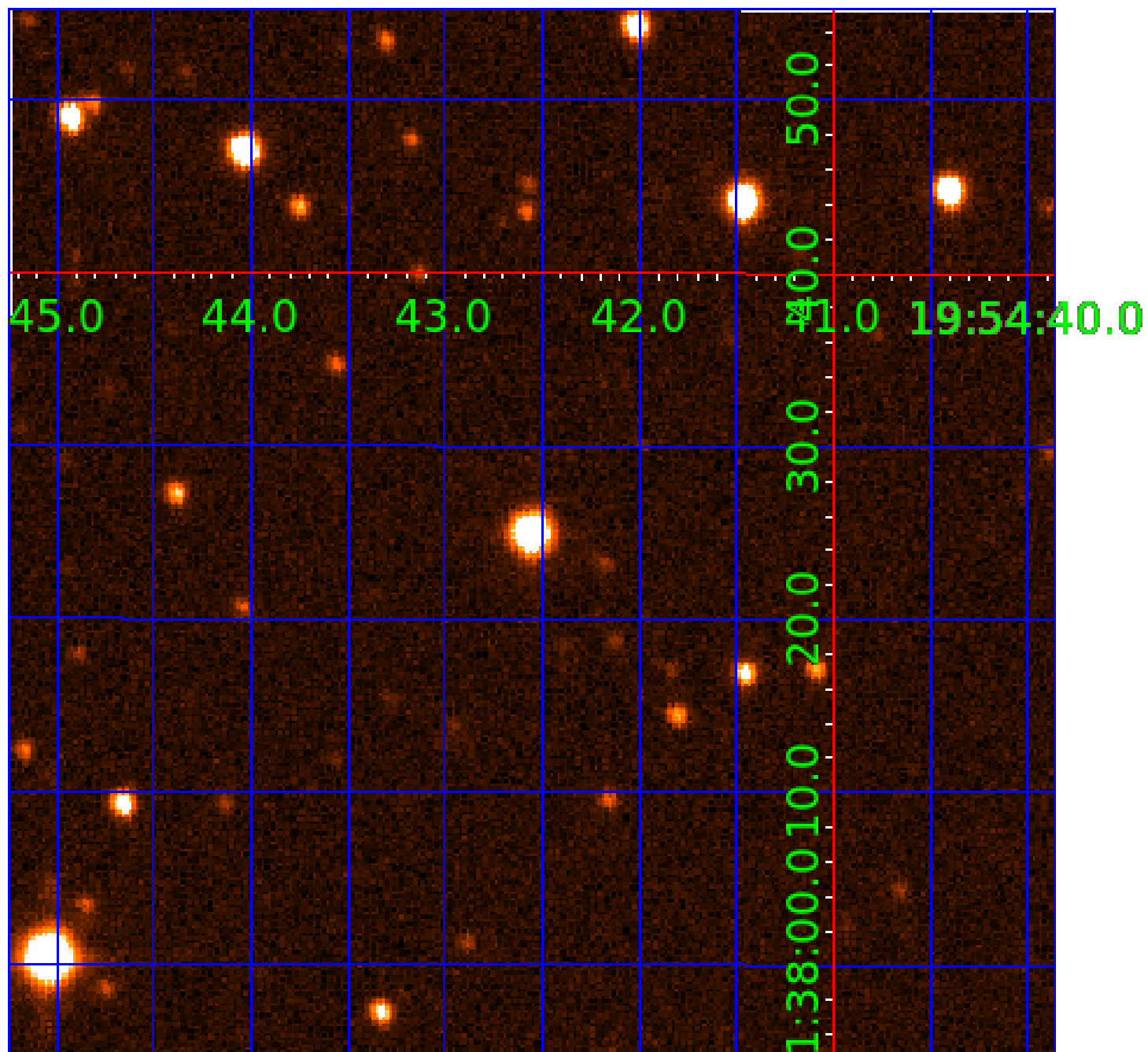


fluxWeightedCentroids, Planet 1 of 6



UKIRT Image

Declination



KIC 006311520

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

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

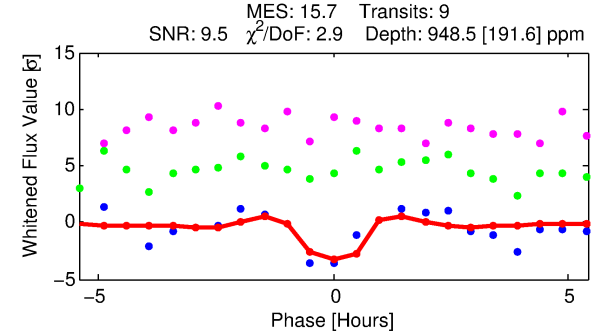
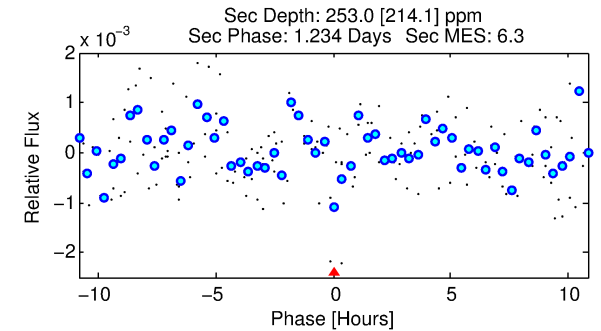
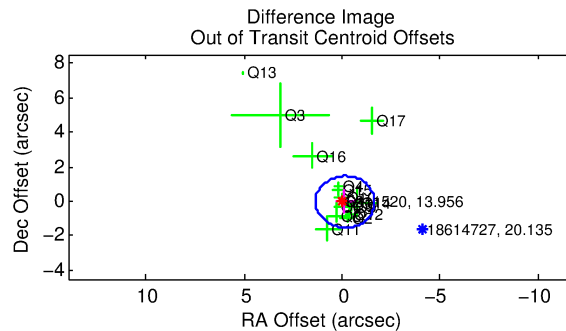
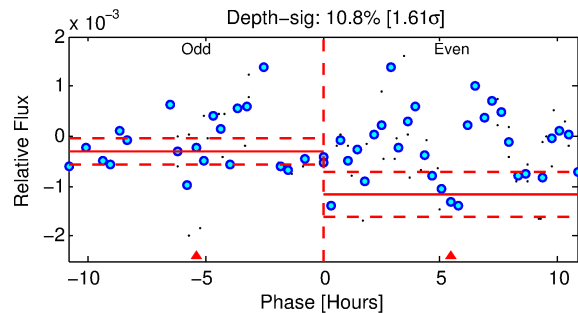
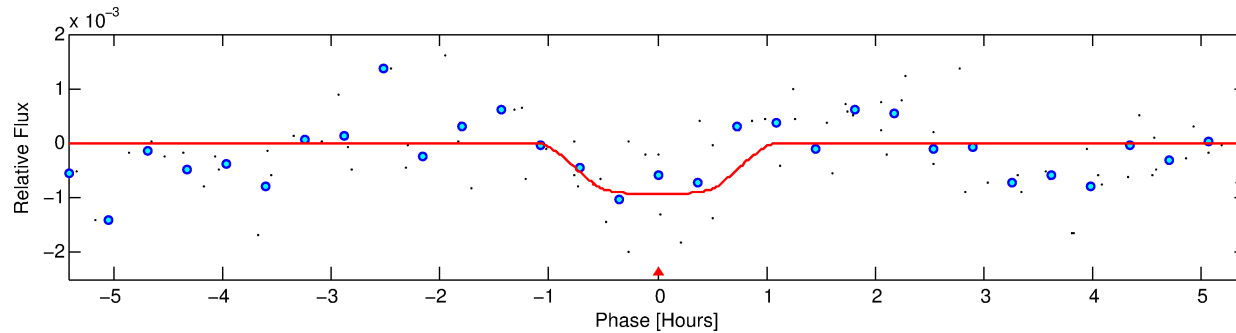
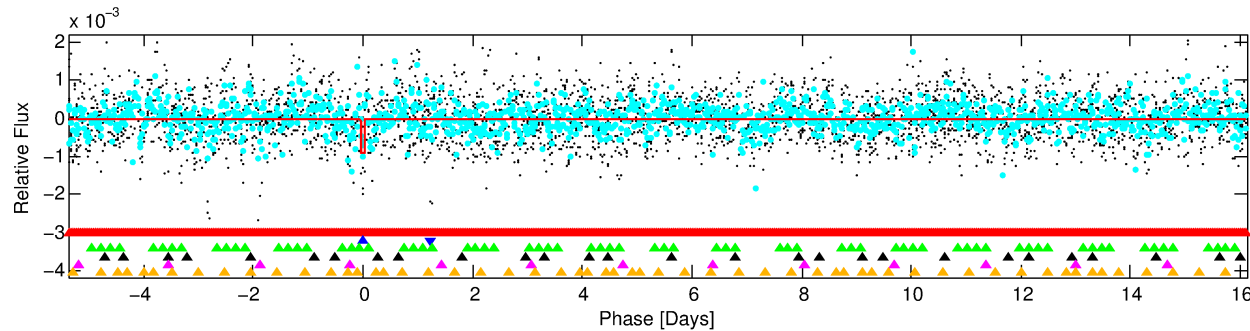
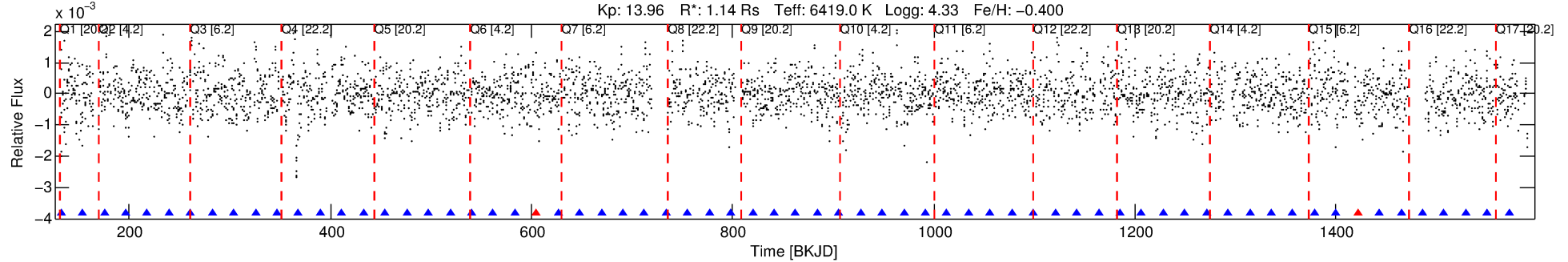
Ephemeris Match Information For 006311520-02

No Significant Match Found

DV One-Page Summary

KIC: 6311520 Candidate: 2 of 6 Period: 21.489 d
KOI: K04115 Corr: No Ephemeris Match

Kp: 13.96 R*: 1.14 Rs Teff: 6419.0 K Logg: 4.33 Fe/H: -0.400



DV Fit Results:

Period = 21.48923 [0.00019] d
Epoch = 132.2998 [0.0070] BKJD
Rp/R* = 0.0324 [0.0181]
a/R* = 49.98 [144.27]
b = 0.87 [0.80]
Seff = 85.69 [31.24]
Teq = 776 [71] K
Rp = 4.04 [2.53] Re
a = 0.1522 [0.0361] AU
Ag = 197.20 [283.98] [0.69σ]
Teff = 4495 [1578] K [2.35σ]

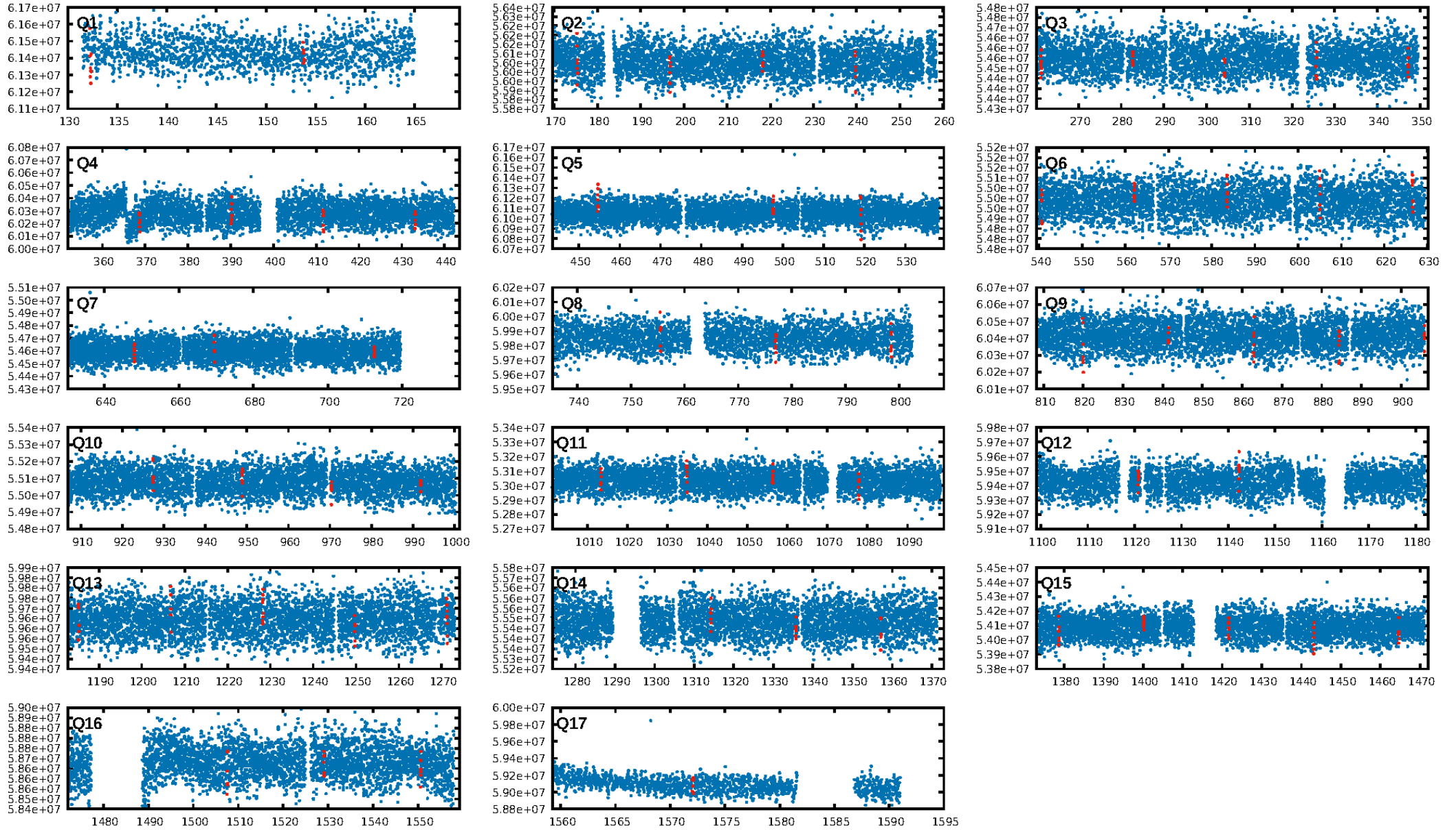
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [14.33σ]
LongPeriod-sig: 100.0% [30.63σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 83.1%
Bootstrap-pfa: 2.89e-24
RollingBand-fgt: 0.75 [6/8]
GhostDiagnostic-chr: 0.06226
Centroid-sig: 7.6%
Centroid-so: 0.340 arcsec [1.25σ]
OotOffset-rm: 0.152 arcsec [0.30σ]
OotOffset-st: 4/3/4/5 [16]
KicOffset-rm: 0.152 arcsec [0.27σ]
KicOffset-st: 4/3/4/5 [16]
DiffImageQuality-fgm: 0.56 [9/16]
DiffImageOverlap-fno: 0.35 [6/17]

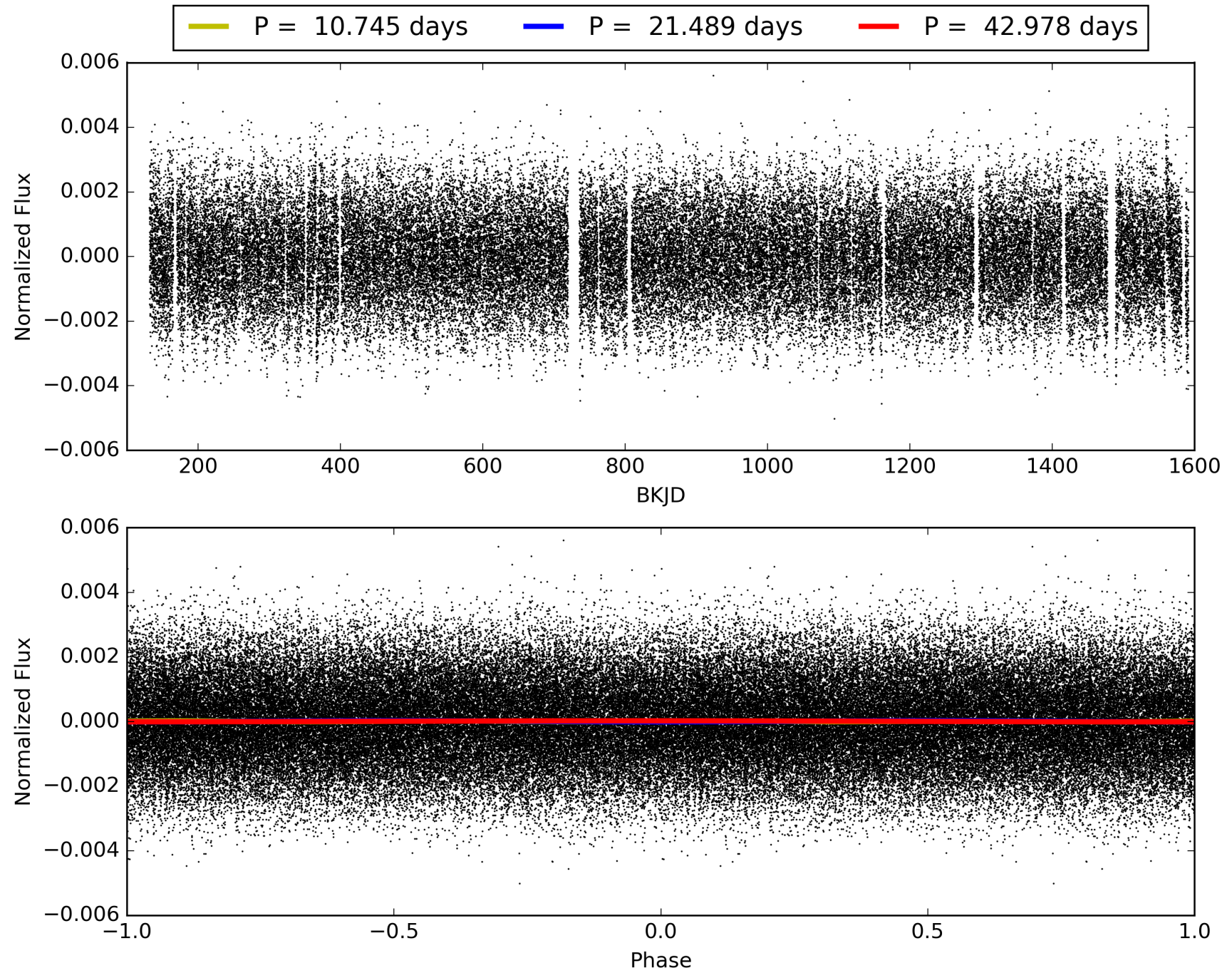
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:31:52 Z

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

TCE 006311520-02, PDC Light Curves

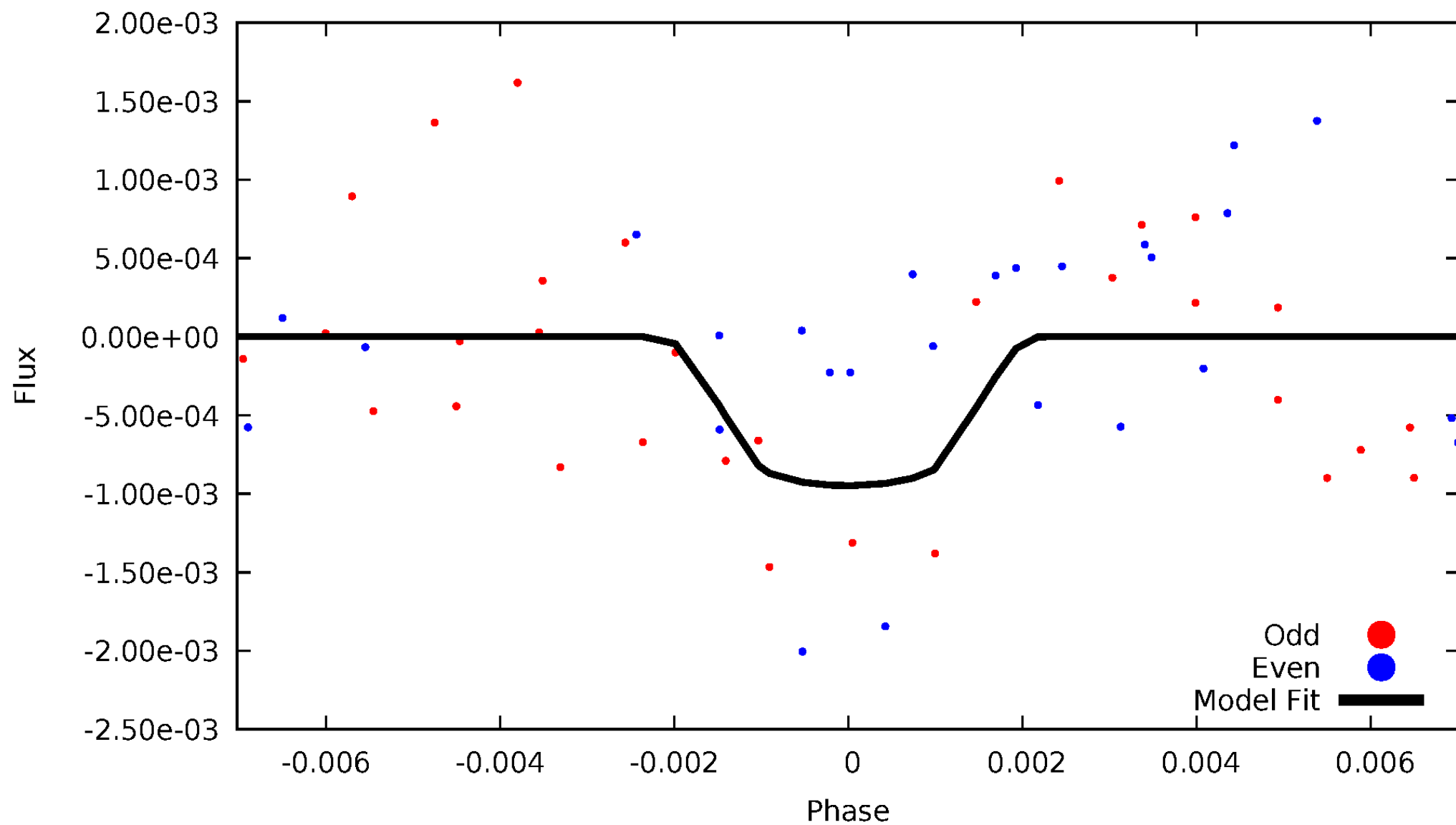


TCE 006311520-02



DV Odd/Even

TCE 006311520-02

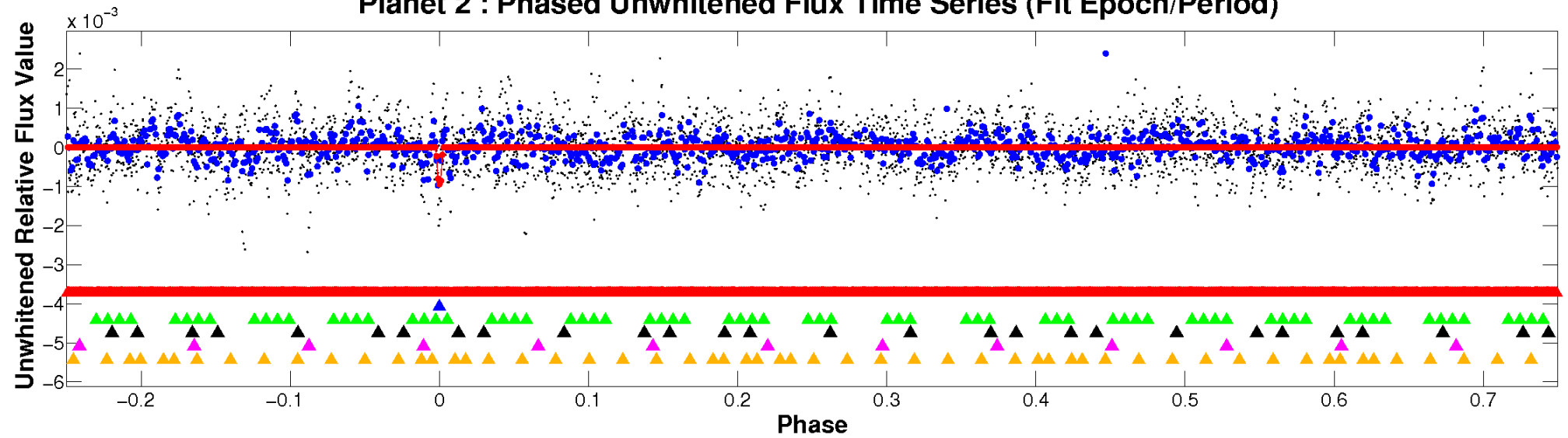


ALT Odd/Even

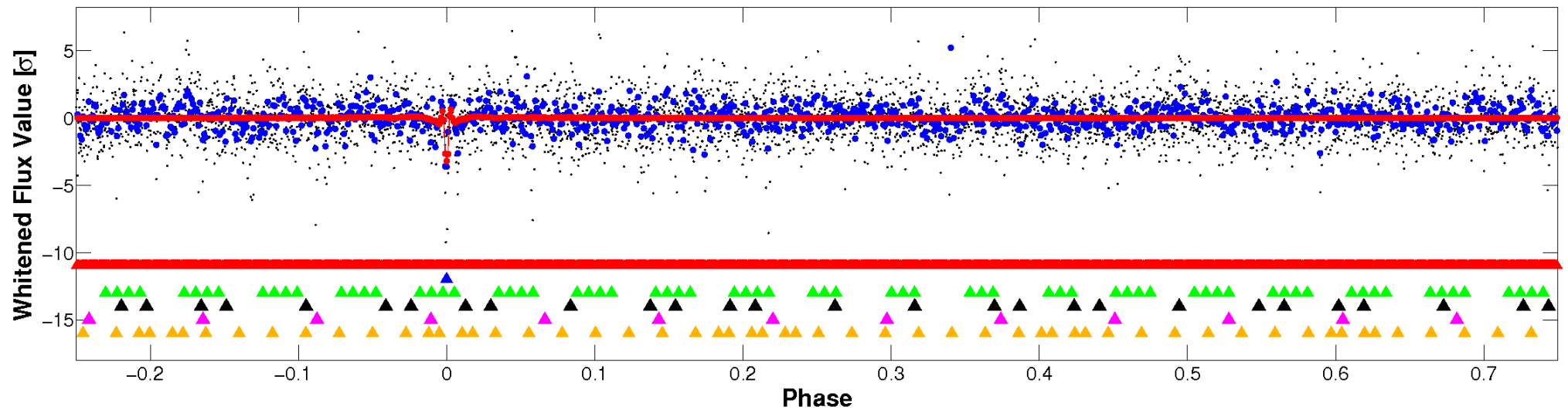
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

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

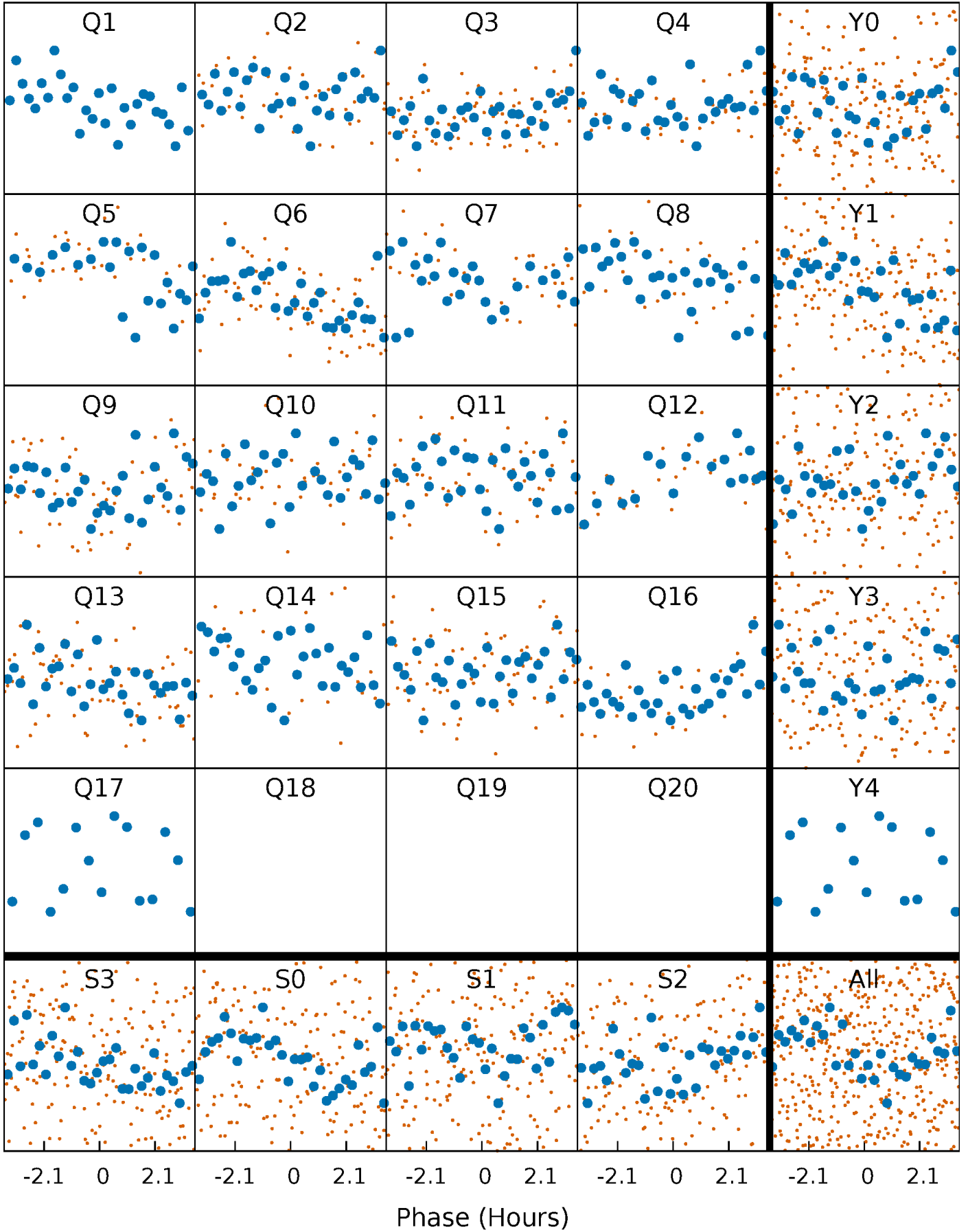


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



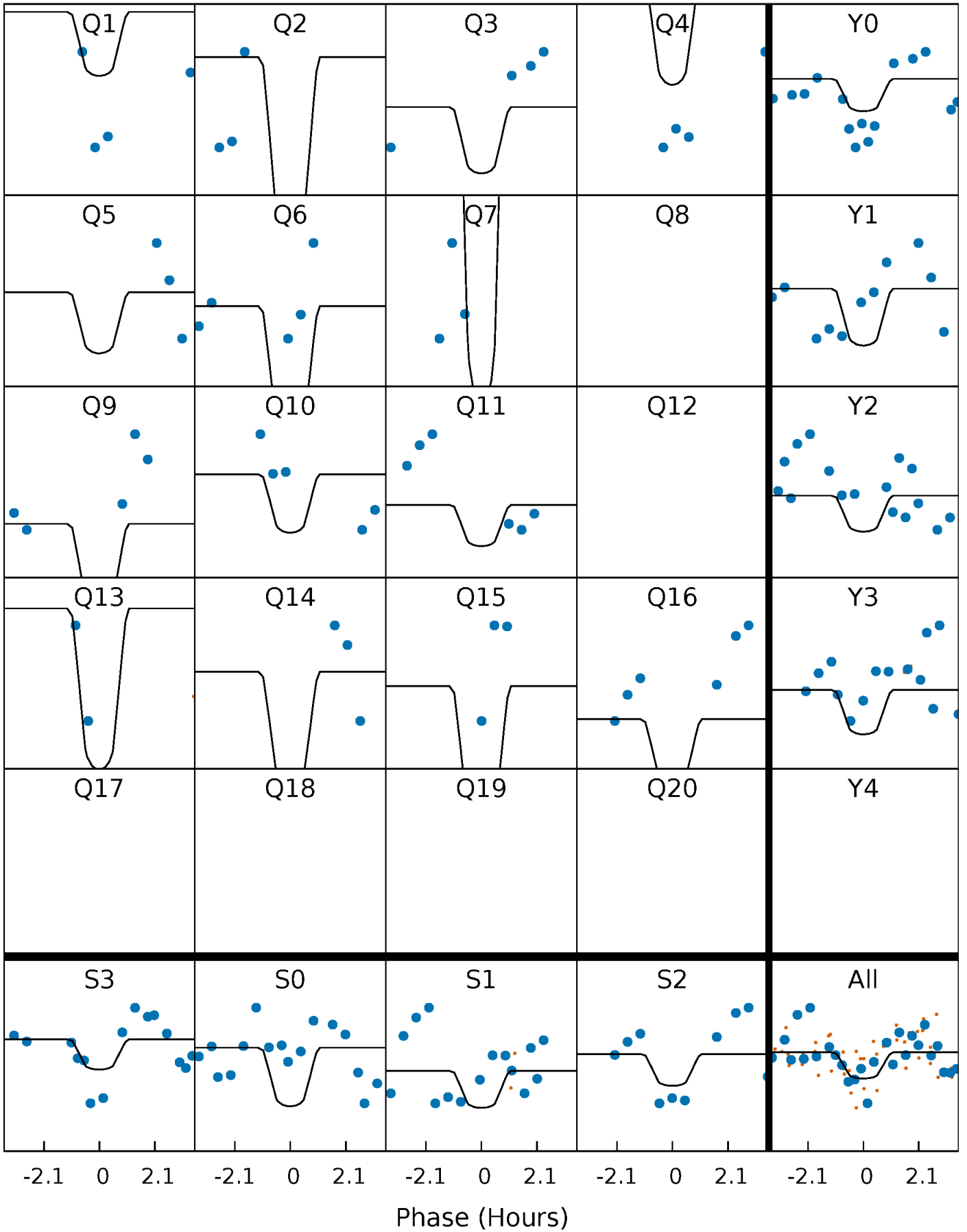
PDC Quarter-Phased Transit Curves

TCE 006311520-02 P= 21.489227 Days $T_0=132.299785$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 006311520-02 P= 21.489227 Days $T_0=132.299785$ (BKJD)

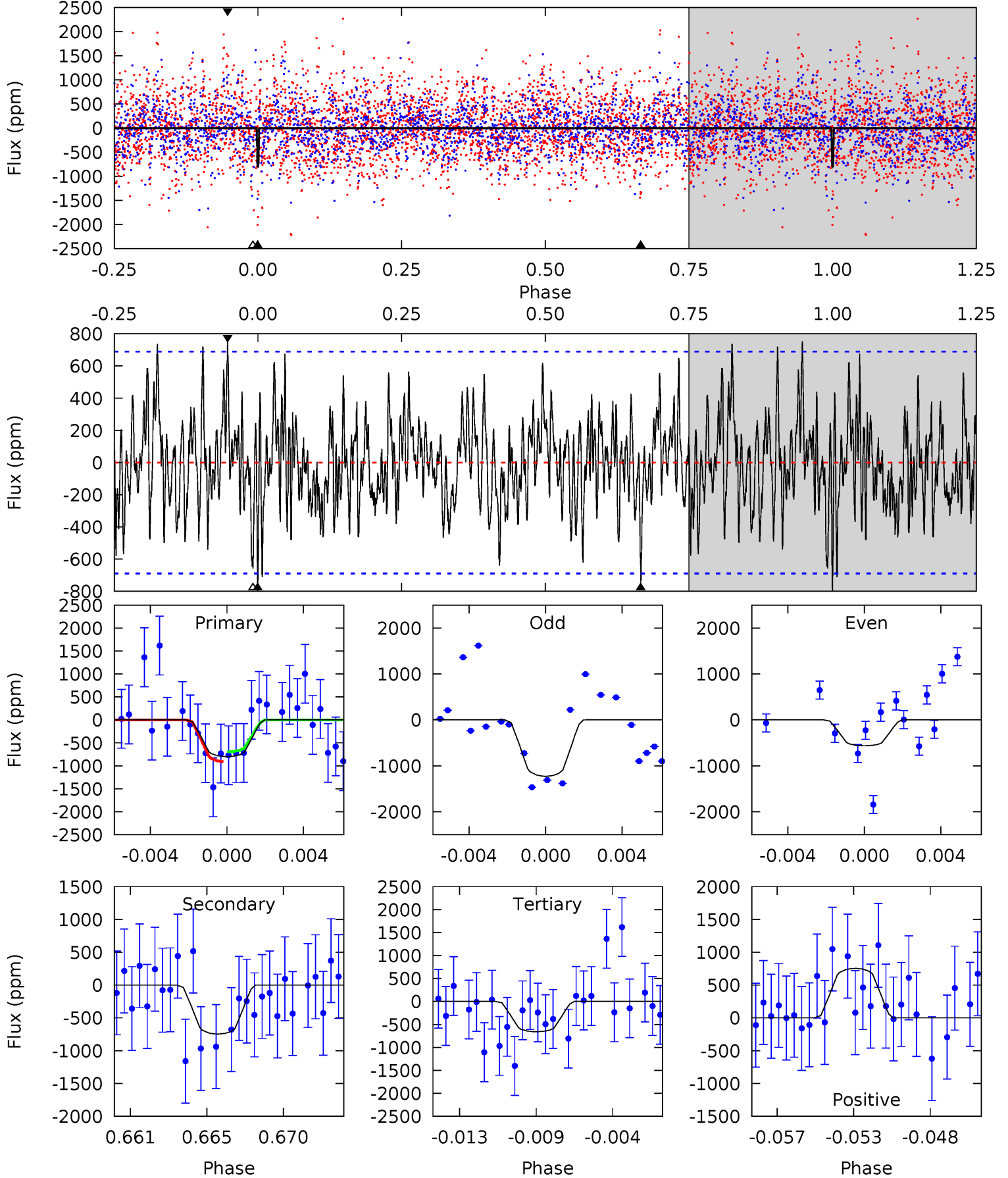


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

006311520-02, P = 21.489227 Days, E = 110.810558 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.01	5.61	4.95	5.67	5.18	2.85	1.77	1.06	0.34	0.66	-0.06	2.35	1.51	0.49	0.81



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 006311520

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6419^{+177}_{-199}	$4.330^{+0.124}_{-0.186}$	$-0.400^{+0.300}_{-0.300}$	$1.142^{+0.325}_{-0.175}$	$1.013^{+0.156}_{-0.114}$	$0.958^{+0.541}_{-0.467}$
	+3%/-3%	+3%/-4%	+75%/-75%	+28%/-15%	+15%/-11%	+56%/-49%
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 006311520-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-747 ± 133	$4.16^{+2.39}_{-2.06}$	1087^{+75}_{-59}	5783^{+2638}_{-1060}	533^{+1547}_{-323}
Alt.	N/A	N/A	N/A	N/A	N/A

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

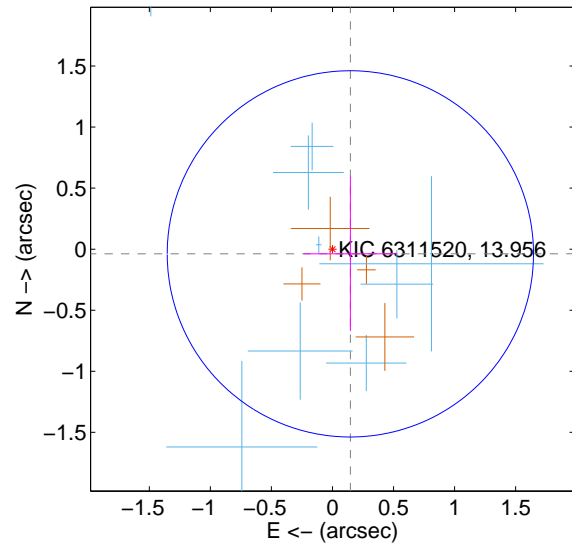
Supplemental centroid analysis for 006311520-02. Kepler magnitude: 13.96. Transit SNR 9.46

There are 9 quarters with good PRF difference image offsets

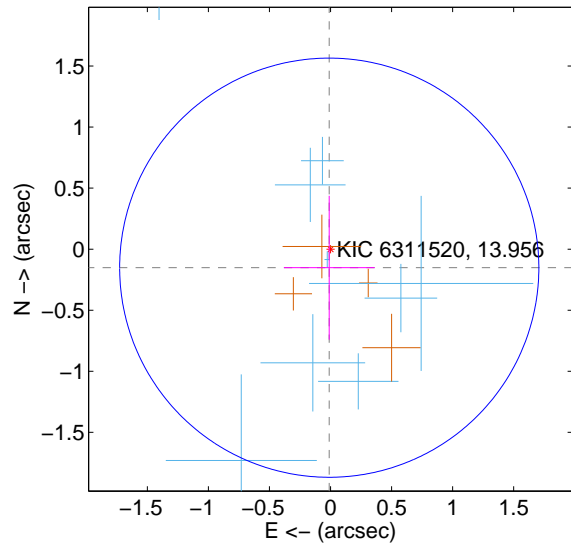
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.152 ± 0.500	0.30	-0.147 ± 0.385	-0.038 ± 0.632
PRF-fit source offset from KIC position	0.152 ± 0.572	0.27	0.010 ± 0.372	-0.152 ± 0.590
photometric centroid source offset	0.34 ± 0.27	1.25	-0.30 ± 0.27	0.15 ± 0.26

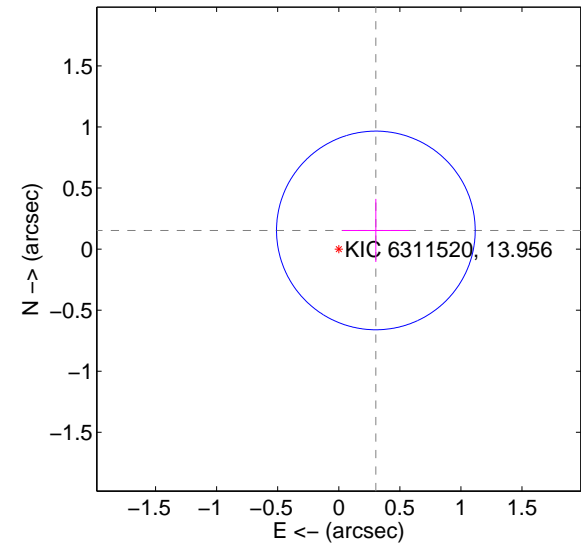
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

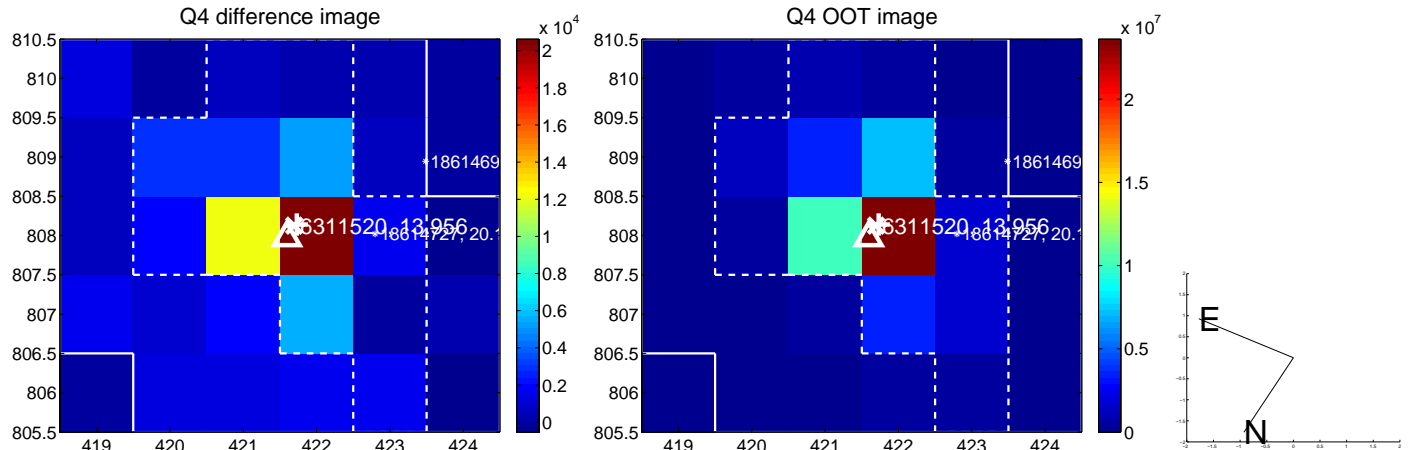
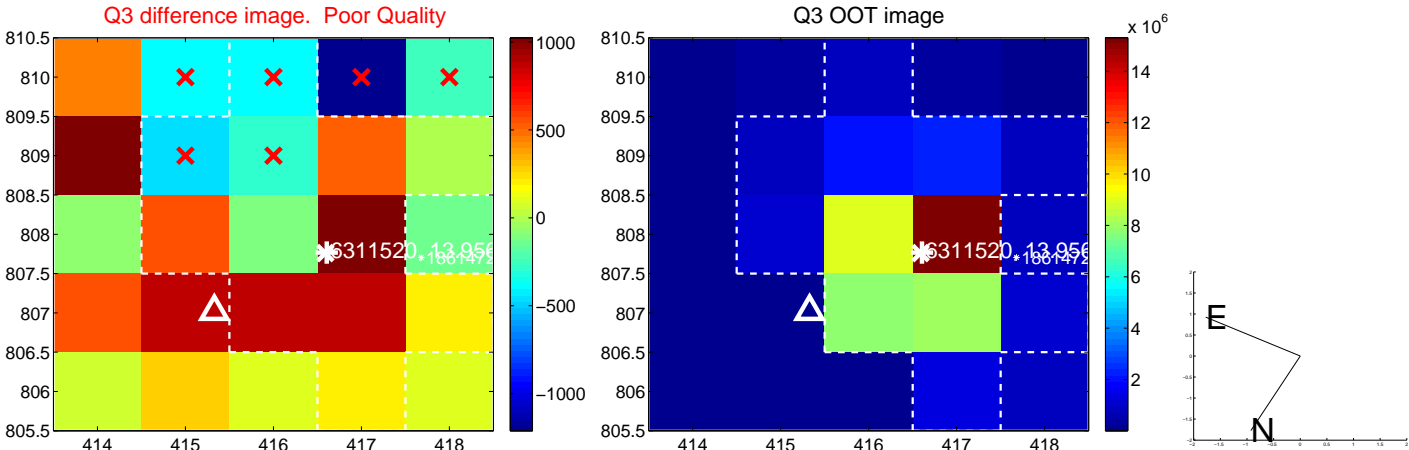
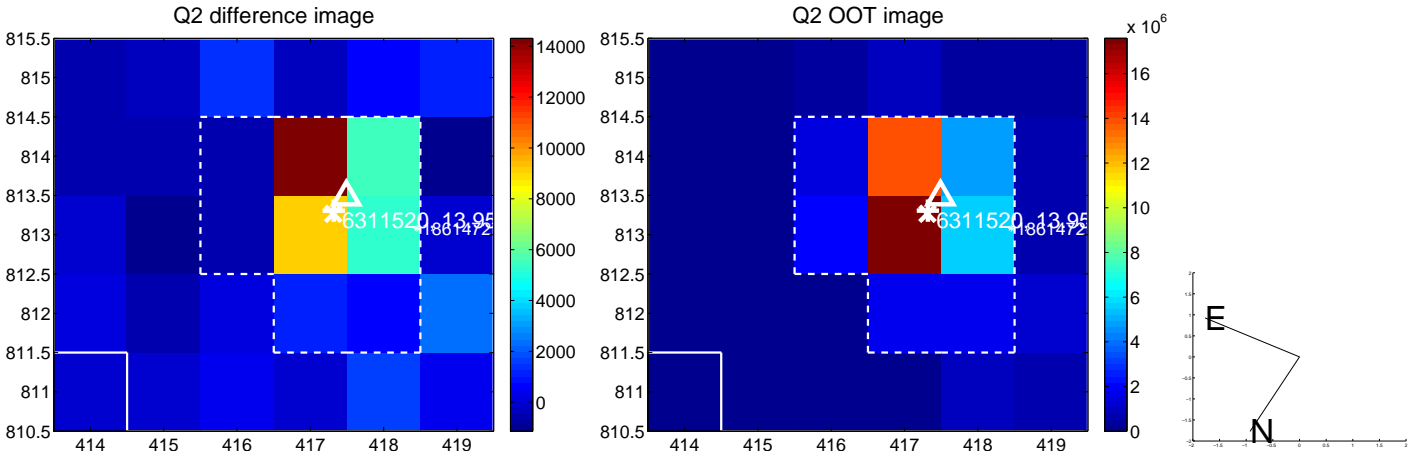
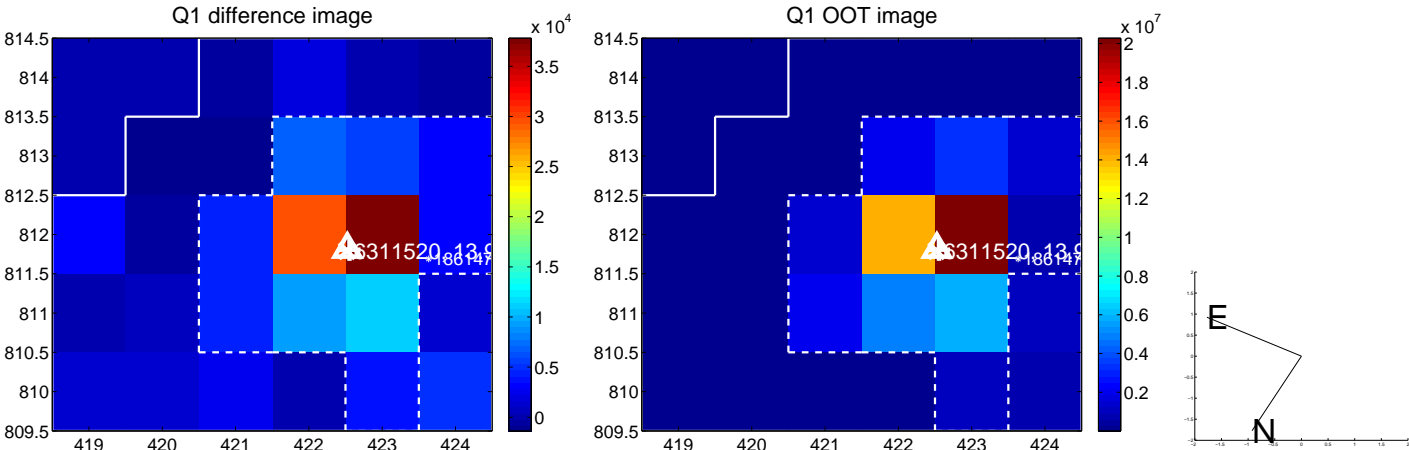


offset from photometric centroids

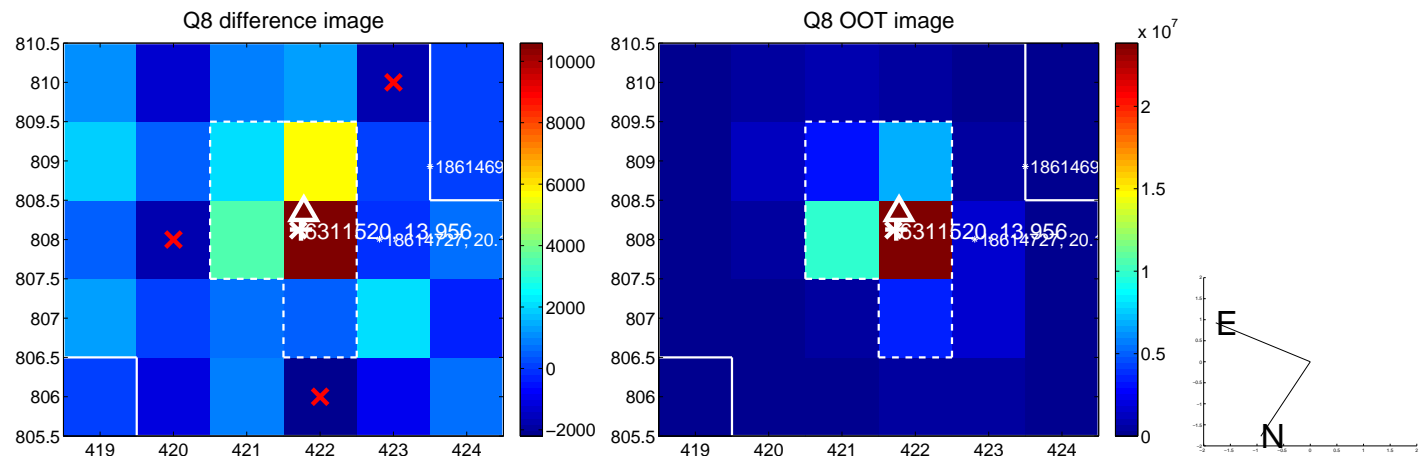
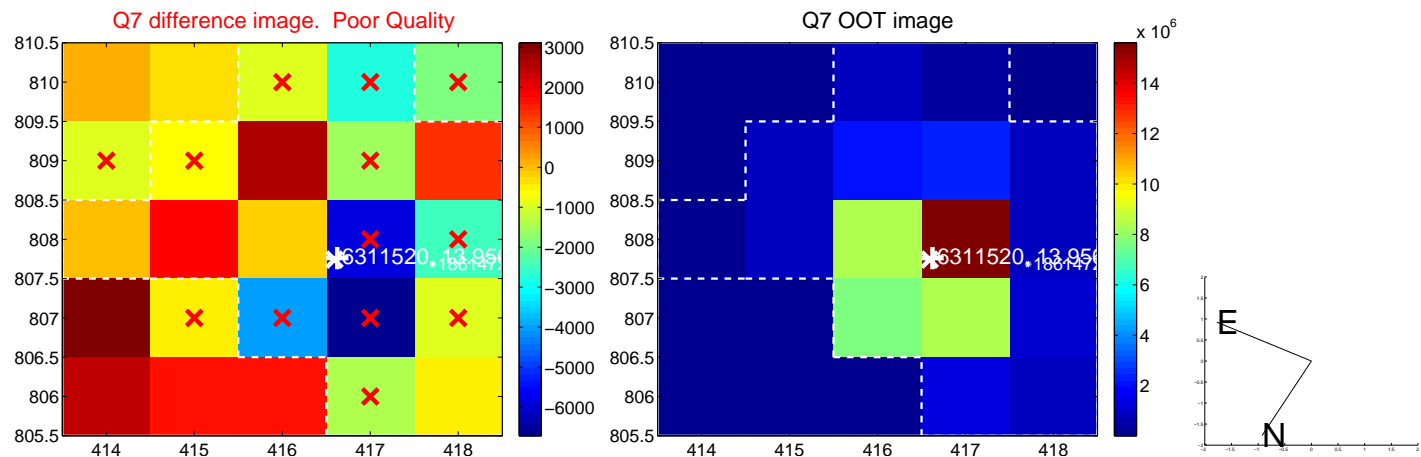
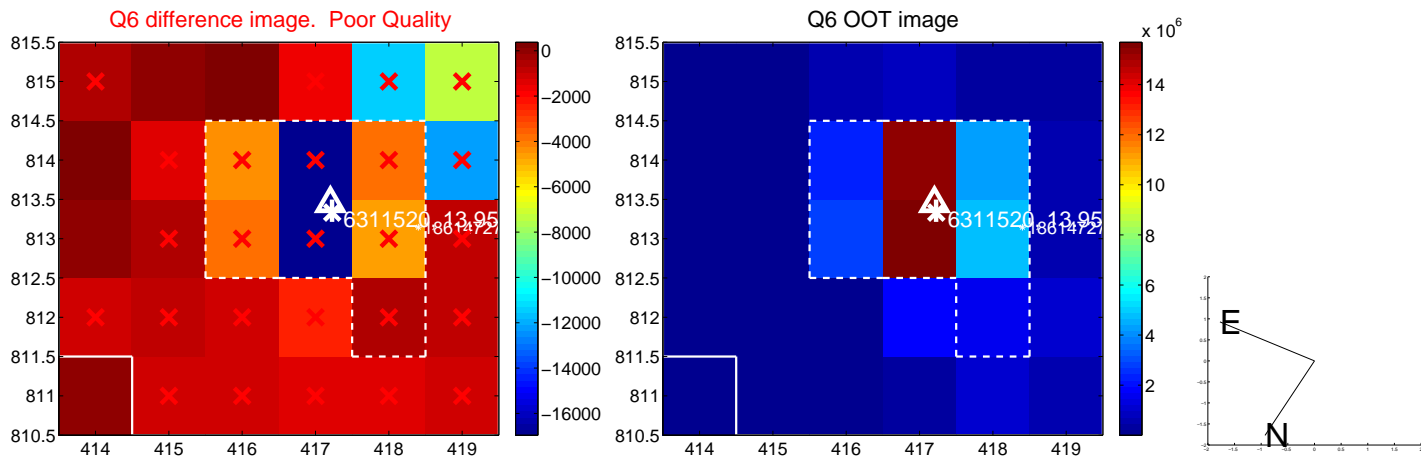
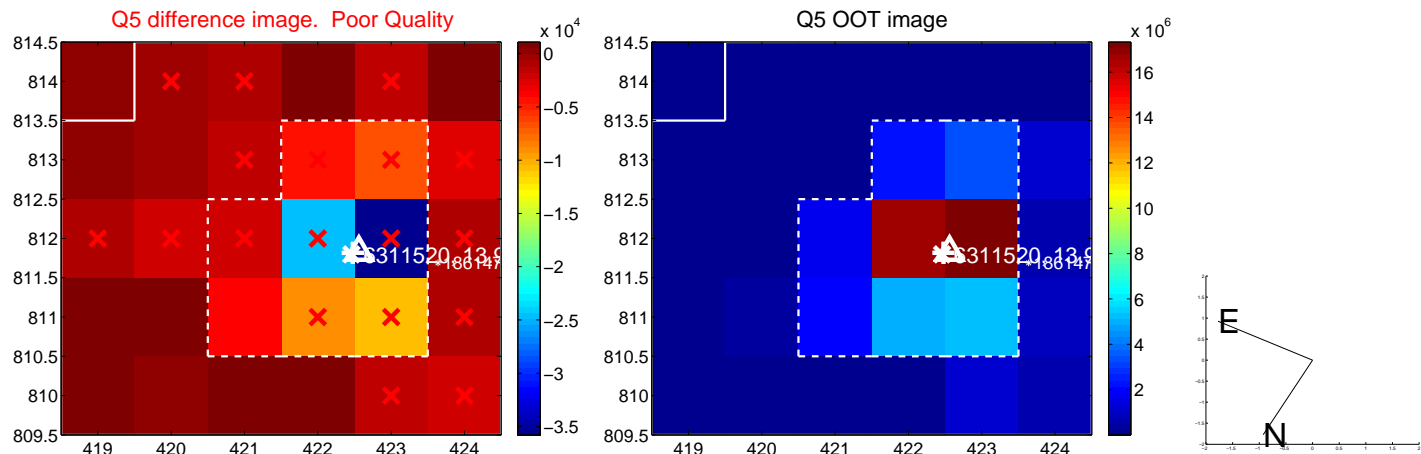


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

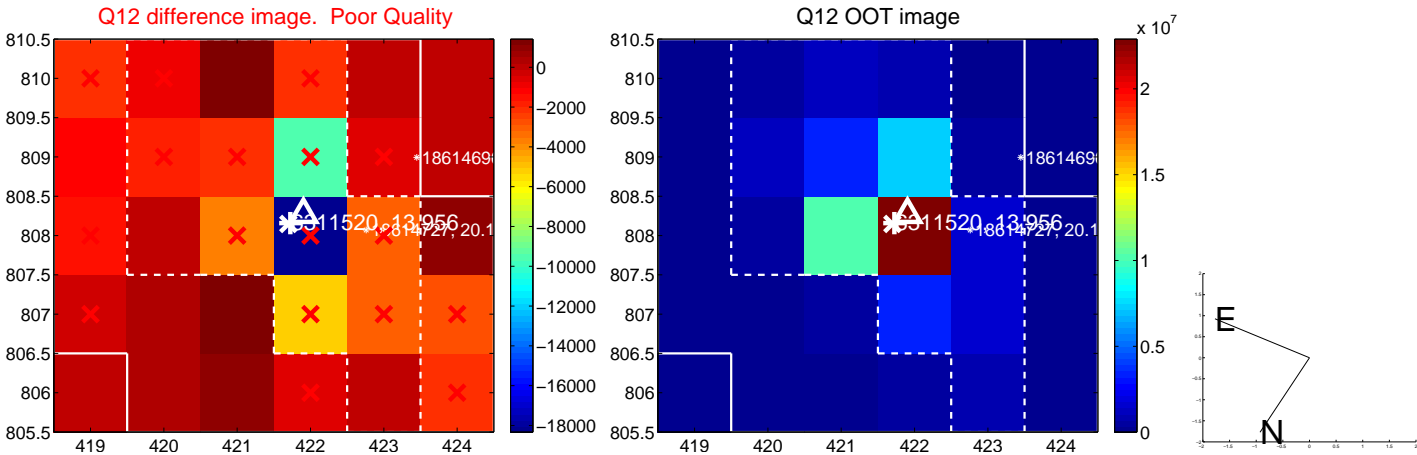
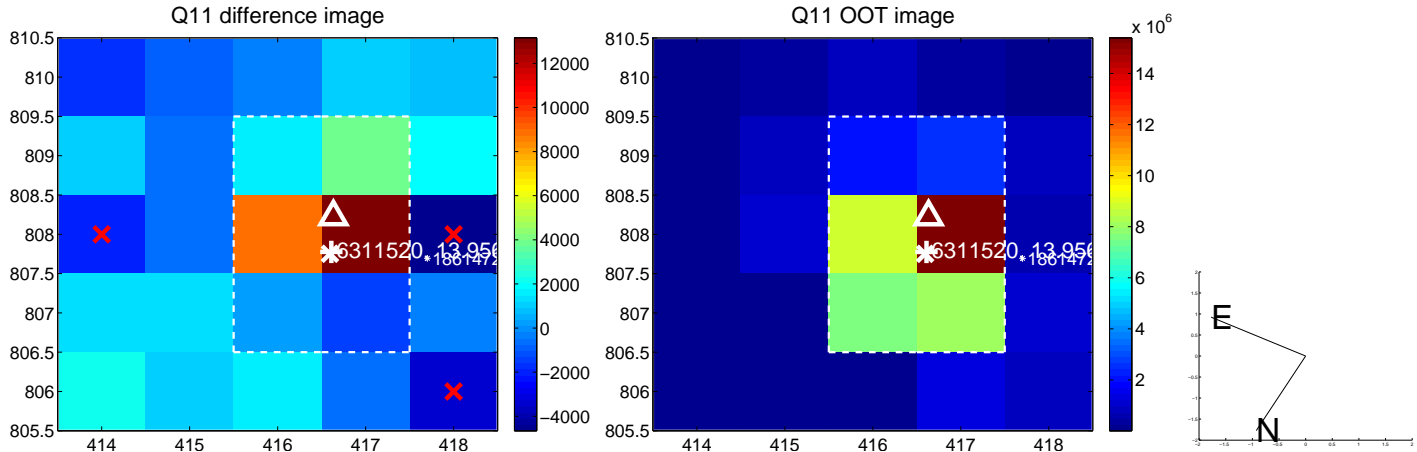
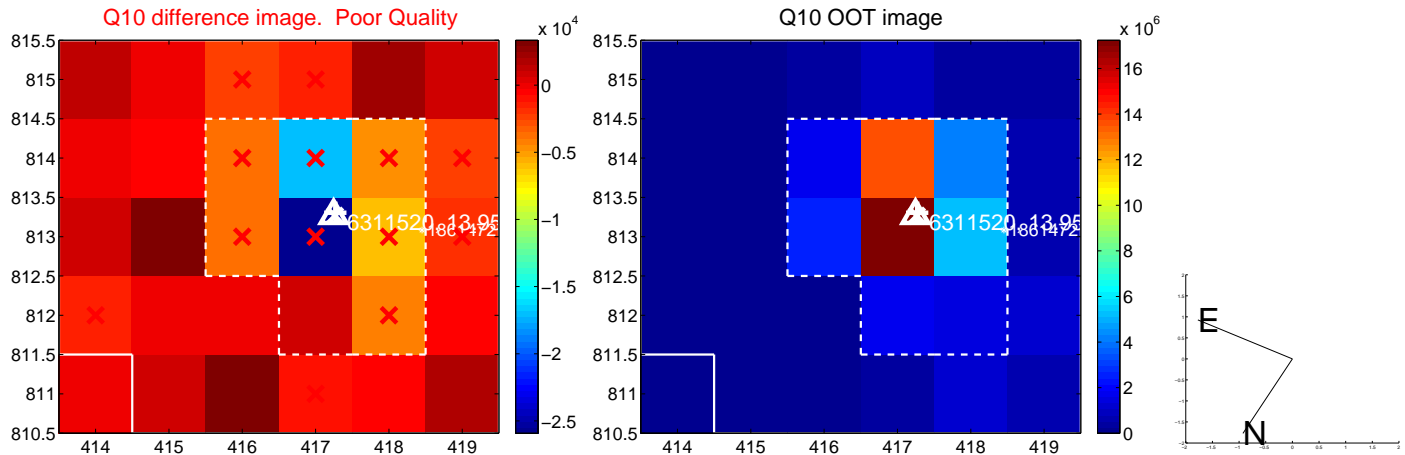
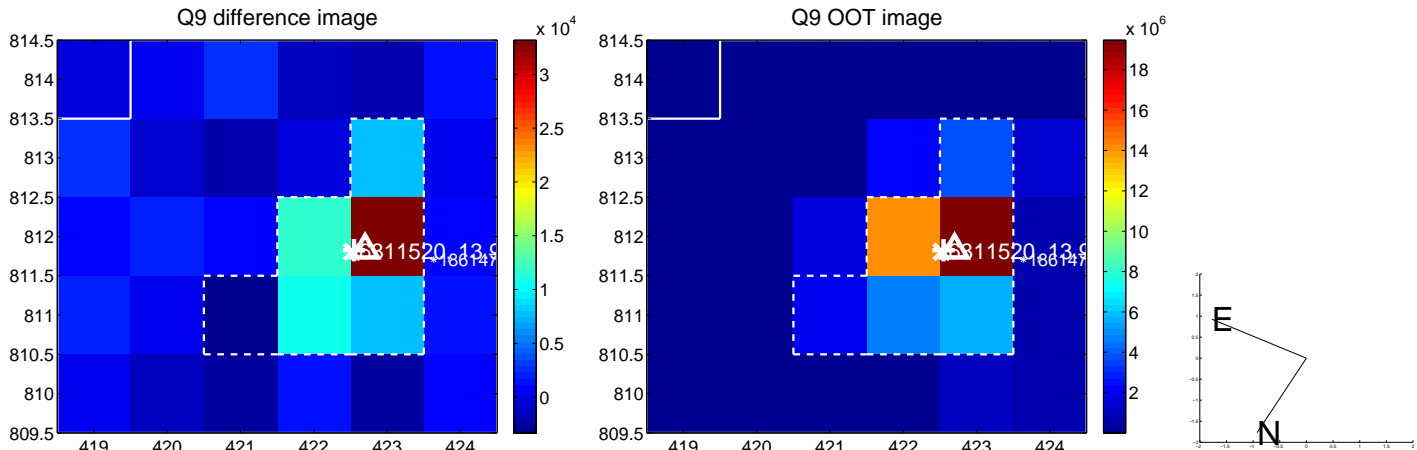
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



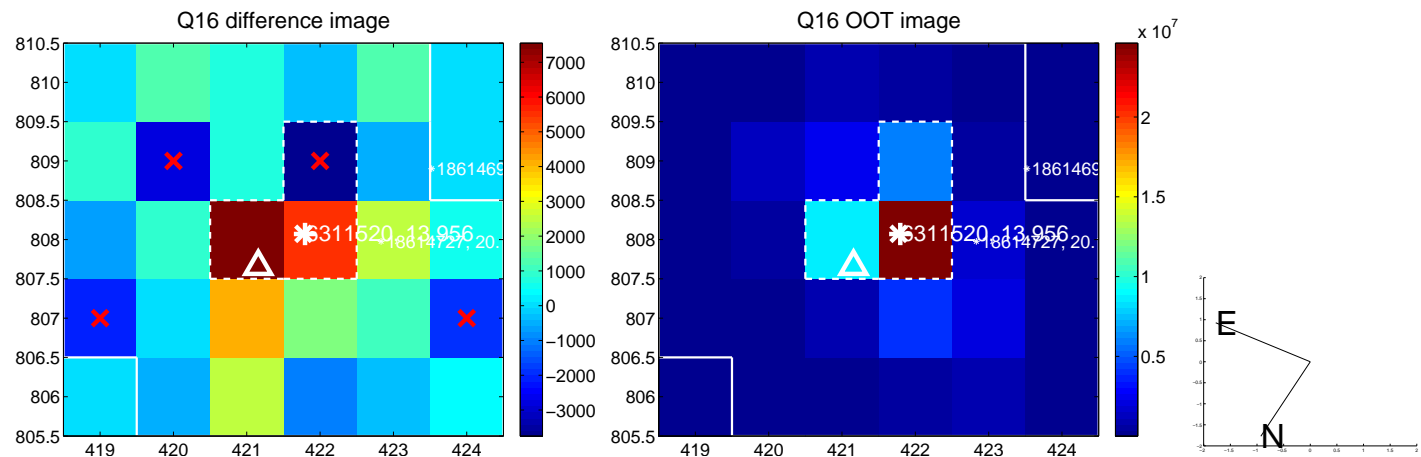
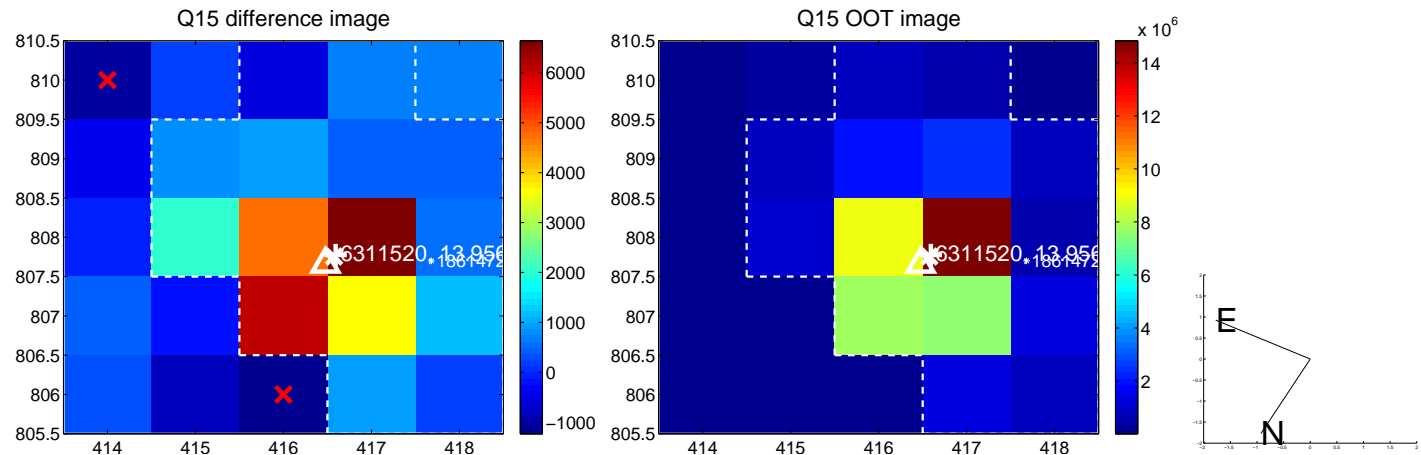
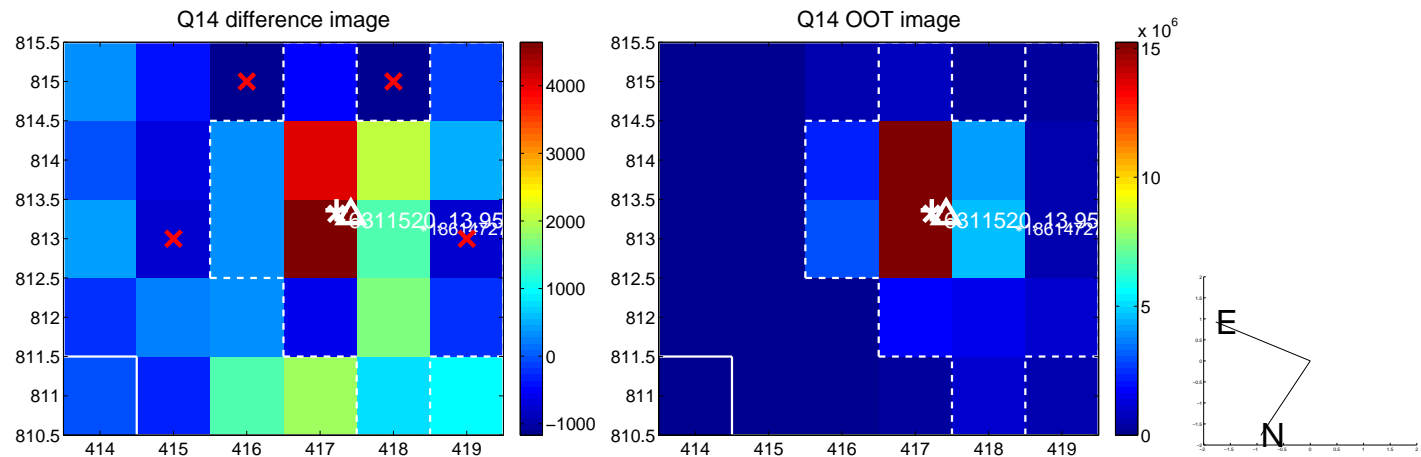
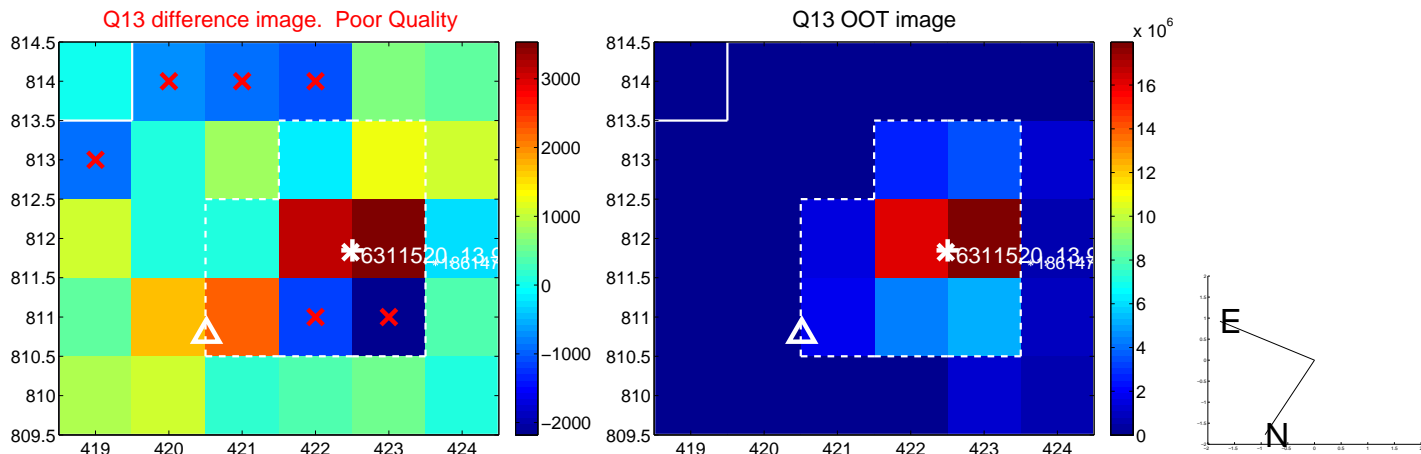
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



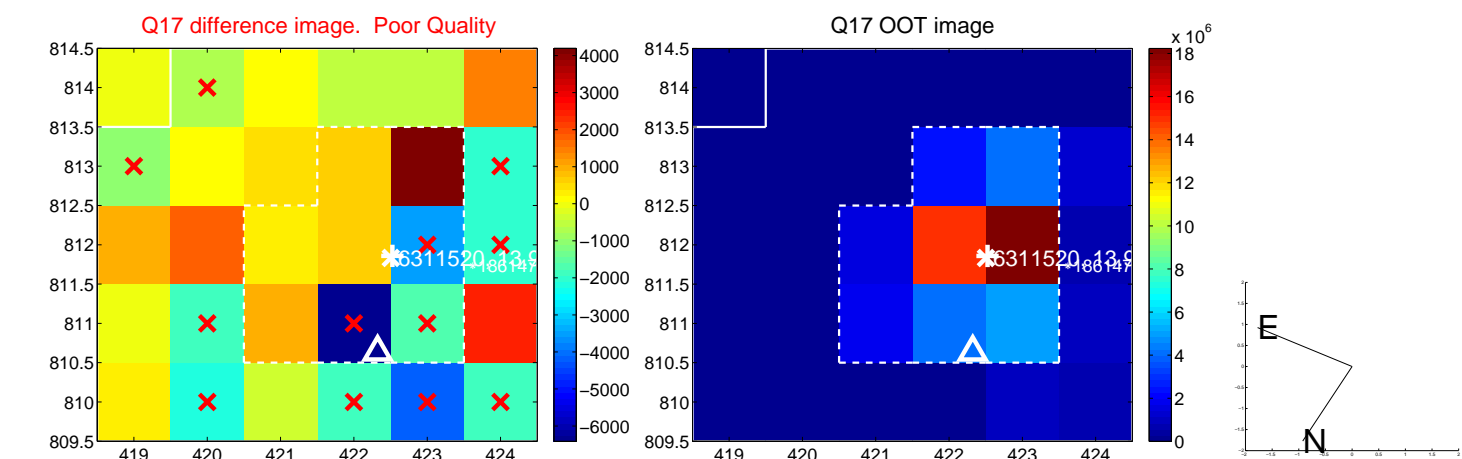
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



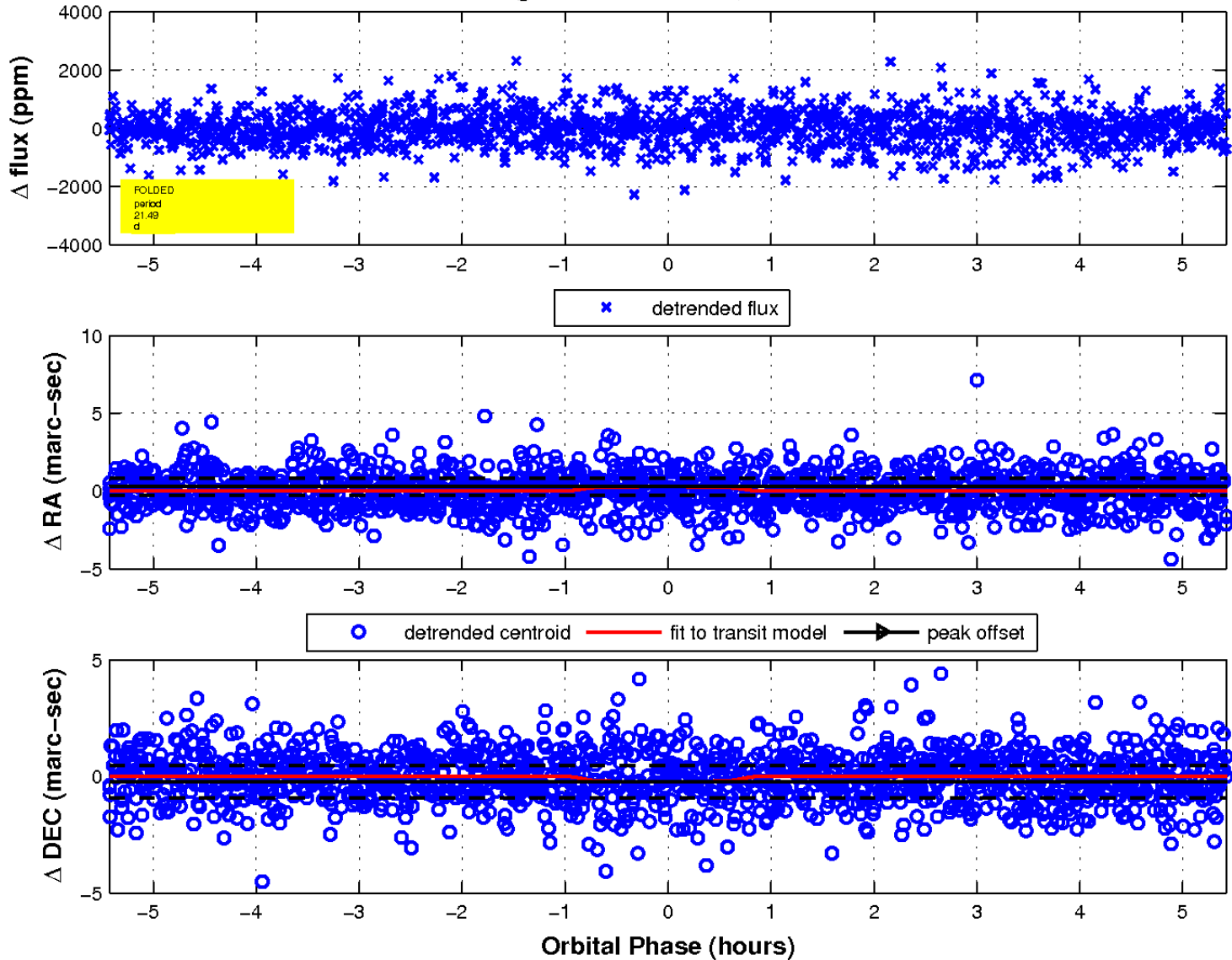
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

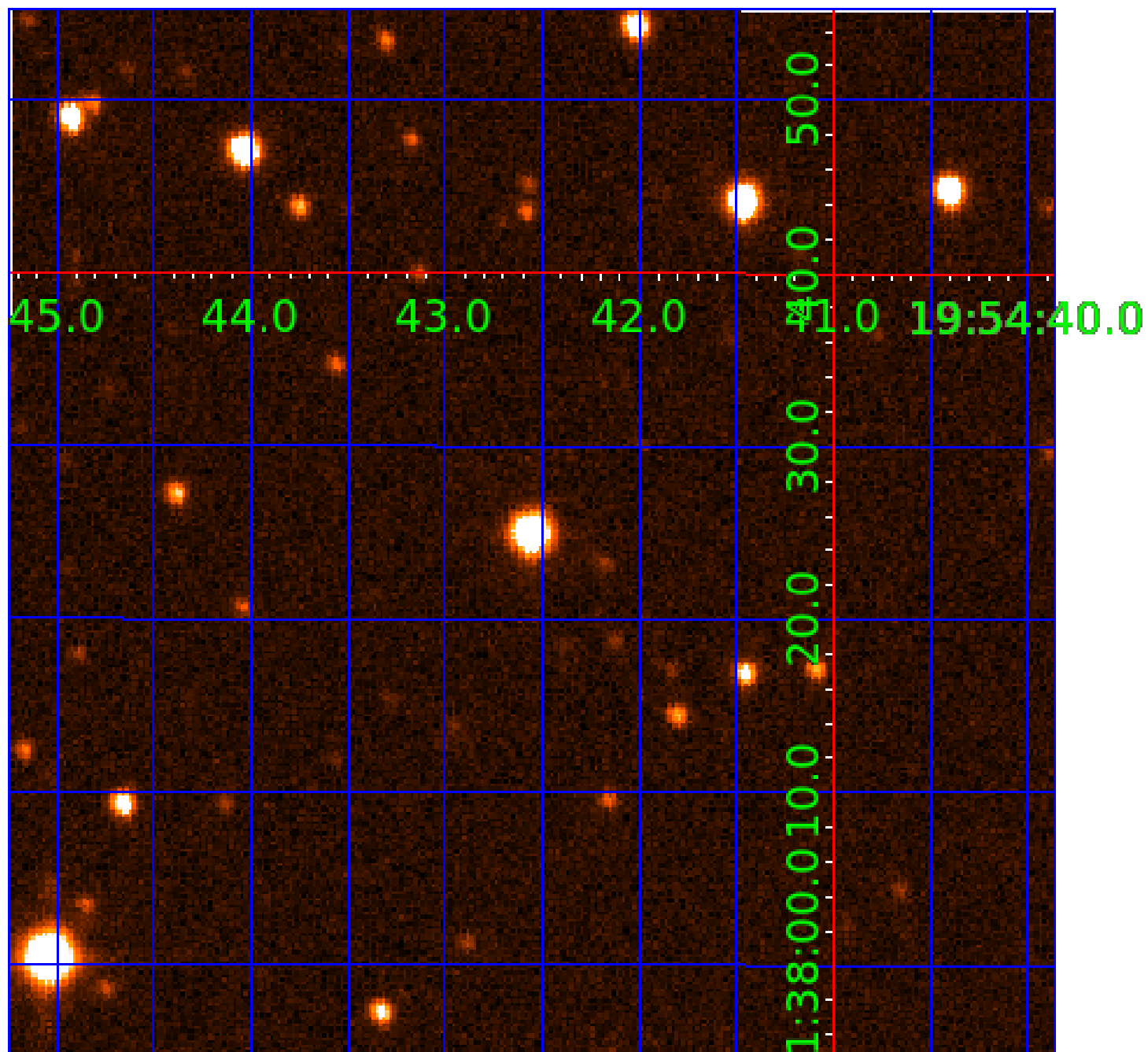


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination



KIC 006311520

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})
006311520-01	OBS	4115.01	0.941840	131.811922	54.4	6.884	16.6	7.9	1.14	6419	0.85	5545.05
006311520-02	OBS	No	21.489227	132.299785	948.5	1.810	15.7	9.5	1.14	6419	4.04	85.69
006311520-03	OBS	No	20.349459	136.972434	1277.5	0.608	11.8	8.1	1.14	6419	4.38	92.14
006311520-04	OBS	No	51.805447	148.281875	393.4	1.992	9.9	7.0	1.14	6419	2.76	26.51
006311520-05	OBS	No	87.610207	191.579582	1050.7	1.706	11.8	9.4	1.14	6419	3.79	13.16
006311520-06	OBS	No	25.690329	137.362268	418.2	2.749	8.0	4.7	1.14	6419	2.73	67.53

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006311520-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT
006311520-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
006311520-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
006311520-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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.

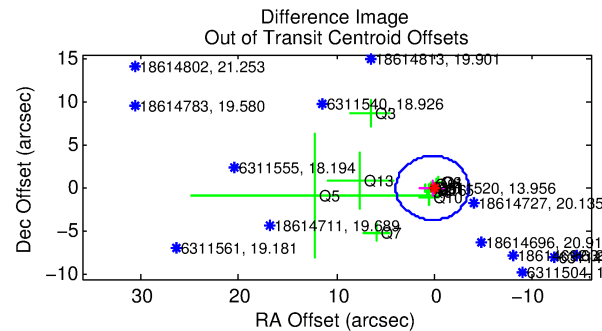
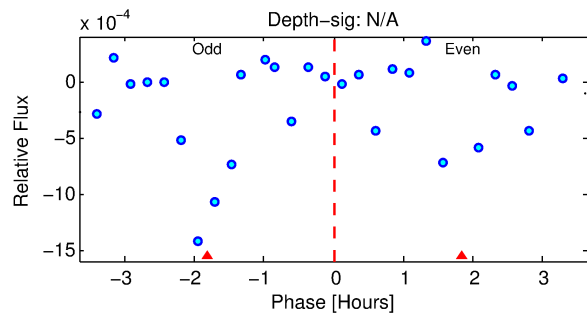
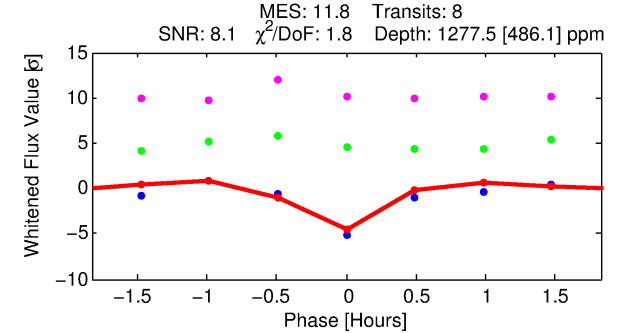
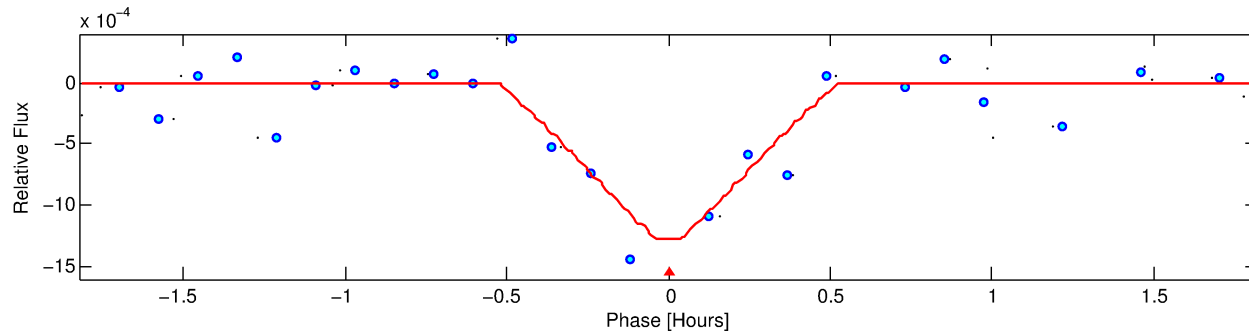
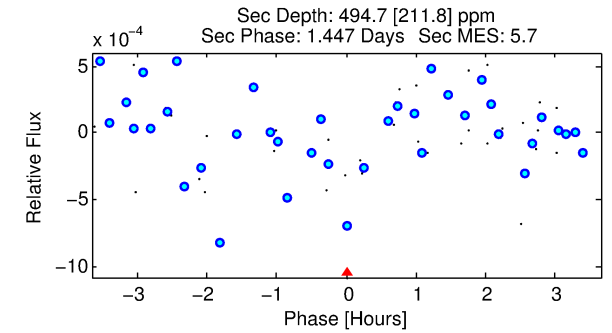
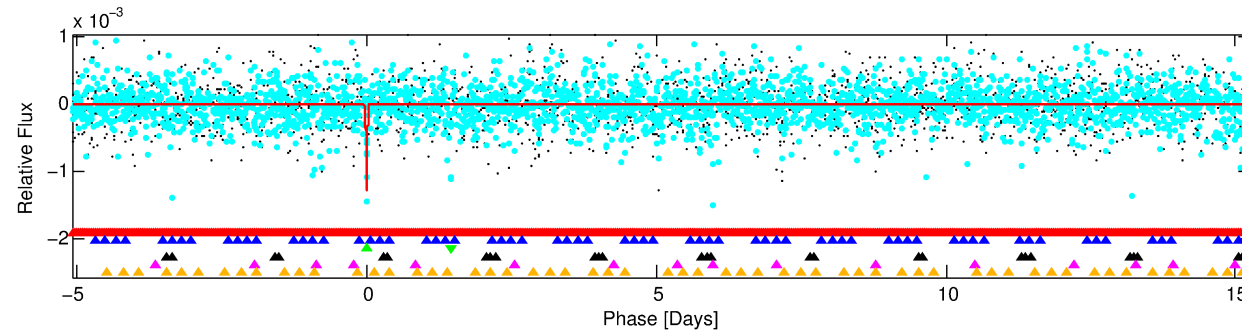
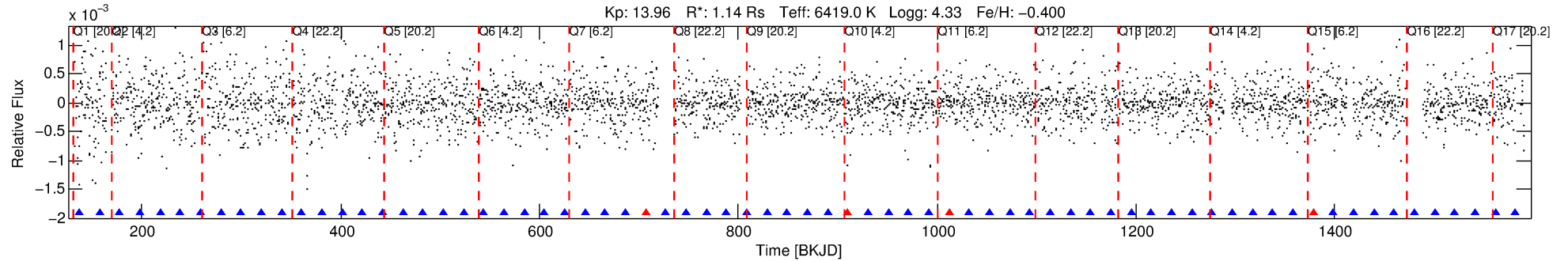
Ephemeris Match Information For 006311520-03

No Significant Match Found

DV One-Page Summary

KIC: 6311520 Candidate: 3 of 6 Period: 20.349 d

KOI: K04115 Corr: No Ephemeris Match



DV Fit Results:

Period = 20.34946 [0.00009] d
Epoch = 136.9724 [0.0026] BKJD
Rp/R* = 0.0351 [0.0353]
a/R* = 221.04 [1029.14]
b = 0.57 [5.75]
Seff = 92.14 [33.59]
Teq = 790 [72] K
Rp = 4.38 [4.58] Re
a = 0.1467 [0.0348] AU
Ag = 305.72 [637.32] [0.48σ]
Teff = 5108 [2630] K [1.64σ]

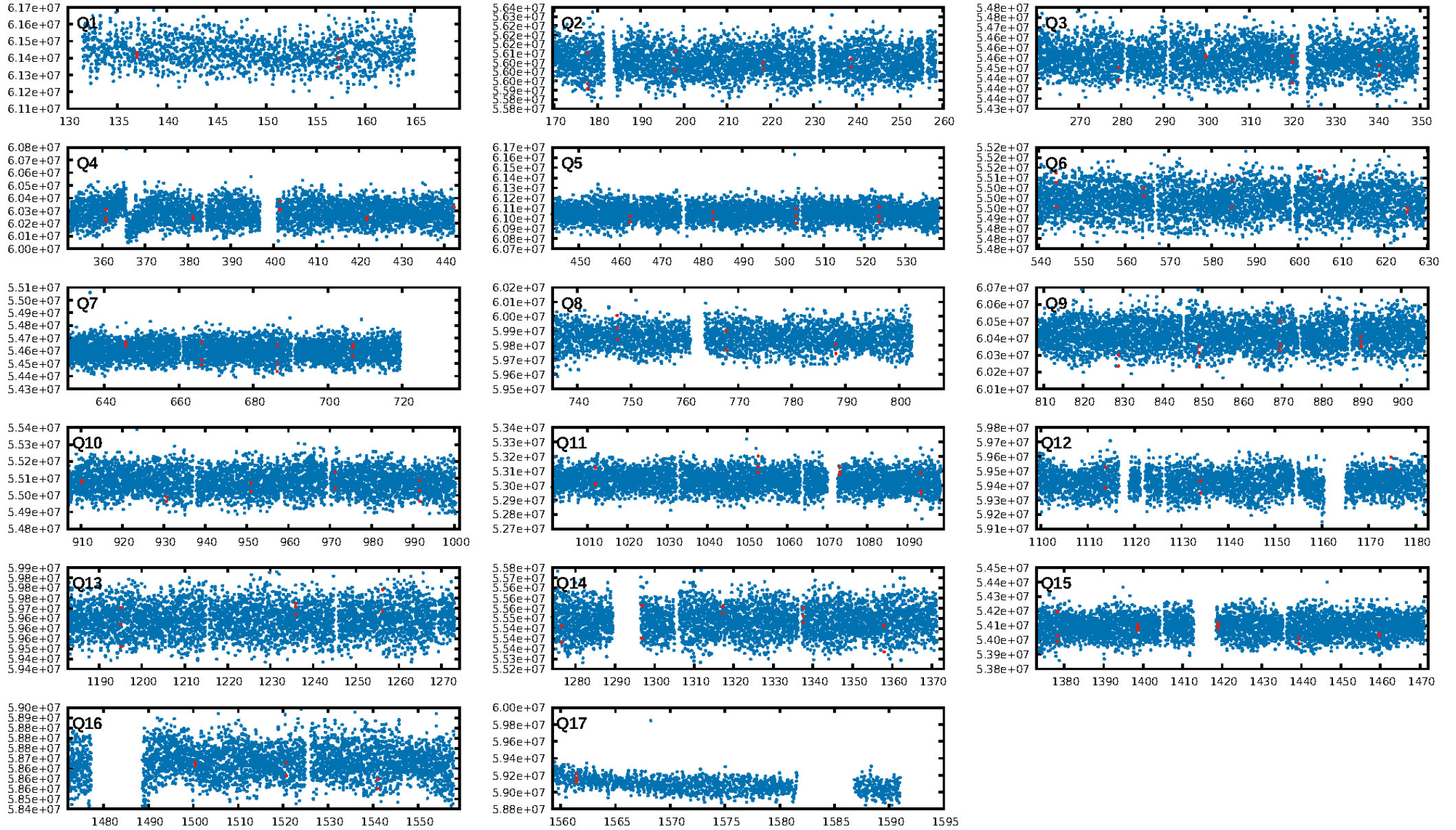
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.40σ]
LongPeriod-sig: 100.0% [14.33σ]
ModelChiSquare2-sig: 10.6%
ModelChiSquareGof-sig: 91.7%
Bootstrap-pfa: 9.10e-15
RollingBand-fgt: 0.43 [3/7]
GhostDiagnostic-chr: -2.752
Centroid-sig: 2.1%
Centroid-so: 0.399 arcsec [1.21σ]
OotOffset-rm: 0.220 arcsec [0.18σ]
KicOffset-rm: 0.192 arcsec [0.19σ]
OotOffset-st: 2/4/2/5 [13]
KicOffset-st: 2/4/2/5 [13]
DiffImageQuality-fgm: 0.38 [5/13]
DiffImageOverlap-fno: 0.57 [8/14]

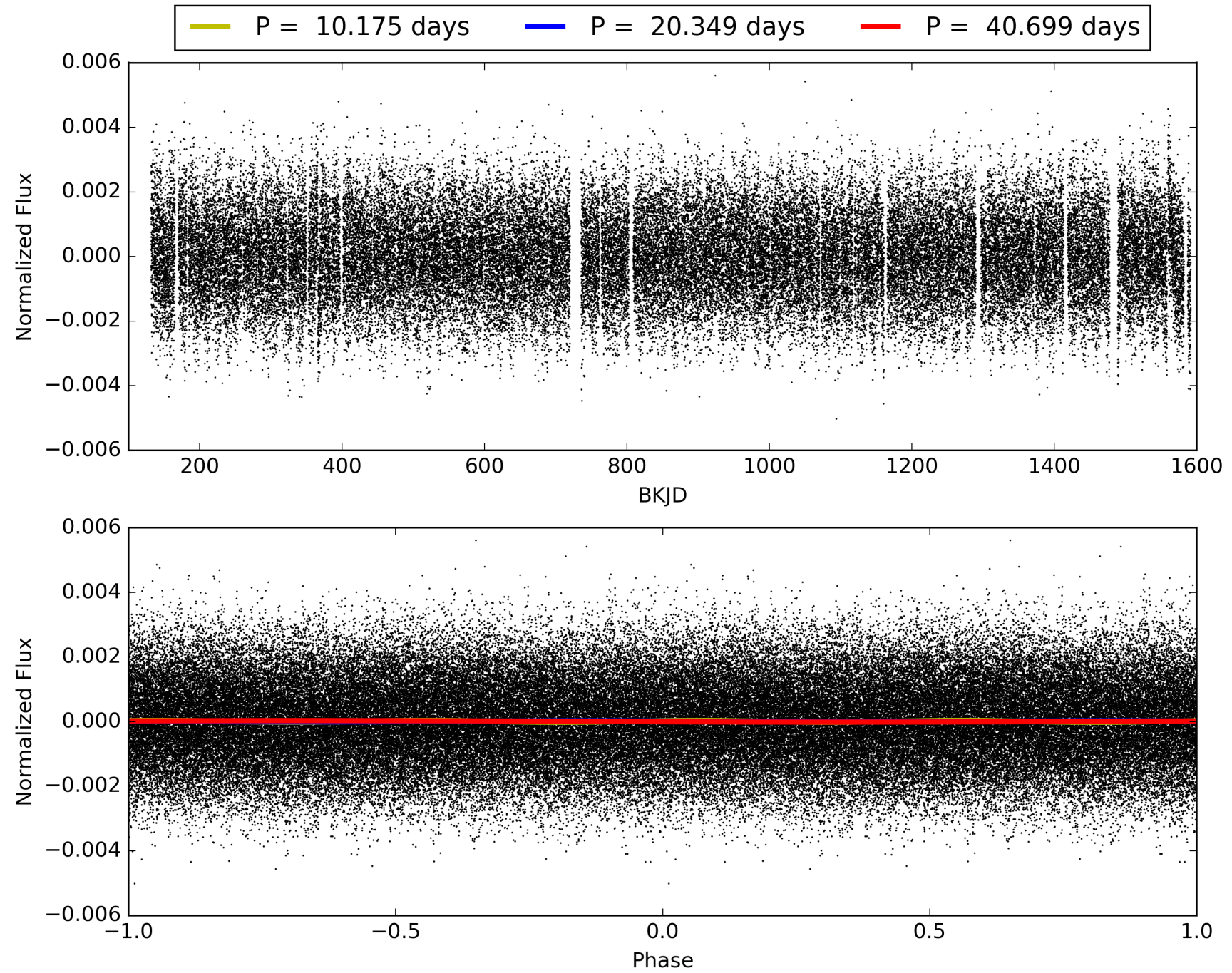
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:31:55 Z

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

TCE 006311520-03, PDC Light Curves

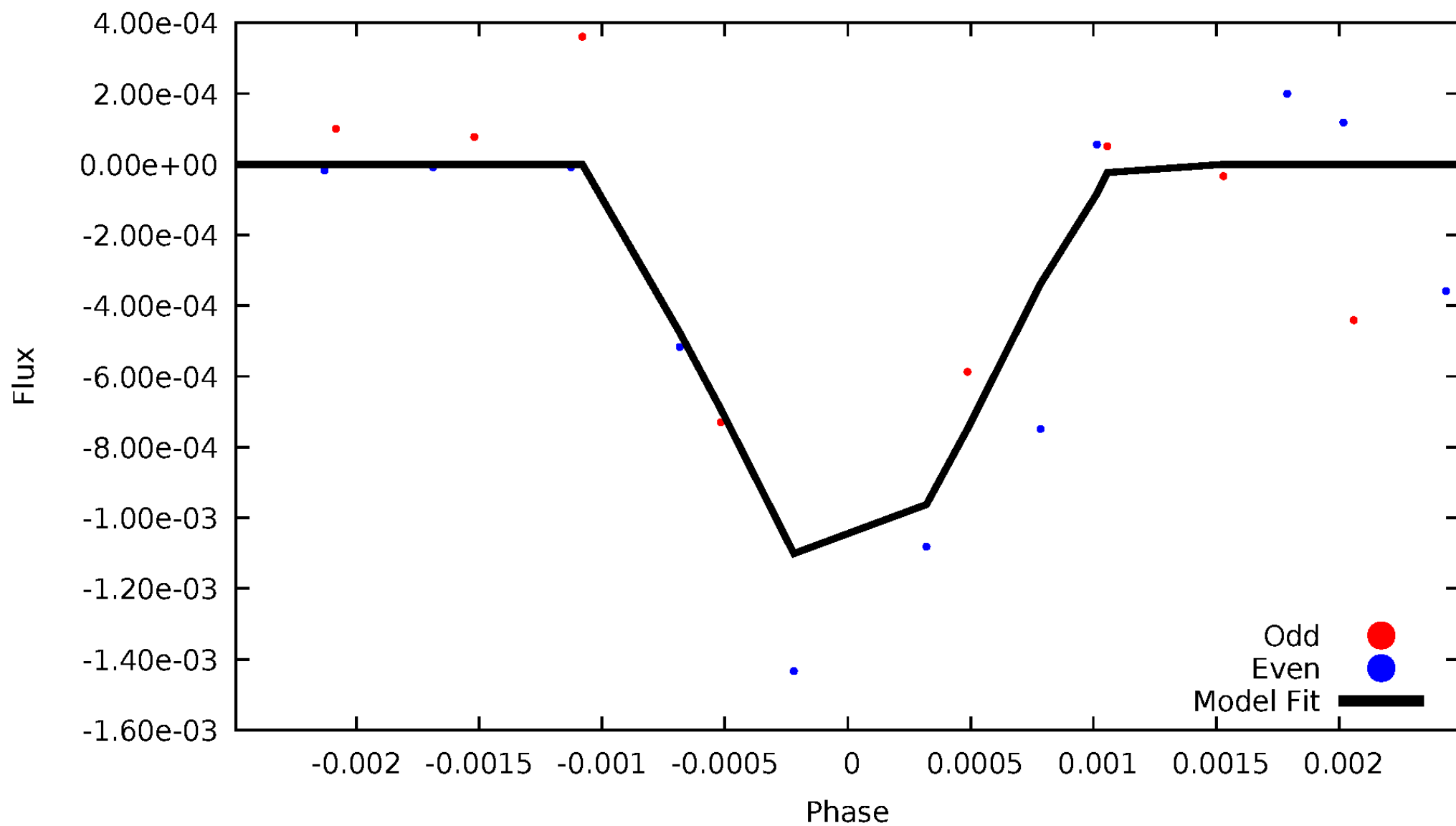


TCE 006311520-03



DV Odd/Even

TCE 006311520-03

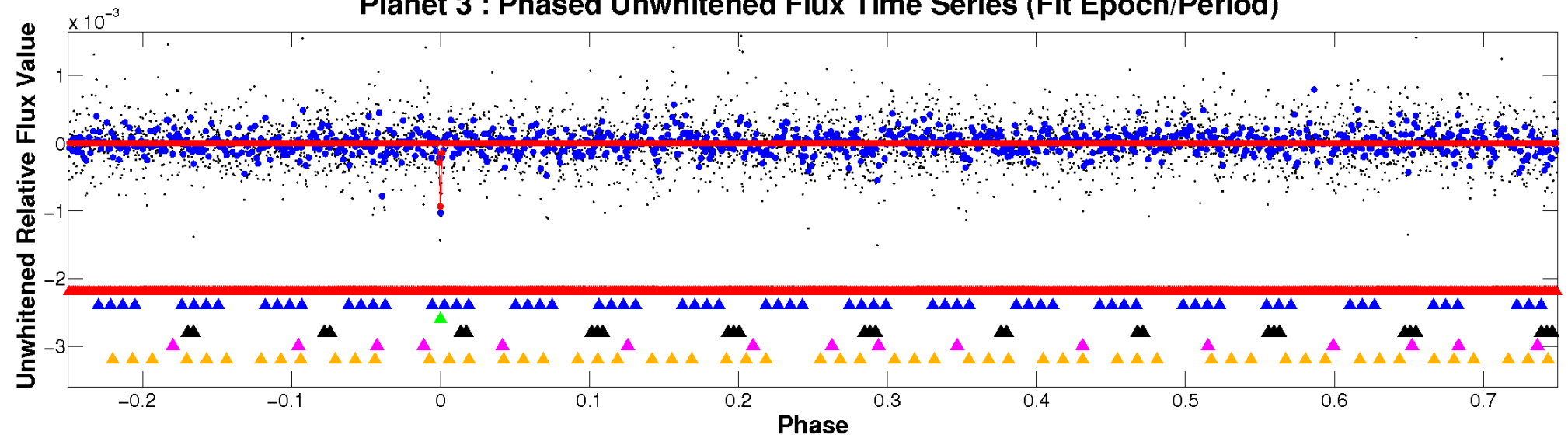


ALT Odd/Even

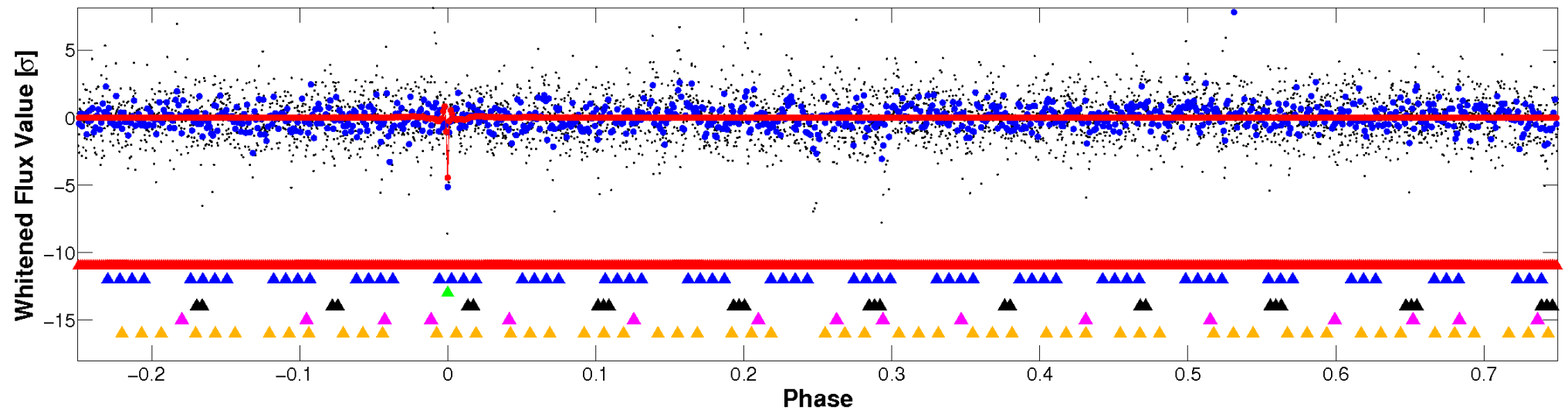
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

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

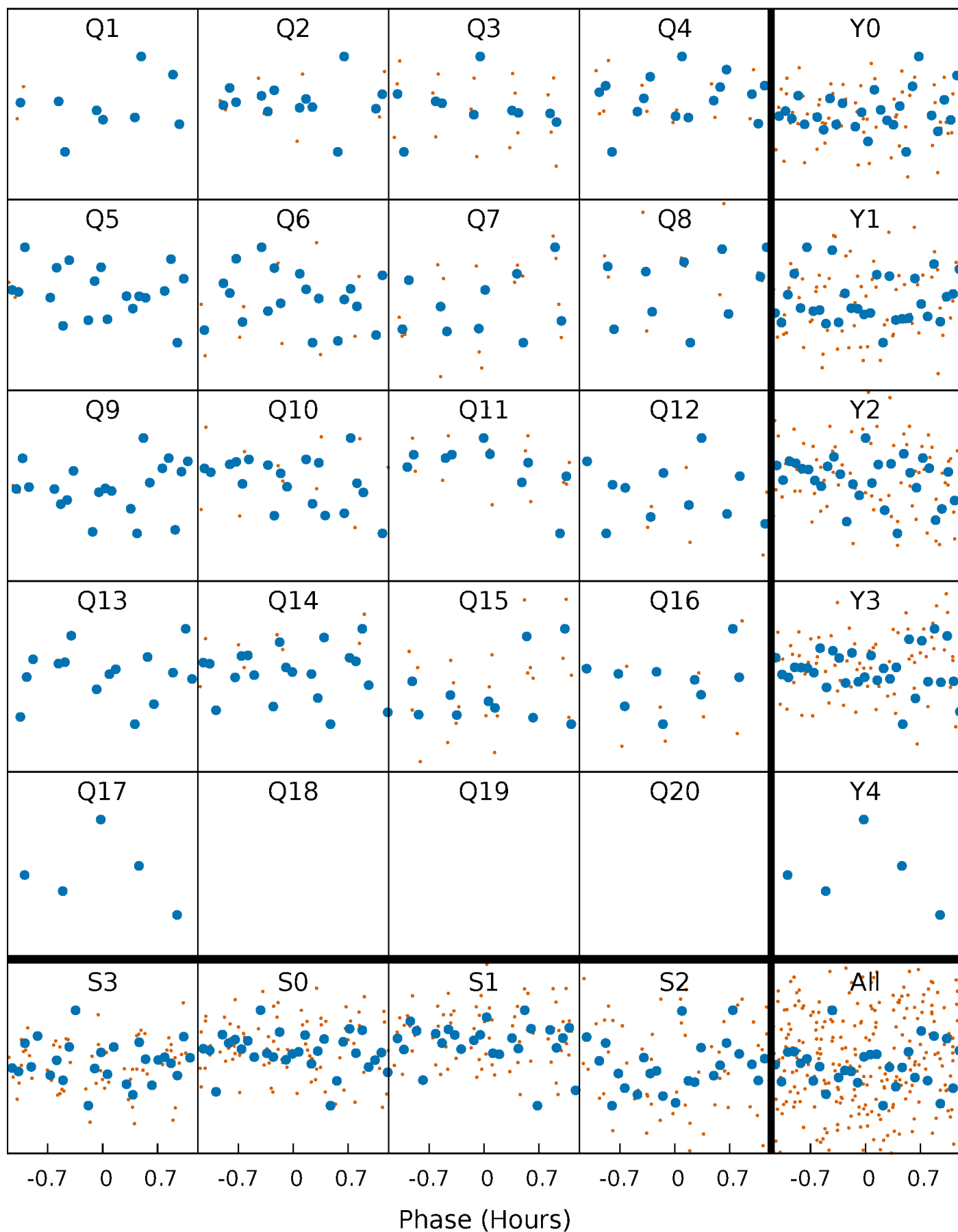


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



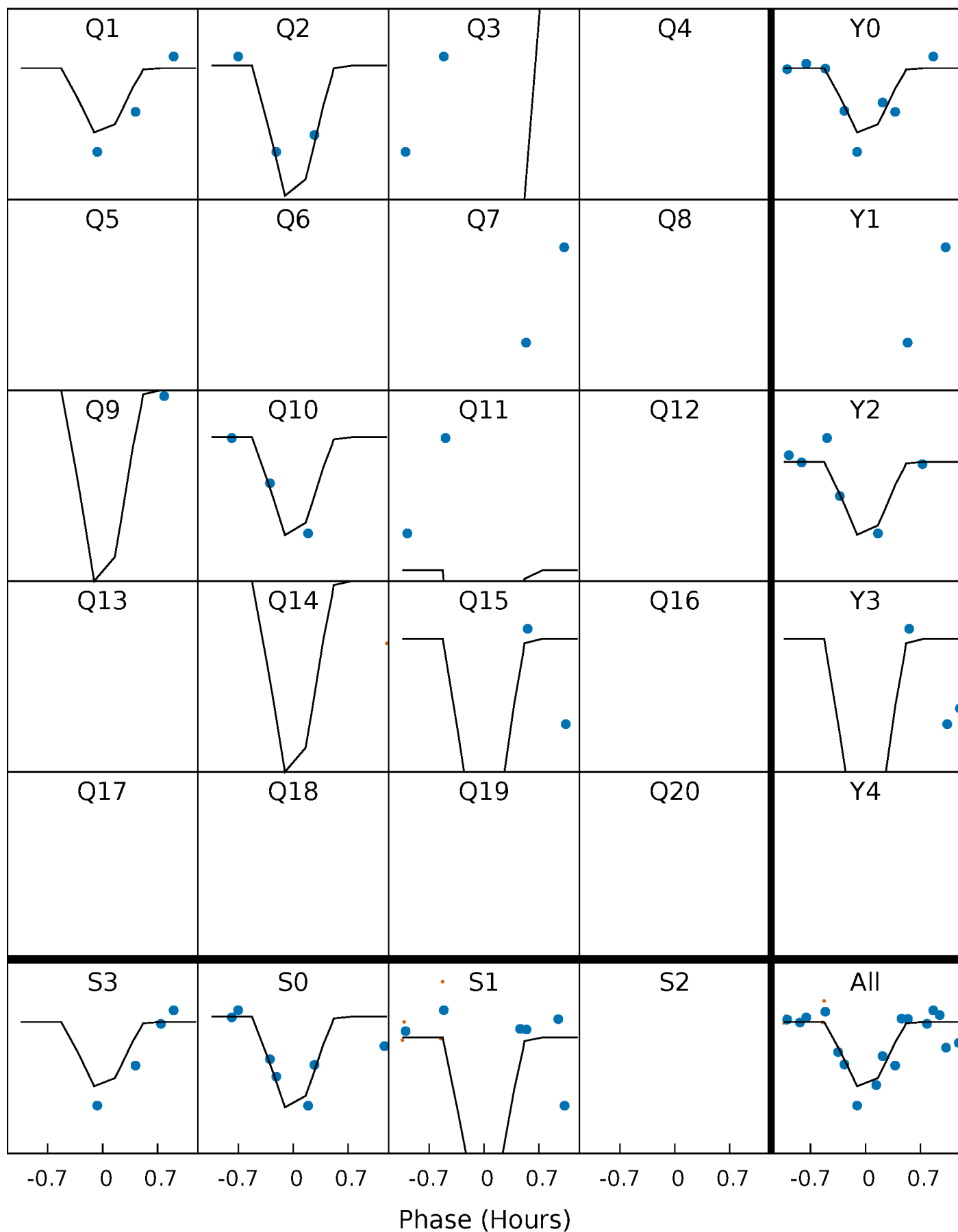
PDC Quarter-Phased Transit Curves

TCE 006311520-03 P= 20.349459 Days $T_0=136.972434$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 006311520-03 P= 20.349459 Days $T_0=136.972434$ (BKJD)

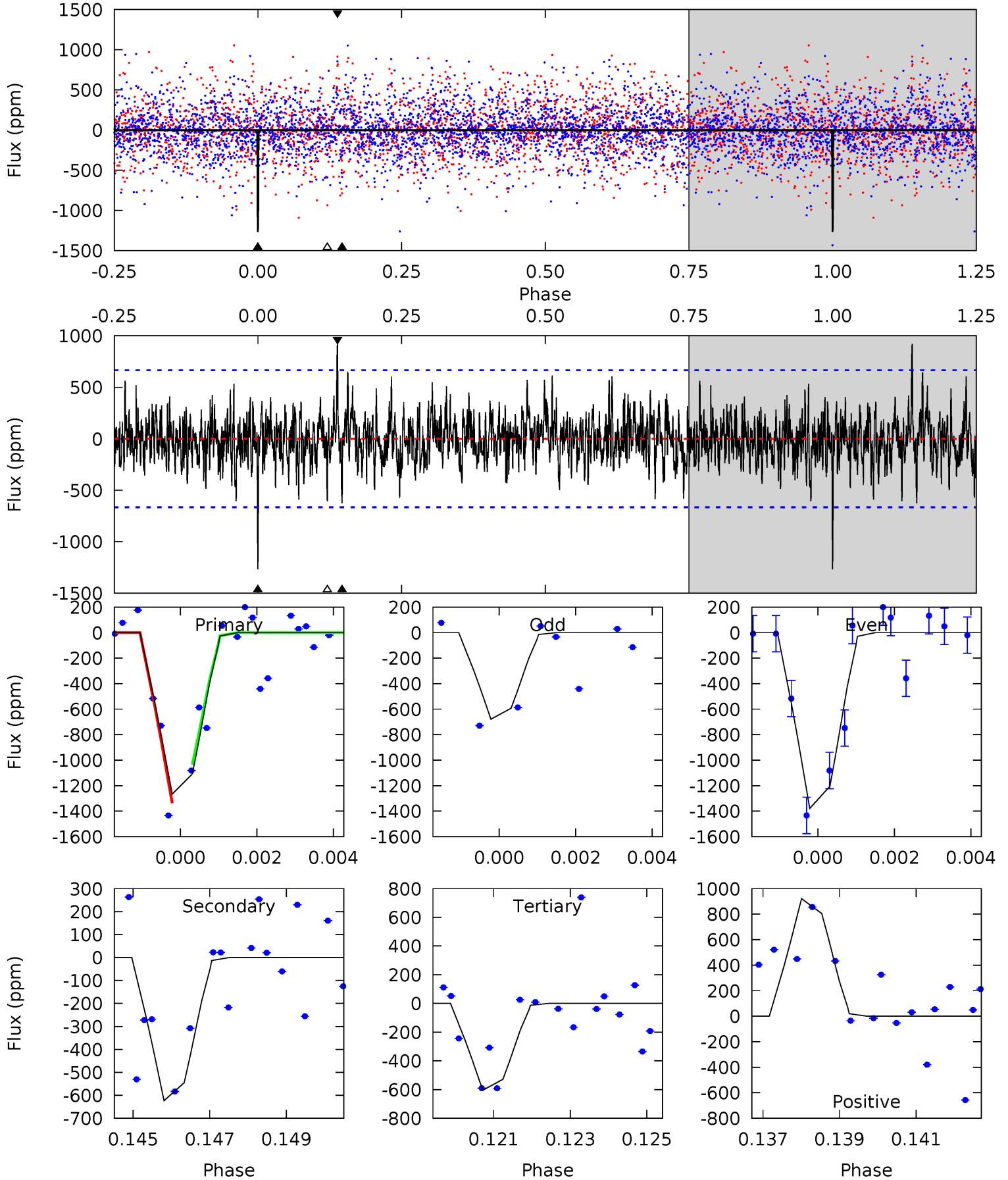


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

006311520-03, P = 20.349459 Days, E = 116.622975 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	4.99	4.84	7.36	5.32	3.08	1.51	5.29	2.77	0.15	-2.38	2.63	1.02	0.42	0.91



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 006311520

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6419^{+177}_{-199}	$4.330^{+0.124}_{-0.186}$	$-0.400^{+0.300}_{-0.300}$	$1.142^{+0.325}_{-0.175}$	$1.013^{+0.156}_{-0.114}$	$0.958^{+0.541}_{-0.467}$
	+3%/-3%	+3%/-4%	+75%/-75%	+28%/-15%	+15%/-11%	+56%/-49%
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 006311520-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-623 ± 125	$5.39^{+4.10}_{-3.72}$	1108^{+80}_{-64}	5020^{+4216}_{-1043}	255^{+2333}_{-176}
Alt.	N/A	N/A	N/A	N/A	N/A

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 $A_{obs} \gg 1.0$

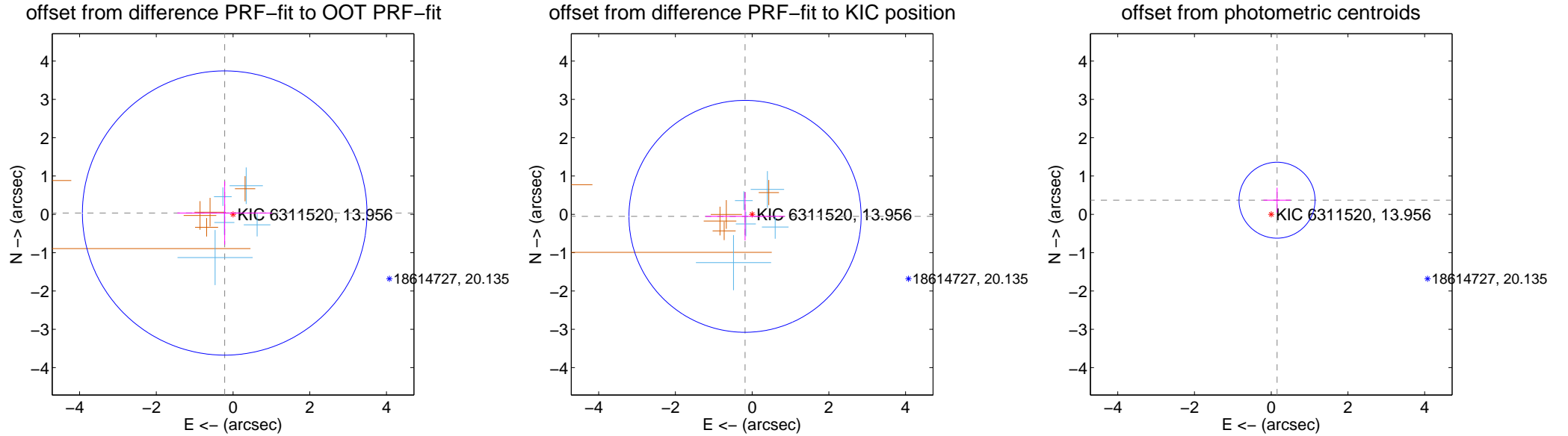
DV Centroid Data

Supplemental centroid analysis for 006311520-03. Kepler magnitude: 13.96. Transit SNR 8.11

There are 5 quarters with good PRF difference image offsets

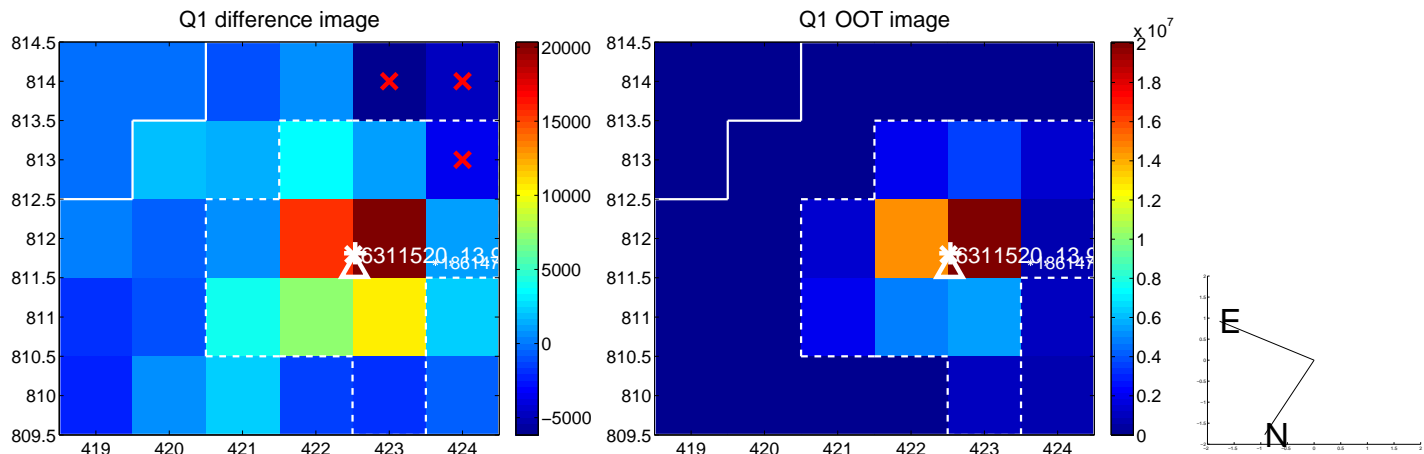
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.220 ± 1.236	0.18	0.218 ± 1.233	0.035 ± 0.825
PRF-fit source offset from KIC position	0.192 ± 1.009	0.19	0.184 ± 1.033	-0.052 ± 0.630
photometric centroid source offset	0.40 ± 0.33	1.21	-0.15 ± 0.35	0.37 ± 0.33

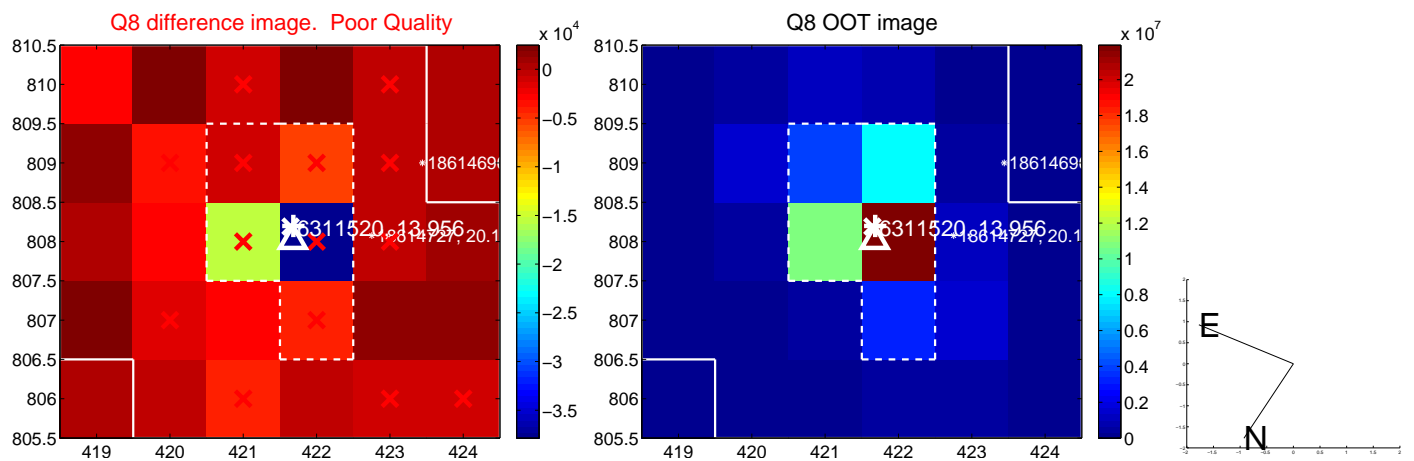
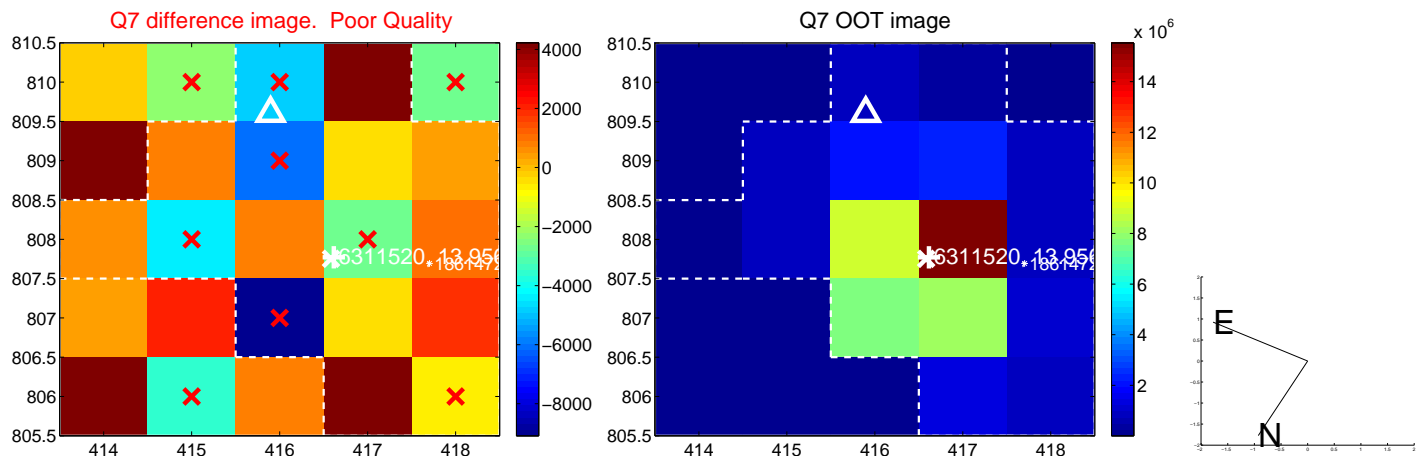
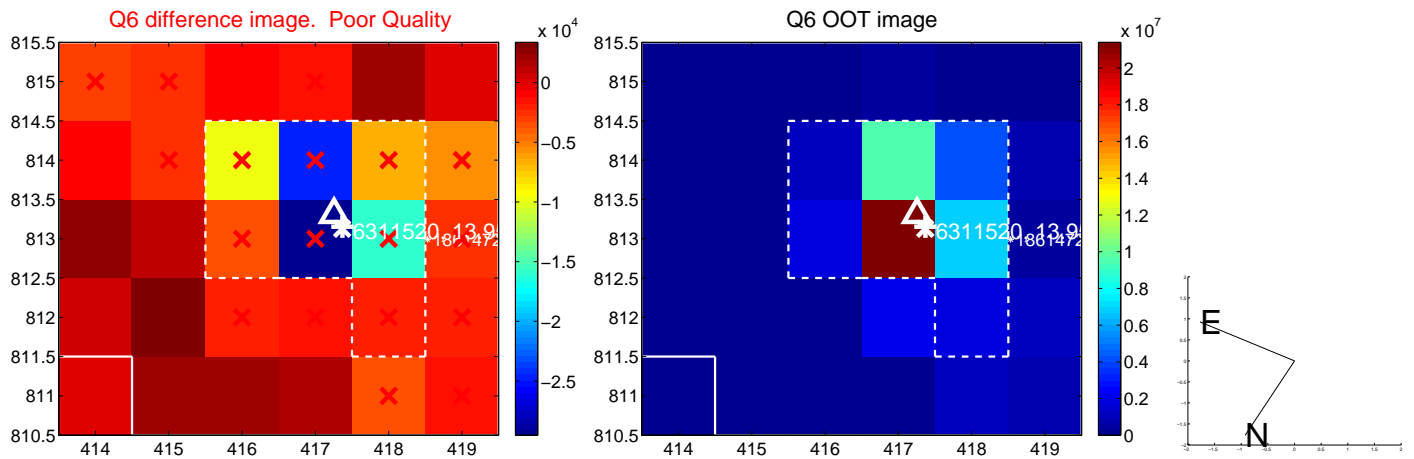
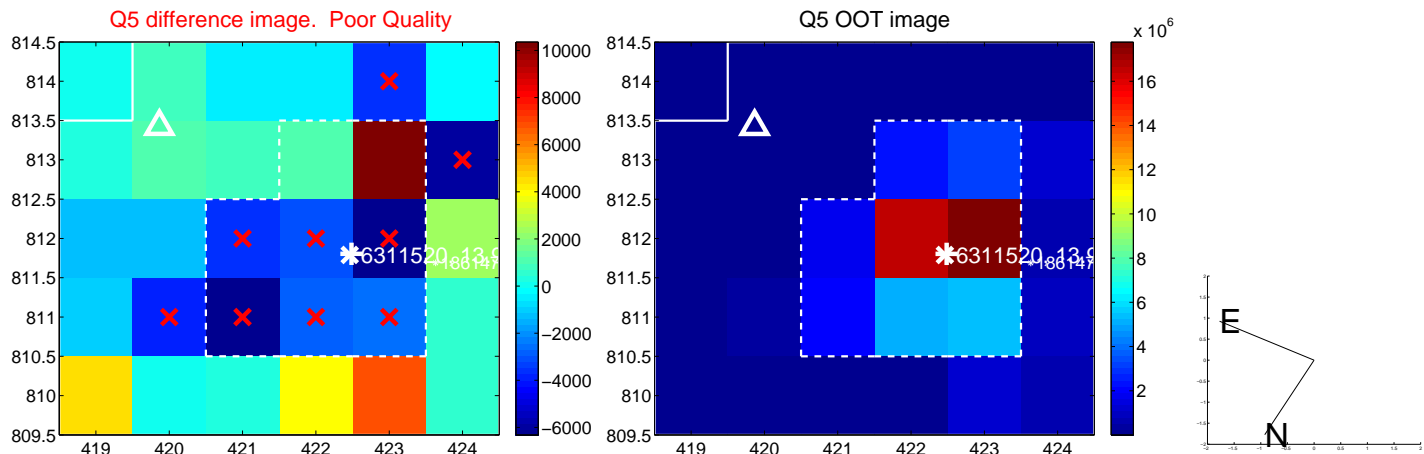


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

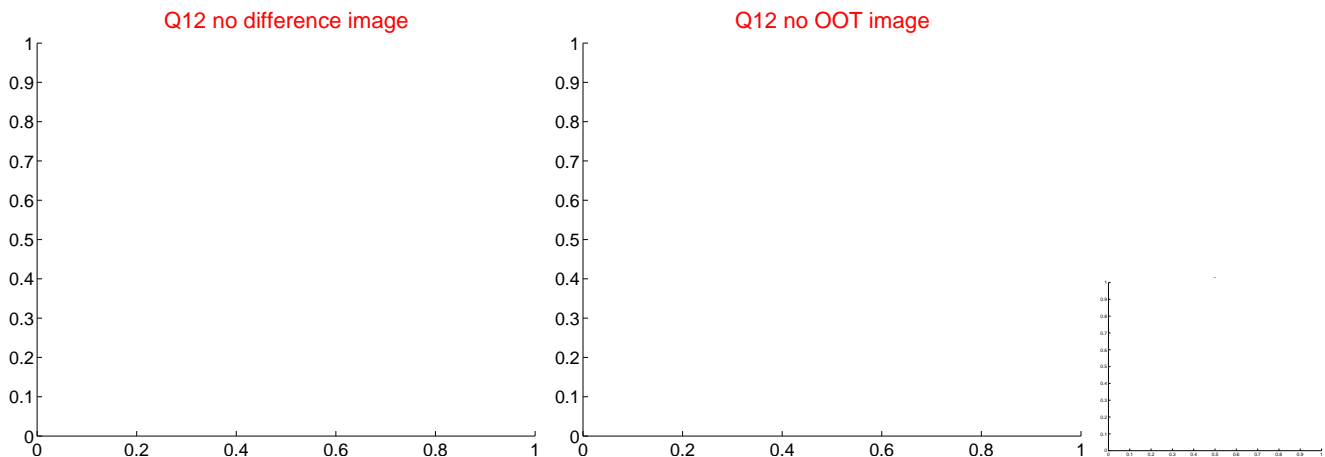
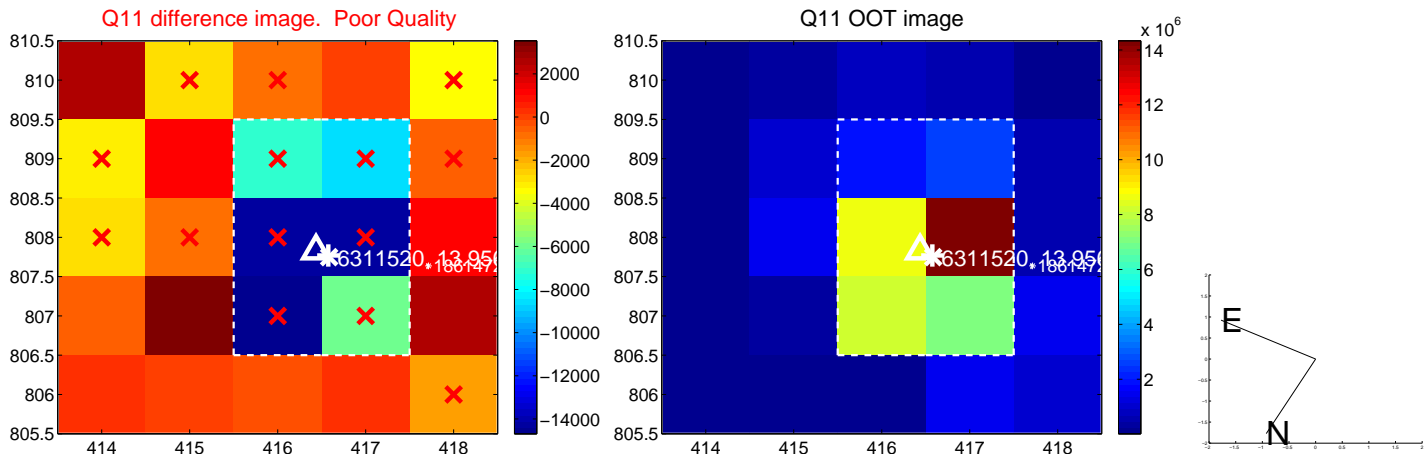
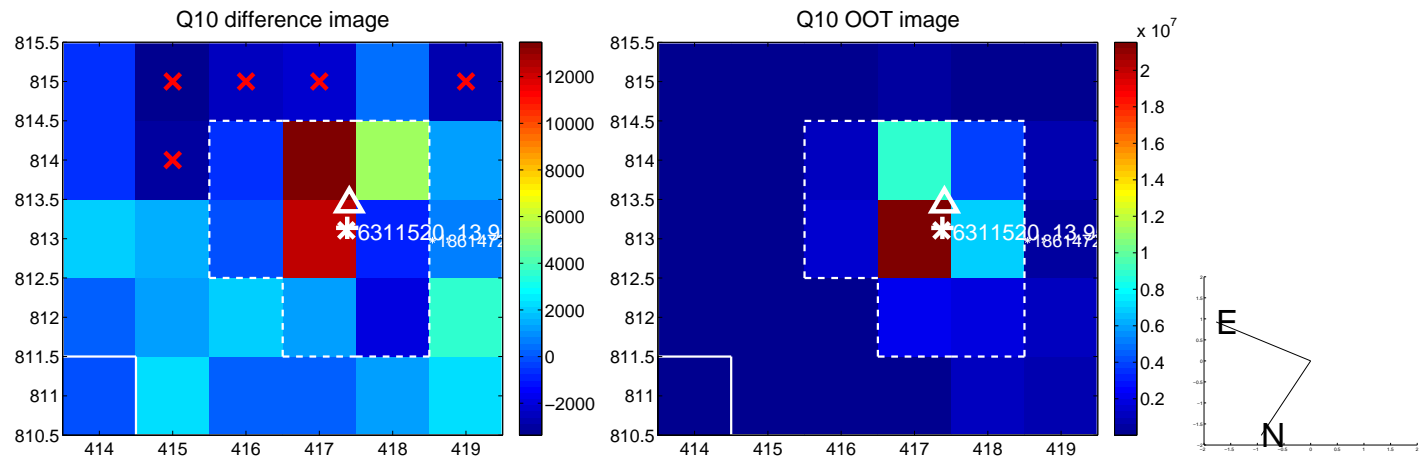
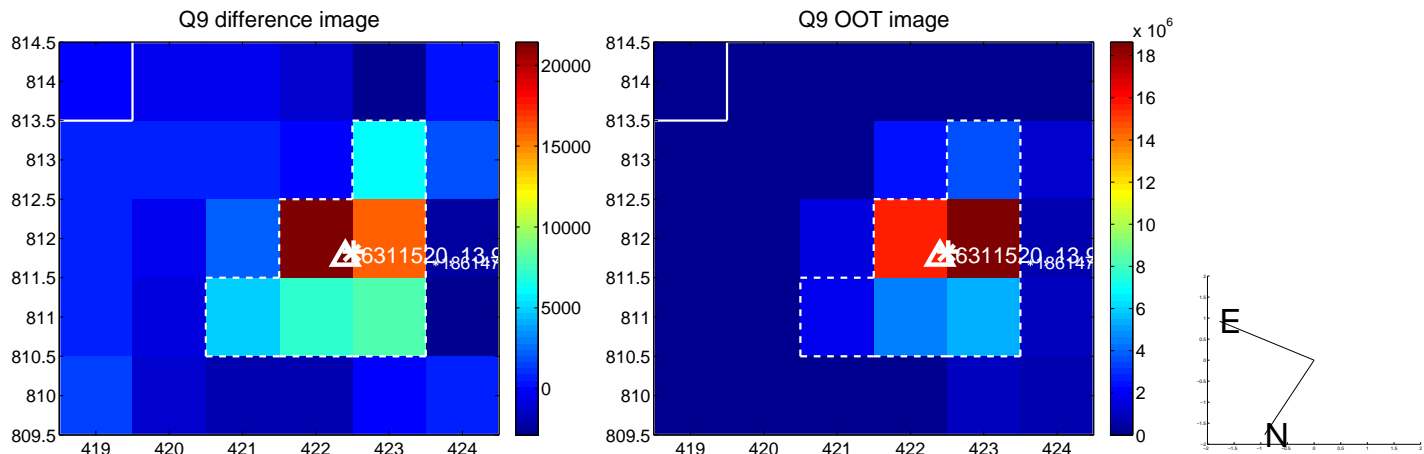
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



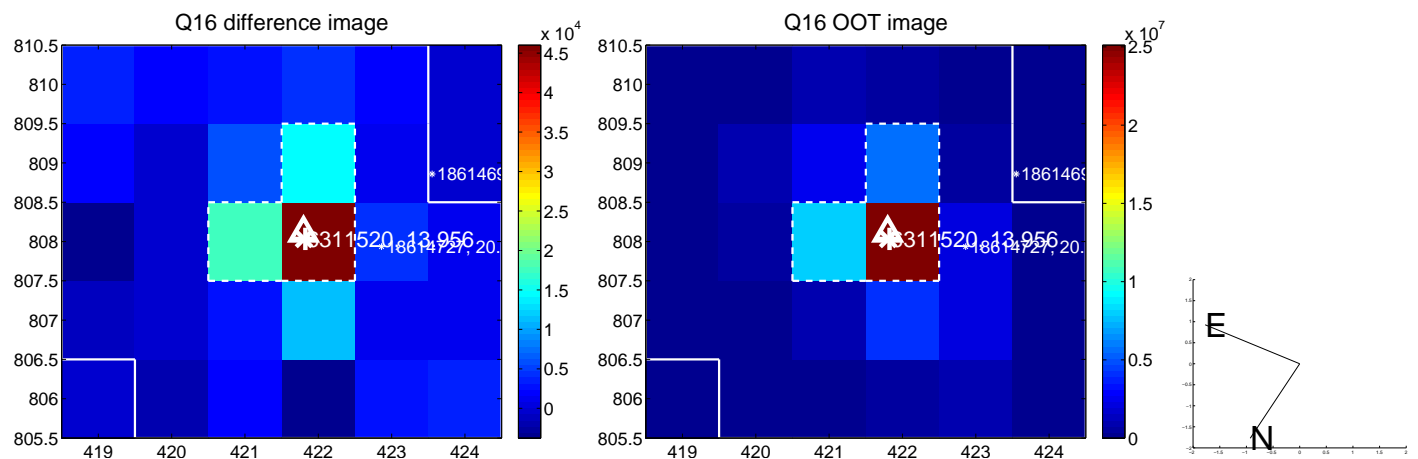
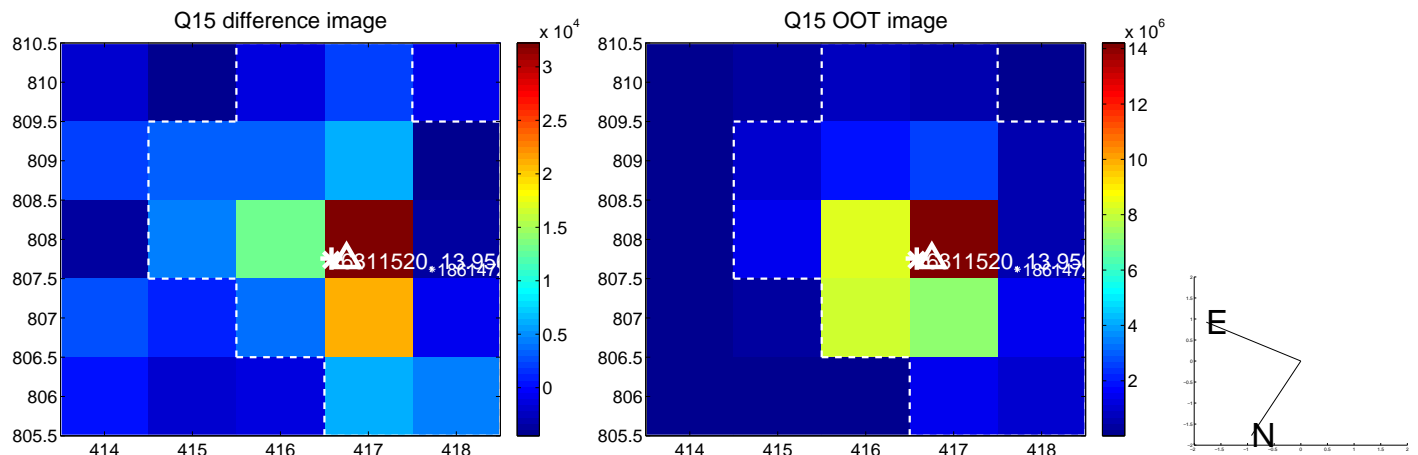
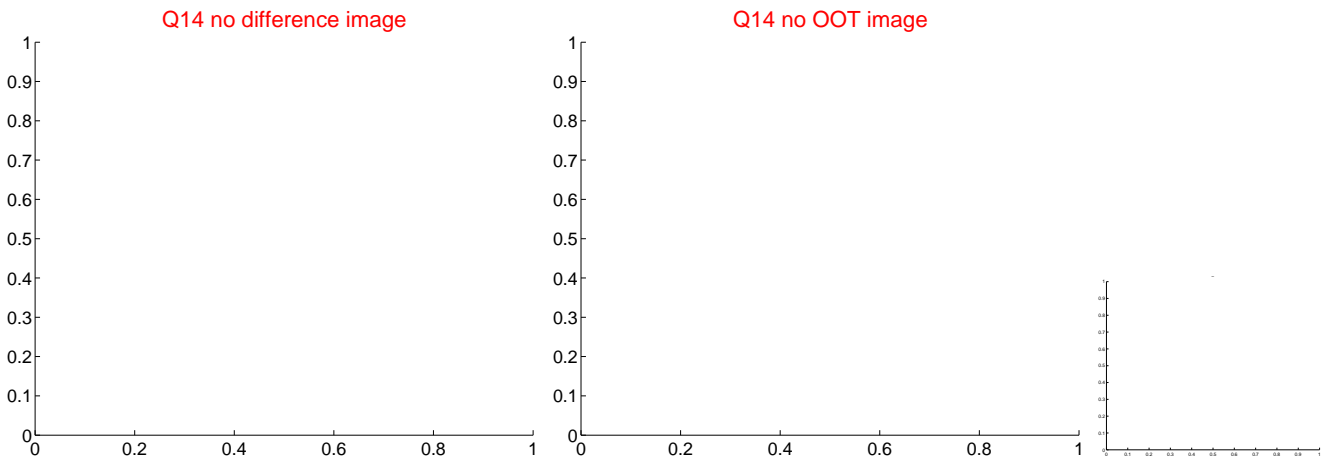
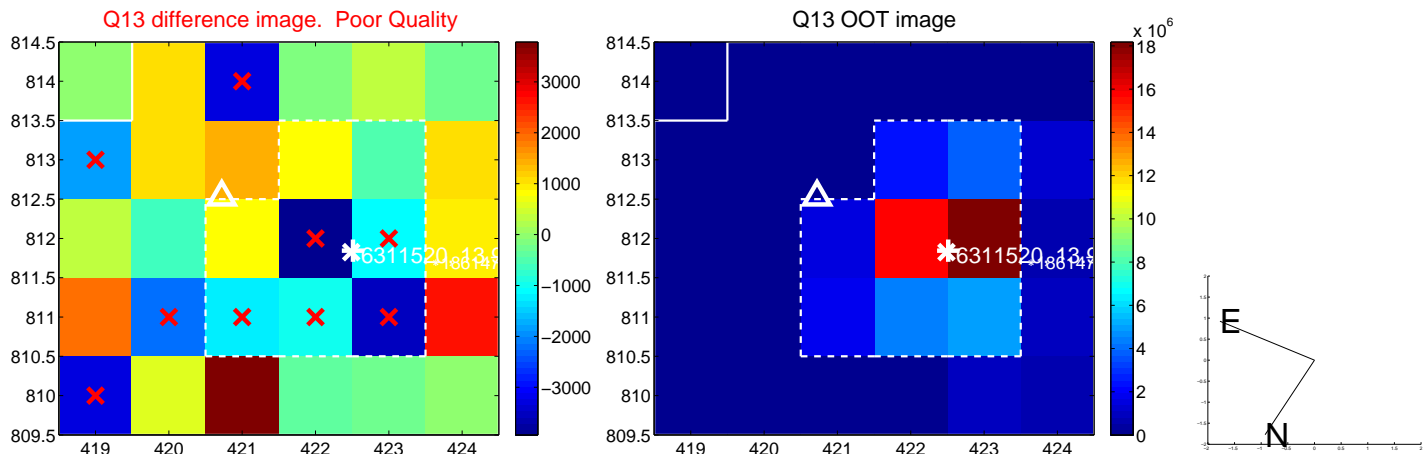
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



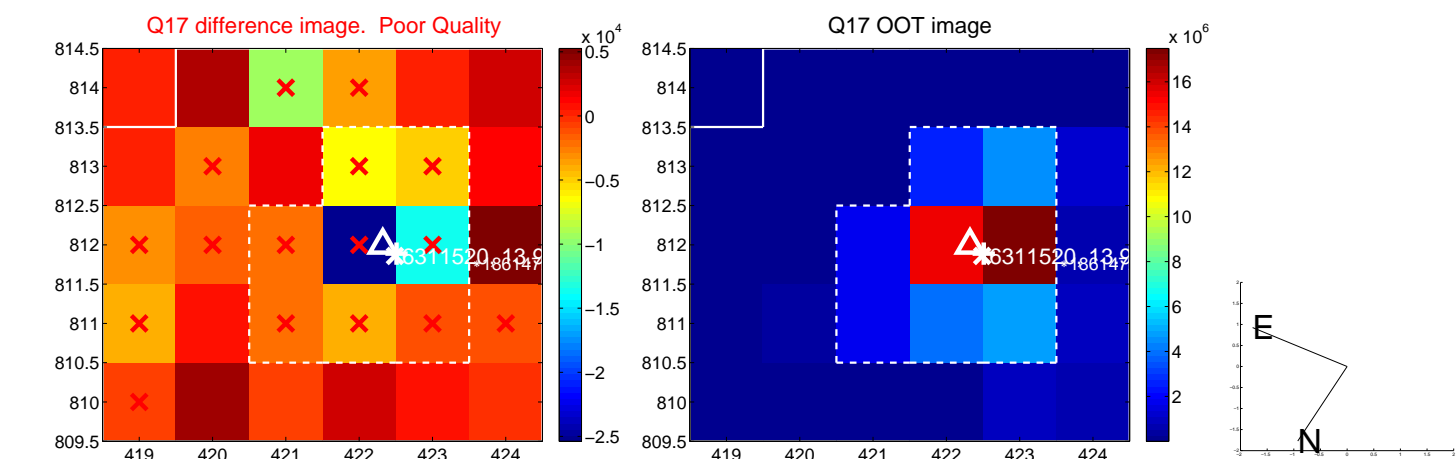
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



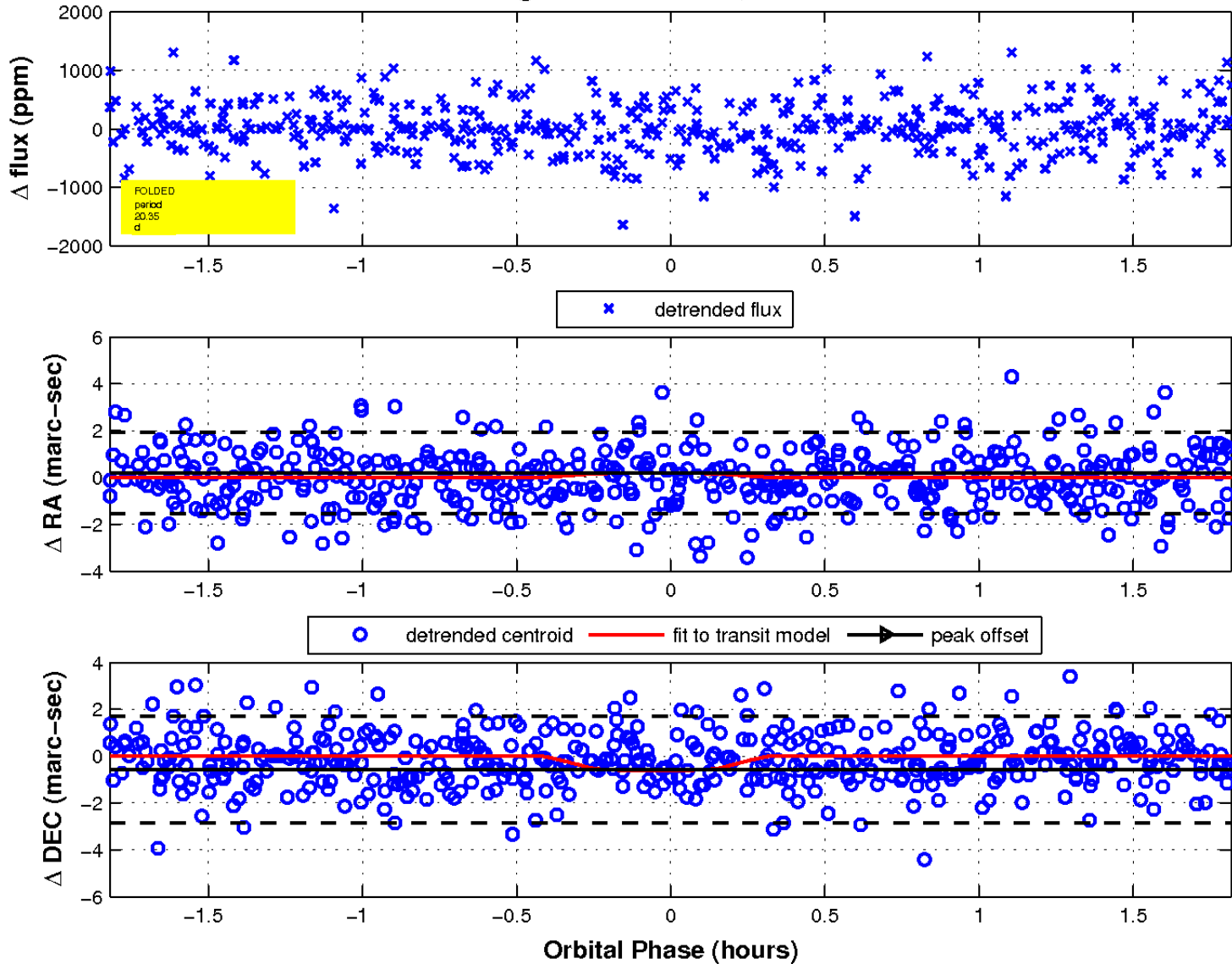
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

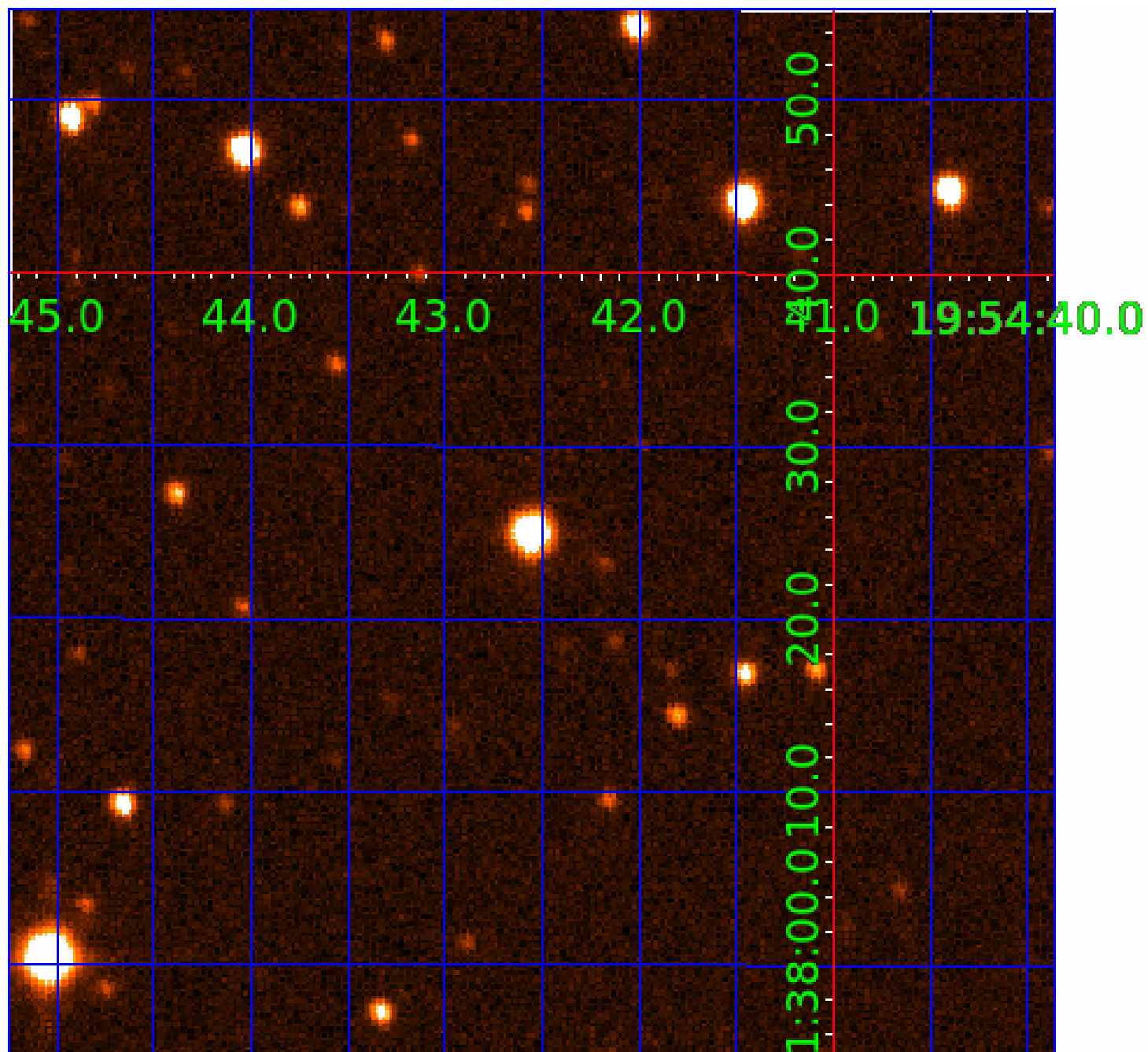


fluxWeightedCentroids, Planet 3 of 6



UKIRT Image

Declination



KIC 006311520

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})
006311520-01	OBS	4115.01	0.941840	131.811922	54.4	6.884	16.6	7.9	1.14	6419	0.85	5545.05
006311520-02	OBS	No	21.489227	132.299785	948.5	1.810	15.7	9.5	1.14	6419	4.04	85.69
006311520-03	OBS	No	20.349459	136.972434	1277.5	0.608	11.8	8.1	1.14	6419	4.38	92.14
006311520-04	OBS	No	51.805447	148.281875	393.4	1.992	9.9	7.0	1.14	6419	2.76	26.51
006311520-05	OBS	No	87.610207	191.579582	1050.7	1.706	11.8	9.4	1.14	6419	3.79	13.16
006311520-06	OBS	No	25.690329	137.362268	418.2	2.749	8.0	4.7	1.14	6419	2.73	67.53

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006311520-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT
006311520-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
006311520-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
006311520-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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 006311520-04

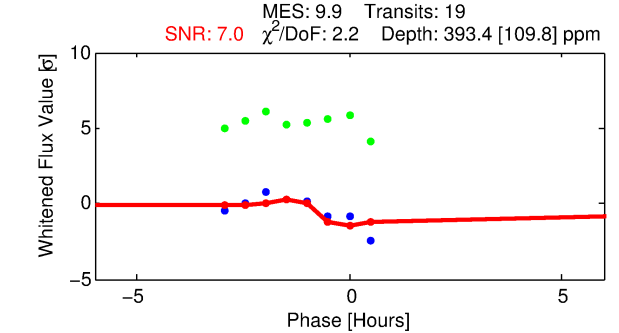
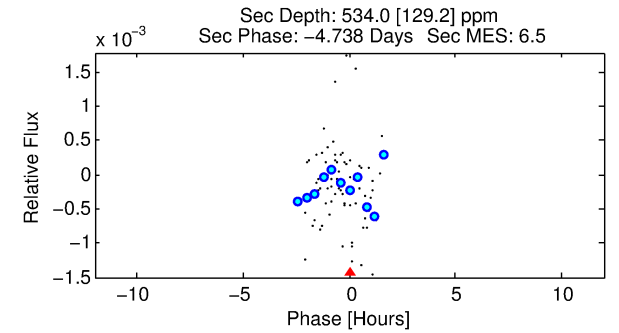
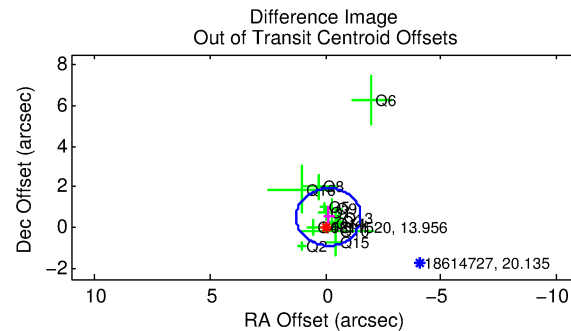
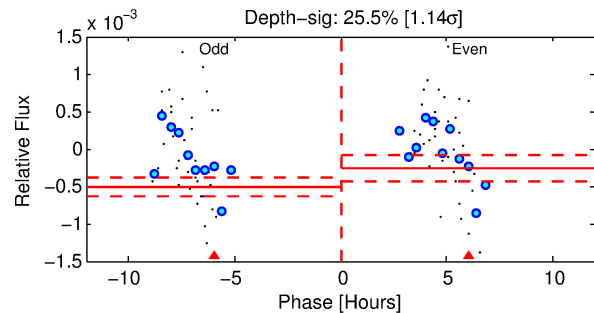
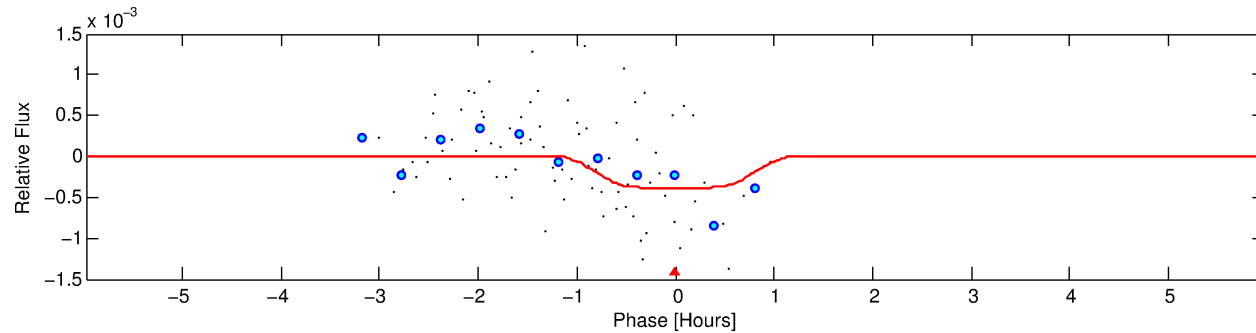
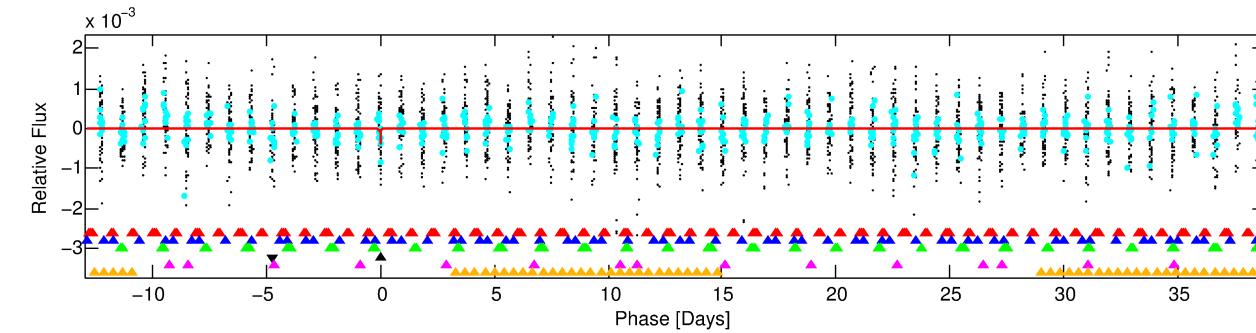
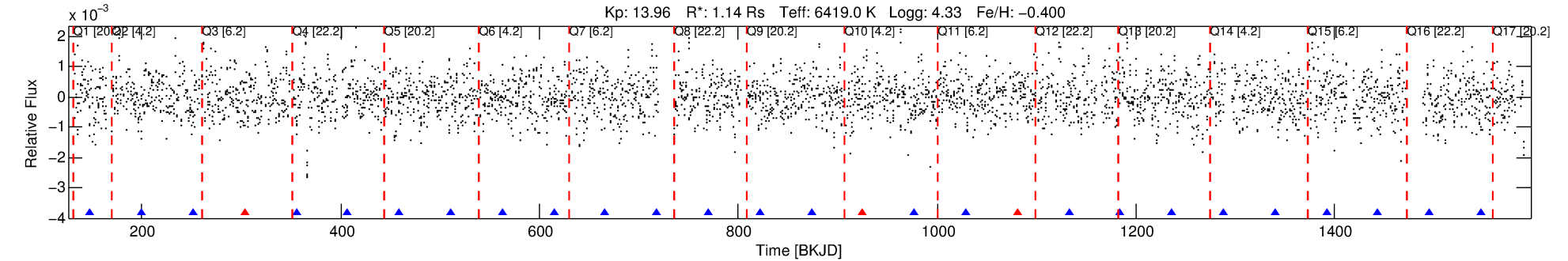
No Significant Match Found

DV One-Page Summary

KIC: 6311520 Candidate: 4 of 6 Period: 51.805 d

KOI: K04115 Corr: No Ephemeris Match

Kp: 13.96 R*: 1.14 Rs Teff: 6419.0 K Logg: 4.33 Fe/H: -0.400



DV Fit Results:

Period = 51.80545 [0.00125] d
Epoch = 148.2819 [0.0125] BKJD
Rp/R* = 0.0221 [0.0092]
a/R* = 80.41 [166.92]
b = 0.94 [0.26]
Seff = 26.51 [9.66]
Teff = 579 [53] K
Rp = 2.76 [1.38] Re
a = 0.2736 [0.0650] AU
Ag = 2887.09 [2676.34] [1.08σ]
Teffp = 6557 [1427] K [4.19σ]

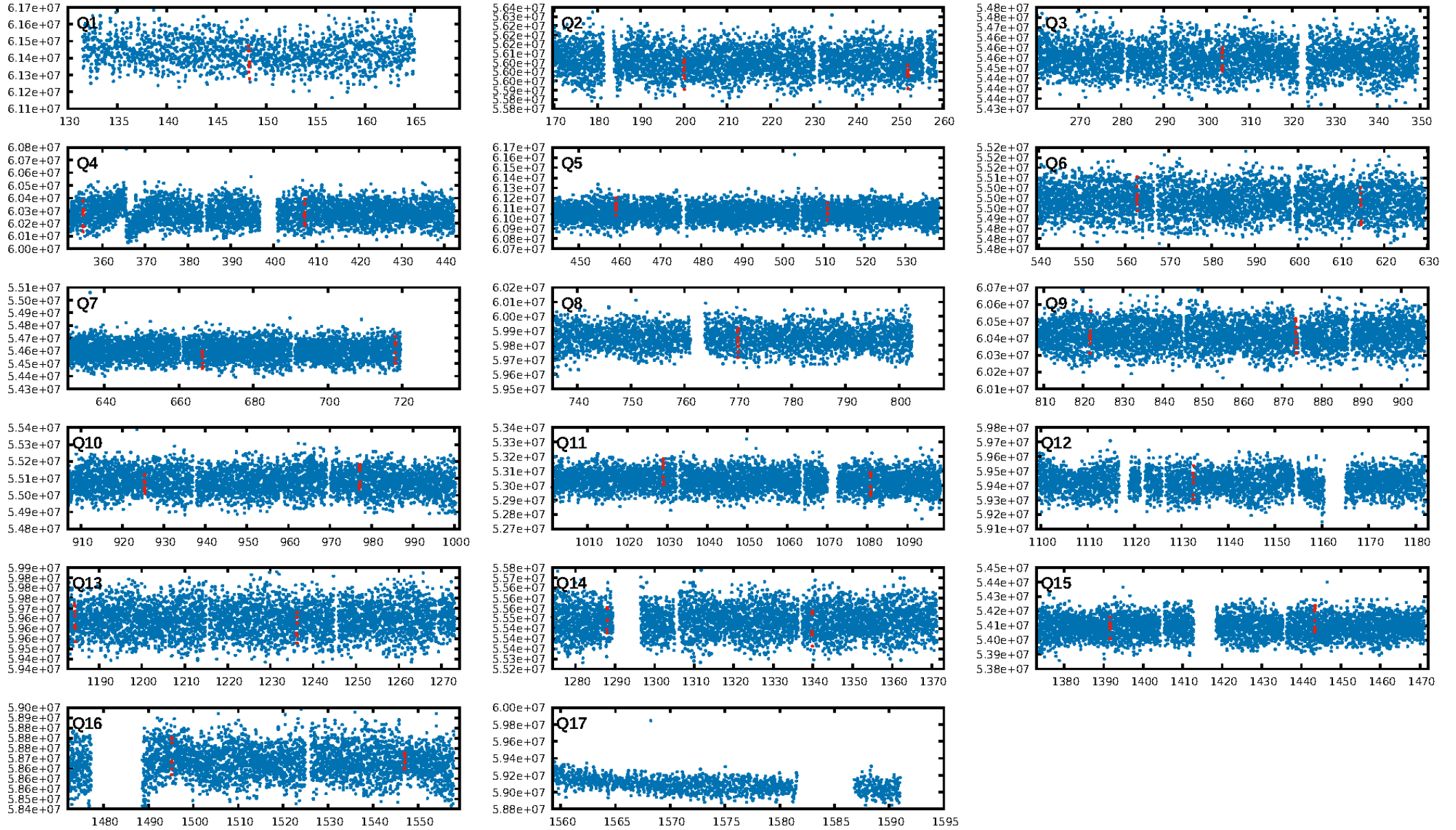
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [184.60σ]
LongPeriod-sig: 100.0% [327.64σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 97.0%
Bootstrap-pfa: 5.13e-11
RollingBand-fgt: 0.83 [15/18]
GhostDiagnostic-chr: -6.642
Centroid-sig: 17.1%
Centroid-so: 0.955 arcsec [1.03σ]
OotOffset-rm: 0.550 arcsec [1.17σ]
KicOffset-rm: 0.463 arcsec [1.00σ]
OotOffset-st: 4/3/3/4 [14]
KicOffset-st: 4/3/3/4 [14]
DiffImageQuality-fgm: 0.50 [7/14]
DiffImageOverlap-fno: 0.69 [11/16]

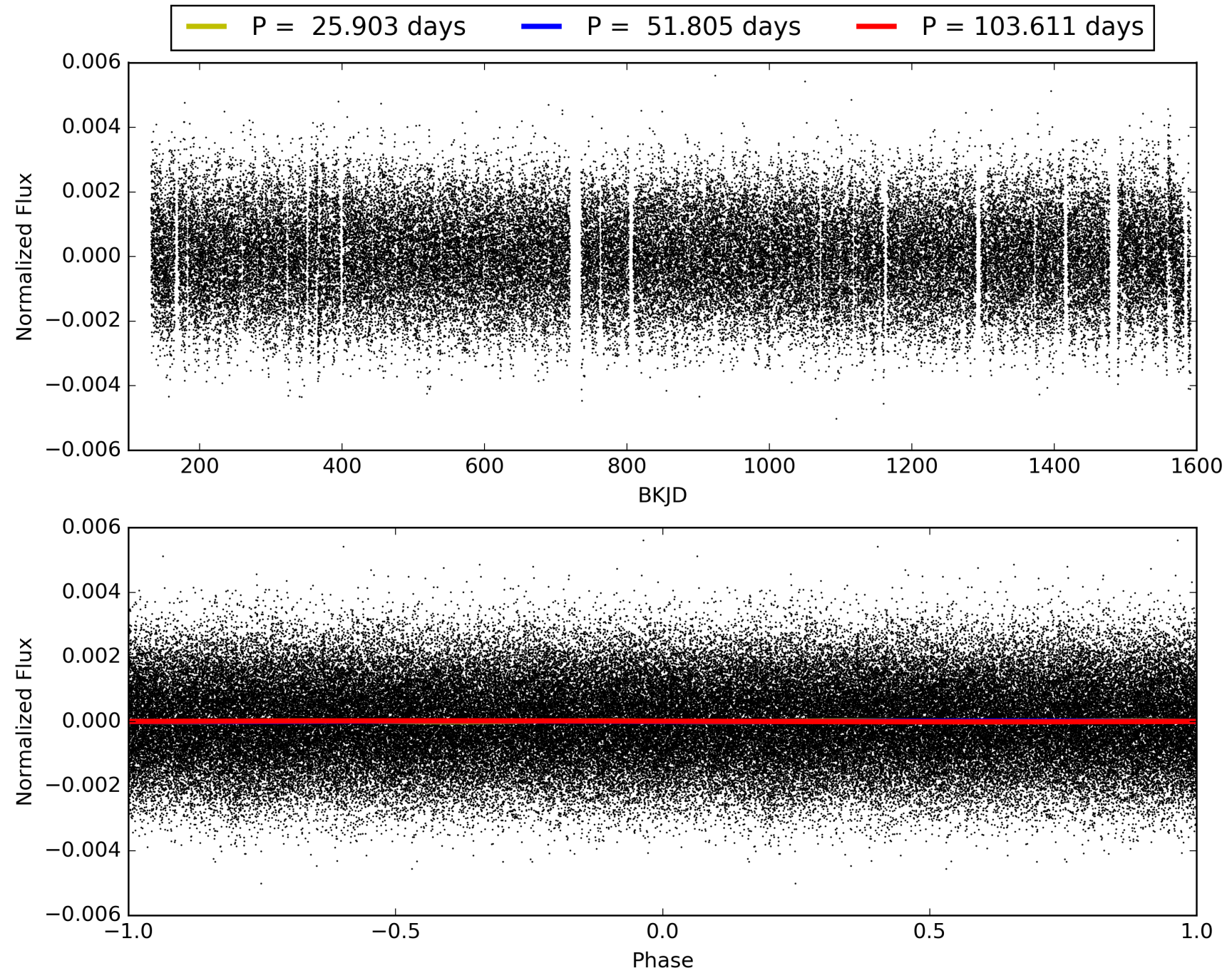
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:31:58 Z

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

TCE 006311520-04, PDC Light Curves

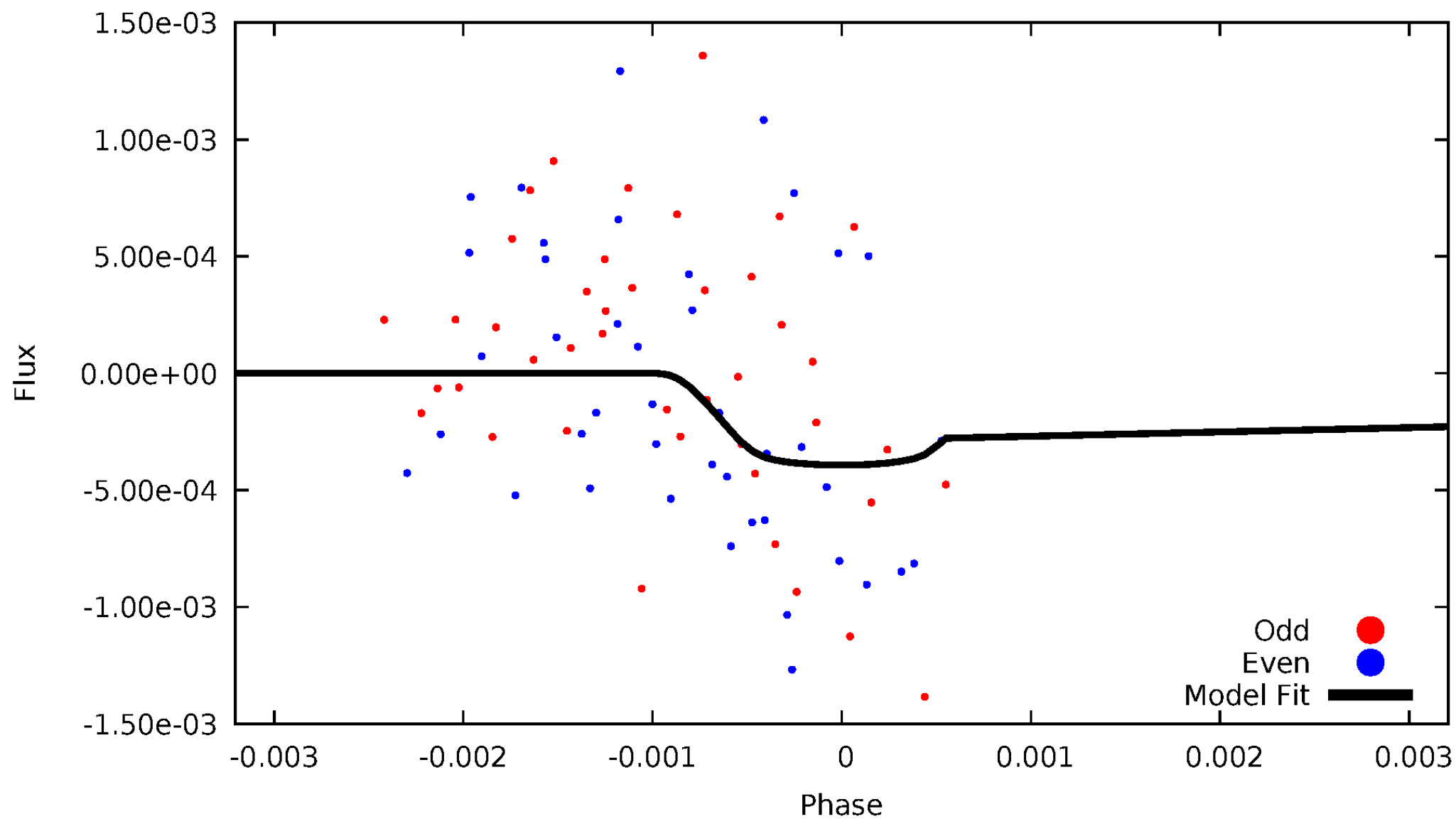


TCE 006311520-04



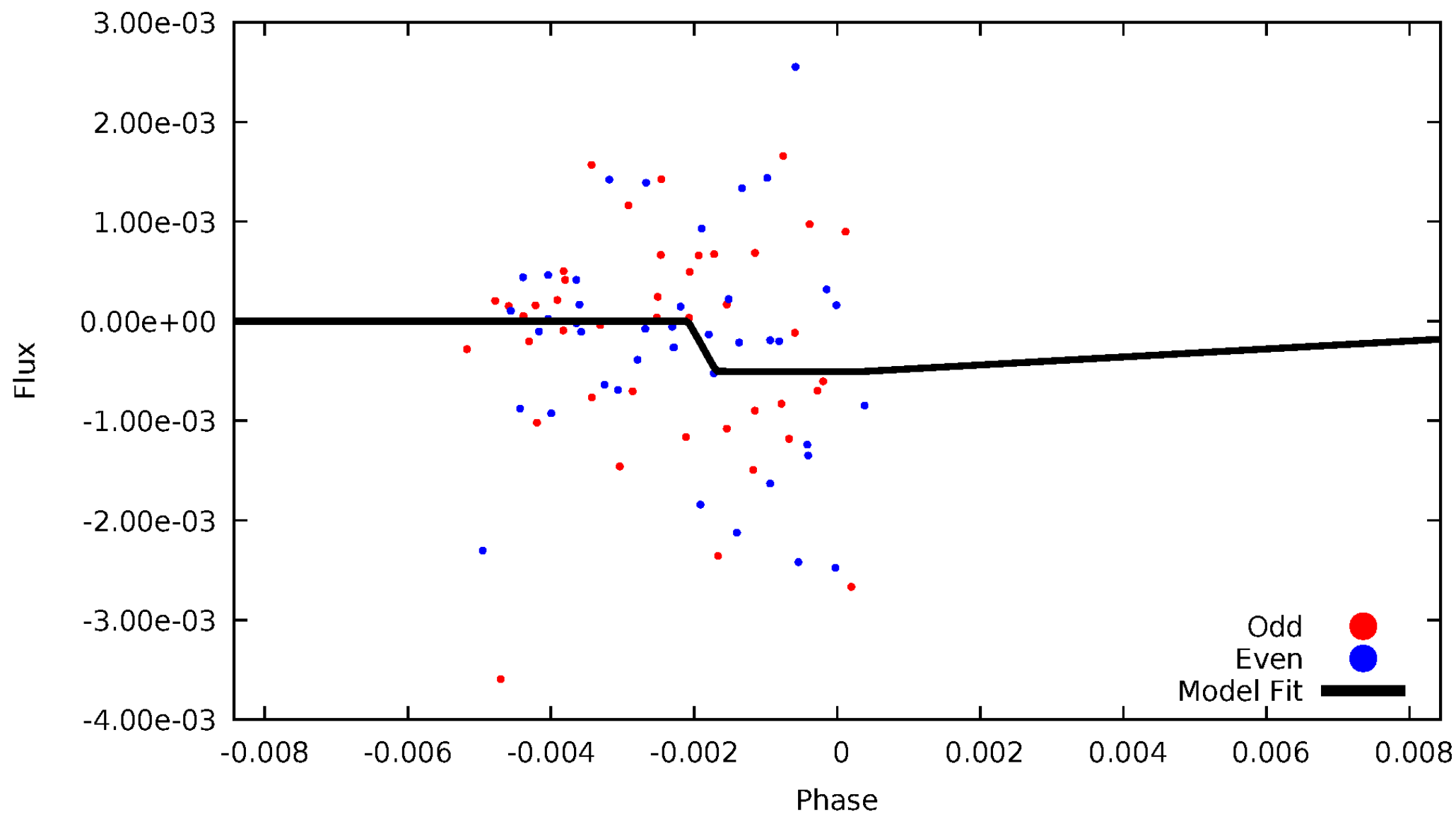
DV Odd/Even

TCE 006311520-04



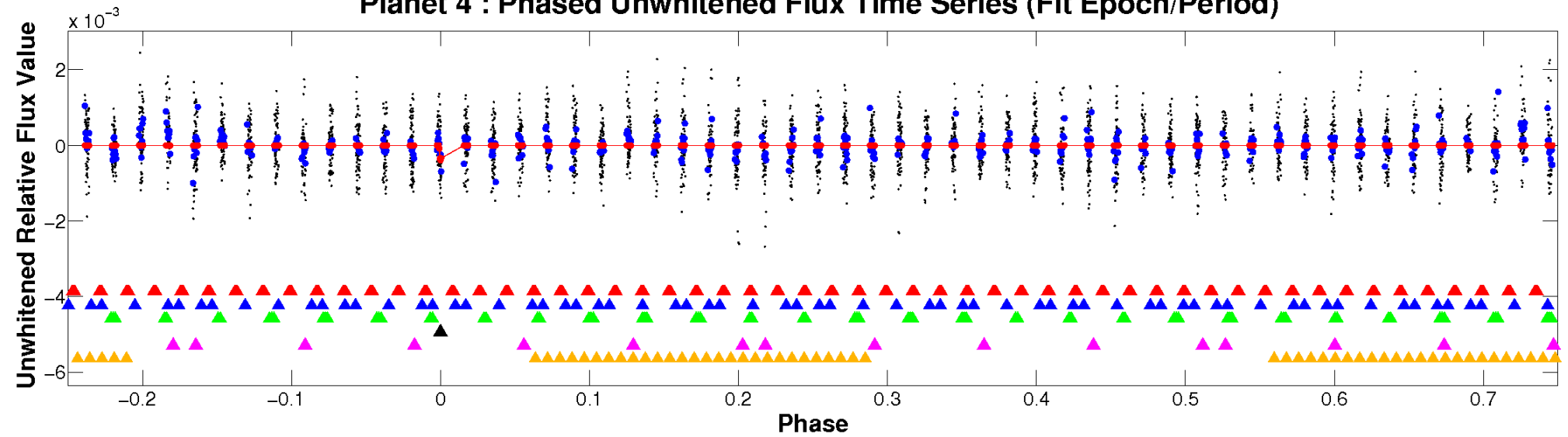
ALT Odd/Even

TCE 006311520-04

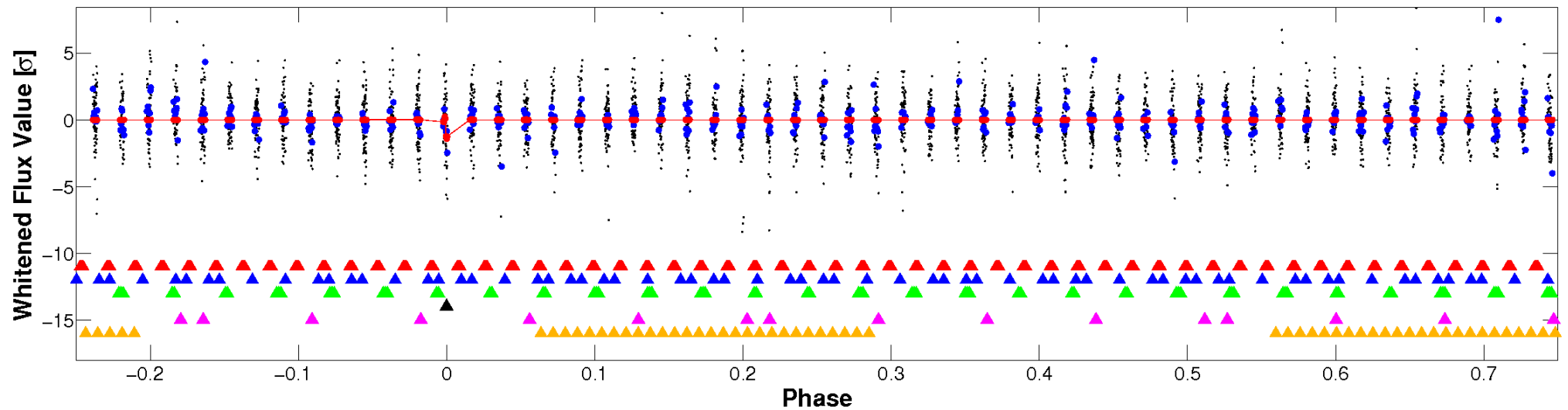


Non-Whitened Vs. Whitened Light Curve

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

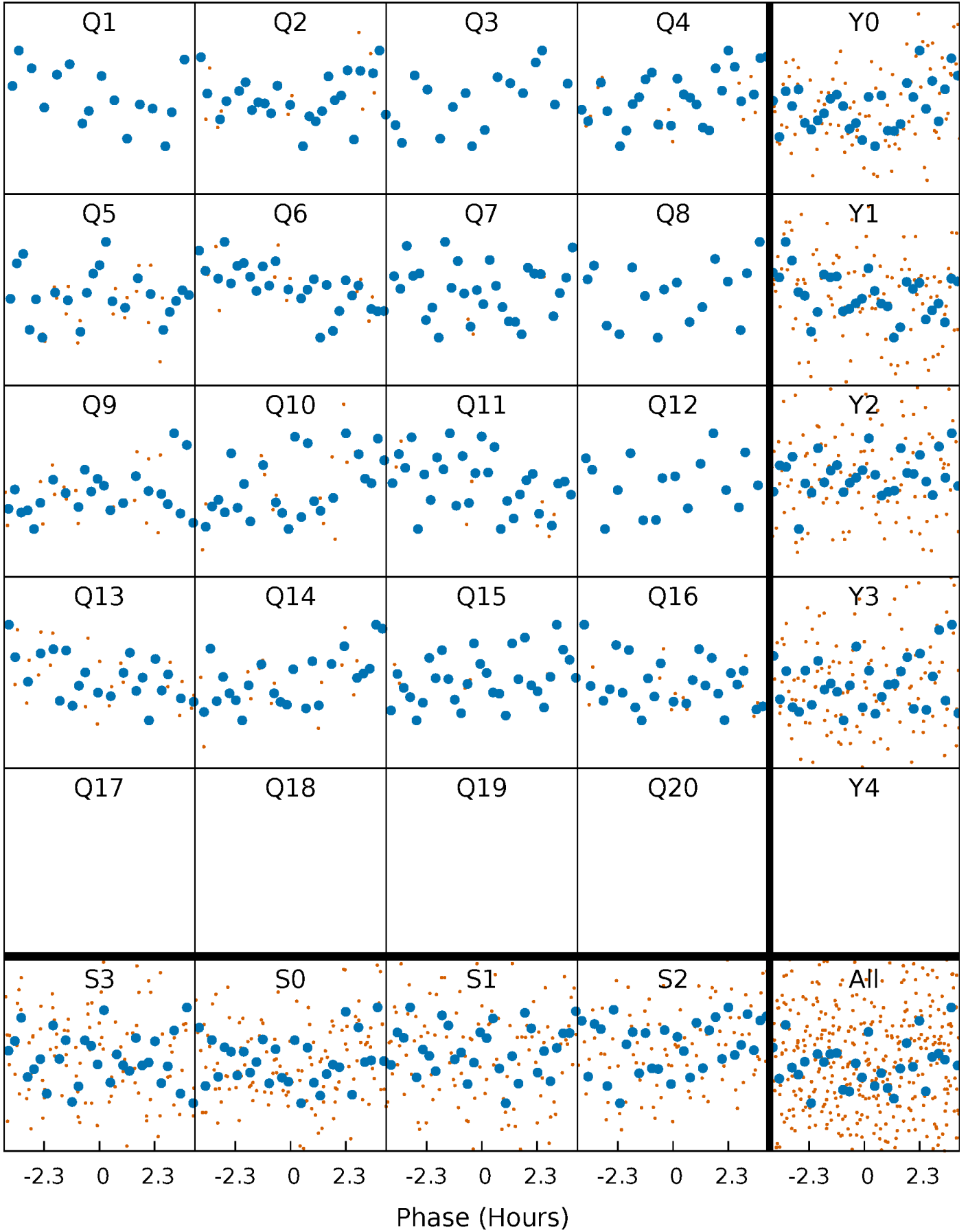


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



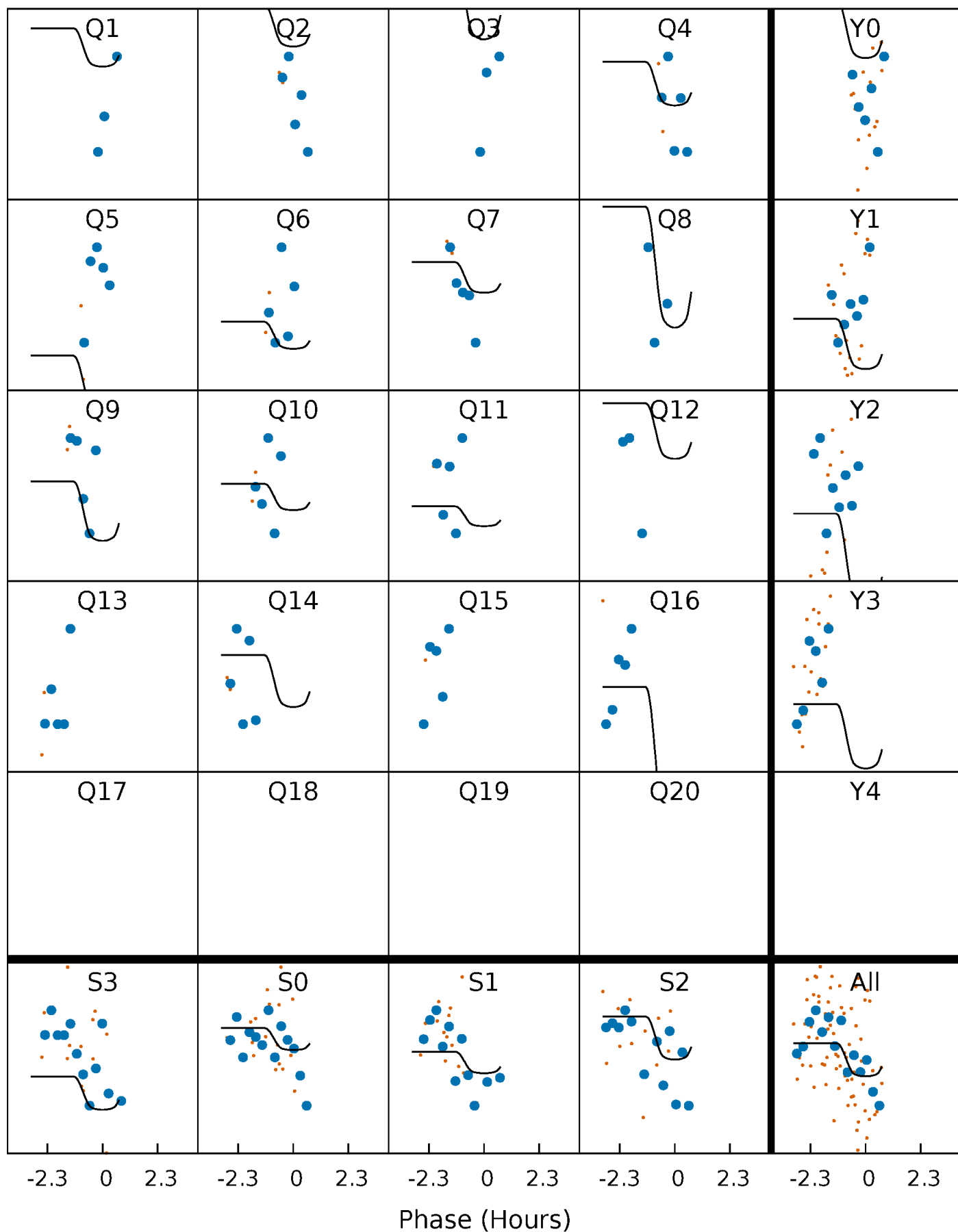
PDC Quarter-Phased Transit Curves

TCE 006311520-04 $P = 51.805447$ Days $T_0 = 148.281874$ (BKJD)



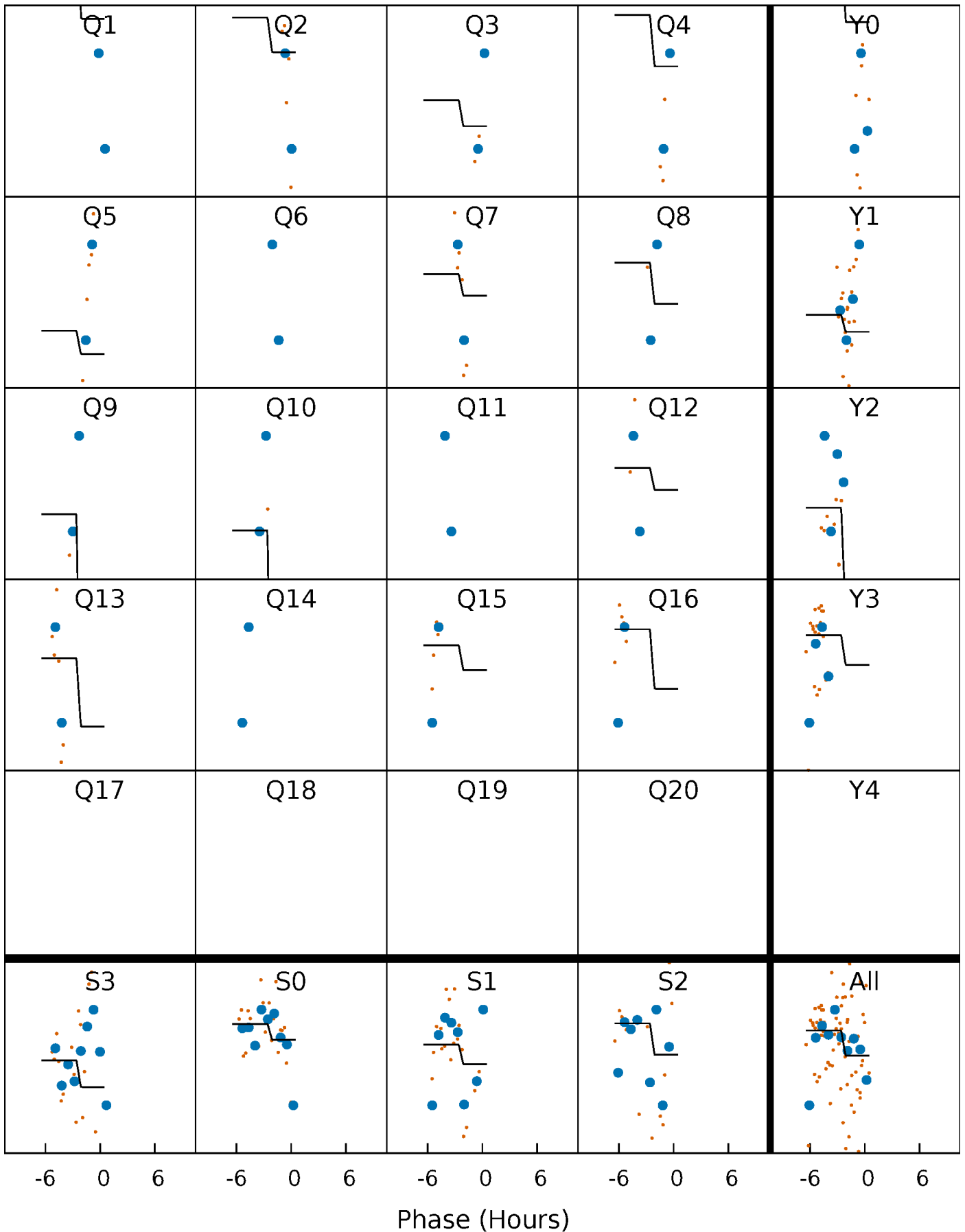
DV Quarter-Phased Transit Curves

TCE 006311520-04 P= 51.805447 Days $T_0=148.281874$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

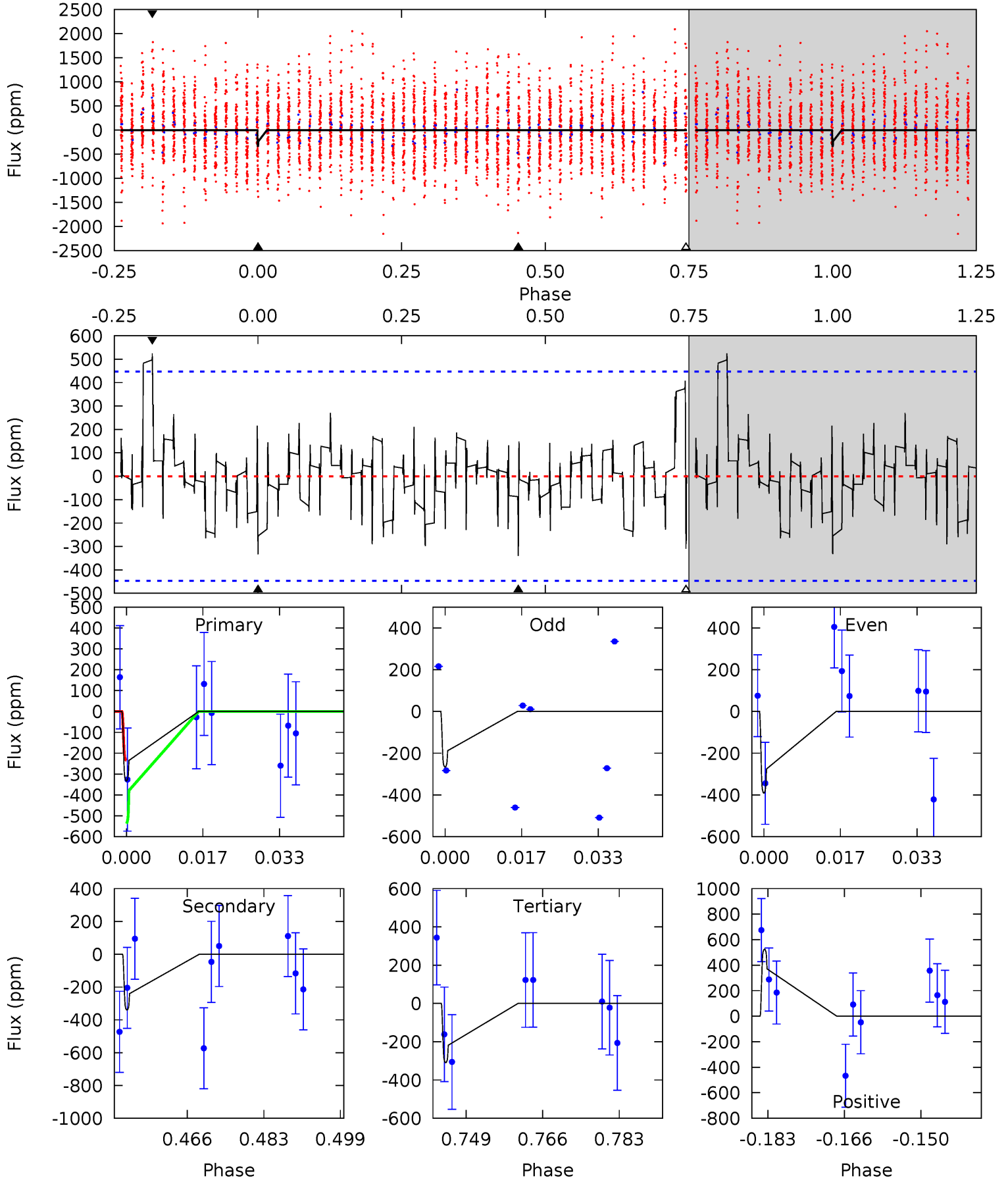
TCE 006311520-04 P= 51.810464 Days $T_0=148.289321$ (BKJD)



DV Model-Shift Uniqueness Test

006311520-04, P = 51.805447 Days, E = 96.476427 Days

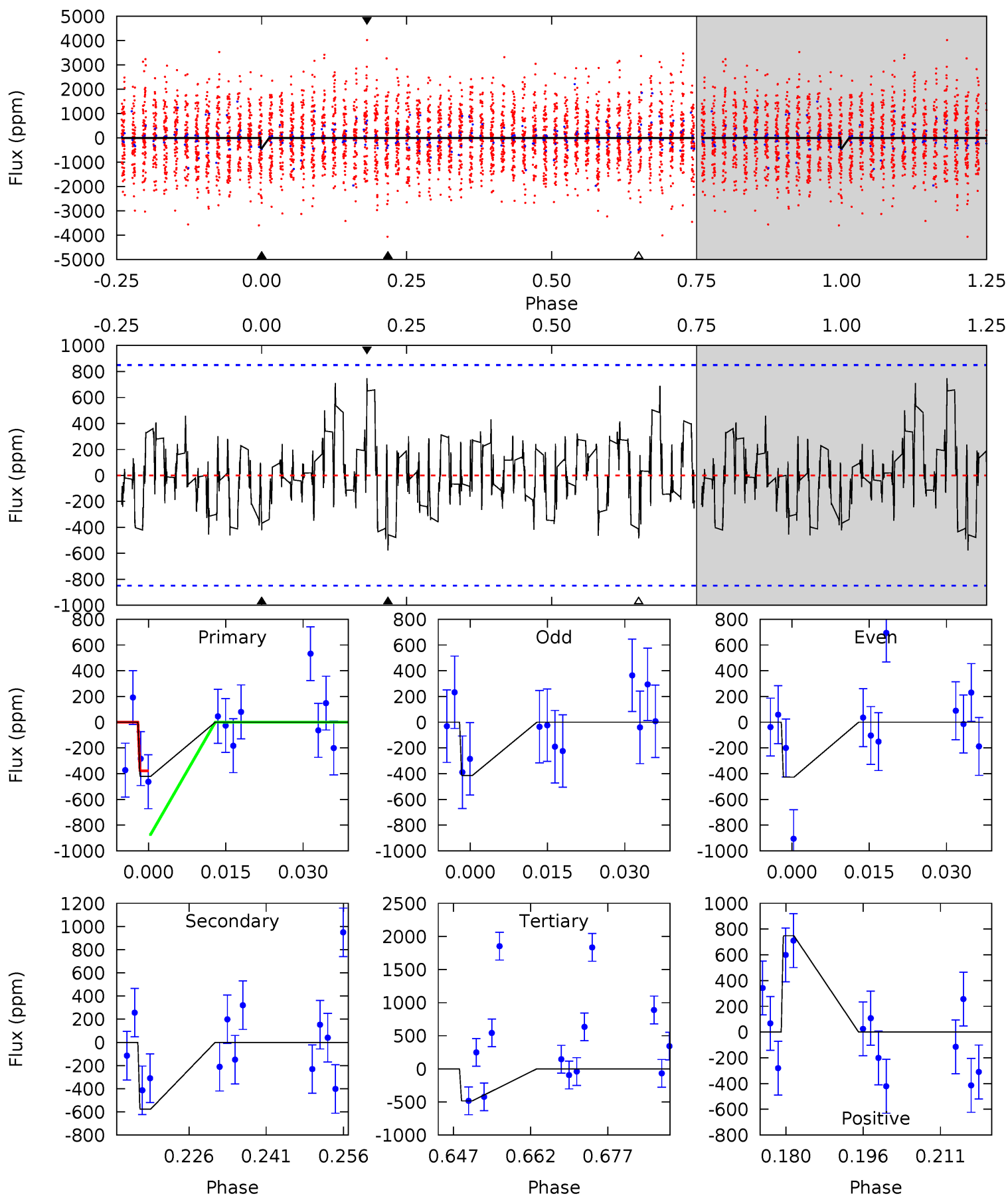
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.67	3.75	3.41	5.79	4.93	2.39	1.37	0.26	-2.12	0.34	-2.04	0.69	0.73	0.61	1.44



Alt Model-Shift Uniqueness Test

006311520-04, P = 51.810464 Days, E = 96.478857 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.45	3.36	2.82	4.36	4.95	2.43	1.09	-0.37	-1.91	0.54	-1.00	0.04	1.20	0.56	0.78



Stellar Parameters For KIC 006311520

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6419^{+177}_{-199}	$4.330^{+0.124}_{-0.186}$	$-0.400^{+0.300}_{-0.300}$	$1.142^{+0.325}_{-0.175}$	$1.013^{+0.156}_{-0.114}$	$0.958^{+0.541}_{-0.467}$
	+3%/-3%	+3%/-4%	+75%/-75%	+28%/-15%	+15%/-11%	+56%/-49%
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 006311520-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-340 ± 91	$2.85^{+1.23}_{-1.22}$	815^{+57}_{-43}	5718^{+2035}_{-825}	1666^{+3540}_{-905}
Alt.	-577 ± 172	$2.87^{+1.27}_{-1.09}$	812^{+60}_{-46}	6600^{+2088}_{-1122}	2840^{+4645}_{-1548}

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 $A_{obs} \gg 1.0$

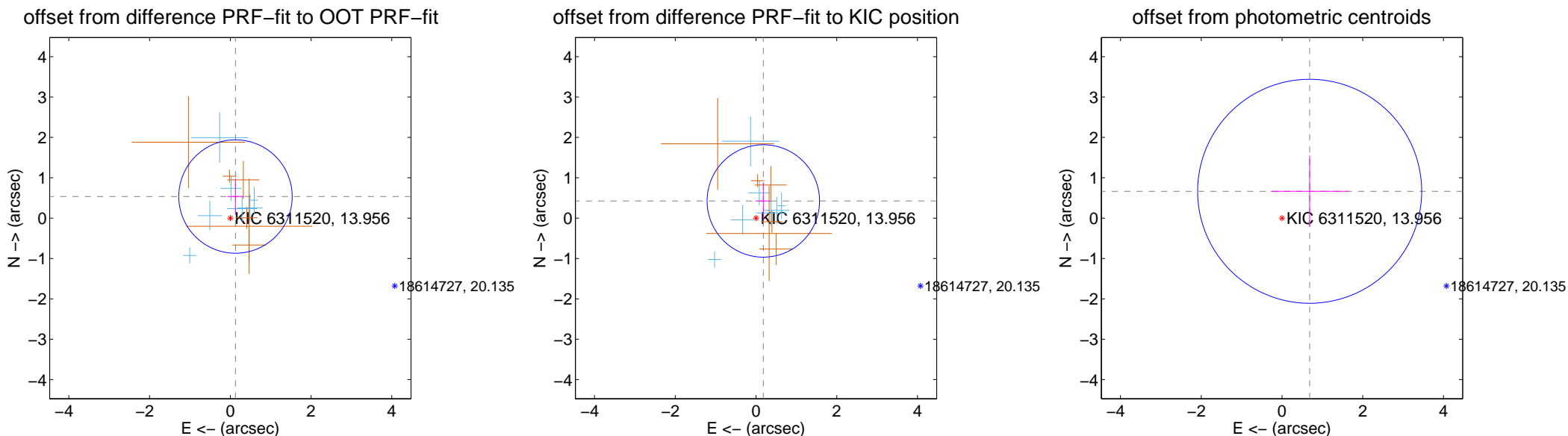
DV Centroid Data

Supplemental centroid analysis for 006311520-04. Kepler magnitude: 13.96. Transit SNR 7.01

There are 7 quarters with good PRF difference image offsets

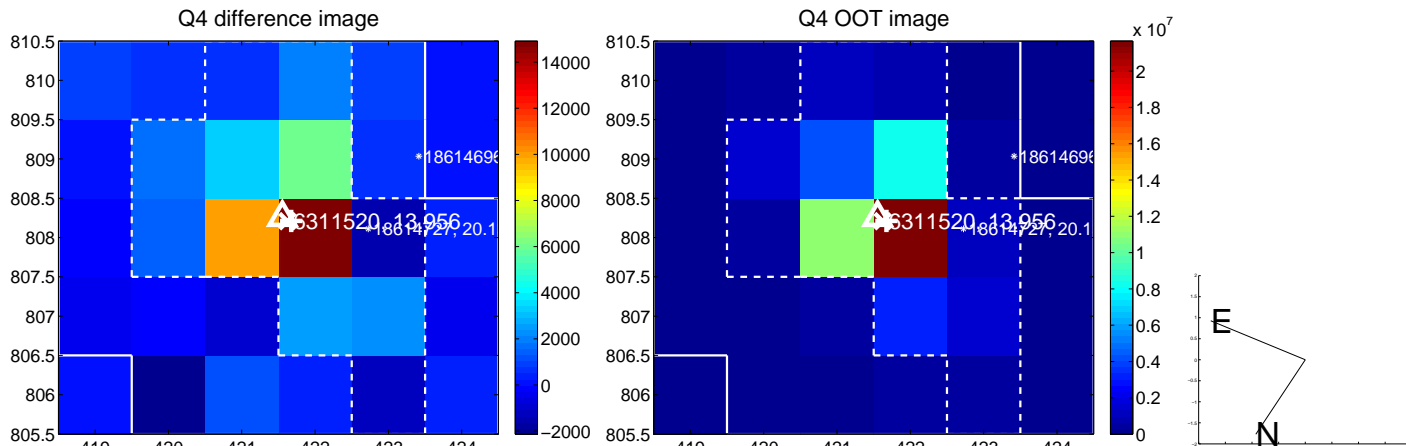
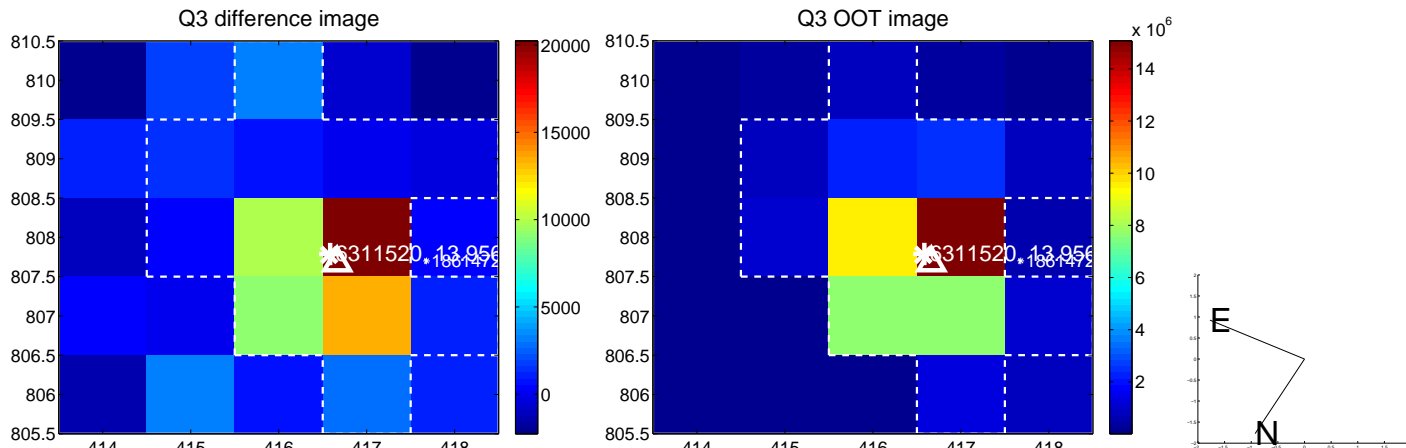
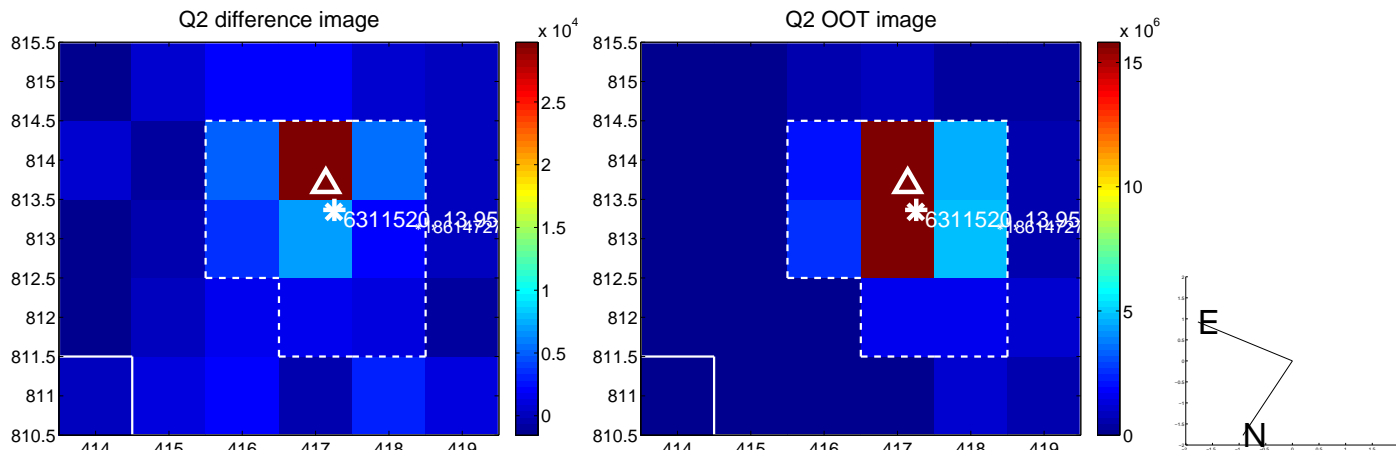
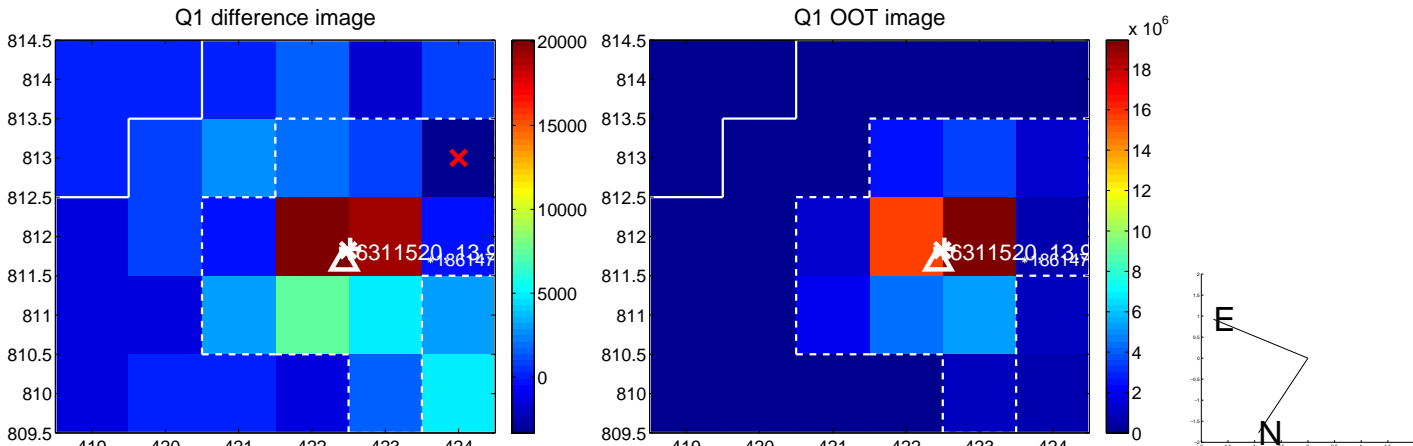
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.550 ± 0.468	1.17	-0.128 ± 0.206	0.535 ± 0.450
PRF-fit source offset from KIC position	0.463 ± 0.464	1.00	-0.181 ± 0.190	0.426 ± 0.458
photometric centroid source offset	0.95 ± 0.93	1.03	-0.69 ± 0.96	0.67 ± 0.89

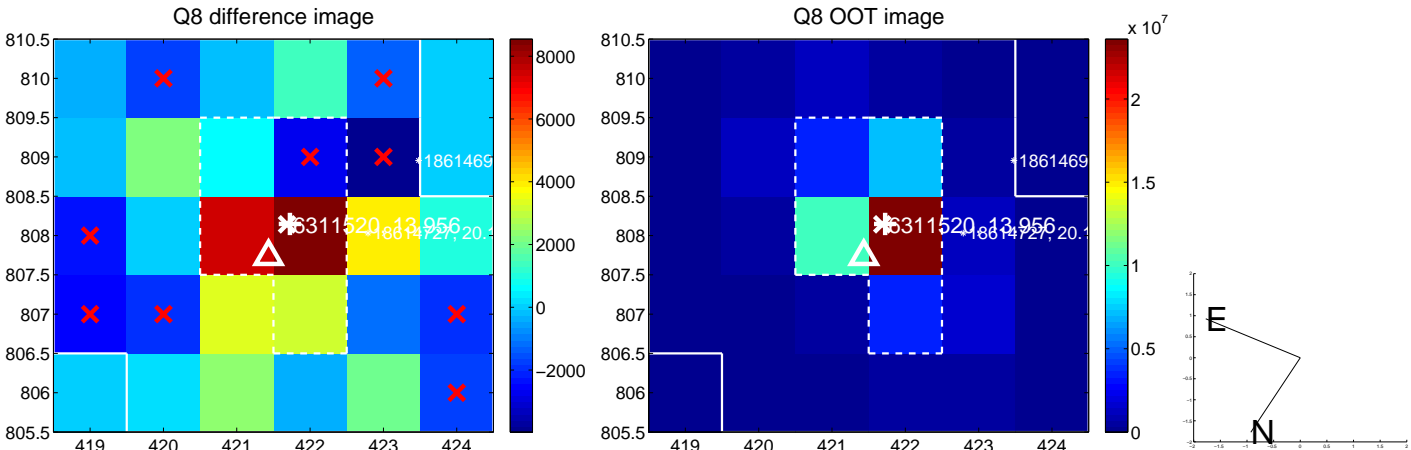
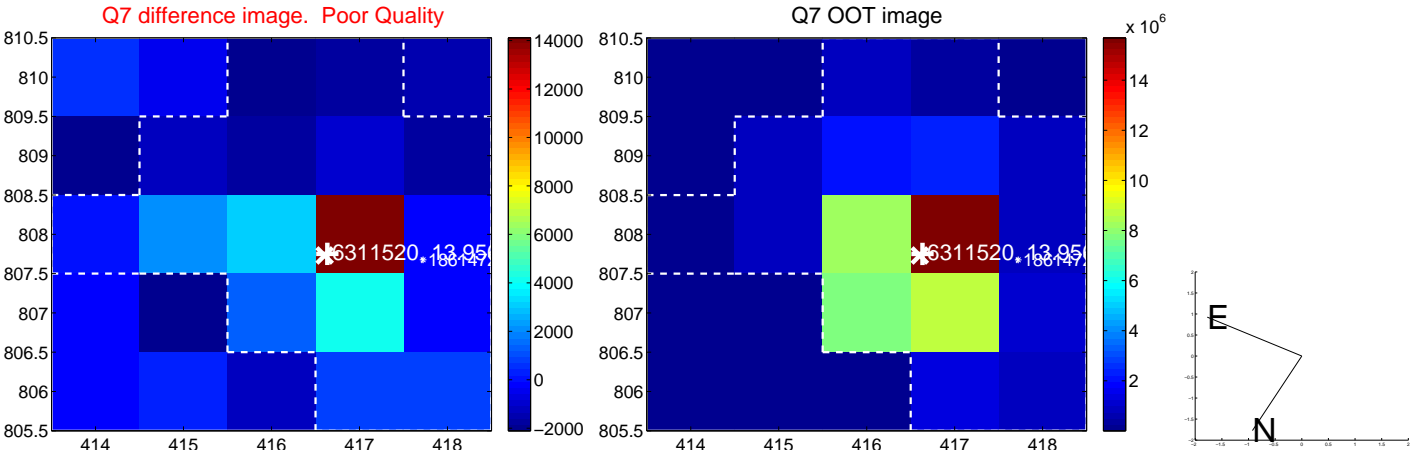
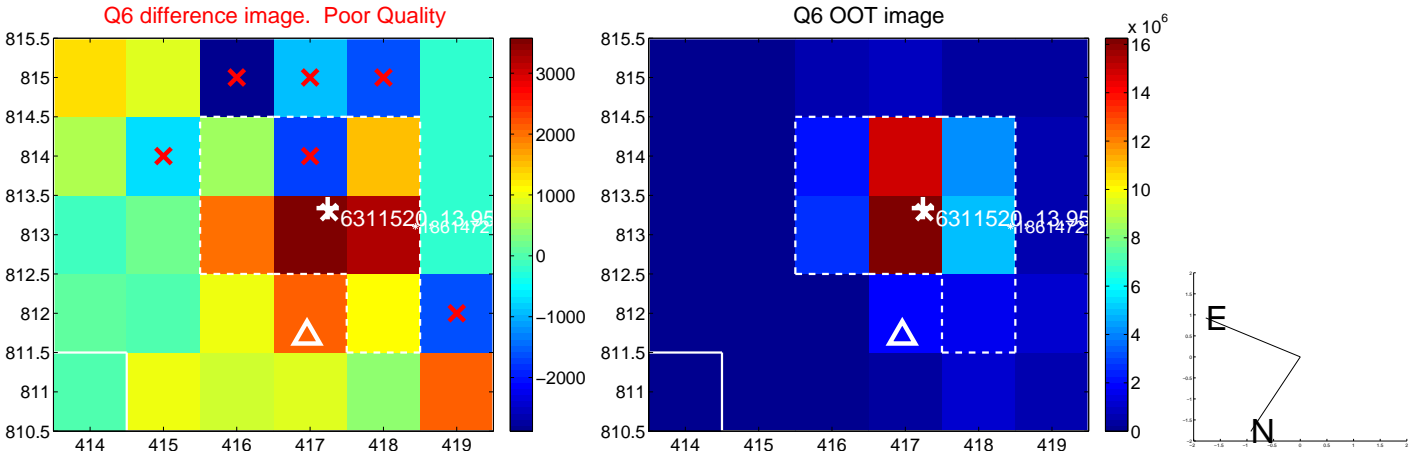
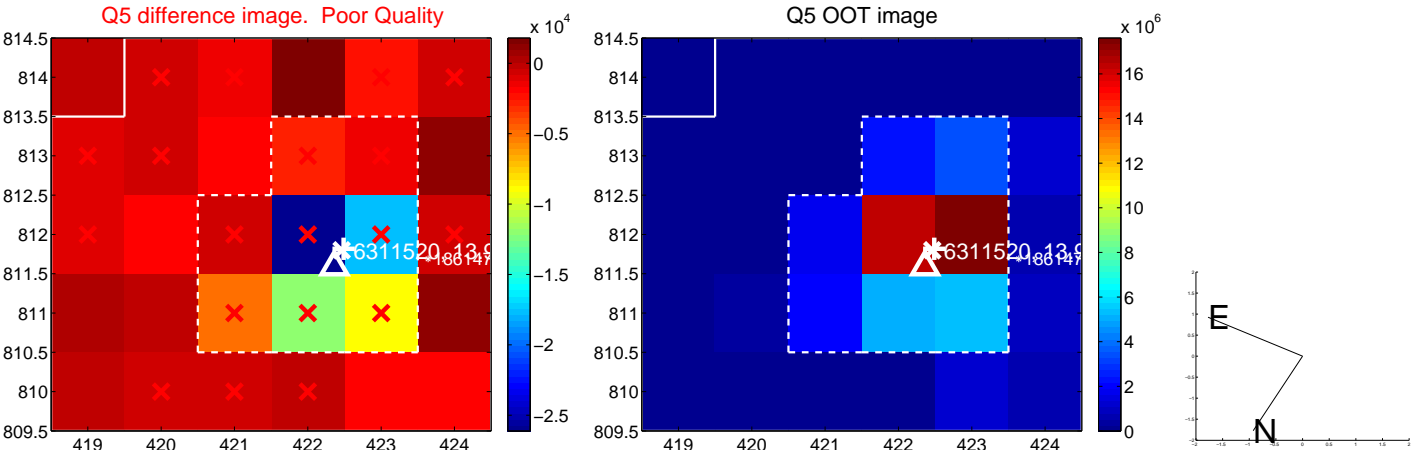


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

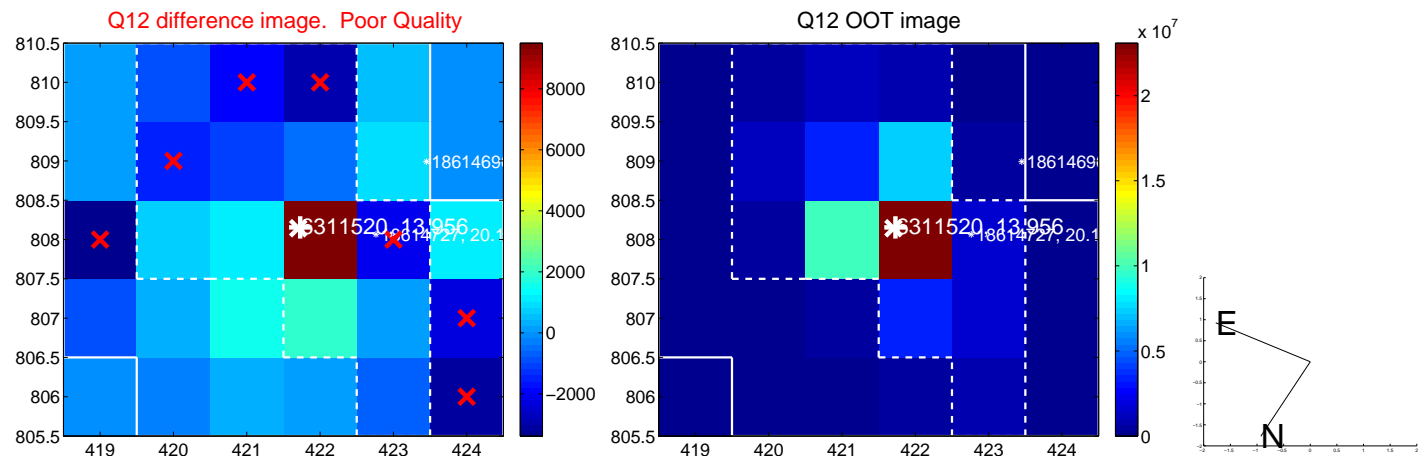
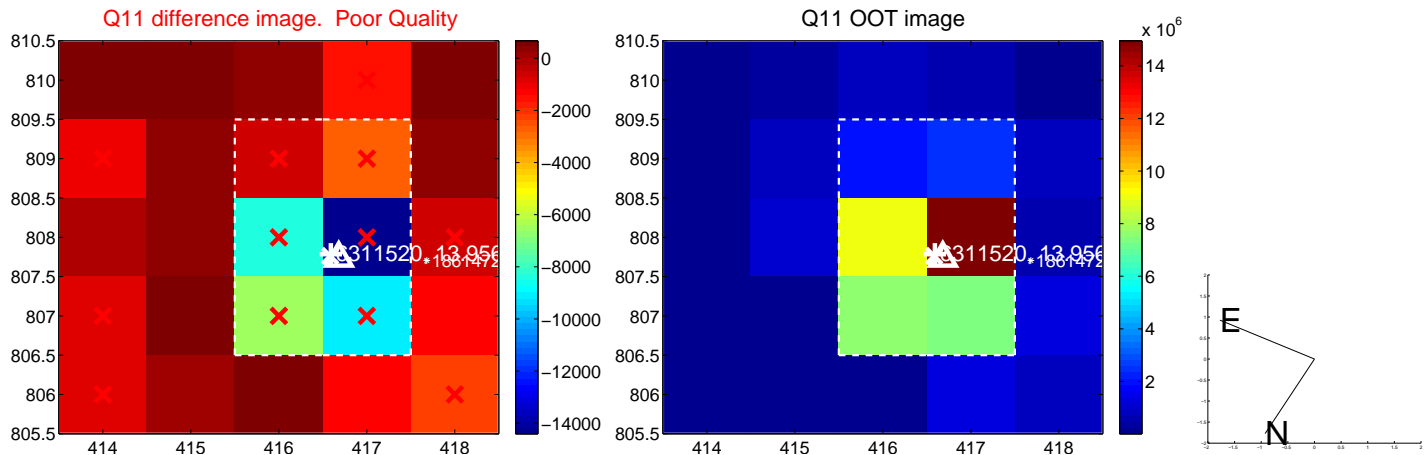
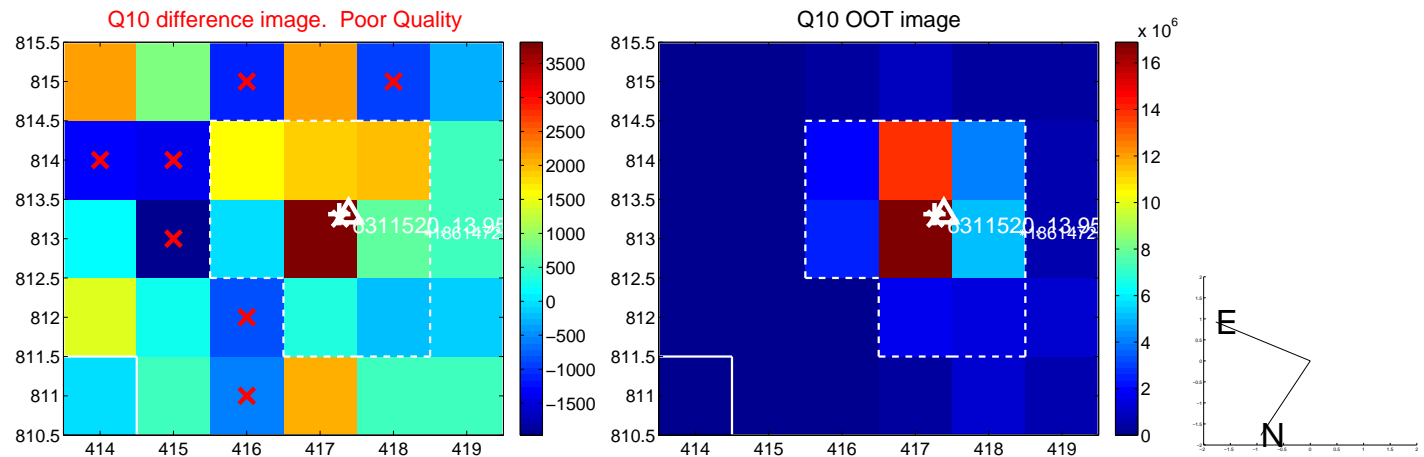
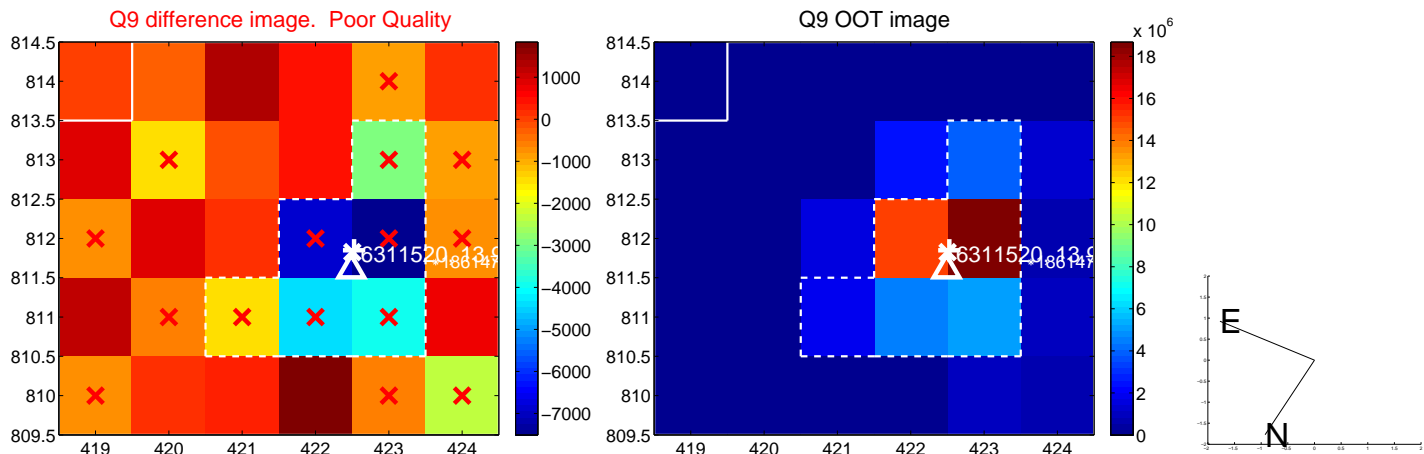
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



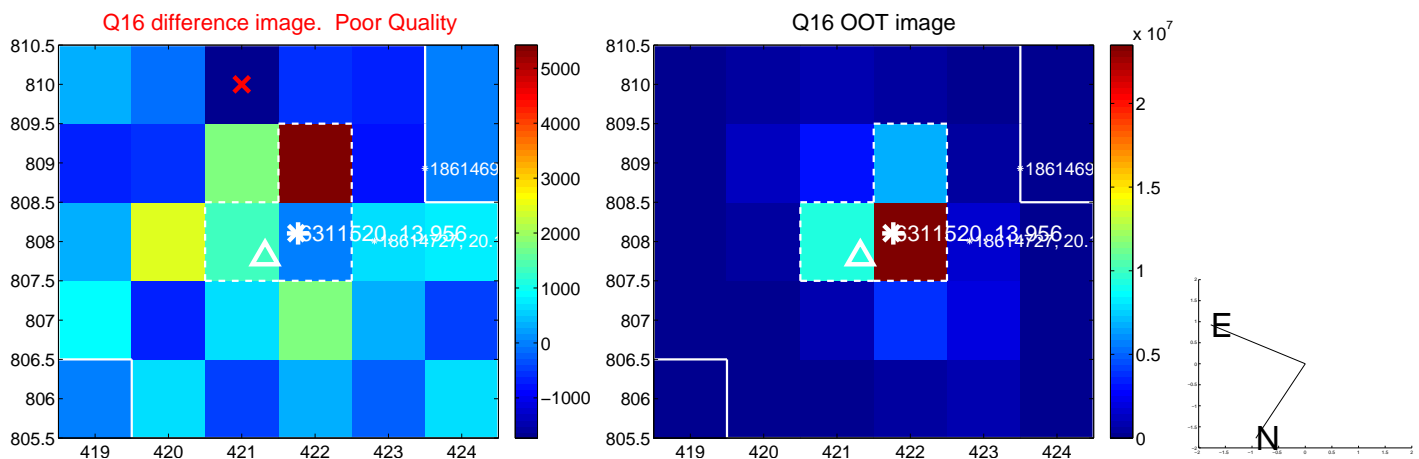
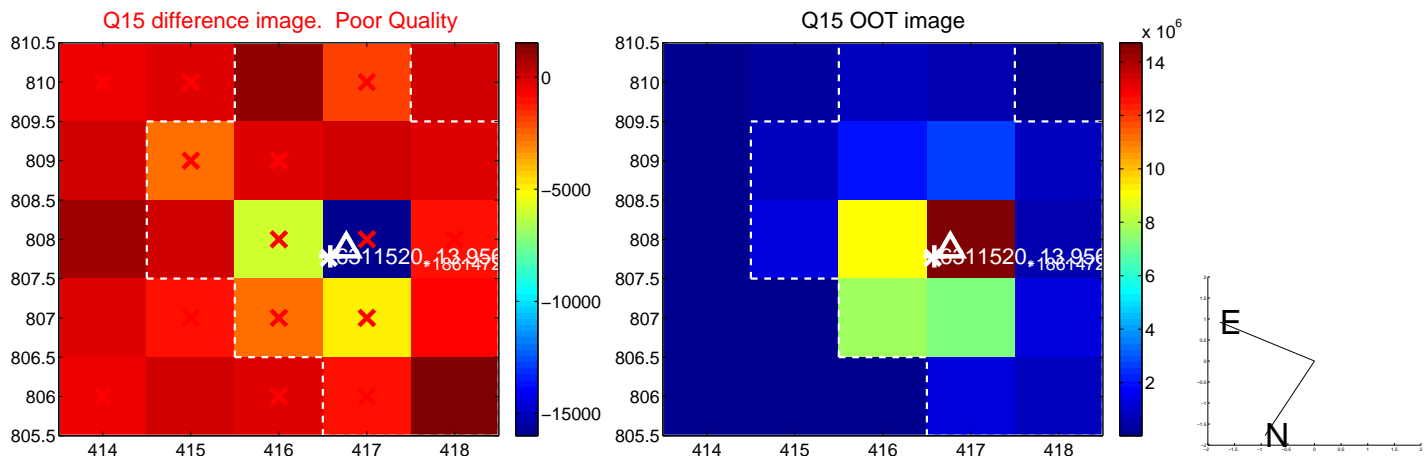
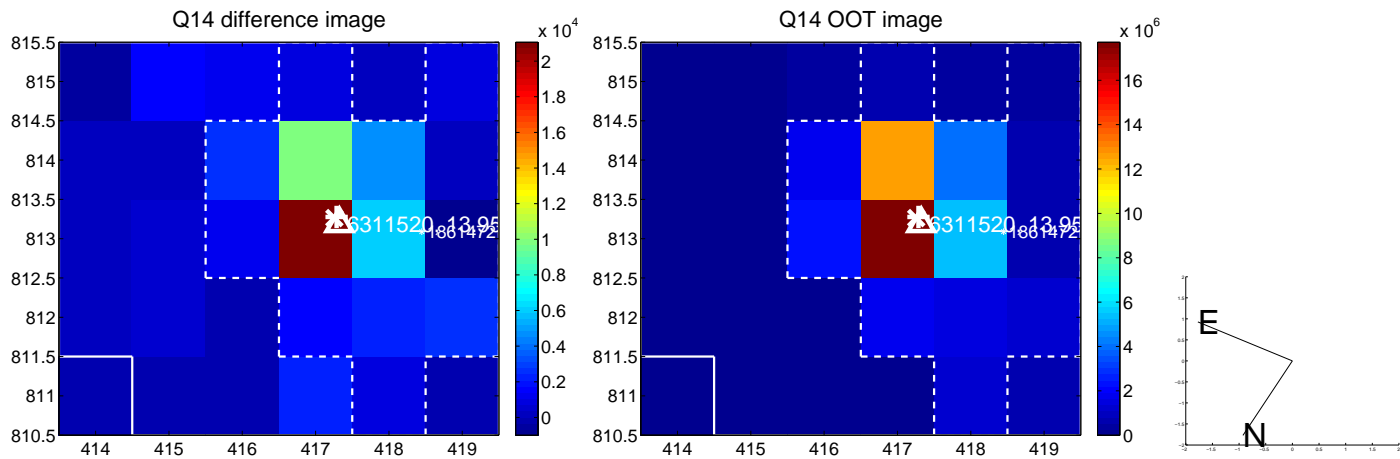
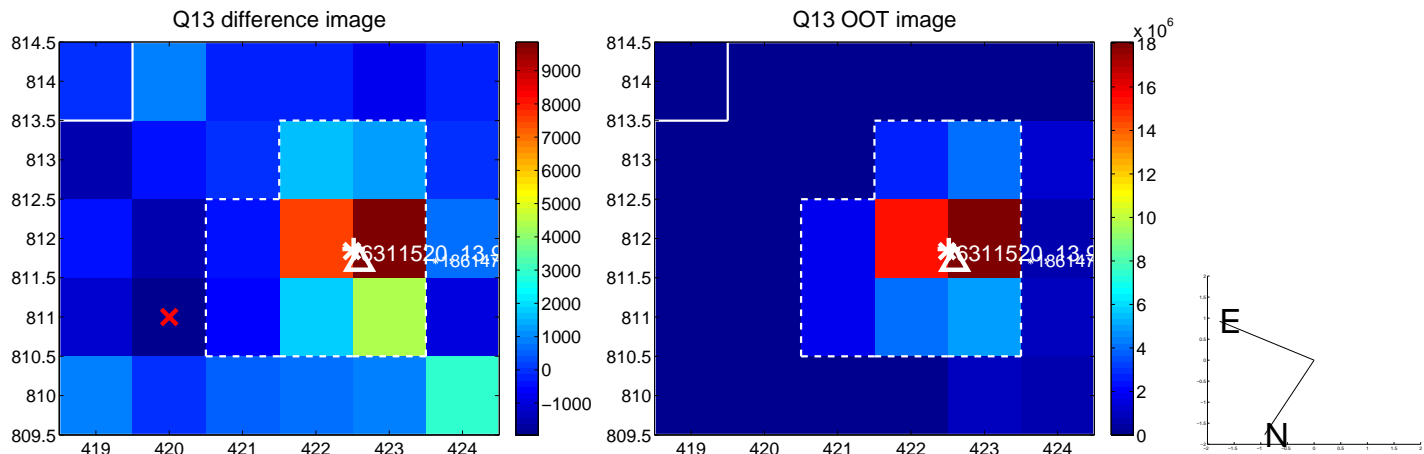
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



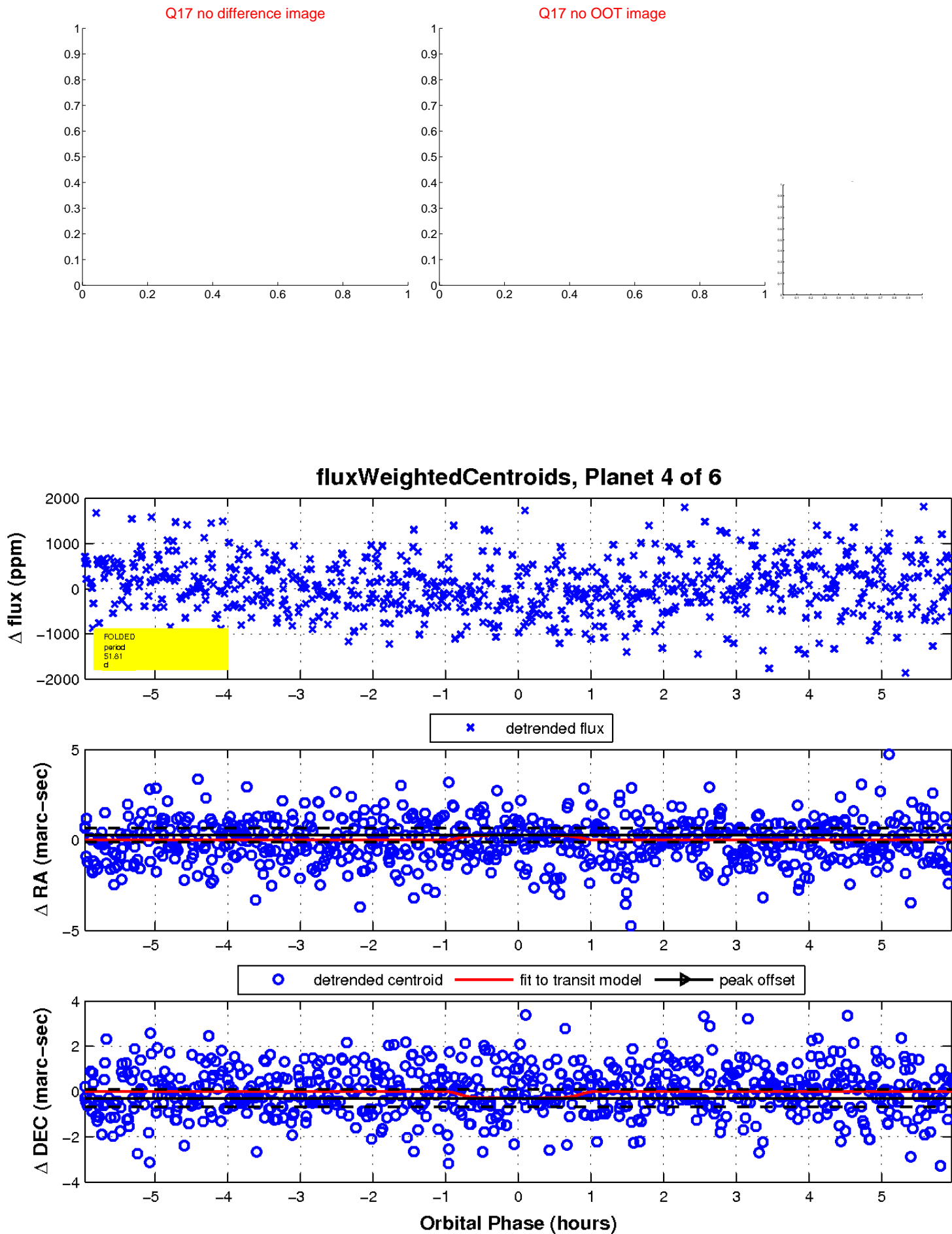
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

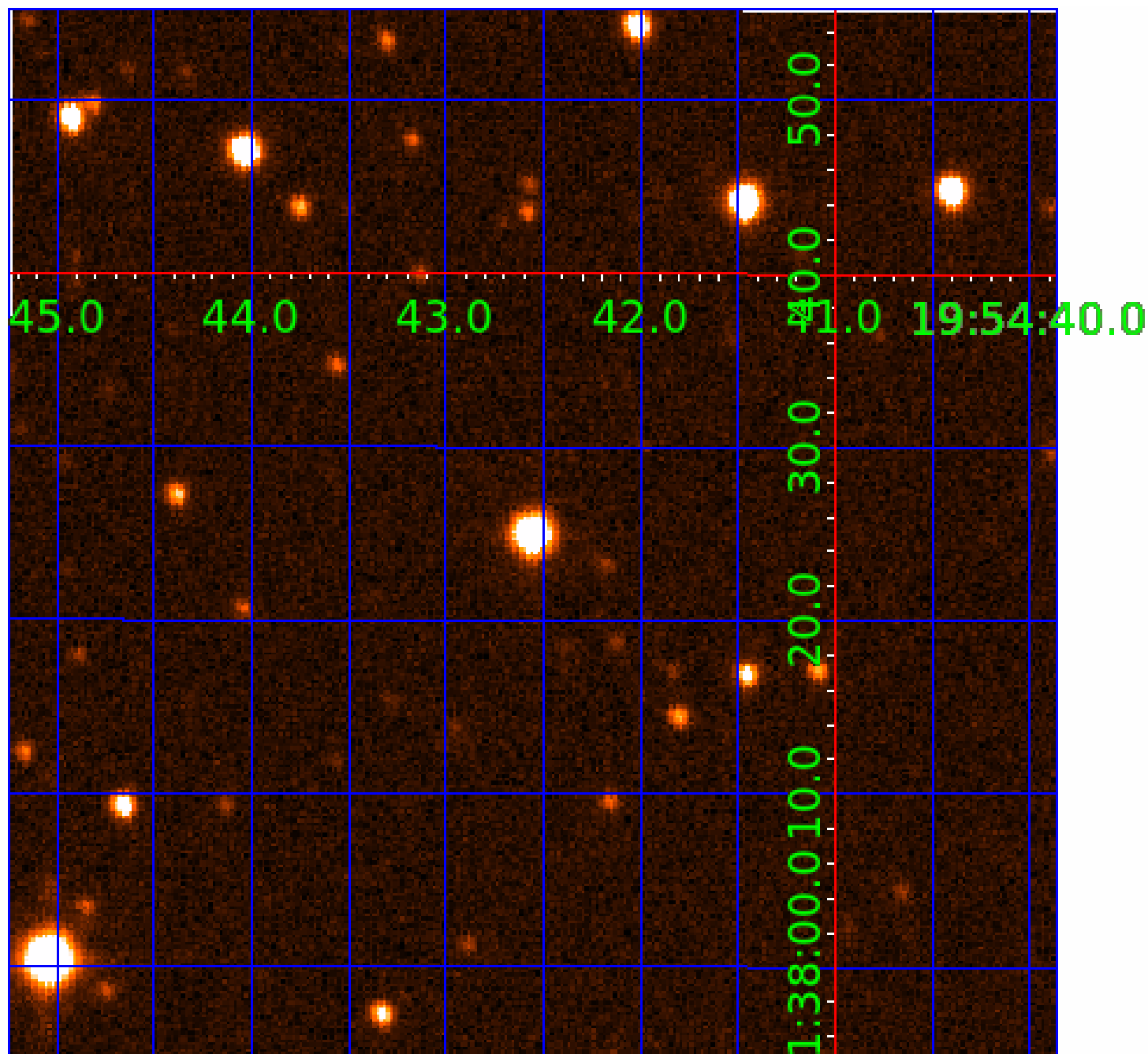


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006311520

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})
006311520-01	OBS	4115.01	0.941840	131.811922	54.4	6.884	16.6	7.9	1.14	6419	0.85	5545.05
006311520-02	OBS	No	21.489227	132.299785	948.5	1.810	15.7	9.5	1.14	6419	4.04	85.69
006311520-03	OBS	No	20.349459	136.972434	1277.5	0.608	11.8	8.1	1.14	6419	4.38	92.14
006311520-04	OBS	No	51.805447	148.281875	393.4	1.992	9.9	7.0	1.14	6419	2.76	26.51
006311520-05	OBS	No	87.610207	191.579582	1050.7	1.706	11.8	9.4	1.14	6419	3.79	13.16
006311520-06	OBS	No	25.690329	137.362268	418.2	2.749	8.0	4.7	1.14	6419	2.73	67.53

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006311520-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT
006311520-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
006311520-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
006311520-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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.

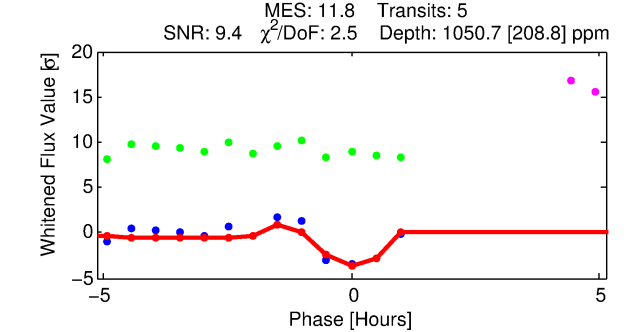
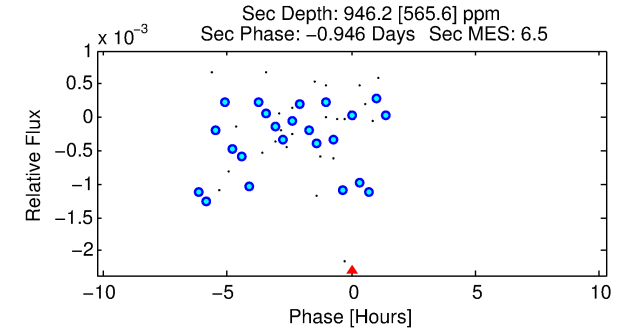
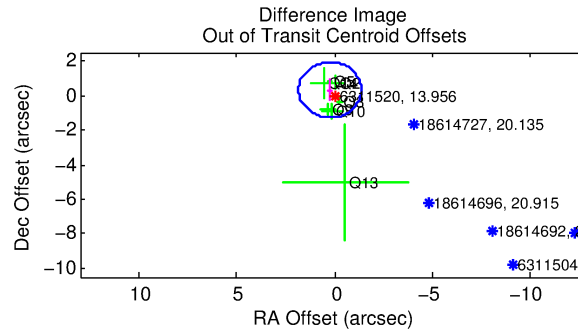
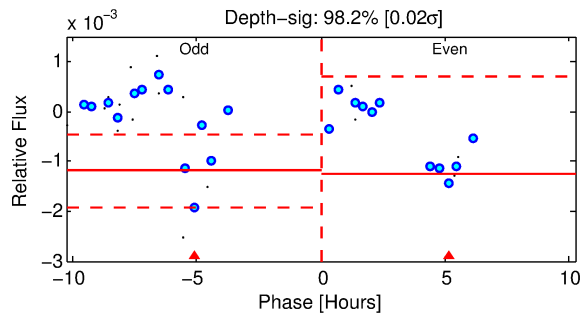
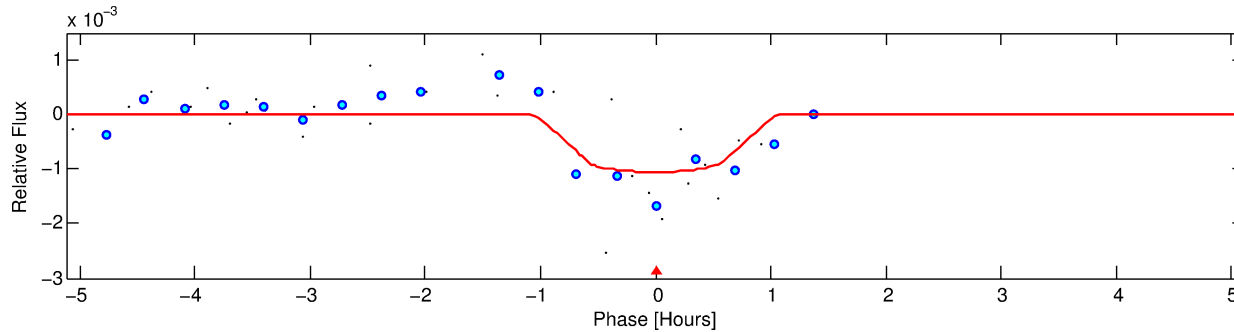
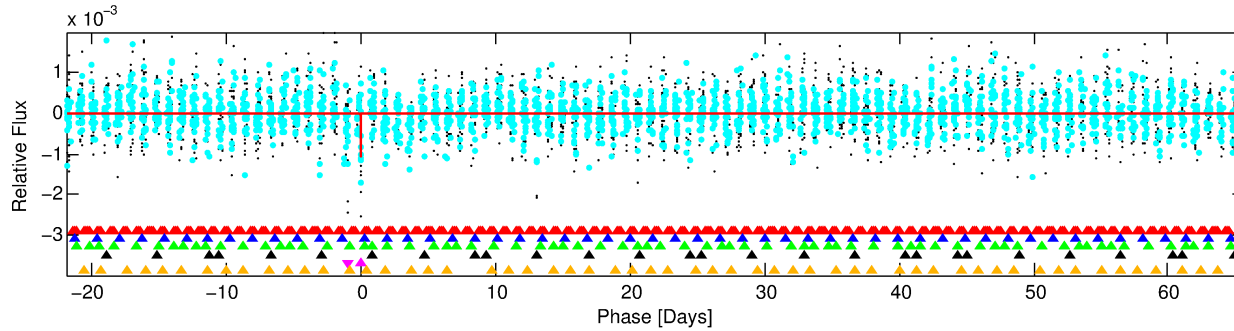
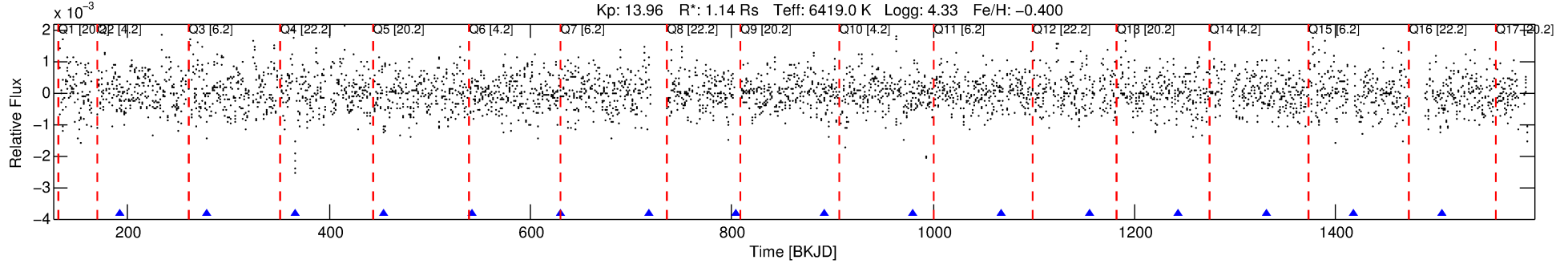
Ephemeris Match Information For 006311520-05

No Significant Match Found

DV One-Page Summary

KIC: 6311520 Candidate: 5 of 6 Period: 87.610 d
KOI: K04115 Corr: No Ephemeris Match

Kp: 13.96 R*: 1.14 Rs Teff: 6419.0 K Logg: 4.33 Fe/H: -0.400



DV Fit Results:

Period = 87.61021 [0.00491] d
Epoch = 191.5796 [0.0134] BKJD
Rp/R* = 0.0304 [0.1295]
a/R* = 375.35 [8356.05]
b = 0.38 [50.54]
Seff = 13.16 [4.80]
Teq = 486 [44] K
Rp = 3.79 [16.18] Re
a = 0.3883 [0.0922] AU
Ag = 5473.47 [46810.13] [0.12σ]
Teffp = 6458 [13798] K [0.43σ]

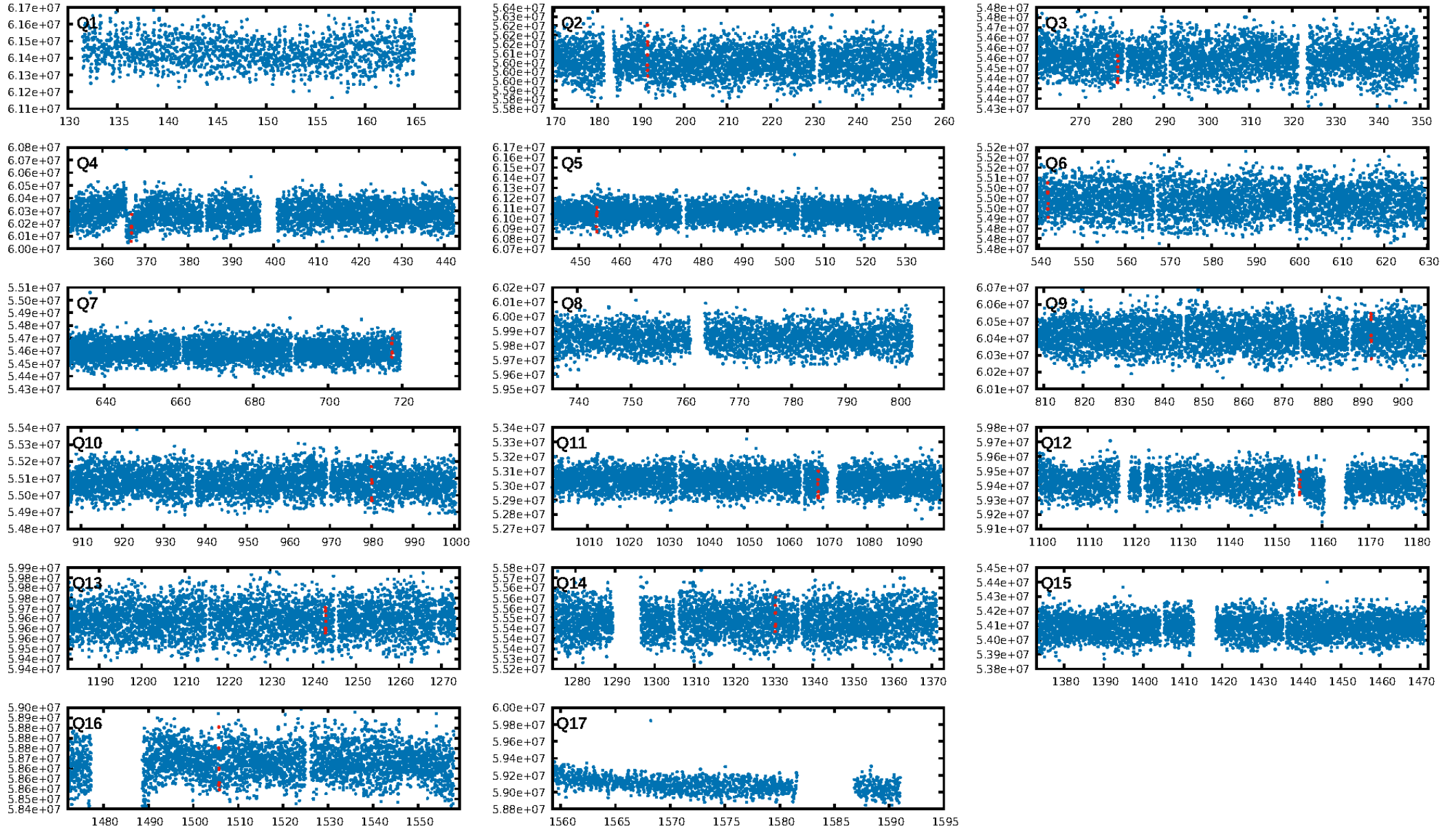
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [327.64σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 83.5%
Bootstrap-pfa: 4.48e-13
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -1.31
Centroid-sig: 20.3%
Centroid-so: 0.637 arcsec [1.21σ]
OotOffset-rm: 0.406 arcsec [0.76σ]
OotOffset-st: 3/1/0/3 [7]
KicOffset-rm: 0.336 arcsec [0.47σ]
KicOffset-st: 3/1/0/3 [7]
DiffImageQuality-fgm: 0.43 [3/7]
DiffImageOverlap-fno: 0.36 [4/11]

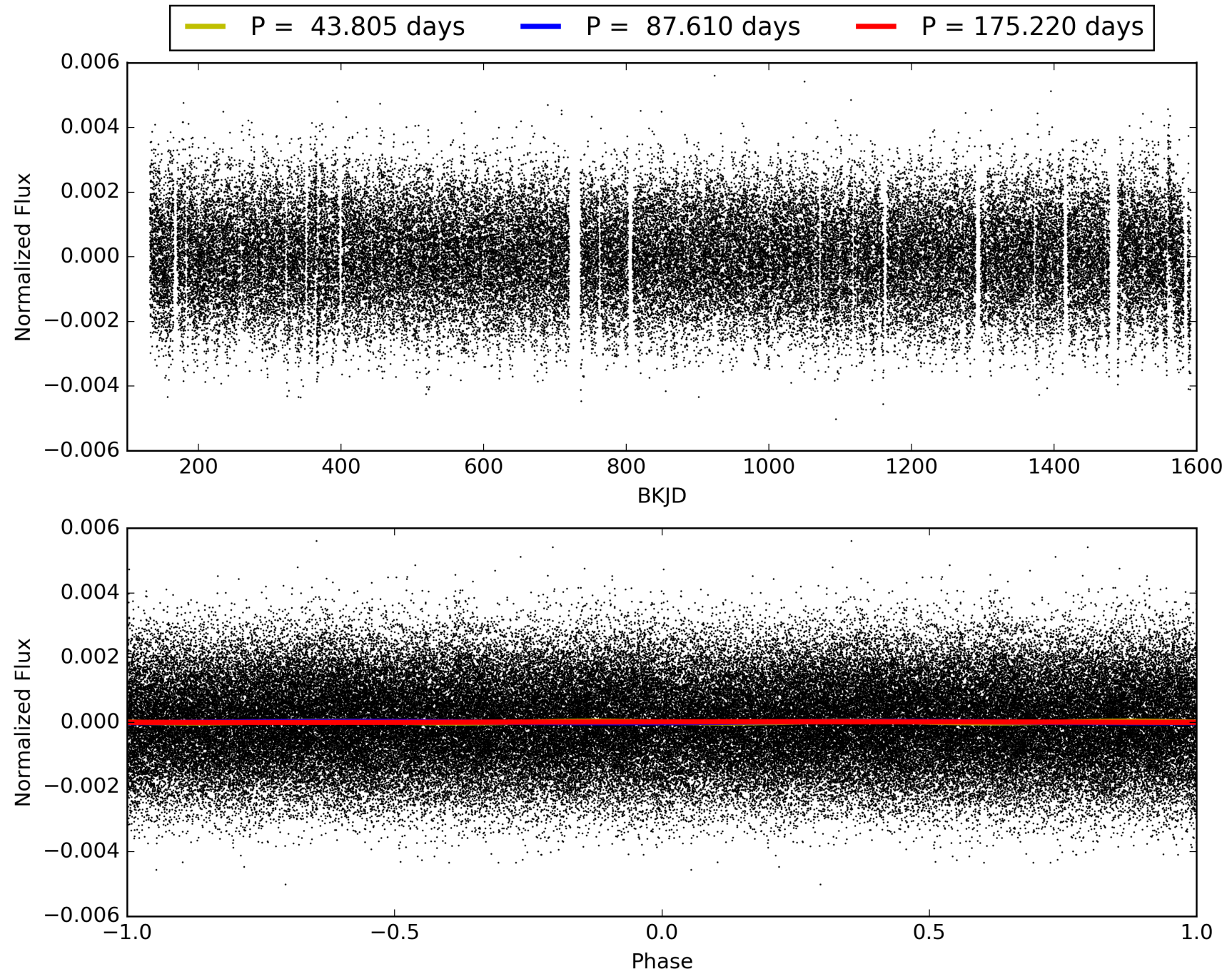
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:32:01 Z

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

TCE 006311520-05, PDC Light Curves

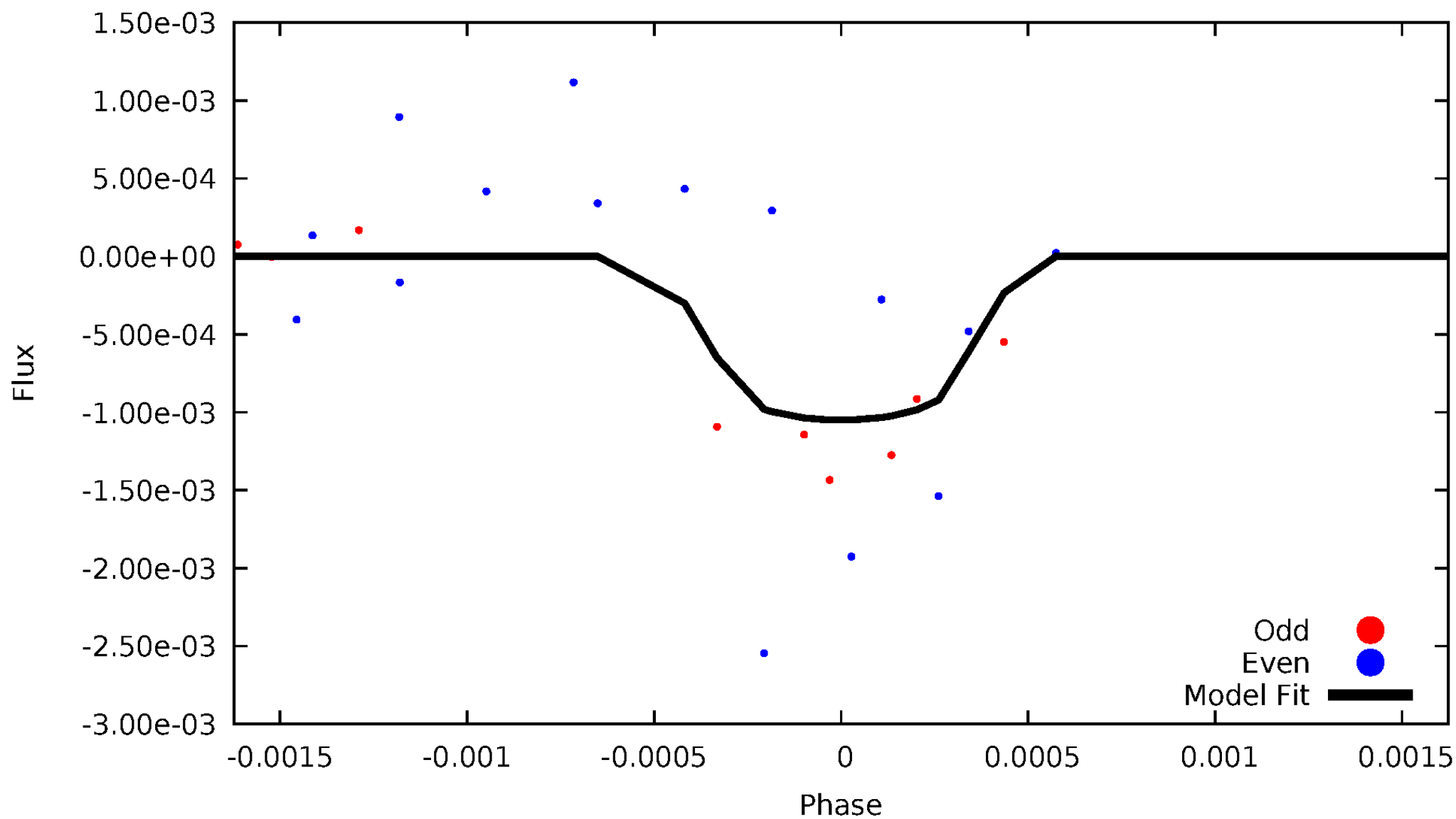


TCE 006311520-05



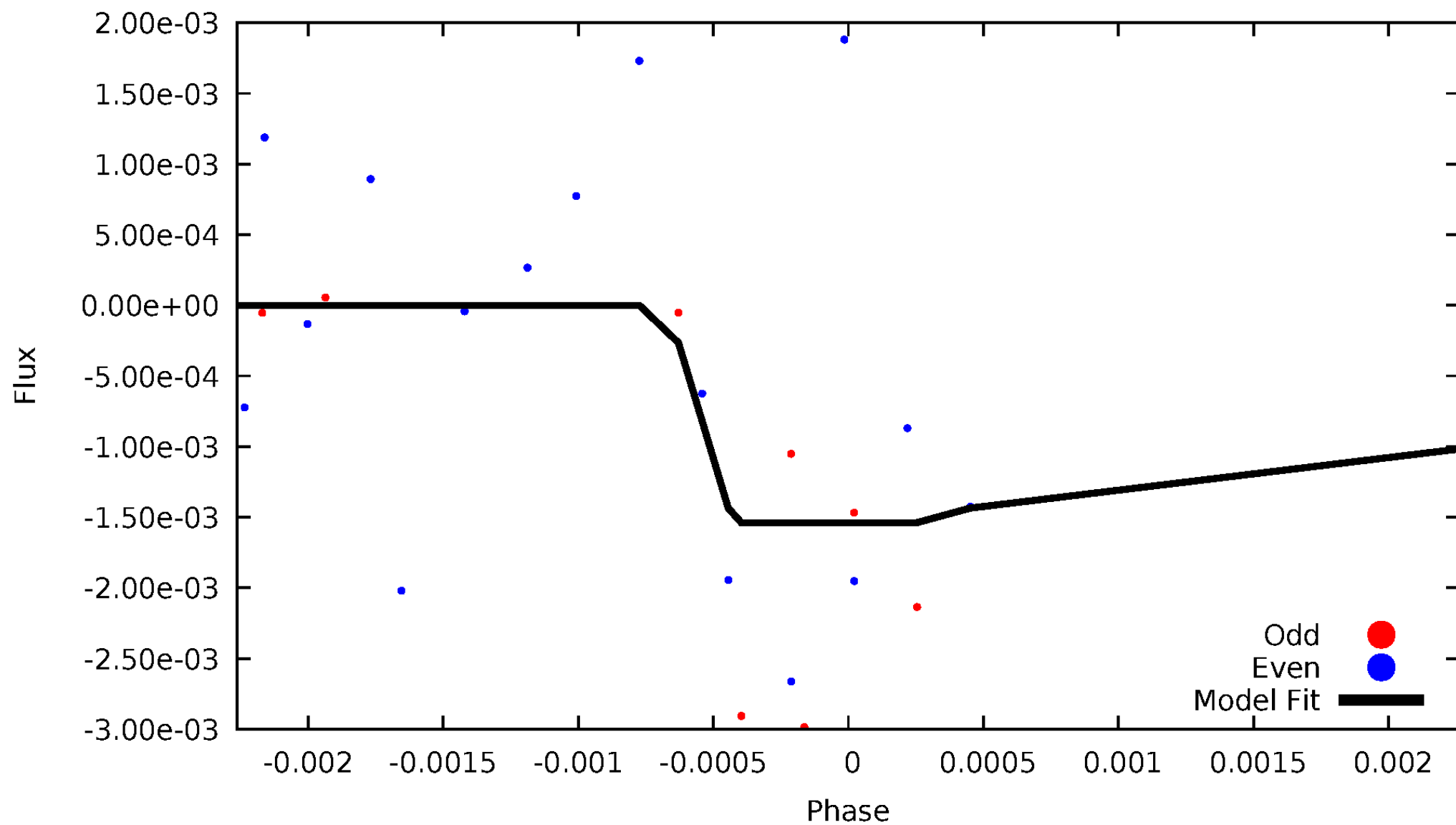
DV Odd/Even

TCE 006311520-05



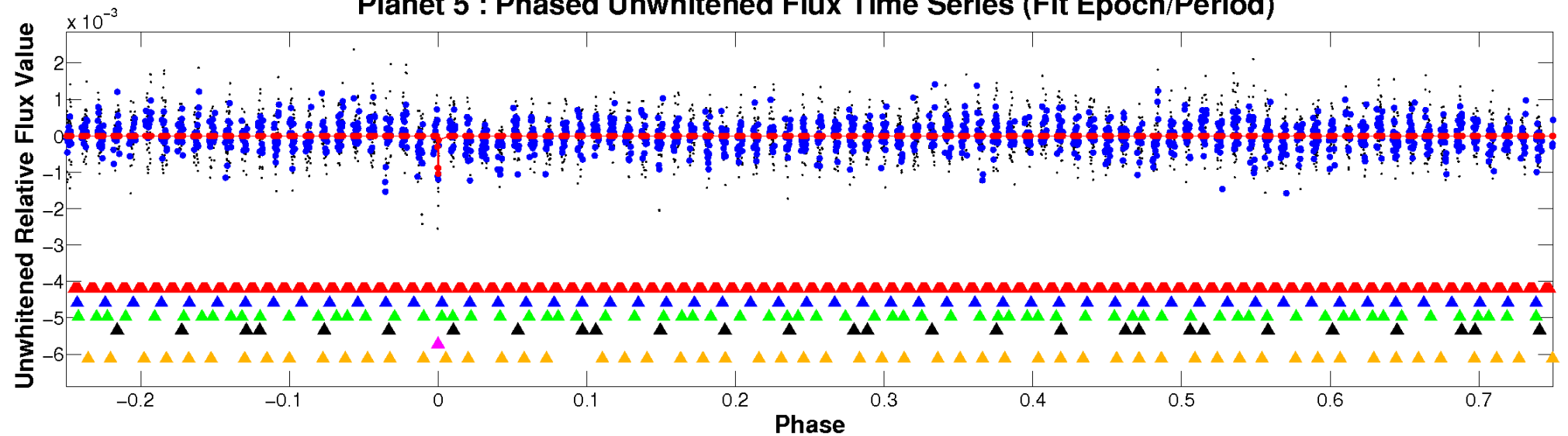
ALT Odd/Even

TCE 006311520-05

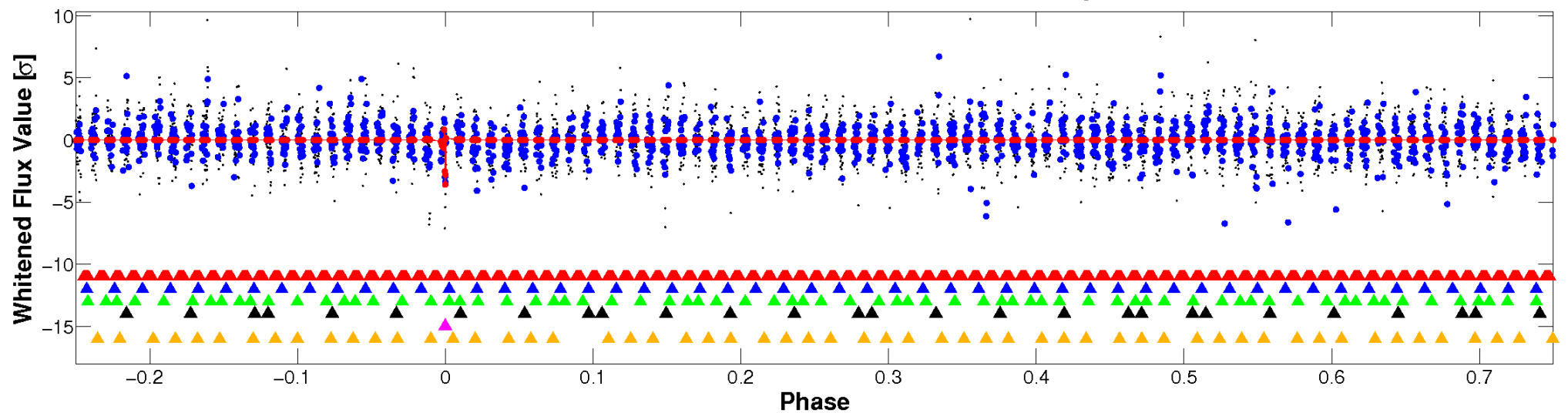


Non-Whitened Vs. Whitened Light Curve

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

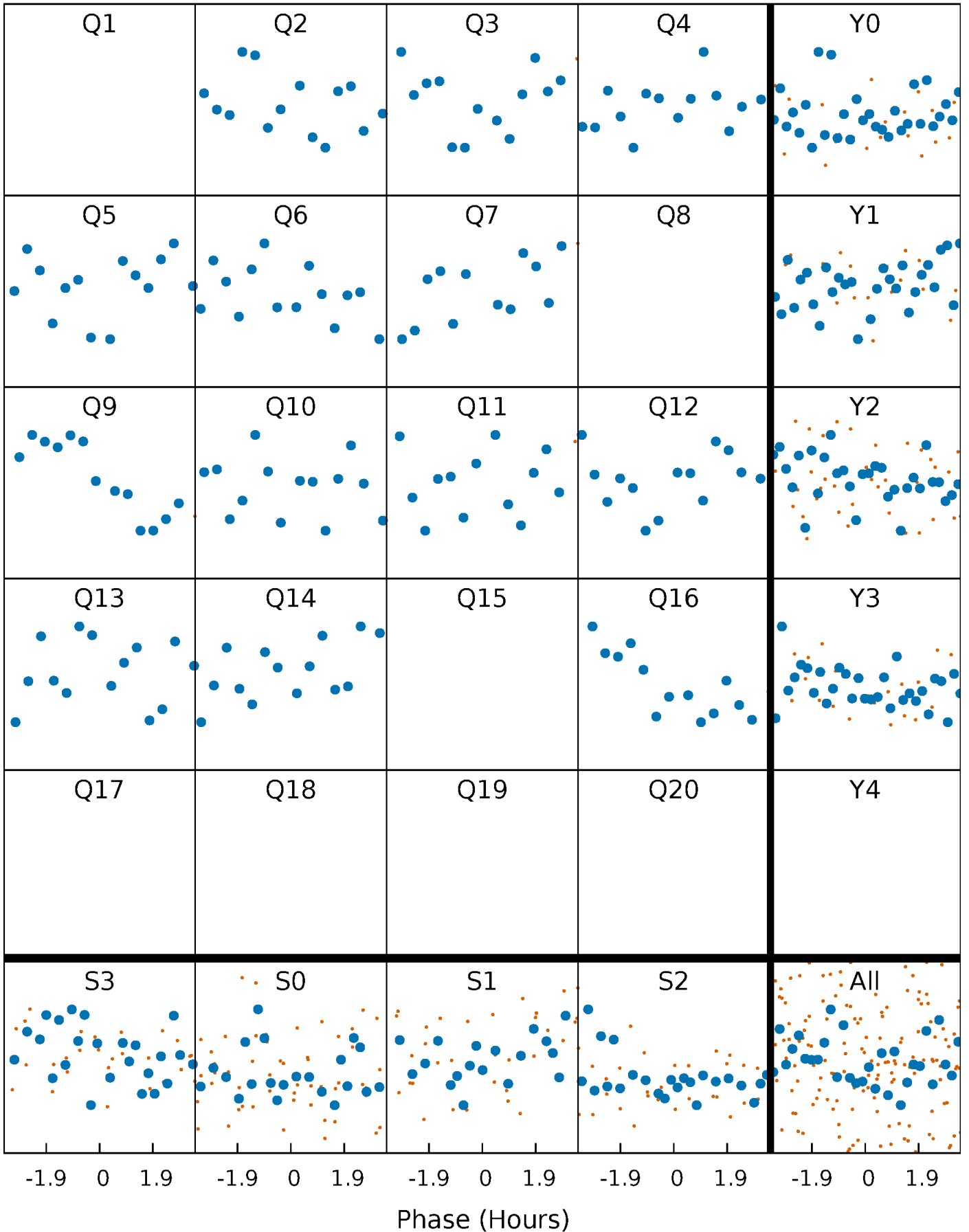


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



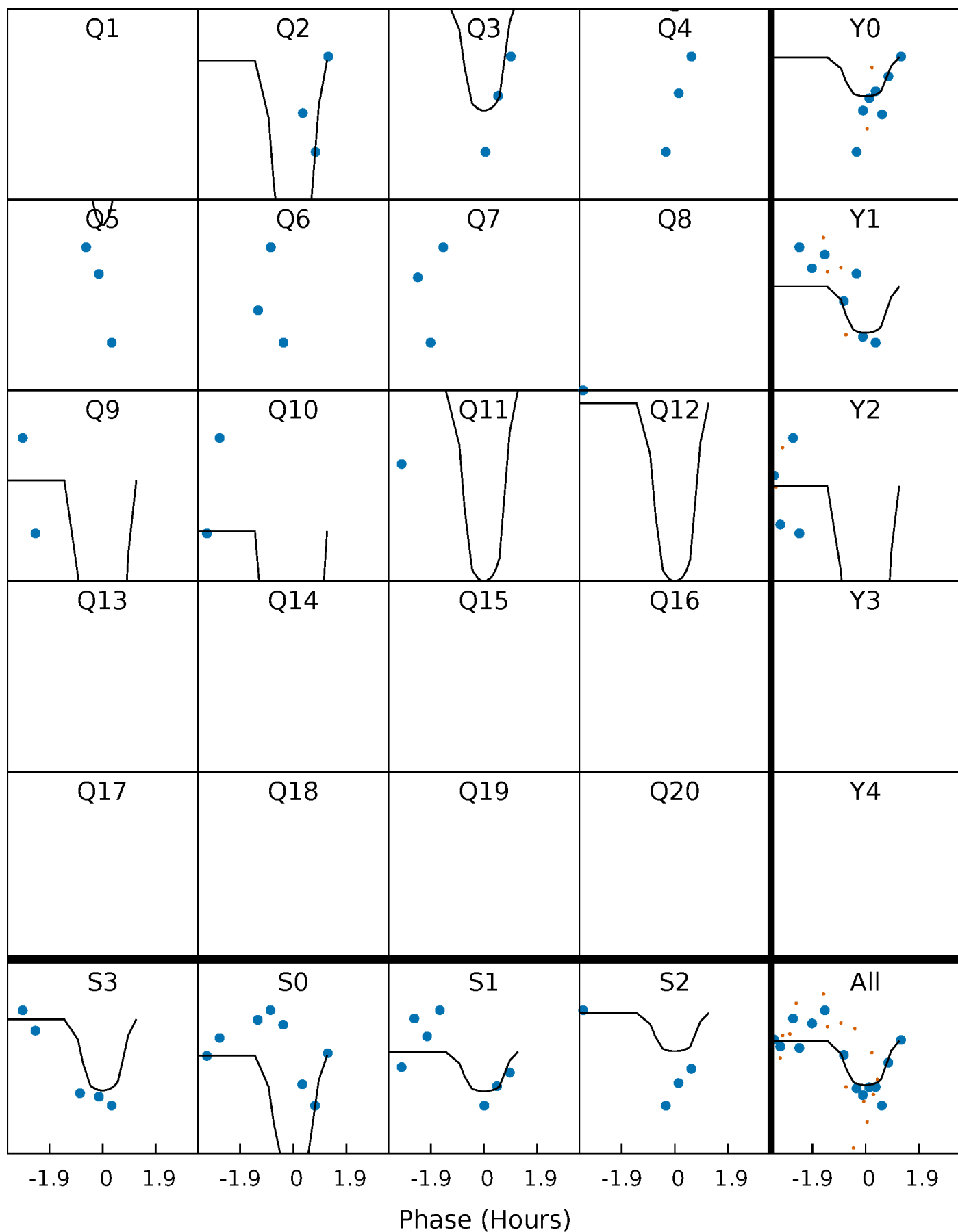
PDC Quarter-Phased Transit Curves

TCE 006311520-05 P= 87.610207 Days $T_0=191.579582$ (BKJD)



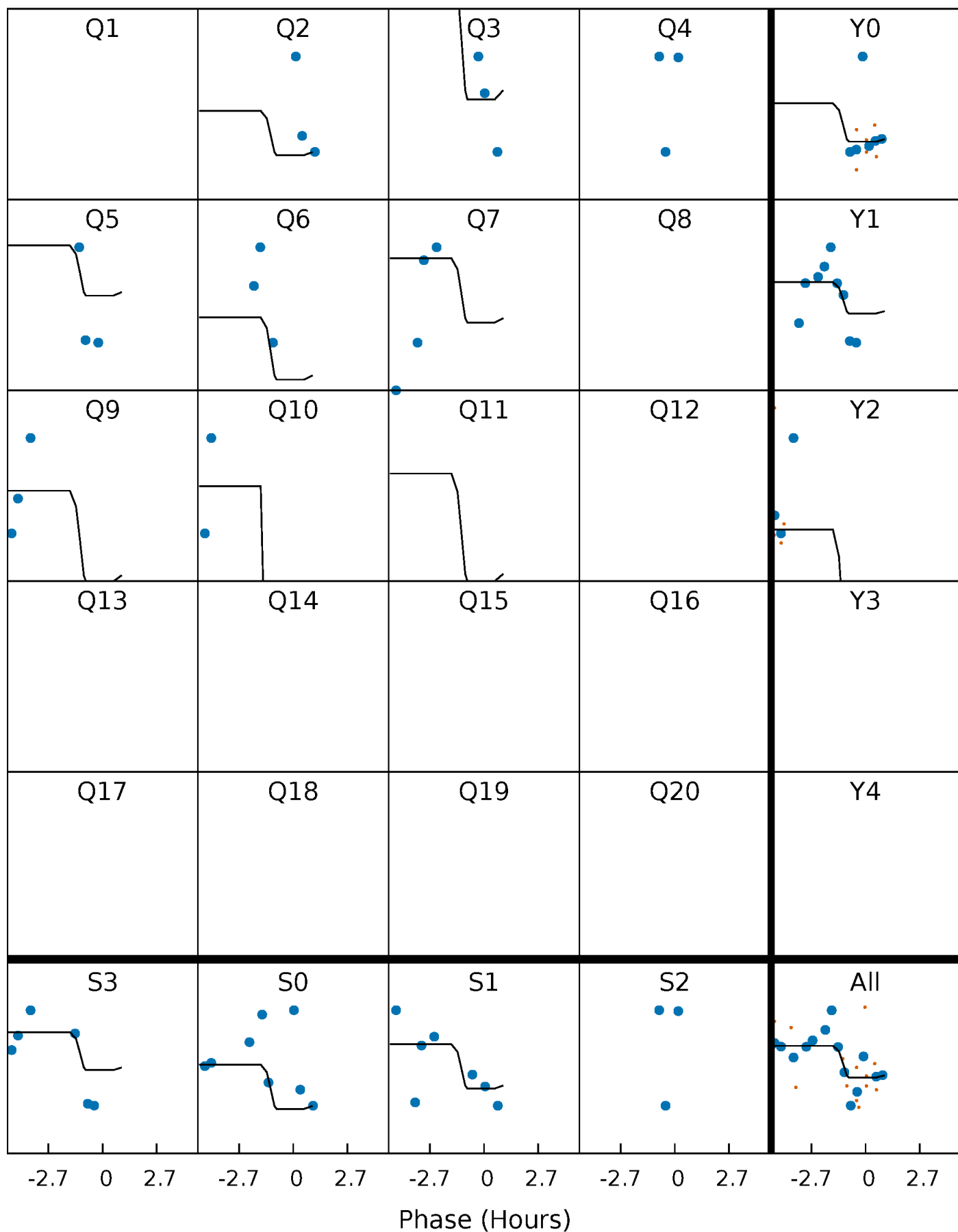
DV Quarter-Phased Transit Curves

TCE 006311520-05 $P = 87.610207$ Days $T_0 = 191.579582$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

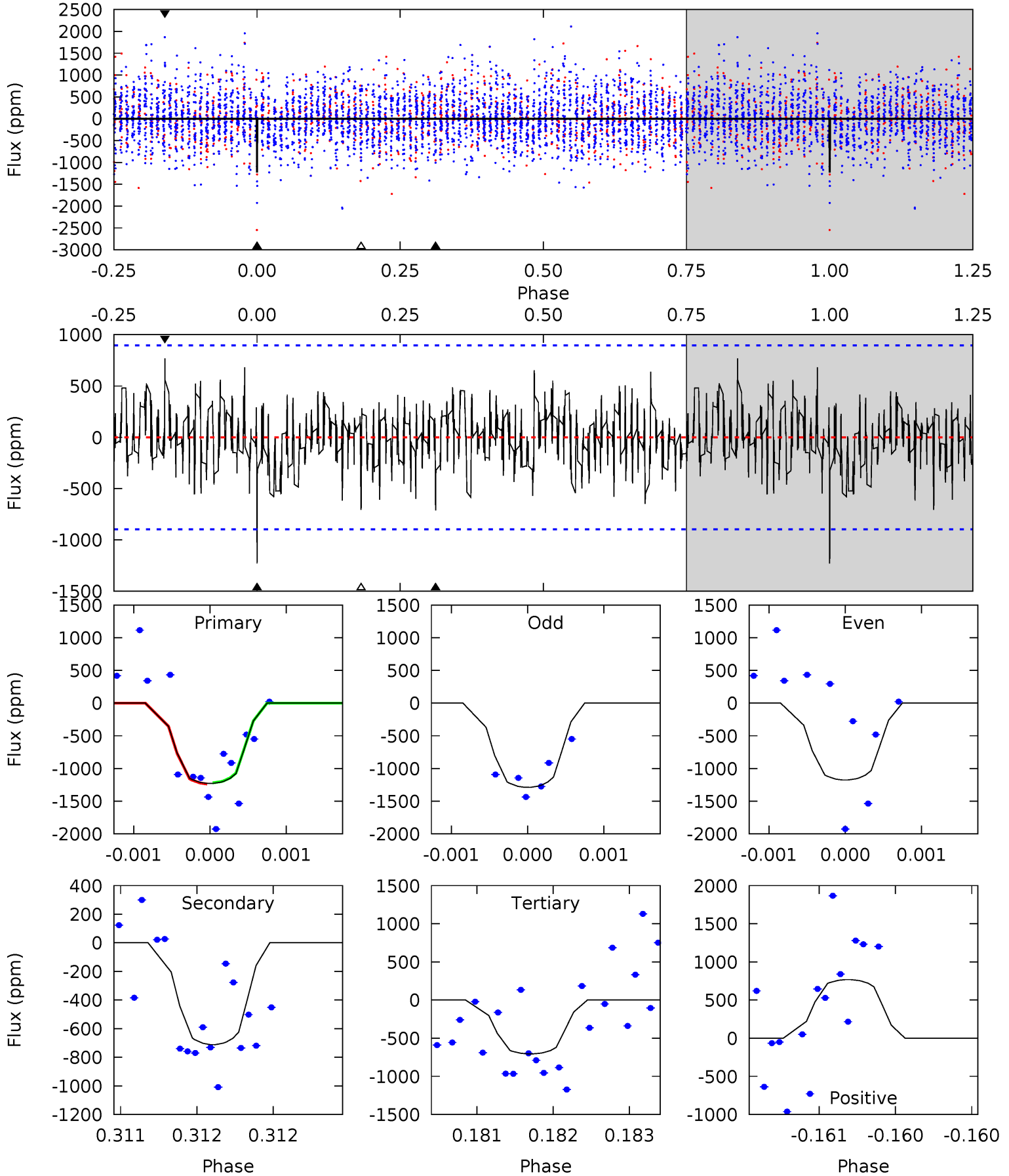
TCE 006311520-05 $P = 87.615316$ Days $T_0 = 191.590330$ (BKJD)



DV Model-Shift Uniqueness Test

006311520-05, P = 87.610207 Days, E = 103.969375 Days

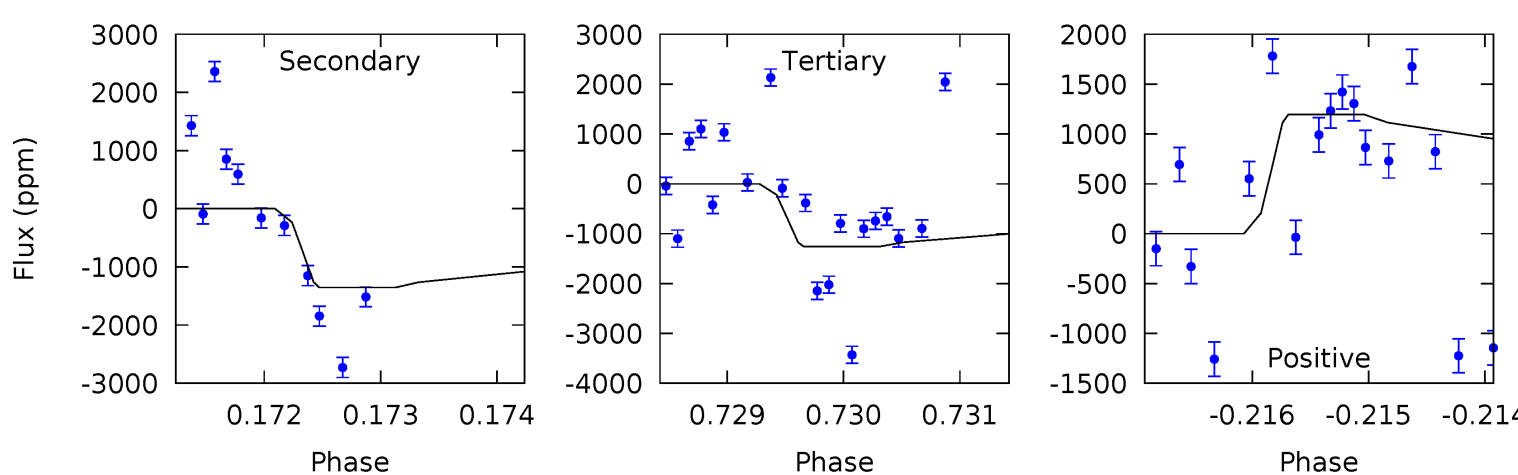
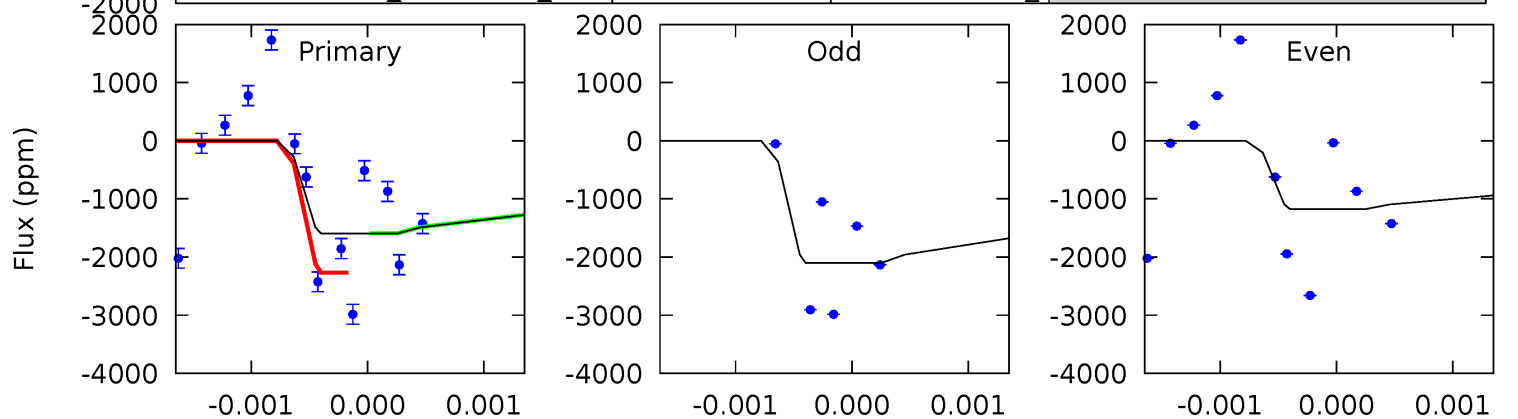
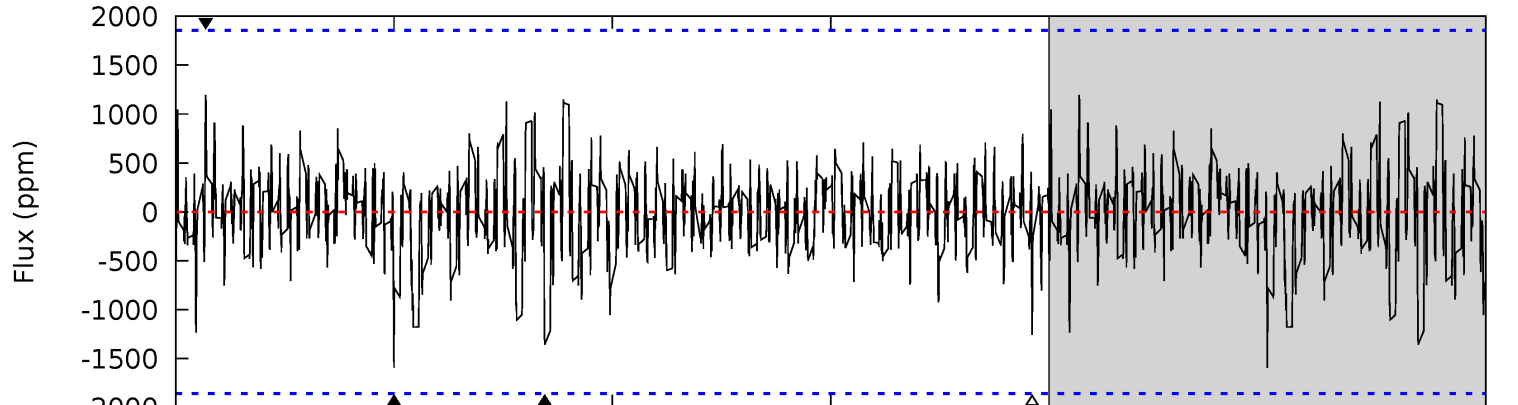
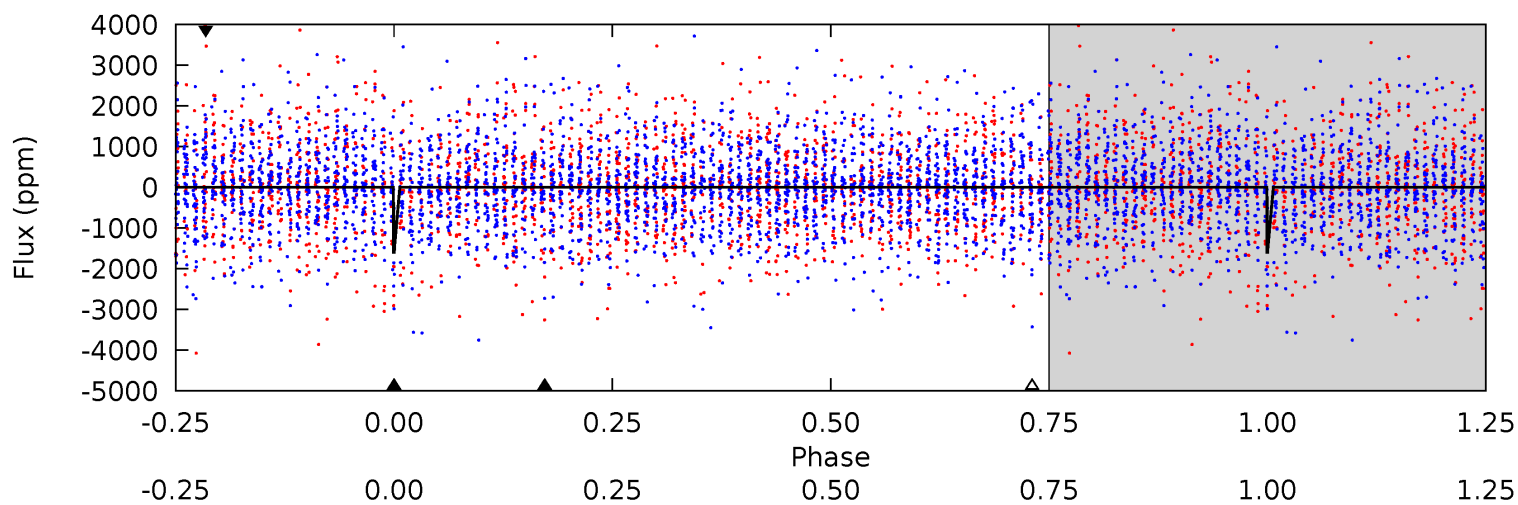
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.54	4.36	4.33	4.71	5.50	3.36	1.38	3.21	2.83	0.03	-0.35	0.34	0.75	0.38	0.05



Alt Model-Shift Uniqueness Test

006311520-05, P = 87.615316 Days, E = 103.975014 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.68	3.98	3.69	3.51	5.45	3.29	0.98	0.99	1.18	0.29	0.47	1.36	0.90	0.43	0



Stellar Parameters For KIC 006311520

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6419^{+177}_{-199}	$4.330^{+0.124}_{-0.186}$	$-0.400^{+0.300}_{-0.300}$	$1.142^{+0.325}_{-0.175}$	$1.013^{+0.156}_{-0.114}$	$0.958^{+0.541}_{-0.467}$
	+3%/-3%	+3%/-4%	+75%/-75%	+28%/-15%	+15%/-11%	+56%/-49%
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 006311520-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-711 ± 163	$13.49^{+12.61}_{-9.55}$	684^{+51}_{-41}	3657^{+2363}_{-672}	329^{+3551}_{-246}
Alt.	-1355 ± 340	$14.45^{+13.29}_{-10.00}$	683^{+49}_{-41}	3957^{+2591}_{-757}	542^{+5066}_{-399}

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 $A_{obs} \gg 1.0$

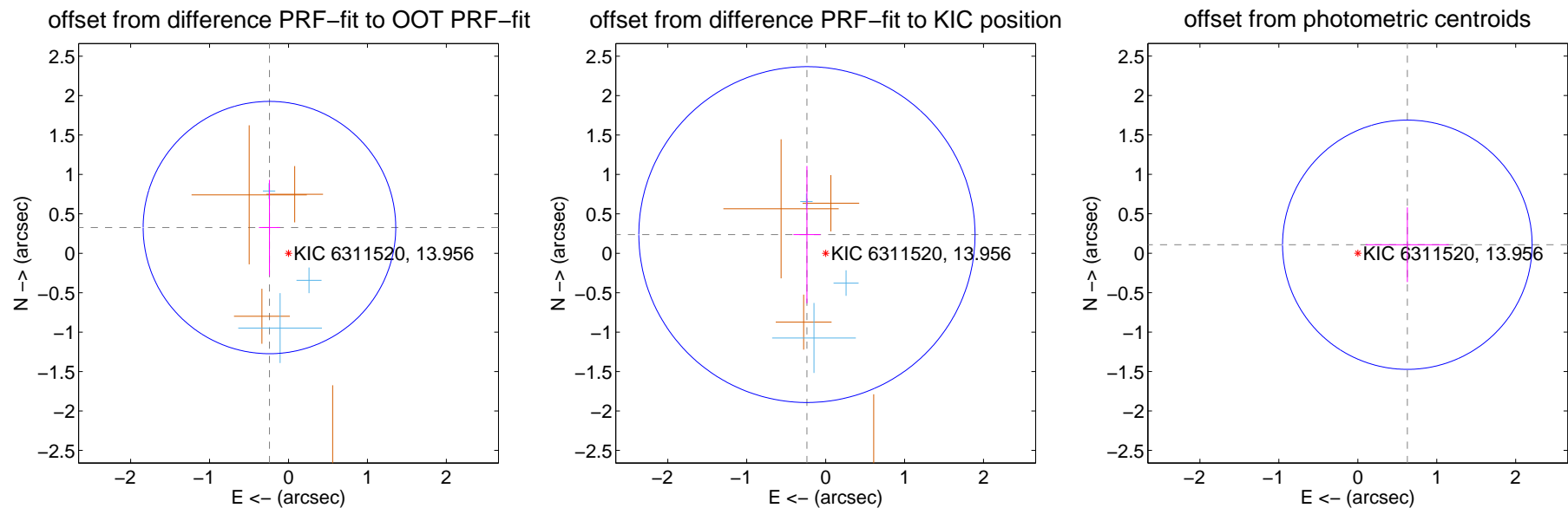
DV Centroid Data

Supplemental centroid analysis for 006311520-05. Kepler magnitude: 13.96. Transit SNR 9.40

There are 3 quarters with good PRF difference image offsets

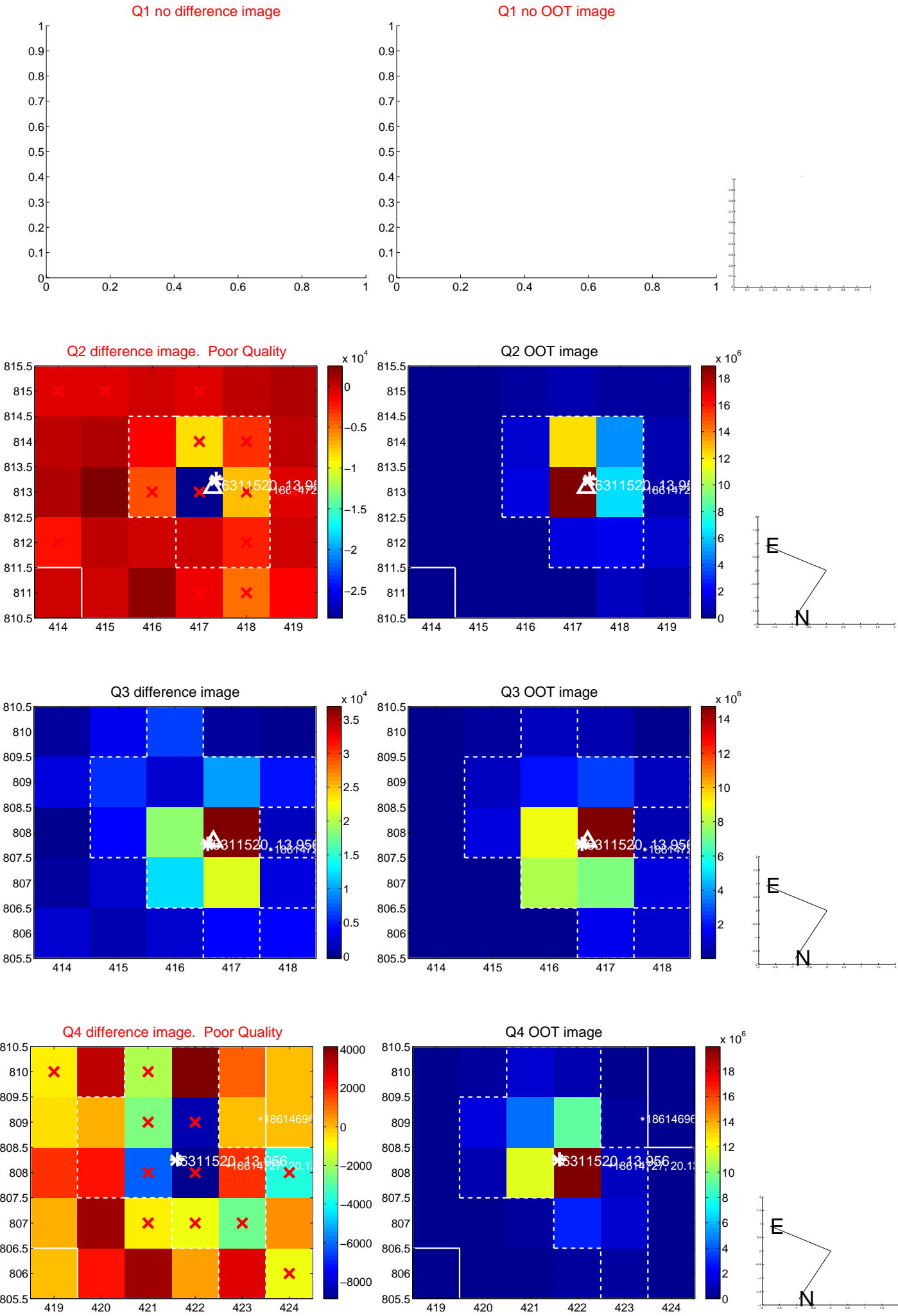
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.406 ± 0.534	0.76	0.241 ± 0.133	0.326 ± 0.605
PRF-fit source offset from KIC position	0.336 ± 0.710	0.47	0.237 ± 0.171	0.237 ± 0.871
photometric centroid source offset	0.64 ± 0.53	1.21	-0.63 ± 0.53	0.11 ± 0.47

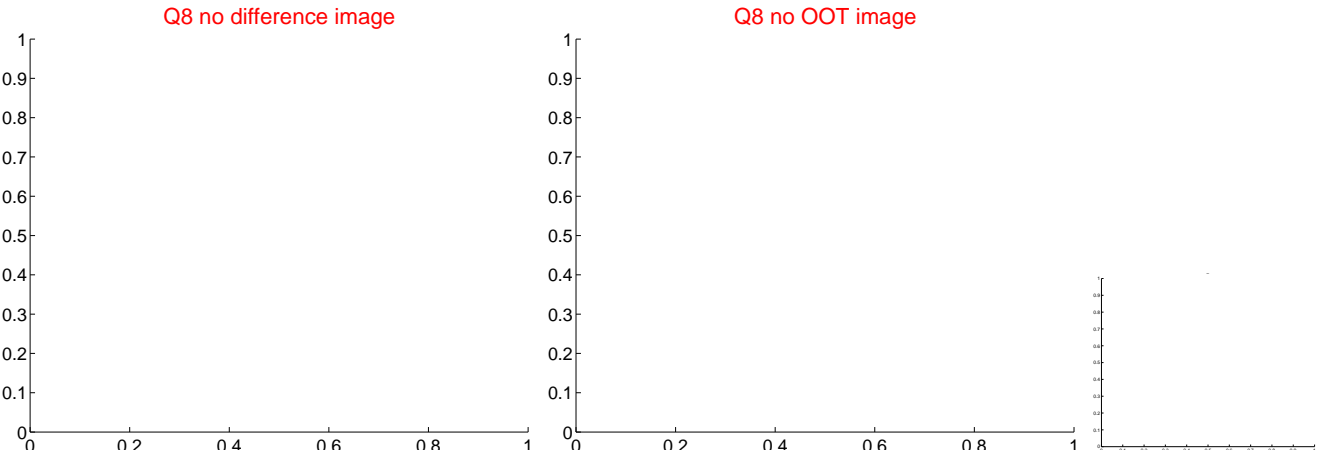
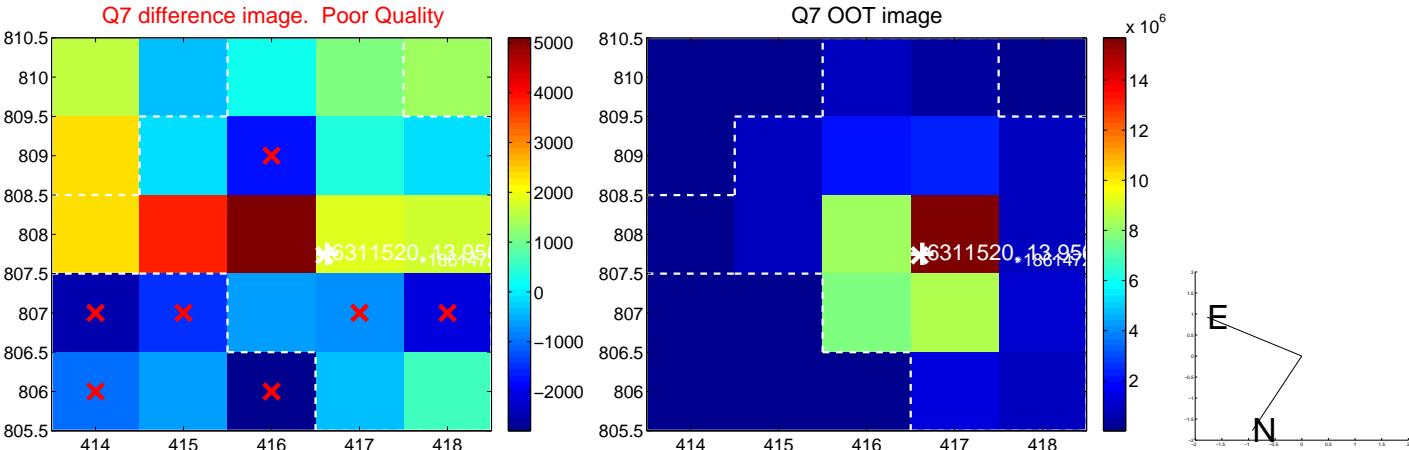
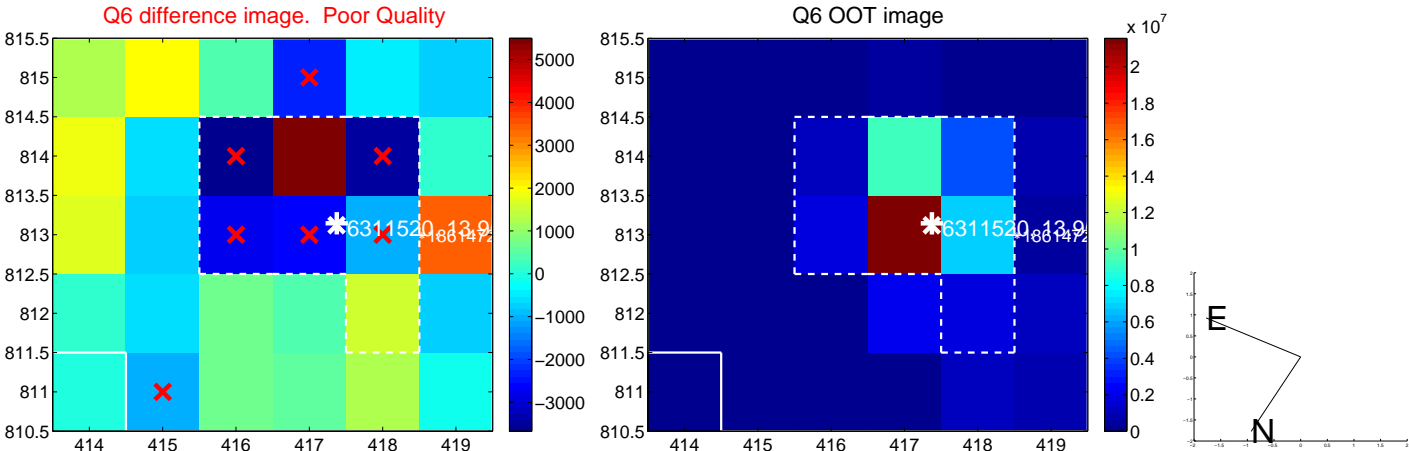
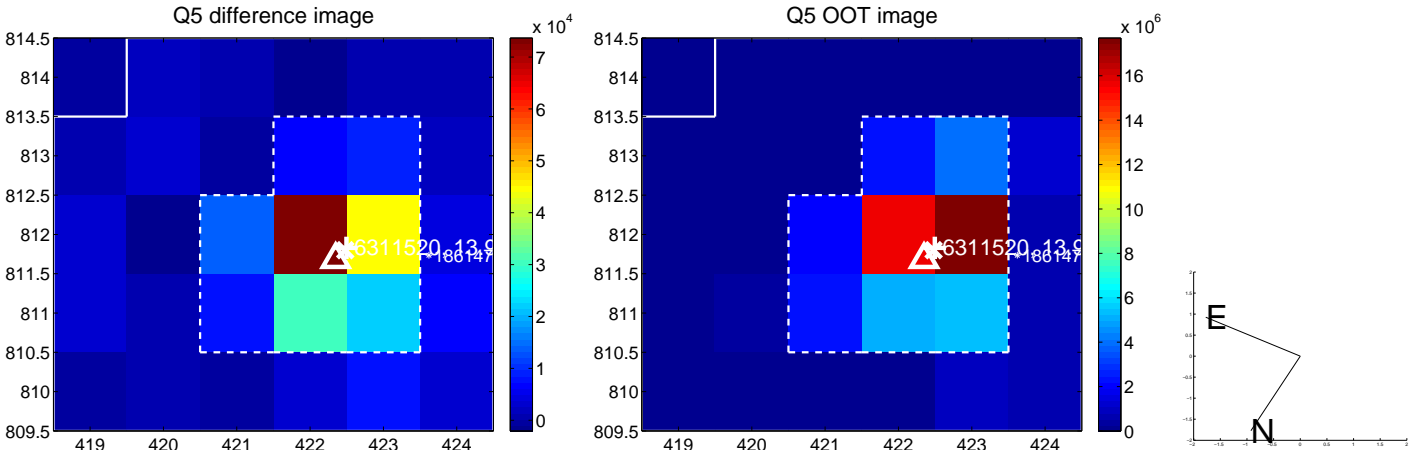


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

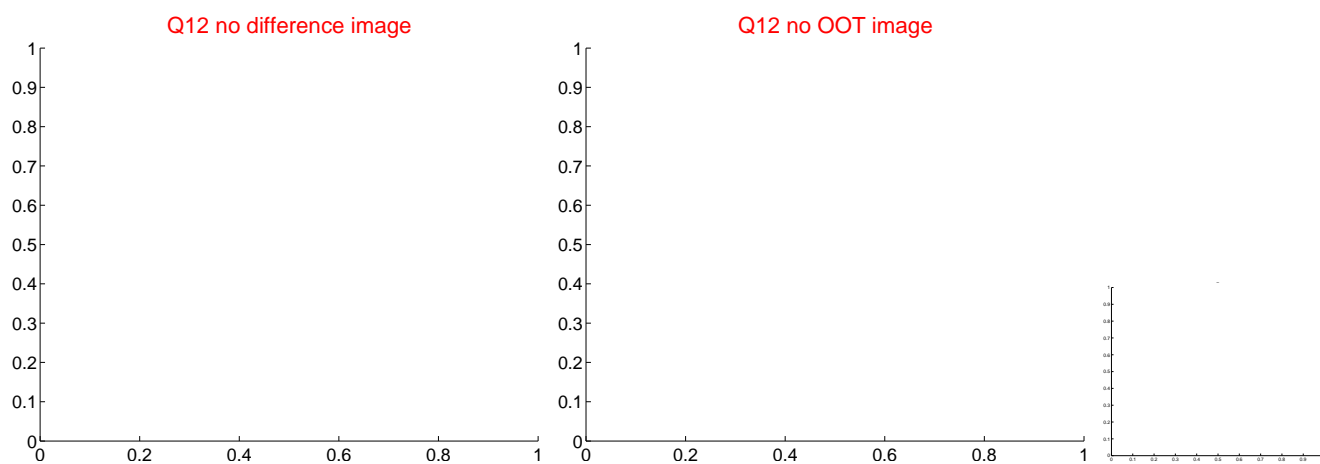
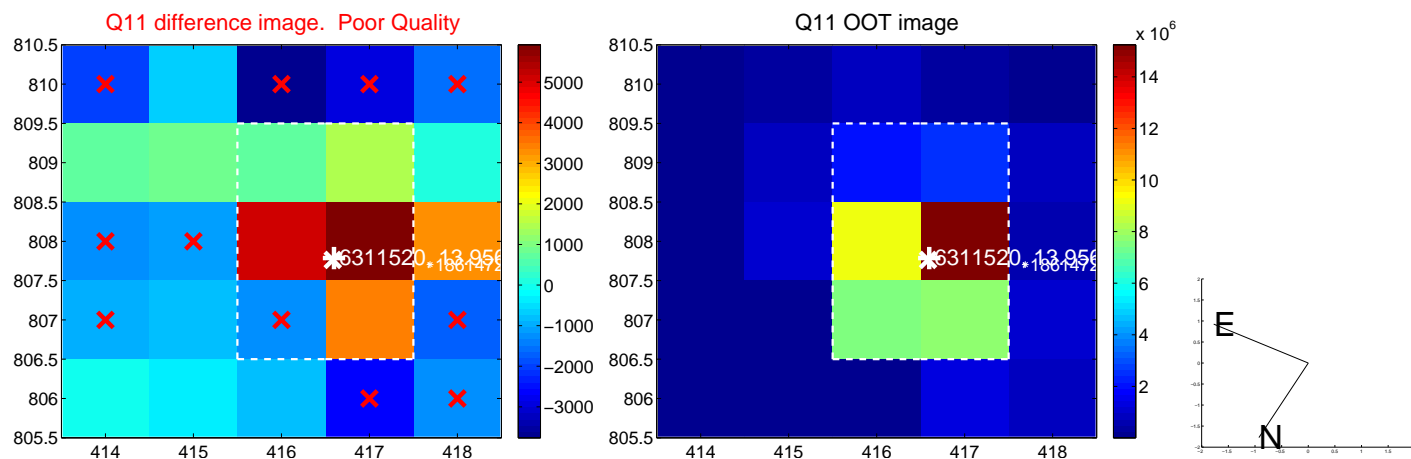
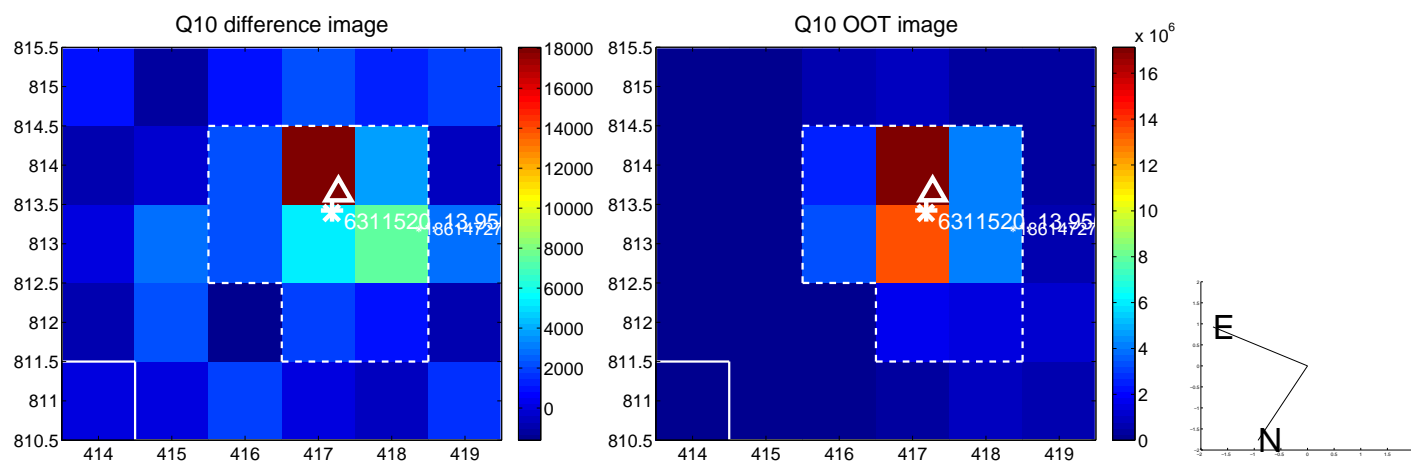
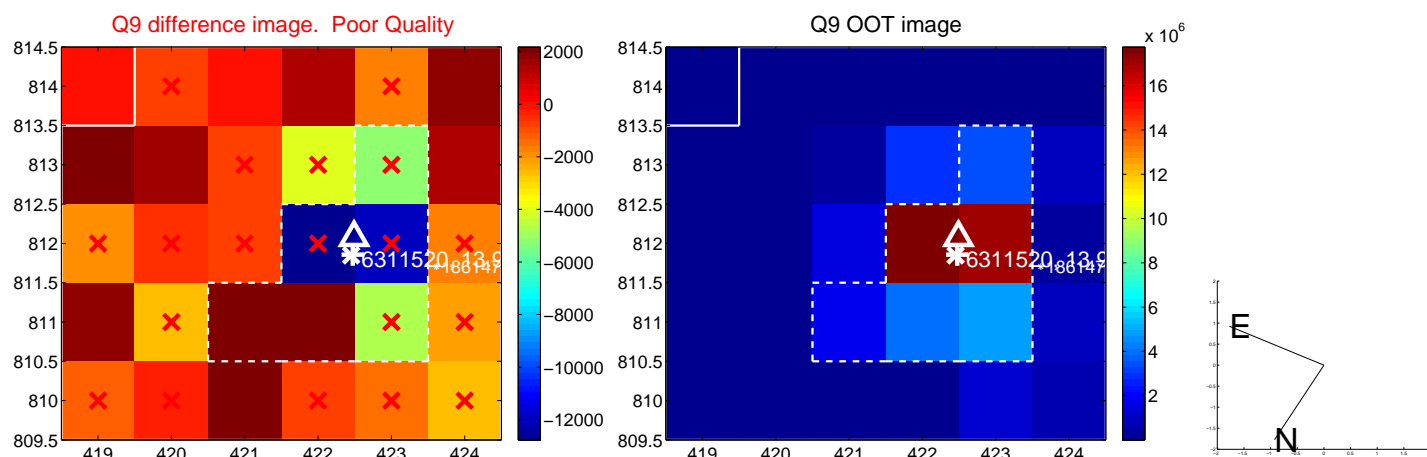
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



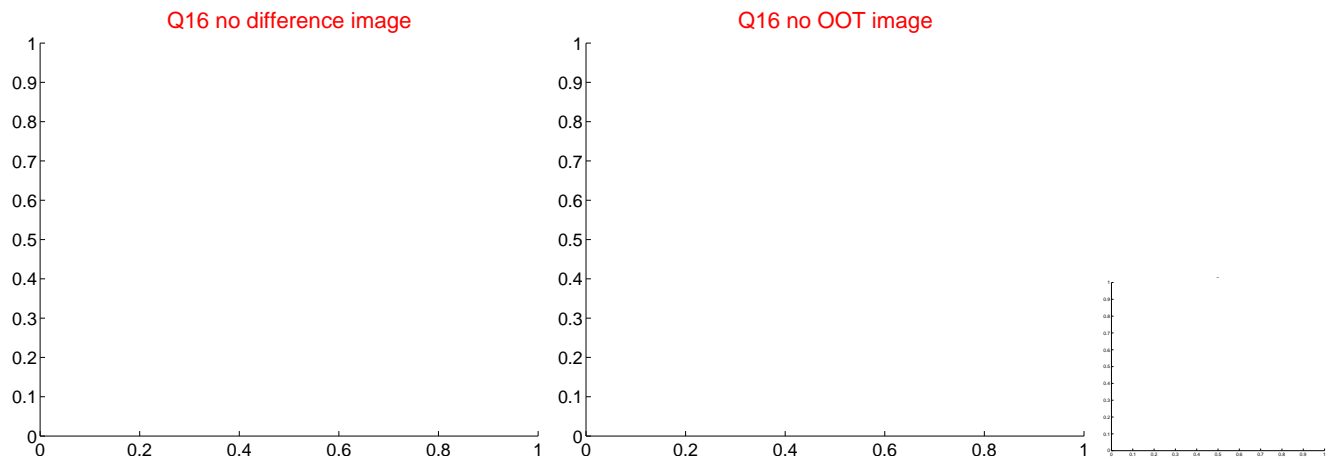
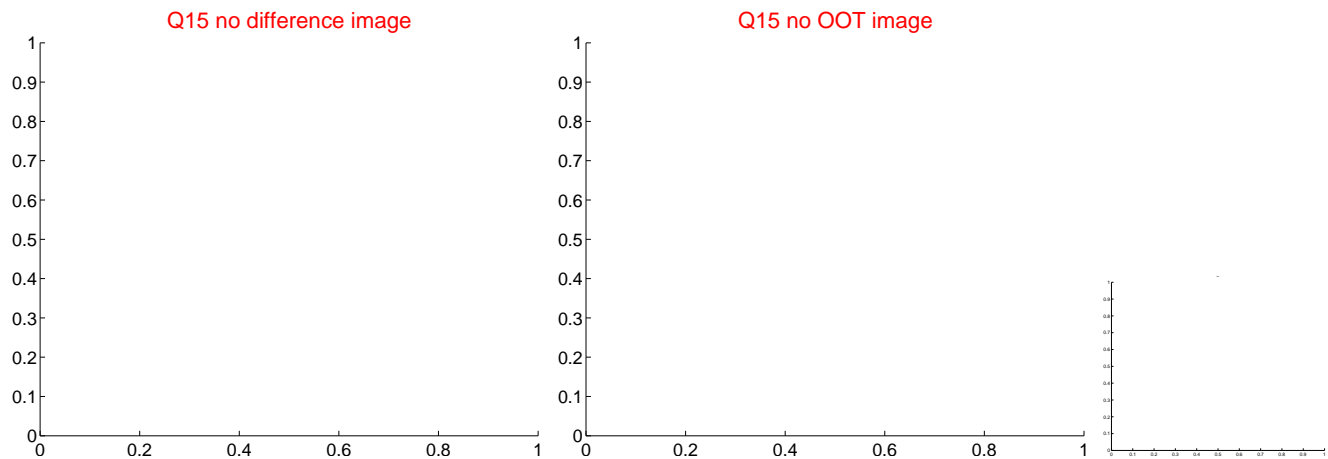
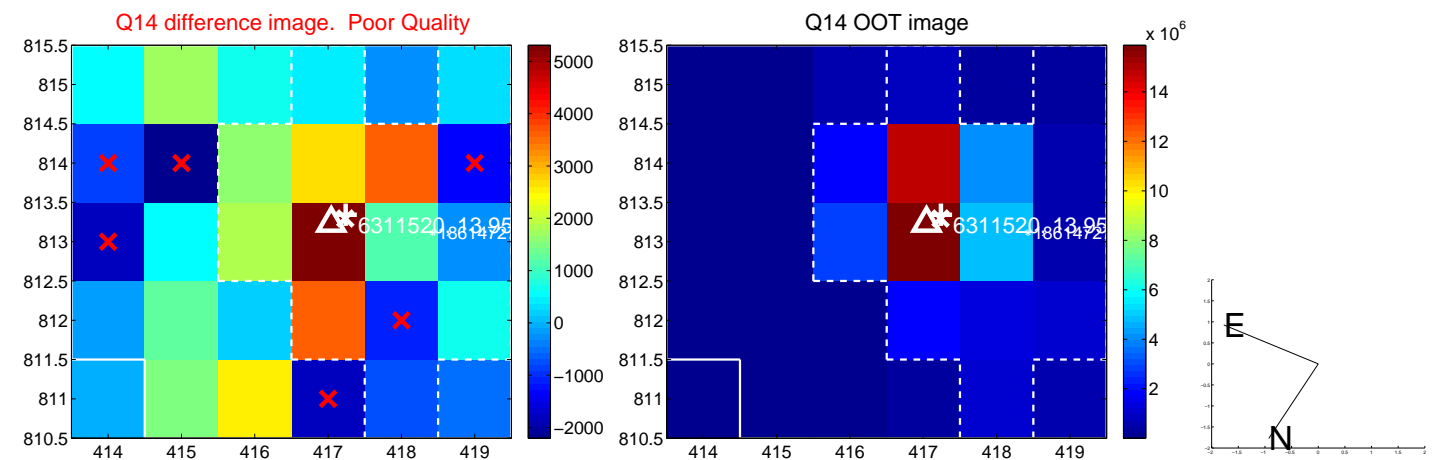
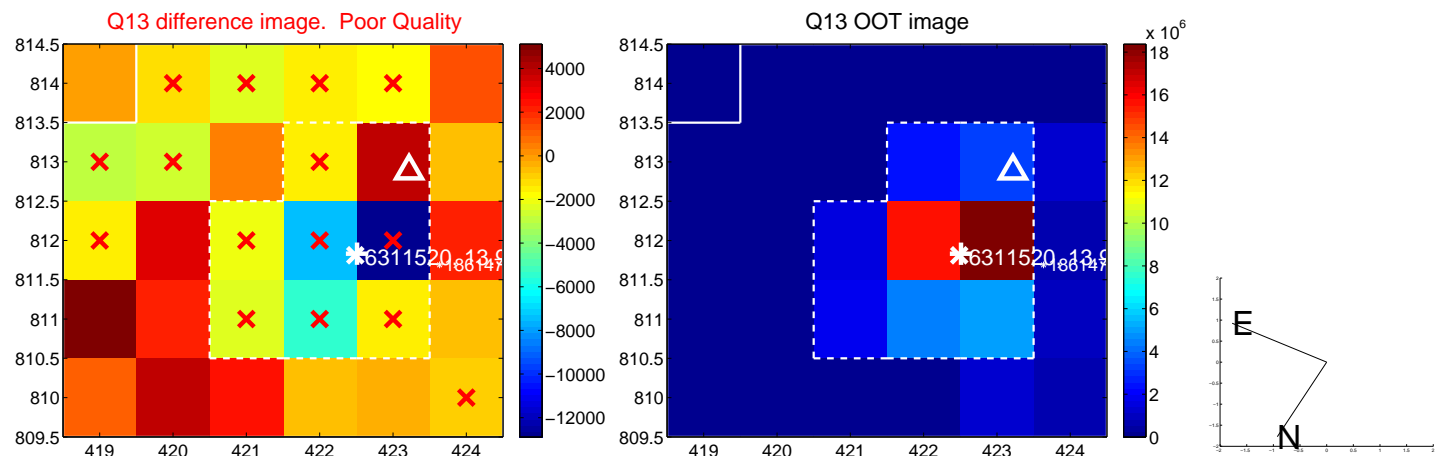
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



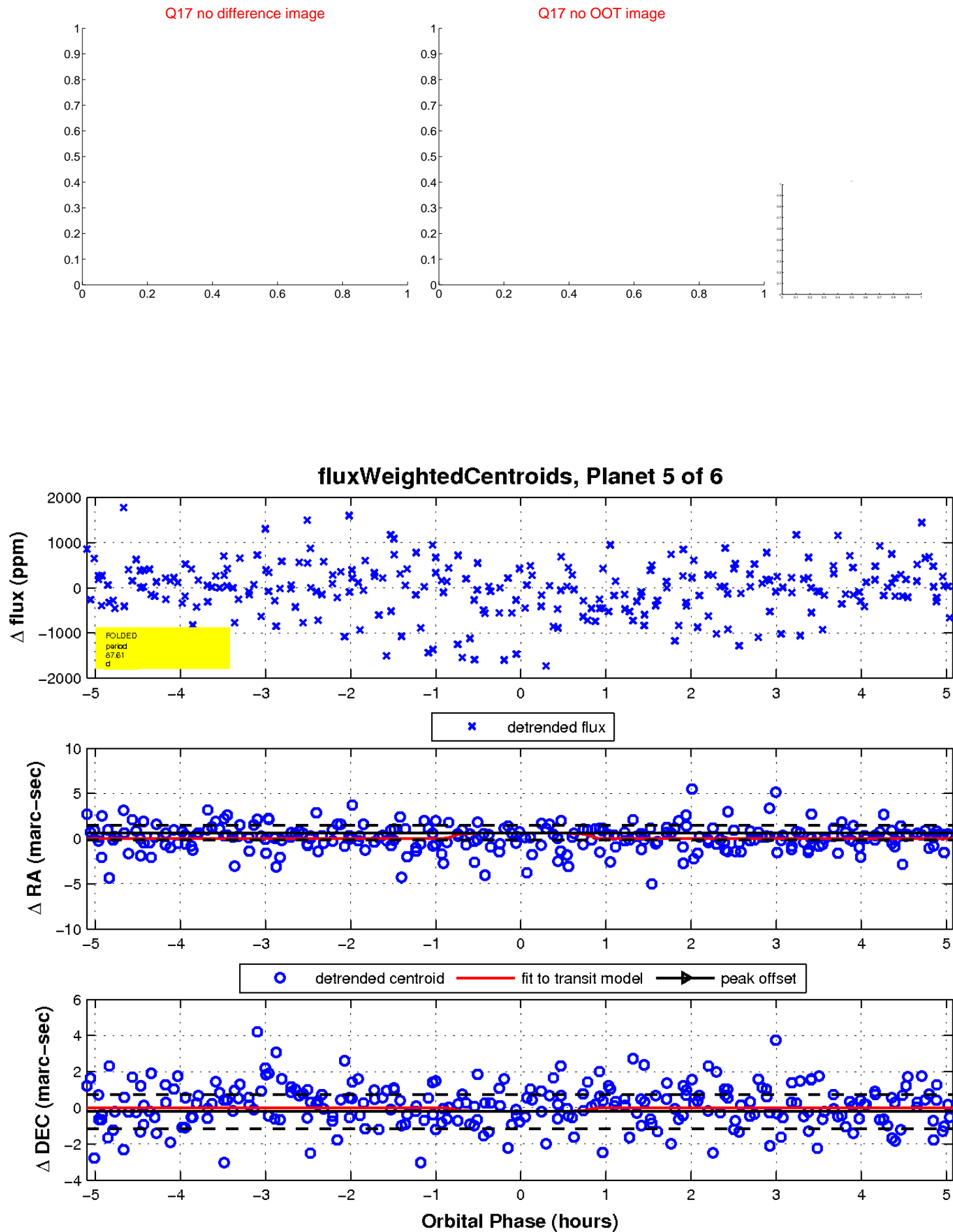
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

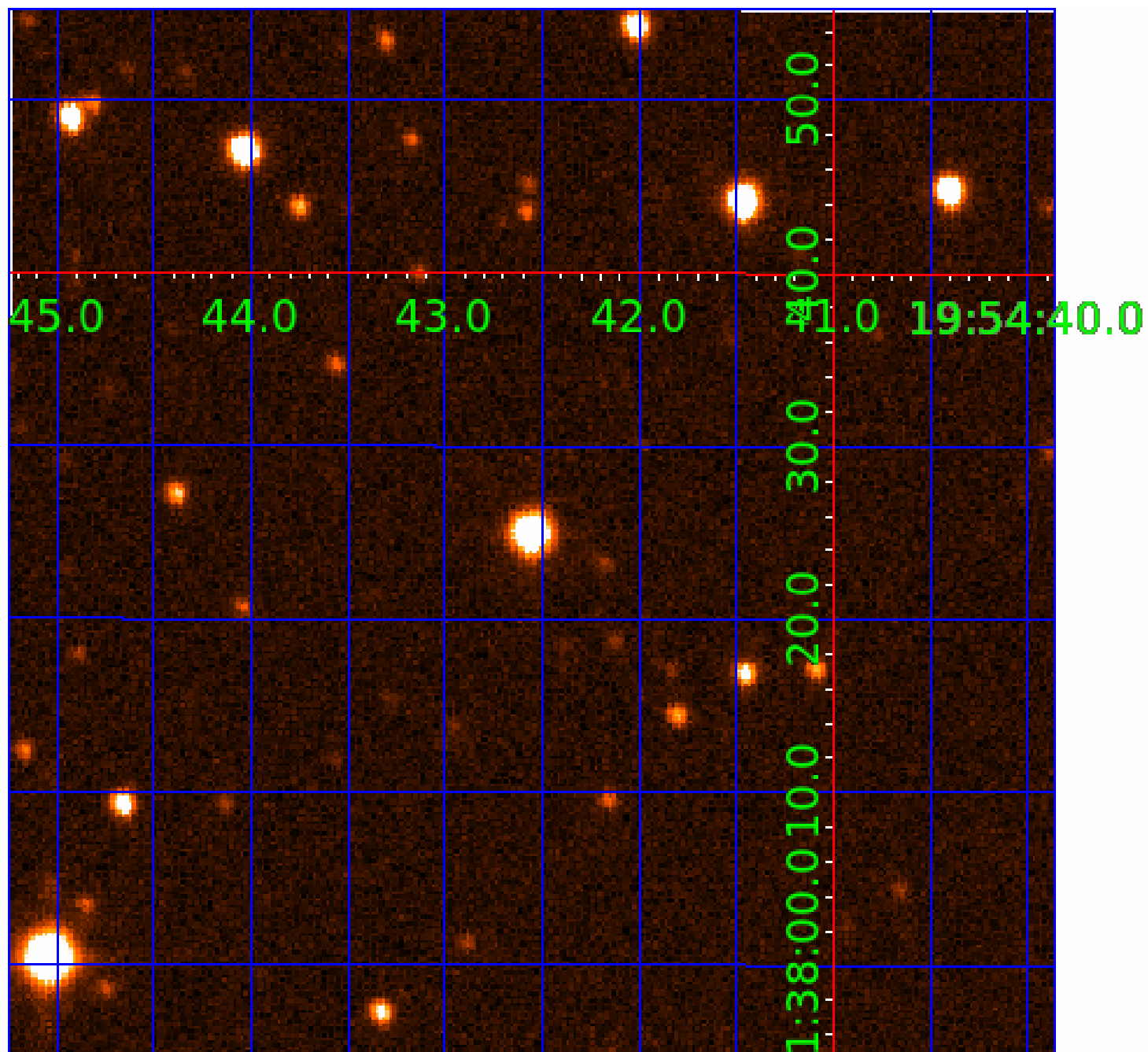


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006311520

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})
006311520-01	OBS	4115.01	0.941840	131.811922	54.4	6.884	16.6	7.9	1.14	6419	0.85	5545.05
006311520-02	OBS	No	21.489227	132.299785	948.5	1.810	15.7	9.5	1.14	6419	4.04	85.69
006311520-03	OBS	No	20.349459	136.972434	1277.5	0.608	11.8	8.1	1.14	6419	4.38	92.14
006311520-04	OBS	No	51.805447	148.281875	393.4	1.992	9.9	7.0	1.14	6419	2.76	26.51
006311520-05	OBS	No	87.610207	191.579582	1050.7	1.706	11.8	9.4	1.14	6419	3.79	13.16
006311520-06	OBS	No	25.690329	137.362268	418.2	2.749	8.0	4.7	1.14	6419	2.73	67.53

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006311520-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT
006311520-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
006311520-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
006311520-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006311520-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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.

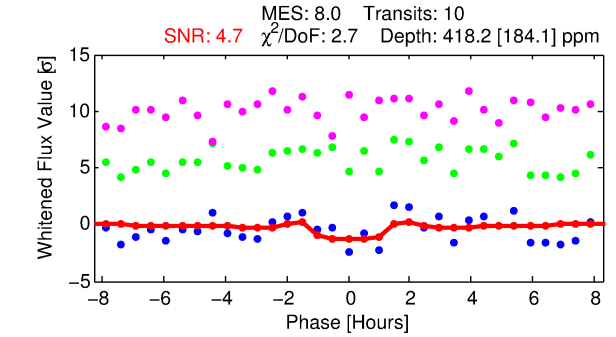
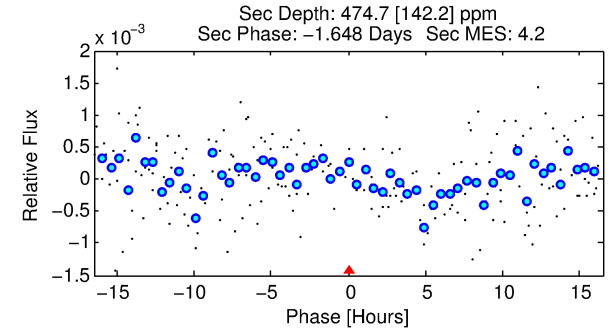
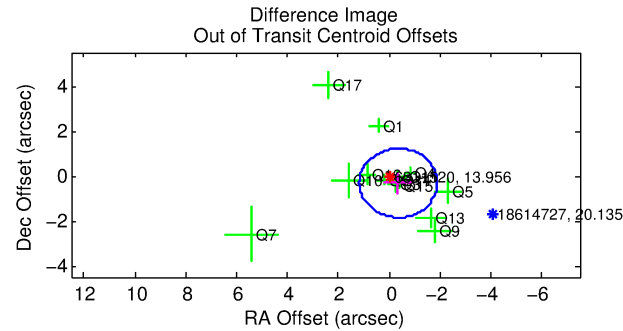
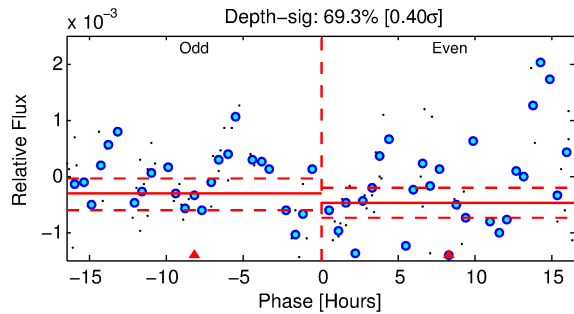
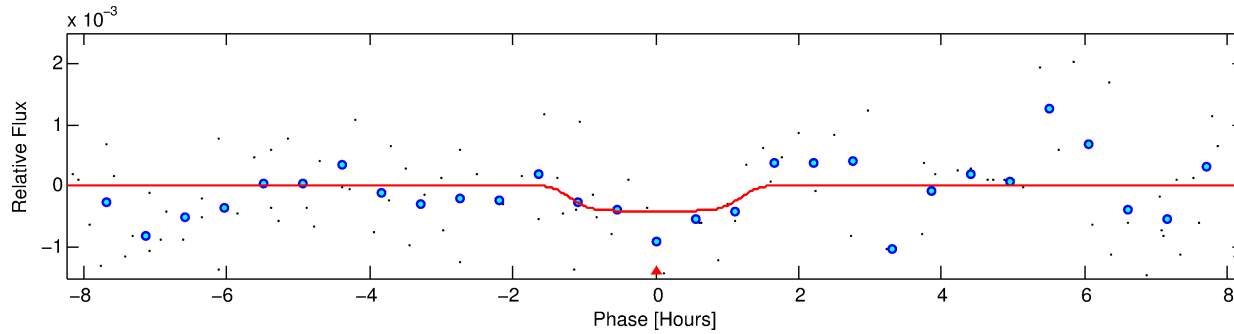
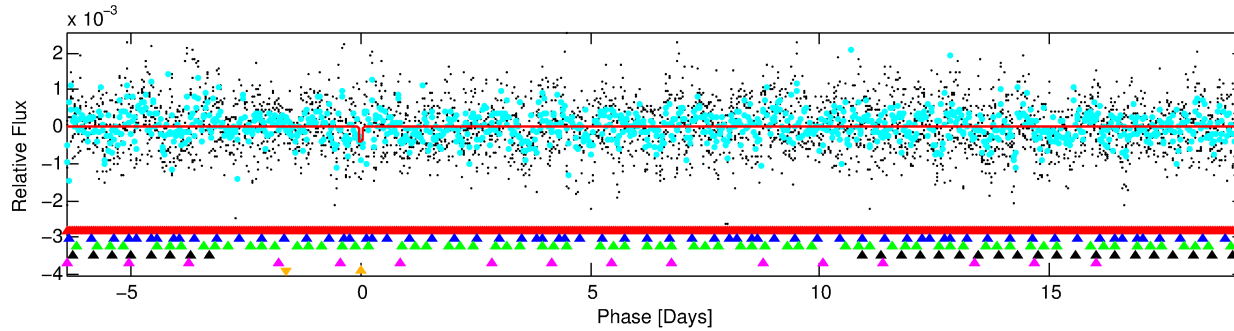
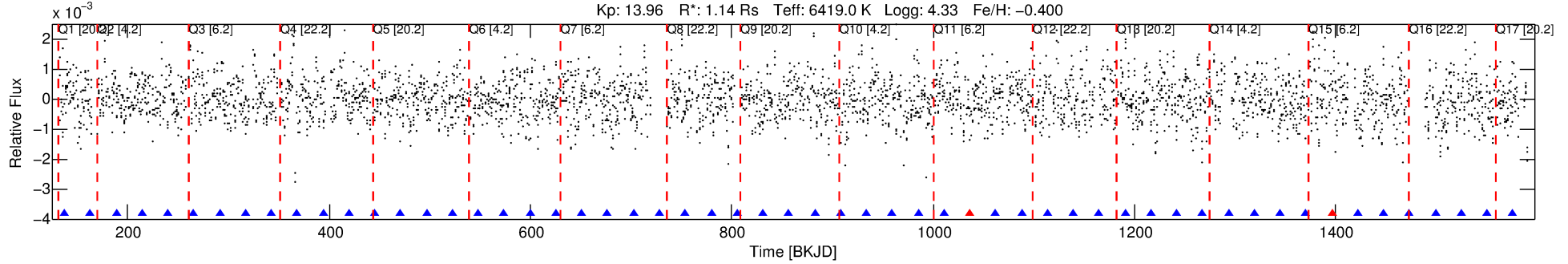
Ephemeris Match Information For 006311520-06

No Significant Match Found

DV One-Page Summary

KIC: 6311520 Candidate: 6 of 6 Period: 25.690 d
KOI: K04115 Corr: No Ephemeris Match

Kp: 13.96 R*: 1.14 Rs Teff: 6419.0 K Logg: 4.33 Fe/H: -0.400



DV Fit Results:

Period = 25.69033 [0.00056] d
Epoch = 137.3623 [0.0169] BKJD
Rp/R* = 0.0219 [0.0230]
a/R* = 34.44 [188.62]
b = 0.90 [1.16]
Seff = 67.53 [24.62]
Teq = 731 [67] K
Rp = 2.73 [2.96] Re
a = 0.1714 [0.0407] AU
Ag = 1027.00 [2199.76] [0.47σ]
Teffp = 6398 [3388] K [1.67σ]

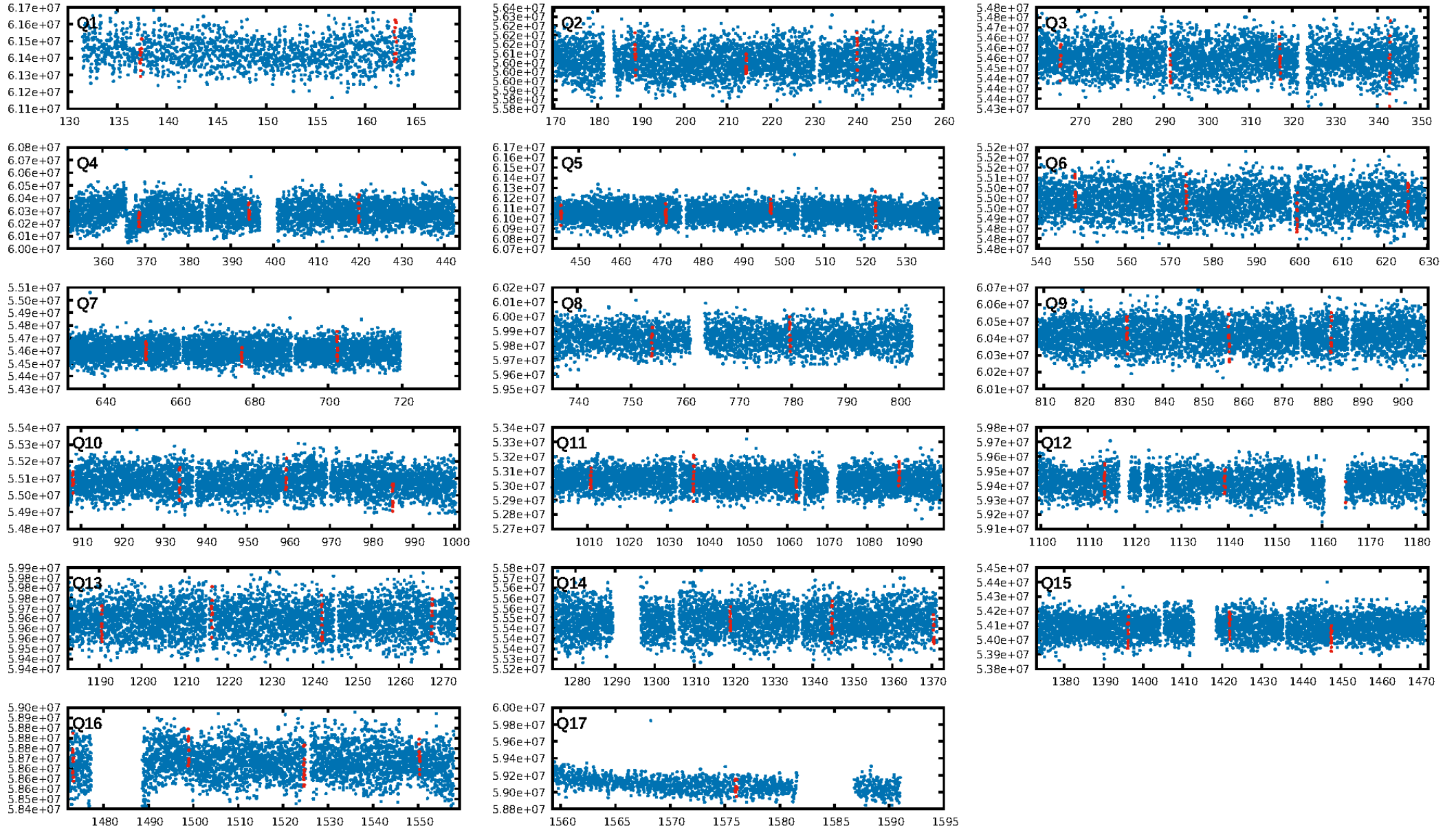
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [30.63σ]
LongPeriod-sig: 100.0% [184.60σ]
ModelChiSquare2-sig: 19.8%
ModelChiSquareGof-sig: 96.6%
Bootstrap-pfa: 4.51e-10
RollingBand-fgt: 0.80 [8/10]
GhostDiagnostic-chr: -0.08591
Centroid-sig: 0.1%
Centroid-so: 0.946 arcsec [1.83σ]
OotOffset-rm: 0.477 arcsec [0.93σ]
KicOffset-rm: 0.569 arcsec [1.10σ]
OotOffset-st: 3/4/2/5 [14]
KicOffset-st: 3/4/2/5 [14]
DiffImageQuality-fgm: 0.36 [5/14]
DiffImageOverlap-fno: 0.12 [2/17]

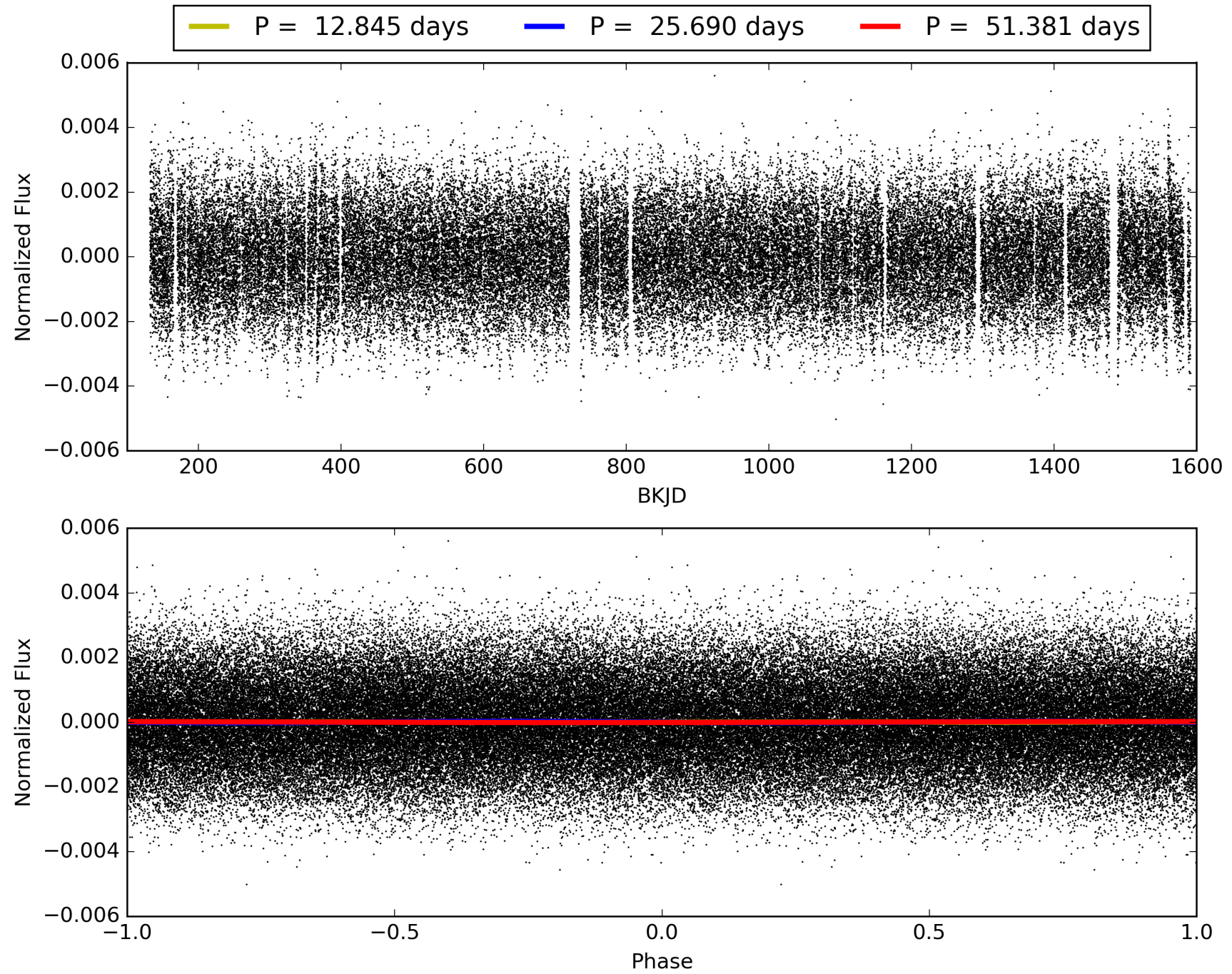
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:32:04 Z

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

TCE 006311520-06, PDC Light Curves

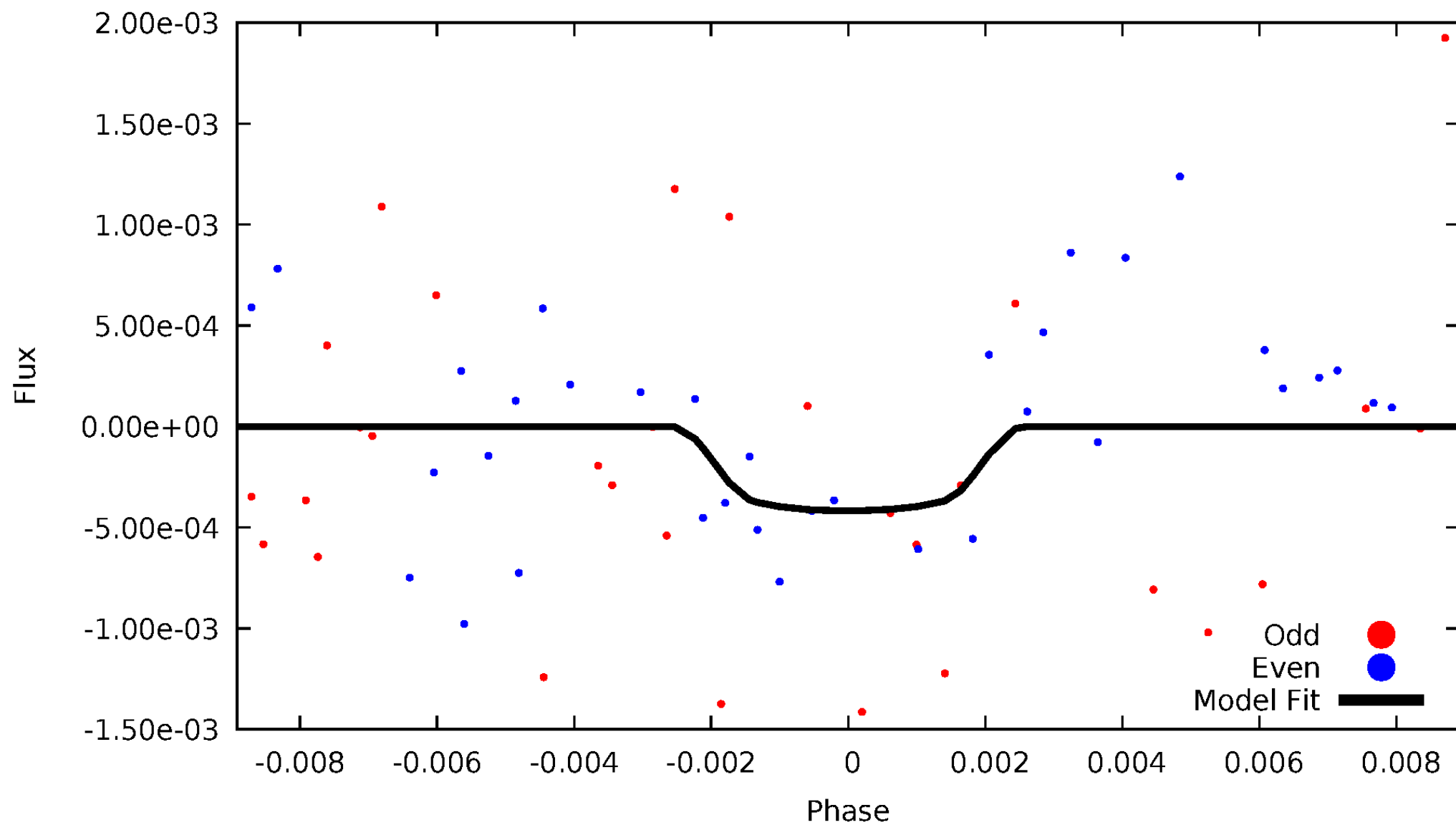


TCE 006311520-06



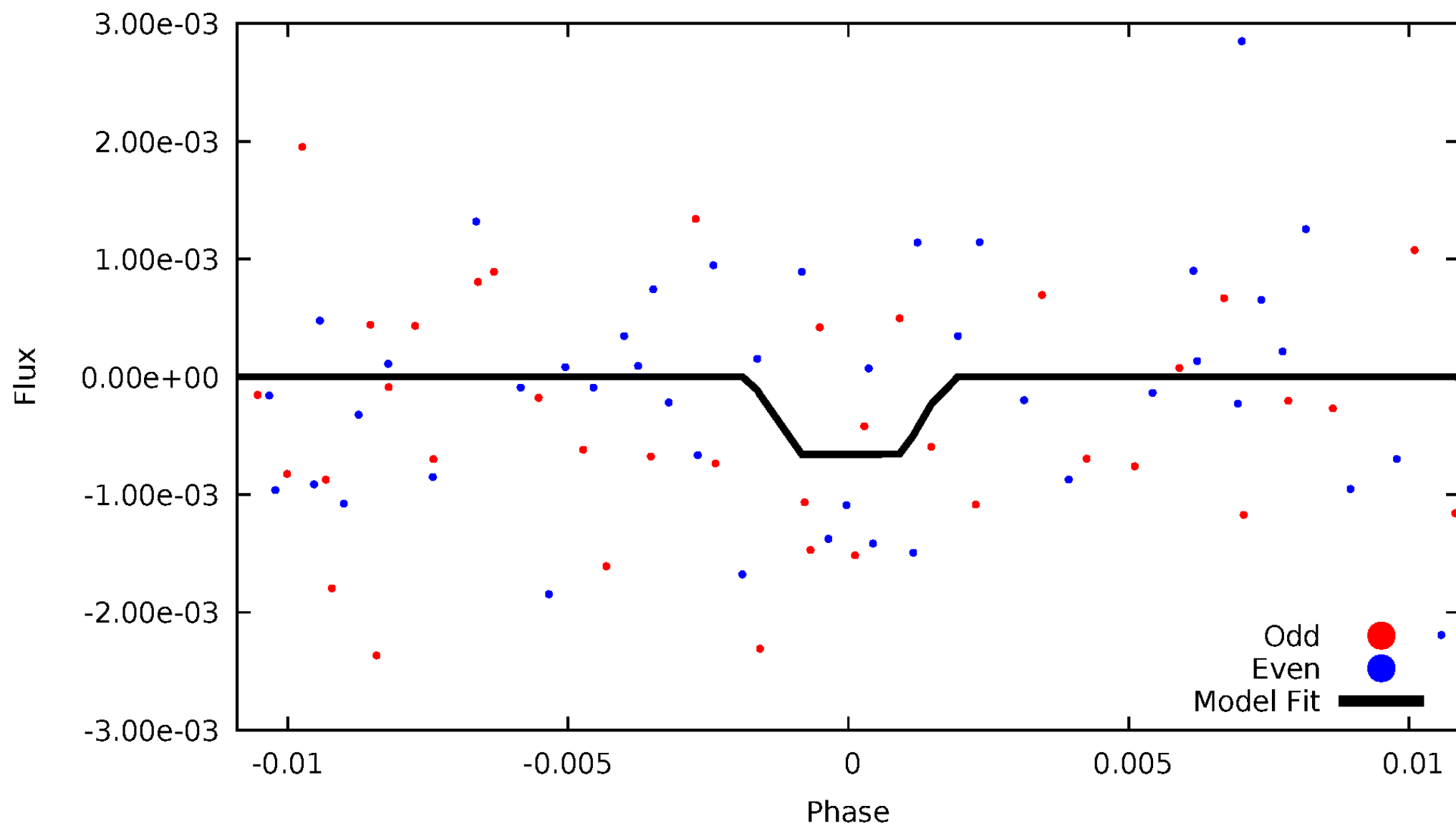
DV Odd/Even

TCE 006311520-06



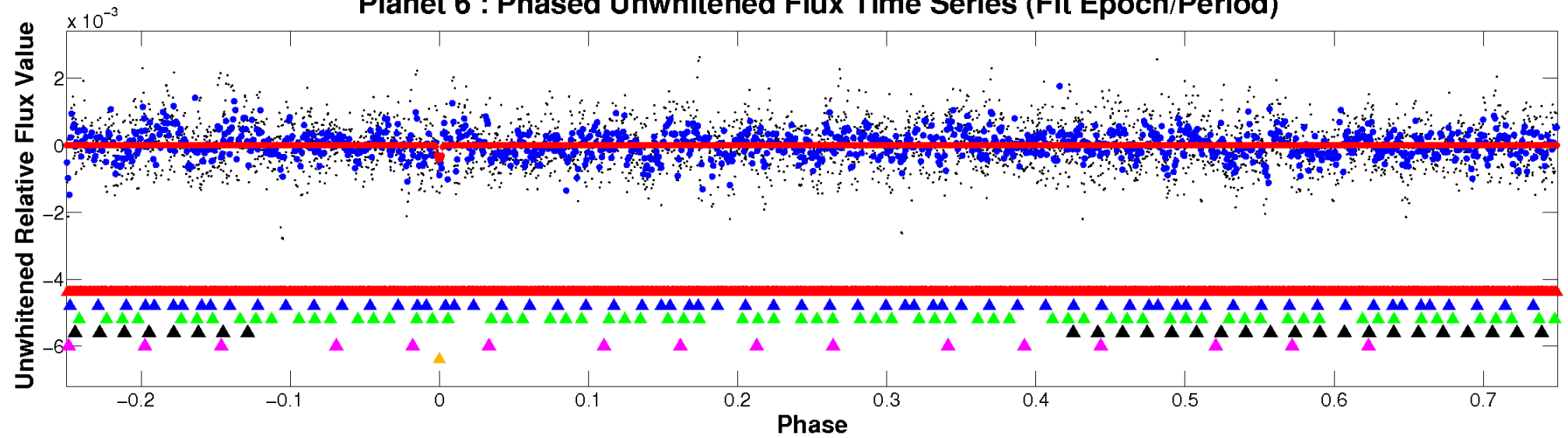
ALT Odd/Even

TCE 006311520-06

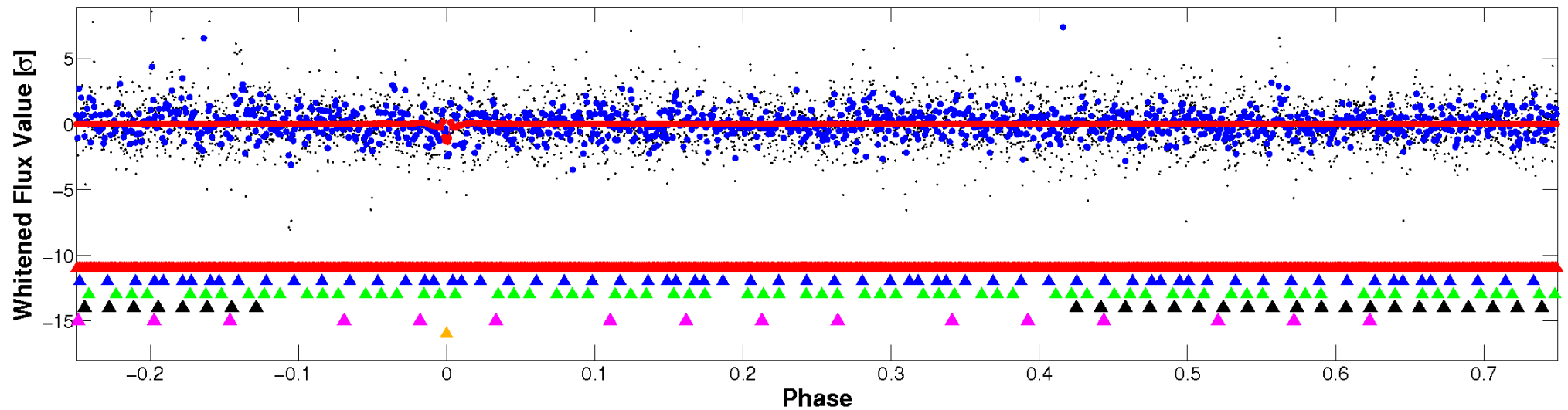


Non-Whitened Vs. Whitened Light Curve

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

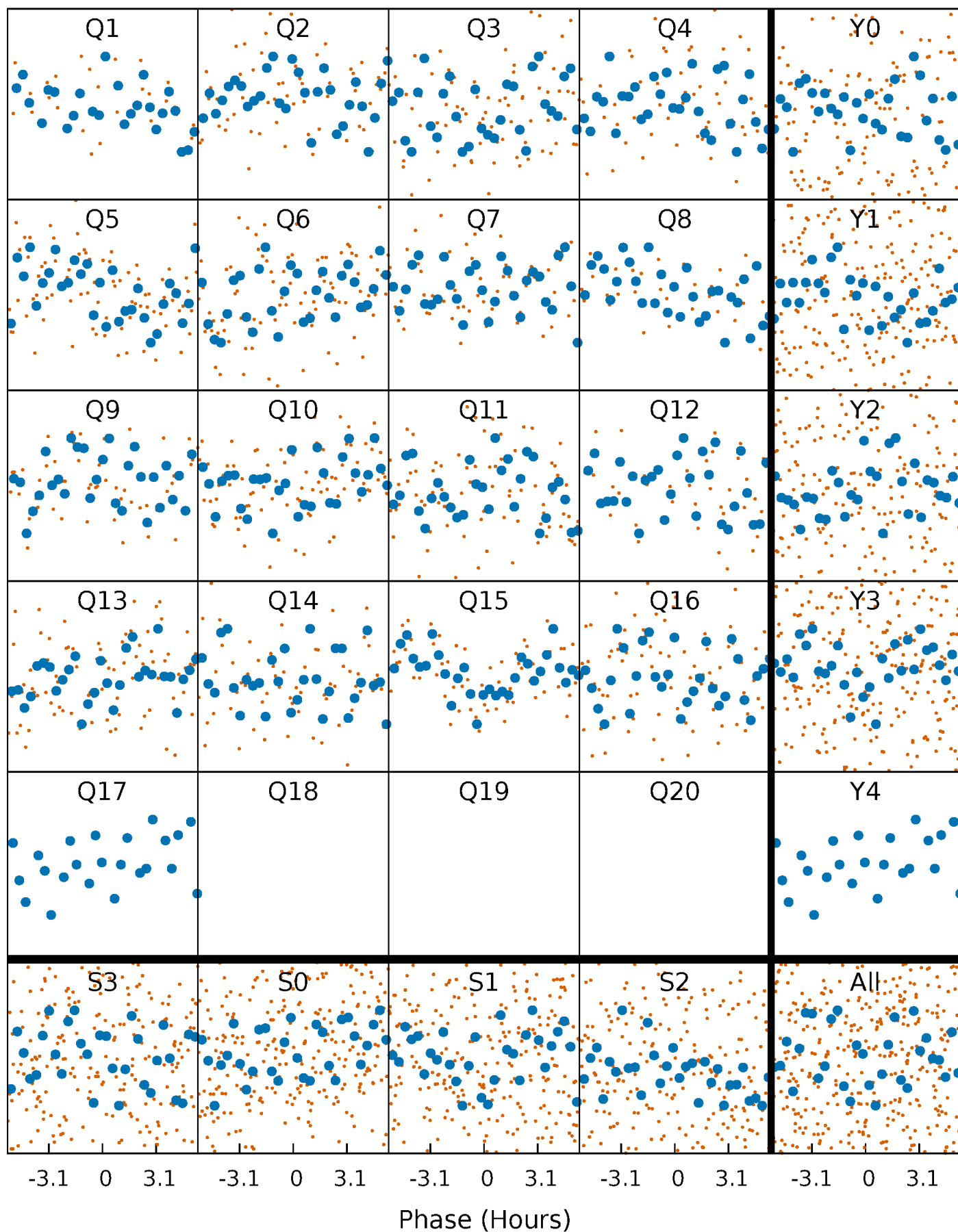


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



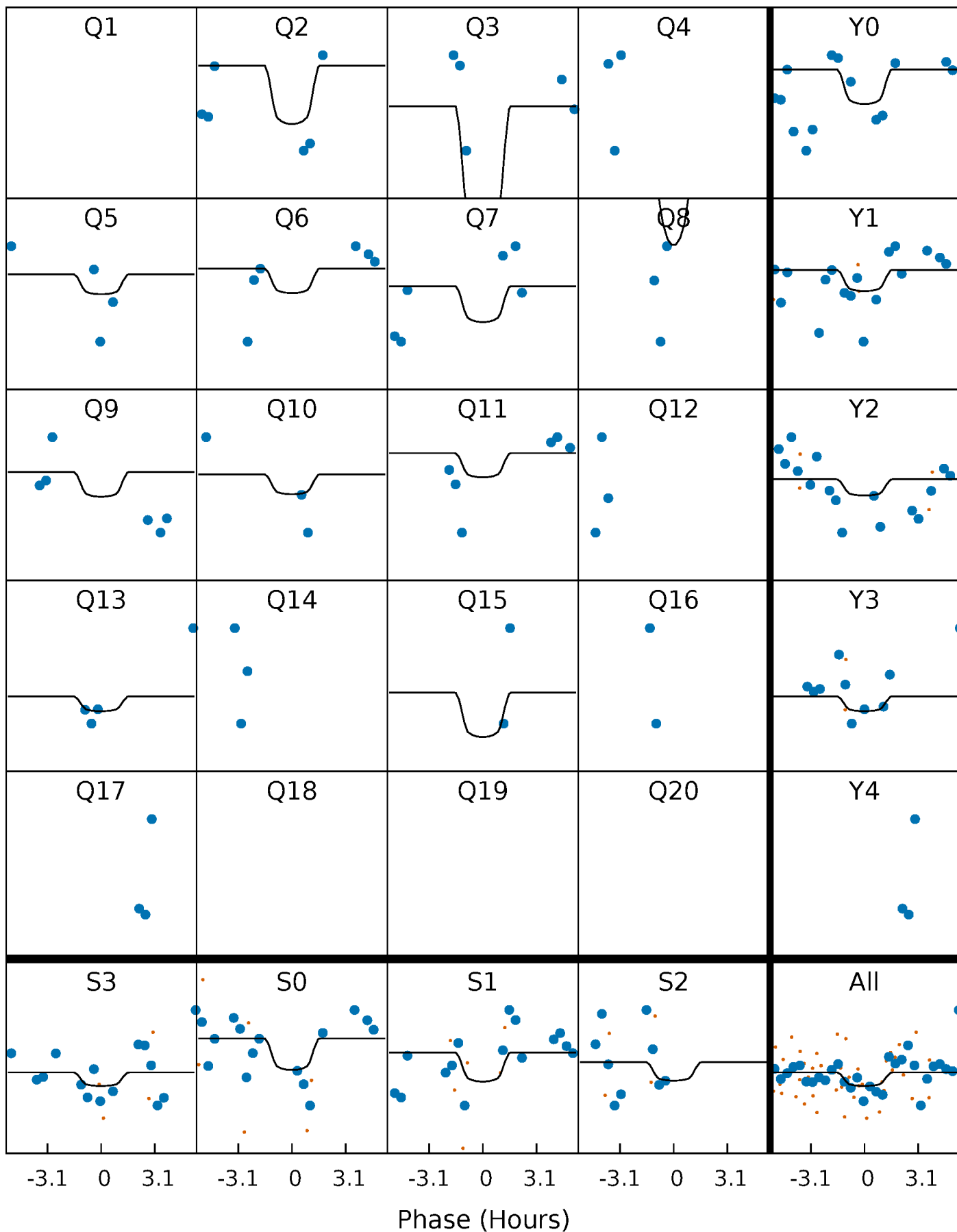
PDC Quarter-Phased Transit Curves

TCE 006311520-06 P= 25.690329 Days $T_0=137.362268$ (BKJD)



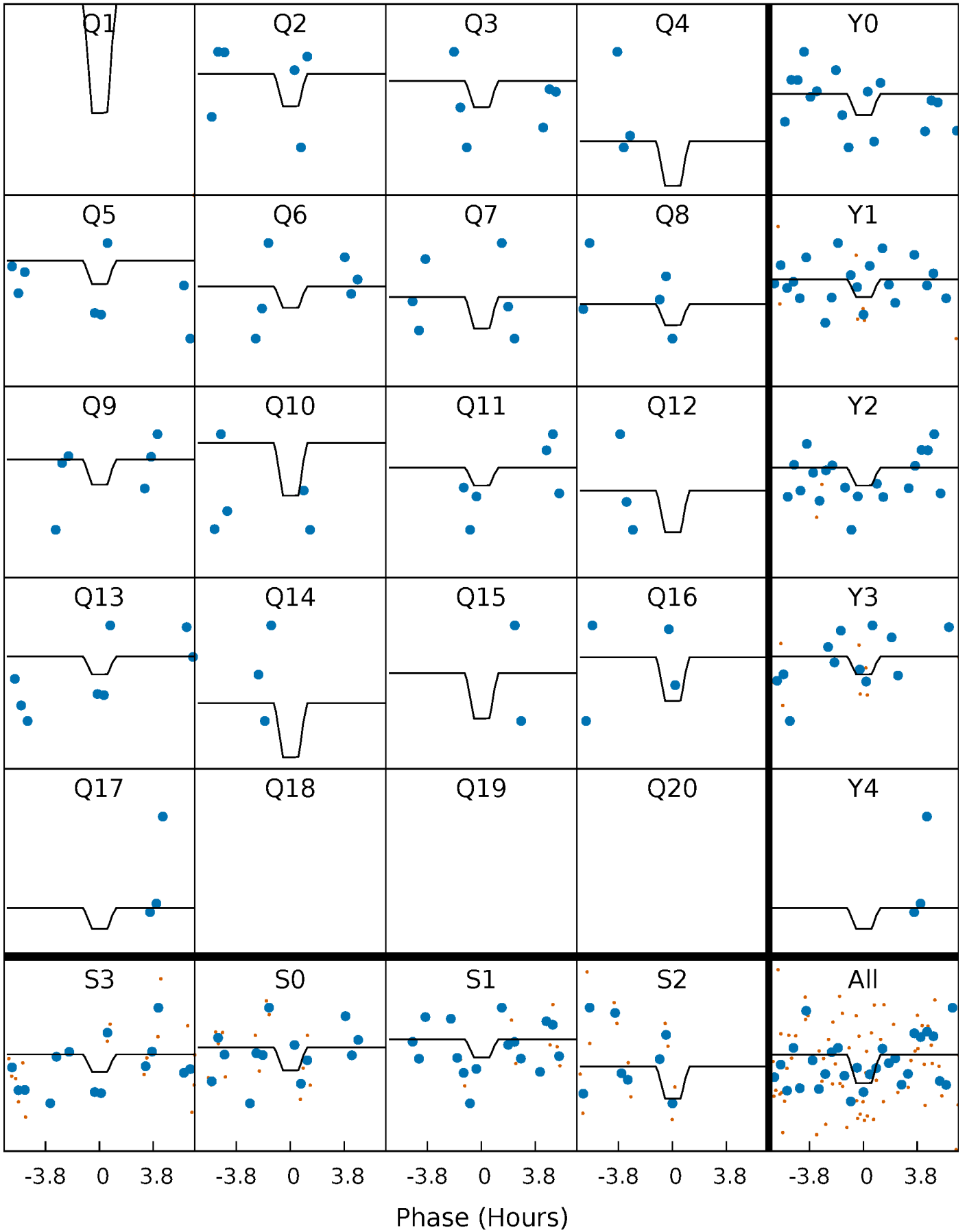
DV Quarter-Phased Transit Curves

TCE 006311520-06 P= 25.690329 Days $T_0=137.362268$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

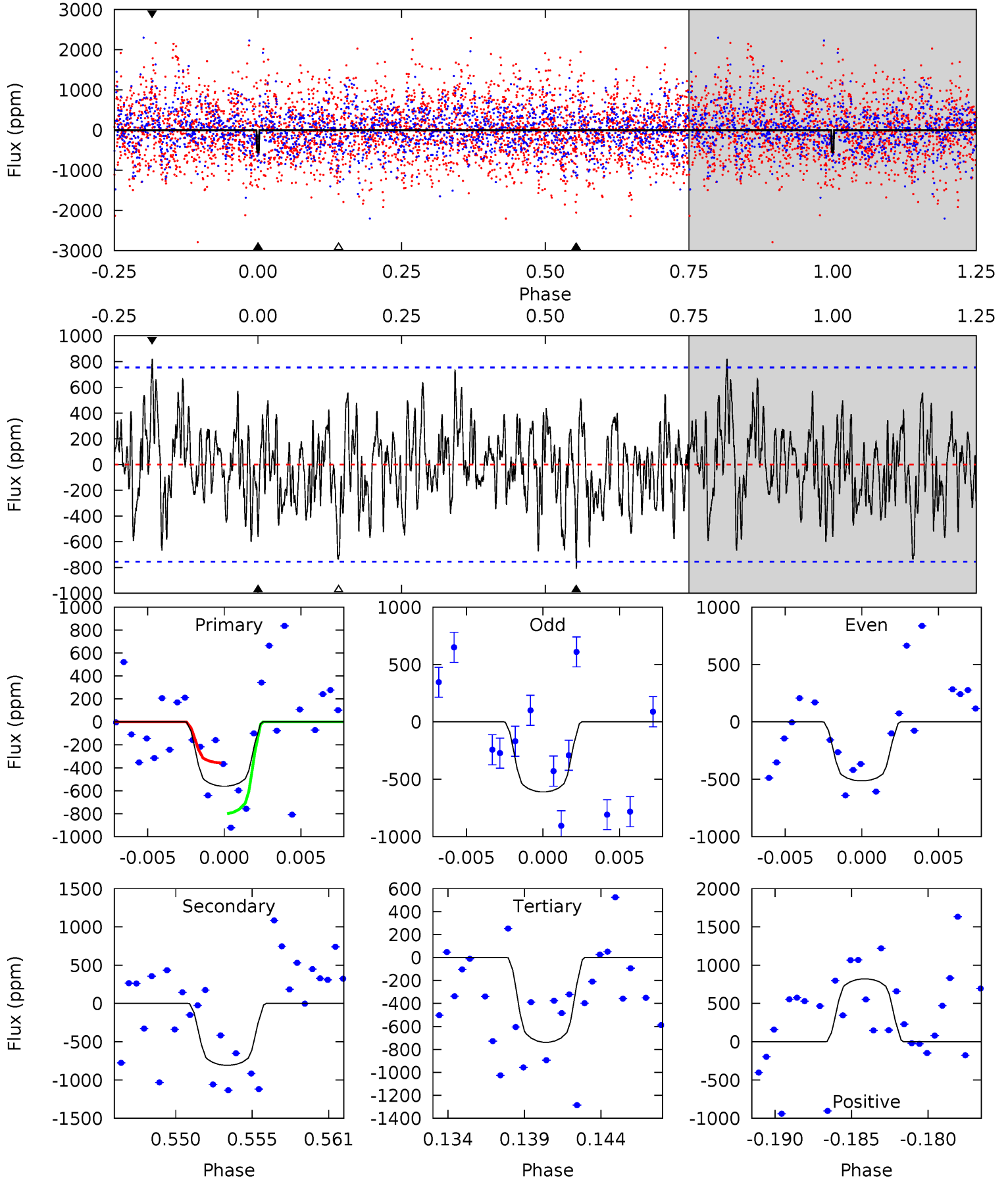
TCE 006311520-06 P= 25.688980 Days $T_0=137.381846$ (BKJD)



DV Model-Shift Uniqueness Test

006311520-06, $P = 25.690329$ Days, $E = 111.671939$ Days

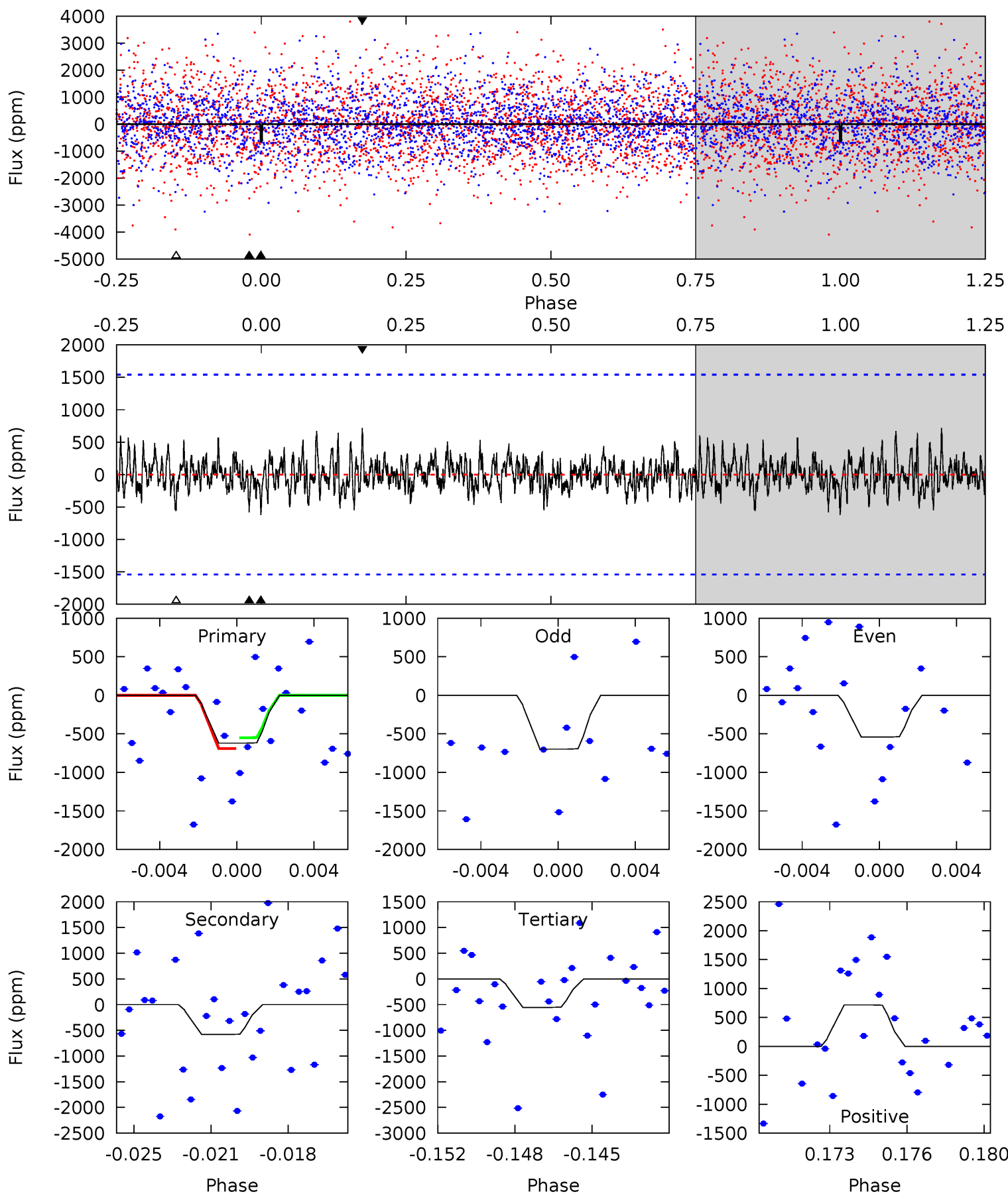
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.83	5.52	5.04	5.61	5.15	2.80	1.78	-1.21	-1.78	0.48	-0.09	0.33	0.51	0.50	1.52



Alt Model-Shift Uniqueness Test

006311520-06, $P = 25.688980$ Days, $E = 111.692866$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.10	1.97	1.87	2.43	5.22	2.92	0.67	0.23	-0.33	0.09	-0.46	0.26	0.87	0.54	0.23



Stellar Parameters For KIC 006311520

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6419^{+177}_{-199}	$4.330^{+0.124}_{-0.186}$	$-0.400^{+0.300}_{-0.300}$	$1.142^{+0.325}_{-0.175}$	$1.013^{+0.156}_{-0.114}$	$0.958^{+0.541}_{-0.467}$
	+3%/-3%	+3%/-4%	+75%/-75%	+28%/-15%	+15%/-11%	+56%/-49%
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 006311520-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-807 ± 146	$3.44^{+2.37}_{-2.37}$	1028^{+76}_{-56}	6563^{+8356}_{-1507}	1116^{+10911}_{-744}
Alt.	-580 ± 295	$3.80^{+2.93}_{-2.31}$	1024^{+74}_{-54}	5555^{+4152}_{-1292}	573^{+3352}_{-424}

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

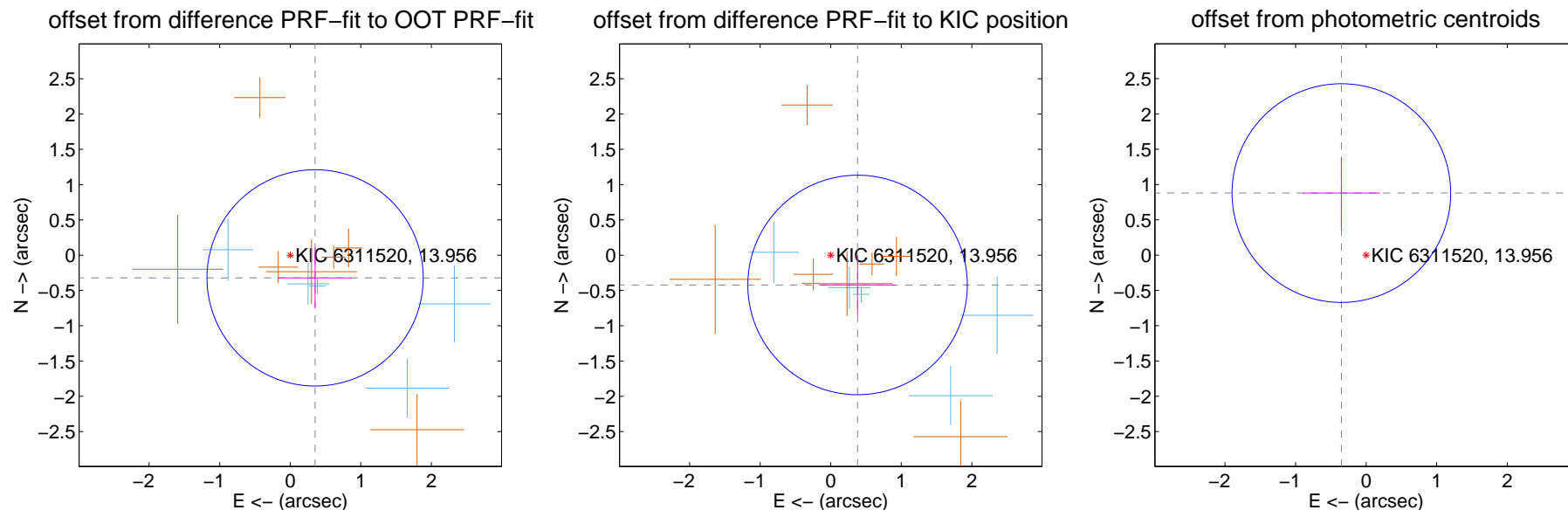
DV Centroid Data

Supplemental centroid analysis for 006311520-06. Kepler magnitude: 13.96. Transit SNR 4.70

There are 5 quarters with good PRF difference image offsets

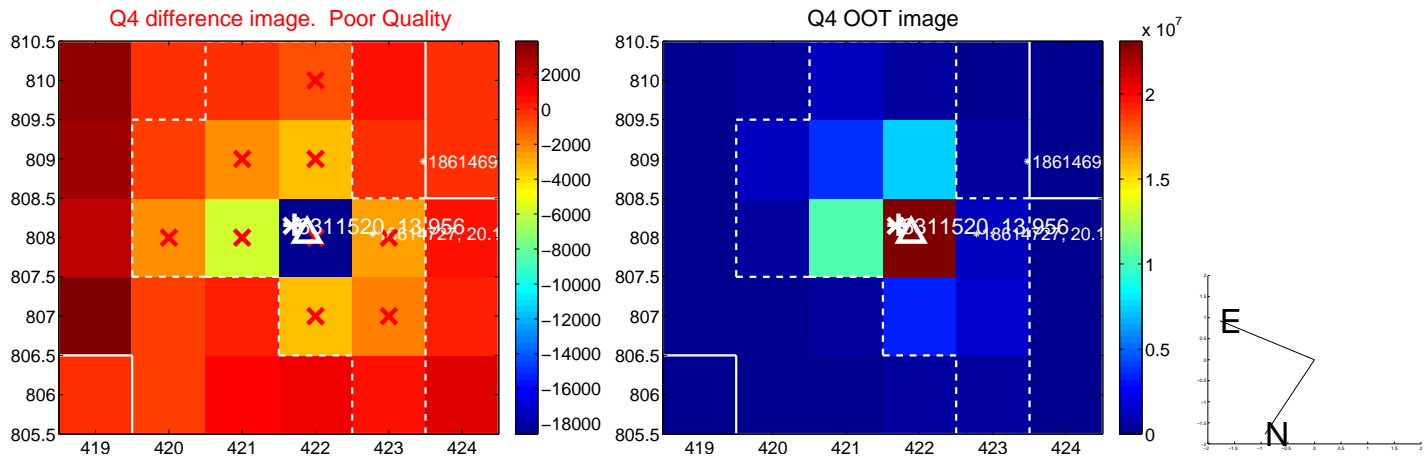
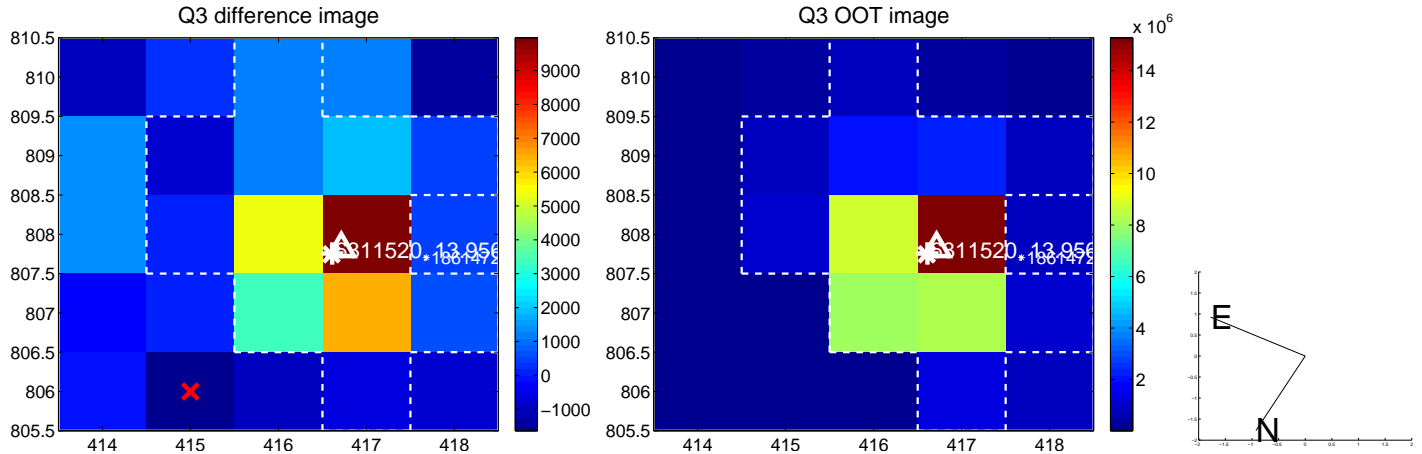
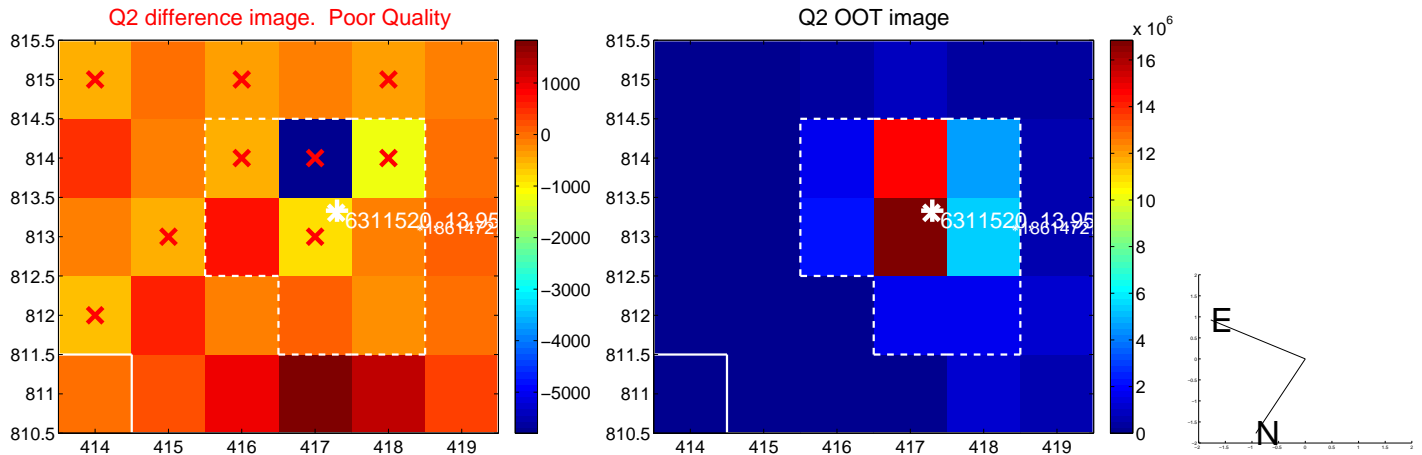
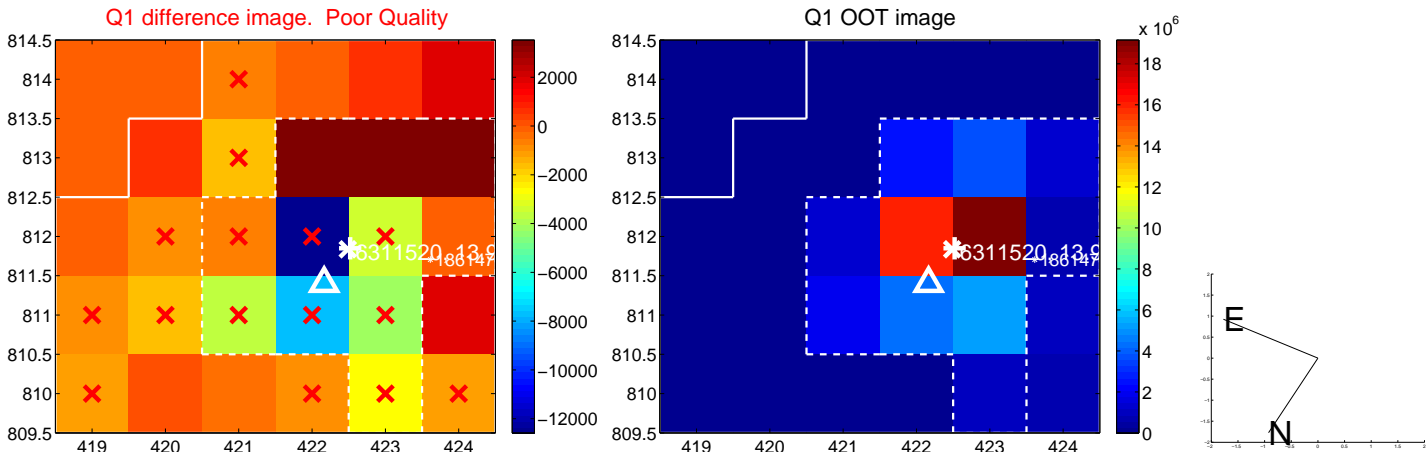
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.477 ± 0.511	0.93	-0.352 ± 0.519	-0.322 ± 0.428
PRF-fit source offset from KIC position	0.569 ± 0.518	1.10	-0.381 ± 0.529	-0.422 ± 0.426
photometric centroid source offset	0.95 ± 0.52	1.83	0.35 ± 0.55	0.88 ± 0.51

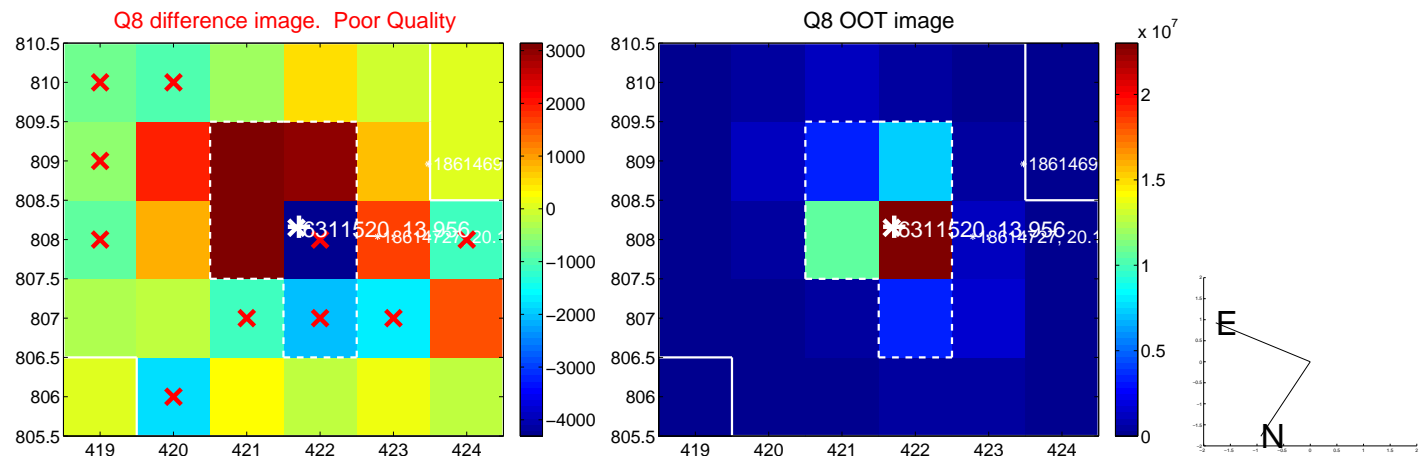
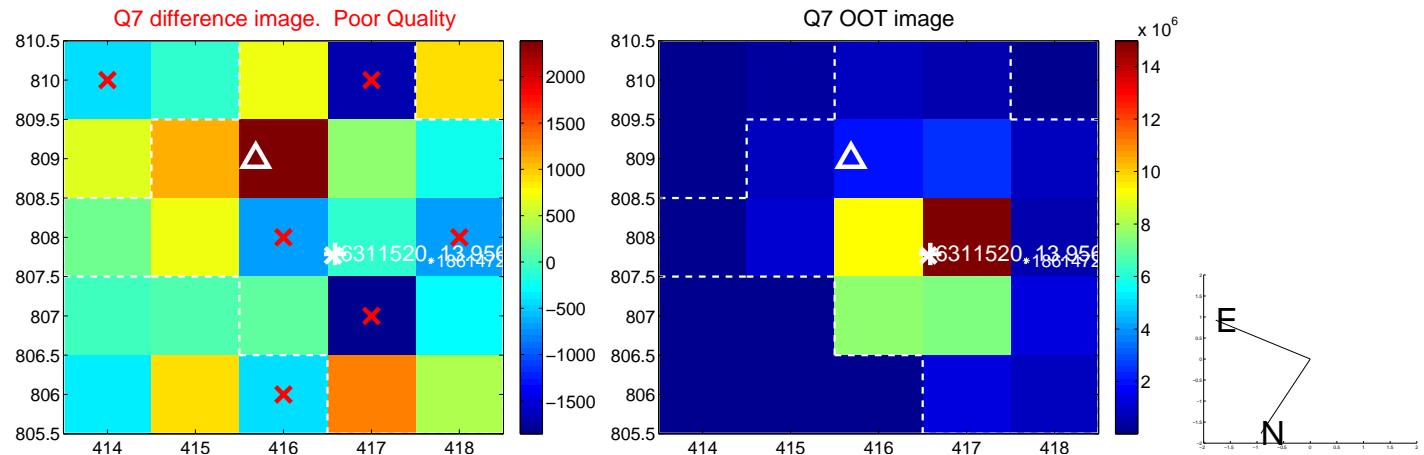
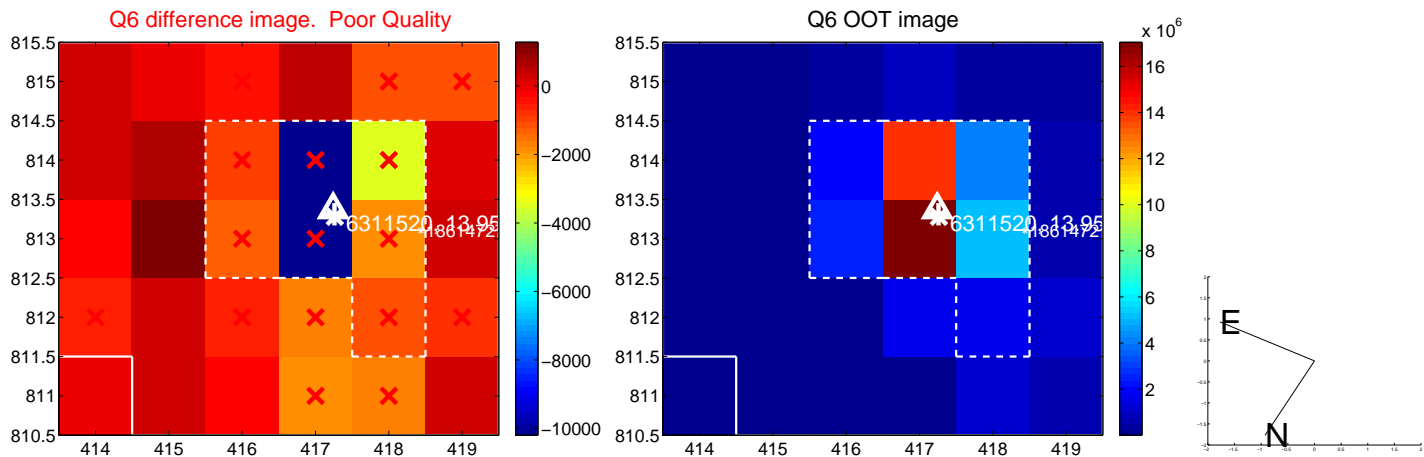
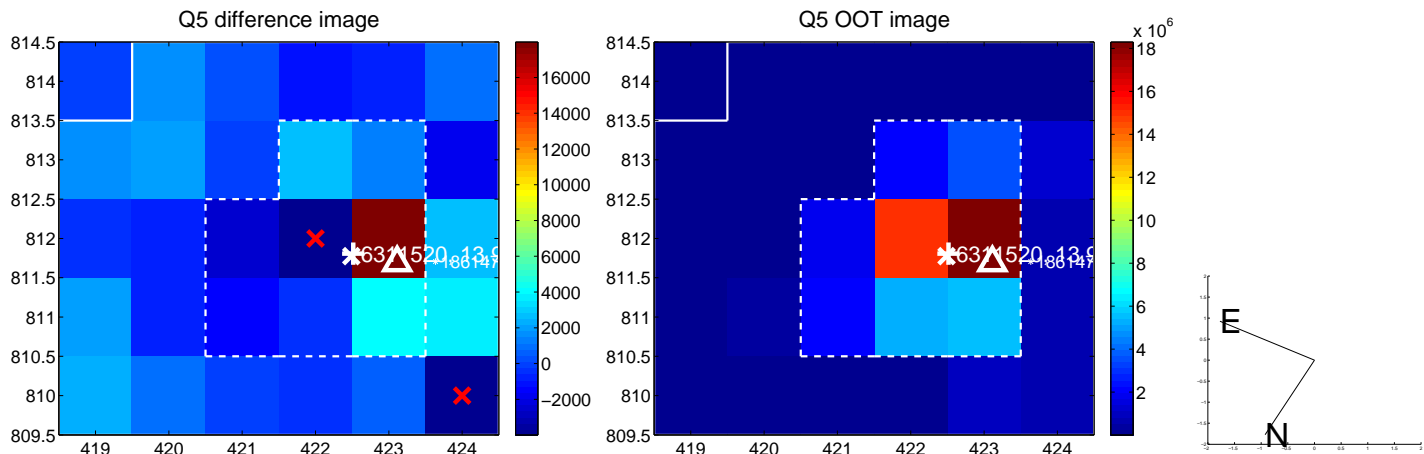


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

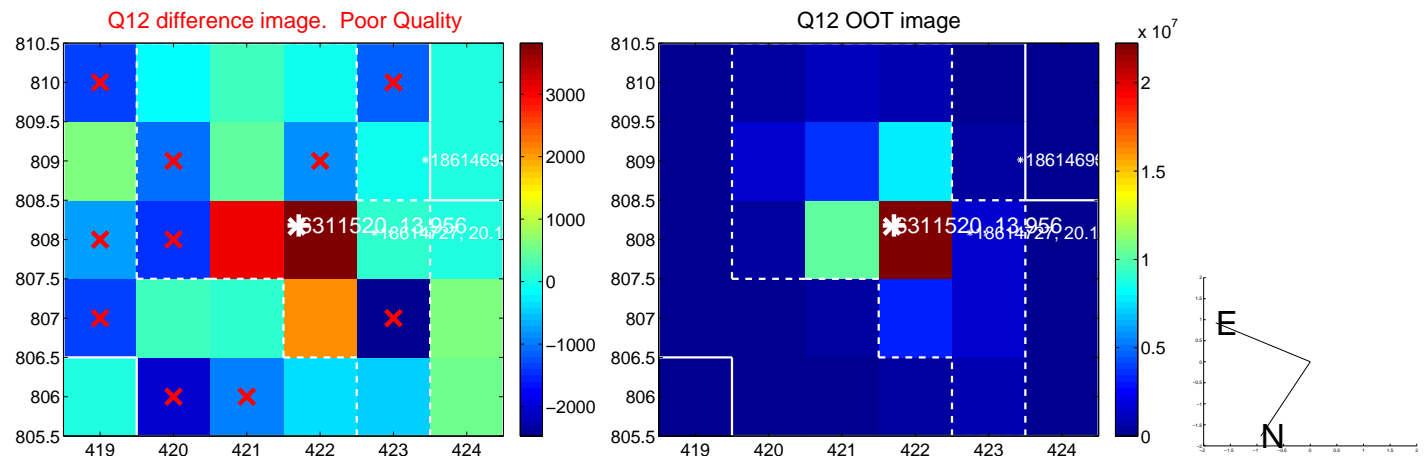
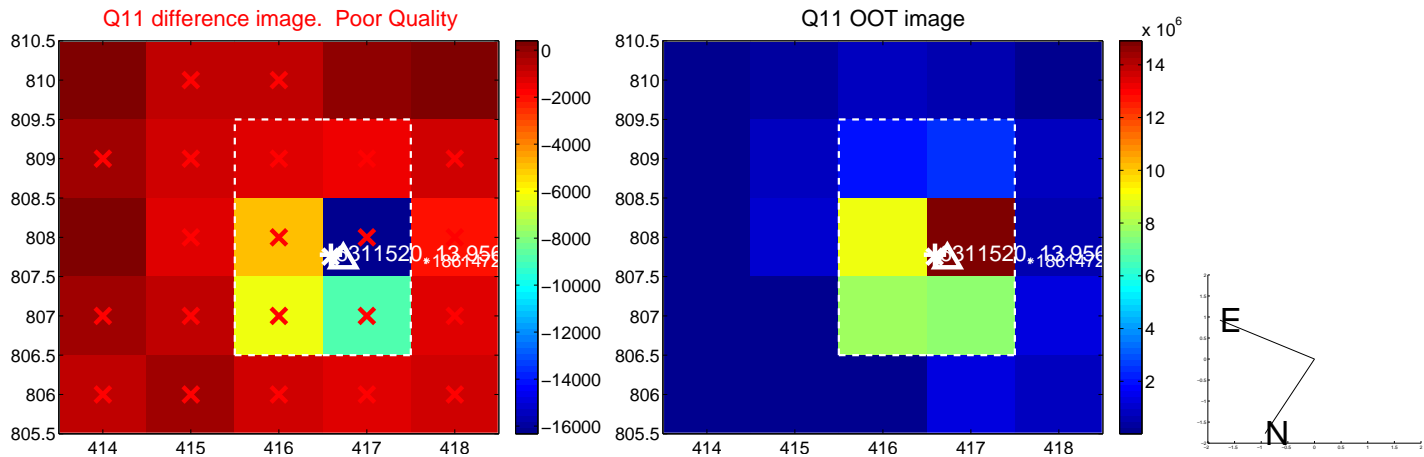
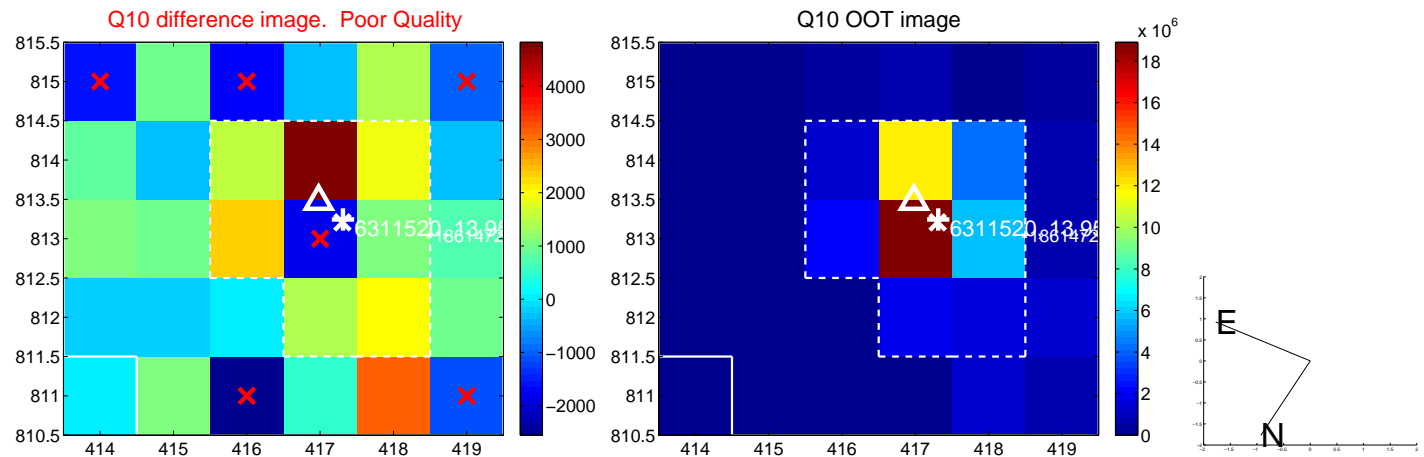
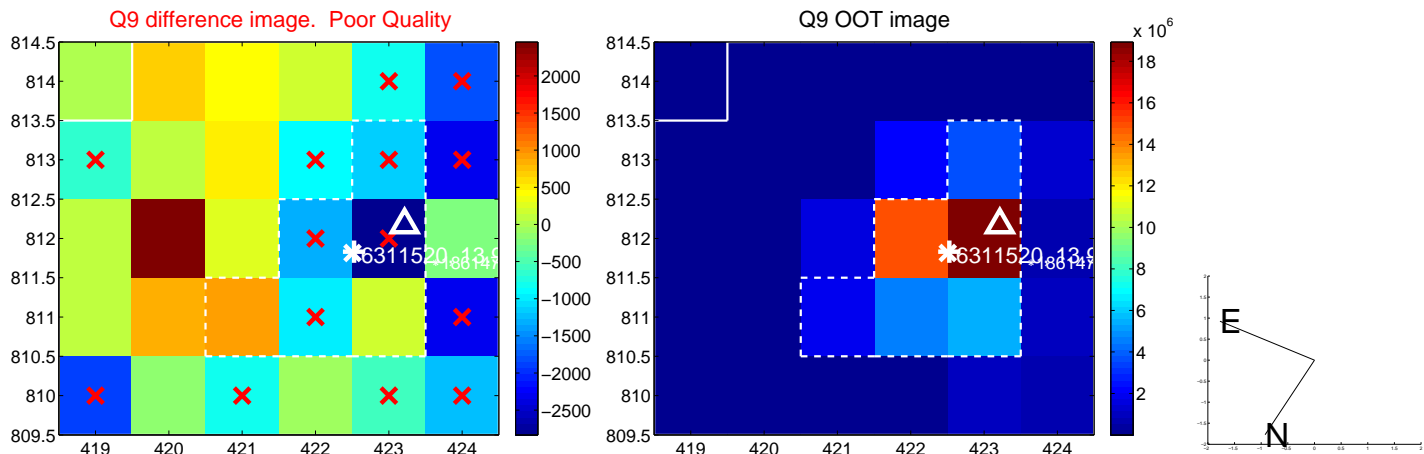
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



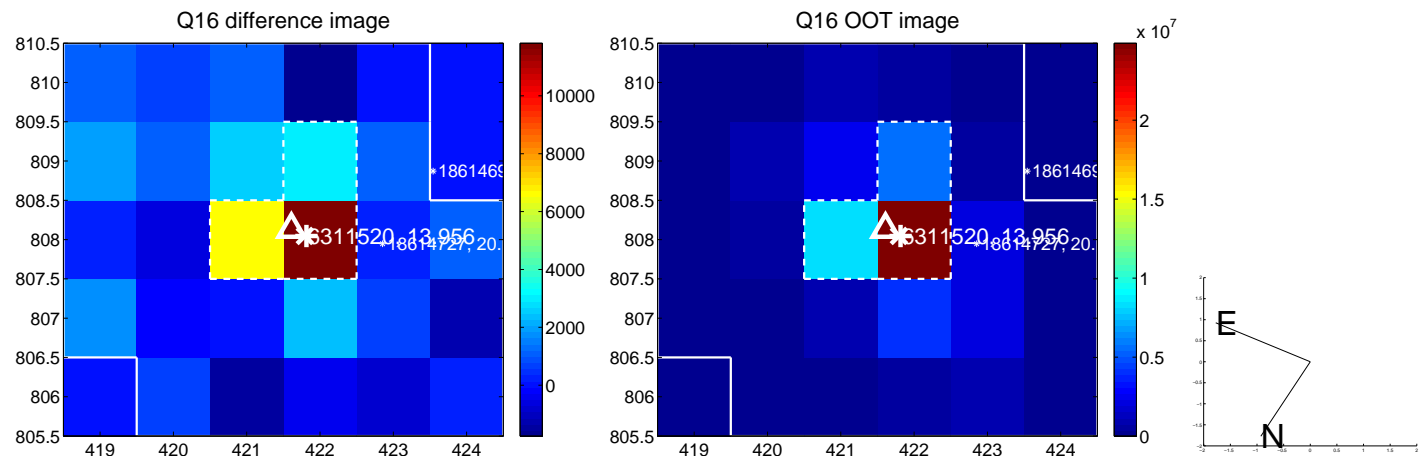
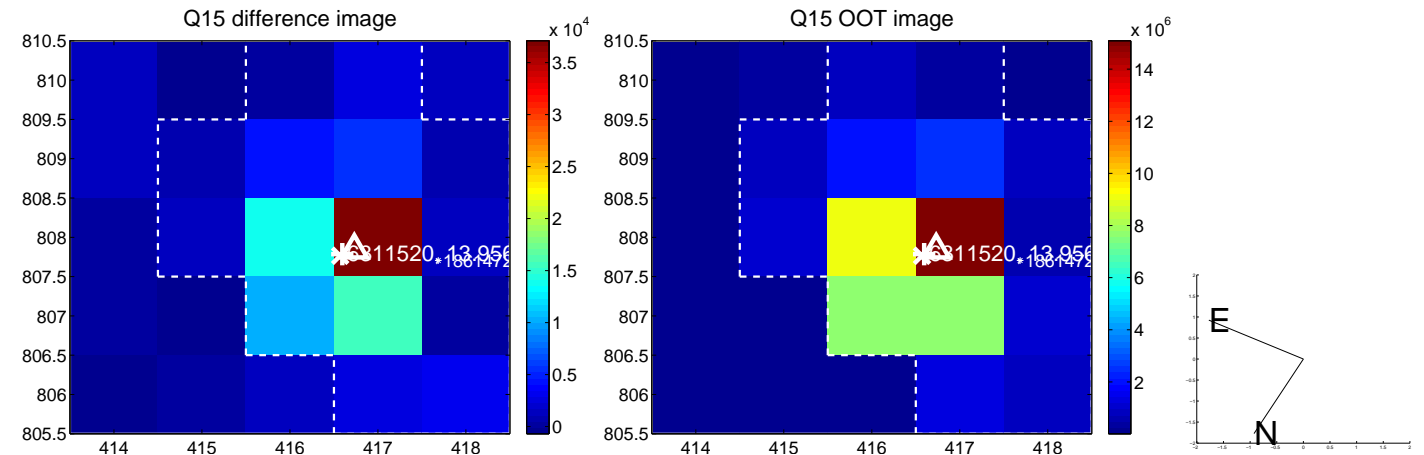
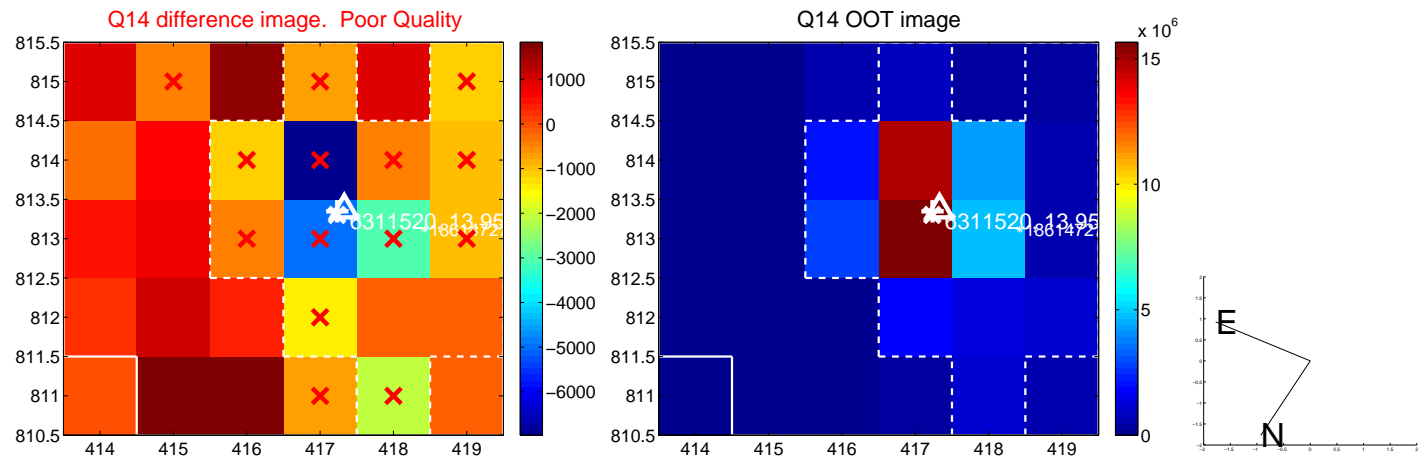
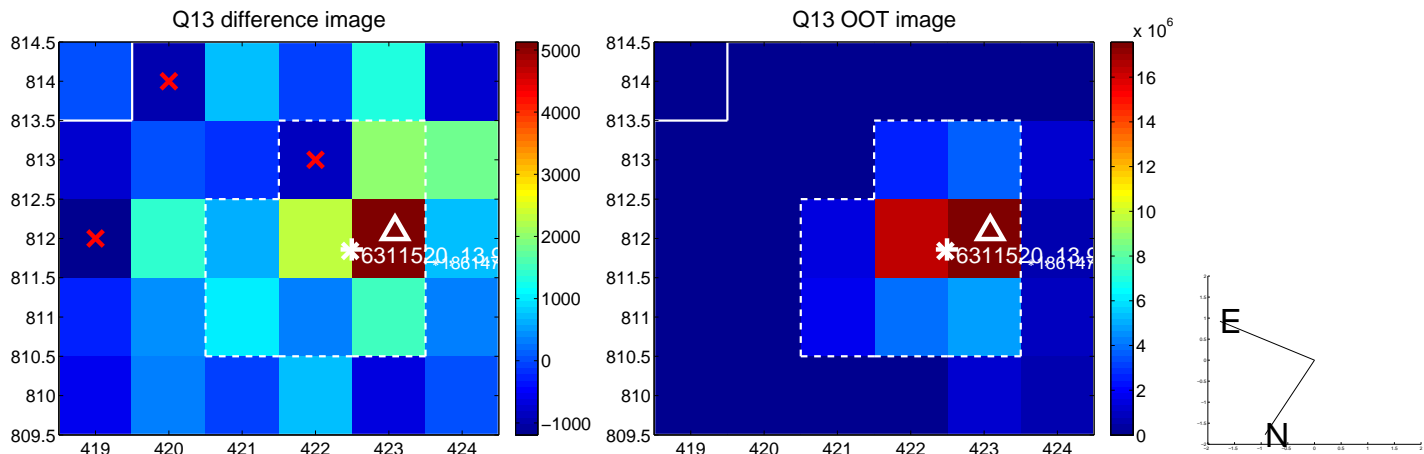
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



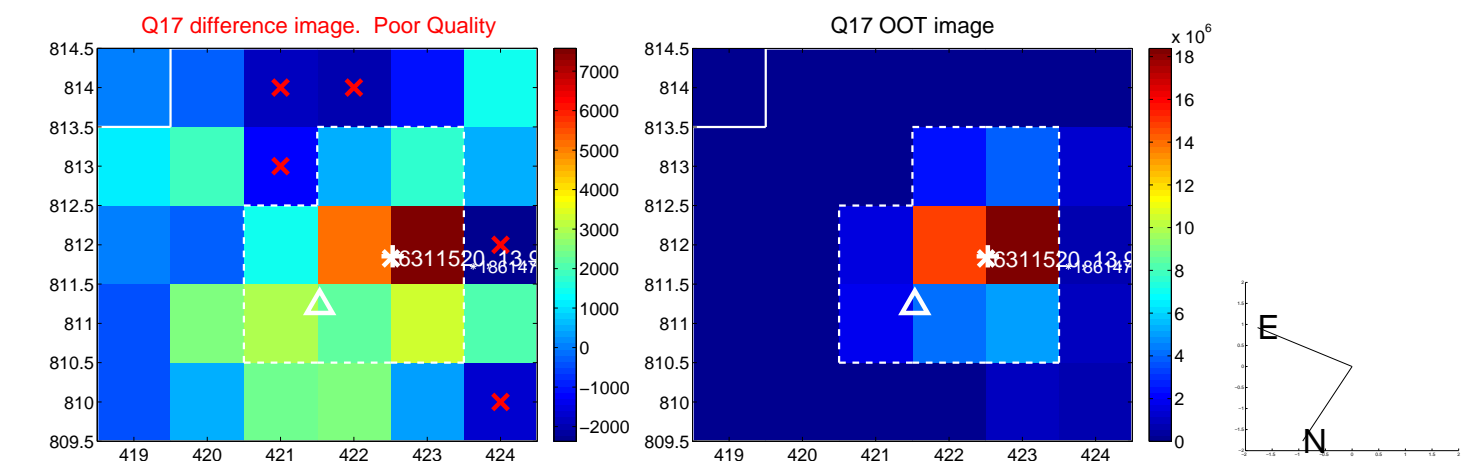
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



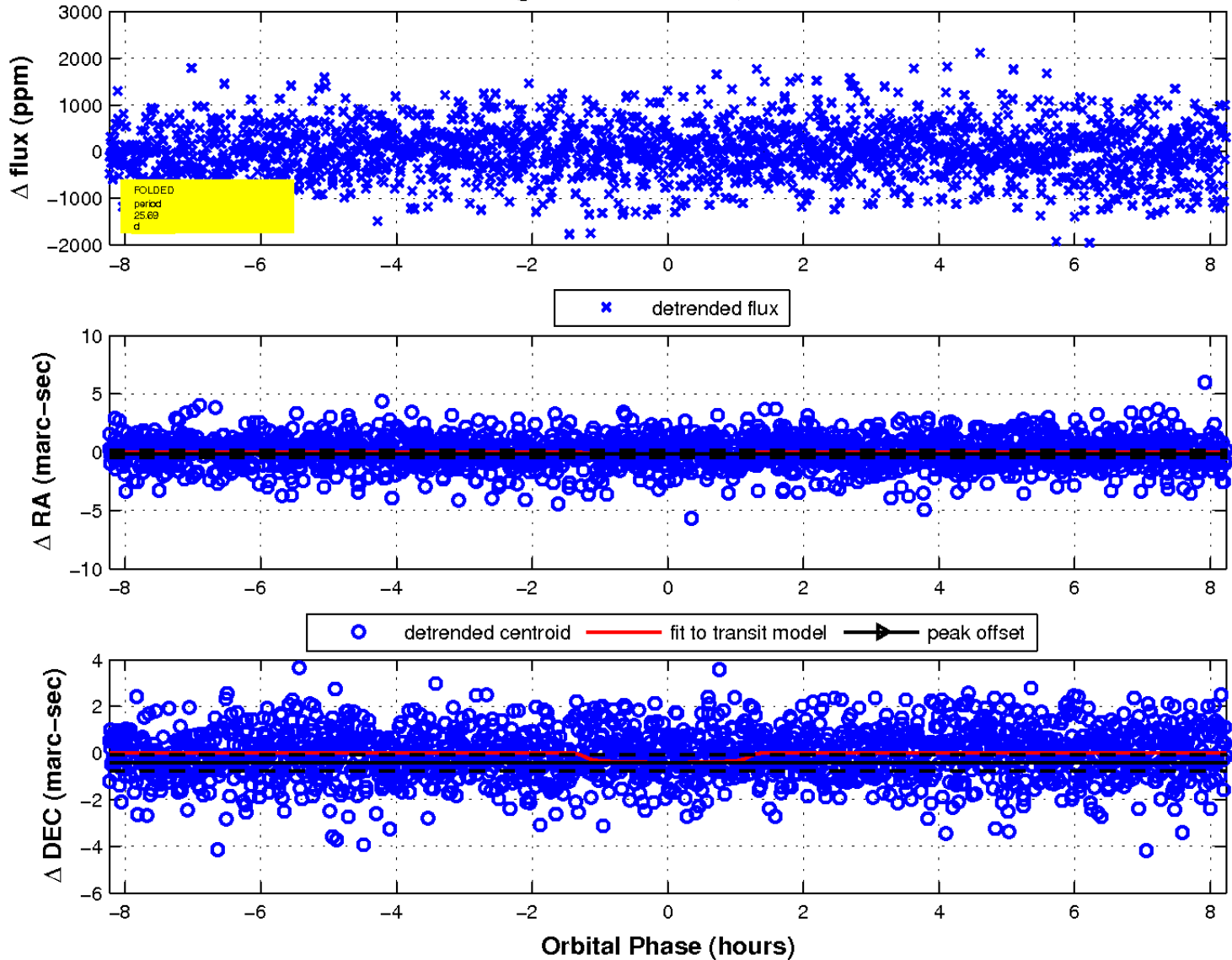
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 6 of 6



UKIRT Image

Declination

