

KIC 010918016

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})
010918016-01	OBS	No	621.886186	269.058680	5167.5	5.663	15.7	8.2	0.68	4197	4.74	0.08
010918016-02	OBS	No	1.040601	132.212686	456.2	6.455	12.2	17.6	0.68	4197	1.43	412.94
010918016-03	OBS	No	61.898834	144.176452	2620.9	2.269	15.1	7.7	0.68	4197	3.34	1.78
010918016-04	OBS	No	1.040541	131.712287	30.8	7.258	13.4	1.6	0.68	4197	0.36	412.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010918016-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
010918016-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
010918016-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT
010918016-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—SWEET_NTL—LPP_DV—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.

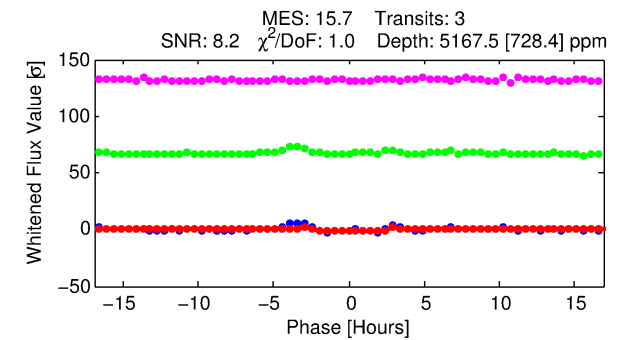
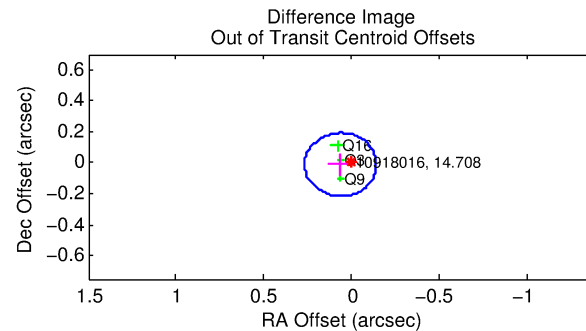
Ephemeris Match Information For 010918016-01

No Significant Match Found

KIC: 10918016 Candidate: 1 of 4 Period: 621.886 d

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Figure 1 is a plot of Relative Flux versus Time [BKJD] for the star HD 10180. The plot shows a noisy light curve with a baseline around 0.0. Several vertical dashed red lines mark specific times, labeled Q1 through Q17 with their corresponding [Fe/H] values in brackets. Three blue triangles point to specific times on the x-axis. The plot is titled with stellar parameters: $R_p: 14.71$, $T: 6360$ K, $T_{\text{eff}}: 4570$ K, $\text{Logg}: 4.61$, $\text{Fe/H}: 0.566$.

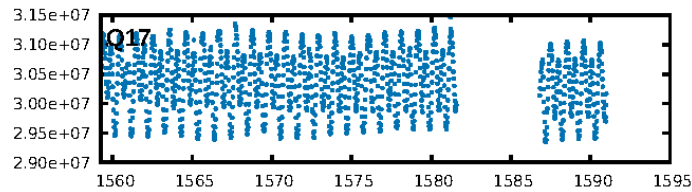
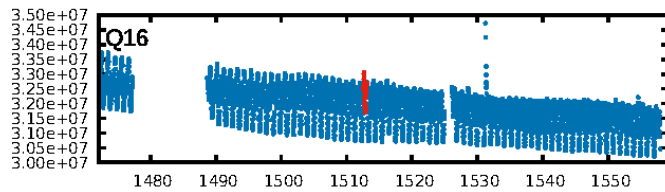
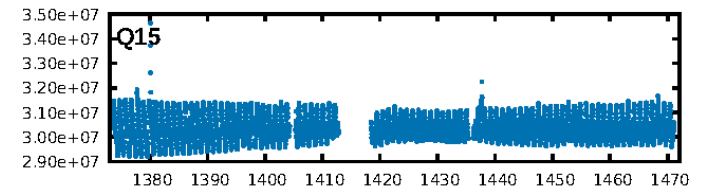
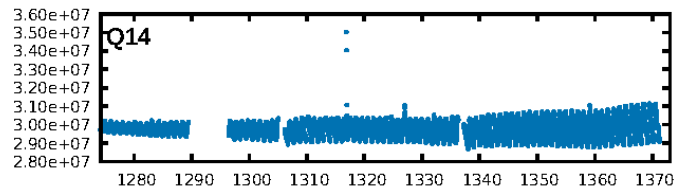
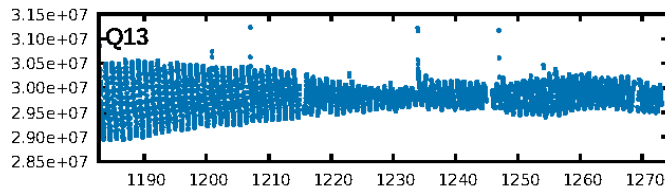
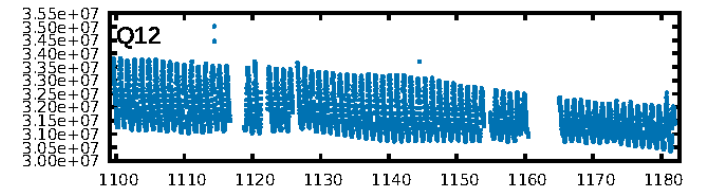
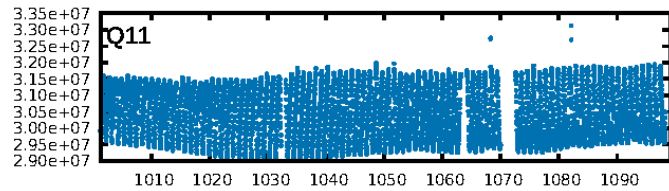
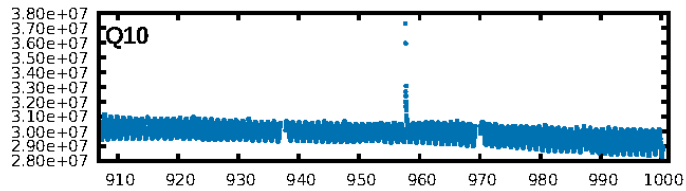
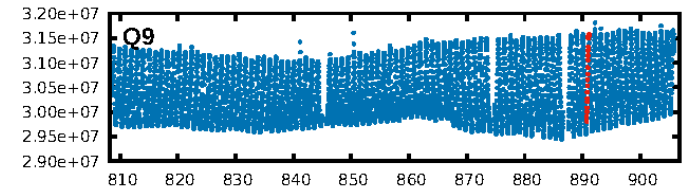
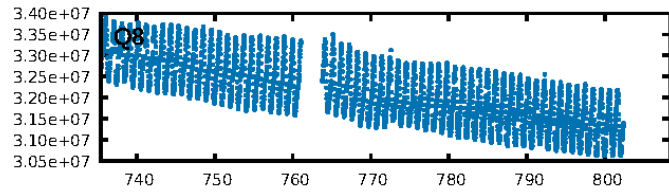
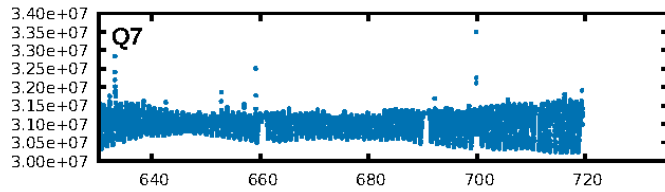
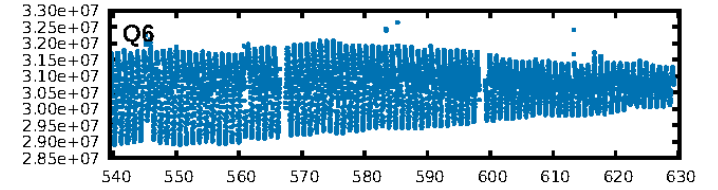
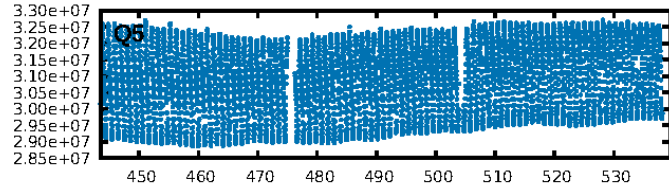
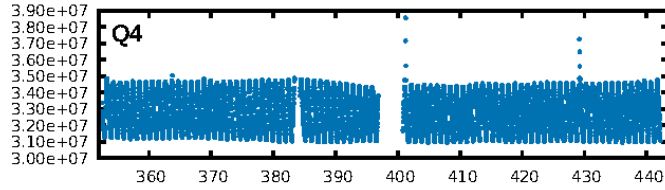
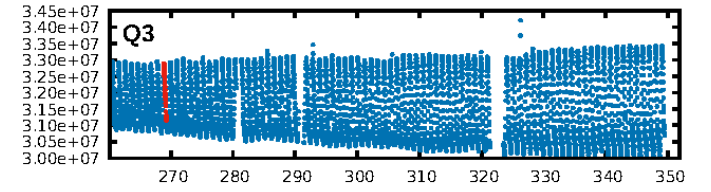
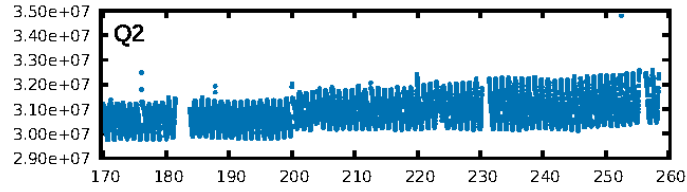
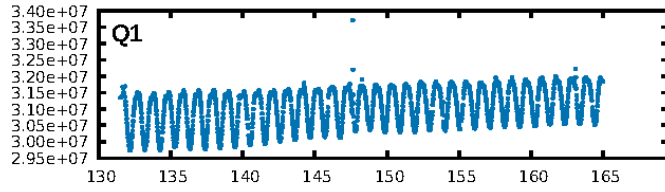


ShortPeriod-sig: 100.0% [2203.15σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.3%
ModelChiSquareGof-sig: 82.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 5.262

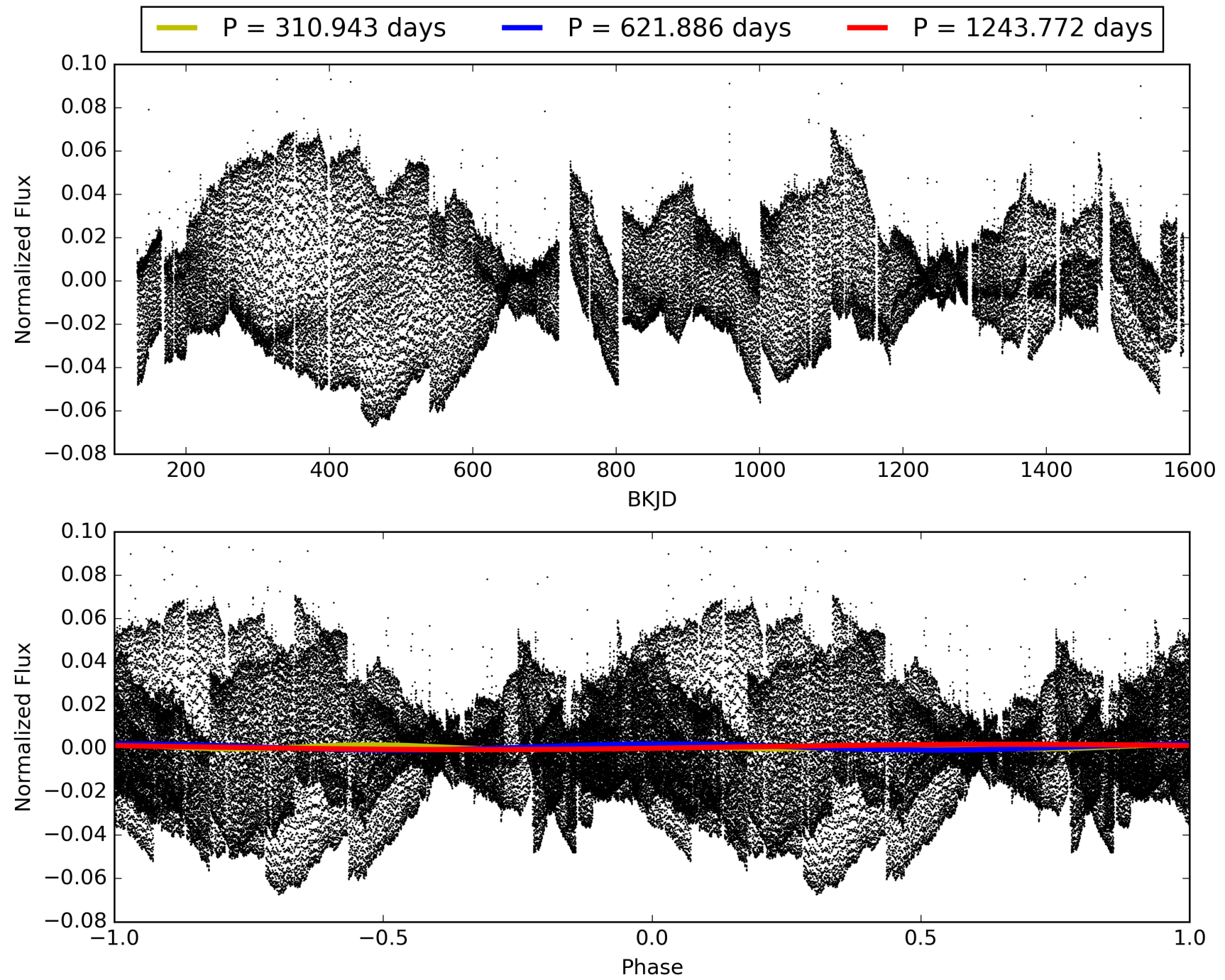
Centroid-sig: 2.0%
Centroid-so: 0.334 arcsec [1.87σ]
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OotOffset-rm: 0.126 arcsec [1.82σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.00 [0/3]

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

TCE 010918016-01, PDC Light Curves

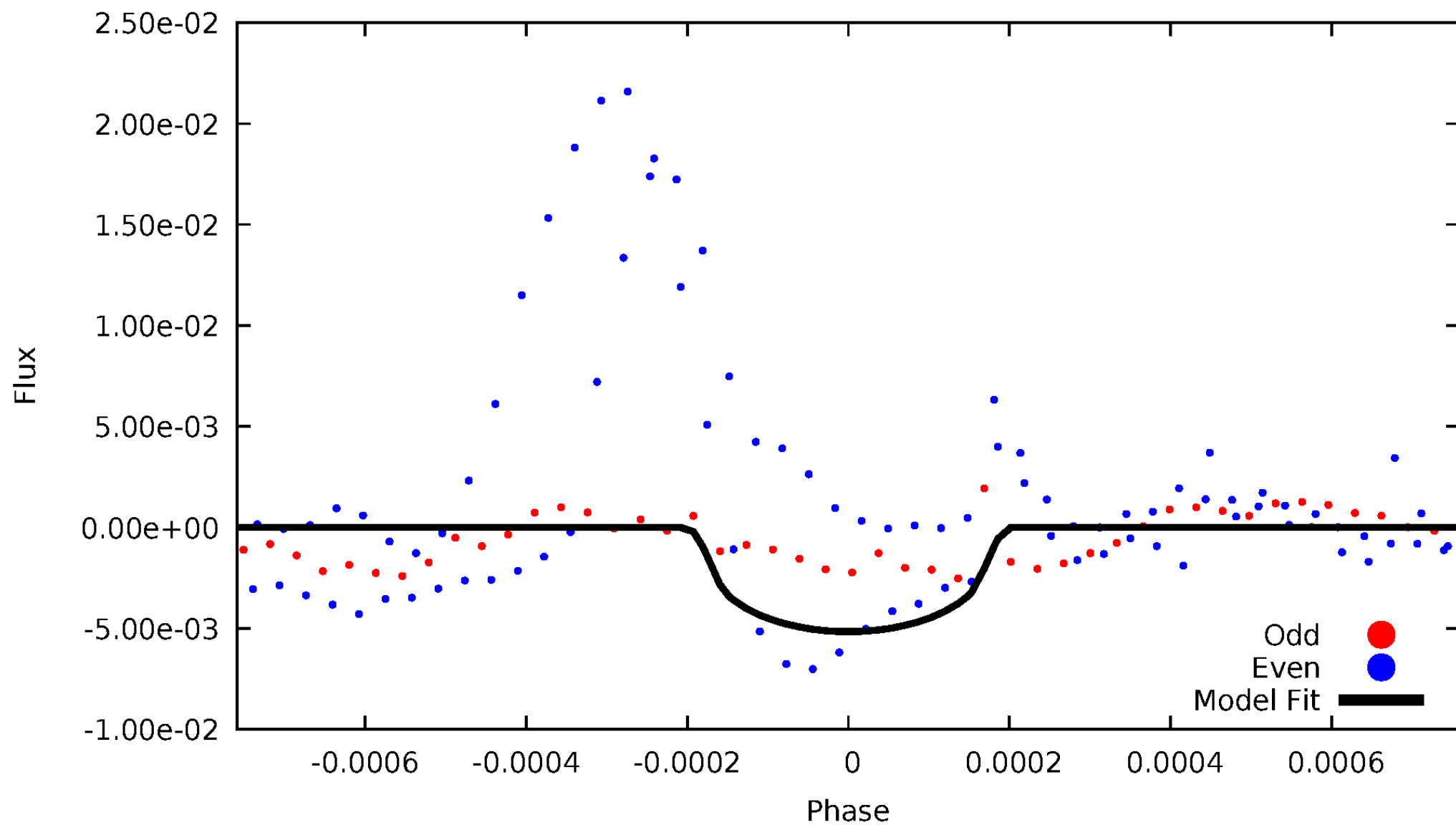


TCE 010918016-01



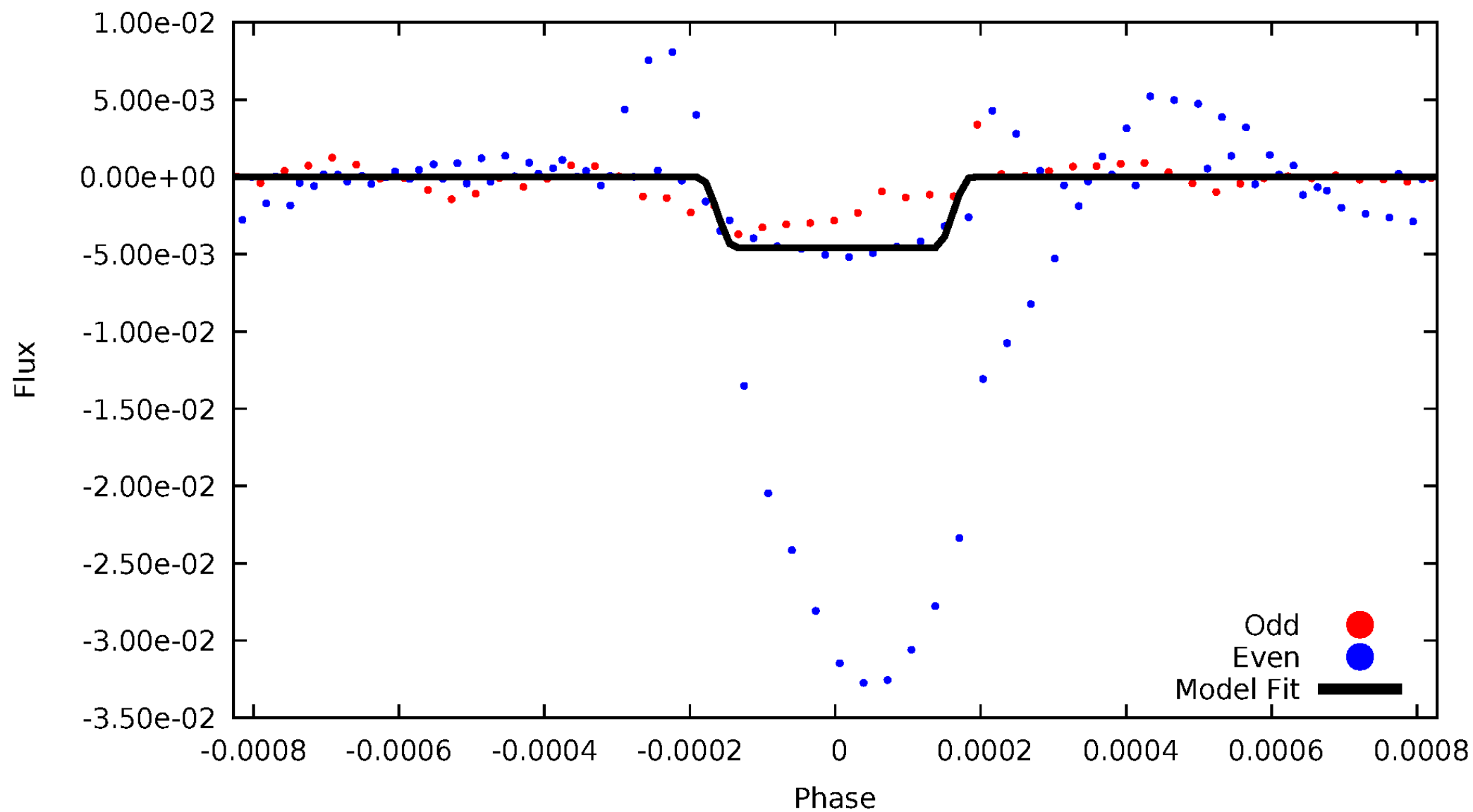
DV Odd/Even

TCE 010918016-01



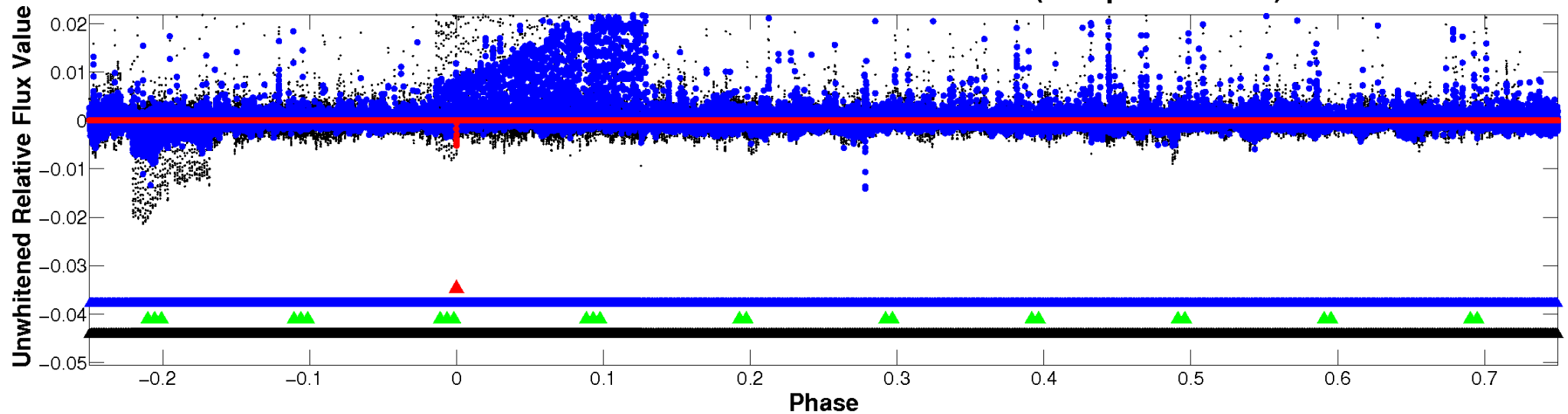
ALT Odd/Even

TCE 010918016-01

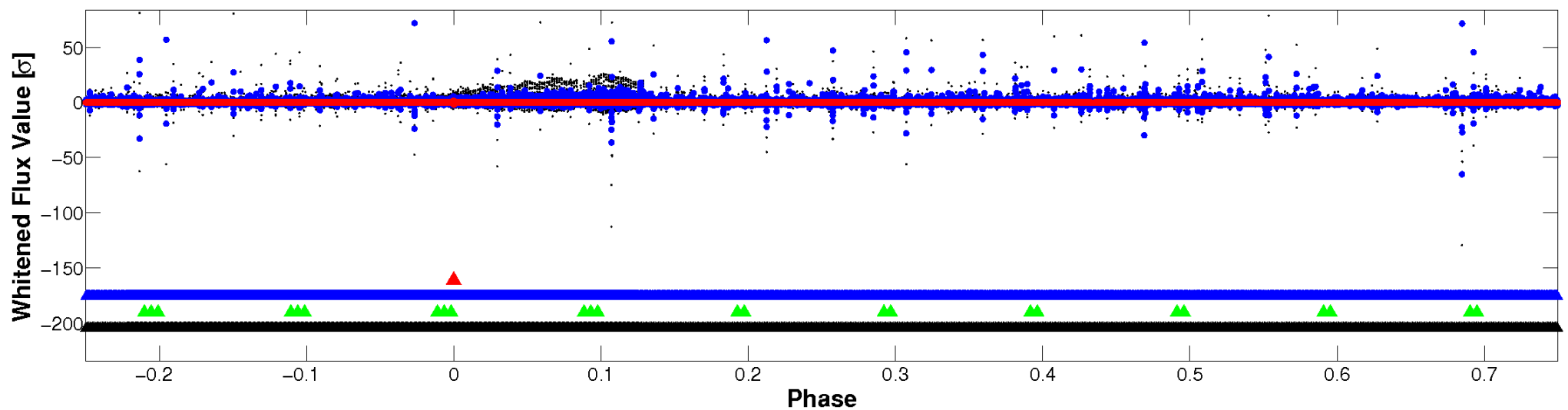


Non-Whitened Vs. Whitened Light Curve

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

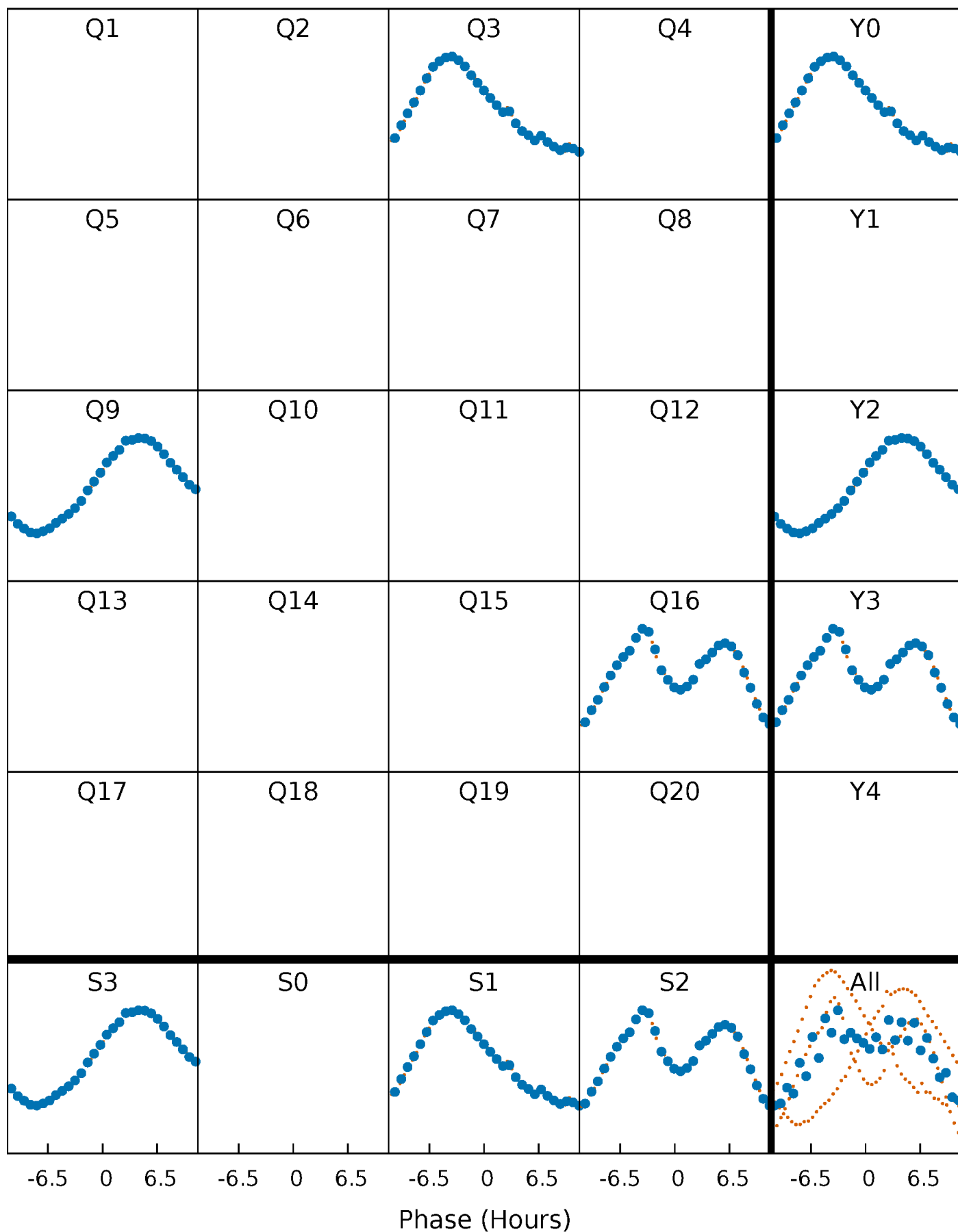


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



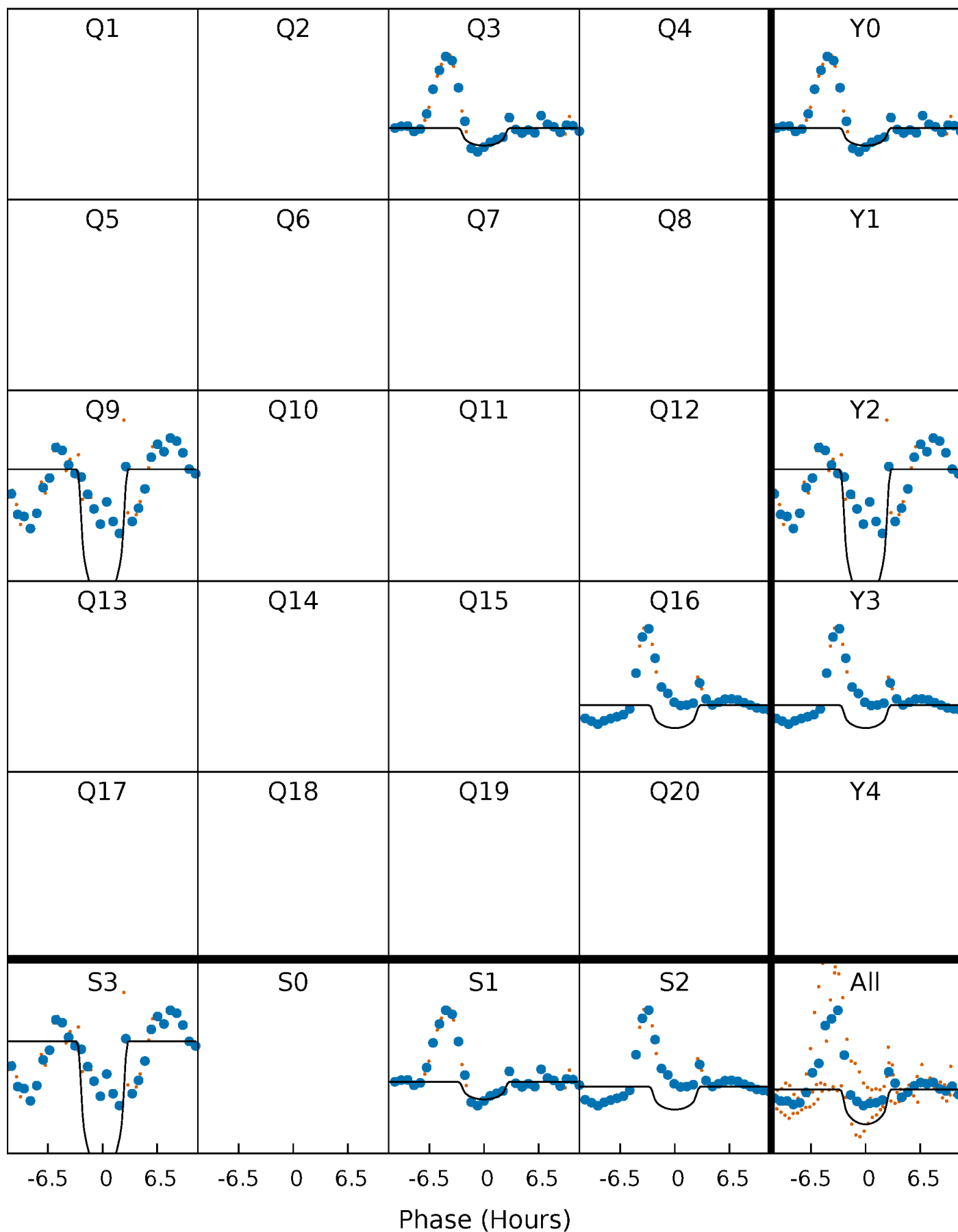
PDC Quarter-Phased Transit Curves

TCE 010918016-01 P=621.886186 Days $T_0=269.058680$ (BKJD)



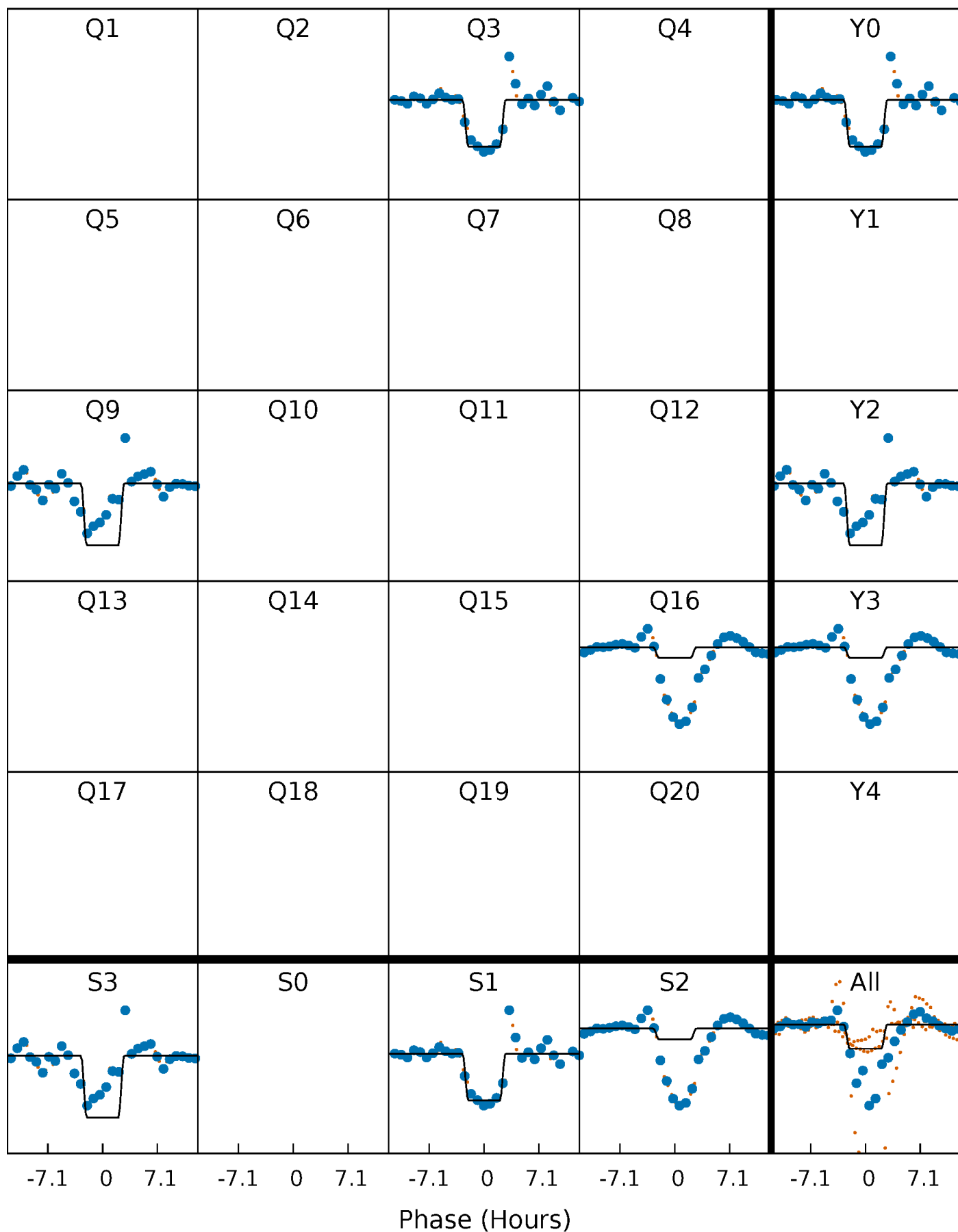
DV Quarter-Phased Transit Curves

TCE 010918016-01 P=621.886186 Days $T_0=269.058680$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

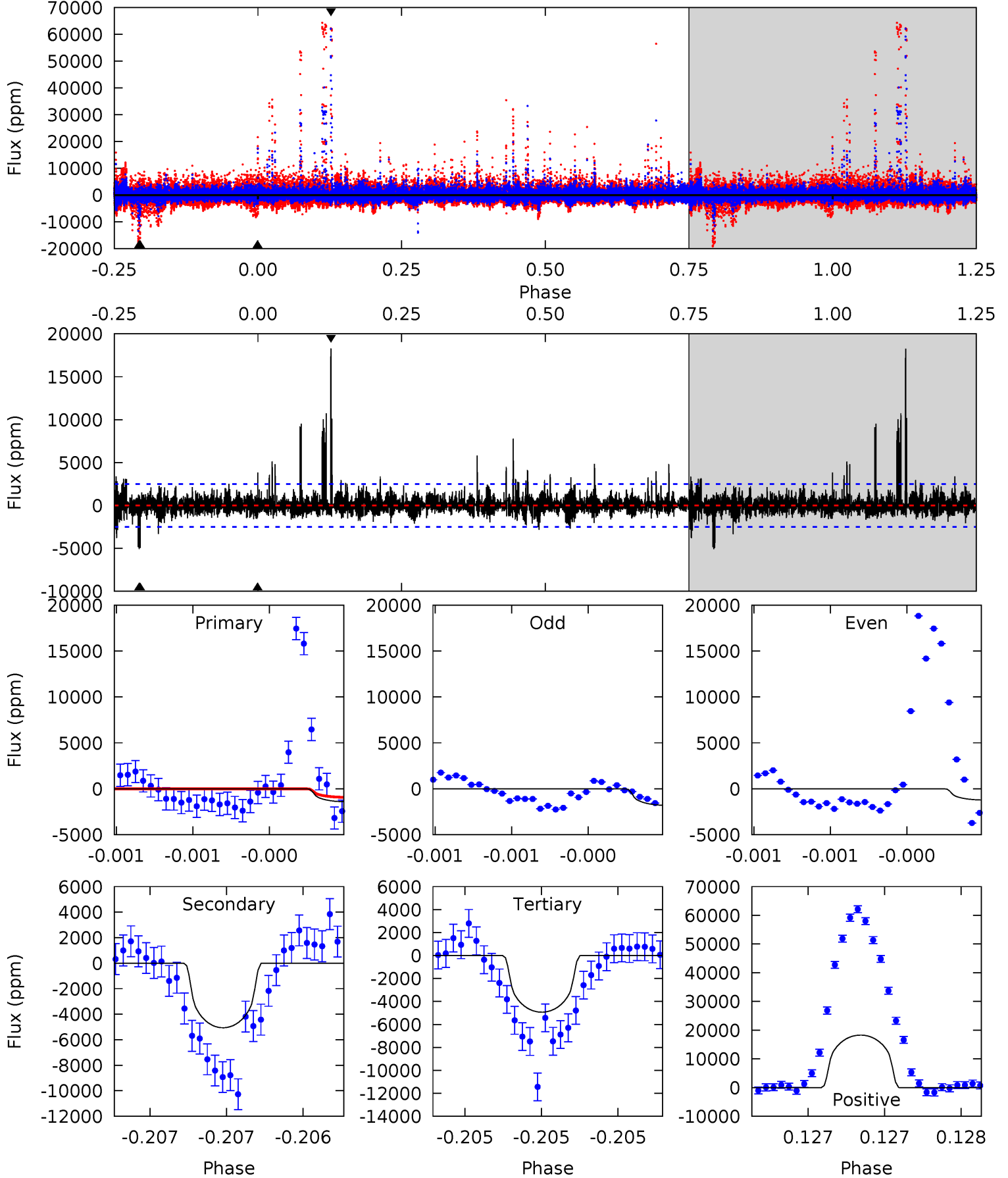
TCE 010918016-01 P=621.888587 Days $T_0=269.039889$ (BKJD)



DV Model-Shift Uniqueness Test

010918016-01, P = 621.886186 Days, E = 269.058680 Days

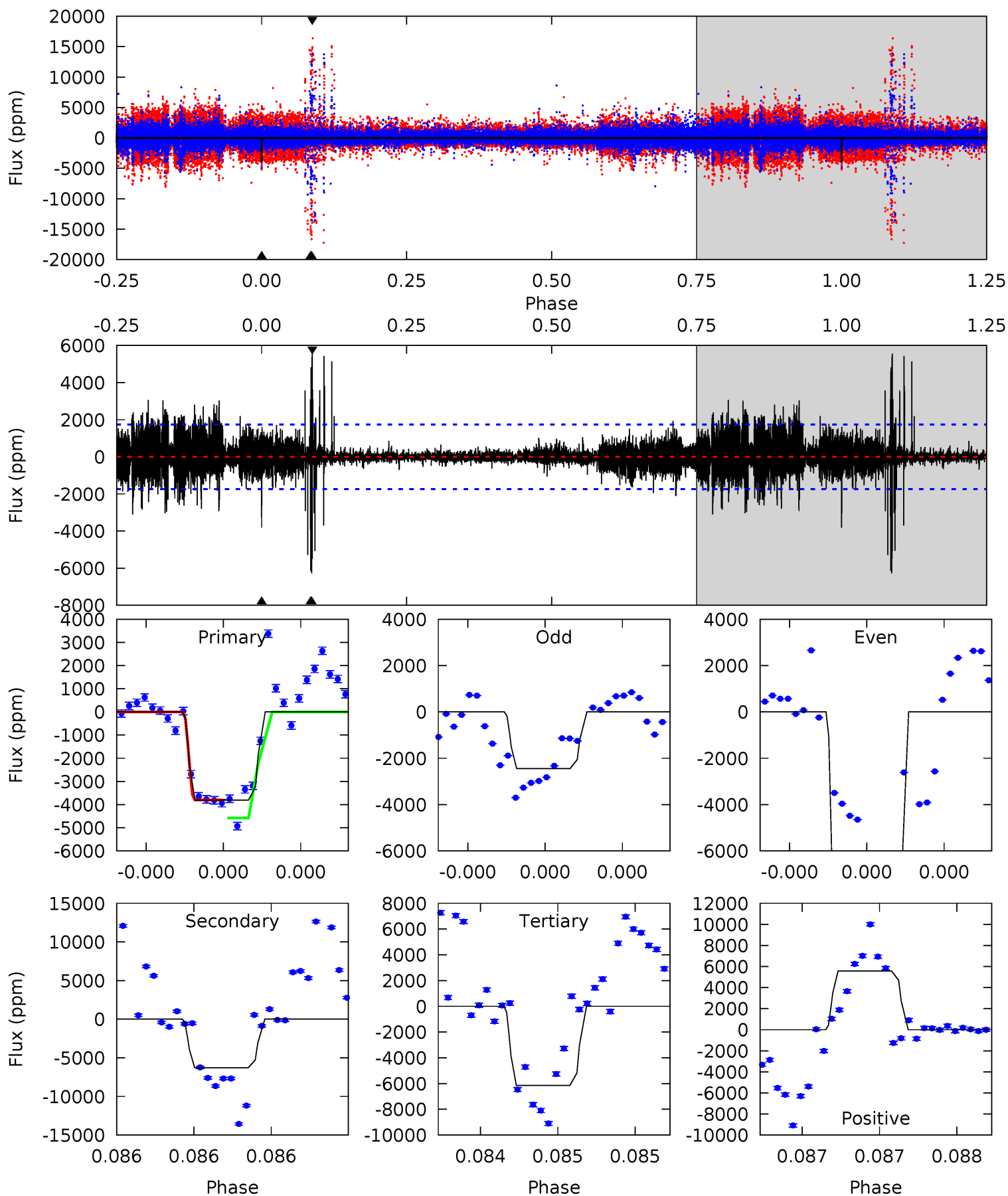
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.18	11.4	11.1	41.1	5.61	3.54	2.28	-7.92	-38.0	0.29	-29.7	0.41	0.79	0.78	1.09



Alt Model-Shift Uniqueness Test

010918016-01, P = 621.888587 Days, E = 269.039889 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	20.3	19.9	18.0	5.63	3.57	2.14	-7.56	-5.68	0.41	2.28	17.4	2.51	0.47	1.17



Stellar Parameters For KIC 010918016

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4197^{+146}_{-161}	$4.605^{+0.052}_{-0.016}$	$0.360^{+0.100}_{-0.300}$	$0.683^{+0.023}_{-0.058}$	$0.684^{+0.038}_{-0.055}$	$3.027^{+0.696}_{-0.202}$
	+3%/-4%	+1%/-0%	+28%/-83%	+3%/-8%	+6%/-8%	+23%/-7%
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 010918016-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-5063 ± 444	$4.65^{+1.57}_{-1.55}$	189^{+7}_{-8}	4382^{+826}_{-488}	$204242^{+259220}_{-89403}$
Alt.	-6273 ± 310	$4.95^{+1.52}_{-1.51}$	189^{+7}_{-8}	4439^{+807}_{-449}	$223687^{+242416}_{-93748}$

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

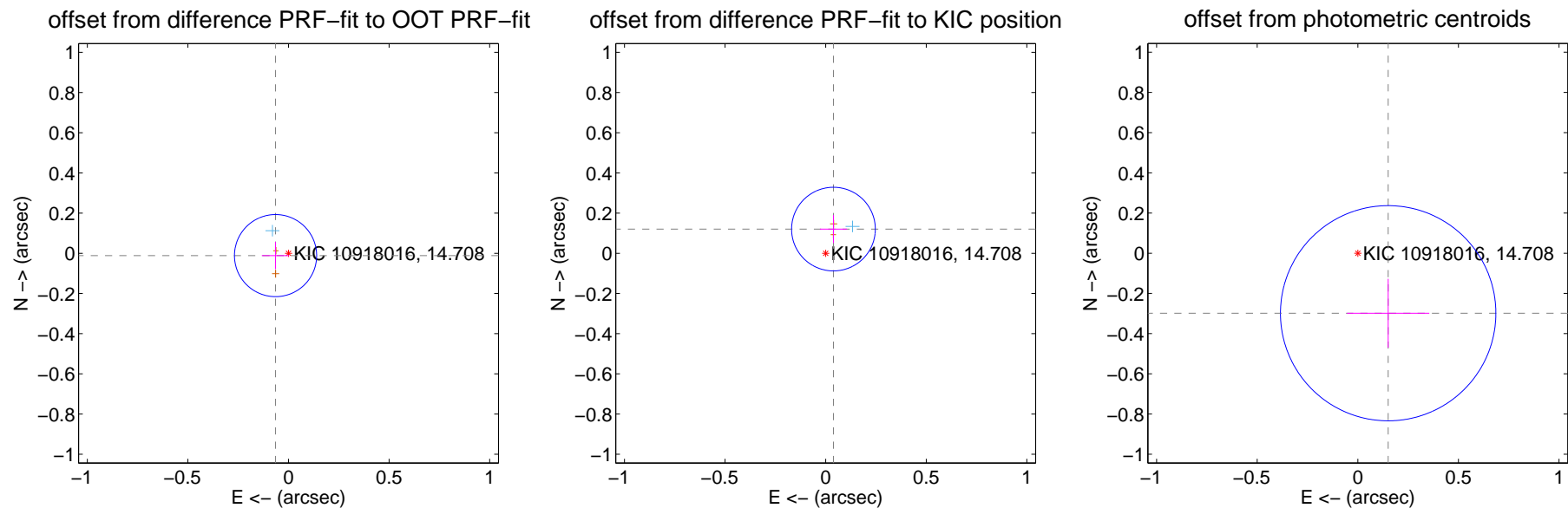
DV Centroid Data

Supplemental centroid analysis for 010918016-01. Kepler magnitude: 14.71. Transit SNR 8.18

There are 1 quarters with good PRF difference image offsets

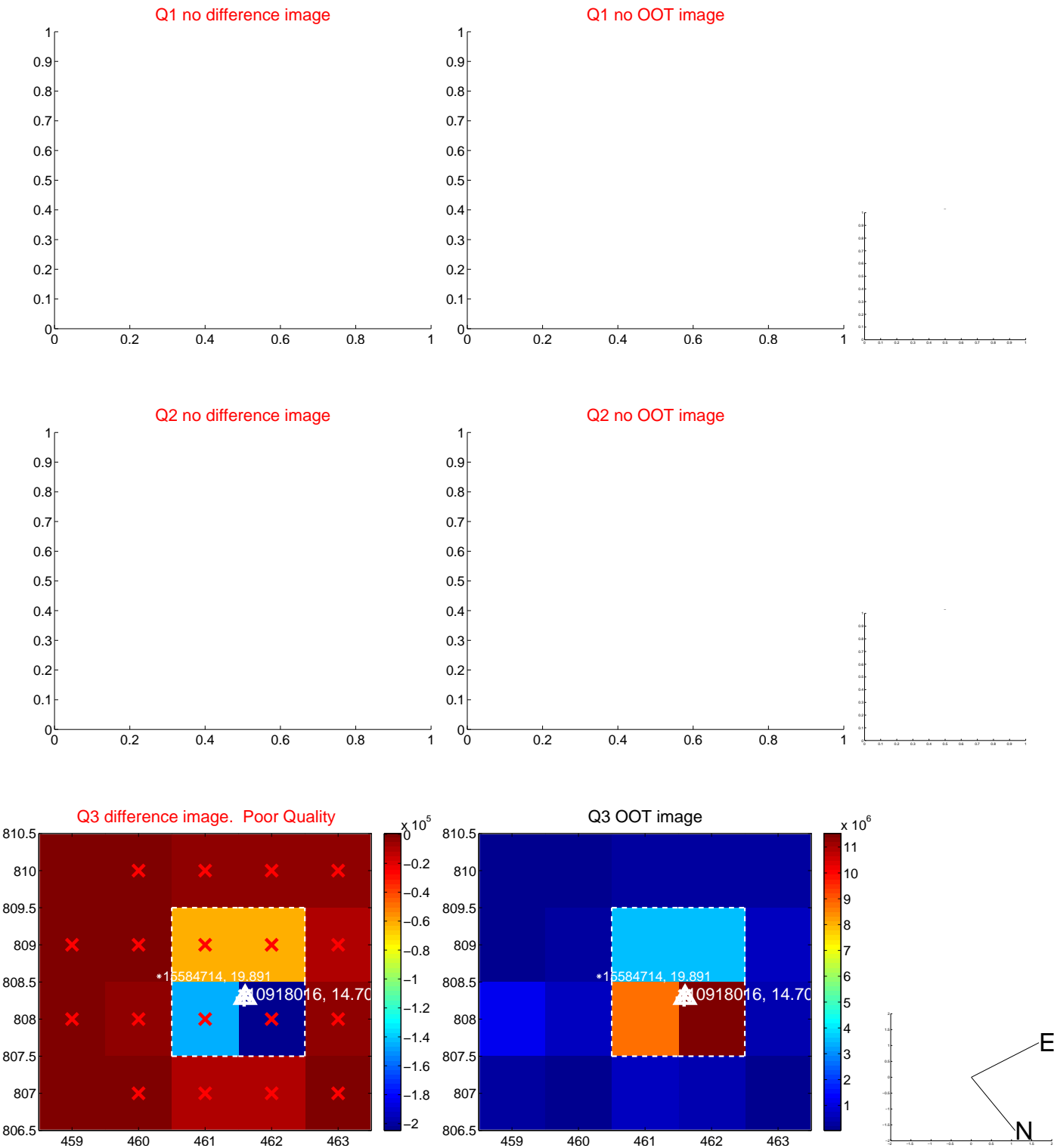
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.065 ± 0.068	0.96	0.064 ± 0.068	-0.012 ± 0.068
PRF-fit source offset from KIC position	0.126 ± 0.069	1.82	-0.039 ± 0.067	0.120 ± 0.070
photometric centroid source offset	0.33 ± 0.18	1.87	-0.15 ± 0.20	-0.30 ± 0.17



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.

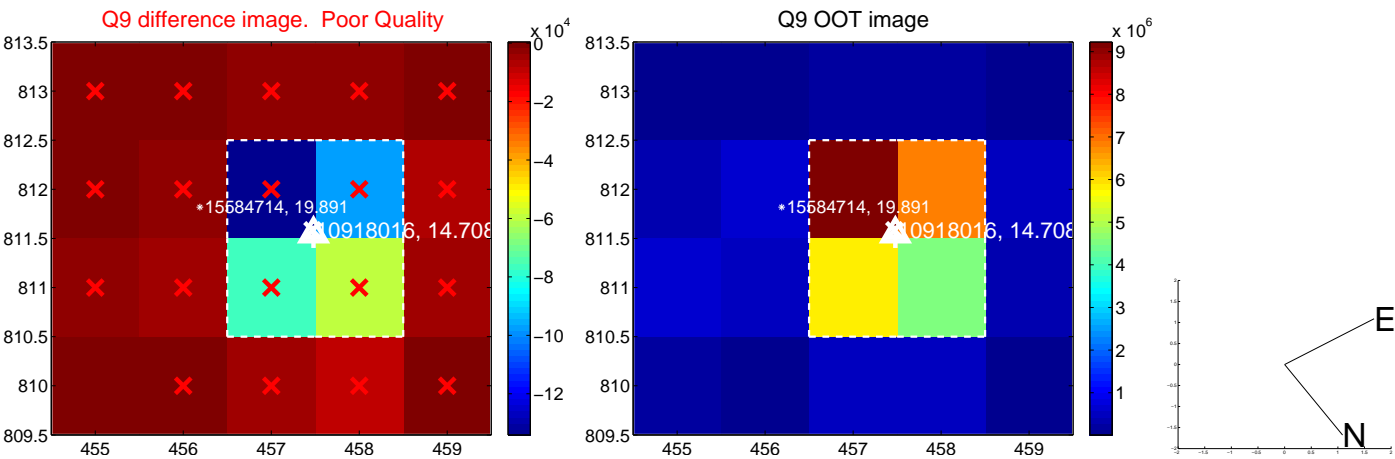
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



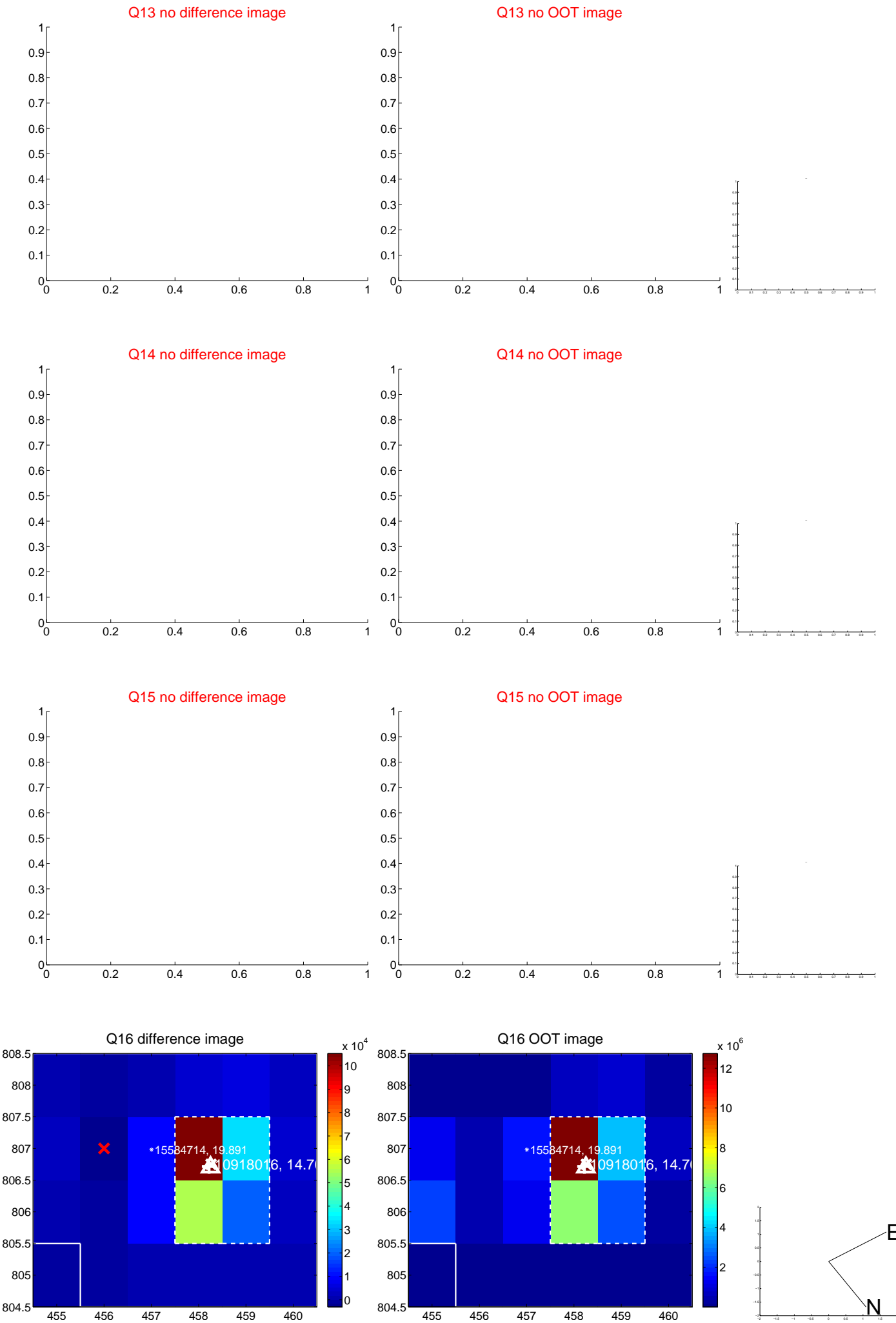
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



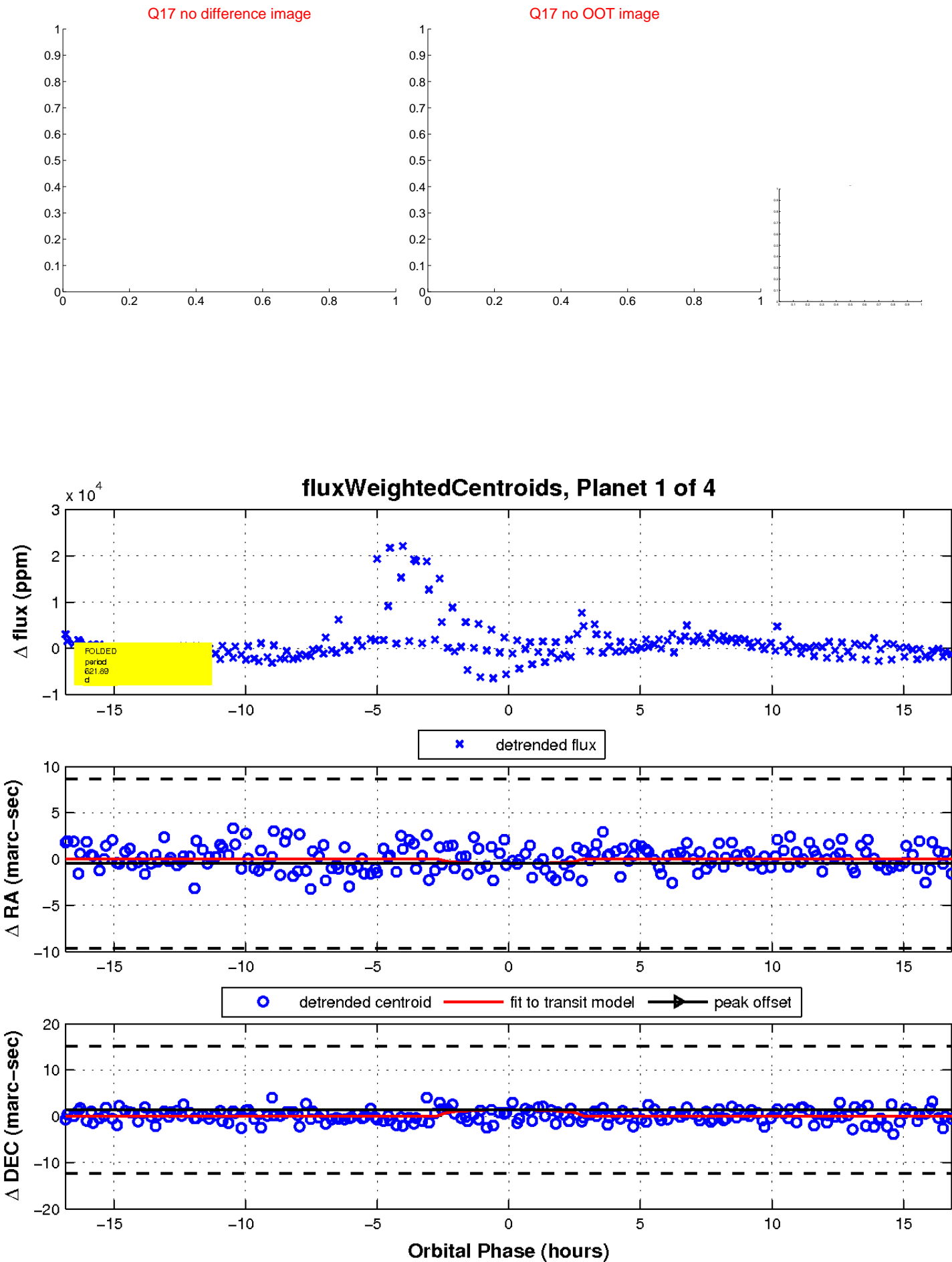
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

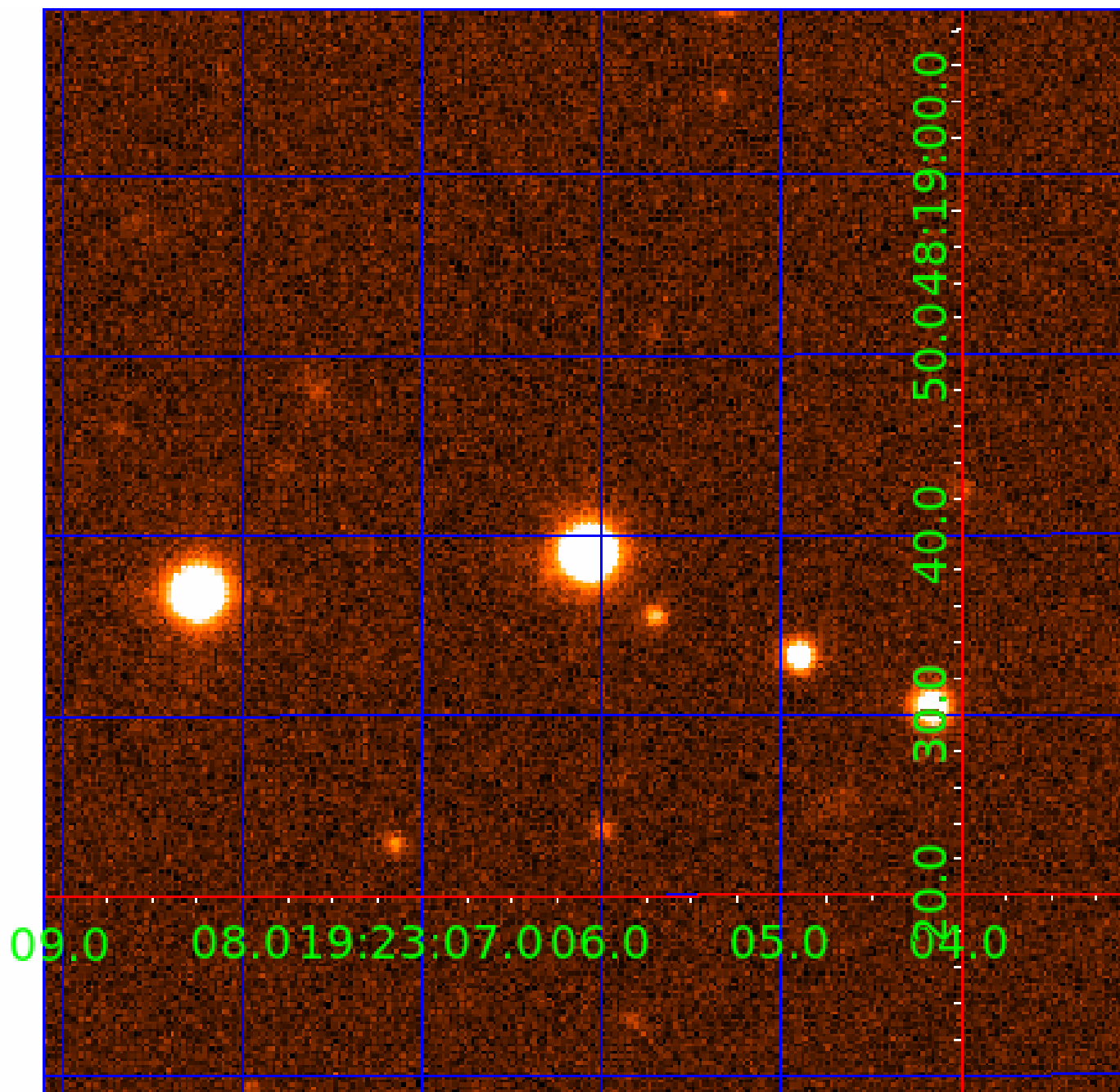


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010918016

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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Robovetter Results

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010918016-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
010918016-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT
010918016-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—SWEET_NTL—LPP_DV—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.

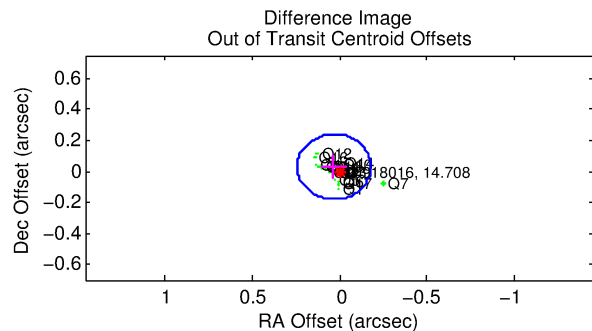
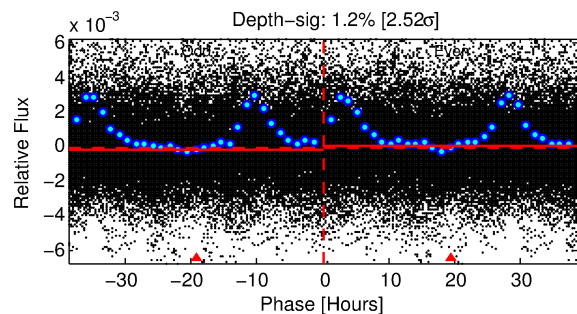
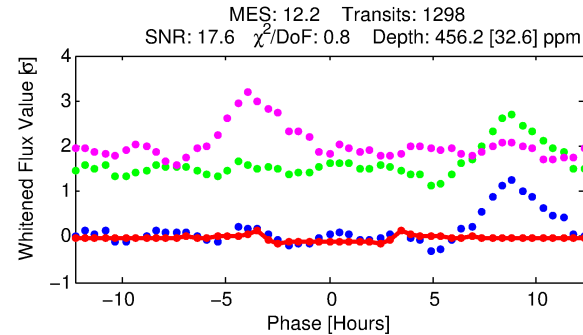
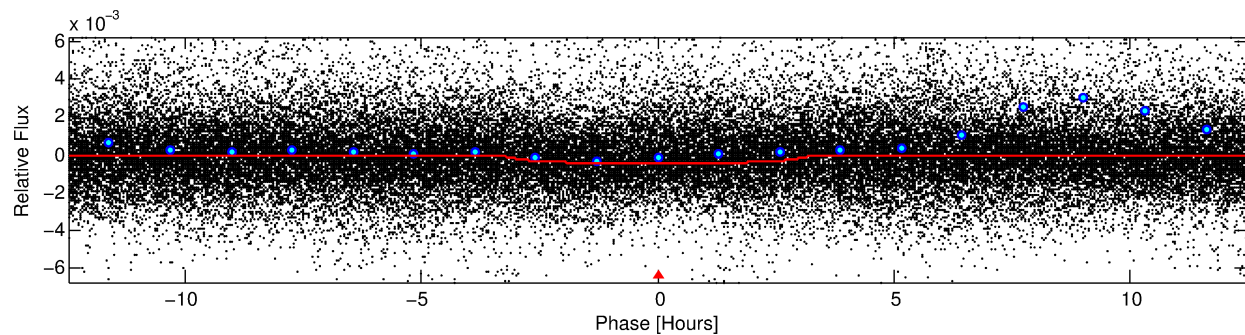
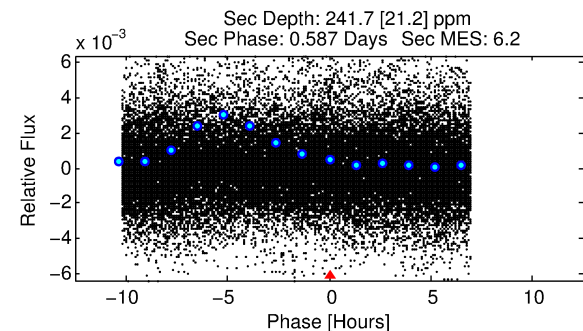
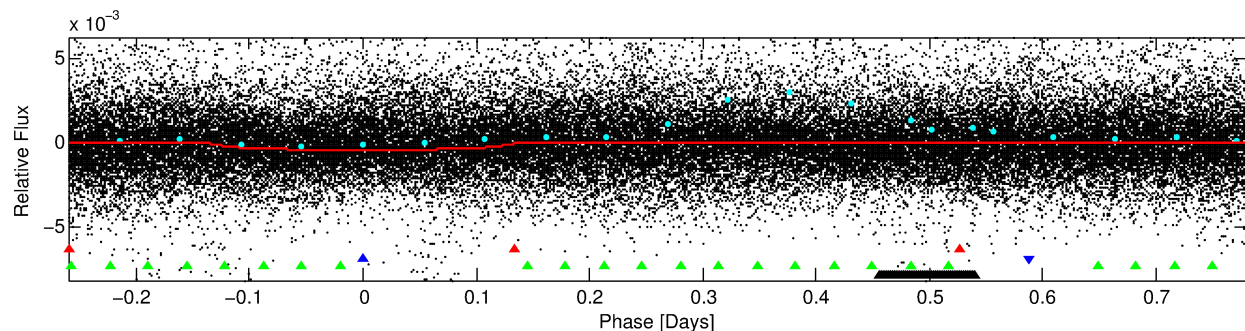
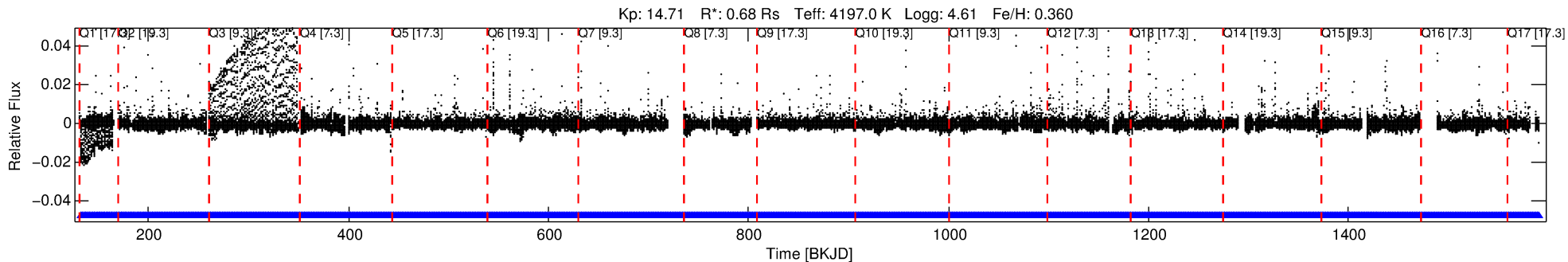
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010918016-02

No Significant Match Found

DV One-Page Summary

KIC: 10918016 Candidate: 2 of 4 Period: 1.041 d



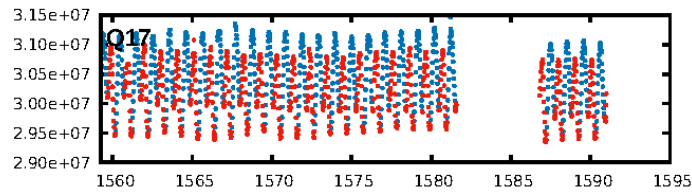
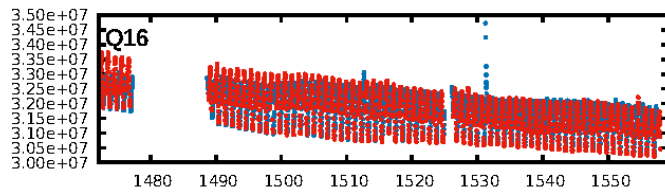
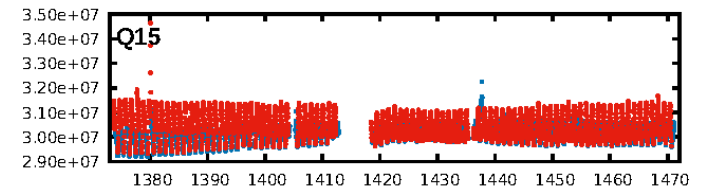
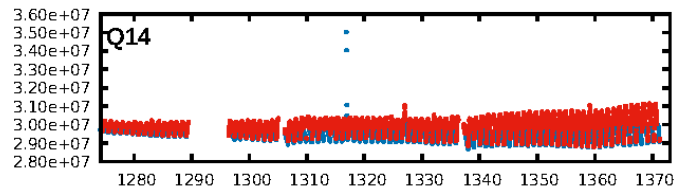
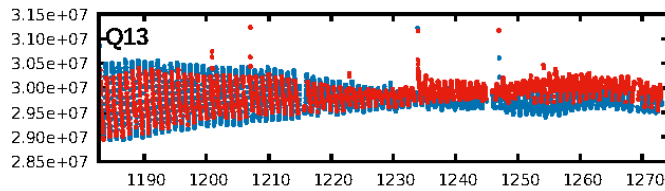
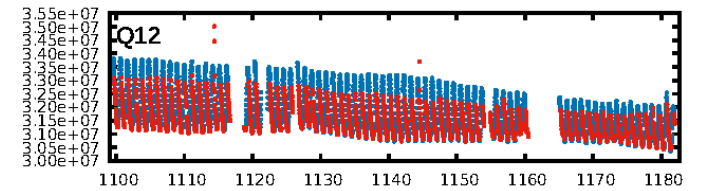
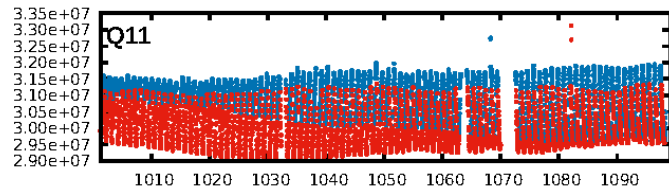
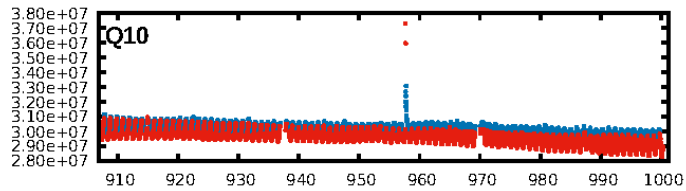
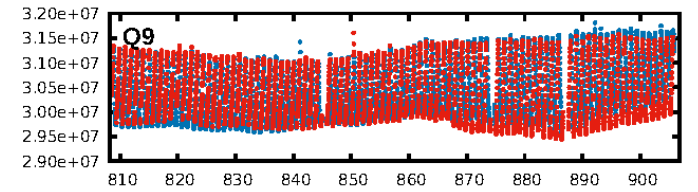
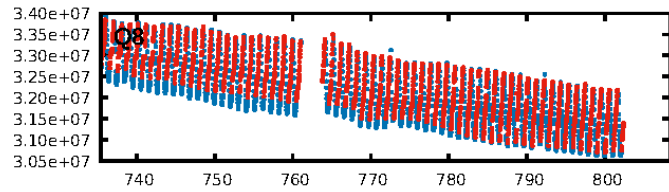
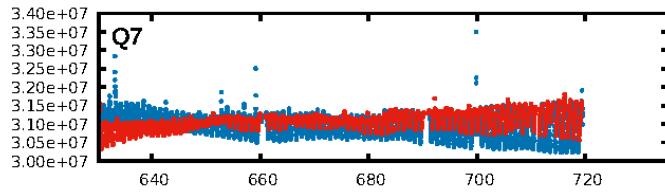
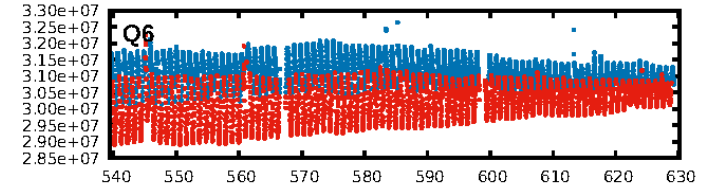
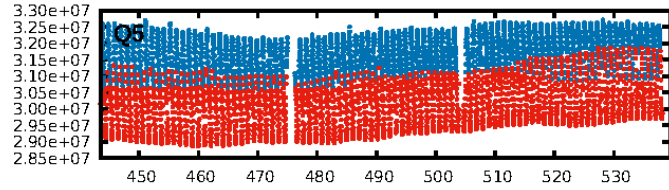
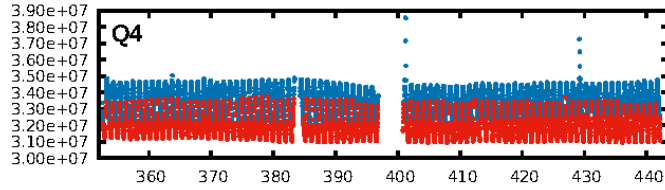
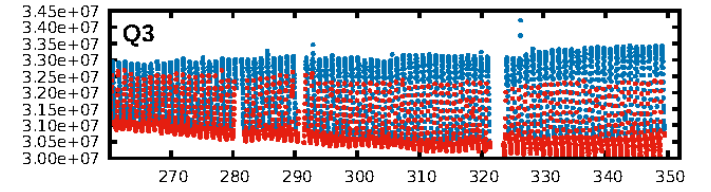
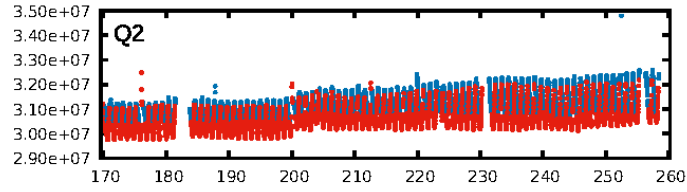
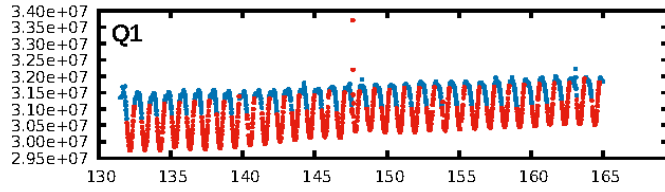
DV Fit Results:

Period = 1.04060 [0.00001] d
Epoch = 132.2127 [0.0012] BKJD
Rp/R* = 0.0192 [0.0031]
a/R* = 1.35 [0.28]
b = 0.41 [0.97]
Seff = 412.94 [75.15]
Teff = 1149 [52] K
Rp = 1.43 [0.26] Re
a = 0.0177 [0.0012] AU
Ag = 20.43 [7.12] [2.73σ]
Teffp = 3778 [348] K [7.48σ]

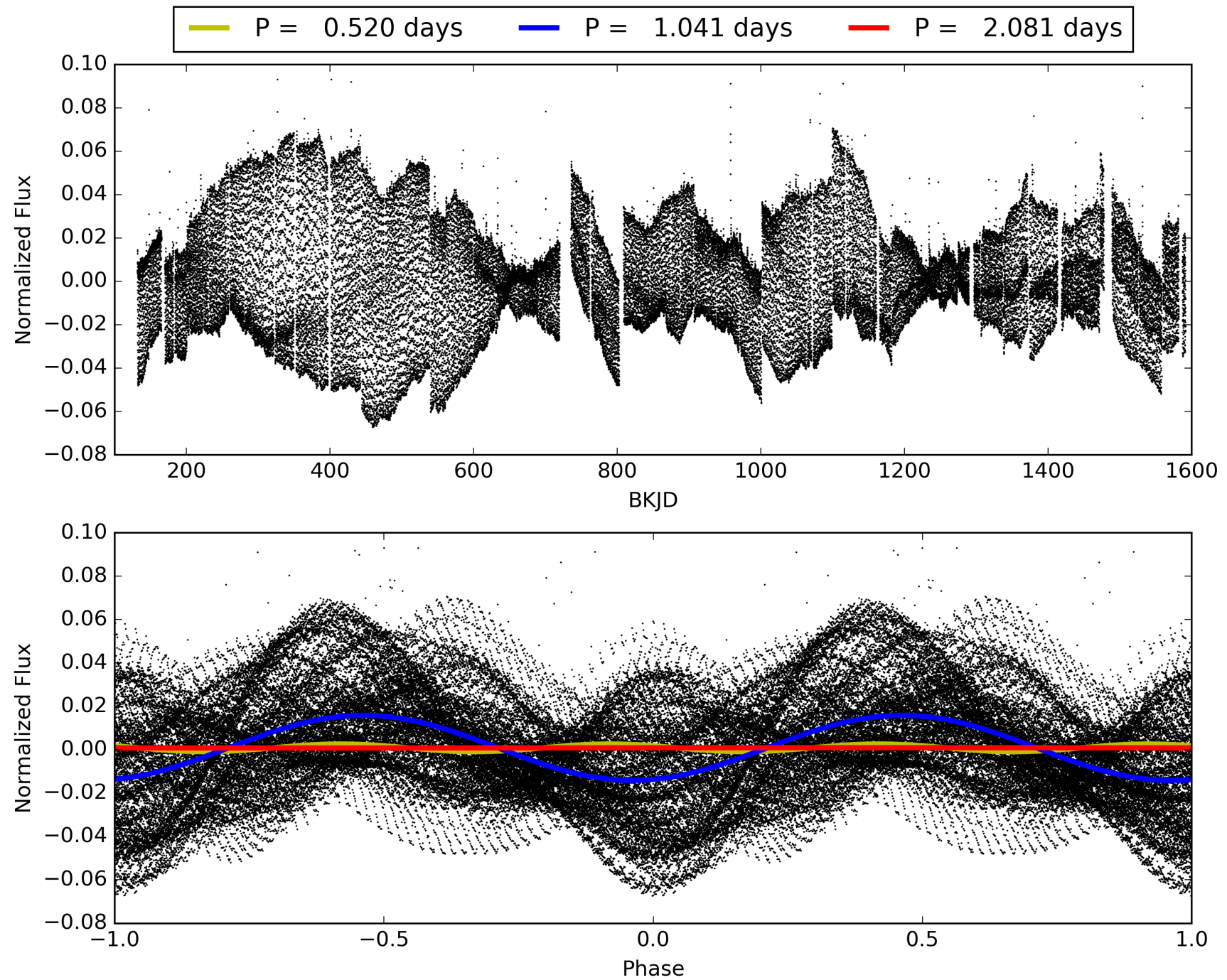
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [213.46σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1240/1240]
GhostDiagnostic-chr: -0.6934
Centroid-sig: 0.1%
Centroid-so: 0.437 arcsec [4.33σ]
OotOffset-rm: 0.044 arcsec [0.63σ]
KicOffset-rm: 0.106 arcsec [1.56σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.59 [10/17]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 010918016-02, PDC Light Curves

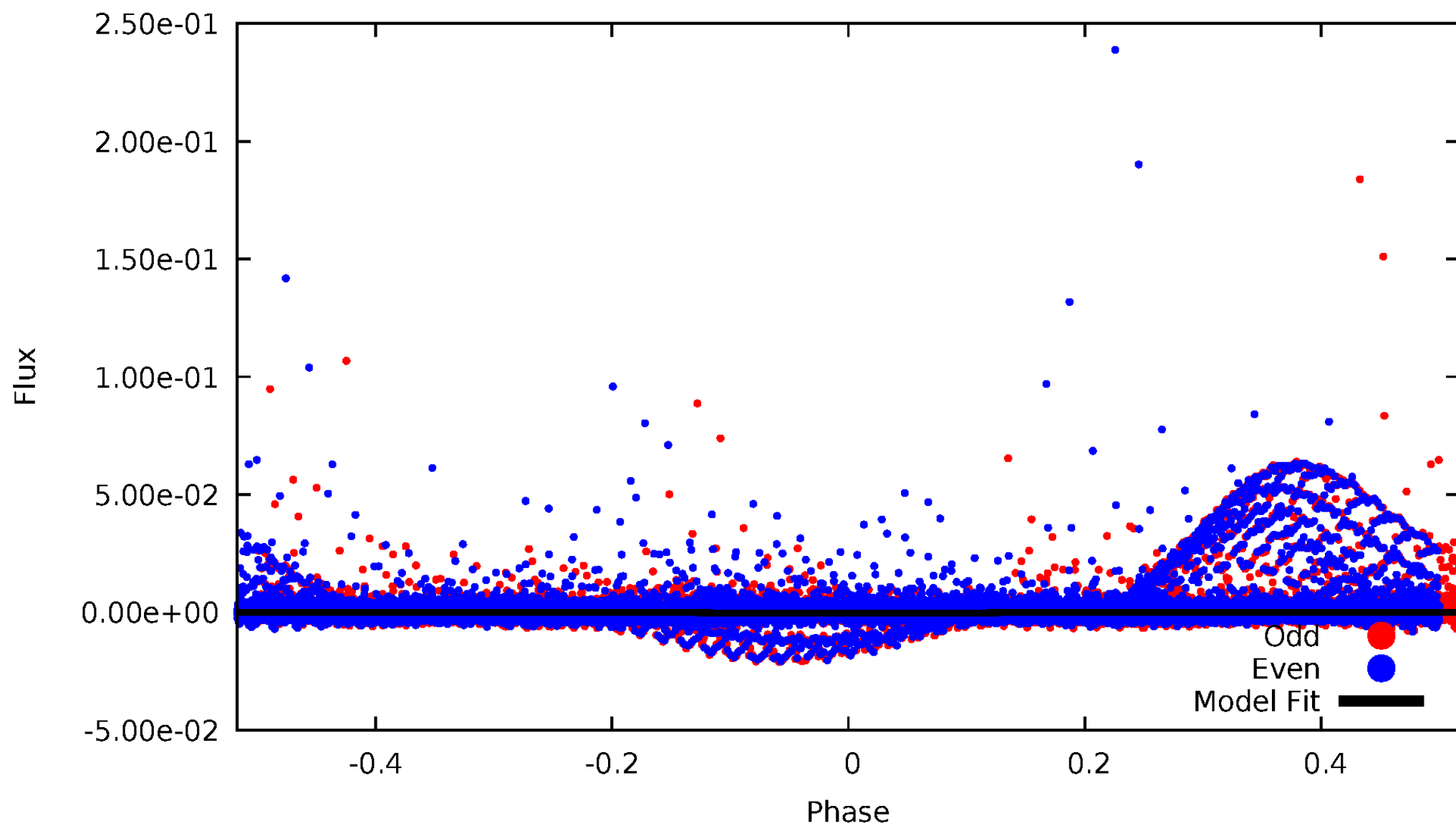


TCE 010918016-02



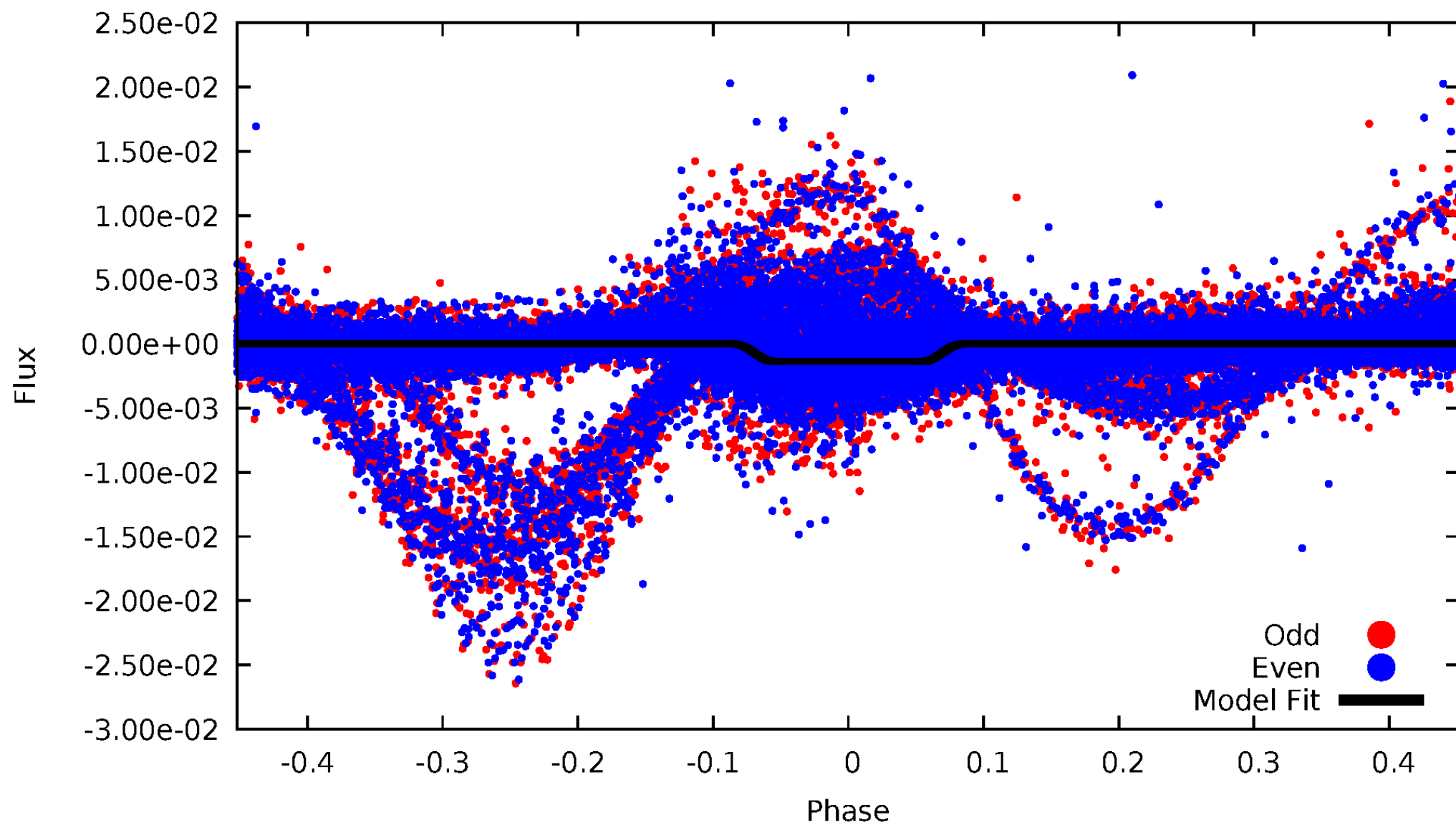
DV Odd/Even

TCE 010918016-02



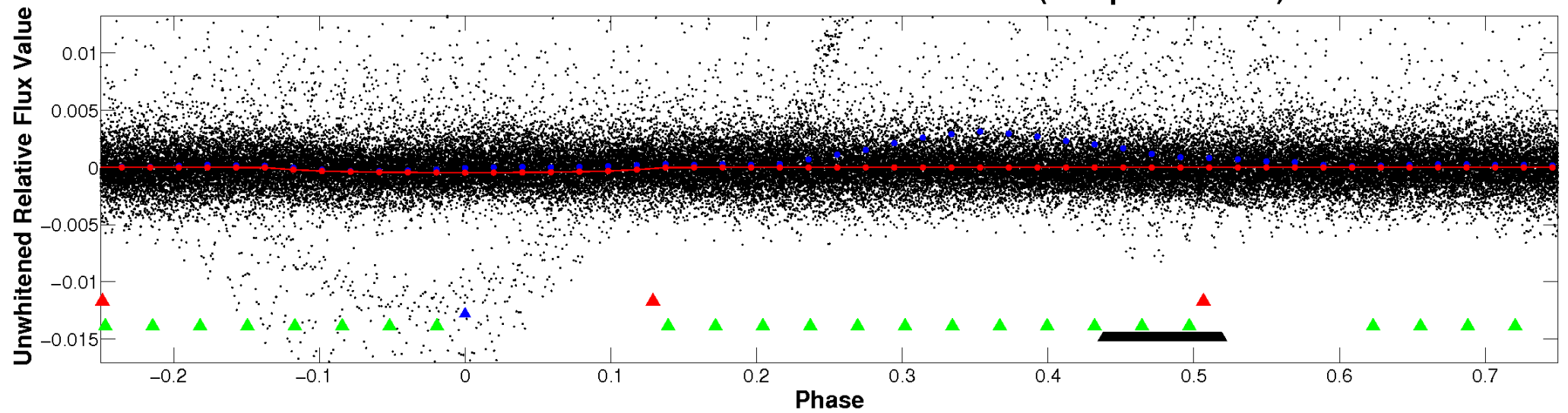
ALT Odd/Even

TCE 010918016-02

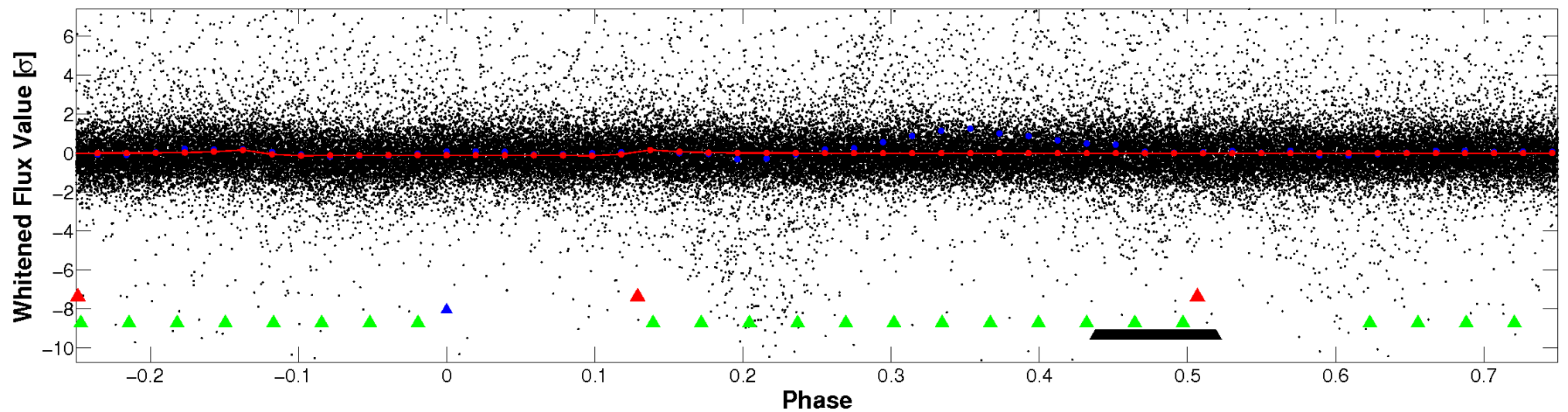


Non-Whitened Vs. Whitened Light Curve

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

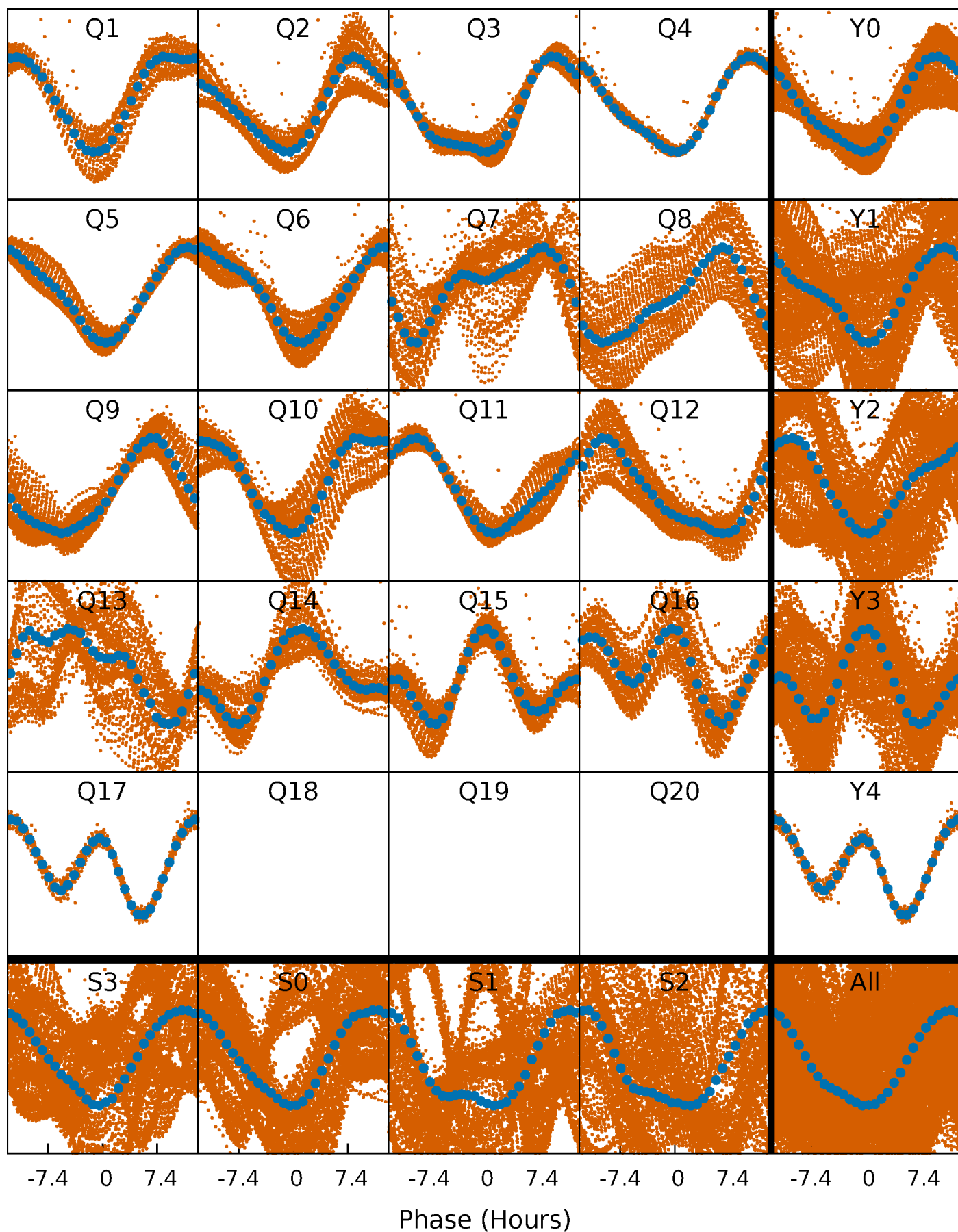


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



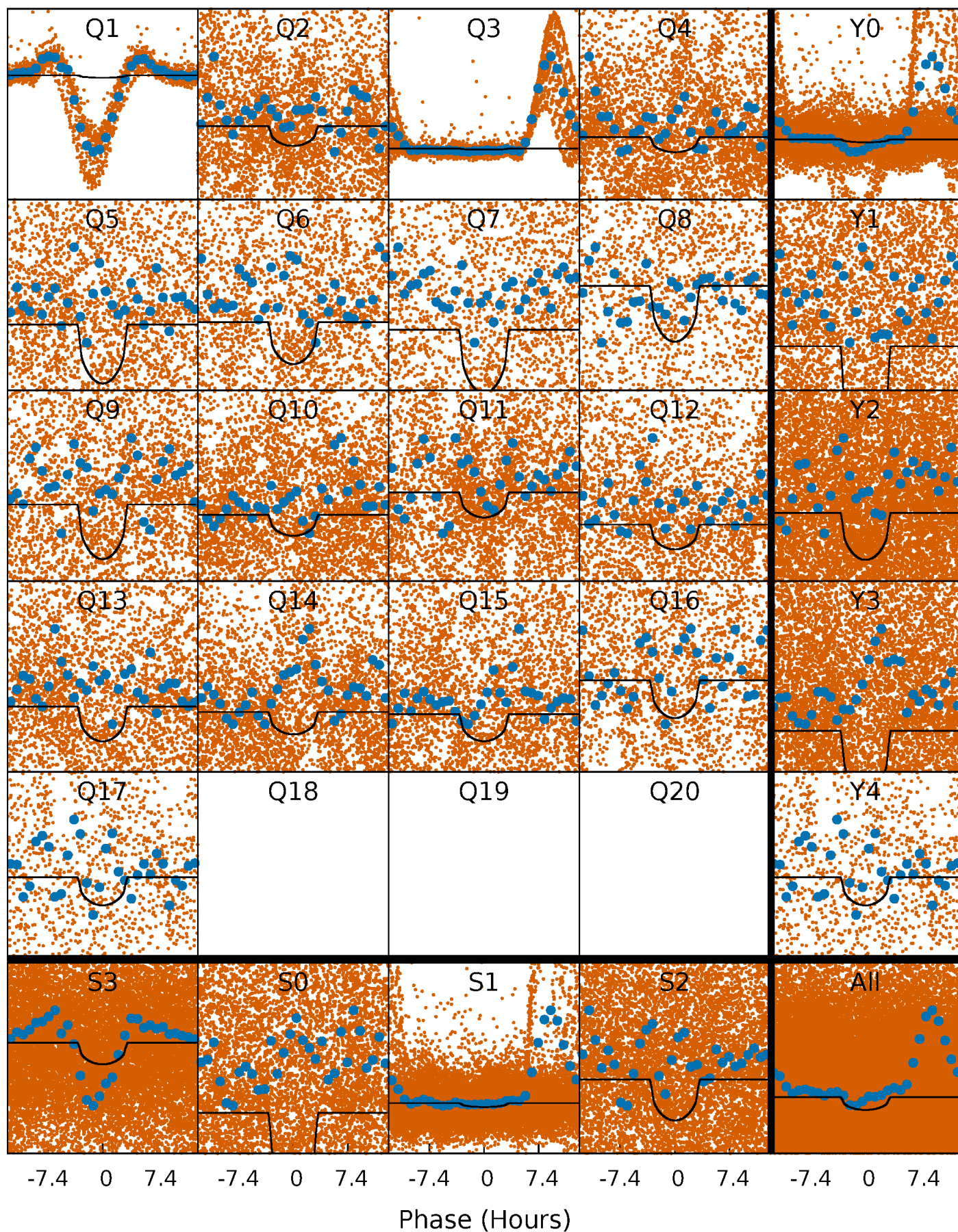
PDC Quarter-Phased Transit Curves

TCE 010918016-02 P= 1.040601 Days $T_0=132.212685$ (BKJD)



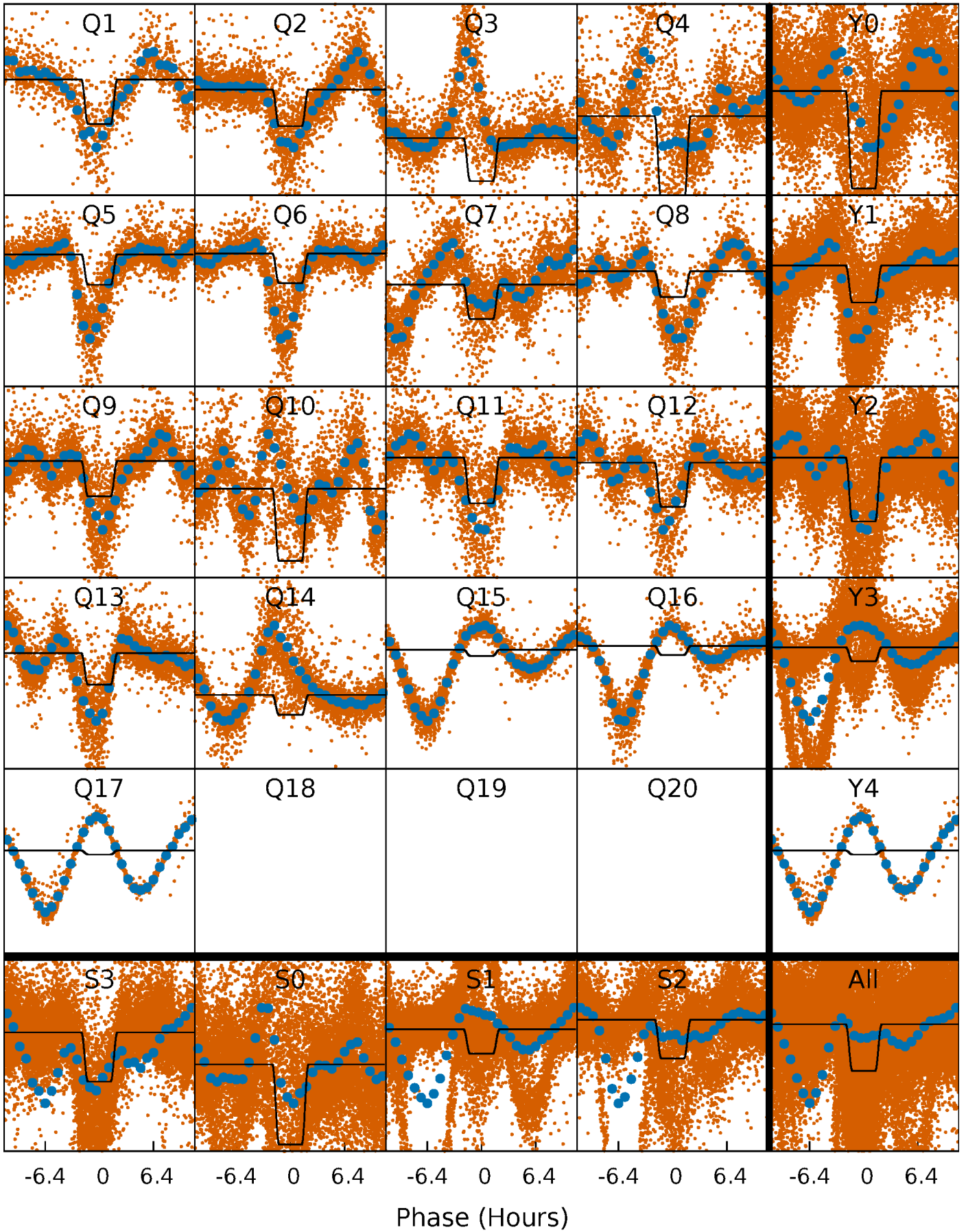
DV Quarter-Phased Transit Curves

TCE 010918016-02 P= 1.040601 Days $T_0=132.212685$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

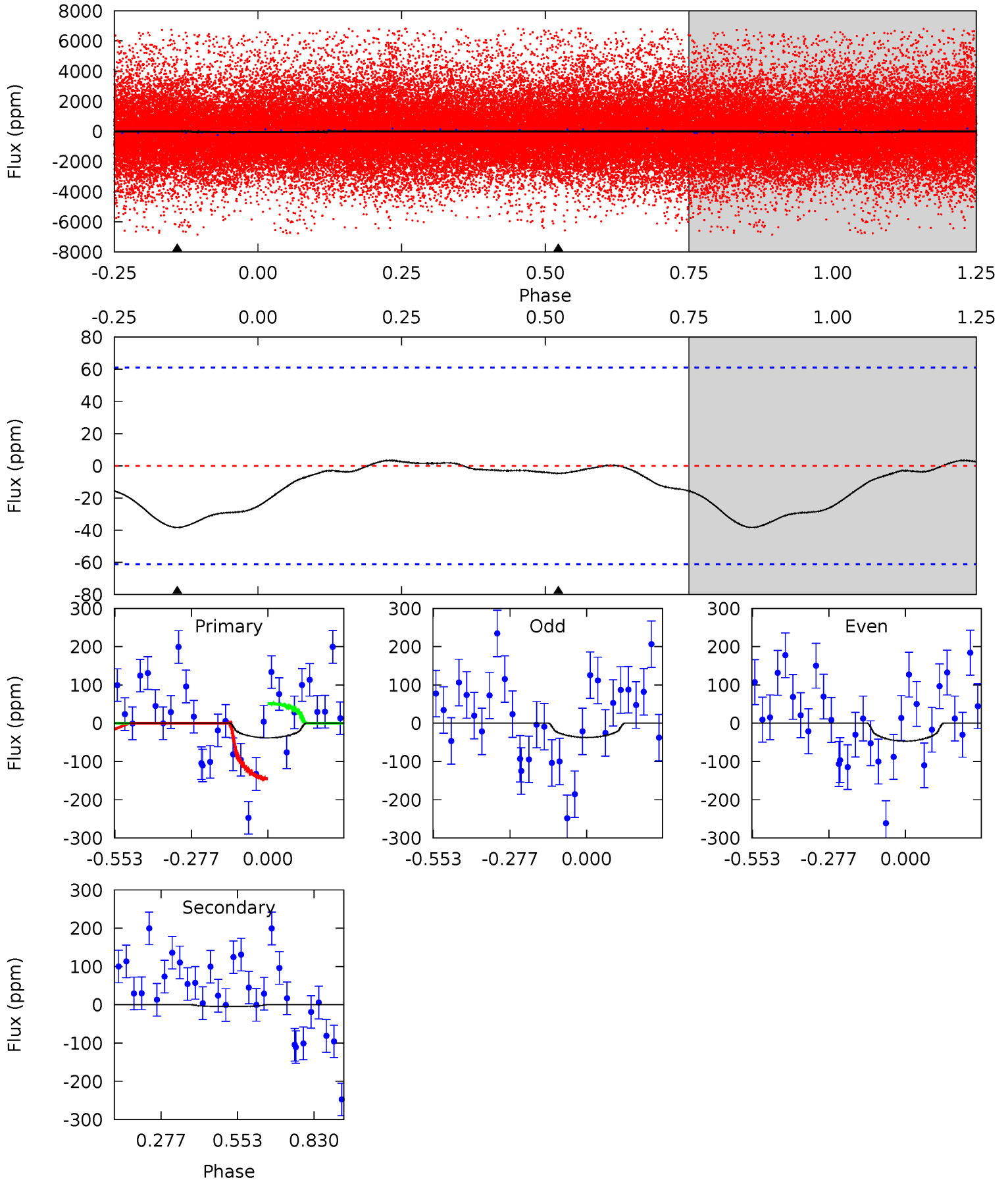
TCE 010918016-02 P= 1.040622 Days $T_0=132.205030$ (BKJD)



DV Model-Shift Uniqueness Test

010918016-02, P = 1.040601 Days, E = 131.172084 Days

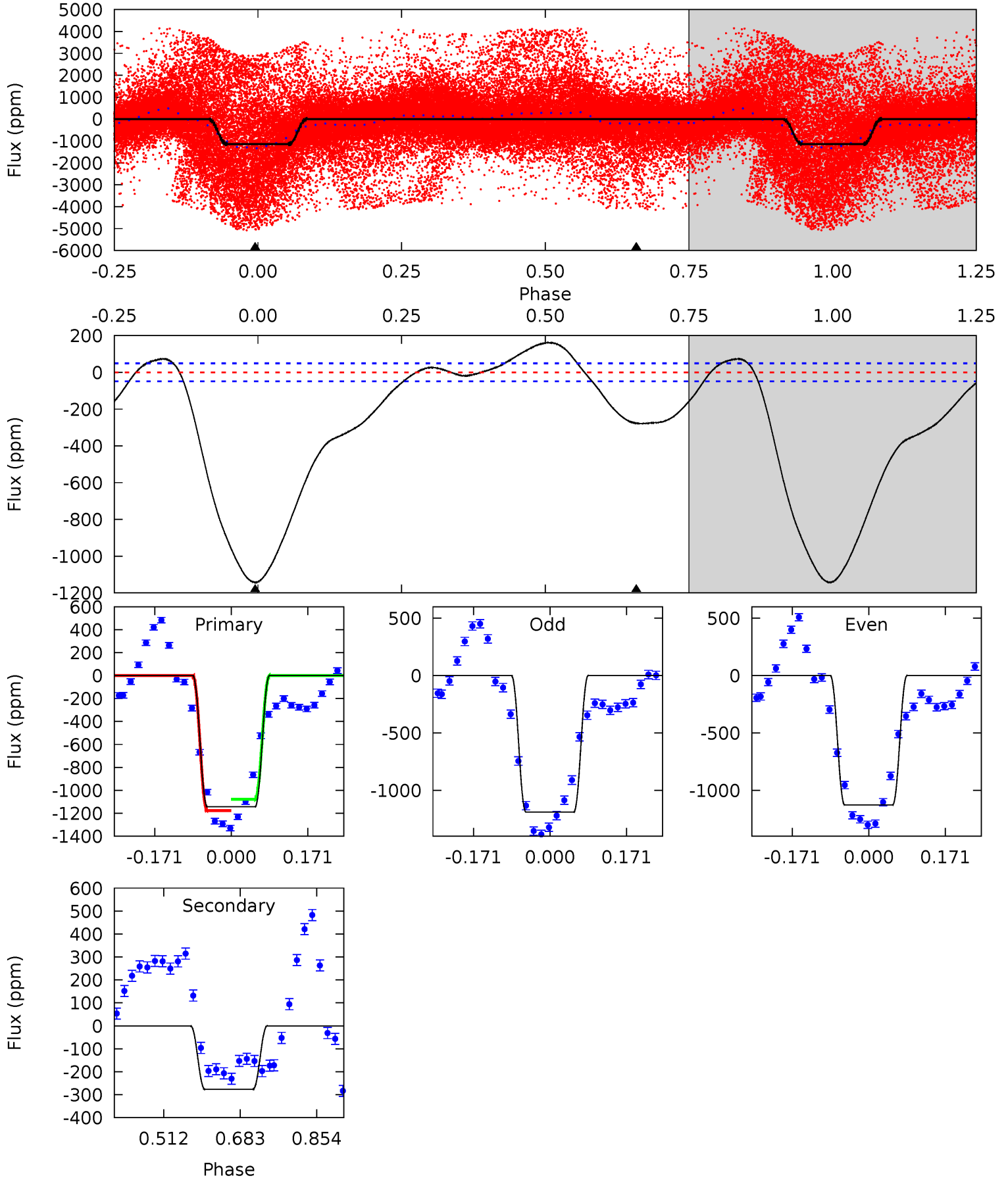
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.72	0.33	0	0	4.35	1.09	0.20	2.72	2.72	0.33	0.33	0.34	0.81	0.08	3.51



Alt Model-Shift Uniqueness Test

010918016-02, P = 1.040622 Days, E = 131.164408 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
103.9	25.2	0	0	4.45	1.37	10.1	103.9	103.9	25.2	25.2	2.86	0.44	0.12	0



Stellar Parameters For KIC 010918016

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4197^{+146}_{-161}	$4.605^{+0.052}_{-0.016}$	$0.360^{+0.100}_{-0.300}$	$0.683^{+0.023}_{-0.058}$	$0.684^{+0.038}_{-0.055}$	$3.027^{+0.696}_{-0.202}$
	+3%/-4%	+1%/-0%	+28%/-83%	+3%/-8%	+6%/-8%	+23%/-7%
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 010918016-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-5 ± 14	$1.41^{+0.23}_{-0.22}$	1595^{+60}_{-65}	1866^{+743}_{-4442}	$0.367^{+1.302}_{-1.301}$
Alt.	-277 ± 11	$2.74^{+0.23}_{-0.25}$	1591^{+59}_{-61}	3198^{+119}_{-127}	$6.424^{+1.350}_{-0.967}$

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 $A_{obs} \gg 1.0$

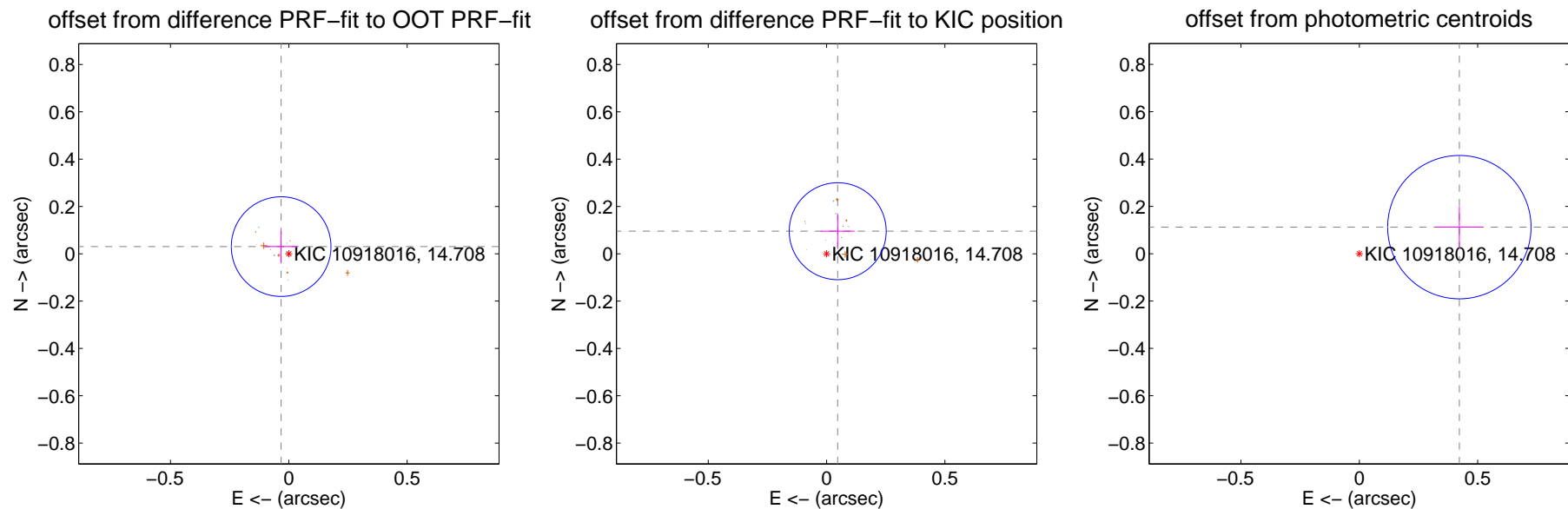
DV Centroid Data

Supplemental centroid analysis for 010918016-02. Kepler magnitude: 14.71. Transit SNR 17.57

There are 10 quarters with good PRF difference image offsets

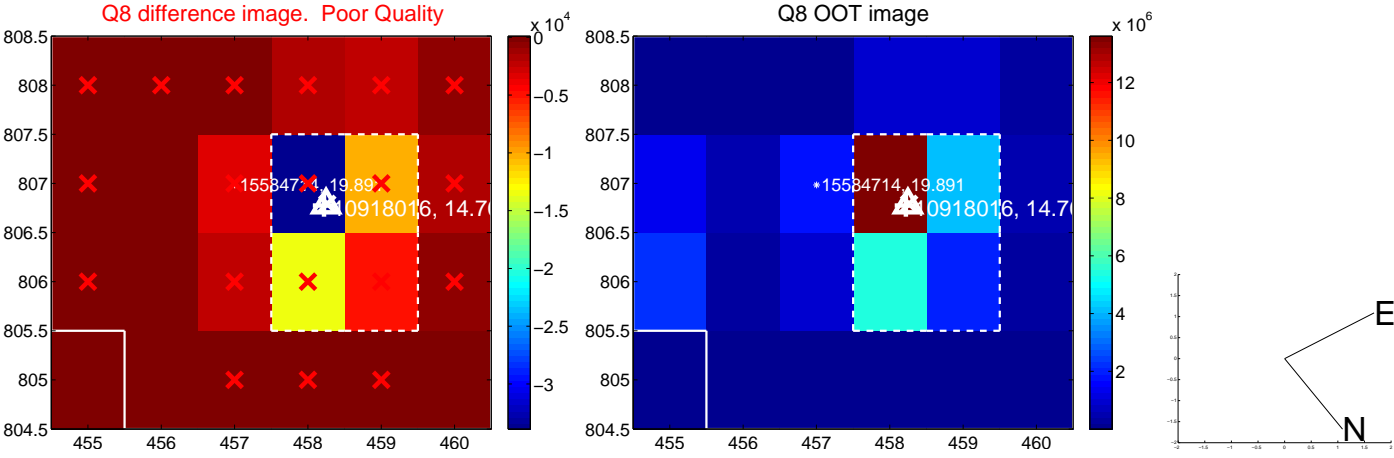
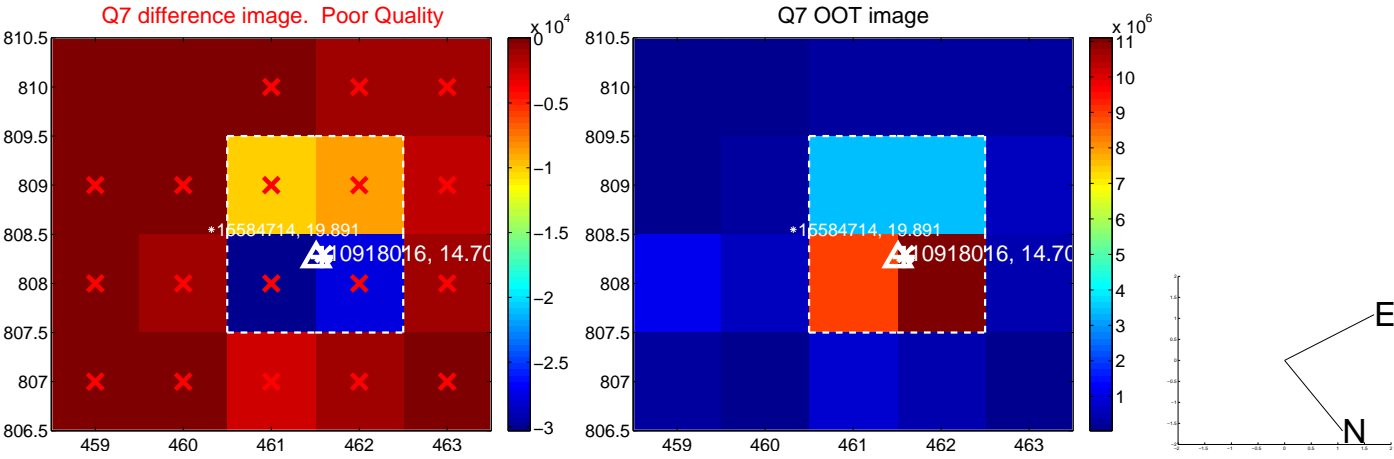
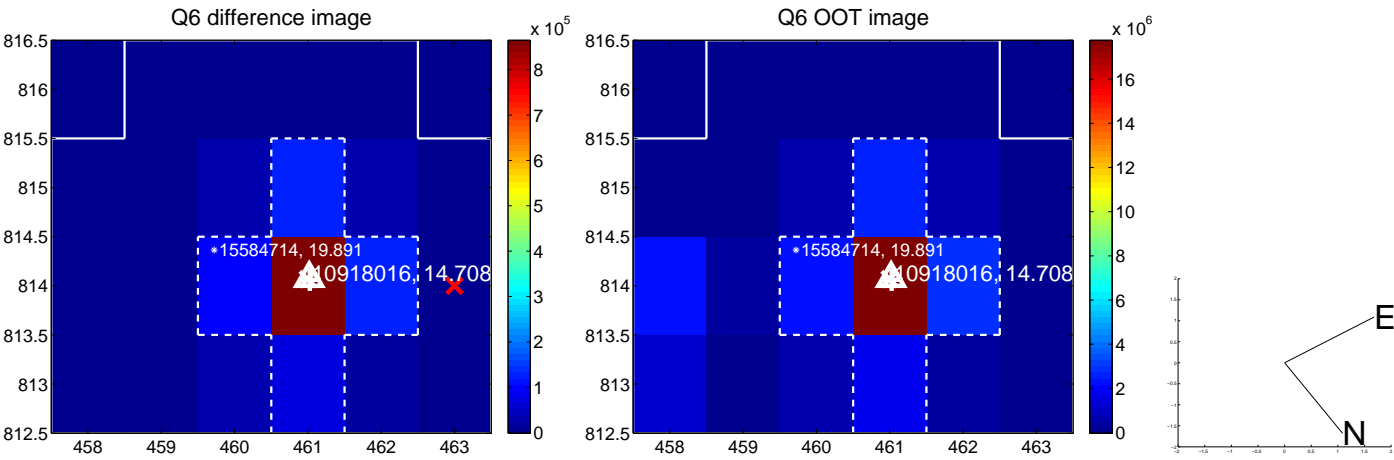
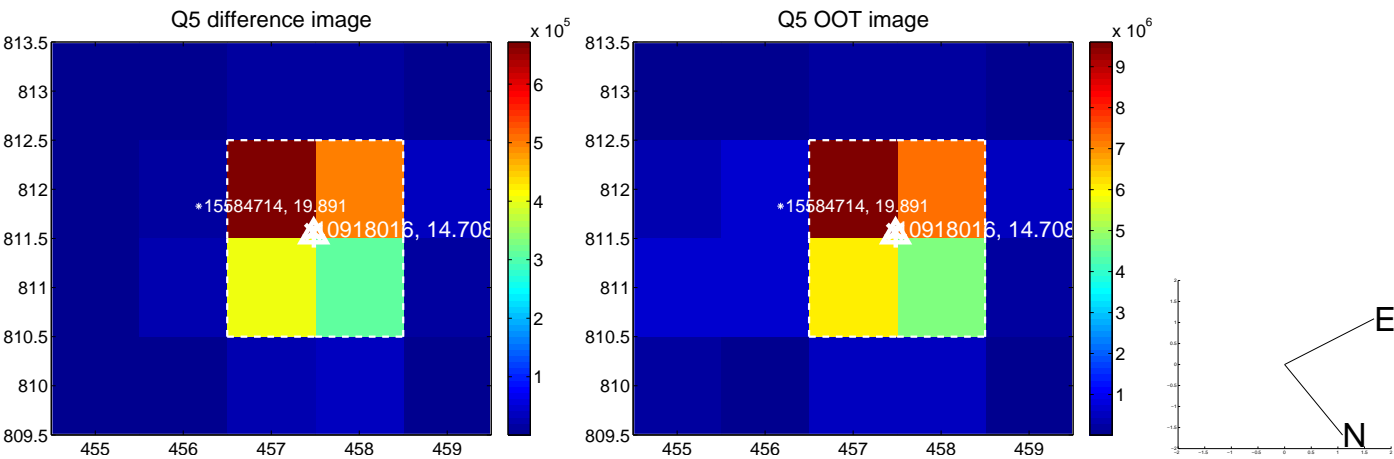
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.044 ± 0.070	0.63	0.032 ± 0.070	0.030 ± 0.068
PRF-fit source offset from KIC position	0.106 ± 0.068	1.56	-0.047 ± 0.071	0.095 ± 0.069
photometric centroid source offset	0.44 ± 0.10	4.33	-0.42 ± 0.10	0.11 ± 0.09

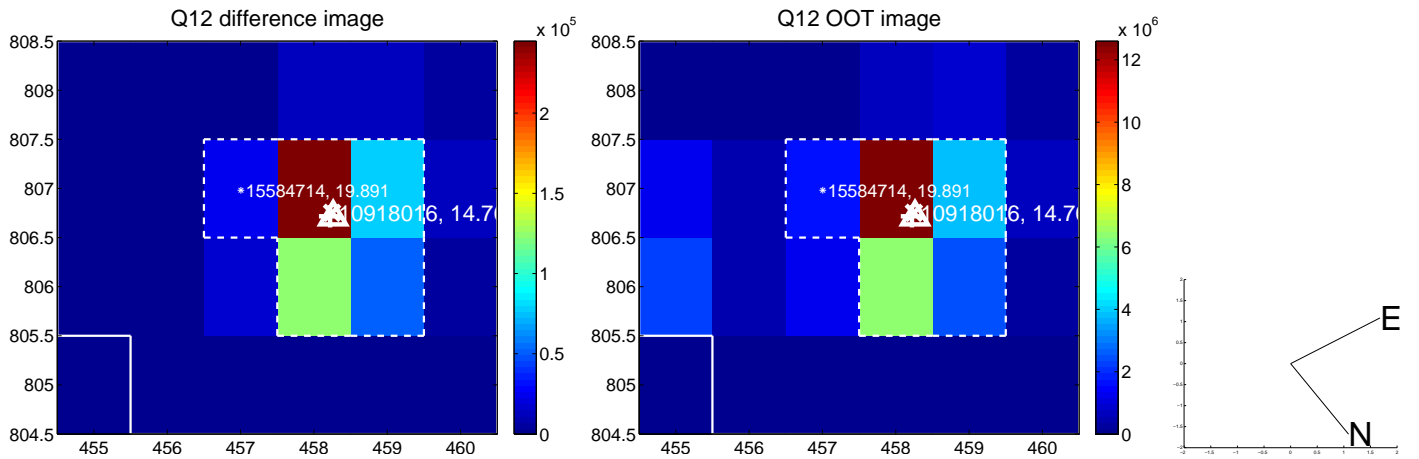
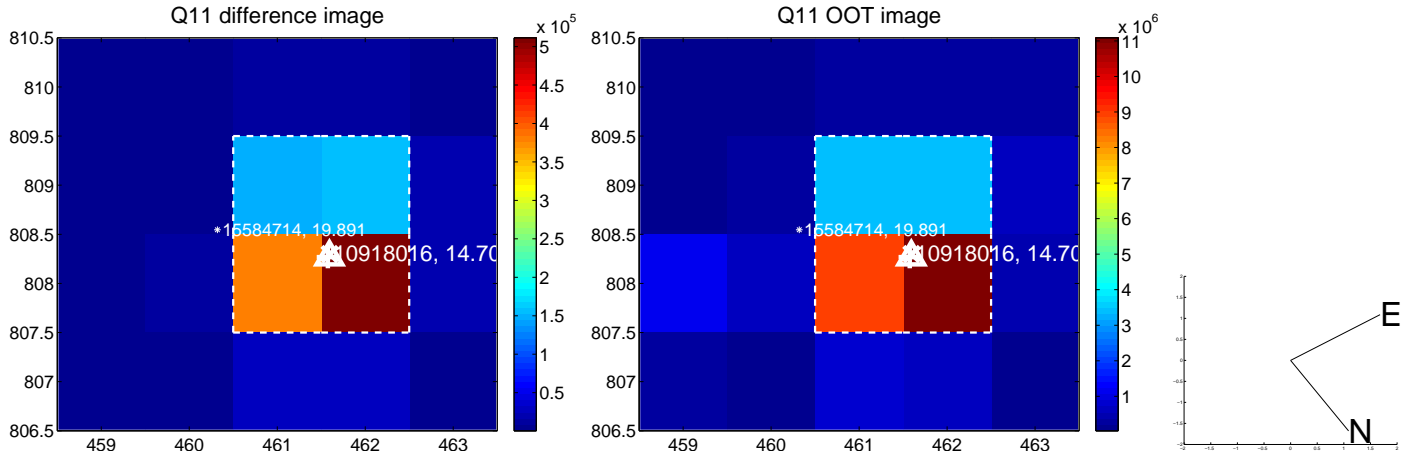
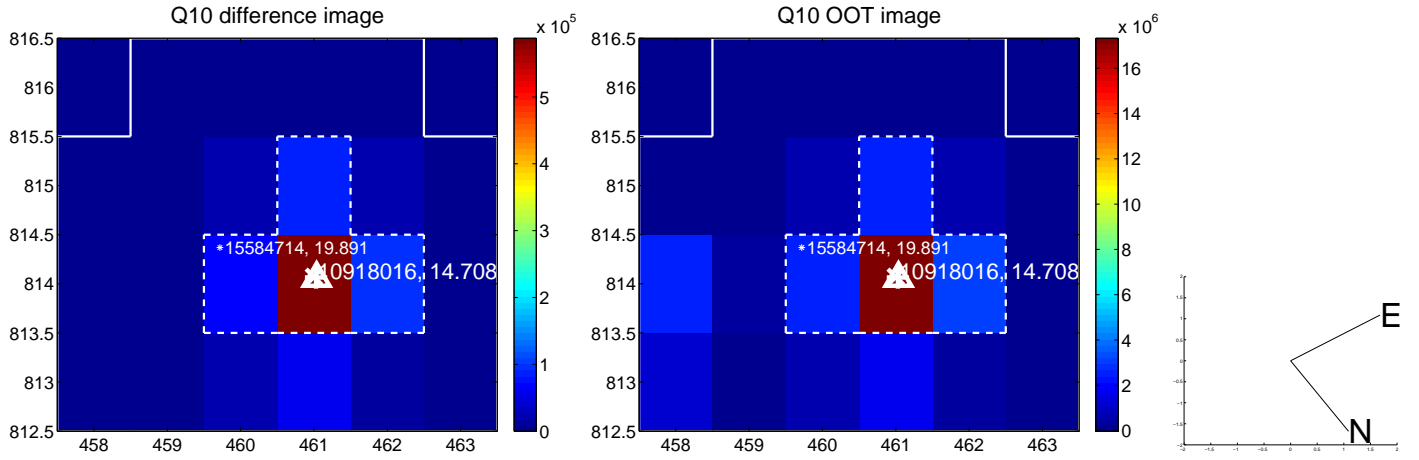
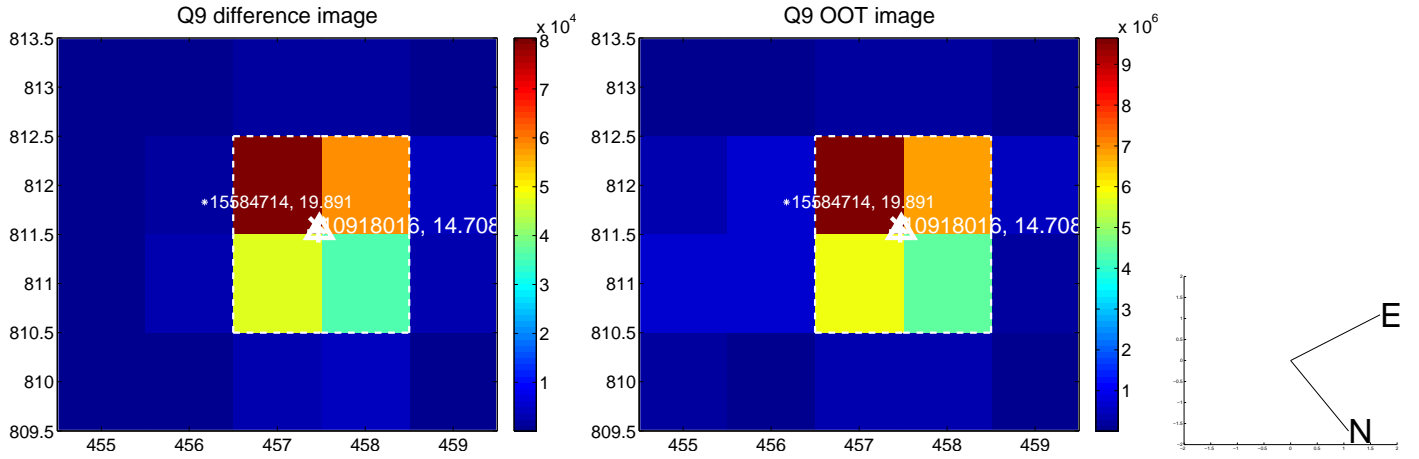


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

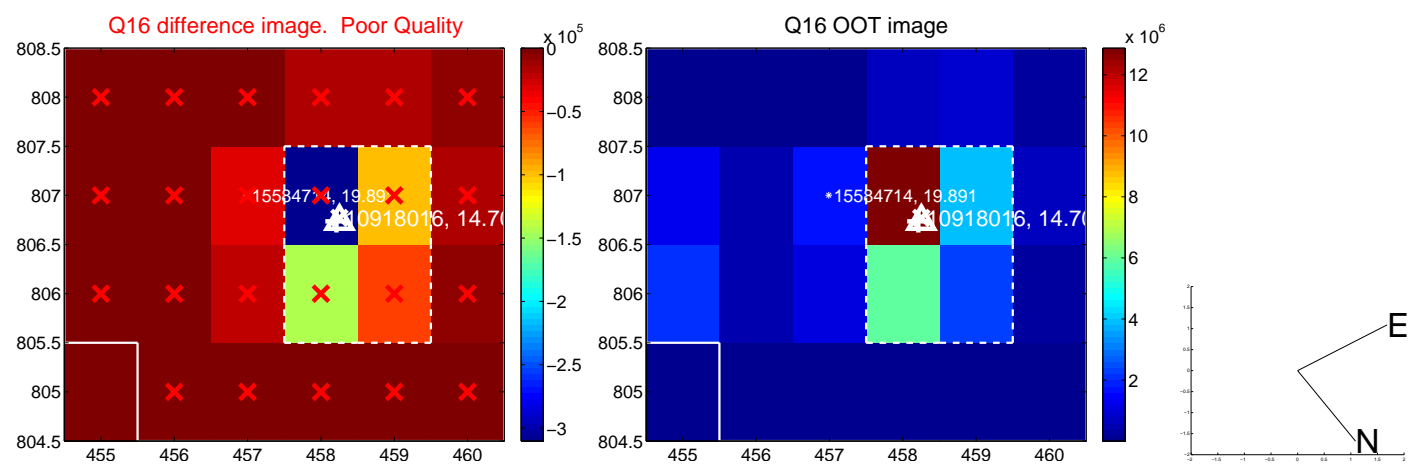
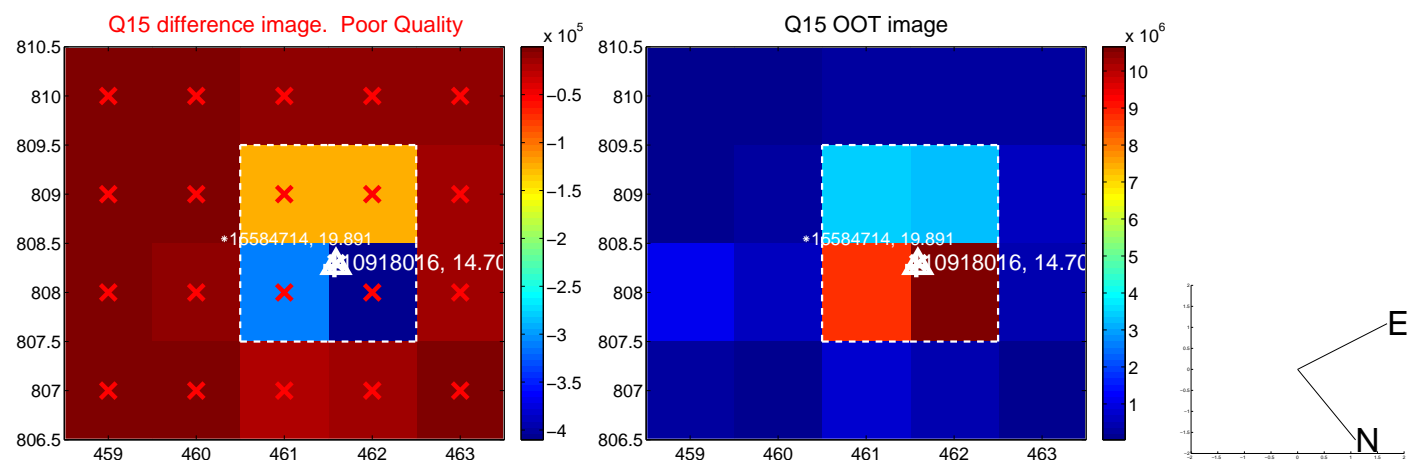
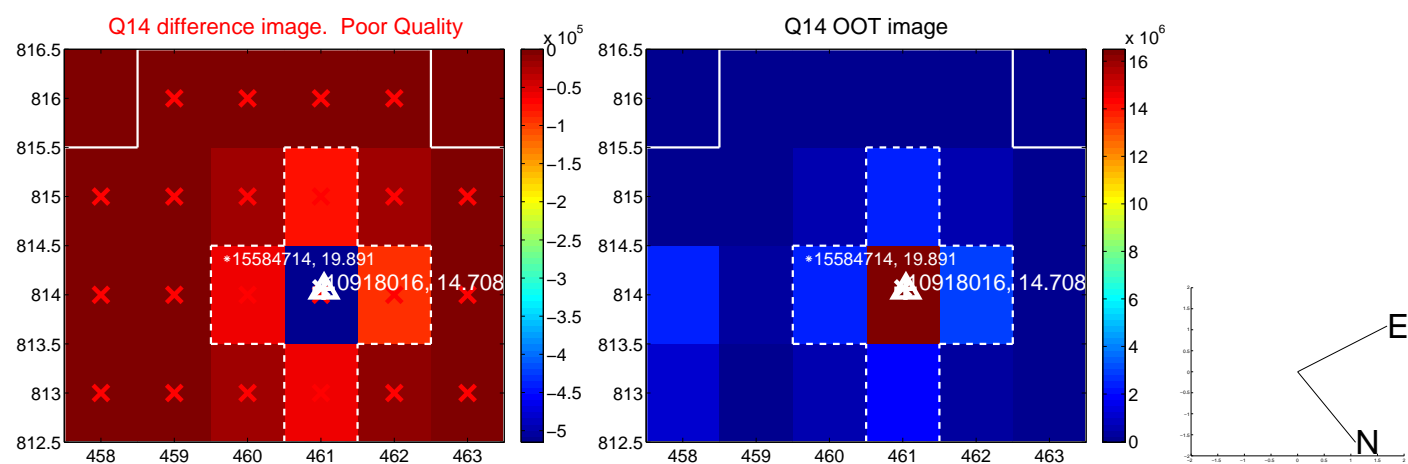
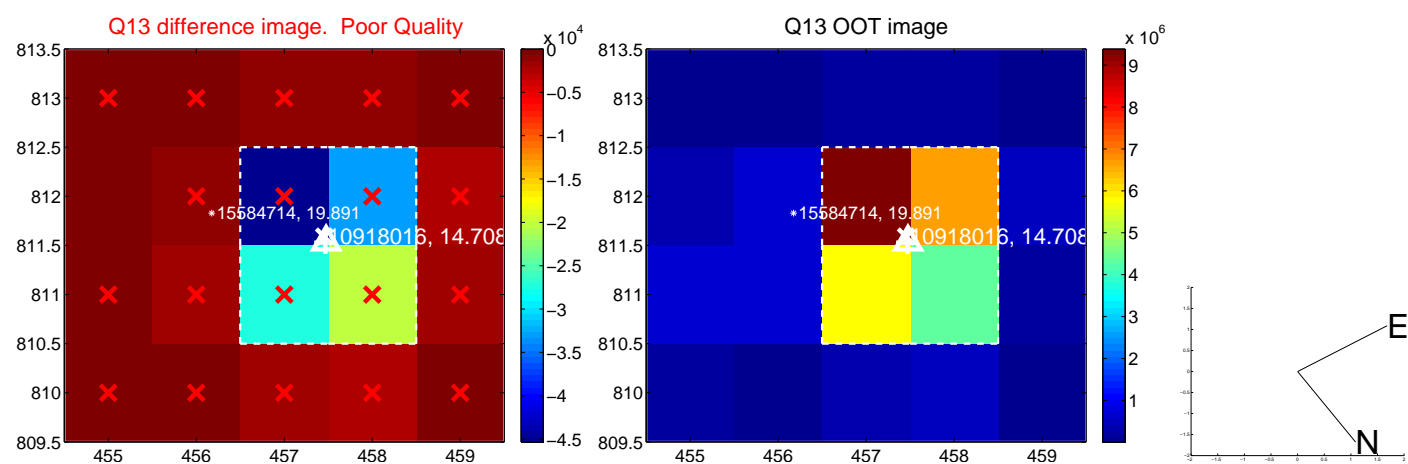
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



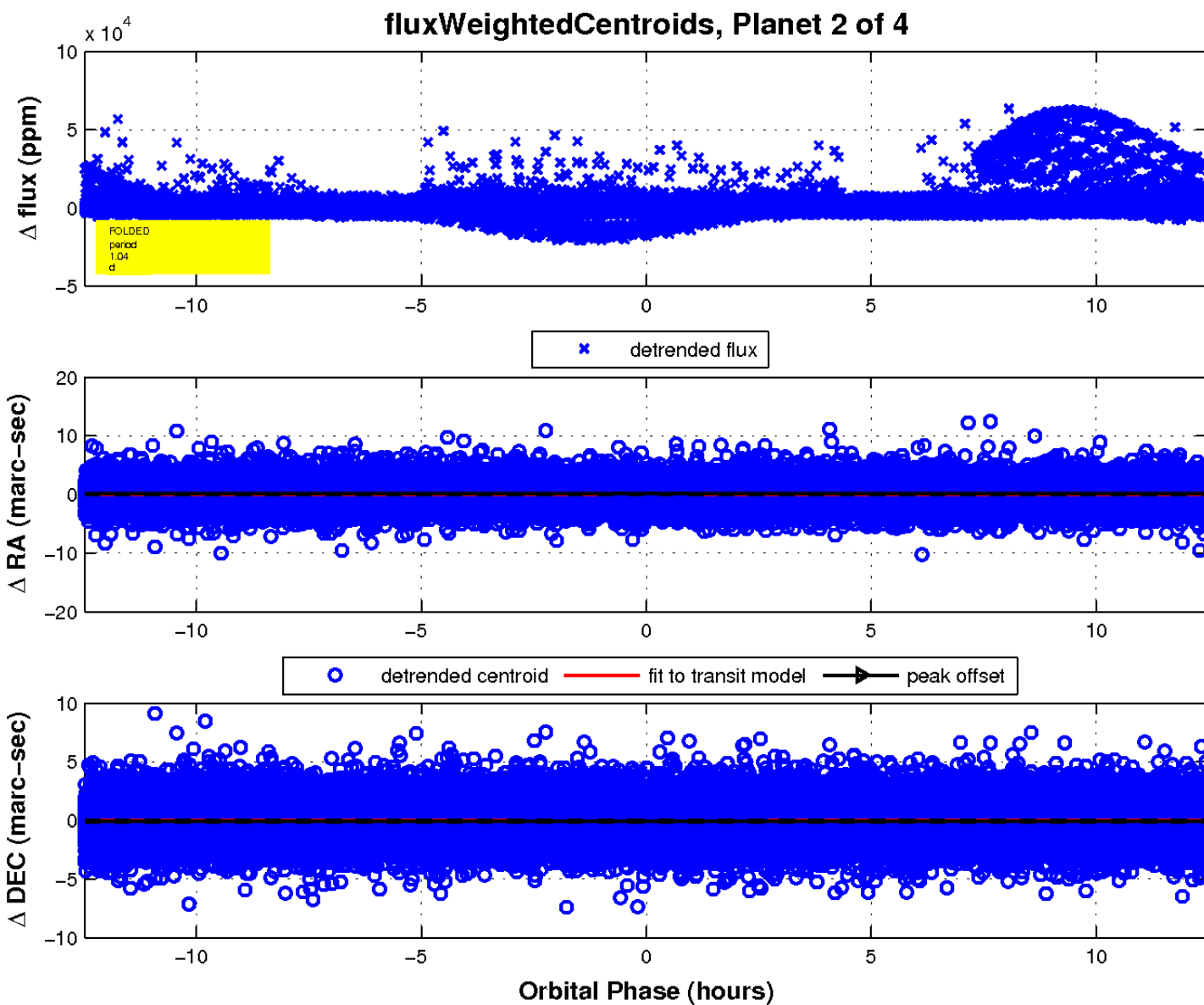
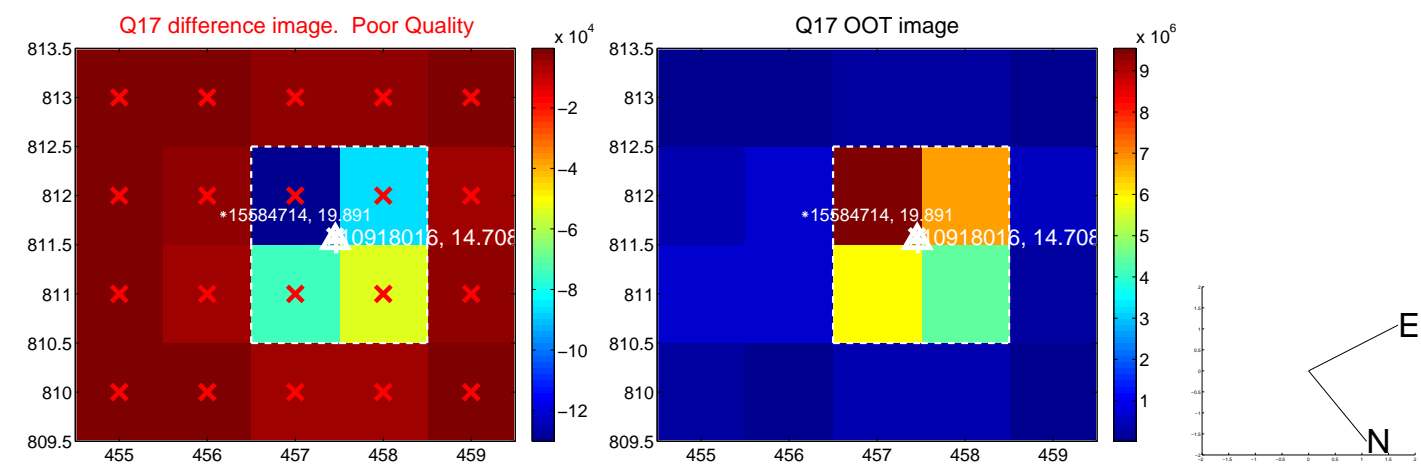
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

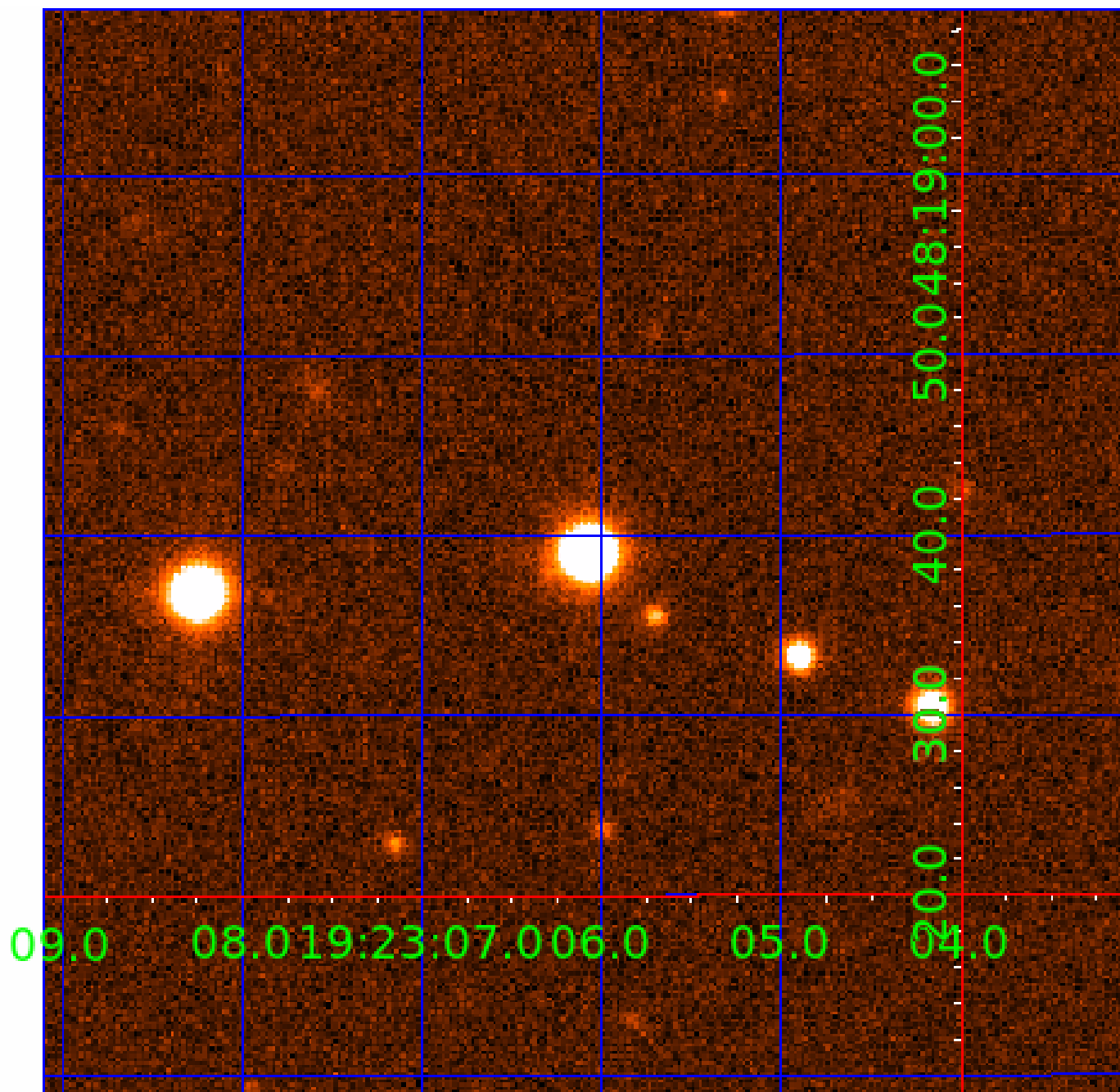


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010918016

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})
010918016-01	OBS	No	621.886186	269.058680	5167.5	5.663	15.7	8.2	0.68	4197	4.74	0.08
010918016-02	OBS	No	1.040601	132.212686	456.2	6.455	12.2	17.6	0.68	4197	1.43	412.94
010918016-03	OBS	No	61.898834	144.176452	2620.9	2.269	15.1	7.7	0.68	4197	3.34	1.78
010918016-04	OBS	No	1.040541	131.712287	30.8	7.258	13.4	1.6	0.68	4197	0.36	412.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010918016-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
010918016-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
010918016-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT
010918016-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—SWEET_NTL—LPP_DV—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.

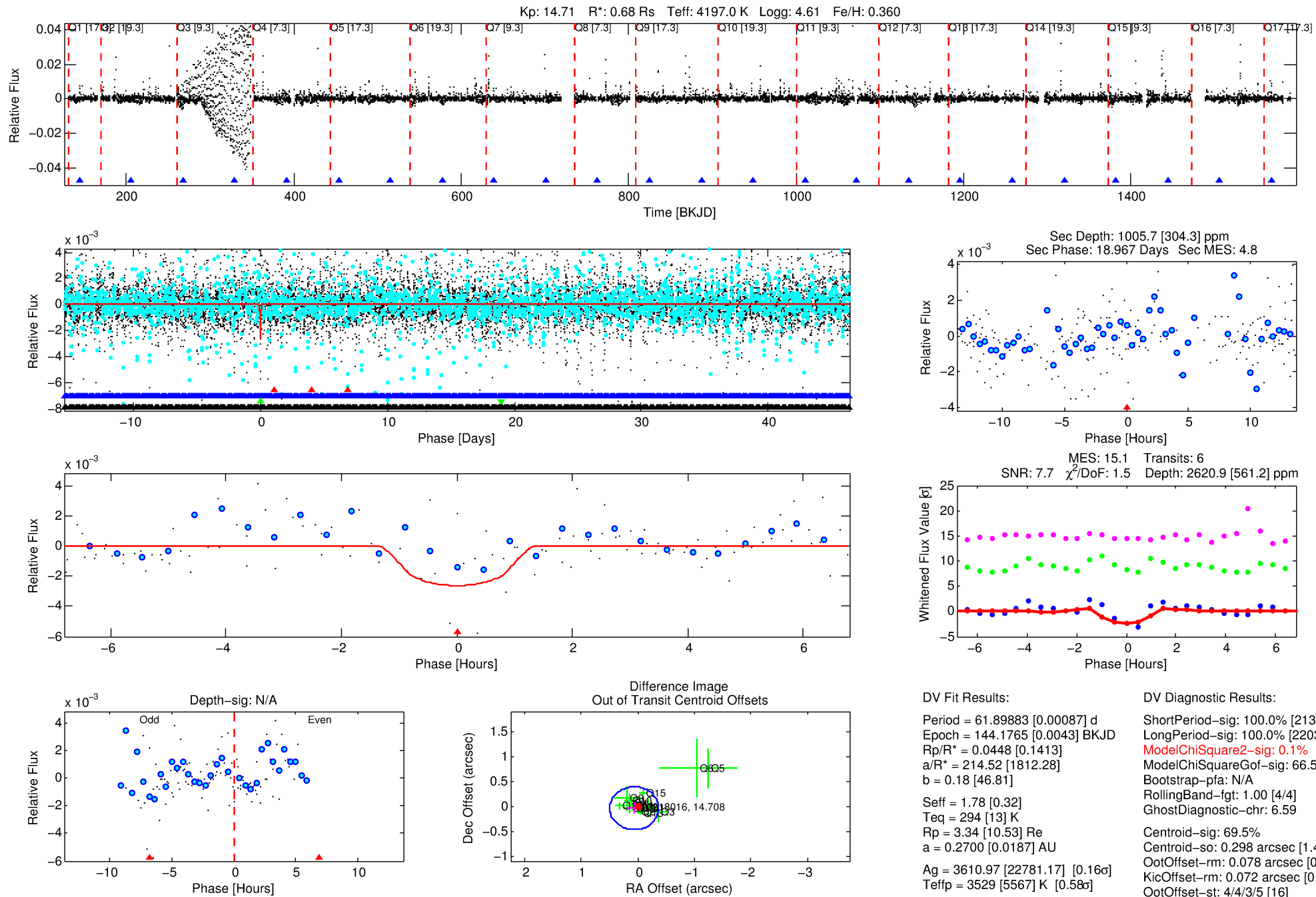
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010918016-03

No Significant Match Found

DV One-Page Summary

KIC: 10918016 Candidate: 3 of 4 Period: 61.899 d



DV Fit Results:

Period = 61.89883 [0.00087] d
Epoch = 144.1765 [0.0043] BKJD
Rp/R* = 0.0448 [0.1413]
a/R* = 214.52 [1812.28]
b = 0.18 [46.81]
Seff = 1.78 [0.32]
Teq = 294 [13] K
Rp = 3.34 [10.53] Re
a = 0.2700 [0.0187] AU
Ag = 3610.97 [22781.17] [0.16σ]
Teffp = 3529 [5567] K [0.58σ]

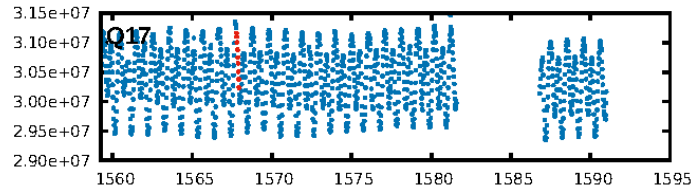
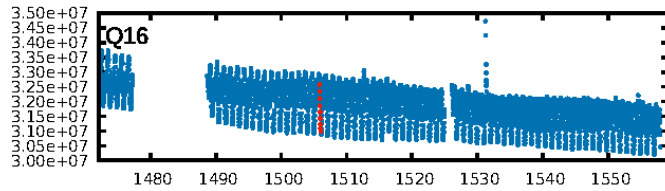
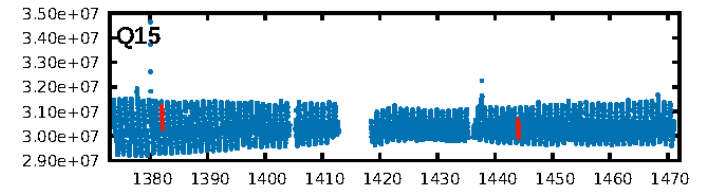
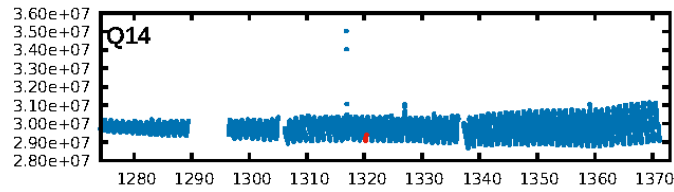
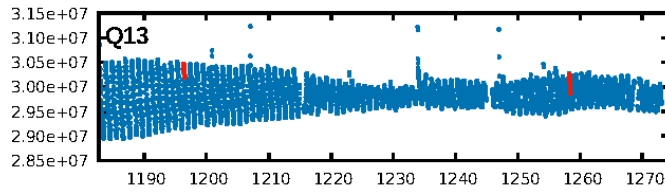
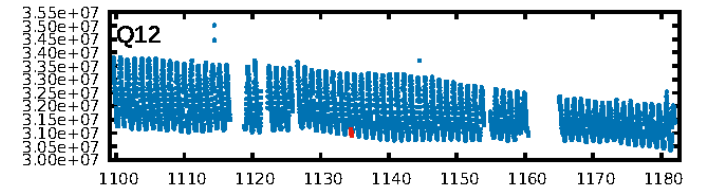
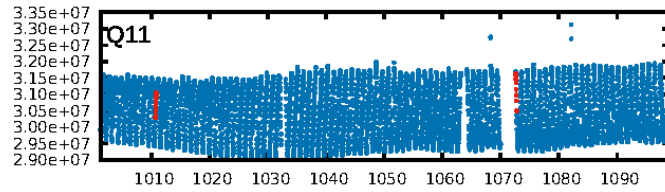
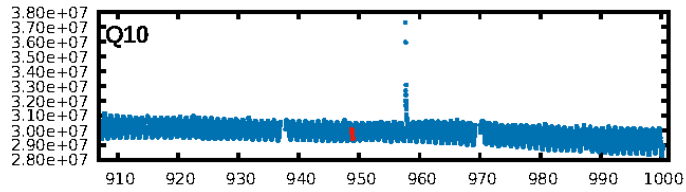
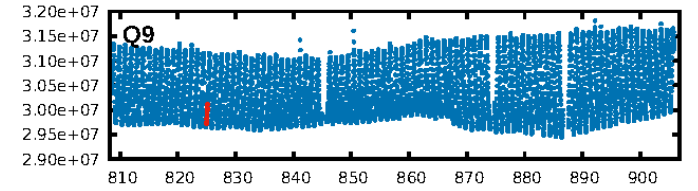
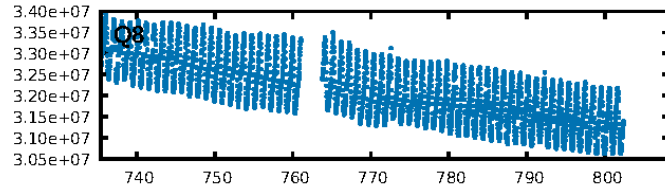
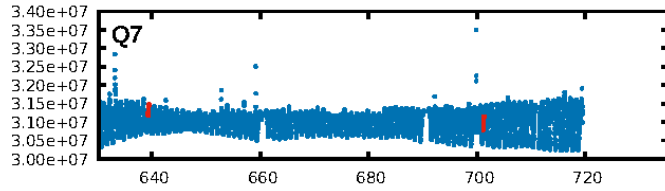
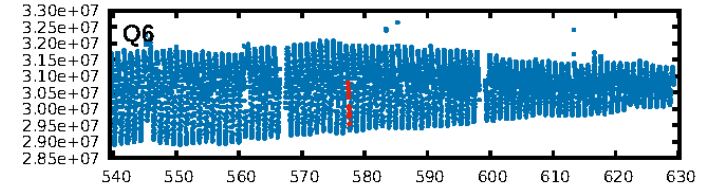
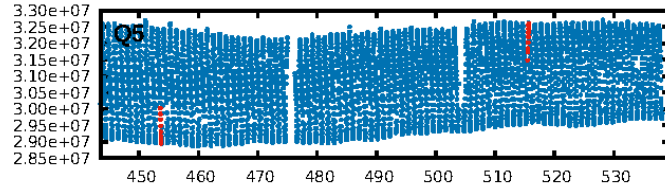
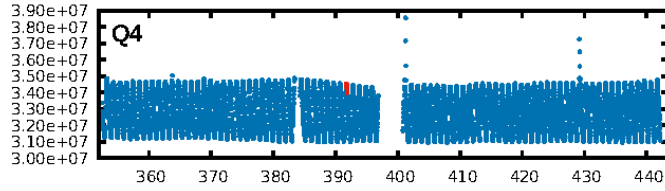
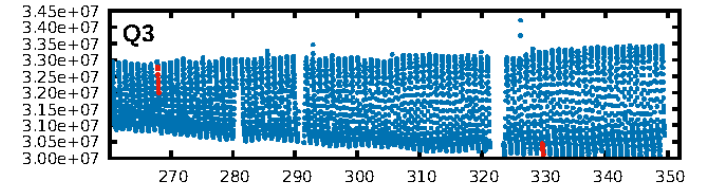
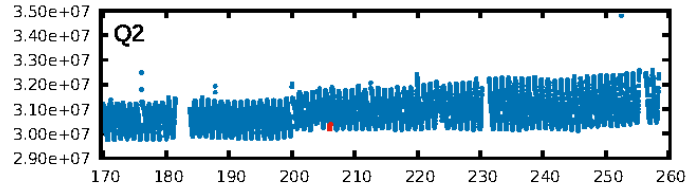
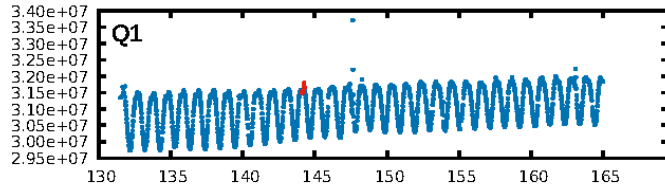
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [213.46σ]
LongPeriod-sig: 100.0% [2203.15σ]
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 66.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 6.59
Centroid-sig: 69.5%
Centroid-so: 0.298 arcsec [1.43σ]
OotOffset-rm: 0.078 arcsec [0.55σ]
KicOffset-rm: 0.072 arcsec [0.62σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 0.56 [9/16]
DiffImageOverlap-fno: 0.00 [0/16]

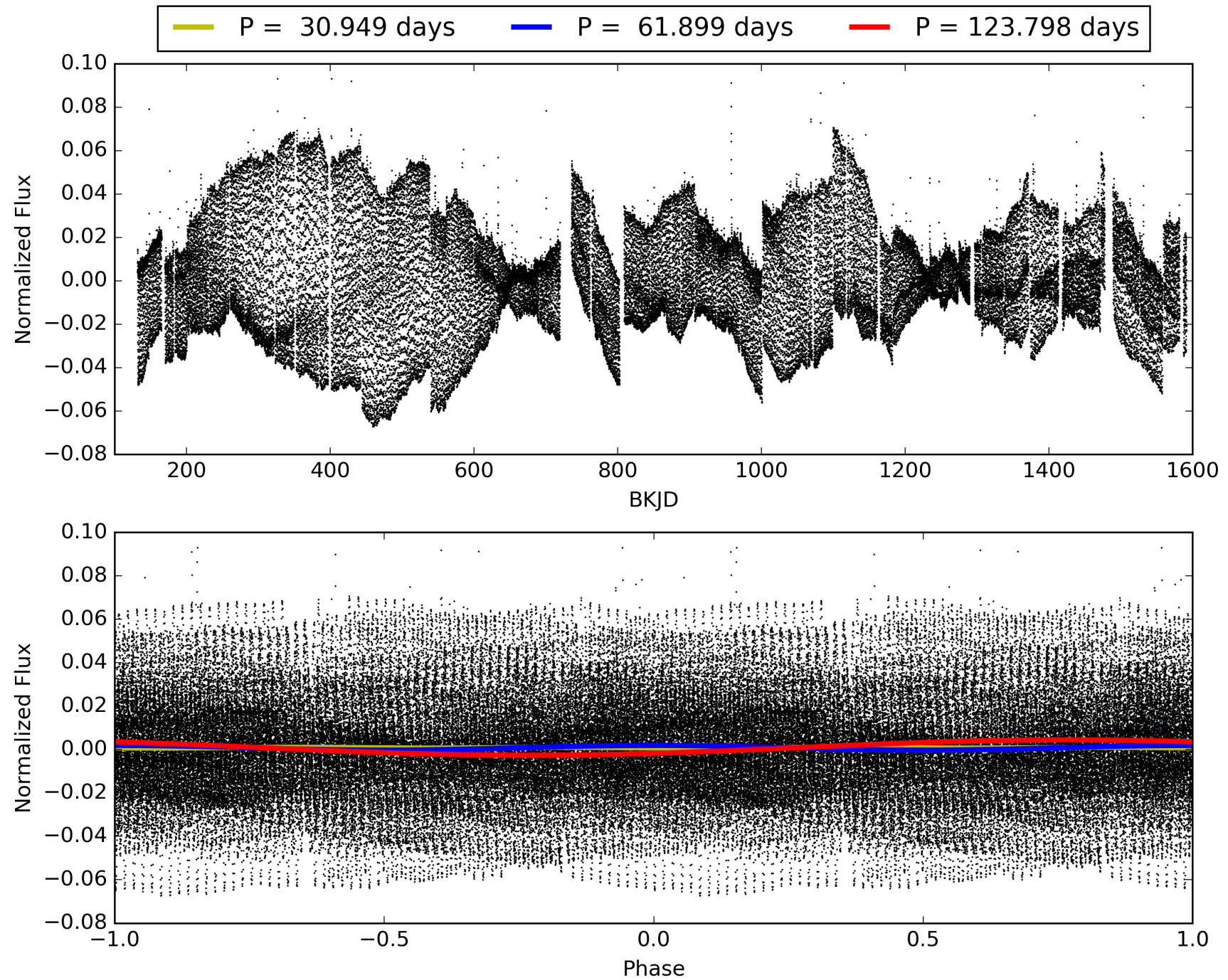
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:45:03 Z

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

TCE 010918016-03, PDC Light Curves

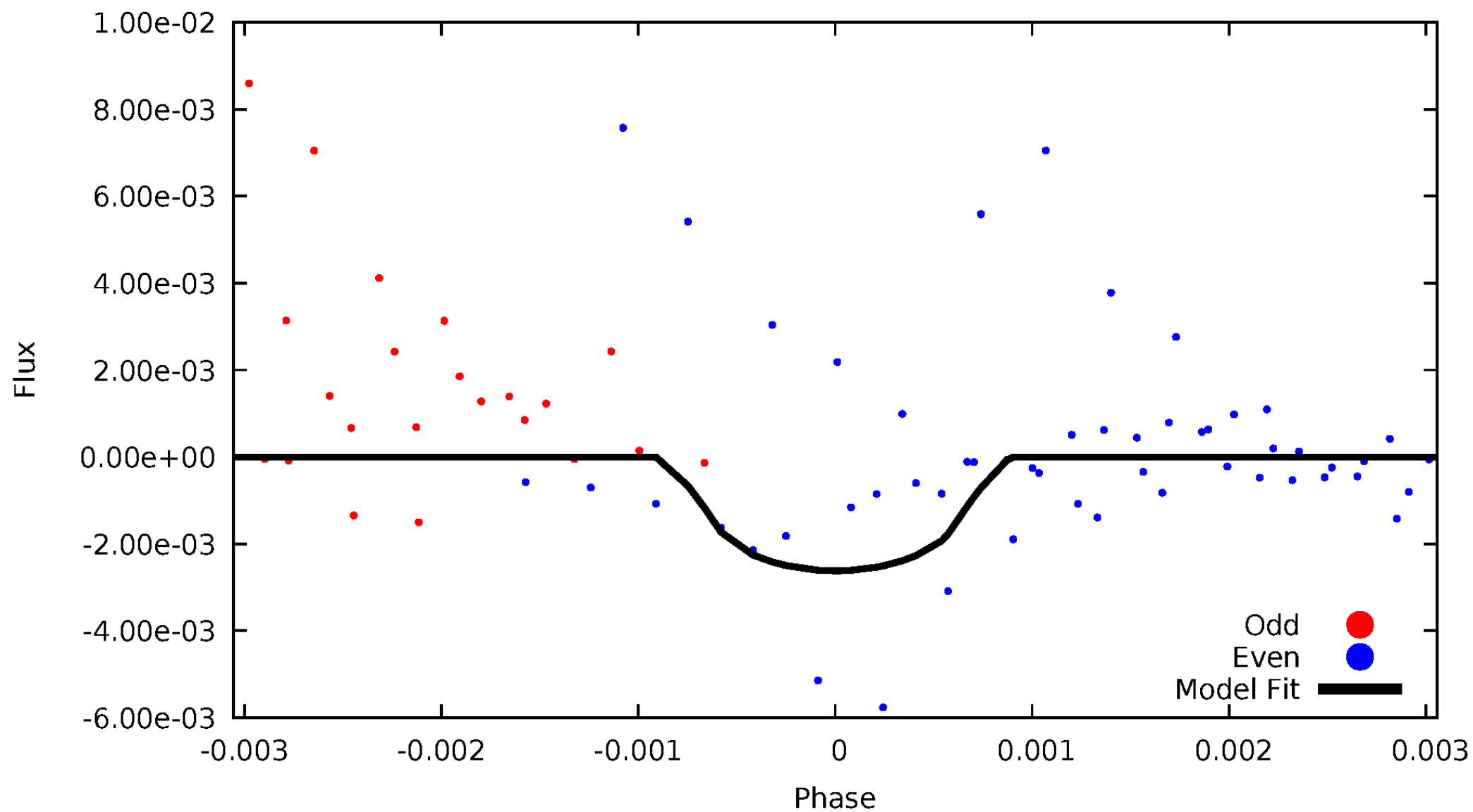


TCE 010918016-03



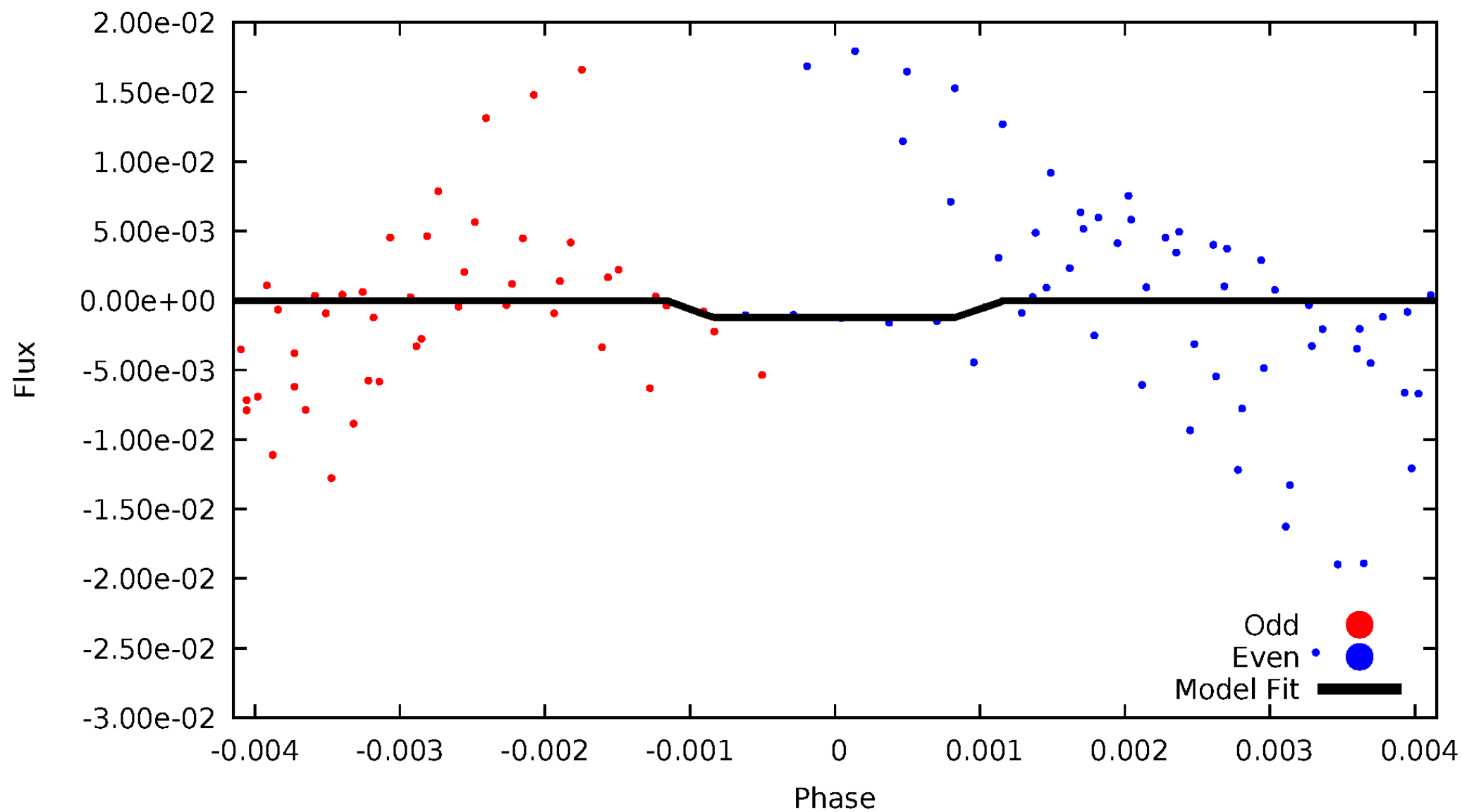
DV Odd/Even

TCE 010918016-03



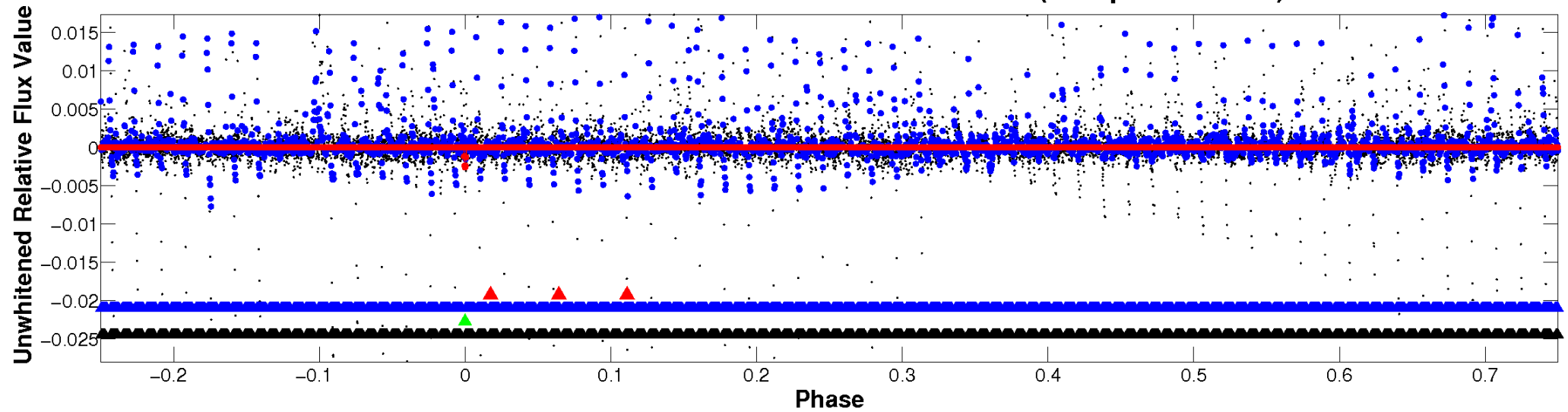
ALT Odd/Even

TCE 010918016-03

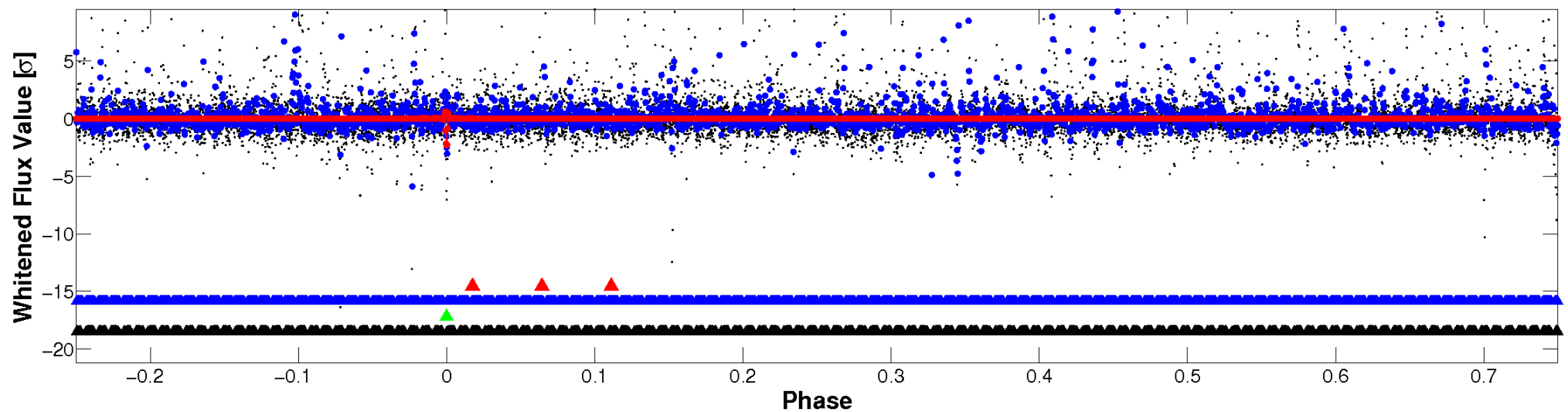


Non-Whitened Vs. Whitened Light Curve

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

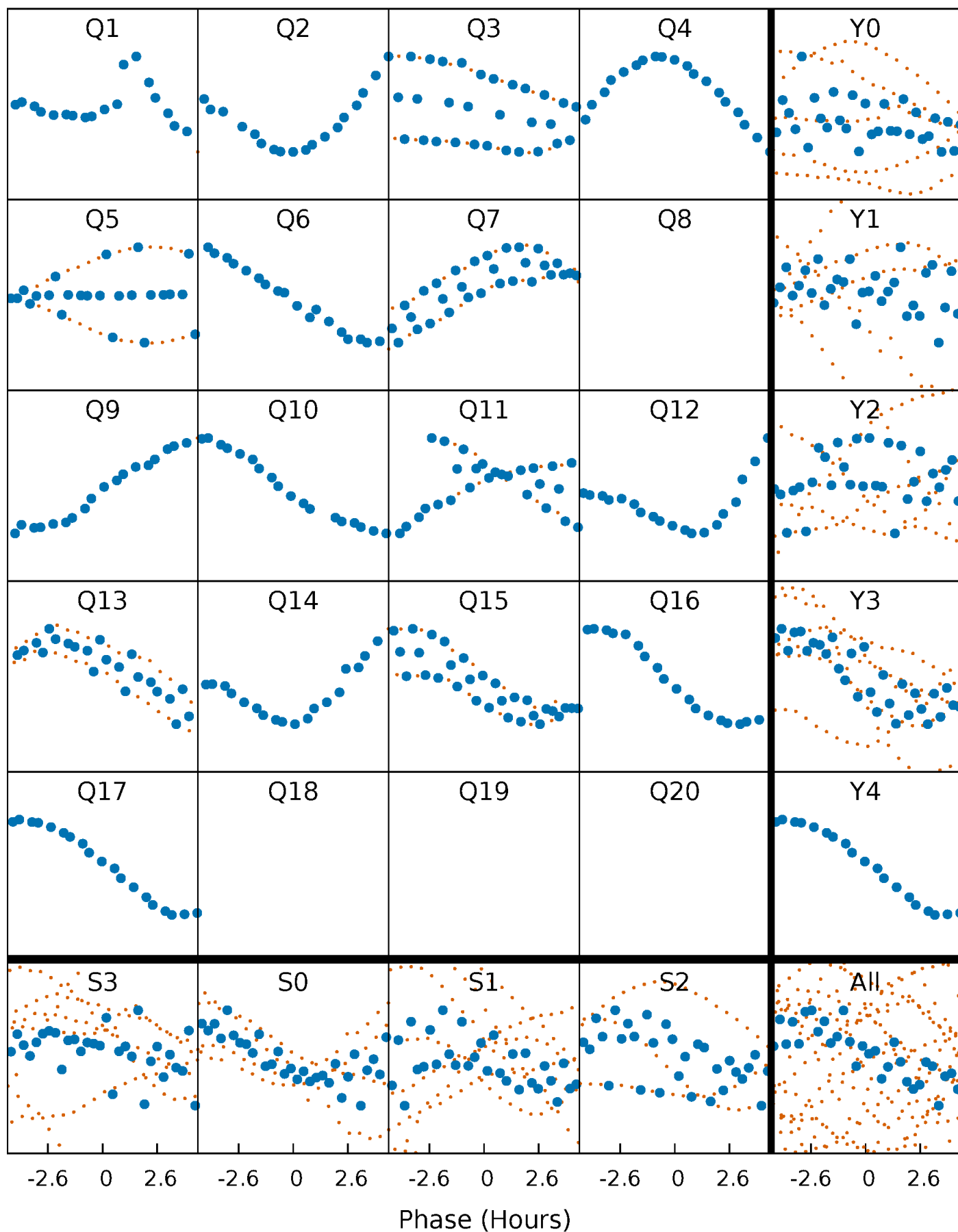


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



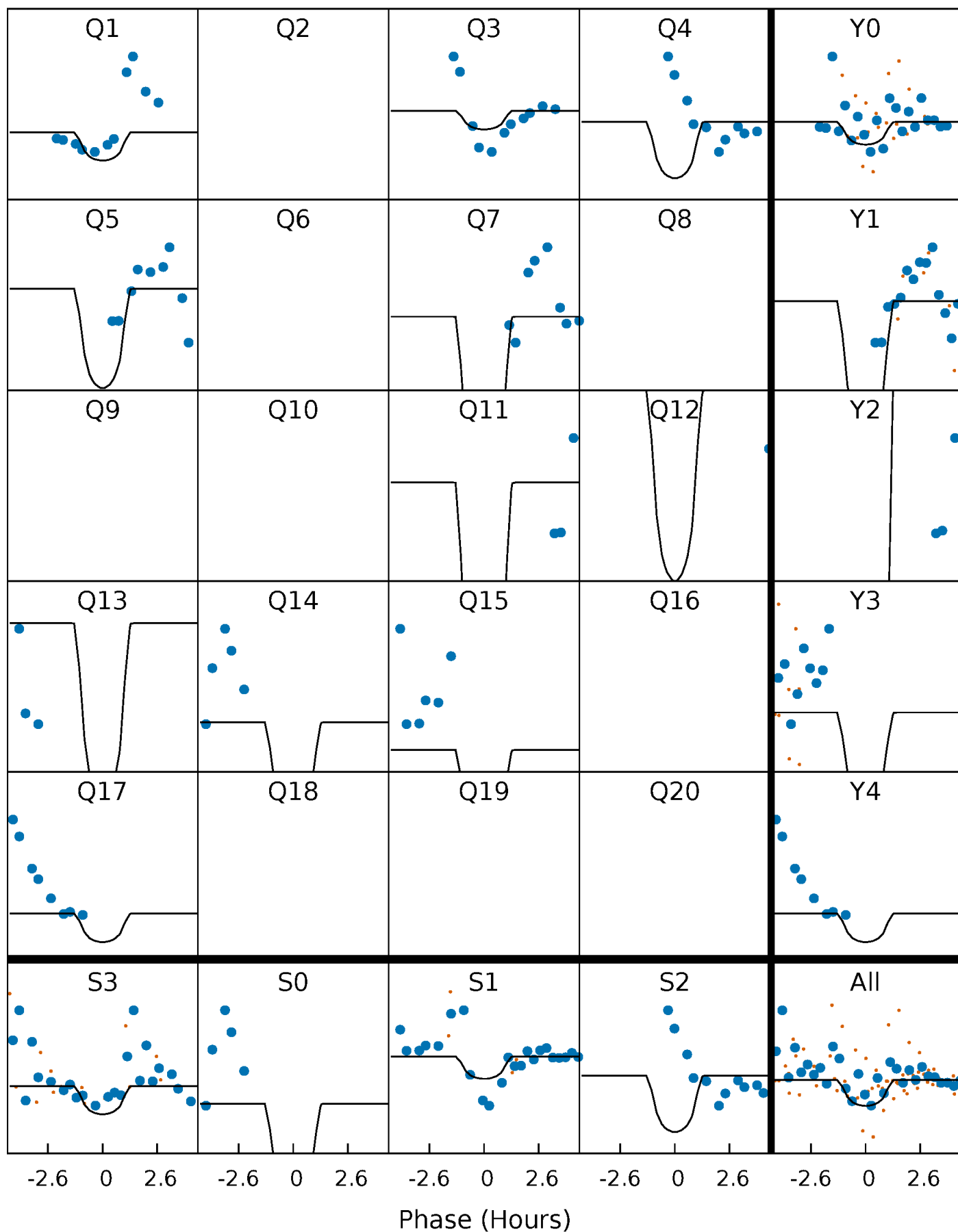
PDC Quarter-Phased Transit Curves

TCE 010918016-03 P= 61.898834 Days $T_0=144.176452$ (BKJD)



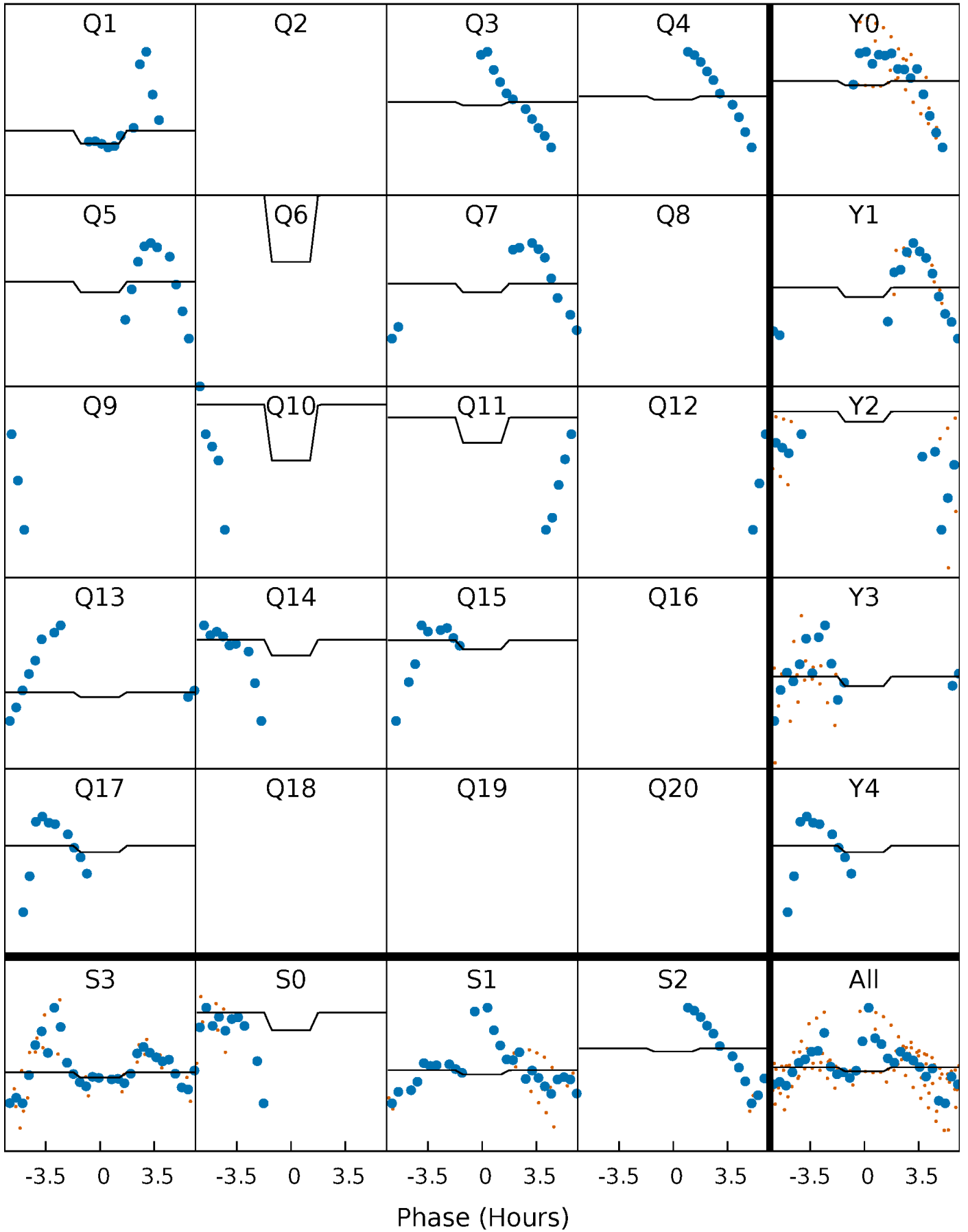
DV Quarter-Phased Transit Curves

TCE 010918016-03 P= 61.898834 Days $T_0=144.176452$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

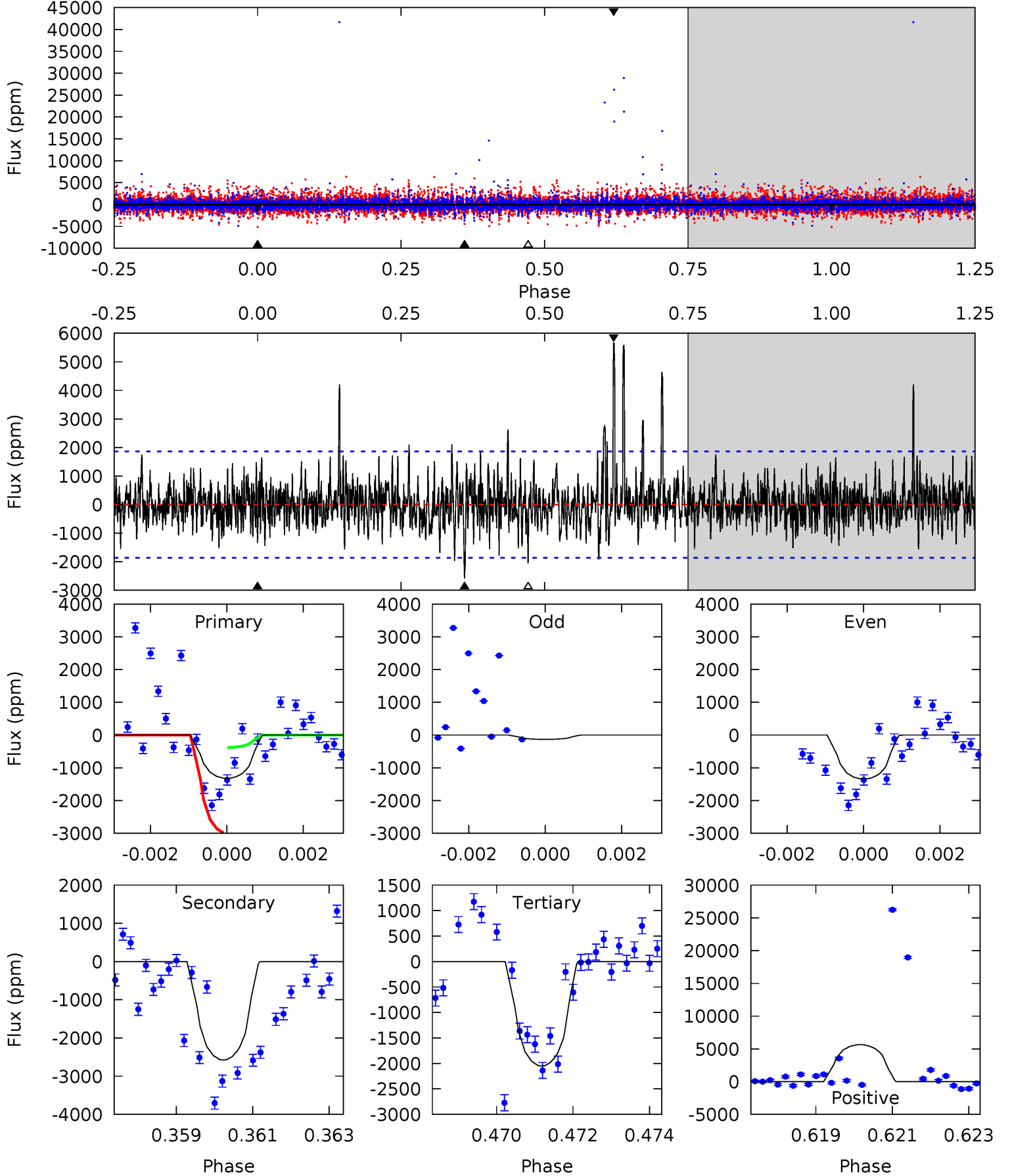
TCE 010918016-03 P= 61.900964 Days $T_0=144.117406$ (BKJD)



DV Model-Shift Uniqueness Test

010918016-03, P = 61.898834 Days, E = 82.277618 Days

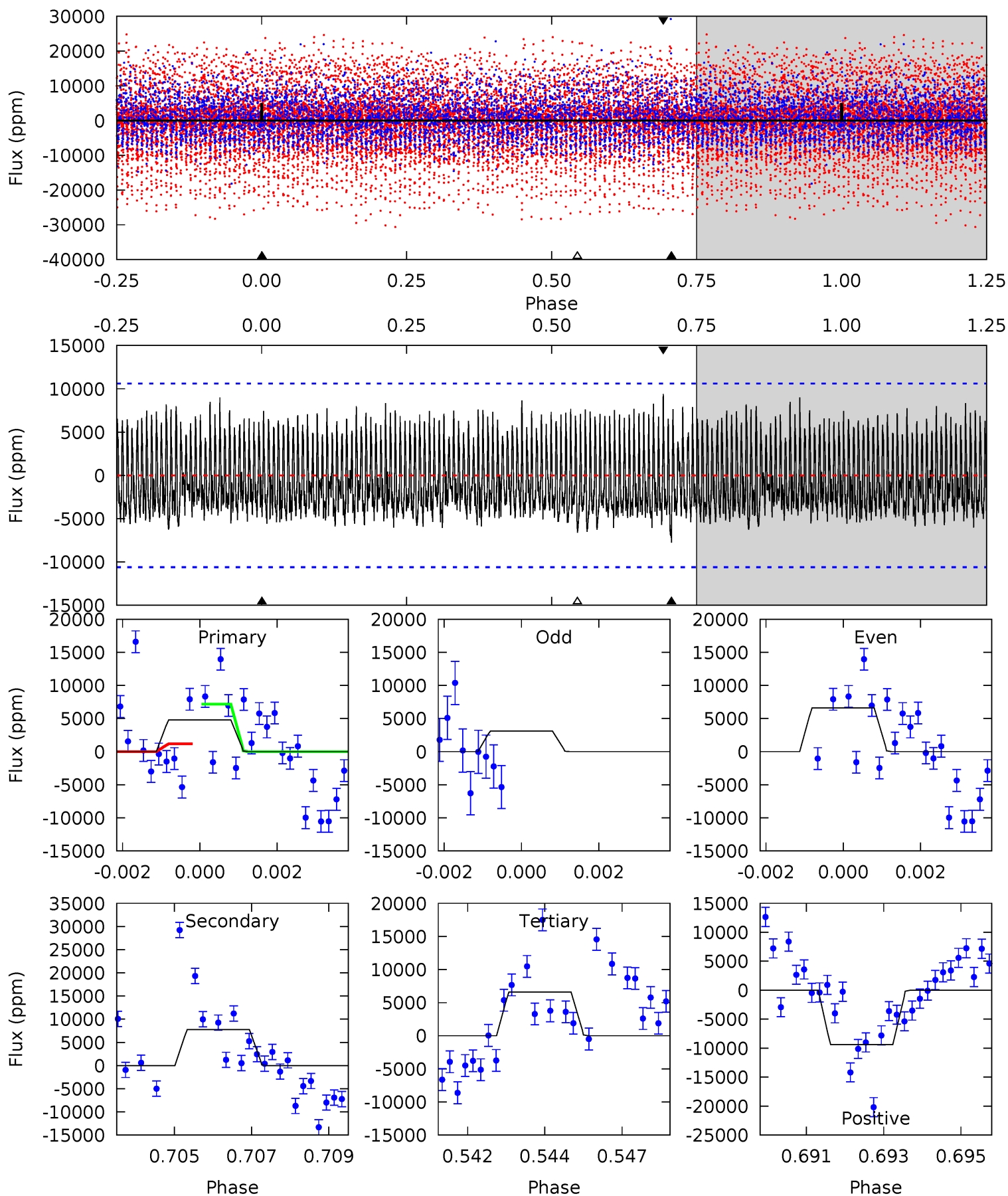
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.79	7.39	5.88	16.2	5.33	3.10	1.82	-2.09	-12.4	1.51	-8.81	0.80	1.05	0.69	3.45



Alt Model-Shift Uniqueness Test

010918016-03, P = 61.900964 Days, E = 82.216442 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.40	3.89	3.31	4.71	5.32	3.08	1.78	-0.91	-2.30	0.58	-0.82	0.59	1.00	0.55	1.41



Stellar Parameters For KIC 010918016

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4197^{+146}_{-161}	$4.605^{+0.052}_{-0.016}$	$0.360^{+0.100}_{-0.300}$	$0.683^{+0.023}_{-0.058}$	$0.684^{+0.038}_{-0.055}$	$3.027^{+0.696}_{-0.202}$
	+3%/-4%	+1%/-0%	+28%/-83%	+3%/-8%	+6%/-8%	+23%/-7%
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 010918016-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2580 ± 349	$7.62^{+9.23}_{-5.21}$	408^{+17}_{-15}	3329^{+1629}_{-676}	1847^{+15984}_{-1472}
Alt.	-7758 ± 1994	$8.34^{+8.30}_{-5.71}$	408^{+16}_{-16}	3813^{+2307}_{-743}	4376^{+39566}_{-3358}

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 $A_{obs} \gg 1.0$

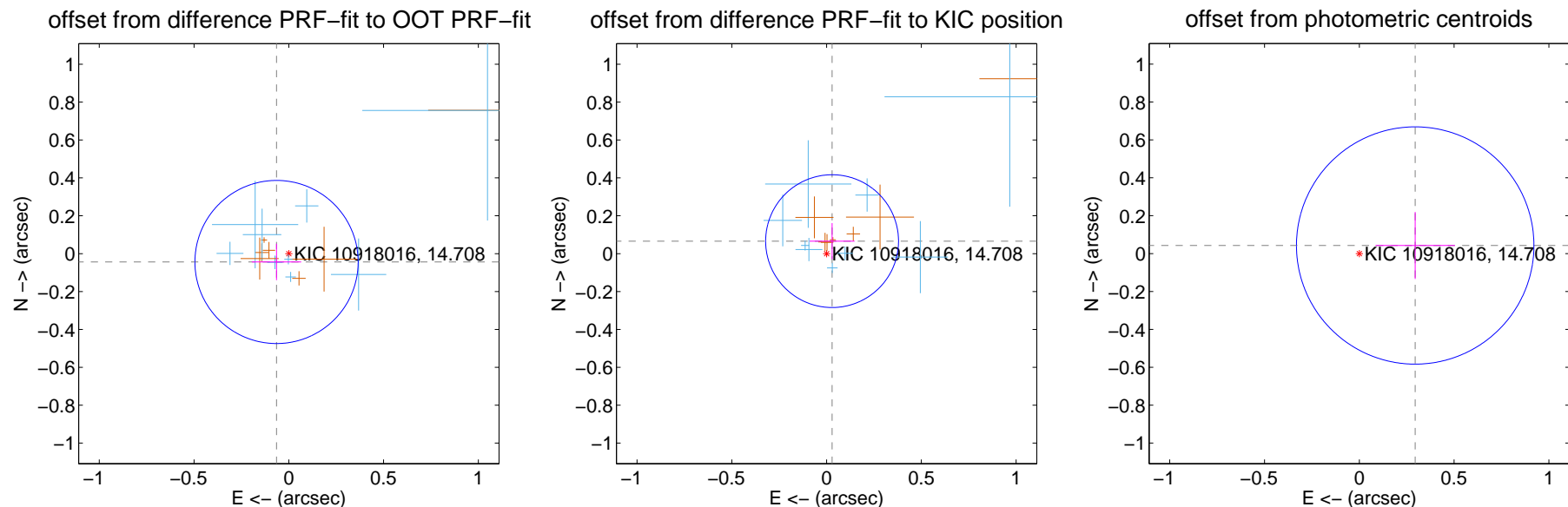
DV Centroid Data

Supplemental centroid analysis for 010918016-03. Kepler magnitude: 14.71. Transit SNR 7.65

There are 9 quarters with good PRF difference image offsets

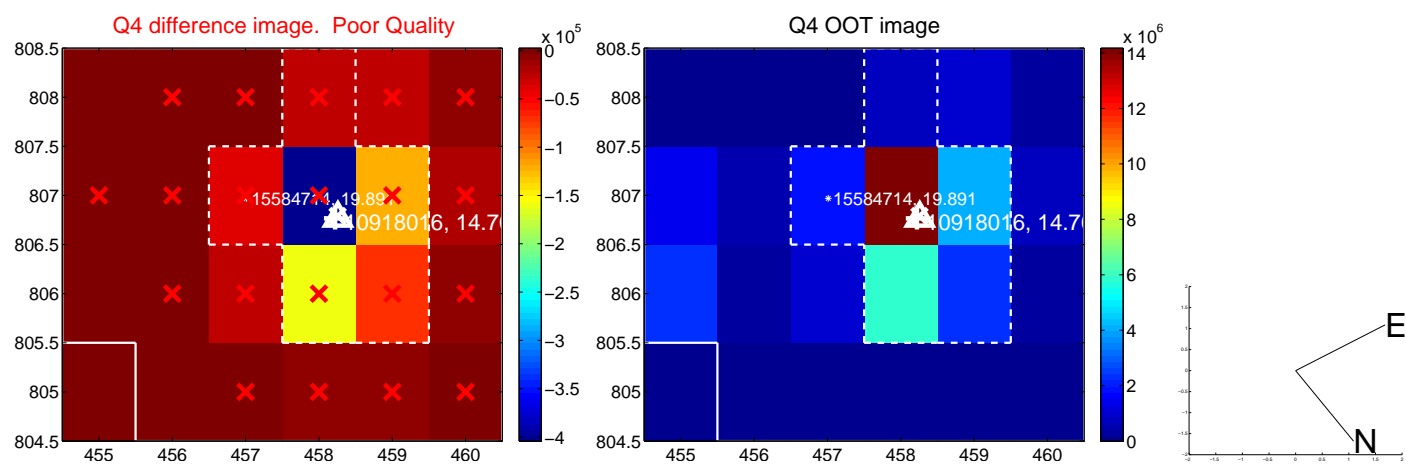
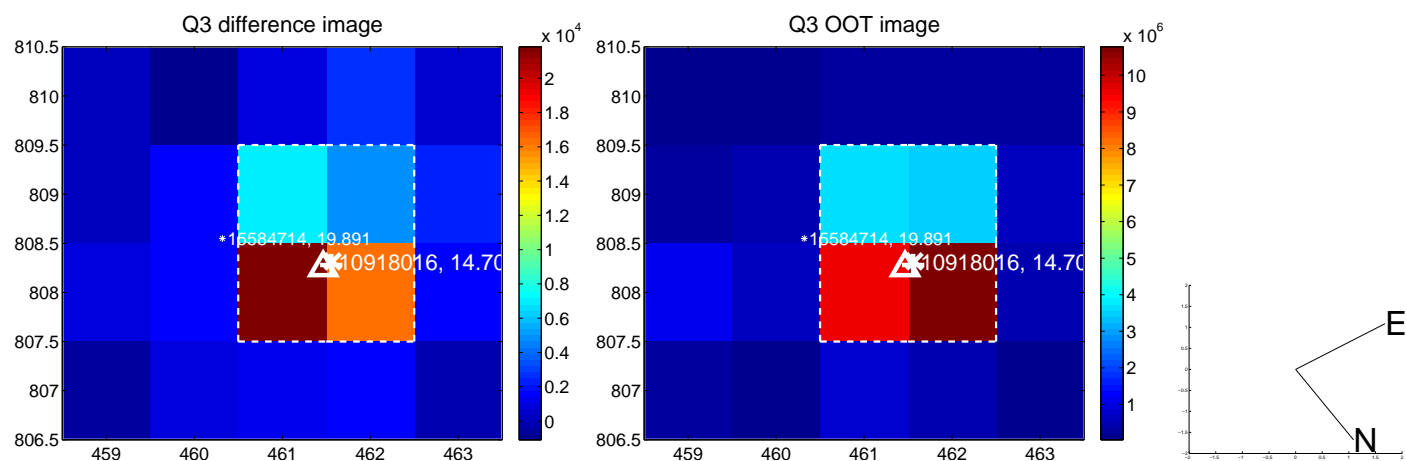
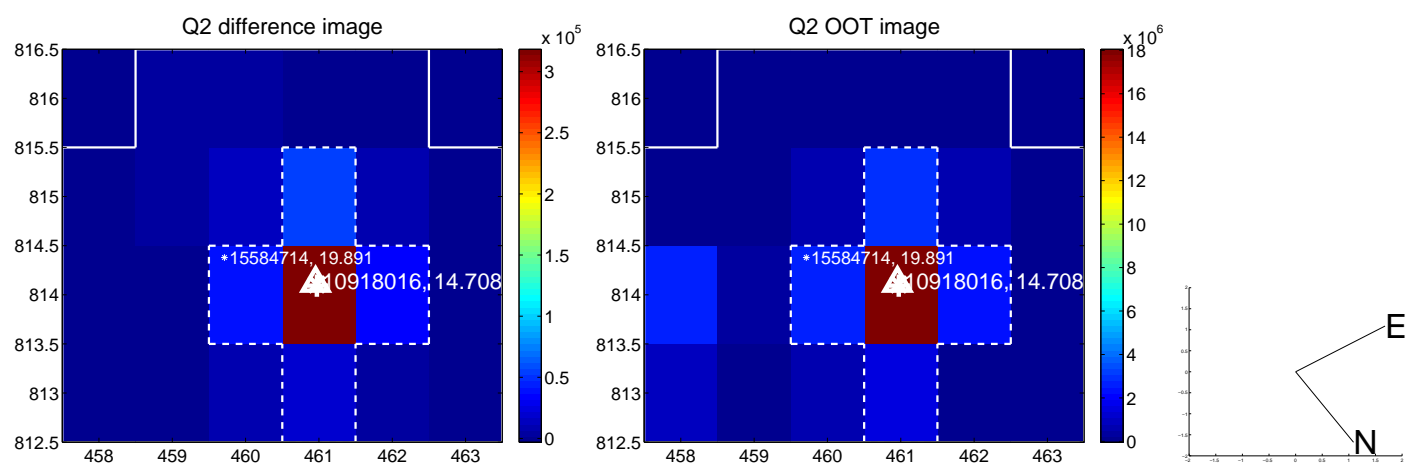
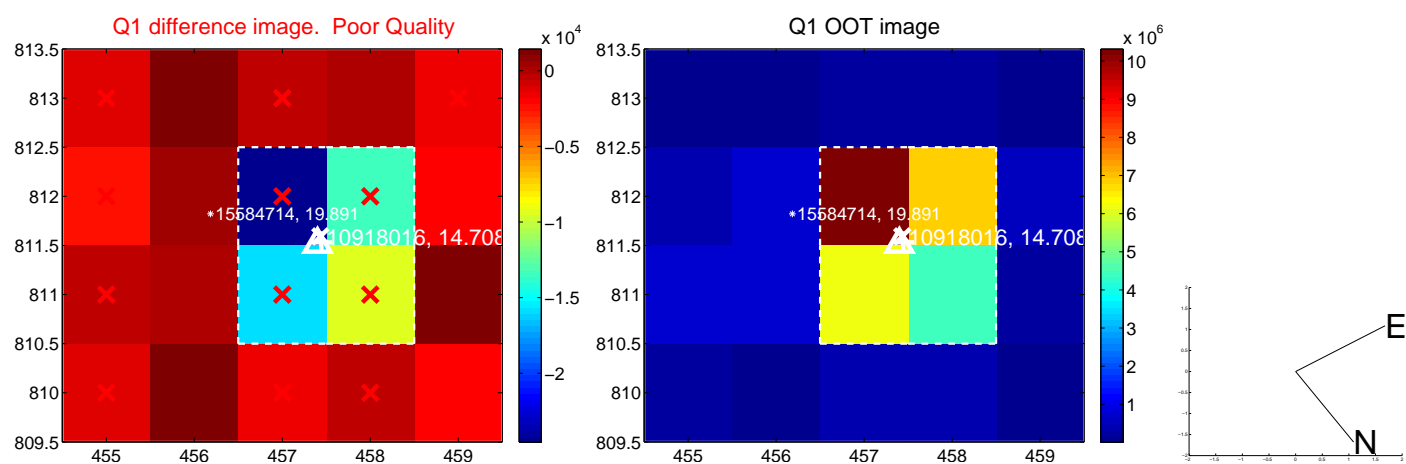
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.078 ± 0.144	0.55	0.065 ± 0.130	-0.044 ± 0.096
PRF-fit source offset from KIC position	0.072 ± 0.117	0.62	-0.029 ± 0.119	0.066 ± 0.096
photometric centroid source offset	0.30 ± 0.21	1.43	-0.29 ± 0.21	0.04 ± 0.18

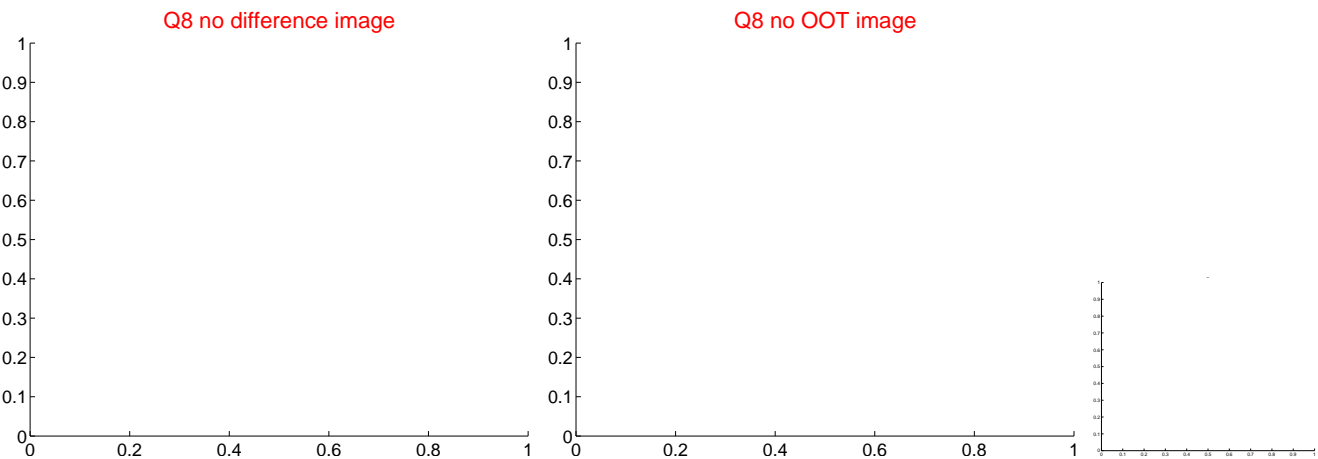
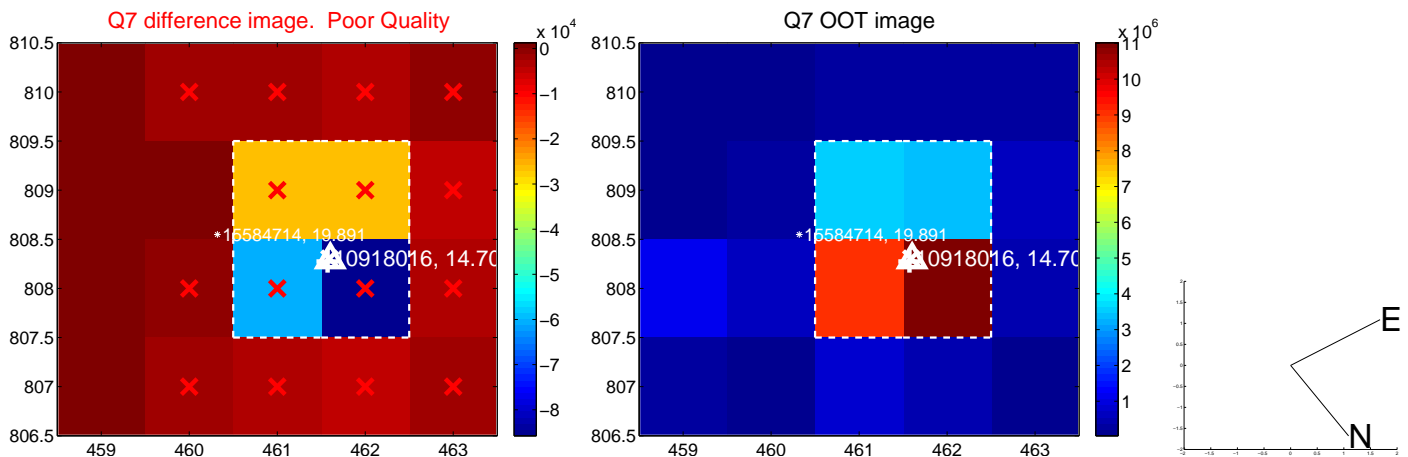
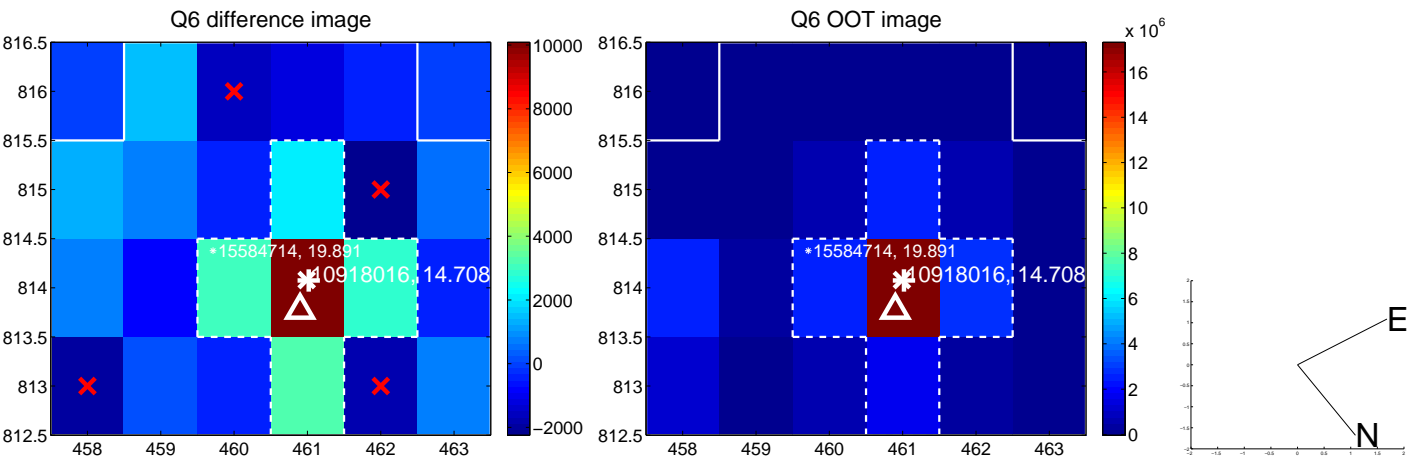
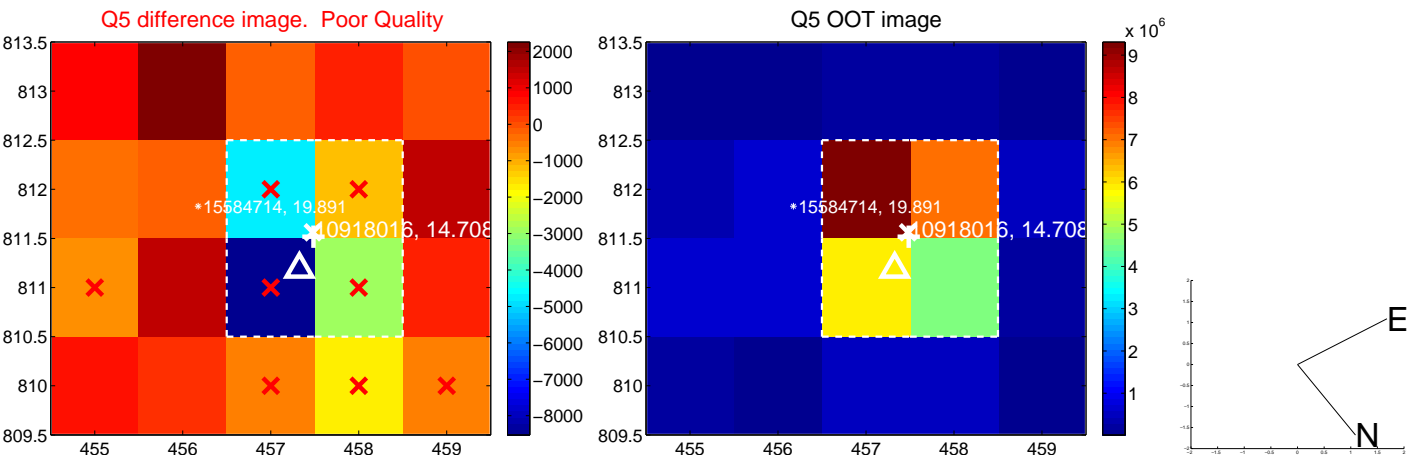


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

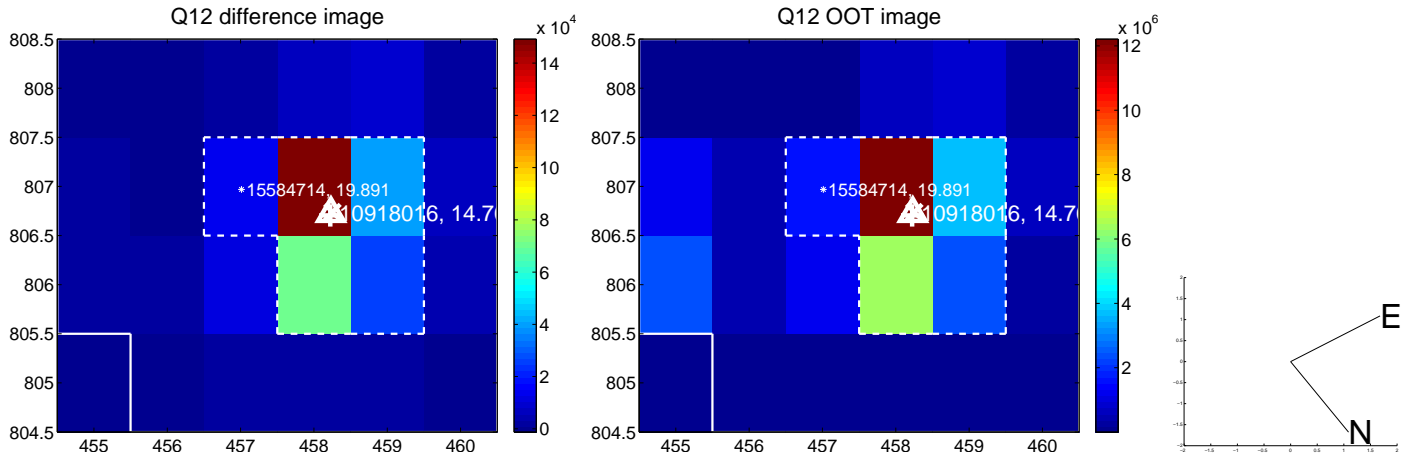
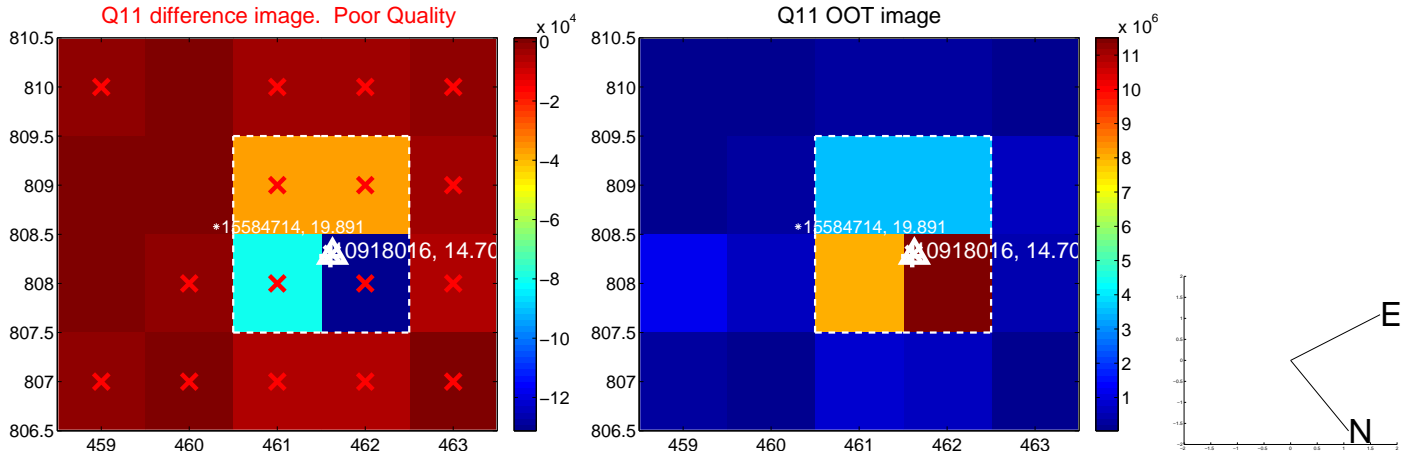
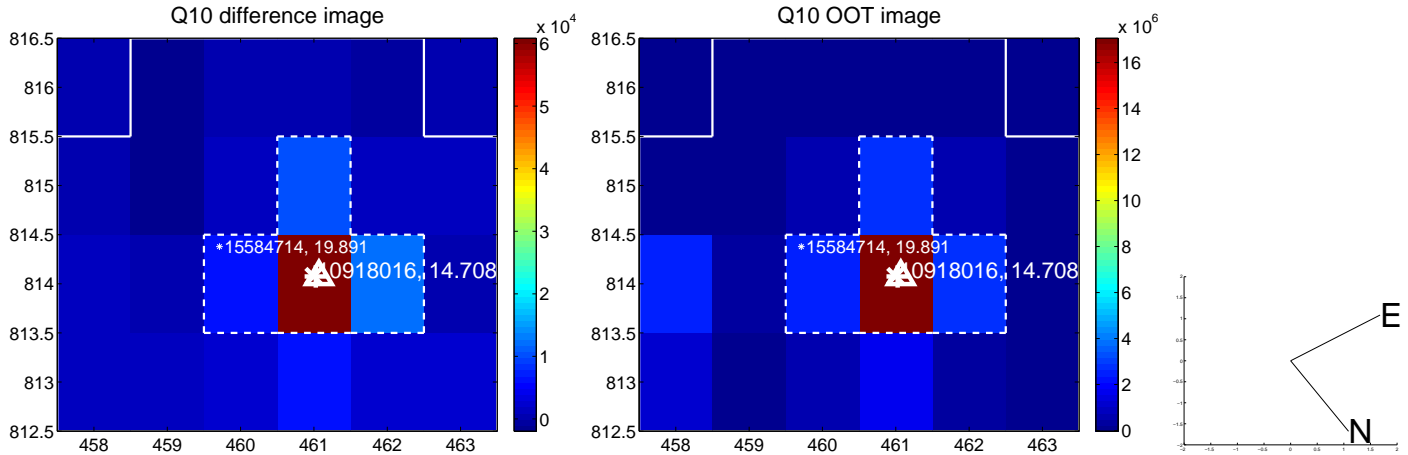
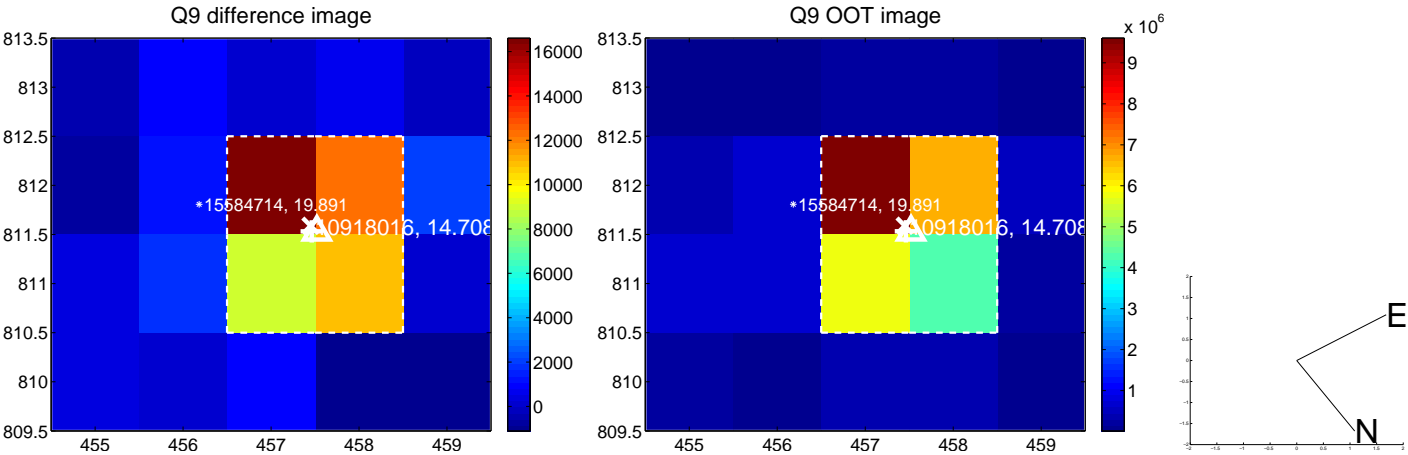
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



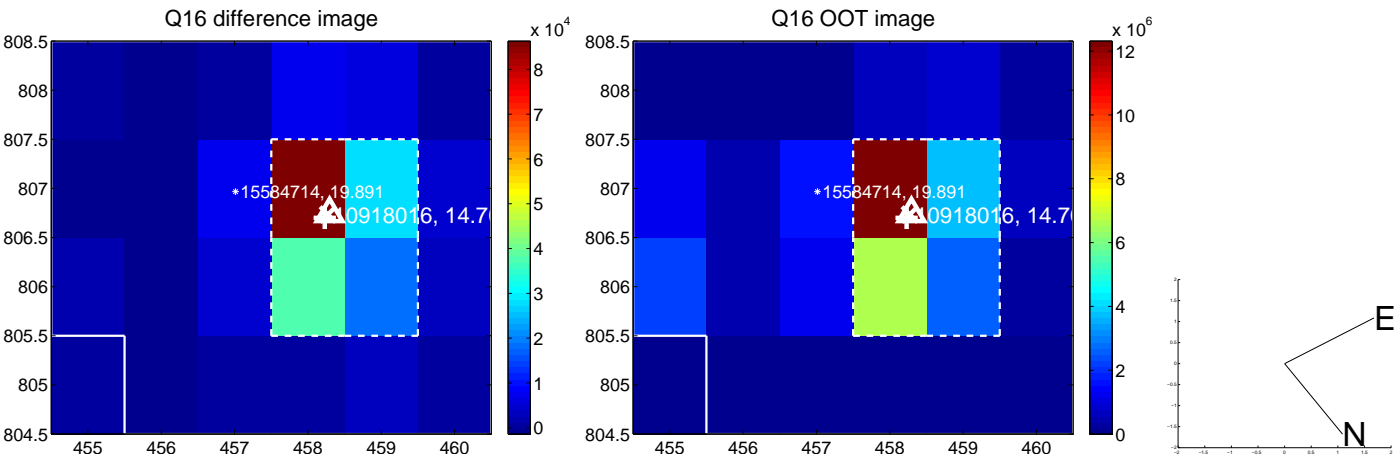
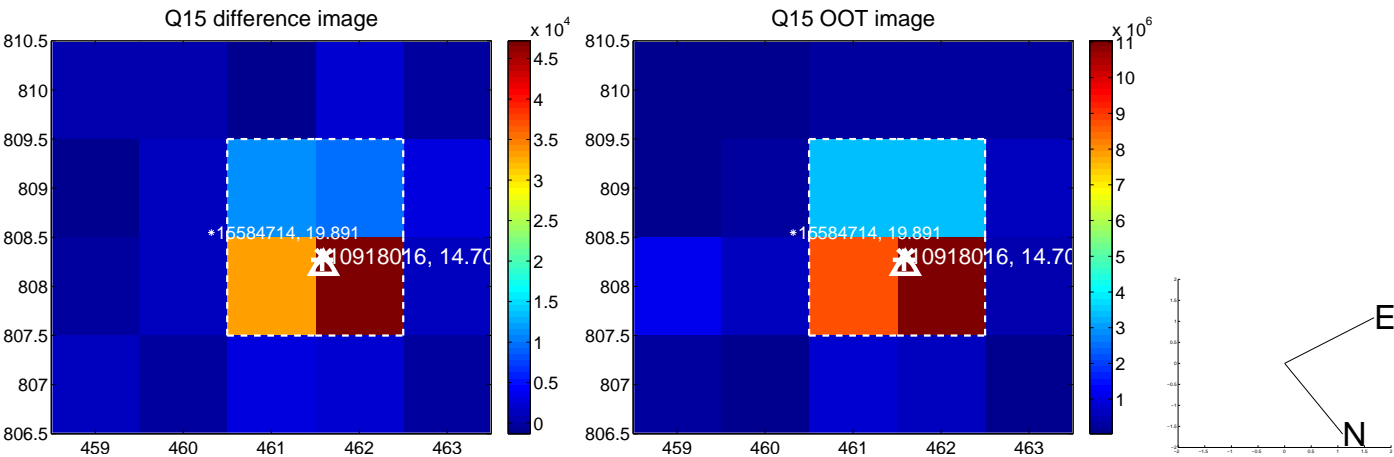
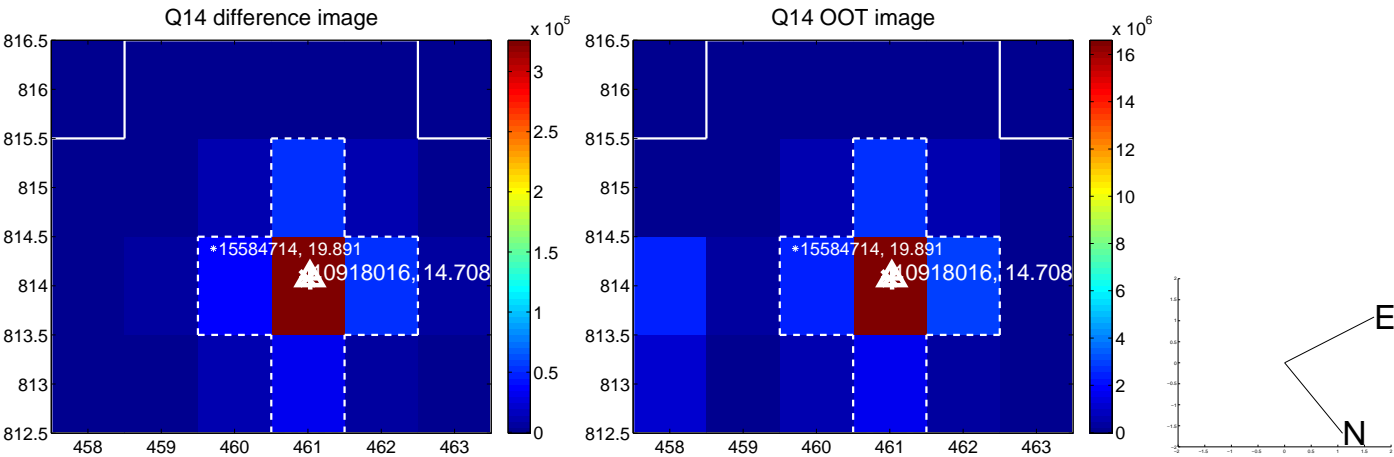
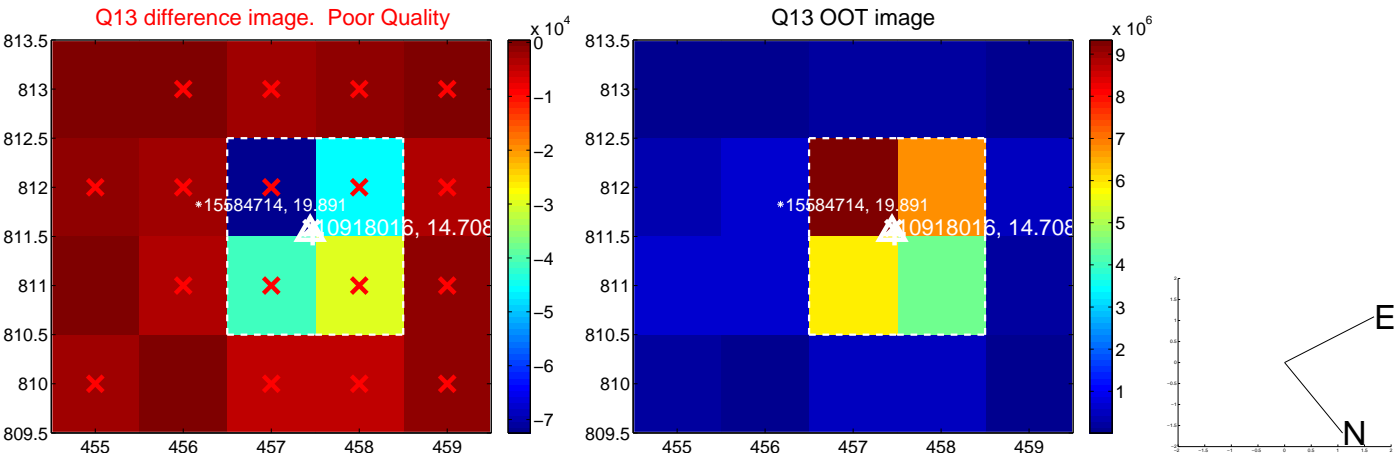
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



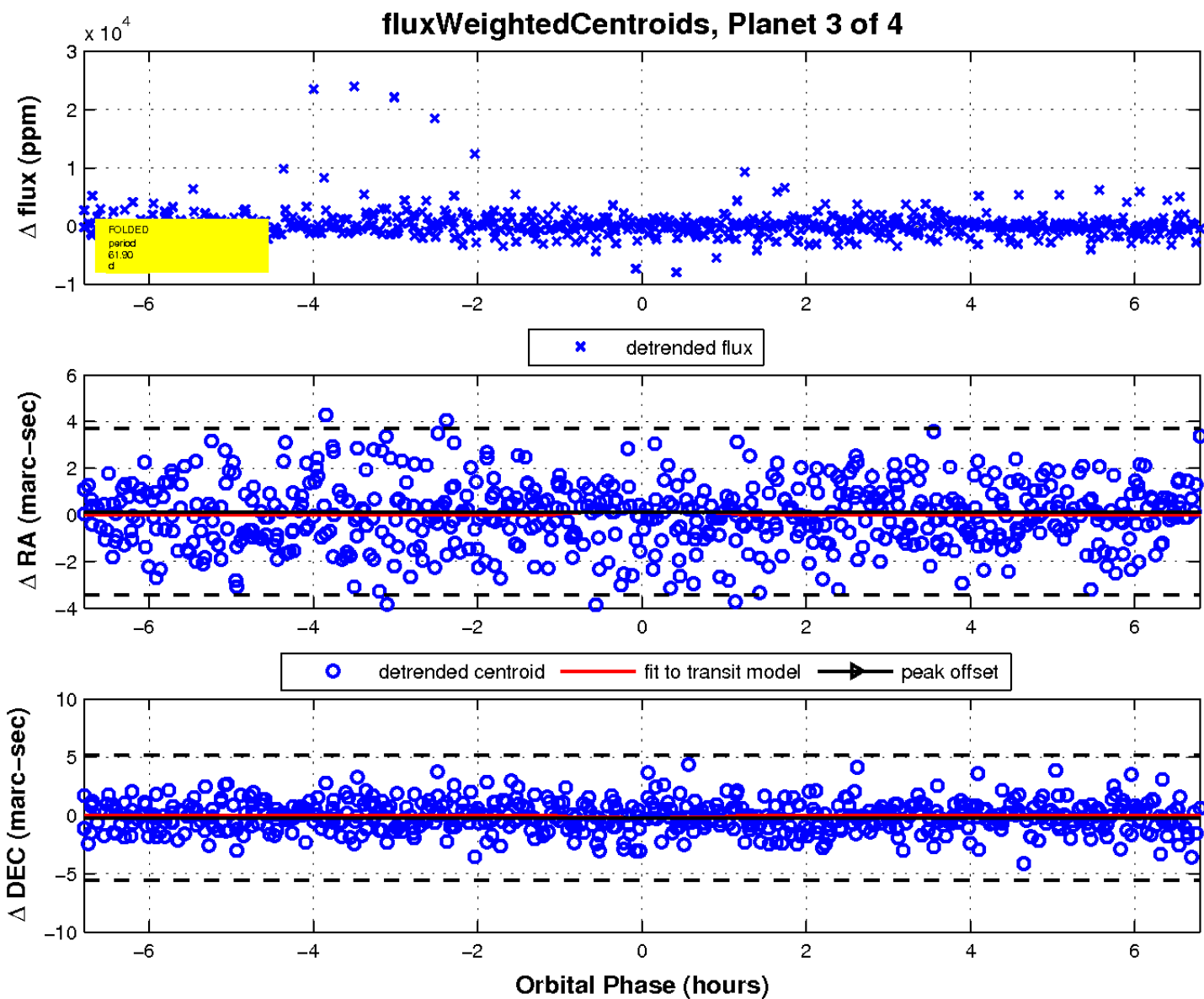
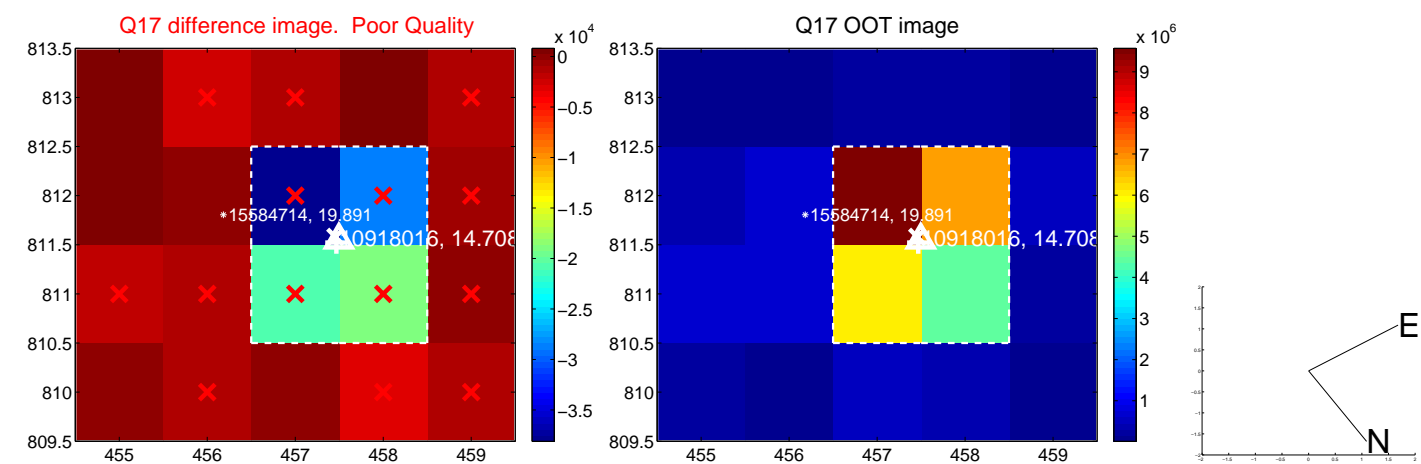
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

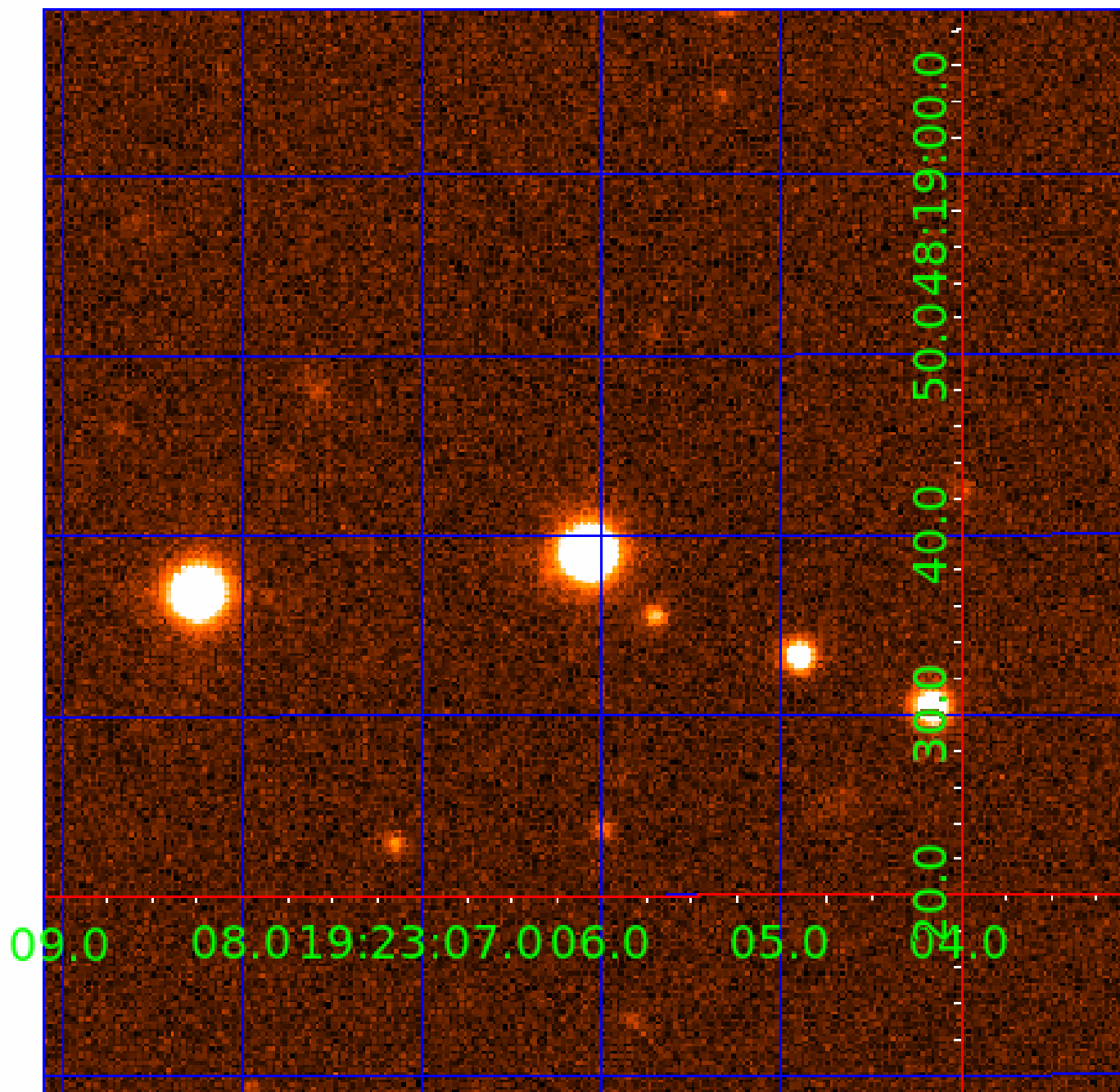


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010918016

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})
010918016-01	OBS	No	621.886186	269.058680	5167.5	5.663	15.7	8.2	0.68	4197	4.74	0.08
010918016-02	OBS	No	1.040601	132.212686	456.2	6.455	12.2	17.6	0.68	4197	1.43	412.94
010918016-03	OBS	No	61.898834	144.176452	2620.9	2.269	15.1	7.7	0.68	4197	3.34	1.78
010918016-04	OBS	No	1.040541	131.712287	30.8	7.258	13.4	1.6	0.68	4197	0.36	412.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010918016-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
010918016-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
010918016-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT
010918016-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—TRANS_GAPPED—SWEET_NTL—LPP_DV—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.

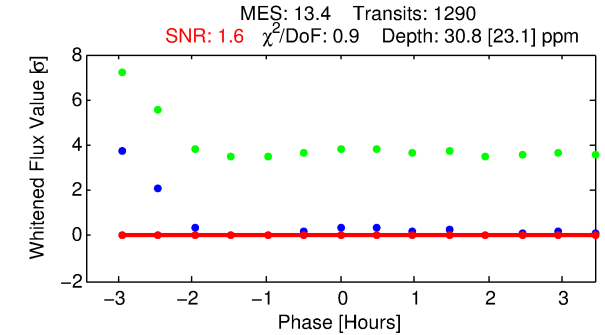
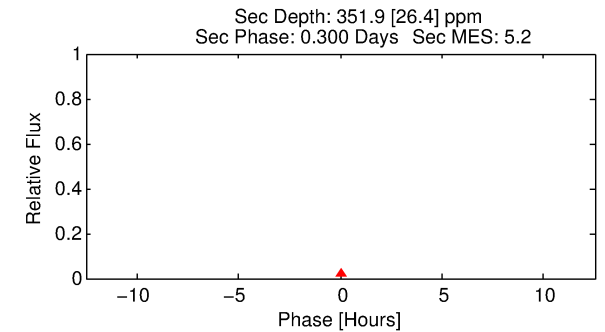
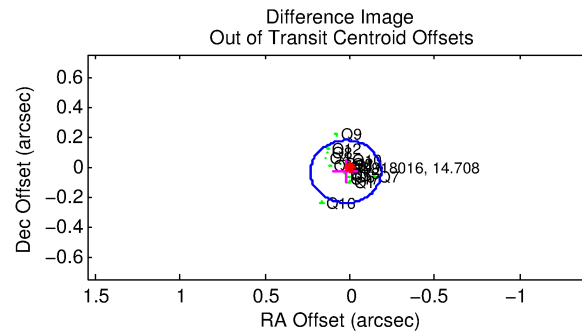
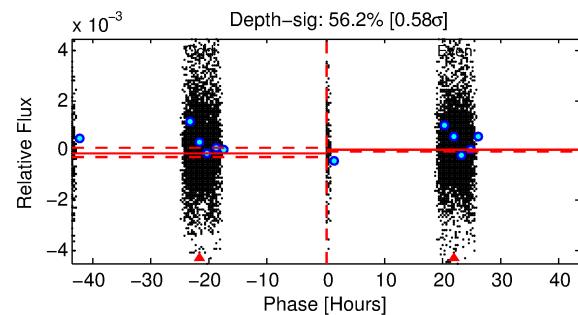
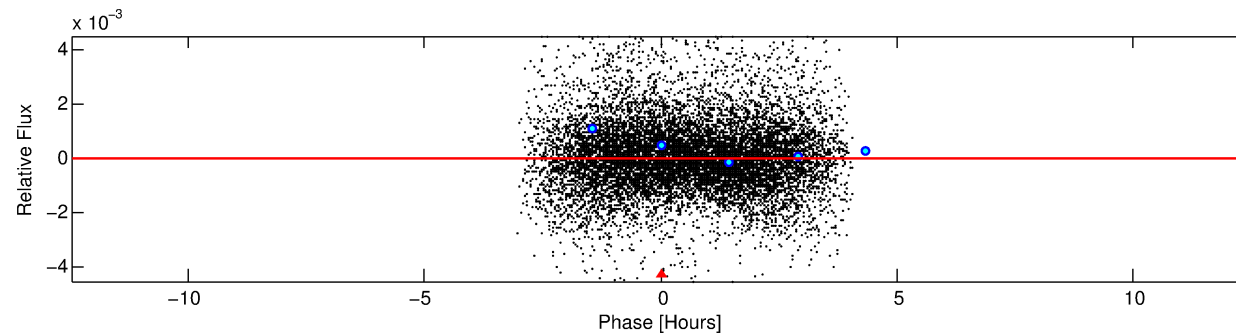
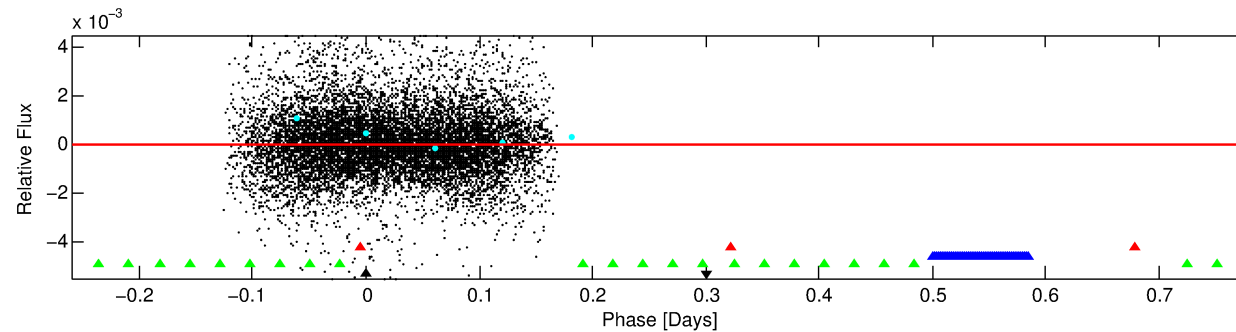
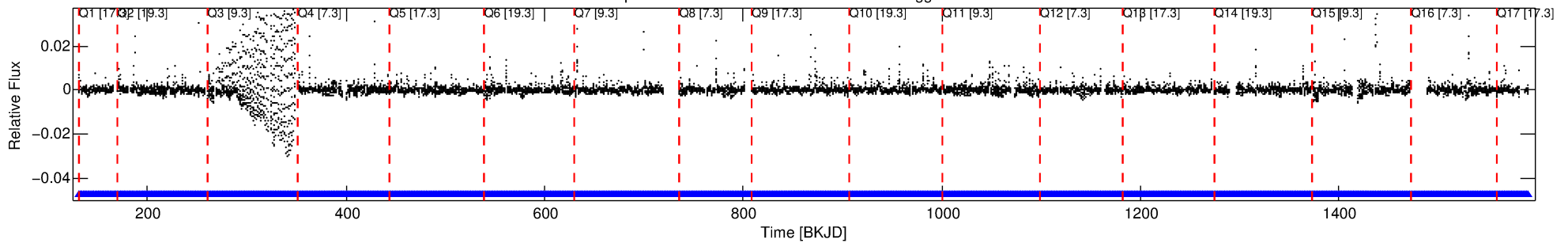
Ephemeris Match Information For 010918016-04

No Significant Match Found

DV One-Page Summary

KIC: 10918016 Candidate: 4 of 4 Period: 1.041 d

Kp: 14.71 R*: 0.68 Rs Teff: 4197.0 K Logg: 4.61 Fe/H: 0.360



DV Fit Results:

Period = 1.04054 [0.00019] d
Epoch = 131.7123 [0.1493] BKJD
Rp/R* = 0.0048 [0.0188]
a/R* = 1.27 [5.00]
b = 0.01 [950.87]
Seff = 412.97 [75.16]
Teq = 1149 [52] K
Rp = 0.36 [1.40] Re
a = 0.0177 [0.0012] AU
Ag = 471.42 [3686.59] [0.13σ]
Teffp = 8281 [16192] K [0.44σ]

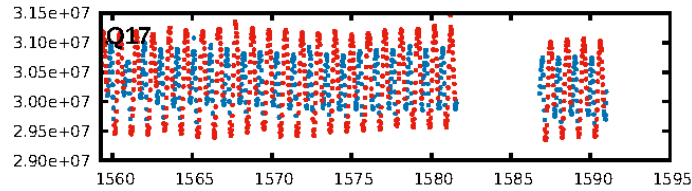
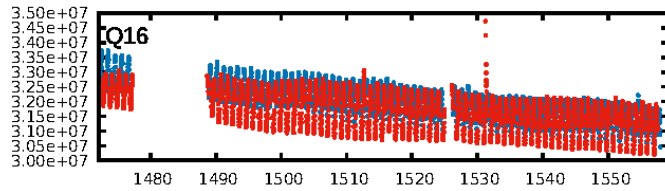
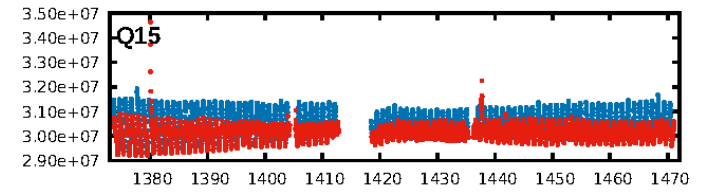
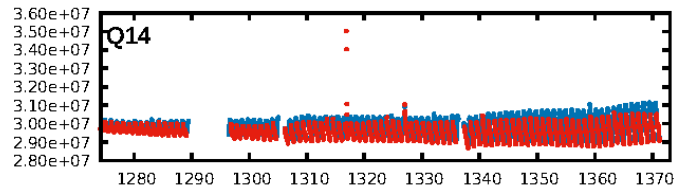
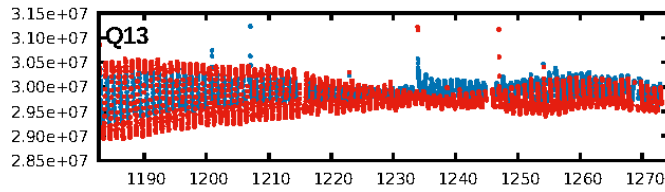
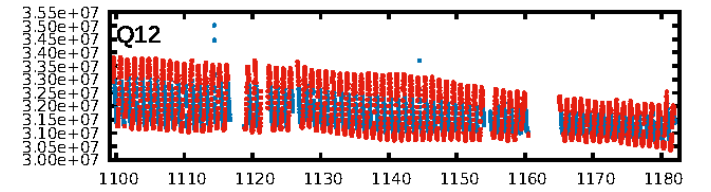
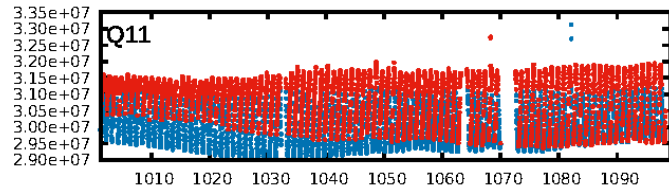
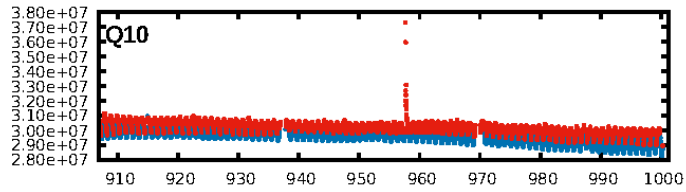
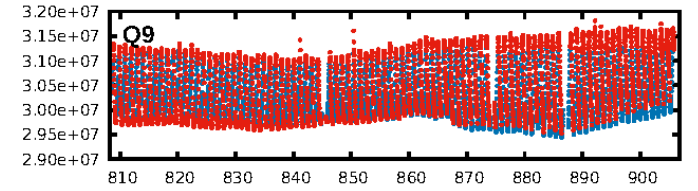
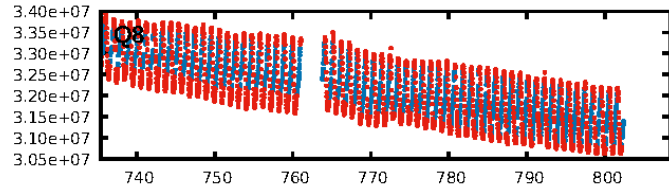
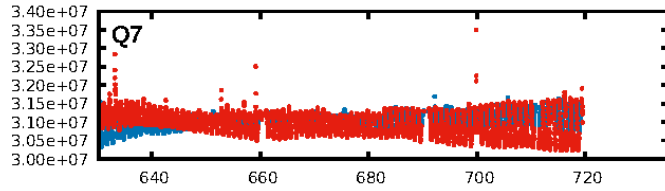
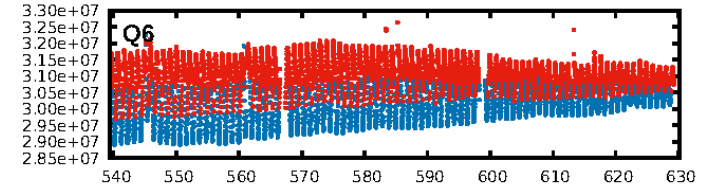
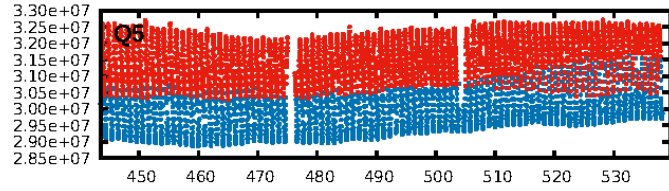
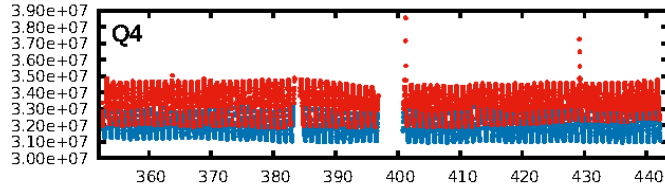
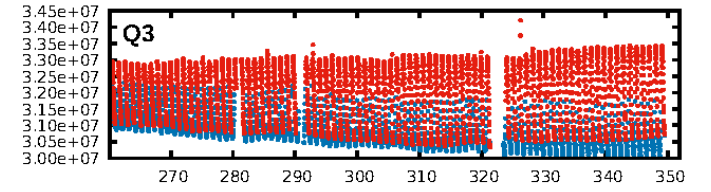
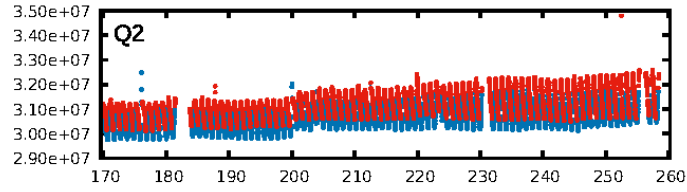
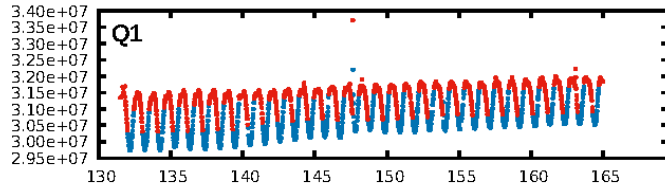
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1232/1232]
GhostDiagnostic-chr: -1.16
Centroid-sig: 0.8%
Centroid-so: 2.320 arcsec [1.82σ]
OotOffset-rm: 0.042 arcsec [0.60σ]
KicOffset-rm: 0.097 arcsec [1.35σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.29 [5/17]
DiffImageOverlap-fno: 0.00 [0/17]

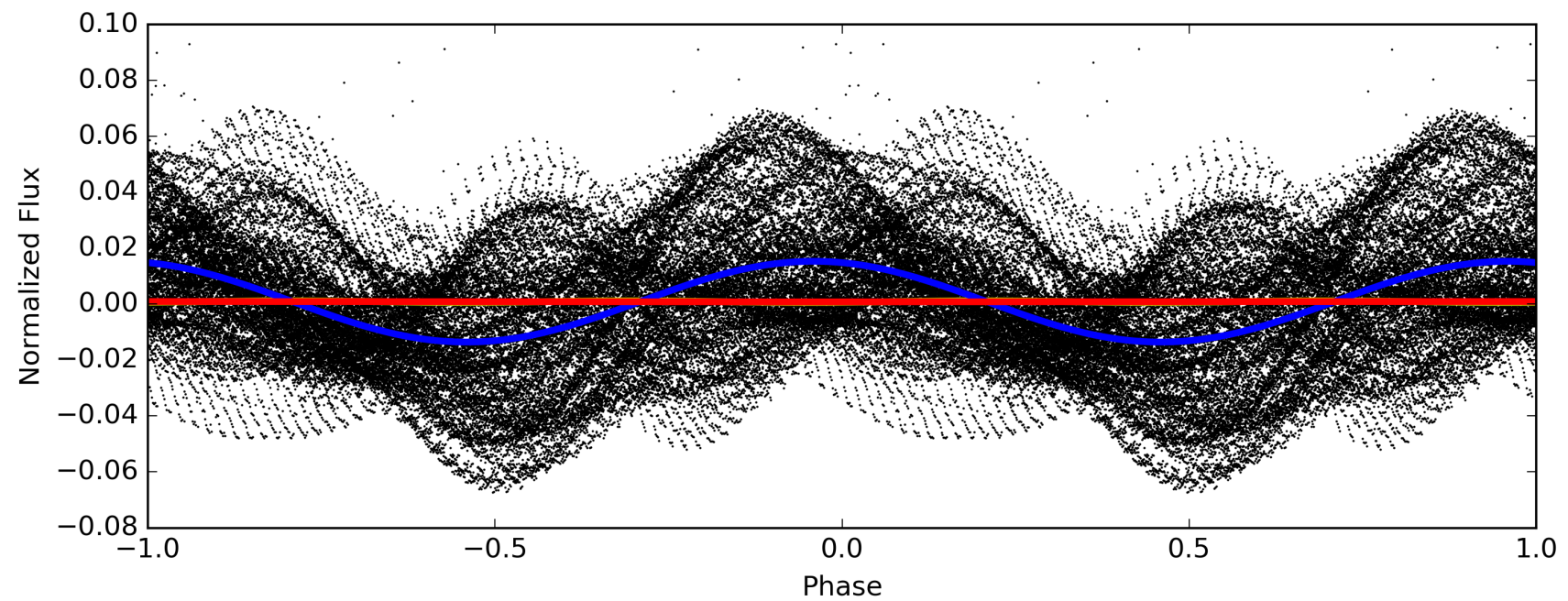
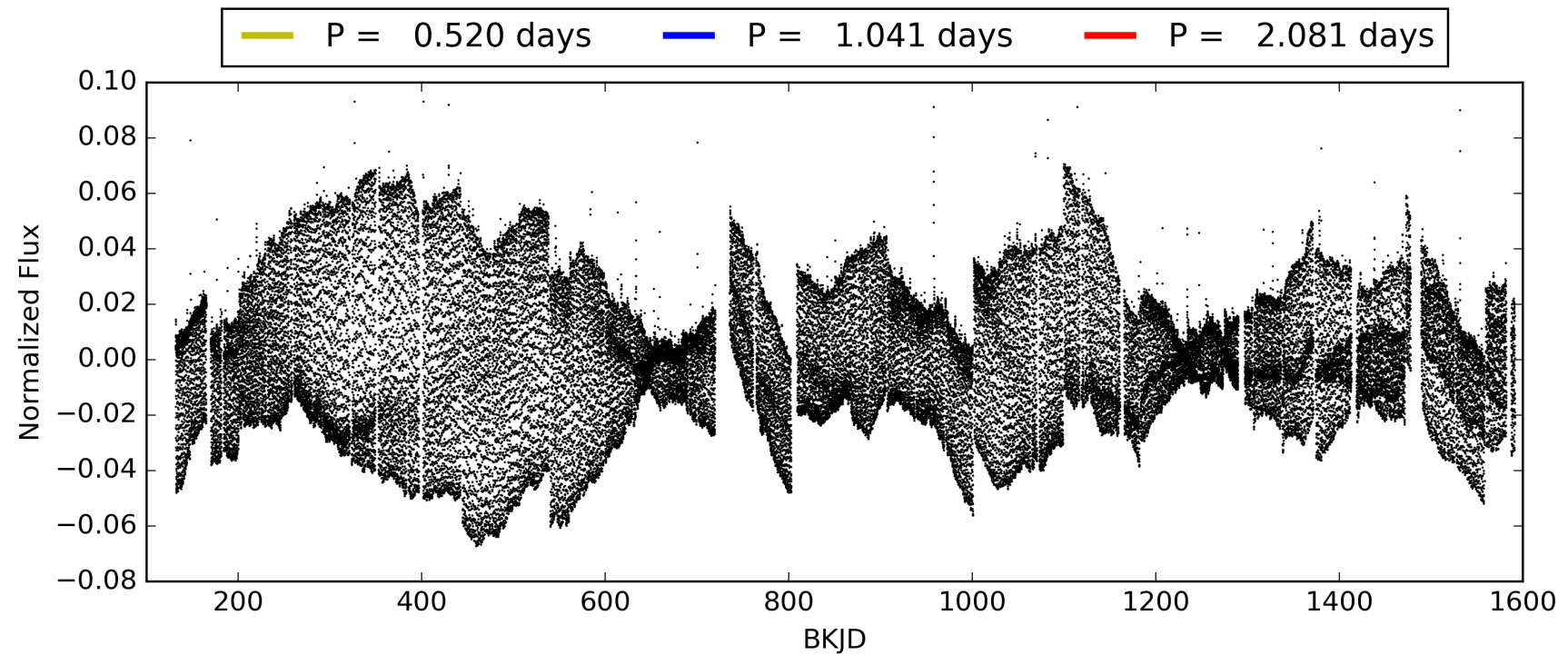
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:45:10 Z

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

TCE 010918016-04, PDC Light Curves

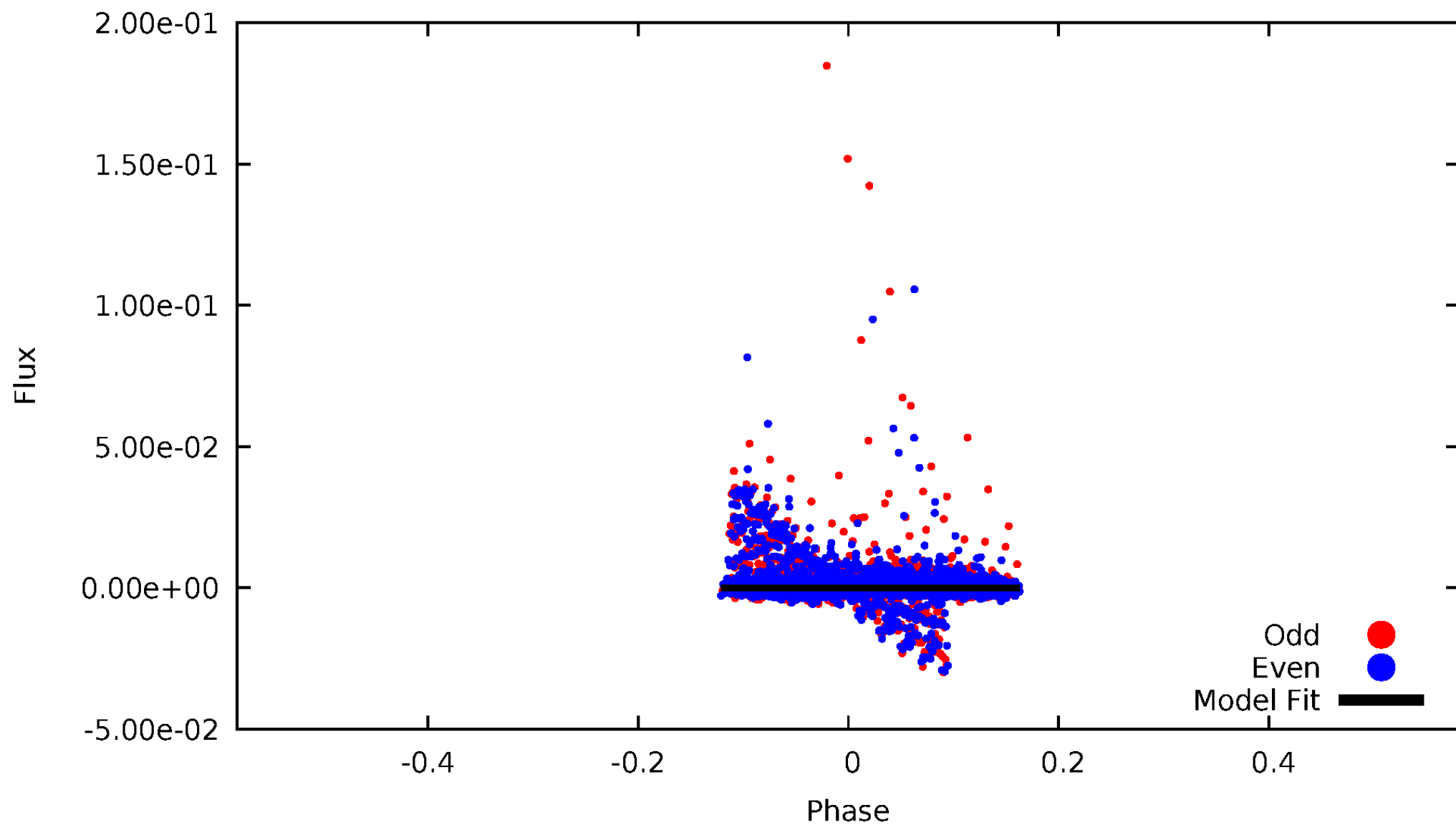


TCE 010918016-04



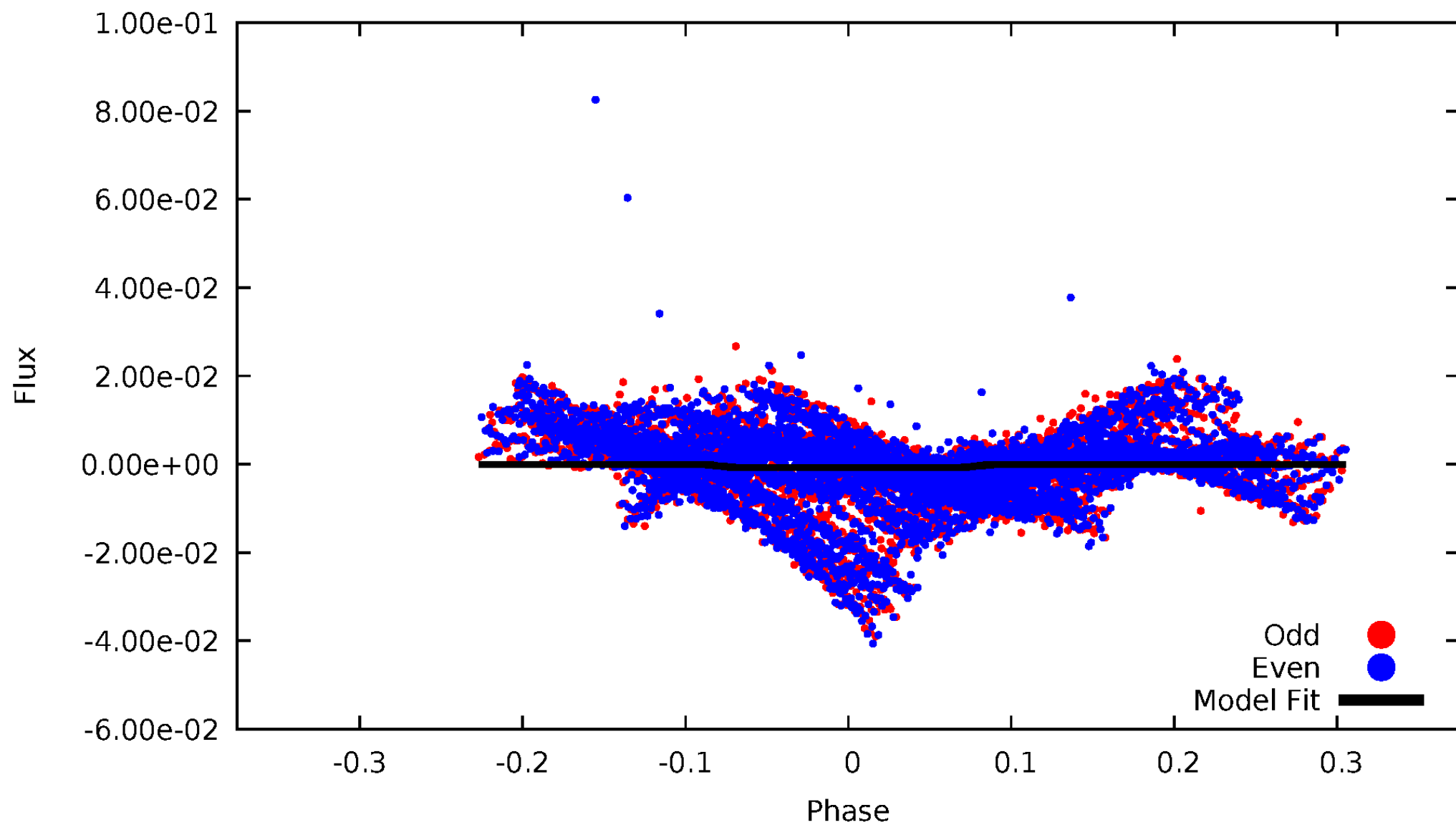
DV Odd/Even

TCE 010918016-04



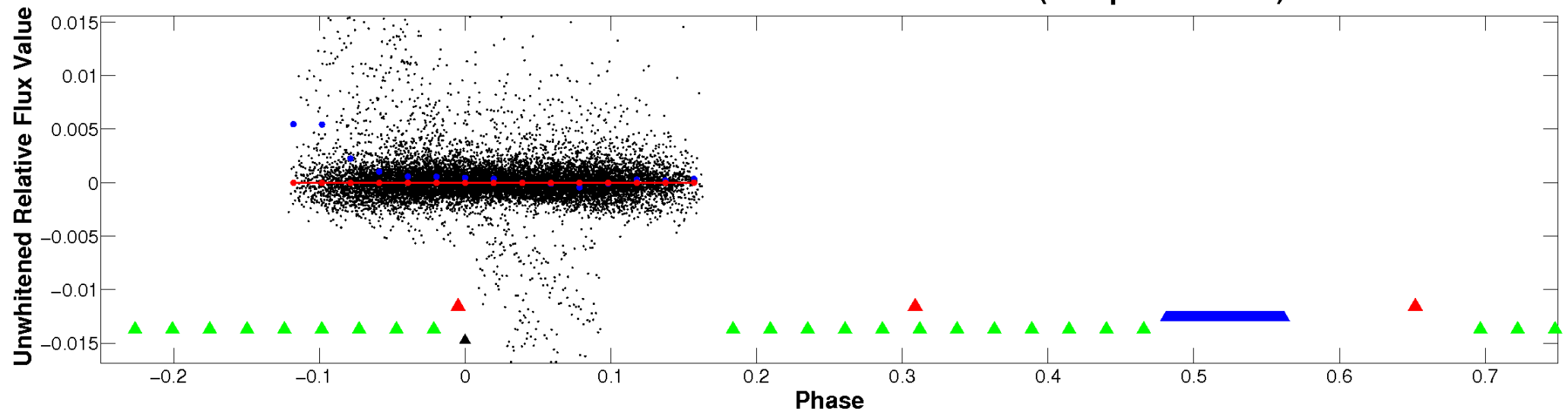
ALT Odd/Even

TCE 010918016-04

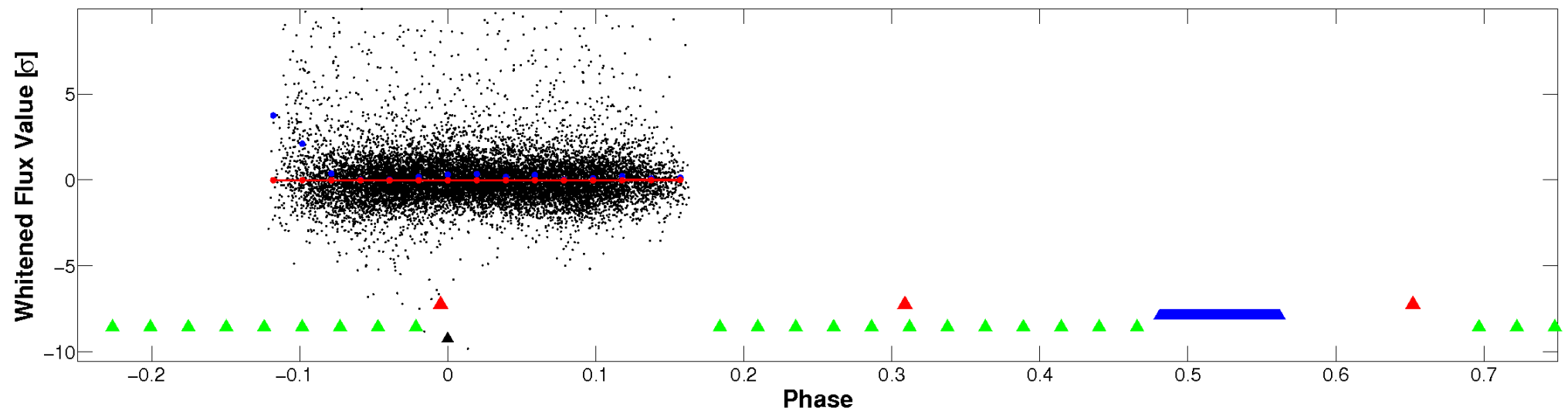


Non-Whitened Vs. Whitened Light Curve

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

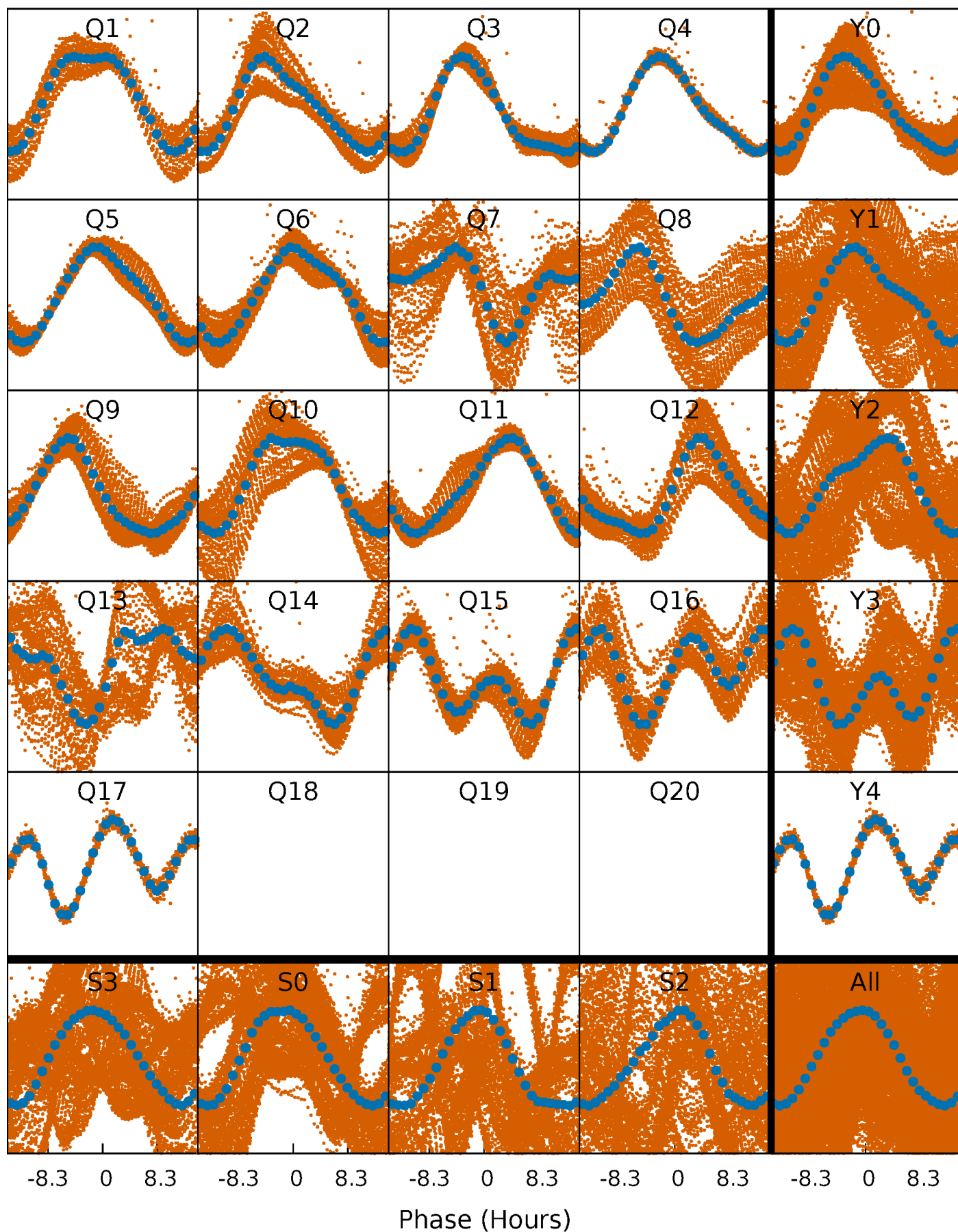


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



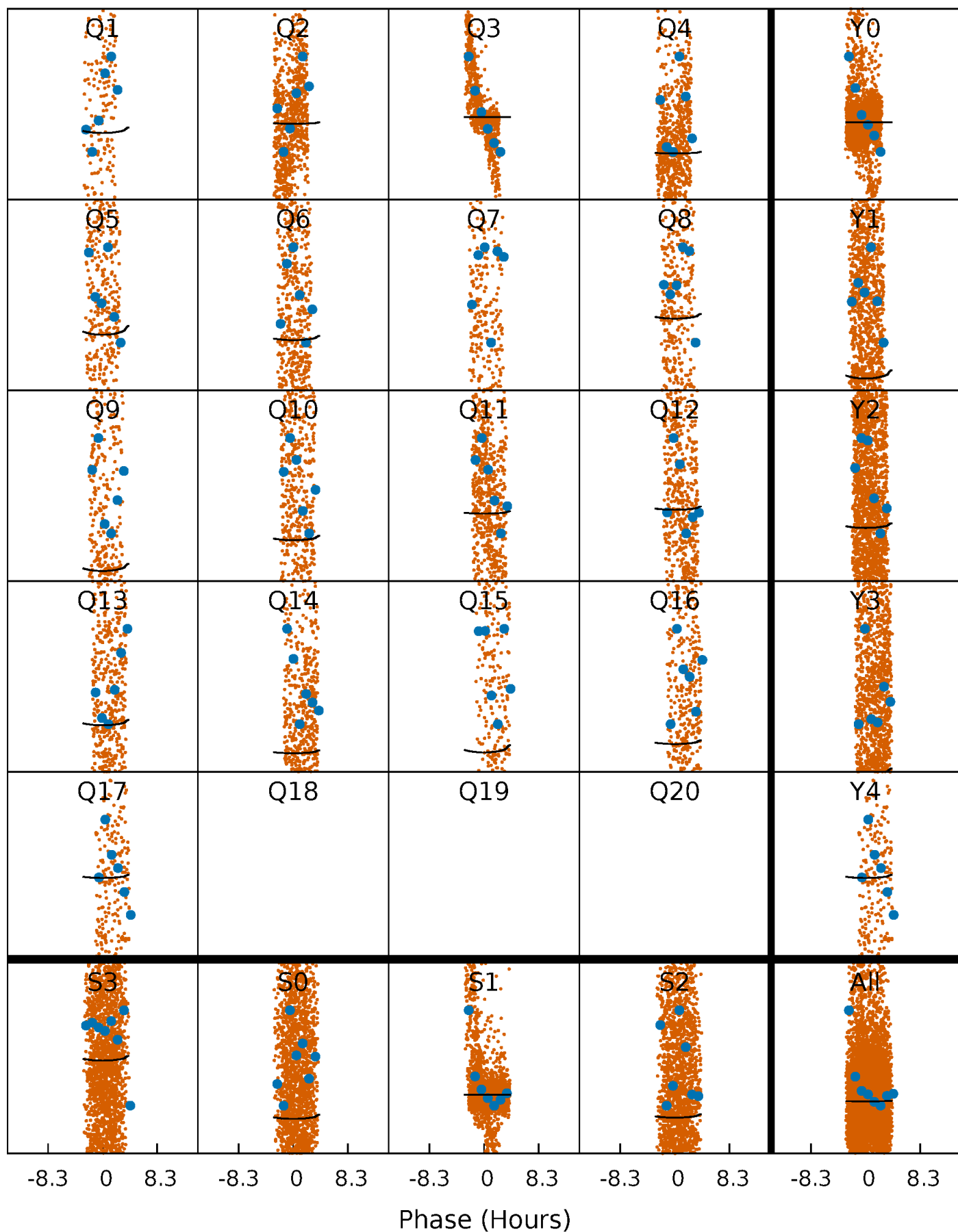
PDC Quarter-Phased Transit Curves

TCE 010918016-04 P= 1.040541 Days $T_0=131.712287$ (BKJD)



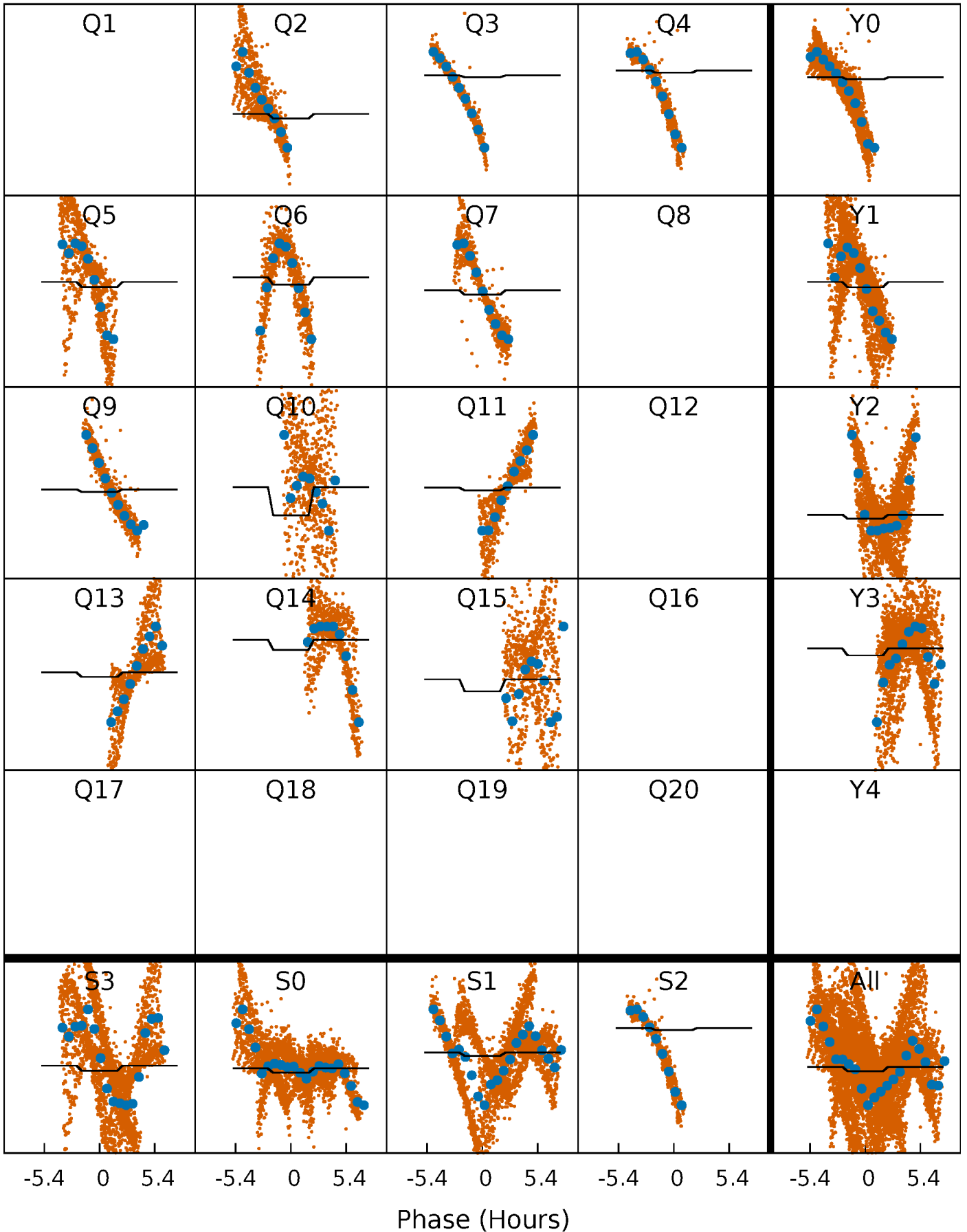
DV Quarter-Phased Transit Curves

TCE 010918016-04 P= 1.040541 Days $T_0=131.712287$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

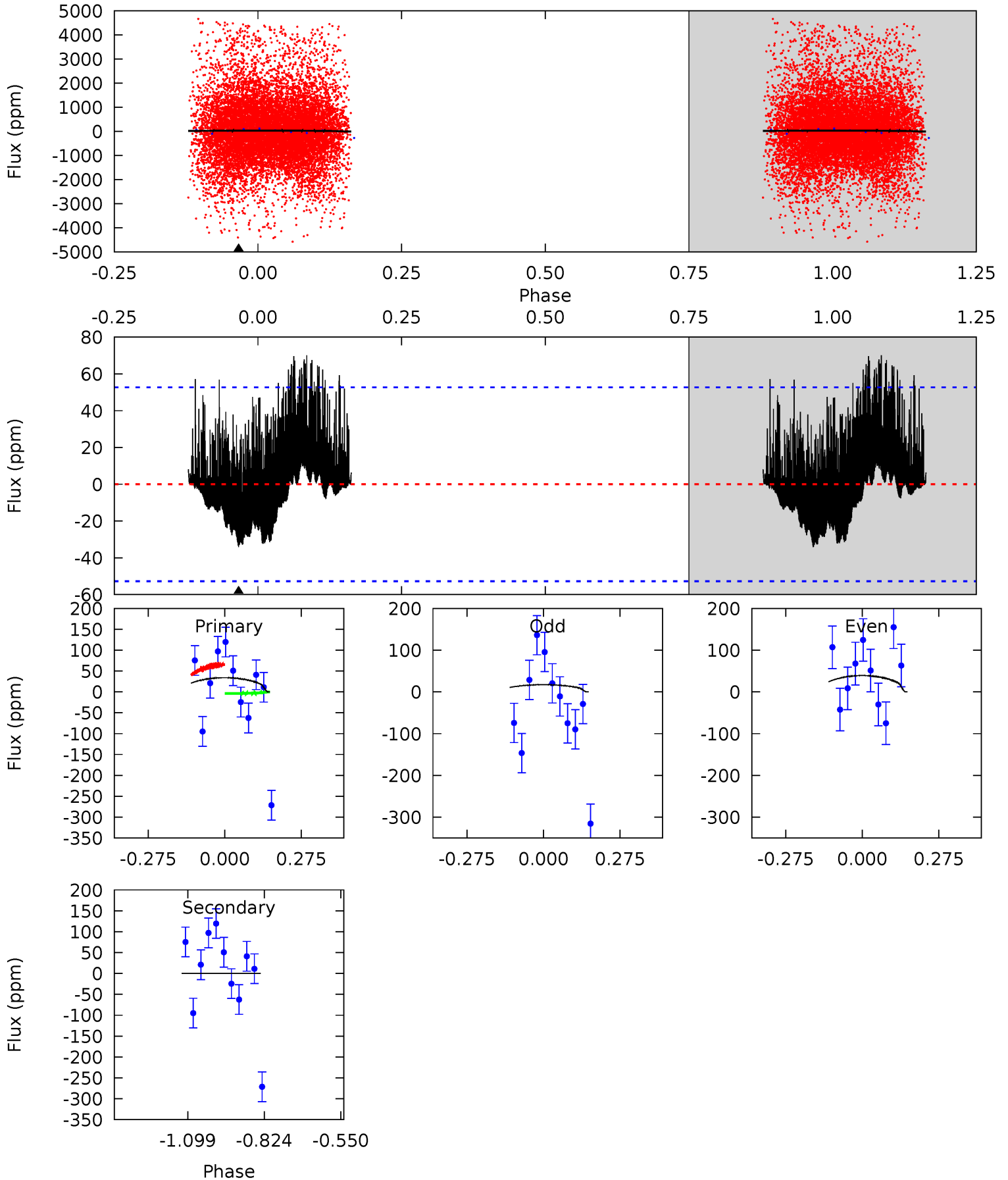
TCE 010918016-04 $P = 1.040323$ Days $T_0 = 131.836051$ (BKJD)



DV Model-Shift Uniqueness Test

010918016-04, P = 1.040541 Days, E = 130.671746 Days

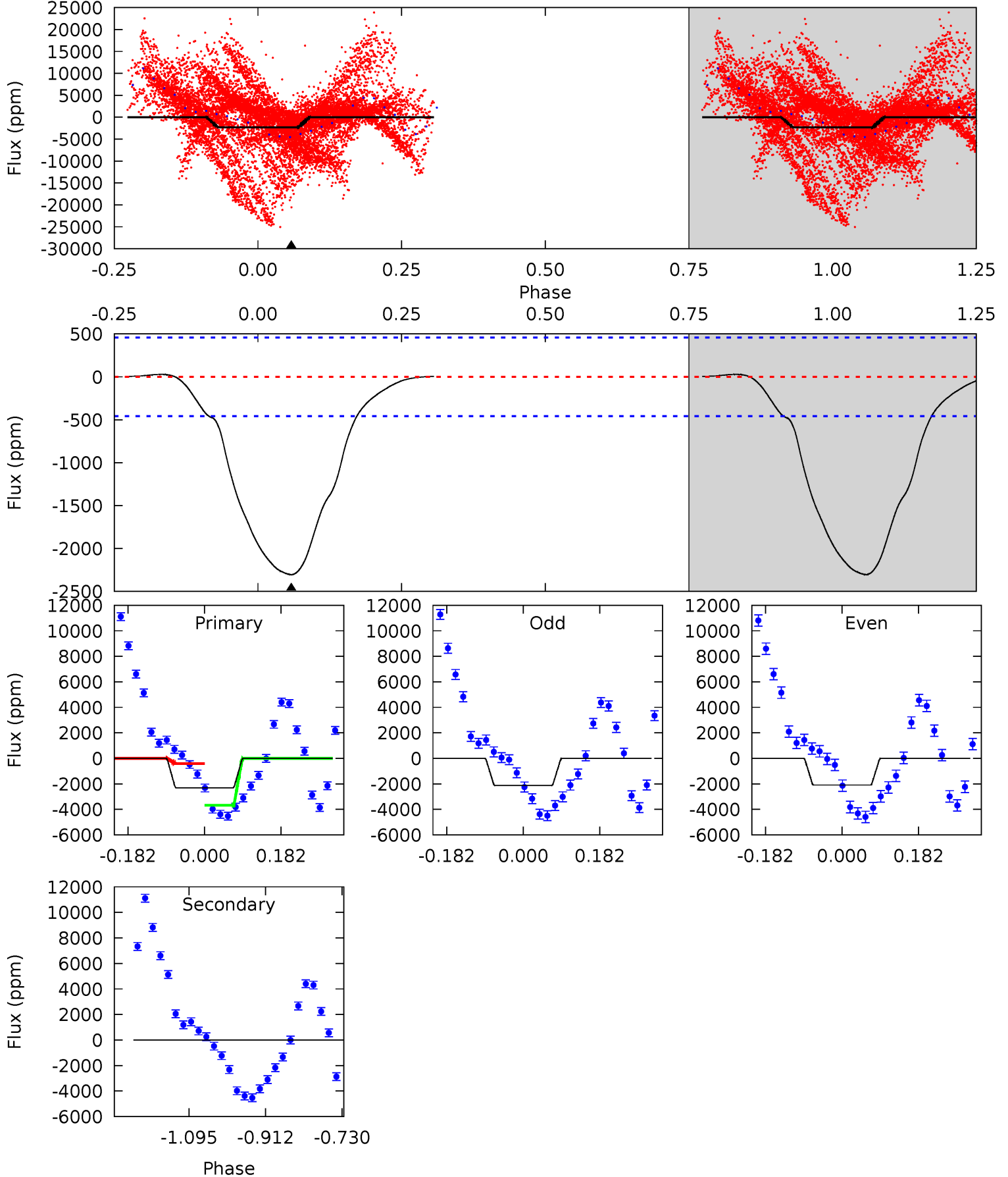
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.81	0	0	0	4.35	1.09	0.72	2.81	2.81	0	0	0.89	6.19	0.67	2.37



Alt Model-Shift Uniqueness Test

010918016-04, P = 1.040323 Days, E = 131.836051 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.3	0	0	0	4.44	1.33	0.36	22.3	22.3	0	0	0.11	2.42	0.01	15.9



Stellar Parameters For KIC 010918016

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4197^{+146}_{-161}	$4.605^{+0.052}_{-0.016}$	$0.360^{+0.100}_{-0.300}$	$0.683^{+0.023}_{-0.058}$	$0.684^{+0.038}_{-0.055}$	$3.027^{+0.696}_{-0.202}$
	+3%/-4%	+1%/-0%	+28%/-83%	+3%/-8%	+6%/-8%	+23%/-7%
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 010918016-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 12	$1.14^{+1.07}_{-0.82}$	1592^{+67}_{-60}	-2154^{+5020}_{-748}	$0.017^{+2.755}_{-2.946}$
Alt.	0 ± 103	$2.19^{+1.34}_{-1.21}$	1593^{+56}_{-61}	-2287^{+5334}_{-860}	$-0.197^{+5.118}_{-5.133}$

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 $A_{obs} \gg 1.0$

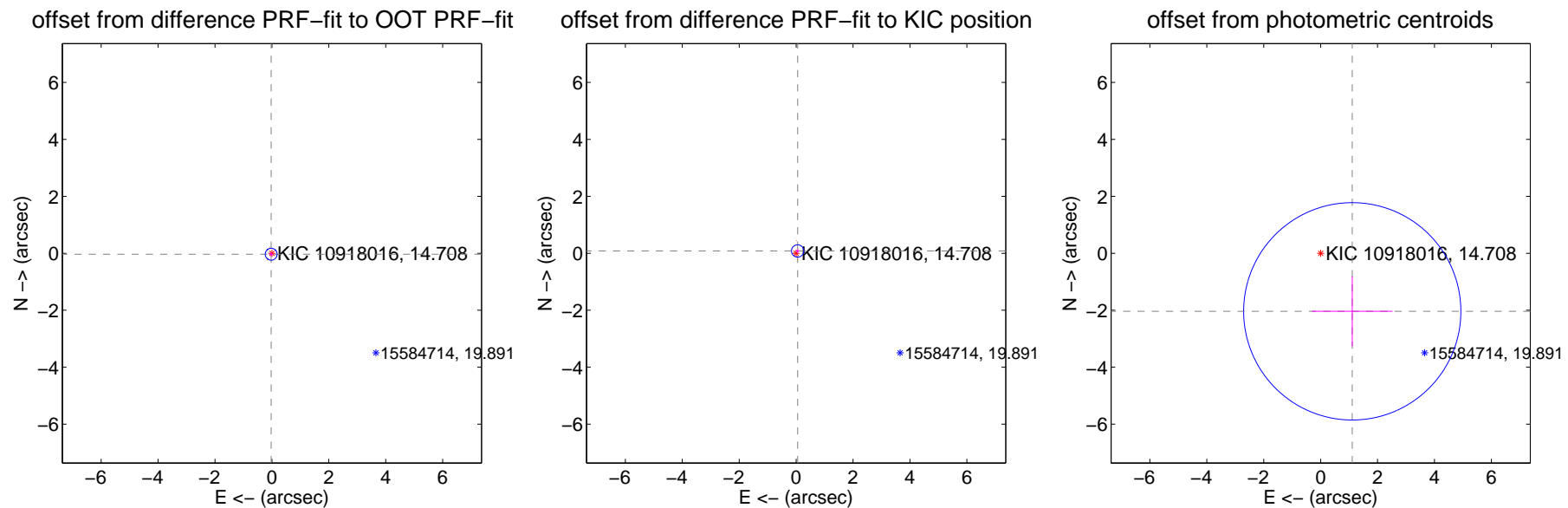
DV Centroid Data

Supplemental centroid analysis for 010918016-04. Kepler magnitude: 14.71. Transit SNR 1.63

There are 5 quarters with good PRF difference image offsets

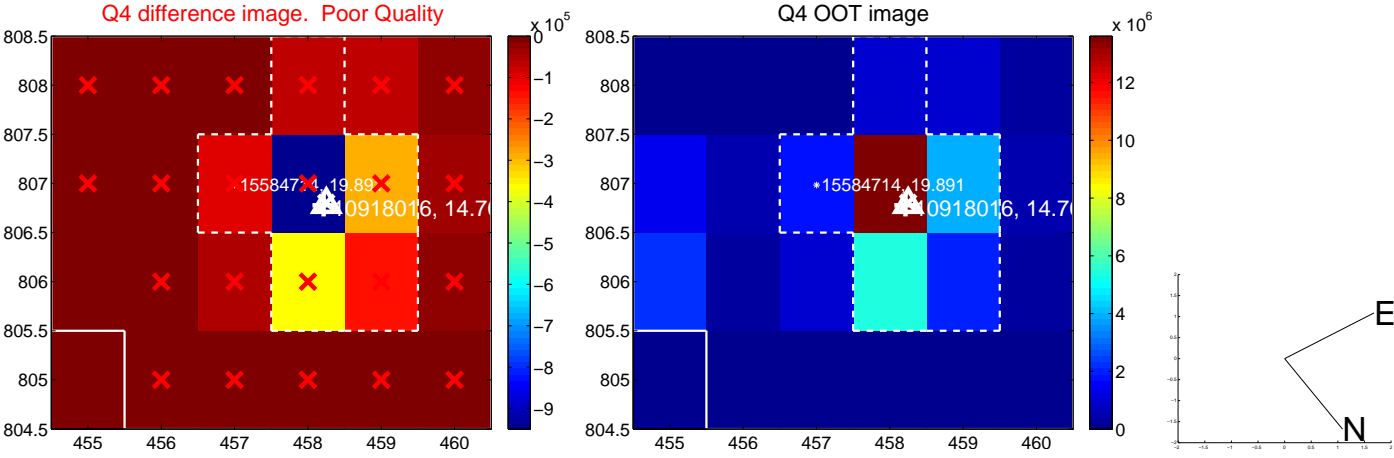
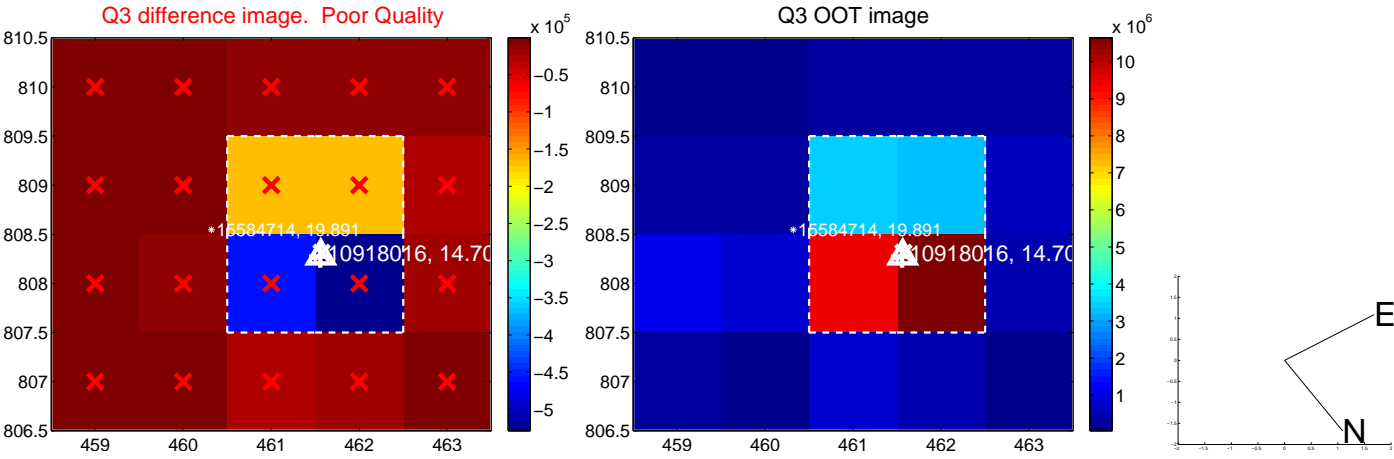
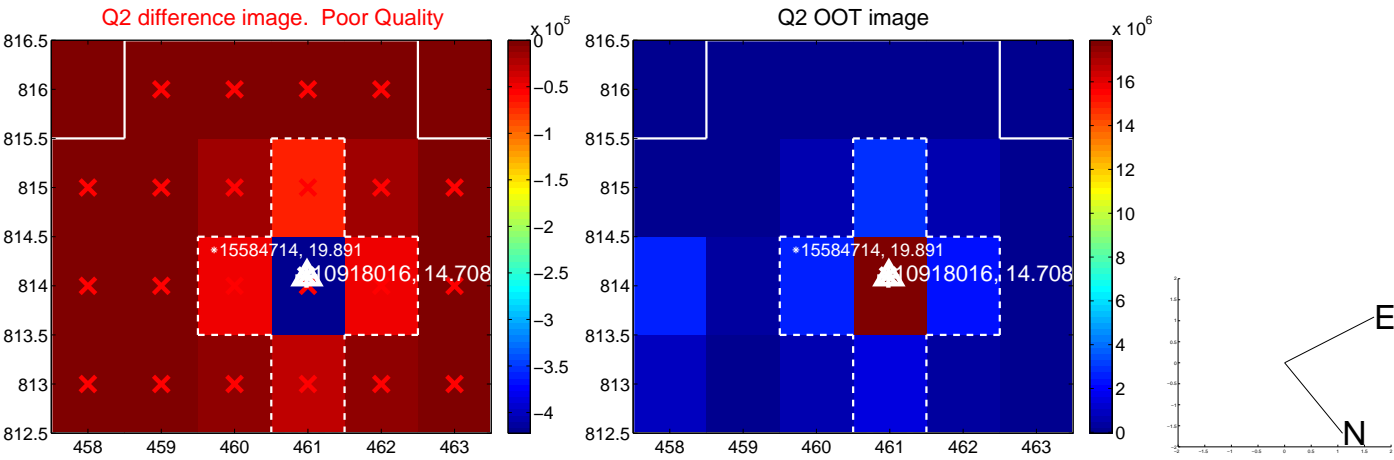
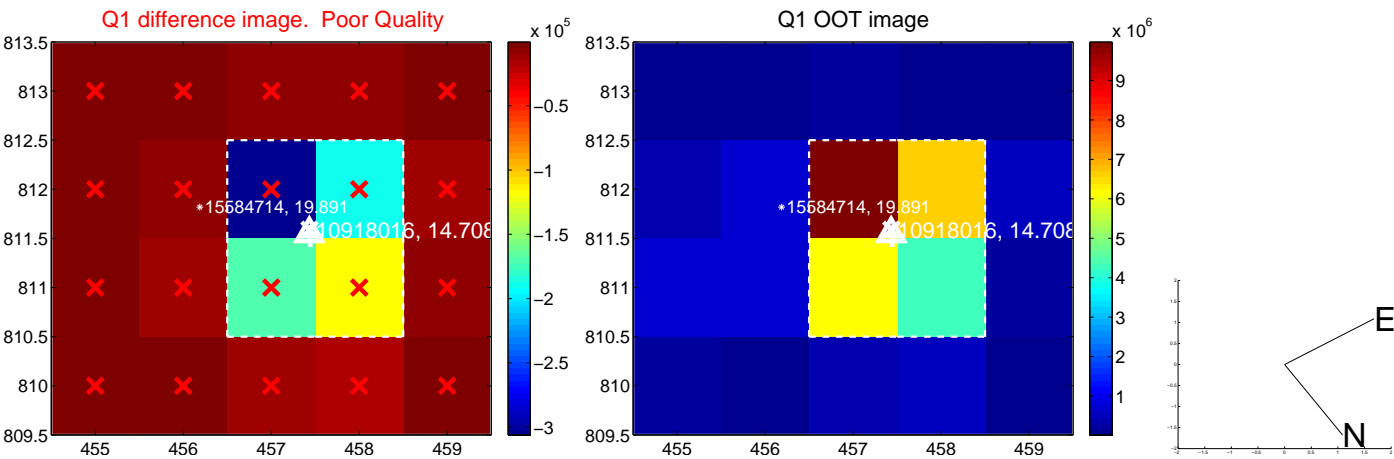
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.042 ± 0.070	0.60	0.026 ± 0.069	-0.033 ± 0.071
PRF-fit source offset from KIC position	0.097 ± 0.072	1.35	-0.053 ± 0.070	0.082 ± 0.074
photometric centroid source offset	2.32 ± 1.27	1.82	-1.11 ± 1.41	-2.04 ± 1.23

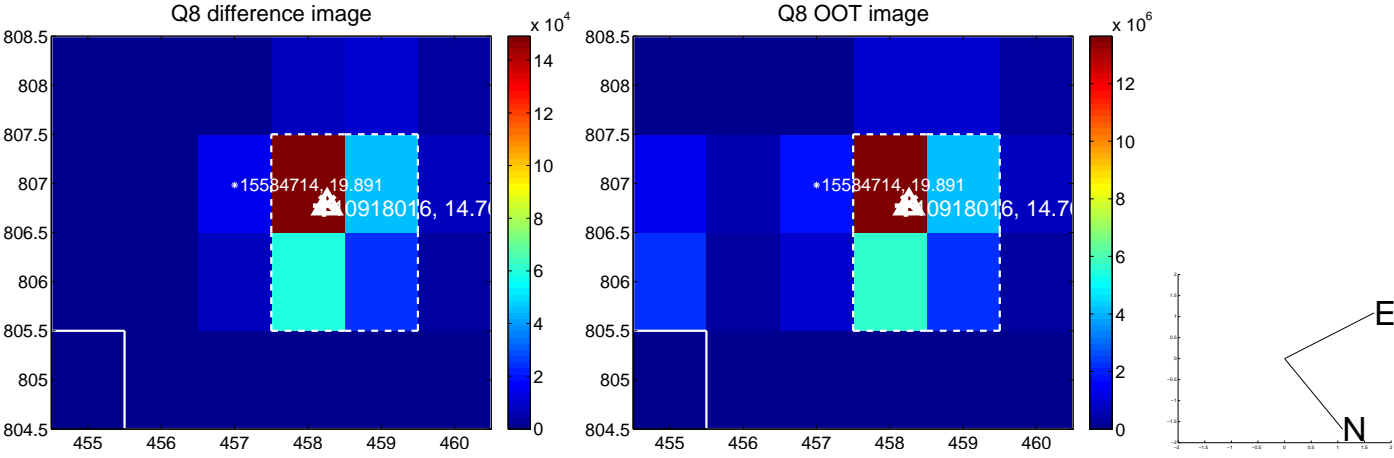
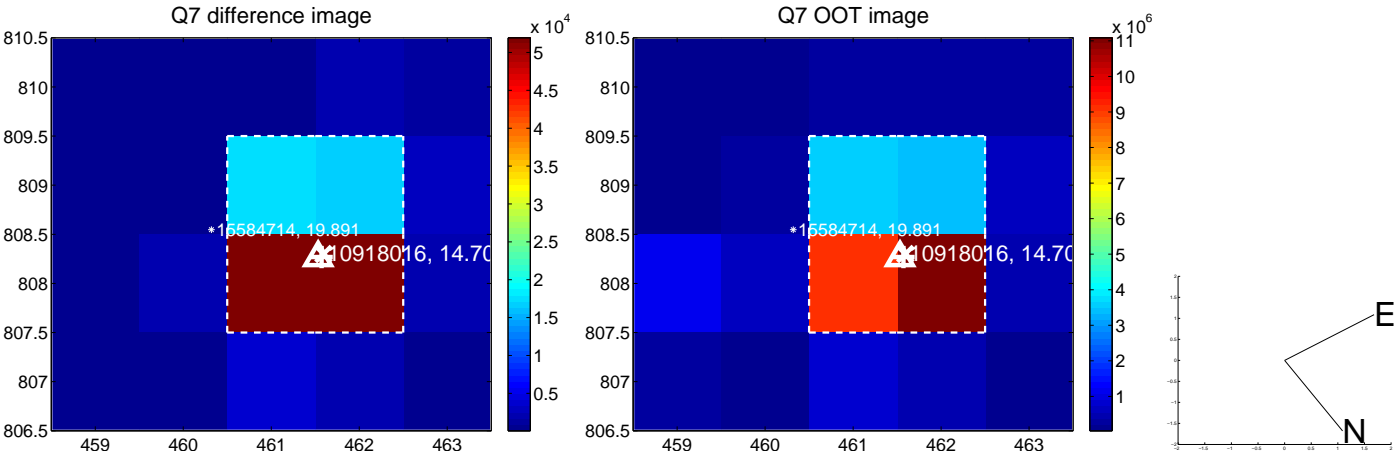
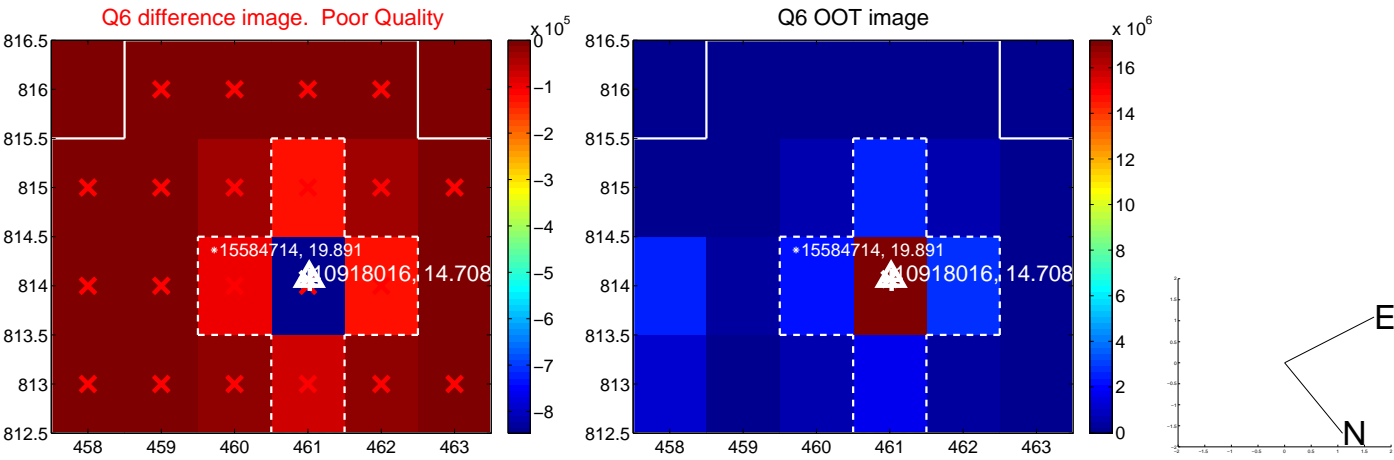
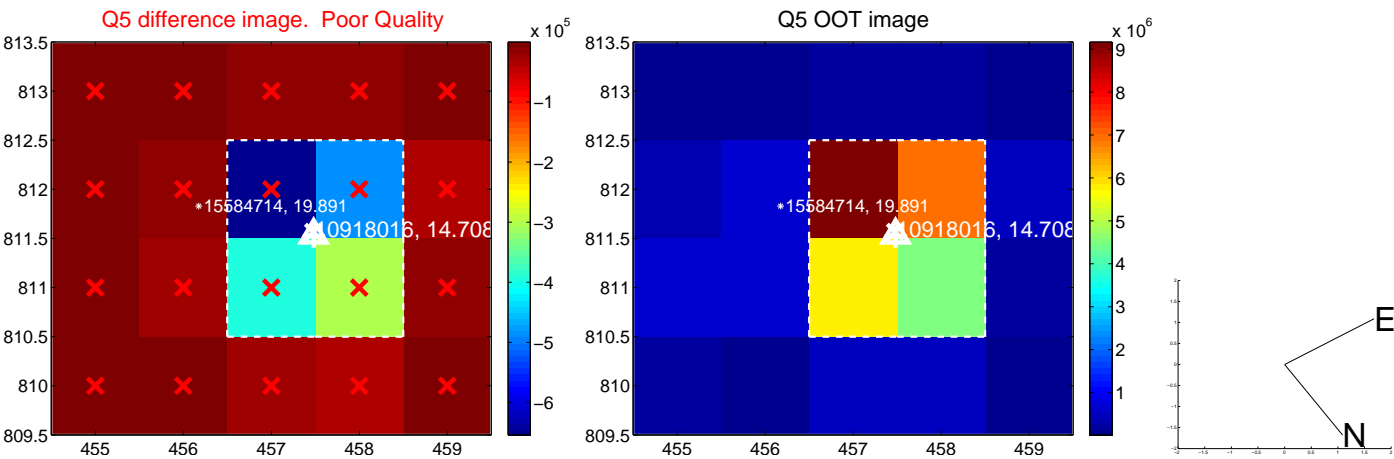


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

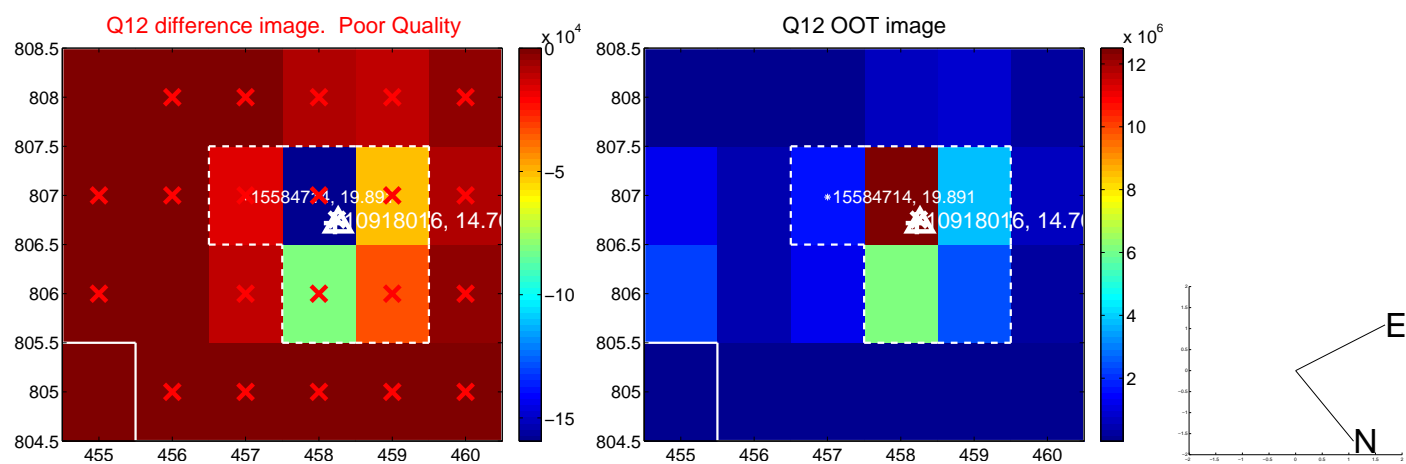
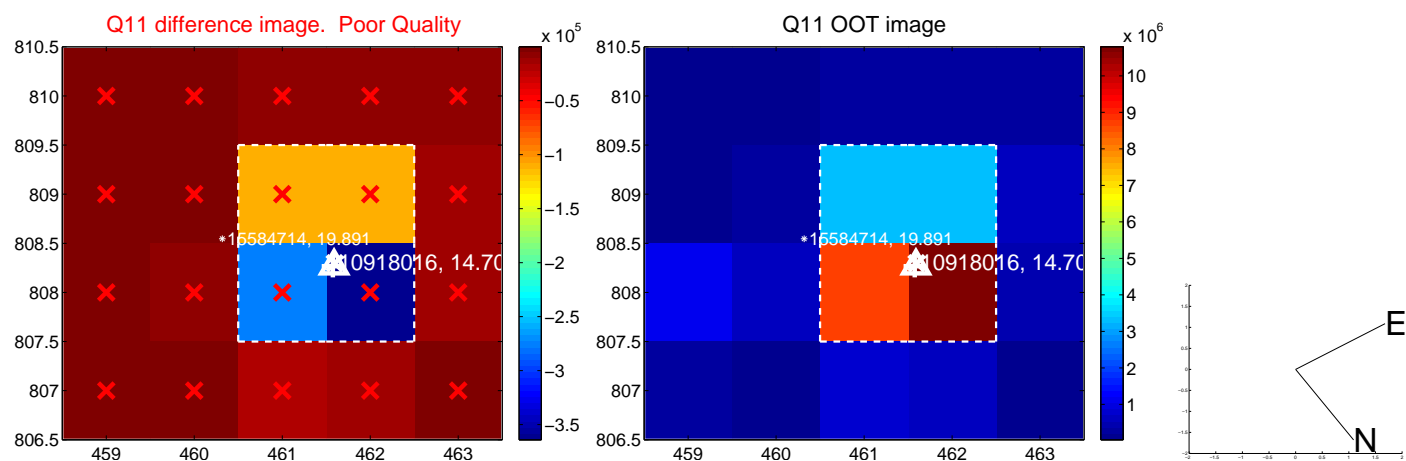
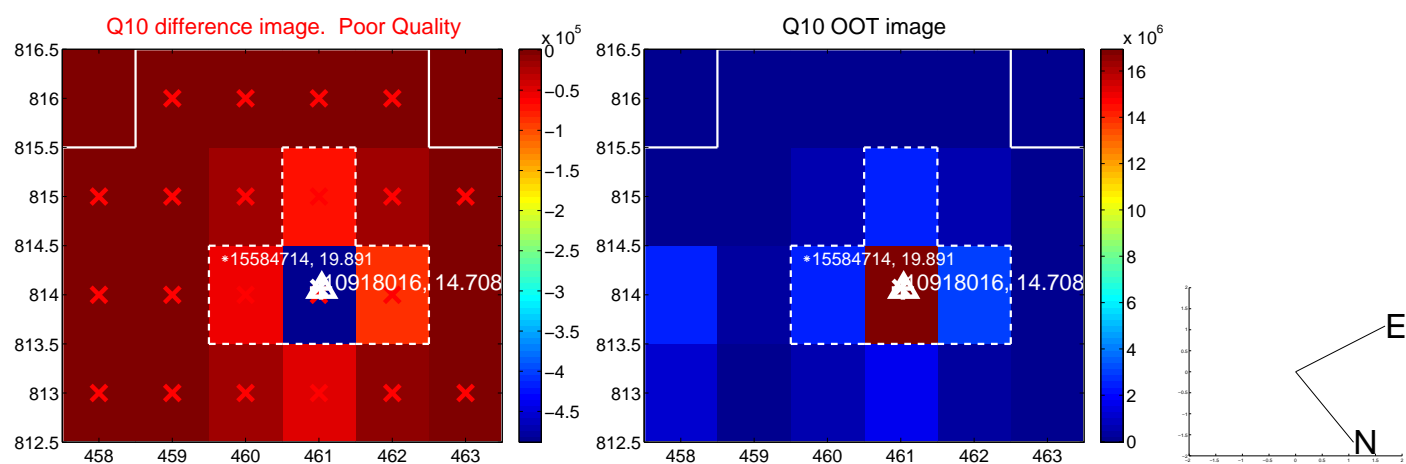
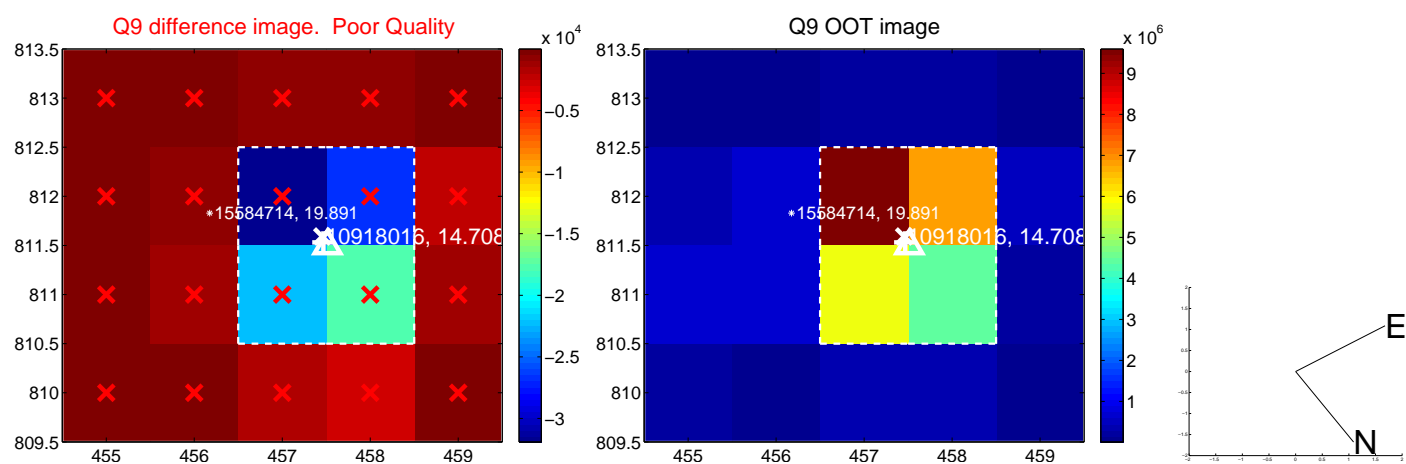
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



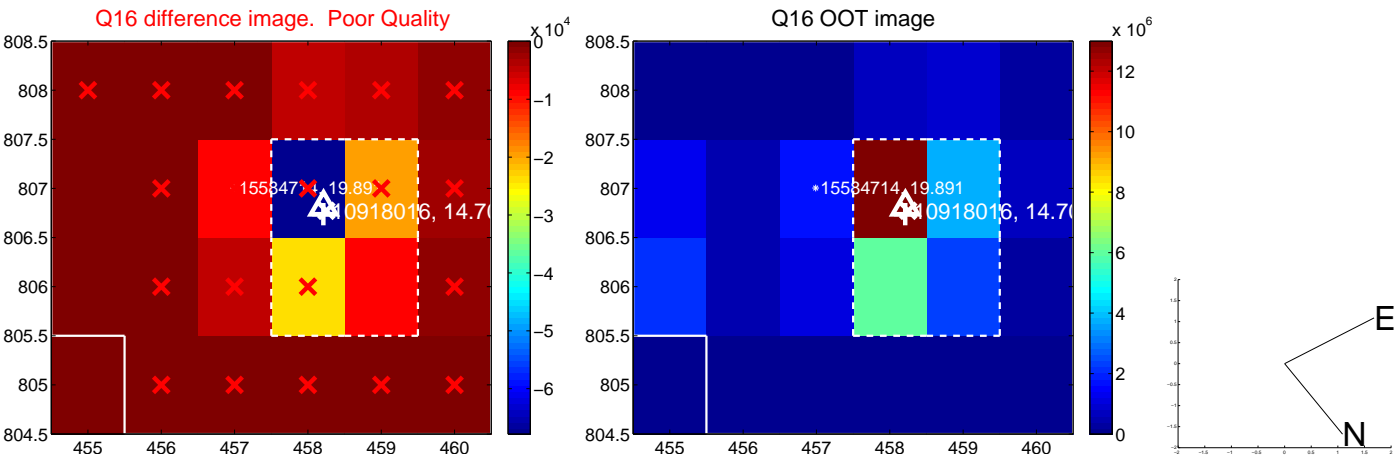
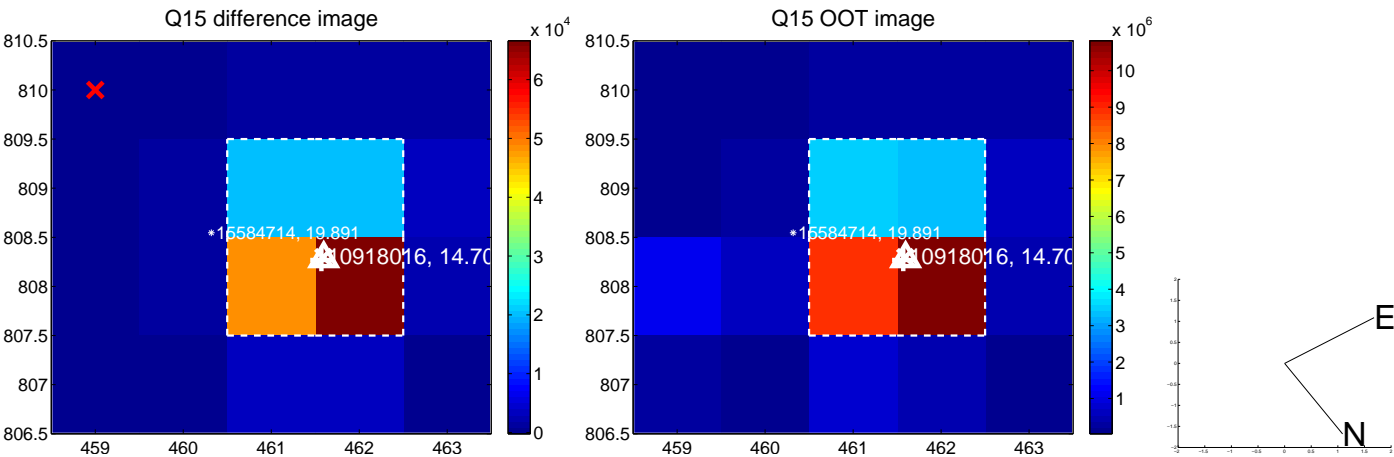
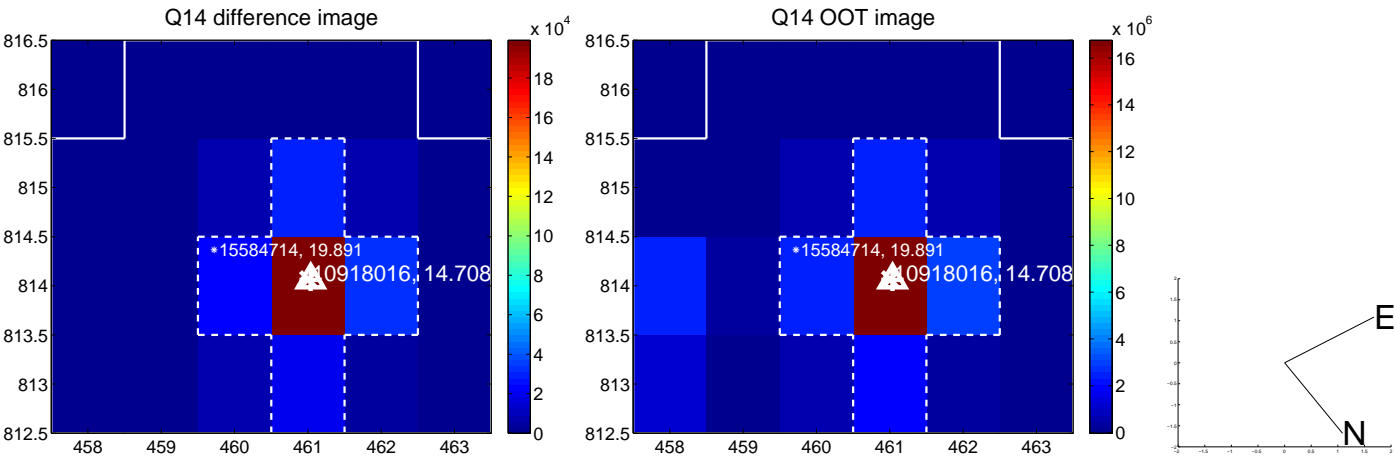
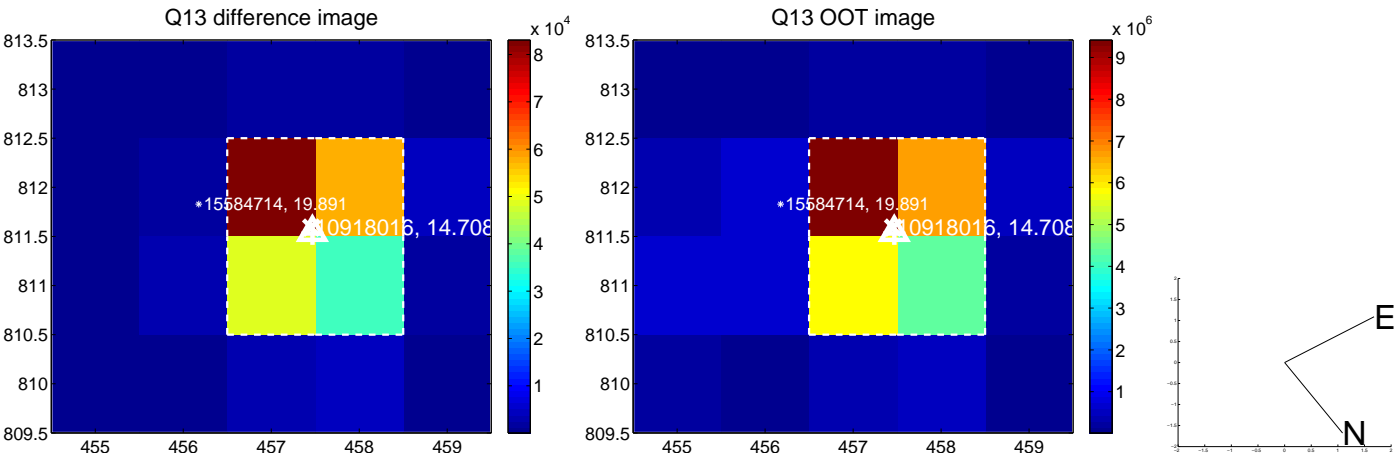
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



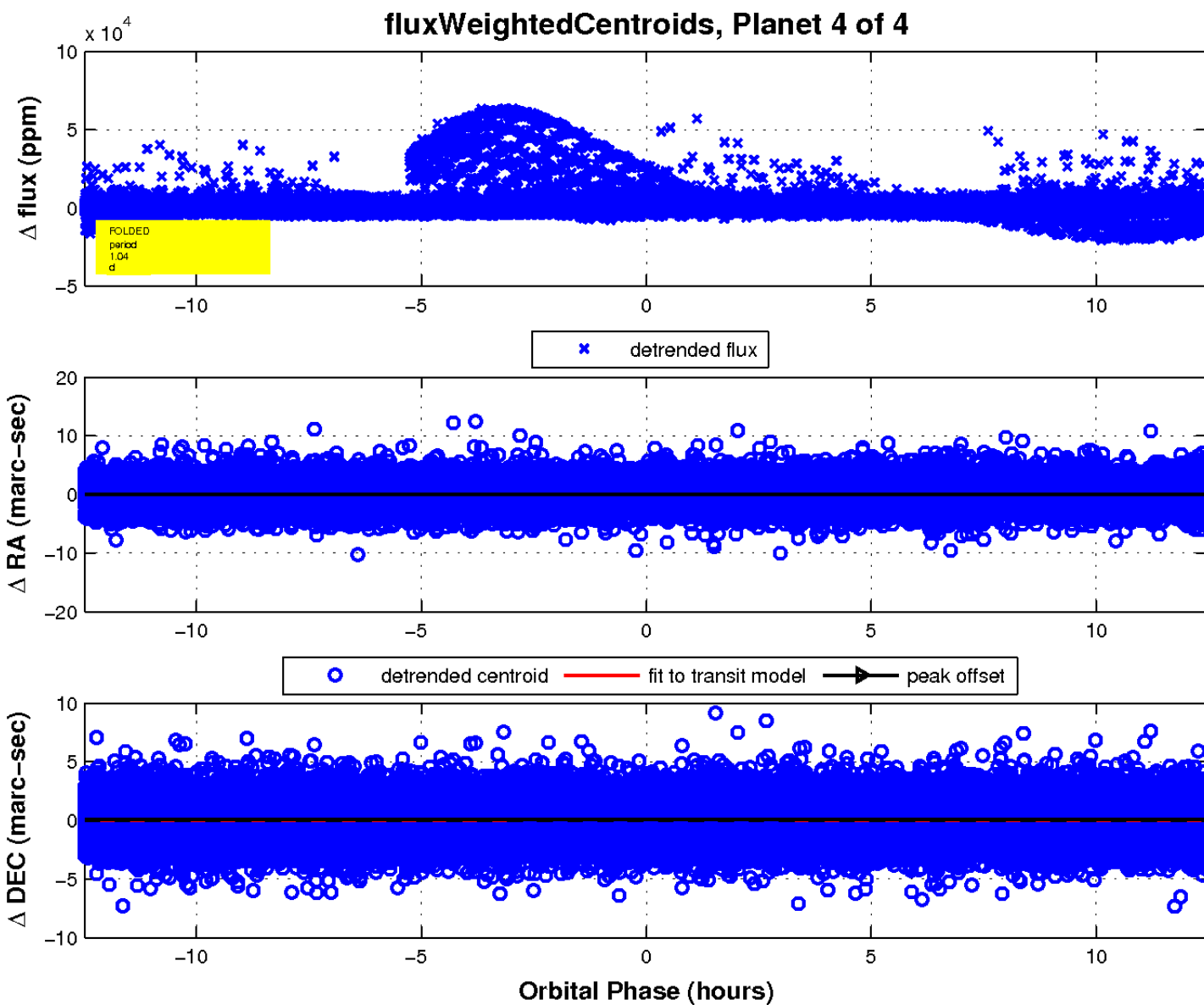
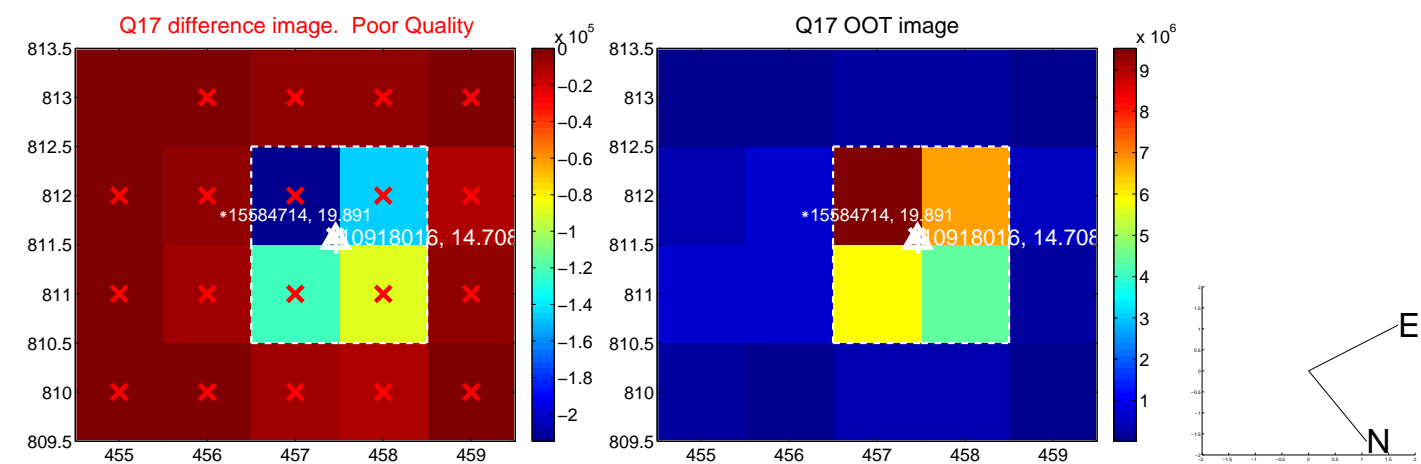
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

