

KIC 009835416

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})
009835416-01	OBS	No	4.036802	132.643170	64.3	5.733	20.2	13.6	1.68	7241	1.56	2237.43
009835416-02	OBS	No	1.916791	133.257923	41.5	4.187	11.5	11.7	1.68	7241	1.23	6039.96
009835416-03	OBS	No	518.270748	188.514794	343.2	3.208	7.7	8.4	1.68	7241	3.58	3.46

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009835416-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009835416-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
009835416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

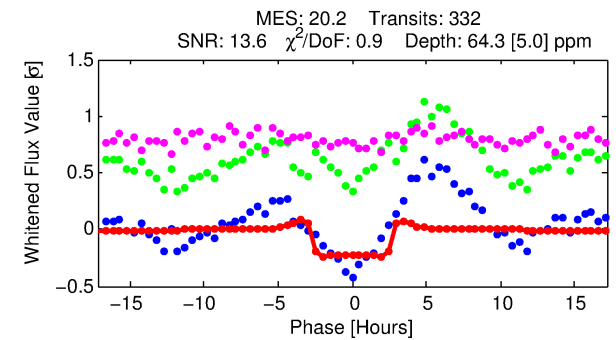
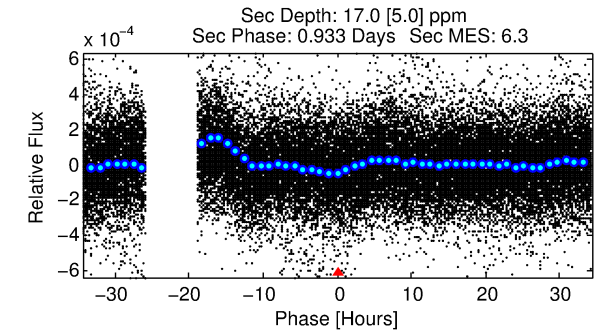
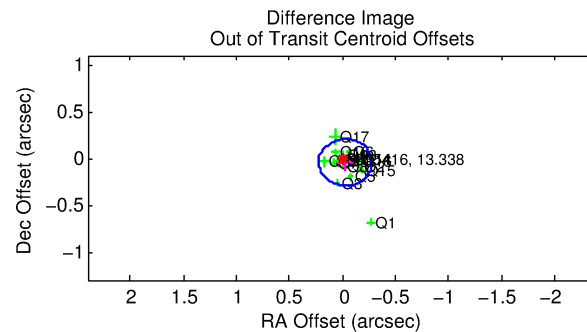
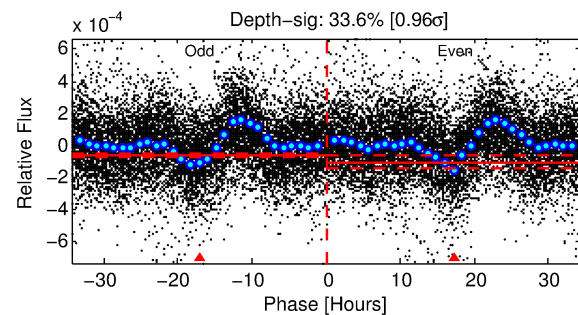
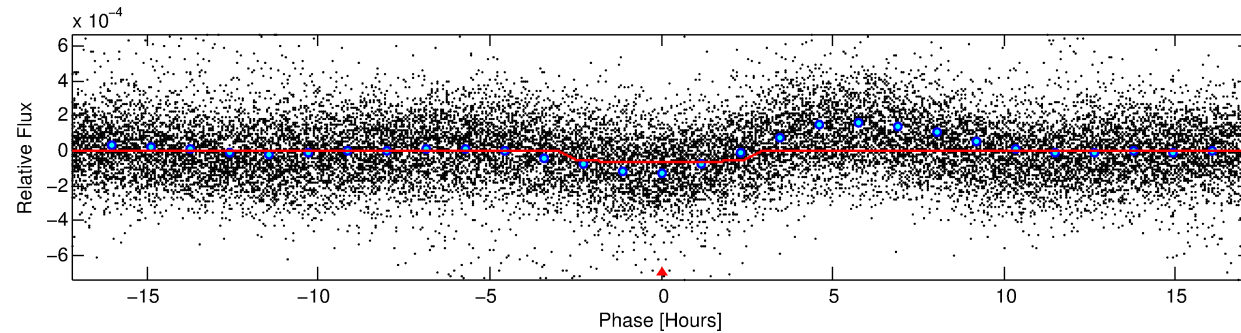
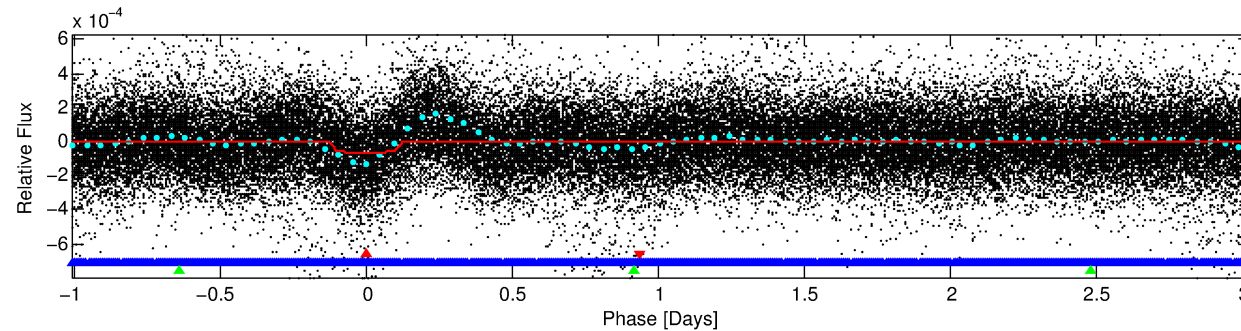
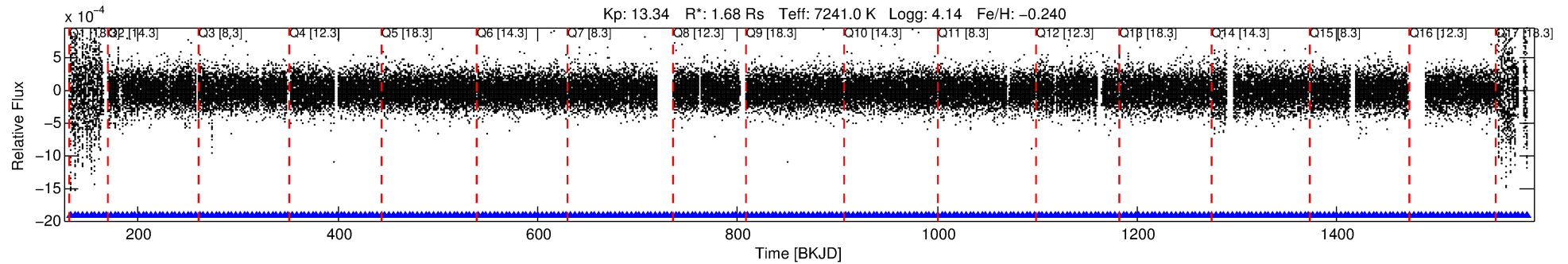
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009835416-01

No Significant Match Found

DV One-Page Summary

KIC: 9835416 Candidate: 1 of 3 Period: 4.037 d



DV Fit Results:

Period = 4.03680 [0.00002] d
Epoch = 132.6432 [0.0034] BKJD
Rp/R* = 0.0085 [0.0012]
a/R* = 2.61 [1.95]
b = 0.90 [0.18]
Seff = 2237.44 [869.99]
Teff = 1754 [170] K
Rp = 1.56 [0.52] Re
a = 0.0558 [0.0138] AU
Ag = 11.88 [6.45] [1.69 σ]
Teffp = 5034 [562] K [5.58 σ]

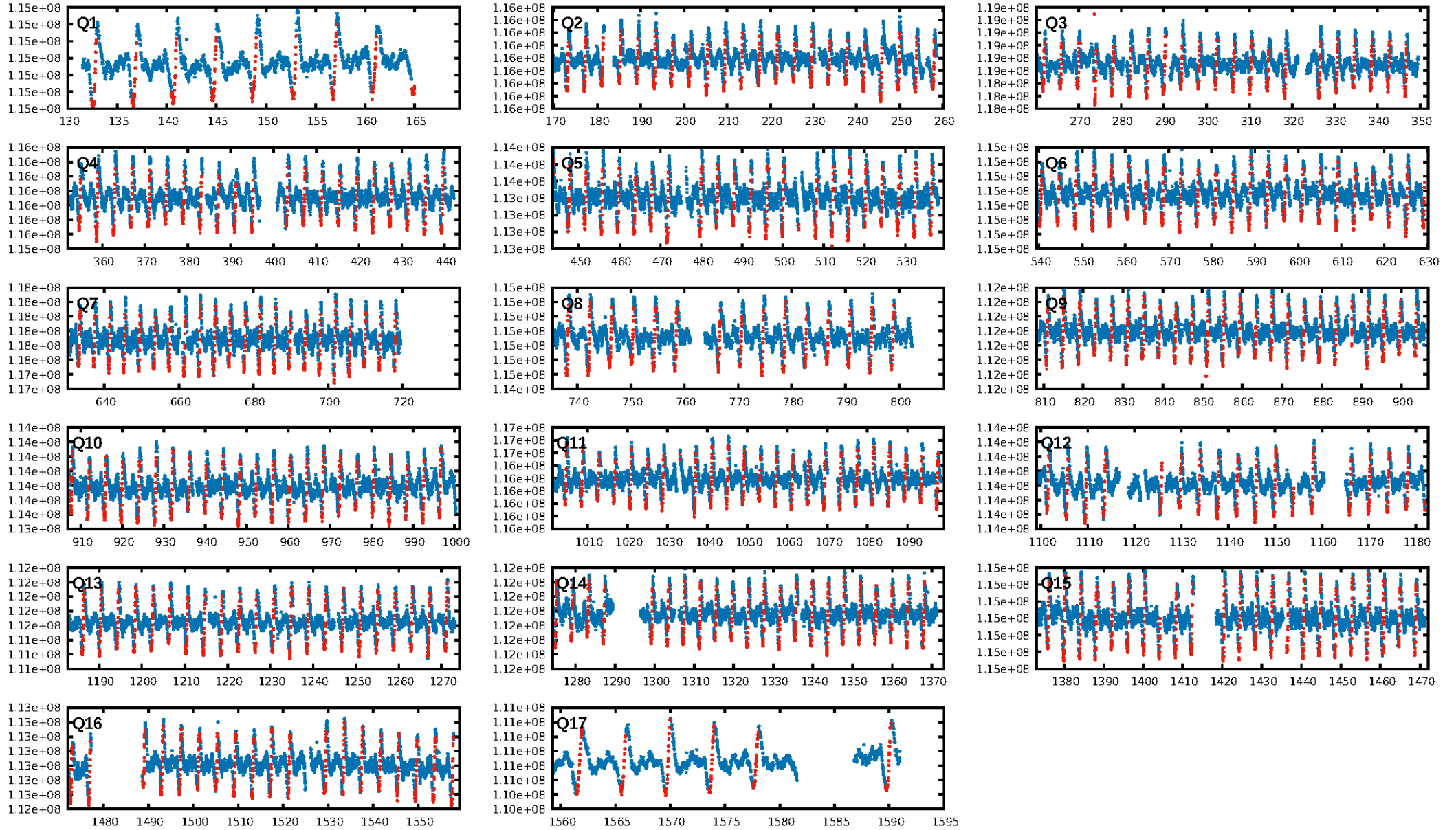
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.17 σ]
LongPeriod-sig: 100.0% [1878.59 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.51e-65
RollingBand-fgt: 1.00 [317/317]
GhostDiagnostic-chr: 1.662
Centroid-sig: 0.3%
Centroid-so: 1.007 arcsec [2.20 σ]
OotOffset-rm: 0.052 arcsec [0.63 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.086 arcsec [1.10 σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

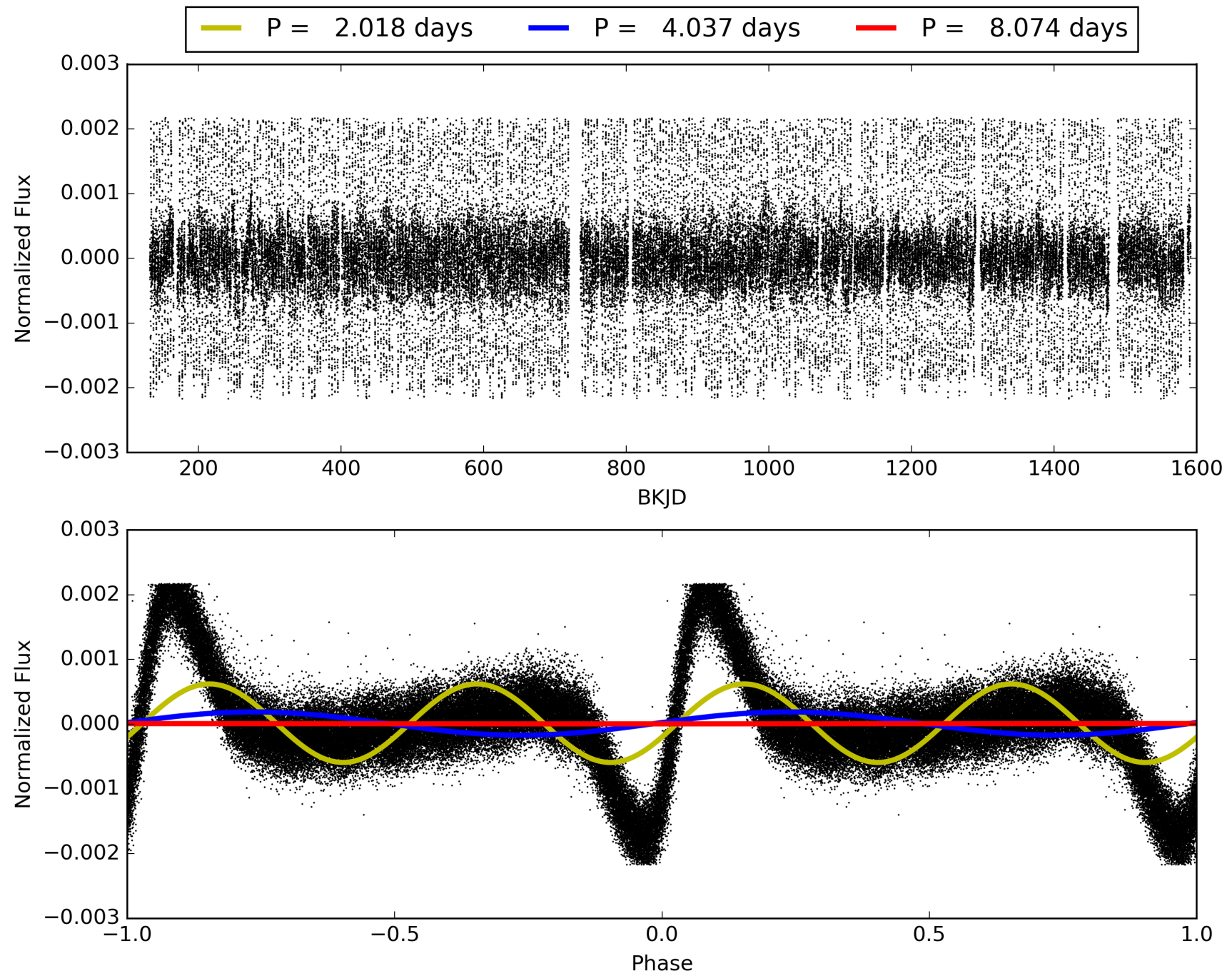
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009835416-01, PDC Light Curves

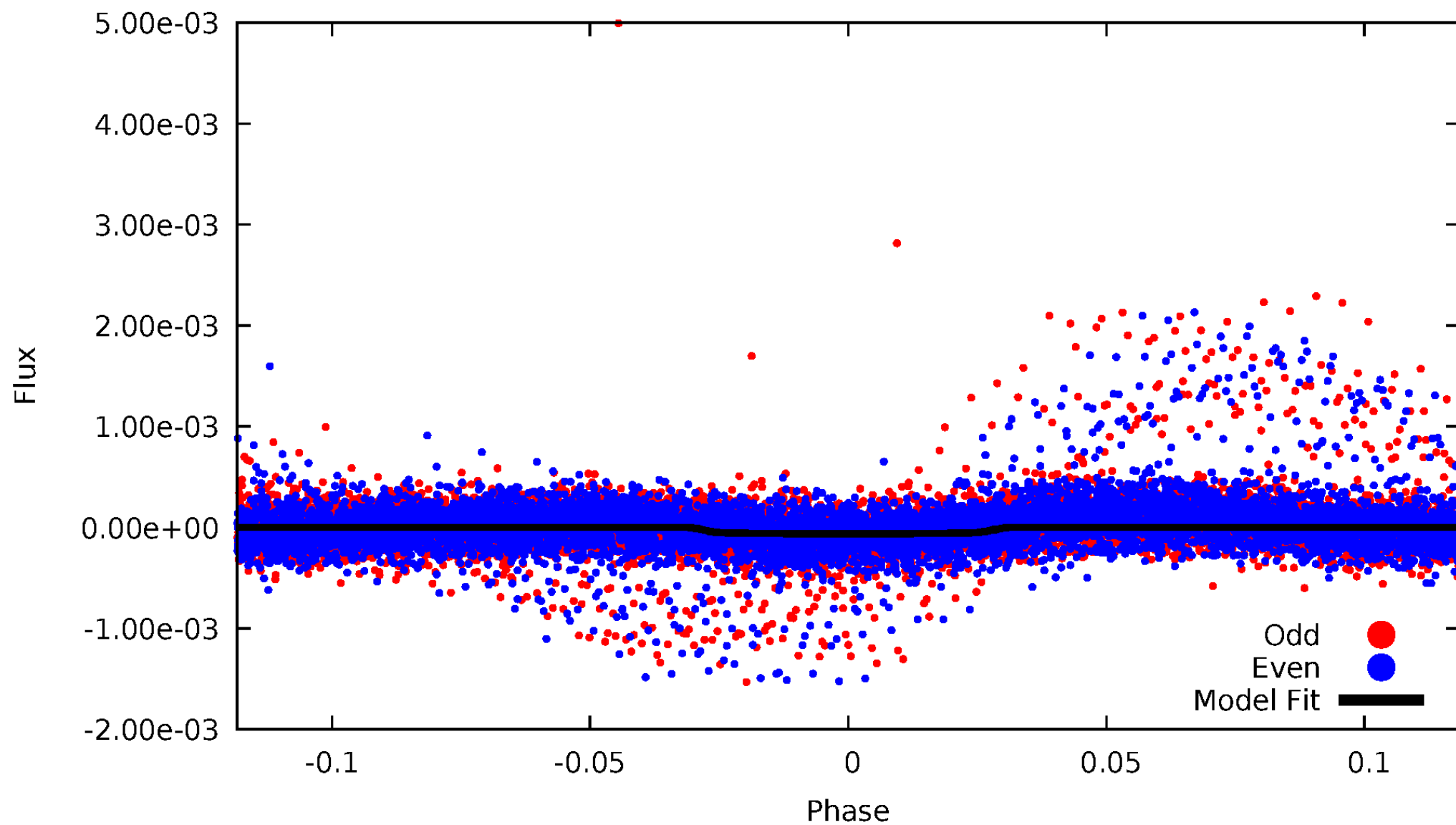


TCE 009835416-01



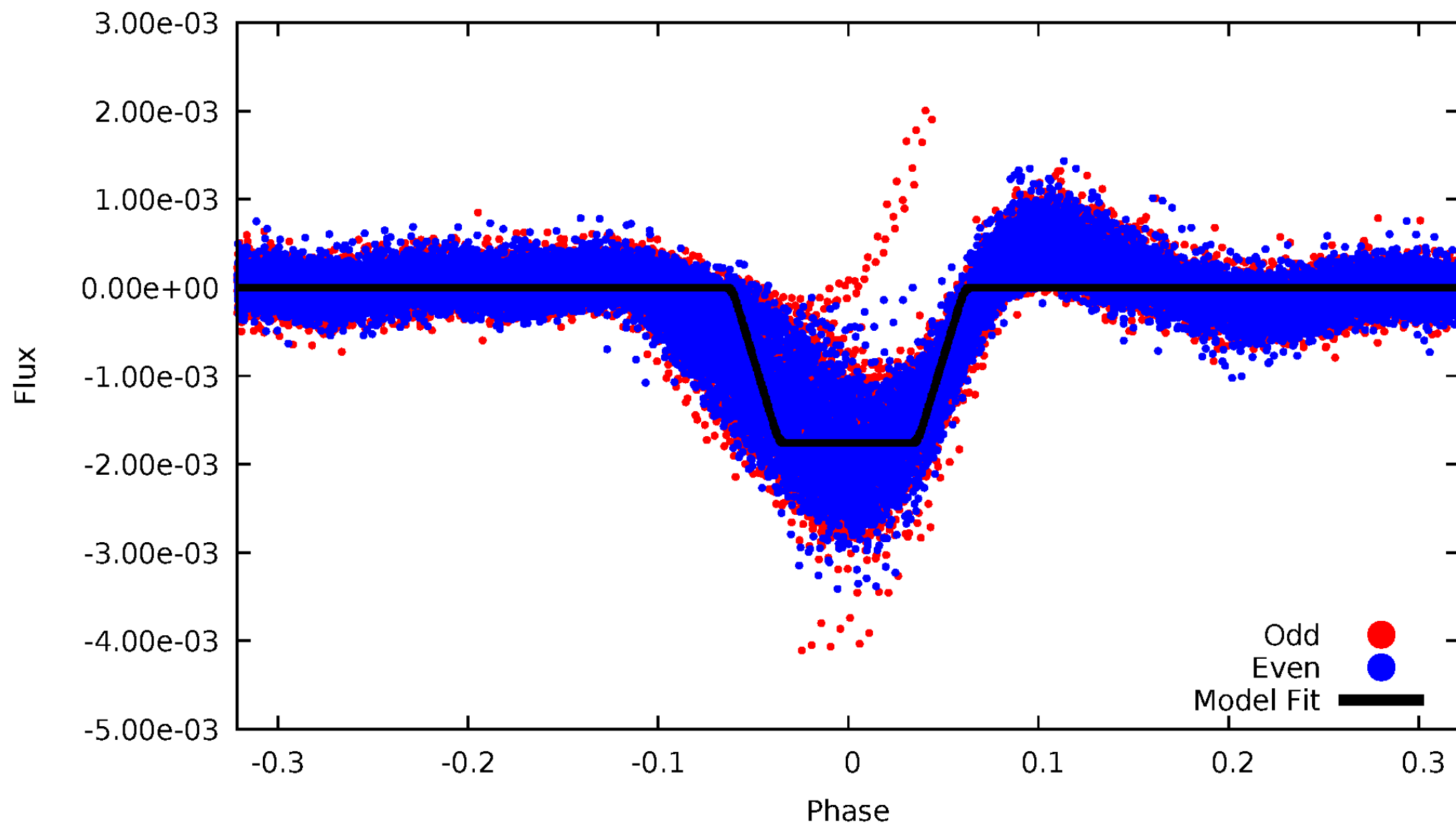
DV Odd/Even

TCE 009835416-01

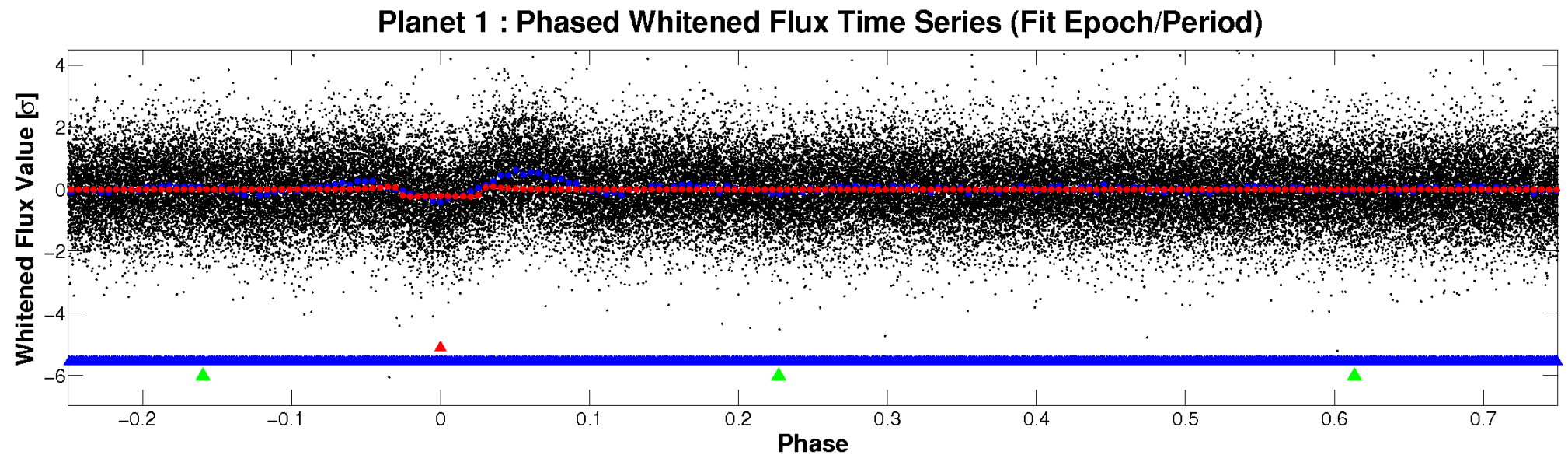
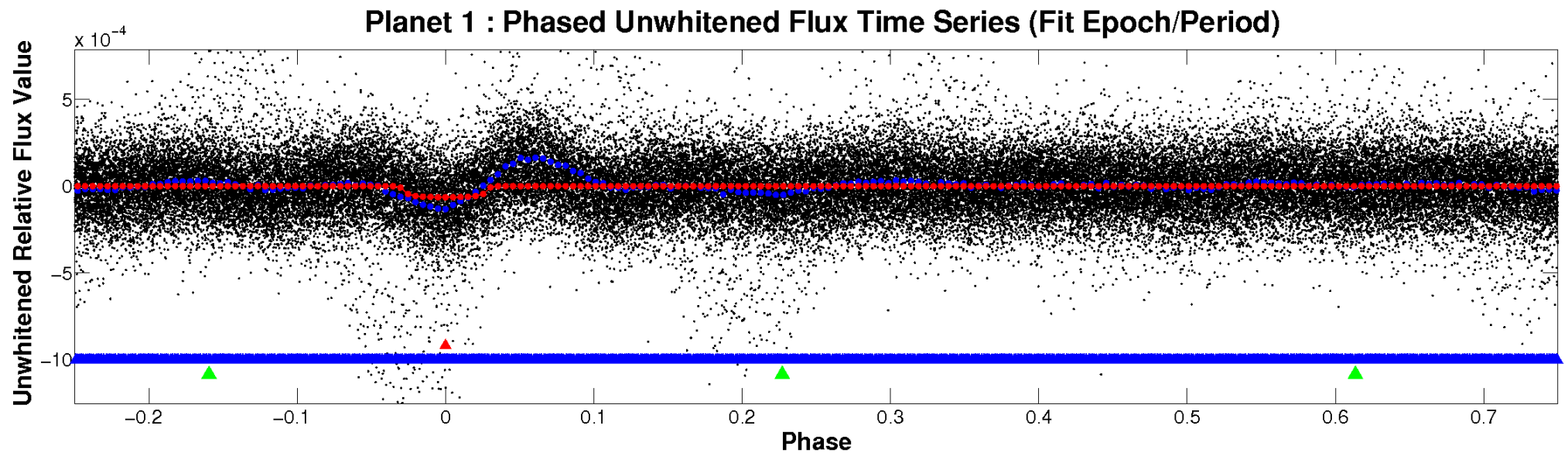


ALT Odd/Even

TCE 009835416-01

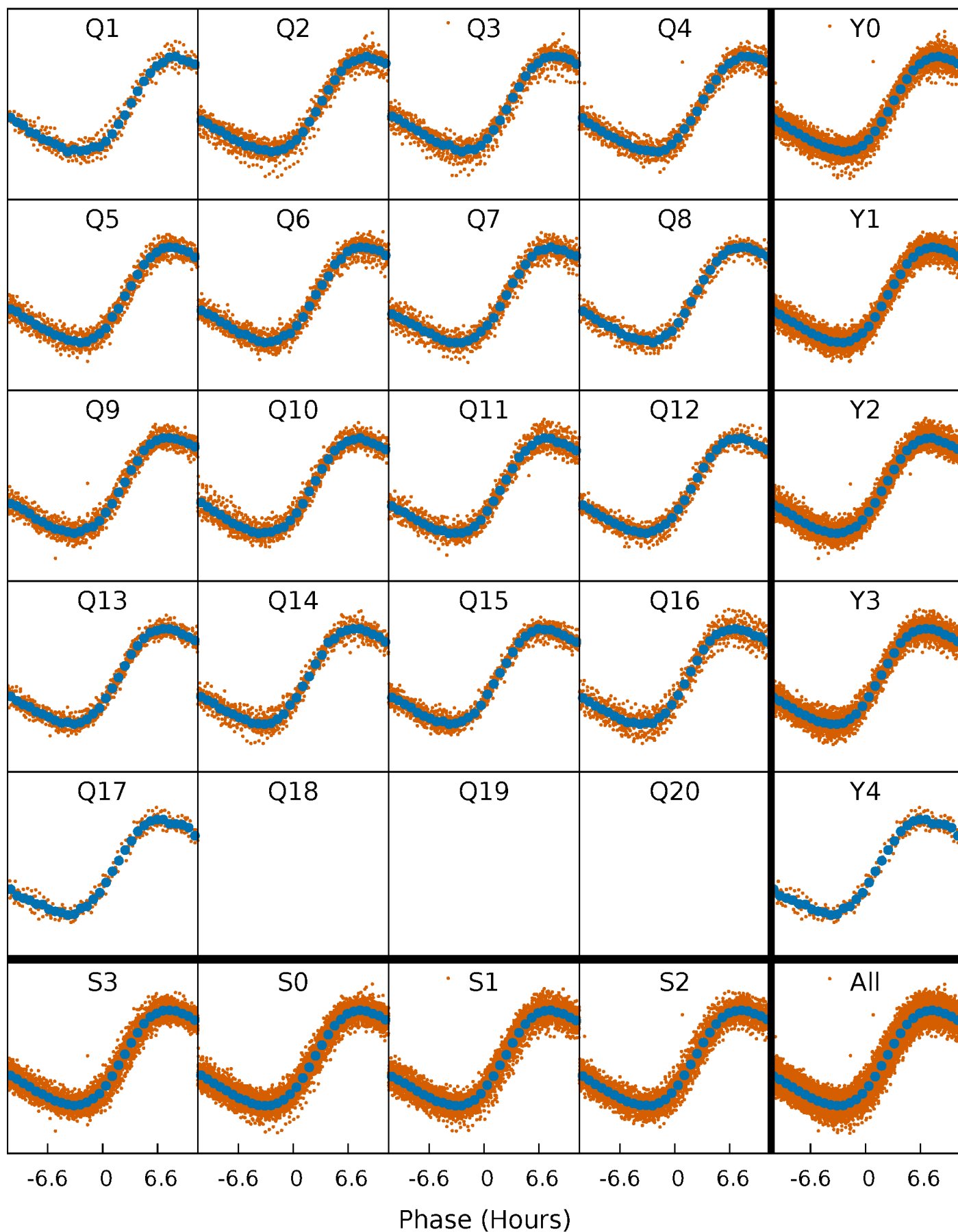


Non-Whitened Vs. Whitened Light Curve



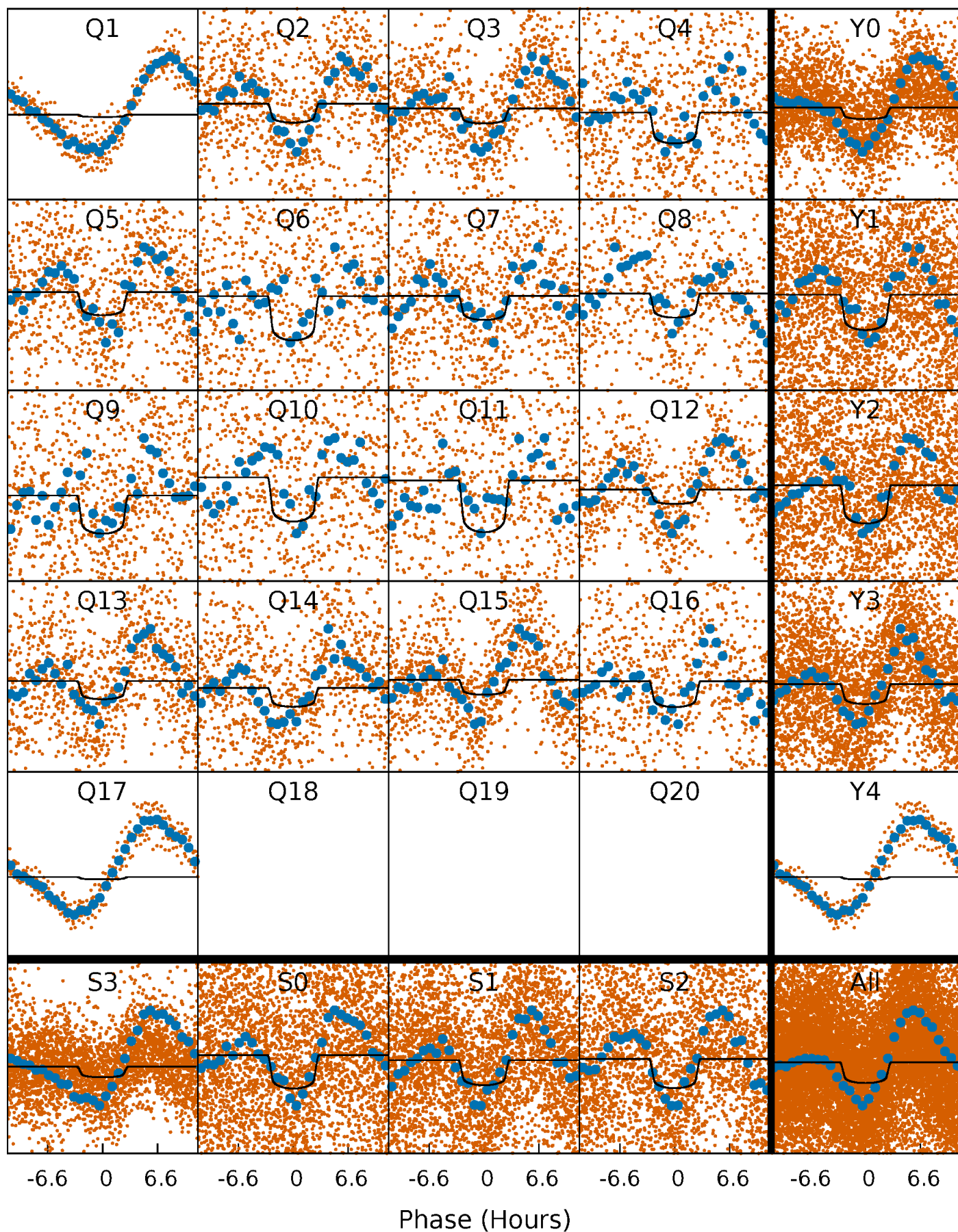
PDC Quarter-Phased Transit Curves

TCE 009835416-01 P= 4.036802 Days $T_0=132.643170$ (BKJD)



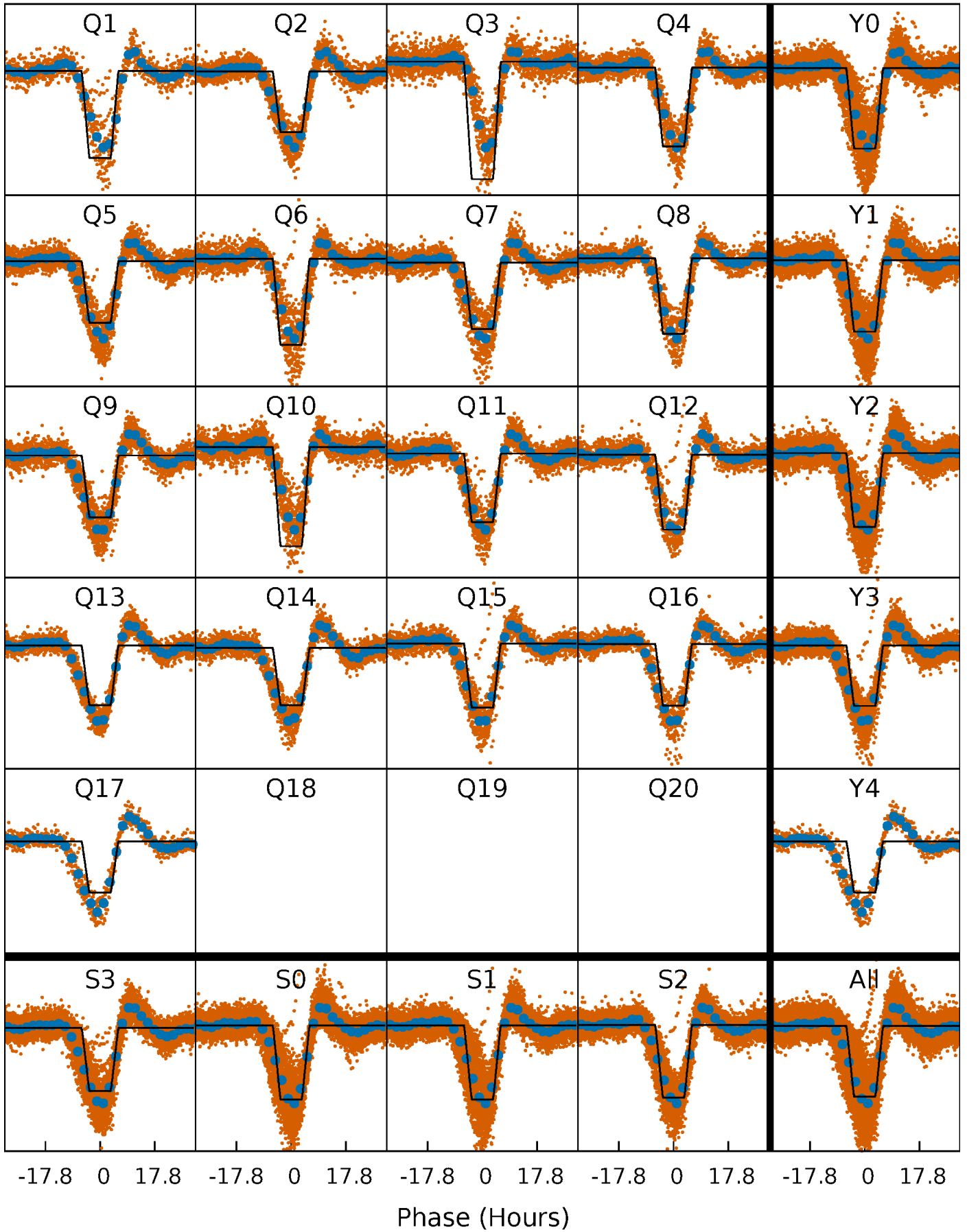
DV Quarter-Phased Transit Curves

TCE 009835416-01 P= 4.036802 Days $T_0=132.643170$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

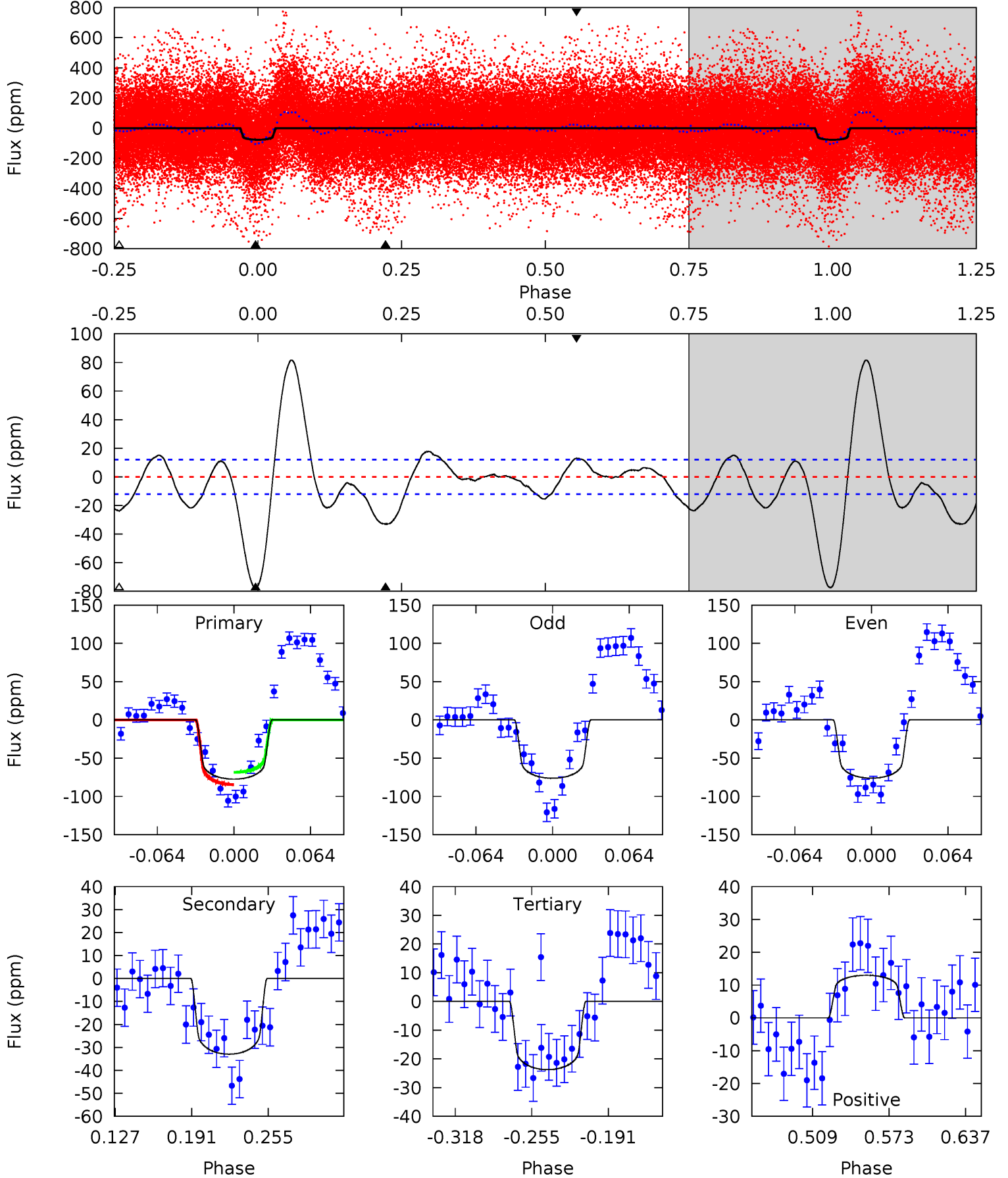
TCE 009835416-01 P= 4.036733 Days $T_0=132.553009$ (BKJD)



DV Model-Shift Uniqueness Test

009835416-01, P = 4.036802 Days, E = 128.606368 Days

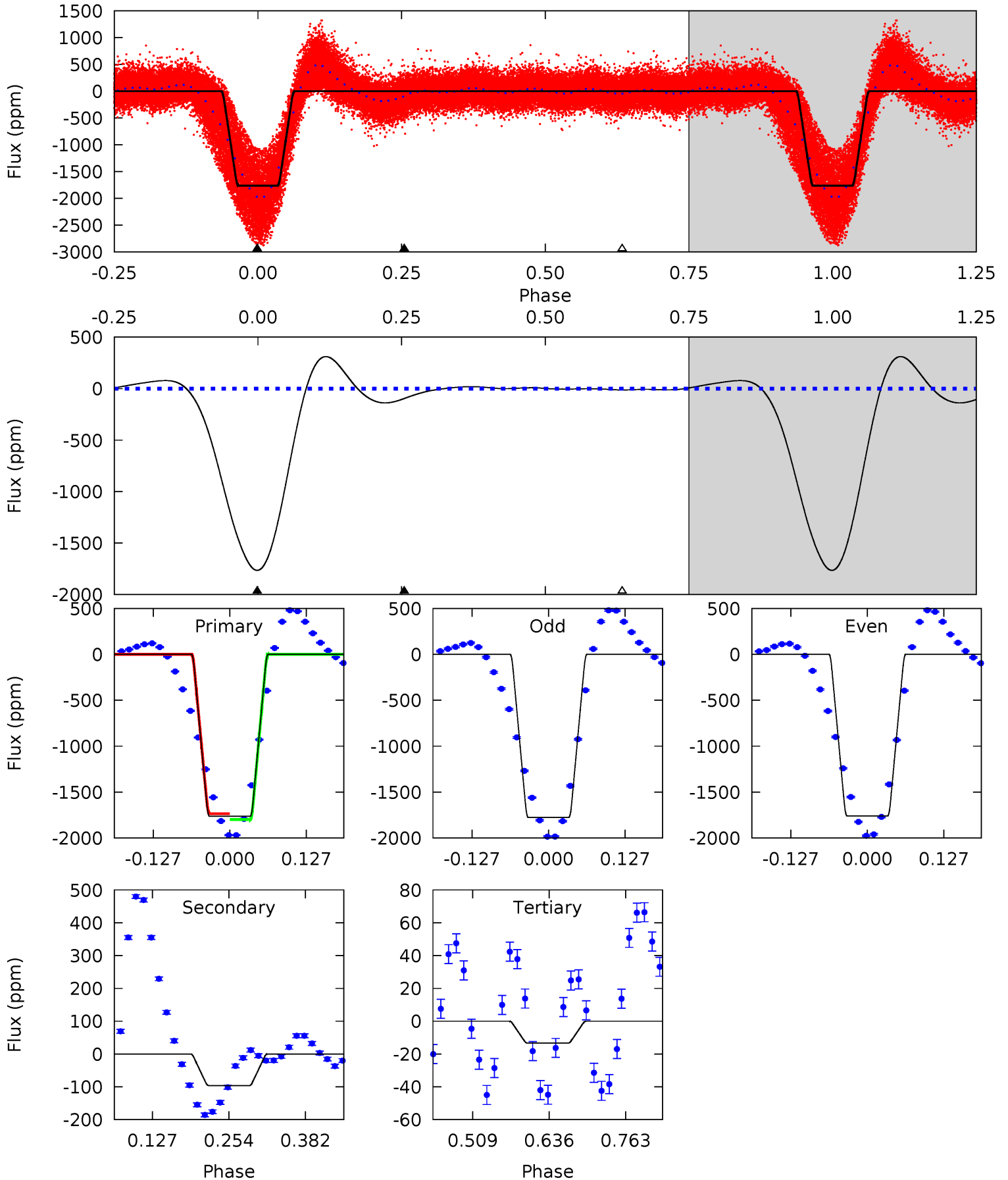
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.8	12.7	9.14	4.99	4.66	1.85	6.03	20.6	24.8	3.55	7.69	0.01	1.24	0.51	3.09



Alt Model-Shift Uniqueness Test

009835416-01, P = 4.036733 Days, E = 128.516276 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
903.0	49.2	6.83	0	4.51	1.53	15.5	896.2	903.0	42.4	49.2	4.03	0.98	0.15	14.5



Stellar Parameters For KIC 009835416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7241^{+228}_{-304}	$4.139^{+0.153}_{-0.187}$	$-0.240^{+0.250}_{-0.350}$	$1.681^{+0.508}_{-0.370}$	$1.420^{+0.219}_{-0.241}$	$0.421^{+0.336}_{-0.217}$
	+3%/-4%	+4%/-5%	+104%/-146%	+30%/-22%	+15%/-17%	+80%/-52%
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 009835416-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-33 ± 3	$1.58^{+0.35}_{-0.31}$	2463^{+195}_{-165}	5867^{+510}_{-431}	22^{+11}_{-7}
Alt.	-96 ± 2	$7.76^{+1.24}_{-0.97}$	2459^{+186}_{-173}	3757^{+95}_{-108}	$2.706^{+0.715}_{-0.642}$

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

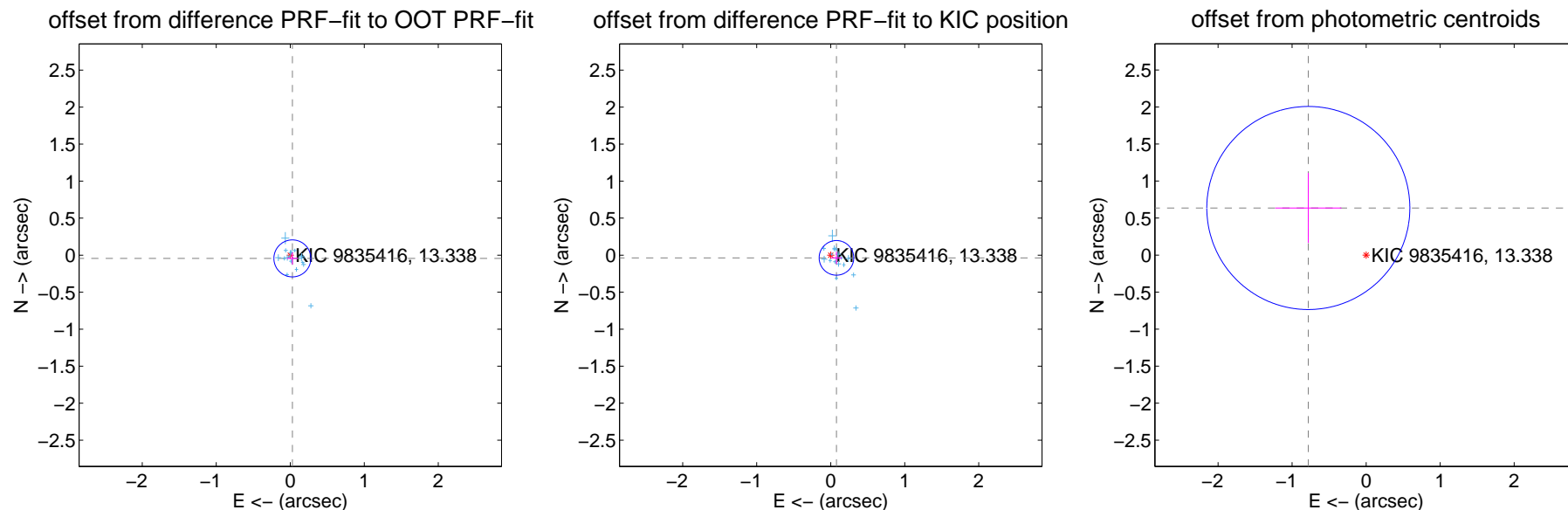
DV Centroid Data

Supplemental centroid analysis for 009835416-01. Kepler magnitude: 13.34. Transit SNR 13.56

There are 17 quarters with good PRF difference image offsets

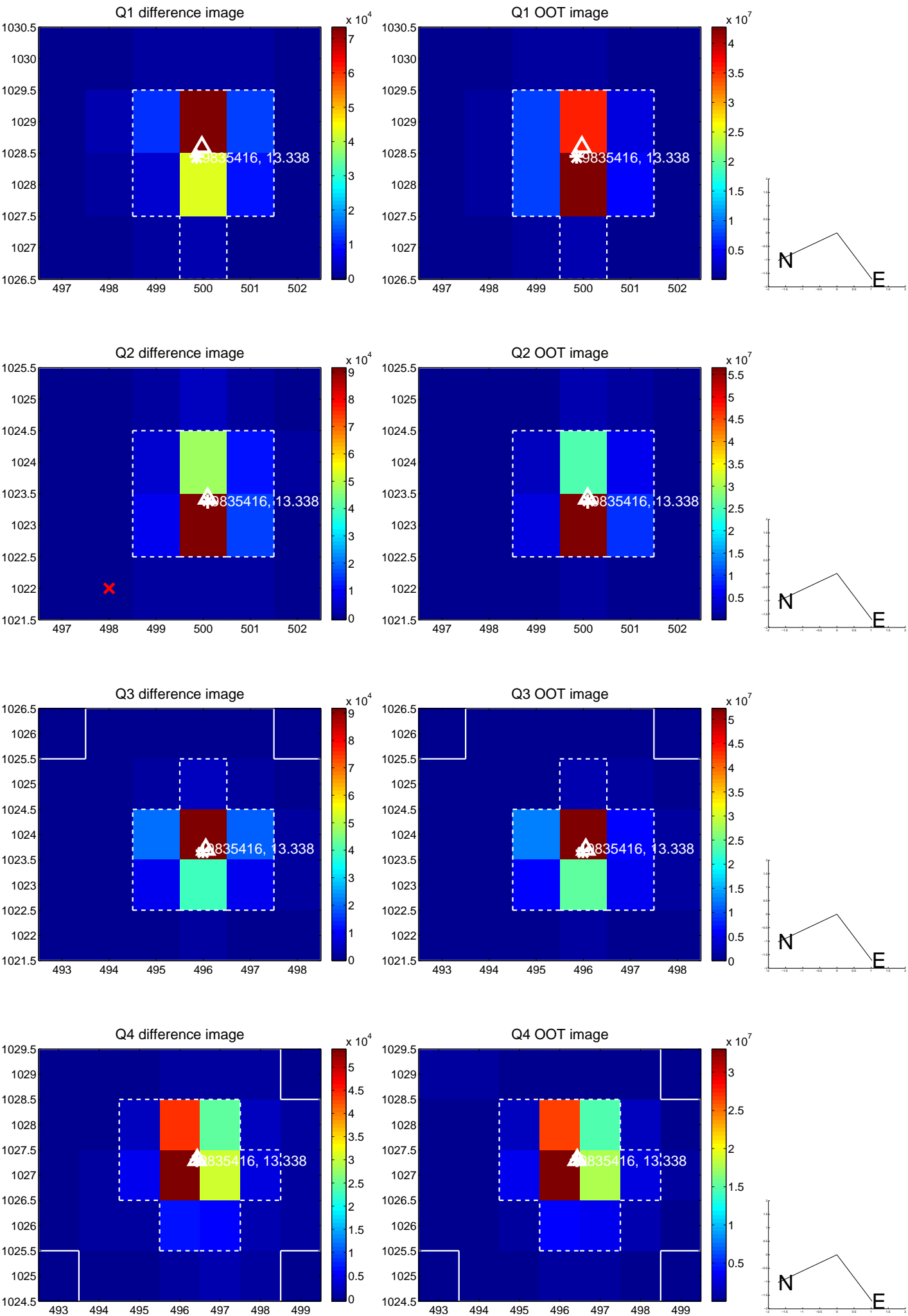
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.052 ± 0.083	0.63	-0.028 ± 0.072	-0.044 ± 0.082
PRF-fit source offset from KIC position	0.086 ± 0.078	1.10	-0.077 ± 0.072	-0.037 ± 0.083
photometric centroid source offset	1.01 ± 0.46	2.20	0.78 ± 0.45	0.64 ± 0.47

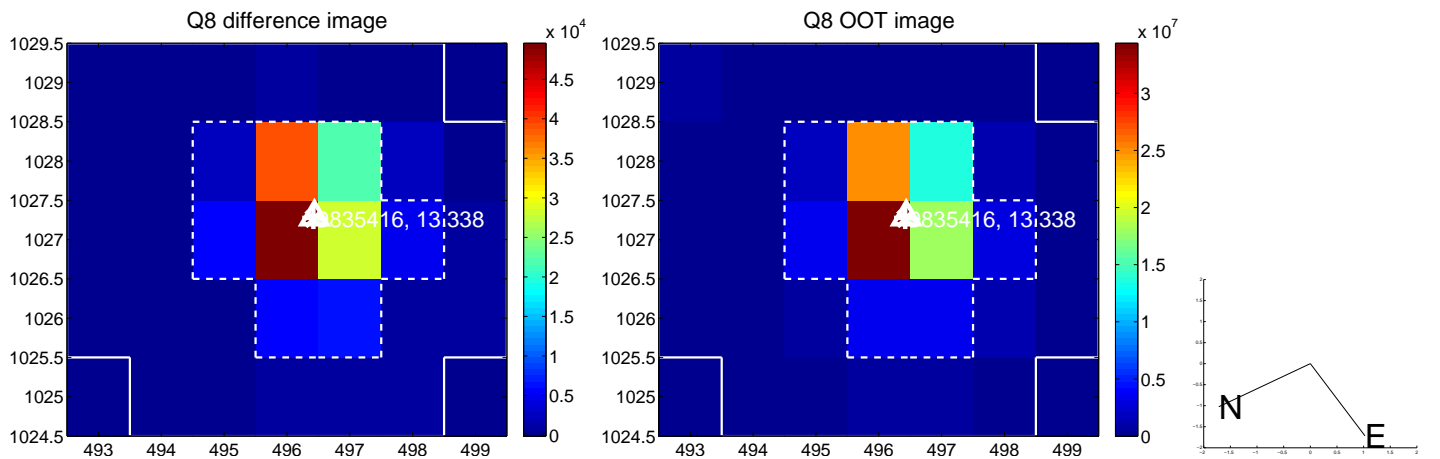
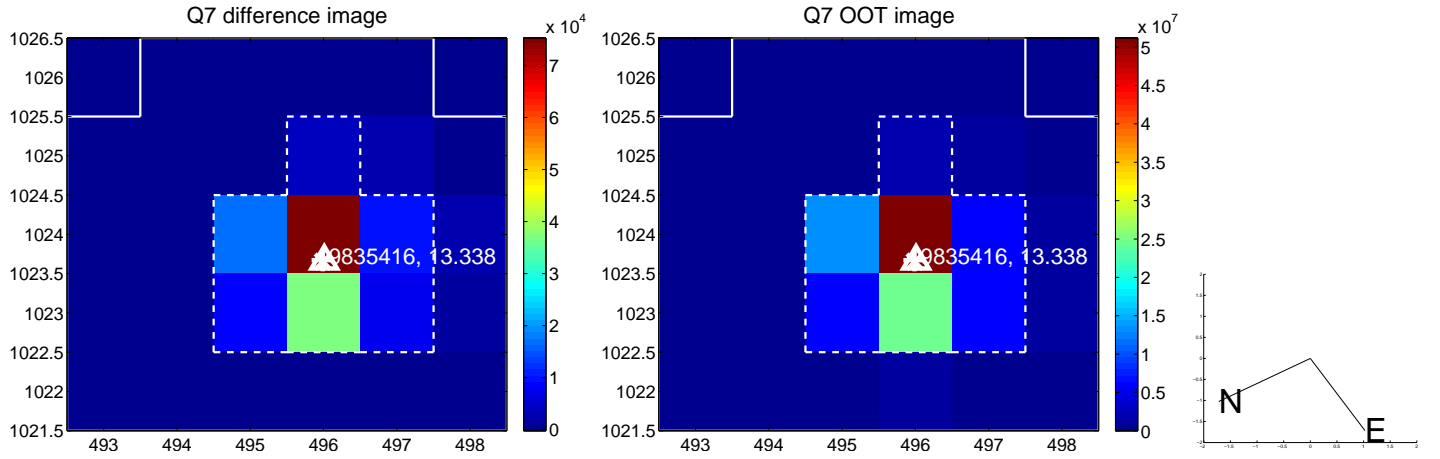
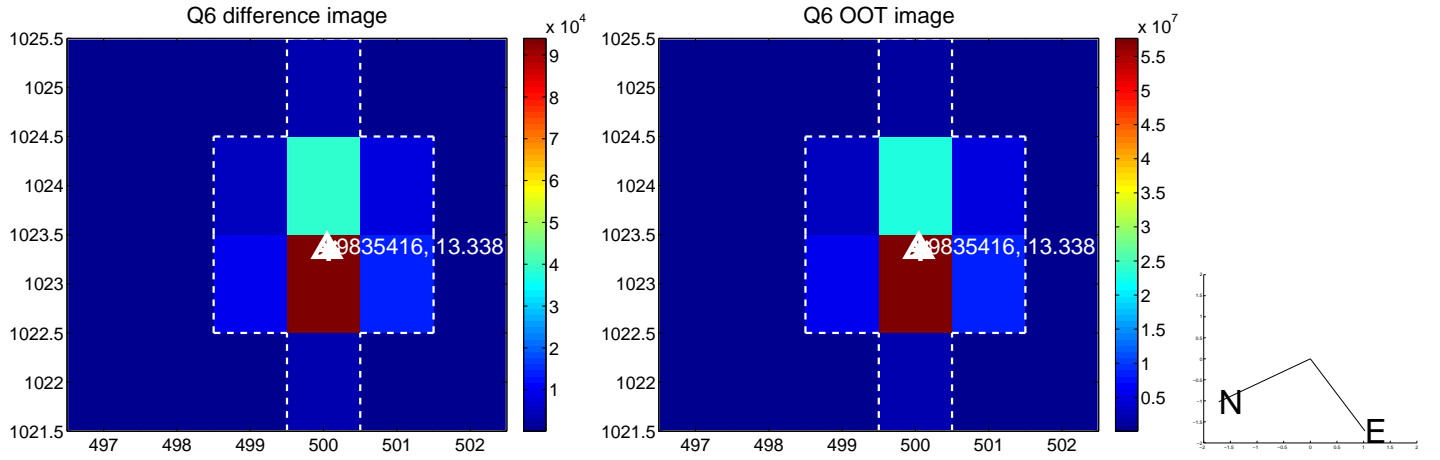
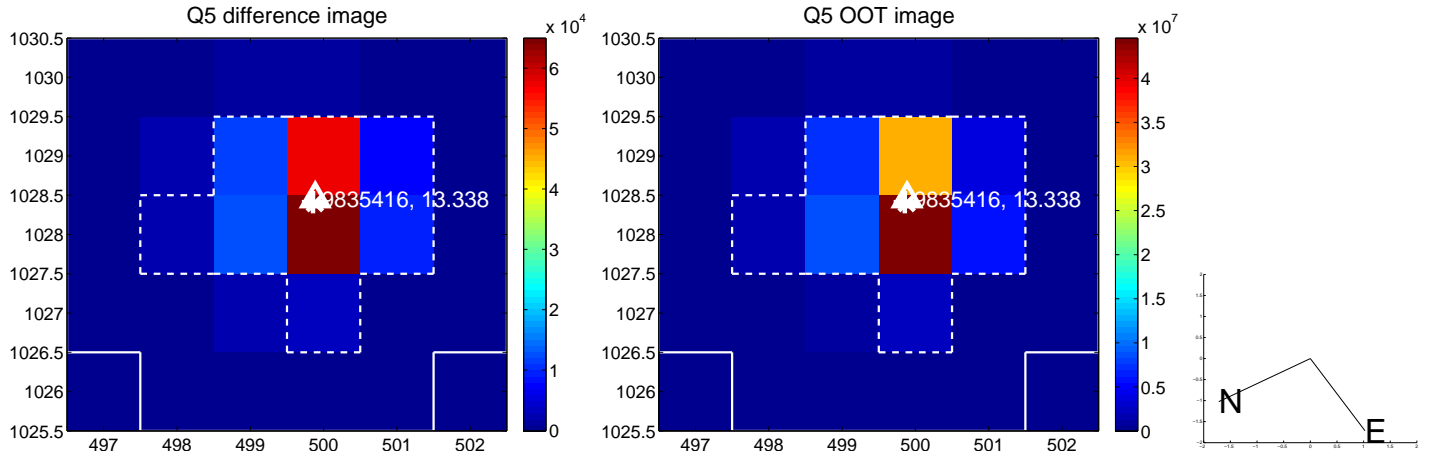


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

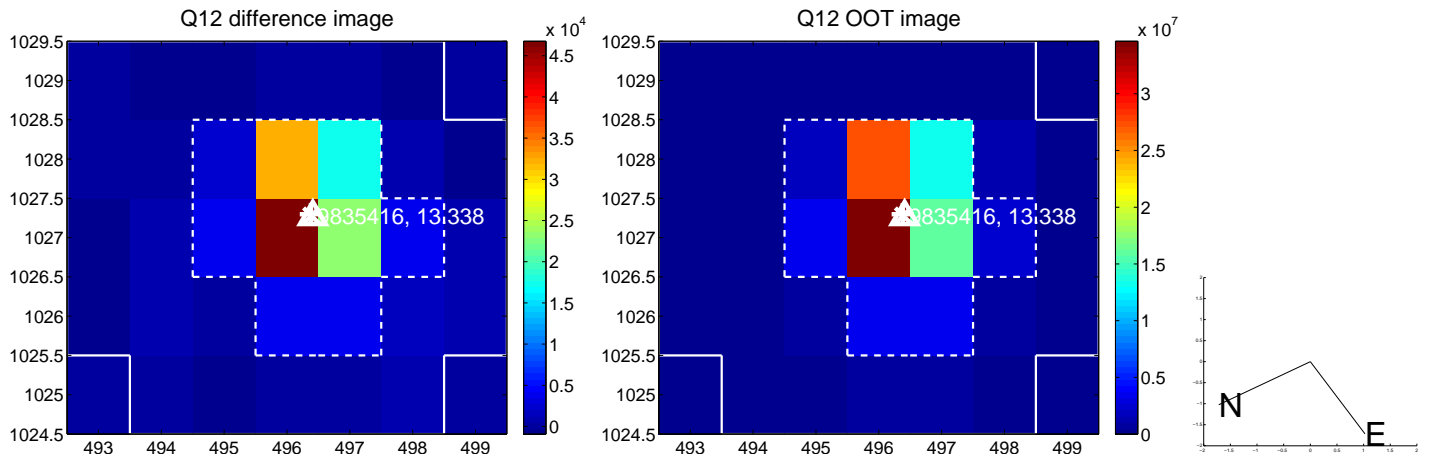
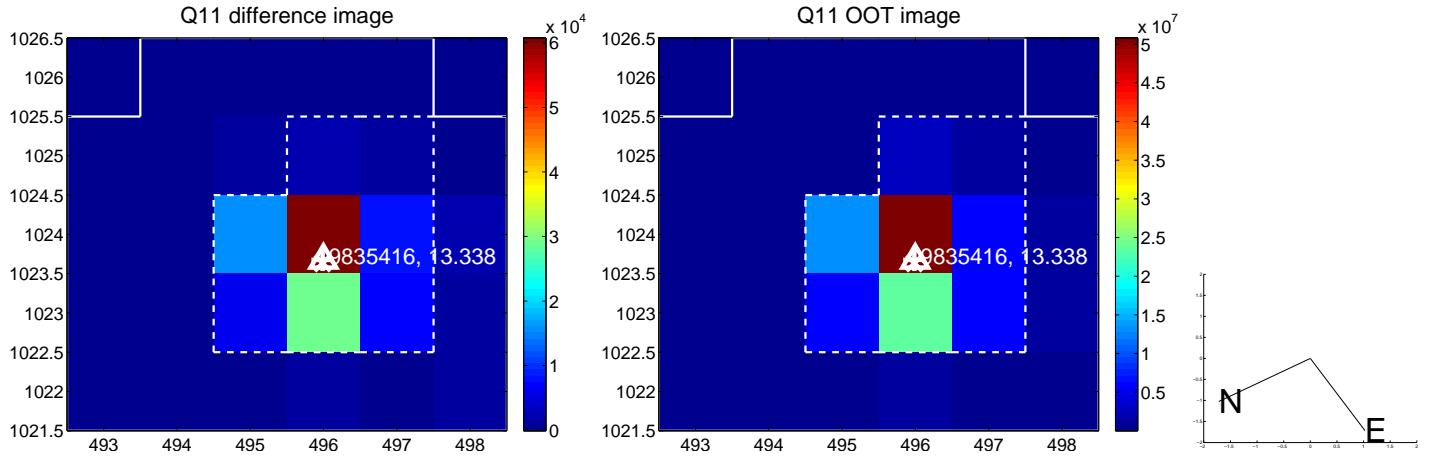
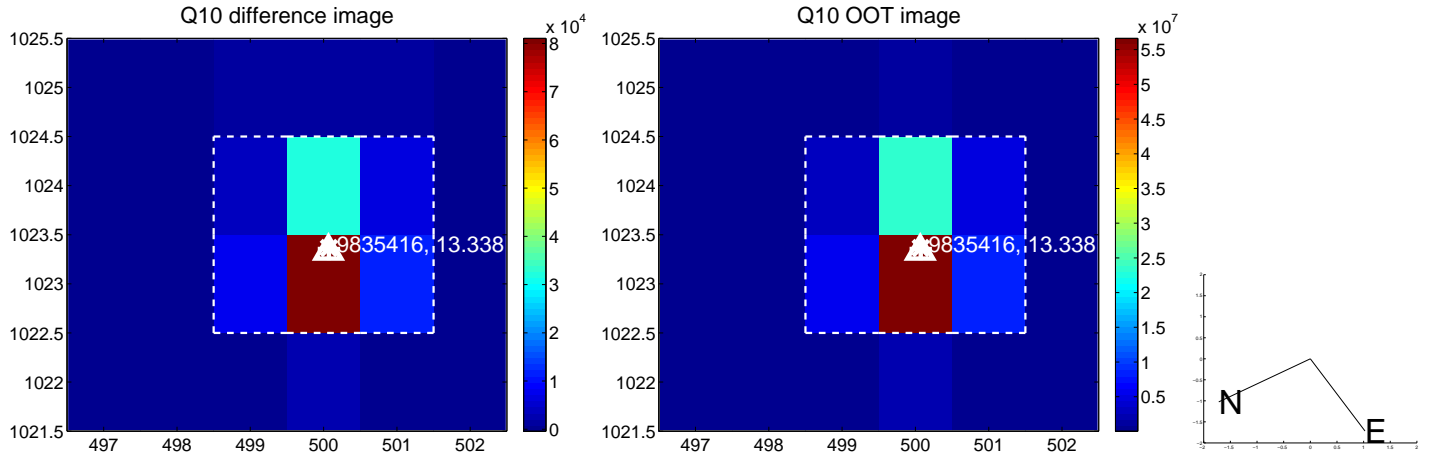
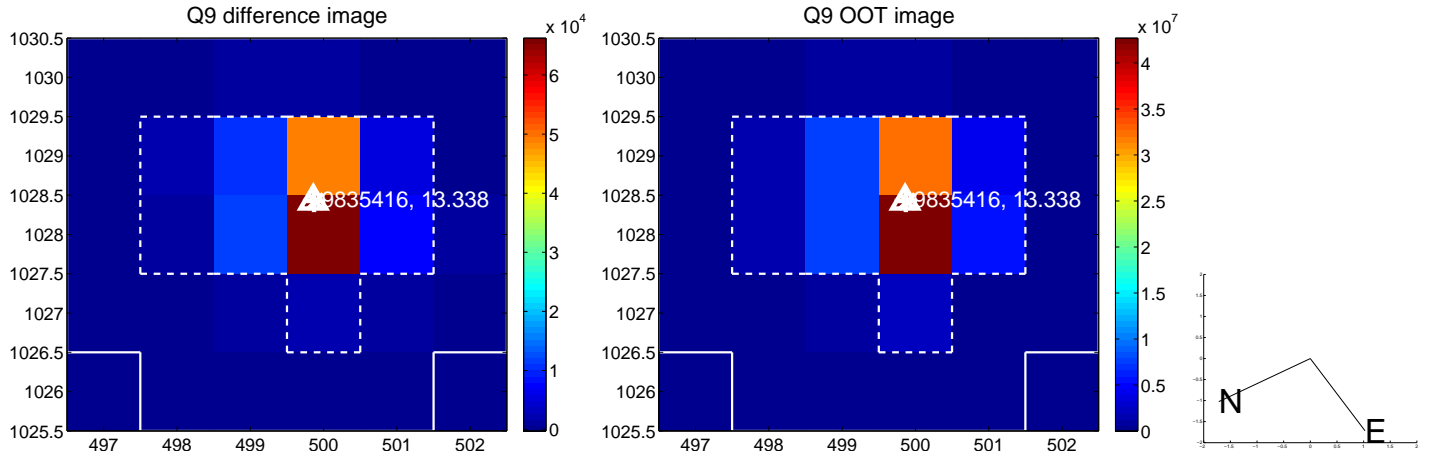
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



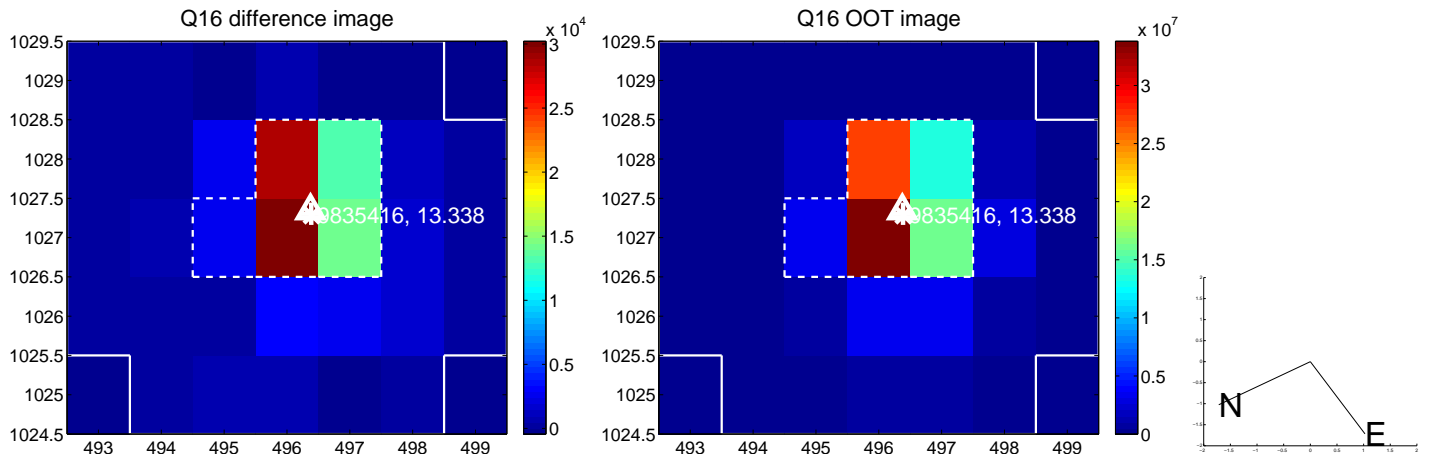
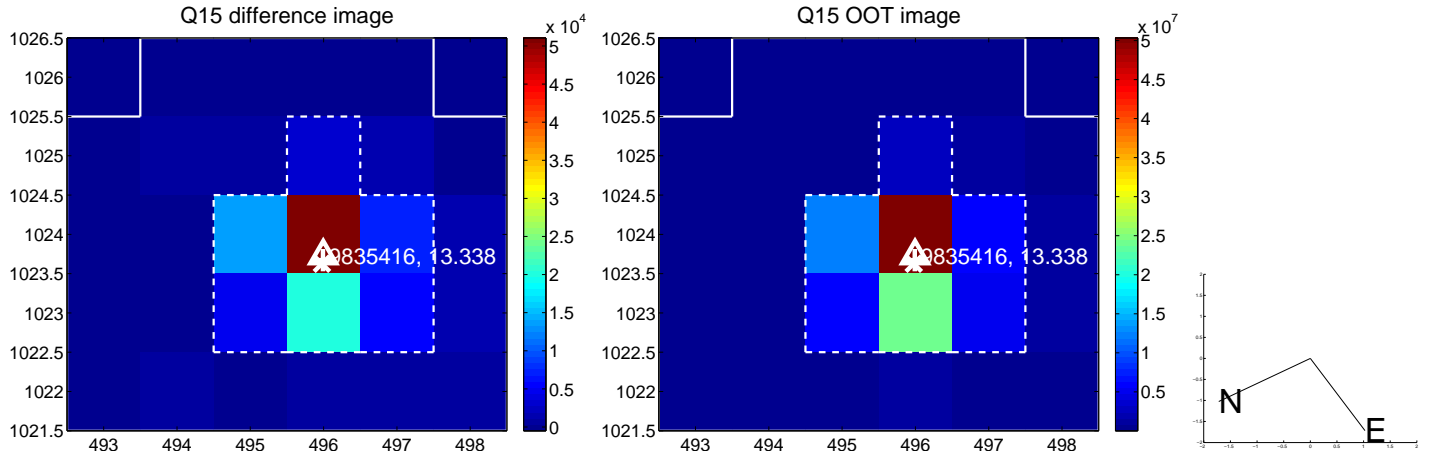
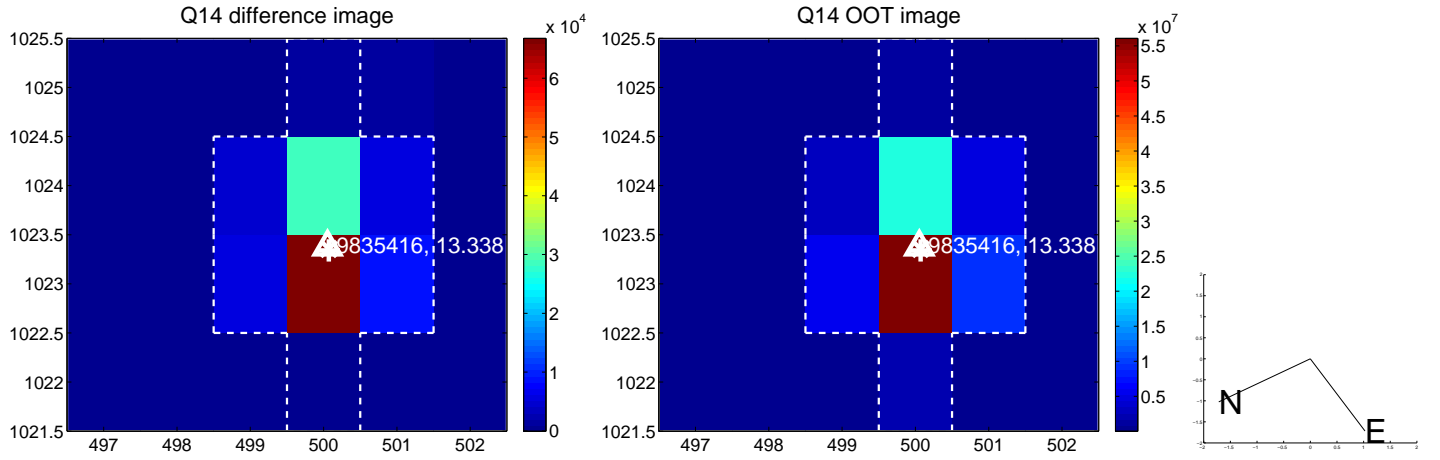
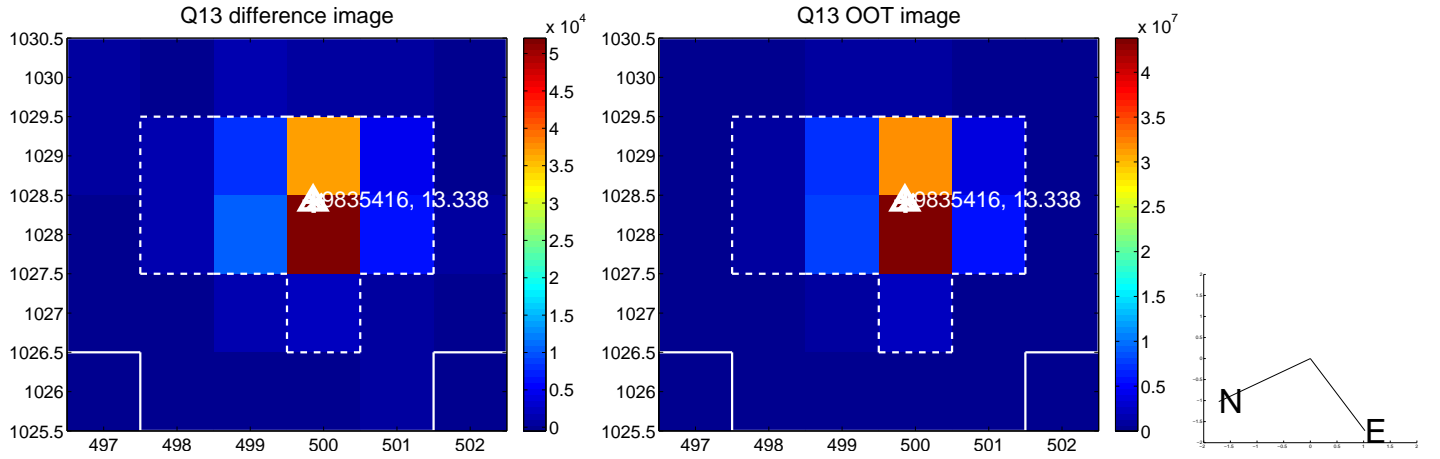
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



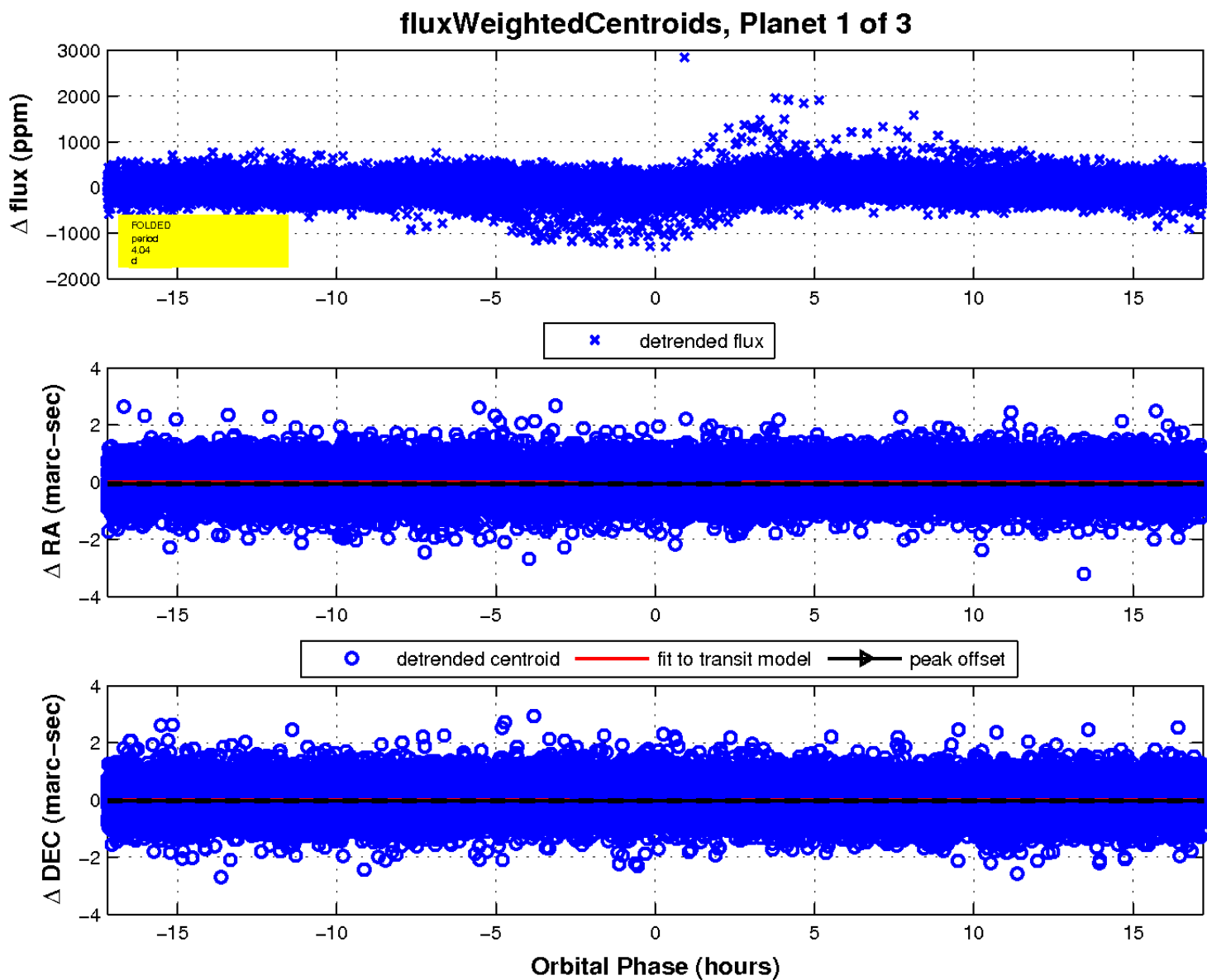
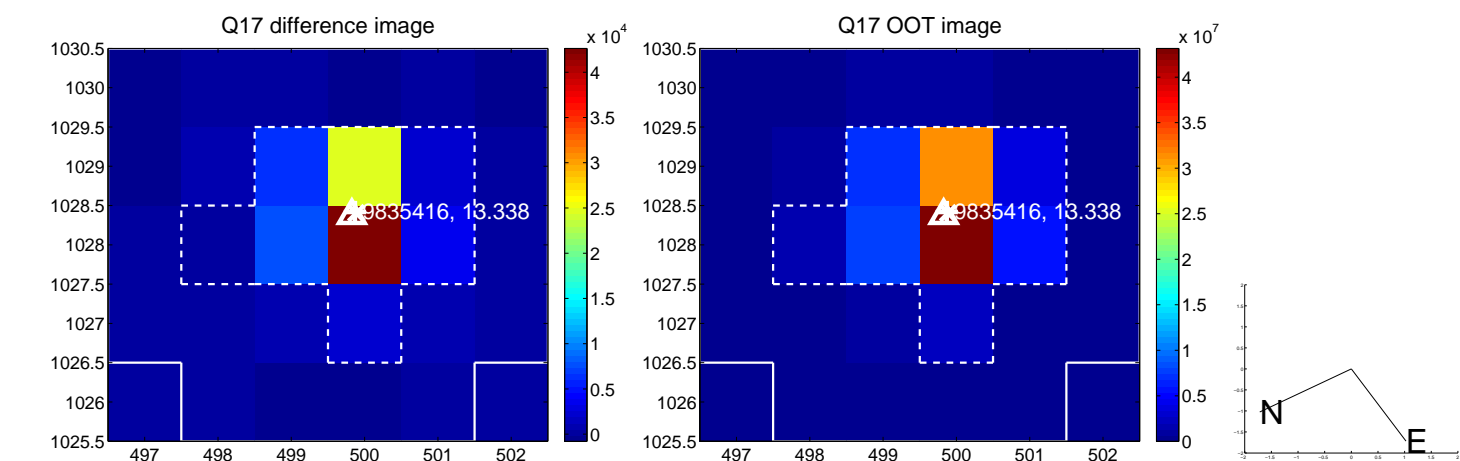
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

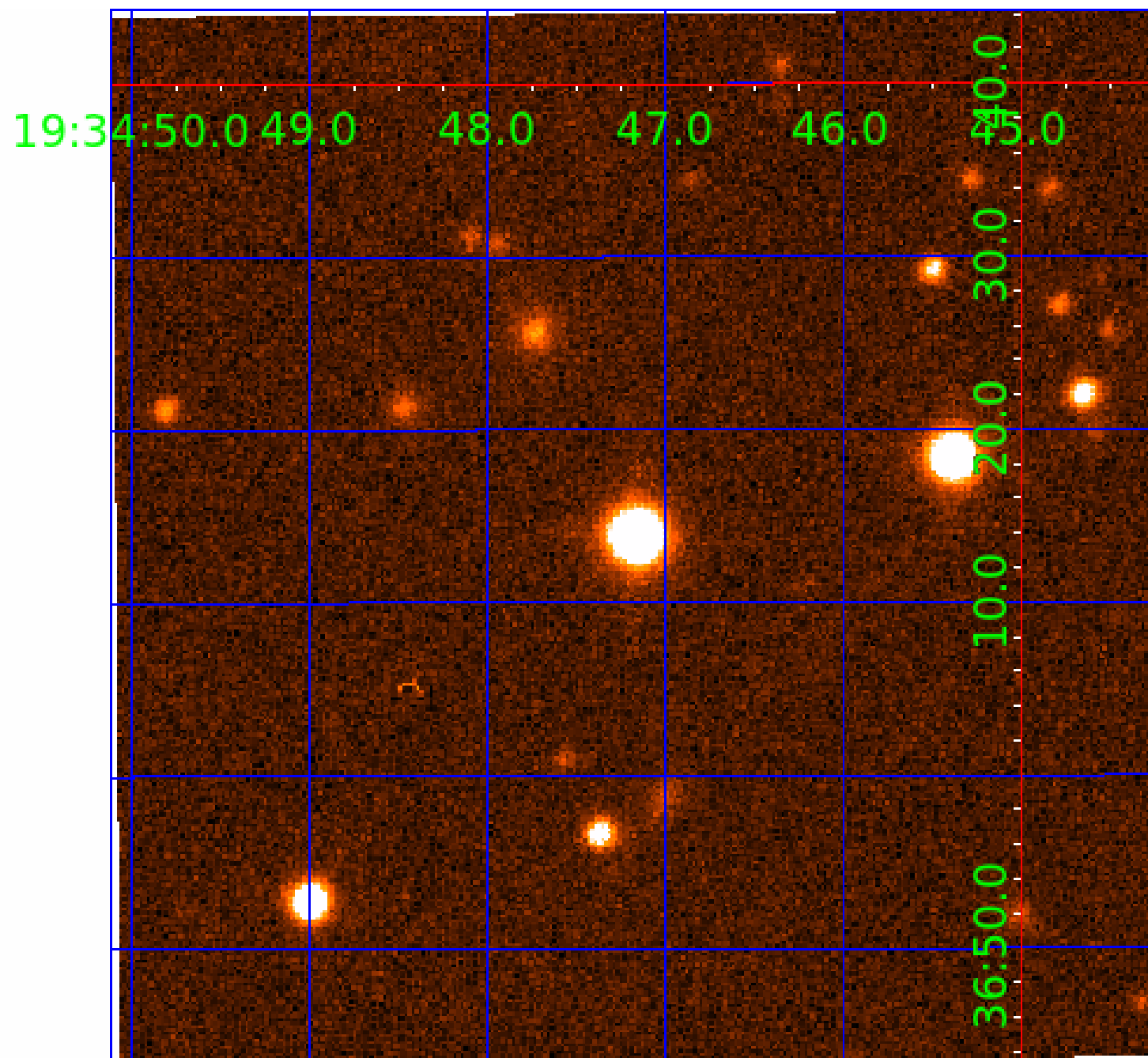


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009835416

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})
009835416-01	OBS	No	4.036802	132.643170	64.3	5.733	20.2	13.6	1.68	7241	1.56	2237.43
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009835416-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009835416-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
009835416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

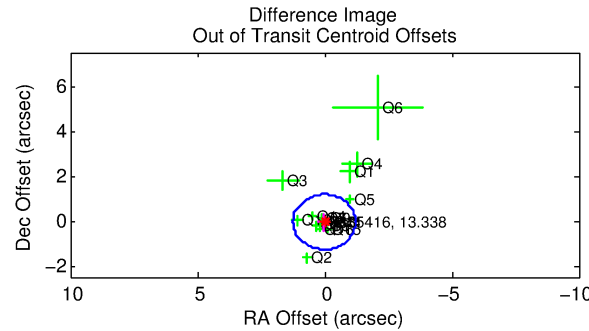
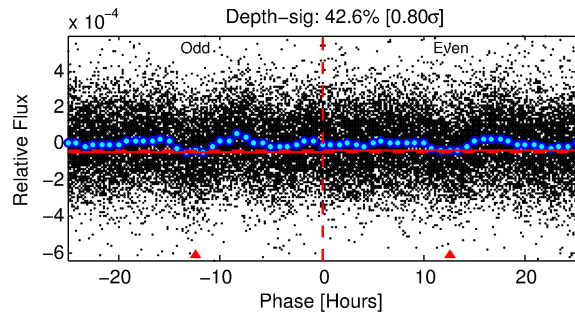
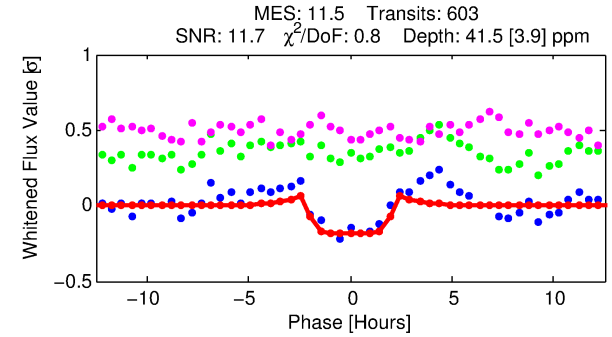
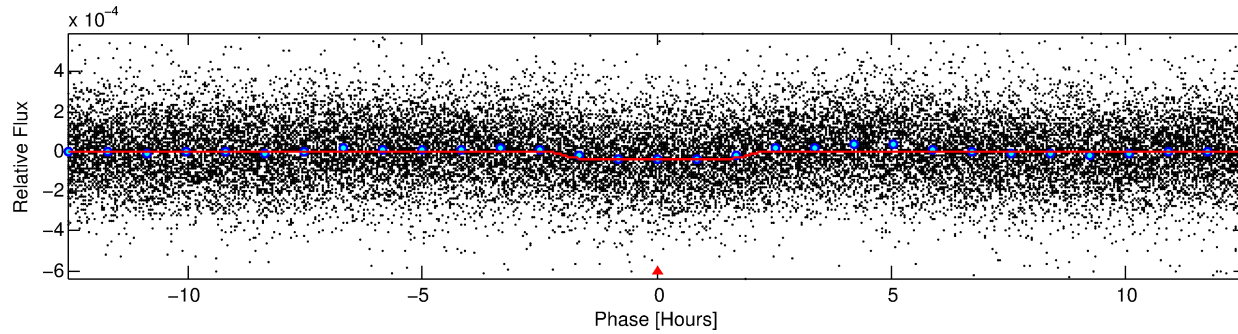
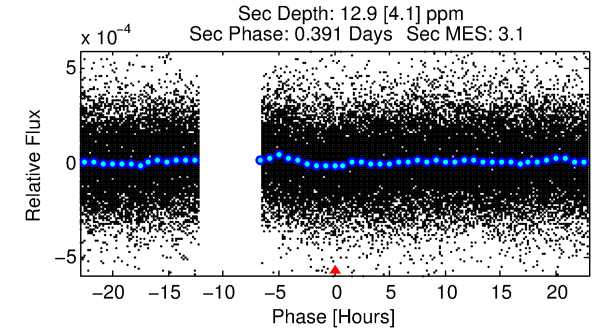
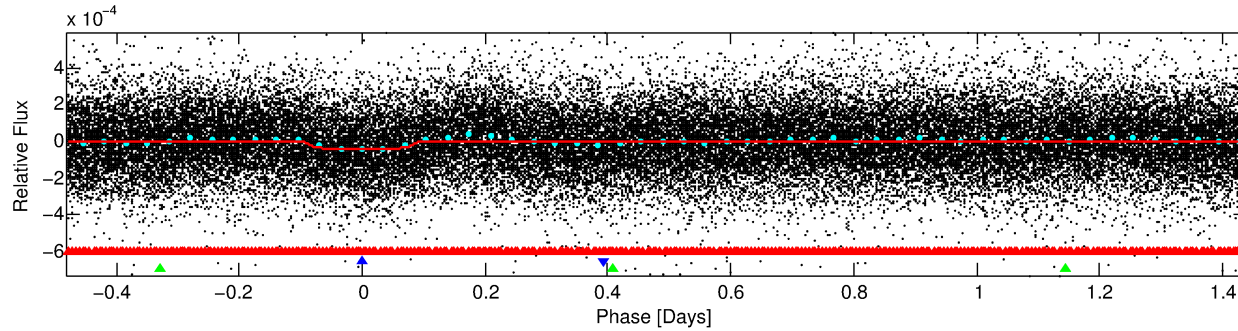
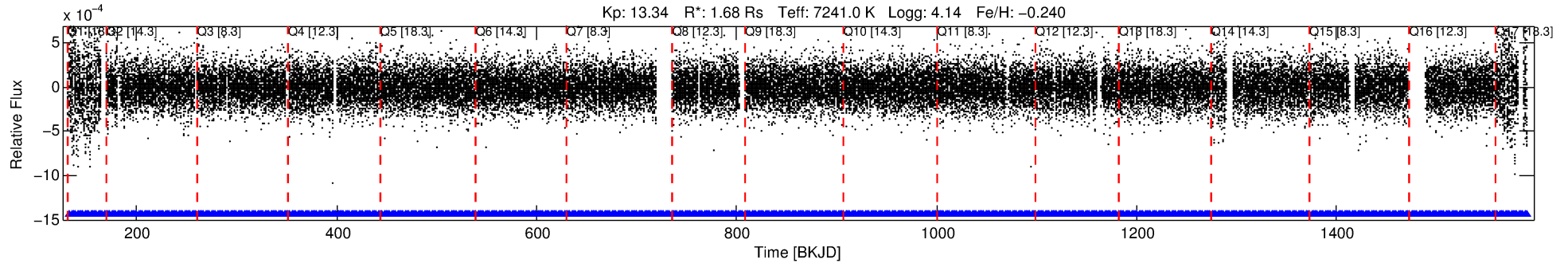
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009835416-02

No Significant Match Found

DV One-Page Summary

KIC: 9835416 Candidate: 2 of 3 Period: 1.917 d



DV Fit Results:

Period = 1.91679 [0.00001] d
Epoch = 133.2579 [0.0030] BKJD
Rp/R* = 0.0067 [0.0016]
a/R* = 1.98 [2.15]
b = 0.87 [0.40]
Seff = 6039.96 [2348.54]
Teq = 2248 [219] K
Rp = 1.23 [0.47] Re
a = 0.0339 [0.0084] AU
Ag = 5.39 [3.59] [1.22σ]
Teffp = 5295 [783] K [3.75σ]

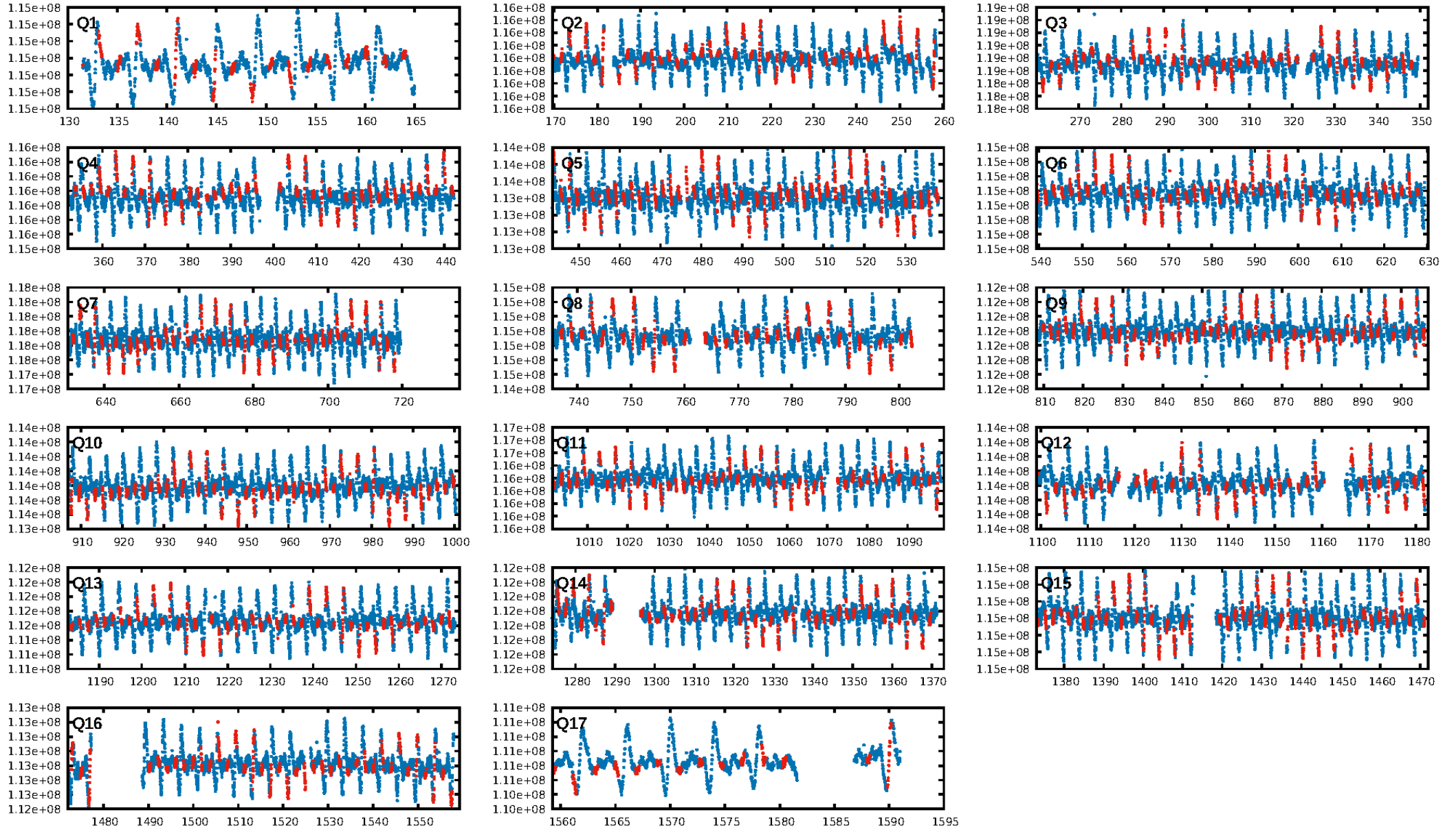
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [7.17σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.46e-23
RollingBand-fgt: 1.00 [576/576]
GhostDiagnostic-chr: 0.9041
Centroid-sig: 2.8%
Centroid-so: 0.919 arcsec [1.62σ]
OotOffset-rm: 0.057 arcsec [0.14σ]
KicOffset-rm: 0.071 arcsec [0.23σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.71 [12/17]
DiffImageOverlap-fno: 1.00 [17/17]

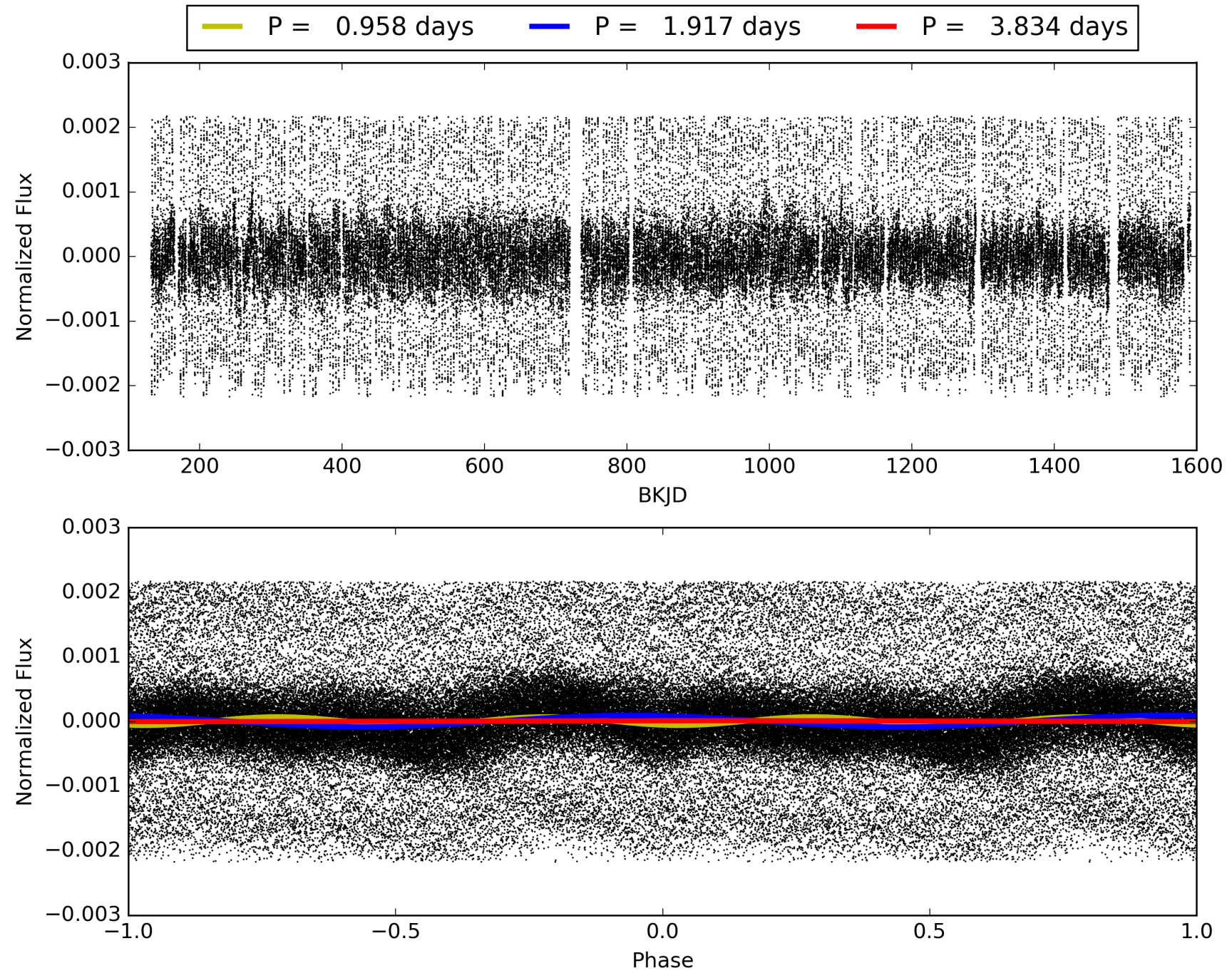
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:23:47 Z

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

TCE 009835416-02, PDC Light Curves

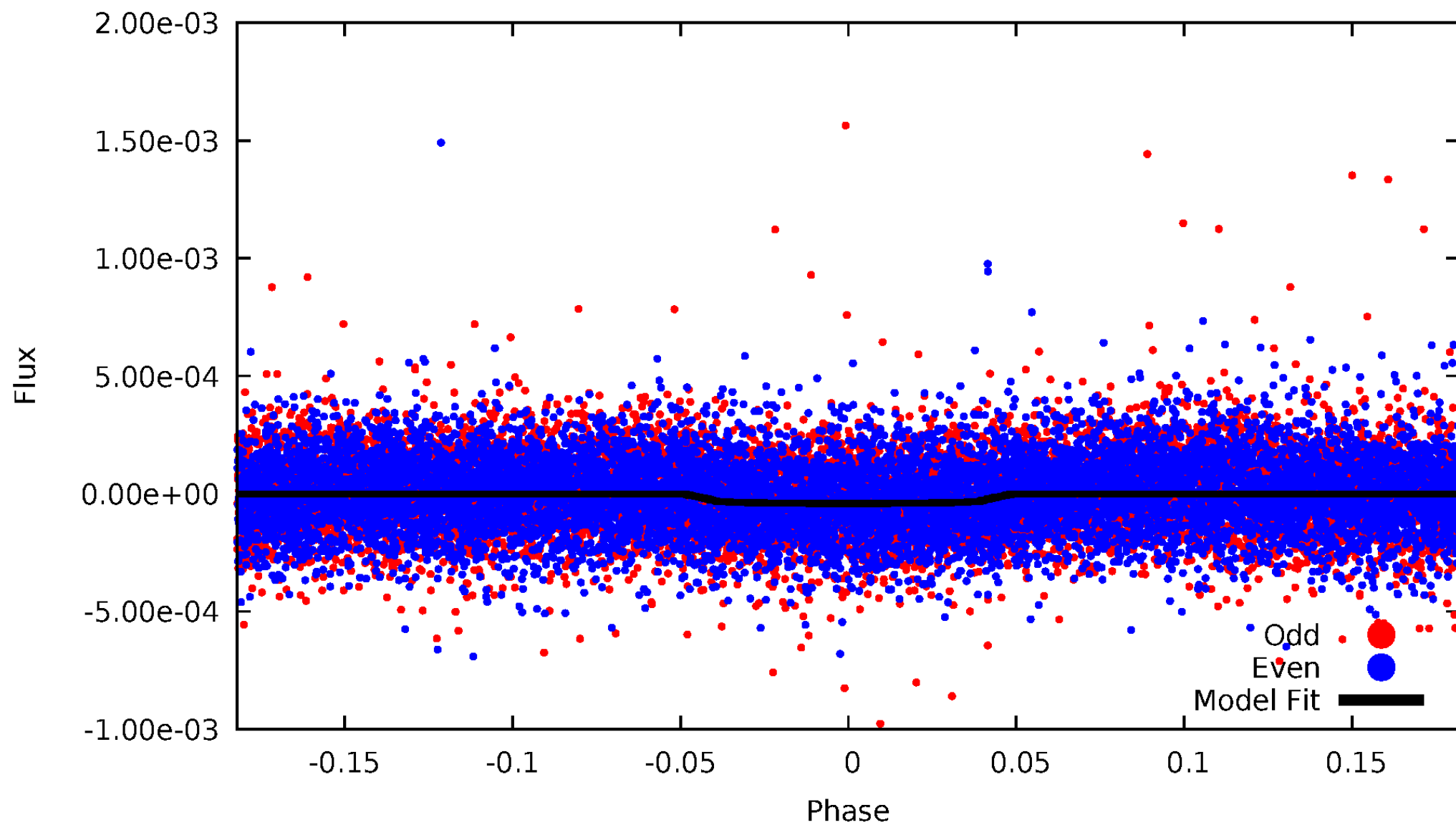


TCE 009835416-02



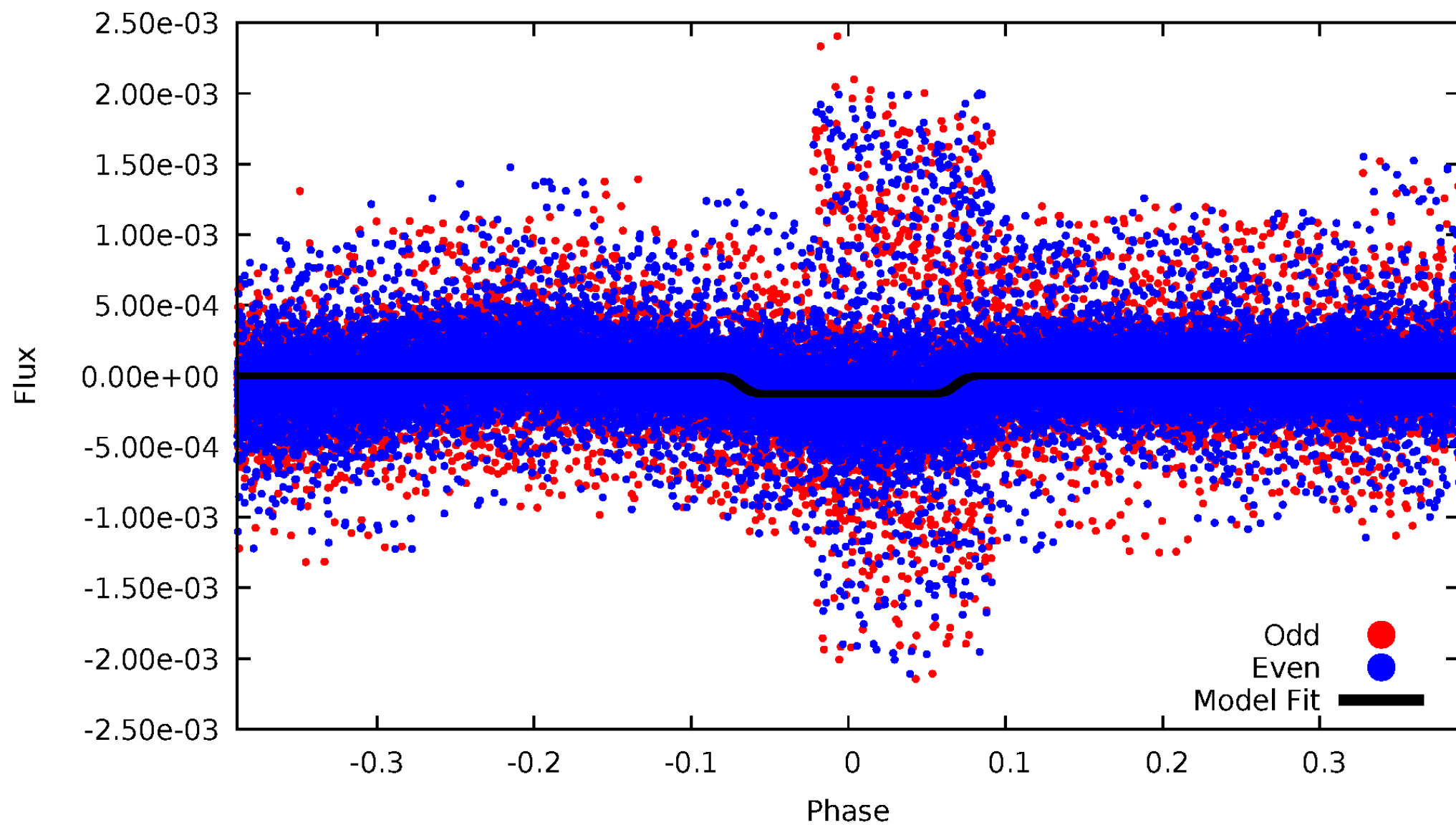
DV Odd/Even

TCE 009835416-02



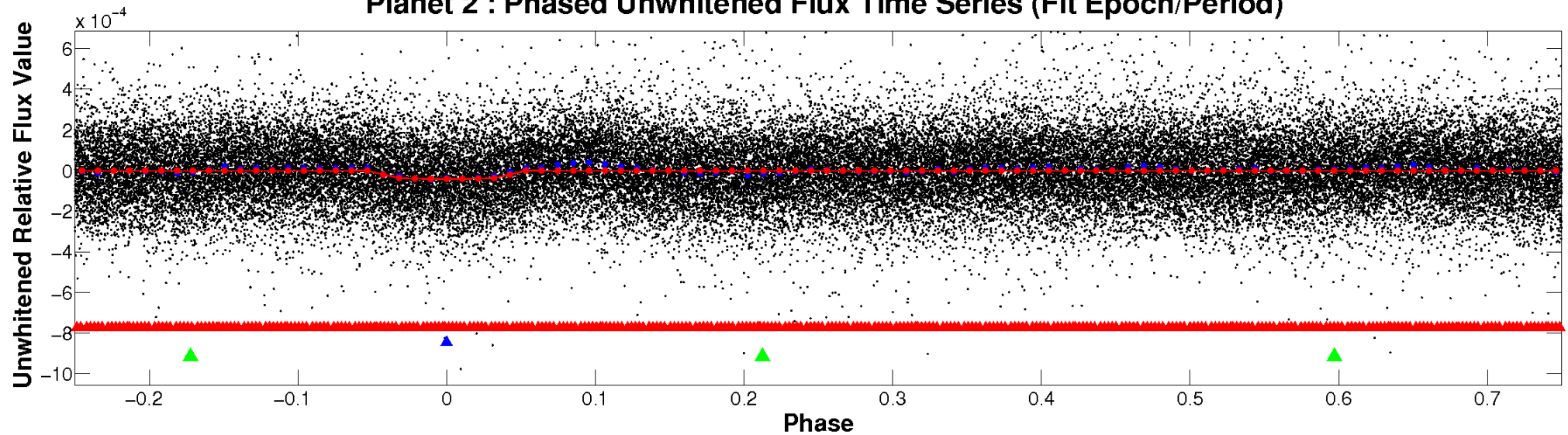
ALT Odd/Even

TCE 009835416-02

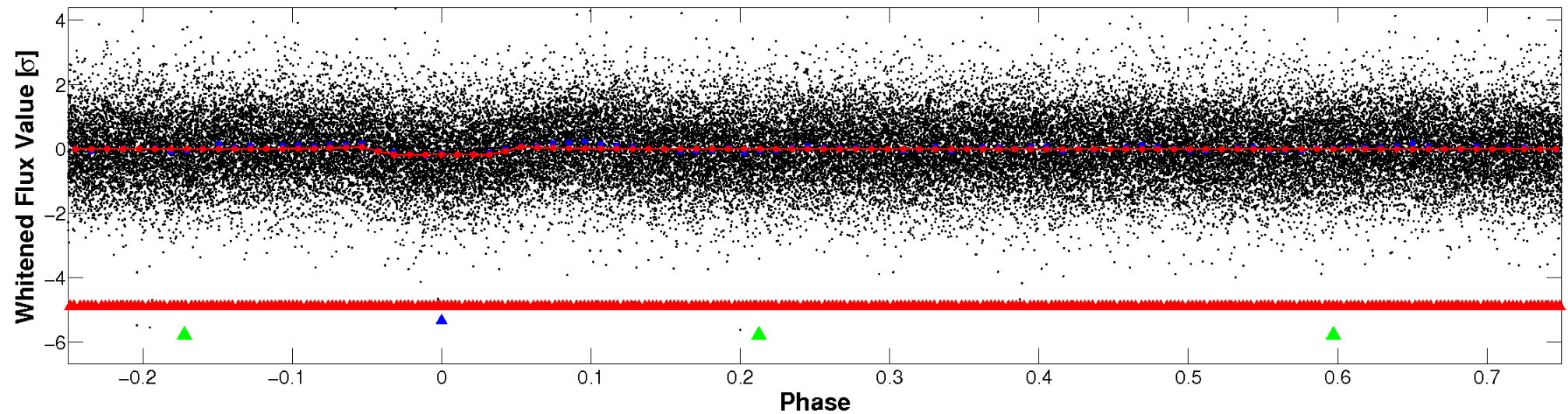


Non-Whitened Vs. Whitened Light Curve

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

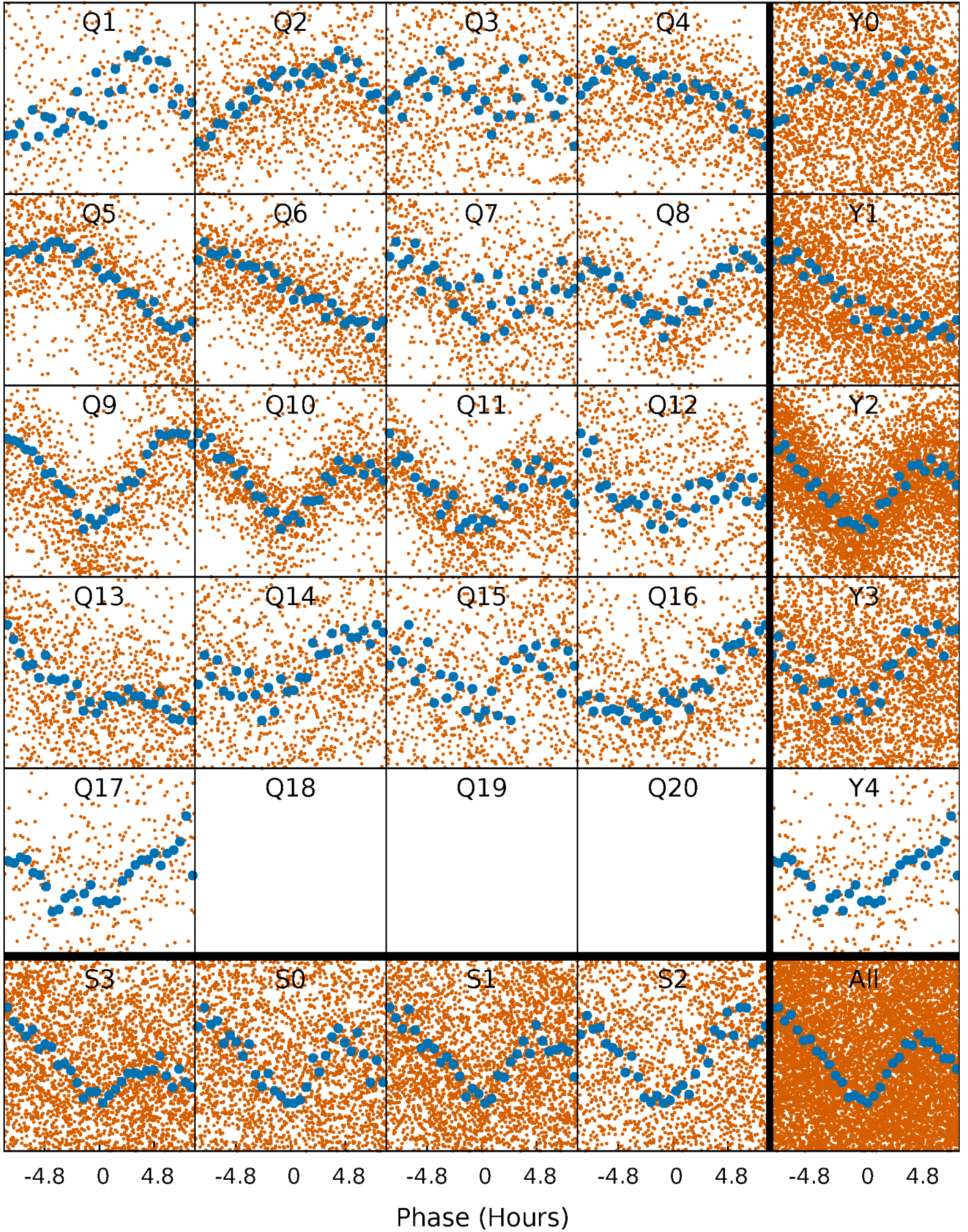


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



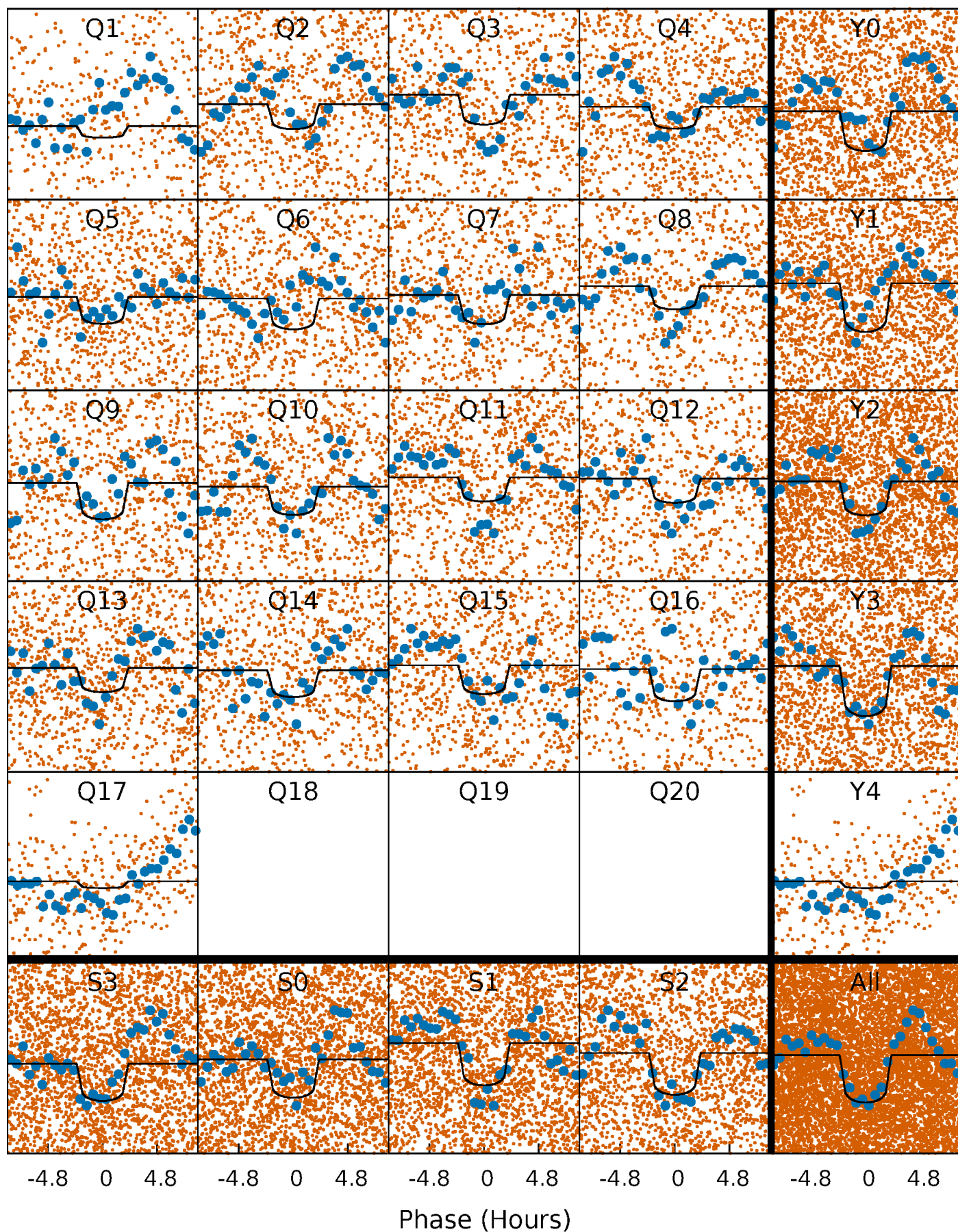
PDC Quarter-Phased Transit Curves

TCE 009835416-02 P= 1.916791 Days $T_0=133.257923$ (BKJD)



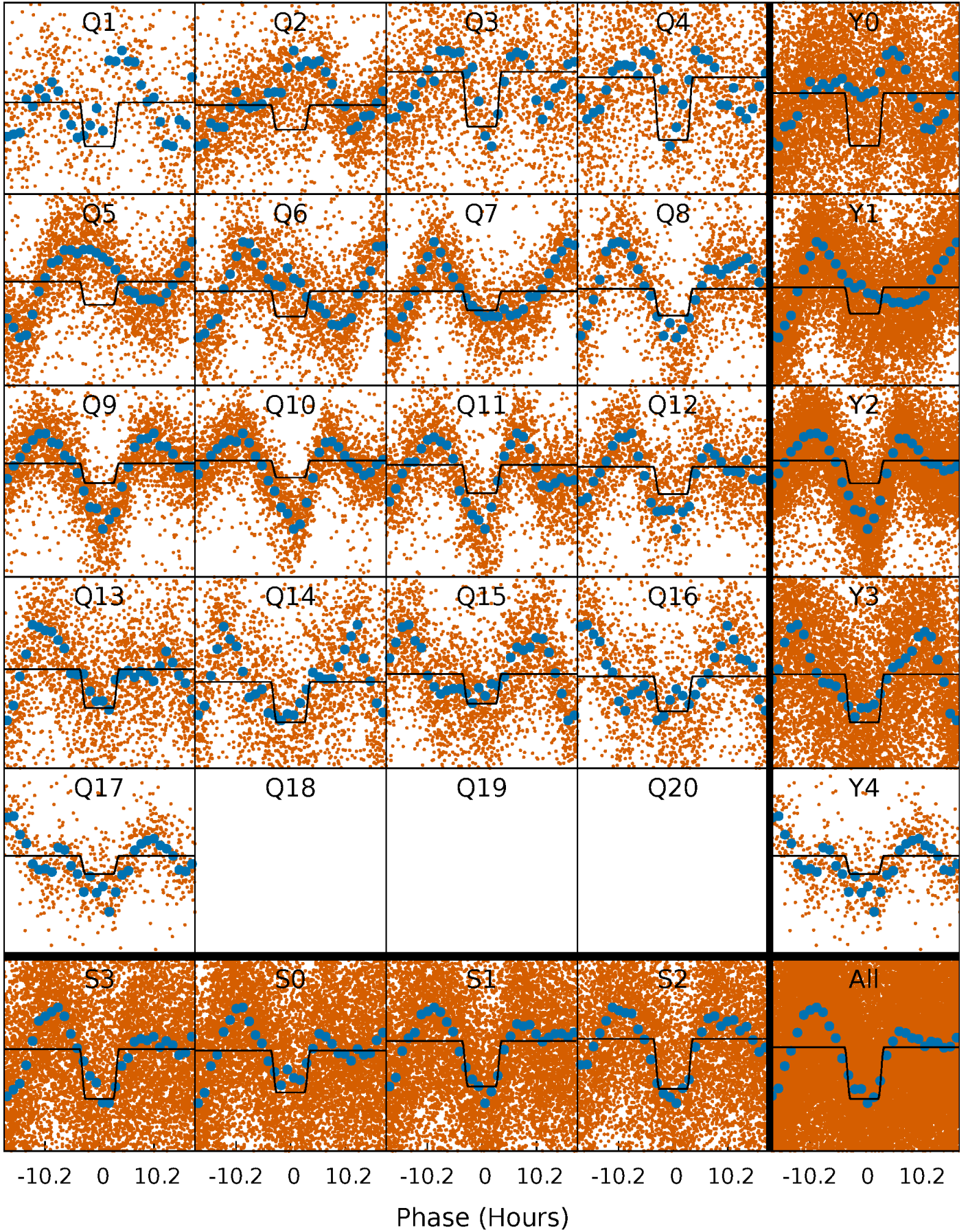
DV Quarter-Phased Transit Curves

TCE 009835416-02 P= 1.916791 Days $T_0=133.257923$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

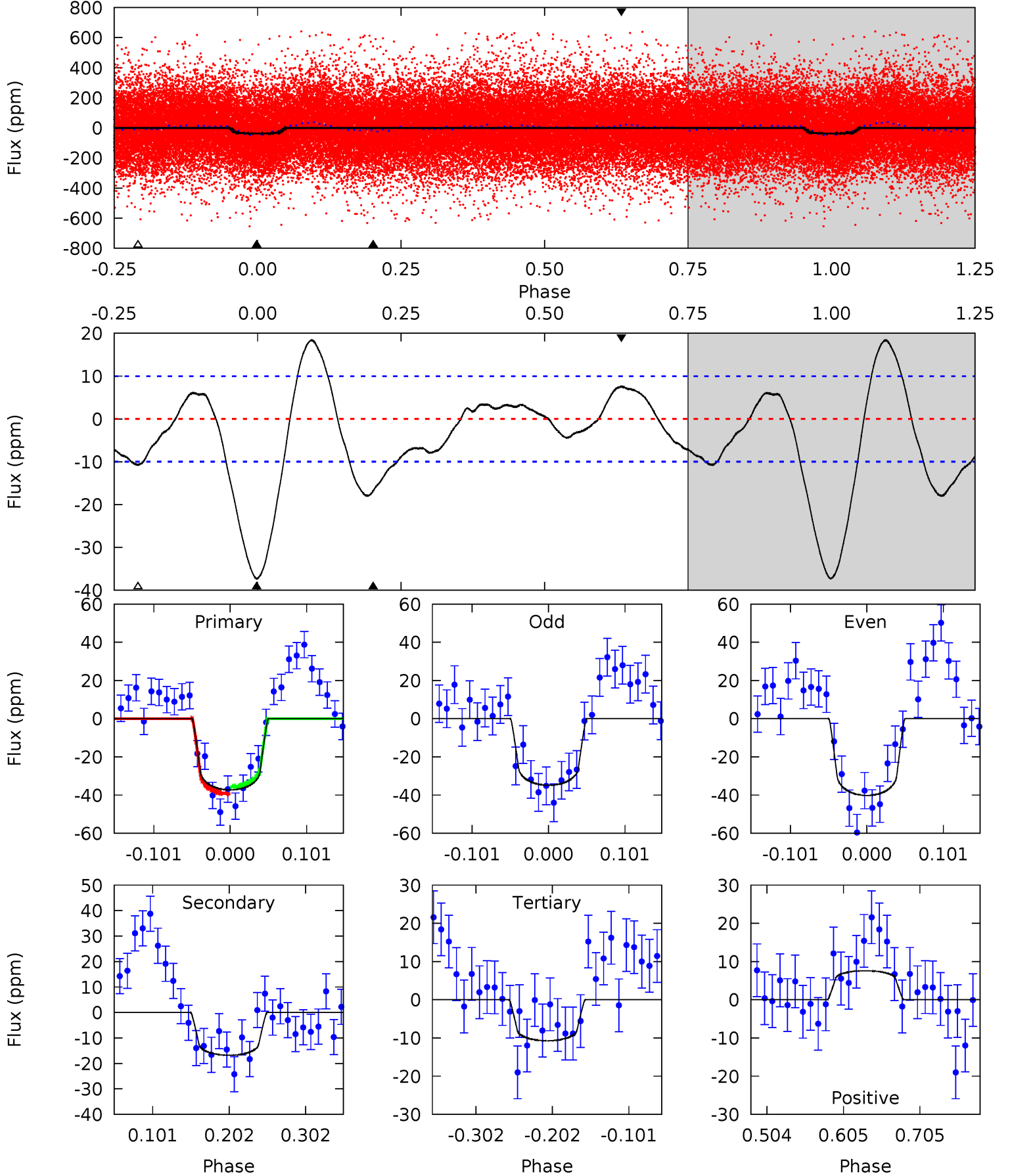
TCE 009835416-02 P= 1.916767 Days $T_0=133.202944$ (BKJD)



DV Model-Shift Uniqueness Test

009835416-02, P = 1.916791 Days, E = 131.341132 Days

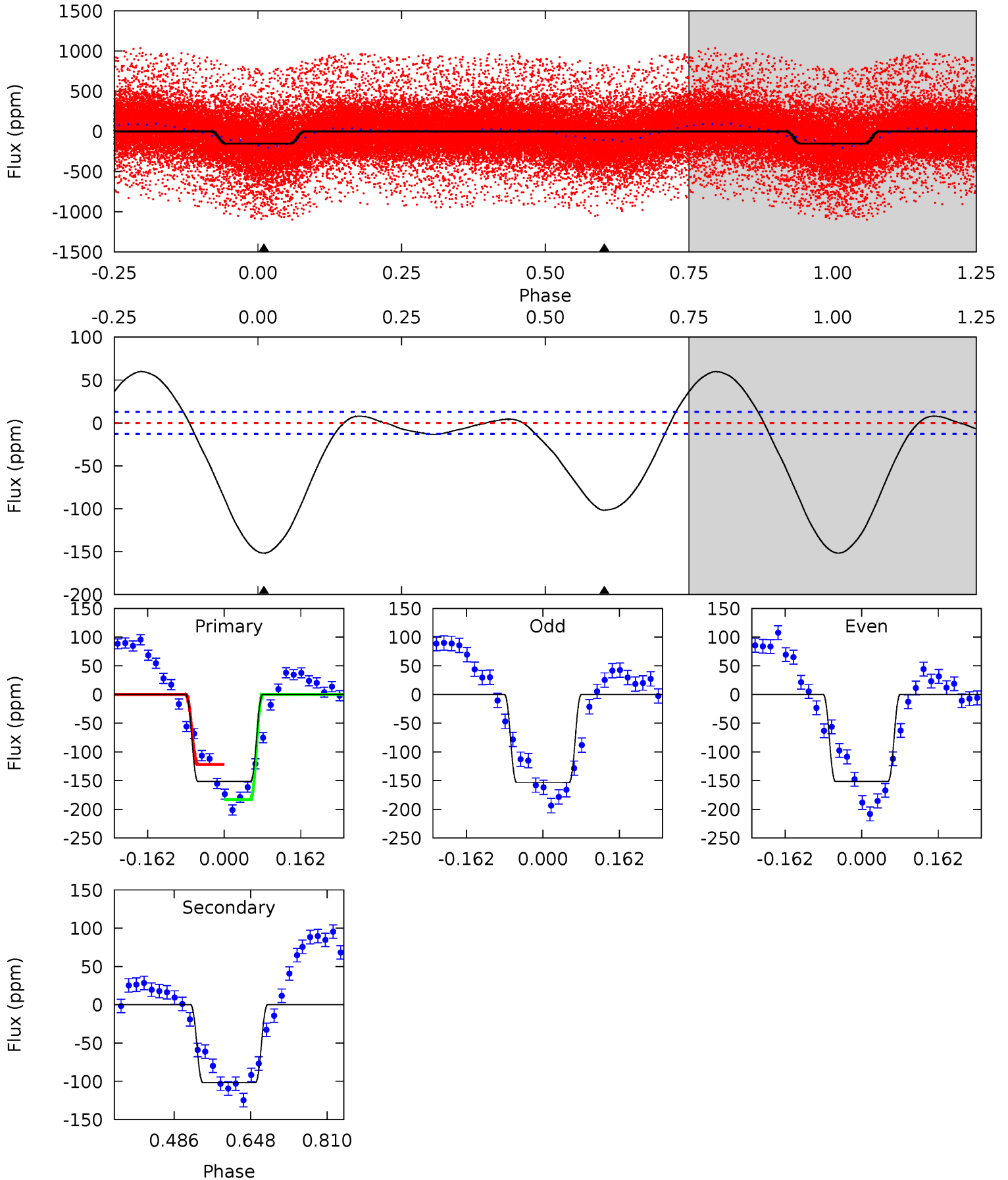
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.1	7.70	4.92	3.47	4.56	1.64	2.28	12.2	13.6	2.78	4.23	1.24	0.99	0.33	0.85



Alt Model-Shift Uniqueness Test

009835416-02, P = 1.916767 Days, E = 131.286177 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.0	35.5	0	0	4.46	1.40	8.77	53.0	53.0	35.5	35.5	0.32	0.50	0.28	11.0



Stellar Parameters For KIC 009835416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7241^{+228}_{-304}	$4.139^{+0.153}_{-0.187}$	$-0.240^{+0.250}_{-0.350}$	$1.681^{+0.508}_{-0.370}$	$1.420^{+0.219}_{-0.241}$	$0.421^{+0.336}_{-0.217}$
	+3%/-4%	+4%/-5%	+104%/-146%	+30%/-22%	+15%/-17%	+80%/-52%
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 009835416-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-17 ± 2	$1.25^{+0.35}_{-0.32}$	3134^{+240}_{-211}	5513^{+830}_{-584}	$6.835^{+5.478}_{-2.735}$
Alt.	-102 ± 3	$2.07^{+0.45}_{-0.37}$	3150^{+266}_{-202}	6774^{+622}_{-513}	15^{+7}_{-5}

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

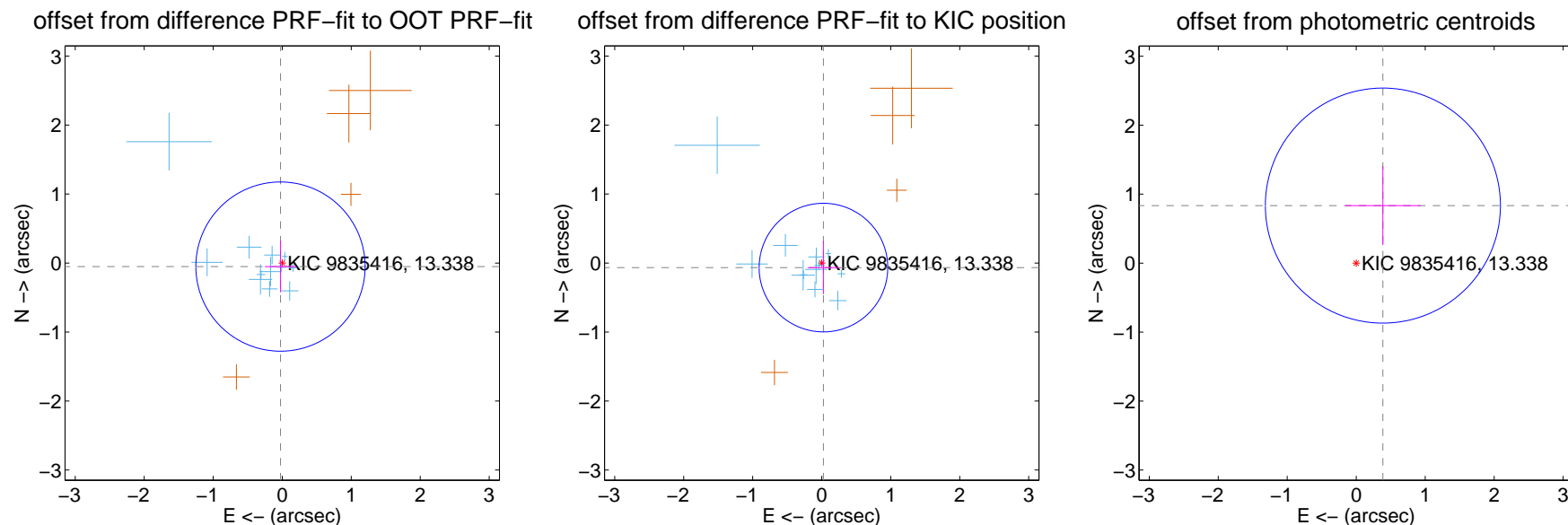
DV Centroid Data

Supplemental centroid analysis for 009835416-02. Kepler magnitude: 13.34. Transit SNR 11.71

There are 12 quarters with good PRF difference image offsets

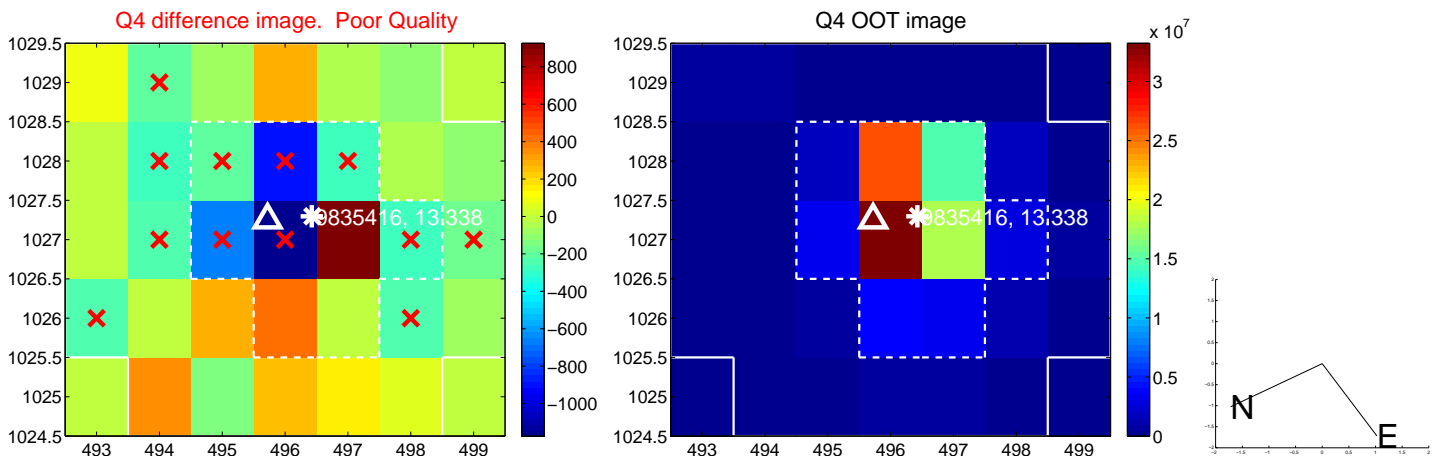
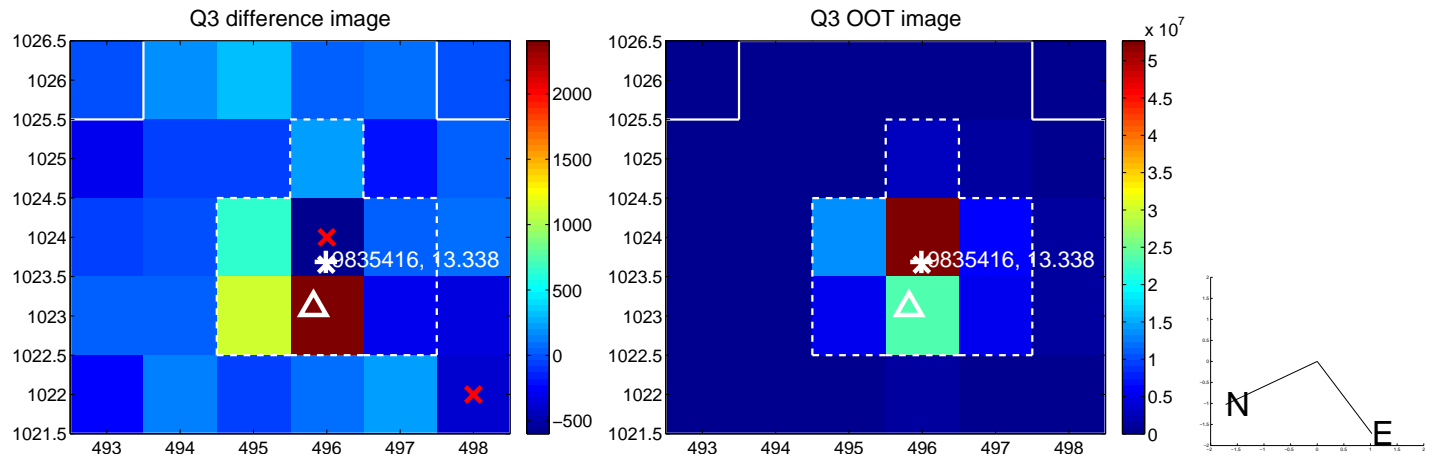
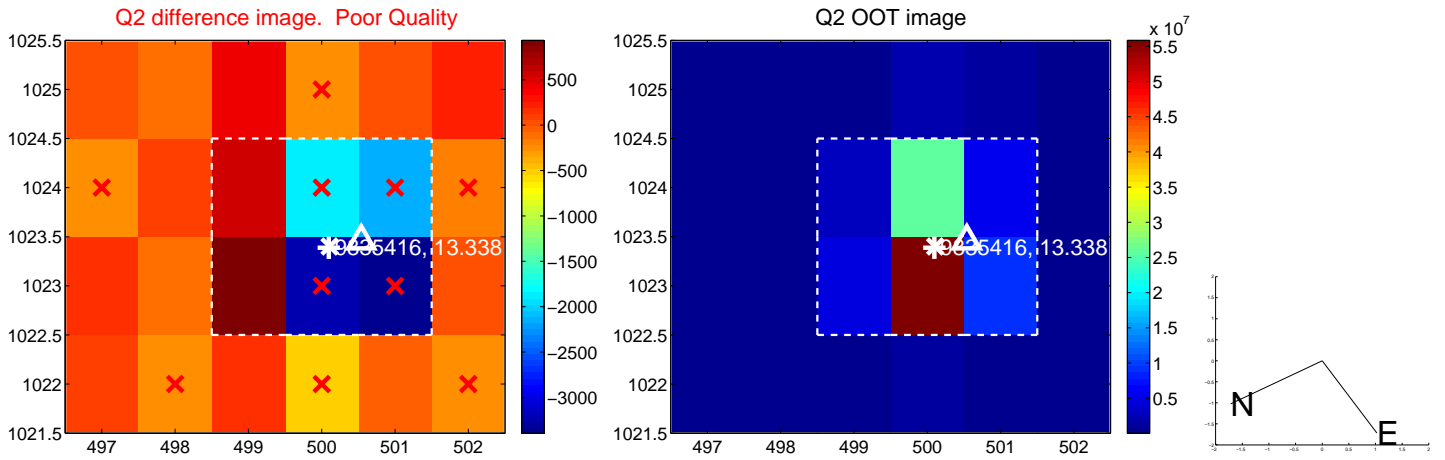
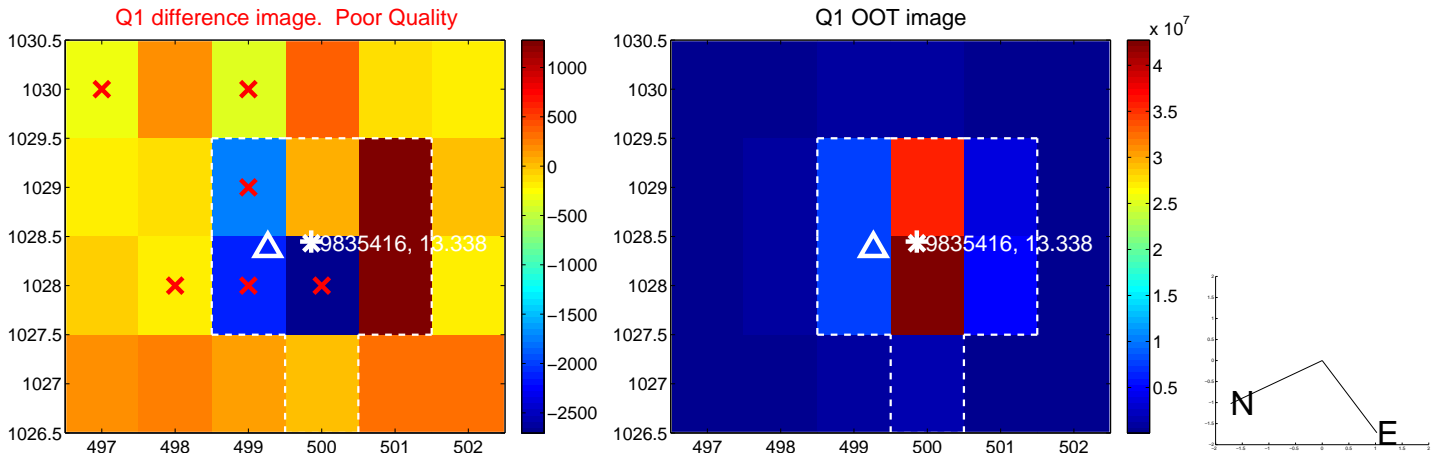
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.057 ± 0.409	0.14	0.025 ± 0.228	-0.051 ± 0.372
PRF-fit source offset from KIC position	0.071 ± 0.311	0.23	-0.025 ± 0.229	-0.066 ± 0.384
photometric centroid source offset	0.92 ± 0.57	1.62	-0.39 ± 0.55	0.83 ± 0.57

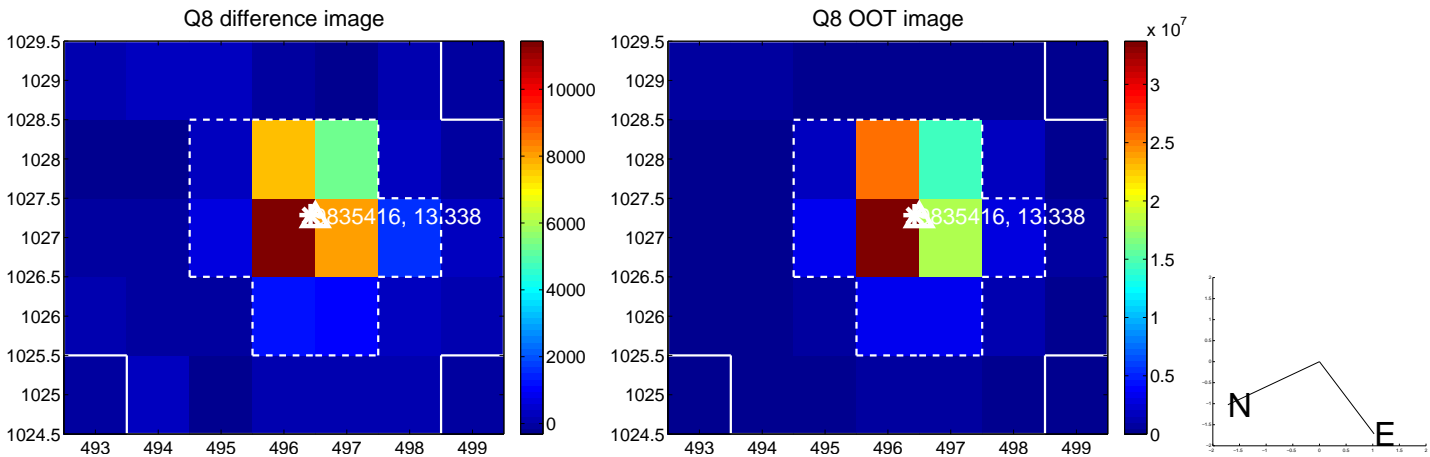
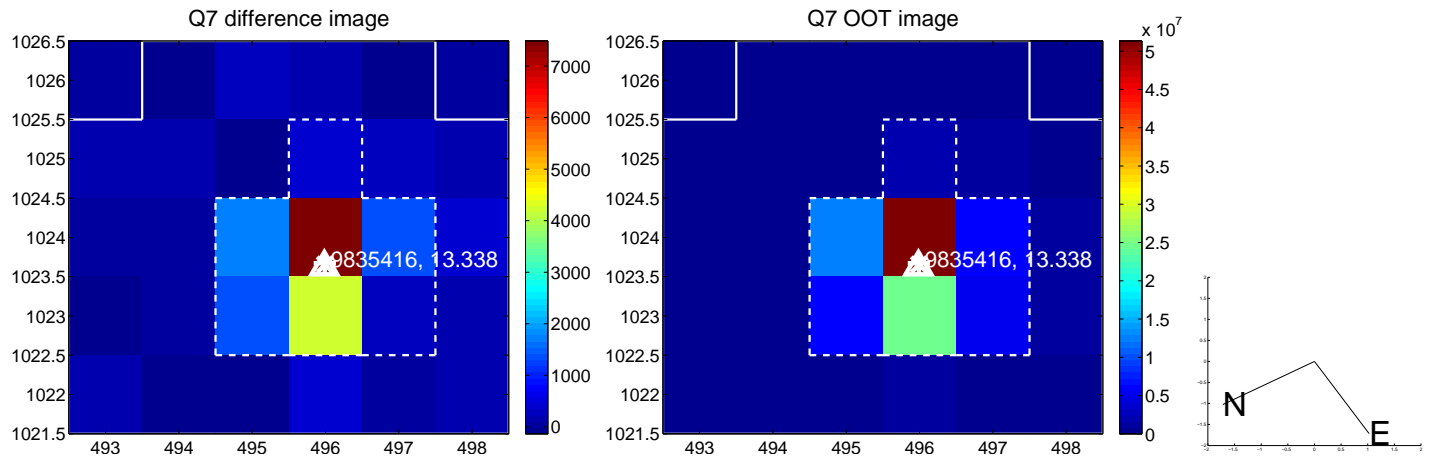
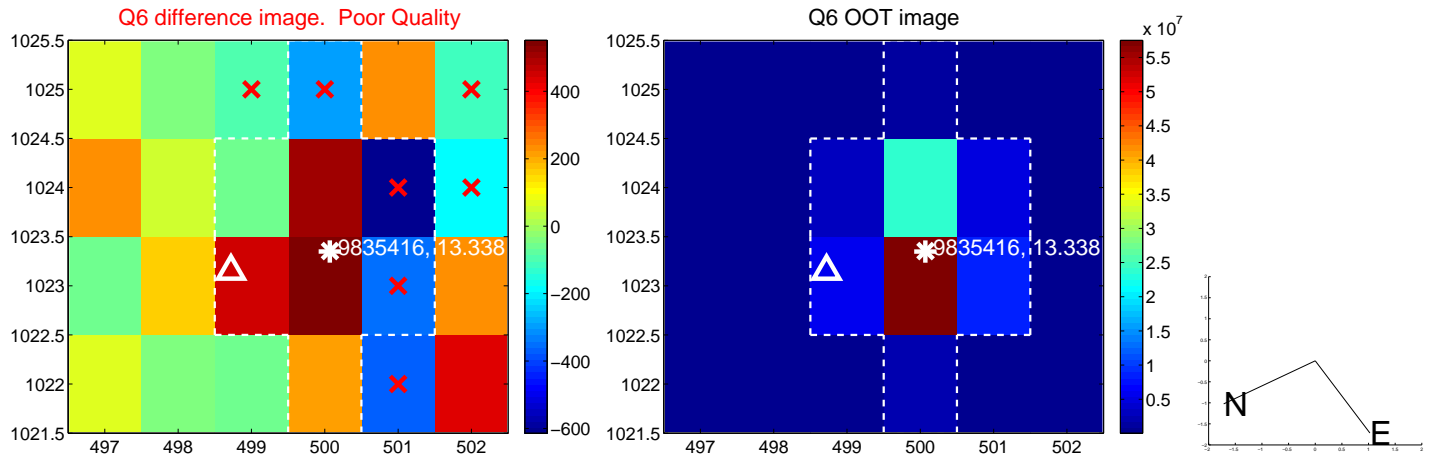
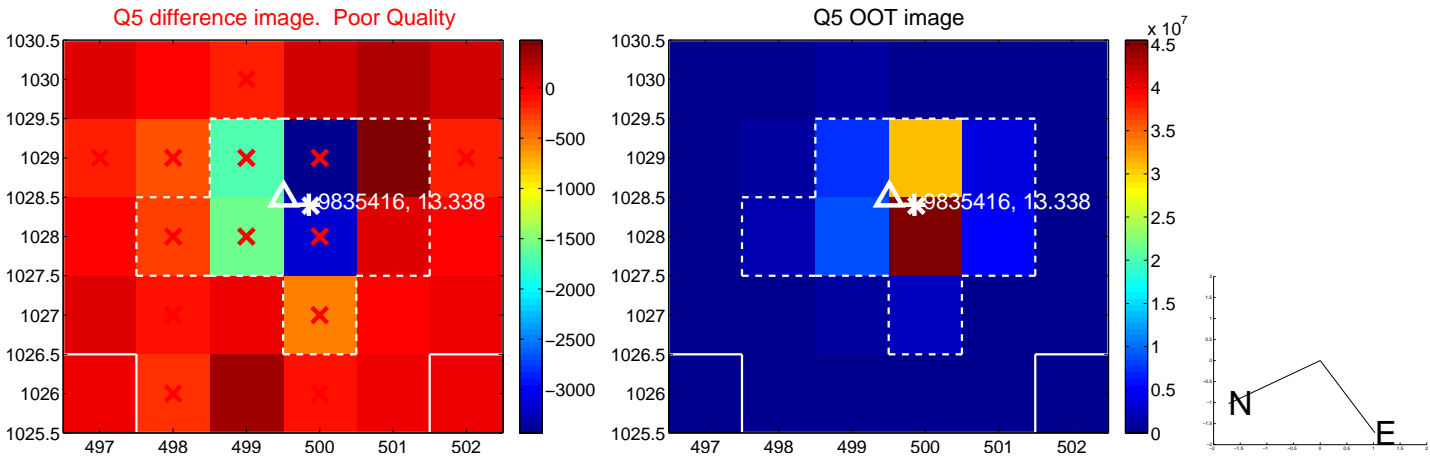


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

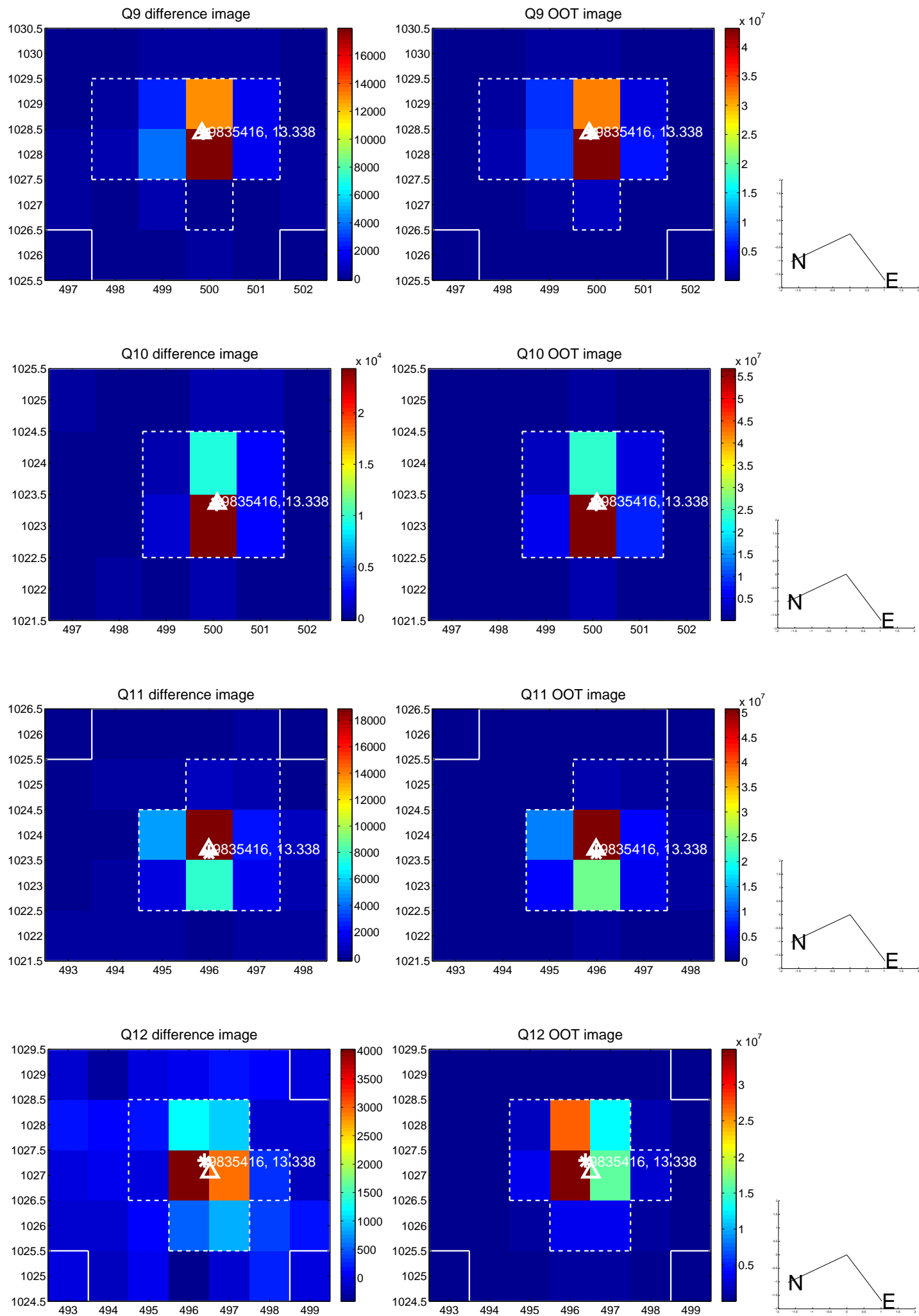
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



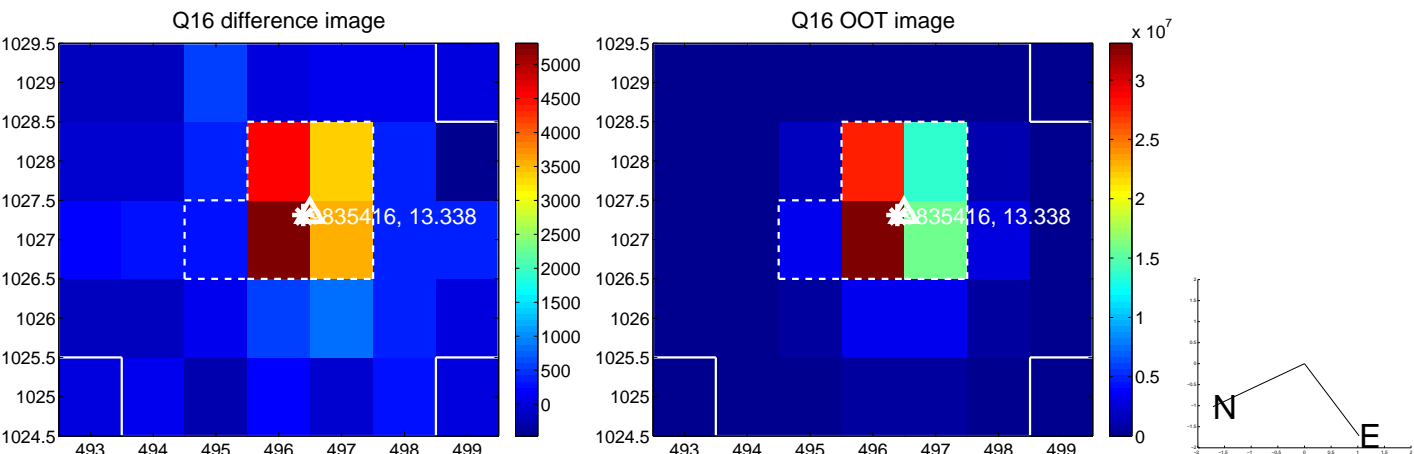
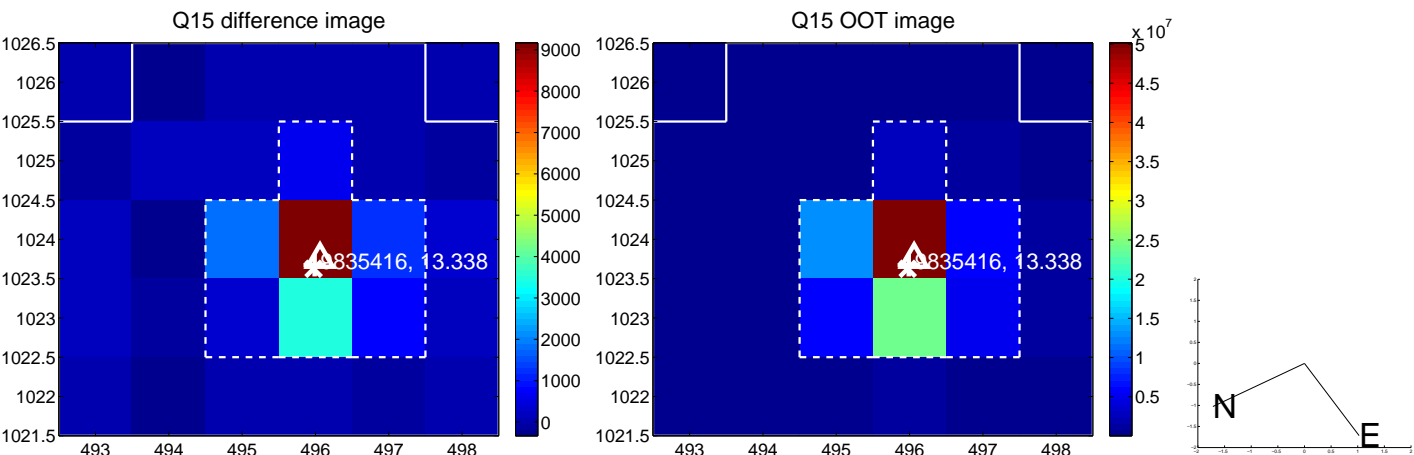
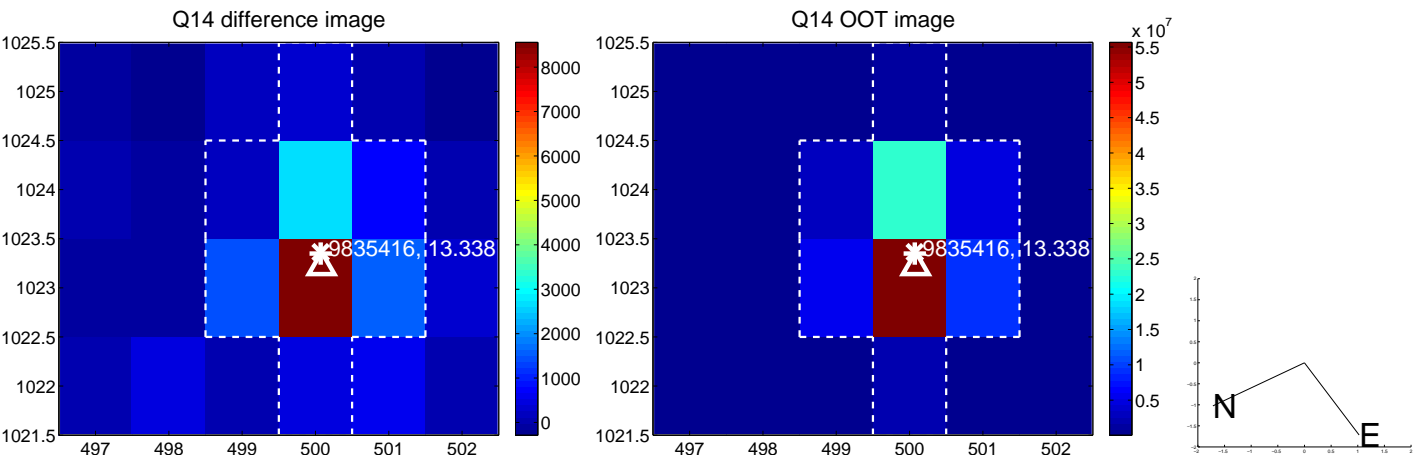
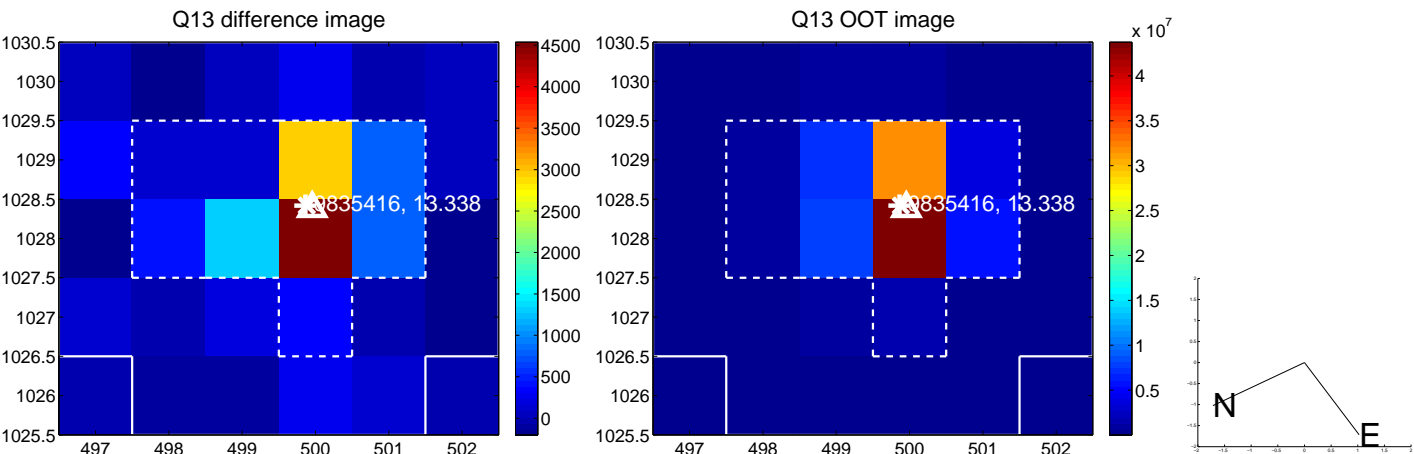
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

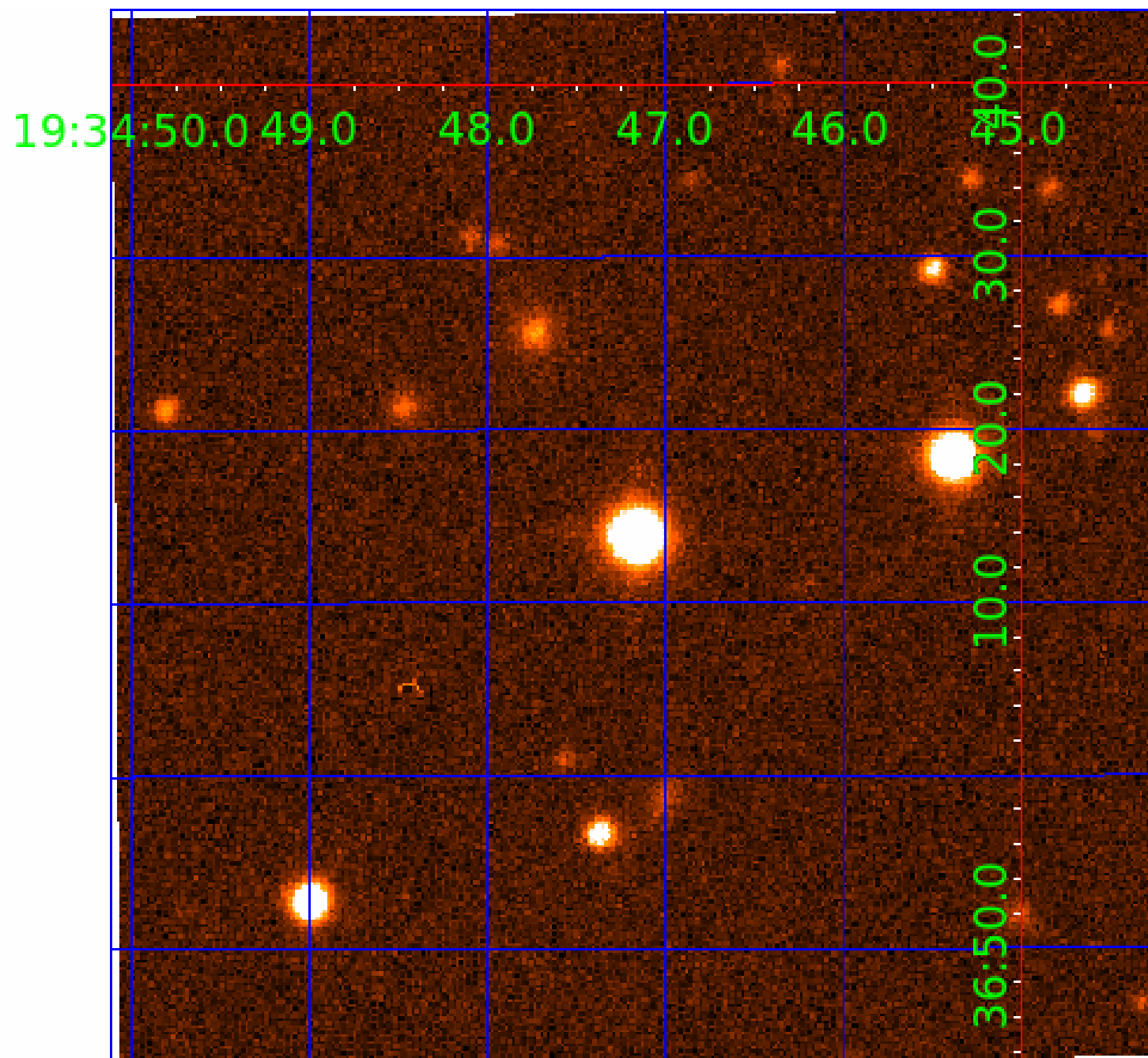


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009835416

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})
009835416-01	OBS	No	4.036802	132.643170	64.3	5.733	20.2	13.6	1.68	7241	1.56	2237.43
009835416-02	OBS	No	1.916791	133.257923	41.5	4.187	11.5	11.7	1.68	7241	1.23	6039.96
009835416-03	OBS	No	518.270748	188.514794	343.2	3.208	7.7	8.4	1.68	7241	3.58	3.46

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009835416-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009835416-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
009835416-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

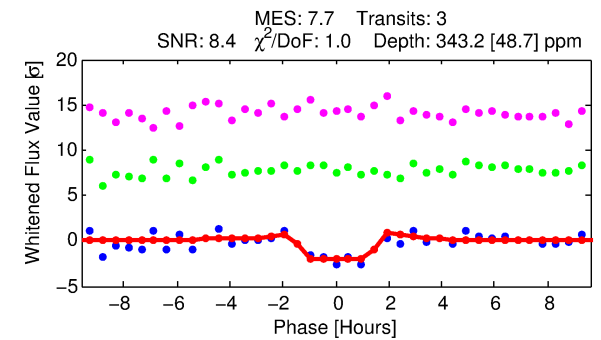
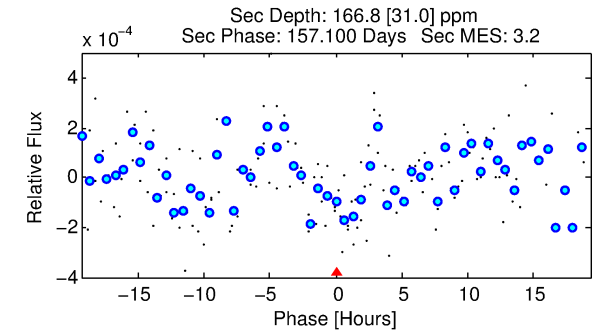
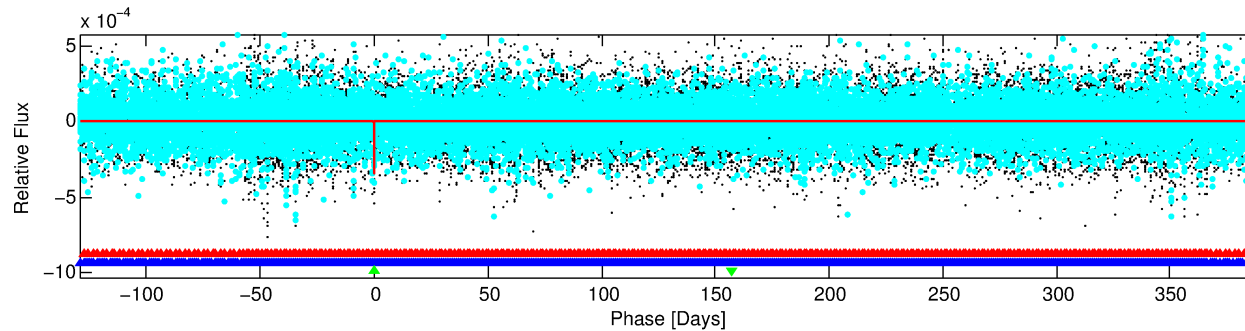
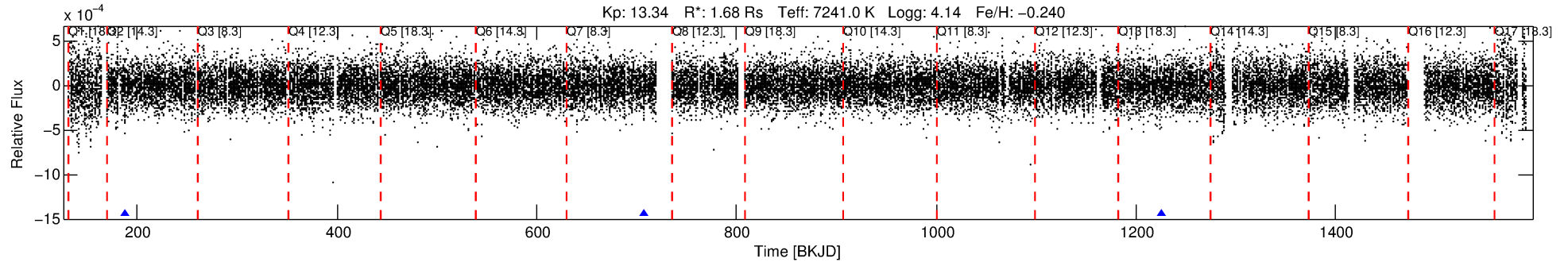
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009835416-03

No Significant Match Found

DV One-Page Summary

KIC: 9835416 Candidate: 3 of 3 Period: 518.271 d

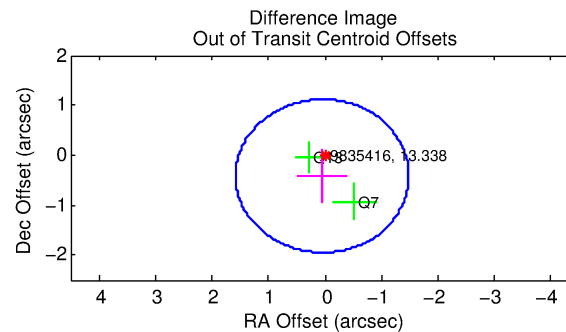
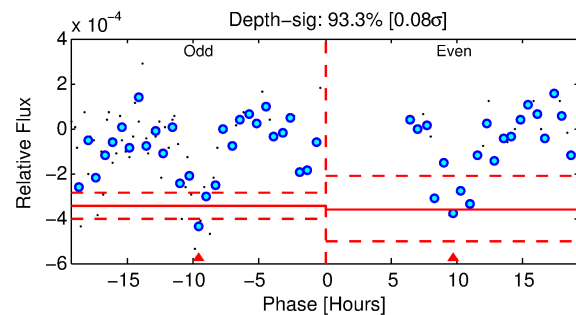
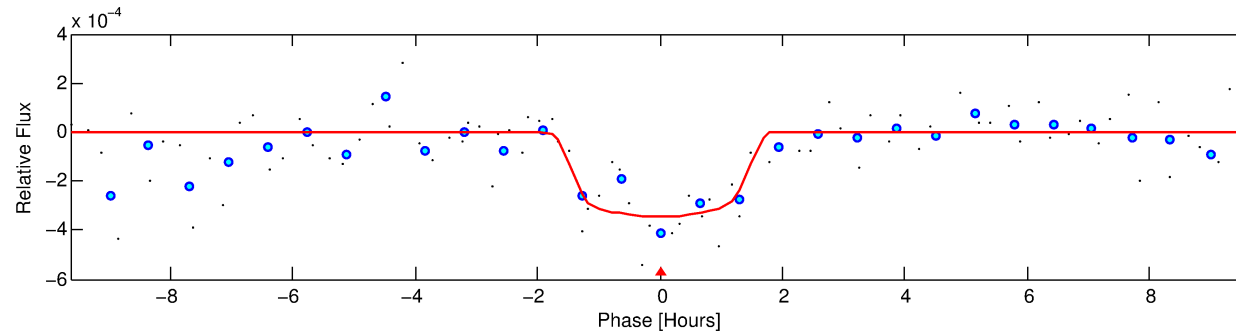


DV Fit Results:

Period = 518.27075 [0.00580] d
Epoch = 188.5148 [0.0101] BKJD
Rp/R* = 0.0195 [0.0063]
a/R* = 619.41 [1178.98]
b = 0.89 [0.46]
Seff = 3.45 [1.34]
Teq = 348 [34] K
Rp = 3.58 [1.58] Re
a = 1.4194 [0.3511] AU
Ag = 14424.28 [10925.62] [1.32σ]
Teffp = 5890 [1019] K [5.44σ]

DV Diagnostic Results:

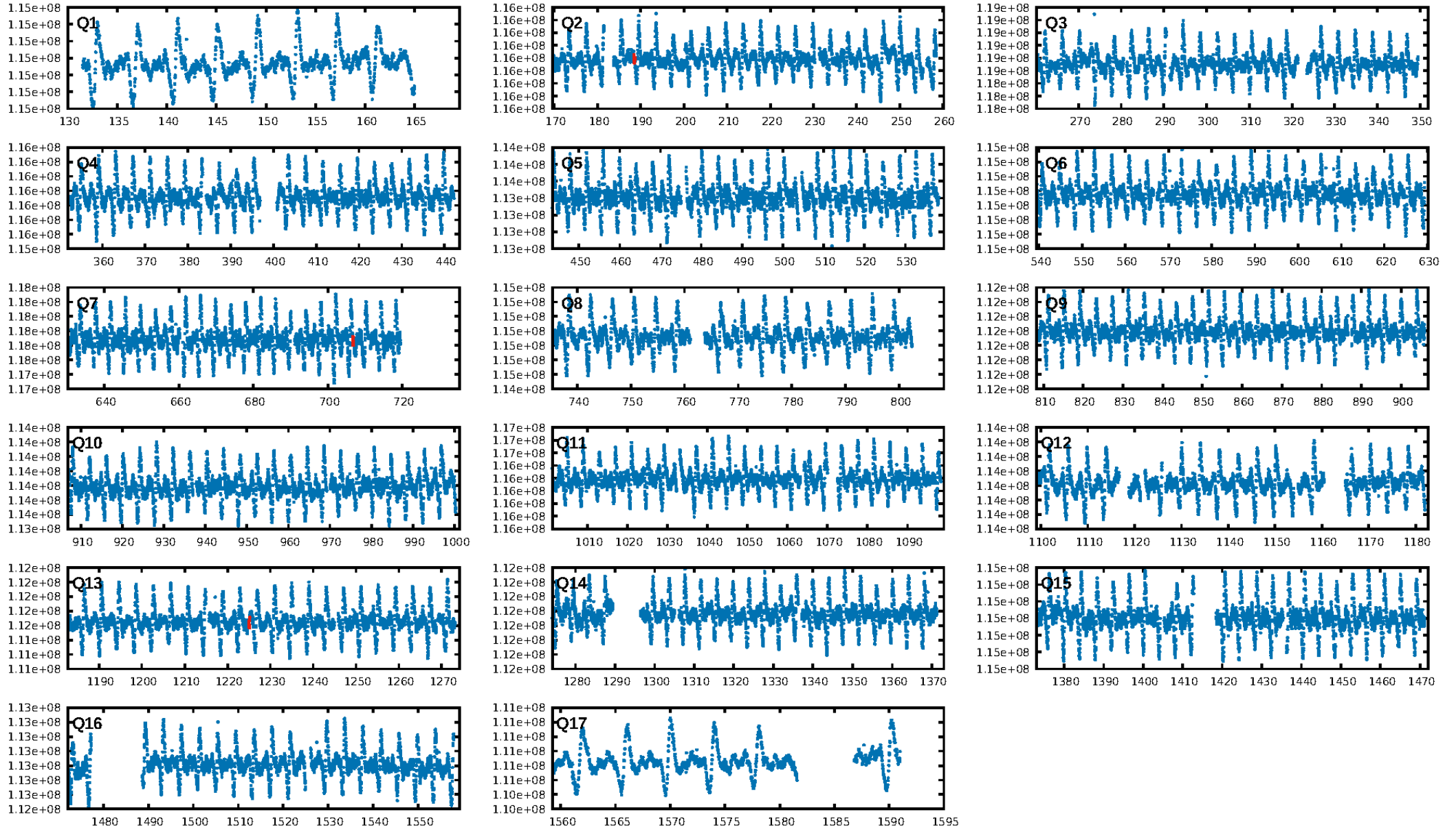
ShortPeriod-sig: 100.0% [1878.59σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 63.5%
ModelChiSquareGof-sig: 81.6%
Bootstrap-pfa: 7.41e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.3512
Centroid-sig: 12.9%
Centroid-so: 1.386 arcsec [1.12σ]
OotOffset-rm: 0.419 arcsec [0.82σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-rm: 0.392 arcsec [0.69σ]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 0.33 [1/3]



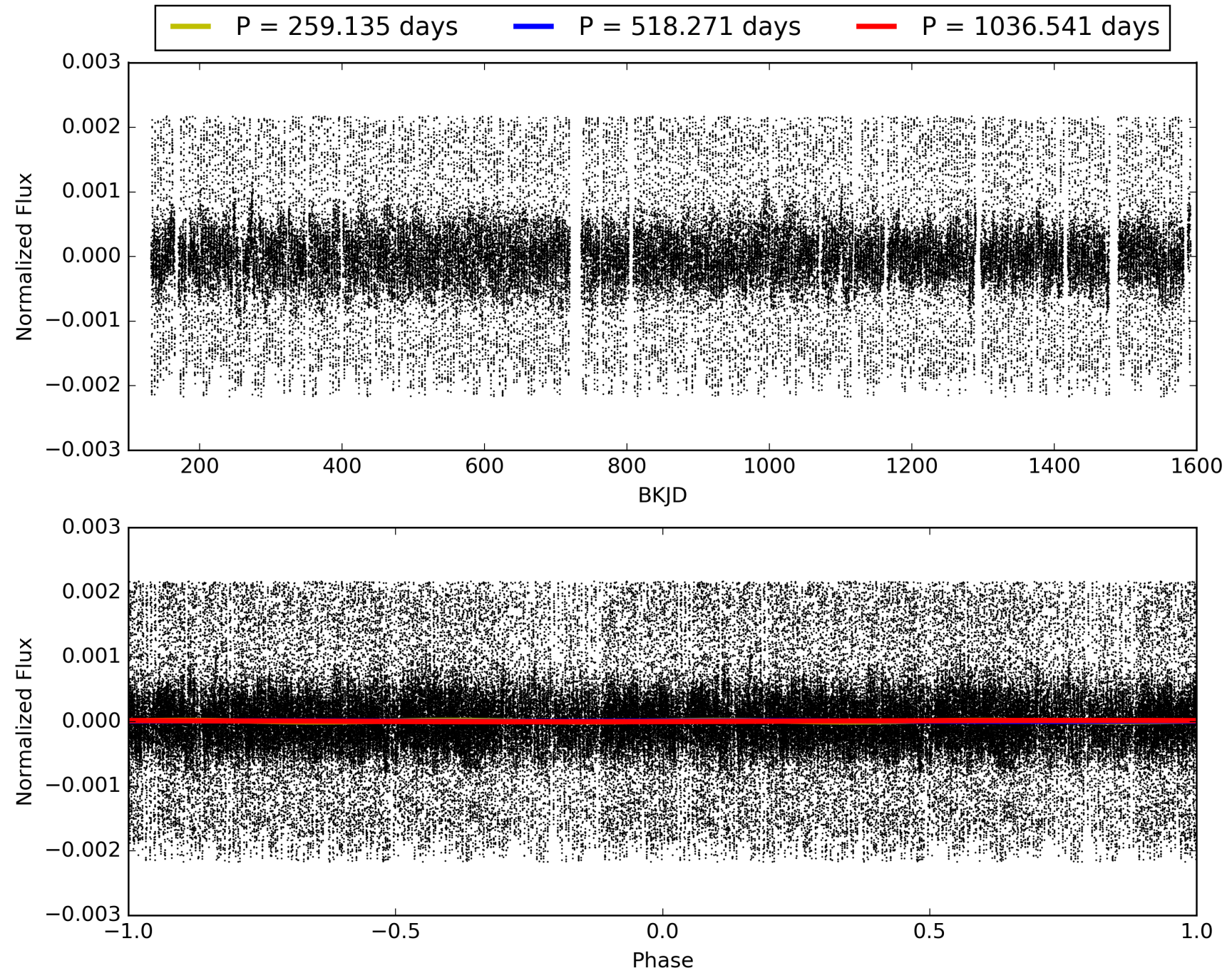
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:24:04 Z

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

TCE 009835416-03, PDC Light Curves

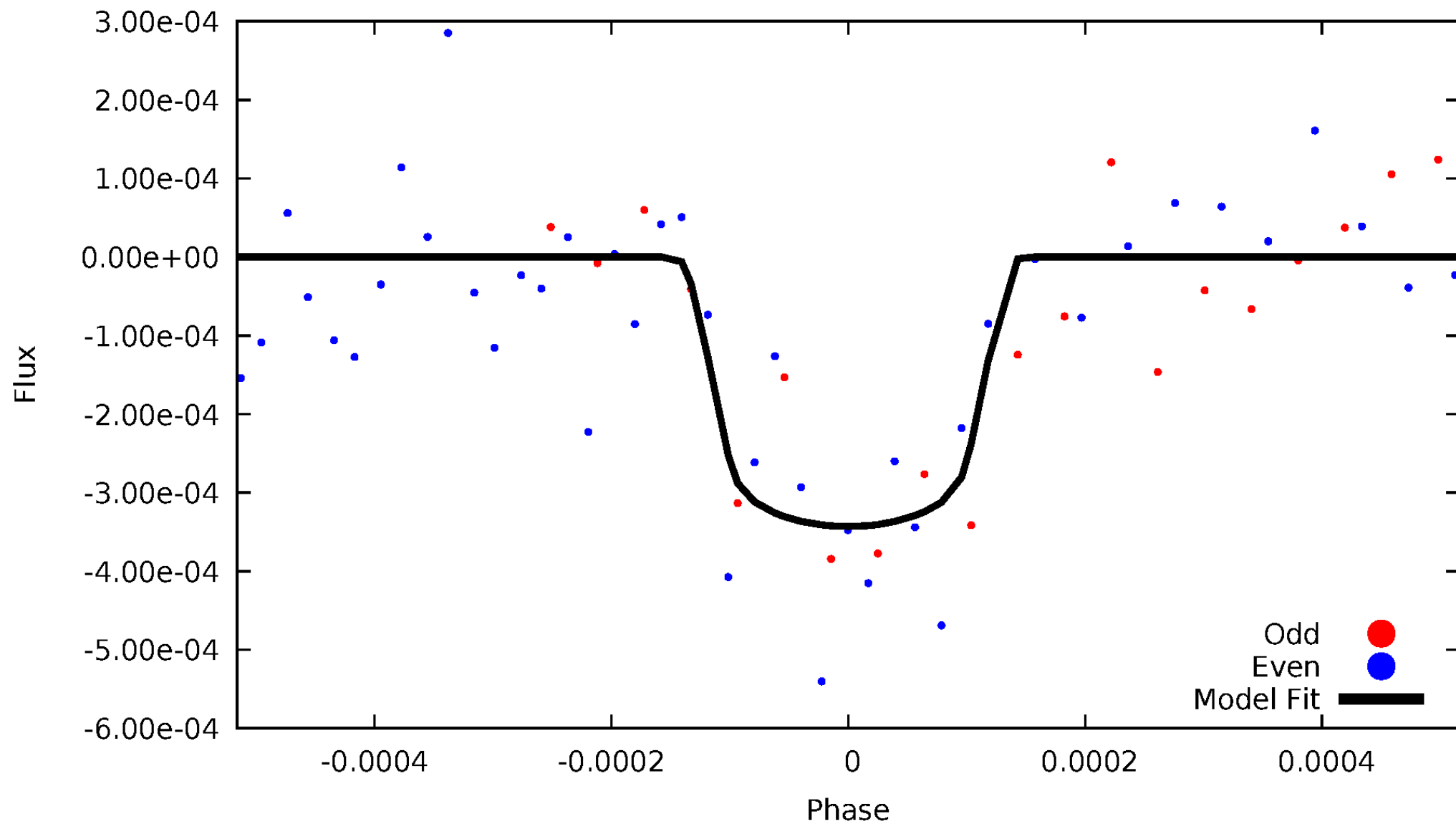


TCE 009835416-03



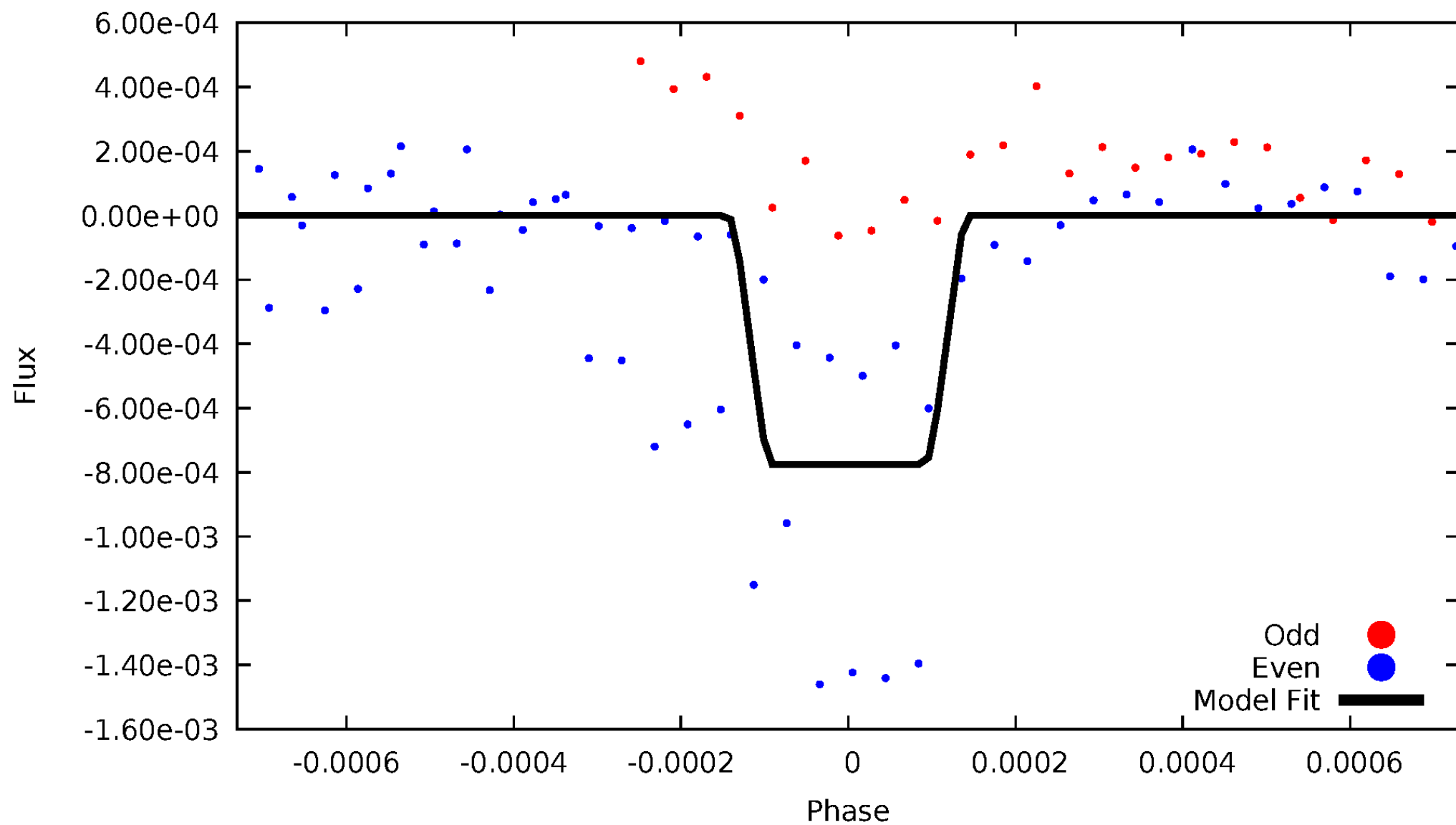
DV Odd/Even

TCE 009835416-03



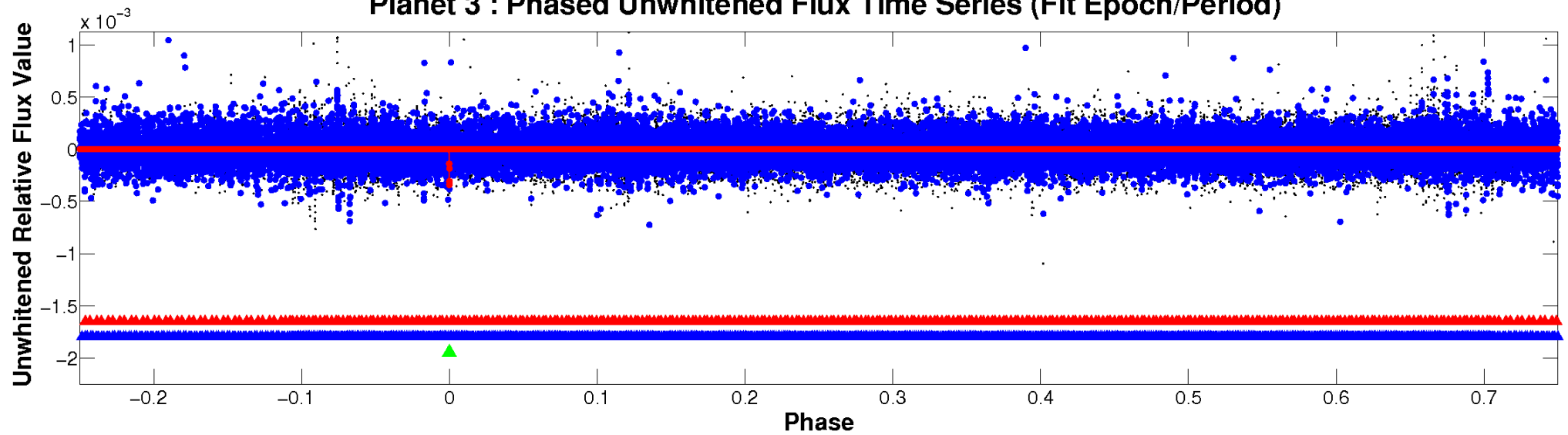
ALT Odd/Even

TCE 009835416-03

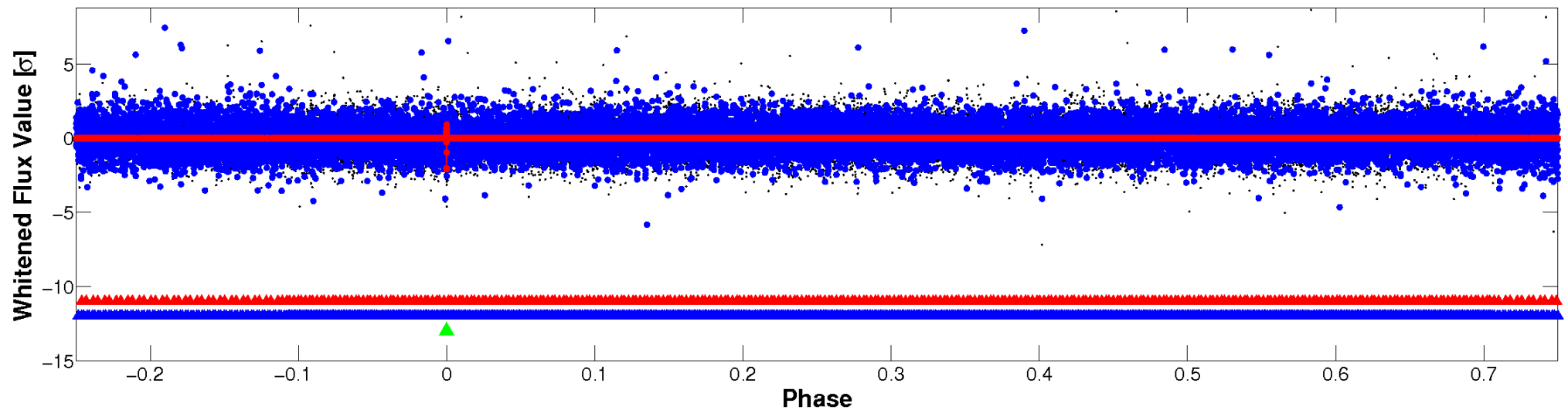


Non-Whitened Vs. Whitened Light Curve

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

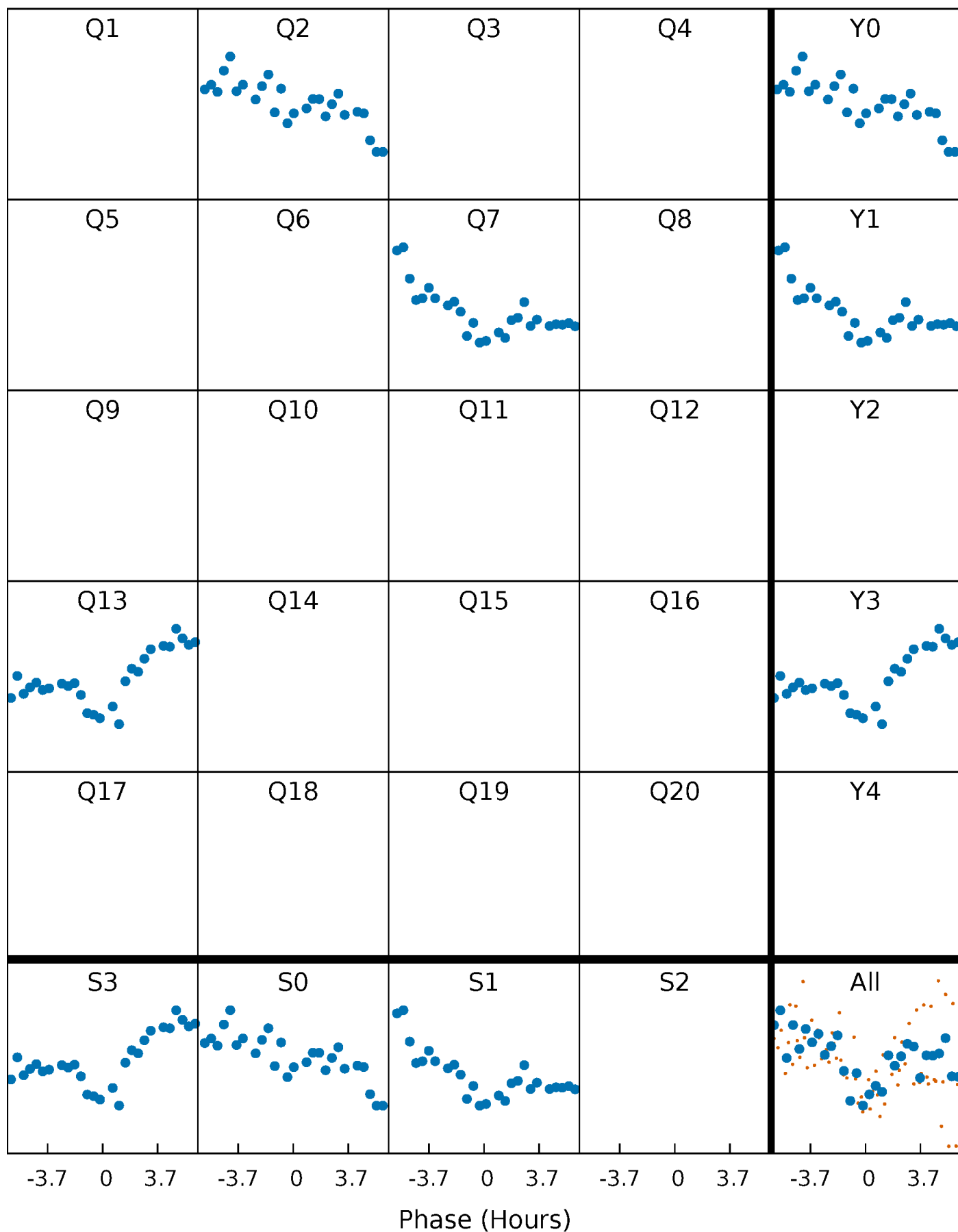


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



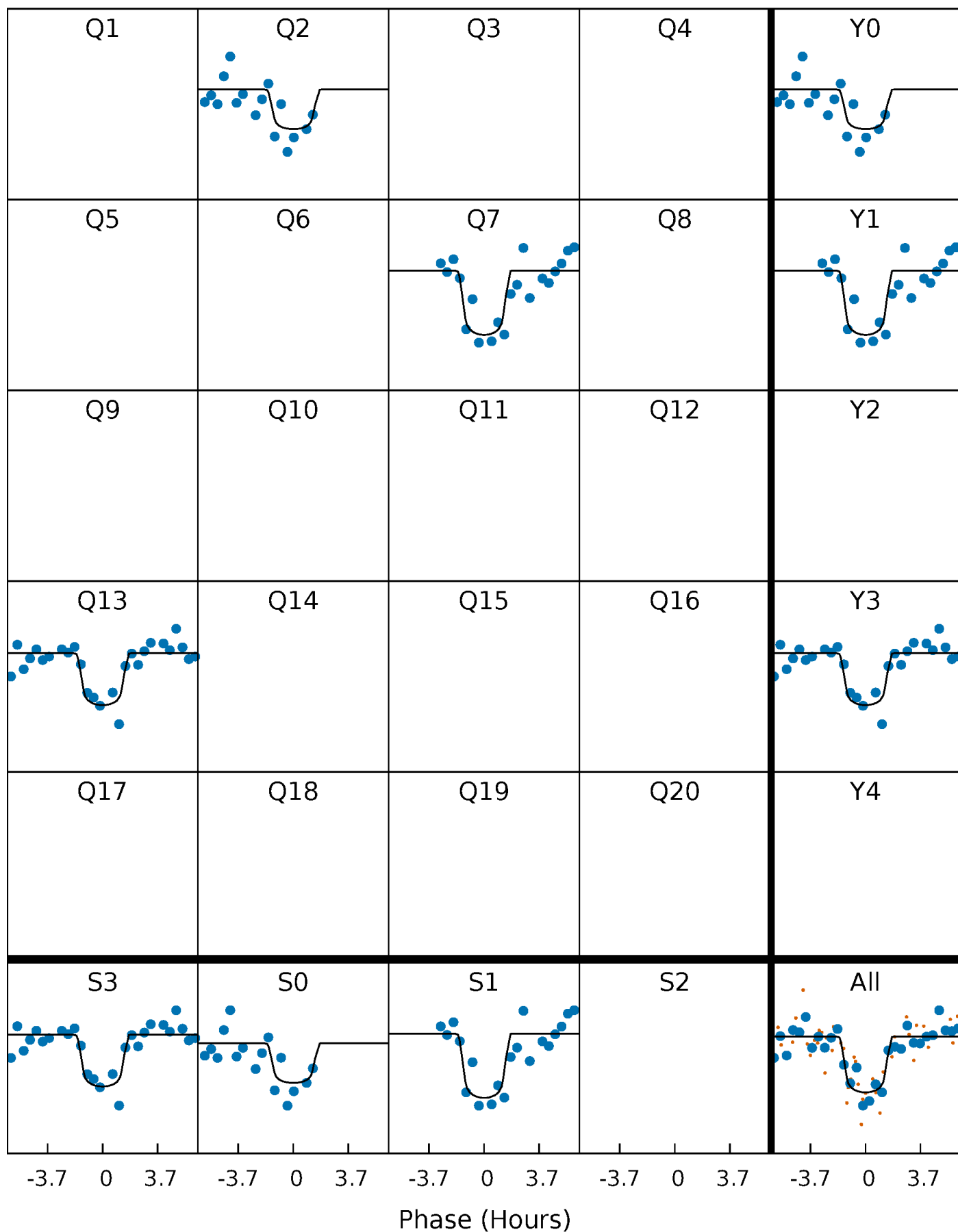
PDC Quarter-Phased Transit Curves

TCE 009835416-03 $P=518.270748$ Days $T_0=188.514794$ (BKJD)



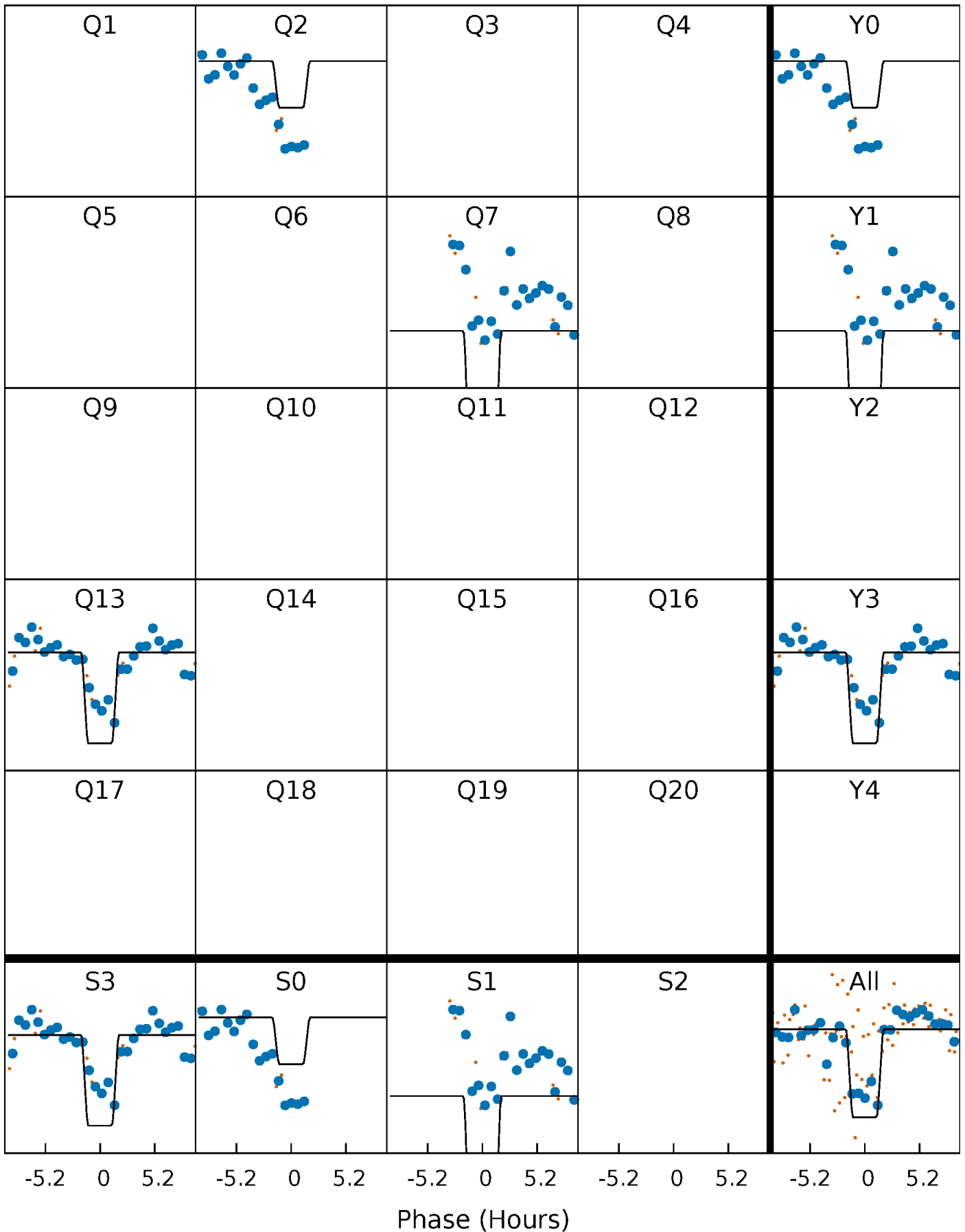
DV Quarter-Phased Transit Curves

TCE 009835416-03 $P=518.270748$ Days $T_0=188.514794$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

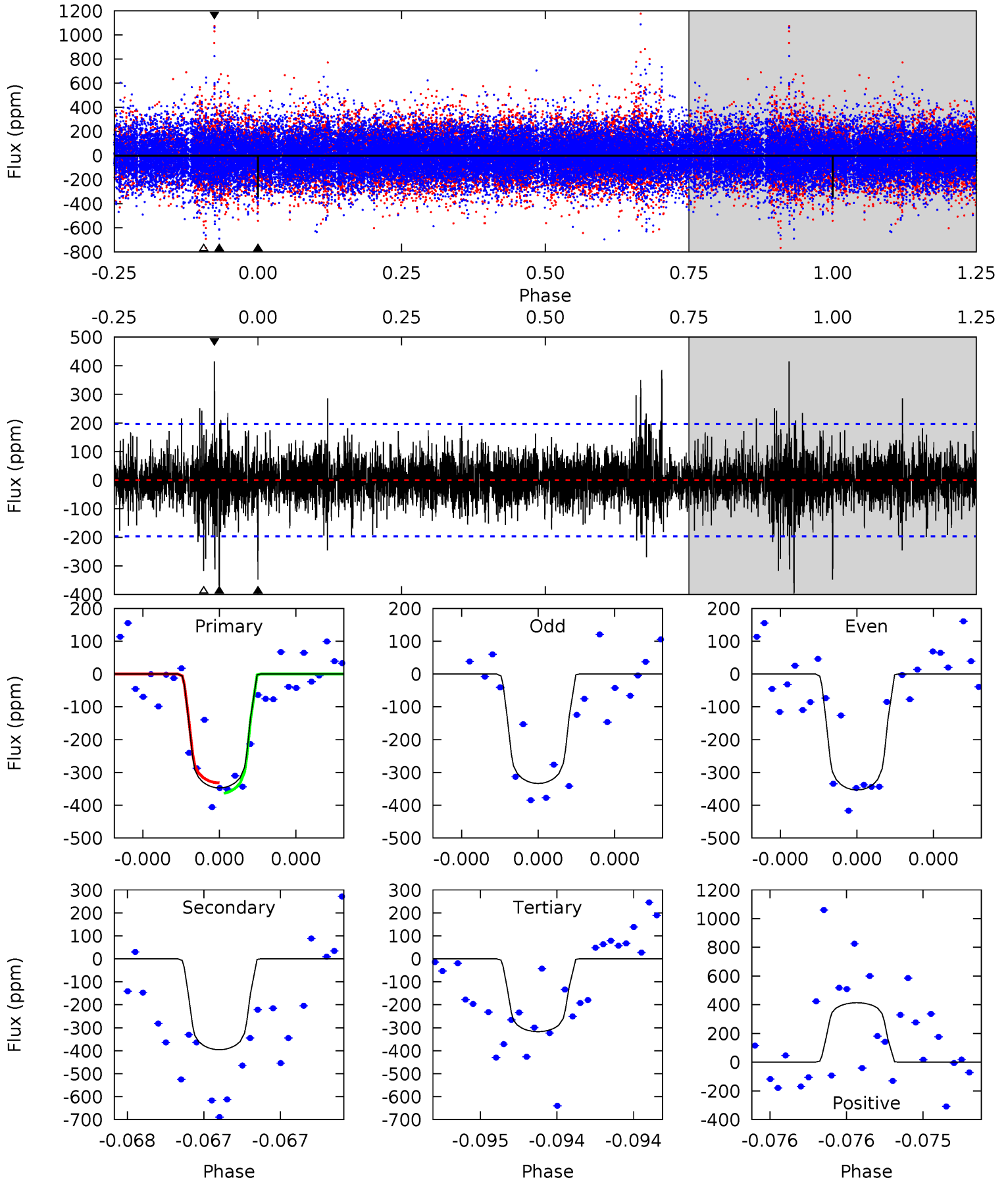
TCE 009835416-03 P=518.263193 Days $T_0=188.520899$ (BKJD)



DV Model-Shift Uniqueness Test

009835416-03, P = 518.270748 Days, E = 188.514794 Days

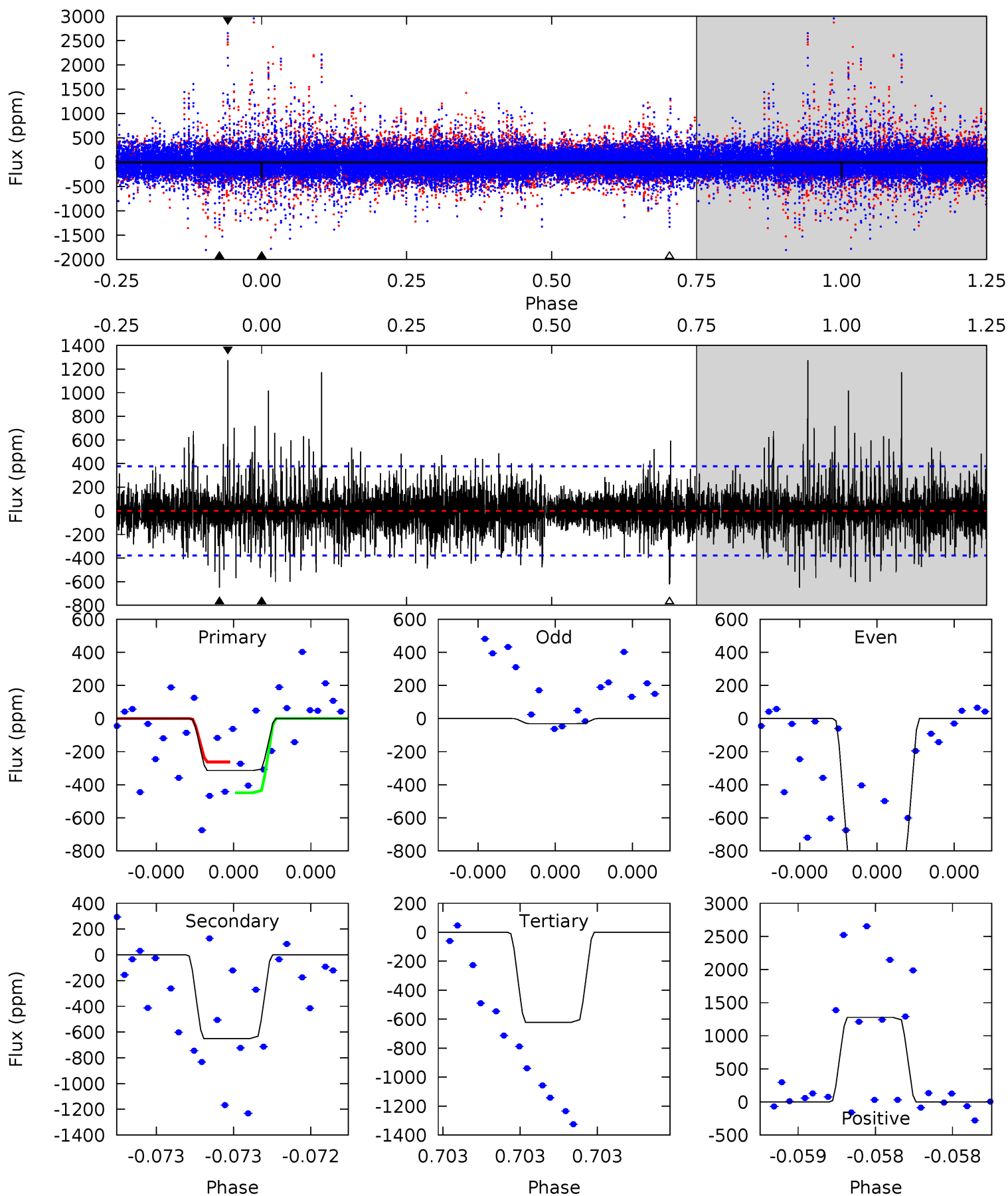
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.0	11.4	9.16	12.0	5.67	3.62	1.70	0.87	-1.93	2.27	-0.54	0.28	1.04	0.51	0.46



Alt Model-Shift Uniqueness Test

009835416-03, P = 518.263193 Days, E = 188.520899 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.73	9.79	9.34	19.2	5.68	3.65	2.04	-4.62	-14.5	0.44	-9.40	6.63	1.35	0.66	1.40



Stellar Parameters For KIC 009835416

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7241^{+228}_{-304}	$4.139^{+0.153}_{-0.187}$	$-0.240^{+0.250}_{-0.350}$	$1.681^{+0.508}_{-0.370}$	$1.420^{+0.219}_{-0.241}$	$0.421^{+0.336}_{-0.217}$
	+3%/-4%	+4%/-5%	+104%/-146%	+30%/-22%	+15%/-17%	+80%/-52%
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 009835416-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-396 ± 35	$3.58^{+1.36}_{-1.21}$	487^{+37}_{-34}	7320^{+2073}_{-1095}	33656^{+43787}_{-15648}
Alt.	-651 ± 67	$5.11^{+1.57}_{-1.31}$	486^{+37}_{-33}	6888^{+1145}_{-805}	27147^{+22302}_{-11058}

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 $A_{obs} \gg 1.0$

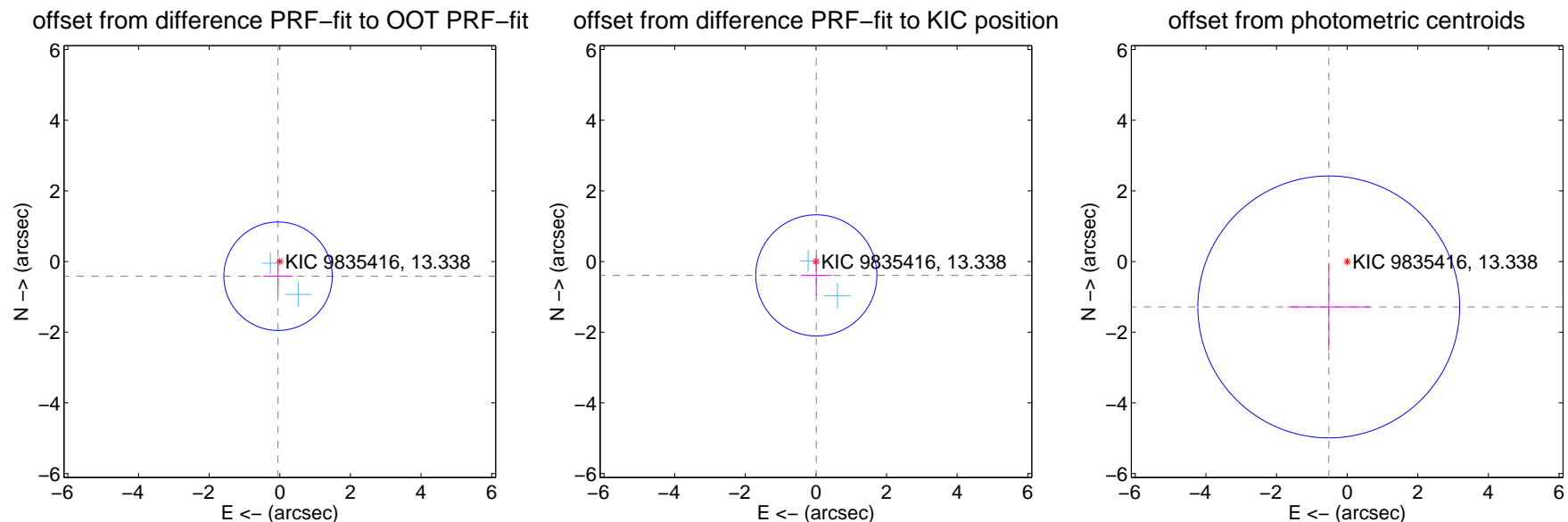
DV Centroid Data

Supplemental centroid analysis for 009835416-03. Kepler magnitude: 13.34. Transit SNR 8.42

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.419 ± 0.512	0.82	0.049 ± 0.419	-0.416 ± 0.513
PRF-fit source offset from KIC position	0.392 ± 0.572	0.69	-0.012 ± 0.437	-0.392 ± 0.572
photometric centroid source offset	1.39 ± 1.24	1.12	0.52 ± 1.16	-1.29 ± 1.25



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.

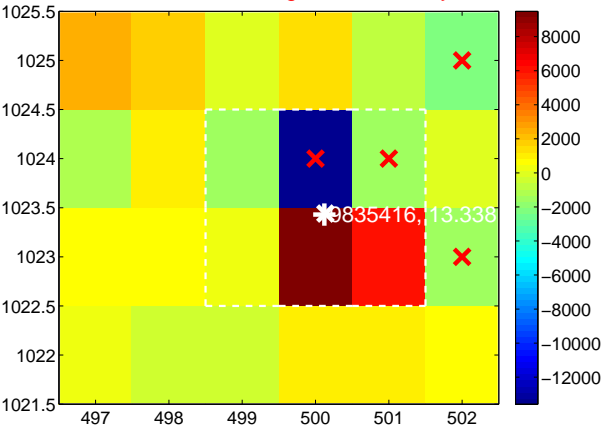
Q1 no difference image



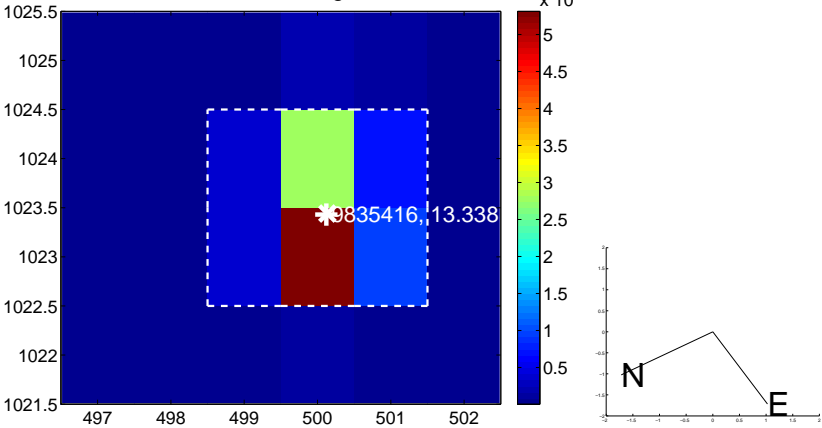
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



Q3 no difference image



Q3 no OOT image



Q4 no difference image



Q4 no OOT image



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

Q5 no difference image



Q5 no OOT image



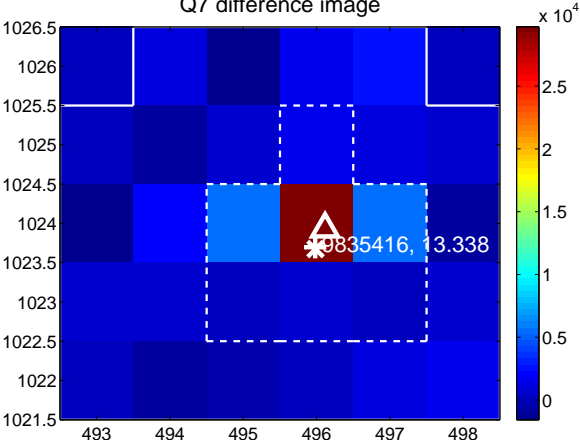
Q6 no difference image



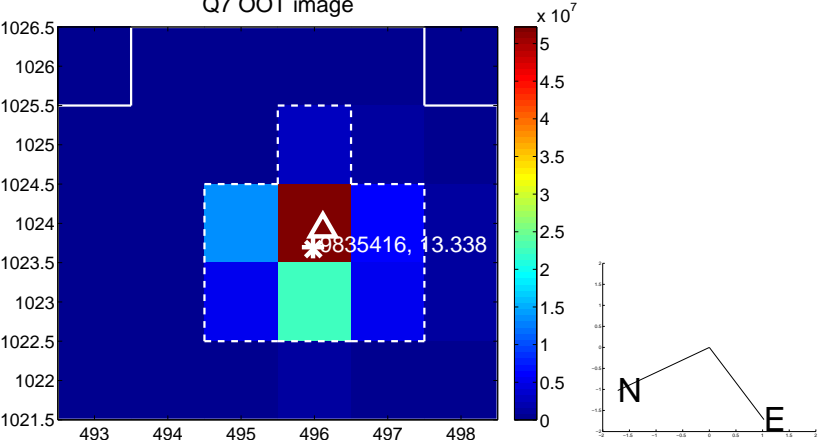
Q6 no OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image



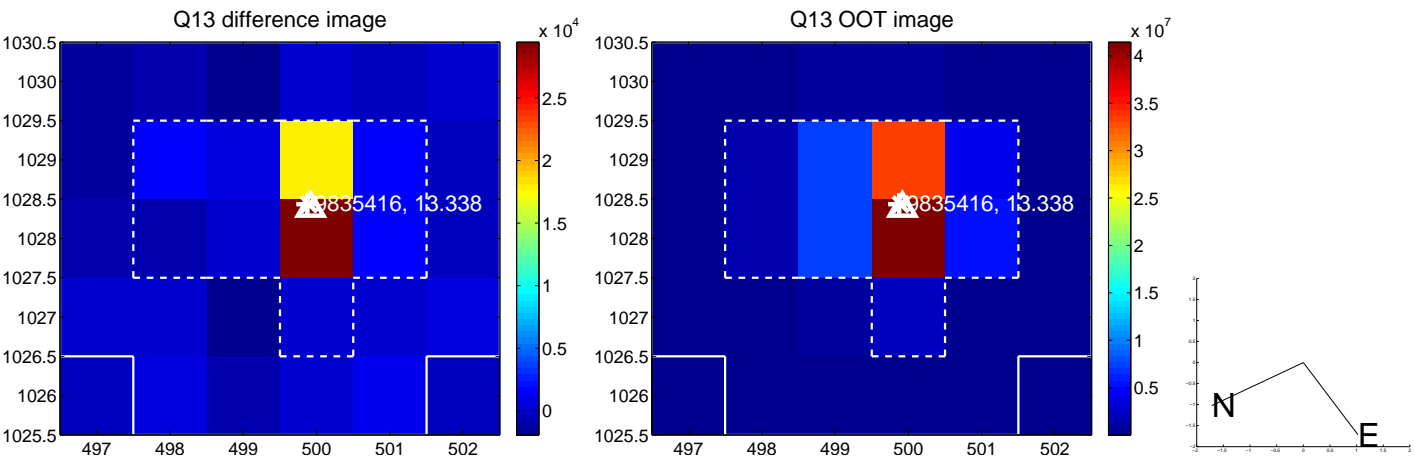
Q8 no OOT image



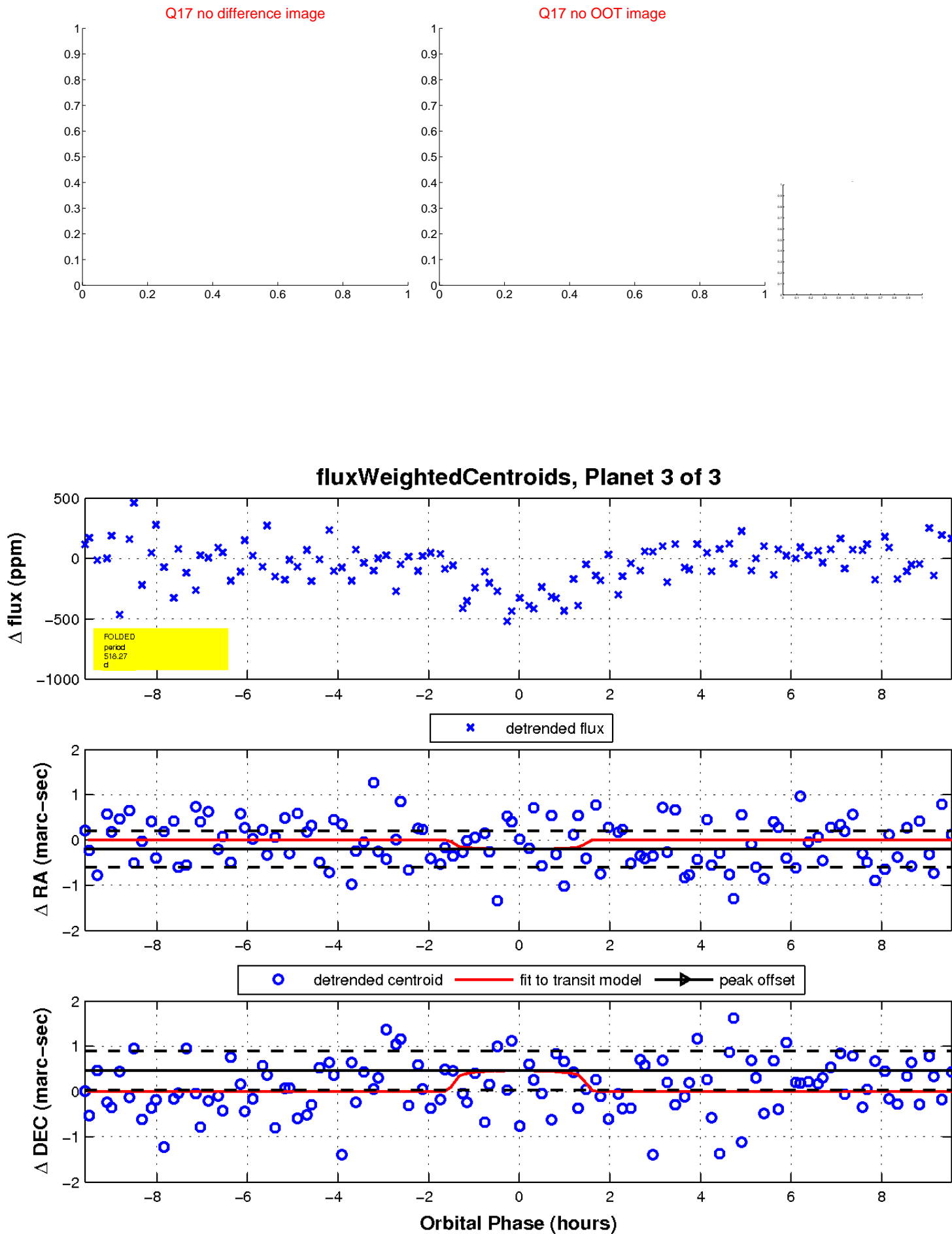
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

