

KIC 010223616

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})
010223616-01	OBS	No	58.265347	185.207258	5655.8	3.318	60.6	45.9	0.48	4457	4.51	1.51
010223616-02	OBS	1076.01	29.125779	142.139653	1130.9	7.207	67.7	20.4	0.48	4457	3.15	3.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010223616-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_ODDEVEN_DV
010223616-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT

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

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

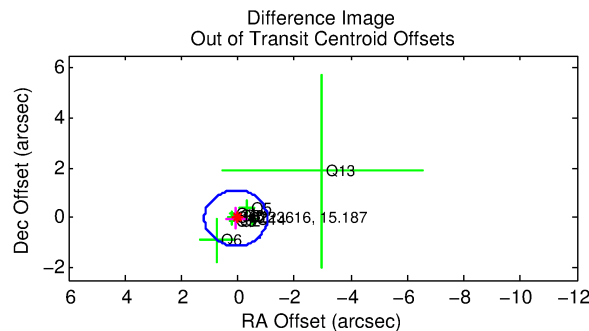
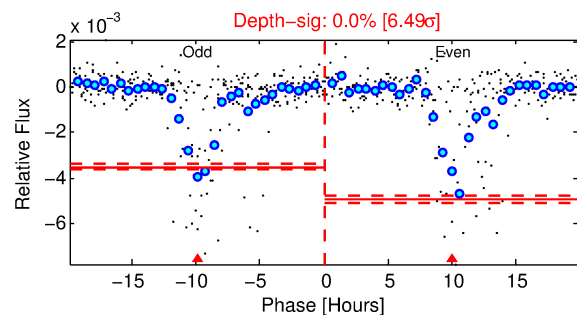
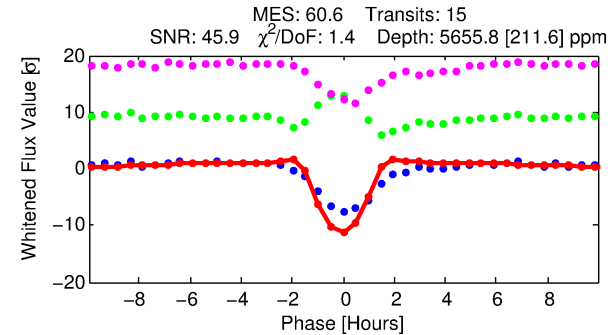
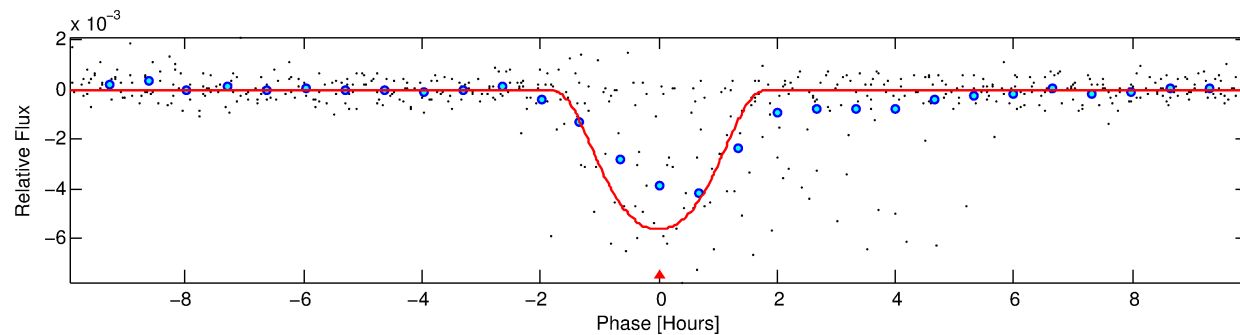
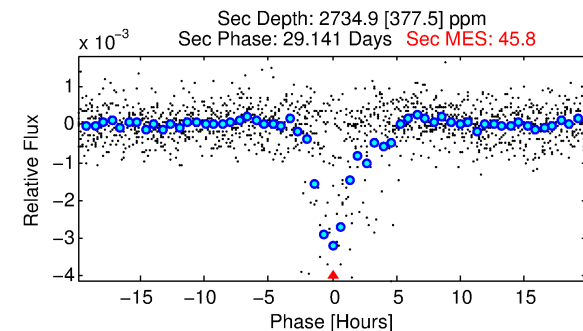
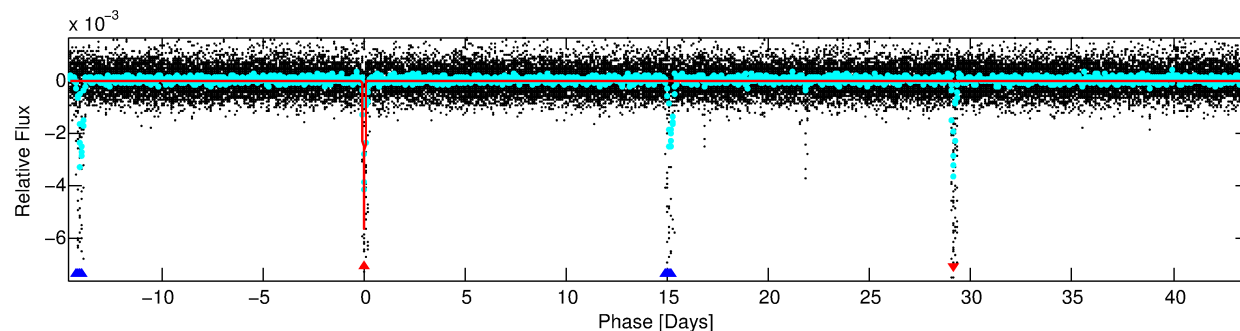
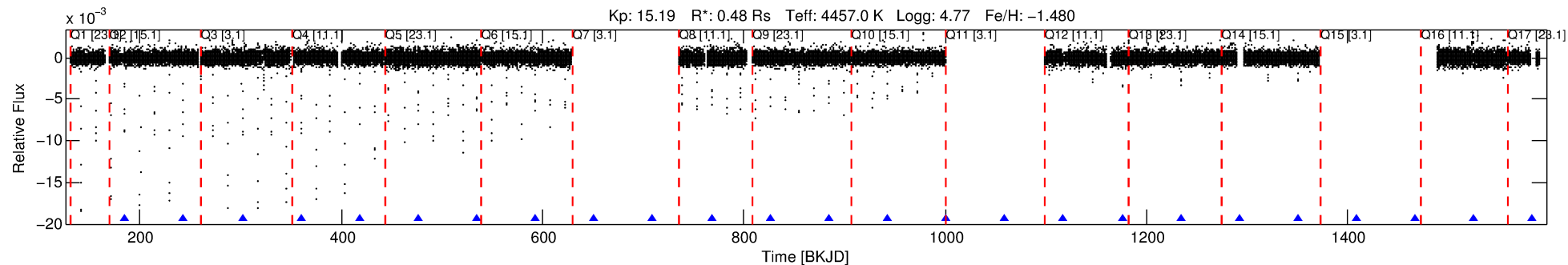
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010223616-01

No Significant Match Found

DV One-Page Summary

KIC: 10223616 Candidate: 1 of 2 Period: 58.265 d
KOI: K01076 Corr: No Ephemeris Match



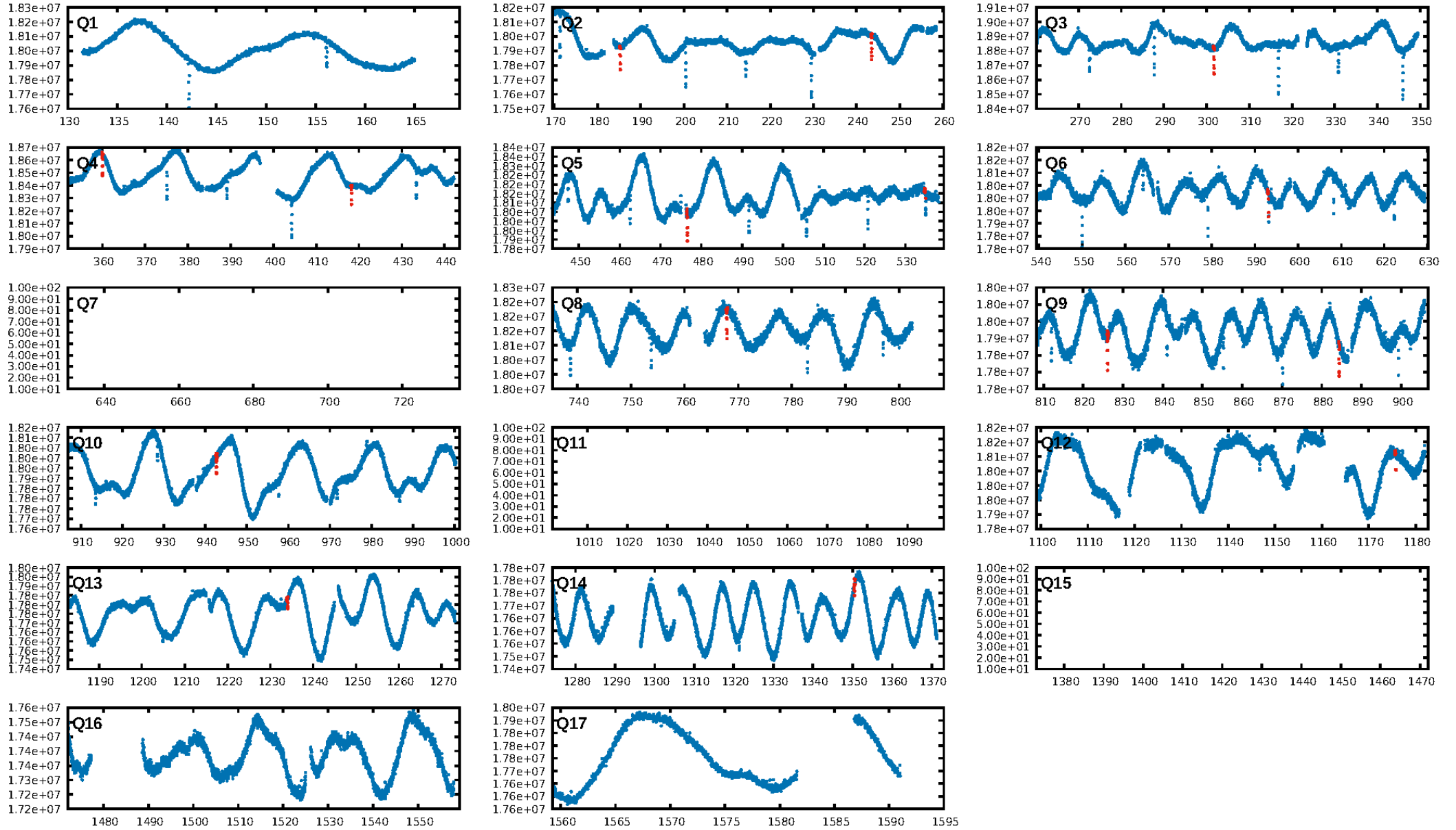
DV Fit Results:

Period = 58.26535 [0.00010] d
Epoch = 185.2073 [0.0012] BKJD
Rp/R* = 0.0859 [0.0061]
a/R* = 76.91 [4.36]
b = 0.92 [0.02]
Seff = 1.51 [0.27]
Teq = 283 [12] K
Rp = 4.51 [0.54] Re
a = 0.2325 [0.0186] AU
Ag = 4001.04 [918.34] [4.36 σ]
Teffp = 3478 [207] K [15.38 σ]

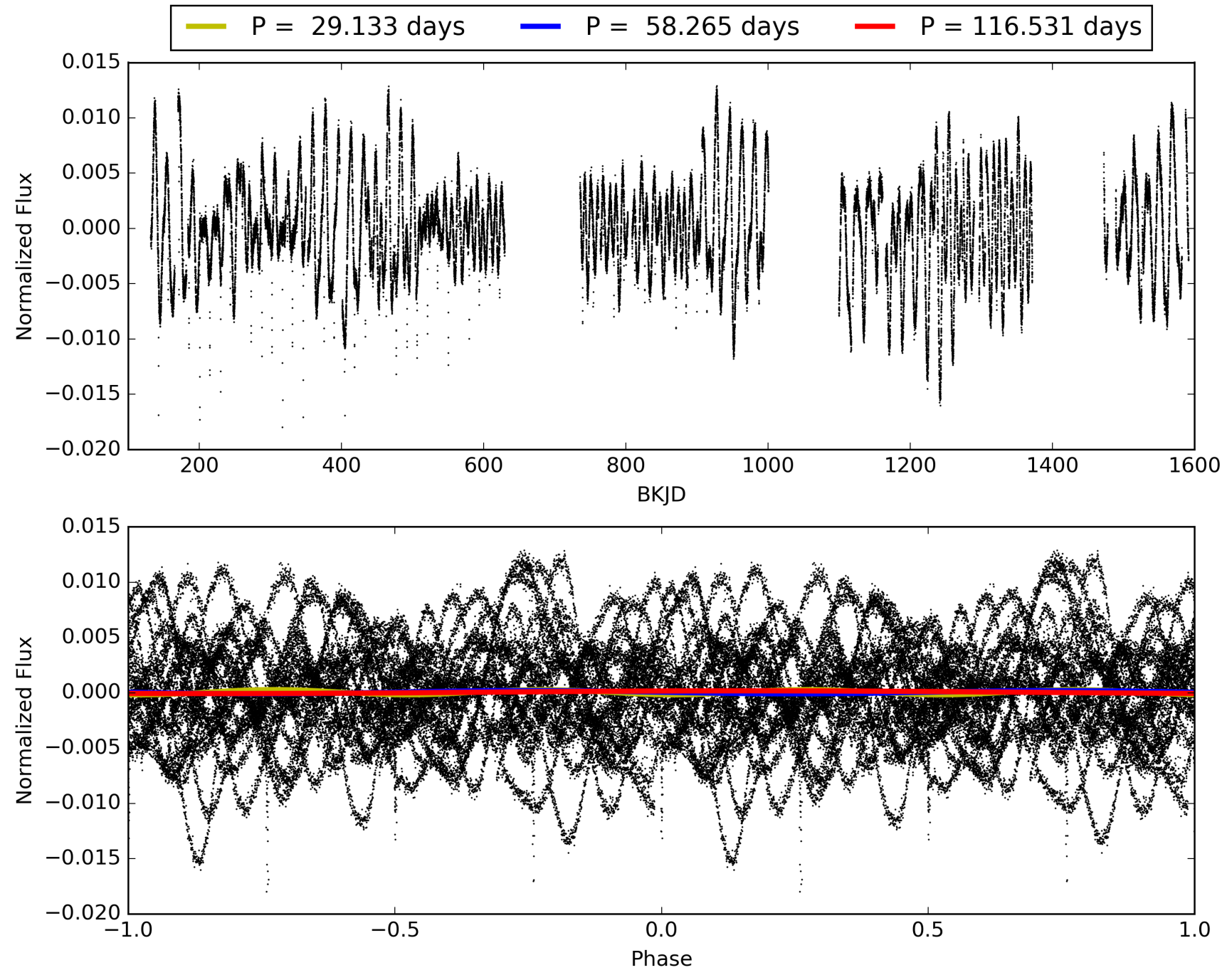
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [88.14 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 92.4%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [15/15]
GhostDiagnostic-chr: 3.319
Centroid-sig: 93.2%
Centroid-so: 0.042 arcsec [0.26 σ]
OotOffset-rm: 0.079 arcsec [0.21 σ]
KicOffset-rm: 0.176 arcsec [0.46 σ]
OotOffset-st: 4/1/2/3 [10]
KicOffset-st: 4/1/2/3 [10]
DiffImageQuality-fgm: 0.70 [7/10]
DiffImageOverlap-fno: 1.00 [11/11]

TCE 010223616-01, PDC Light Curves

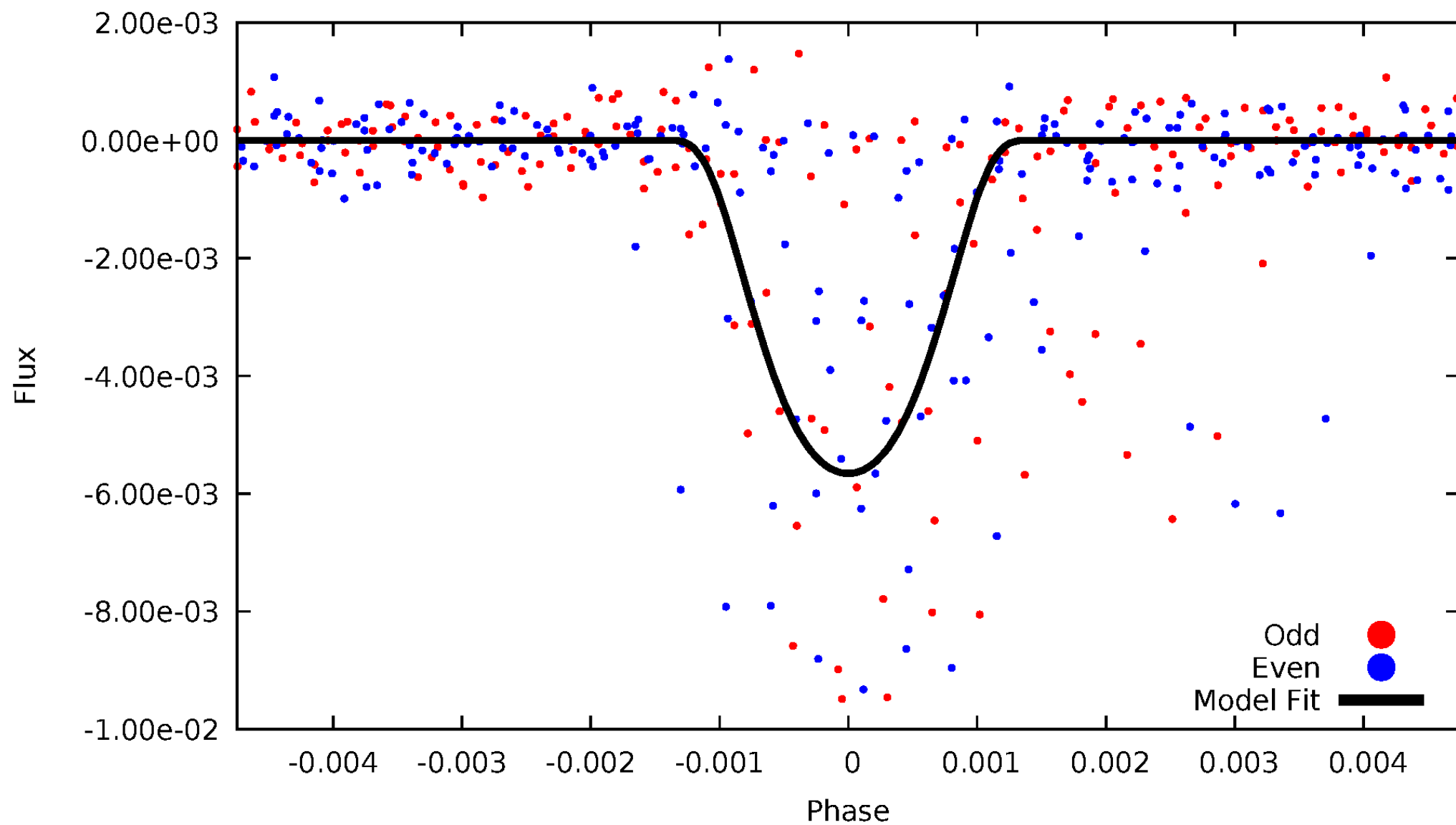


TCE 010223616-01



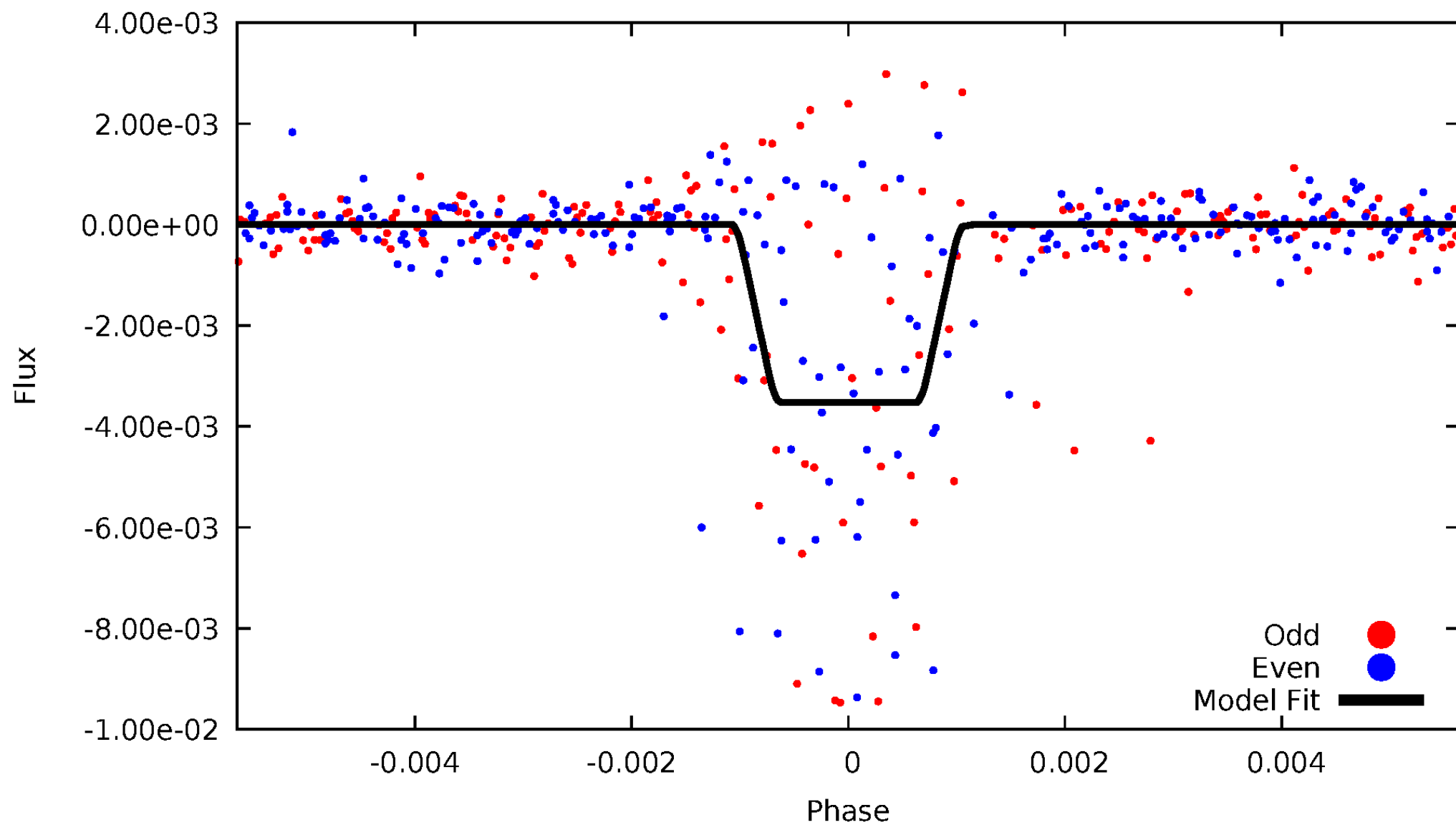
DV Odd/Even

TCE 010223616-01



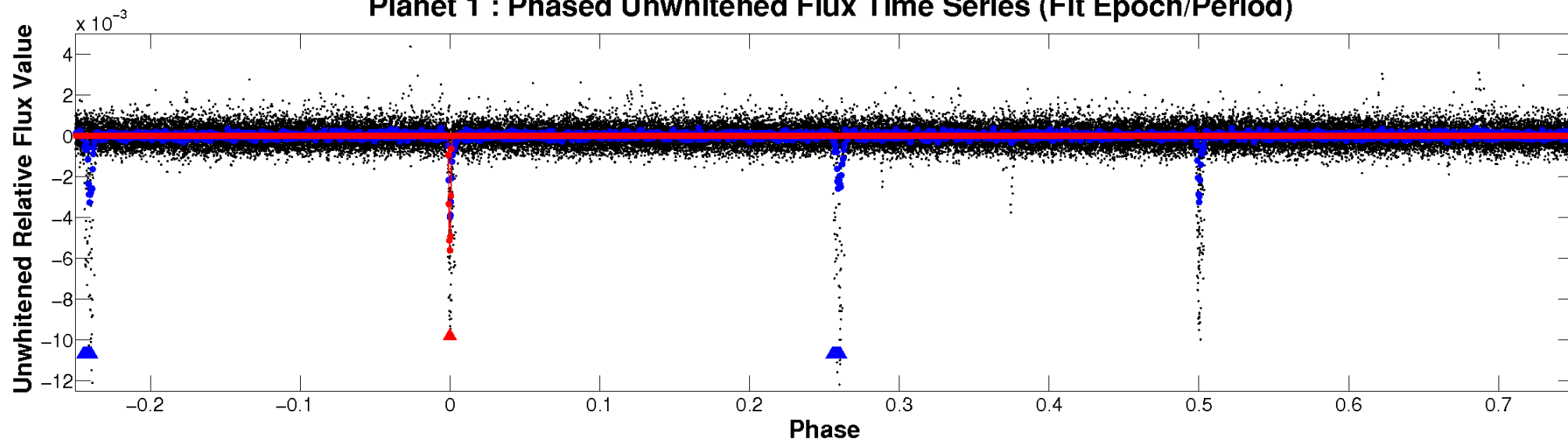
ALT Odd/Even

TCE 010223616-01

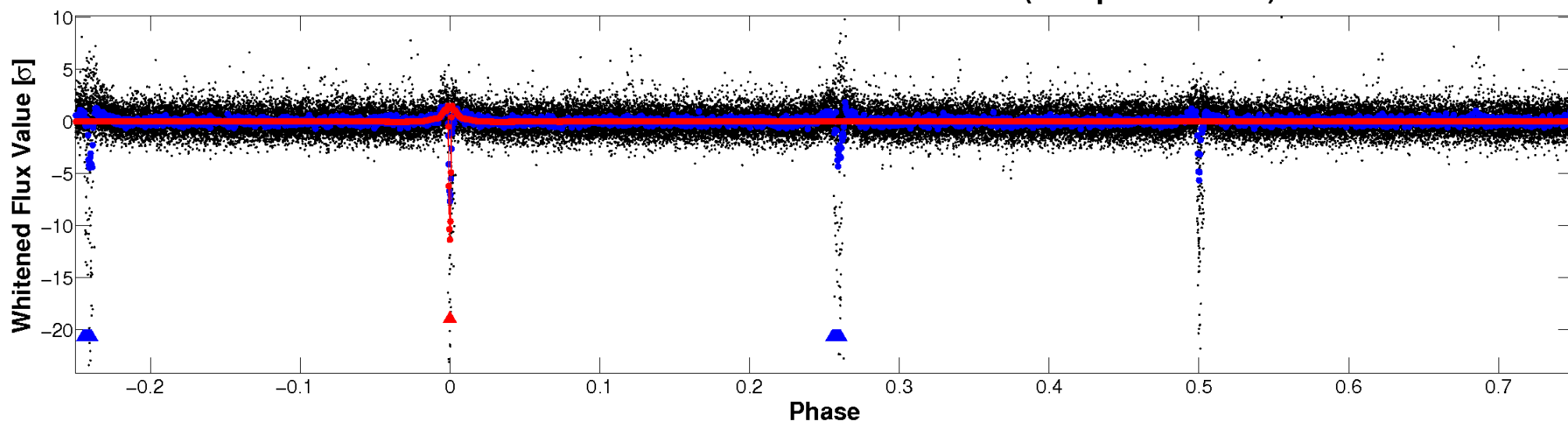


Non-Whitened Vs. Whitened Light Curve

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

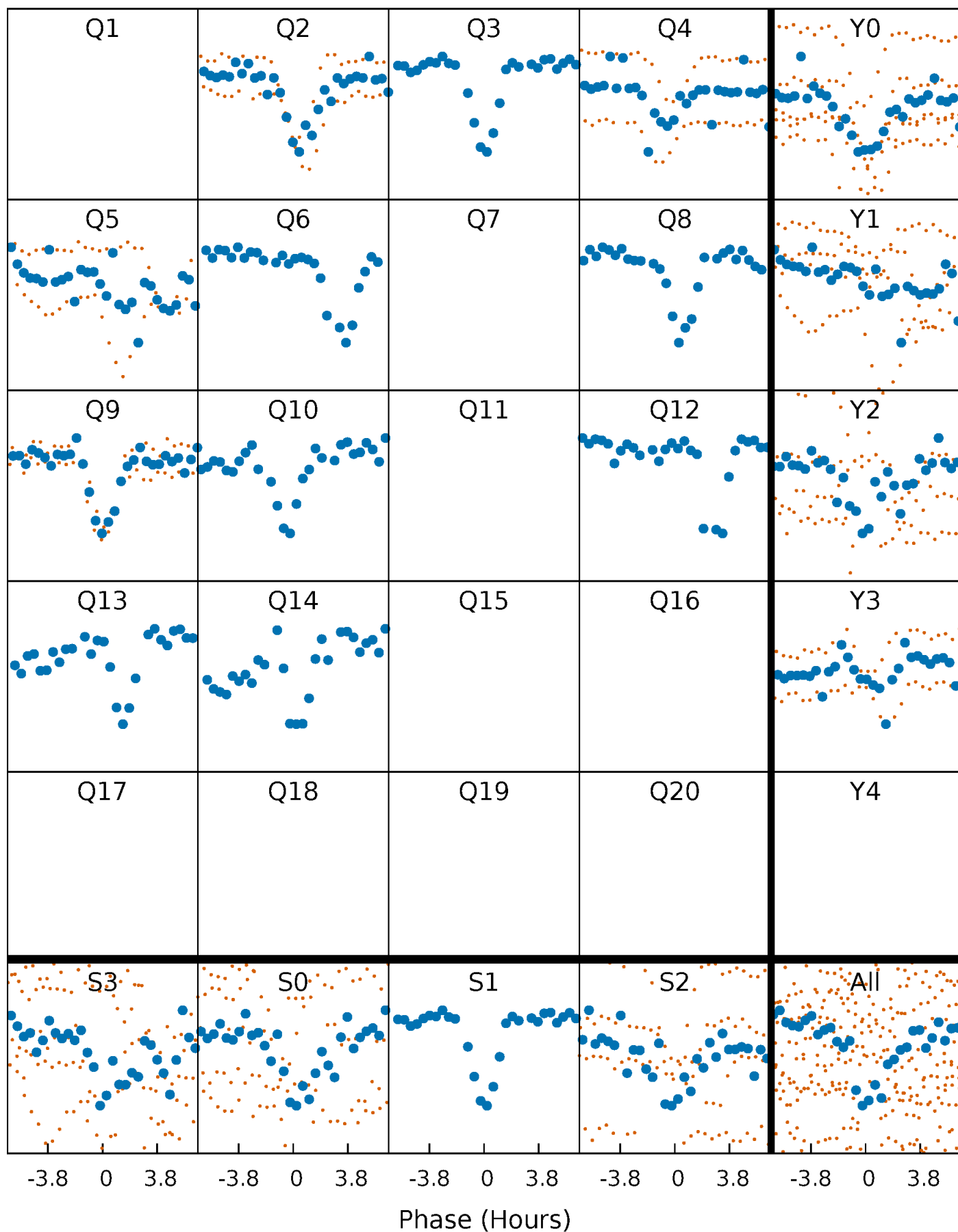


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



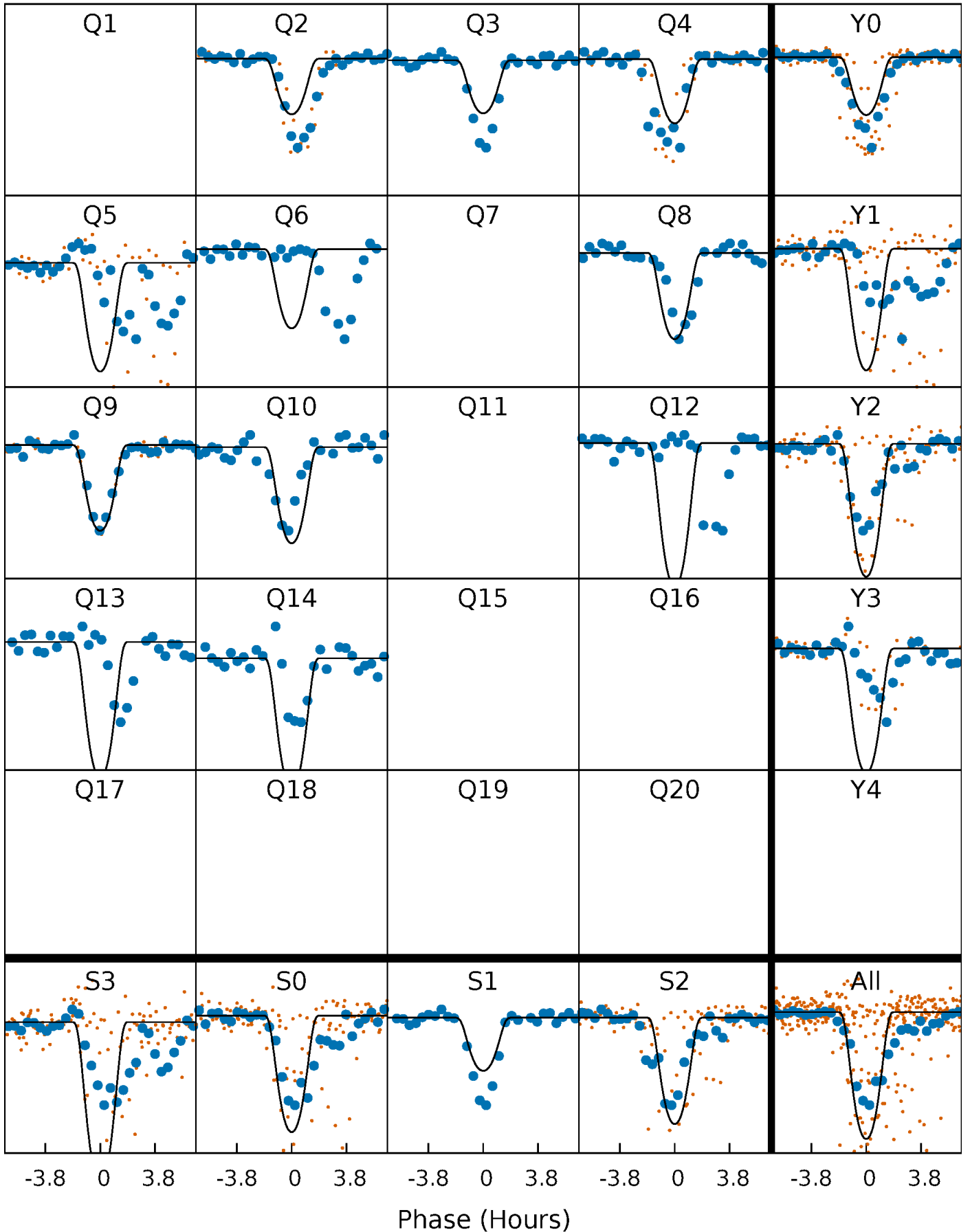
PDC Quarter-Phased Transit Curves

TCE 010223616-01 P= 58.265347 Days $T_0=185.207258$ (BKJD)



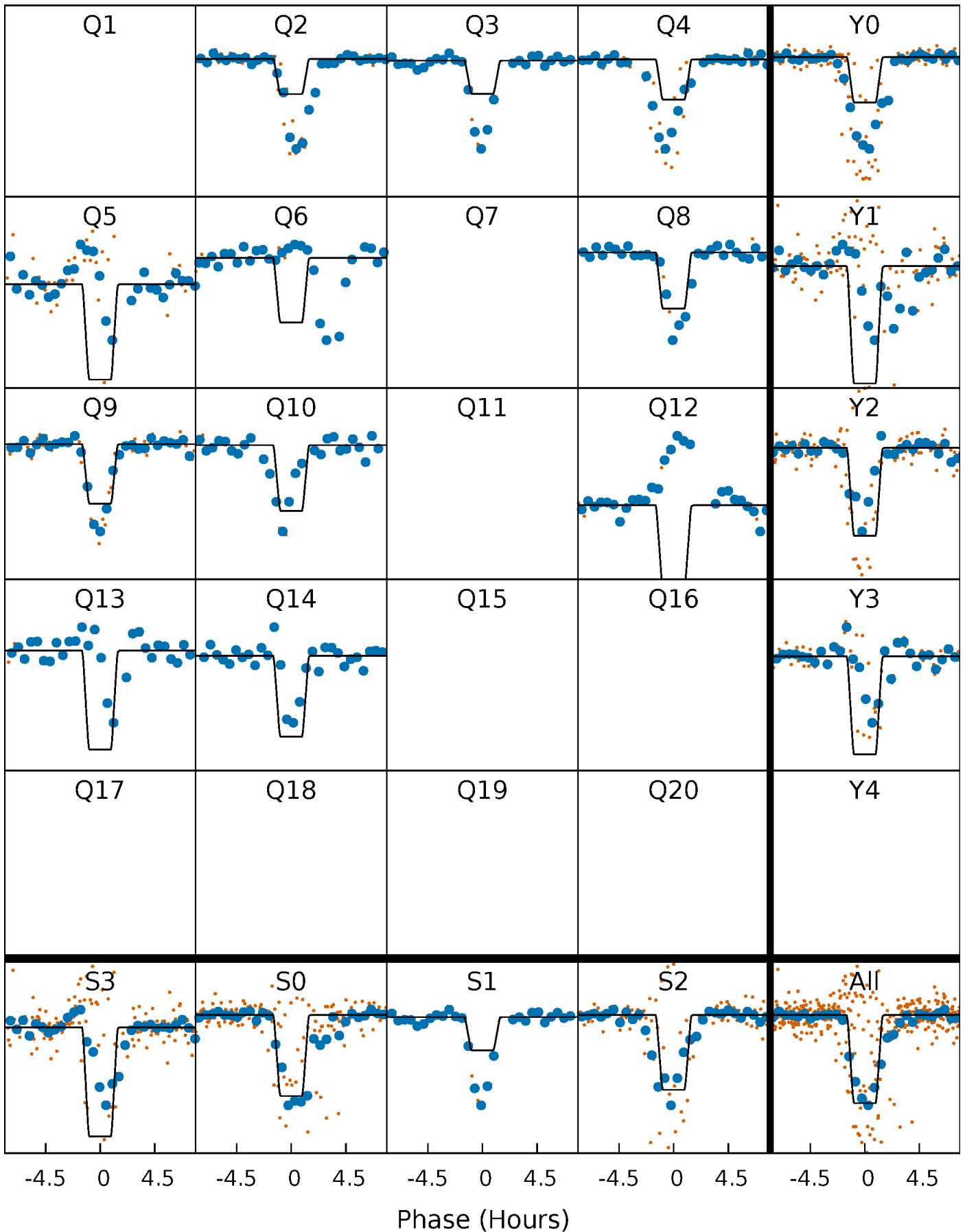
DV Quarter-Phased Transit Curves

TCE 010223616-01 P= 58.265347 Days $T_0=185.207258$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

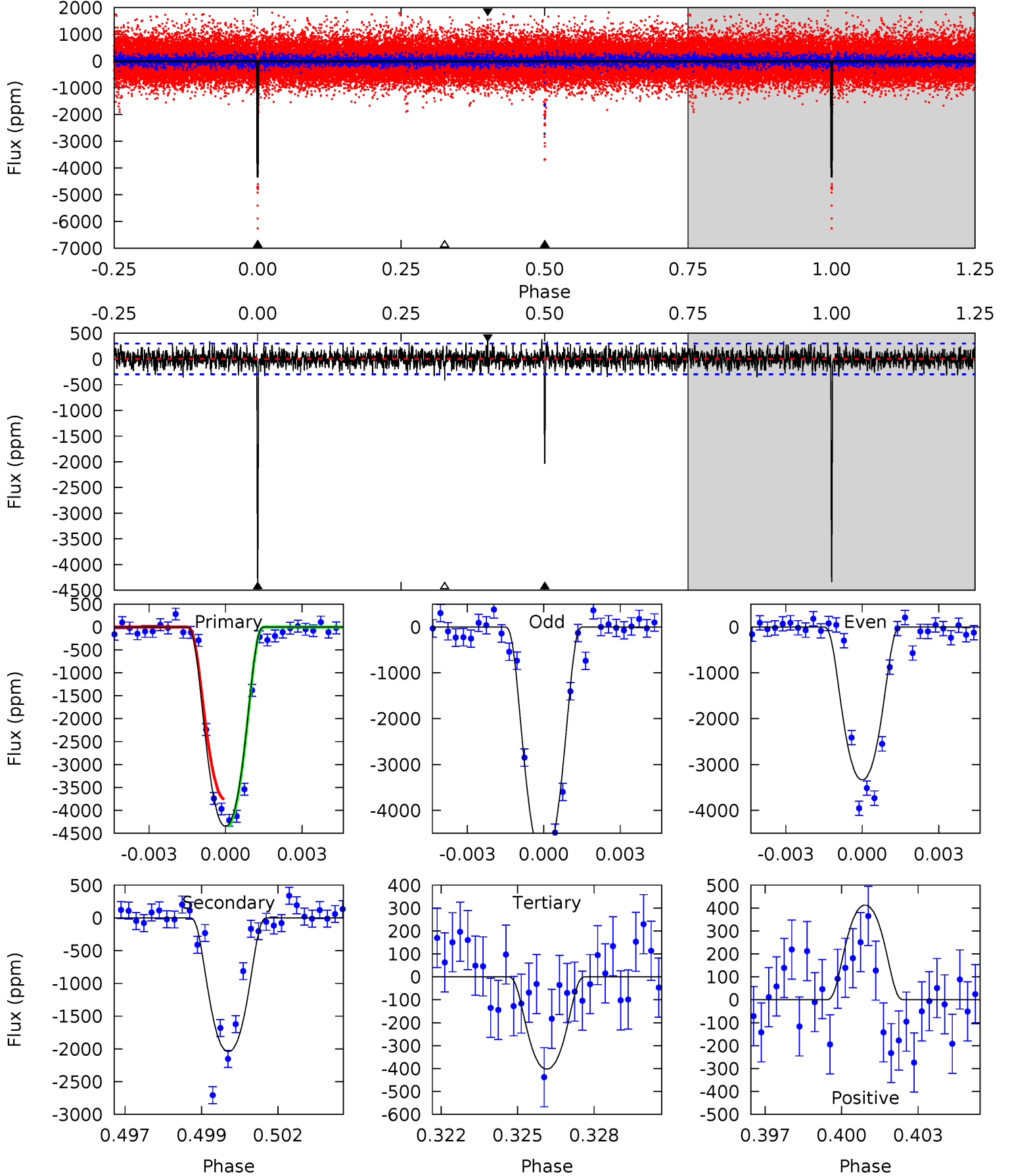
TCE 010223616-01 P= 58.265855 Days $T_0=185.208288$ (BKJD)



DV Model-Shift Uniqueness Test

010223616-01, P = 58.265347 Days, E = 126.941911 Days

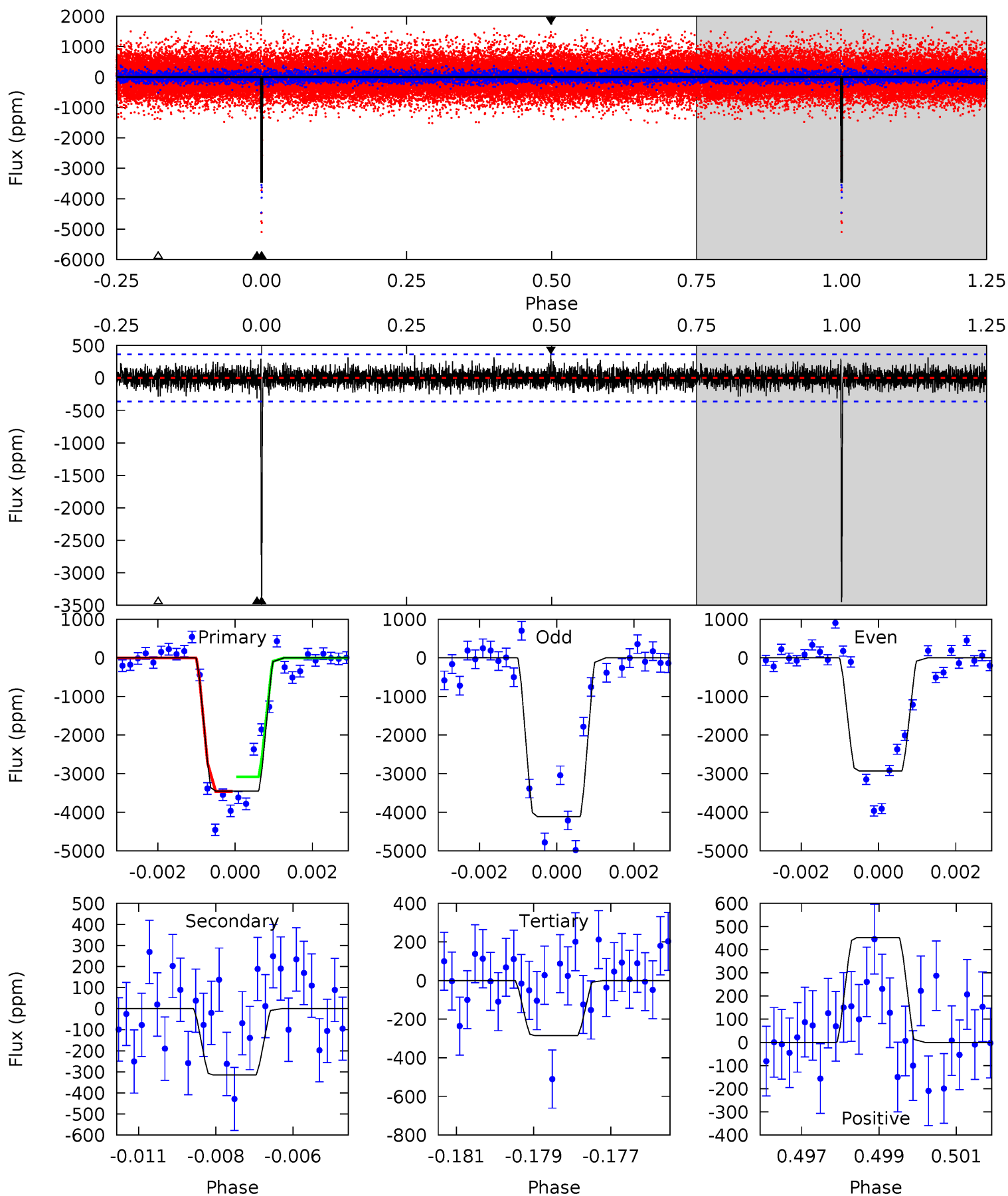
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
76.2	35.8	7.06	7.24	5.27	3.00	1.83	69.2	69.0	28.7	28.6	14.8	0.90	0.09	0



Alt Model-Shift Uniqueness Test

010223616-01, P = 58.265855 Days, E = 126.942433 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
50.5	4.61	4.17	6.61	5.32	3.08	1.19	46.3	43.9	0.44	-2.00	9.17	0.81	0.12	0



Stellar Parameters For KIC 010223616

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4457^{+121}_{-148}	$4.767^{+0.063}_{-0.027}$	$-1.480^{+0.300}_{-0.300}$	$0.481^{+0.031}_{-0.046}$	$0.494^{+0.031}_{-0.034}$	$6.239^{+1.712}_{-0.713}$
	+3%/-3%	+1%/-1%	+20%/-20%	+6%/-10%	+6%/-7%	+27%/-11%
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 010223616-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2037 ± 57	$4.45^{+0.38}_{-0.37}$	393^{+12}_{-17}	3548^{+129}_{-120}	3097^{+567}_{-463}
Alt.	-315 ± 68	$3.10^{+0.32}_{-0.35}$	392^{+14}_{-14}	2985^{+149}_{-138}	969^{+347}_{-253}

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 $A_{obs} \gg 1.0$

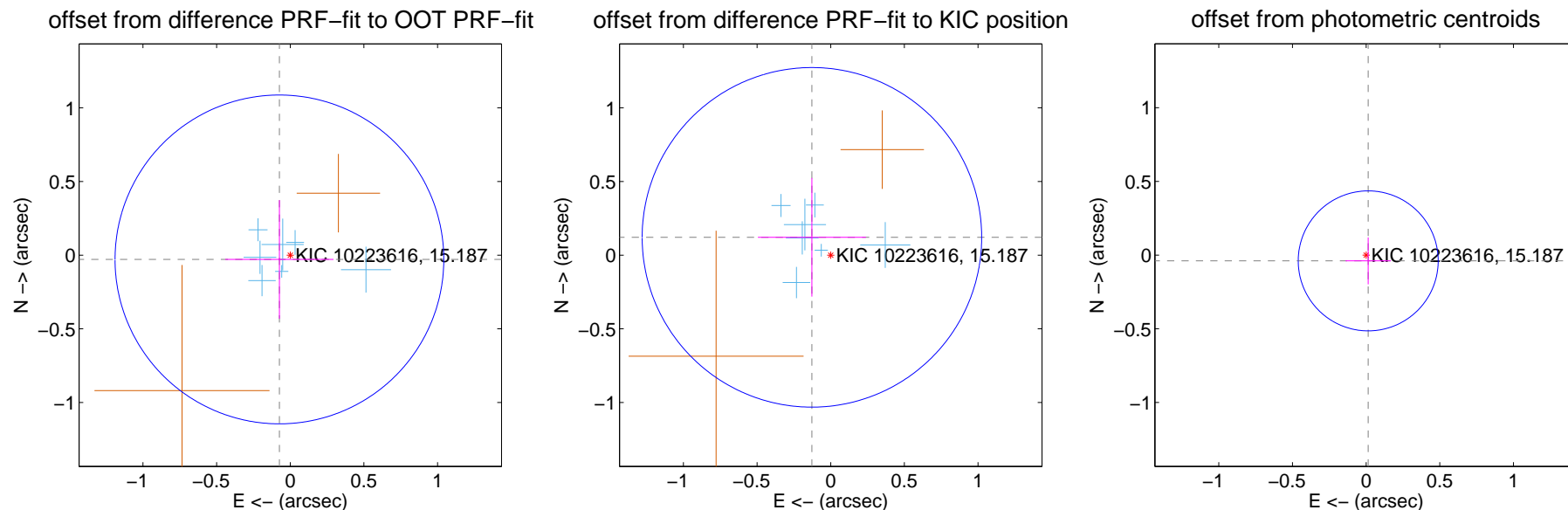
DV Centroid Data

Supplemental centroid analysis for 010223616-01. Kepler magnitude: 15.19. Transit SNR 45.91

There are 7 quarters with good PRF difference image offsets

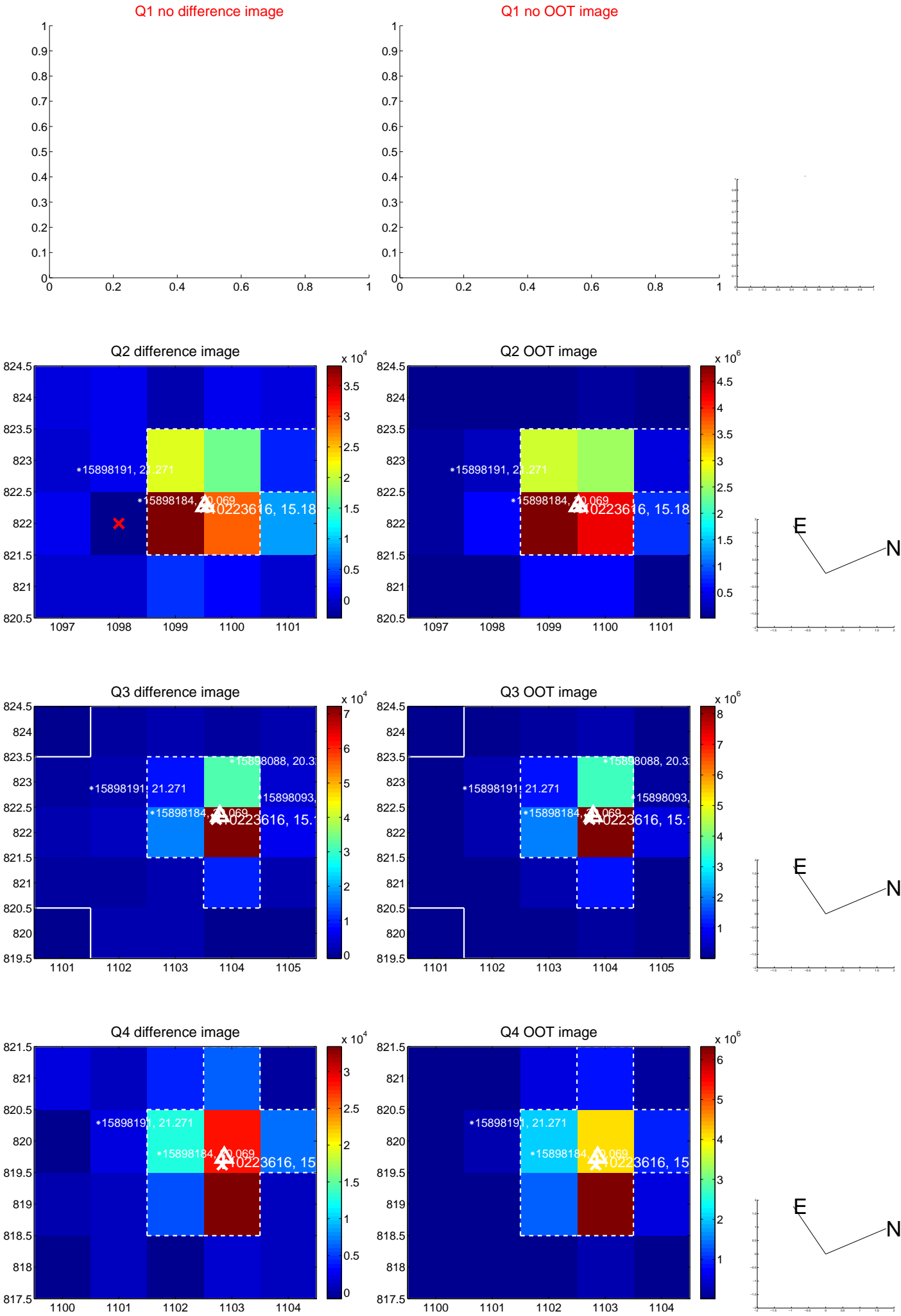
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.079 ± 0.372	0.21	0.074 ± 0.367	-0.029 ± 0.402
PRF-fit source offset from KIC position	0.176 ± 0.384	0.46	0.128 ± 0.367	0.121 ± 0.402
photometric centroid source offset	0.04 ± 0.16	0.26	-0.01 ± 0.15	-0.04 ± 0.16

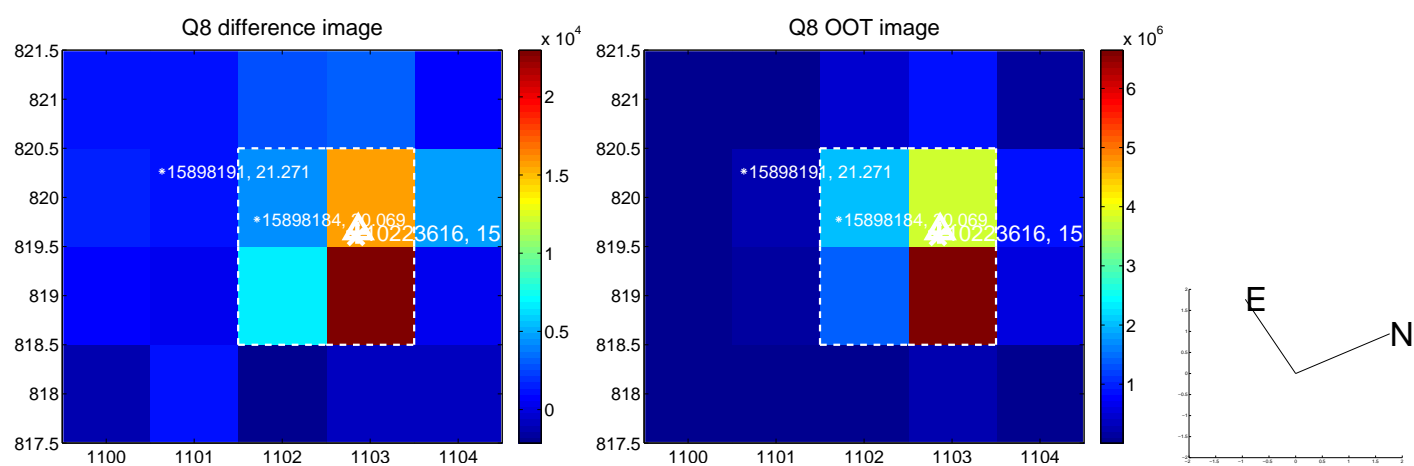
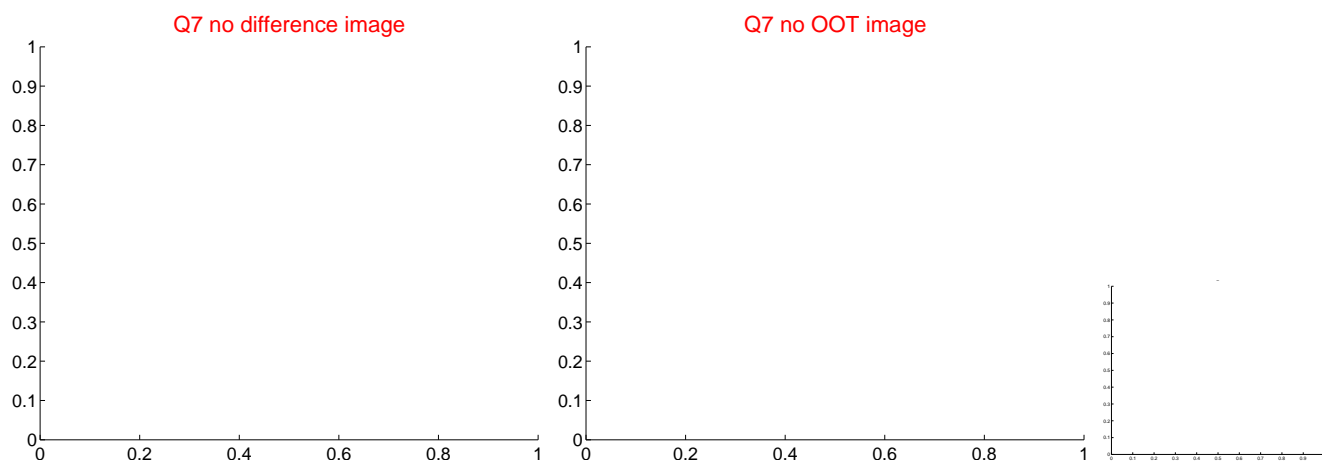
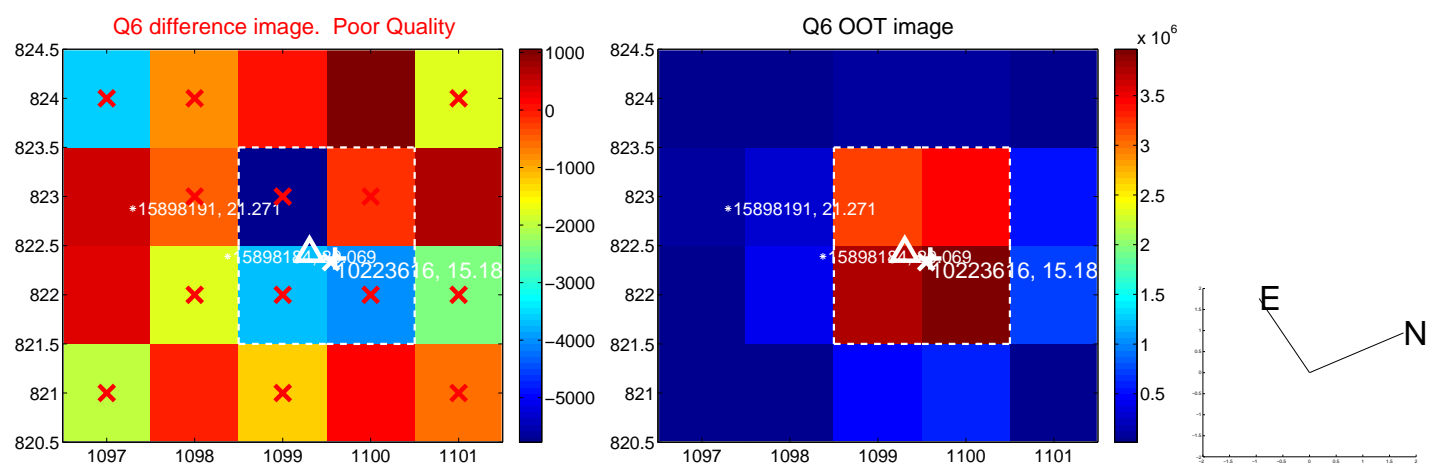
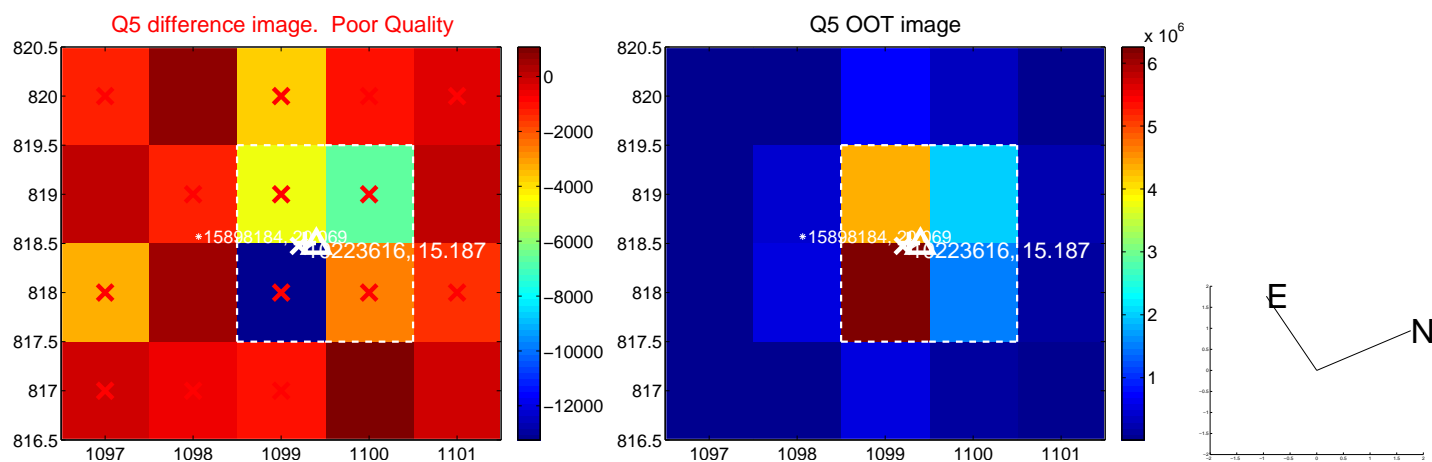


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

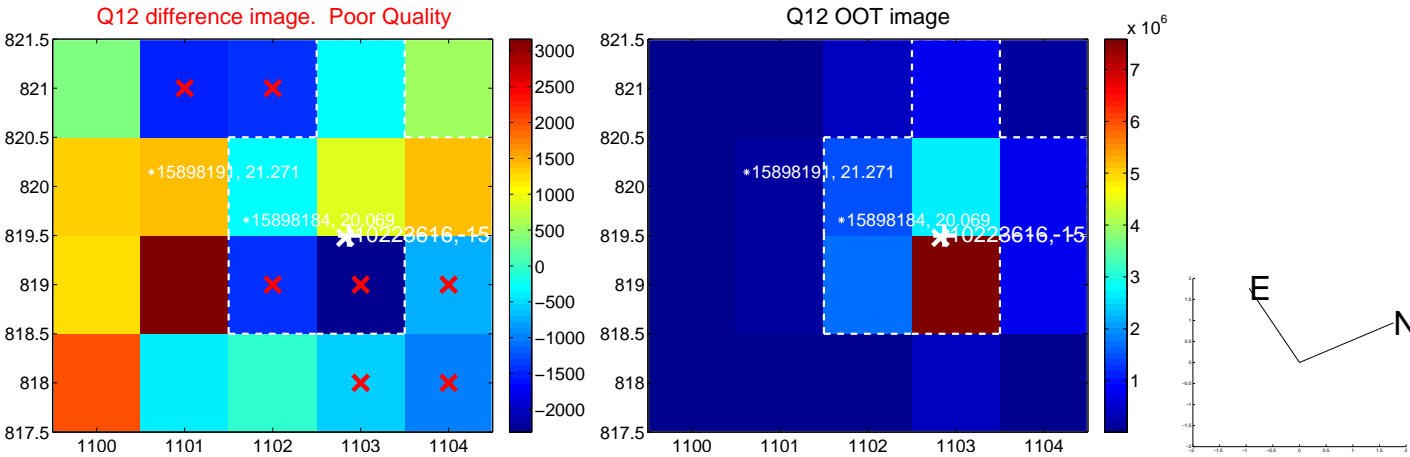
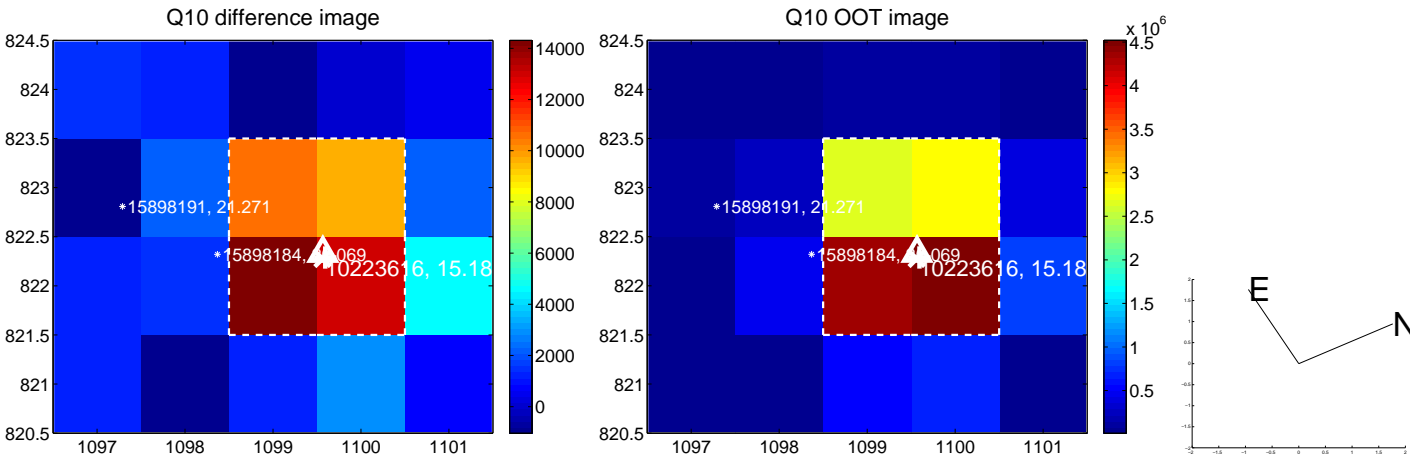
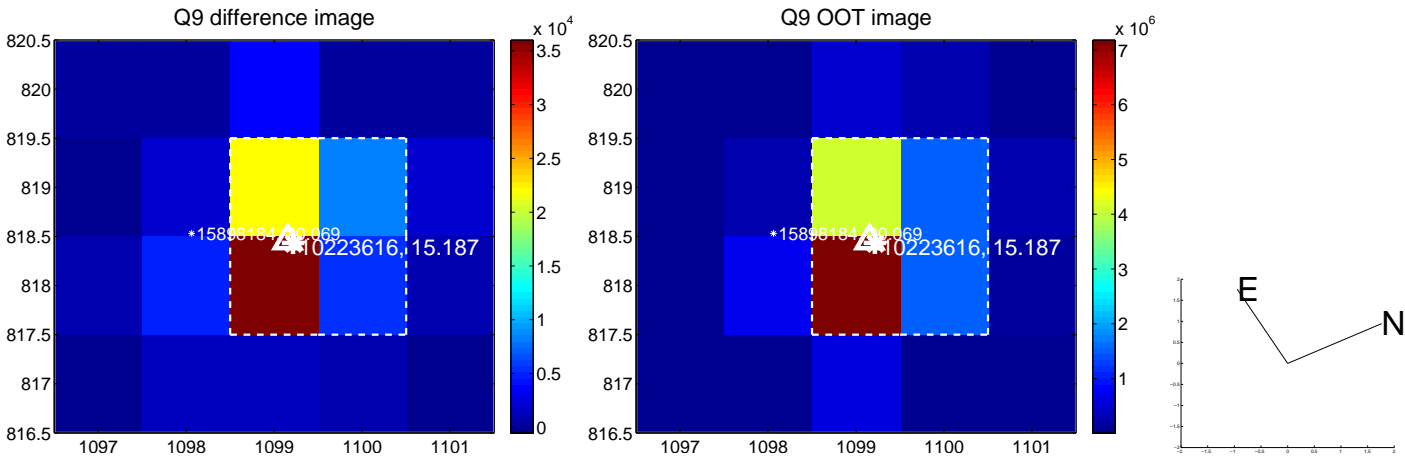
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



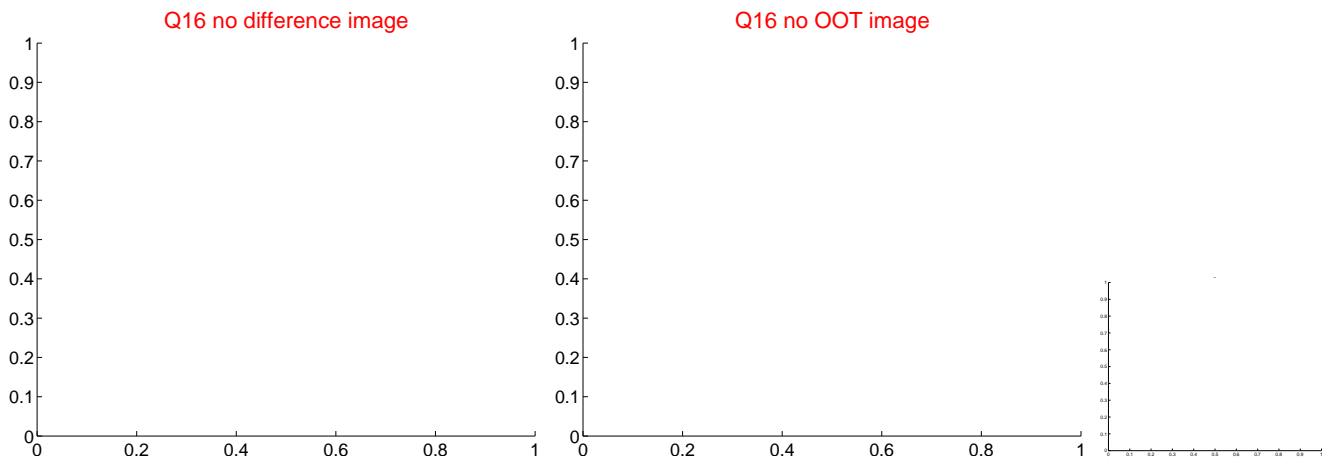
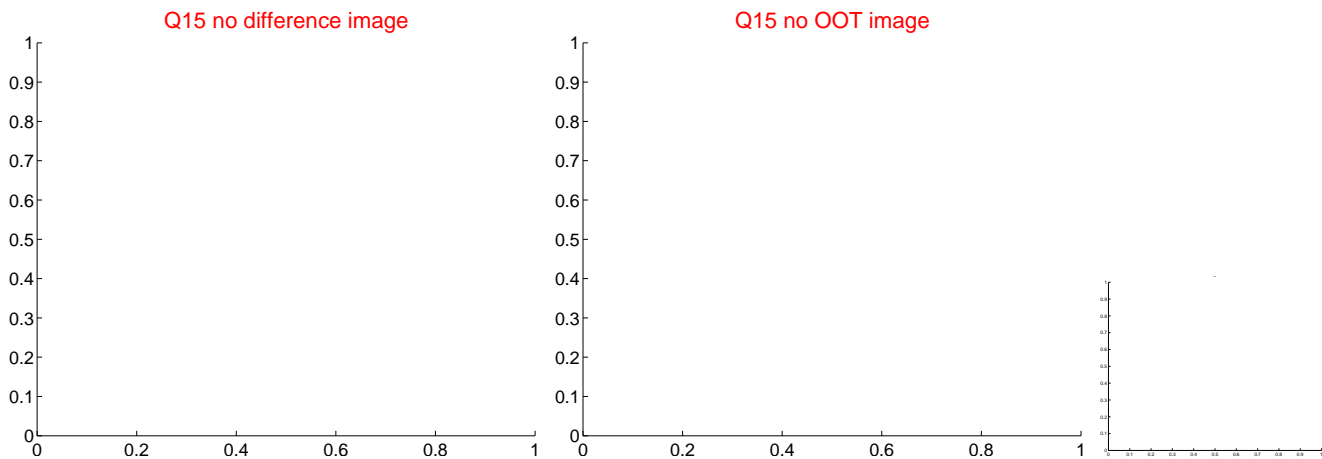
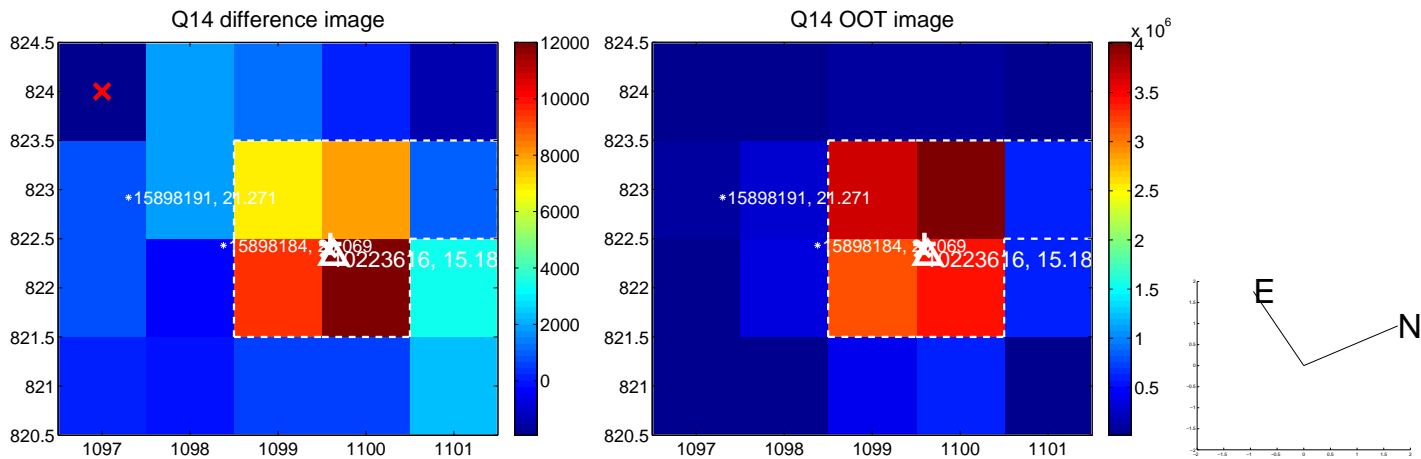
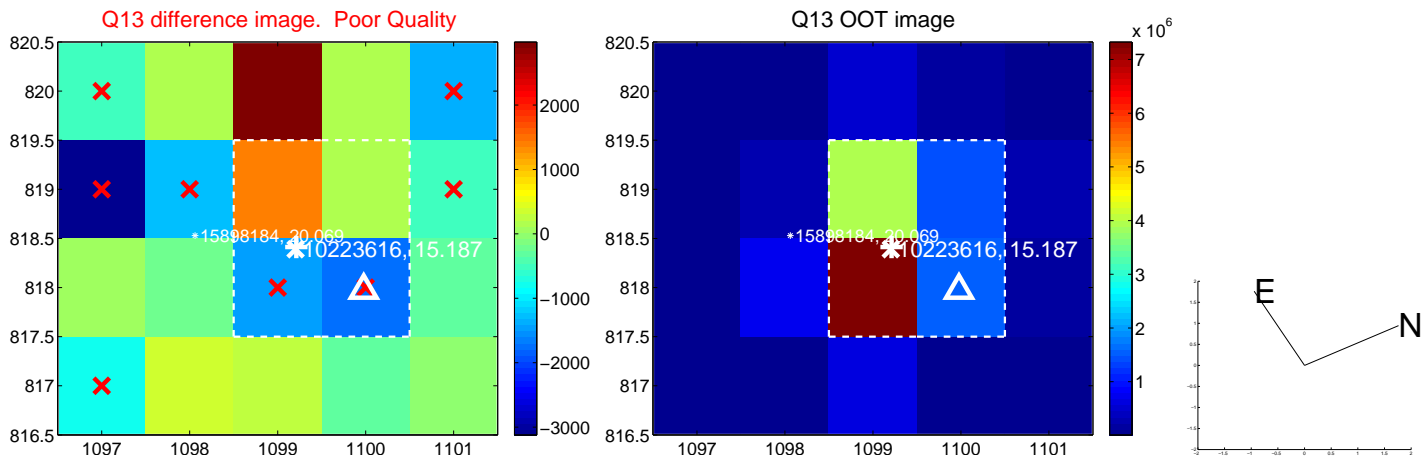
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



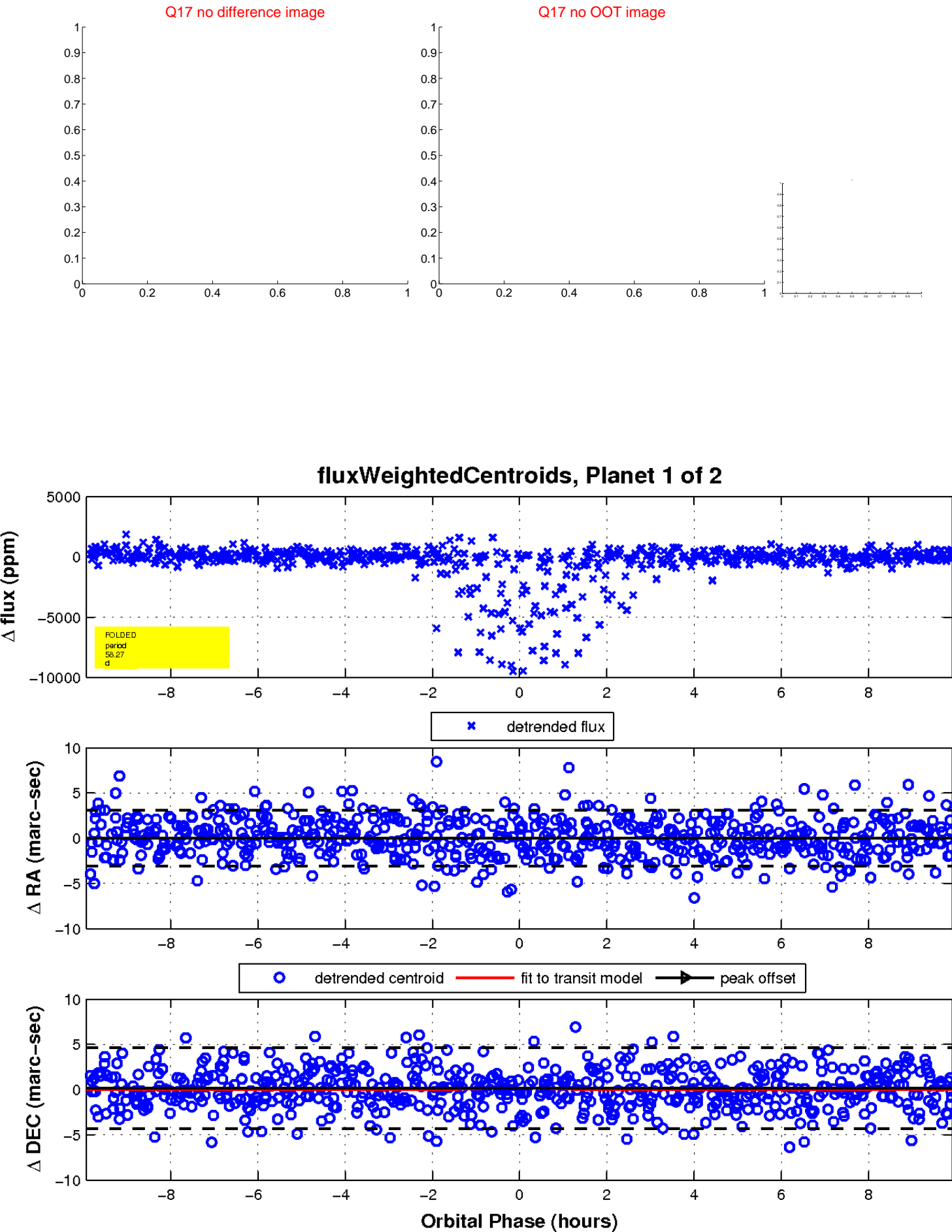
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

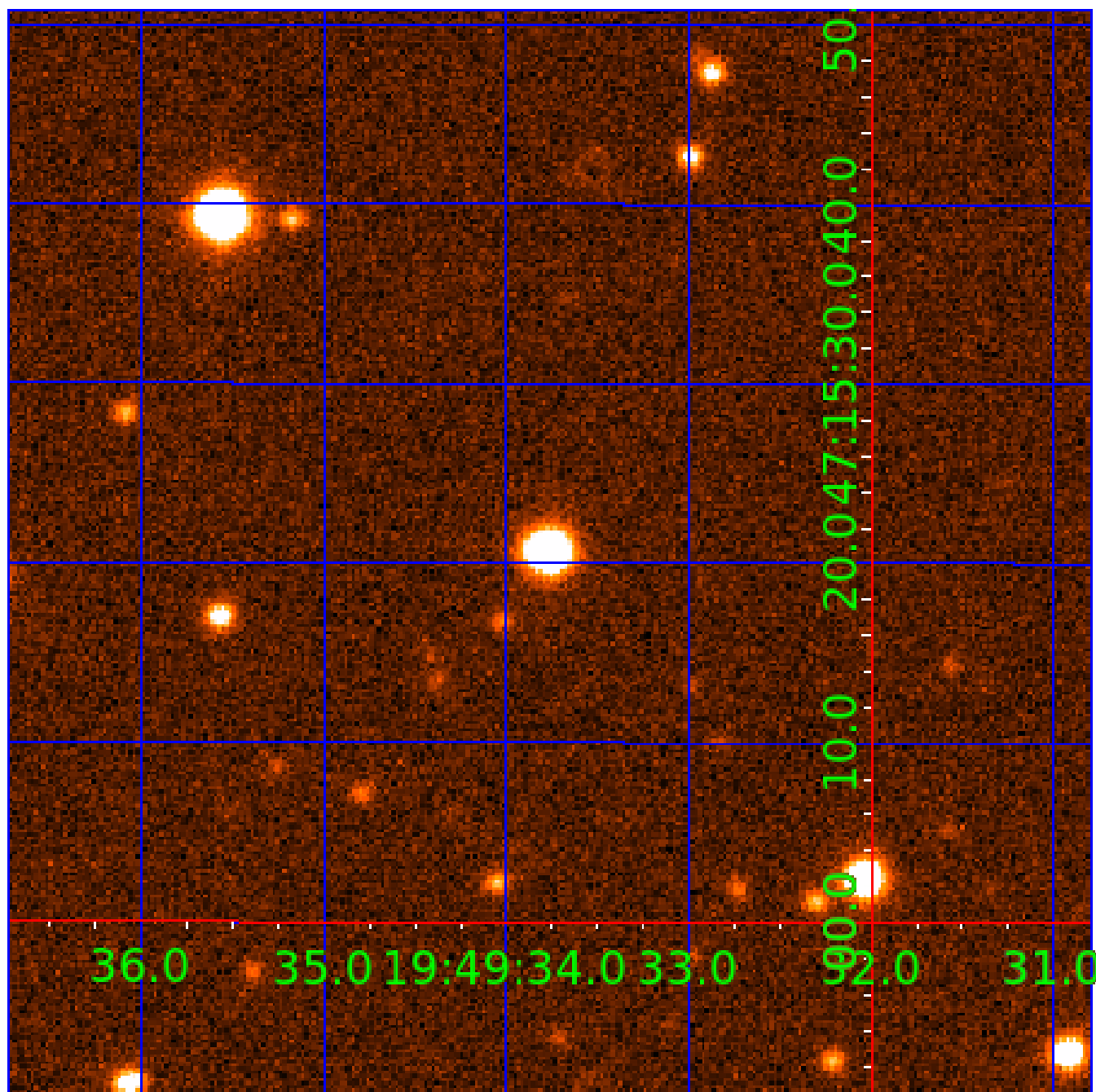


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010223616

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})
010223616-01	OBS	No	58.265347	185.207258	5655.8	3.318	60.6	45.9	0.48	4457	4.51	1.51
010223616-02	OBS	1076.01	29.125779	142.139653	1130.9	7.207	67.7	20.4	0.48	4457	3.15	3.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010223616-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_ODDEVEN_DV
010223616-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT

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

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

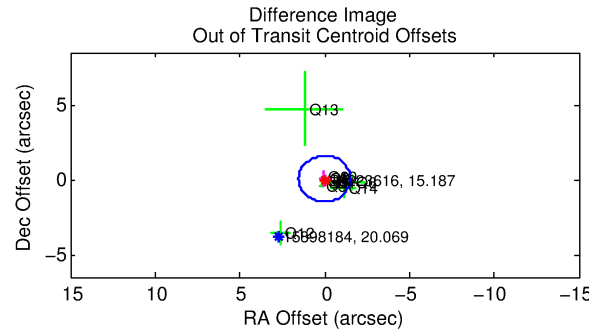
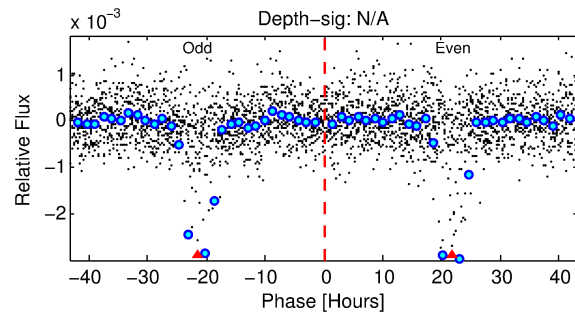
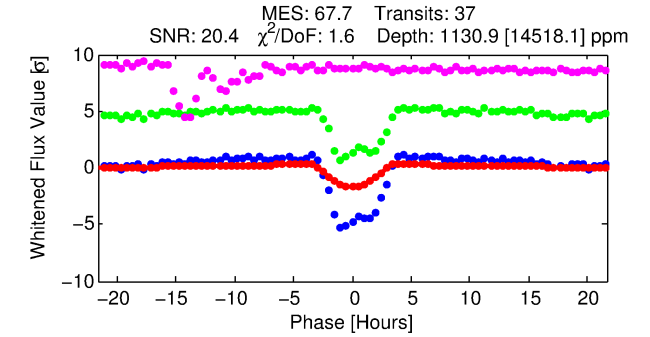
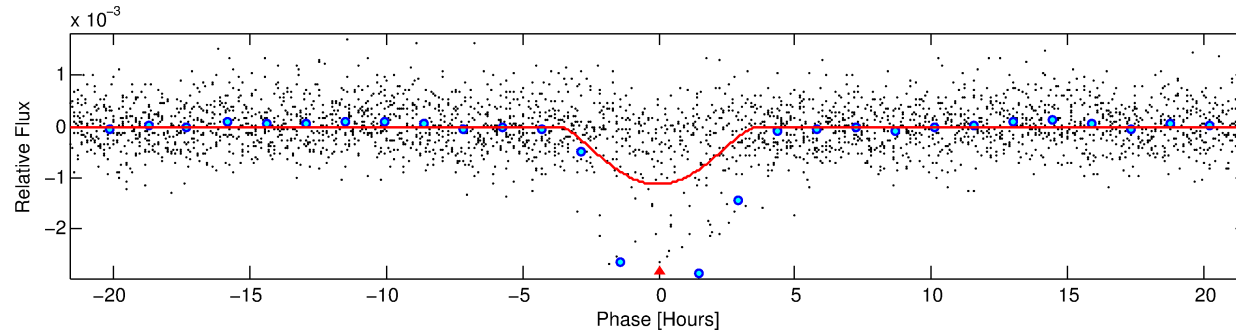
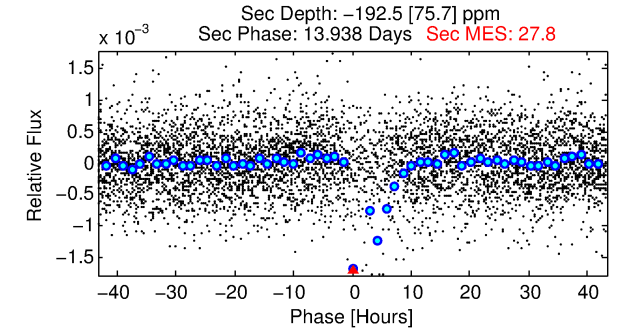
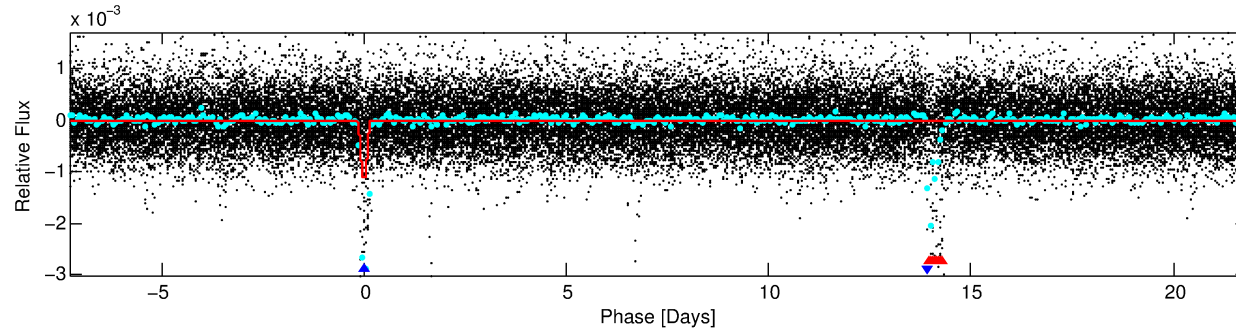
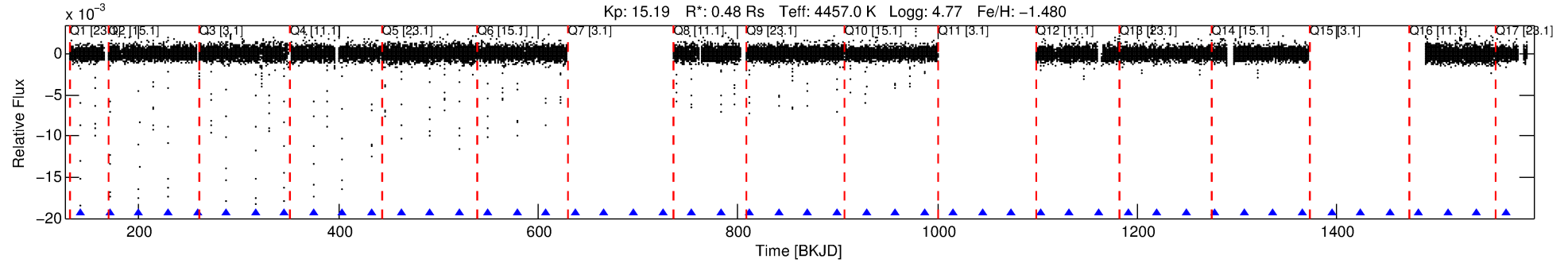
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010223616-02

No Significant Match Found

DV One-Page Summary

KIC: 10223616 Candidate: 2 of 2 Period: 29.126 d
KOI: K01076.01 Corr: 0.769



DV Fit Results:

Period = 29.12578 [0.00029] d
Epoch = 142.1397 [0.0078] BKJD
Rp/R* = 0.0600 [0.1068]
a/R* = 10.90 [4.40]
b = 1.00 [0.66]
Seff = 3.81 [0.67]
Teq = 356 [16] K
Rp = 3.15 [5.61] Re
a = 0.1464 [0.0117] AU
Ag = N/A
Teffp = N/A

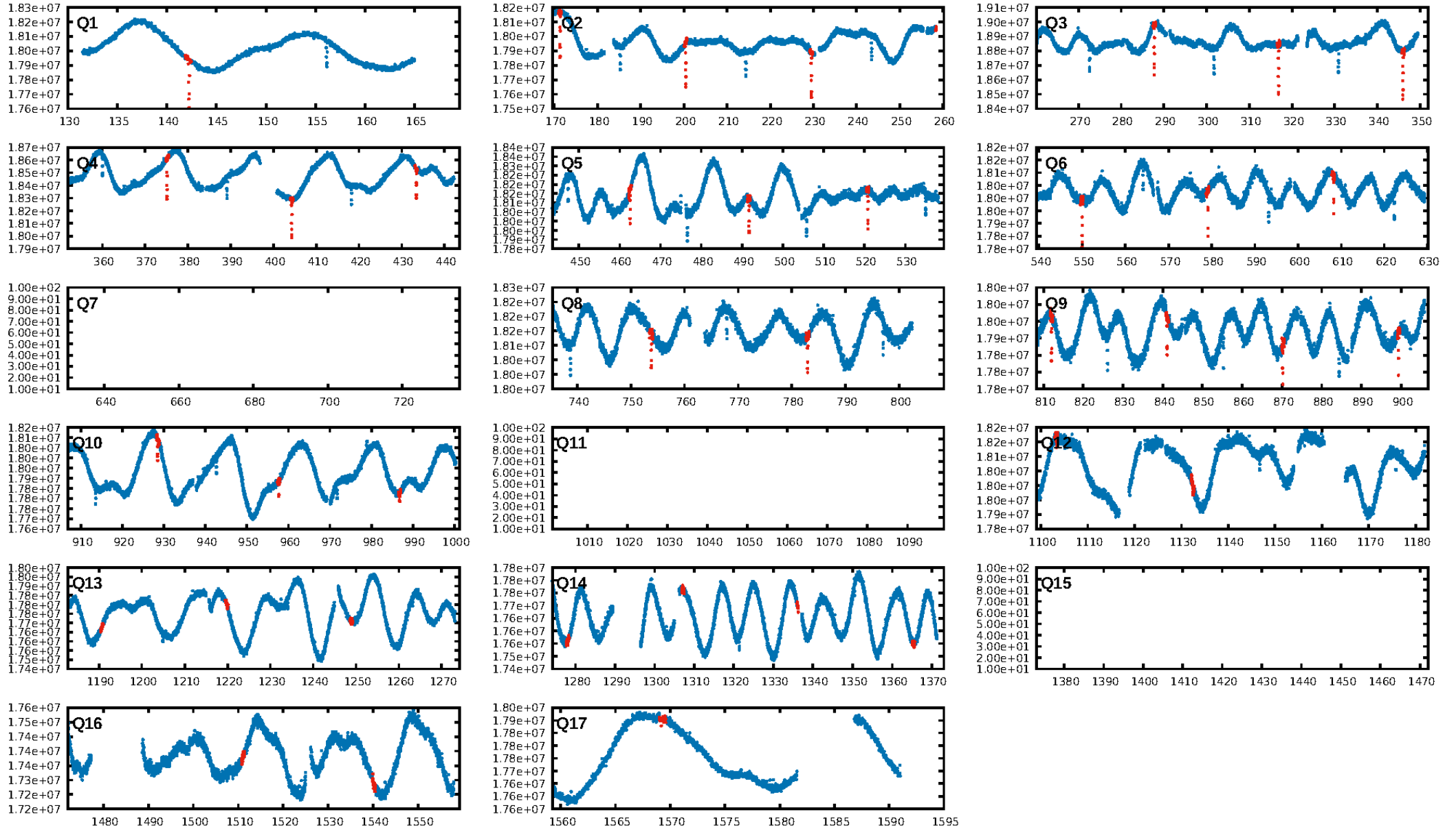
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [88.14 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 93.4%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [35/35]
GhostDiagnostic-chr: 3.266
Centroid-sig: 0.0%
Centroid-so: 0.920 arcsec [2.57 σ]
OotOffset-rm: 0.057 arcsec [0.11 σ]
KicOffset-rm: 0.240 arcsec [0.49 σ]
OotOffset-st: 4/1/3/4 [12]
KicOffset-st: 4/1/3/4 [12]
DiffImageQuality-fgm: 0.92 [11/12]
DiffImageOverlap-fno: 1.00 [14/14]

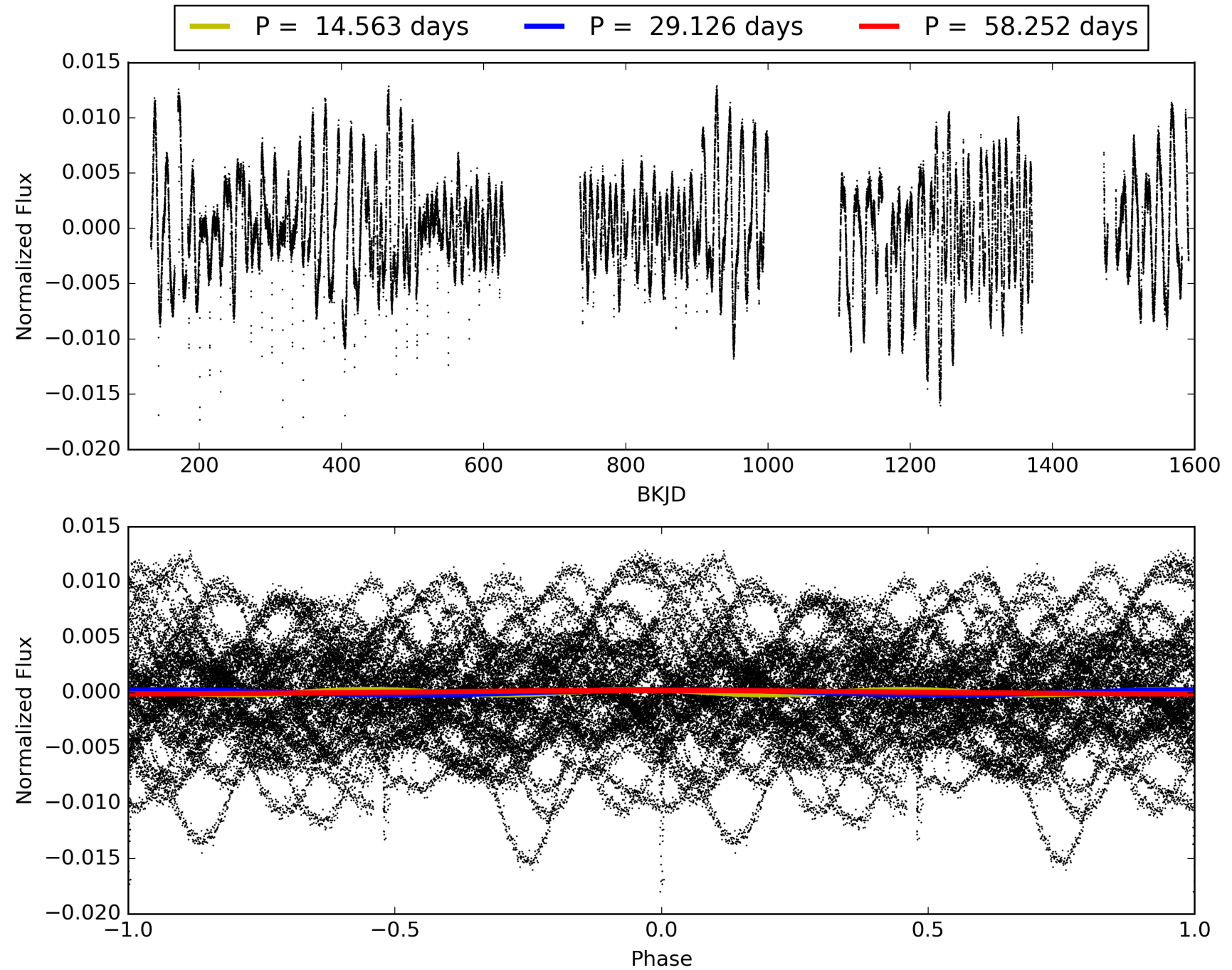
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 16:51:54 Z

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

TCE 010223616-02, PDC Light Curves

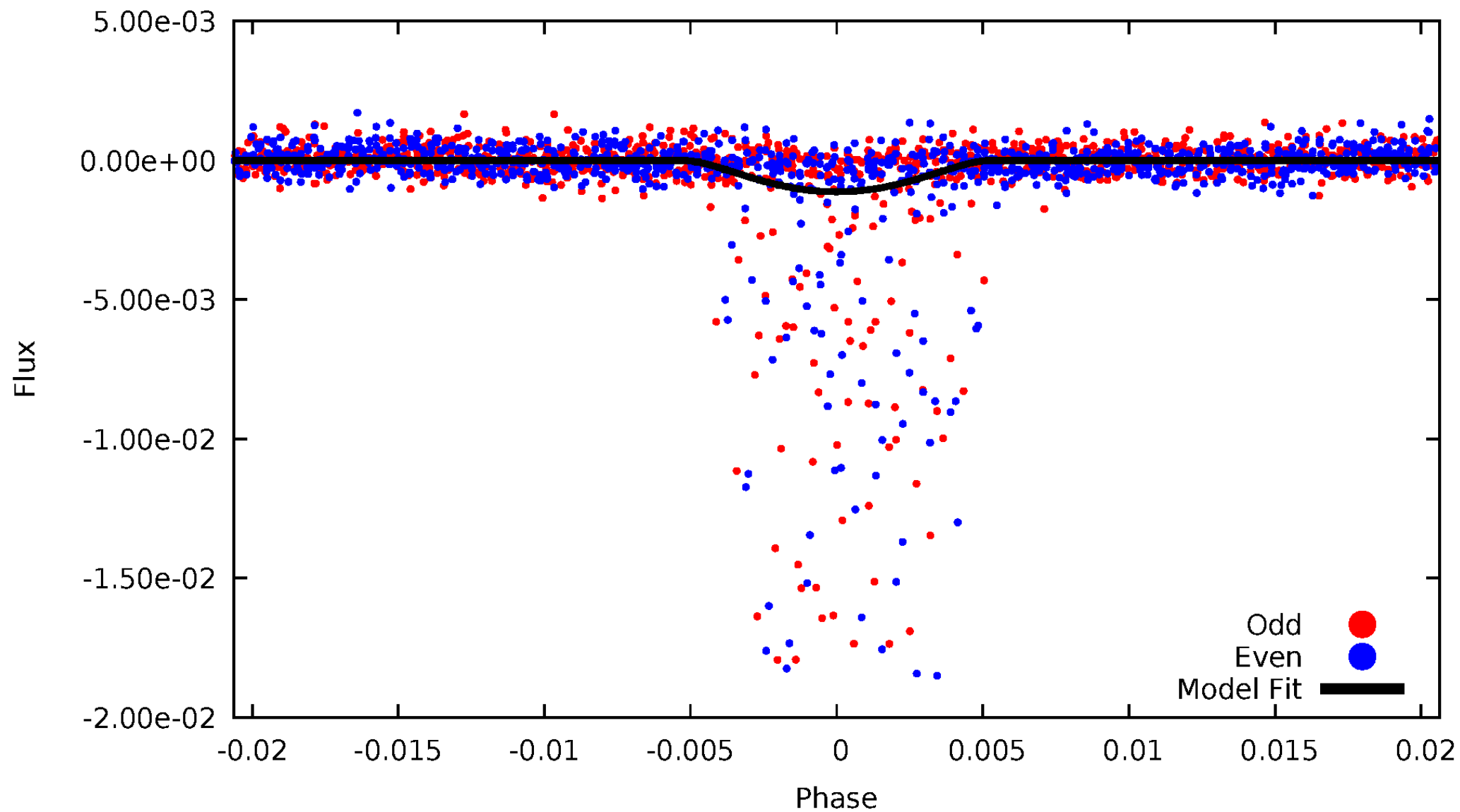


TCE 010223616-02



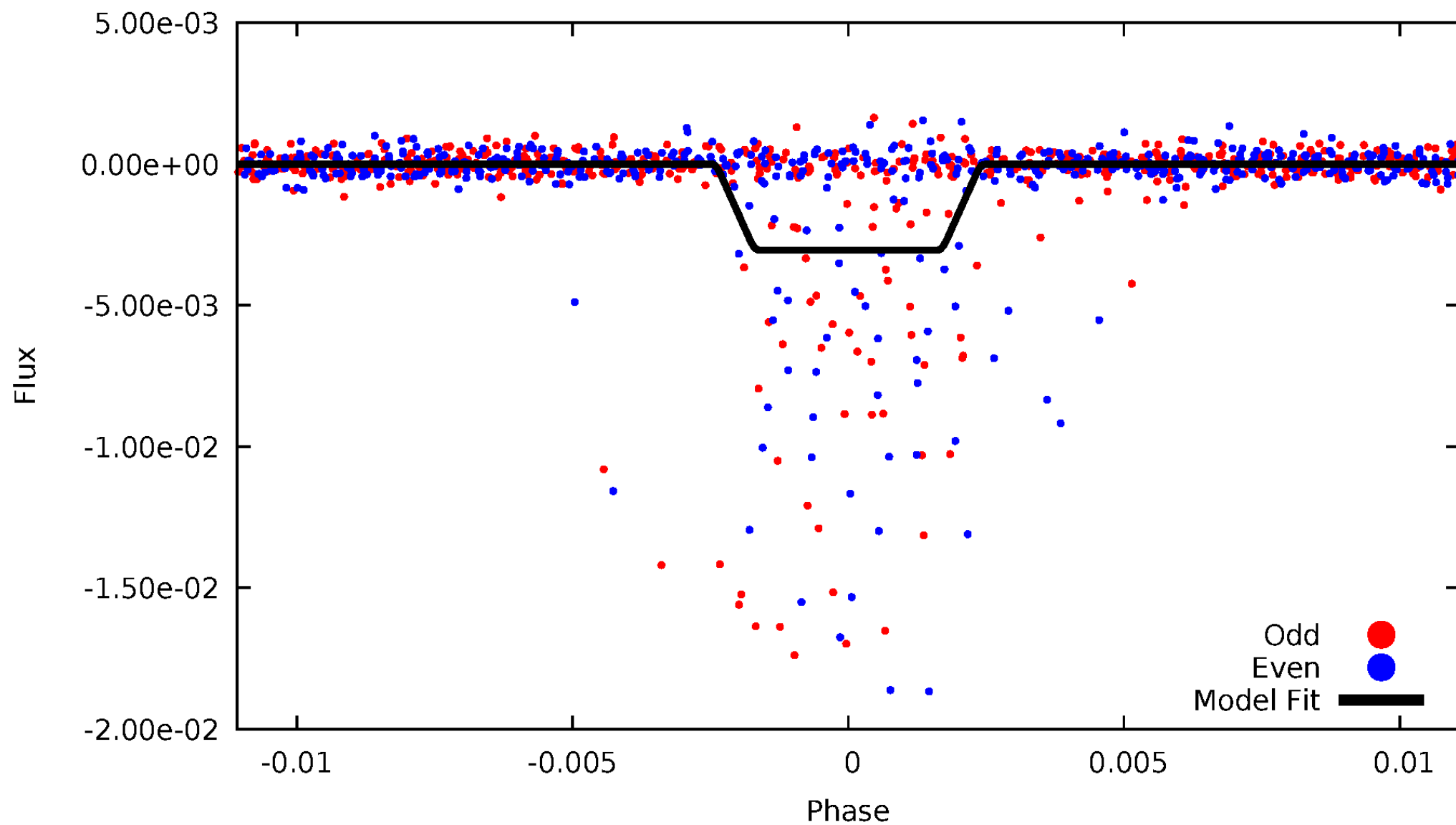
DV Odd/Even

TCE 010223616-02



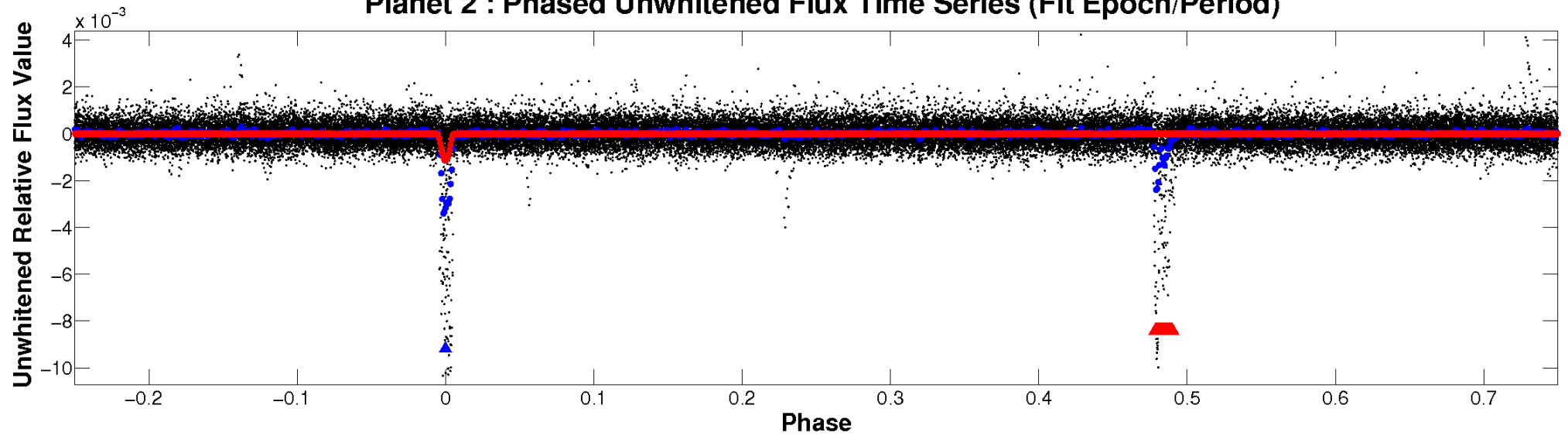
ALT Odd/Even

TCE 010223616-02

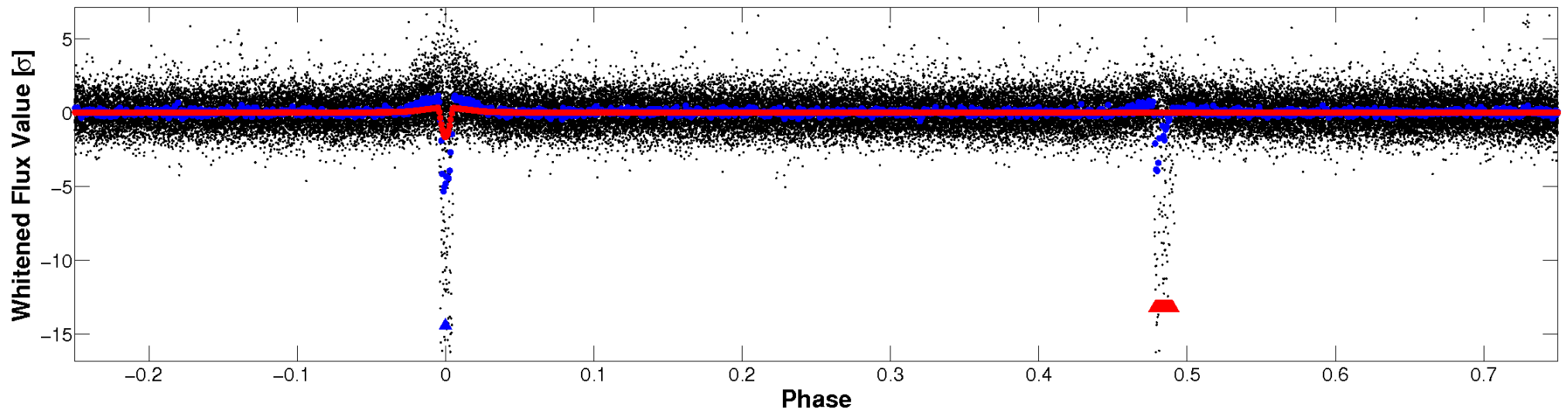


Non-Whitened Vs. Whitened Light Curve

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

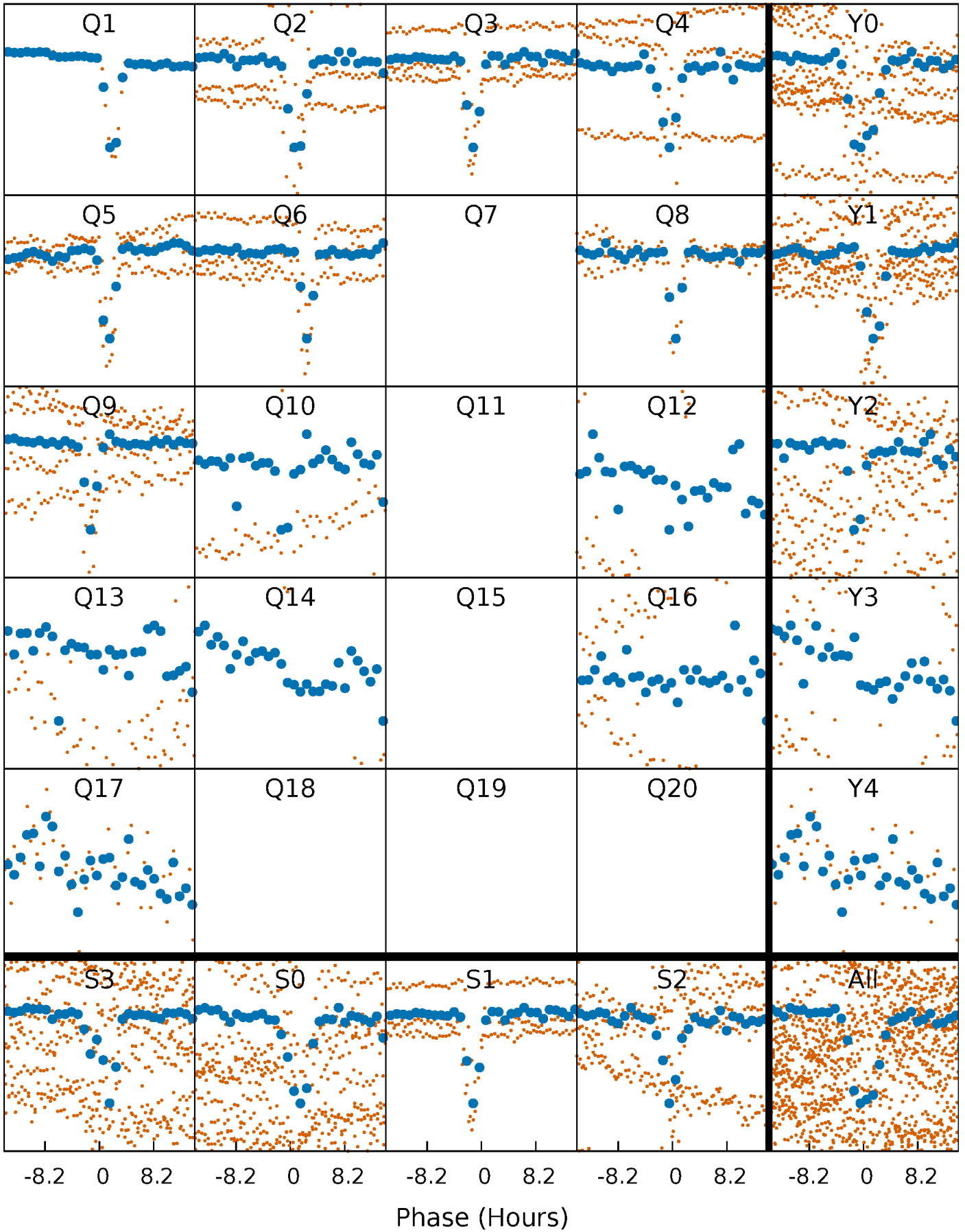


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



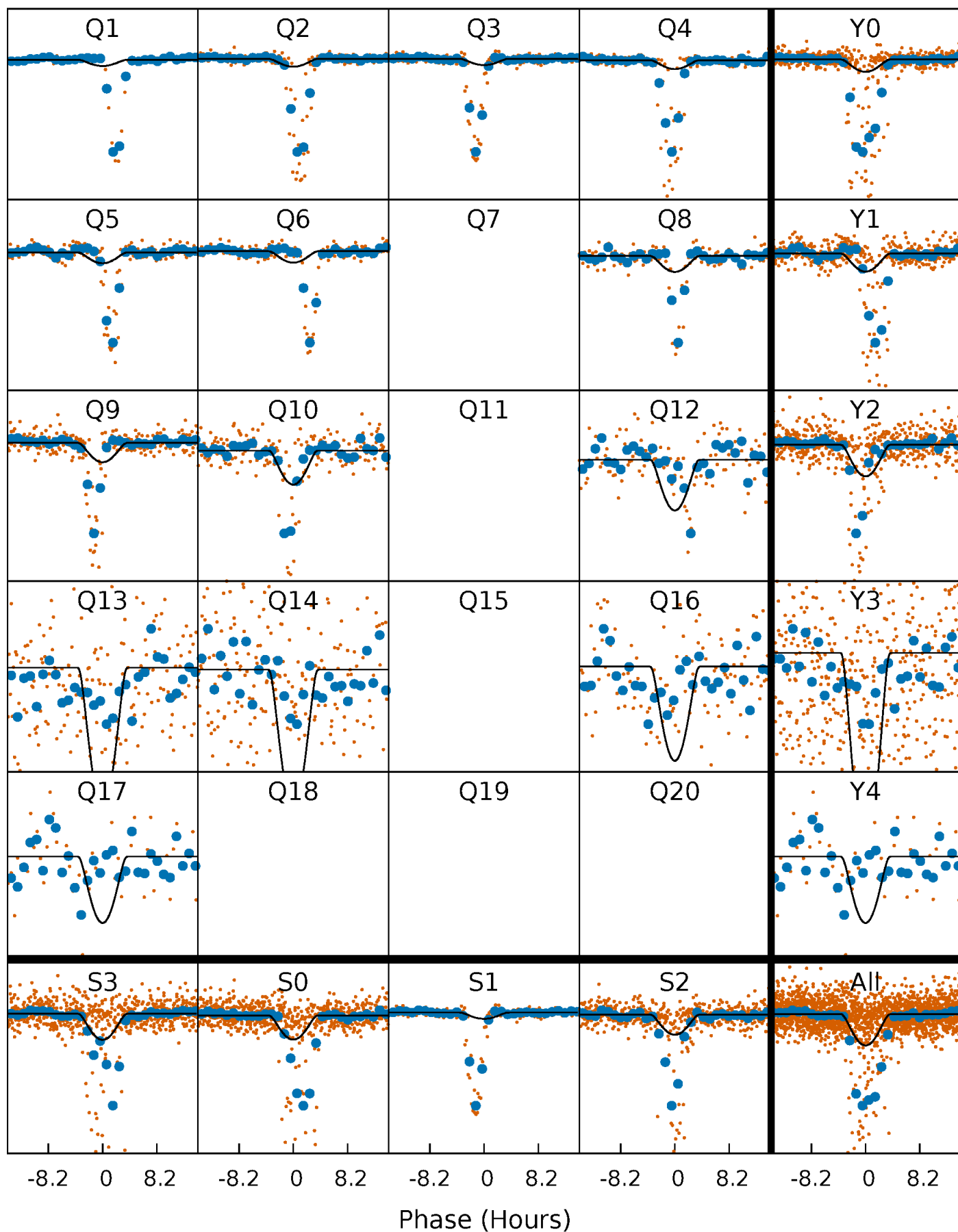
PDC Quarter-Phased Transit Curves

TCE 010223616-02 P= 29.125779 Days $T_0=142.139653$ (BKJD)



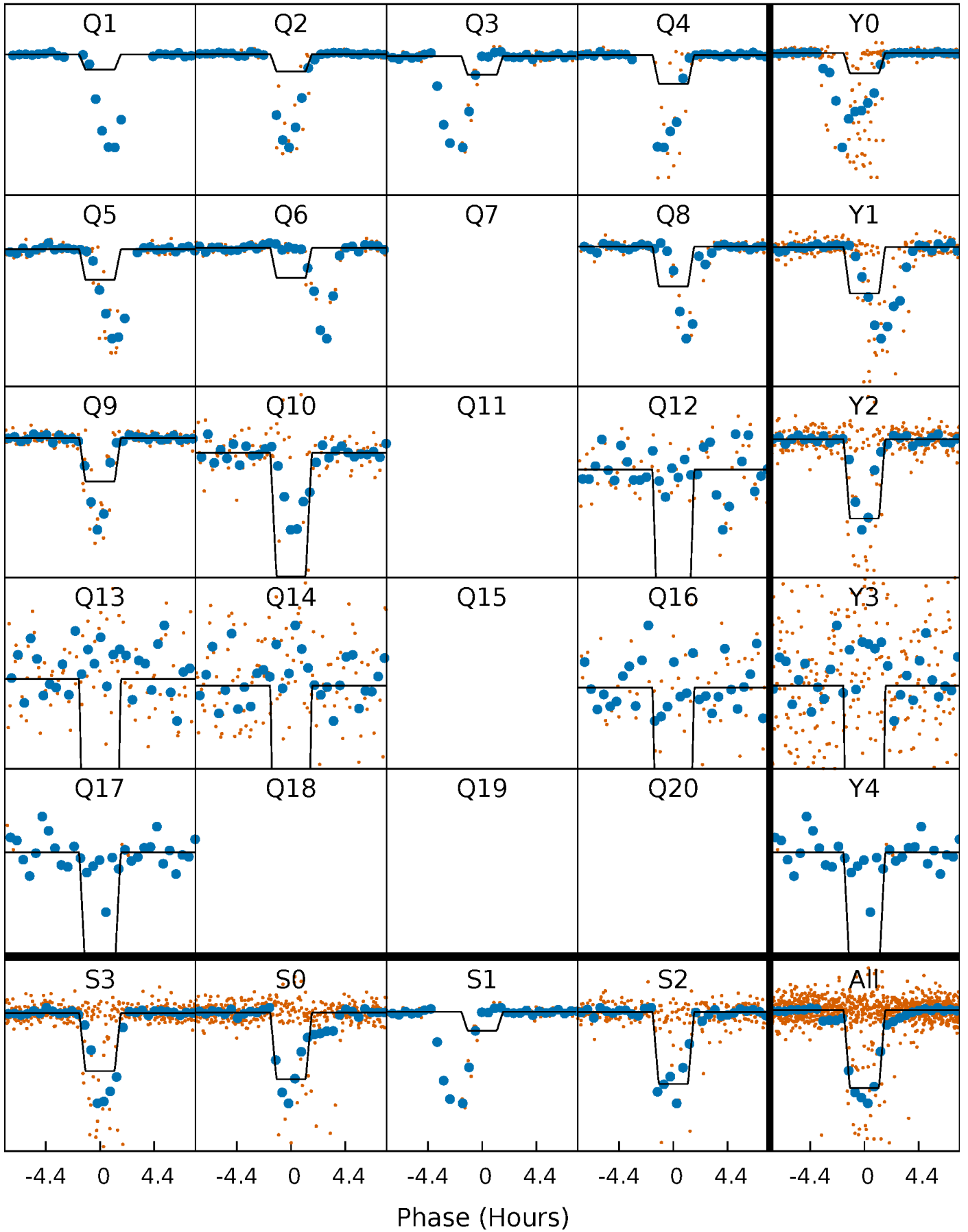
DV Quarter-Phased Transit Curves

TCE 010223616-02 P= 29.125779 Days $T_0=142.139653$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

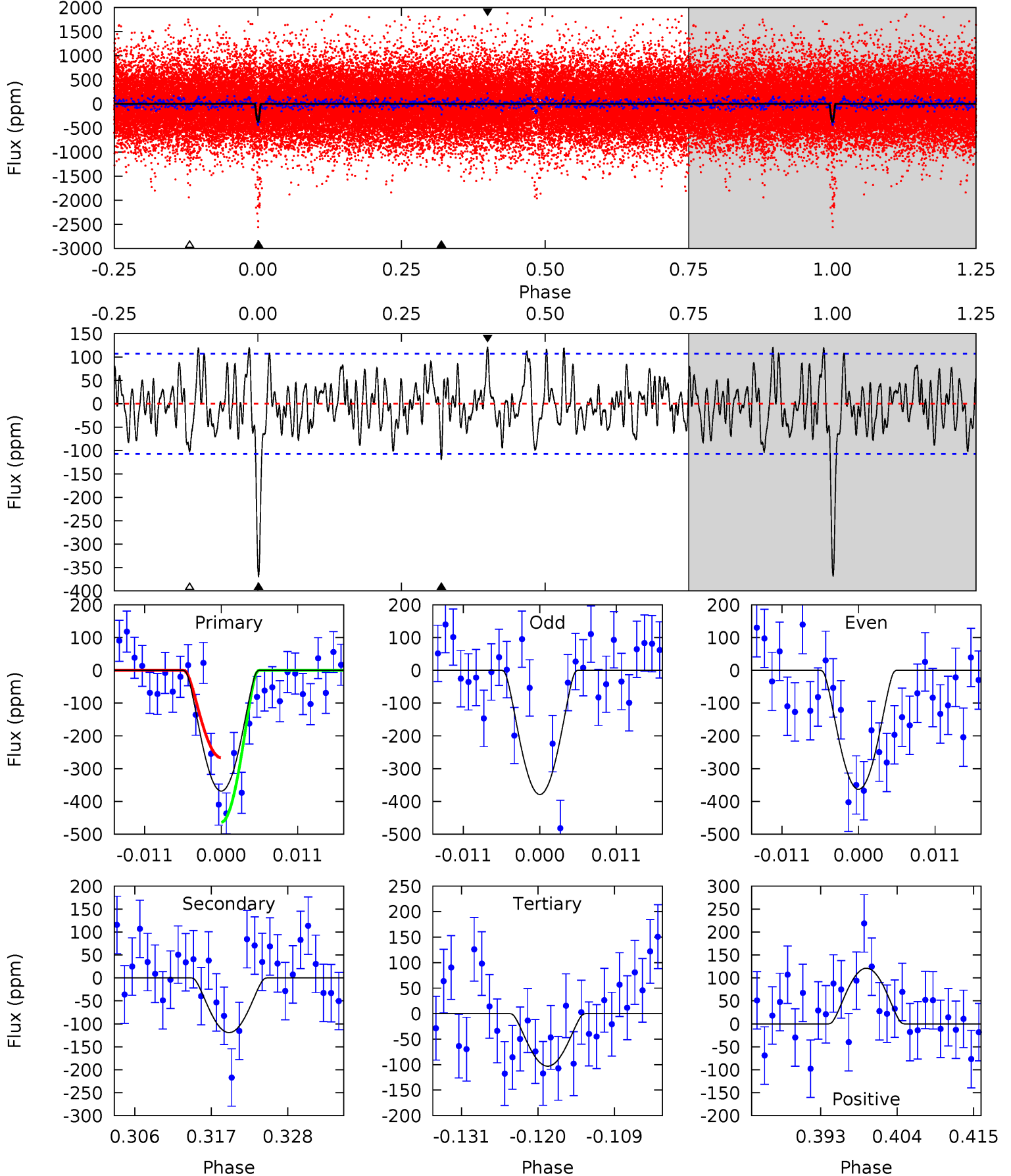
TCE 010223616-02 P= 29.121762 Days $T_0=142.197241$ (BKJD)



DV Model-Shift Uniqueness Test

010223616-02, P = 29.125779 Days, E = 113.013874 Days

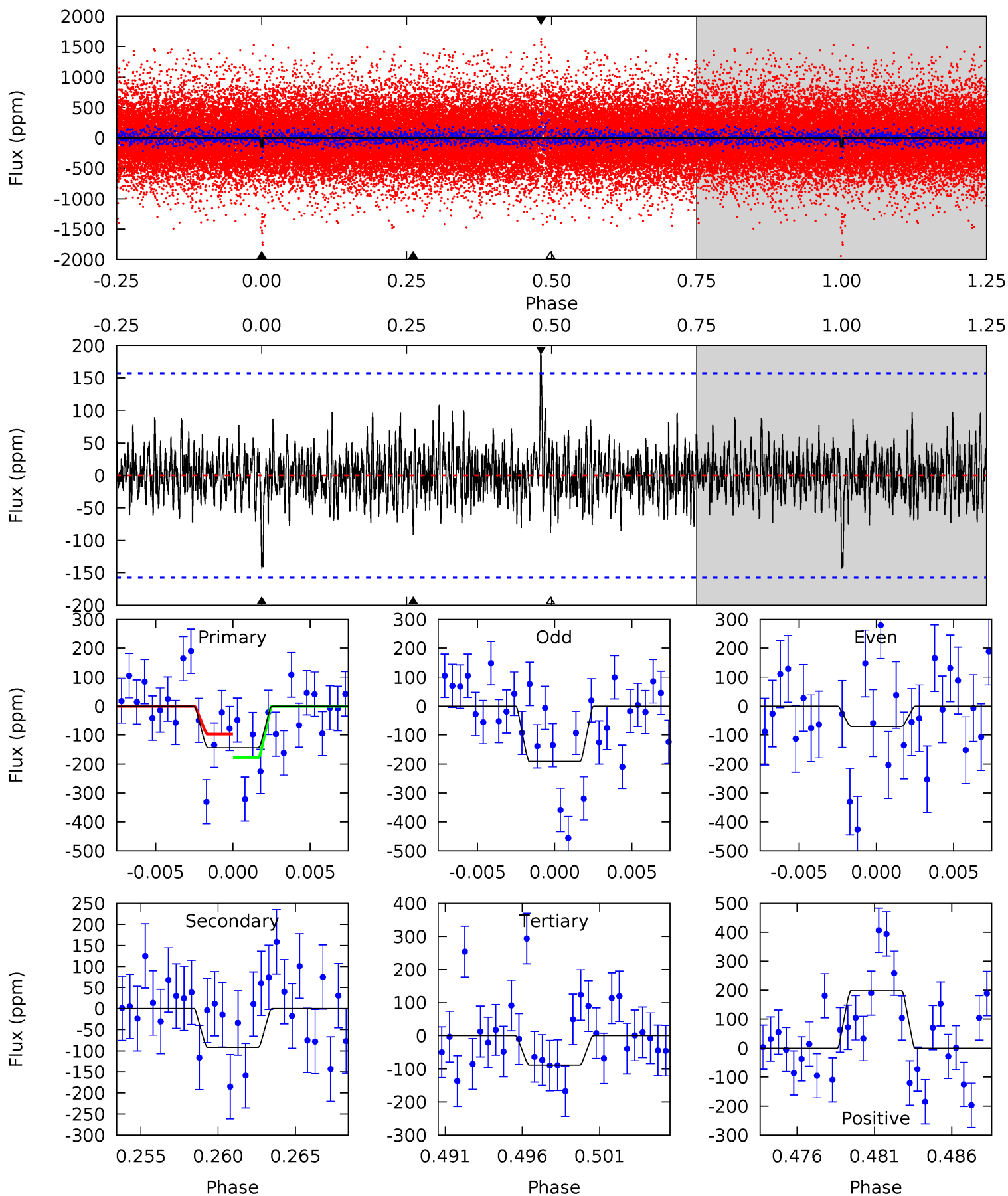
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.2	5.57	4.82	5.67	5.01	2.55	2.00	12.4	11.6	0.75	-0.09	0.37	1.64	0.25	0



Alt Model-Shift Uniqueness Test

010223616-02, P = 29.121762 Days, E = 113.075479 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.71	3.01	2.89	6.50	5.16	2.81	1.03	1.82	-1.79	0.12	-3.48	1.99	1.49	0.58	1.31



Stellar Parameters For KIC 010223616

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4457^{+121}_{-148}	$4.767^{+0.063}_{-0.027}$	$-1.480^{+0.300}_{-0.300}$	$0.481^{+0.031}_{-0.046}$	$0.494^{+0.031}_{-0.034}$	$6.239^{+1.712}_{-0.713}$
	+3%/-3%	+1%/-1%	+20%/-20%	+6%/-10%	+6%/-7%	+27%/-11%
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 010223616-02 / KOI 1076.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-119 ± 21	$4.97^{+4.80}_{-3.12}$	494^{+17}_{-19}	2334^{+666}_{-328}	58^{+360}_{-44}
Alt.	-92 ± 31	$4.94^{+4.60}_{-3.12}$	494^{+15}_{-20}	2252^{+649}_{-300}	40^{+262}_{-29}

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

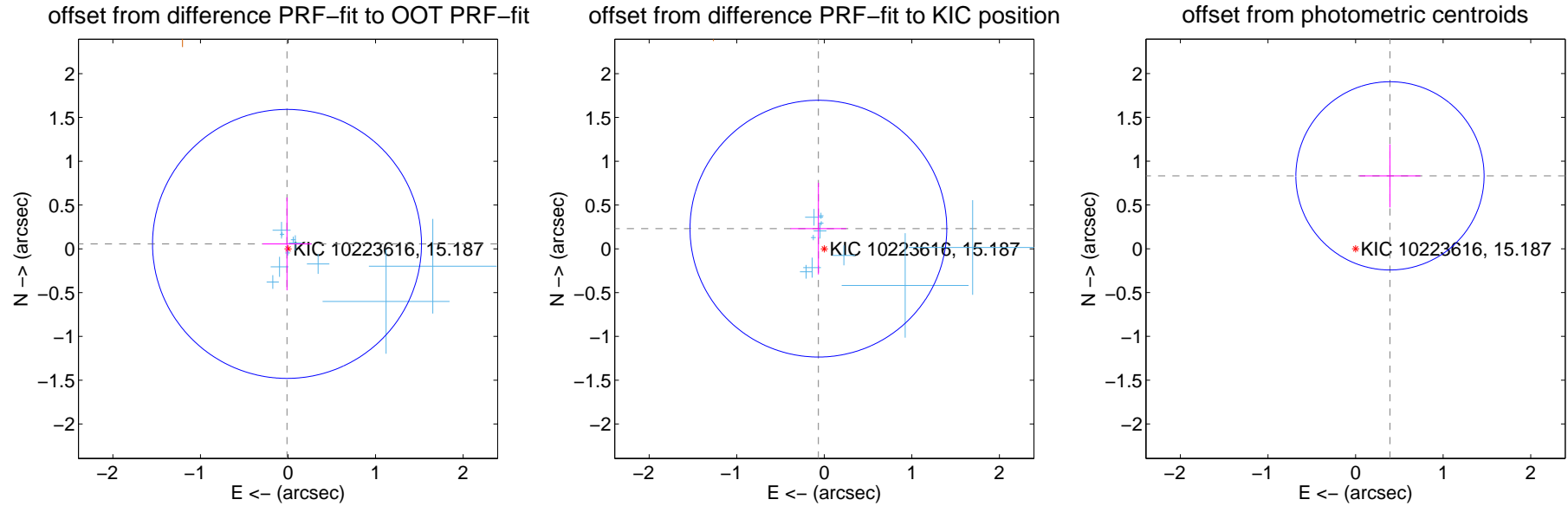
DV Centroid Data

Supplemental centroid analysis for 010223616-02. Kepler magnitude: 15.19. Transit SNR 20.45

There are 11 quarters with good PRF difference image offsets

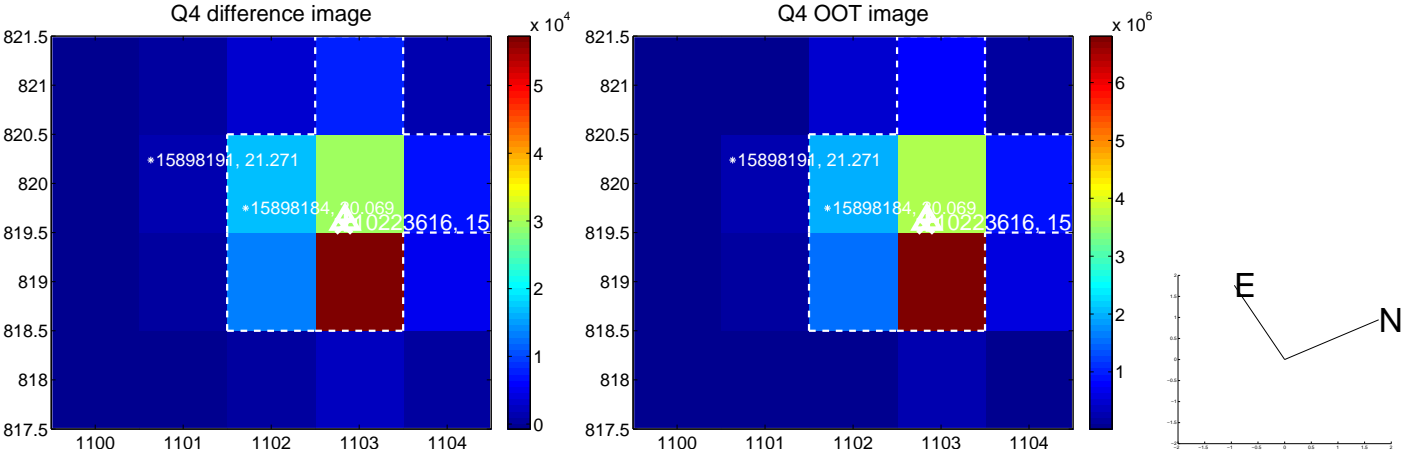
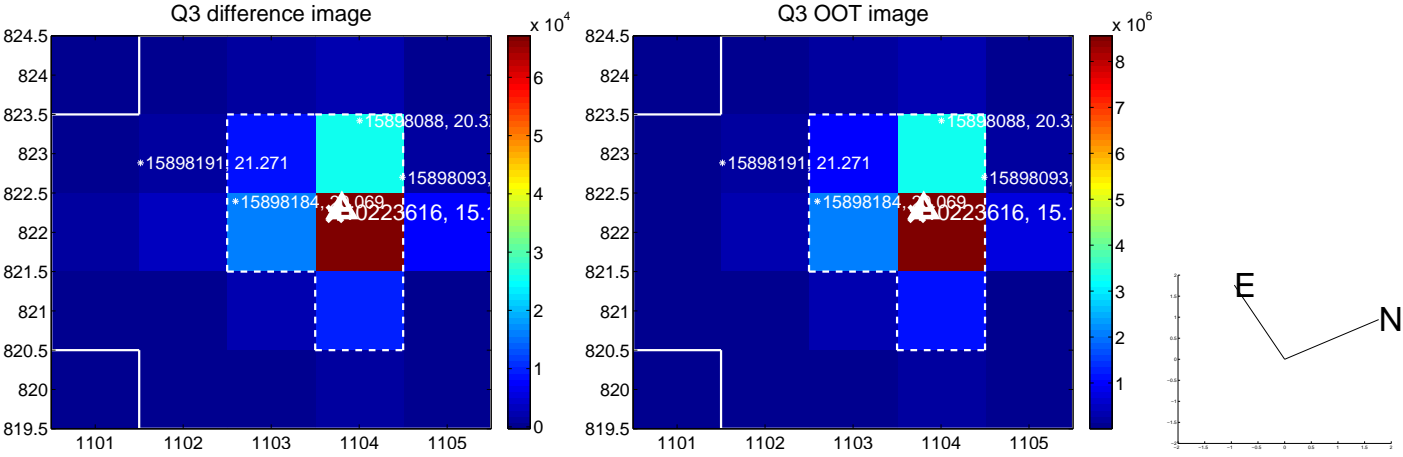
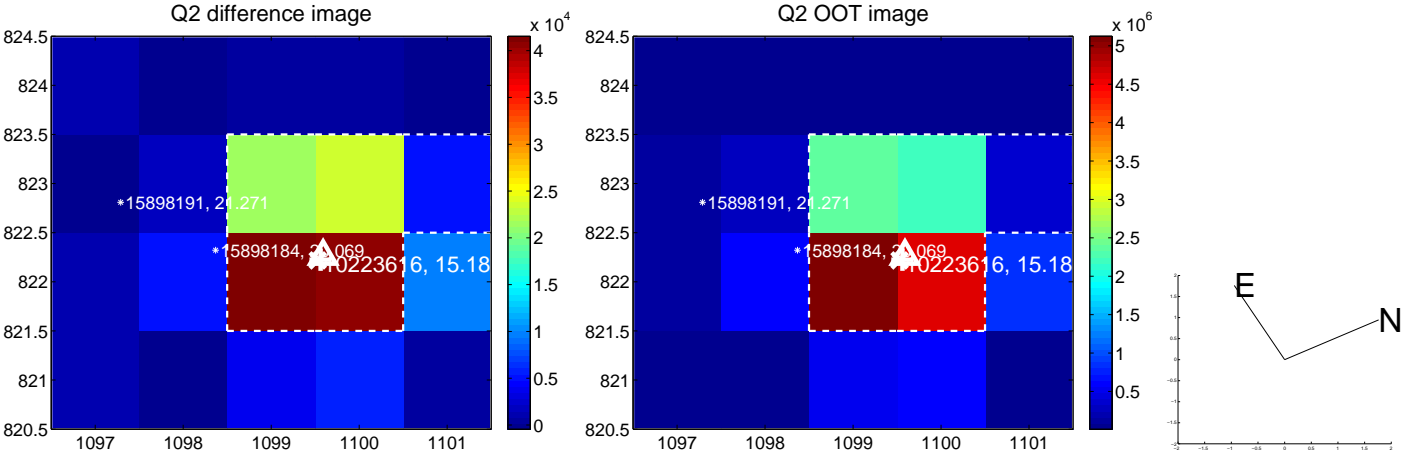
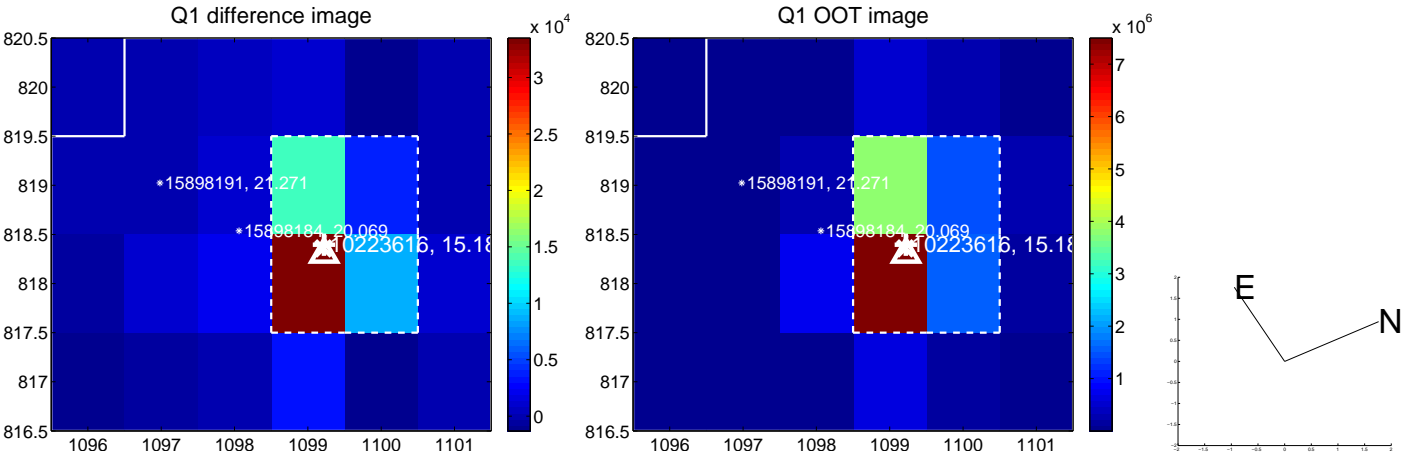
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.057 ± 0.512	0.11	0.012 ± 0.278	0.056 ± 0.530
PRF-fit source offset from KIC position	0.240 ± 0.489	0.49	0.067 ± 0.319	0.230 ± 0.523
photometric centroid source offset	0.92 ± 0.36	2.57	-0.39 ± 0.35	0.83 ± 0.36

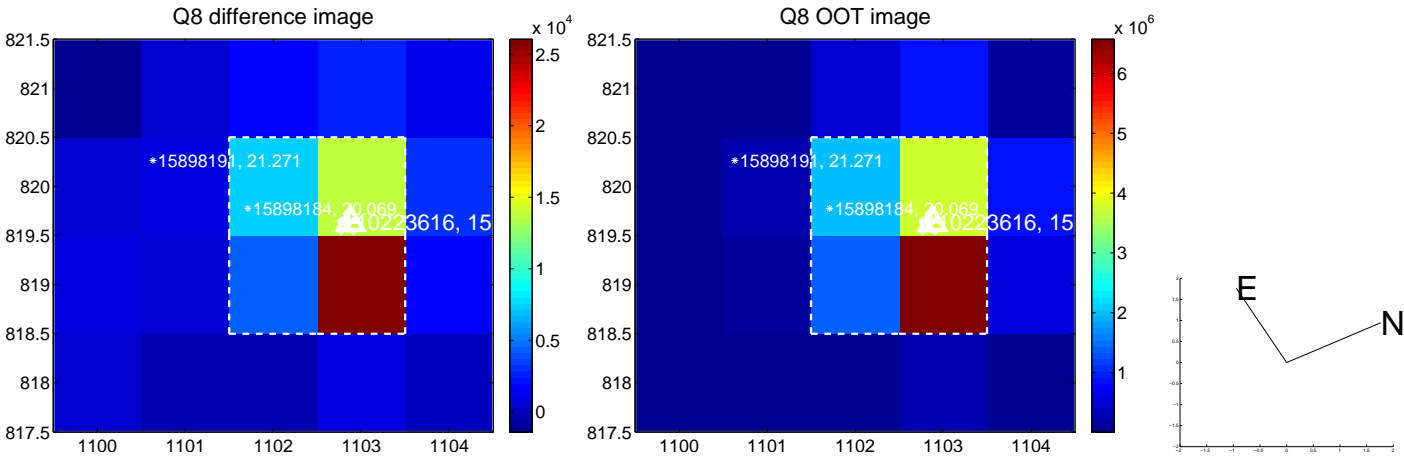
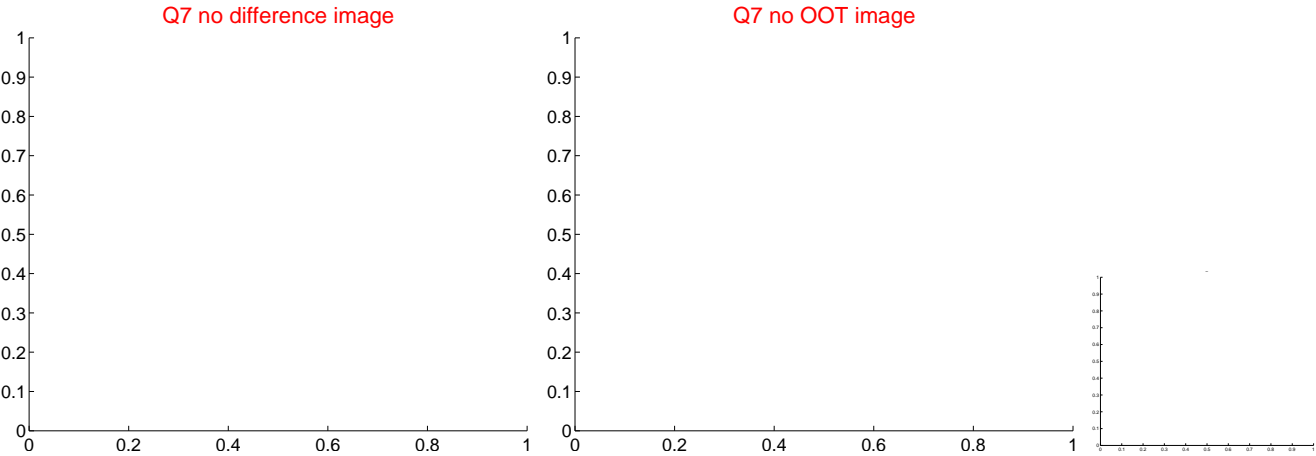
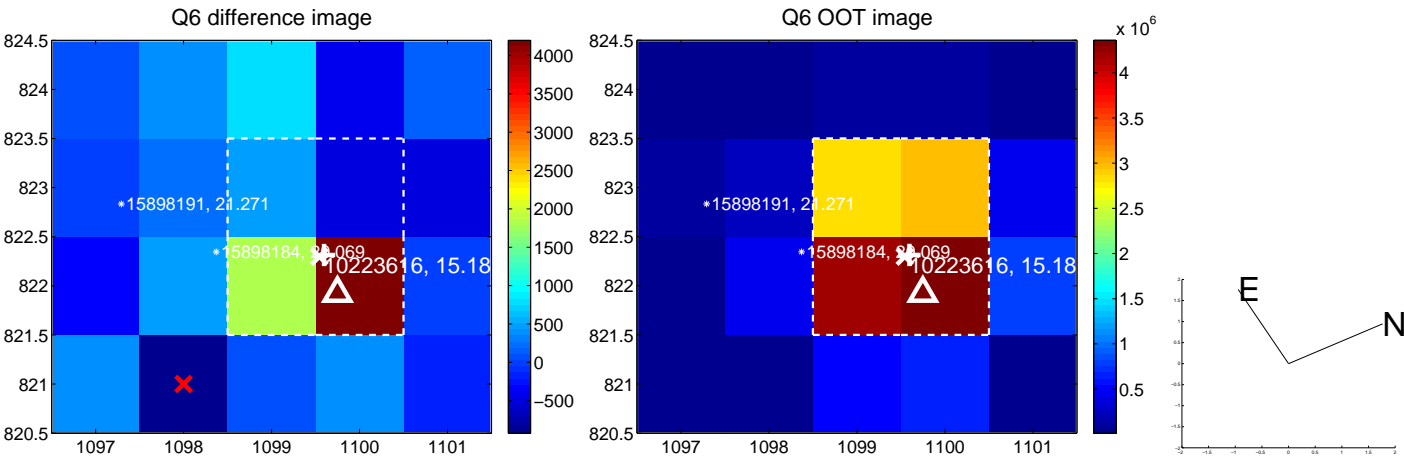
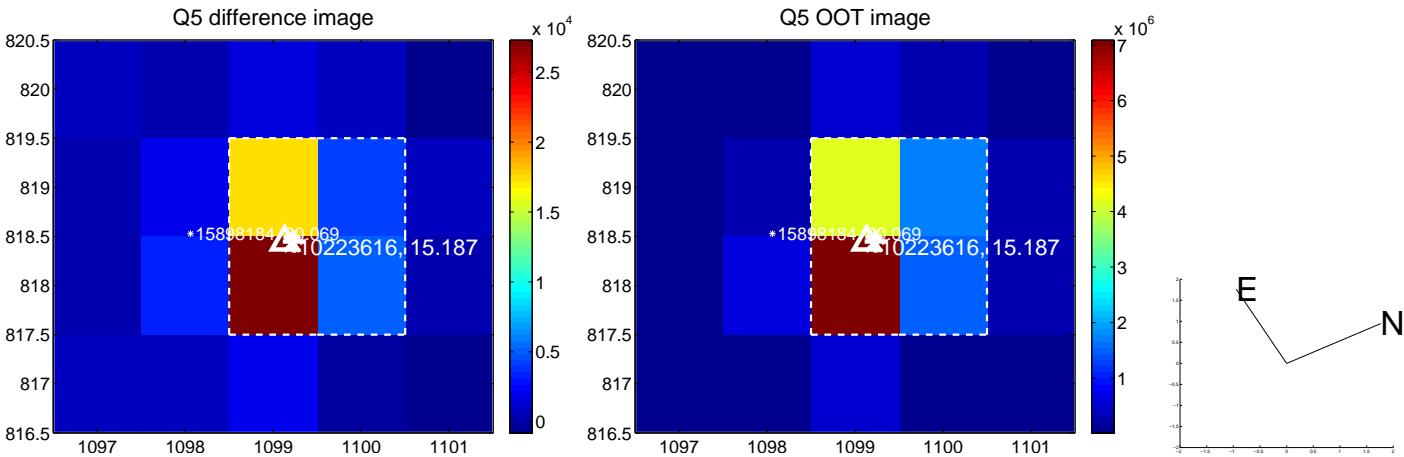


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

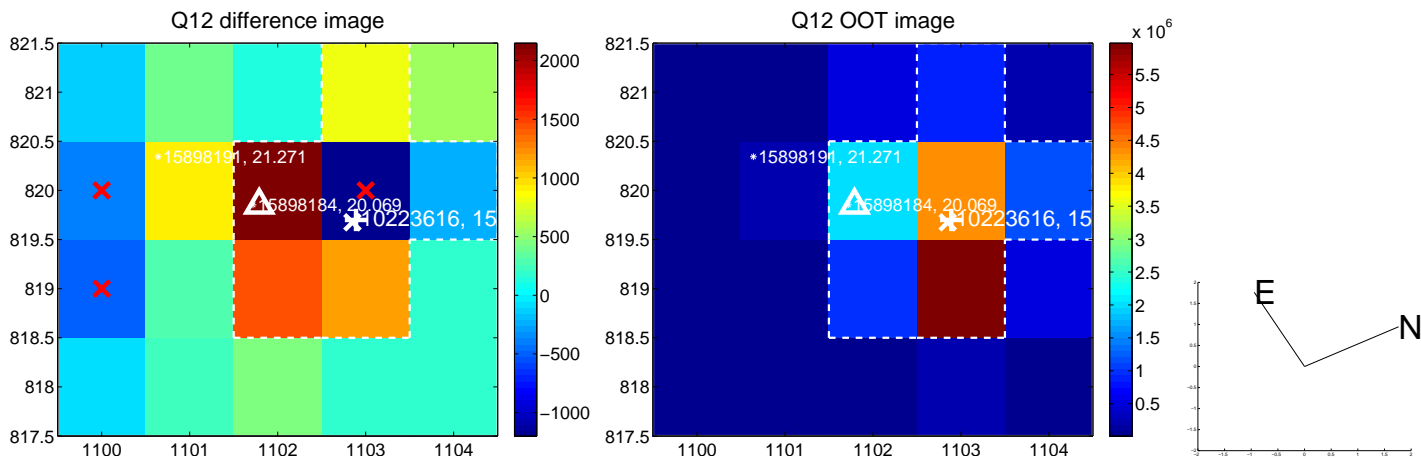
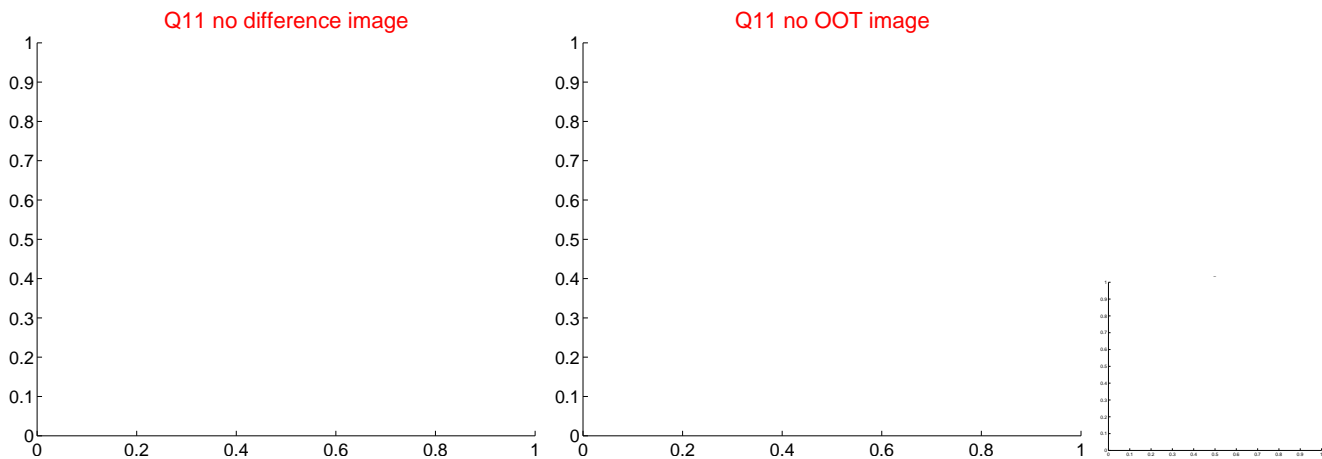
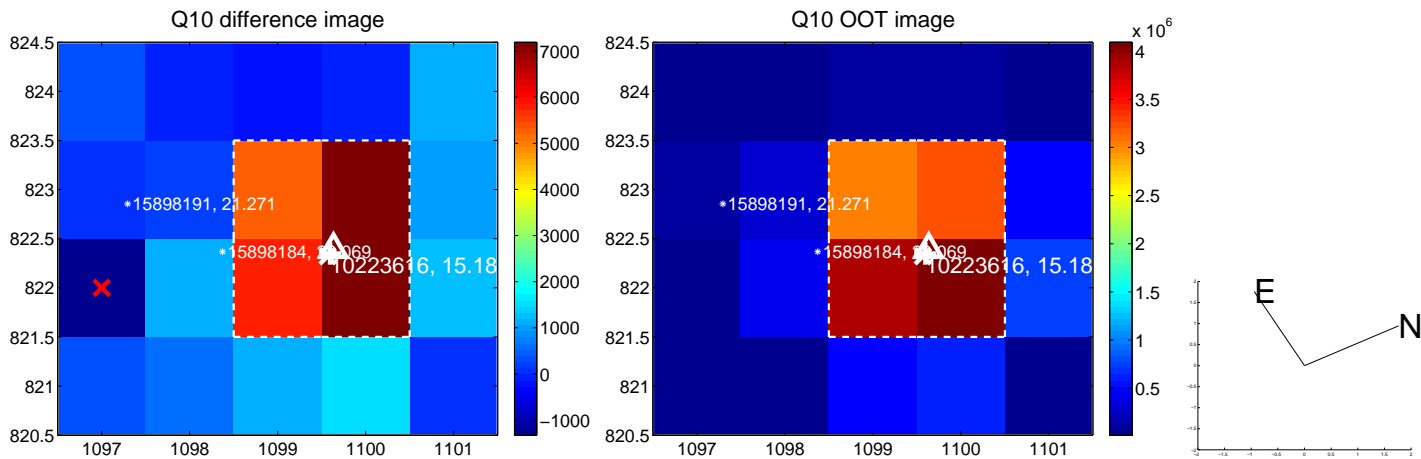
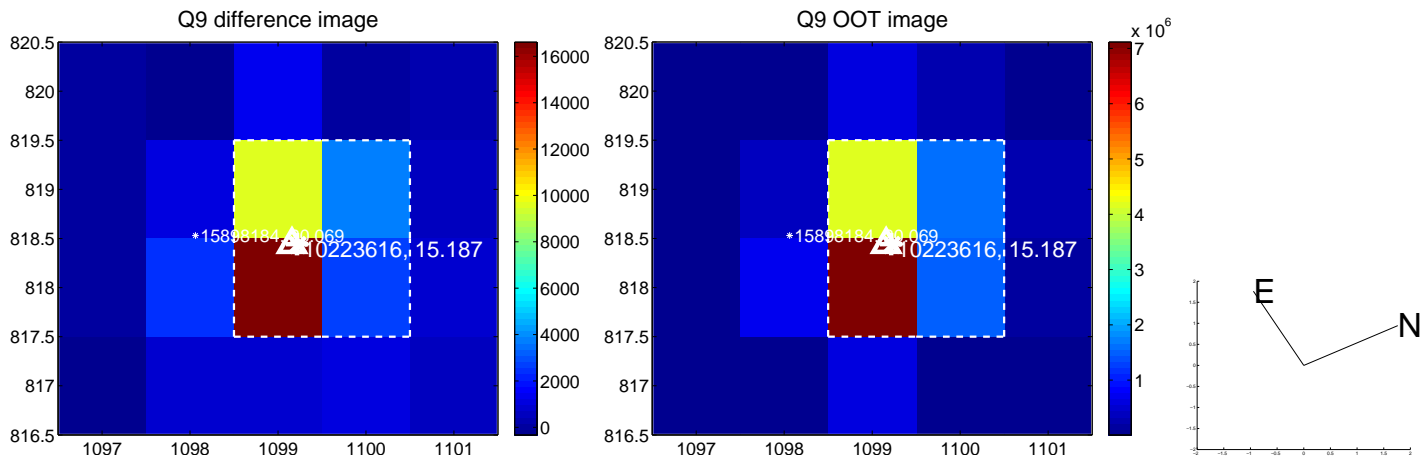
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



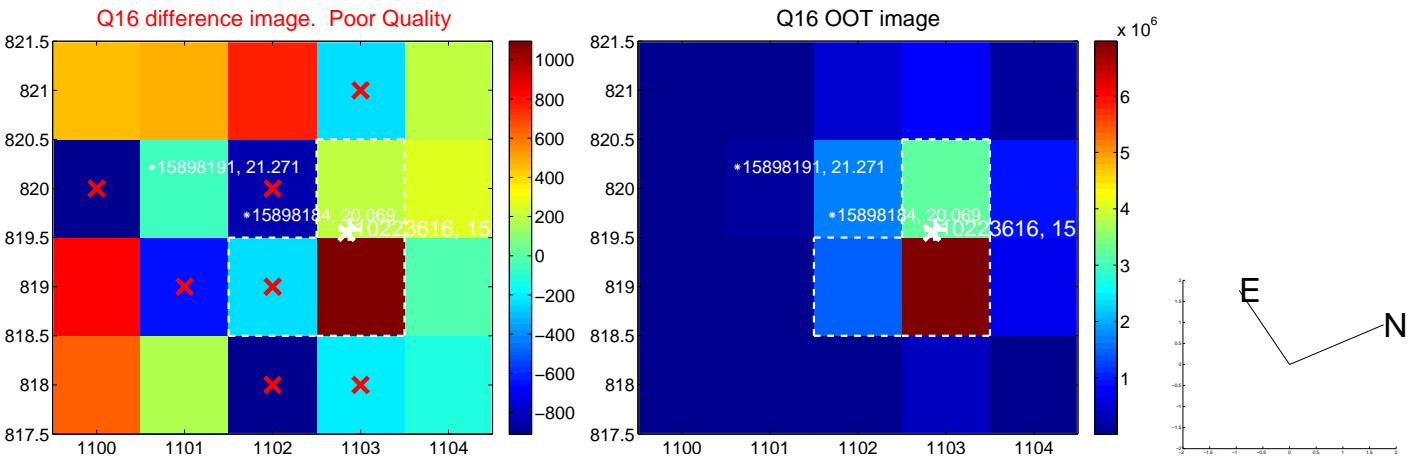
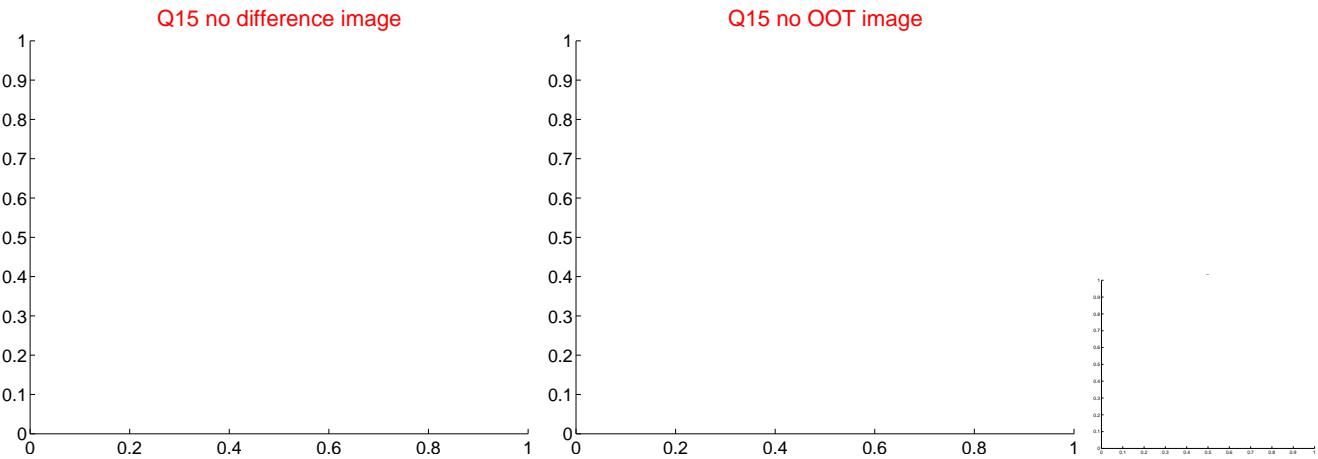
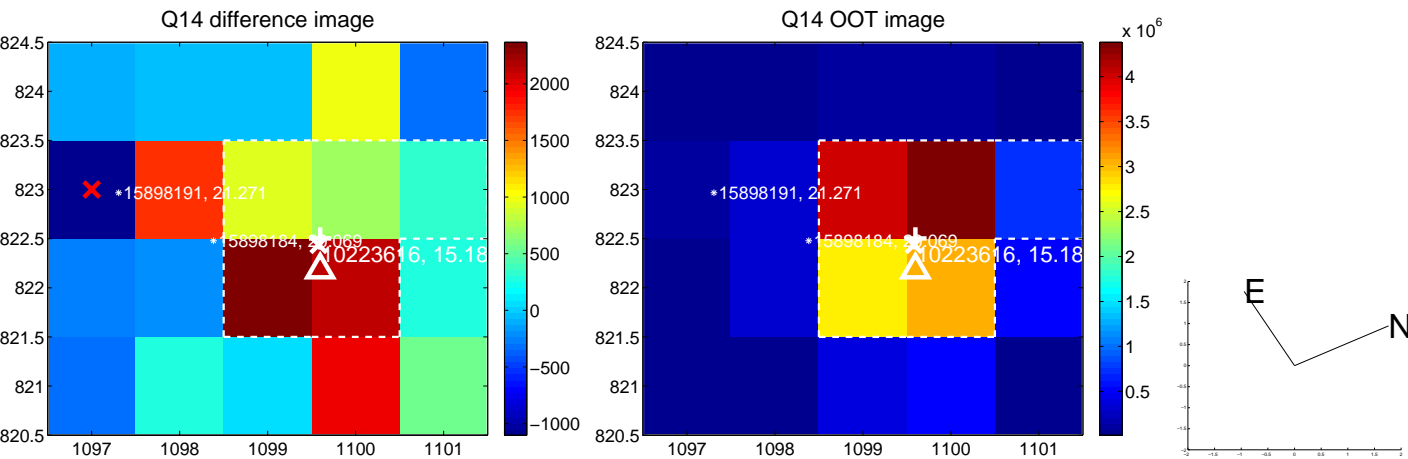
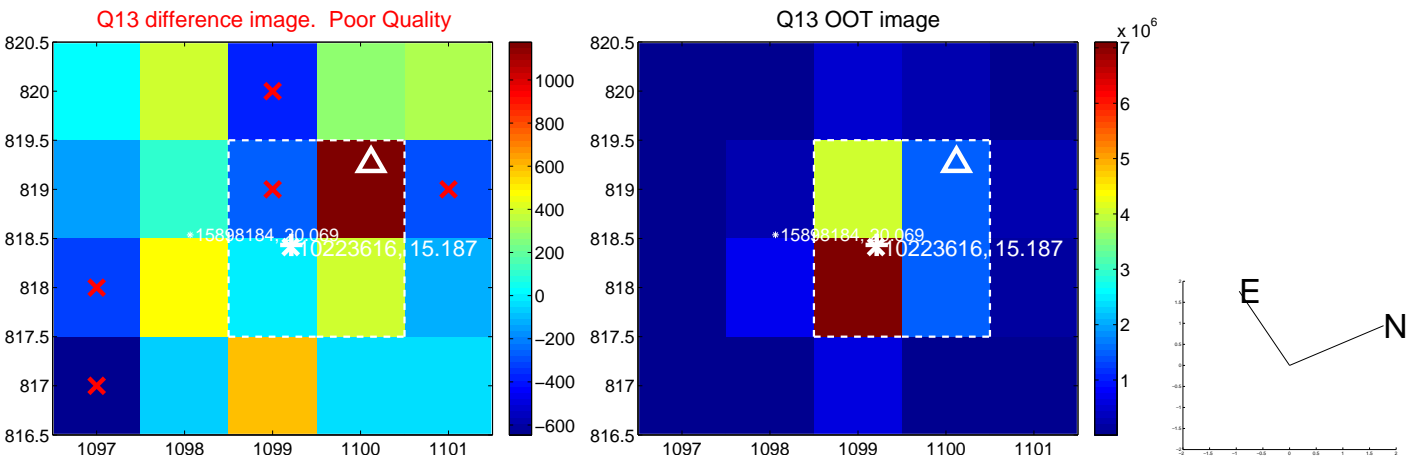
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



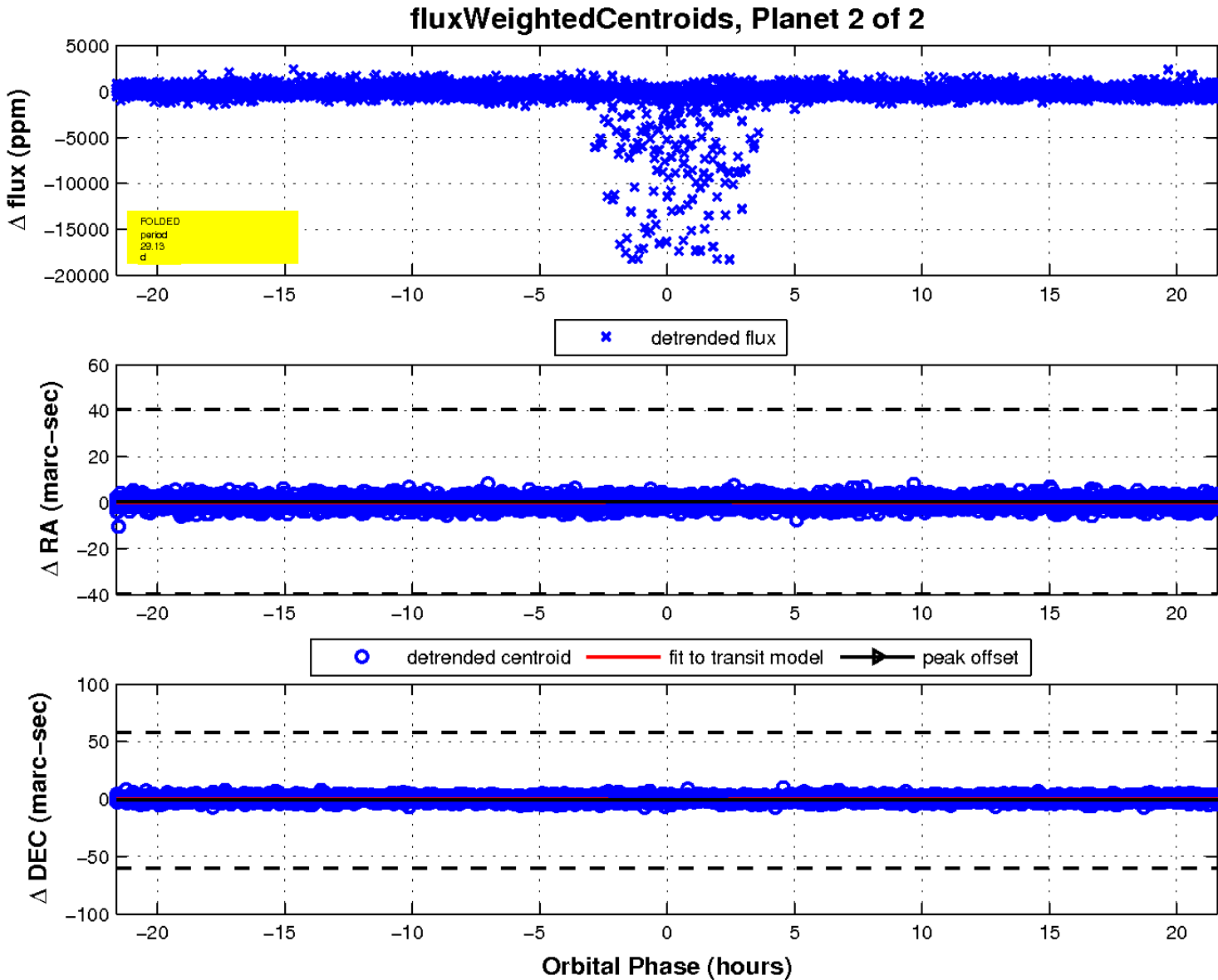
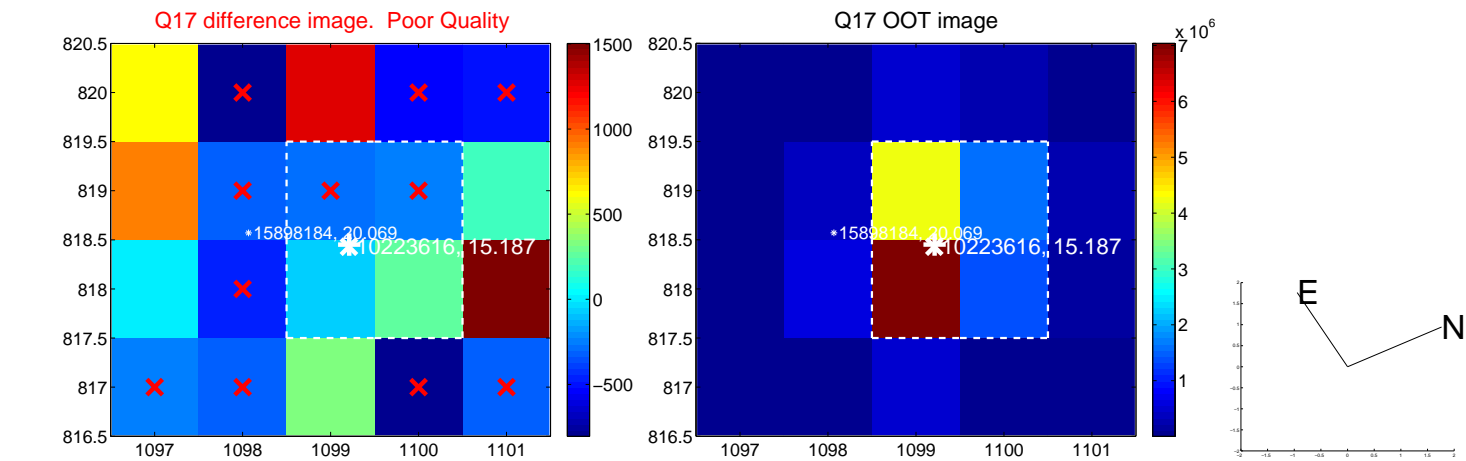
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UKIRT Image

Declination

