

KIC 007109675

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})
007109675-01	OBS	0872.01	33.601808	153.064534	7343.2	4.444	173.8	167.3	0.93	5149	8.19	14.24
007109675-02	OBS	0872.02	6.766523	138.062849	359.6	3.056	16.8	19.0	0.93	5149	2.18	120.68

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007109675-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007109675-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

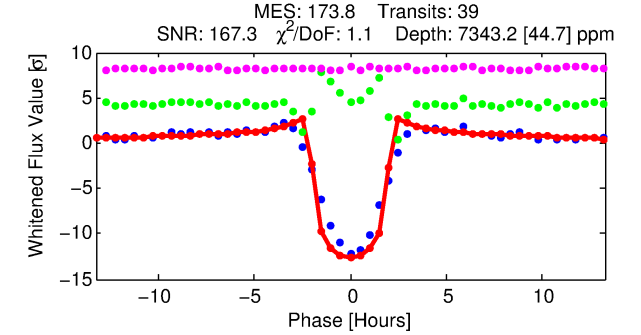
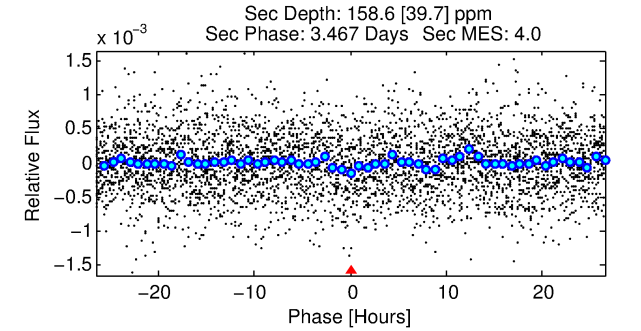
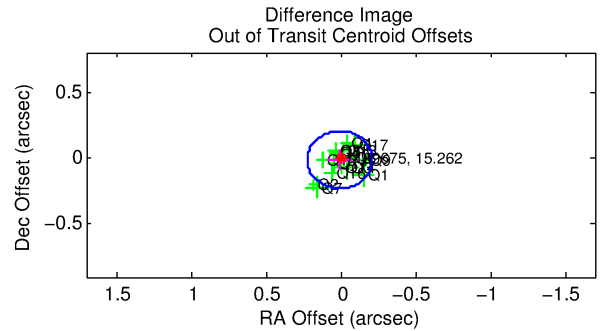
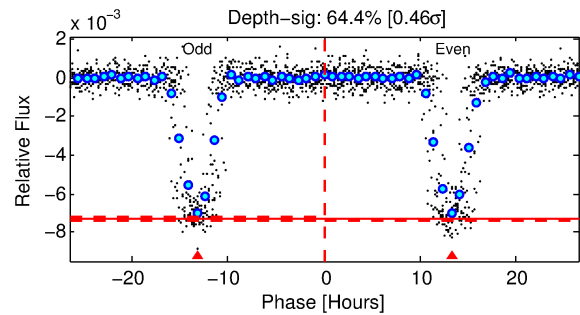
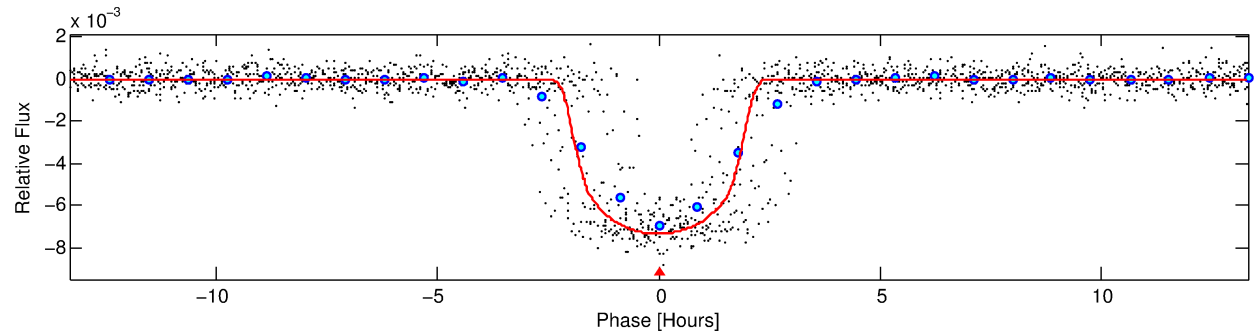
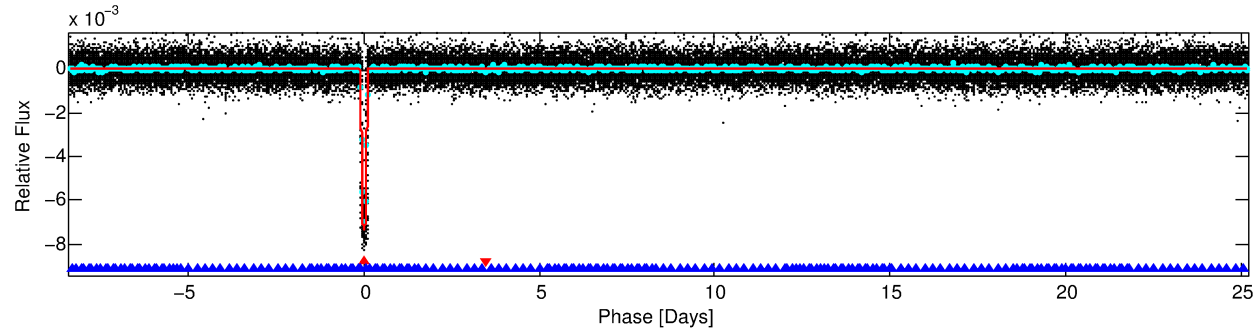
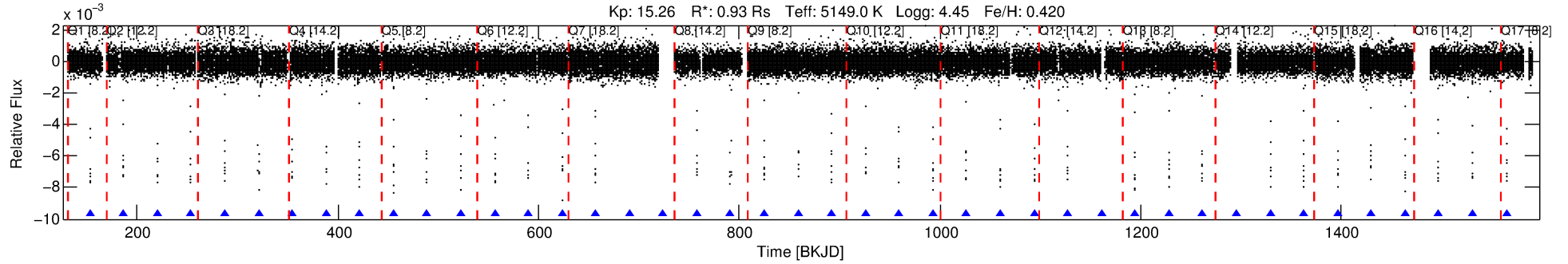
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007109675-01

No Significant Match Found

DV One-Page Summary

KIC: 7109675 Candidate: 1 of 2 Period: 33.602 d
KOI: K00872.01 Name: Kepler-46b Corr: 0.965



DV Fit Results:

Period = 33.60181 [0.00002] d
Epoch = 153.0645 [0.0005] BKJD
Rp/R* = 0.0807 [0.0016]
a/R* = 52.69 [3.32]
b = 0.58 [0.07]
Seff = 14.24 [1.81]
Teff = 495 [16] K
Rp = 8.19 [0.51] Re
a = 0.1956 [0.0112] AU
Ag = 49.73 [13.42] [3.63 σ]
Teffp = 2034 [137] K [11.19 σ]

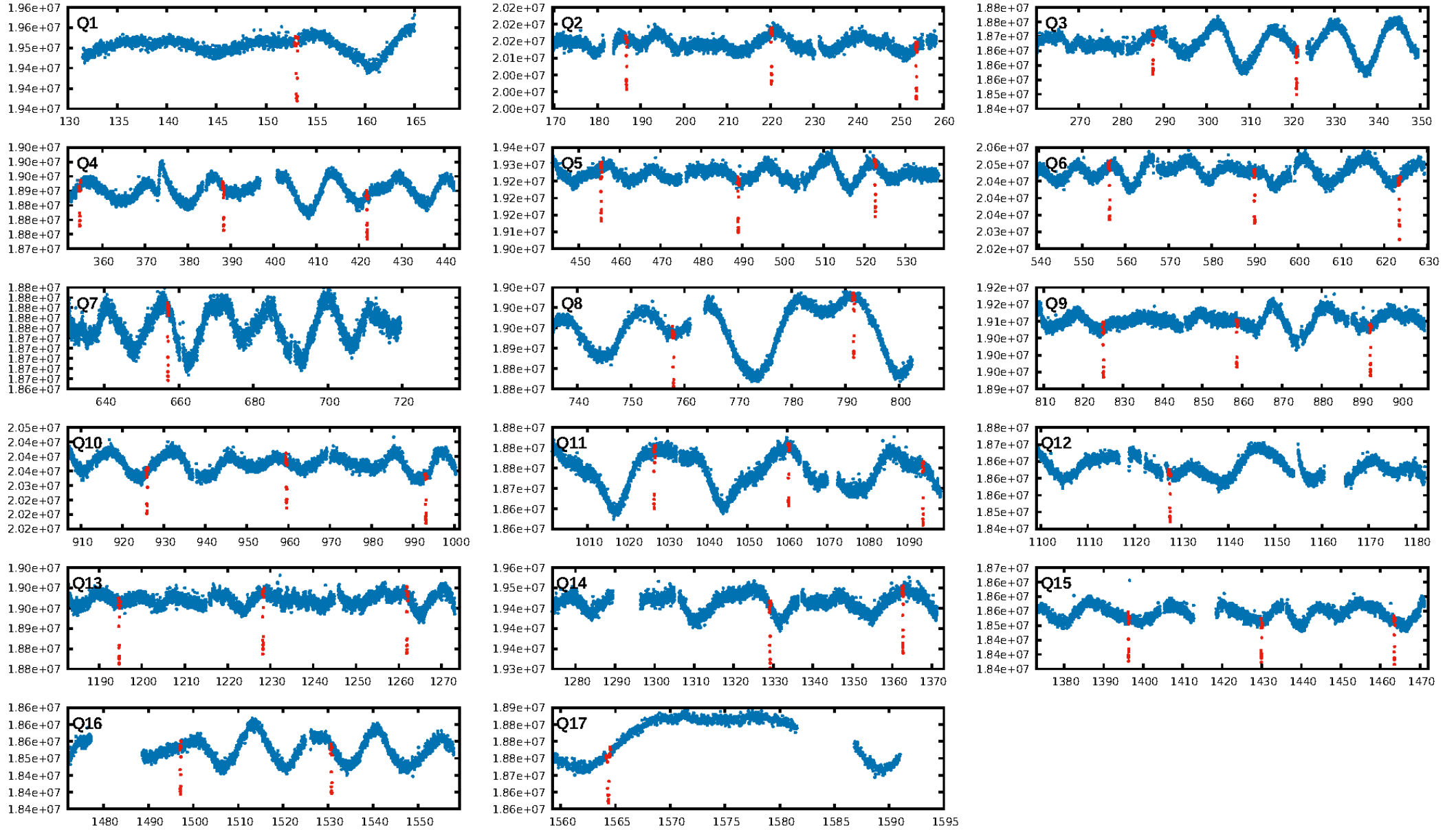
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [119.42 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 89.9%
ModelChiSquareGof-sig: 99.6%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [37/37]
GhostDiagnostic-chr: 3.542
Centroid-sig: 33.0%
Centroid-so: 0.162 arcsec [2.97 σ]
OotOffset-rm: 0.015 arcsec [0.21 σ]
KicOffset-rm: 0.099 arcsec [1.41 σ]
OotOffset-st: 4/4/3/5 [16]
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DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 0.88 [14/16]

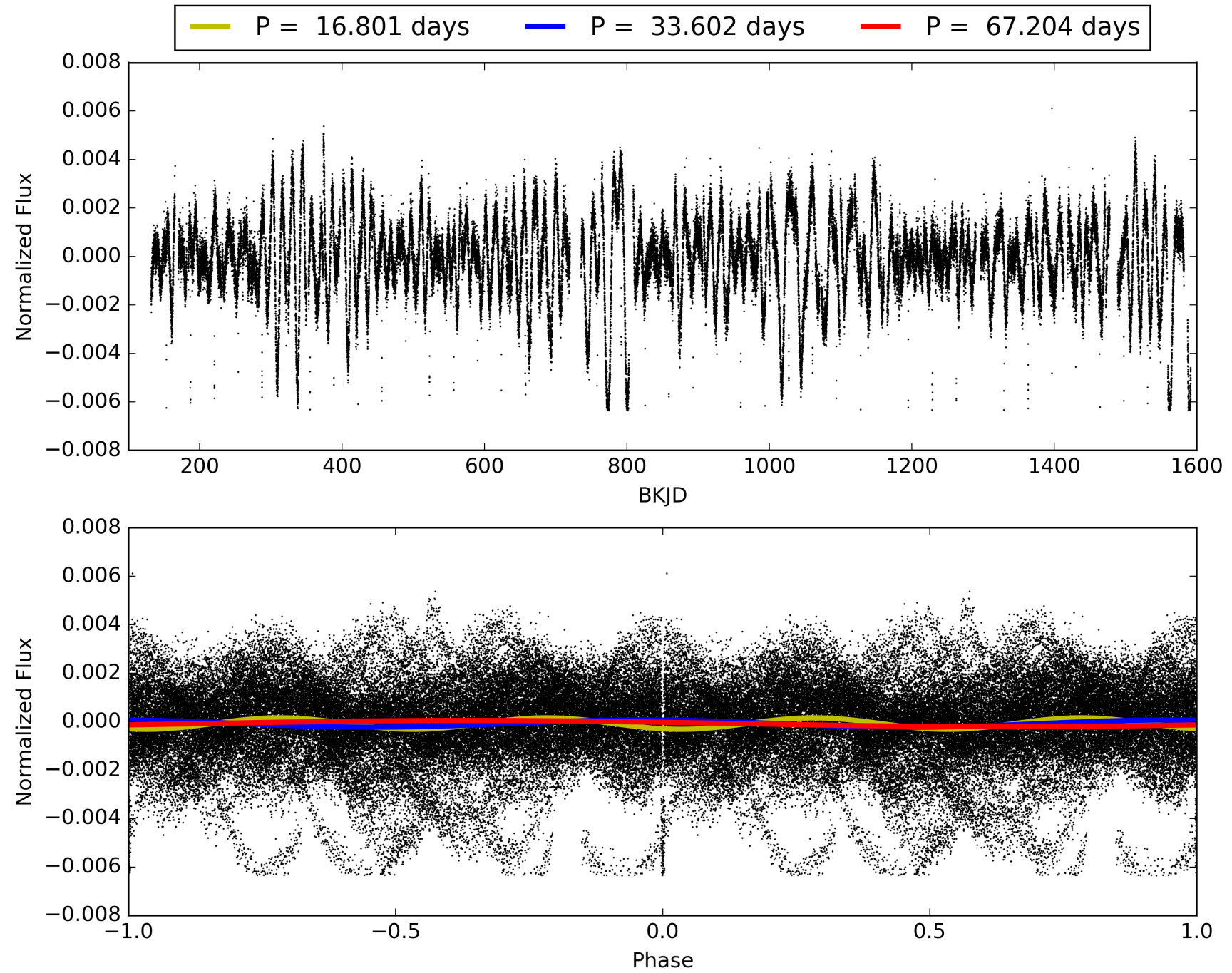
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 007109675-01, PDC Light Curves

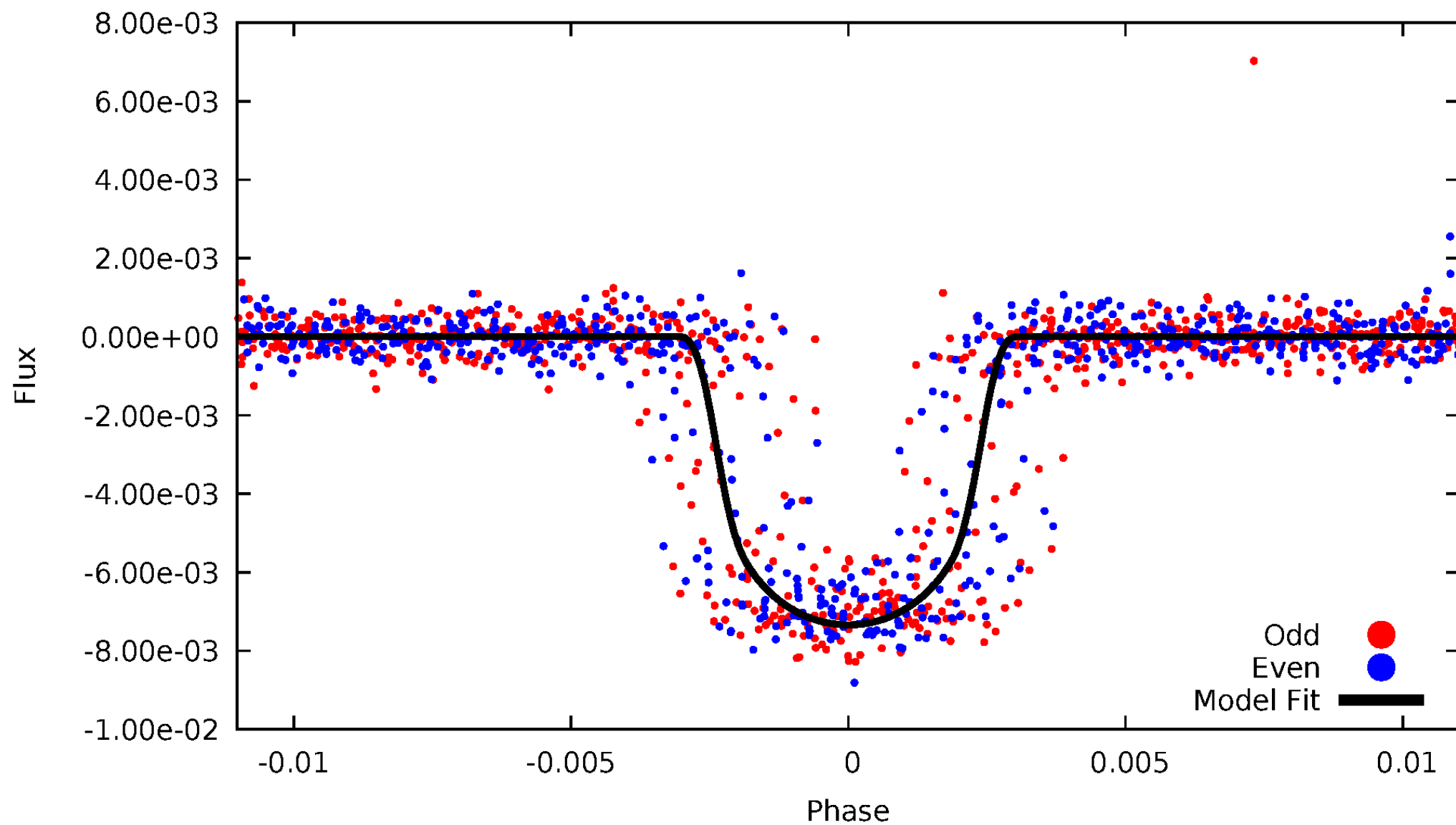


TCE 007109675-01



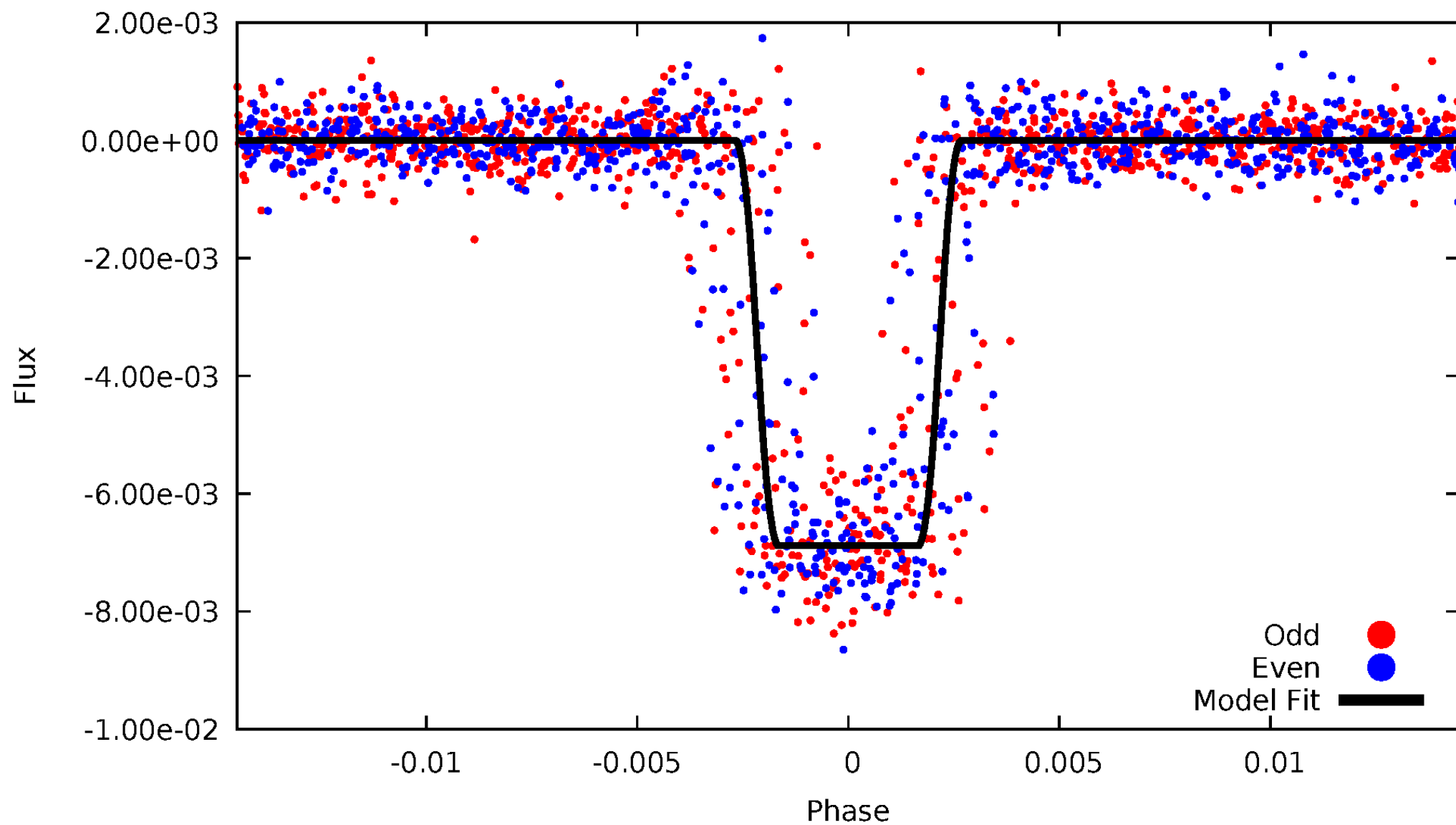
DV Odd/Even

TCE 007109675-01

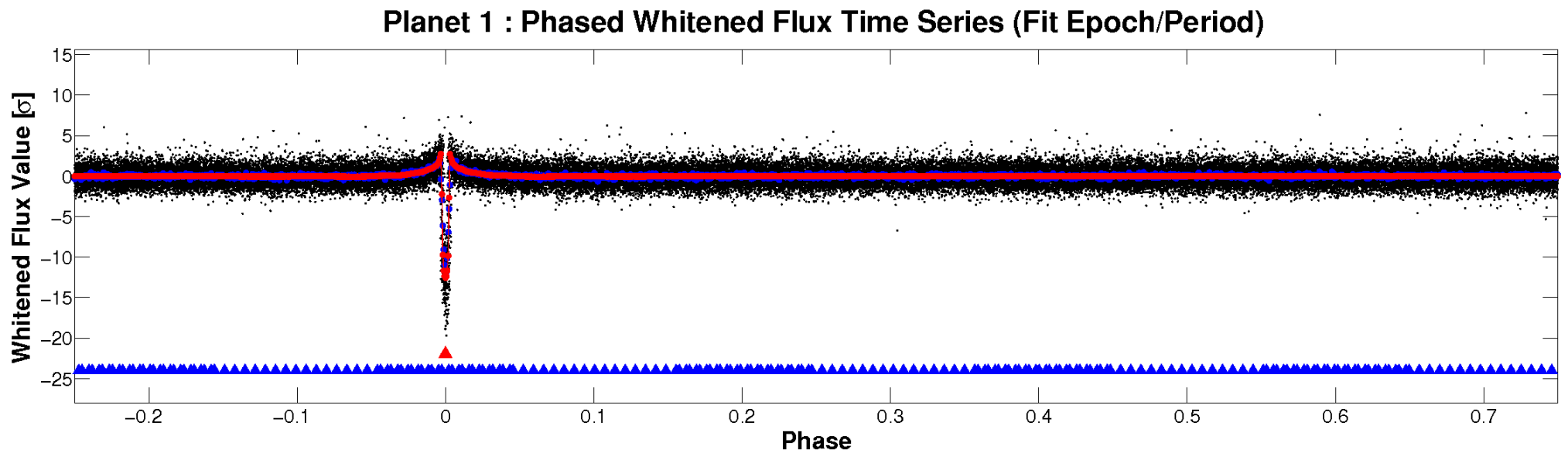
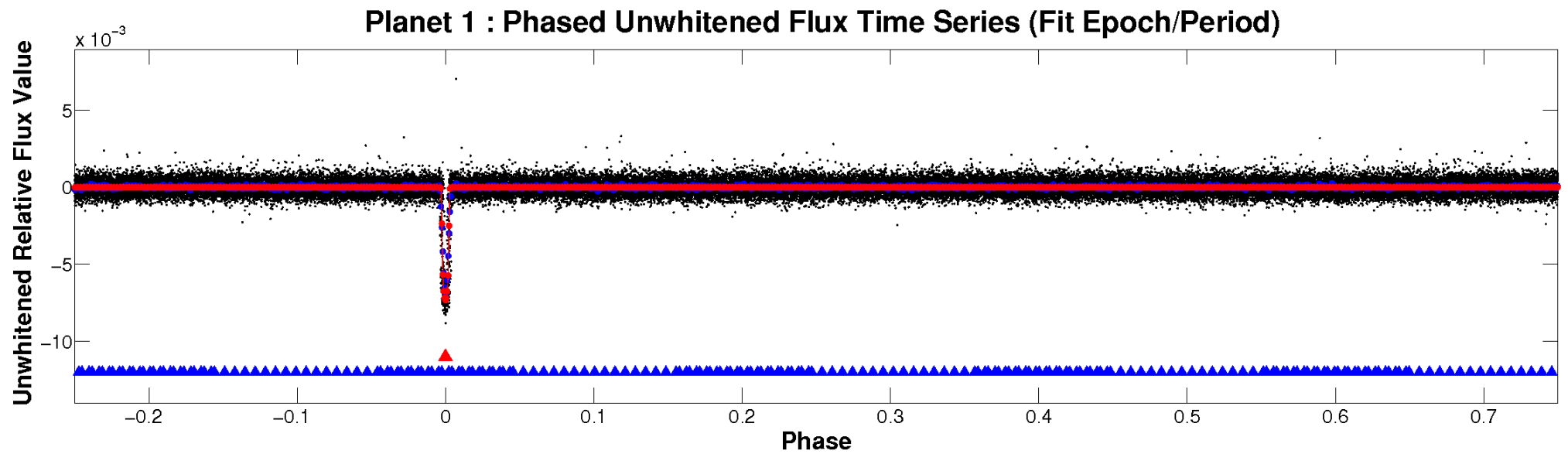


ALT Odd/Even

TCE 007109675-01

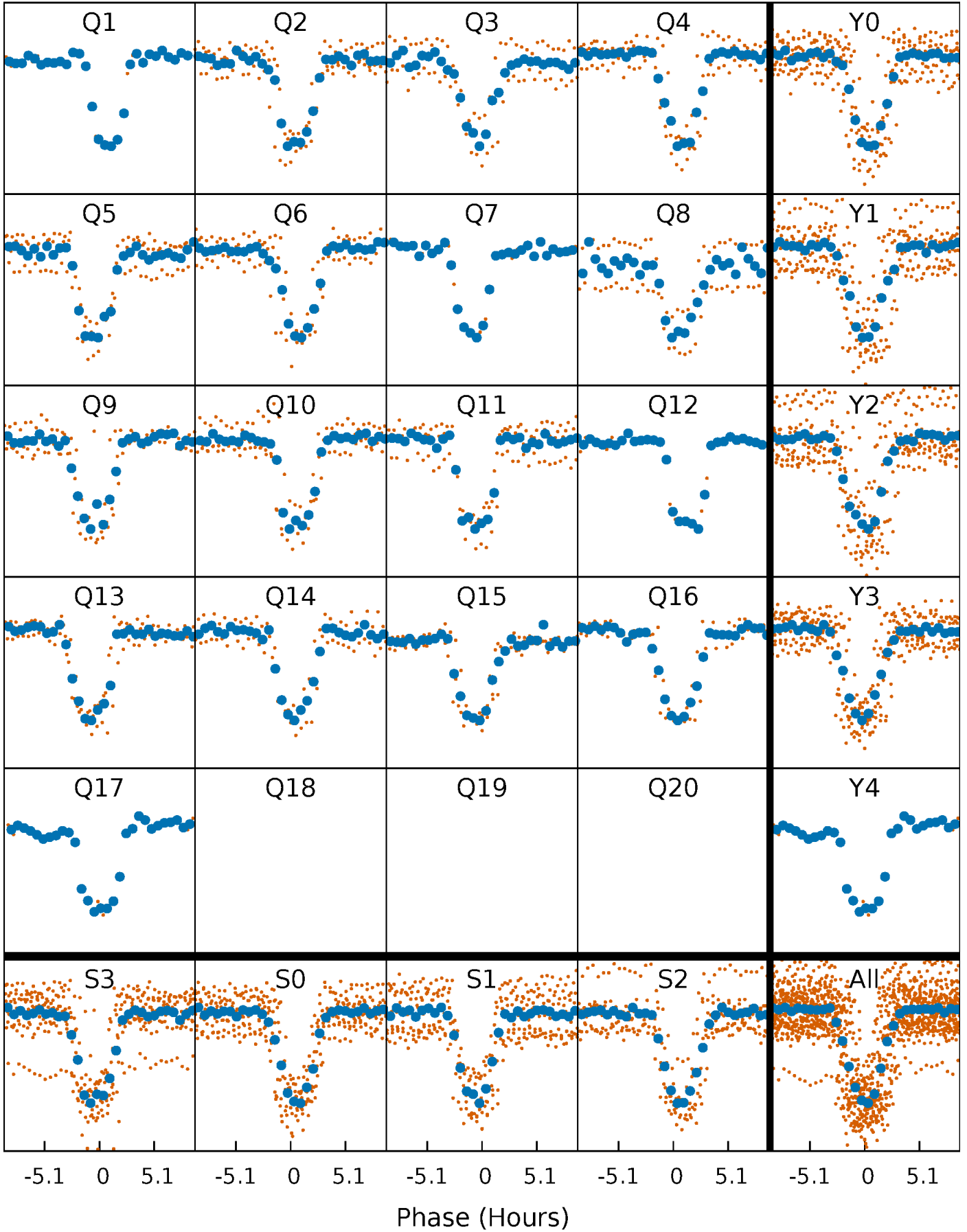


Non-Whitened Vs. Whitened Light Curve



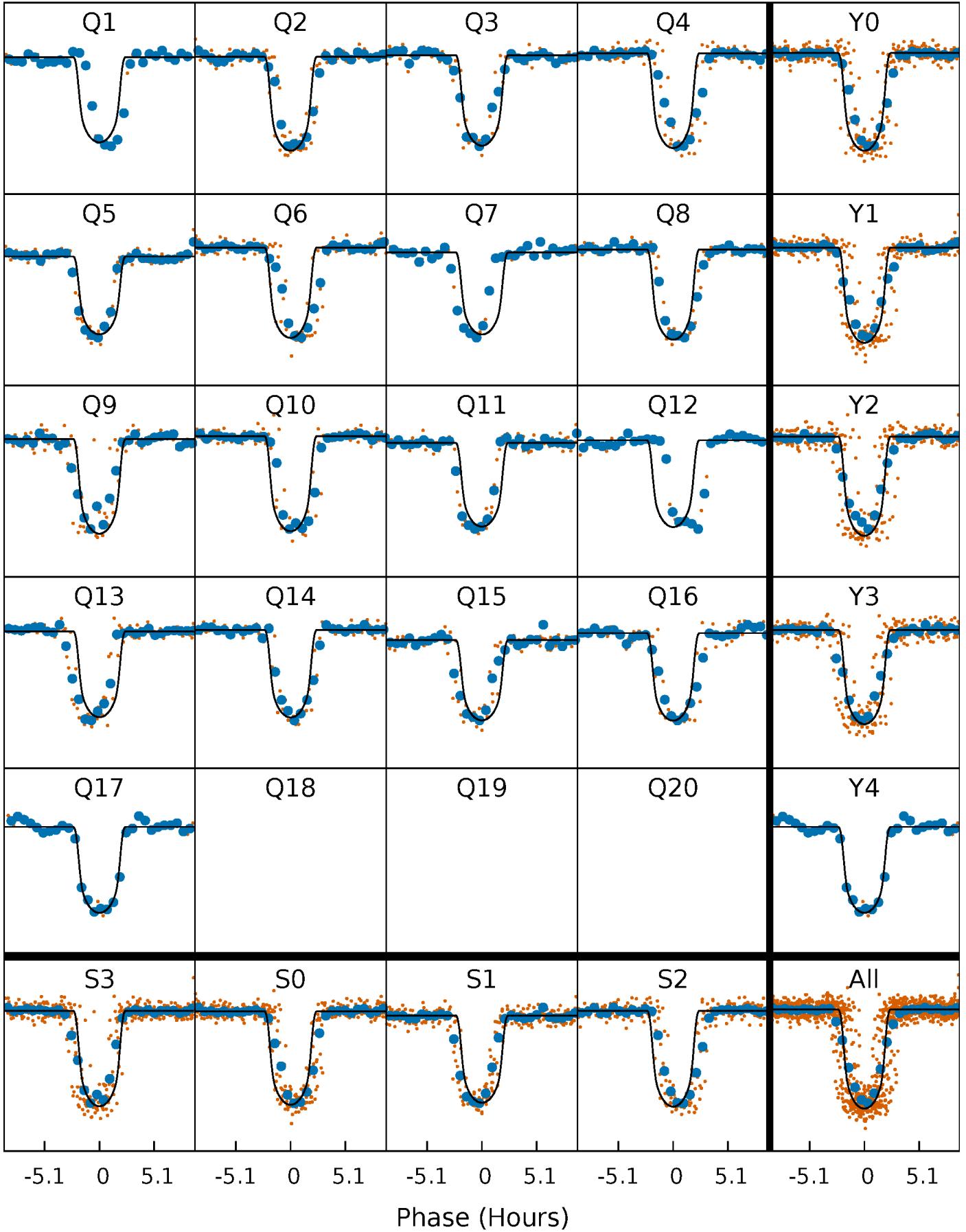
PDC Quarter-Phased Transit Curves

TCE 007109675-01 P= 33.601808 Days $T_0=153.064534$ (BKJD)



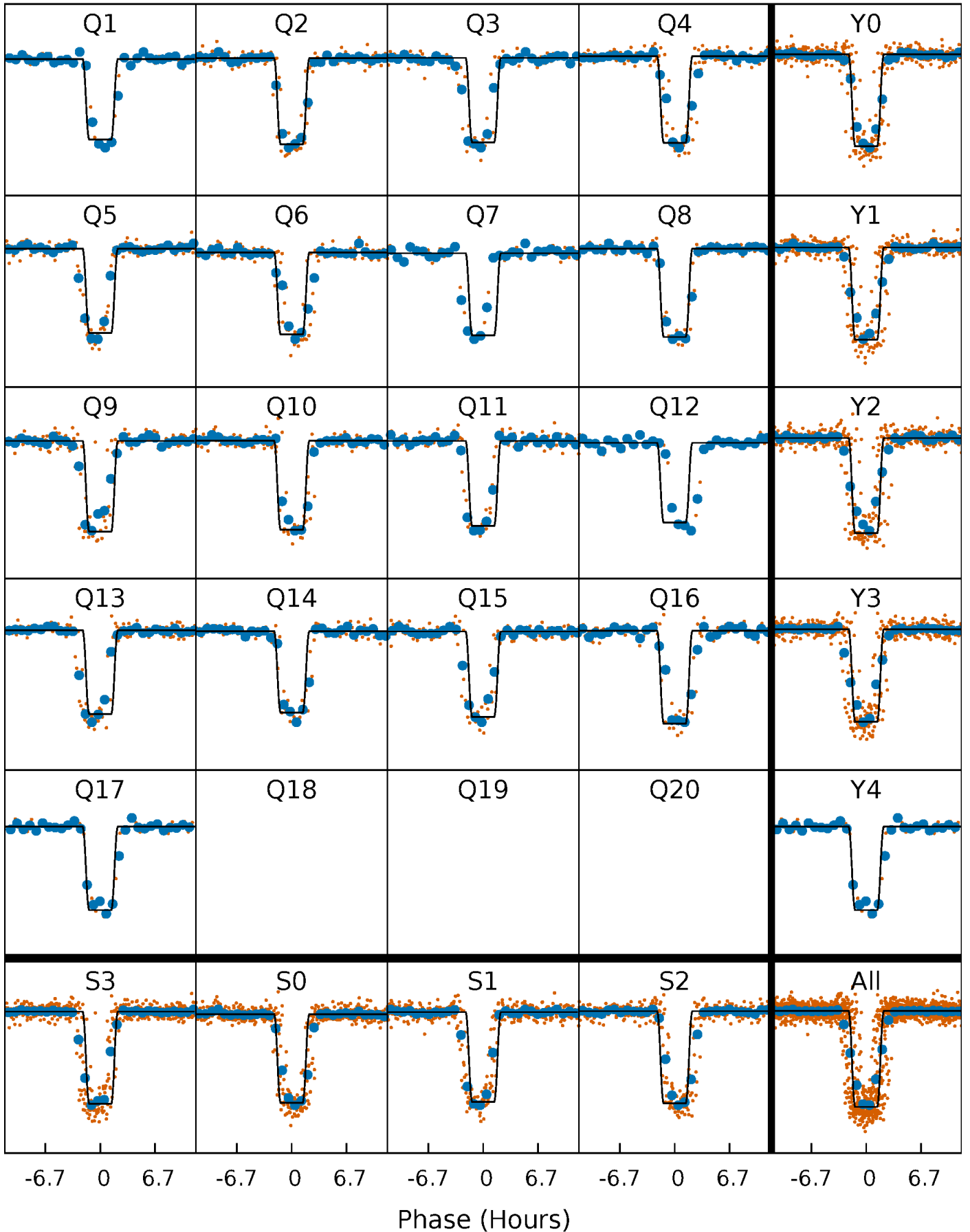
DV Quarter-Phased Transit Curves

TCE 007109675-01 P= 33.601808 Days $T_0=153.064534$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

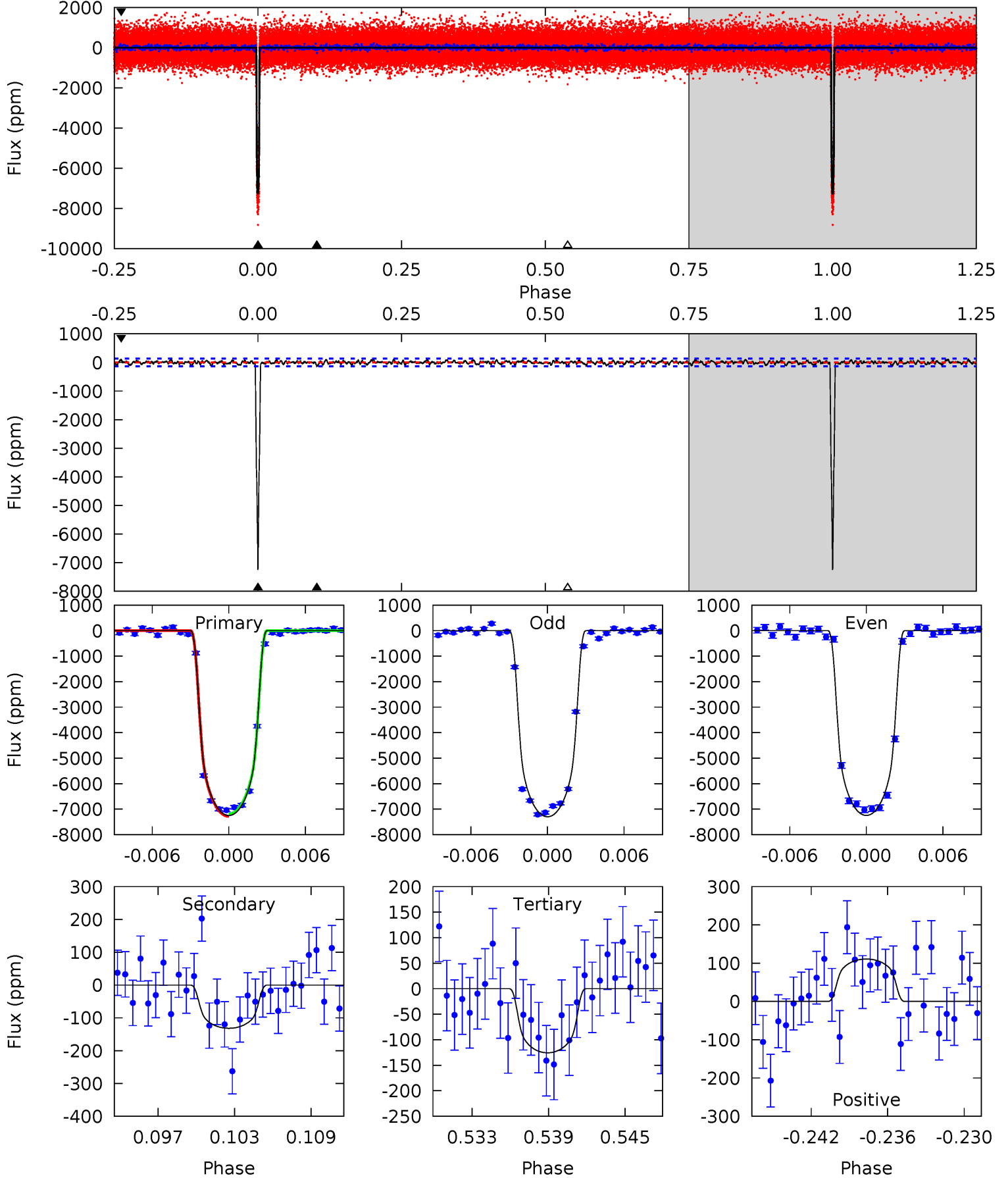
TCE 007109675-01 P= 33.601387 Days $T_0=153.078138$ (BKJD)



DV Model-Shift Uniqueness Test

007109675-01, $P = 33.601808$ Days, $E = 119.462726$ Days

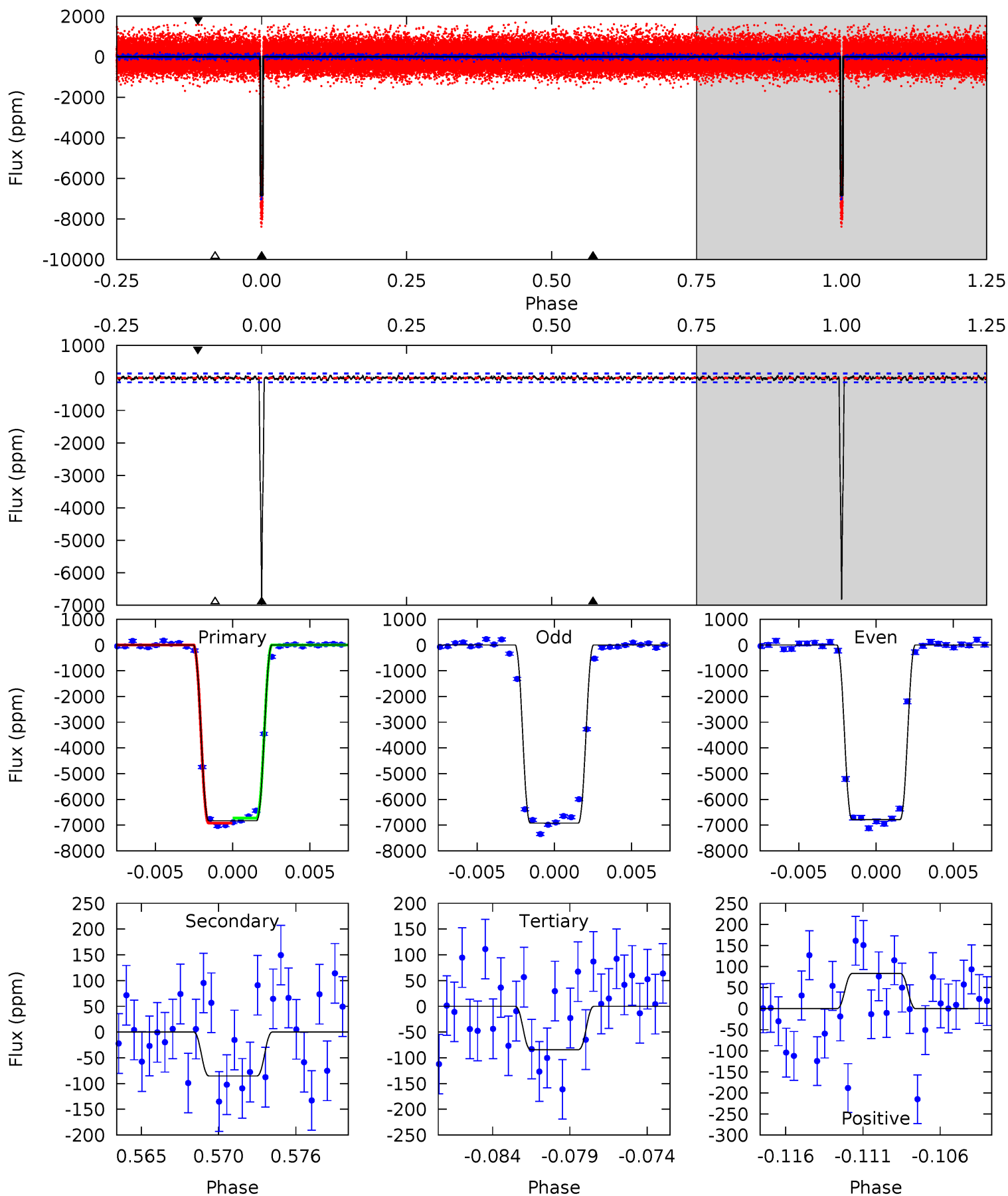
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
271.6	4.94	4.71	4.16	5.12	2.74	1.47	266.9	267.5	0.23	0.78	0.97	0.96	0.02	1.60



Alt Model-Shift Uniqueness Test

007109675-01, P = 33.601387 Days, E = 119.476751 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
258.3	3.23	3.18	3.16	5.15	2.79	1.04	255.1	255.1	0.05	0.07	2.59	0.97	0.01	3.67



Stellar Parameters For KIC 007109675

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5149^{+113}_{-82}	$4.447^{+0.054}_{-0.036}$	$0.420^{+0.050}_{-0.150}$	$0.930^{+0.044}_{-0.055}$	$0.882^{+0.040}_{-0.029}$	$1.546^{+0.305}_{-0.175}$
	+2%/-2%	+1%/-1%	+12%/-36%	+5%/-6%	+5%/-3%	+20%/-11%
Source	SPE44	TRA44	SPE44	DSEP		

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

Secondary Eclipse Parameters for KIC 007109675-01 / KOI 0872.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-132 ± 27	$8.16^{+0.30}_{-0.35}$	691^{+17}_{-18}	2699^{+78}_{-79}	42^{+9}_{-9}
Alt.	-85 ± 26	$8.41^{+0.31}_{-0.33}$	693^{+17}_{-17}	2536^{+105}_{-126}	26^{+9}_{-9}

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

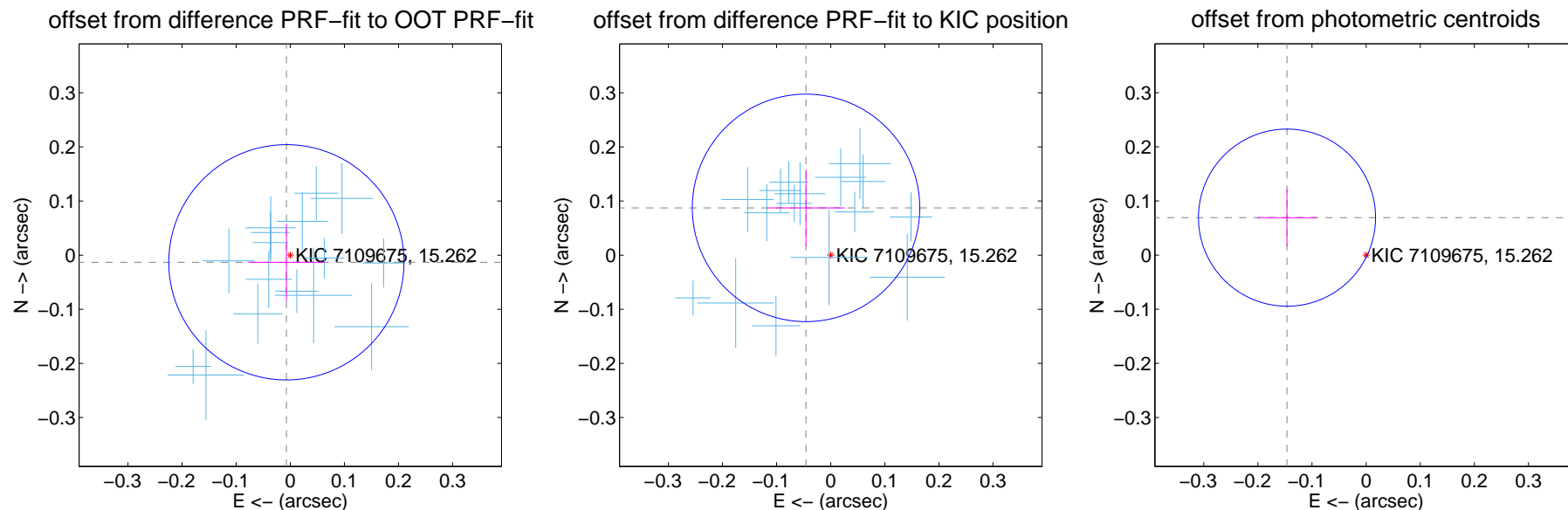
DV Centroid Data

Supplemental centroid analysis for 007109675-01. Kepler magnitude: 15.26. Transit SNR 167.31

There are 16 quarters with good PRF difference image offsets

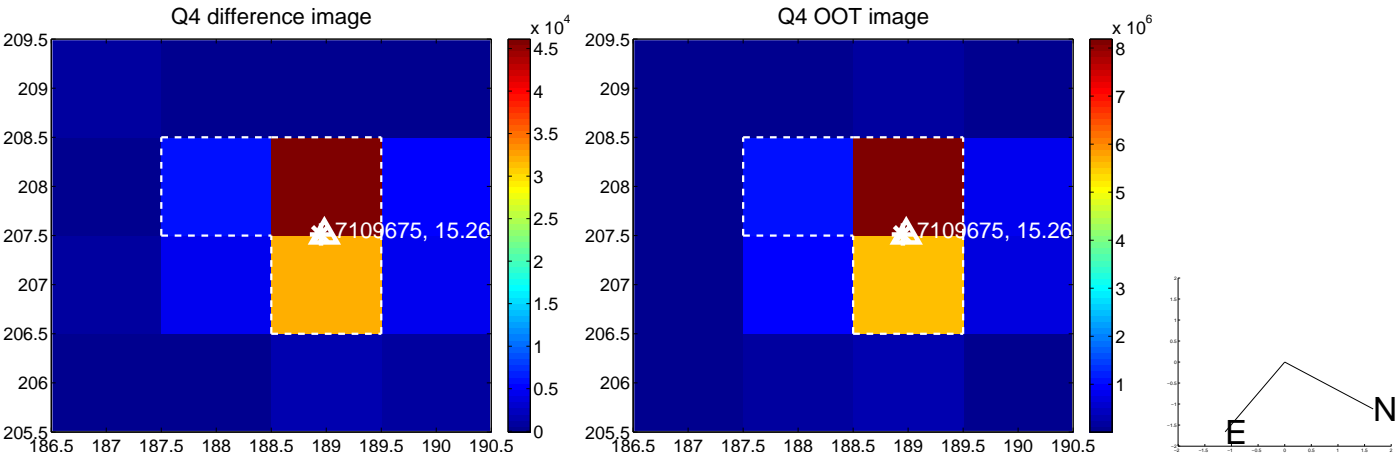
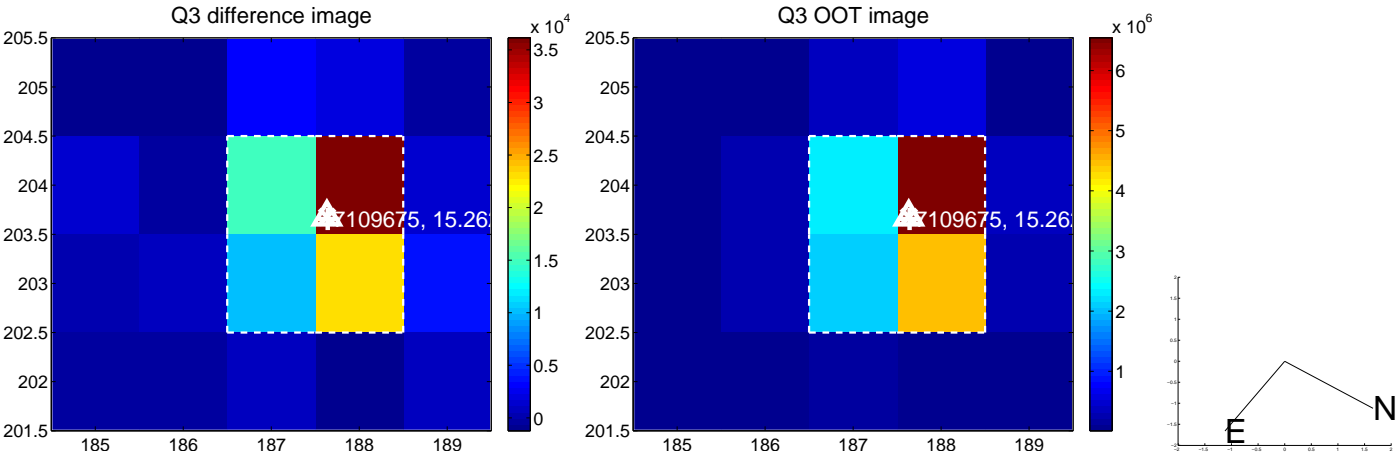
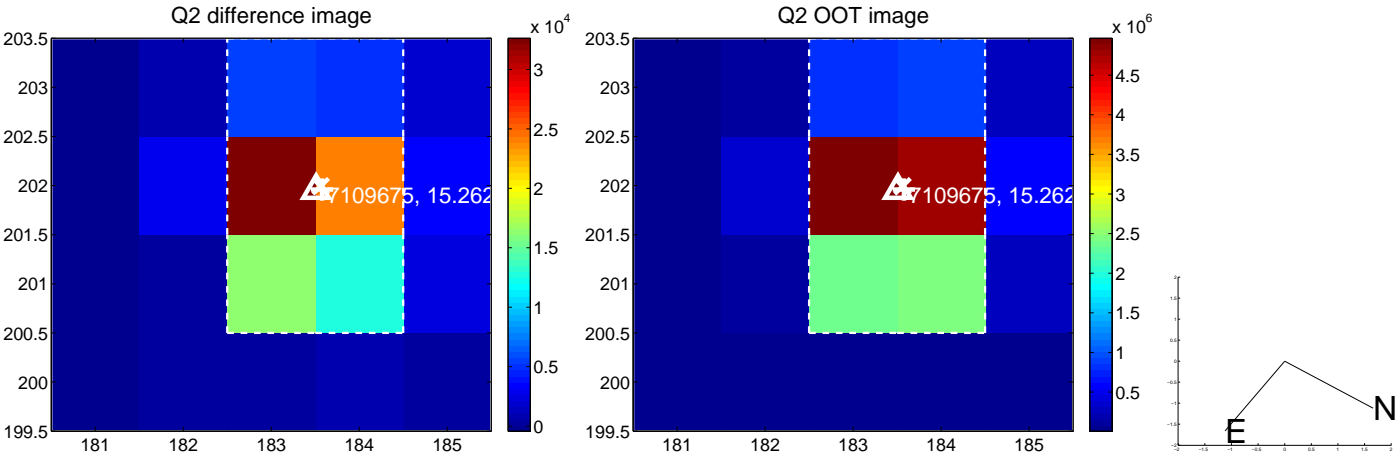
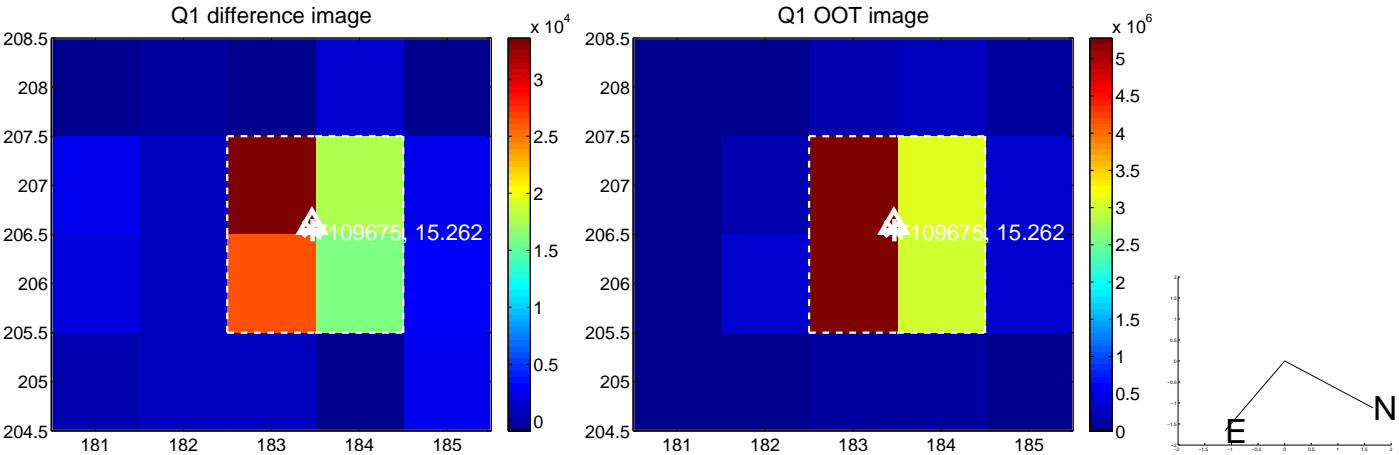
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.015 ± 0.072	0.21	0.007 ± 0.071	-0.013 ± 0.071
PRF-fit source offset from KIC position	0.099 ± 0.070	1.41	0.046 ± 0.072	0.087 ± 0.071
photometric centroid source offset	0.16 ± 0.05	2.97	0.15 ± 0.06	0.07 ± 0.05

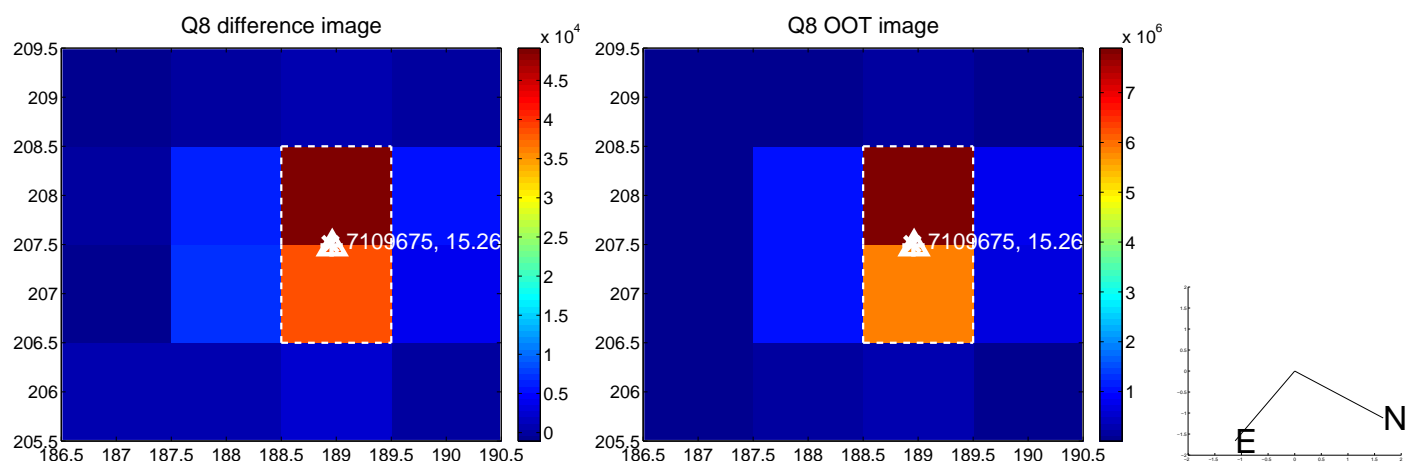
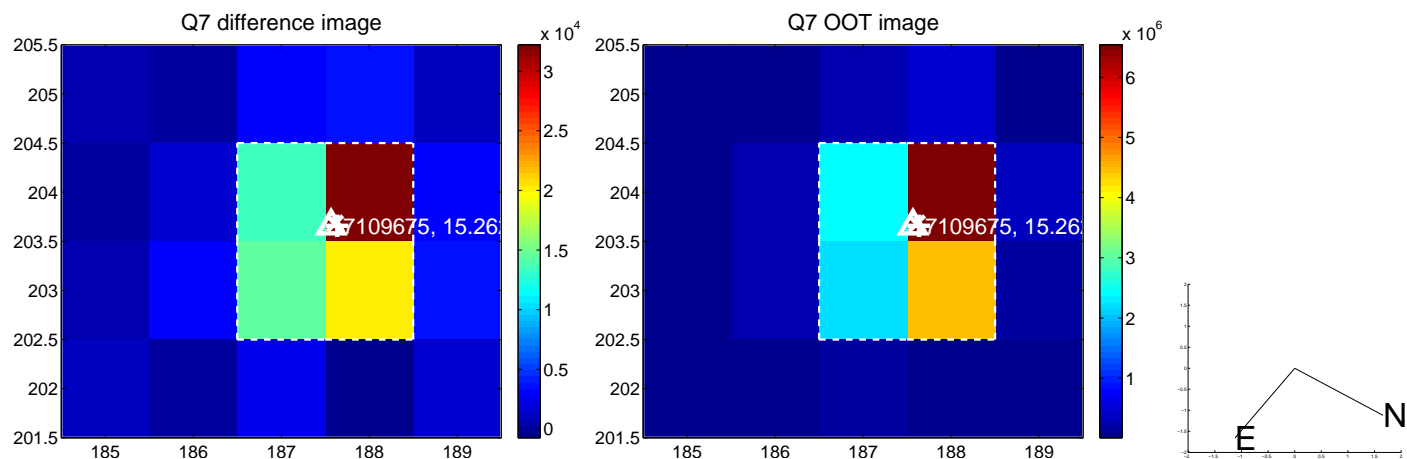
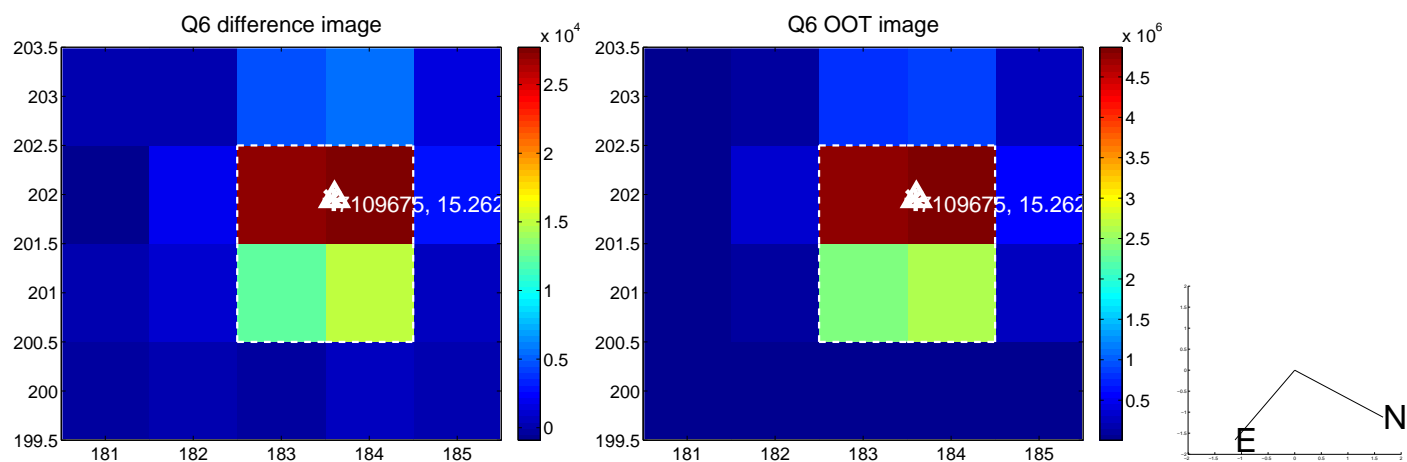
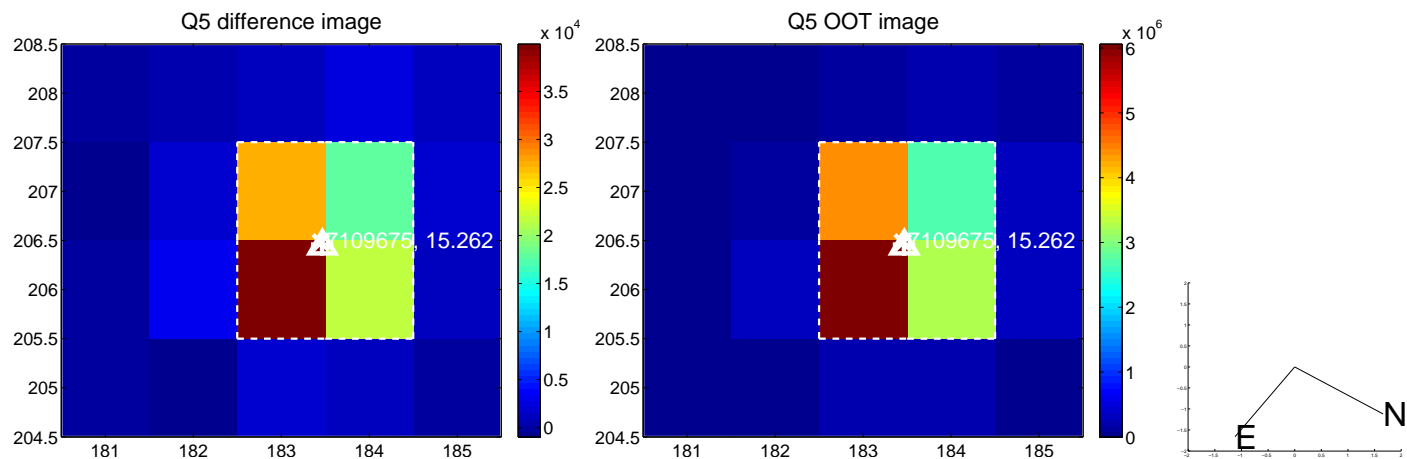


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

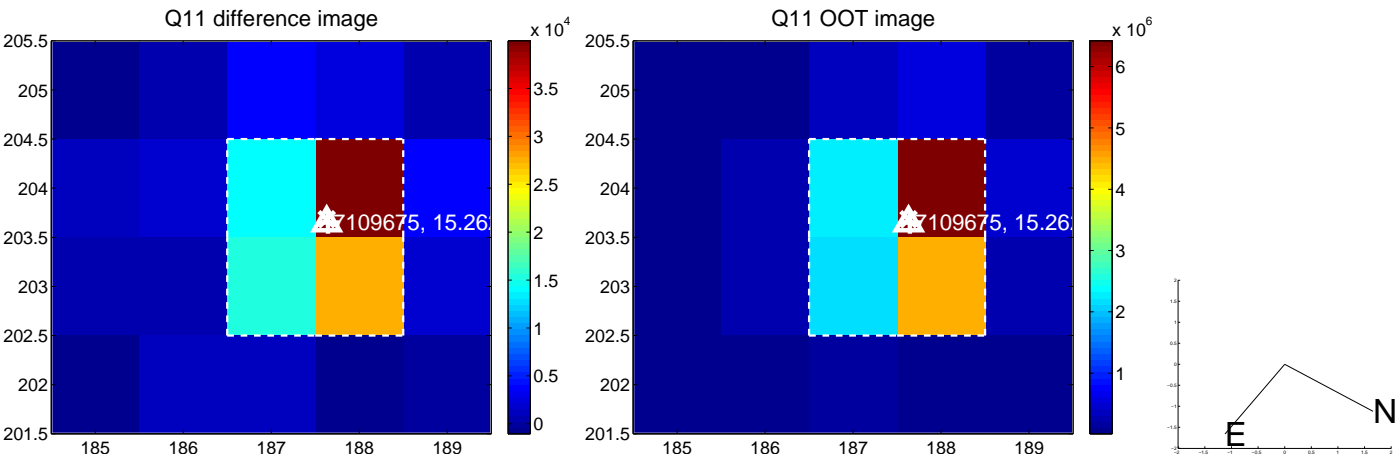
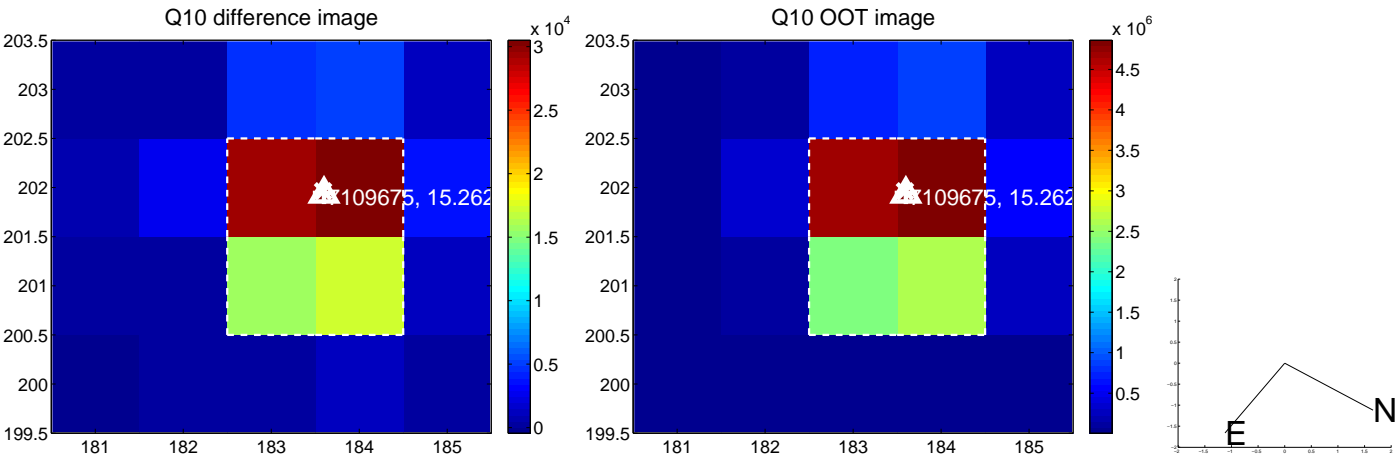
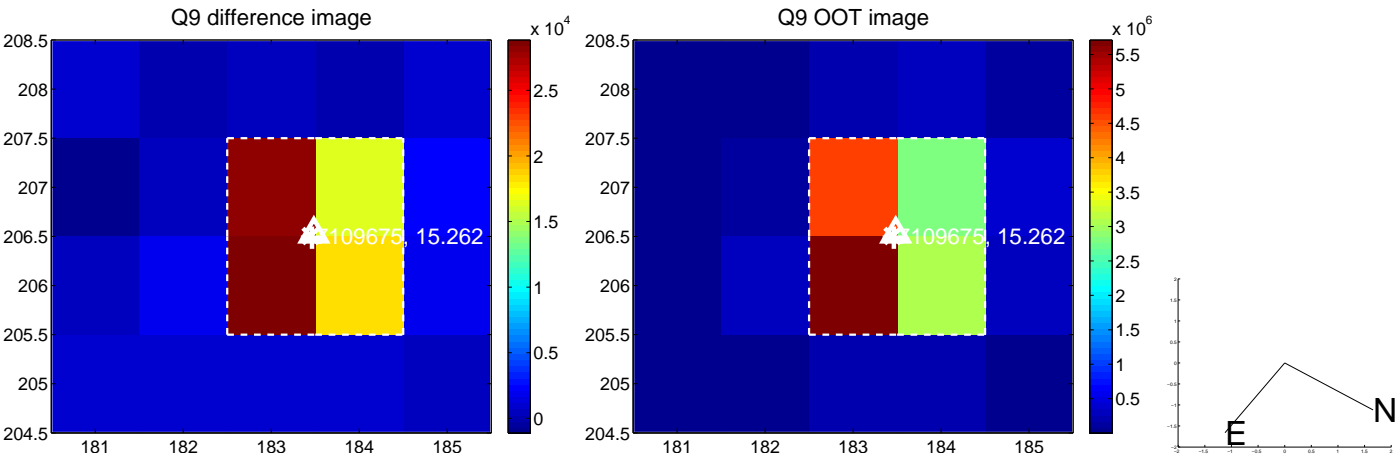
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



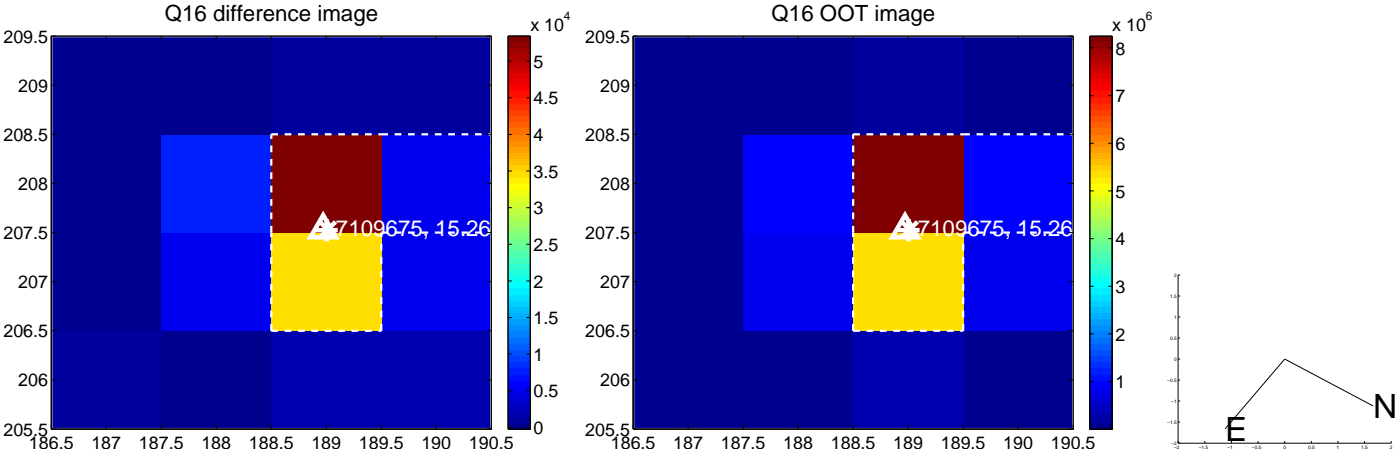
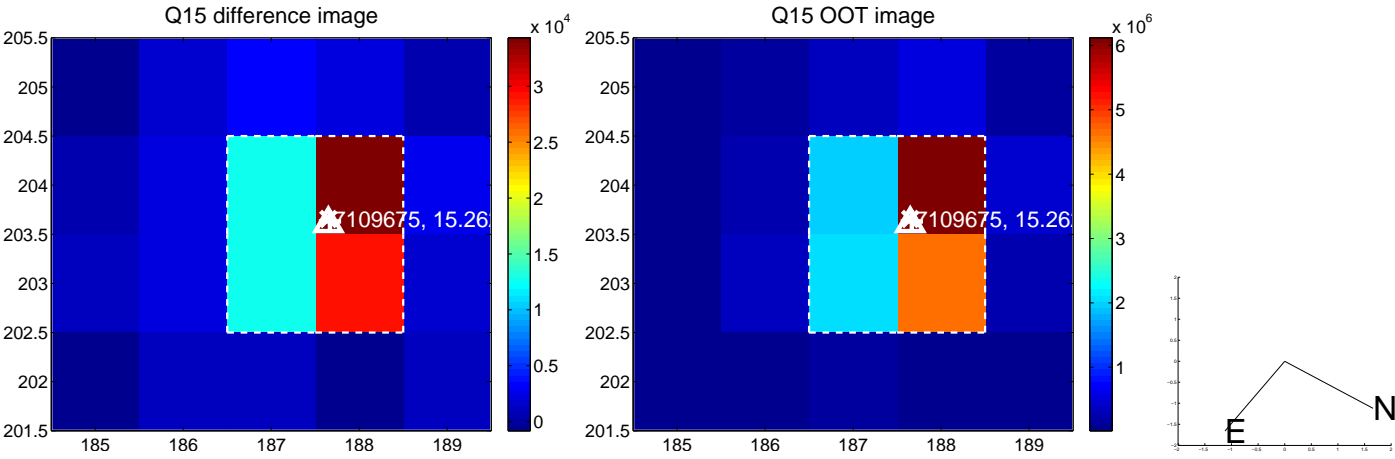
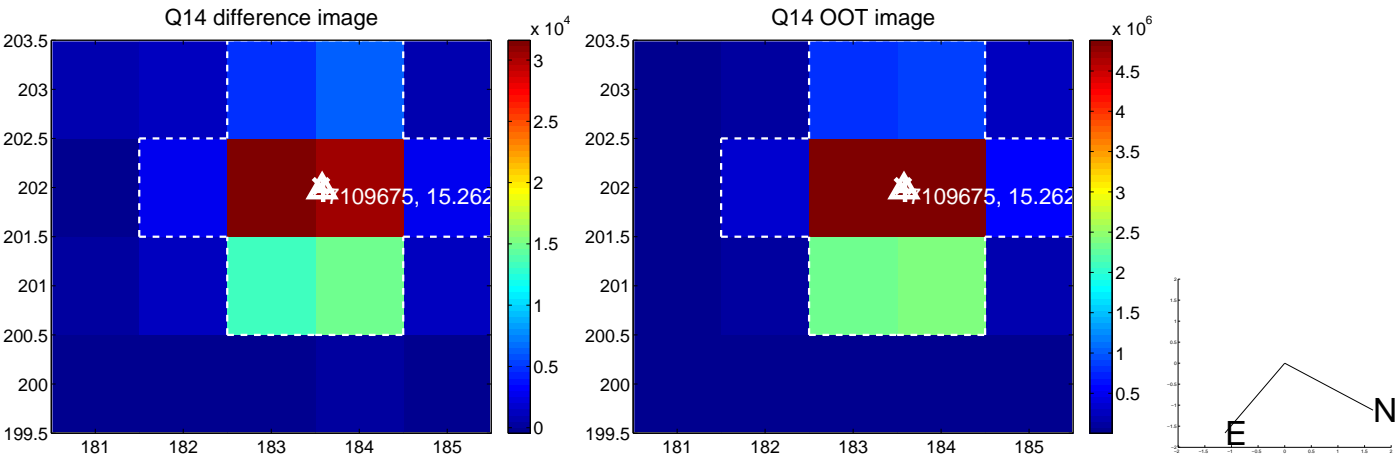
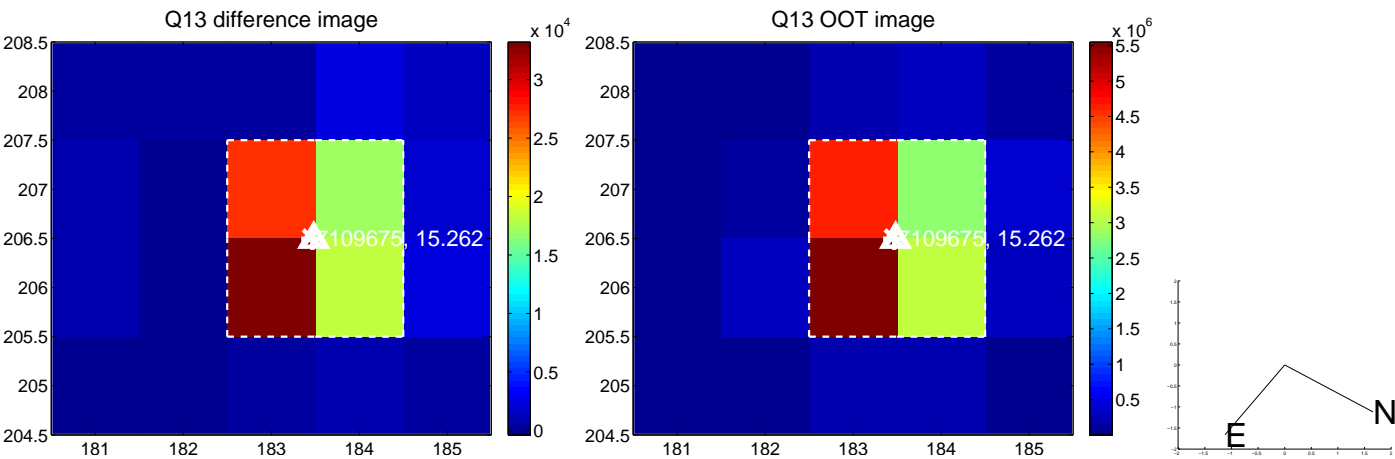
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



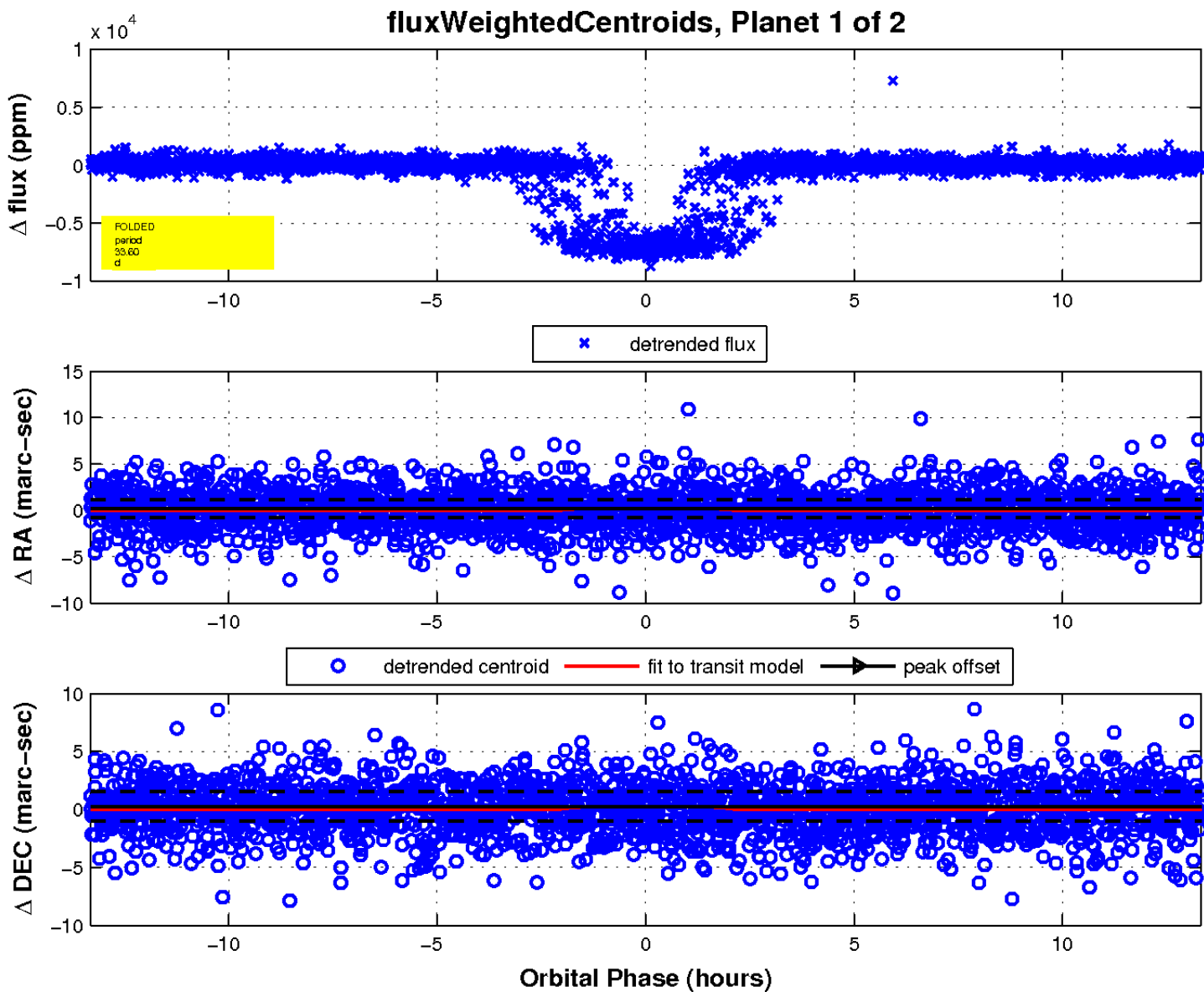
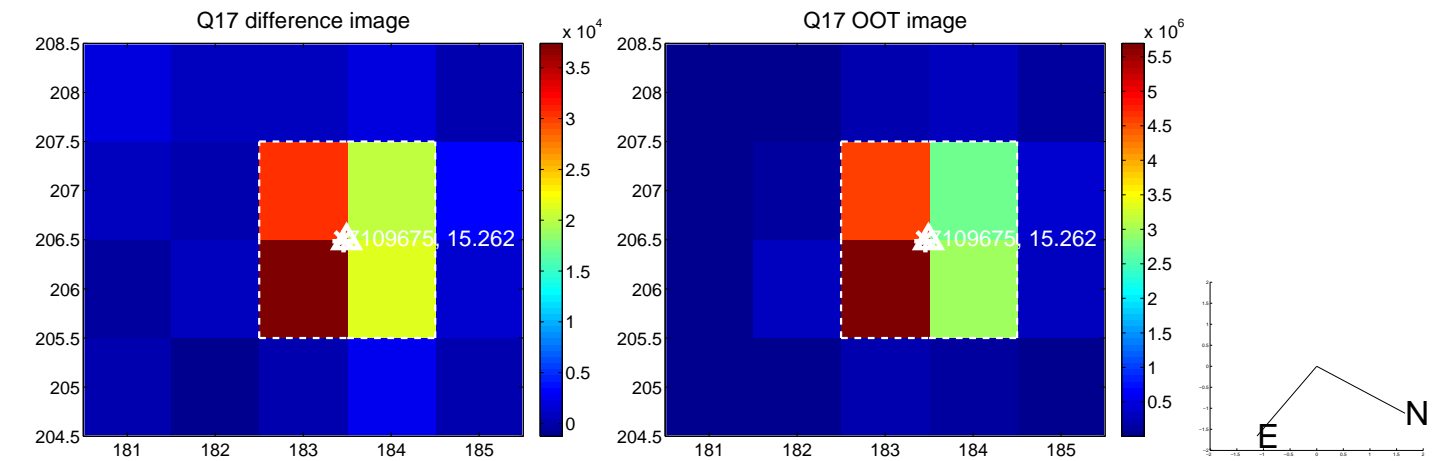
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

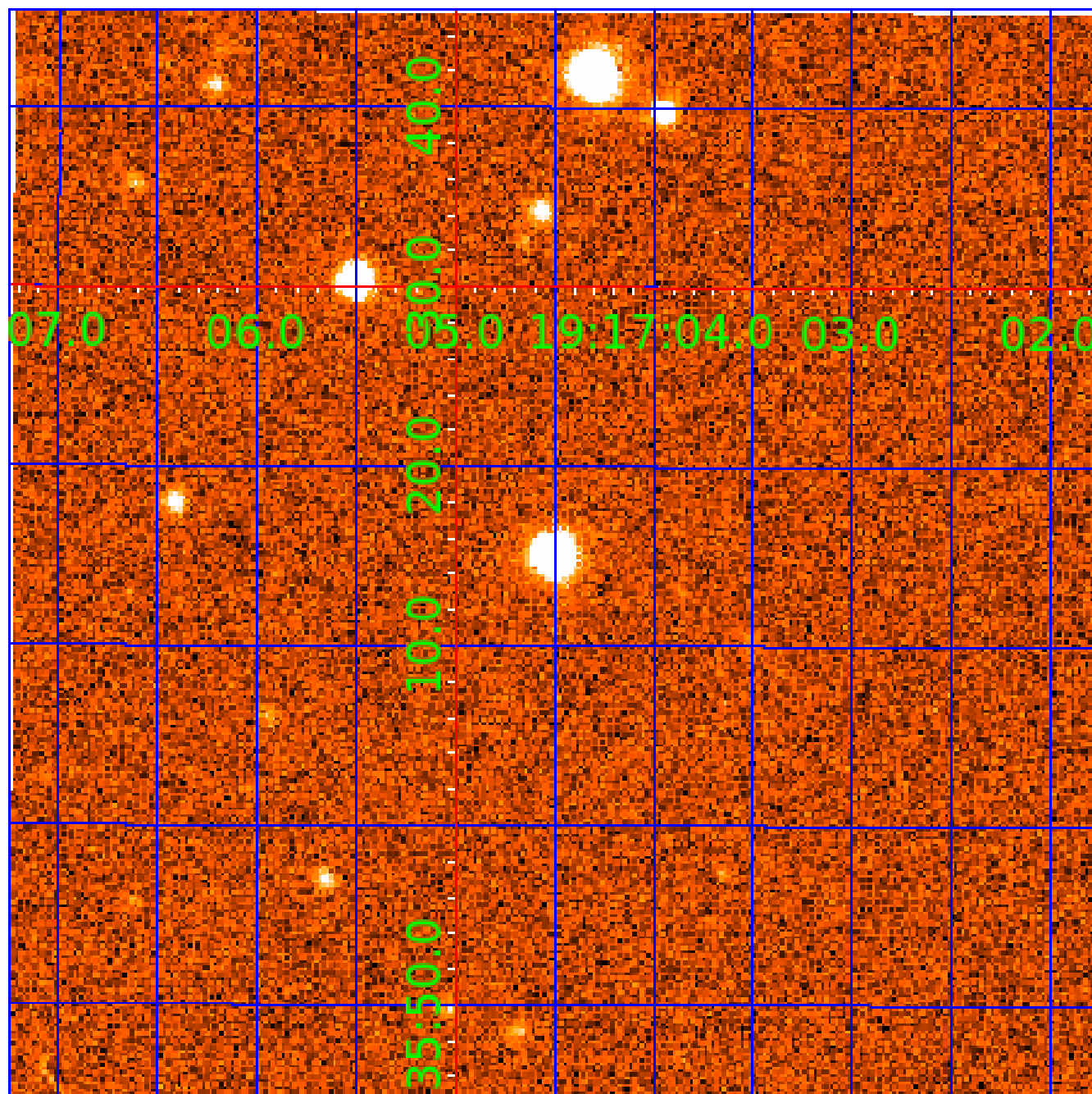


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007109675

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})
007109675-01	OBS	0872.01	33.601808	153.064534	7343.2	4.444	173.8	167.3	0.93	5149	8.19	14.24
007109675-02	OBS	0872.02	6.766523	138.062849	359.6	3.056	16.8	19.0	0.93	5149	2.18	120.68

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007109675-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007109675-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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.

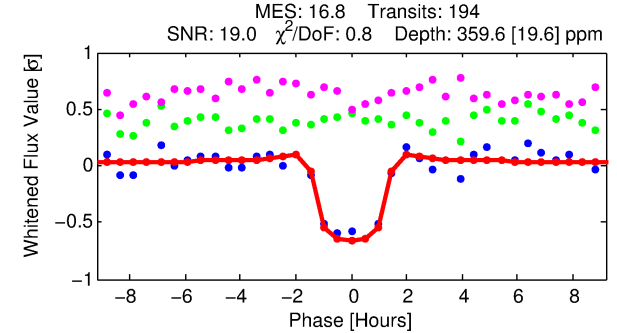
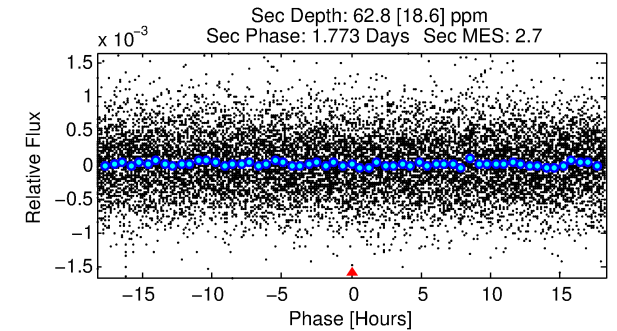
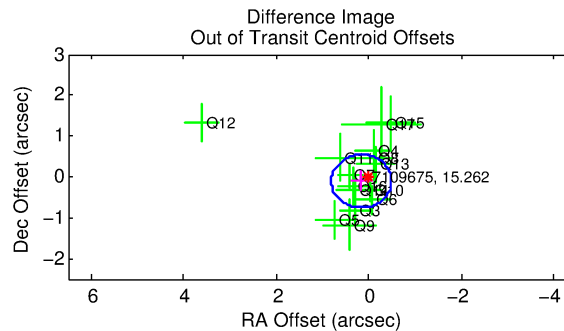
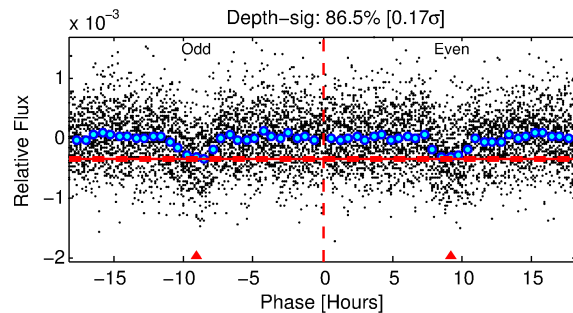
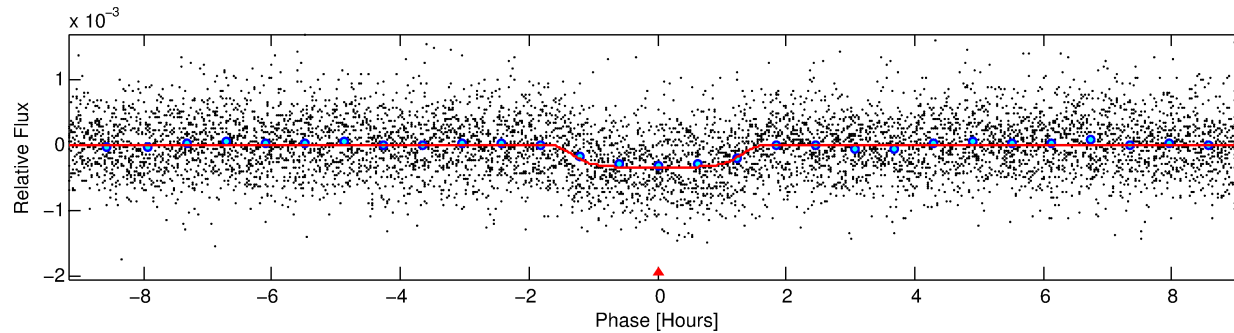
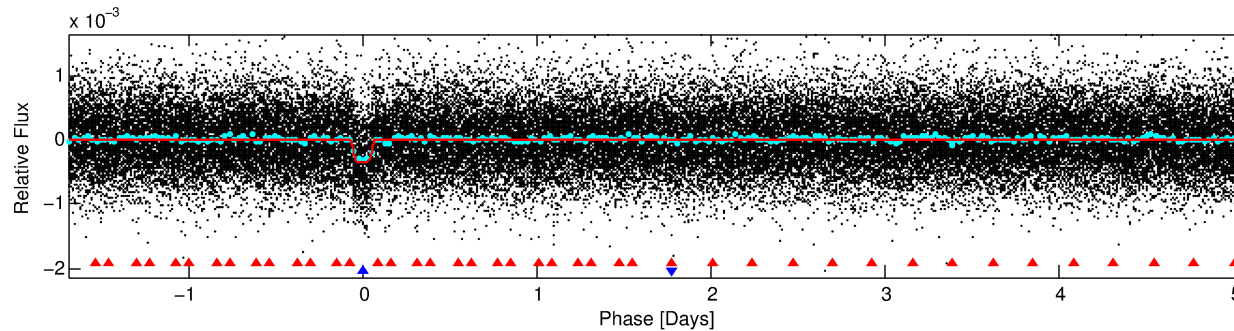
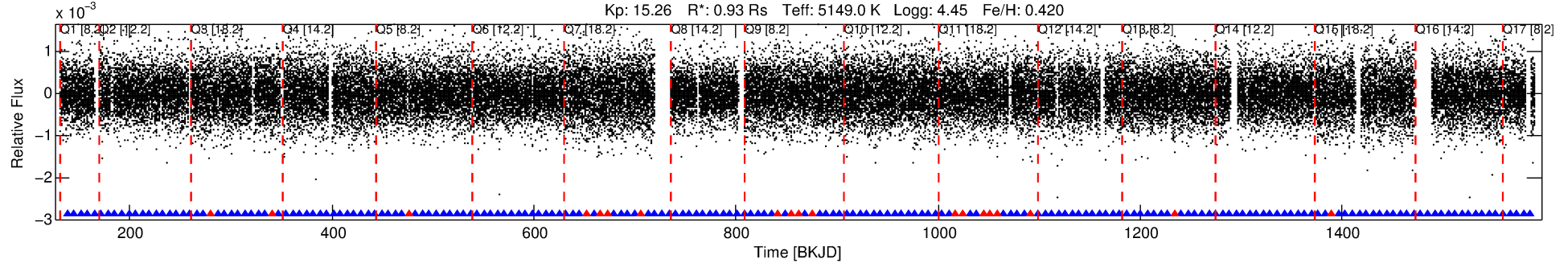
Ephemeris Match Information For 007109675-02

No Significant Match Found

DV One-Page Summary

KIC: 7109675 Candidate: 2 of 2 Period: 6.767 d
KOI: K00872.02 Name: Kepler-46d Corr: 0.988

Kp: 15.26 R*: 0.93 Rs Teff: 5149.0 K Logg: 4.45 Fe/H: 0.420



DV Fit Results:

Period = 6.76652 [0.00003] d
Epoch = 138.0628 [0.0028] BKJD
Rp/R* = 0.0215 [0.0039]
a/R* = 7.86 [5.54]
b = 0.91 [0.14]
Seff = 120.68 [15.33]
Teq = 845 [27] K
Rp = 2.18 [0.42] Re
a = 0.0672 [0.0038] AU
Ag = 32.81 [15.66] [2.03σ]
Teffp = 3127 [373] K [6.11σ]

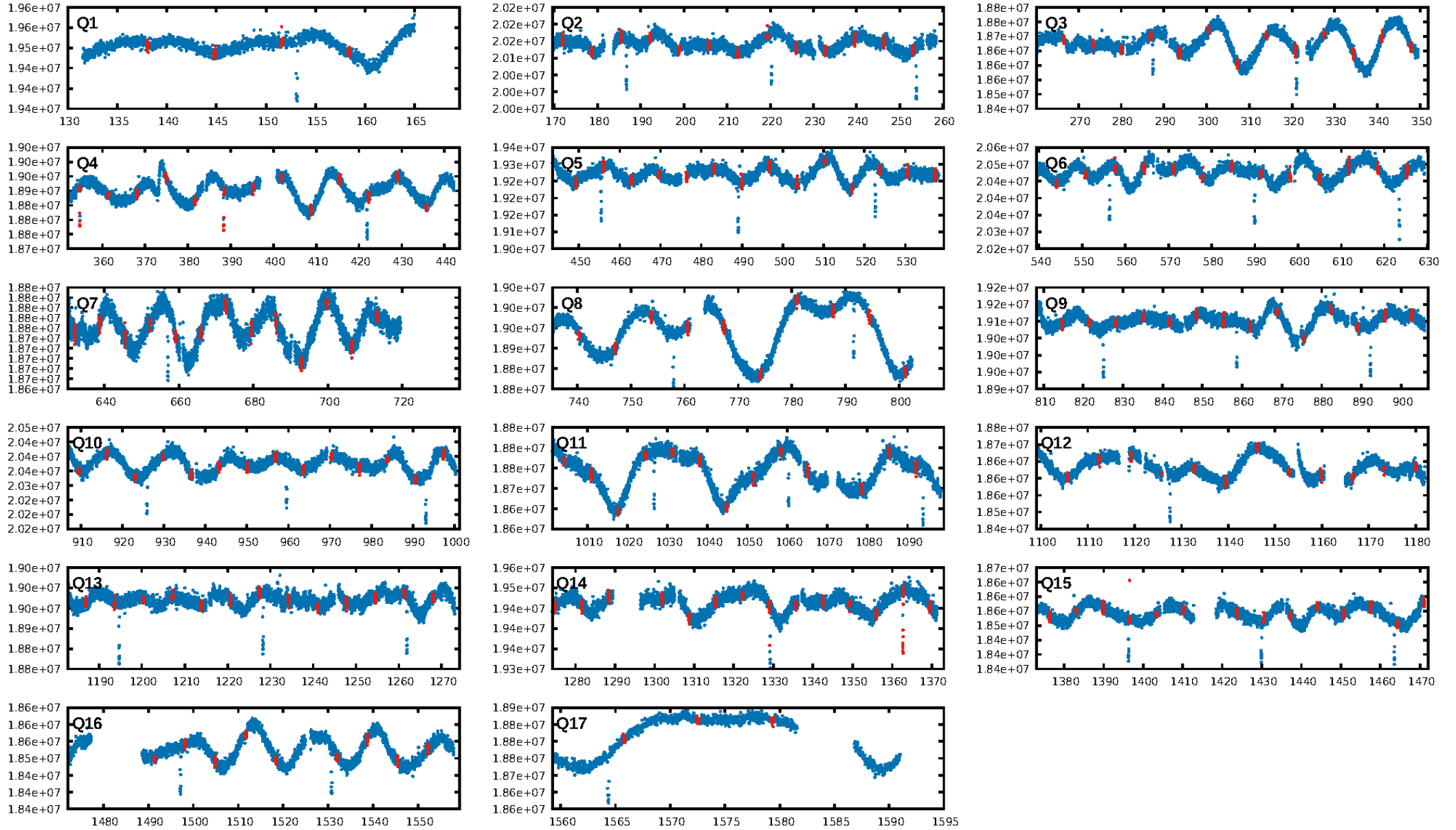
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [119.42σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.29e-59
RollingBand-fgt: 0.90 [168/187]
GhostDiagnostic-chr: 2.868
Centroid-sig: 93.8%
Centroid-so: 0.307 arcsec [0.52σ]
OotOffset-rm: 0.190 arcsec [0.87σ]
KicOffset-rm: 0.194 arcsec [0.82σ]
OotOffset-st: 3/4/4/4 [15]
KicOffset-st: 3/4/4/4 [15]
DiffImageQuality-fgm: 0.87 [13/15]
DiffImageOverlap-fno: 1.00 [17/17]

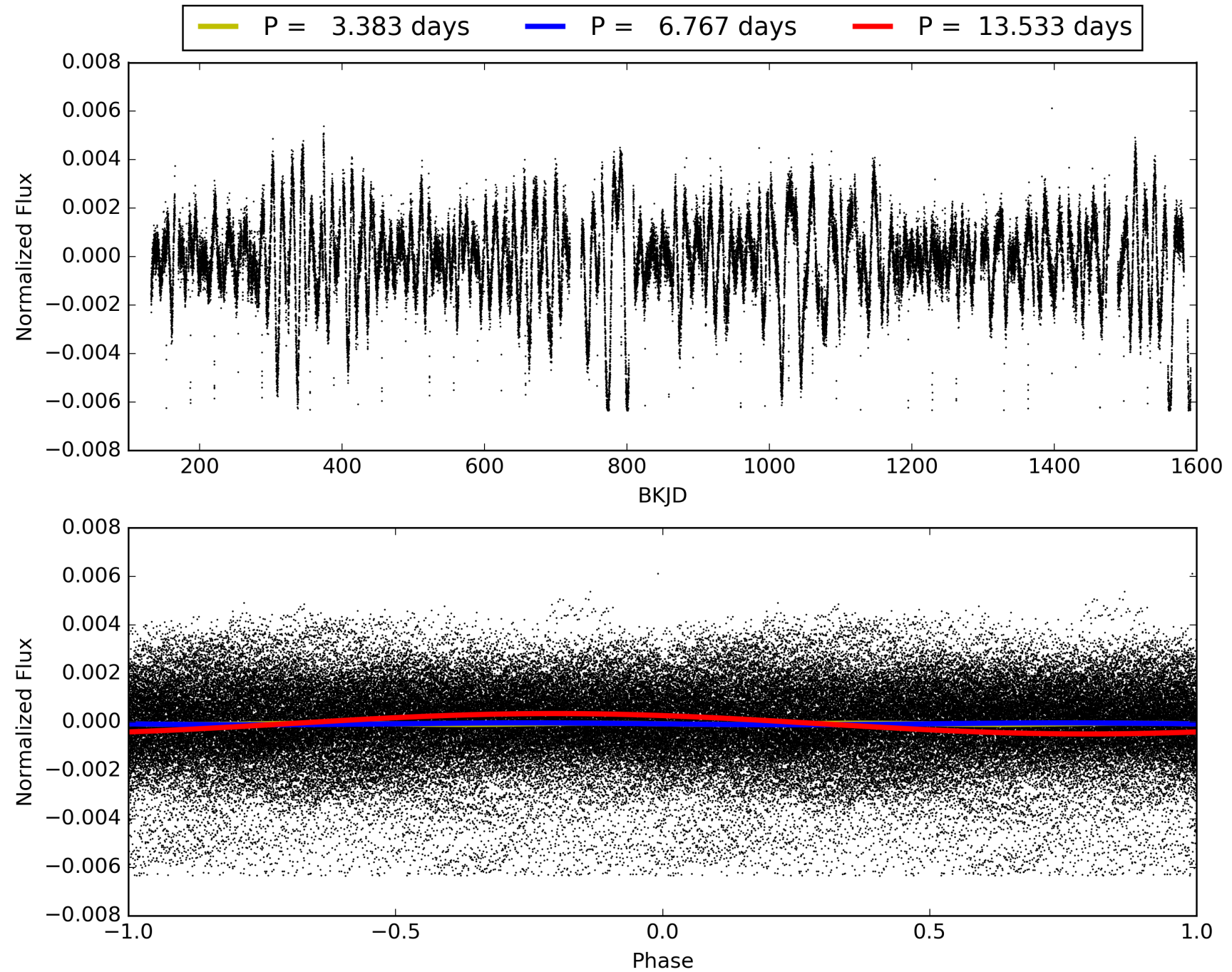
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:26:02 Z

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

TCE 007109675-02, PDC Light Curves

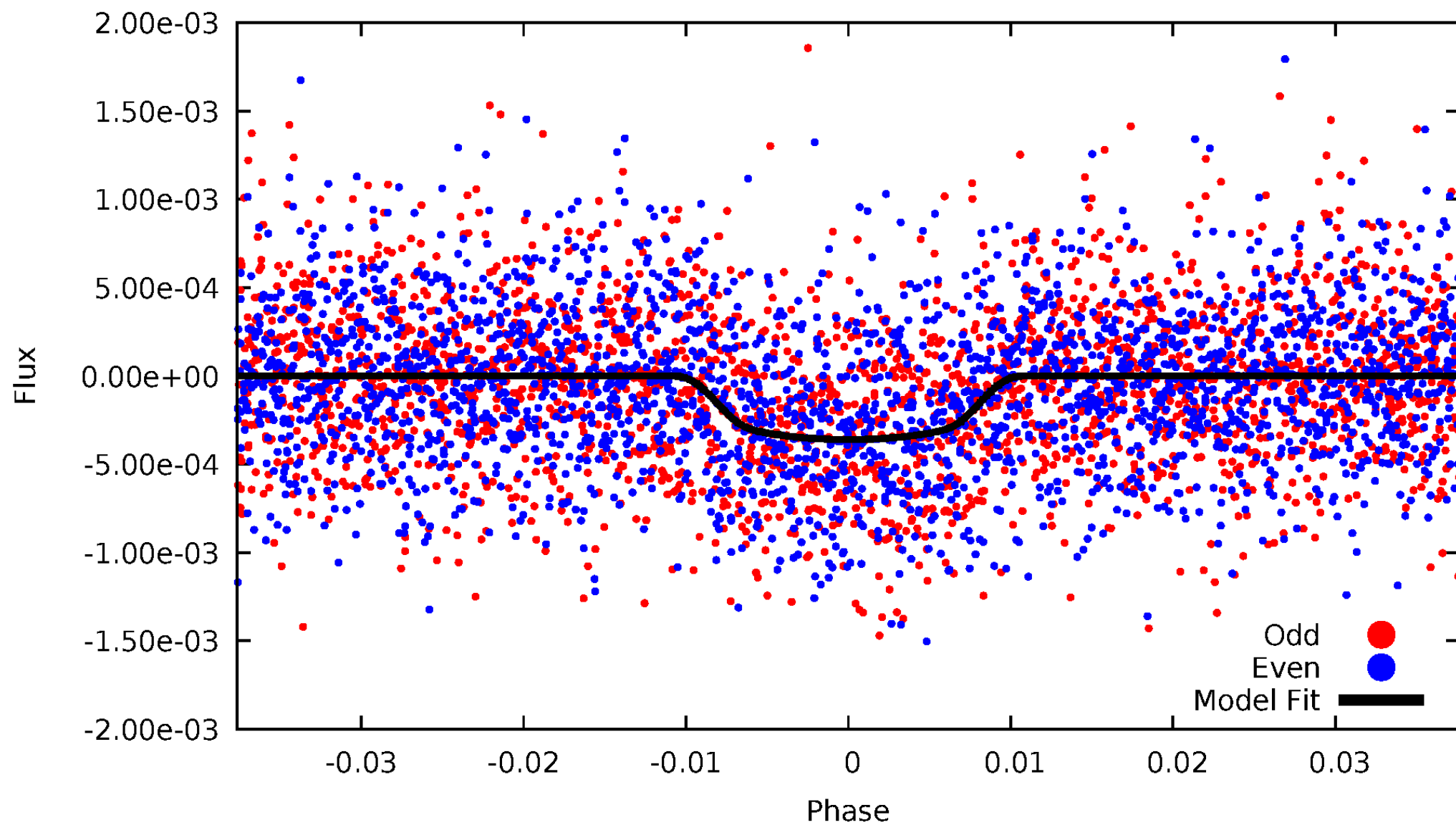


TCE 007109675-02



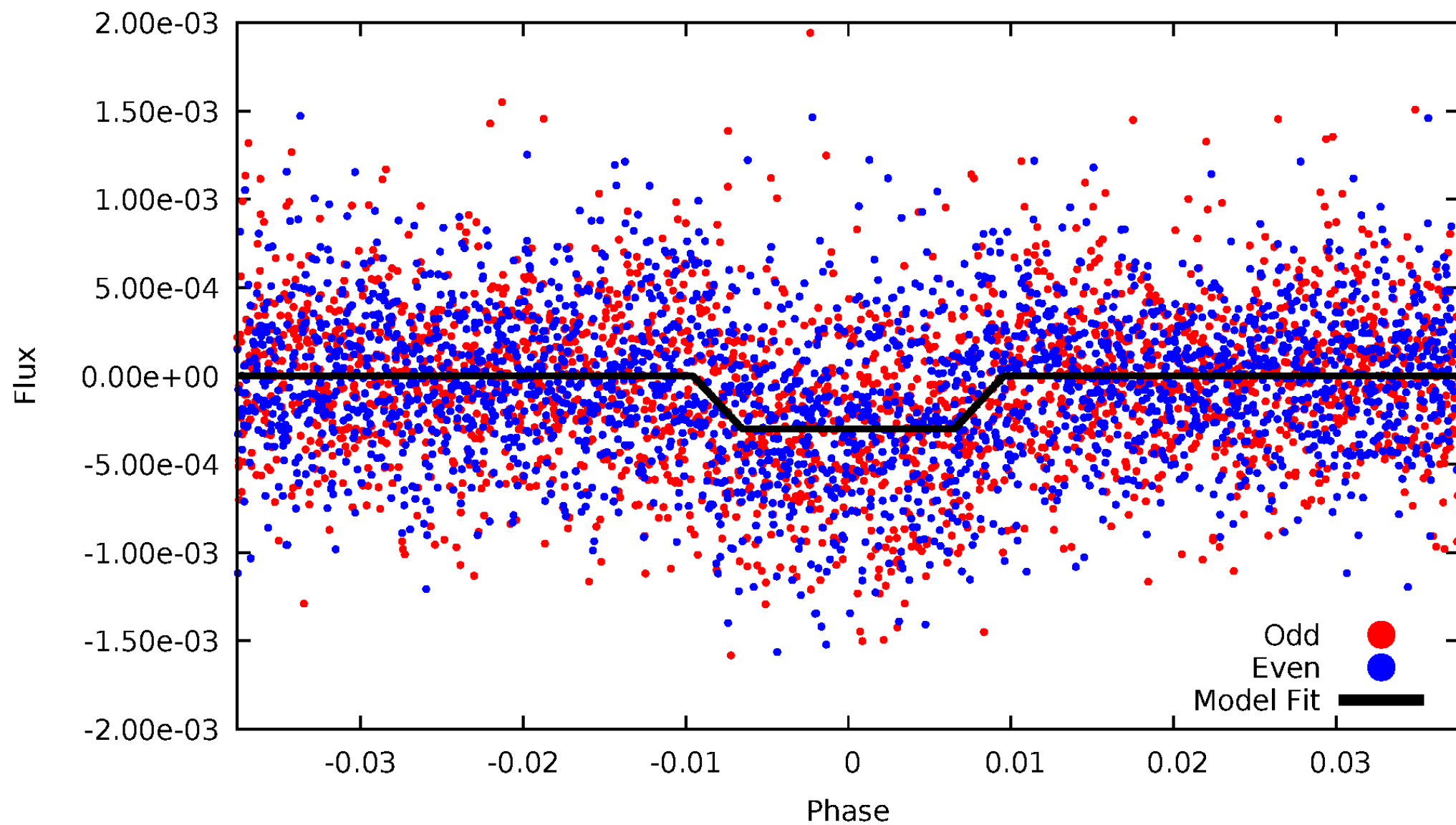
DV Odd/Even

TCE 007109675-02



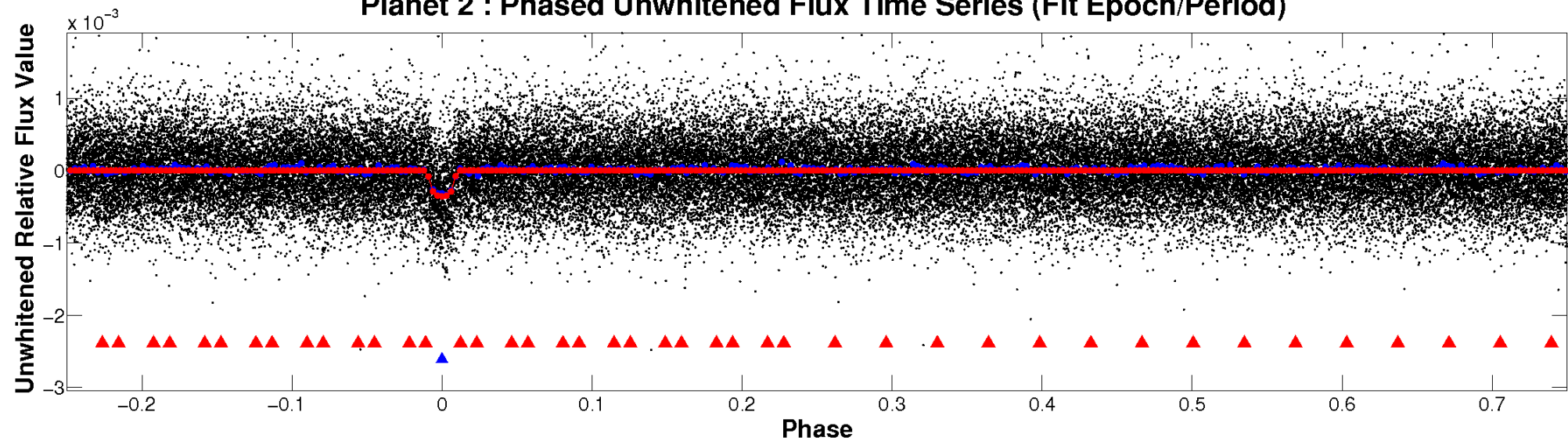
ALT Odd/Even

TCE 007109675-02

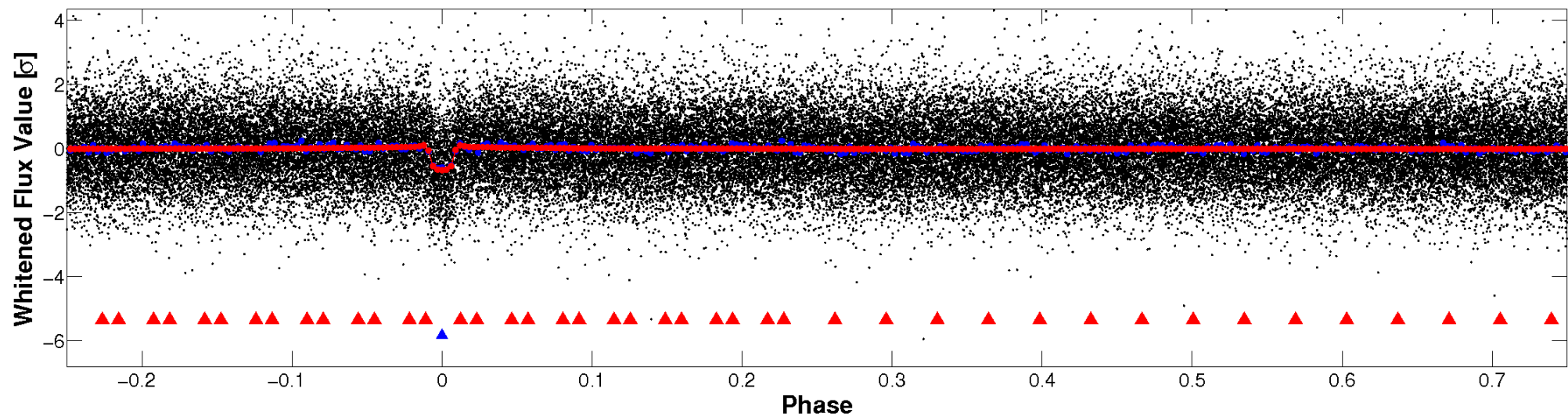


Non-Whitened Vs. Whitened Light Curve

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

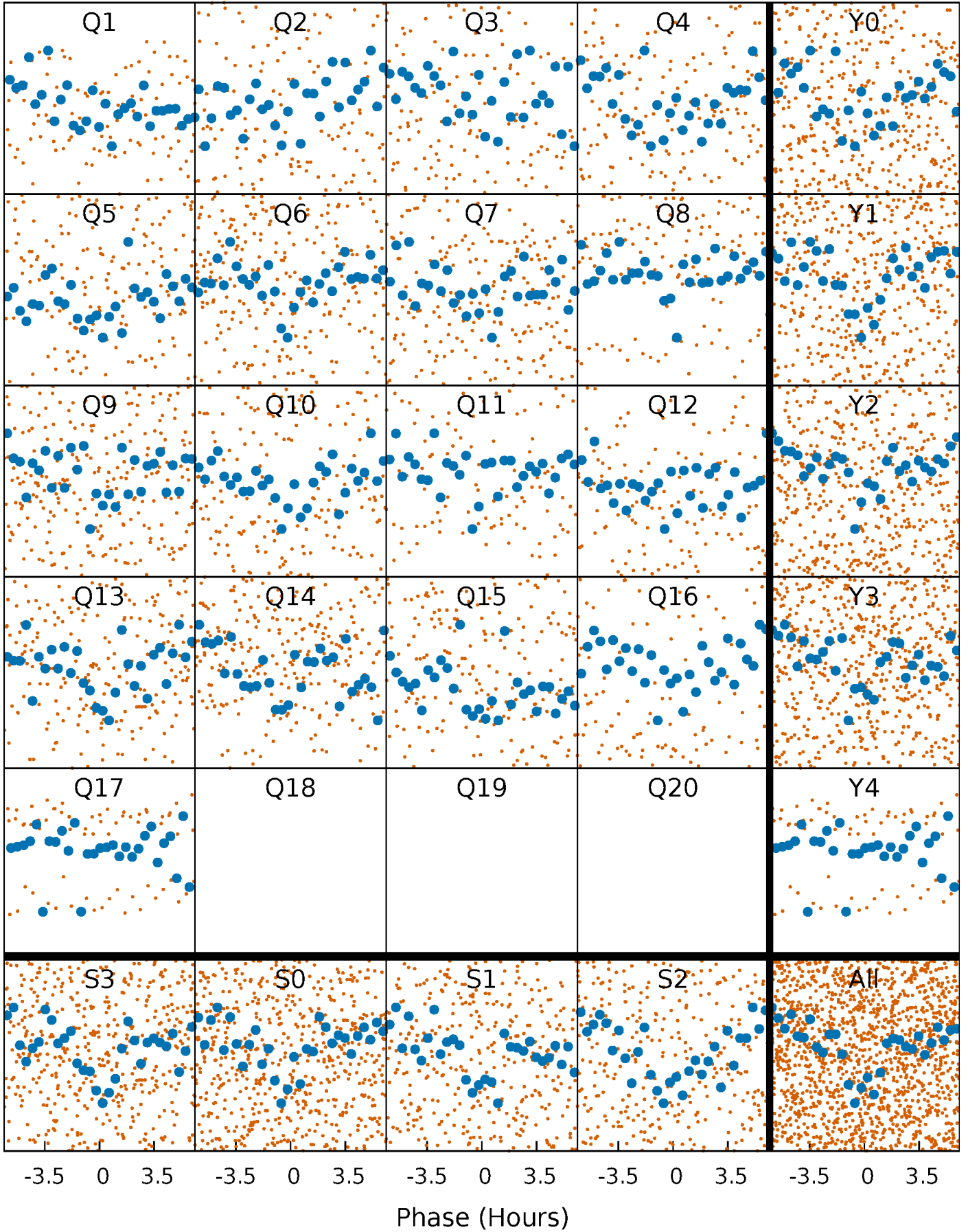


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



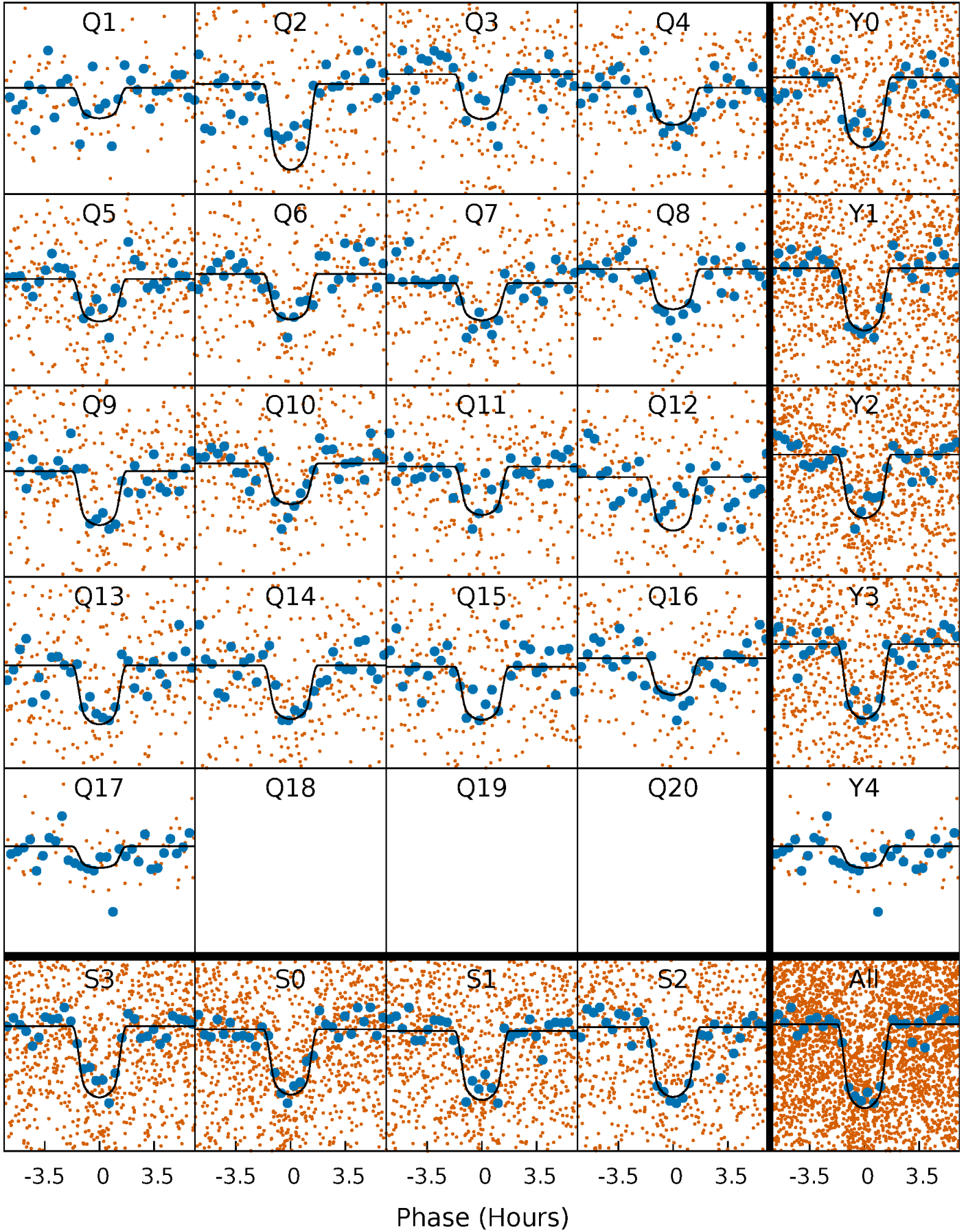
PDC Quarter-Phased Transit Curves

TCE 007109675-02 P= 6.766523 Days $T_0=138.062849$ (BKJD)



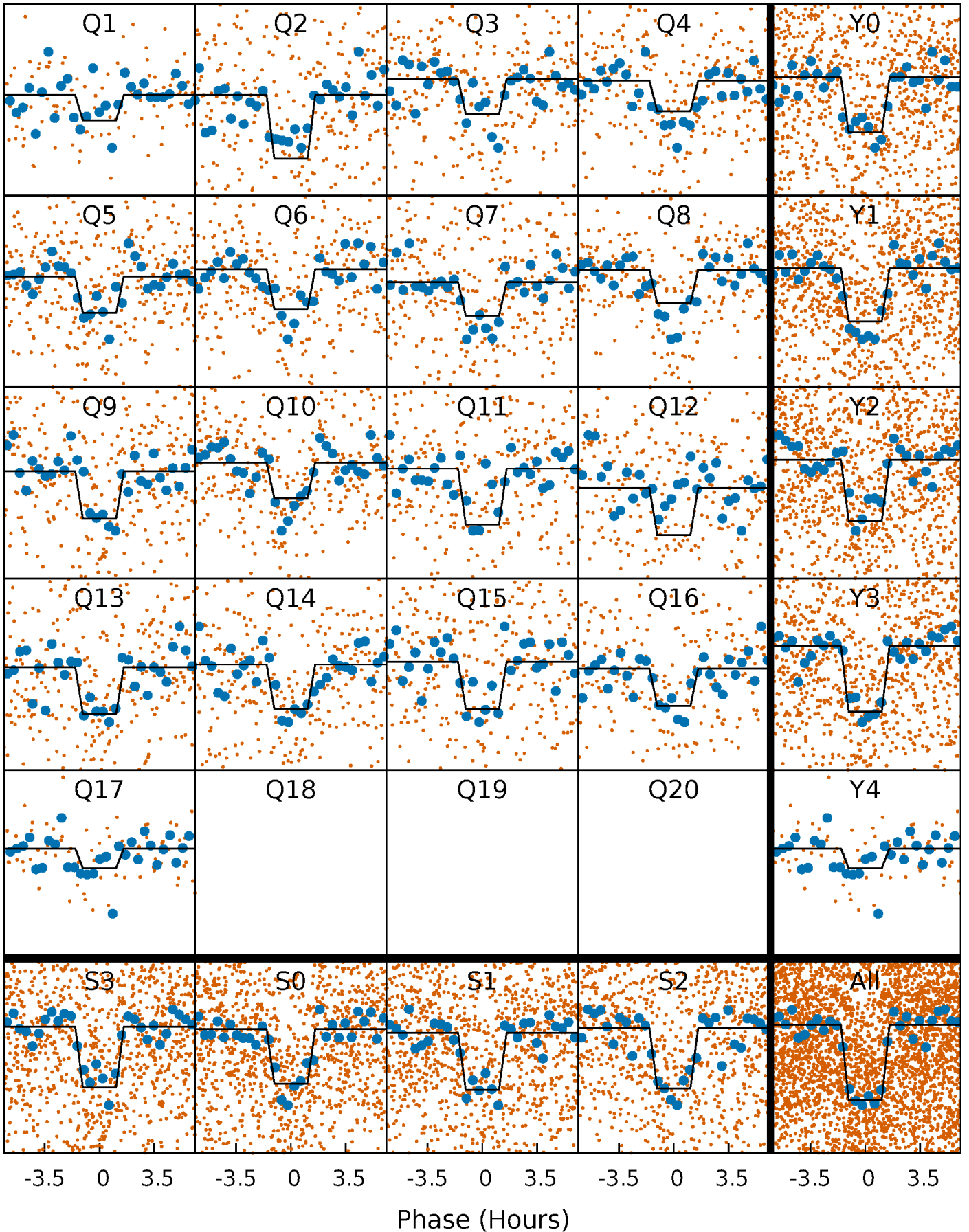
DV Quarter-Phased Transit Curves

TCE 007109675-02 P= 6.766523 Days $T_0=138.062849$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

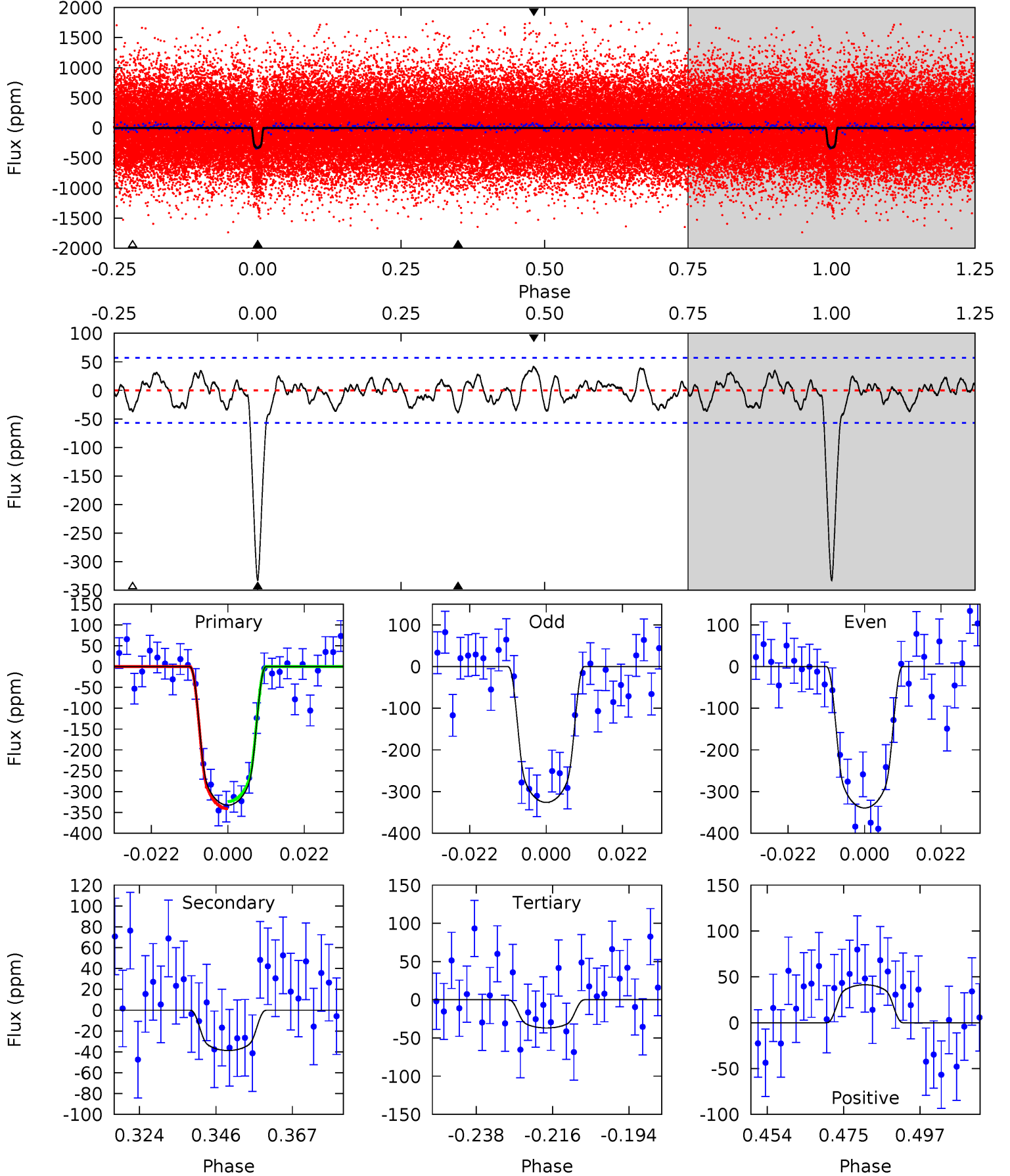
TCE 007109675-02 P= 6.766533 Days $T_0=138.061878$ (BKJD)



DV Model-Shift Uniqueness Test

007109675-02, P = 6.766523 Days, E = 131.296326 Days

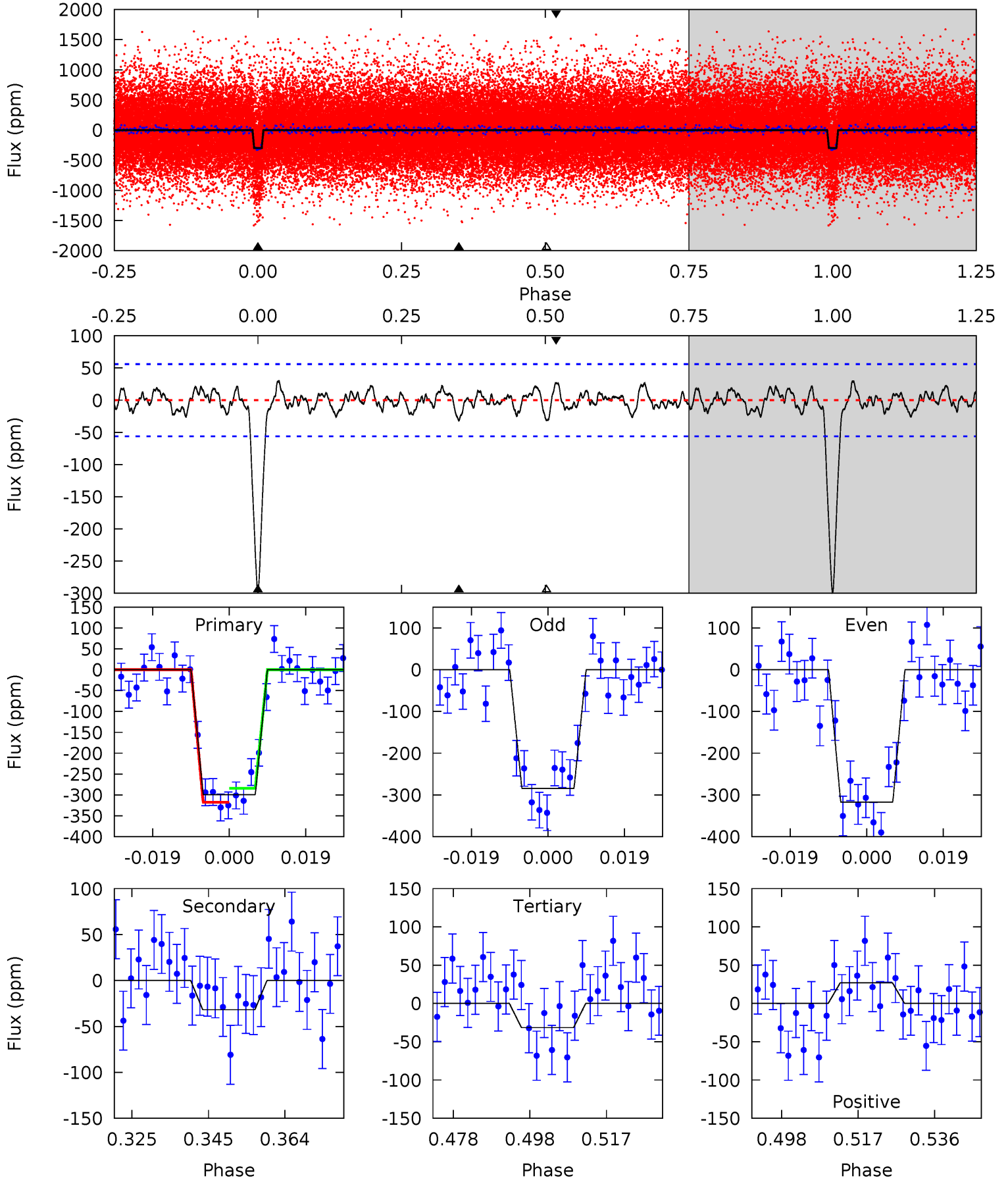
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.5	3.31	3.16	3.53	4.88	2.30	1.48	25.3	24.9	0.15	-0.22	0.57	1.03	0.11	0.73



Alt Model-Shift Uniqueness Test

007109675-02, P = 6.766533 Days, E = 131.295345 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.2	2.79	2.76	2.36	4.90	2.34	1.02	23.4	23.8	0.03	0.42	1.43	1.05	0.09	1.46



Stellar Parameters For KIC 007109675

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5149^{+113}_{-82}	$4.447^{+0.054}_{-0.036}$	$0.420^{+0.050}_{-0.150}$	$0.930^{+0.044}_{-0.055}$	$0.882^{+0.040}_{-0.029}$	$1.546^{+0.305}_{-0.175}$
	+2%/-2%	+1%/-1%	+12%/-36%	+5%/-6%	+5%/-3%	+20%/-11%
Source	SPE44	TRA44	SPE44	DSEP		

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

Secondary Eclipse Parameters for KIC 007109675-02 / KOI 0872.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-39 ± 12	$2.17^{+0.40}_{-0.40}$	1181^{+29}_{-29}	3291^{+275}_{-236}	20^{+13}_{-8}
Alt.	-32 ± 11	$1.74^{+0.43}_{-0.38}$	1181^{+28}_{-27}	3417^{+358}_{-302}	26^{+21}_{-11}

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 $A_{obs} \gg 1.0$

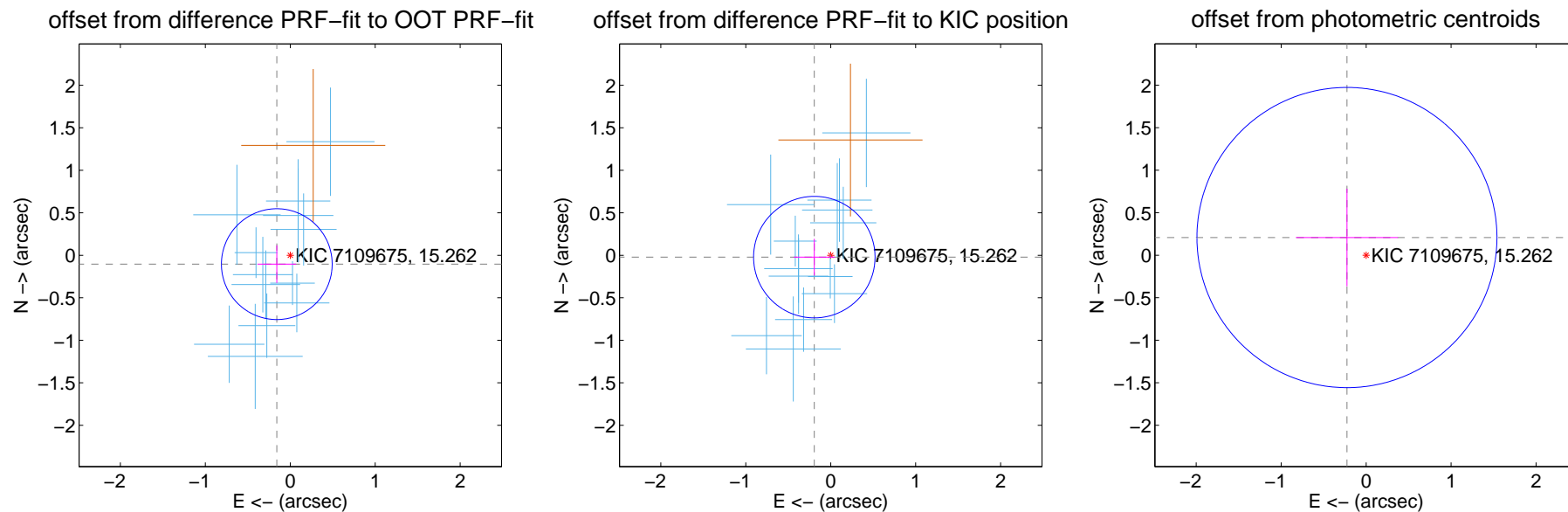
DV Centroid Data

Supplemental centroid analysis for 007109675-02. Kepler magnitude: 15.26. Transit SNR 18.97

There are 13 quarters with good PRF difference image offsets

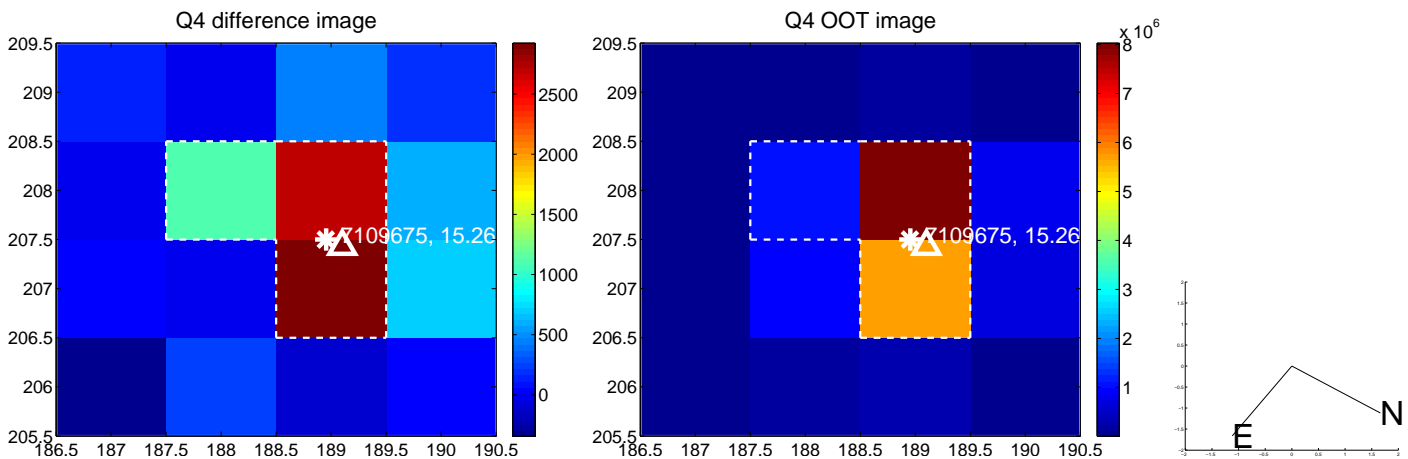
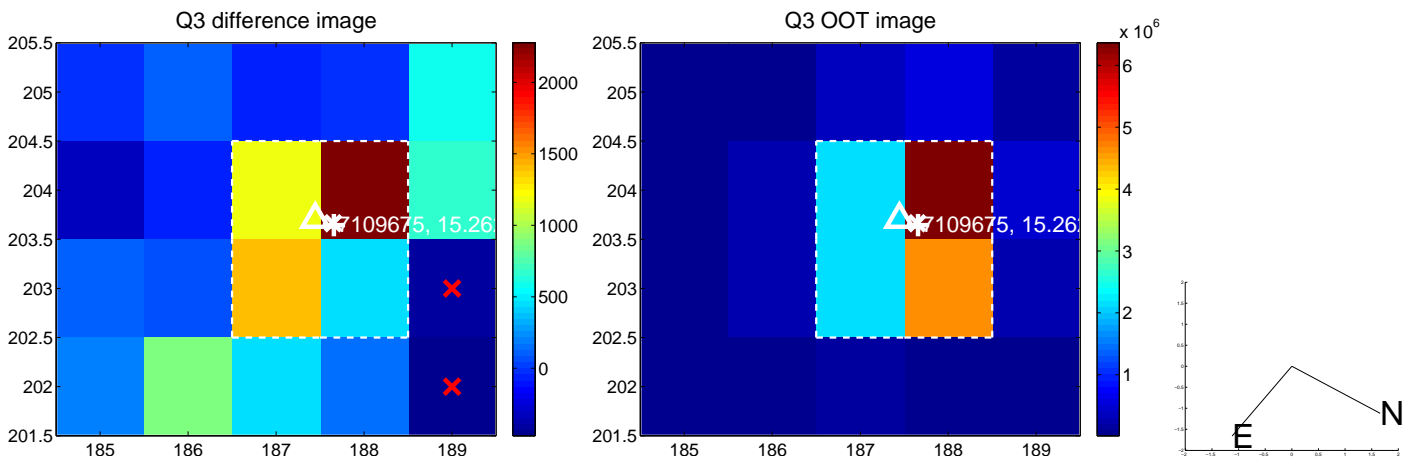
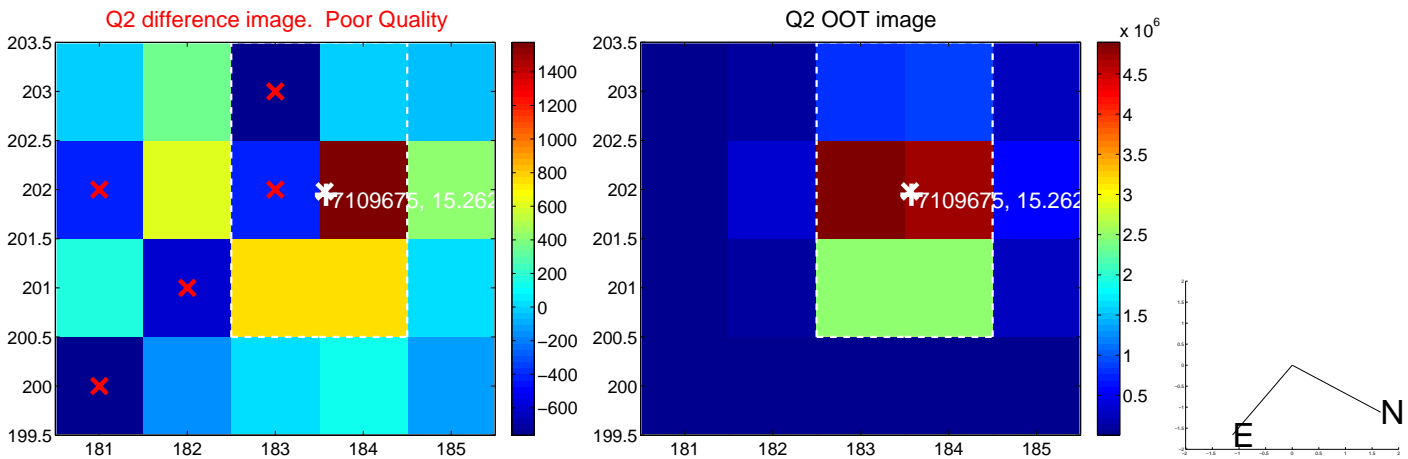
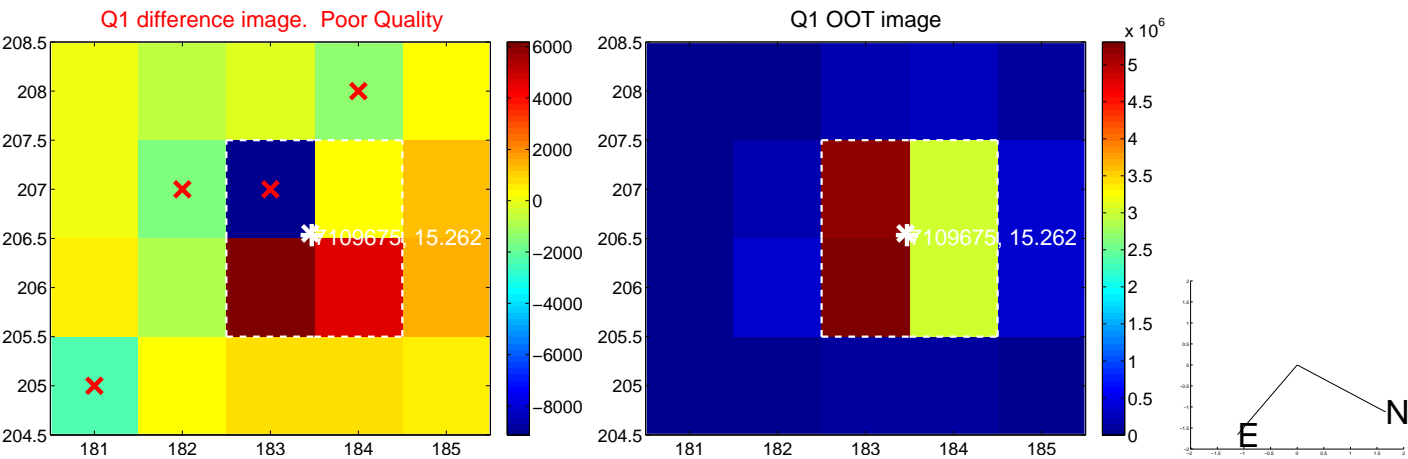
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.190 ± 0.217	0.87	0.158 ± 0.227	-0.104 ± 0.221
PRF-fit source offset from KIC position	0.194 ± 0.238	0.82	0.193 ± 0.241	-0.022 ± 0.216
photometric centroid source offset	0.31 ± 0.59	0.52	0.23 ± 0.60	0.21 ± 0.57

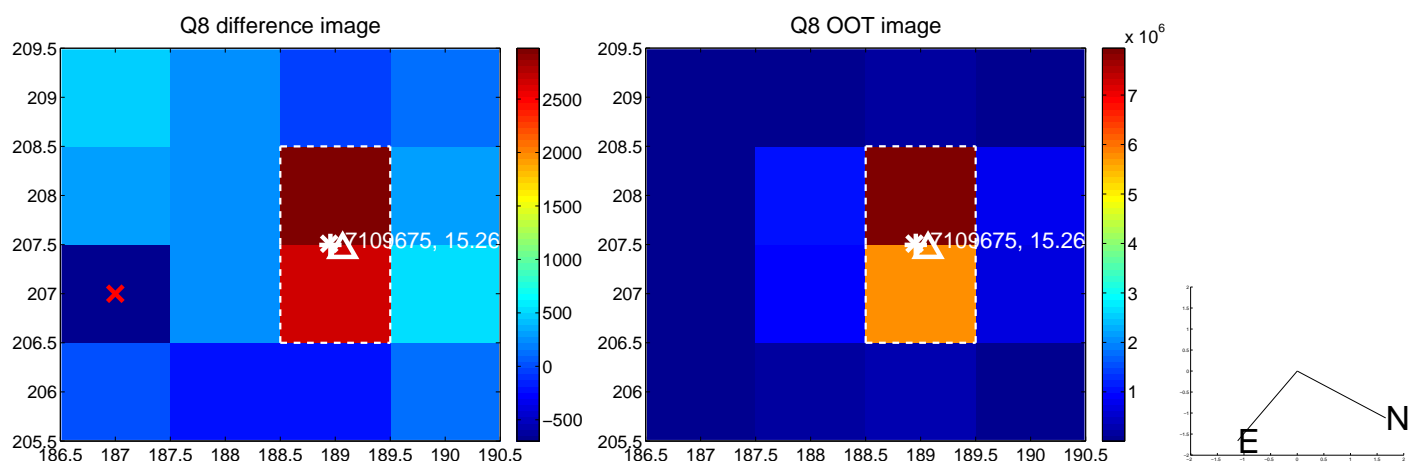
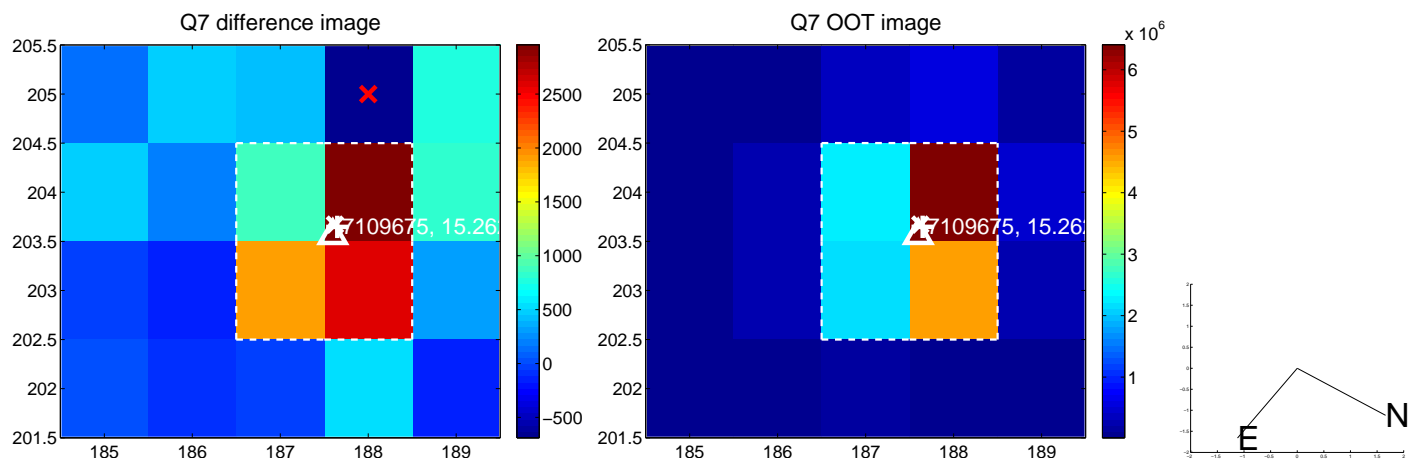
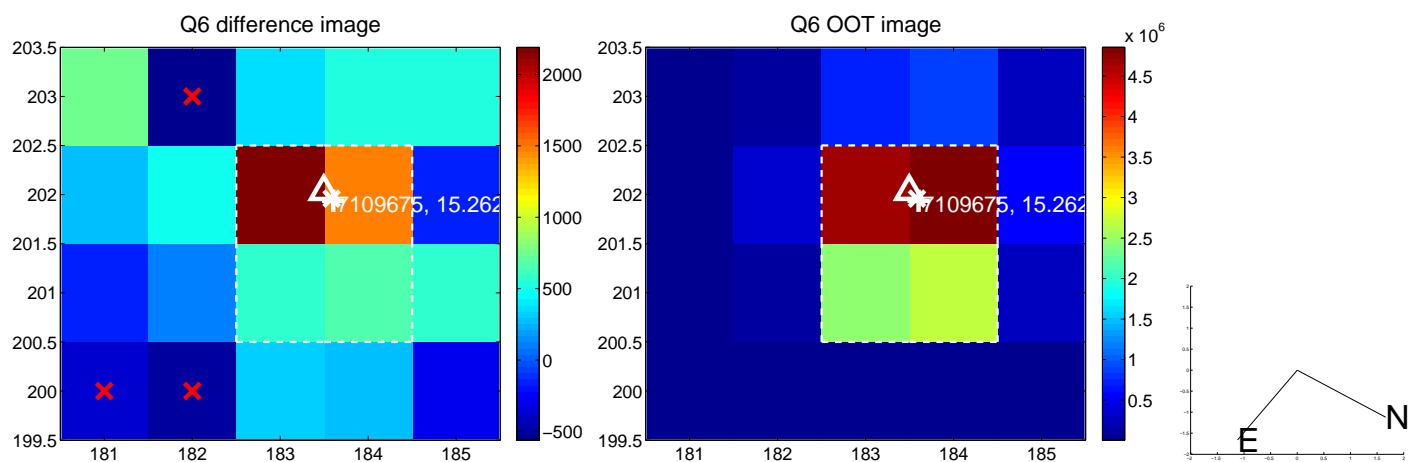
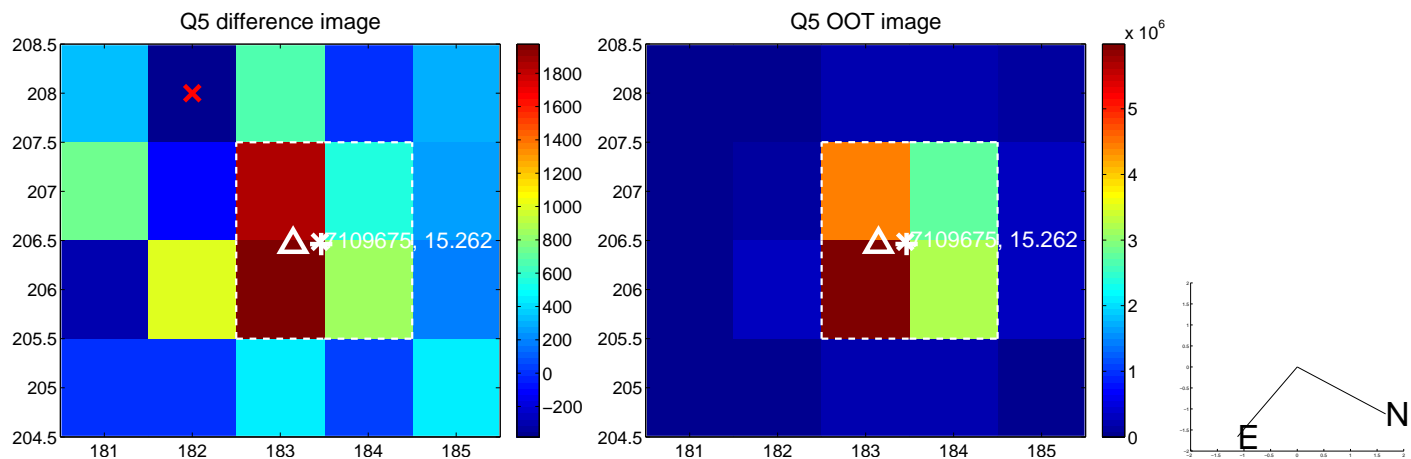


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

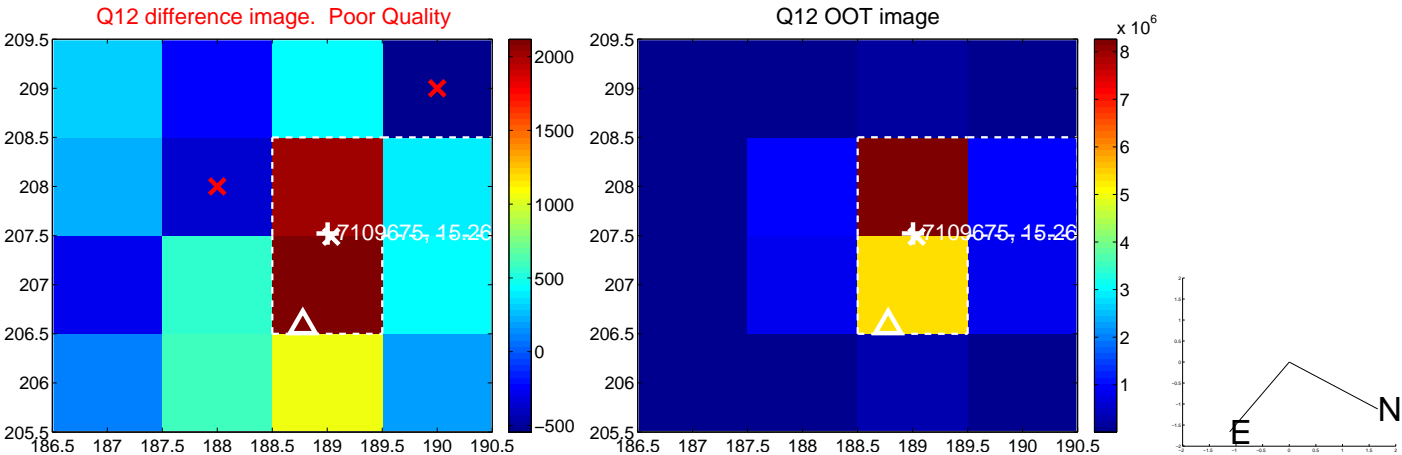
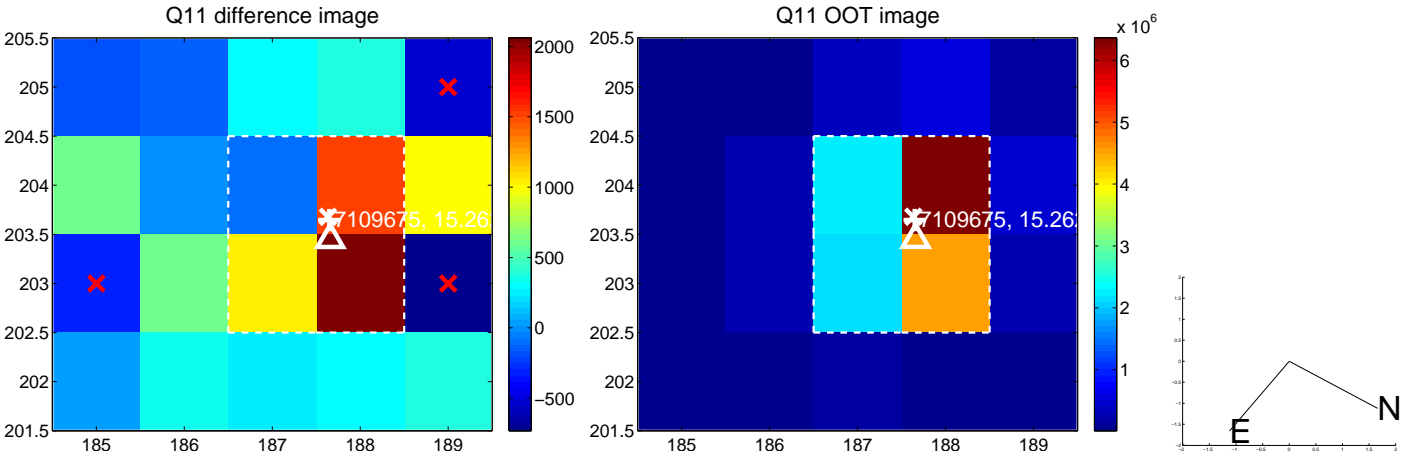
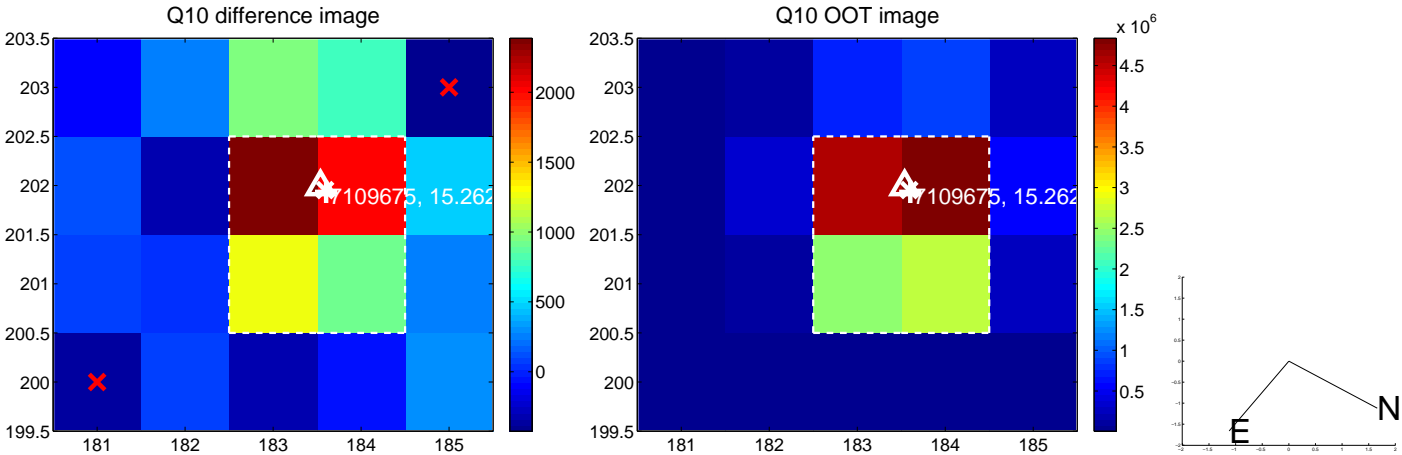
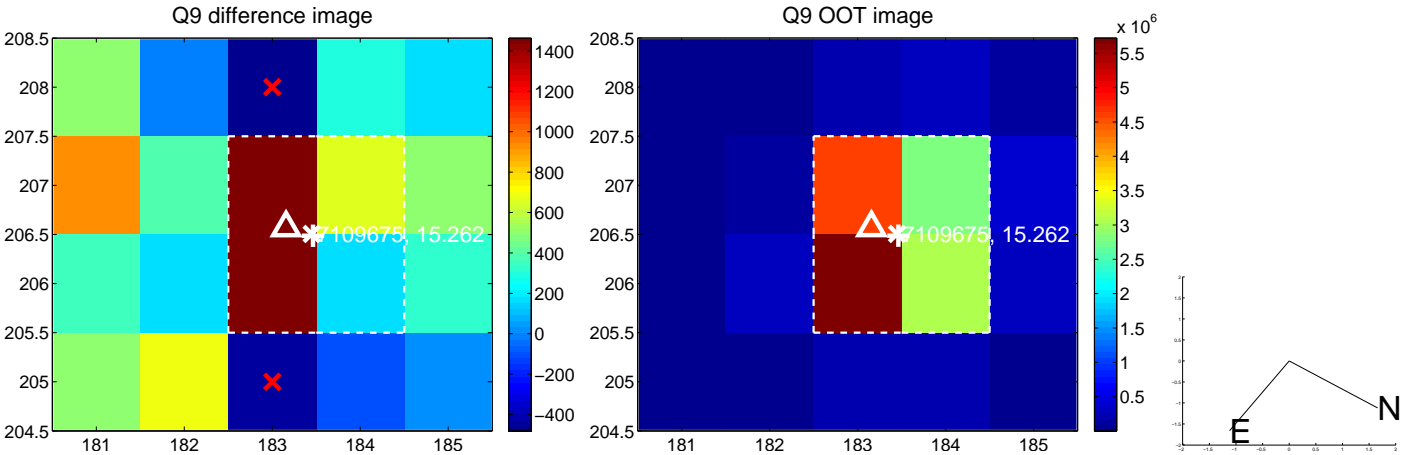
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



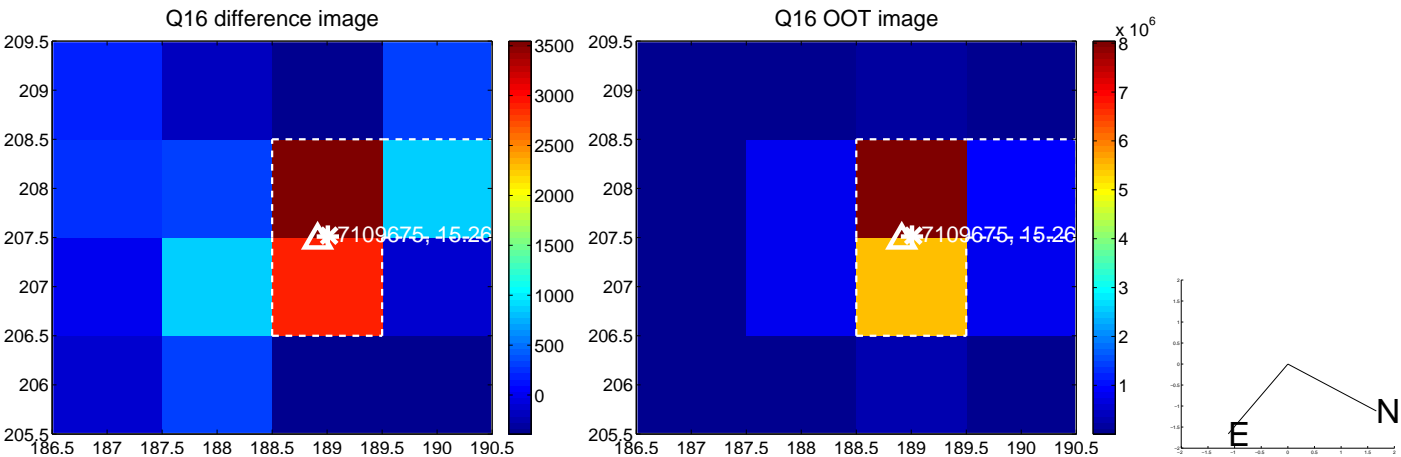
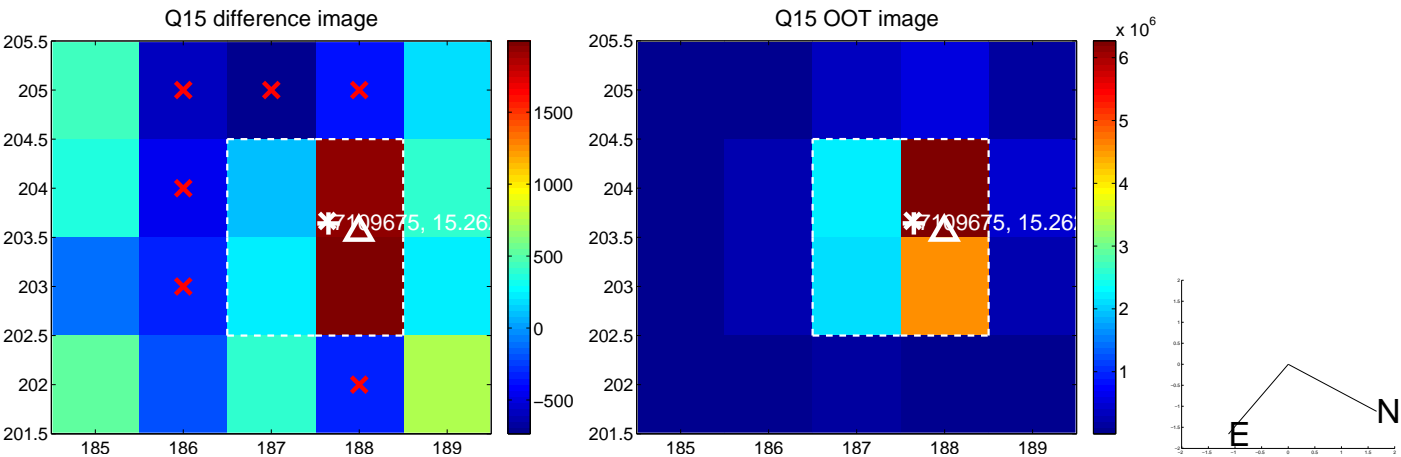
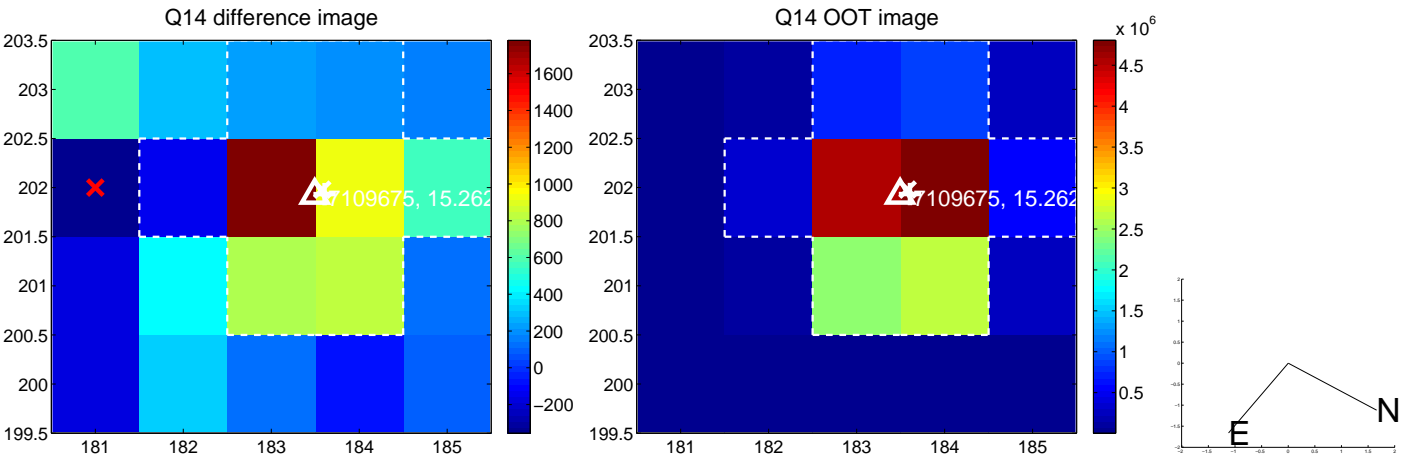
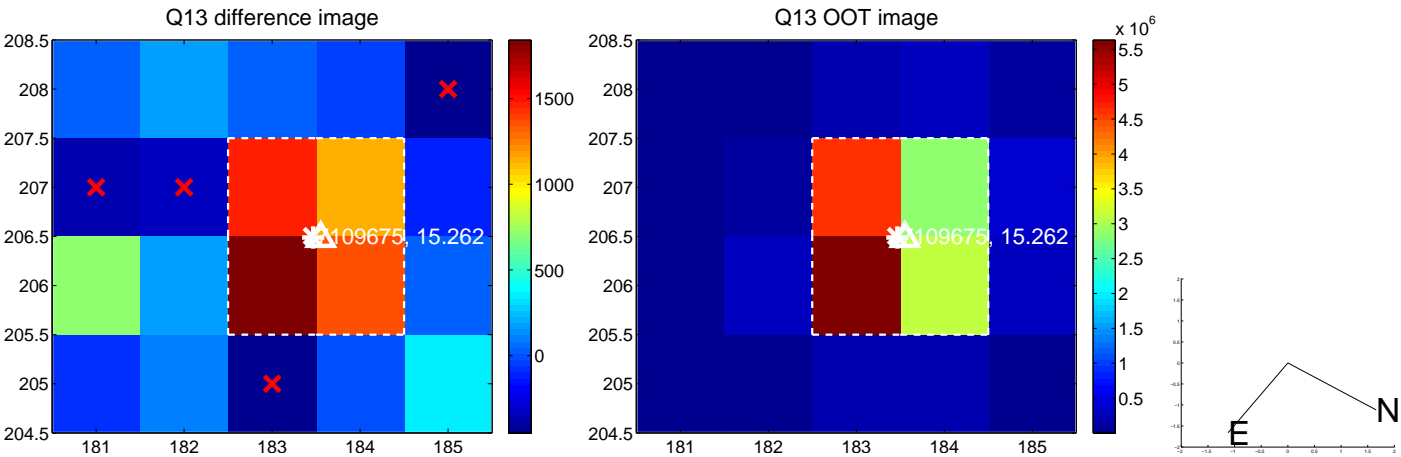
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



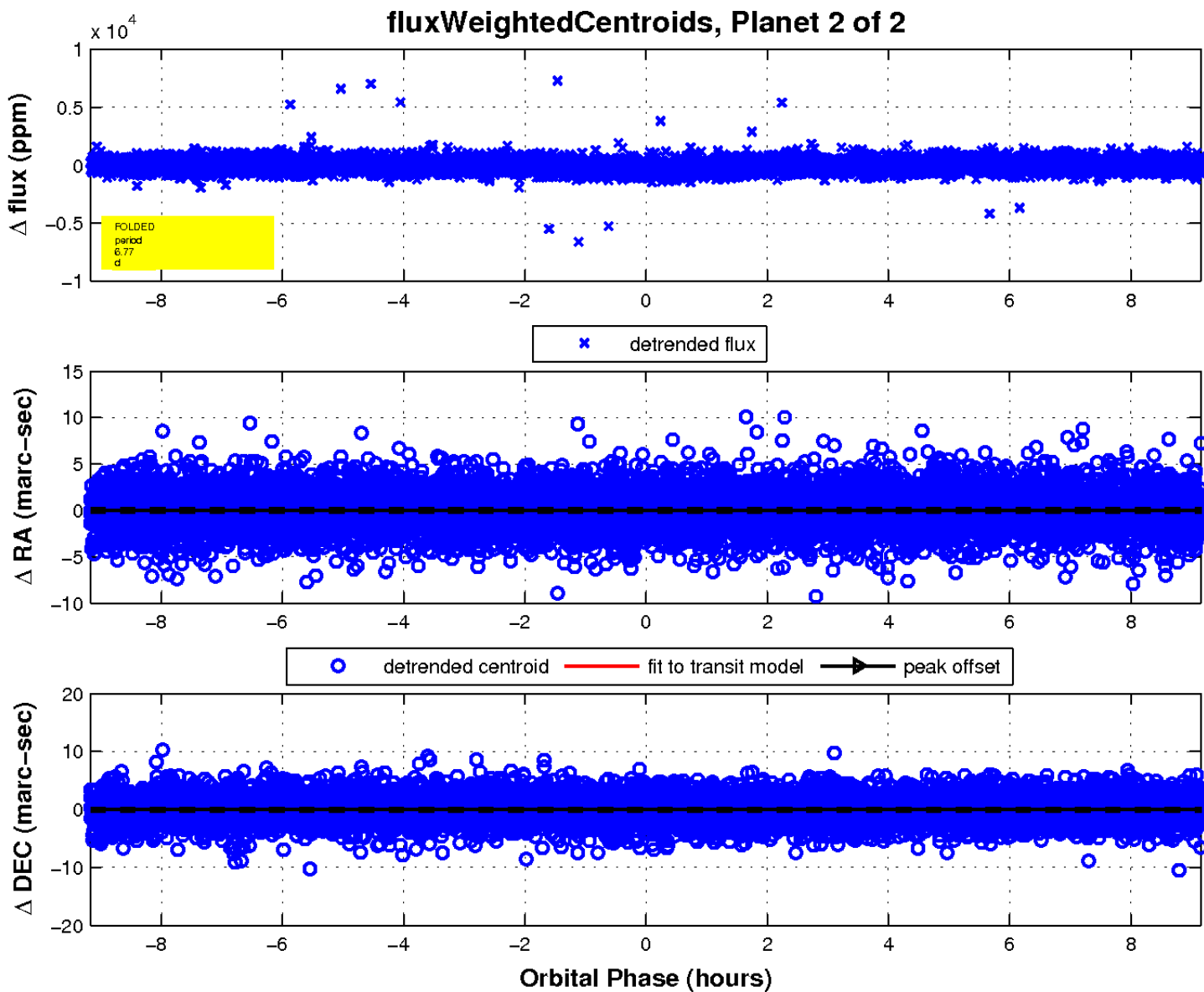
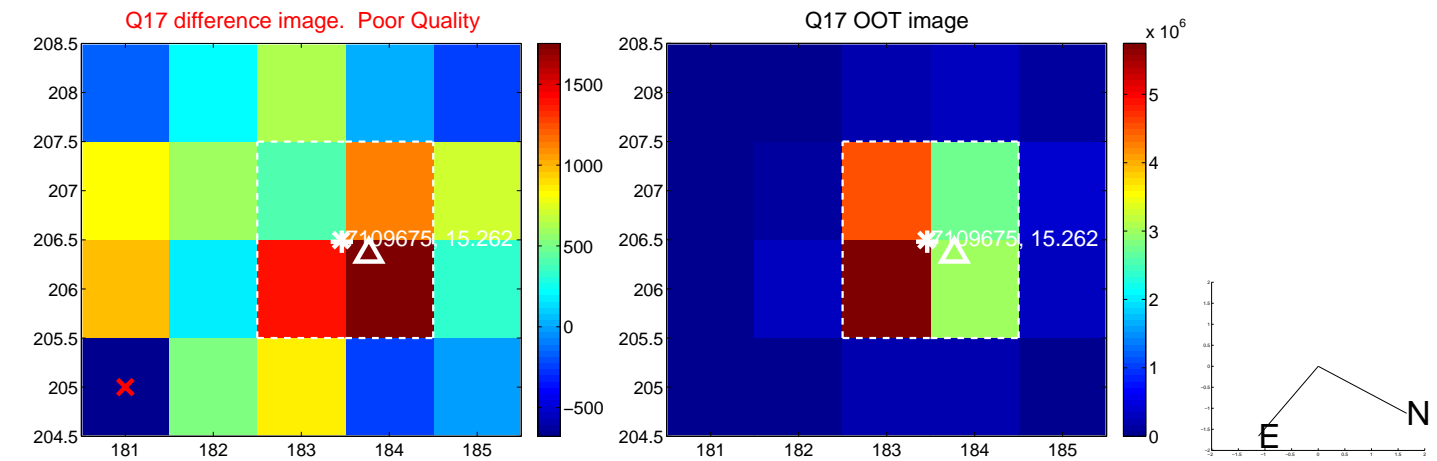
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

