

KIC 008738735

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})
008738735-01	OBS	0693.02	15.660580	146.348212	390.0	7.259	43.6	46.8	1.04	6000	2.31	78.14
008738735-02	OBS	0693.01	28.779745	135.740929	250.5	8.550	22.4	23.4	1.04	6000	1.95	34.72

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008738735-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008738735-02	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.

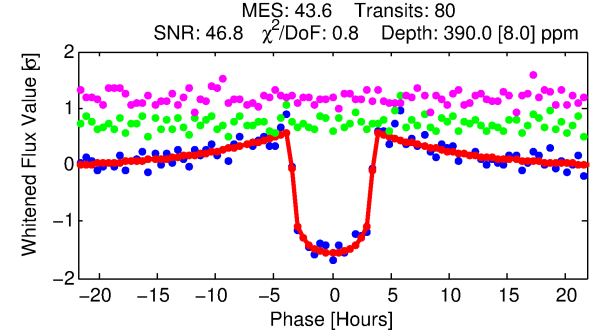
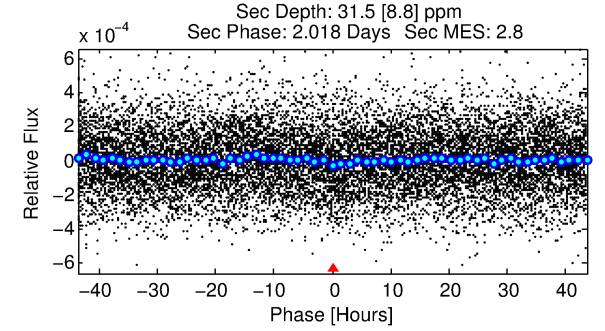
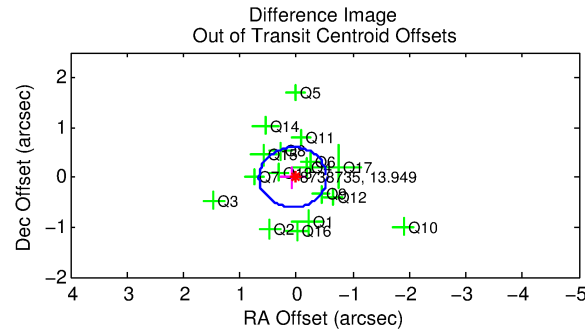
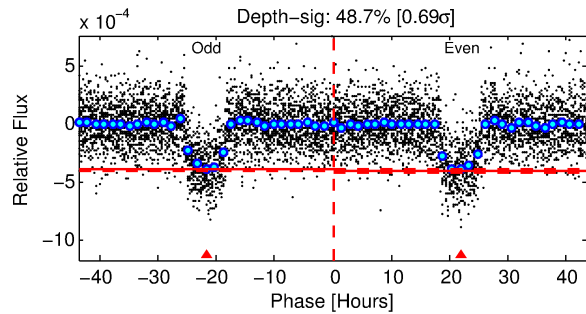
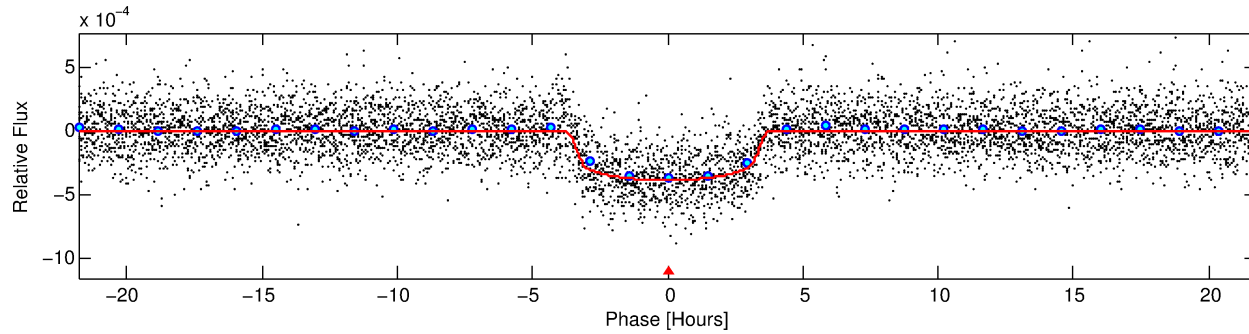
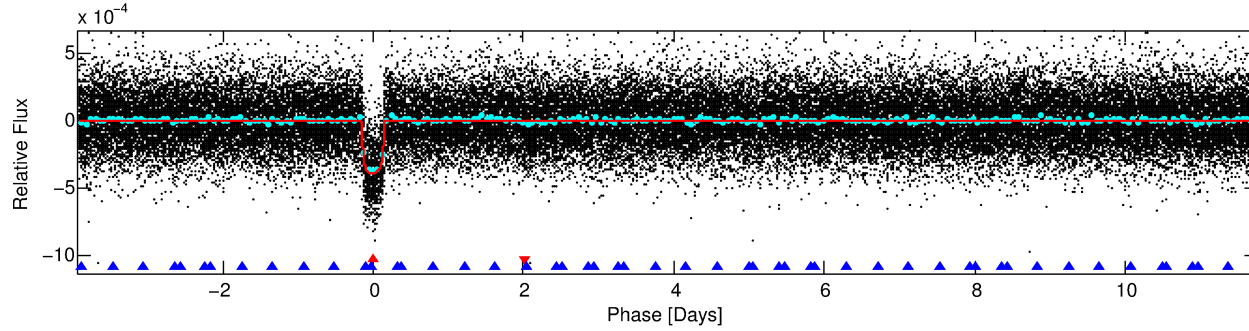
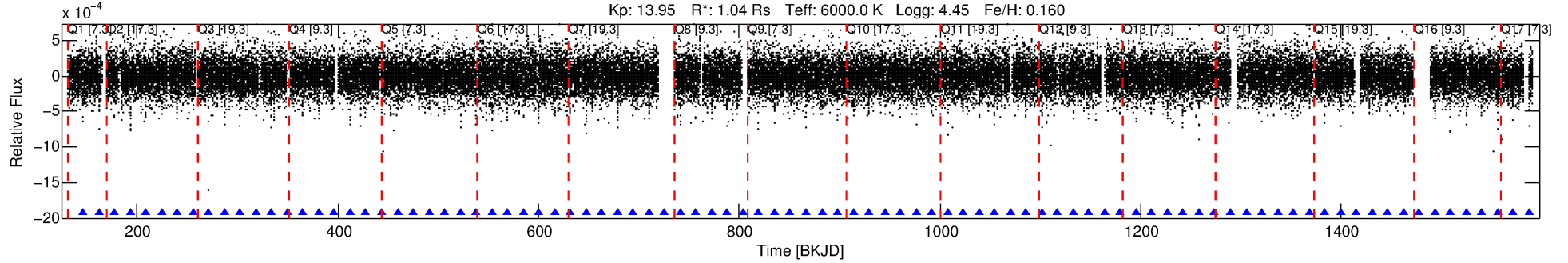
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008738735-01

No Significant Match Found

DV One-Page Summary

KIC: 8738735 Candidate: 1 of 2 Period: 15.661 d
KOI: K00693.02 Name: Kepler-214b Corr: 0.983



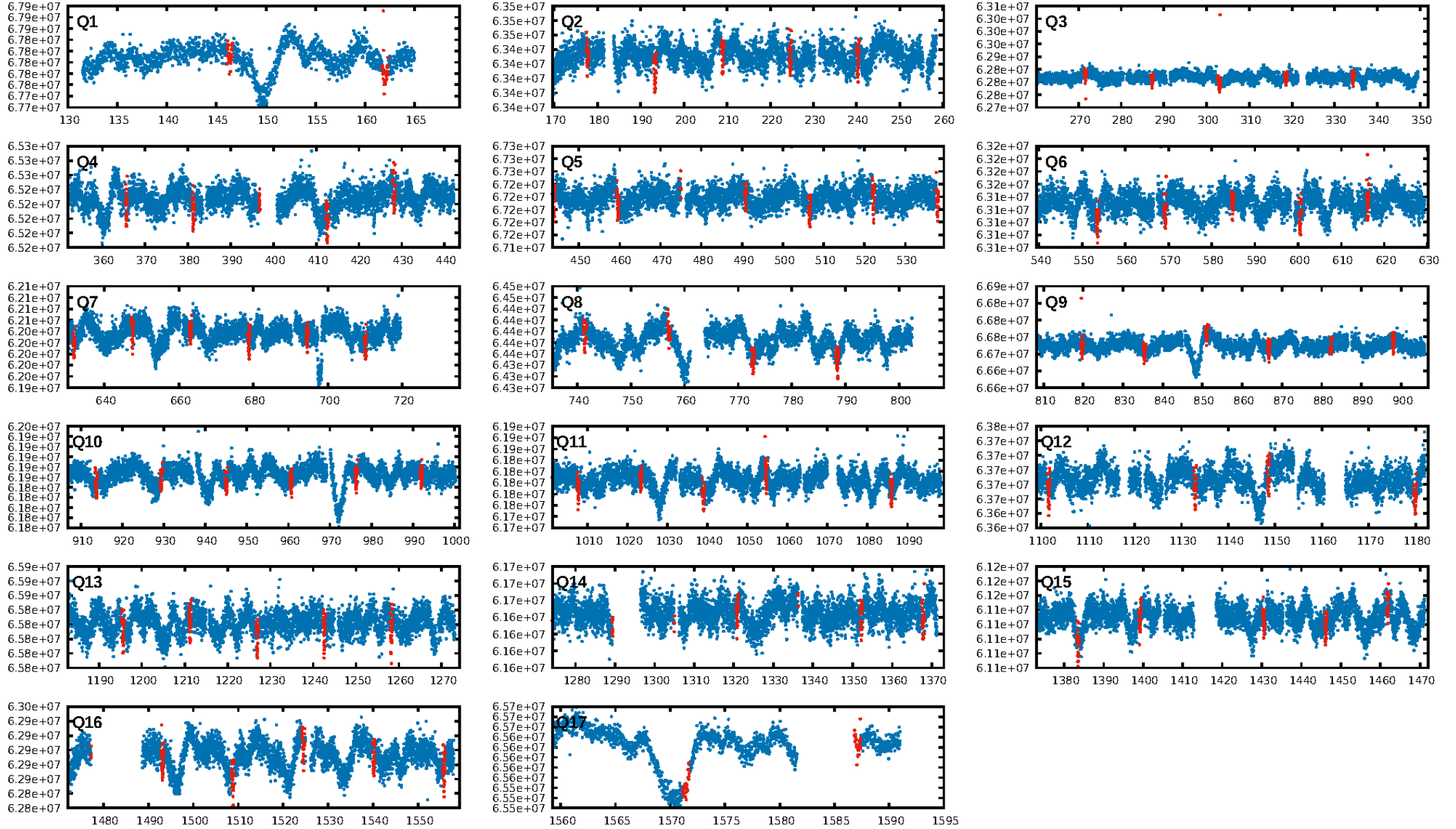
DV Fit Results:

Period = 15.66058 [0.00004] d
Epoch = 146.3482 [0.0022] BKJD
Rp/R* = 0.0203 [0.0013]
a/R* = 9.99 [2.81]
b = 0.82 [0.11]
Seff = 78.14 [19.10]
Teq = 758 [46] K
Rp = 2.31 [0.41] Re
a = 0.1273 [0.0188] AU
Ag = 52.44 [19.98] [2.58 σ]
Teffp = 3154 [253] K [9.30 σ]

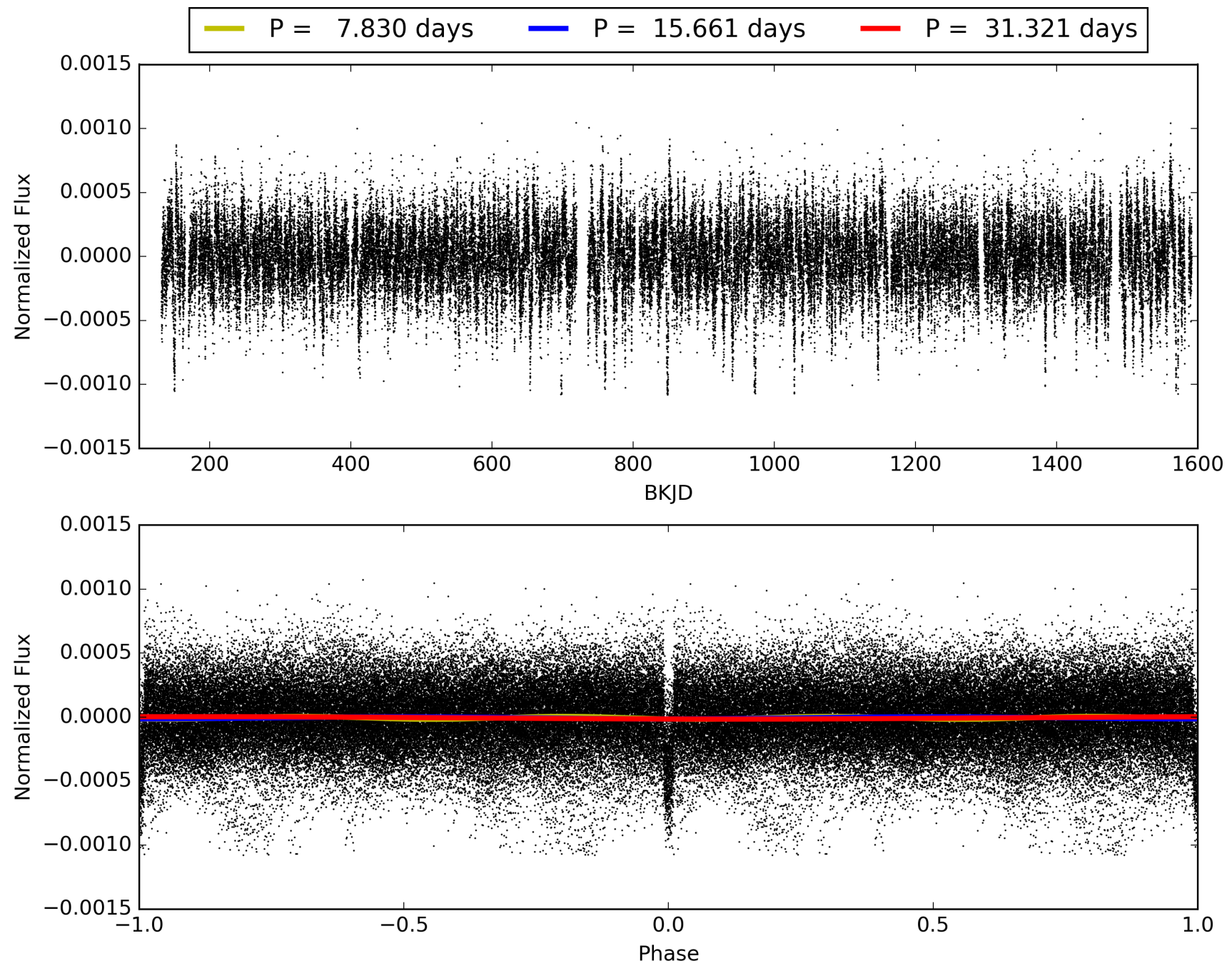
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [28.07 σ]
ModelChiSquare2-sig: 98.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [76/76]
GhostDiagnostic-chr: 4.911
Centroid-sig: 0.4%
Centroid-so: 0.361 arcsec [1.82 σ]
OotOffset-rm: 0.063 arcsec [0.31 σ]
KicOffset-rm: 0.090 arcsec [0.43 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 008738735-01, PDC Light Curves

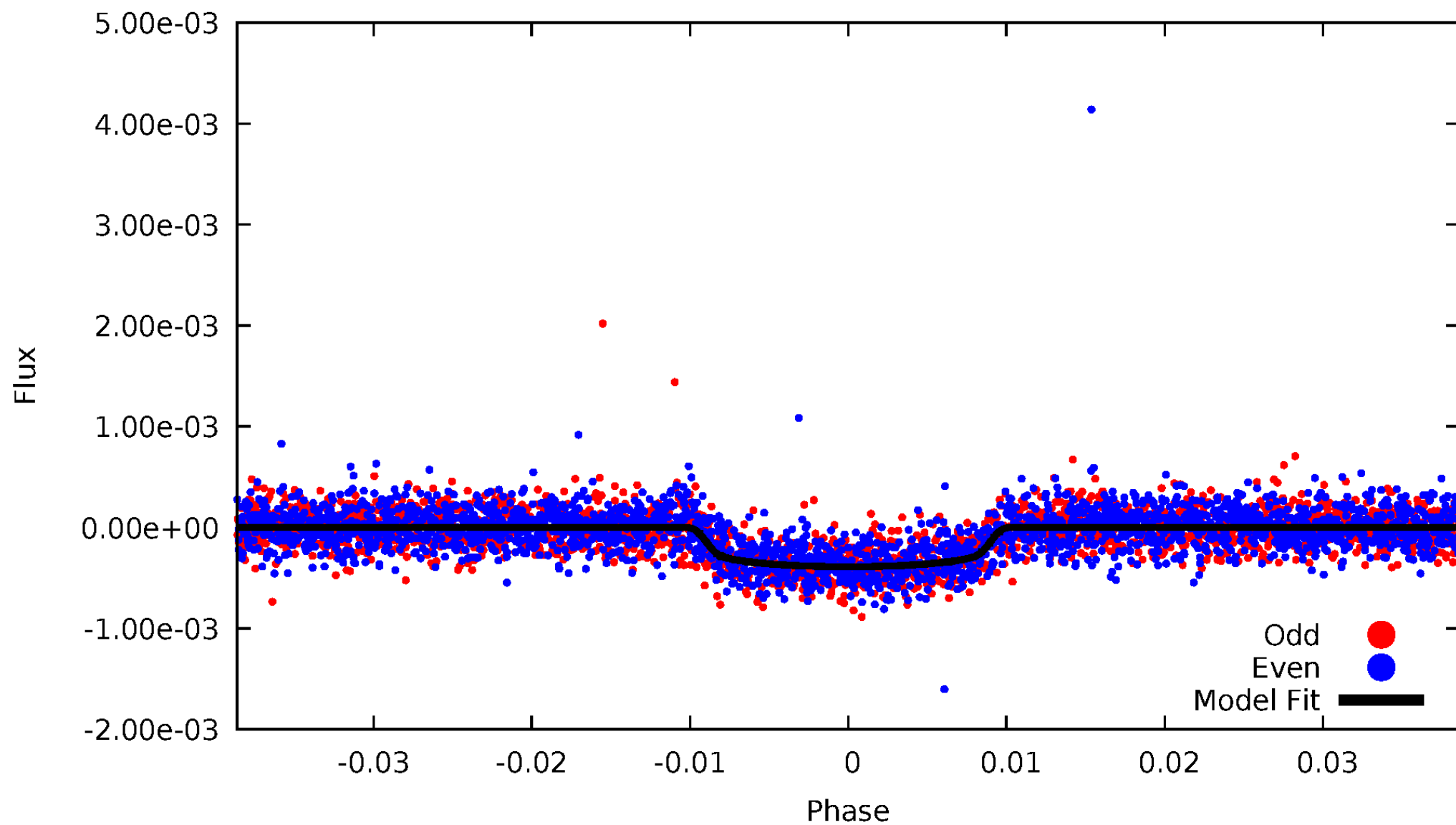


TCE 008738735-01



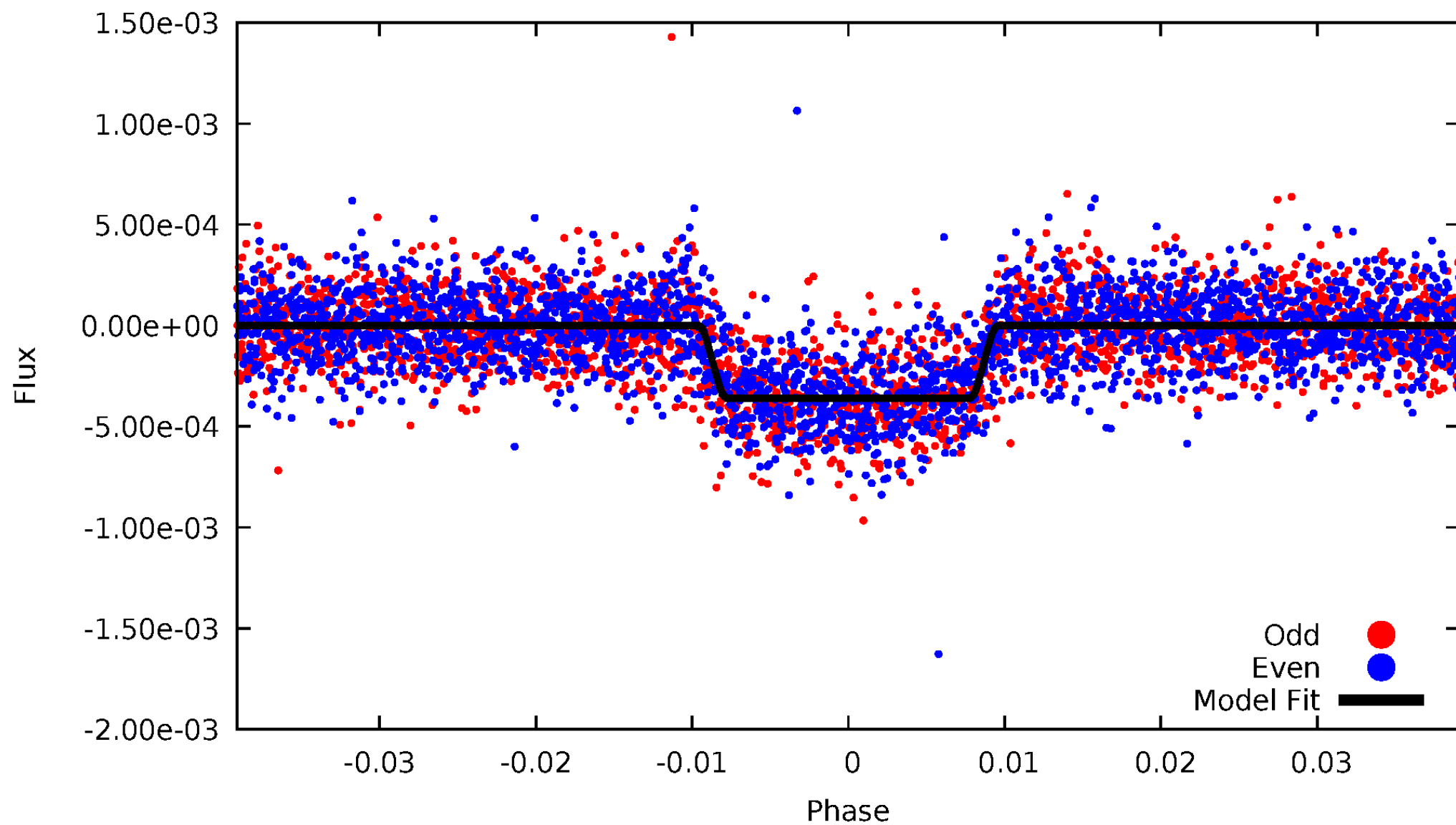
DV Odd/Even

TCE 008738735-01



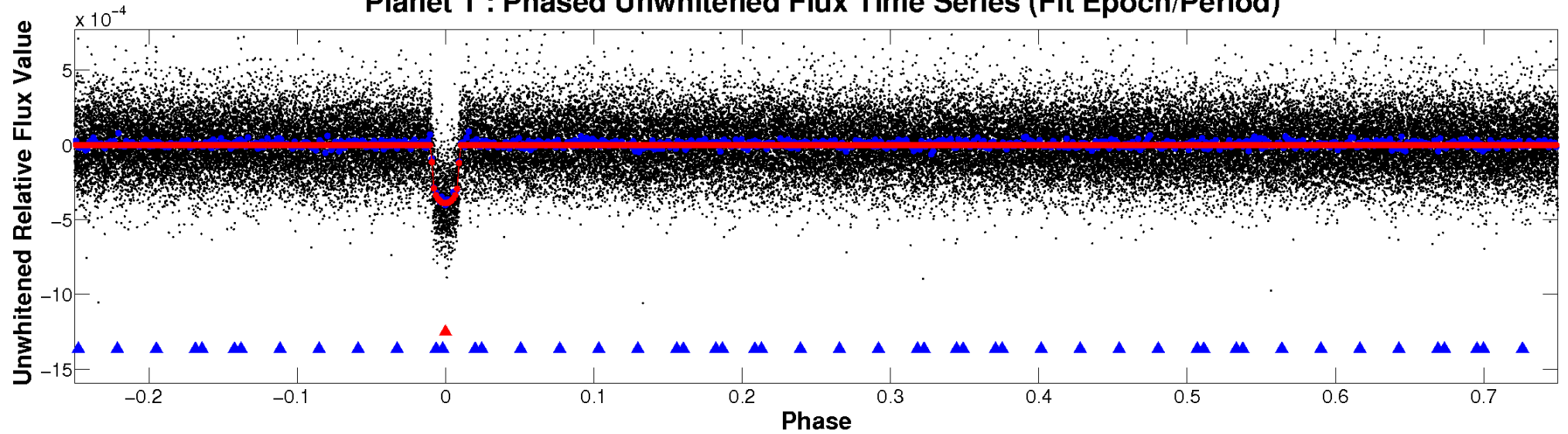
ALT Odd/Even

TCE 008738735-01

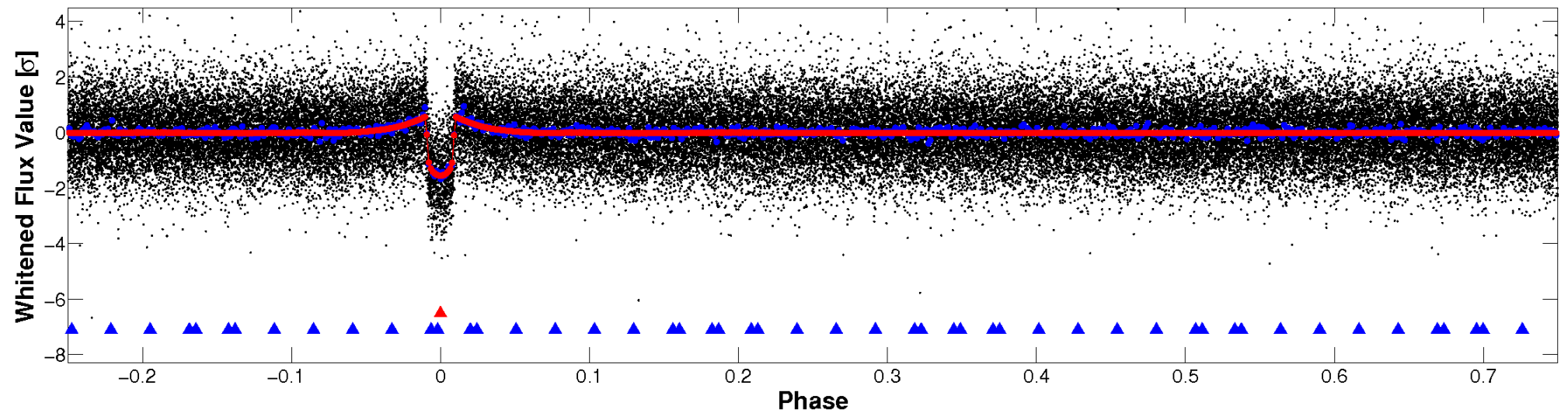


Non-Whitened Vs. Whitened Light Curve

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

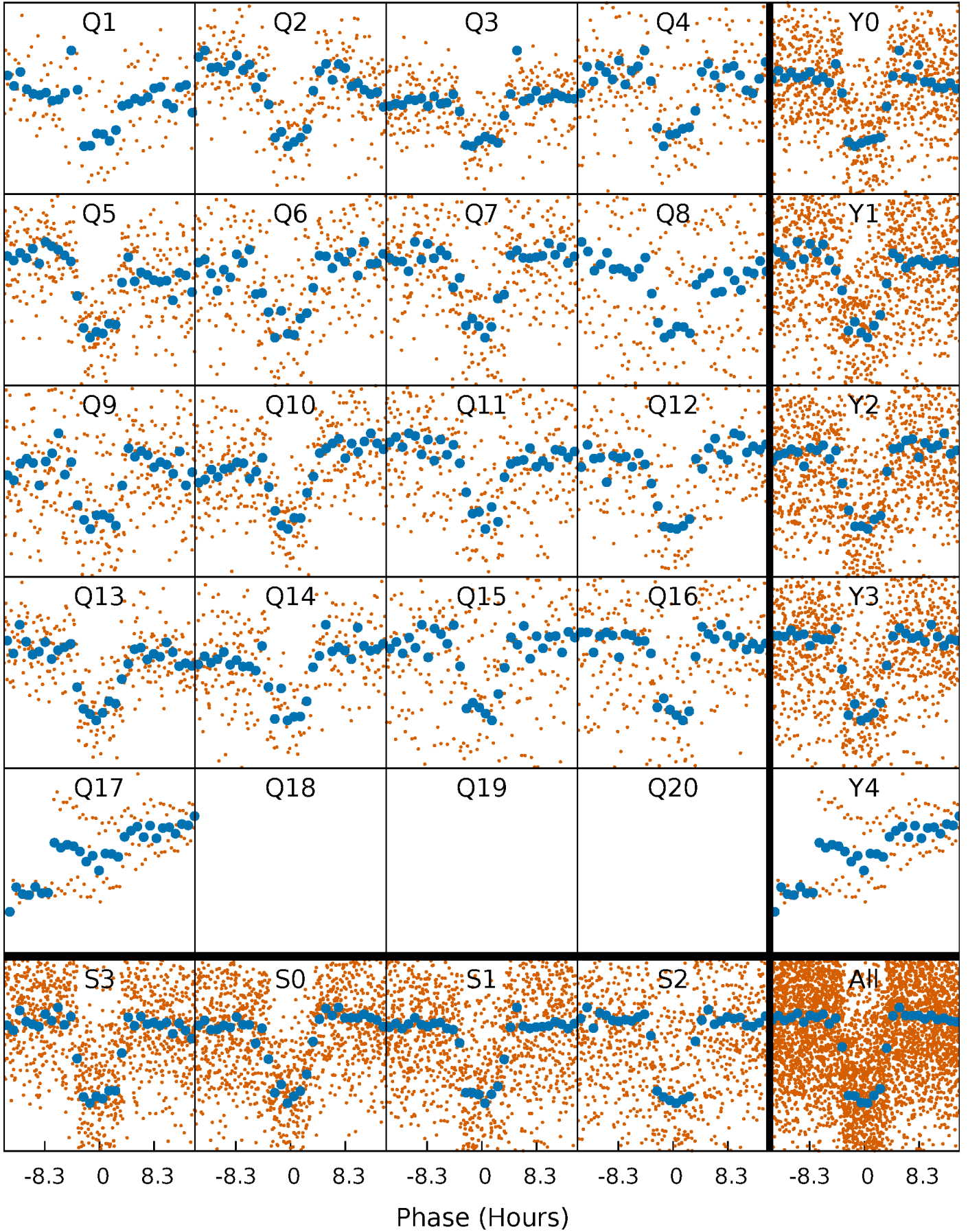


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



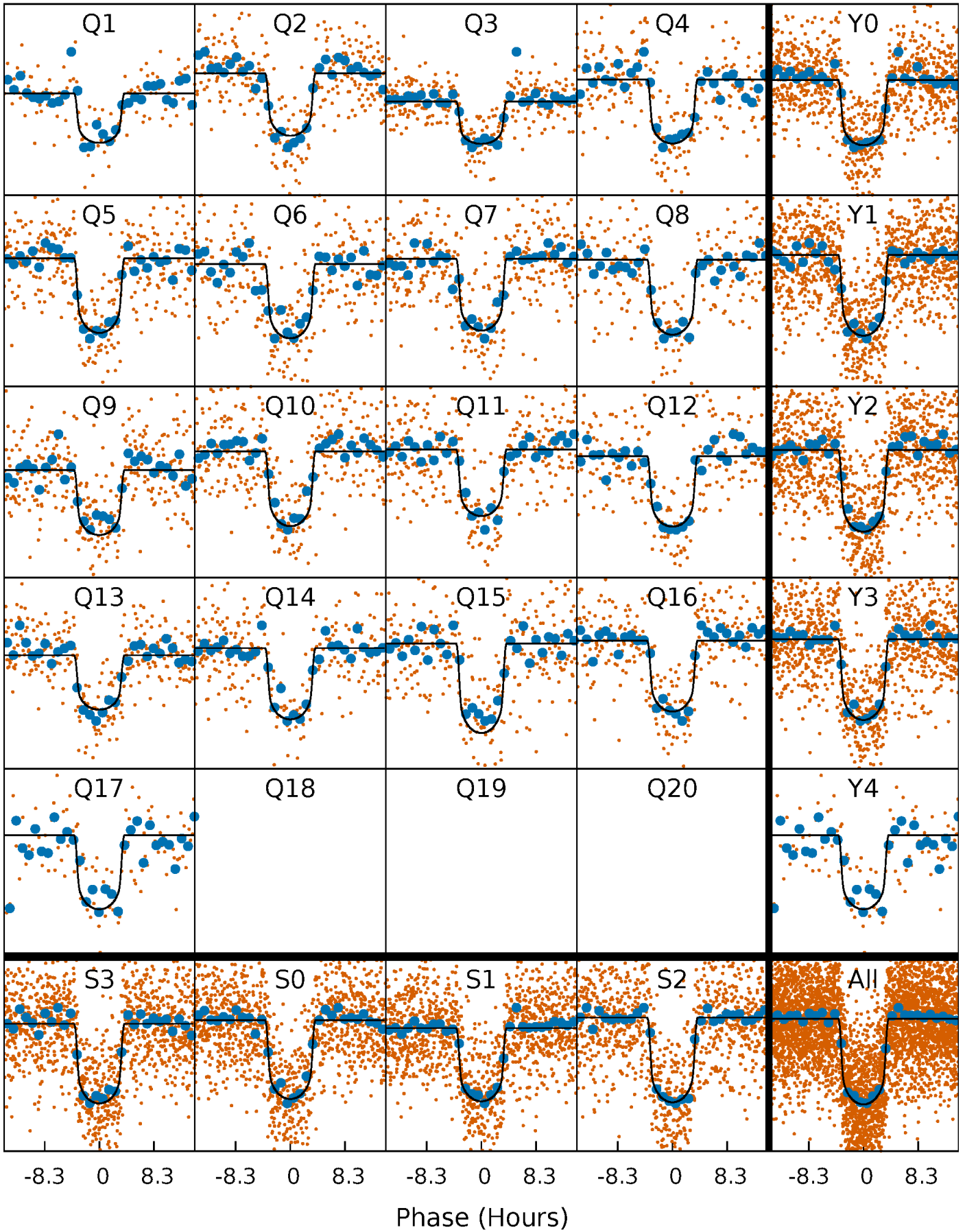
PDC Quarter-Phased Transit Curves

TCE 008738735-01 P= 15.660580 Days $T_0=146.348212$ (BKJD)



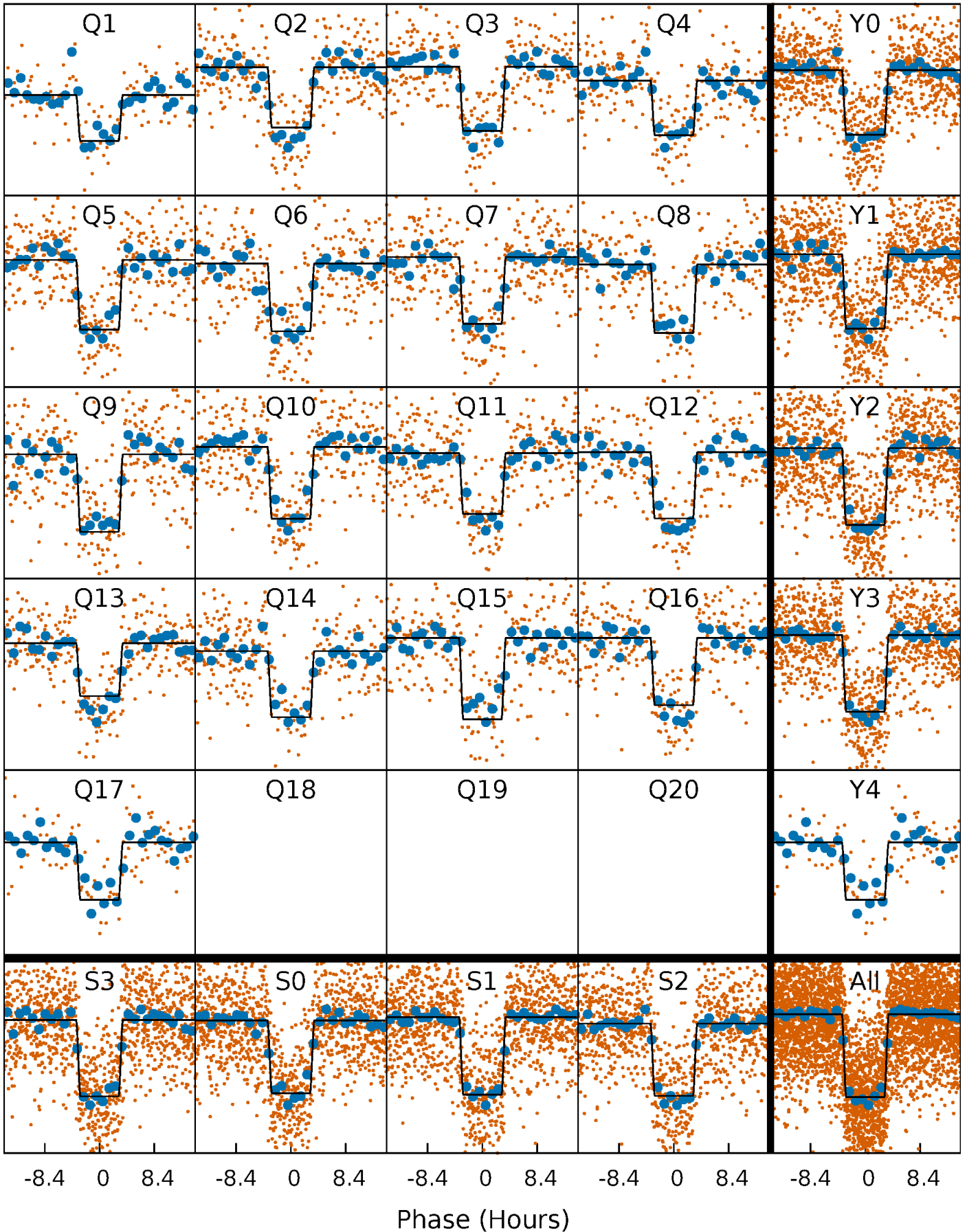
DV Quarter-Phased Transit Curves

TCE 008738735-01 P= 15.660580 Days $T_0=146.348212$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

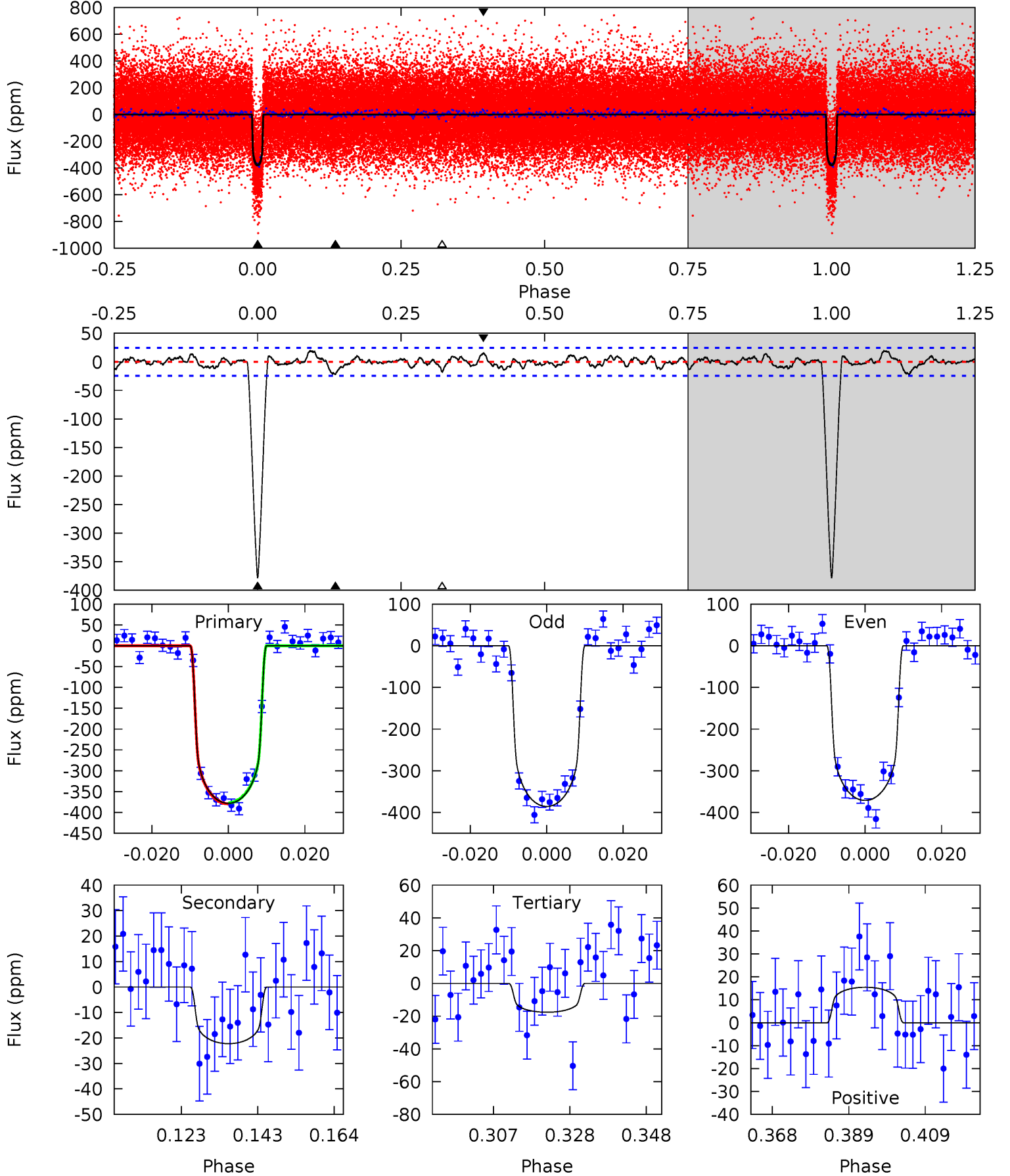
TCE 008738735-01 P= 15.660473 Days $T_0=146.353896$ (BKJD)



DV Model-Shift Uniqueness Test

008738735-01, $P = 15.660580$ Days, $E = 130.687632$ Days

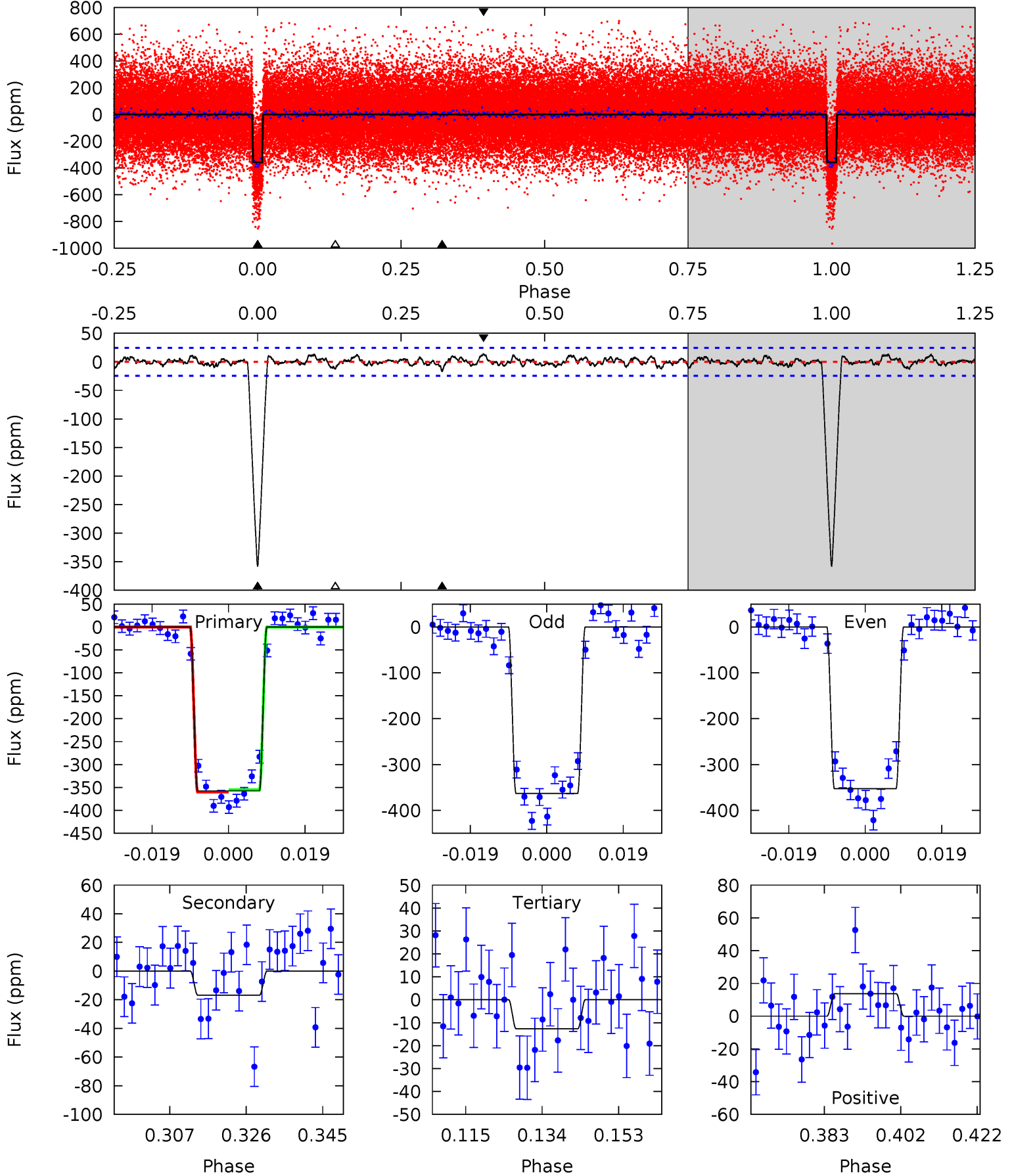
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
75.9	4.46	3.54	3.10	4.89	2.32	1.24	72.3	72.8	0.92	1.36	1.45	0.97	0.05	0.24



Alt Model-Shift Uniqueness Test

008738735-01, $P = 15.660473$ Days, $E = 130.693423$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
71.6	3.36	2.53	2.75	4.90	2.34	1.00	69.1	68.8	0.83	0.61	1.04	0.99	0.04	0.45



Stellar Parameters For KIC 008738735

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6000^{+106}_{-142}	$4.450^{+0.032}_{-0.128}$	$0.160^{+0.150}_{-0.150}$	$1.044^{+0.173}_{-0.062}$	$1.122^{+0.070}_{-0.085}$	$1.388^{+0.178}_{-0.506}$
	+2%/-2%	+1%/-3%	+94%/-94%	+17%/-6%	+6%/-8%	+13%/-36%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 008738735-01 / KOI 0693.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-22 ± 5	$2.36^{+0.21}_{-0.18}$	1072^{+39}_{-33}	3405^{+139}_{-155}	35^{+10}_{-9}
Alt.	-17 ± 5	$2.21^{+0.27}_{-0.20}$	1070^{+46}_{-33}	3317^{+162}_{-194}	29^{+11}_{-10}

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 $A_{obs} \gg 1.0$

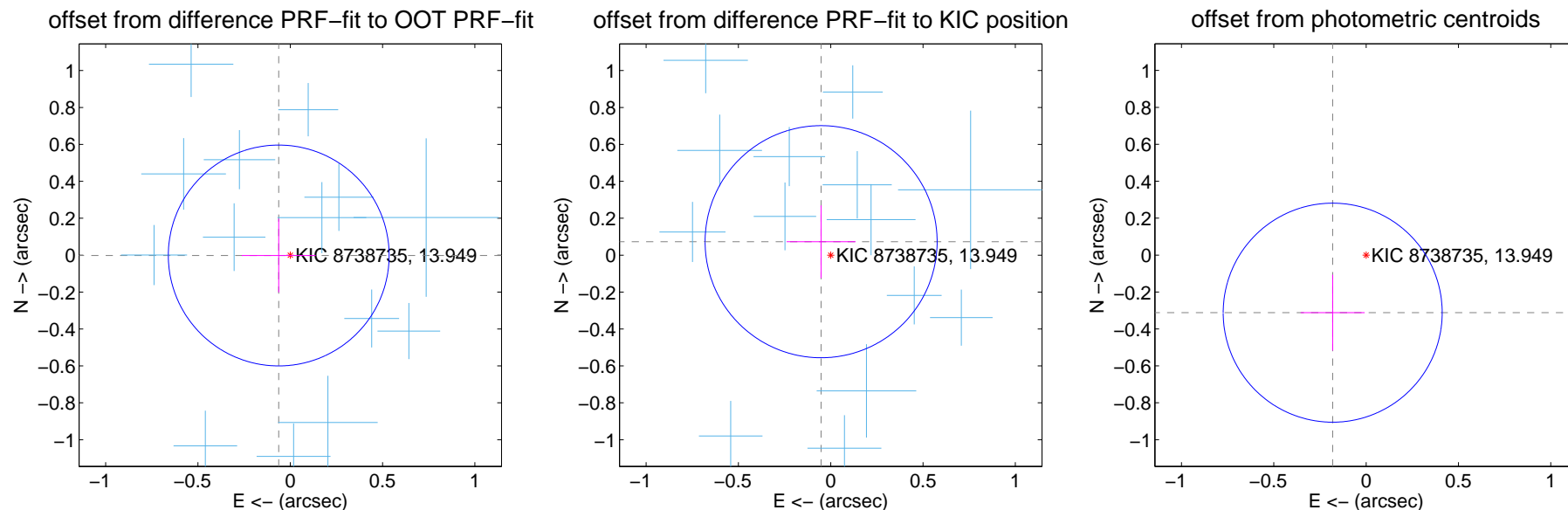
DV Centroid Data

Supplemental centroid analysis for 008738735-01. Kepler magnitude: 13.95. Transit SNR 46.81

There are 17 quarters with good PRF difference image offsets

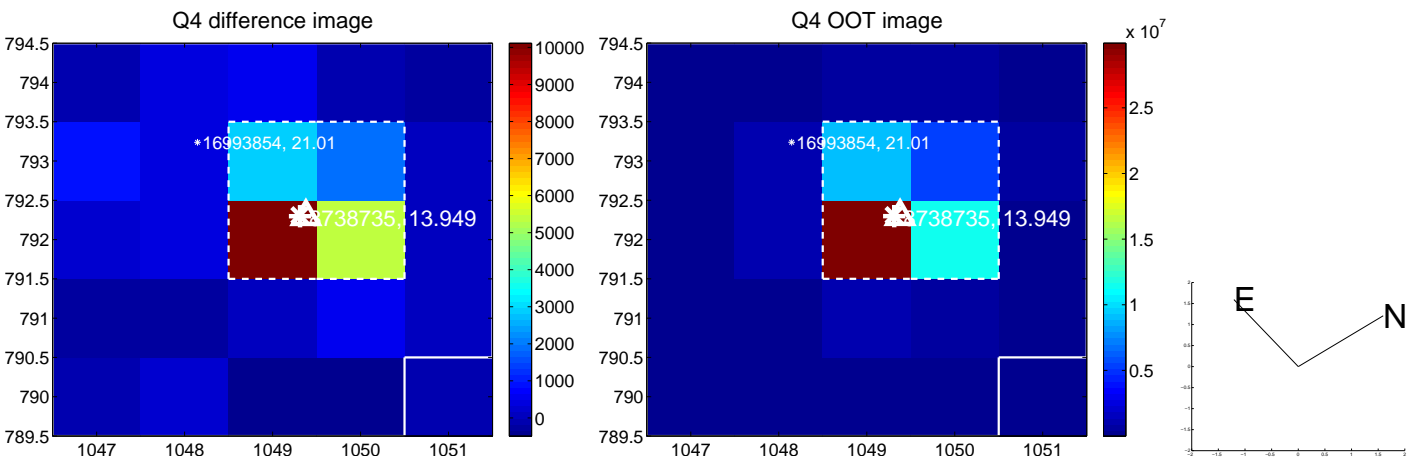
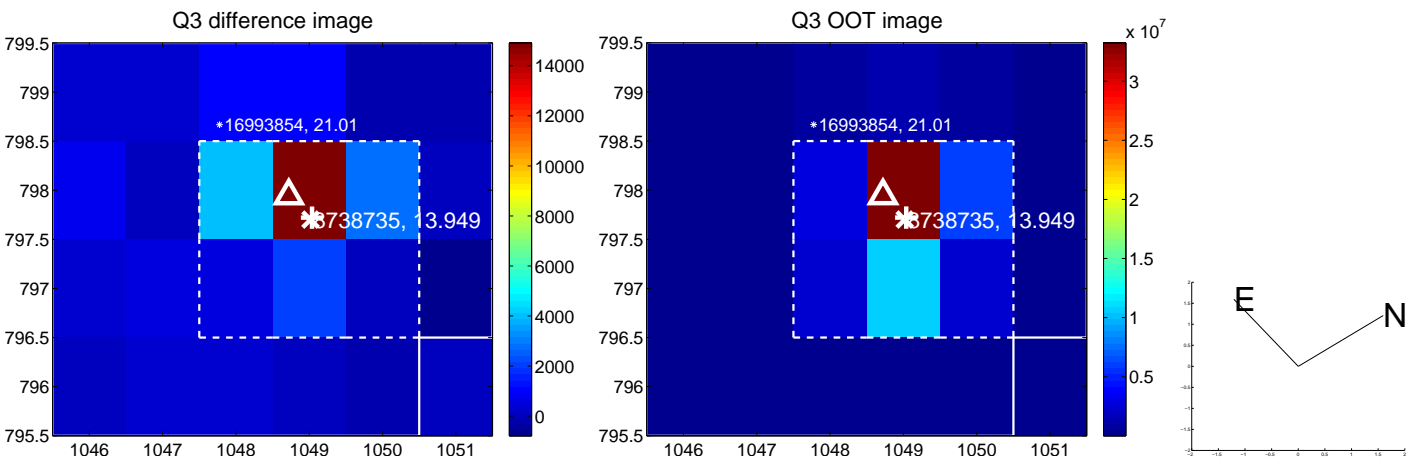
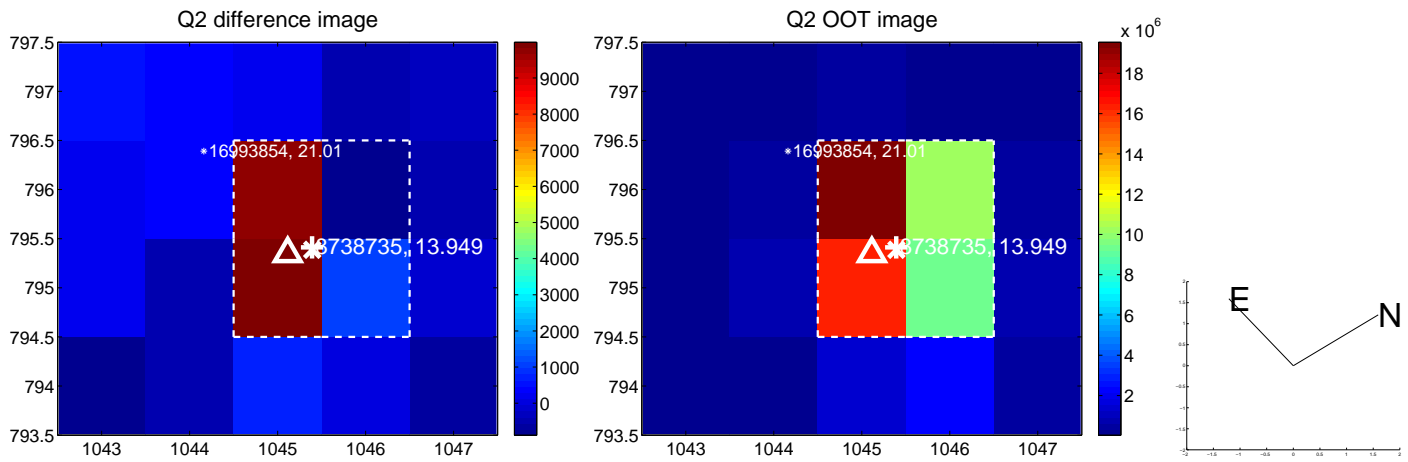
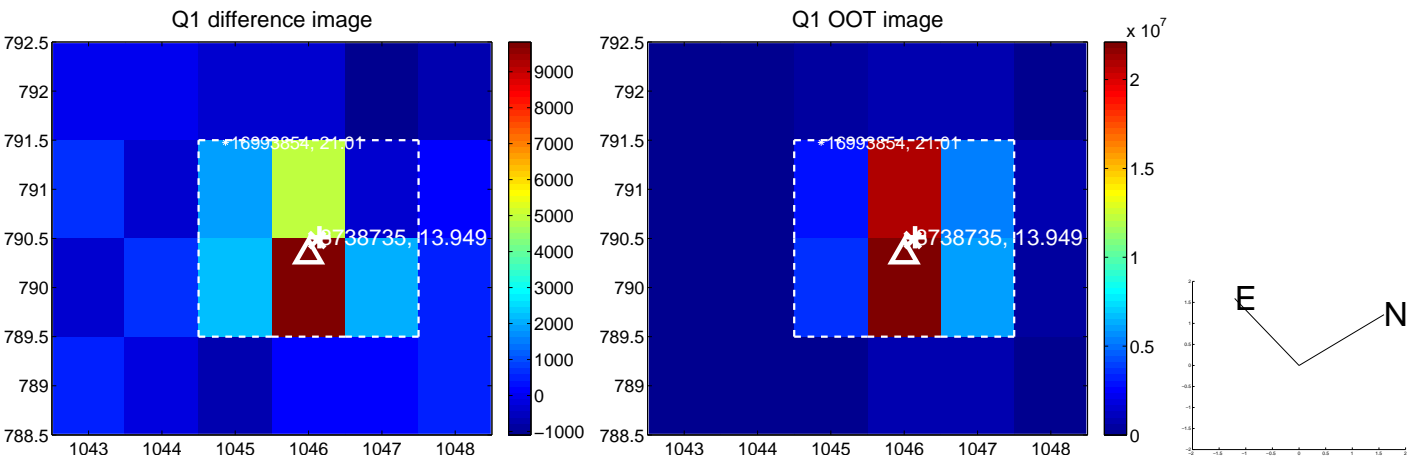
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.063 ± 0.199	0.31	0.063 ± 0.201	-0.002 ± 0.200
PRF-fit source offset from KIC position	0.090 ± 0.210	0.43	0.052 ± 0.187	0.073 ± 0.197
photometric centroid source offset	0.36 ± 0.20	1.82	0.18 ± 0.17	-0.31 ± 0.21

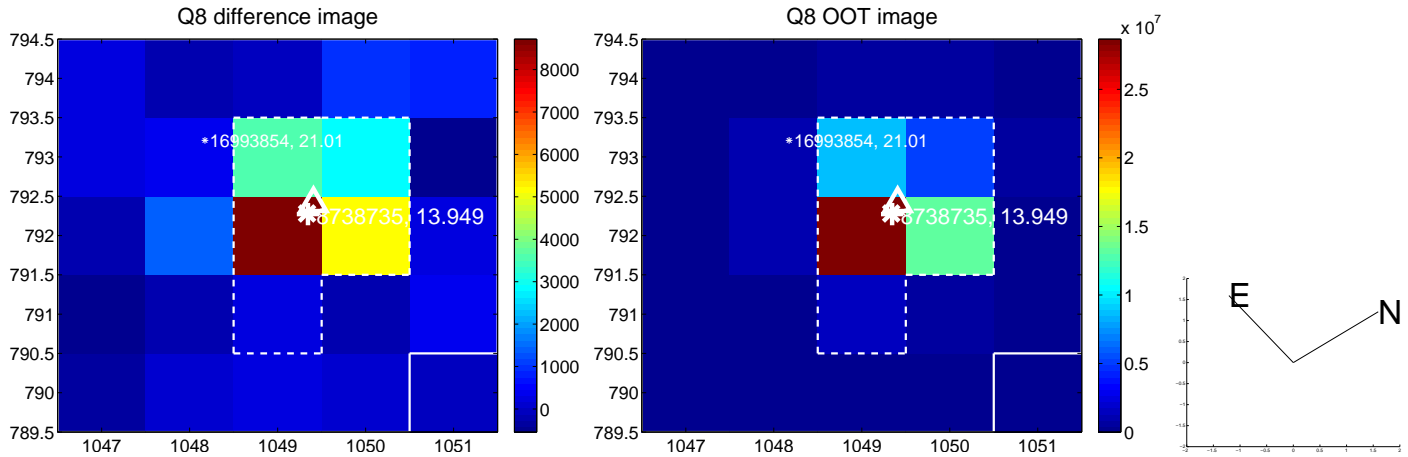
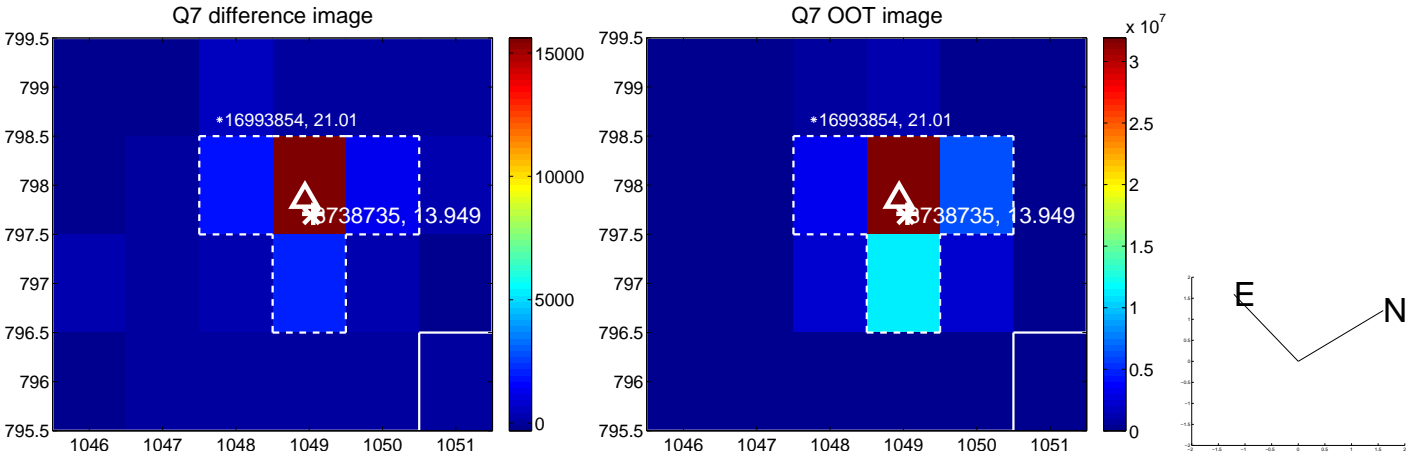
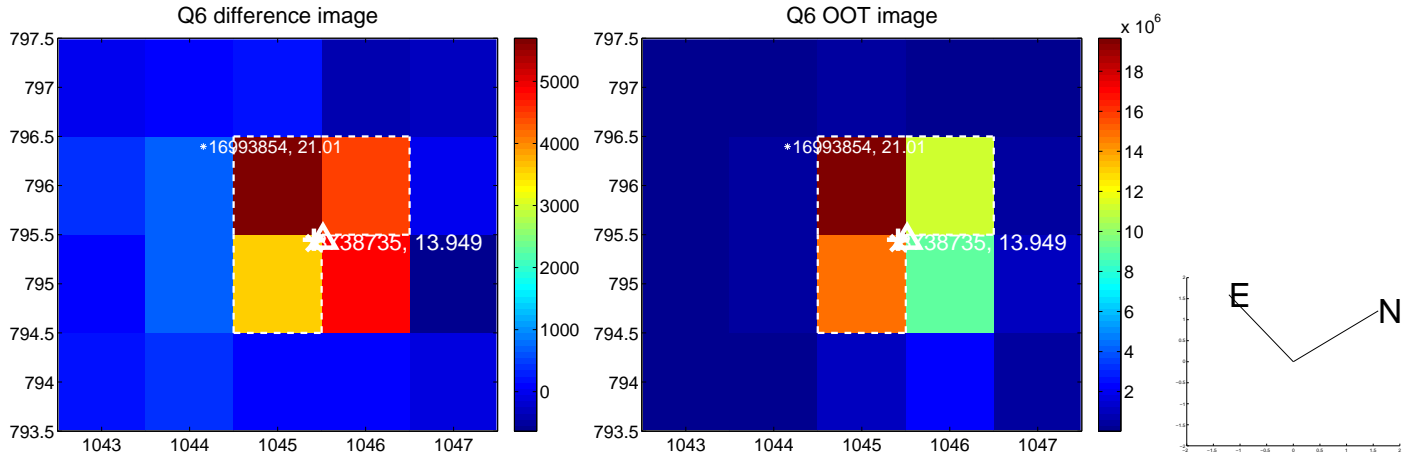
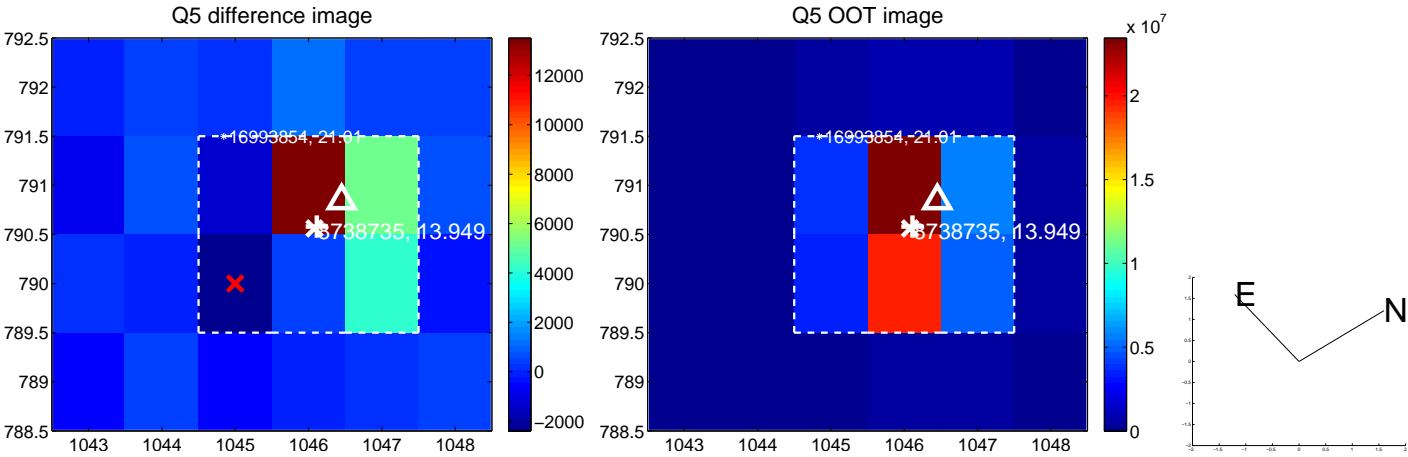


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

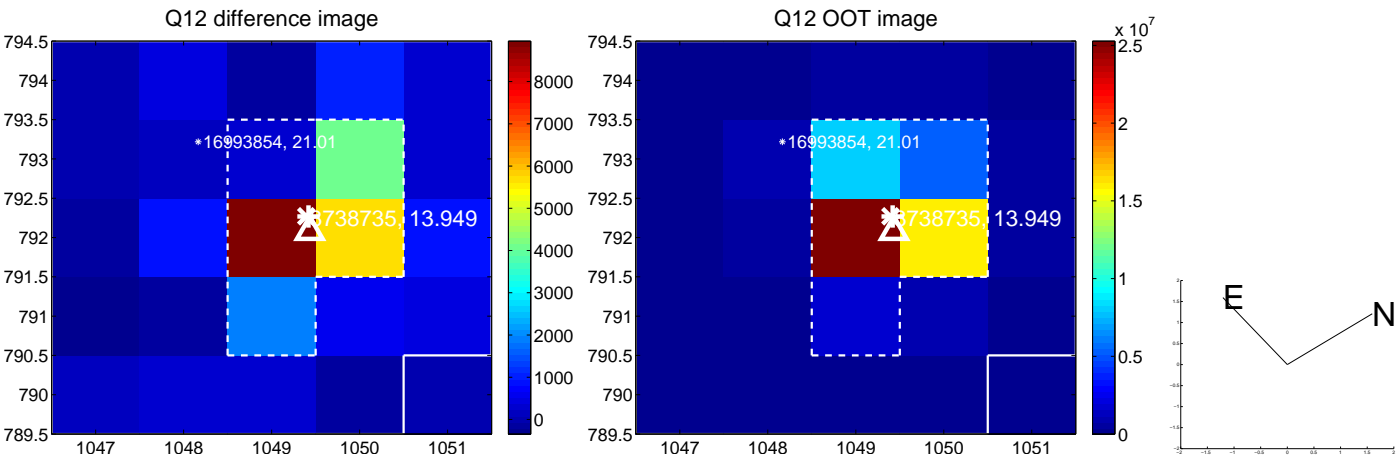
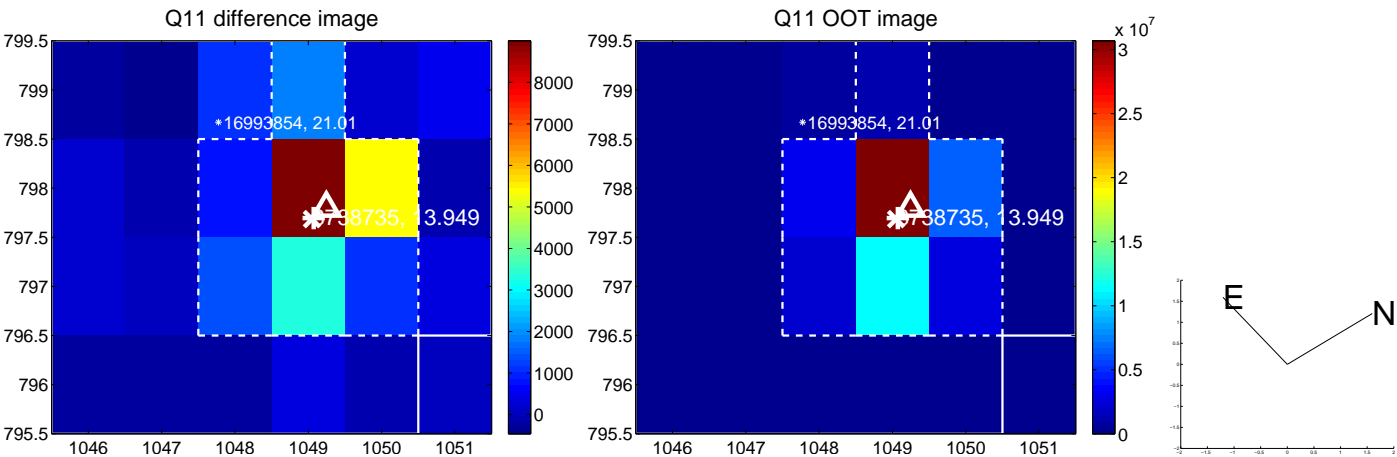
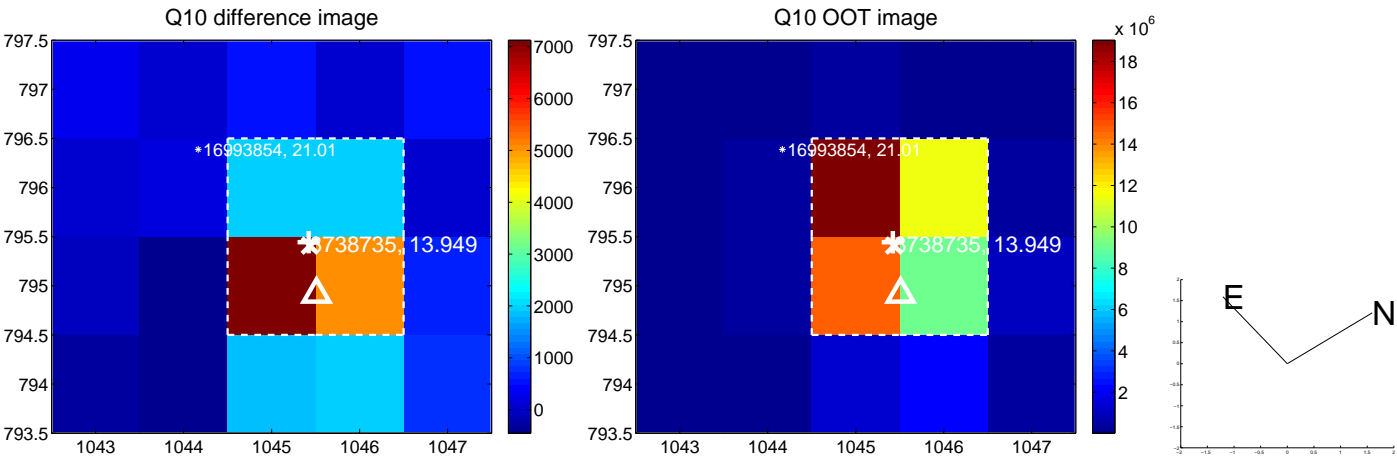
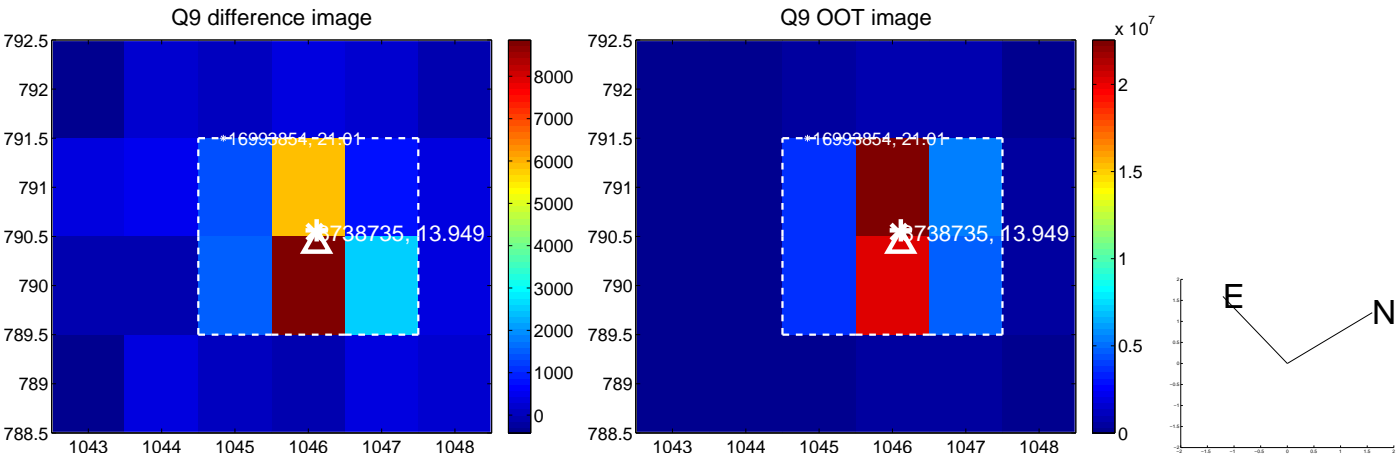
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



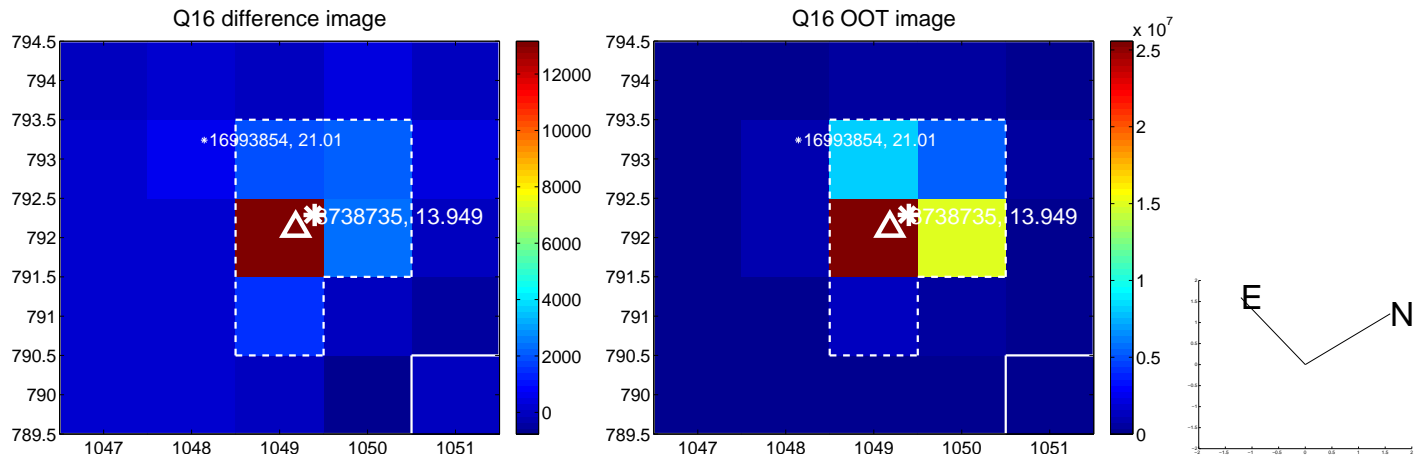
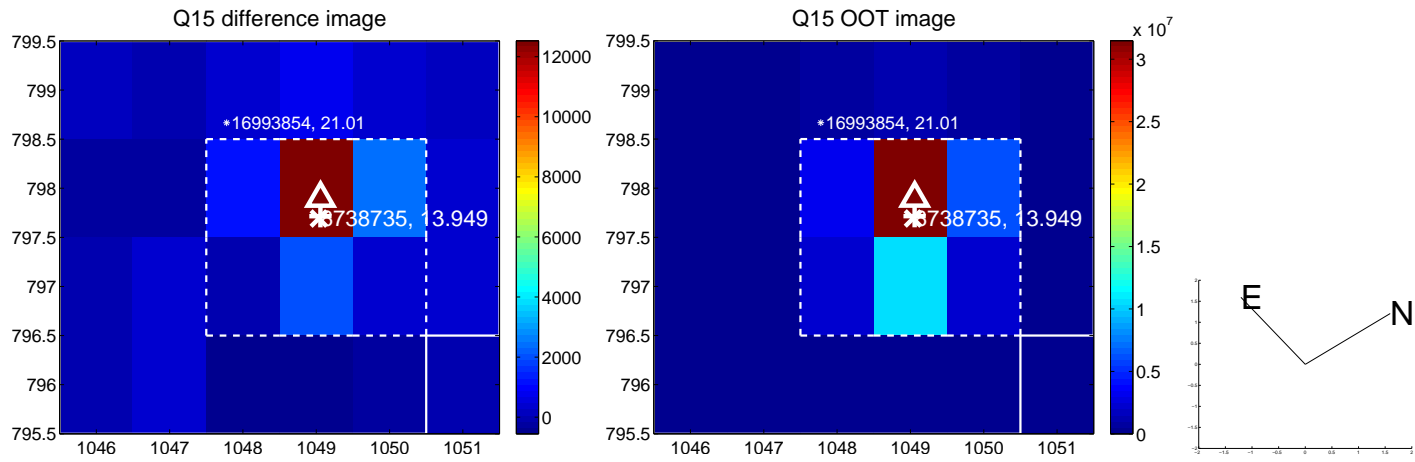
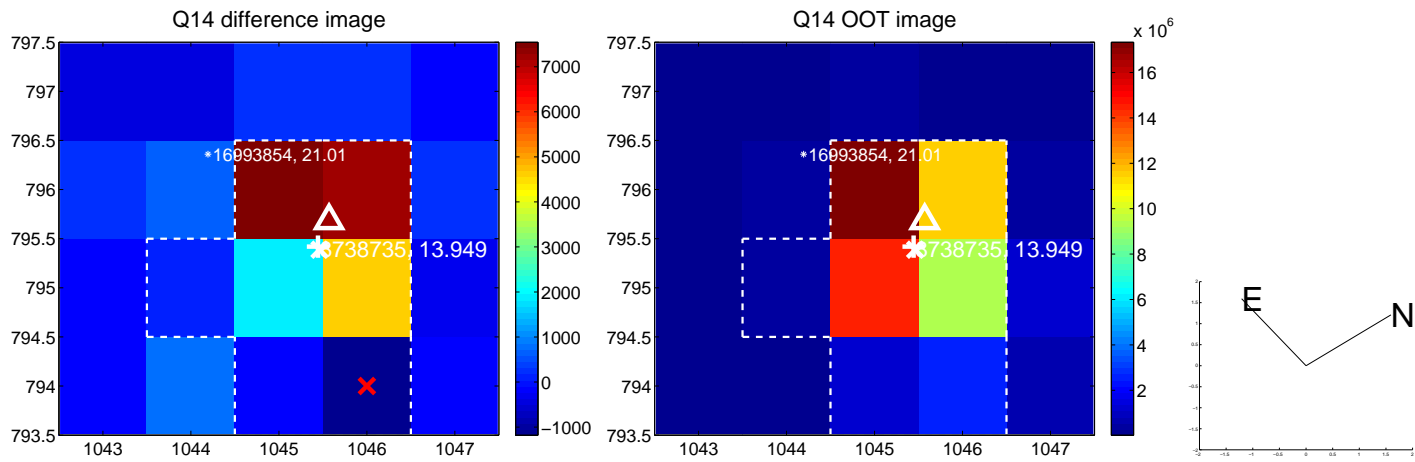
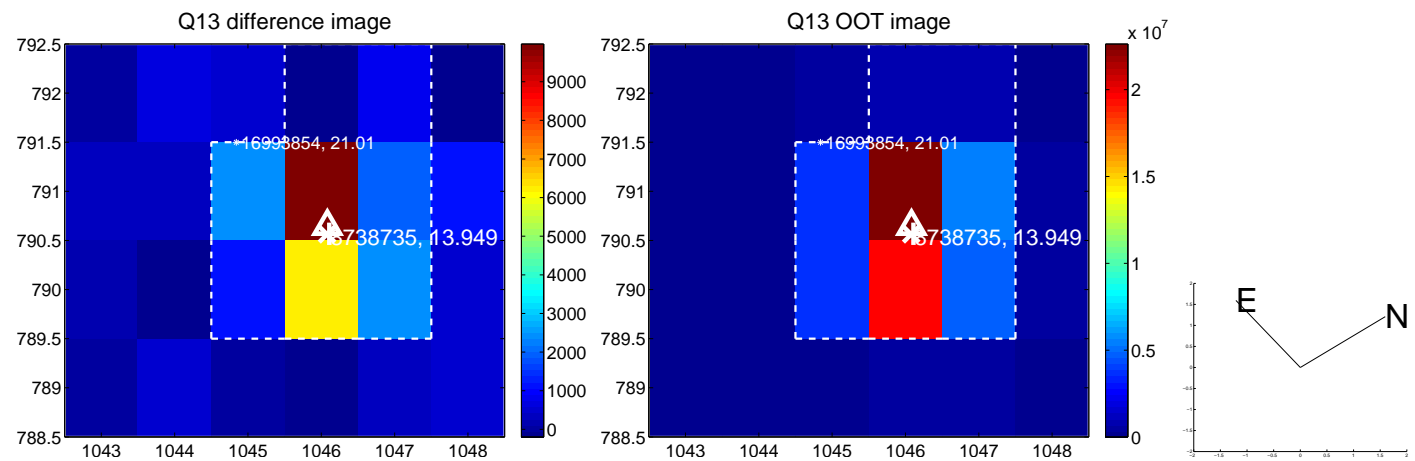
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



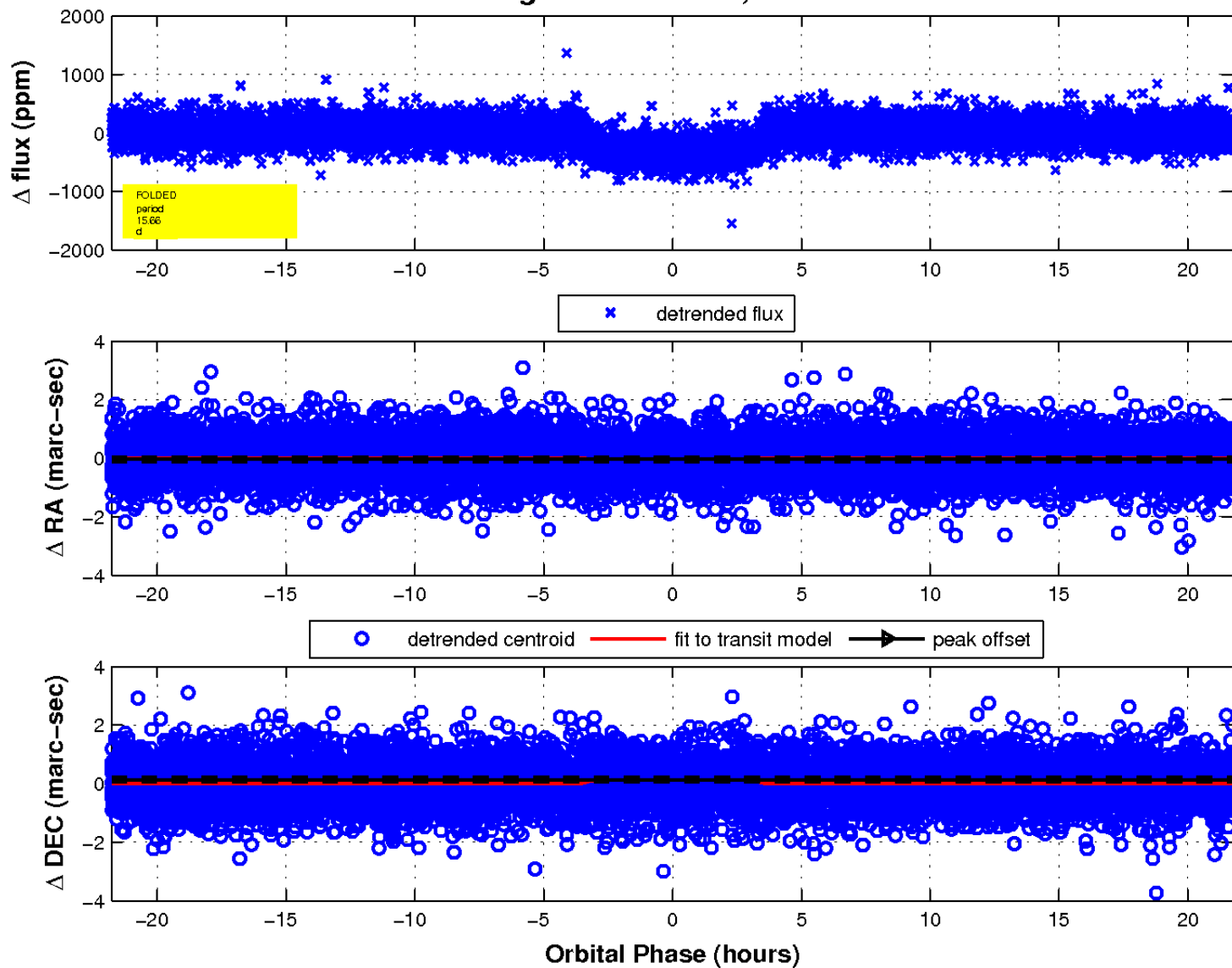
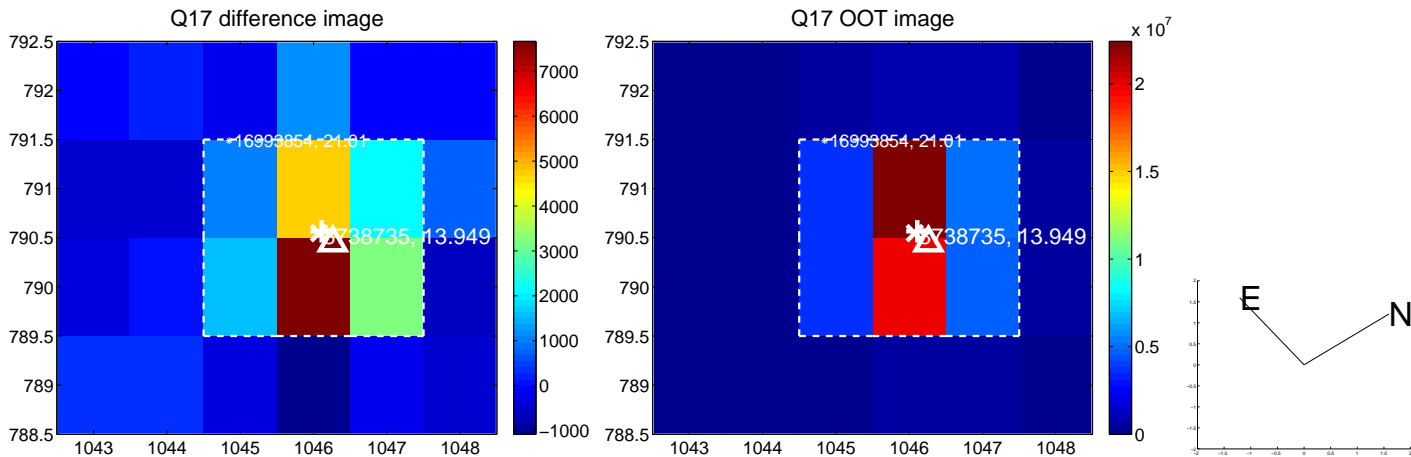
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

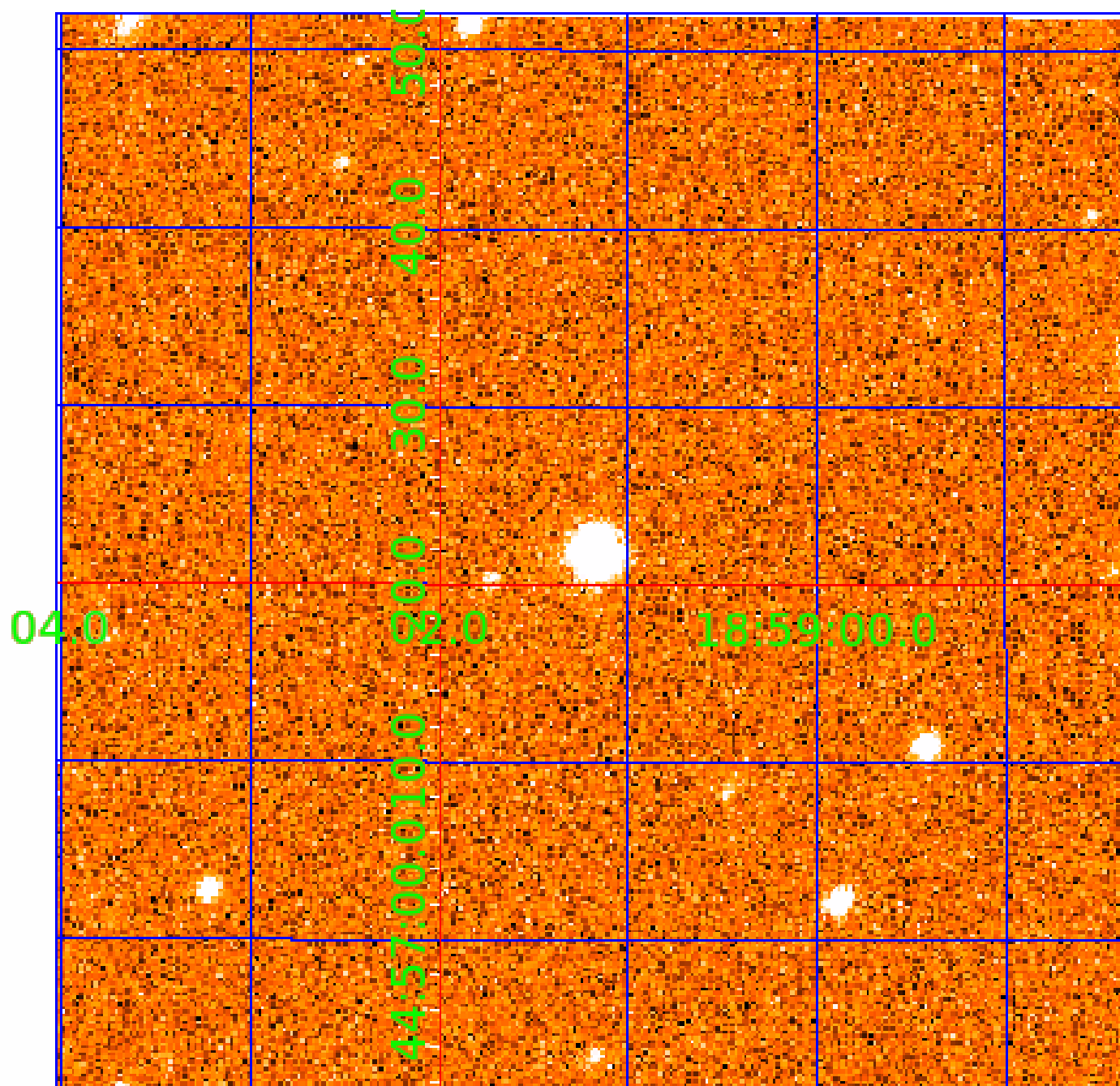


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008738735

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})
008738735-01	OBS	0693.02	15.660580	146.348212	390.0	7.259	43.6	46.8	1.04	6000	2.31	78.14
008738735-02	OBS	0693.01	28.779745	135.740929	250.5	8.550	22.4	23.4	1.04	6000	1.95	34.72

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008738735-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008738735-02	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.

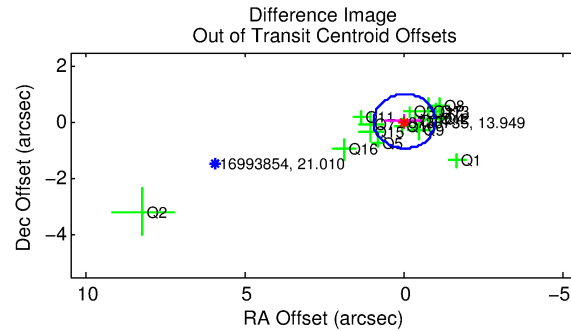
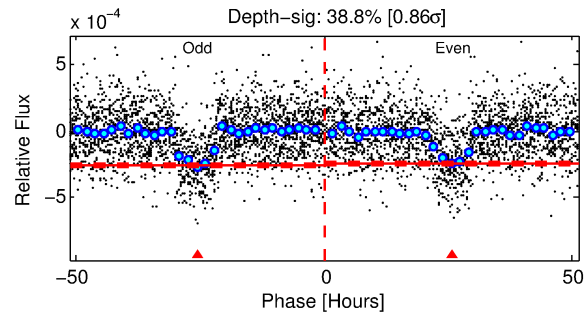
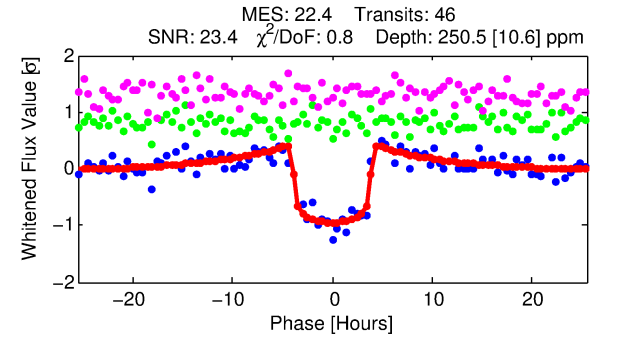
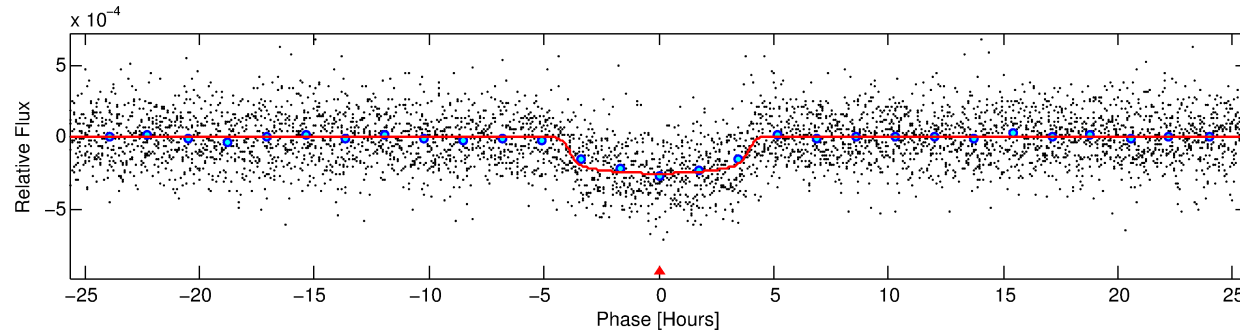
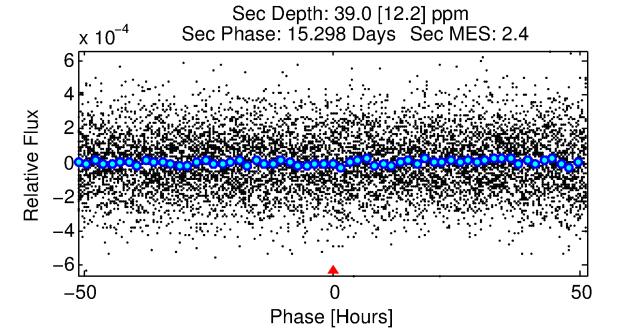
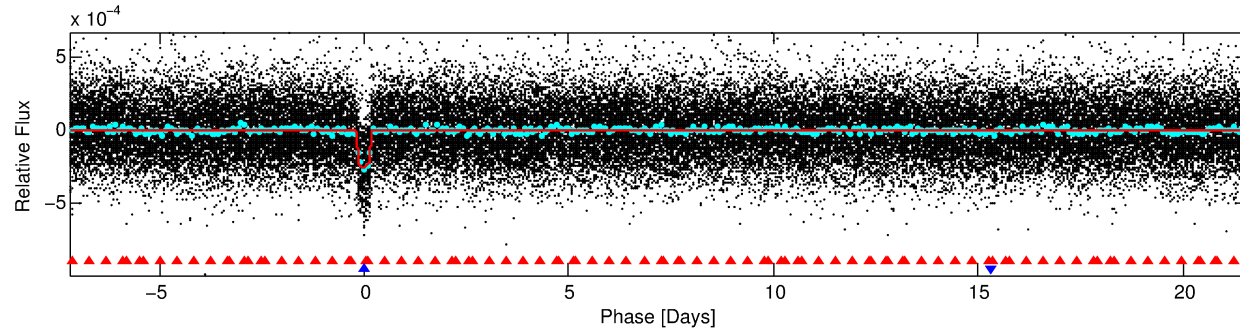
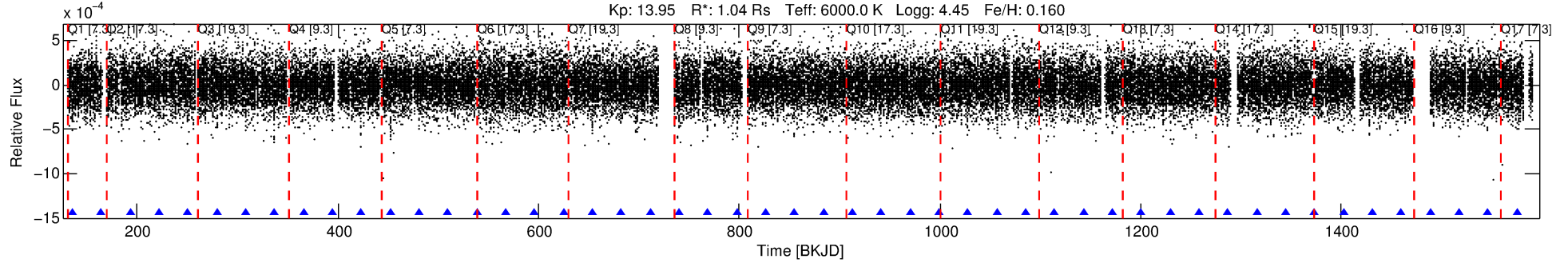
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008738735-02

No Significant Match Found

DV One-Page Summary

KIC: 8738735 Candidate: 2 of 2 Period: 28.780 d
KOI: K00693.01 Name: Kepler-214c Corr: 0.989



DV Fit Results:

Period = 28.77974 [0.00018] d
Epoch = 135.7409 [0.0051] BKJD
Rp/R* = 0.0171 [0.0011]
a/R* = 12.34 [3.51]
b = 0.90 [0.06]
Seff = 34.71 [8.49]
Teff = 619 [38] K
Rp = 1.95 [0.35] Re
a = 0.1909 [0.0282] AU
Ag = 205.17 [83.18] [2.45σ]
Teffp = 3622 [317] K [9.41σ]

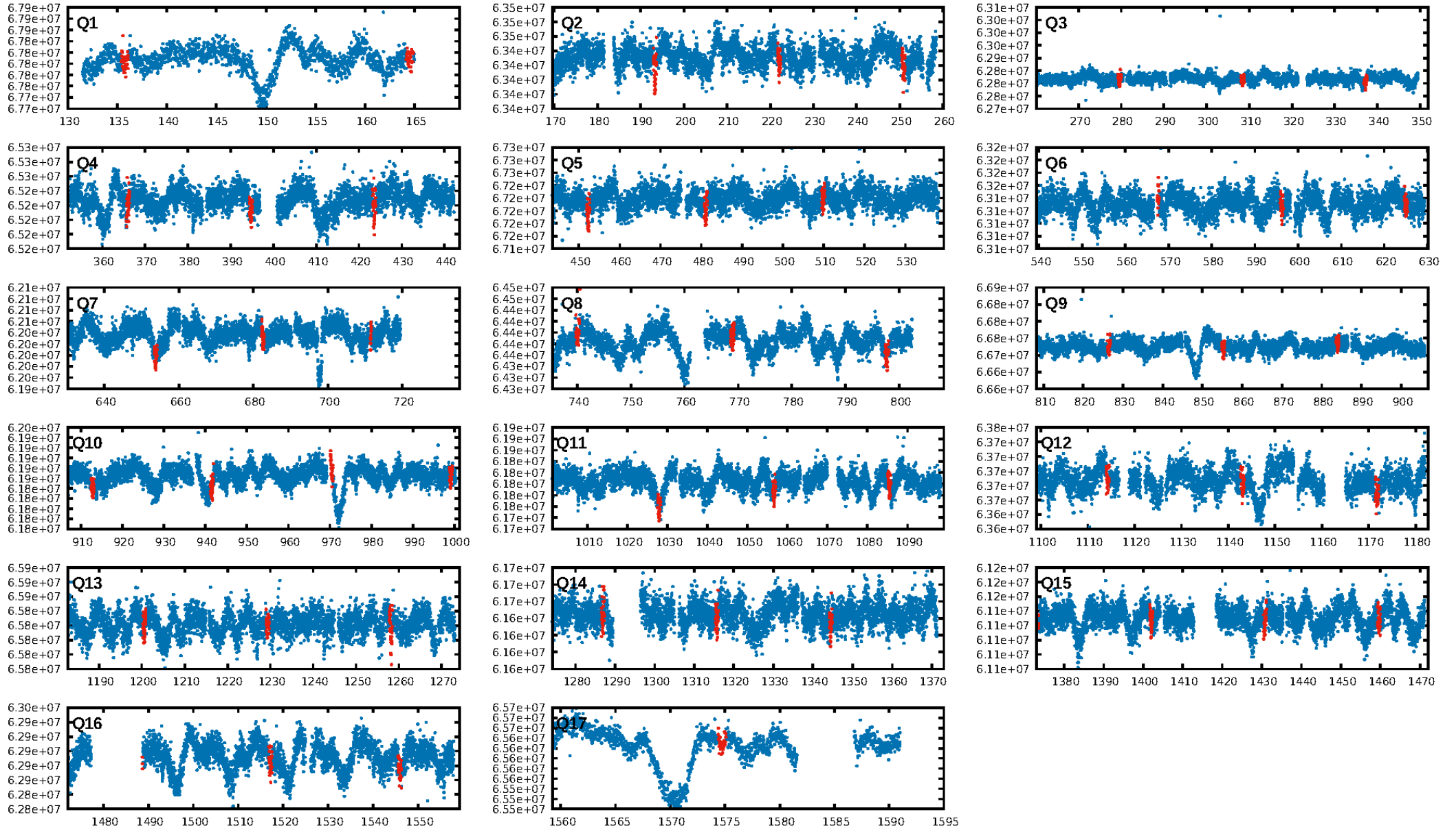
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [28.07σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 27.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.47e-104
RollingBand-fgt: 1.00 [43/43]
GhostDiagnostic-chr: 4.189
Centroid-sig: 0.0%
Centroid-so: 1.521 arcsec [3.93σ]
OotOffset-rm: 0.050 arcsec [0.15σ]
KicOffset-rm: 0.137 arcsec [0.50σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.94 [15/16]
DiffImageOverlap-fno: 0.94 [16/17]

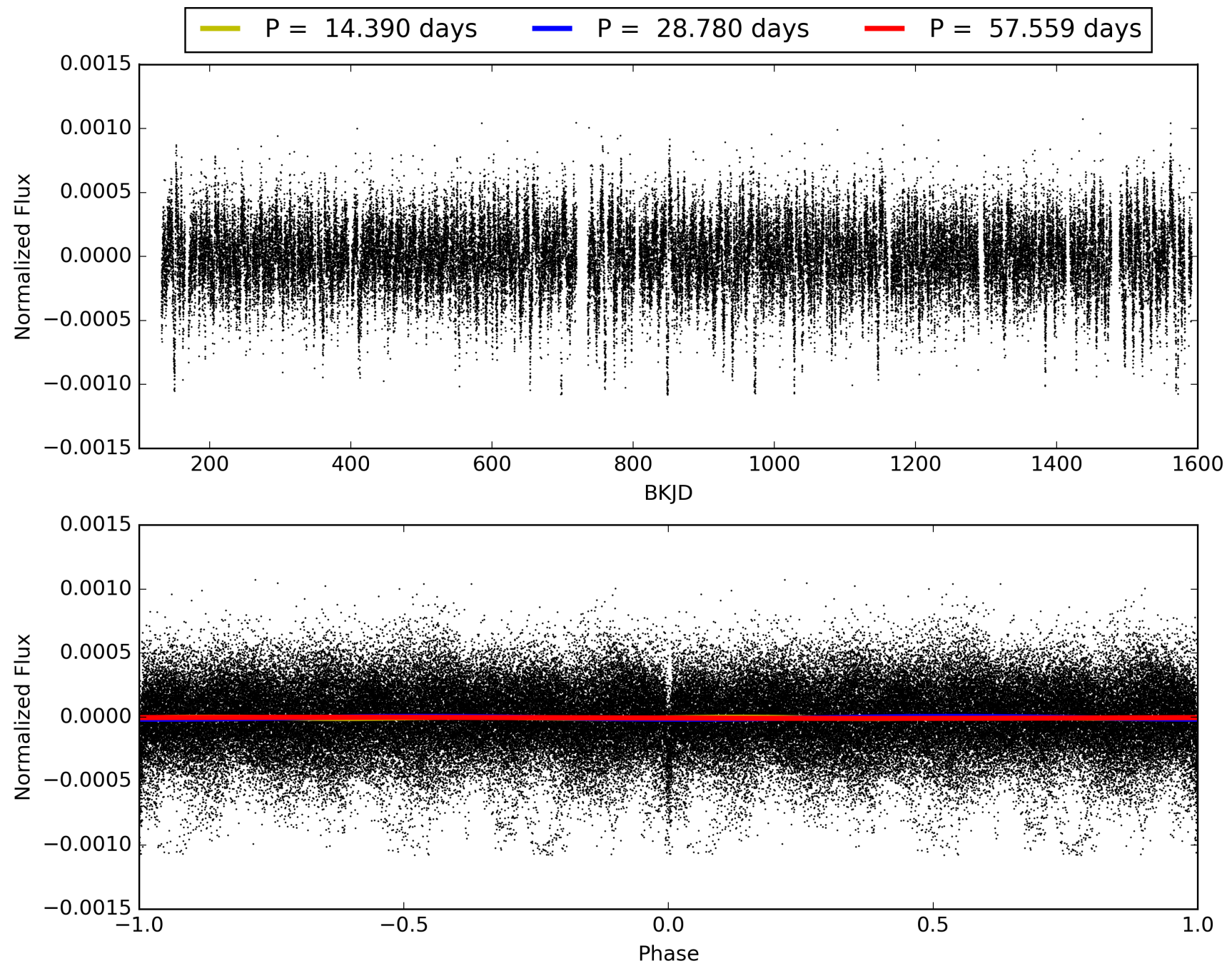
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 11:38:30 Z

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

TCE 008738735-02, PDC Light Curves

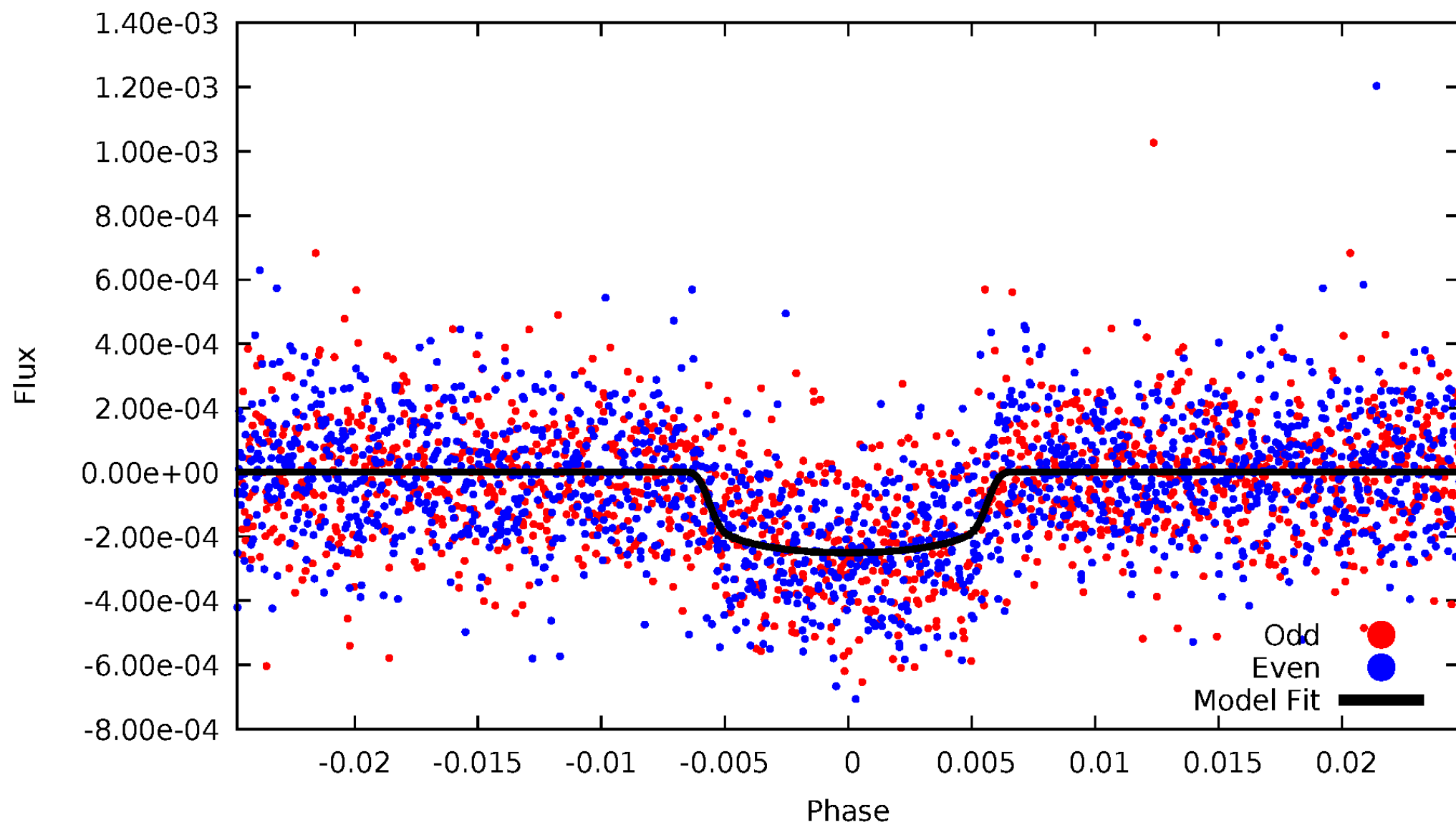


TCE 008738735-02



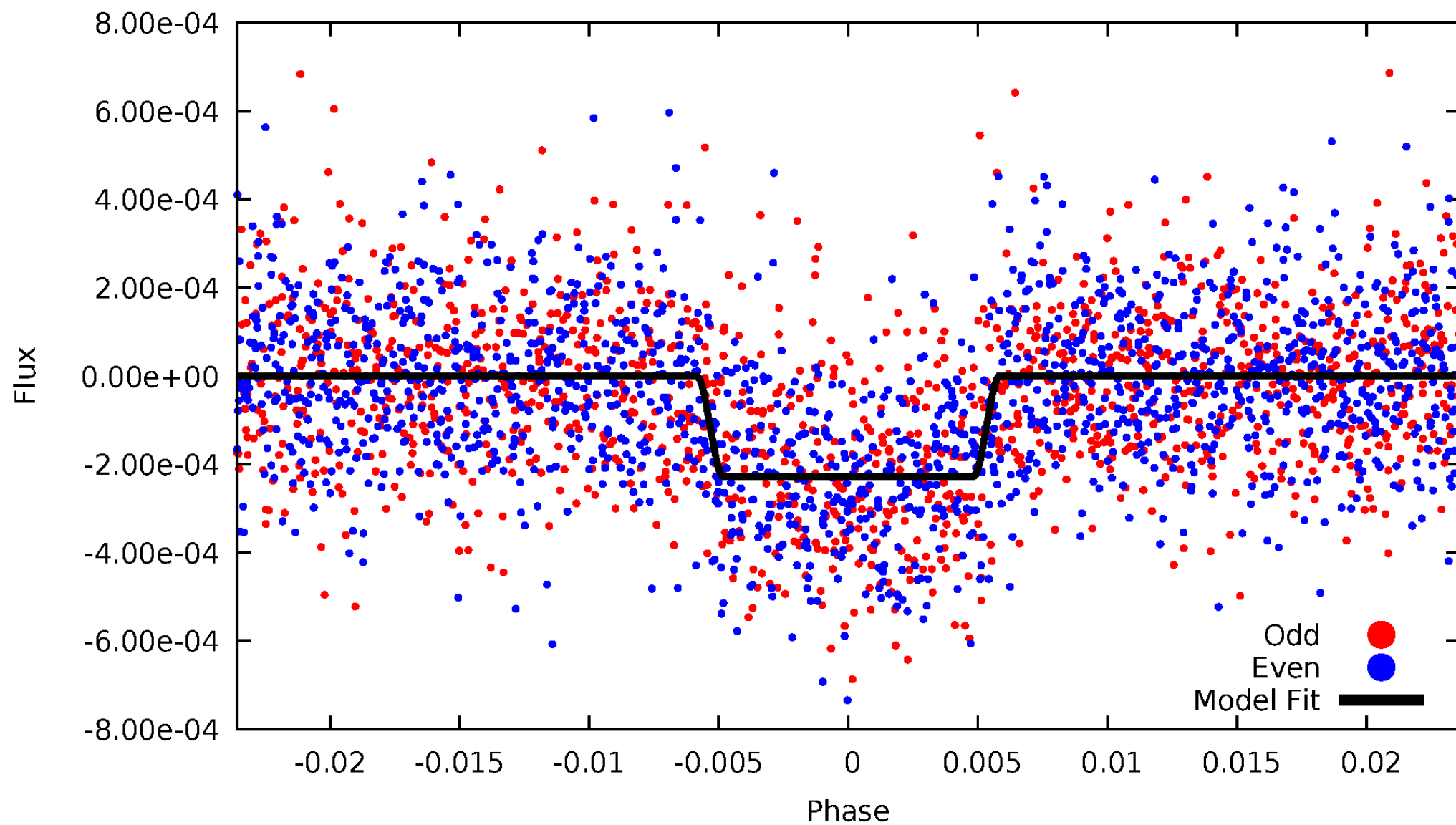
DV Odd/Even

TCE 008738735-02



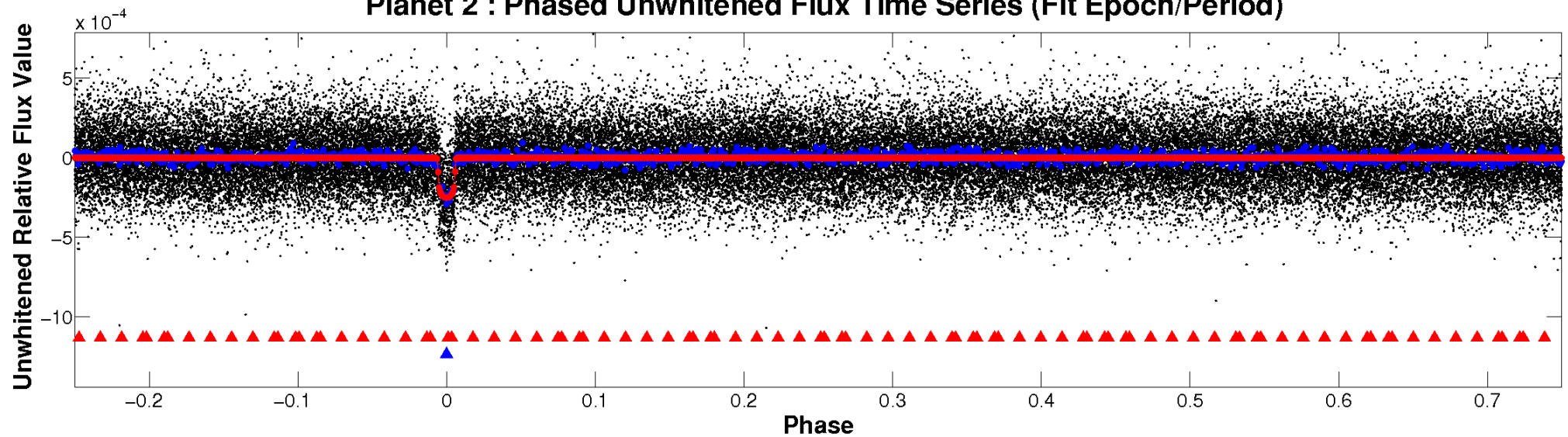
ALT Odd/Even

TCE 008738735-02

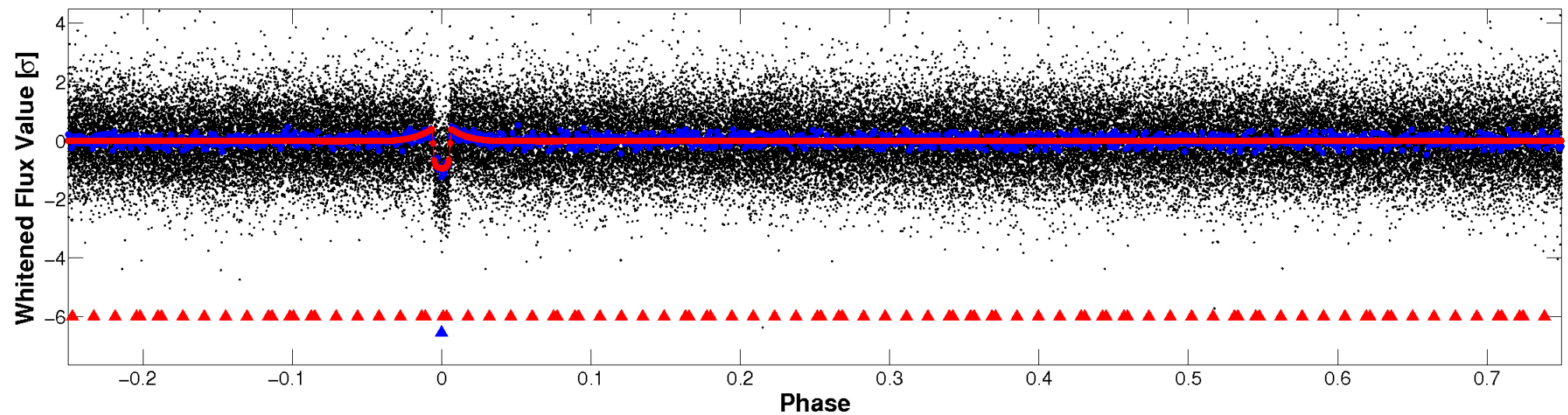


Non-Whitened Vs. Whitened Light Curve

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

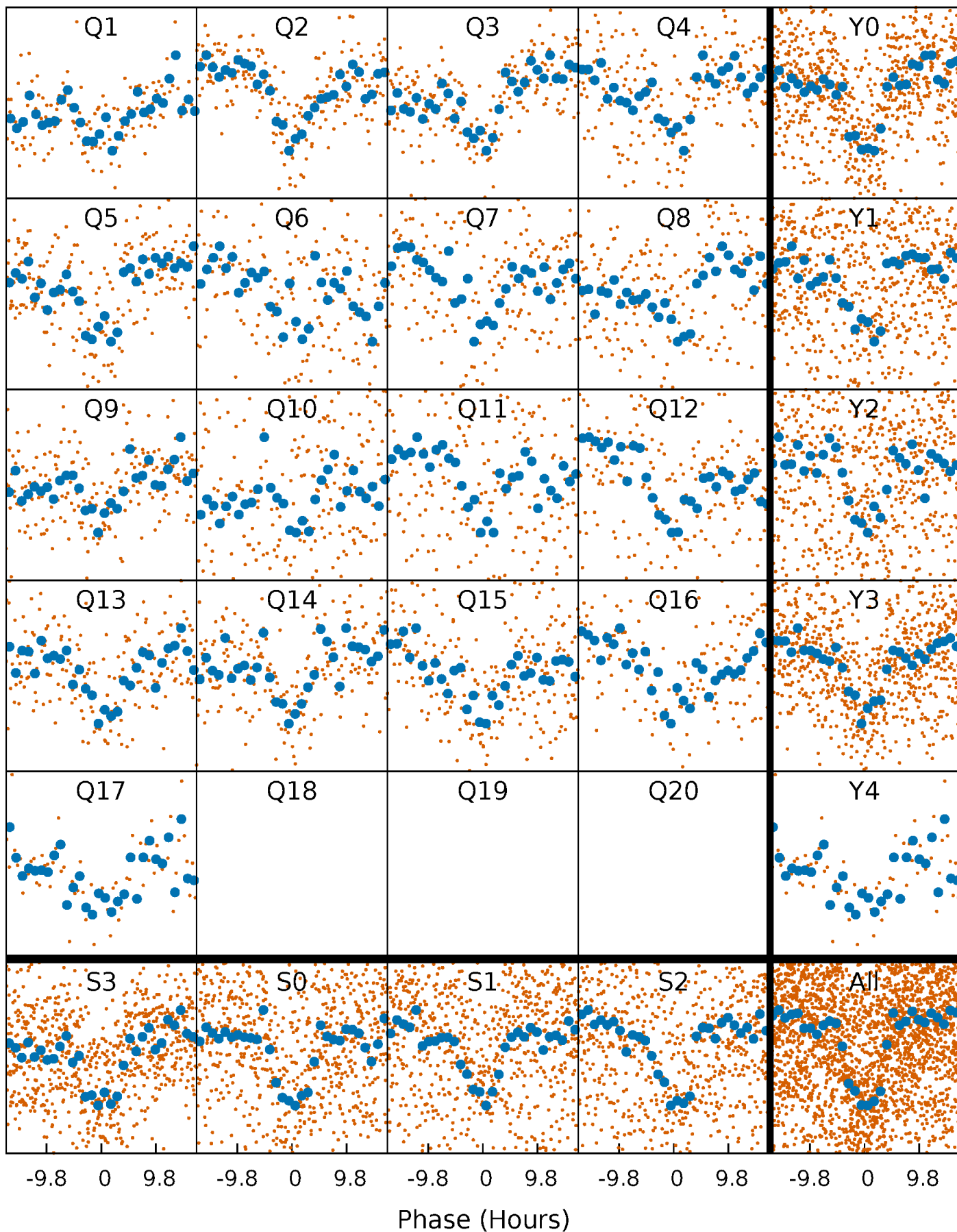


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



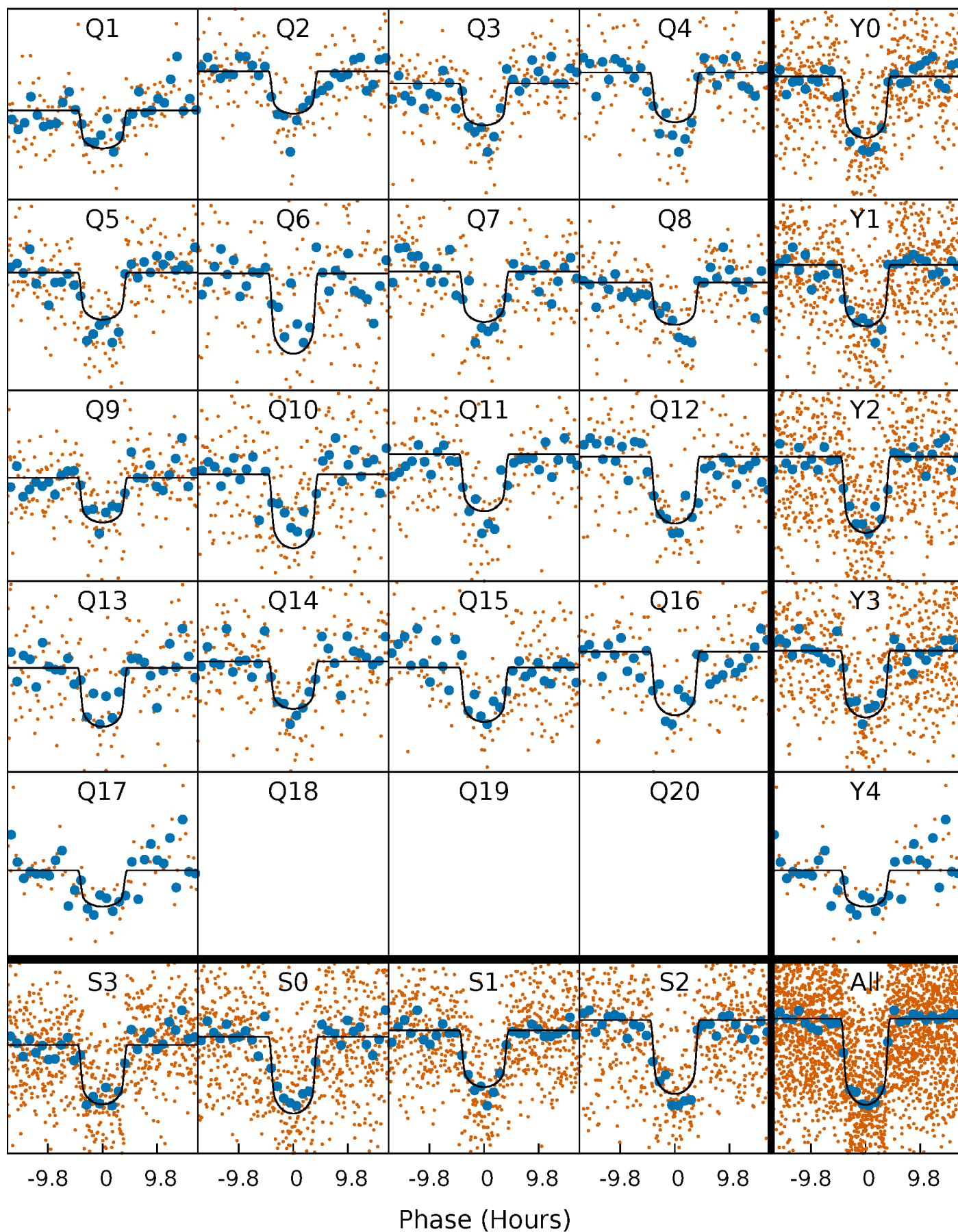
PDC Quarter-Phased Transit Curves

TCE 008738735-02 P= 28.779745 Days $T_0=135.740929$ (BKJD)



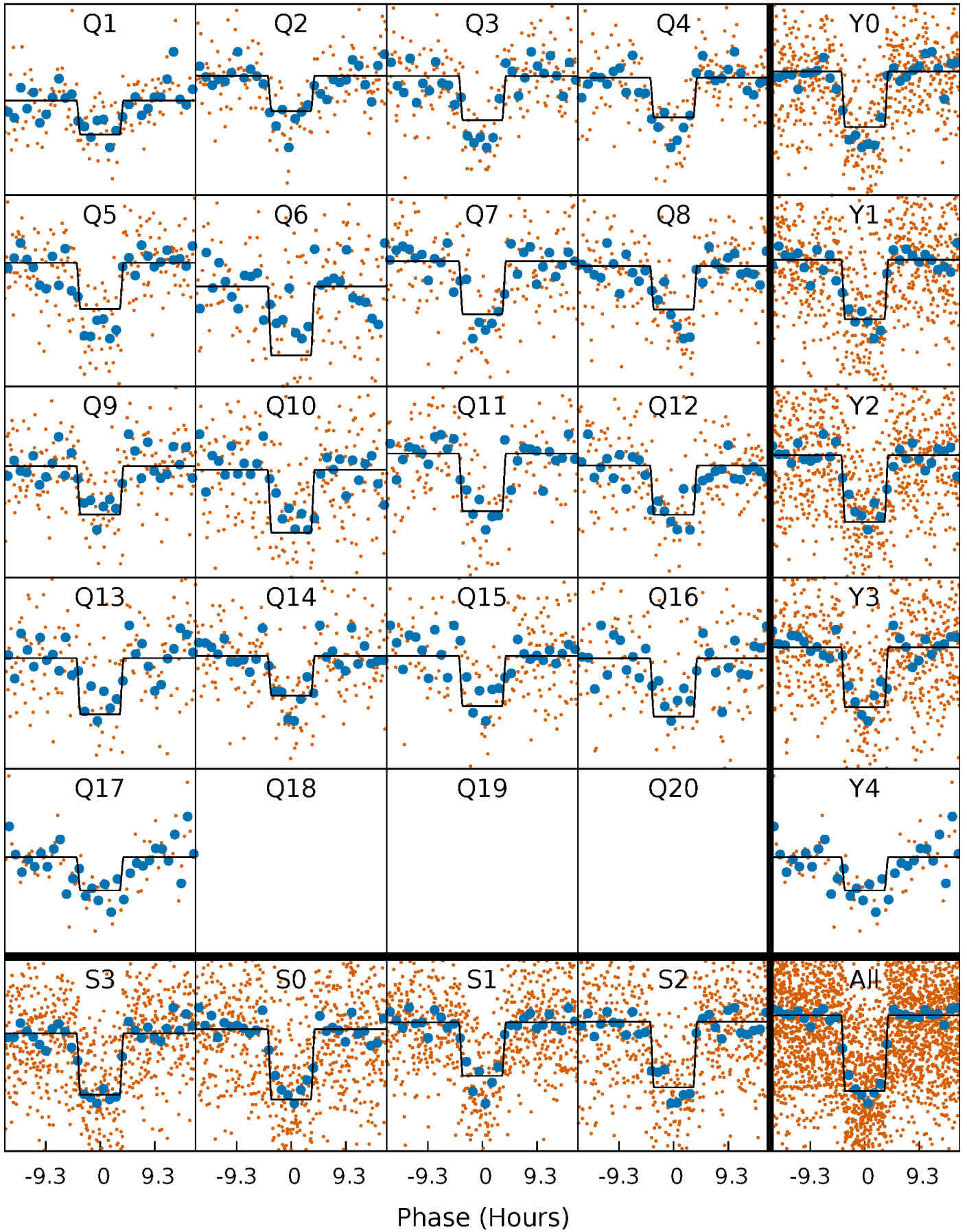
DV Quarter-Phased Transit Curves

TCE 008738735-02 P= 28.779745 Days $T_0=135.740929$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

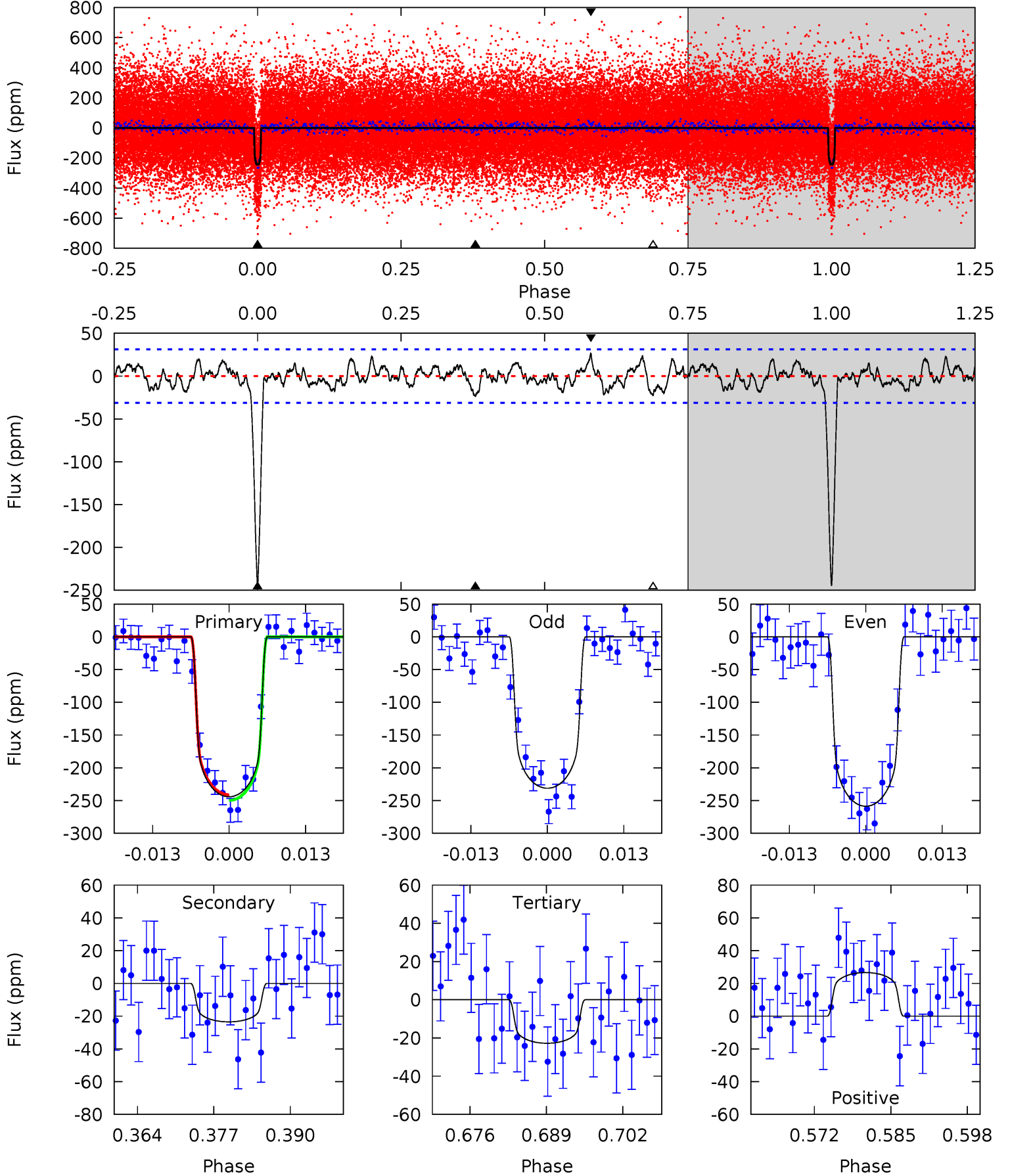
TCE 008738735-02 P= 28.779028 Days $T_0=135.757668$ (BKJD)



DV Model-Shift Uniqueness Test

008738735-02, $P = 28.779745$ Days, $E = 106.961184$ Days

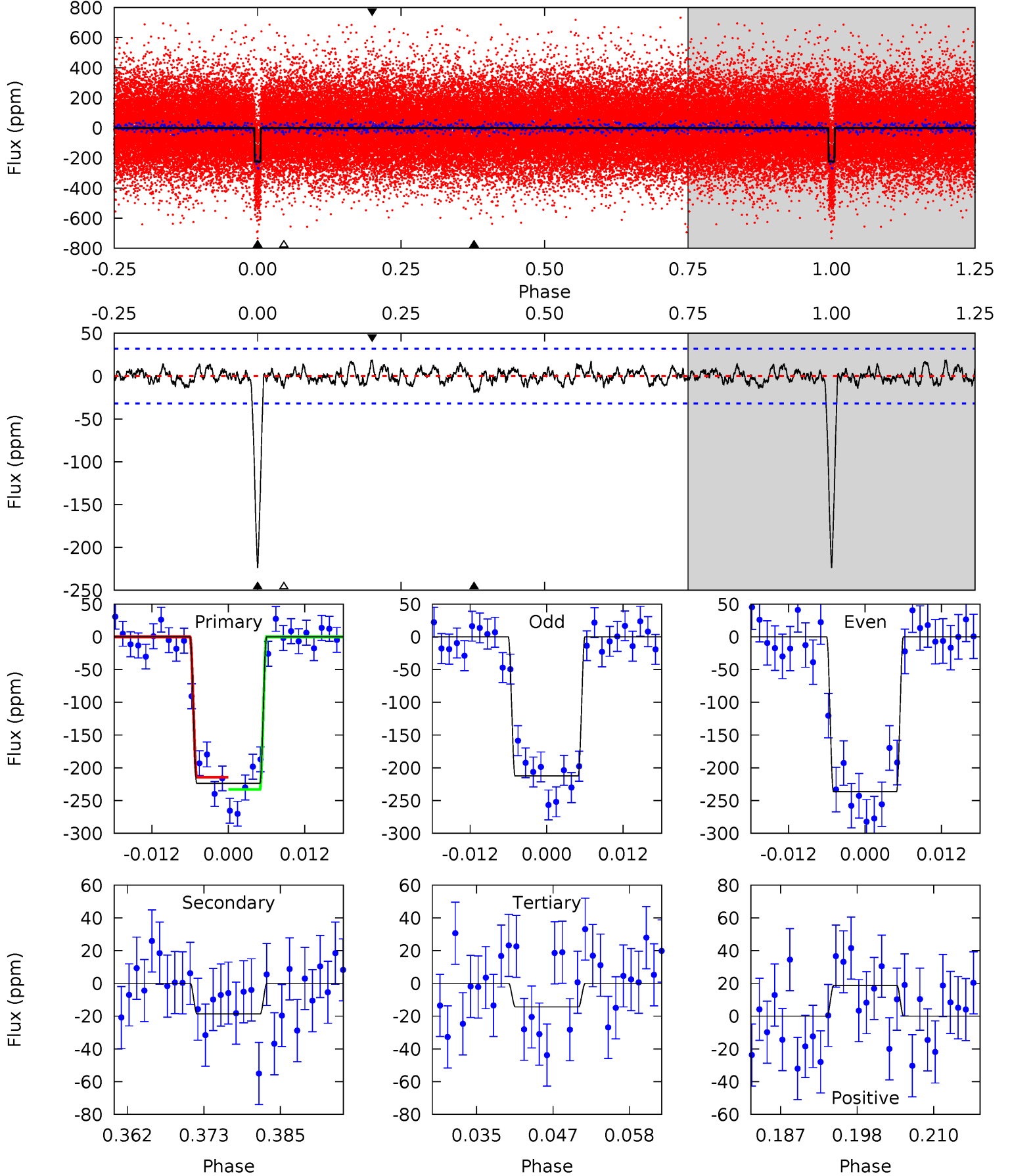
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.9	3.74	3.63	4.24	4.98	2.48	1.48	35.3	34.7	0.12	-0.50	2.19	0.96	0.10	0.69



Alt Model-Shift Uniqueness Test

008738735-02, P = 28.779028 Days, E = 106.978640 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.0	2.91	2.25	2.93	5.00	2.52	0.97	32.7	32.0	0.66	-0.02	1.88	0.96	0.08	1.47



Stellar Parameters For KIC 008738735

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6000^{+106}_{-142}	$4.450^{+0.032}_{-0.128}$	$0.160^{+0.150}_{-0.150}$	$1.044^{+0.173}_{-0.062}$	$1.122^{+0.070}_{-0.085}$	$1.388^{+0.178}_{-0.506}$
	+2%/-2%	+1%/-3%	+94%/-94%	+17%/-6%	+6%/-8%	+13%/-36%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 008738735-02 / KOI 0693.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-24 ± 6	$2.00^{+0.21}_{-0.18}$	876^{+38}_{-29}	3614^{+202}_{-191}	113^{+45}_{-34}
Alt.	-19 ± 6	$1.76^{+0.20}_{-0.15}$	876^{+33}_{-27}	3656^{+197}_{-256}	121^{+48}_{-47}

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

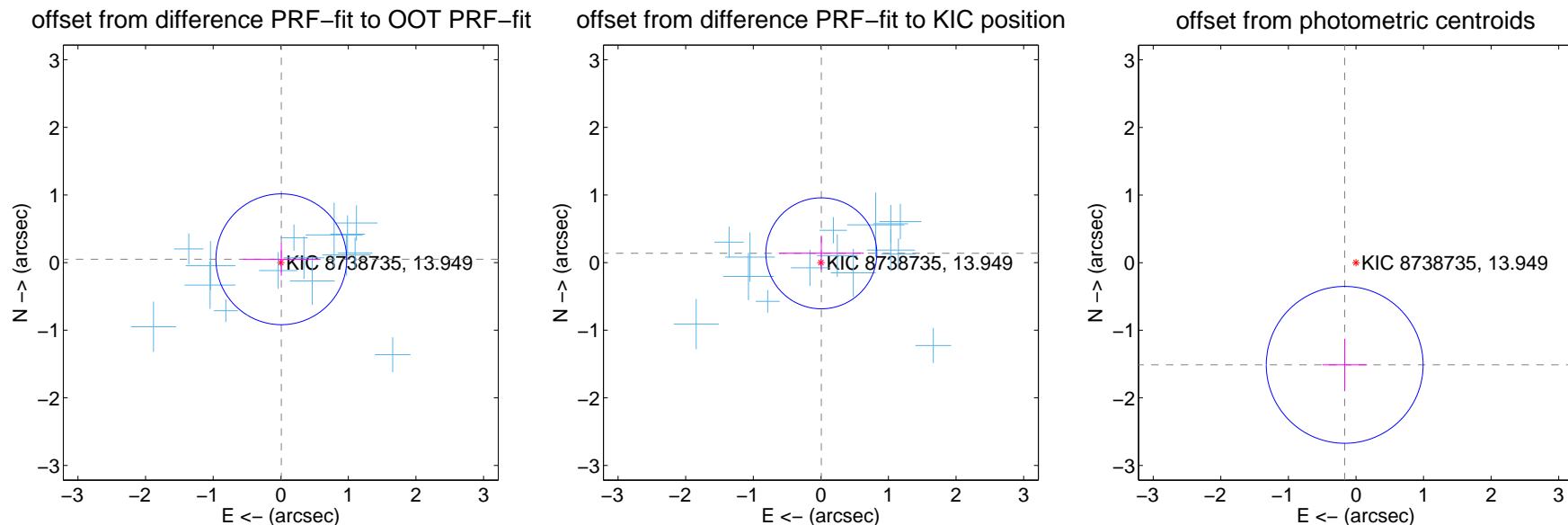
DV Centroid Data

Supplemental centroid analysis for 008738735-02. Kepler magnitude: 13.95. Transit SNR 23.40

There are 15 quarters with good PRF difference image offsets

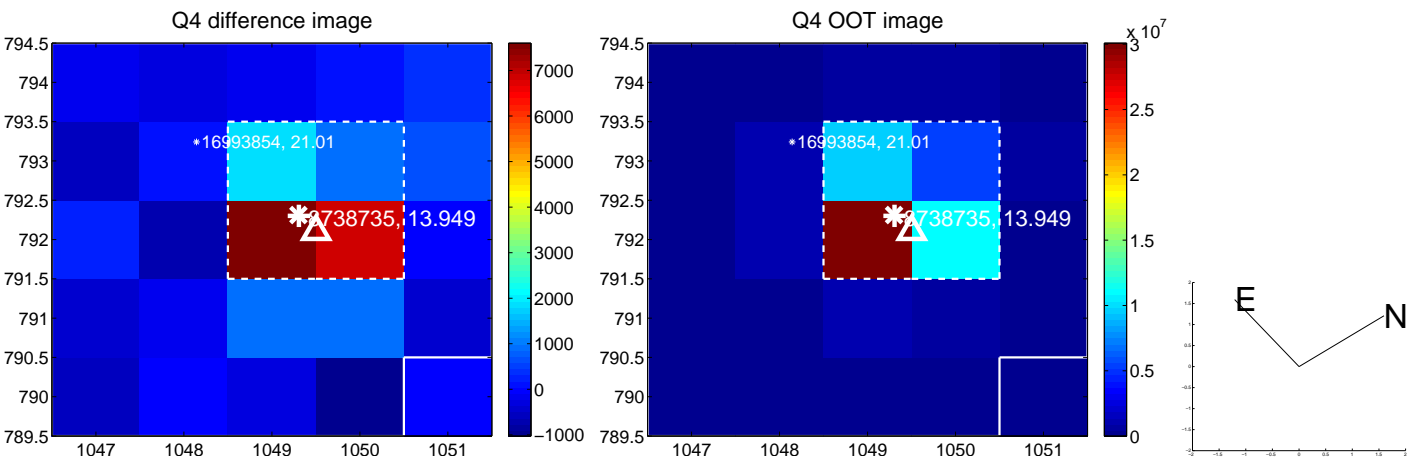
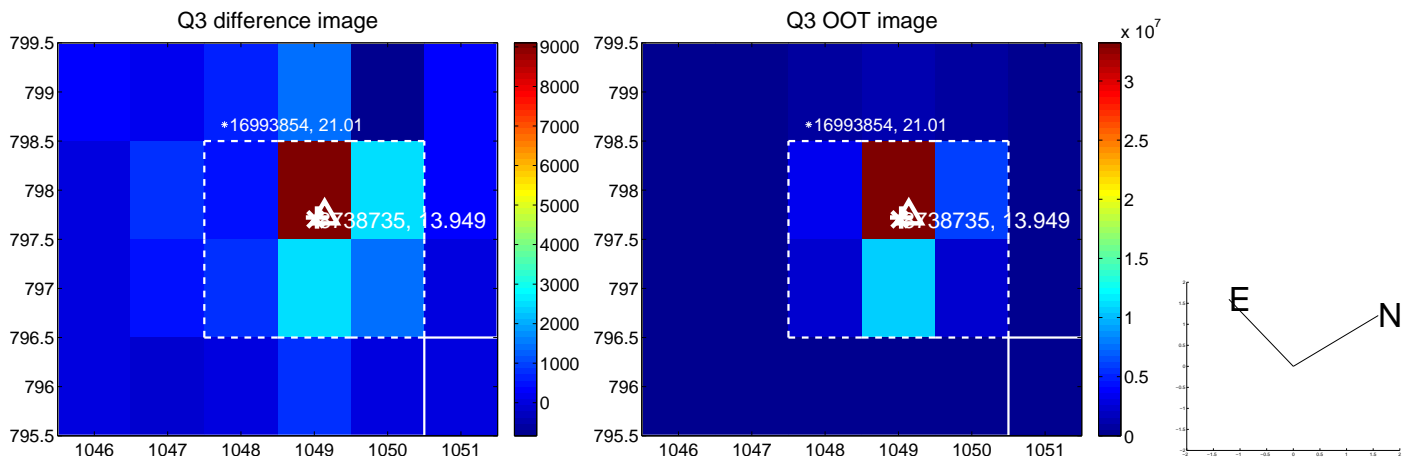
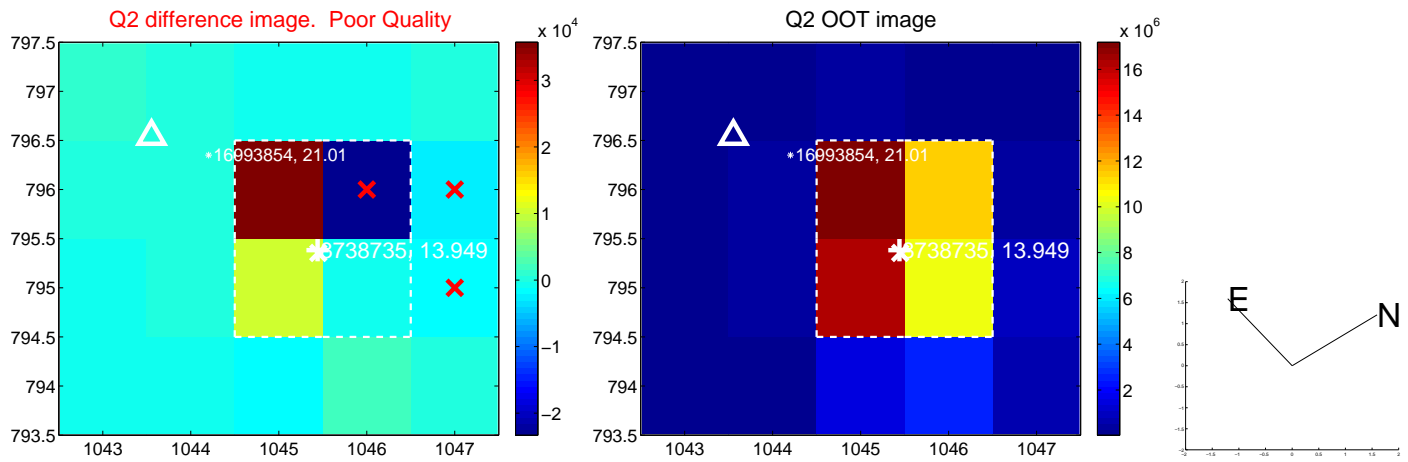
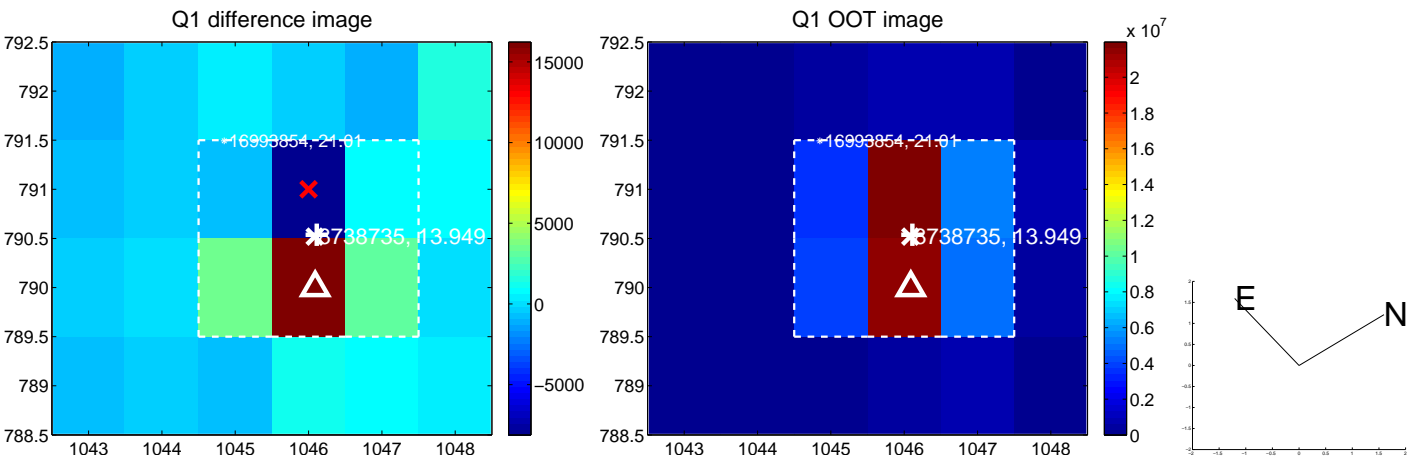
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.050 ± 0.322	0.15	-0.009 ± 0.570	0.049 ± 0.244
PRF-fit source offset from KIC position	0.137 ± 0.274	0.50	-0.007 ± 0.627	0.137 ± 0.248
photometric centroid source offset	1.52 ± 0.39	3.93	0.17 ± 0.33	-1.51 ± 0.39

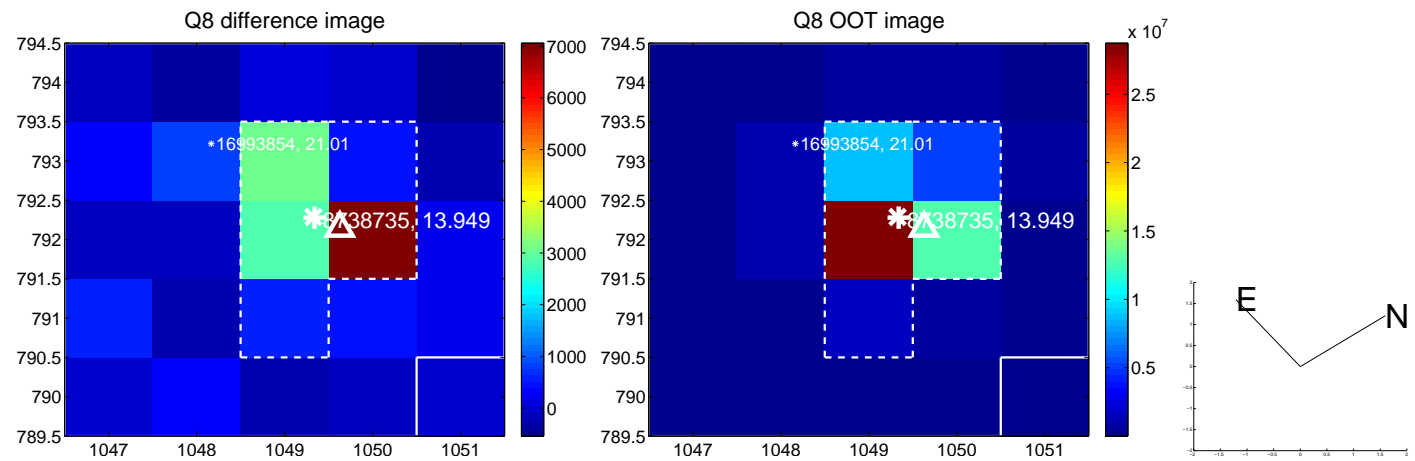
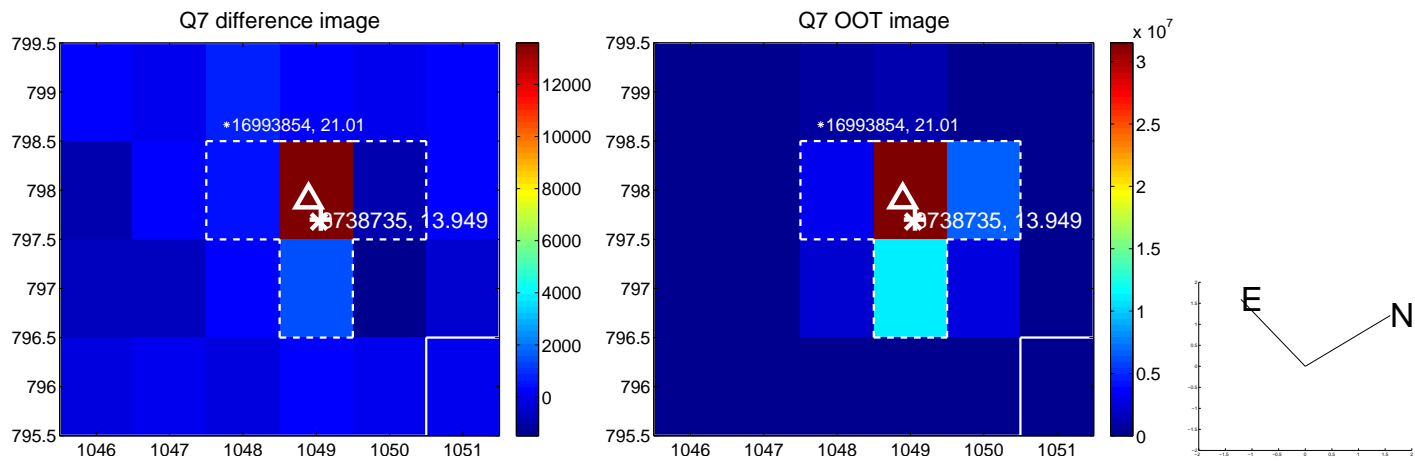
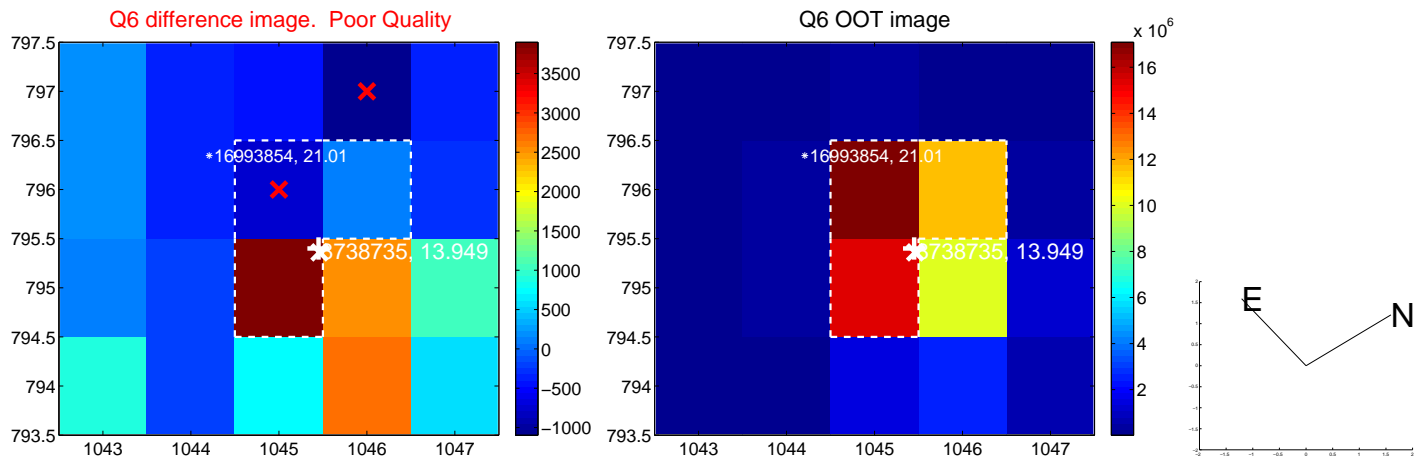
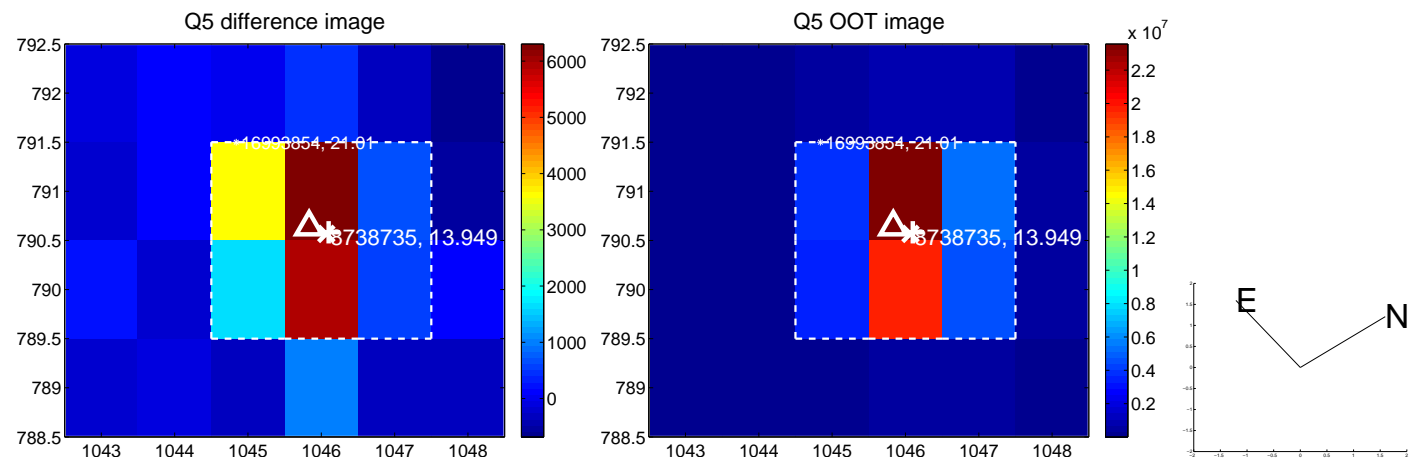


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

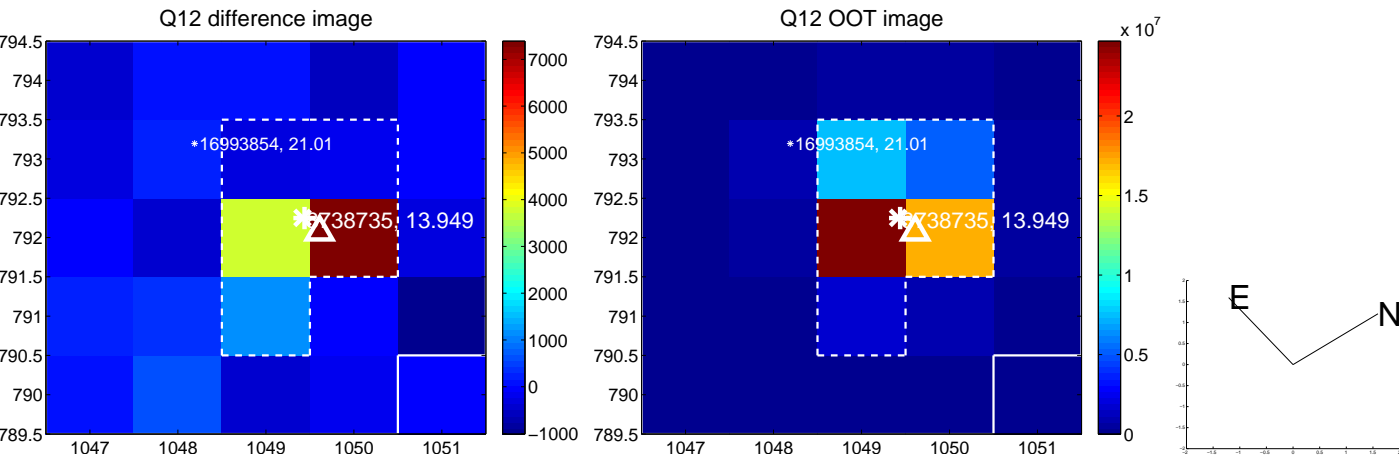
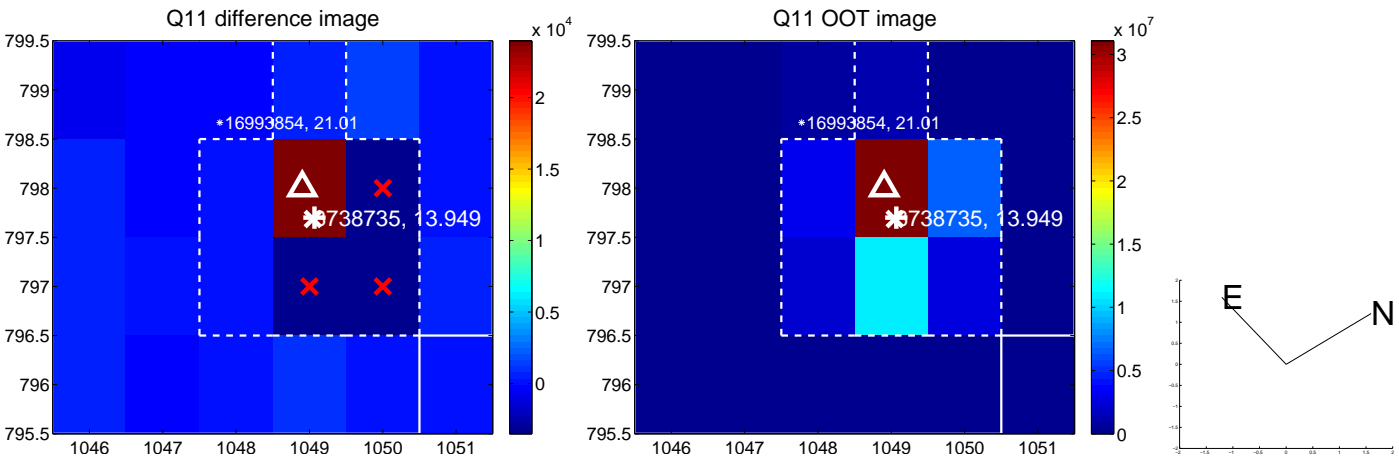
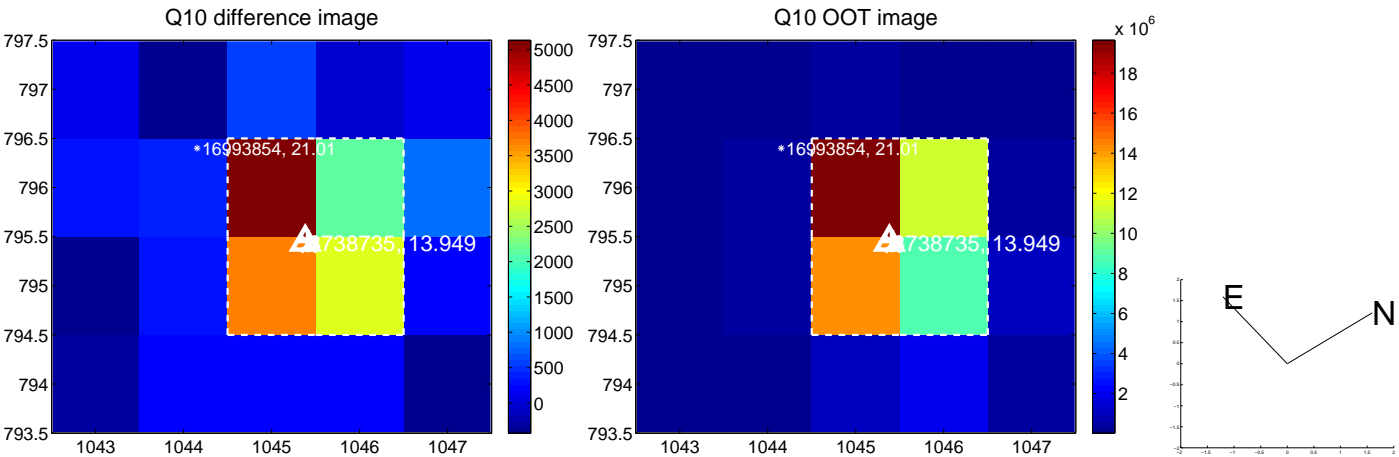
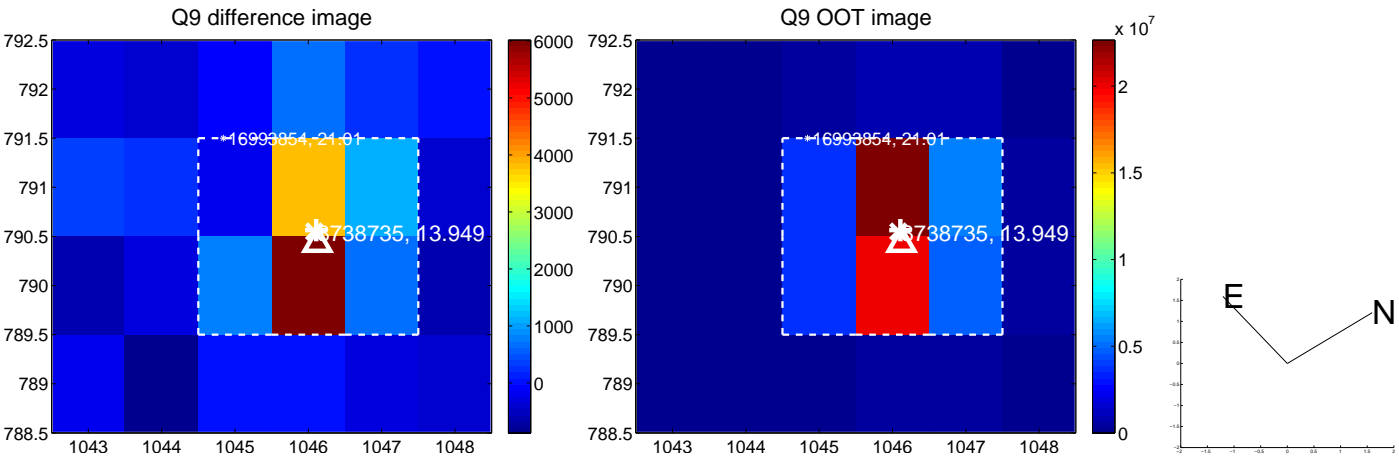
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



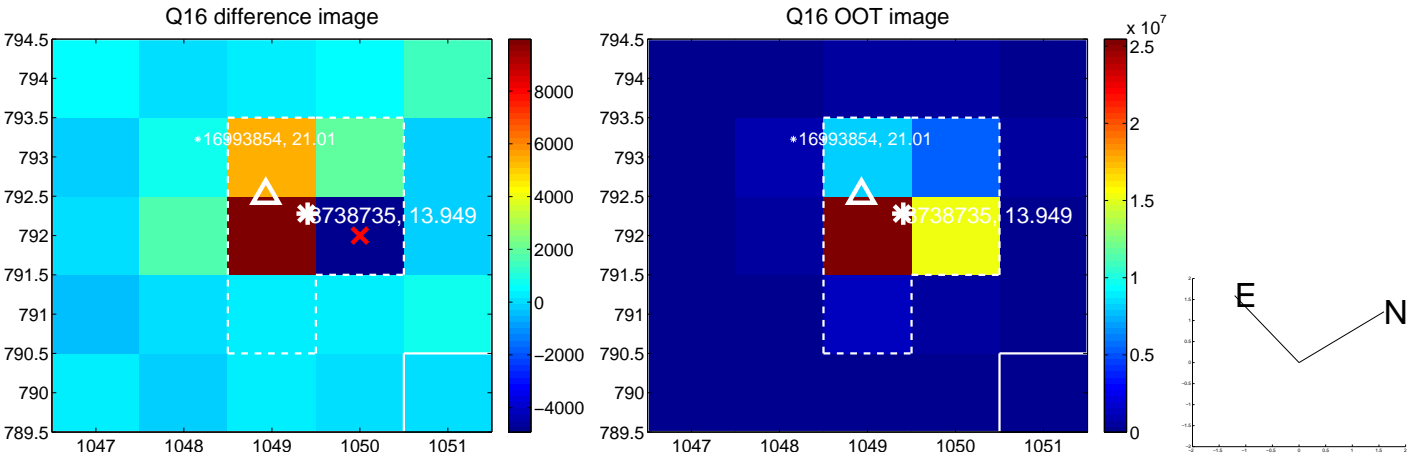
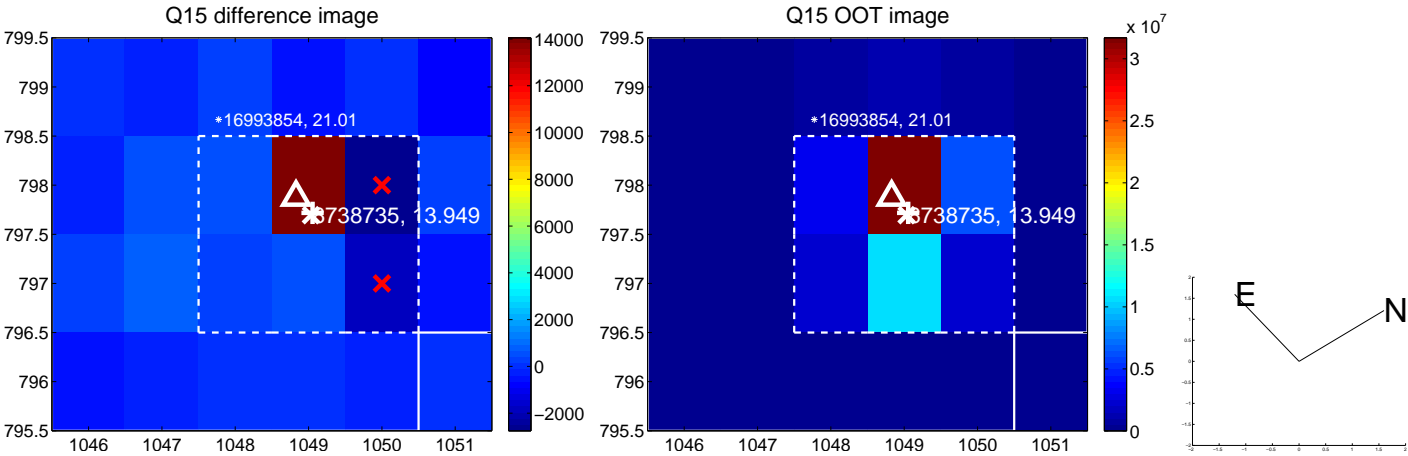
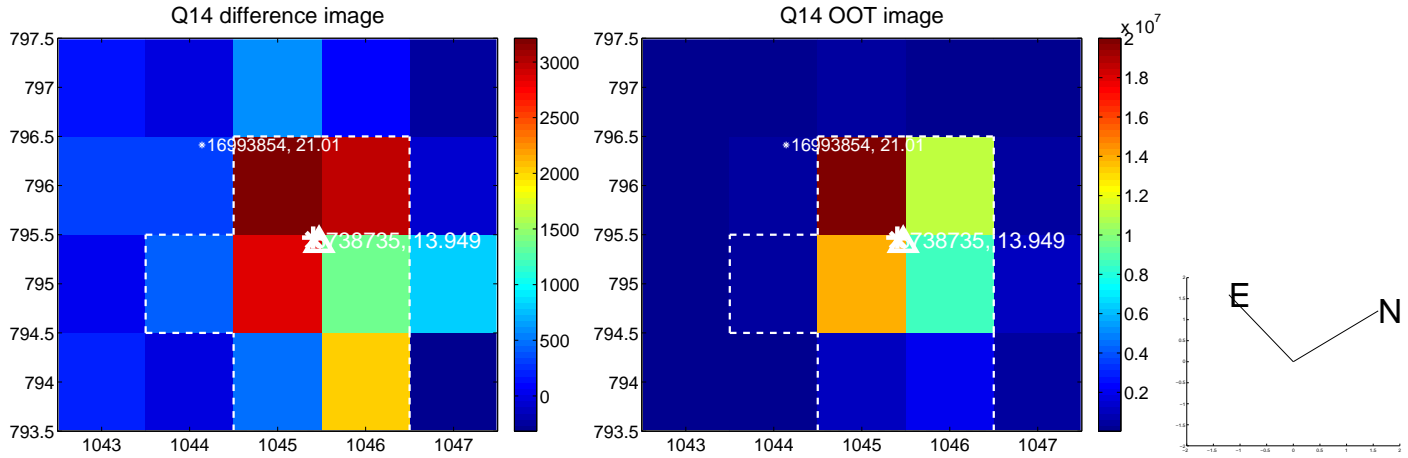
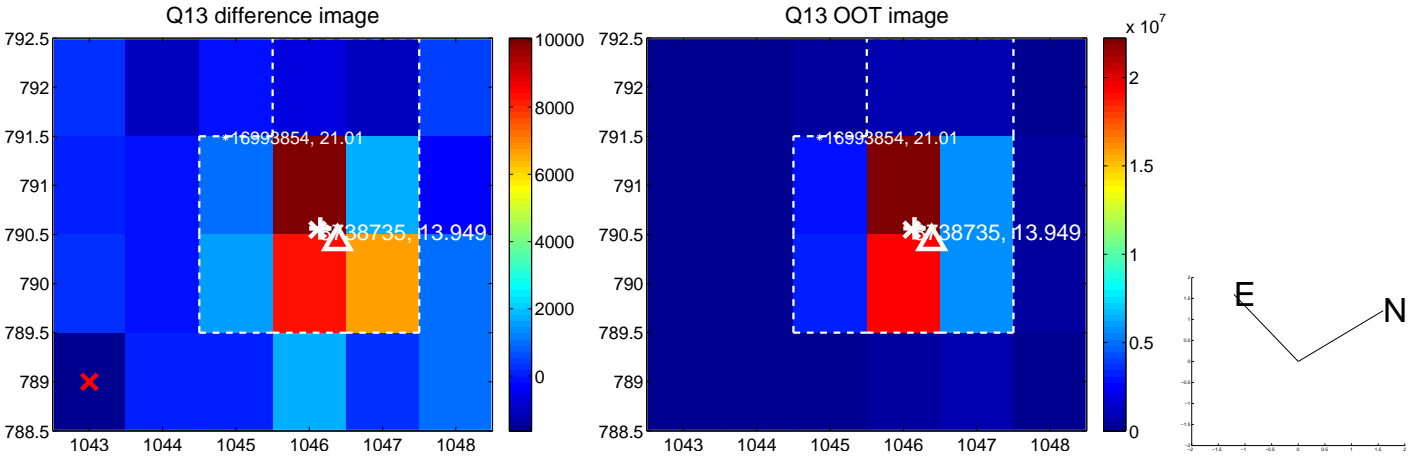
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



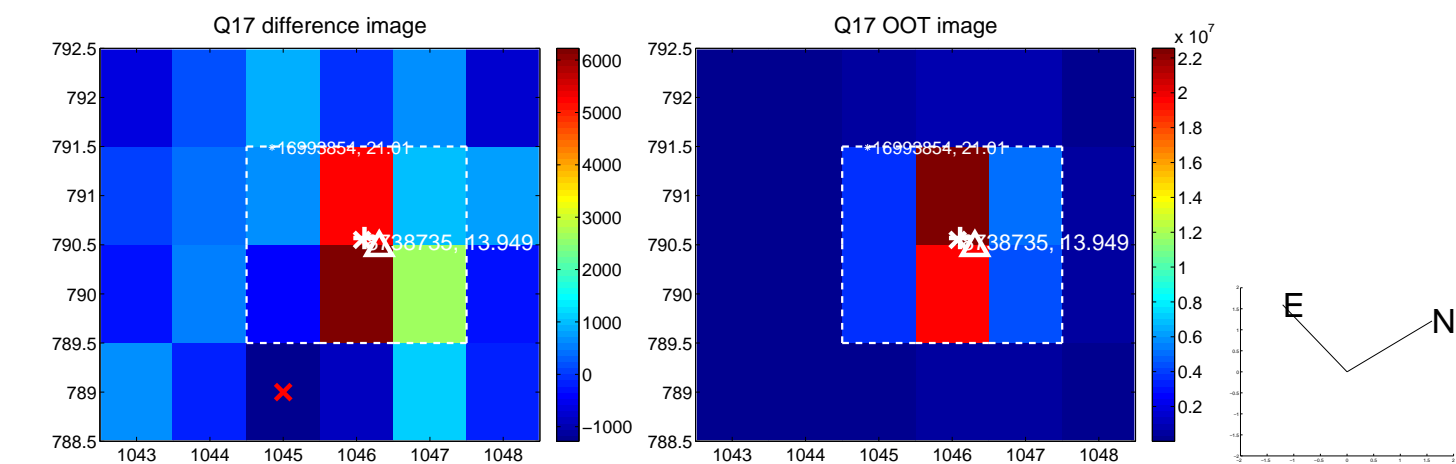
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



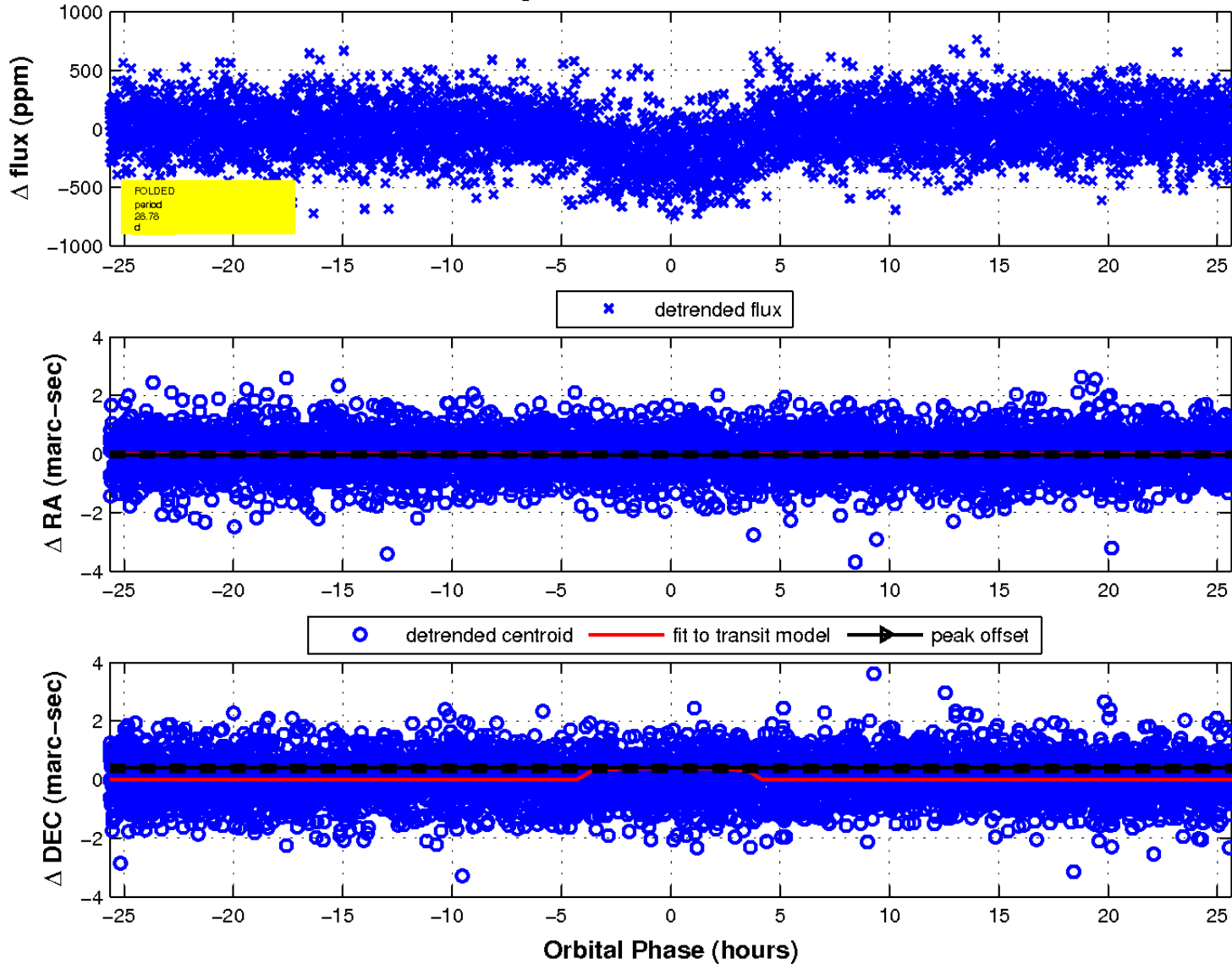
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

