

KIC 009602613

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})
009602613-01	OBS	2612.01	4.612323	133.853880	29.2	2.738	11.4	12.2	0.96	5495	0.62	268.75
009602613-02	OBS	2612.02	7.573013	131.940908	30.8	2.735	8.3	9.6	0.96	5495	0.61	138.75

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009602613-01	OBS	PC	0.86	0	0	0	0	NO_COMMENT
009602613-02	OBS	PC	0.95	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.

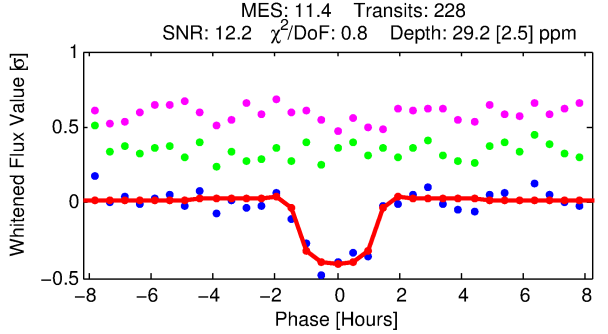
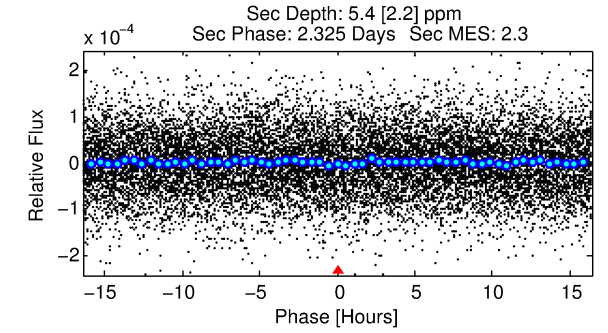
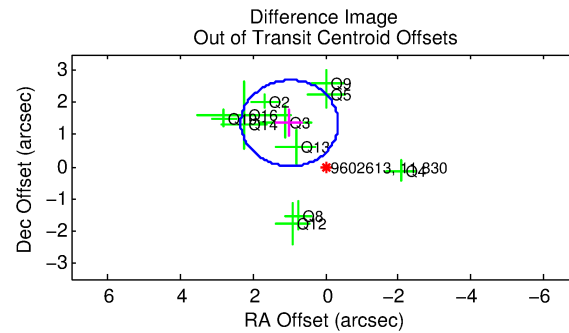
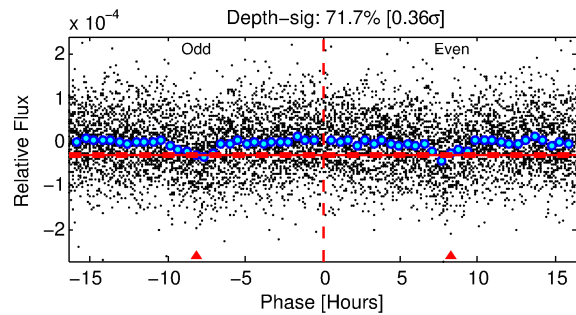
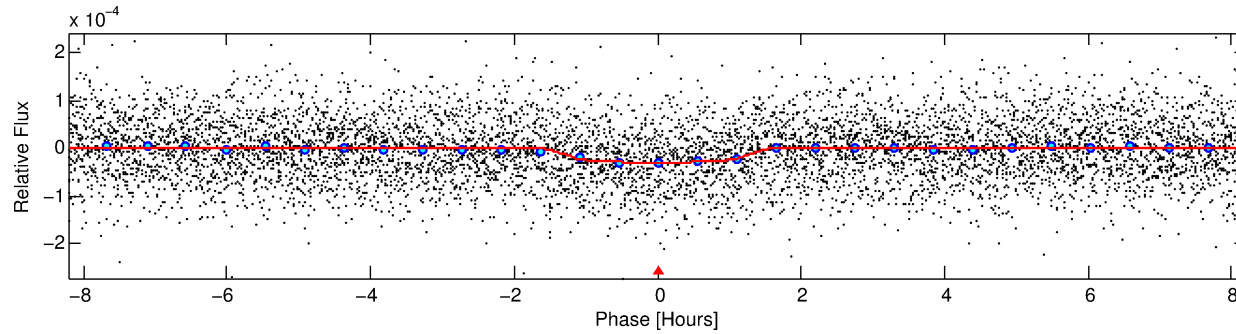
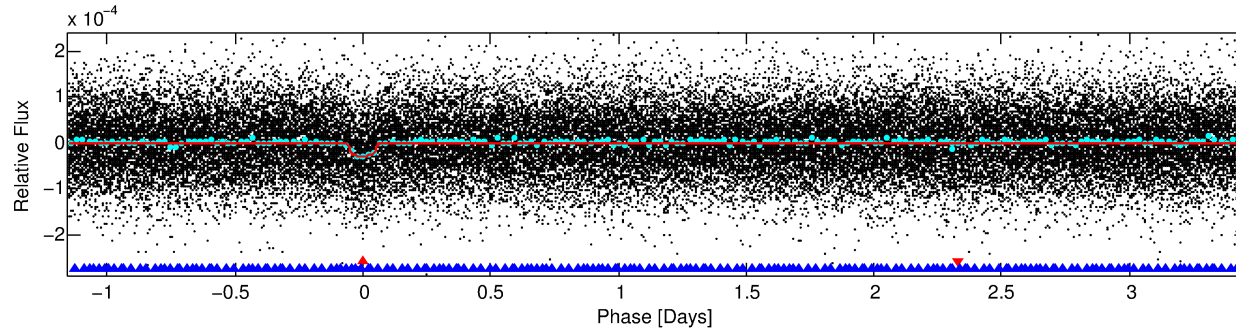
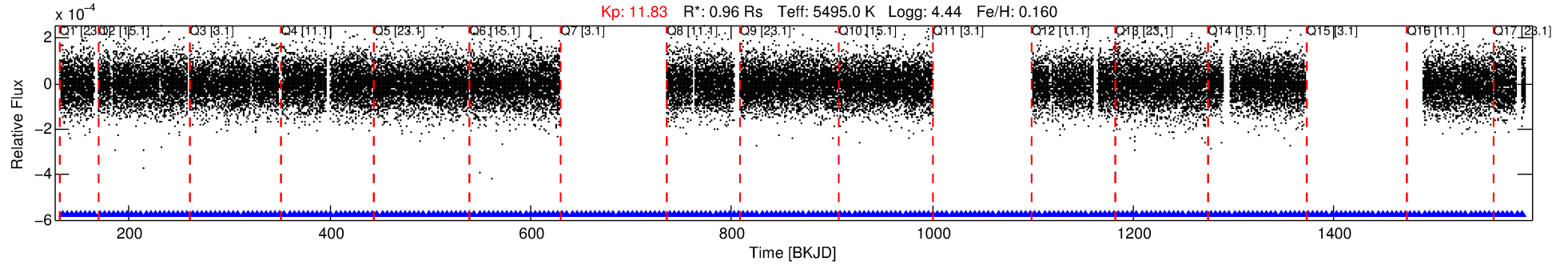
Ephemeris Match Information For 009602613-01

No Significant Match Found

DV One-Page Summary

KIC: 9602613 Candidate: 1 of 2 Period: 4.612 d
 KOI: K02612.01 Corr: 0.956

Kp: 11.83 R*: 0.96 Rs Teff: 5495.0 K Logg: 4.44 Fe/H: 0.160



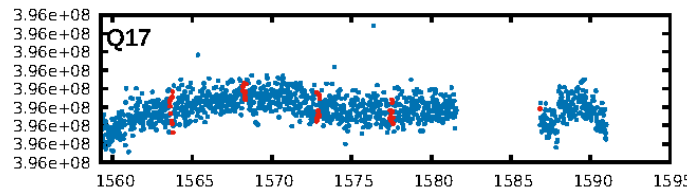
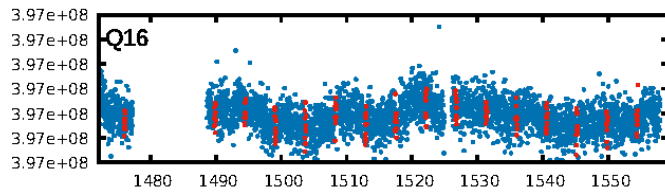
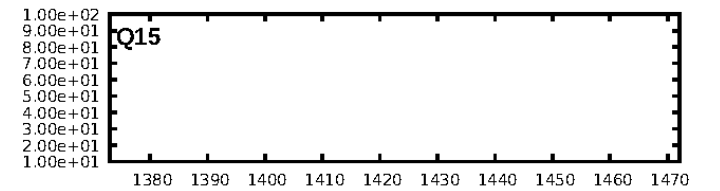
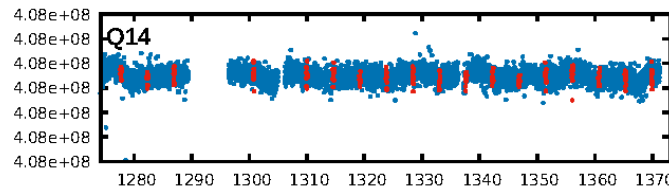
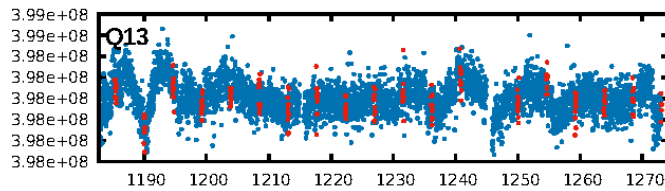
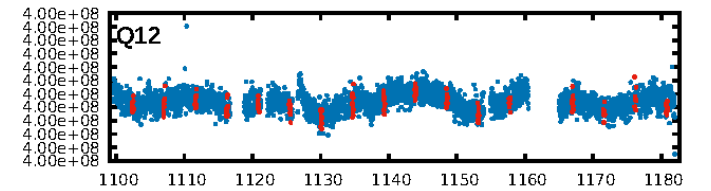
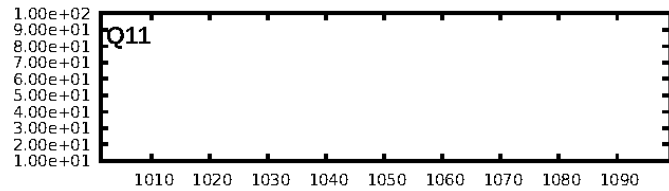
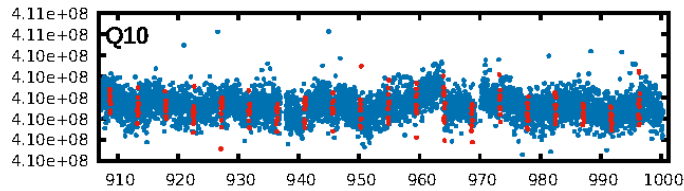
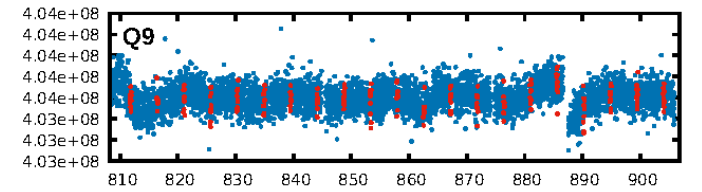
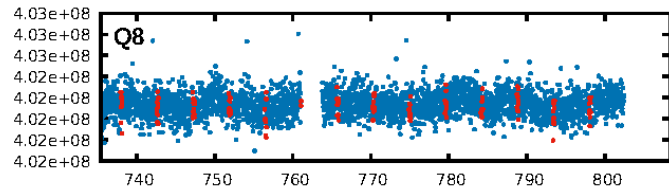
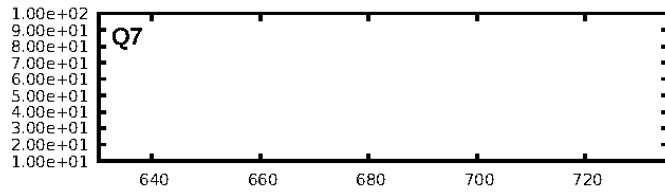
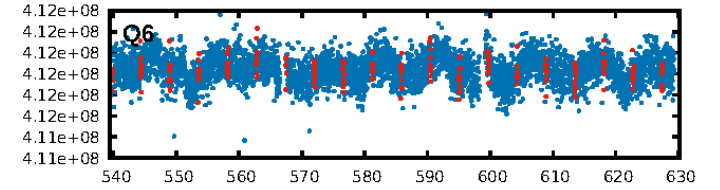
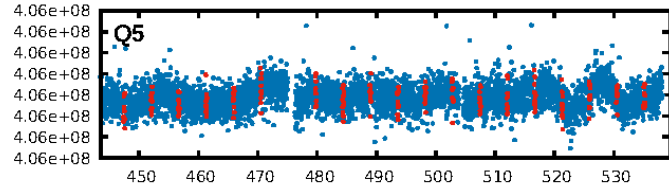
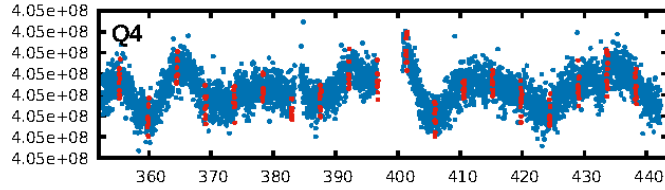
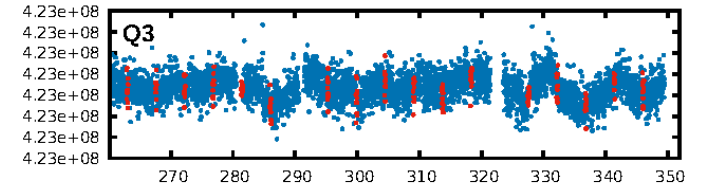
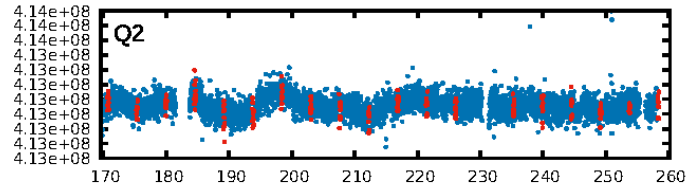
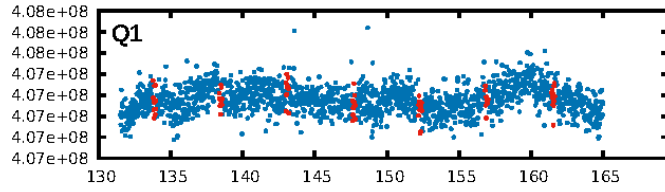
DV Fit Results:

Period = 4.61232 [0.00003] d
 Epoch = 133.8539 [0.0037] BKJD
 Rp/R* = 0.0059 [0.0021]
 a/R* = 5.95 [9.23]
 b = 0.90 [0.36]
 Seff = 268.75 [48.84]
 Teq = 1032 [47] K
 Rp = 0.62 [0.24] Re
 a = 0.0530 [0.0058] AU
 Ag = 21.38 [18.15] [1.12σ]
 Teffp = 3432 [715] K [3.35σ]

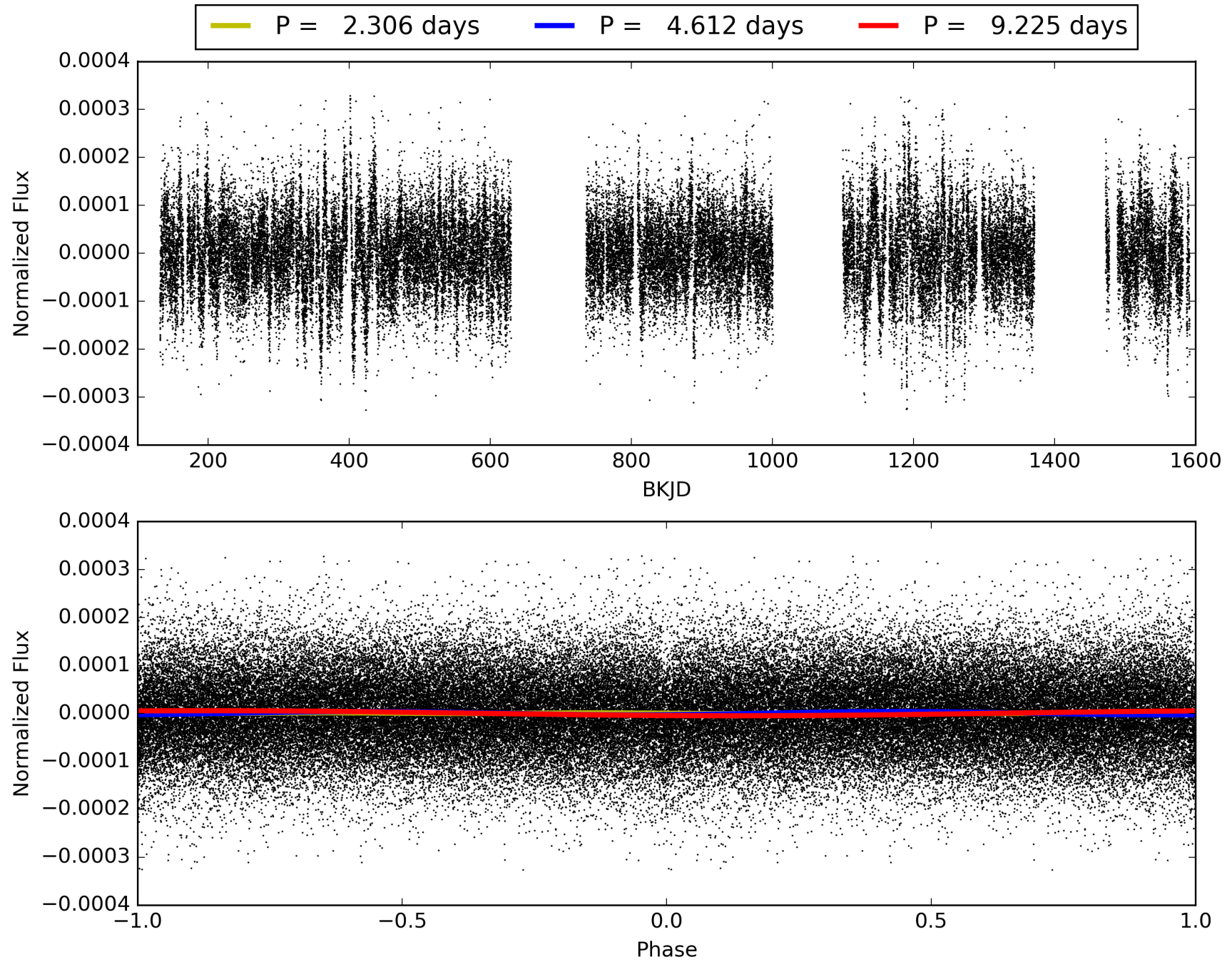
DV Diagnostic Results:

ShortPeriod-sig: N/A
 LongPeriod-sig: 100.0% [18.36σ]
 ModelChiSquare2-sig: N/A
 ModelChiSquareGof-sig: N/A
 Bootstrap-pfa: 8.59e-29
 RollingBand-fgt: 1.00 [217/217]
 GhostDiagnostic-chr: 3.339
 Centroid-sig: 0.0%
 Centroid-so: 2.125 arcsec [2.58σ]
 OotOffset-rm: 1.677 arcsec [3.75σ]
 KicOffset-rm: 1.636 arcsec [3.57σ]
 OotOffset-st: 3/1/4/3 [11]
 KicOffset-st: 3/1/4/3 [11]
 DiffImageQuality-fgm: 0.91 [10/11]
 DiffImageOverlap-fno: 1.00 [14/14]

TCE 009602613-01, PDC Light Curves

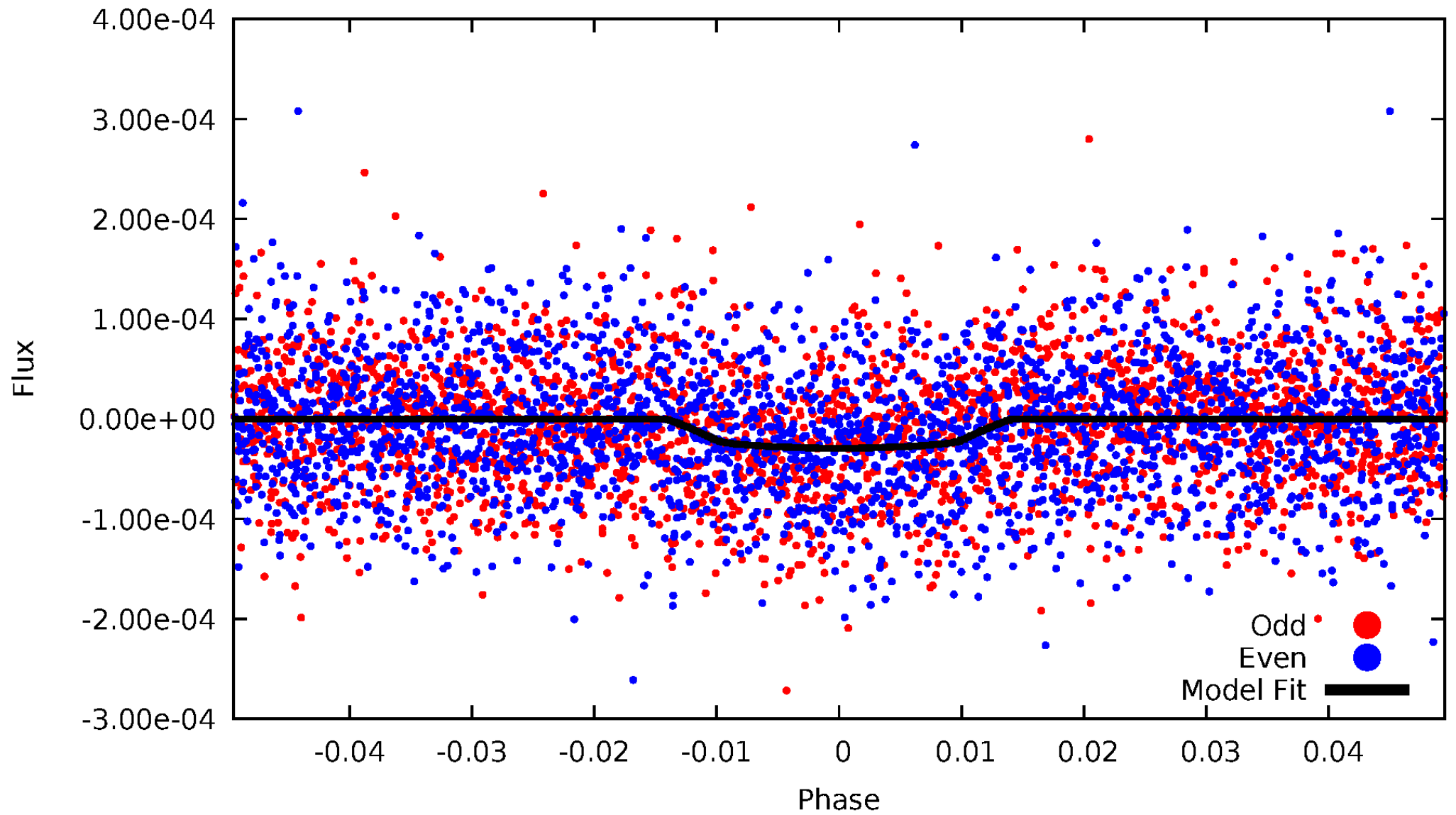


TCE 009602613-01



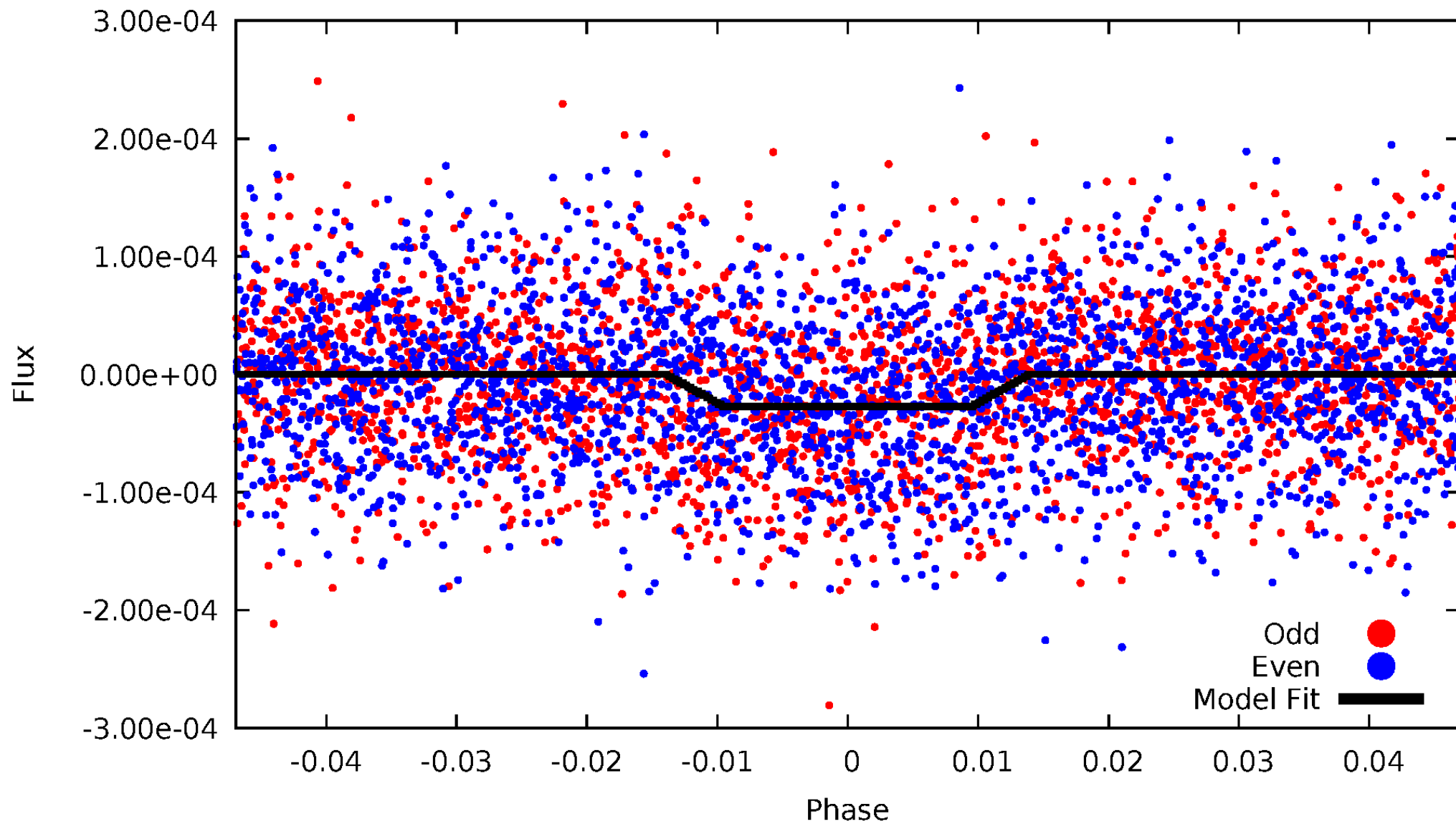
DV Odd/Even

TCE 009602613-01

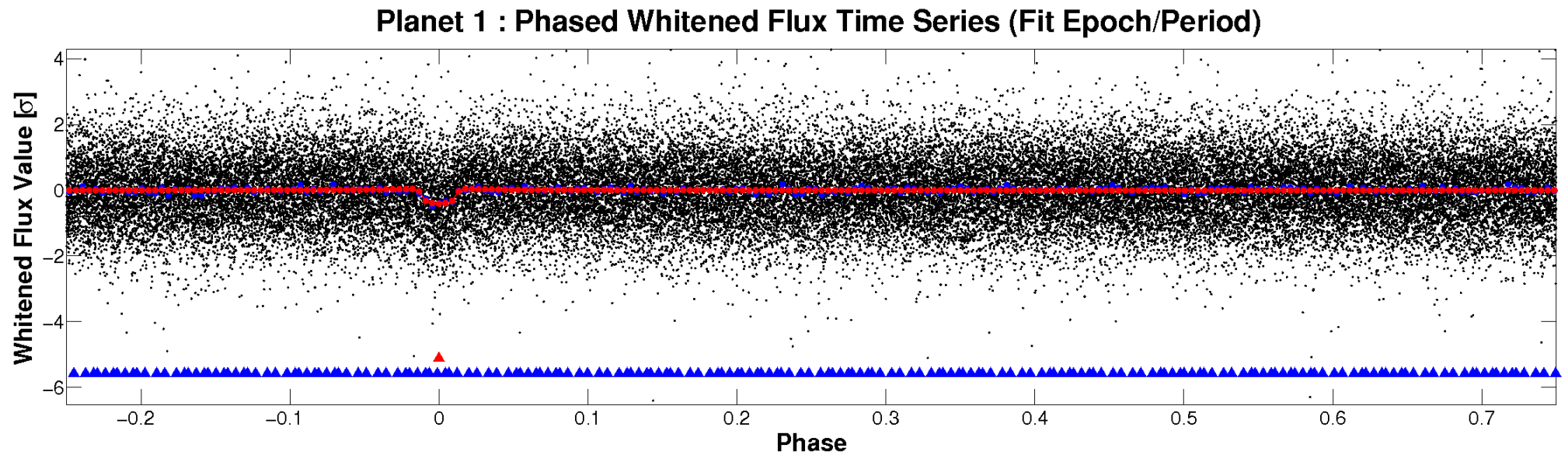
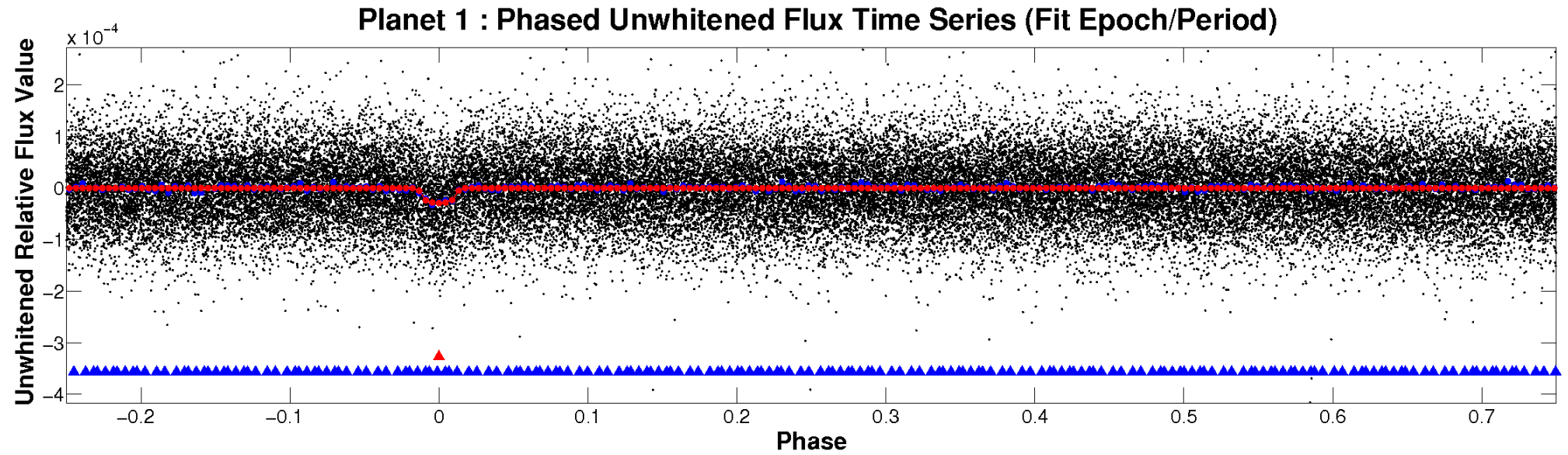


ALT Odd/Even

TCE 009602613-01

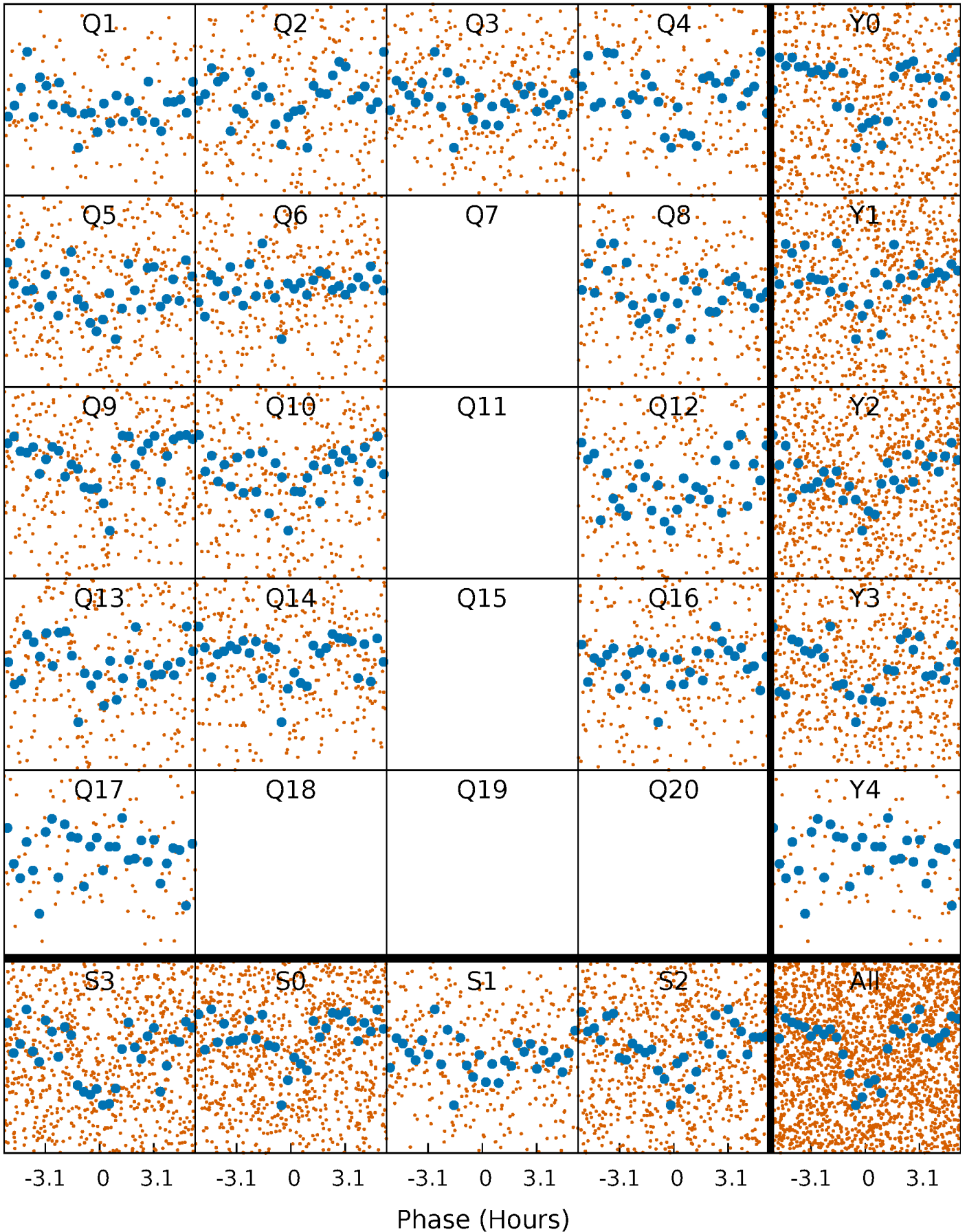


Non-Whitened Vs. Whitened Light Curve



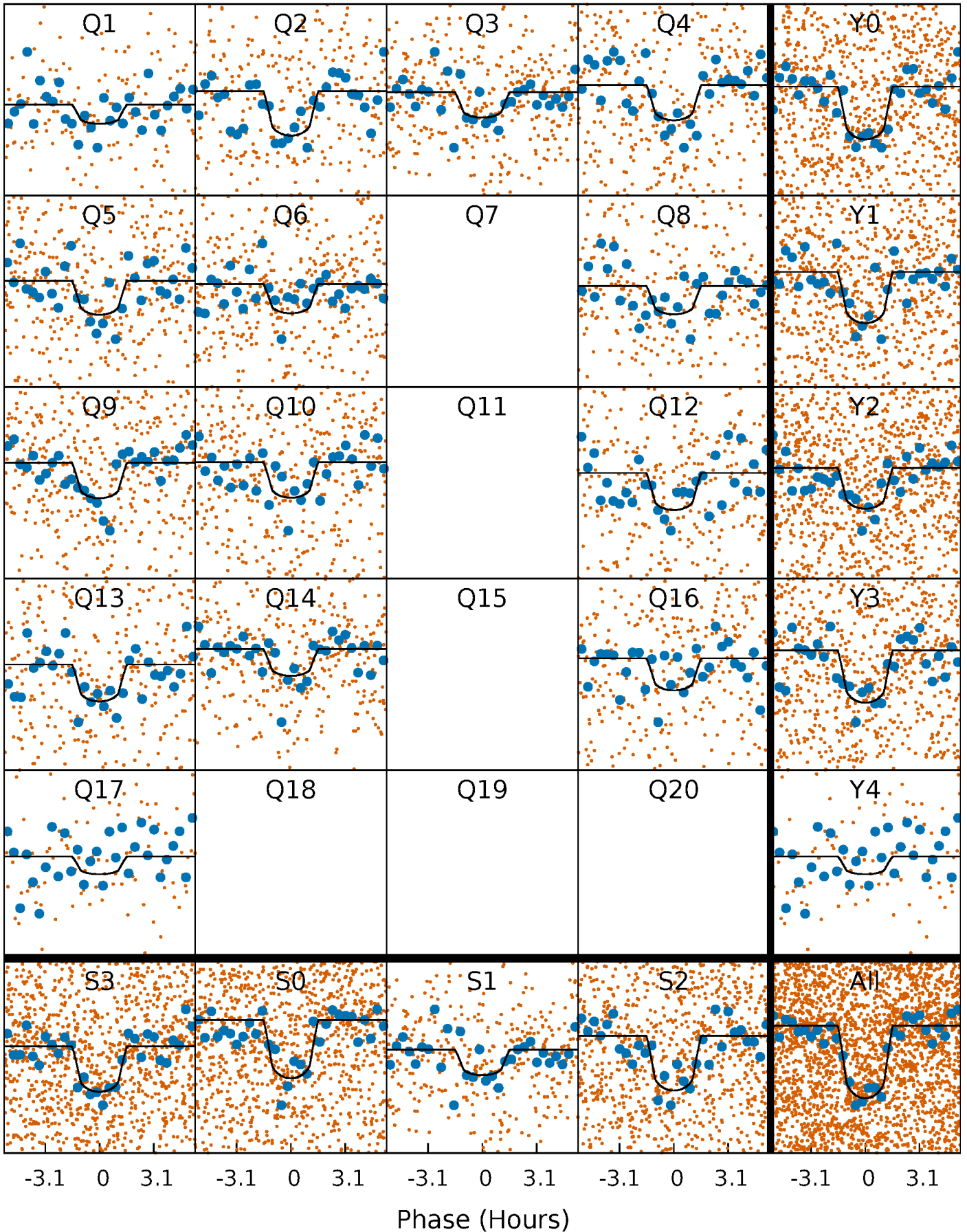
PDC Quarter-Phased Transit Curves

TCE 009602613-01 P= 4.612323 Days $T_0=133.853880$ (BKJD)



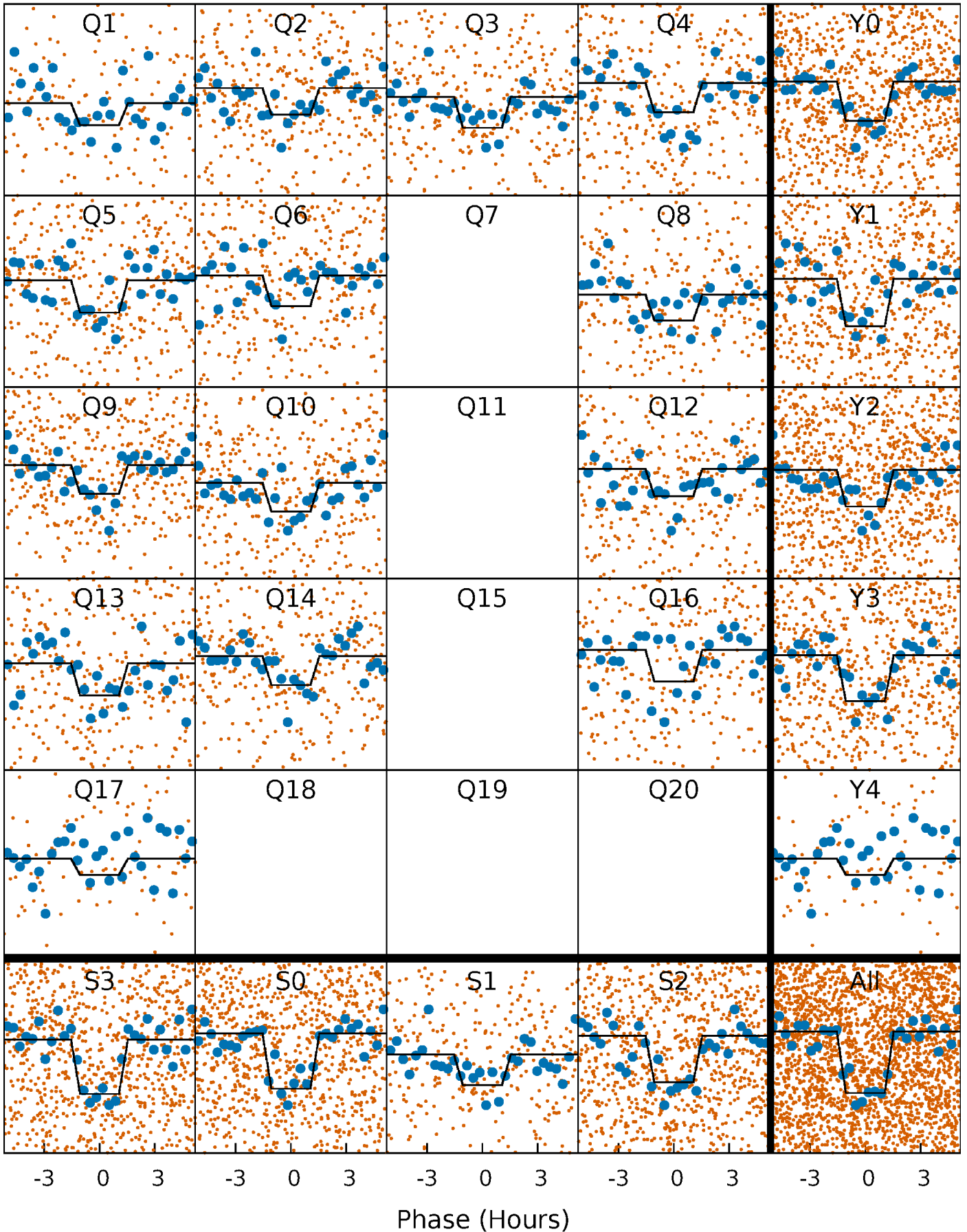
DV Quarter-Phased Transit Curves

TCE 009602613-01 P= 4.612323 Days $T_0=133.853880$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

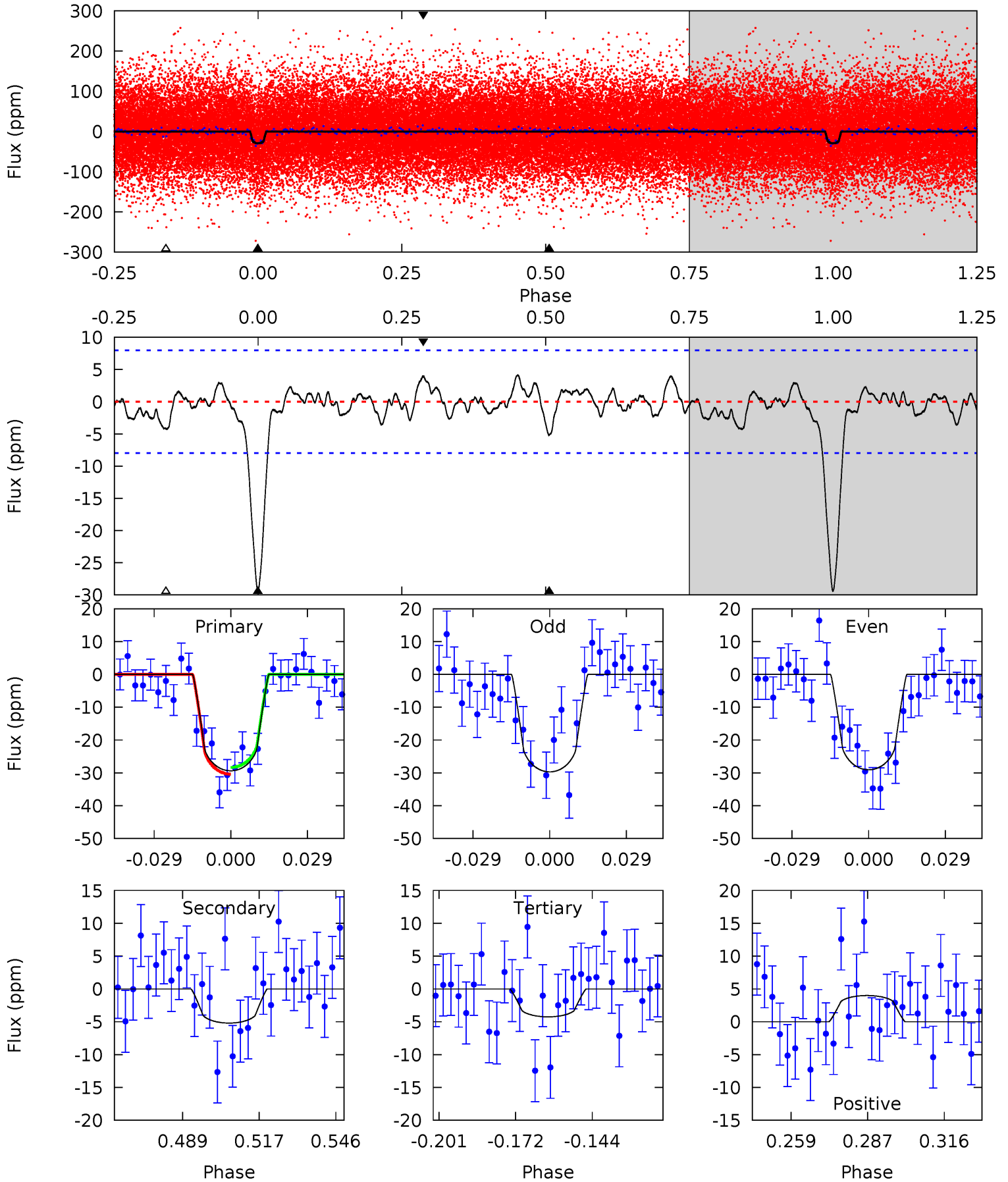
TCE 009602613-01 P= 4.612239 Days $T_0=133.862809$ (BKJD)



DV Model-Shift Uniqueness Test

009602613-01, P = 4.612323 Days, E = 129.241557 Days

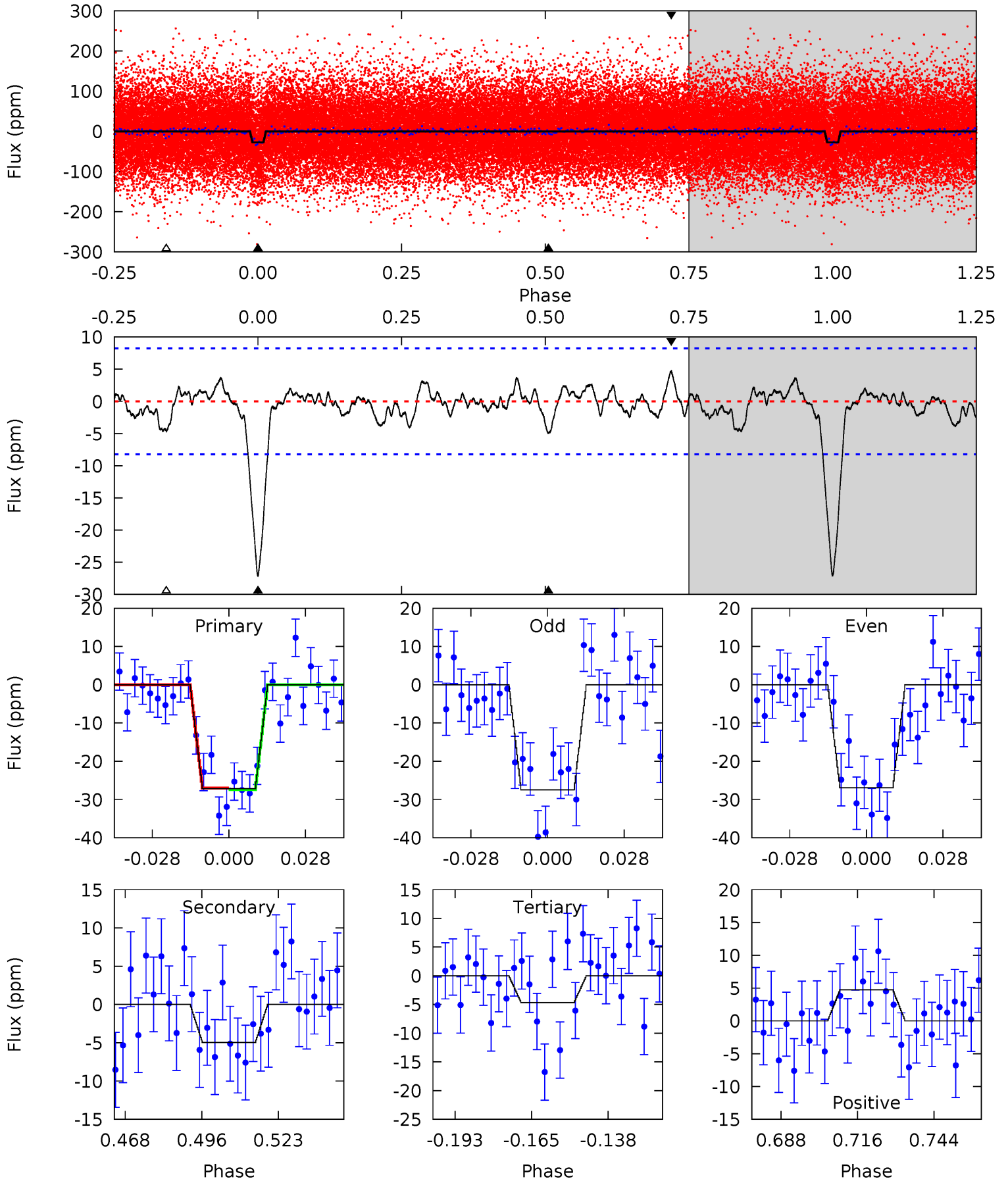
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.7	3.14	2.57	2.41	4.82	2.19	0.99	15.2	15.3	0.57	0.73	0.19	1.04	0.12	0.62



Alt Model-Shift Uniqueness Test

009602613-01, P = 4.612239 Days, E = 129.250570 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	2.91	2.75	2.78	4.83	2.20	0.97	13.2	13.2	0.17	0.14	0.17	0.97	0.15	0.12



Stellar Parameters For KIC 009602613

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5495^{+74}_{-82}	$4.442^{+0.072}_{-0.099}$	$0.160^{+0.150}_{-0.150}$	$0.961^{+0.115}_{-0.086}$	$0.932^{+0.052}_{-0.047}$	$1.478^{+0.404}_{-0.450}$
	+1%/-1%	+2%/-2%	+94%/-94%	+12%/-9%	+6%/-5%	+27%/-30%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 009602613-01 / KOI 2612.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-5 ± 2	$0.63^{+0.23}_{-0.26}$	1442^{+54}_{-42}	3752^{+796}_{-430}	20^{+37}_{-10}
Alt.	-5 ± 2	$0.53^{+0.23}_{-0.21}$	1443^{+54}_{-42}	3902^{+928}_{-471}	25^{+51}_{-13}

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

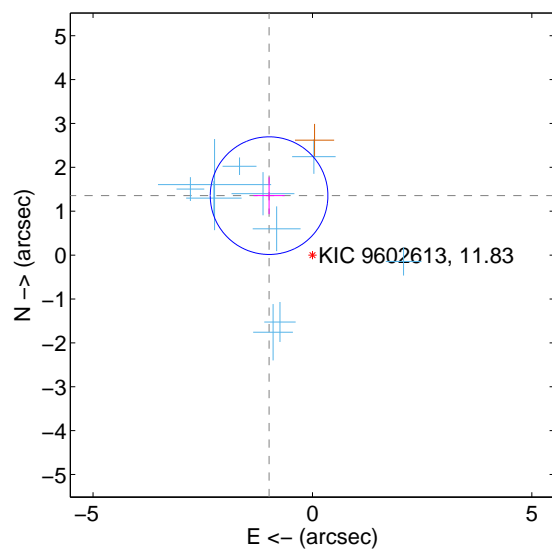
Supplemental centroid analysis for 009602613-01. **Kepler magnitude: 11.83.** Transit SNR 12.20

There are 10 quarters with good PRF difference image offsets

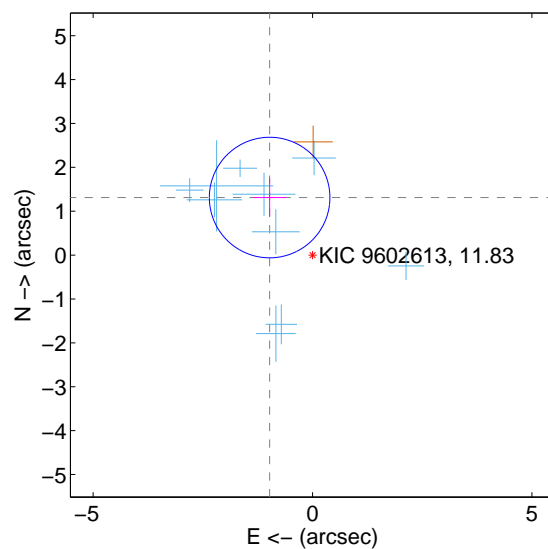
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.677 ± 0.447	3.75	0.988 ± 0.355	1.355 ± 0.420
PRF-fit source offset from KIC position	1.636 ± 0.458	3.57	0.977 ± 0.379	1.311 ± 0.439
photometric centroid source offset	2.12 ± 0.82	2.58	-0.21 ± 0.93	2.11 ± 0.82

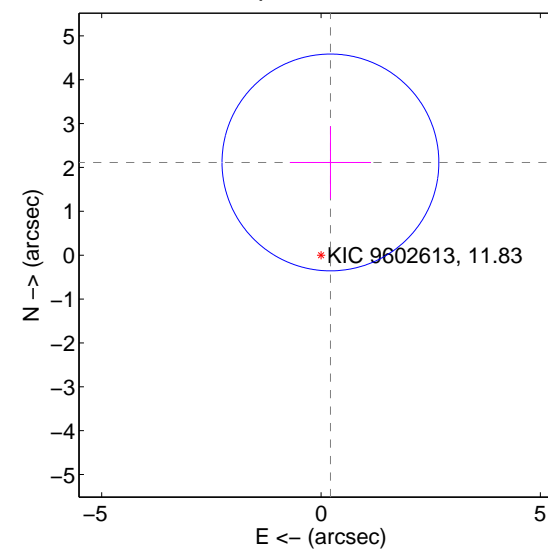
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

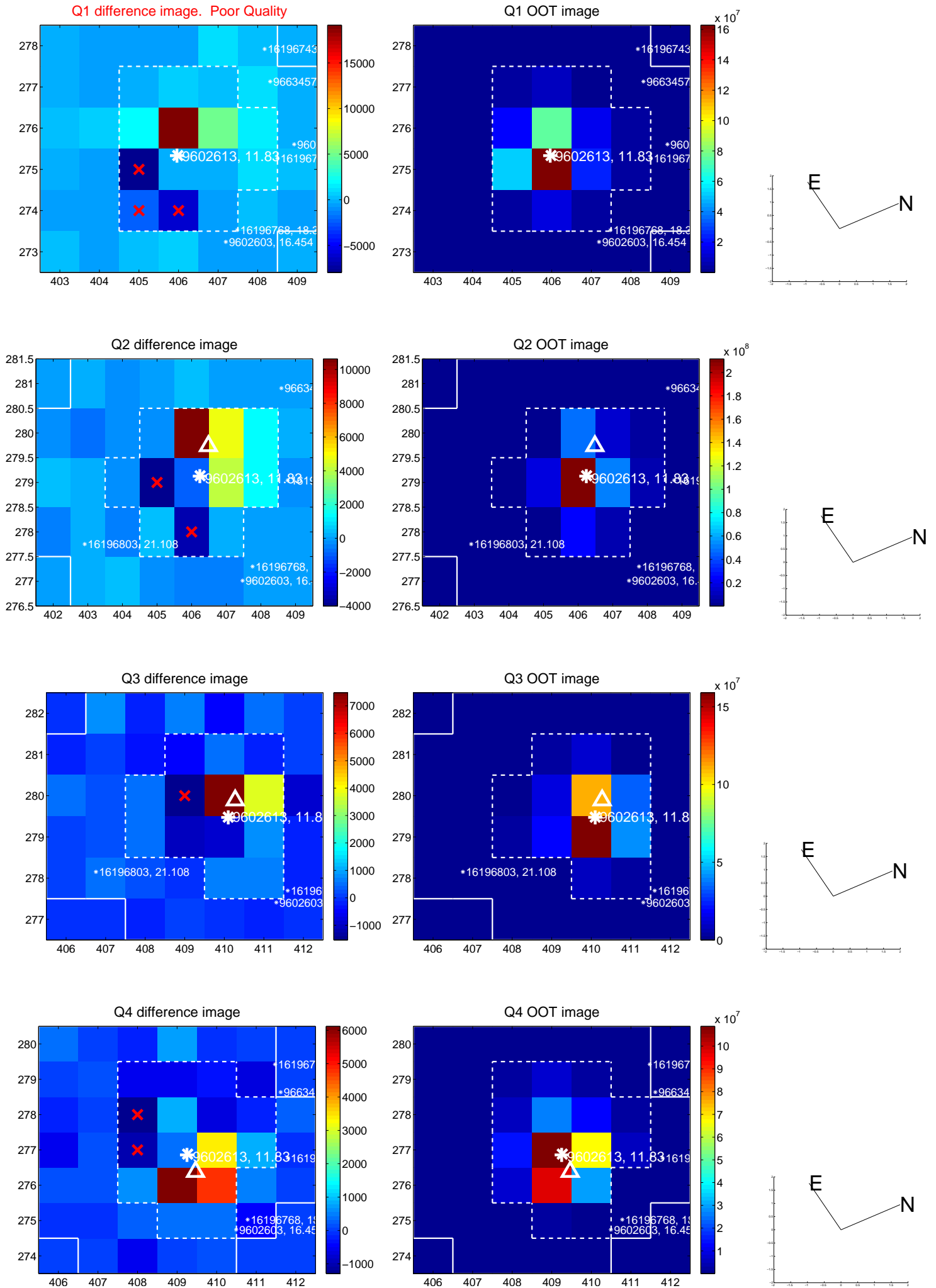


offset from photometric centroids

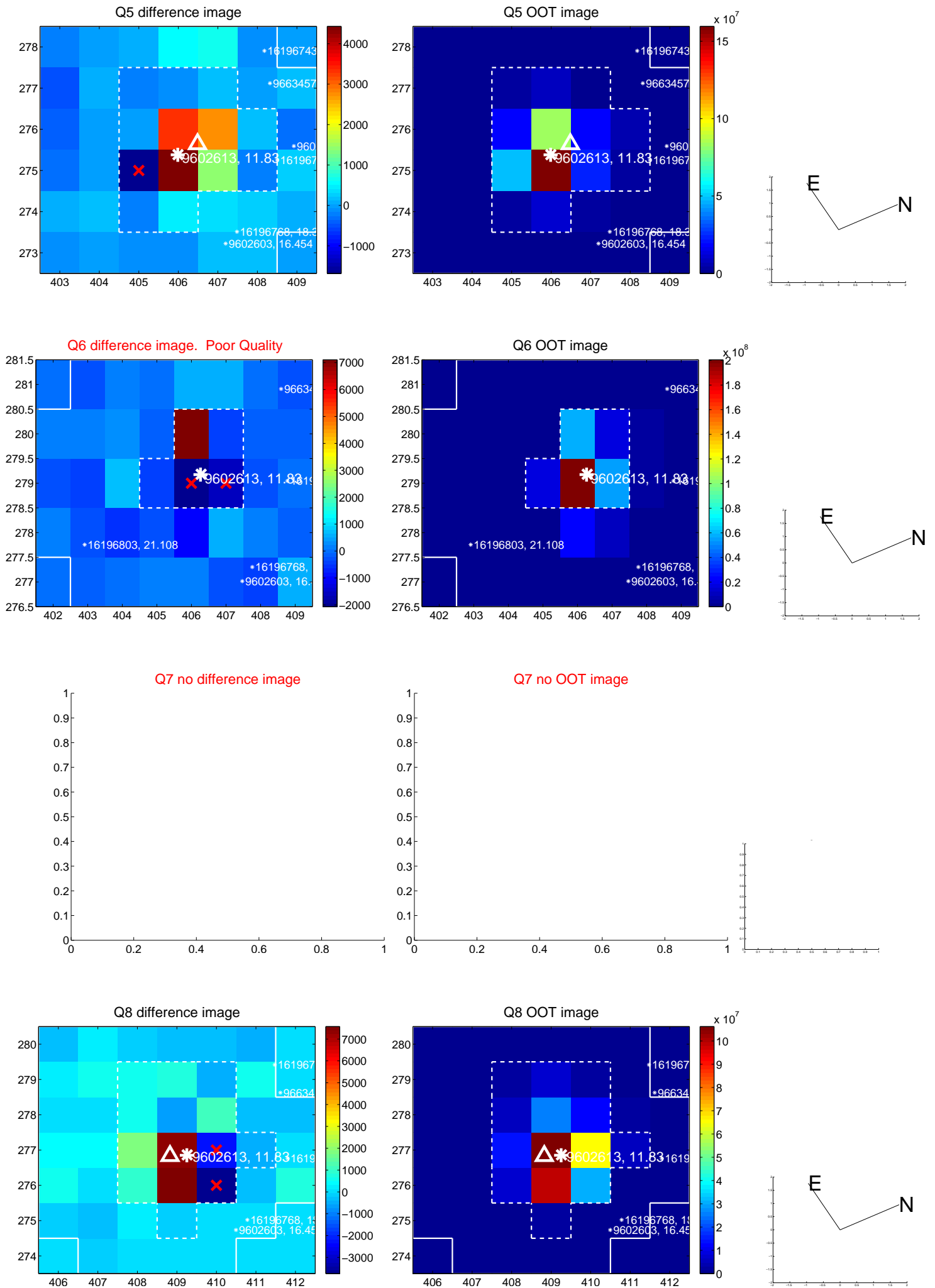


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

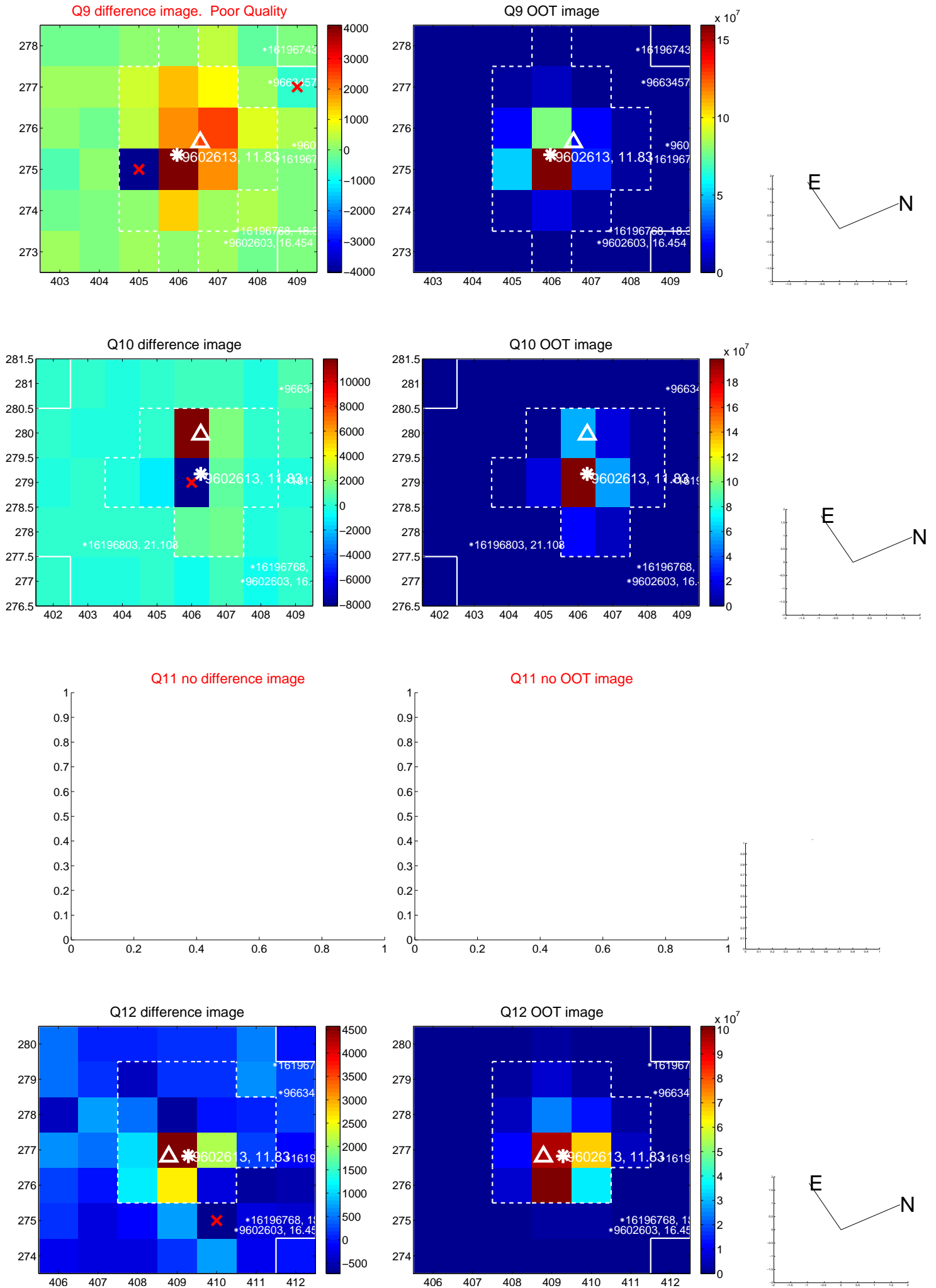
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



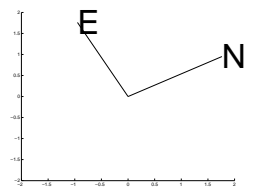
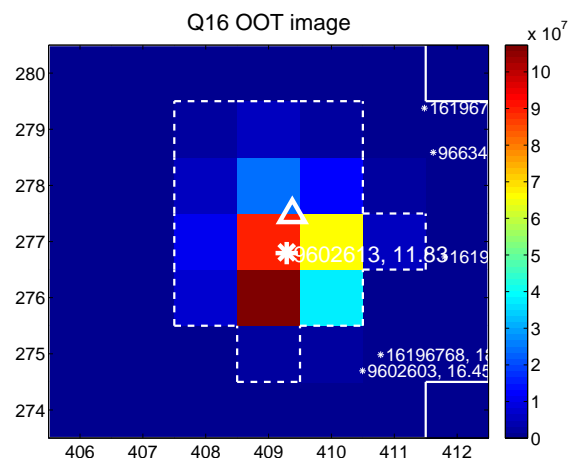
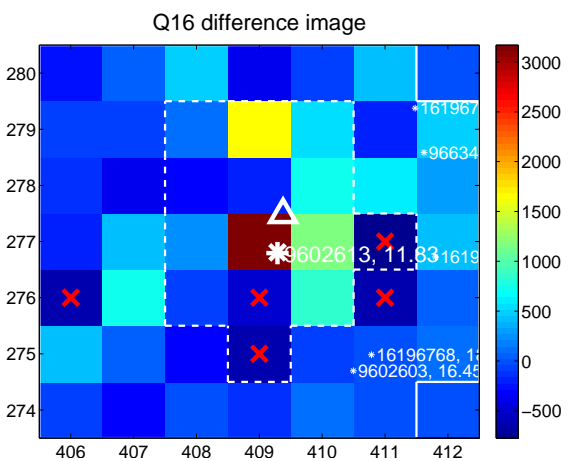
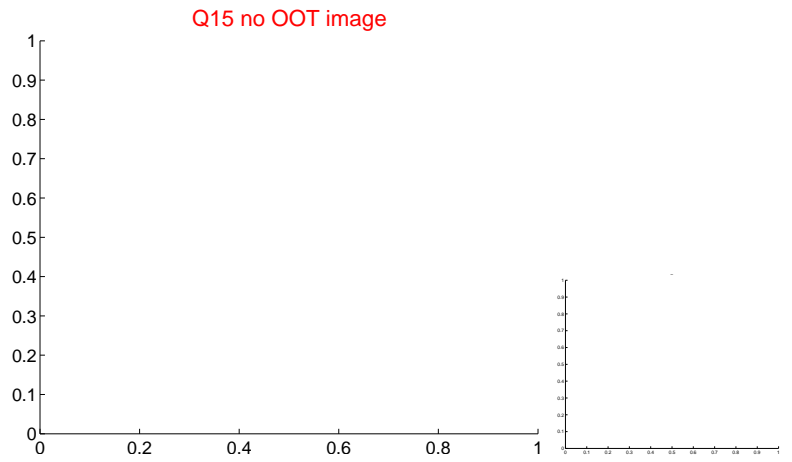
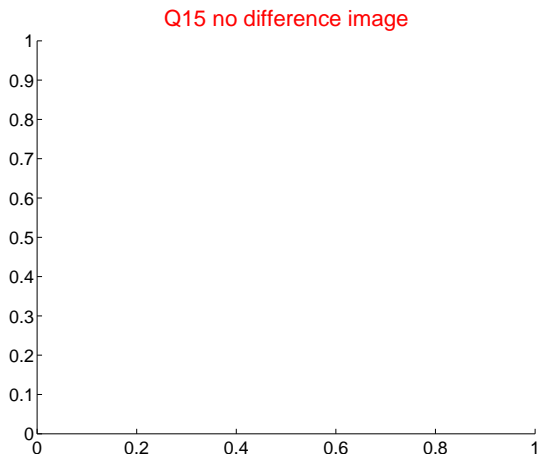
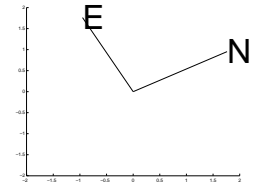
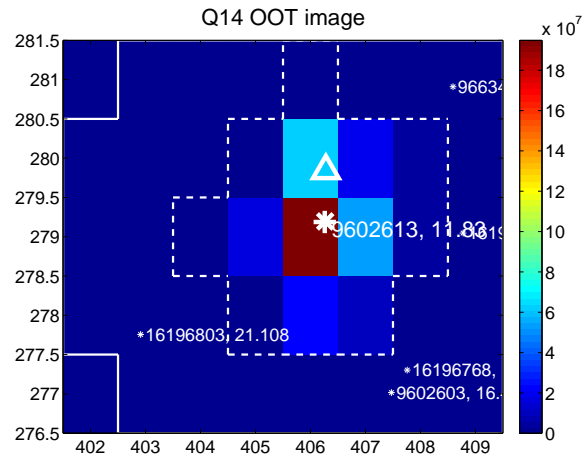
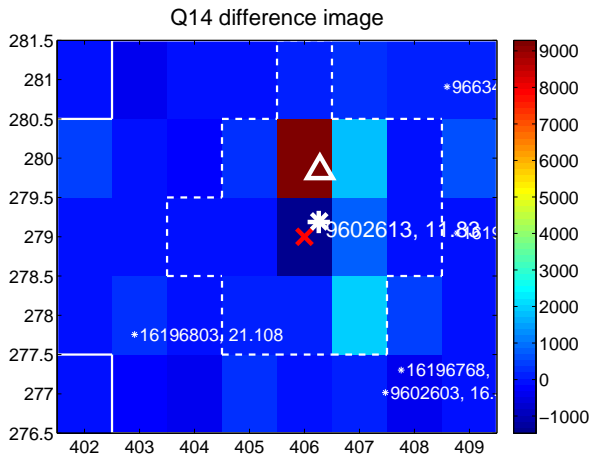
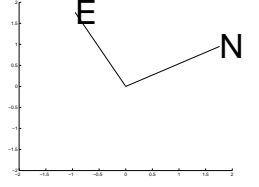
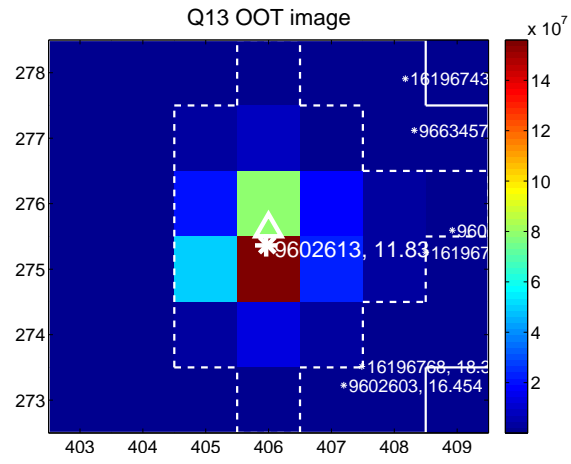
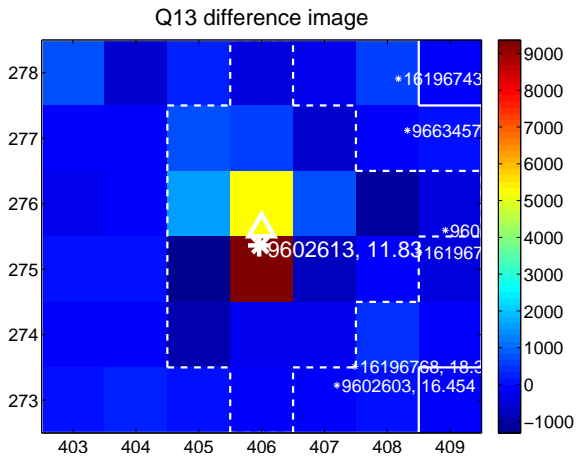
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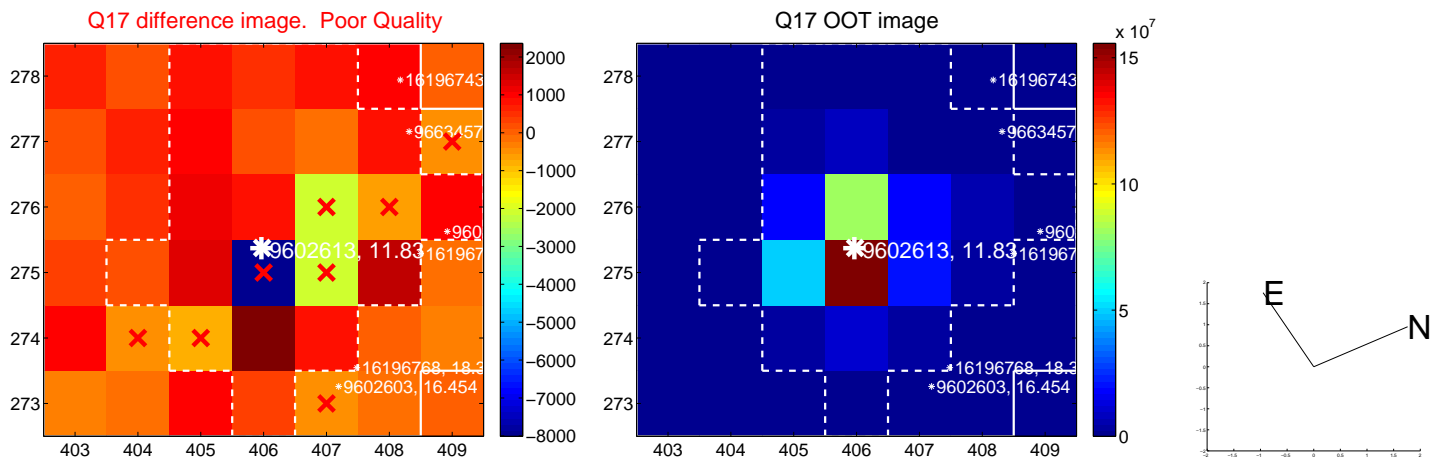
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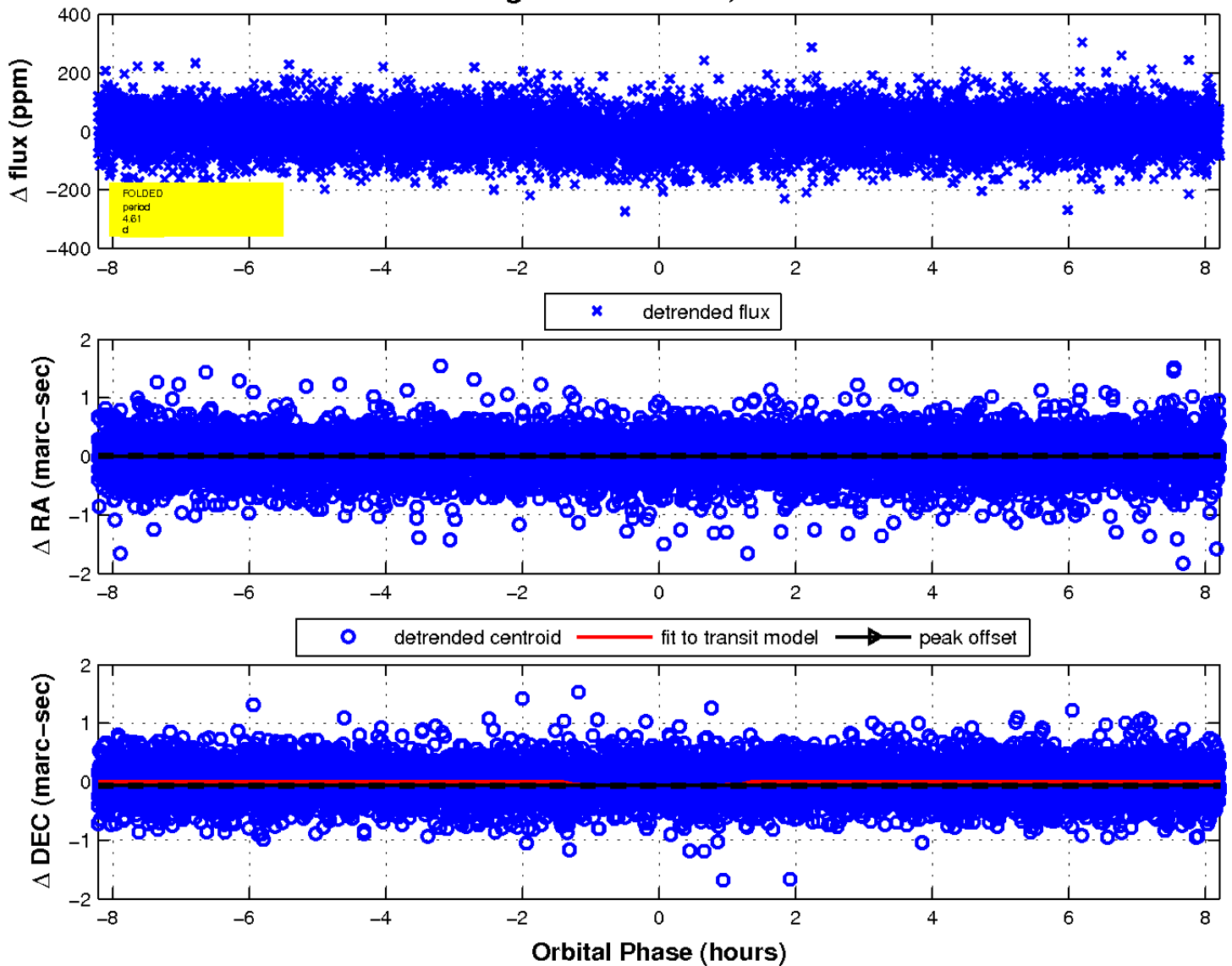
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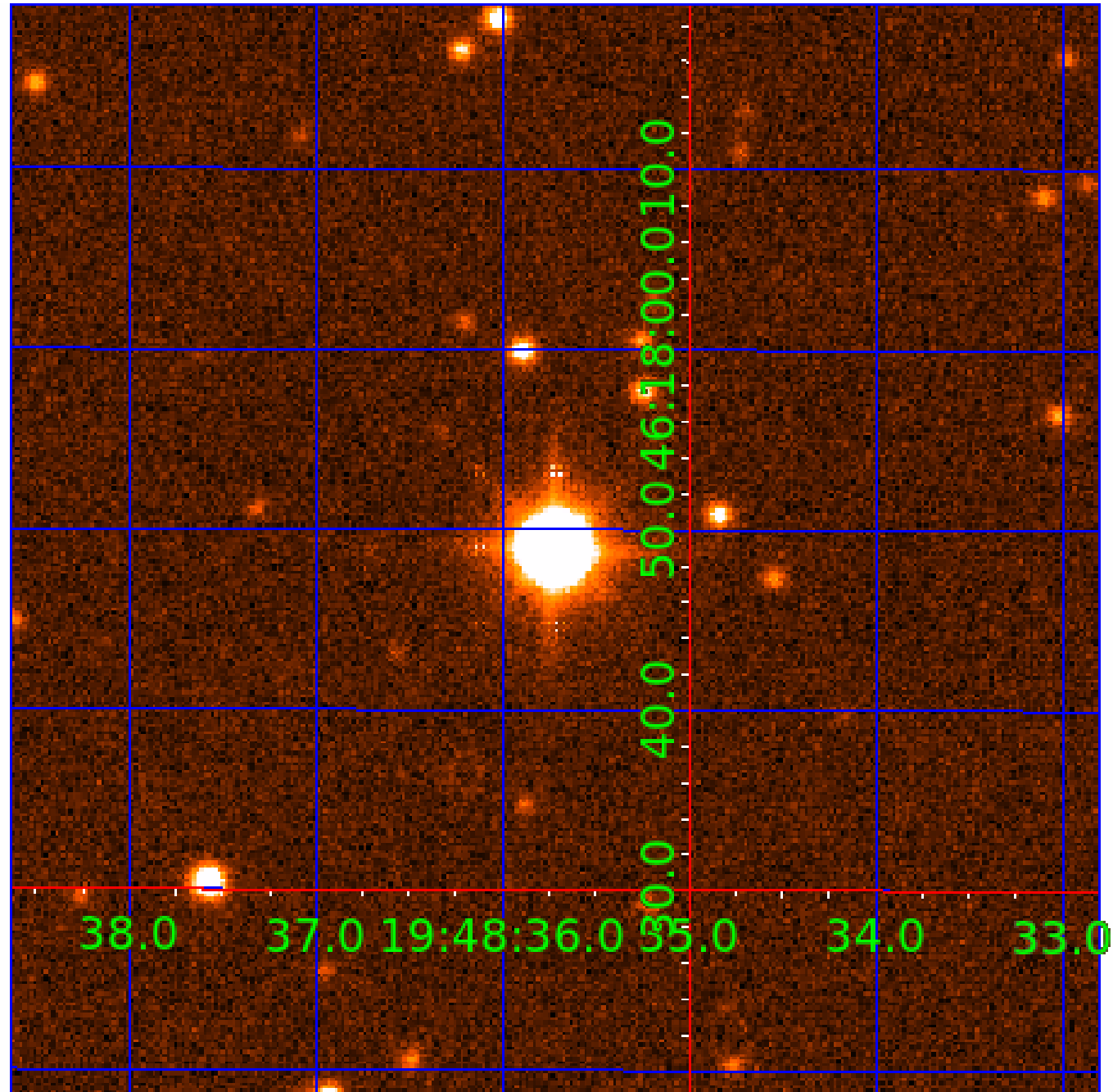


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009602613

Q1-17 DR25 TCE Parameters

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

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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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.

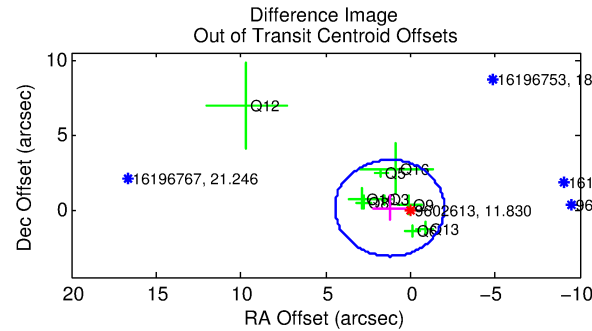
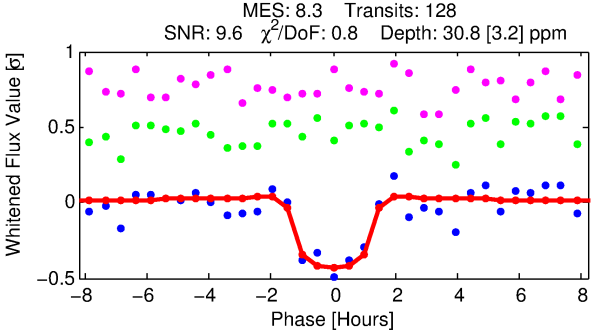
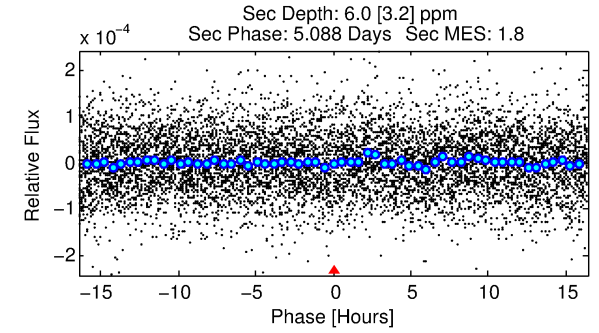
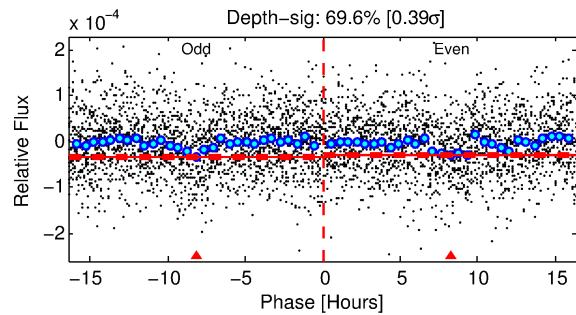
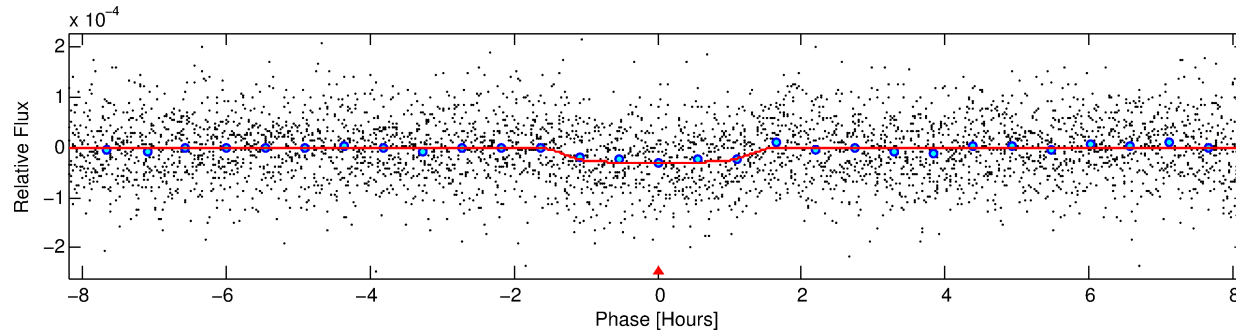
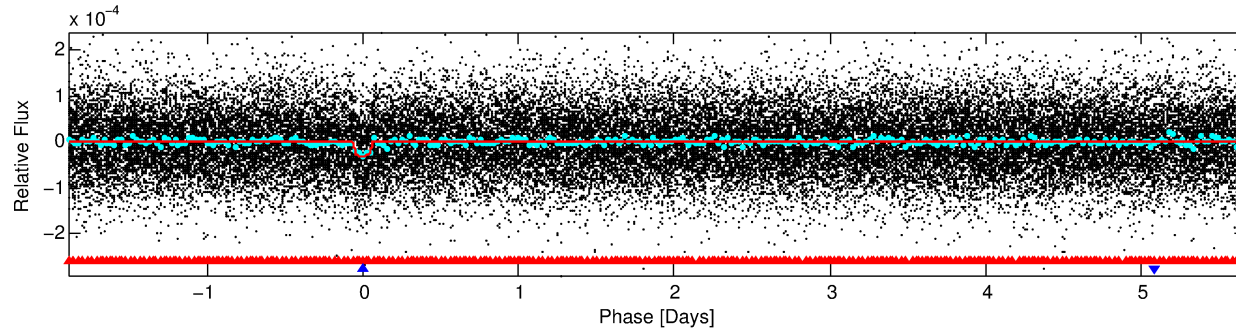
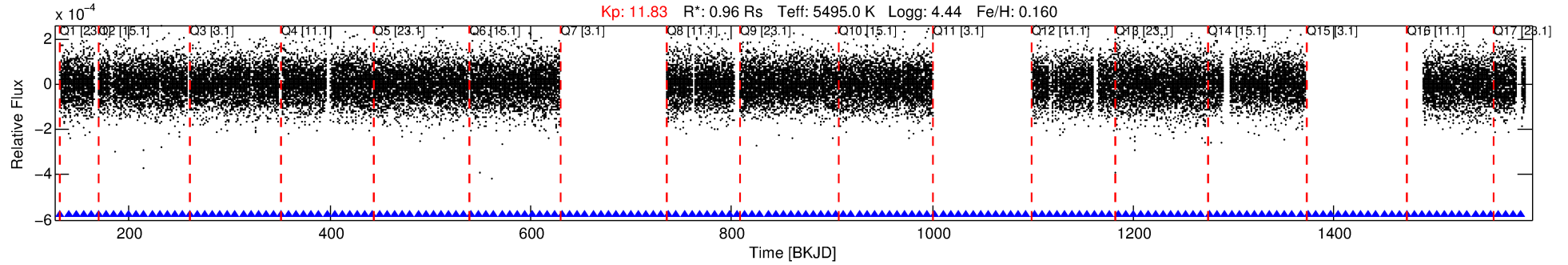
Ephemeris Match Information For 009602613-02

No Significant Match Found

DV One-Page Summary

KIC: 9602613 Candidate: 2 of 2 Period: 7.573 d
 KOI: K02612.02 Corr: 0.961

Kp: 11.83 R*: 0.96 Rs Teff: 5495.0 K Logg: 4.44 Fe/H: 0.160



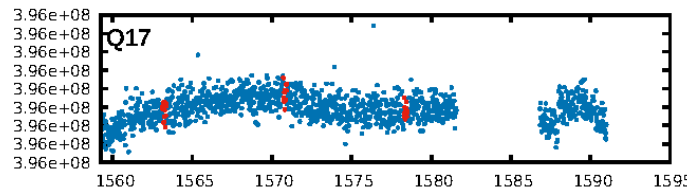
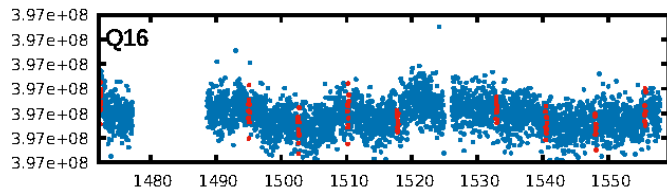
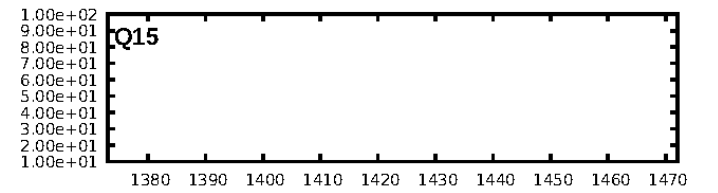
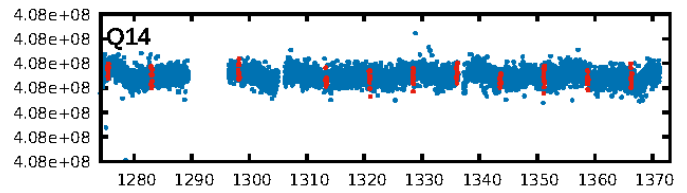
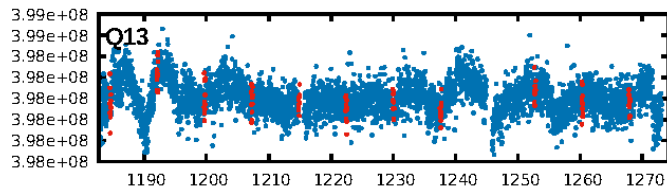
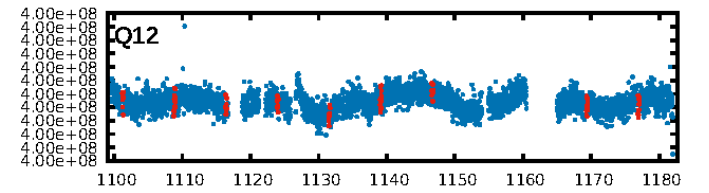
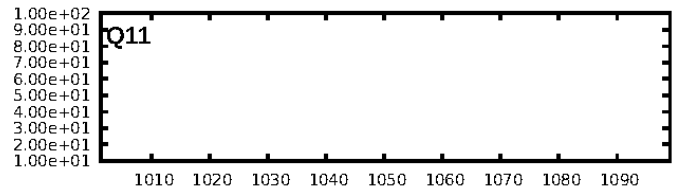
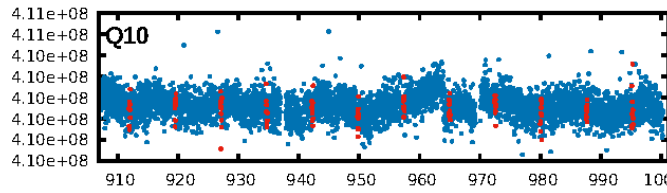
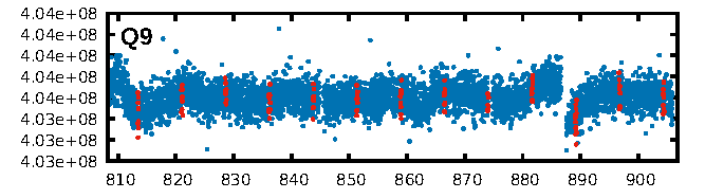
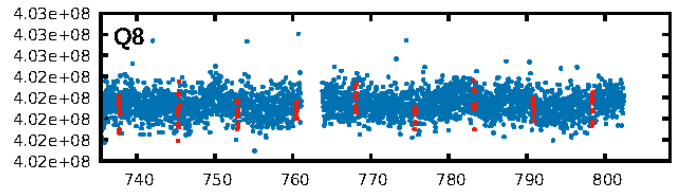
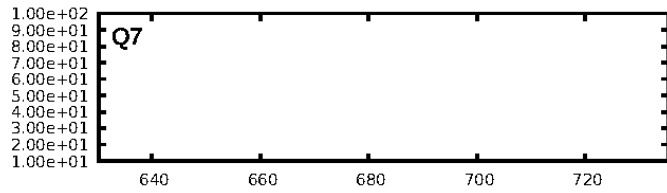
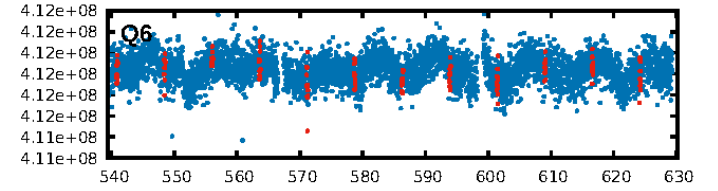
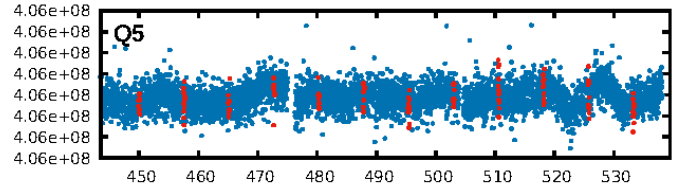
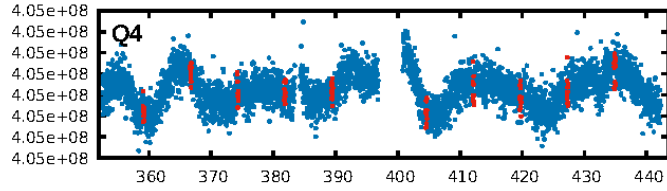
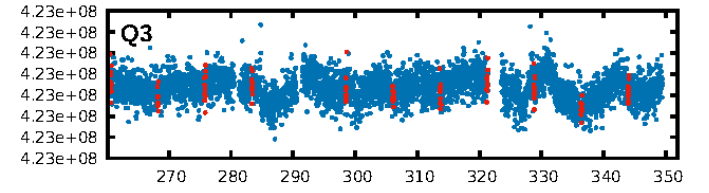
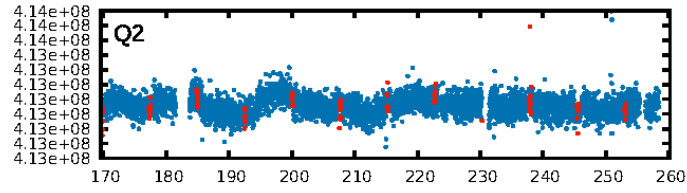
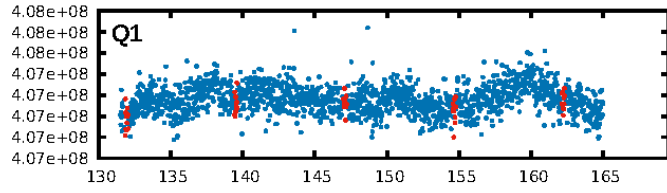
DV Fit Results:

Period = 7.57301 [0.00006] d
 Epoch = 131.9409 [0.0051] BKJD
 Rp/R* = 0.0058 [0.0029]
 a/R* = 11.74 [24.40]
 b = 0.84 [0.75]
 Serr = 138.75 [25.21]
 Teq = 875 [40] K
 Rp = 0.61 [0.31] Re
 a = 0.0737 [0.0081] AU
 Ag = 48.76 [55.79] [0.86σ]
 Teffp = 3576 [1012] K [2.67σ]

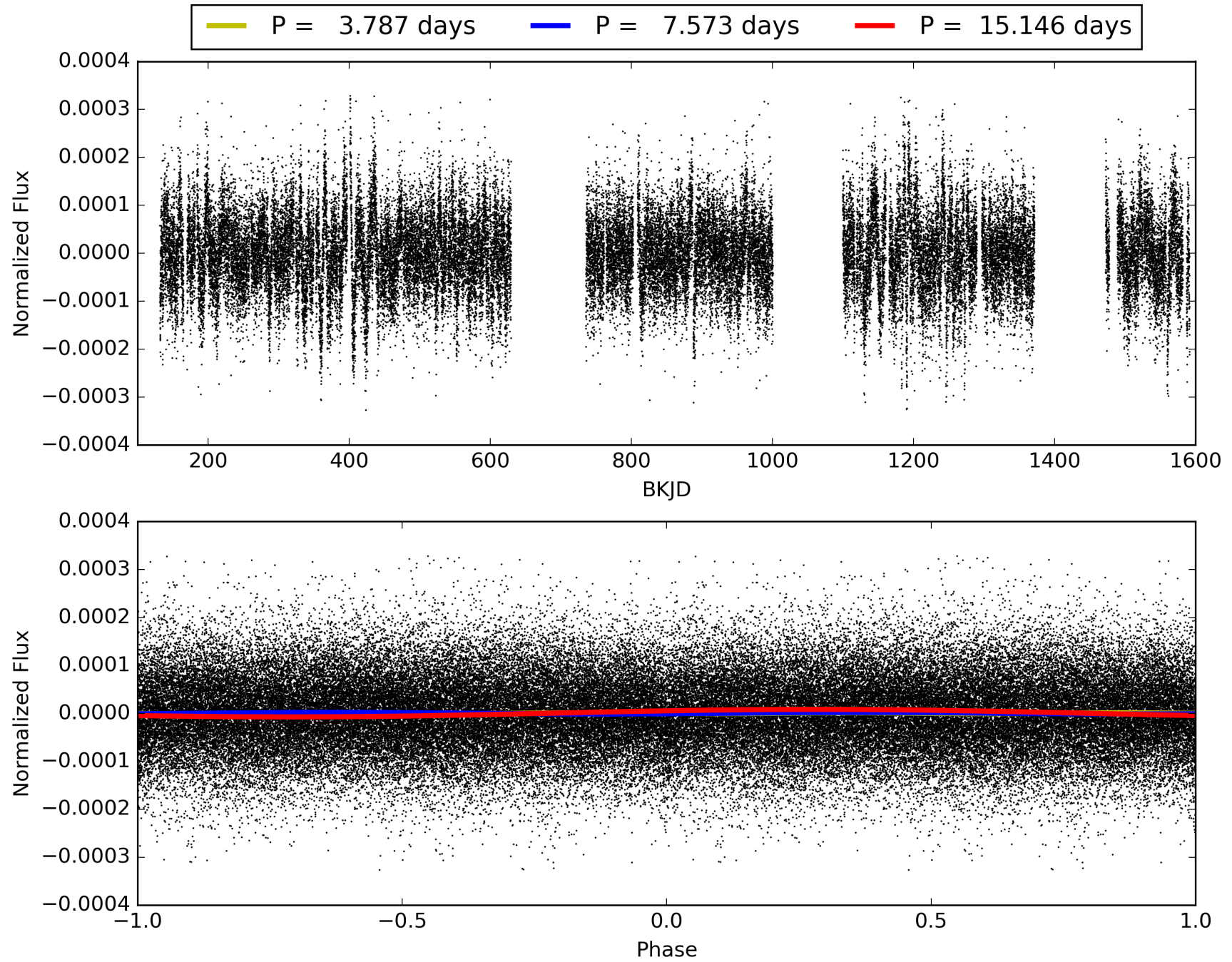
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [18.36σ]
 LongPeriod-sig: N/A
 ModelChiSquare2-sig: 100.0%
 ModelChiSquareGof-sig: 100.0%
 Bootstrap-pfa: 3.92e-16
 RollingBand-fgt: 1.00 [120/120]
 GhostDiagnostic-chr: 8.241
 Centroid-sig: 20.7%
 Centroid-so: 1.380 arcsec [1.23σ]
 OotOffset-rm: 1.225 arcsec [1.14σ]
 OotOffset-st: 2/1/3/3 [9]
 KicOffset-rm: 1.217 arcsec [1.24σ]
 KicOffset-st: 2/1/3/3 [9]
 DiffImageQuality-fgm: 0.78 [7/9]
 DiffImageOverlap-fno: 1.00 [14/14]

TCE 009602613-02, PDC Light Curves

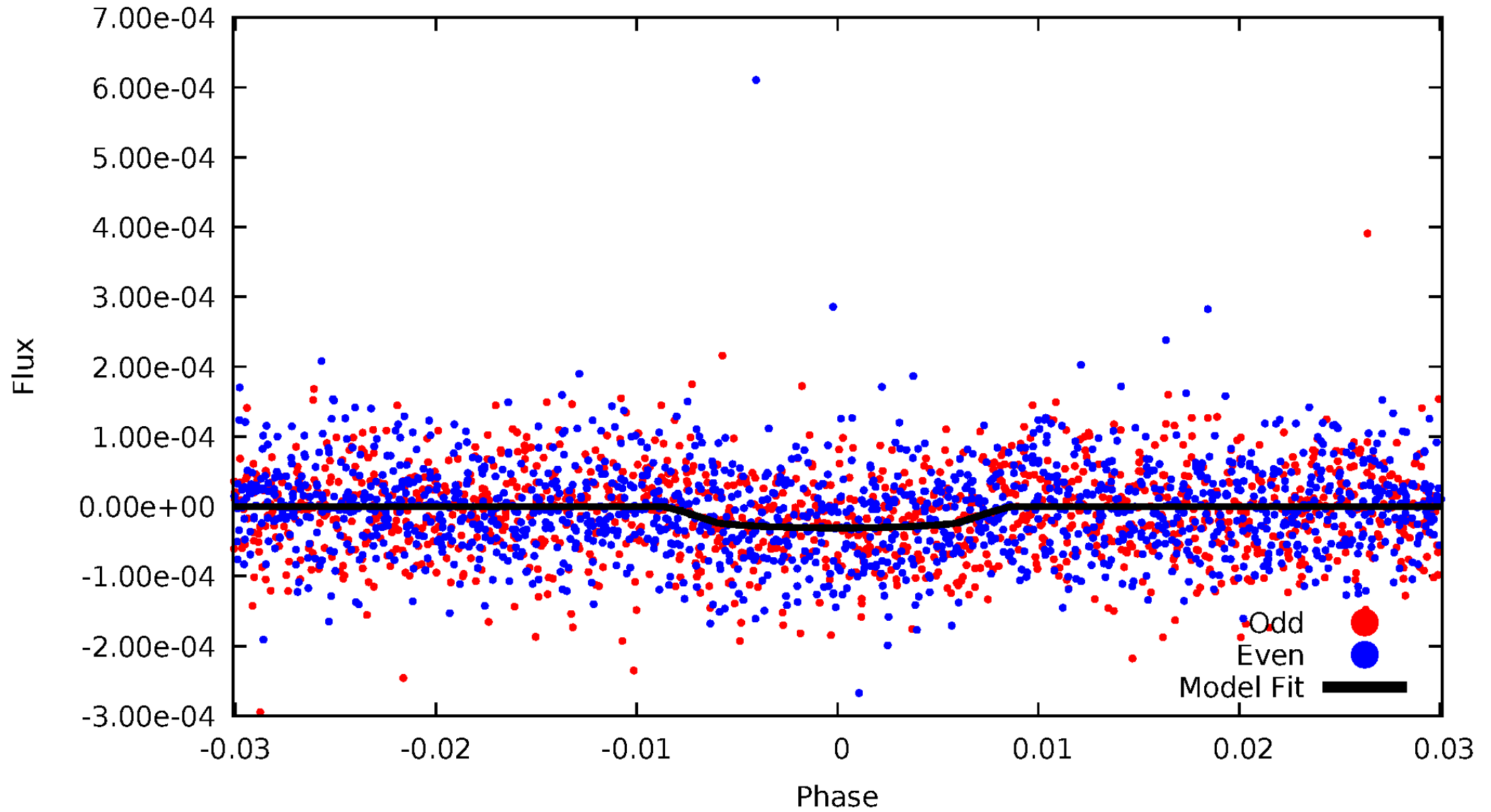


TCE 009602613-02



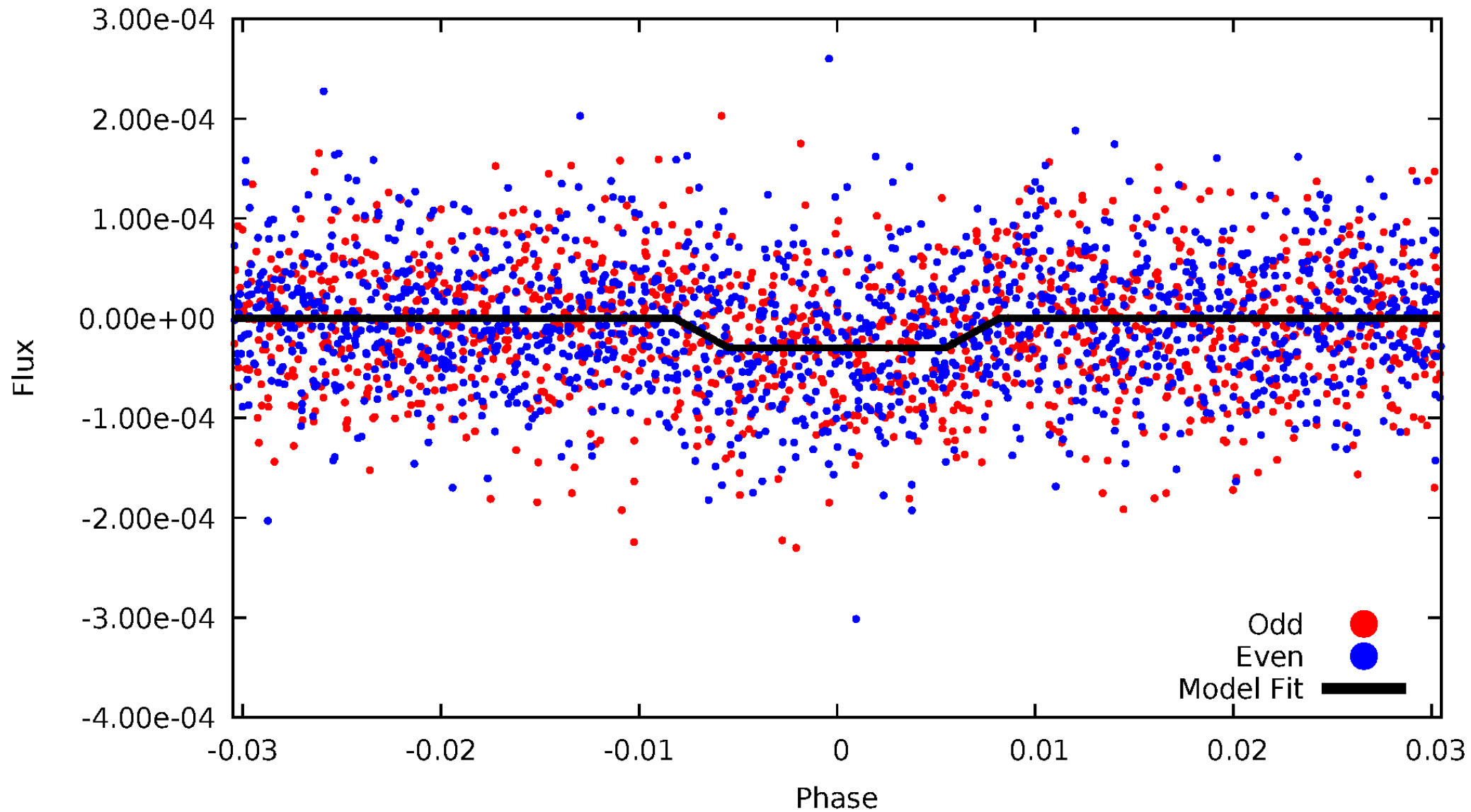
DV Odd/Even

TCE 009602613-02



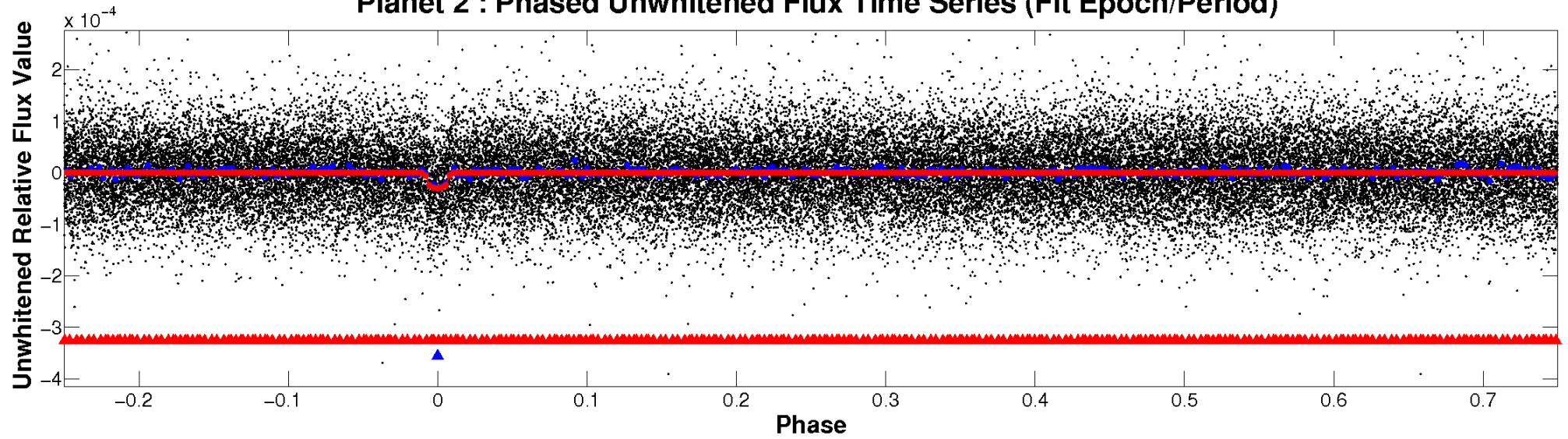
ALT Odd/Even

TCE 009602613-02

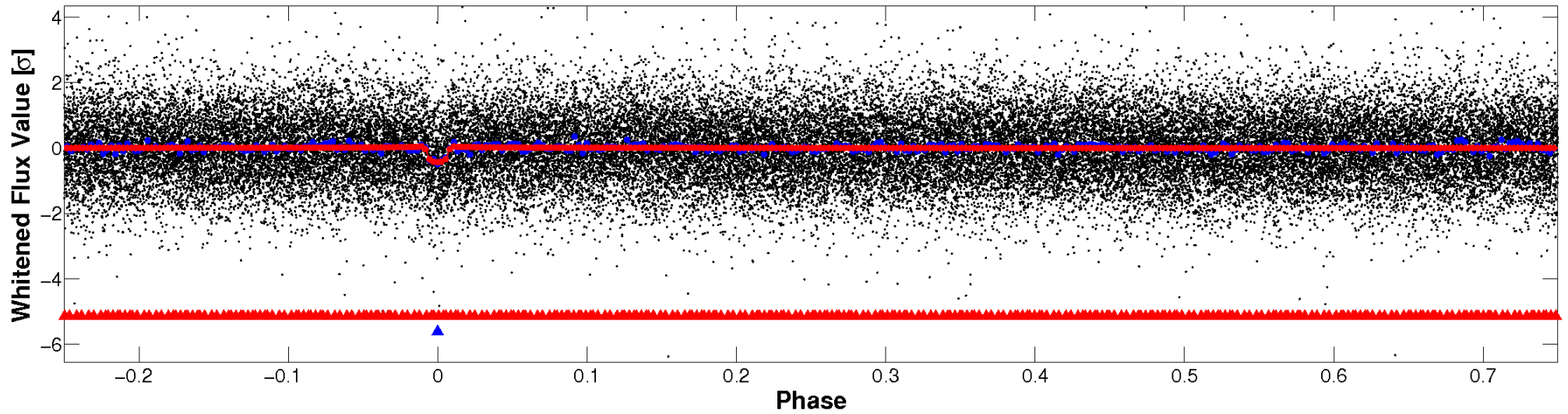


Non-Whitened Vs. Whitened Light Curve

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

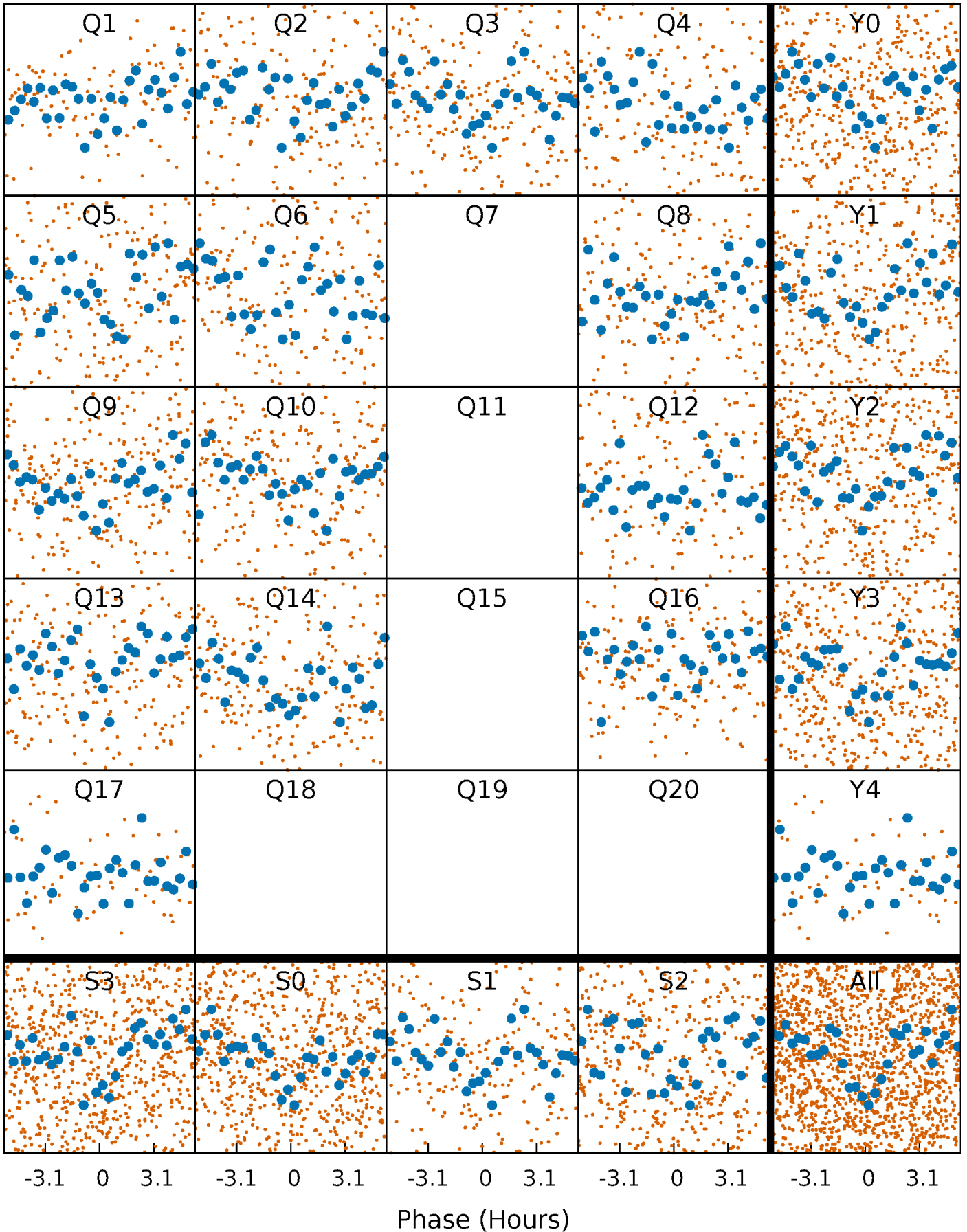


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



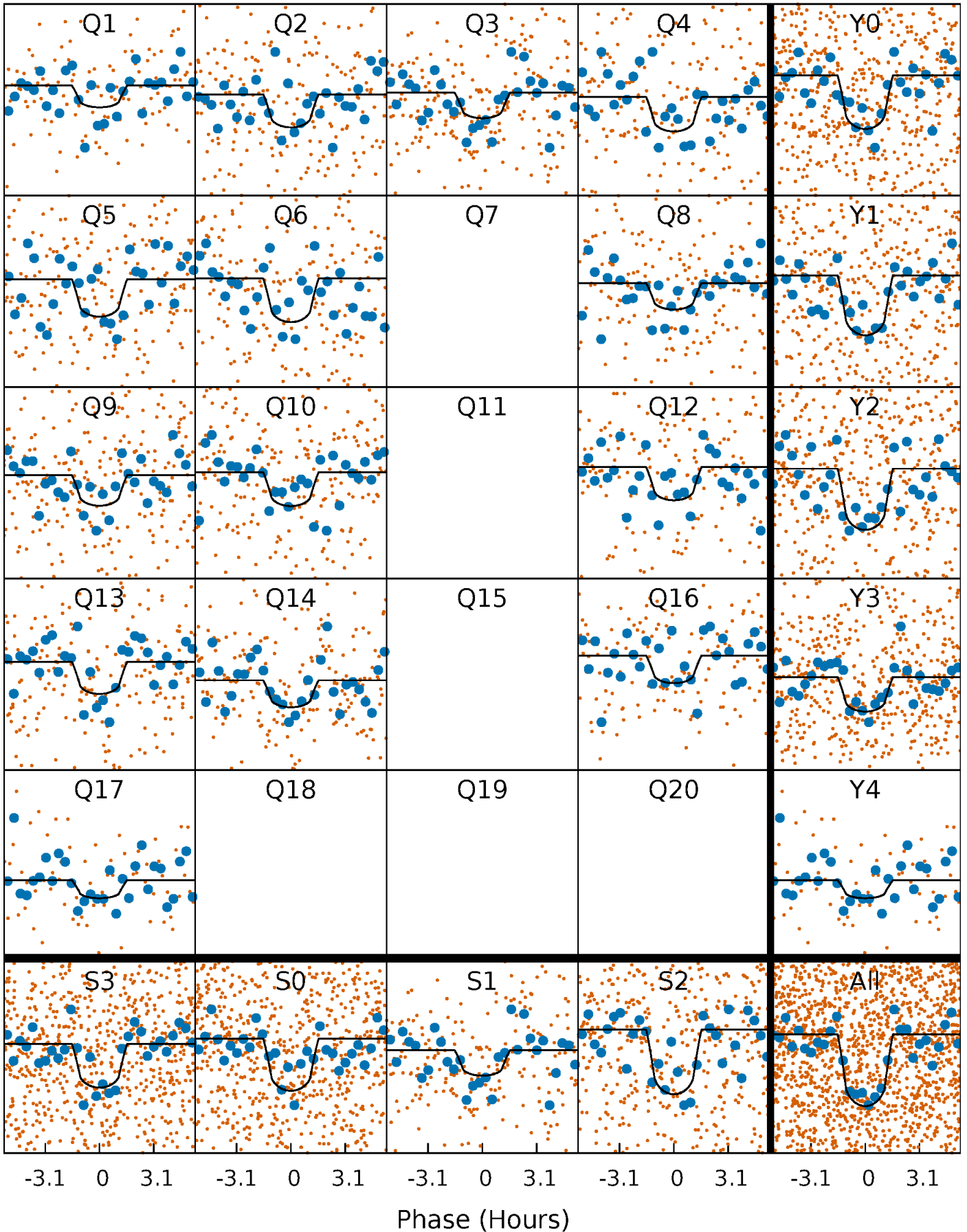
PDC Quarter-Phased Transit Curves

TCE 009602613-02 P= 7.573013 Days $T_0=131.940908$ (BKJD)



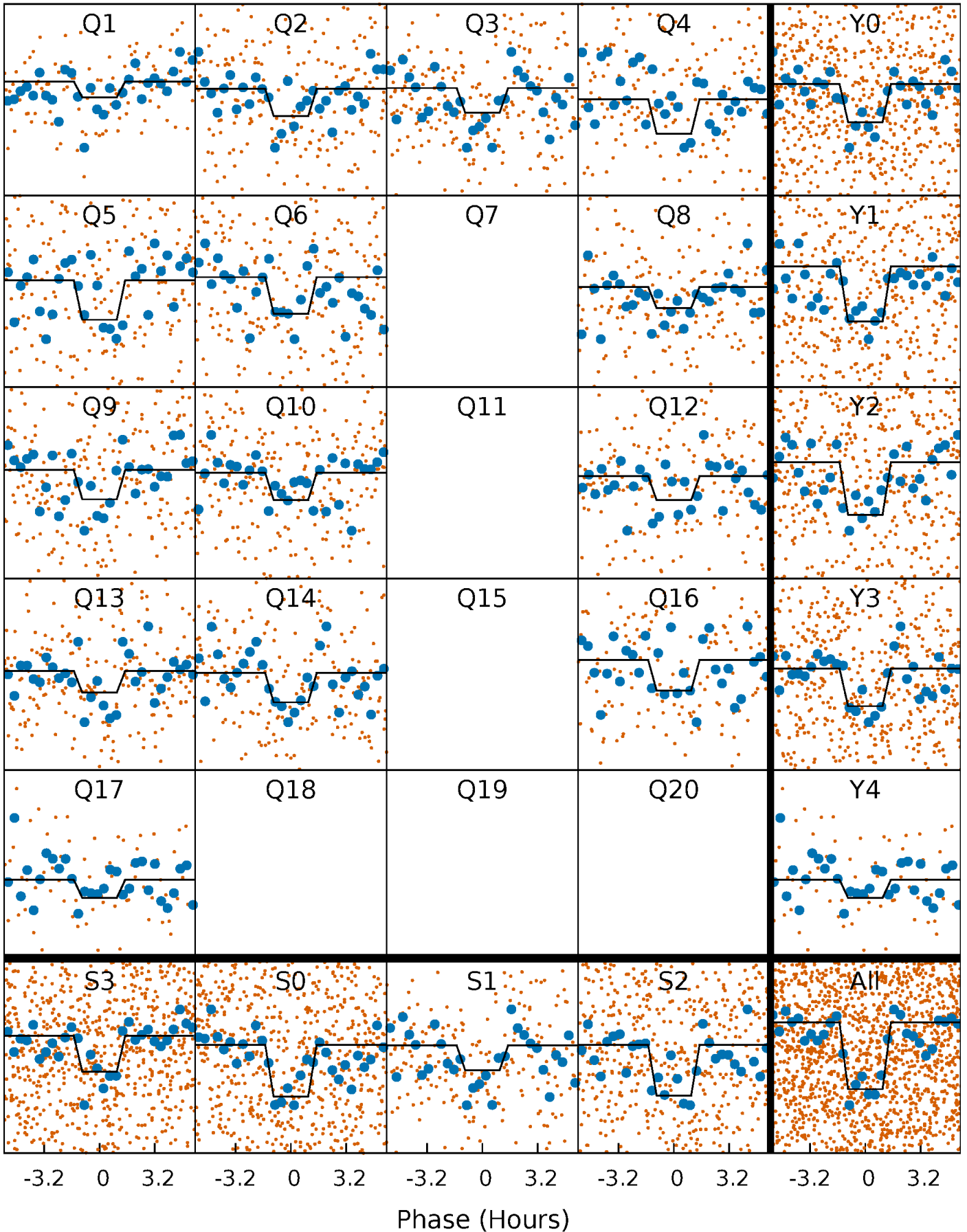
DV Quarter-Phased Transit Curves

TCE 009602613-02 P= 7.573013 Days $T_0=131.940908$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

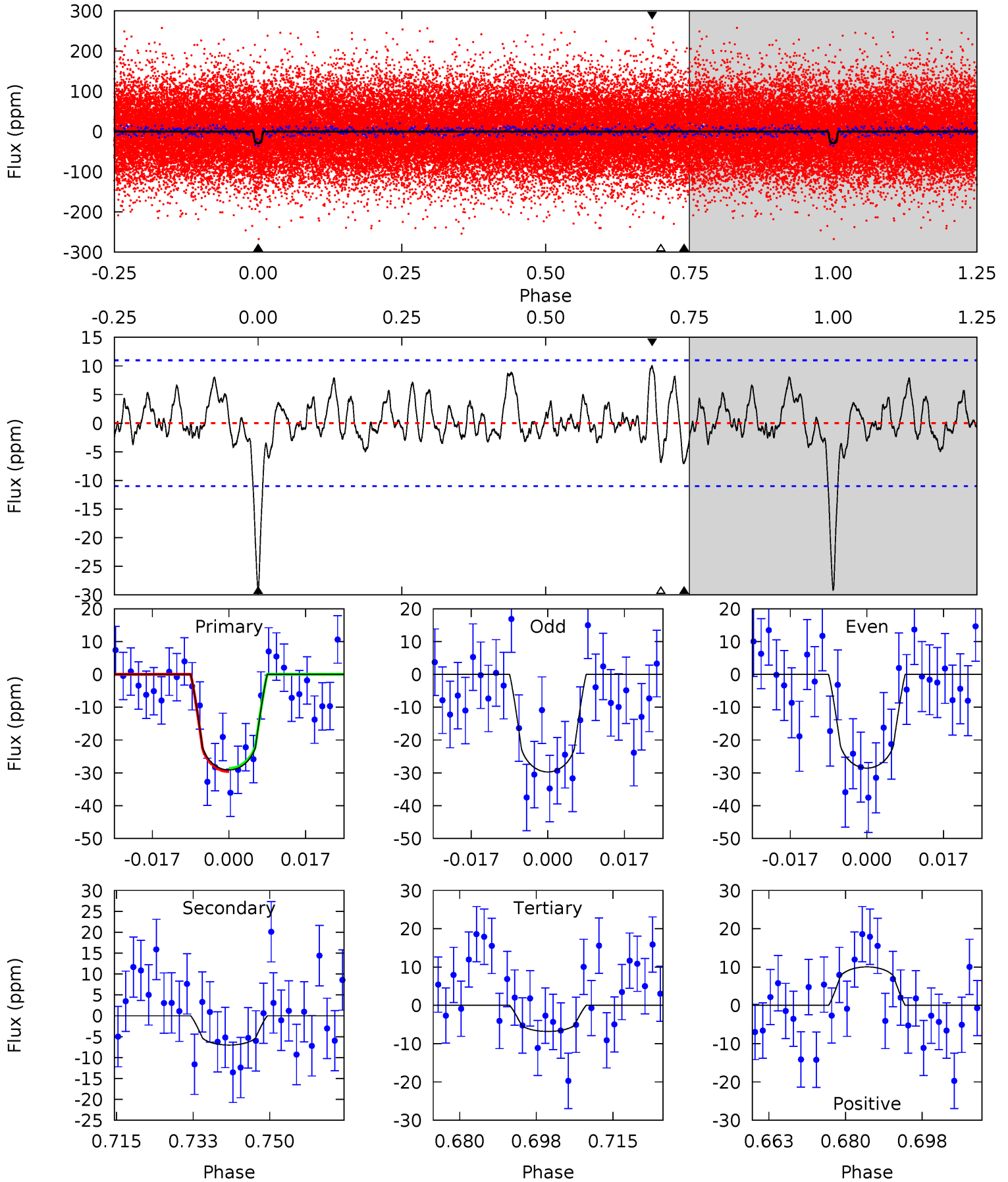
TCE 009602613-02 P= 7.573022 Days $T_0=131.941292$ (BKJD)



DV Model-Shift Uniqueness Test

009602613-02, P = 7.573013 Days, E = 124.367895 Days

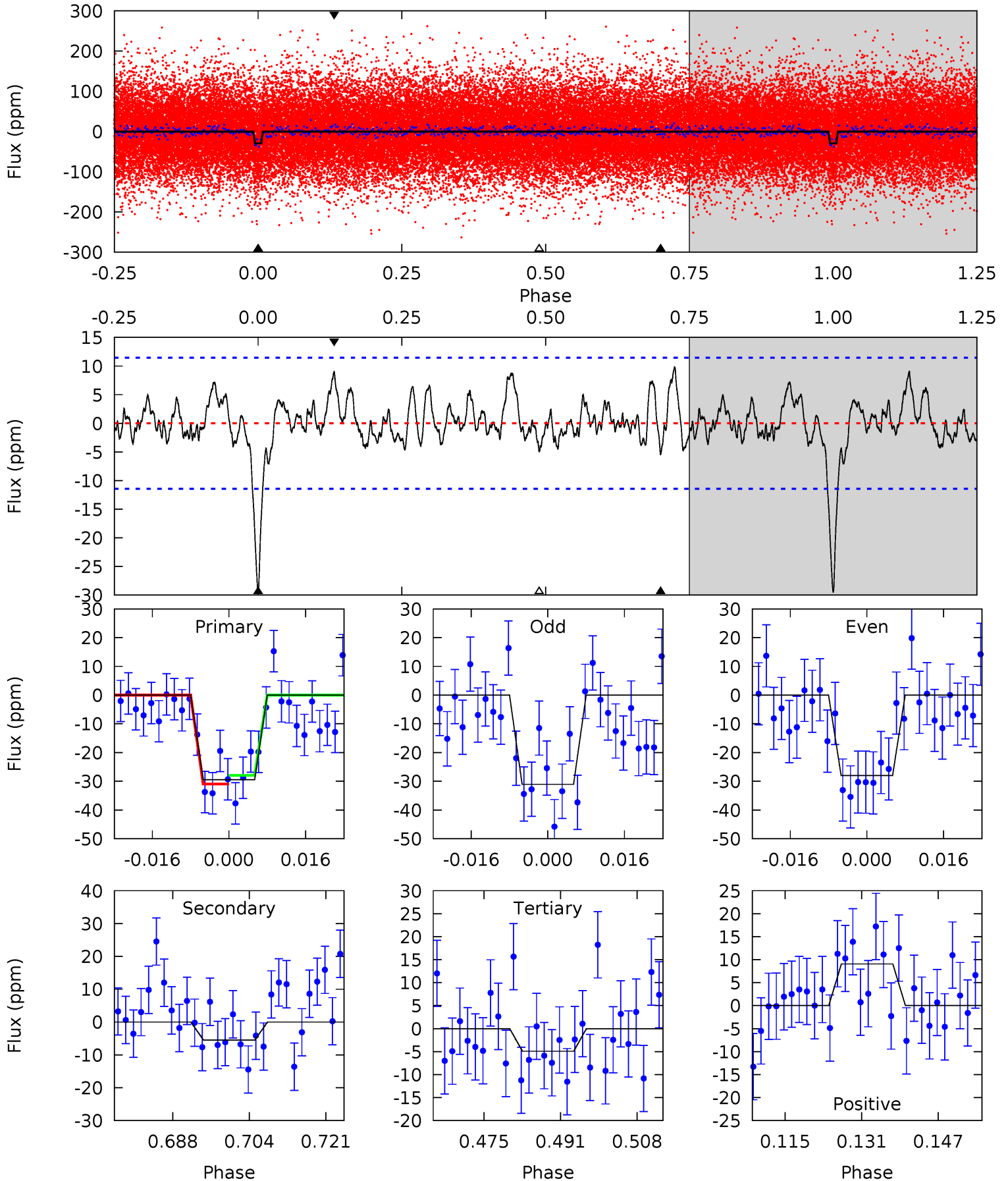
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	3.13	3.05	4.50	4.92	2.38	1.33	9.99	8.54	0.08	-1.36	0.26	0.86	0.26	0.20



Alt Model-Shift Uniqueness Test

009602613-02, P = 7.573022 Days, E = 124.368270 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	2.36	2.11	3.91	4.93	2.40	1.28	10.6	8.78	0.24	-1.55	0.66	0.93	0.25	0.65



Stellar Parameters For KIC 009602613

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5495^{+74}_{-82}	$4.442^{+0.072}_{-0.099}$	$0.160^{+0.150}_{-0.150}$	$0.961^{+0.115}_{-0.086}$	$0.932^{+0.052}_{-0.047}$	$1.478^{+0.404}_{-0.450}$
	+1%/-1%	+2%/-2%	+94%/-94%	+12%/-9%	+6%/-5%	+27%/-30%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 009602613-02 / KOI 2612.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-7 ± 2	$0.61^{+0.32}_{-0.29}$	1226^{+42}_{-37}	3983^{+1160}_{-575}	55^{+153}_{-33}
Alt.	-5 ± 2	$0.59^{+0.32}_{-0.30}$	1226^{+46}_{-36}	3887^{+1177}_{-642}	46^{+147}_{-30}

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

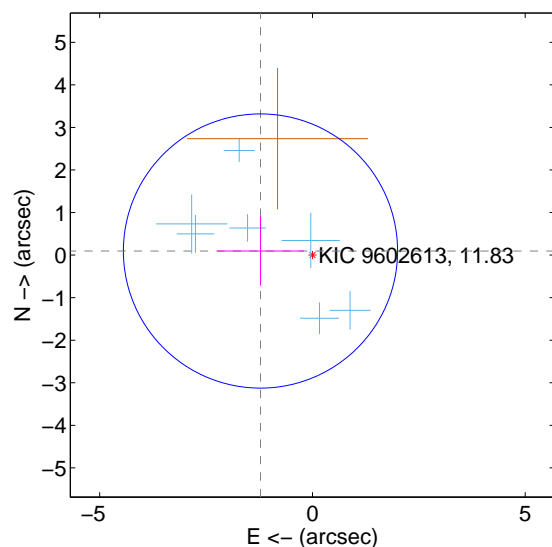
Supplemental centroid analysis for 009602613-02. **Kepler magnitude: 11.83.** Transit SNR 9.57

There are 7 quarters with good PRF difference image offsets

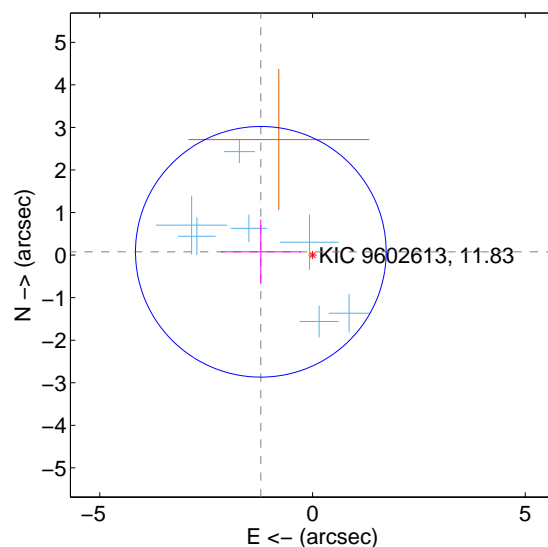
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.225 ± 1.074	1.14	1.221 ± 1.021	0.096 ± 0.817
PRF-fit source offset from KIC position	1.217 ± 0.982	1.24	1.215 ± 0.943	0.077 ± 0.759
photometric centroid source offset	1.38 ± 1.12	1.23	-1.29 ± 1.14	0.50 ± 1.01

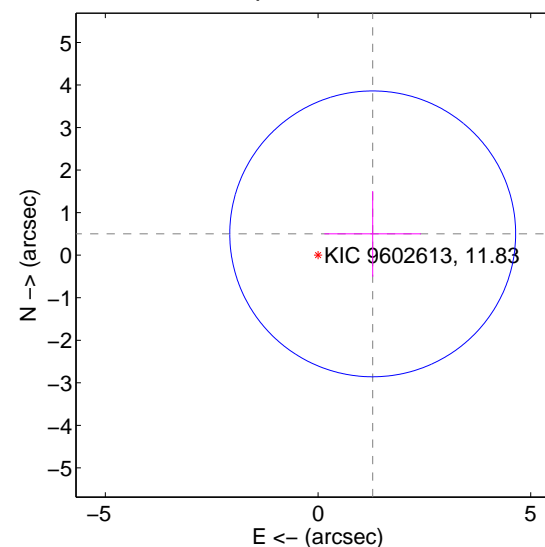
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

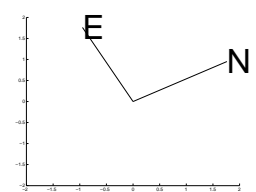
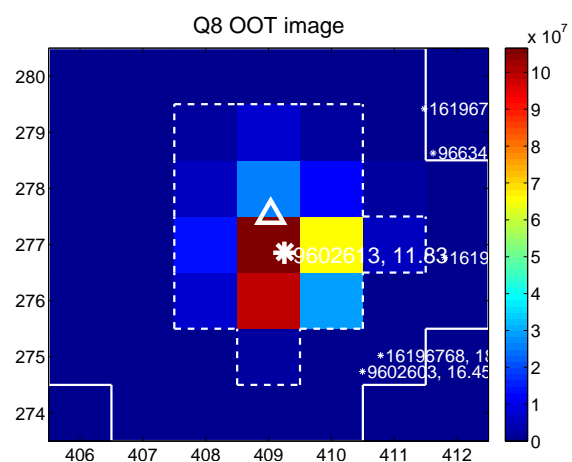
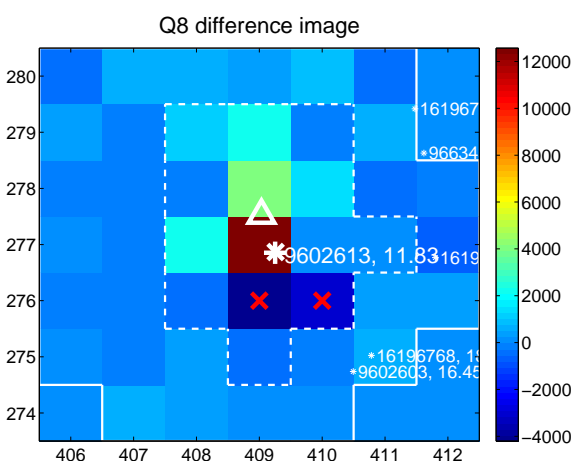
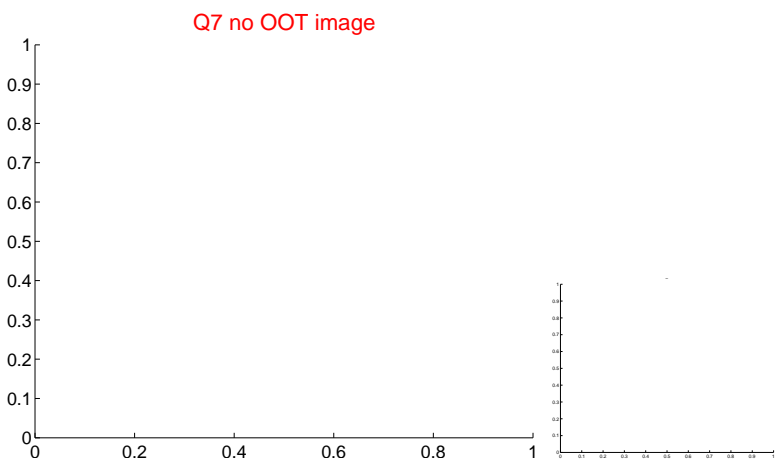
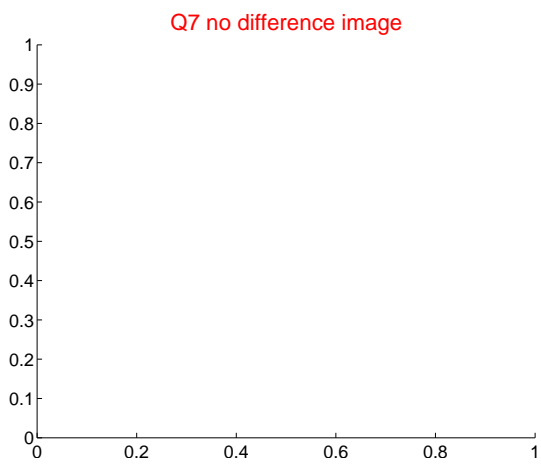
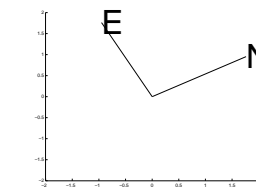
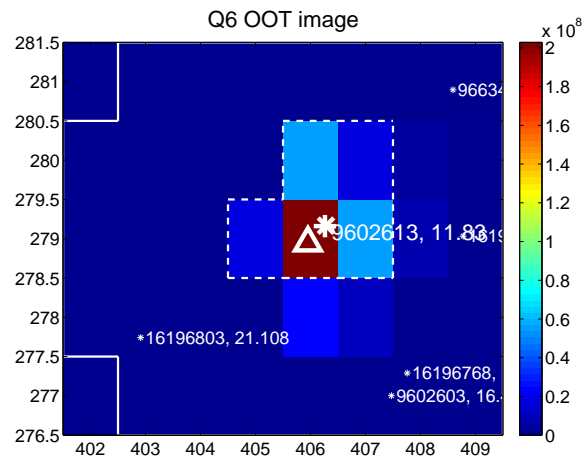
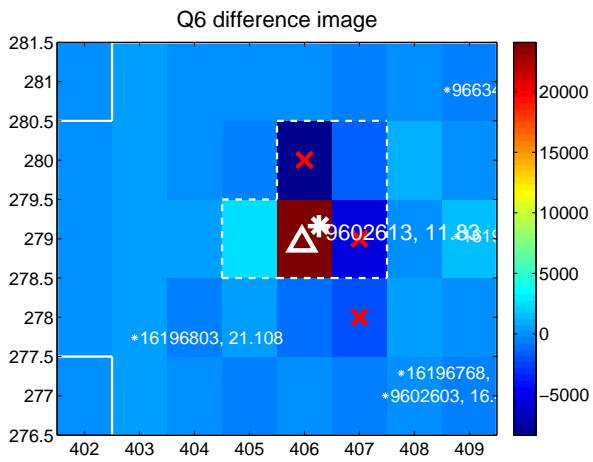
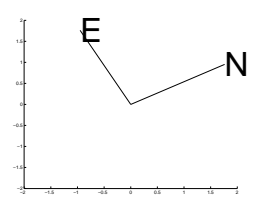
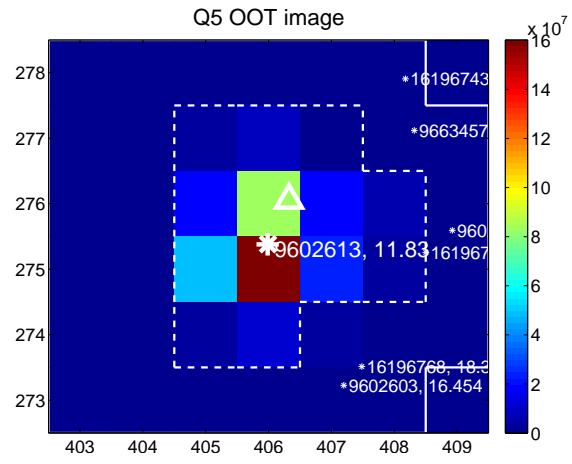
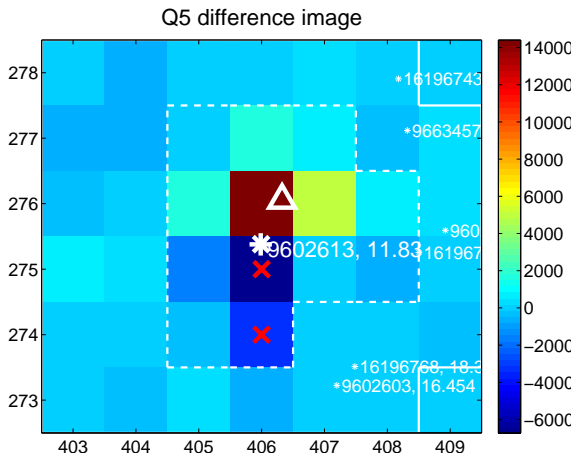


offset from photometric centroids

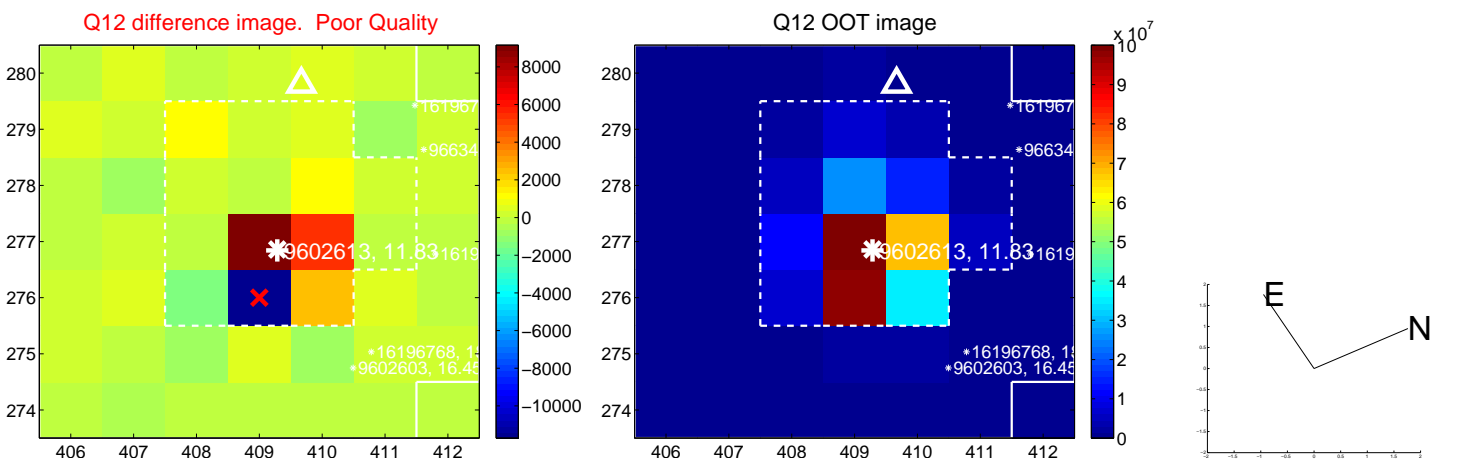
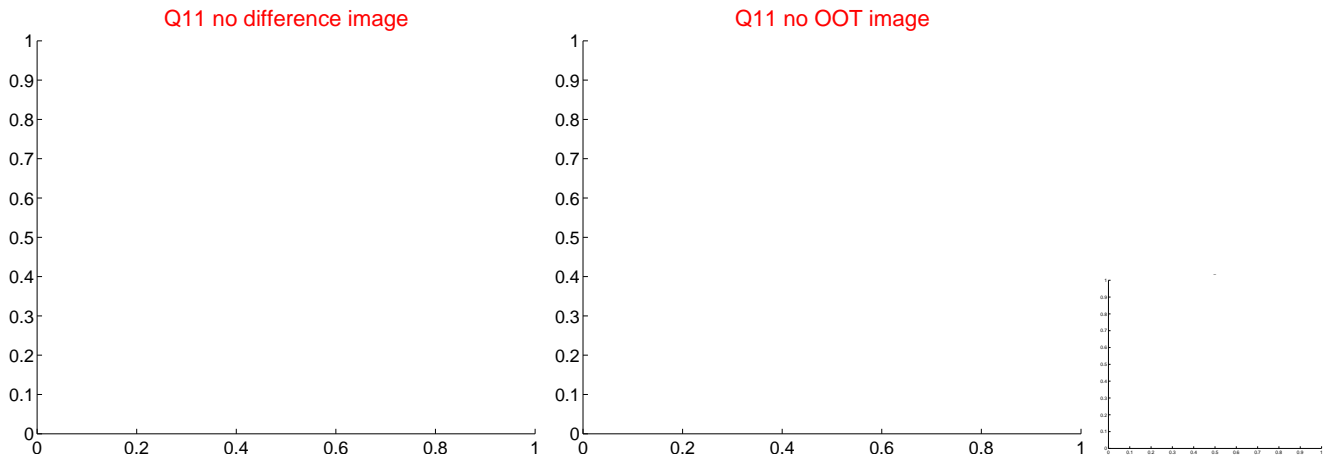
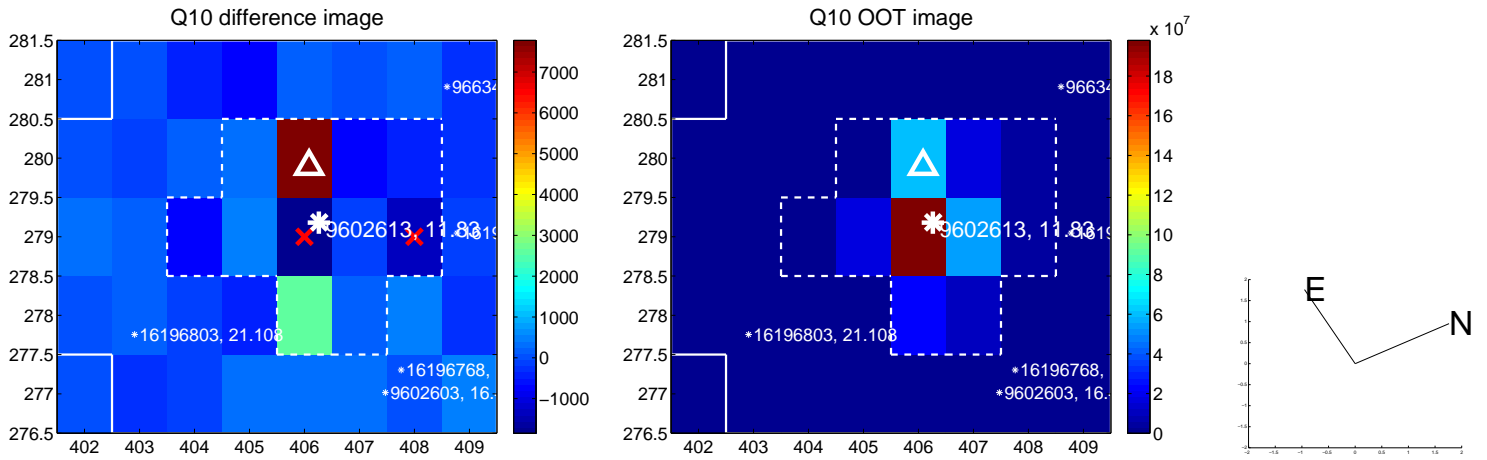
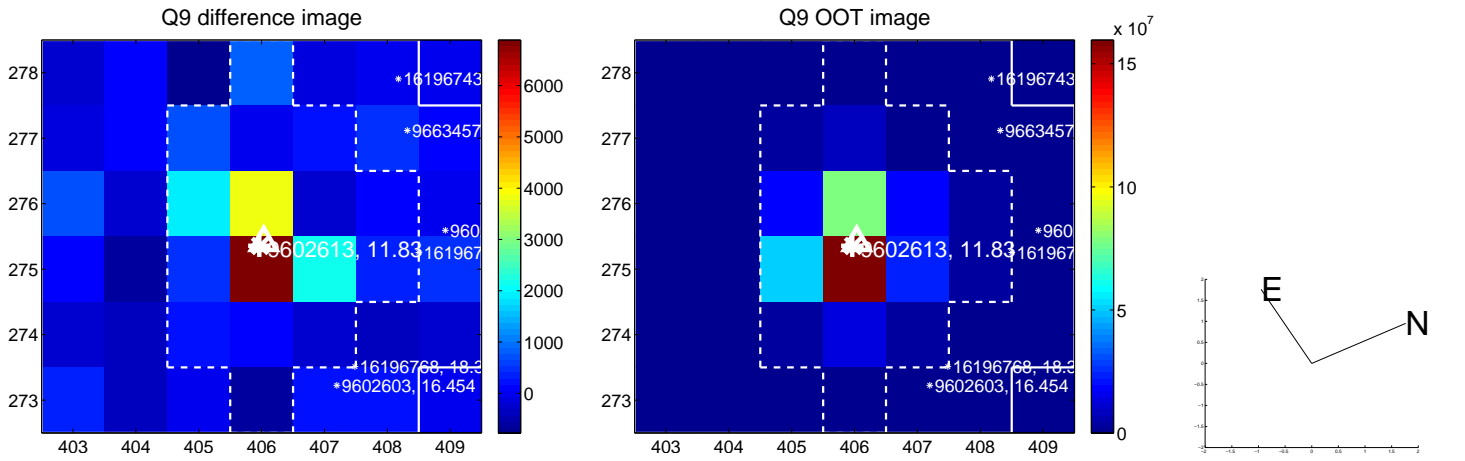


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

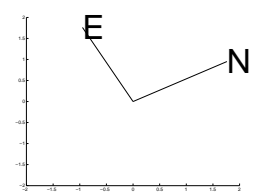
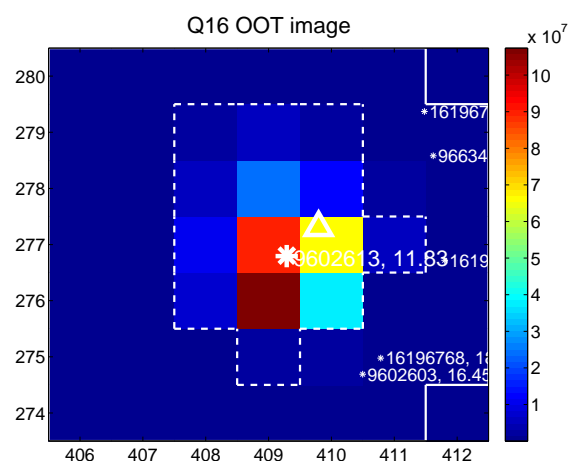
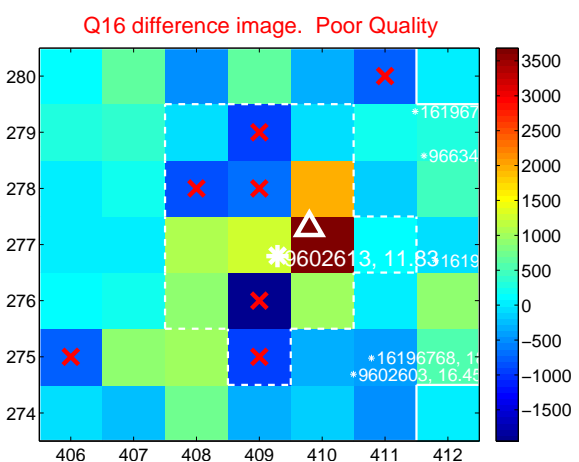
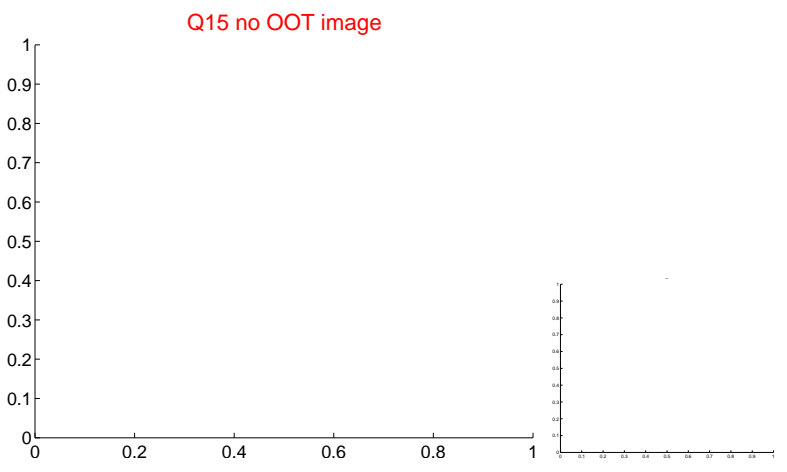
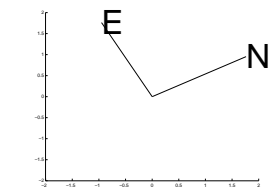
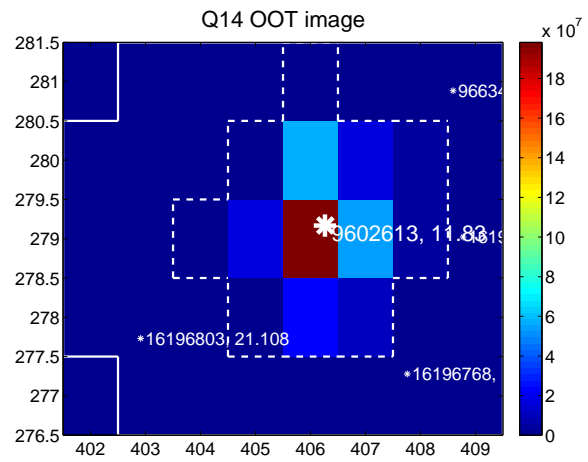
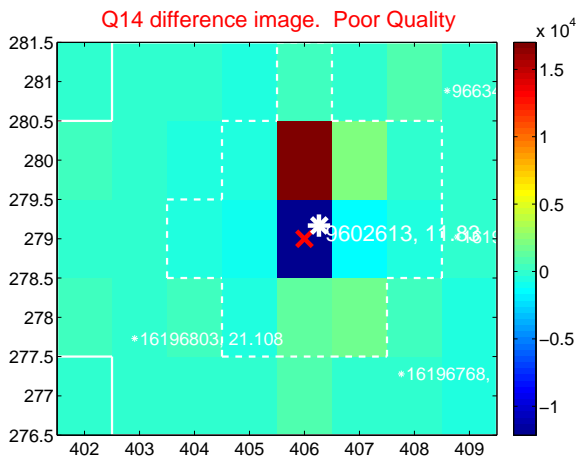
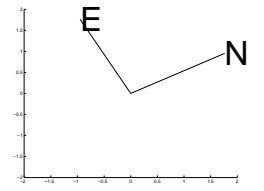
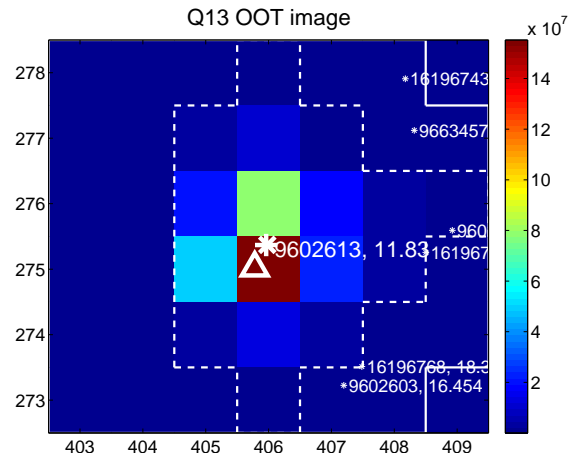
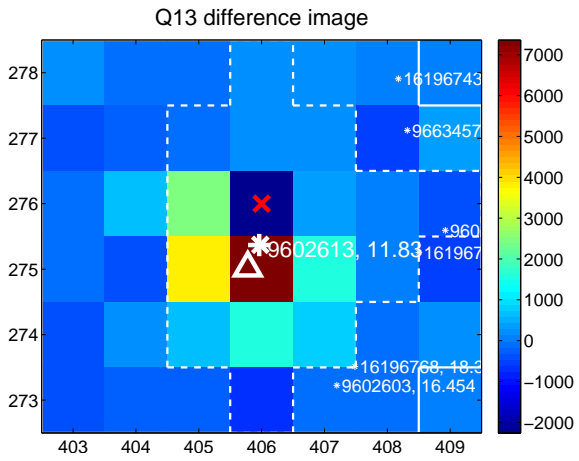
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



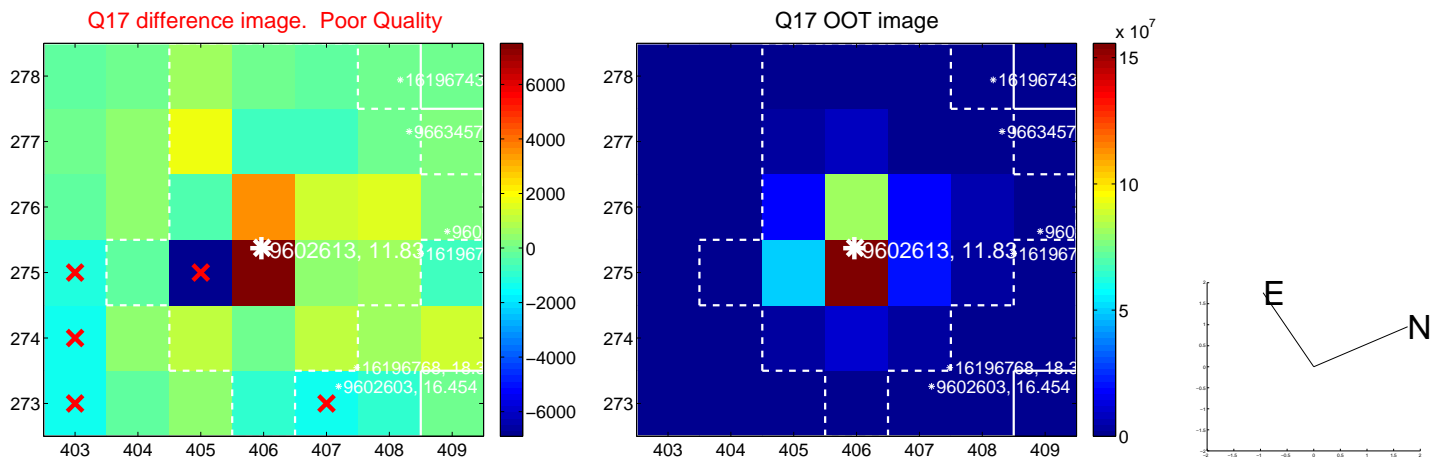
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



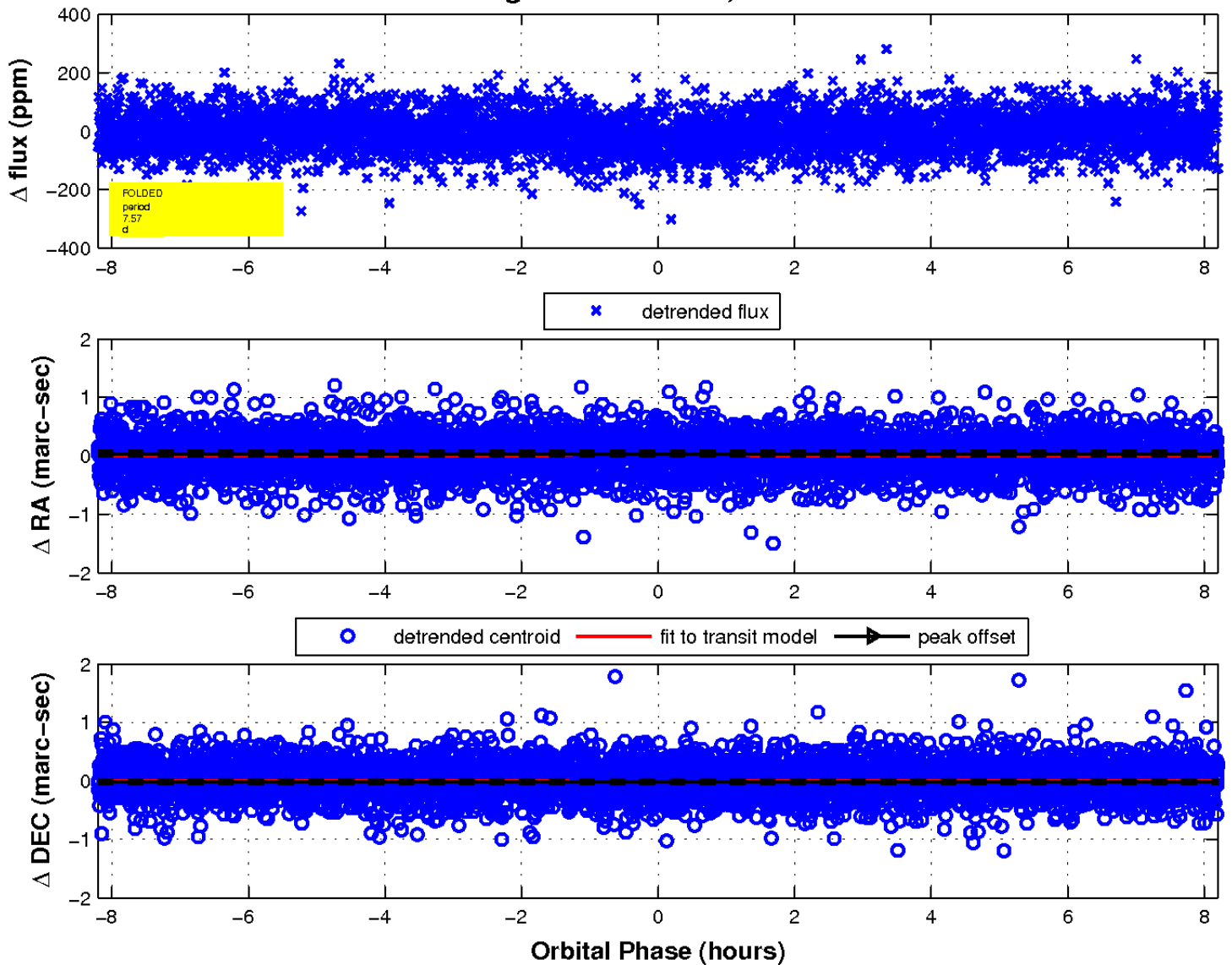
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

