

KIC 006949607

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})
006949607-01	OBS	0870.01	5.912251	136.713423	920.0	2.658	55.5	60.1	0.57	4072	2.08	27.82
006949607-02	OBS	0870.02	8.985808	139.742343	800.5	3.380	42.2	45.3	0.57	4072	2.02	15.92

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006949607-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006949607-02	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.

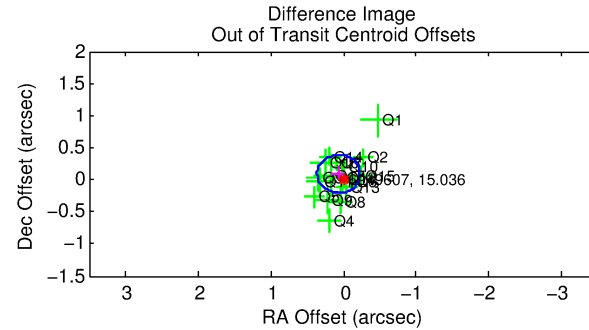
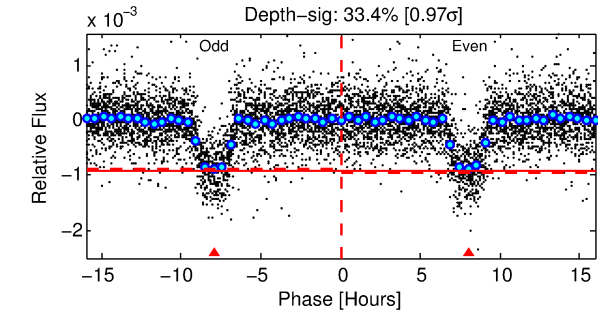
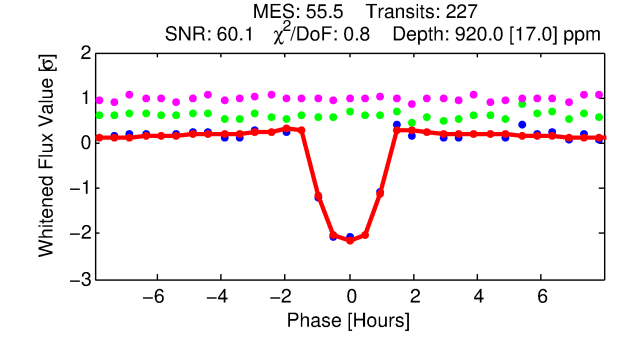
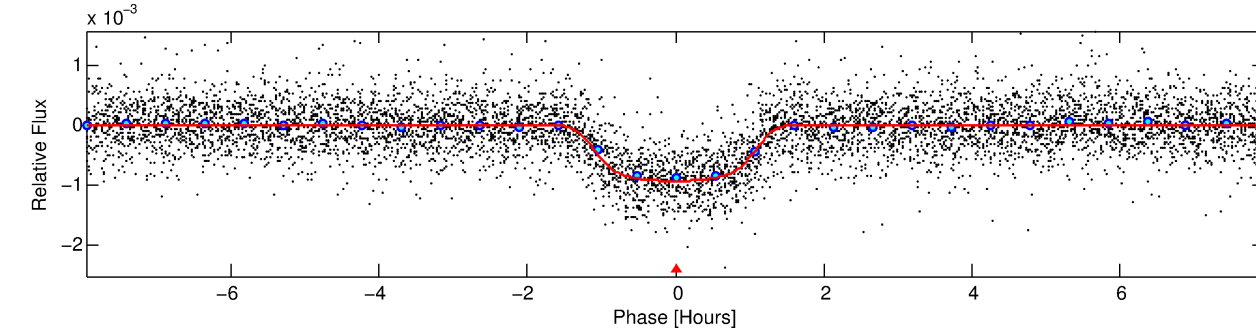
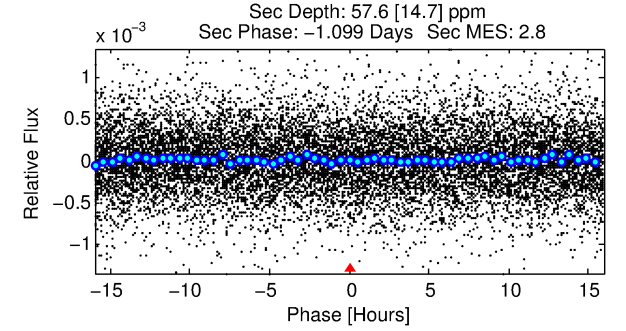
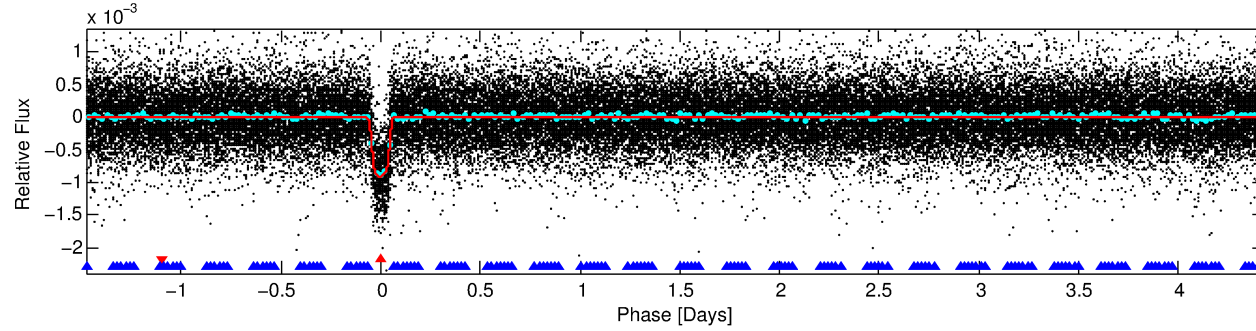
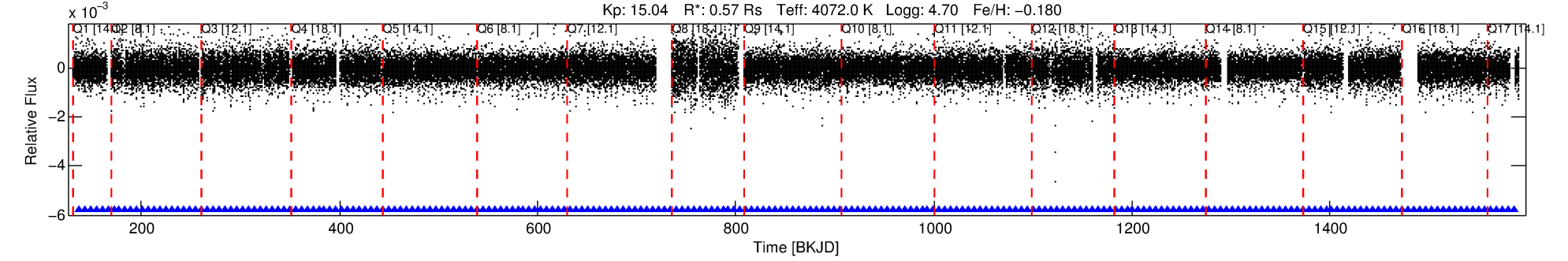
Ephemeris Match Information For 006949607-01

No Significant Match Found

DV One-Page Summary

KIC: 6949607 Candidate: 1 of 2 Period: 5.912 d
KOI: K00870.01 Name: Kepler-28b Corr: 0.955

Kp: 15.04 R*: 0.57 Rs Teff: 4072.0 K Logg: 4.70 Fe/H: -0.180



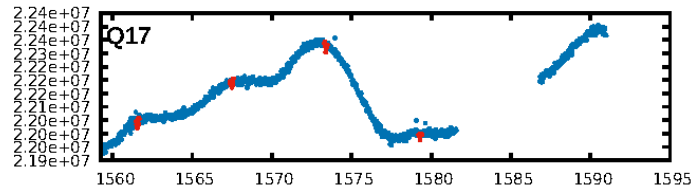
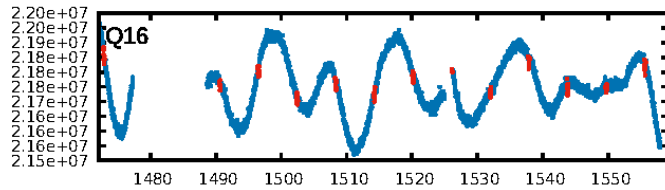
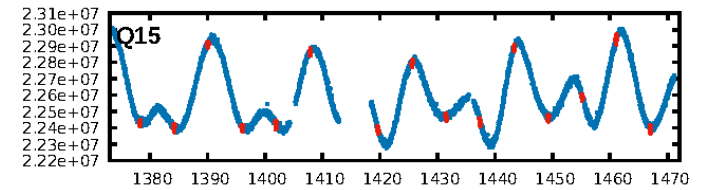
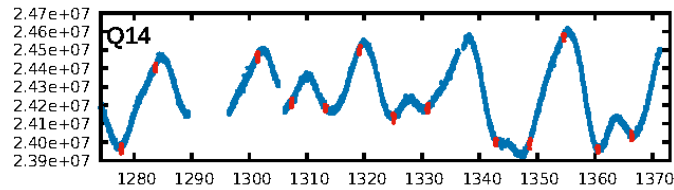
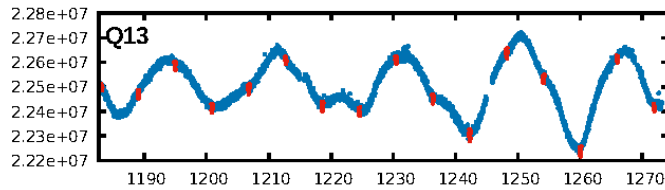
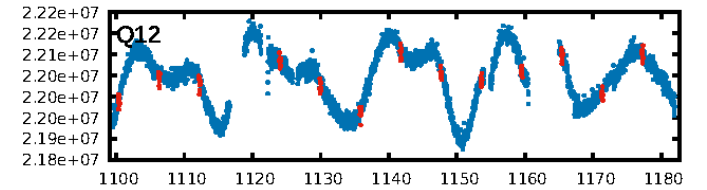
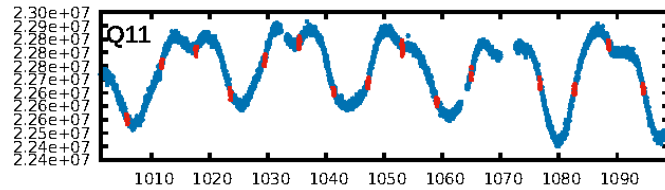
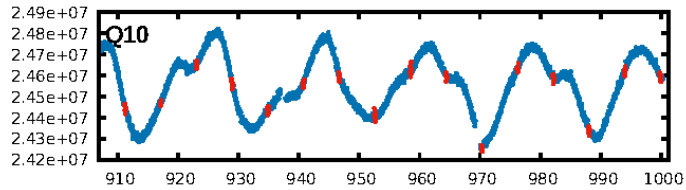
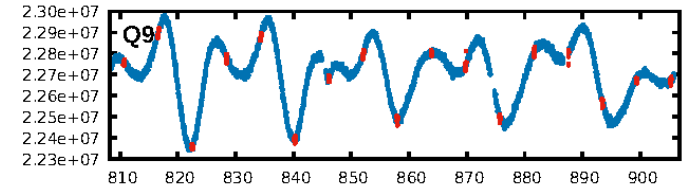
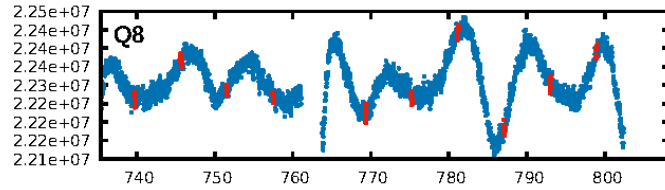
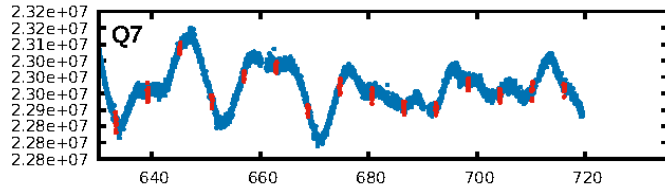
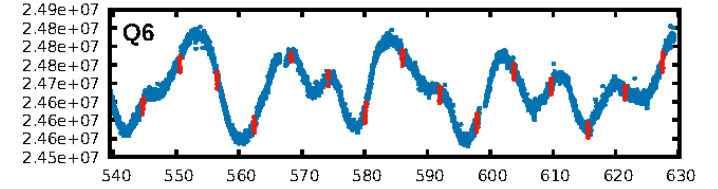
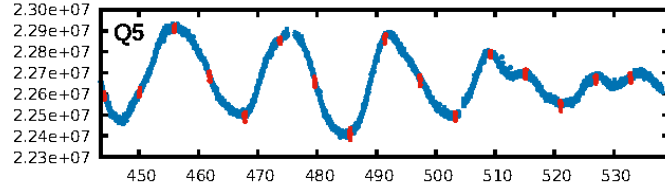
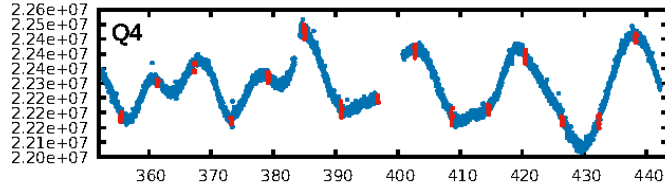
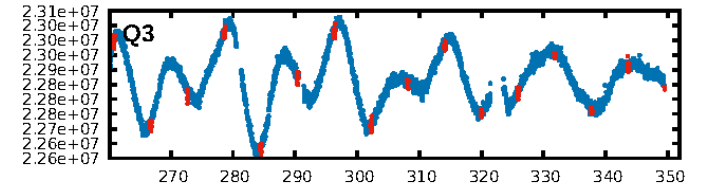
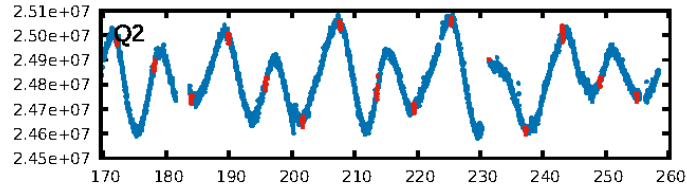
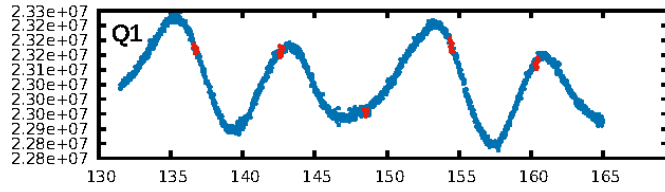
DV Fit Results:

Period = 5.91225 [0.00001] d
Epoch = 136.7134 [0.0008] BKJD
Rp/R* = 0.0334 [0.0014]
a/R* = 8.68 [1.39]
b = 0.90 [0.03]
Seff = 27.82 [2.72]
Teq = 586 [14] K
Rp = 2.08 [0.14] Re
a = 0.0536 [0.0023] AU
Ag = 21.06 [5.76] [3.48σ]
Teff = 1940 [135] K [9.94σ]

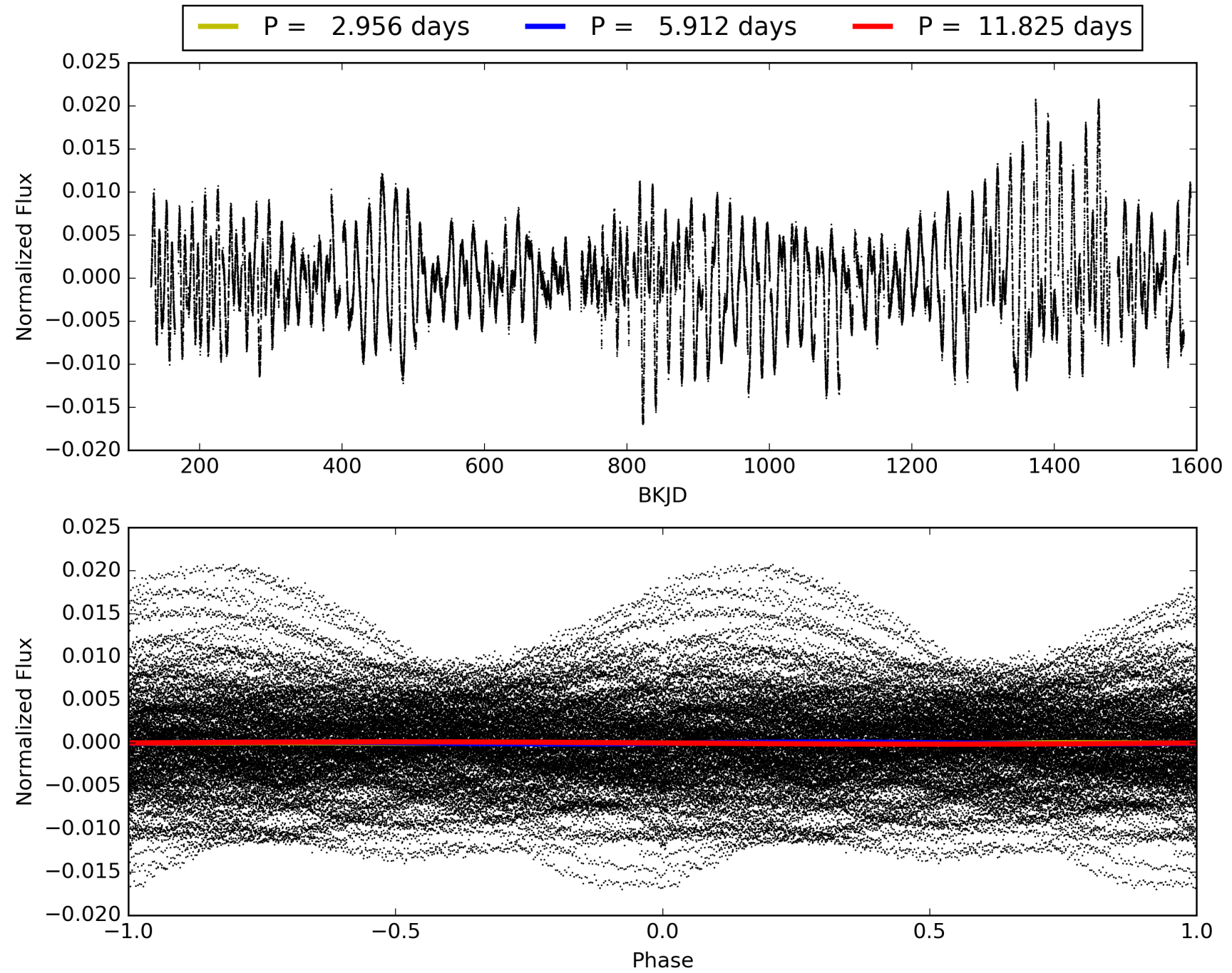
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [17.15σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [218/218]
GhostDiagnostic-chr: 2.238
Centroid-sig: N/A
Centroid-so: 0.206 arcsec [1.07σ]
OotOffset-rm: 0.113 arcsec [1.14σ]
KicOffset-rm: 0.337 arcsec [2.97σ]
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 006949607-01, PDC Light Curves

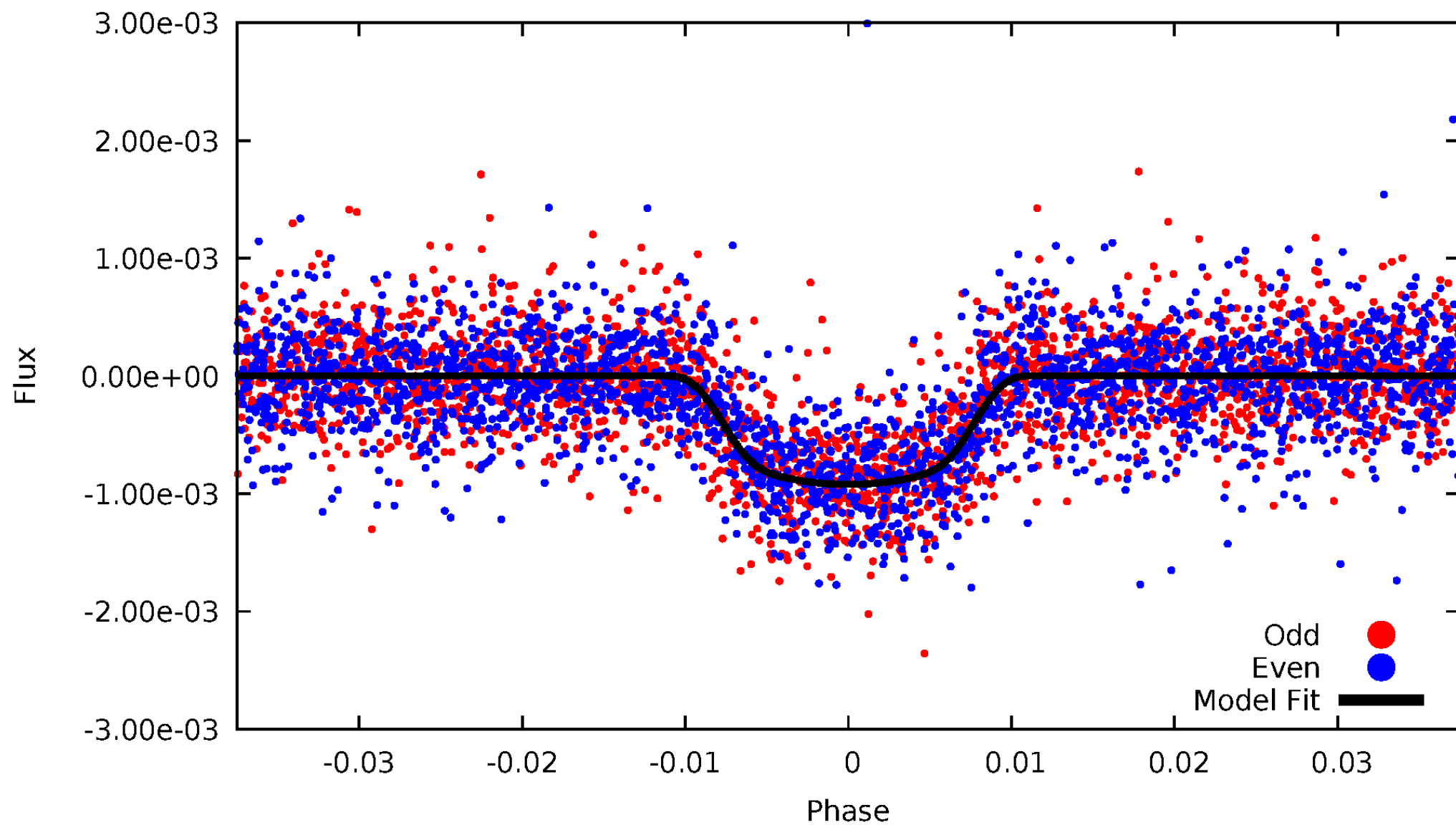


TCE 006949607-01



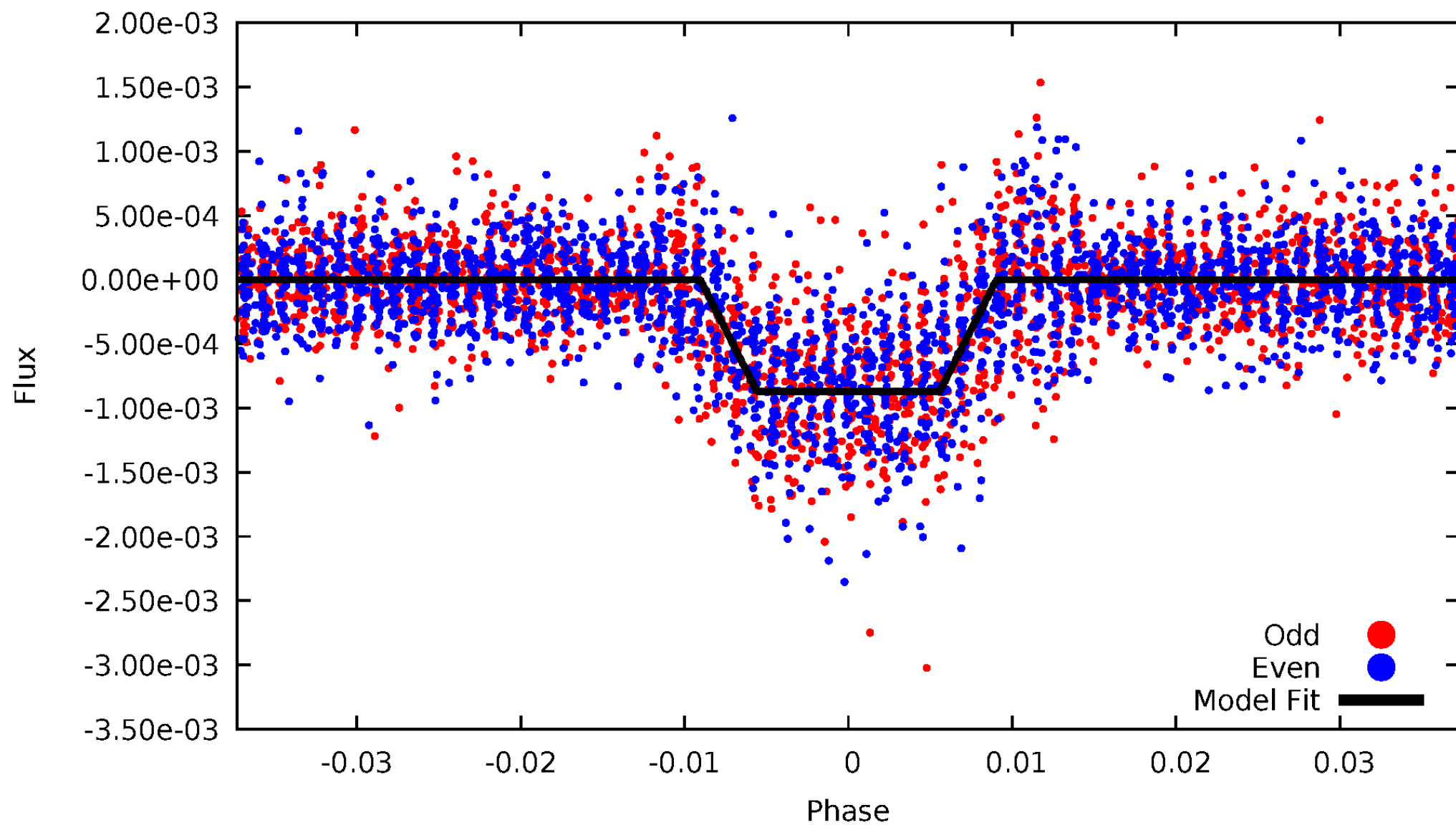
DV Odd/Even

TCE 006949607-01



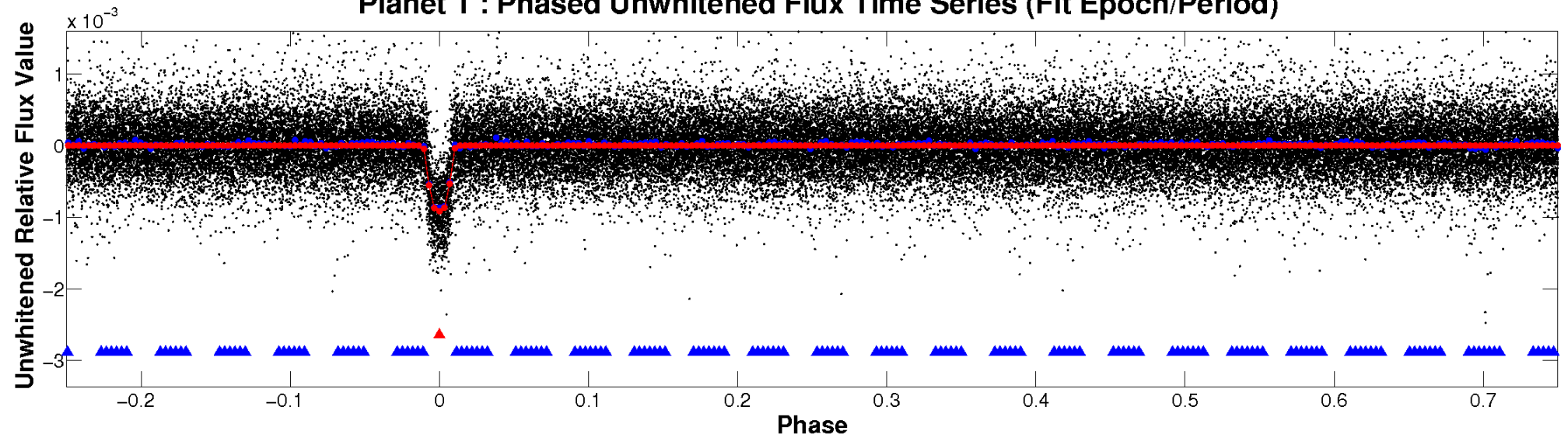
ALT Odd/Even

TCE 006949607-01

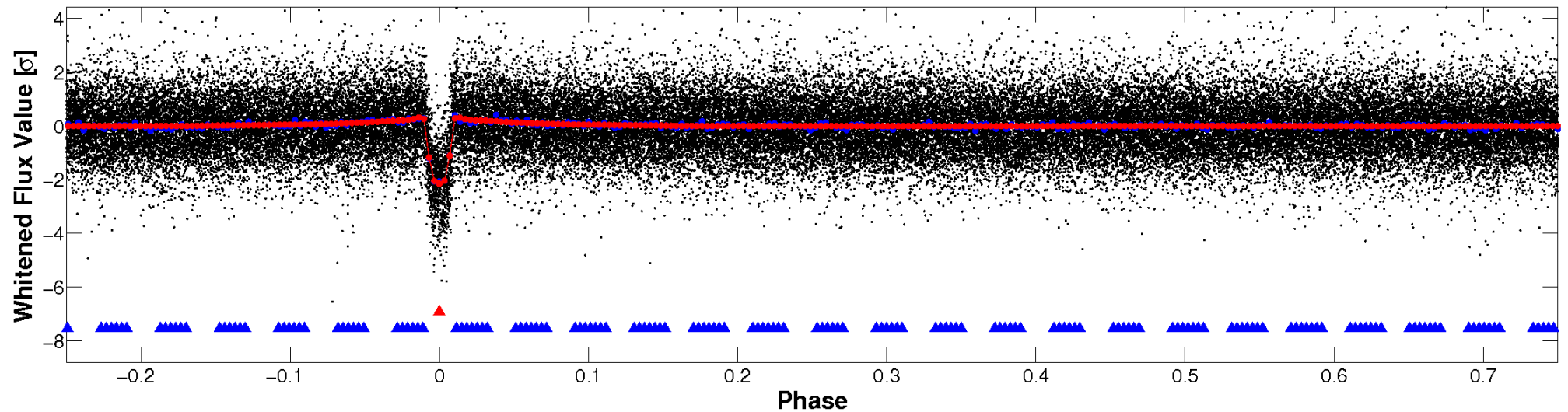


Non-Whitened Vs. Whitened Light Curve

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

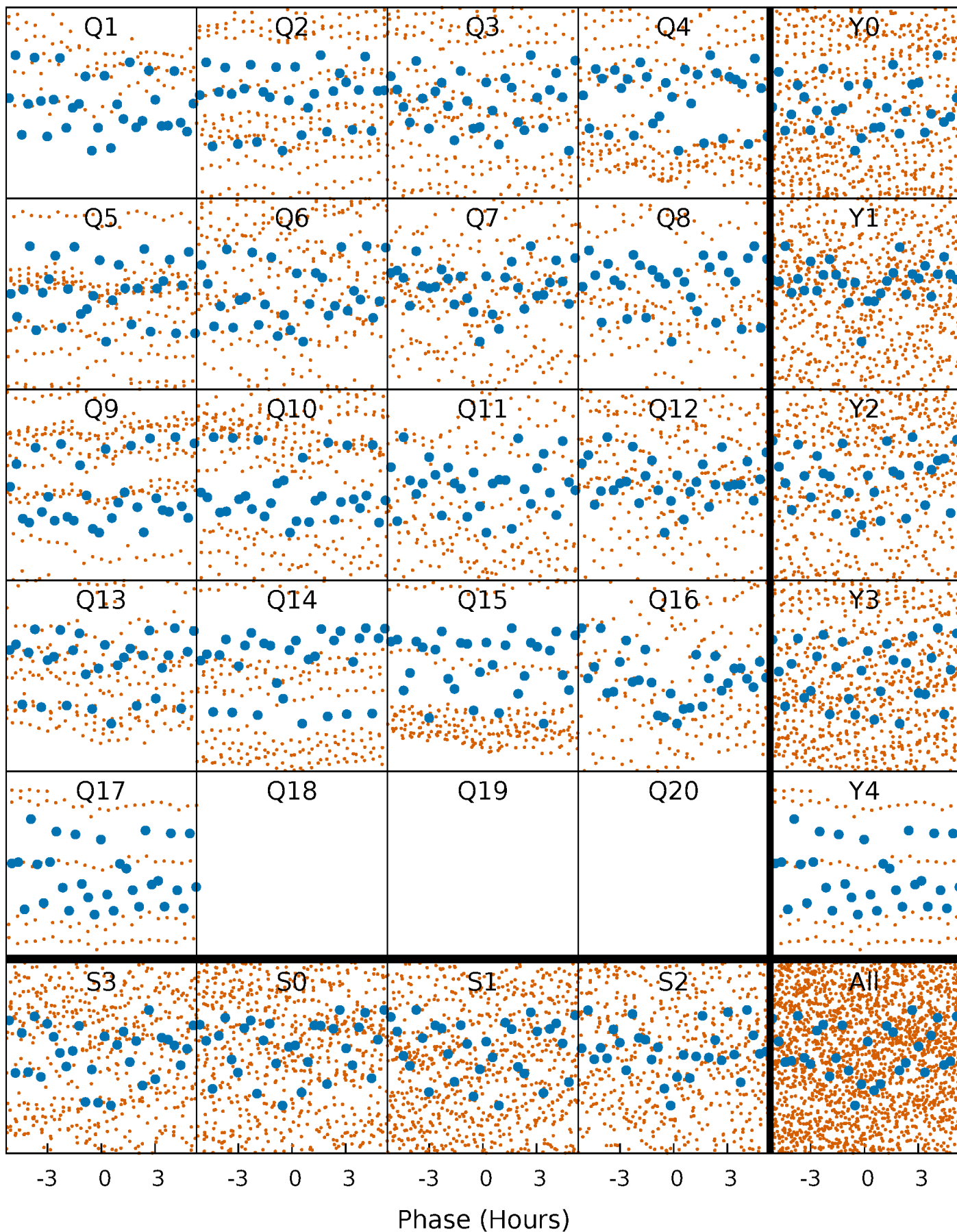


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



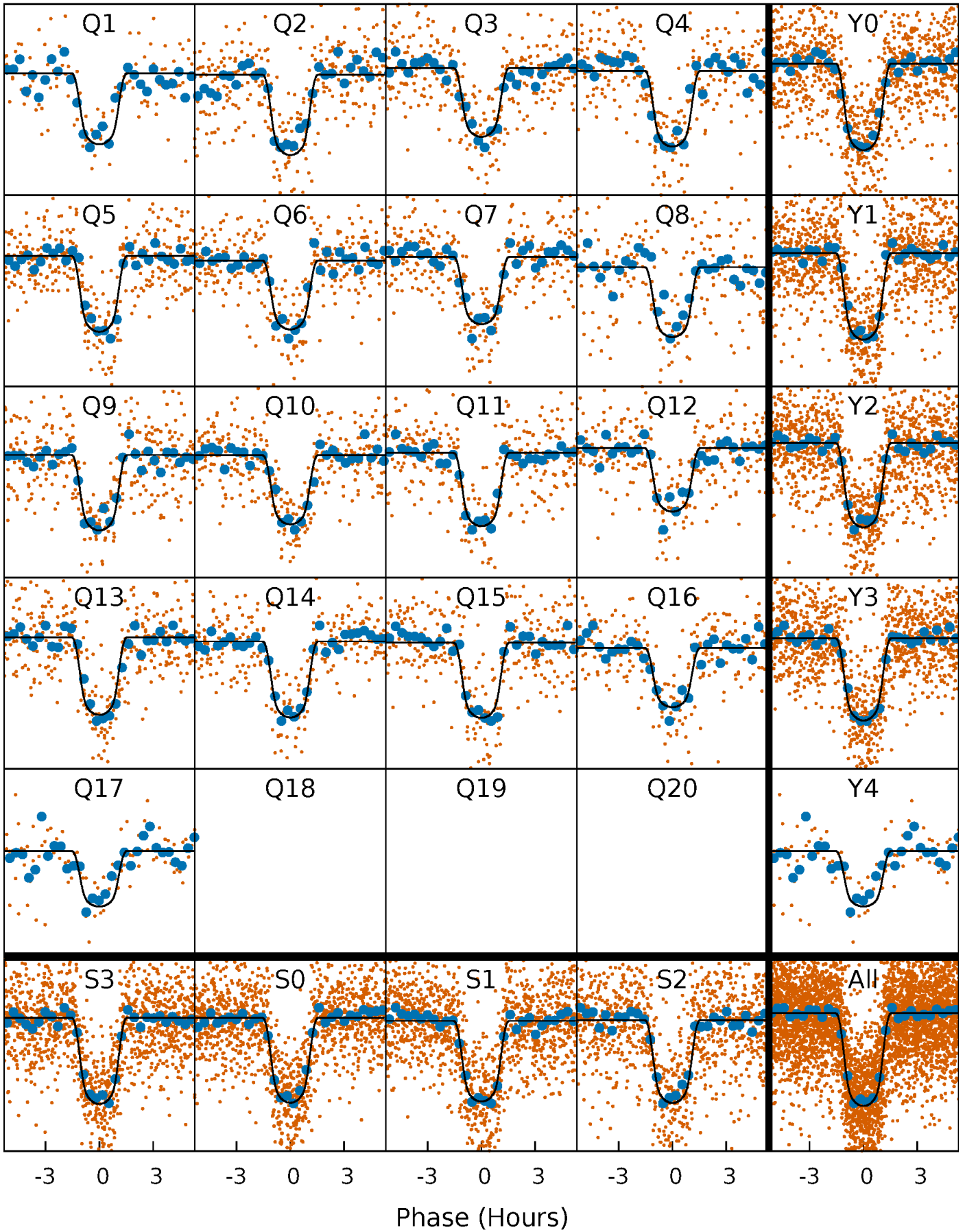
PDC Quarter-Phased Transit Curves

TCE 006949607-01 P= 5.912251 Days $T_0=136.713423$ (BKJD)



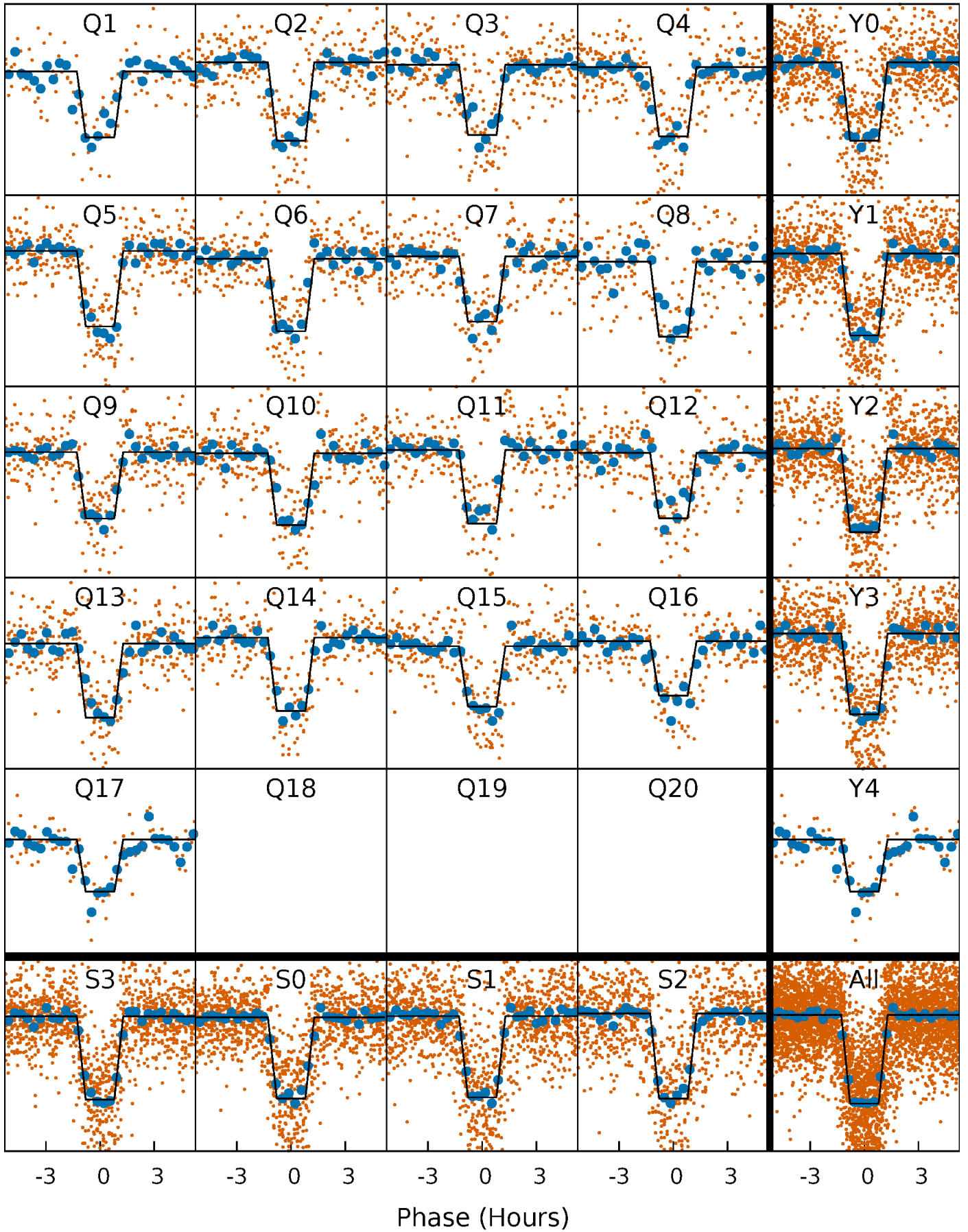
DV Quarter-Phased Transit Curves

TCE 006949607-01 P= 5.912251 Days $T_0=136.713423$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

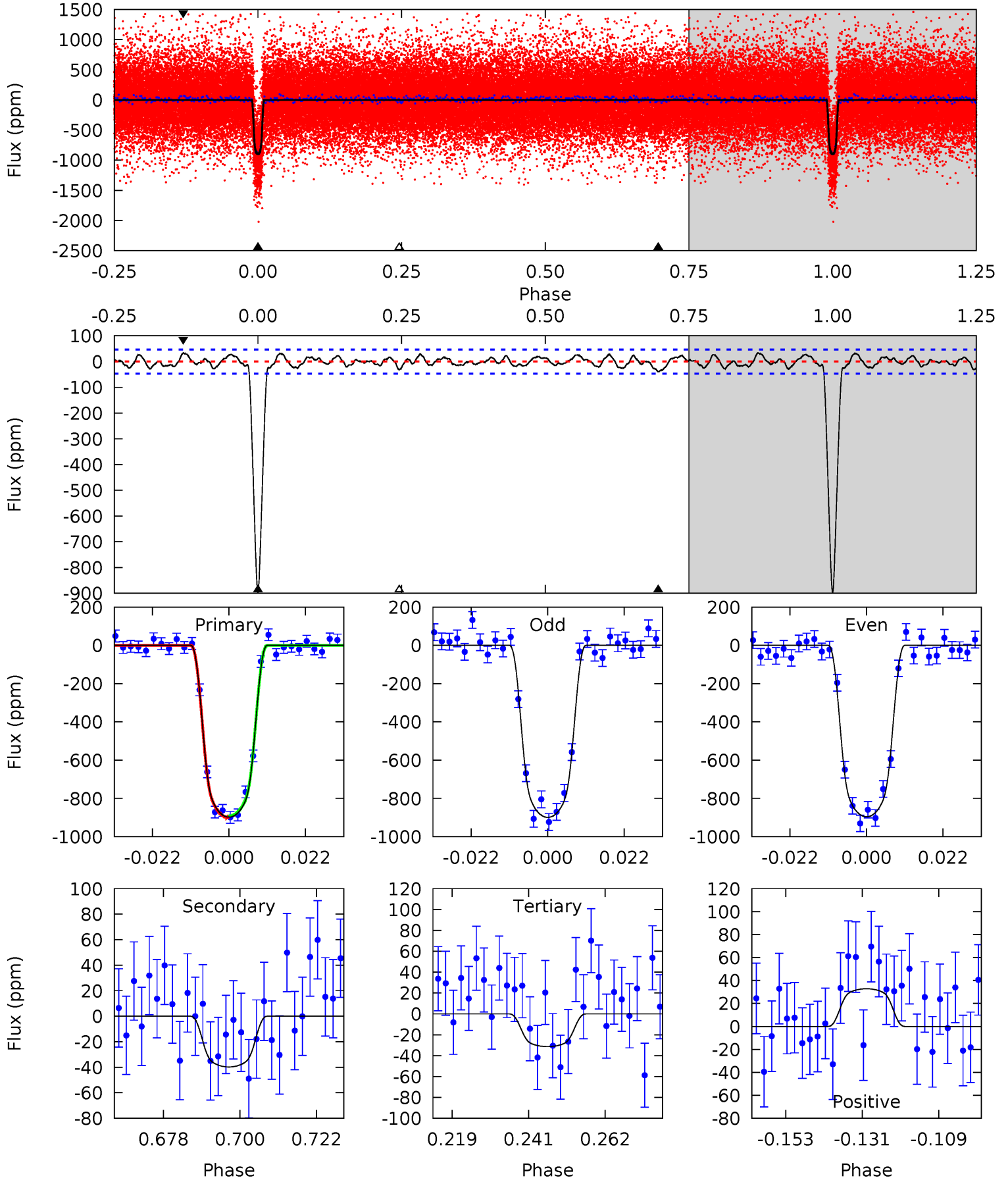
TCE 006949607-01 P= 5.912224 Days $T_0=136.716346$ (BKJD)



DV Model-Shift Uniqueness Test

006949607-01, P = 5.912251 Days, E = 130.801172 Days

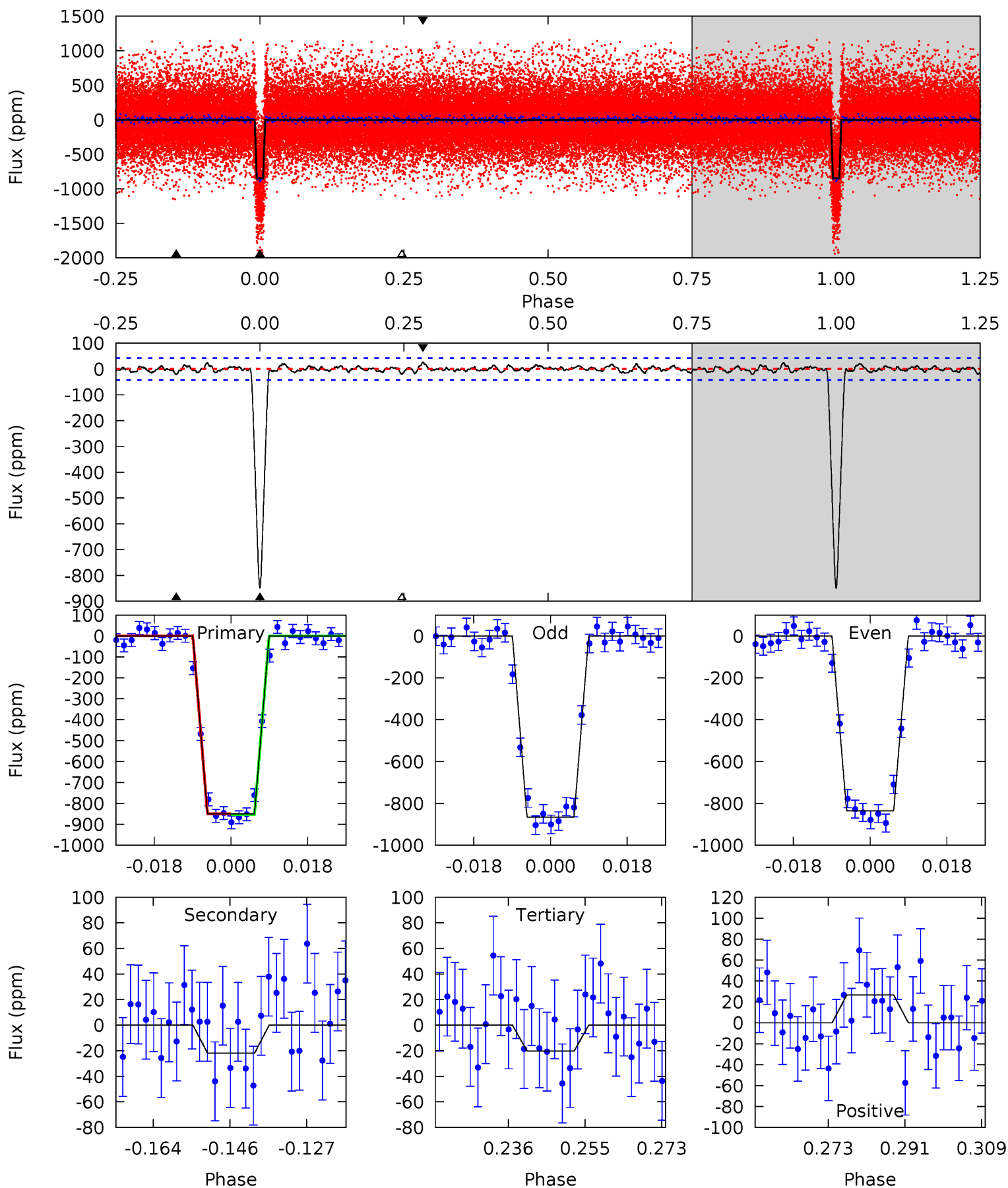
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
93.4	4.14	3.26	3.41	4.87	2.29	1.47	90.1	90.0	0.88	0.72	0.17	0.99	0.04	0.47



Alt Model-Shift Uniqueness Test

006949607-01, P = 5.912224 Days, E = 130.804122 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
97.4	2.50	2.32	3.04	4.91	2.36	0.90	95.1	94.4	0.18	-0.54	1.69	1.01	0.03	0.17



Stellar Parameters For KIC 006949607

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4072^{+73}_{-81}	$4.696^{+0.023}_{-0.028}$	$-0.180^{+0.150}_{-0.150}$	$0.570^{+0.029}_{-0.032}$	$0.586^{+0.029}_{-0.036}$	$4.452^{+0.542}_{-0.437}$
	+2%/-2%	+0%/-1%	+83%/-83%	+5%/-6%	+5%/-6%	+12%/-10%
Source	SPE5	SPE5	SPE5	DSEP		

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

Secondary Eclipse Parameters for KIC 006949607-01 / KOI 0870.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-40 ± 10	$2.08^{+0.11}_{-0.11}$	820^{+18}_{-18}	2490^{+75}_{-93}	14^{+4}_{-4}
Alt.	-22 ± 9	$1.83^{+0.10}_{-0.11}$	819^{+17}_{-18}	2385^{+112}_{-144}	10^{+4}_{-4}

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

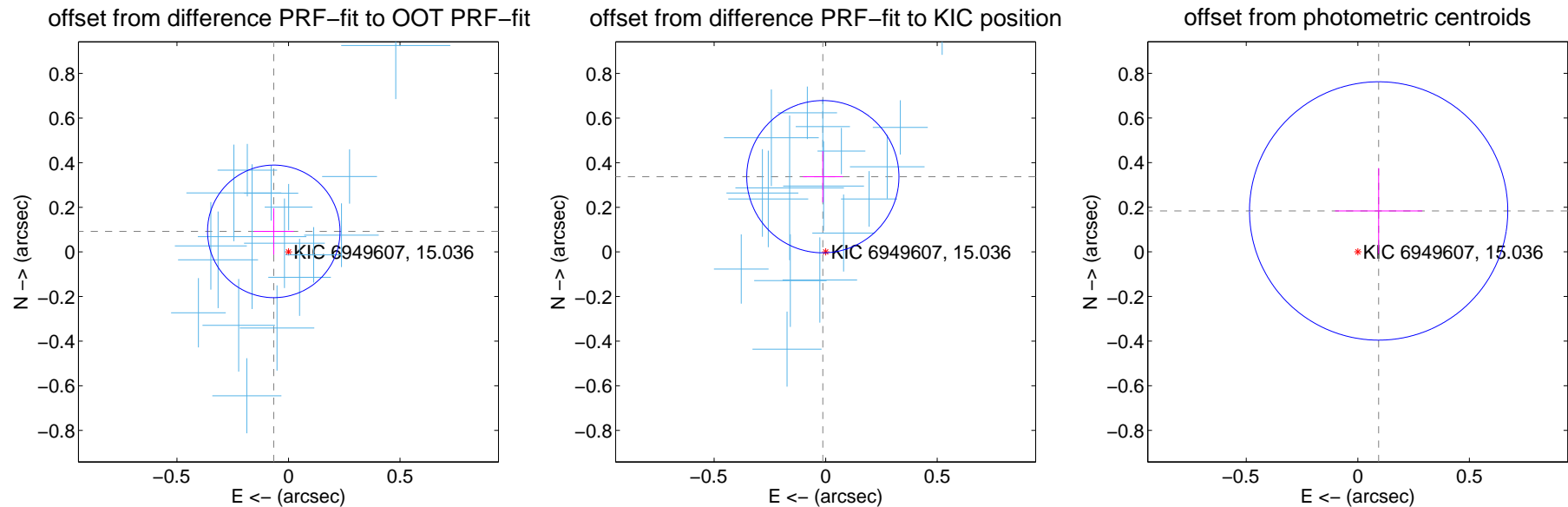
DV Centroid Data

Supplemental centroid analysis for 006949607-01. Kepler magnitude: 15.04. Transit SNR 60.08

There are 17 quarters with good PRF difference image offsets

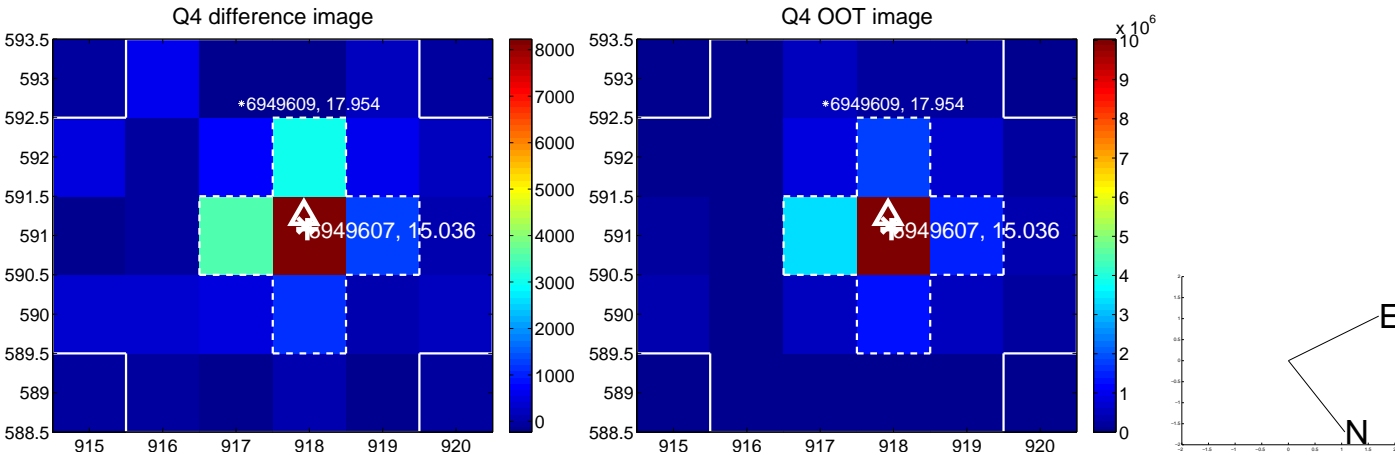
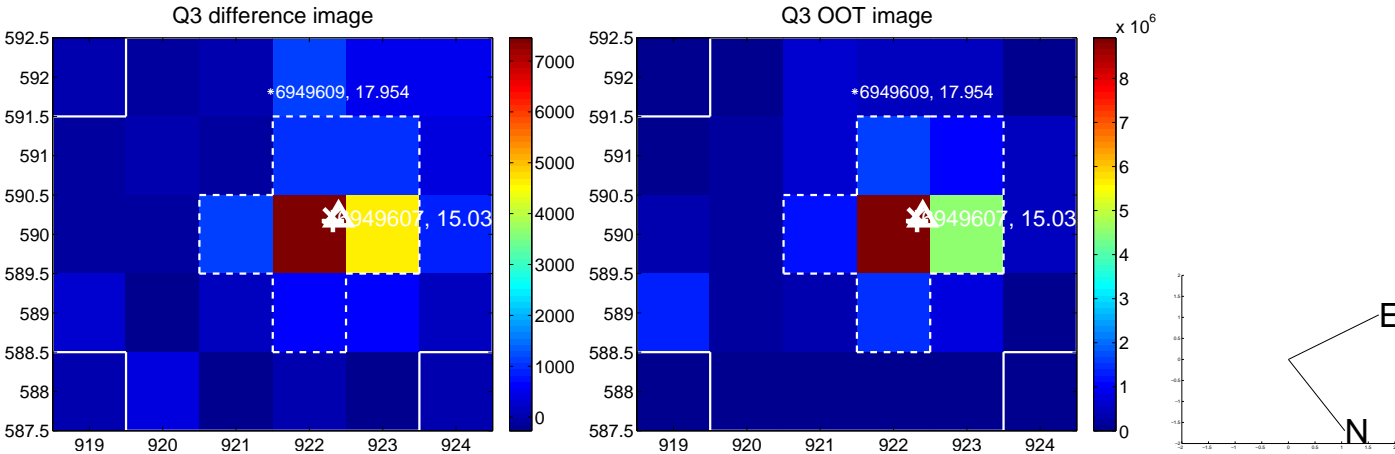
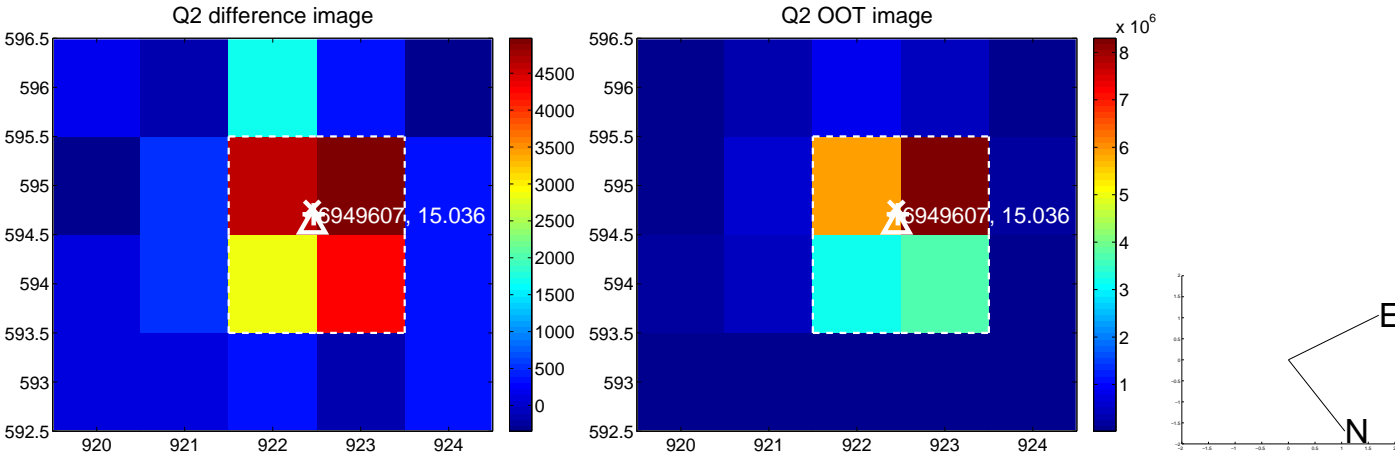
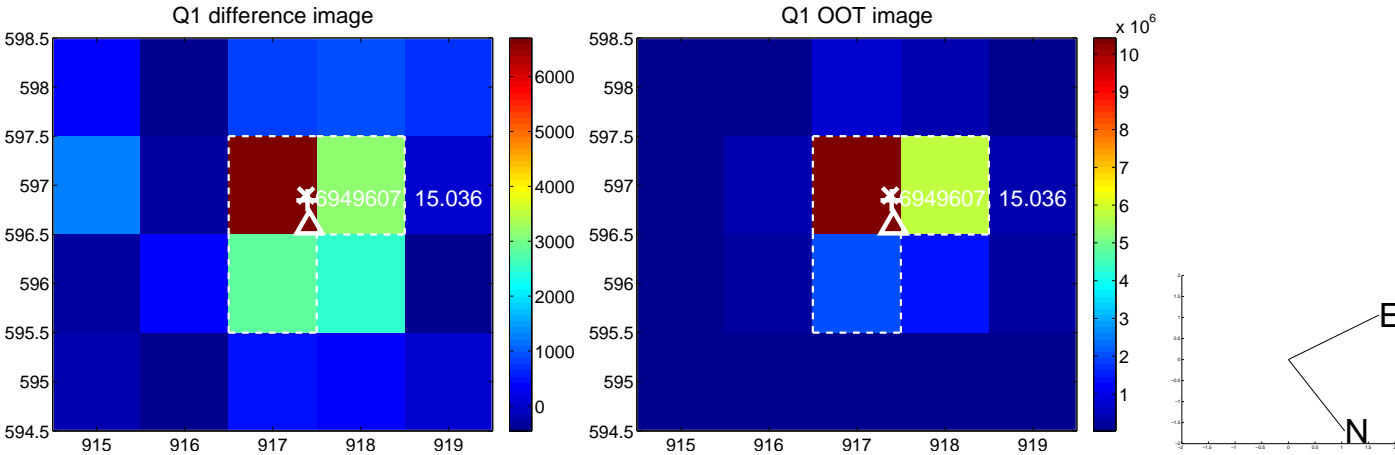
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.113 ± 0.099	1.14	0.066 ± 0.089	0.092 ± 0.104
PRF-fit source offset from KIC position	0.337 ± 0.114	2.97	0.013 ± 0.089	0.337 ± 0.115
photometric centroid source offset	0.21 ± 0.19	1.07	-0.09 ± 0.20	0.18 ± 0.19

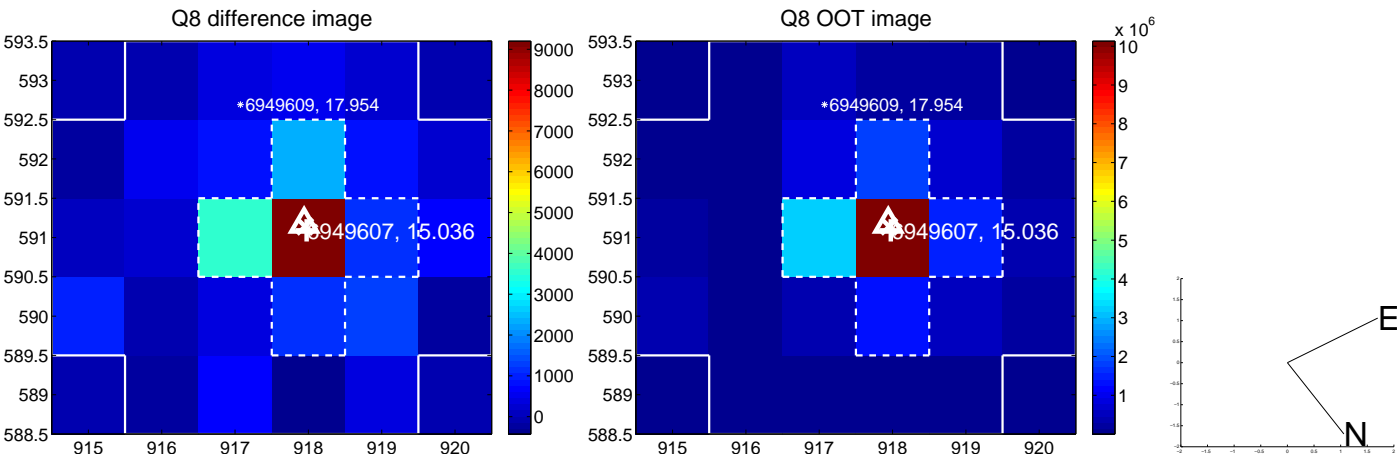
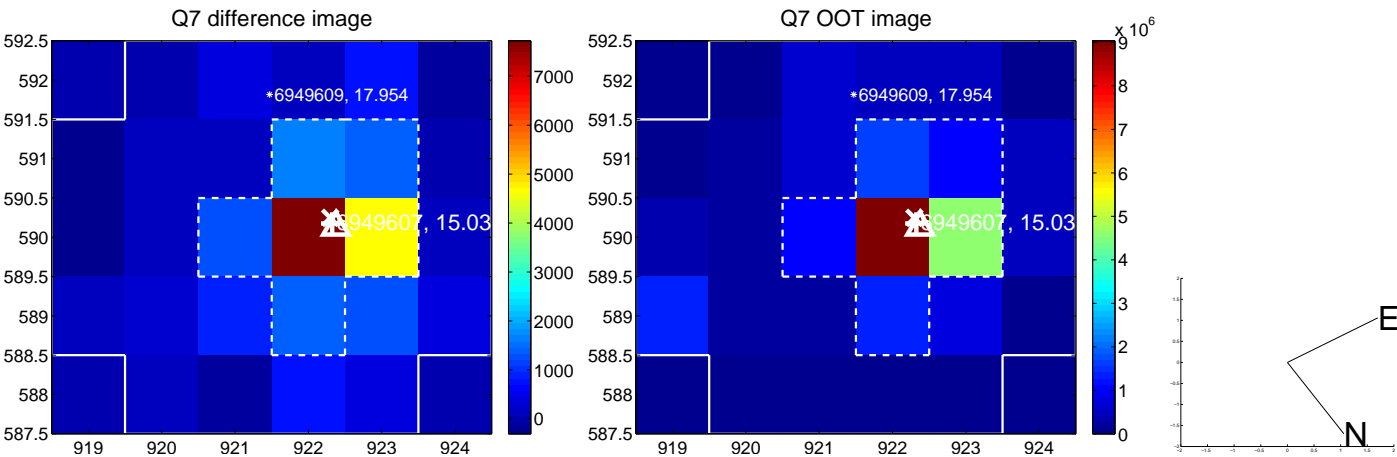
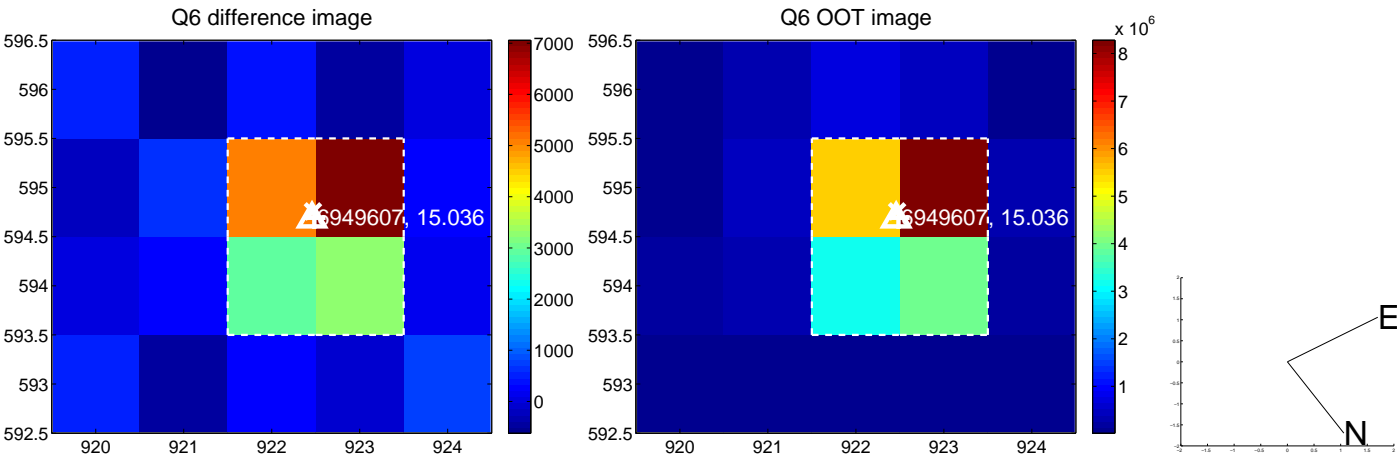
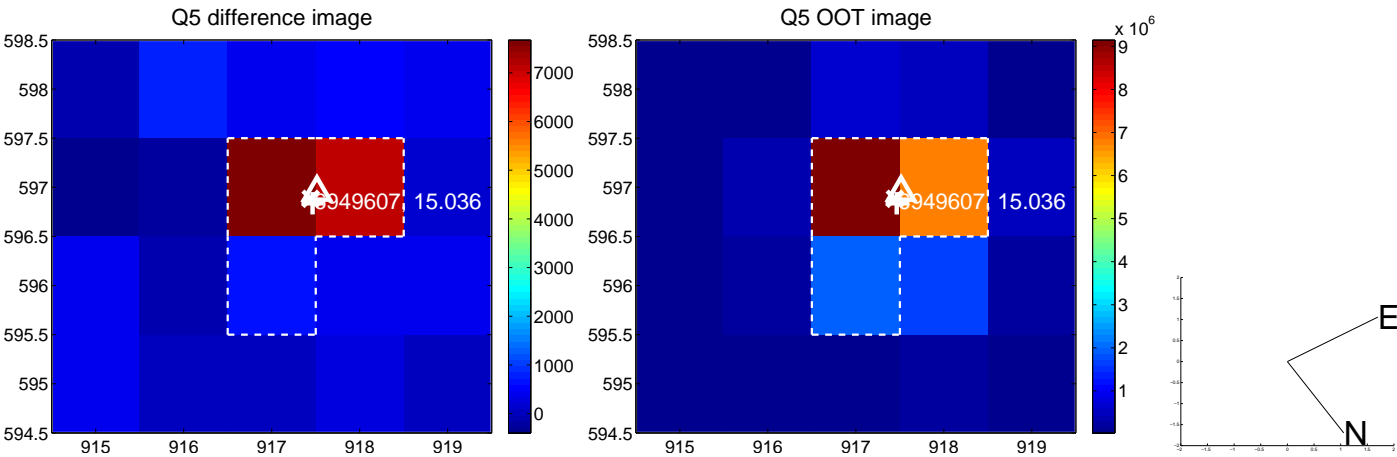


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

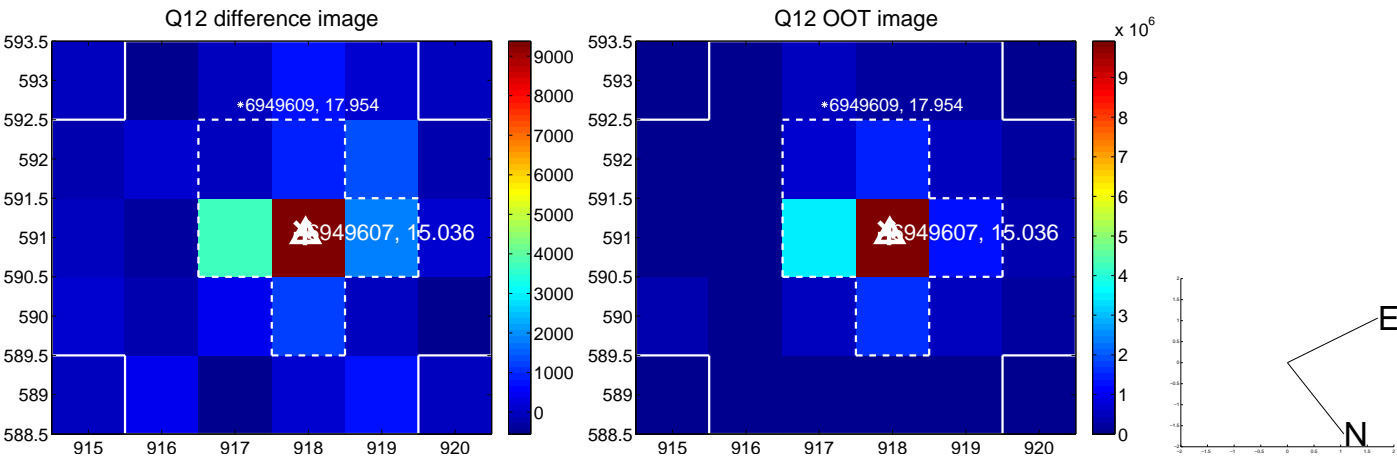
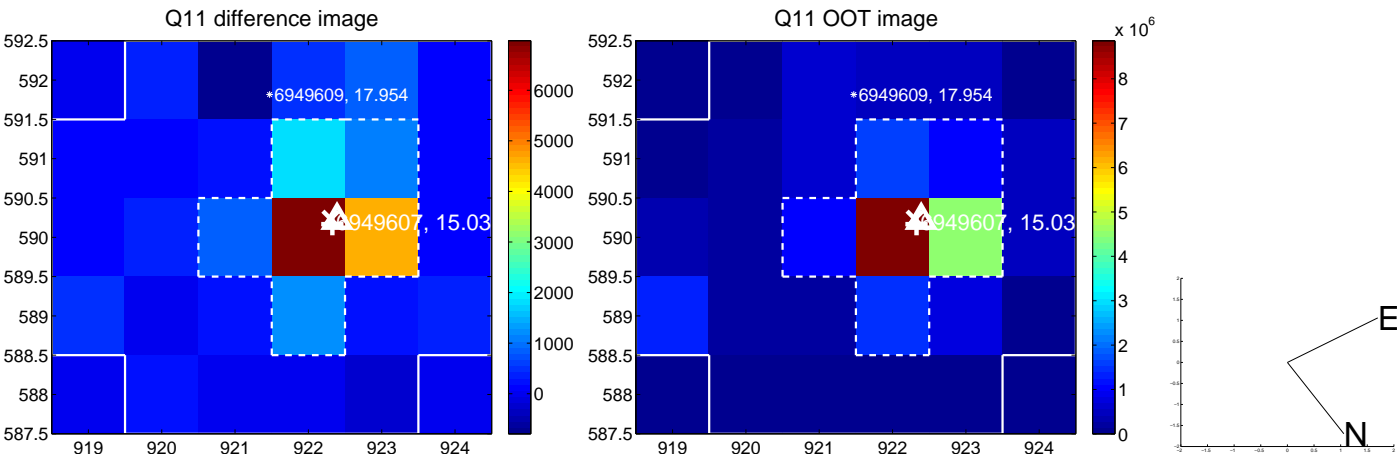
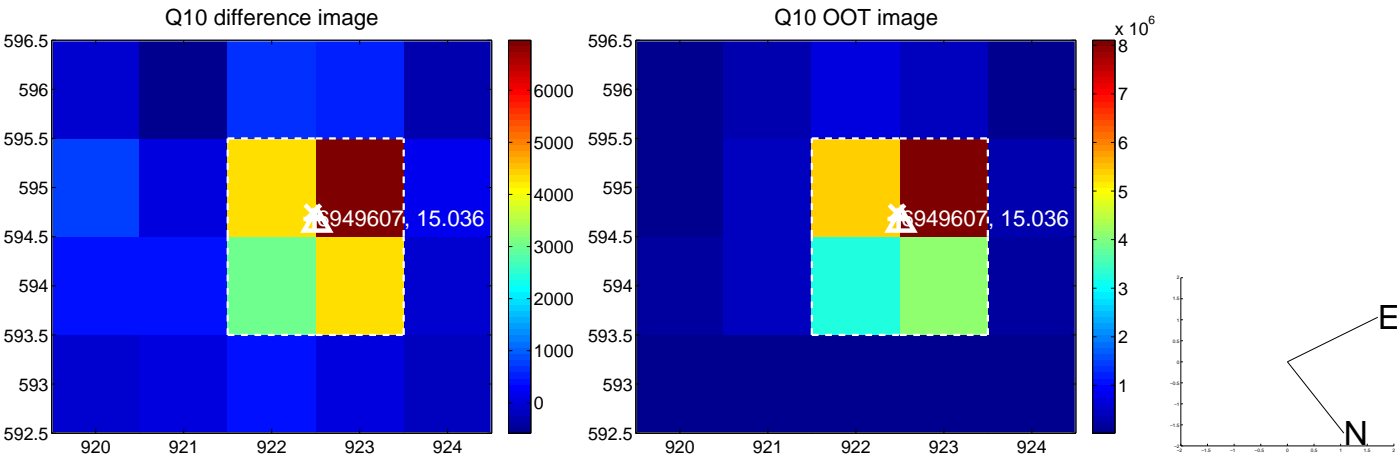
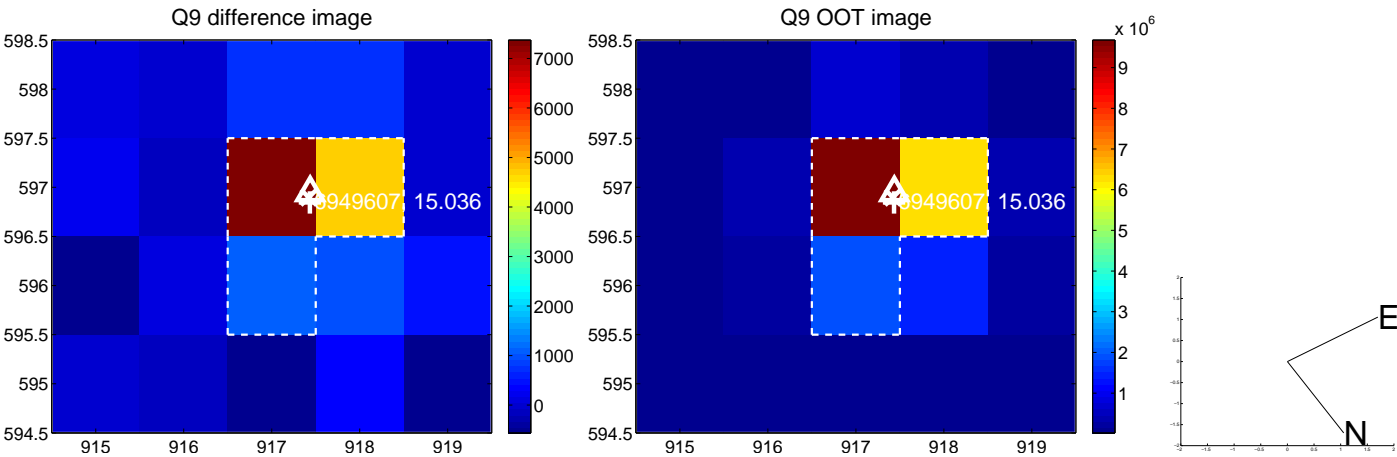
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



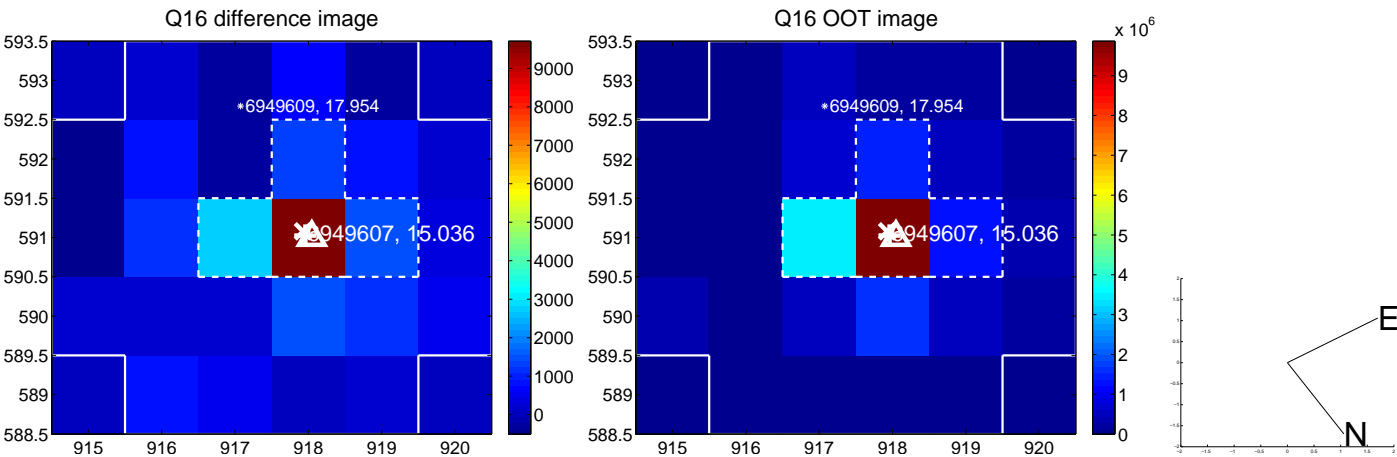
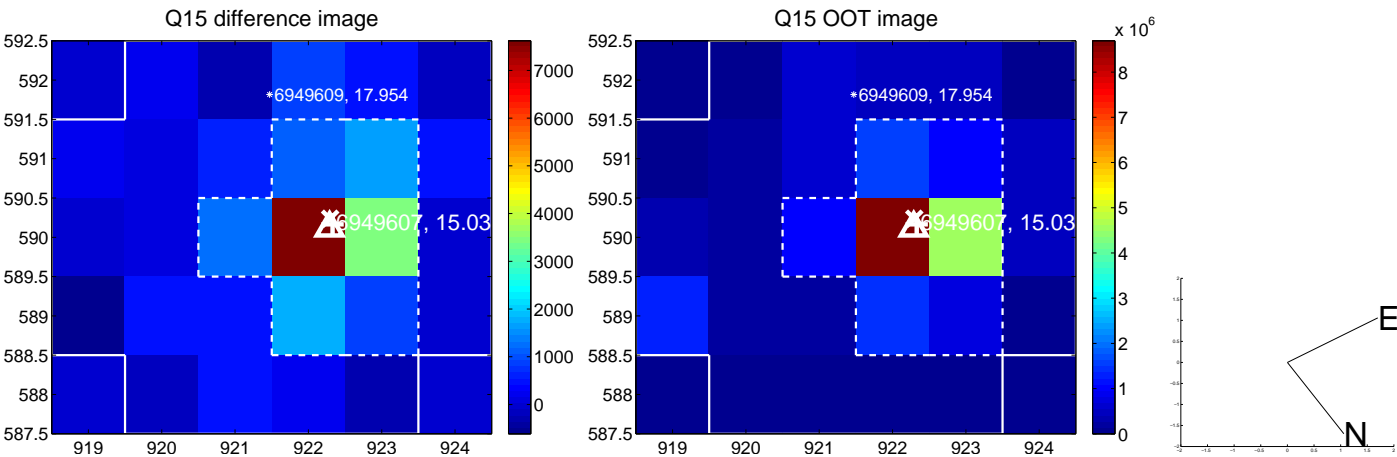
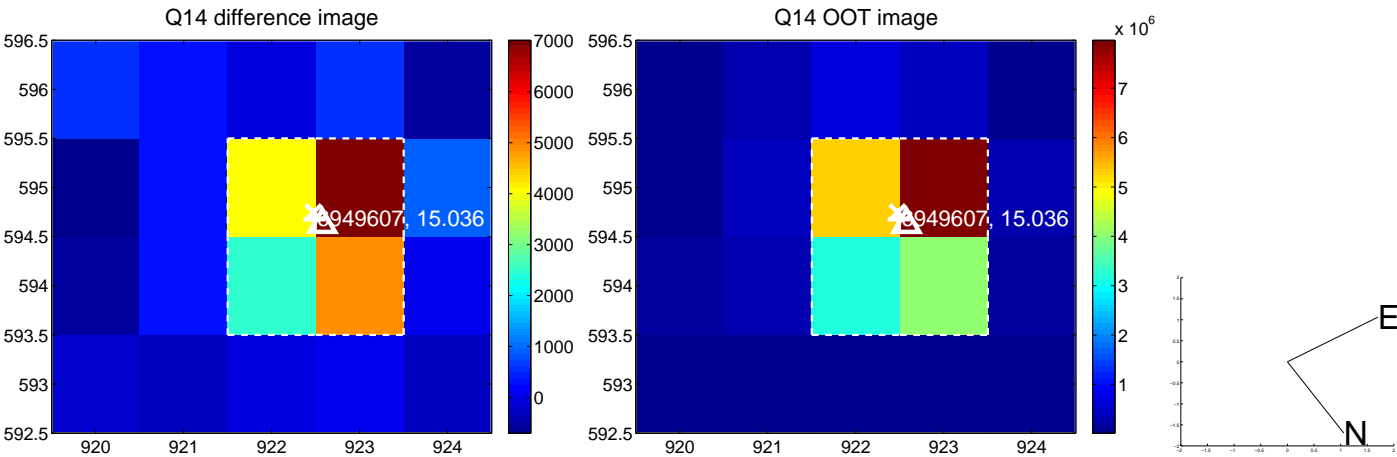
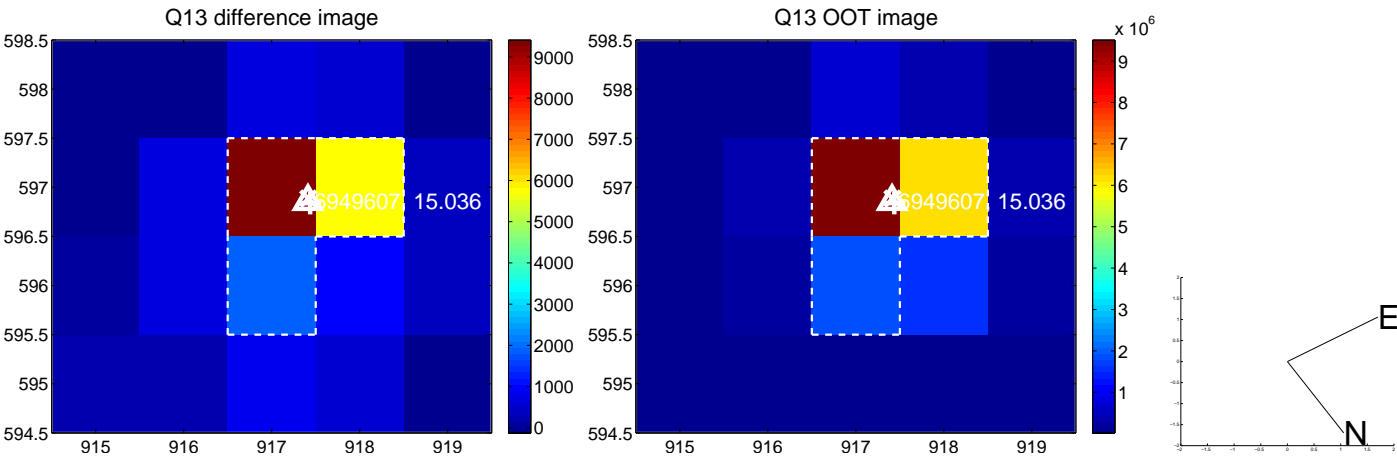
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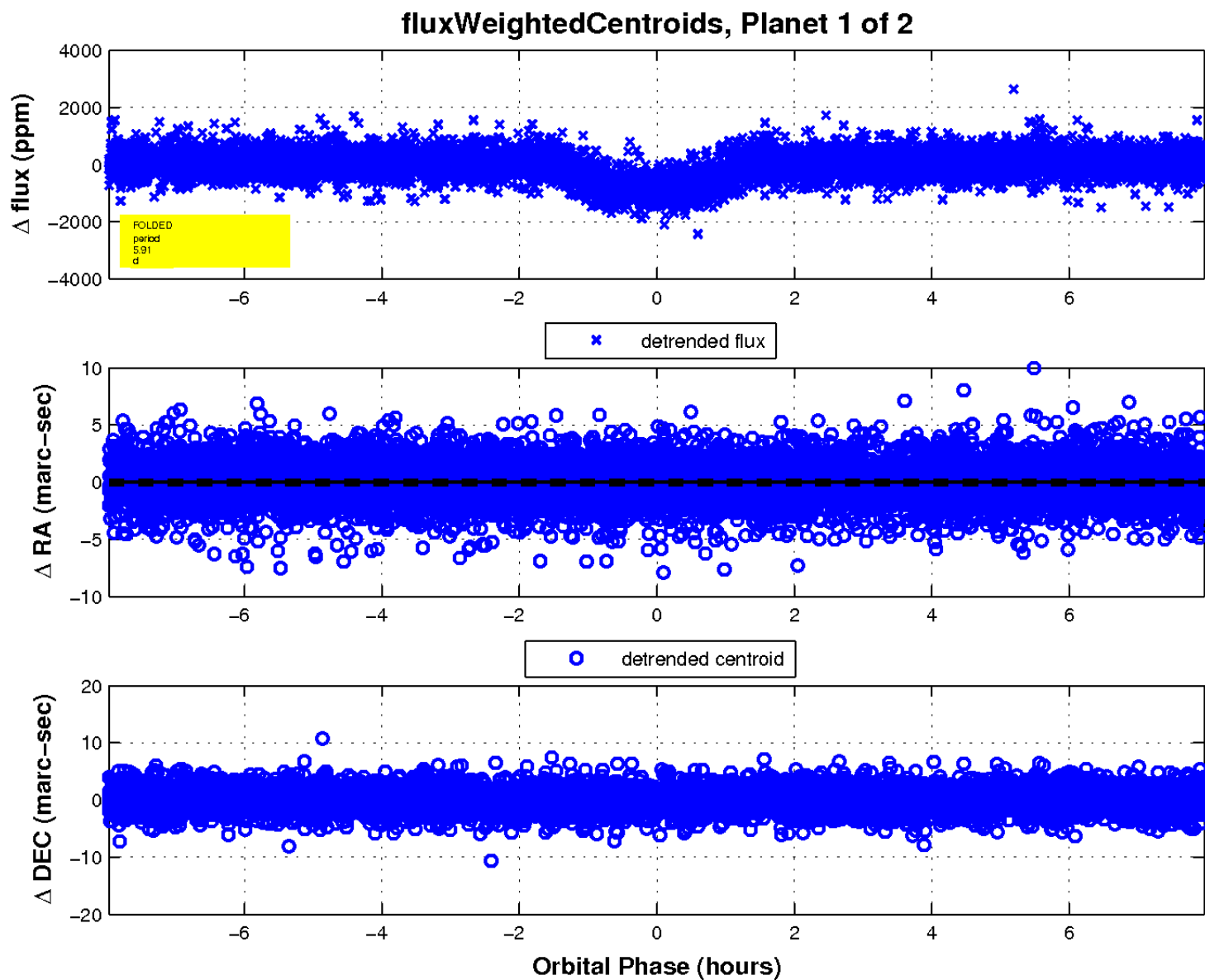
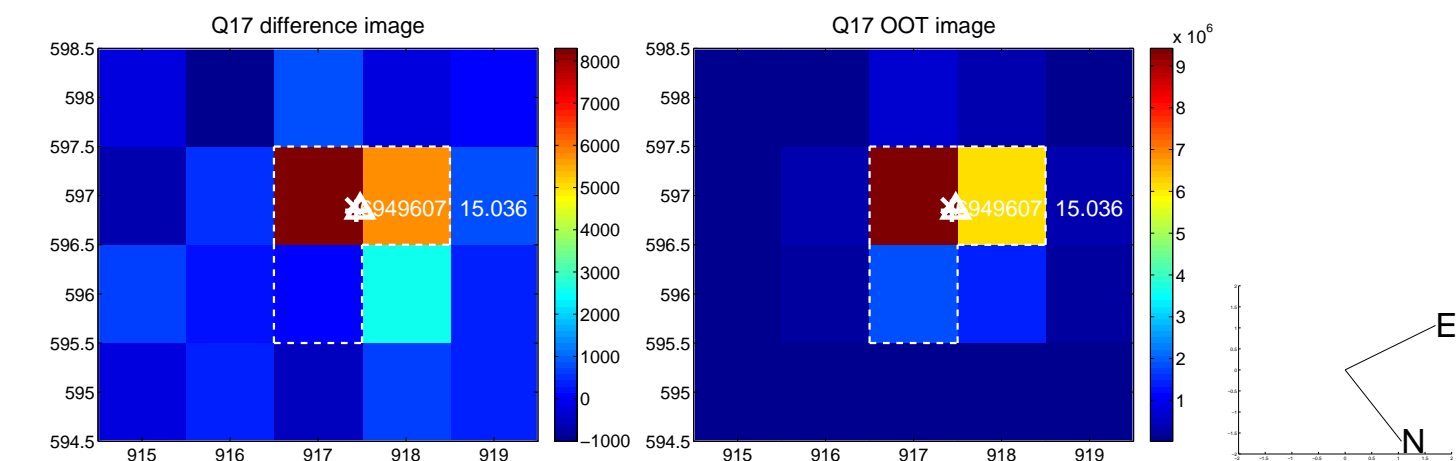
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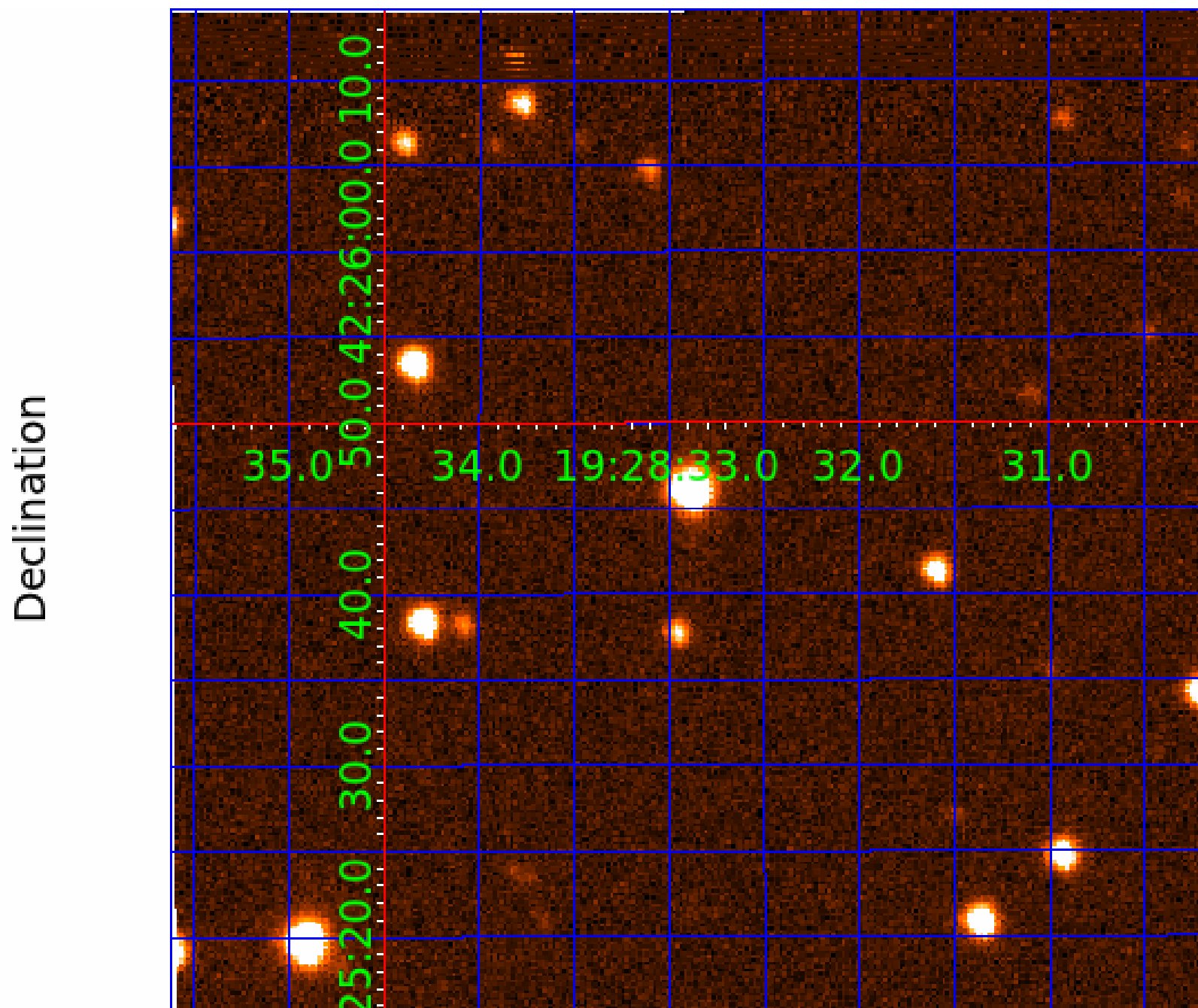
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UKIRT Image



KIC 006949607

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Robovetter Results

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

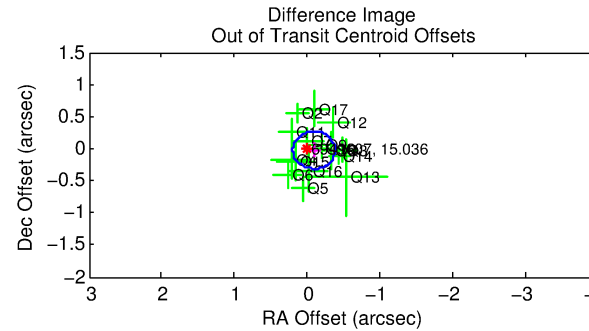
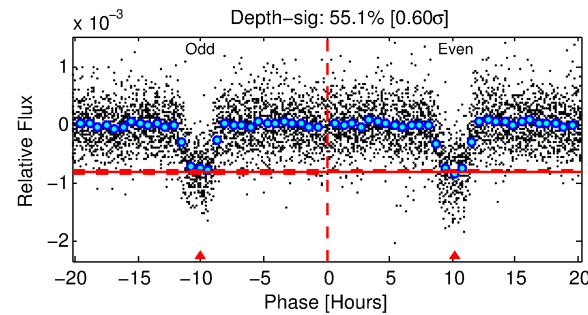
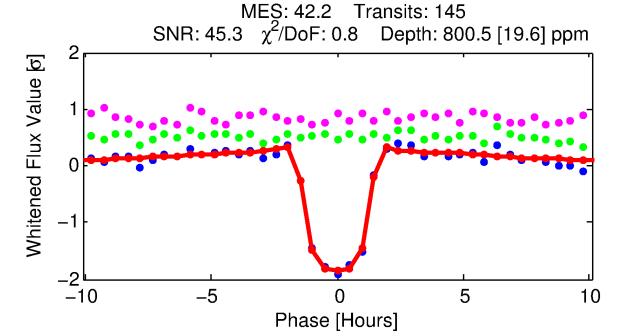
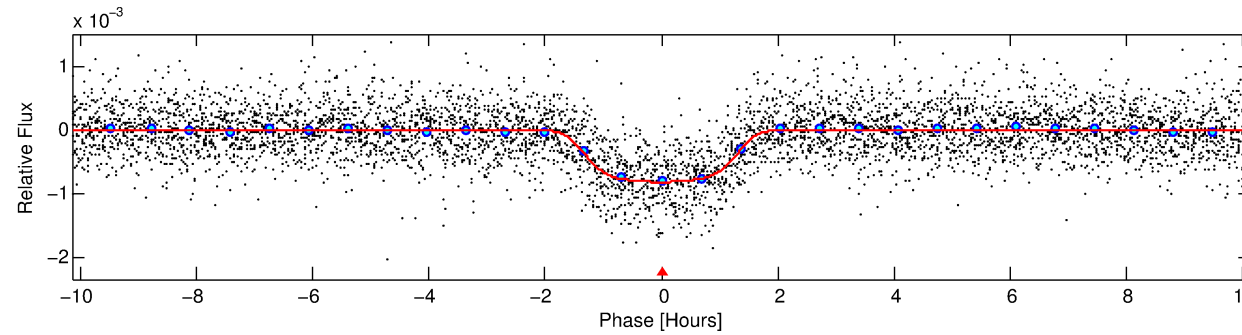
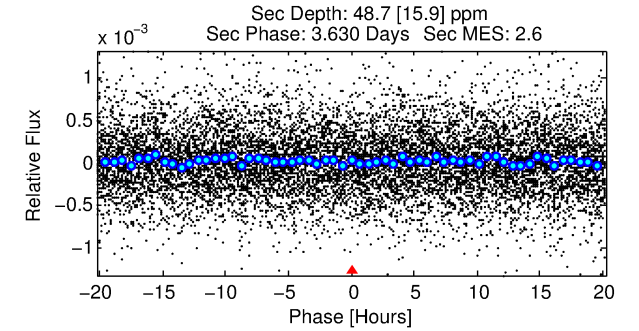
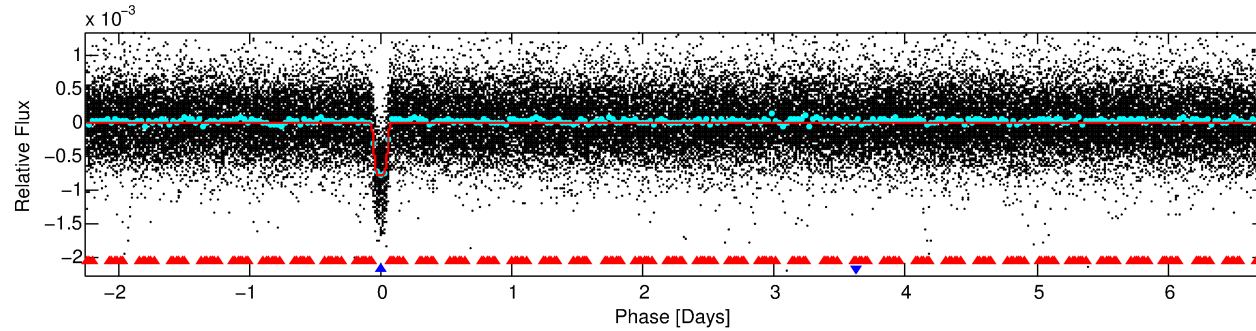
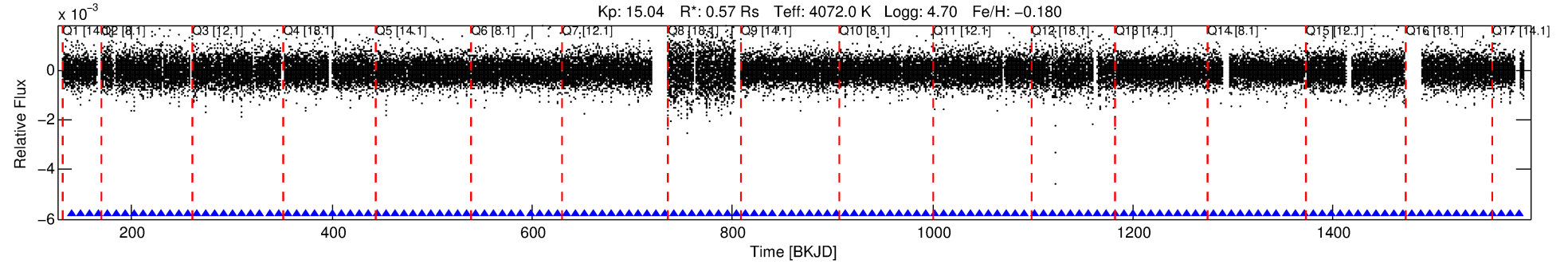
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006949607-02

No Significant Match Found

DV One-Page Summary

KIC: 6949607 Candidate: 2 of 2 Period: 8.986 d
KOI: K00870.02 Name: Kepler-28c Corr: 0.947



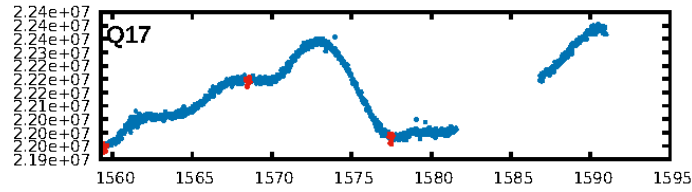
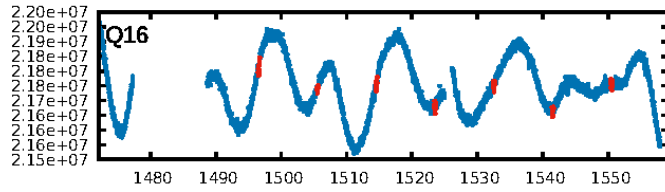
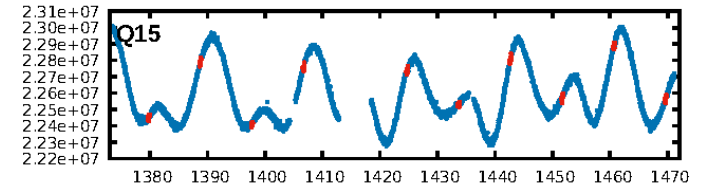
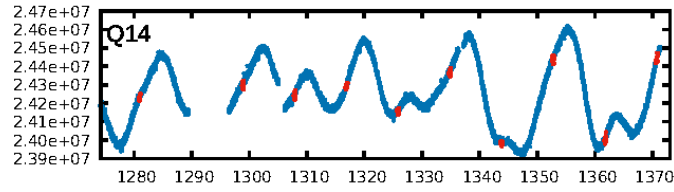
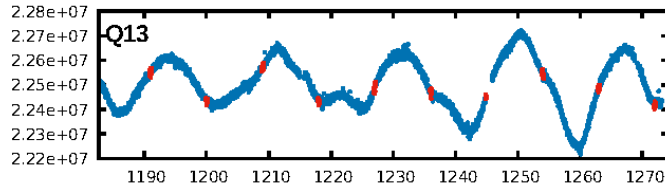
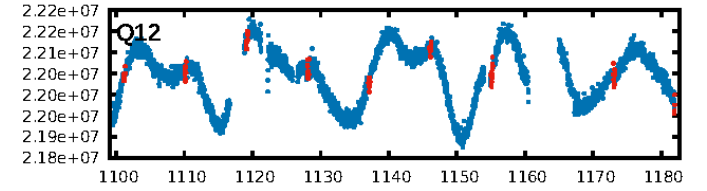
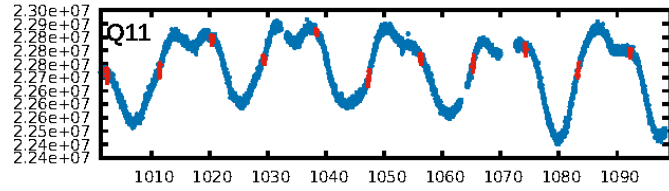
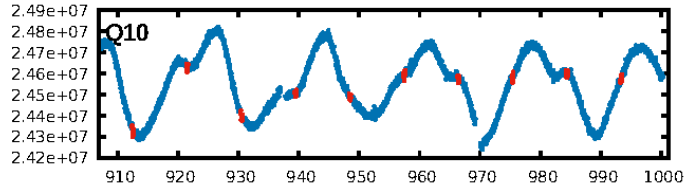
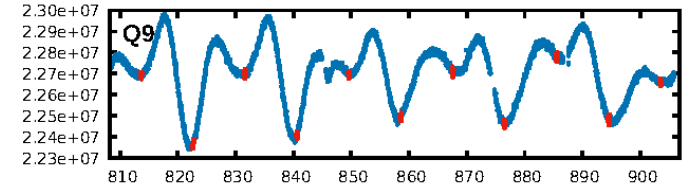
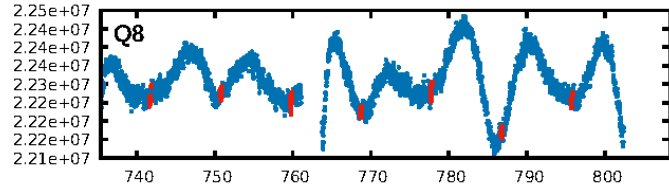
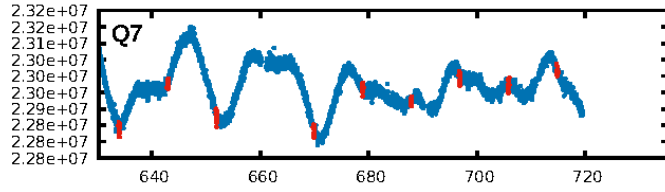
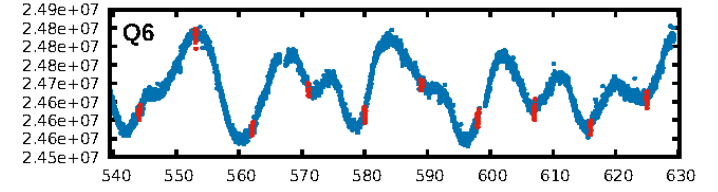
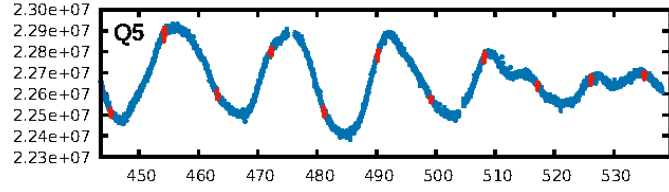
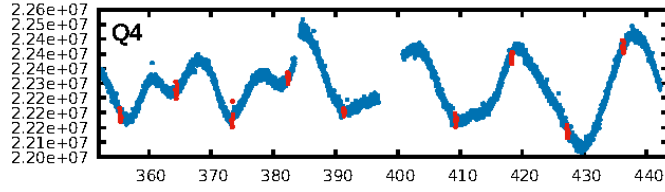
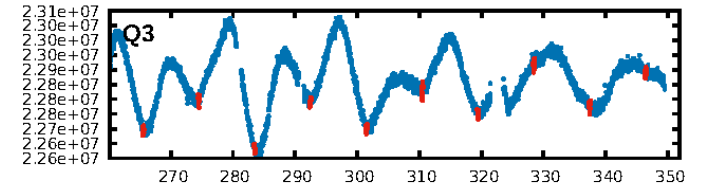
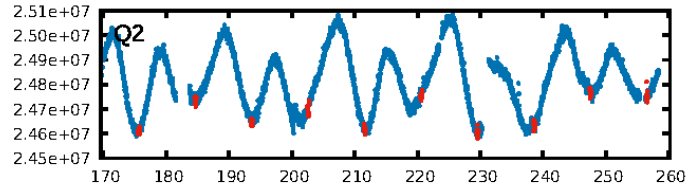
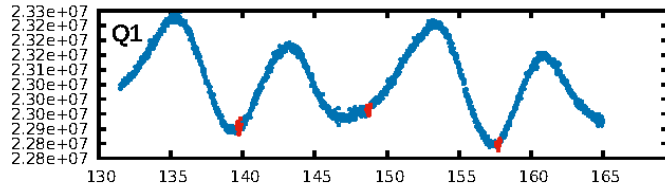
DV Fit Results:

Period = 8.98581 [0.00002] d
Epoch = 139.7423 [0.0016] BKJD
 R_p/R^* = 0.0325 [0.0009]
 a/R^* = 9.08 [0.90]
 b = 0.93 [0.01]
 S_{eff} = 15.92 [1.56]
 T_{eq} = 509 [12] K
 R_p = 2.02 [0.13] R_{e}
 a = 0.0709 [0.0031] AU
 A_g = 32.95 [11.11] [2.88σ]
 T_{eff} = 1887 [161] K [8.52σ]

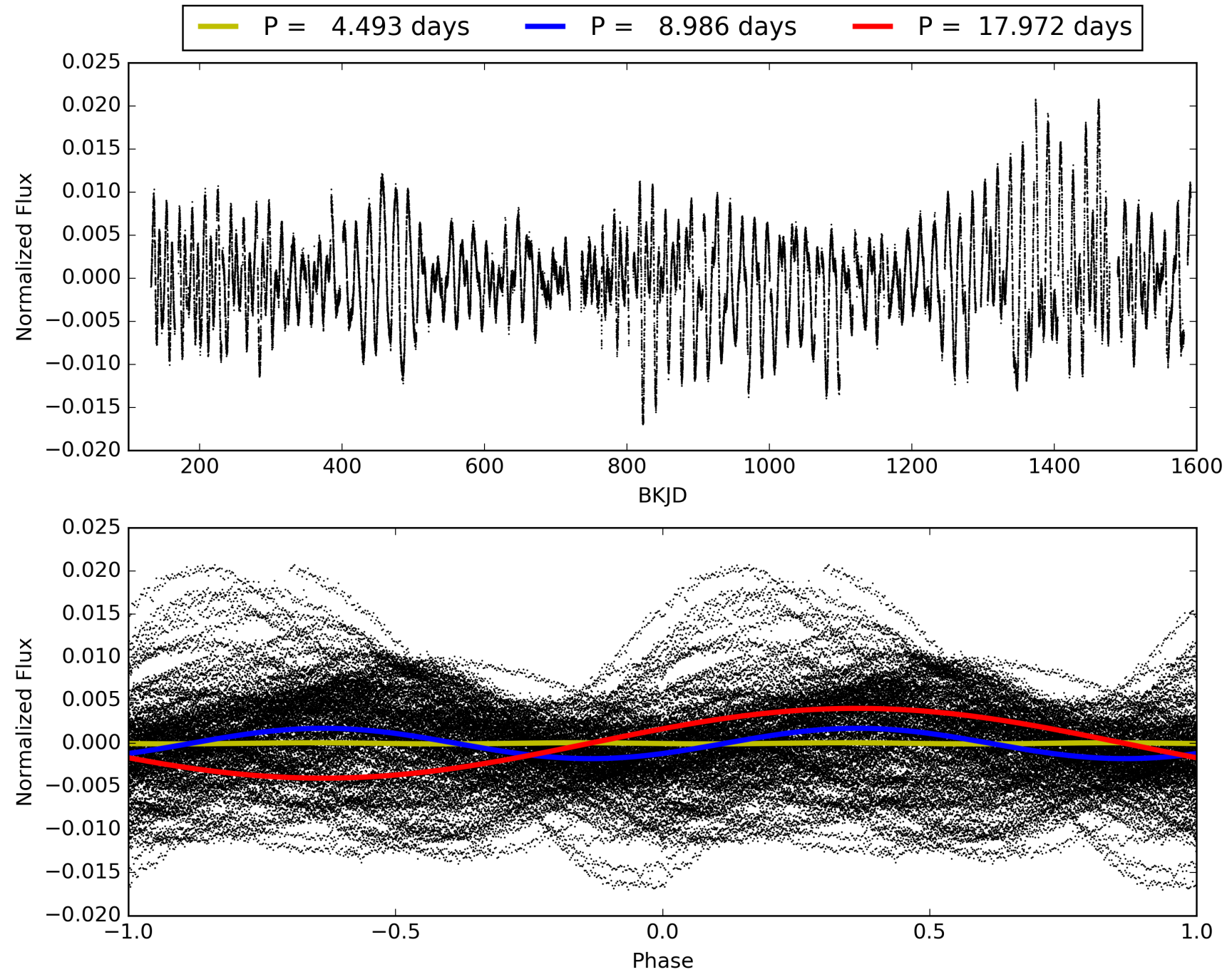
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.15σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 98.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [139/139]
GhostDiagnostic-chr: 1.626
Centroid-sig: N/A
Centroid-so: 0.640 arcsec [2.56σ]
OotOffset-rm: 0.095 arcsec [0.98σ]
KicOffset-rm: 0.287 arcsec [2.67σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 006949607-02, PDC Light Curves

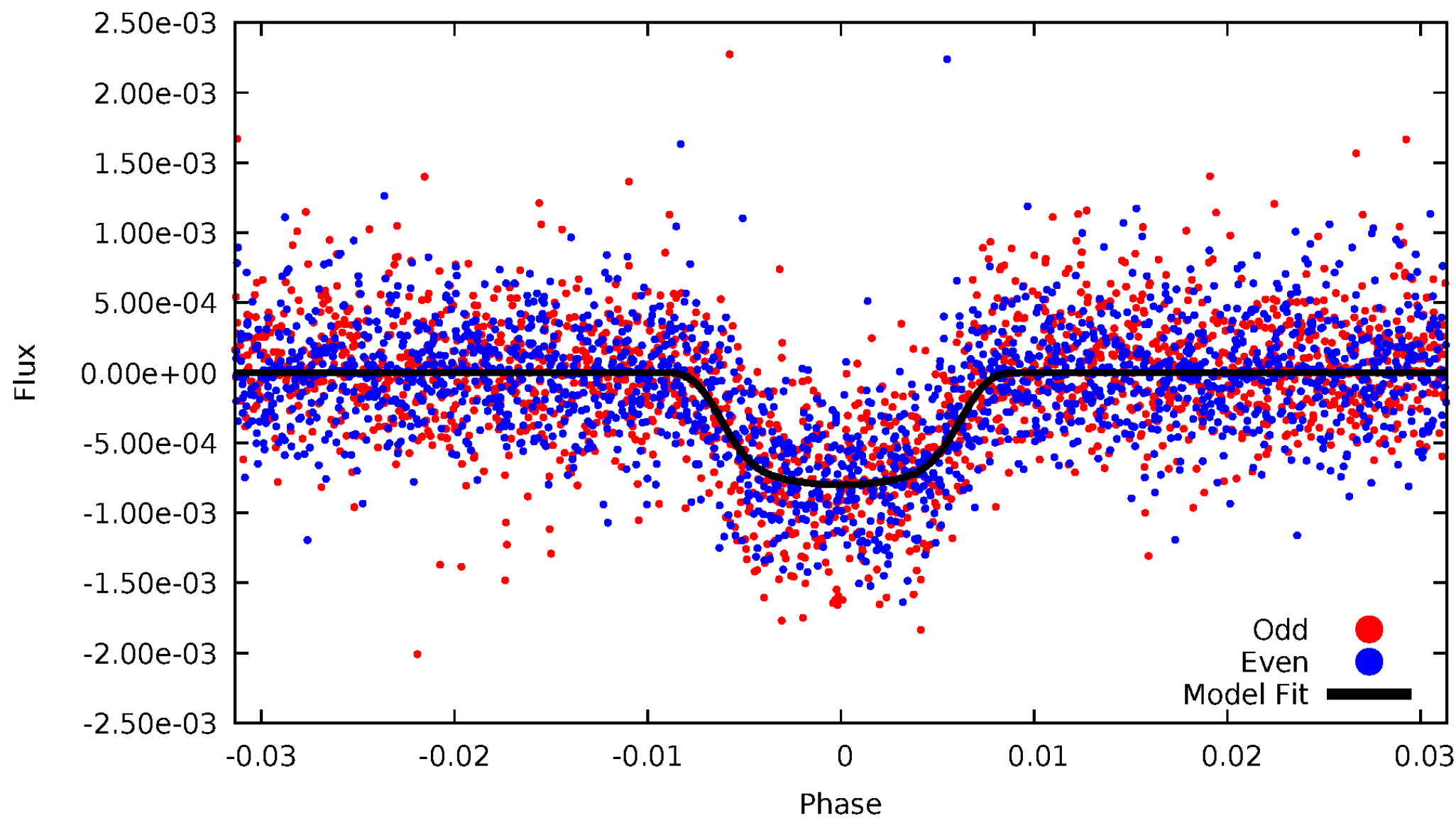


TCE 006949607-02



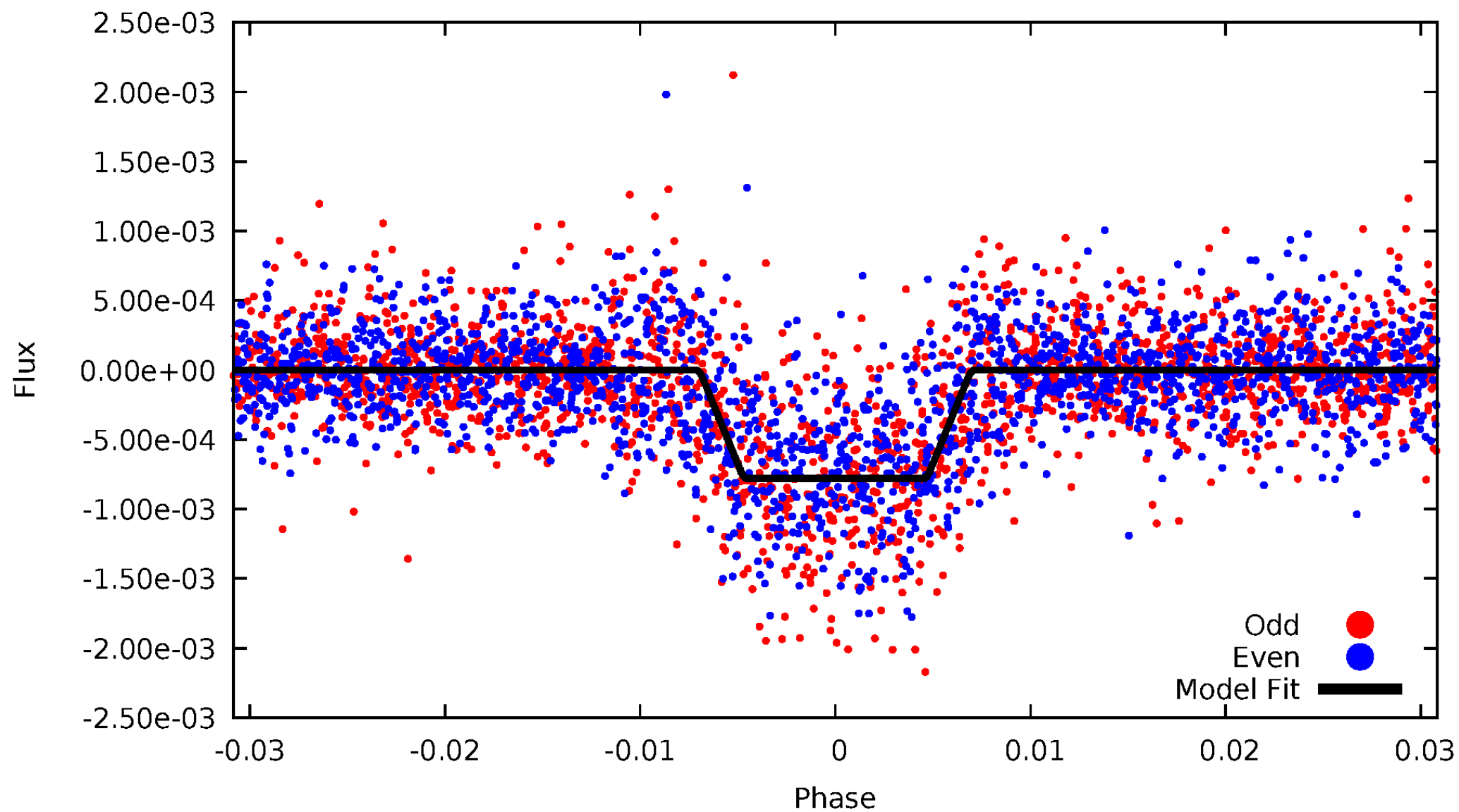
DV Odd/Even

TCE 006949607-02



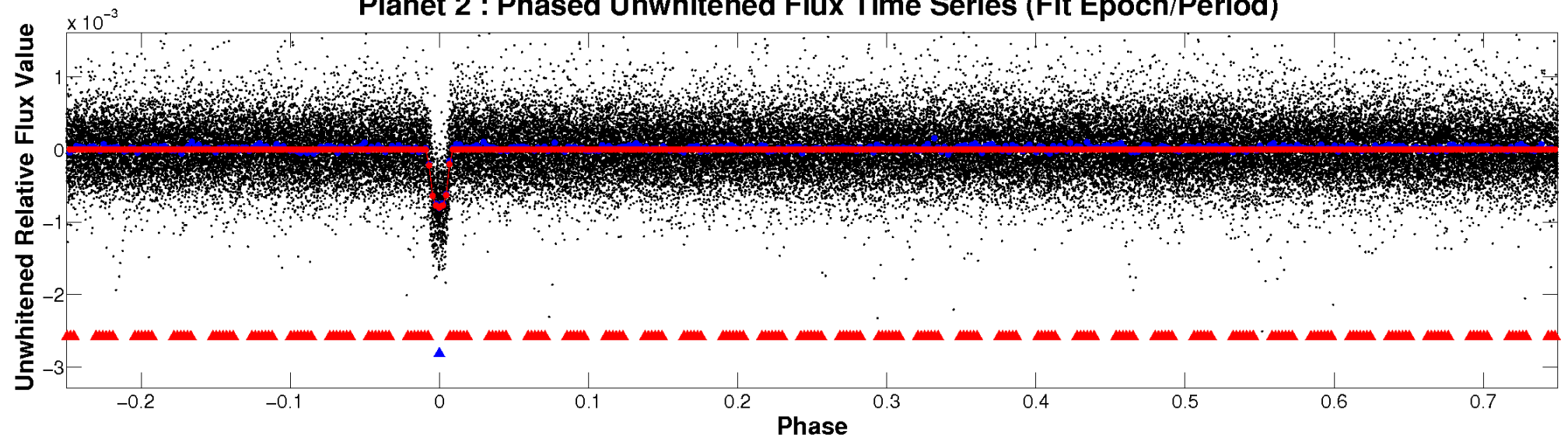
ALT Odd/Even

TCE 006949607-02

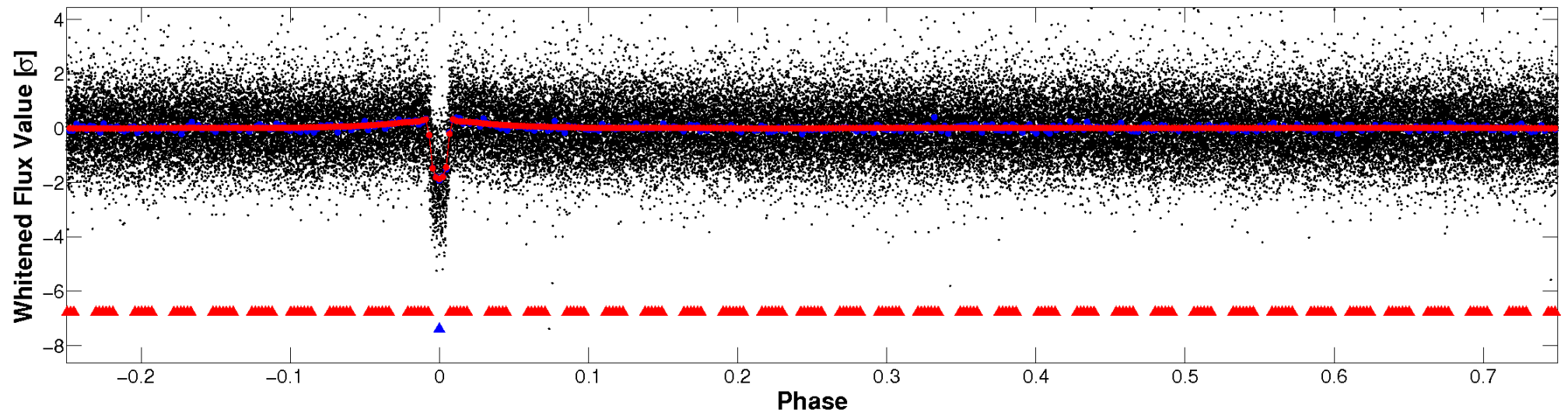


Non-Whitened Vs. Whitened Light Curve

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

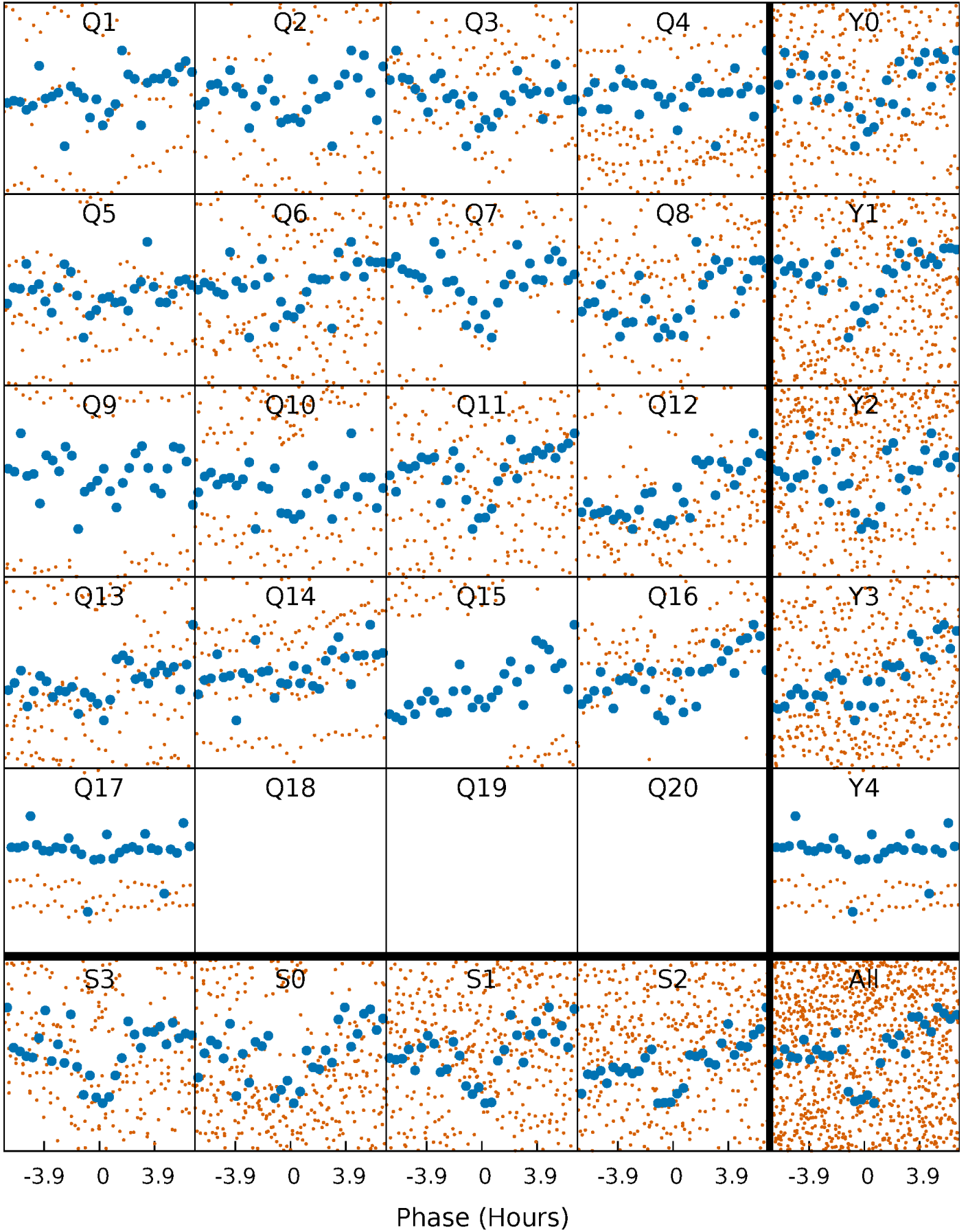


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



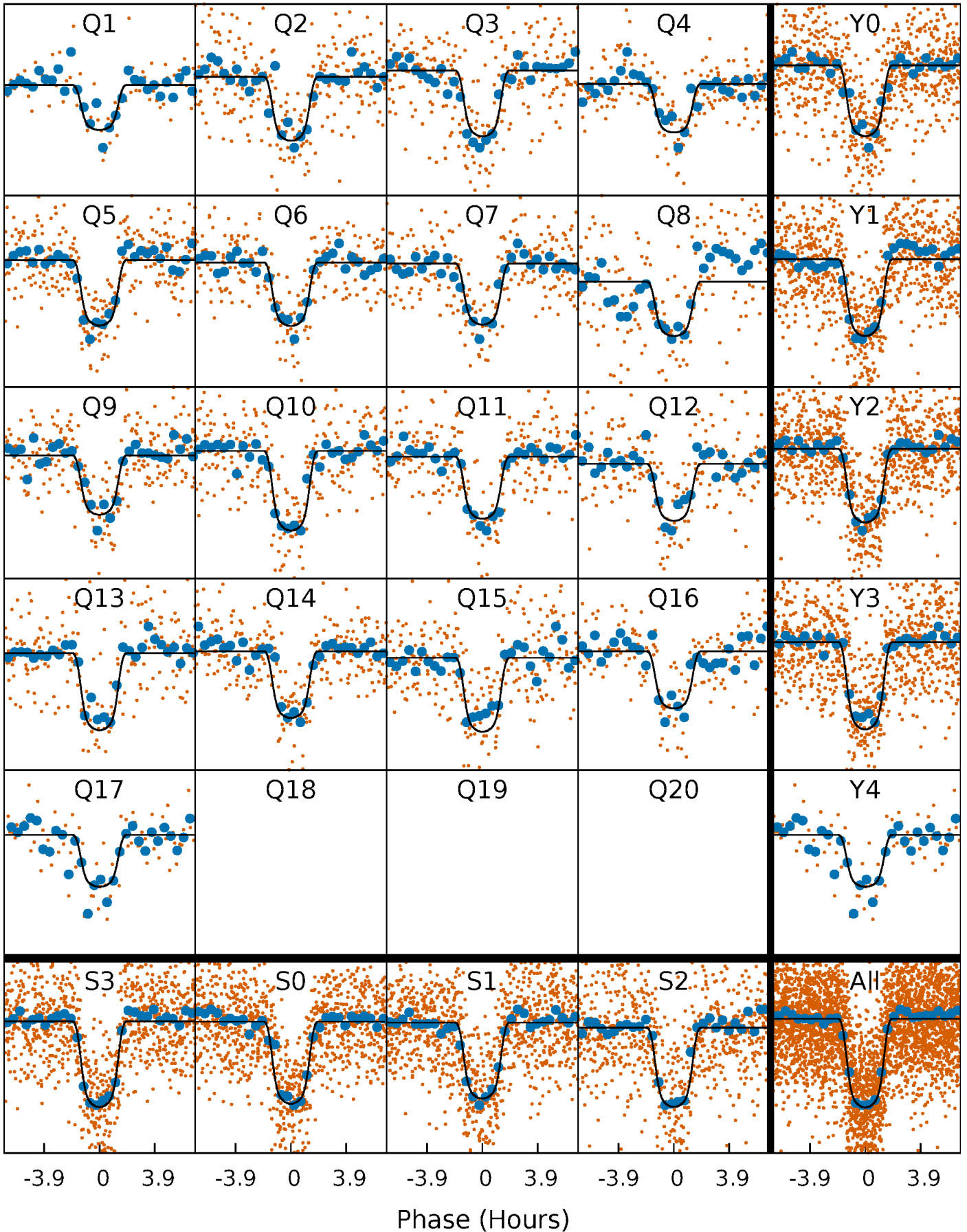
PDC Quarter-Phased Transit Curves

TCE 006949607-02 P= 8.985808 Days $T_0=139.742343$ (BKJD)



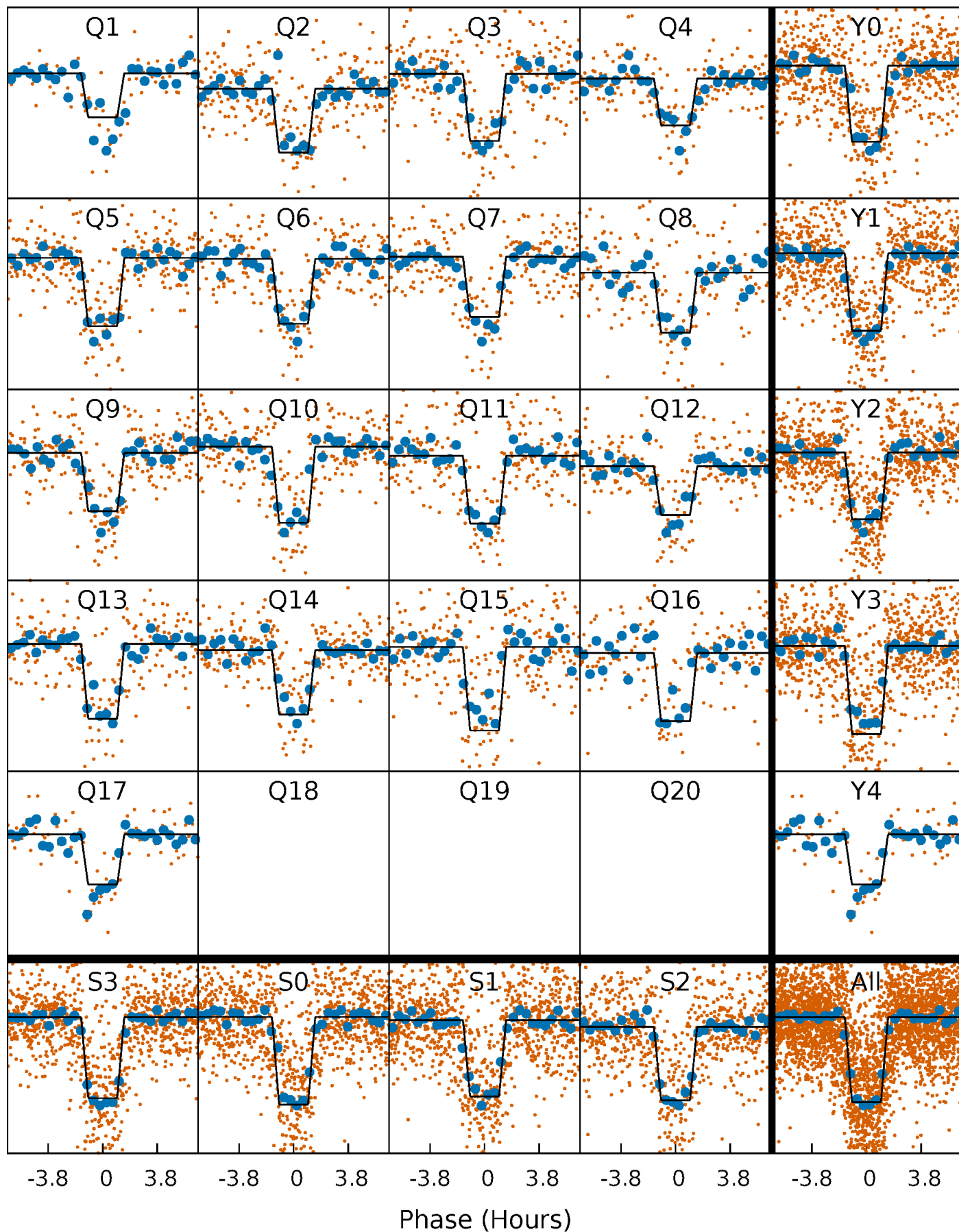
DV Quarter-Phased Transit Curves

TCE 006949607-02 P= 8.985808 Days $T_0=139.742343$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

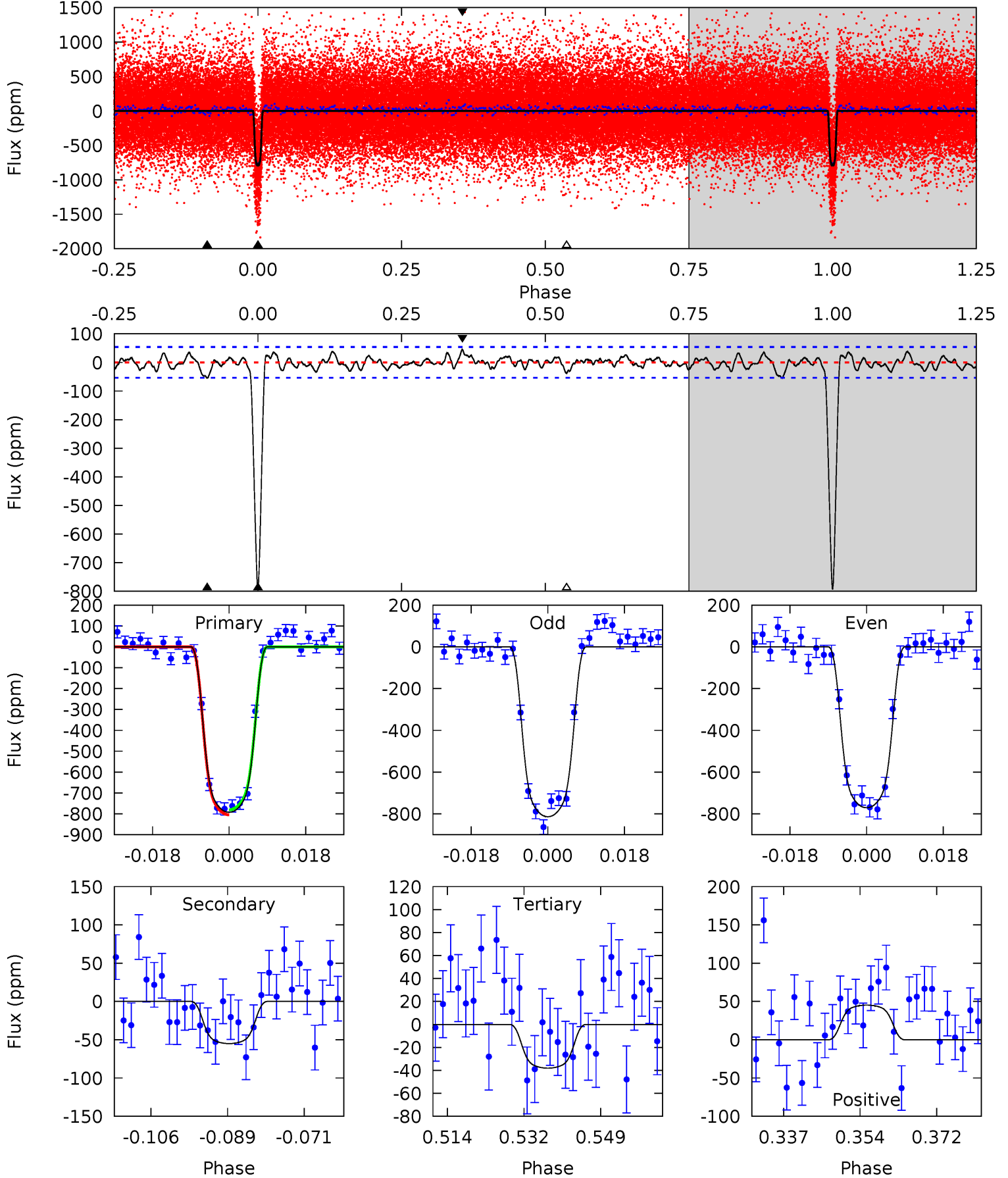
TCE 006949607-02 P= 8.985887 Days $T_0=139.736586$ (BKJD)



DV Model-Shift Uniqueness Test

006949607-02, P = 8.985808 Days, E = 130.756535 Days

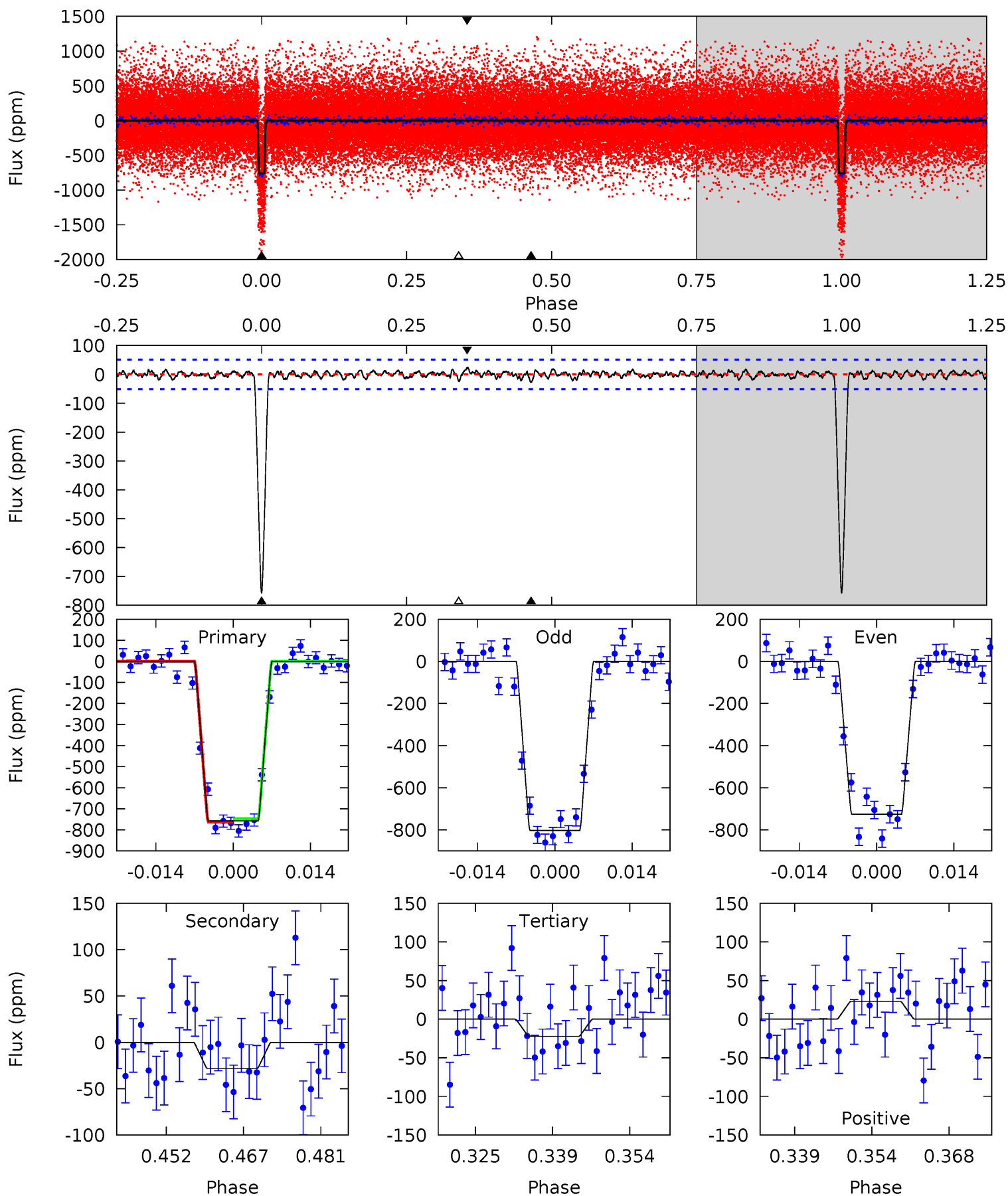
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
72.3	5.03	3.48	4.13	4.92	2.37	1.33	68.9	68.2	1.55	0.90	1.97	0.99	0.05	1.09



Alt Model-Shift Uniqueness Test

006949607-02, P = 8.985887 Days, E = 130.750699 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
73.7	2.74	2.17	2.23	4.96	2.45	0.77	71.5	71.5	0.58	0.51	3.75	0.98	0.03	0.81



Stellar Parameters For KIC 006949607

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4072^{+73}_{-81}	$4.696^{+0.023}_{-0.028}$	$-0.180^{+0.150}_{-0.150}$	$0.570^{+0.029}_{-0.032}$	$0.586^{+0.029}_{-0.036}$	$4.452^{+0.542}_{-0.437}$
	+2%/-2%	+0%/-1%	+83%/-83%	+5%/-6%	+5%/-6%	+12%/-10%
Source	SPE5	SPE5	SPE5	DSEP		

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

Secondary Eclipse Parameters for KIC 006949607-02 / KOI 0870.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-55 ± 11	$2.03^{+0.08}_{-0.08}$	713^{+16}_{-15}	2612^{+80}_{-80}	37^{+8}_{-8}
Alt.	-28 ± 10	$1.74^{+0.08}_{-0.07}$	712^{+17}_{-16}	2491^{+105}_{-139}	25^{+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 $A_{\text{obs}} \gg 1.0$

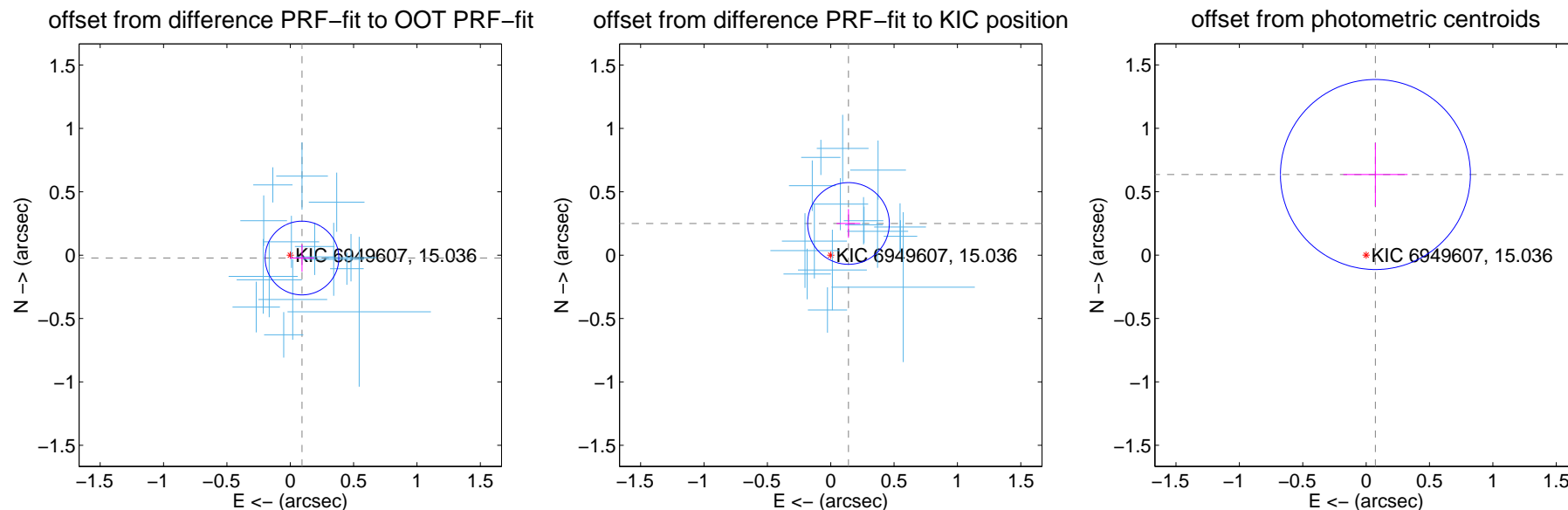
DV Centroid Data

Supplemental centroid analysis for 006949607-02. Kepler magnitude: 15.04. Transit SNR 45.27

There are 16 quarters with good PRF difference image offsets

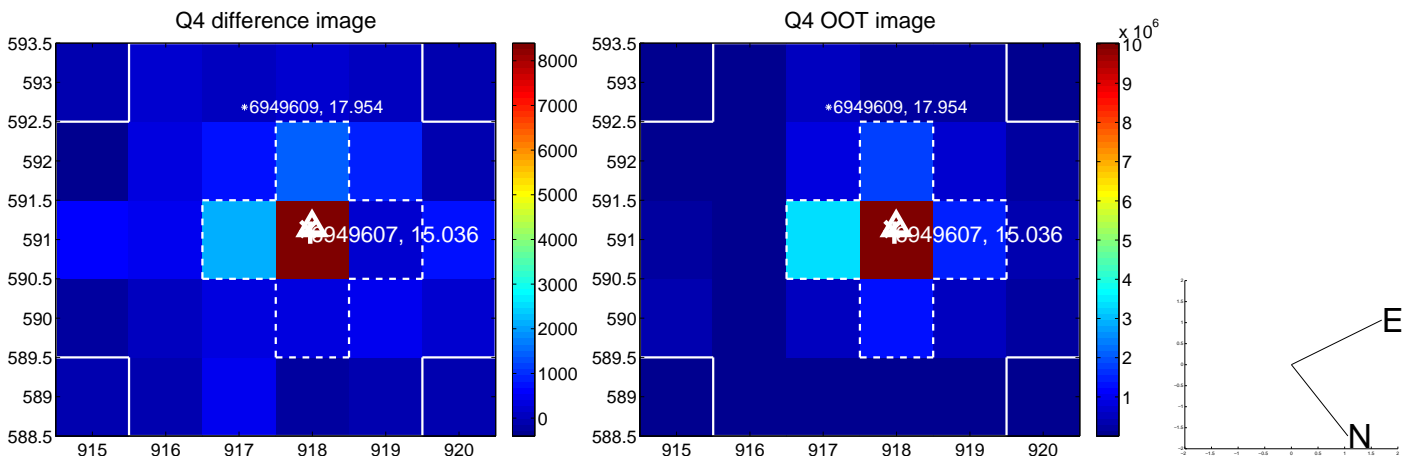
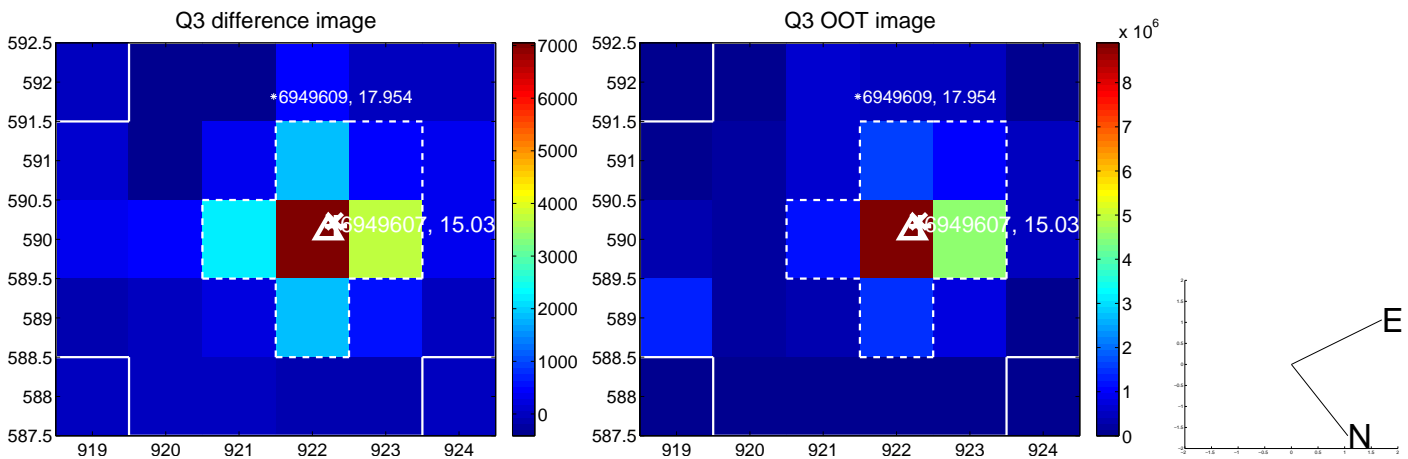
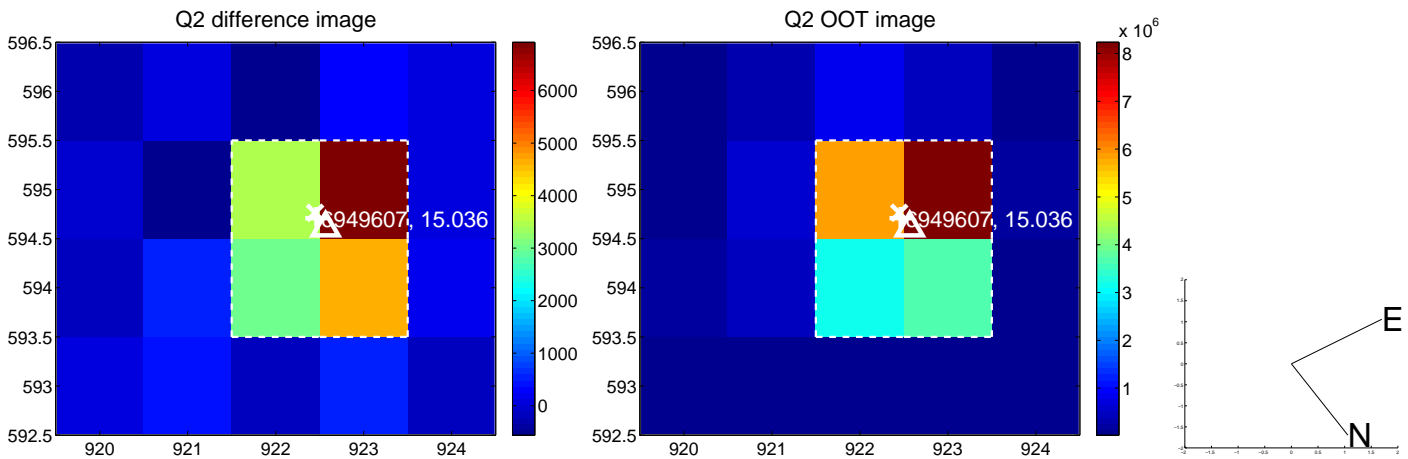
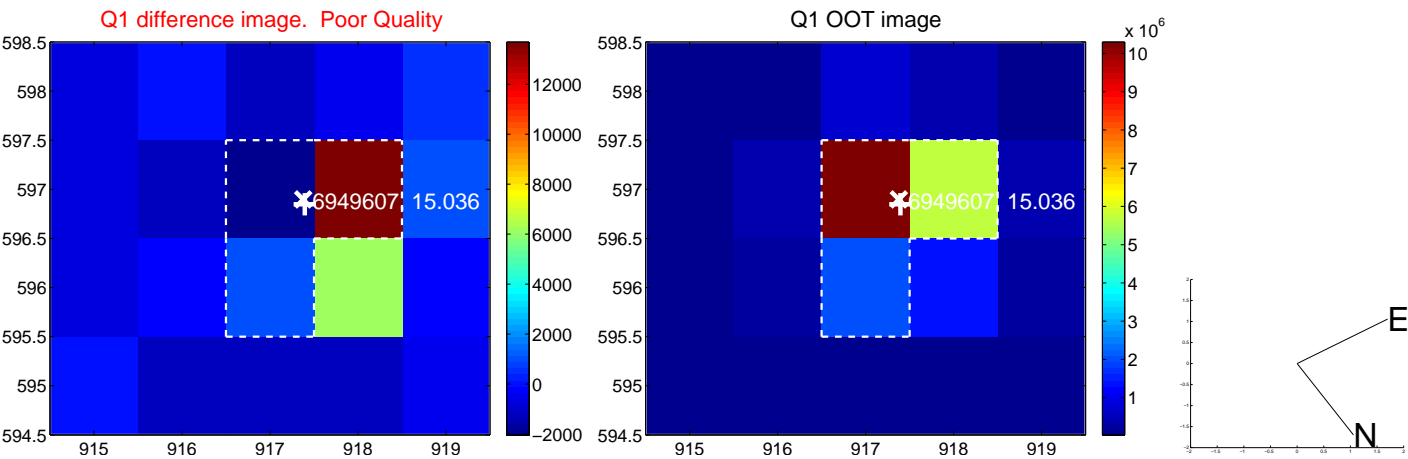
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.095 ± 0.097	0.98	-0.092 ± 0.096	-0.023 ± 0.107
PRF-fit source offset from KIC position	0.287 ± 0.107	2.67	-0.140 ± 0.094	0.250 ± 0.113
photometric centroid source offset	0.64 ± 0.25	2.56	-0.07 ± 0.25	0.64 ± 0.25

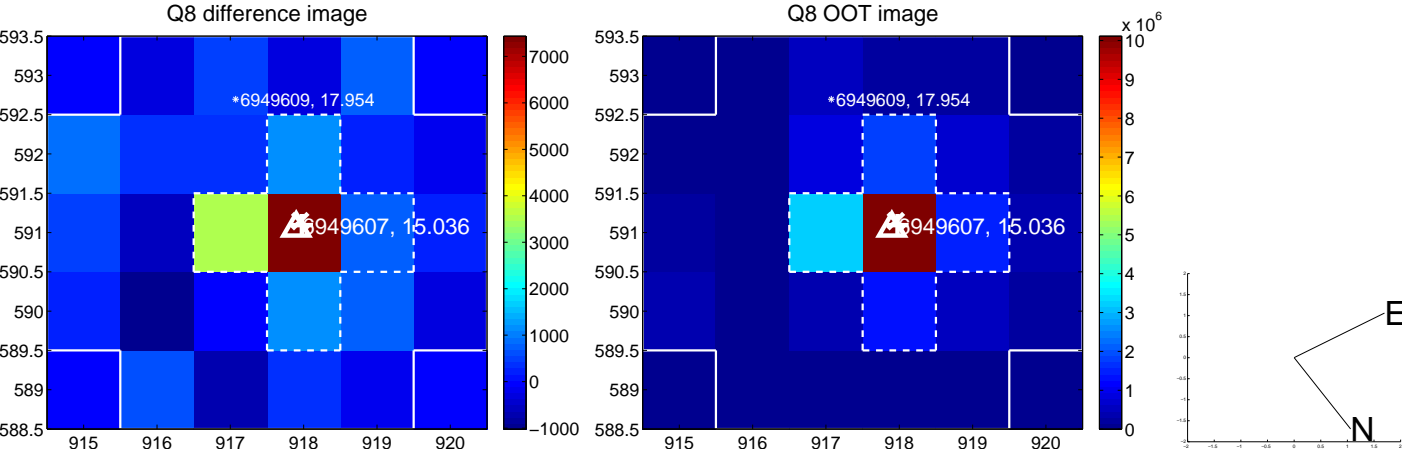
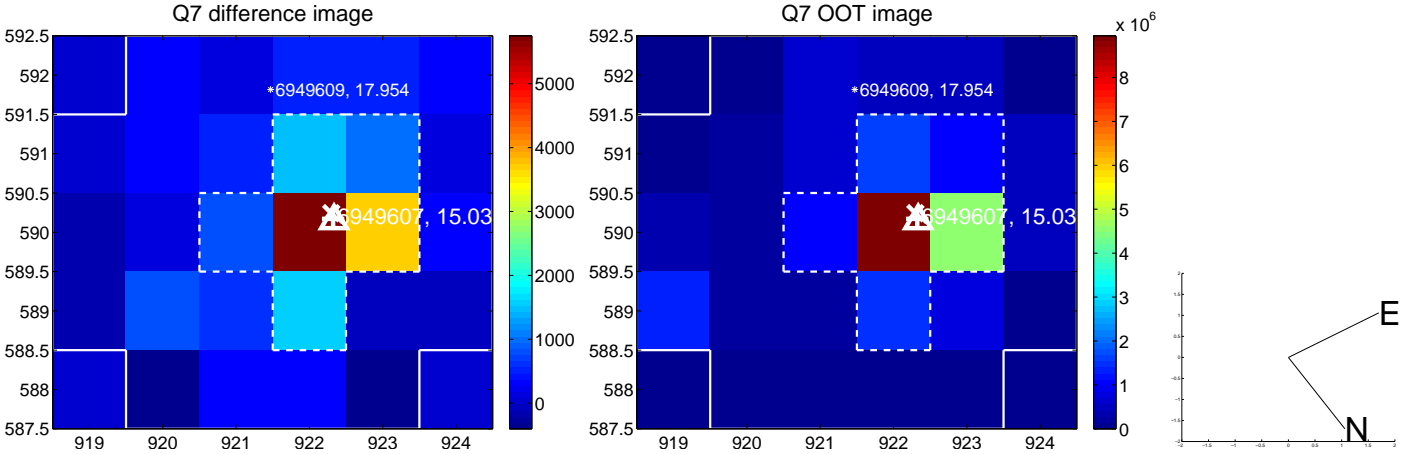
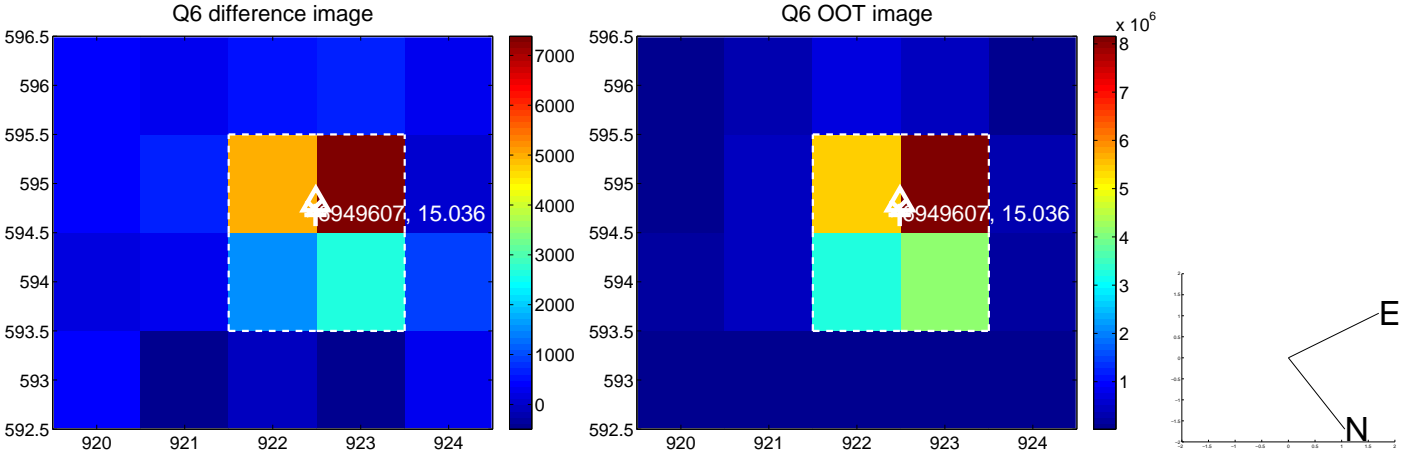
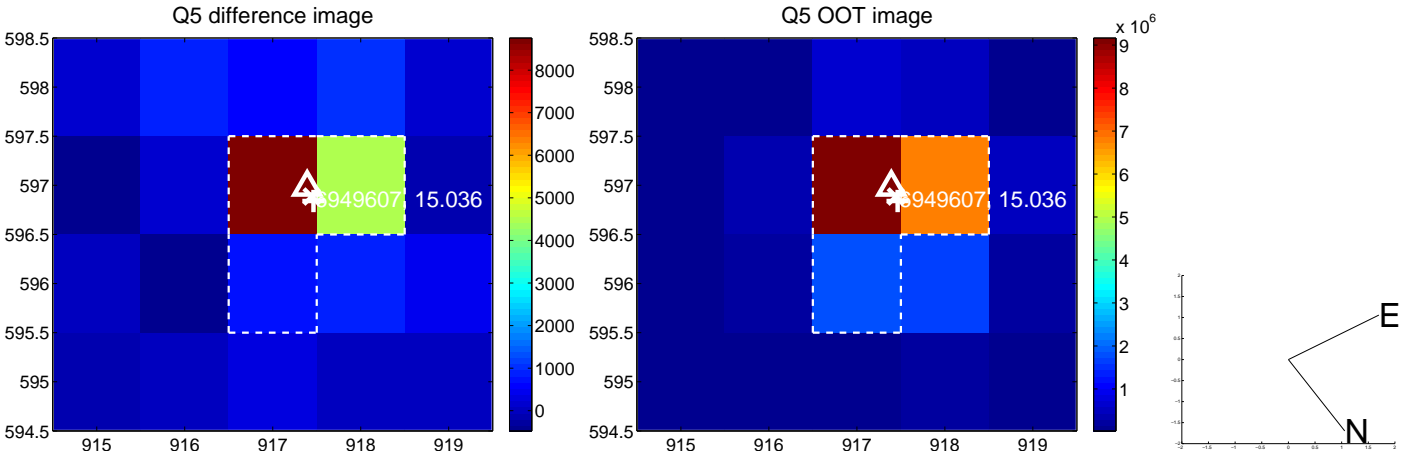


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

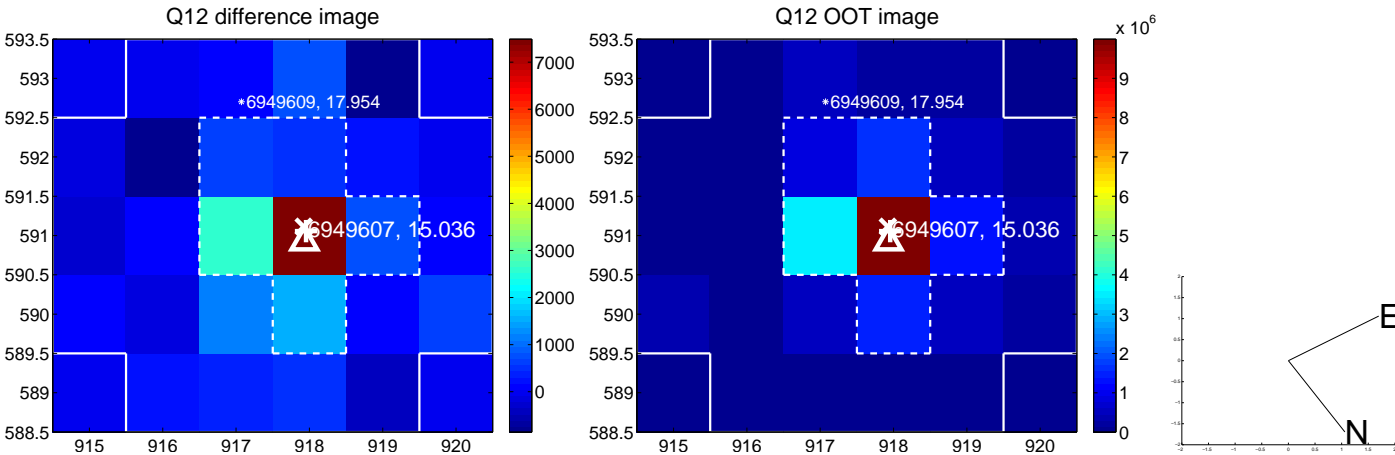
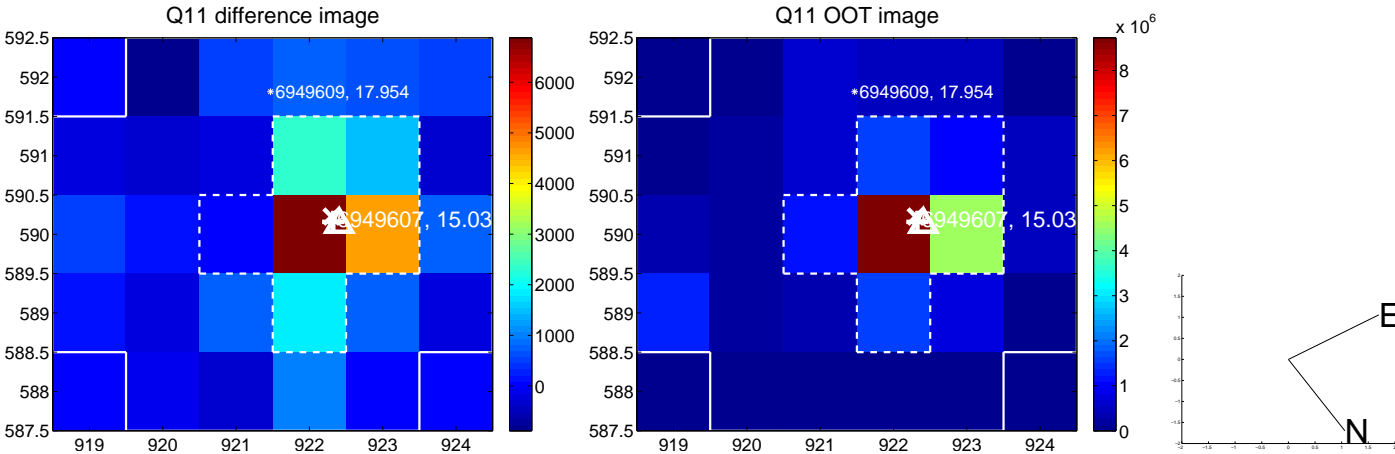
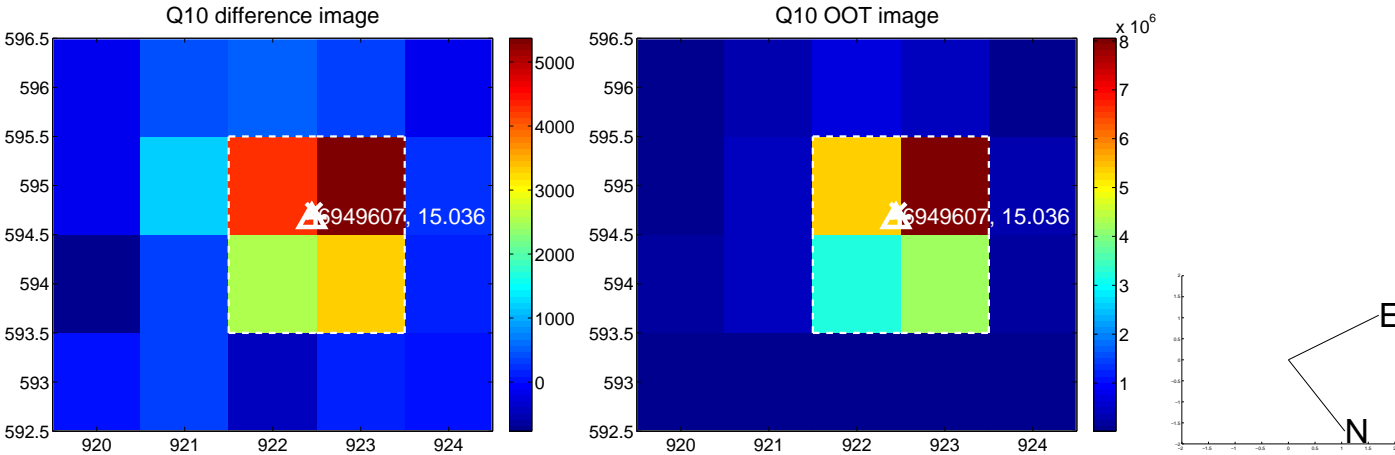
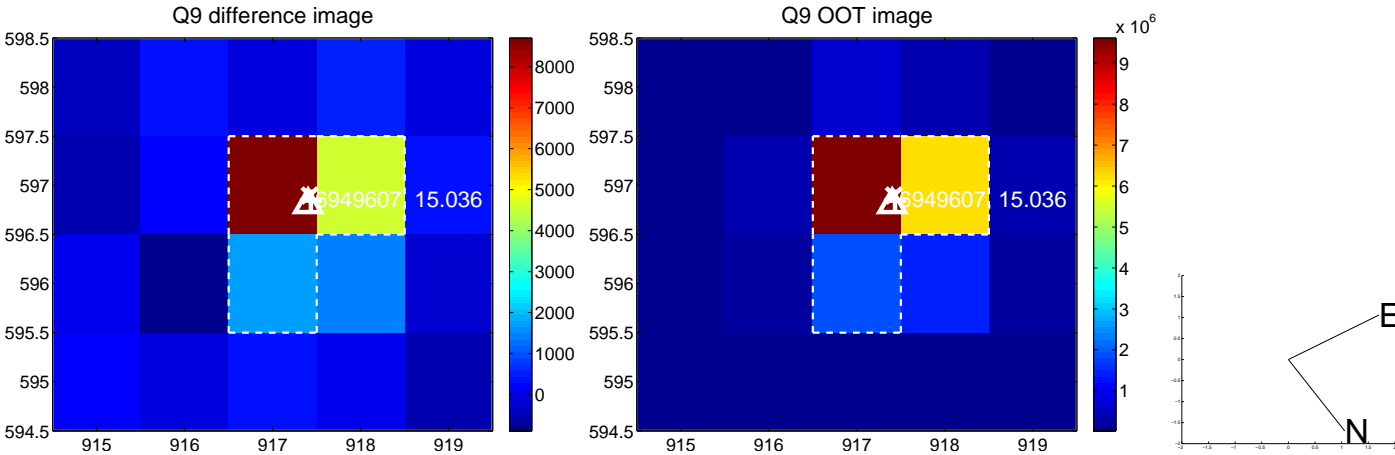
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



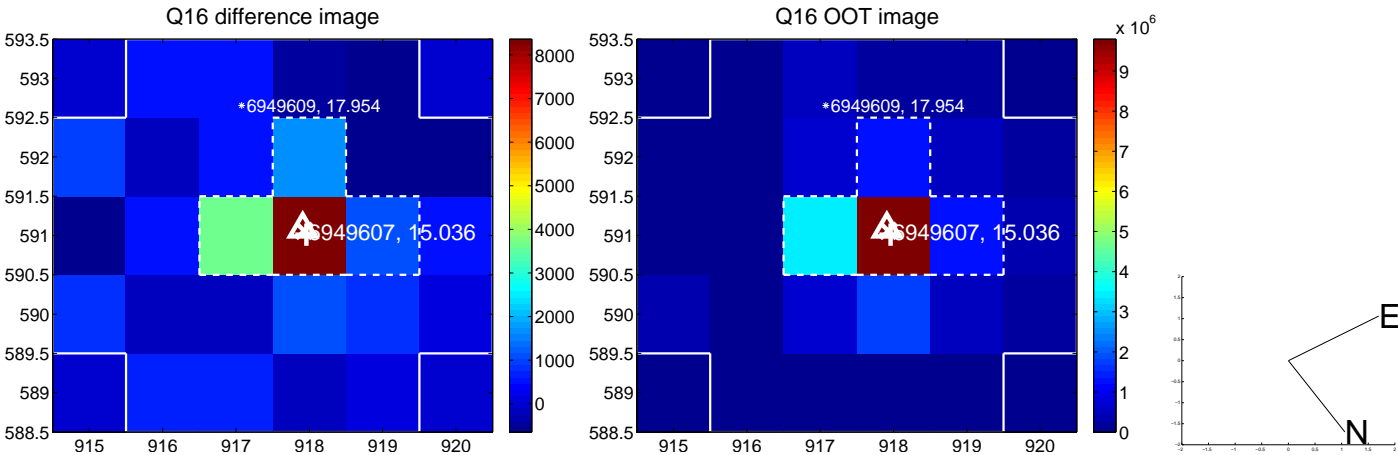
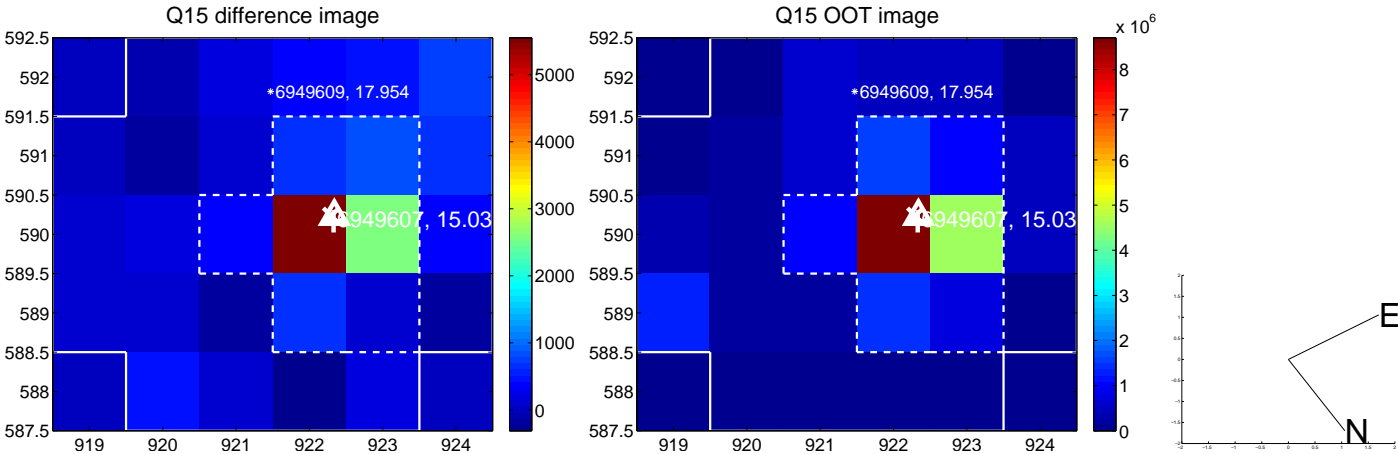
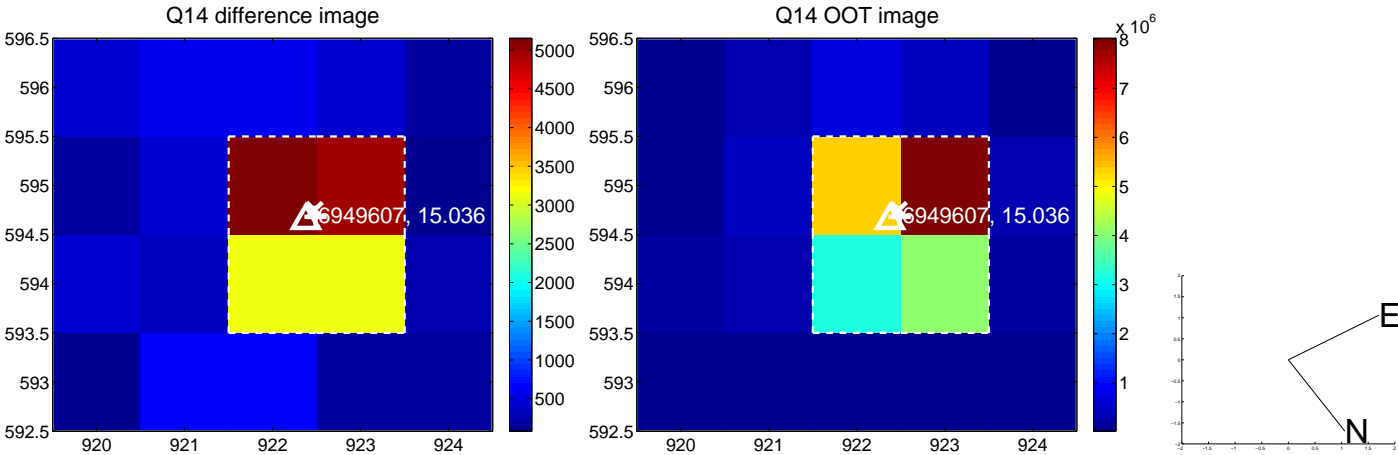
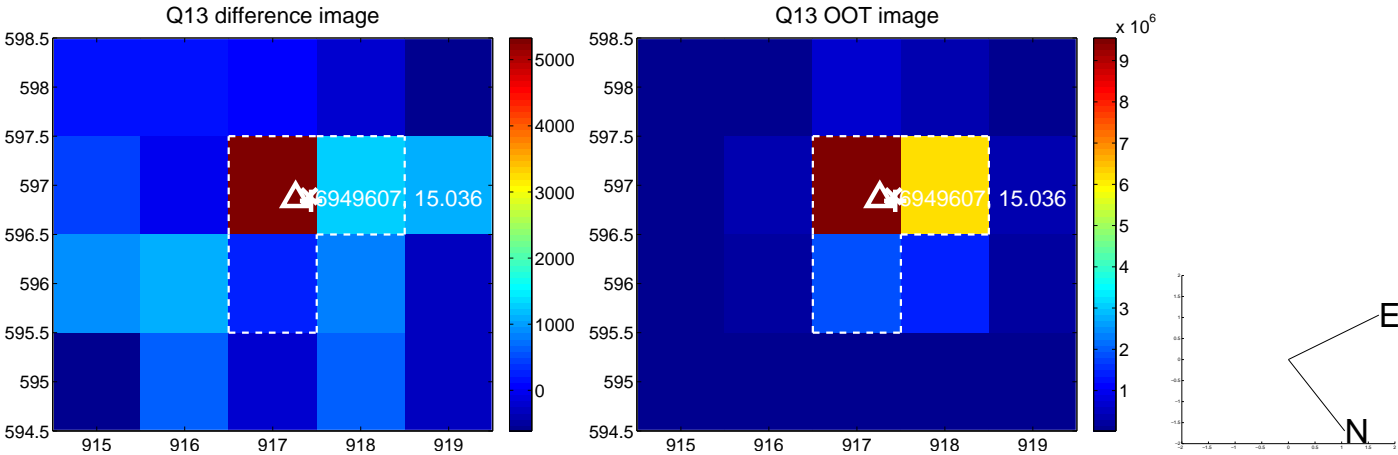
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



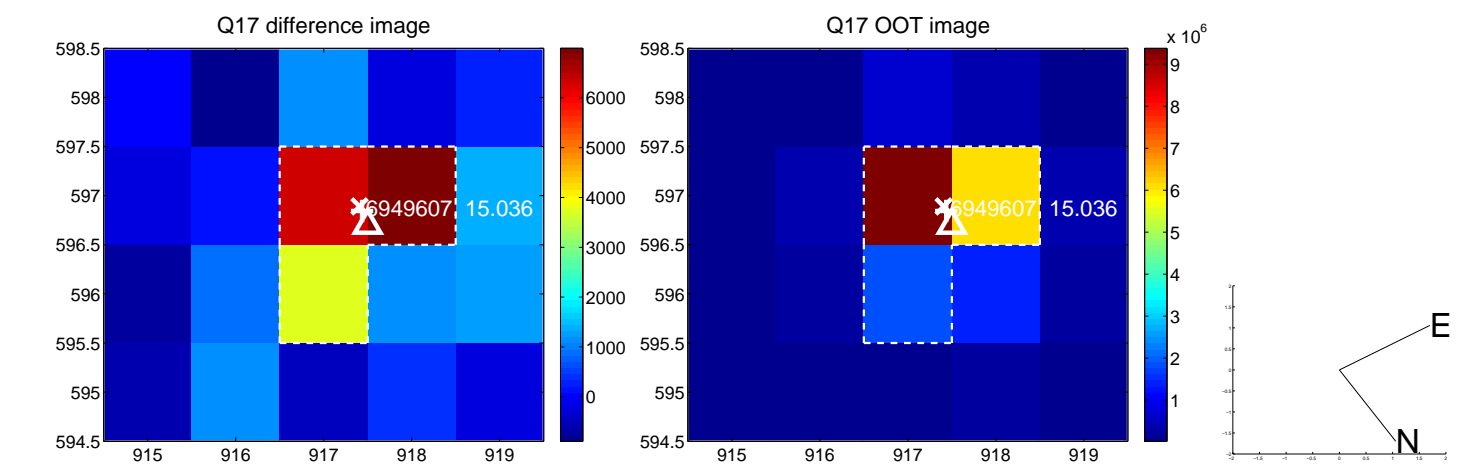
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



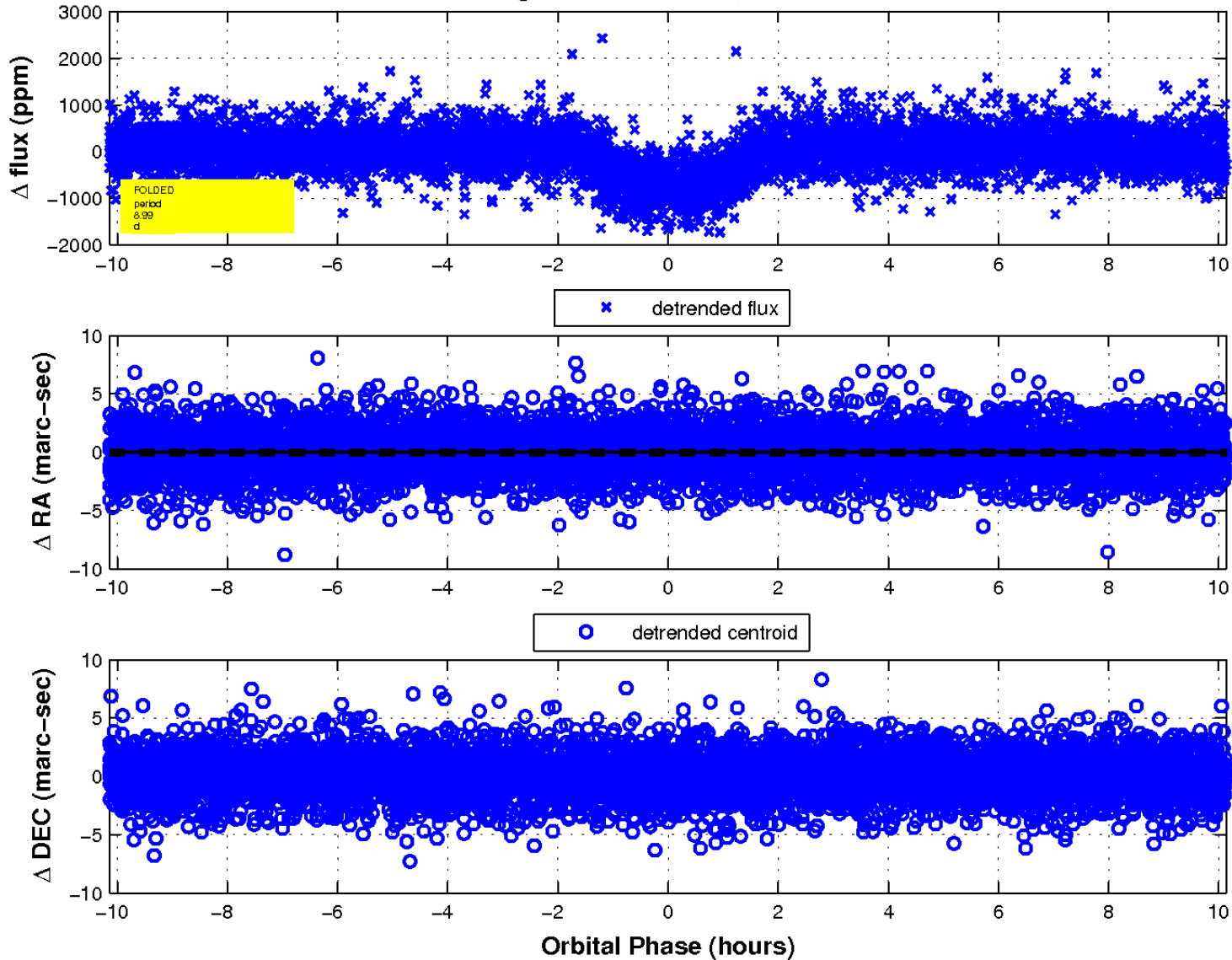
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

