

KIC 012017921

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})
012017921-01	OBS	No	3.185920	134.228737	29.6	13.948	9.4	7.3	2.83	6660	1.97	5380.19
012017921-02	OBS	No	3.185913	132.648359	43.0	21.997	12.4	15.0	2.83	6660	1.94	5380.21

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012017921-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
012017921-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

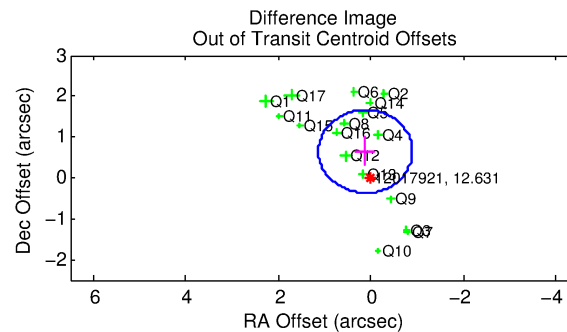
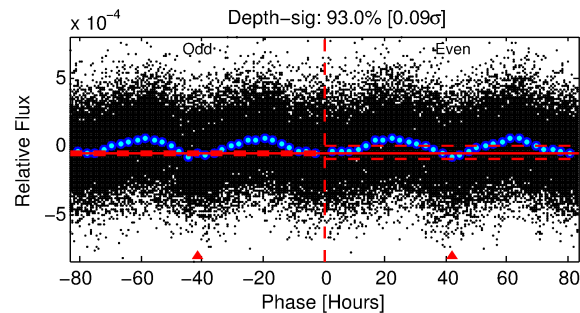
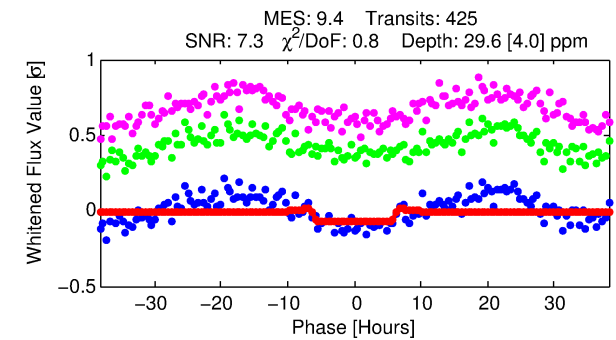
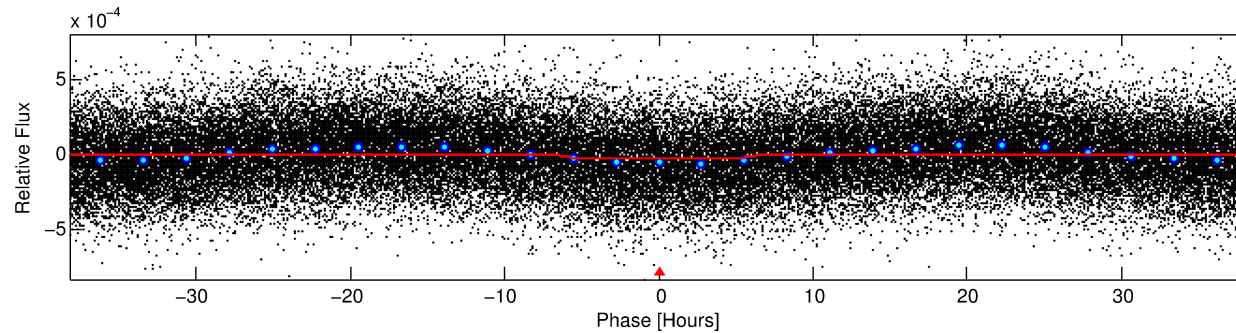
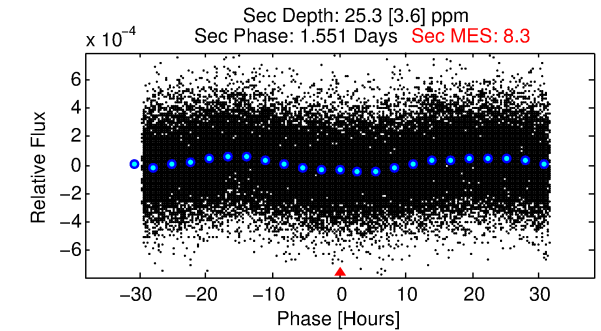
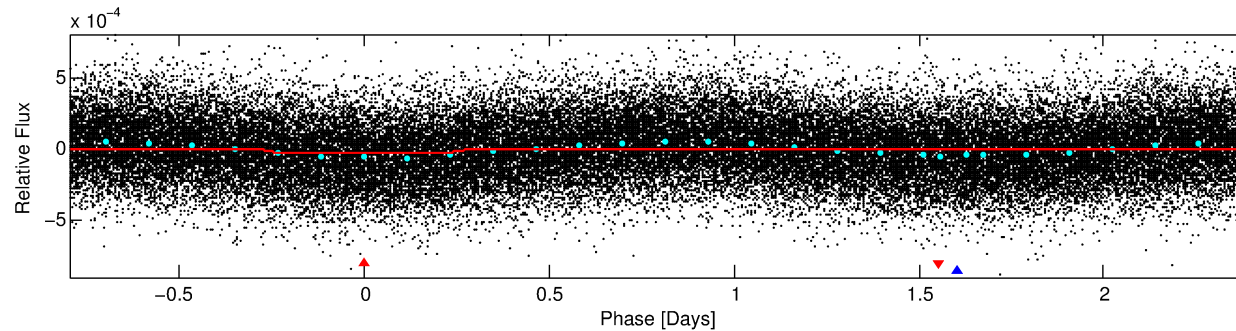
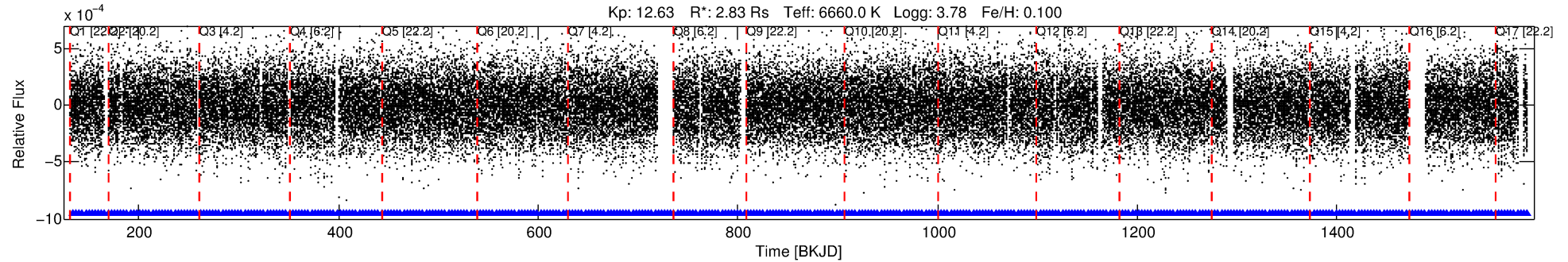
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012017921-01

No Significant Match Found

DV One-Page Summary

KIC: 12017921 Candidate: 1 of 2 Period: 3.186 d



DV Fit Results:

Period = 3.18592 [0.00009] d
Epoch = 134.2287 [0.0184] BKJD
Rp/R* = 0.0064 [0.0006]
a/R* = 1.09 [0.06]
b = 0.97 [0.02]
Seff = 5380.19 [4025.80]
Teq = 2184 [409] K
Rp = 1.97 [0.94] Re
a = 0.0512 [0.0233] AU
Ag = 9.39 [7.21] [1.16σ]
Teffp = 5910 [409] K [6.45σ]

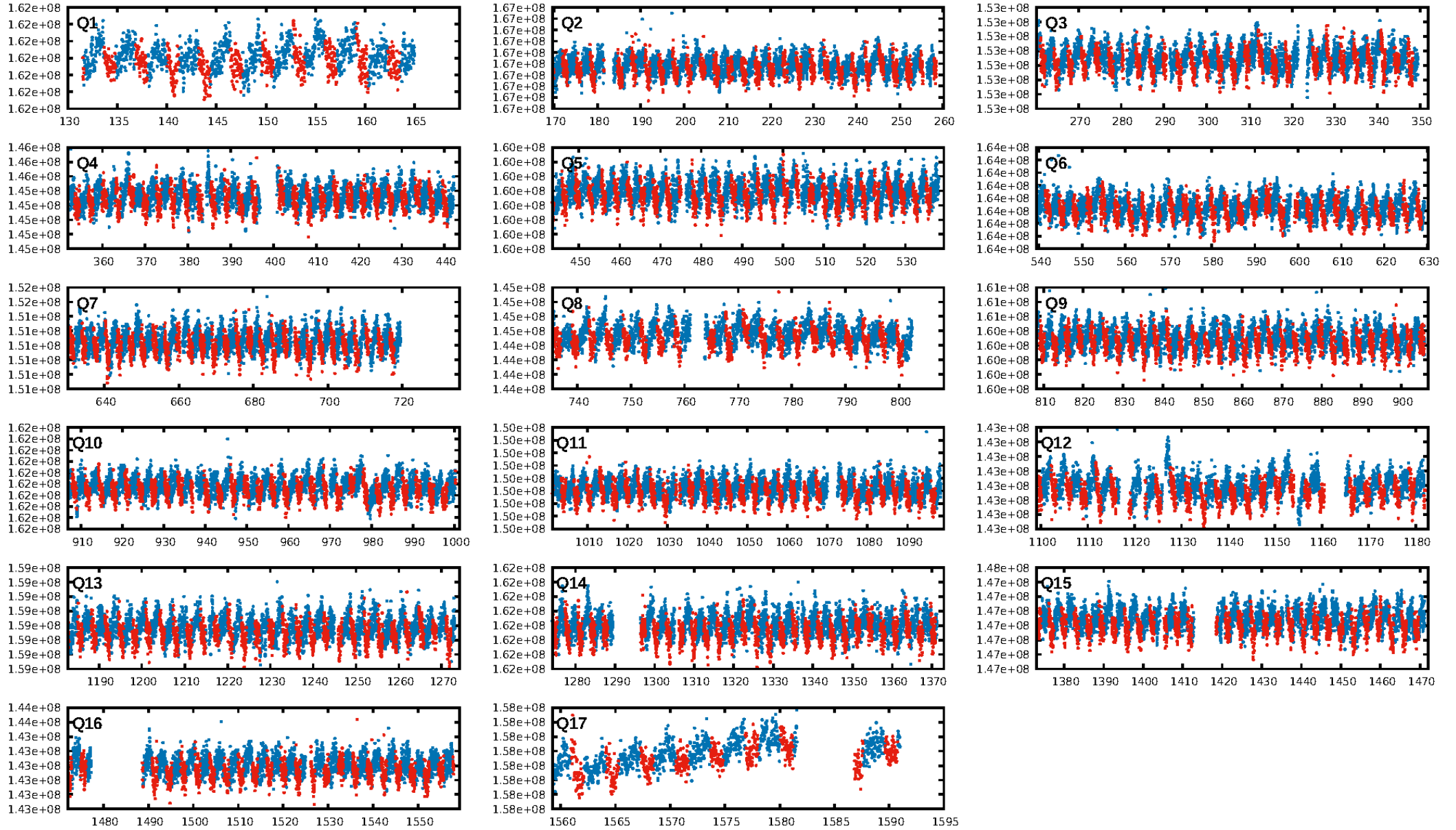
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [406/406]
GhostDiagnostic-chr: 1.917
Centroid-sig: 0.4%
Centroid-so: 1.398 arcsec [2.11σ]
OotOffset-rm: 0.657 arcsec [1.94σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.653 arcsec [1.92σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 1.00 [17/17]

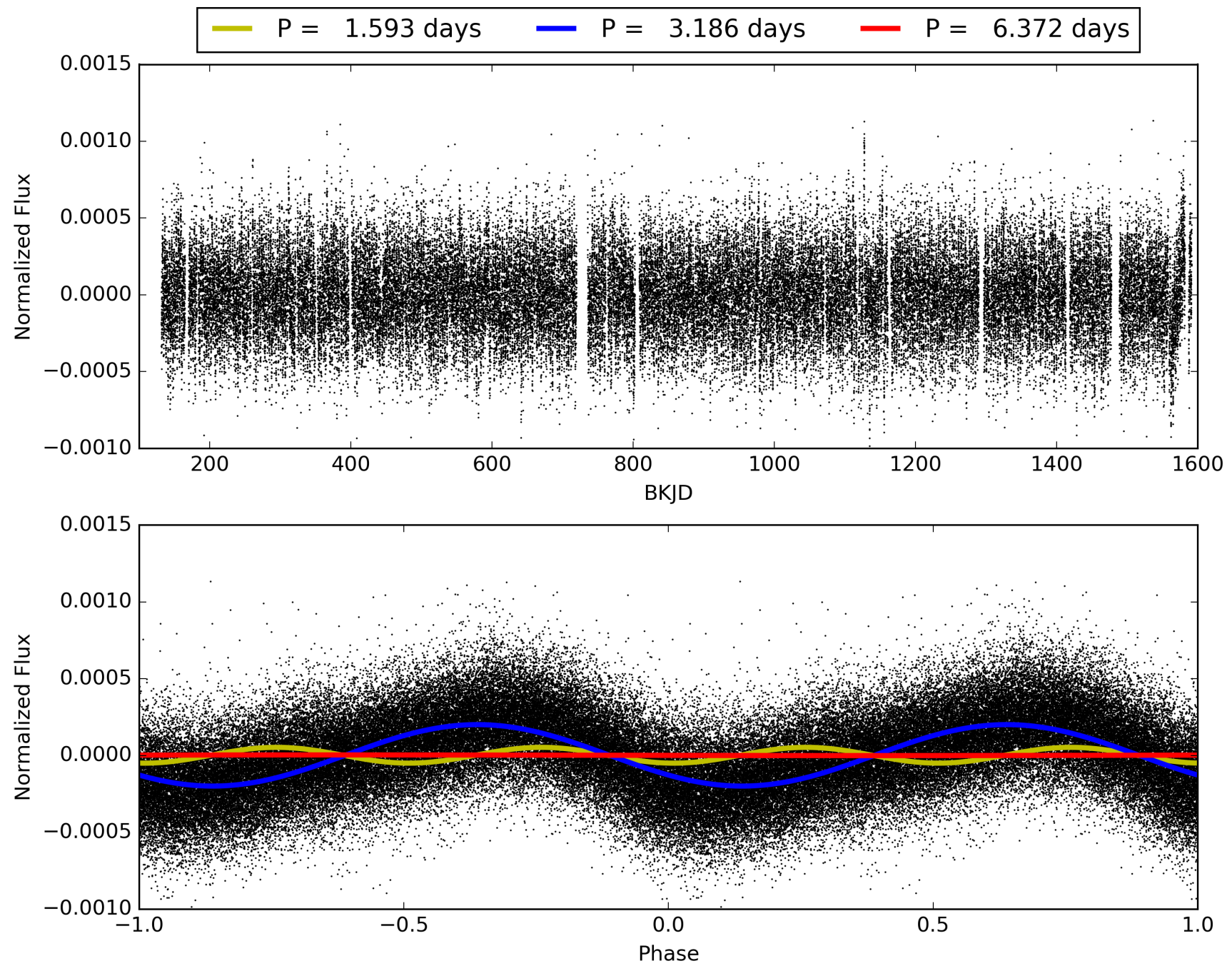
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012017921-01, PDC Light Curves

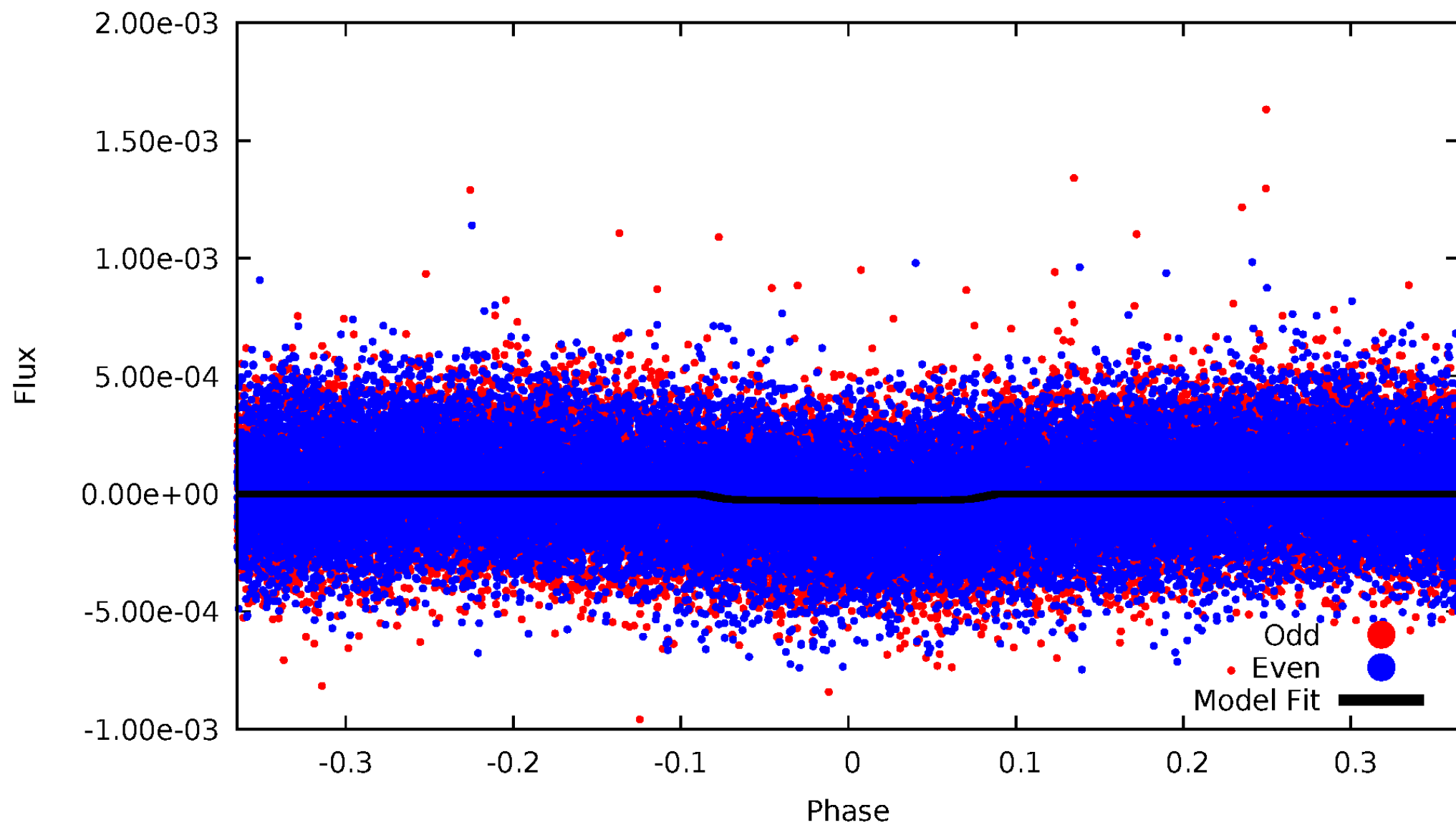


TCE 012017921-01



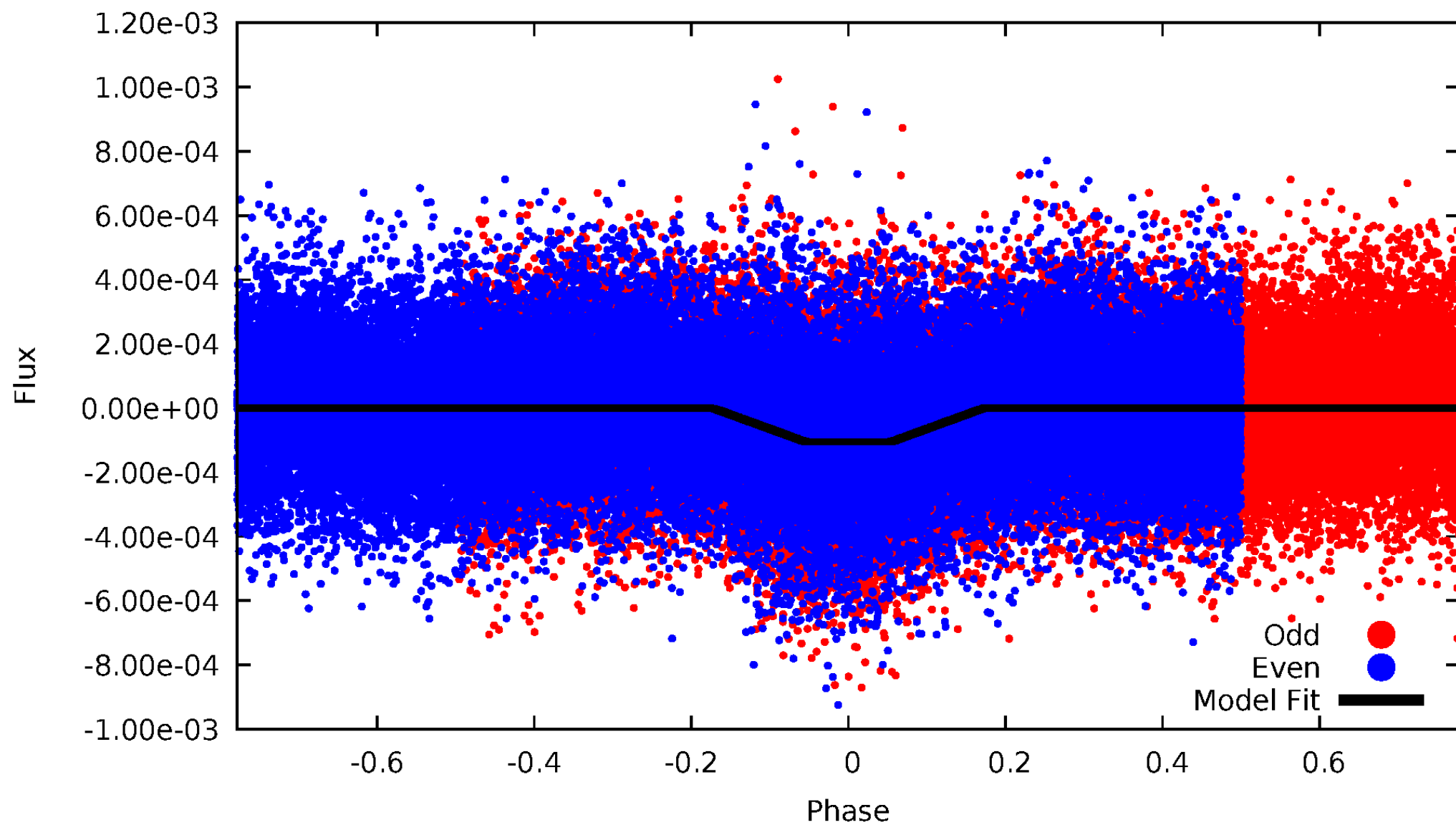
DV Odd/Even

TCE 012017921-01

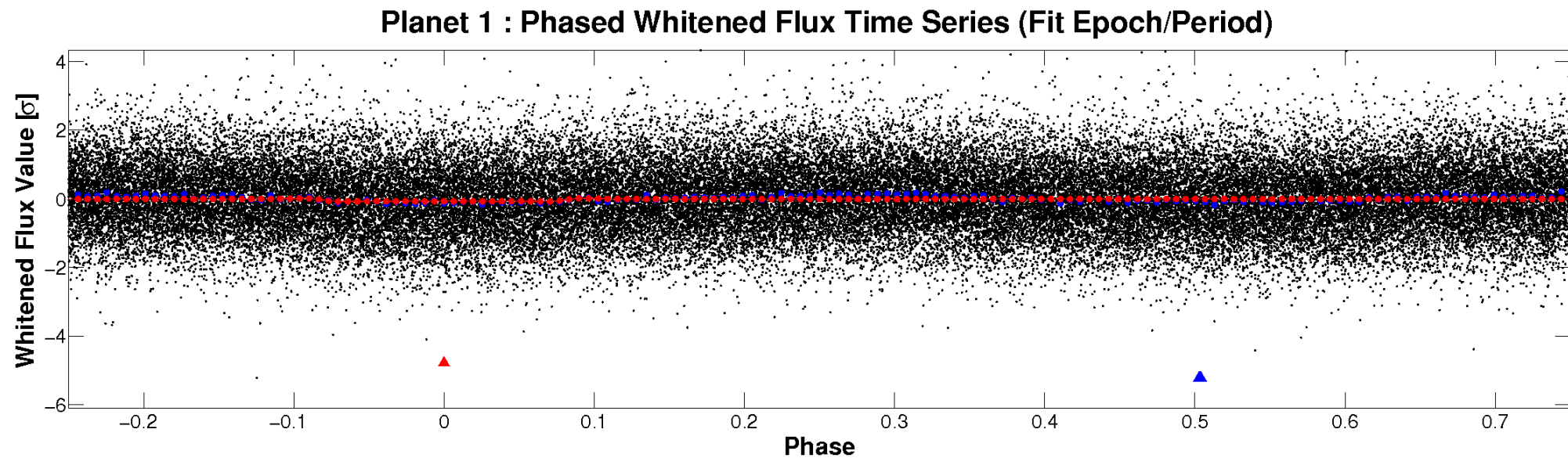
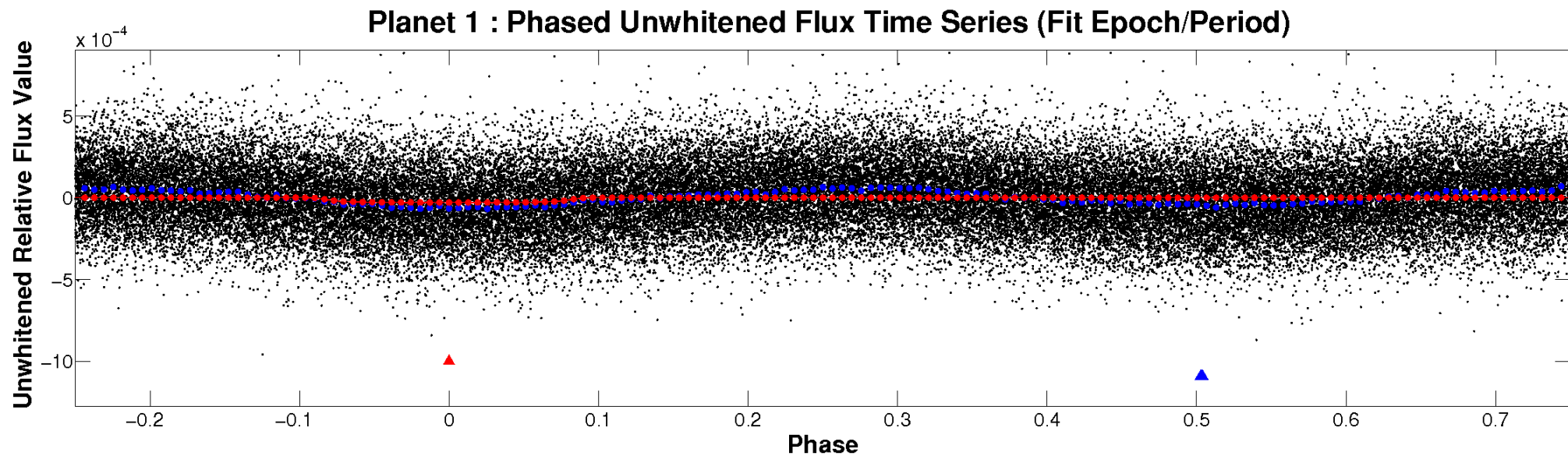


ALT Odd/Even

TCE 012017921-01

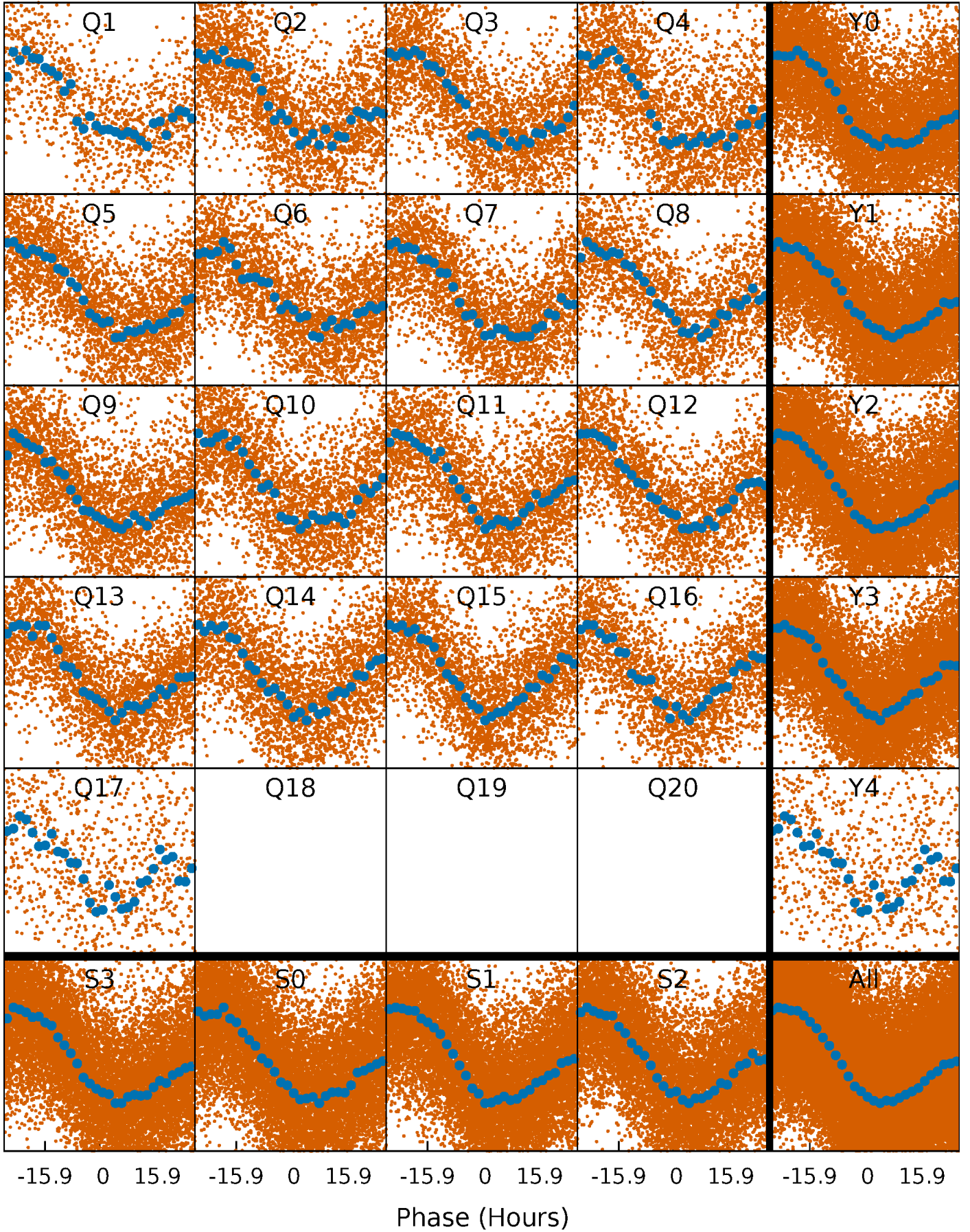


Non-Whitened Vs. Whitened Light Curve



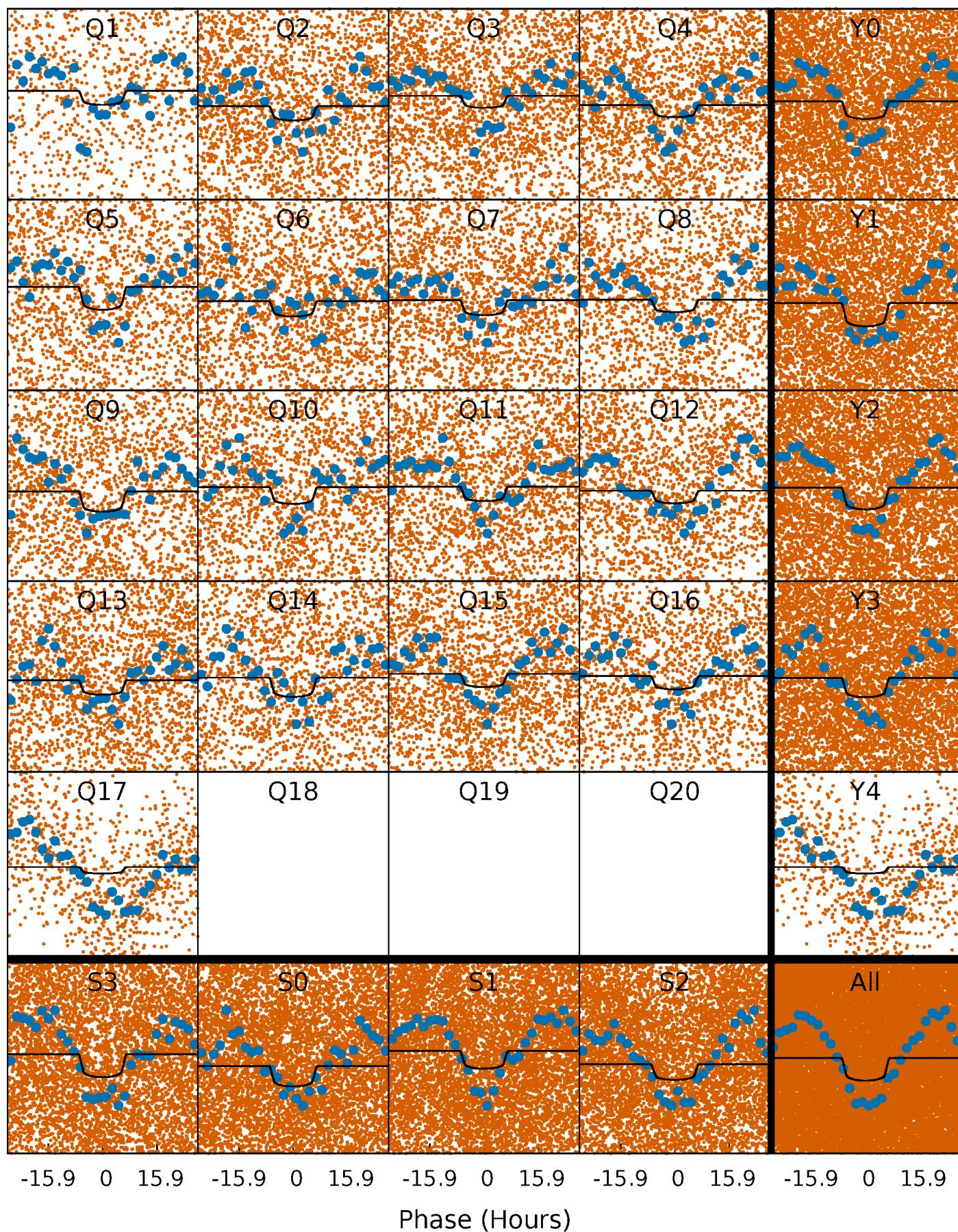
PDC Quarter-Phased Transit Curves

TCE 012017921-01 P= 3.185920 Days $T_0=134.228737$ (BKJD)



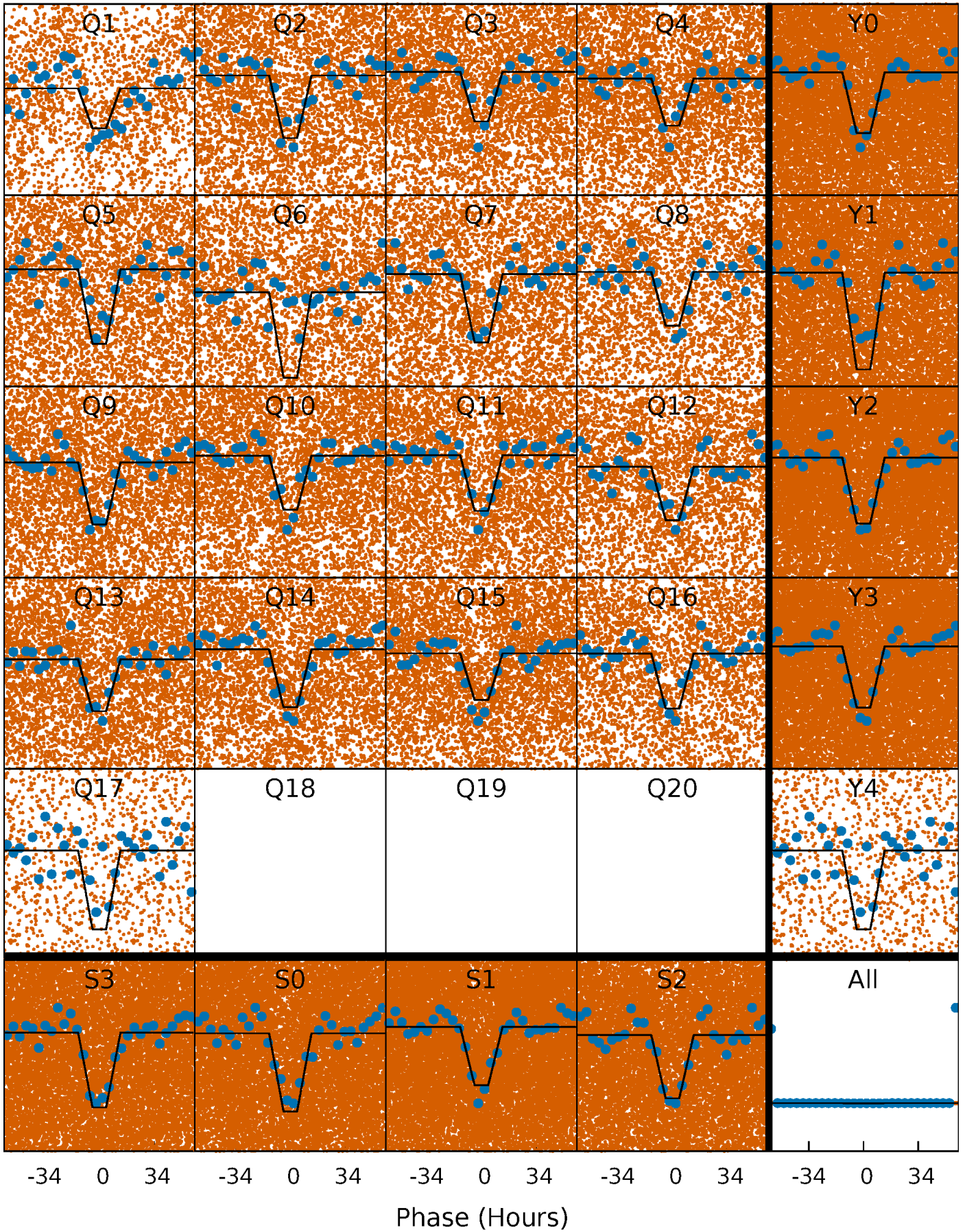
DV Quarter-Phased Transit Curves

TCE 012017921-01 P= 3.185920 Days $T_0=134.228737$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

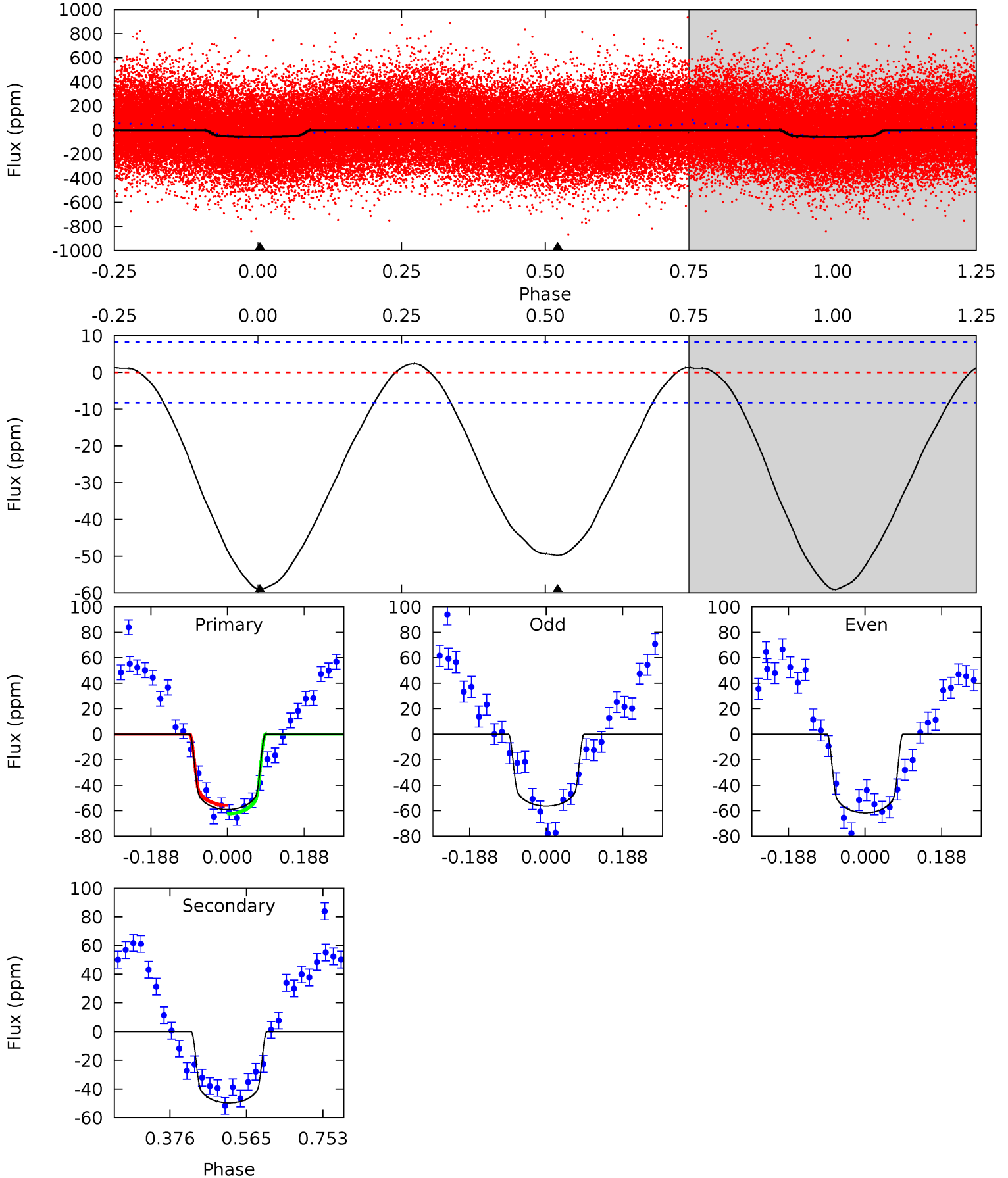
TCE 012017921-01 P= 3.186116 Days $T_0=134.228890$ (BKJD)



DV Model-Shift Uniqueness Test

012017921-01, P = 3.185920 Days, E = 131.042817 Days

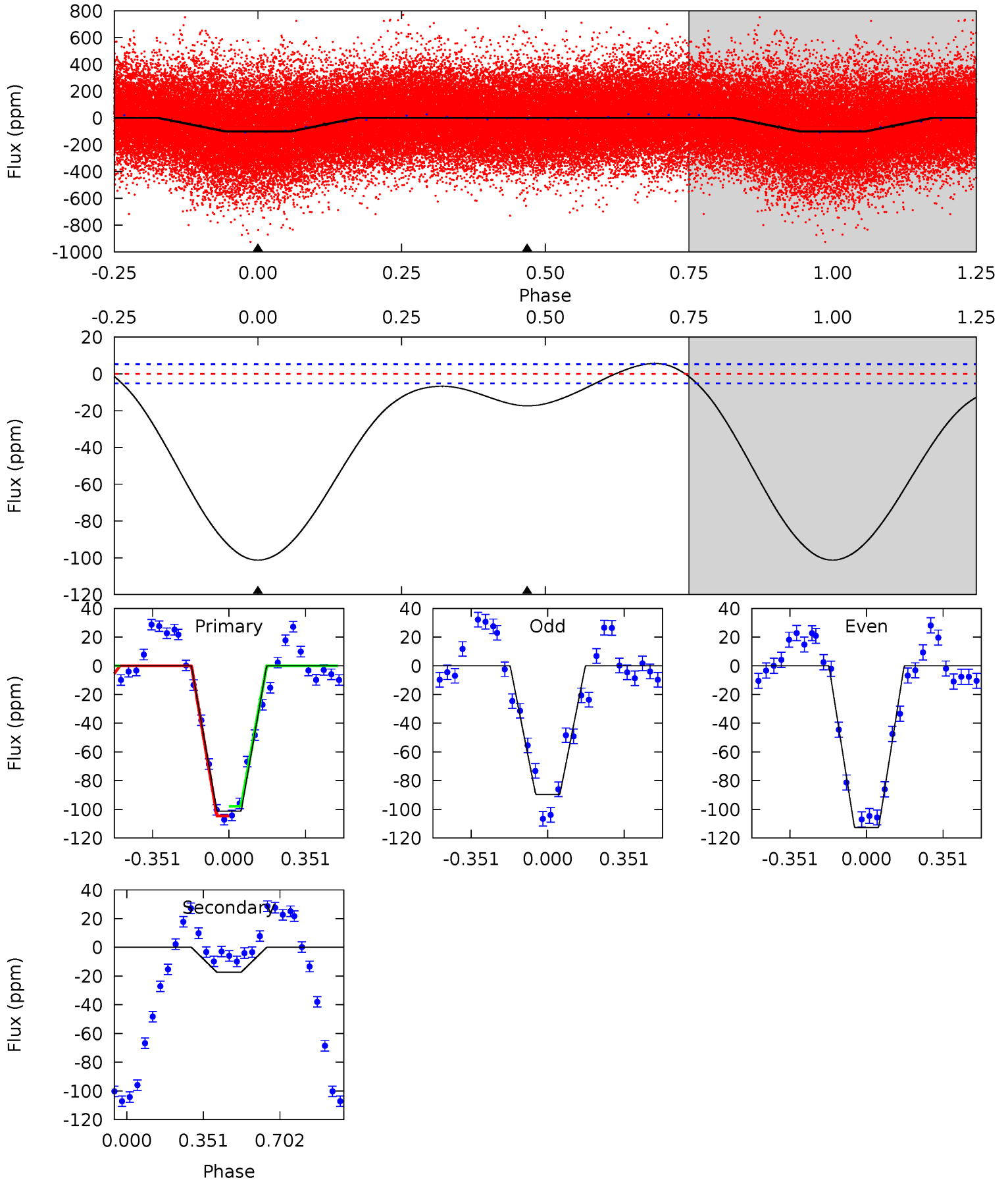
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.7	26.7	0	0	4.43	1.32	1.66	31.7	31.7	26.7	26.7	1.44	0.88	0.04	1.82



Alt Model-Shift Uniqueness Test

012017921-01, P = 3.186116 Days, E = 131.042774 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
82.9	14.2	0	0	4.29	0.93	6.27	82.9	82.9	14.2	14.2	9.40	1.11	0.05	2.75



Stellar Parameters For KIC 012017921

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6660^{+185}_{-255}	$3.781^{+0.432}_{-0.108}$	$0.100^{+0.200}_{-0.300}$	$2.828^{+0.565}_{-1.319}$	$1.763^{+0.164}_{-0.492}$	$0.110^{+0.429}_{-0.039}$
	+3%/-4%	+11%/-3%	+200%/-300%	+20%/-47%	+9%/-28%	+391%/-36%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 012017921-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-50 ± 2	$1.84^{+0.36}_{-0.49}$	2960^{+220}_{-363}	6985^{+440}_{-429}	21^{+16}_{-6}
Alt.	-17 ± 1	$2.96^{+0.51}_{-0.73}$	2955^{+231}_{-352}	4346^{+164}_{-176}	$2.847^{+1.808}_{-0.765}$

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

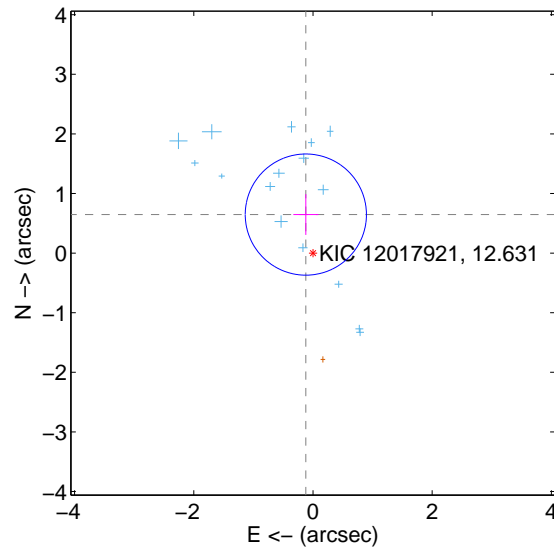
Supplemental centroid analysis for 012017921-01. Kepler magnitude: 12.63. Transit SNR 7.28

There are 16 quarters with good PRF difference image offsets

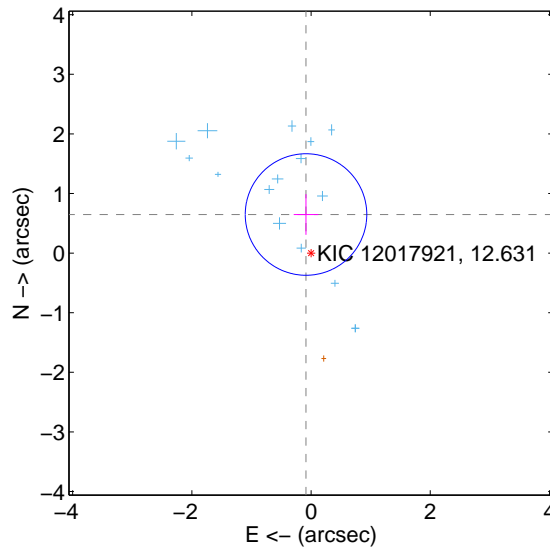
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.657 ± 0.339	1.94	0.120 ± 0.210	0.646 ± 0.342
PRF-fit source offset from KIC position	0.653 ± 0.340	1.92	0.085 ± 0.207	0.647 ± 0.342
photometric centroid source offset	1.40 ± 0.66	2.11	1.13 ± 0.62	-0.83 ± 0.73

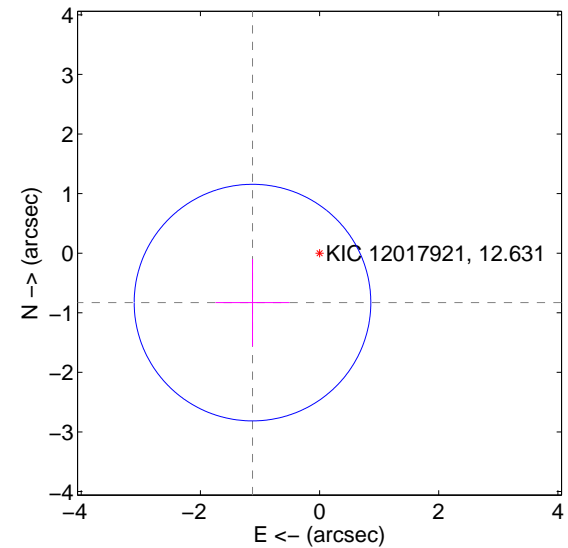
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

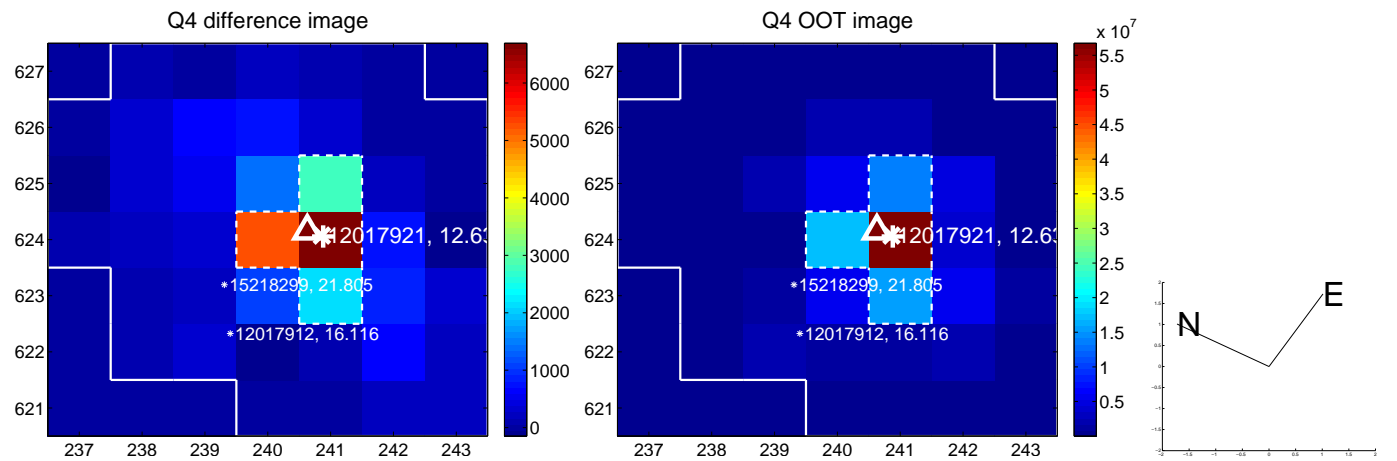
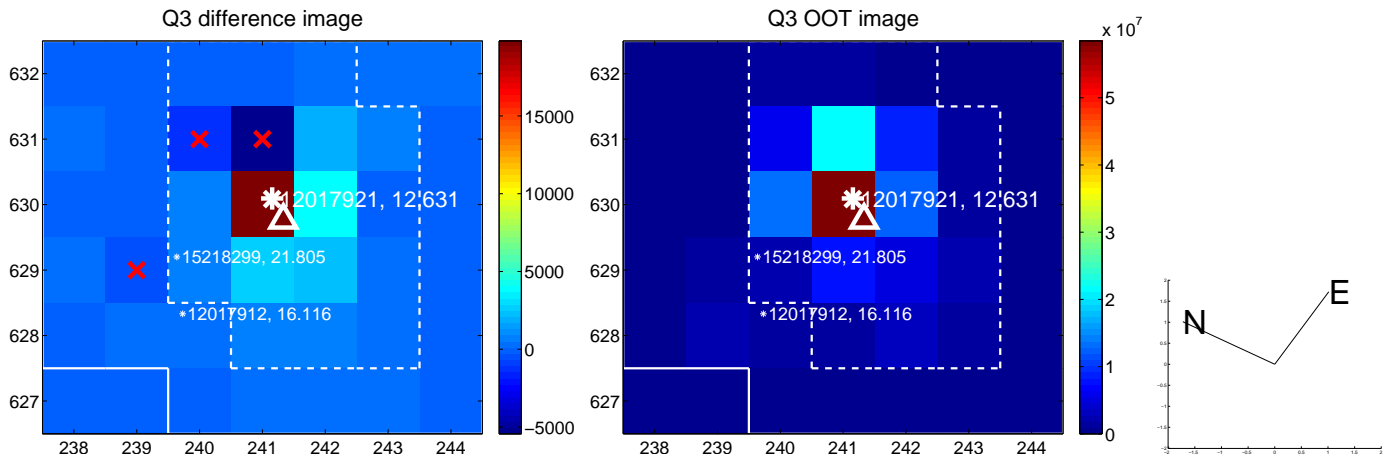
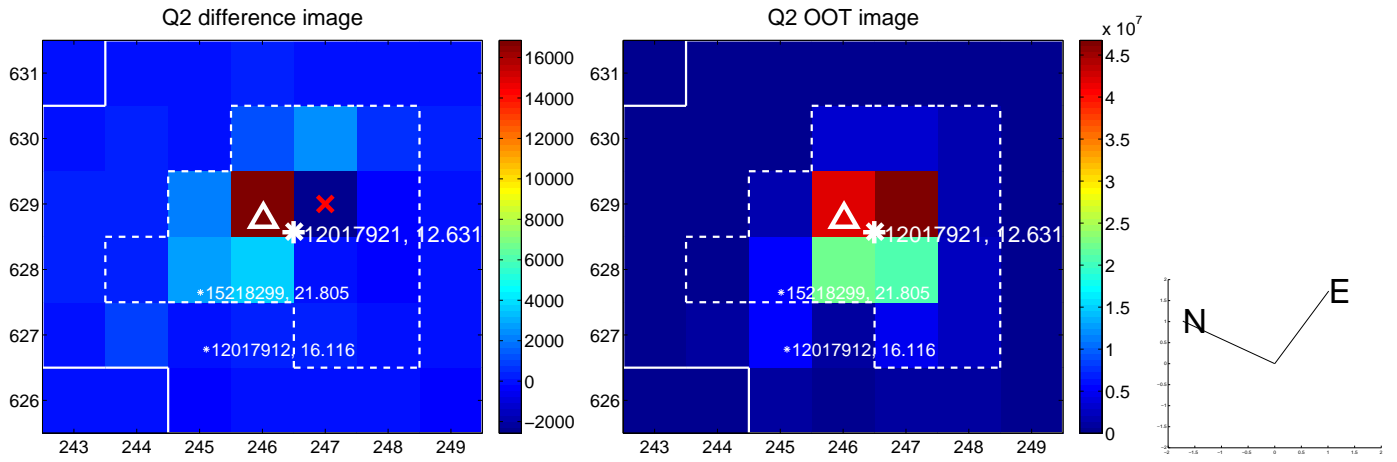
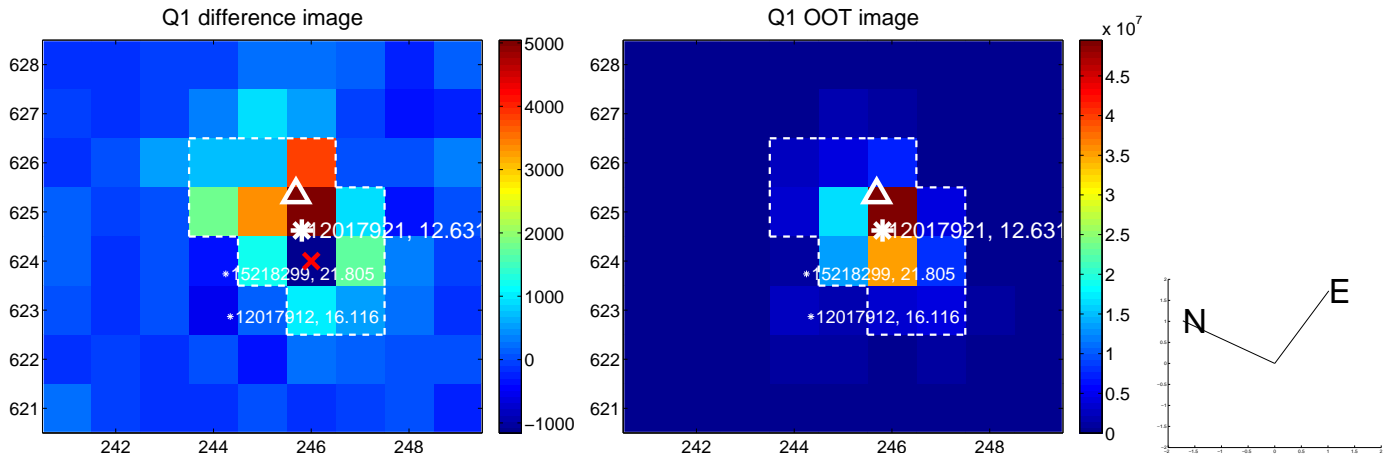


offset from photometric centroids

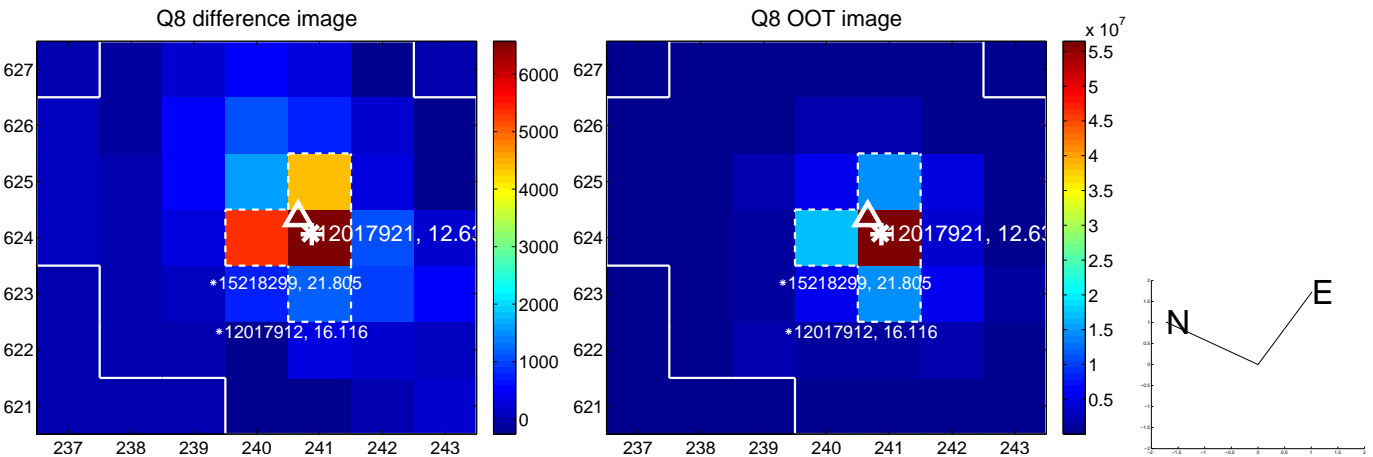
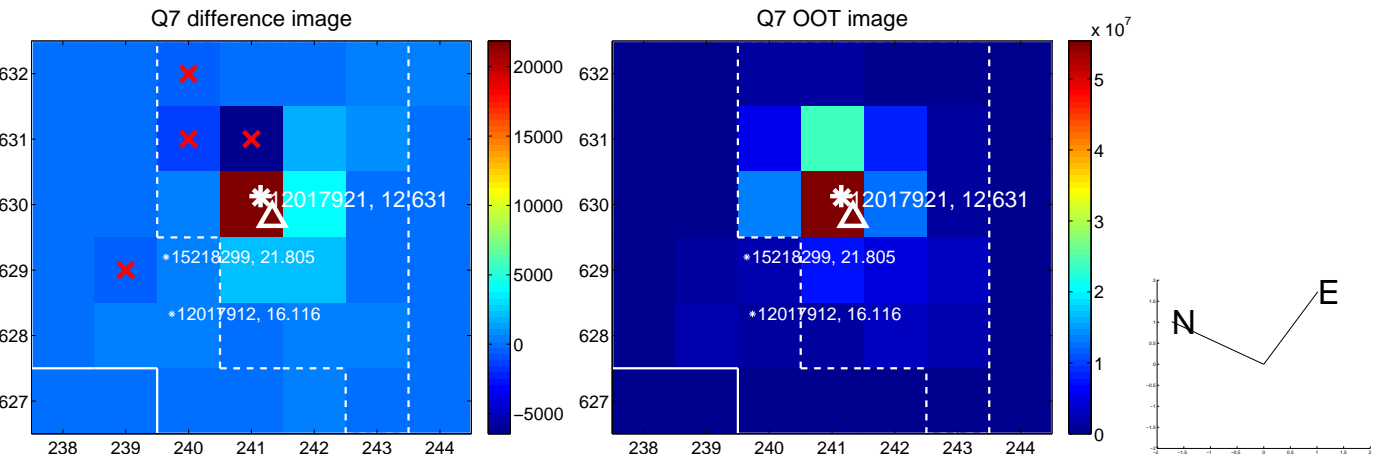
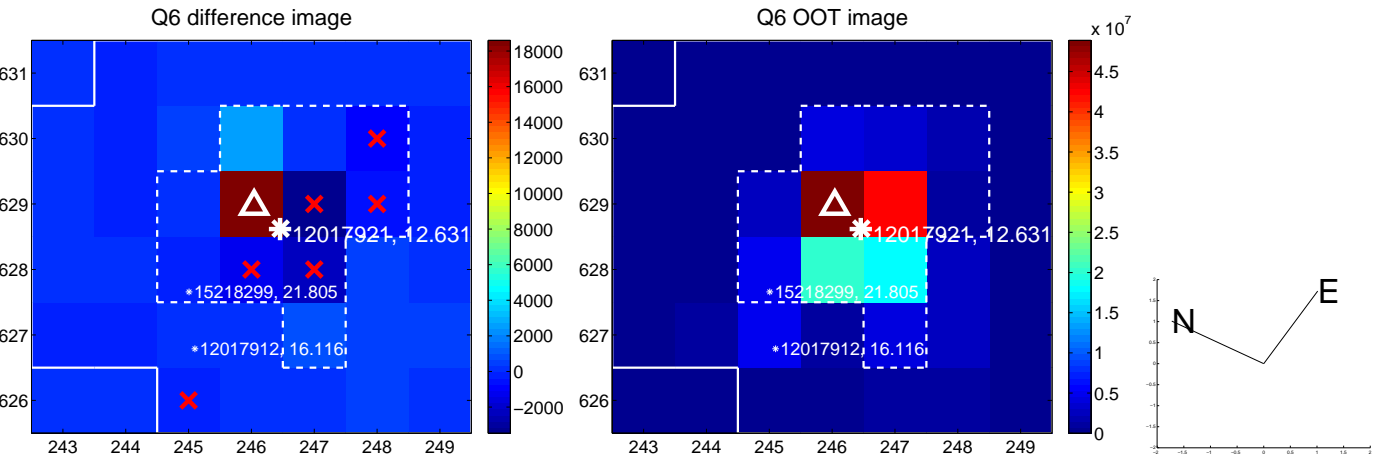
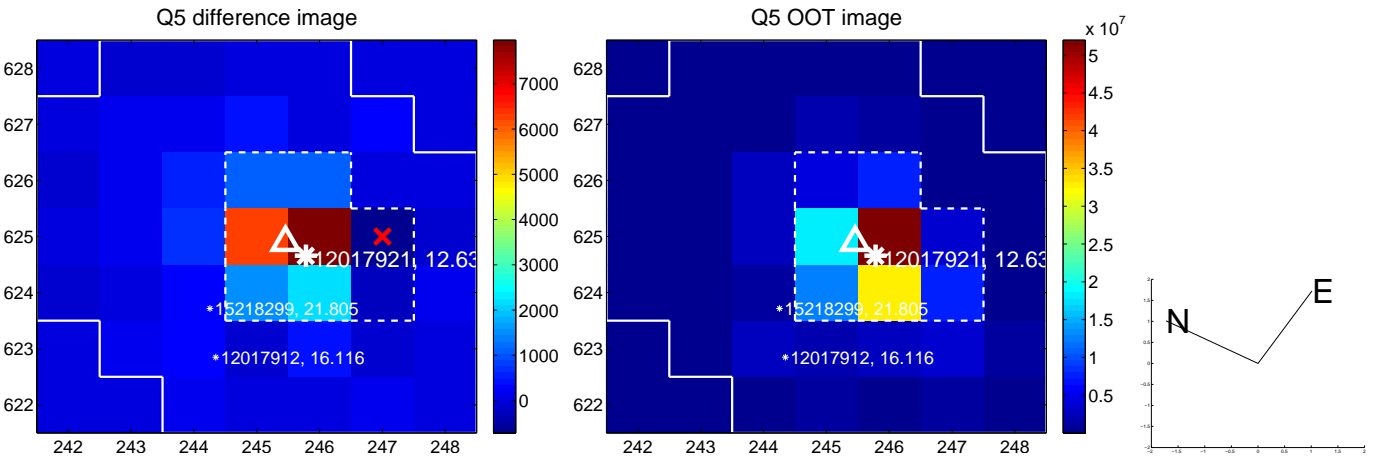


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

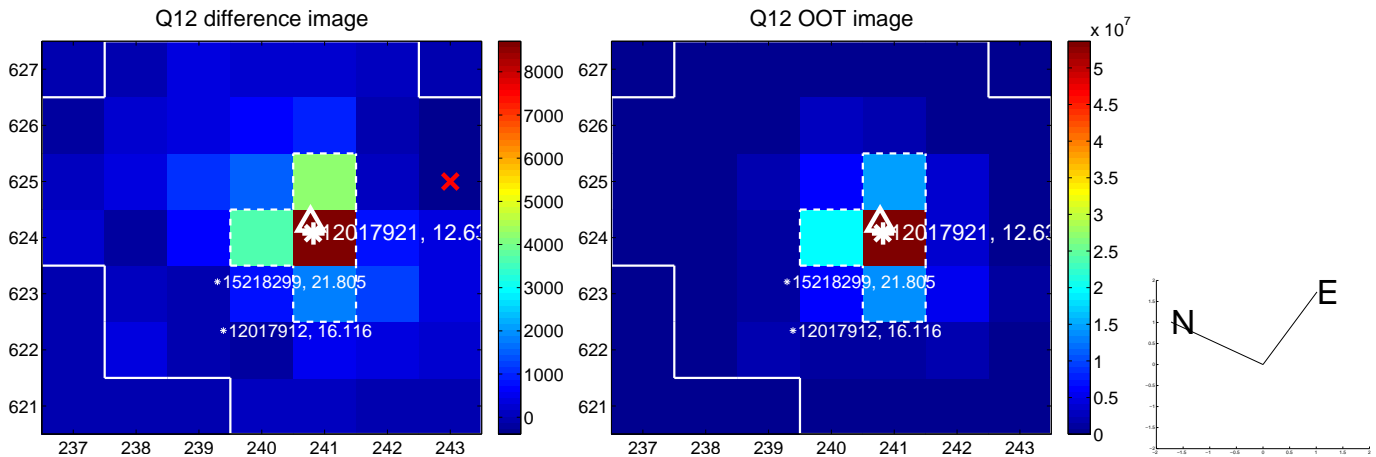
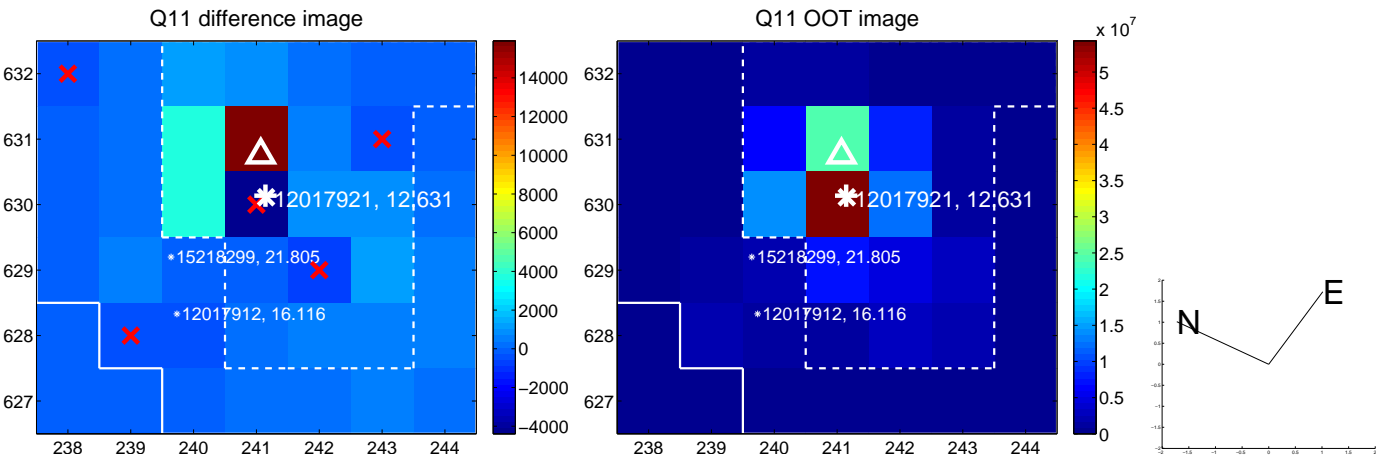
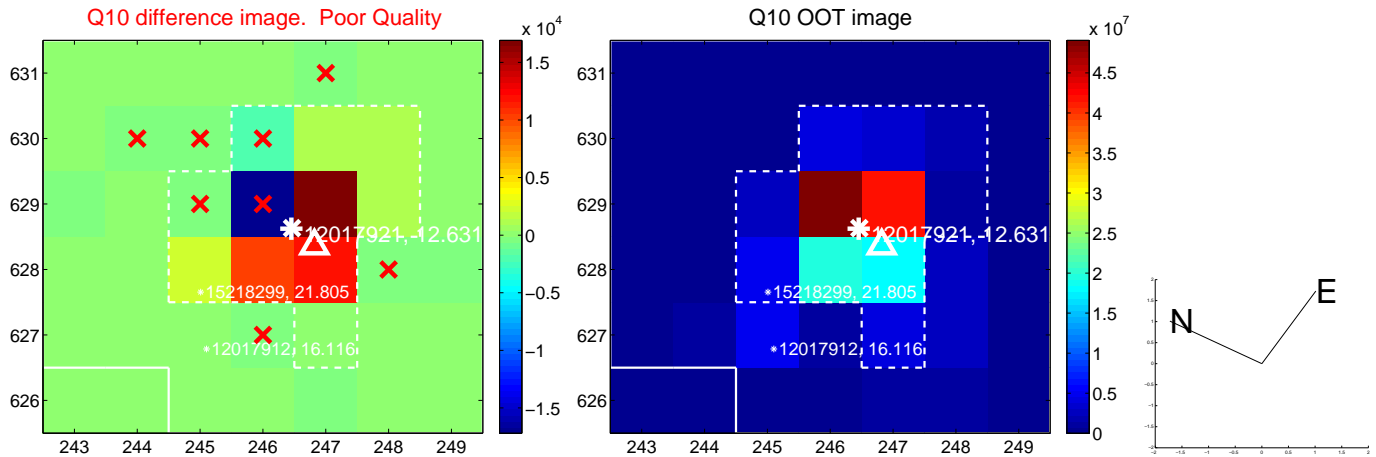
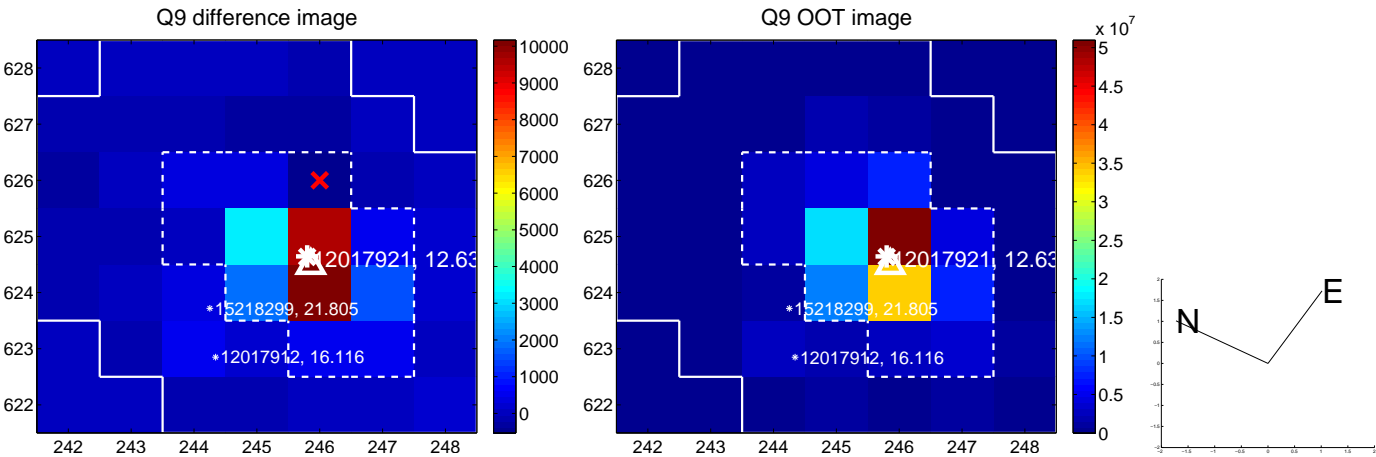
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



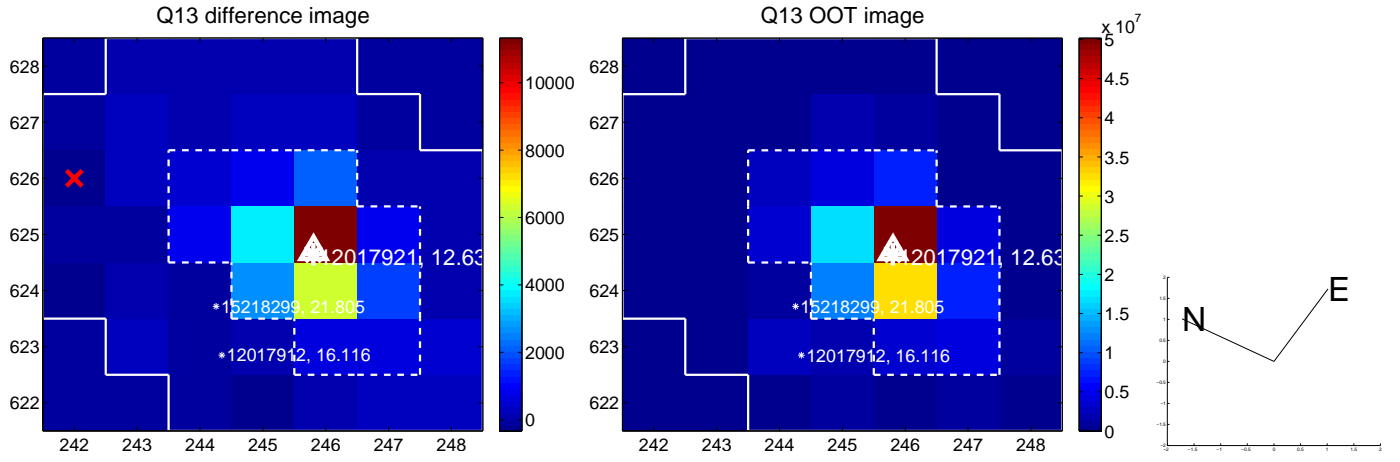
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



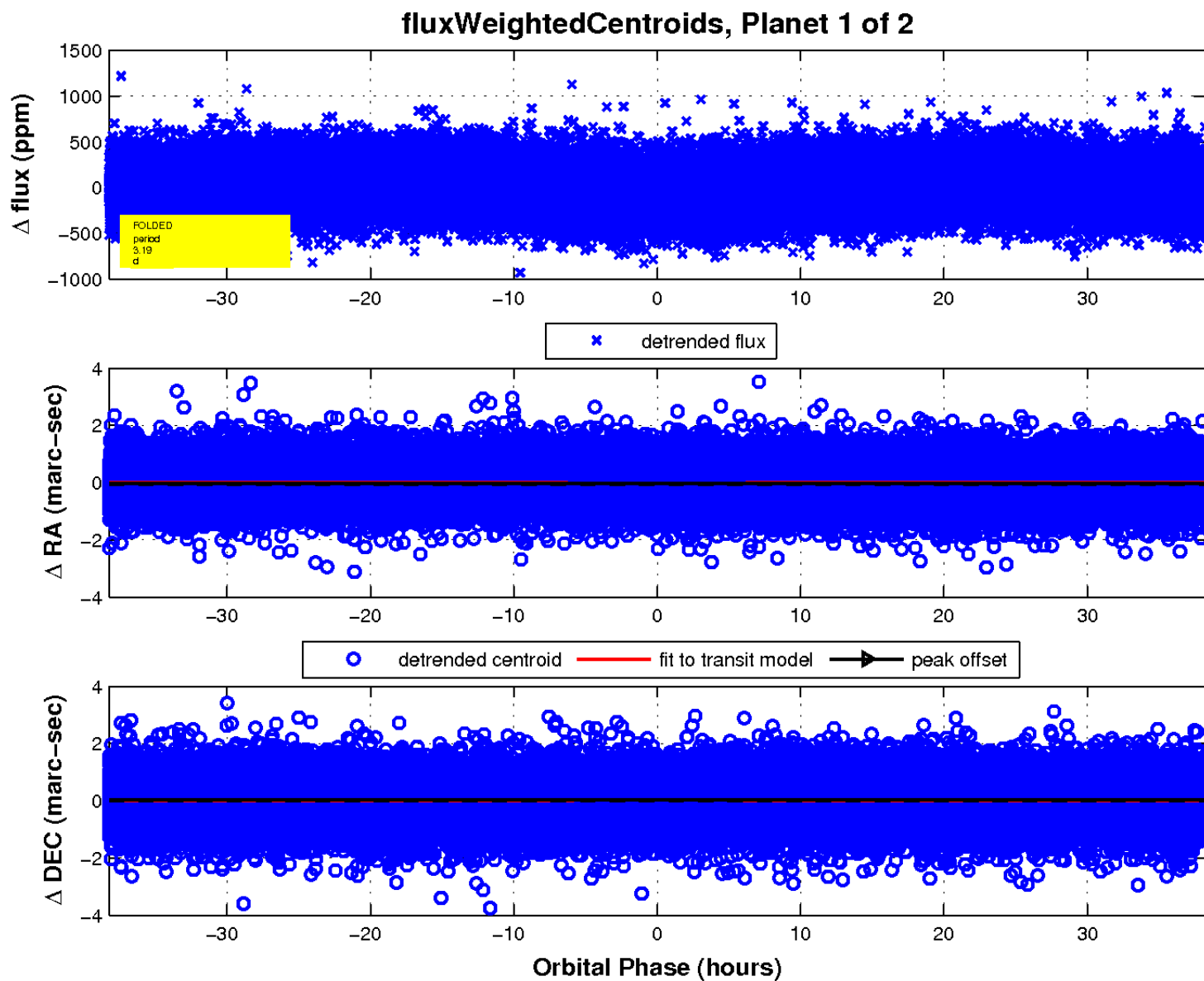
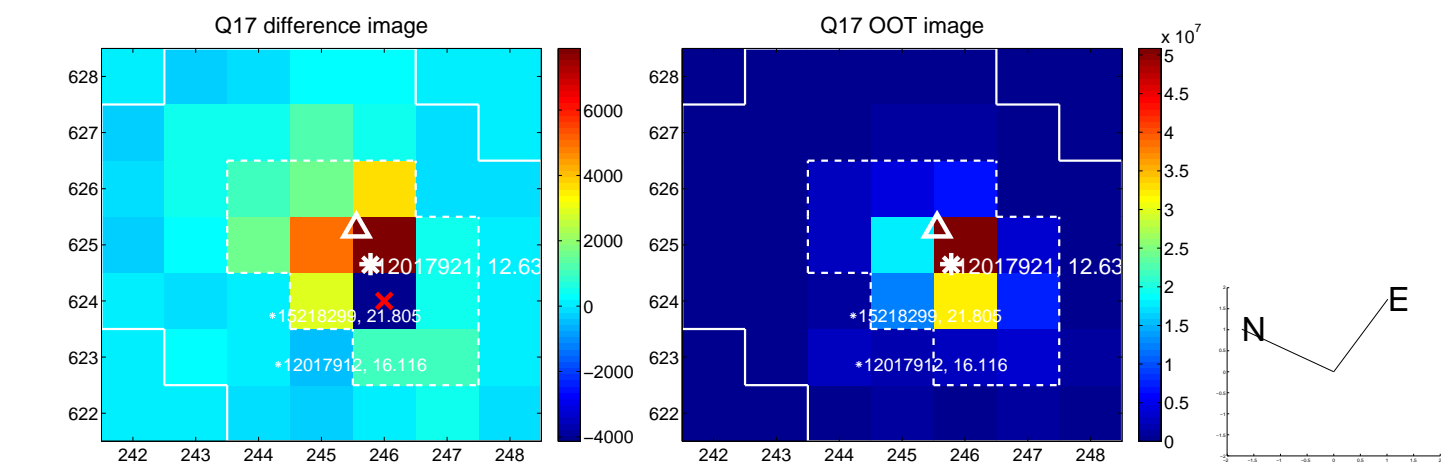
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

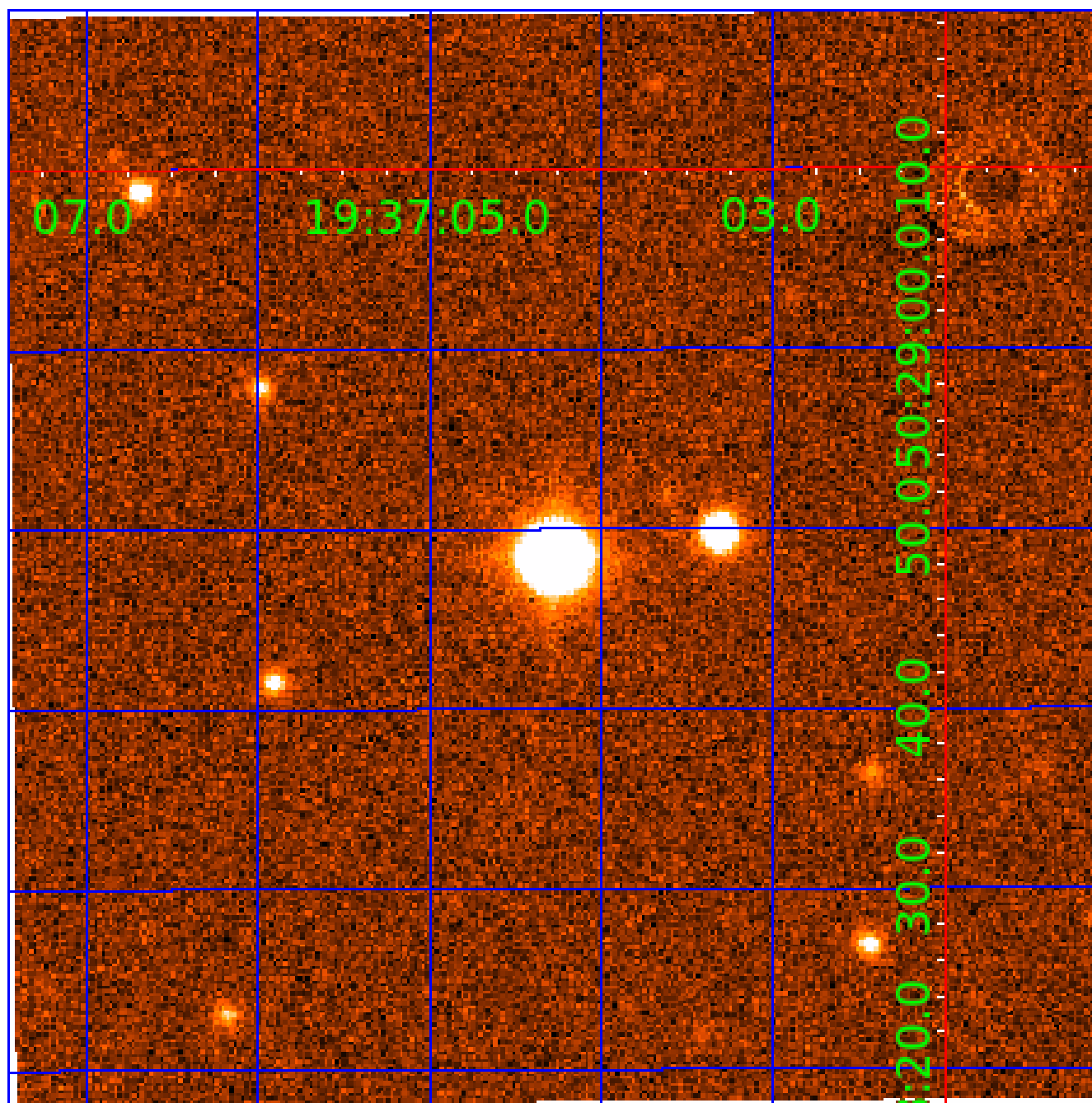


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012017921

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})
012017921-01	OBS	No	3.185920	134.228737	29.6	13.948	9.4	7.3	2.83	6660	1.97	5380.19
012017921-02	OBS	No	3.185913	132.648359	43.0	21.997	12.4	15.0	2.83	6660	1.94	5380.21

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012017921-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
012017921-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

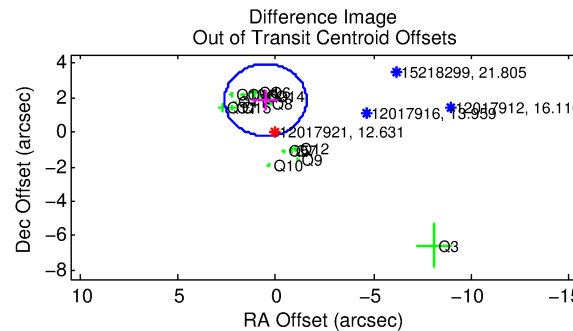
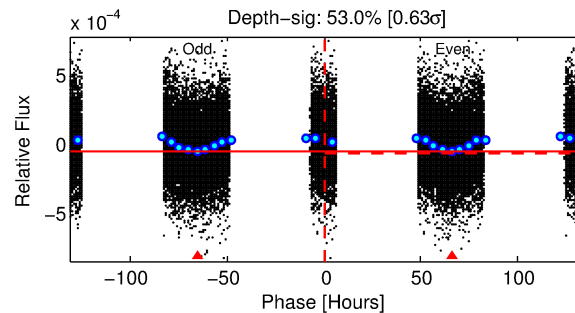
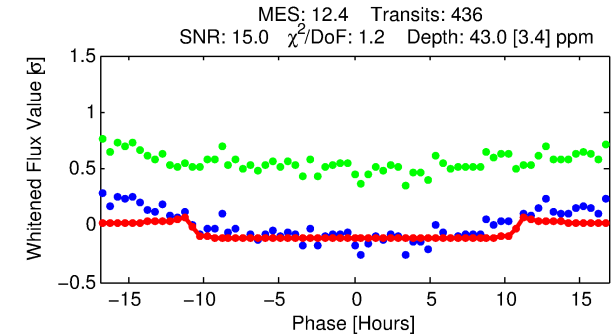
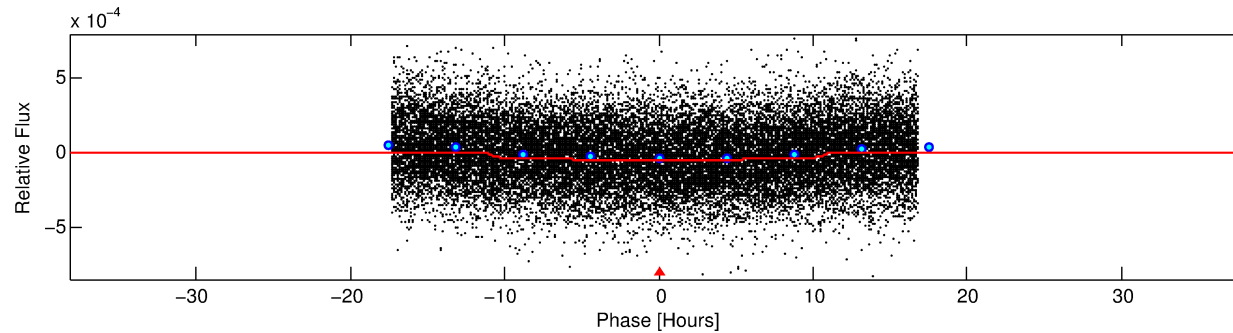
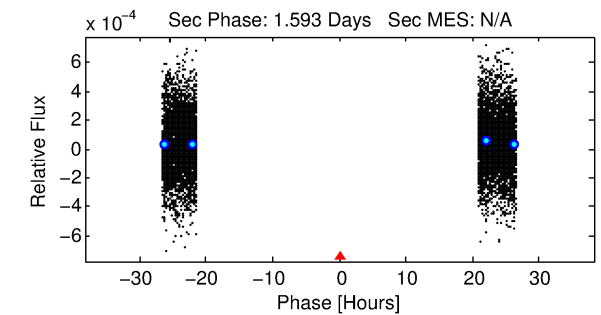
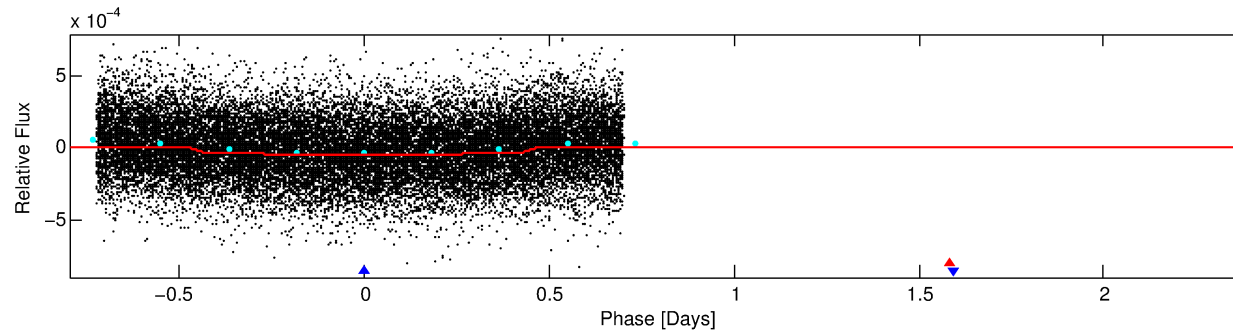
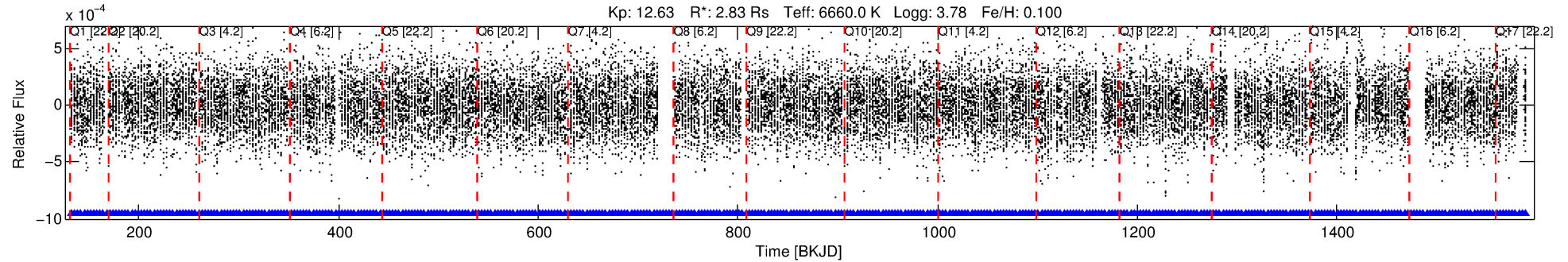
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012017921-02

No Significant Match Found

DV One-Page Summary

KIC: 12017921 Candidate: 2 of 2 Period: 3.186 d



DV Fit Results:

Period = 3.18591 [0.00004] d
Epoch = 132.6484 [0.0069] BKJD
Rp/R* = 0.0063 [0.0018]
a/R* = 1.19 [0.57]
b = 0.60 [1.76]
Seff = 5380.21 [4025.82]
Teq = 2184 [409] K
Rp = 1.94 [1.07] Re
a = 0.0512 [0.0233] AU

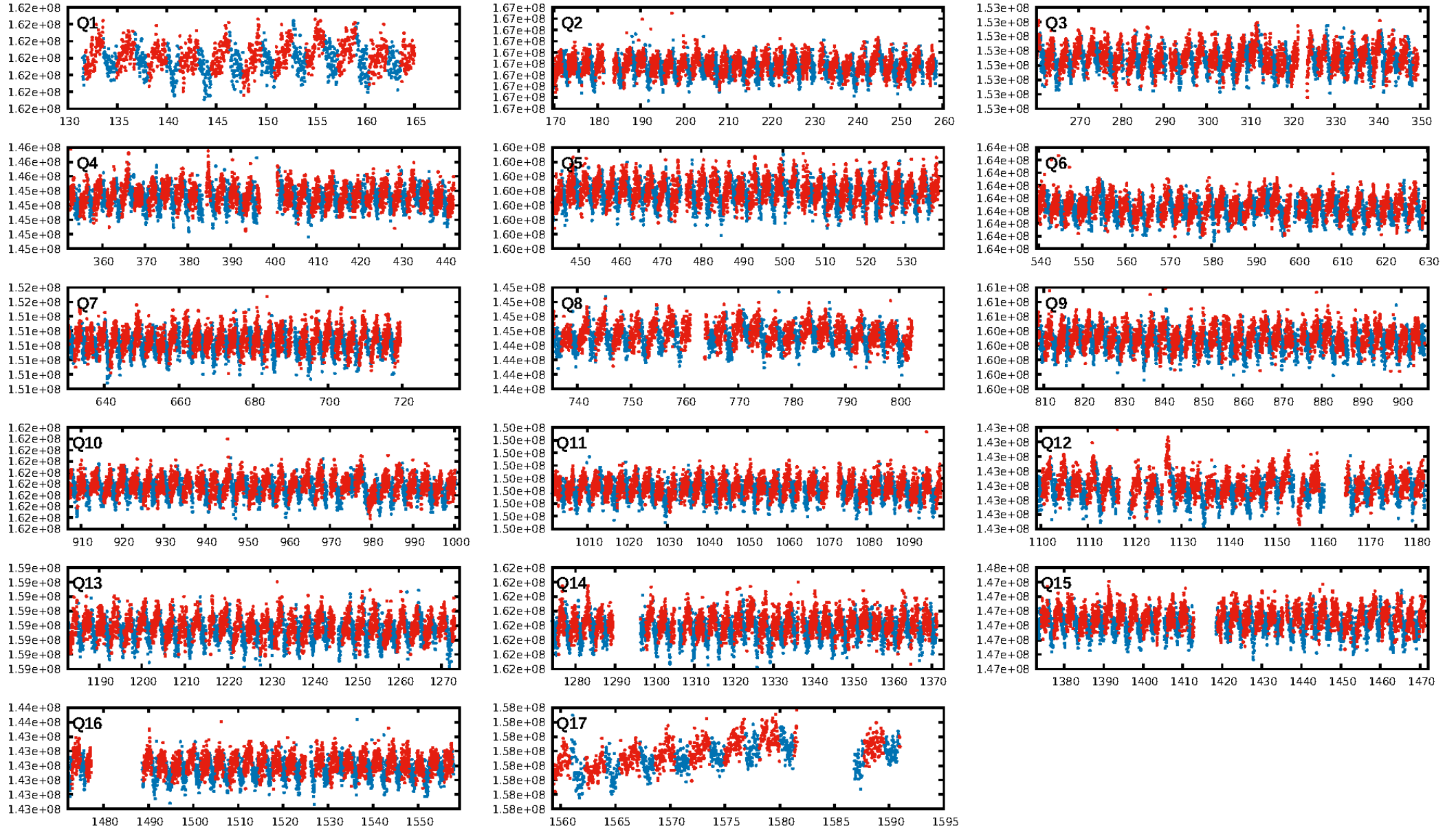
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [417/417]
GhostDiagnostic-chr: 3.953
Centroid-sig: 65.5%
Centroid-so: 0.539 arcsec [1.57σ]
OotOffset-rm: 1.926 arcsec [2.76σ]
KicOffset-rm: 1.948 arcsec [3.06σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.00 [0/17]
DiffImageOverlap-fno: 0.00 [0/17]

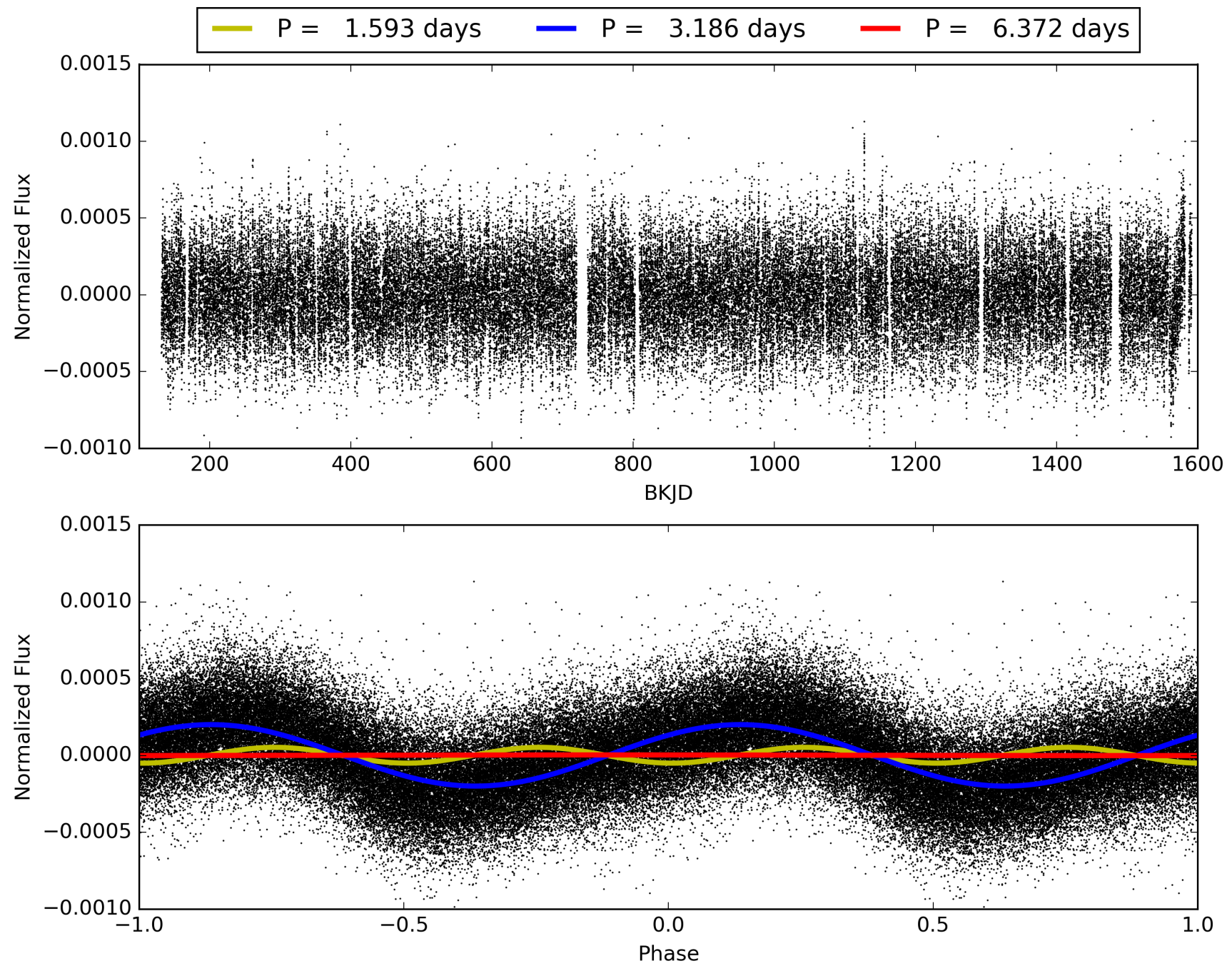
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:50:51 Z

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

TCE 012017921-02, PDC Light Curves

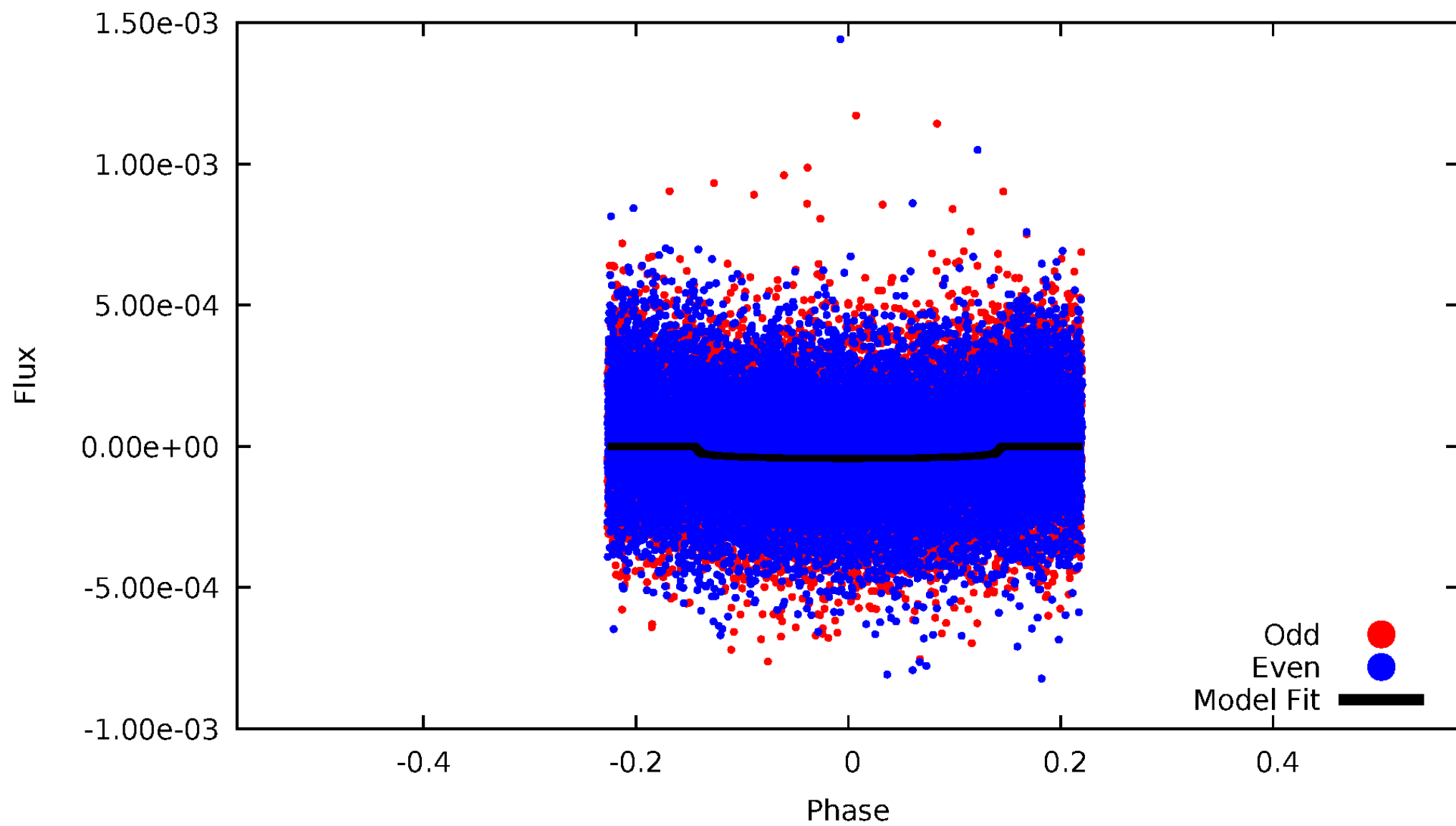


TCE 012017921-02



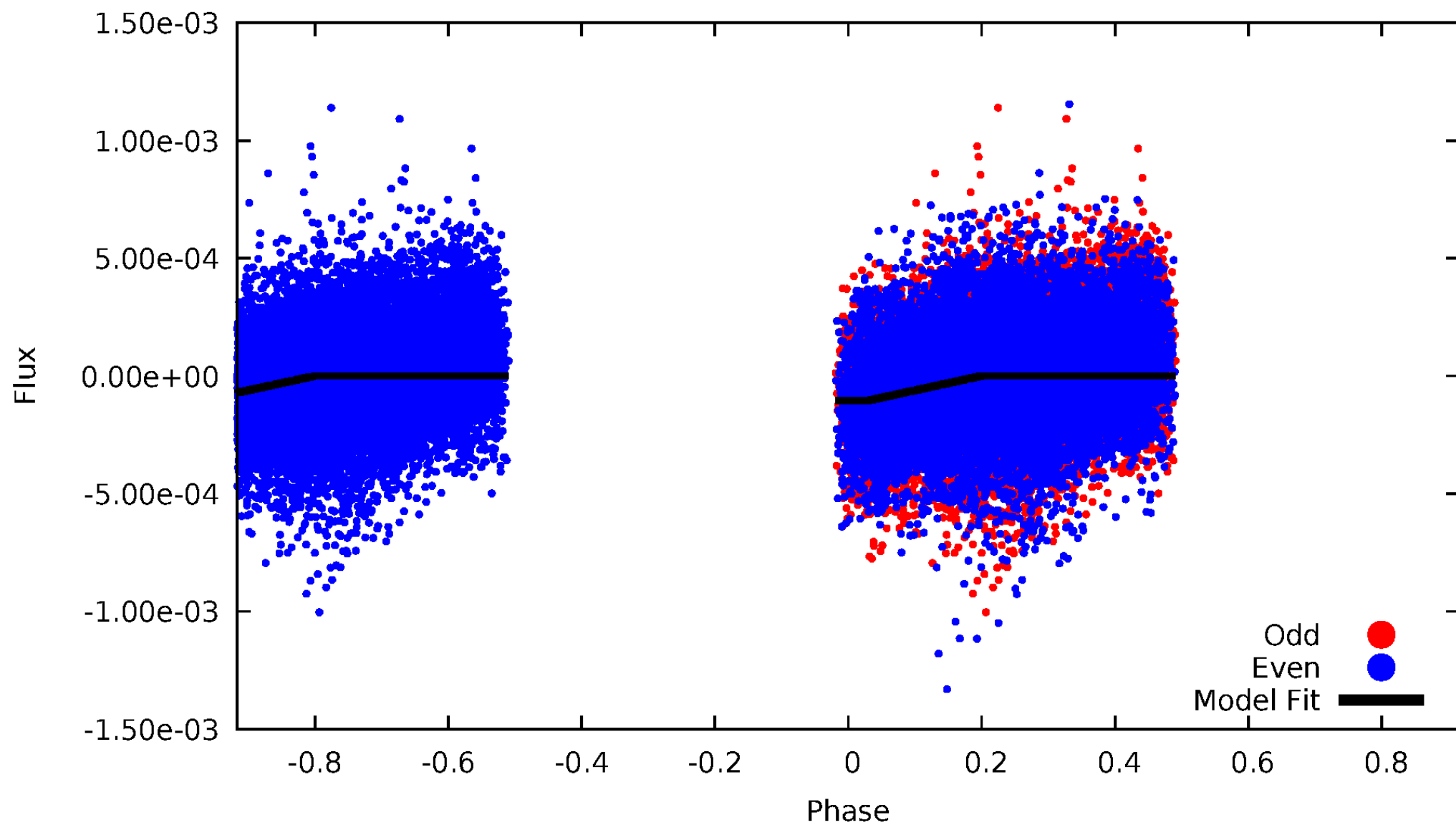
DV Odd/Even

TCE 012017921-02



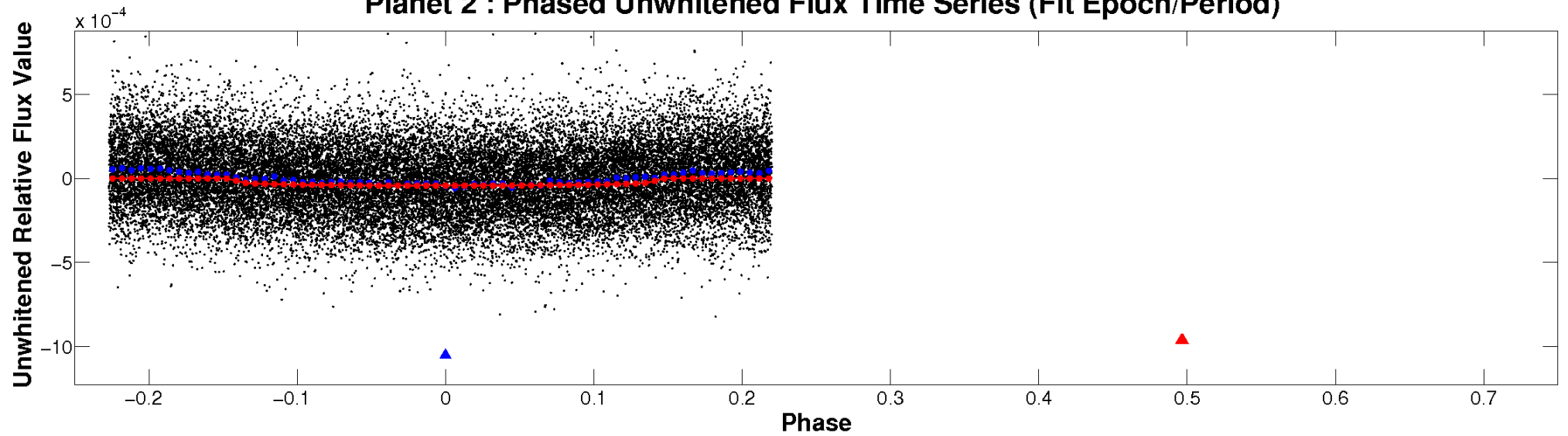
ALT Odd/Even

TCE 012017921-02

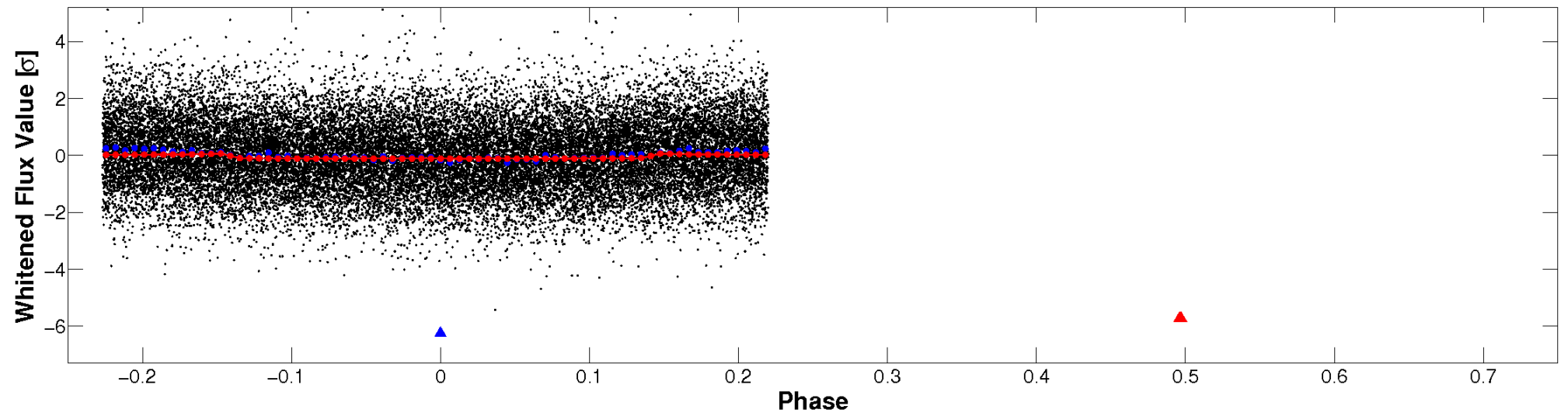


Non-Whitened Vs. Whitened Light Curve

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

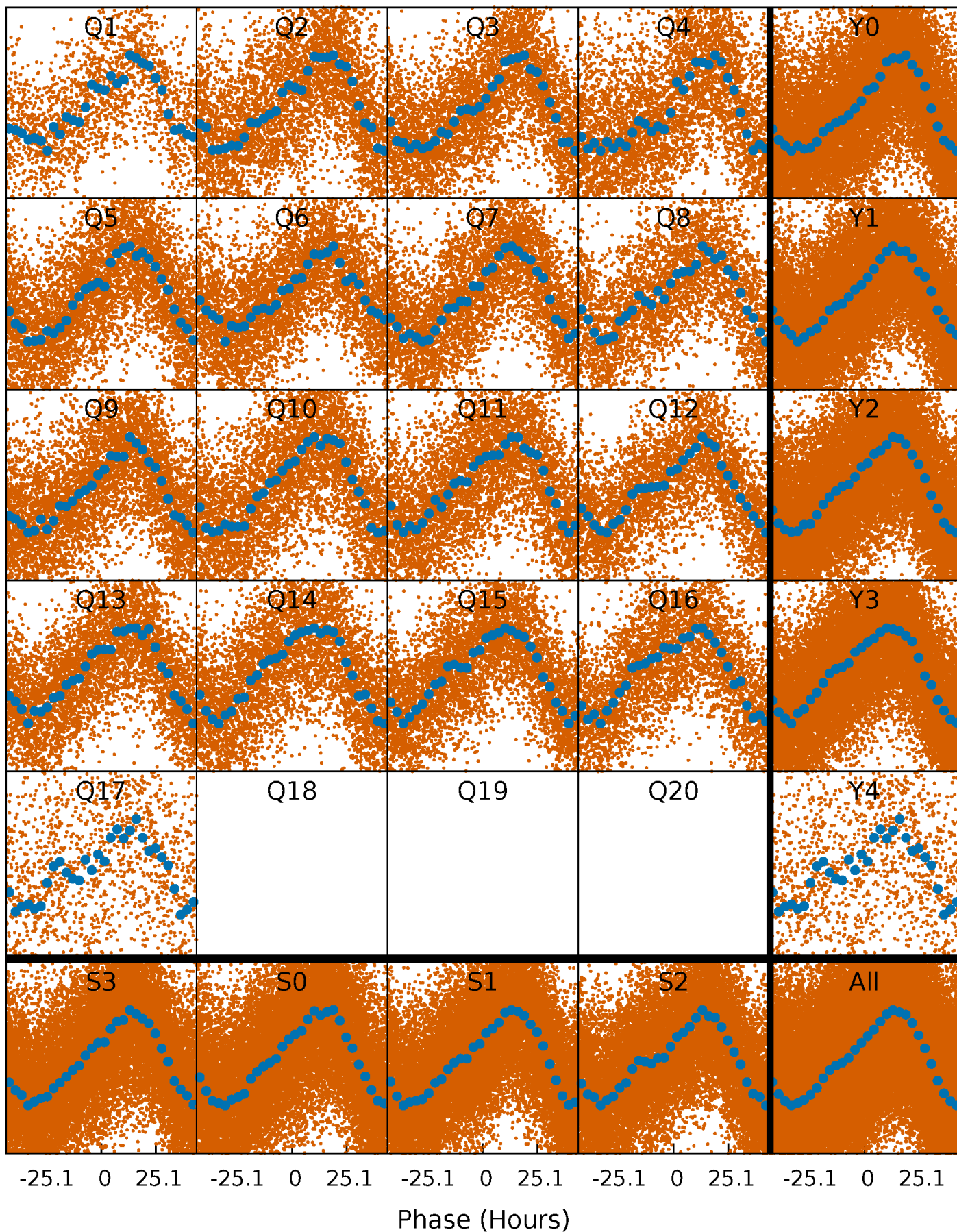


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



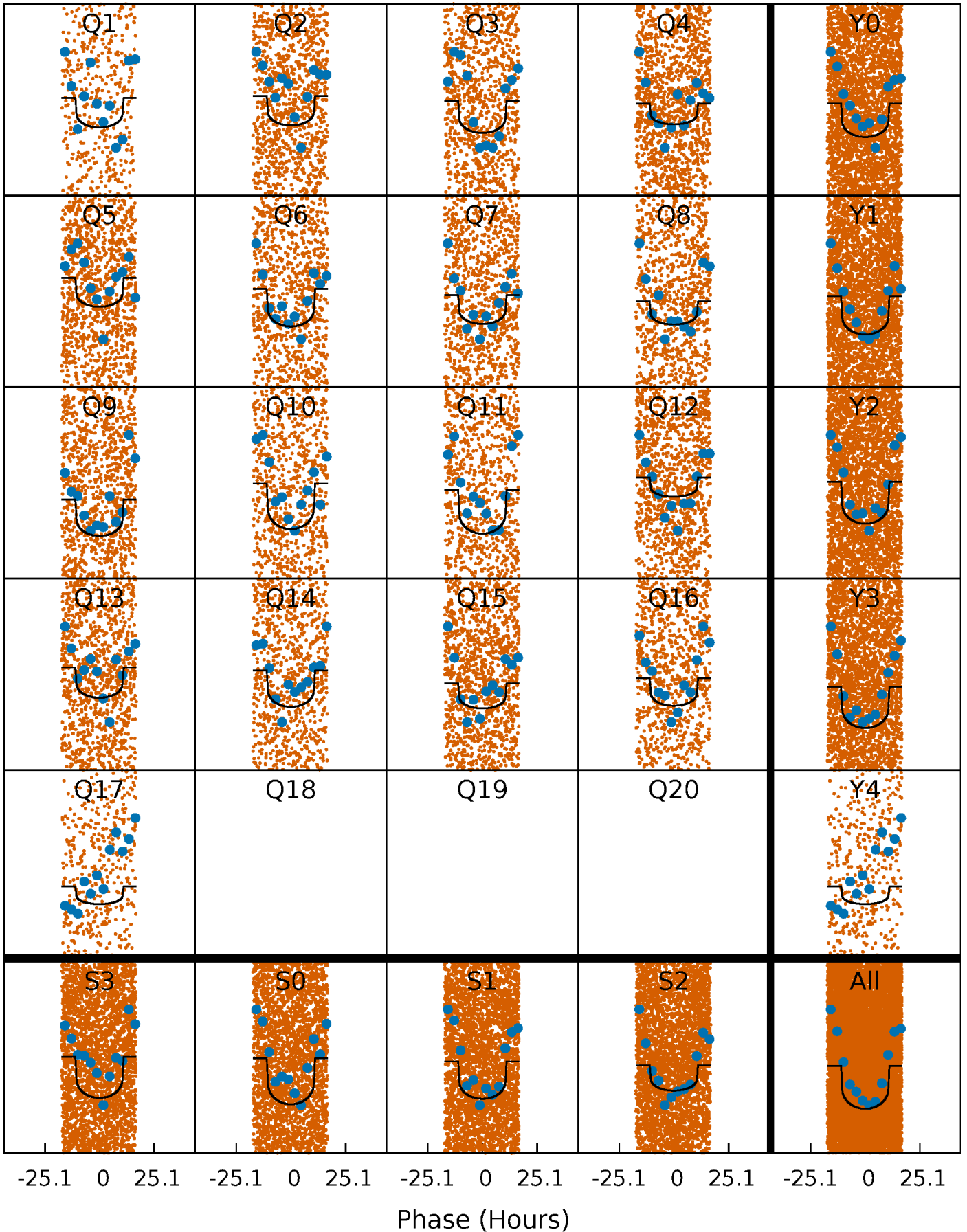
PDC Quarter-Phased Transit Curves

TCE 012017921-02 P= 3.185913 Days $T_0=132.648359$ (BKJD)



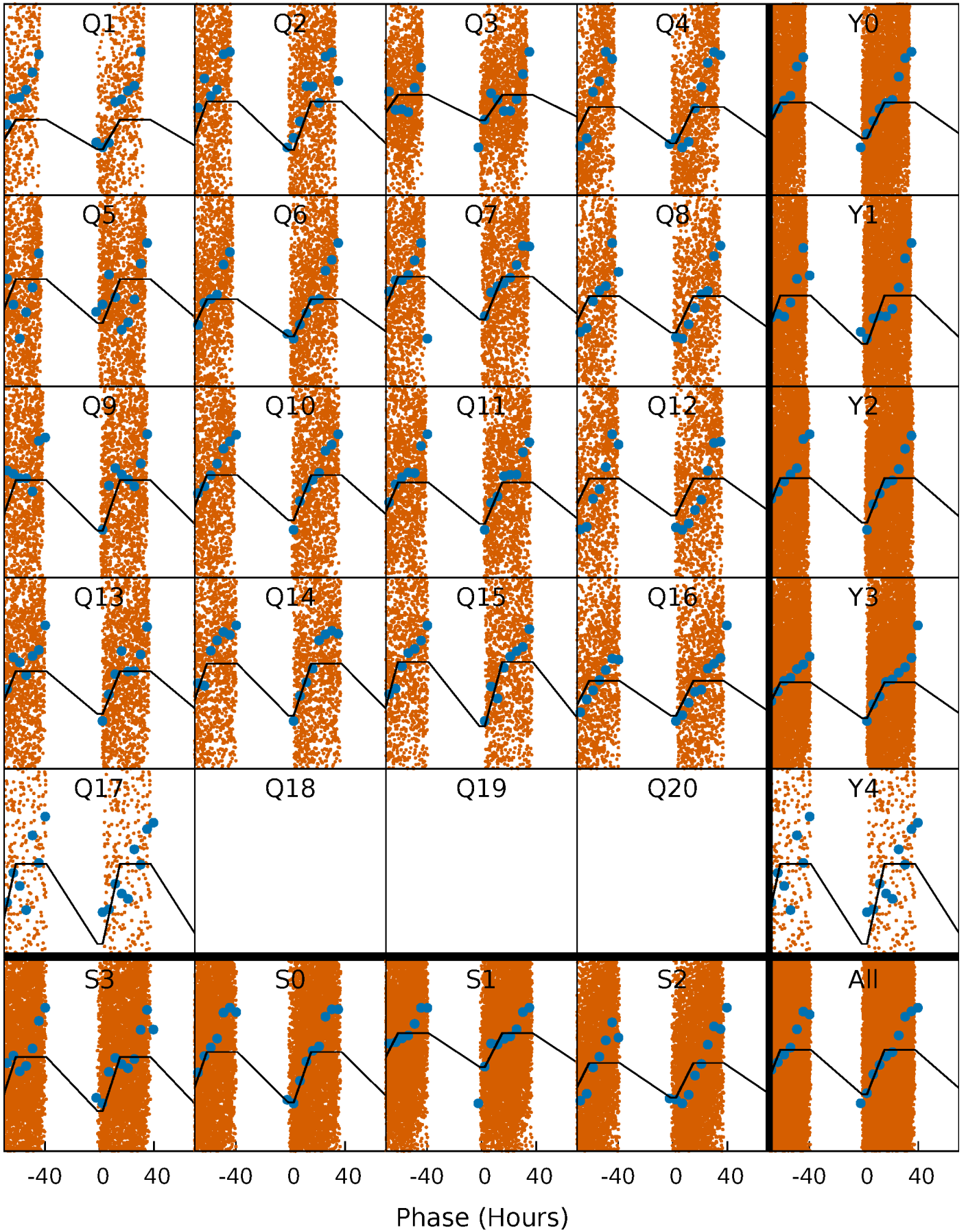
DV Quarter-Phased Transit Curves

TCE 012017921-02 P= 3.185913 Days $T_0=132.648359$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

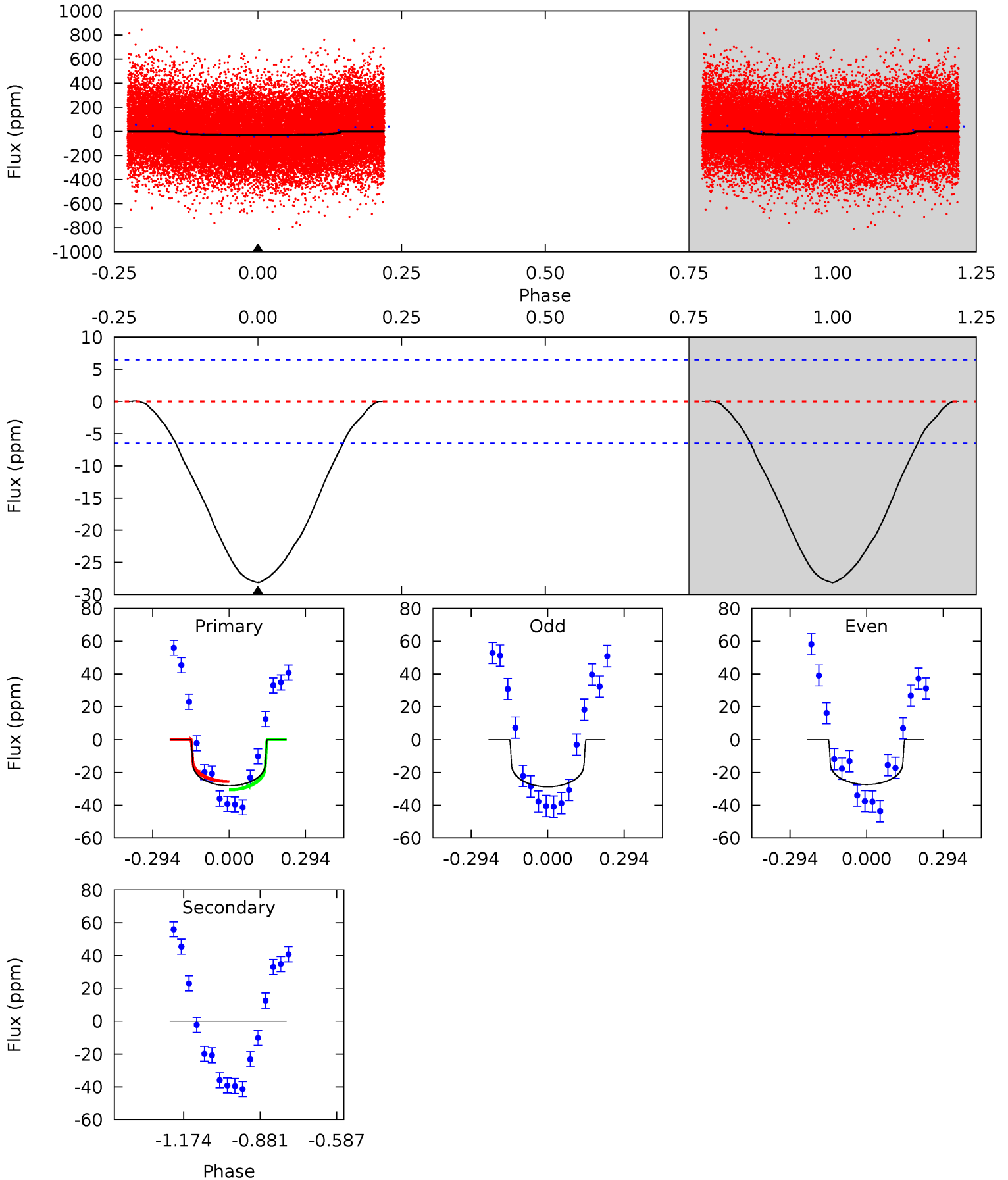
TCE 012017921-02 P= 3.185463 Days $T_0=131.987975$ (BKJD)



DV Model-Shift Uniqueness Test

012017921-02, P = 3.185913 Days, E = 129.462446 Days

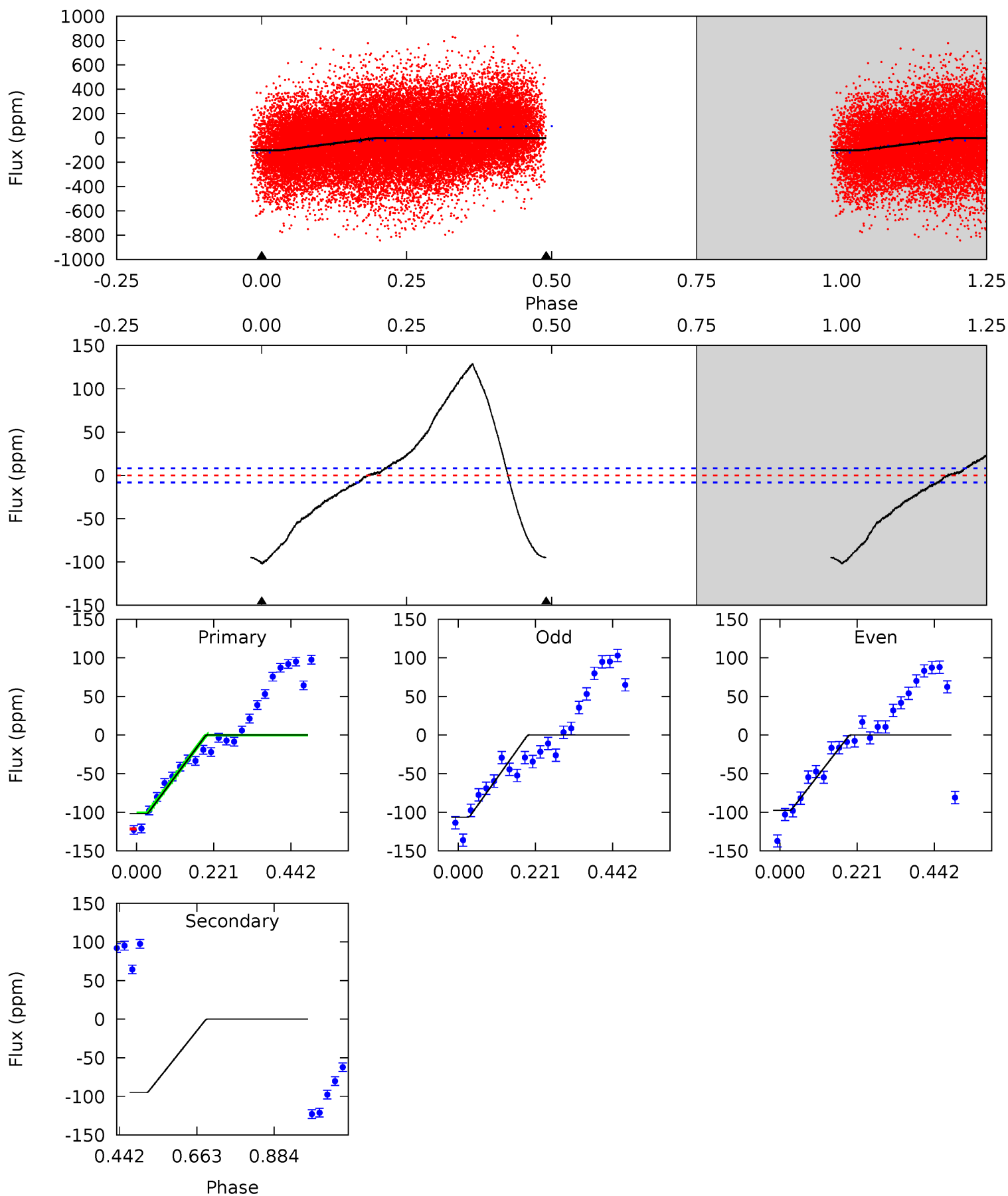
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.8	0	0	0	4.33	1.05	0.08	18.8	18.8	0	0	0.46	1.12	0.00	1.73



Alt Model-Shift Uniqueness Test

012017921-02, P = 3.185463 Days, E = 128.802512 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.8	50.2	0	0	4.40	1.22	18.4	53.8	53.8	50.2	50.2	2.31	1.33	0.56	1.54



Stellar Parameters For KIC 012017921

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6660^{+185}_{-255}	$3.781^{+0.432}_{-0.108}$	$0.100^{+0.200}_{-0.300}$	$2.828^{+0.565}_{-1.319}$	$1.763^{+0.164}_{-0.492}$	$0.110^{+0.429}_{-0.039}$
	+3%/-4%	+11%/-3%	+200%/-300%	+20%/-47%	+9%/-28%	+391%/-36%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 012017921-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1	$1.69^{+0.70}_{-0.59}$	2960^{+218}_{-359}	-3052^{+6300}_{-693}	$0.002^{+0.819}_{-0.902}$
Alt.	-95 ± 2	$2.84^{+0.81}_{-0.71}$	2958^{+242}_{-334}	6482^{+773}_{-573}	17^{+12}_{-6}

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 $A_{obs} \gg 1.0$

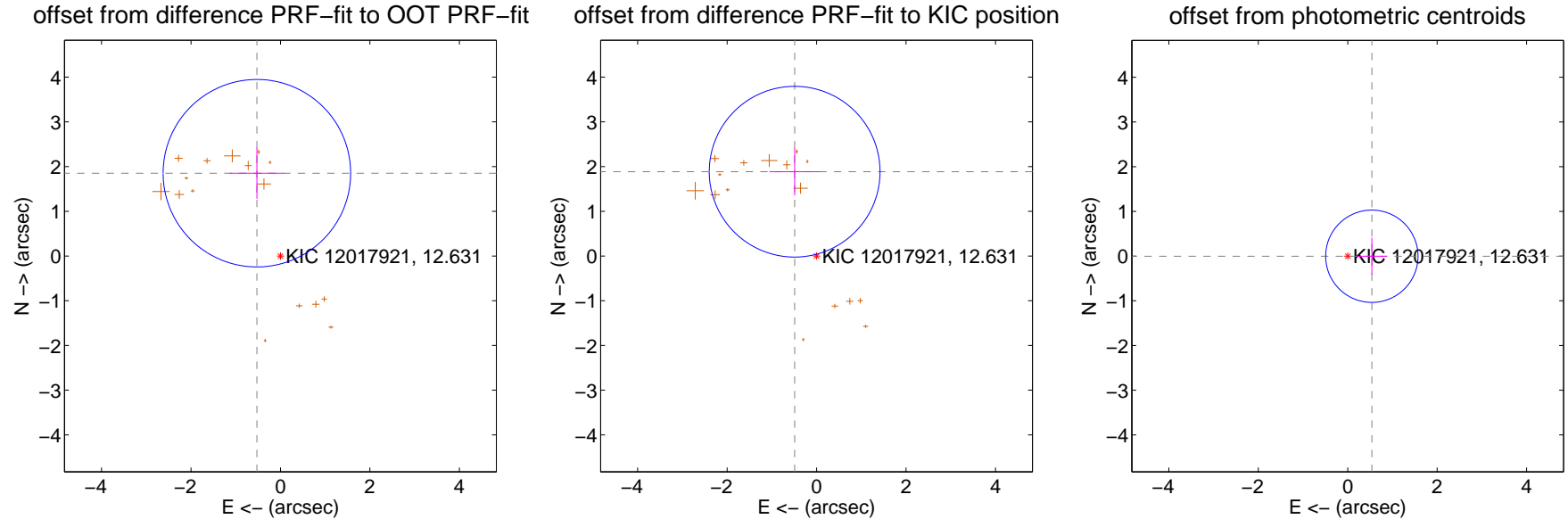
DV Centroid Data

Supplemental centroid analysis for 012017921-02. Kepler magnitude: 12.63. Transit SNR 14.99

There are 0 quarters with good PRF difference image offsets

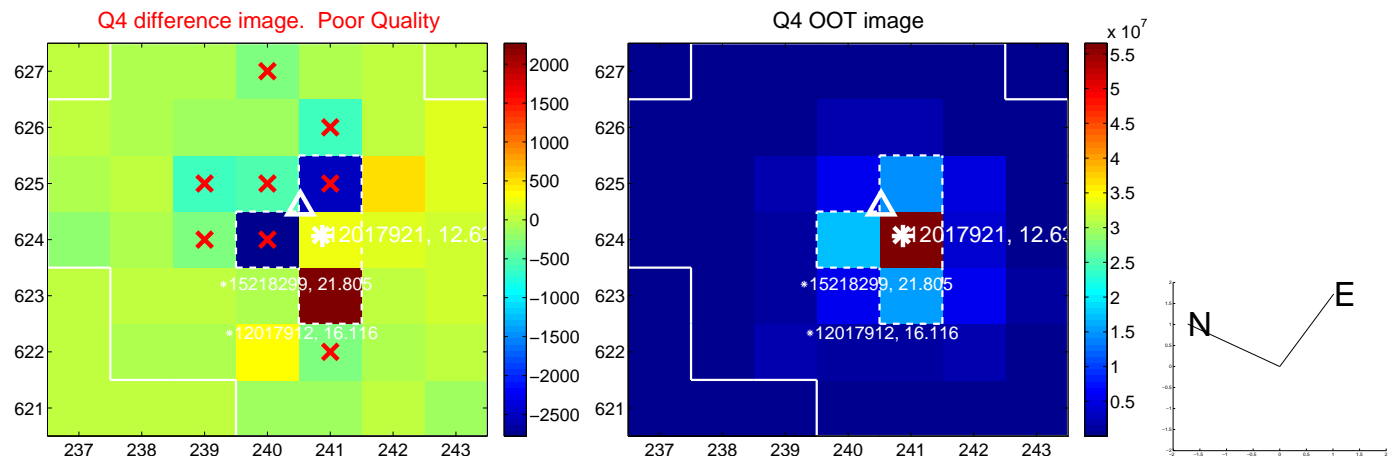
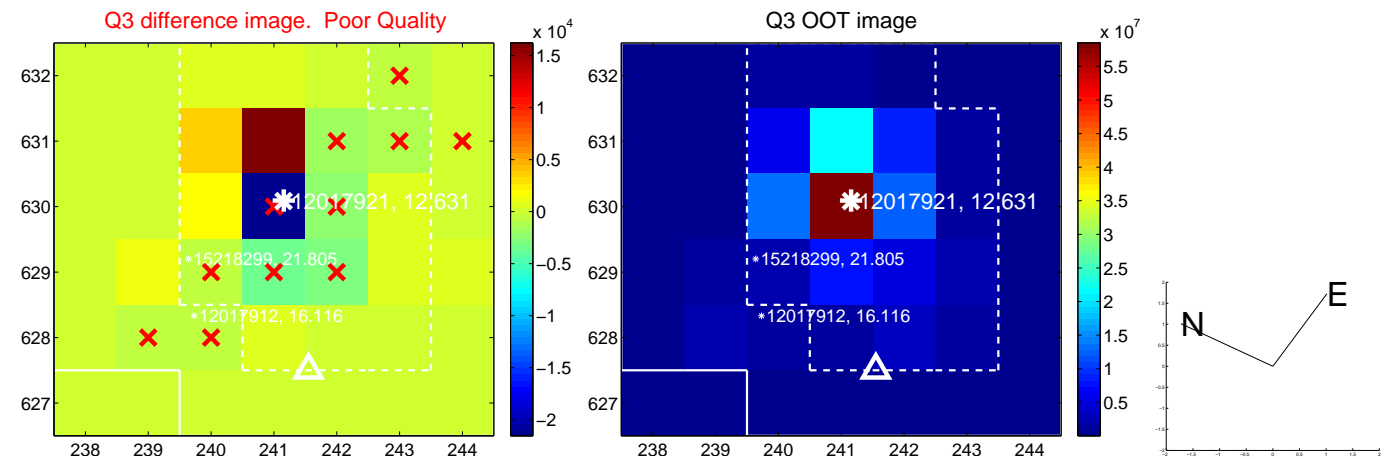
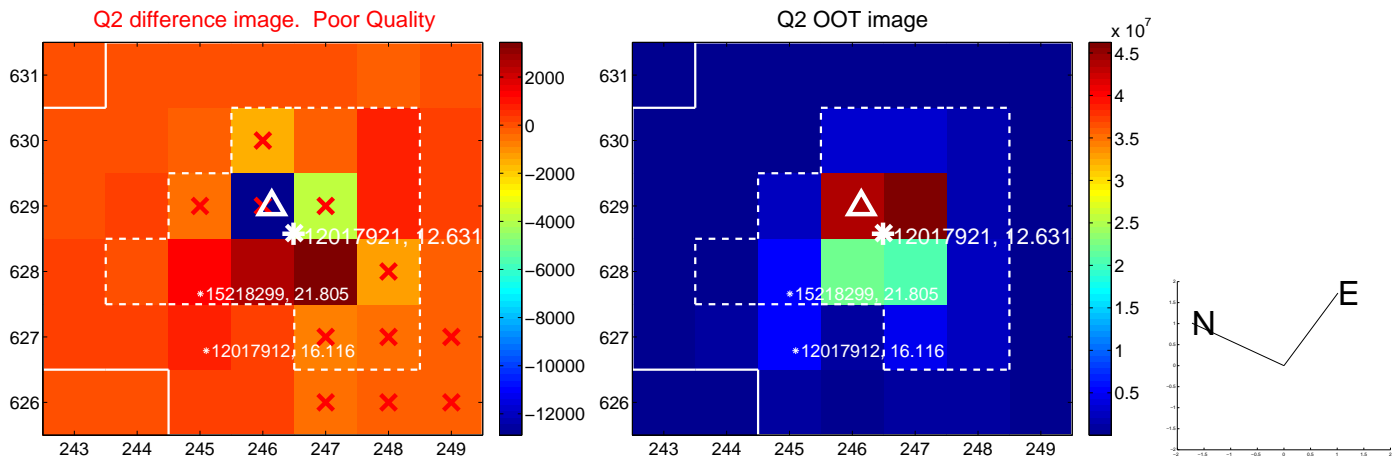
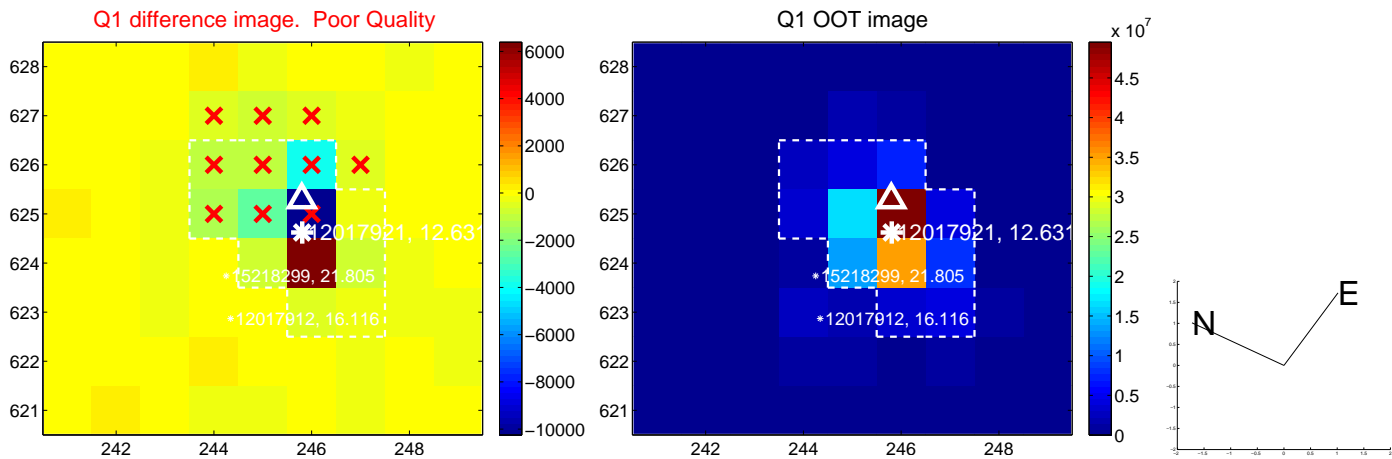
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.926 ± 0.699	2.76	0.527 ± 0.606	1.852 ± 0.570
PRF-fit source offset from KIC position	1.948 ± 0.636	3.06	0.490 ± 0.566	1.885 ± 0.529
photometric centroid source offset	0.54 ± 0.34	1.57	-0.54 ± 0.34	-0.00 ± 0.41

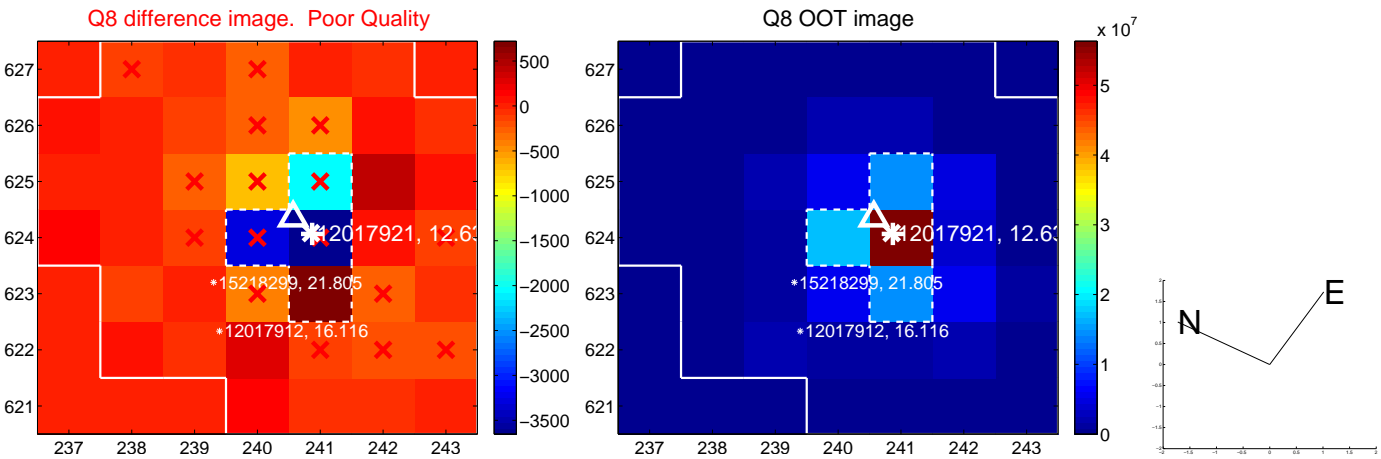
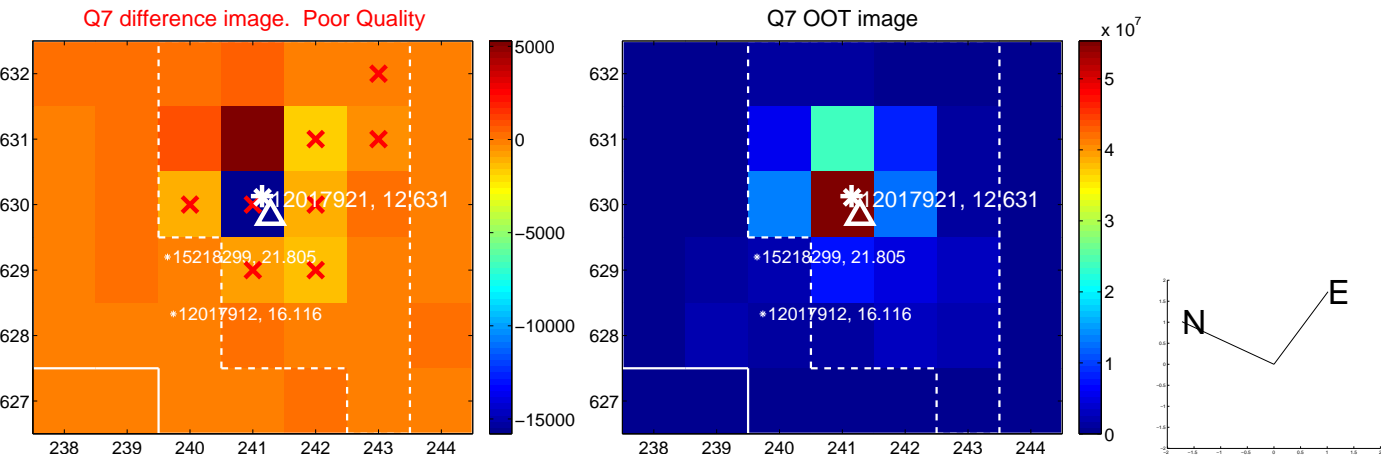
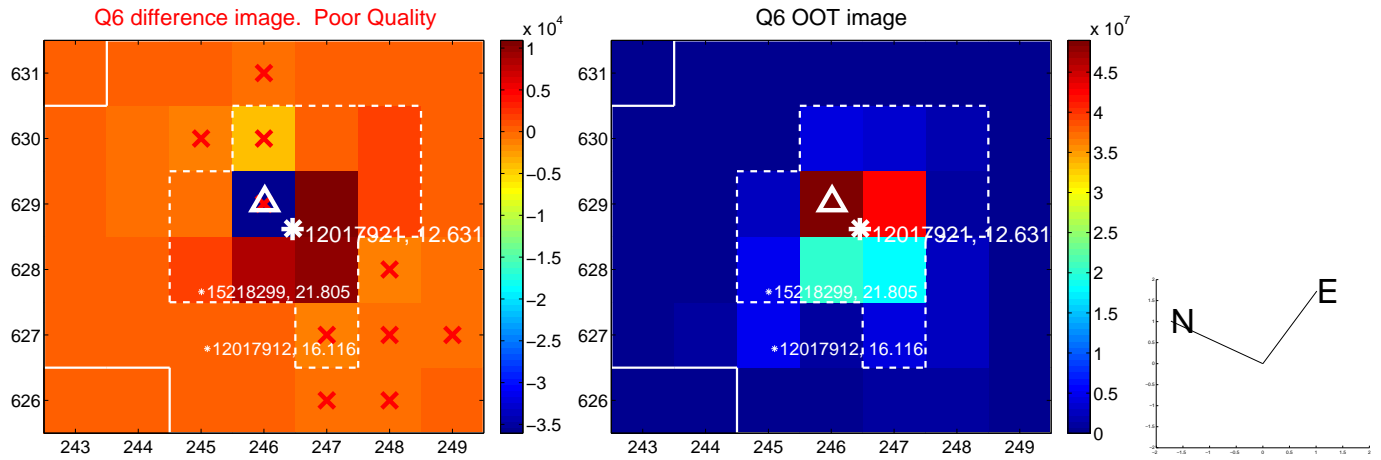
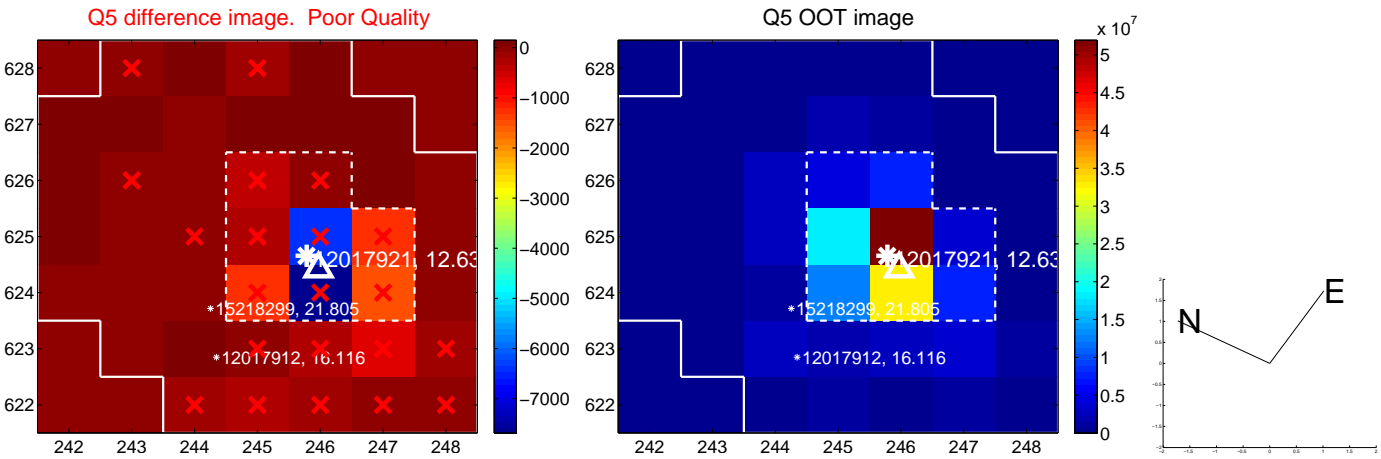


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

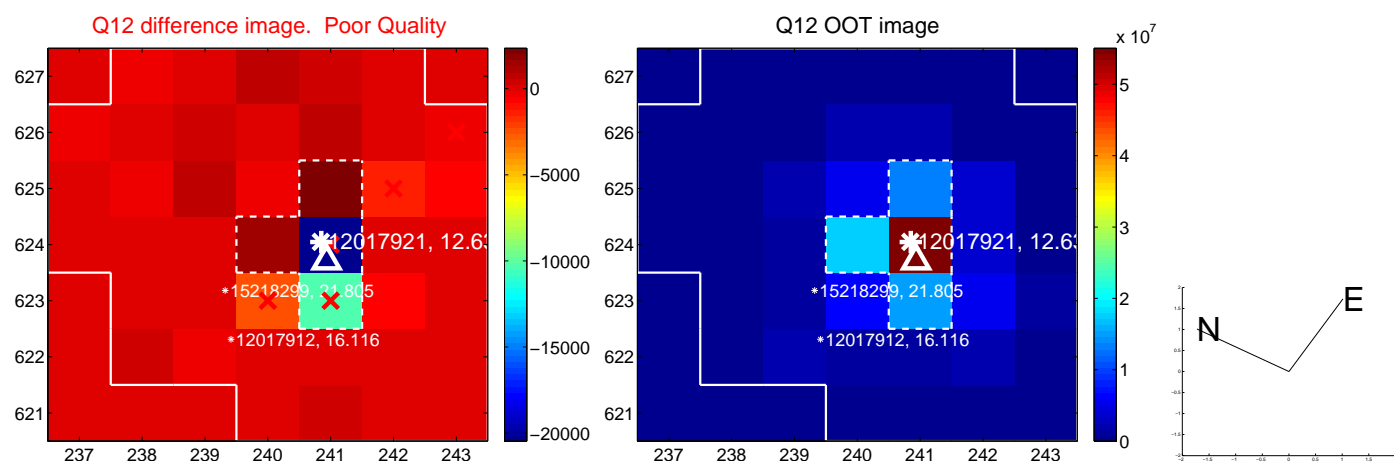
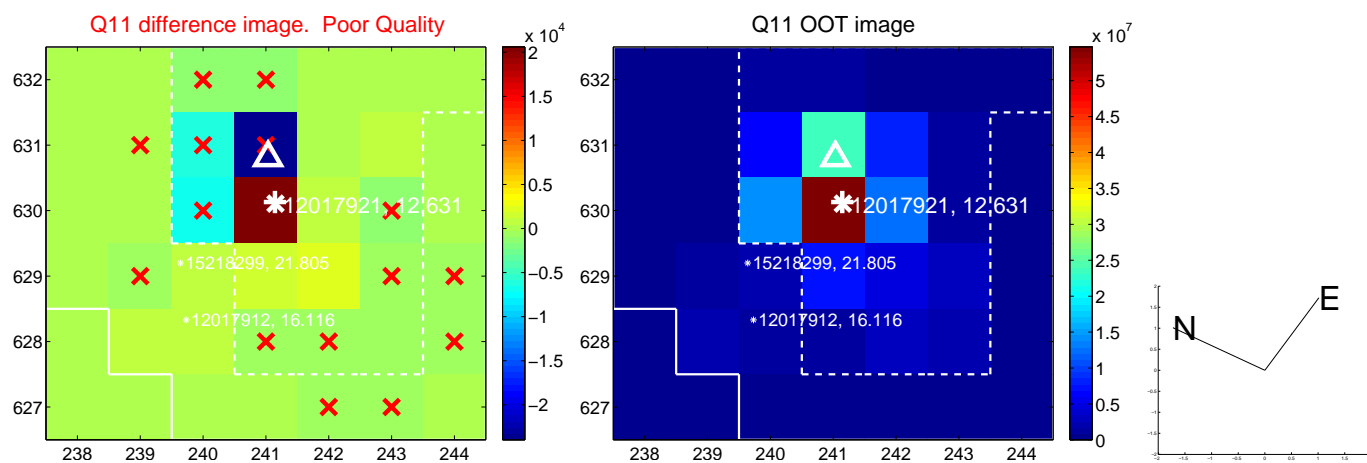
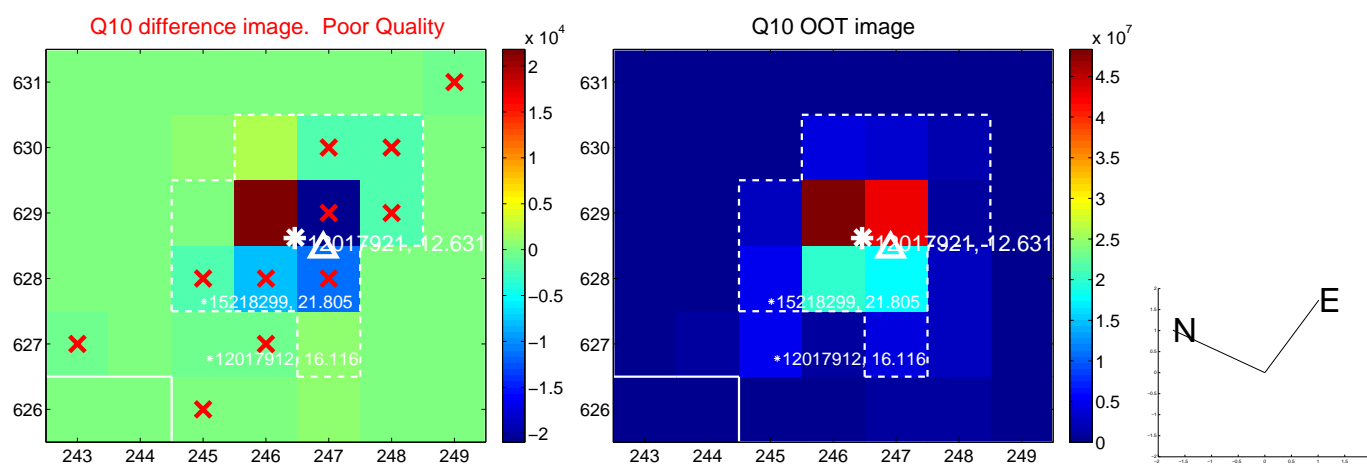
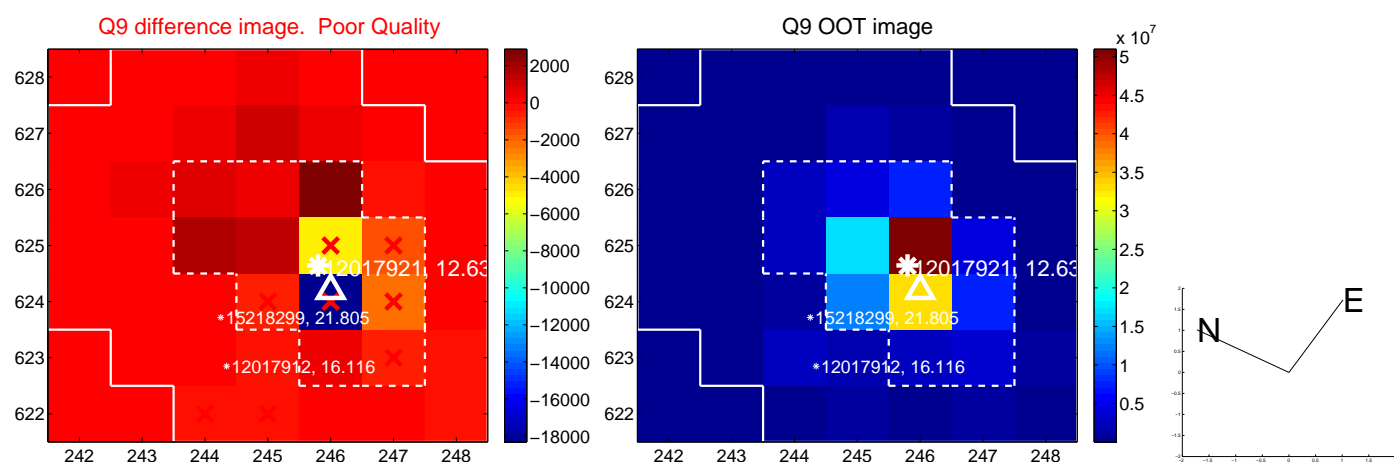
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



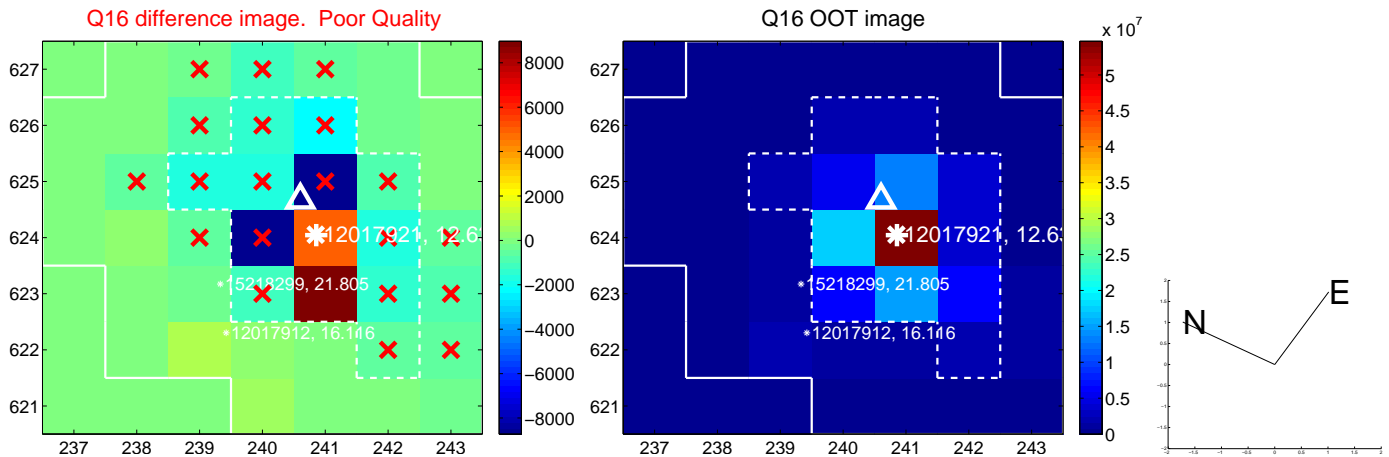
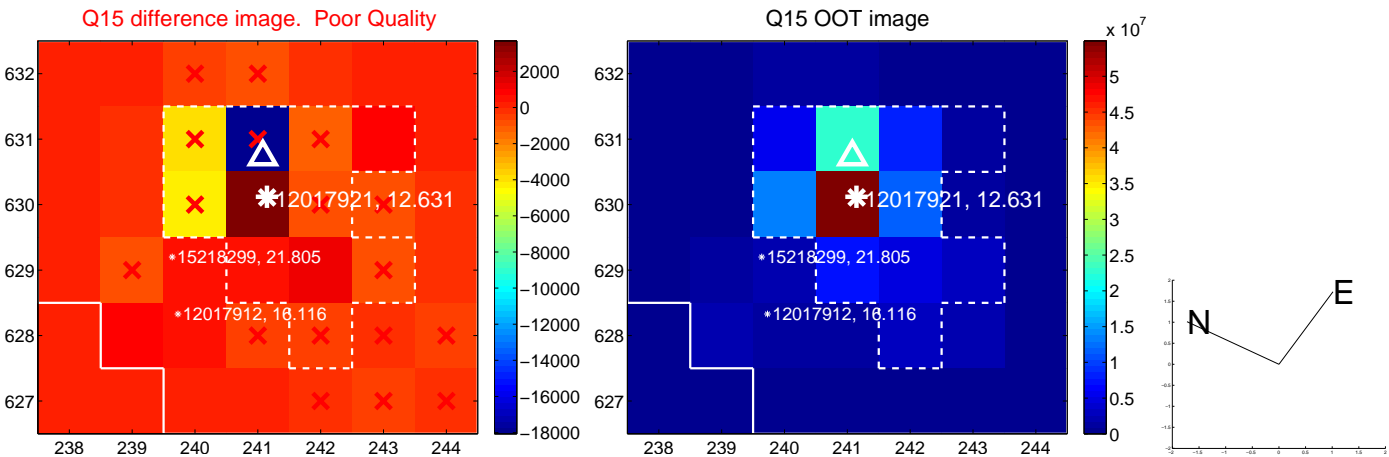
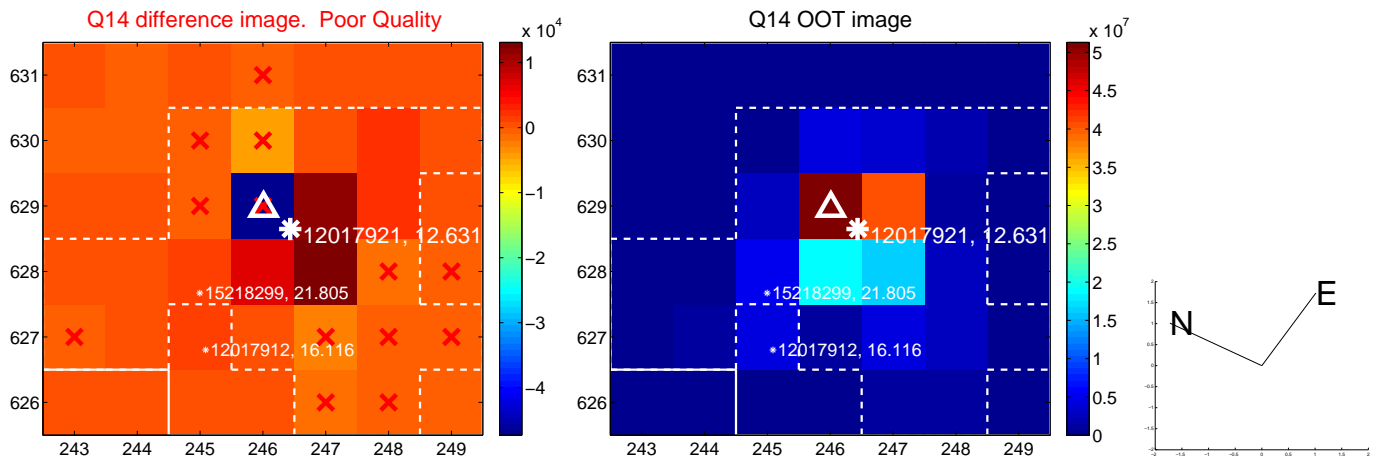
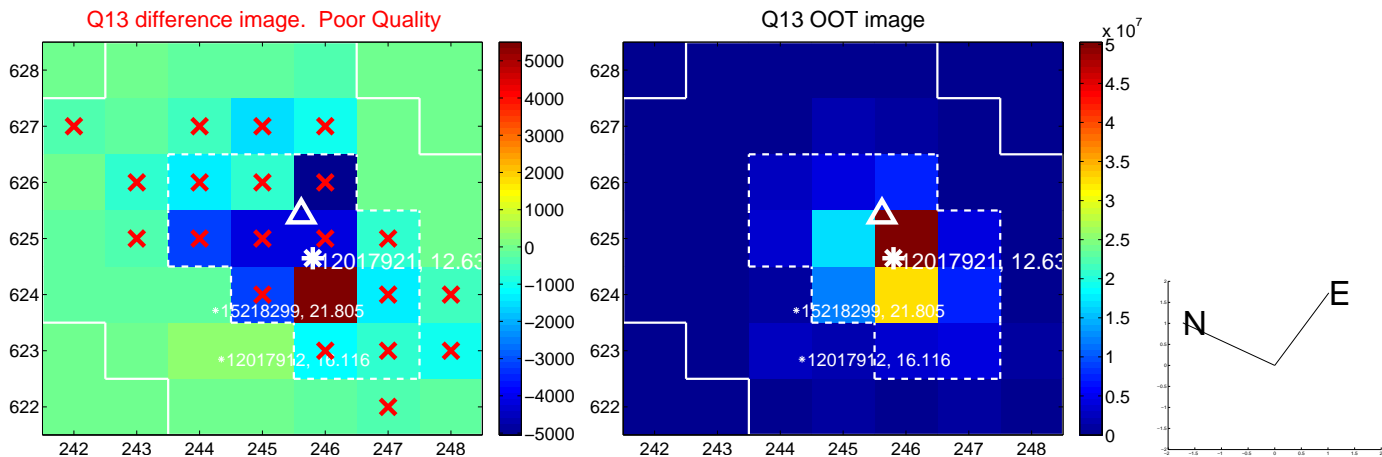
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



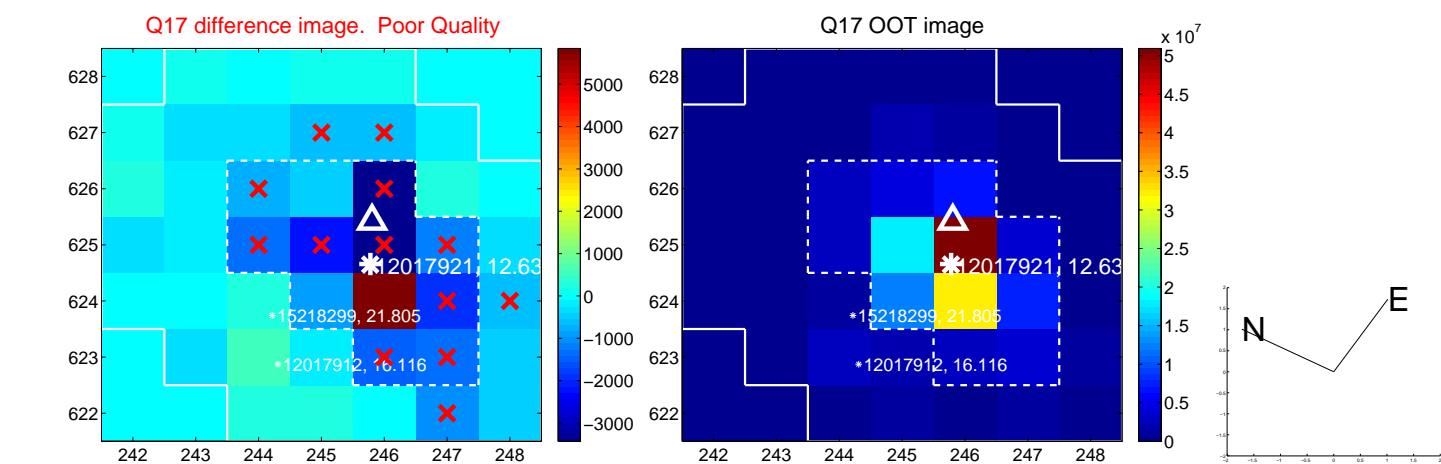
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



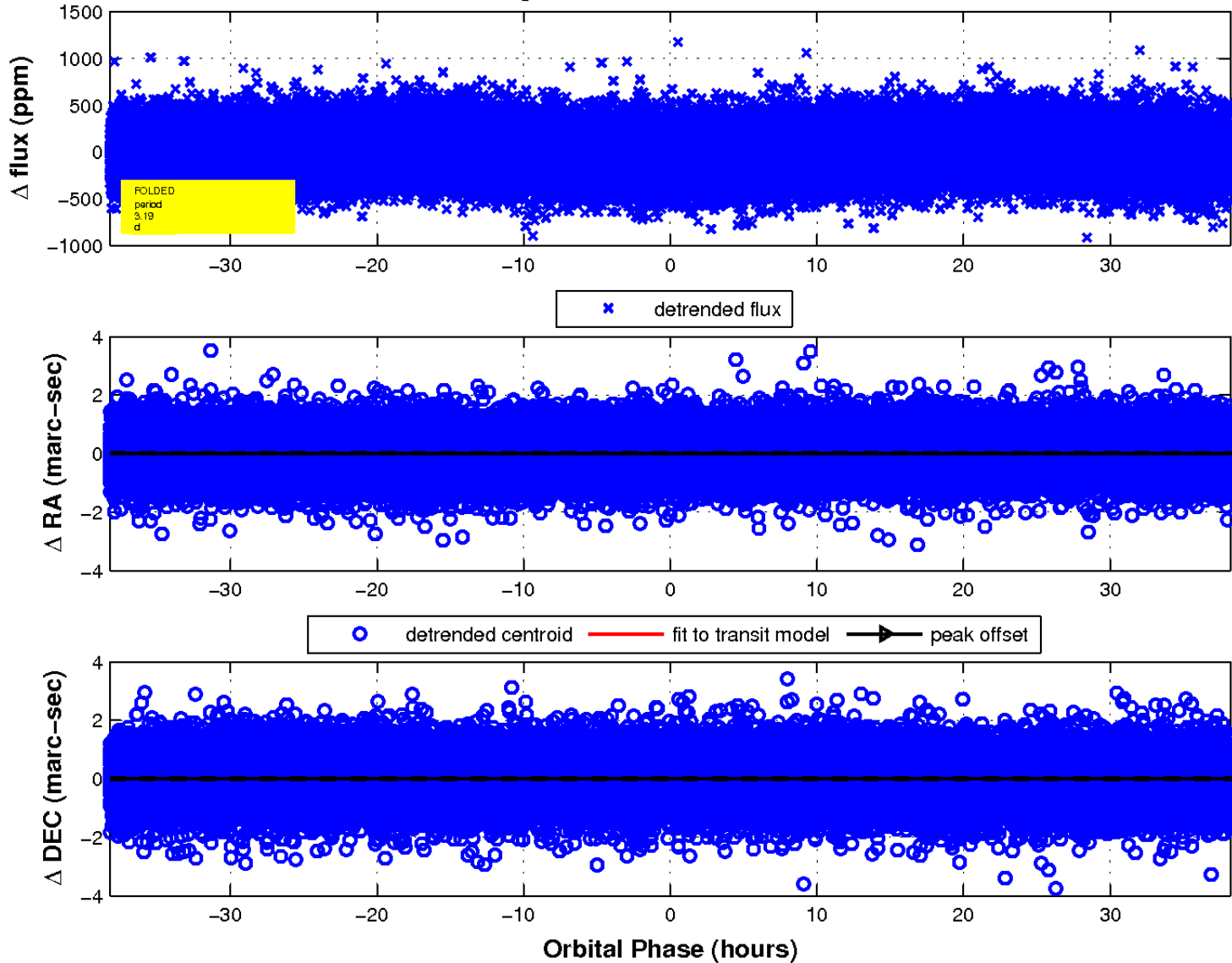
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

