

KIC 012120938

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})
012120938-01	OBS	No	571.506182	410.640484	674.1	10.507	14.6	4.0	1.04	6365	2.82	0.84
012120938-02	OBS	No	1.009430	132.263456	96.8	12.113	11.5	9.6	1.04	6365	1.22	3932.56

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012120938-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
012120938-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—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.

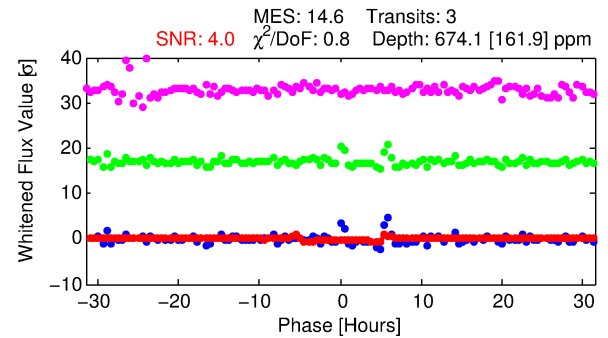
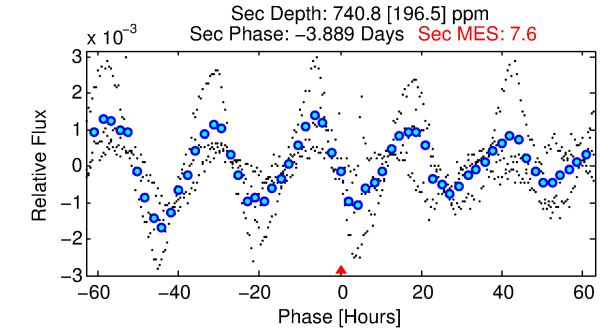
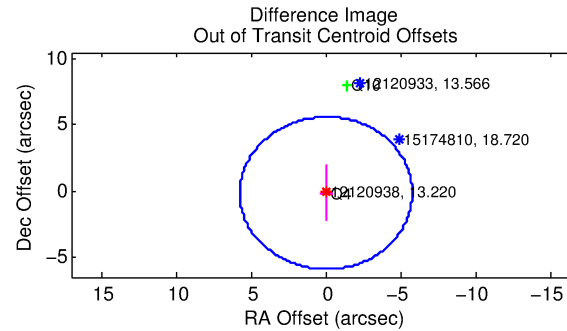
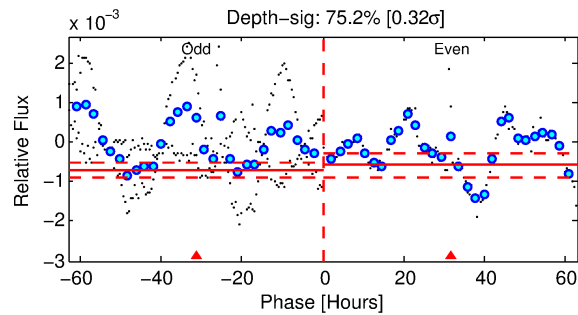
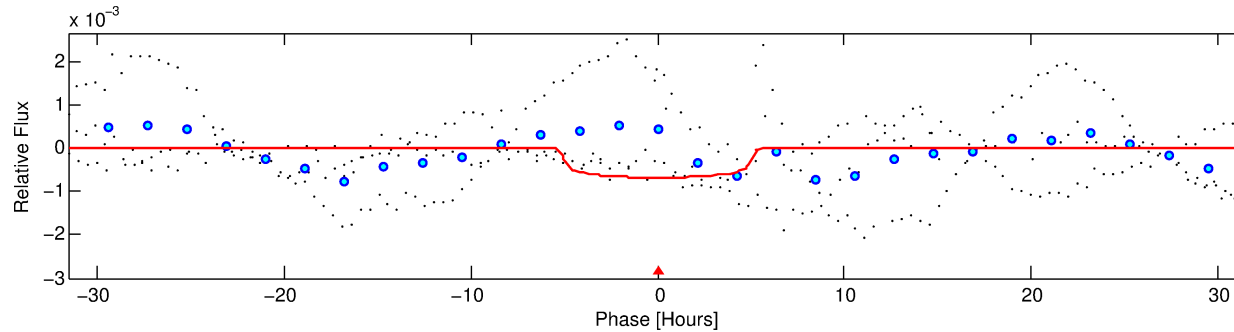
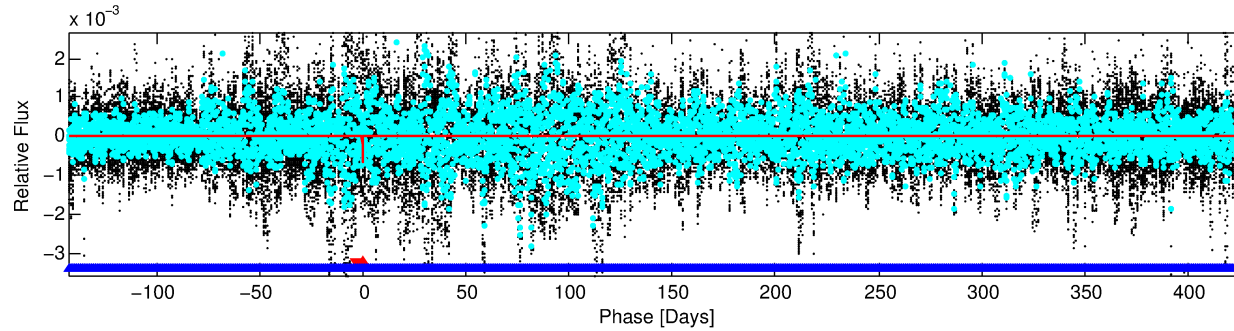
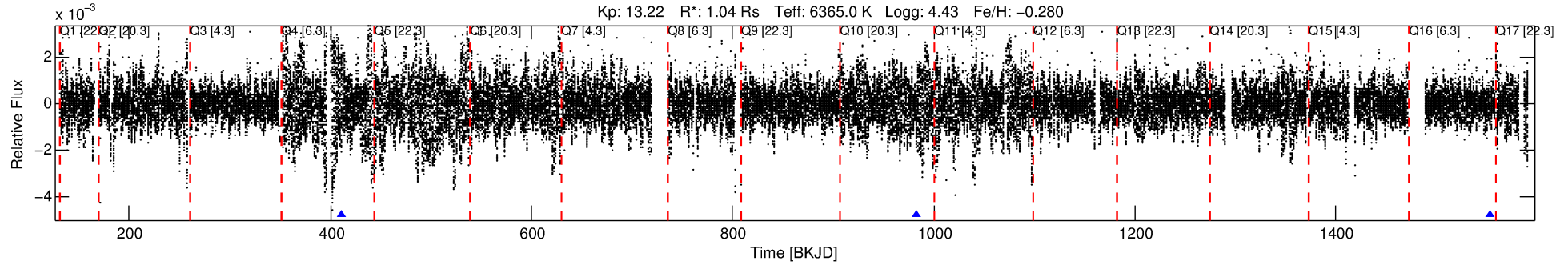
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012120938-01

No Significant Match Found

DV One-Page Summary

KIC: 12120938 Candidate: 1 of 2 Period: 571.506 d



DV Fit Results:

Period = 571.50618 [0.00628] d
Epoch = 410.6405 [0.0089] BKJD
Rp/R* = 0.0248 [0.0073]
a/R* = 351.55 [440.65]
b = 0.58 [1.45]
Seff = 0.84 [0.35]
Teq = 244 [25] K
Rp = 2.82 [1.25] Re
a = 1.3764 [0.3825] AU
Ag = 97257.88 [73706.63] [1.32 σ]
Teffp = 6665 [1091] K [5.88 σ]

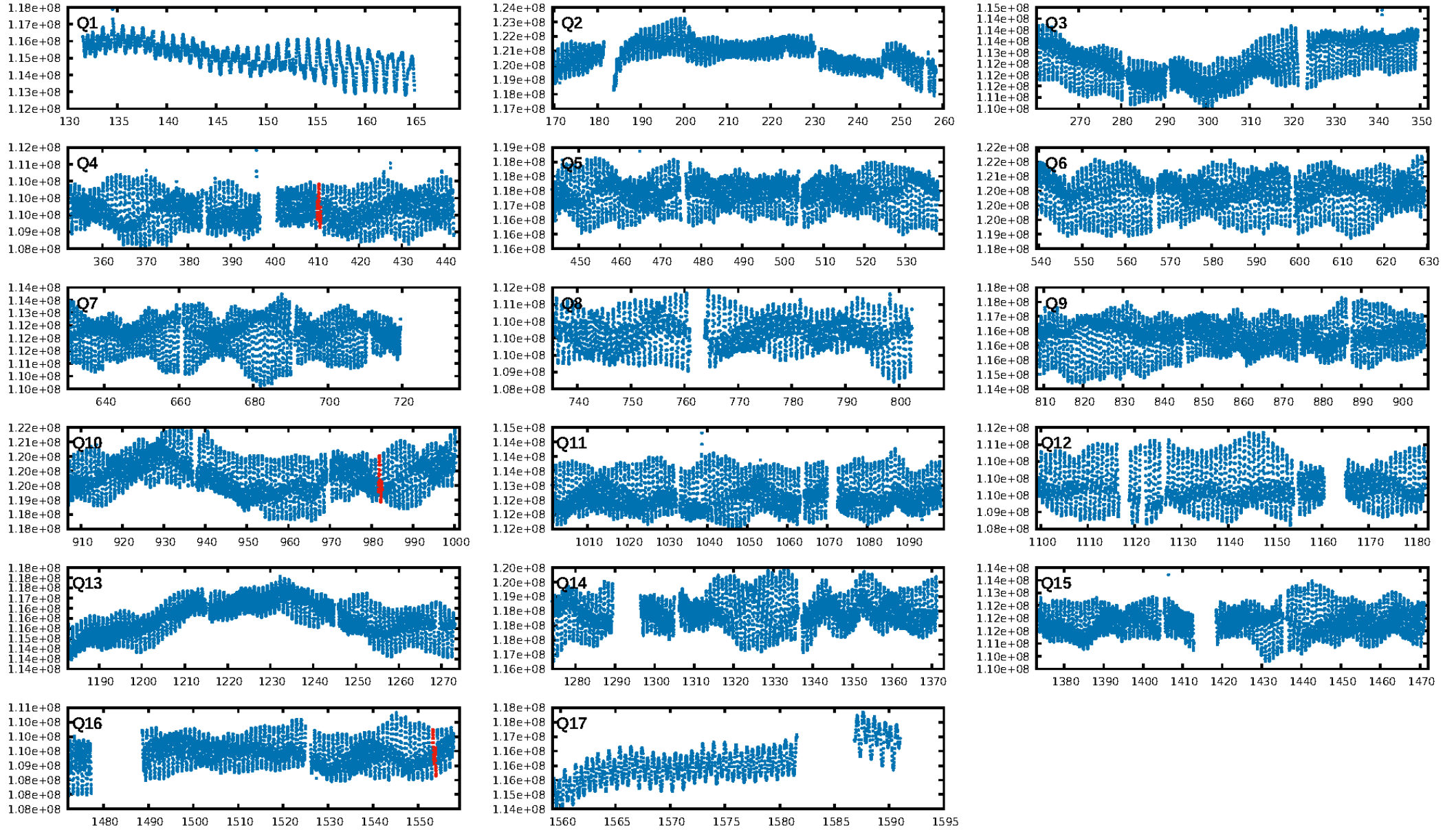
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [853.86 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 73.9%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.607
Centroid-sig: 11.0%
Centroid-so: 1.361 arcsec [0.79 σ]
OotOffset-rm: 0.158 arcsec [0.08 σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-rm: 0.144 arcsec [0.20 σ]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 0.00 [0/3]

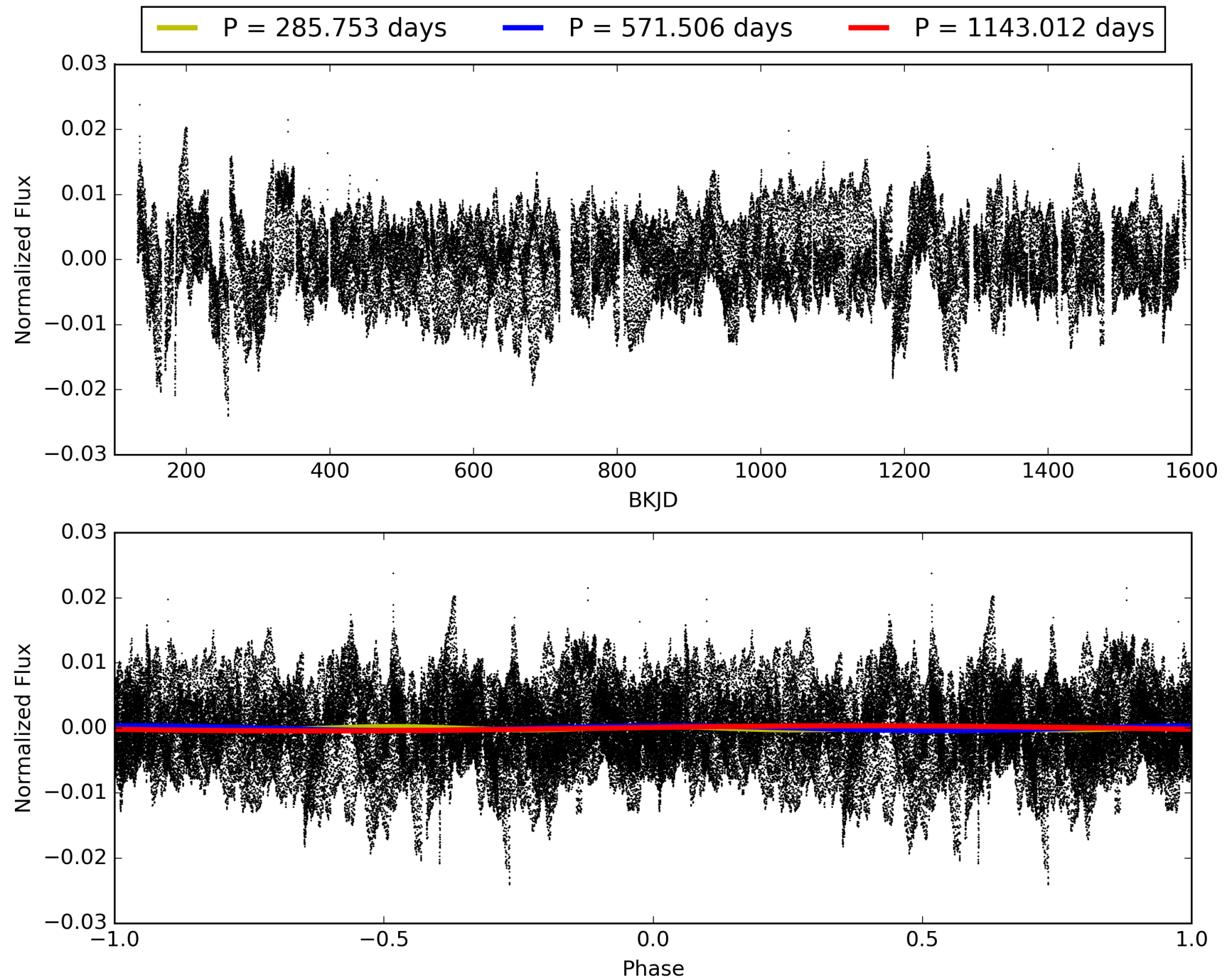
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:30:49 Z

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

TCE 012120938-01, PDC Light Curves

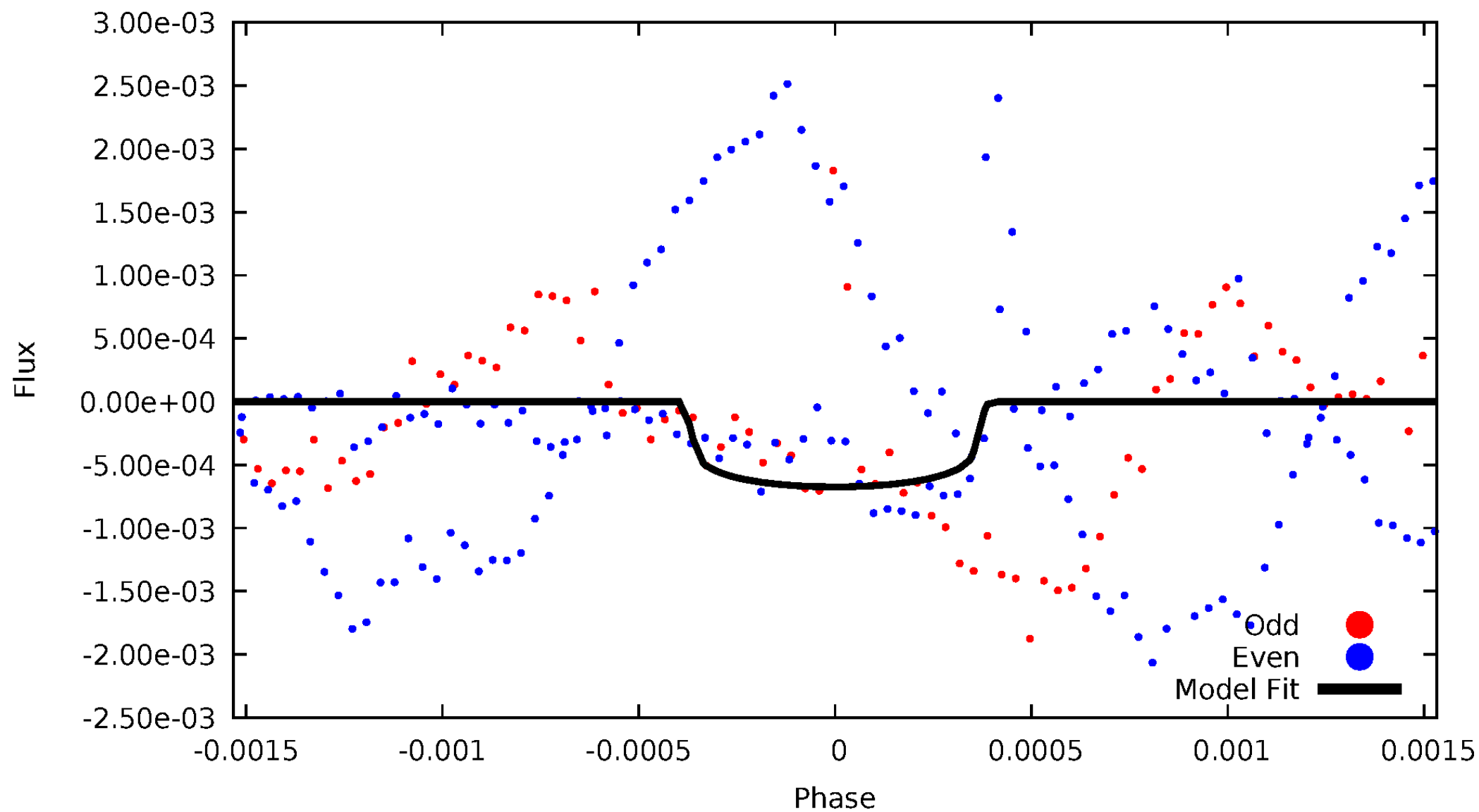


TCE 012120938-01



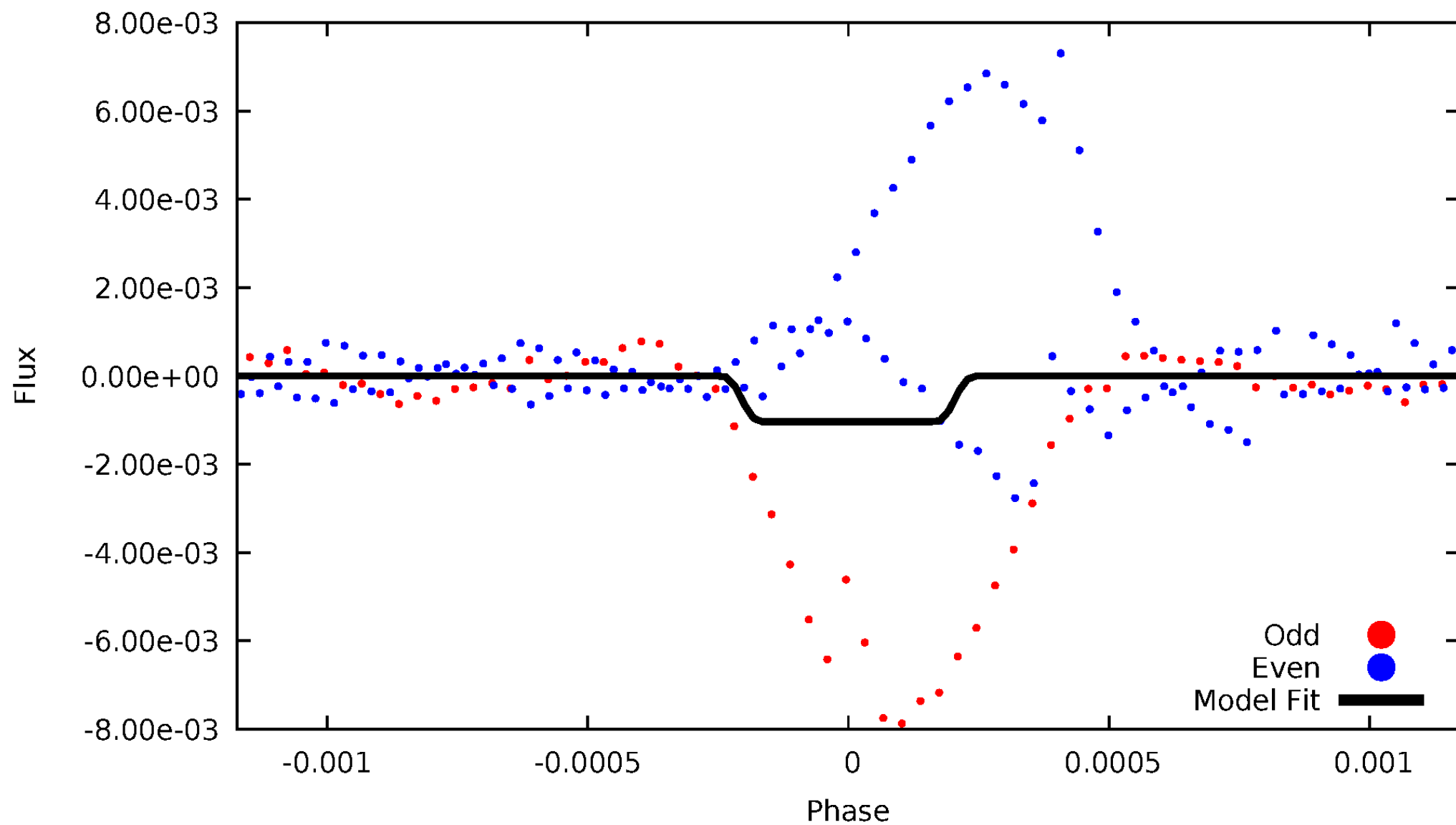
DV Odd/Even

TCE 012120938-01



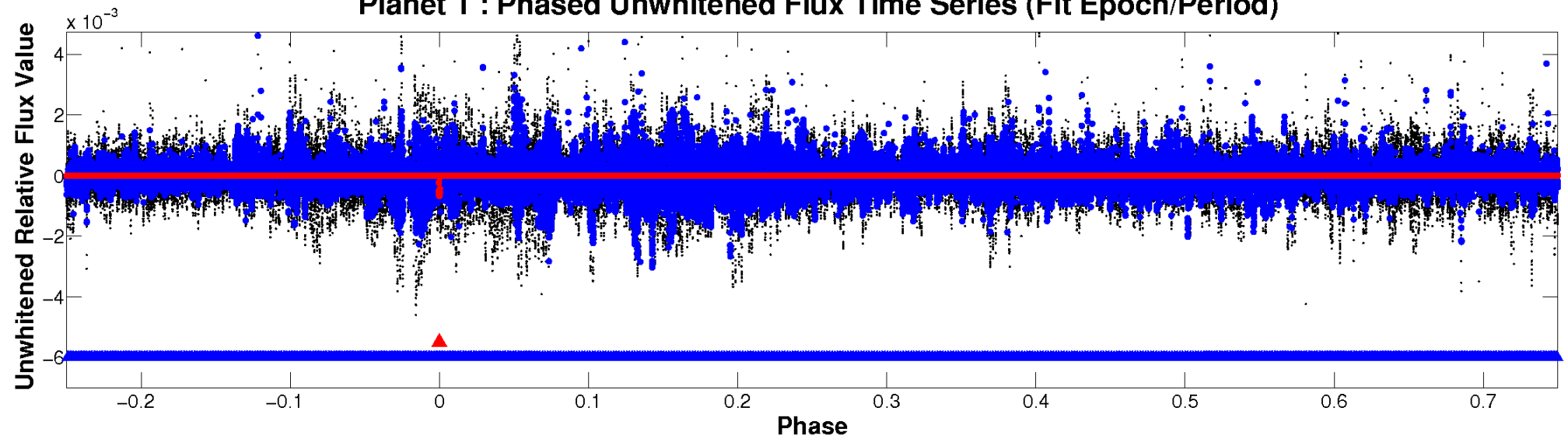
ALT Odd/Even

TCE 012120938-01

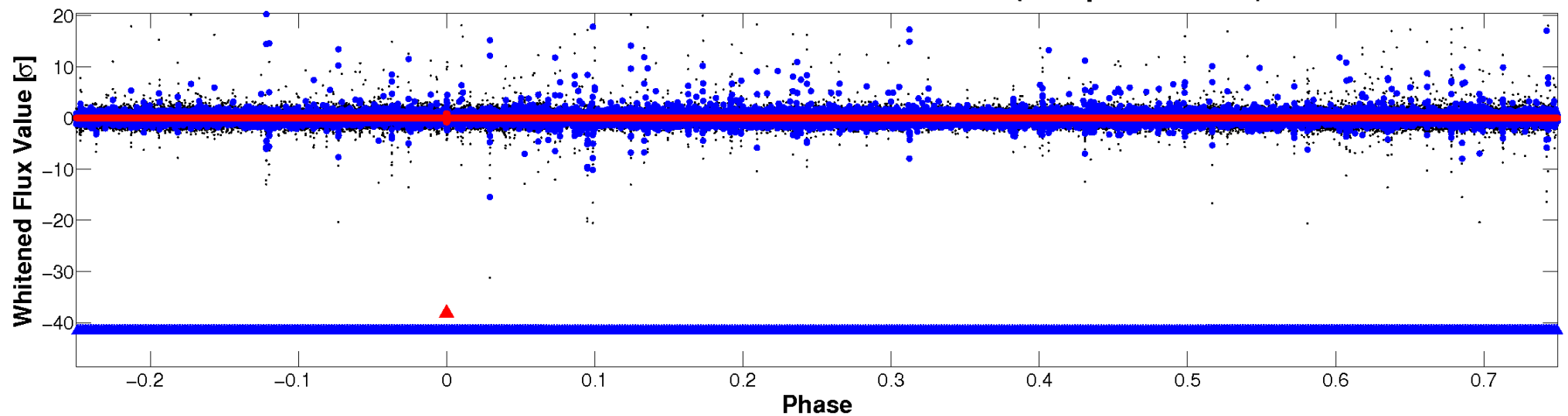


Non-Whitened Vs. Whitened Light Curve

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

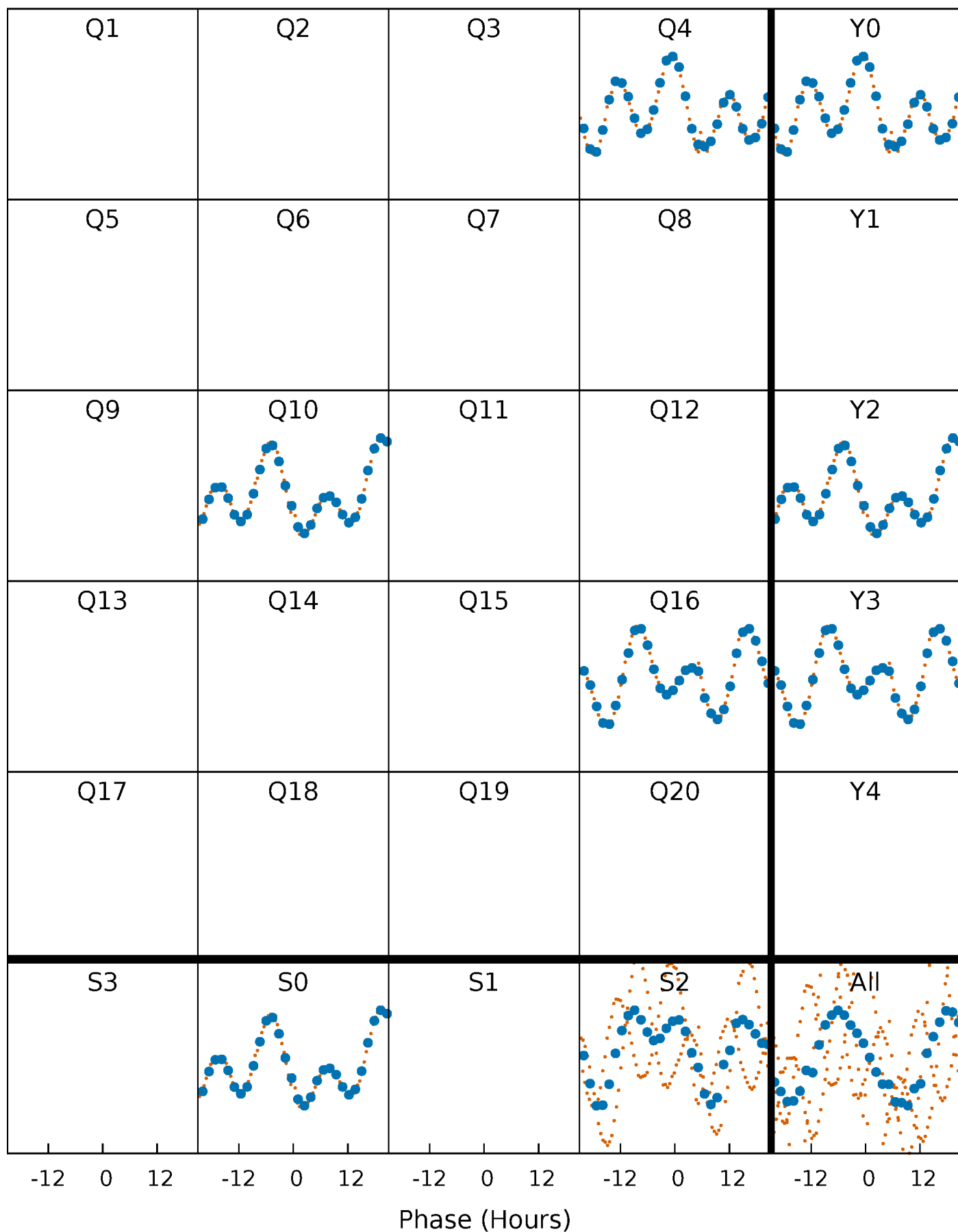


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 012120938-01 P=571.506182 Days $T_0=410.640484$ (BKJD)



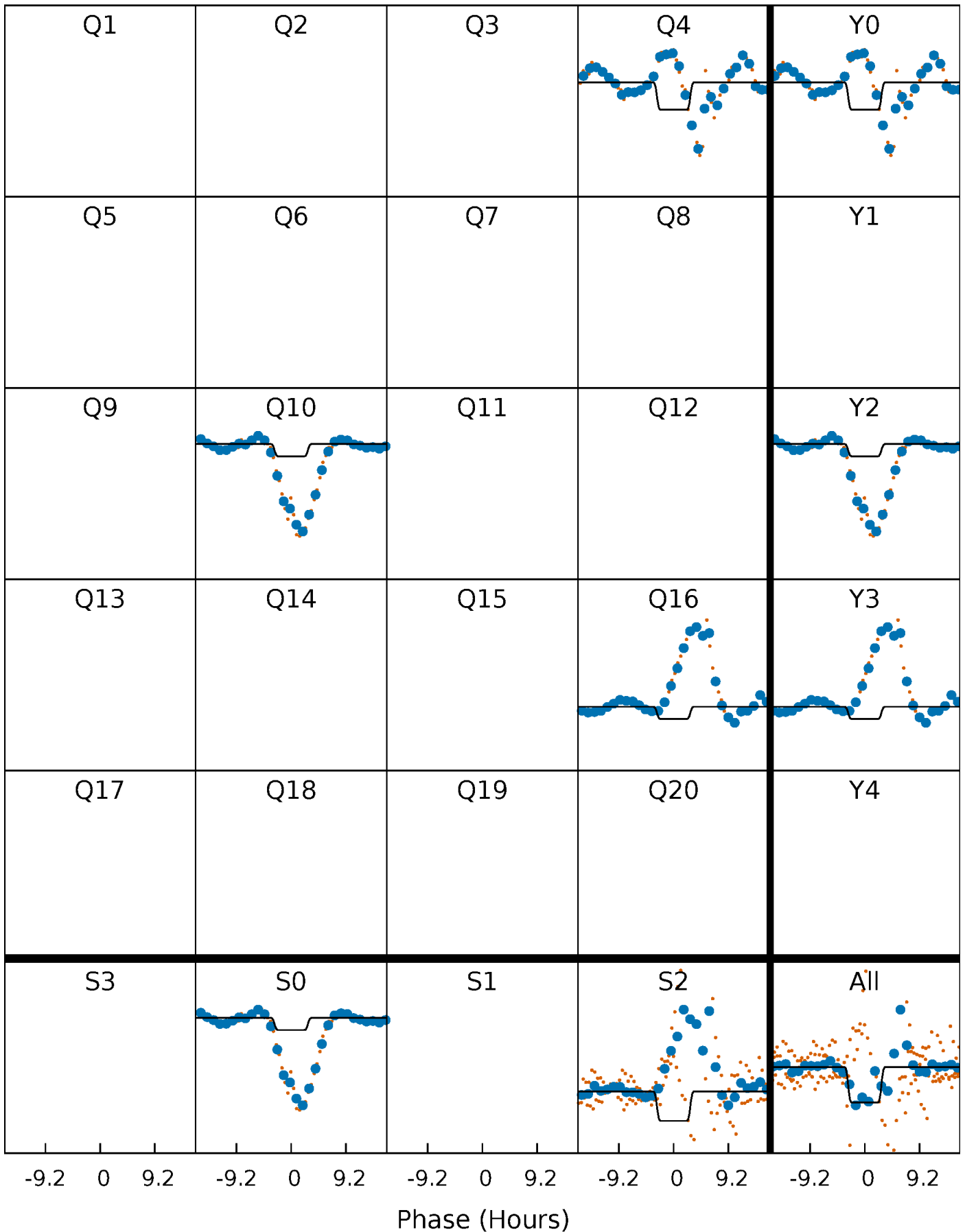
DV Quarter-Phased Transit Curves

TCE 012120938-01 P=571.506182 Days $T_0=410.640484$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

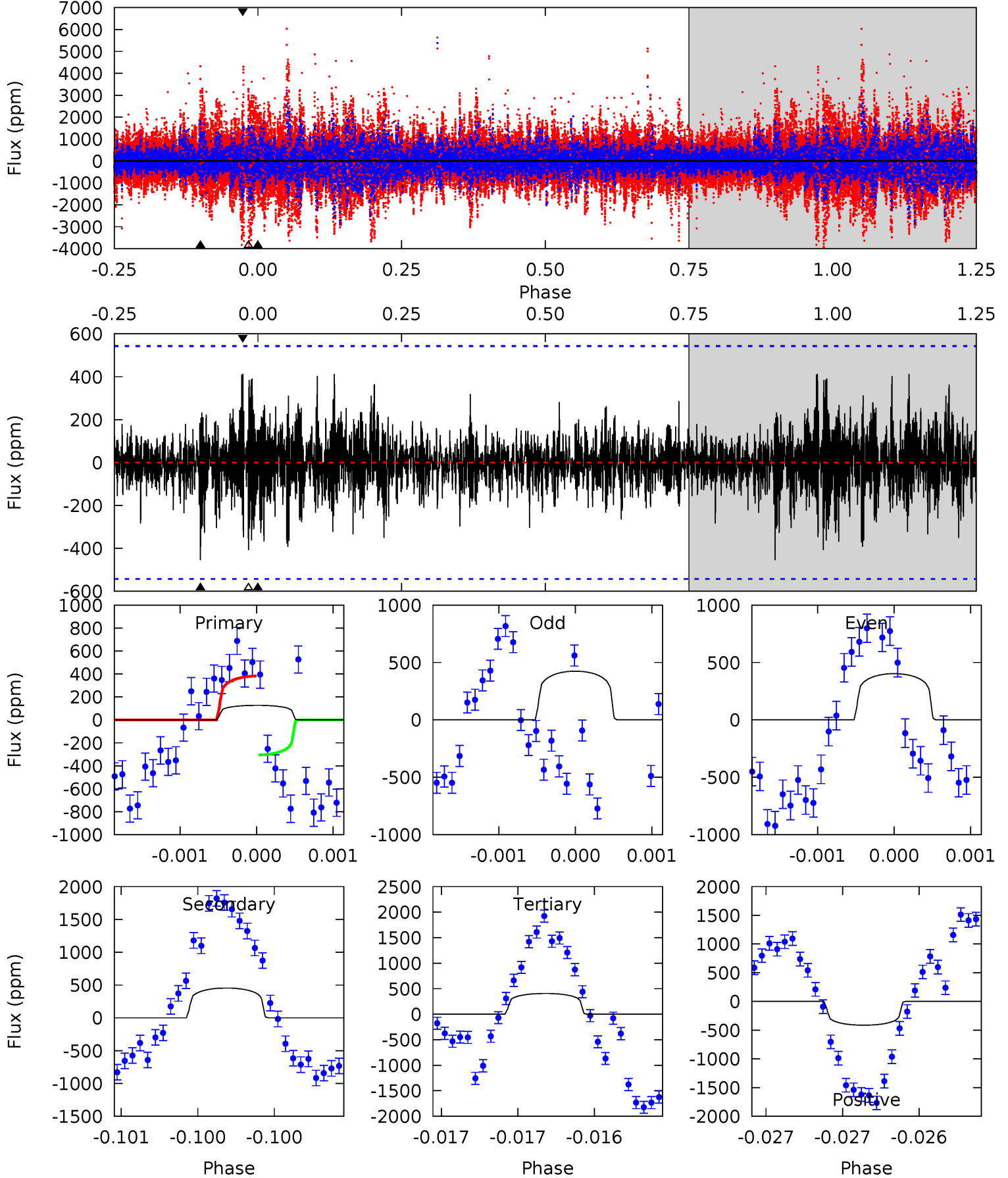
TCE 012120938-01 P=571.492617 Days $T_0=410.654017$ (BKJD)



DV Model-Shift Uniqueness Test

012120938-01, P = 571.506182 Days, E = 410.640484 Days

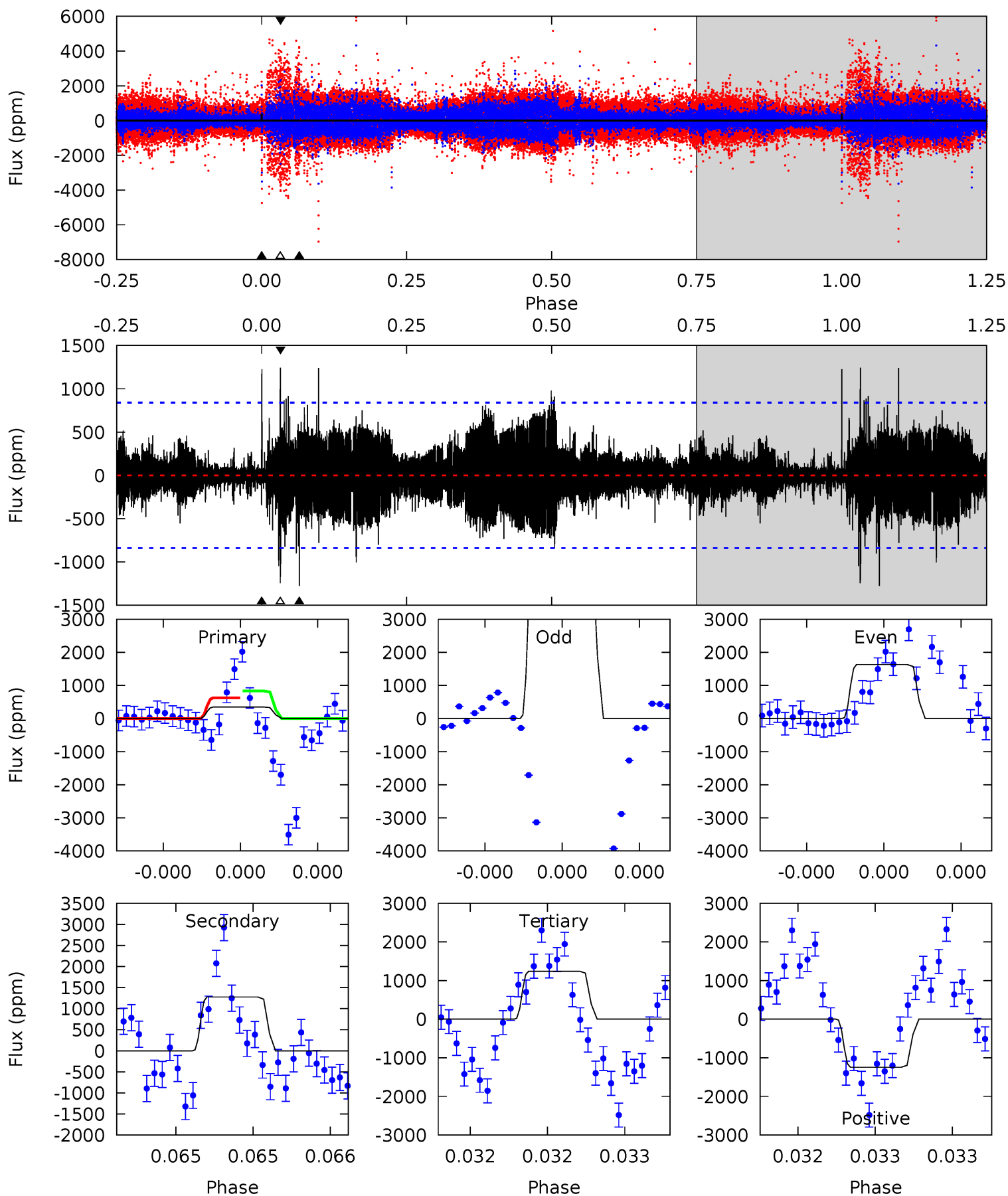
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.29	4.61	4.12	4.19	5.50	3.37	1.01	-2.84	-2.90	0.48	0.42	0.10	-0.30	0.48	0.38



Alt Model-Shift Uniqueness Test

012120938-01, P = 571.492617 Days, E = 410.654017 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.30	8.48	8.26	8.26	5.59	3.50	1.53	-5.96	-5.97	0.22	0.22	16.2	-1.71	0.49	0.56



Stellar Parameters For KIC 012120938

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6365^{+151}_{-189}	$4.431^{+0.067}_{-0.216}$	$-0.280^{+0.250}_{-0.300}$	$1.040^{+0.348}_{-0.116}$	$1.060^{+0.157}_{-0.129}$	$1.328^{+0.385}_{-0.710}$
	+2%/-3%	+2%/-5%	+89%/-107%	+33%/-11%	+15%/-12%	+29%/-53%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 012120938-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-454 ± 99	$3.00^{+1.00}_{-0.92}$	349^{+28}_{-17}	5863^{+1183}_{-733}	51869^{+57412}_{-24731}
Alt.	-1276 ± 150	$3.86^{+0.96}_{-0.99}$	349^{+26}_{-18}	6710^{+1074}_{-687}	89023^{+65899}_{-33526}

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

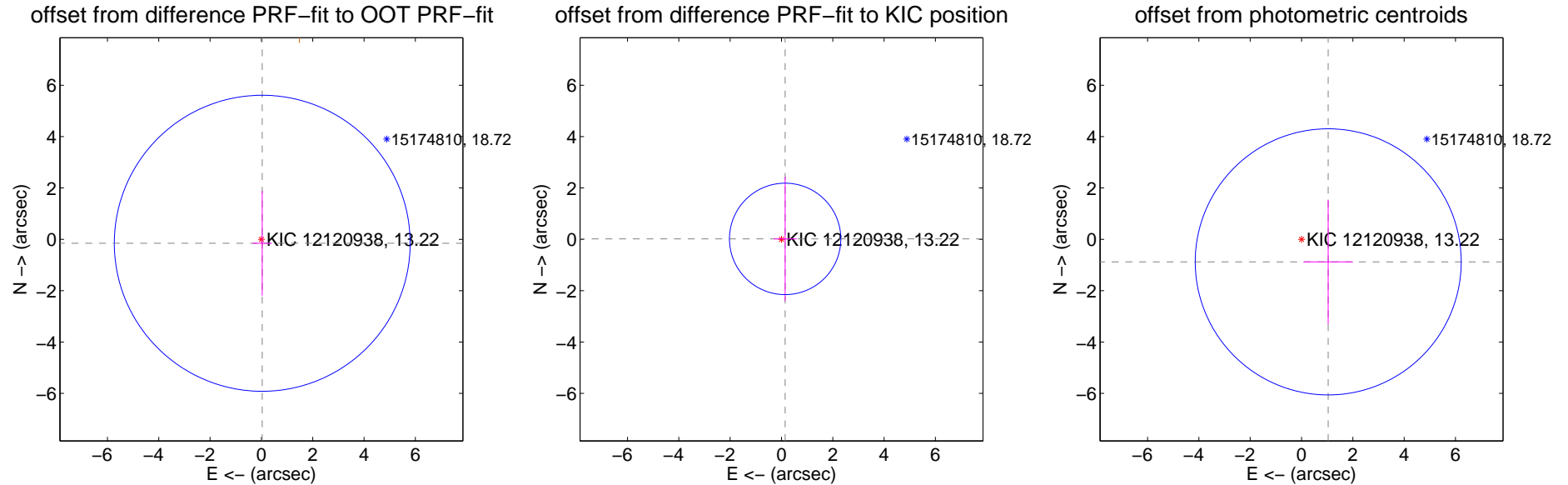
DV Centroid Data

Supplemental centroid analysis for 012120938-01. Kepler magnitude: 13.22. Transit SNR 4.01

There are 0 quarters with good PRF difference image offsets

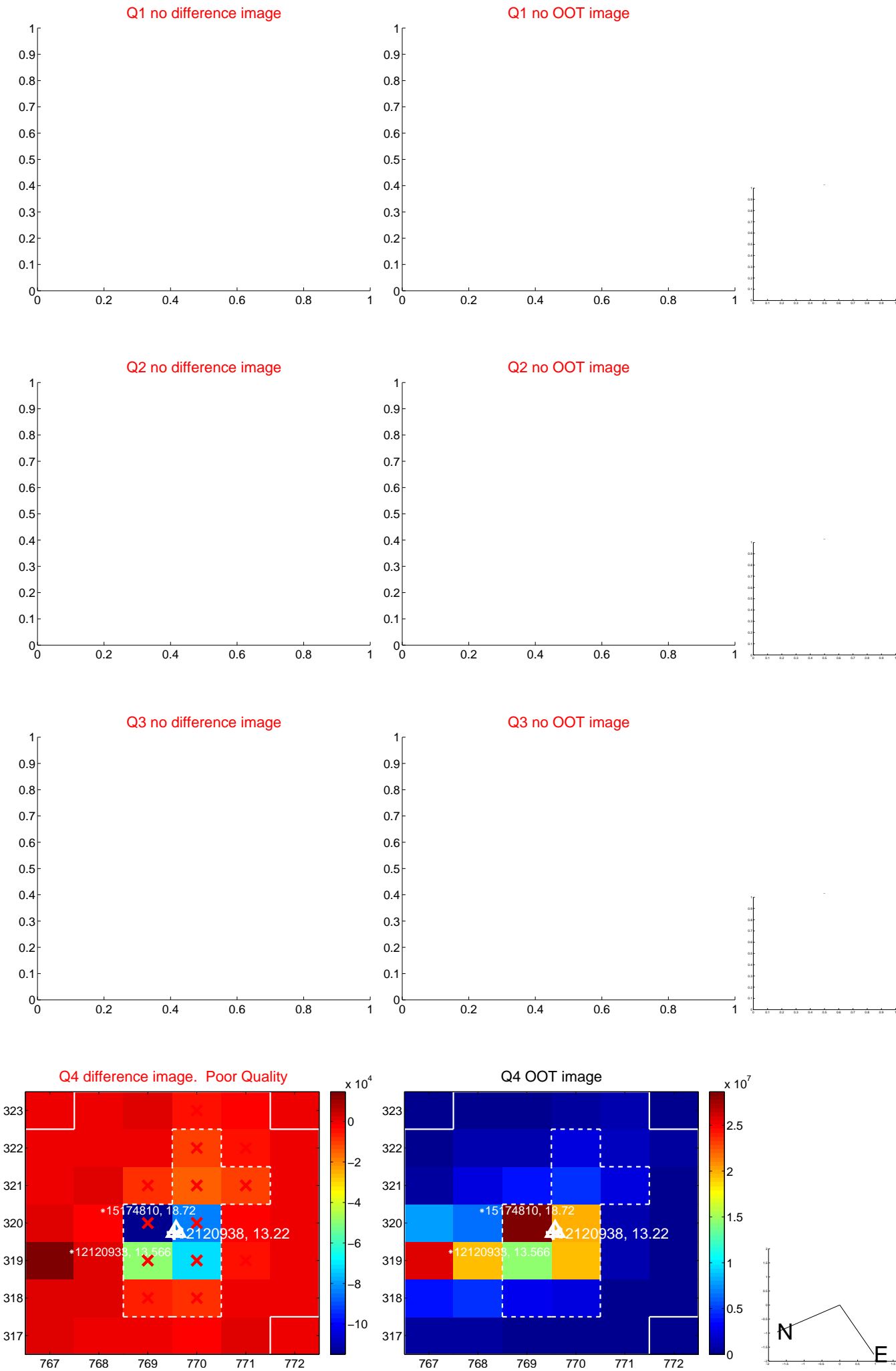
The direct PRF centroid is offset from the target star catalog position by about 0.44 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.158 ± 1.922	0.08	-0.032 ± 0.371	-0.154 ± 2.040
PRF-fit source offset from KIC position	0.144 ± 0.723	0.20	-0.143 ± 0.451	0.016 ± 2.419
photometric centroid source offset	1.36 ± 1.73	0.79	-1.04 ± 0.96	-0.88 ± 2.42



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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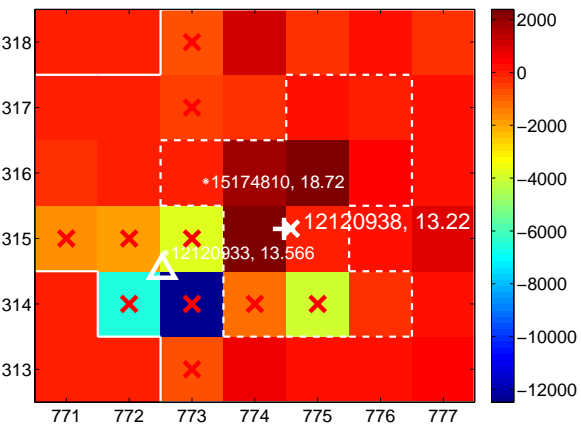
Q9 no difference image



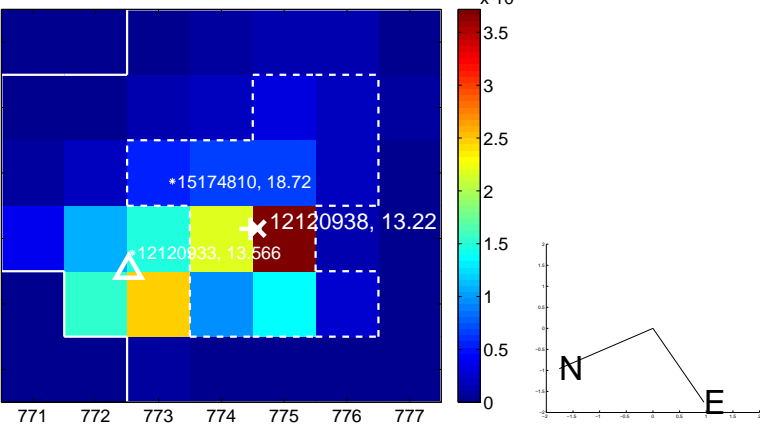
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



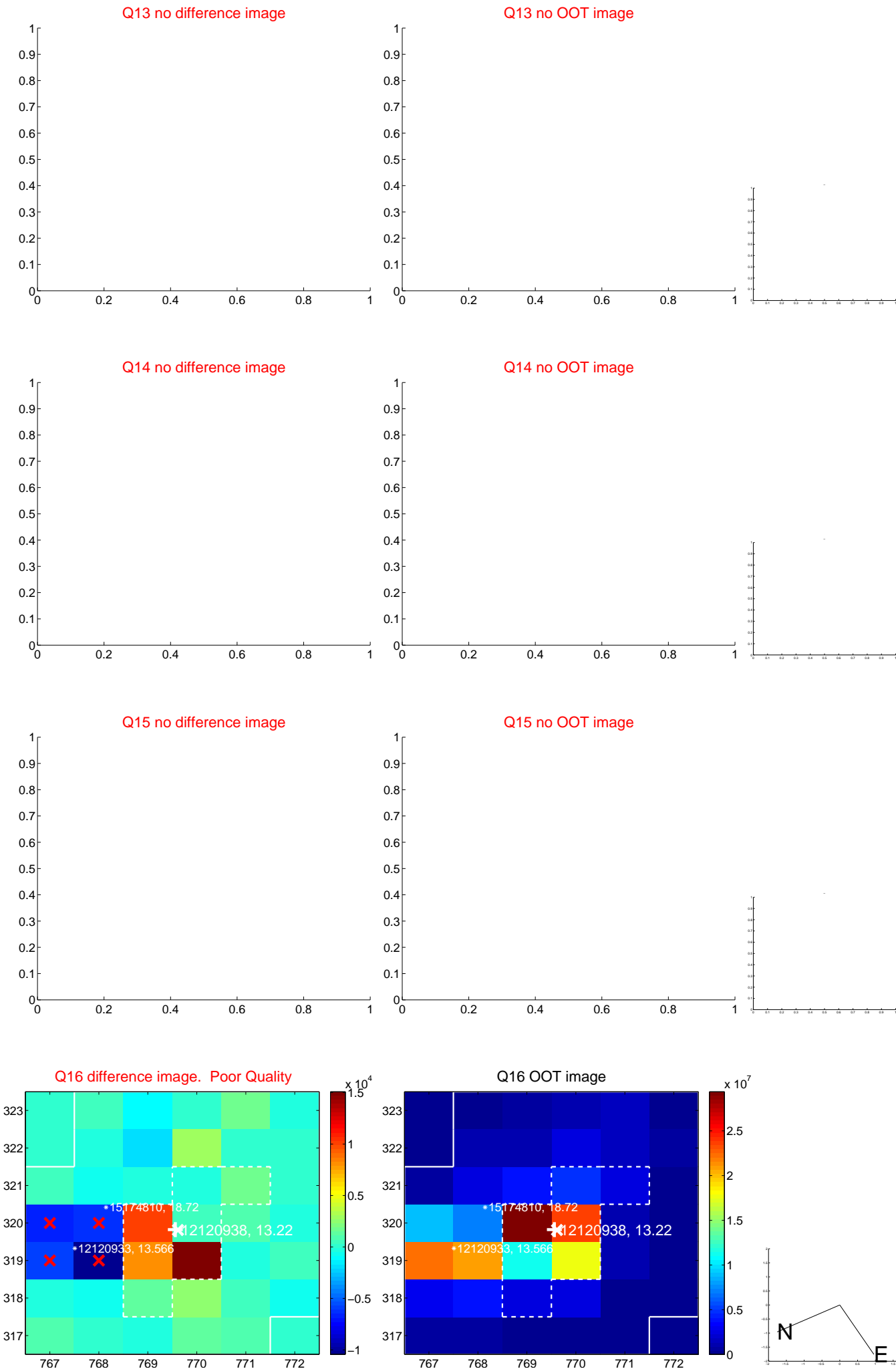
Q12 no difference image



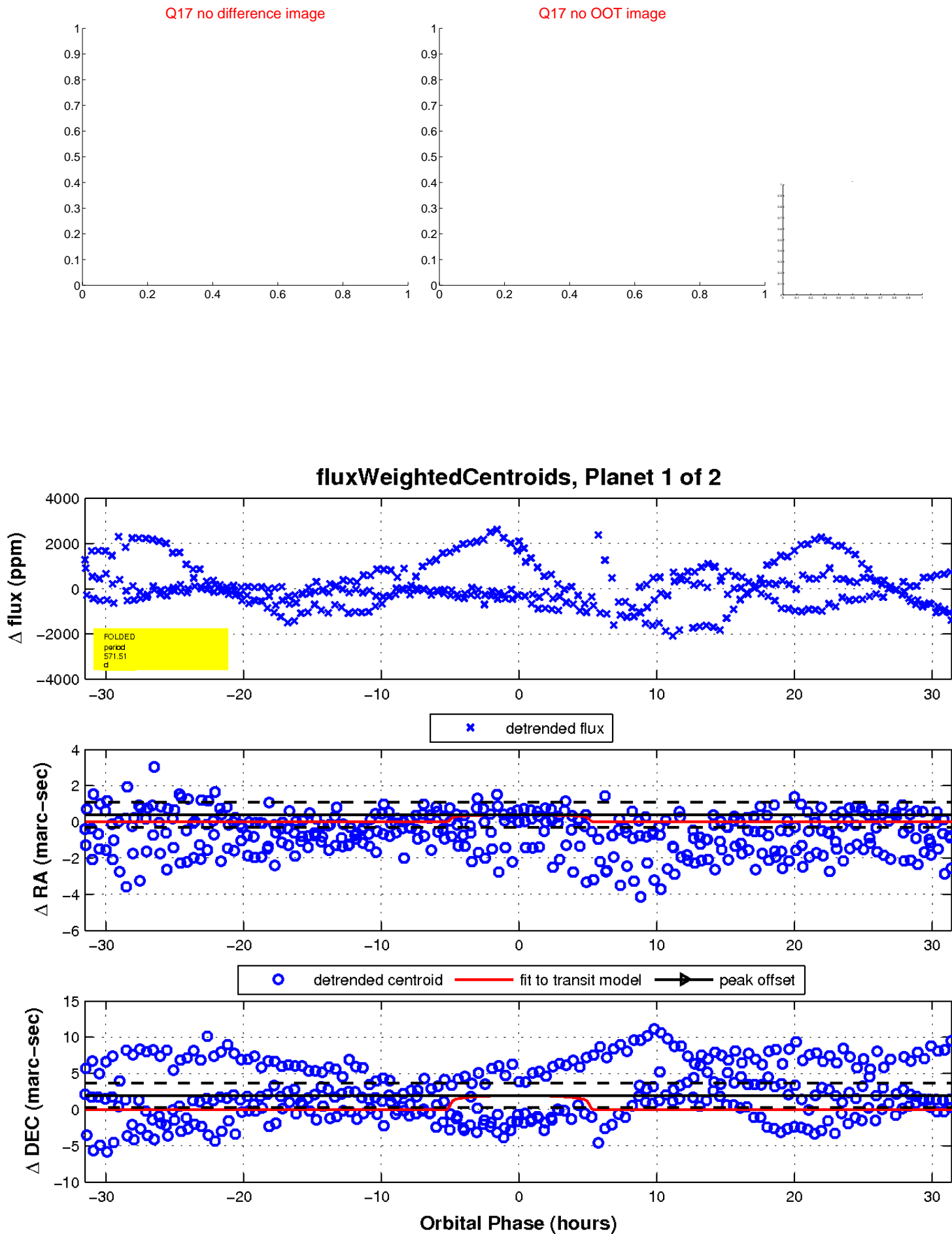
Q12 no OOT image



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

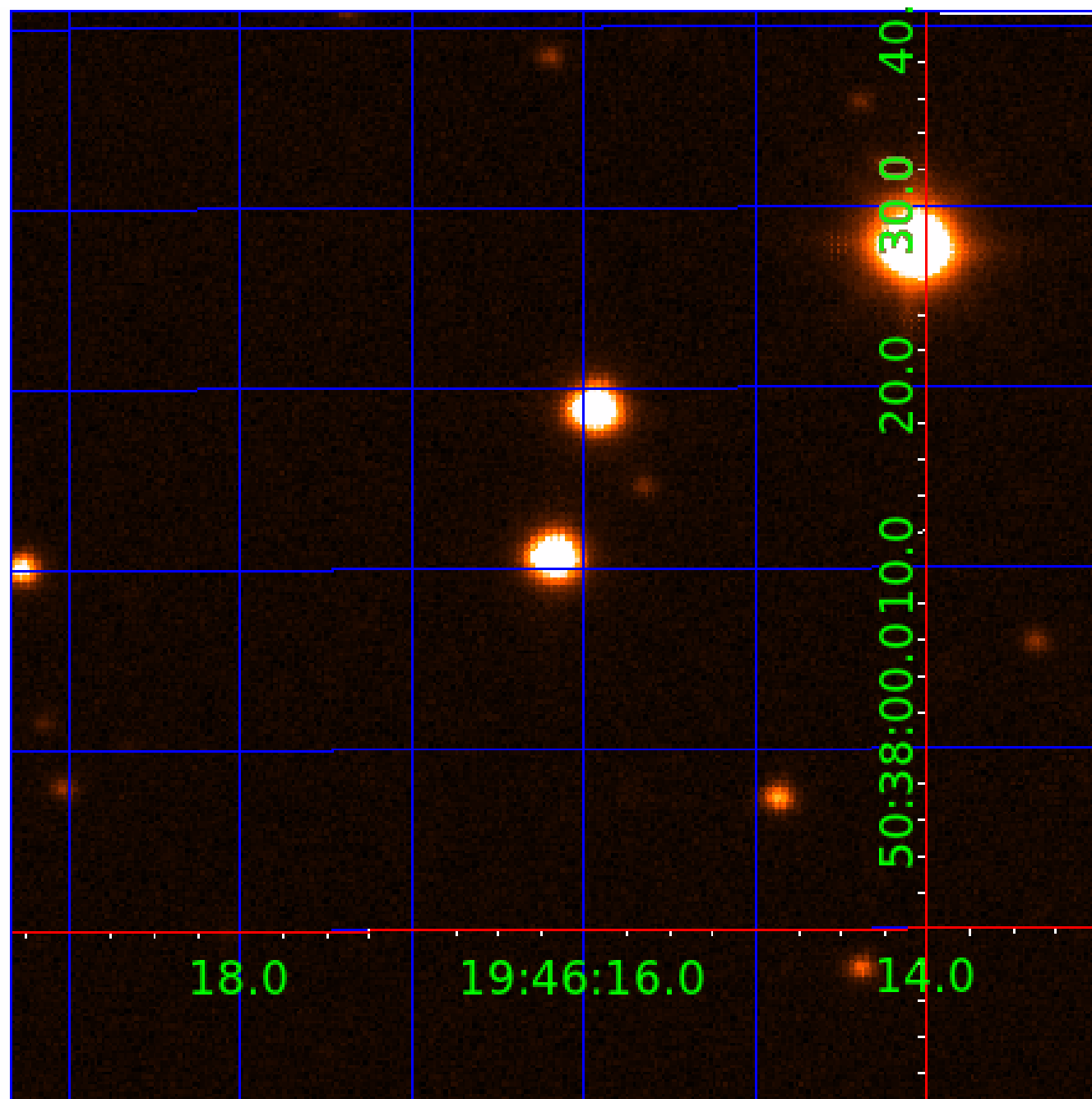


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012120938

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})
012120938-01	OBS	No	571.506182	410.640484	674.1	10.507	14.6	4.0	1.04	6365	2.82	0.84
012120938-02	OBS	No	1.009430	132.263456	96.8	12.113	11.5	9.6	1.04	6365	1.22	3932.56

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012120938-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
012120938-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—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.

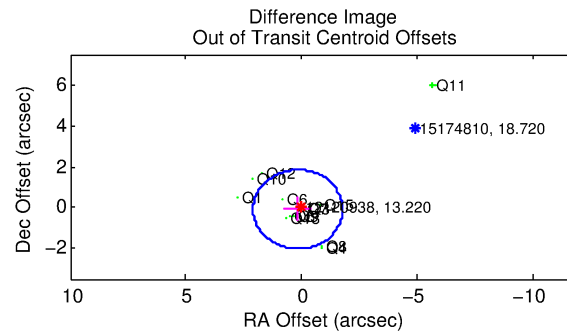
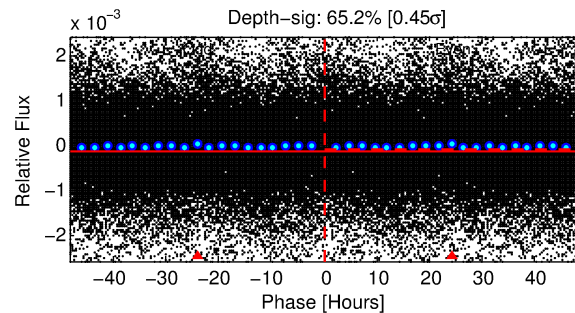
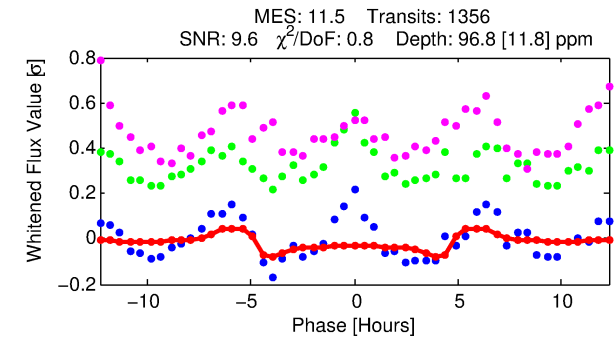
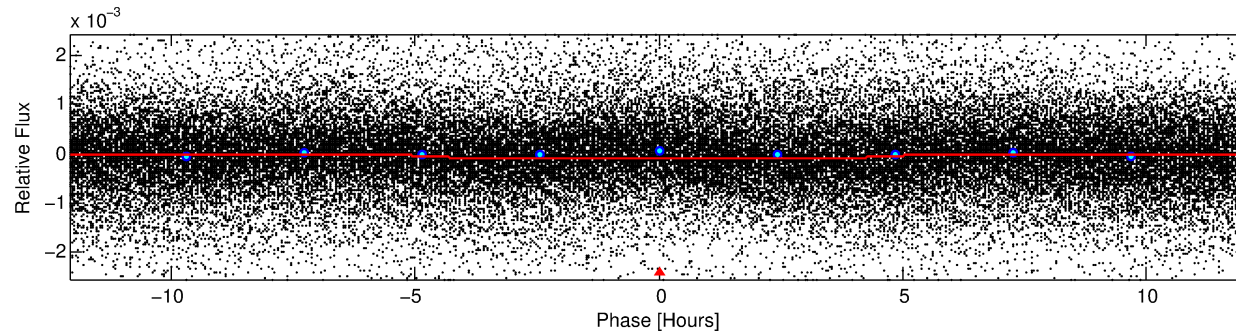
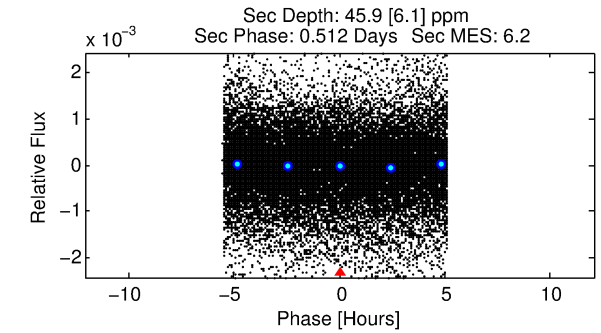
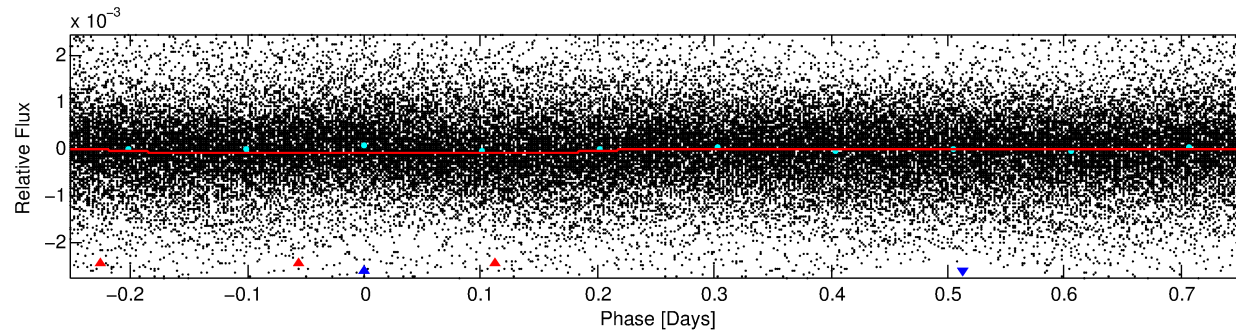
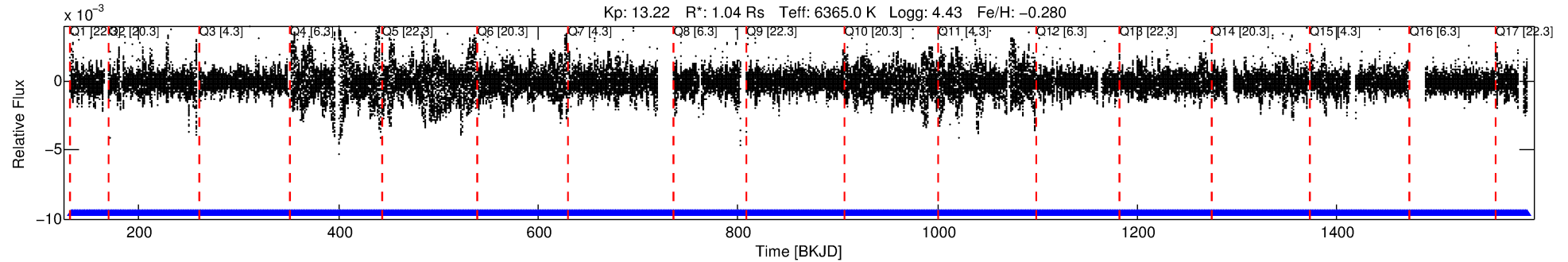
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012120938-02

No Significant Match Found

DV One-Page Summary

KIC: 12120938 Candidate: 2 of 2 Period: 1.009 d



DV Fit Results:

Period = 1.00943 [0.00001] d
Epoch = 132.2635 [0.0036] BKJD
Rp/R* = 0.0107 [0.0006]
a/R* = 1.01 [0.00]
b = 0.92 [0.01]
Seff = 3932.56 [1639.51]
Teq = 2019 [210] K
Rp = 1.22 [0.41] Re
a = 0.0201 [0.0056] AU
Ag = 6.88 [3.02] [1.95σ]
Teffp = 5057 [273] K [8.82σ]

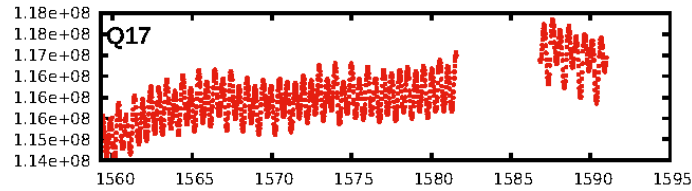
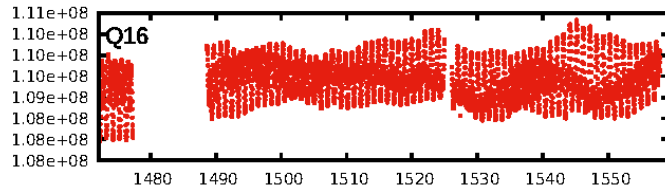
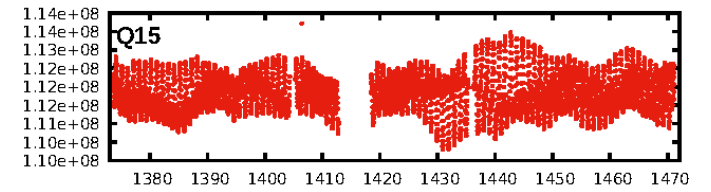
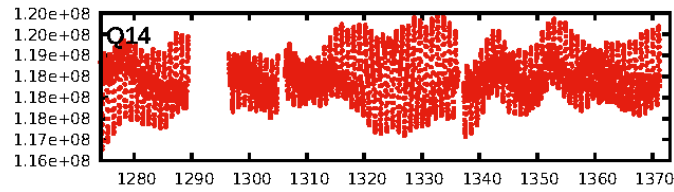
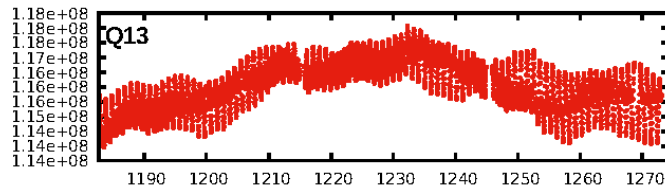
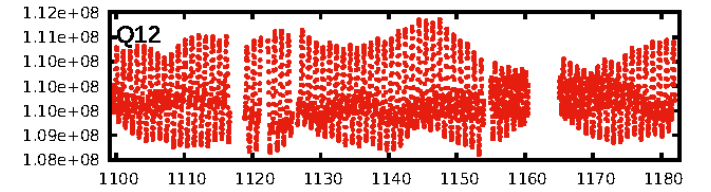
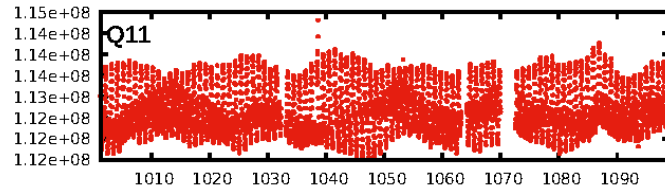
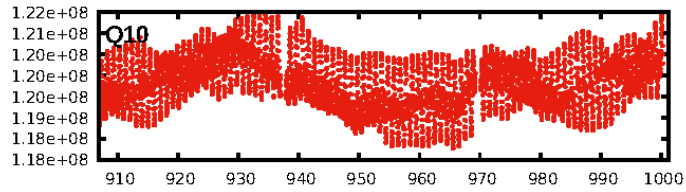
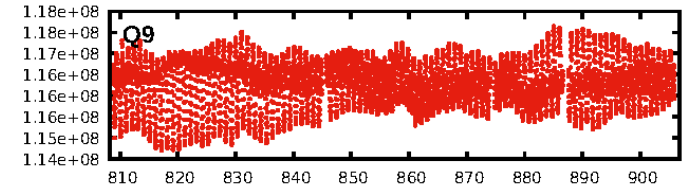
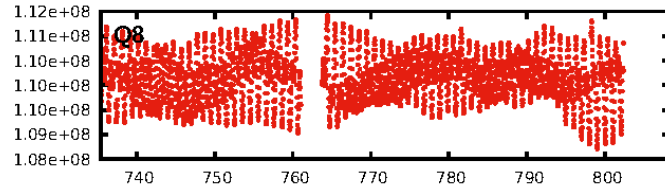
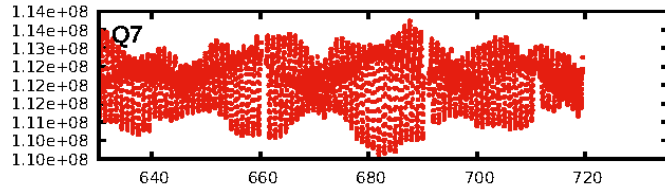
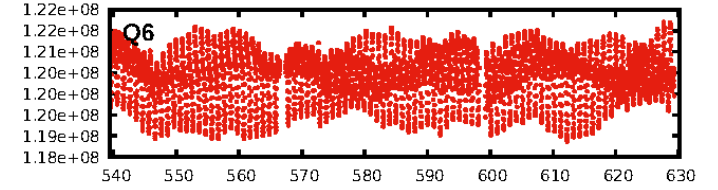
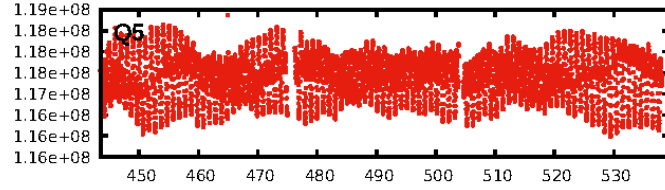
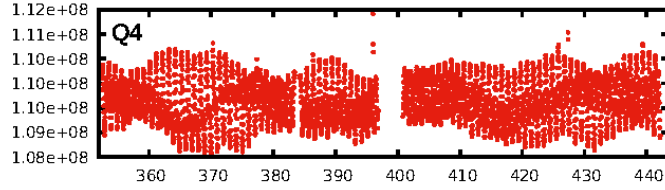
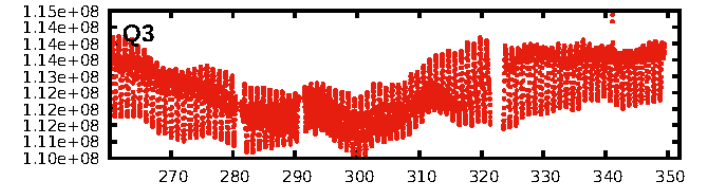
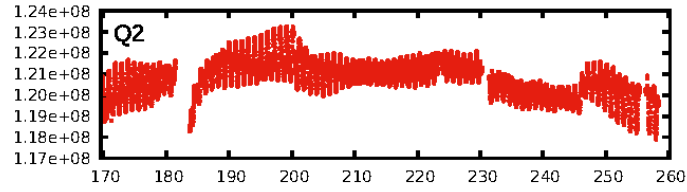
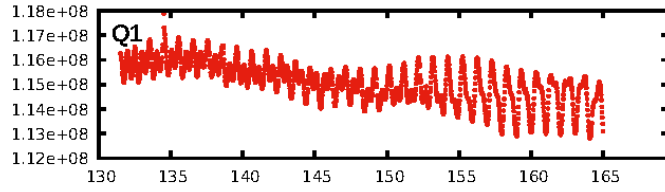
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [853.86σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1294/1294]
GhostDiagnostic-chr: -1.379
Centroid-sig: 0.0%
Centroid-so: 0.528 arcsec [0.53σ]
OotOffset-rm: 0.184 arcsec [0.29σ]
KicOffset-rm: 0.074 arcsec [0.17σ]
OotOffset-st: 2/4/3/4 [13]
KicOffset-st: 2/4/3/4 [13]
DiffImageQuality-fgm: 0.08 [1/13]
DiffImageOverlap-fno: 1.00 [17/17]

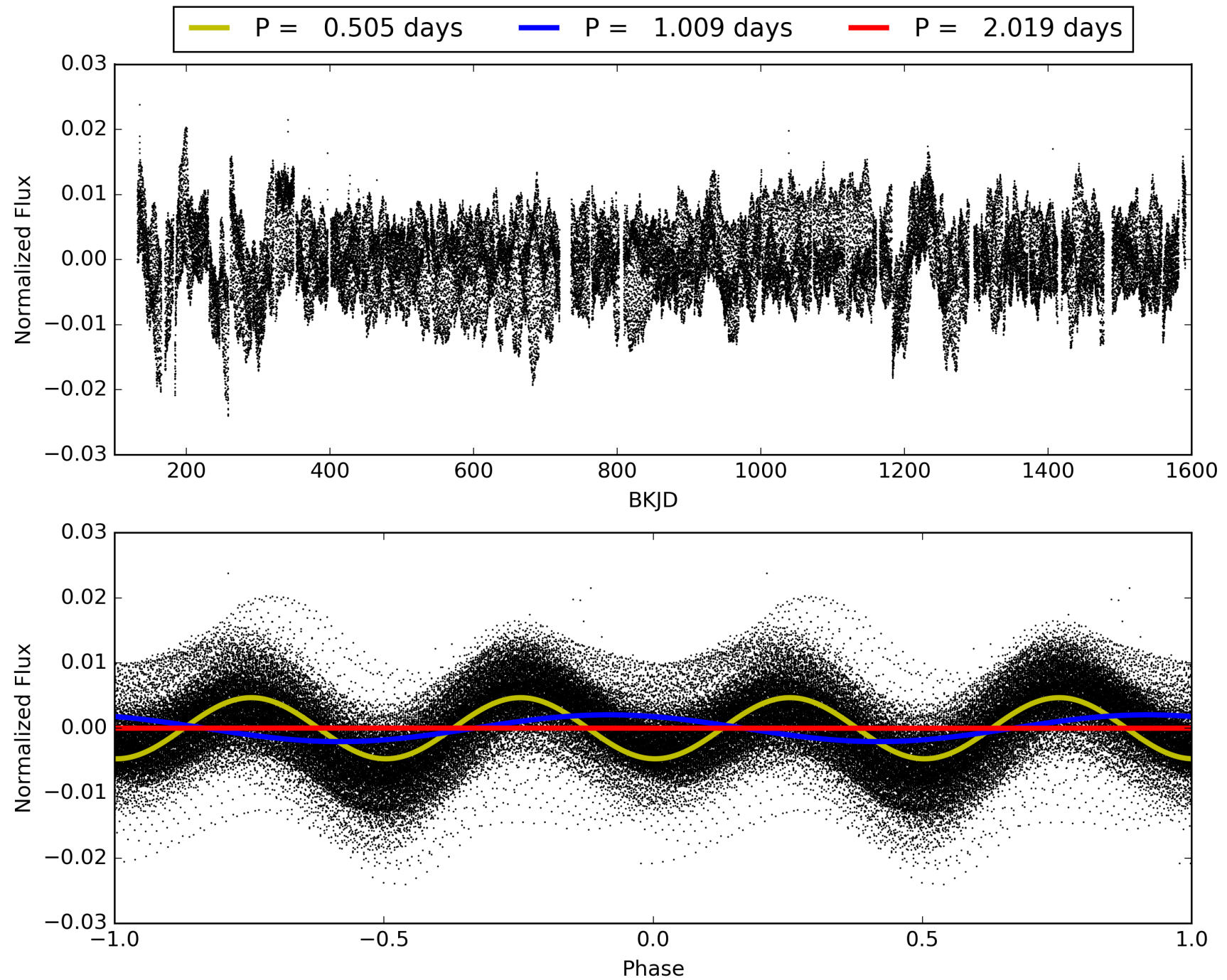
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:31:02 Z

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

TCE 012120938-02, PDC Light Curves

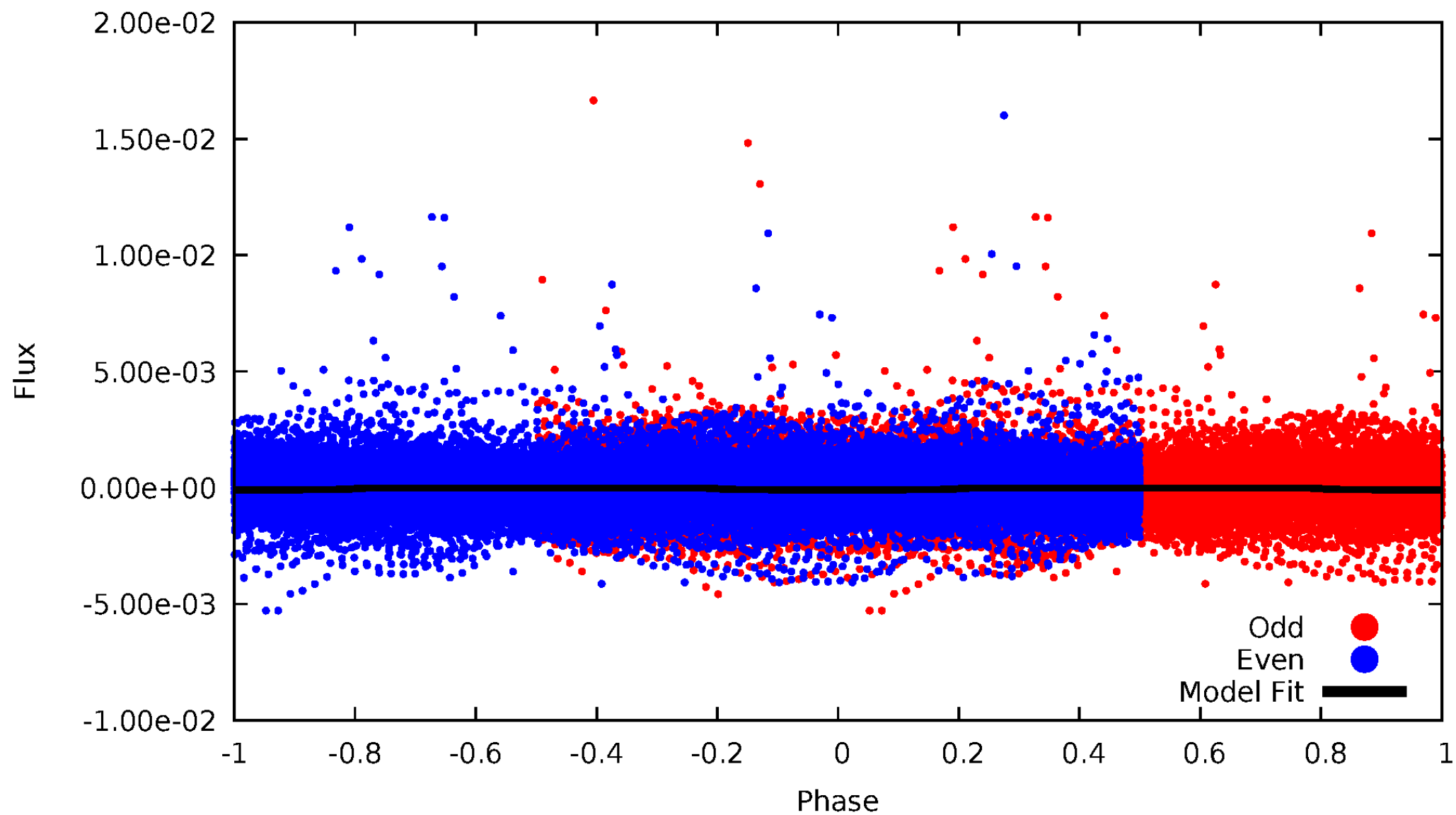


TCE 012120938-02



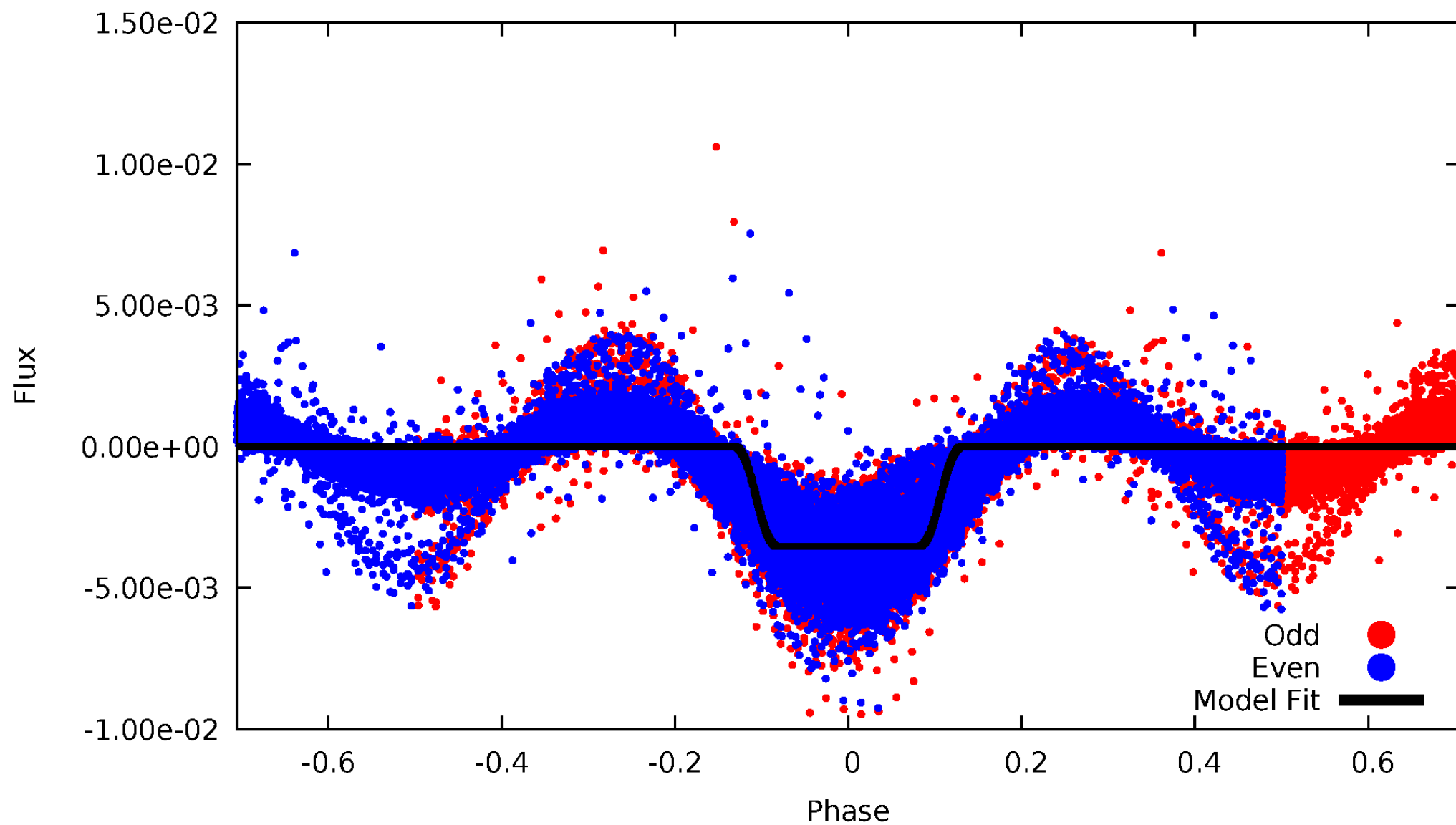
DV Odd/Even

TCE 012120938-02



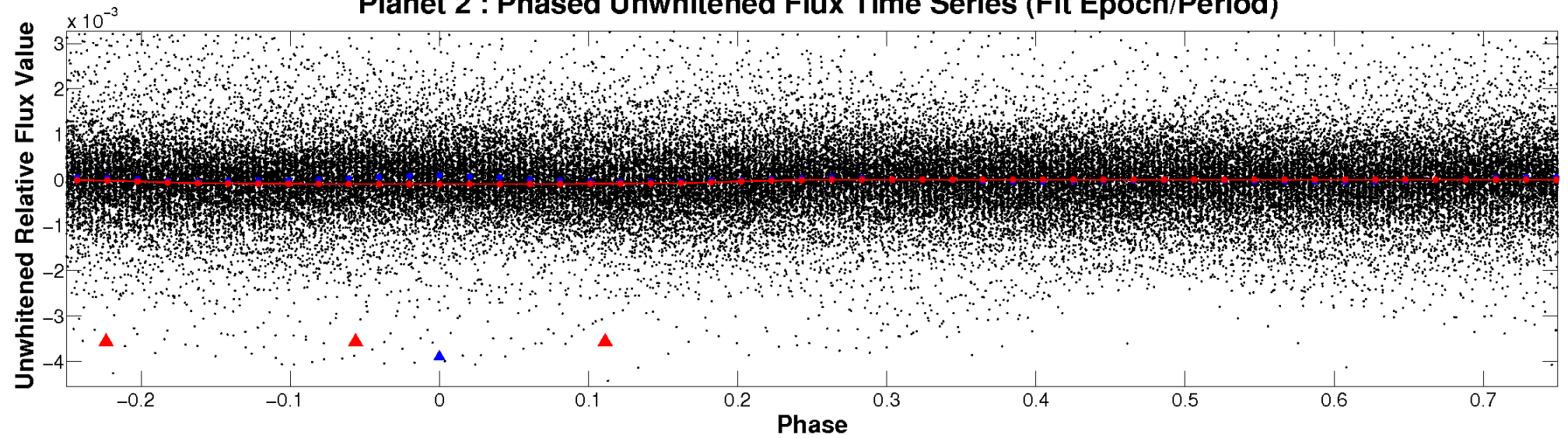
ALT Odd/Even

TCE 012120938-02

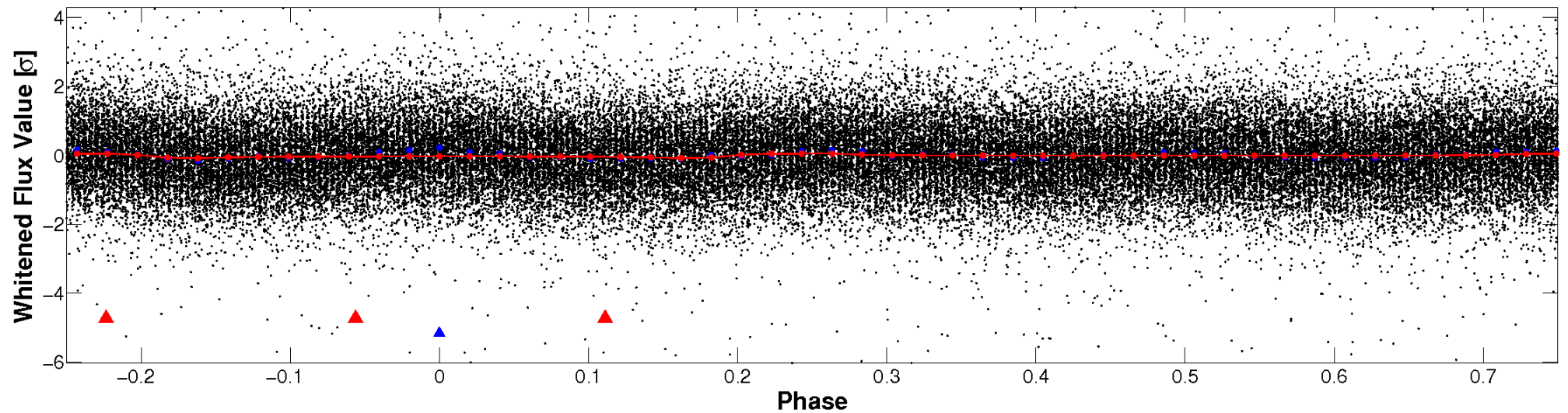


Non-Whitened Vs. Whitened Light Curve

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

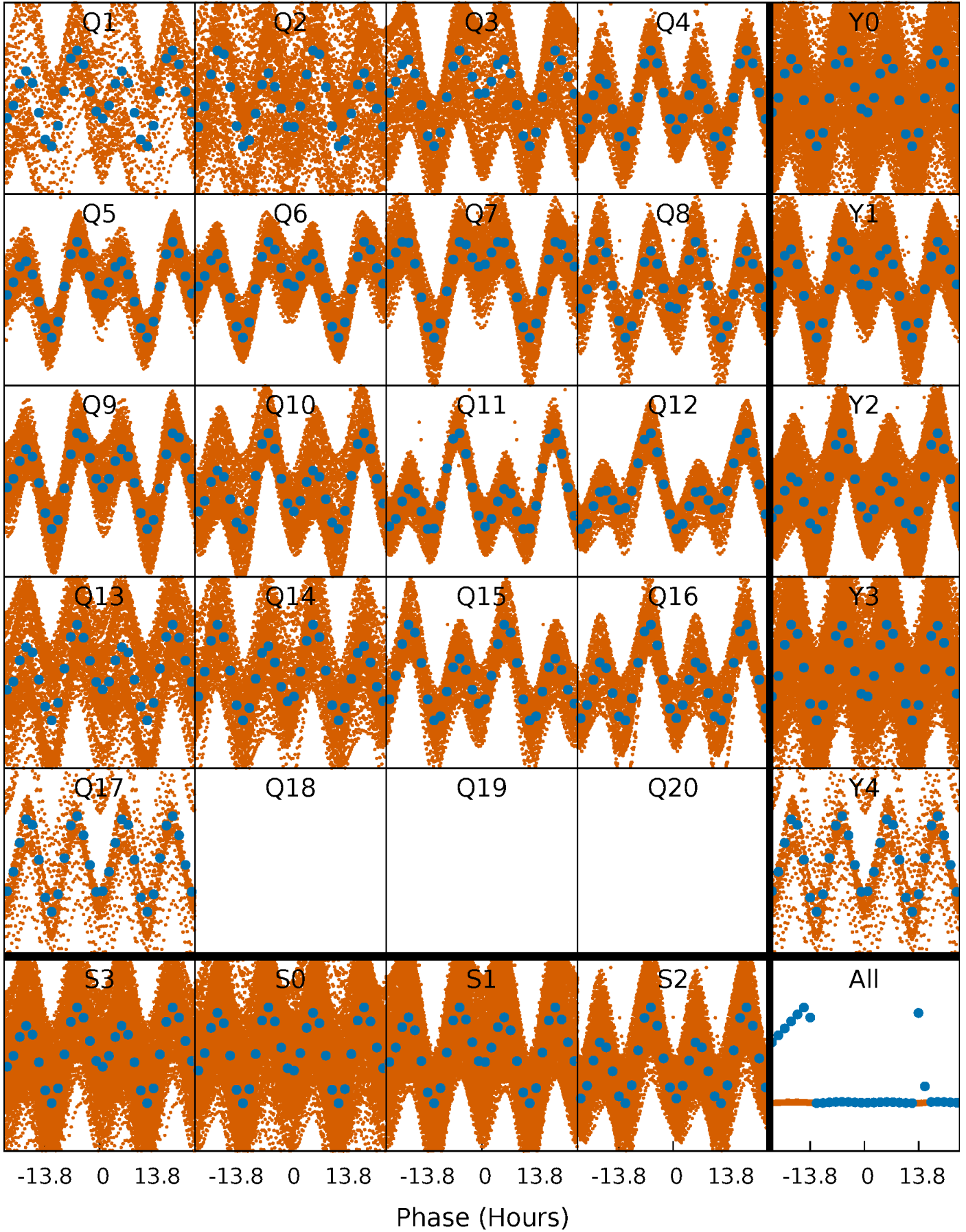


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



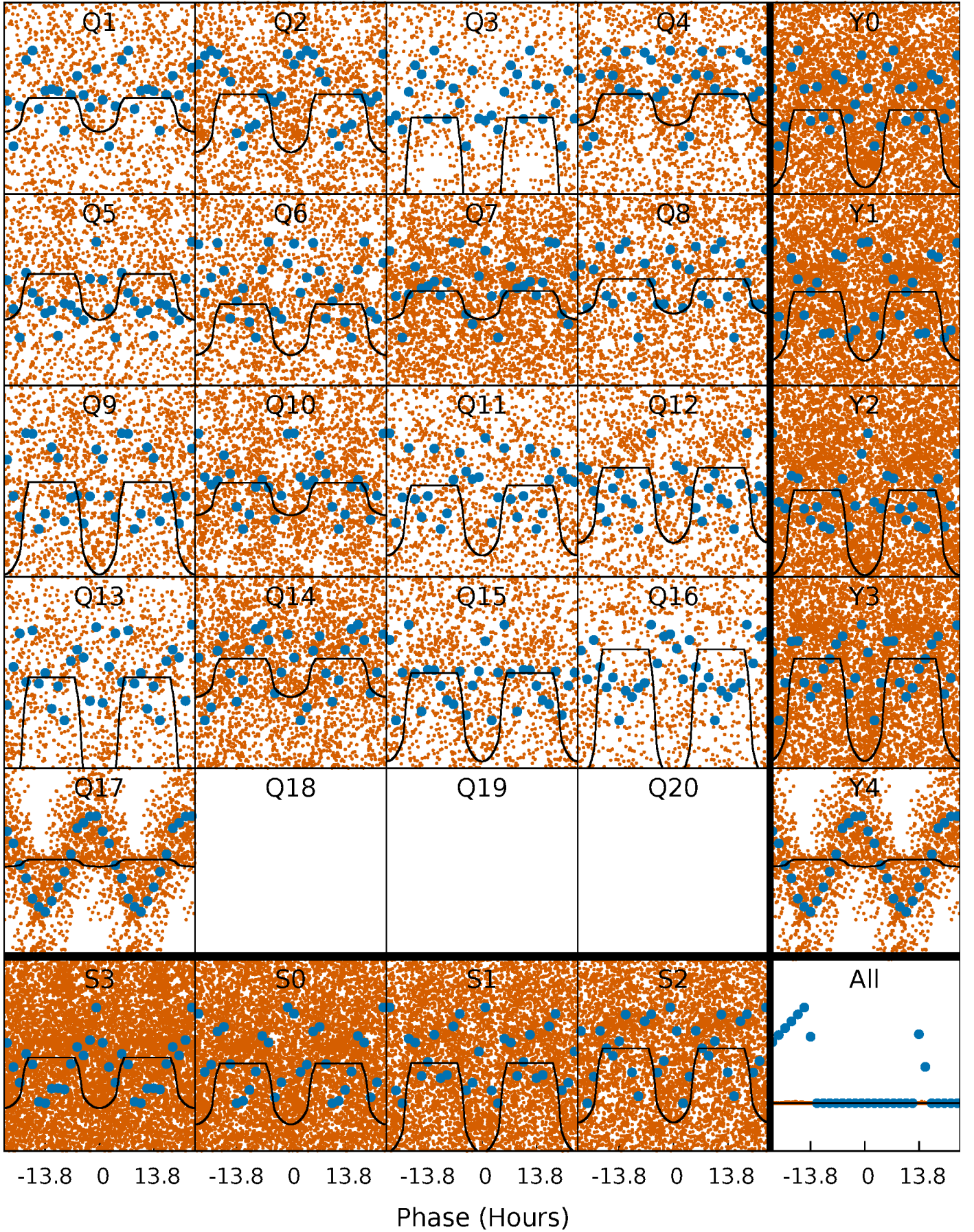
PDC Quarter-Phased Transit Curves

TCE 012120938-02 P= 1.009430 Days $T_0=132.263456$ (BKJD)



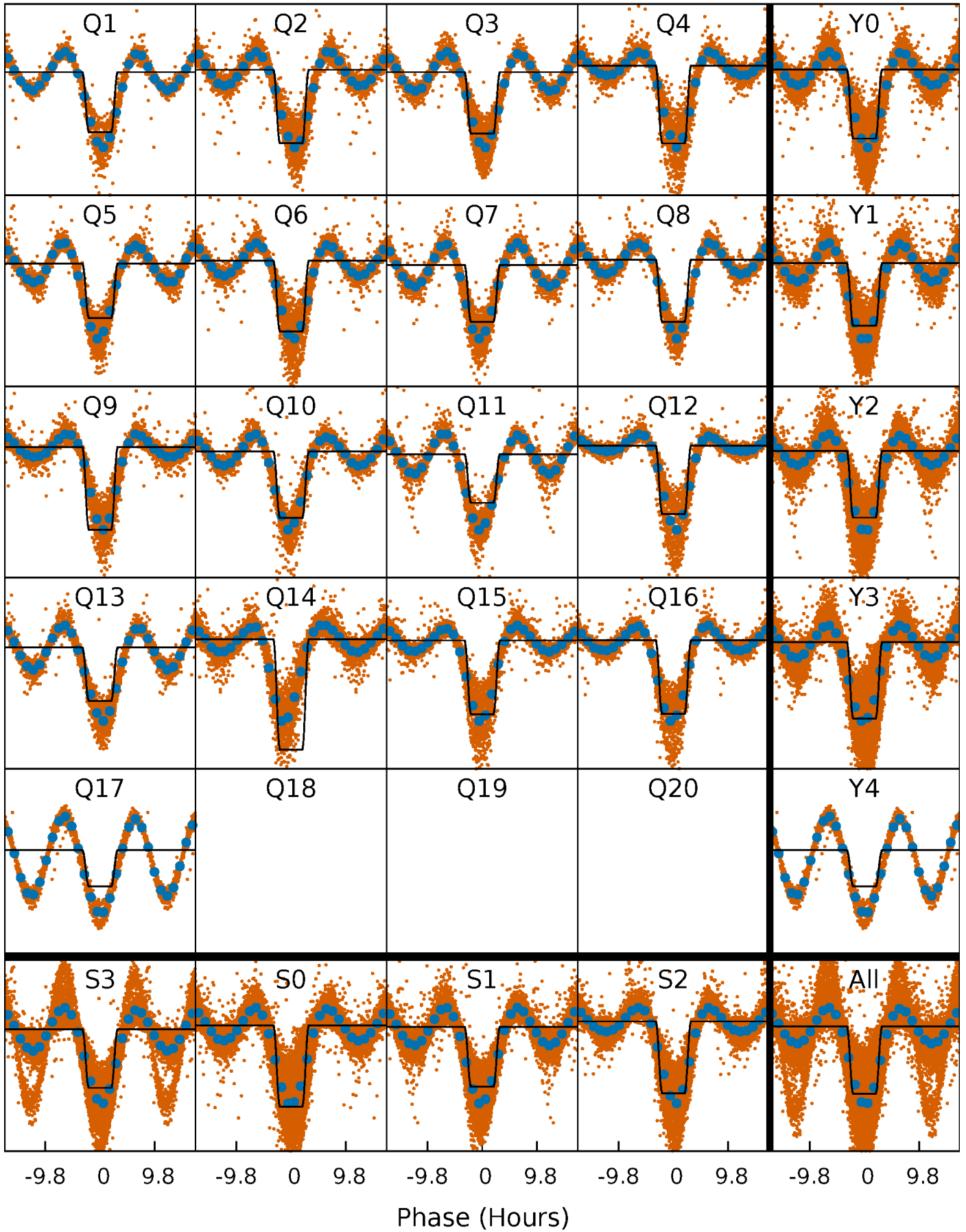
DV Quarter-Phased Transit Curves

TCE 012120938-02 P= 1.009430 Days $T_0=132.263456$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

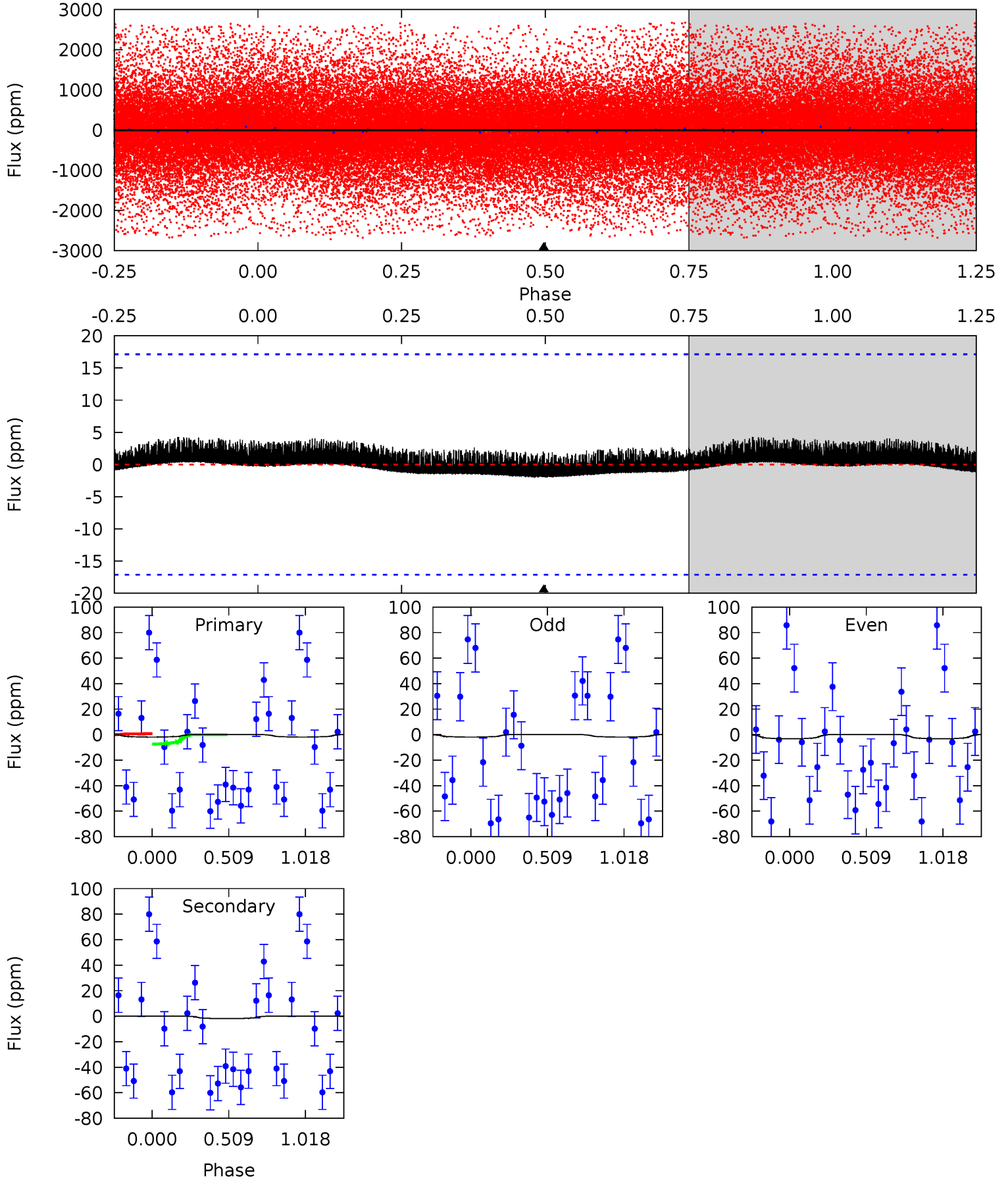
TCE 012120938-02 $P = 1.009438$ Days $T_0 = 132.259007$ (BKJD)



DV Model-Shift Uniqueness Test

012120938-02, P = 1.009430 Days, E = 131.254026 Days

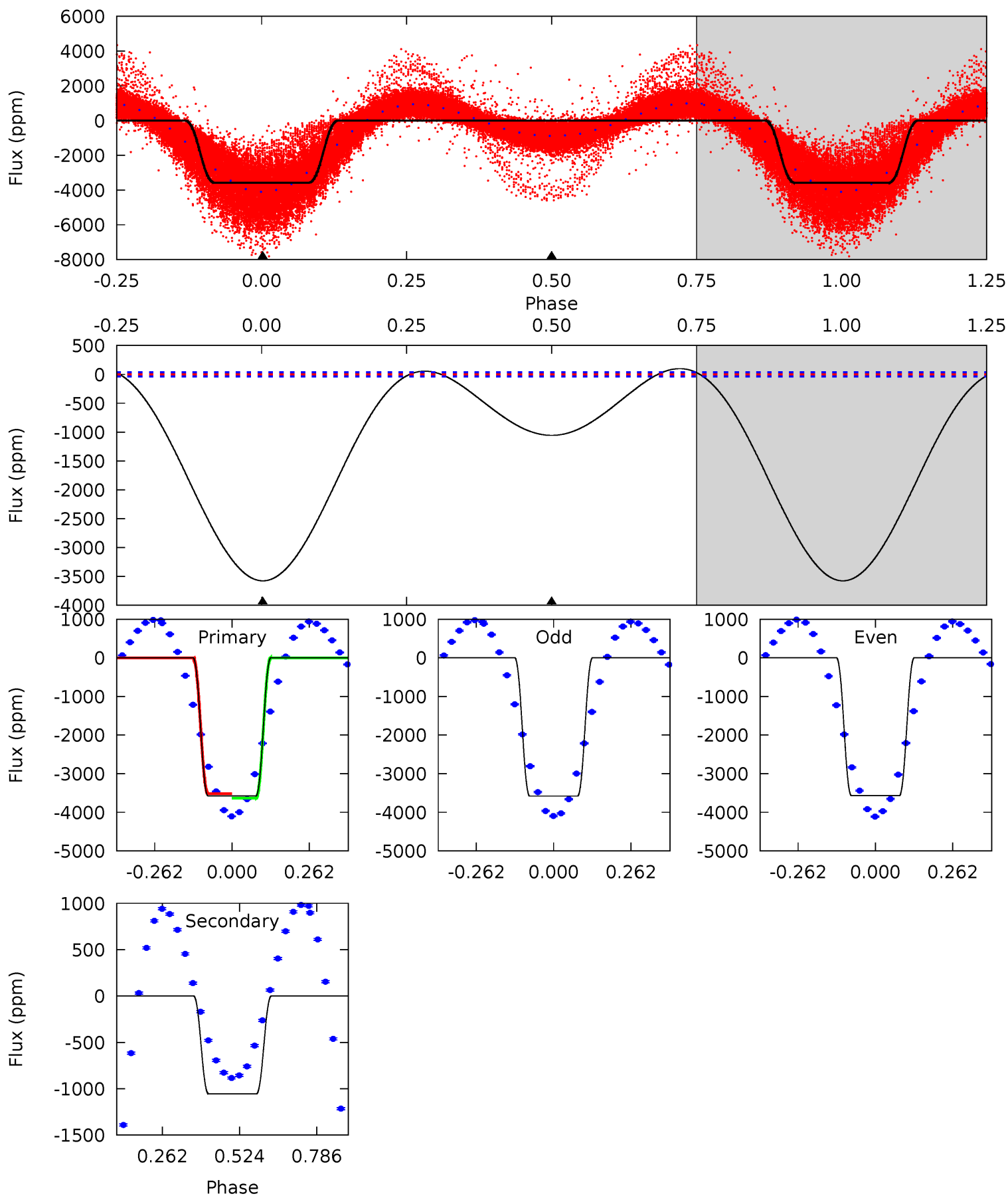
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.46	0.46	0	0	4.21	0.66	0.14	0.46	0.46	0.46	0.46	0.17	7.23	0.69	0.82



Alt Model-Shift Uniqueness Test

012120938-02, P = 1.009438 Days, E = 131.249569 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
436.2	128.8	0	0	4.36	1.12	10.0	436.2	436.2	128.8	128.8	0.72	1.01	0.03	7.18



Stellar Parameters For KIC 012120938

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6365^{+151}_{-189}	$4.431^{+0.067}_{-0.216}$	$-0.280^{+0.250}_{-0.300}$	$1.040^{+0.348}_{-0.116}$	$1.060^{+0.157}_{-0.129}$	$1.328^{+0.385}_{-0.710}$
	+2%/-3%	+2%/-5%	+89%/-107%	+33%/-11%	+15%/-12%	+29%/-53%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 012120938-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2 ± 4	$1.26^{+0.22}_{-0.13}$	2865^{+218}_{-136}	-2544^{+5806}_{-819}	$0.219^{+0.584}_{-0.511}$
Alt.	-1057 ± 8	$6.86^{+1.27}_{-0.52}$	2864^{+237}_{-136}	4756^{+98}_{-115}	$4.923^{+0.690}_{-1.365}$

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

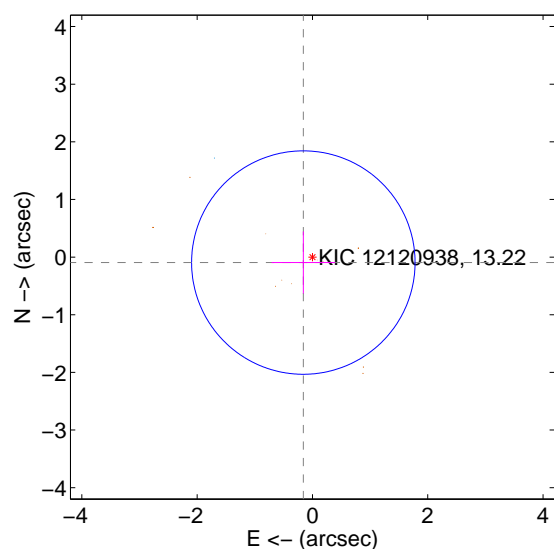
Supplemental centroid analysis for 012120938-02. Kepler magnitude: 13.22. Transit SNR 9.58

There are 1 quarters with good PRF difference image offsets

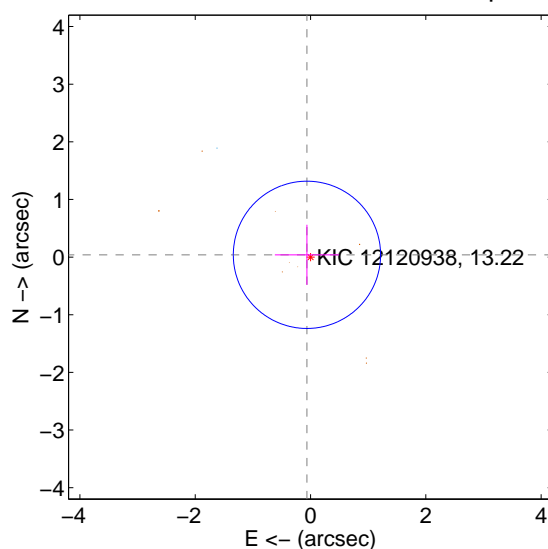
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.184 ± 0.646	0.29	0.158 ± 0.551	-0.095 ± 0.538
PRF-fit source offset from KIC position	0.074 ± 0.426	0.17	0.062 ± 0.557	0.039 ± 0.522
photometric centroid source offset	0.53 ± 0.99	0.53	-0.17 ± 0.33	-0.50 ± 1.04

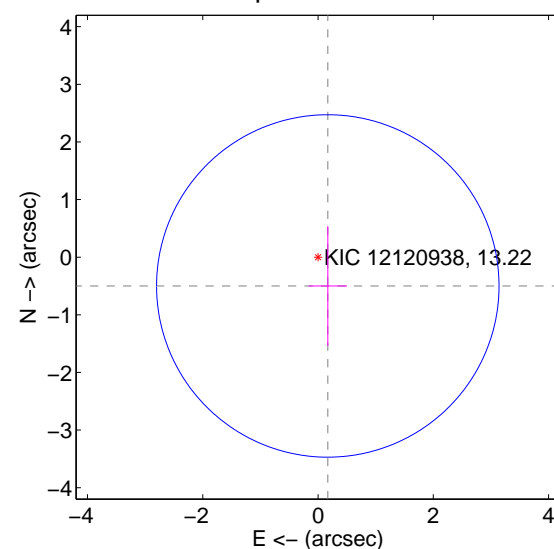
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

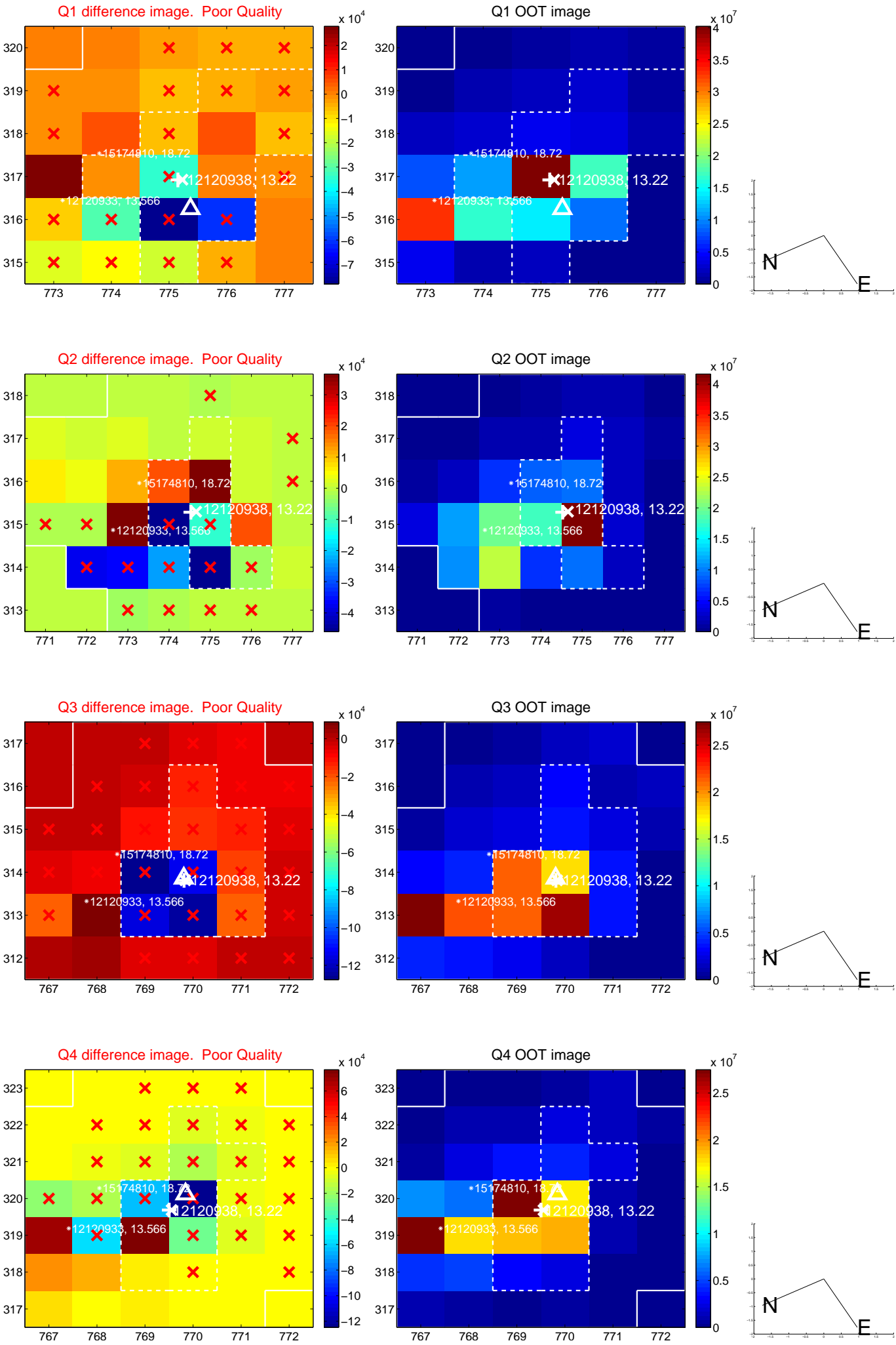


offset from photometric centroids

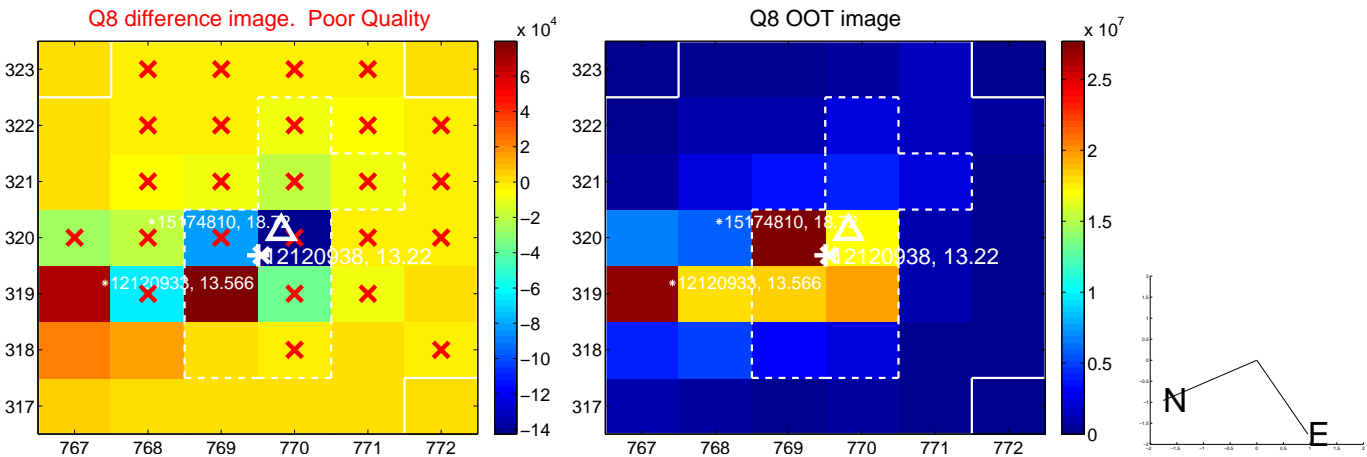
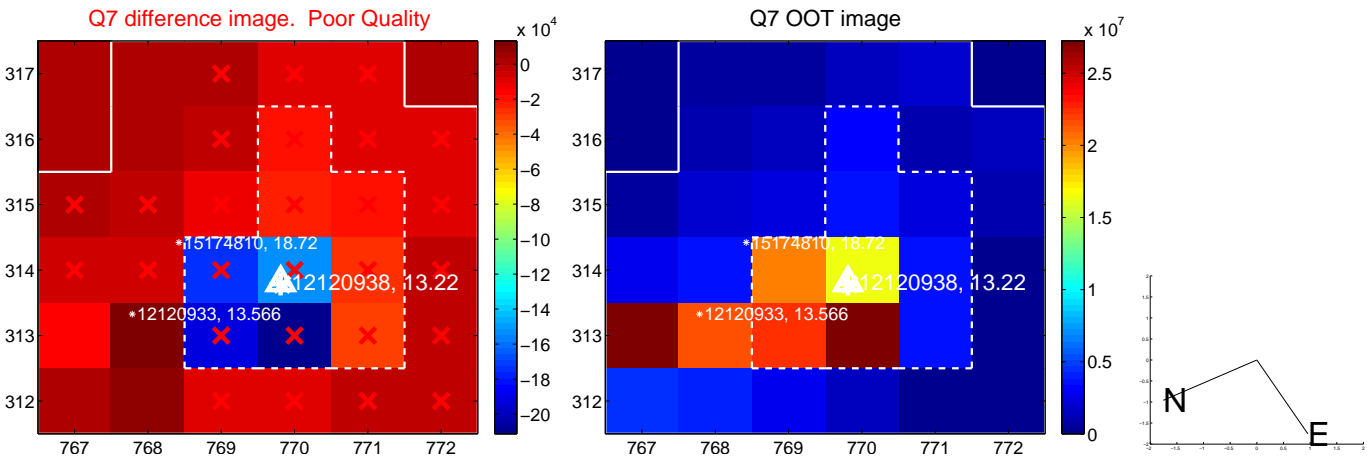
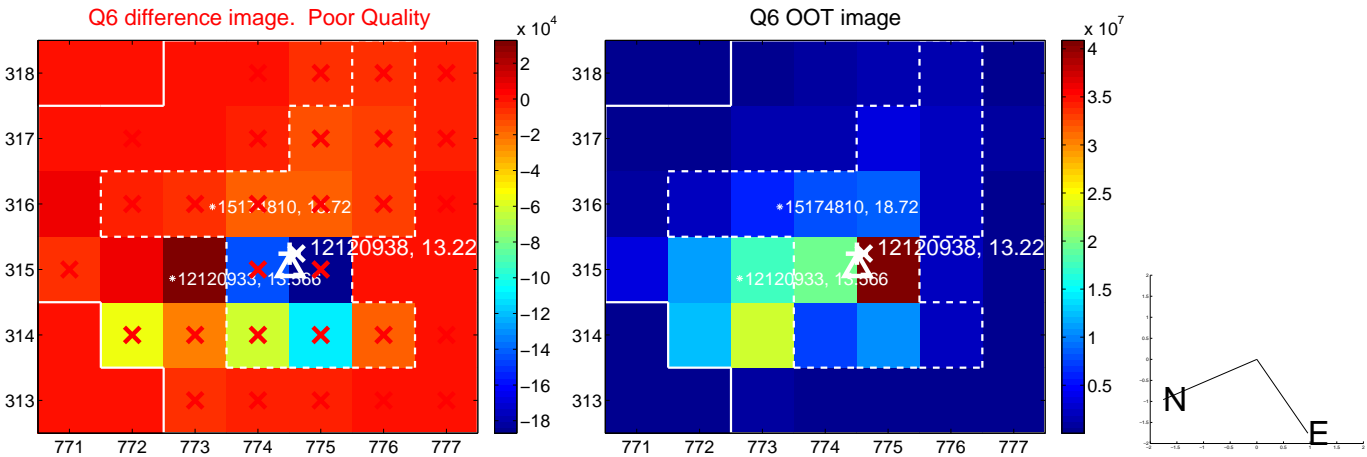
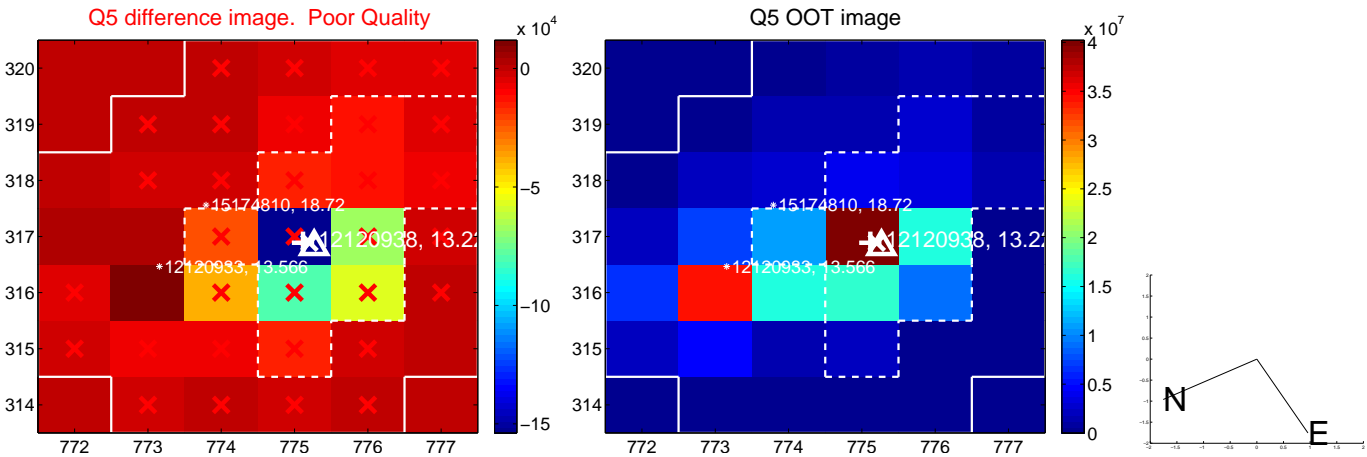


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

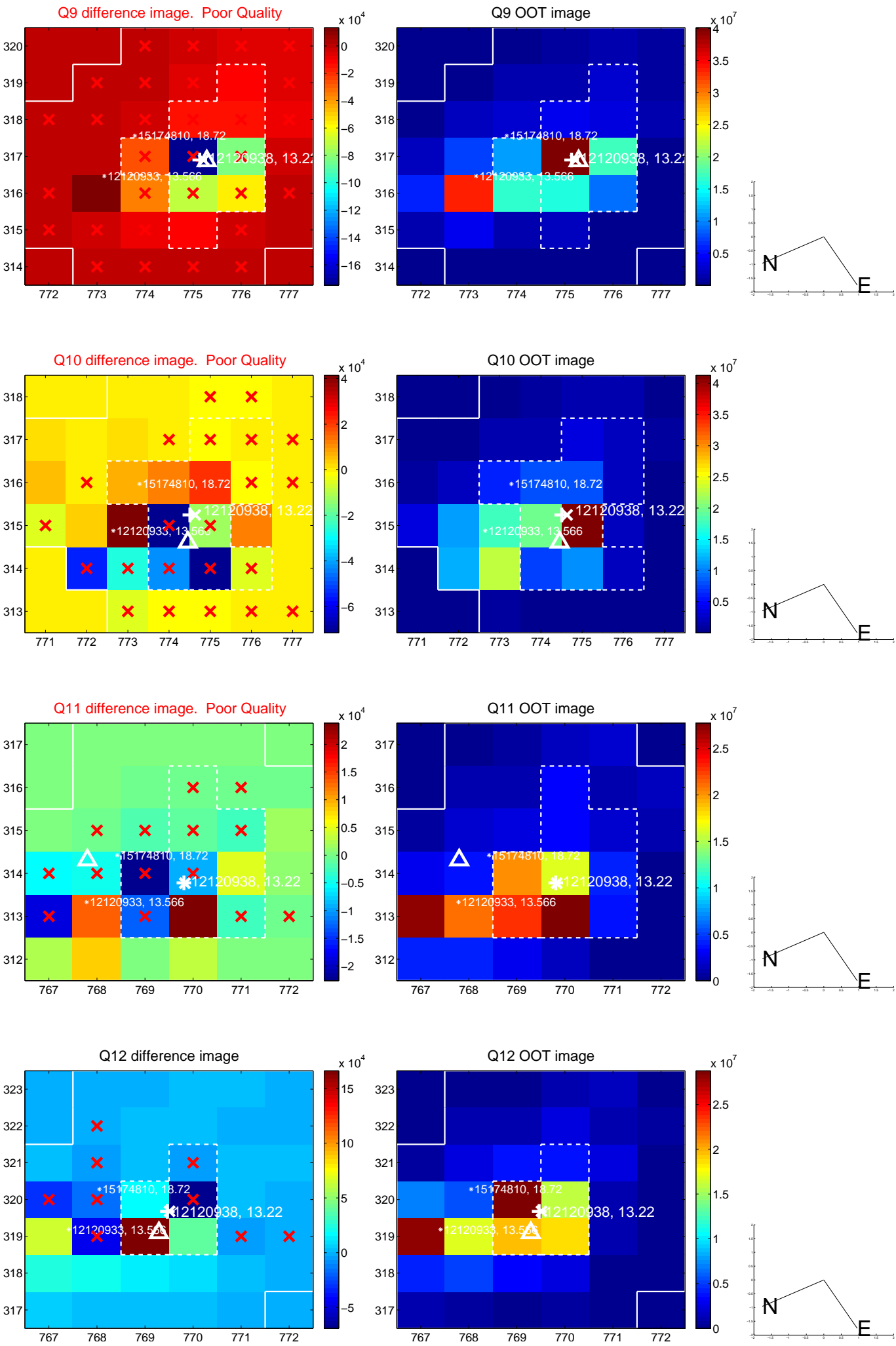
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



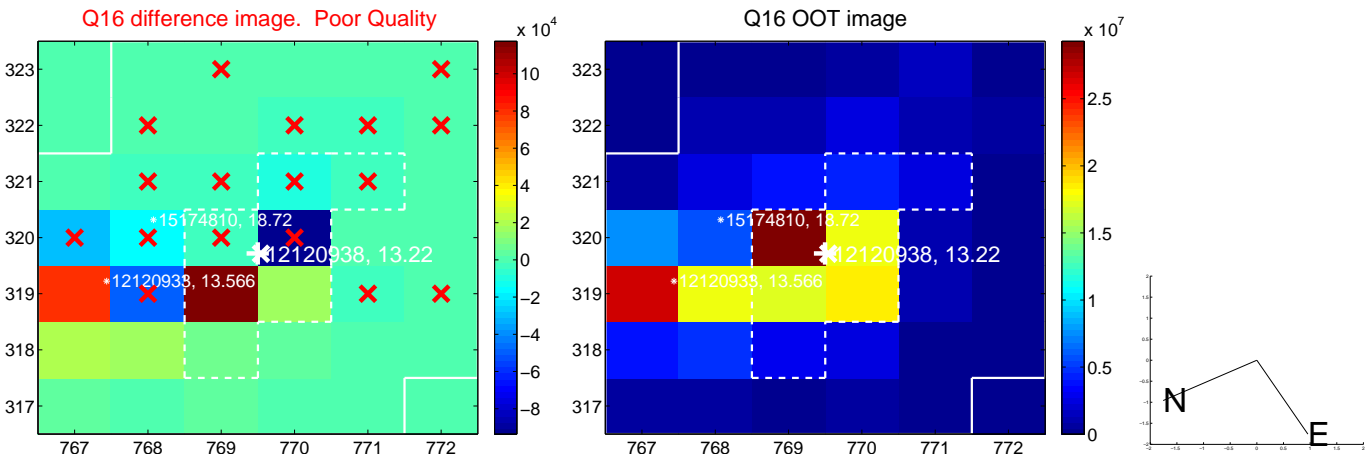
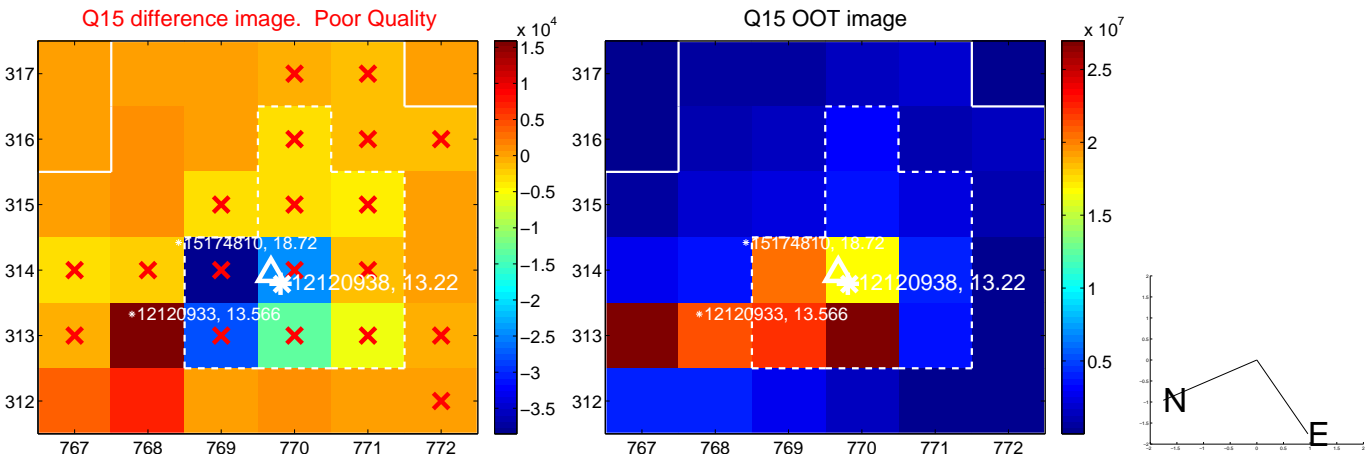
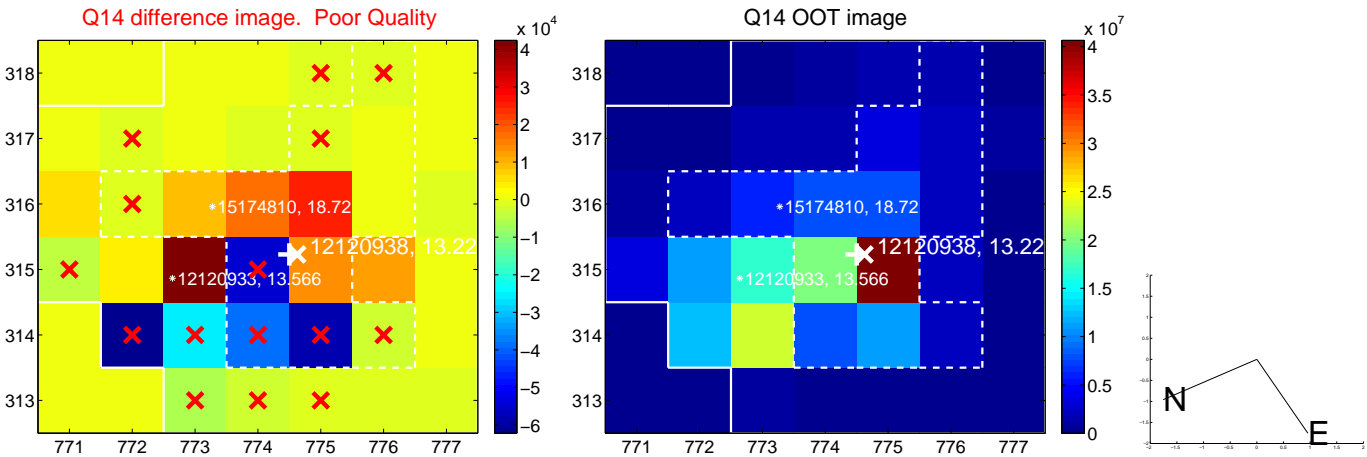
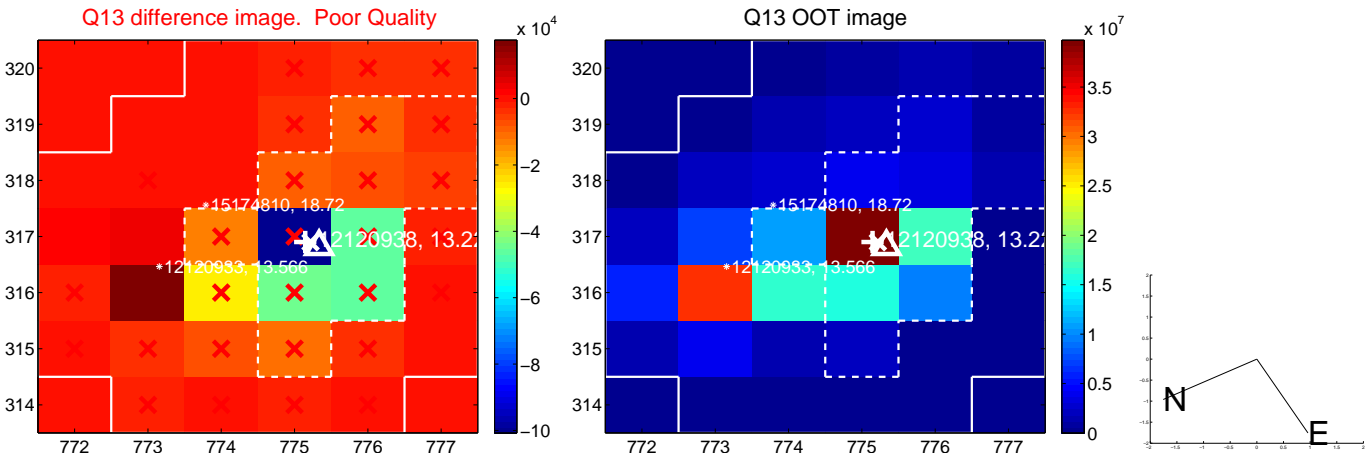
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



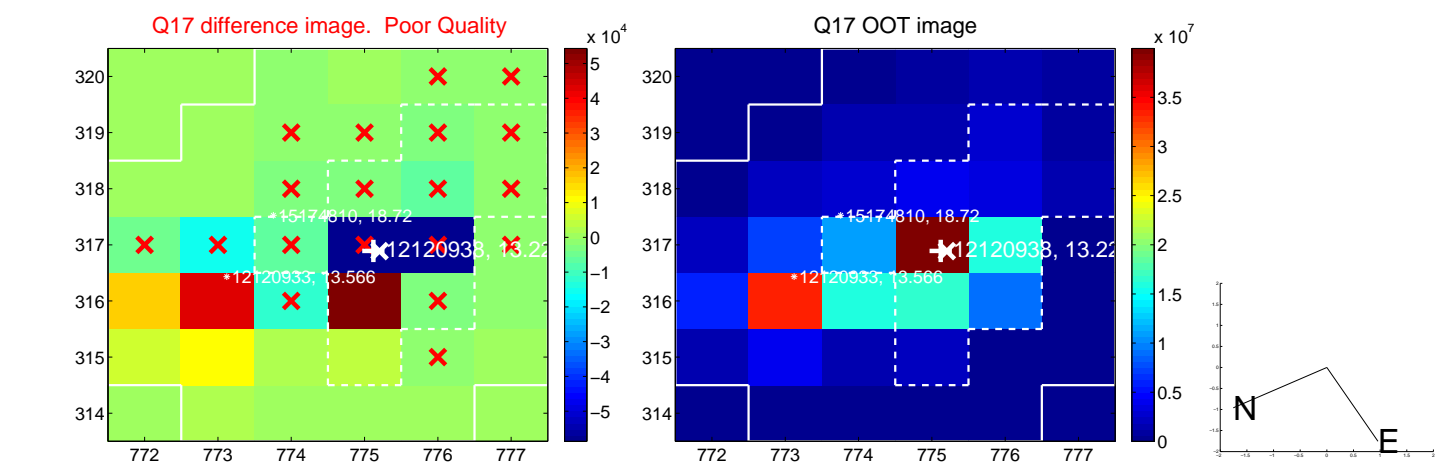
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



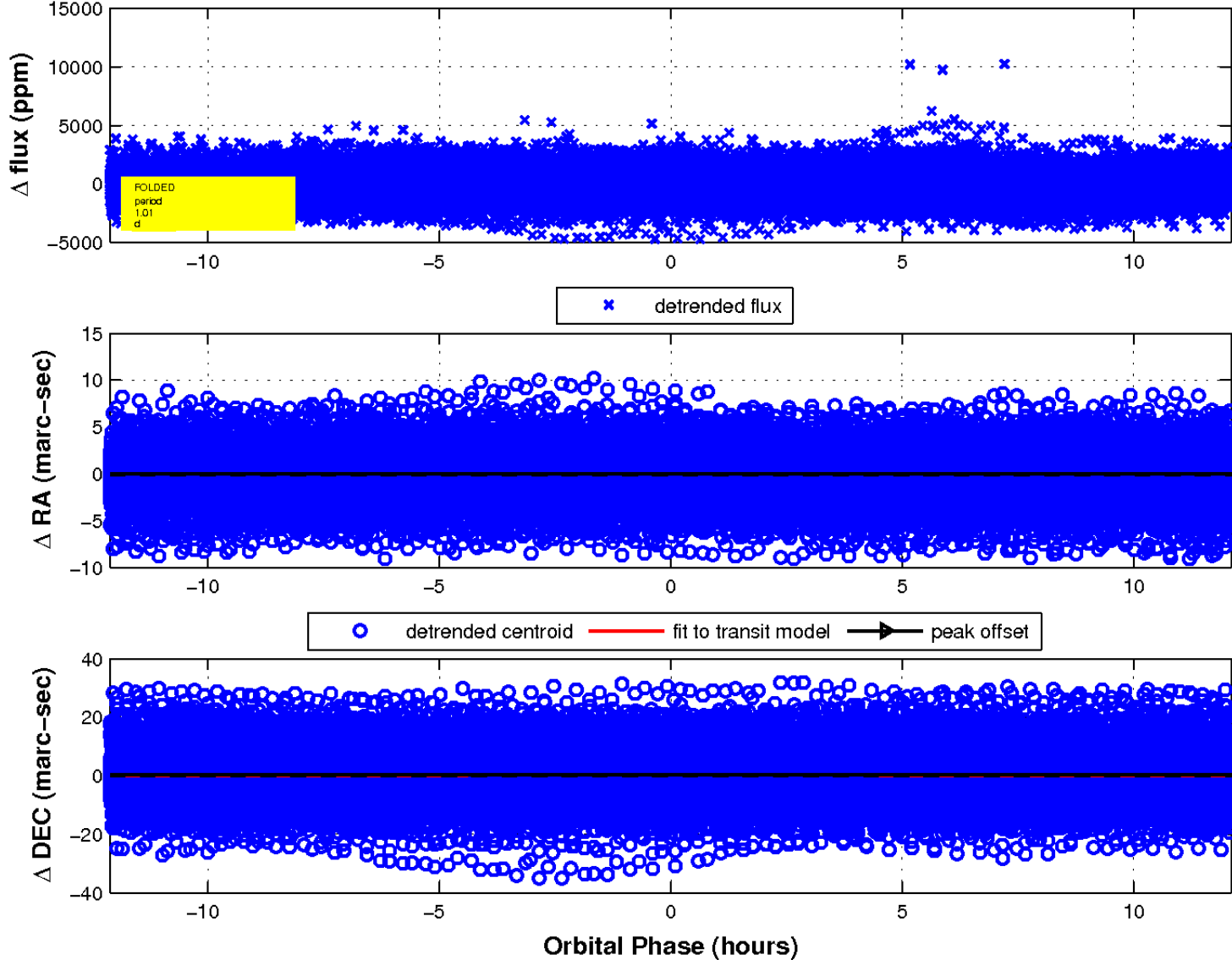
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

