

KIC 005644412

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})
005644412-01	OBS	4194.01	1.538202	132.482544	291.0	1.625	14.8	16.0	0.72	5107	1.50	549.92
005644412-02	OBS	No	339.368572	366.462274	1951.4	4.520	11.5	8.3	0.72	5107	3.12	0.41

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005644412-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
005644412-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—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.

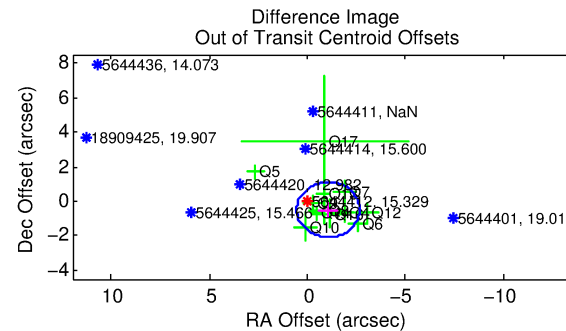
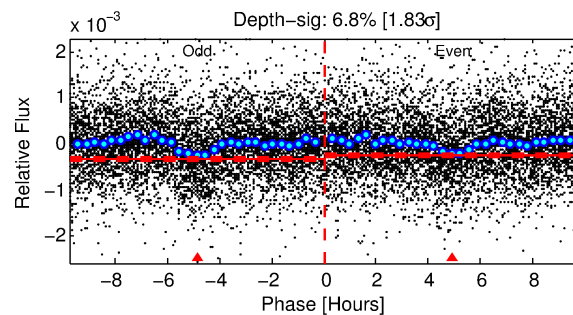
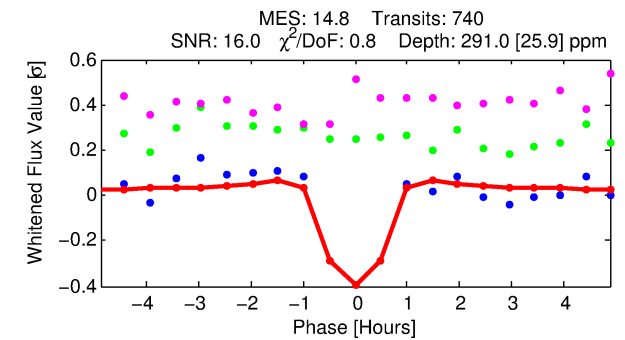
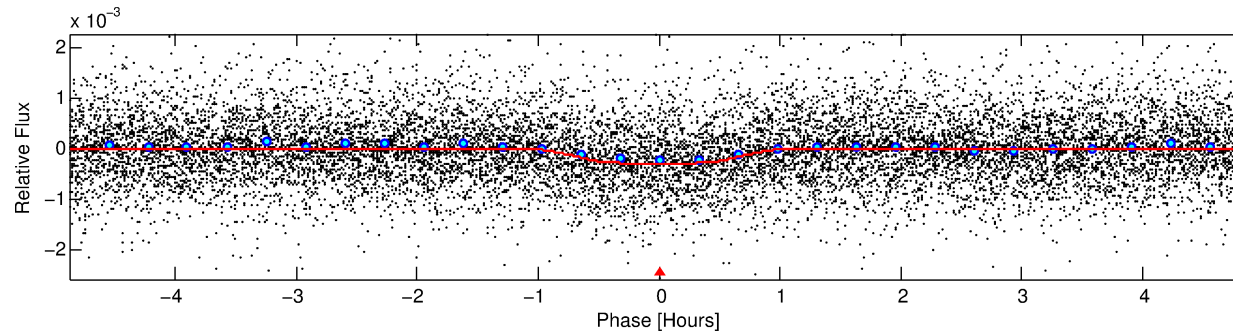
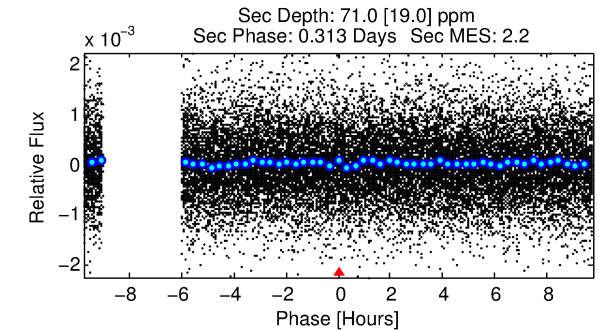
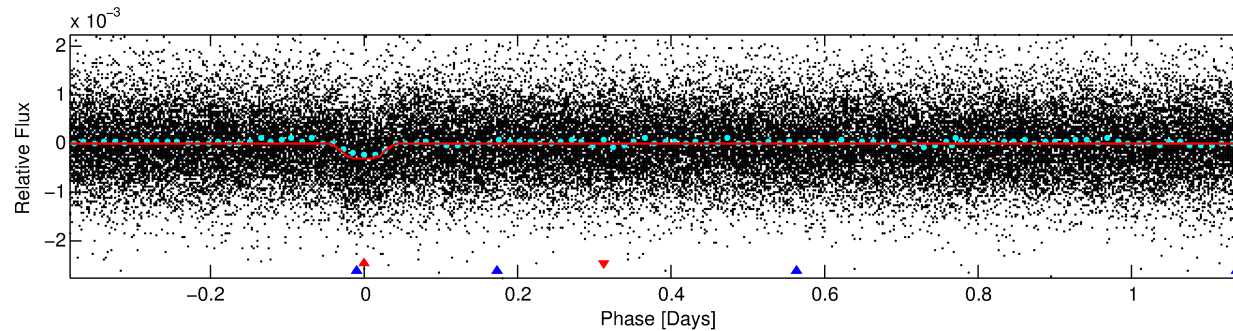
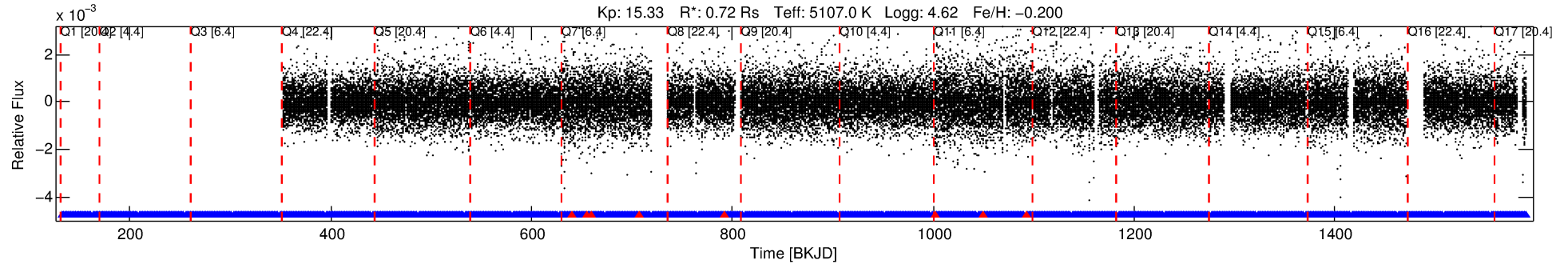
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005644412-01

No Significant Match Found

DV One-Page Summary

KIC: 5644412 Candidate: 1 of 2 Period: 1.538 d
KOI: K04194.01 Corr: 0.952



DV Fit Results:

Period = 1.53820 [0.00001] d
Epoch = 132.4825 [0.0013] BKJD
Rp/R* = 0.0189 [0.0094]
a/R* = 3.62 [6.71]
b = 0.90 [0.45]
Seff = 549.92 [113.69]
Teq = 1235 [64] K
Rp = 1.49 [0.77] Re
a = 0.0241 [0.0026] AU
Ag = 10.13 [10.52] [0.87σ]
Teffp = 3406 [884] K [2.45σ]

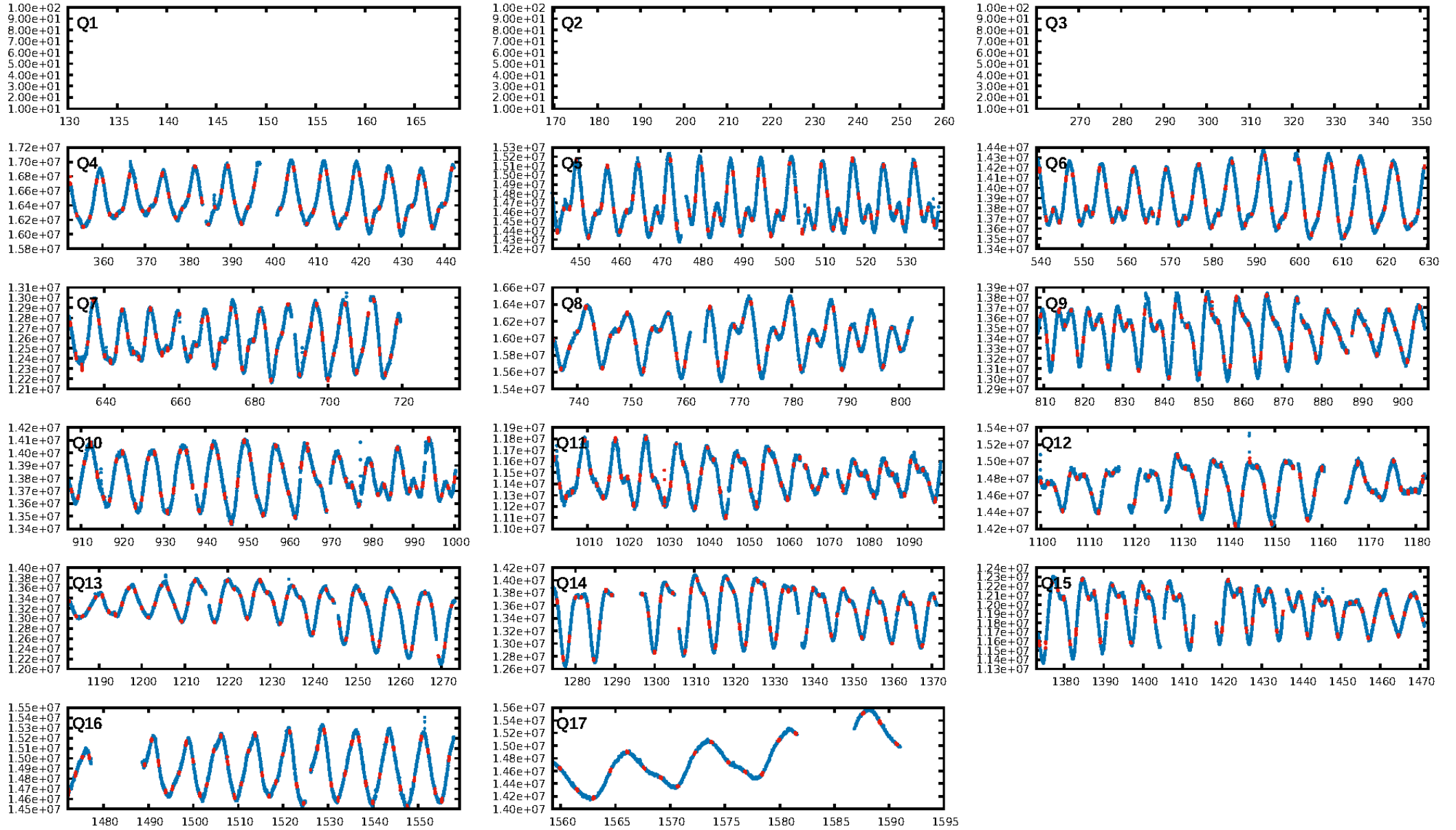
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1688.05σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.10e-42
RollingBand-fgt: 0.99 [714/722]
GhostDiagnostic-chr: 2.113
Centroid-sig: 0.0%
Centroid-so: 2.628 arcsec [4.60σ]
OotOffset-rm: 1.160 arcsec [2.18σ]
KicOffset-rm: 0.336 arcsec [0.85σ]
OotOffset-st: 3/1/4/4 [12]
KicOffset-st: 3/1/4/4 [12]
DiffImageQuality-fgm: 0.92 [11/12]
DiffImageOverlap-fno: 1.00 [14/14]

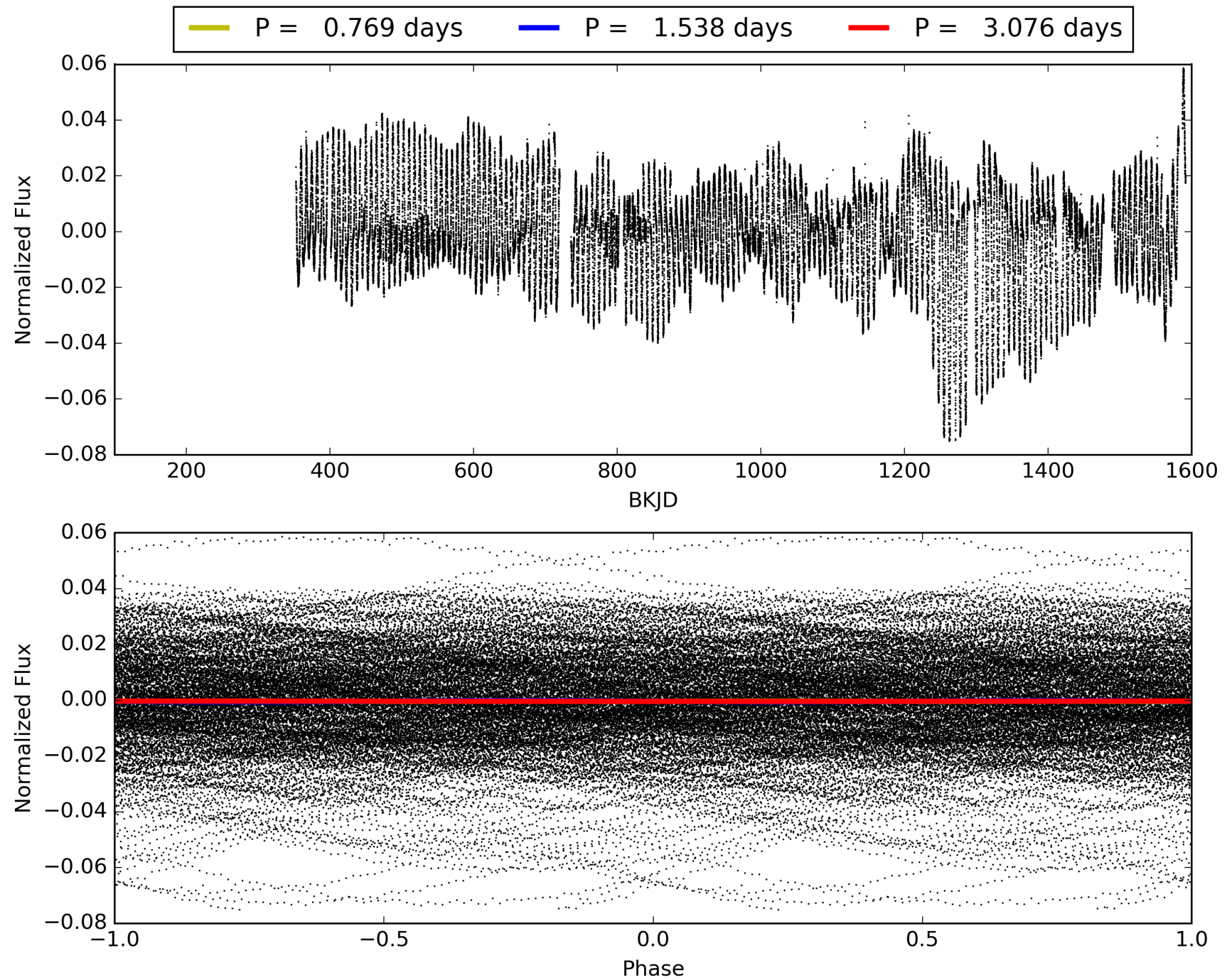
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 005644412-01, PDC Light Curves

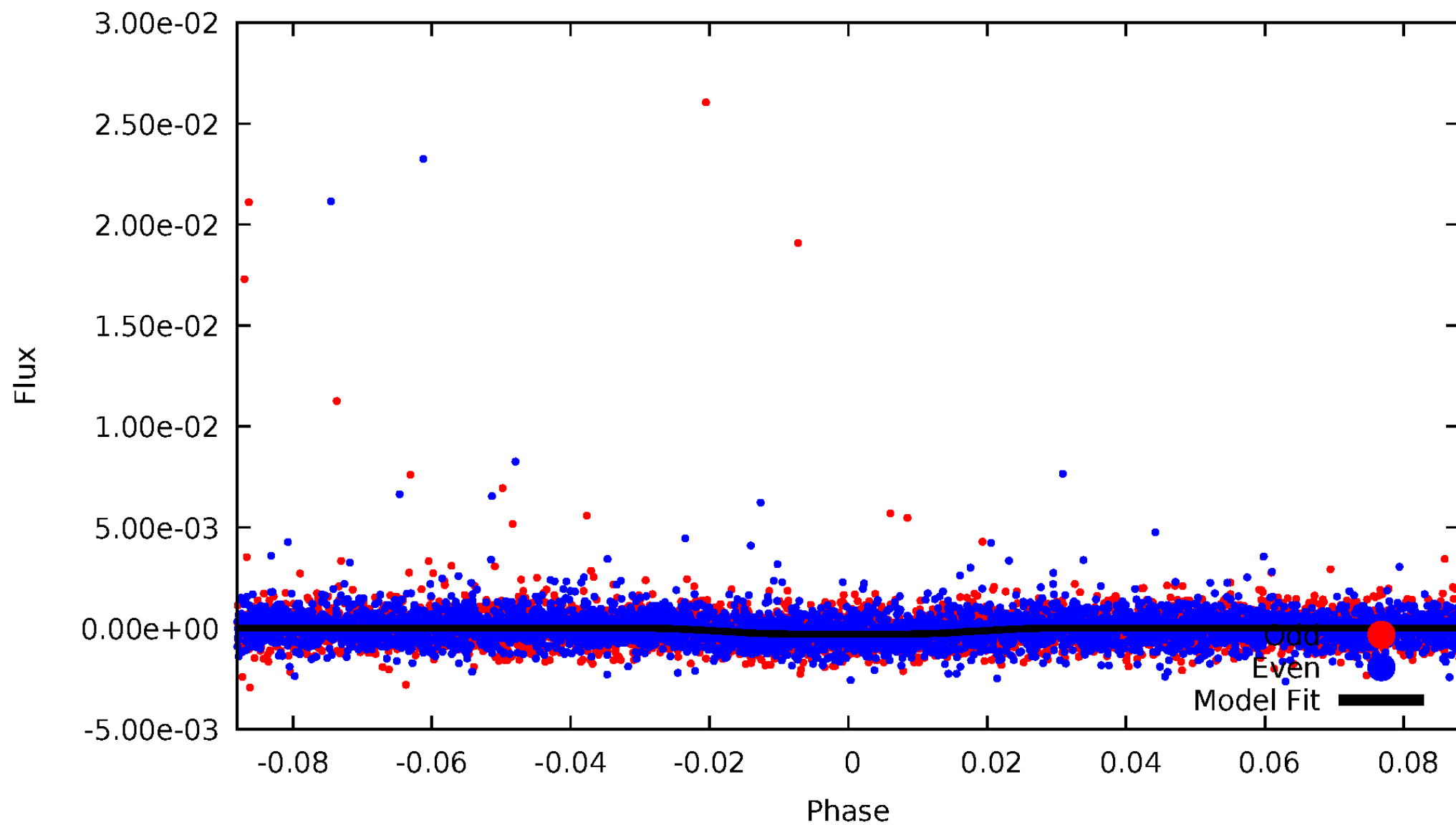


TCE 005644412-01



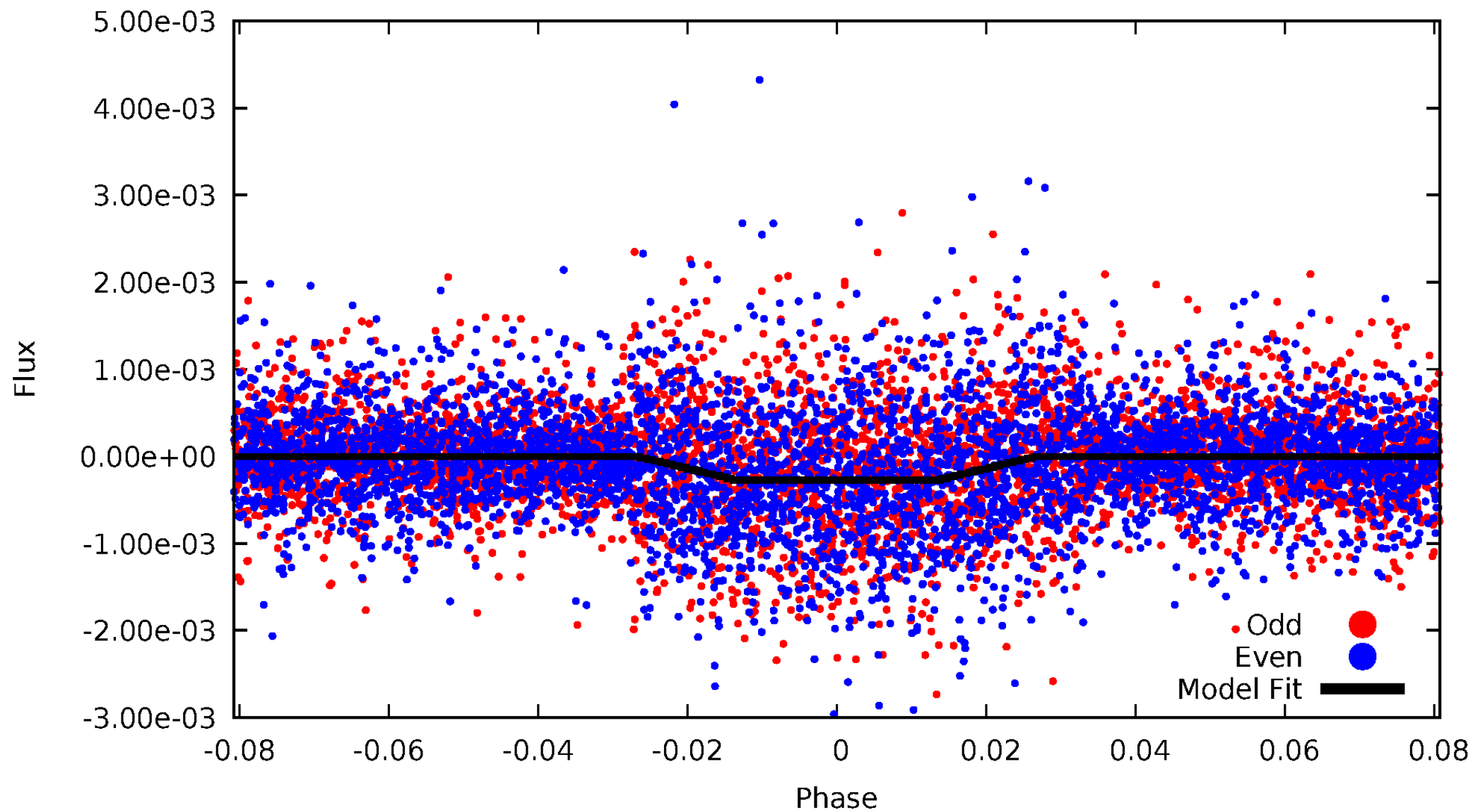
DV Odd/Even

TCE 005644412-01

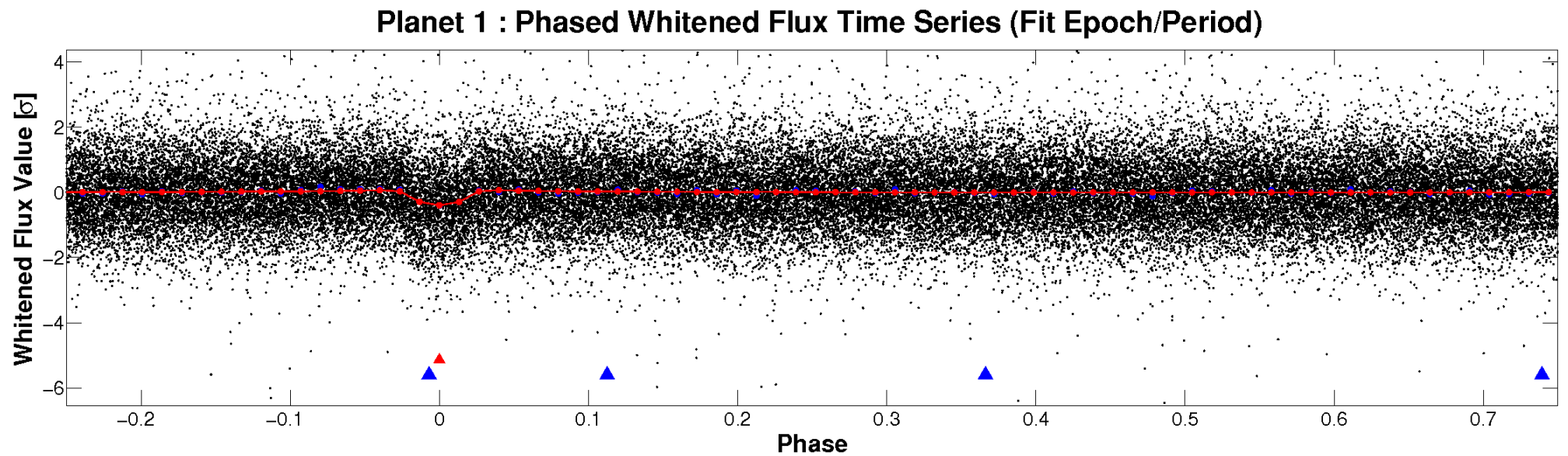
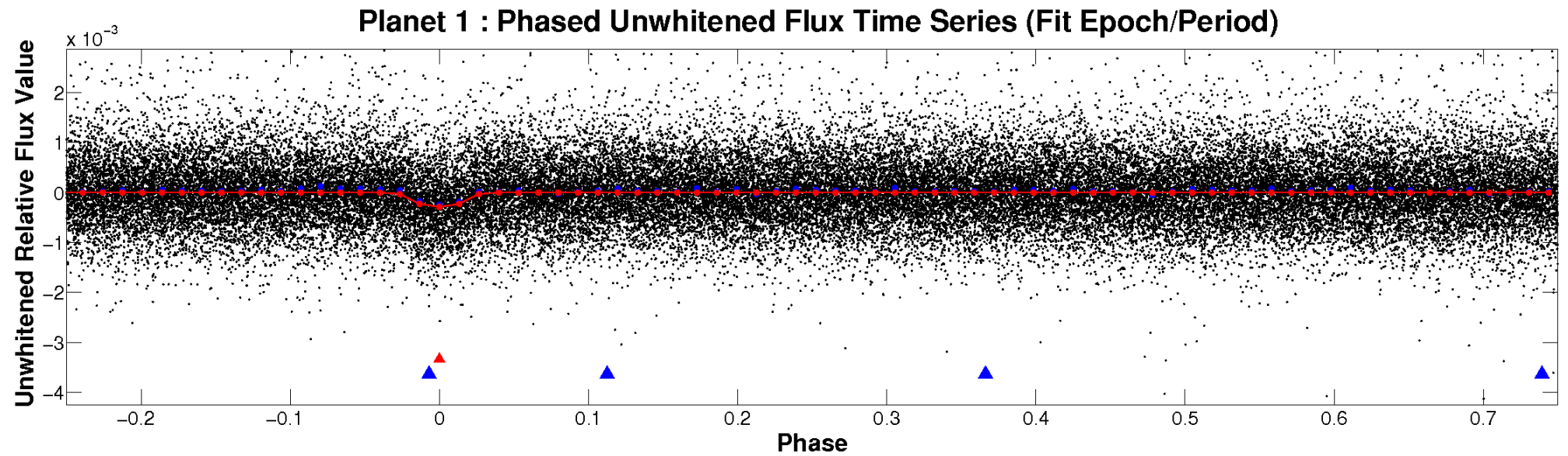


ALT Odd/Even

TCE 005644412-01

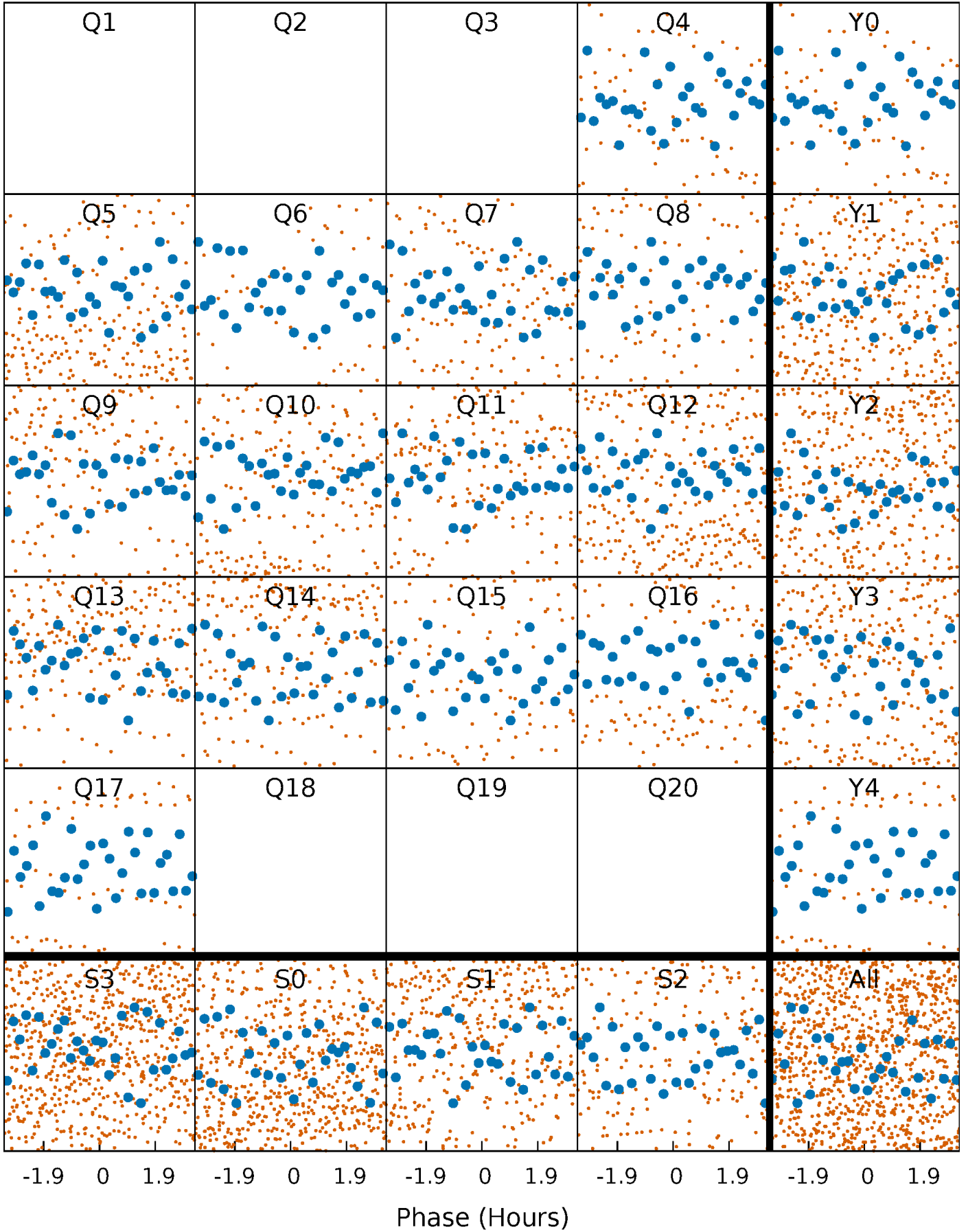


Non-Whitened Vs. Whitened Light Curve



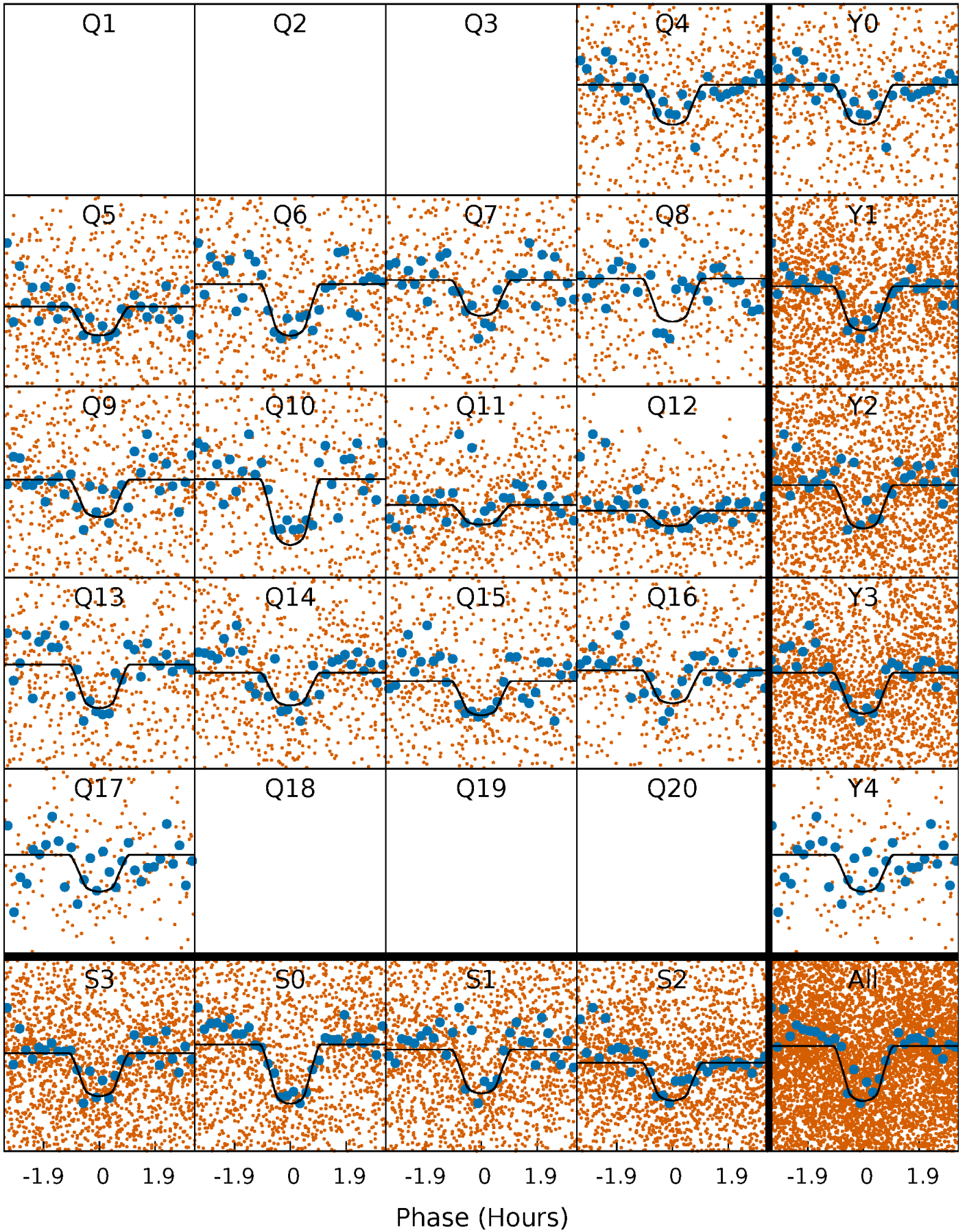
PDC Quarter-Phased Transit Curves

TCE 005644412-01 $P = 1.538202$ Days $T_0 = 132.482544$ (BKJD)



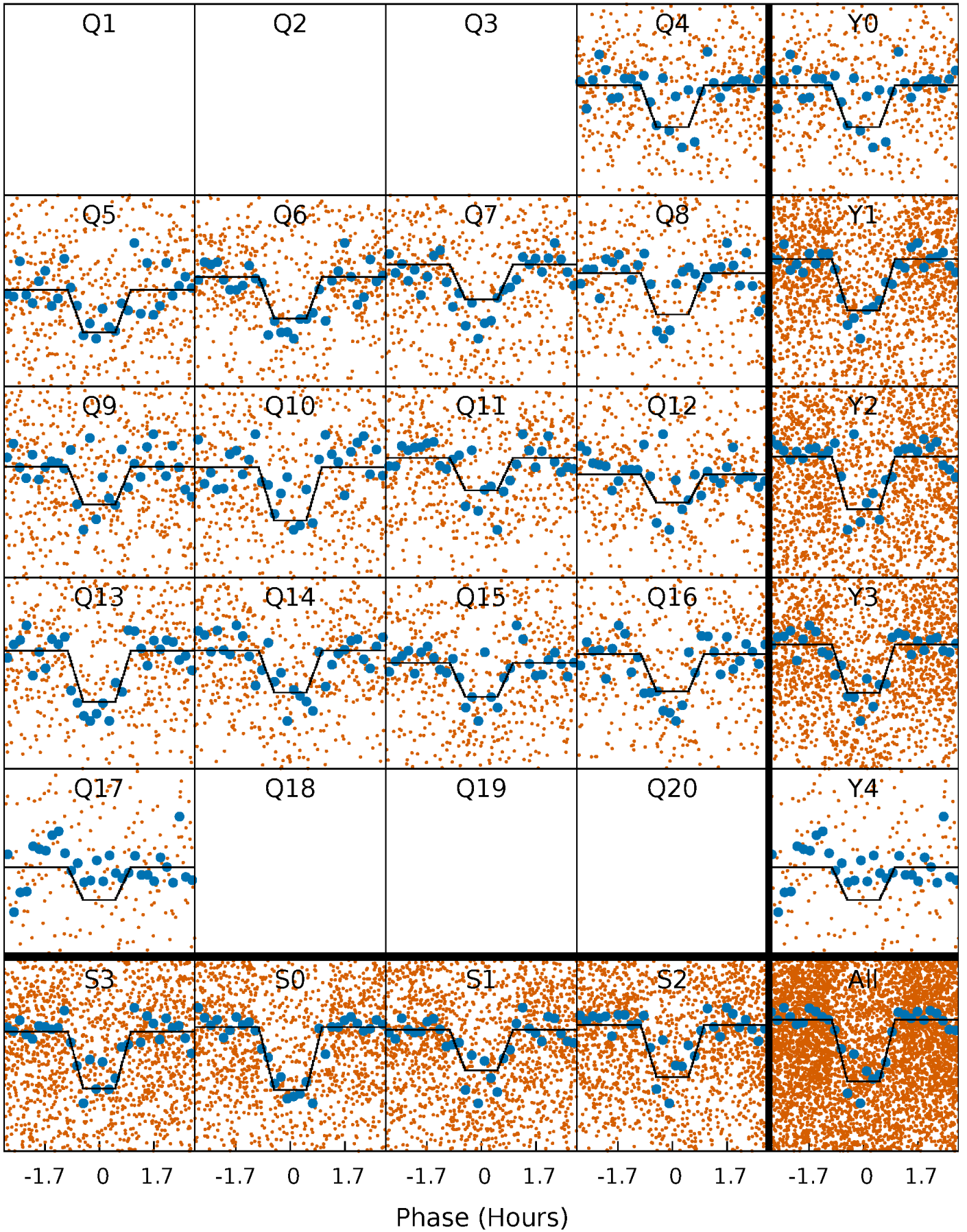
DV Quarter-Phased Transit Curves

TCE 005644412-01 P= 1.538202 Days $T_0=132.482544$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

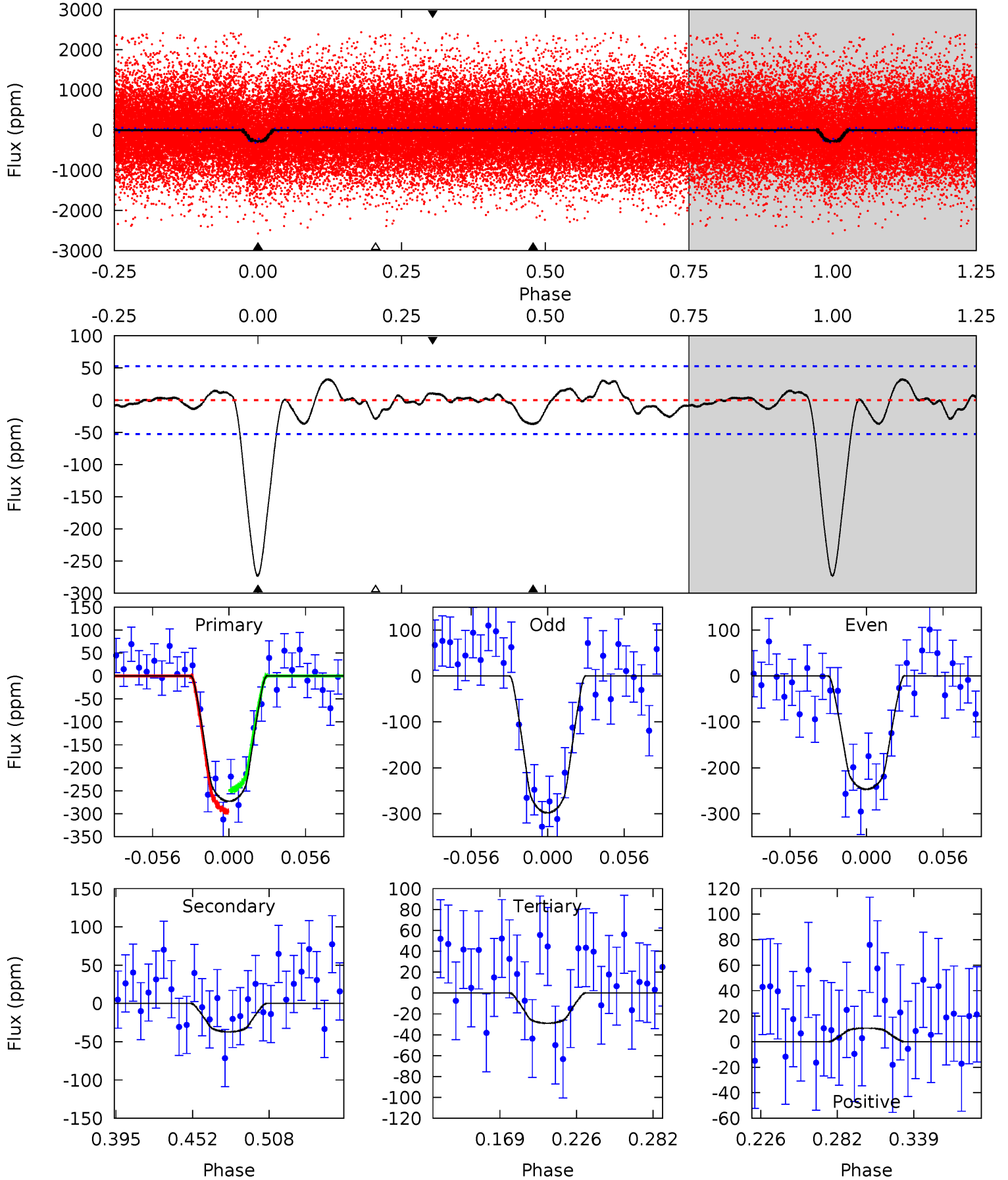
TCE 005644412-01 P= 1.538187 Days $T_0=132.488655$ (BKJD)



DV Model-Shift Uniqueness Test

005644412-01, P = 1.538202 Days, E = 132.482544 Days

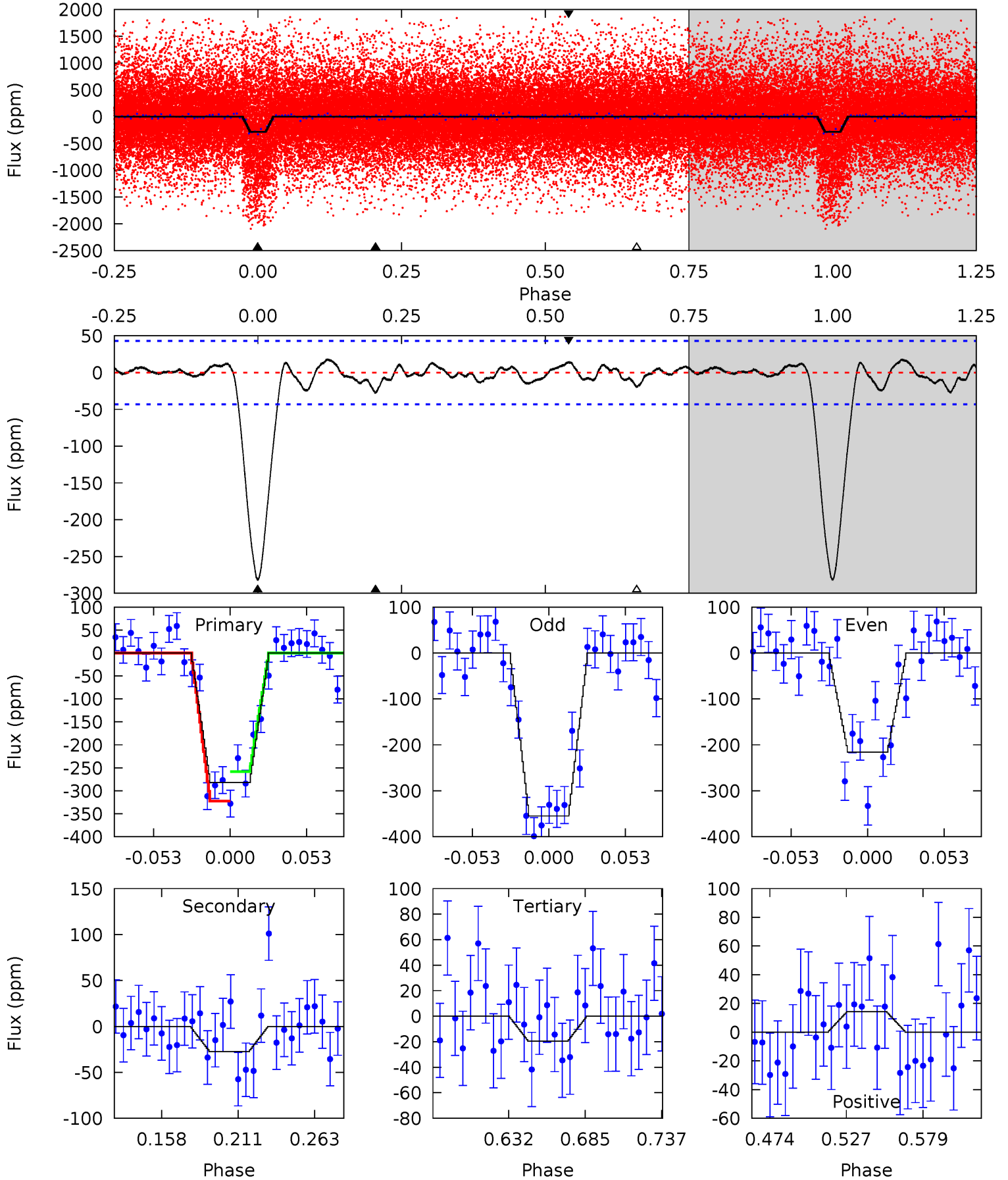
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.2	3.29	2.58	0.94	4.68	1.91	1.23	21.7	23.3	0.71	2.35	2.28	0.78	0.11	2.05



Alt Model-Shift Uniqueness Test

005644412-01, P = 1.538187 Days, E = 132.488655 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.7	2.98	2.14	1.56	4.70	1.94	0.87	28.6	29.2	0.84	1.42	7.60	1.03	0.06	3.51



Stellar Parameters For KIC 005644412

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5107^{+184}_{-184}	$4.615^{+0.033}_{-0.077}$	$-0.200^{+0.300}_{-0.300}$	$0.723^{+0.097}_{-0.065}$	$0.794^{+0.073}_{-0.090}$	$2.955^{+0.521}_{-0.770}$
	+4%/-4%	+1%/-2%	+150%/-150%	+13%/-9%	+9%/-11%	+18%/-26%
Source	KIC0	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 005644412-01 / KOI 4194.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-37 ± 11	$1.58^{+0.75}_{-0.73}$	1741^{+84}_{-74}	3302^{+831}_{-424}	$4.587^{+13.632}_{-2.609}$
Alt.	-27 ± 9	$1.34^{+0.79}_{-0.75}$	1749^{+72}_{-79}	3347^{+1051}_{-543}	$4.684^{+18.714}_{-2.996}$

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

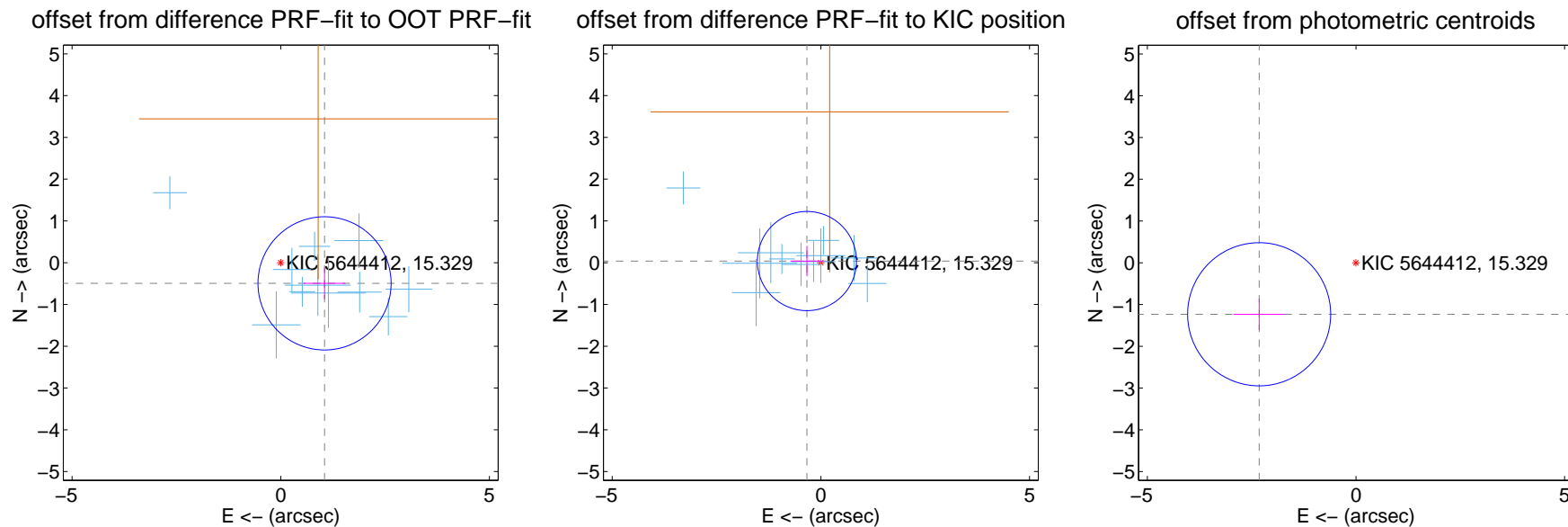
DV Centroid Data

Supplemental centroid analysis for 005644412-01. Kepler magnitude: 15.33. Transit SNR 16.02

There are 11 quarters with good PRF difference image offsets

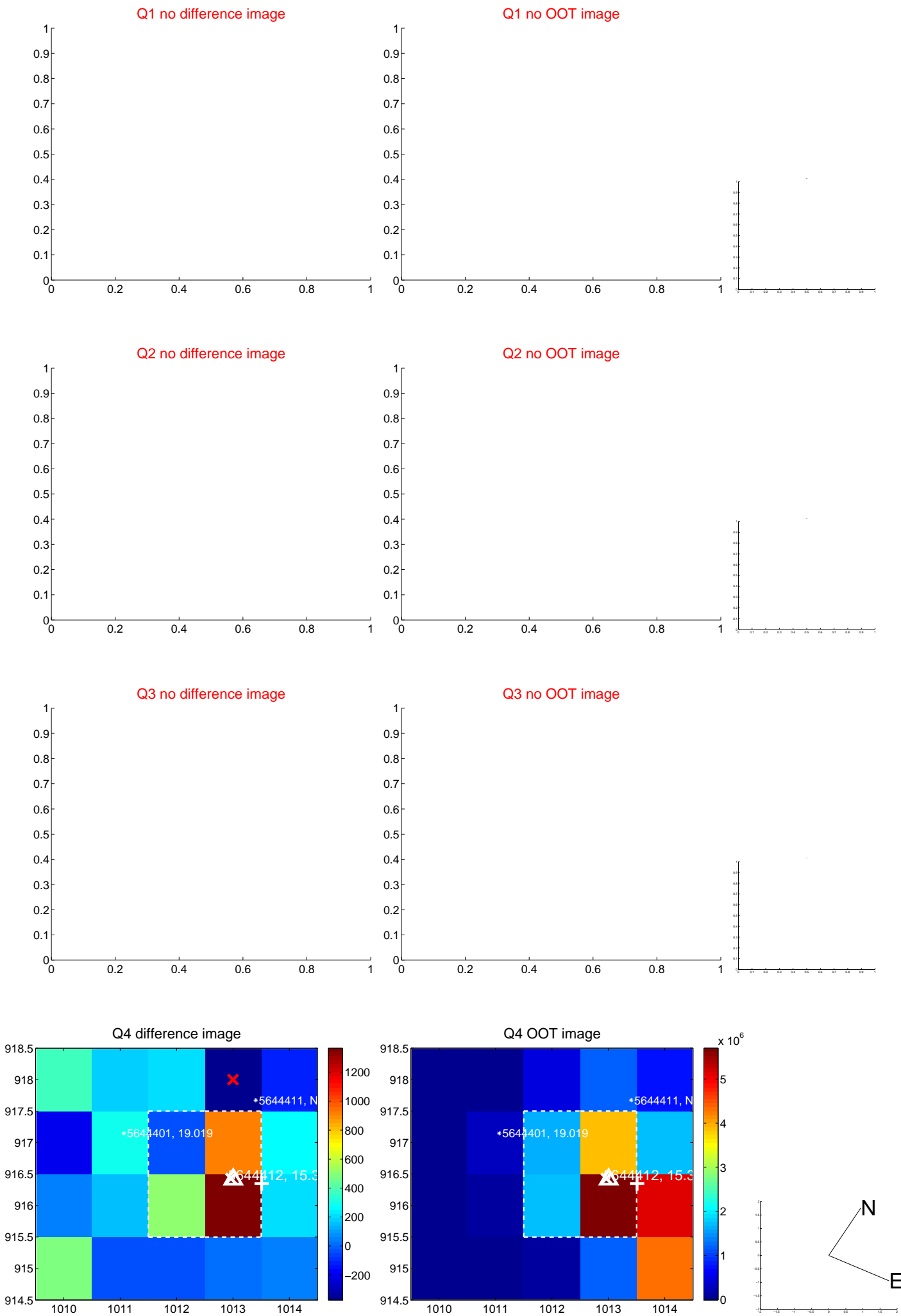
The direct PRF centroid is offset from the target star catalog position by about 0.71 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.160 ± 0.532	2.18	-1.049 ± 0.499	-0.495 ± 0.378
PRF-fit source offset from KIC position	0.336 ± 0.396	0.85	0.334 ± 0.396	0.039 ± 0.364
photometric centroid source offset	2.63 ± 0.57	4.60	2.32 ± 0.62	-1.23 ± 0.37

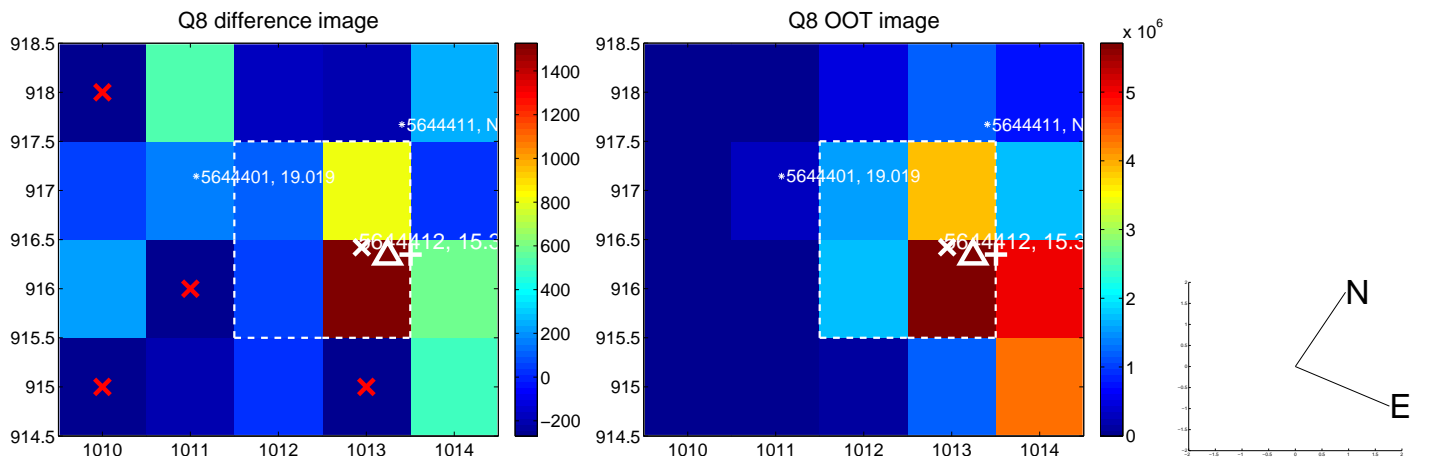
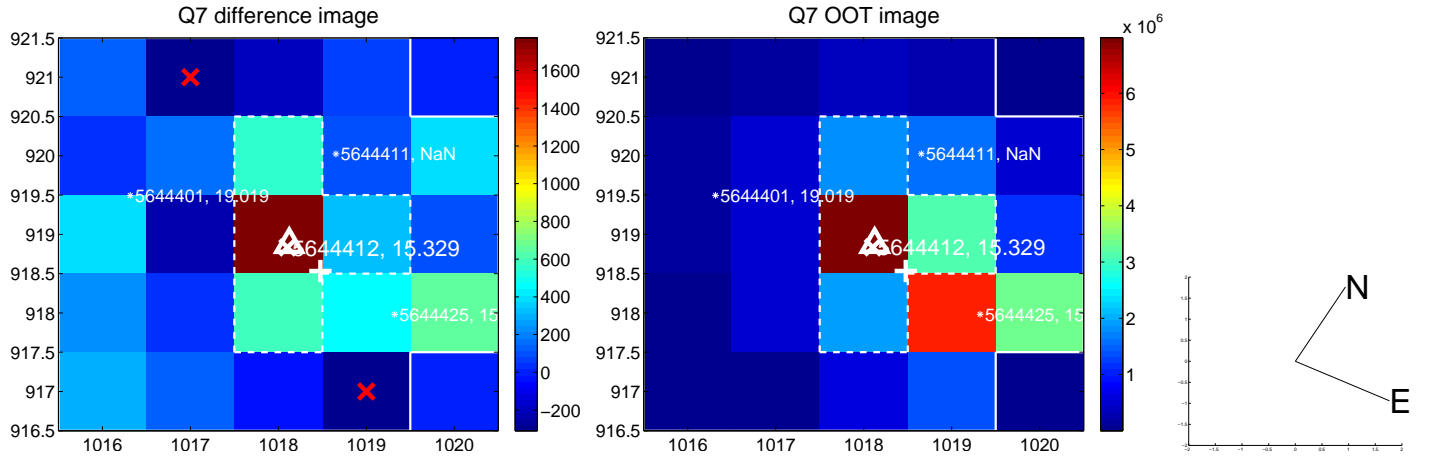
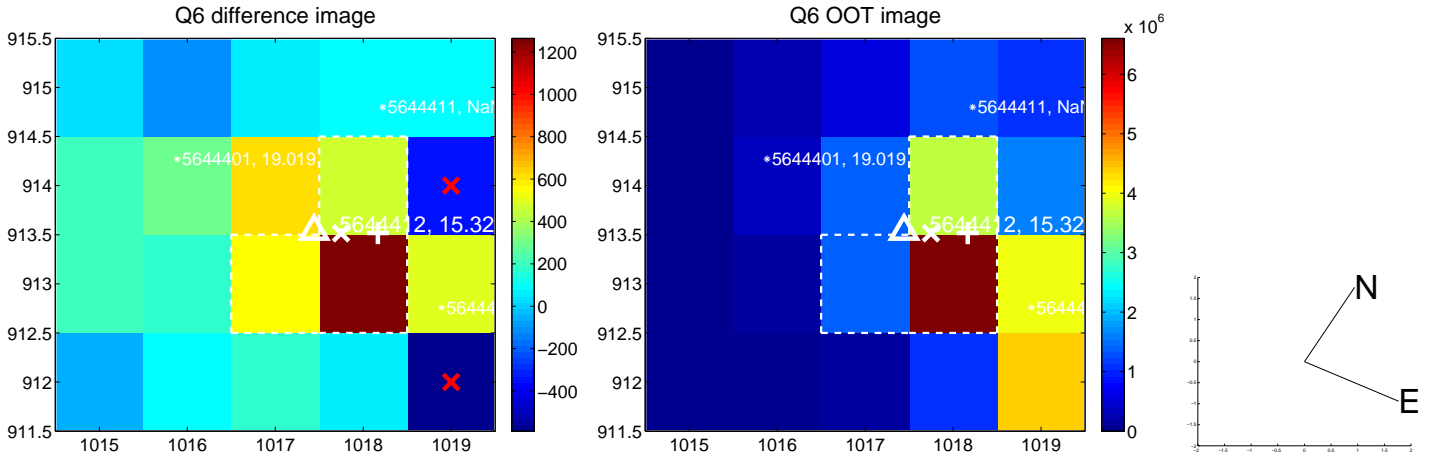
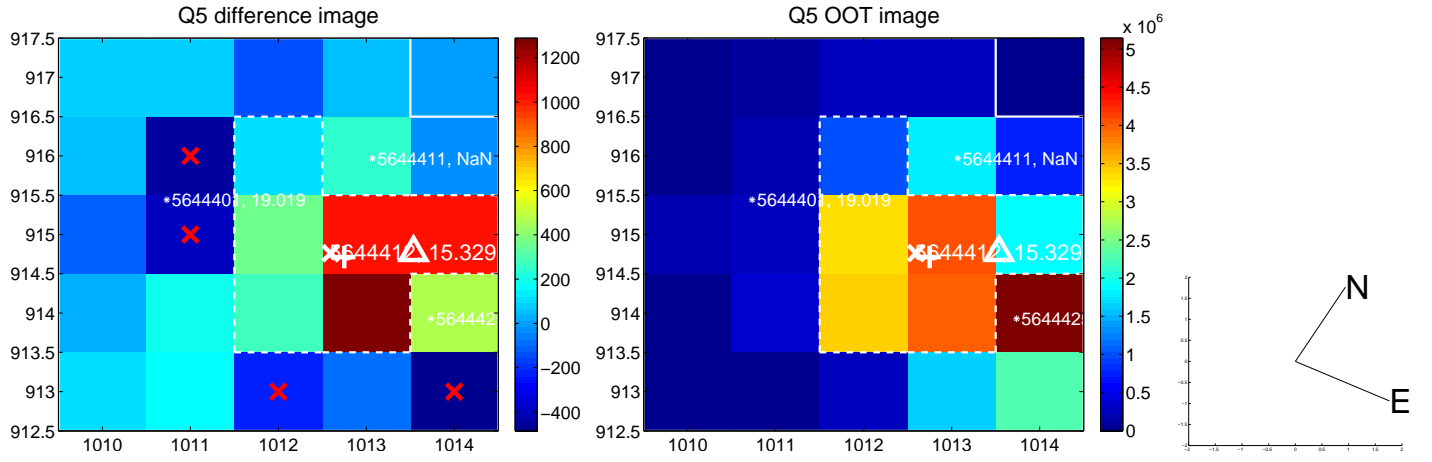


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

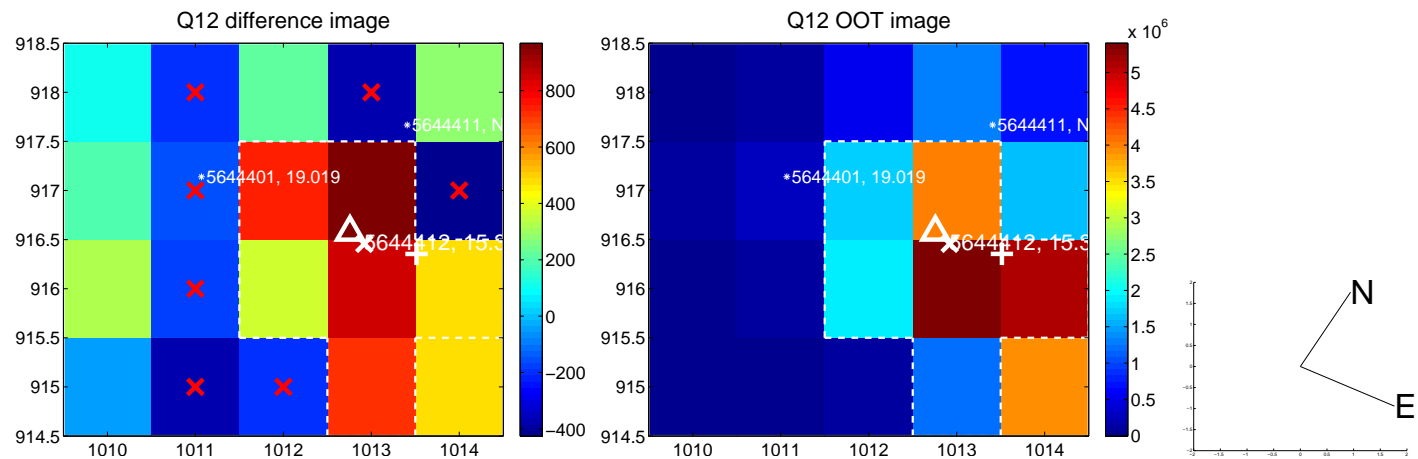
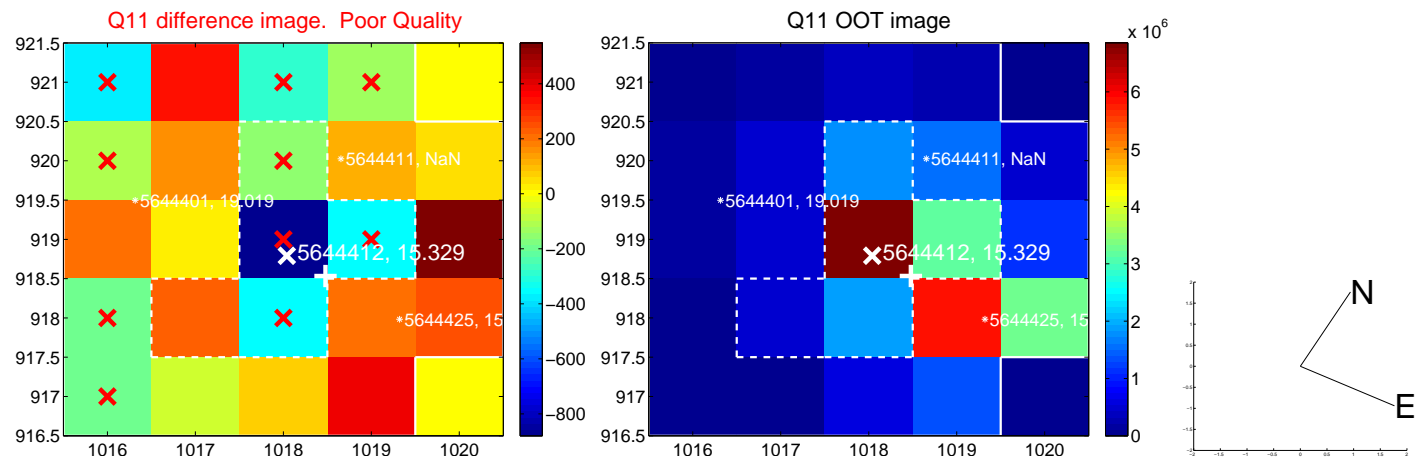
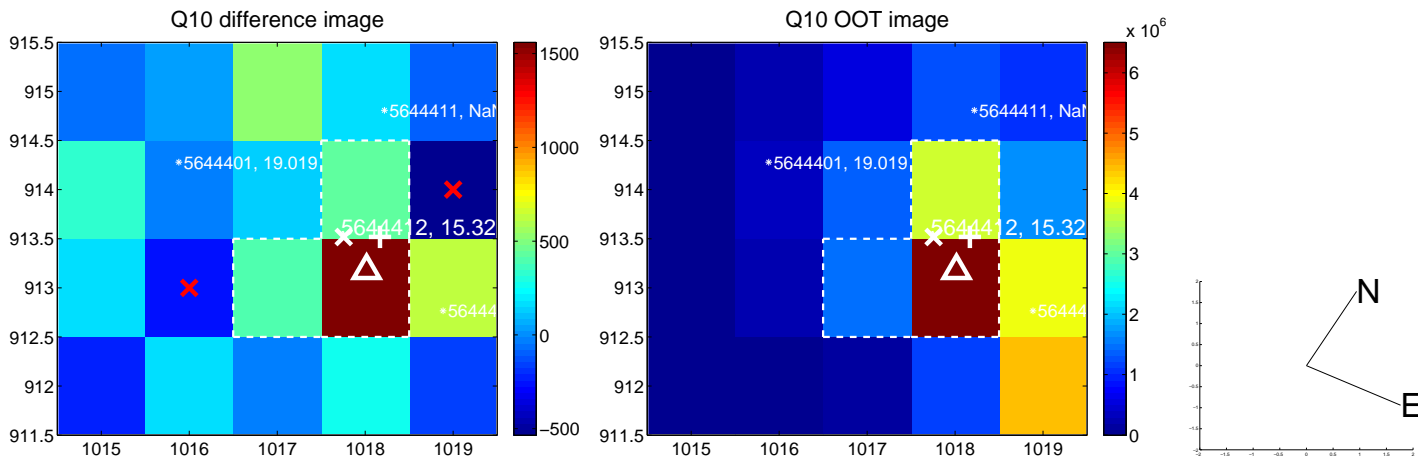
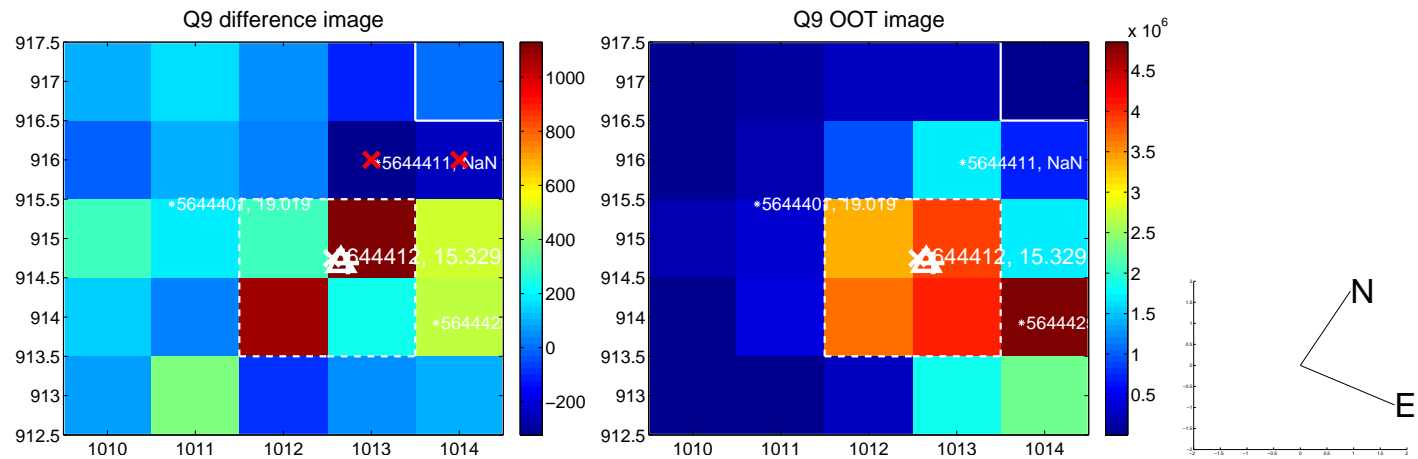
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



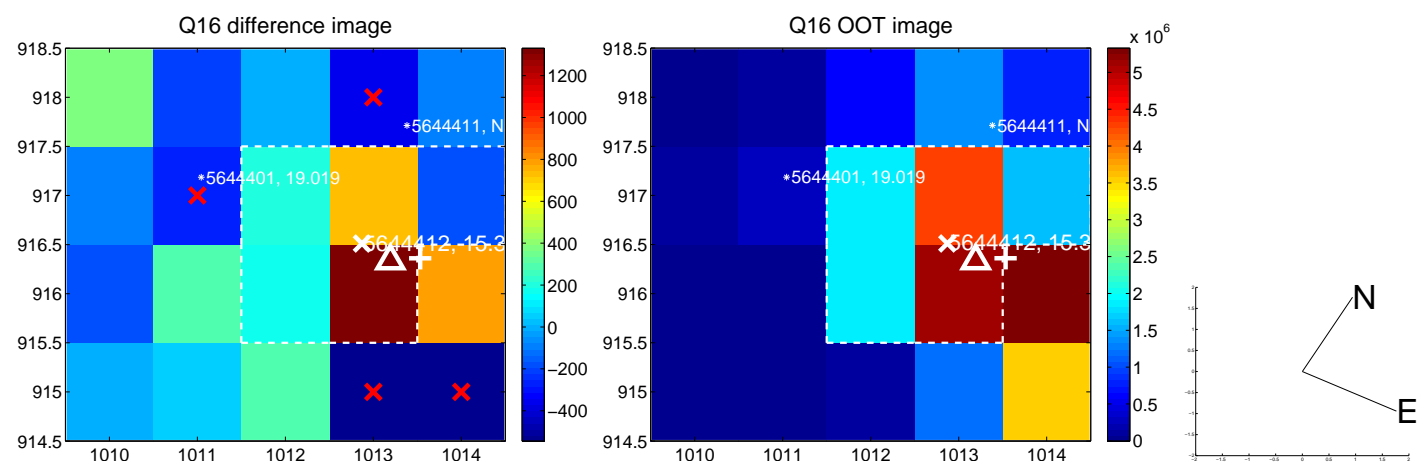
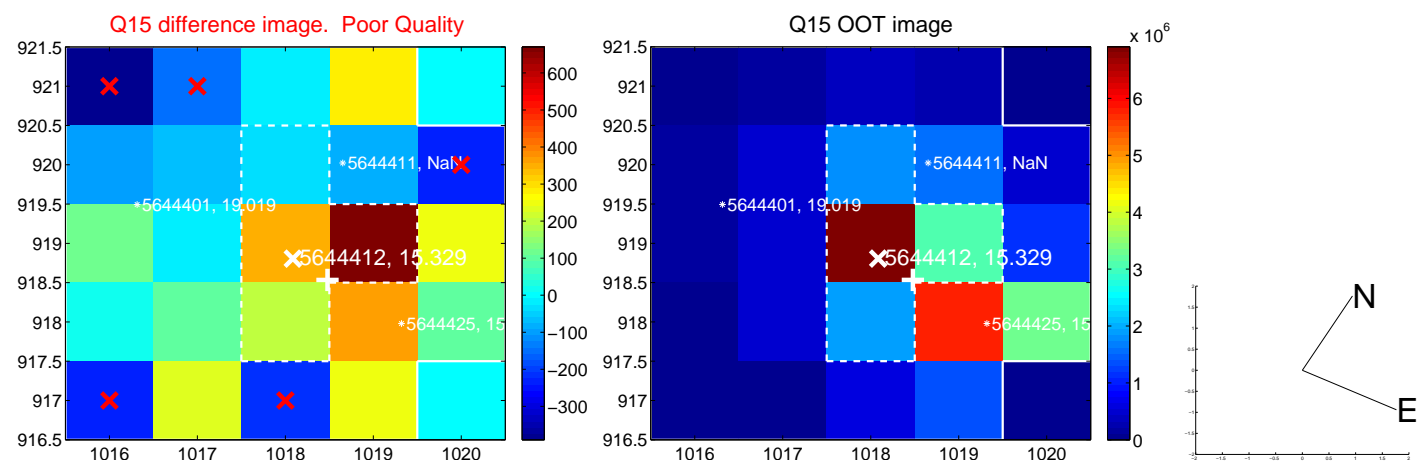
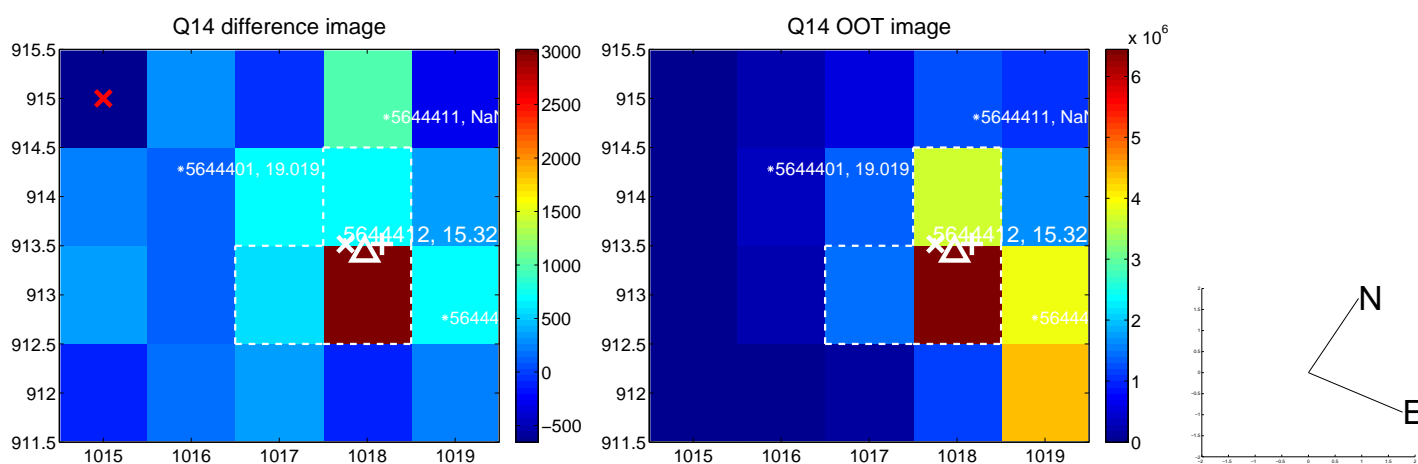
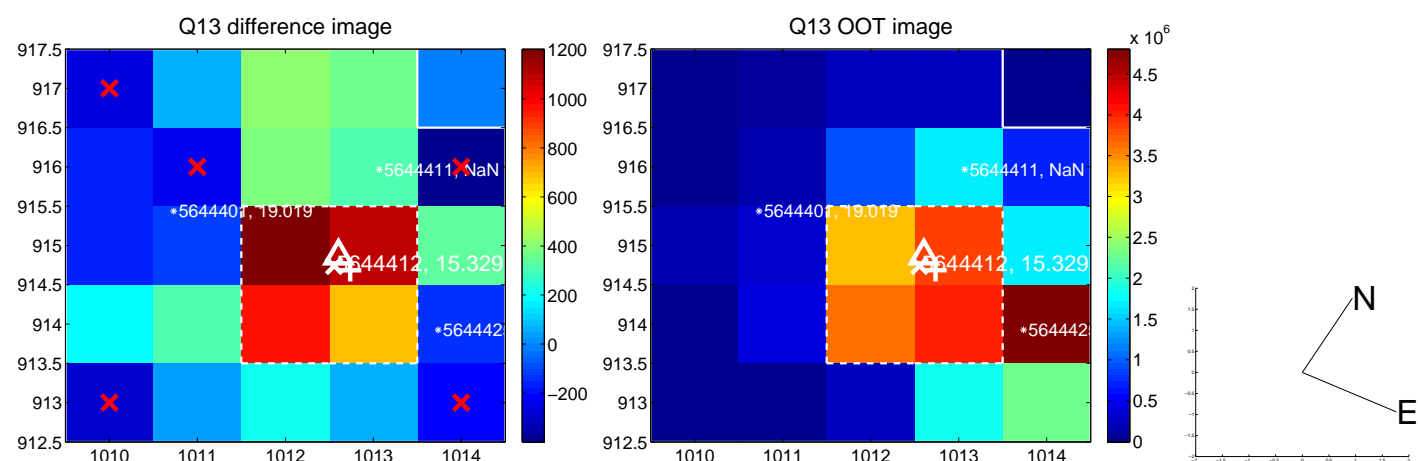
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



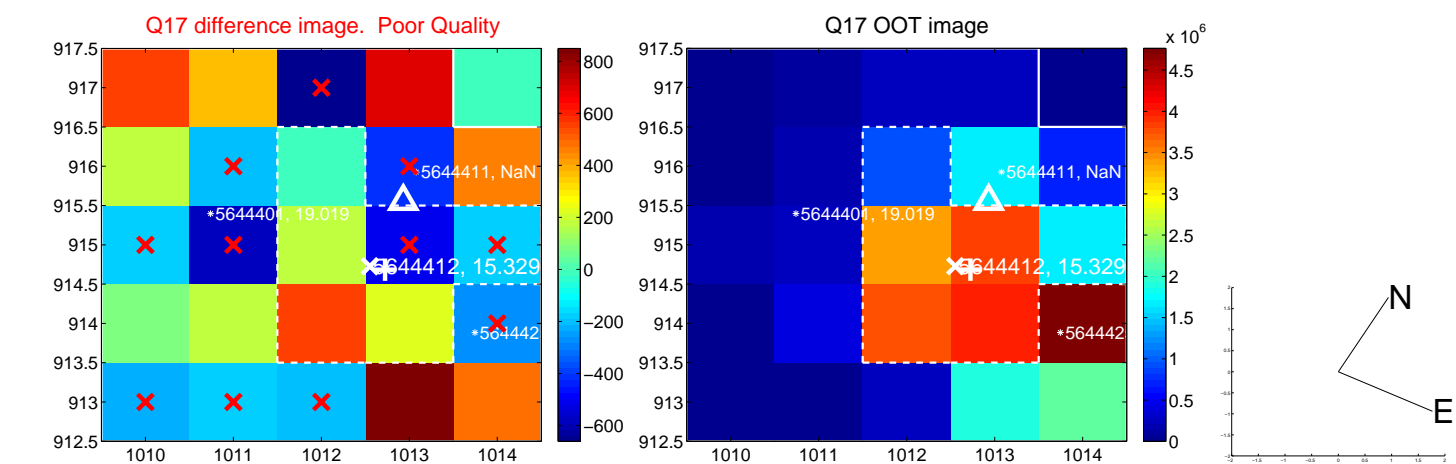
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



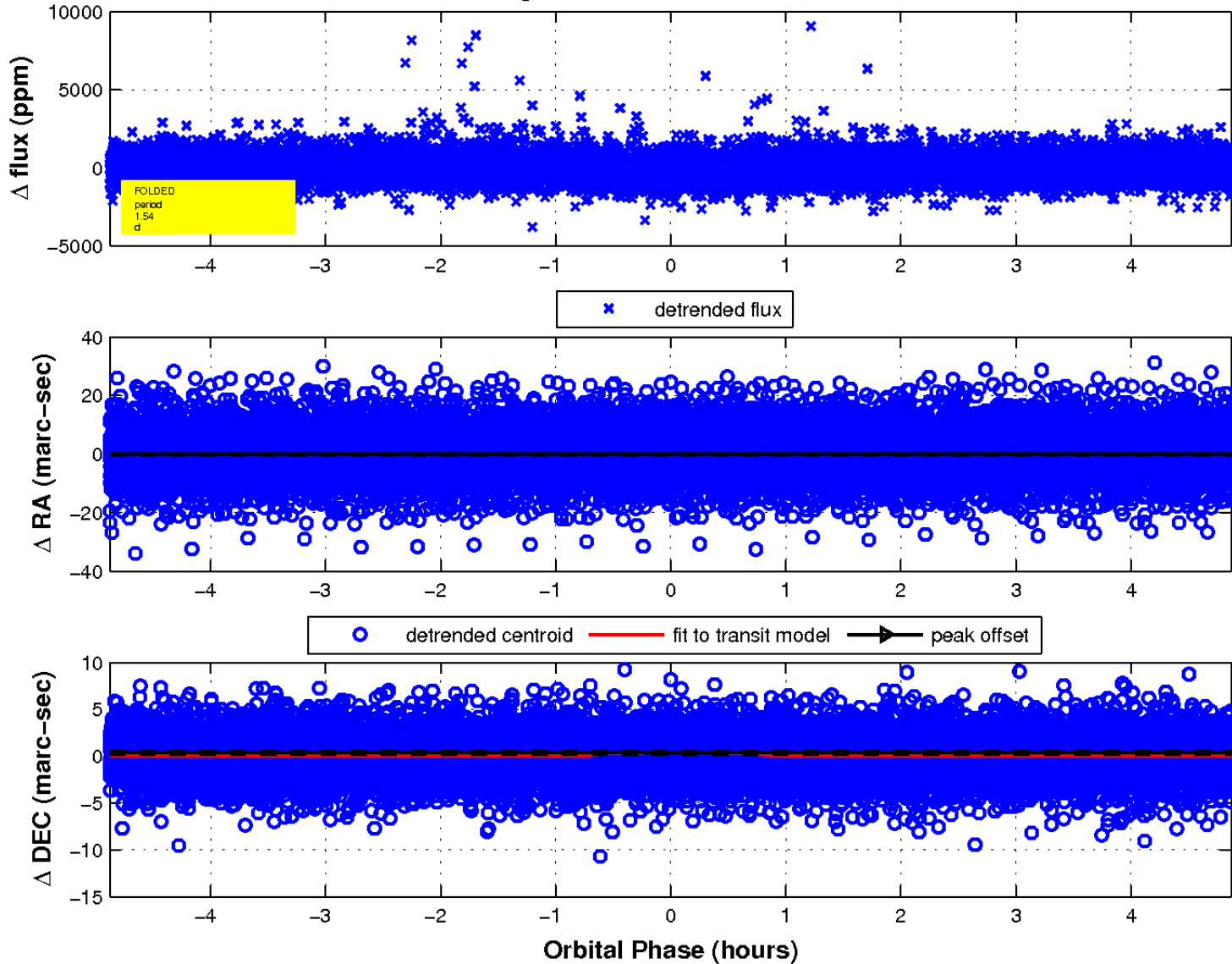
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

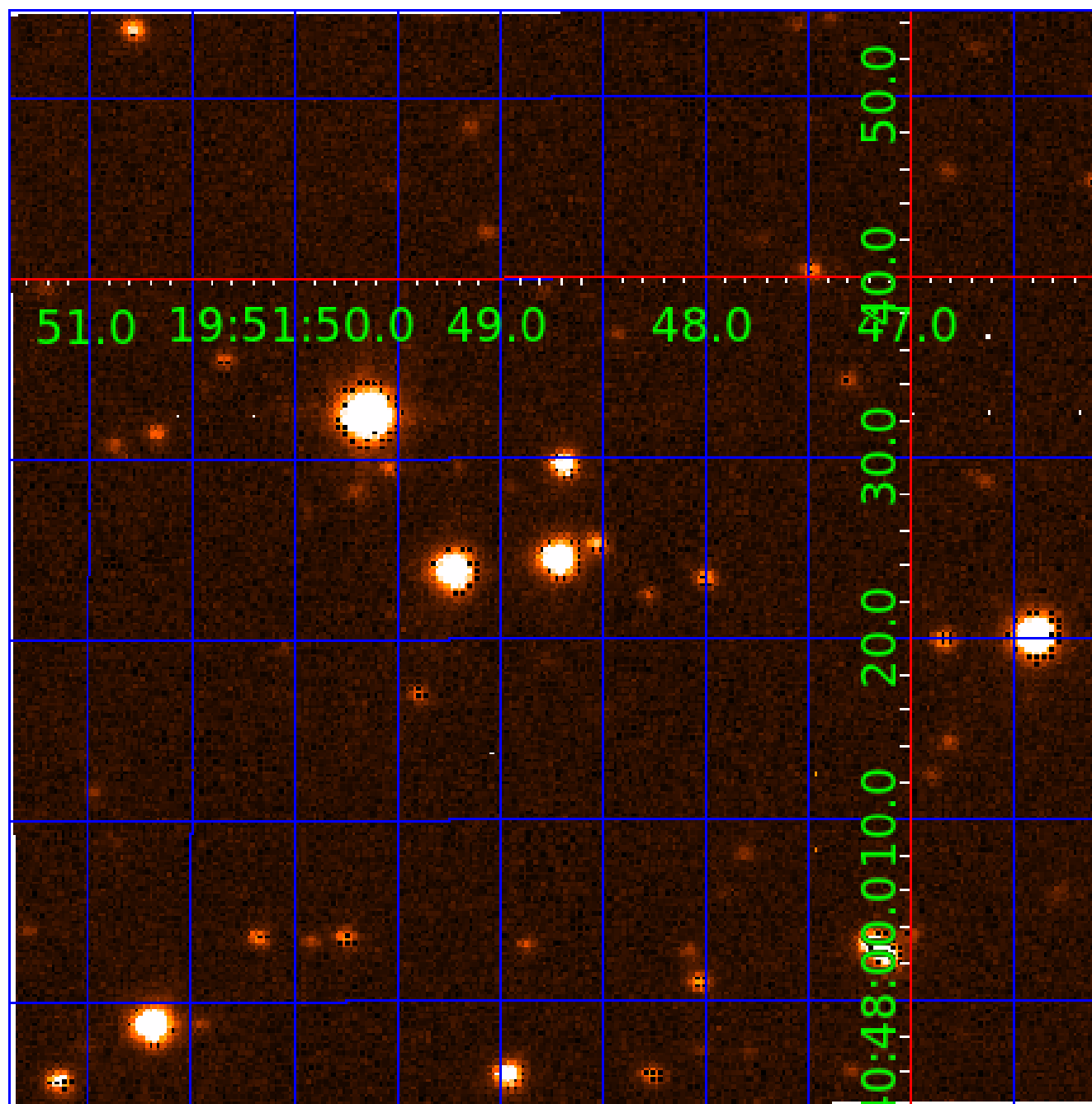


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 005644412

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})
005644412-01	OBS	4194.01	1.538202	132.482544	291.0	1.625	14.8	16.0	0.72	5107	1.50	549.92
005644412-02	OBS	No	339.368572	366.462274	1951.4	4.520	11.5	8.3	0.72	5107	3.12	0.41

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005644412-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
005644412-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—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 005644412-02

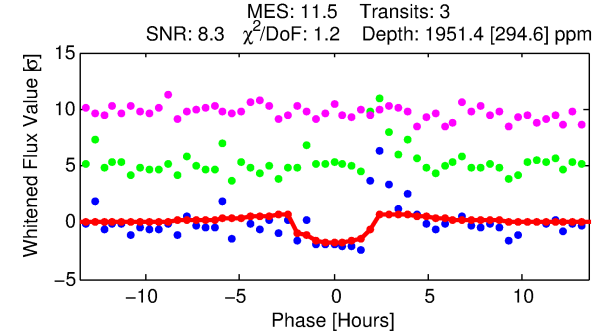
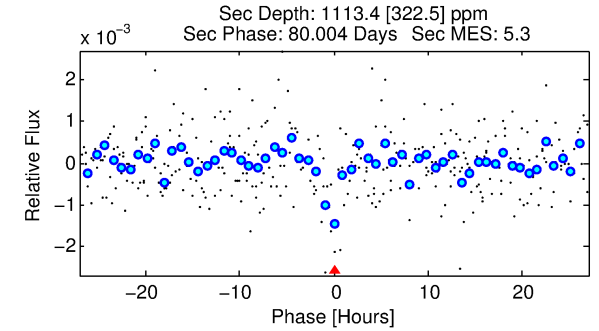
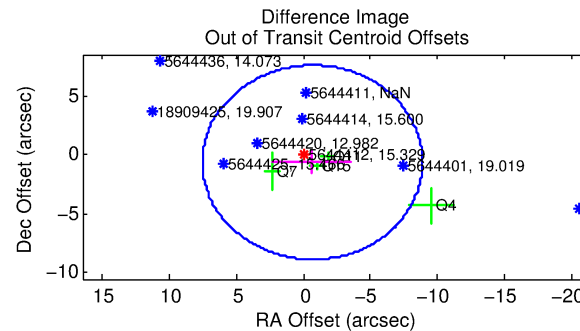
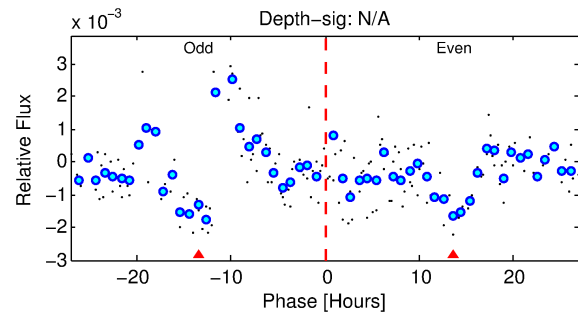
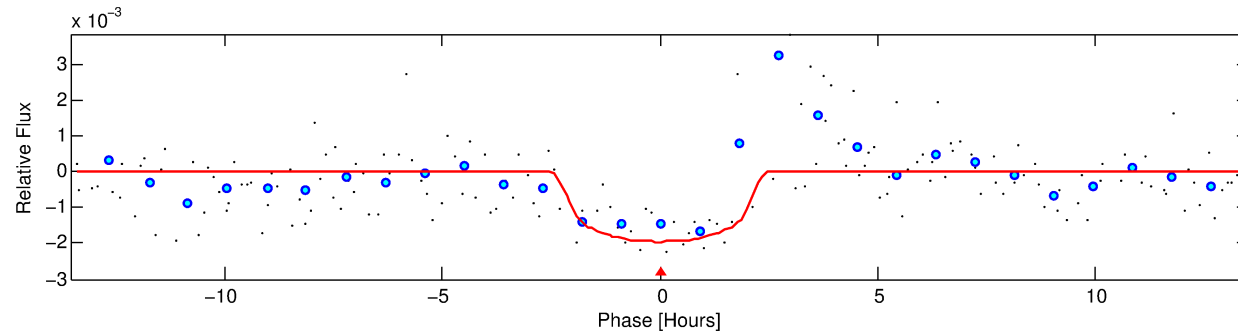
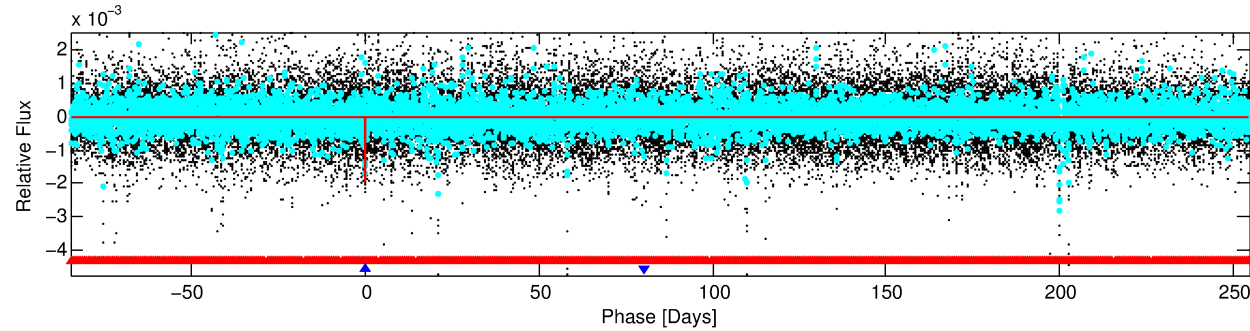
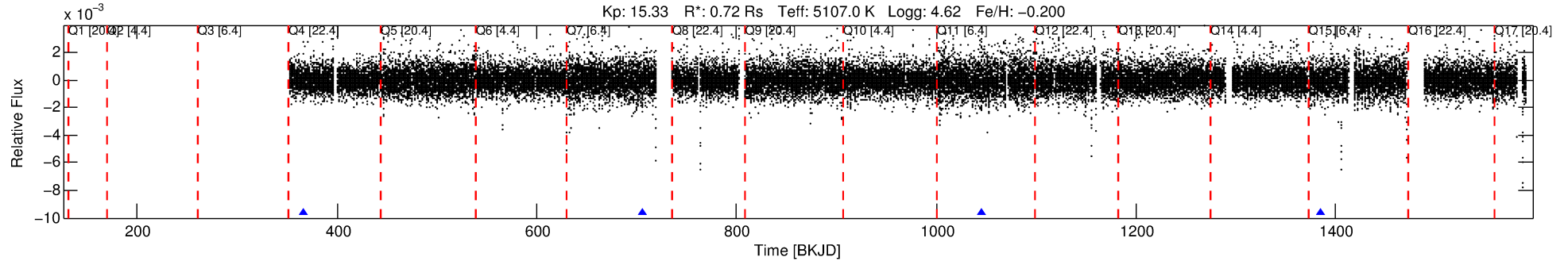
No Significant Match Found

DV One-Page Summary

KIC: 5644412 Candidate: 2 of 2 Period: 339.369 d

KOI: K04194 Corr: No Ephemeris Match

Kp: 15.33 R*: 0.72 Rs Teff: 5107.0 K Logg: 4.62 Fe/H: -0.200



DV Fit Results:

Period = 339.36857 [0.00785] d
Epoch = 366.4623 [0.0106] BKJD
Rp/R* = 0.0396 [0.0982]
a/R* = 587.15 [5246.48]
b = 0.18 [48.22]
Seff = 0.41 [0.09]
Teq = 204 [11] K
Rp = 3.12 [7.76] Re
a = 0.8788 [0.0942] AU
Ag = 48575.24 [241677.09] [0.20σ]
Teffp = 4691 [5834] K [0.77σ]

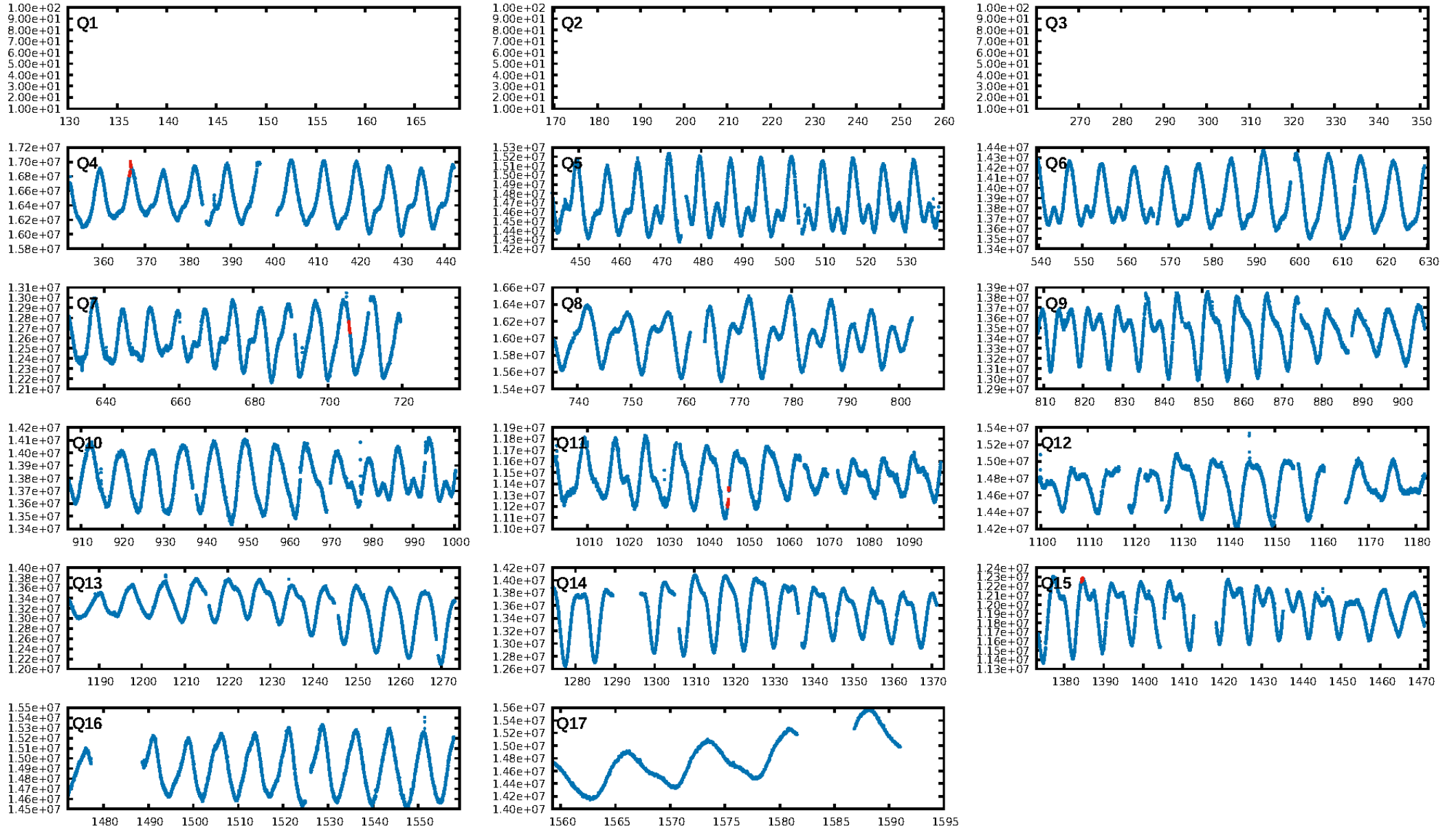
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1688.05σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 18.5%
ModelChiSquareGof-sig: 98.1%
Bootstrap-pfa: 1.07e-11
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.7423
Centroid-sig: 21.1%
Centroid-so: 1.046 arcsec [1.03σ]
OotOffset-rm: 0.924 arcsec [0.34σ]
KicOffset-rm: 1.012 arcsec [0.60σ]
OotOffset-st: 0/3/1/0 [4]
KicOffset-st: 0/3/1/0 [4]
DiffImageQuality-fgm: 0.50 [2/4]
DiffImageOverlap-fno: 0.25 [1/4]

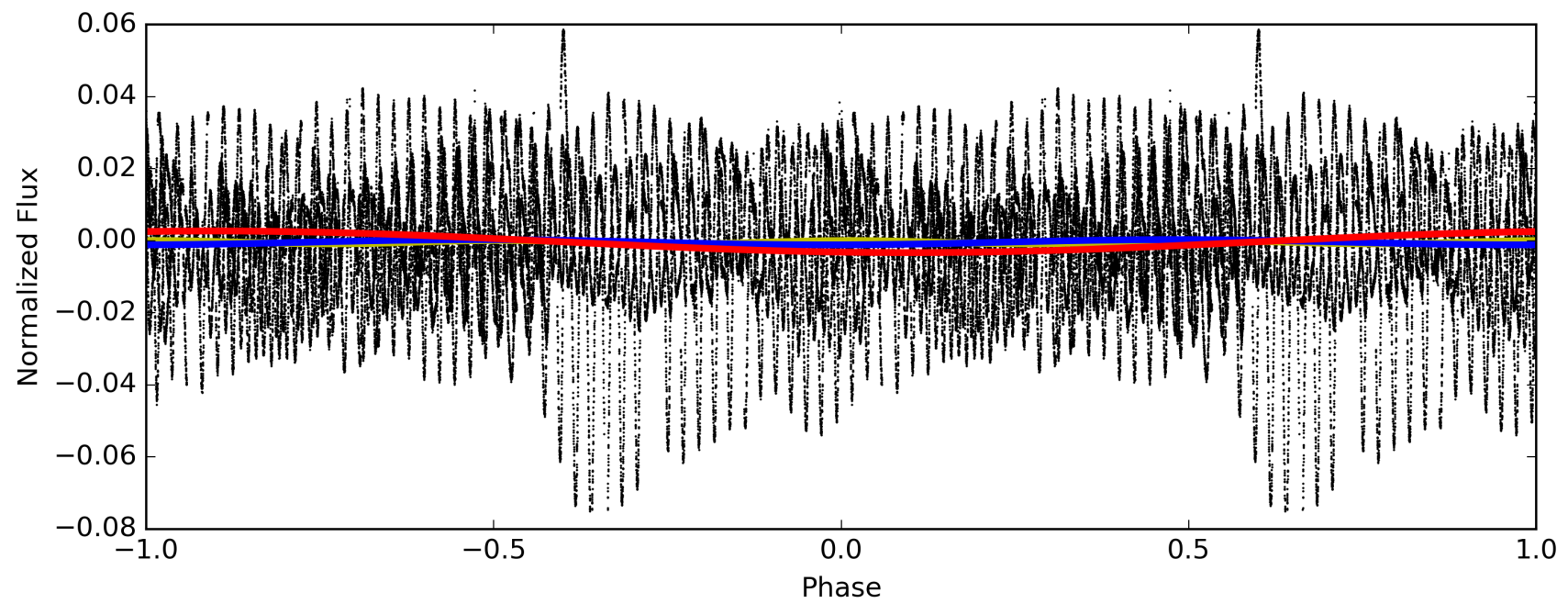
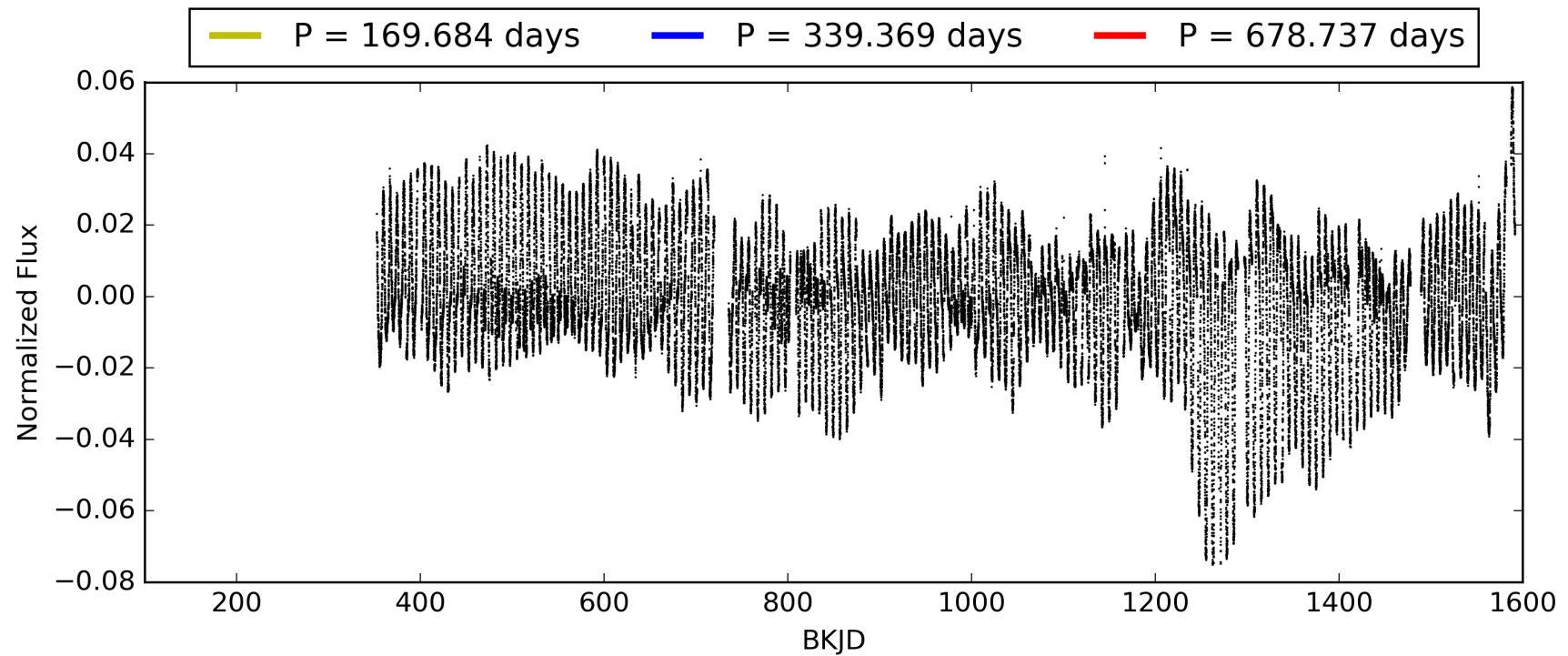
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:05:07 Z

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

TCE 005644412-02, PDC Light Curves

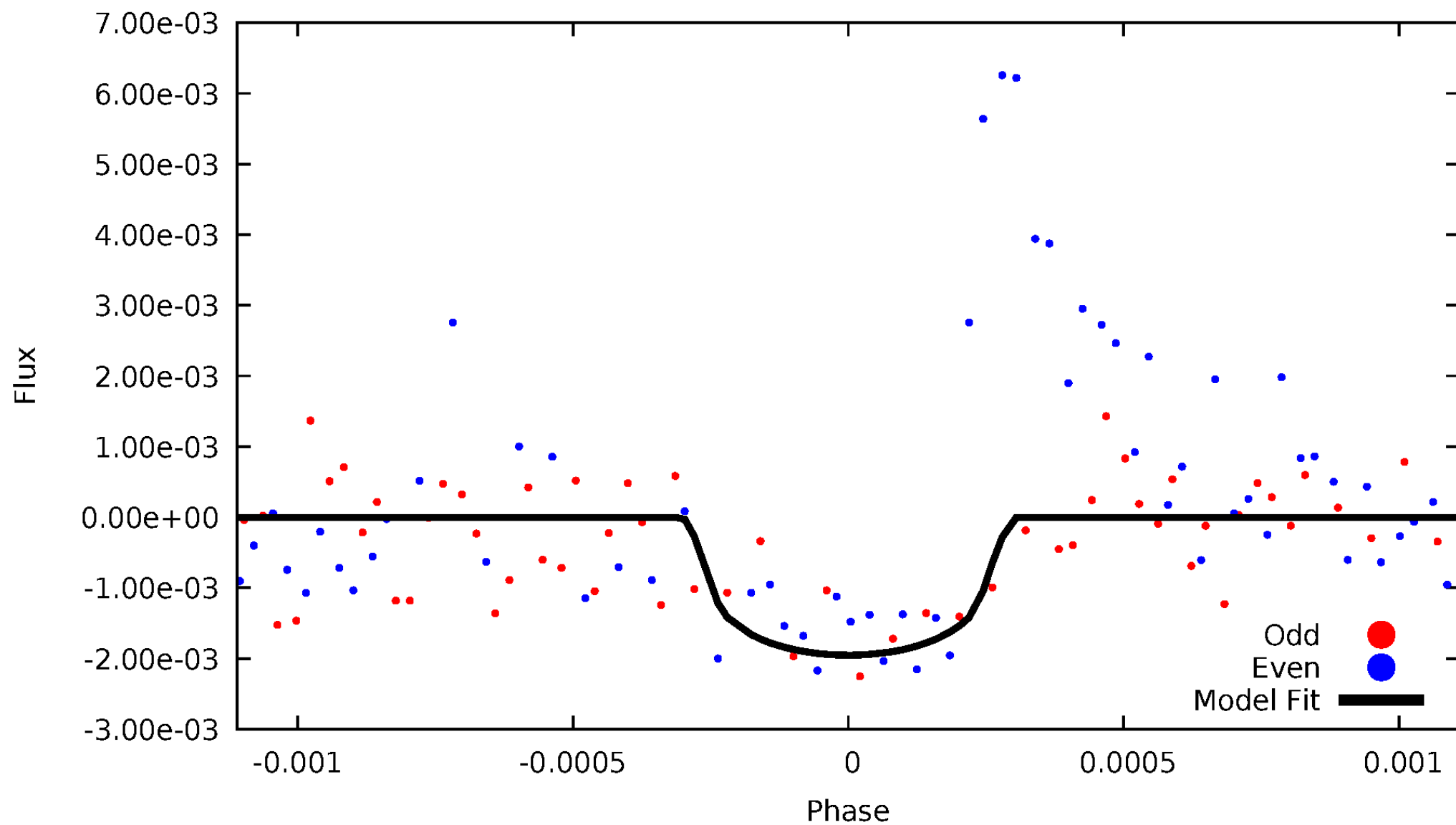


TCE 005644412-02



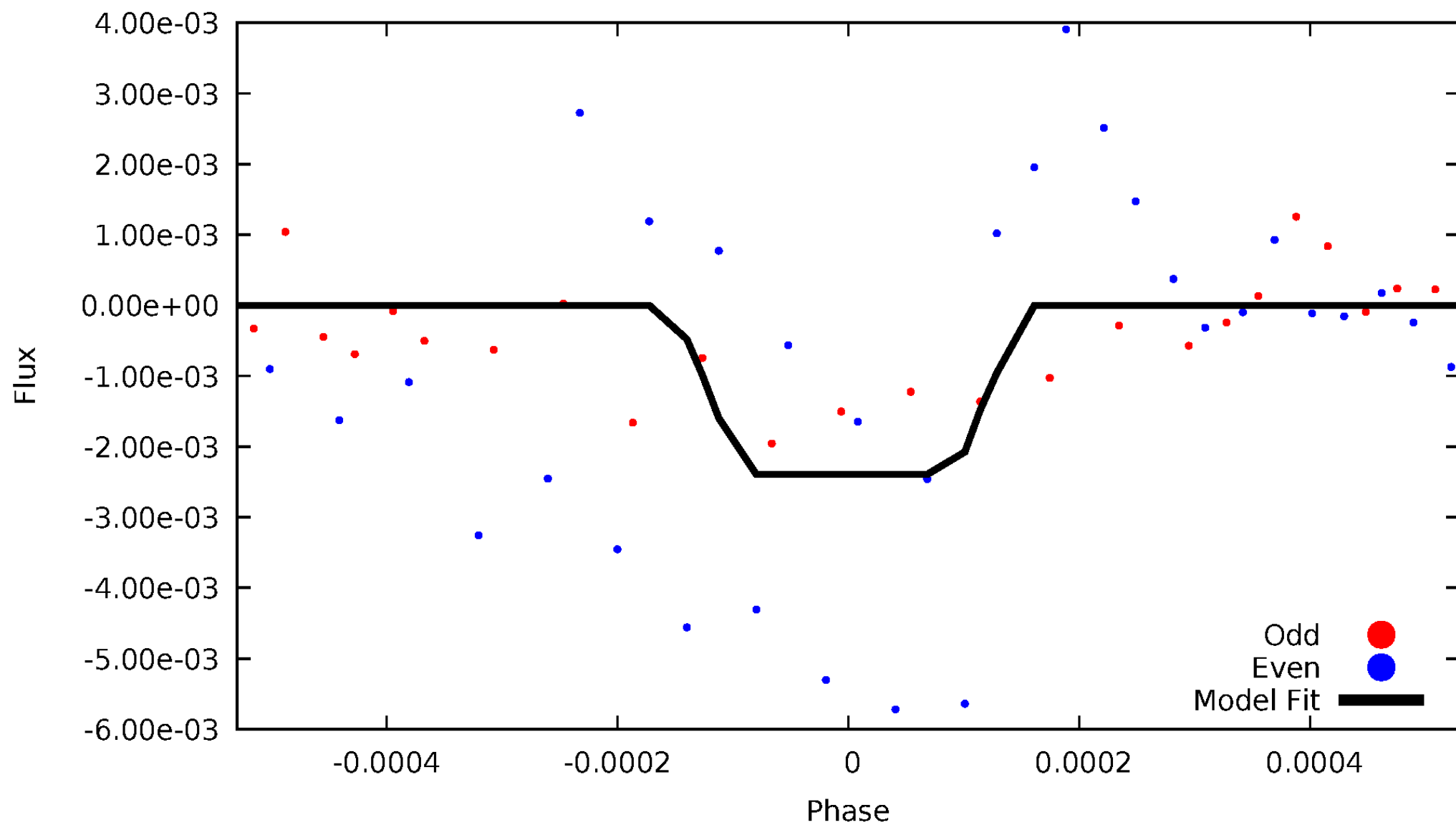
DV Odd/Even

TCE 005644412-02



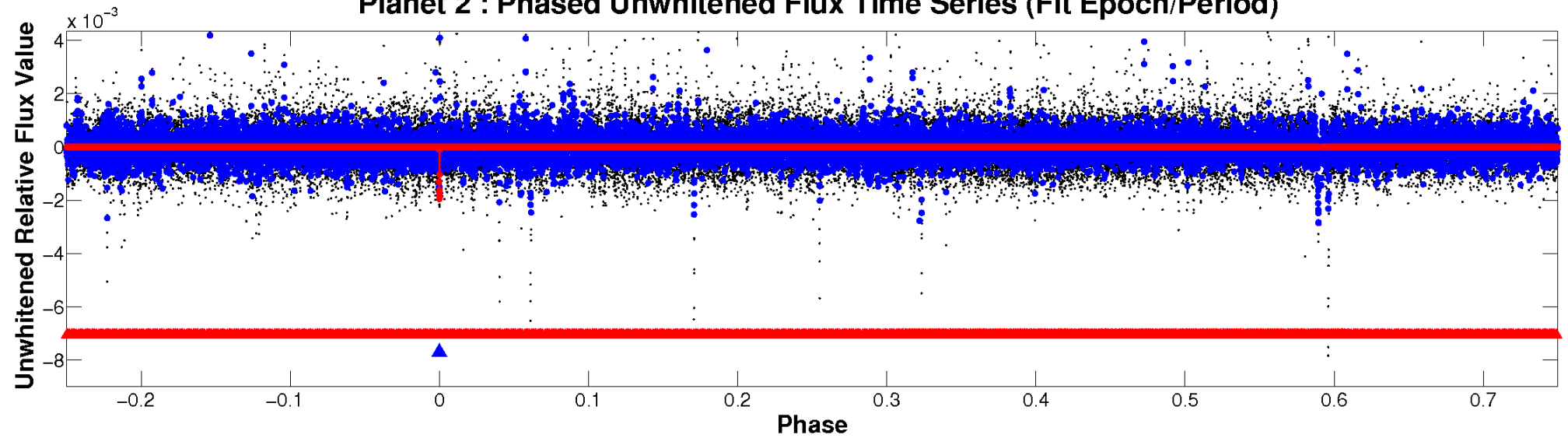
ALT Odd/Even

TCE 005644412-02

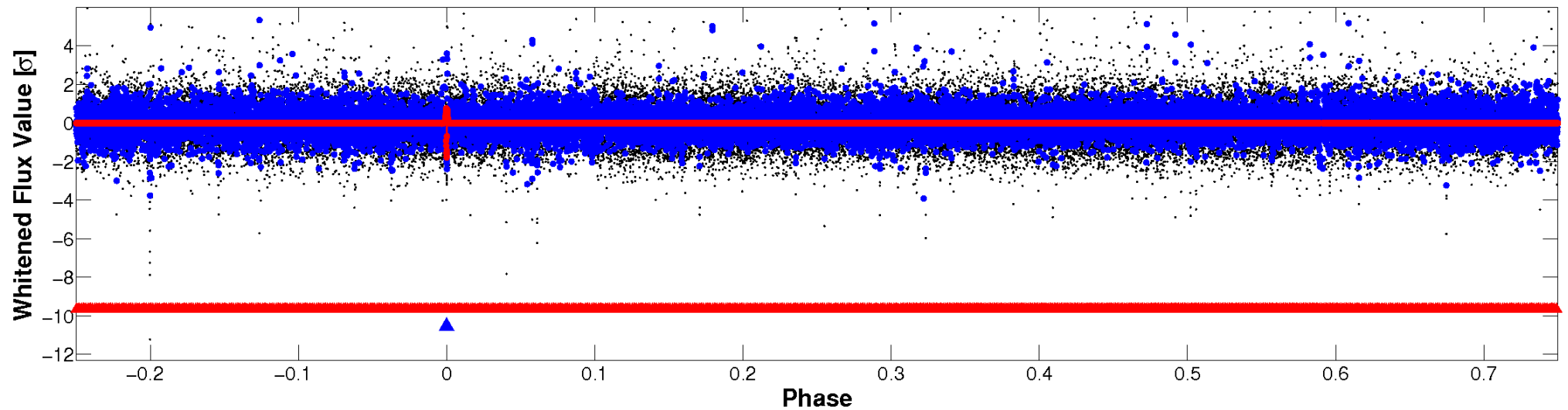


Non-Whitened Vs. Whitened Light Curve

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

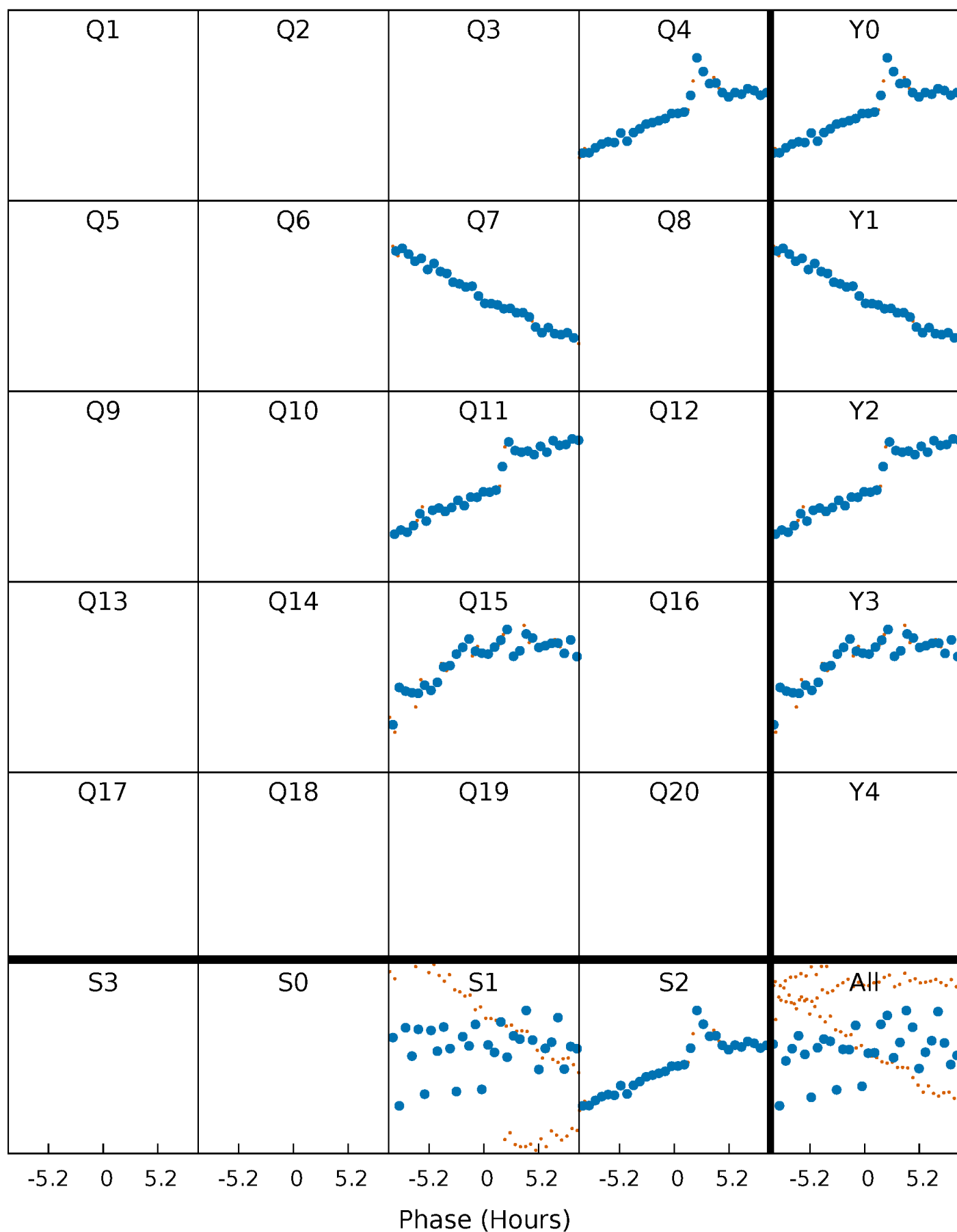


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



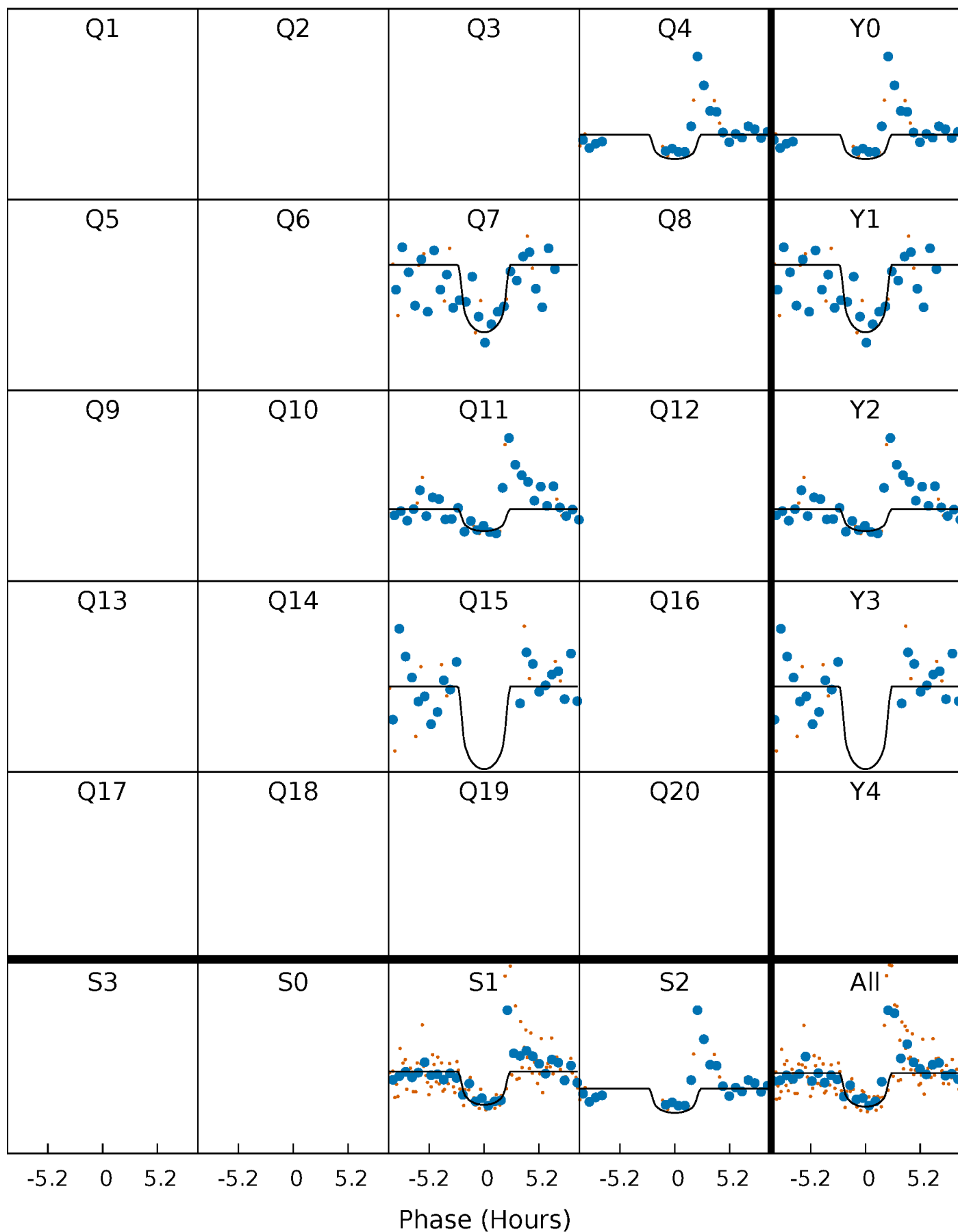
PDC Quarter-Phased Transit Curves

TCE 005644412-02 $P=339.368572$ Days $T_0=366.462274$ (BKJD)



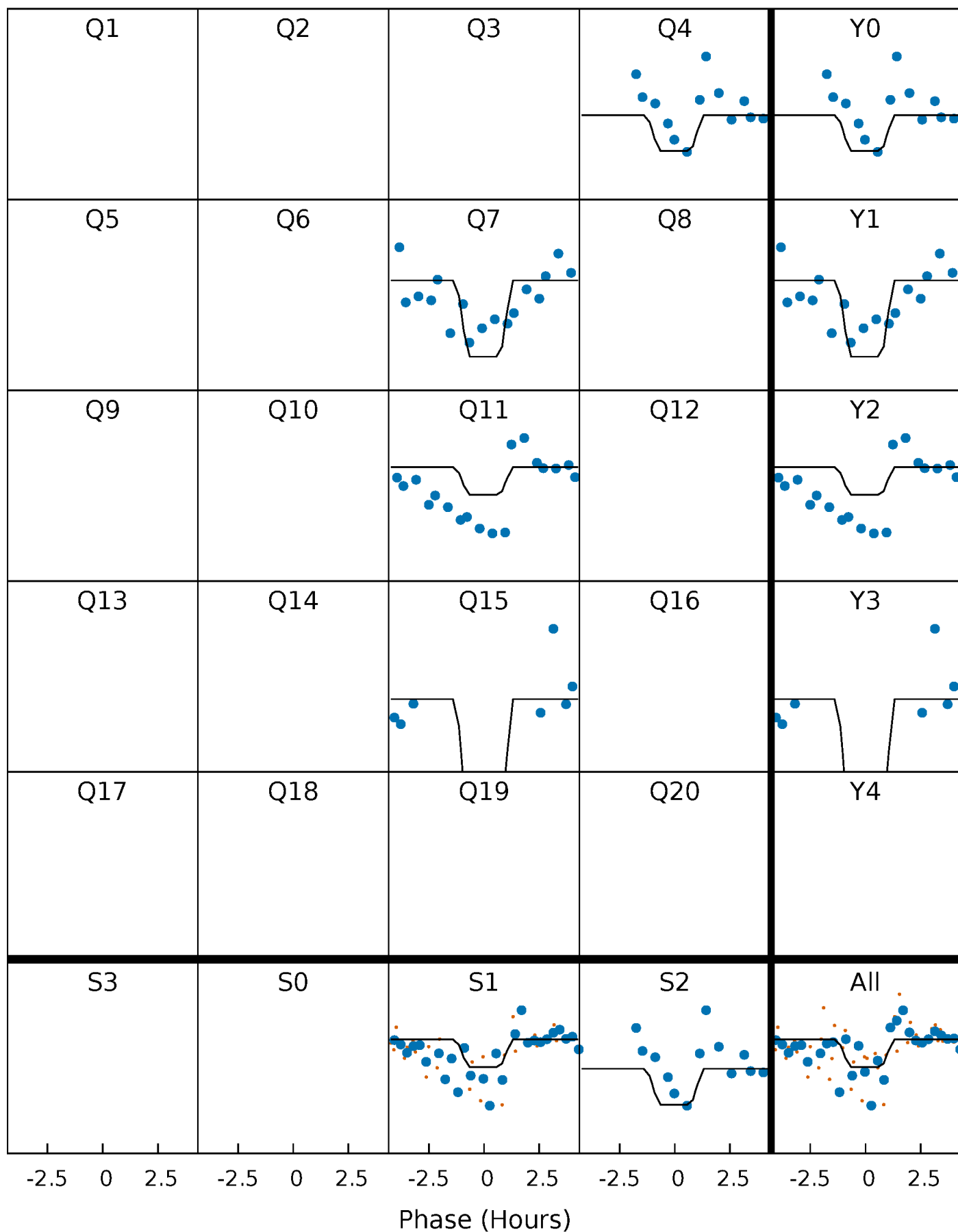
DV Quarter-Phased Transit Curves

TCE 005644412-02 $P=339.368572$ Days $T_0=366.462274$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

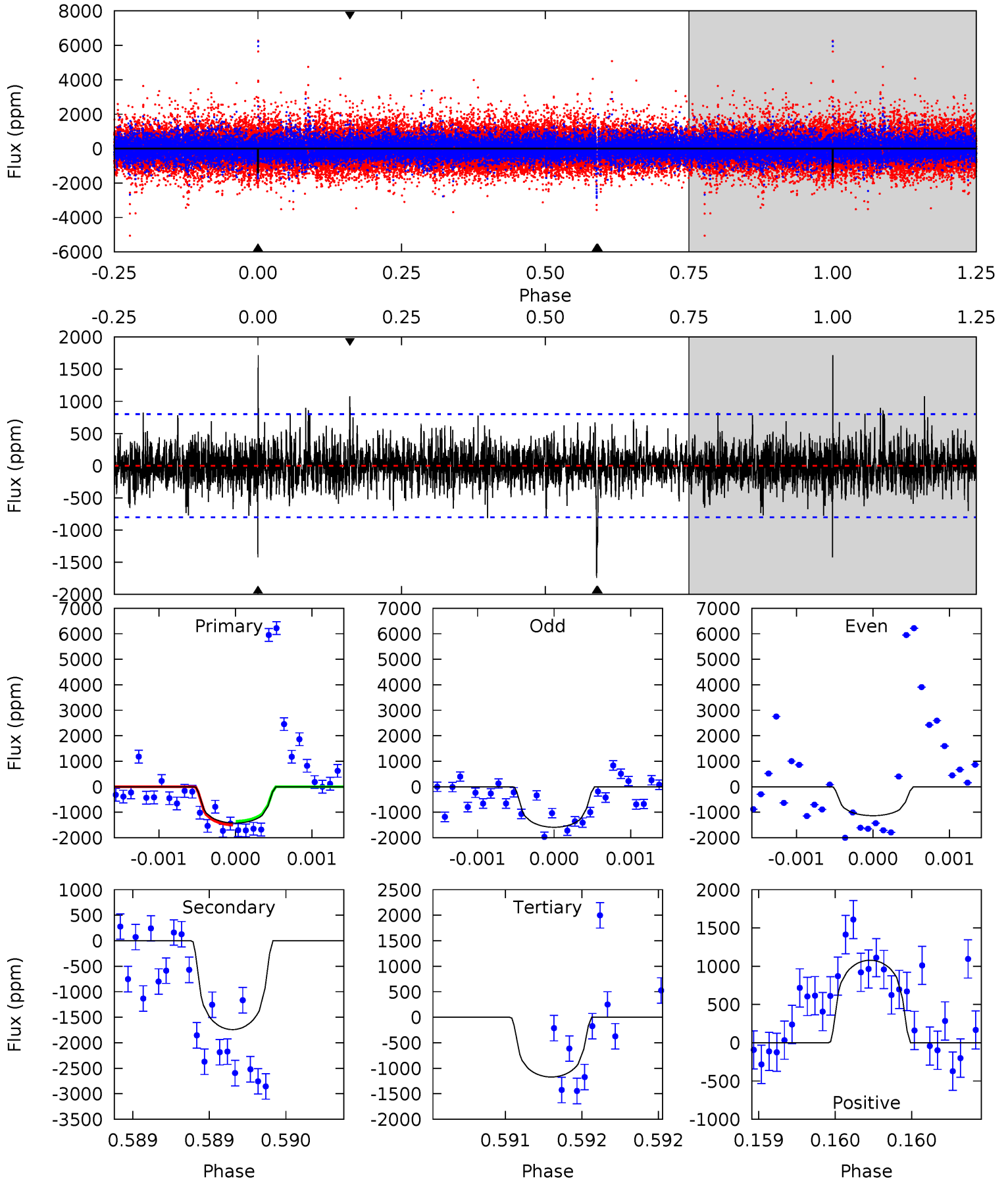
TCE 005644412-02 P=339.367376 Days $T_0=366.493074$ (BKJD)



DV Model-Shift Uniqueness Test

005644412-02, P = 339.368572 Days, E = 27.093702 Days

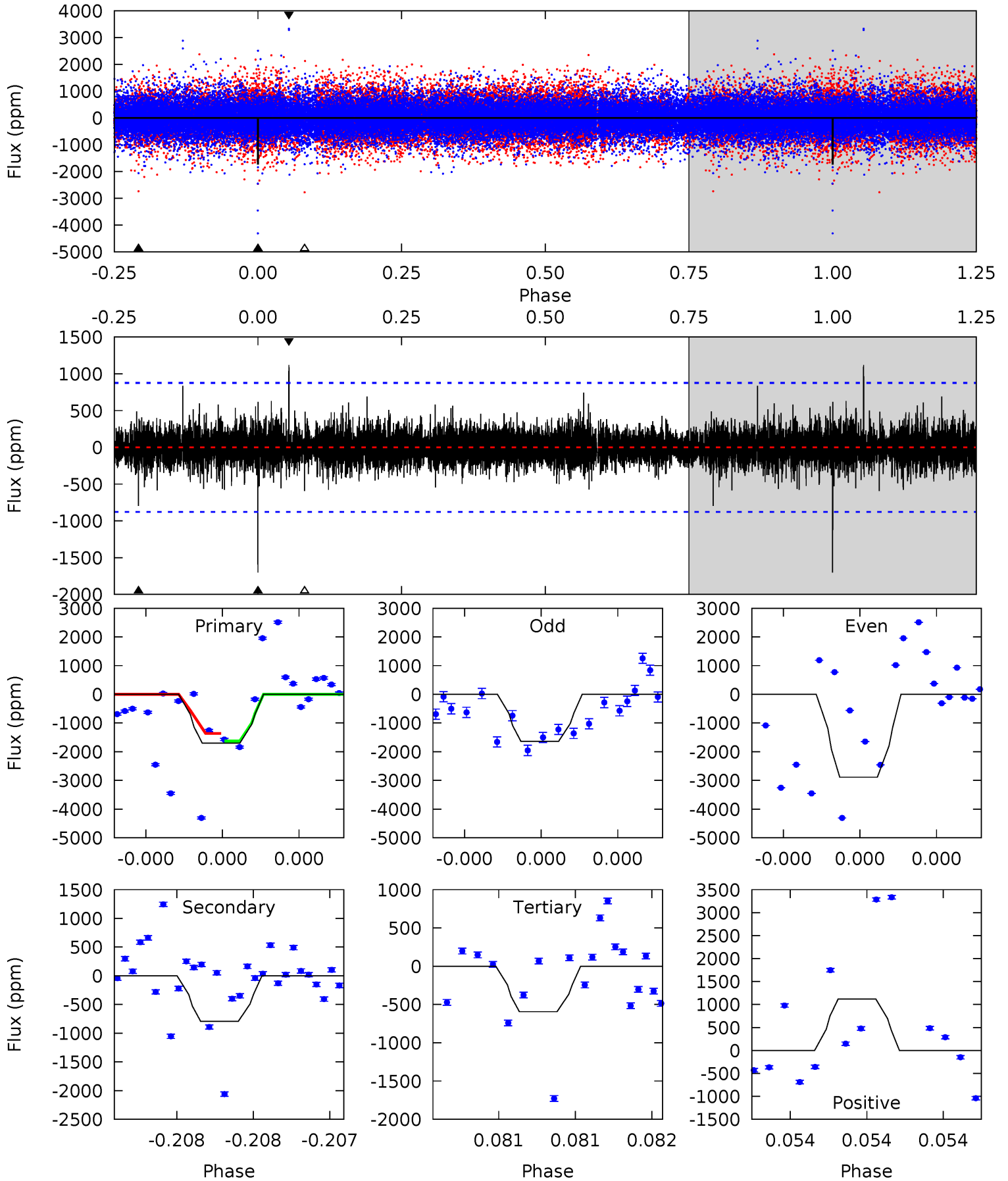
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.85	12.1	8.10	7.46	5.55	3.44	1.44	1.75	2.39	3.96	4.59	1.54	0.88	0.50	0.51



Alt Model-Shift Uniqueness Test

005644412-02, P = 339.367376 Days, E = 27.125698 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	5.12	3.83	7.23	5.66	3.61	0.91	7.16	3.76	1.29	-2.11	4.24	1.68	0.40	0.76



Stellar Parameters For KIC 005644412

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5107^{+184}_{-184}	$4.615^{+0.033}_{-0.077}$	$-0.200^{+0.300}_{-0.300}$	$0.723^{+0.097}_{-0.065}$	$0.794^{+0.073}_{-0.090}$	$2.955^{+0.521}_{-0.770}$
	+4%/-4%	+1%/-2%	+150%/-150%	+13%/-9%	+9%/-11%	+18%/-26%
Source	KIC0	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 005644412-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1742 ± 144	$6.46^{+6.39}_{-4.09}$	289^{+14}_{-13}	3975^{+2079}_{-784}	$17775^{+115330}_{-13264}$
Alt.	-794 ± 155	$6.67^{+6.58}_{-4.43}$	289^{+13}_{-12}	3430^{+1767}_{-623}	7663^{+58600}_{-5839}

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

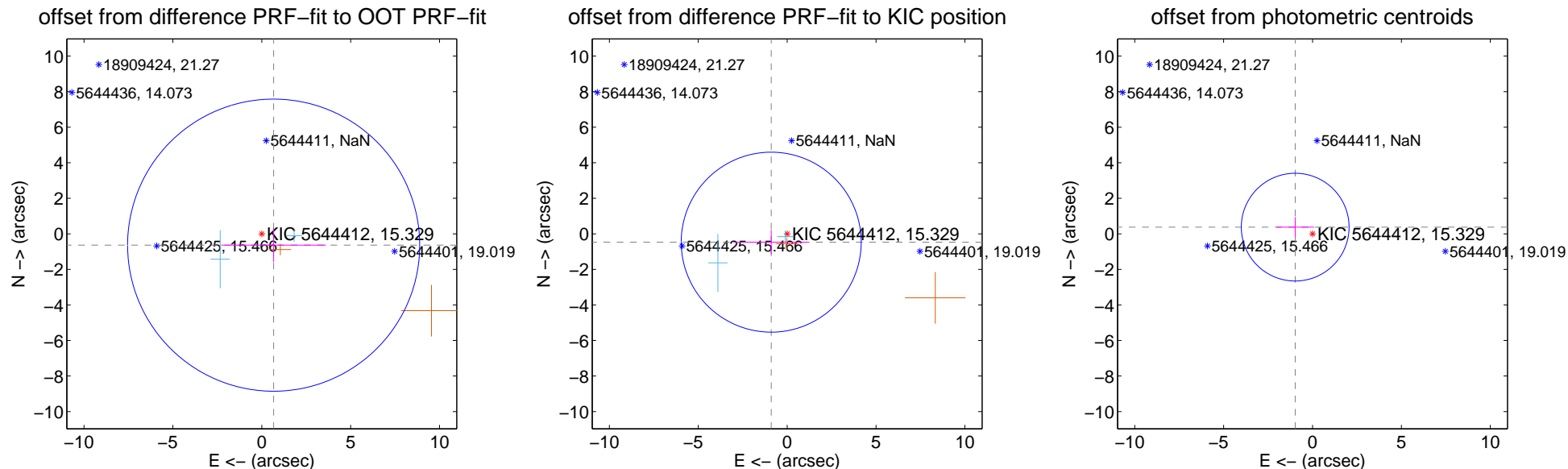
DV Centroid Data

Supplemental centroid analysis for 005644412-02. Kepler magnitude: 15.33. Transit SNR 8.29

There are 2 quarters with good PRF difference image offsets

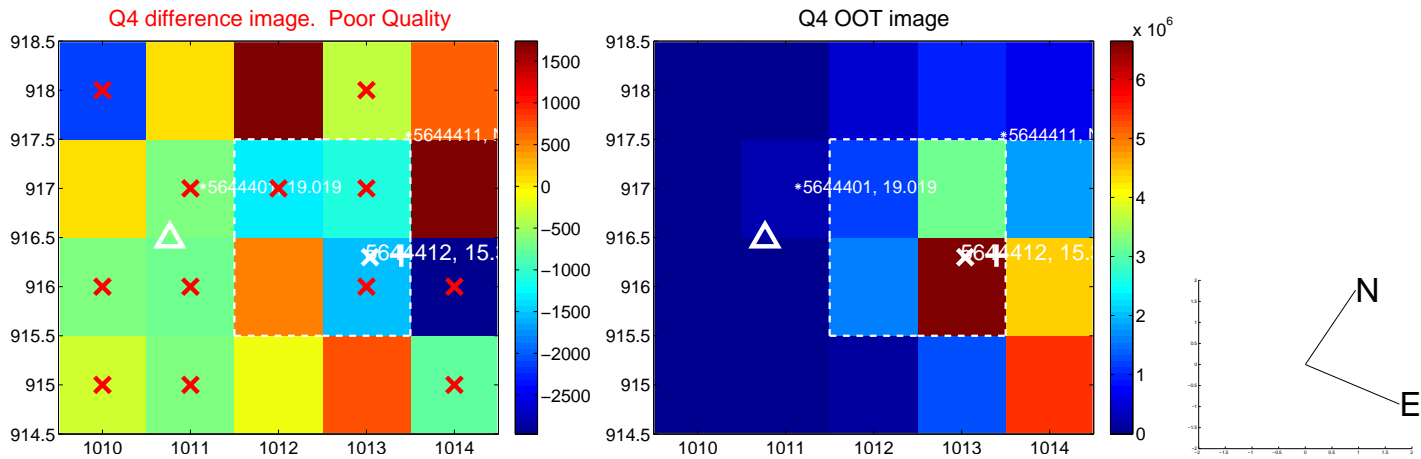
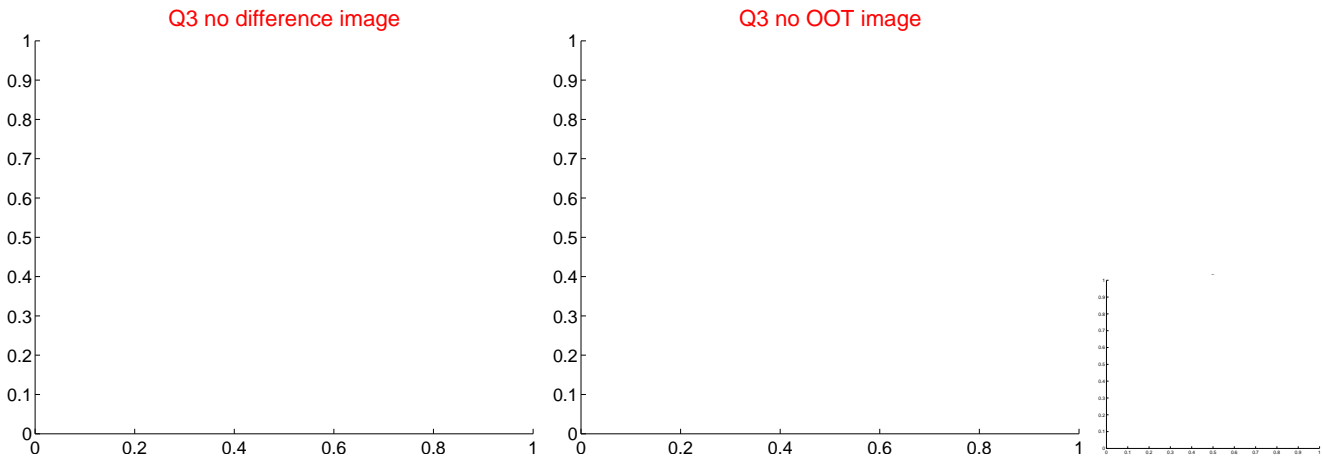
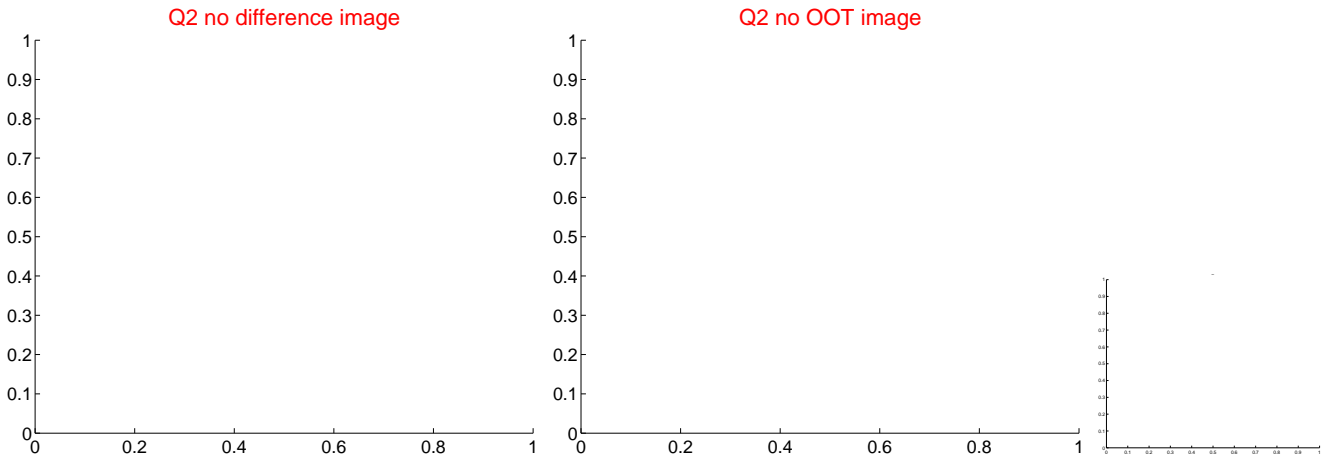
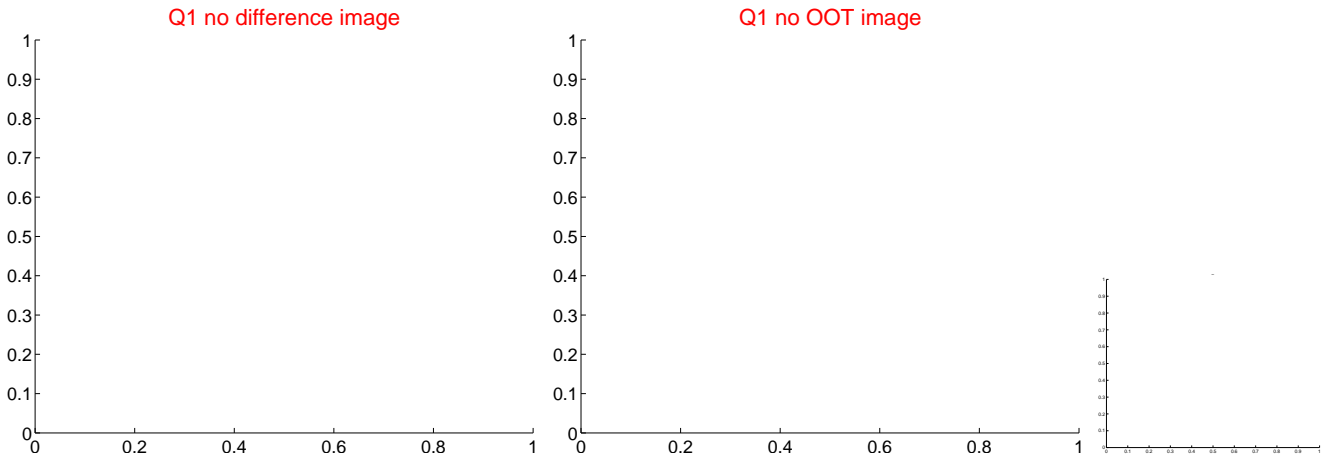
The direct PRF centroid is offset from the target star catalog position by about 1.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.924 ± 2.739	0.34	-0.669 ± 2.945	-0.637 ± 0.958
PRF-fit source offset from KIC position	1.012 ± 1.688	0.60	0.897 ± 2.114	-0.469 ± 0.686
photometric centroid source offset	1.05 ± 1.01	1.03	0.98 ± 1.06	0.38 ± 0.56



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.

Q5 no difference image



Q5 no OOT image



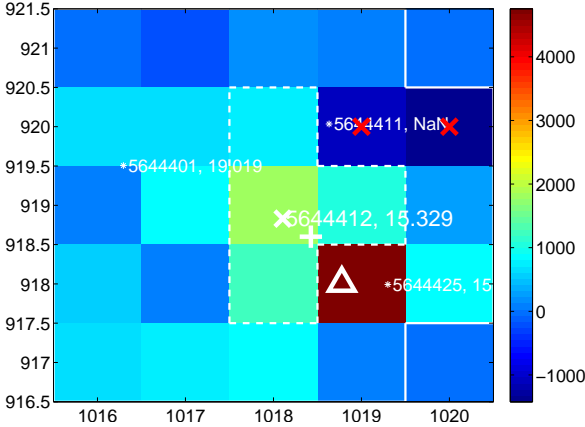
Q6 no difference image



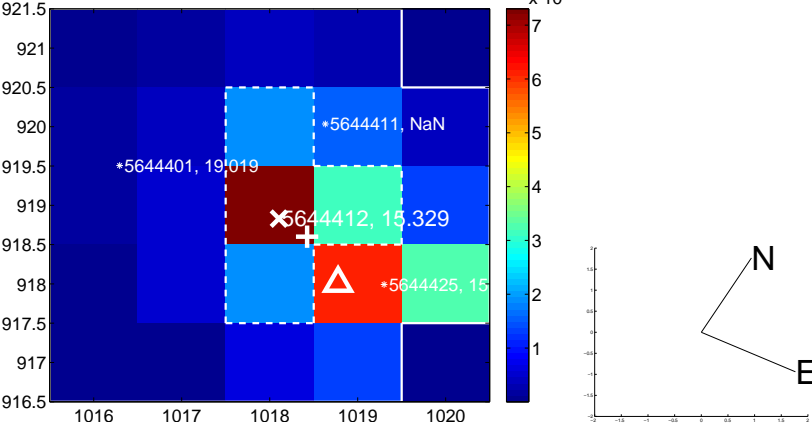
Q6 no OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image

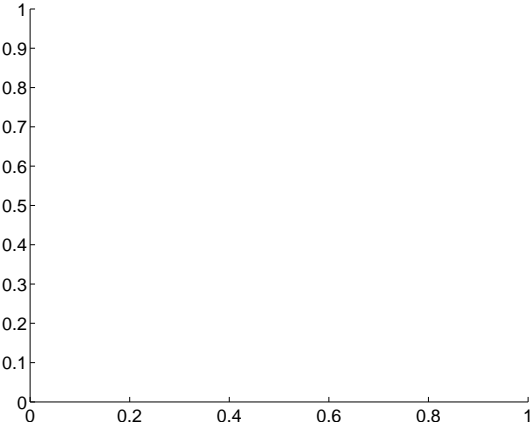


Q8 no OOT image

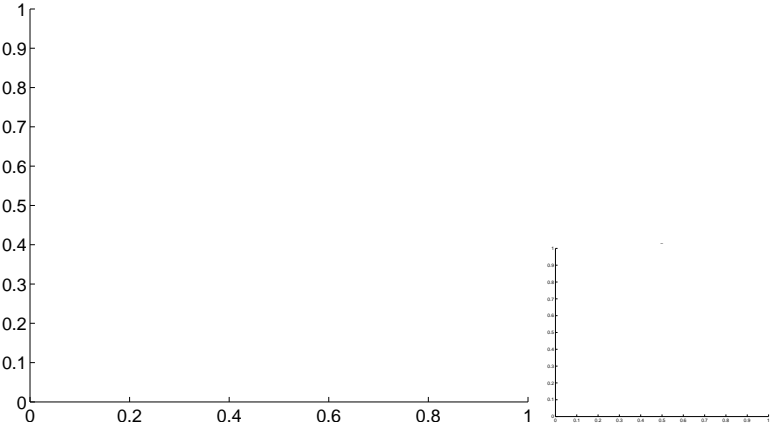


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

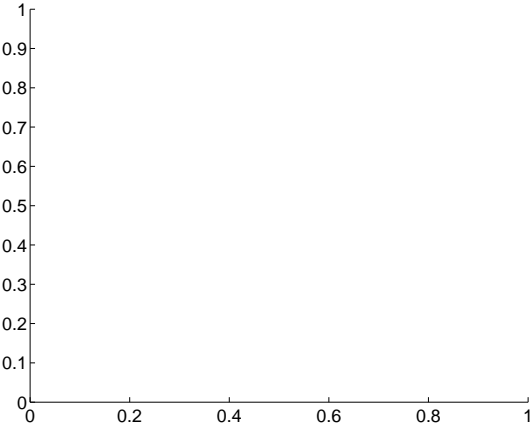
Q9 no difference image



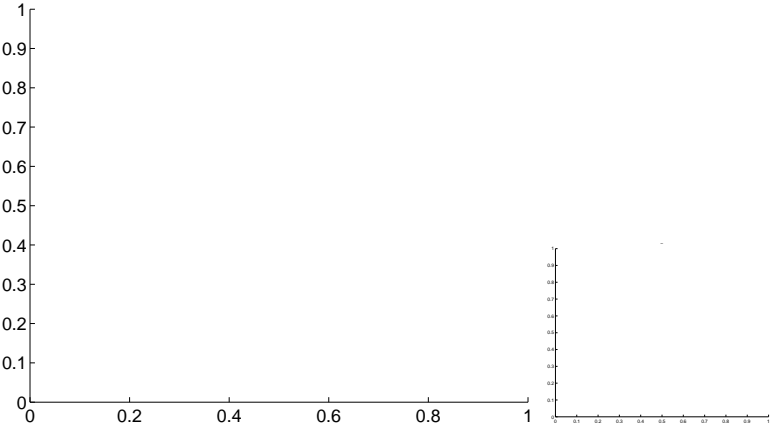
Q9 no OOT image



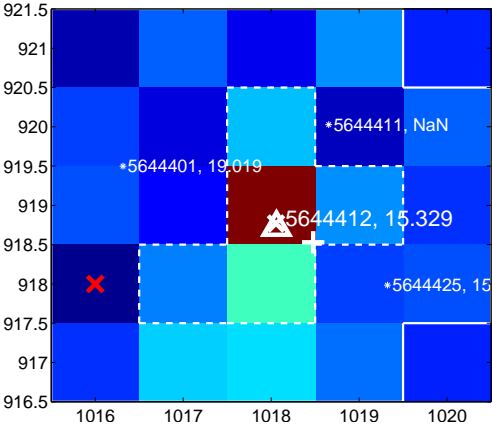
Q10 no difference image



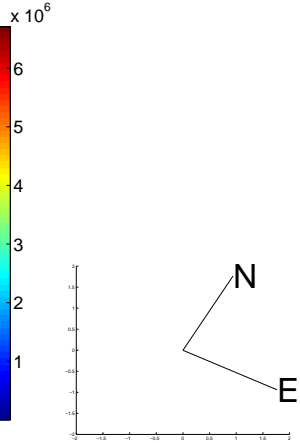
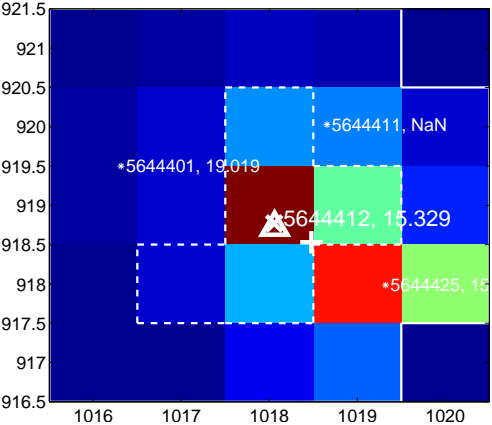
Q10 no OOT image



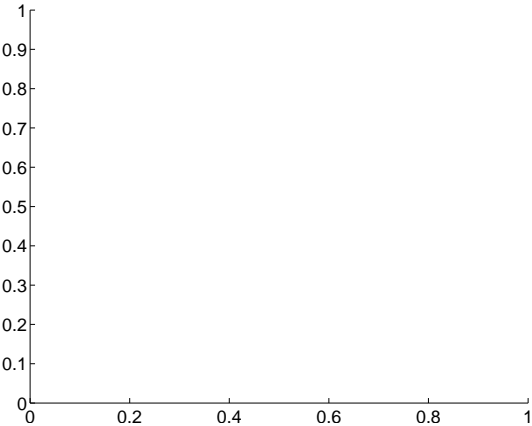
Q11 difference image



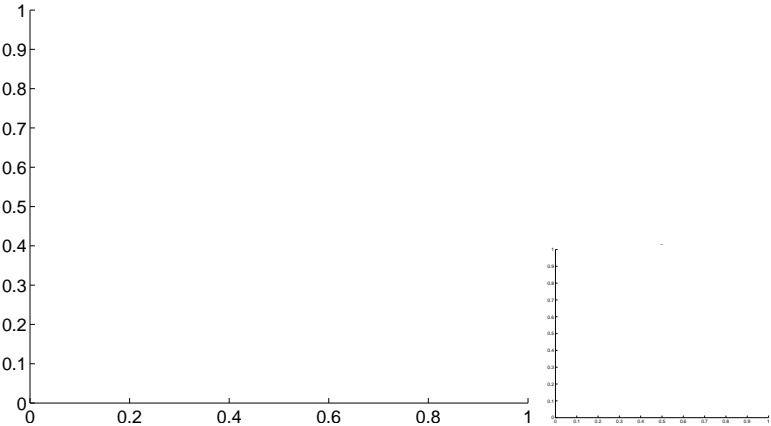
Q11 OOT image



Q12 no difference image



Q12 no OOT image



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

Q13 no difference image



Q13 no OOT image



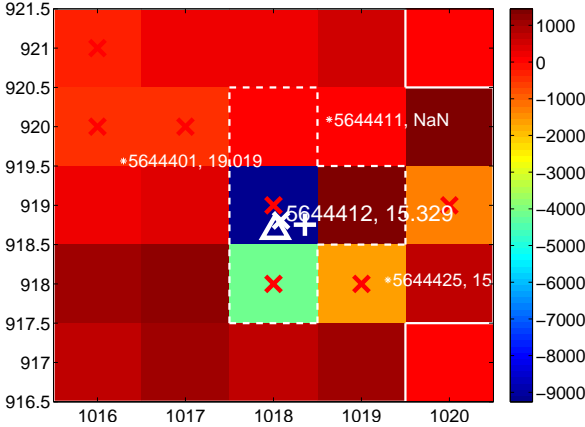
Q14 no difference image



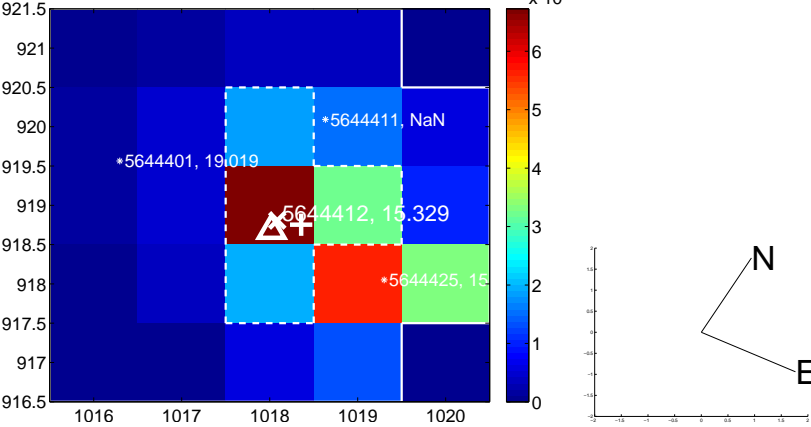
Q14 no OOT image



Q15 difference image. Poor Quality



Q15 OOT image



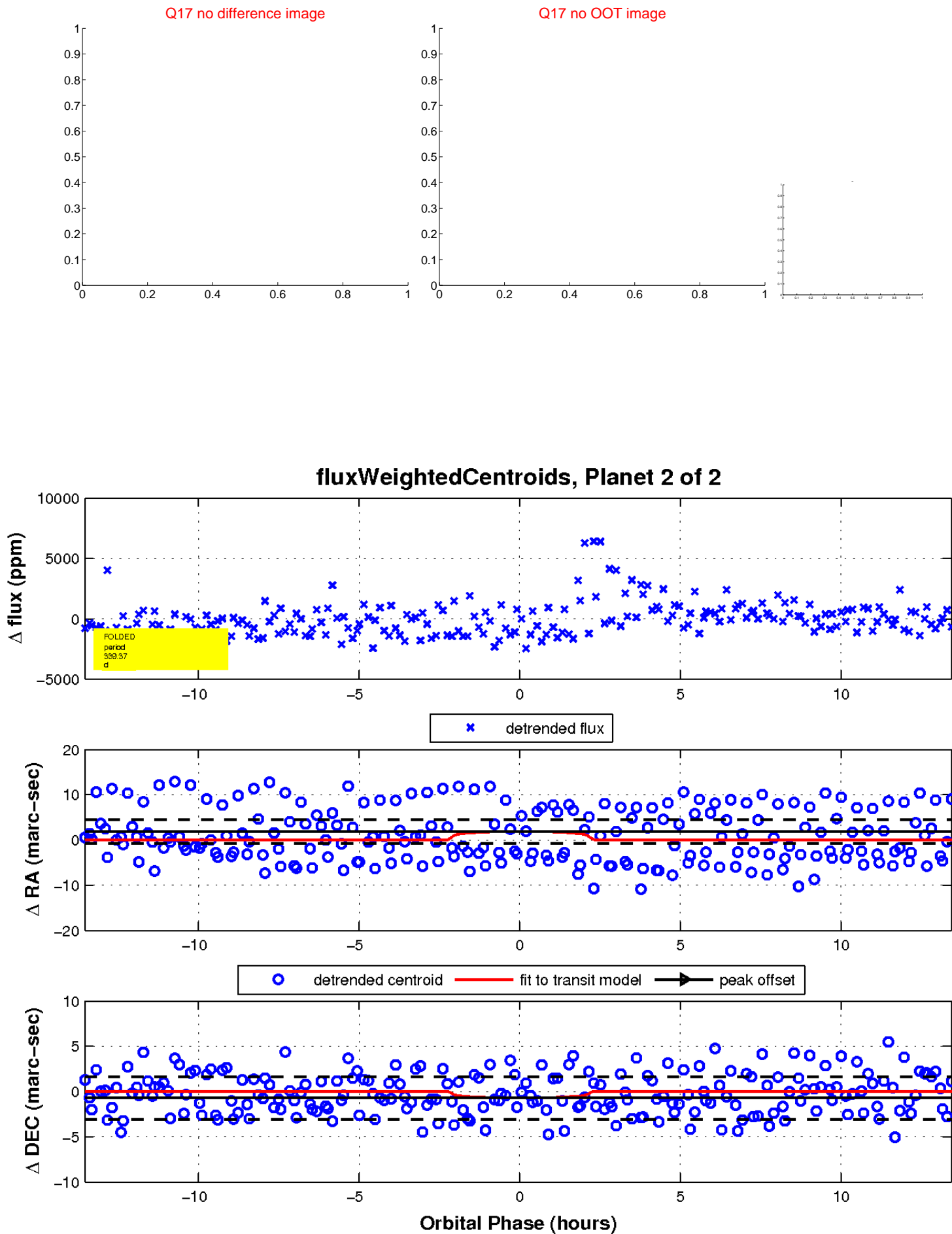
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

