

KIC 009163458

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})
009163458-01	OBS	No	1.477098	131.831833	100.5	8.280	8.9	9.0	1.00	5780	1.08	1551.41
009163458-02	OBS	No	194.723714	181.660538	1487.9	13.393	9.7	8.0	1.00	5780	3.93	2.31
009163458-03	OBS	No	98.523709	219.190406	1846.0	3.340	7.9	8.7	1.00	5780	7.06	5.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009163458-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
009163458-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009163458-03	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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

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

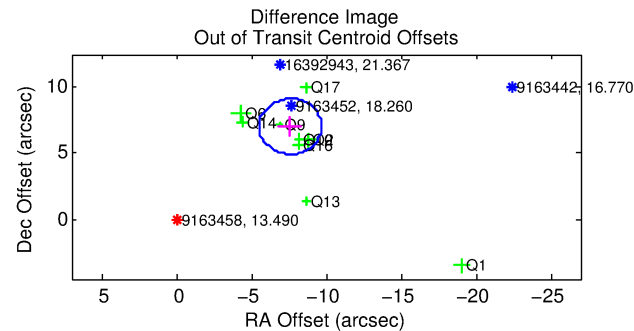
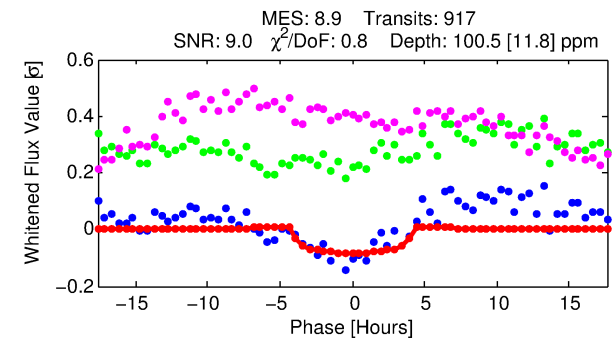
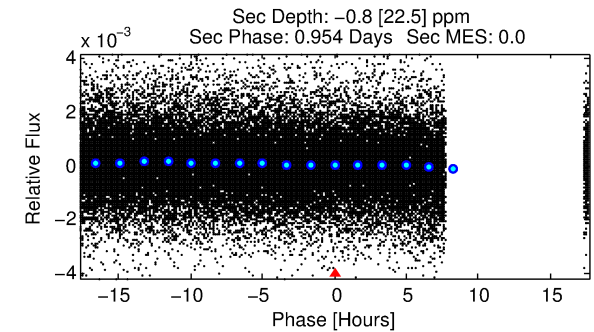
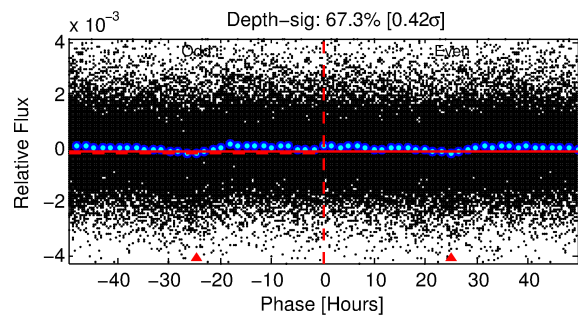
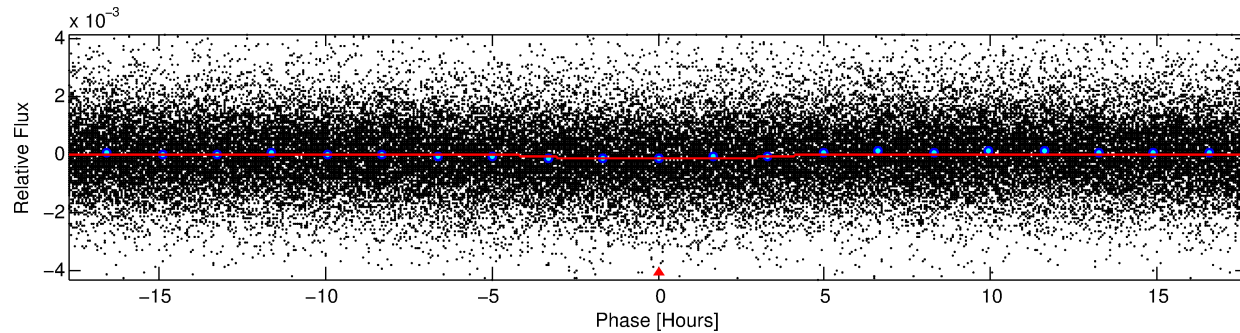
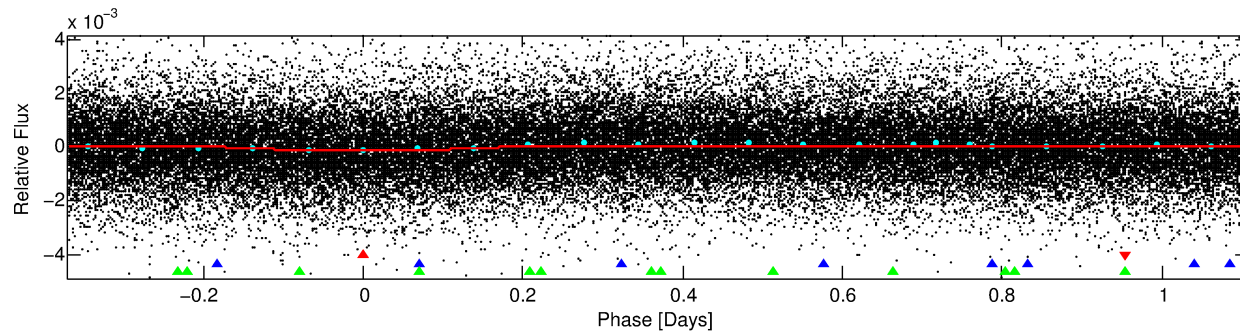
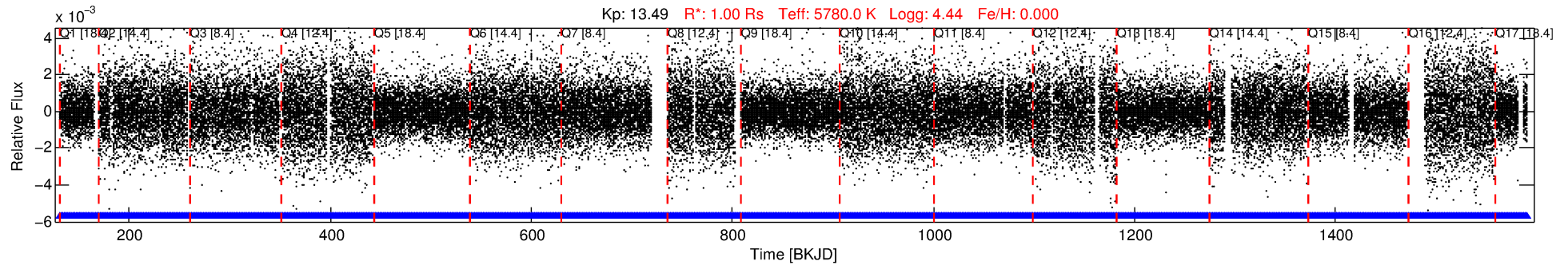
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009163458-01

No Significant Match Found

DV One-Page Summary

KIC: 9163458 Candidate: 1 of 3 Period: 1.477 d



DV Fit Results:

Period = 1.47710 [0.00003] d
Epoch = 131.8318 [0.0093] BKJD
Rp/R* = 0.0099 [0.0092]
a/R* = 1.27 [1.97]
b = 0.74 [2.59]
Seff = 1551.41 [0.04]
Teff = 1600 [0] K
Rp = 1.08 [1.01] Re
a = 0.0254 [0.0000] AU
Ag = N/A
Teffp = N/A

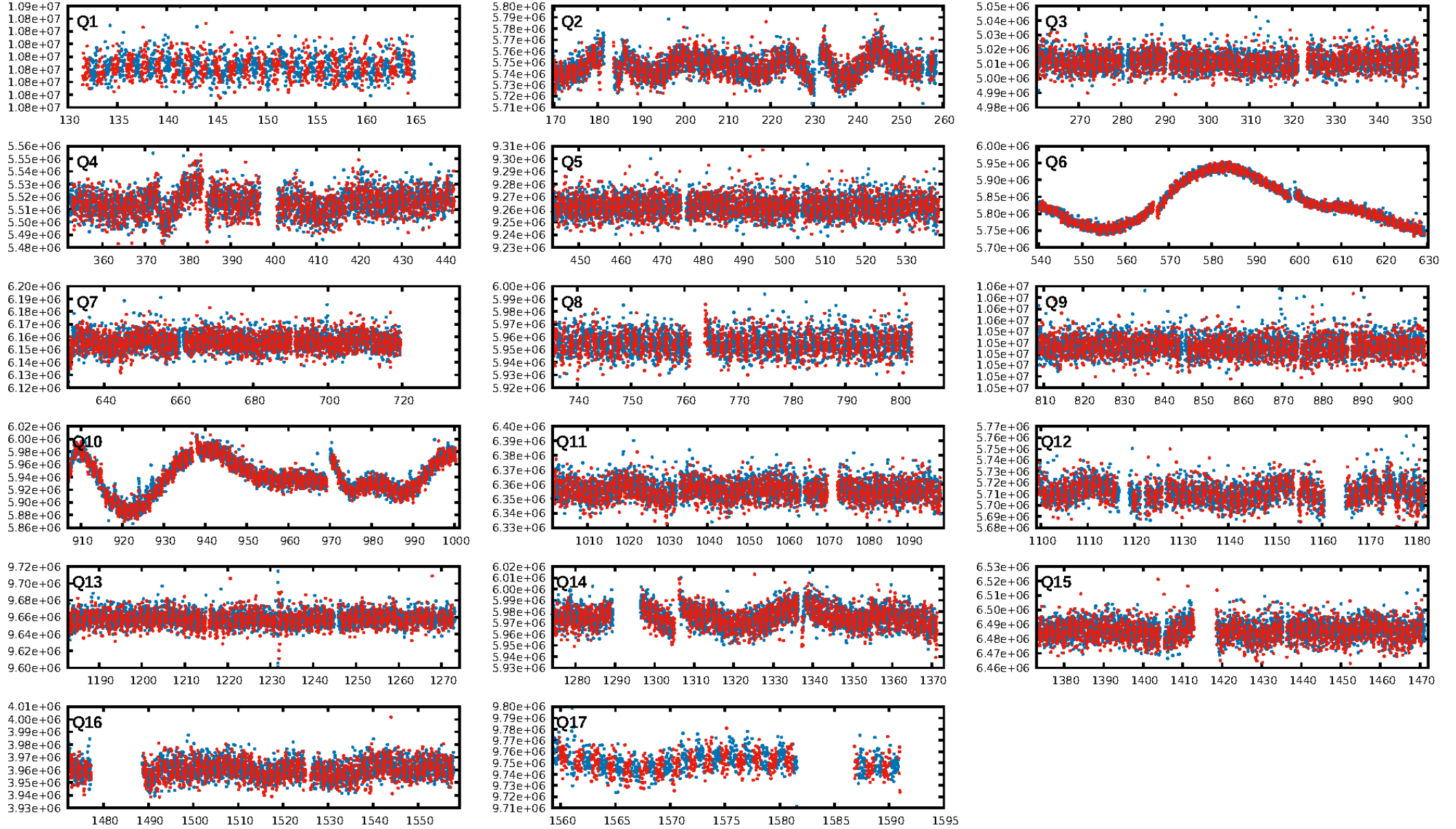
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [260.87 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.45e-18
RollingBand-fgt: 1.00 [876/876]
GhostDiagnostic-chr: 0.2077
Centroid-sig: 0.0%
Centroid-so: 1.621 arcsec [1.85 σ]
OotOffset-rm: 10.371 arcsec [14.84 σ]
KicOffset-rm: 2.981 arcsec [3.41 σ]
OotOffset-st: 4/0/1/4 [9]
KicOffset-st: 4/3/4/4 [15]
DiffImageQuality-fgm: 0.00 [0/15]
DiffImageOverlap-fno: 1.00 [17/17]

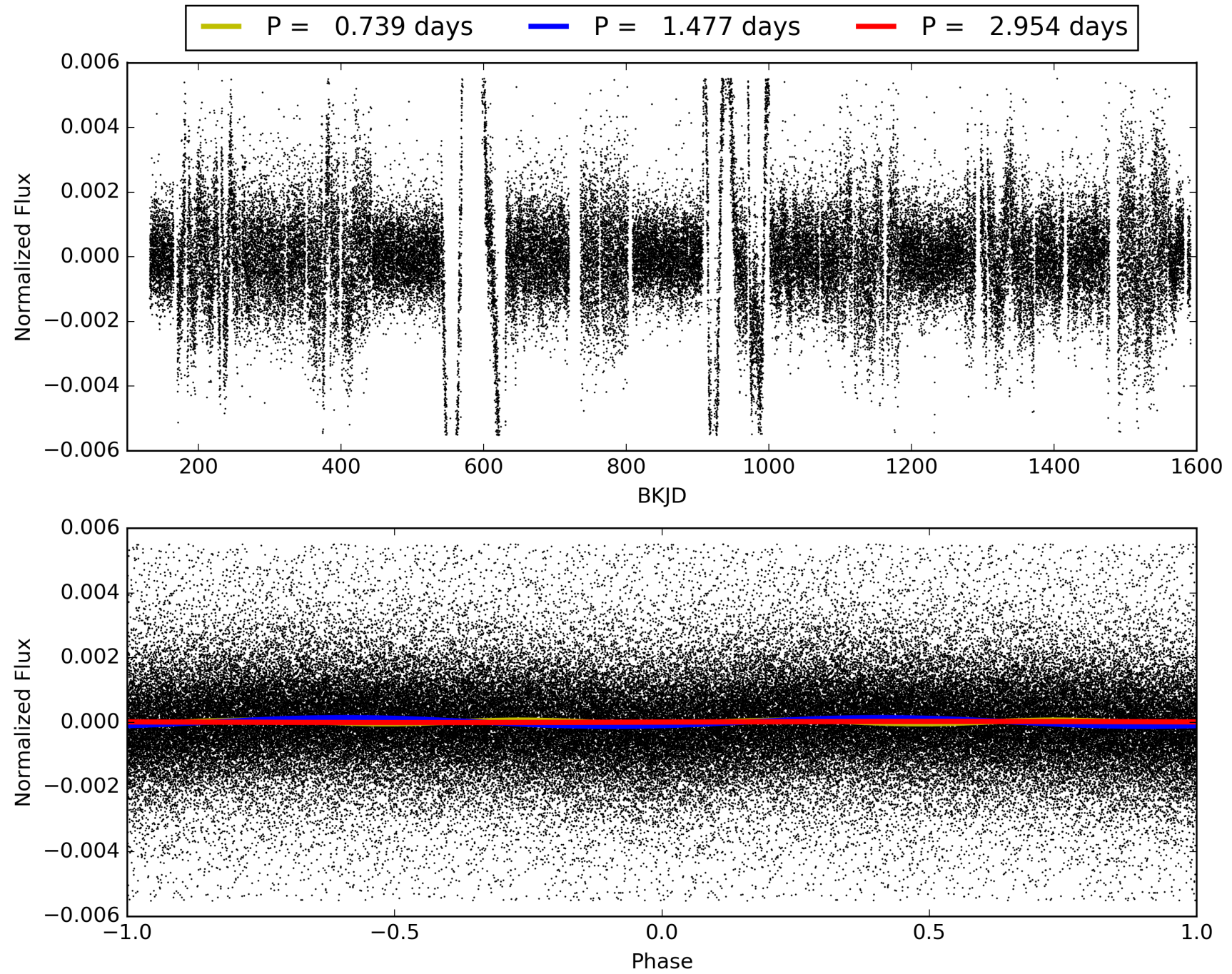
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009163458-01, PDC Light Curves

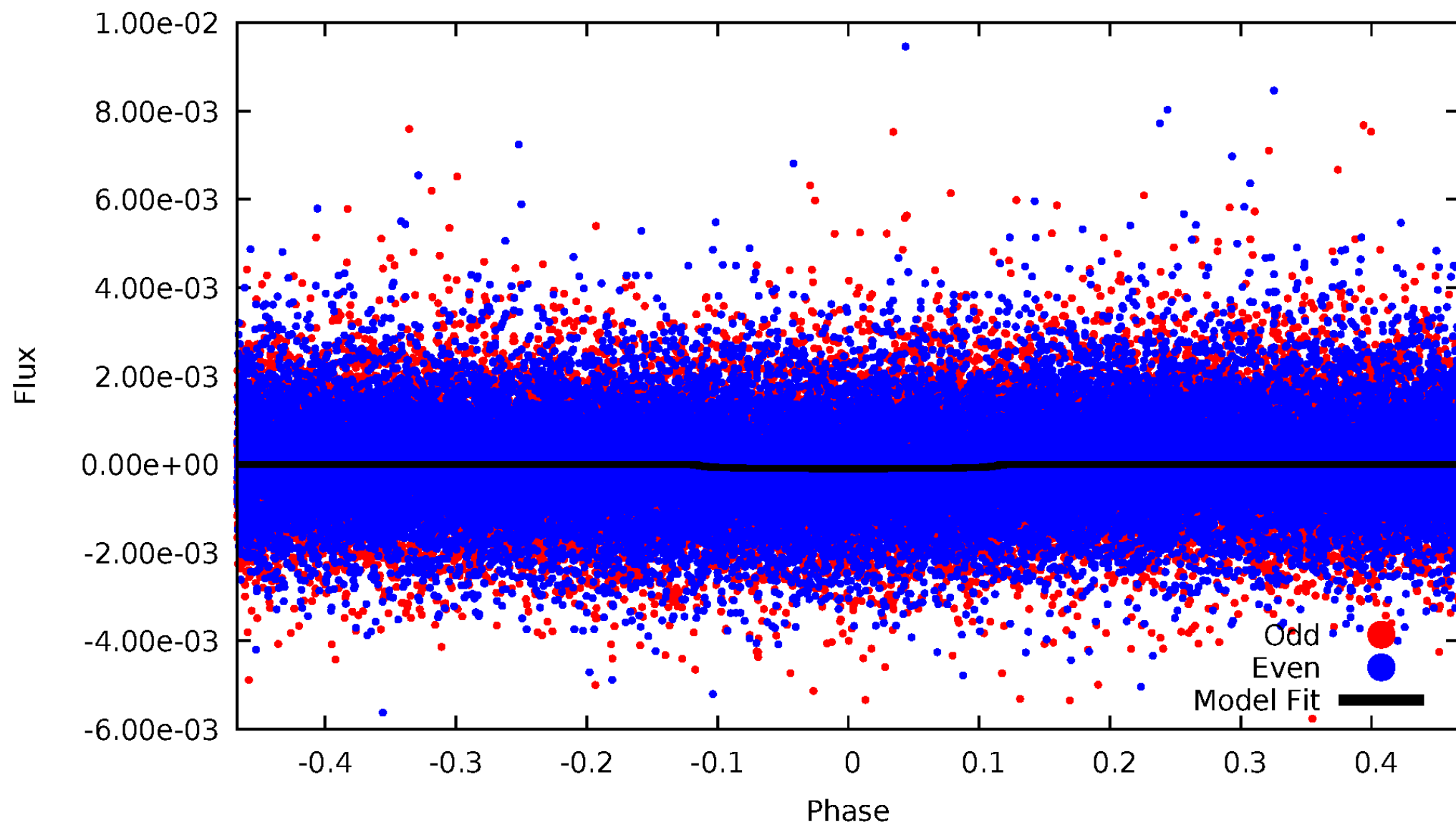


TCE 009163458-01



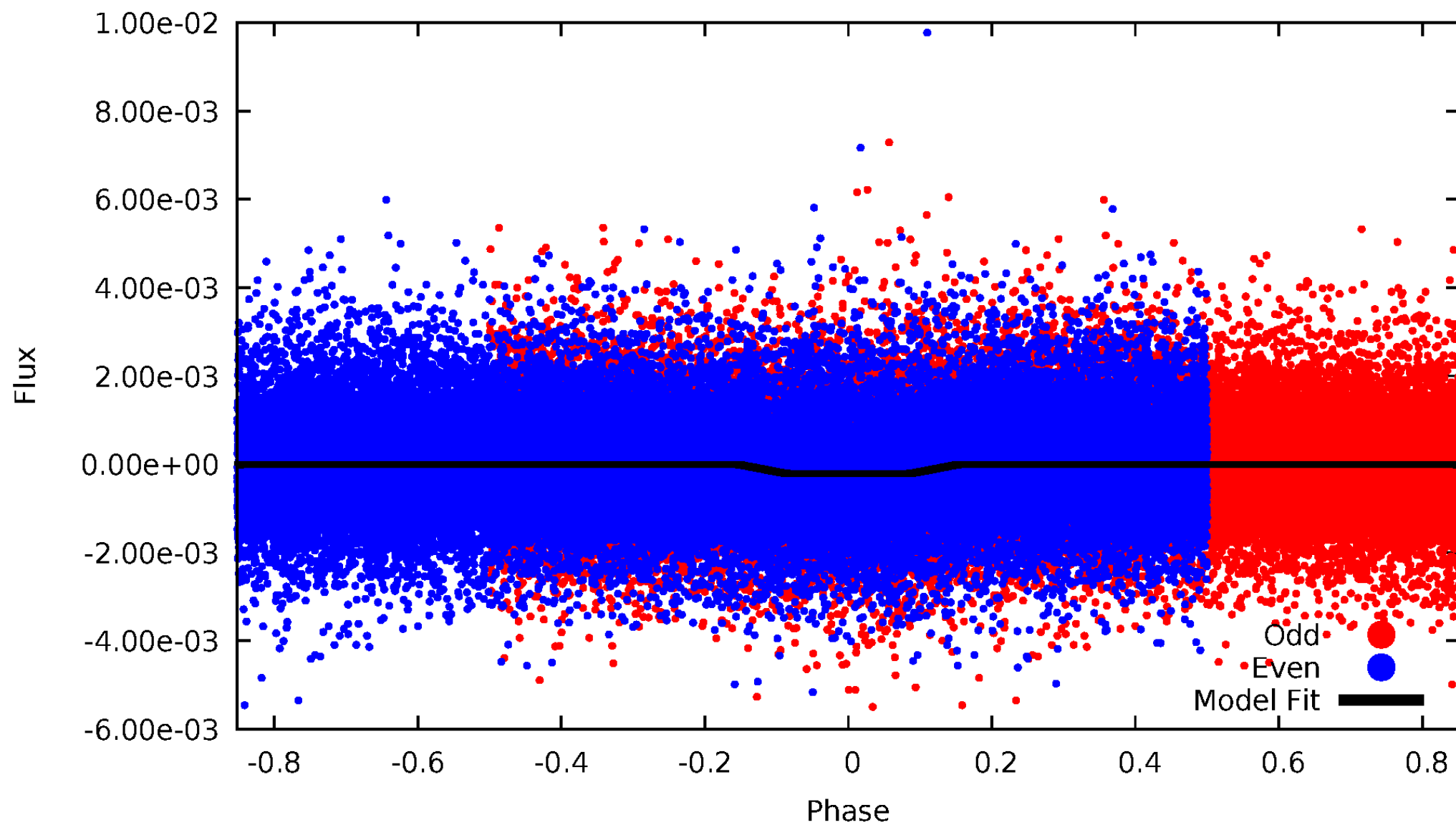
DV Odd/Even

TCE 009163458-01

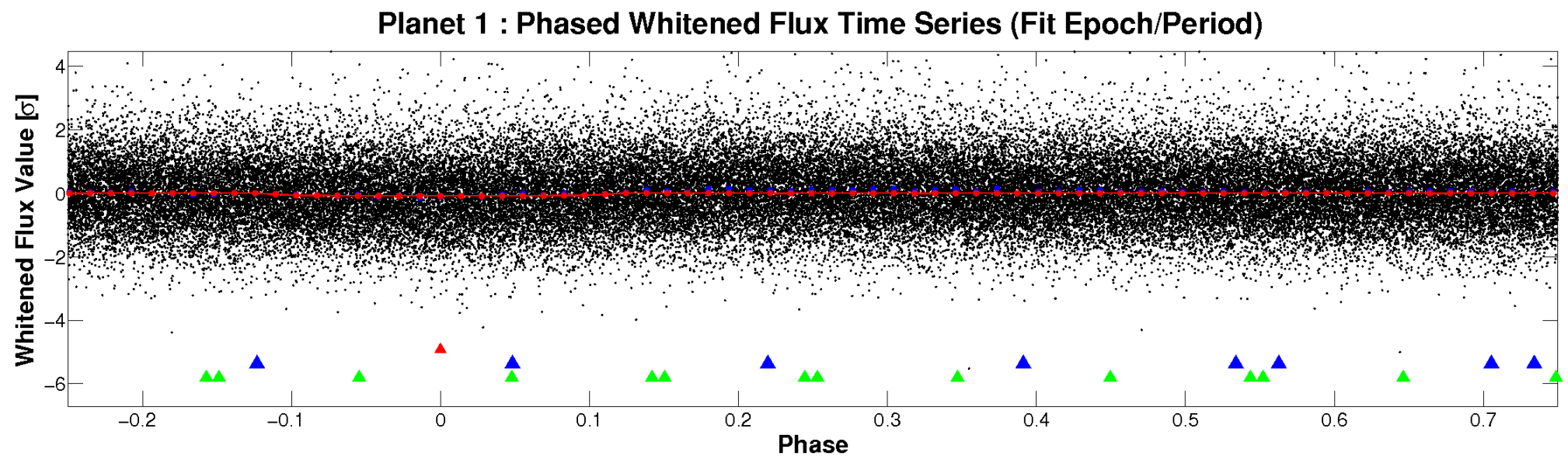
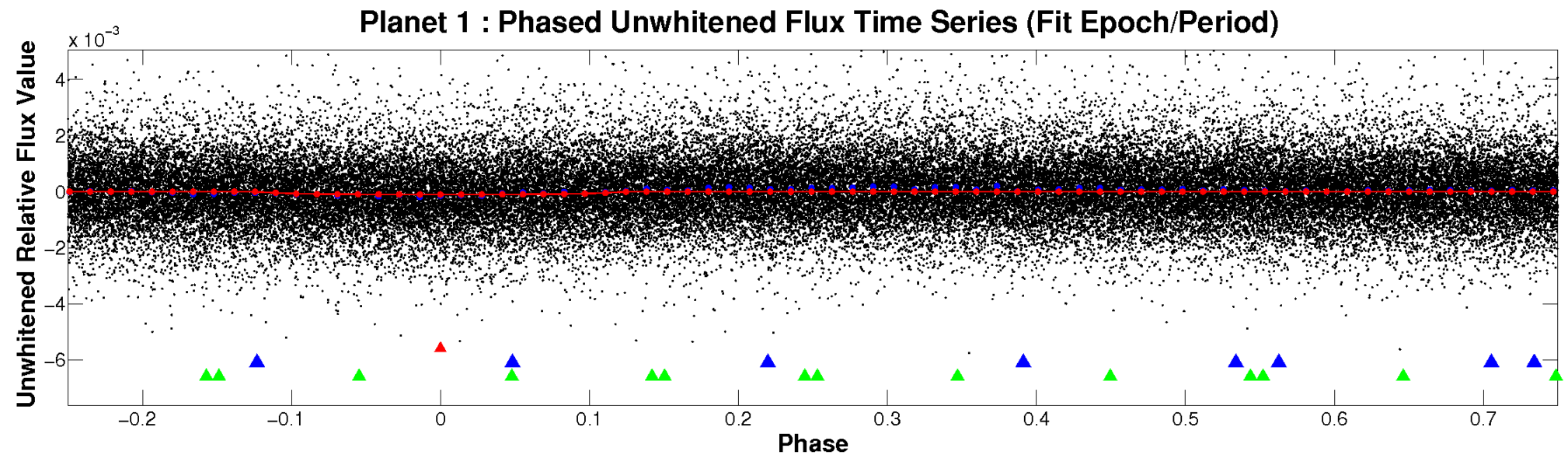


ALT Odd/Even

TCE 009163458-01

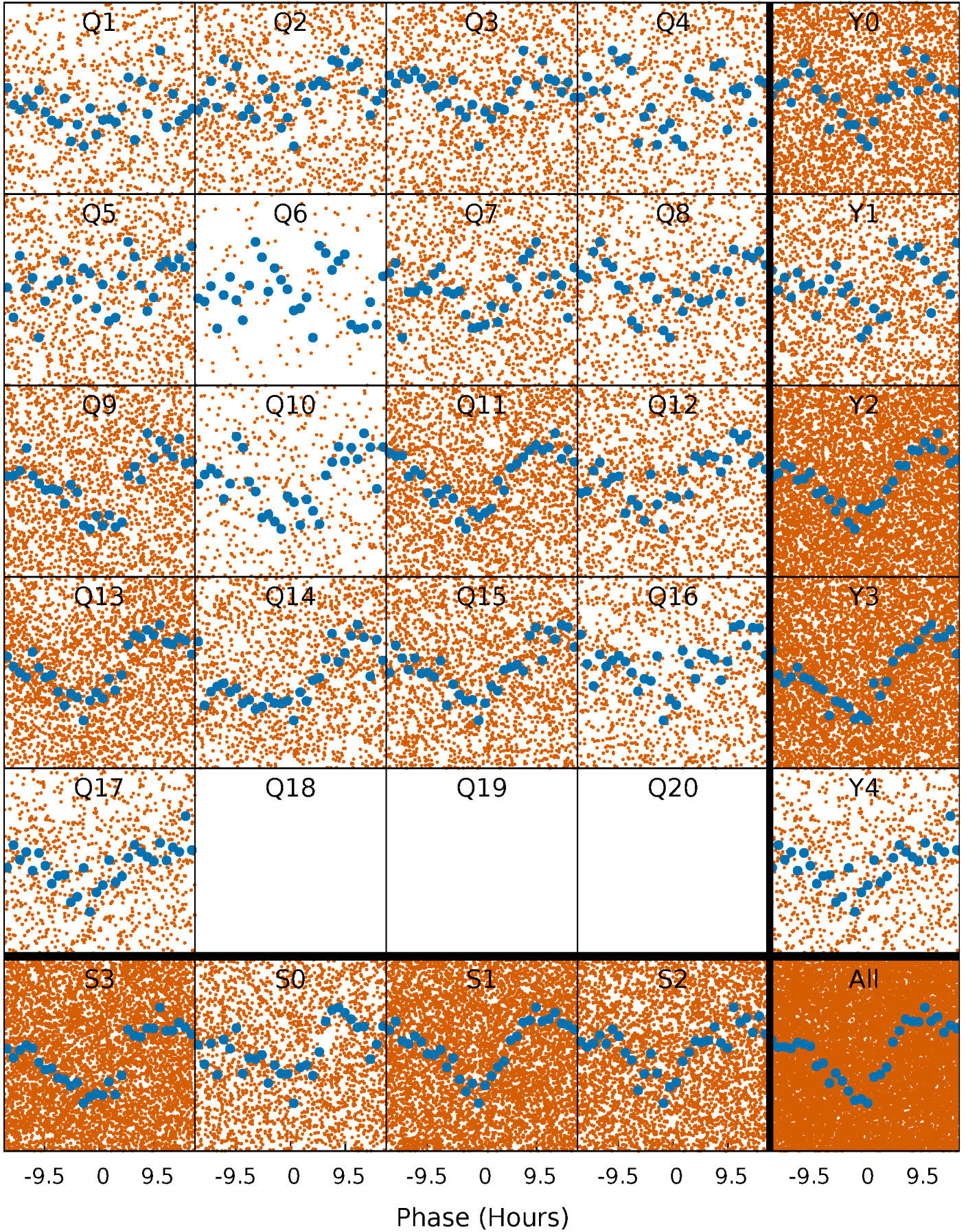


Non-Whitened Vs. Whitened Light Curve



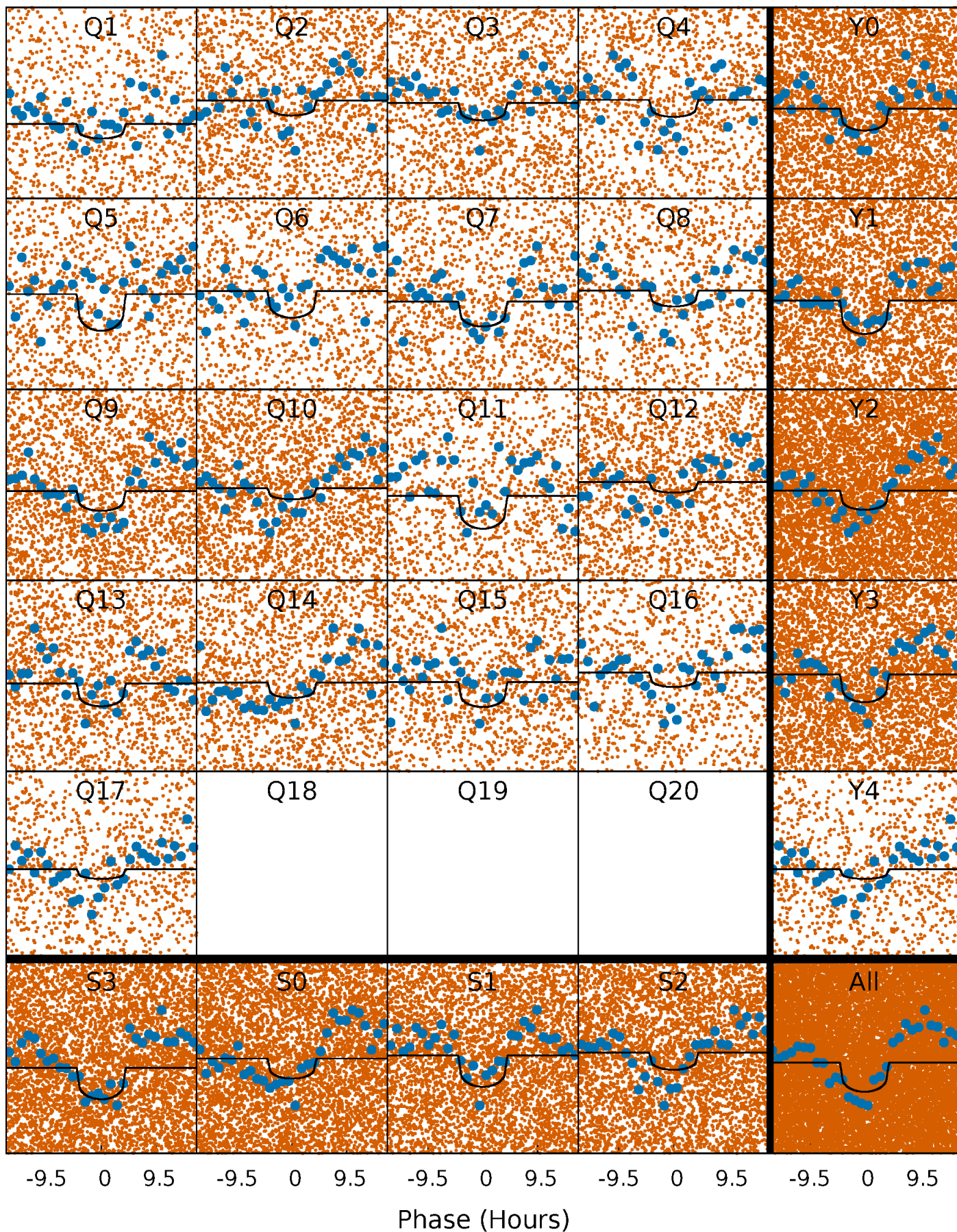
PDC Quarter-Phased Transit Curves

TCE 009163458-01 P= 1.477098 Days $T_0=131.831833$ (BKJD)



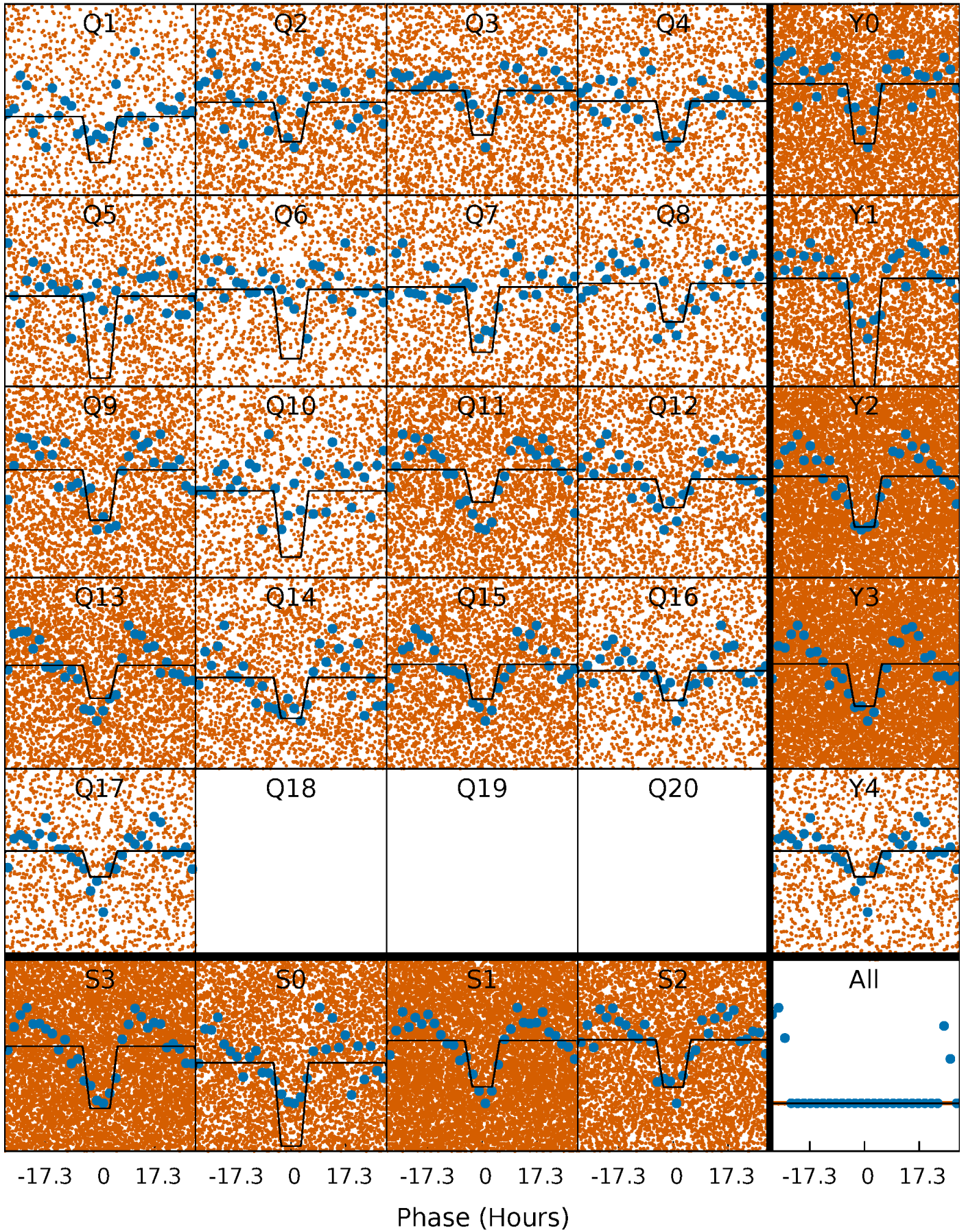
DV Quarter-Phased Transit Curves

TCE 009163458-01 P= 1.477098 Days $T_0=131.831833$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

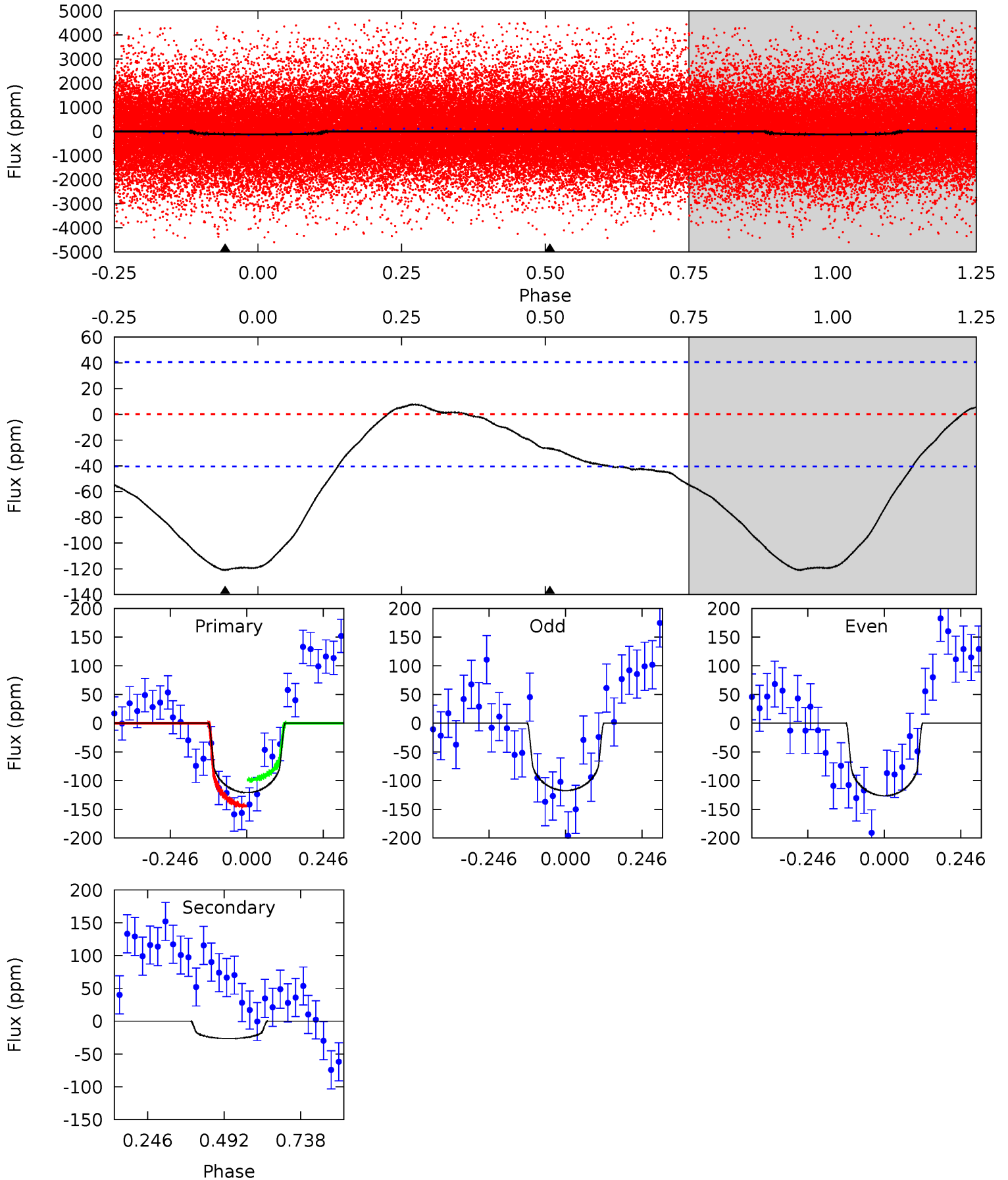
TCE 009163458-01 P= 1.477026 Days $T_0=131.802991$ (BKJD)



DV Model-Shift Uniqueness Test

009163458-01, P = 1.477098 Days, E = 130.354735 Days

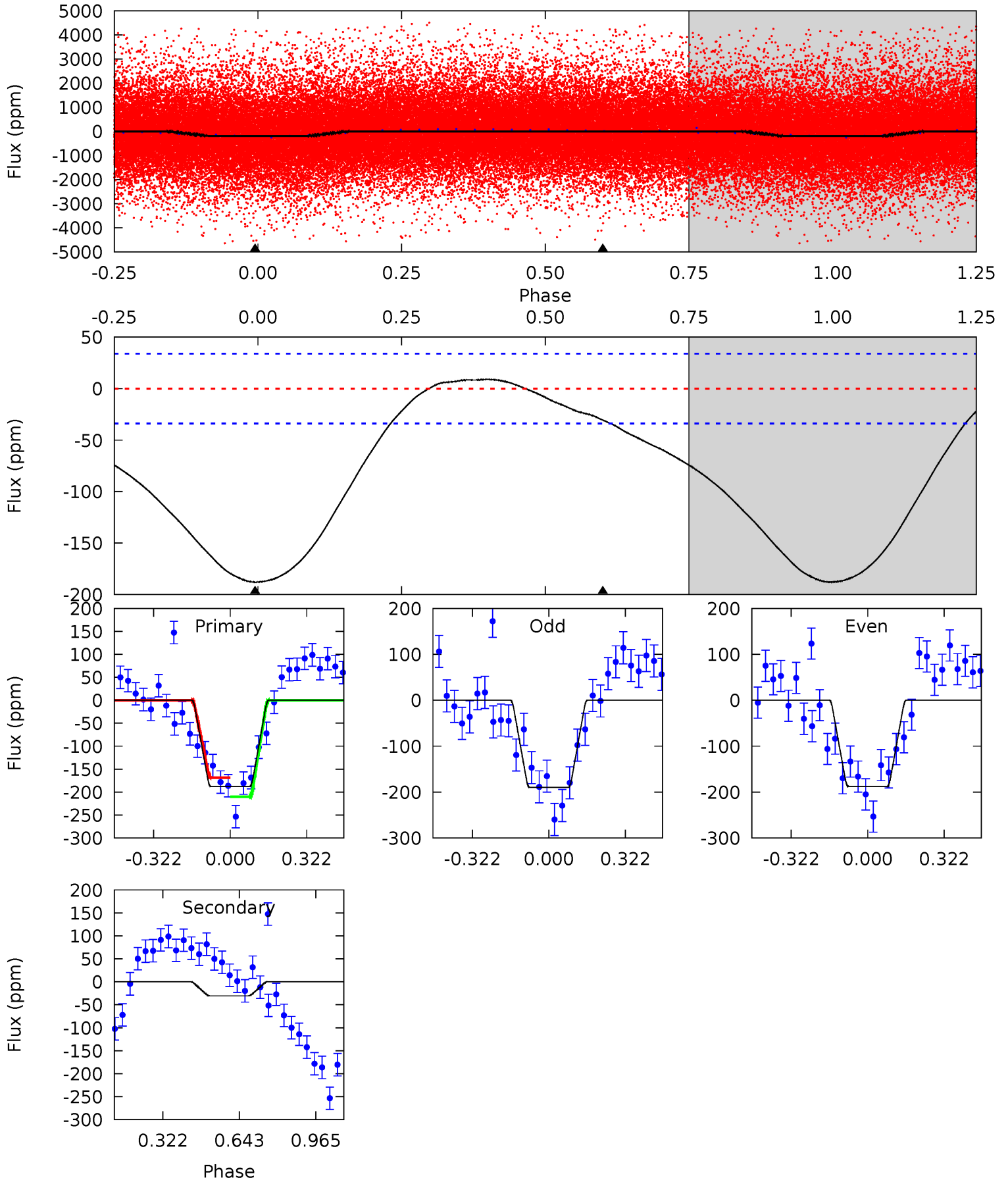
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	2.87	0	0	4.37	1.16	0.97	13.0	13.0	2.87	2.87	0.50	1.18	0.06	2.52



Alt Model-Shift Uniqueness Test

009163458-01, P = 1.477026 Days, E = 130.325965 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.9	3.88	0	0	4.31	0.99	1.20	23.9	23.9	3.88	3.88	0.12	1.04	0.05	2.63



Stellar Parameters For KIC 009163458

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

Secondary Eclipse Parameters for KIC 009163458-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-27 ± 9	$1.25^{+1.02}_{-0.77}$	2234^{+109}_{-105}	4113^{+2189}_{-887}	$5.824^{+37.242}_{-4.232}$
Alt.	-31 ± 8	$1.64^{+1.03}_{-0.92}$	2237^{+105}_{-99}	3802^{+1558}_{-645}	$3.963^{+16.615}_{-2.508}$

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 $A_{obs} \gg 1.0$

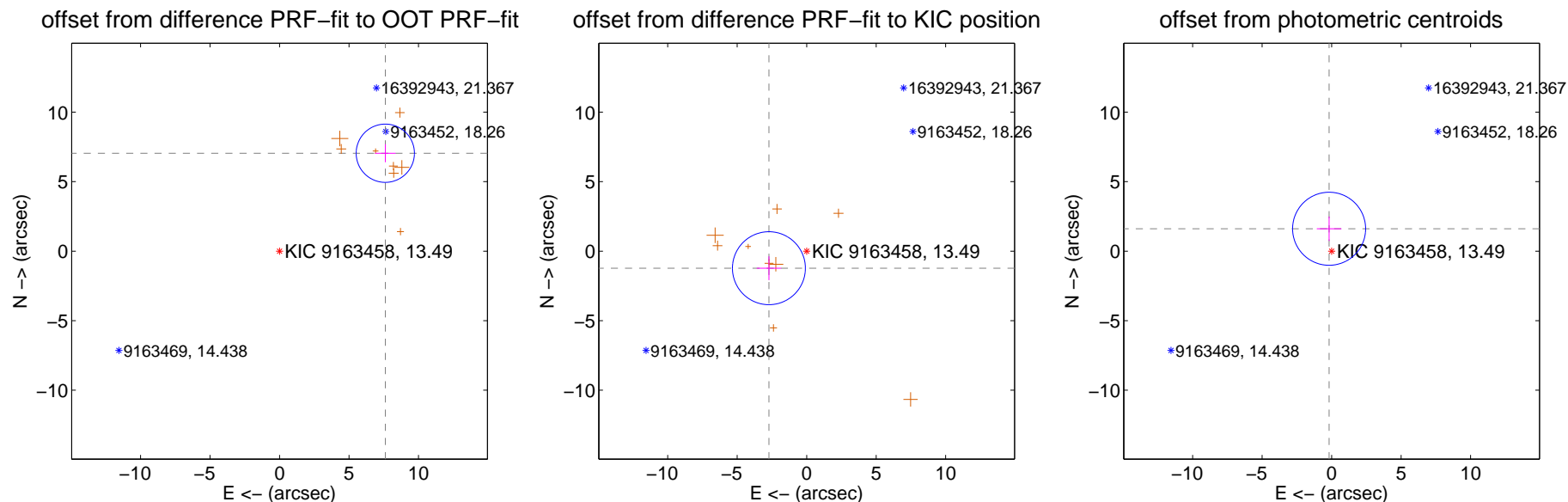
DV Centroid Data

Supplemental centroid analysis for 009163458-01. Kepler magnitude: 13.49. Transit SNR 8.98

There are 0 quarters with good PRF difference image offsets

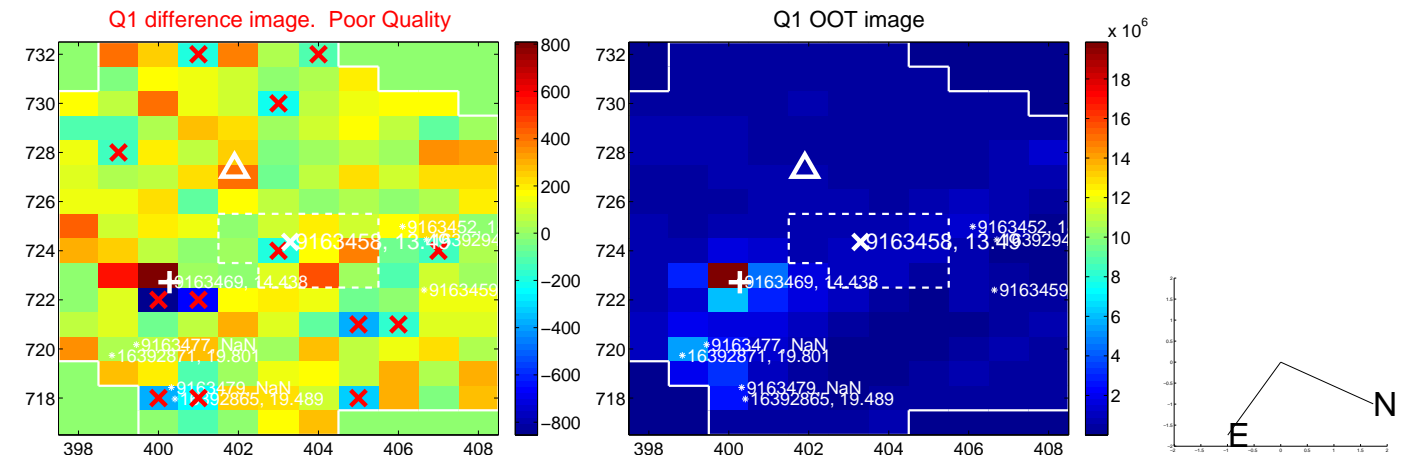
The OOT PRF centroid is offset from the target star catalog position by about 12.83 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	10.371 ± 0.699	14.84	-7.612 ± 0.740	7.044 ± 0.647
PRF-fit source offset from KIC position	2.981 ± 0.875	3.41	2.717 ± 0.879	-1.226 ± 0.856
photometric centroid source offset	1.62 ± 0.88	1.85	0.18 ± 0.88	1.61 ± 0.88

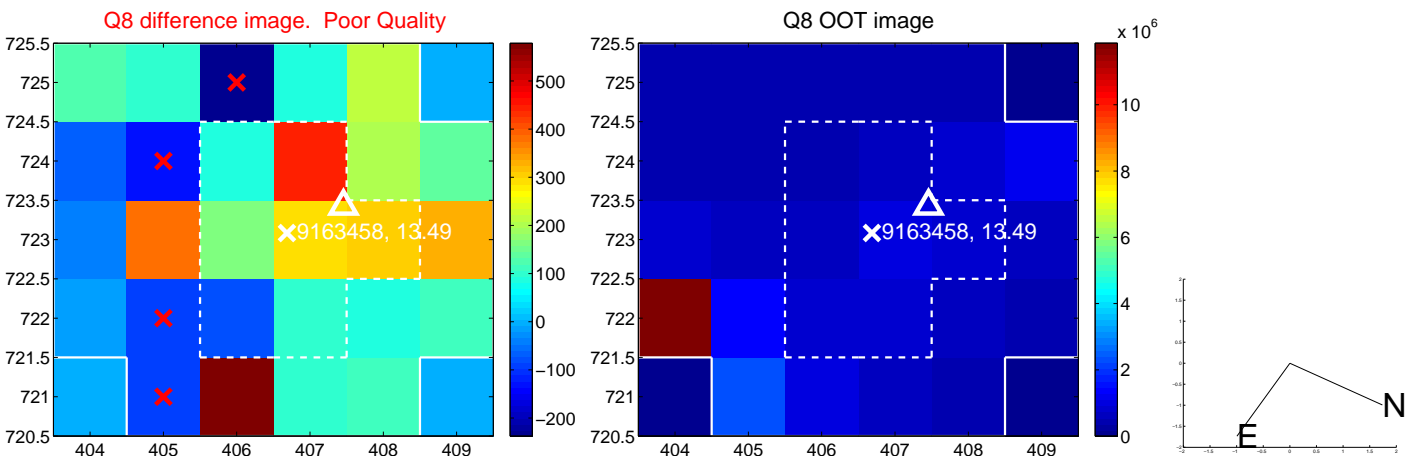
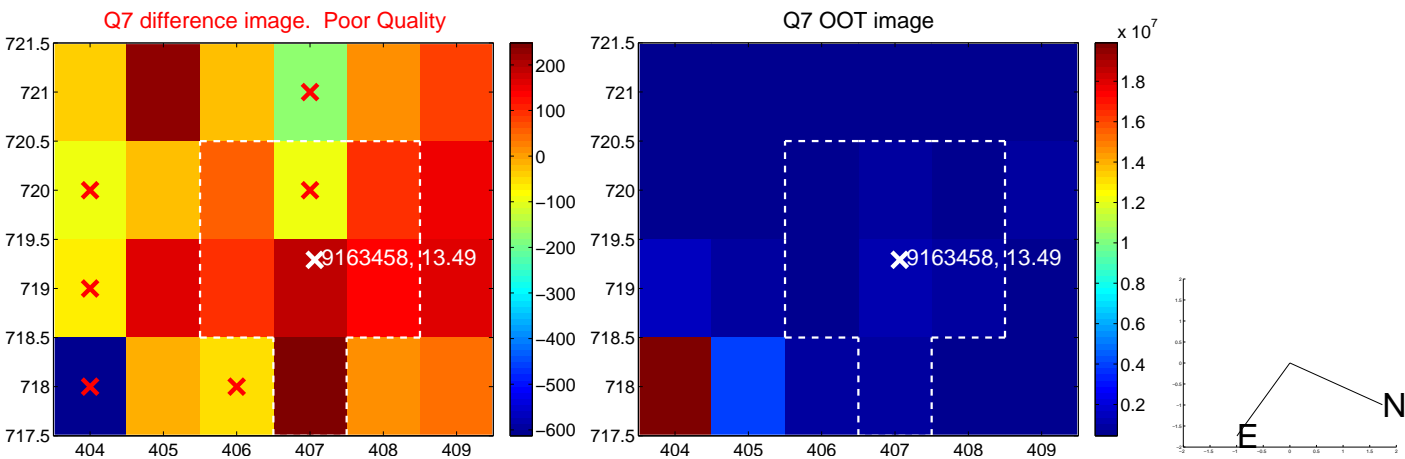
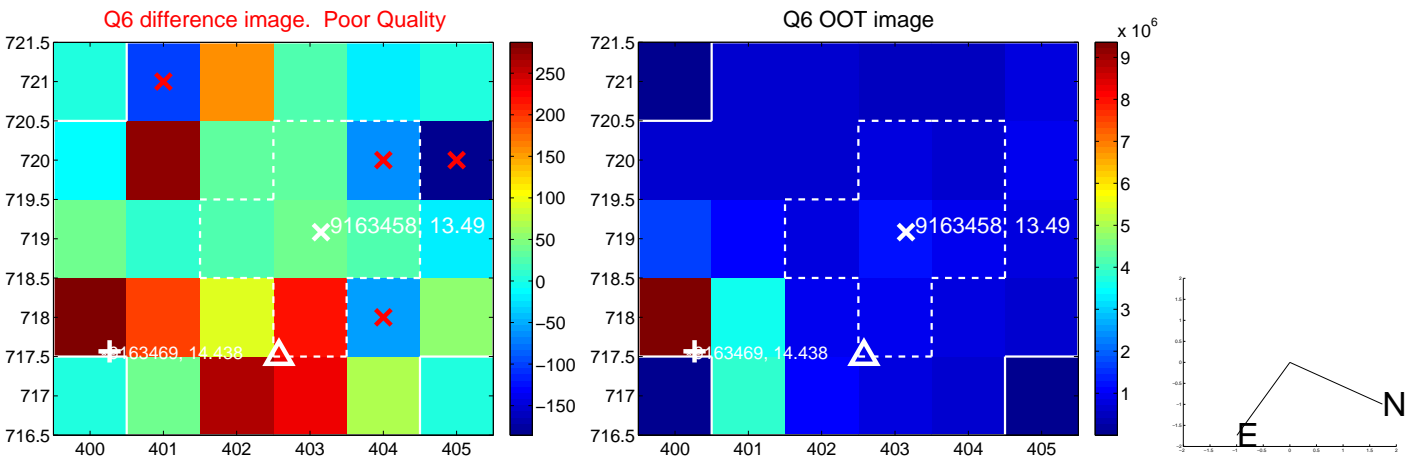
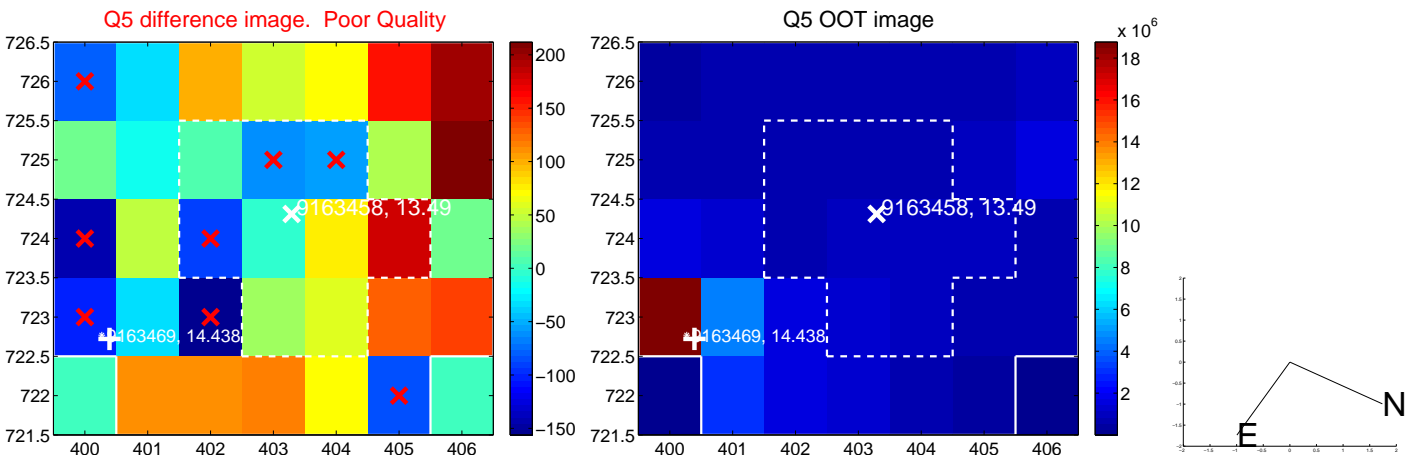


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

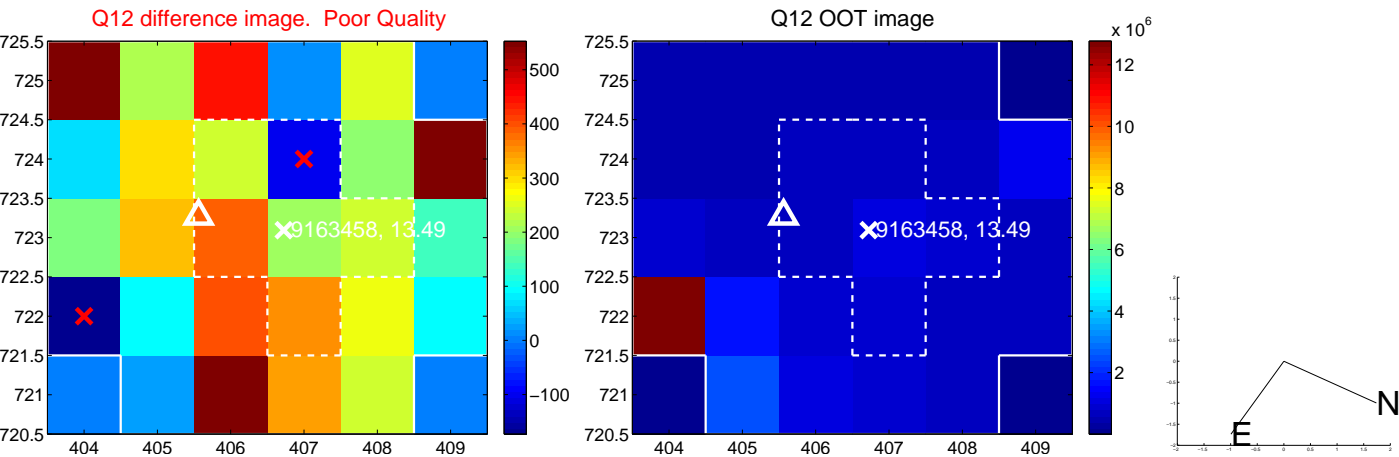
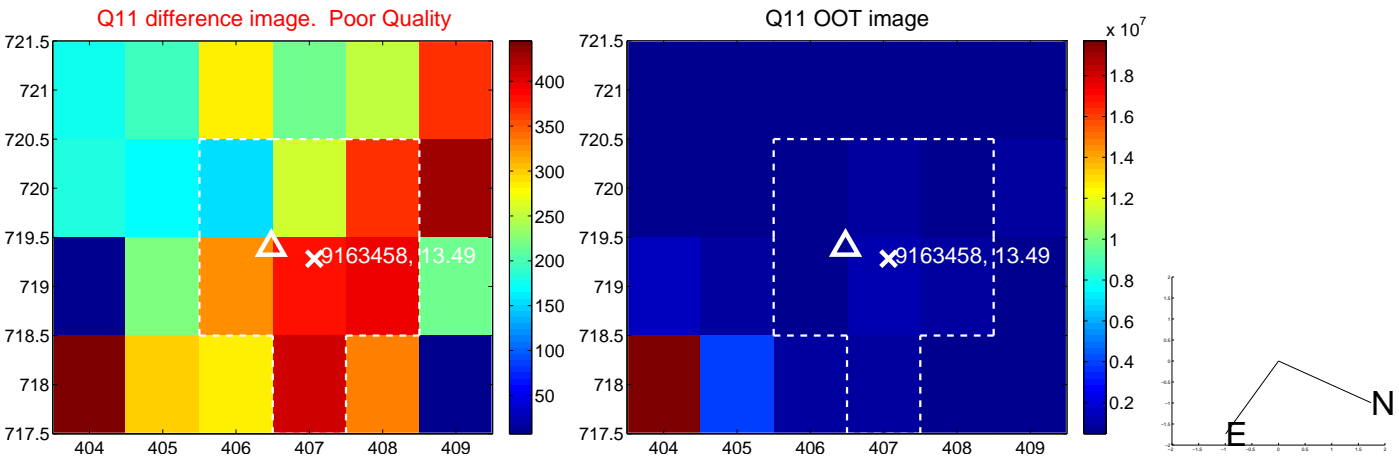
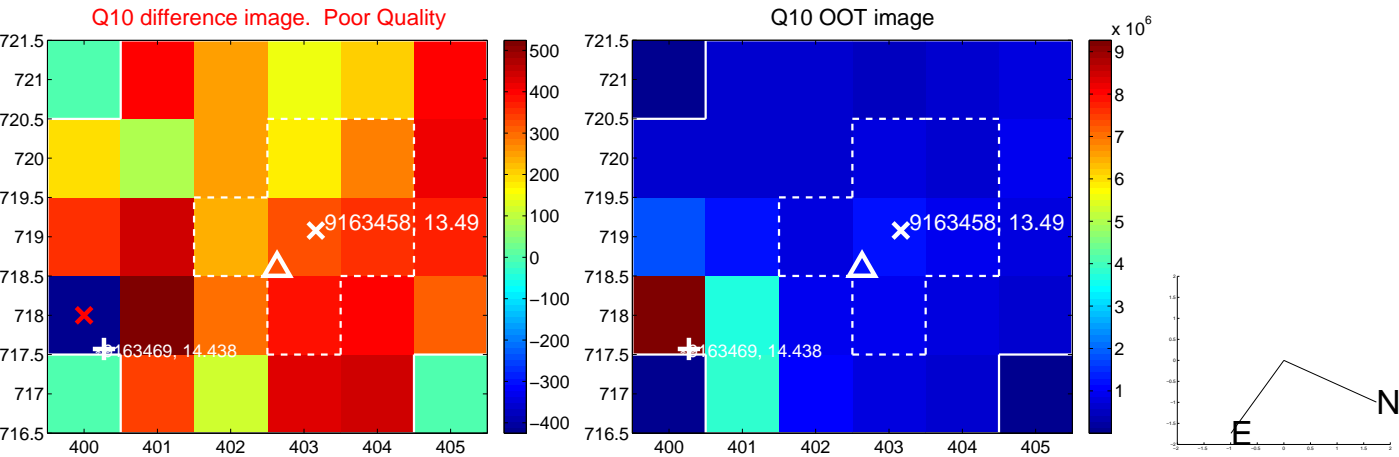
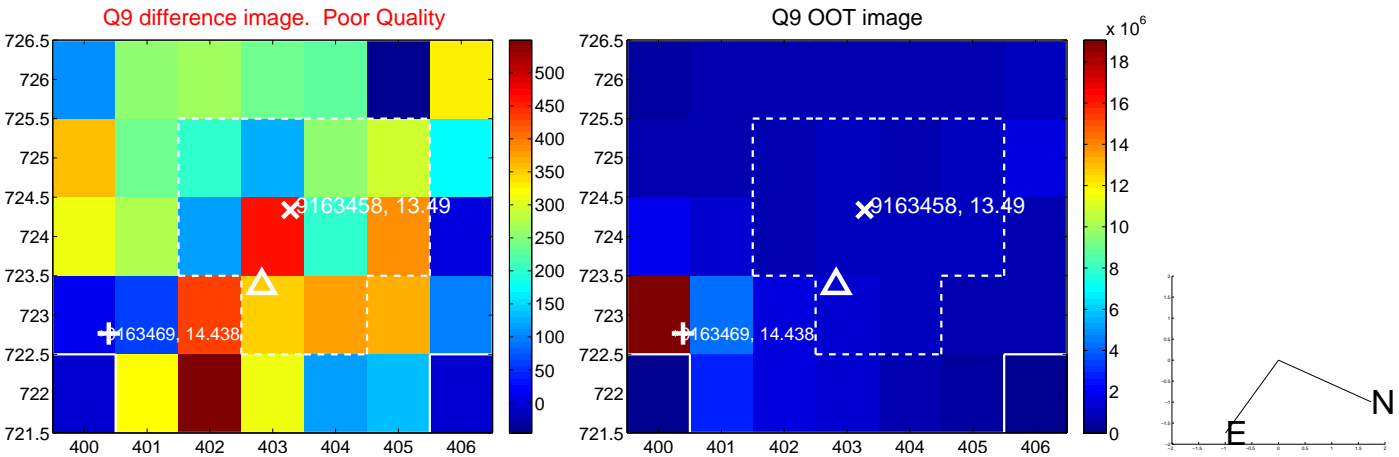
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



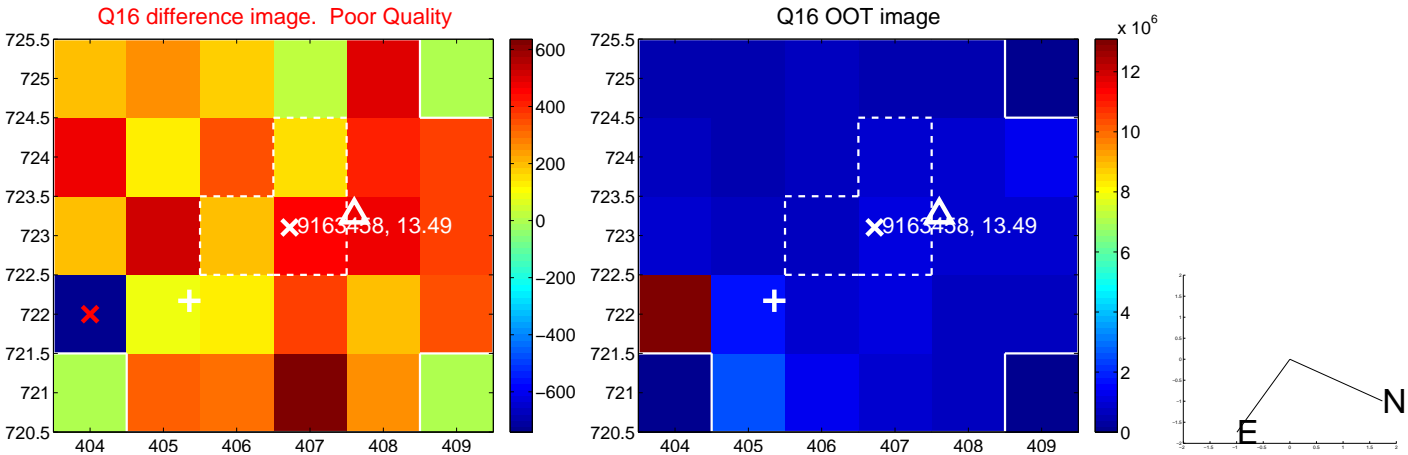
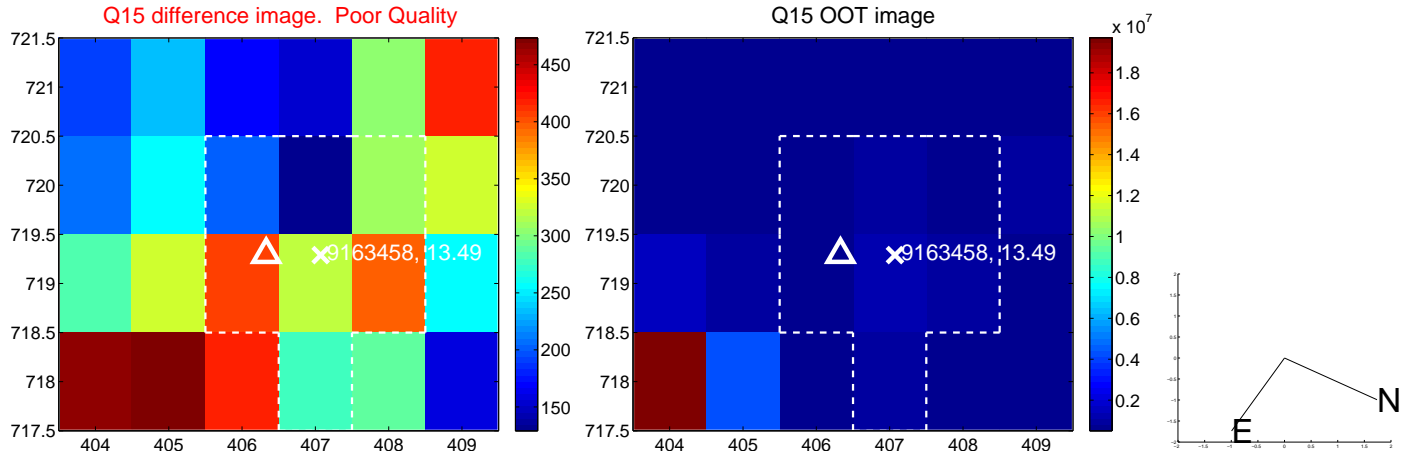
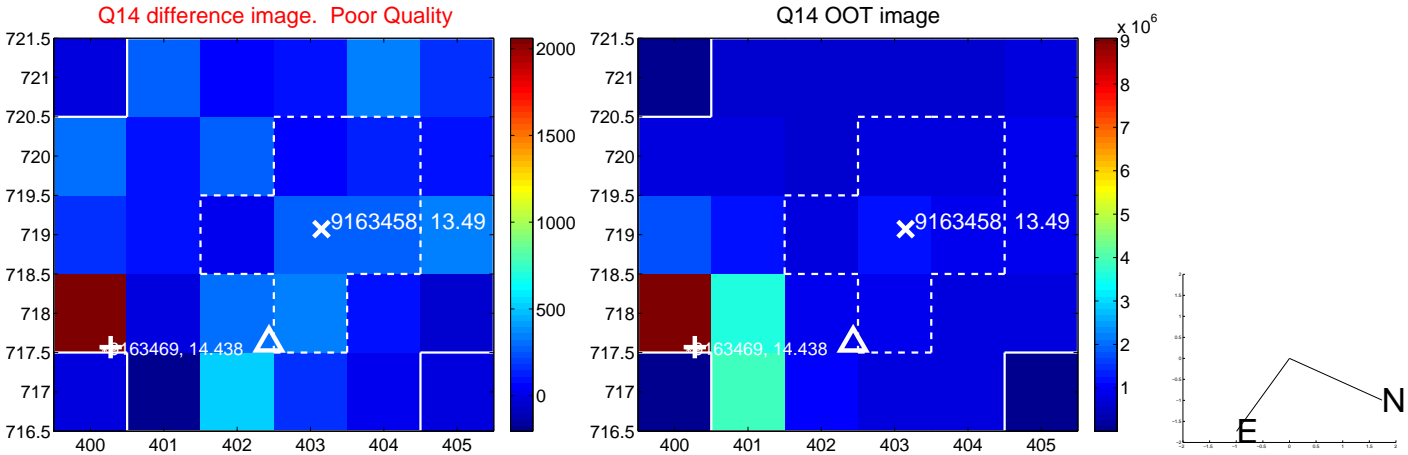
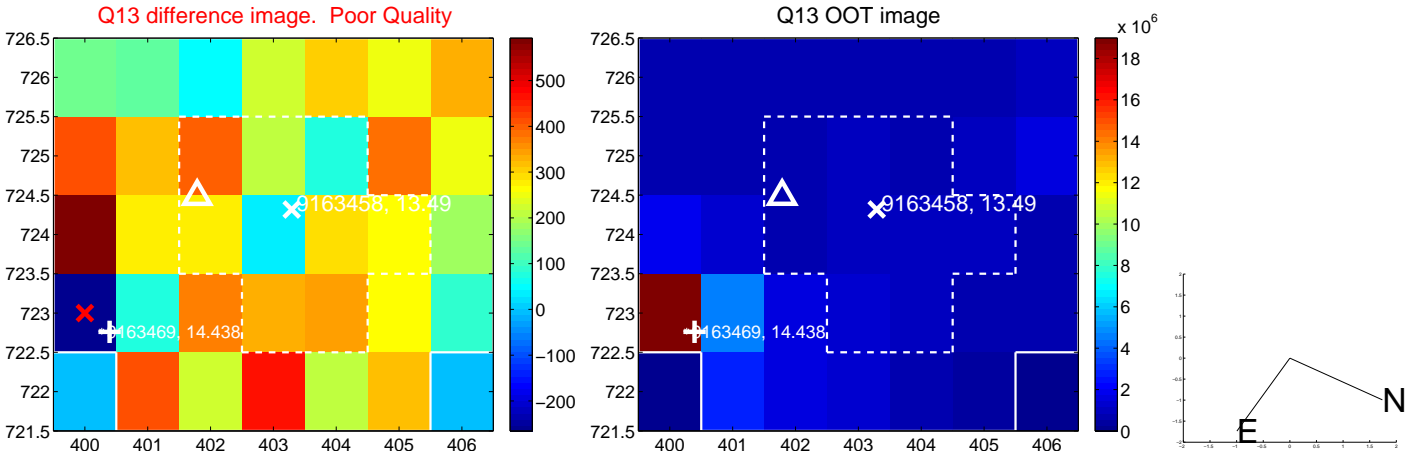
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



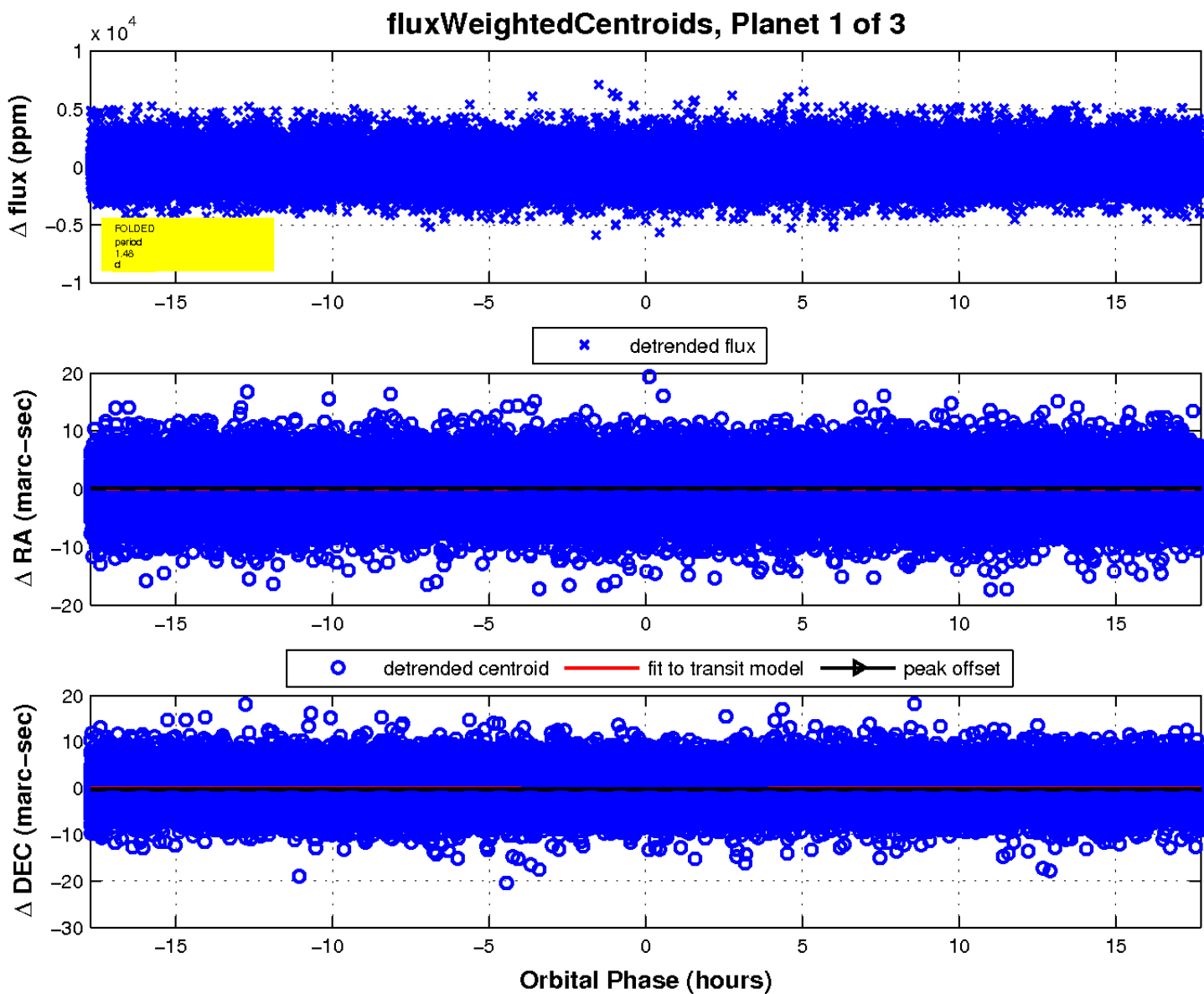
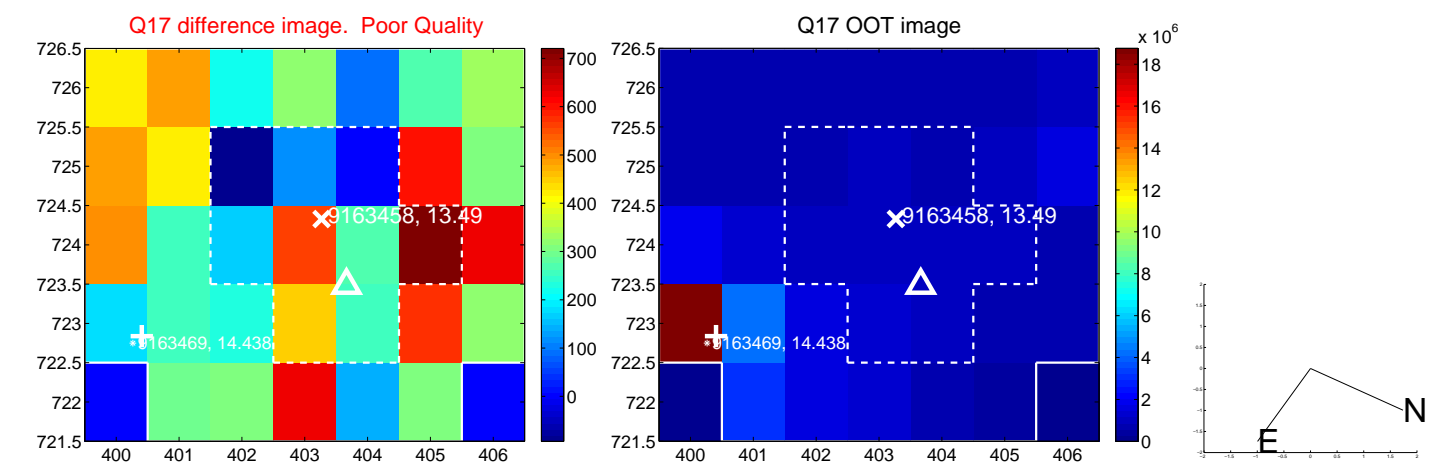
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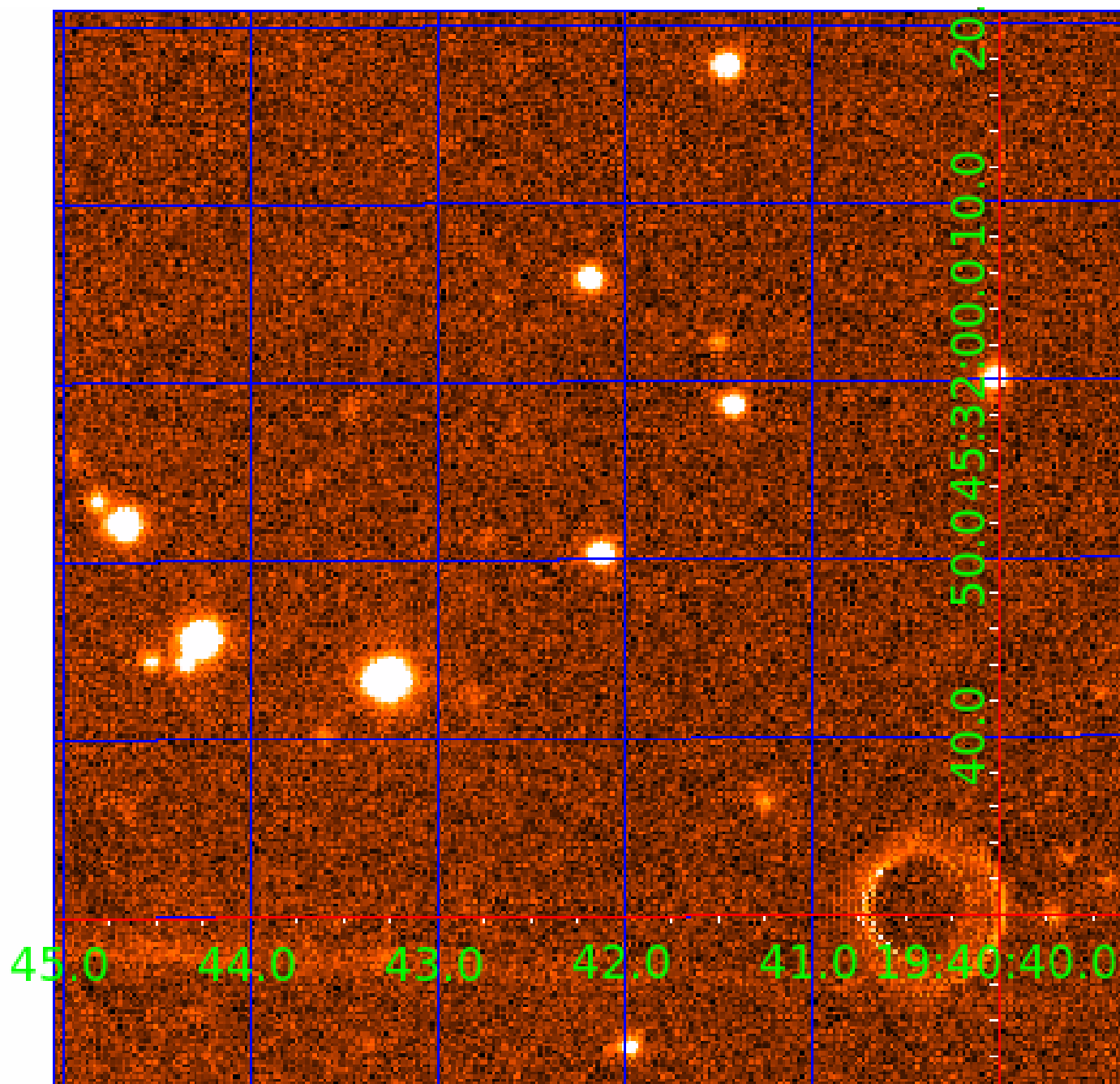


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009163458

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})
009163458-01	OBS	No	1.477098	131.831833	100.5	8.280	8.9	9.0	1.00	5780	1.08	1551.41
009163458-02	OBS	No	194.723714	181.660538	1487.9	13.393	9.7	8.0	1.00	5780	3.93	2.31
009163458-03	OBS	No	98.523709	219.190406	1846.0	3.340	7.9	8.7	1.00	5780	7.06	5.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009163458-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
009163458-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009163458-03	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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

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

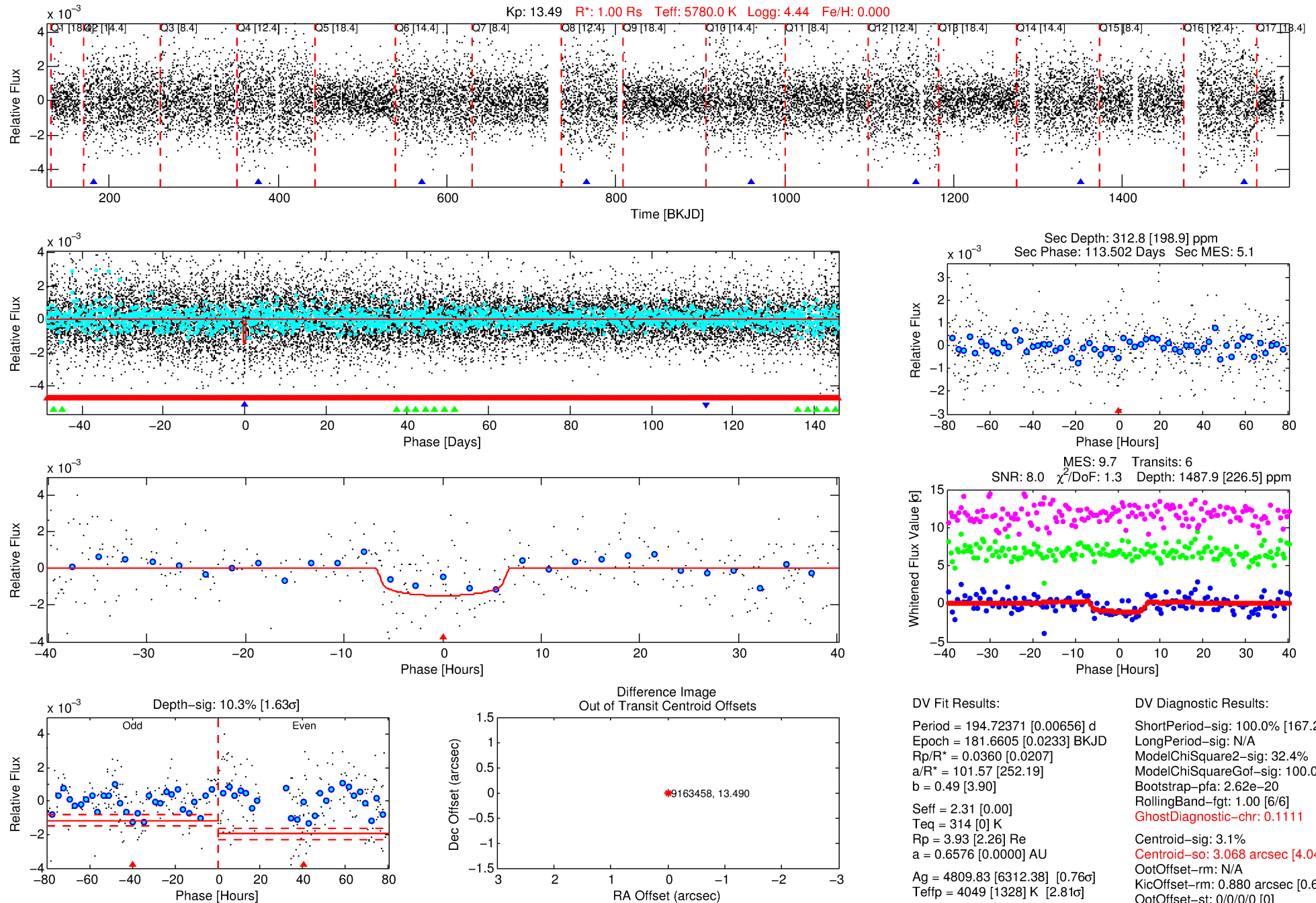
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009163458-02

No Significant Match Found

DV One-Page Summary

KIC: 9163458 Candidate: 2 of 3 Period: 194.724 d



DV Fit Results:

Period = 194.72371 [0.00656] d
Epoch = 181.6605 [0.0233] BKJD
 R_p/R^* = 0.0360 [0.0207]
 a/R^* = 101.57 [252.19]
 b = 0.49 [3.90]
 S_{eff} = 2.31 [0.00]
 T_{eq} = 314 [0] K
 R_p = 3.93 [2.26] R_{e}
 a = 0.6576 [0.0000] AU
 A_g = 4809.83 [6312.38] [0.76 σ]
 T_{effp} = 4049 [1328] K [2.81 σ]

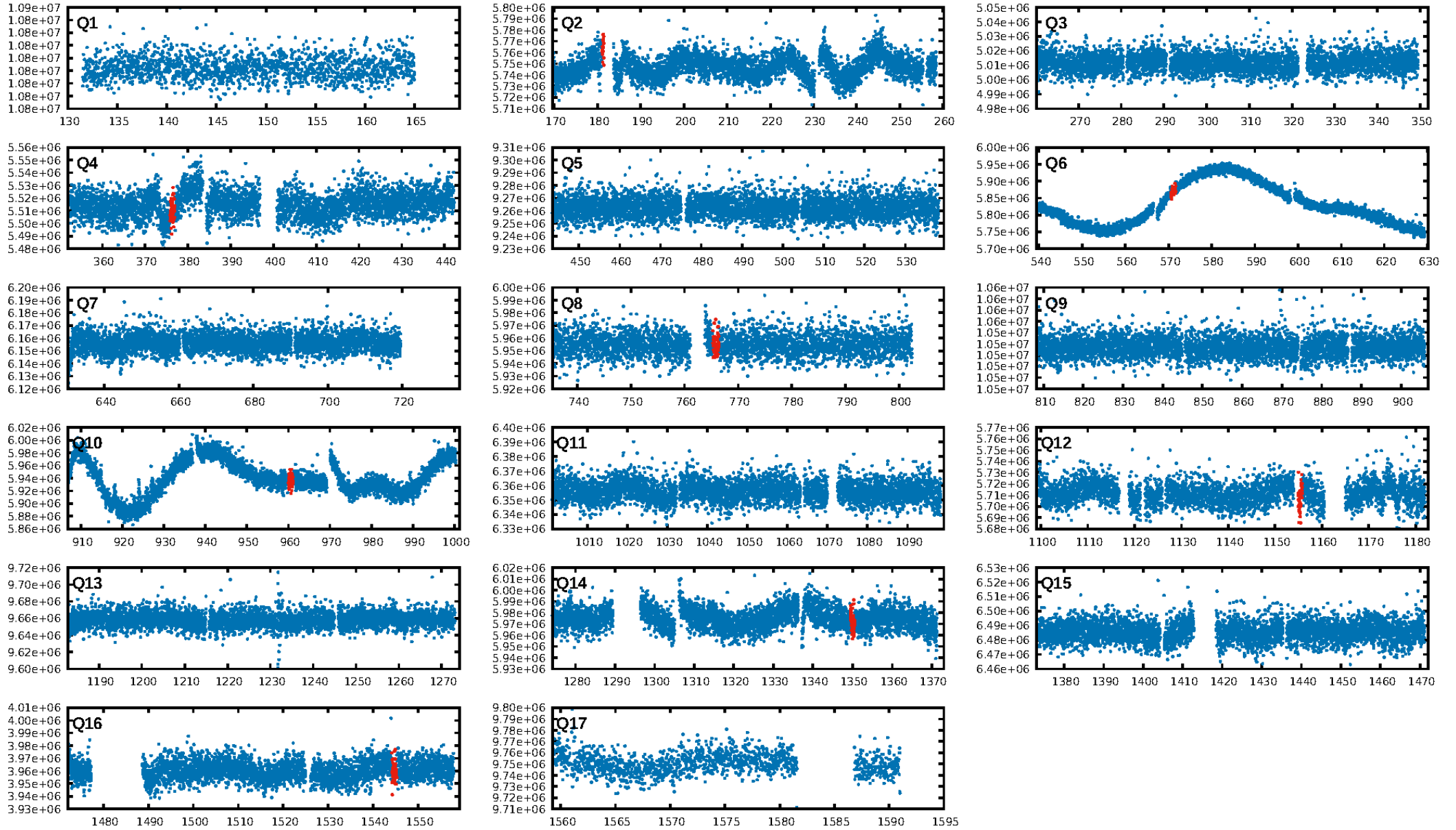
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [167.27 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 32.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.62e-20
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 0.1111
Centroid-sig: 3.1%
Centroid-so: 3.068 arcsec [4.04 σ]
OotOffset-rm: N/A
KicOffset-rm: 0.880 arcsec [0.66 σ]
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/2/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 0.00 [0/6]

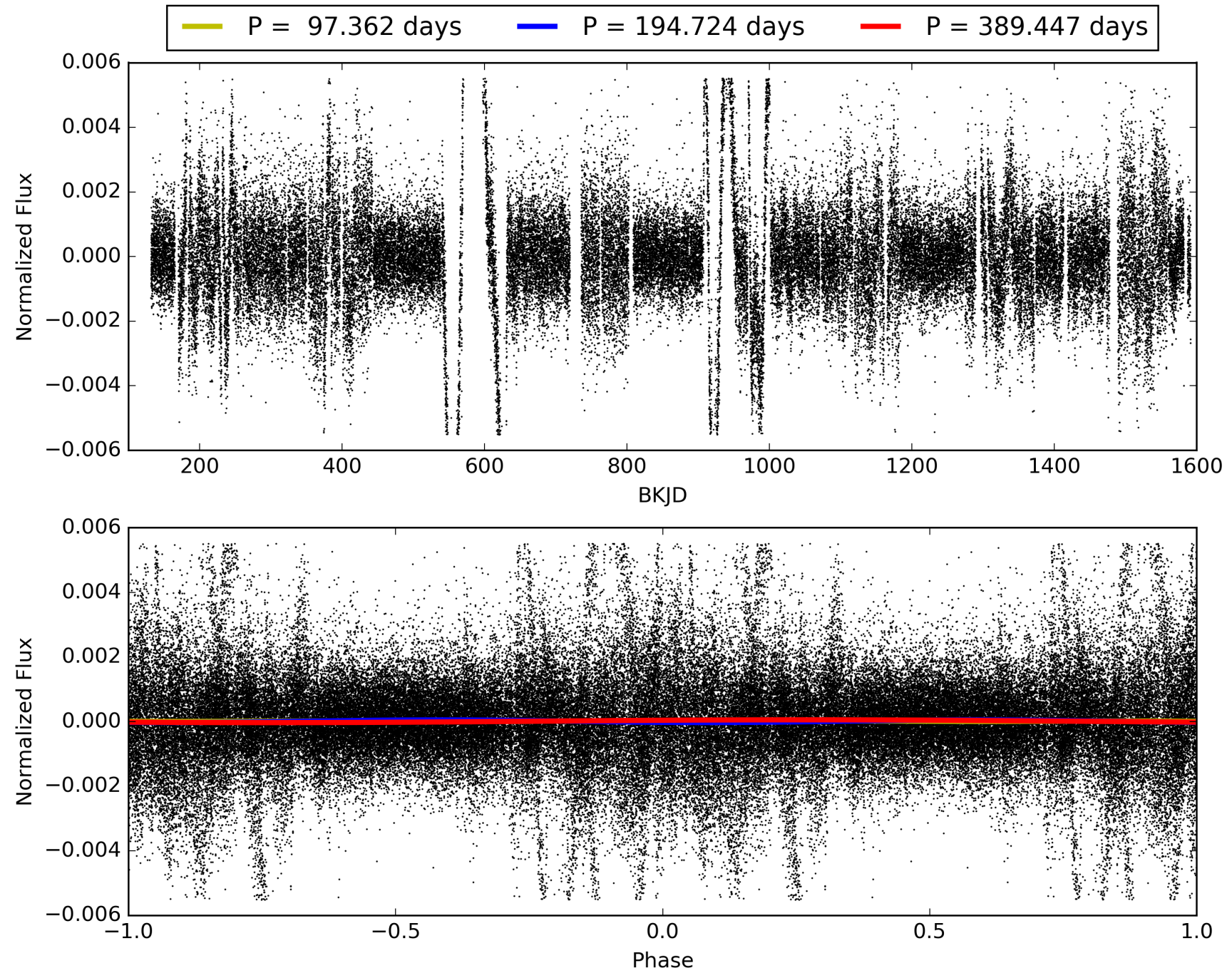
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 11:48:34 Z

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

TCE 009163458-02, PDC Light Curves

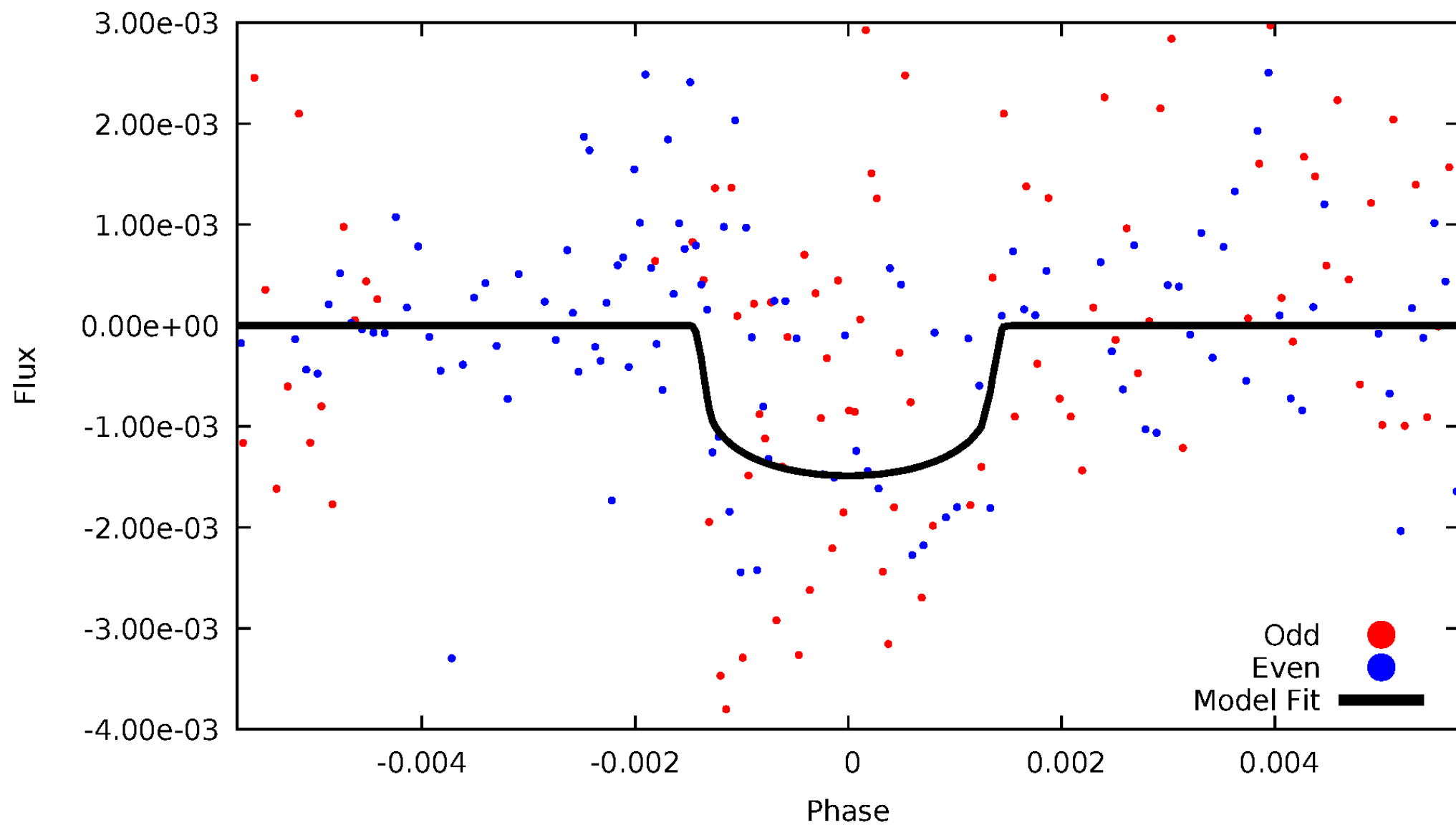


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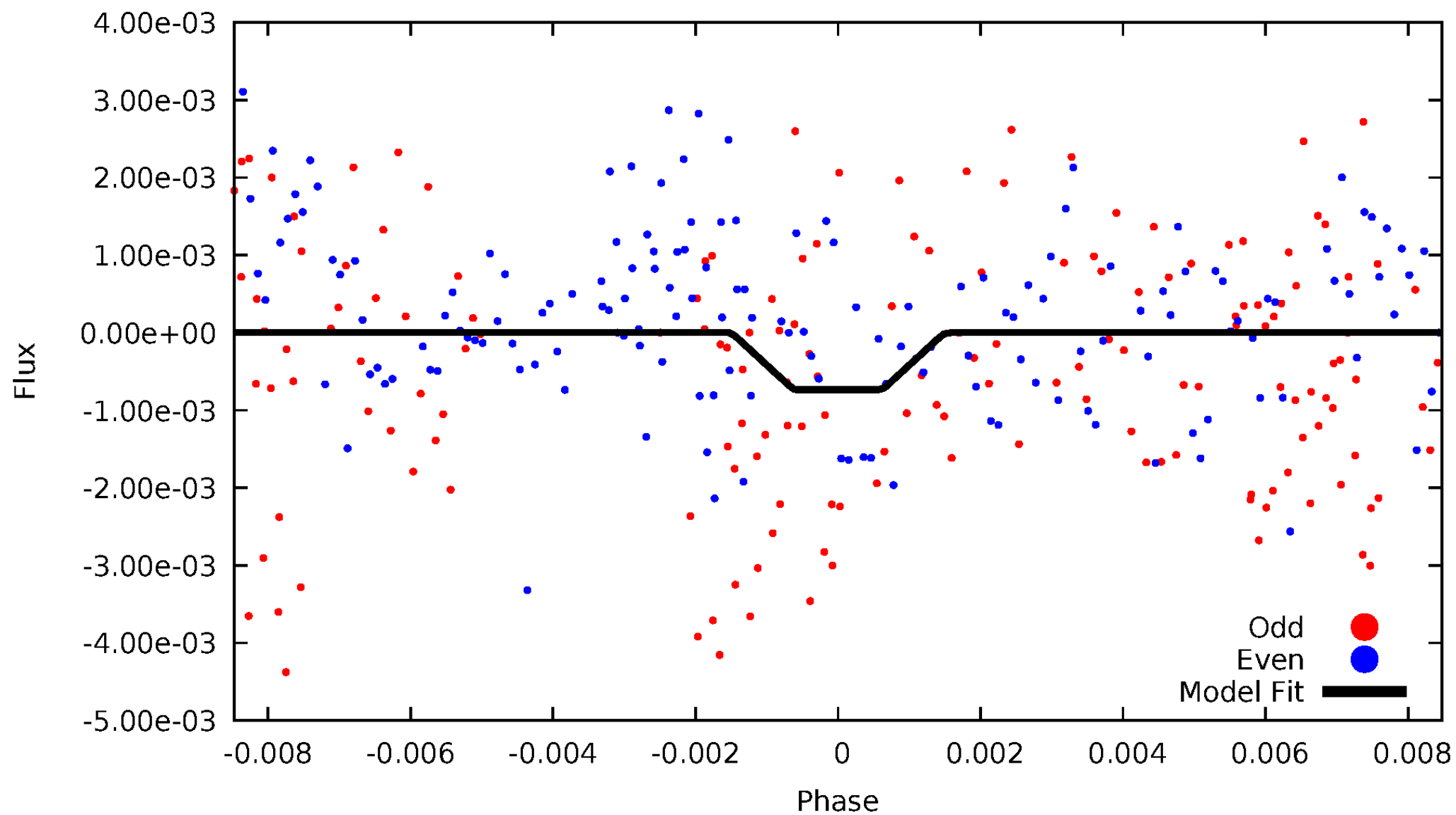
DV Odd/Even

TCE 009163458-02



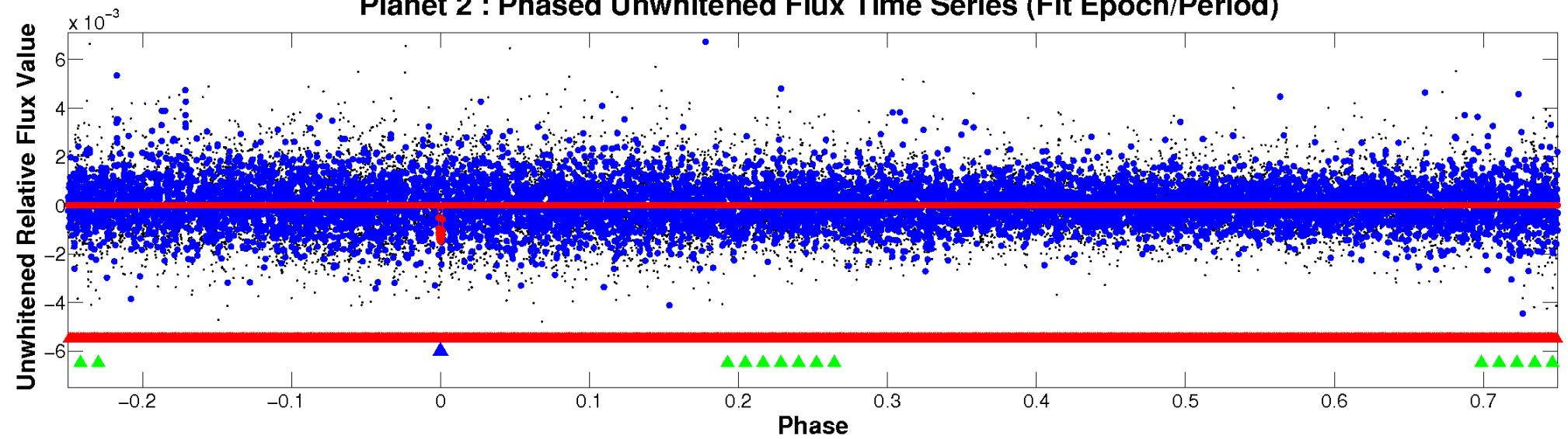
ALT Odd/Even

TCE 009163458-02

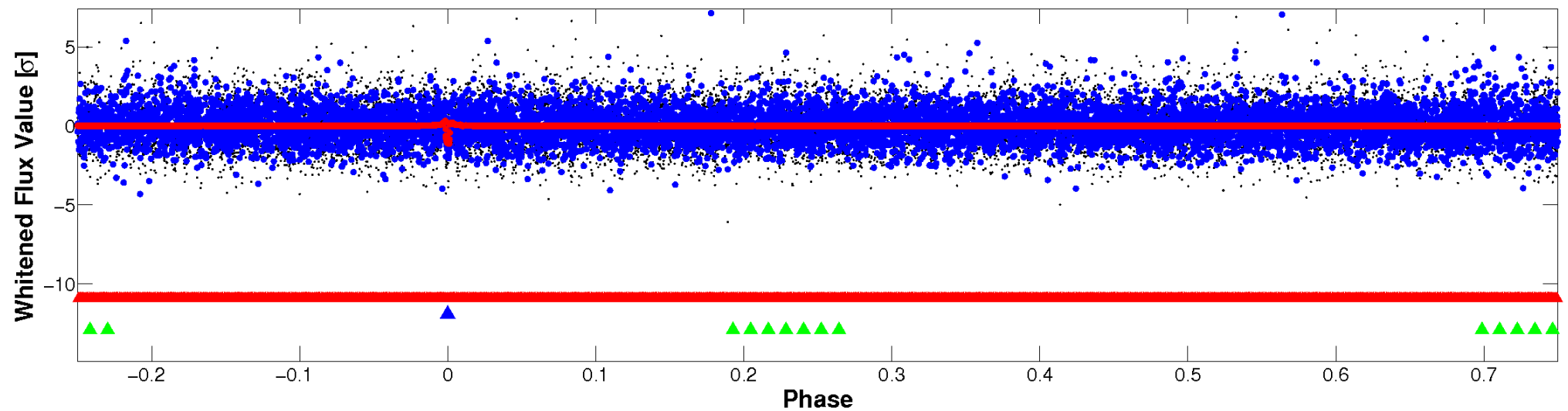


Non-Whitened Vs. Whitened Light Curve

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

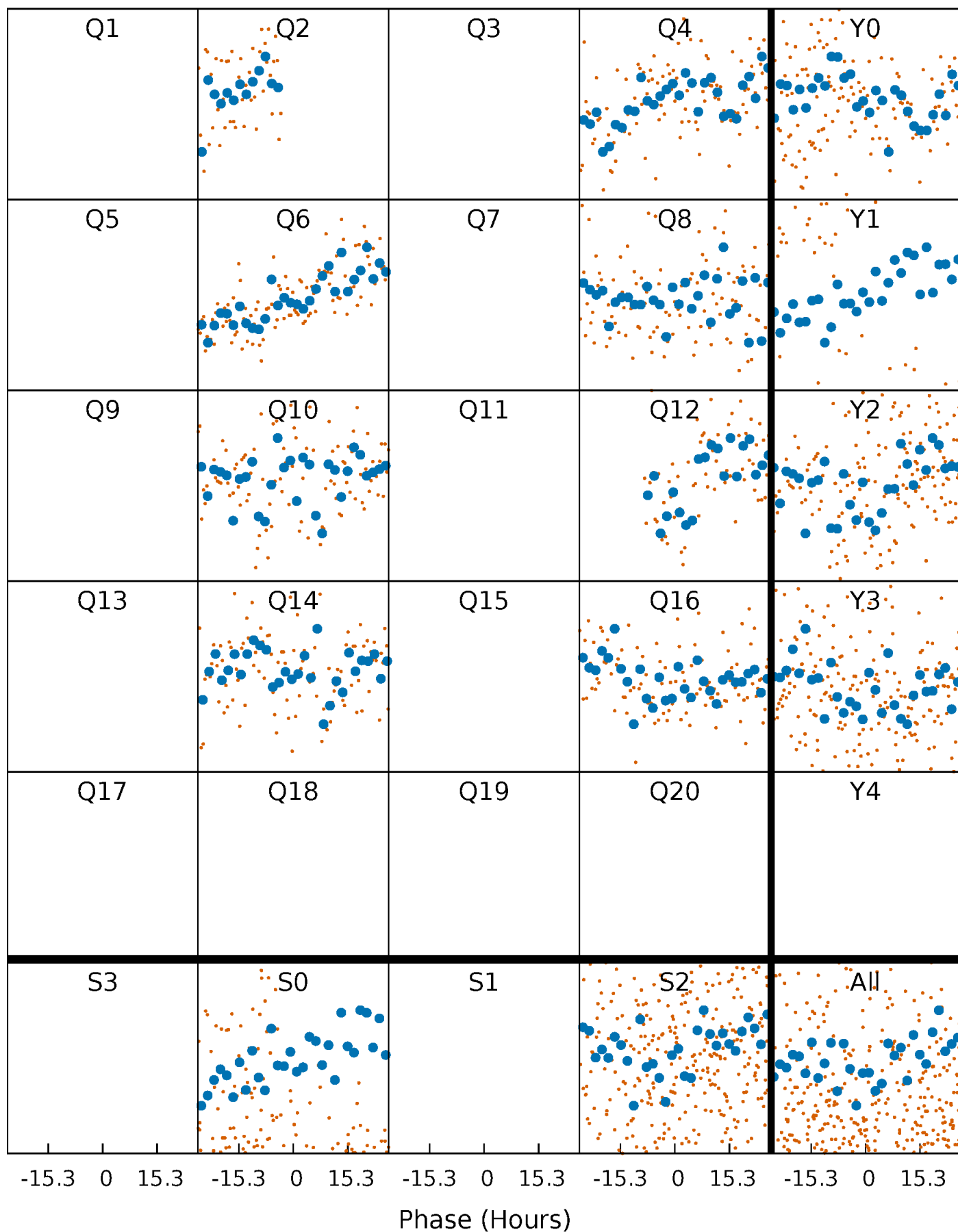


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



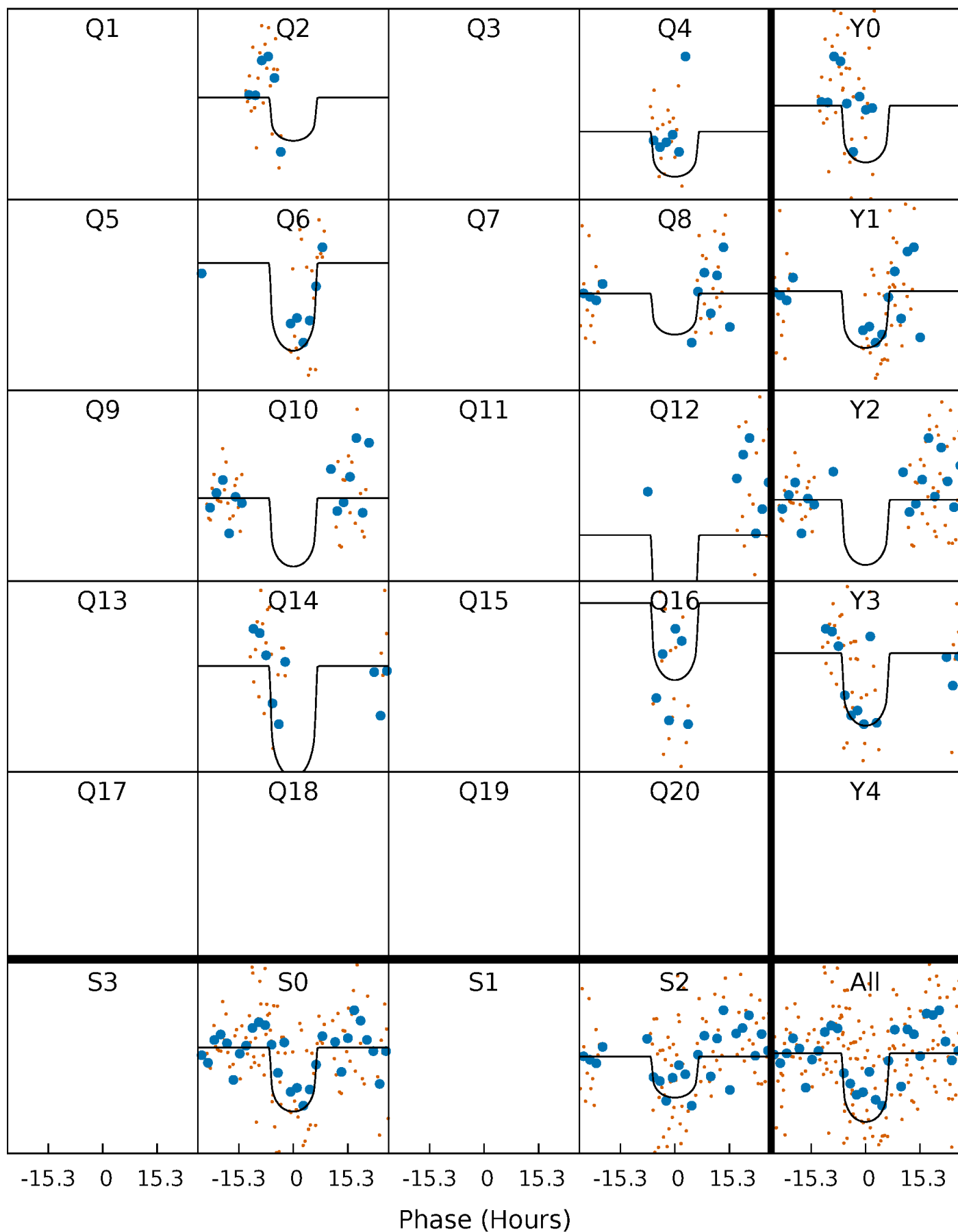
PDC Quarter-Phased Transit Curves

TCE 009163458-02 P=194.723714 Days $T_0=181.660538$ (BKJD)



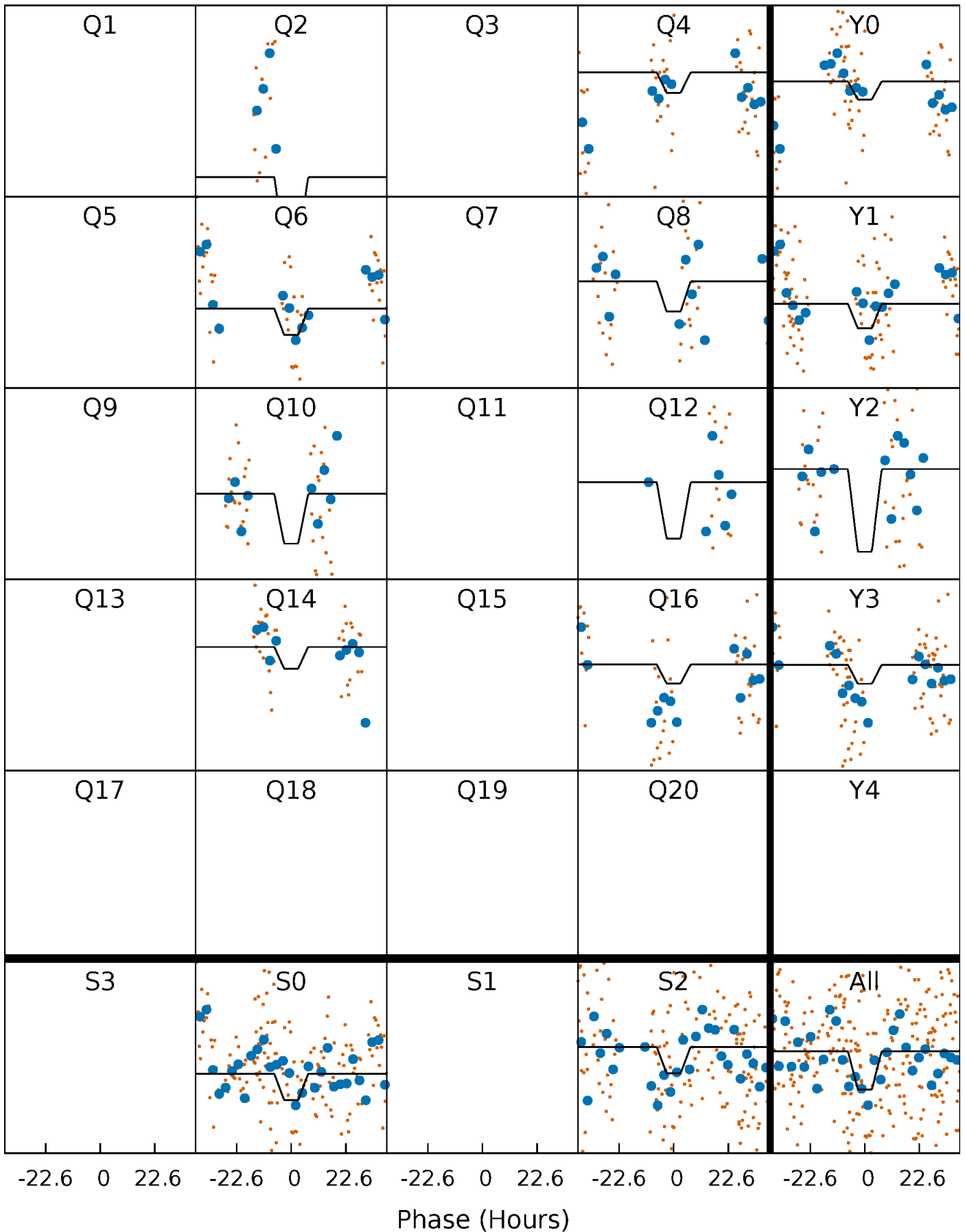
DV Quarter-Phased Transit Curves

TCE 009163458-02 P=194.723714 Days $T_0=181.660538$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

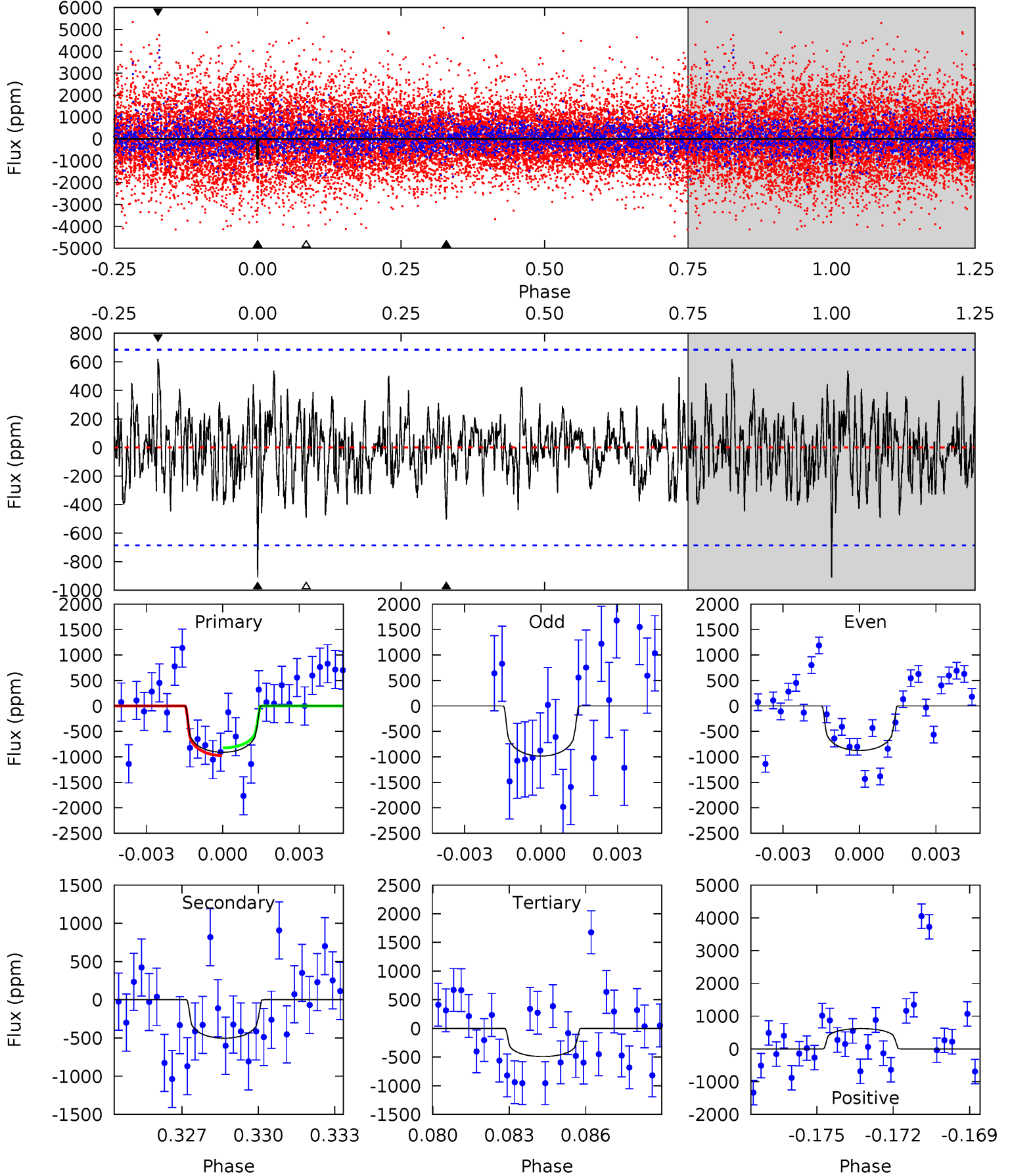
TCE 009163458-02 P=194.731827 Days $T_0=181.752688$ (BKJD)



DV Model-Shift Uniqueness Test

009163458-02, P = 194.723714 Days, E = 181.660538 Days

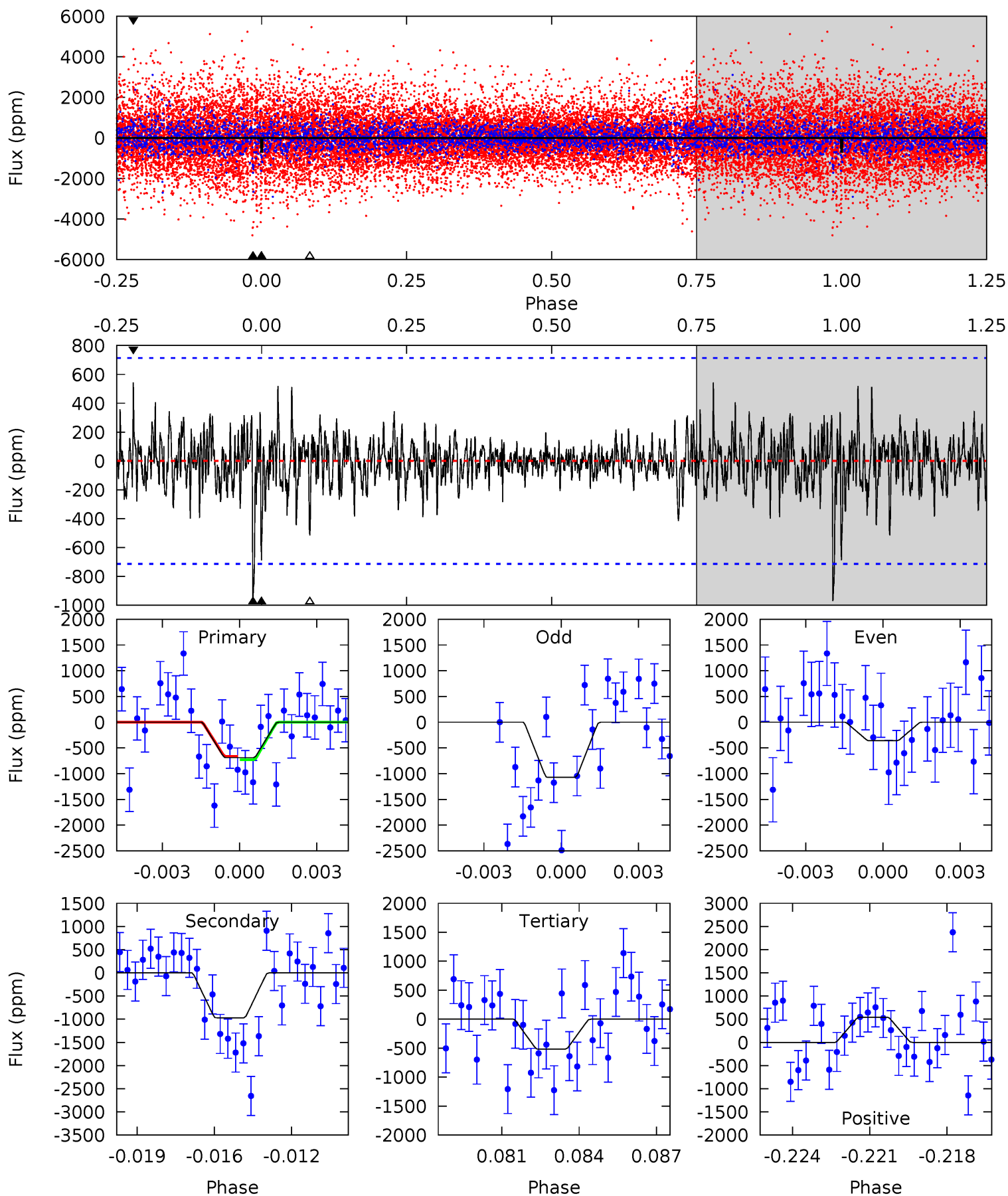
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.98	3.86	3.76	4.75	5.25	2.97	1.31	3.22	2.23	0.10	-0.89	0.42	1.00	0.41	0.58



Alt Model-Shift Uniqueness Test

009163458-02, P = 194.731827 Days, E = 181.752688 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.06	7.13	3.79	4.00	5.25	2.96	0.96	1.27	1.06	3.34	3.13	2.57	1.81	0.36	0.24



Stellar Parameters For KIC 009163458

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

Secondary Eclipse Parameters for KIC 009163458-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-503 ± 130	$3.91^{+2.25}_{-1.96}$	439^{+20}_{-20}	4668^{+1797}_{-763}	7683^{+24682}_{-4799}
Alt.	-969 ± 136	$3.20^{+2.15}_{-1.82}$	439^{+22}_{-22}	5947^{+3730}_{-1211}	$22264^{+103657}_{-14348}$

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 $A_{obs} \gg 1.0$

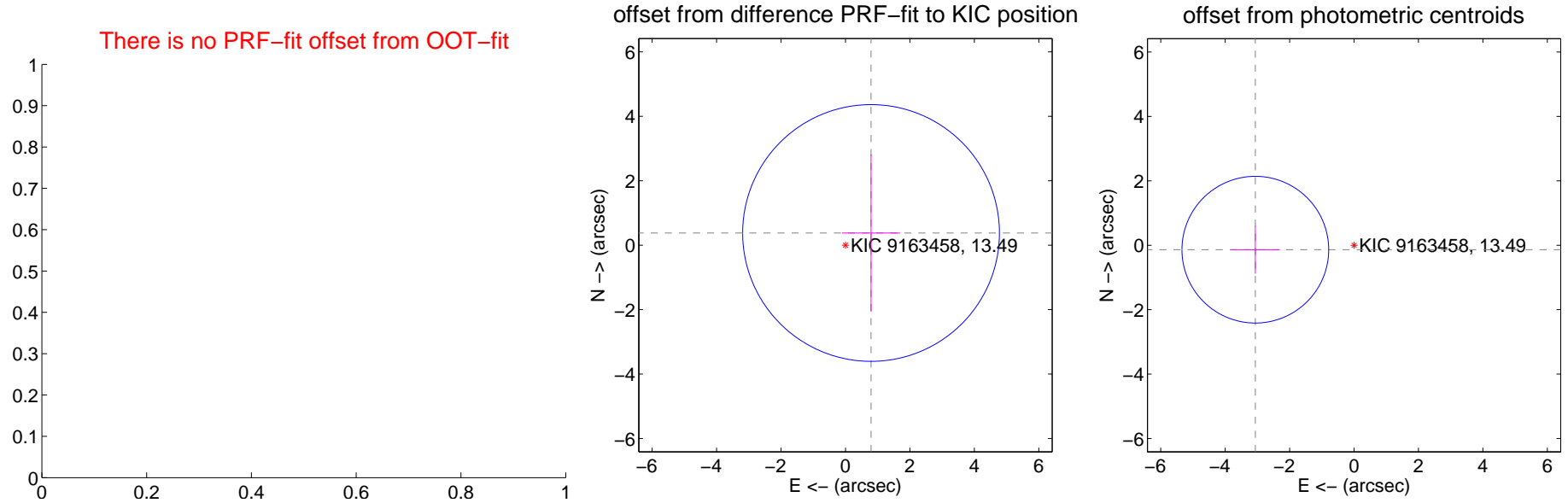
DV Centroid Data

Supplemental centroid analysis for 009163458-02. Kepler magnitude: 13.49. Transit SNR 8.02

There are 0 quarters with good PRF difference image offsets

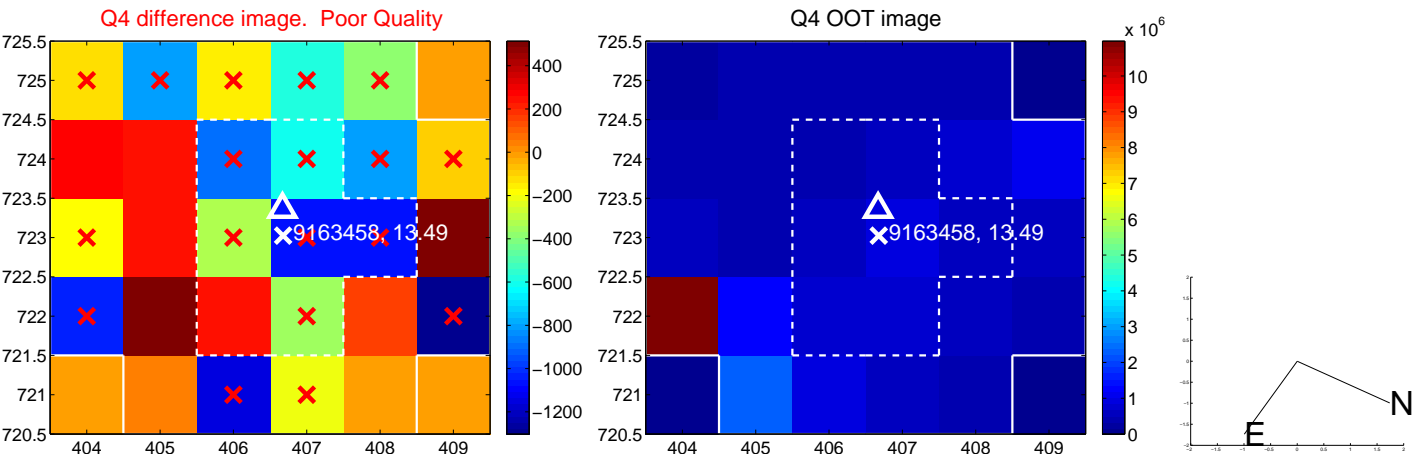
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	0.880 ± 1.328	0.66	-0.794 ± 0.901	0.378 ± 2.440
photometric centroid source offset	3.07 ± 0.76	4.04	3.06 ± 0.76	-0.14 ± 0.74



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.

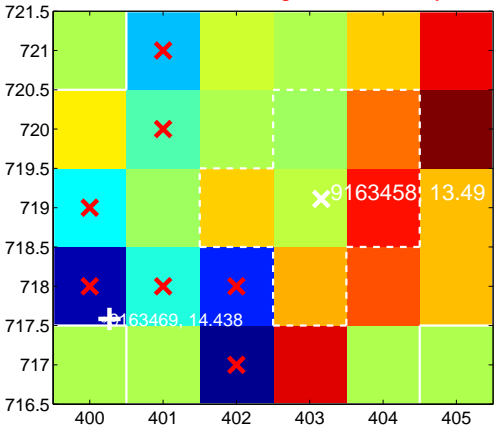
Q5 no difference image



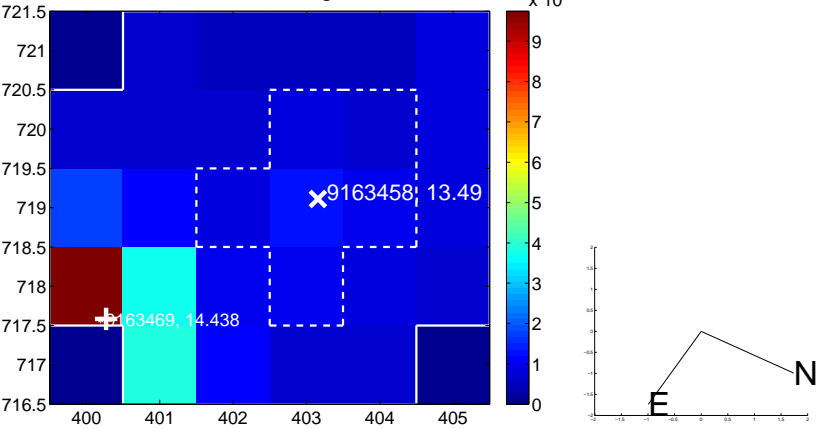
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



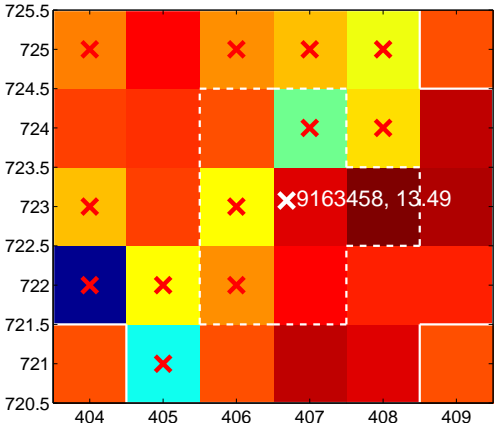
Q7 no difference image



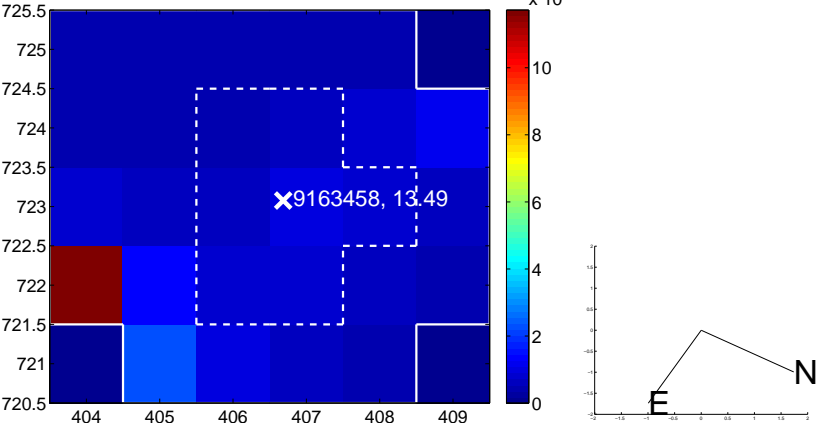
Q7 no OOT image



Q8 difference image. Poor Quality



Q8 OOT image



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

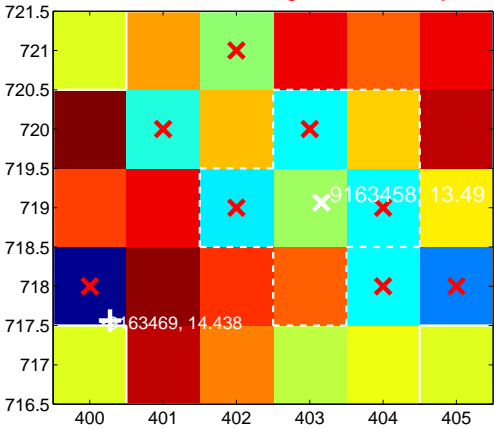
Q9 no difference image



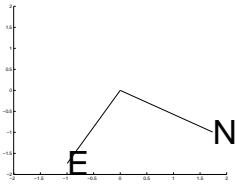
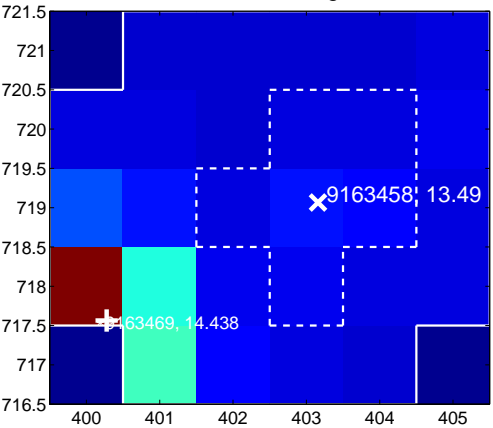
Q9 no OOT image



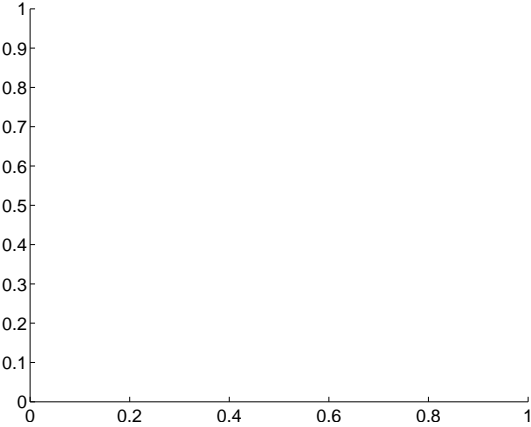
Q10 difference image. Poor Quality



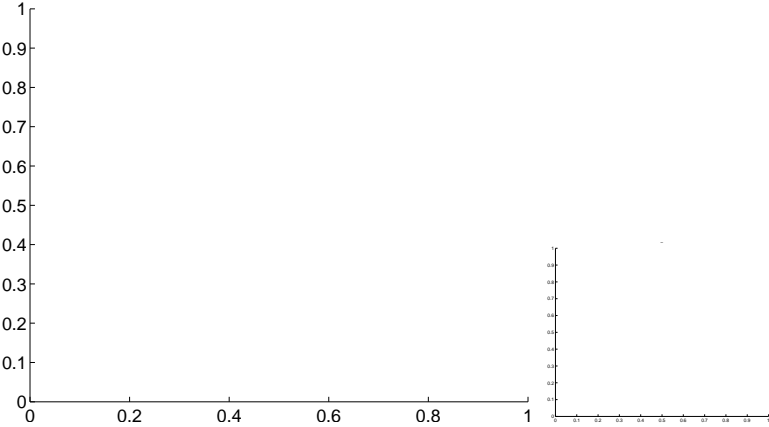
Q10 OOT image



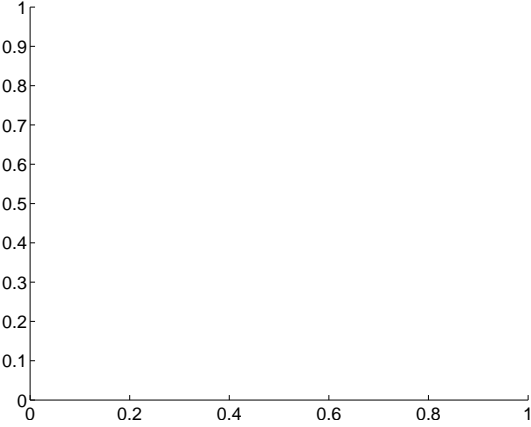
Q11 no difference image



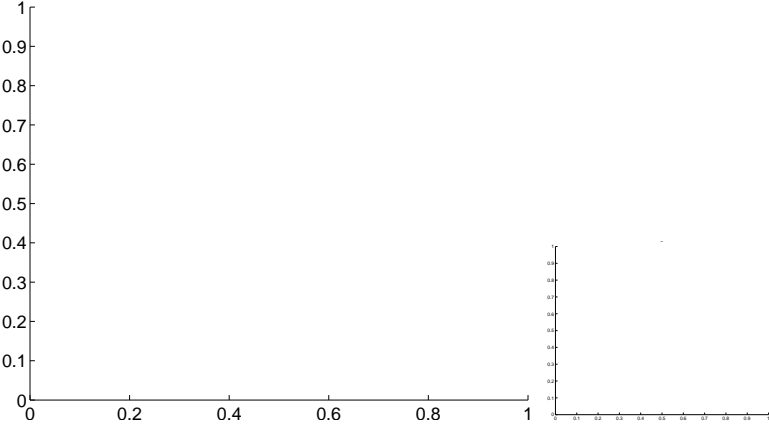
Q11 no OOT image



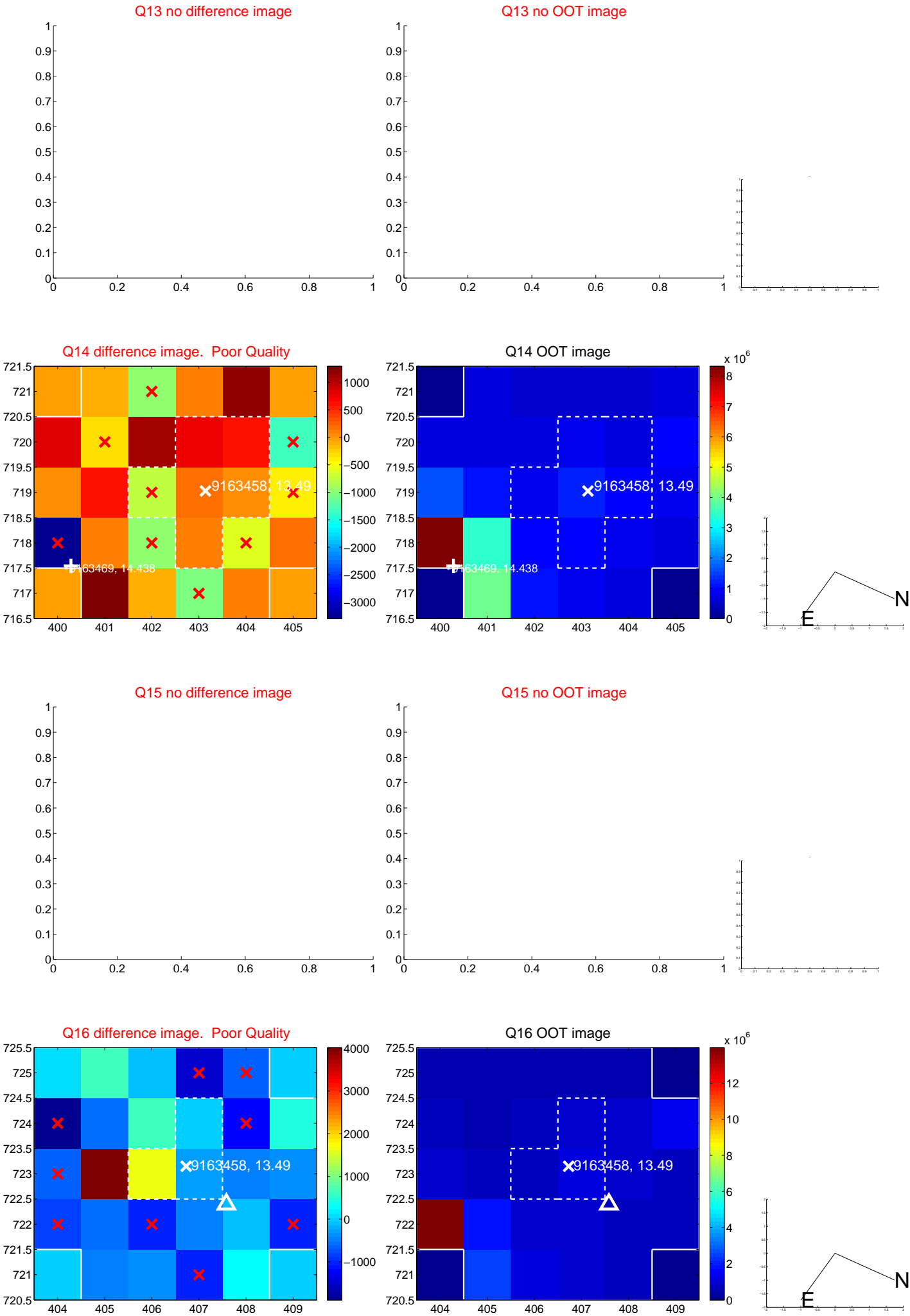
Q12 no difference image



Q12 no OOT image

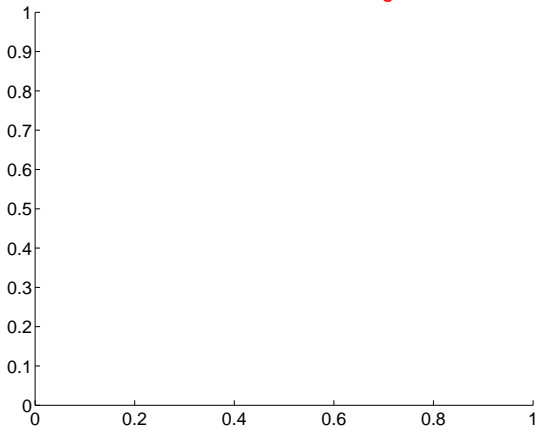


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

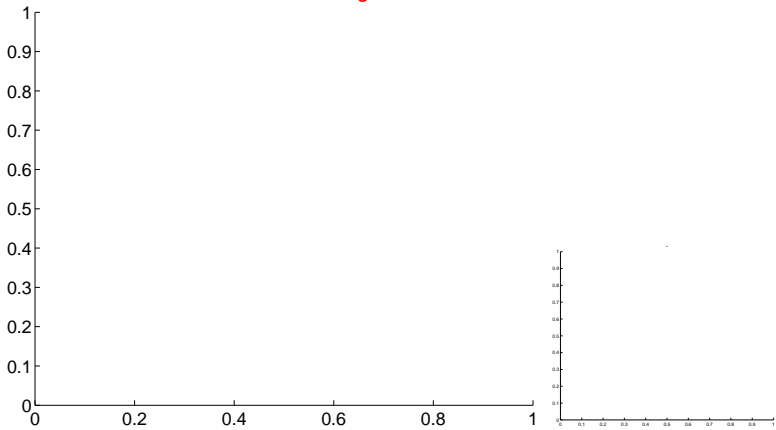


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

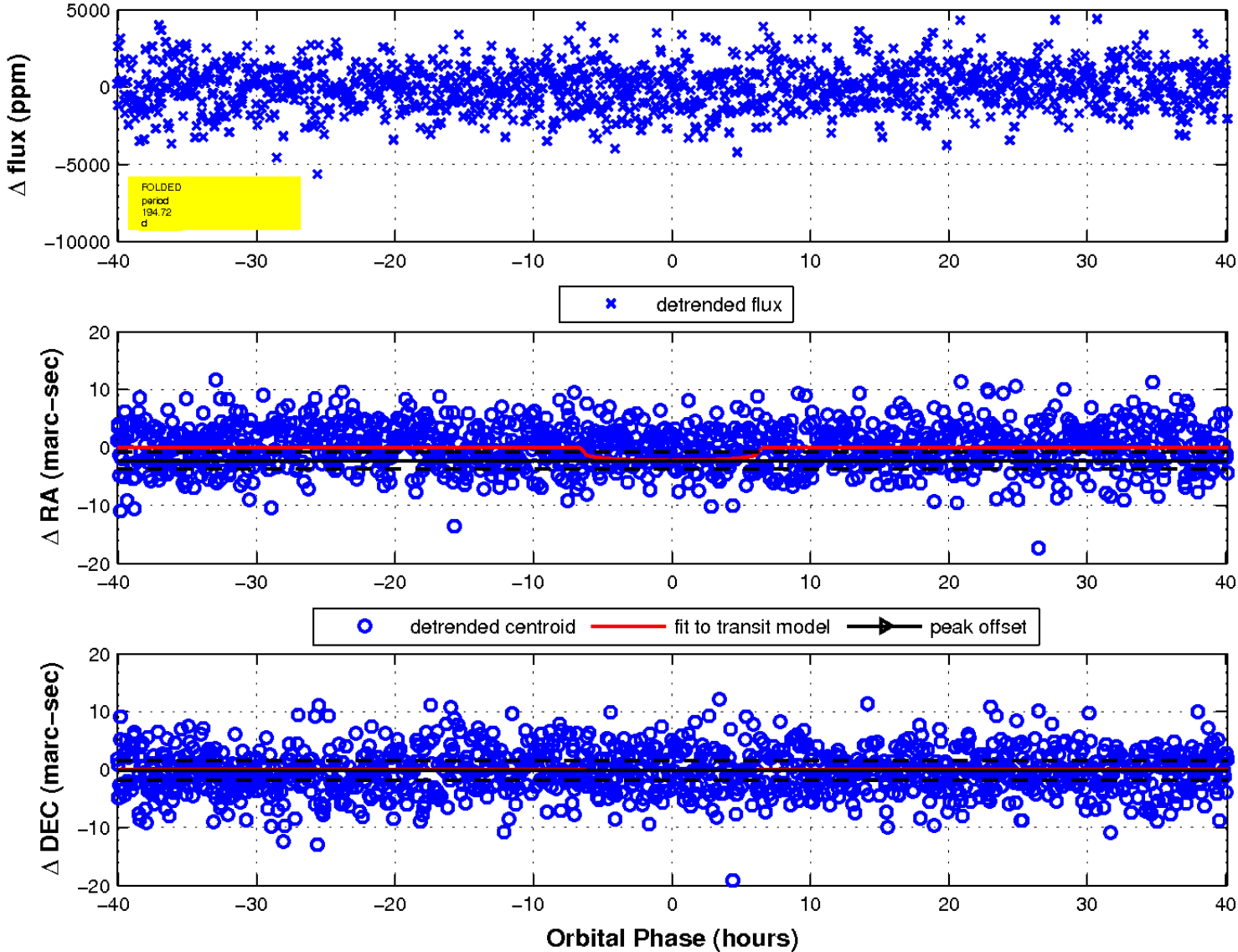
Q17 no difference image



Q17 no OOT image

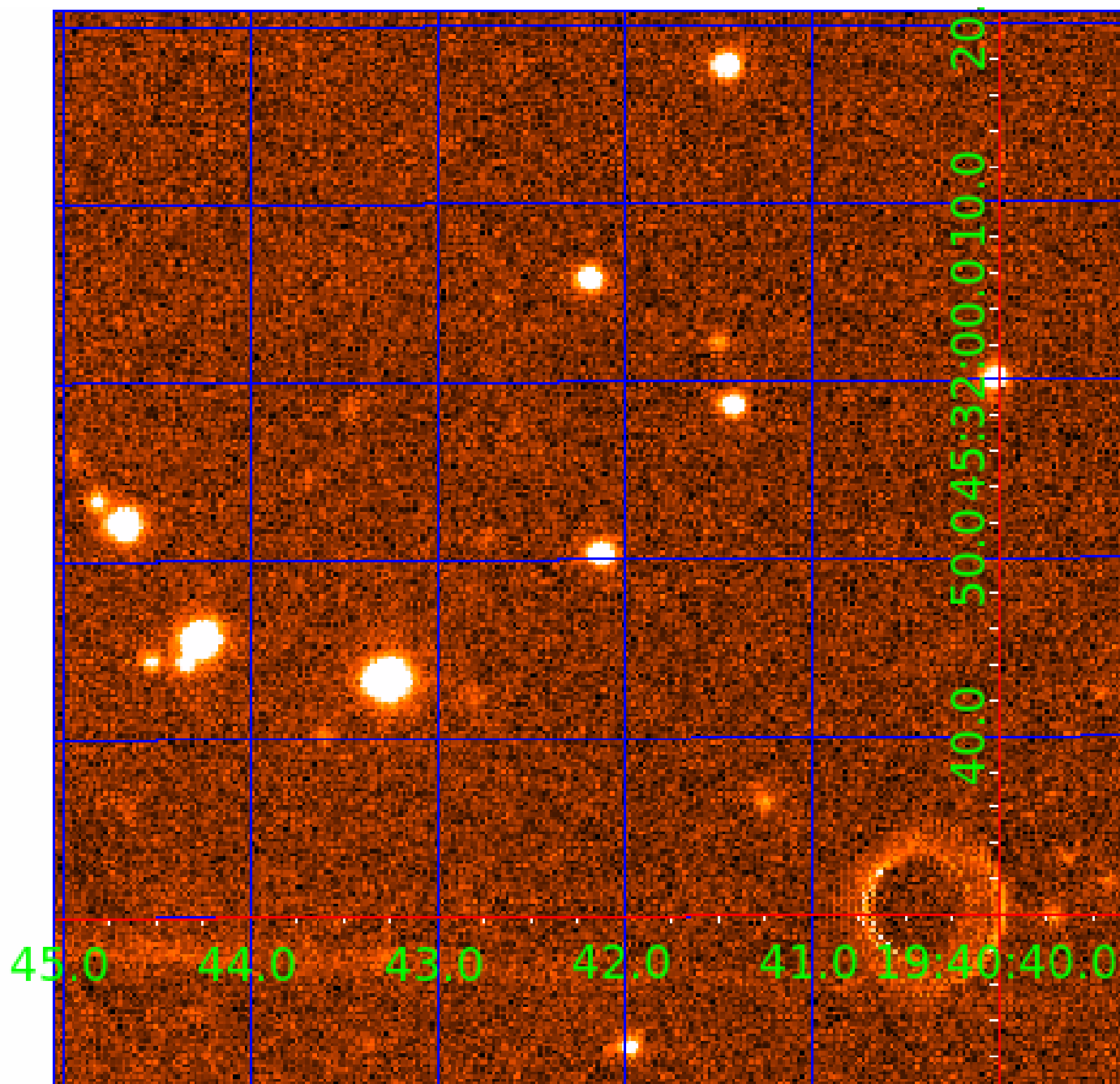


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



KIC 009163458

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})
009163458-01	OBS	No	1.477098	131.831833	100.5	8.280	8.9	9.0	1.00	5780	1.08	1551.41
009163458-02	OBS	No	194.723714	181.660538	1487.9	13.393	9.7	8.0	1.00	5780	3.93	2.31
009163458-03	OBS	No	98.523709	219.190406	1846.0	3.340	7.9	8.7	1.00	5780	7.06	5.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009163458-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET—HALO_GHOST
009163458-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009163458-03	OBS	FP	0.00	1	0	1	0	TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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

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

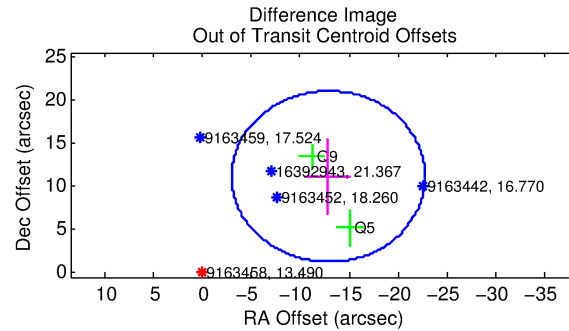
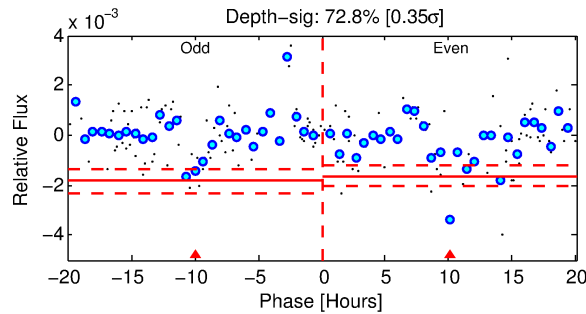
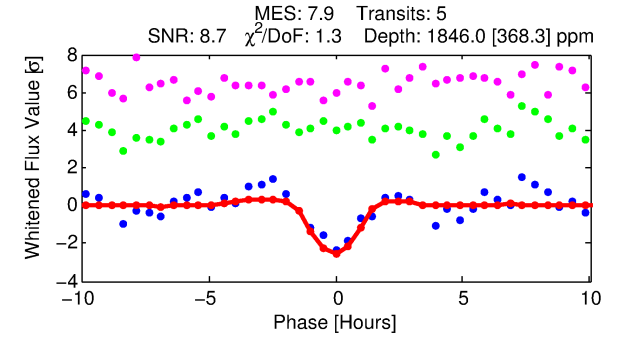
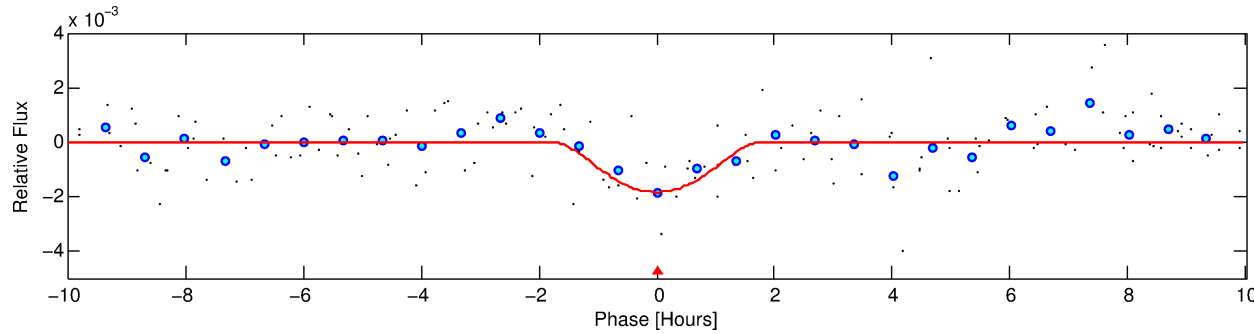
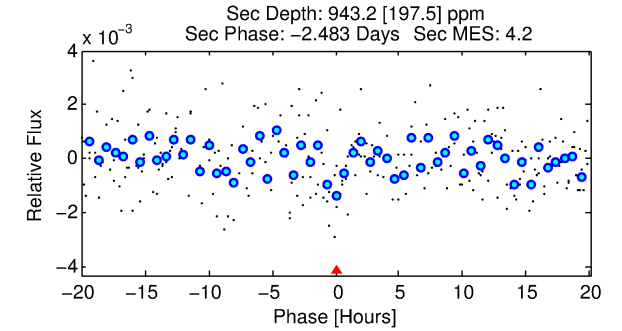
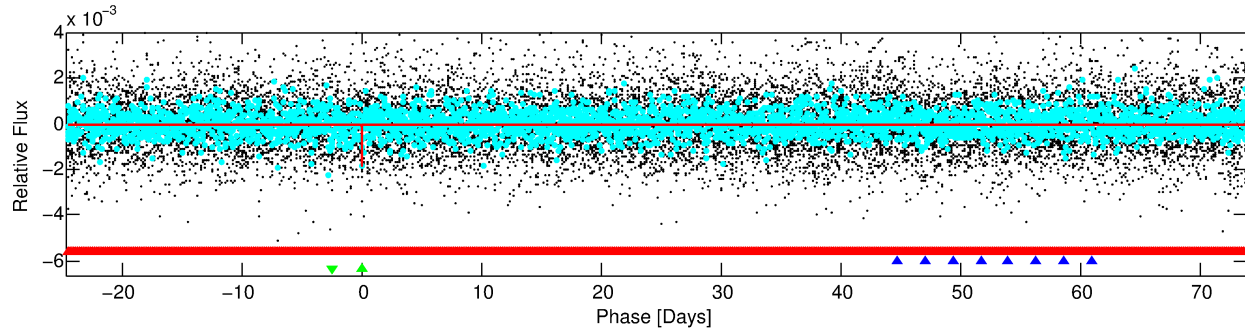
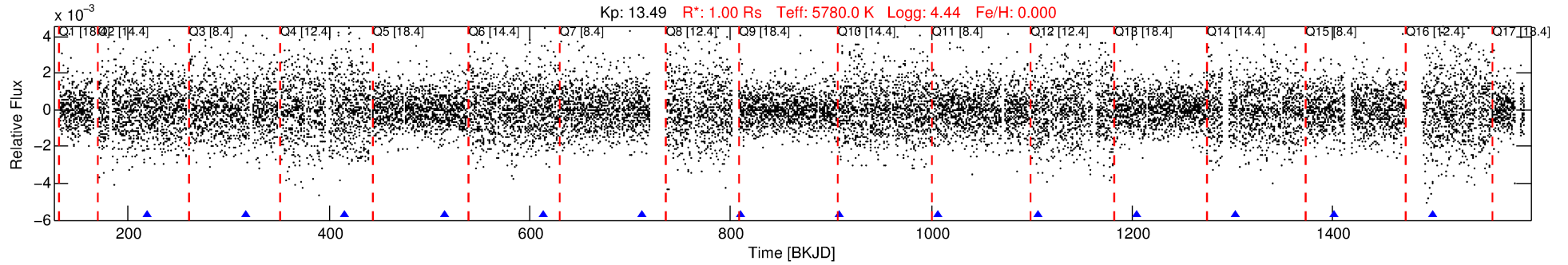
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009163458-03

No Significant Match Found

DV One-Page Summary

KIC: 9163458 Candidate: 3 of 3 Period: 98.524 d



DV Fit Results:

Period = 98.52371 [0.00147] d
Epoch = 219.1904 [0.0131] BKJD
Rp/R* = 0.0647 [0.2680]
a/R* = 92.24 [109.49]
b = 0.98 [0.45]
Seff = 5.74 [0.00]
Teq = 395 [0] K
Rp = 7.06 [29.24] Re
a = 0.4176 [0.0000] AU
Ag = 1814.94 [15038.44] [0.12σ]
Teff = 3982 [8249] K [0.43σ]

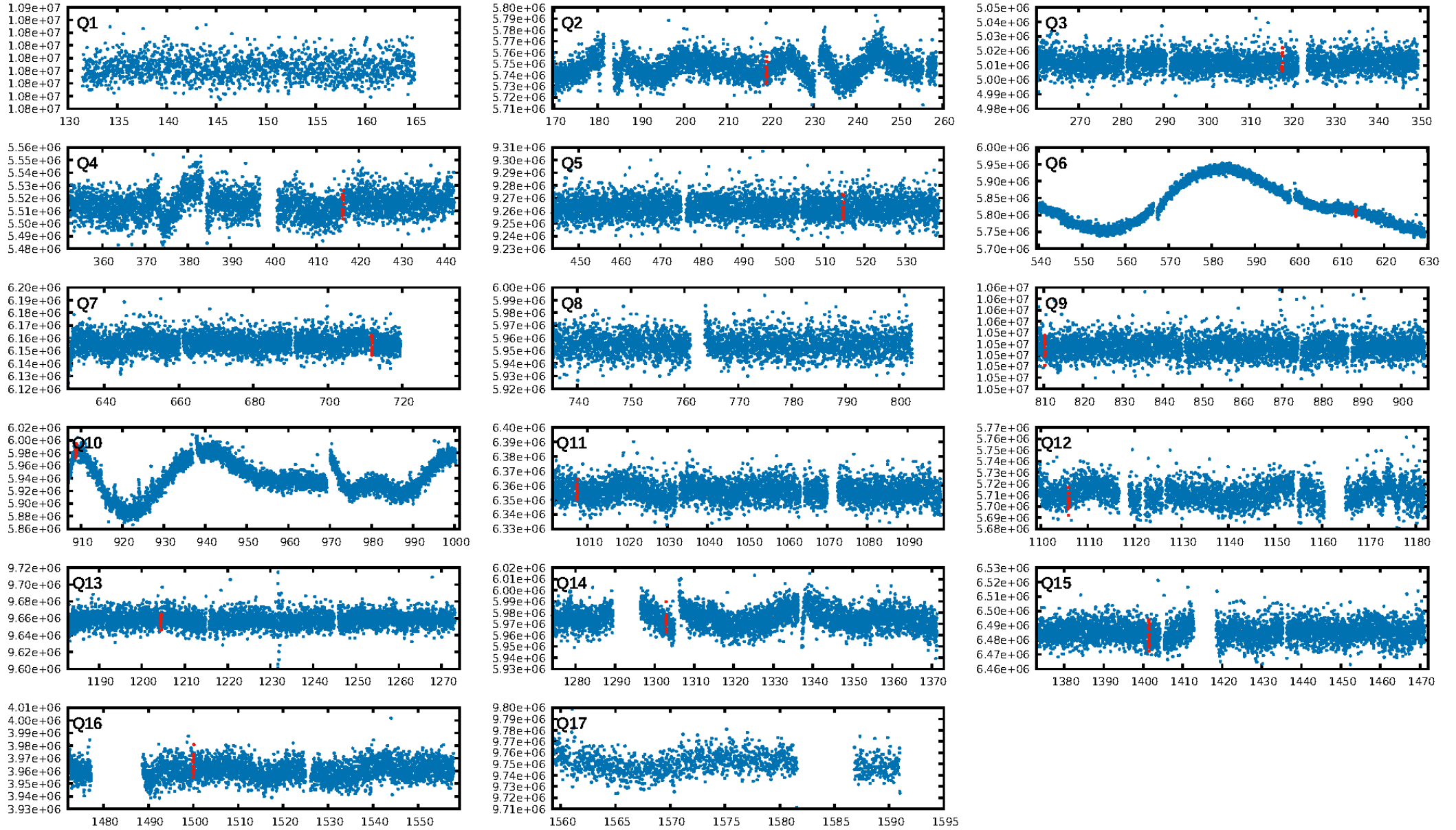
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [260.87σ]
LongPeriod-sig: 100.0% [167.27σ]
ModelChiSquare2-sig: 80.9%
ModelChiSquareGof-sig: 89.3%
Bootstrap-pfa: 2.32e-10
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -13.98
Centroid-sig: 19.0%
Centroid-so: 1.656 arcsec [2.20σ]
OotOffset-rm: 17.005 arcsec [5.16σ]
KicOffset-rm: 1.229 arcsec [0.98σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/3/1/2 [6]
DiffImageQuality-fgm: 0.00 [0/6]
DiffImageOverlap-fno: 0.36 [5/14]

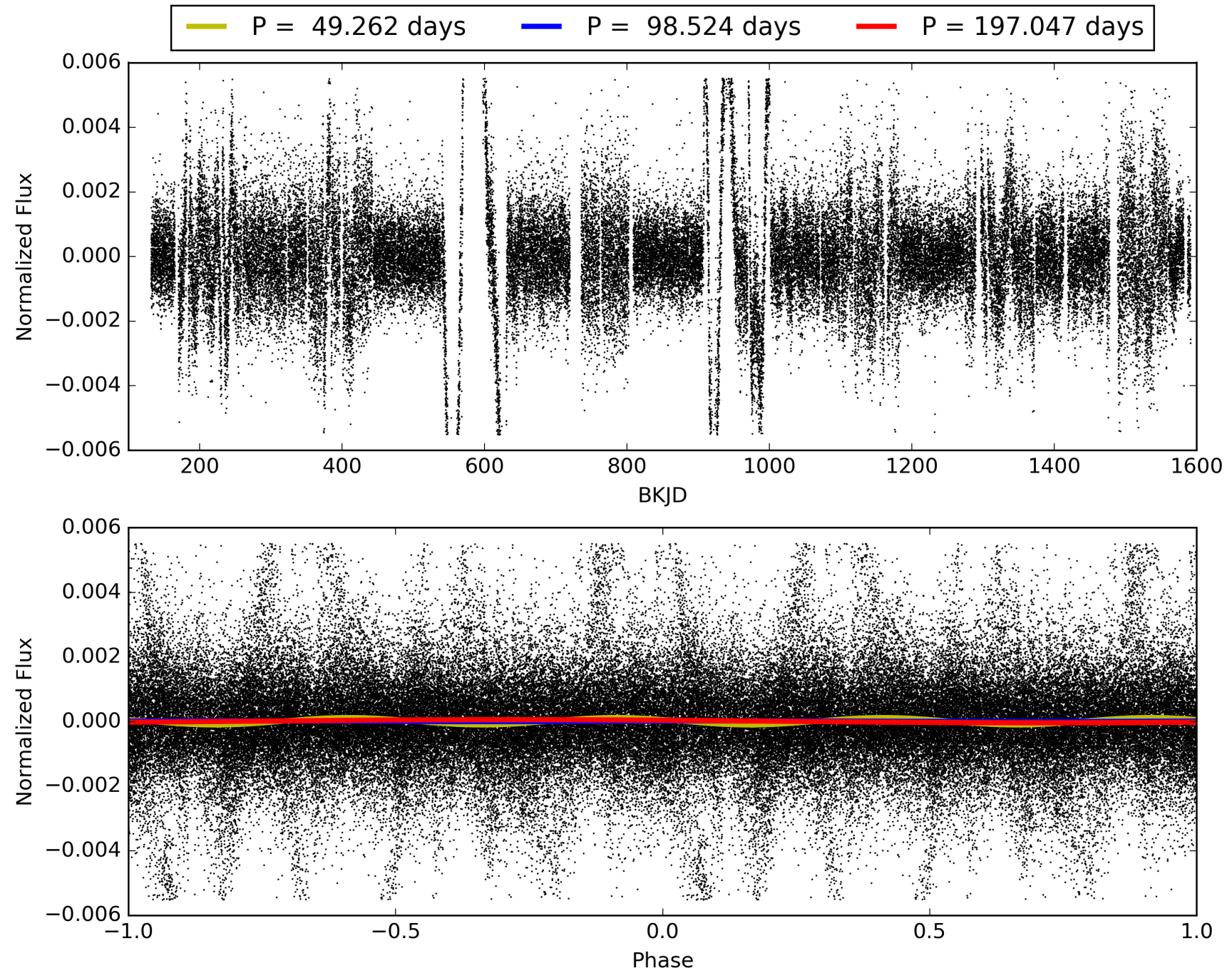
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 11:48:39 Z

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

TCE 009163458-03, PDC Light Curves

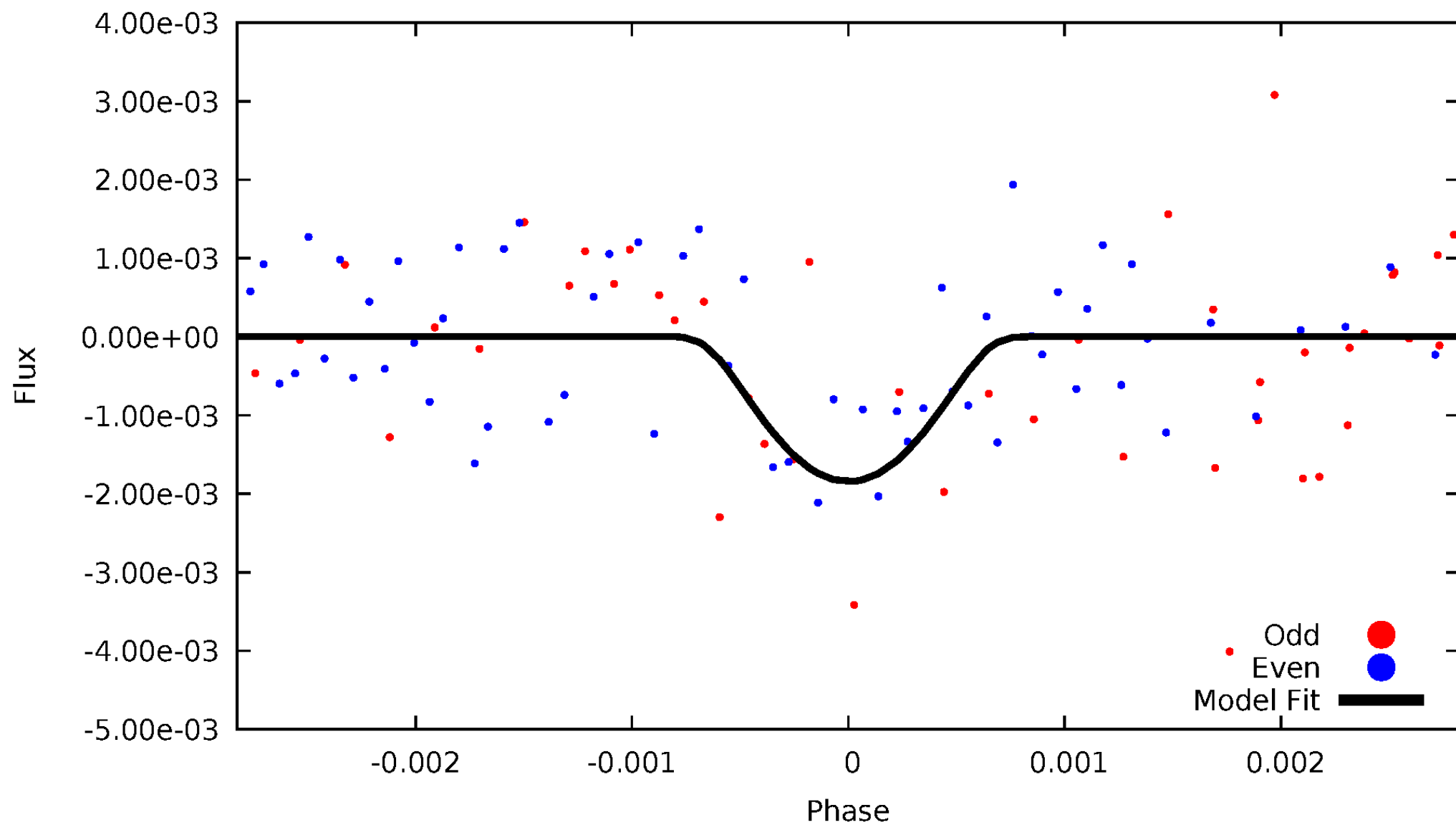


TCE 009163458-03



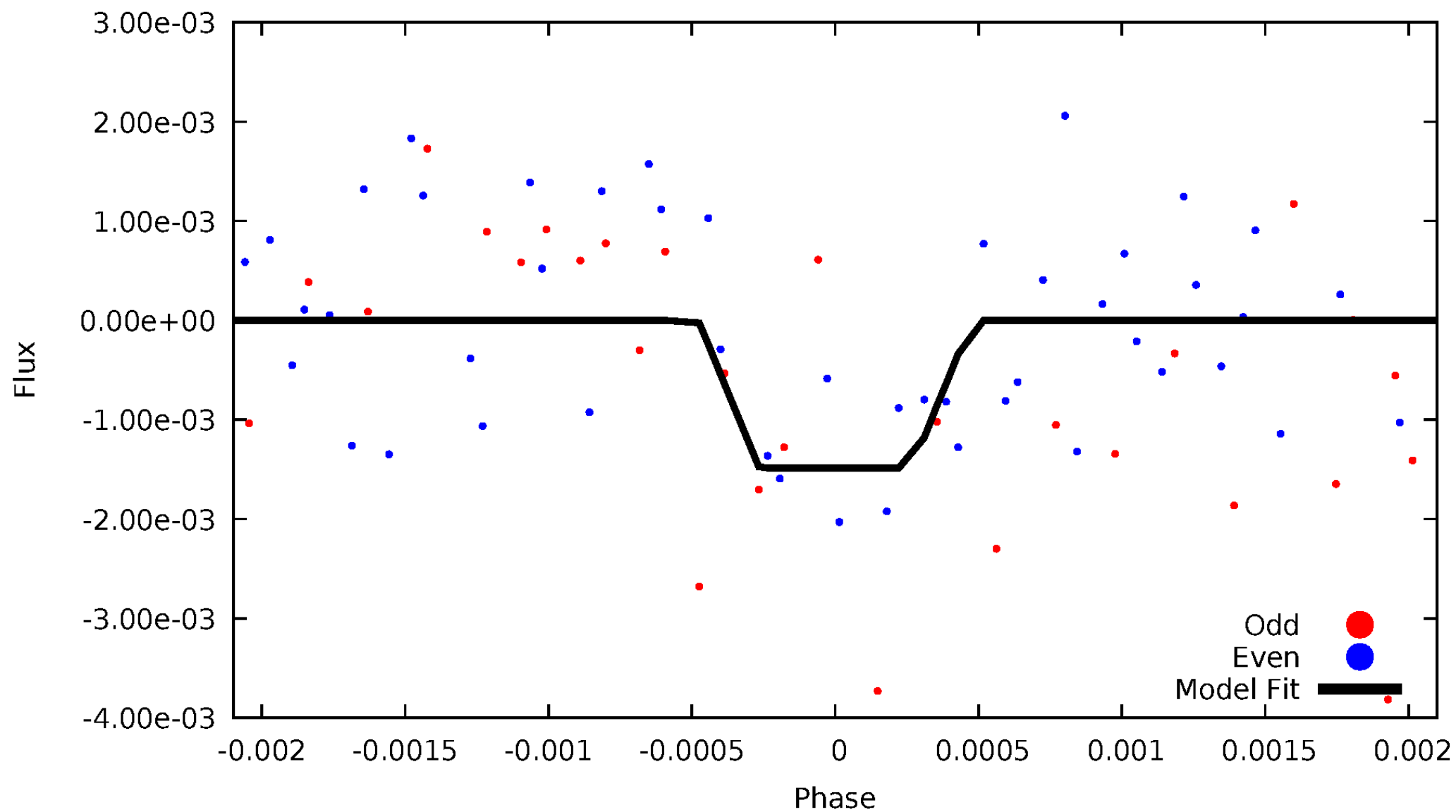
DV Odd/Even

TCE 009163458-03



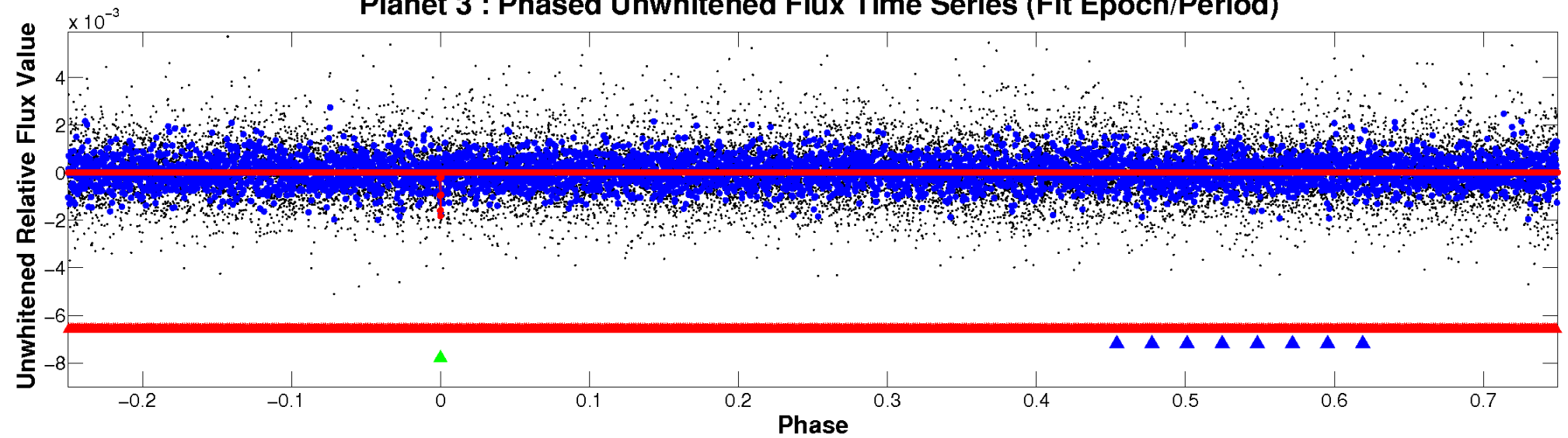
ALT Odd/Even

TCE 009163458-03

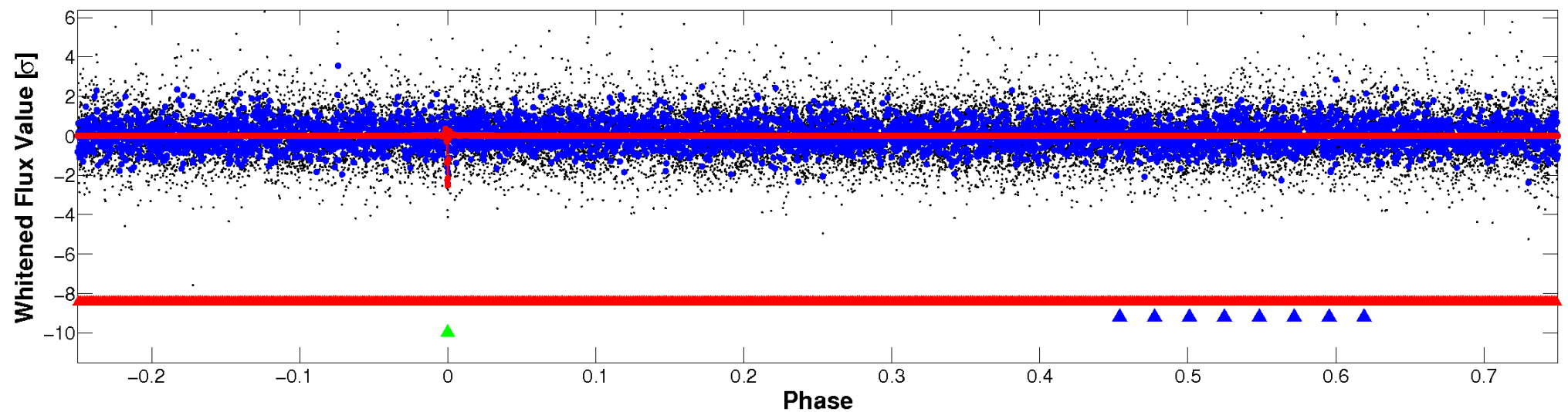


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

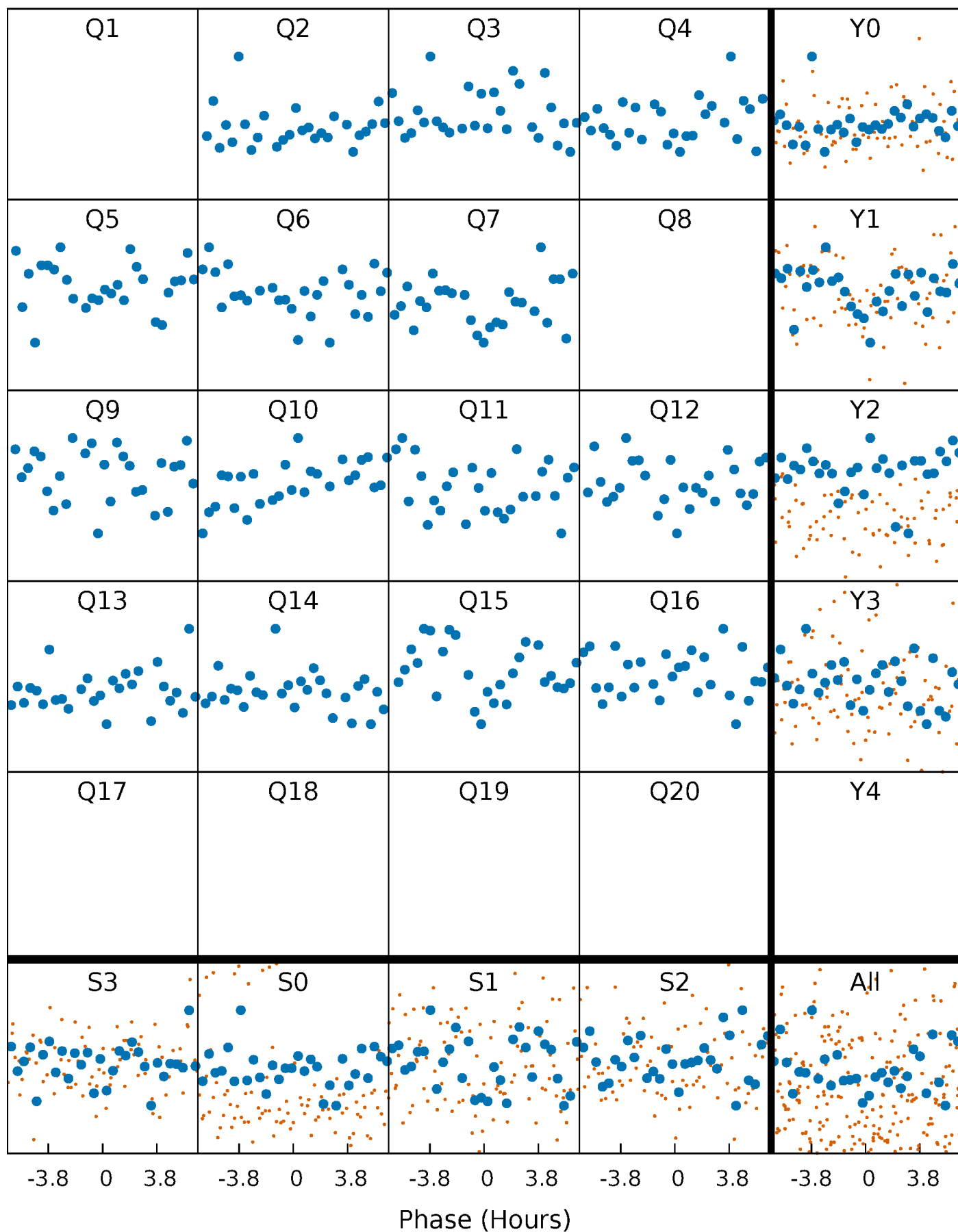


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



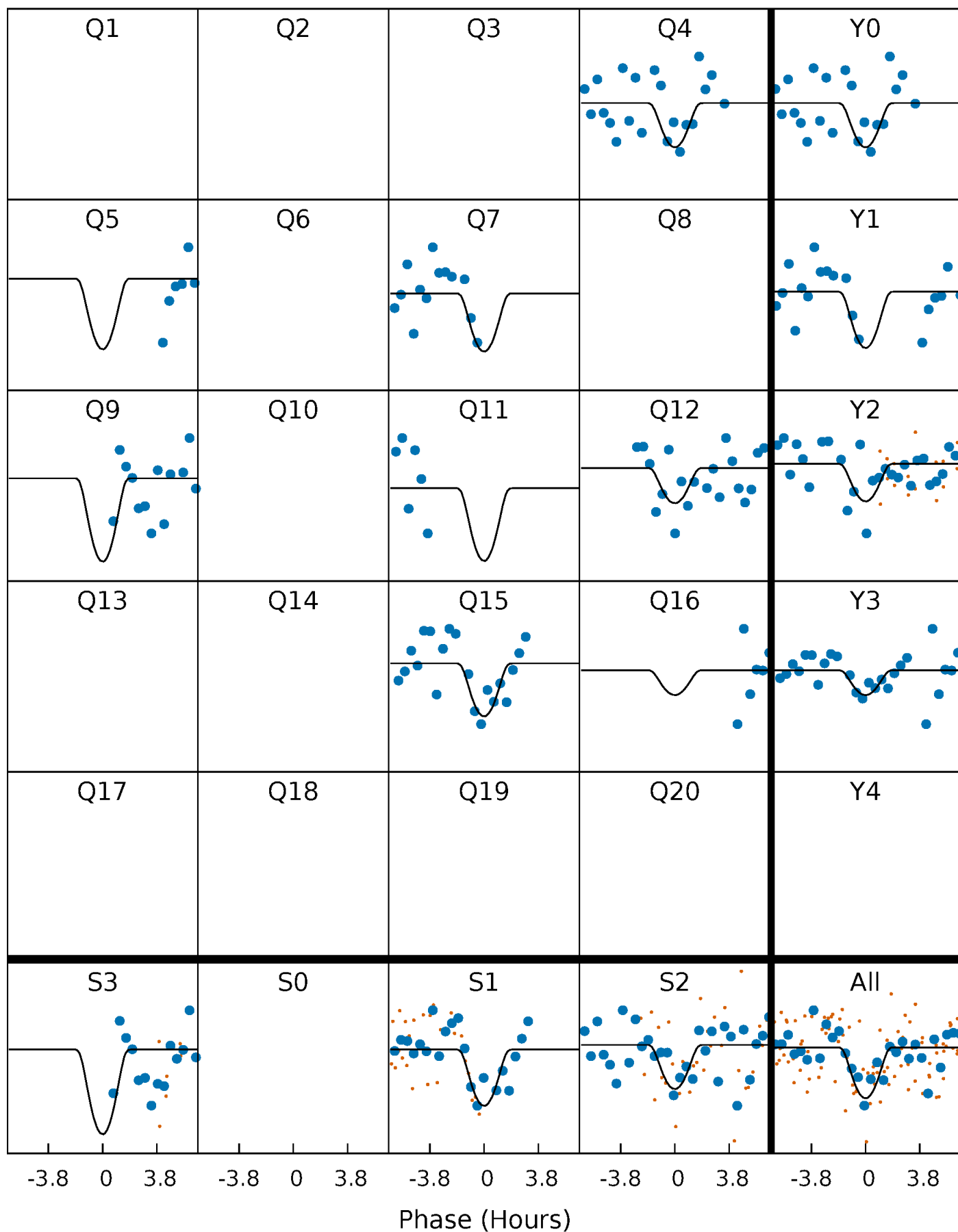
PDC Quarter-Phased Transit Curves

TCE 009163458-03 P= 98.523709 Days $T_0=219.190405$ (BKJD)



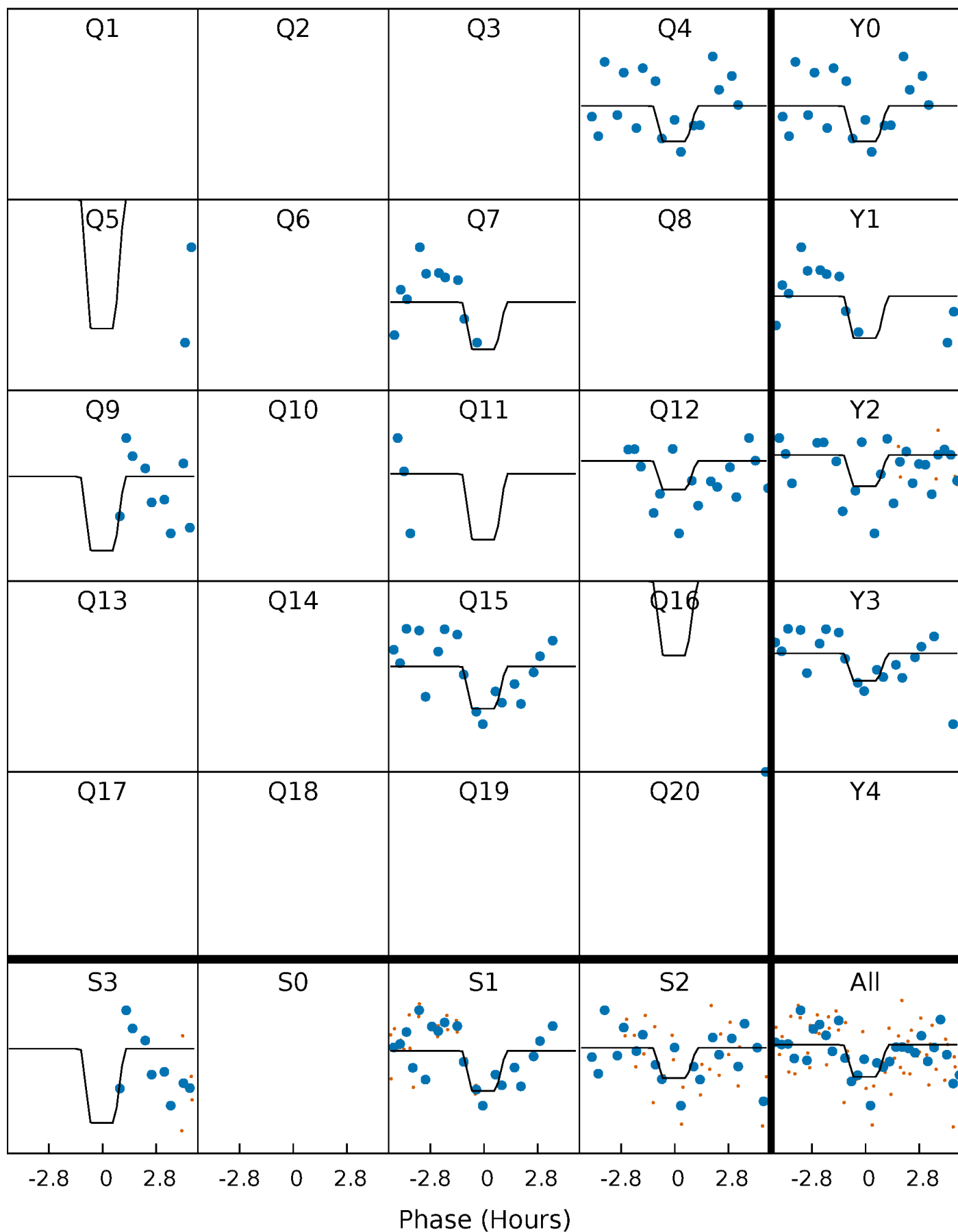
DV Quarter-Phased Transit Curves

TCE 009163458-03 P= 98.523709 Days $T_0=219.190405$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

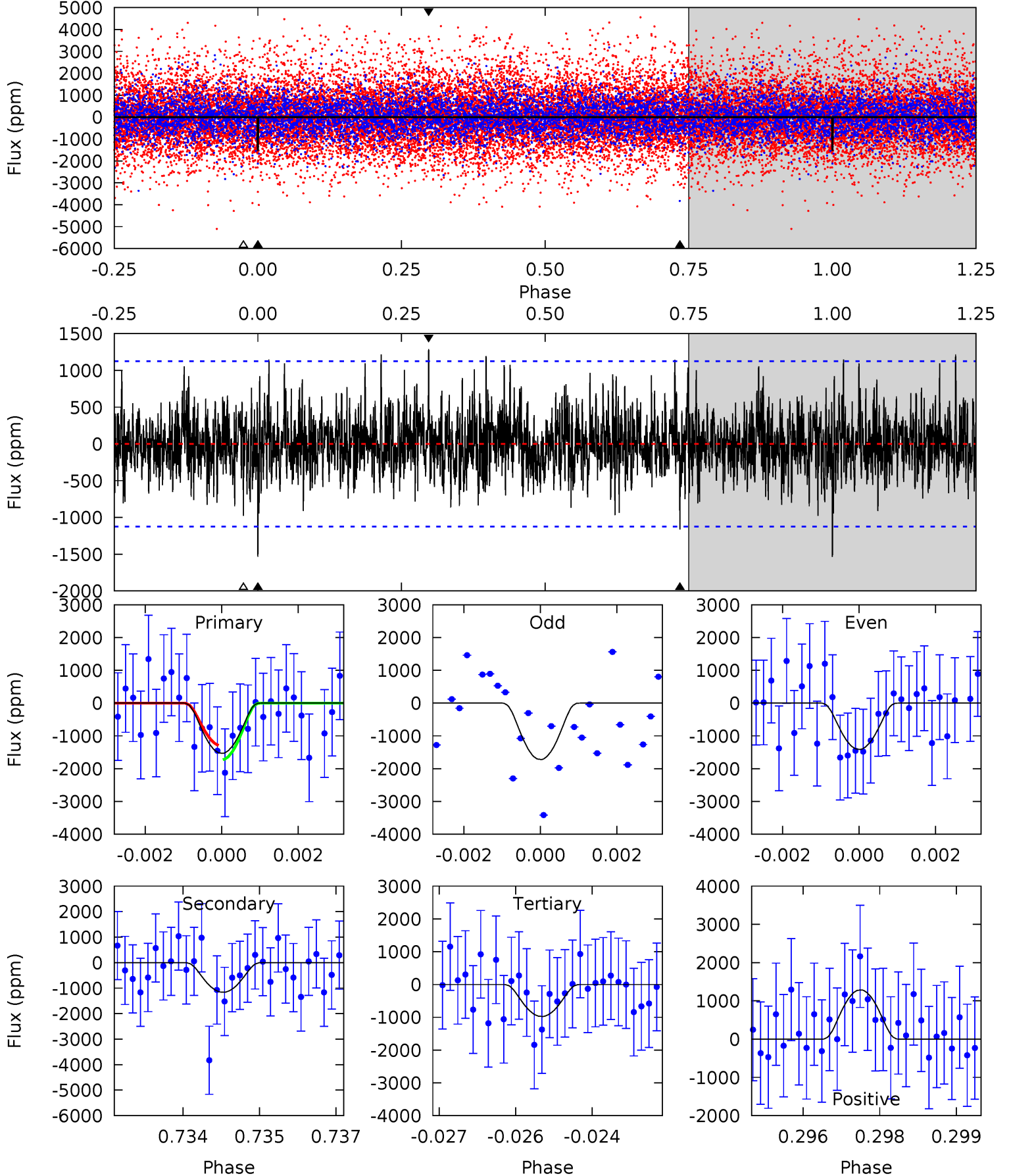
TCE 009163458-03 P= 98.522581 Days $T_0=219.188683$ (BKJD)



DV Model-Shift Uniqueness Test

009163458-03, P = 98.523709 Days, E = 120.666696 Days

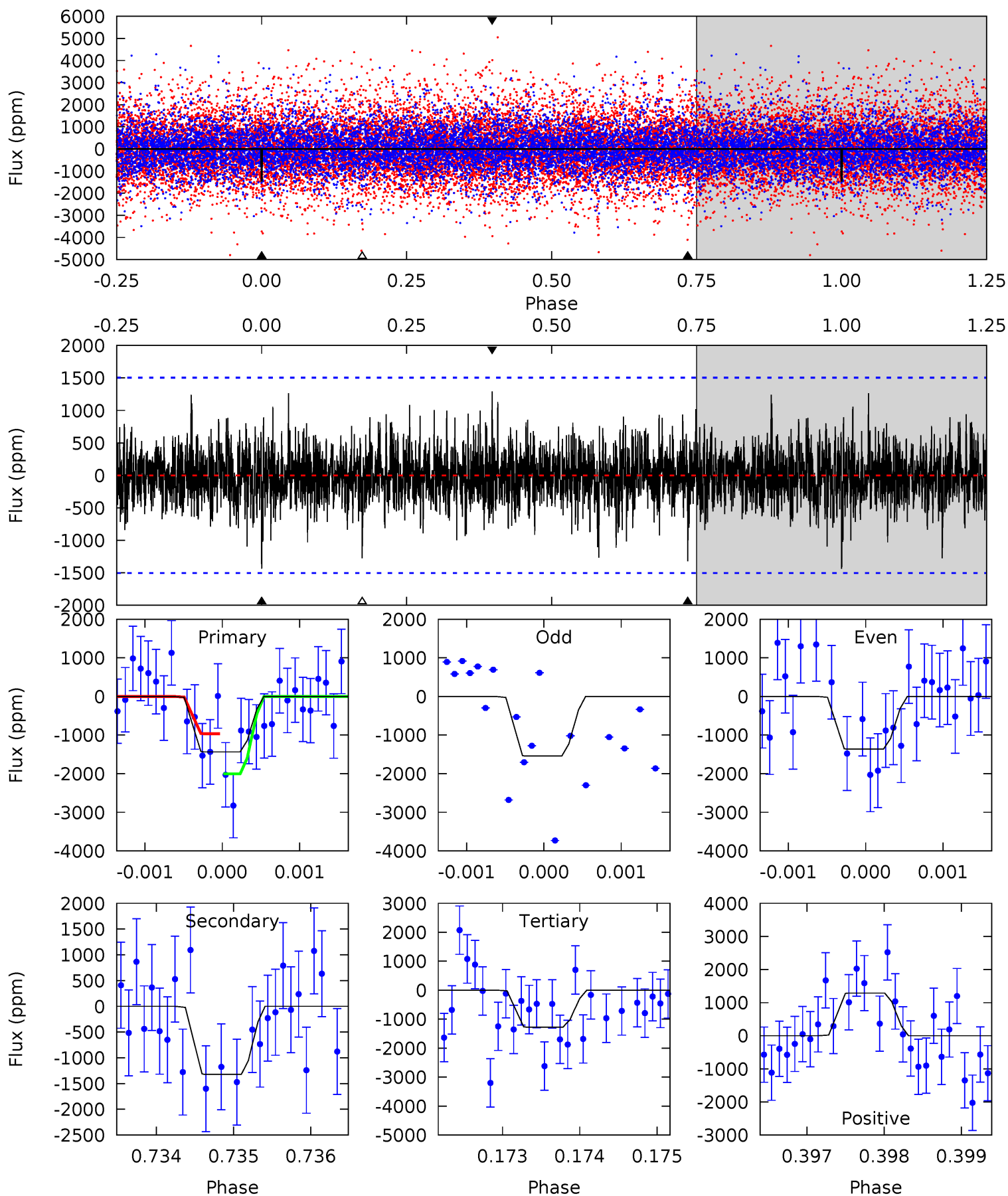
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.32	5.54	4.66	6.14	5.37	3.15	1.54	2.66	1.17	0.88	-0.60	0.71	0.85	0.46	1.05



Alt Model-Shift Uniqueness Test

009163458-03, P = 98.522581 Days, E = 120.666102 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.21	4.80	4.62	4.68	5.46	3.30	1.15	0.59	0.53	0.18	0.12	0.32	1.02	0.47	1.90



Stellar Parameters For KIC 009163458

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

Secondary Eclipse Parameters for KIC 009163458-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1162 ± 210	$22.56^{+23.09}_{-15.19}$	551^{+26}_{-25}	3006^{+1305}_{-511}	216^{+1768}_{-163}
Alt.	-1322 ± 276	$21.49^{+19.75}_{-14.88}$	552^{+25}_{-26}	3120^{+1611}_{-525}	273^{+2793}_{-200}

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 $A_{obs} \gg 1.0$

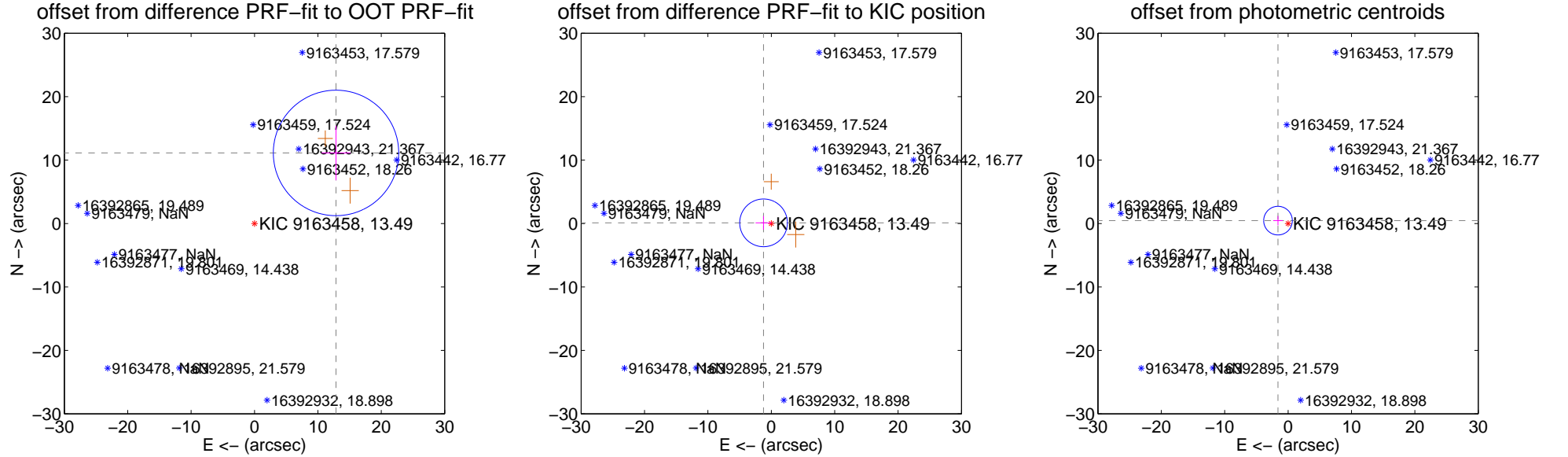
DV Centroid Data

Supplemental centroid analysis for 009163458-03. Kepler magnitude: 13.49. Transit SNR 8.70

There are 0 quarters with good PRF difference image offsets

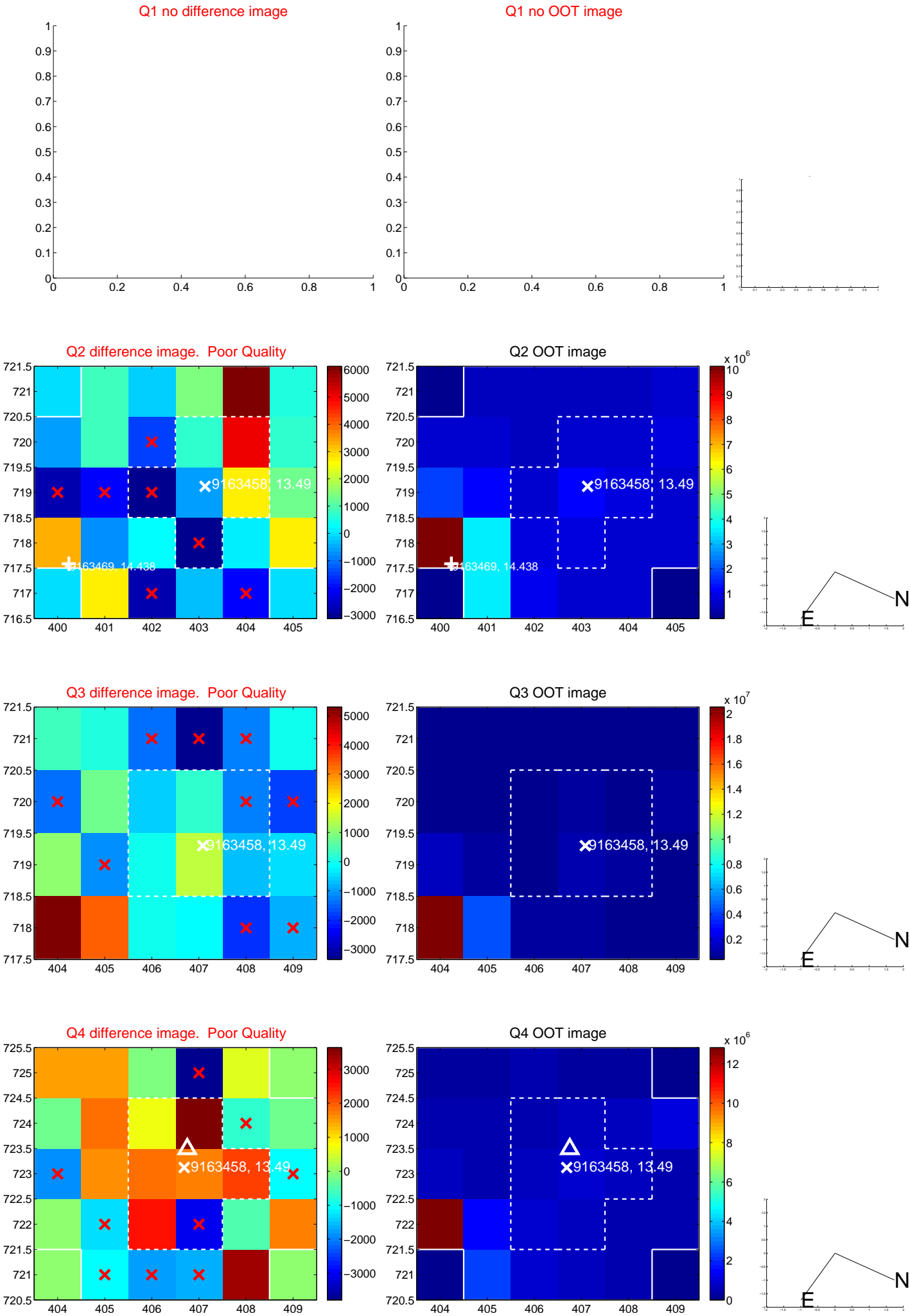
The OOT PRF centroid is offset from the target star catalog position by about 13.08 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	17.005 \pm 3.297	5.16	-12.859 \pm 2.273	11.127 \pm 4.299
PRF-fit source offset from KIC position	1.229 \pm 1.254	0.98	1.225 \pm 1.255	0.108 \pm 1.080
photometric centroid source offset	1.66 \pm 0.75	2.20	1.59 \pm 0.75	0.46 \pm 0.74

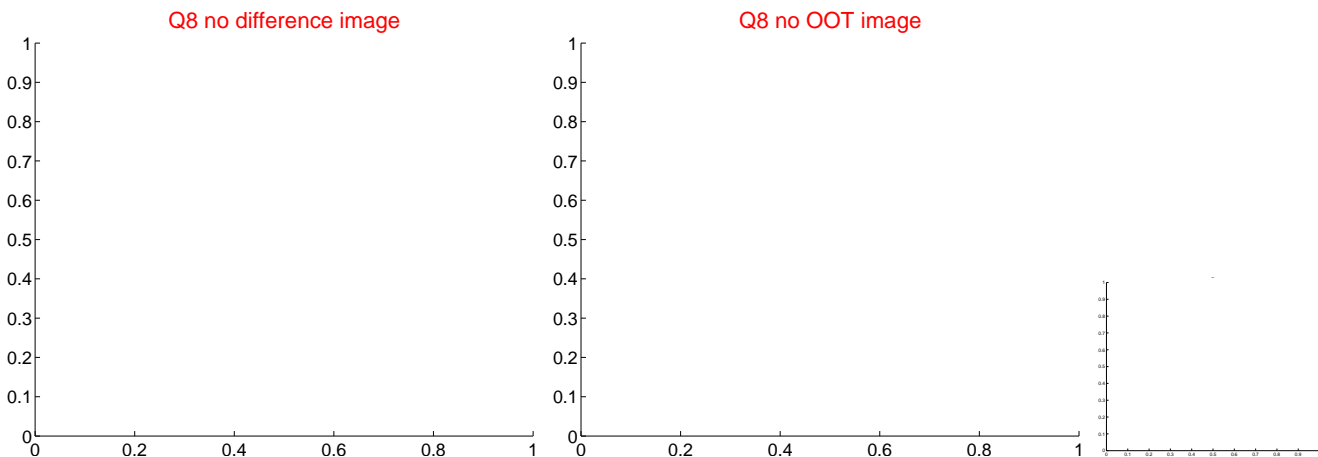
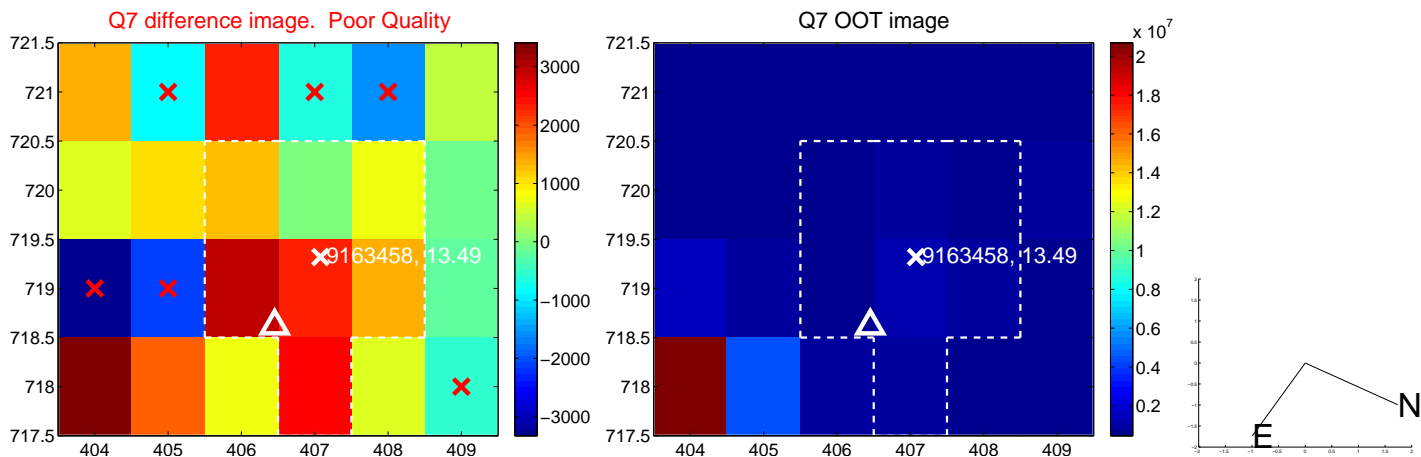
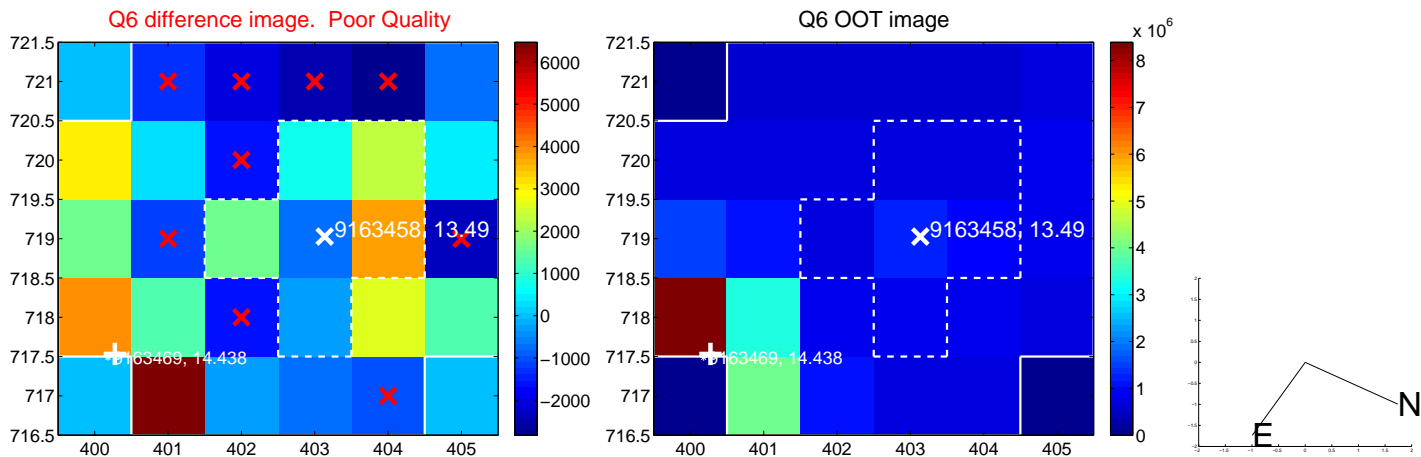
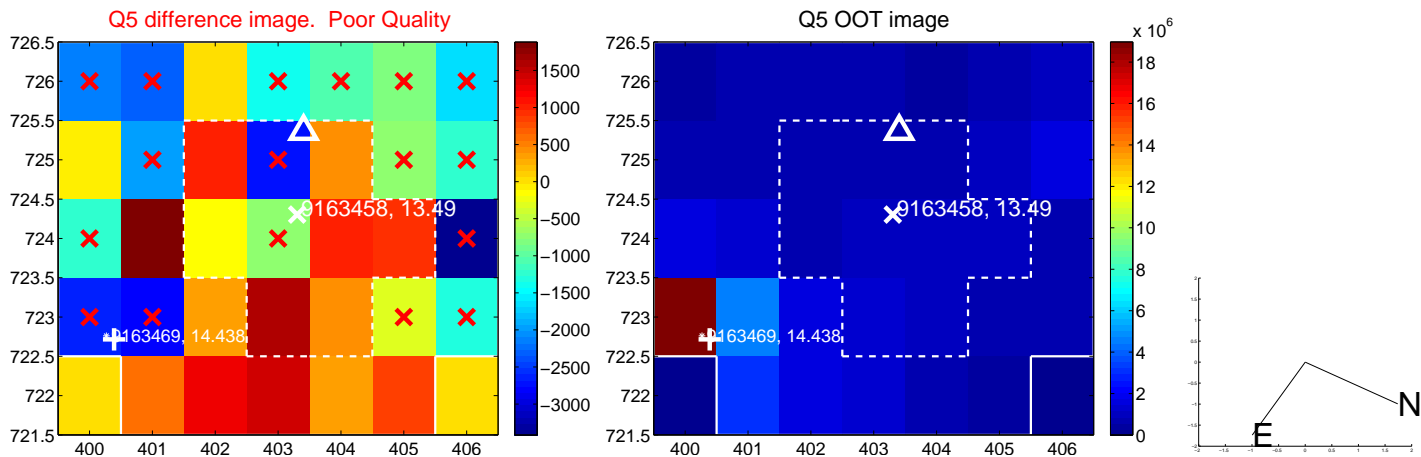


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

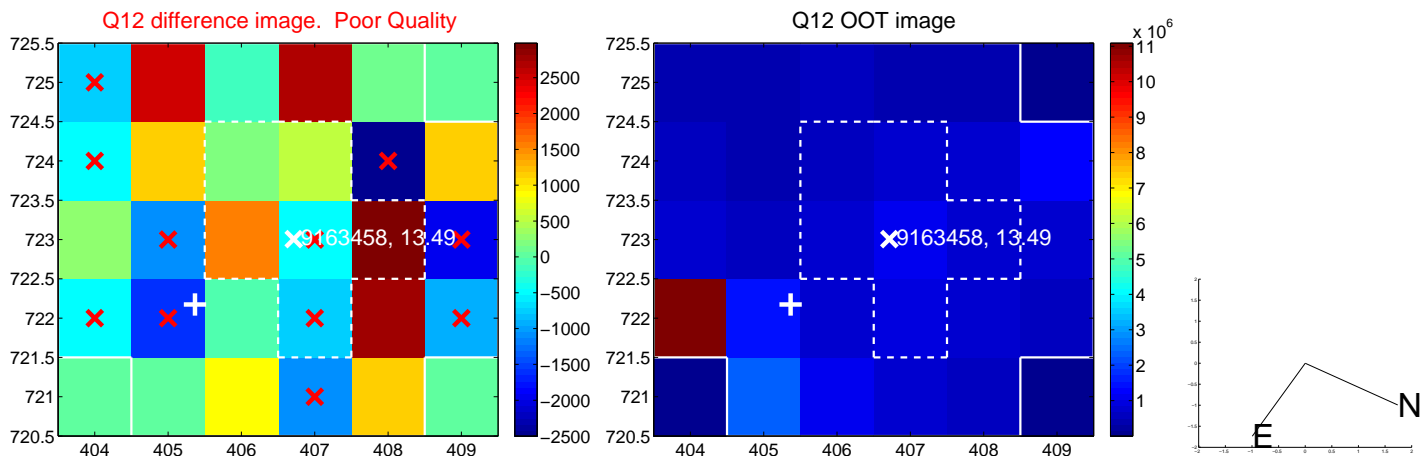
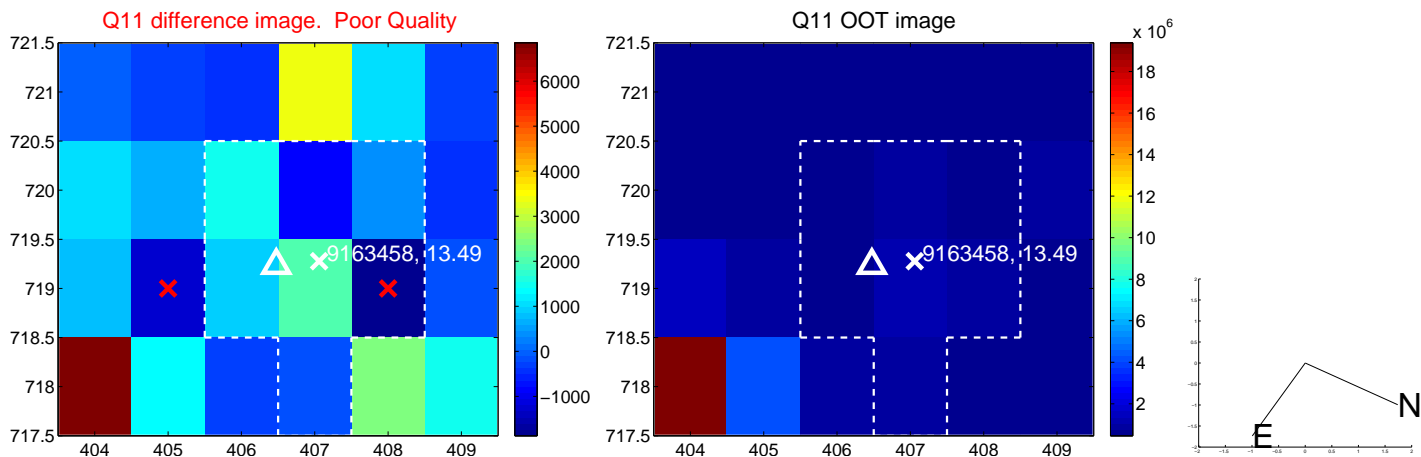
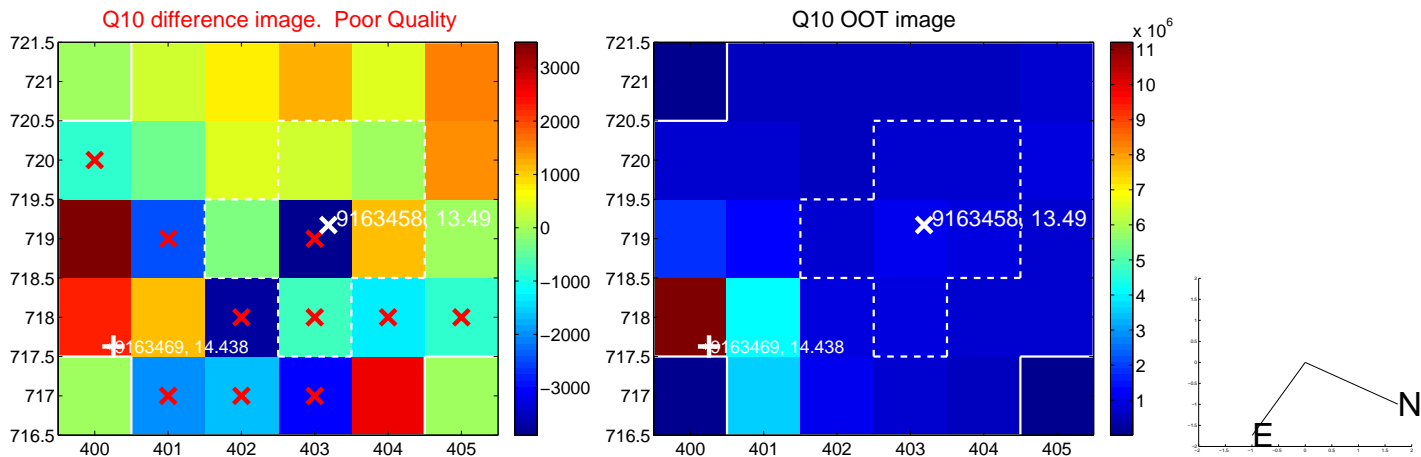
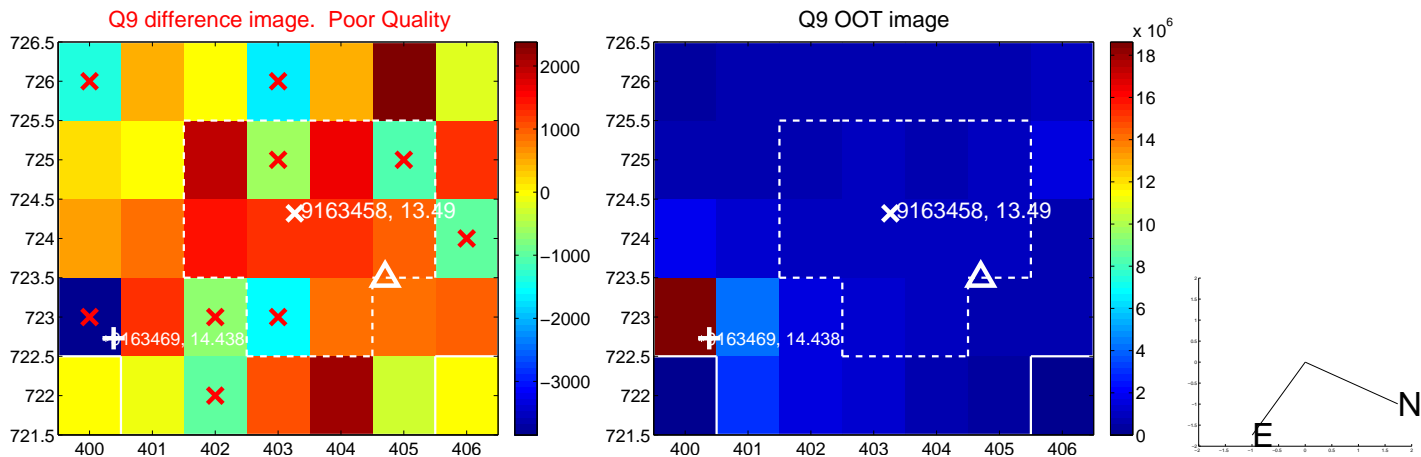
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



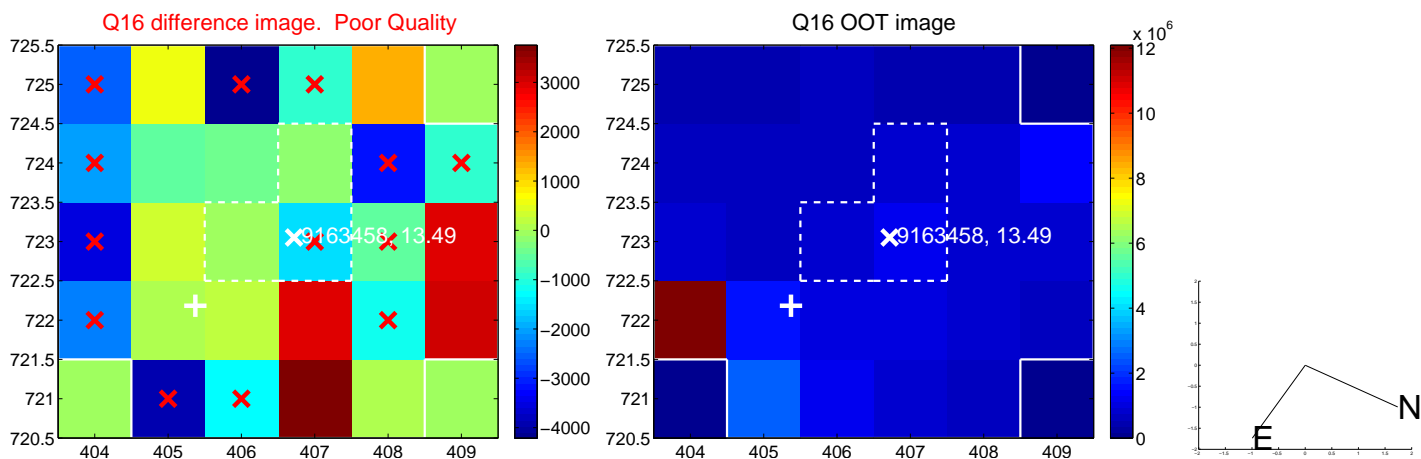
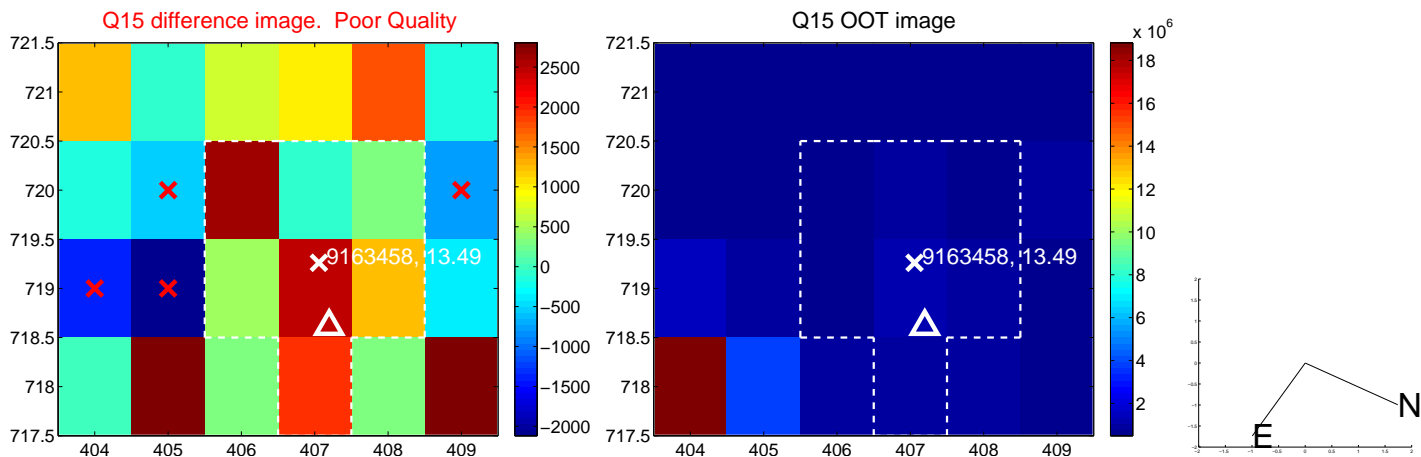
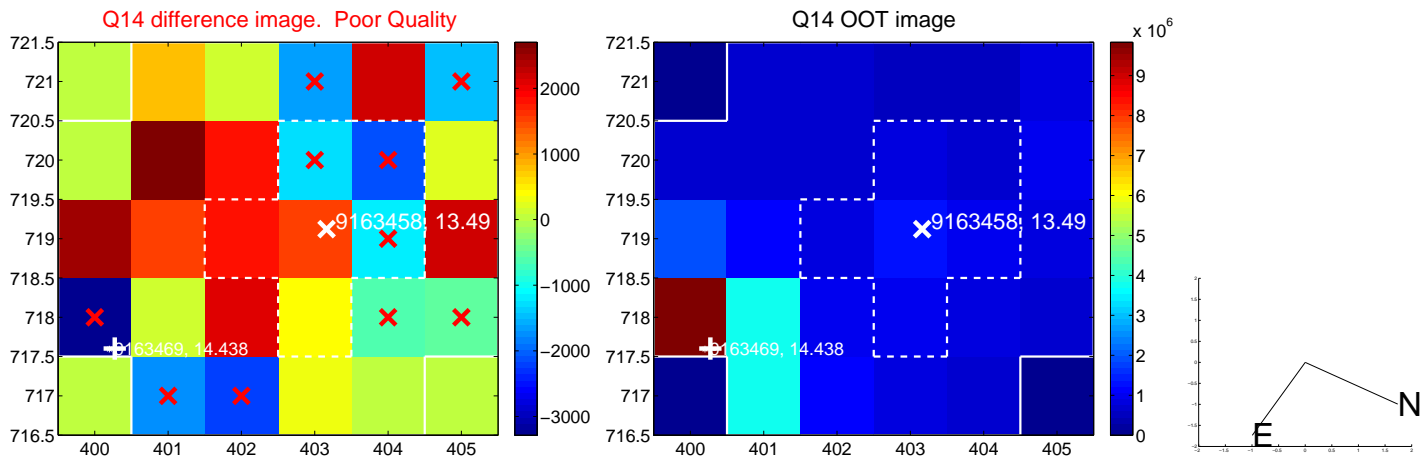
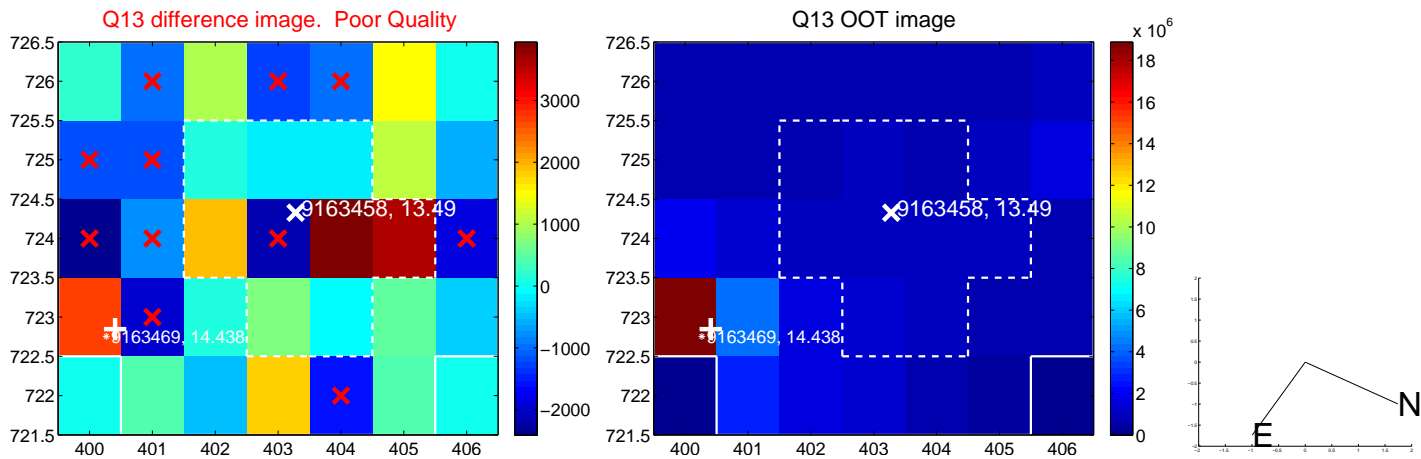
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



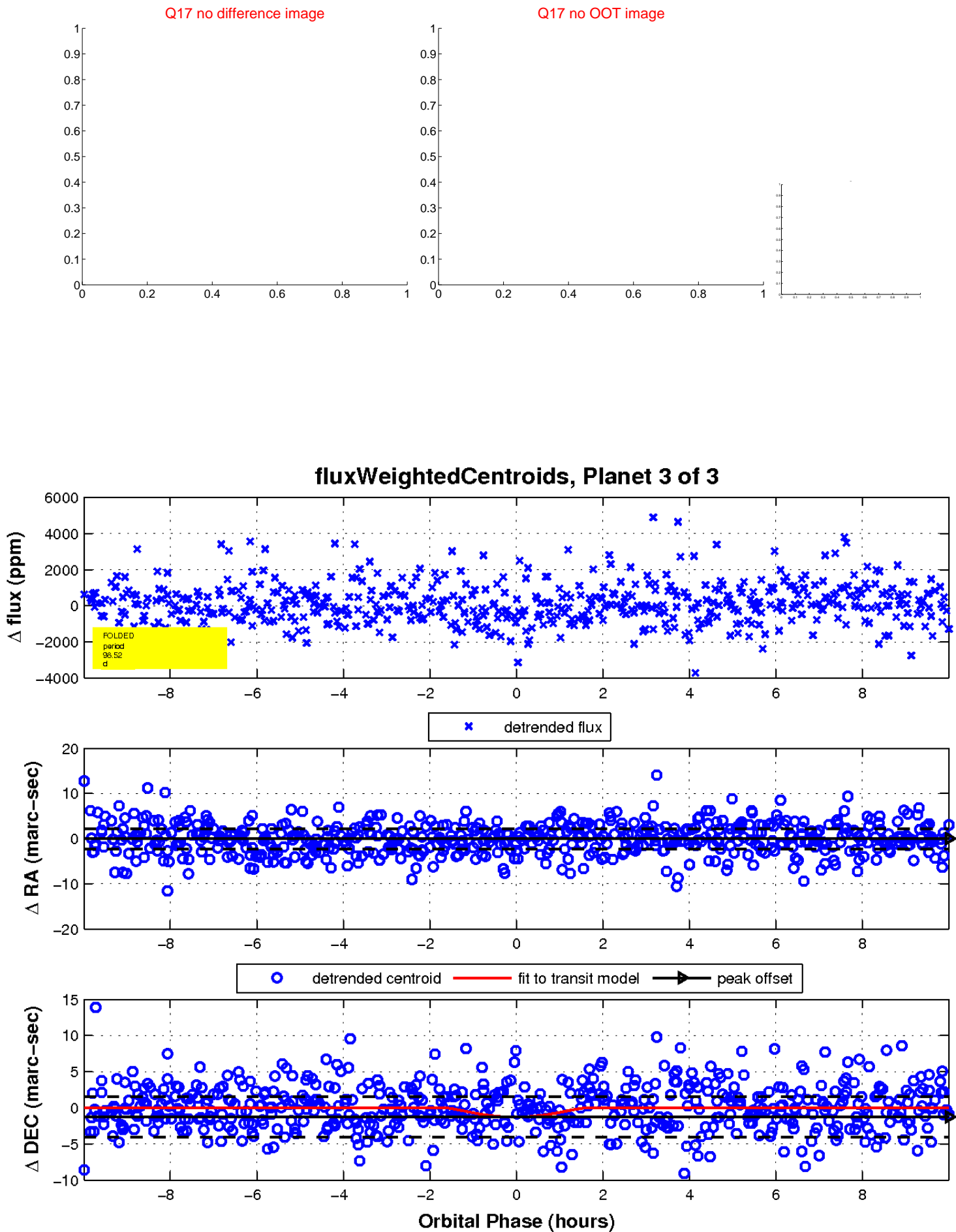
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

