

KIC 005990915

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})
005990915-01	OBS	No	2.725507	131.732828	57.8	10.575	9.0	6.6	2.81	7302	2.52	9781.02
005990915-02	OBS	No	292.973874	205.999266	494.2	5.091	14.6	3.5	2.81	7302	11.90	19.14
005990915-03	OBS	No	241.878528	231.245110	1105.9	5.591	12.1	9.2	2.81	7302	17.42	24.71
005990915-04	OBS	No	400.689034	467.822214	6825.9	27.073	10.5	12.6	2.81	7302	41.12	12.61

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005990915-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
005990915-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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—INCONSISTENT_TRANS
005990915-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT— MOD_POS_ALT
005990915-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—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.

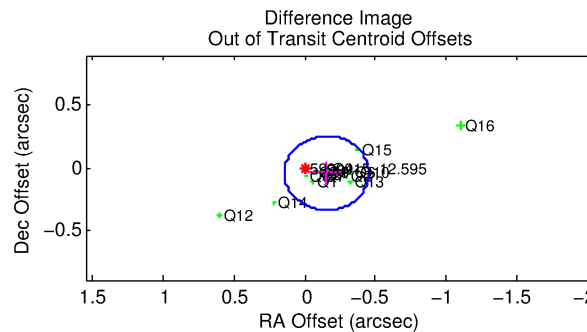
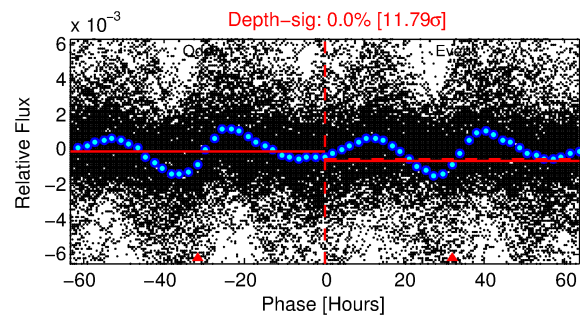
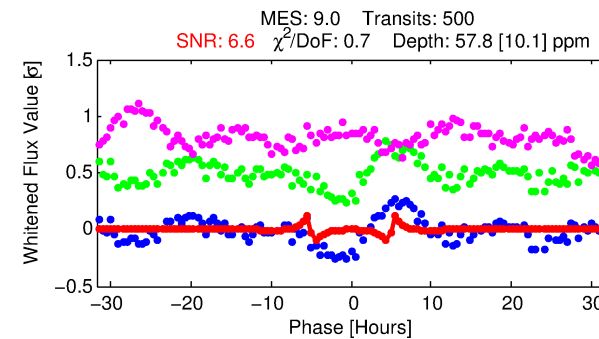
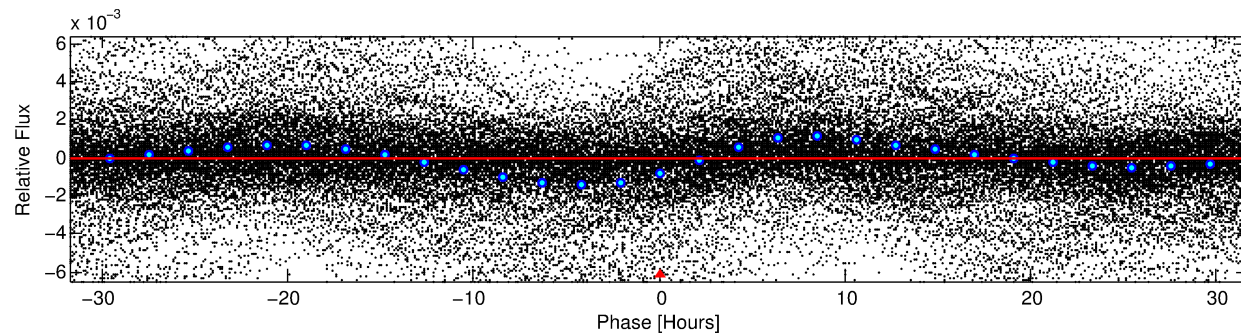
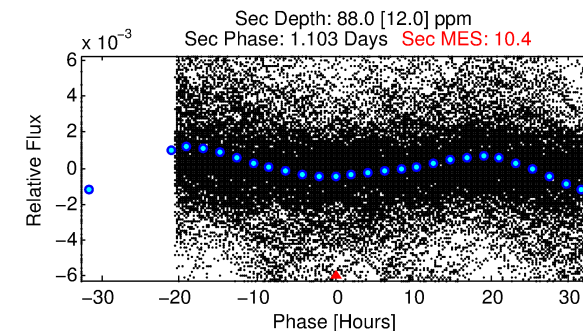
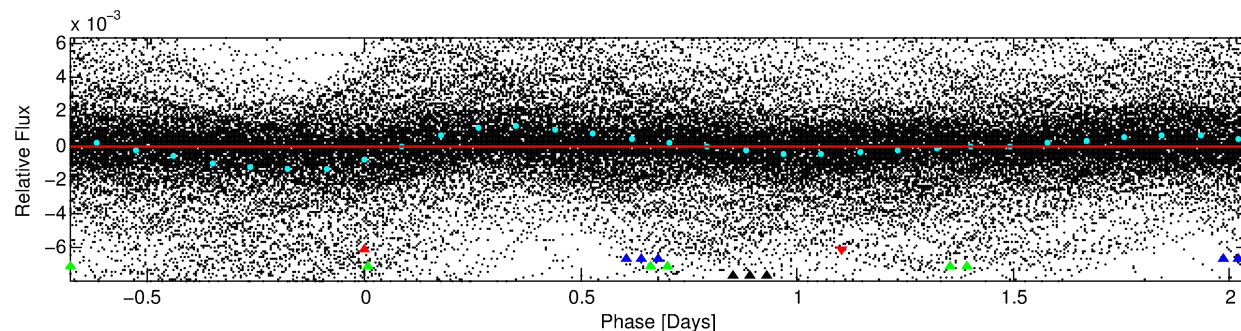
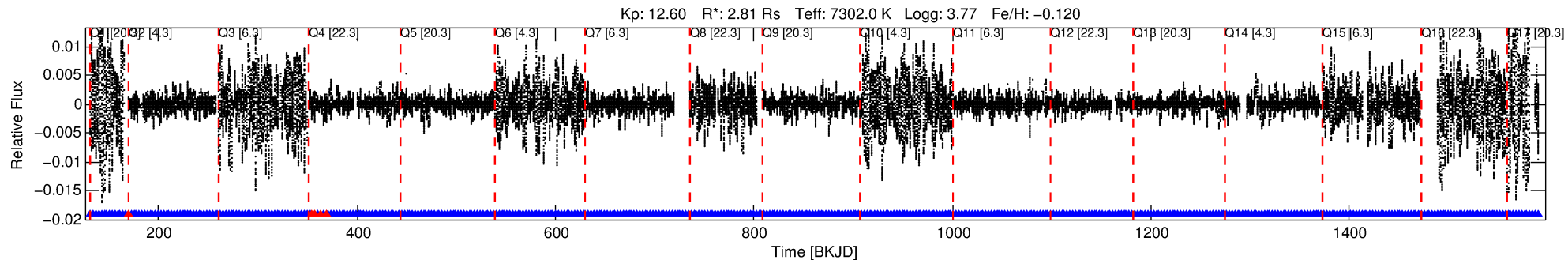
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005990915-01

No Significant Match Found

DV One-Page Summary

KIC: 5990915 Candidate: 1 of 4 Period: 2.726 d



DV Fit Results:

Period = 2.72551 [0.00002] d
Epoch = 131.7328 [0.0029] BKJD
Rp/R* = 0.0082 [0.0009]
a/R* = 1.26 [0.13]
b = 0.91 [0.05]
Seff = 9781.02 [7058.45]
Teq = 2536 [457] K
Rp = 2.52 [1.08] Re
a = 0.0454 [0.0192] AU
Ag = 15.76 [11.66] [1.27σ]
Teff = 7812 [617] K [6.87σ]

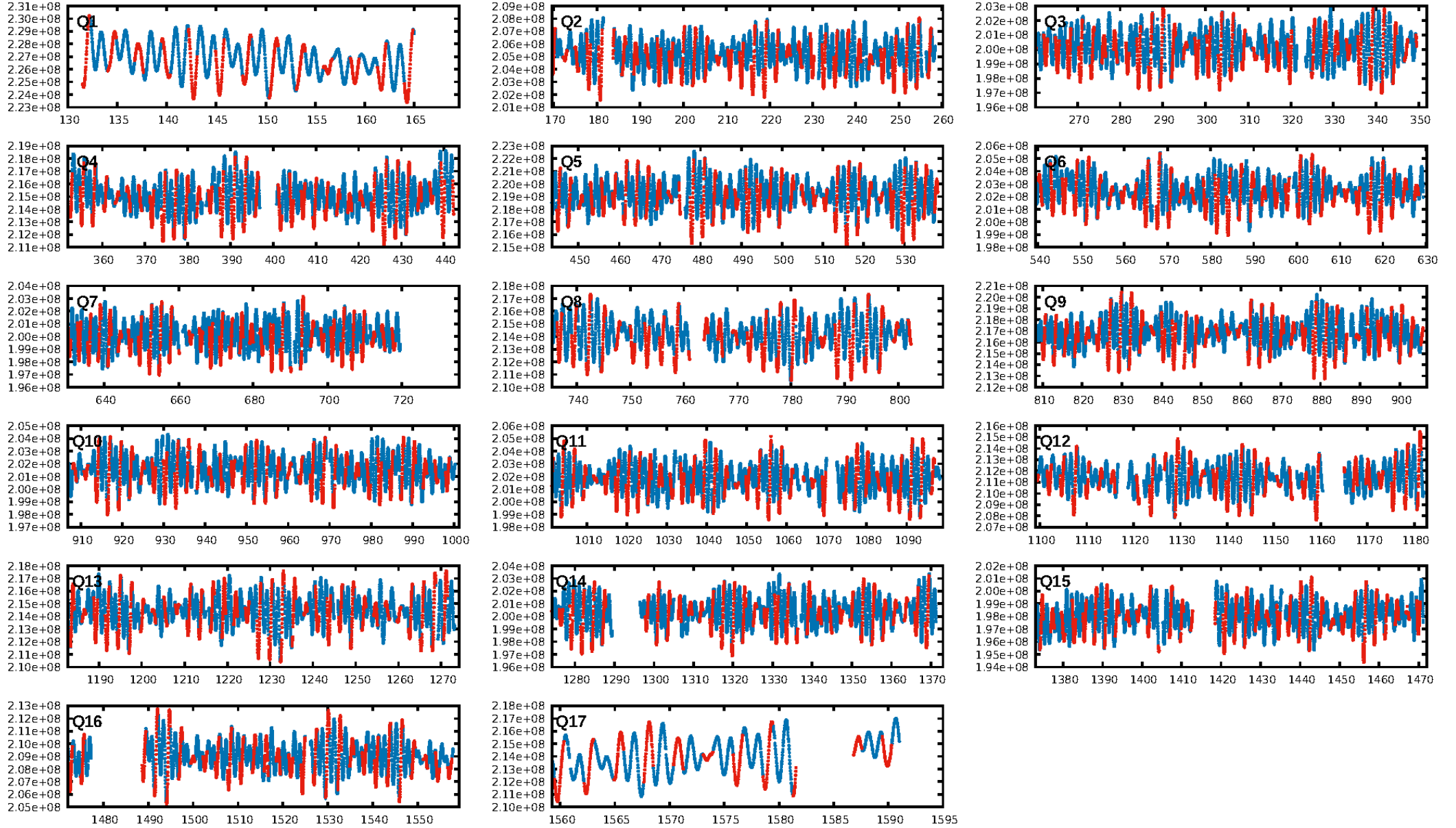
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [479.84σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.18e-14
RollingBand-fgt: 0.99 [471/476]
GhostDiagnostic-chr: 0.2918
Centroid-sig: 0.0%
Centroid-so: 3.044 arcsec [4.37σ]
OotOffset-rm: 0.160 arcsec [1.61σ]
KicOffset-rm: 0.041 arcsec [0.38σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [17/17]

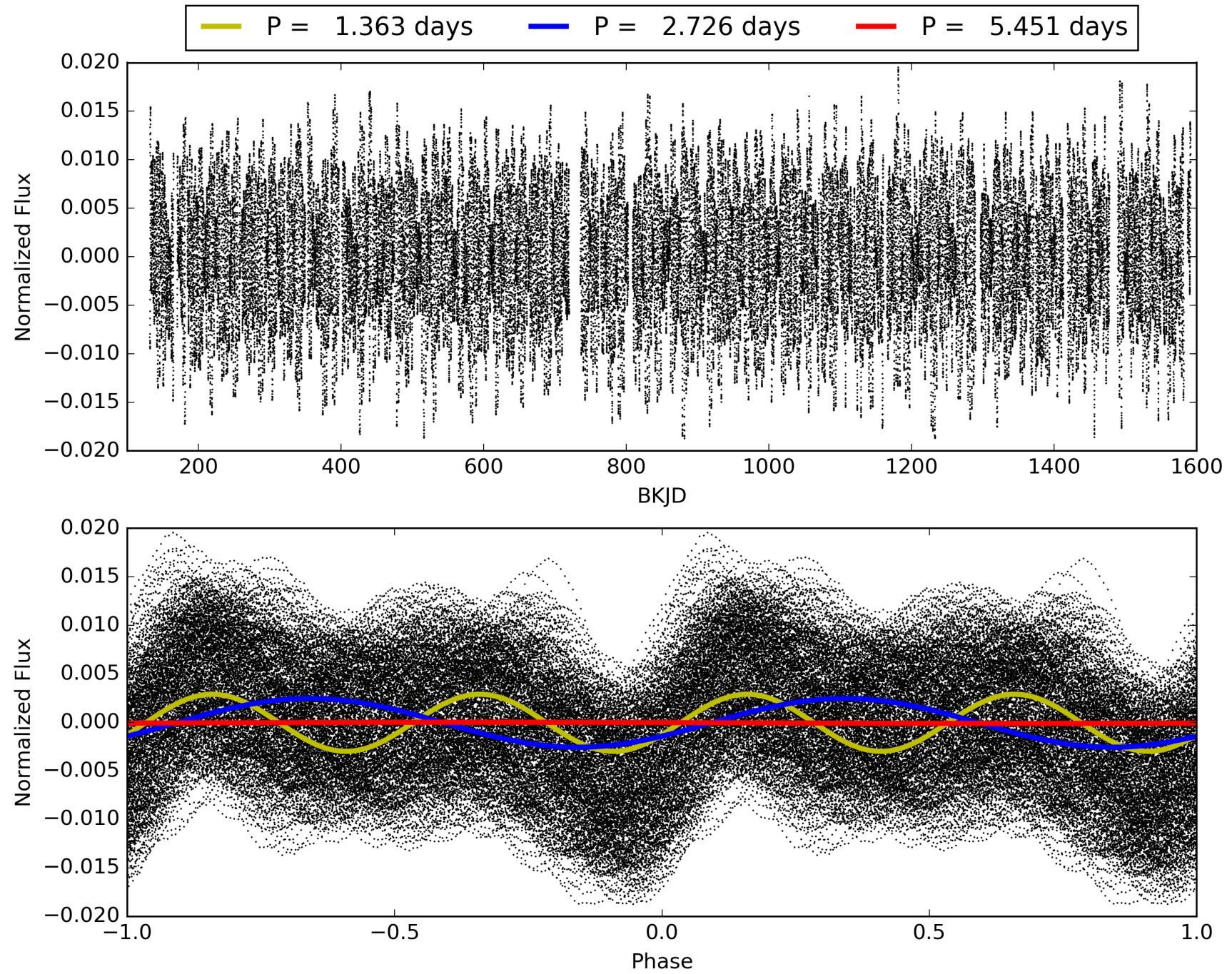
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:13:49 Z

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

TCE 005990915-01, PDC Light Curves

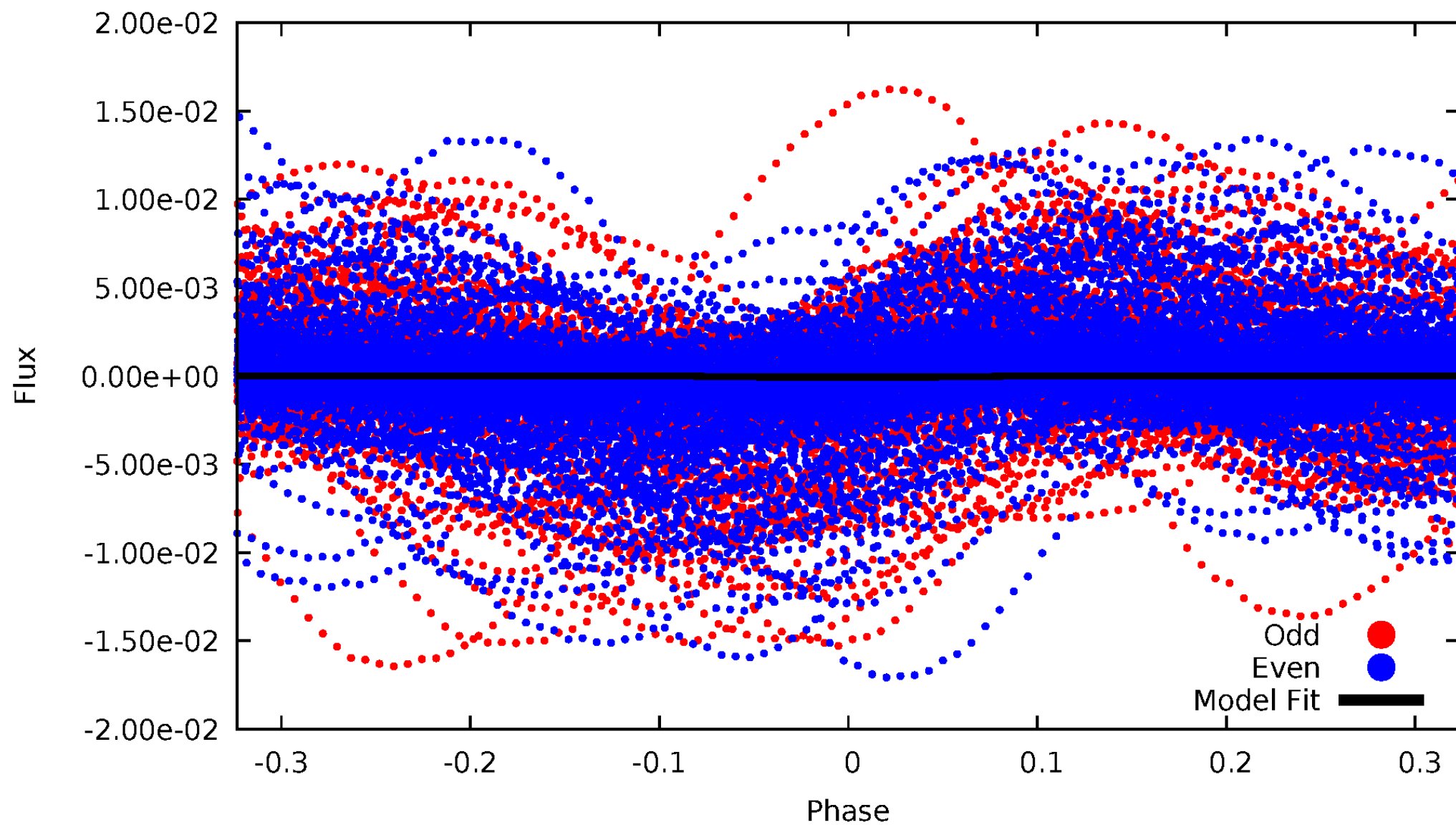


TCE 005990915-01



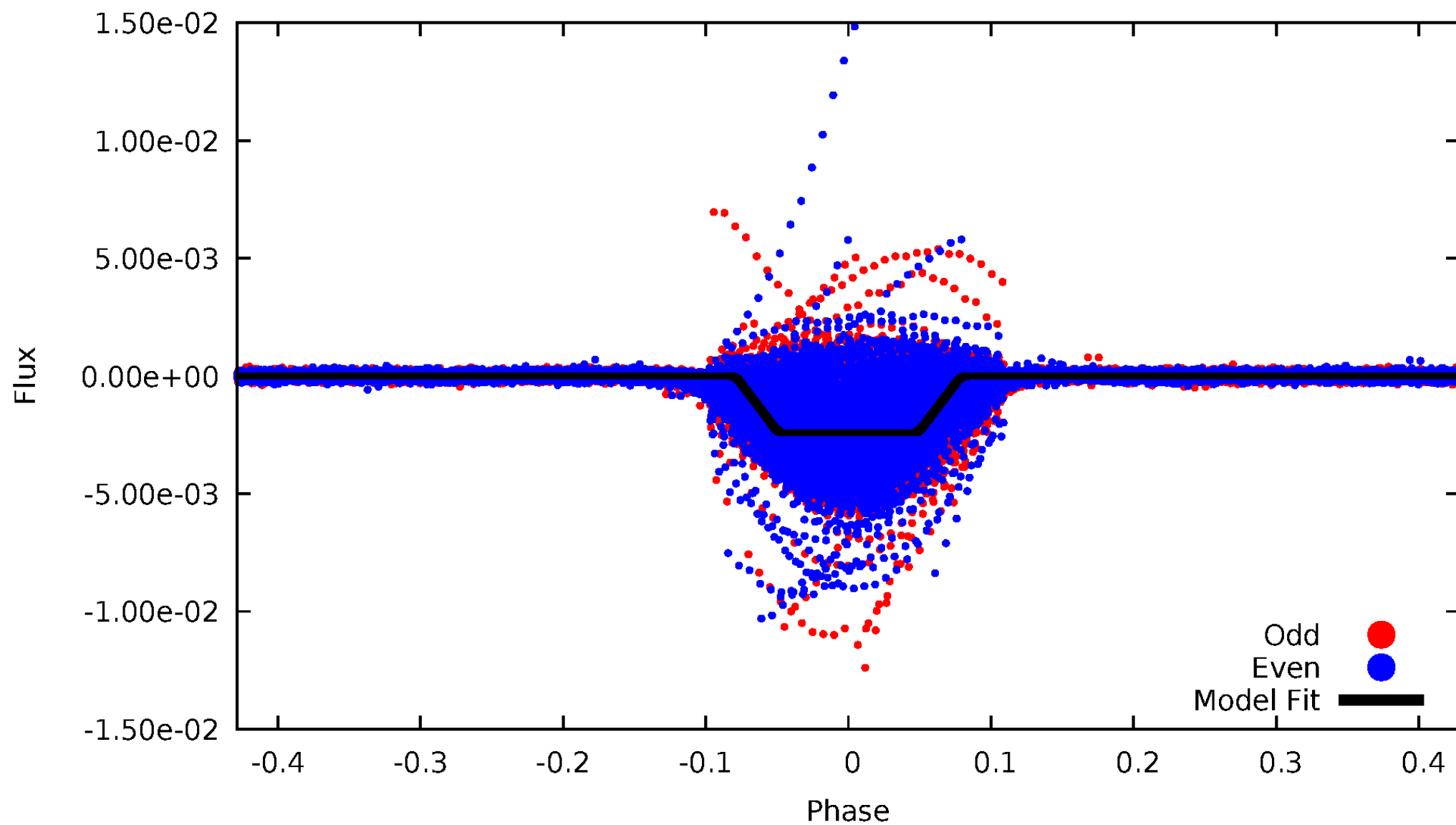
DV Odd/Even

TCE 005990915-01



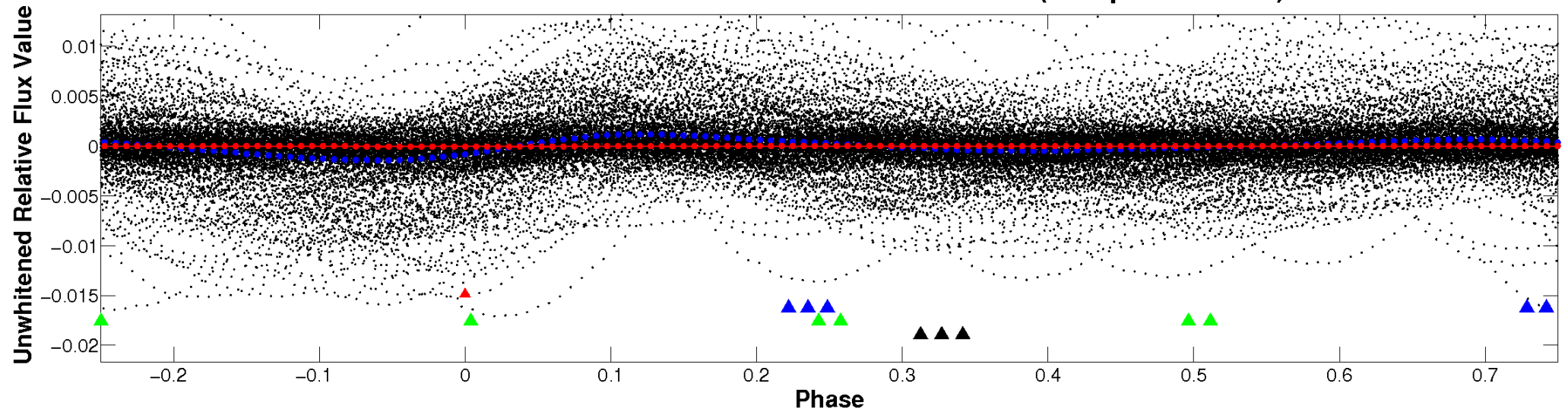
ALT Odd/Even

TCE 005990915-01

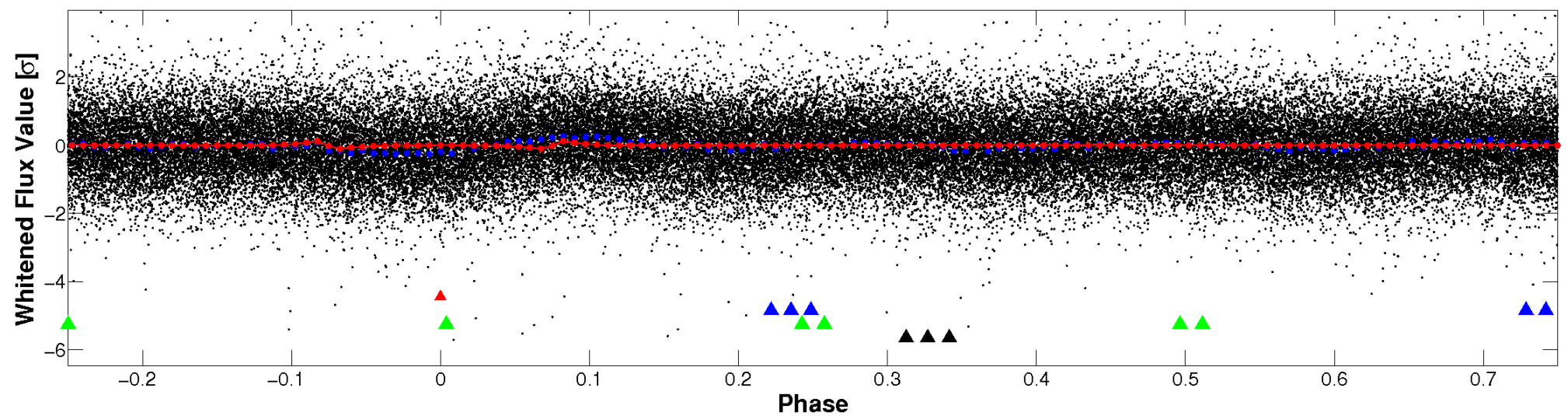


Non-Whitened Vs. Whitened Light Curve

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

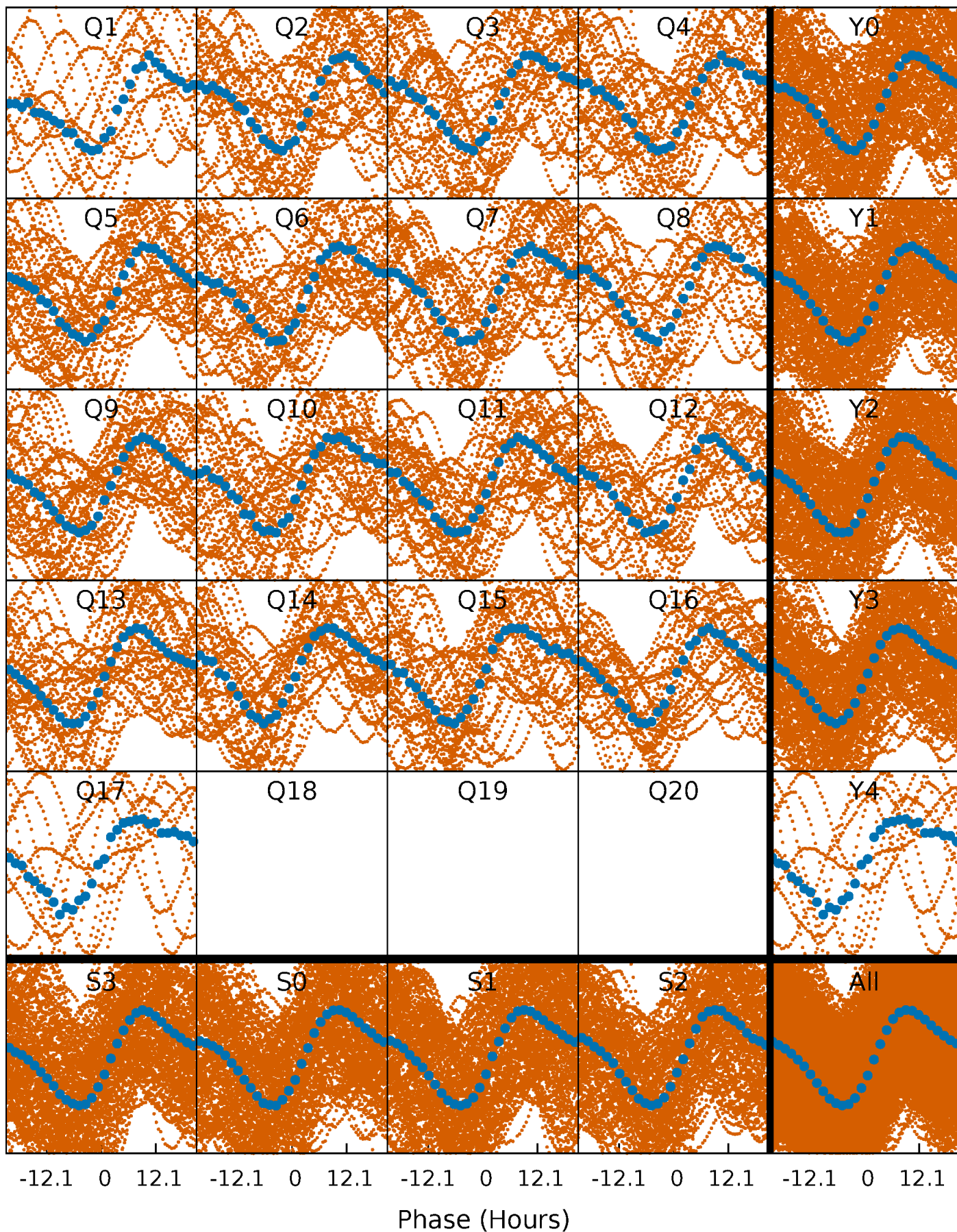


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



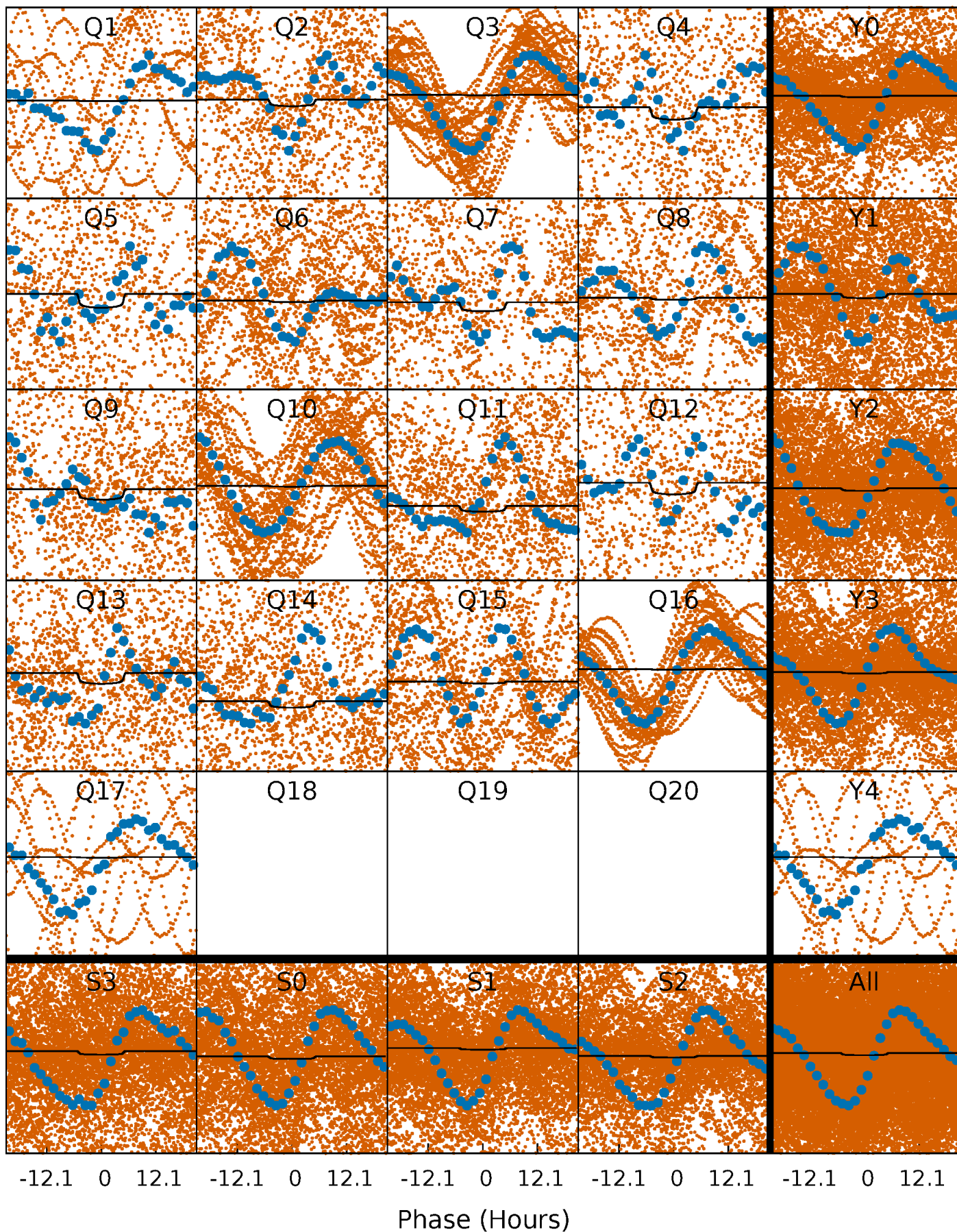
PDC Quarter-Phased Transit Curves

TCE 005990915-01 P= 2.725507 Days $T_0=131.732829$ (BKJD)



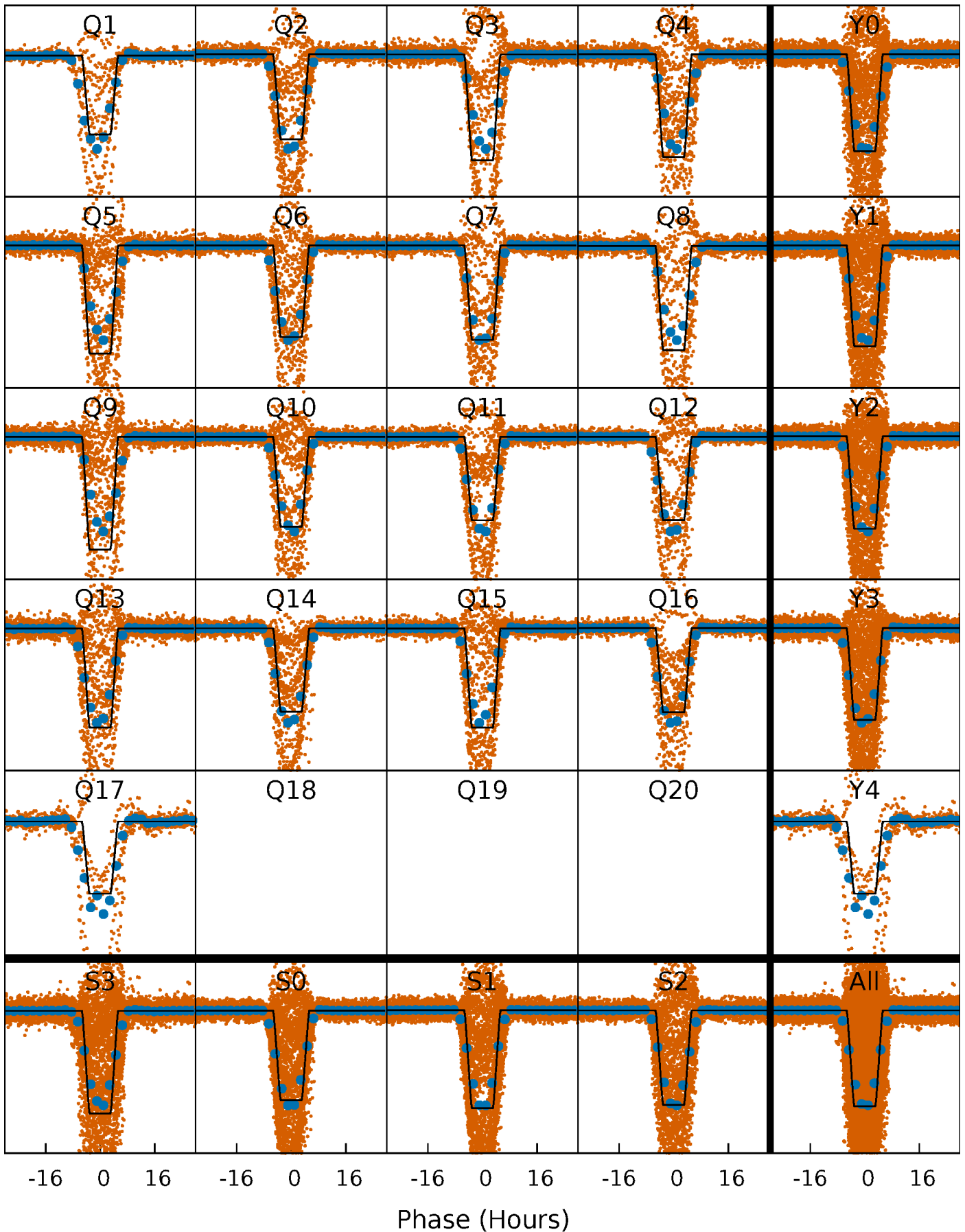
DV Quarter-Phased Transit Curves

TCE 005990915-01 P= 2.725507 Days $T_0=131.732829$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

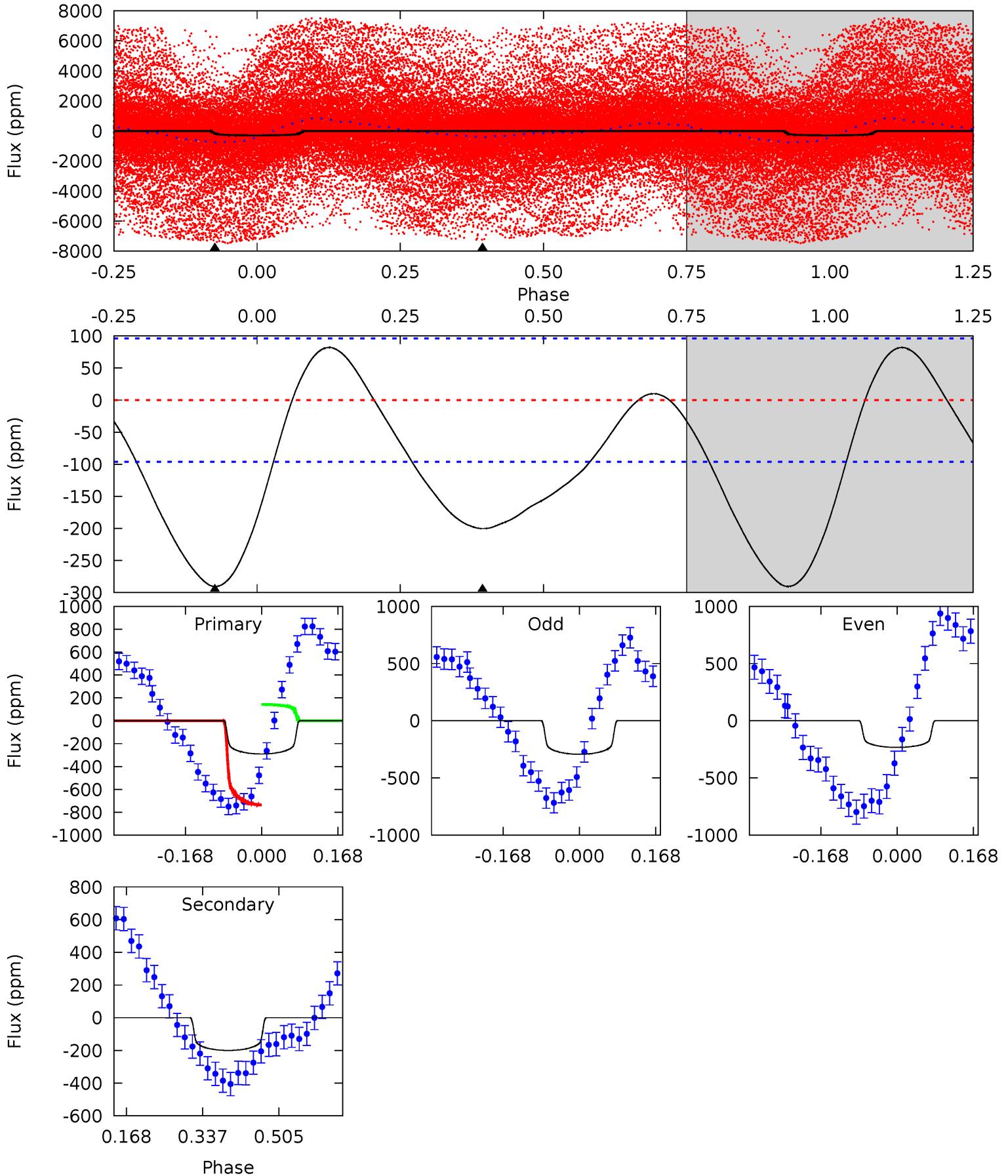
TCE 005990915-01 P= 2.725200 Days $T_0=131.741682$ (BKJD)



DV Model-Shift Uniqueness Test

005990915-01, P = 2.725507 Days, E = 129.007322 Days

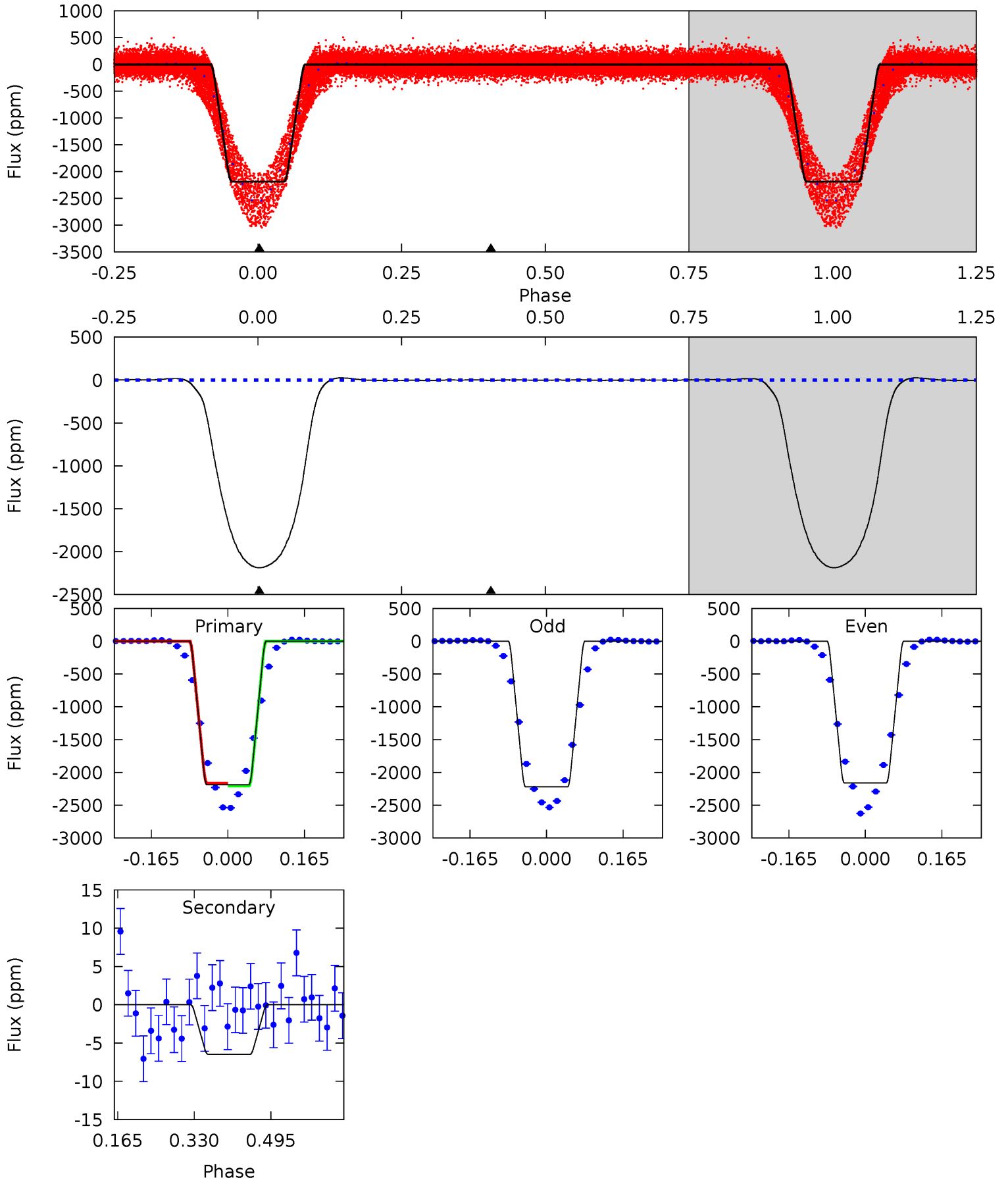
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.5	9.28	0	0	4.45	1.38	2.46	13.5	13.5	9.28	9.28	1.41	5.16	0.22	13.6



Alt Model-Shift Uniqueness Test

005990915-01, P = 2.725200 Days, E = 129.016482 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1140	3.37	0	0	4.46	1.39	1.83	1140	1140	3.37	3.37	15.5	1.00	0.01	0



Stellar Parameters For KIC 005990915

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7302^{+232}_{-348}	$3.765^{+0.416}_{-0.098}$	$-0.120^{+0.250}_{-0.350}$	$2.815^{+0.501}_{-1.169}$	$1.682^{+0.184}_{-0.342}$	$0.106^{+0.368}_{-0.033}$
	+3%/-5%	+11%/-3%	+208%/-292%	+18%/-42%	+11%/-20%	+346%/-31%
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 005990915-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-200 ± 22	$2.31^{+0.48}_{-0.52}$	3398^{+277}_{-378}	10356^{+1219}_{-1013}	43^{+26}_{-13}
Alt.	-6 ± 2	$14.51^{+1.76}_{-3.24}$	3414^{+251}_{-362}	-3252^{+232}_{-155}	$0.036^{+0.024}_{-0.013}$

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

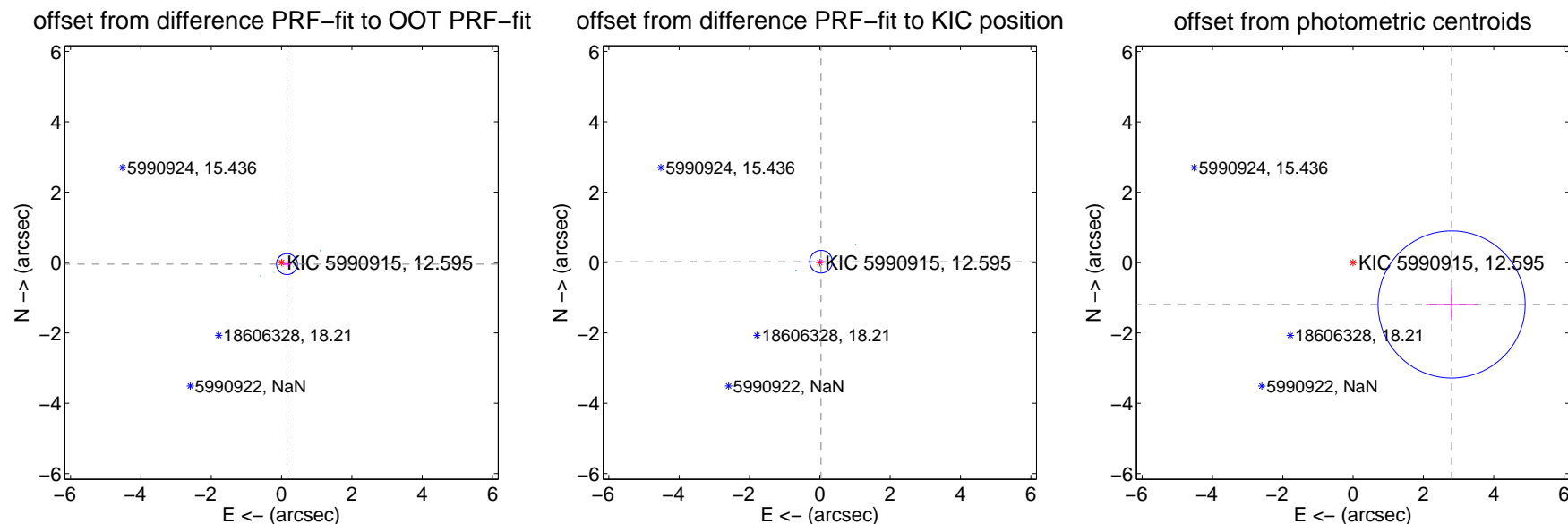
DV Centroid Data

Supplemental centroid analysis for 005990915-01. Kepler magnitude: 12.60. Transit SNR 6.59

There are 16 quarters with good PRF difference image offsets

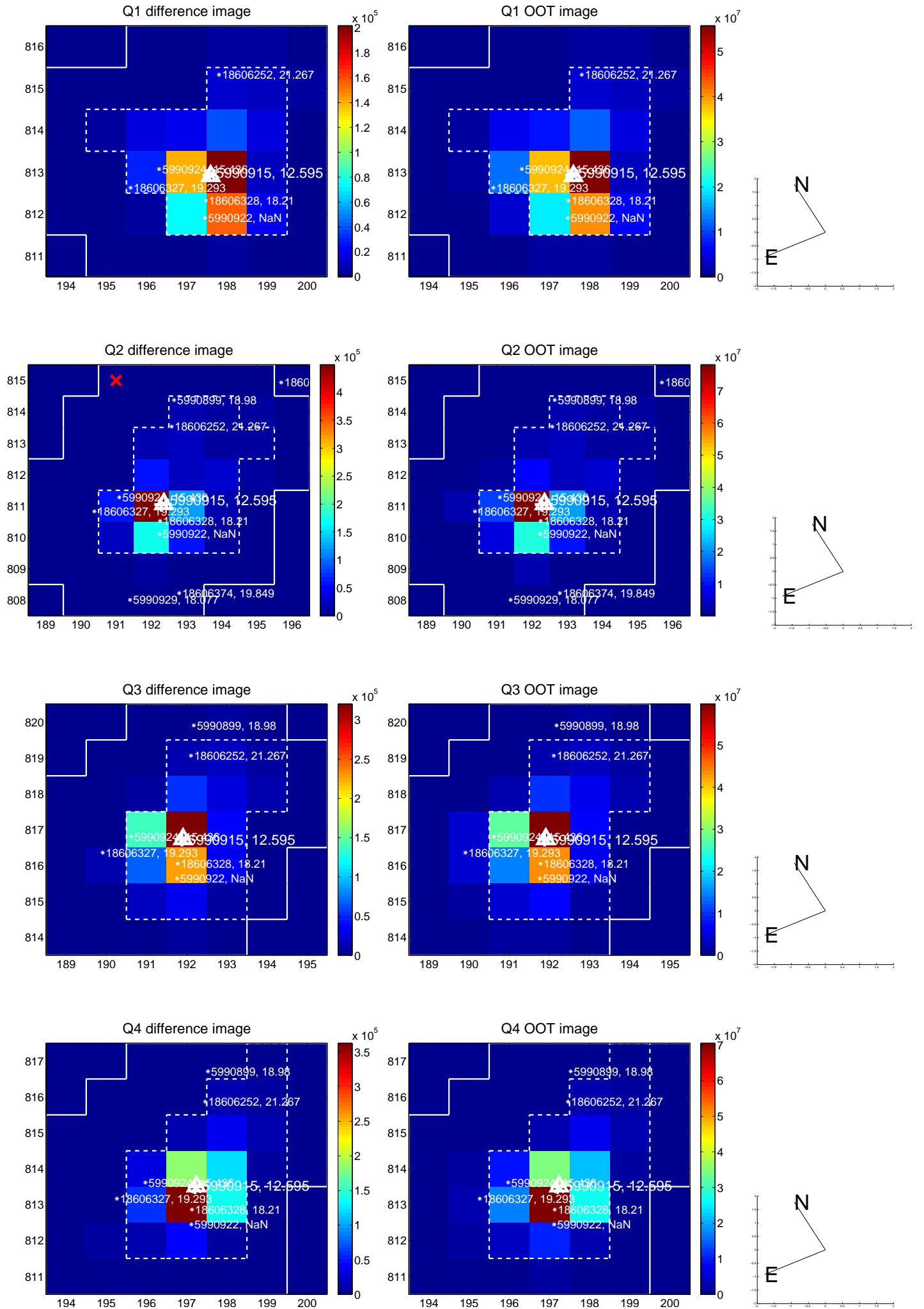
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.160 ± 0.099	1.61	-0.153 ± 0.109	-0.044 ± 0.077
PRF-fit source offset from KIC position	0.041 ± 0.107	0.38	-0.033 ± 0.103	0.025 ± 0.077
photometric centroid source offset	3.04 ± 0.70	4.37	-2.80 ± 0.73	-1.19 ± 0.45

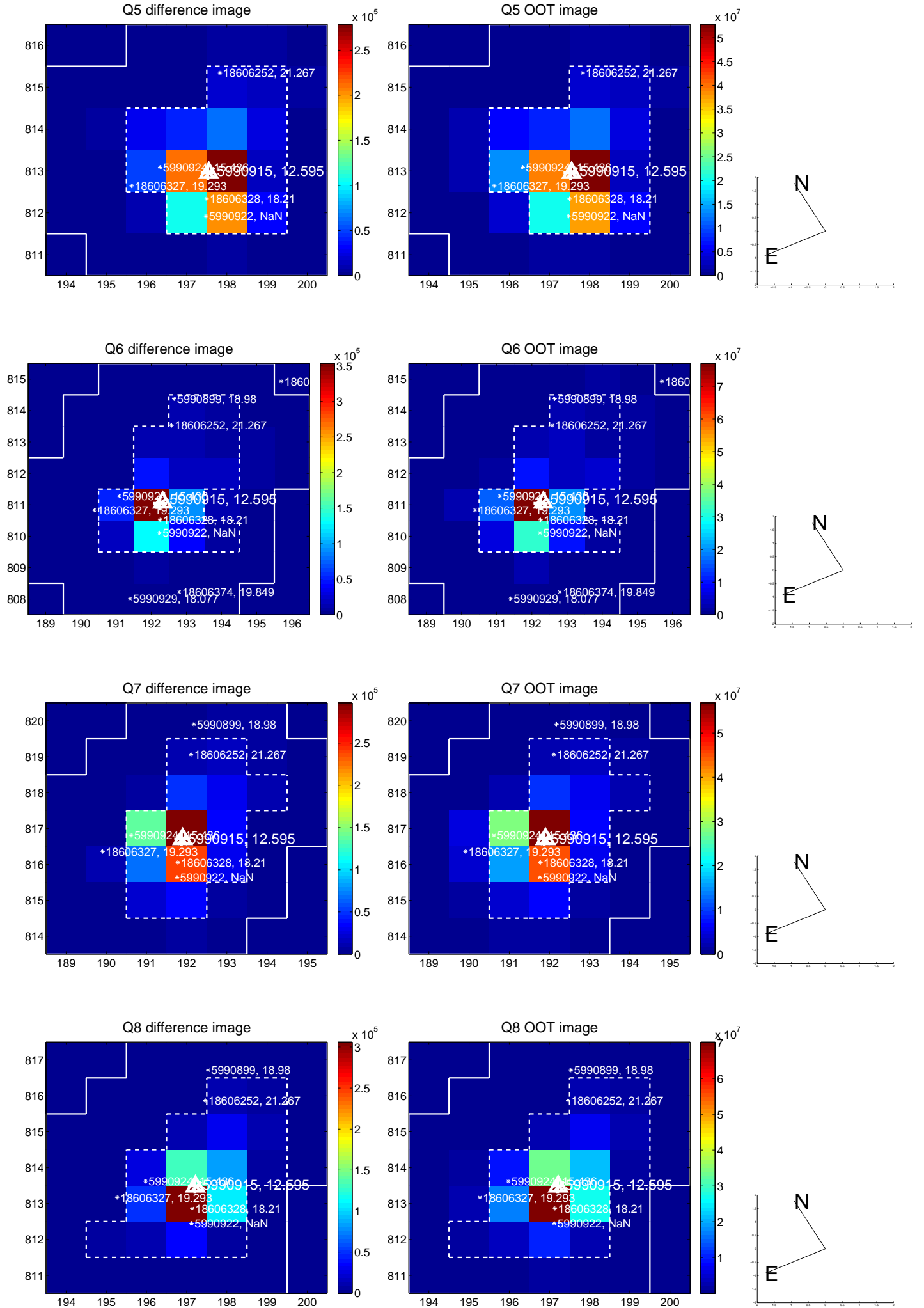


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

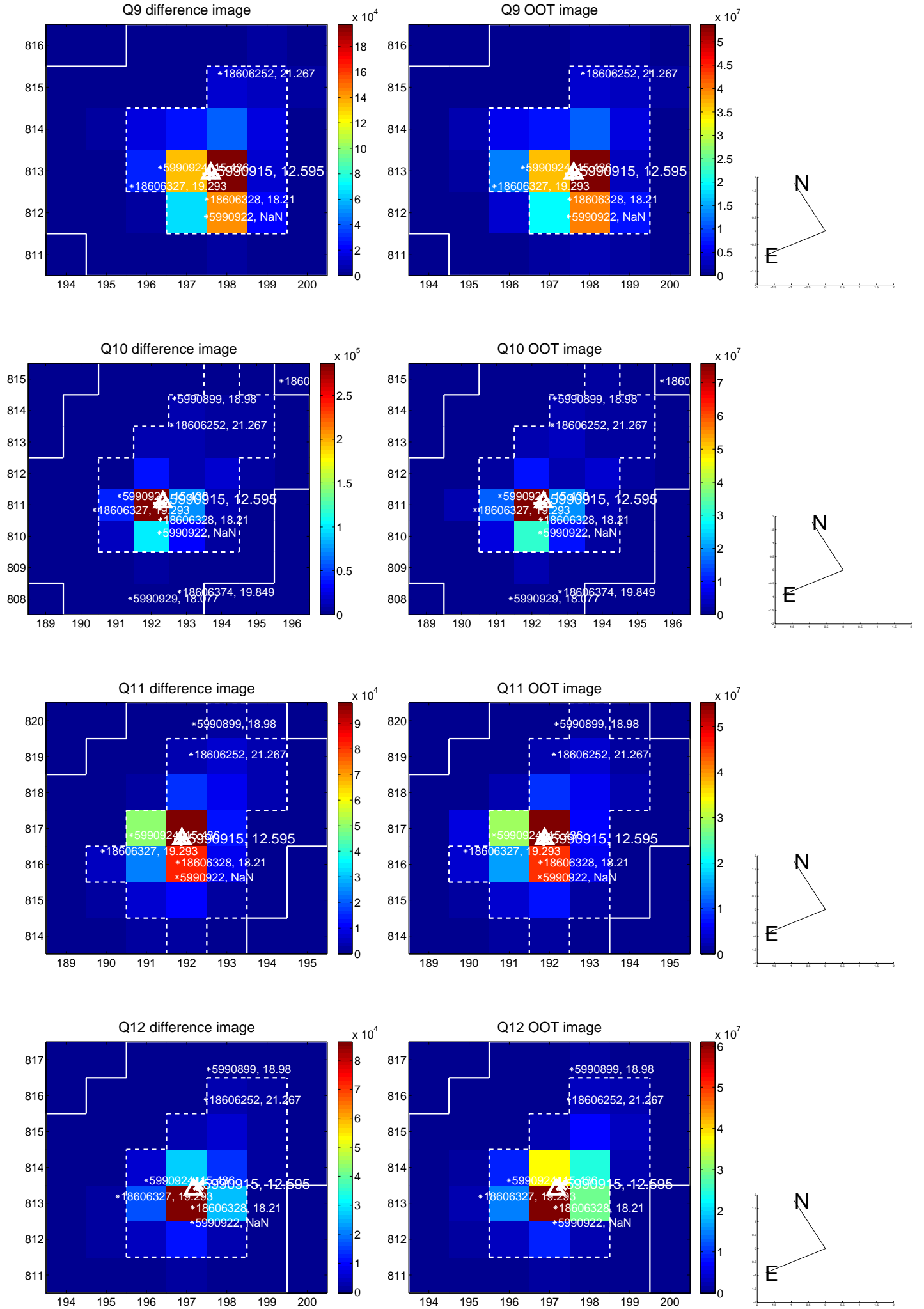
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



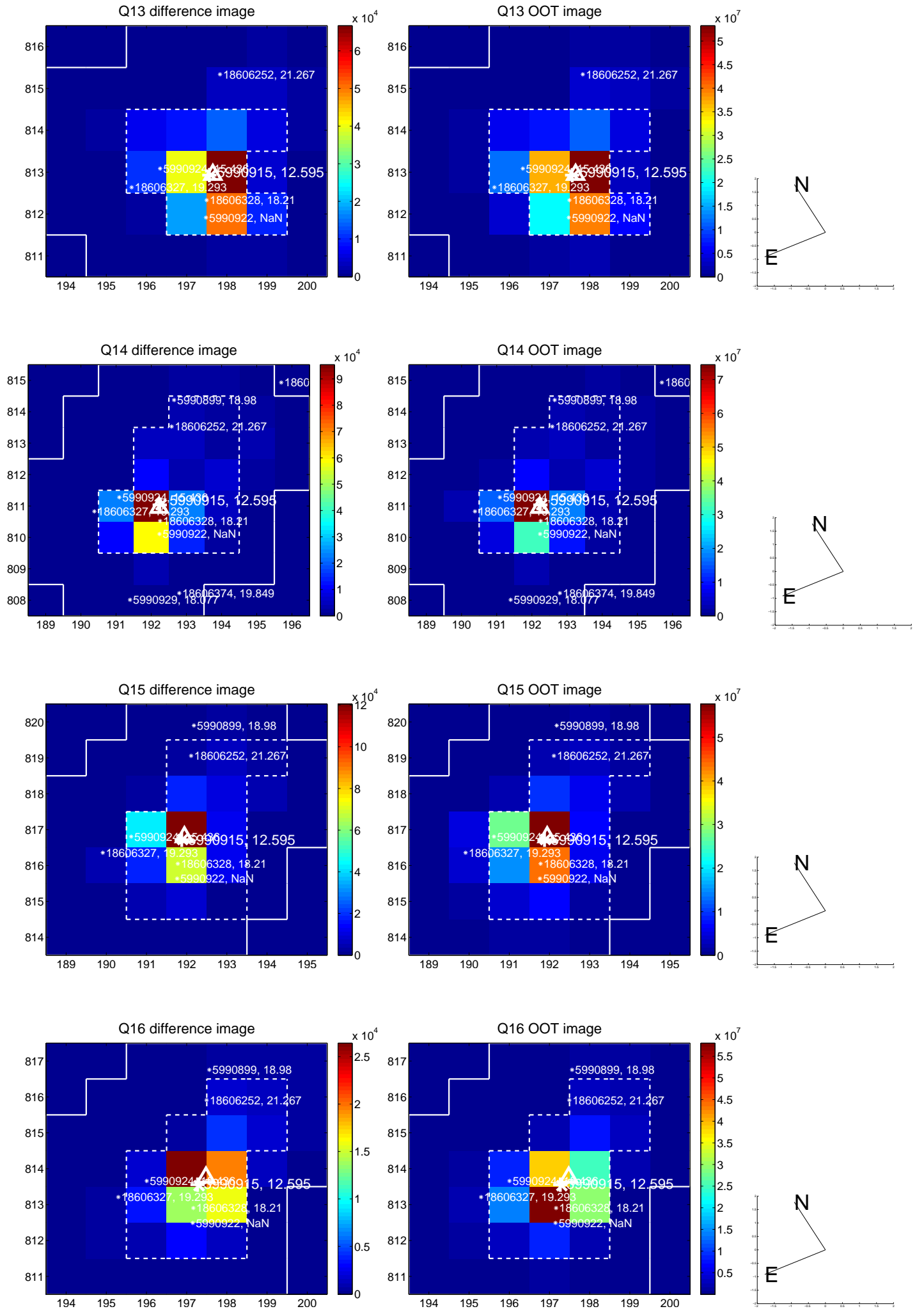
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



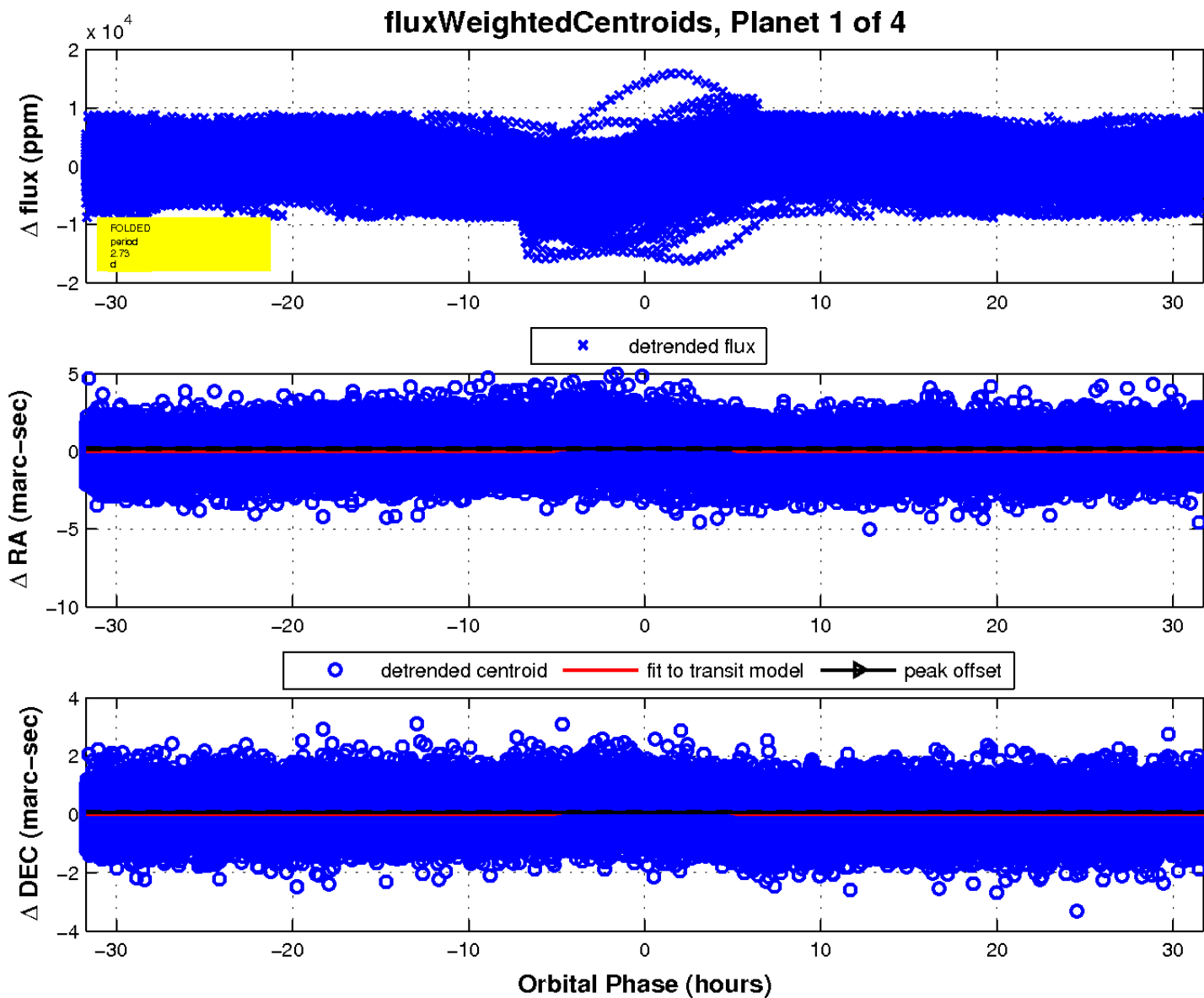
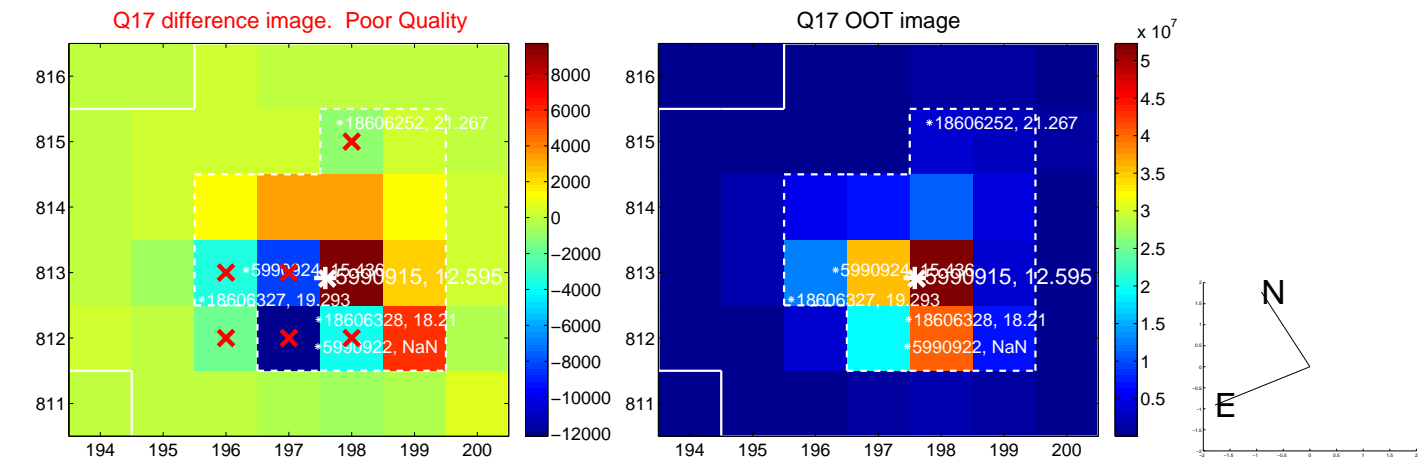
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

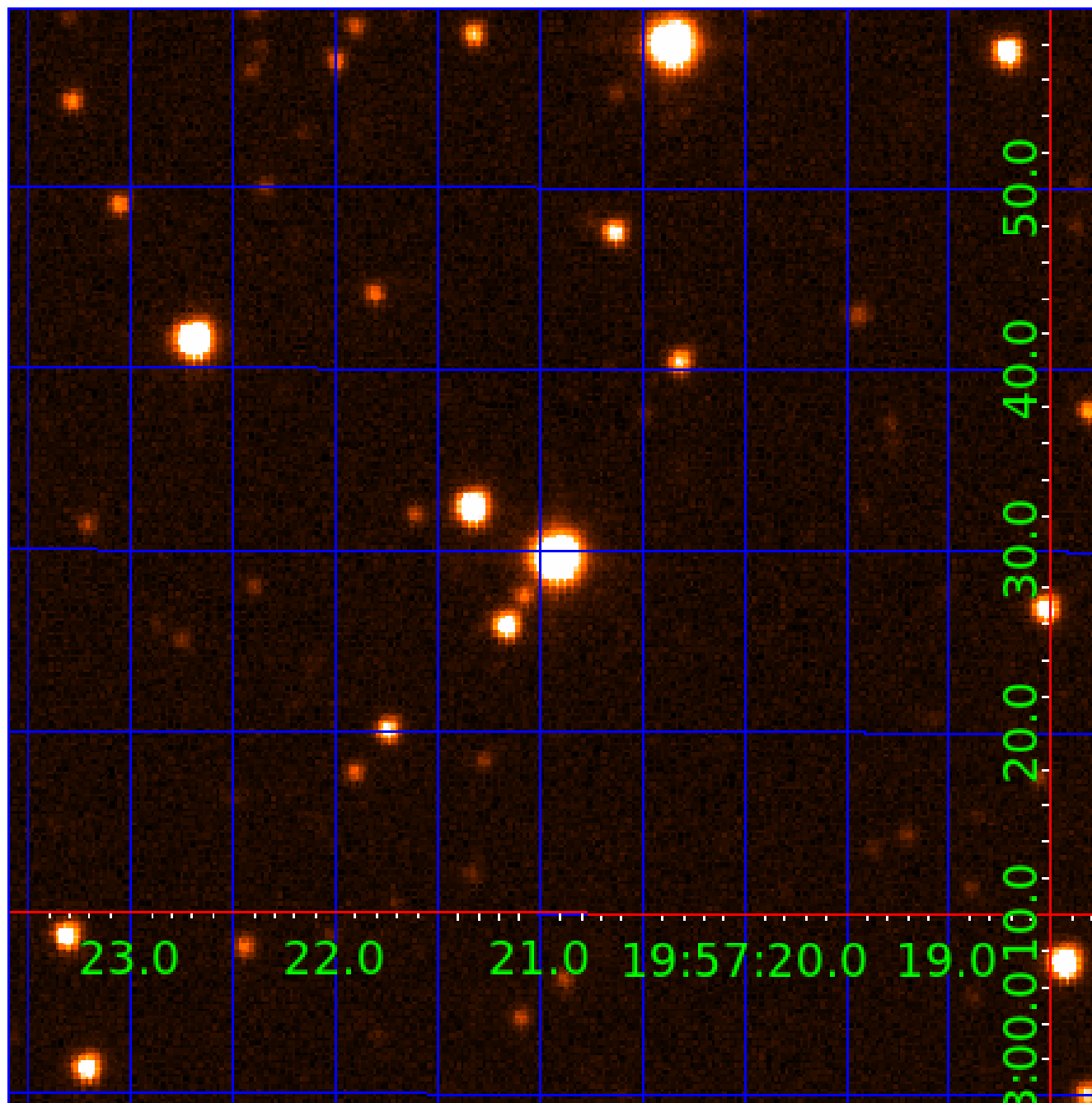


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005990915

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})
005990915-01	OBS	No	2.725507	131.732828	57.8	10.575	9.0	6.6	2.81	7302	2.52	9781.02
005990915-02	OBS	No	292.973874	205.999266	494.2	5.091	14.6	3.5	2.81	7302	11.90	19.14
005990915-03	OBS	No	241.878528	231.245110	1105.9	5.591	12.1	9.2	2.81	7302	17.42	24.71
005990915-04	OBS	No	400.689034	467.822214	6825.9	27.073	10.5	12.6	2.81	7302	41.12	12.61

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005990915-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
005990915-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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—INCONSISTENT_TRANS
005990915-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT
005990915-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—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.

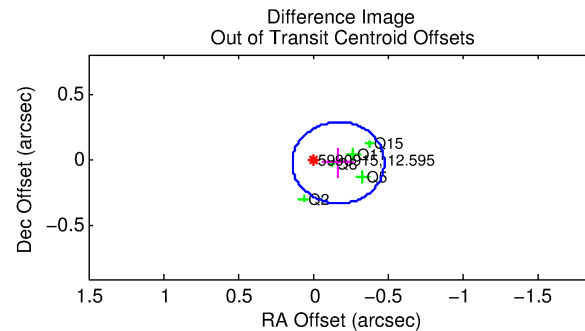
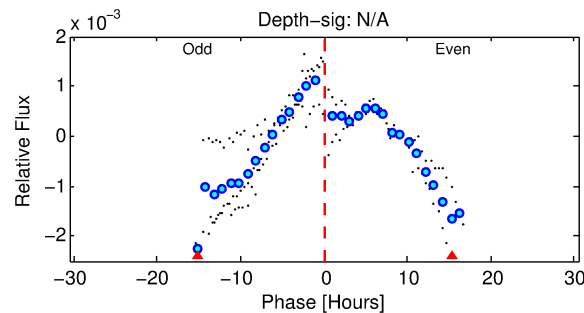
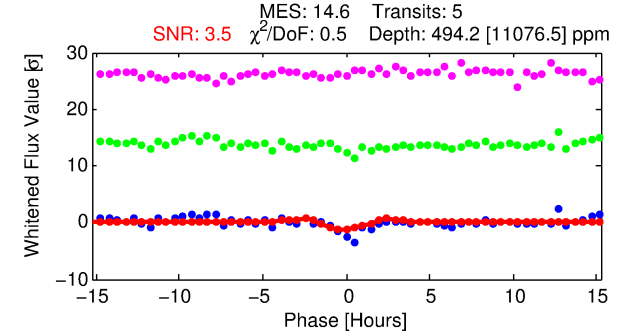
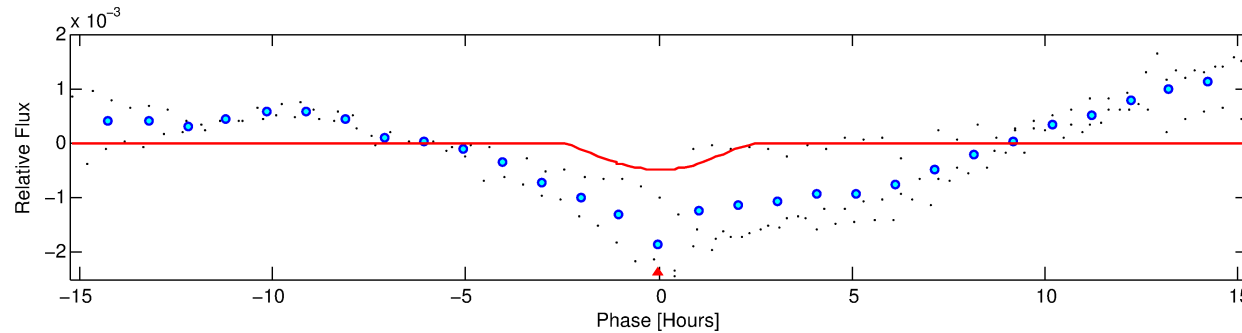
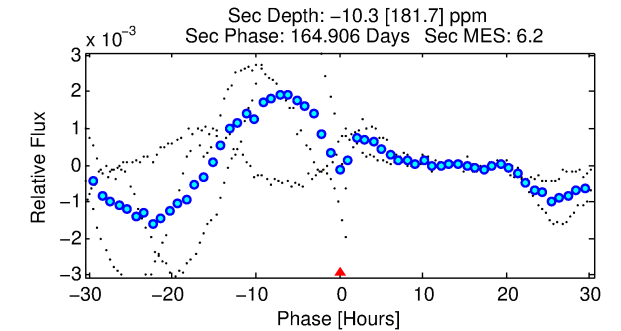
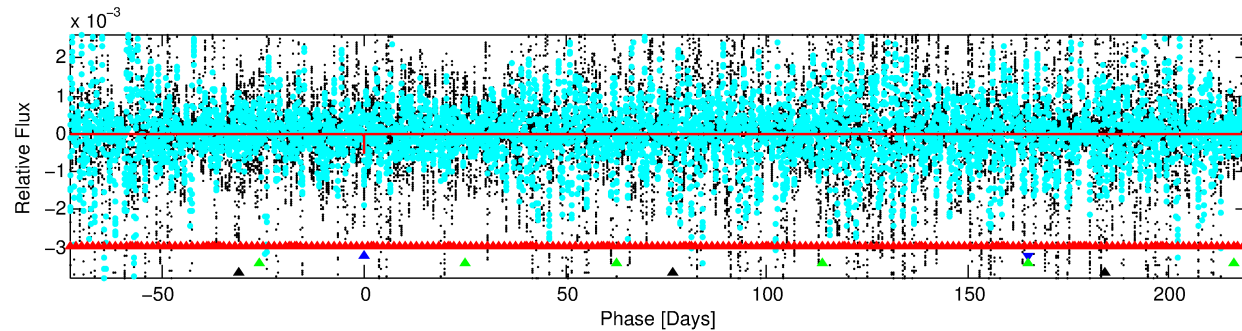
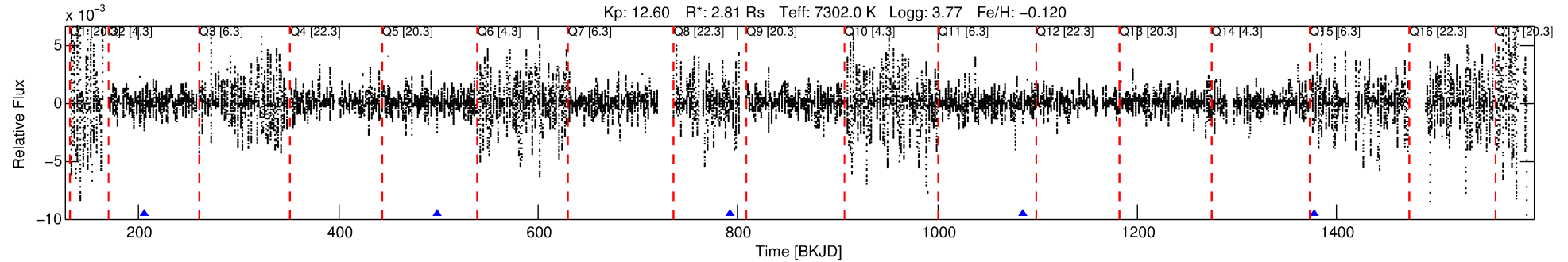
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005990915-02

No Significant Match Found

DV One-Page Summary

KIC: 5990915 Candidate: 2 of 4 Period: 292.974 d



DV Fit Results:

Period = 292.97387 [0.00626] d
Epoch = 205.9993 [0.0137] BKJD
Rp/R* = 0.0387 [0.1377]
a/R* = 123.57 [115.20]
b = 1.00 [0.80]
Seff = 19.14 [13.81]
Teq = 533 [96] K
Rp = 11.90 [42.60] Re
a = 1.0270 [0.4340] AU
Ag = N/A
Teffp = N/A

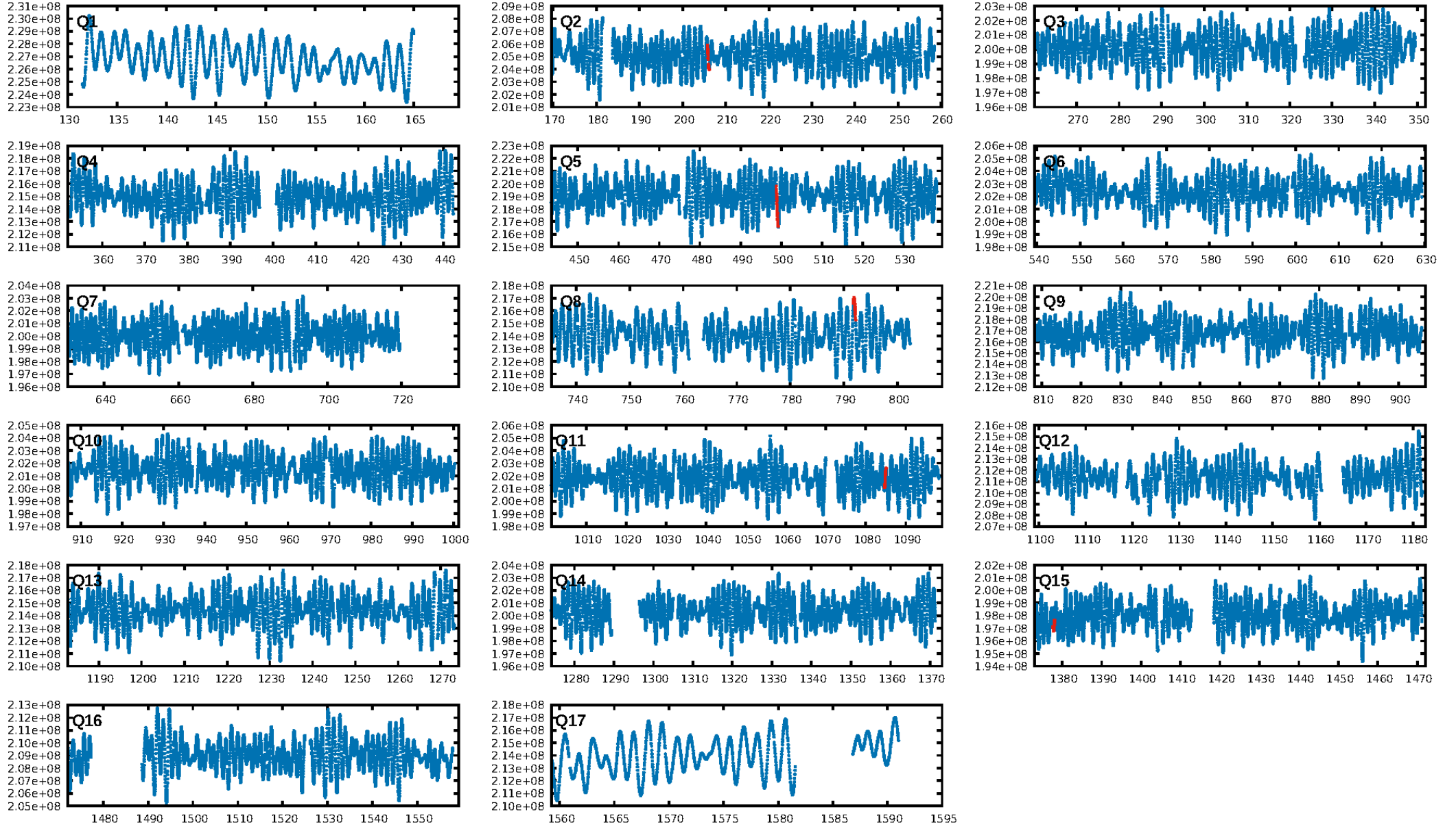
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [162.19 σ]
LongPeriod-sig: 100.0% [93.85 σ]
ModelChiSquare2-sig: 44.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.49e-15
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -0.532
Centroid-sig: 2.9%
Centroid-so: 1.213 arcsec [1.24 σ]
OotOffset-rm: 0.172 arcsec [1.68 σ]
KicOffset-rm: 0.083 arcsec [0.70 σ]
OotOffset-st: 1/2/1/1 [5]
KicOffset-st: 1/2/1/1 [5]
DiffImageQuality-fgm: 0.60 [3/5]
DiffImageOverlap-fno: 0.60 [3/5]

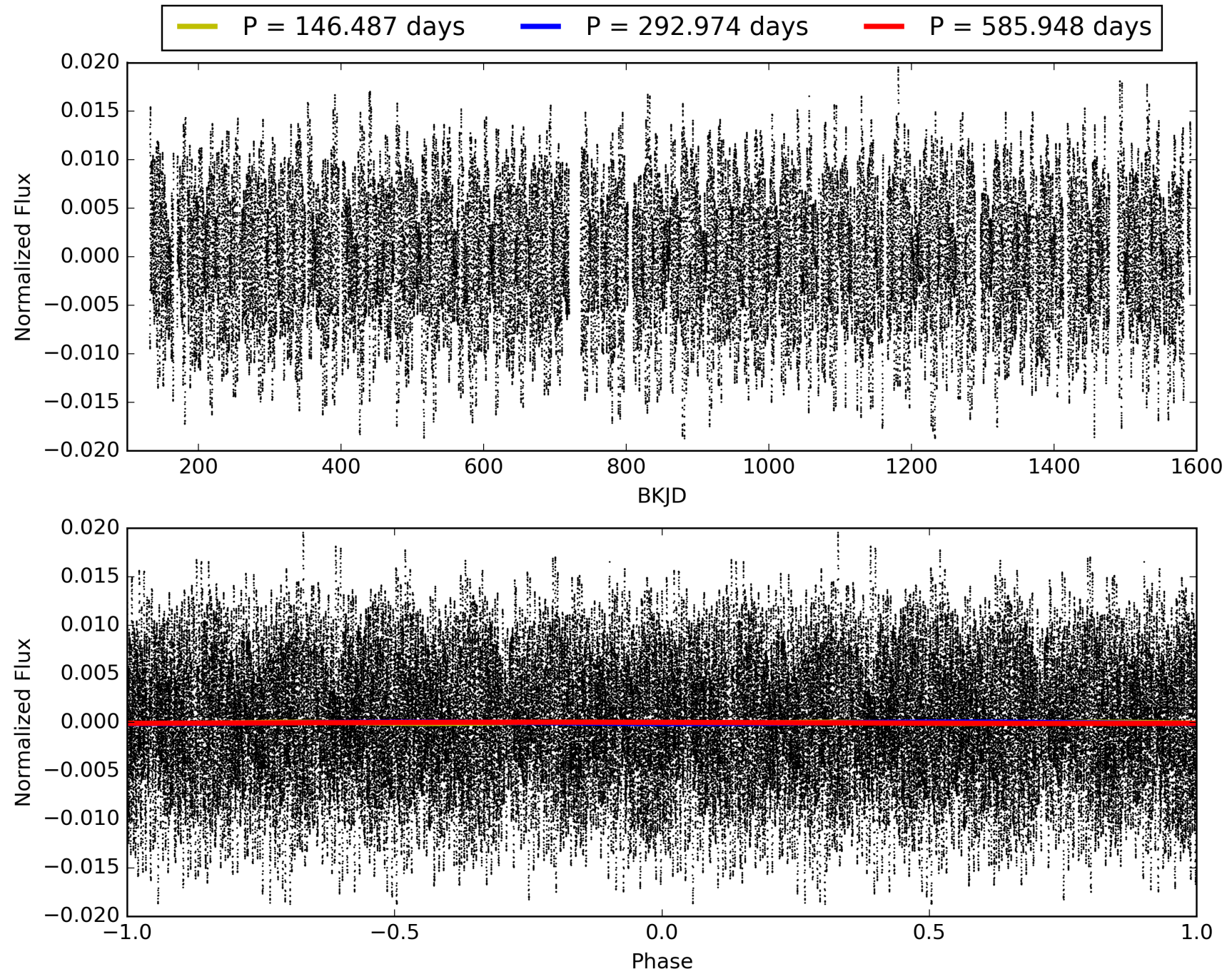
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:14:02 Z

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

TCE 005990915-02, PDC Light Curves

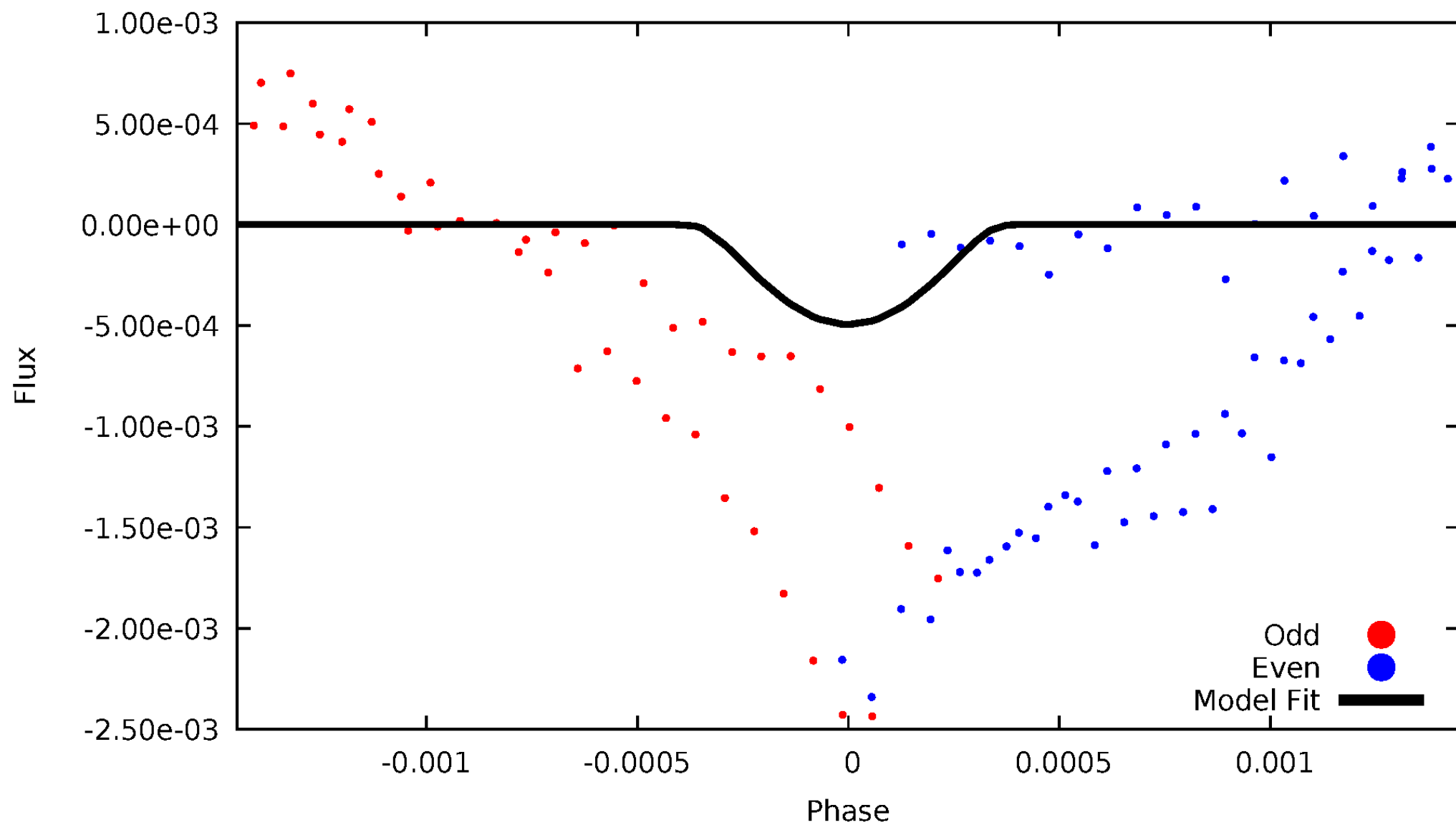


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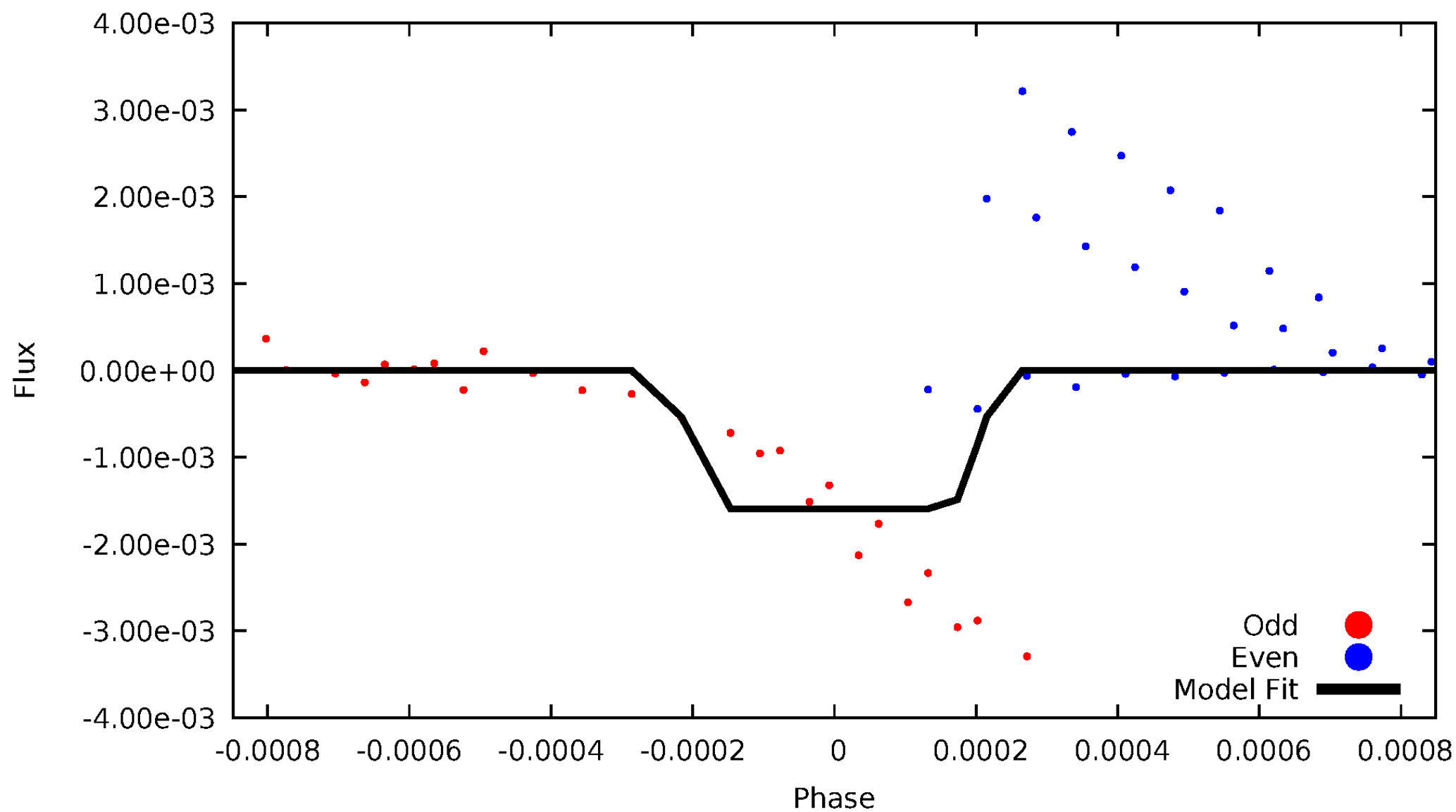
DV Odd/Even

TCE 005990915-02



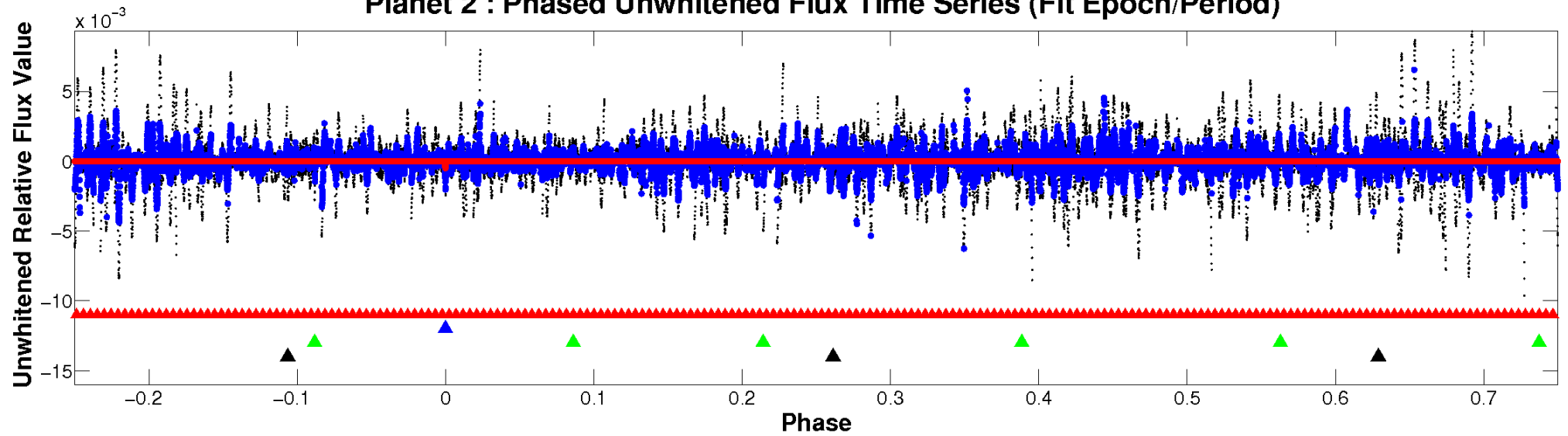
ALT Odd/Even

TCE 005990915-02

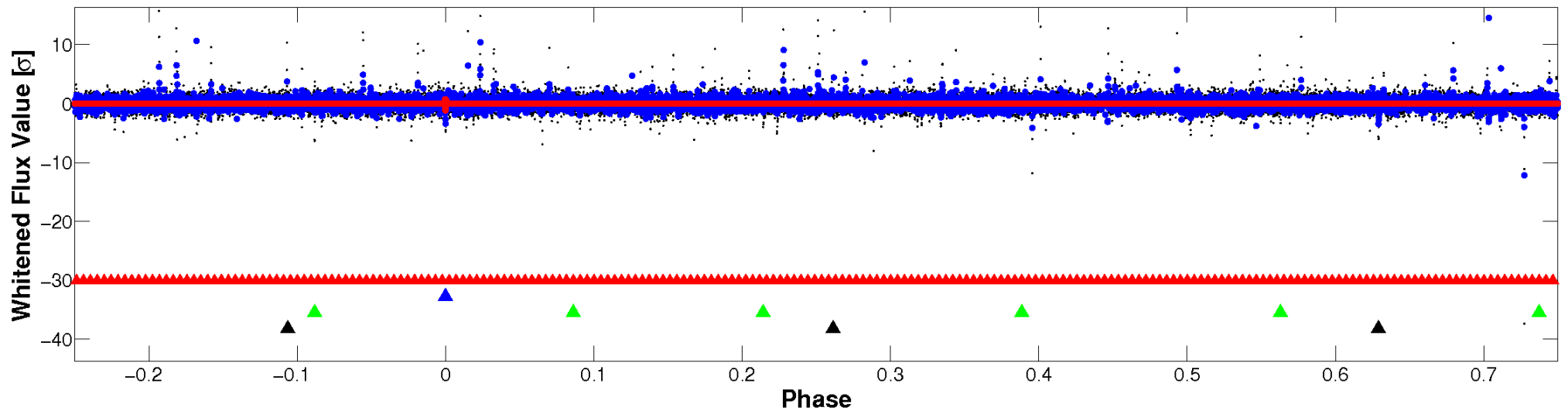


Non-Whitened Vs. Whitened Light Curve

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

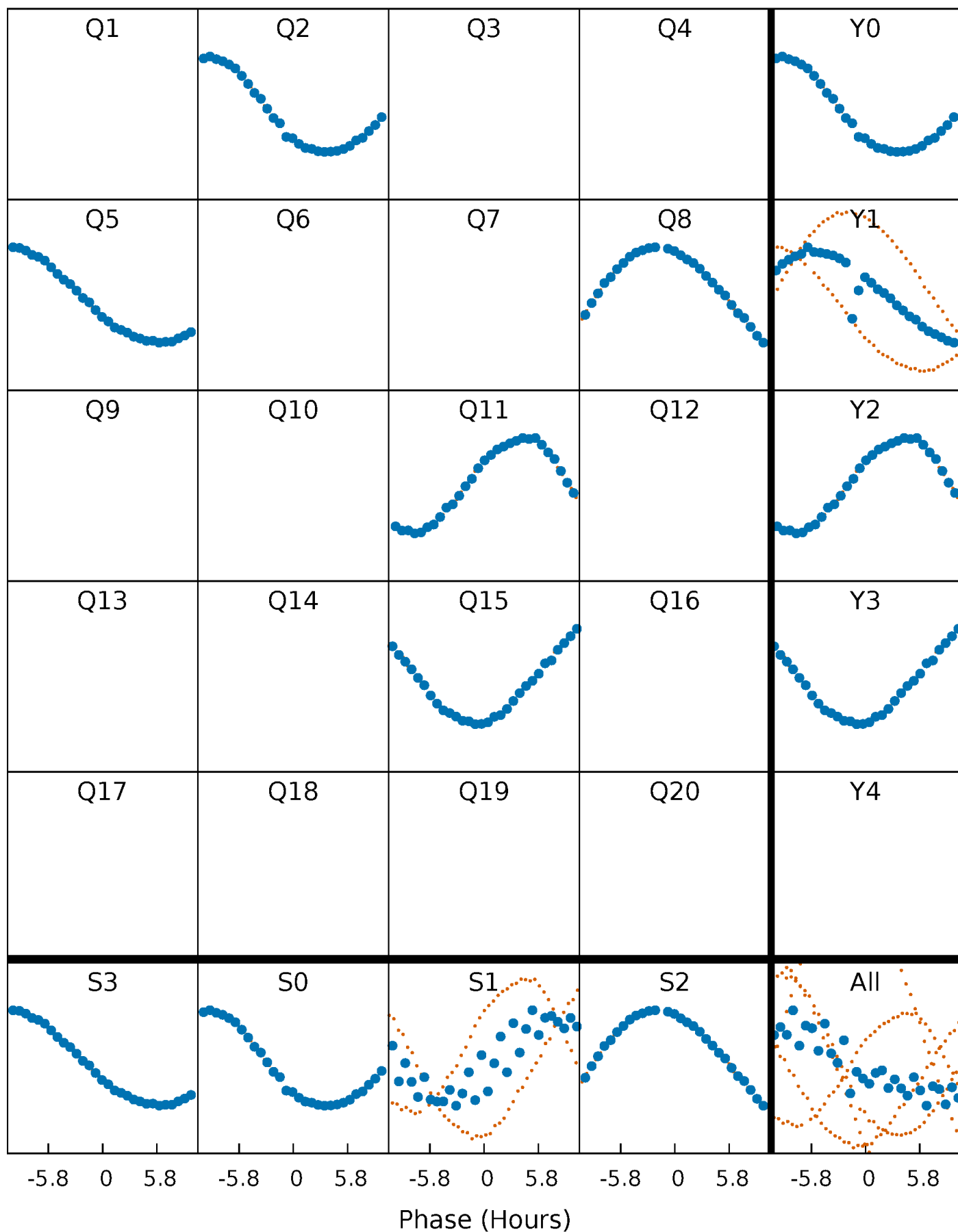


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



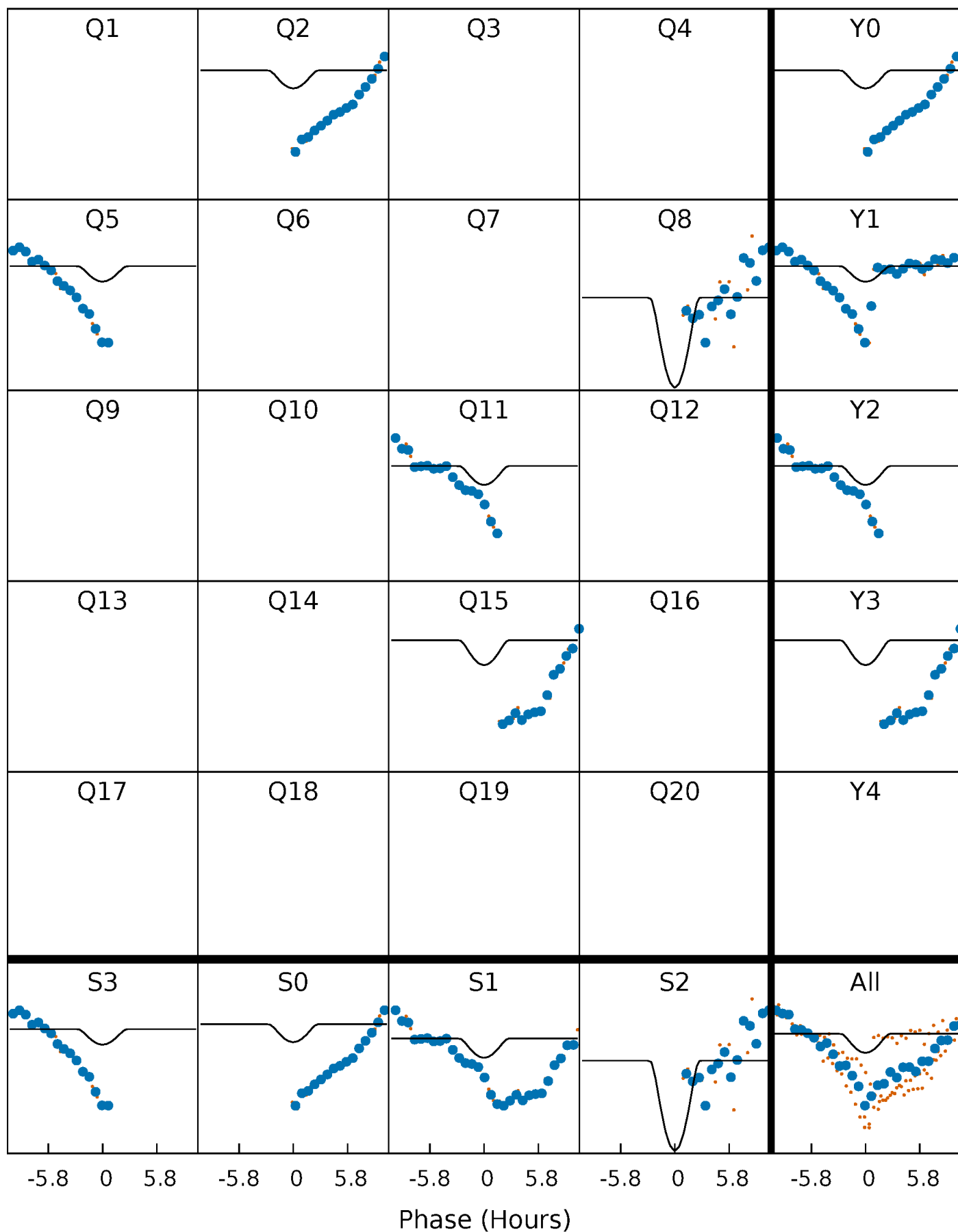
PDC Quarter-Phased Transit Curves

TCE 005990915-02 P=292.973874 Days $T_0=205.999266$ (BKJD)



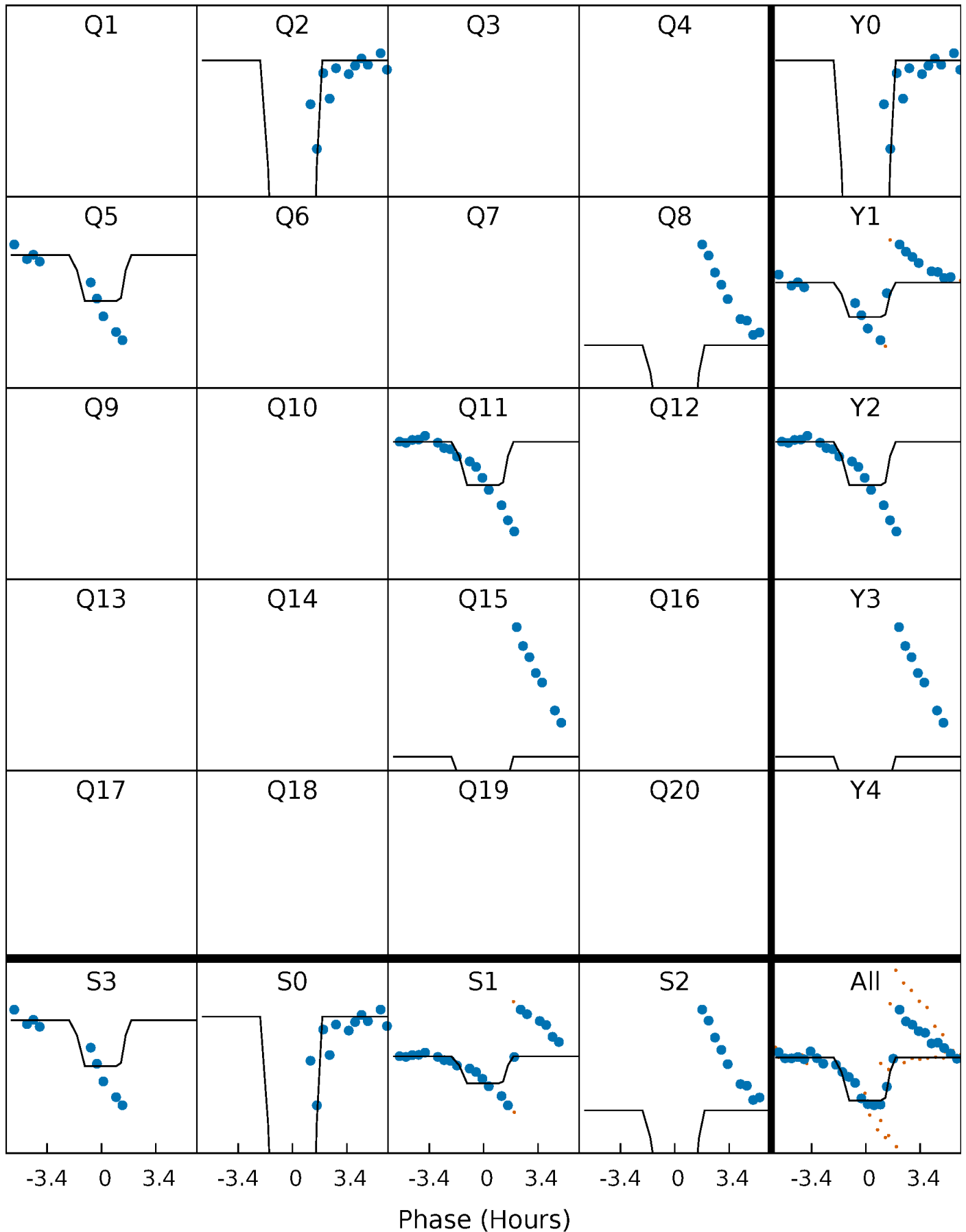
DV Quarter-Phased Transit Curves

TCE 005990915-02 P=292.973874 Days $T_0=205.999266$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

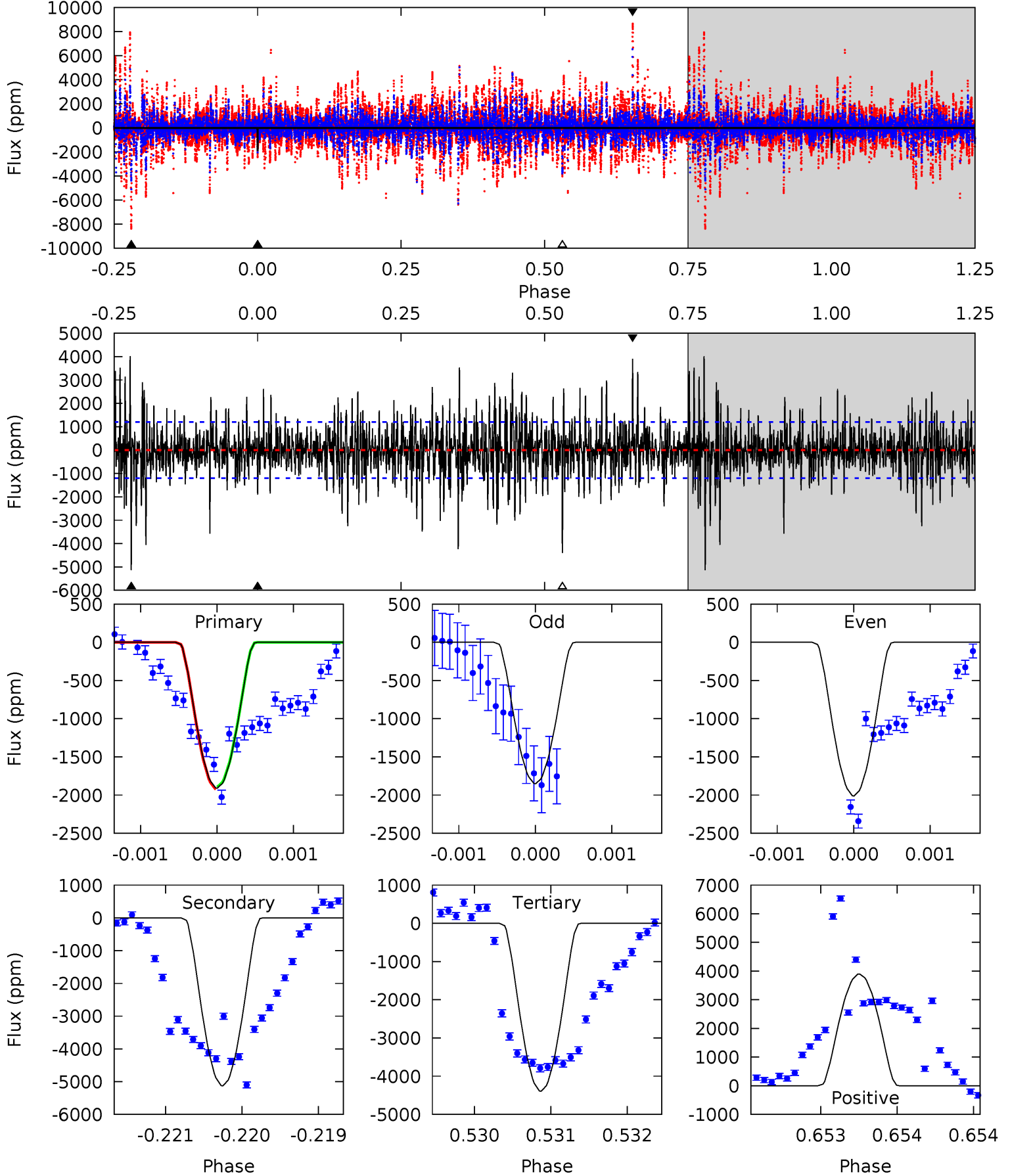
TCE 005990915-02 P=292.982396 Days $T_0=205.956294$ (BKJD)



DV Model-Shift Uniqueness Test

005990915-02, P = 292.973874 Days, E = 205.999266 Days

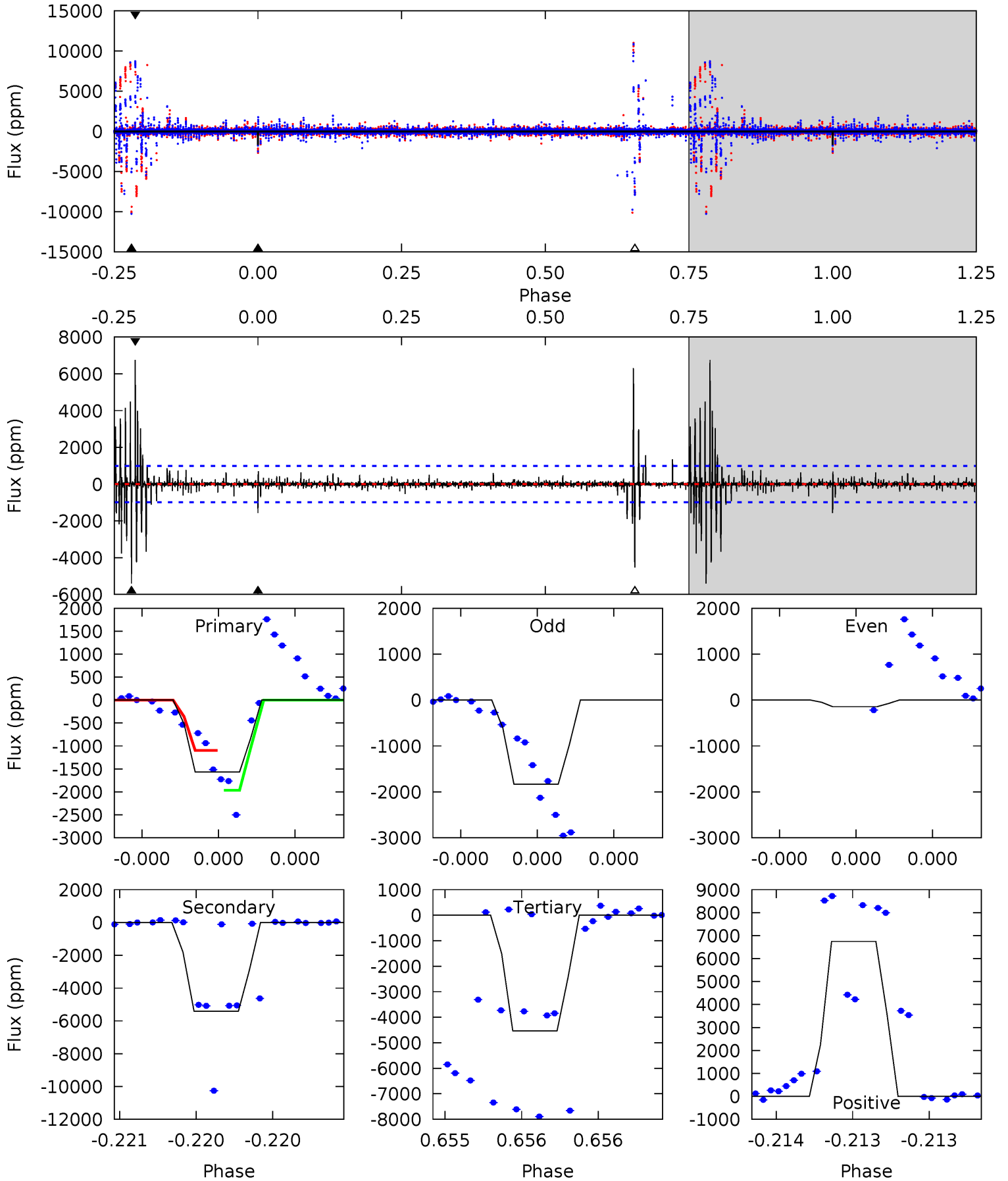
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.74	23.5	20.1	17.9	5.50	3.36	4.05	-11.4	-9.12	3.36	5.63	0.37	0.87	0.44	0.06



Alt Model-Shift Uniqueness Test

005990915-02, P = 292.982396 Days, E = 205.956294 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.89	30.7	25.7	38.2	5.58	3.49	2.12	-16.8	-29.3	5.00	-7.56	4.36	0.83	0.55	2.41



Stellar Parameters For KIC 005990915

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7302^{+232}_{-348}	$3.765^{+0.416}_{-0.098}$	$-0.120^{+0.250}_{-0.350}$	$2.815^{+0.501}_{-1.169}$	$1.682^{+0.184}_{-0.342}$	$0.106^{+0.368}_{-0.033}$
	+3%/-5%	+11%/-3%	+208%/-292%	+18%/-42%	+11%/-20%	+346%/-31%
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 005990915-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-5130 ± 218	$28.77^{+34.99}_{-19.62}$	718^{+60}_{-84}	6000^{+6573}_{-1672}	3608^{+32453}_{-2870}
Alt.	-5412 ± 177	$29.42^{+31.64}_{-20.64}$	722^{+55}_{-83}	5867^{+7356}_{-1487}	3627^{+38269}_{-2810}

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

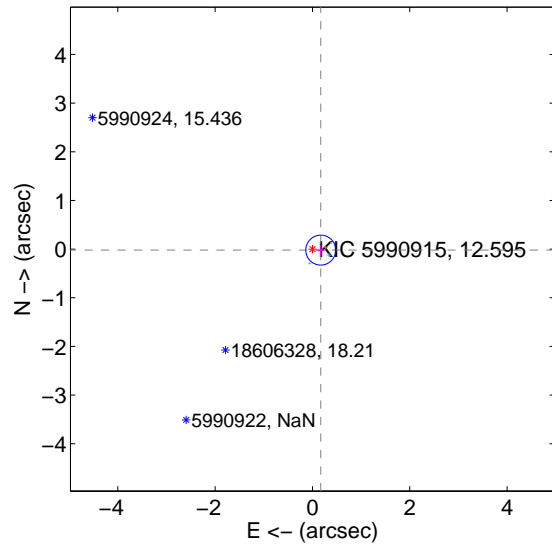
Supplemental centroid analysis for 005990915-02. Kepler magnitude: 12.60. Transit SNR 3.54

There are 3 quarters with good PRF difference image offsets

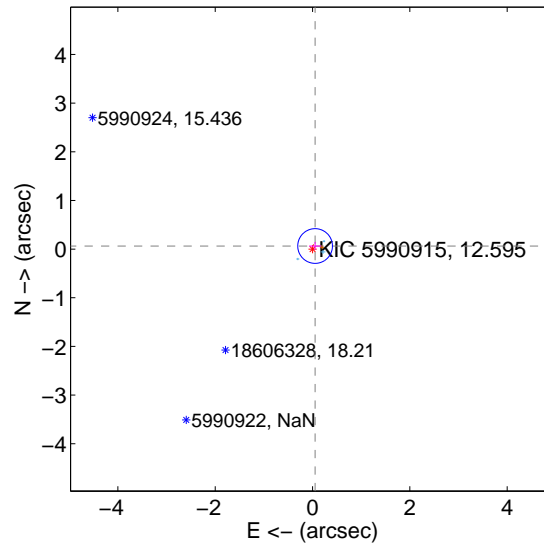
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.172 ± 0.103	1.68	-0.171 ± 0.102	-0.021 ± 0.111
PRF-fit source offset from KIC position	0.083 ± 0.119	0.70	-0.053 ± 0.124	0.063 ± 0.084
photometric centroid source offset	1.21 ± 0.98	1.24	-0.76 ± 1.18	-0.95 ± 0.82

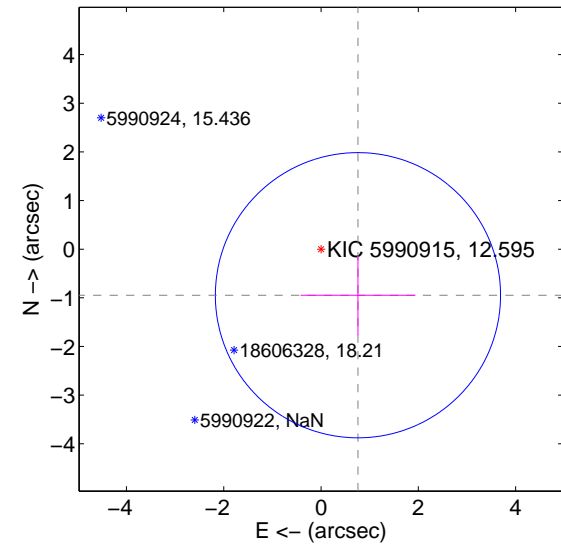
offset from difference PRF-fit to OOT PRF-fit



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.

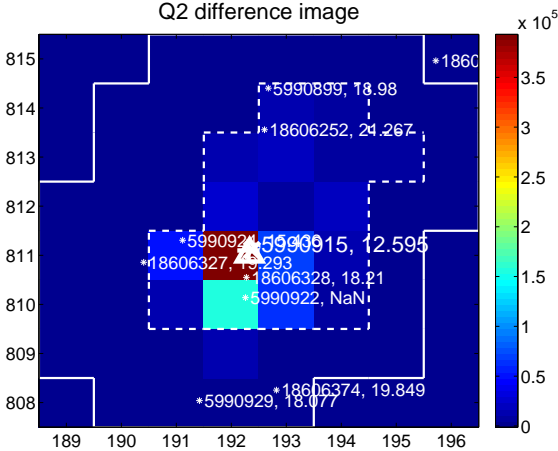
Q1 no difference image



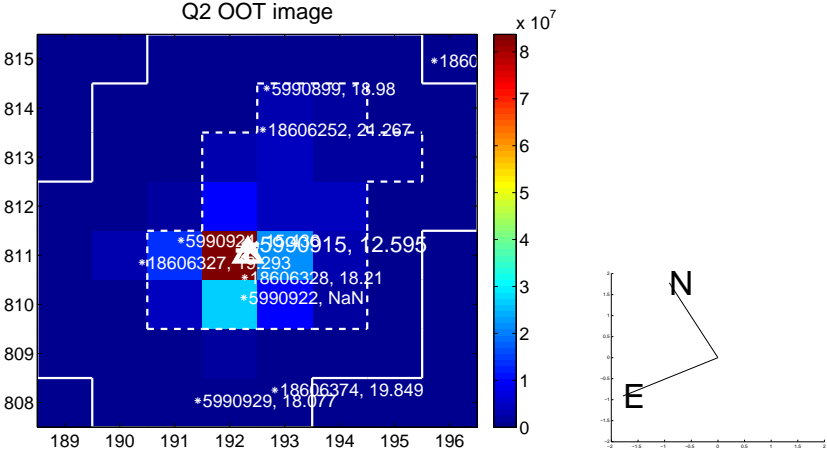
Q1 no OOT image



Q2 difference image



Q2 OOT image



Q3 no difference image



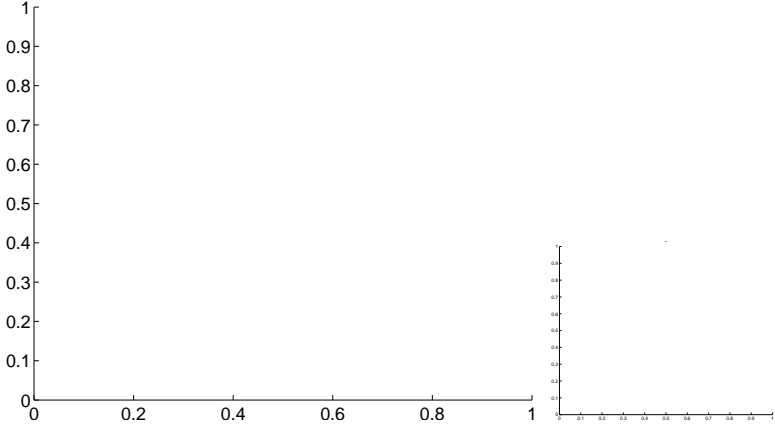
Q3 no OOT image



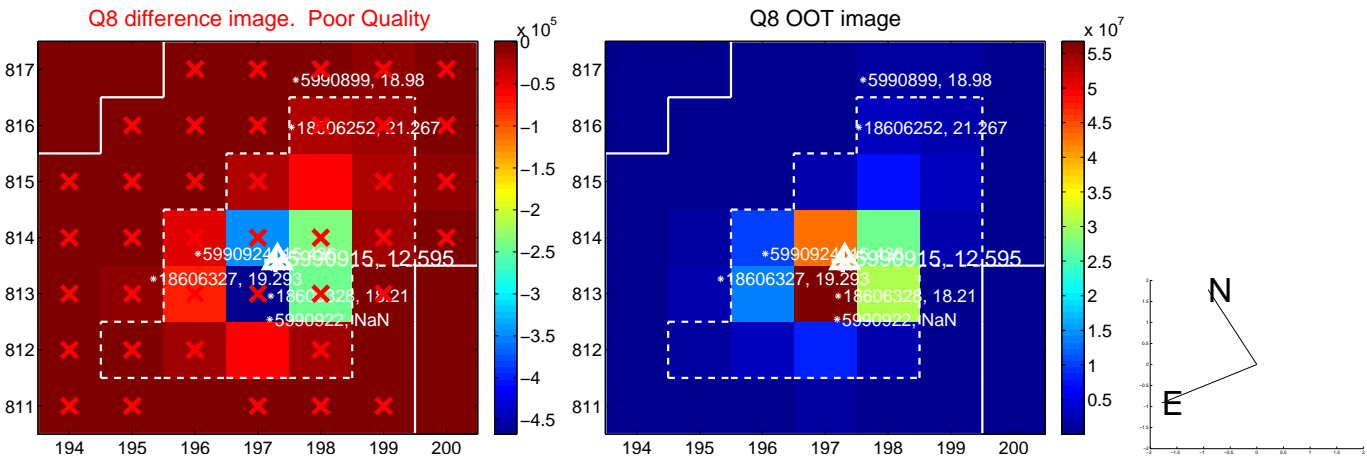
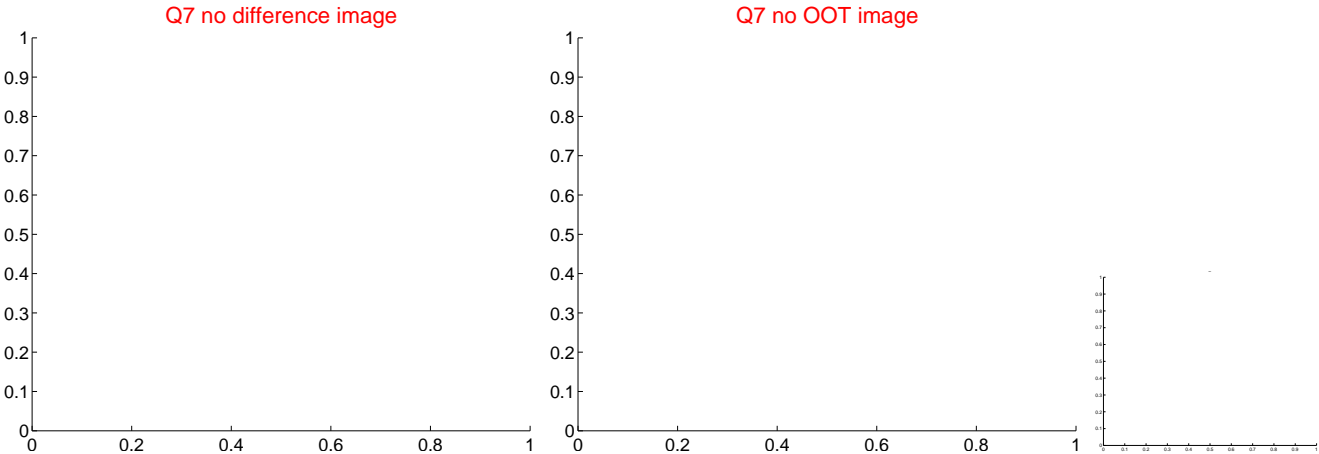
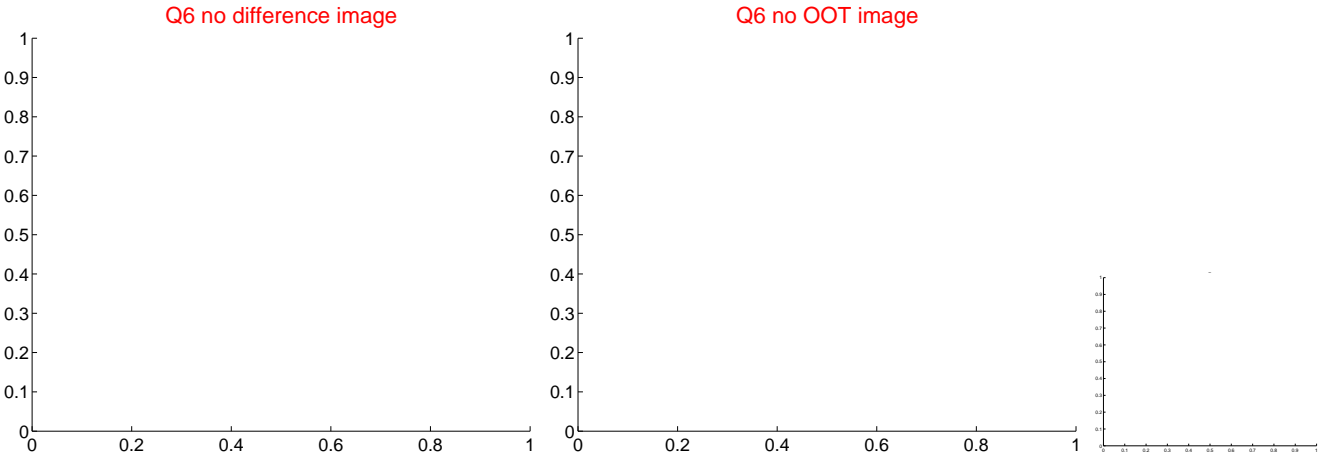
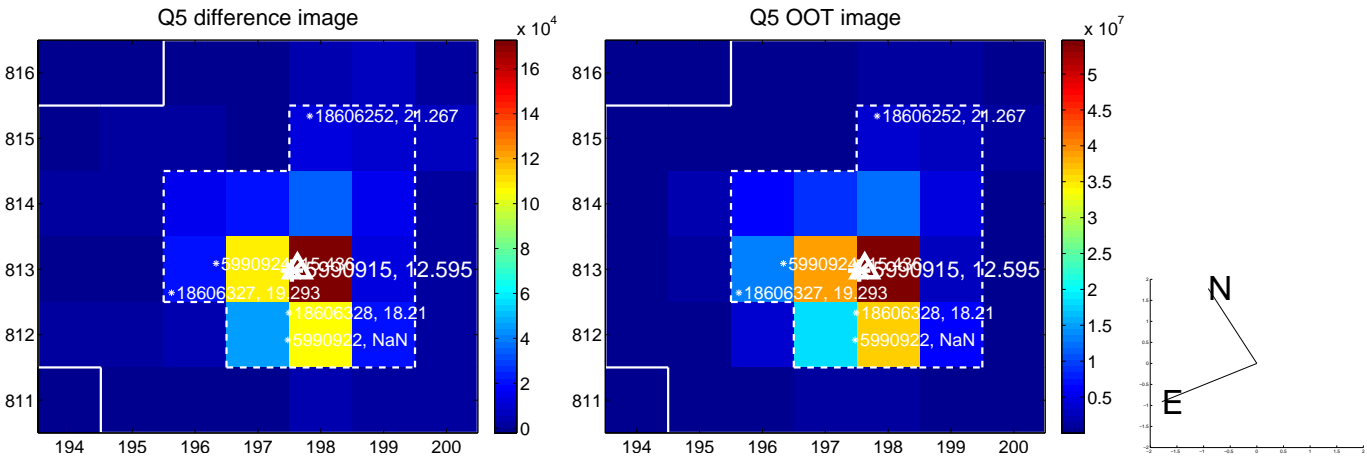
Q4 no difference image



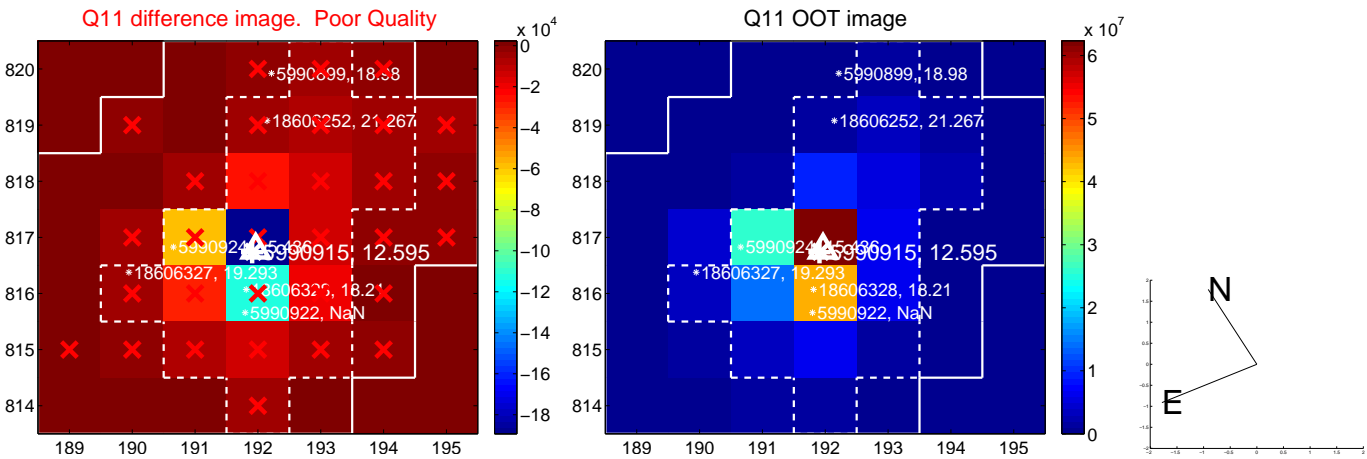
Q4 no OOT image



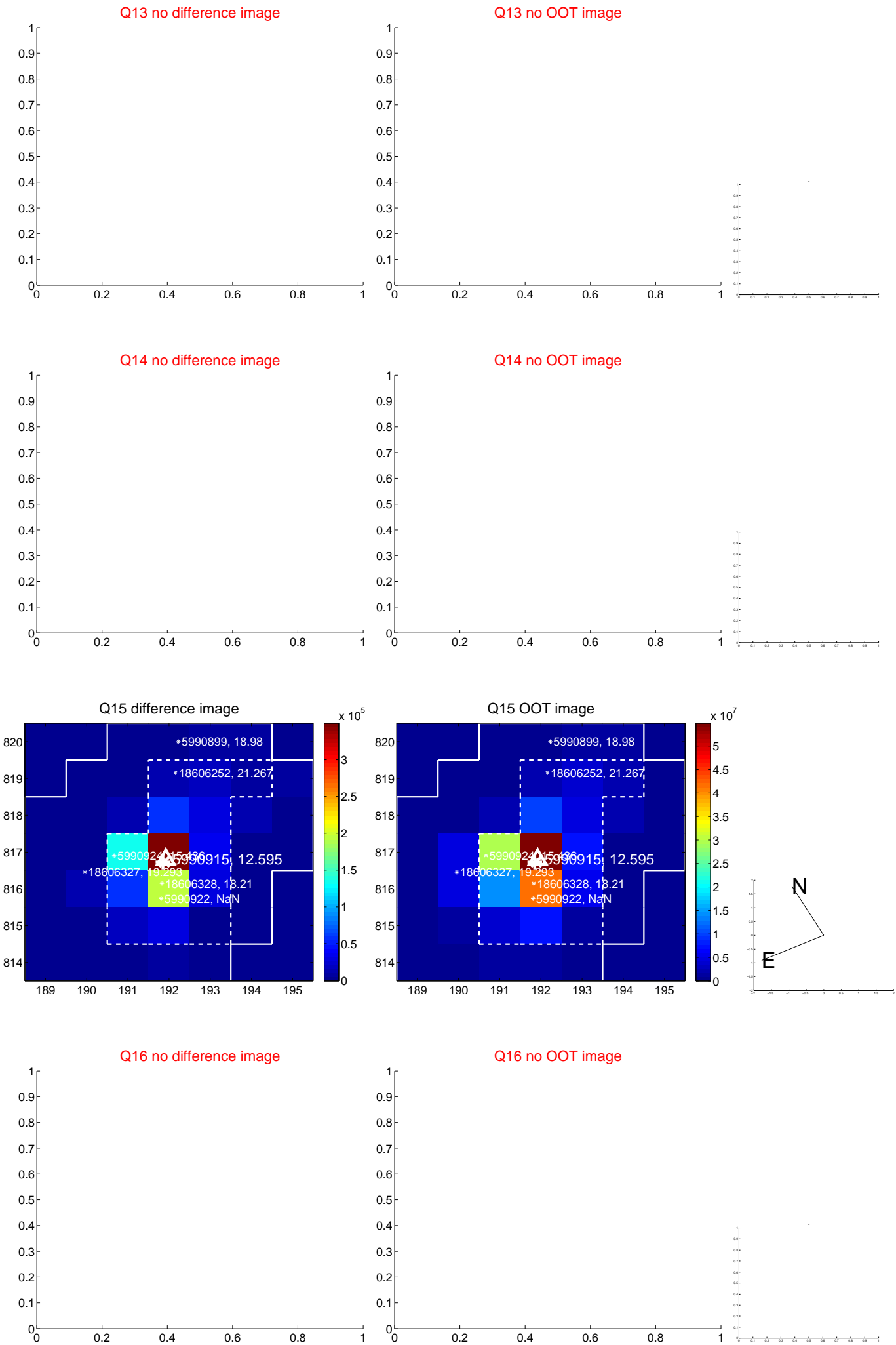
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



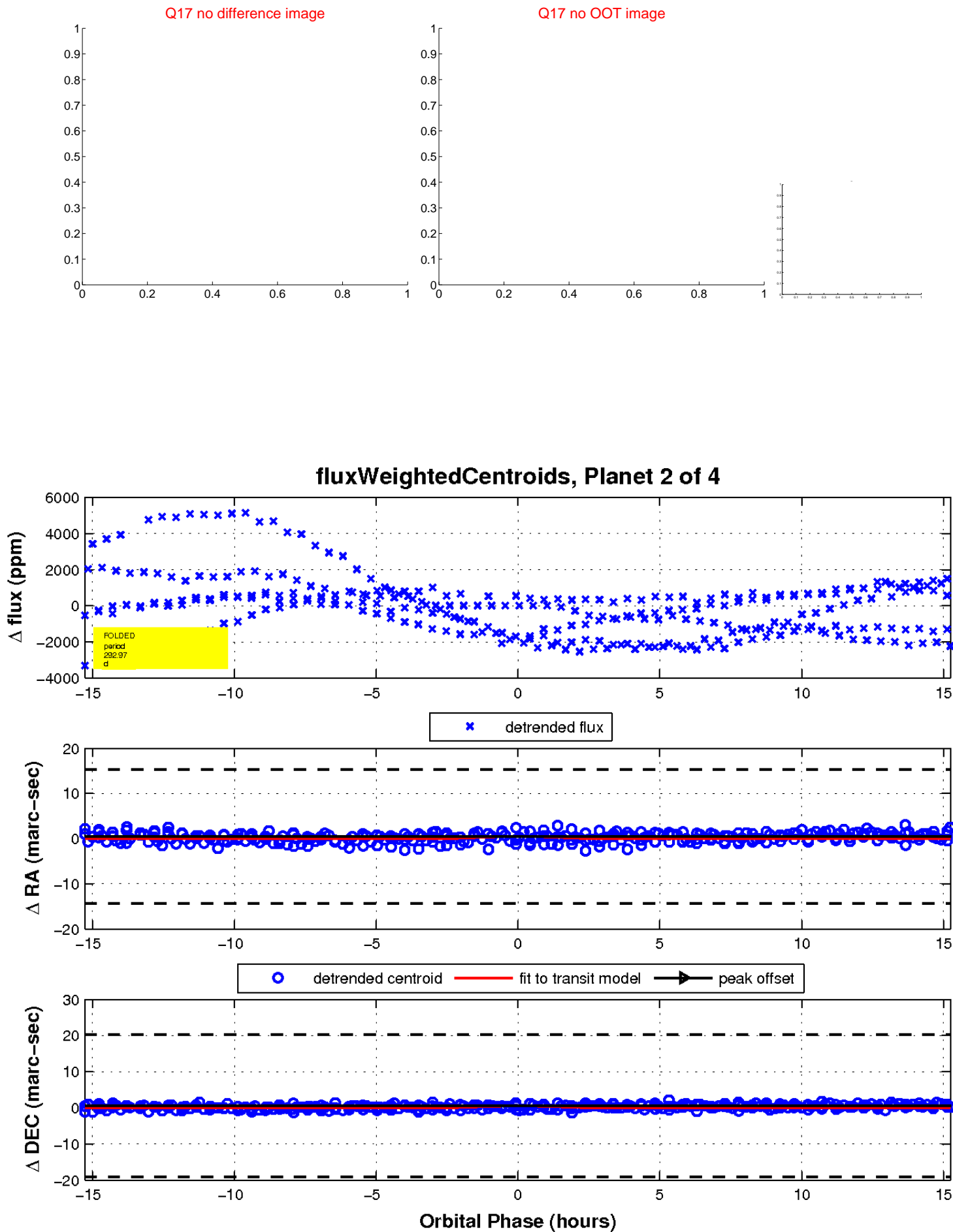
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

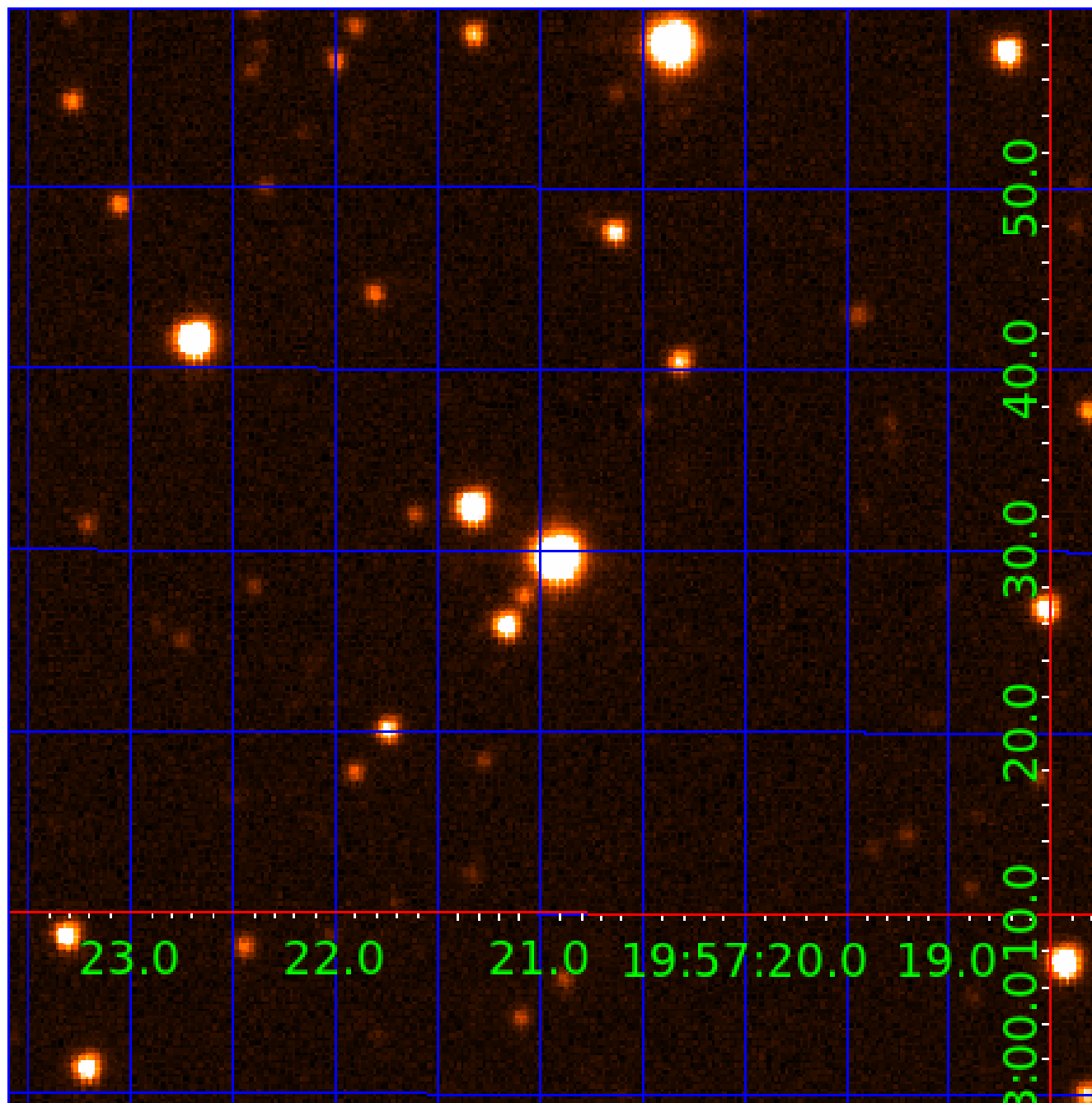


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005990915

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})
005990915-01	OBS	No	2.725507	131.732828	57.8	10.575	9.0	6.6	2.81	7302	2.52	9781.02
005990915-02	OBS	No	292.973874	205.999266	494.2	5.091	14.6	3.5	2.81	7302	11.90	19.14
005990915-03	OBS	No	241.878528	231.245110	1105.9	5.591	12.1	9.2	2.81	7302	17.42	24.71
005990915-04	OBS	No	400.689034	467.822214	6825.9	27.073	10.5	12.6	2.81	7302	41.12	12.61

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005990915-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
005990915-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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—INCONSISTENT_TRANS
005990915-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT— MOD_POS_ALT
005990915-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—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.

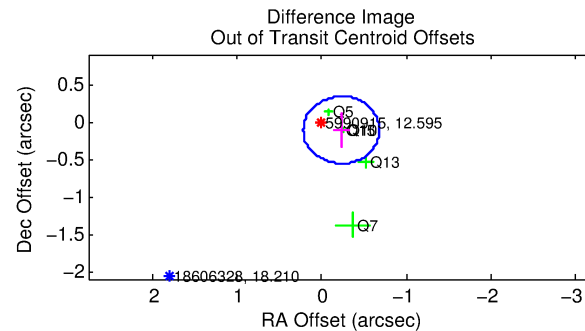
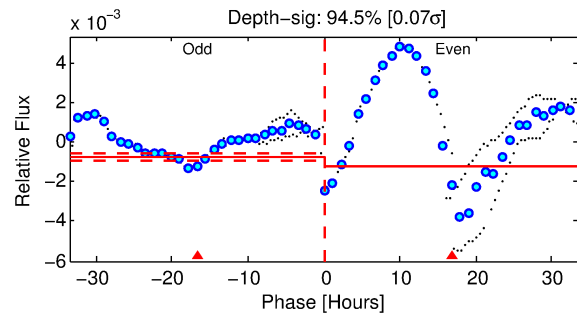
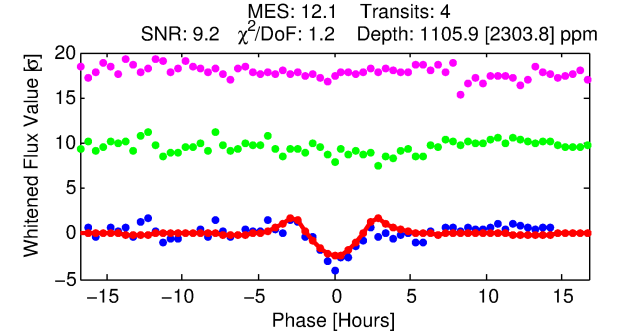
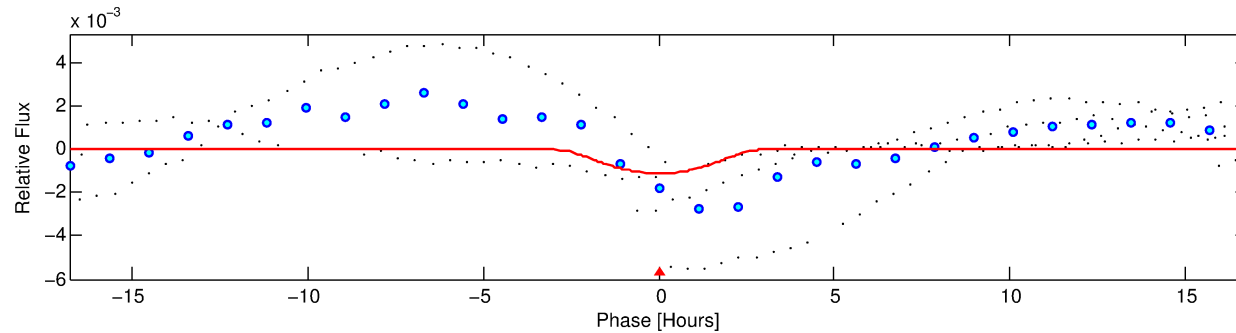
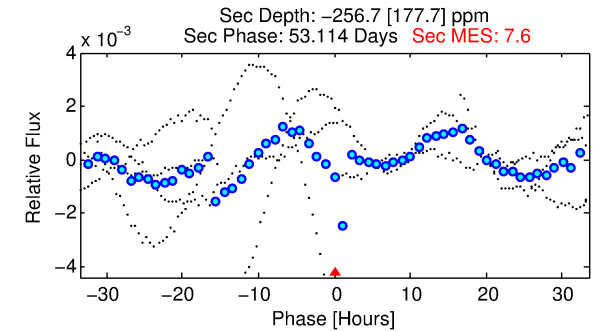
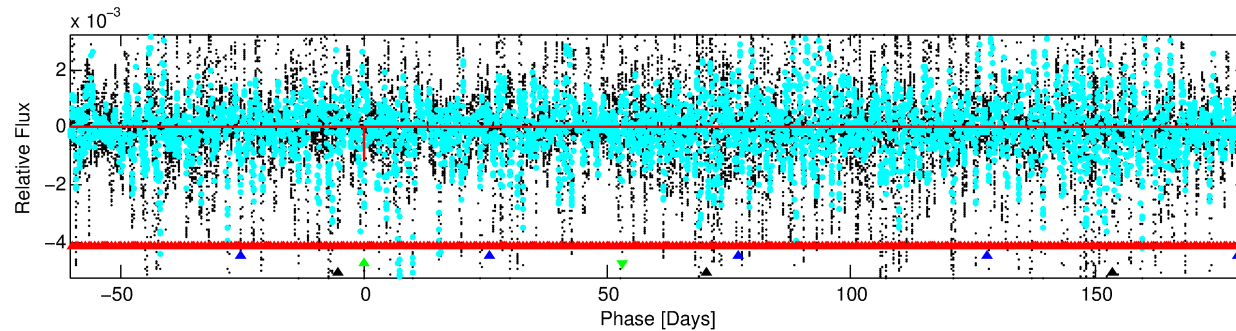
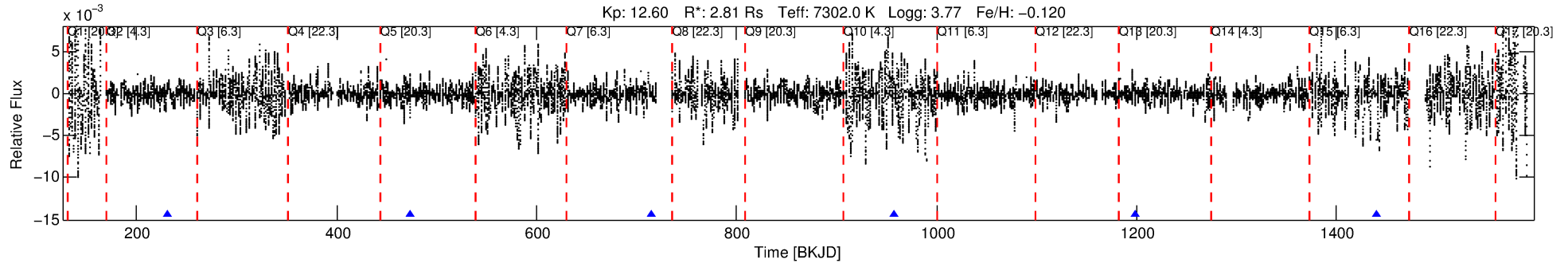
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005990915-03

No Significant Match Found

DV One-Page Summary

KIC: 5990915 Candidate: 3 of 4 Period: 241.879 d



DV Fit Results:

Period = 241.87853 [0.00361] d
Epoch = 231.2451 [0.0126] BKJD
Rp/R* = 0.0567 [0.1032]
a/R* = 112.88 [49.96]
b = 1.00 [0.07]
Seff = 24.71 [17.83]
Teq = 569 [103] K
Rp = 17.42 [32.52] Re
a = 0.9038 [0.3820] AU
Ag = N/A
Teffp = N/A

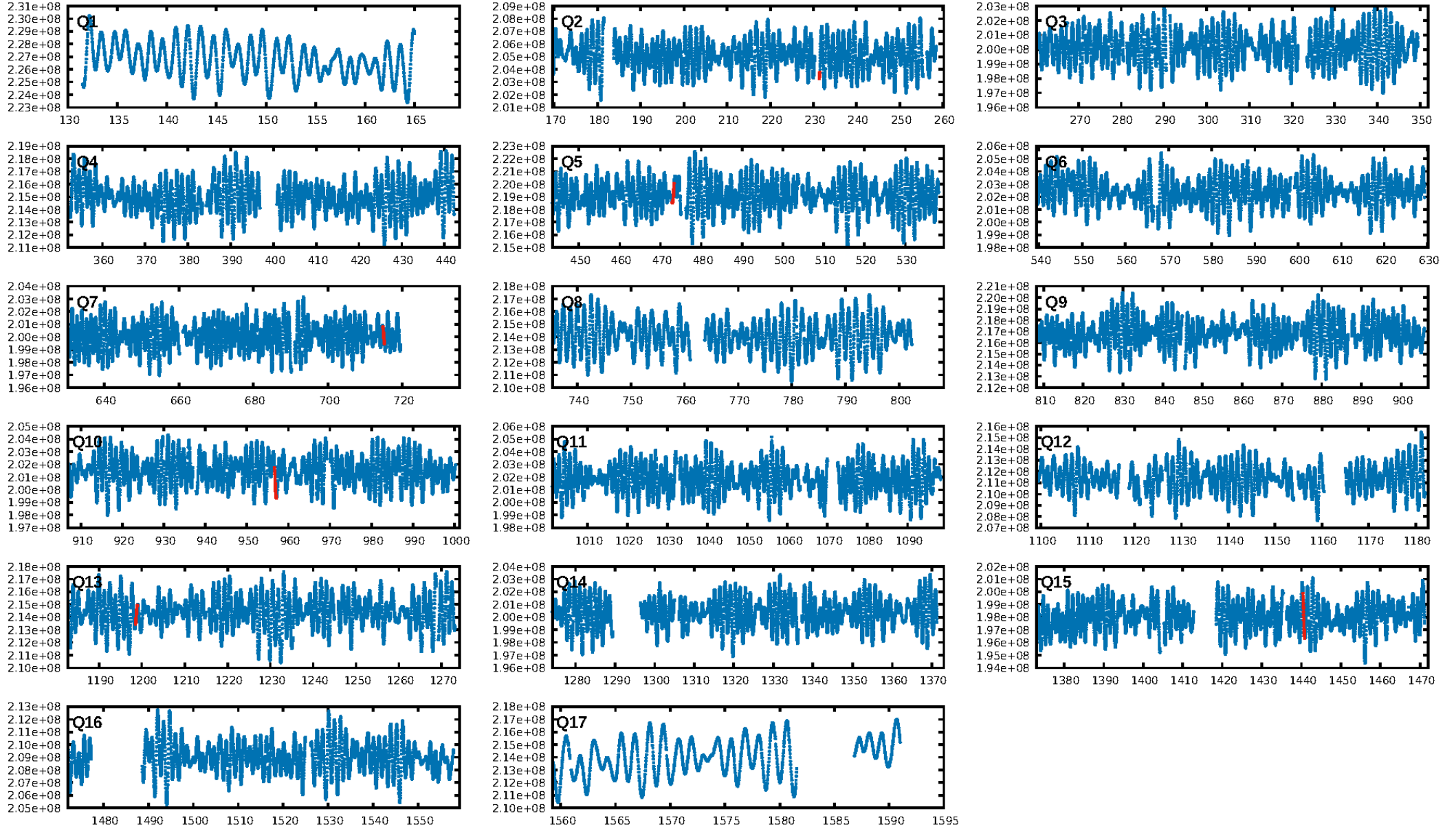
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [479.84 σ]
LongPeriod-sig: 100.0% [162.19 σ]
ModelChiSquare2-sig: 28.5%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: 8.64e-13
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.2682
Centroid-sig: 82.2%
Centroid-so: 0.221 arcsec [0.57 σ]
OotOffset-rm: 0.259 arcsec [1.73 σ]
KicOffset-rm: 0.126 arcsec [0.66 σ]
OotOffset-st: 1/2/0/2 [5]
KicOffset-st: 1/2/0/2 [5]
DiffImageQuality-fgm: 0.60 [3/5]
DiffImageOverlap-fno: 0.20 [1/5]

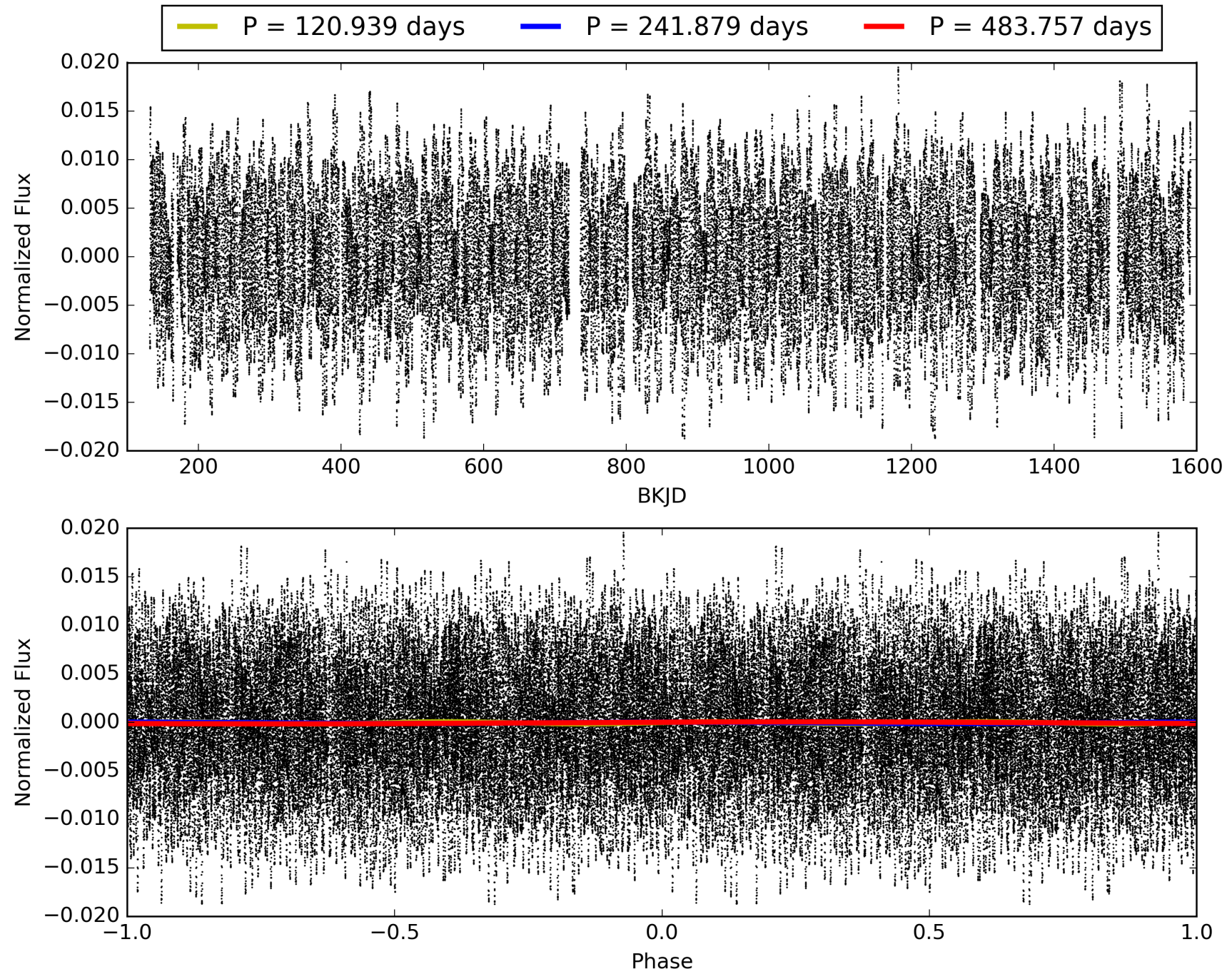
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:14:09 Z

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

TCE 005990915-03, PDC Light Curves

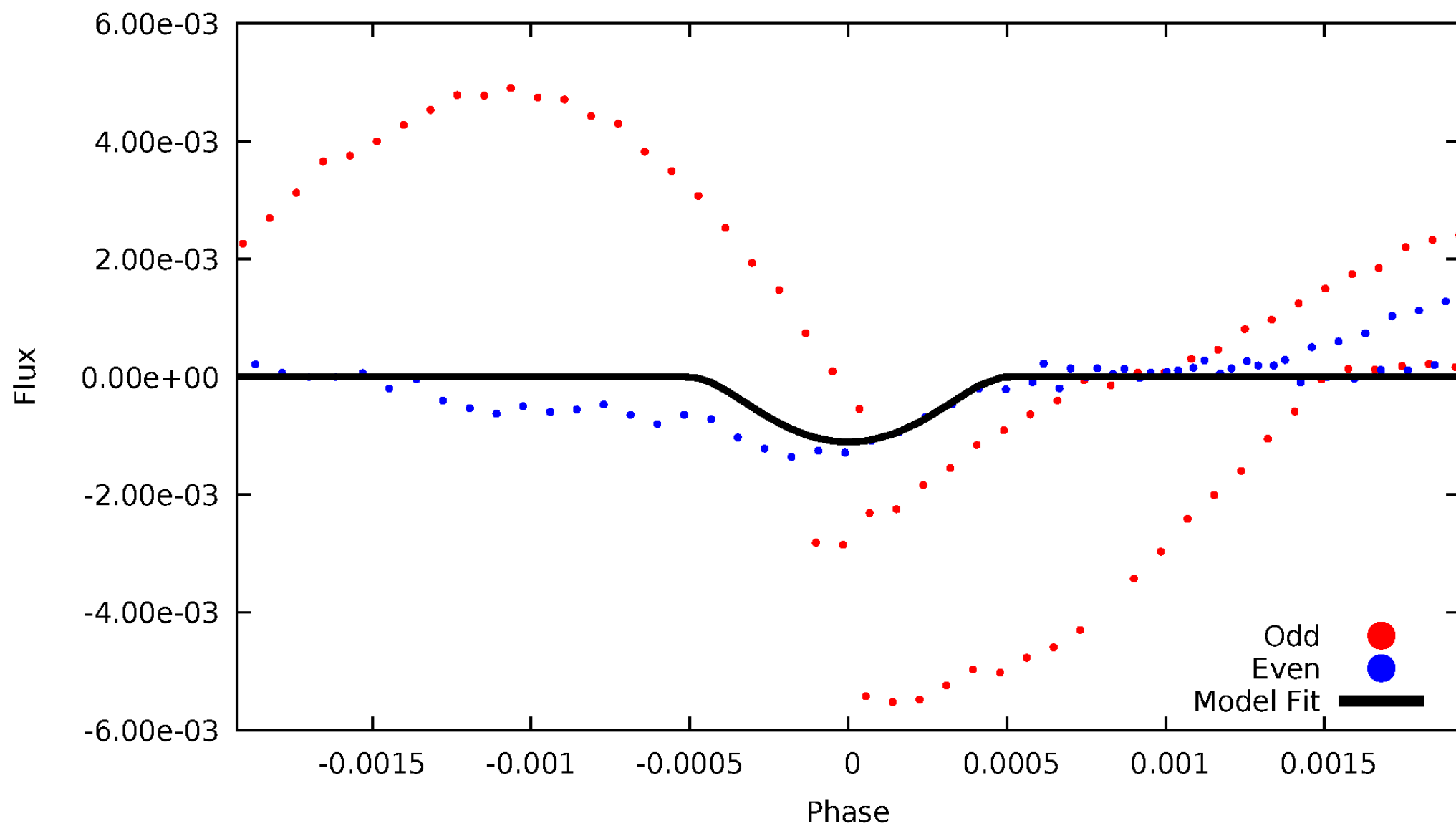


TCE 005990915-03



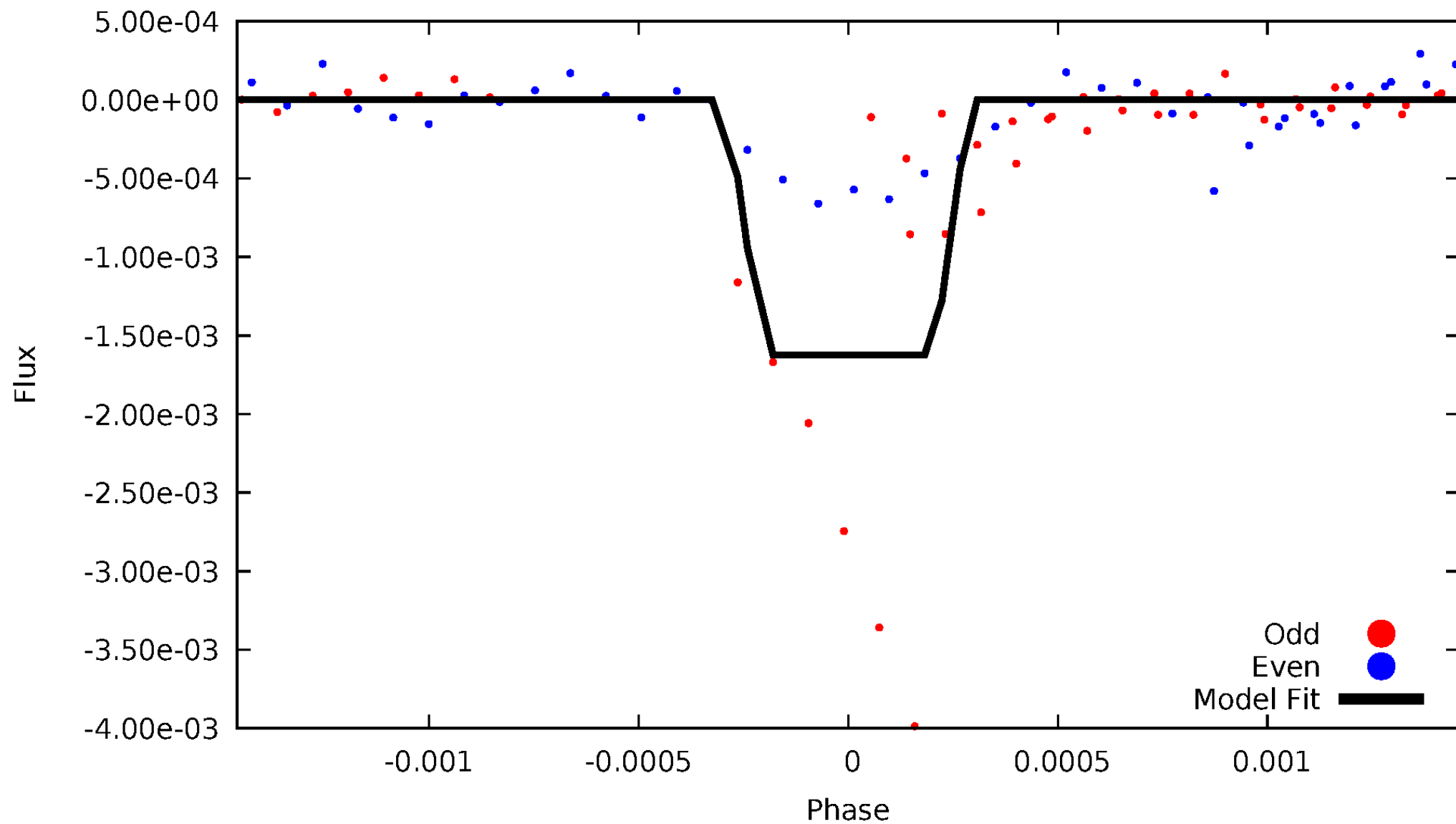
DV Odd/Even

TCE 005990915-03



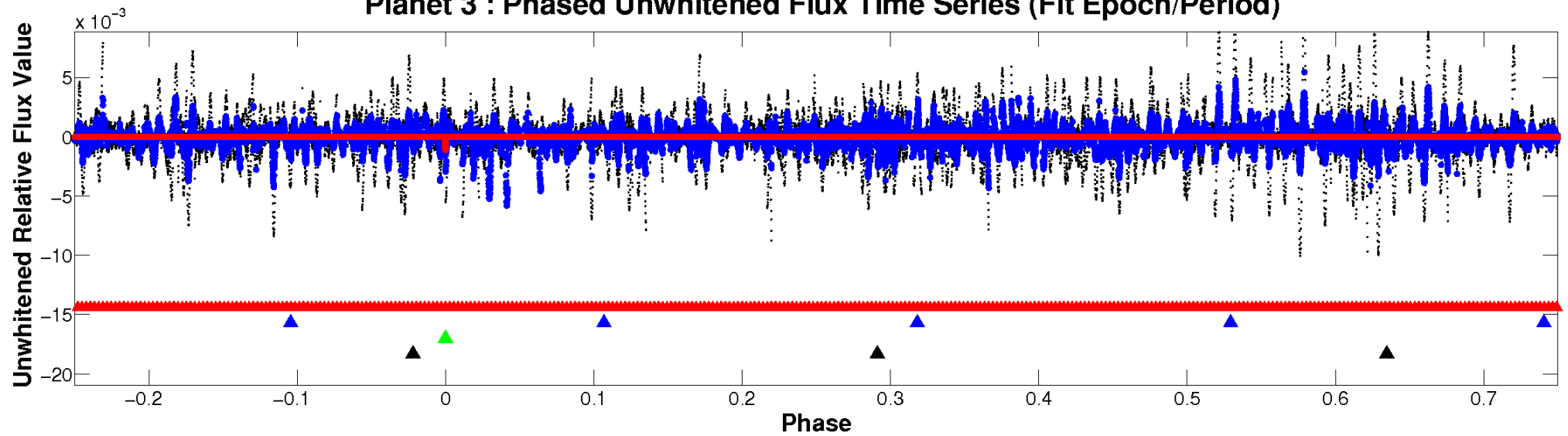
ALT Odd/Even

TCE 005990915-03

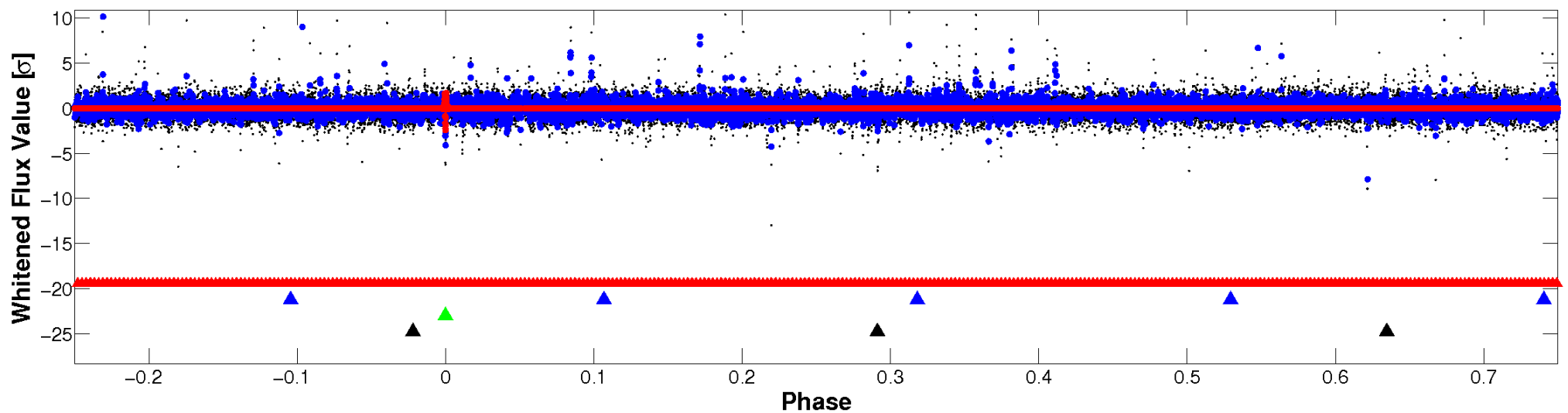


Non-Whitened Vs. Whitened Light Curve

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

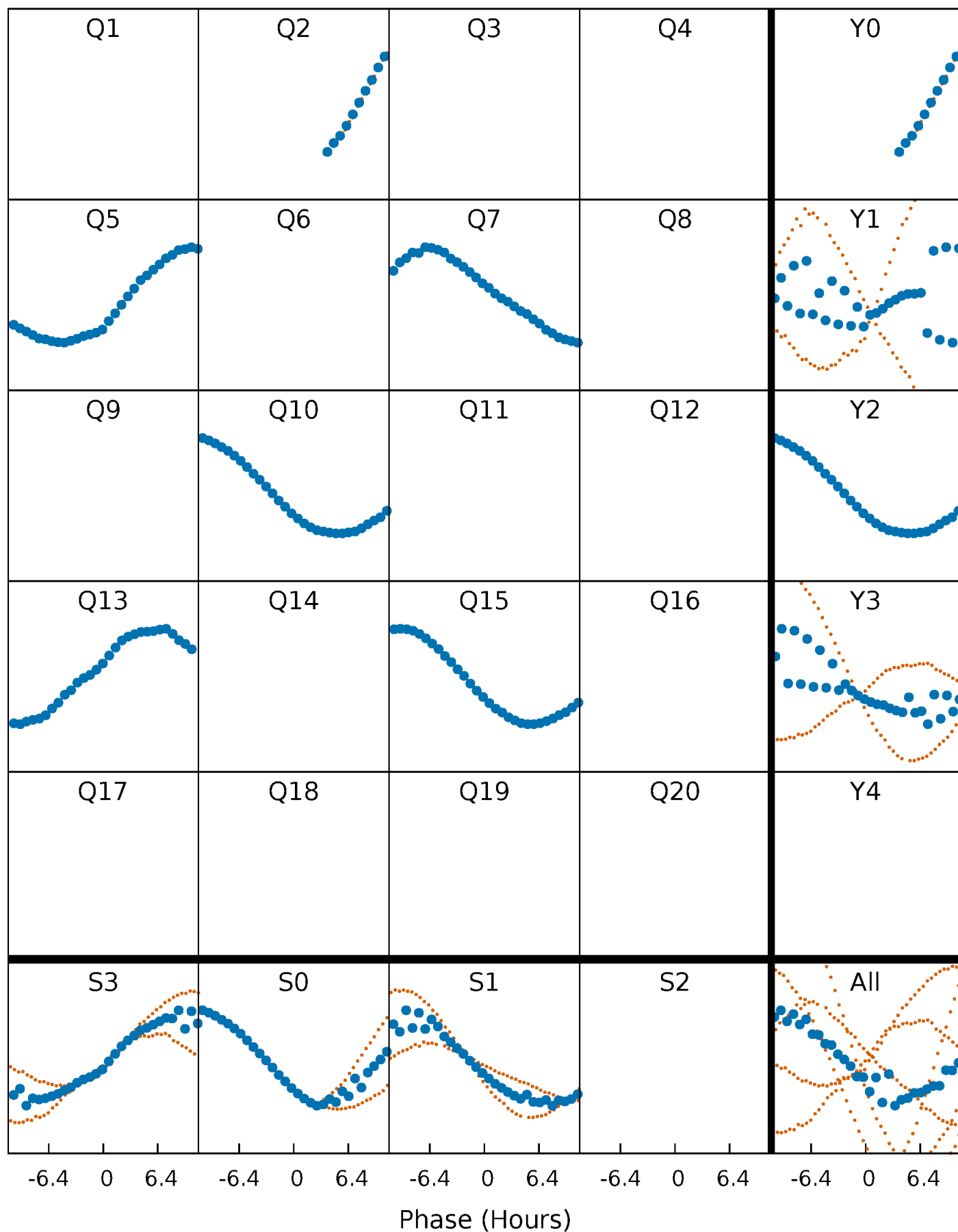


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



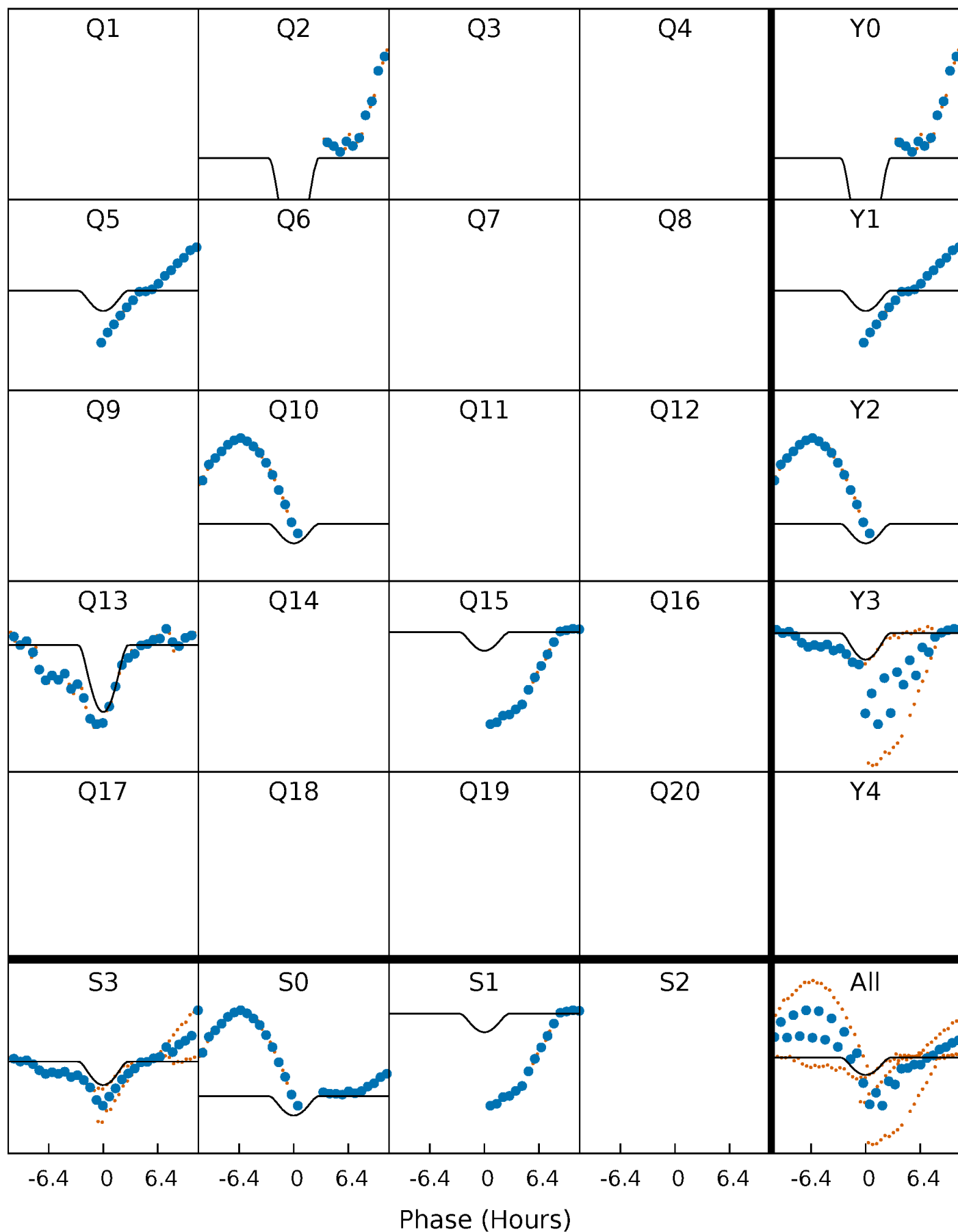
PDC Quarter-Phased Transit Curves

TCE 005990915-03 $P=241.878528$ Days $T_0=231.245110$ (BKJD)



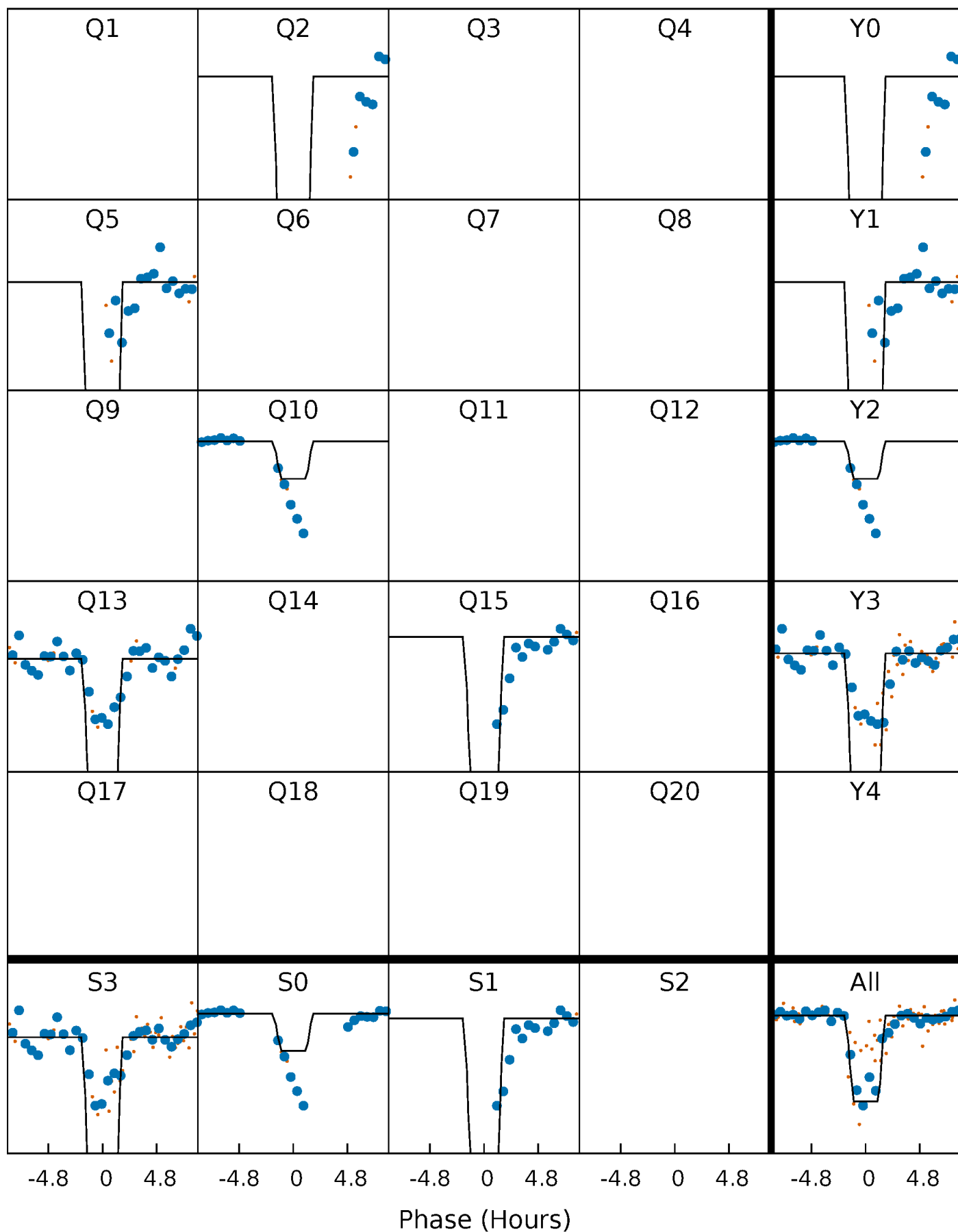
DV Quarter-Phased Transit Curves

TCE 005990915-03 P=241.878528 Days $T_0=231.245110$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

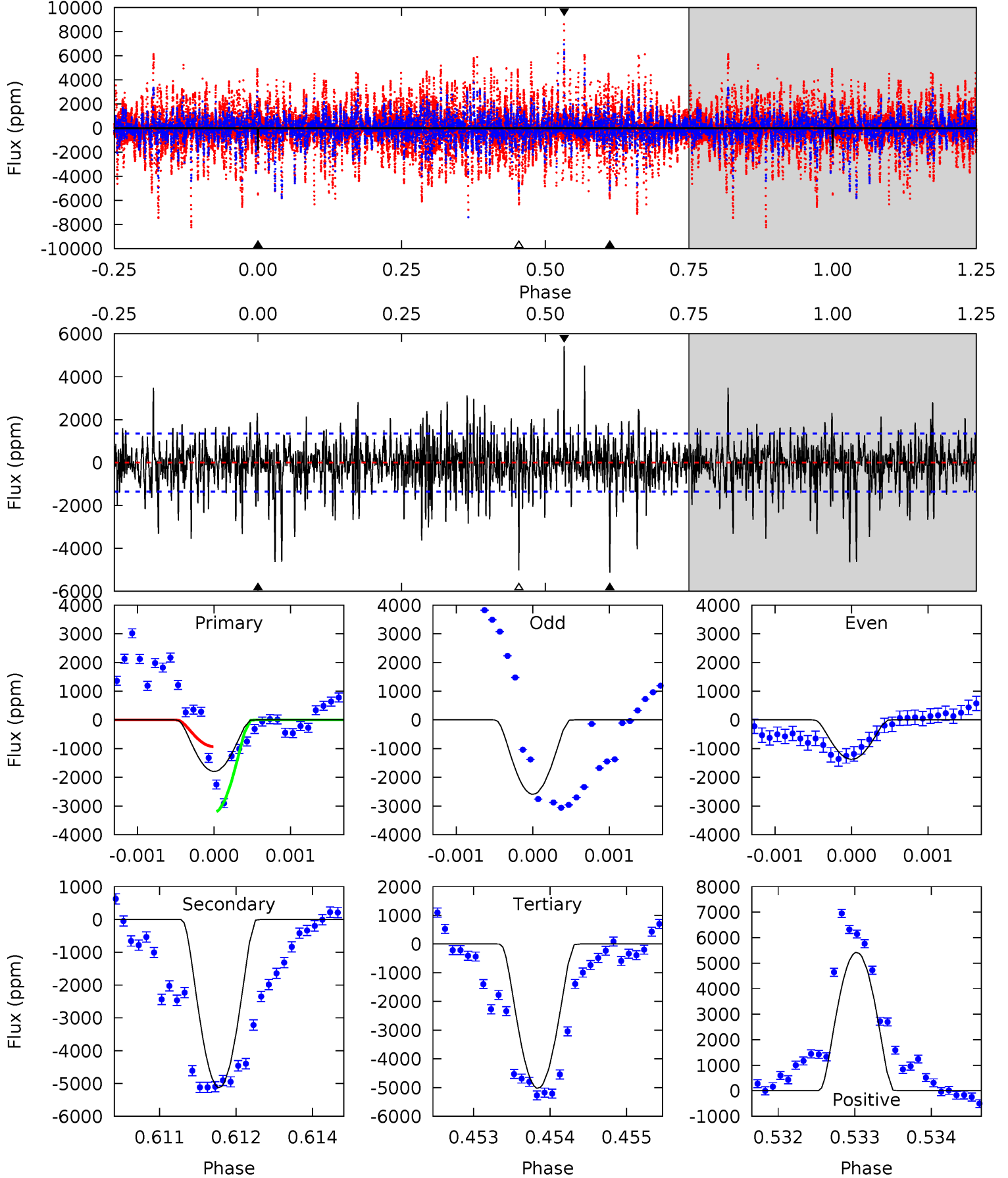
TCE 005990915-03 P=241.882384 Days $T_0=231.203560$ (BKJD)



DV Model-Shift Uniqueness Test

005990915-03, P = 241.878528 Days, E = 231.245110 Days

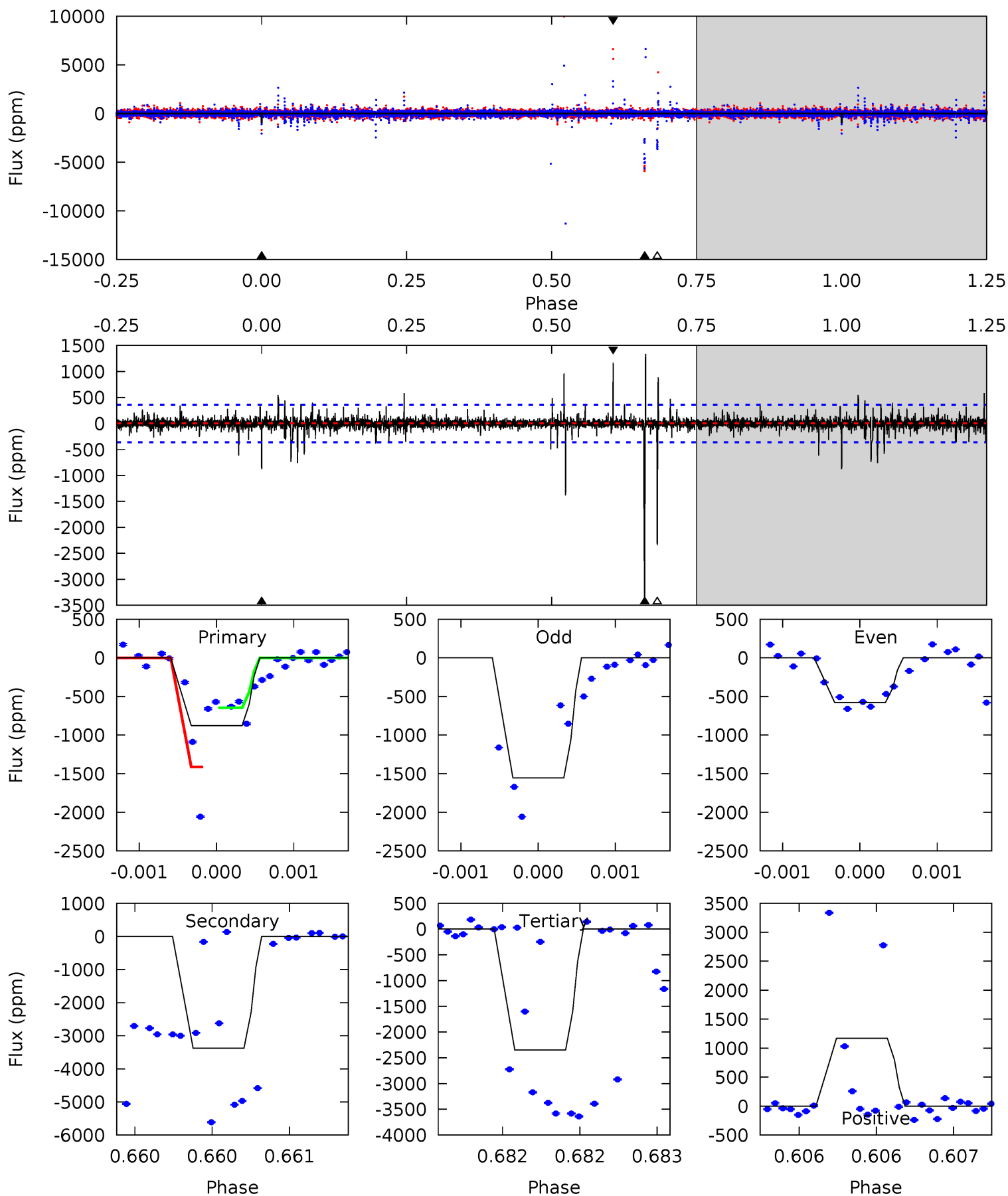
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.24	20.7	20.2	21.8	5.45	3.28	3.60	-13.0	-14.6	0.42	-1.19	2.02	1.25	0.51	4.78



Alt Model-Shift Uniqueness Test

005990915-03, P = 241.882384 Days, E = 231.203560 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.5	52.1	36.2	18.0	5.56	3.46	1.59	-22.7	-4.48	15.9	34.0	1.95	1.46	0.28	0



Stellar Parameters For KIC 005990915

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7302^{+232}_{-348}	$3.765^{+0.416}_{-0.098}$	$-0.120^{+0.250}_{-0.350}$	$2.815^{+0.501}_{-1.169}$	$1.682^{+0.184}_{-0.342}$	$0.106^{+0.368}_{-0.033}$
	+3%/-5%	+11%/-3%	+208%/-292%	+18%/-42%	+11%/-20%	+346%/-31%
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 005990915-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-5127 ± 248	$28.44^{+25.40}_{-19.70}$	770^{+63}_{-79}	6116^{+6989}_{-1512}	2931^{+27524}_{-2144}
Alt.	-3374 ± 65	$22.74^{+24.66}_{-15.33}$	769^{+58}_{-86}	6060^{+6580}_{-1664}	2980^{+24212}_{-2290}

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 $A_{obs} \gg 1.0$

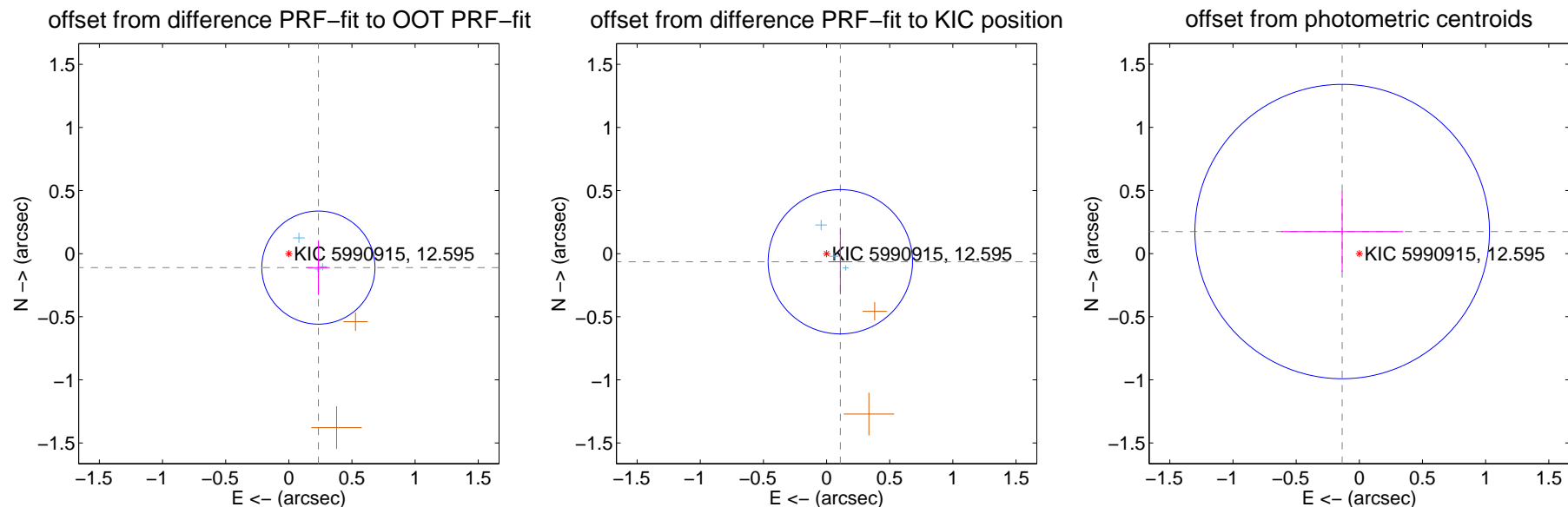
DV Centroid Data

Supplemental centroid analysis for 005990915-03. Kepler magnitude: 12.60. Transit SNR 9.19

There are 3 quarters with good PRF difference image offsets

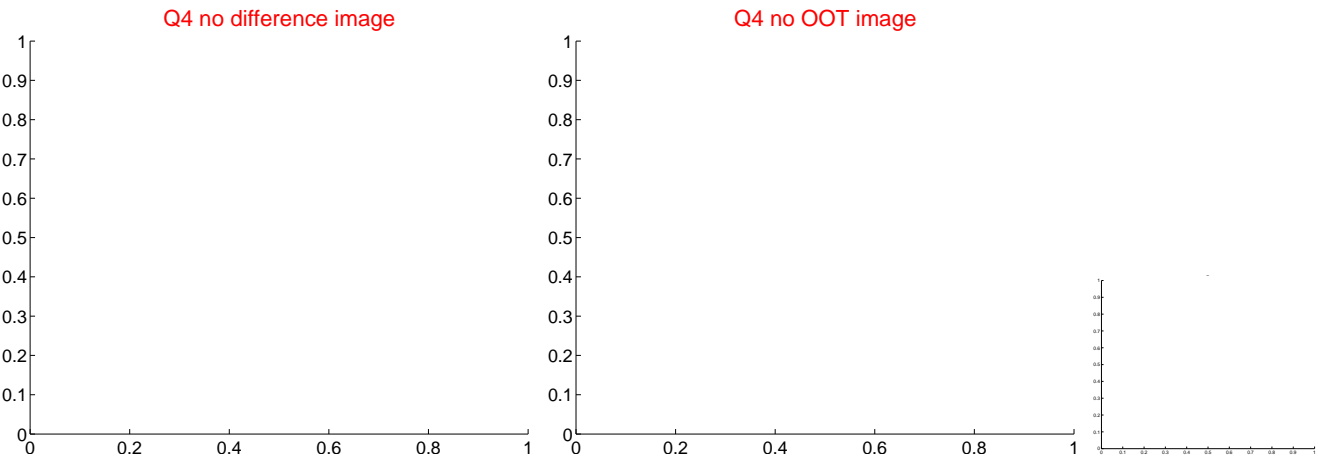
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.259 ± 0.149	1.73	-0.234 ± 0.091	-0.111 ± 0.216
PRF-fit source offset from KIC position	0.126 ± 0.191	0.66	-0.109 ± 0.095	-0.064 ± 0.258
photometric centroid source offset	0.22 ± 0.39	0.57	0.14 ± 0.48	0.17 ± 0.32

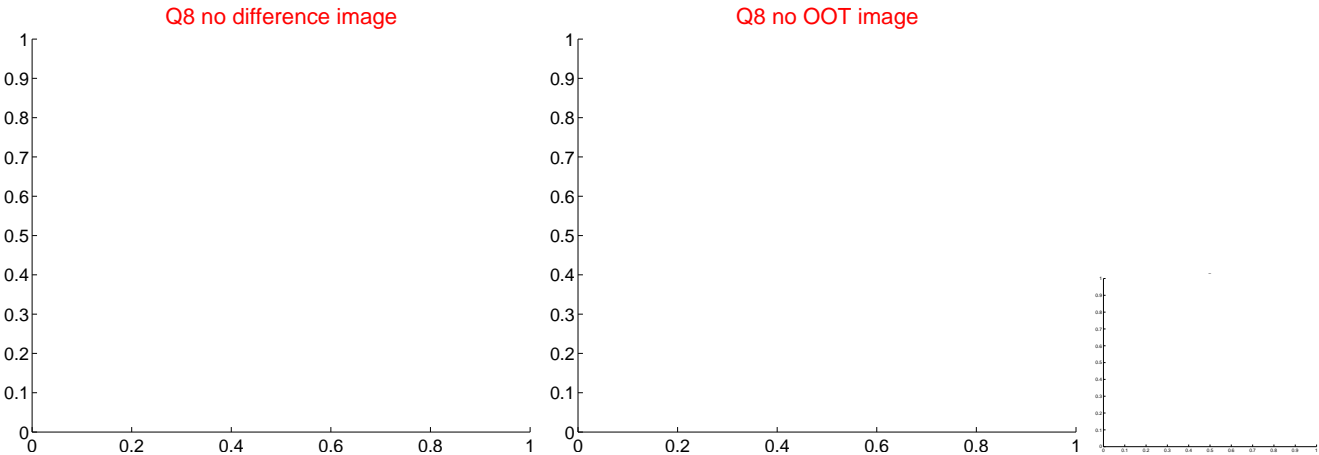
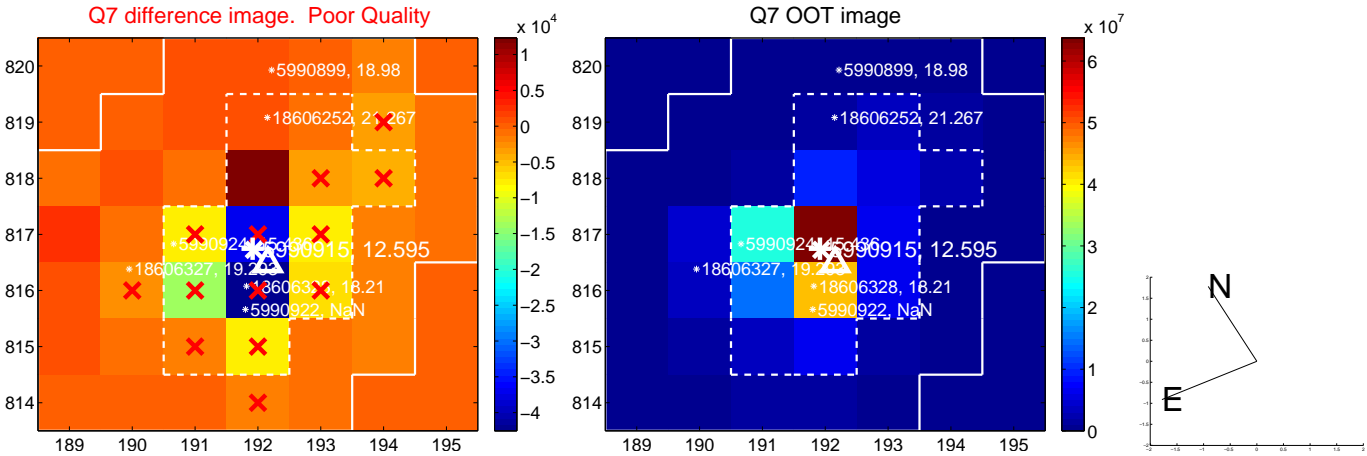
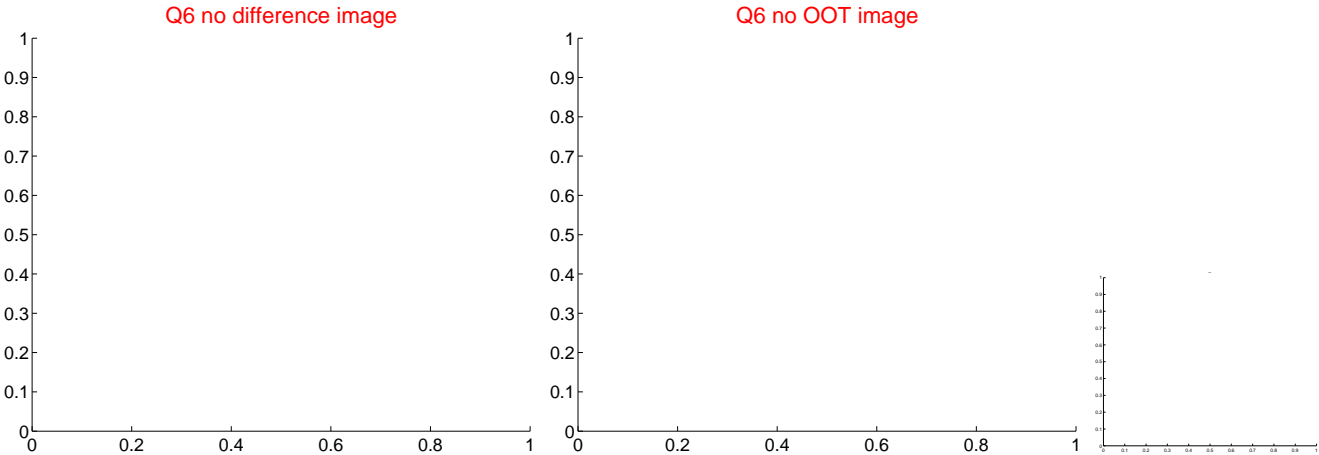
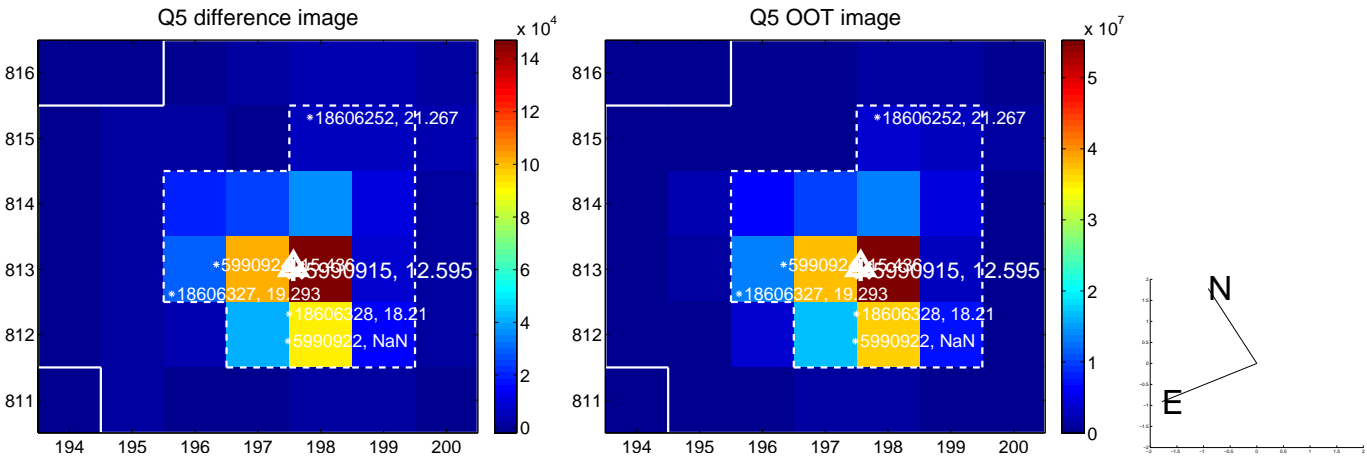


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

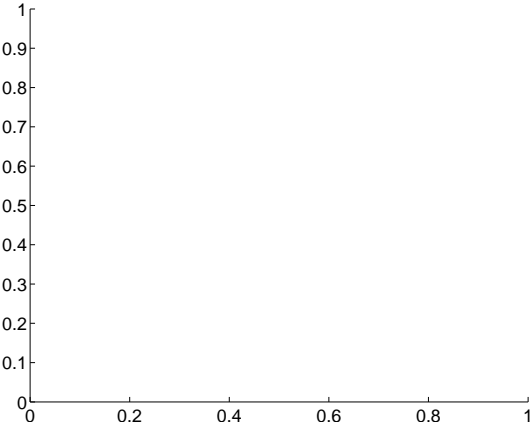


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

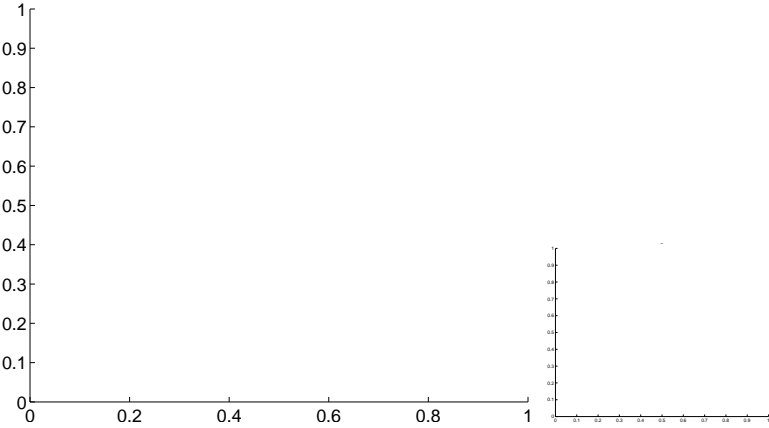


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

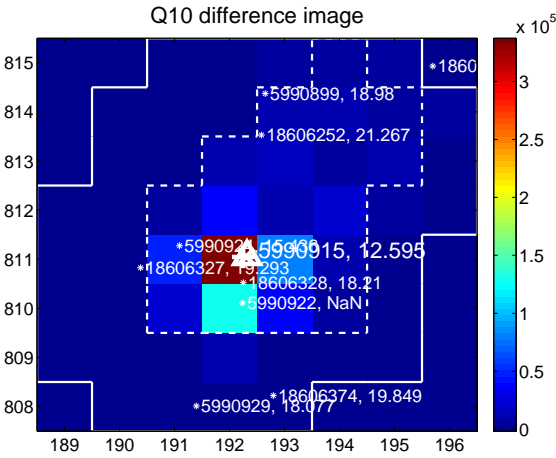
Q9 no difference image



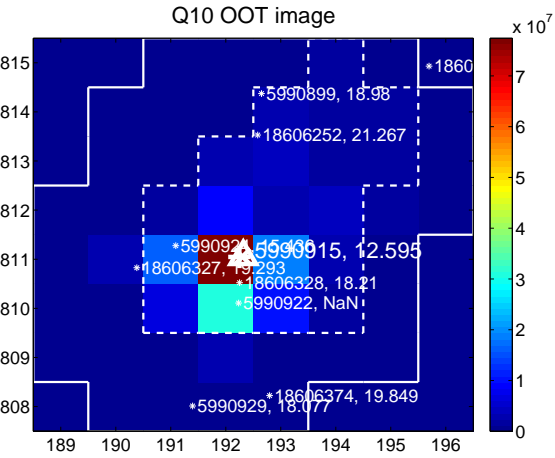
Q9 no OOT image



Q10 difference image



Q10 OOT image



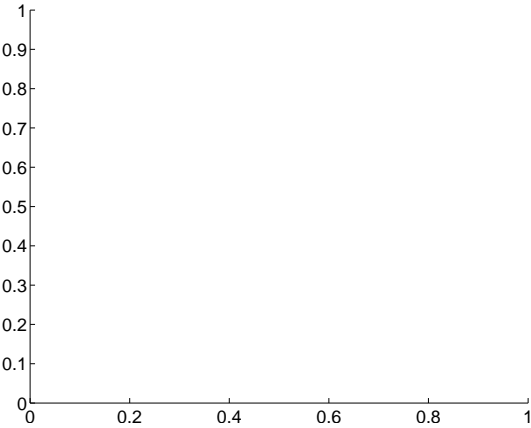
Q11 no difference image



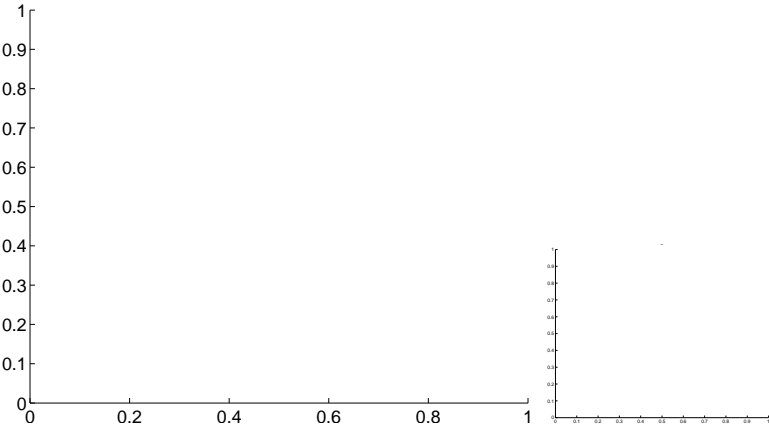
Q11 no OOT image



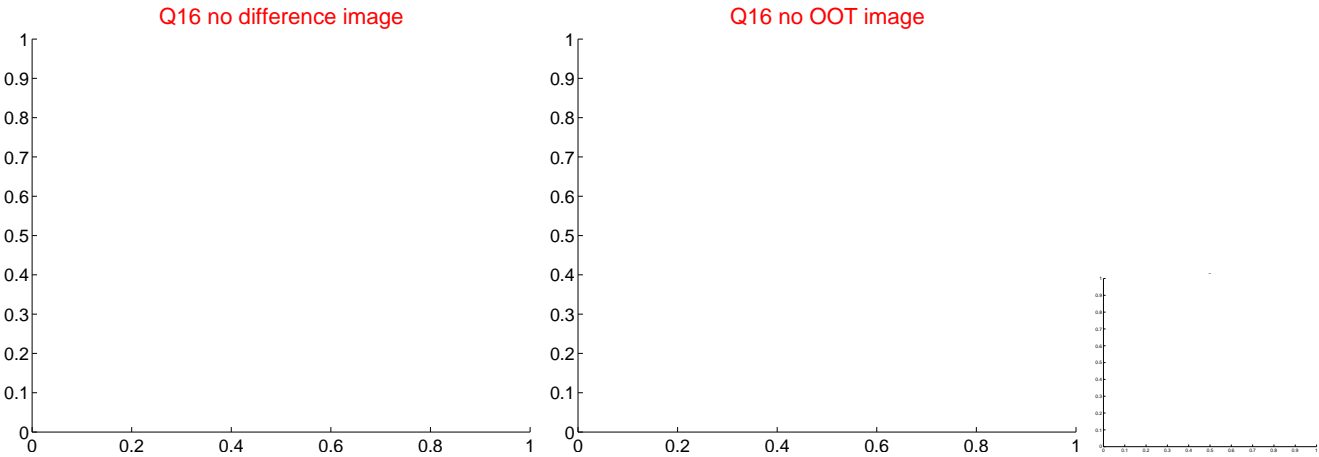
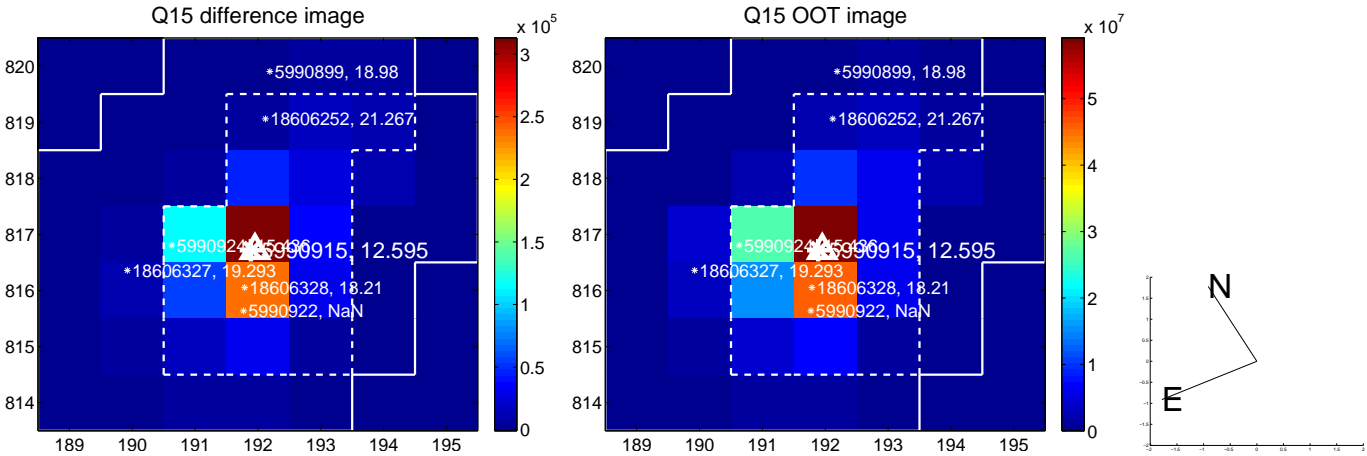
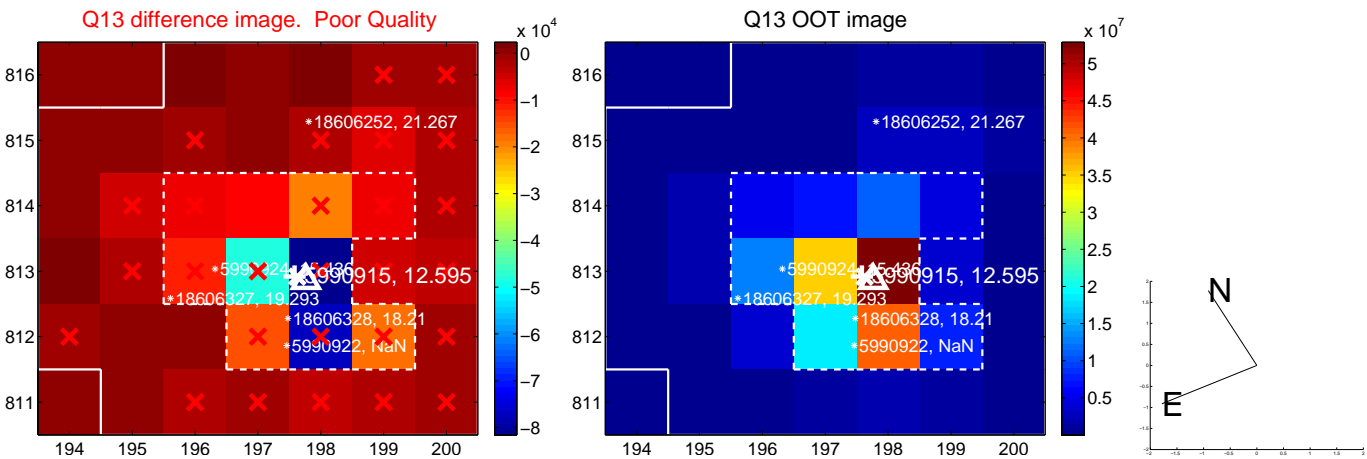
Q12 no difference image



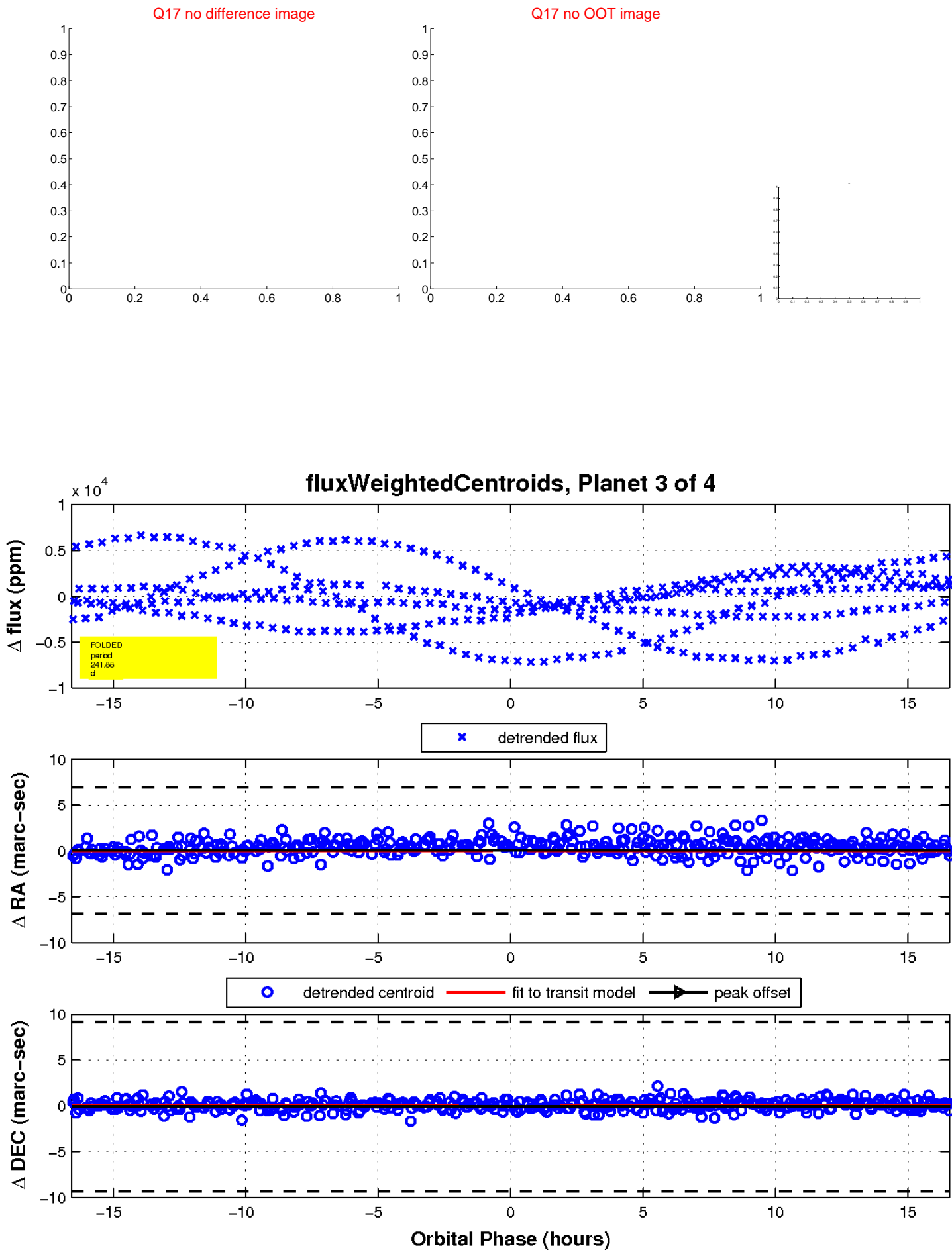
Q12 no OOT image



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

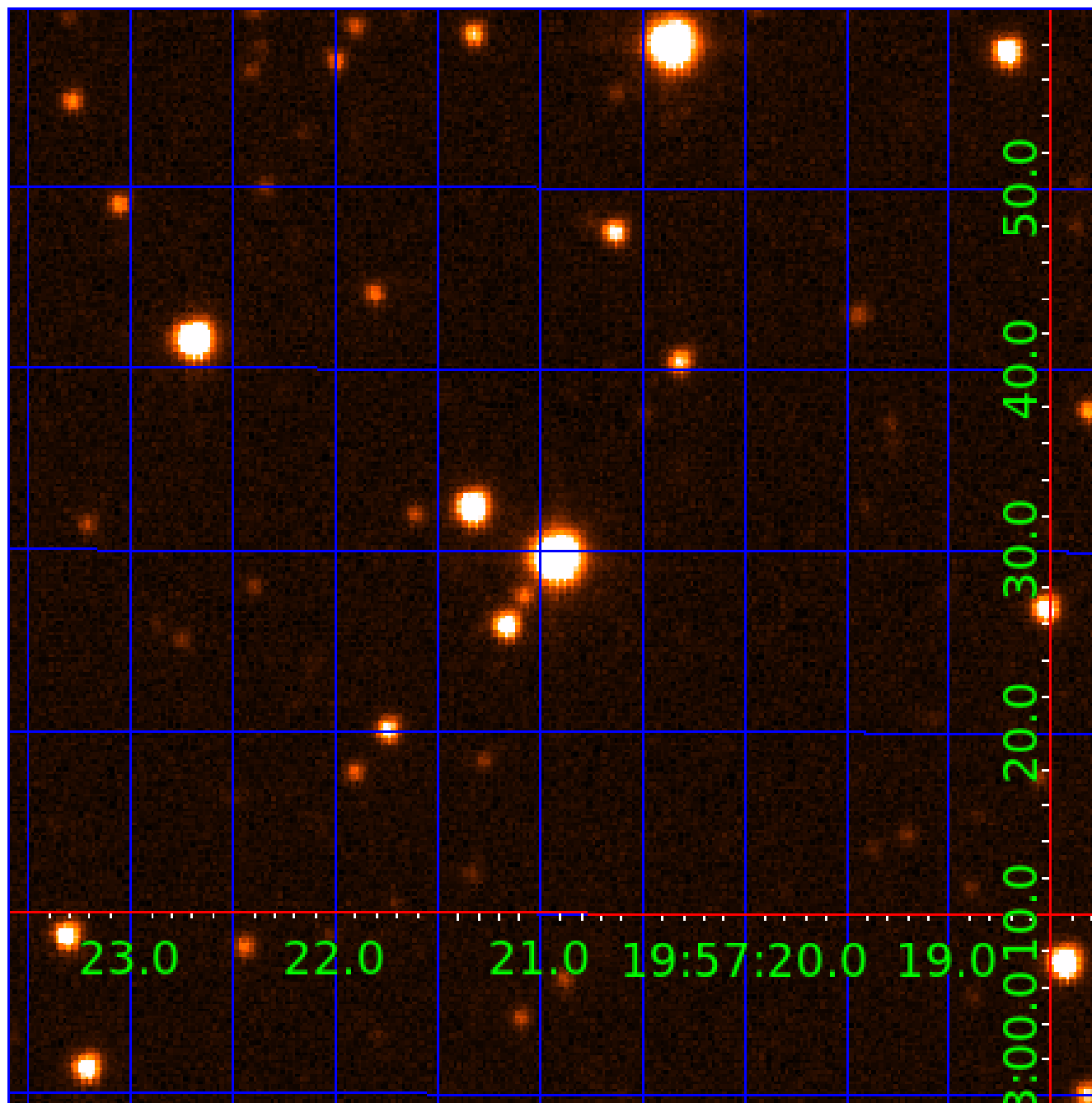


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005990915

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})
005990915-01	OBS	No	2.725507	131.732828	57.8	10.575	9.0	6.6	2.81	7302	2.52	9781.02
005990915-02	OBS	No	292.973874	205.999266	494.2	5.091	14.6	3.5	2.81	7302	11.90	19.14
005990915-03	OBS	No	241.878528	231.245110	1105.9	5.591	12.1	9.2	2.81	7302	17.42	24.71
005990915-04	OBS	No	400.689034	467.822214	6825.9	27.073	10.5	12.6	2.81	7302	41.12	12.61

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005990915-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
005990915-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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—INCONSISTENT_TRANS
005990915-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT— MOD_POS_ALT
005990915-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—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.

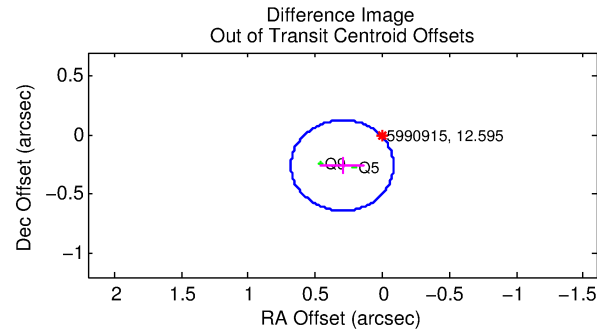
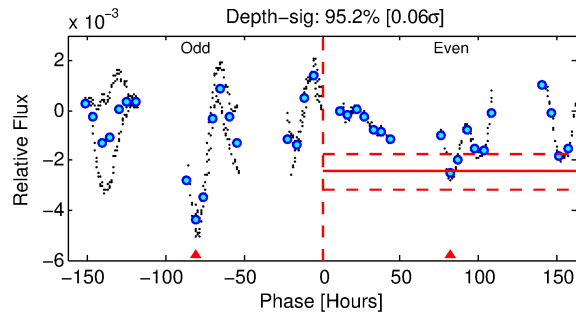
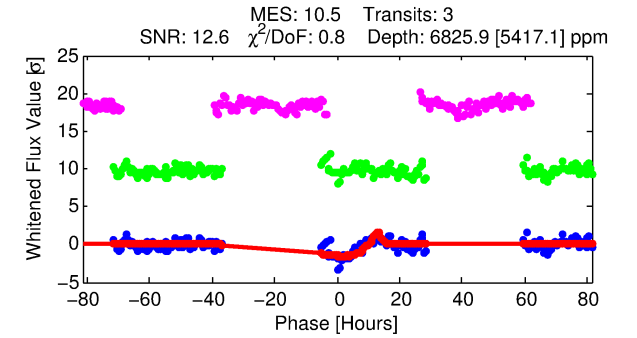
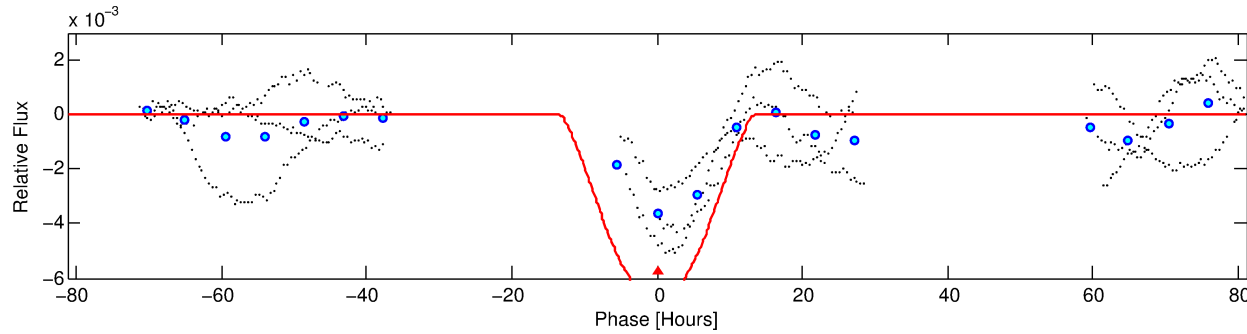
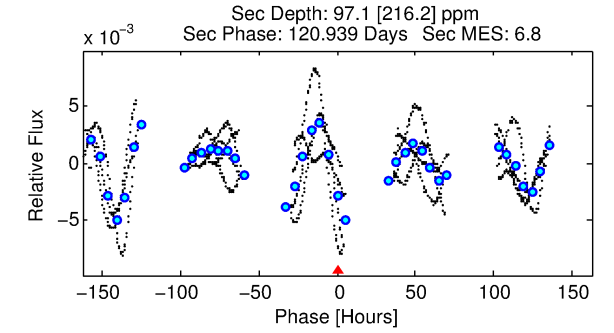
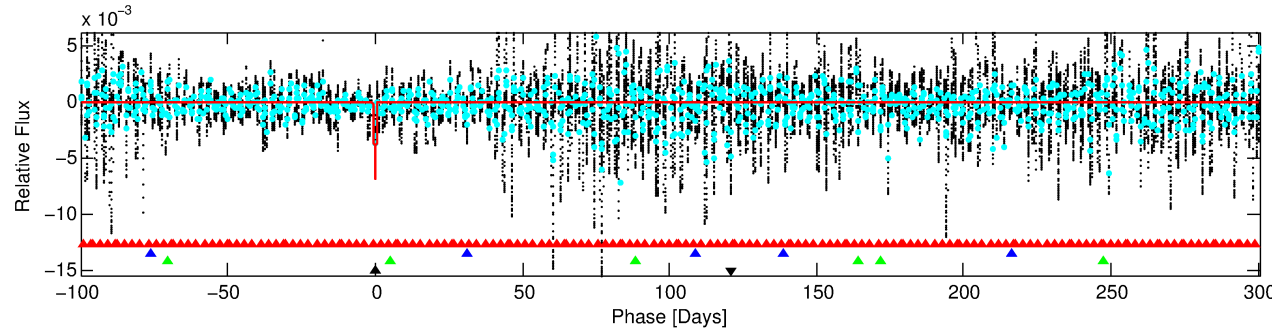
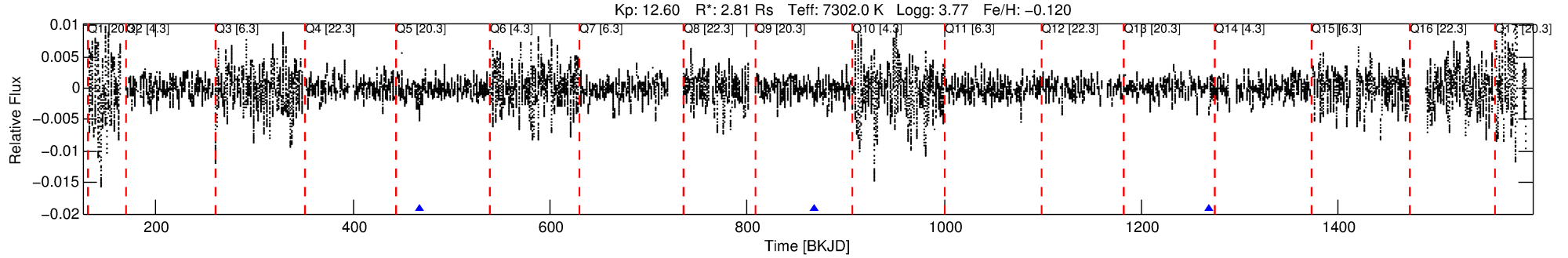
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005990915-04

No Significant Match Found

DV One-Page Summary

KIC: 5990915 Candidate: 4 of 4 Period: 400.689 d



DV Fit Results:

Period = 400.68903 [0.01355] d
Epoch = 467.8222 [0.0730] BKJD
Rp/R* = 0.1339 [0.0895]
a/R* = 60.44 [6.71]
b = 1.00 [0.20]
Seff = 12.61 [9.10]
Teq = 480 [87] K
Rp = 41.12 [32.35] Re
a = 1.2654 [0.5348] AU
Ag = 50.59 [136.00] [0.36σ]
Teff = 1981 [1289] K [1.16σ]

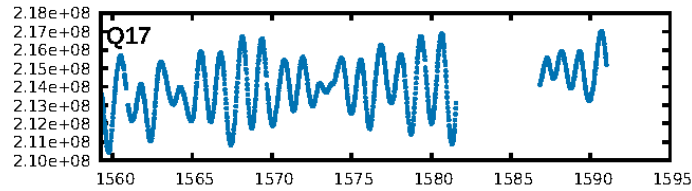
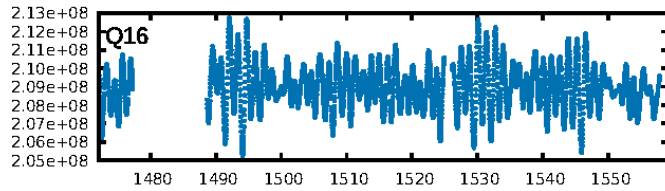
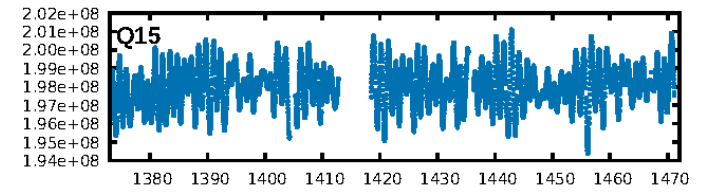
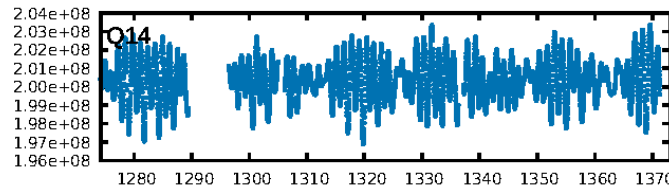
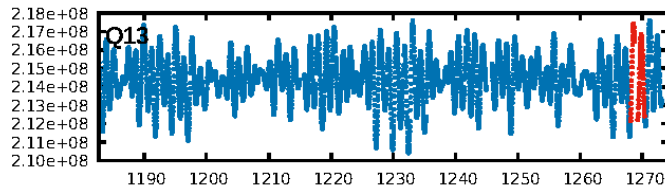
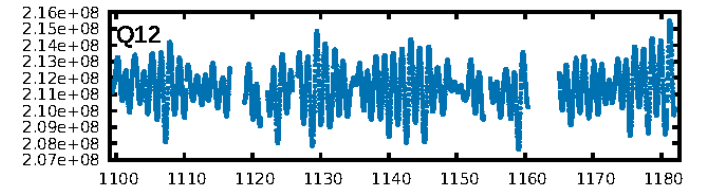
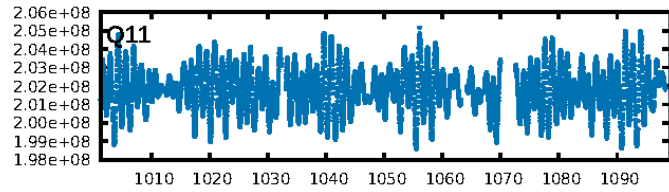
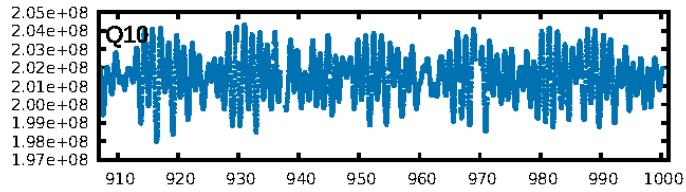
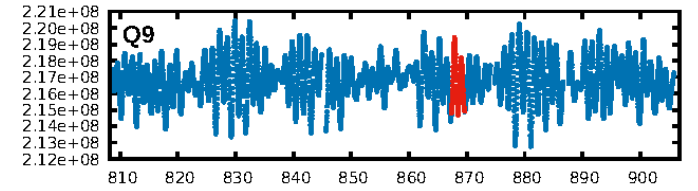
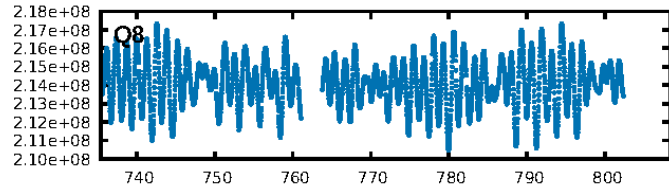
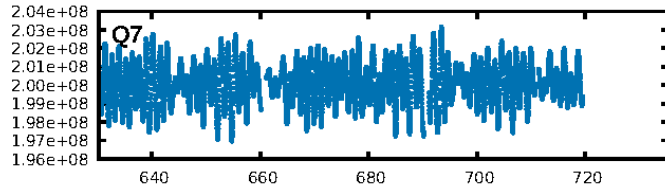
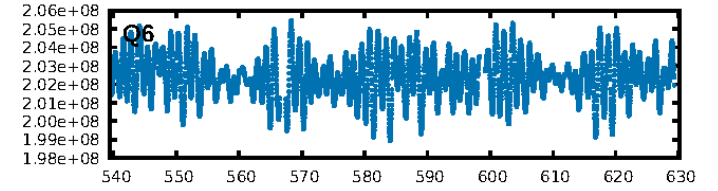
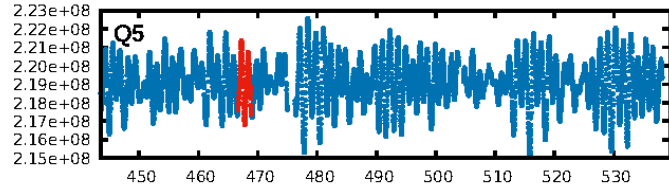
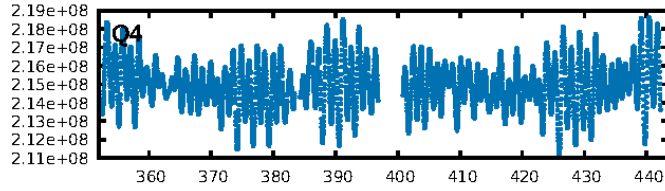
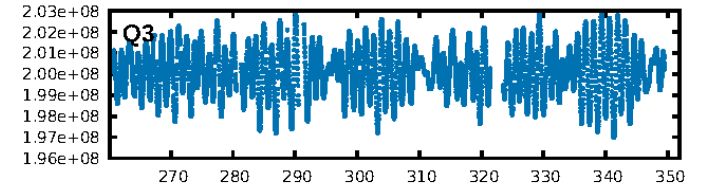
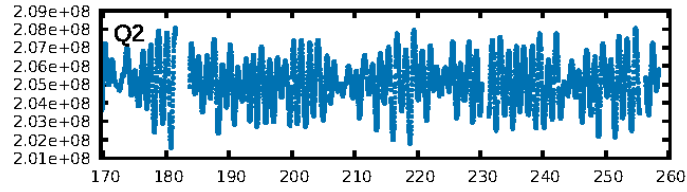
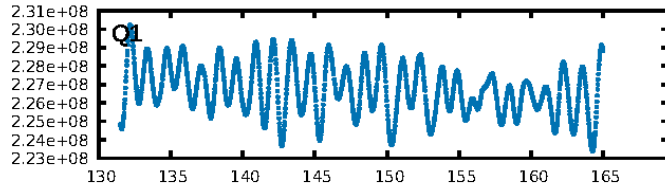
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [93.85σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 7.65e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.7328
Centroid-sig: 0.0%
Centroid-so: 0.181 arcsec [1.65σ]
OotOffset-rm: 0.395 arcsec [3.10σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-rm: 0.461 arcsec [2.96σ]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 0.00 [0/2]

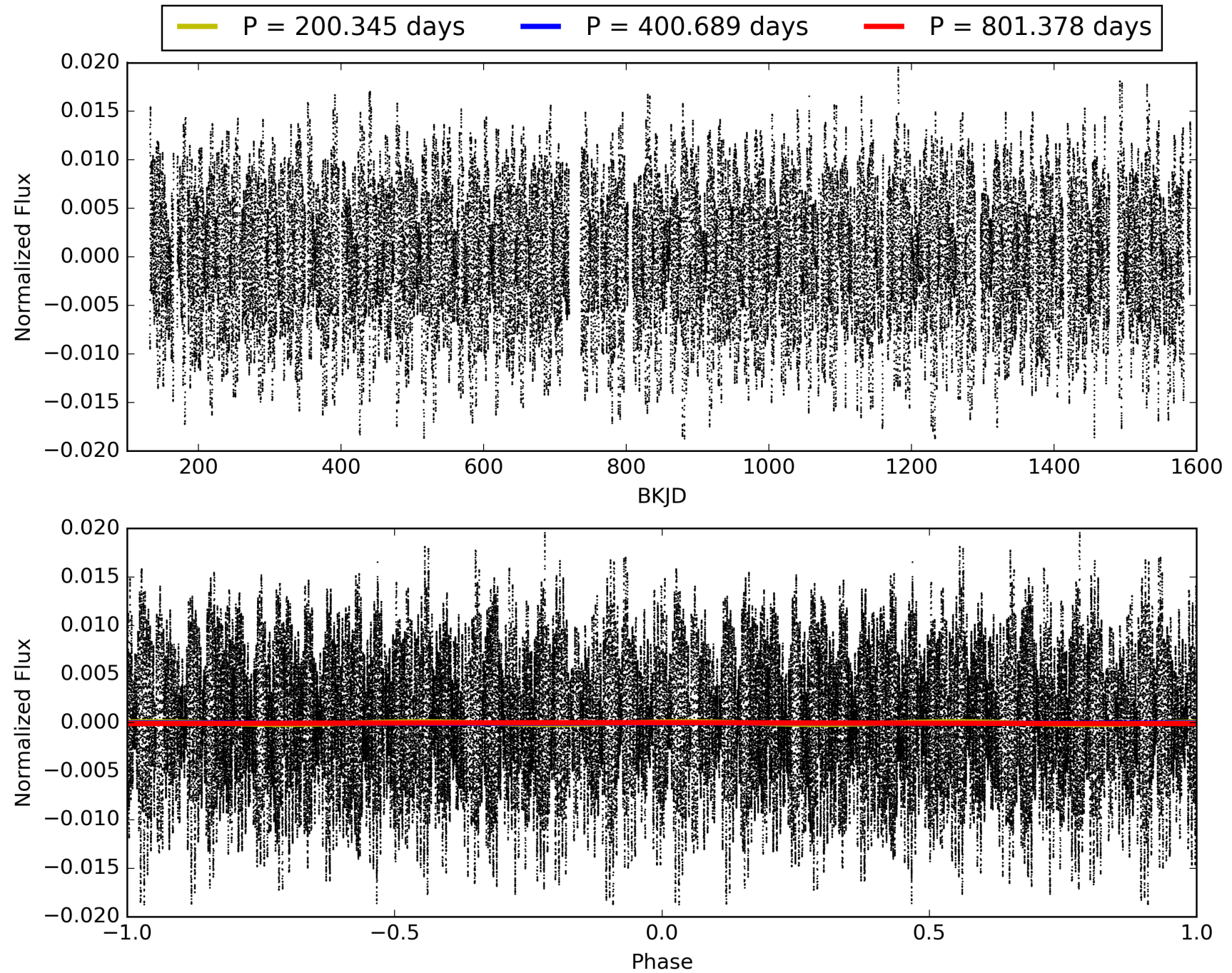
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:14:15 Z

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

TCE 005990915-04, PDC Light Curves

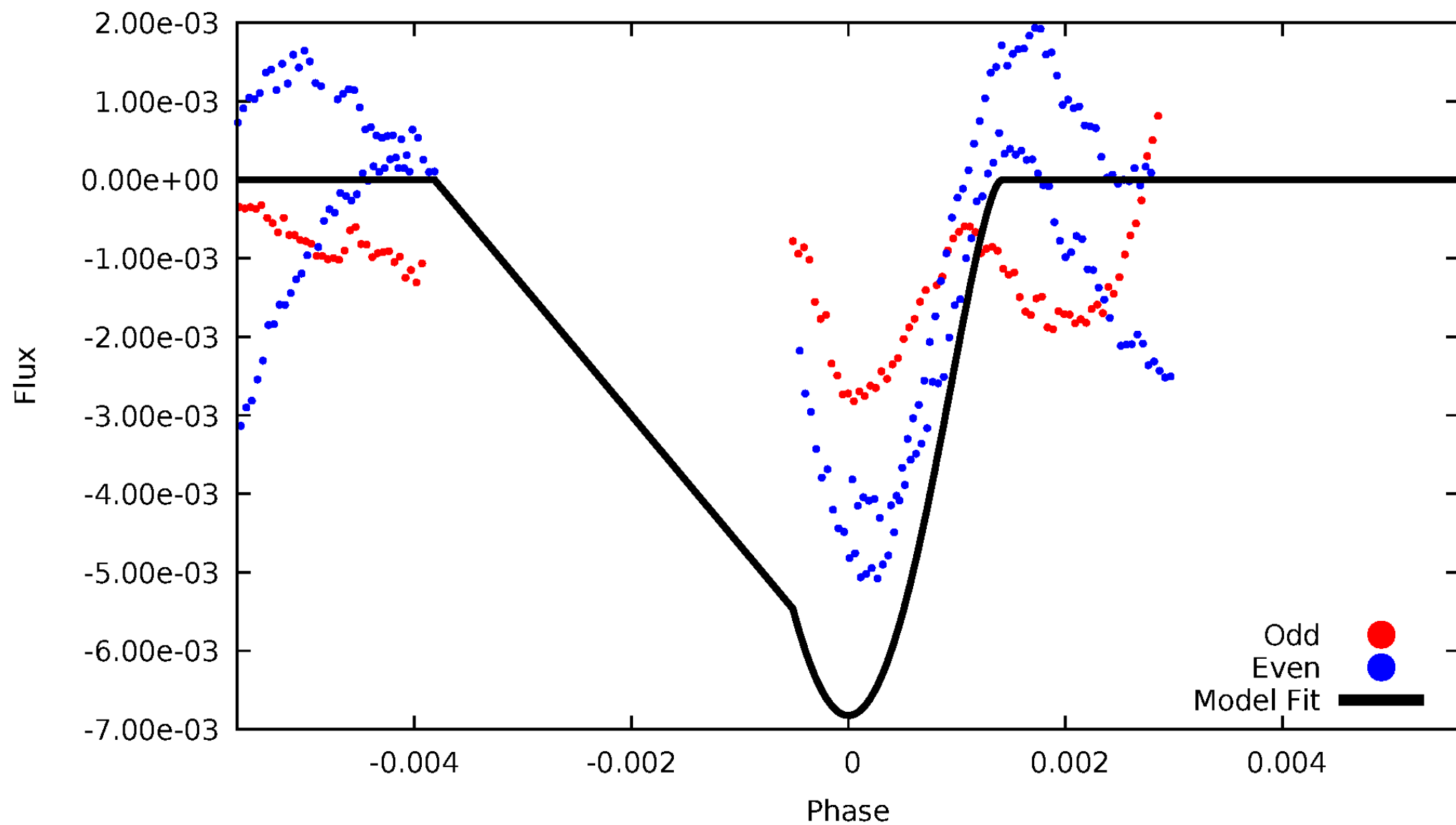


TCE 005990915-04



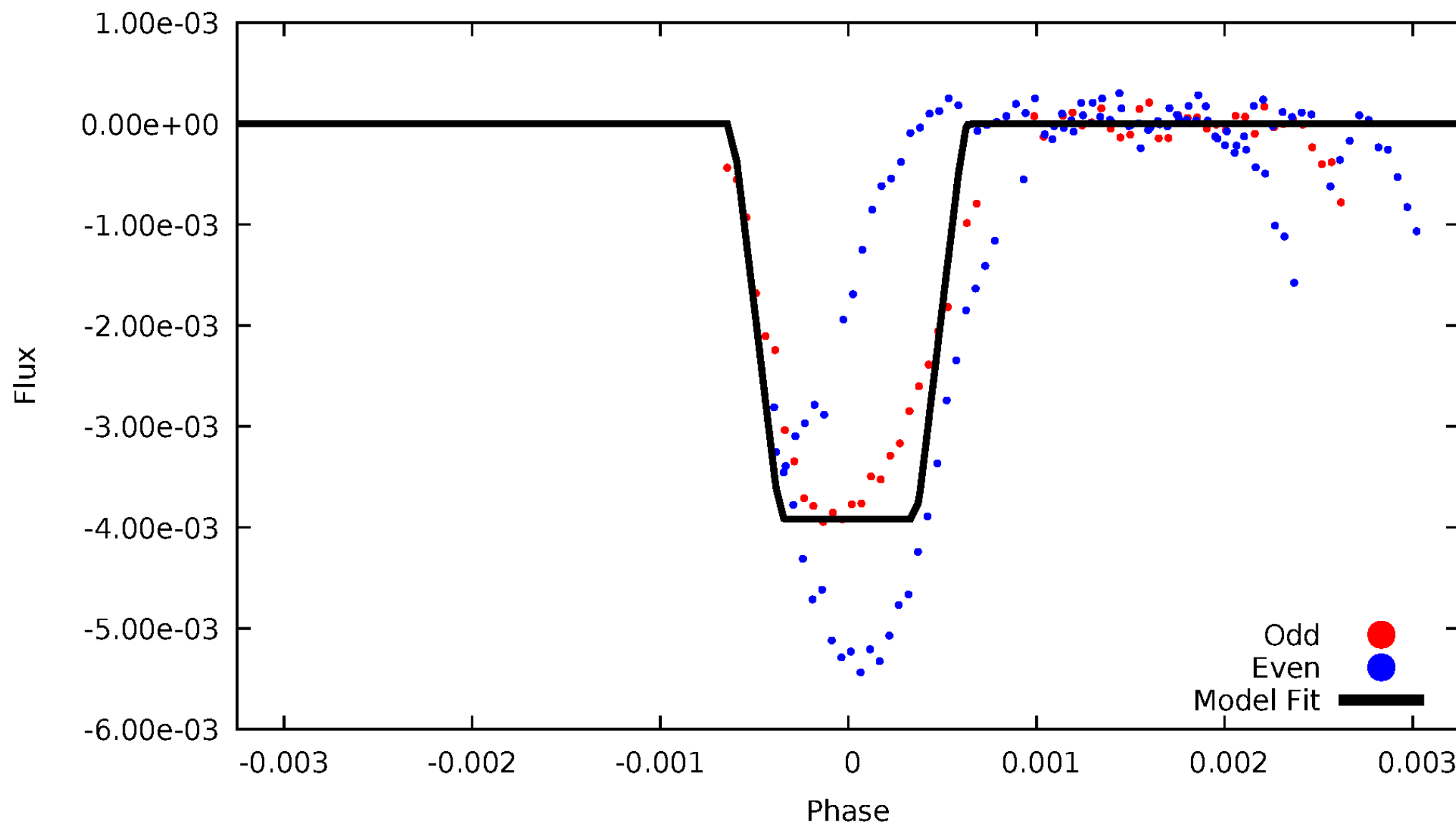
DV Odd/Even

TCE 005990915-04



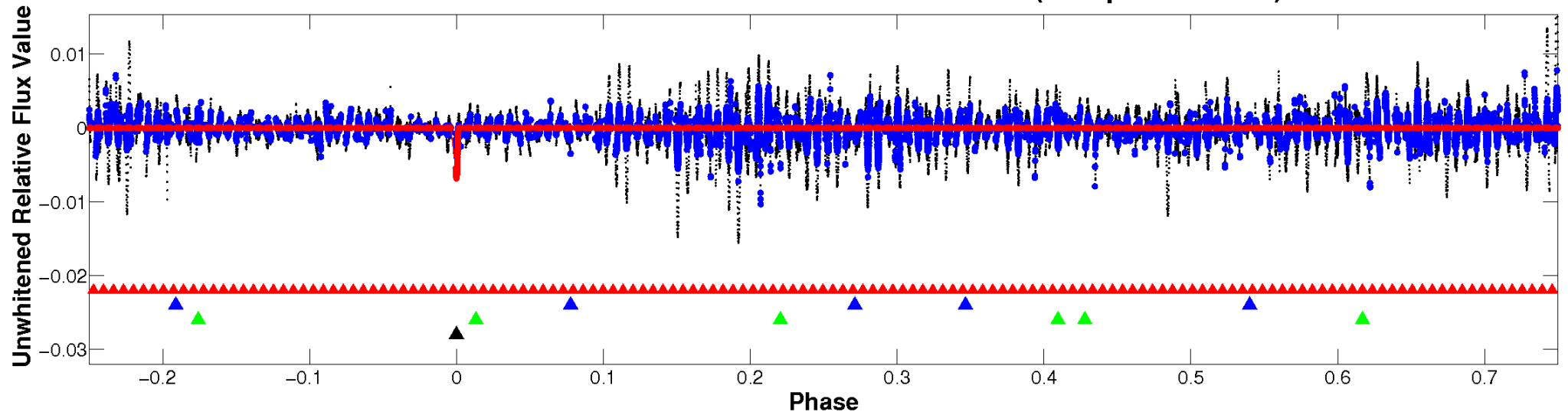
ALT Odd/Even

TCE 005990915-04

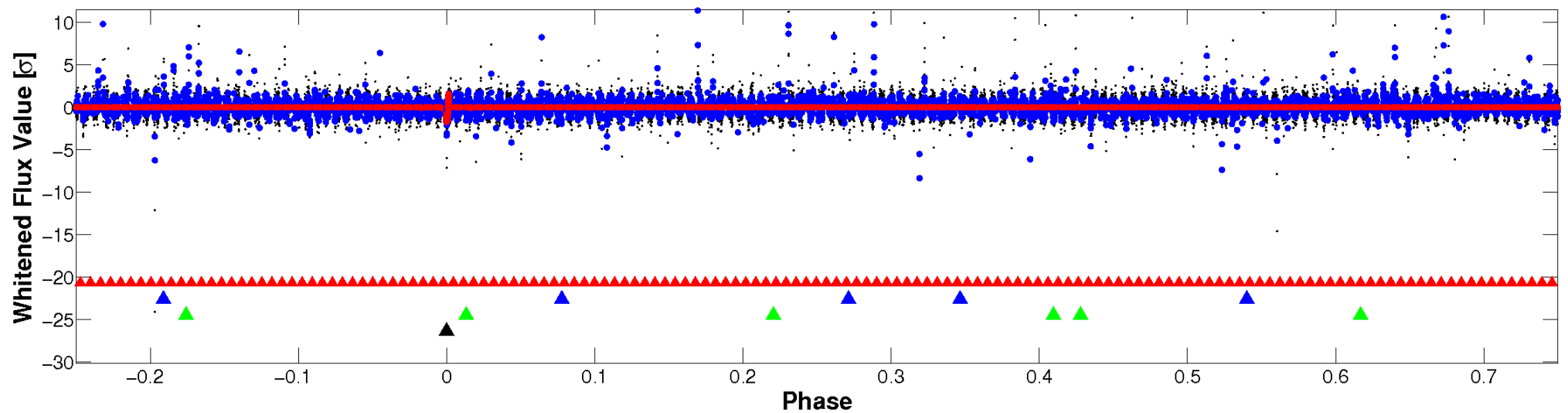


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

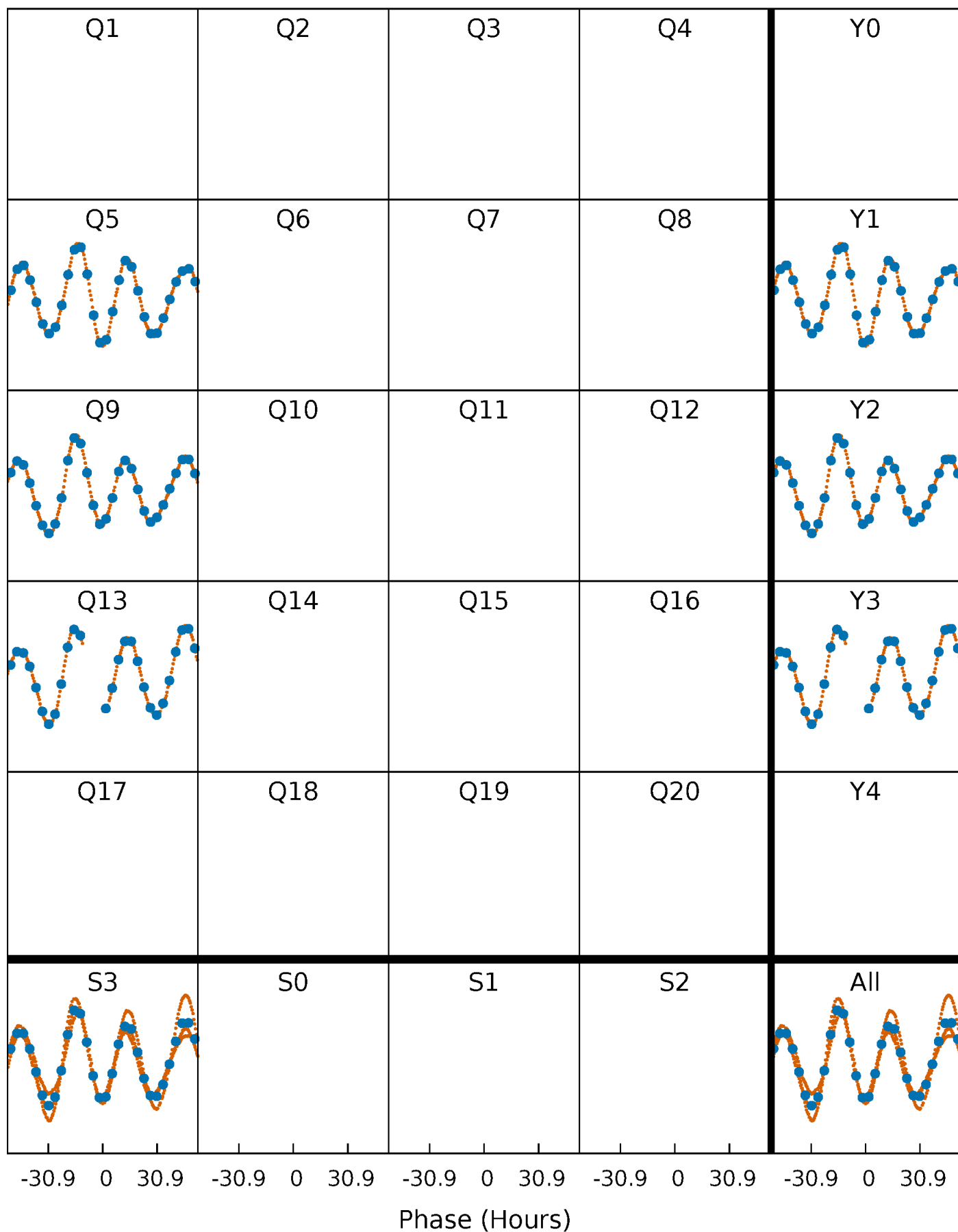


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



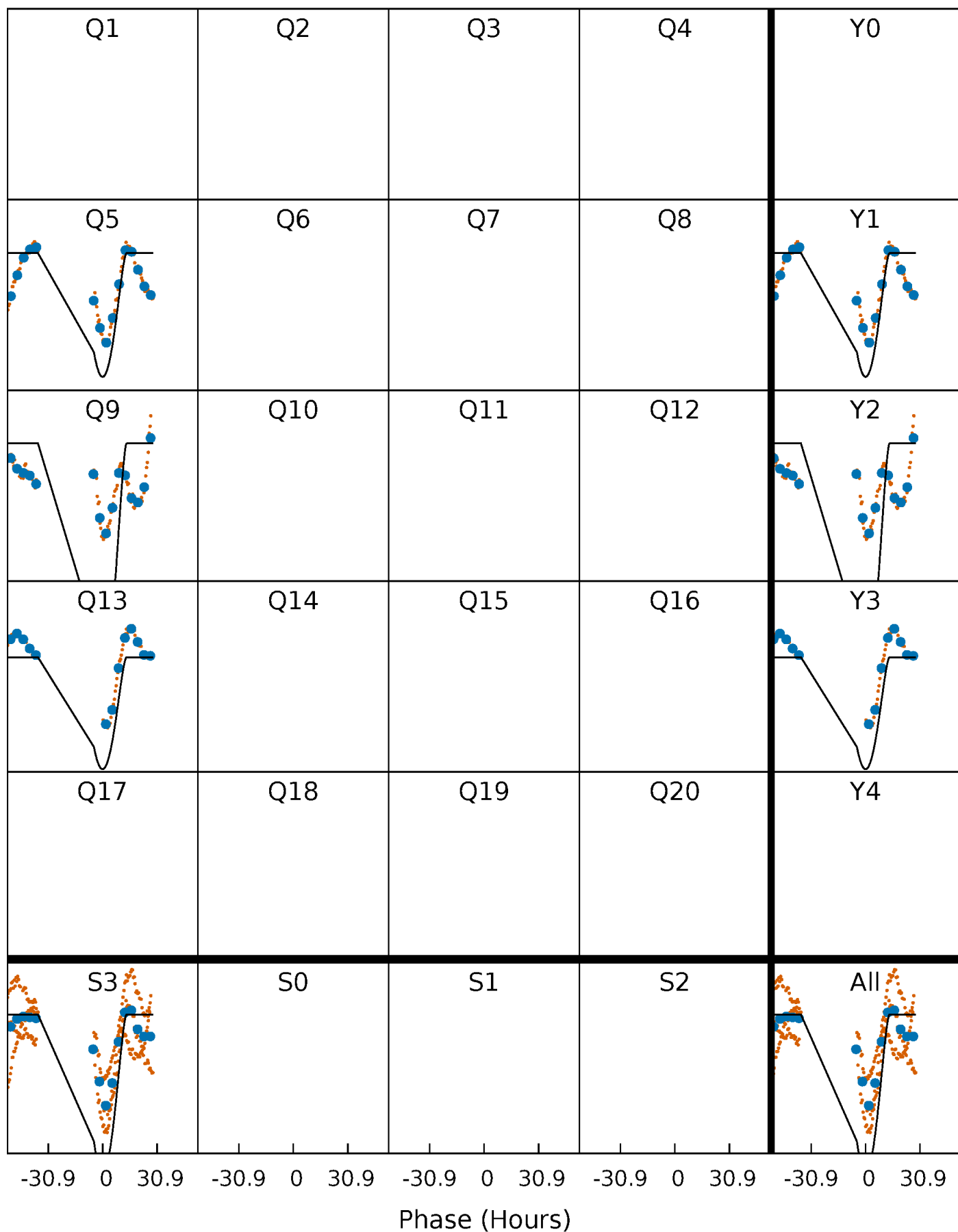
PDC Quarter-Phased Transit Curves

TCE 005990915-04 P=400.689034 Days $T_0=467.822214$ (BKJD)



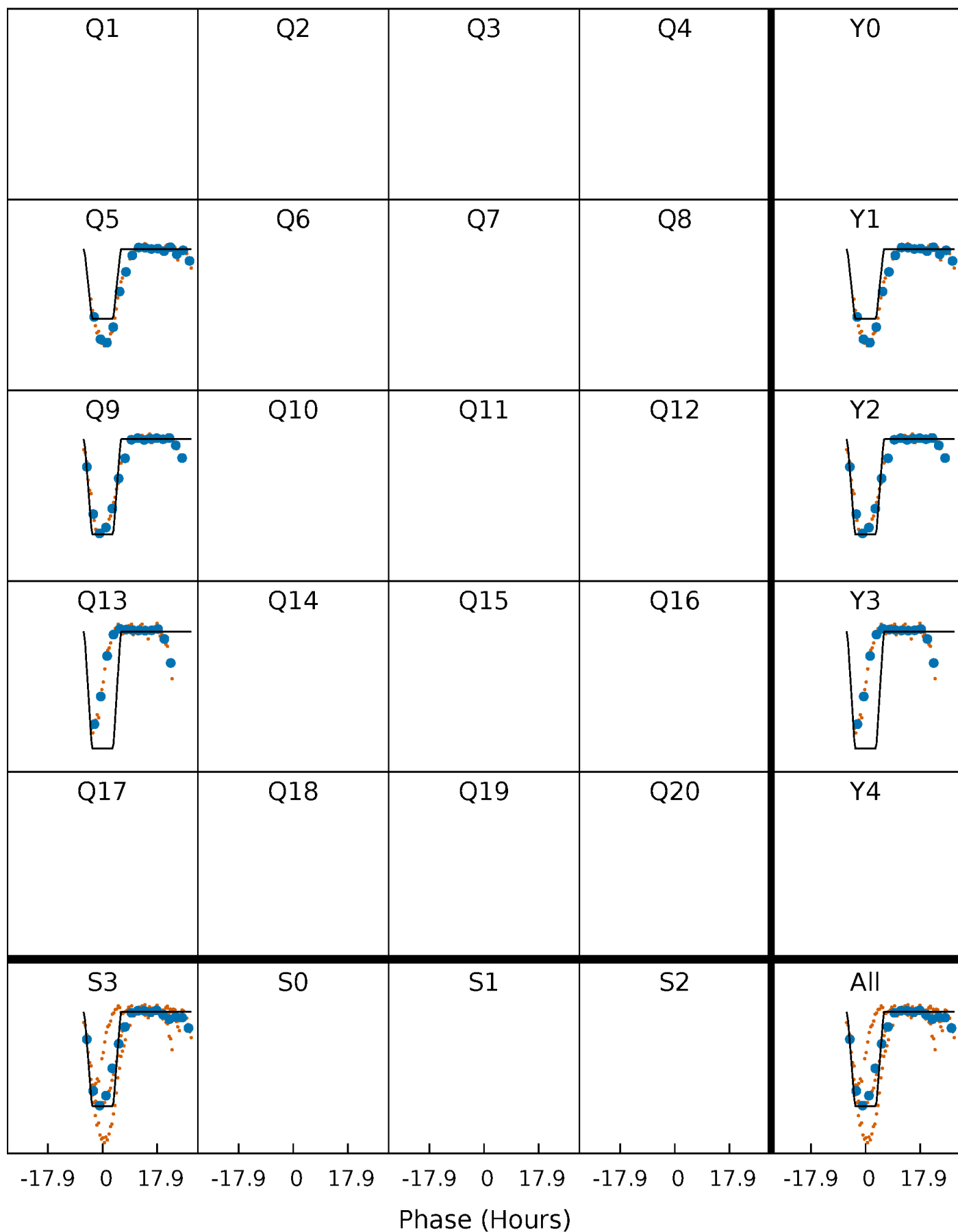
DV Quarter-Phased Transit Curves

TCE 005990915-04 $P=400.689034$ Days $T_0=467.822214$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

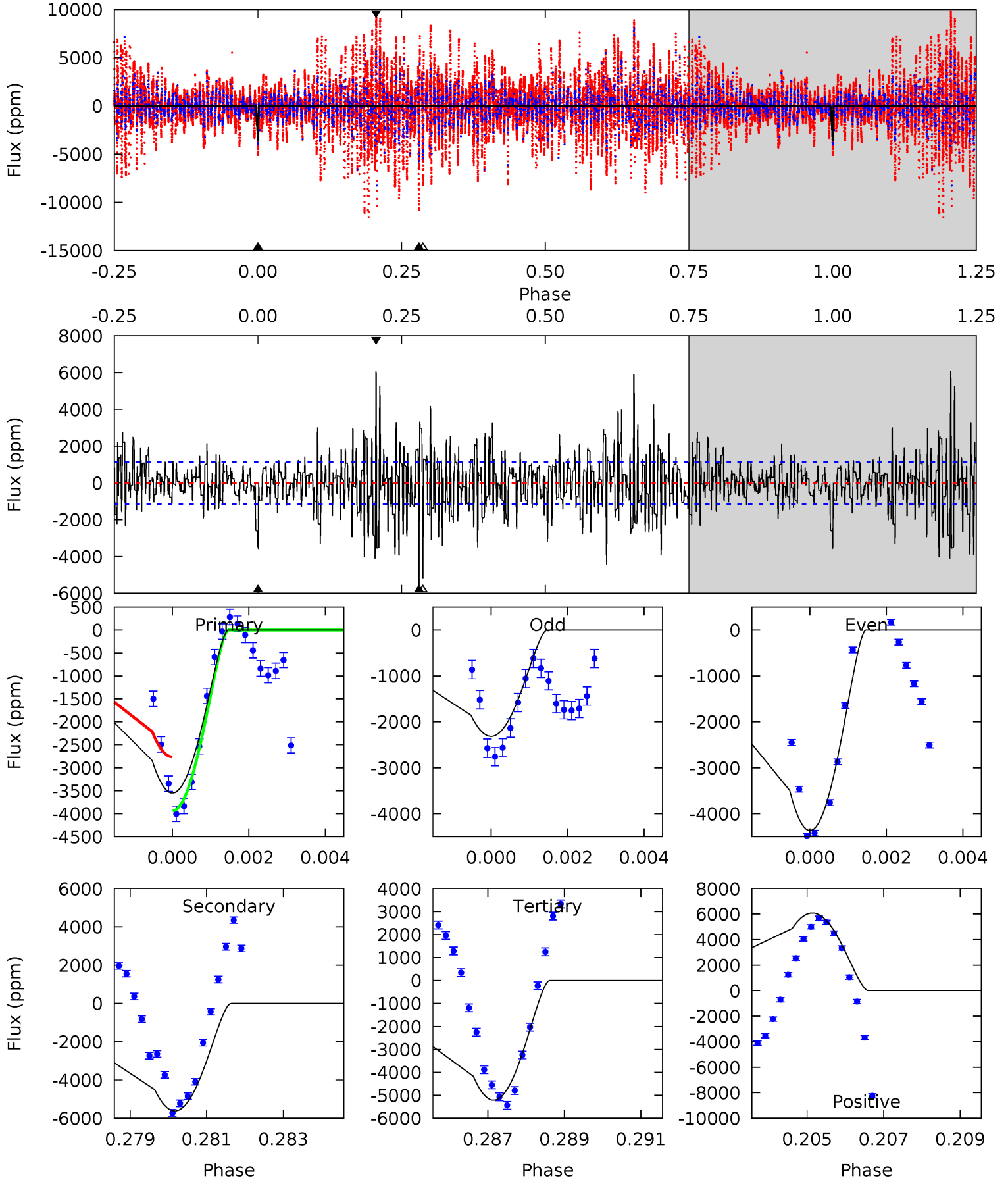
TCE 005990915-04 P=400.783846 Days $T_0=467.801043$ (BKJD)



DV Model-Shift Uniqueness Test

005990915-04, P = 400.689034 Days, E = 67.133180 Days

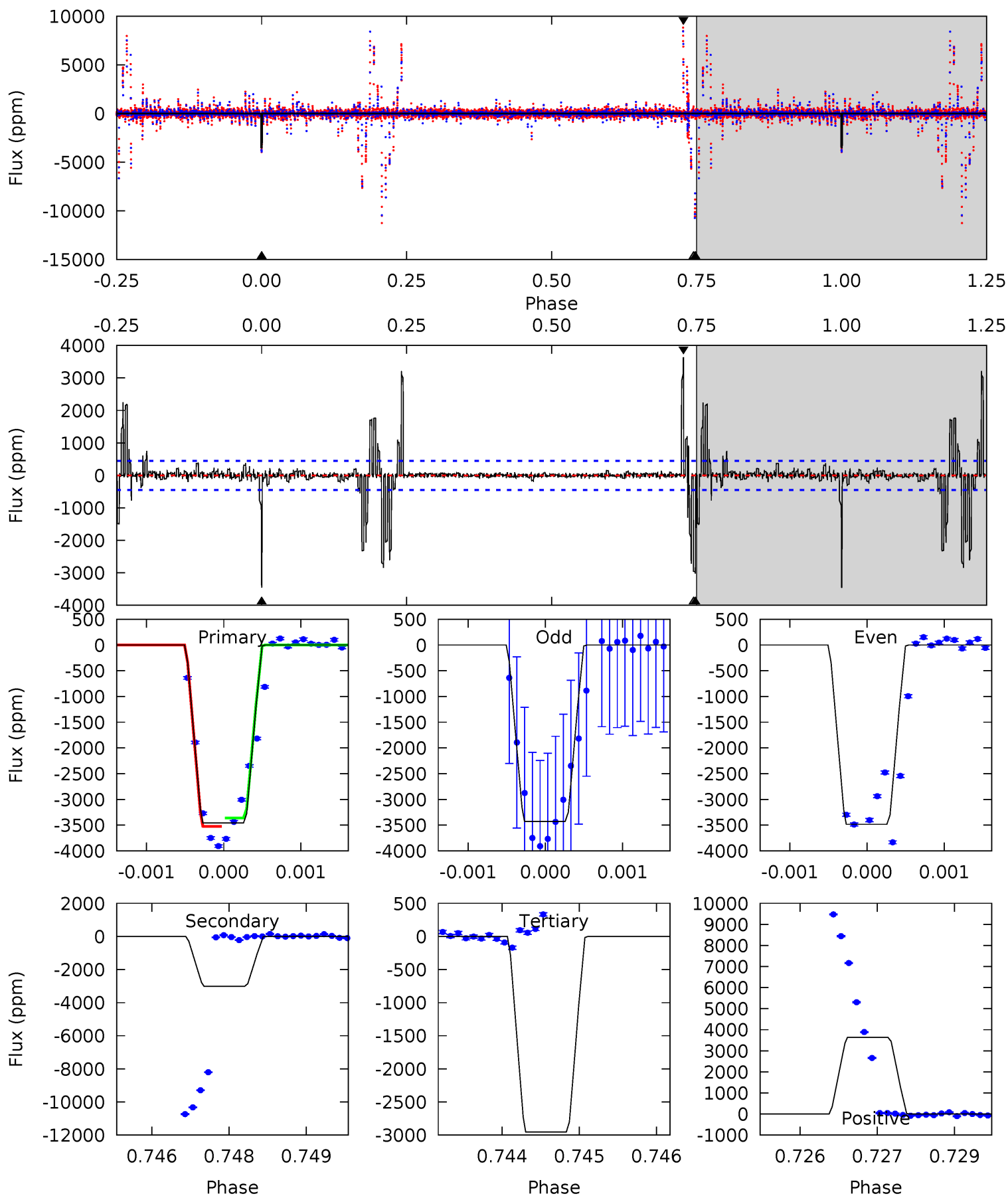
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.6	26.3	24.4	28.5	5.33	3.10	6.31	-7.77	-11.8	1.89	-2.19	3.87	0.91	0.52	2.29



Alt Model-Shift Uniqueness Test

005990915-04, $P = 400.783846$ Days, $E = 67.017197$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
41.5	36.2	35.5	43.6	5.41	3.22	2.95	6.04	-2.11	0.73	-7.43	0.20	0.95	0.51	0



Stellar Parameters For KIC 005990915

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7302^{+232}_{-348}	$3.765^{+0.416}_{-0.098}$	$-0.120^{+0.250}_{-0.350}$	$2.815^{+0.501}_{-1.169}$	$1.682^{+0.184}_{-0.342}$	$0.106^{+0.368}_{-0.033}$
	+3%/-5%	+11%/-3%	+208%/-292%	+18%/-42%	+11%/-20%	+346%/-31%
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 005990915-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-5616 ± 214	$38.41^{+28.19}_{-20.93}$	652^{+47}_{-77}	5327^{+2654}_{-969}	3321^{+13345}_{-2204}
Alt.	-3016 ± 83	$24.67^{+21.55}_{-16.85}$	646^{+54}_{-72}	5632^{+5437}_{-1297}	4428^{+37413}_{-3215}

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

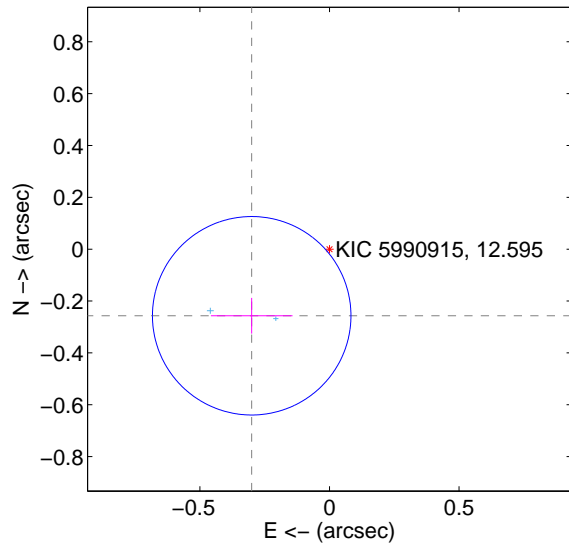
Supplemental centroid analysis for 005990915-04. Kepler magnitude: 12.60. Transit SNR 12.62

There are 2 quarters with good PRF difference image offsets

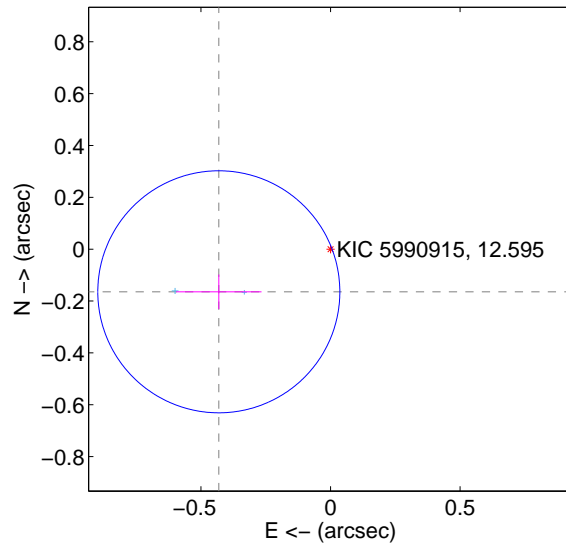
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.395 ± 0.128	3.10	0.300 ± 0.157	-0.257 ± 0.069
PRF-fit source offset from KIC position	0.461 ± 0.156	2.96	0.431 ± 0.165	-0.164 ± 0.067
photometric centroid source offset	0.18 ± 0.11	1.65	0.15 ± 0.12	-0.10 ± 0.06

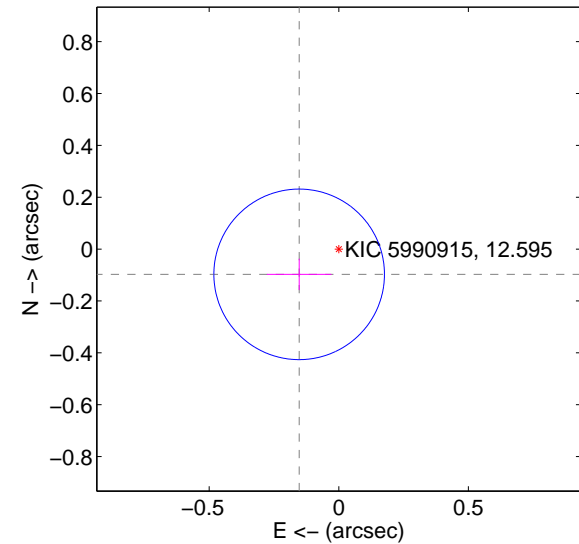
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

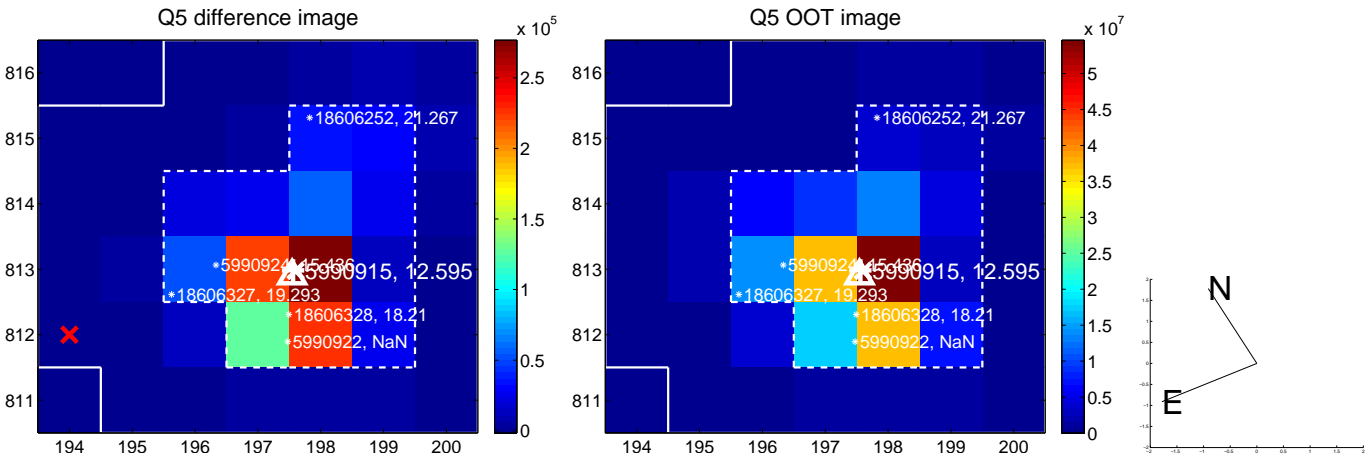


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

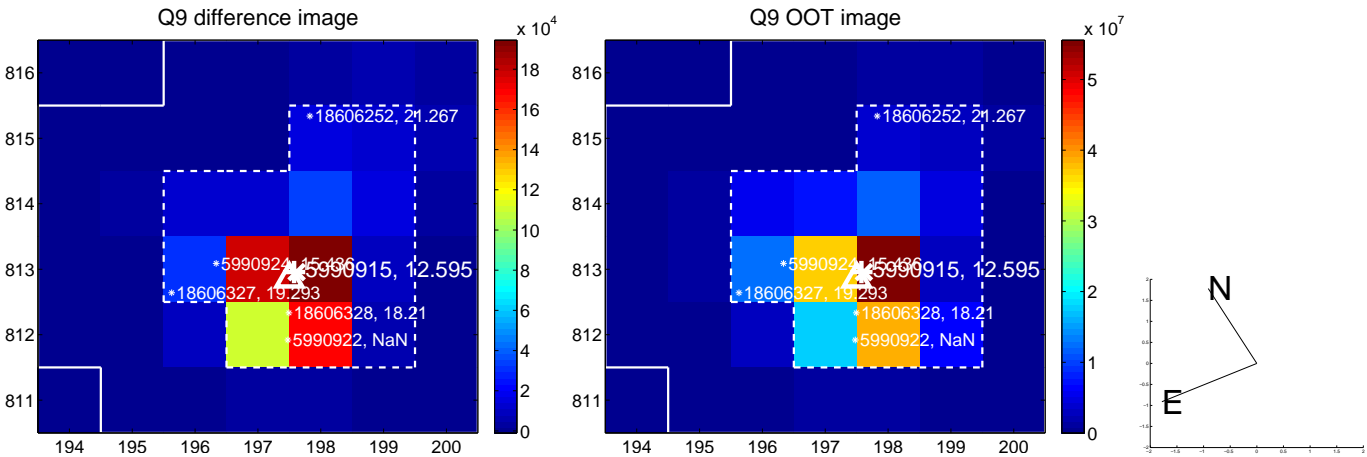
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



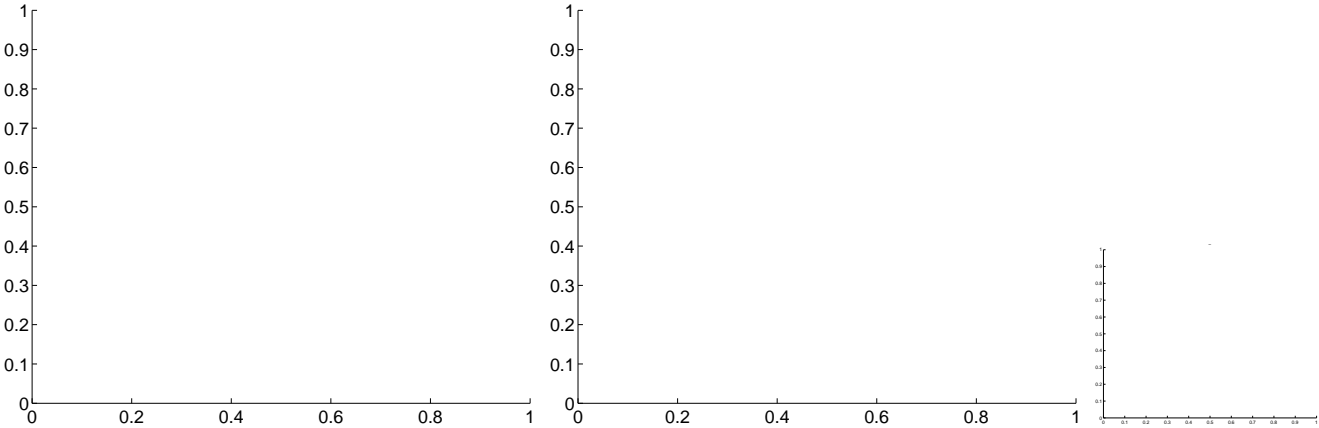
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



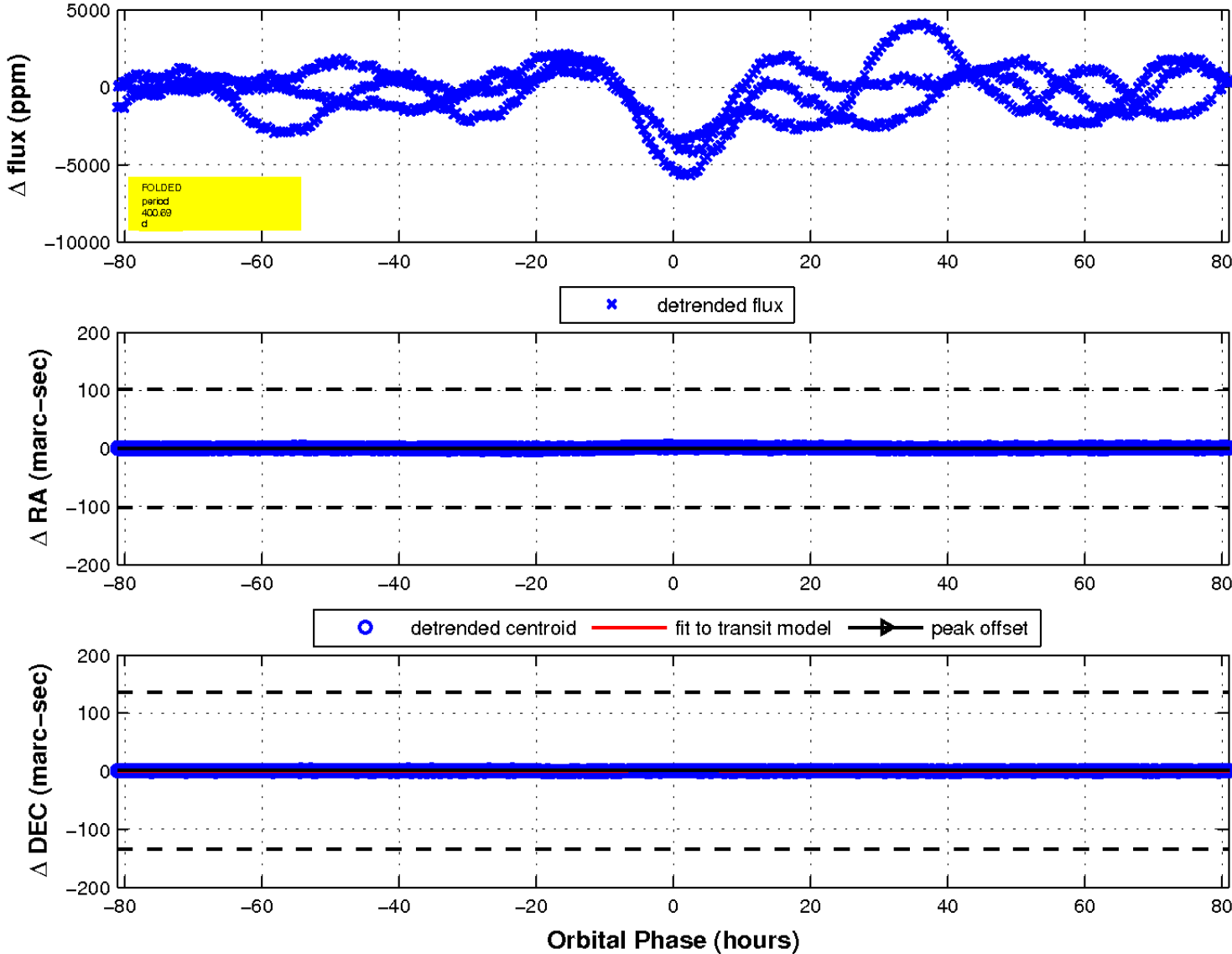
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q17 no difference image

Q17 no OOT image



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

