

KIC 009970568

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})
009970568-01	OBS	No	0.761375	131.773155	86.1	4.981	11.6	7.0	3.31	8035	3.13	95374.74
009970568-02	OBS	No	6.849496	134.393510	2076.3	2.075	12.6	9.7	3.31	8035	27.48	5097.45
009970568-03	OBS	No	30.488151	135.191934	1286.3	2.736	10.7	8.8	3.31	8035	13.60	696.18
009970568-04	OBS	No	108.630100	155.707473	2355.6	3.769	10.6	9.9	3.31	8035	29.25	127.93
009970568-05	OBS	No	51.809300	179.787566	2073.0	5.115	10.3	13.0	3.31	8035	15.51	343.31
009970568-06	OBS	No	9.624401	133.642564	889.2	1.961	9.2	9.5	3.31	8035	13.06	3238.92
009970568-07	OBS	No	27.073036	138.845537	965.7	3.769	9.0	8.0	3.31	8035	10.94	815.67
009970568-08	OBS	No	14.115709	139.253007	1679.2	2.645	9.9	11.7	3.31	8035	23.27	1943.69
009970568-09	OBS	No	8.894852	132.463277	42.6	2.000	9.2	-1.0	3.31	8035	2.19	3597.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970568-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

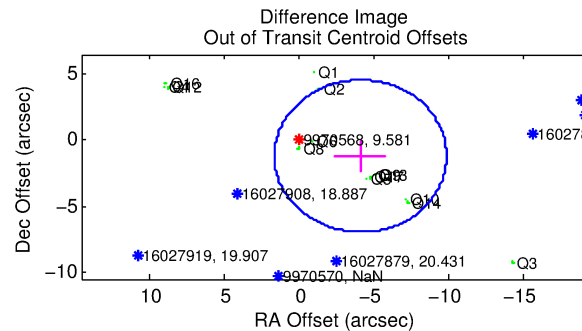
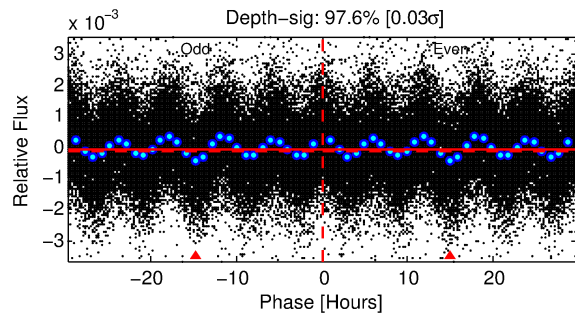
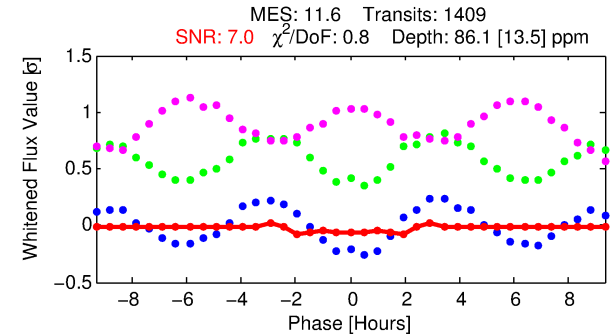
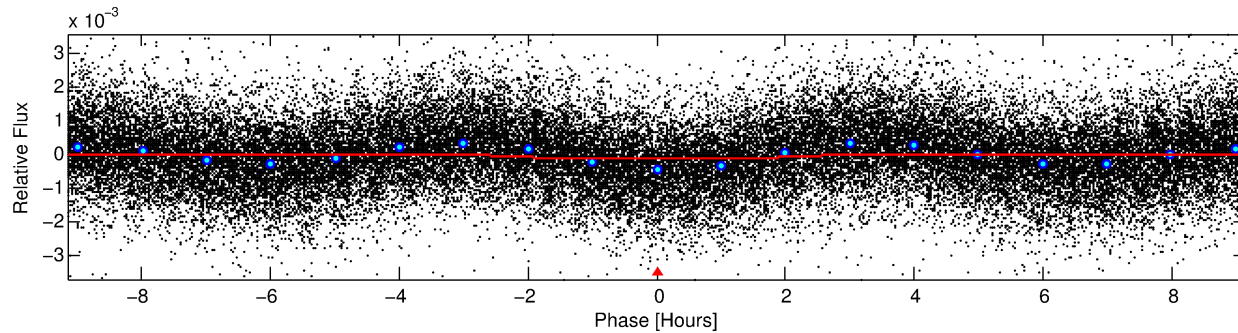
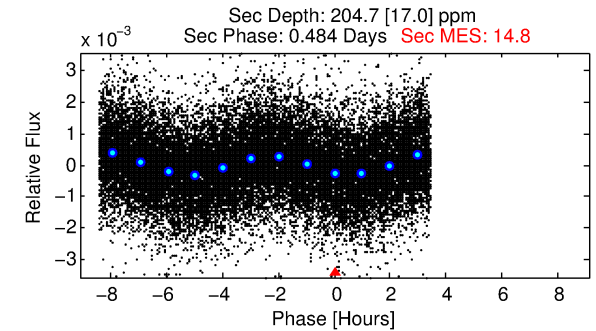
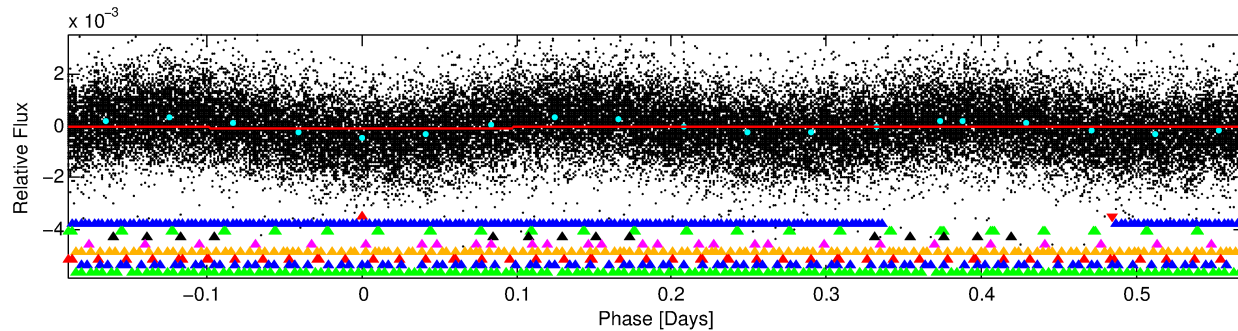
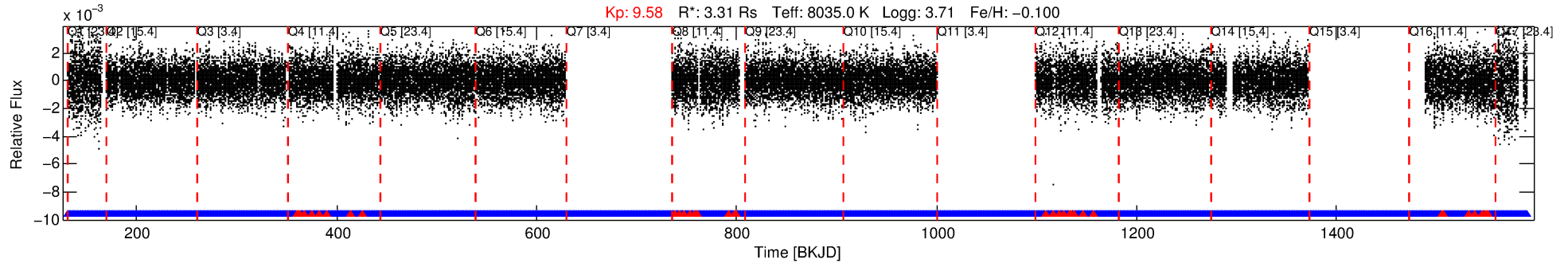
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009970568-01

No Significant Match Found

DV One-Page Summary

KIC: 9970568 Candidate: 1 of 9 Period: 0.761 d



DV Fit Results:

Period = 0.76137 [0.00002] d
Epoch = 131.7732 [0.0032] BKJD
a/R* = 0.0087 [0.0071]
a/R* = 1.31 [2.53]
b = 0.31 [13.85]
Seff = 95374.74 [72211.68]
Teq = 4481 [848] K
Rp = 3.13 [2.97] Re
a = 0.0207 [0.0095] AU
Ag = 4.94 [8.89] [0.44σ]
Teffp = 10330 [4267] K [1.34σ]

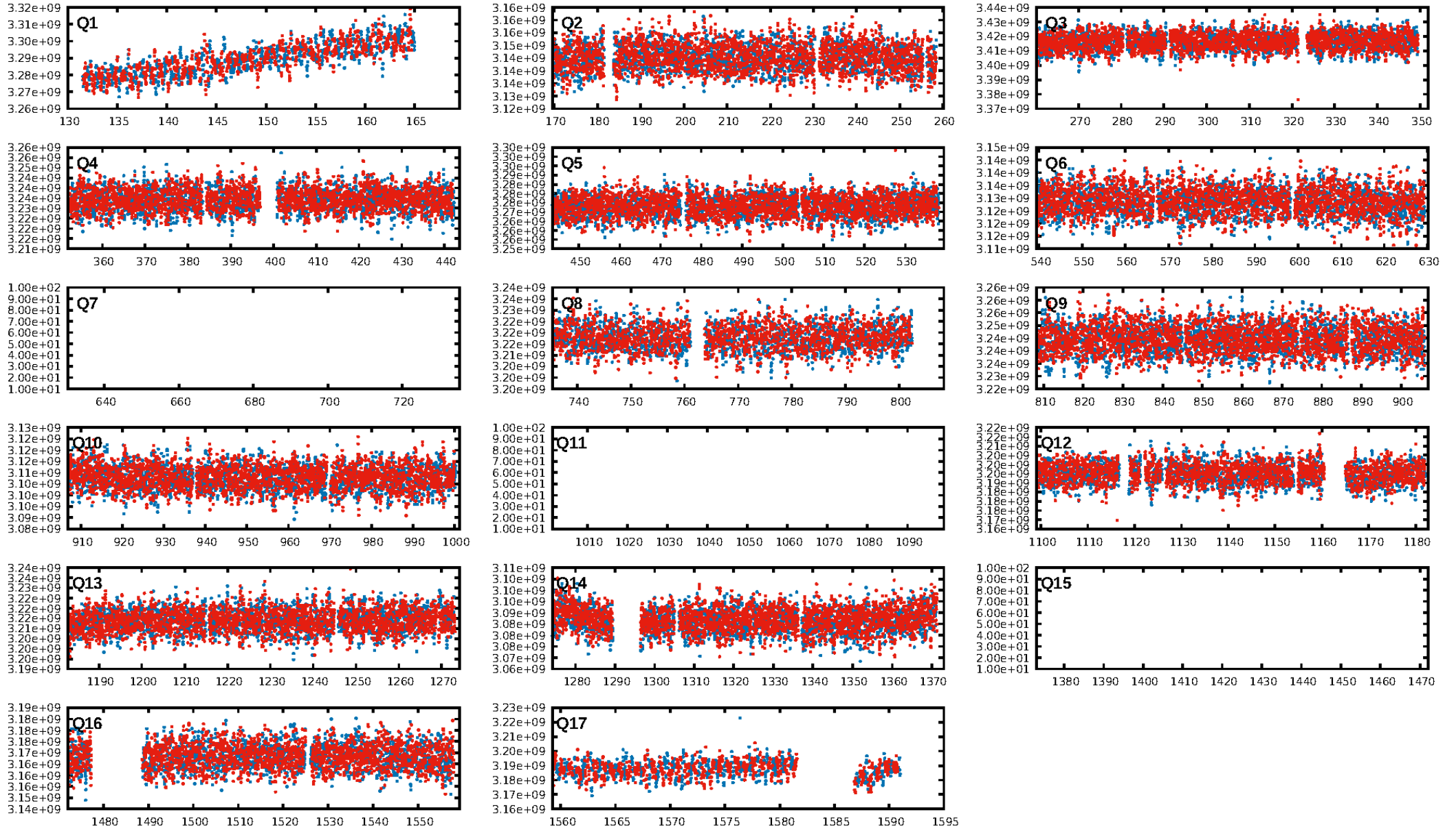
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [27.08σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.97 [1293/1329]
GhostDiagnostic-chr: N/A
Centroid-sig: 73.2%
Centroid-so: 0.084 arcsec [0.28σ]
OotOffset-rm: 4.330 arcsec [2.26σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-rm: 4.846 arcsec [2.48σ]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.07 [1/14]
DiffImageOverlap-fno: 1.00 [14/14]

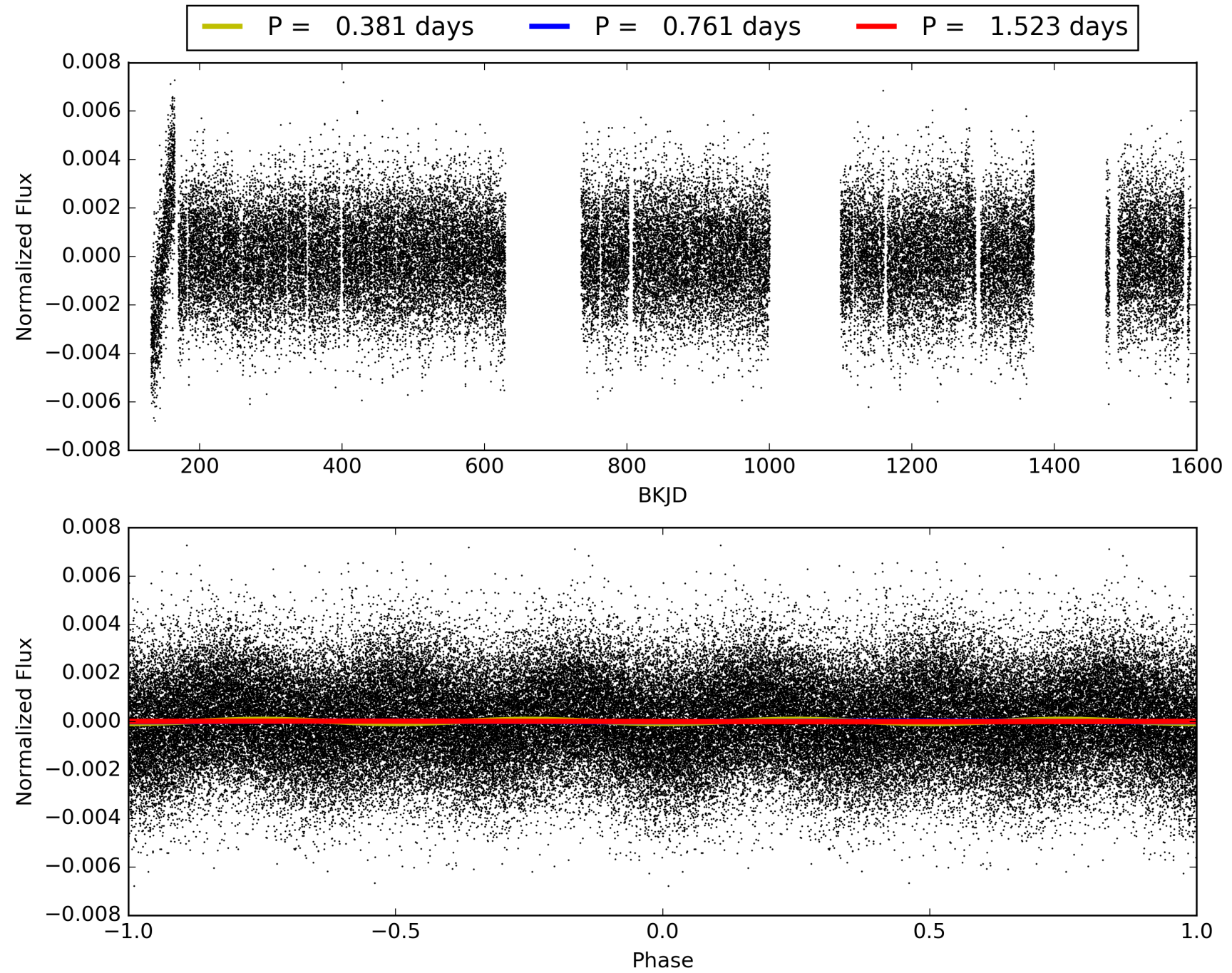
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:15 Z

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

TCE 009970568-01, PDC Light Curves

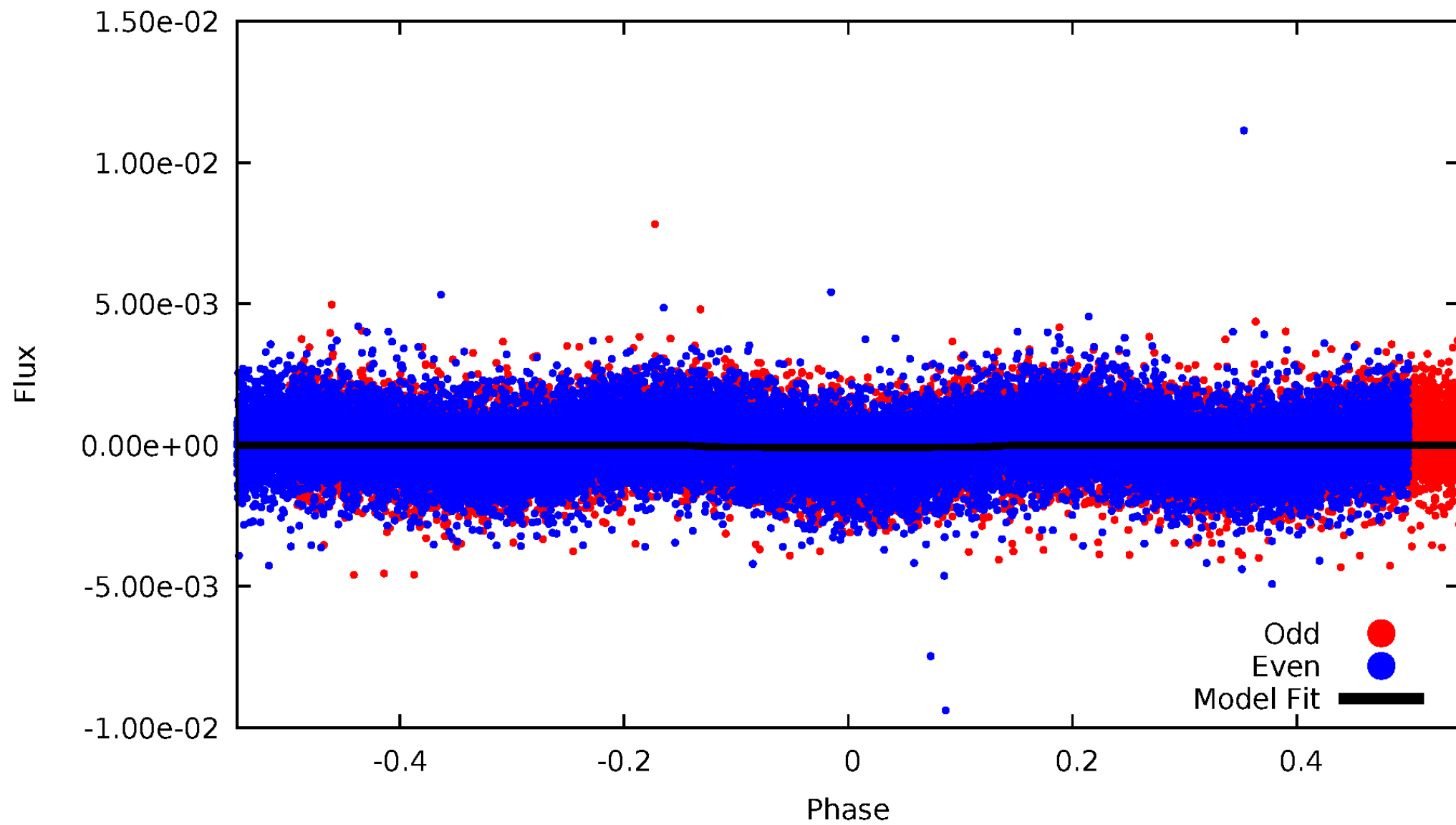


TCE 009970568-01



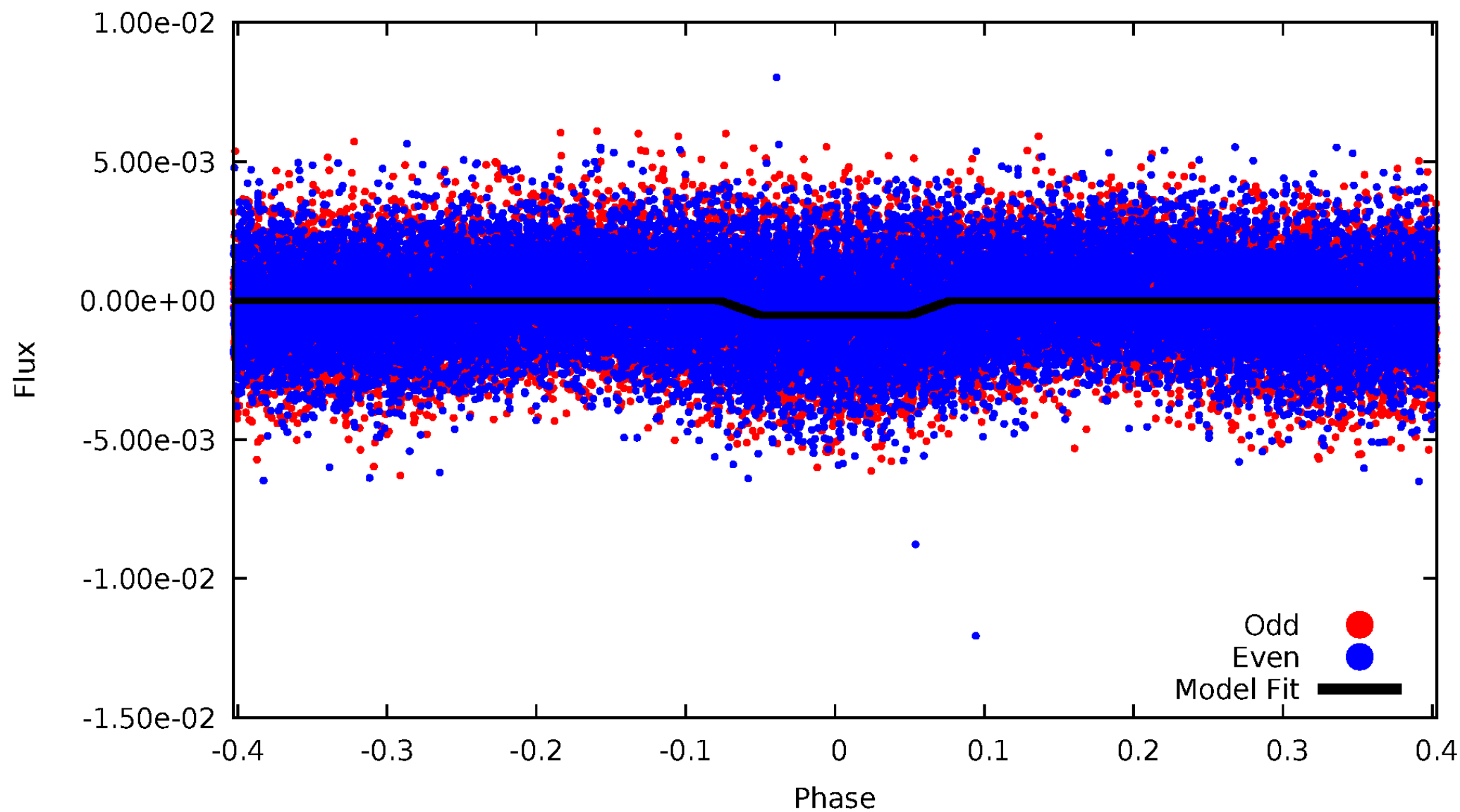
DV Odd/Even

TCE 009970568-01

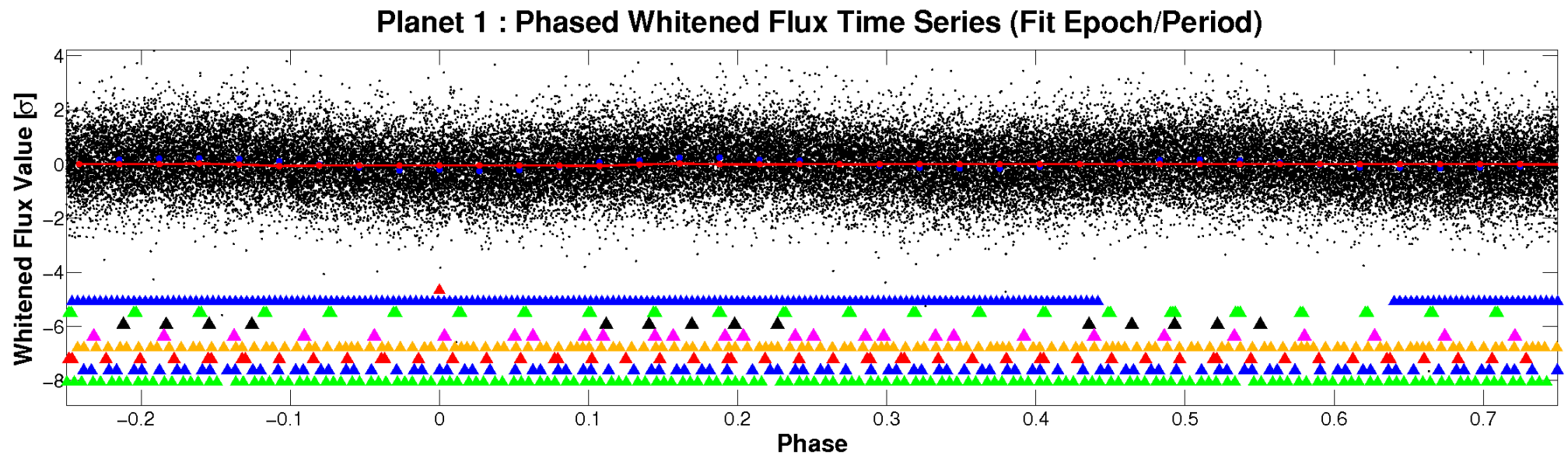
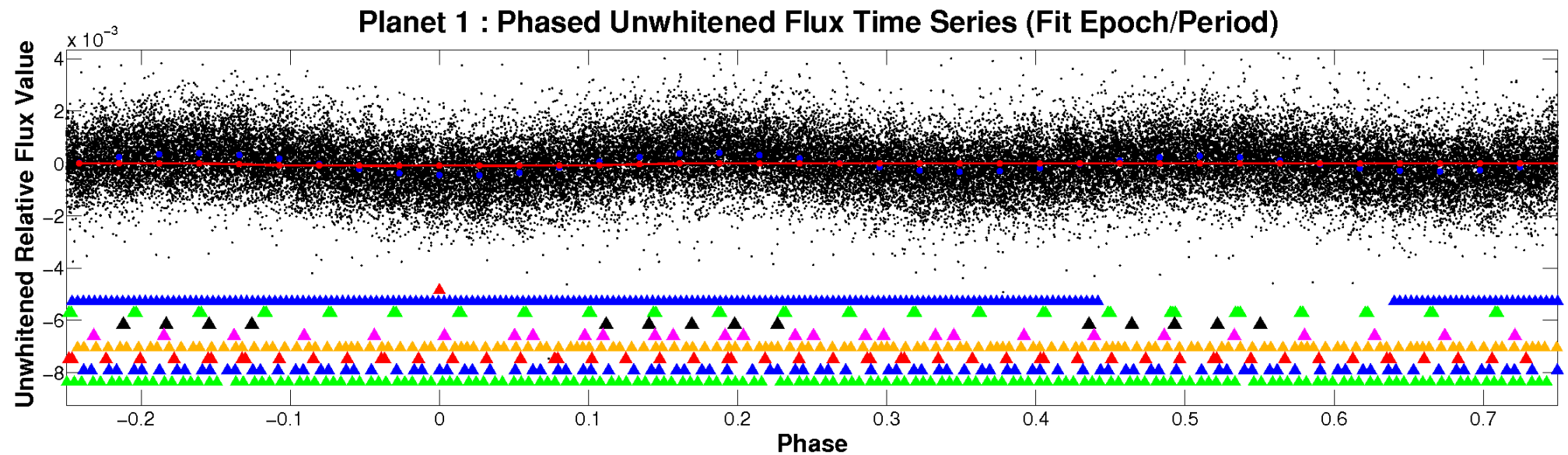


ALT Odd/Even

TCE 009970568-01

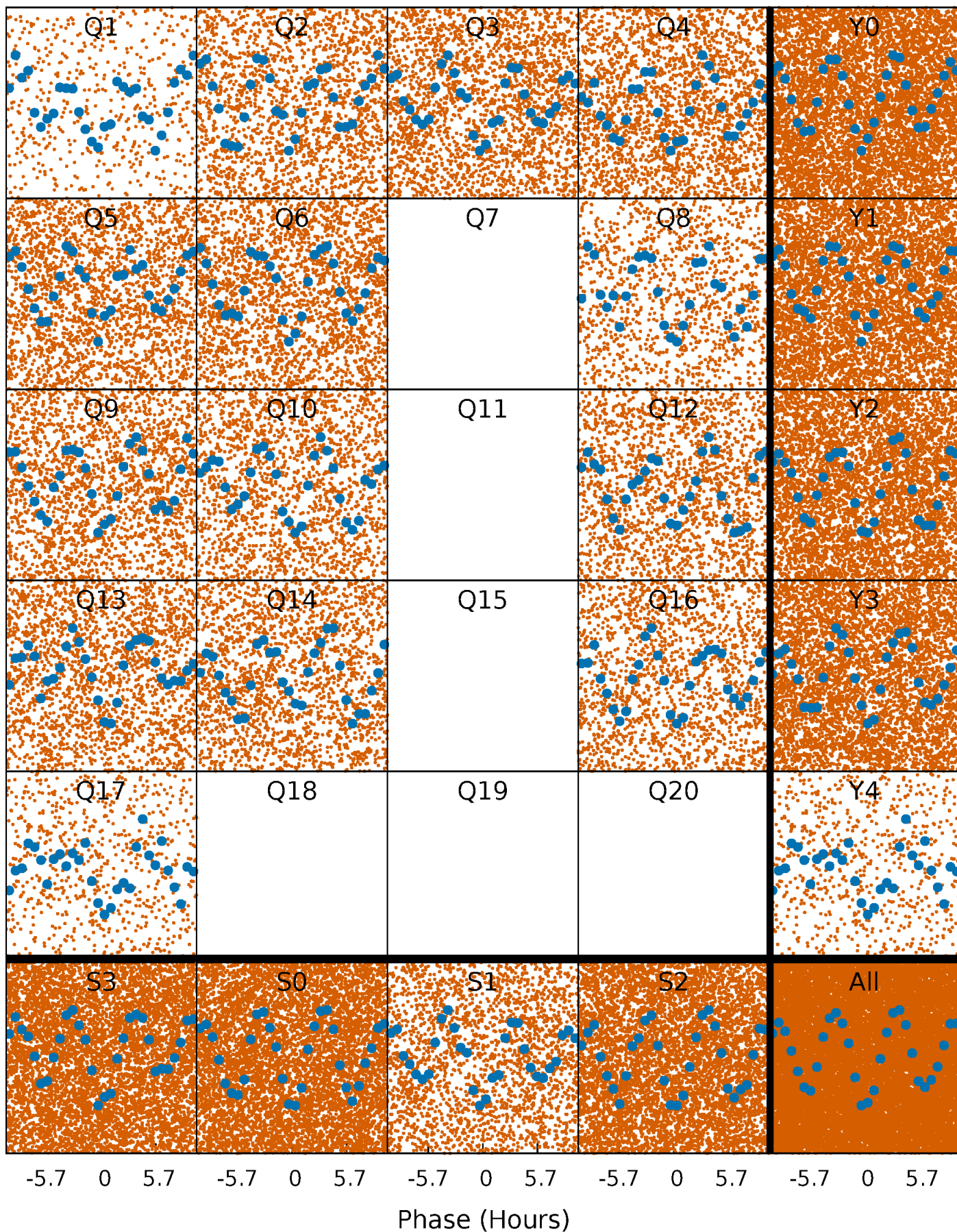


Non-Whitened Vs. Whitened Light Curve



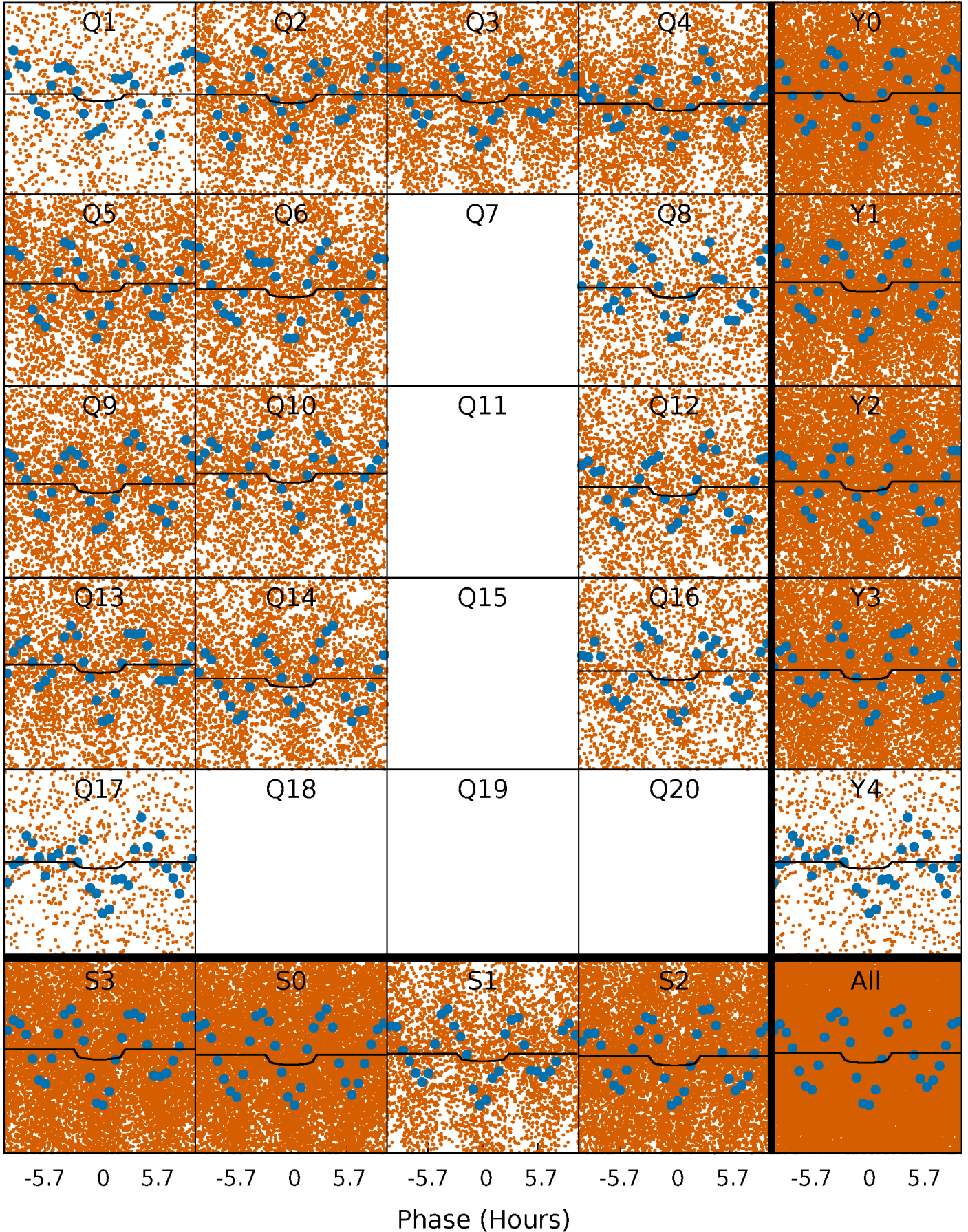
PDC Quarter-Phased Transit Curves

TCE 009970568-01 P= 0.761375 Days $T_0=131.773155$ (BKJD)



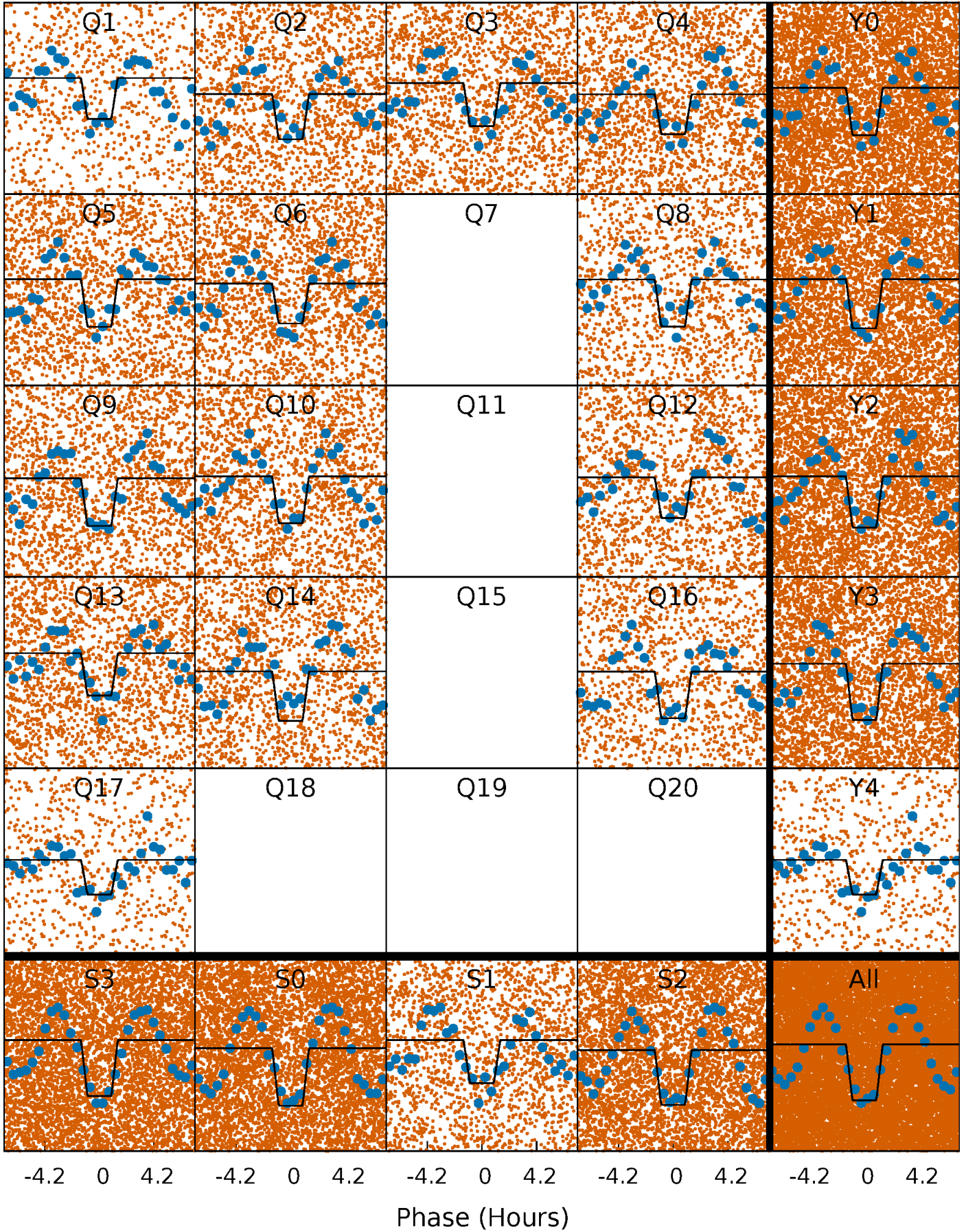
DV Quarter-Phased Transit Curves

TCE 009970568-01 P= 0.761375 Days $T_0=131.773155$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

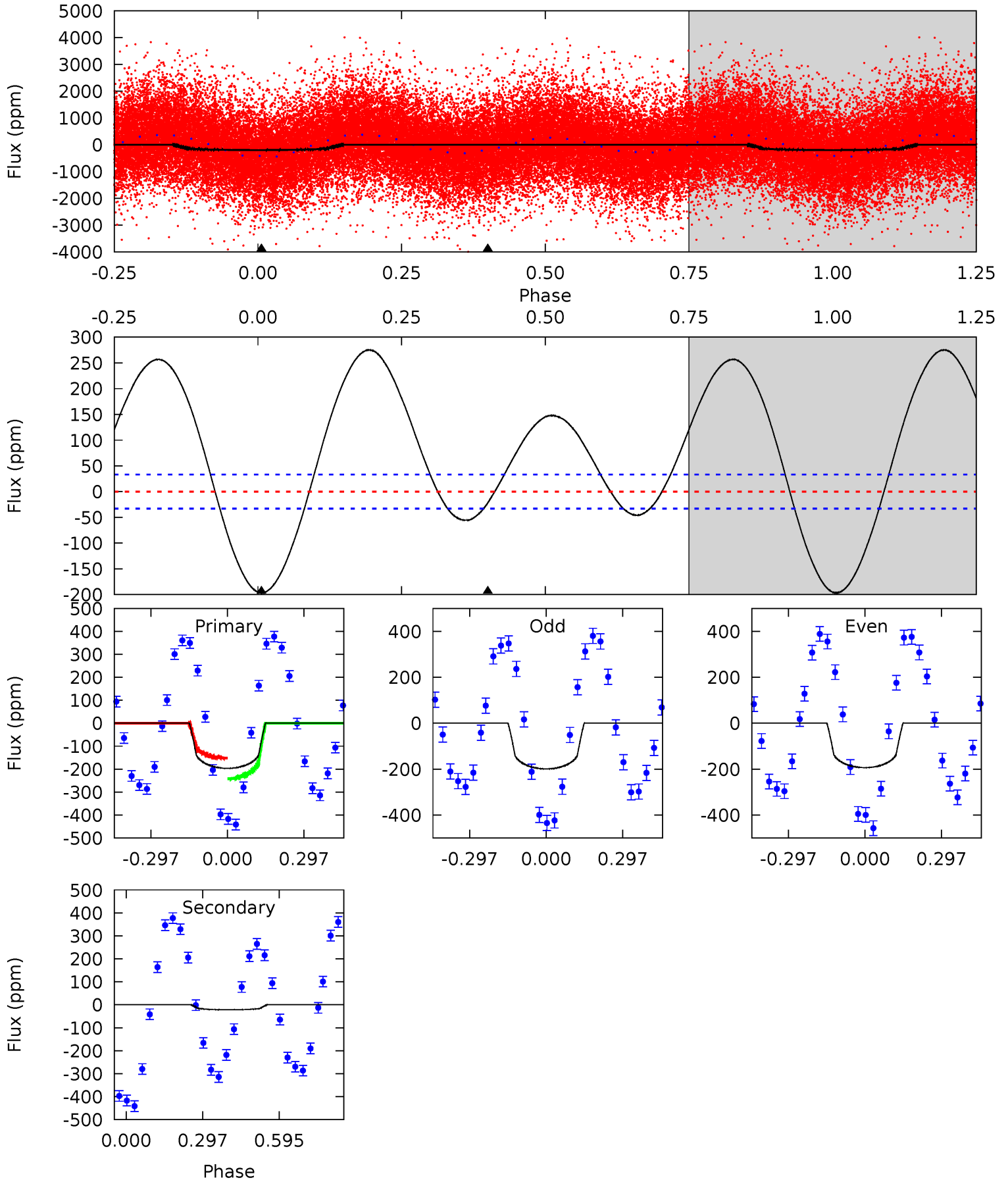
TCE 009970568-01 P= 0.761394 Days $T_0=131.762579$ (BKJD)



DV Model-Shift Uniqueness Test

009970568-01, P = 0.761375 Days, E = 131.011780 Days

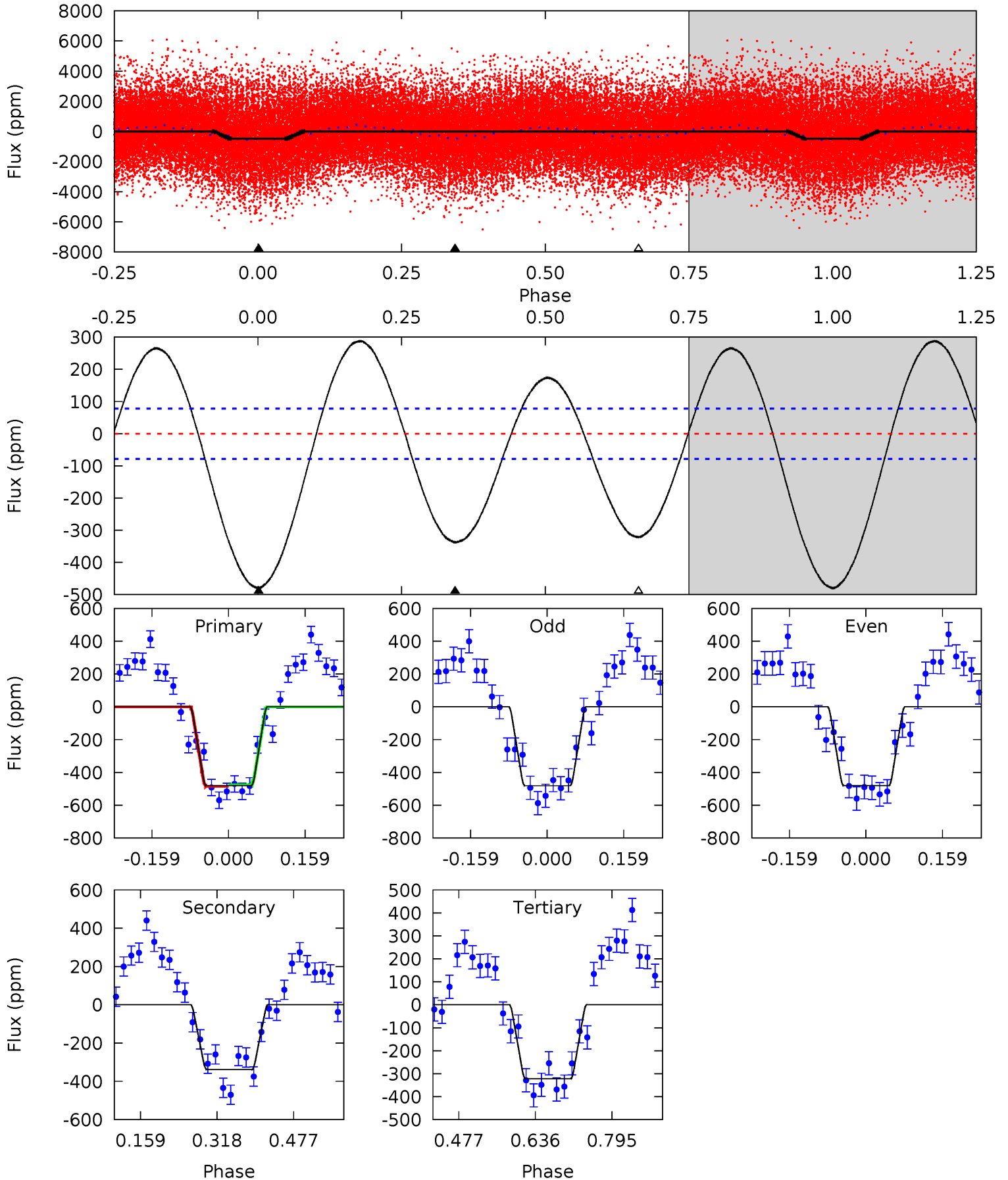
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.6	2.85	0	0	4.33	1.04	7.14	25.6	25.6	2.85	2.85	0.37	1.21	0.58	5.99



Alt Model-Shift Uniqueness Test

009970568-01, P = 0.761394 Days, E = 131.001185 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.5	19.3	18.4	0	4.47	1.41	12.0	9.08	27.5	0.92	19.3	0.04	0.93	0.37	0.28



Stellar Parameters For KIC 009970568

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8035^{+223}_{-362}	$3.709^{+0.432}_{-0.108}$	$-0.100^{+0.200}_{-0.350}$	$3.312^{+0.789}_{-1.579}$	$2.046^{+0.372}_{-0.538}$	$0.079^{+0.307}_{-0.028}$
	+3%/-5%	+12%/-3%	+200%/-350%	+24%/-48%	+18%/-26%	+388%/-35%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009970568-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-22 ± 8	$3.01^{+2.43}_{-1.82}$	6021^{+493}_{-686}	4678^{+3835}_{-8899}	$0.568^{+2.822}_{-0.413}$
Alt.	-338 ± 17	$7.60^{+3.11}_{-2.94}$	6024^{+512}_{-729}	6446^{+2146}_{-1114}	$1.390^{+2.188}_{-0.688}$

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

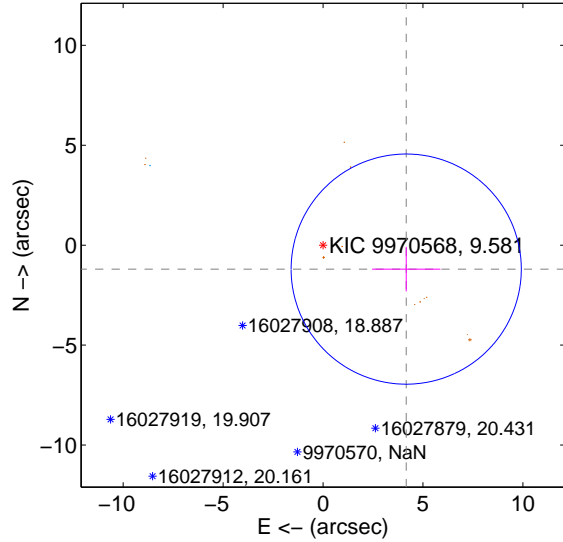
Supplemental centroid analysis for 009970568-01. **Kepler magnitude: 9.58.** Transit SNR 6.97

There are 1 quarters with good PRF difference image offsets

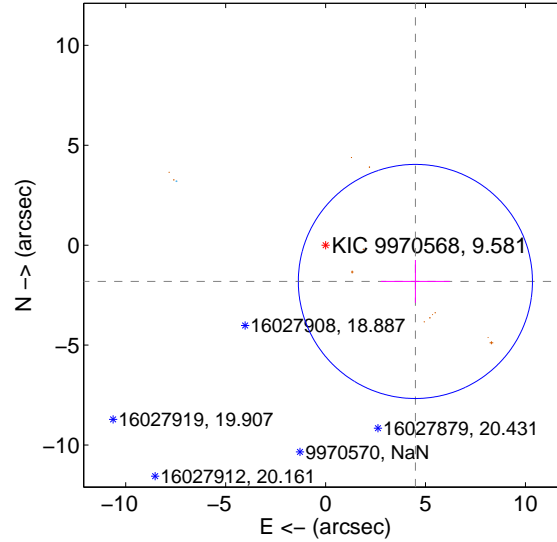
The direct PRF centroid is offset from the target star catalog position by about 0.87 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.330 ± 1.919	2.26	-4.161 ± 1.708	-1.197 ± 1.116
PRF-fit source offset from KIC position	4.846 ± 1.952	2.48	-4.493 ± 1.721	-1.815 ± 1.072
photometric centroid source offset	0.08 ± 0.30	0.28	0.08 ± 0.31	0.02 ± 0.14

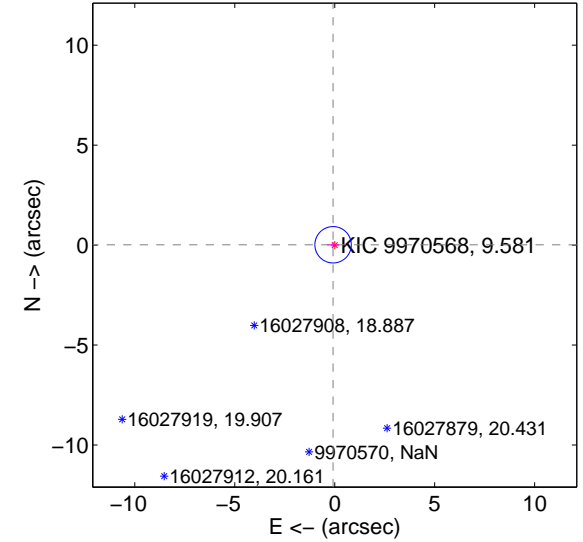
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

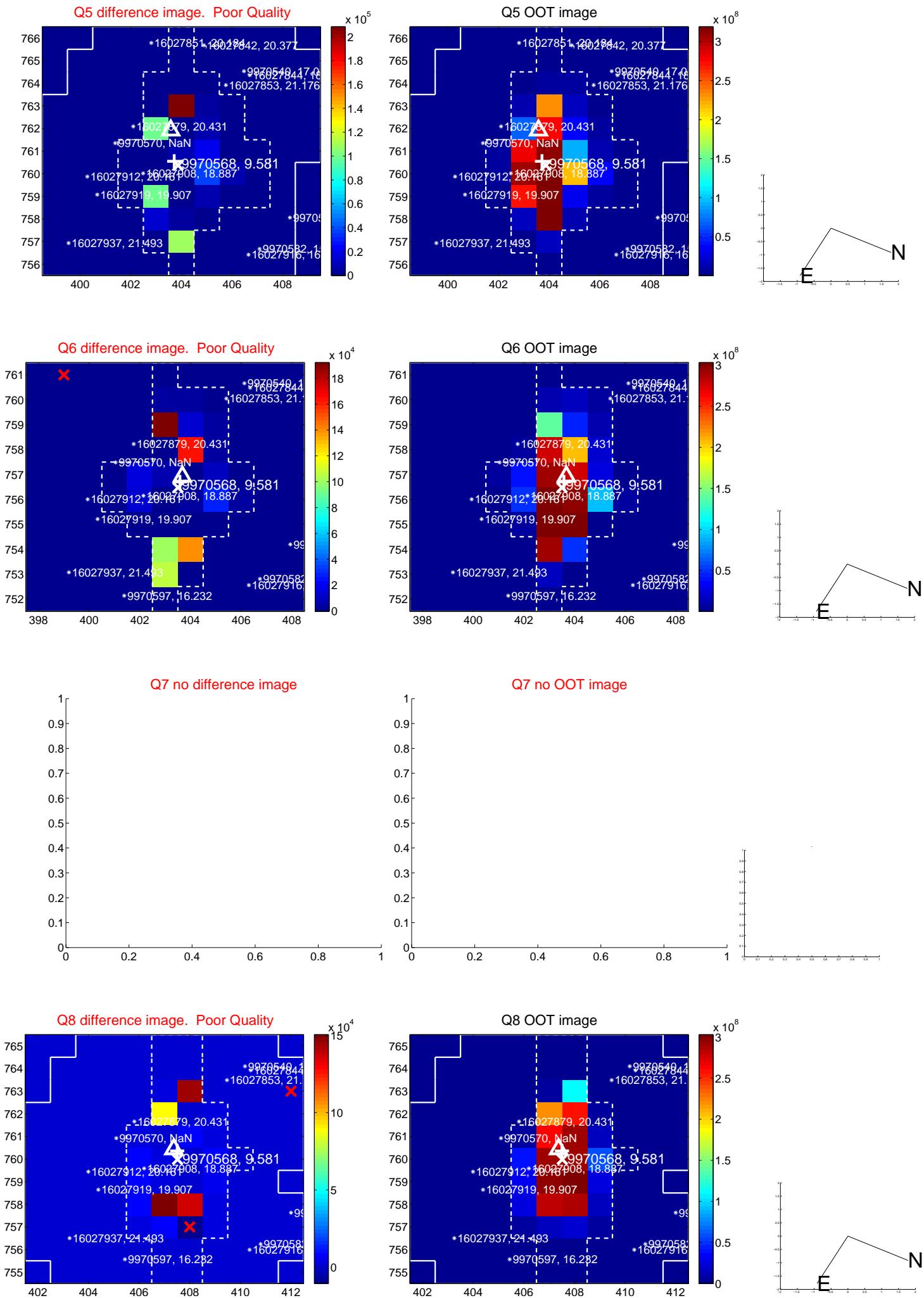


offset from photometric centroids

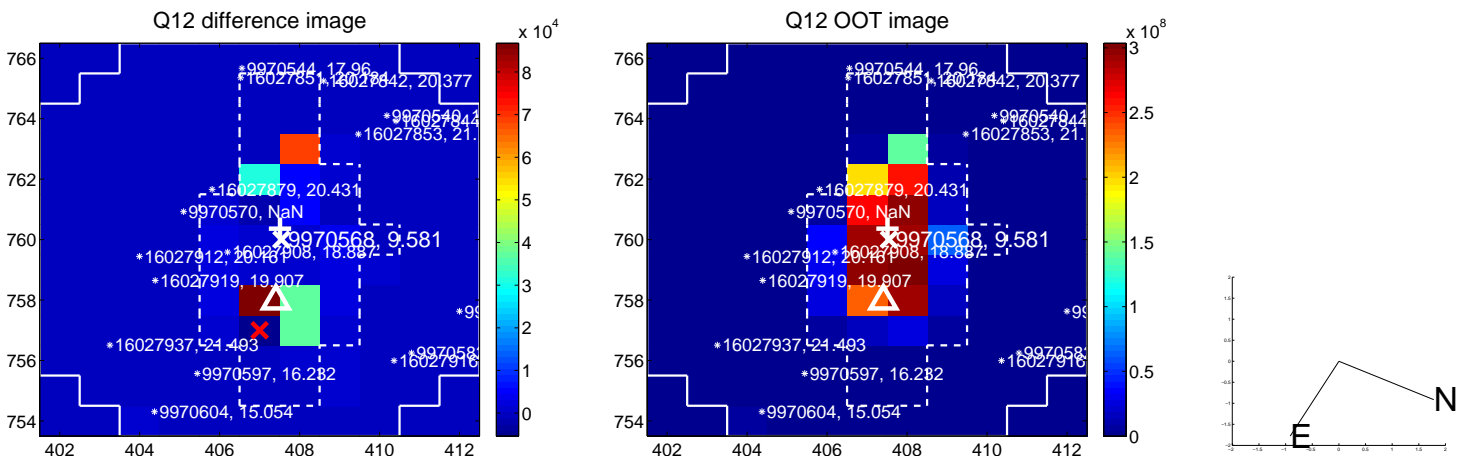
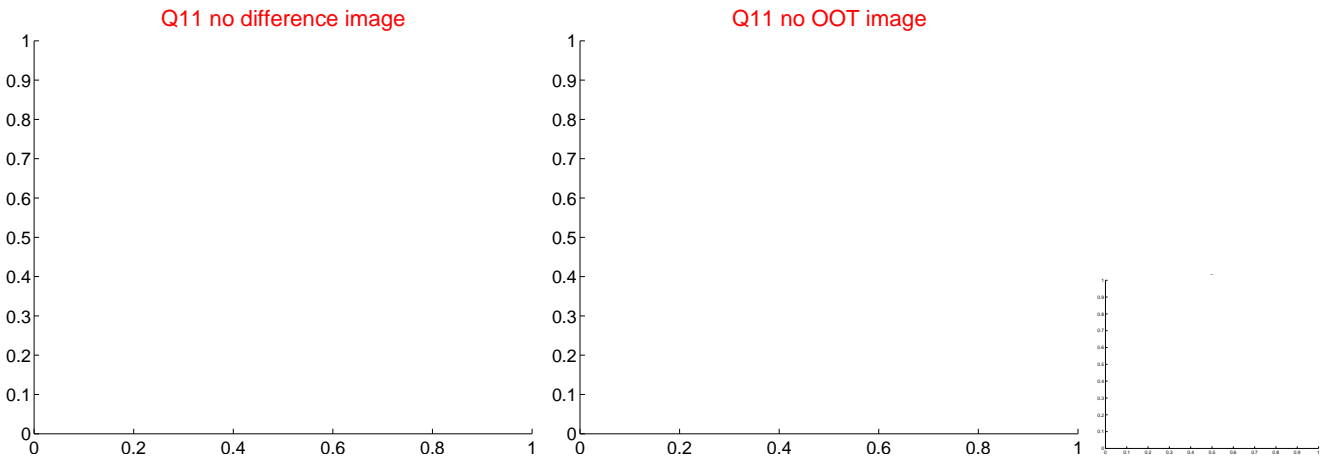
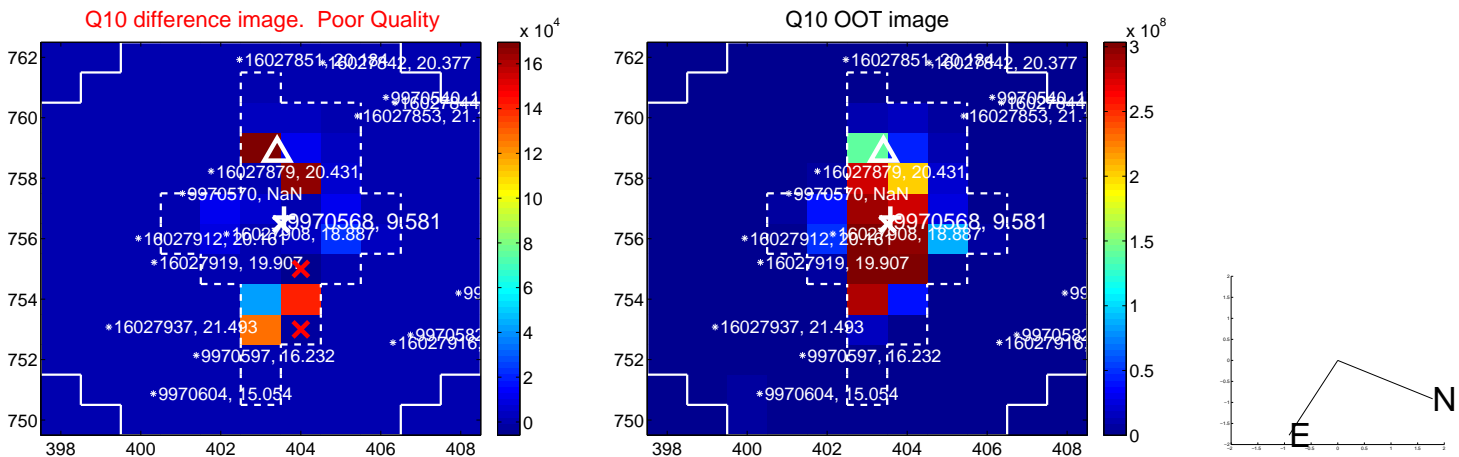
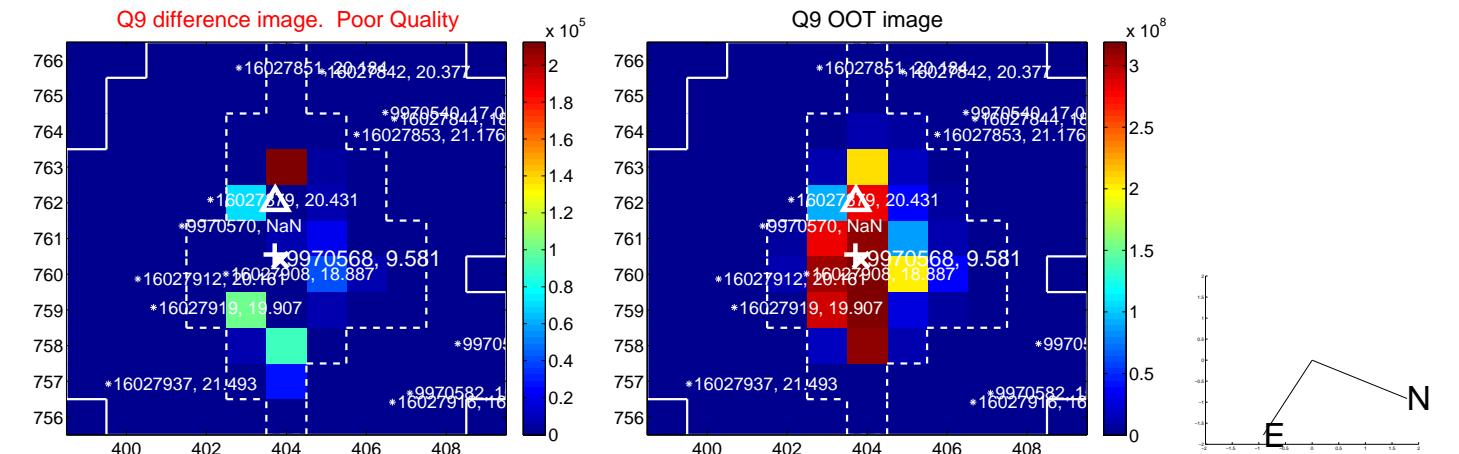


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

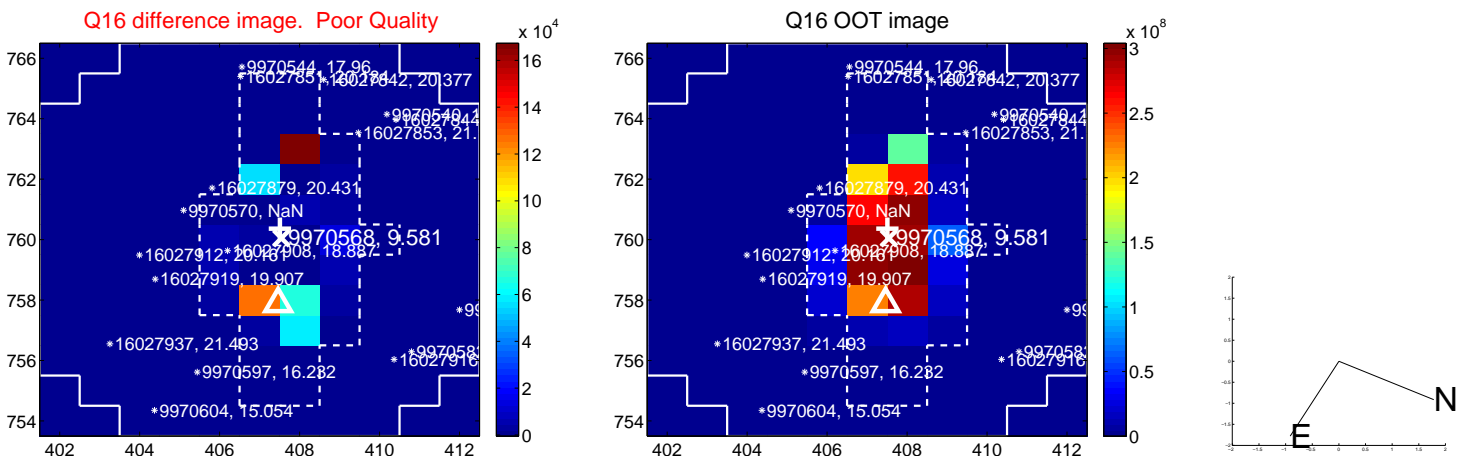
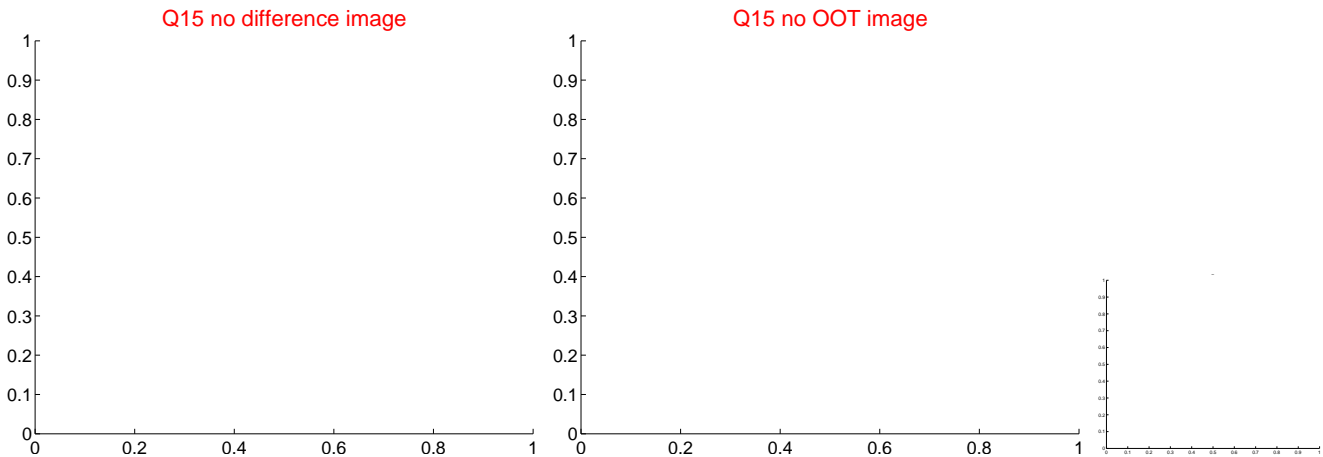
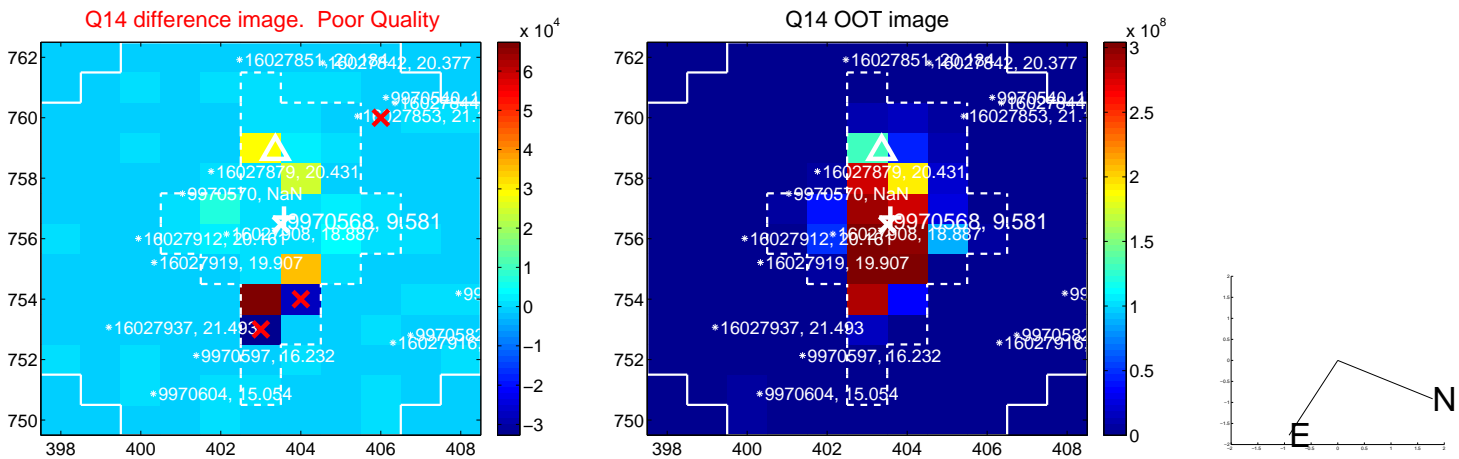
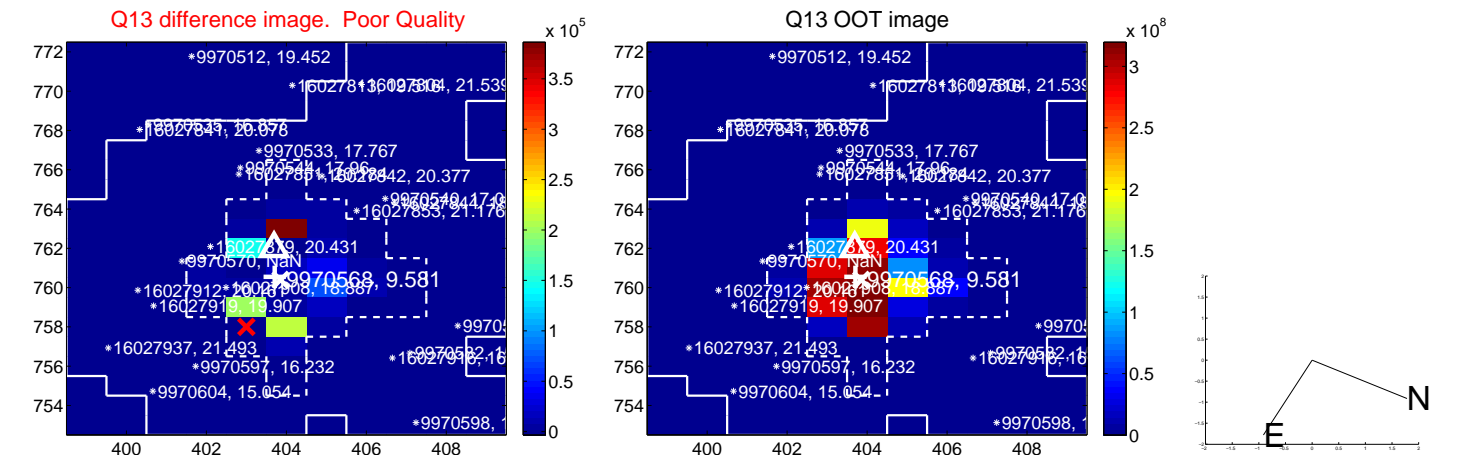
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



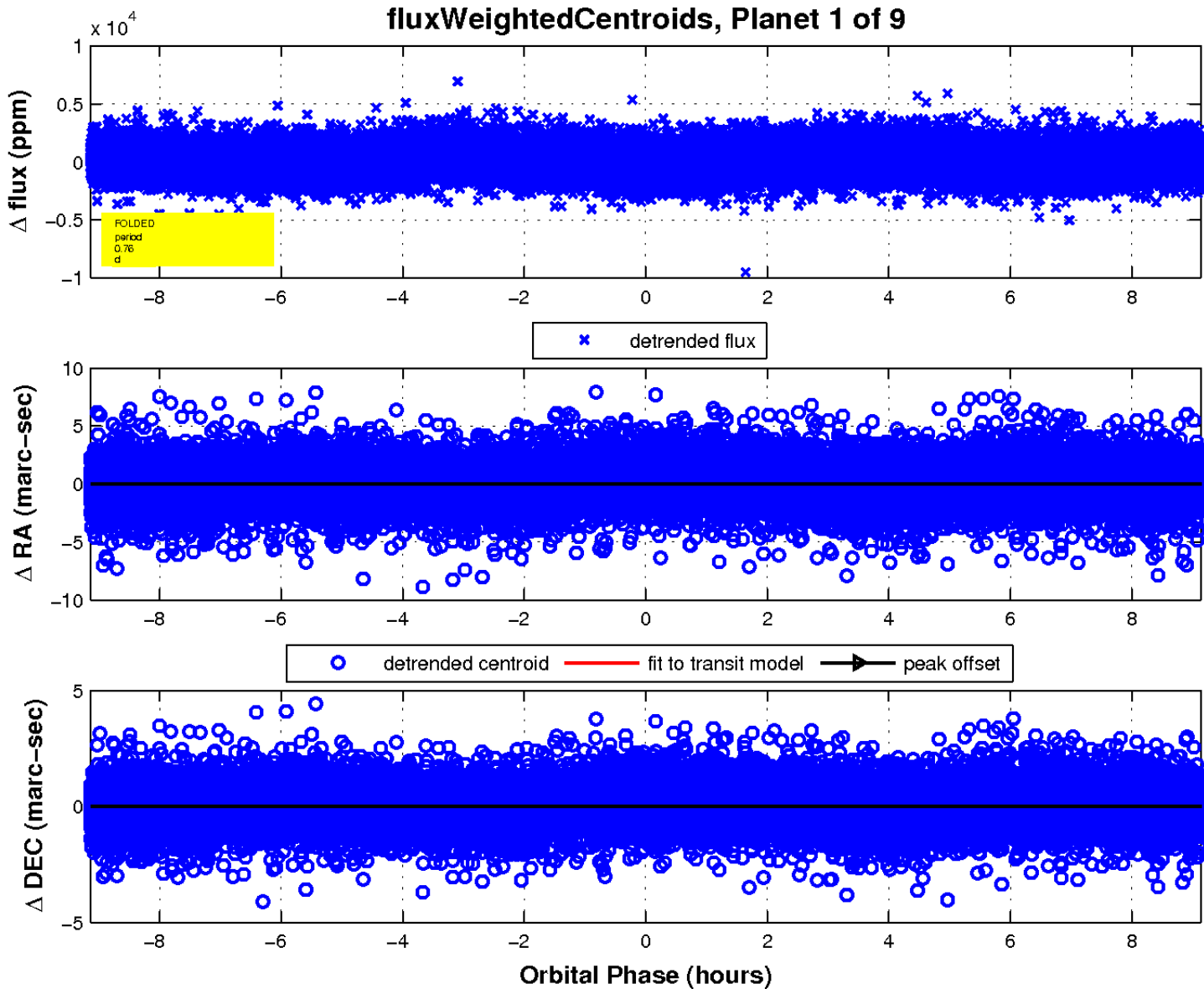
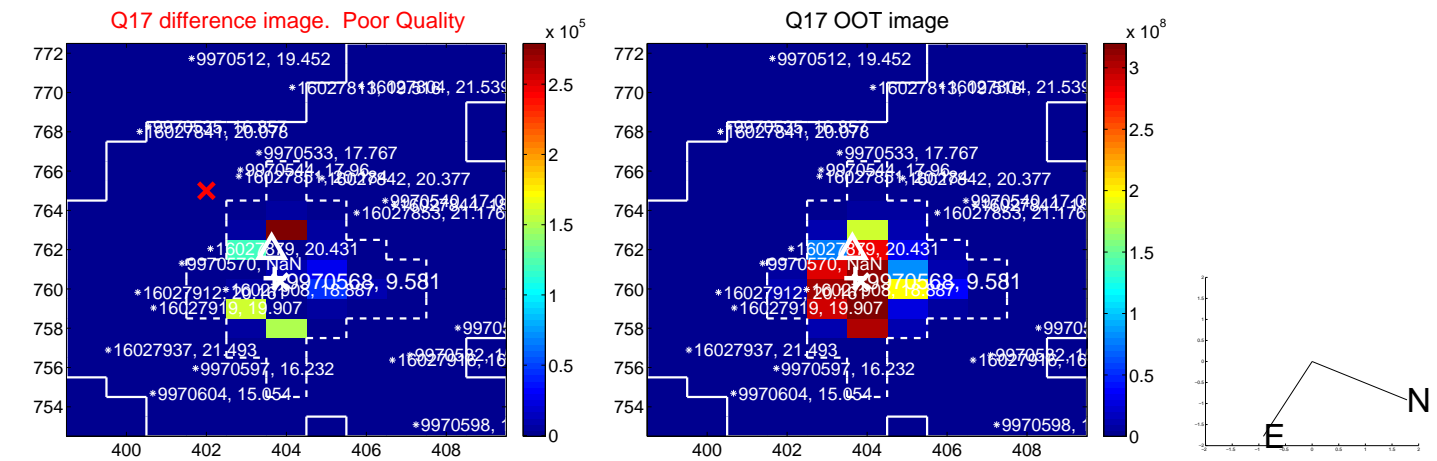
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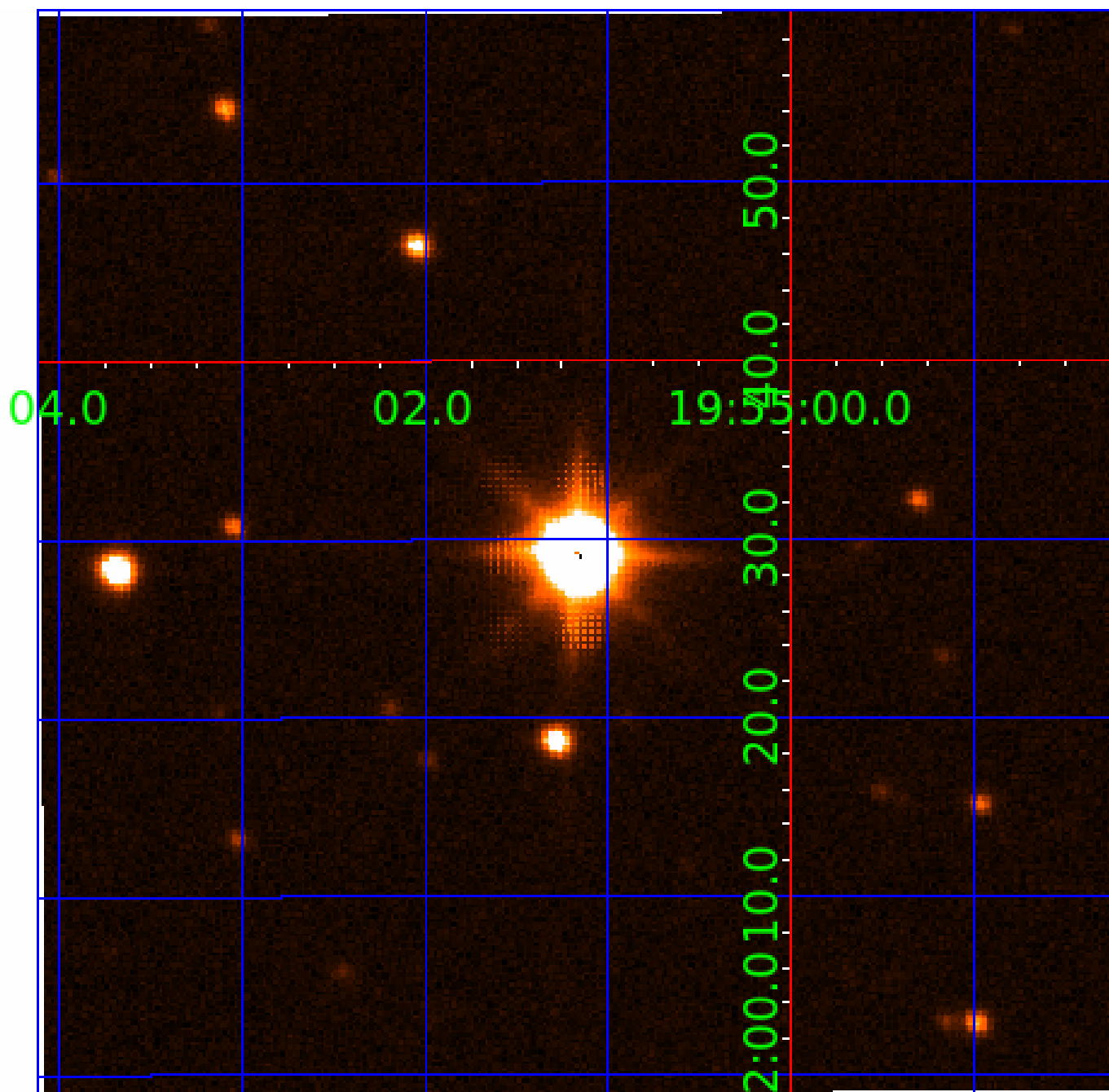


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UKIRT Image

Declination



KIC 009970568

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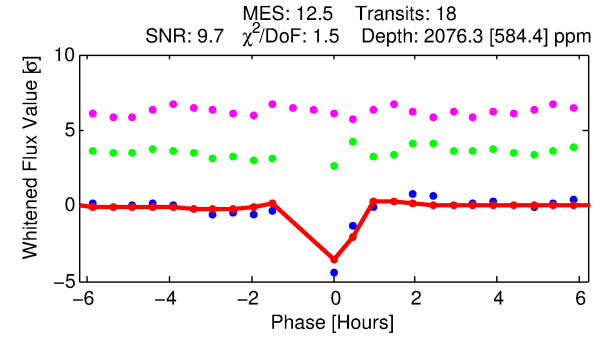
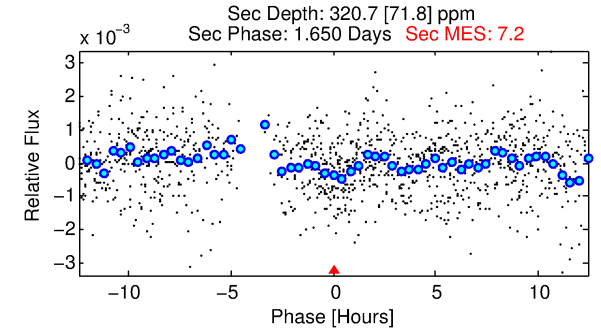
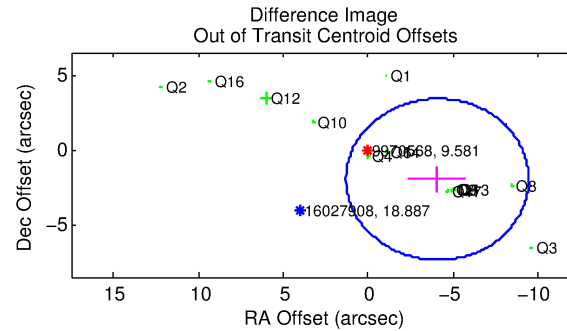
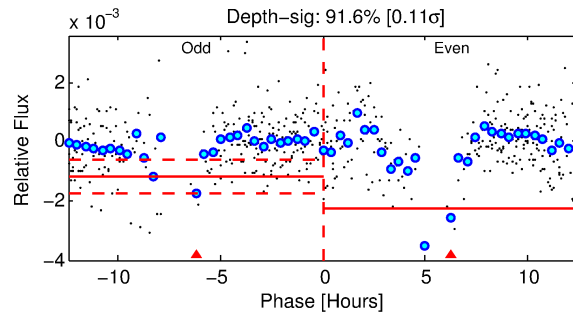
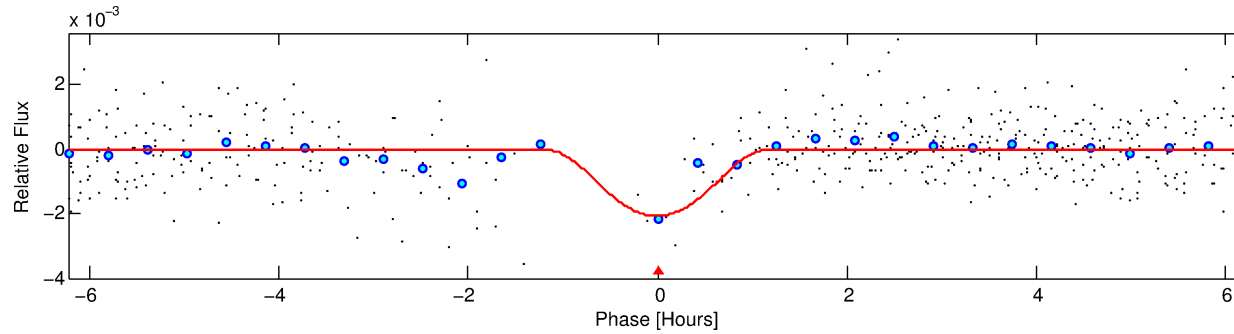
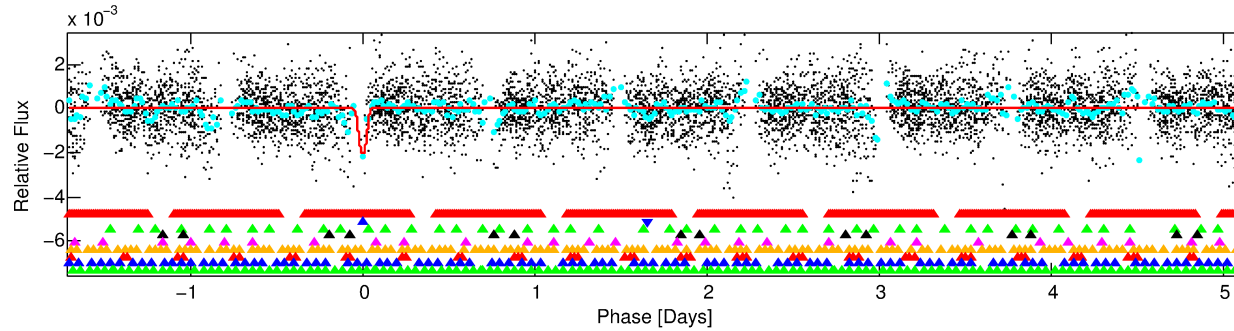
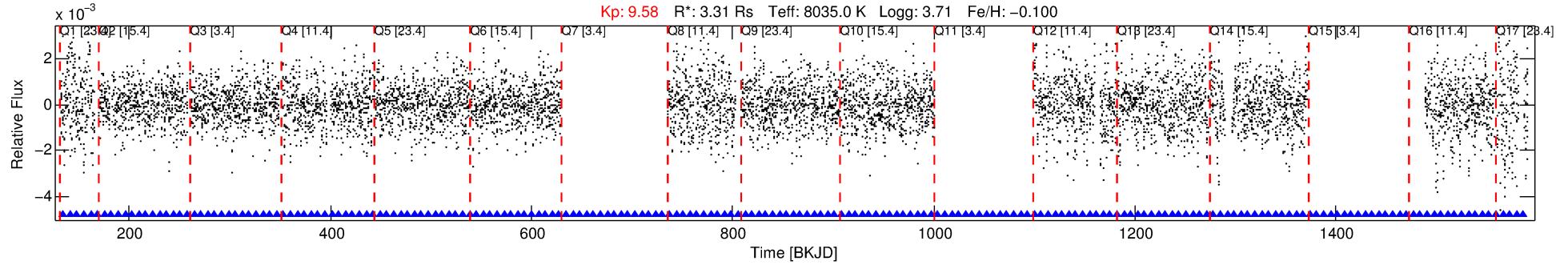
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009970568-02

No Significant Match Found

DV One-Page Summary

KIC: 9970568 Candidate: 2 of 9 Period: 6.849 d



DV Fit Results:

Period = 6.84950 [0.00016] d
Epoch = 134.3935 [0.0078] BKJD
 $R_p/R^* = 0.0760$ [0.3763]
 $a/R^* = 10.19$ [10.59]
 $b = 1.00$ [0.56]
 $S_{\text{eff}} = 5097.45$ [3859.47]
 $T_{\text{eq}} = 2155$ [408] K
 $R_p = 27.48$ [136.62] Re
 $a = 0.0896$ [0.0412] AU
 $A_g = 1.88$ [18.65] [0.05 σ]
 $T_{\text{eff}} = 3900$ [9655] K [0.18 σ]

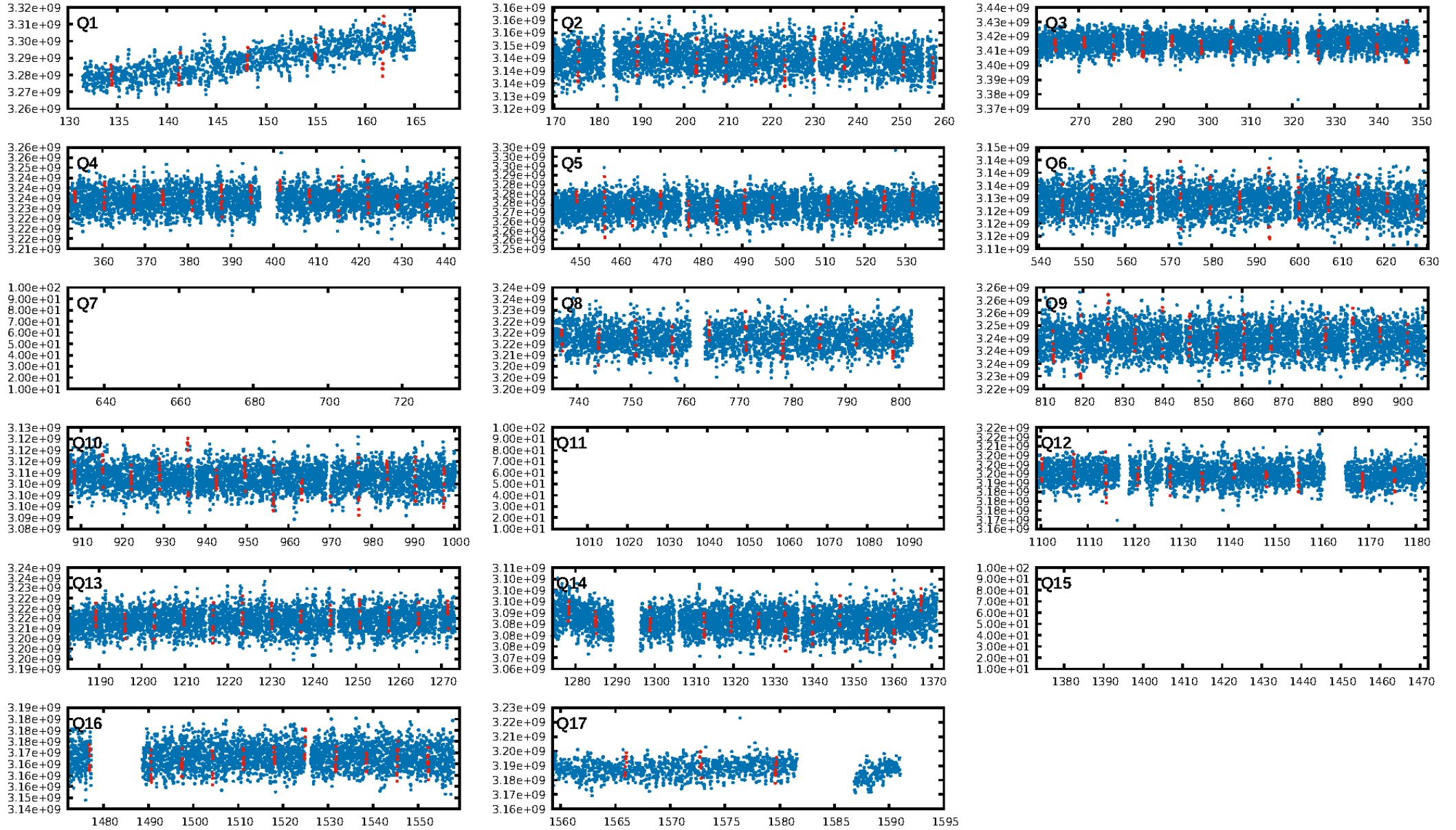
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [27.08 σ]
LongPeriod-sig: 100.0% [17.03 σ]
ModelChiSquare2-sig: 4.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [13/13]
GhostDiagnostic-chr: N/A
Centroid-sig: 4.1%
Centroid-so: 0.259 arcsec [4.78 σ]
OotOffset-rm: 4.550 arcsec [2.53 σ]
KicOffset-rm: 5.257 arcsec [2.94 σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.00 [0/14]
DiffImageOverlap-fno: 0.00 [0/14]

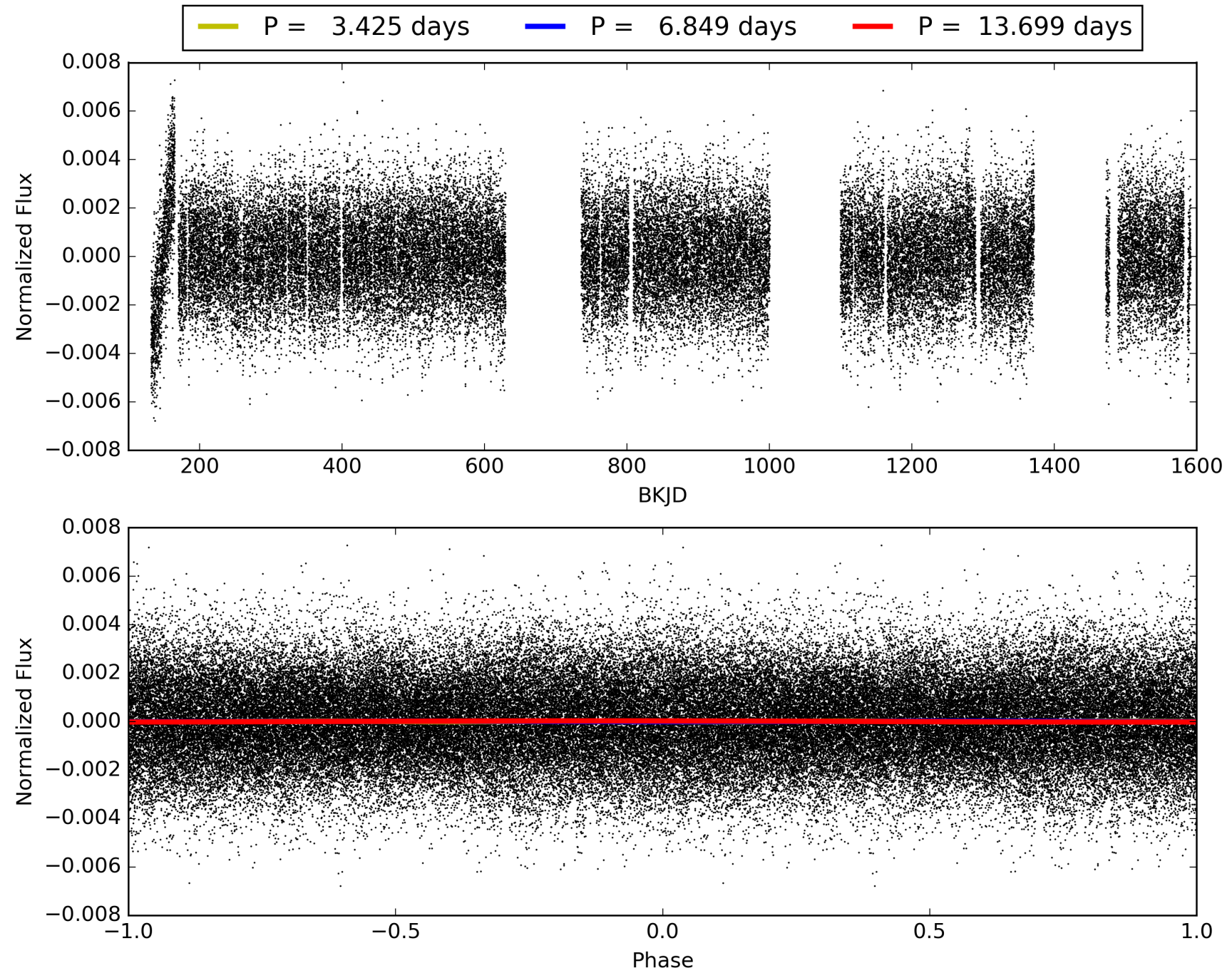
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:25 Z

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

TCE 009970568-02, PDC Light Curves

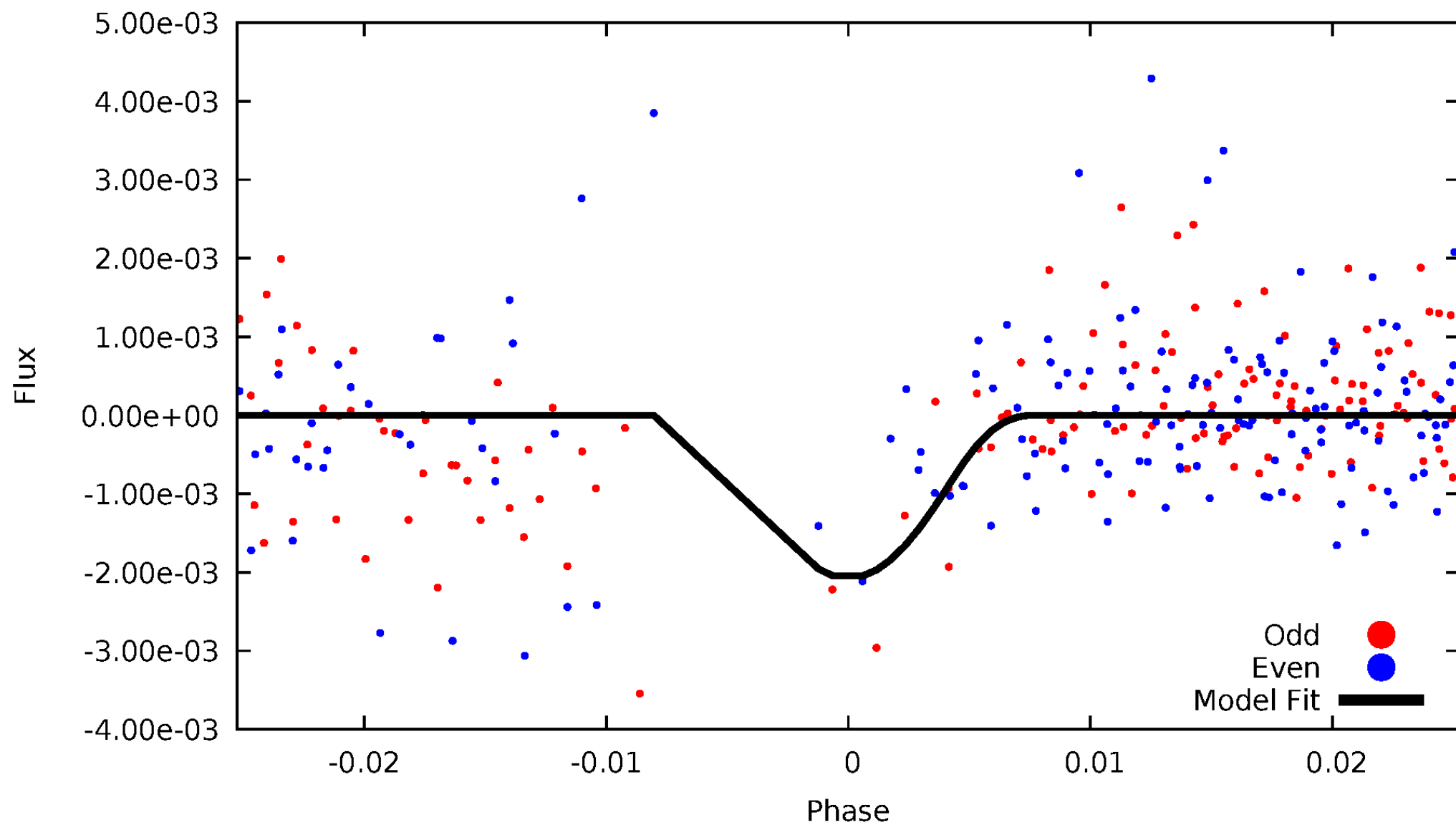


TCE 009970568-02



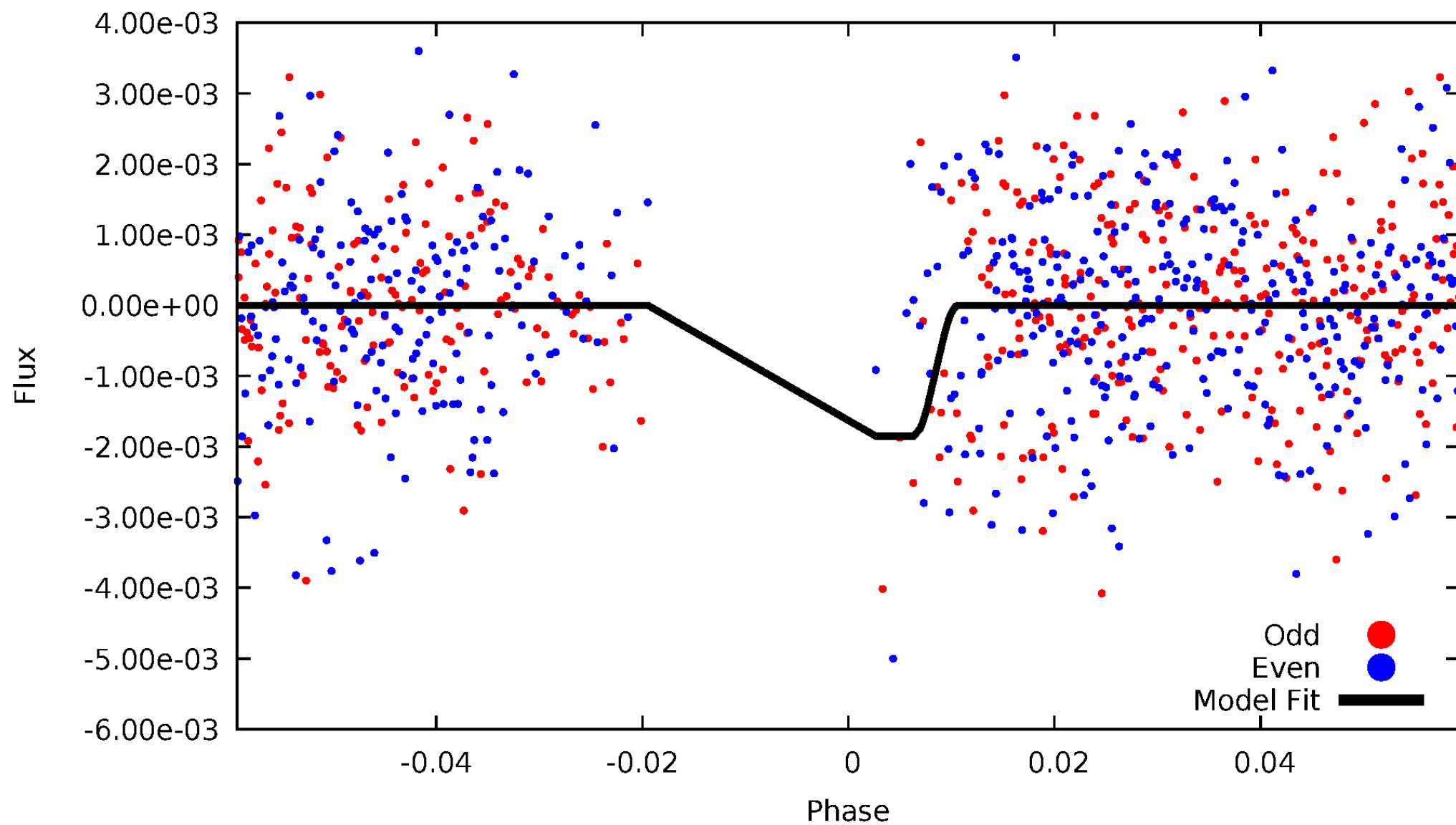
DV Odd/Even

TCE 009970568-02



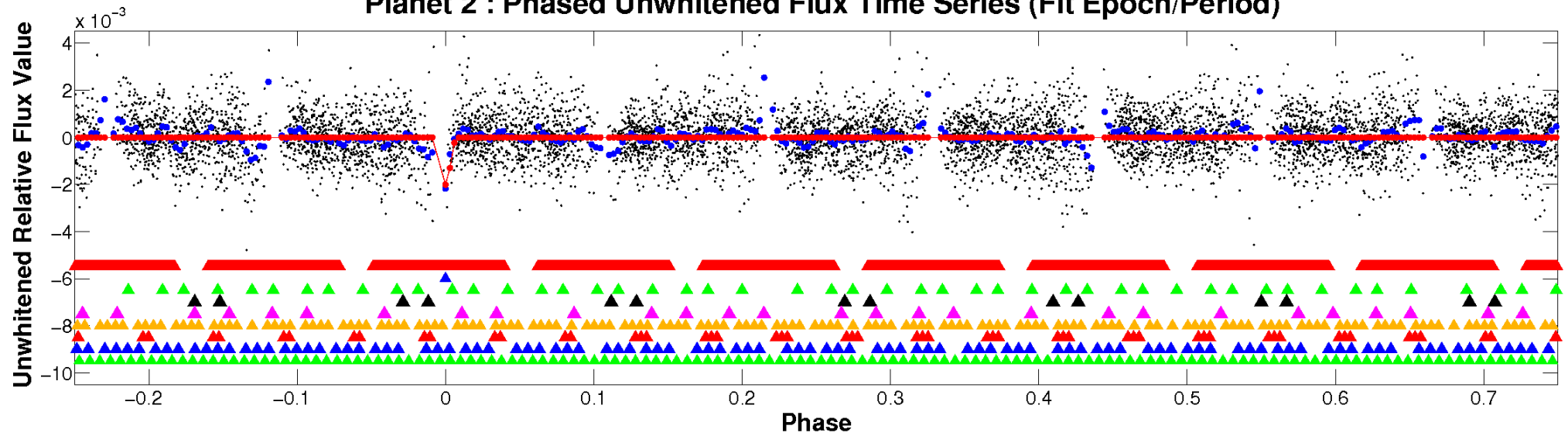
ALT Odd/Even

TCE 009970568-02

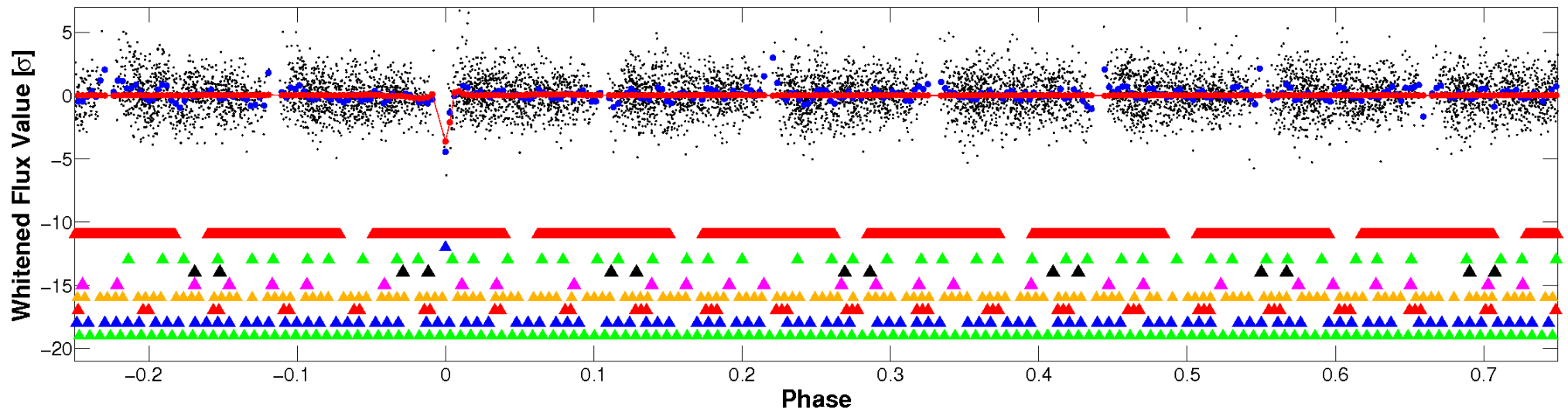


Non-Whitened Vs. Whitened Light Curve

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

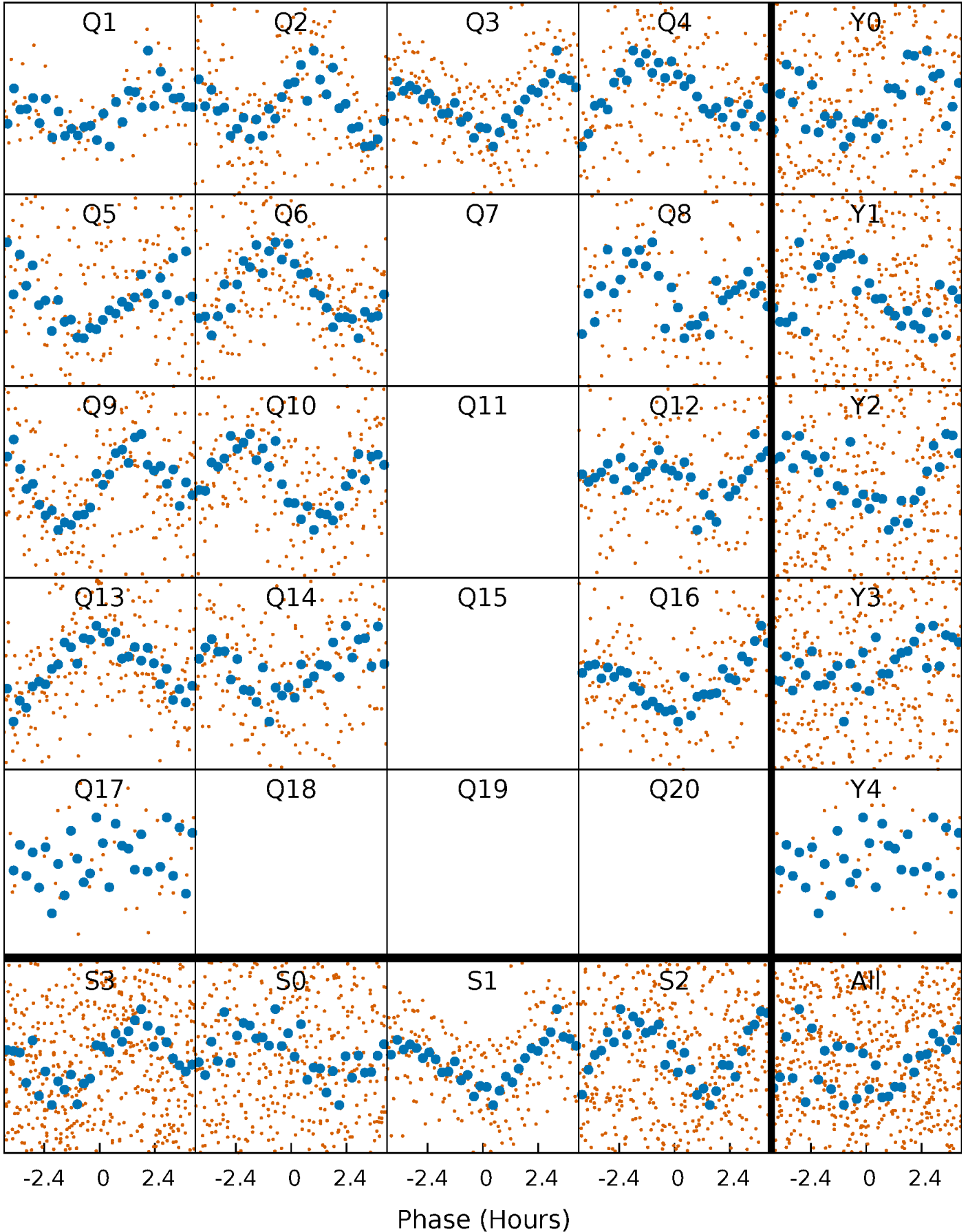


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



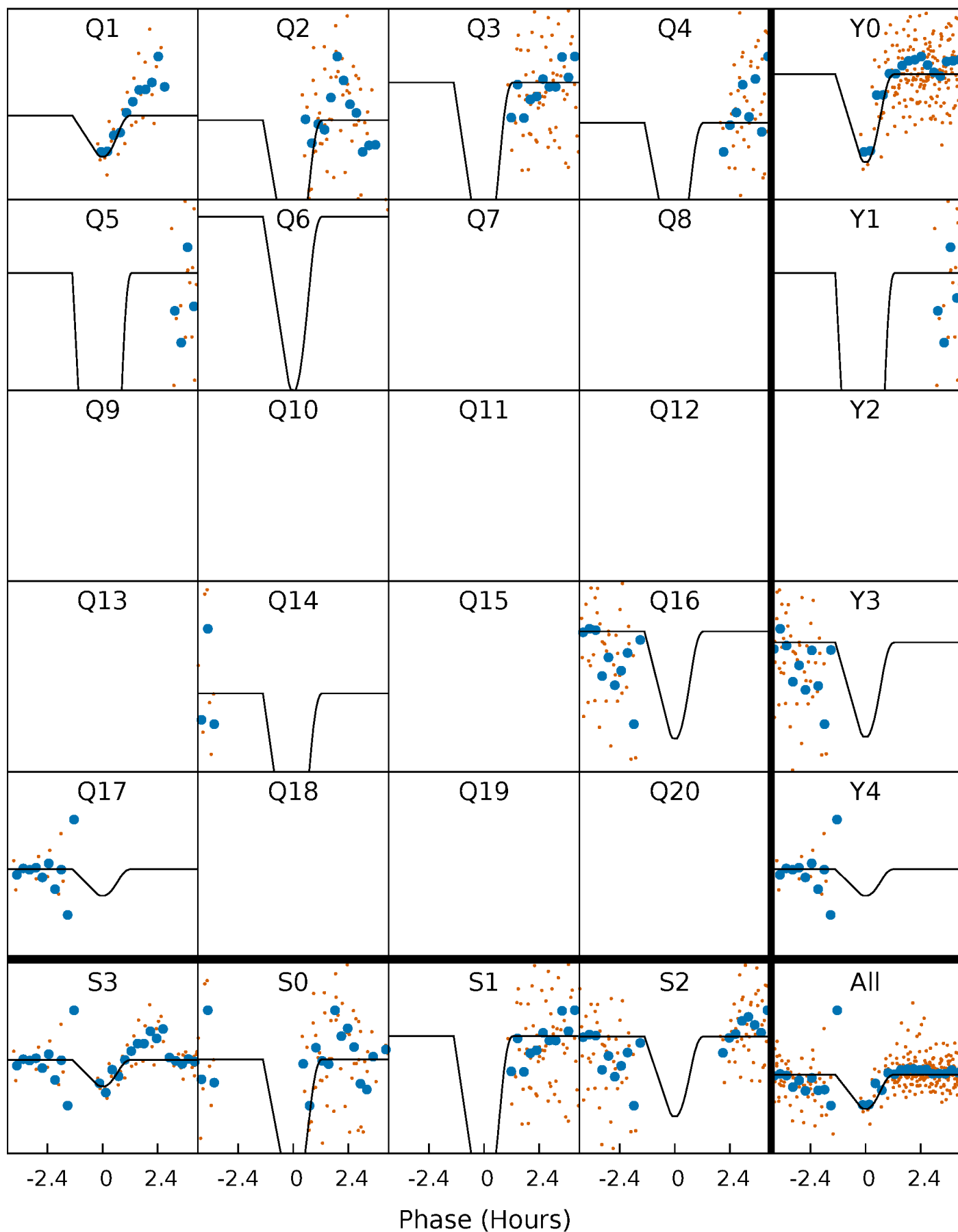
PDC Quarter-Phased Transit Curves

TCE 009970568-02 P= 6.849496 Days $T_0=134.393510$ (BKJD)



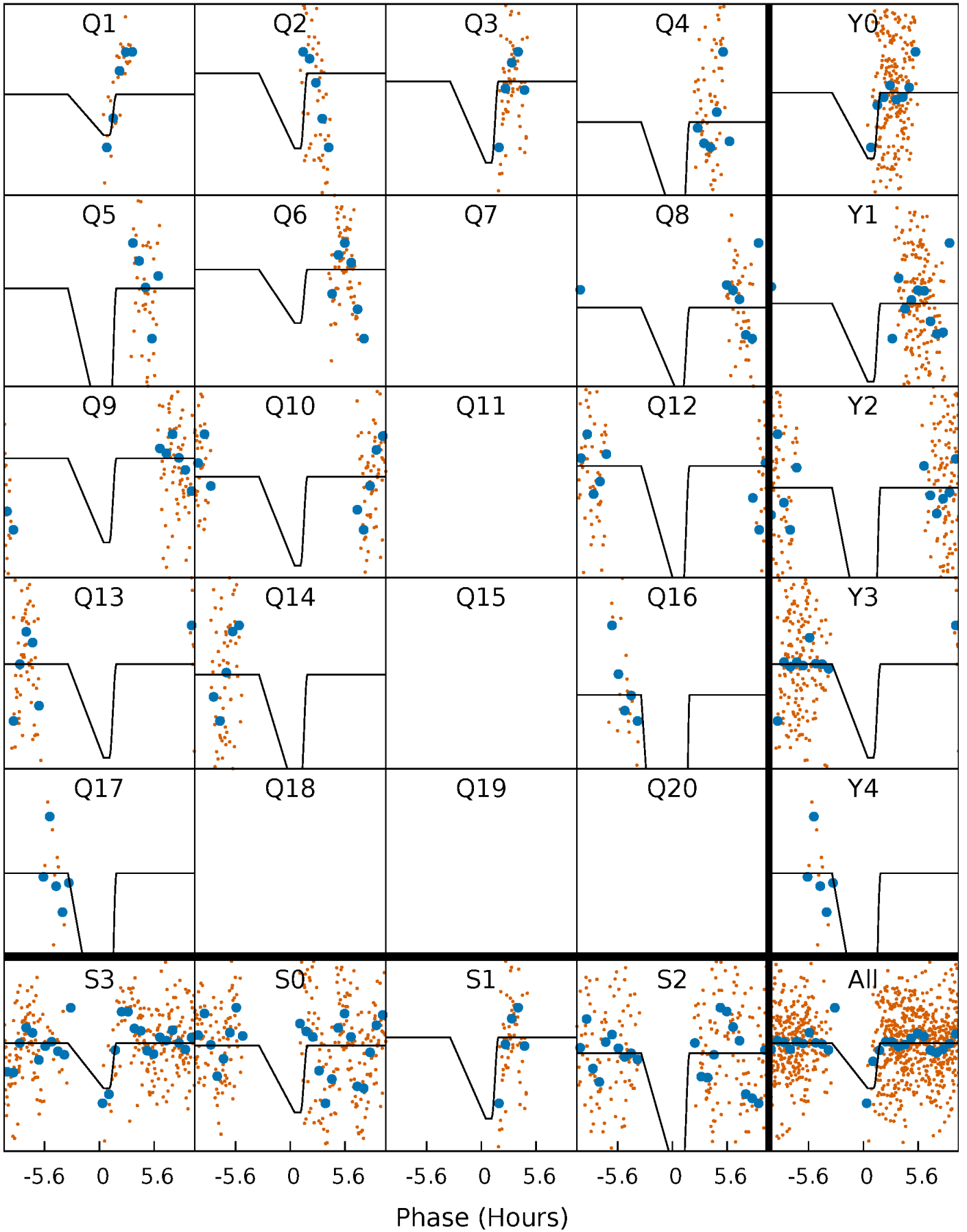
DV Quarter-Phased Transit Curves

TCE 009970568-02 P= 6.849496 Days $T_0=134.393510$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

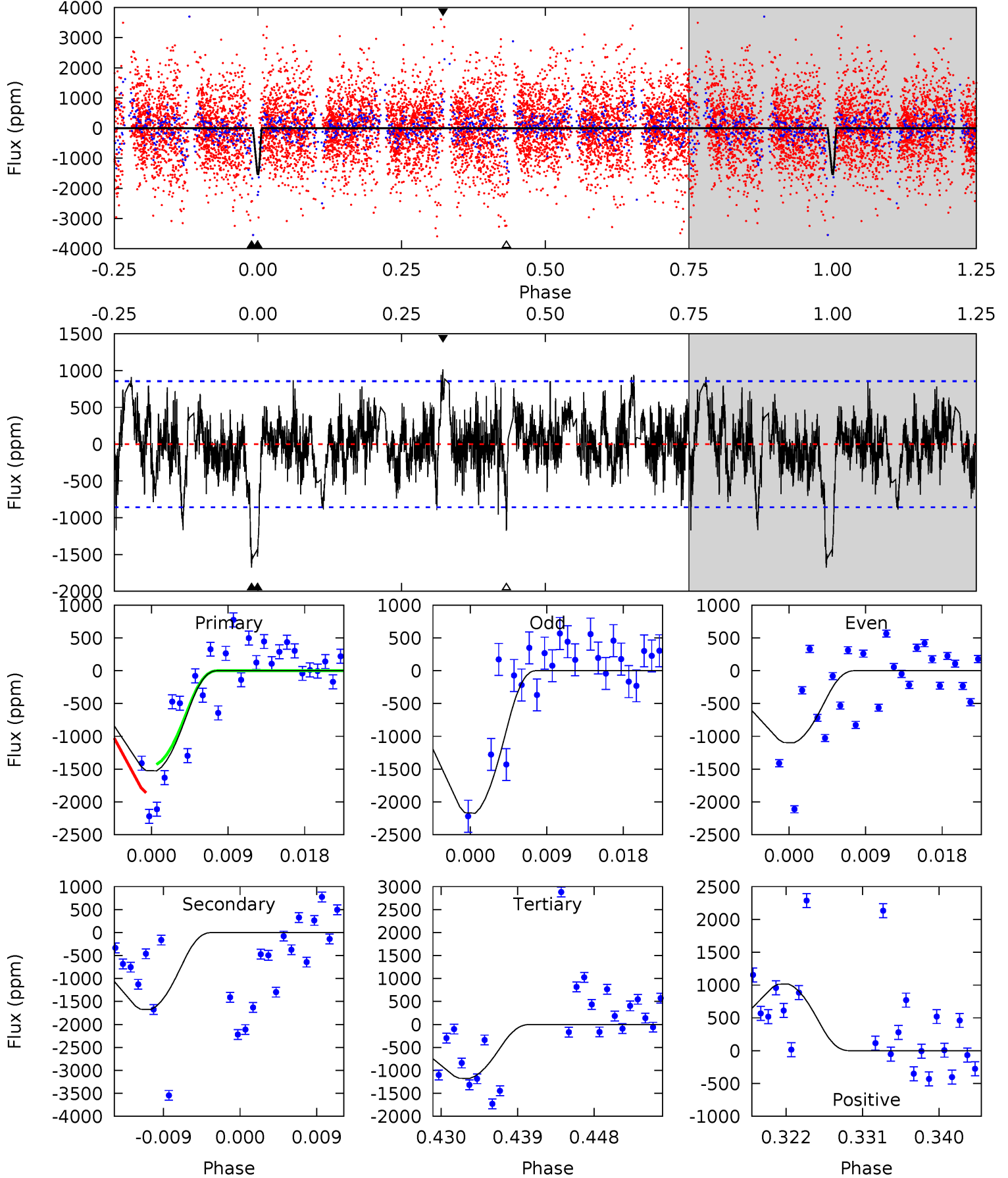
TCE 009970568-02 P= 6.850002 Days $T_0=134.365651$ (BKJD)



DV Model-Shift Uniqueness Test

009970568-02, P = 6.849496 Days, E = 127.544014 Days

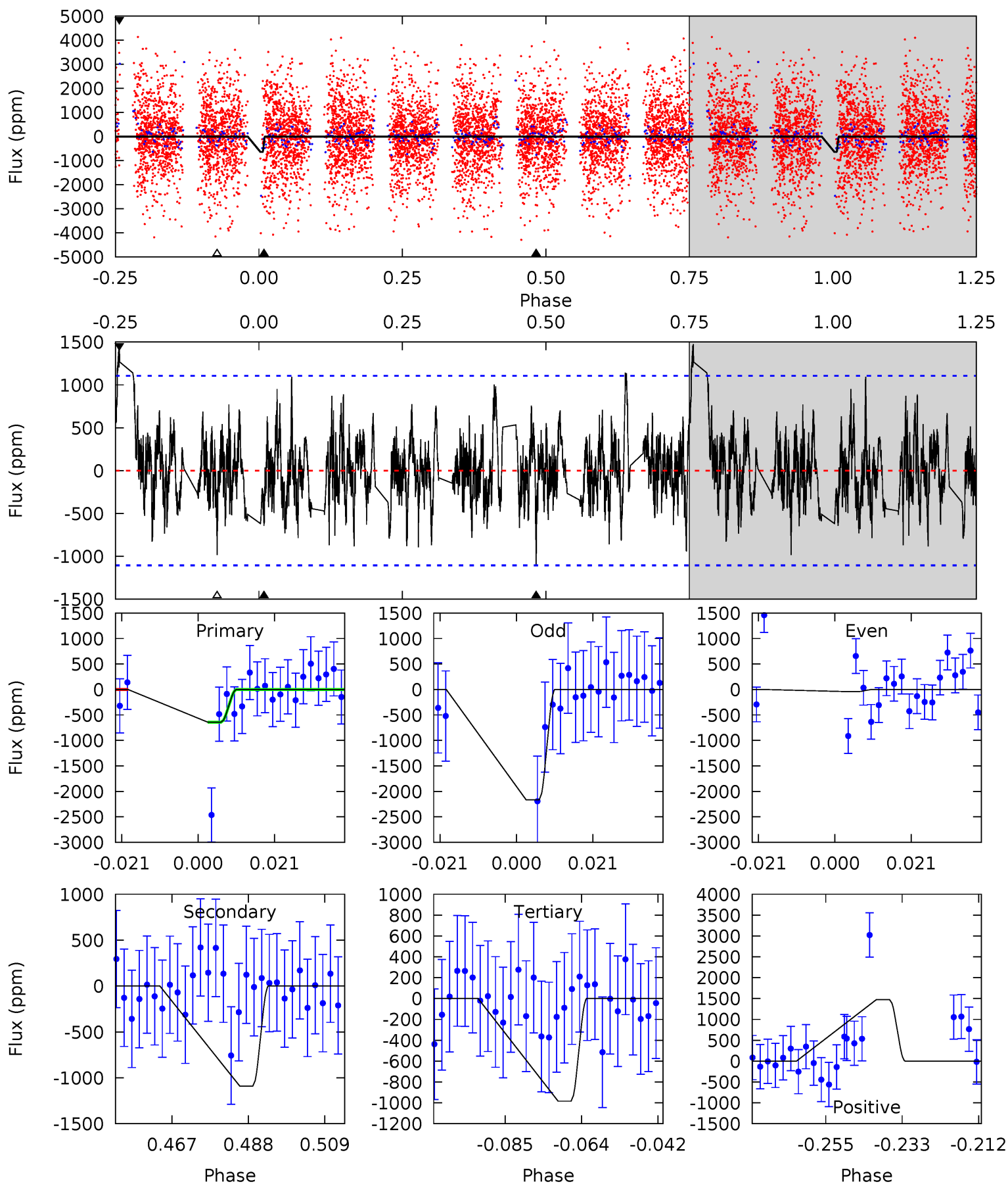
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.99	9.86	6.92	5.98	5.05	2.61	1.72	2.07	3.01	2.94	3.88	3.14	1.03	0.38	0.45



Alt Model-Shift Uniqueness Test

009970568-02, P = 6.850002 Days, E = 127.515649 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.84	4.82	4.34	6.52	4.88	2.30	1.40	-1.51	-3.68	0.47	-1.70	4.59	1.64	0.58	0



Stellar Parameters For KIC 009970568

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	ρ_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8035^{+223}_{-362}	$3.709^{+0.432}_{-0.108}$	$-0.100^{+0.200}_{-0.350}$	$3.312^{+0.789}_{-1.579}$	$2.046^{+0.372}_{-0.538}$	$0.079^{+0.307}_{-0.028}$
	+3%/-5%	+12%/-3%	+200%/-350%	+24%/-48%	+18%/-26%	+388%/-35%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009970568-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1675 ± 170	$92.41^{+102.75}_{-64.62}$	2904^{+221}_{-357}	3255^{+2000}_{-5851}	$0.870^{+8.629}_{-0.673}$
Alt.	-1090 ± 226	$84.59^{+109.28}_{-57.45}$	2918^{+220}_{-361}	2944^{+1830}_{-5735}	$0.624^{+5.731}_{-0.501}$

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

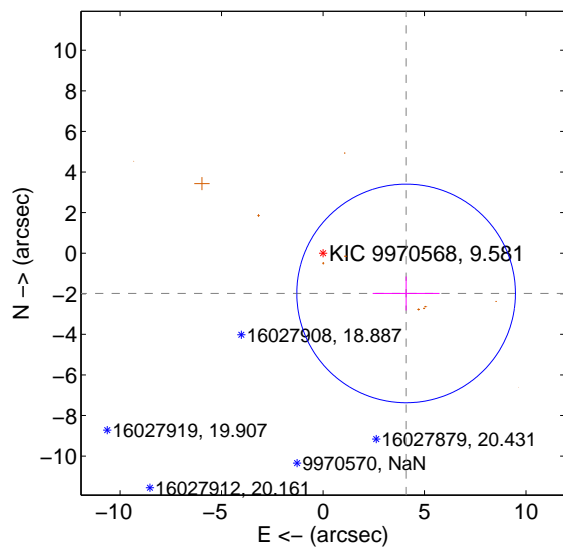
Supplemental centroid analysis for 009970568-02. **Kepler magnitude: 9.58.** Transit SNR 9.68

There are 0 quarters with good PRF difference image offsets

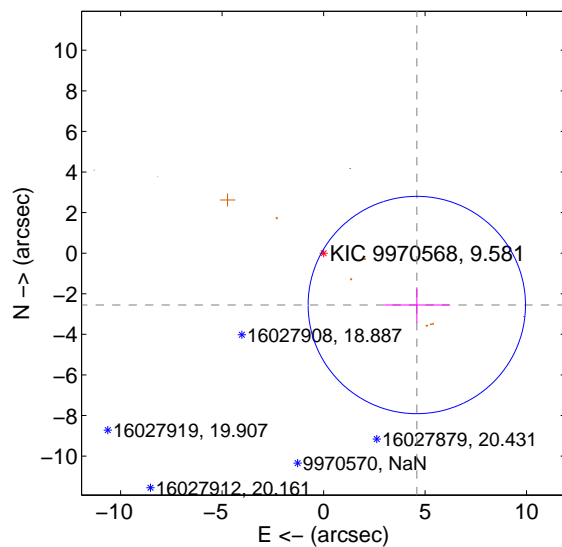
The direct PRF centroid is offset from the target star catalog position by about 0.88 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.550 ± 1.795	2.53	-4.094 ± 1.647	-1.984 ± 0.838
PRF-fit source offset from KIC position	5.257 ± 1.785	2.94	-4.594 ± 1.602	-2.555 ± 0.868
photometric centroid source offset	0.26 ± 0.05	4.78	0.24 ± 0.06	0.10 ± 0.03

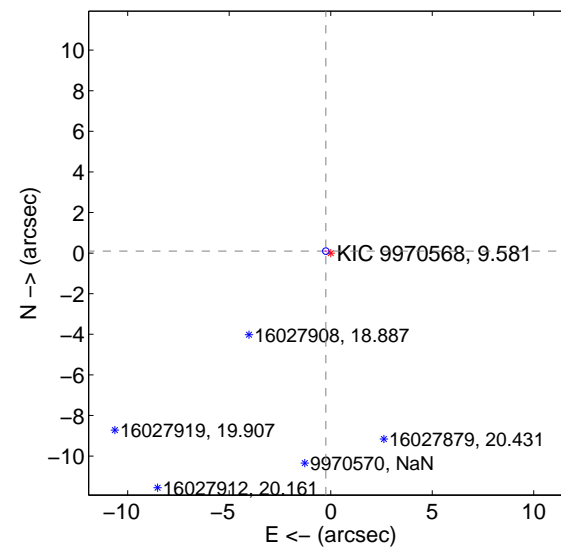
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

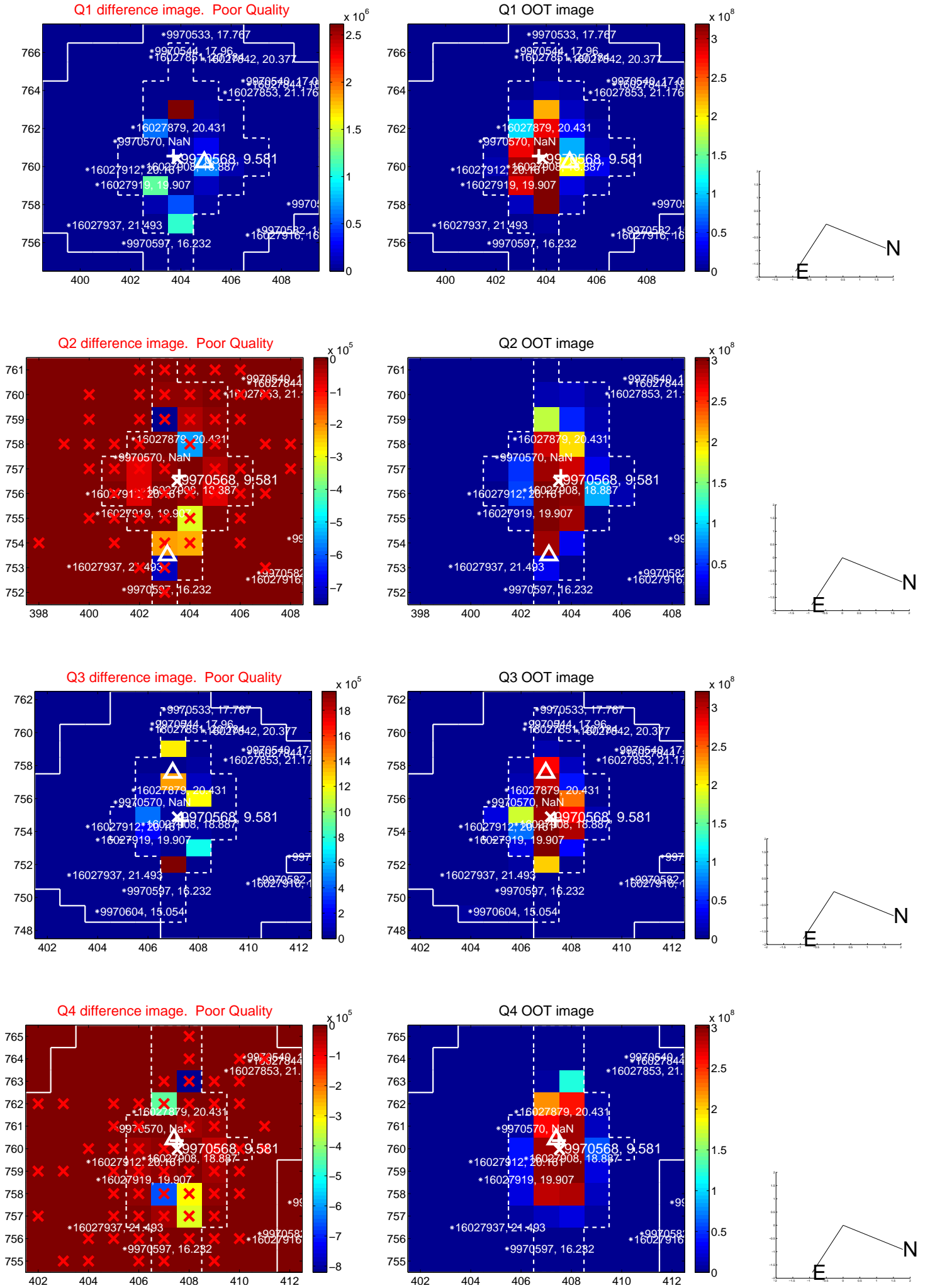


offset from photometric centroids

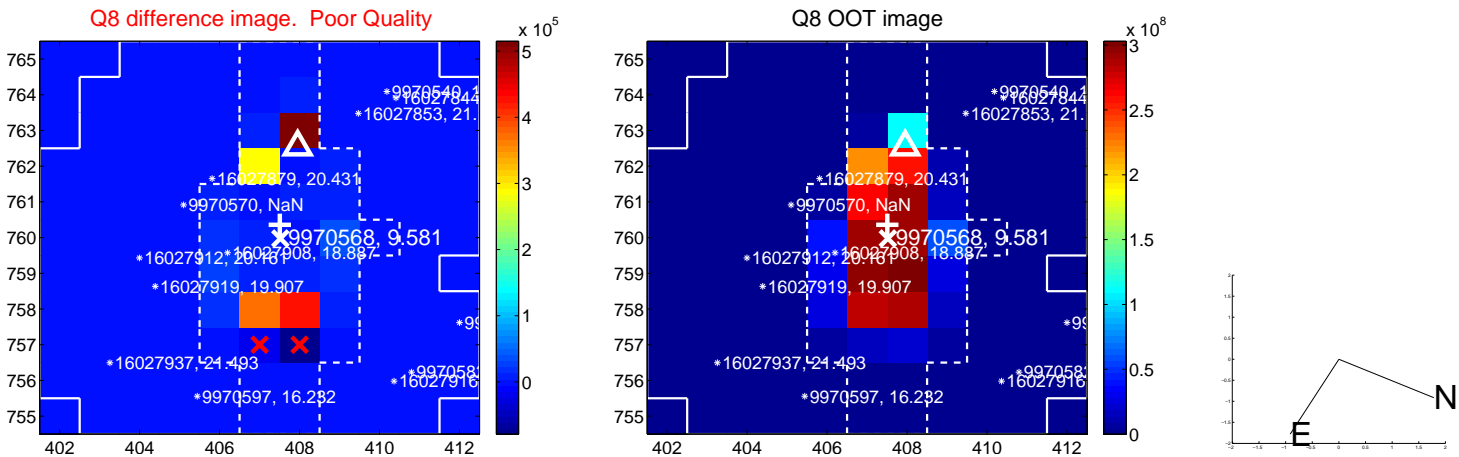
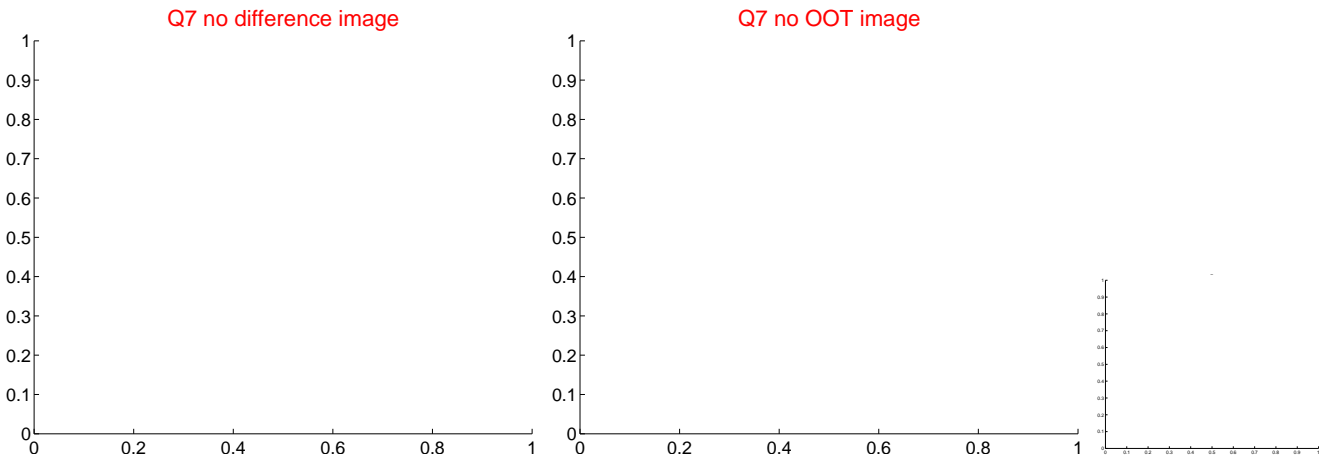
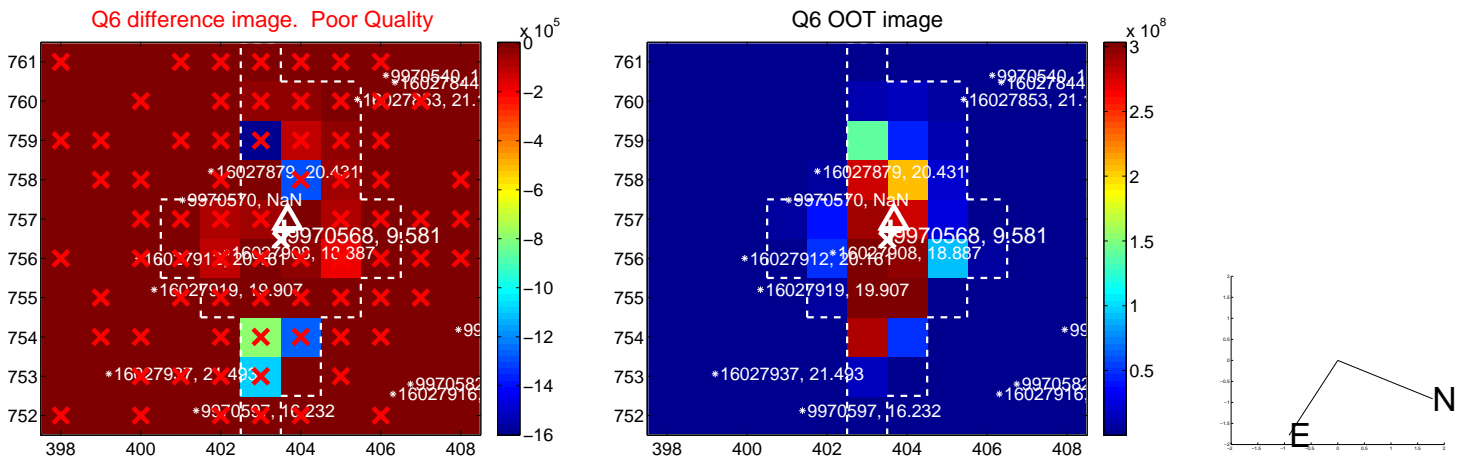
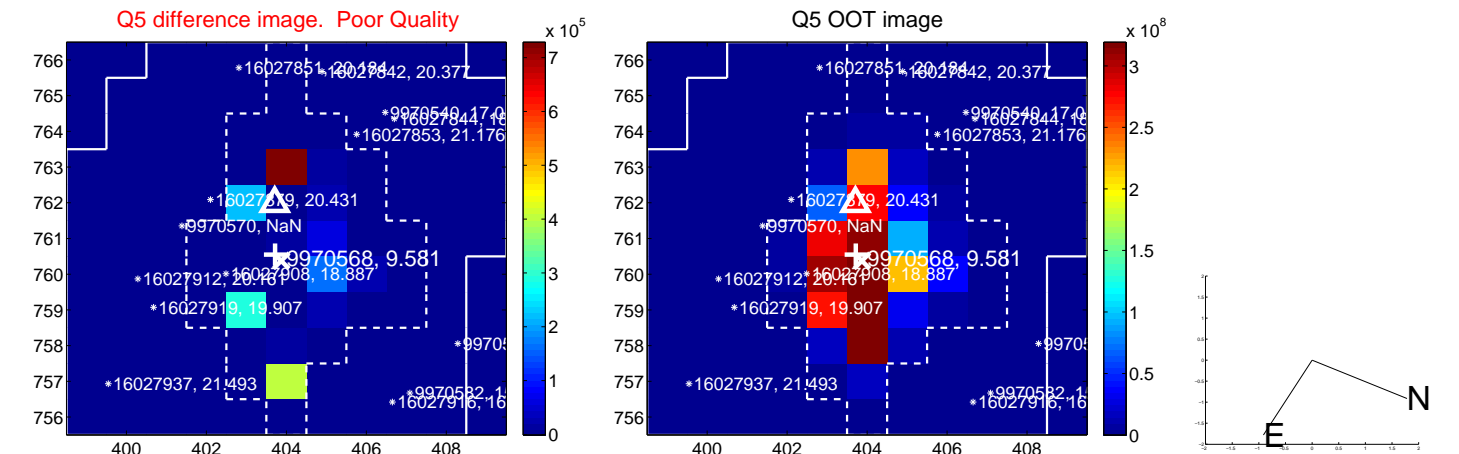


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

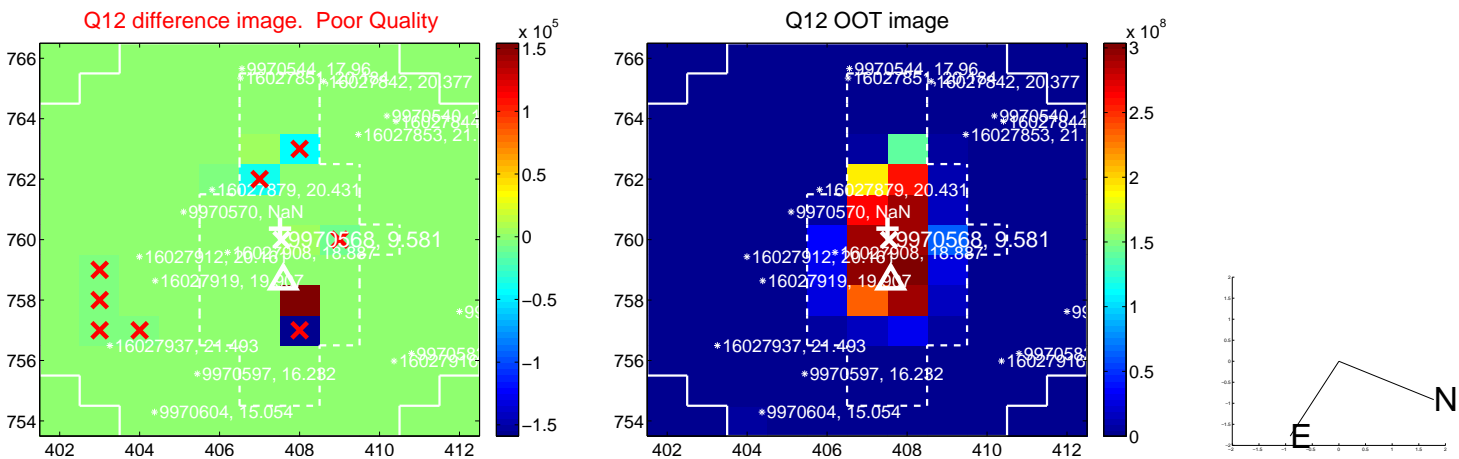
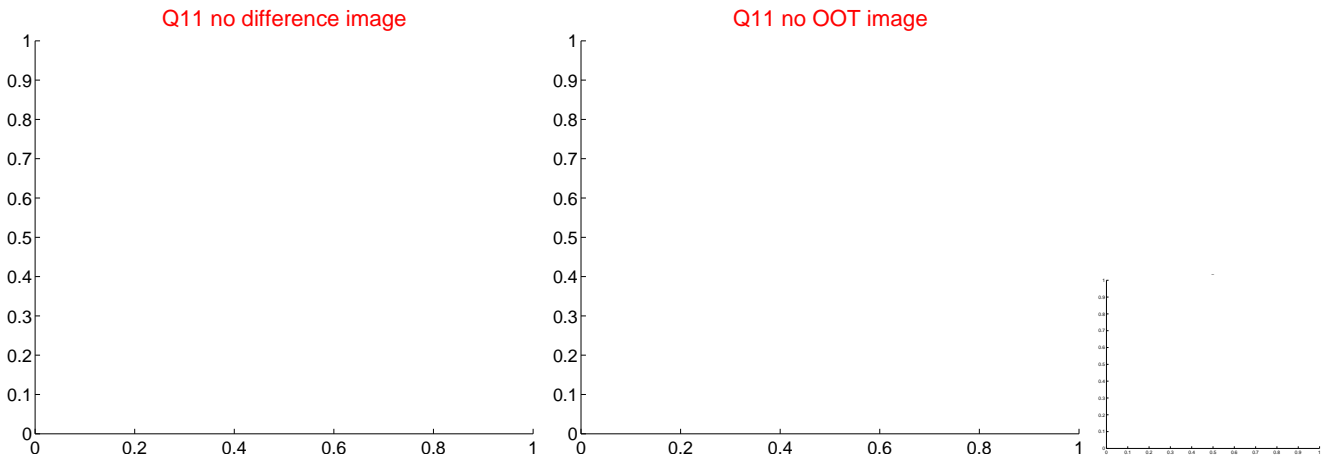
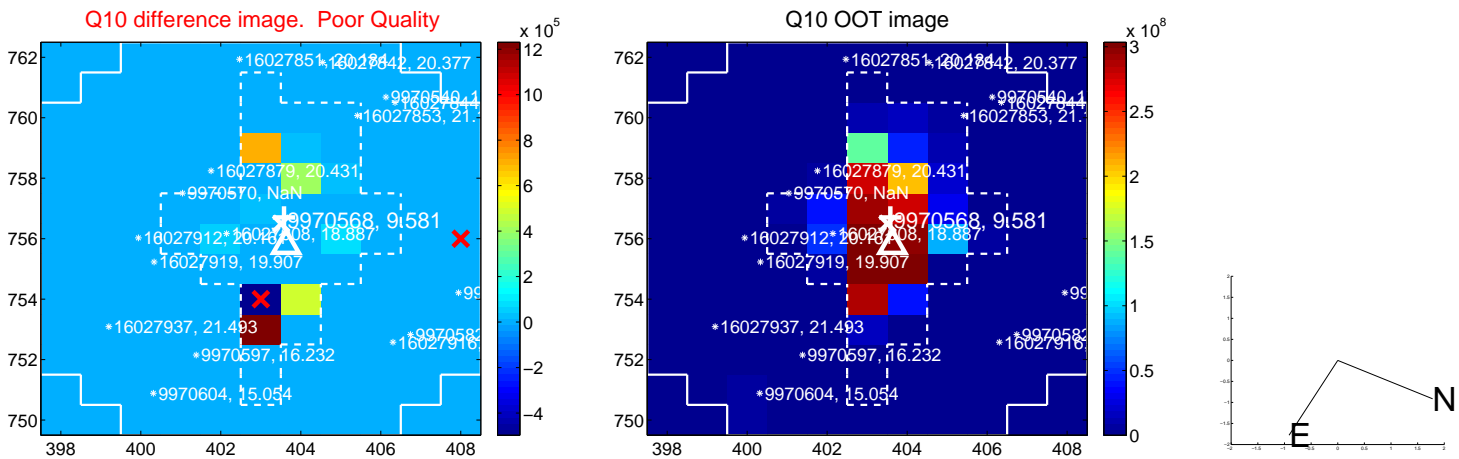
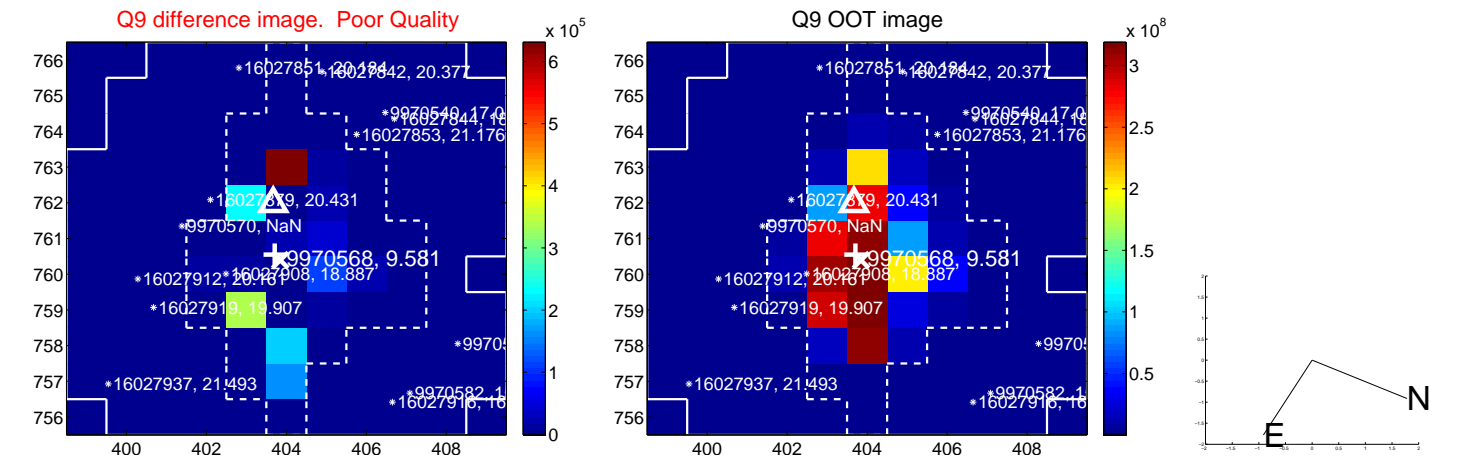
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



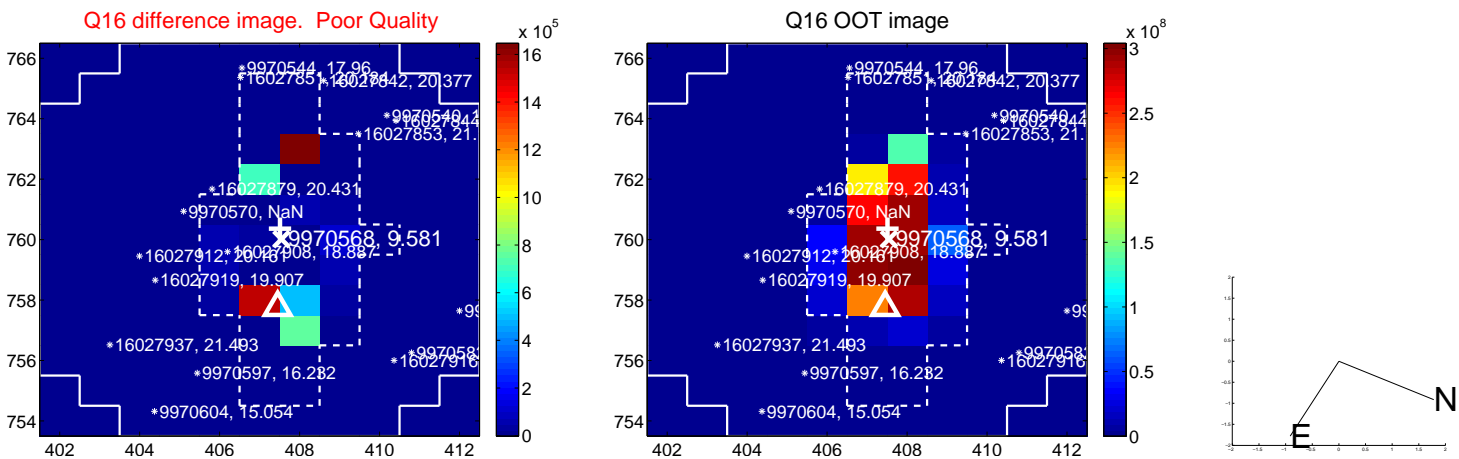
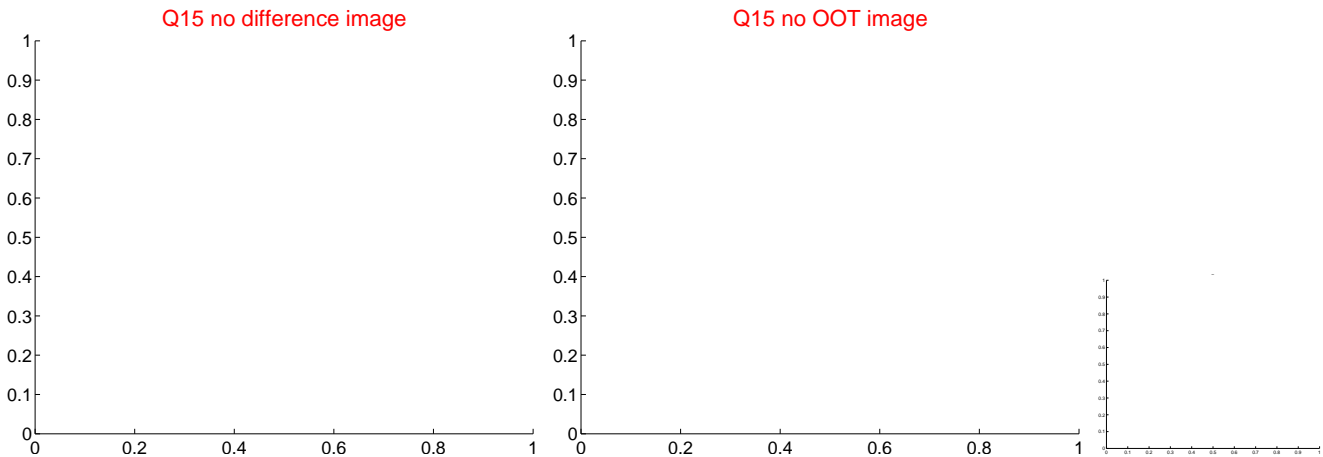
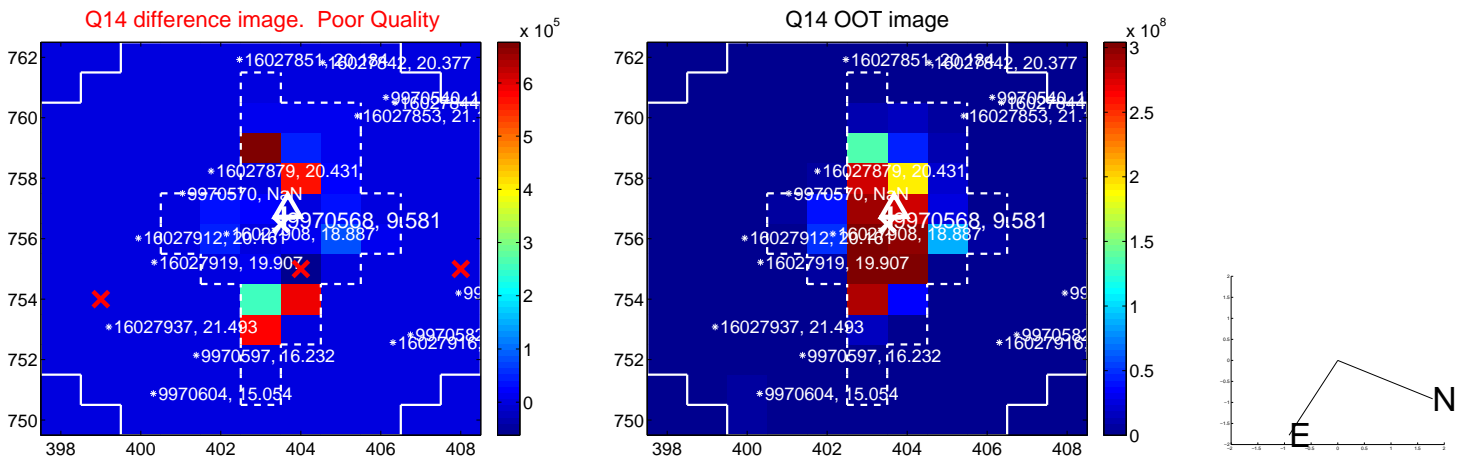
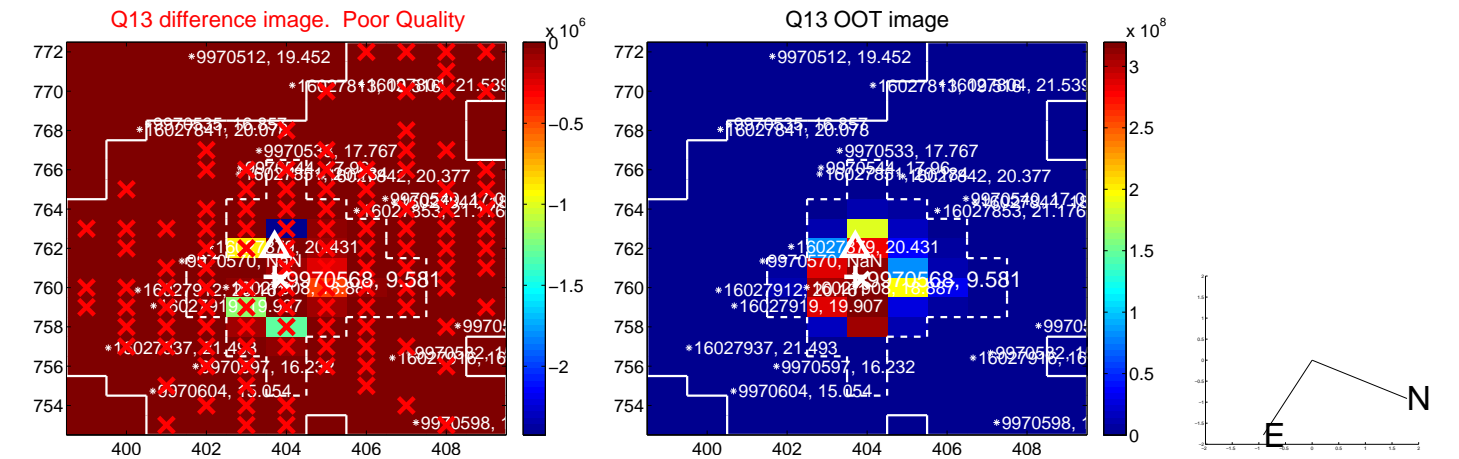
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



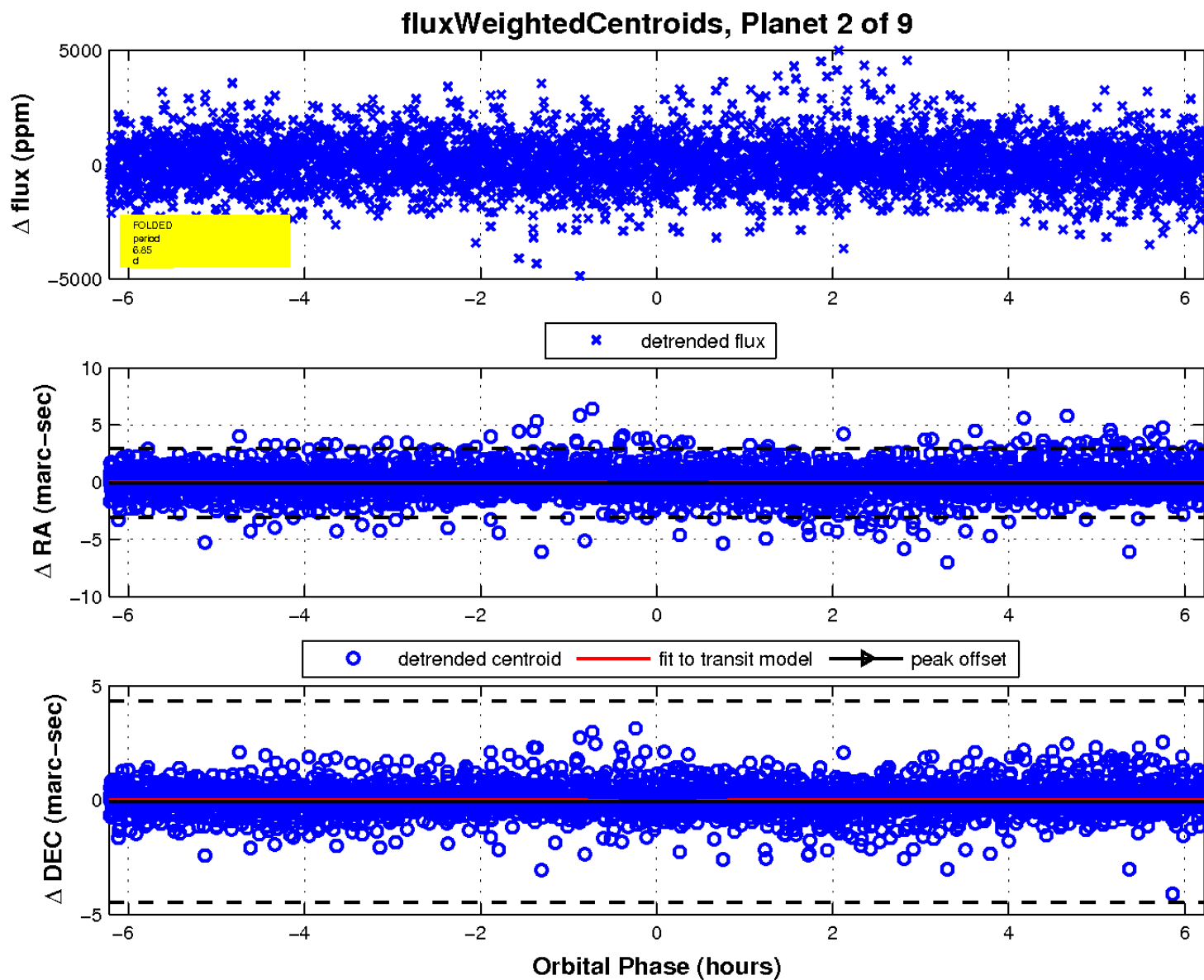
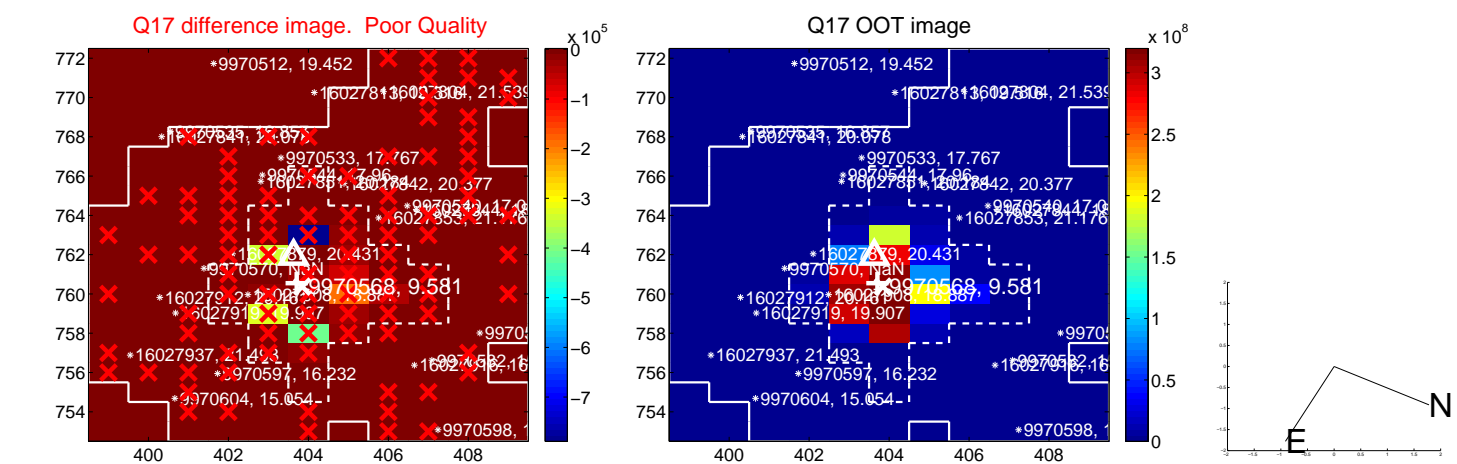
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

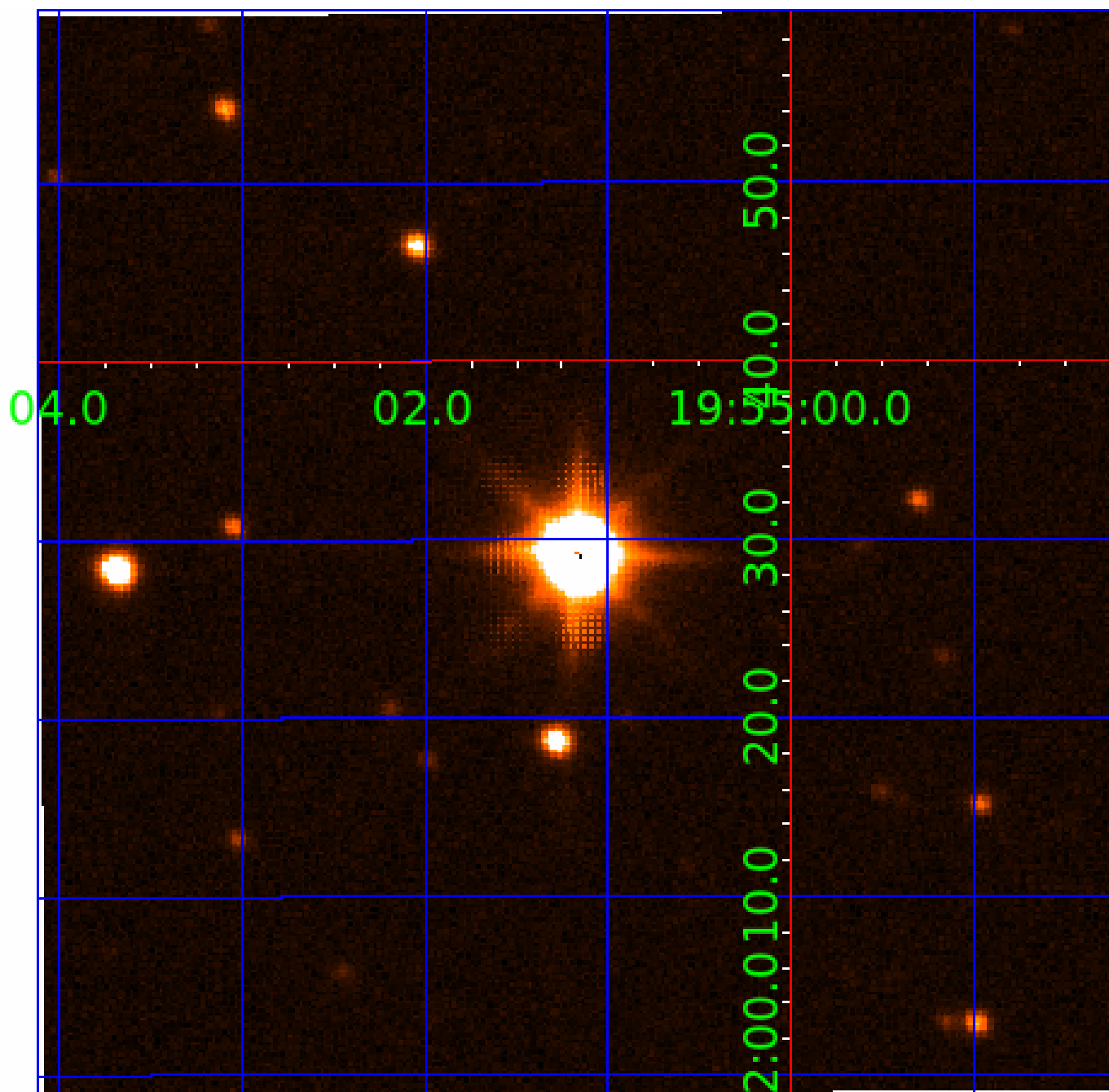


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009970568

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})
009970568-01	OBS	No	0.761375	131.773155	86.1	4.981	11.6	7.0	3.31	8035	3.13	95374.74
009970568-02	OBS	No	6.849496	134.393510	2076.3	2.075	12.6	9.7	3.31	8035	27.48	5097.45
009970568-03	OBS	No	30.488151	135.191934	1286.3	2.736	10.7	8.8	3.31	8035	13.60	696.18
009970568-04	OBS	No	108.630100	155.707473	2355.6	3.769	10.6	9.9	3.31	8035	29.25	127.93
009970568-05	OBS	No	51.809300	179.787566	2073.0	5.115	10.3	13.0	3.31	8035	15.51	343.31
009970568-06	OBS	No	9.624401	133.642564	889.2	1.961	9.2	9.5	3.31	8035	13.06	3238.92
009970568-07	OBS	No	27.073036	138.845537	965.7	3.769	9.0	8.0	3.31	8035	10.94	815.67
009970568-08	OBS	No	14.115709	139.253007	1679.2	2.645	9.9	11.7	3.31	8035	23.27	1943.69
009970568-09	OBS	No	8.894852	132.463277	42.6	2.000	9.2	-1.0	3.31	8035	2.19	3597.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970568-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

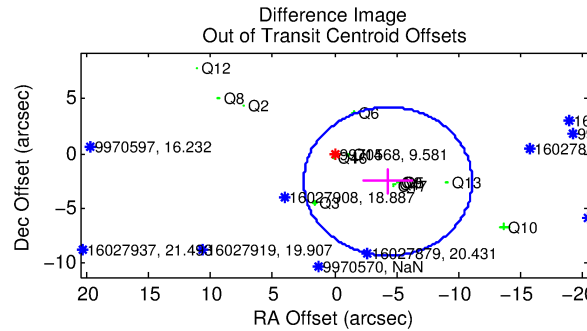
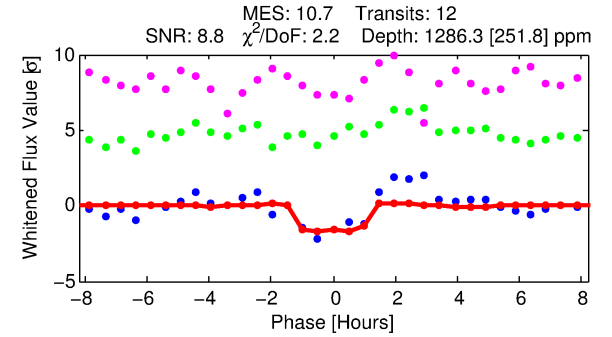
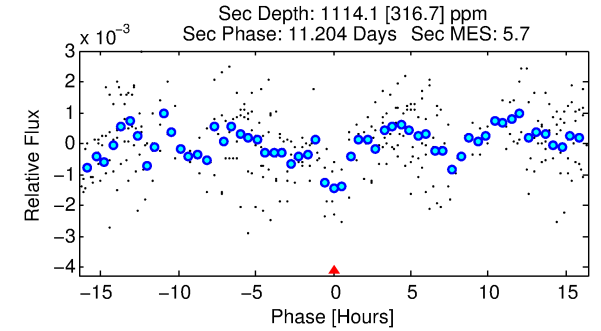
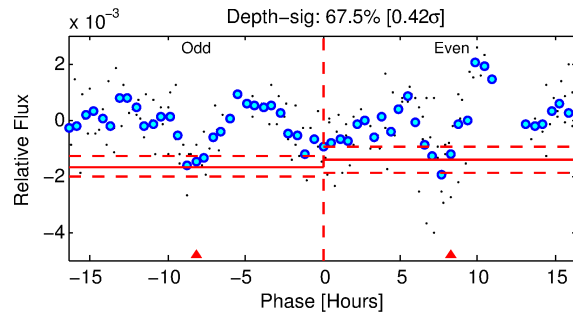
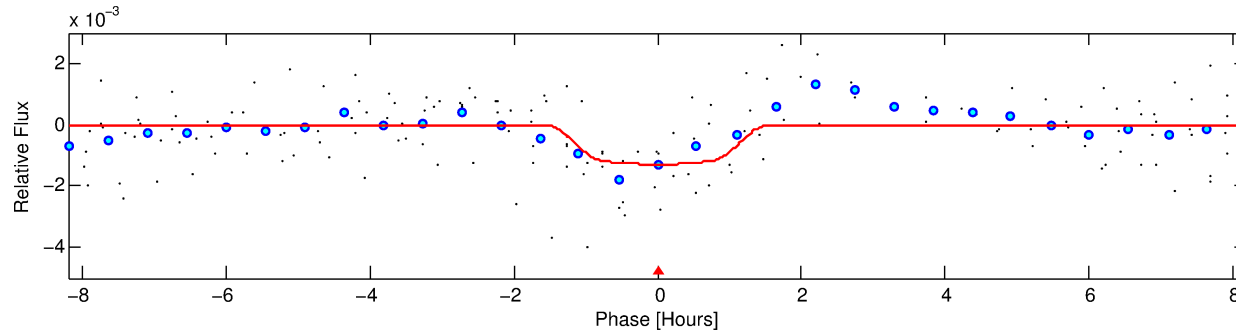
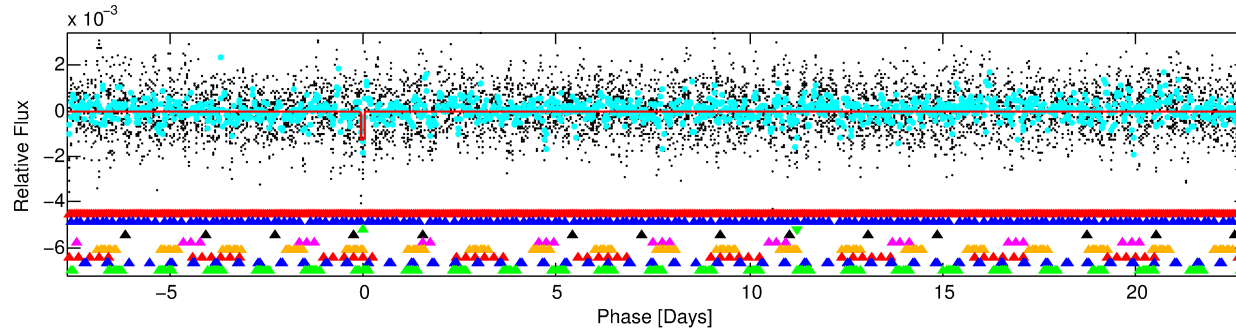
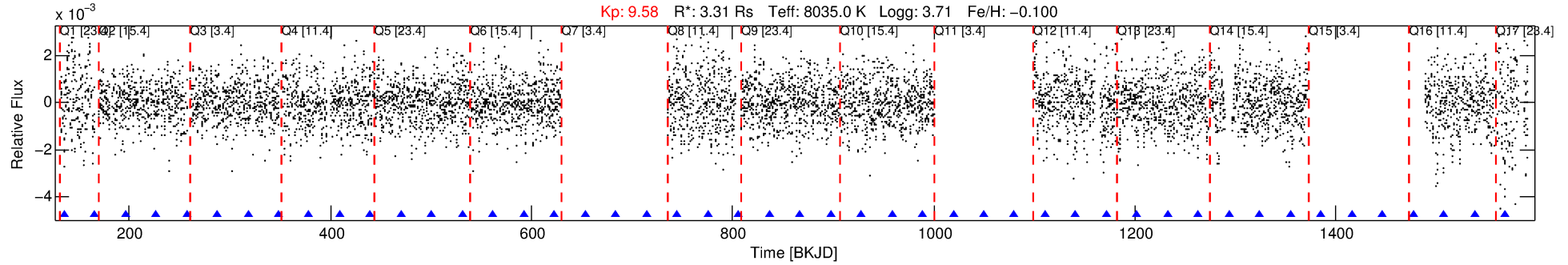
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009970568-03

No Significant Match Found

DV One-Page Summary

KIC: 9970568 Candidate: 3 of 9 Period: 30.488 d



DV Fit Results:

Period = 30.48815 [0.00030] d
Epoch = 135.1919 [0.0078] BKJD
 $R_p/R^* = 0.0376$ [0.0115]
 $a/R^* = 47.90$ [77.28]
 $b = 0.87$ [0.44]
 $\text{Seff} = 696.18$ [527.11]
 $T_{\text{eq}} = 1310$ [248] K
 $R_p = 13.60$ [7.70] R_e
 $a = 0.2426$ [0.1114] AU
 $\text{Ag} = 195.12$ [194.73] [1.00 σ]
 $T_{\text{eff}} = 7569$ [1321] K [4.66 σ]

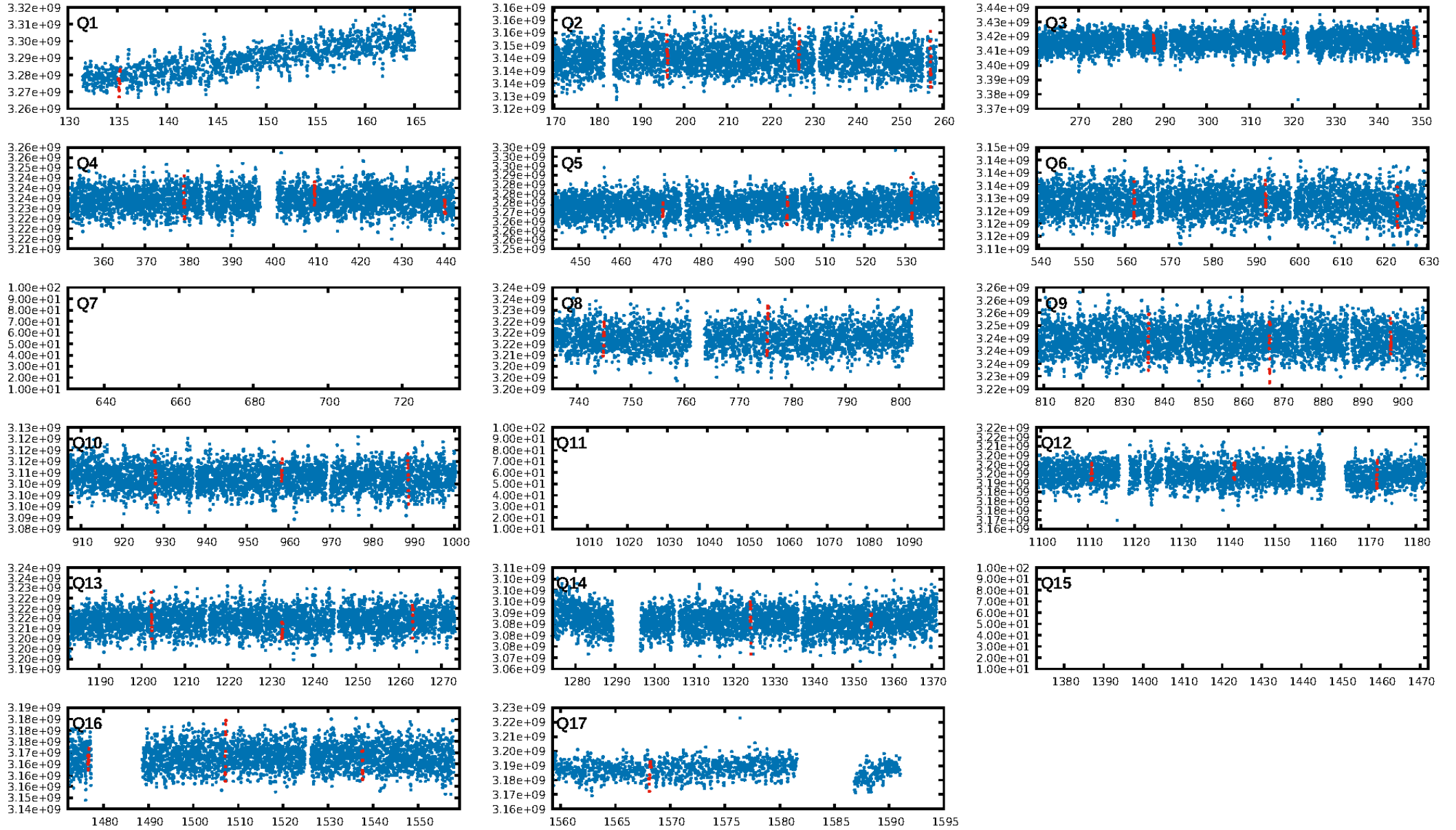
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.60 σ]
LongPeriod-sig: 100.0% [88.21 σ]
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 86.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [10/10]
GhostDiagnostic-chr: N/A
Centroid-sig: 22.7%
Centroid-so: 0.042 arcsec [0.25 σ]
OotOffset-rm: 4.999 arcsec [2.21 σ]
KicOffset-rm: 5.740 arcsec [3.11 σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.00 [0/14]
DiffImageOverlap-fno: 0.00 [0/14]

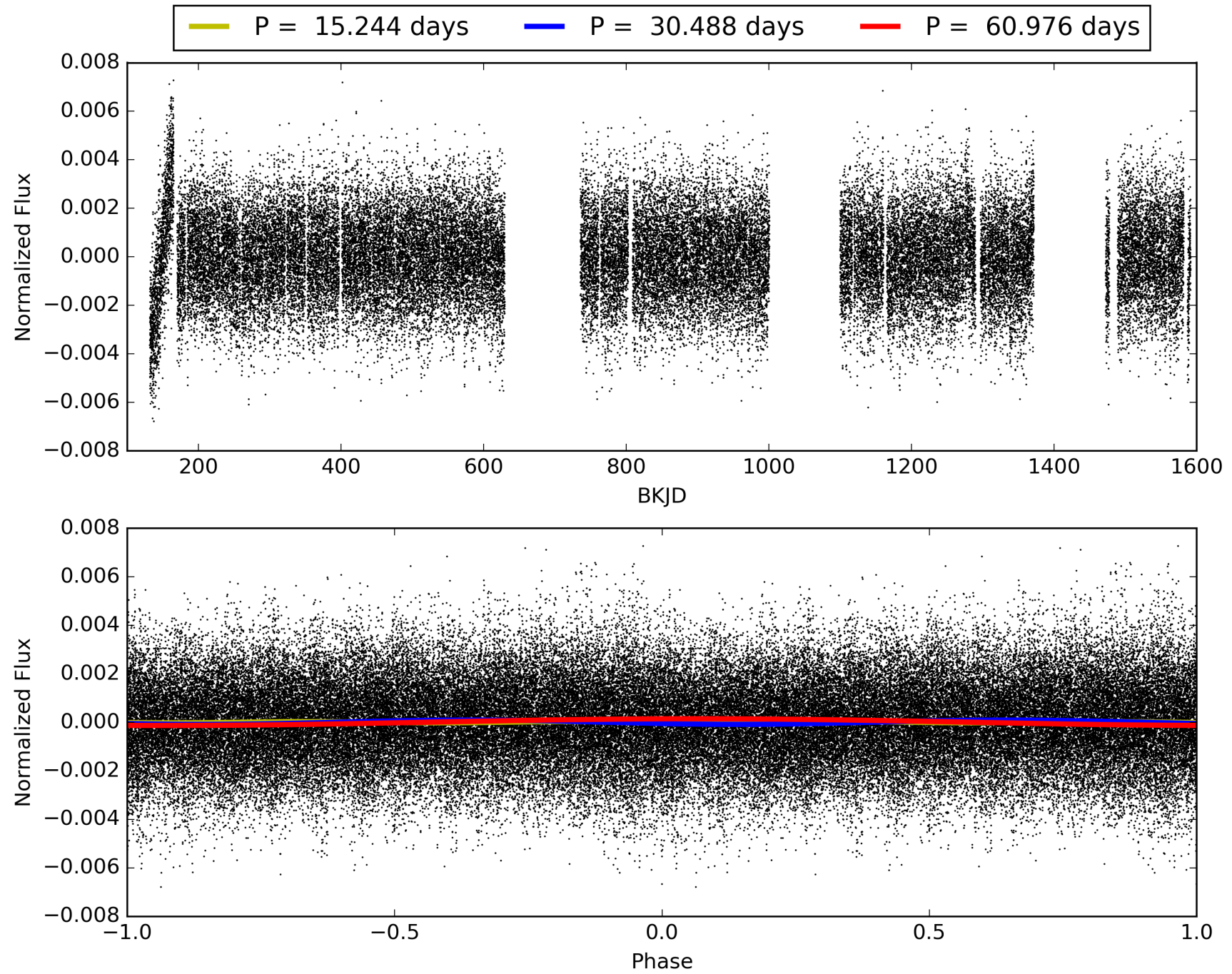
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:29 Z

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

TCE 009970568-03, PDC Light Curves

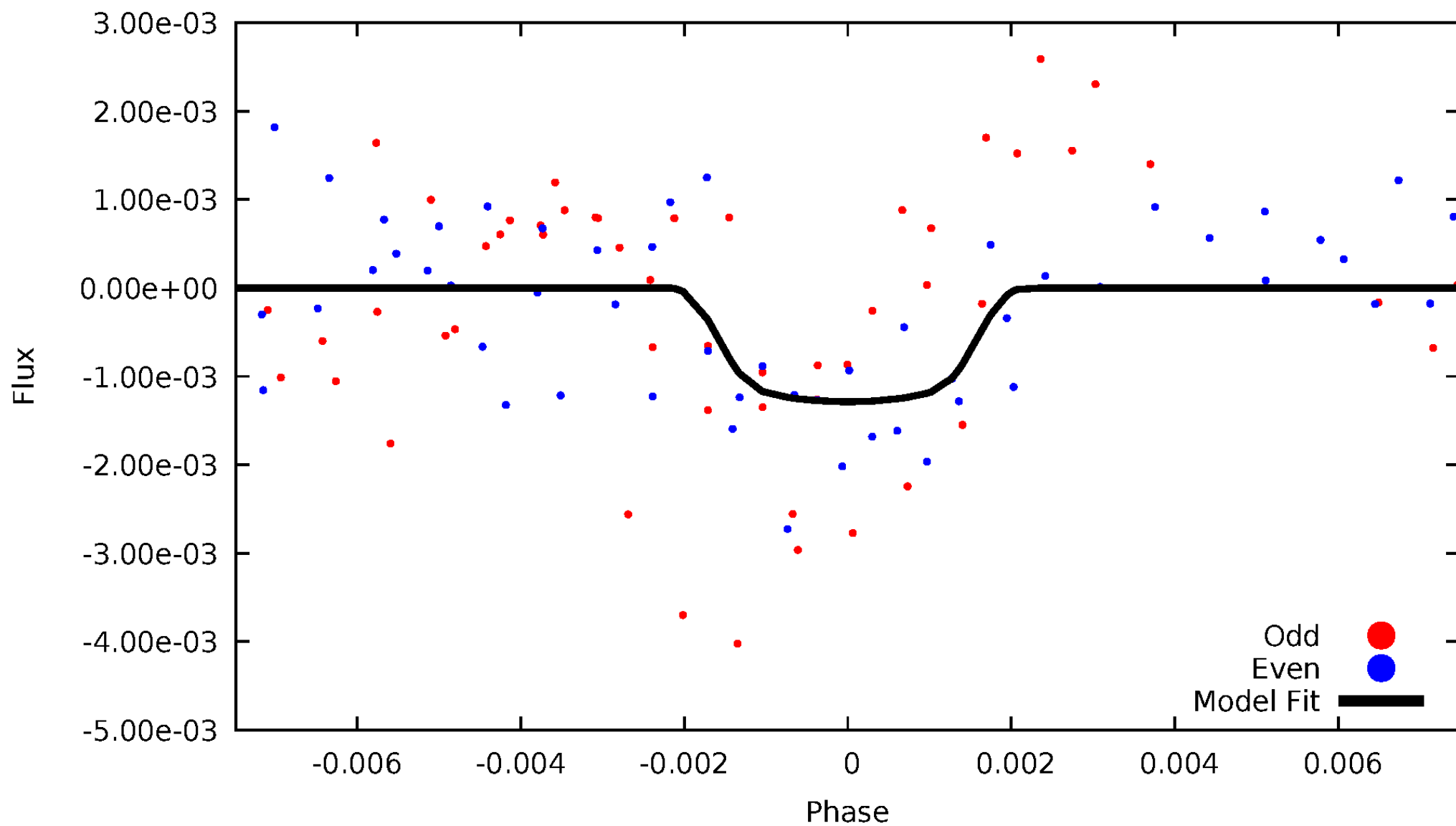


TCE 009970568-03



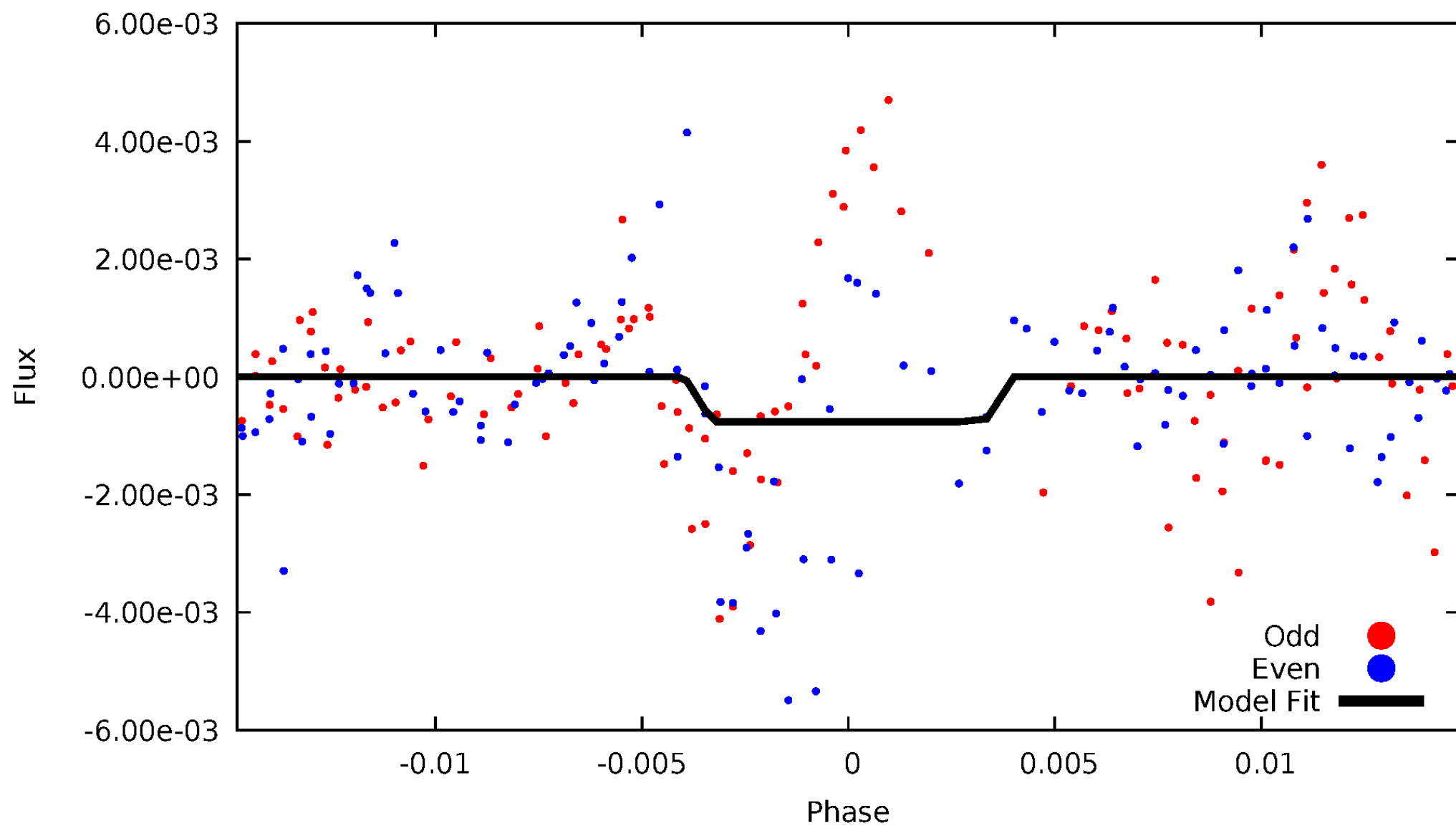
DV Odd/Even

TCE 009970568-03



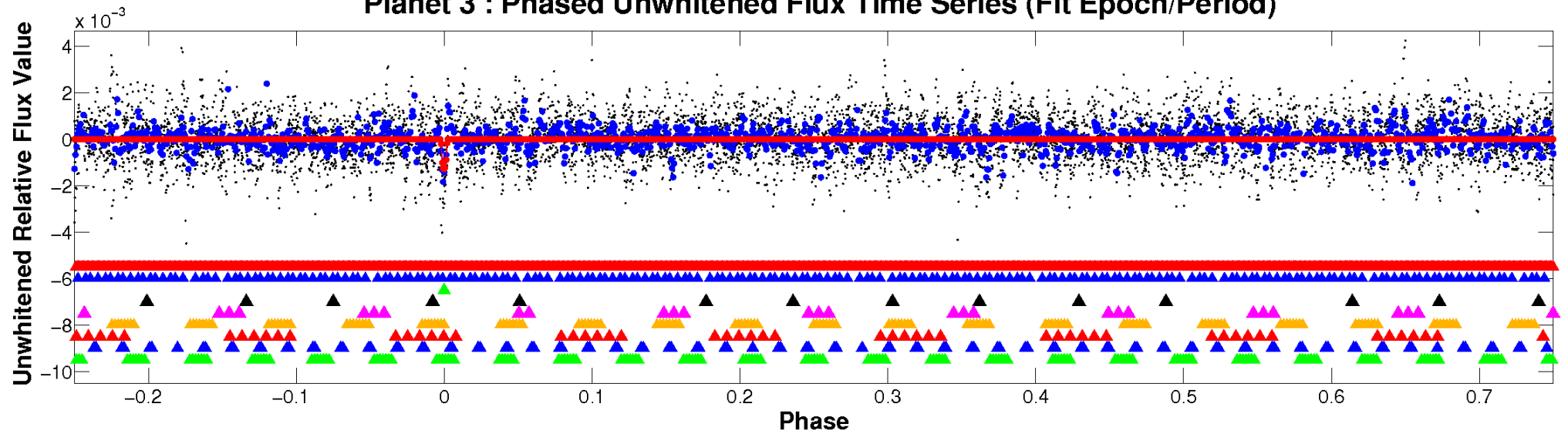
ALT Odd/Even

TCE 009970568-03

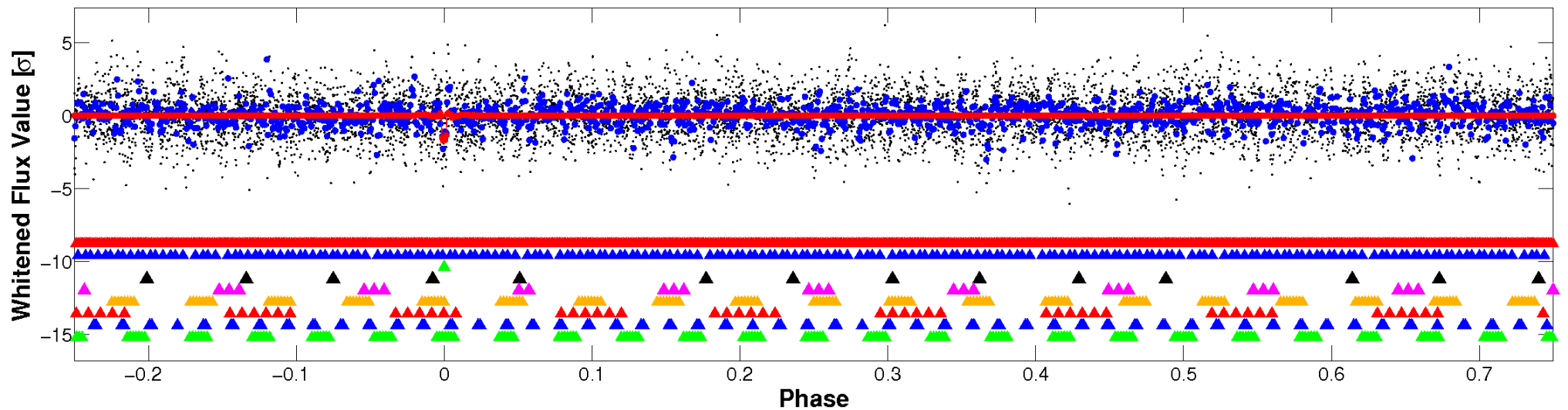


Non-Whitened Vs. Whitened Light Curve

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

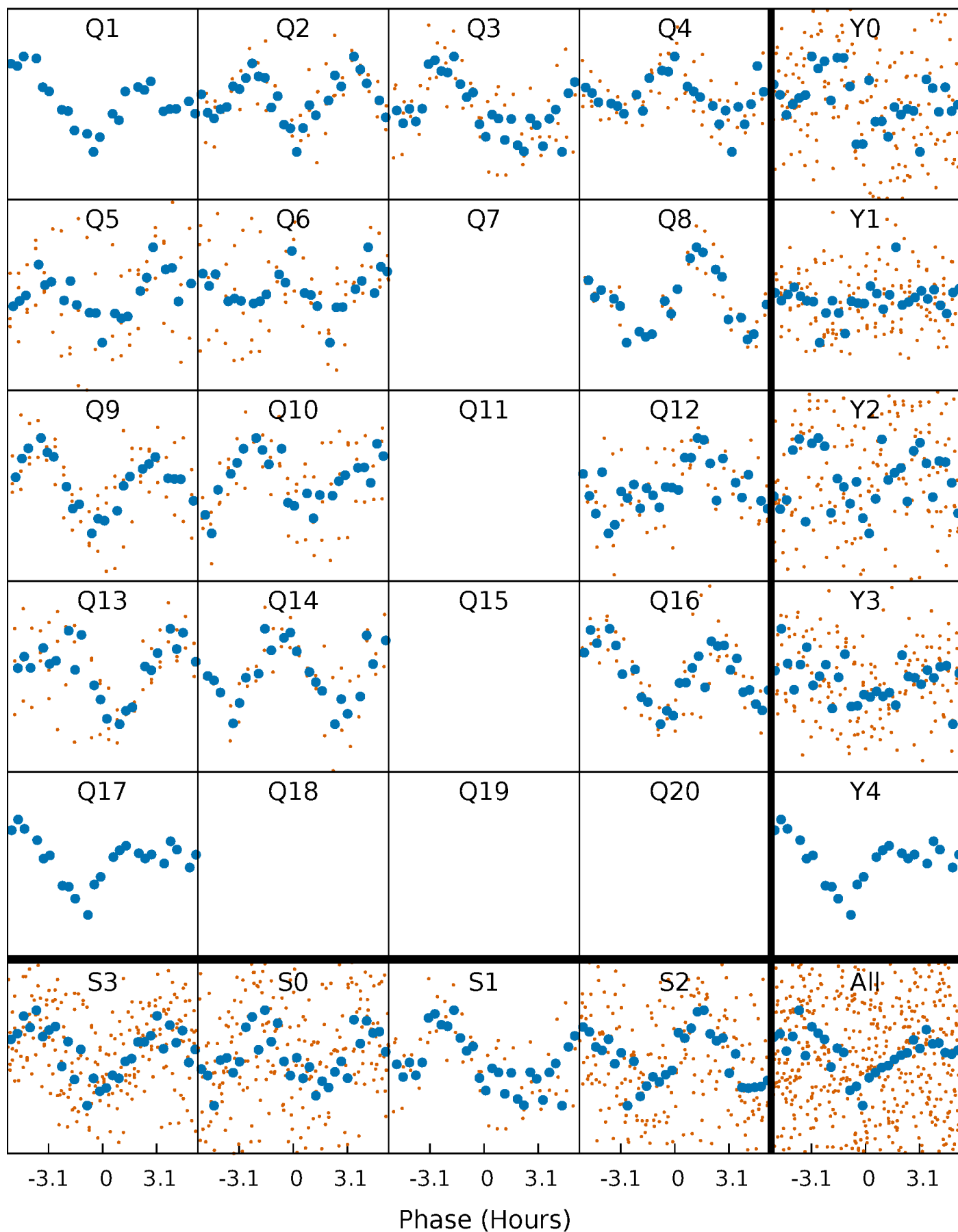


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



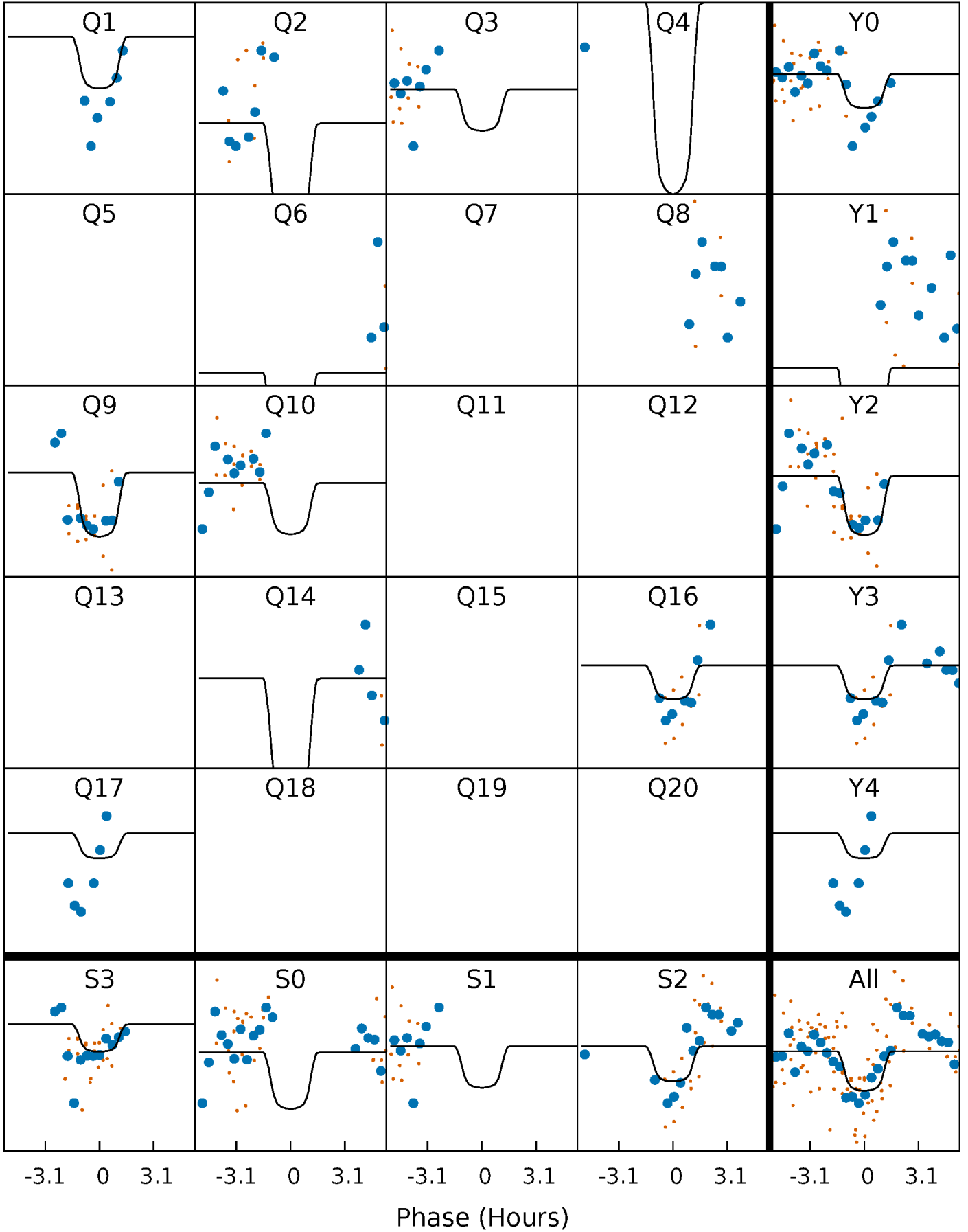
PDC Quarter-Phased Transit Curves

TCE 009970568-03 P= 30.488151 Days $T_0=135.191934$ (BKJD)



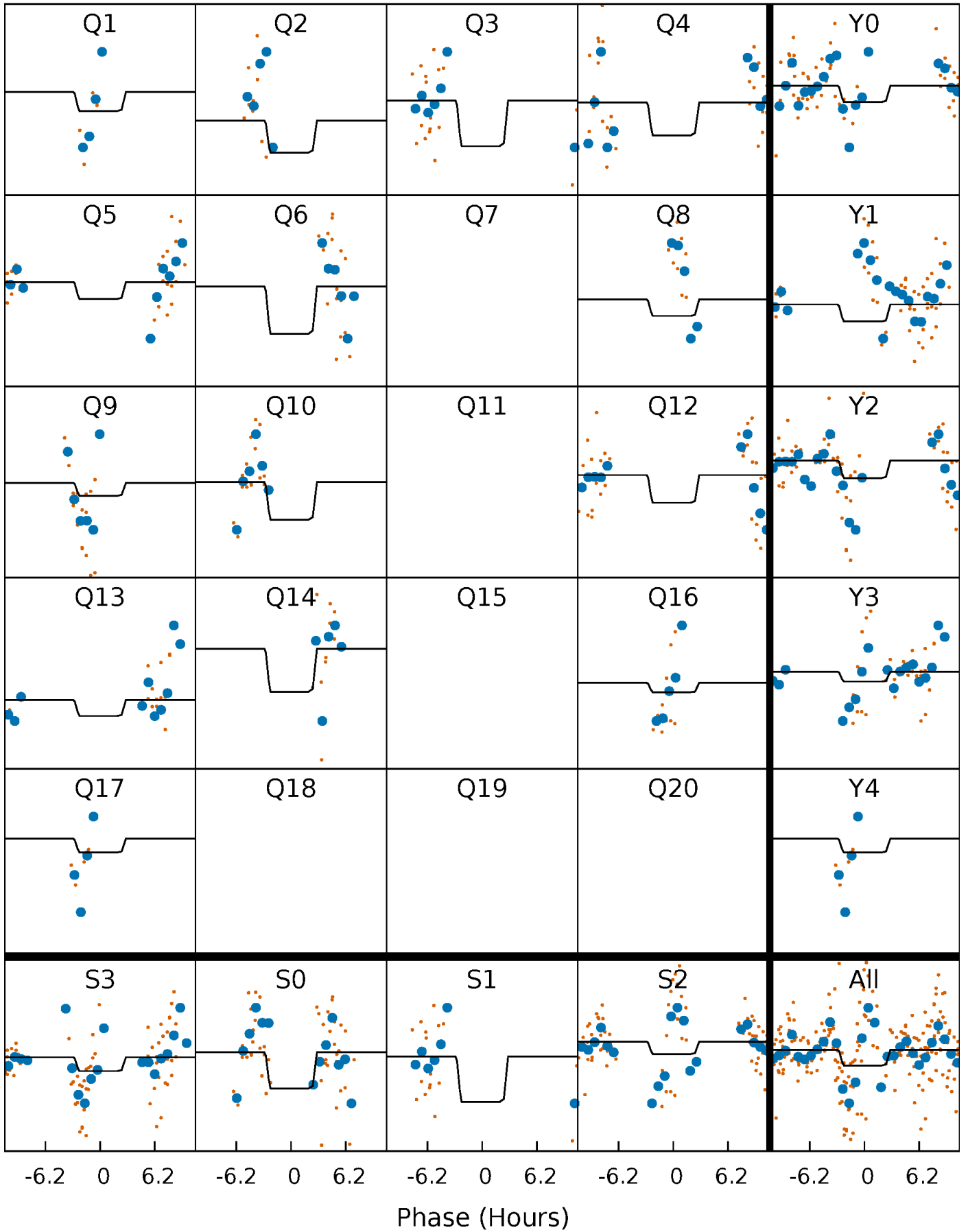
DV Quarter-Phased Transit Curves

TCE 009970568-03 P= 30.488151 Days $T_0=135.191934$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

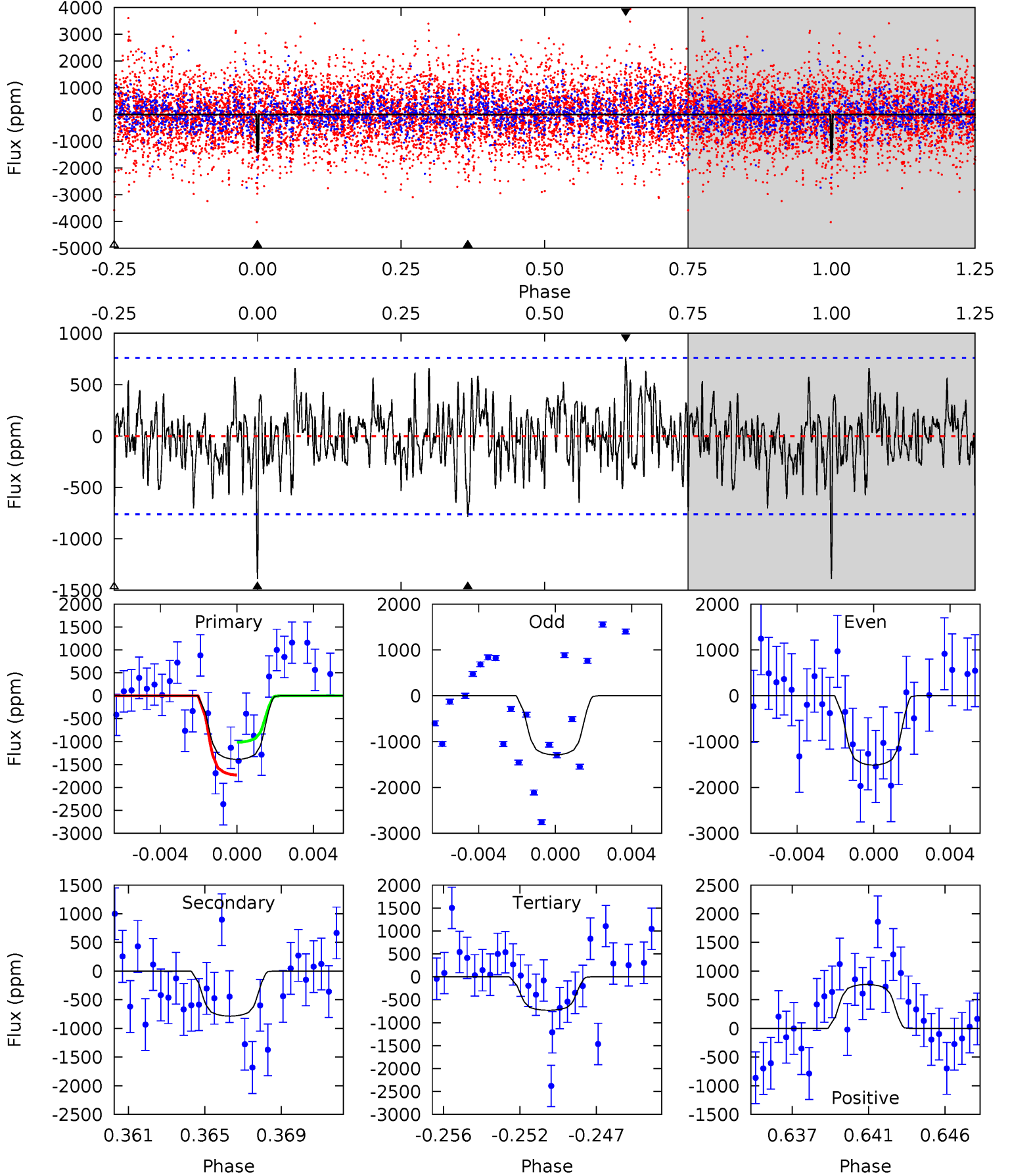
TCE 009970568-03 P= 30.488179 Days $T_0=135.244682$ (BKJD)



DV Model-Shift Uniqueness Test

009970568-03, P = 30.488151 Days, E = 104.703783 Days

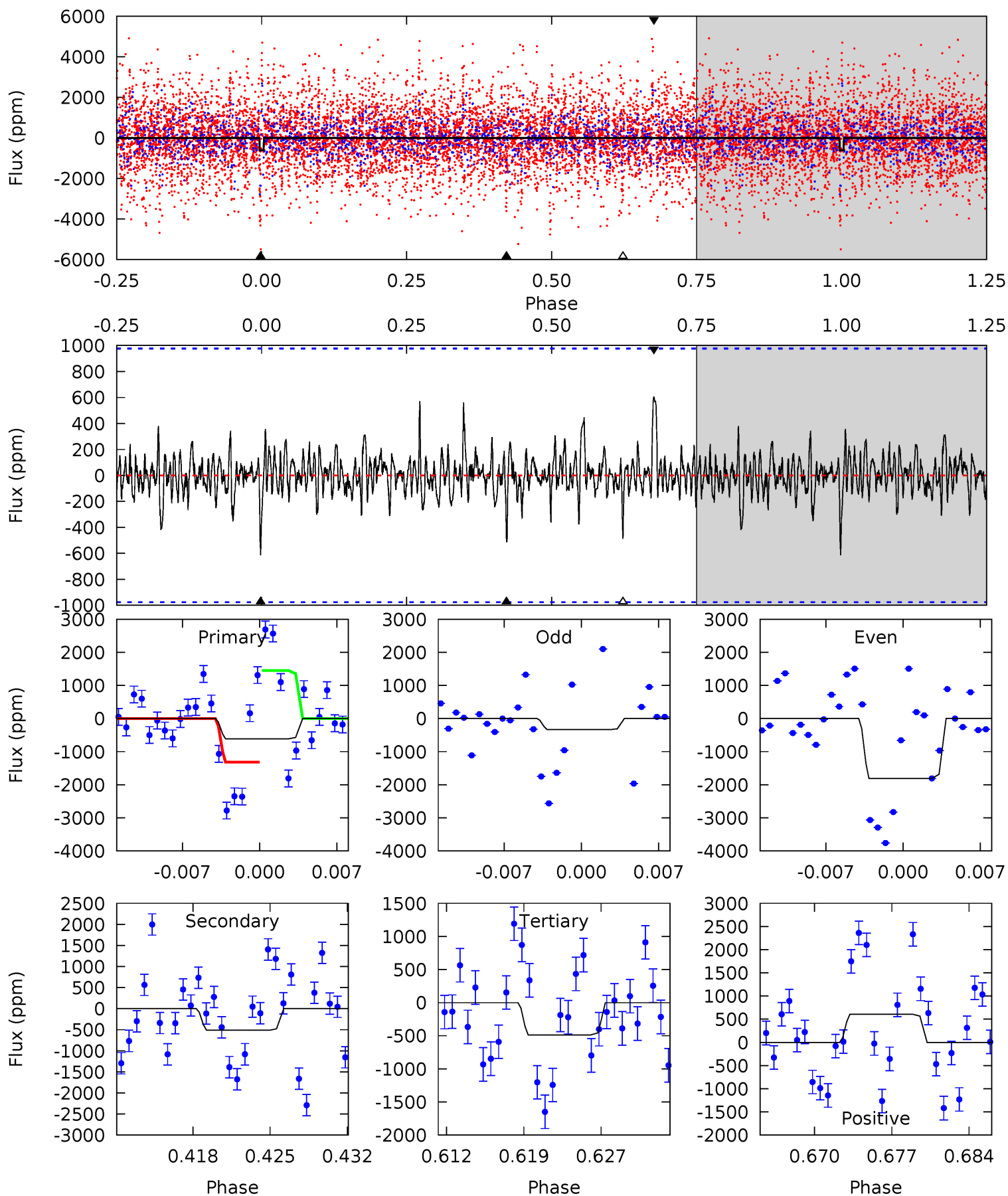
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.48	5.36	4.98	5.24	5.19	2.86	1.65	4.50	4.25	0.39	0.13	0.77	0.71	0.36	2.45



Alt Model-Shift Uniqueness Test

009970568-03, P = 30.488179 Days, E = 104.756503 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.20	2.68	2.54	3.16	5.09	2.69	0.67	0.66	0.04	0.14	-0.48	3.94	0.96	0.50	0.29



Stellar Parameters For KIC 009970568

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8035^{+223}_{-362}	$3.709^{+0.432}_{-0.108}$	$-0.100^{+0.200}_{-0.350}$	$3.312^{+0.789}_{-1.579}$	$2.046^{+0.372}_{-0.538}$	$0.079^{+0.307}_{-0.028}$
	+3%/-5%	+12%/-3%	+200%/-350%	+24%/-48%	+18%/-26%	+388%/-35%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009970568-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-786 ± 147	$12.04^{+5.10}_{-4.26}$	1766^{+143}_{-226}	6750^{+1694}_{-983}	168^{+262}_{-83}
Alt.	-514 ± 192	$8.99^{+4.61}_{-4.01}$	1767^{+137}_{-207}	6956^{+2592}_{-1328}	194^{+424}_{-115}

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

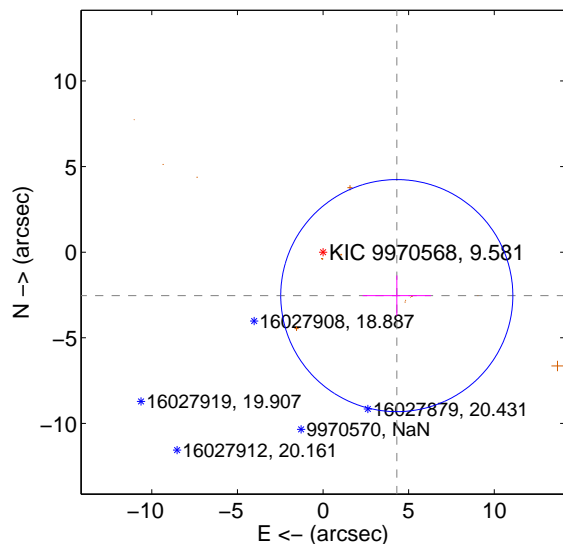
Supplemental centroid analysis for 009970568-03. **Kepler magnitude: 9.58.** Transit SNR 8.78

There are 0 quarters with good PRF difference image offsets

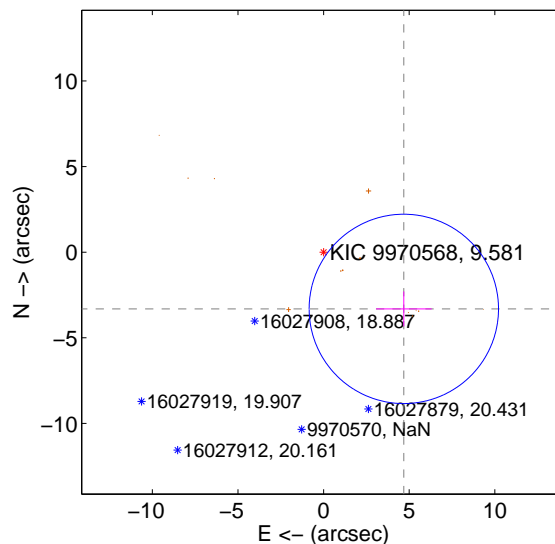
The direct PRF centroid is offset from the target star catalog position by about 0.90 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.999 ± 2.259	2.21	-4.308 ± 1.997	-2.537 ± 1.174
PRF-fit source offset from KIC position	5.740 ± 1.843	3.11	-4.687 ± 1.622	-3.313 ± 1.017
photometric centroid source offset	0.04 ± 0.17	0.25	0.04 ± 0.17	0.01 ± 0.09

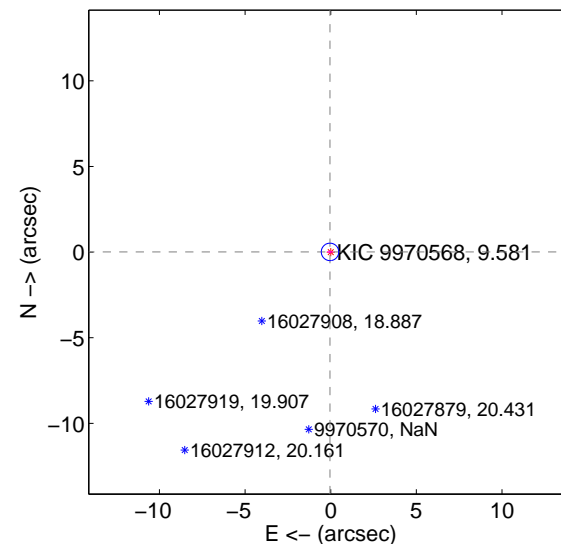
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

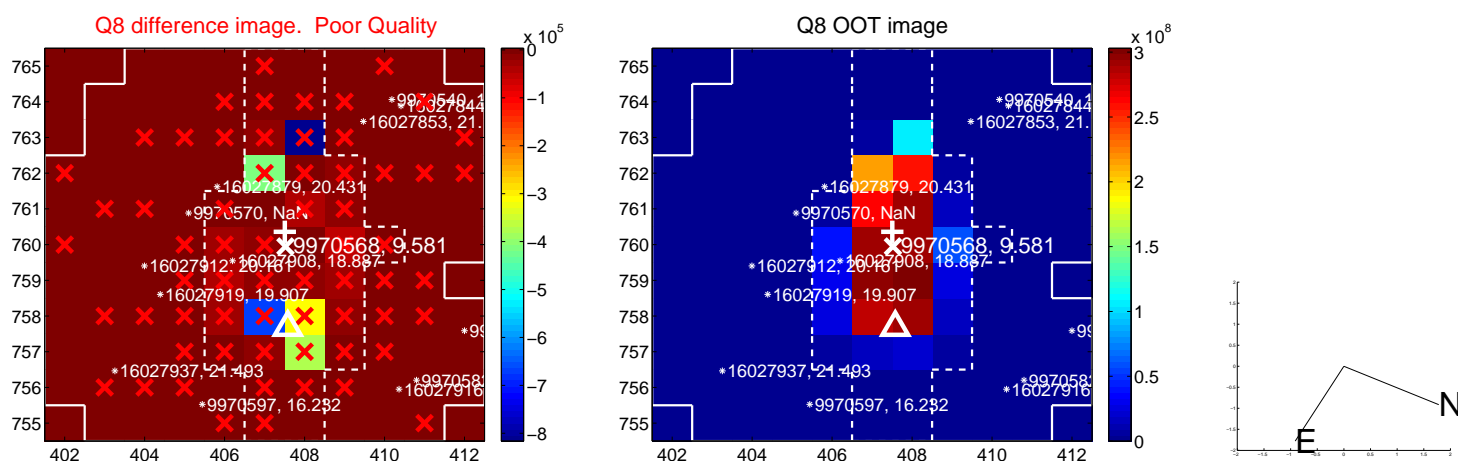
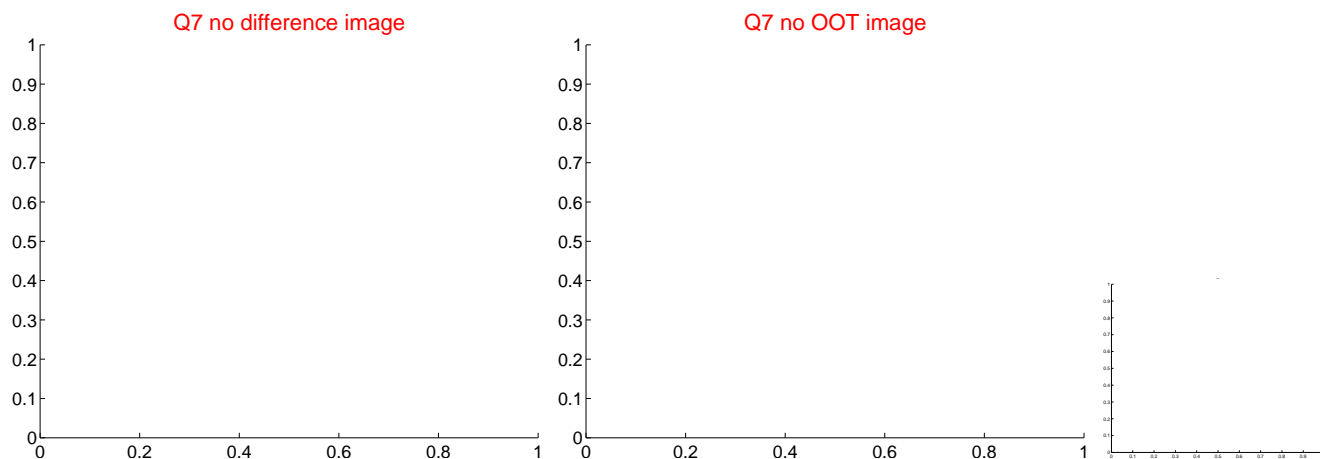
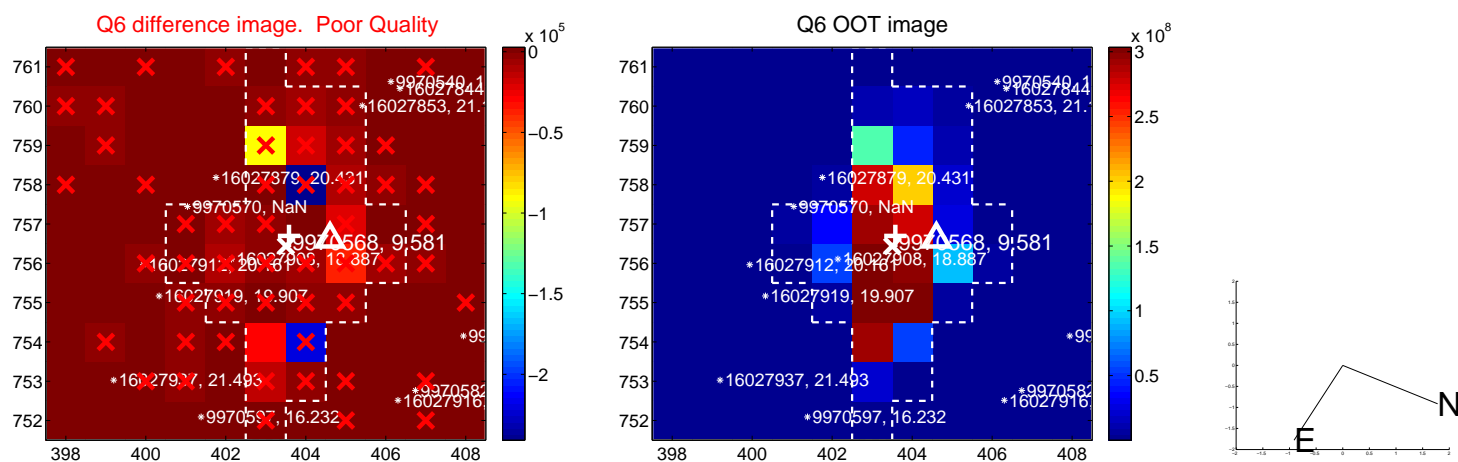
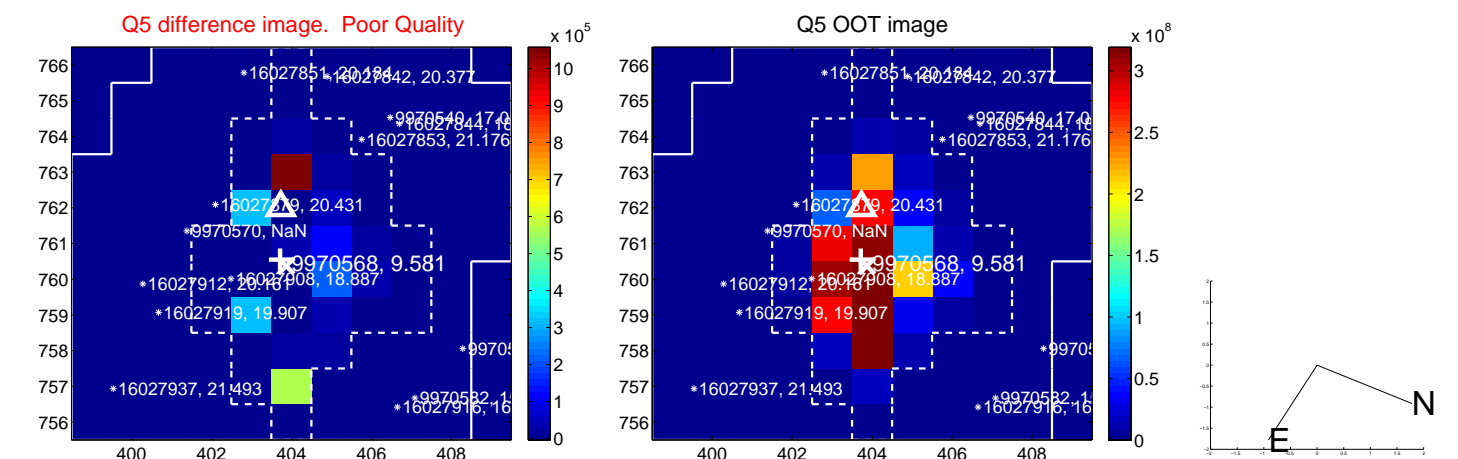


offset from photometric centroids

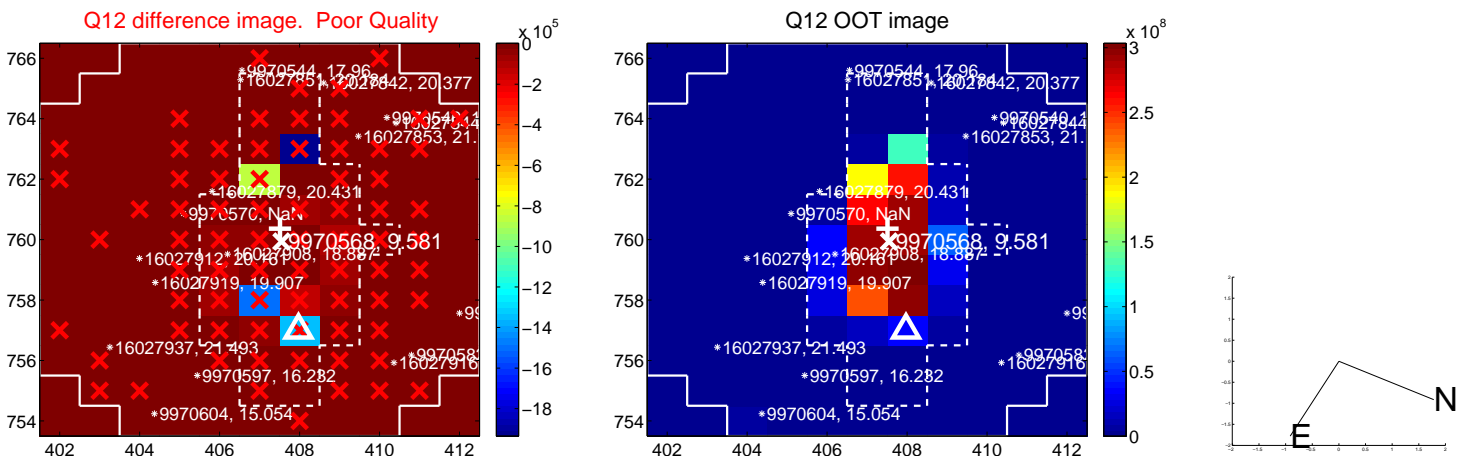
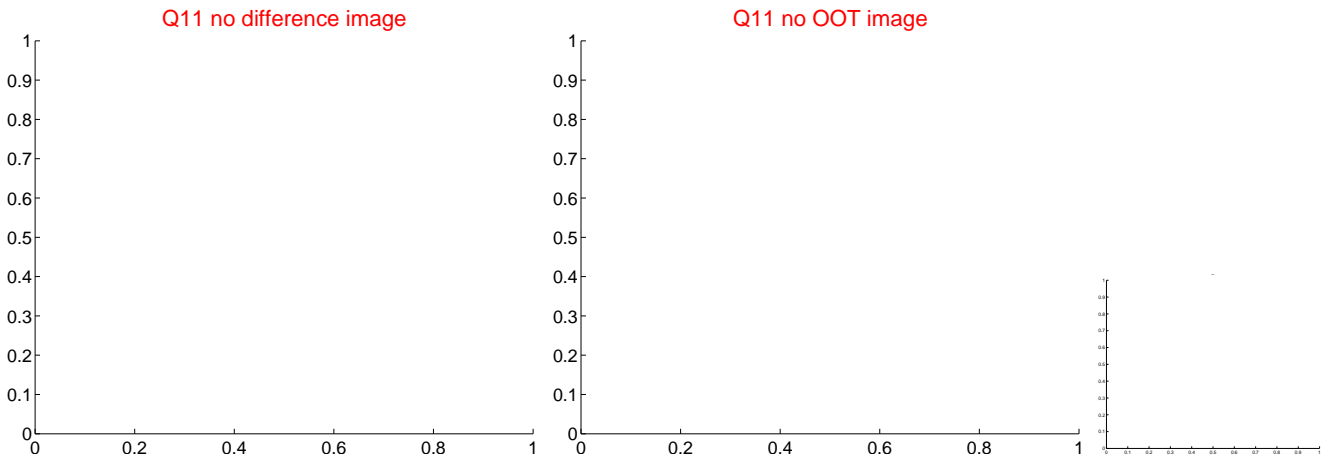
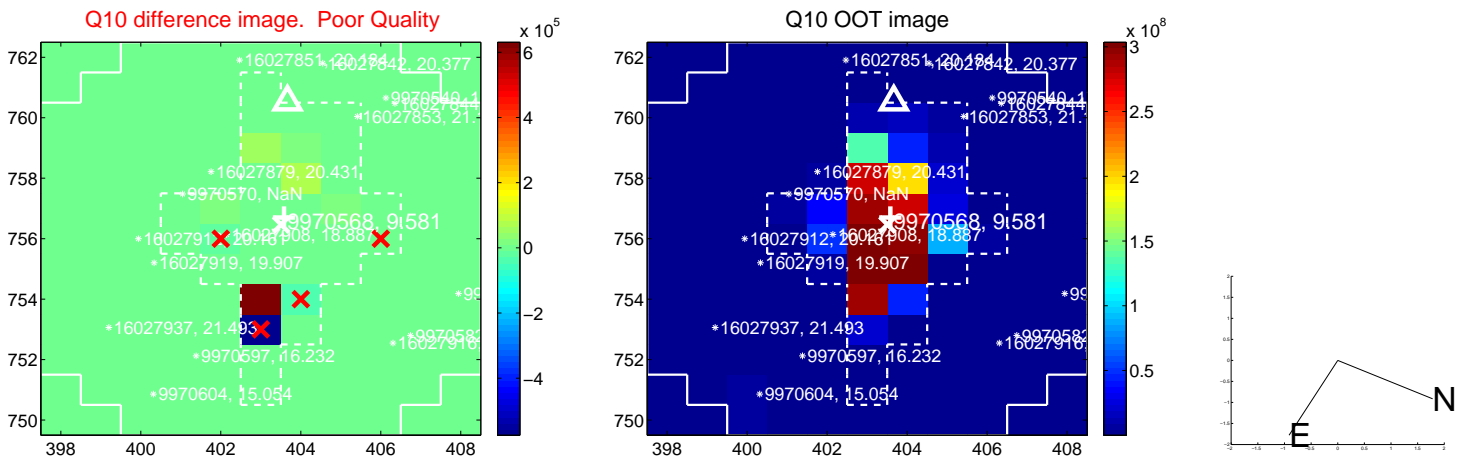
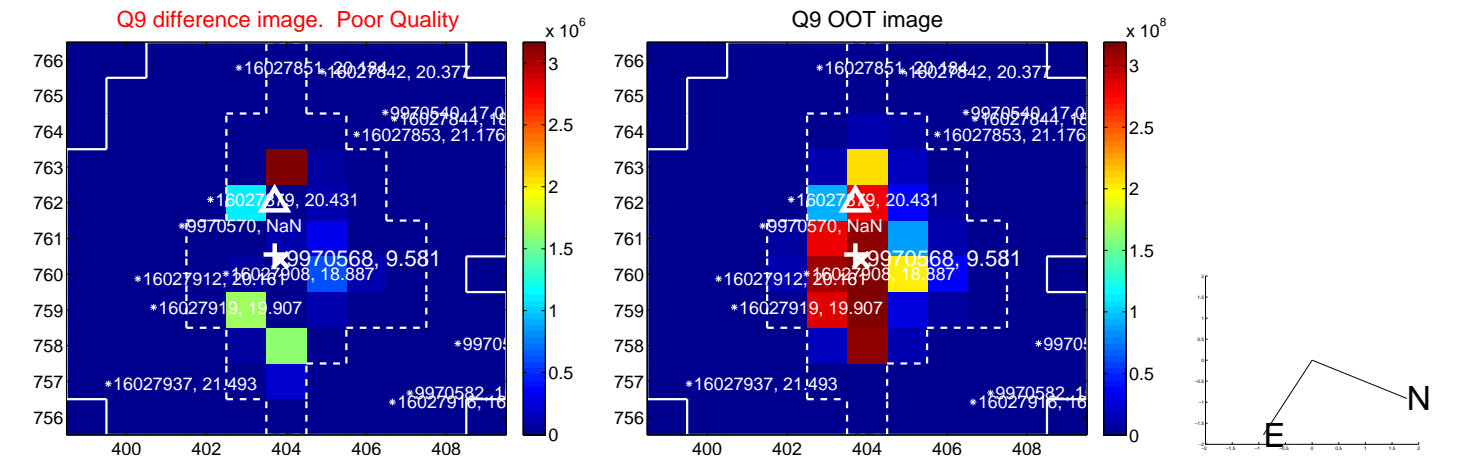


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

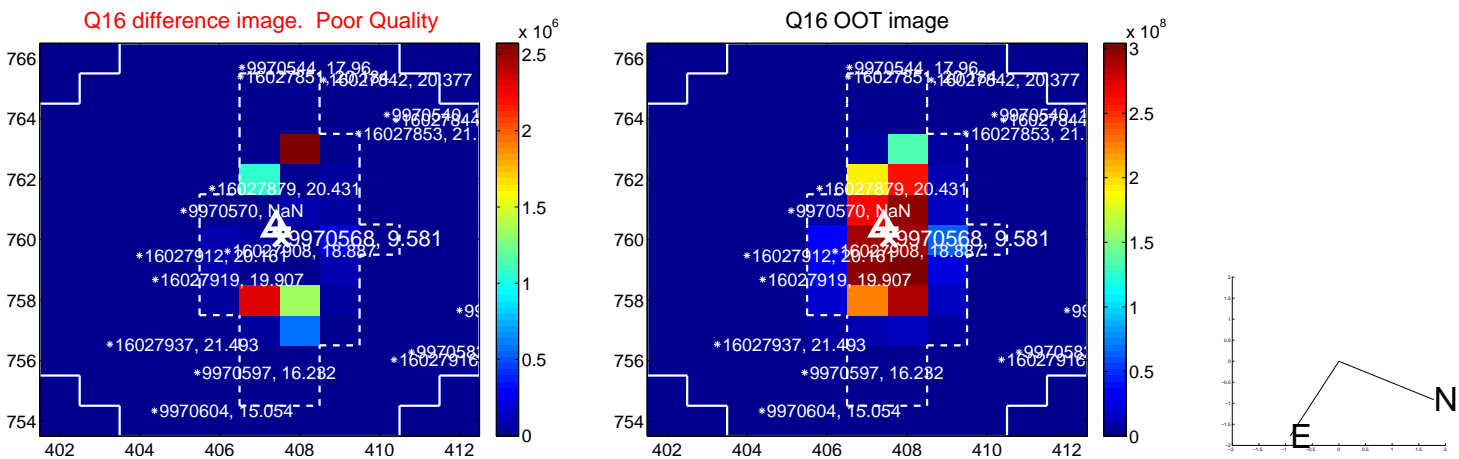
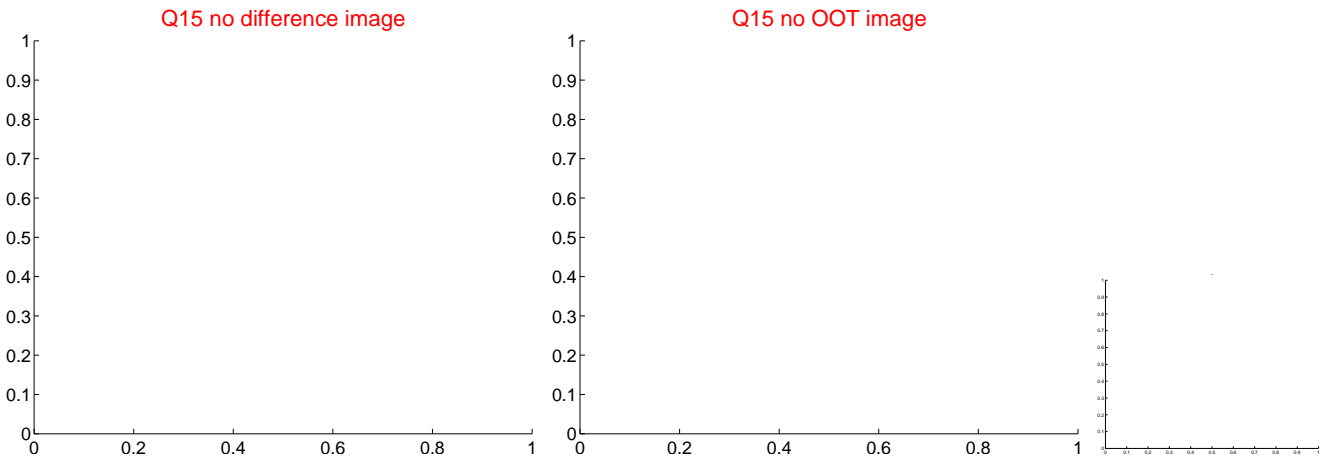
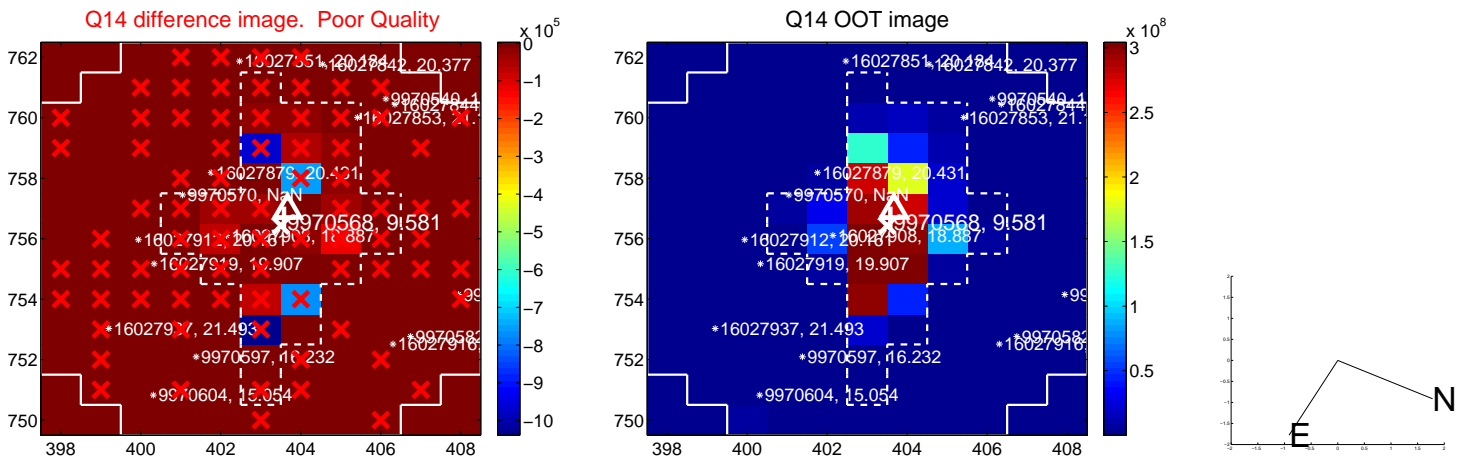
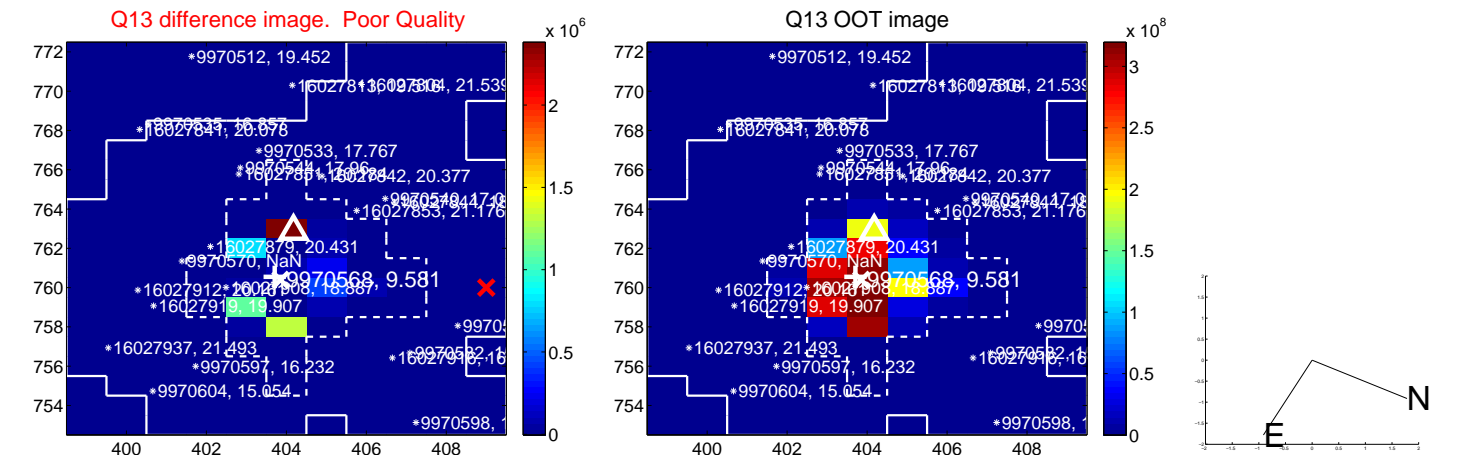
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



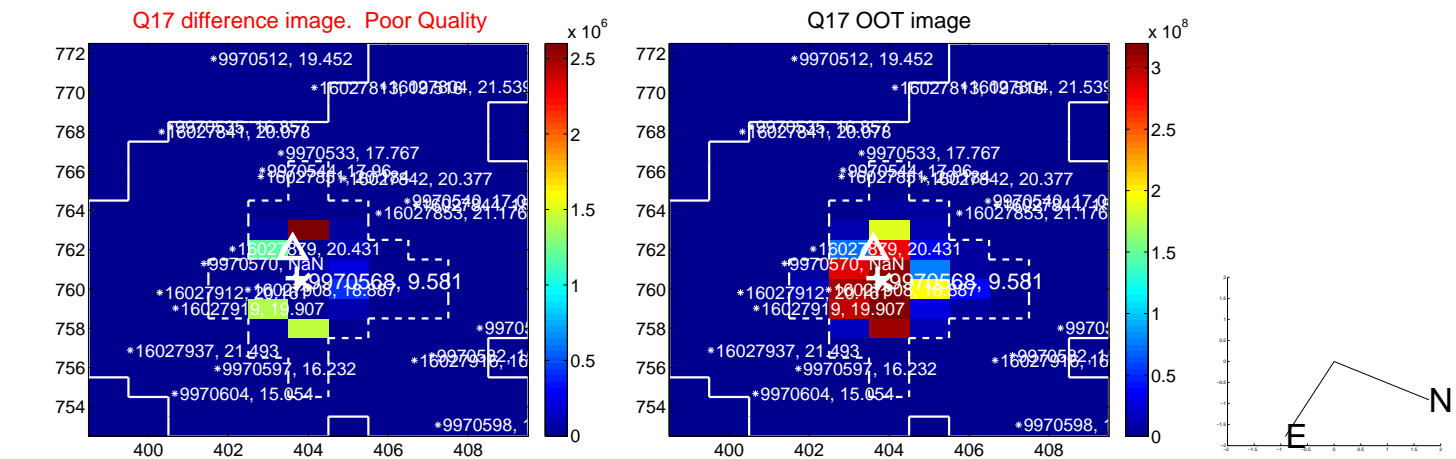
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



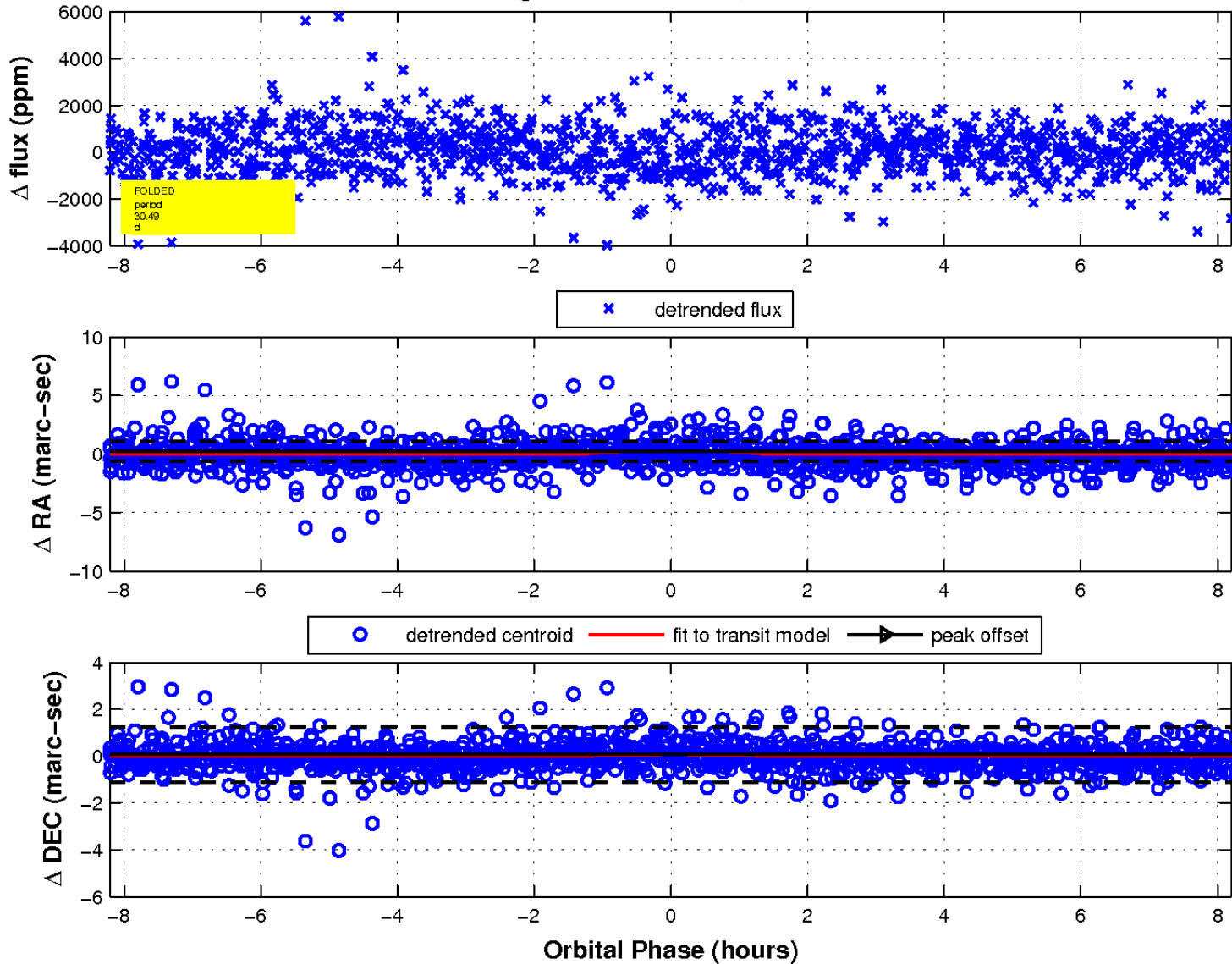
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

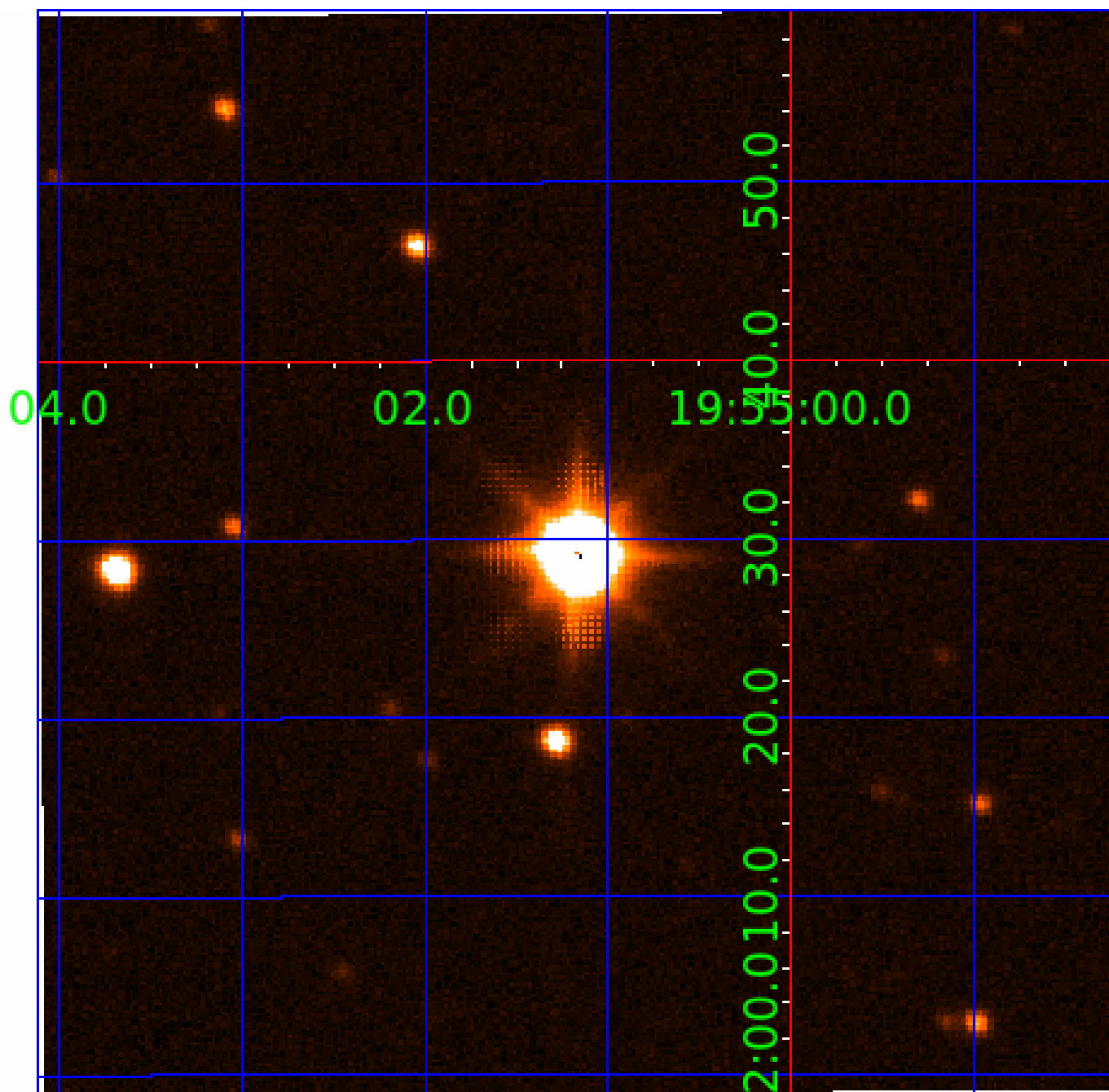


fluxWeightedCentroids, Planet 3 of 9



UKIRT Image

Declination



KIC 009970568

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})
009970568-01	OBS	No	0.761375	131.773155	86.1	4.981	11.6	7.0	3.31	8035	3.13	95374.74
009970568-02	OBS	No	6.849496	134.393510	2076.3	2.075	12.6	9.7	3.31	8035	27.48	5097.45
009970568-03	OBS	No	30.488151	135.191934	1286.3	2.736	10.7	8.8	3.31	8035	13.60	696.18
009970568-04	OBS	No	108.630100	155.707473	2355.6	3.769	10.6	9.9	3.31	8035	29.25	127.93
009970568-05	OBS	No	51.809300	179.787566	2073.0	5.115	10.3	13.0	3.31	8035	15.51	343.31
009970568-06	OBS	No	9.624401	133.642564	889.2	1.961	9.2	9.5	3.31	8035	13.06	3238.92
009970568-07	OBS	No	27.073036	138.845537	965.7	3.769	9.0	8.0	3.31	8035	10.94	815.67
009970568-08	OBS	No	14.115709	139.253007	1679.2	2.645	9.9	11.7	3.31	8035	23.27	1943.69
009970568-09	OBS	No	8.894852	132.463277	42.6	2.000	9.2	-1.0	3.31	8035	2.19	3597.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970568-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

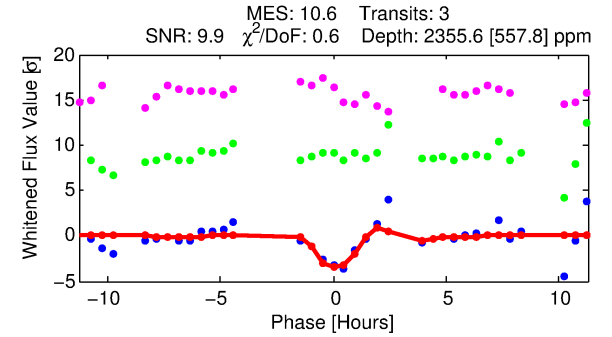
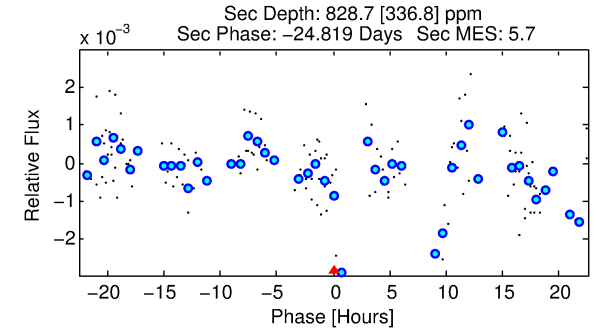
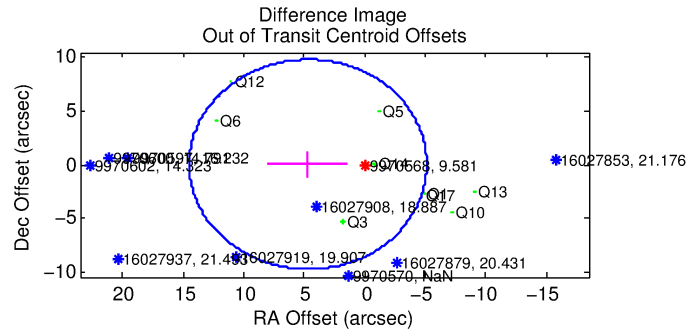
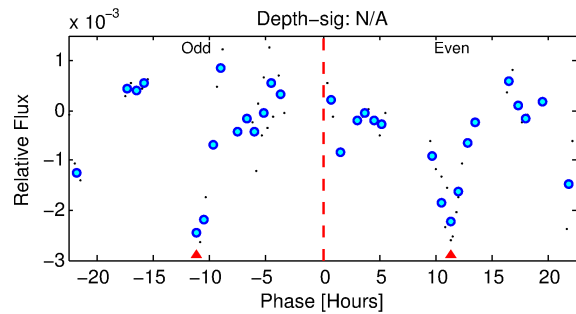
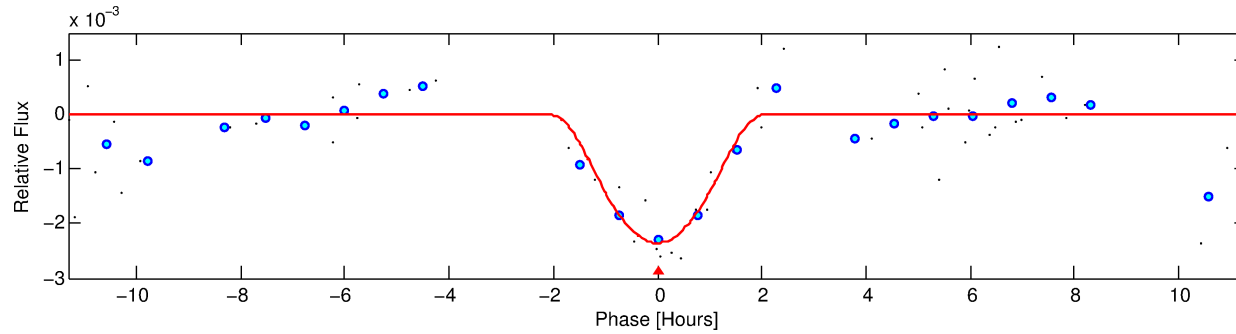
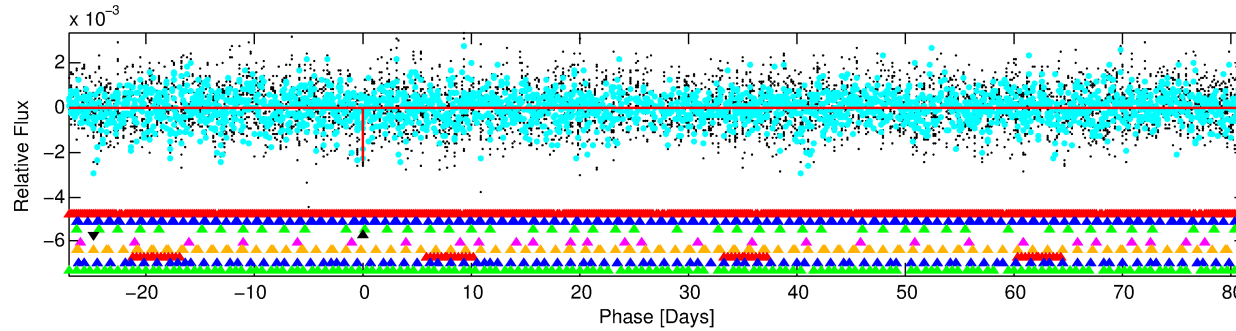
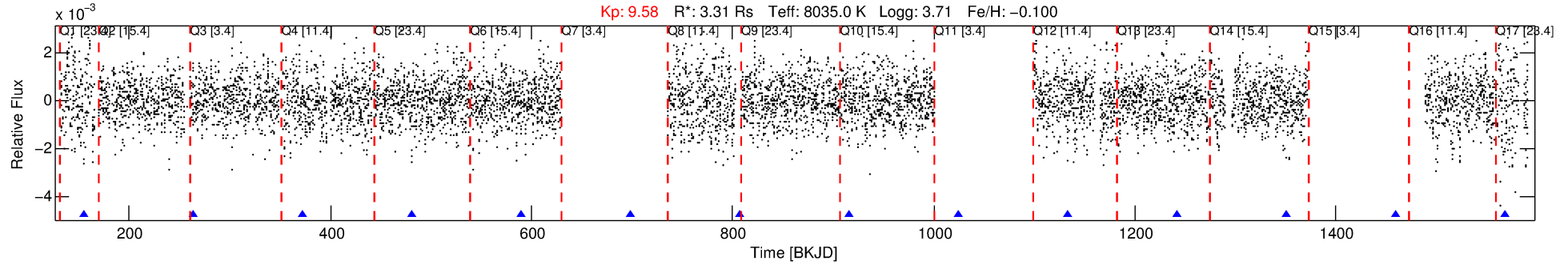
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009970568-04

No Significant Match Found

DV One-Page Summary

KIC: 9970568 Candidate: 4 of 9 Period: 108.630 d



DV Fit Results:

Period = 108.63010 [0.00200] d
Epoch = 155.7075 [0.0104] BKJD
 $R_p/R^* = 0.0809$ [0.2323]
 $a/R^* = 90.66$ [58.90]
 $b = 1.00$ [0.35]
 $\text{Seff} = 127.93$ [96.86]
 $\text{Teq} = 858$ [162] K
 $R_p = 29.25$ [85.12] Re
 $a = 0.5659$ [0.2599] AU
 $\text{Ag} = 170.69$ [990.56] [0.17σ]
 $\text{Teffp} = 4792$ [6900] K [0.57σ]

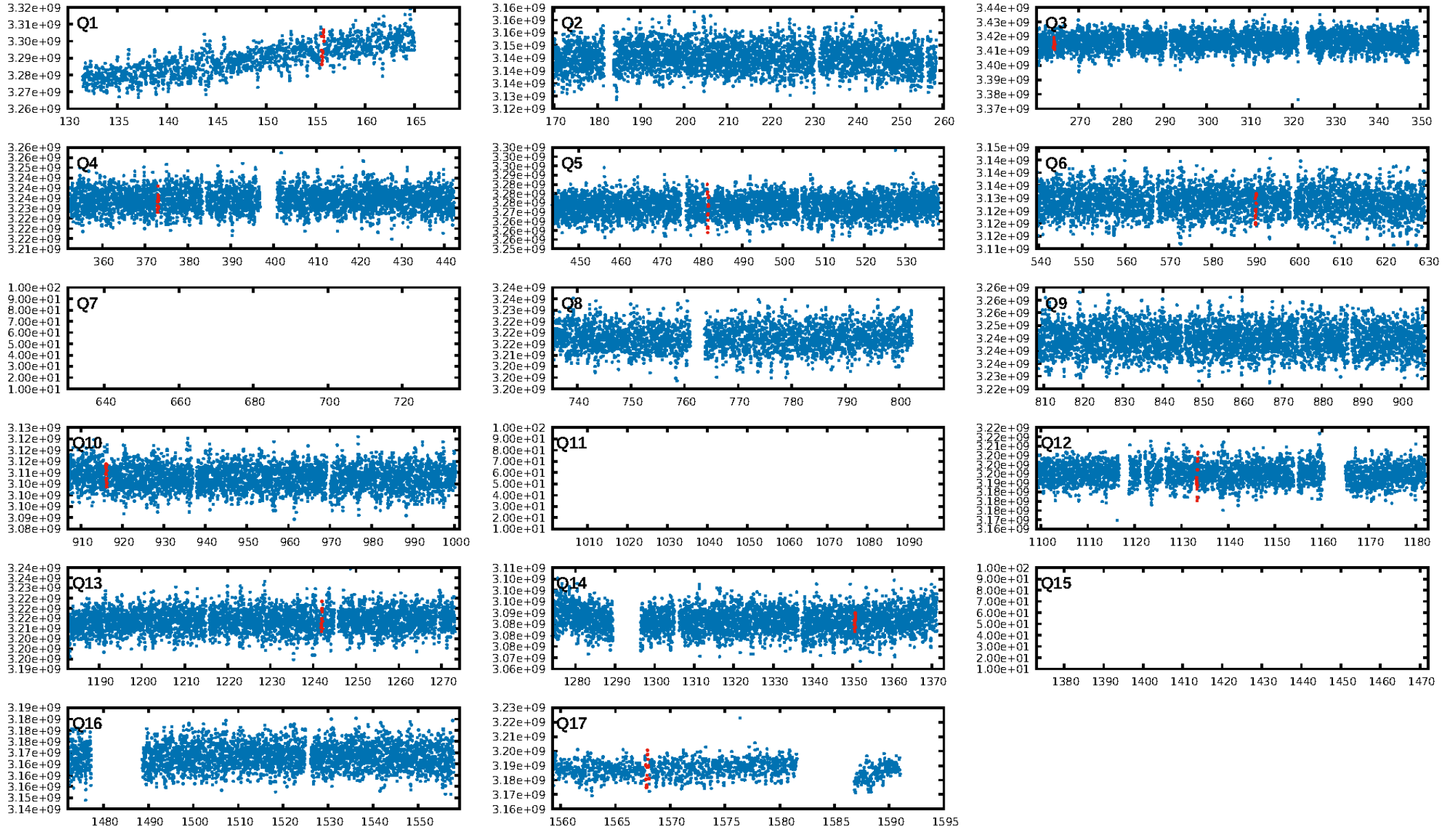
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [214.63σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 54.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: N/A
Centroid-sig: 2.4%
Centroid-so: 0.388 arcsec [1.87σ]
OotOffset-rm: 4.689 arcsec [1.44σ]
OotOffset-st: 3/1/1/4 [9]
KicOffset-rm: 4.059 arcsec [1.33σ]
KicOffset-st: 3/1/1/4 [9]
DiffImageQuality-fgm: 0.00 [0/9]
DiffImageOverlap-fno: 0.00 [0/9]

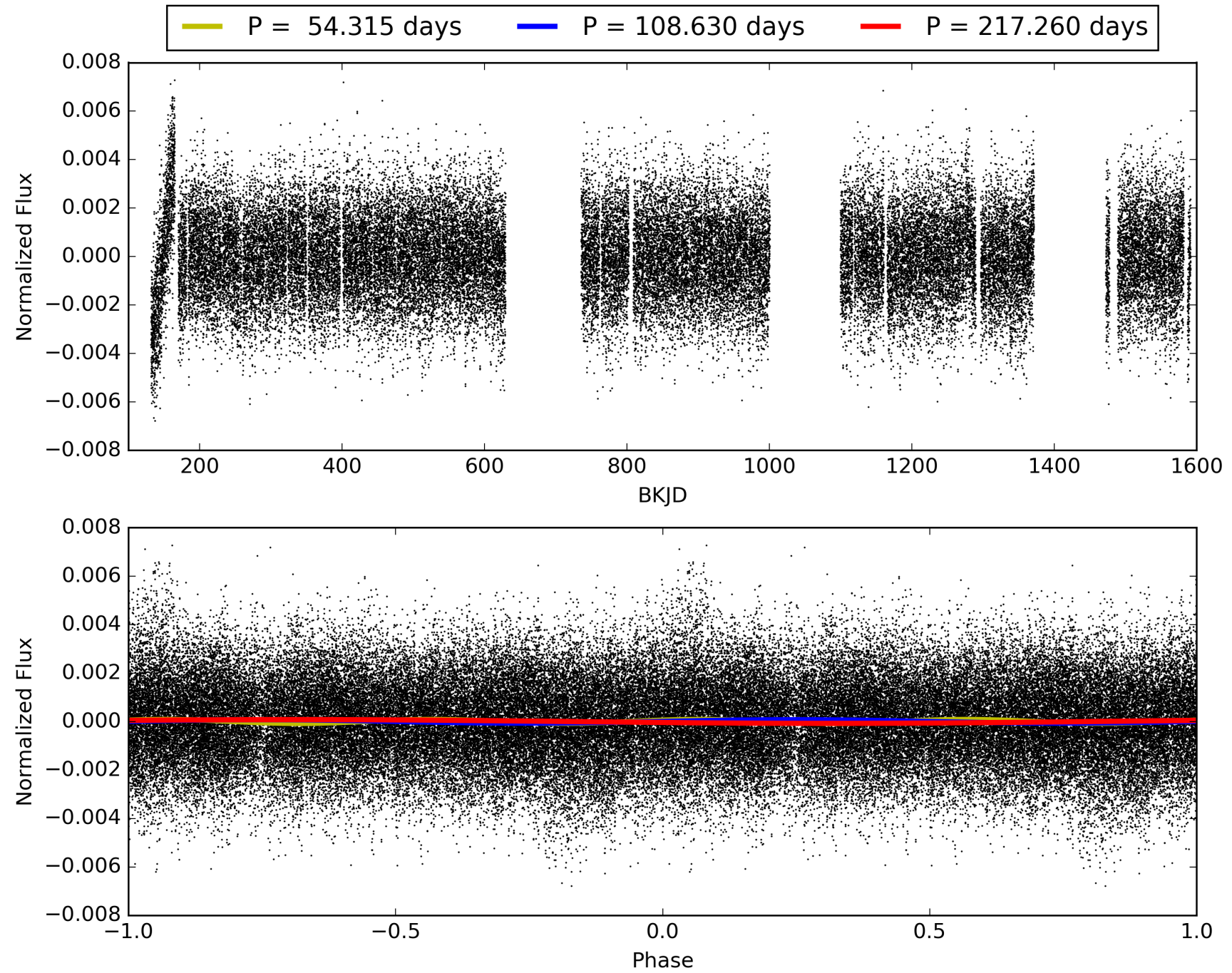
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:32 Z

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

TCE 009970568-04, PDC Light Curves

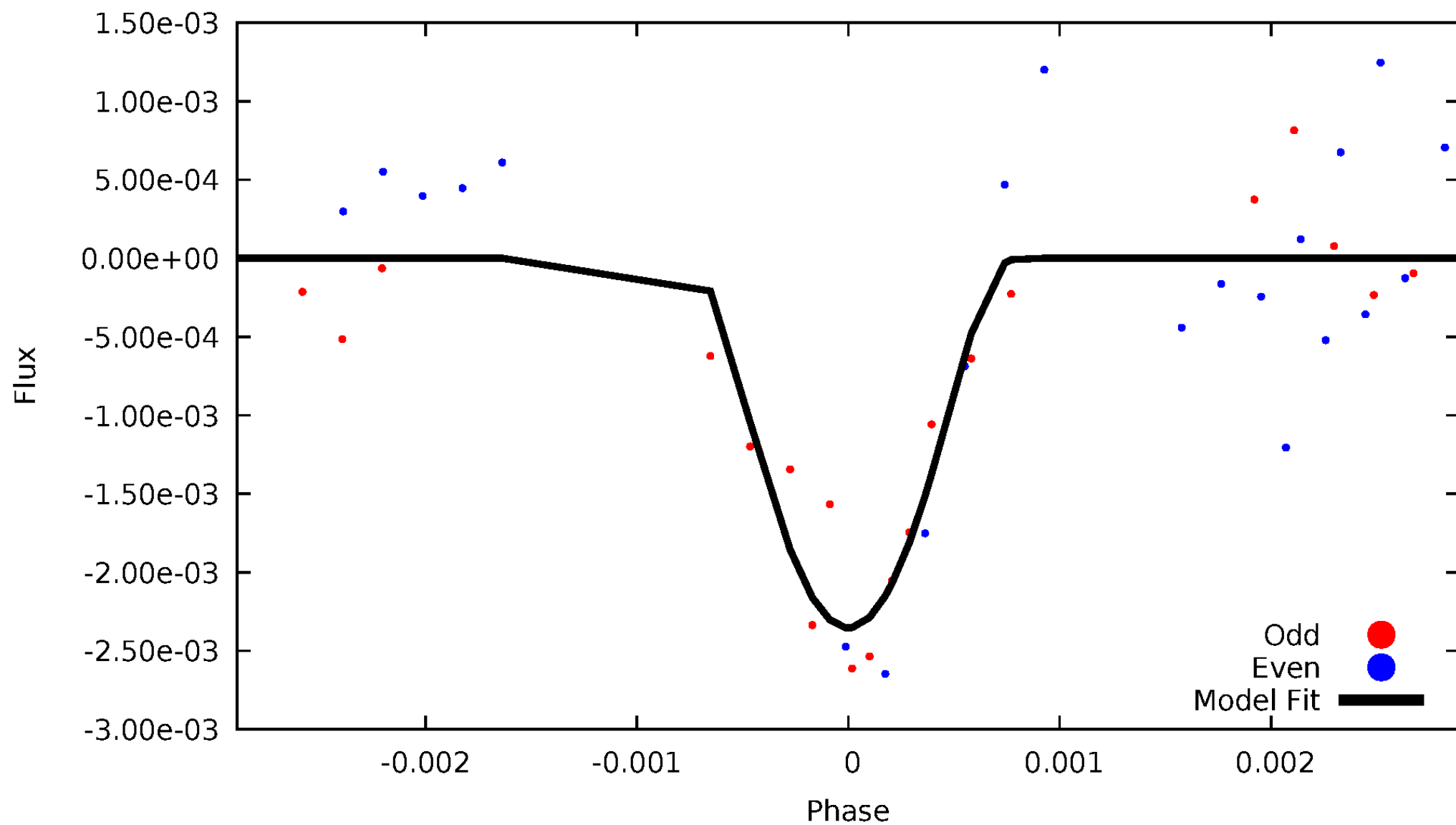


TCE 009970568-04



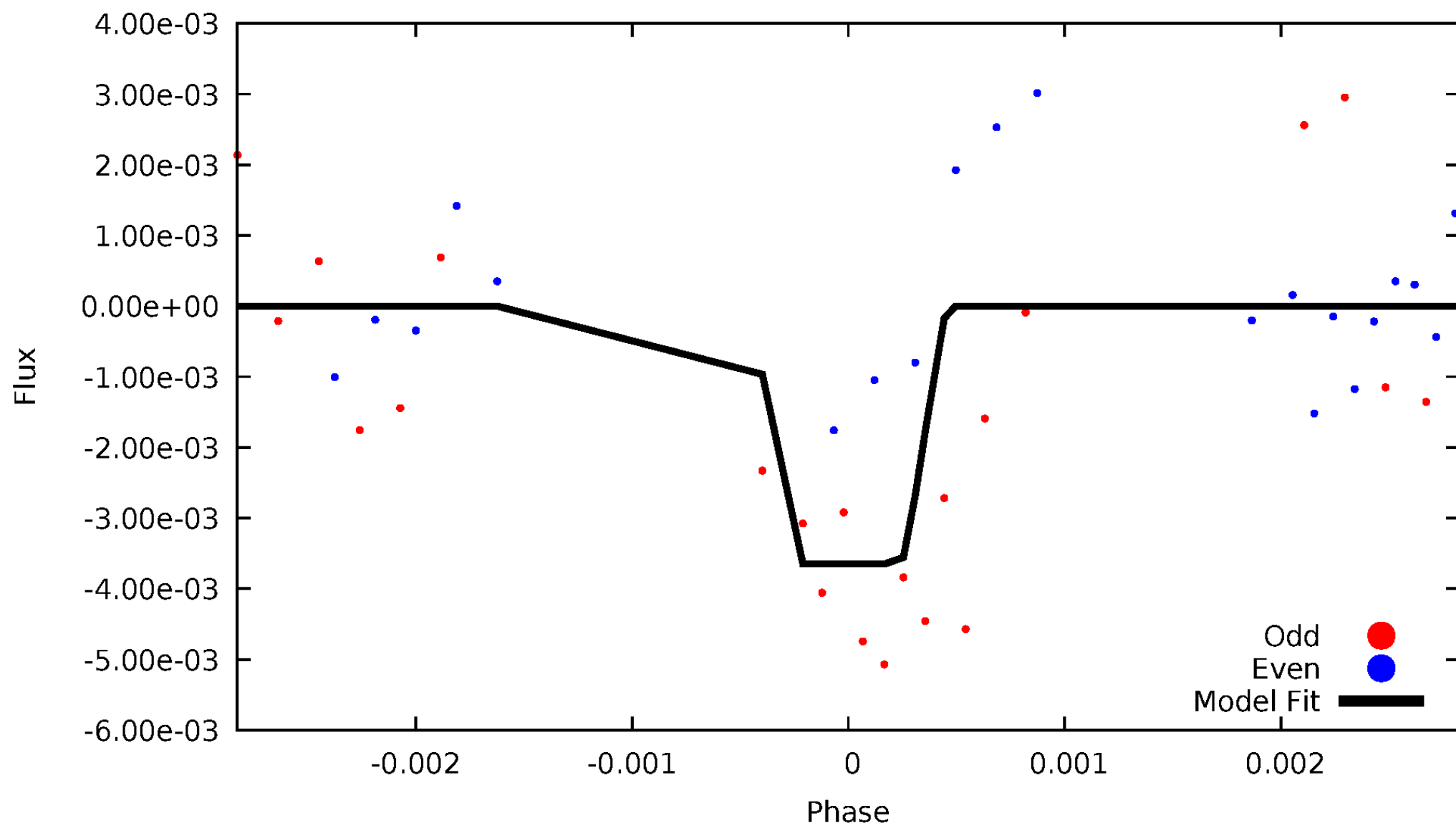
DV Odd/Even

TCE 009970568-04



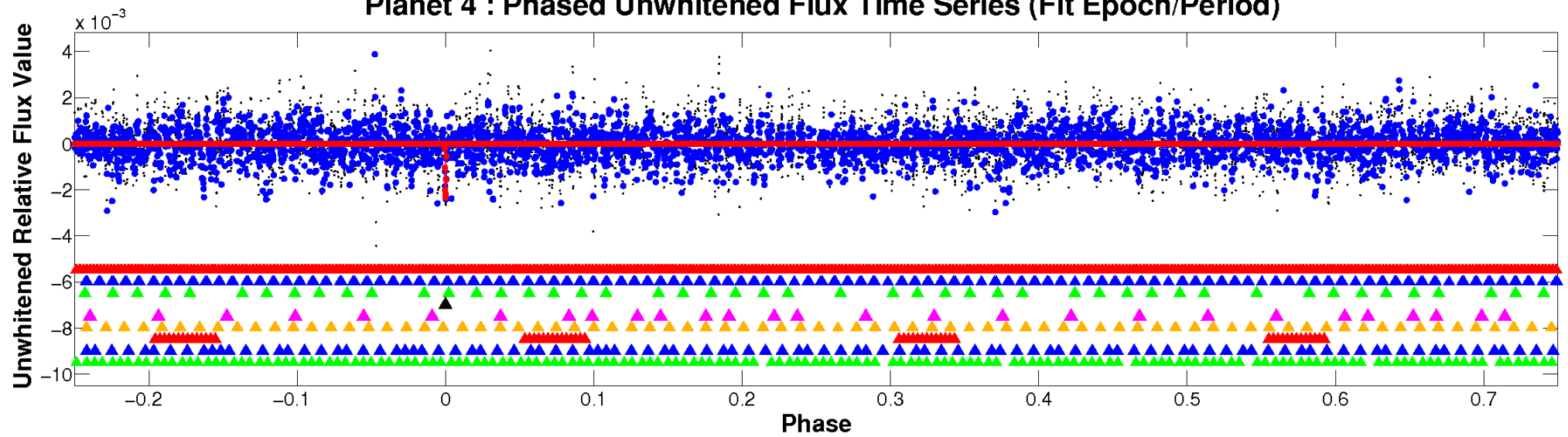
ALT Odd/Even

TCE 009970568-04

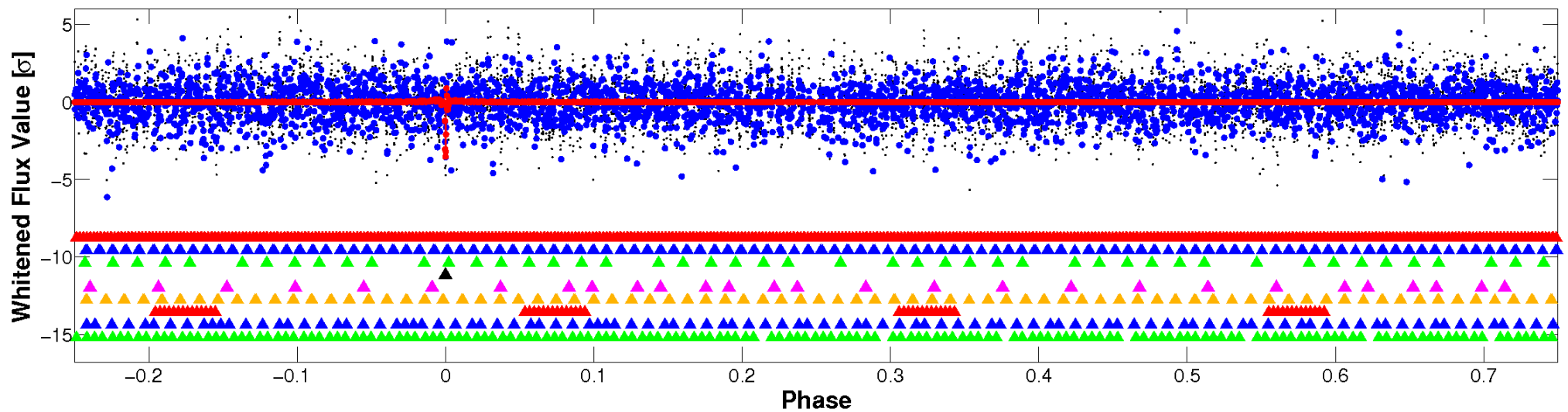


Non-Whitened Vs. Whitened Light Curve

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

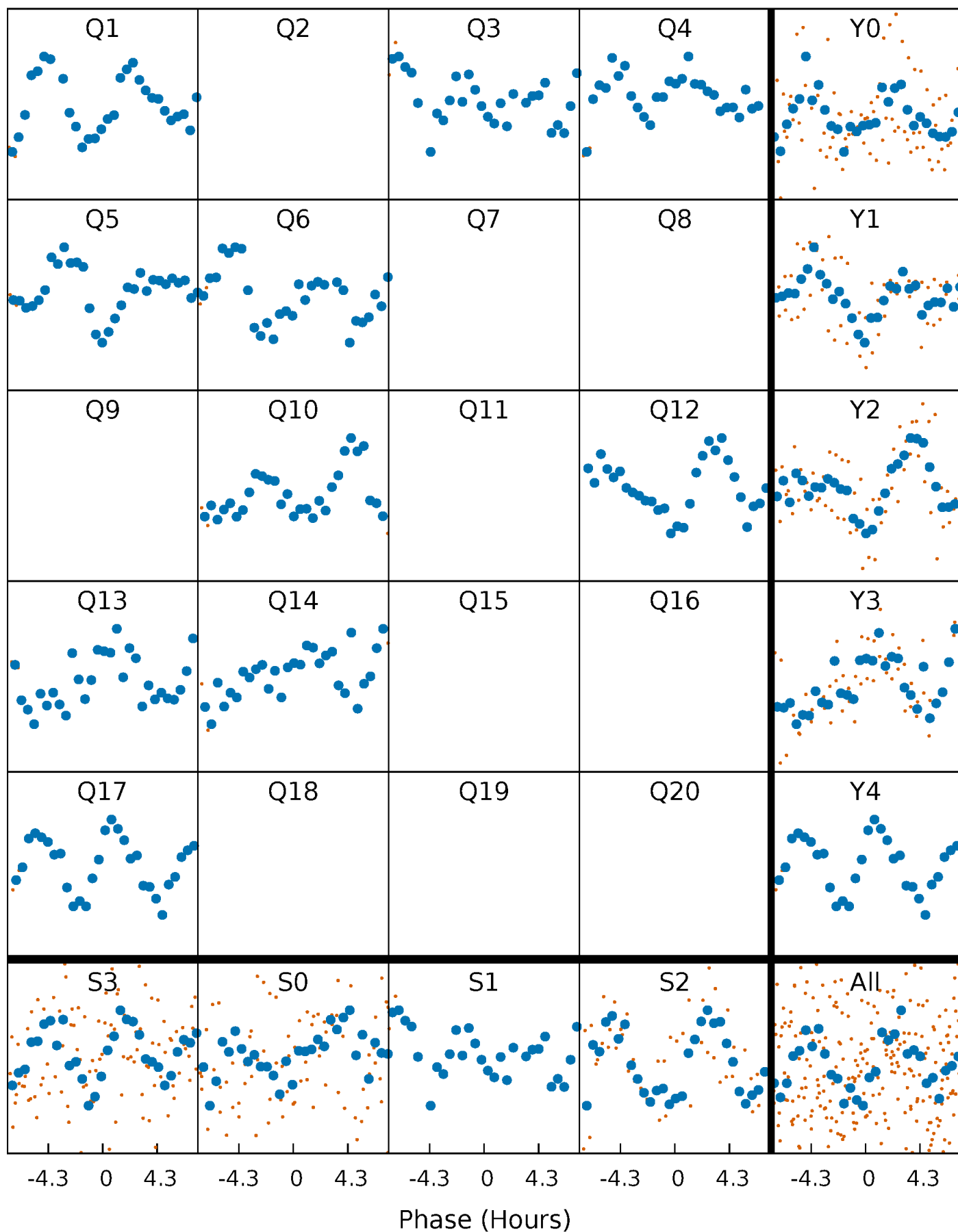


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



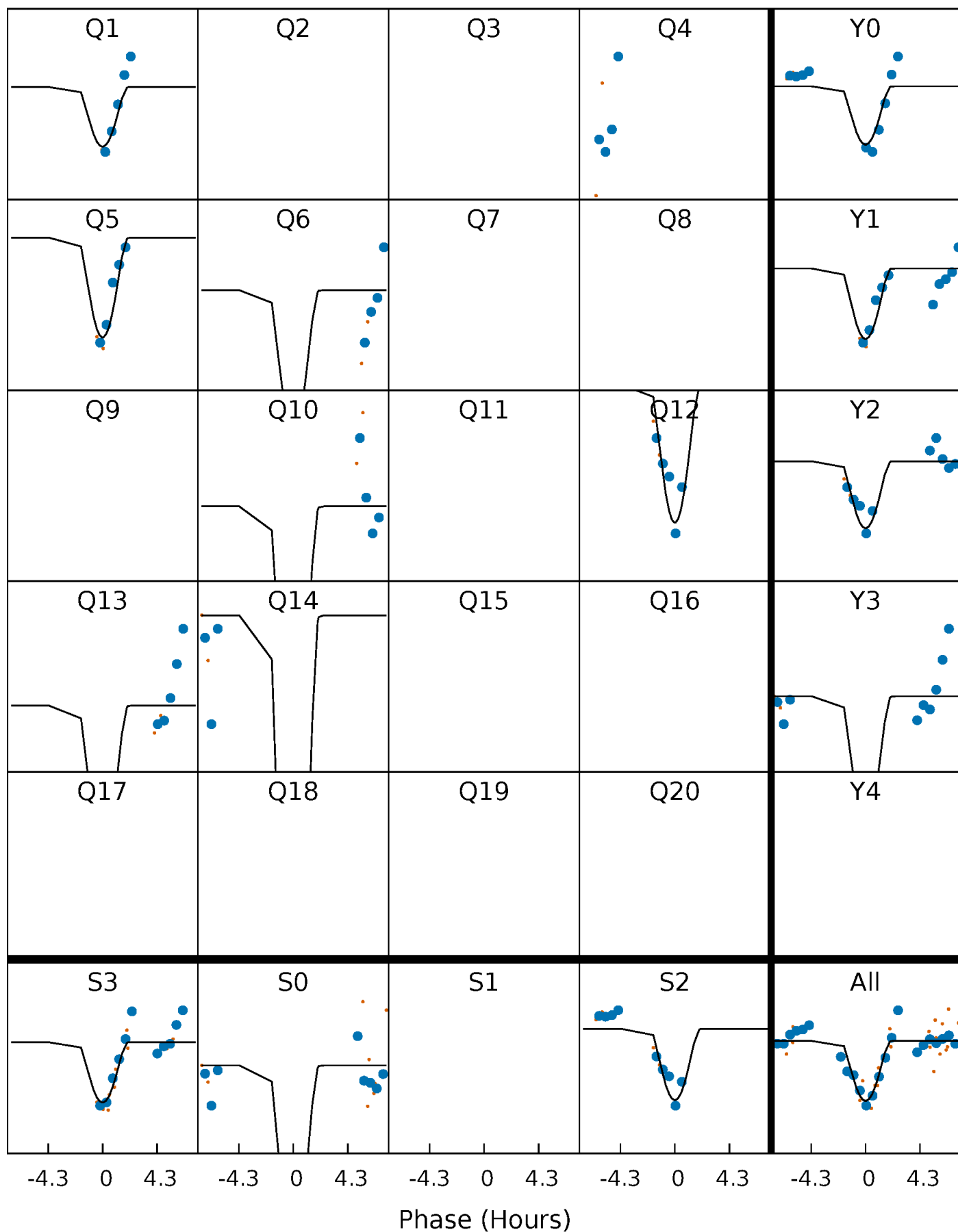
PDC Quarter-Phased Transit Curves

TCE 009970568-04 P=108.630100 Days $T_0=155.707473$ (BKJD)



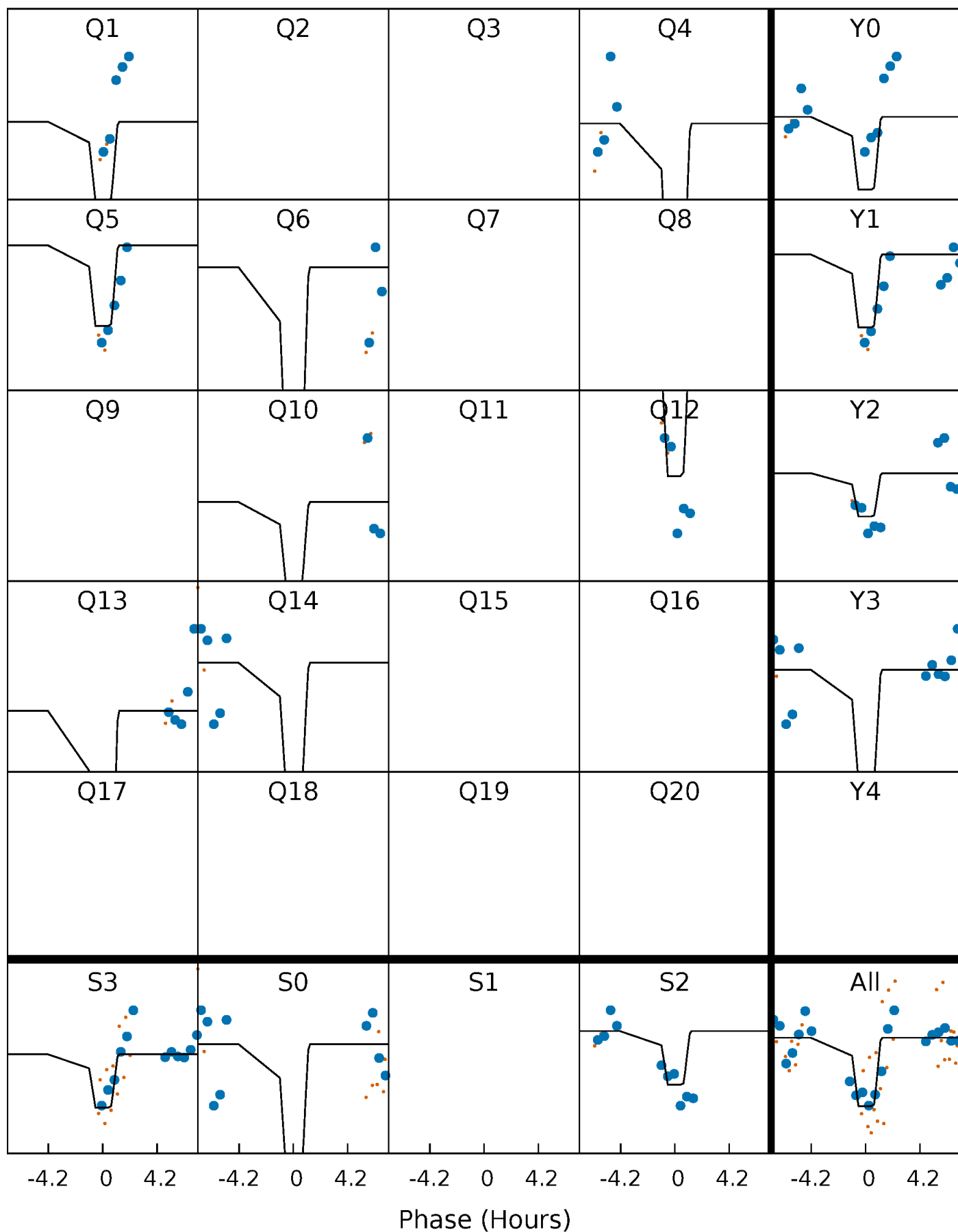
DV Quarter-Phased Transit Curves

TCE 009970568-04 P=108.630100 Days $T_0=155.707473$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

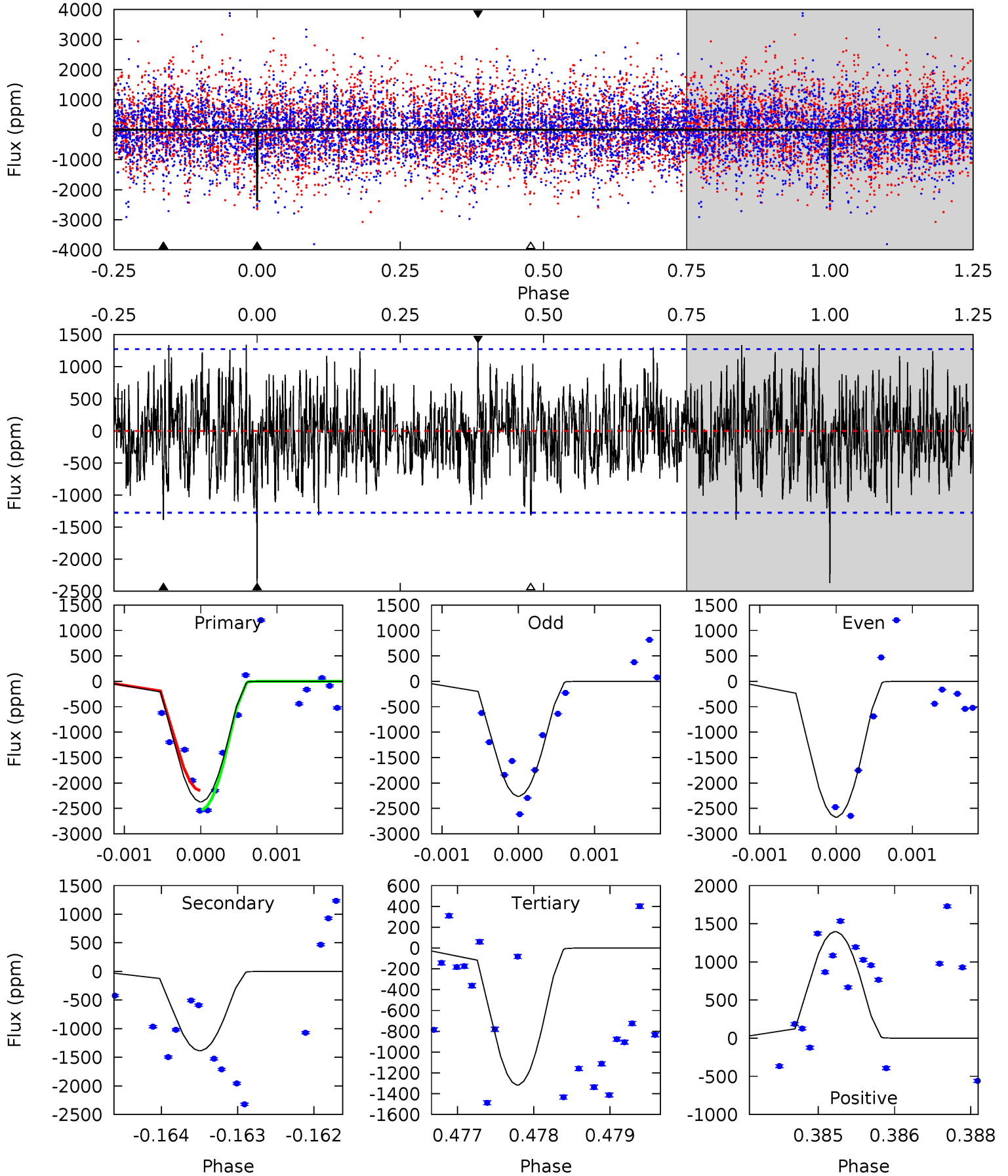
TCE 009970568-04 P=108.626372 Days $T_0=155.713366$ (BKJD)



DV Model-Shift Uniqueness Test

009970568-04, P = 108.630100 Days, E = 47.077373 Days

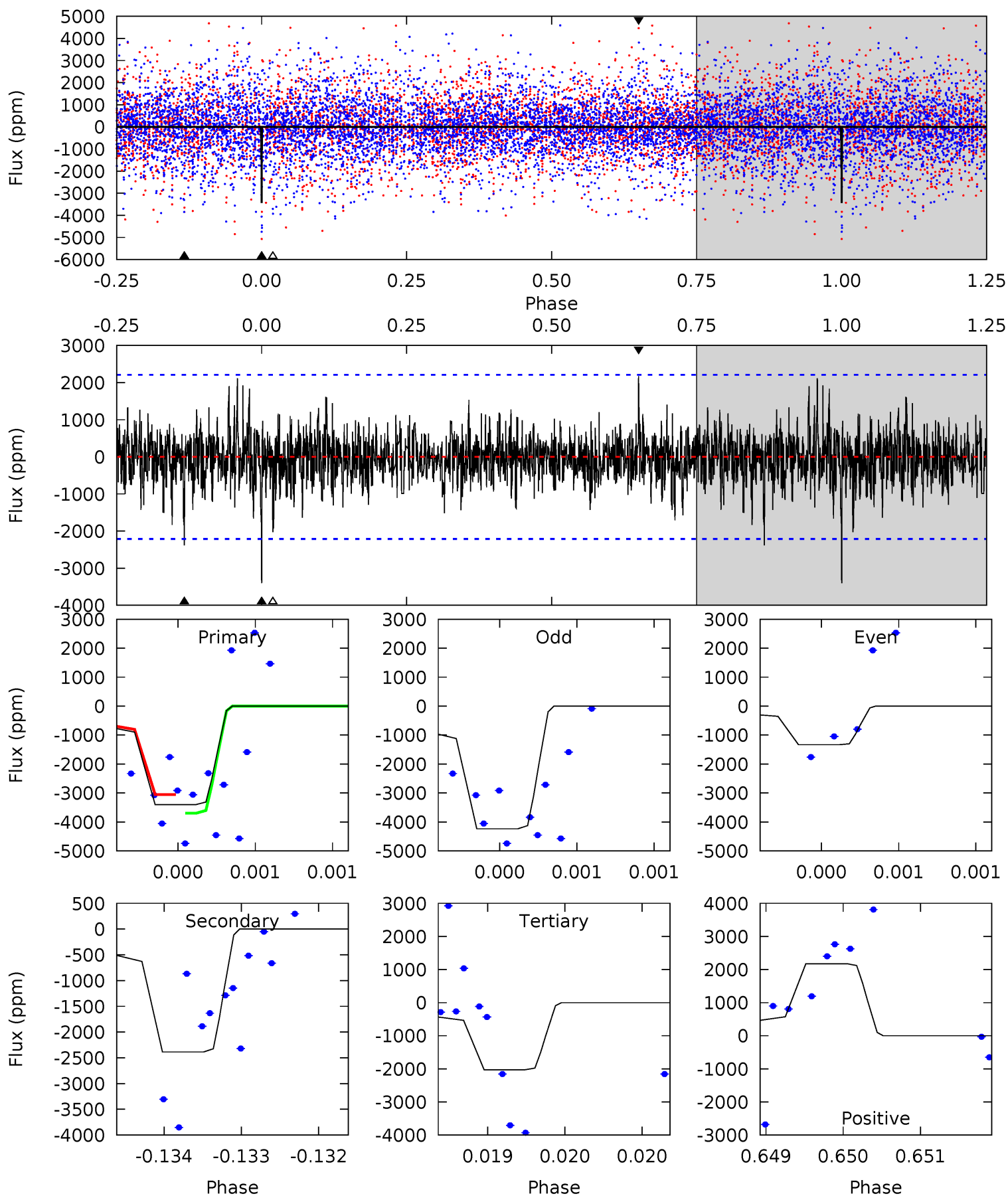
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	5.89	5.60	5.93	5.41	3.23	1.90	4.48	4.15	0.29	-0.05	0.84	0.99	0.37	0.73



Alt Model-Shift Uniqueness Test

009970568-04, P = 108.626372 Days, E = 47.086994 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.48	5.95	5.06	5.43	5.51	3.39	1.24	3.42	3.05	0.90	0.53	3.39	0.78	0.39	0.74



Stellar Parameters For KIC 009970568

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8035^{+223}_{-362}	$3.709^{+0.432}_{-0.108}$	$-0.100^{+0.200}_{-0.350}$	$3.312^{+0.789}_{-1.579}$	$2.046^{+0.372}_{-0.538}$	$0.079^{+0.307}_{-0.028}$
	+3%/-5%	+12%/-3%	+200%/-350%	+24%/-48%	+18%/-26%	+388%/-35%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009970568-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1386 ± 235	$64.16^{+68.82}_{-42.16}$	1159^{+96}_{-139}	3735^{+2111}_{-682}	59^{+452}_{-45}
Alt.	-2386 ± 401	$57.71^{+67.05}_{-40.08}$	1161^{+93}_{-148}	4327^{+2944}_{-989}	122^{+1097}_{-95}

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 $A_{obs} \gg 1.0$

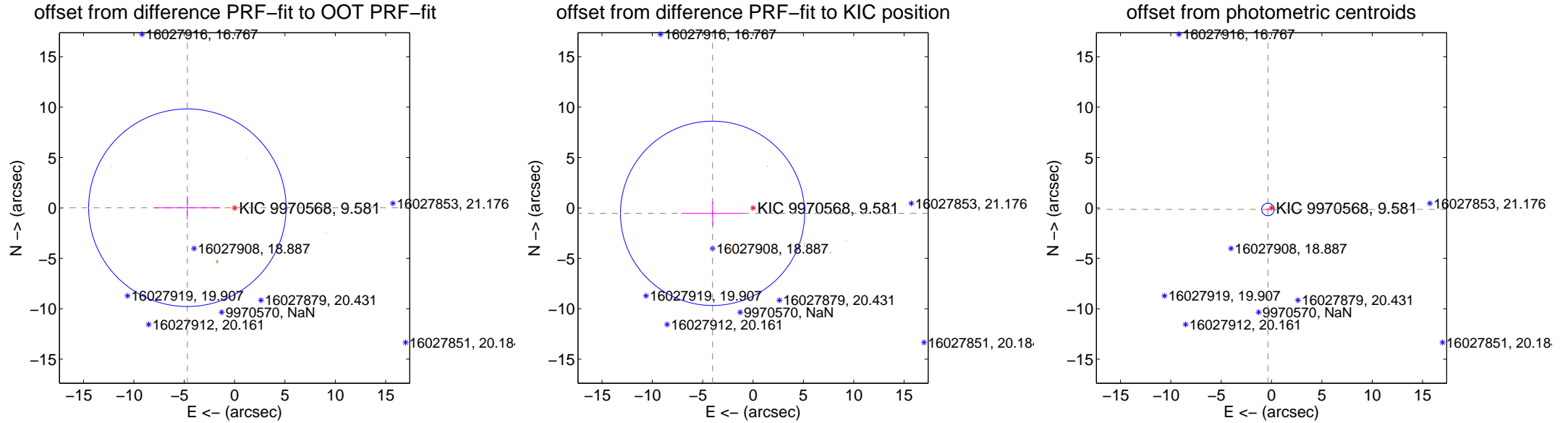
DV Centroid Data

Supplemental centroid analysis for 009970568-04. **Kepler magnitude: 9.58.** Transit SNR 9.87

There are 0 quarters with good PRF difference image offsets

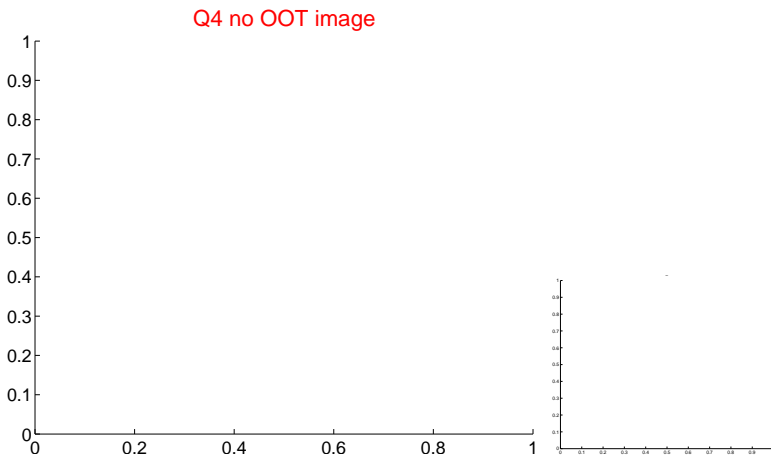
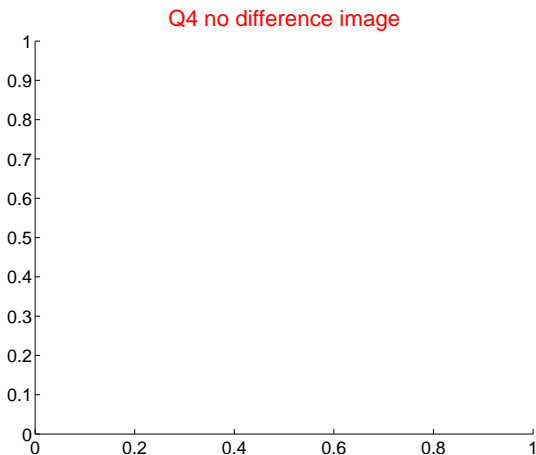
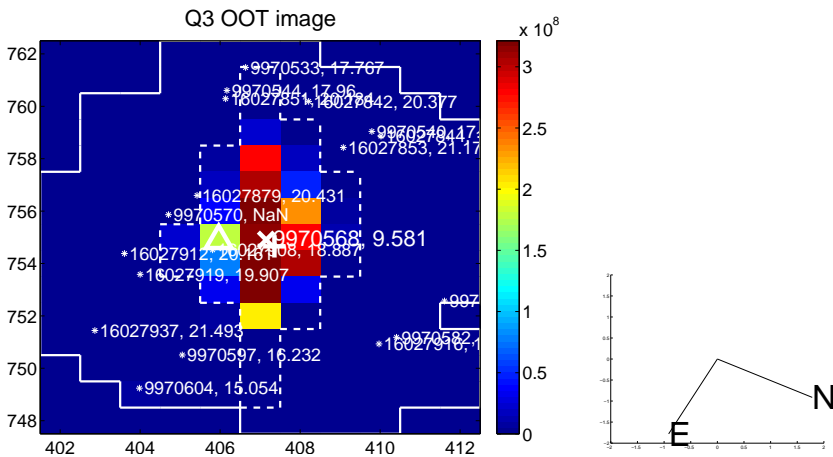
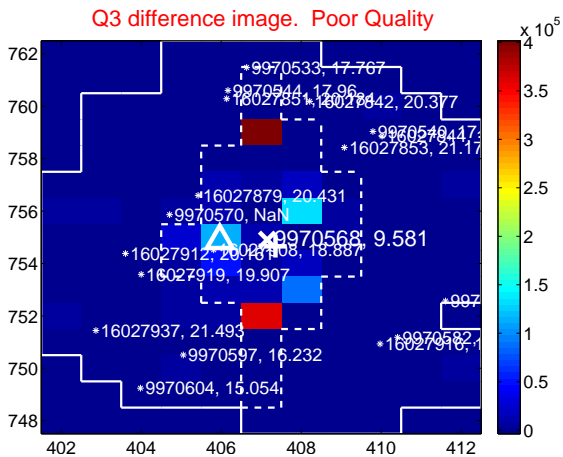
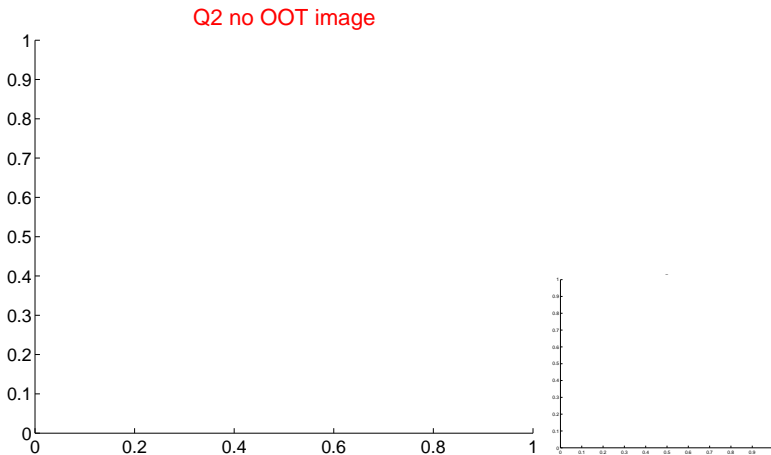
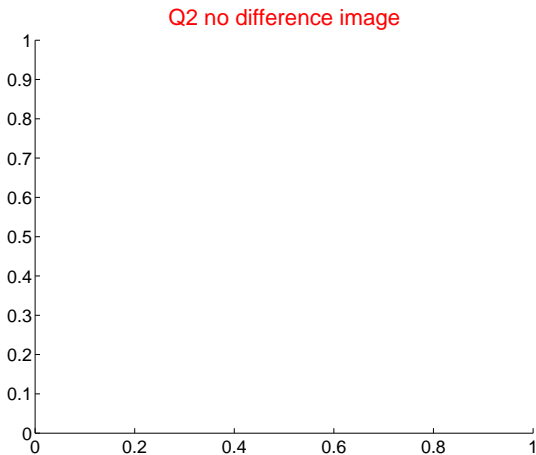
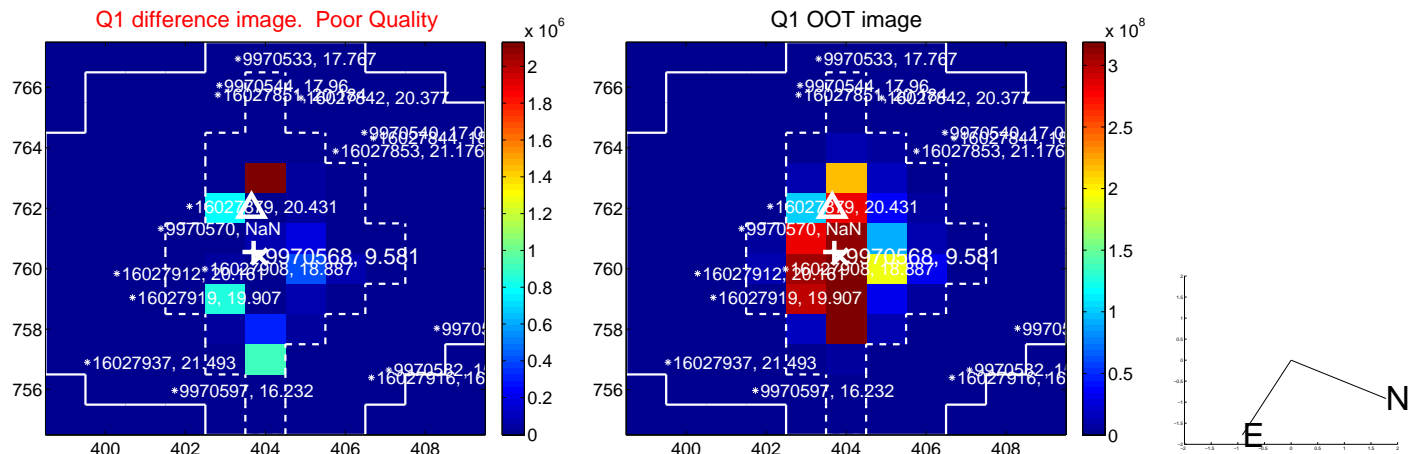
The direct PRF centroid is offset from the target star catalog position by about 0.90 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.689 ± 3.267	1.44	4.689 ± 3.268	0.022 ± 1.176
PRF-fit source offset from KIC position	4.059 ± 3.047	1.33	4.023 ± 3.070	-0.533 ± 1.194
photometric centroid source offset	0.39 ± 0.21	1.87	0.36 ± 0.22	-0.15 ± 0.10

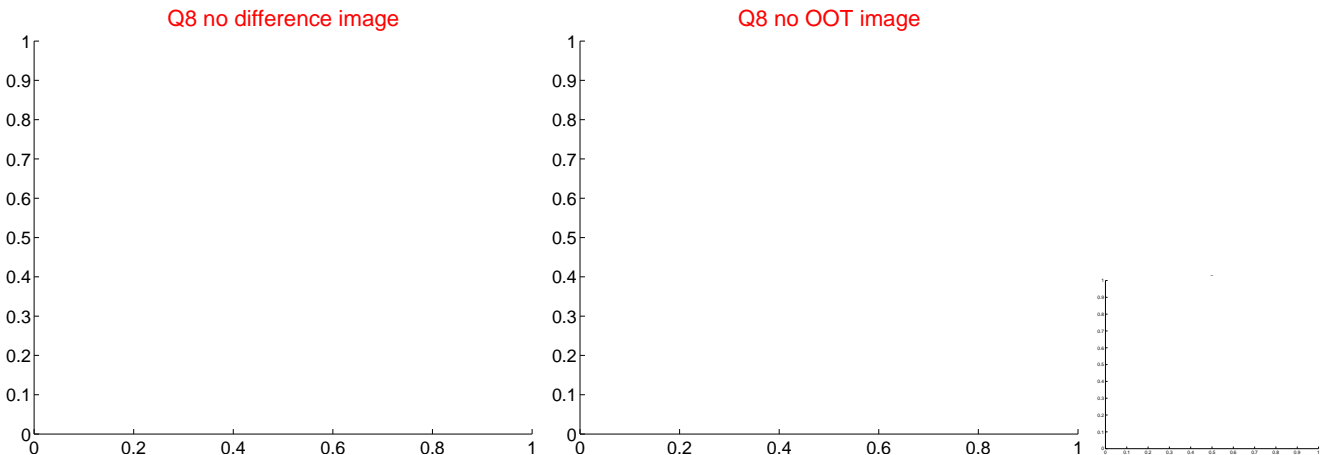
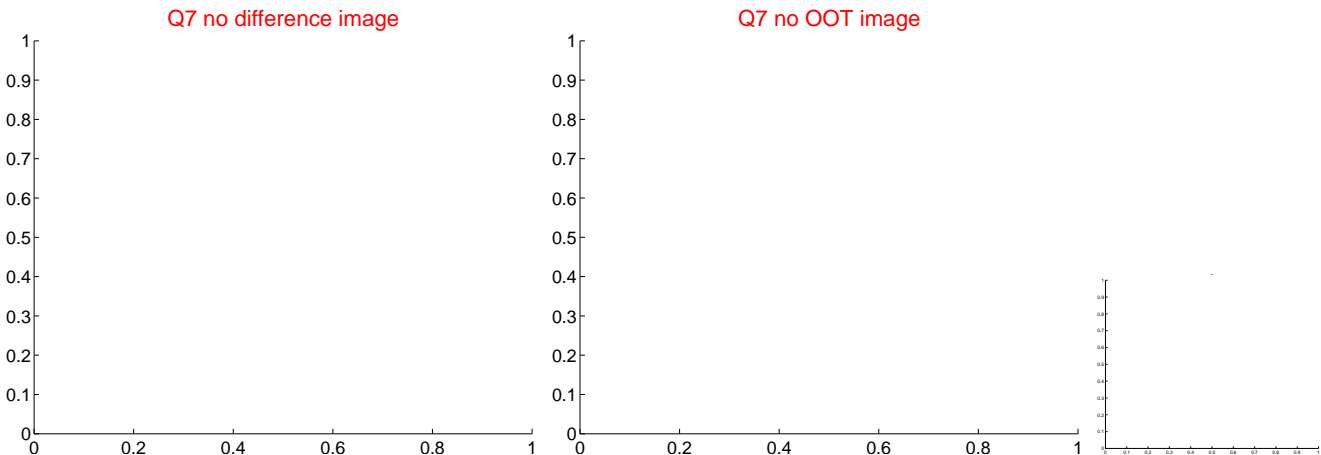
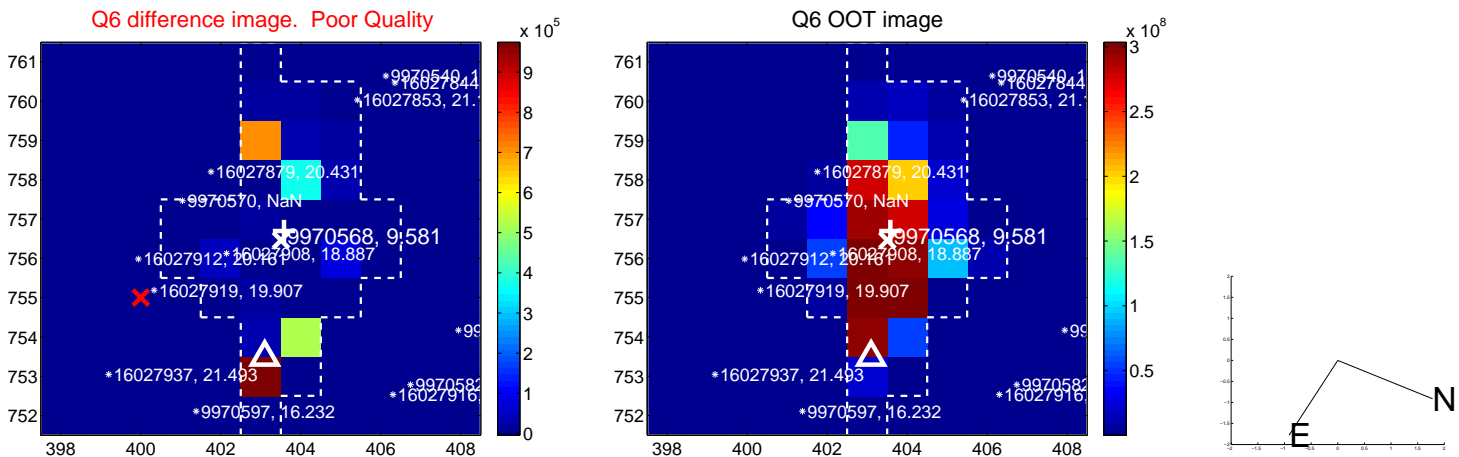
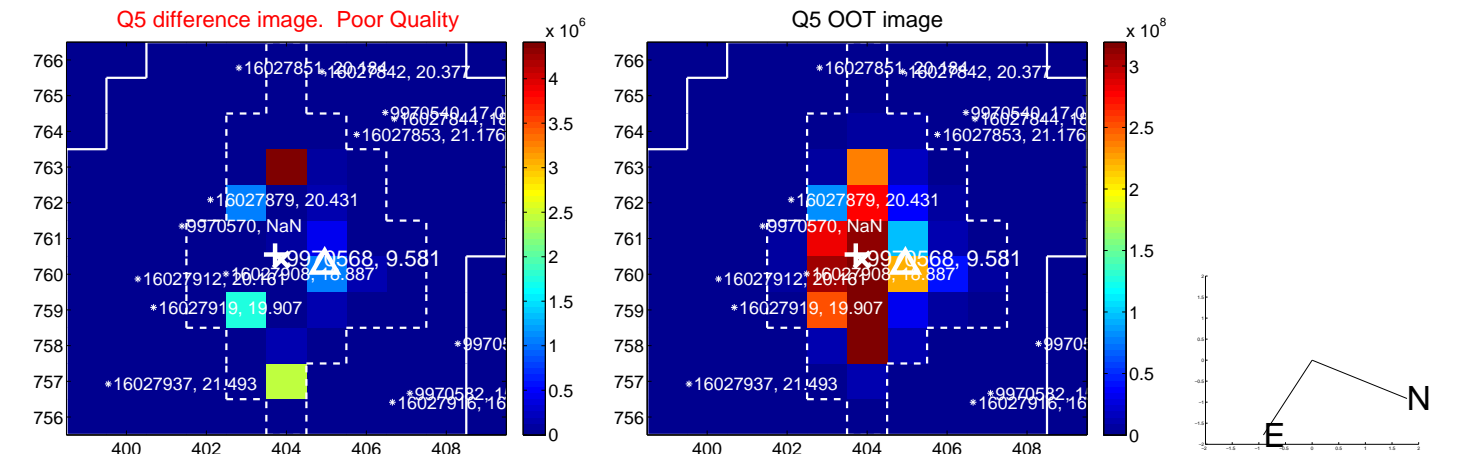


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

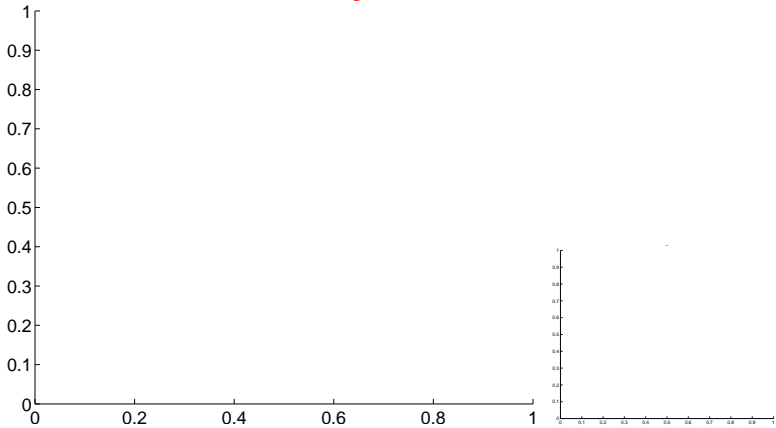


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

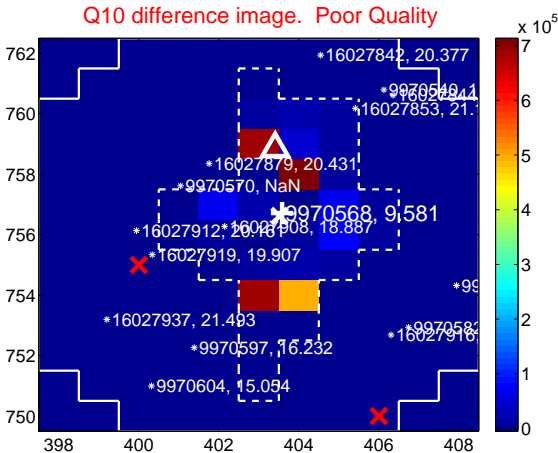
Q9 no difference image



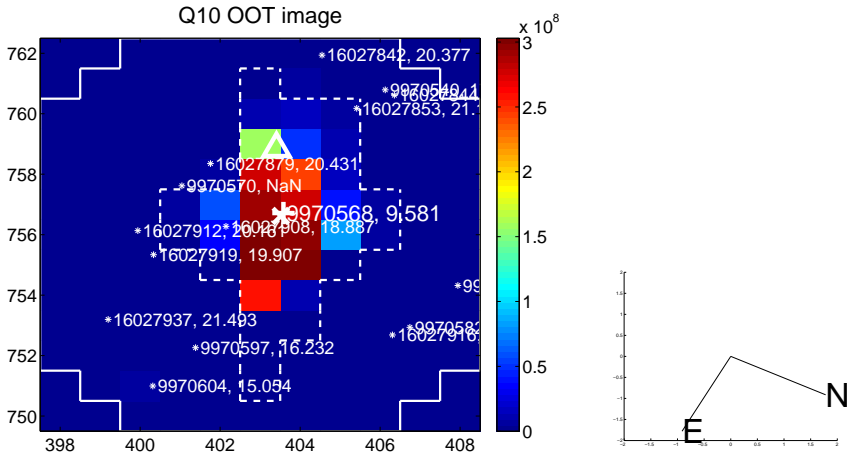
Q9 no OOT image



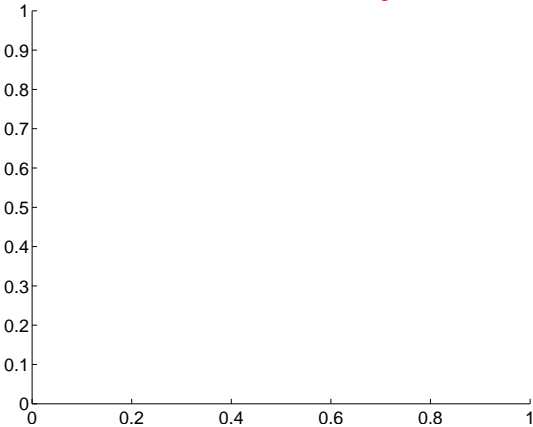
Q10 difference image. Poor Quality



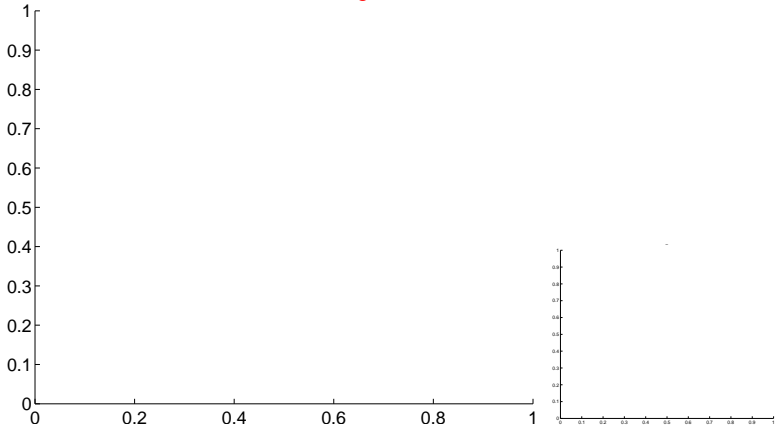
Q10 OOT image



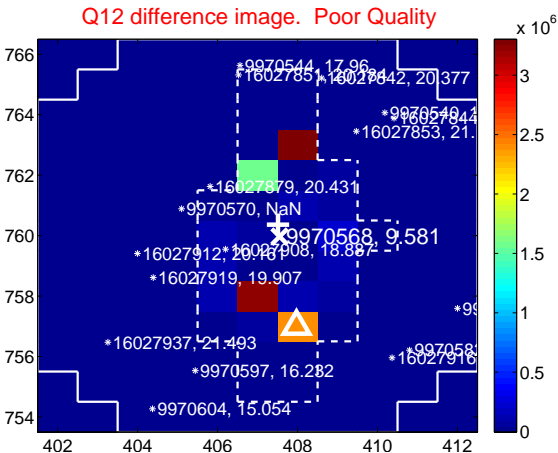
Q11 no difference image



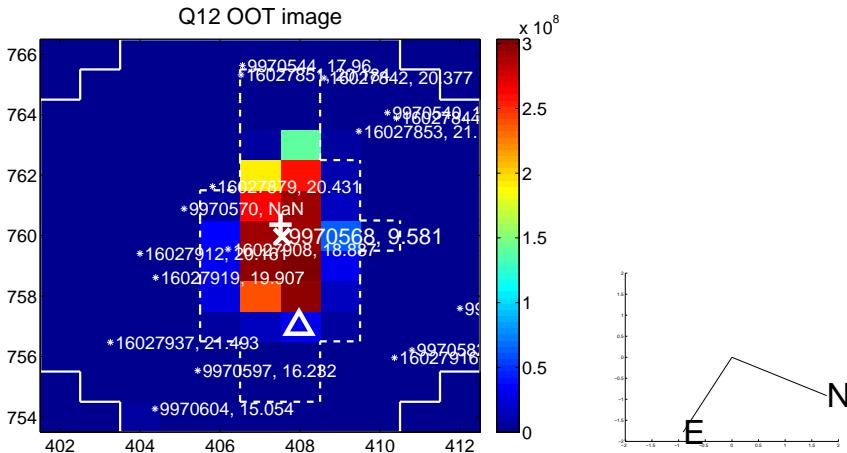
Q11 no OOT image



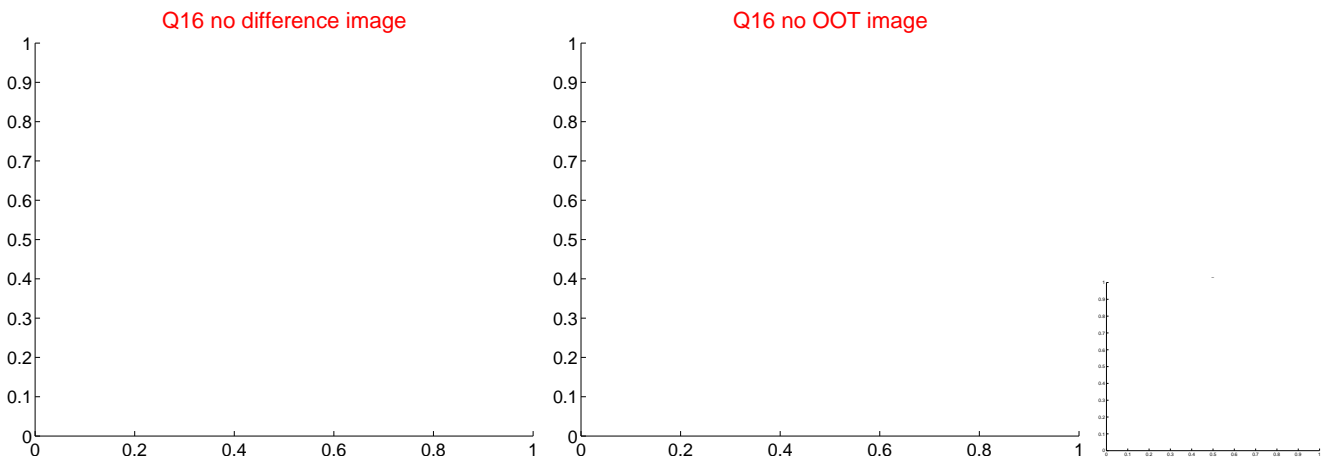
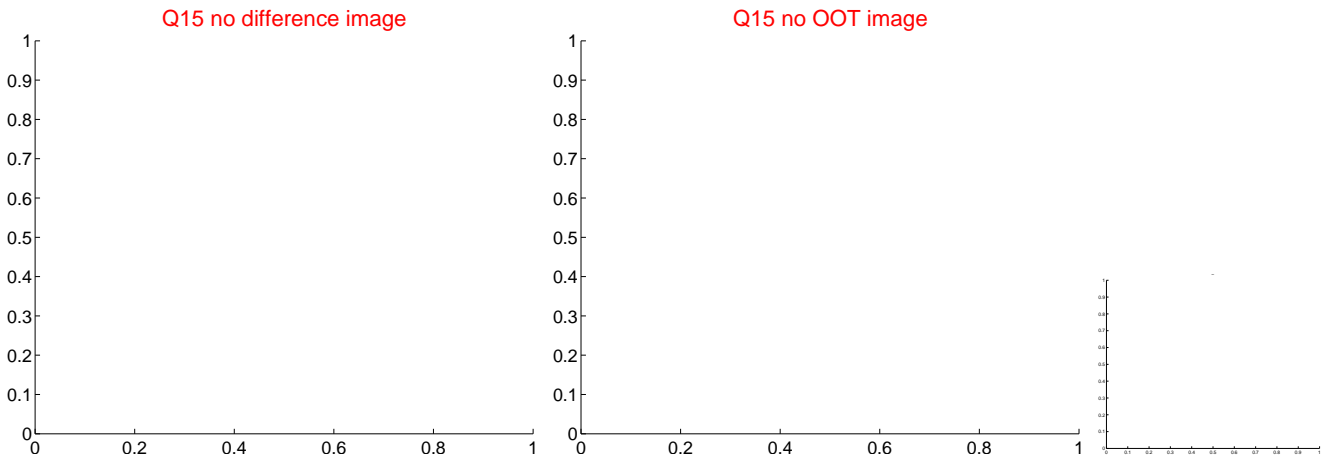
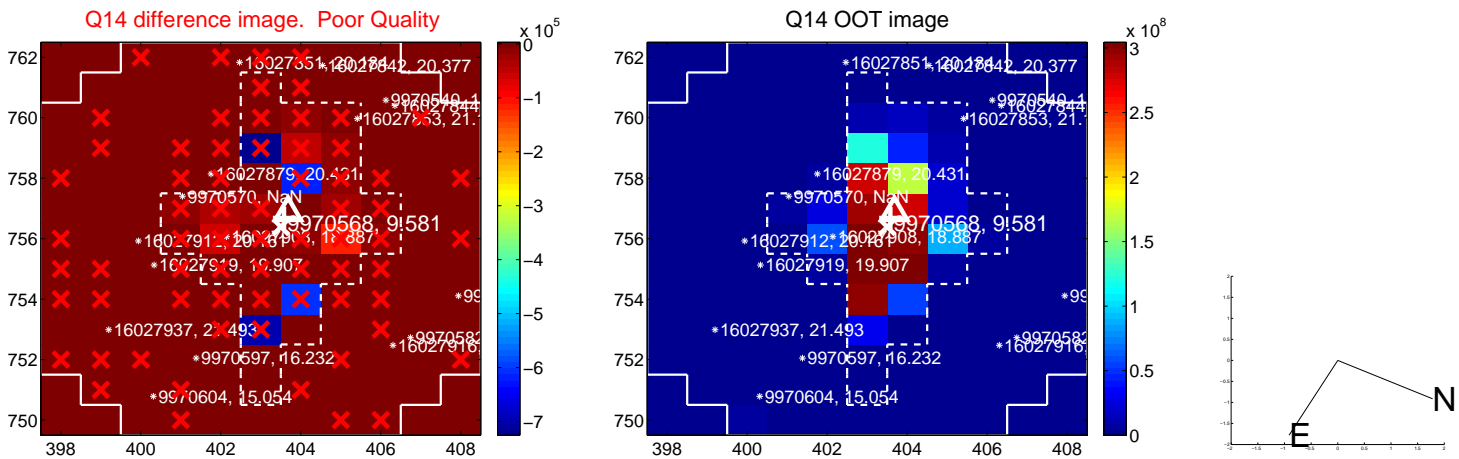
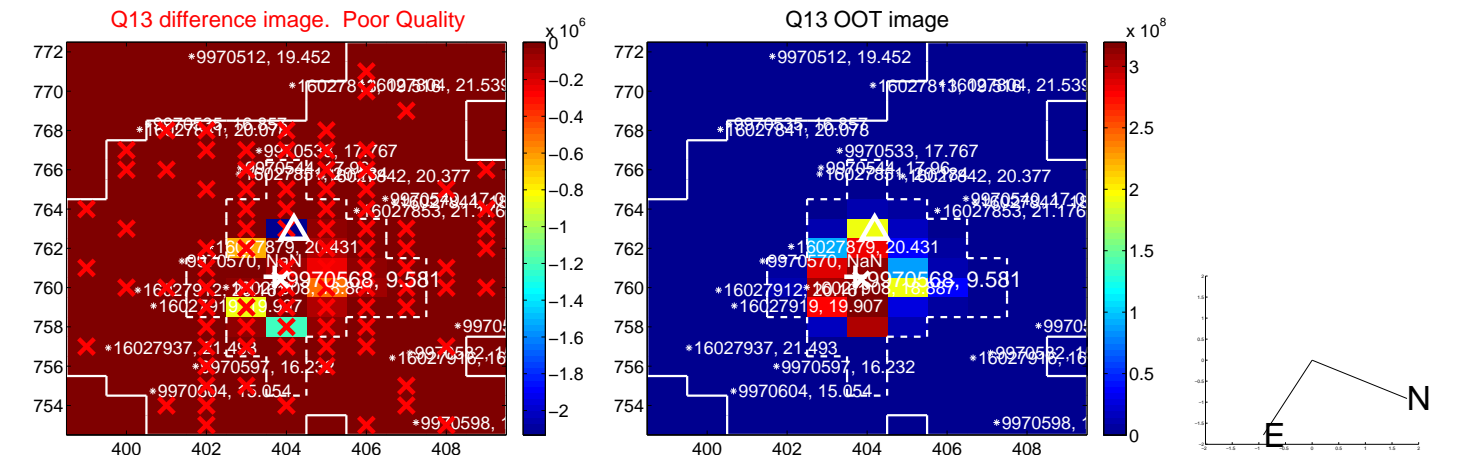
Q12 difference image. Poor Quality



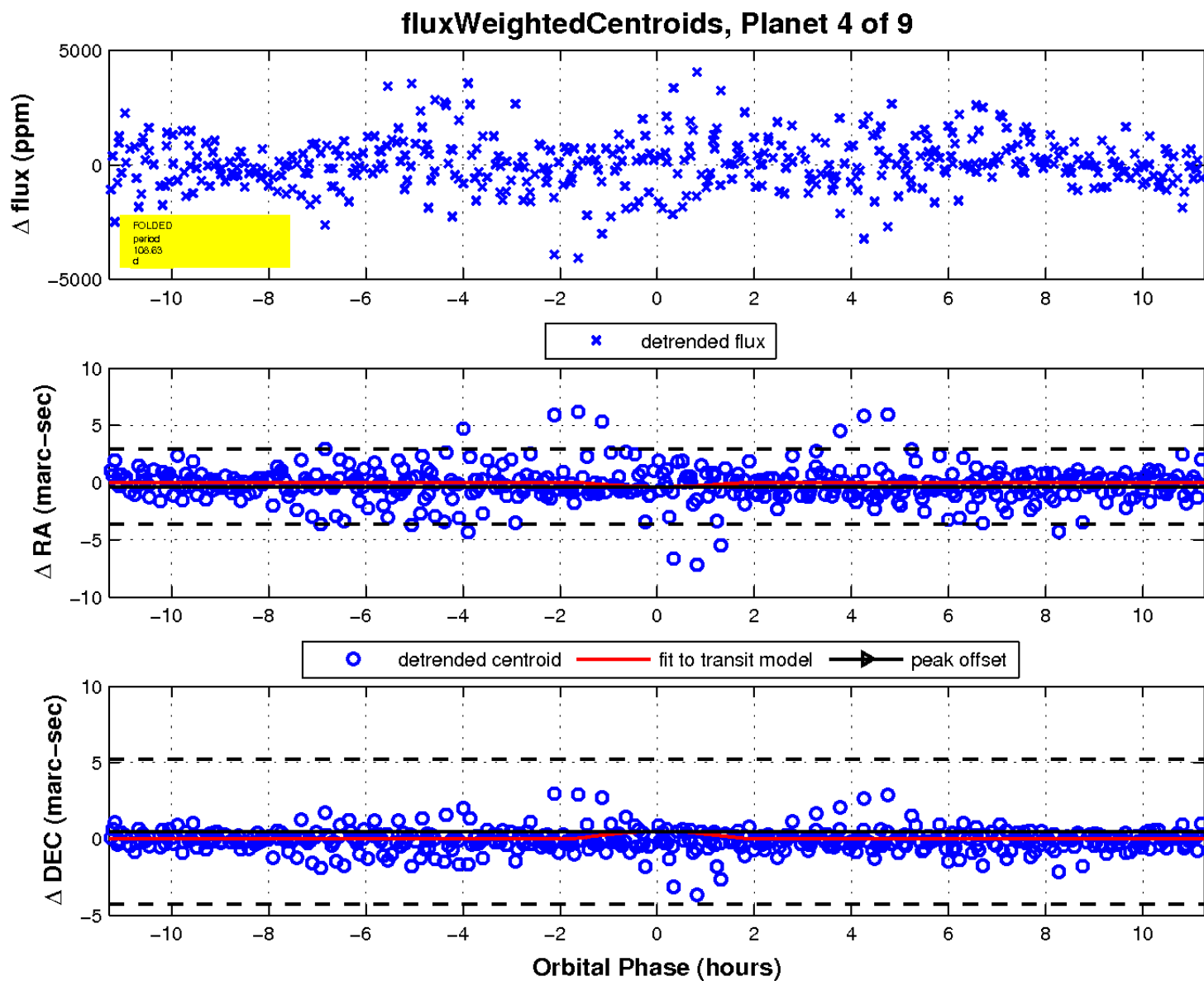
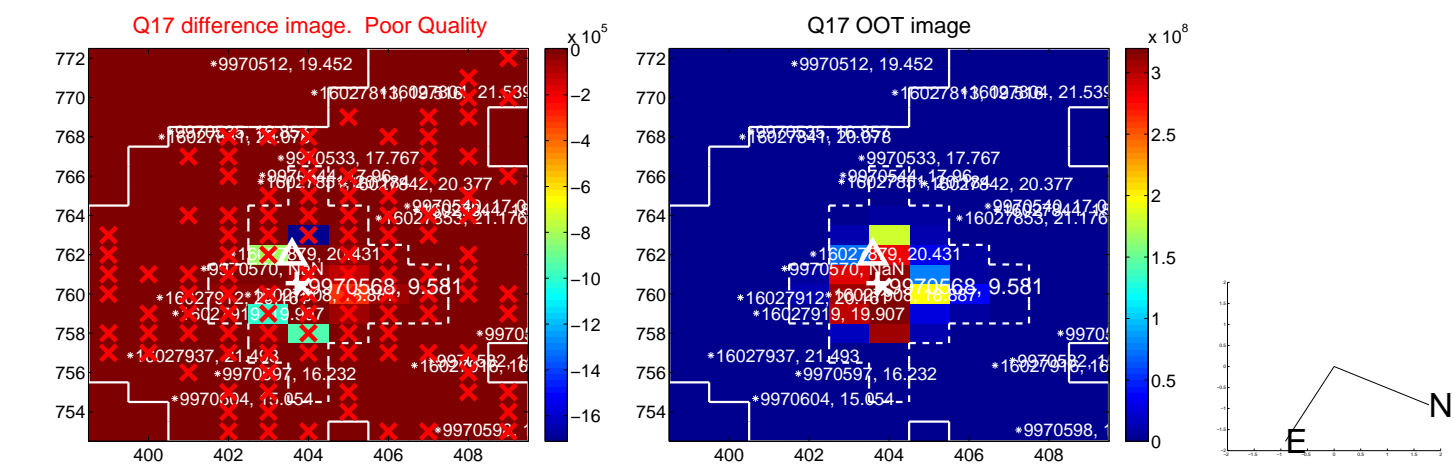
Q12 OOT image



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

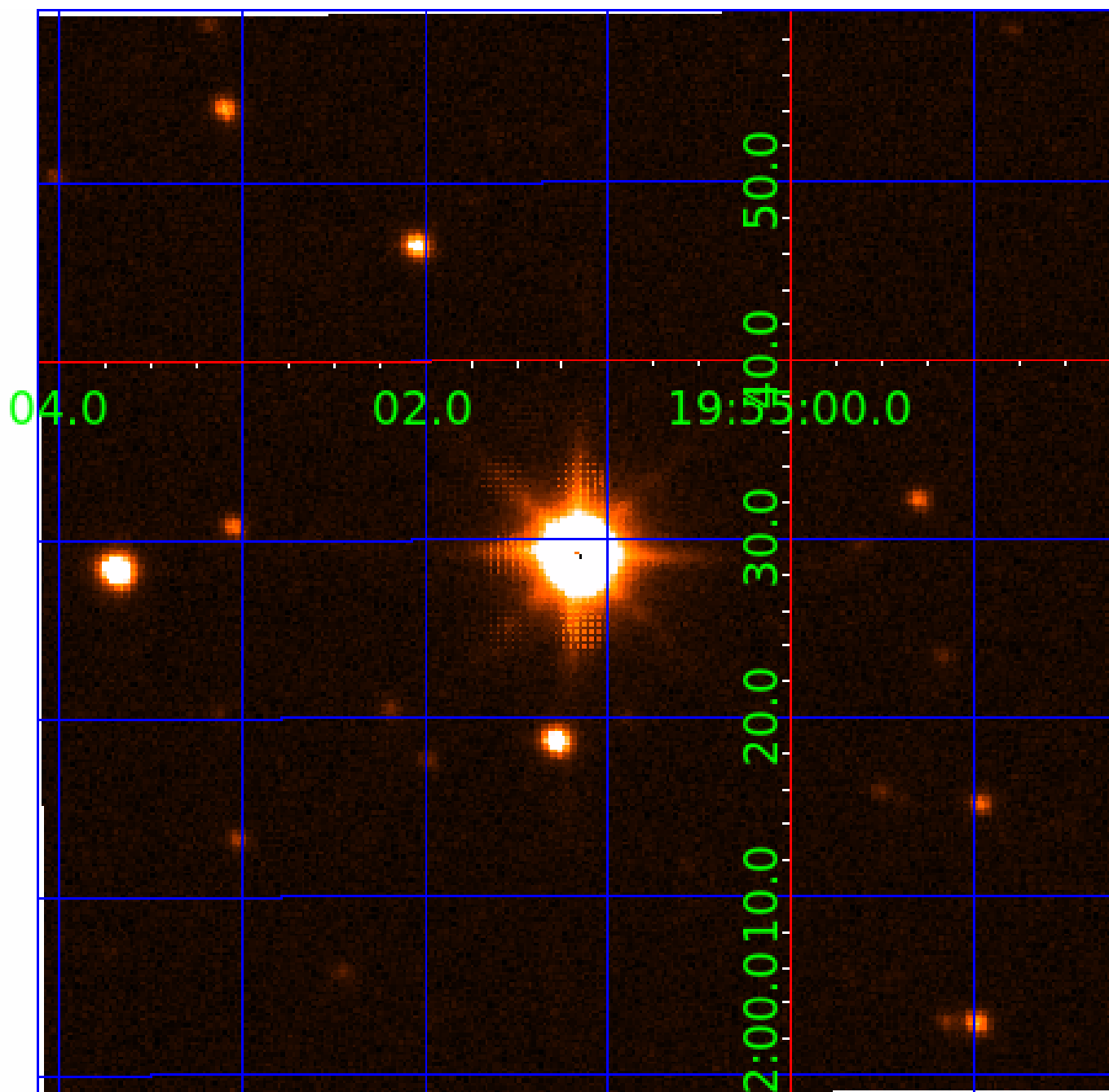


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009970568

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})
009970568-01	OBS	No	0.761375	131.773155	86.1	4.981	11.6	7.0	3.31	8035	3.13	95374.74
009970568-02	OBS	No	6.849496	134.393510	2076.3	2.075	12.6	9.7	3.31	8035	27.48	5097.45
009970568-03	OBS	No	30.488151	135.191934	1286.3	2.736	10.7	8.8	3.31	8035	13.60	696.18
009970568-04	OBS	No	108.630100	155.707473	2355.6	3.769	10.6	9.9	3.31	8035	29.25	127.93
009970568-05	OBS	No	51.809300	179.787566	2073.0	5.115	10.3	13.0	3.31	8035	15.51	343.31
009970568-06	OBS	No	9.624401	133.642564	889.2	1.961	9.2	9.5	3.31	8035	13.06	3238.92
009970568-07	OBS	No	27.073036	138.845537	965.7	3.769	9.0	8.0	3.31	8035	10.94	815.67
009970568-08	OBS	No	14.115709	139.253007	1679.2	2.645	9.9	11.7	3.31	8035	23.27	1943.69
009970568-09	OBS	No	8.894852	132.463277	42.6	2.000	9.2	-1.0	3.31	8035	2.19	3597.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970568-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

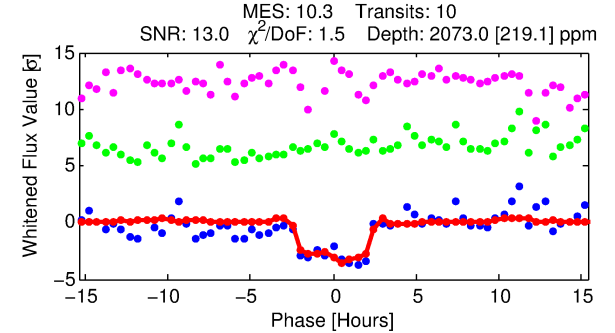
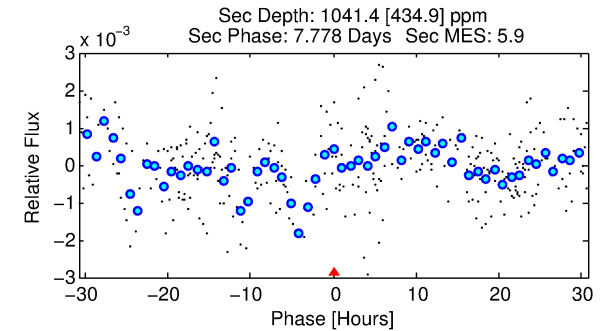
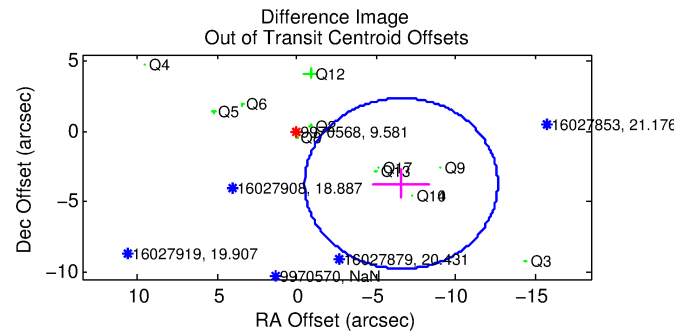
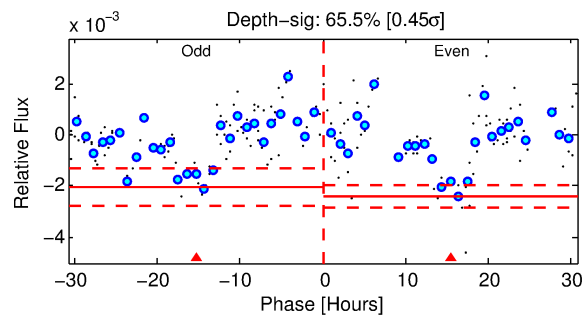
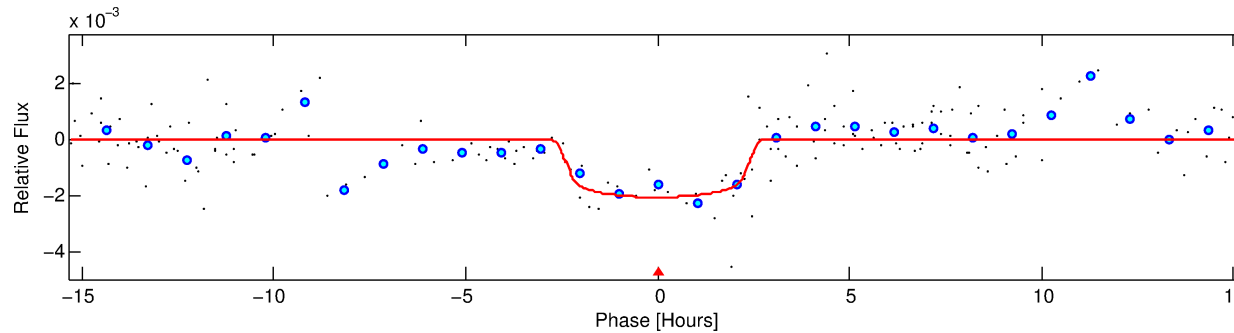
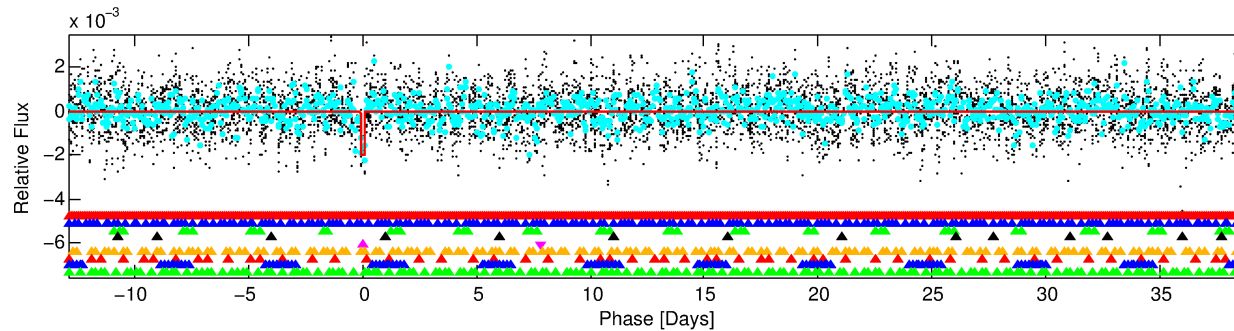
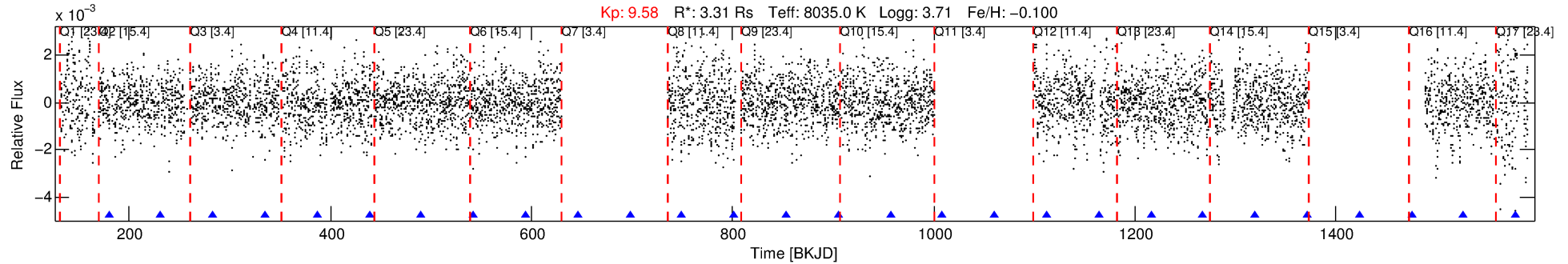
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009970568-05

No Significant Match Found

DV One-Page Summary

KIC: 9970568 Candidate: 5 of 9 Period: 51.809 d



DV Fit Results:

Period = 51.80930 [0.00039] d
Epoch = 179.7876 [0.0062] BKJD
Rp/R* = 0.0429 [0.0119]
a/R* = 73.27 [107.89]
b = 0.44 [2.74]
Seff = 343.31 [259.93]
Teq = 1098 [208] K
Rp = 15.51 [8.56] Re
a = 0.3454 [0.1587] AU
Ag = 284.28 [287.81] [0.98 σ]
Teffp = 6968 [1252] K [4.63 σ]

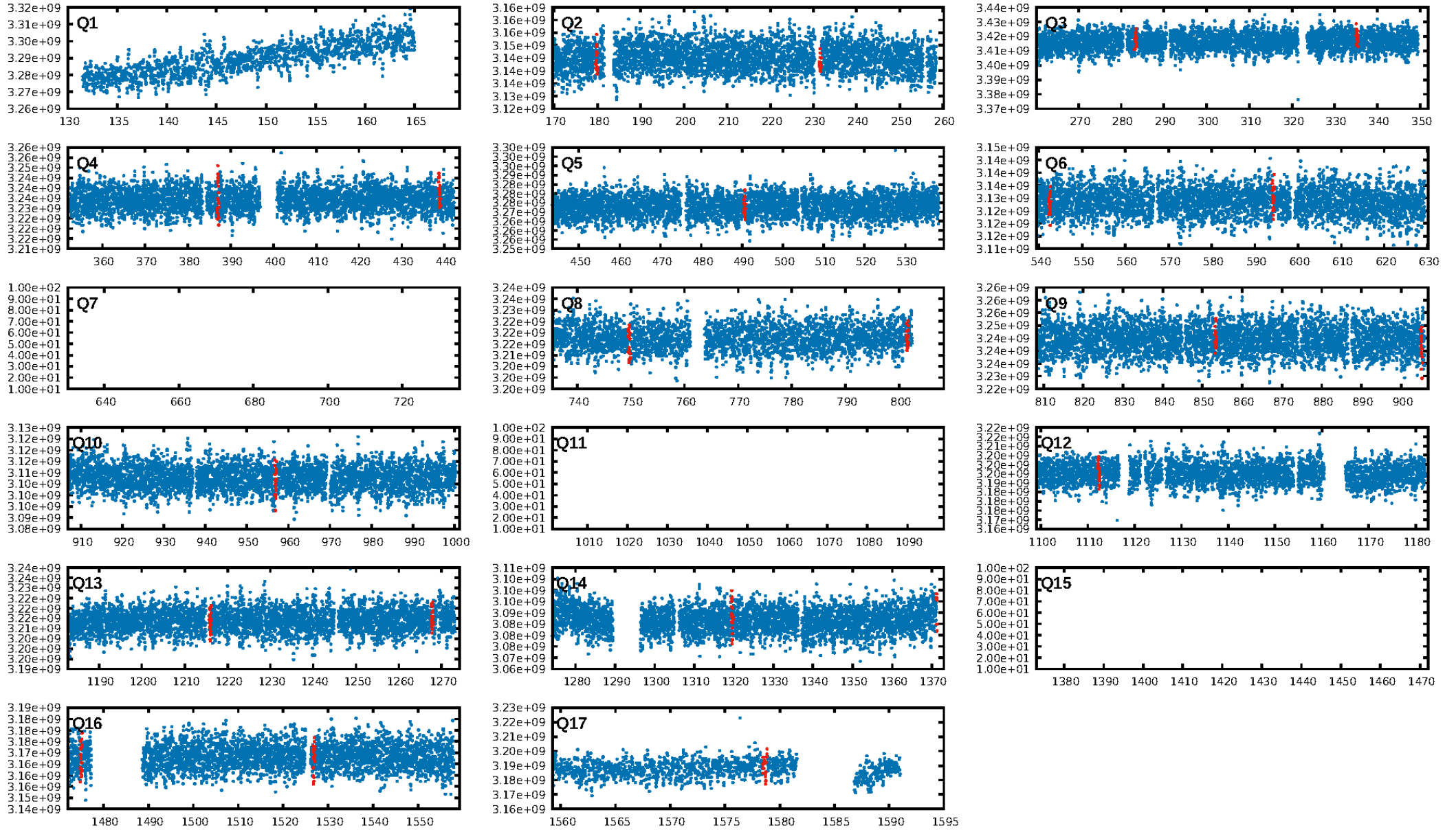
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [88.21 σ]
LongPeriod-sig: 100.0% [214.63 σ]
ModelChiSquare2-sig: 2.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: N/A
Centroid-sig: 9.2%
Centroid-so: 0.122 arcsec [1.59 σ]
OotOffset-rm: 7.534 arcsec [3.72 σ]
KicOffset-rm: 8.920 arcsec [4.34 σ]
OotOffset-st: 4/1/3/4 [12]
KicOffset-st: 4/1/3/4 [12]
DiffImageQuality-fgm: 0.00 [0/12]
DiffImageOverlap-fno: 0.00 [0/12]

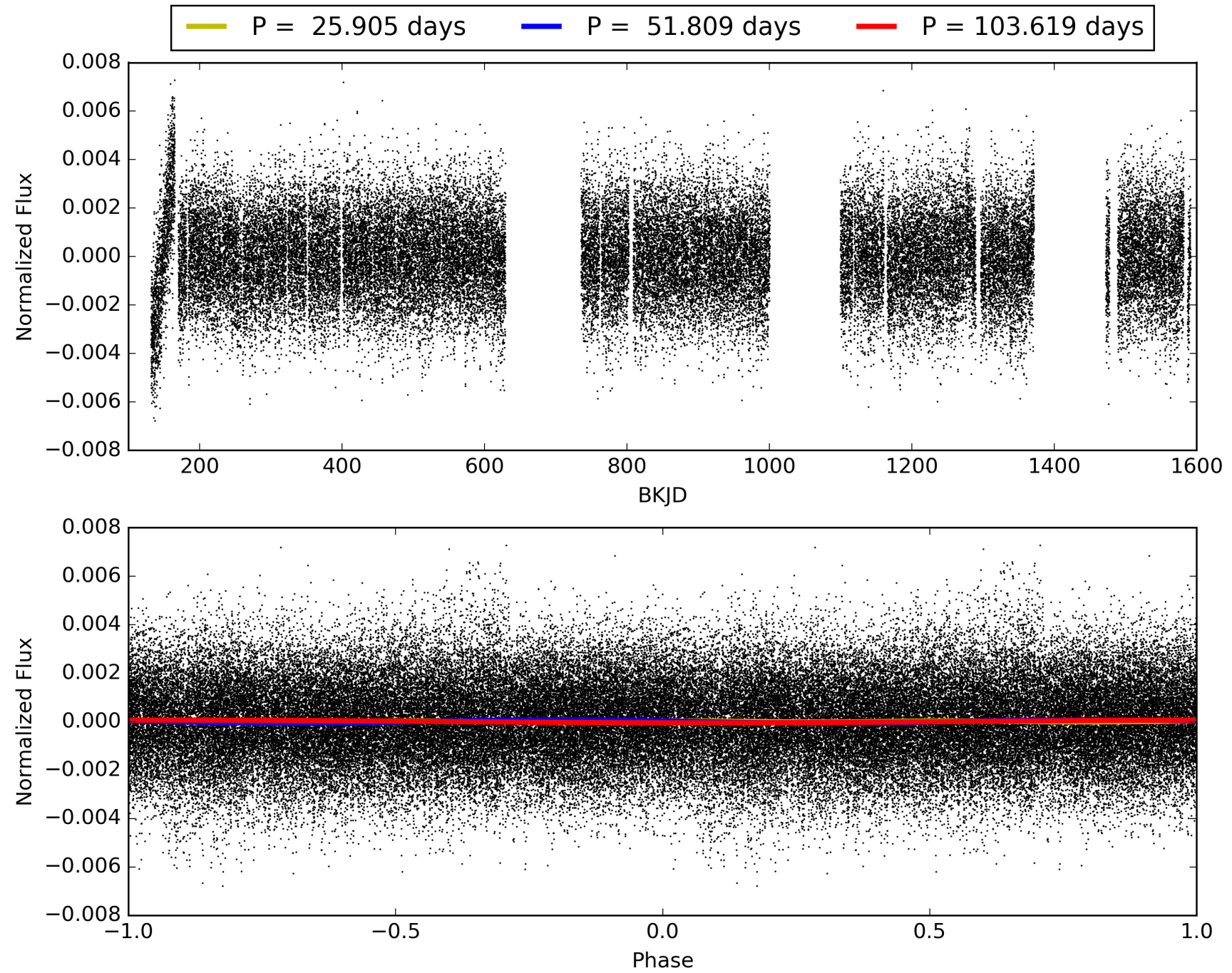
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:35 Z

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

TCE 009970568-05, PDC Light Curves

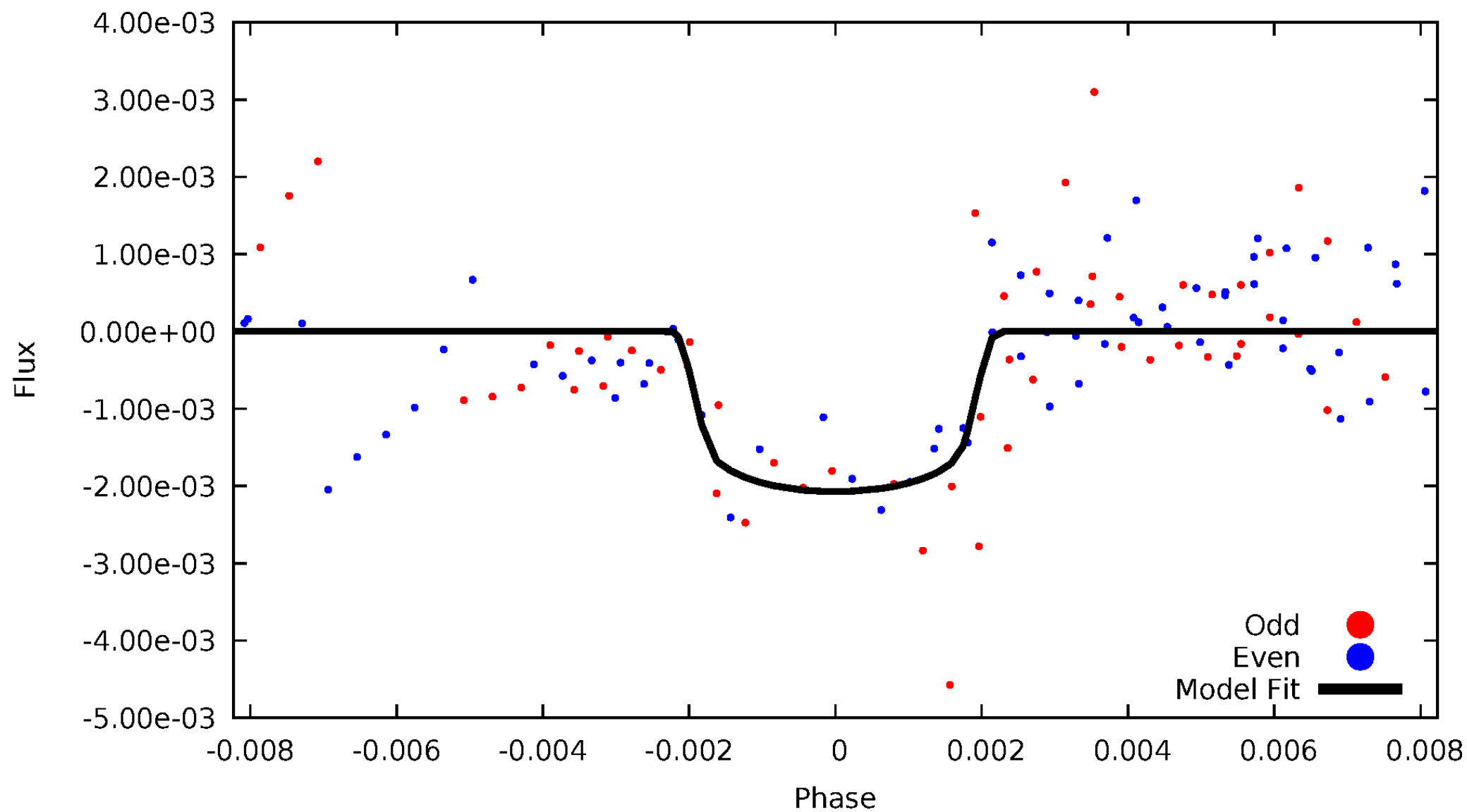


TCE 009970568-05



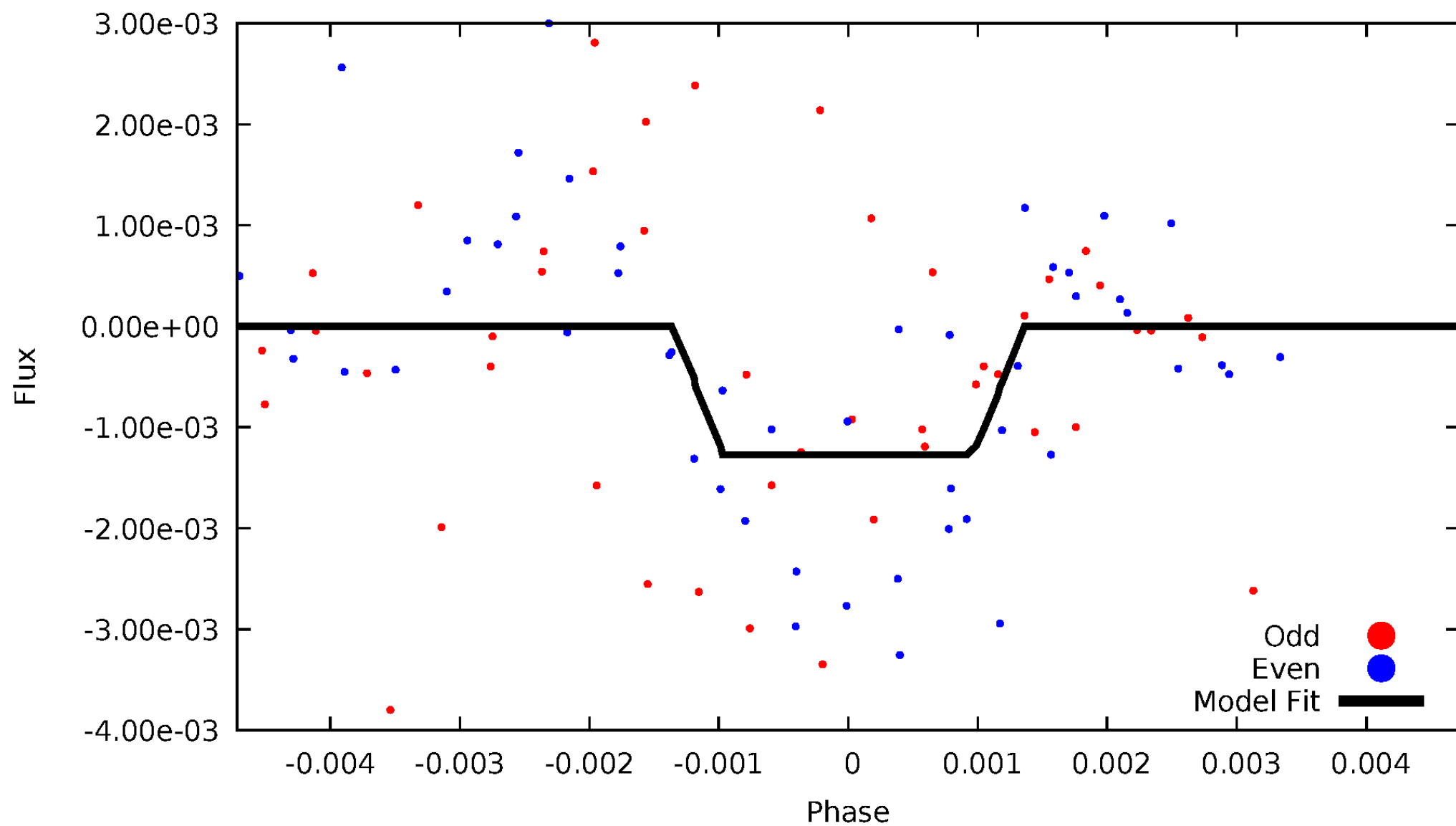
DV Odd/Even

TCE 009970568-05



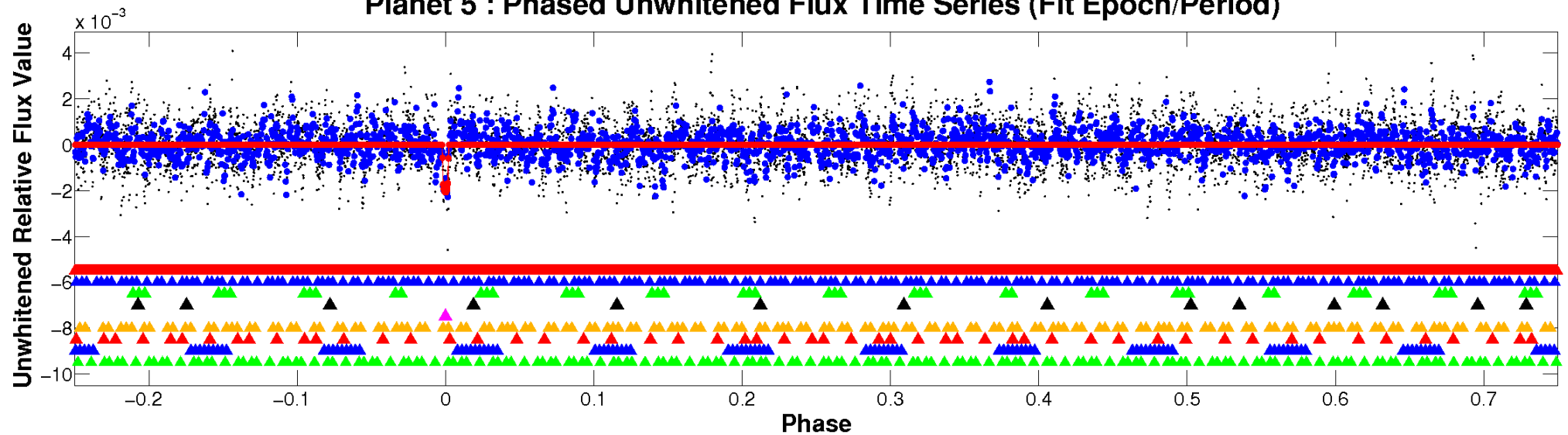
ALT Odd/Even

TCE 009970568-05

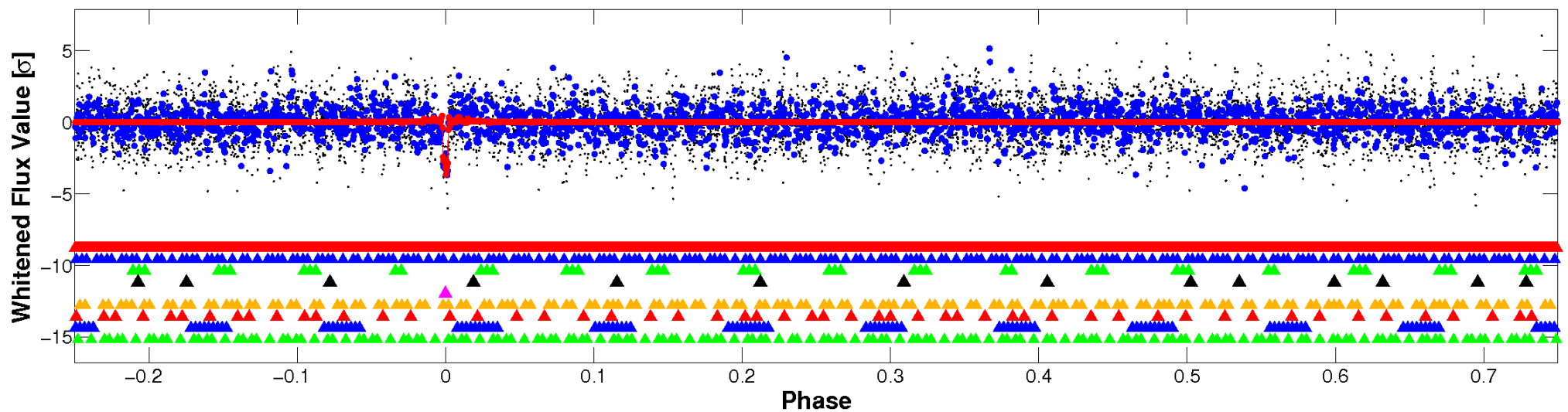


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

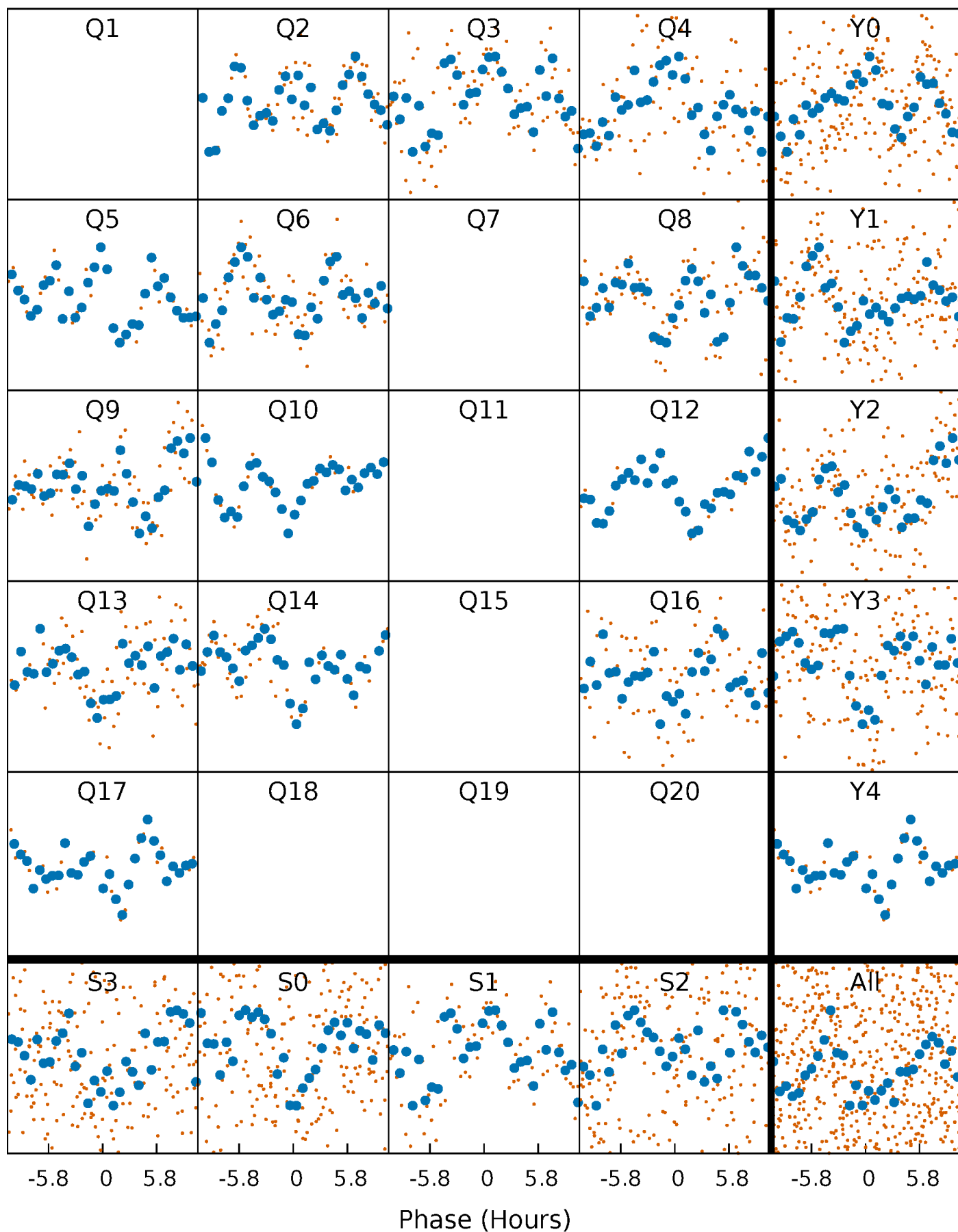


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



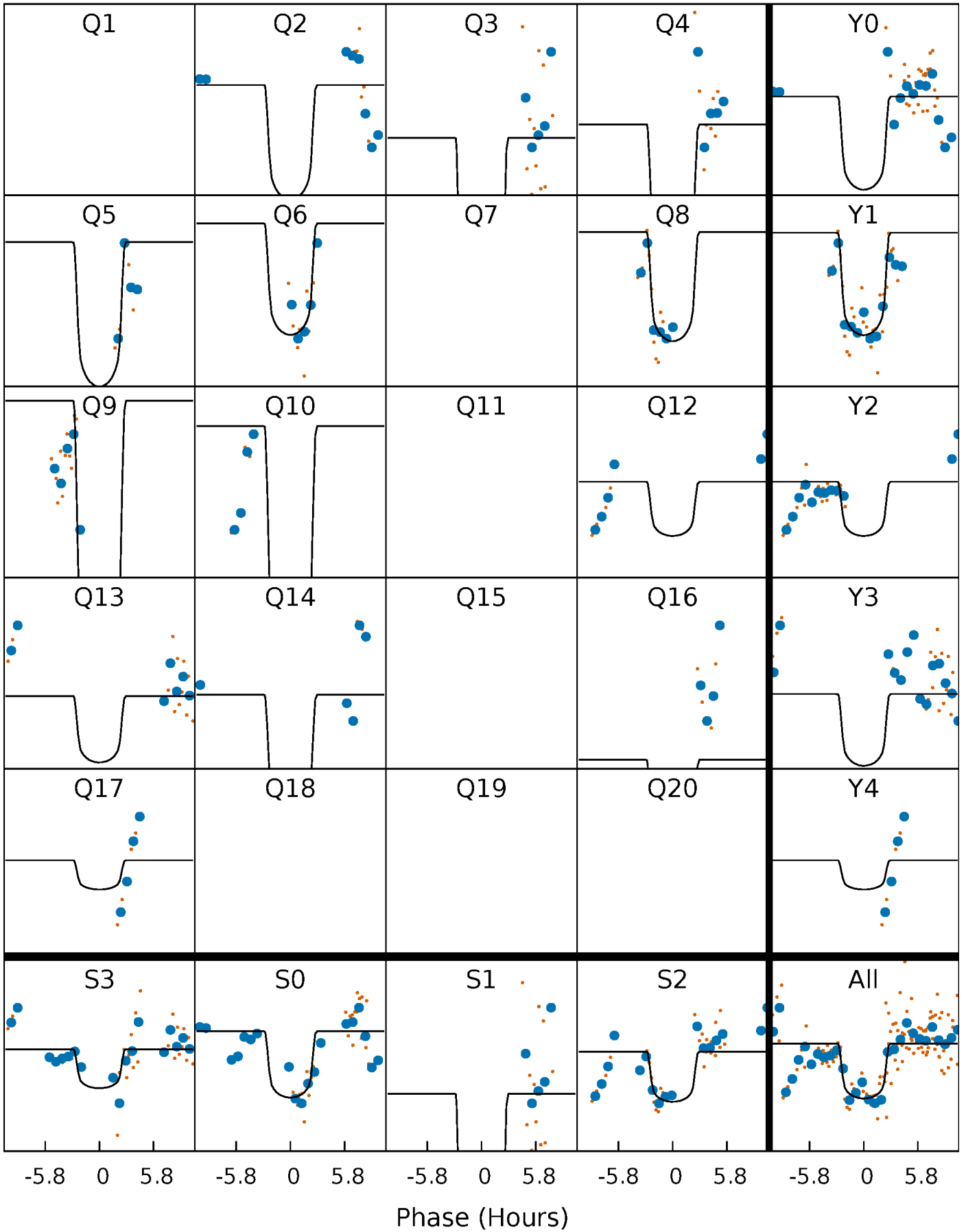
PDC Quarter-Phased Transit Curves

TCE 009970568-05 P= 51.809300 Days $T_0=179.787566$ (BKJD)



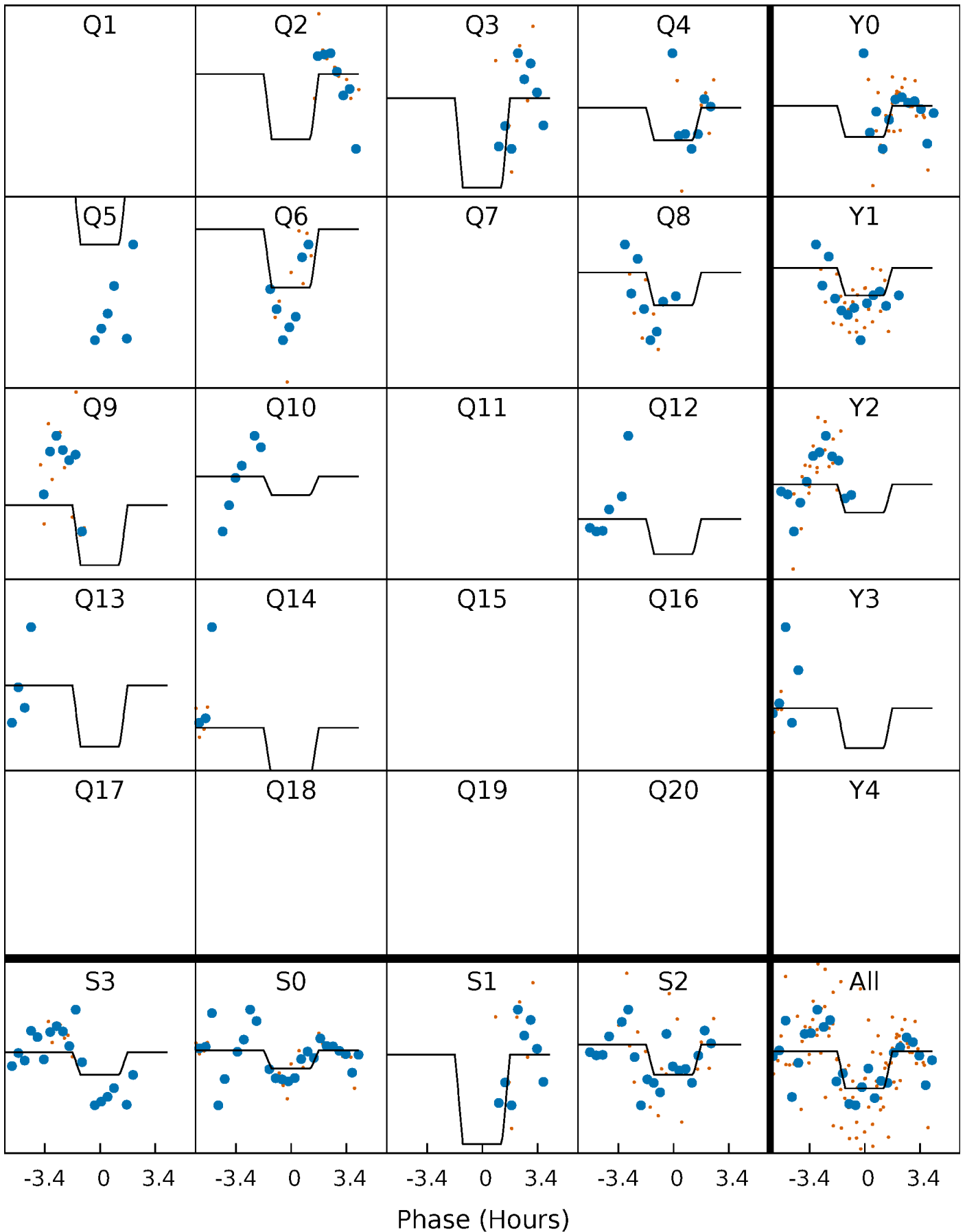
DV Quarter-Phased Transit Curves

TCE 009970568-05 P= 51.809300 Days $T_0=179.787566$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

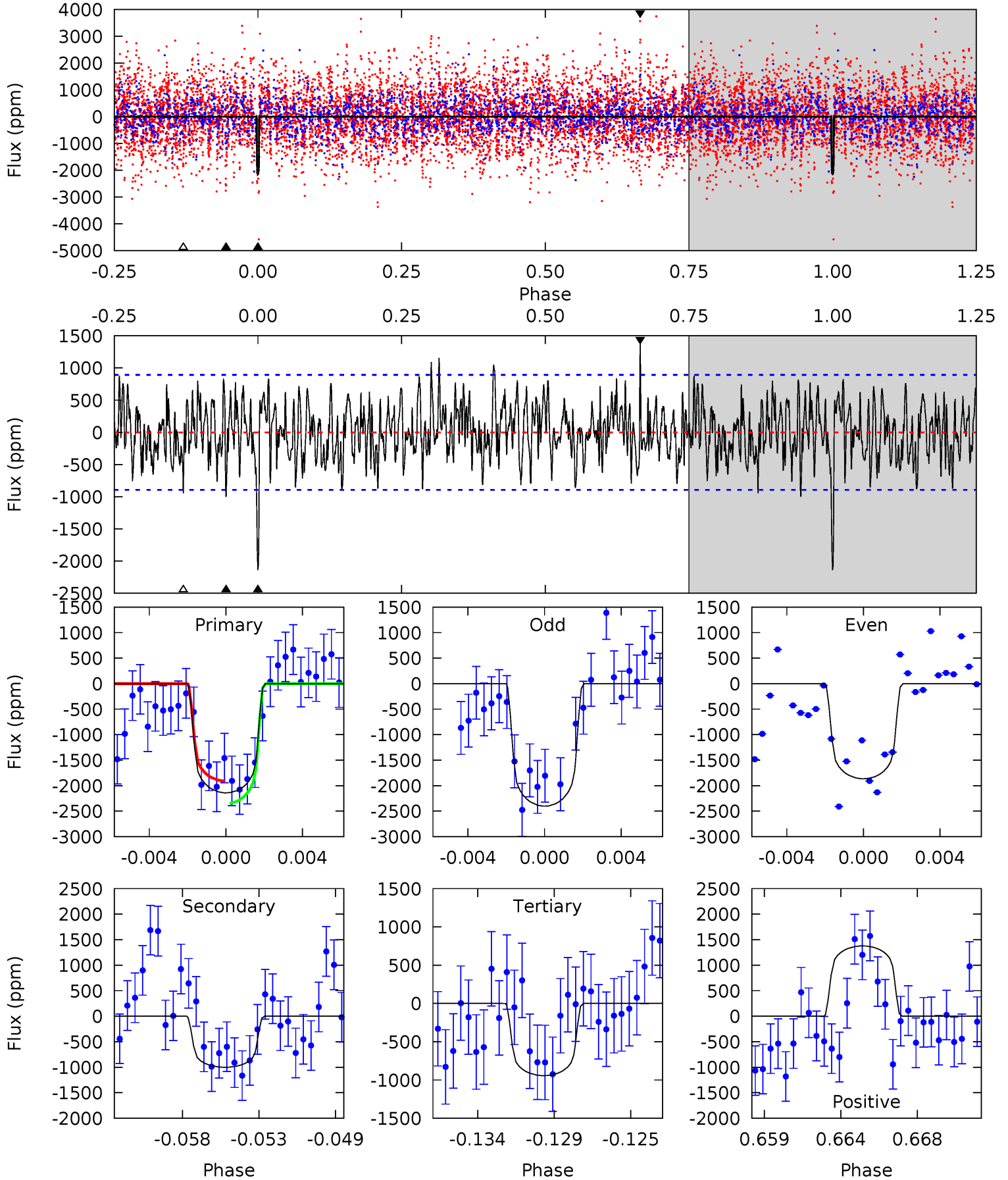
TCE 009970568-05 P= 51.790259 Days $T_0=179.993042$ (BKJD)



DV Model-Shift Uniqueness Test

009970568-05, P = 51.809300 Days, E = 127.978266 Days

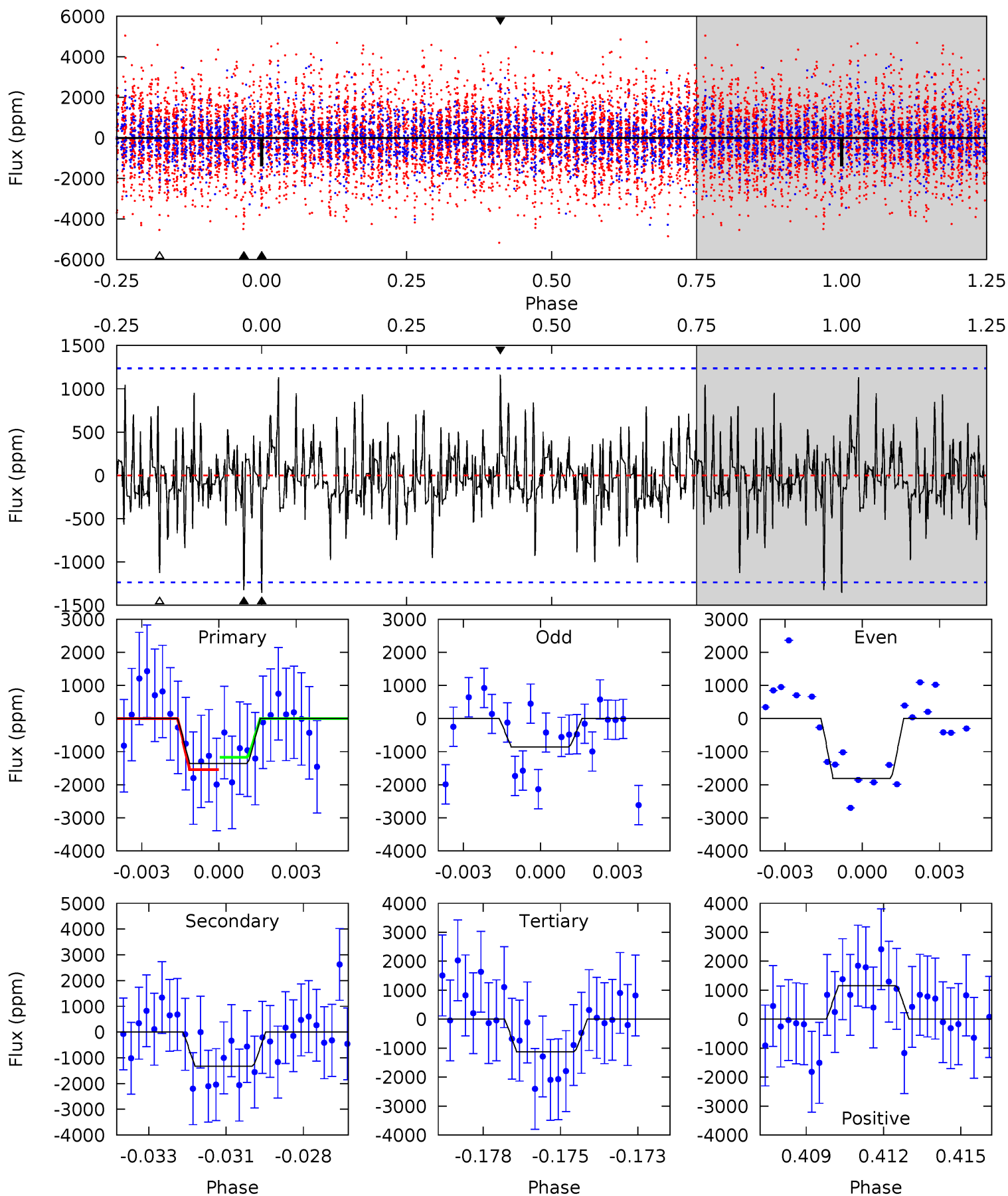
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	5.80	5.46	7.98	5.18	2.84	2.11	6.94	4.42	0.33	-2.18	1.55	1.18	0.39	1.26



Alt Model-Shift Uniqueness Test

009970568-05, P = 51.790259 Days, E = 128.202783 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.79	5.66	4.82	4.92	5.28	3.02	1.42	0.97	0.87	0.84	0.74	2.02	0.77	0.46	0.80



Stellar Parameters For KIC 009970568

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8035^{+223}_{-362}	$3.709^{+0.432}_{-0.108}$	$-0.100^{+0.200}_{-0.350}$	$3.312^{+0.789}_{-1.579}$	$2.046^{+0.372}_{-0.538}$	$0.079^{+0.307}_{-0.028}$
	+3%/-5%	+12%/-3%	+200%/-350%	+24%/-48%	+18%/-26%	+388%/-35%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009970568-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1001 \pm 173	$14.05^{+4.92}_{-4.94}$	1482^{+114}_{-184}	6714^{+1359}_{-849}	341^{+411}_{-166}
Alt.	-1324 \pm 234	$11.54^{+4.92}_{-4.73}$	1481^{+118}_{-174}	8047^{+3216}_{-1243}	657^{+1143}_{-347}

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

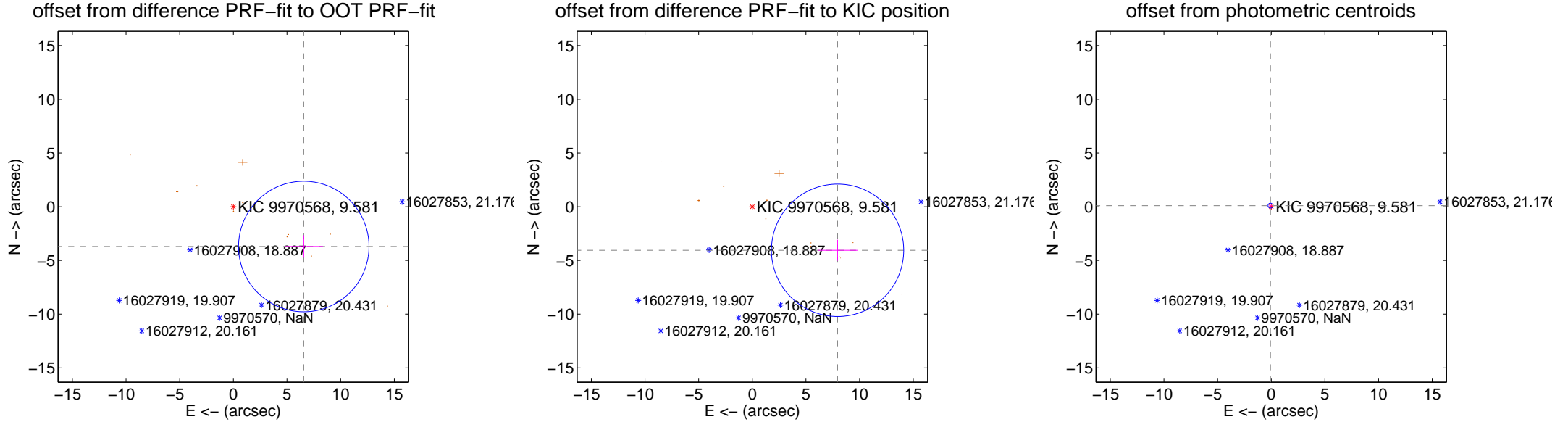
DV Centroid Data

Supplemental centroid analysis for 009970568-05. **Kepler magnitude: 9.58.** Transit SNR 12.99

There are 0 quarters with good PRF difference image offsets

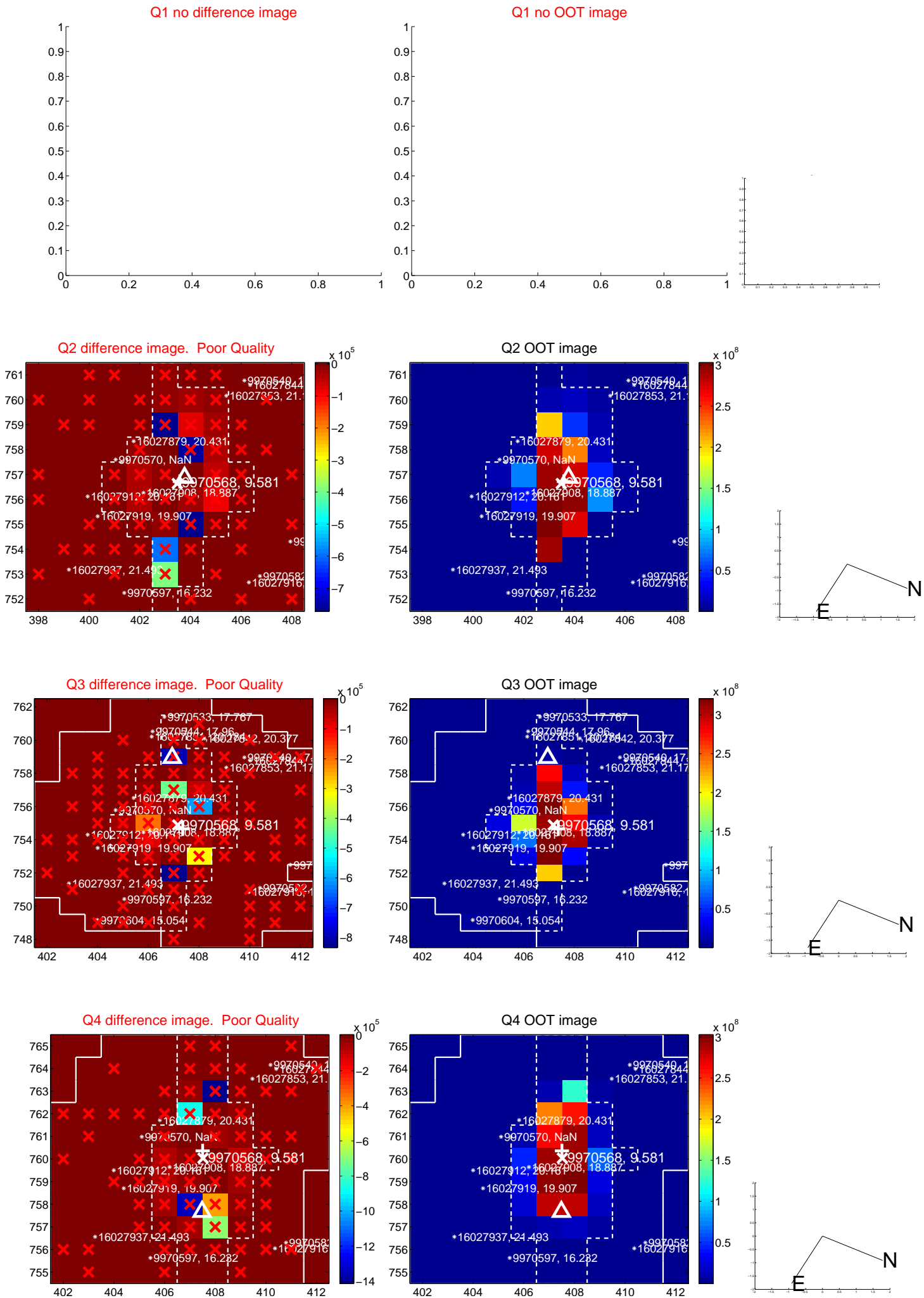
The direct PRF centroid is offset from the target star catalog position by about 0.84 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.534 ± 2.026	3.72	-6.562 ± 1.782	-3.702 ± 1.044
PRF-fit source offset from KIC position	8.920 ± 2.054	4.34	-7.945 ± 1.853	-4.054 ± 0.978
photometric centroid source offset	0.12 ± 0.08	1.59	0.08 ± 0.11	0.10 ± 0.05

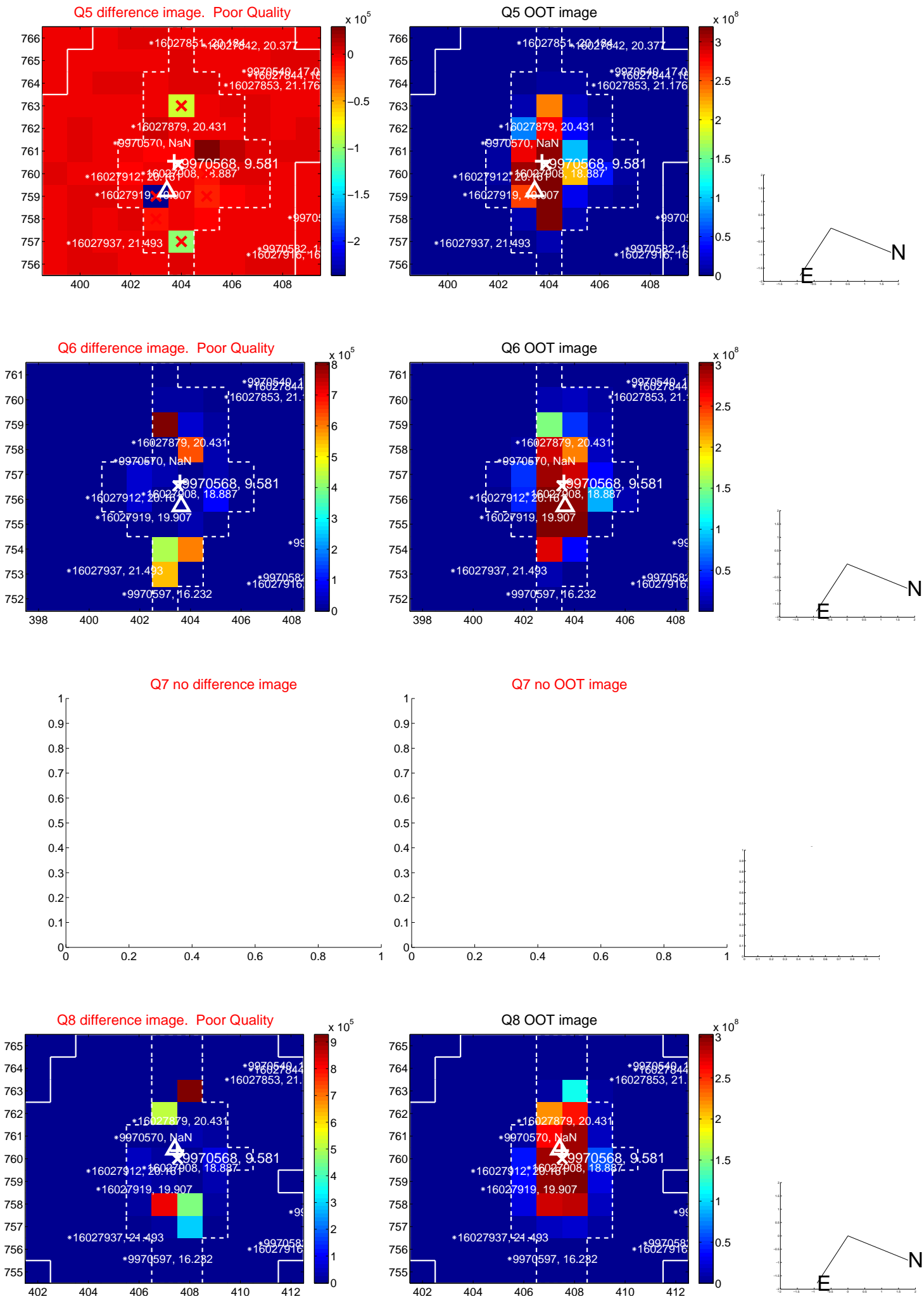


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

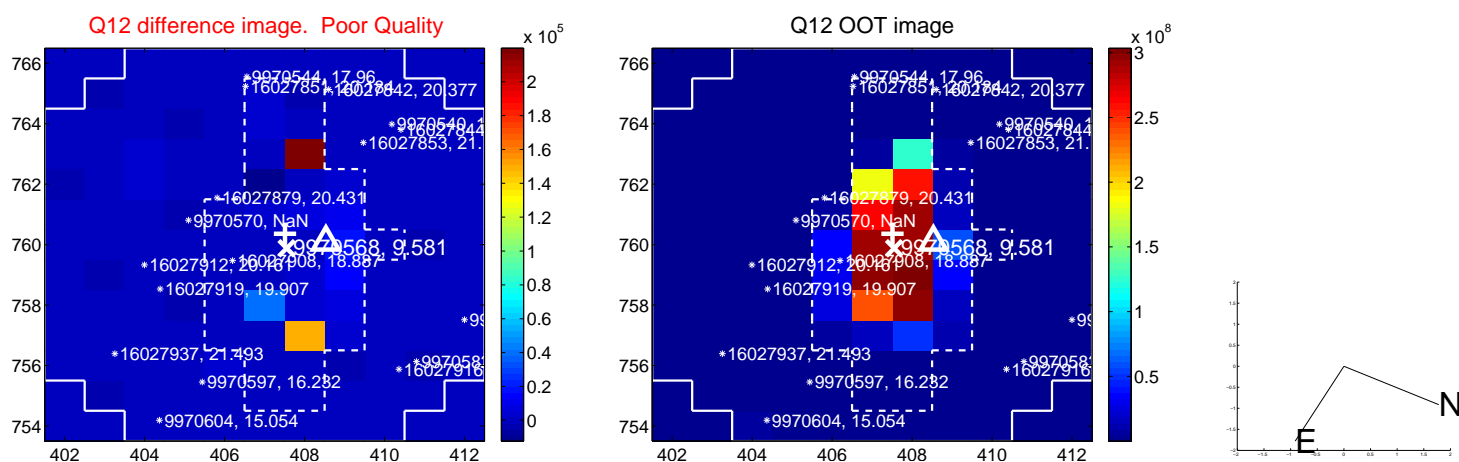
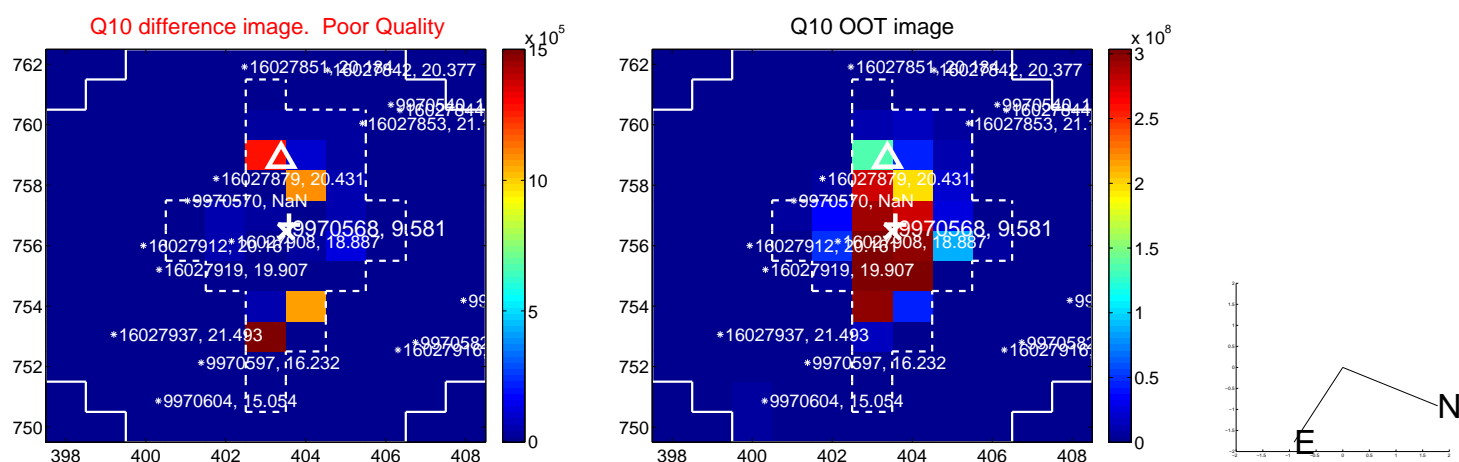
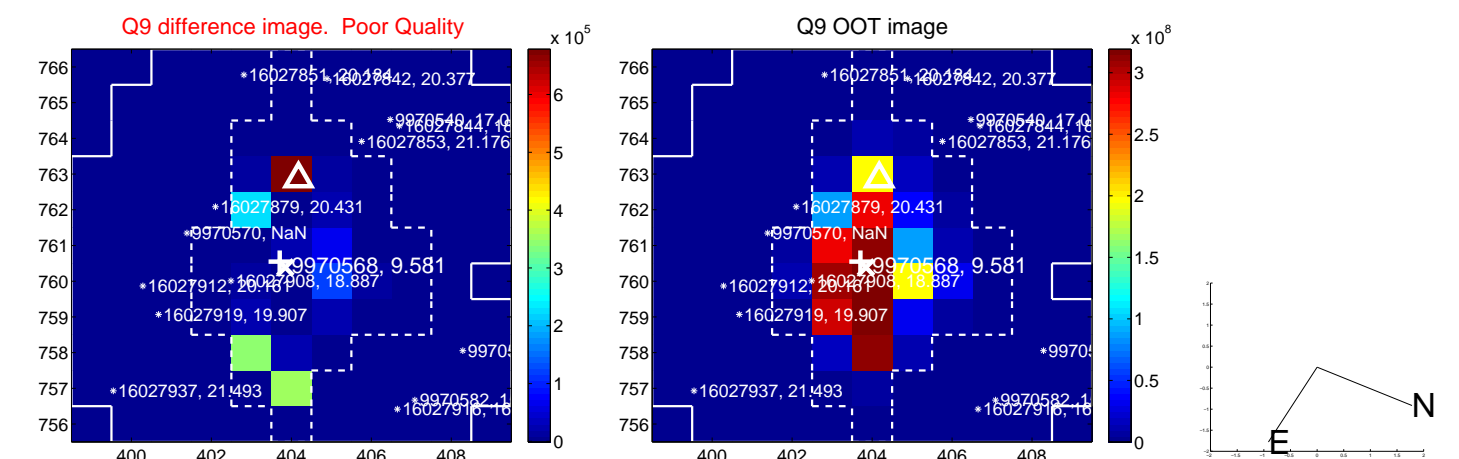
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



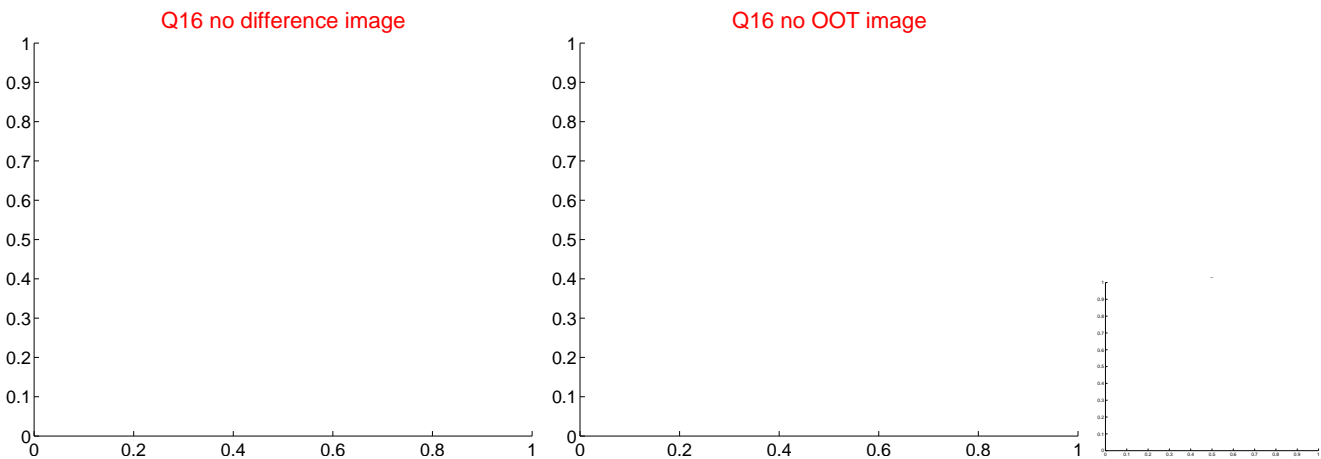
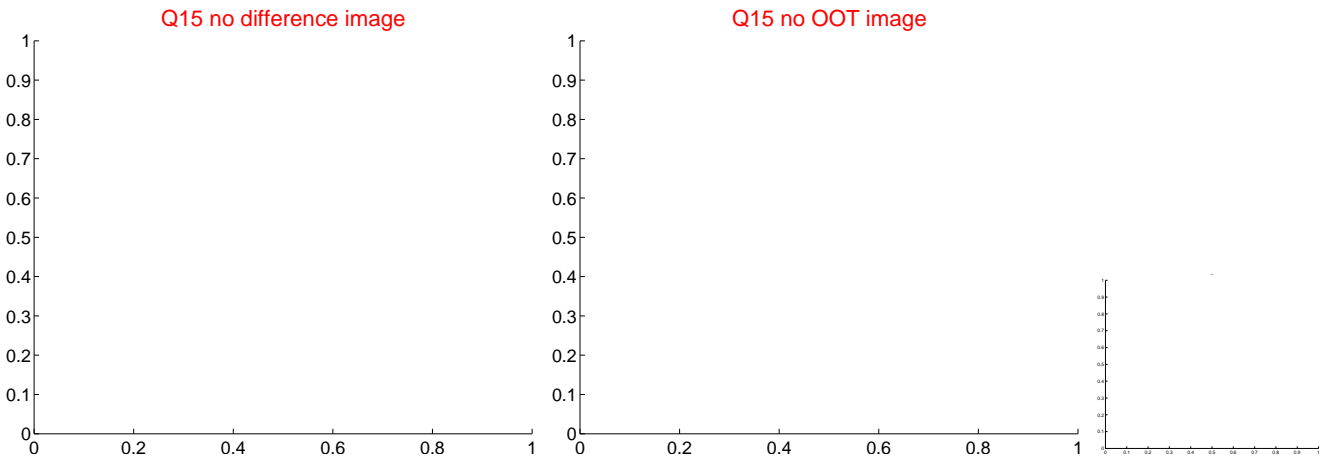
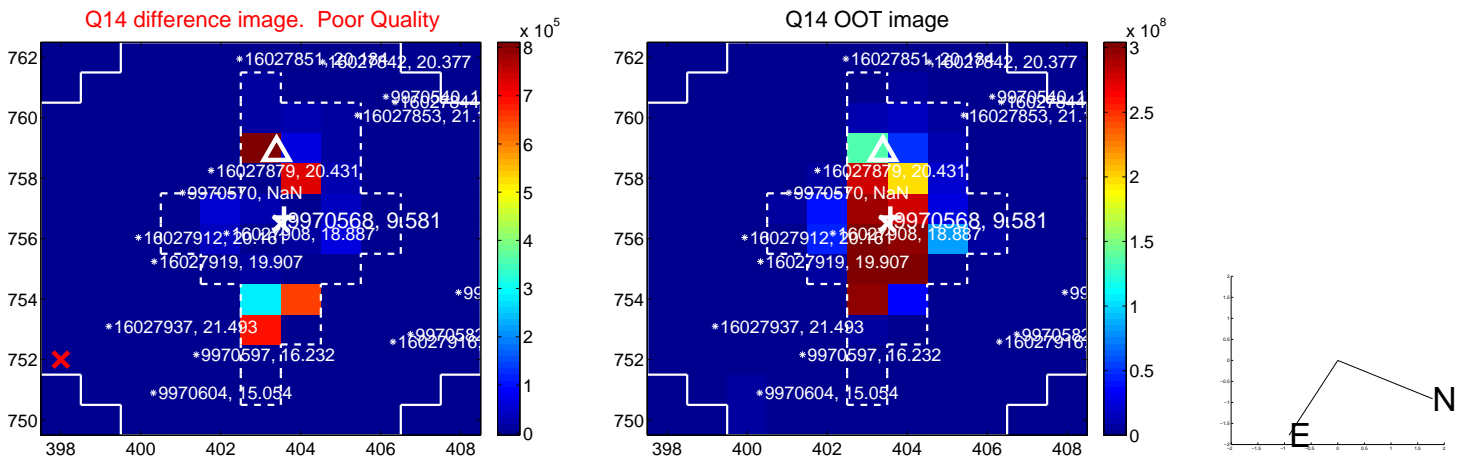
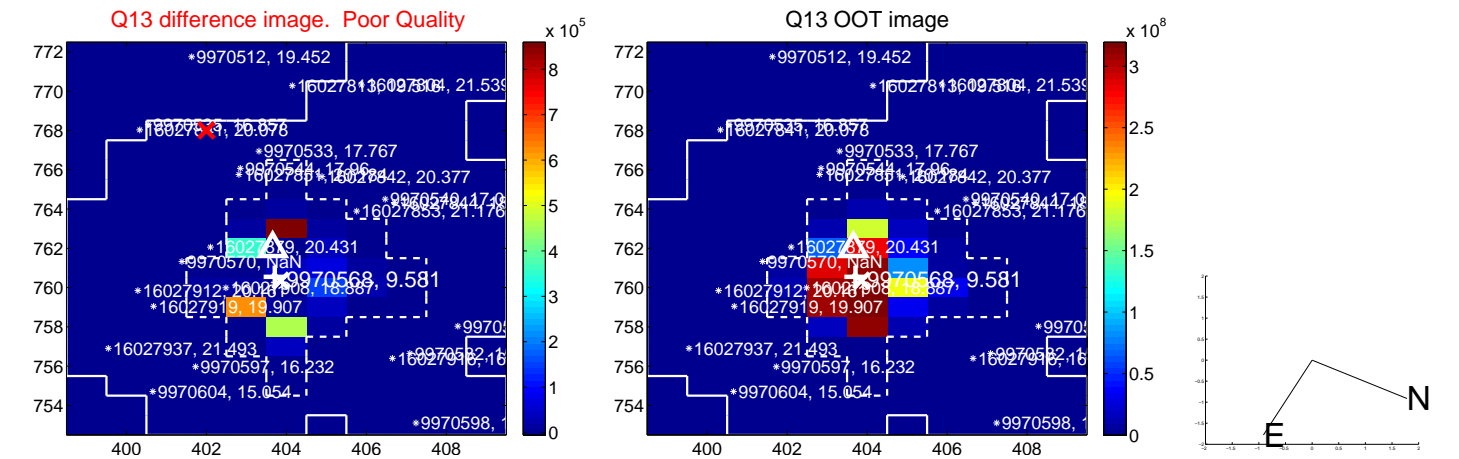
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



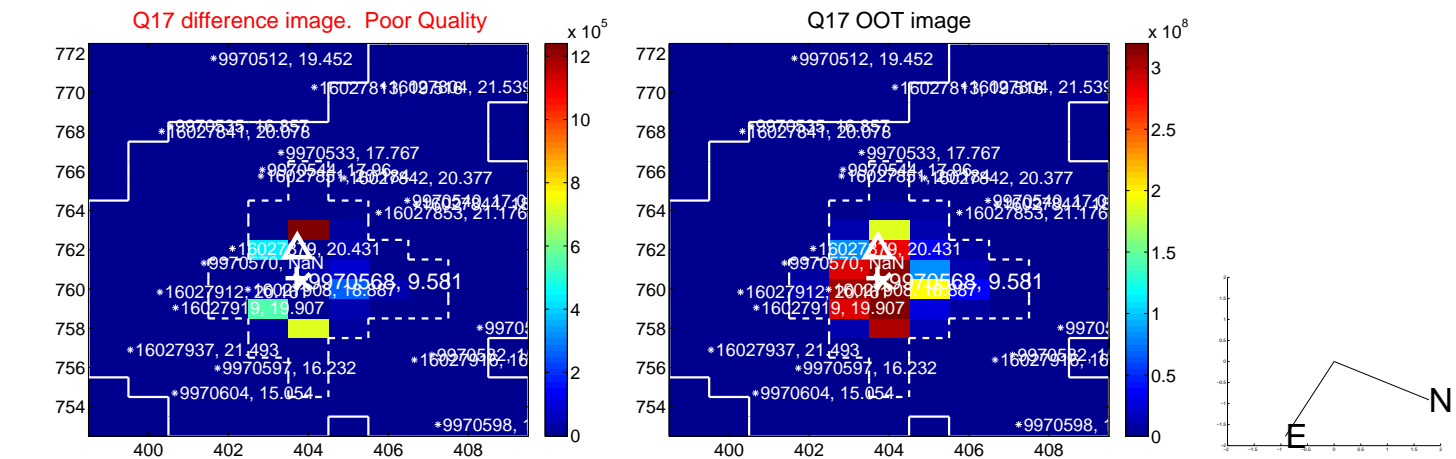
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



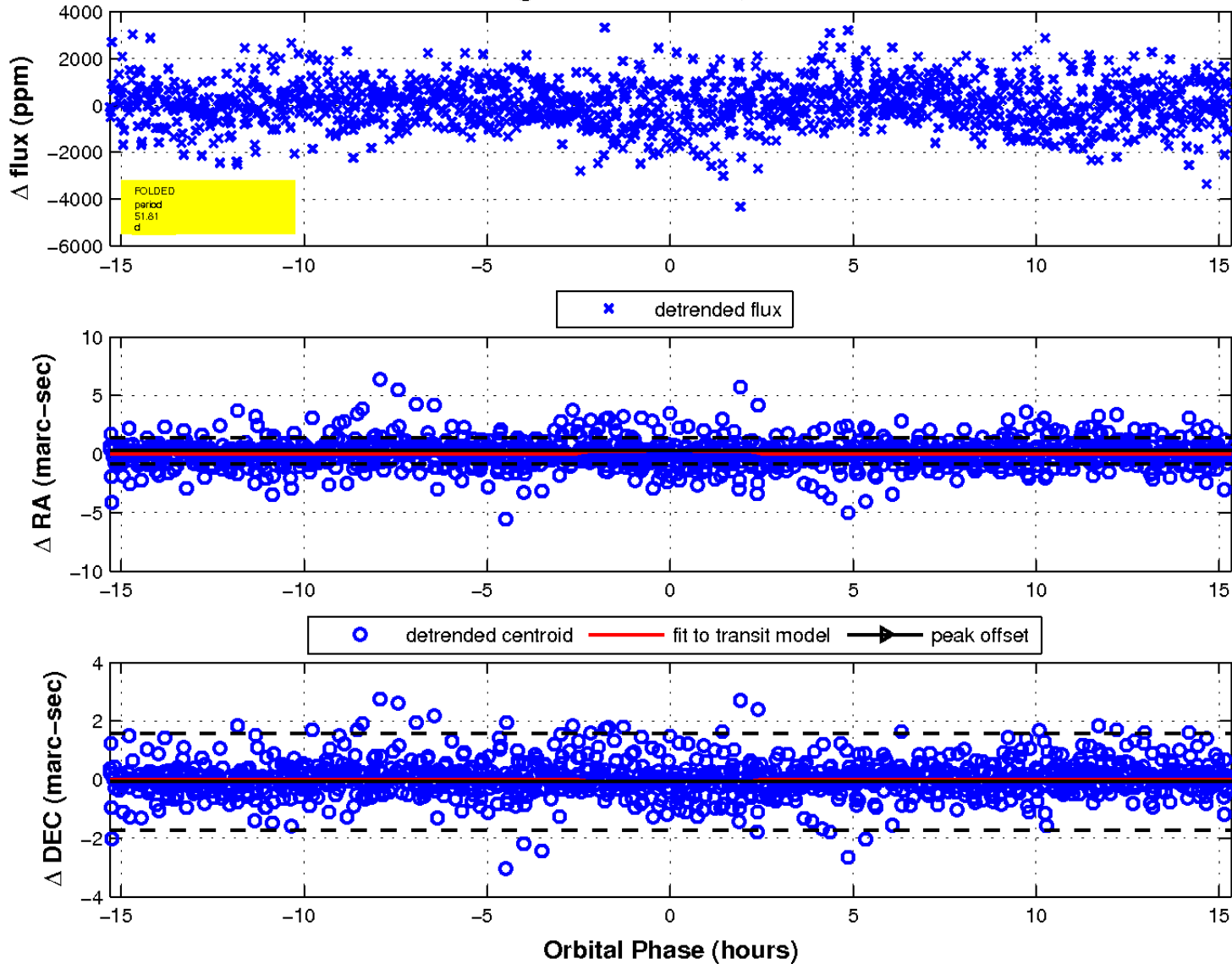
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

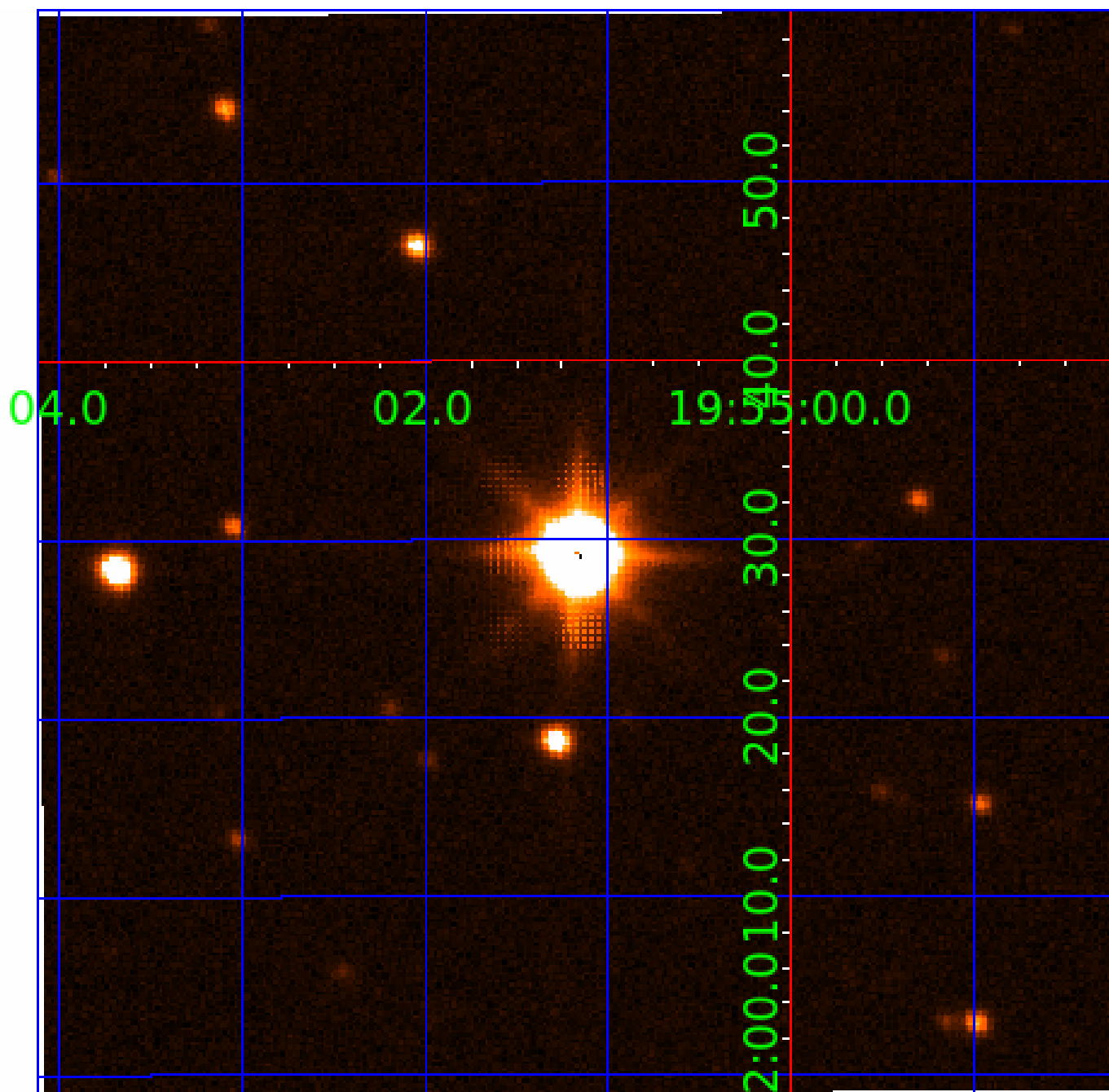


fluxWeightedCentroids, Planet 5 of 9



UKIRT Image

Declination



KIC 009970568

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})
009970568-01	OBS	No	0.761375	131.773155	86.1	4.981	11.6	7.0	3.31	8035	3.13	95374.74
009970568-02	OBS	No	6.849496	134.393510	2076.3	2.075	12.6	9.7	3.31	8035	27.48	5097.45
009970568-03	OBS	No	30.488151	135.191934	1286.3	2.736	10.7	8.8	3.31	8035	13.60	696.18
009970568-04	OBS	No	108.630100	155.707473	2355.6	3.769	10.6	9.9	3.31	8035	29.25	127.93
009970568-05	OBS	No	51.809300	179.787566	2073.0	5.115	10.3	13.0	3.31	8035	15.51	343.31
009970568-06	OBS	No	9.624401	133.642564	889.2	1.961	9.2	9.5	3.31	8035	13.06	3238.92
009970568-07	OBS	No	27.073036	138.845537	965.7	3.769	9.0	8.0	3.31	8035	10.94	815.67
009970568-08	OBS	No	14.115709	139.253007	1679.2	2.645	9.9	11.7	3.31	8035	23.27	1943.69
009970568-09	OBS	No	8.894852	132.463277	42.6	2.000	9.2	-1.0	3.31	8035	2.19	3597.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970568-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

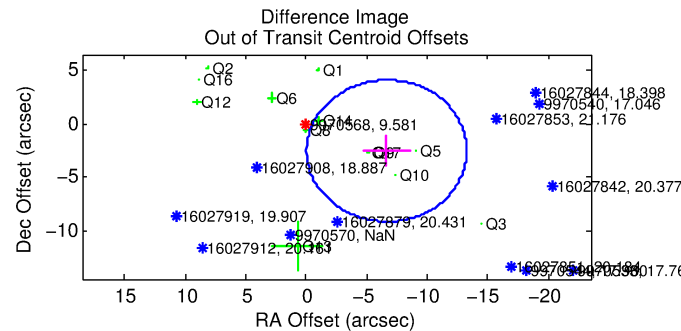
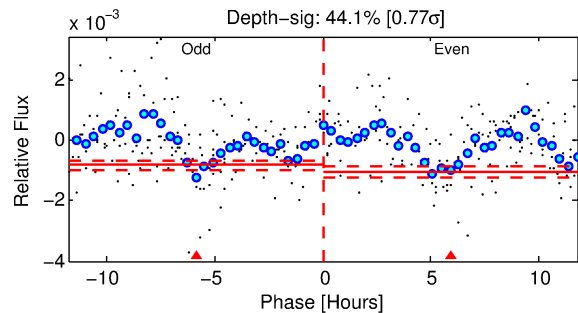
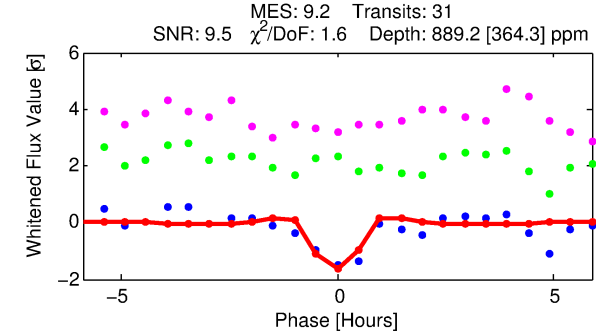
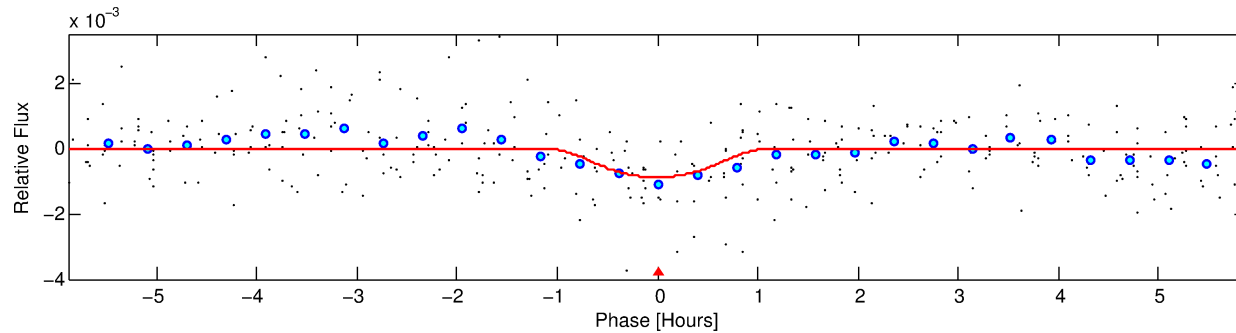
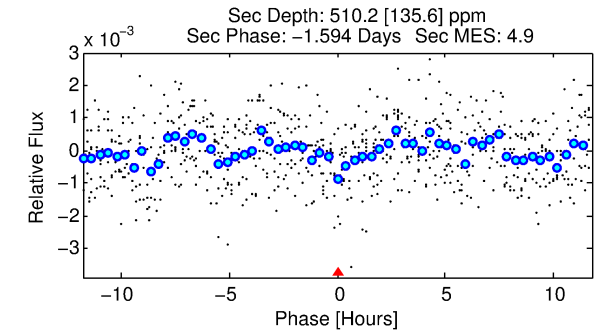
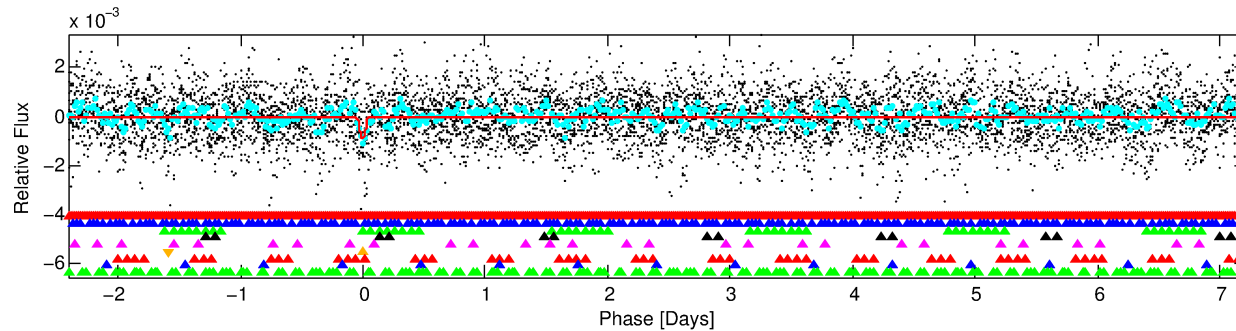
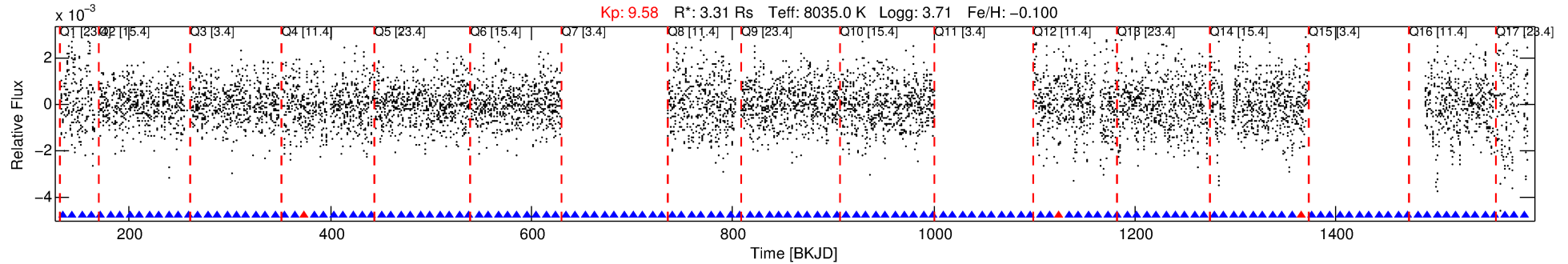
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009970568-06

No Significant Match Found

DV One-Page Summary

KIC: 9970568 Candidate: 6 of 9 Period: 9.624 d



DV Fit Results:

Period = 9.62440 [0.00007] d
Epoch = 133.6426 [0.0050] BKJD
 $R_p/R^* = 0.0361$ [0.0235]
 $a/R^* = 13.68$ [7.25]
 $b = 0.97$ [0.07]
 $\text{Seff} = 3238.92$ [2452.30]
 $T_{\text{eq}} = 1924$ [364] K
 $R_p = 13.06$ [10.53] R_e
 $a = 0.1125$ [0.0517] AU
 $\text{Ag} = 20.81$ [31.57] [0.63σ]
 $T_{\text{eff}} = 6353$ [2126] K [2.05σ]

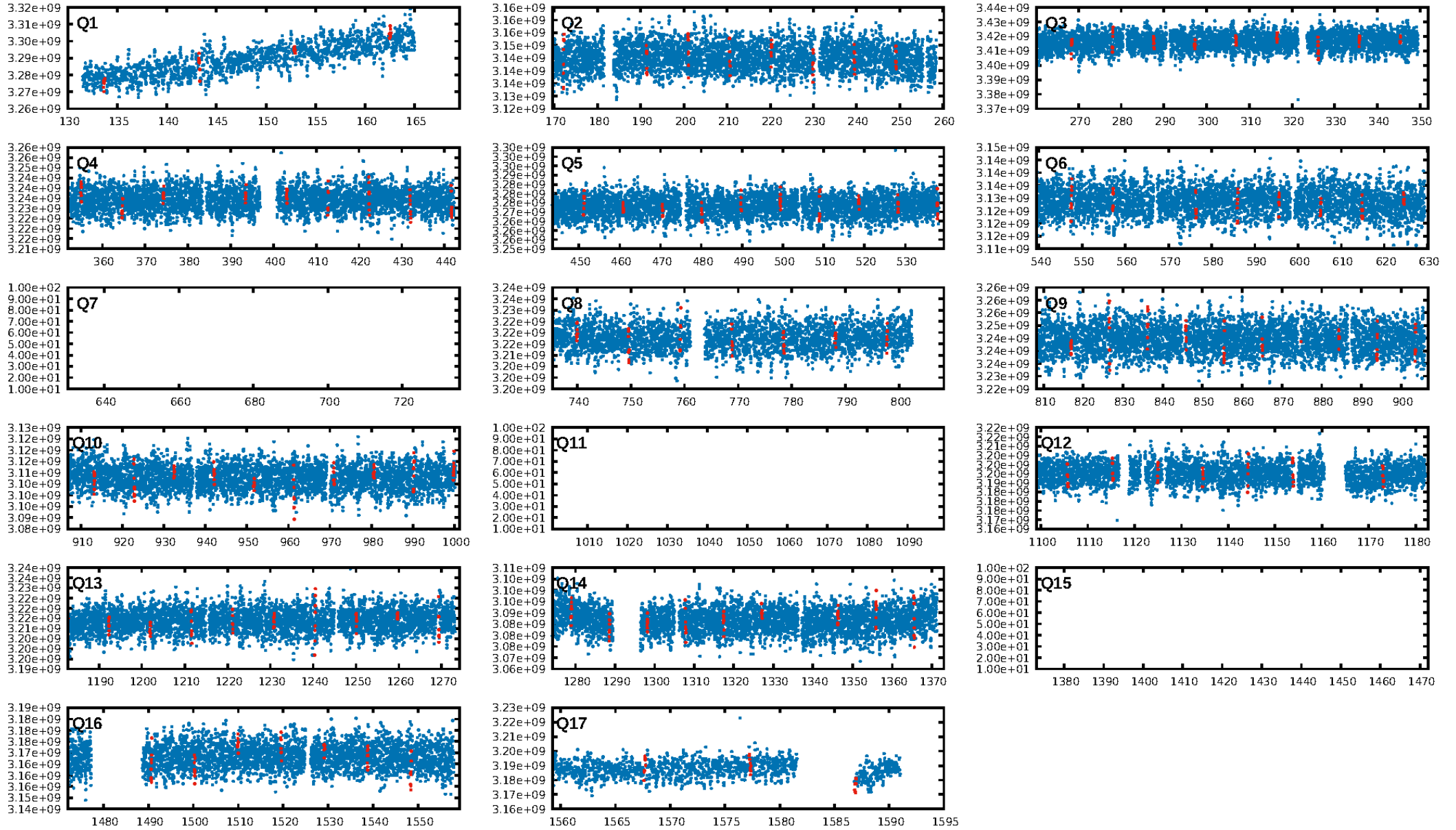
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.25σ]
LongPeriod-sig: 100.0% [32.74σ]
ModelChiSquare2-sig: 22.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.89 [25/28]
GhostDiagnostic-chr: N/A
Centroid-sig: 2.2%
Centroid-so: 0.284 arcsec [2.13σ]
OotOffset-rm: 7.097 arcsec [3.22σ]
KicOffset-rm: 8.096 arcsec [3.84σ]
OotOffset-st: 4/1/3/5 [13]
KicOffset-st: 4/1/3/5 [13]
DiffImageQuality-fgm: 0.00 [0/13]
DiffImageOverlap-fno: 0.43 [6/14]

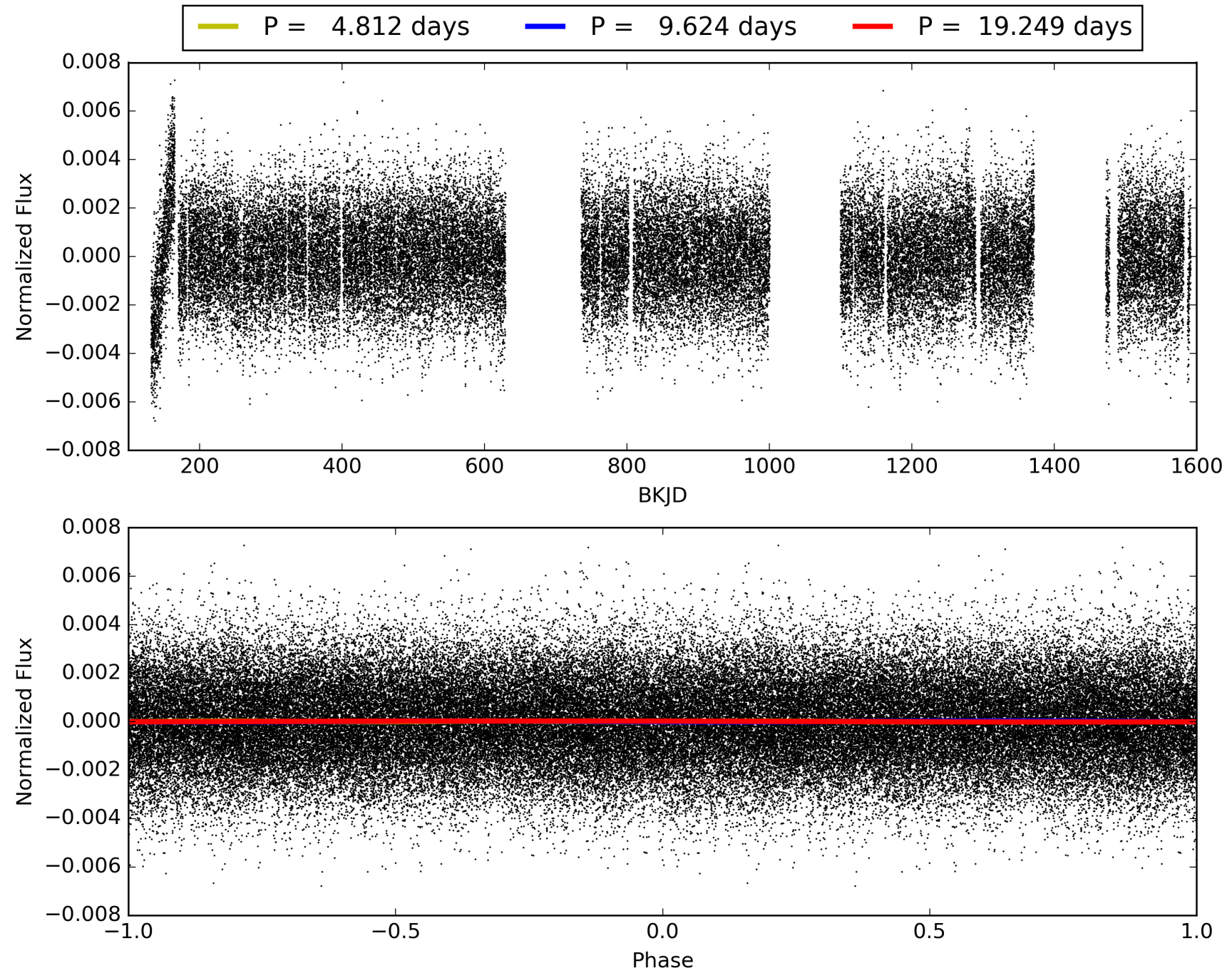
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:39 Z

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

TCE 009970568-06, PDC Light Curves

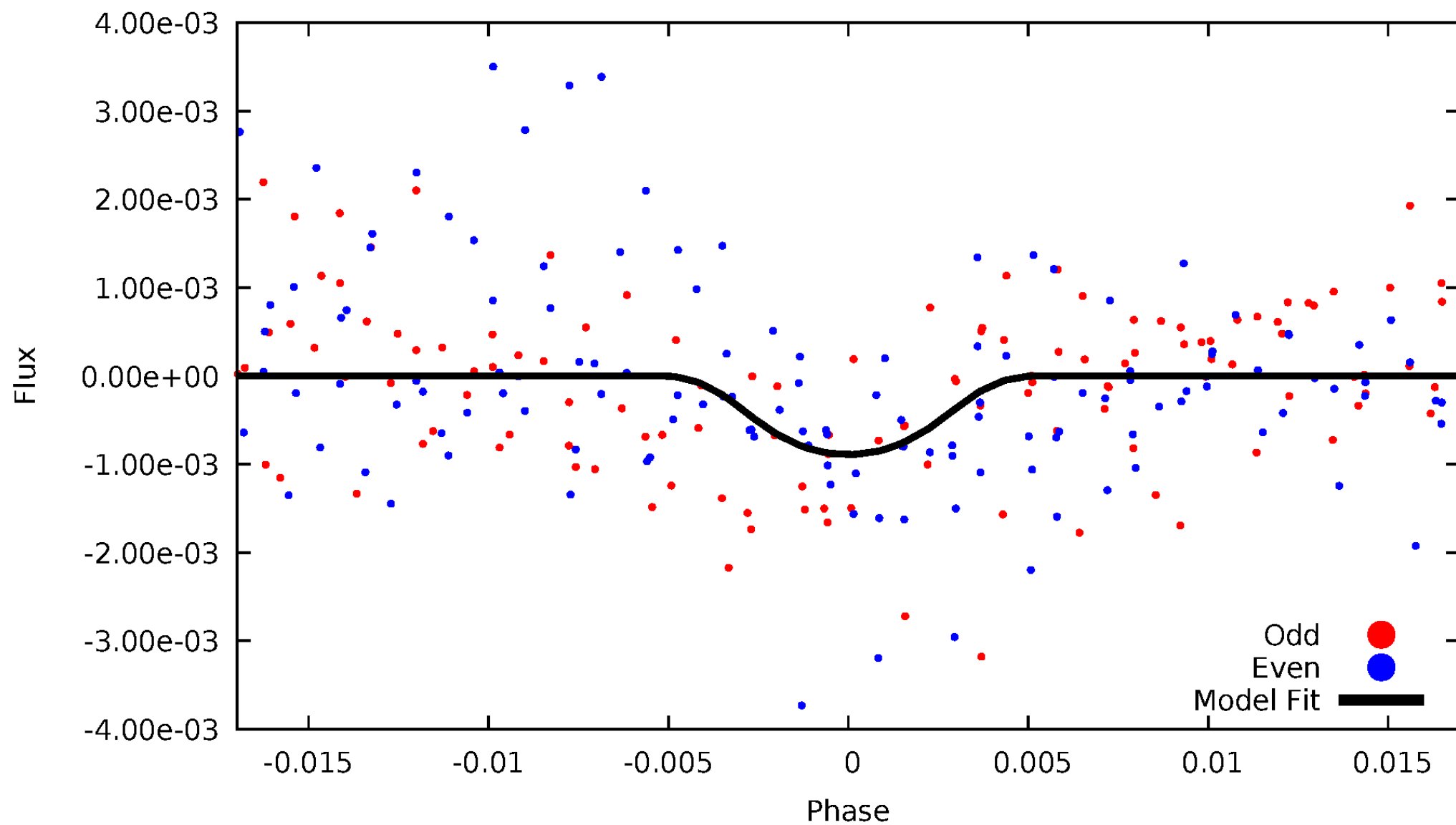


TCE 009970568-06



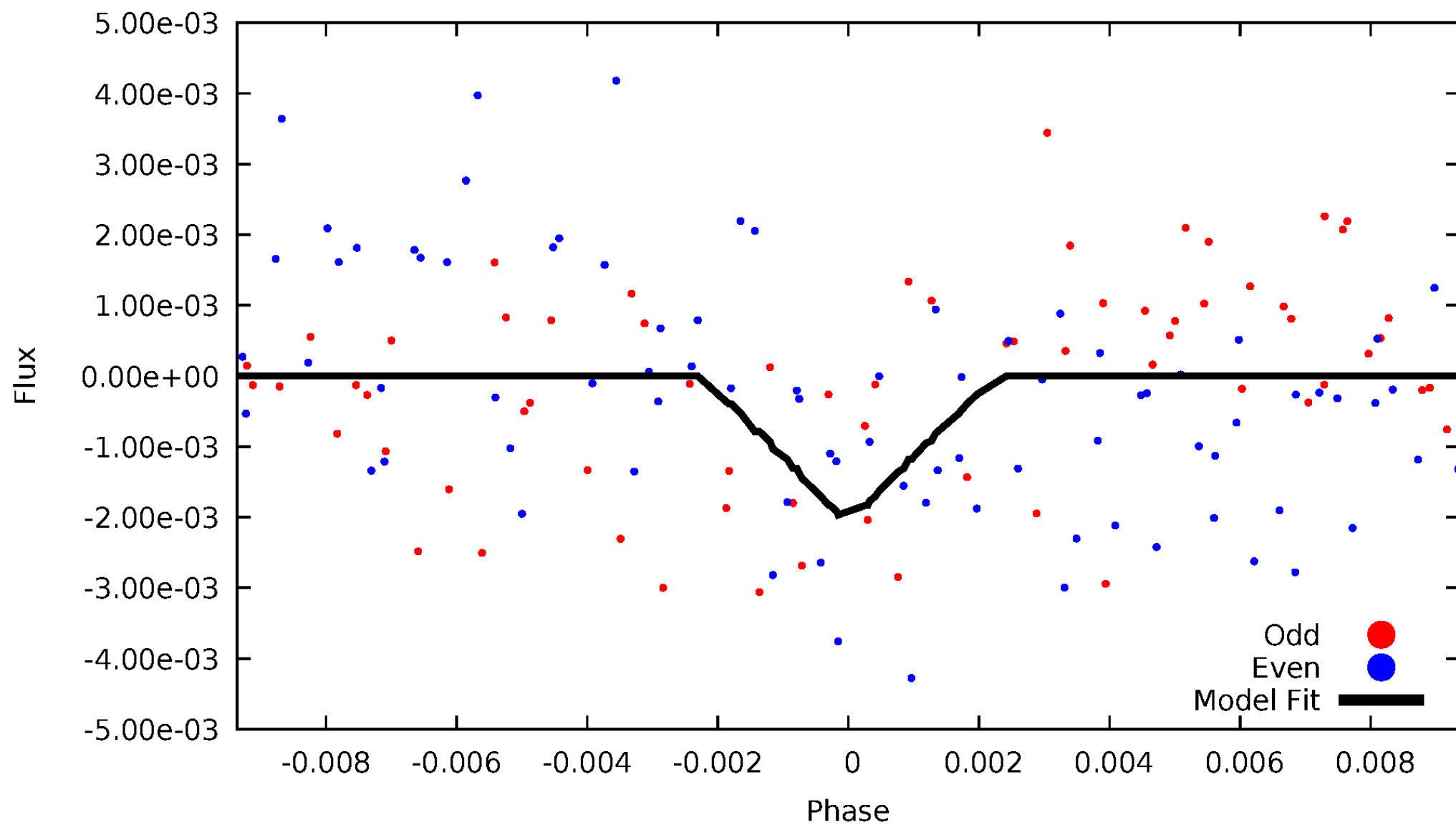
DV Odd/Even

TCE 009970568-06



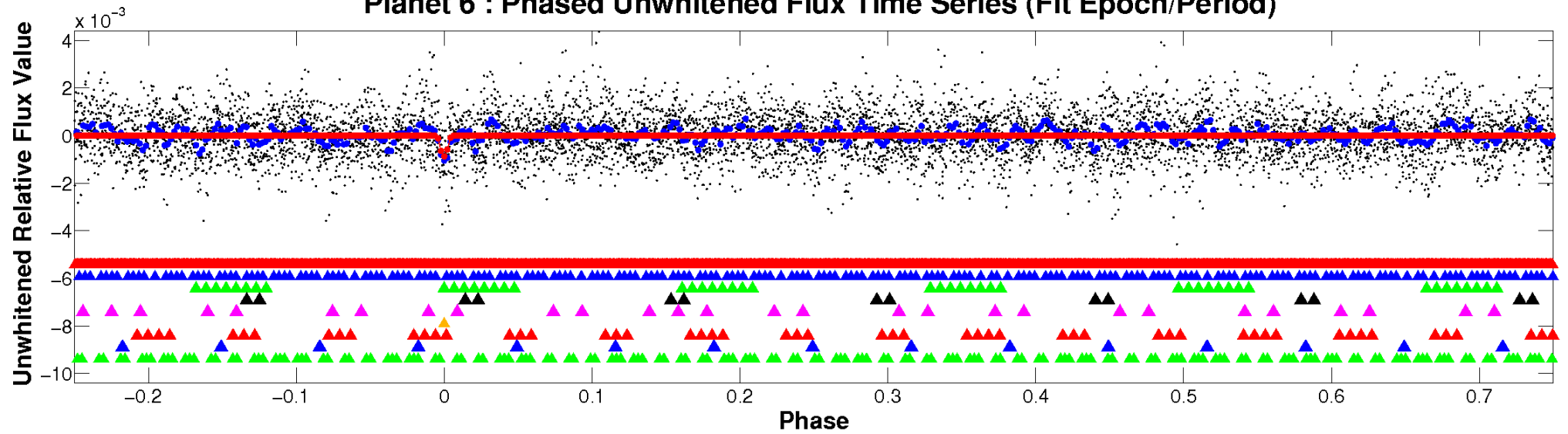
ALT Odd/Even

TCE 009970568-06

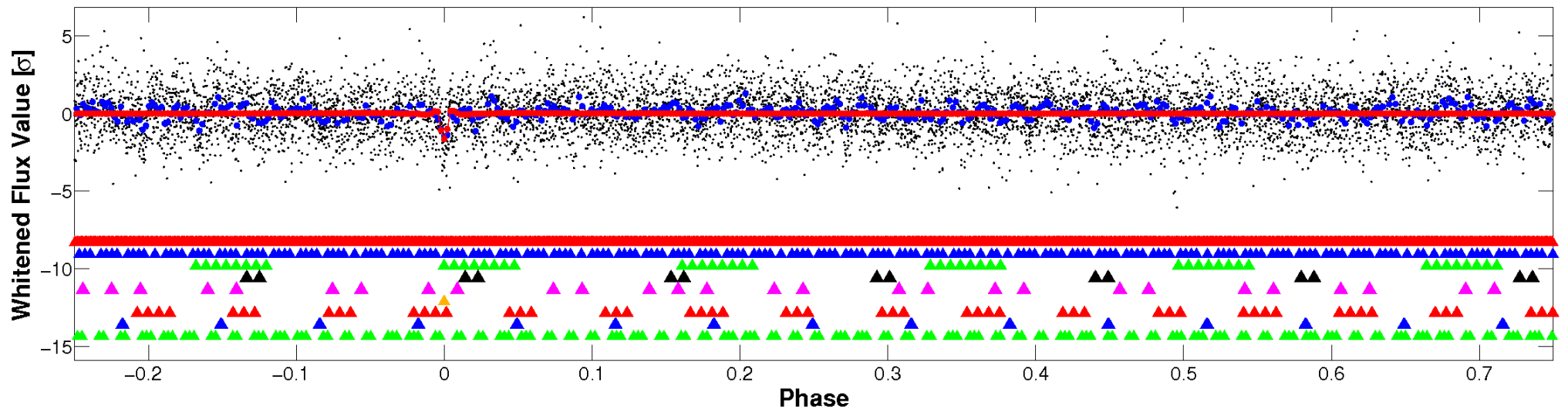


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

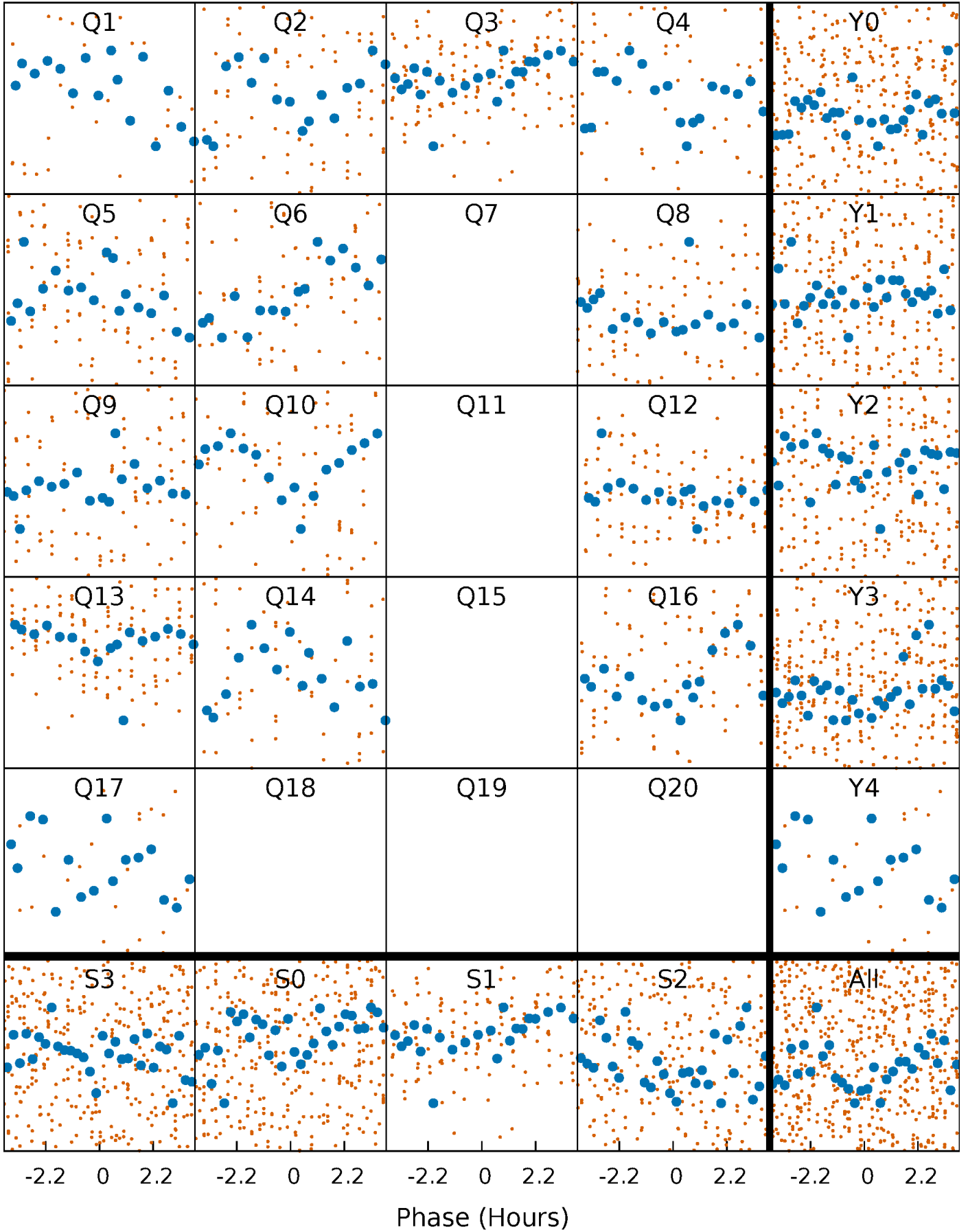


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



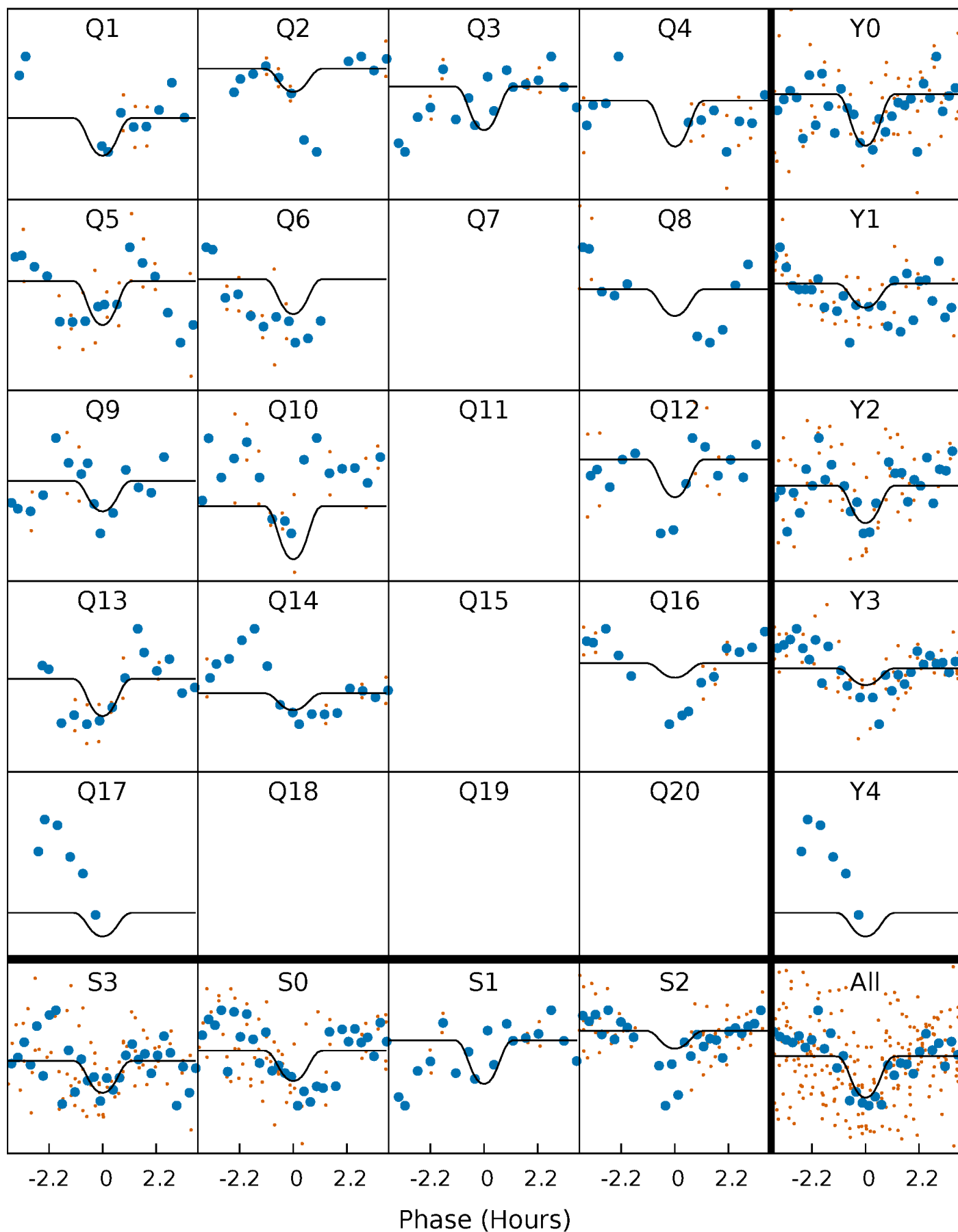
PDC Quarter-Phased Transit Curves

TCE 009970568-06 P= 9.624401 Days $T_0=133.642563$ (BKJD)



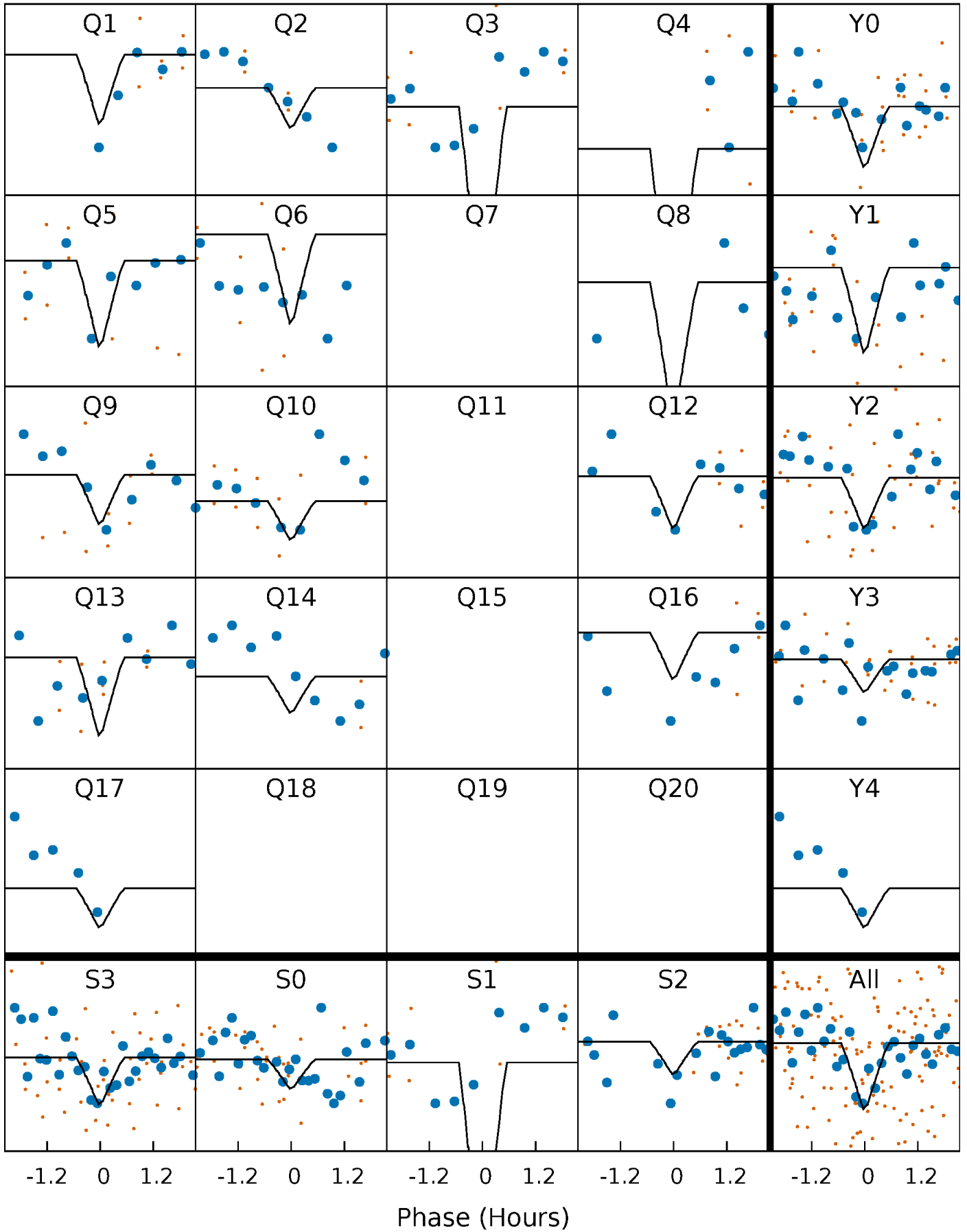
DV Quarter-Phased Transit Curves

TCE 009970568-06 P= 9.624401 Days $T_0=133.642563$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

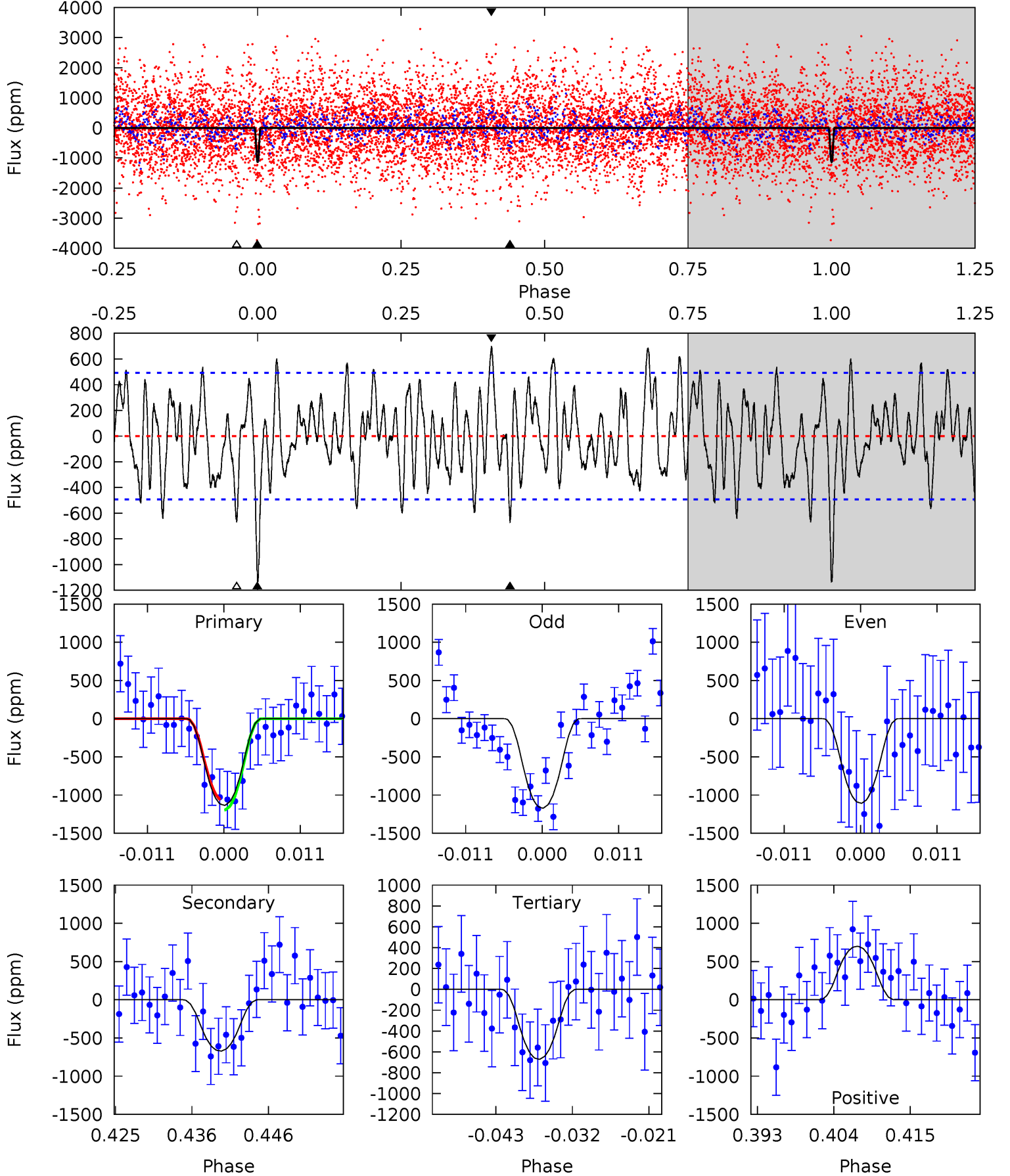
TCE 009970568-06 P= 9.624335 Days $T_0=133.640974$ (BKJD)



DV Model-Shift Uniqueness Test

009970568-06, P = 9.624401 Days, E = 124.018162 Days

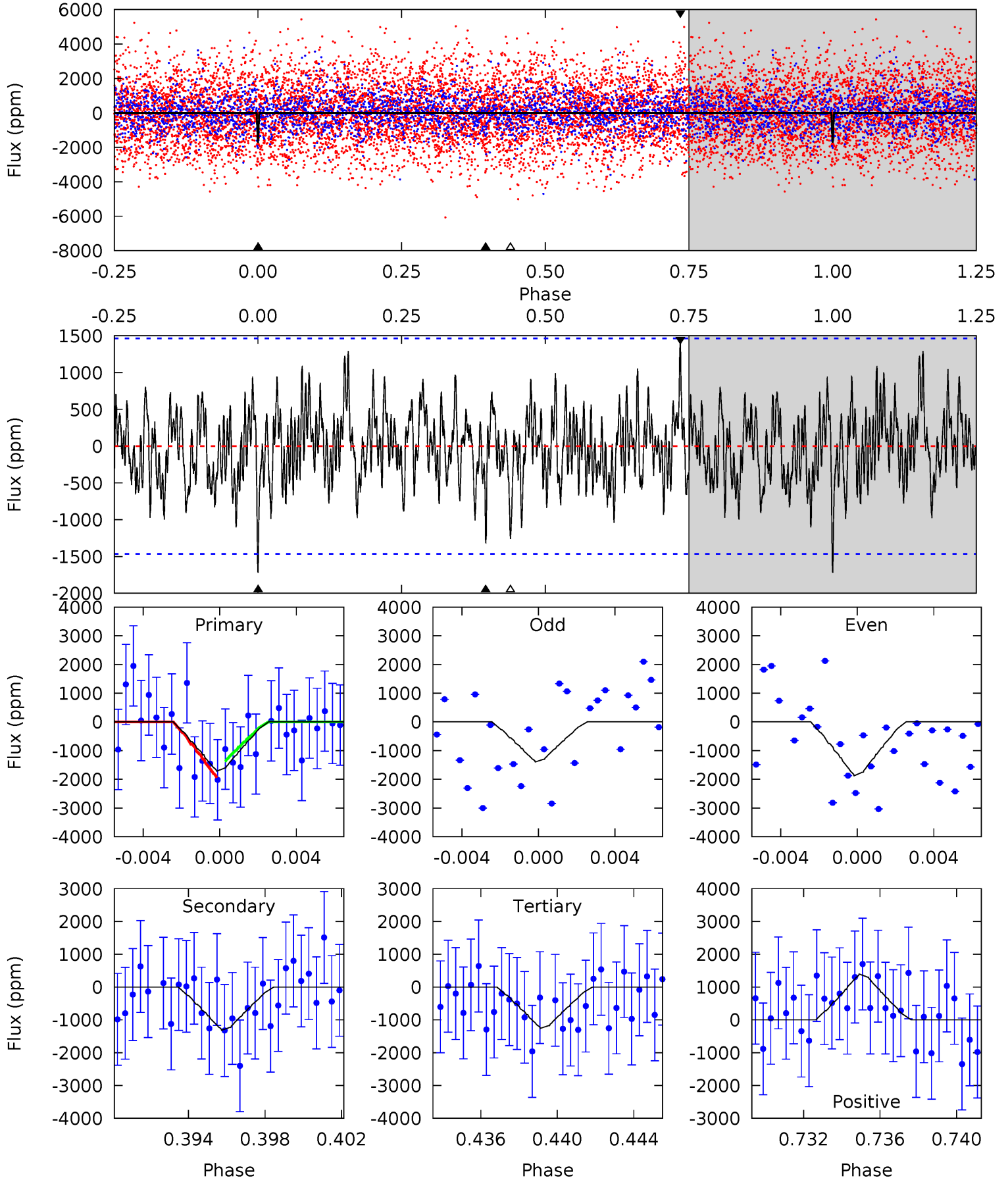
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	6.83	6.83	7.12	5.01	2.55	2.70	4.71	4.42	0.00	-0.29	0.32	1.08	0.38	0.69



Alt Model-Shift Uniqueness Test

009970568-06, P = 9.624335 Days, E = 124.016639 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.11	4.68	4.47	4.97	5.21	2.89	1.52	1.64	1.15	0.20	-0.29	0.83	1.65	0.45	1.03



Stellar Parameters For KIC 009970568

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8035^{+223}_{-362}	$3.709^{+0.432}_{-0.108}$	$-0.100^{+0.200}_{-0.350}$	$3.312^{+0.789}_{-1.579}$	$2.046^{+0.372}_{-0.538}$	$0.079^{+0.307}_{-0.028}$
	+3%/-5%	+12%/-3%	+200%/-350%	+24%/-48%	+18%/-26%	+388%/-35%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009970568-06 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-671 ± 98	$12.22^{+8.03}_{-6.57}$	2594^{+217}_{-336}	6456^{+3849}_{-1327}	32^{+114}_{-20}
Alt.	-1315 ± 281	$15.16^{+8.66}_{-7.32}$	2582^{+199}_{-310}	6793^{+3313}_{-1266}	40^{+105}_{-24}

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

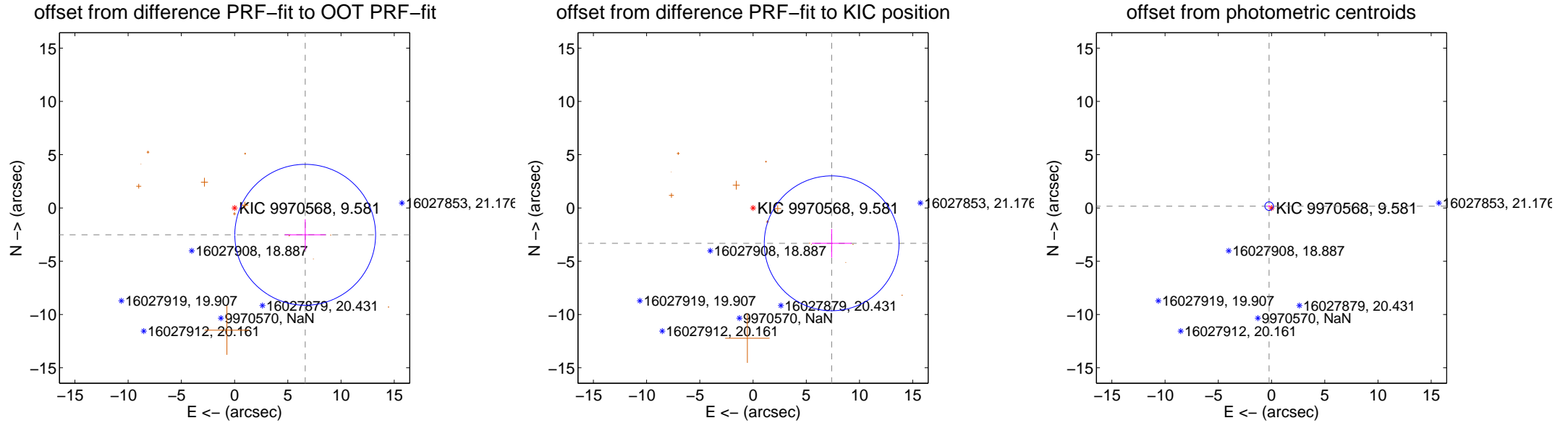
DV Centroid Data

Supplemental centroid analysis for 009970568-06. **Kepler magnitude: 9.58.** Transit SNR 9.51

There are 0 quarters with good PRF difference image offsets

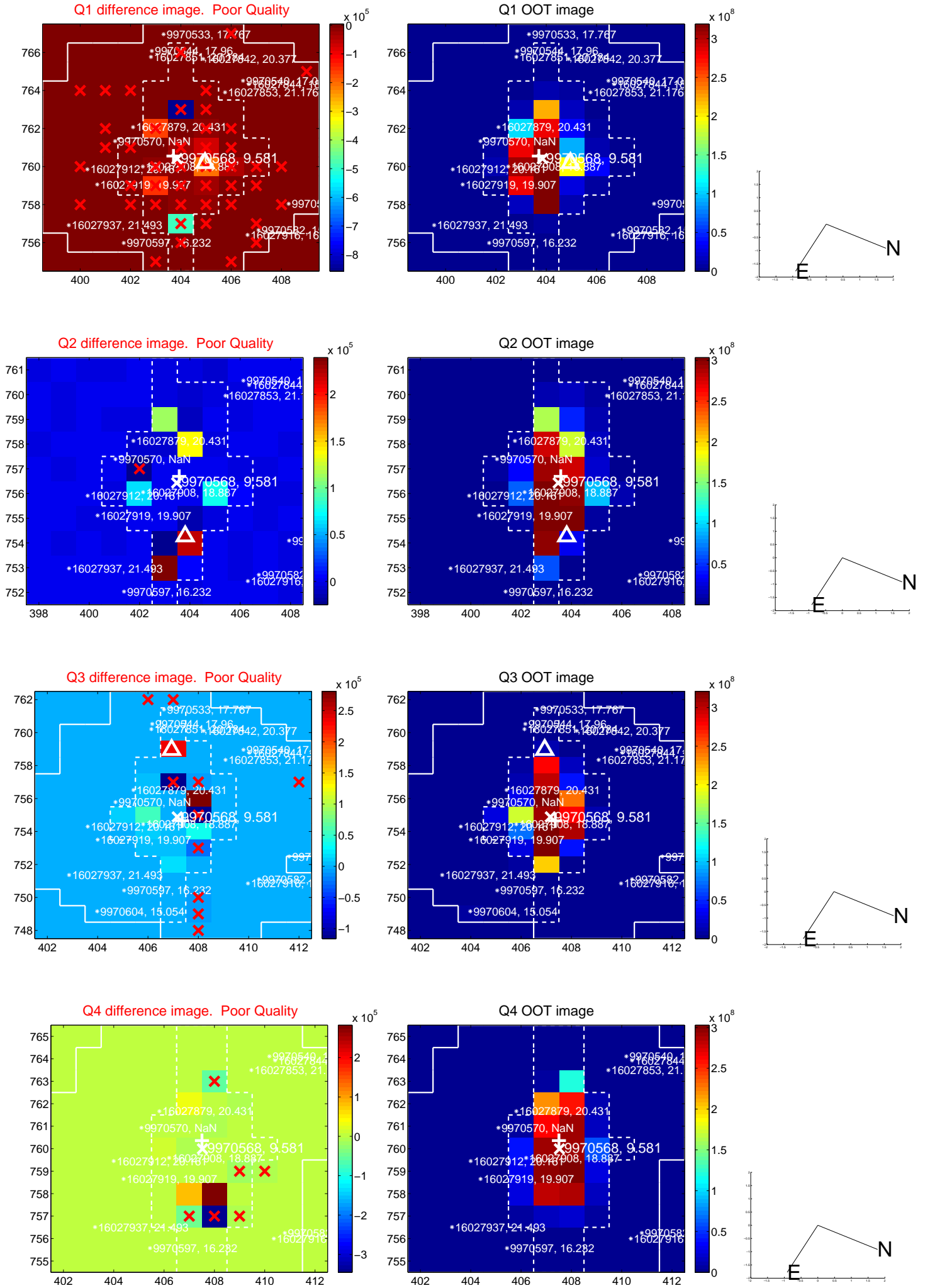
The direct PRF centroid is offset from the target star catalog position by about 0.88 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.097 ± 2.204	3.22	-6.635 ± 1.925	-2.518 ± 1.466
PRF-fit source offset from KIC position	8.096 ± 2.110	3.84	-7.385 ± 1.872	-3.318 ± 1.344
photometric centroid source offset	0.28 ± 0.13	2.13	0.23 ± 0.16	0.17 ± 0.08

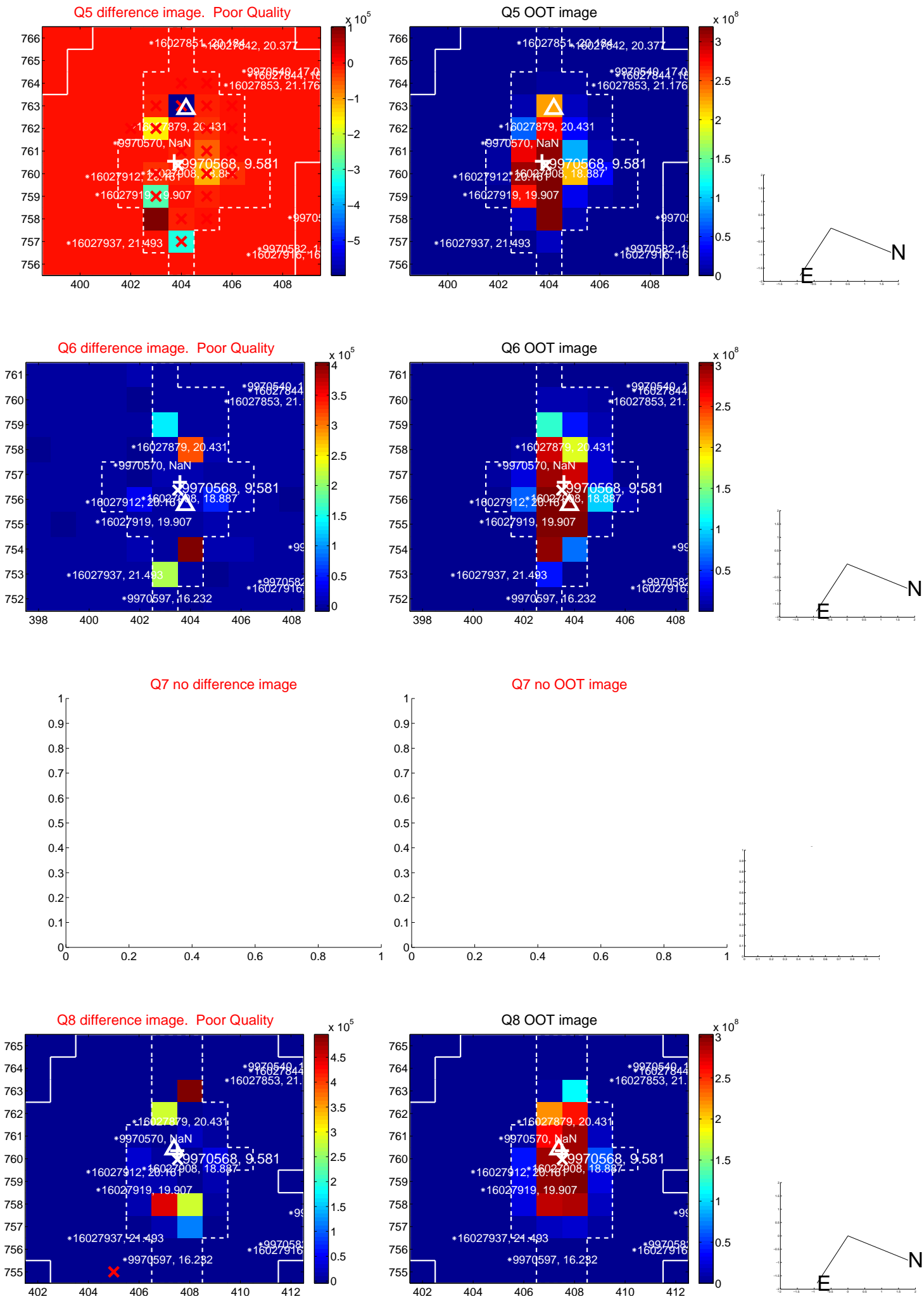


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

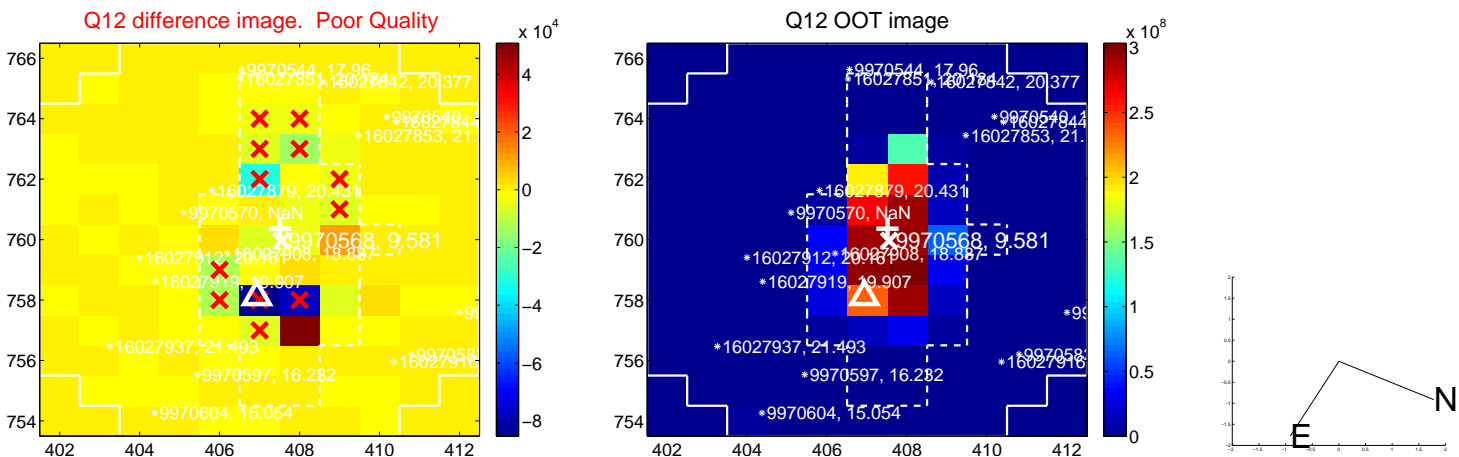
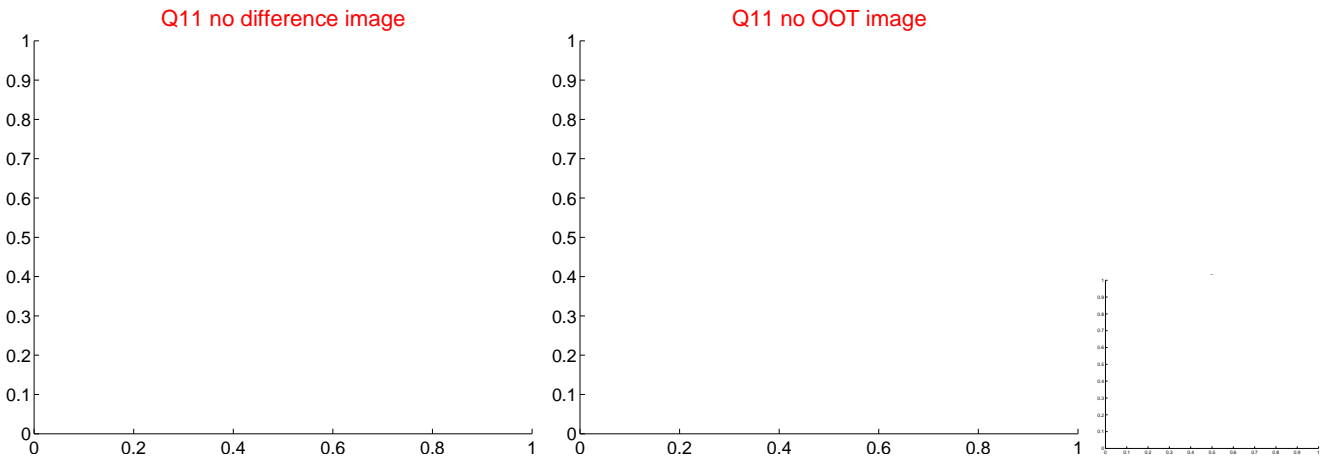
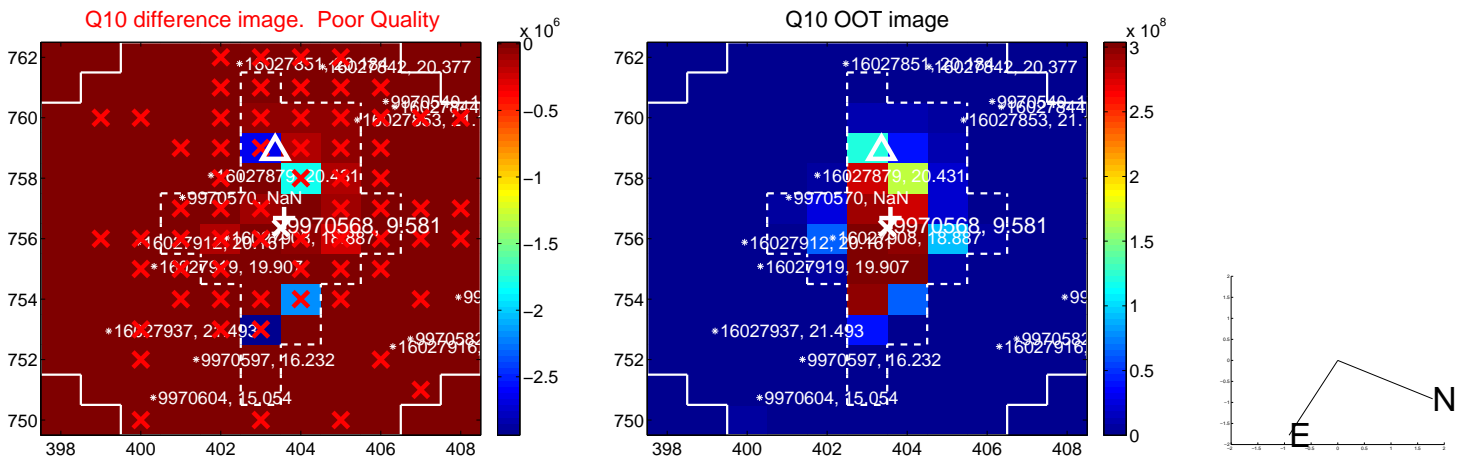
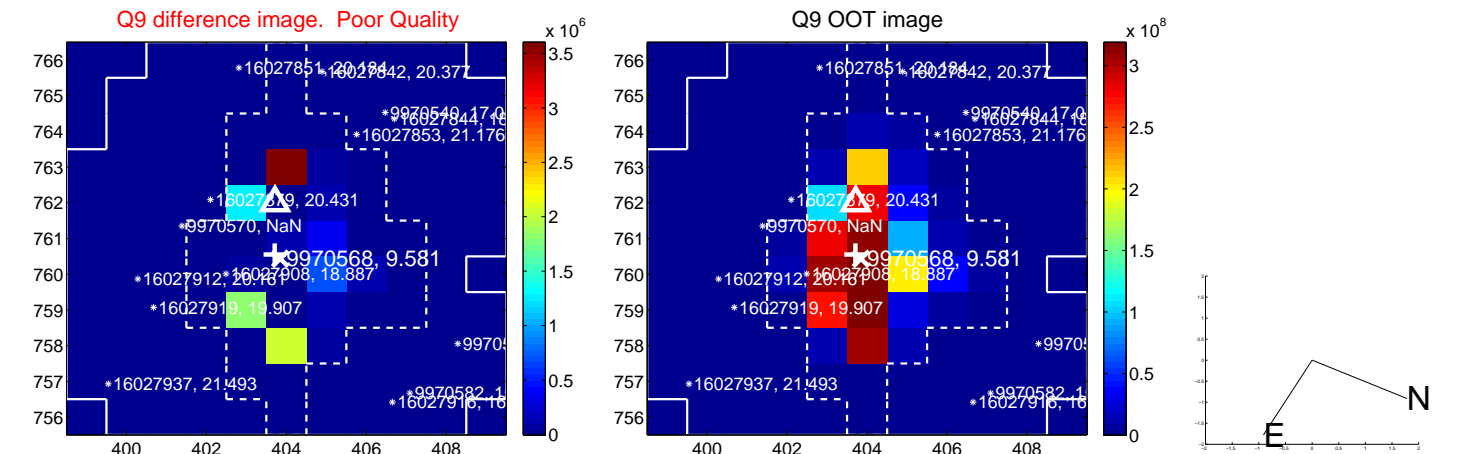
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



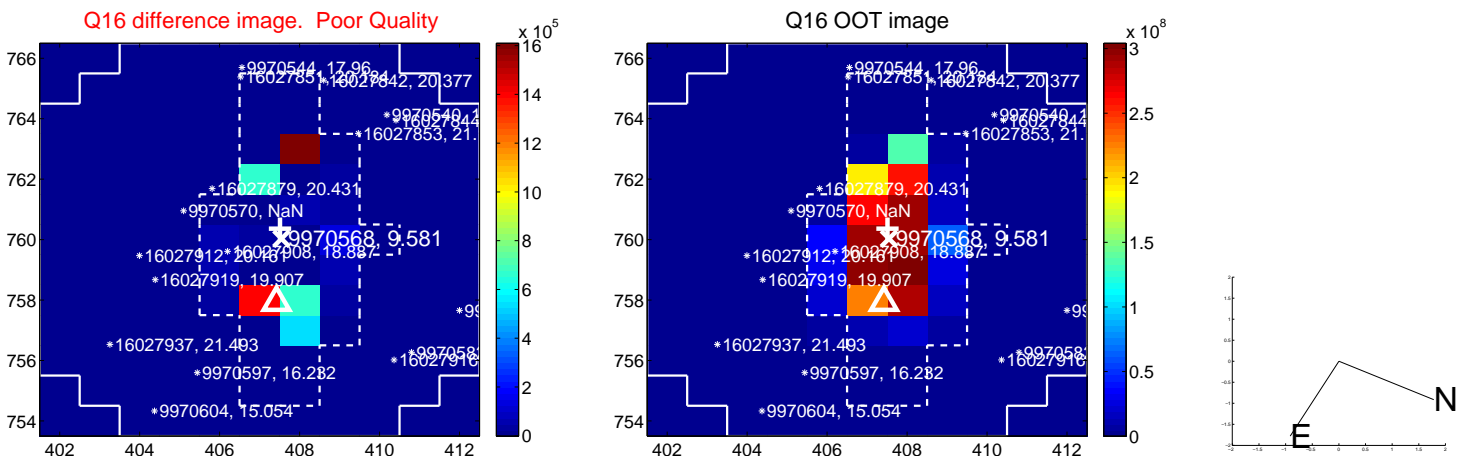
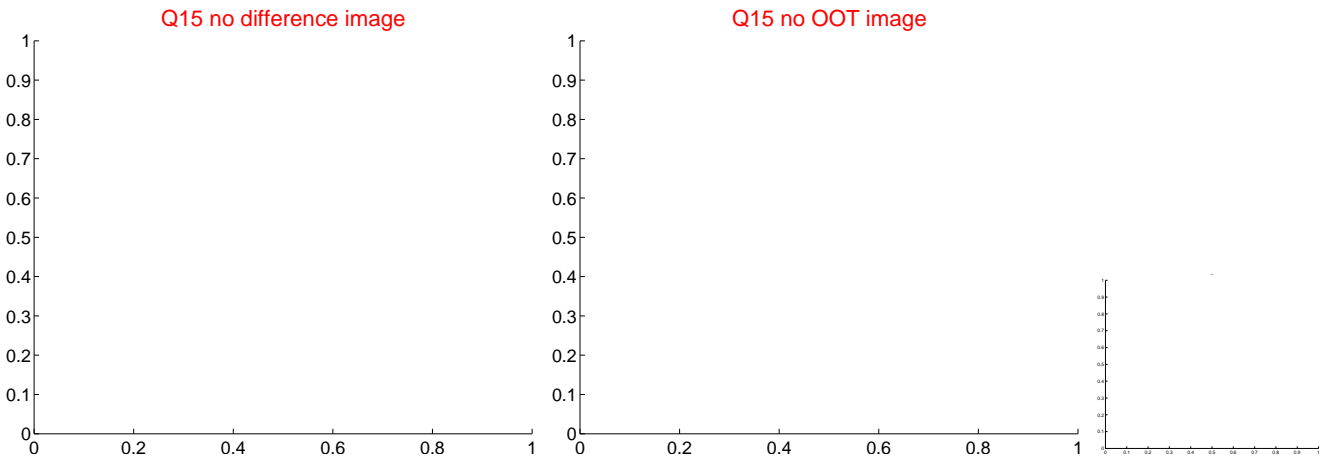
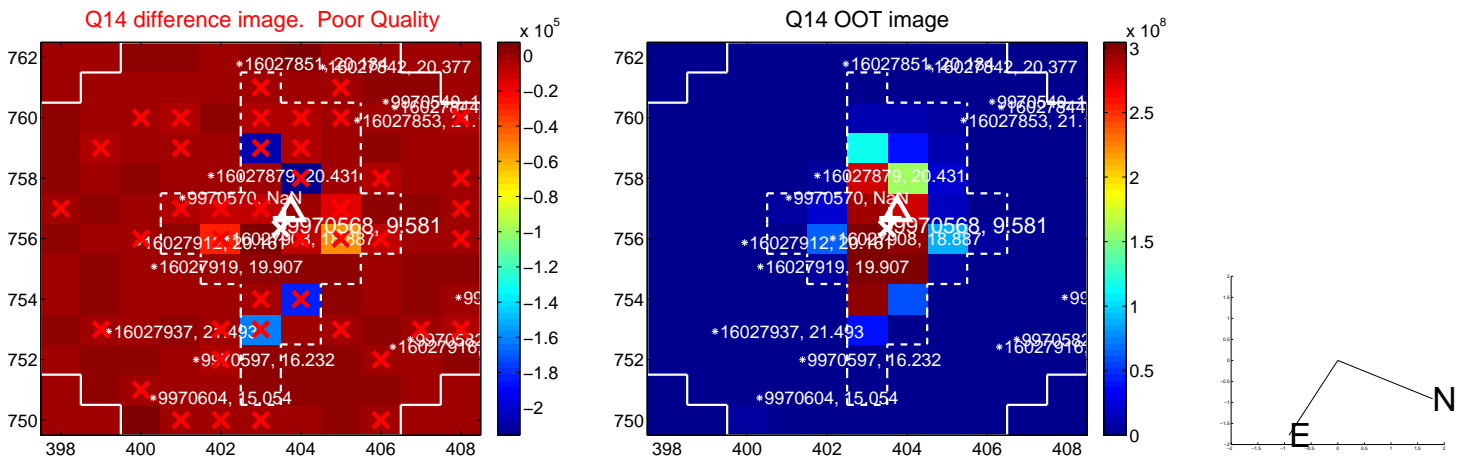
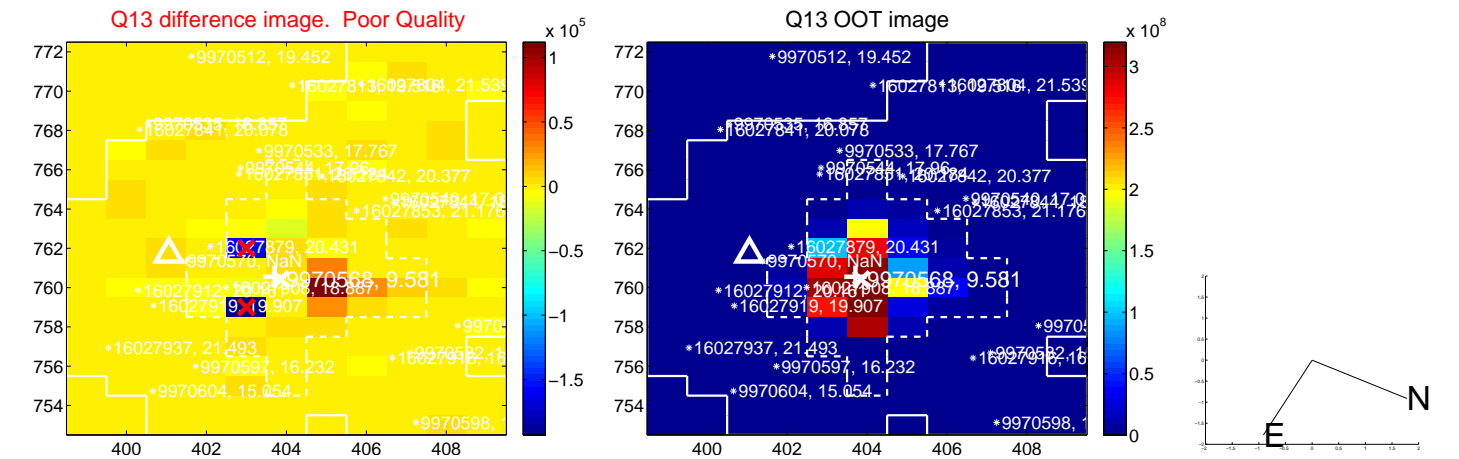
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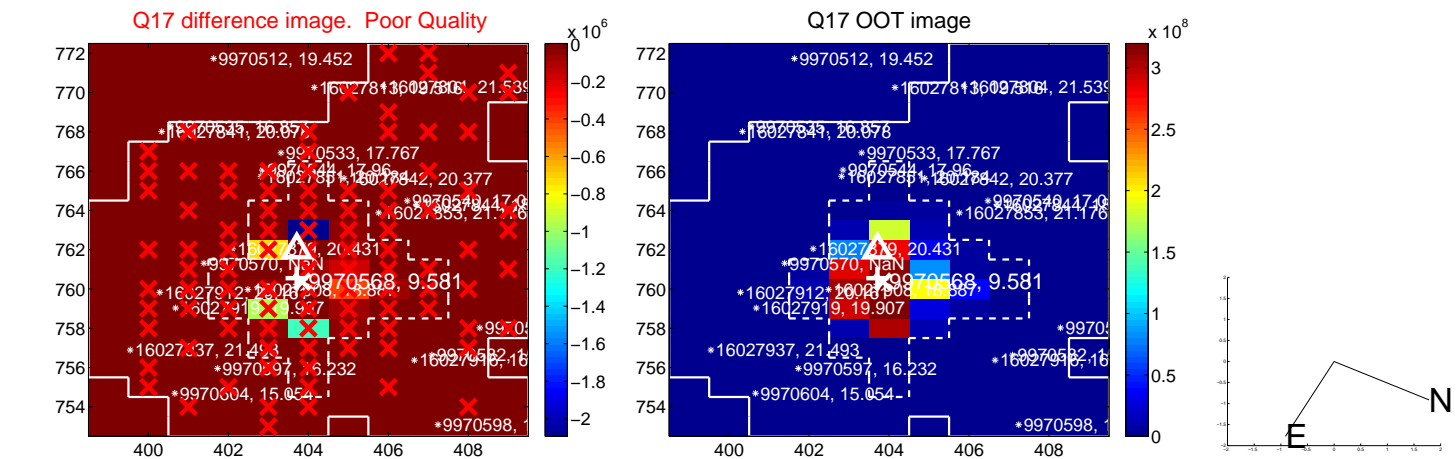
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



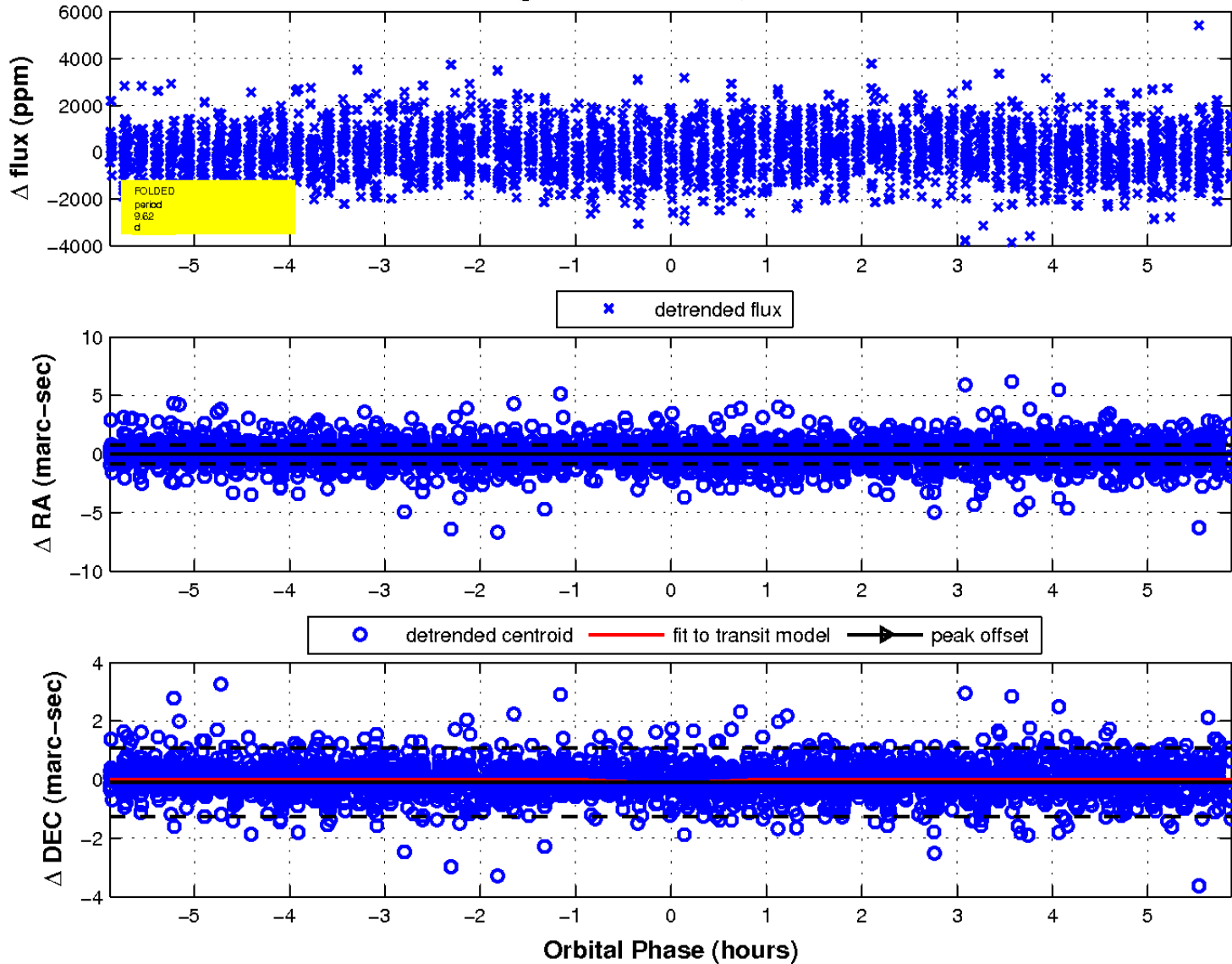
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

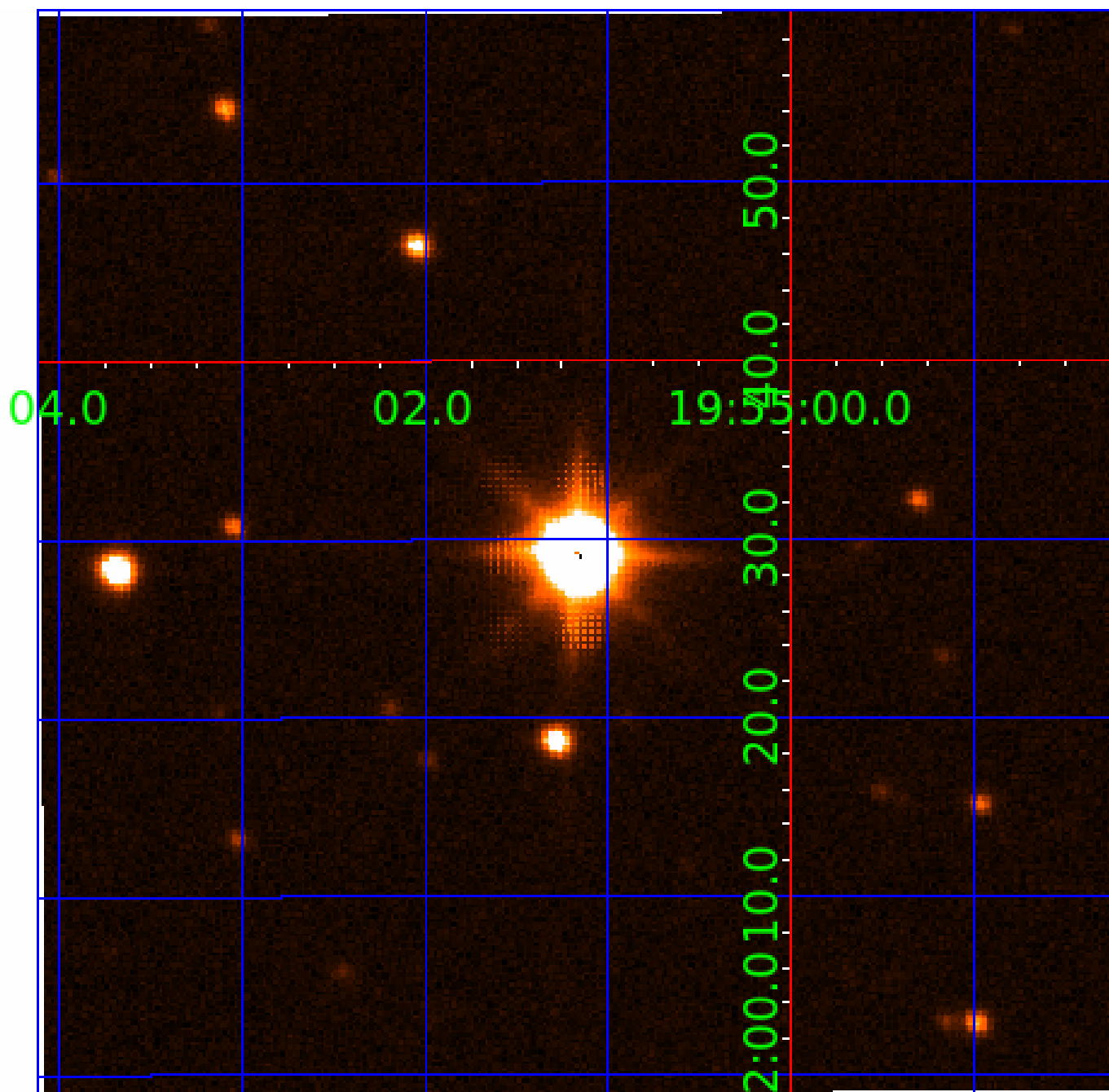


fluxWeightedCentroids, Planet 6 of 9



UKIRT Image

Declination



KIC 009970568

Q1-17 DR25 TCE Parameters

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009970568-07	OBS	No	27.073036	138.845537	965.7	3.769	9.0	8.0	3.31	8035	10.94	815.67
009970568-08	OBS	No	14.115709	139.253007	1679.2	2.645	9.9	11.7	3.31	8035	23.27	1943.69
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009970568-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

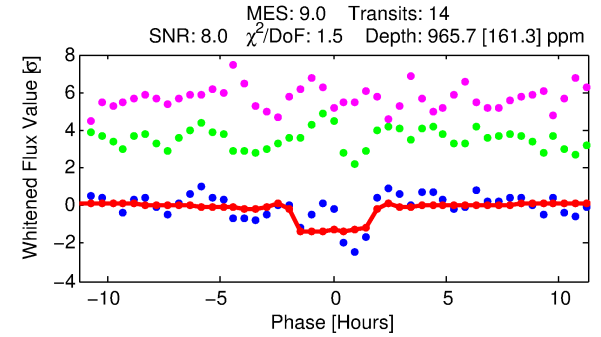
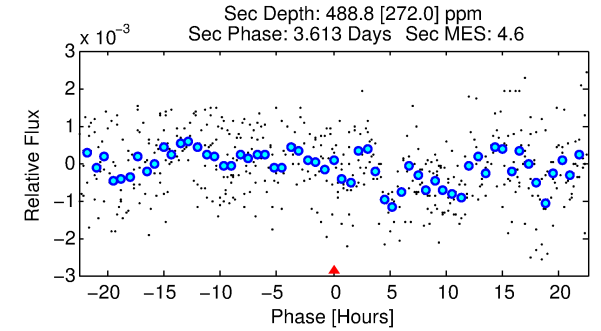
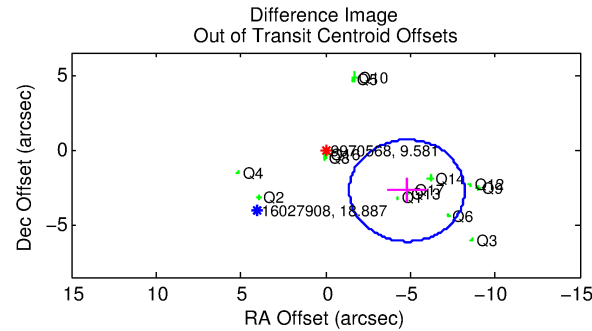
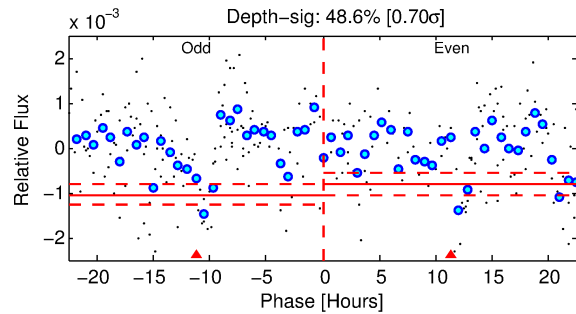
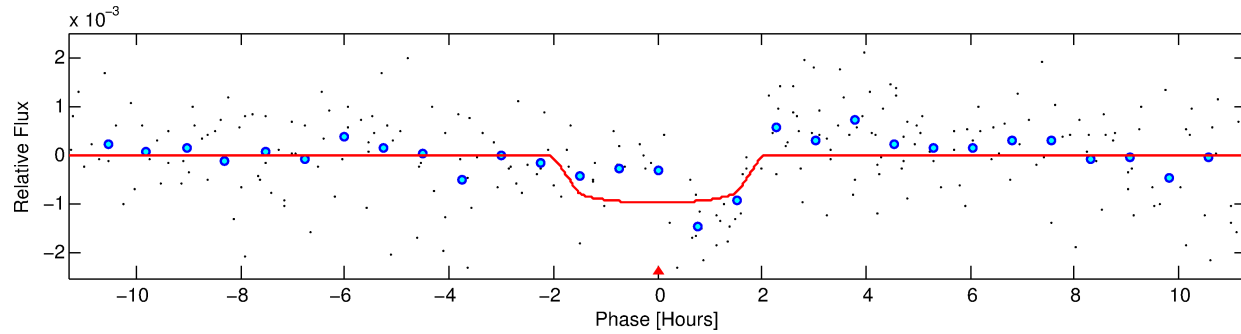
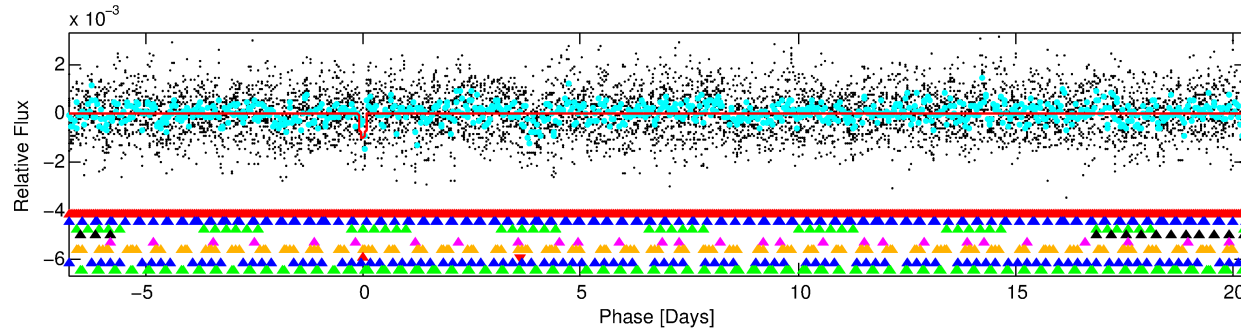
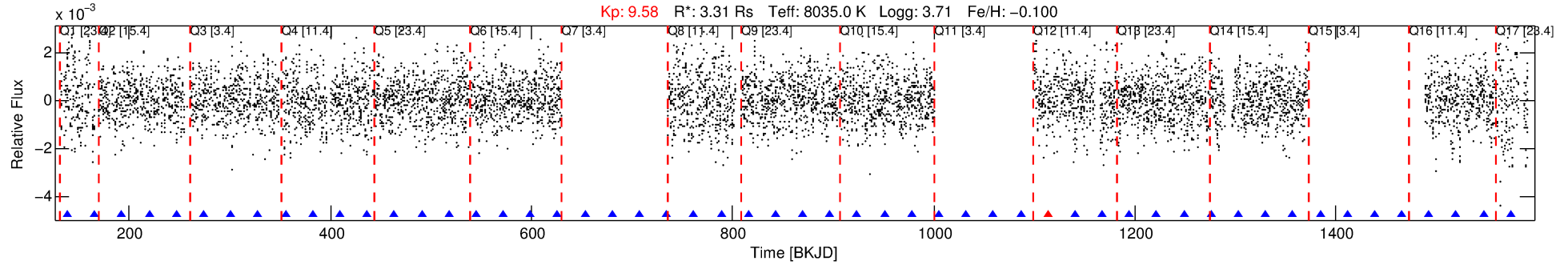
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009970568-07

No Significant Match Found

DV One-Page Summary

KIC: 9970568 Candidate: 7 of 9 Period: 27.073 d



DV Fit Results:

Period = 27.07304 [0.00041] d
Epoch = 138.8455 [0.0096] BKJD
Rp/R* = 0.0303 [0.0290]
a/R* = 43.23 [229.48]
b = 0.66 [4.52]
Seff = 815.67 [617.57]
Teq = 1363 [258] K
Rp = 10.94 [11.71] Re
a = 0.2241 [0.1029] AU
Ag = 112.84 [240.09] [0.47 σ]
Teffp = 6867 [3442] K [1.59 σ]

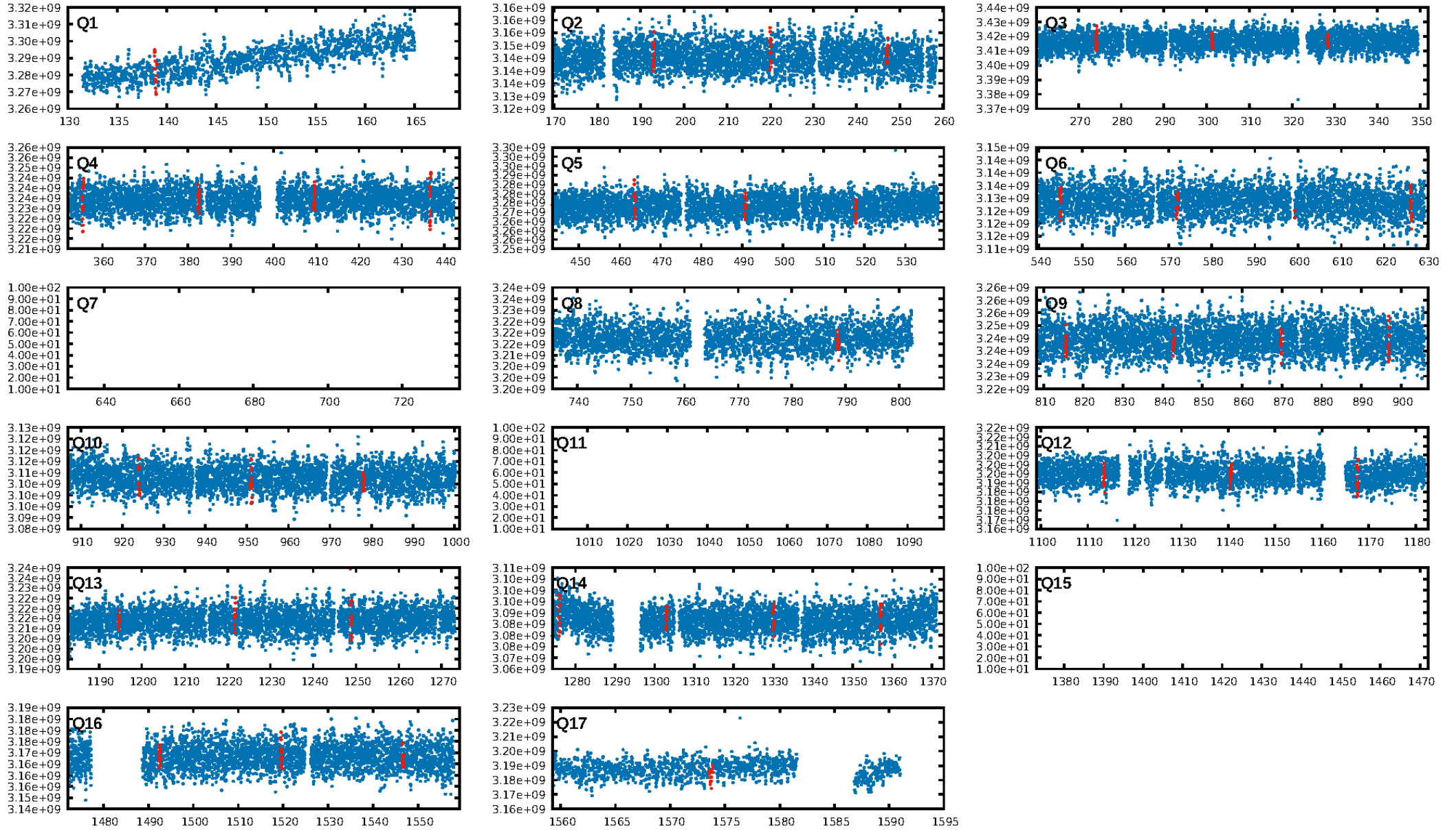
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.54 σ]
LongPeriod-sig: 100.0% [17.60 σ]
ModelChiSquare2-sig: 8.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.93 [13/14]
GhostDiagnostic-chr: N/A
Centroid-sig: 1.1%
Centroid-so: 0.071 arcsec [0.70 σ]
OotOffset-rm: 5.521 arcsec [4.88 σ]
KicOffset-rm: 6.197 arcsec [5.46 σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.00 [0/14]
DiffImageOverlap-fno: 0.00 [0/14]

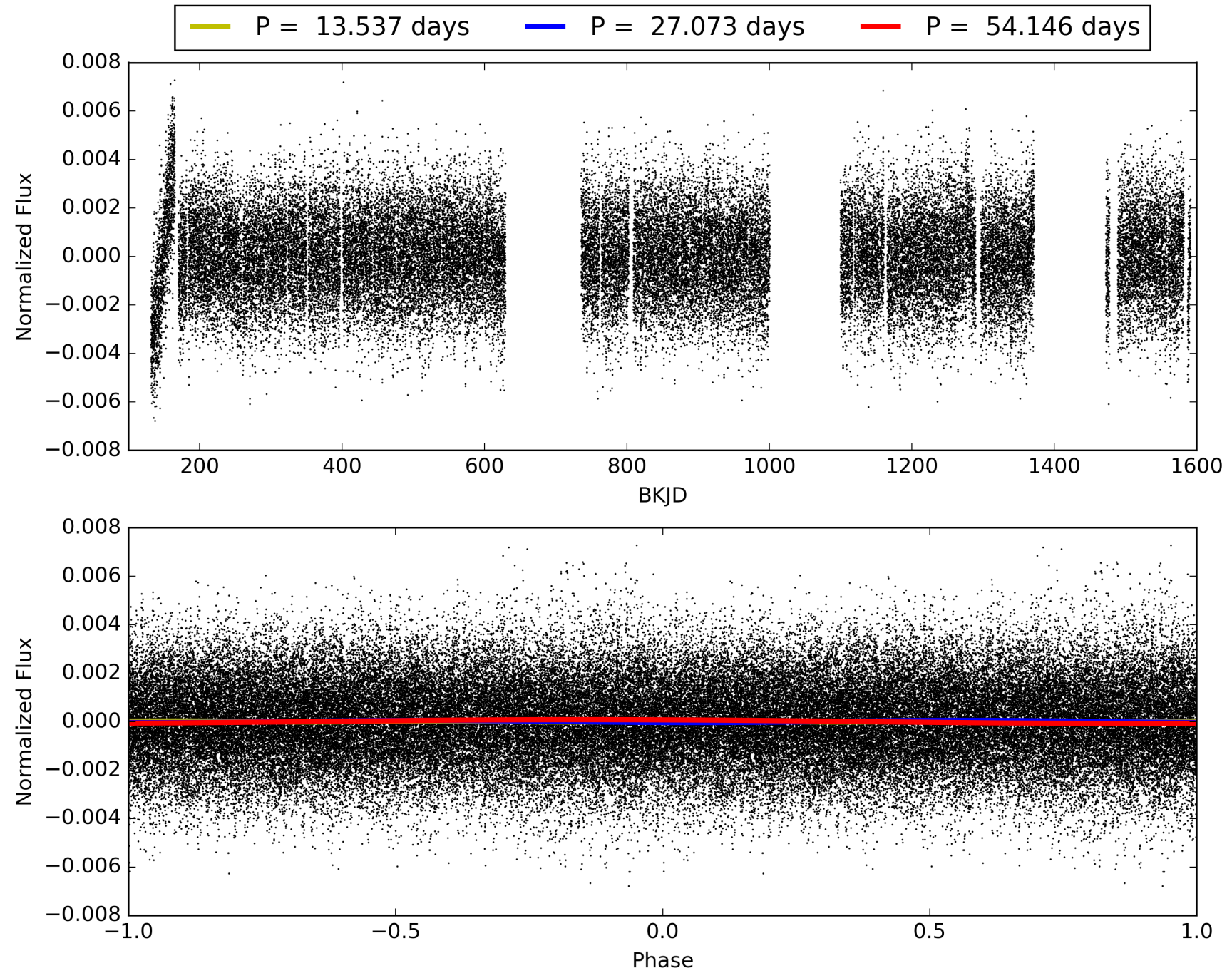
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:42 Z

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

TCE 009970568-07, PDC Light Curves

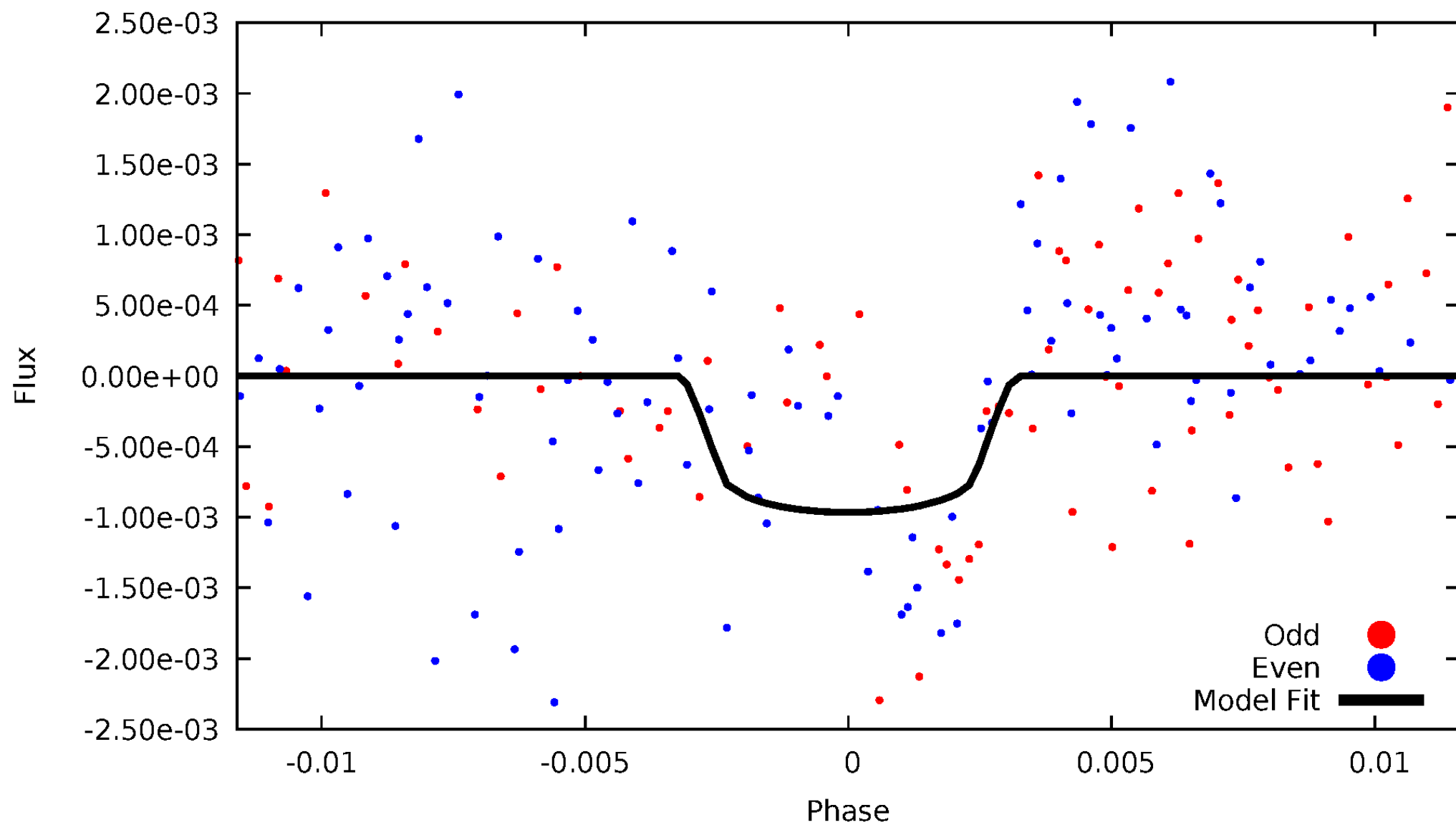


TCE 009970568-07



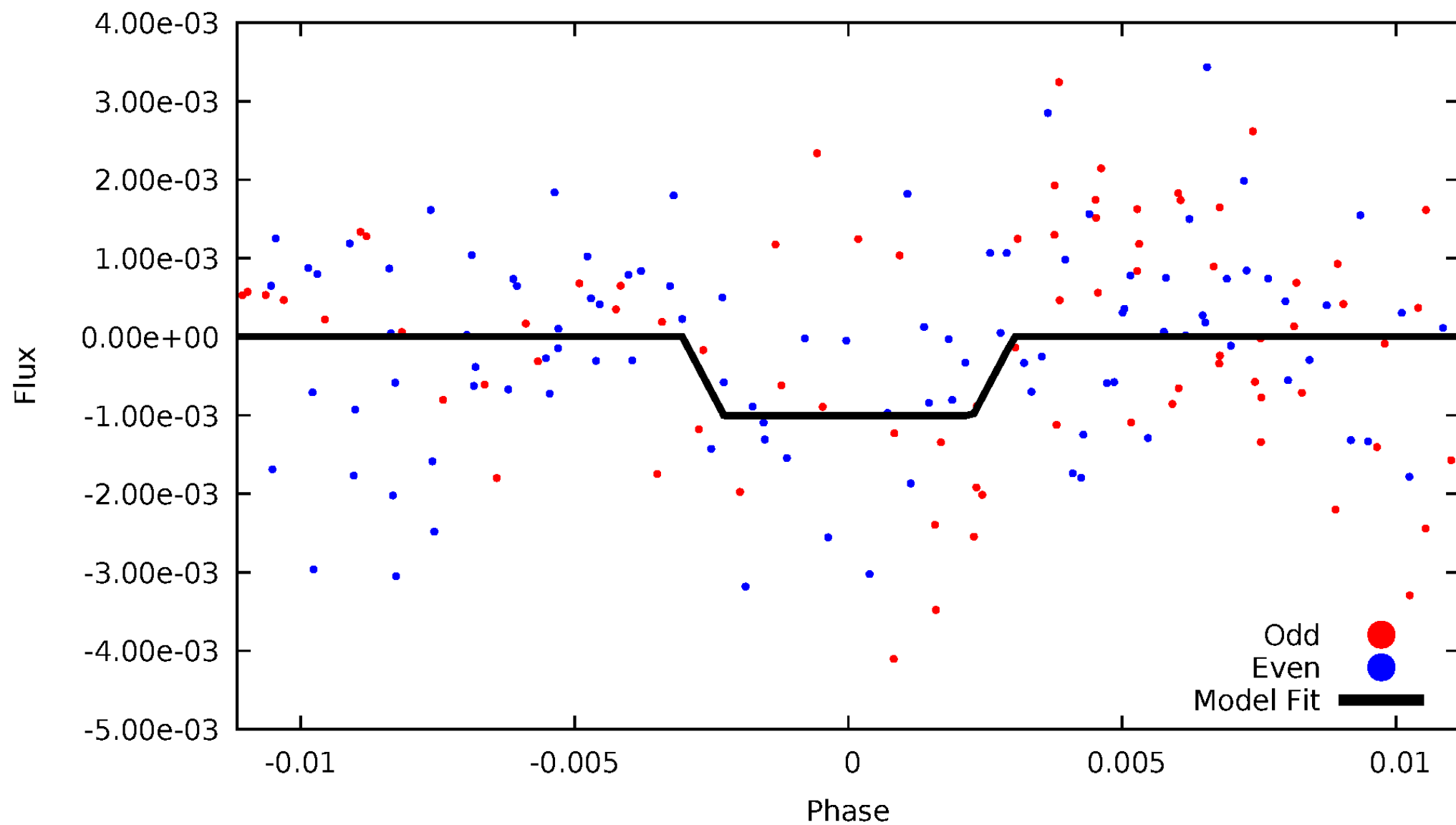
DV Odd/Even

TCE 009970568-07



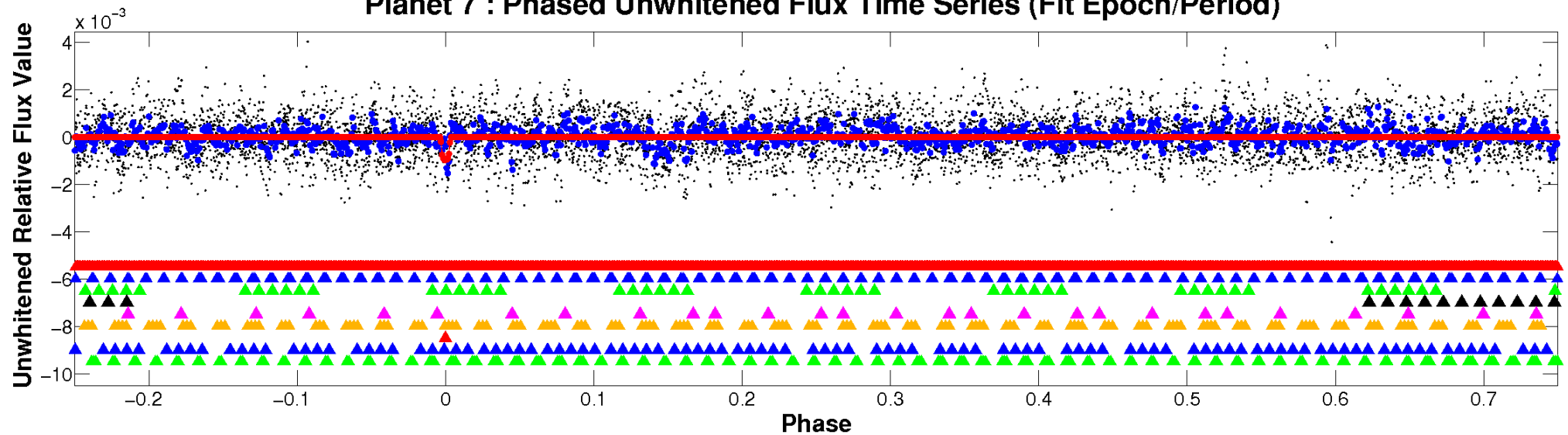
ALT Odd/Even

TCE 009970568-07

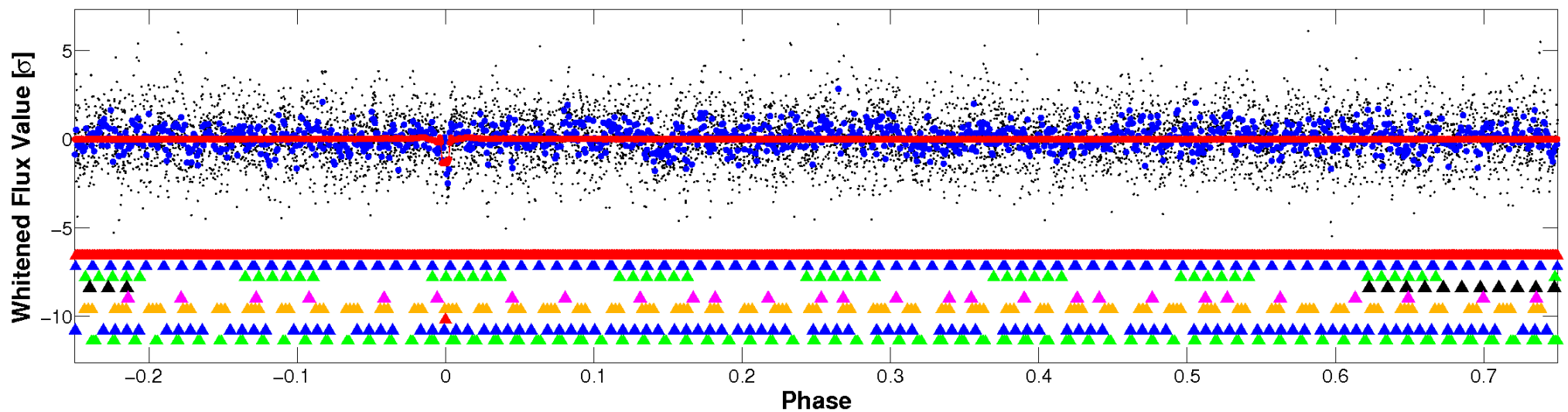


Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

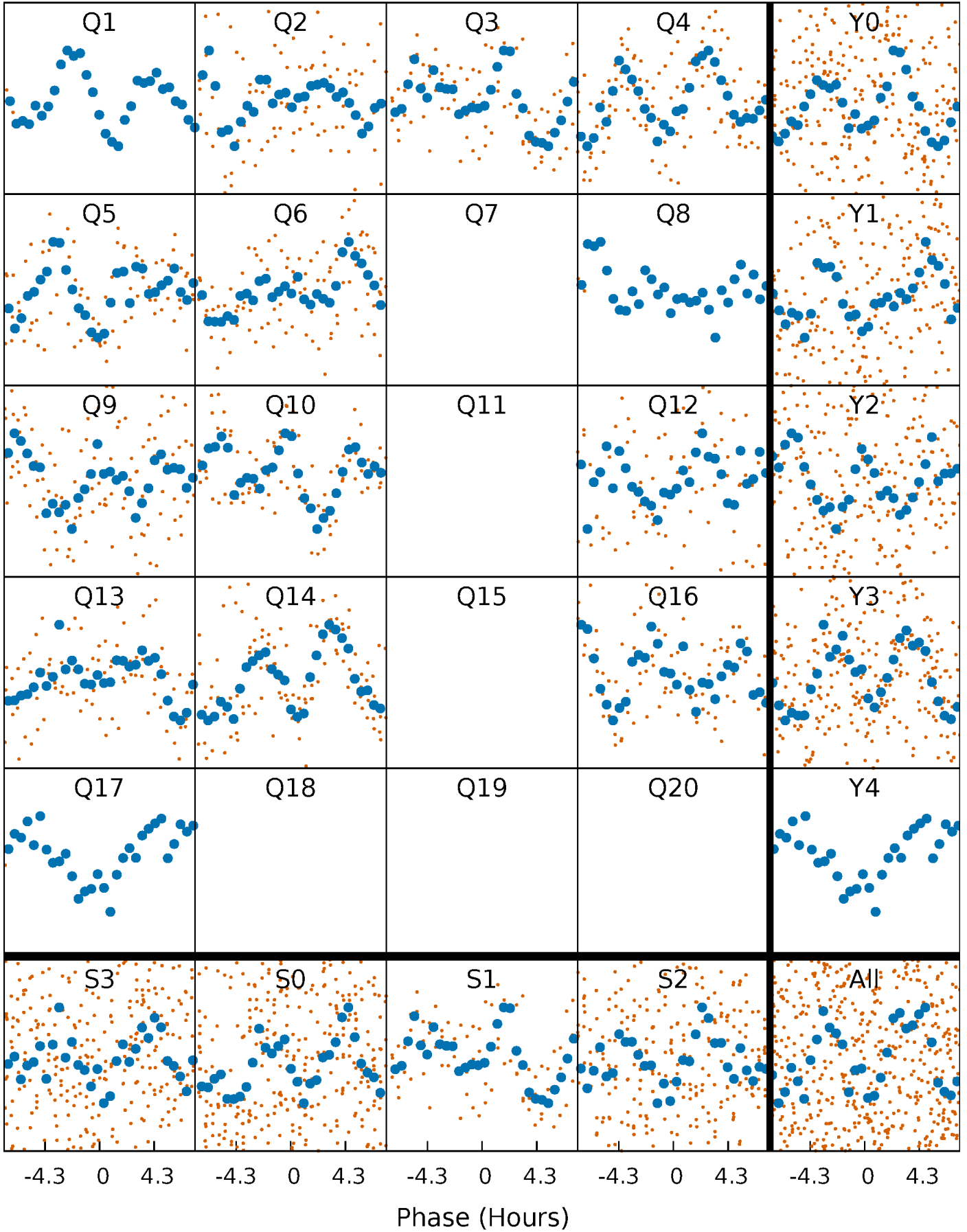


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



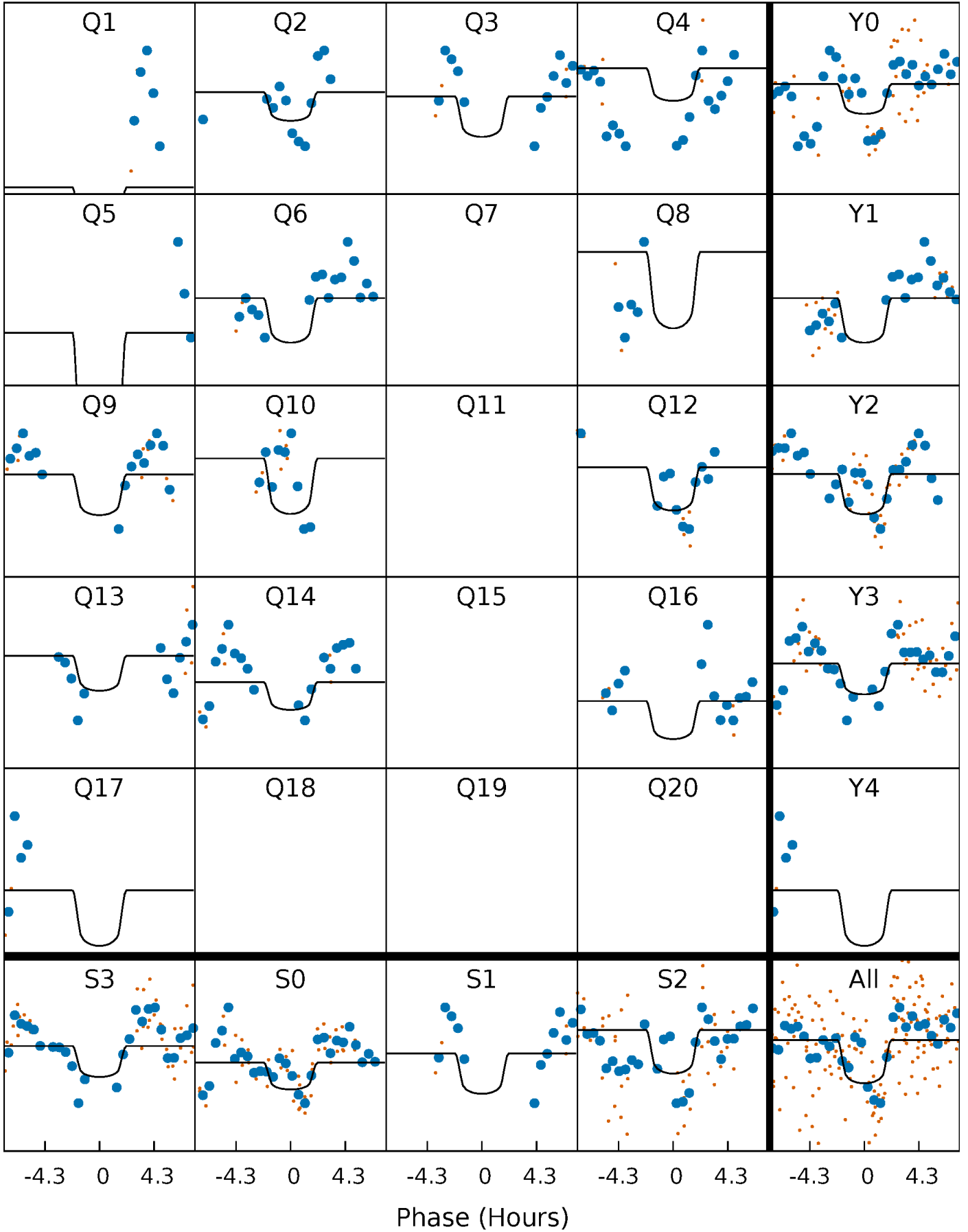
PDC Quarter-Phased Transit Curves

TCE 009970568-07 P= 27.073036 Days $T_0=138.845538$ (BKJD)



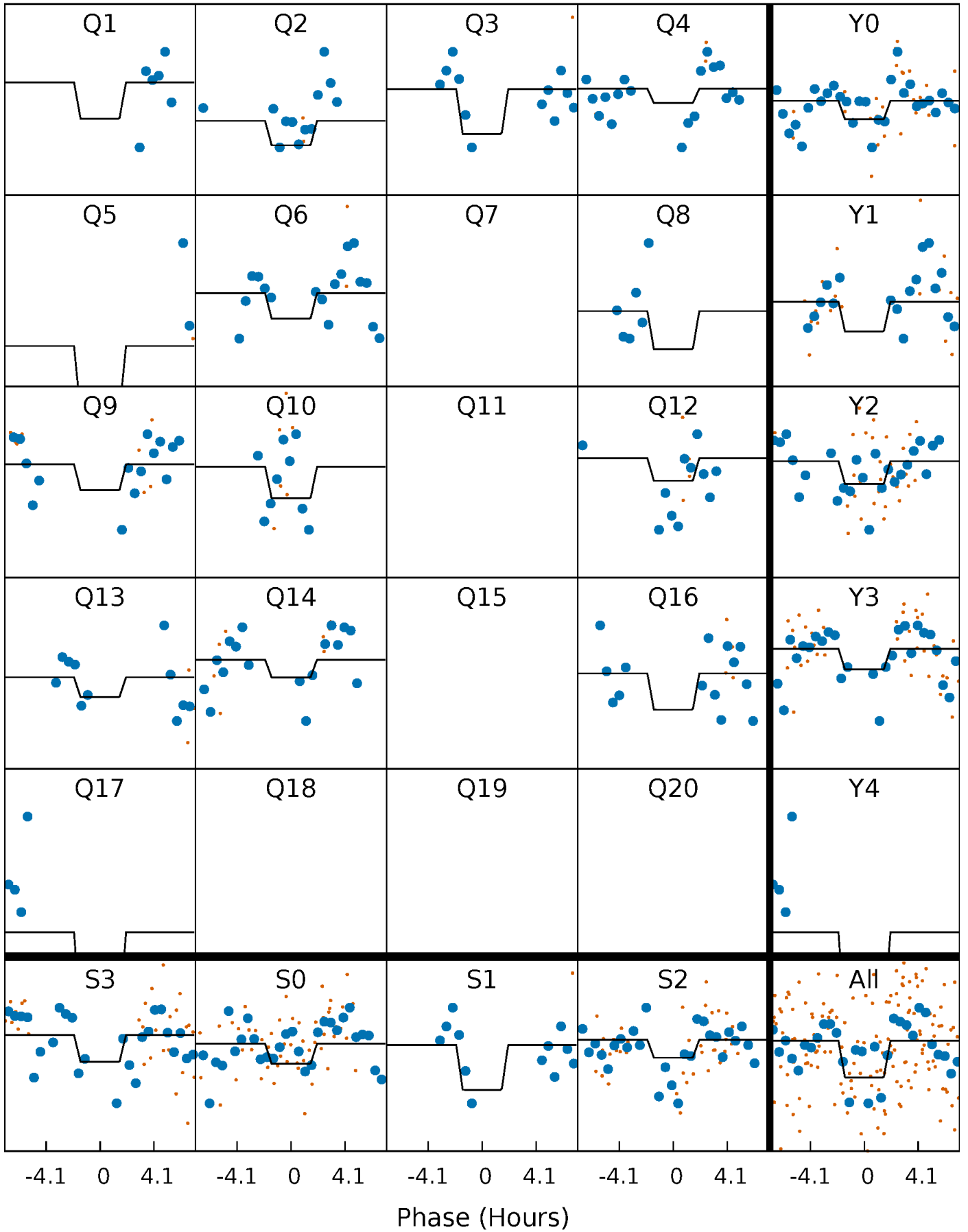
DV Quarter-Phased Transit Curves

TCE 009970568-07 P= 27.073036 Days $T_0=138.845538$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

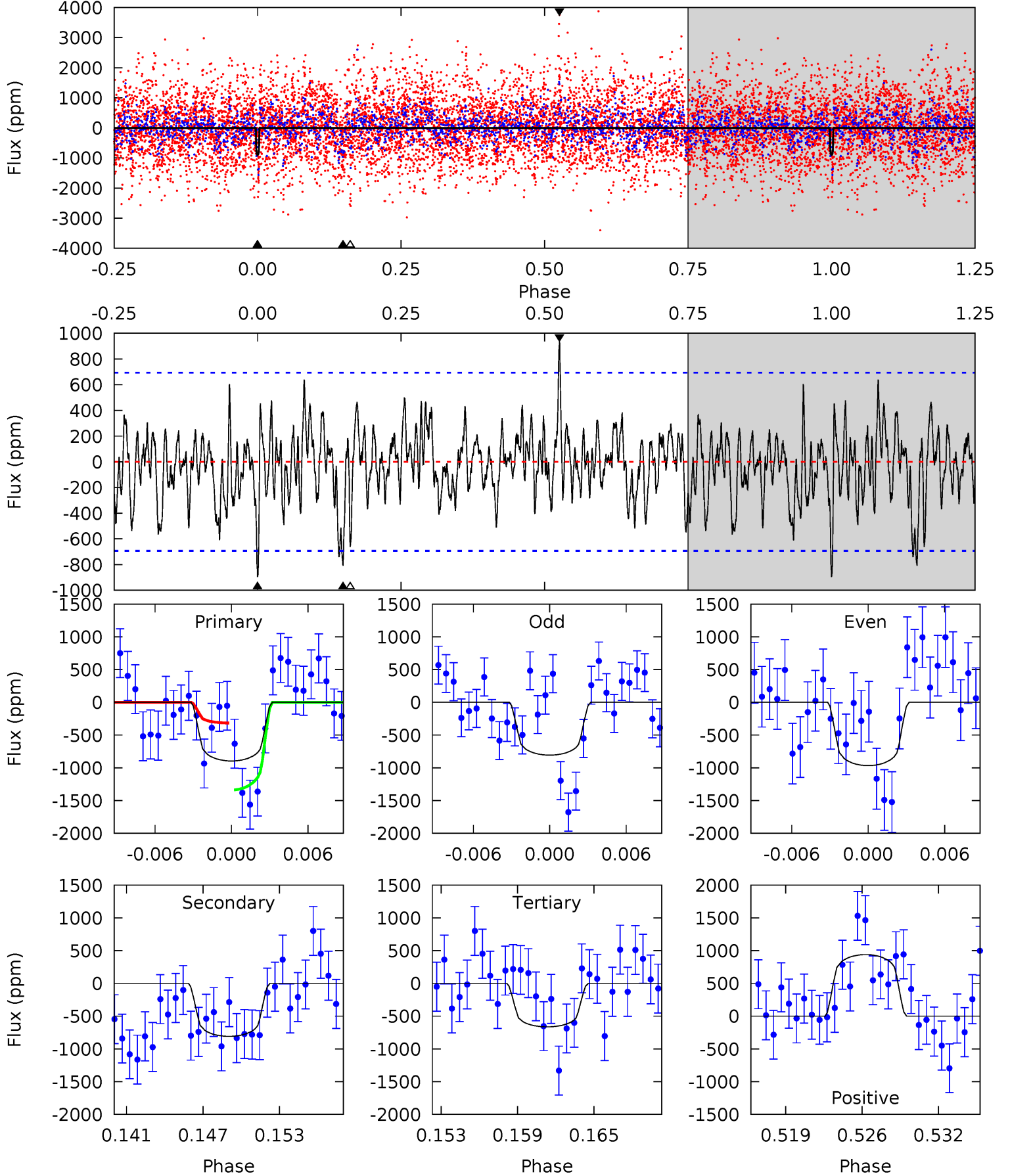
TCE 009970568-07 P= 27.073441 Days $T_0=138.834647$ (BKJD)



DV Model-Shift Uniqueness Test

009970568-07, $P = 27.073036$ Days, $E = 111.772502$ Days

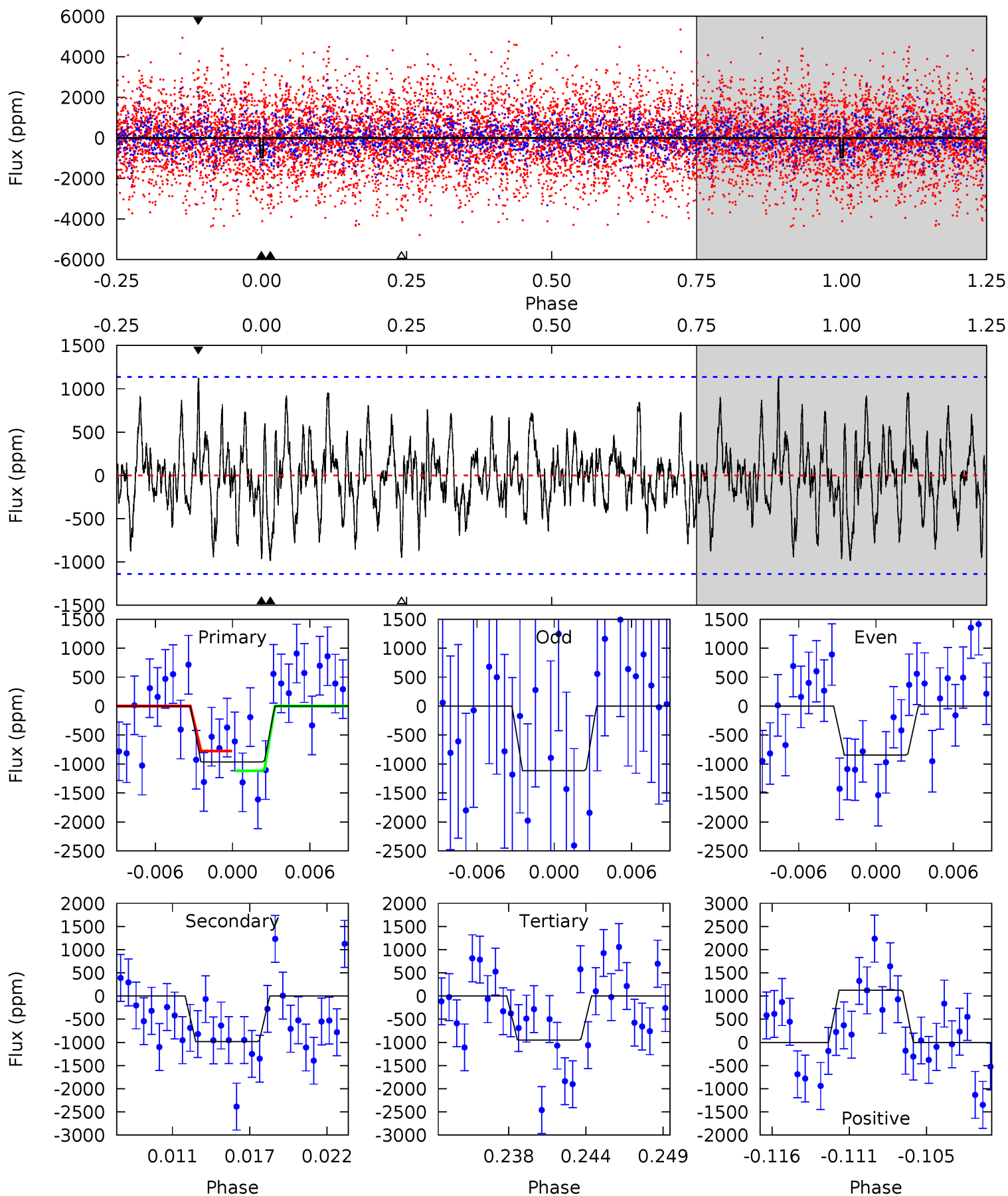
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.62	5.97	4.90	6.93	5.12	2.74	1.67	1.72	-0.32	1.08	-0.96	0.59	0.95	0.51	3.75



Alt Model-Shift Uniqueness Test

009970568-07, P = 27.073441 Days, E = 111.761206 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.36	4.45	4.29	5.09	5.14	2.77	1.51	0.07	-0.73	0.16	-0.64	0.60	0.85	0.53	0.76



Stellar Parameters For KIC 009970568

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8035^{+223}_{-362}	$3.709^{+0.432}_{-0.108}$	$-0.100^{+0.200}_{-0.350}$	$3.312^{+0.789}_{-1.579}$	$2.046^{+0.372}_{-0.538}$	$0.079^{+0.307}_{-0.028}$
	+3%/-5%	+12%/-3%	+200%/-350%	+24%/-48%	+18%/-26%	+388%/-35%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009970568-07 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-809 ± 135	$11.57^{+9.18}_{-7.30}$	1841^{+143}_{-222}	7064^{+8137}_{-1779}	169^{+1129}_{-119}
Alt.	-986 ± 221	$11.98^{+9.91}_{-7.65}$	1827^{+143}_{-195}	7143^{+7710}_{-1796}	182^{+1231}_{-127}

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

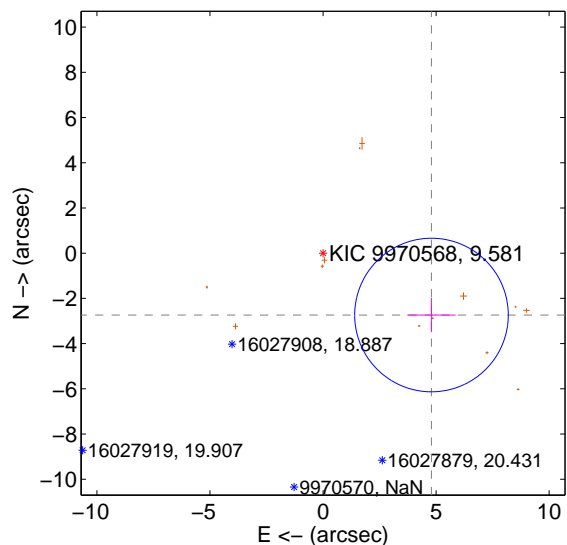
Supplemental centroid analysis for 009970568-07. **Kepler magnitude: 9.58.** Transit SNR 8.05

There are 0 quarters with good PRF difference image offsets

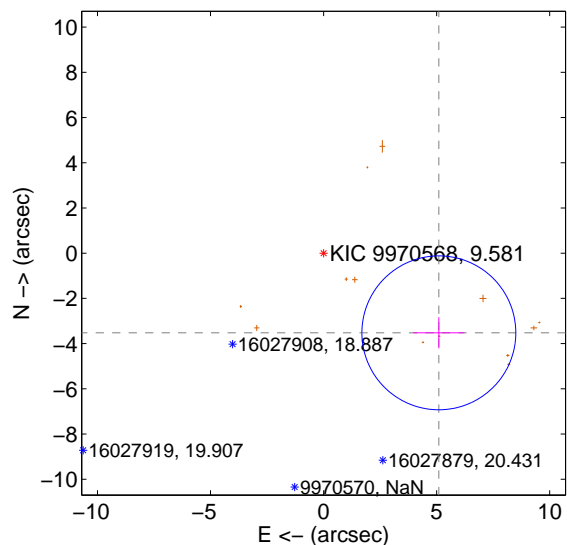
The direct PRF centroid is offset from the target star catalog position by about 0.87 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.521 ± 1.132	4.88	-4.796 ± 1.073	-2.735 ± 0.754
PRF-fit source offset from KIC position	6.197 ± 1.135	5.46	-5.098 ± 1.129	-3.523 ± 0.690
photometric centroid source offset	0.07 ± 0.10	0.70	-0.02 ± 0.19	-0.07 ± 0.09

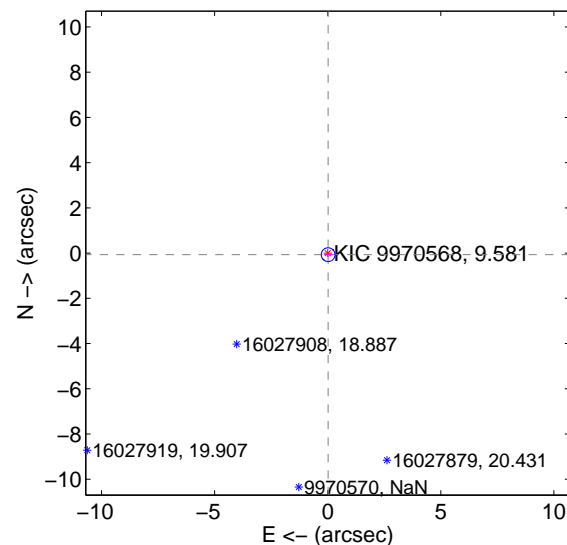
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

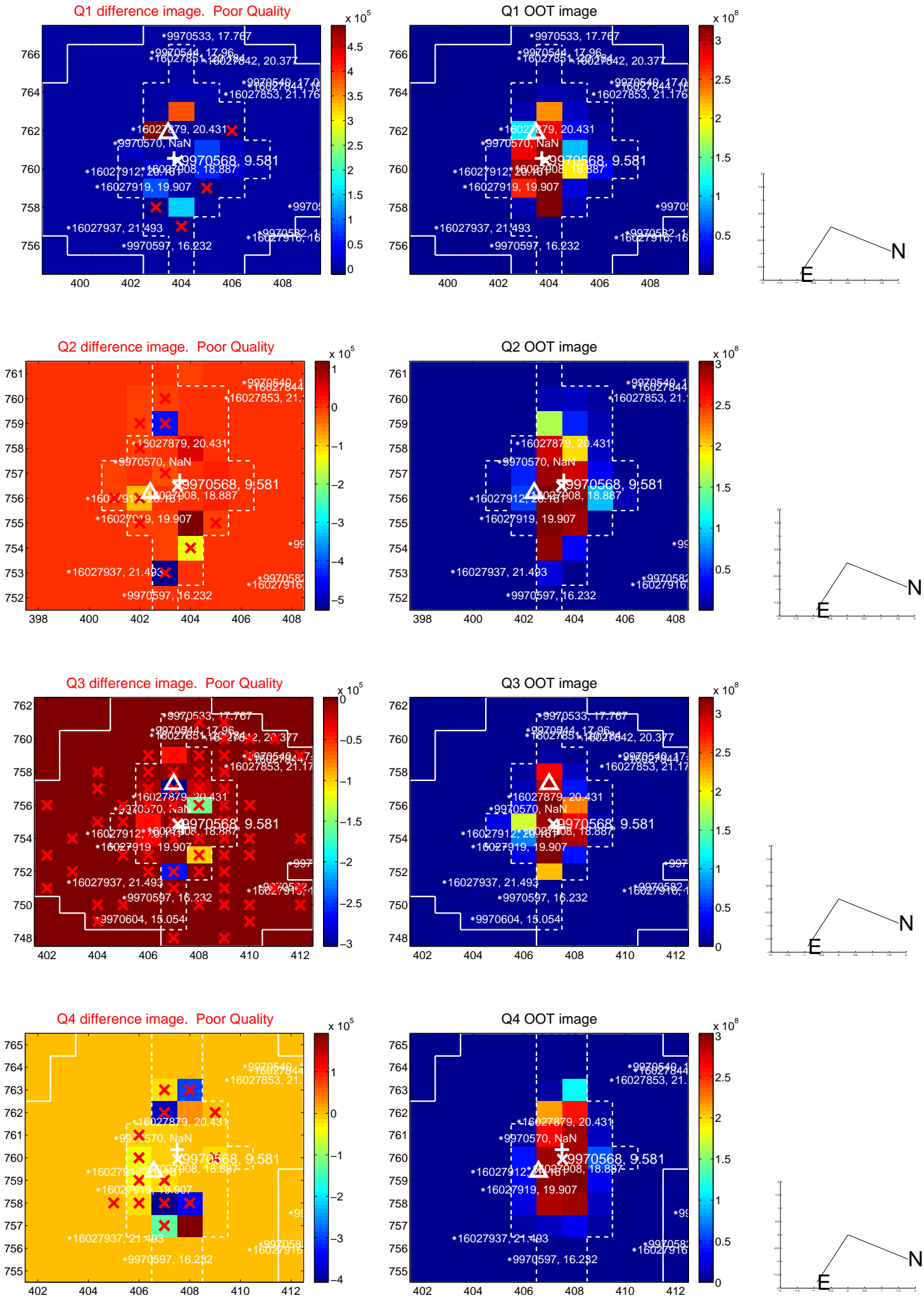


offset from photometric centroids

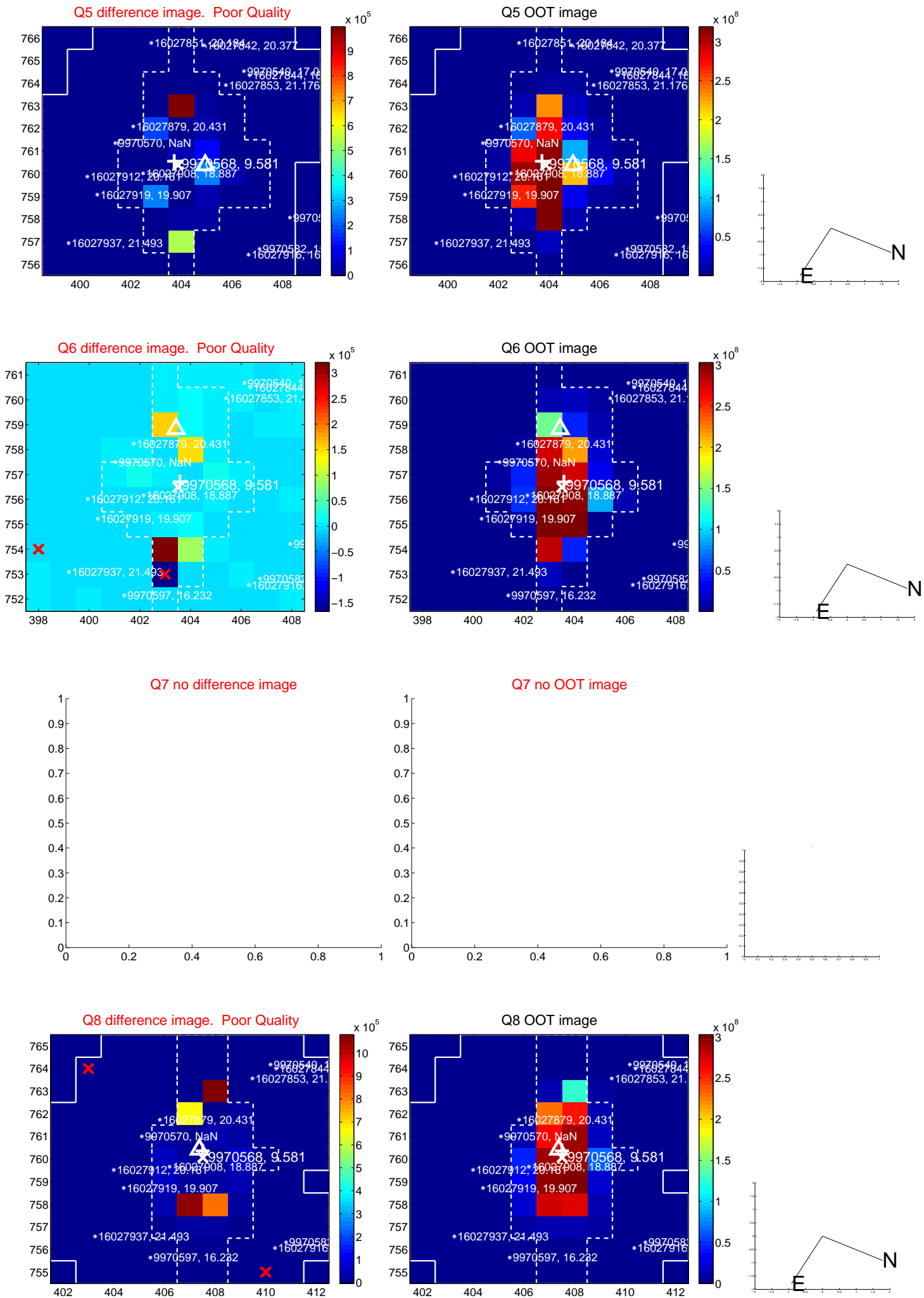


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

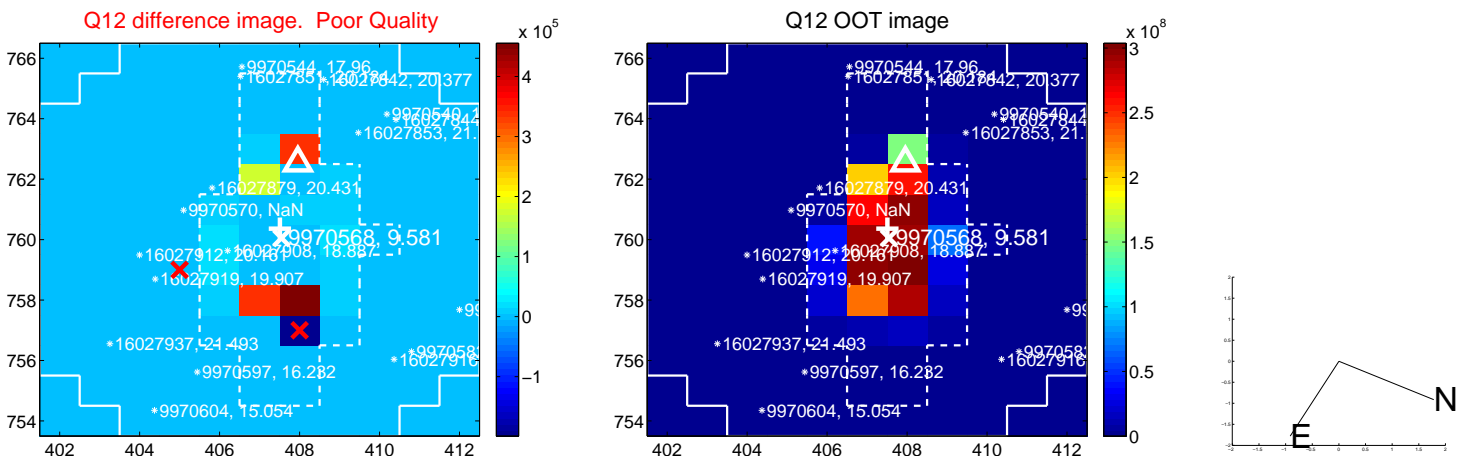
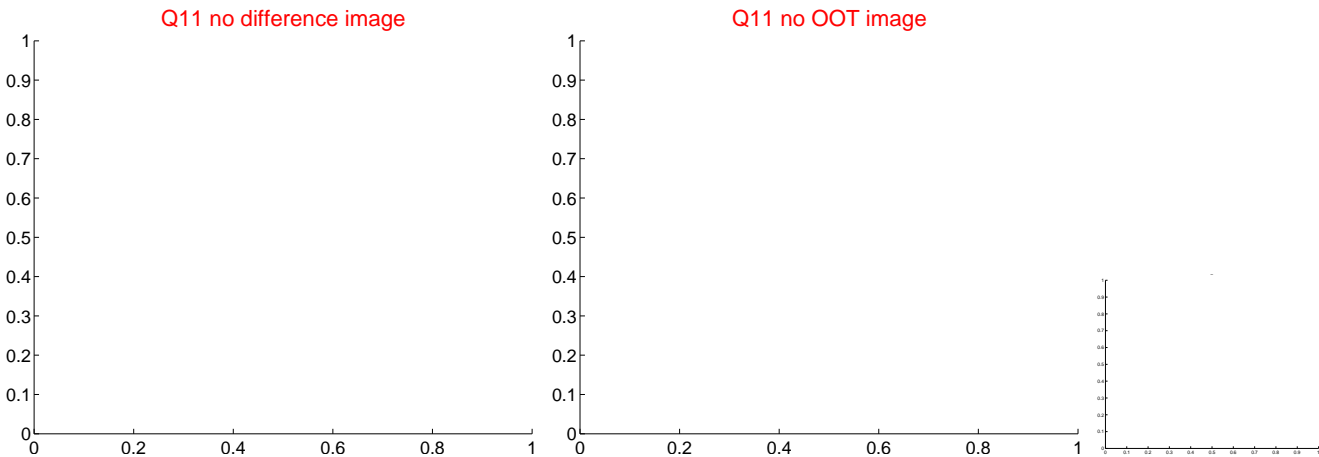
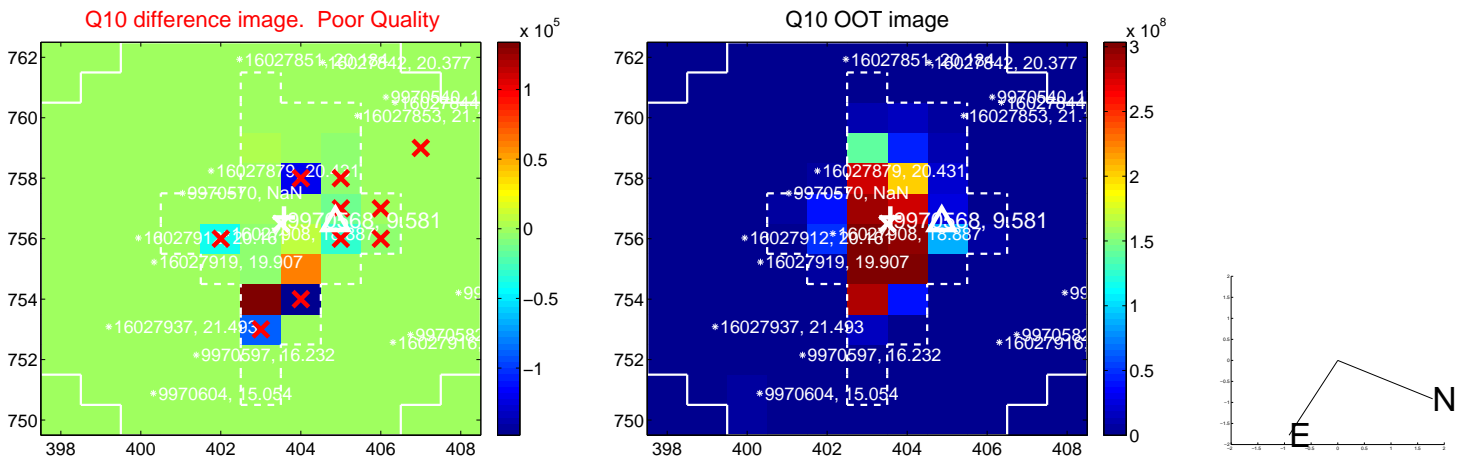
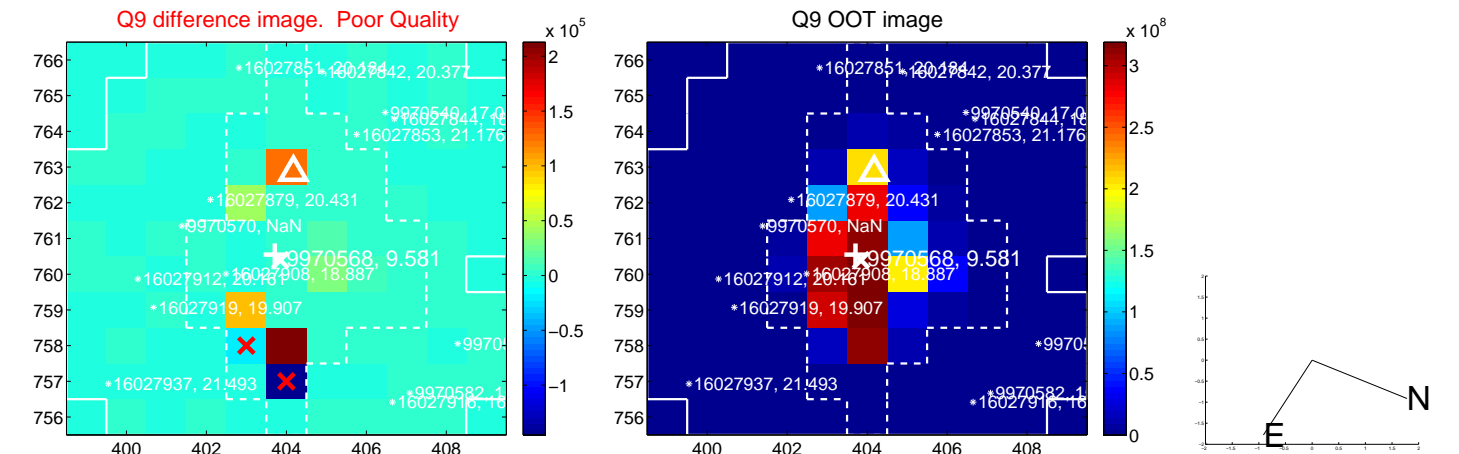
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



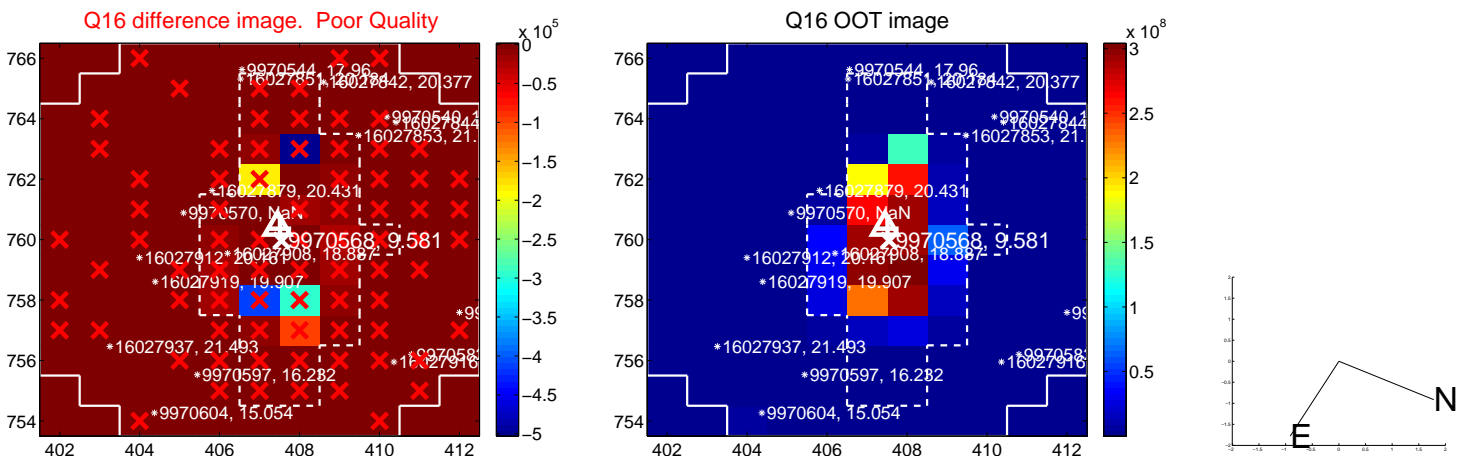
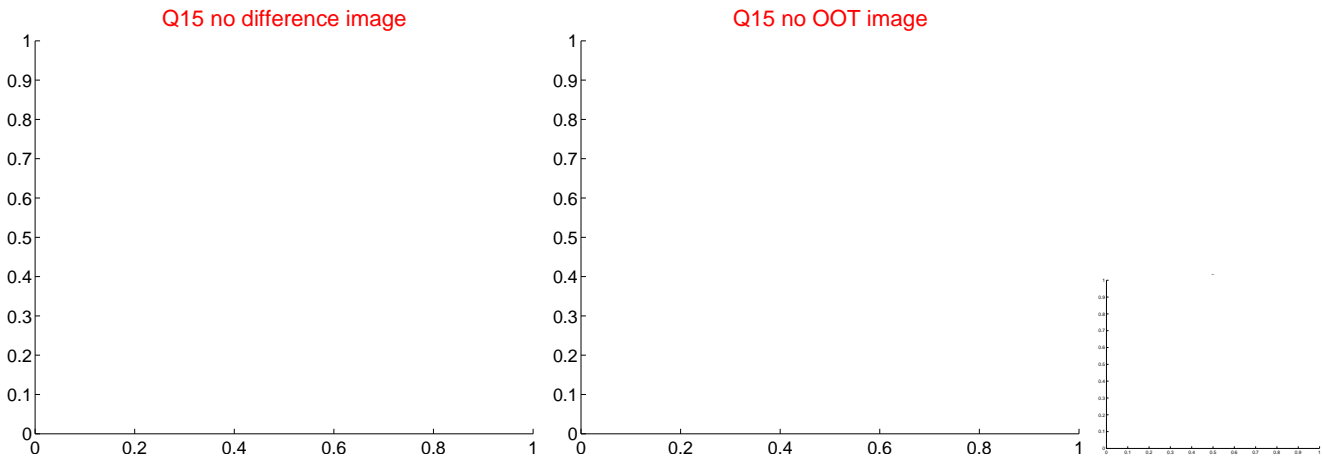
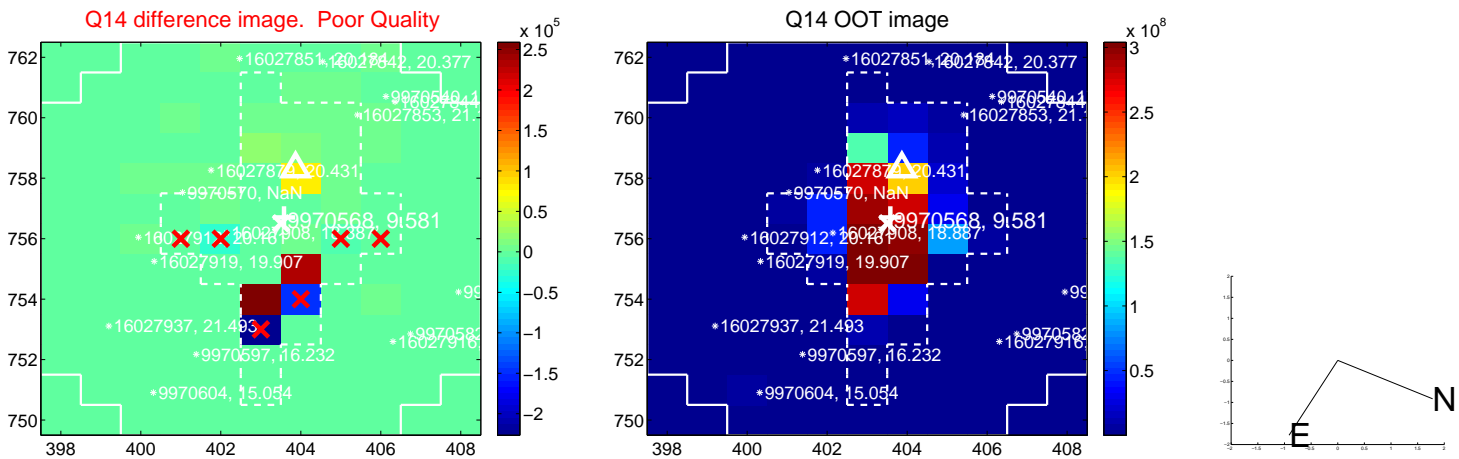
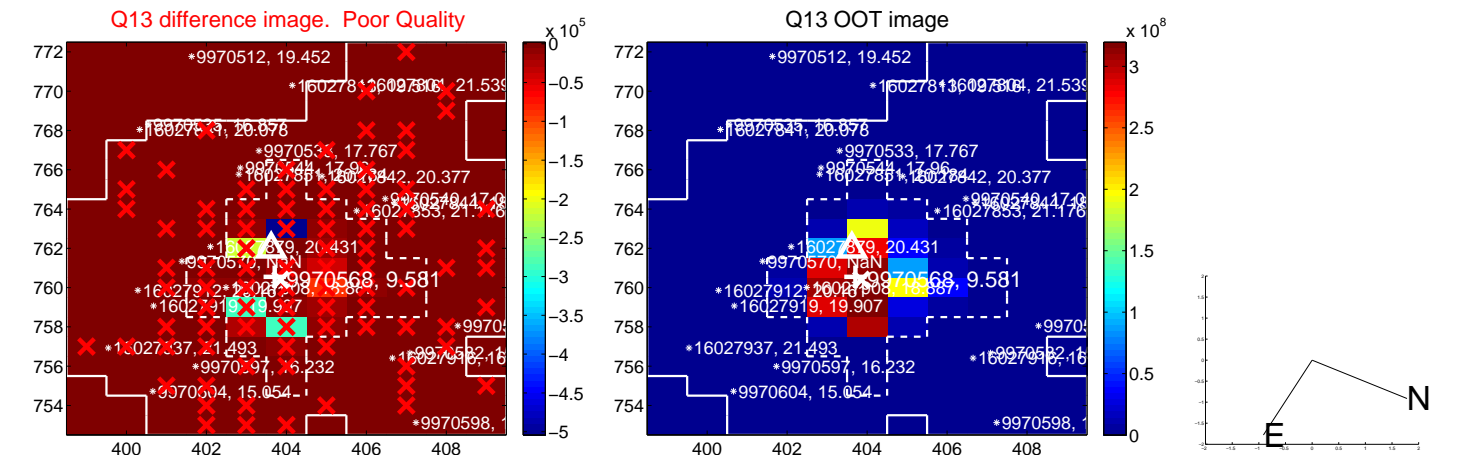
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



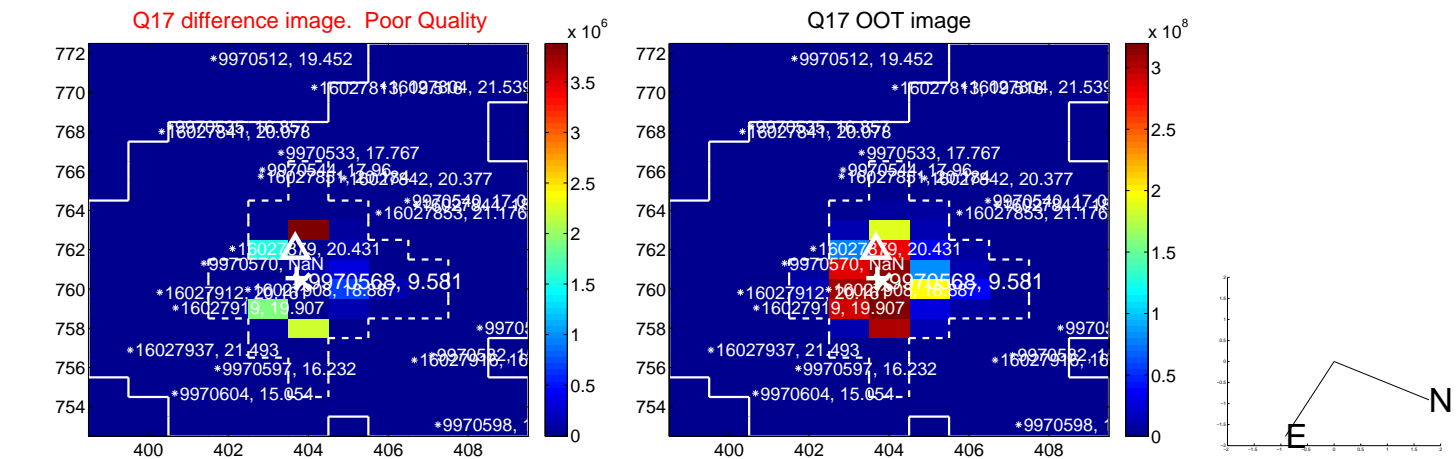
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



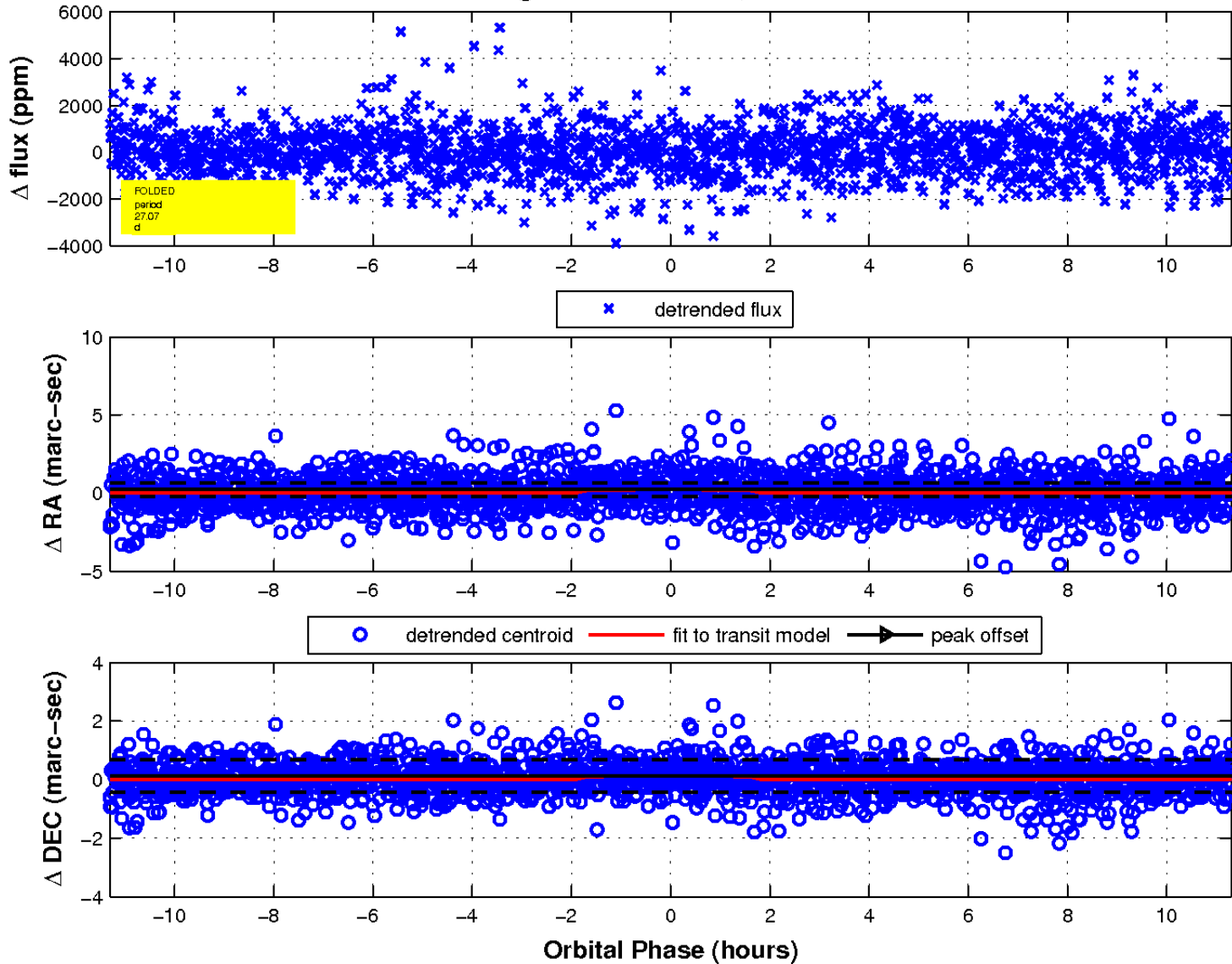
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

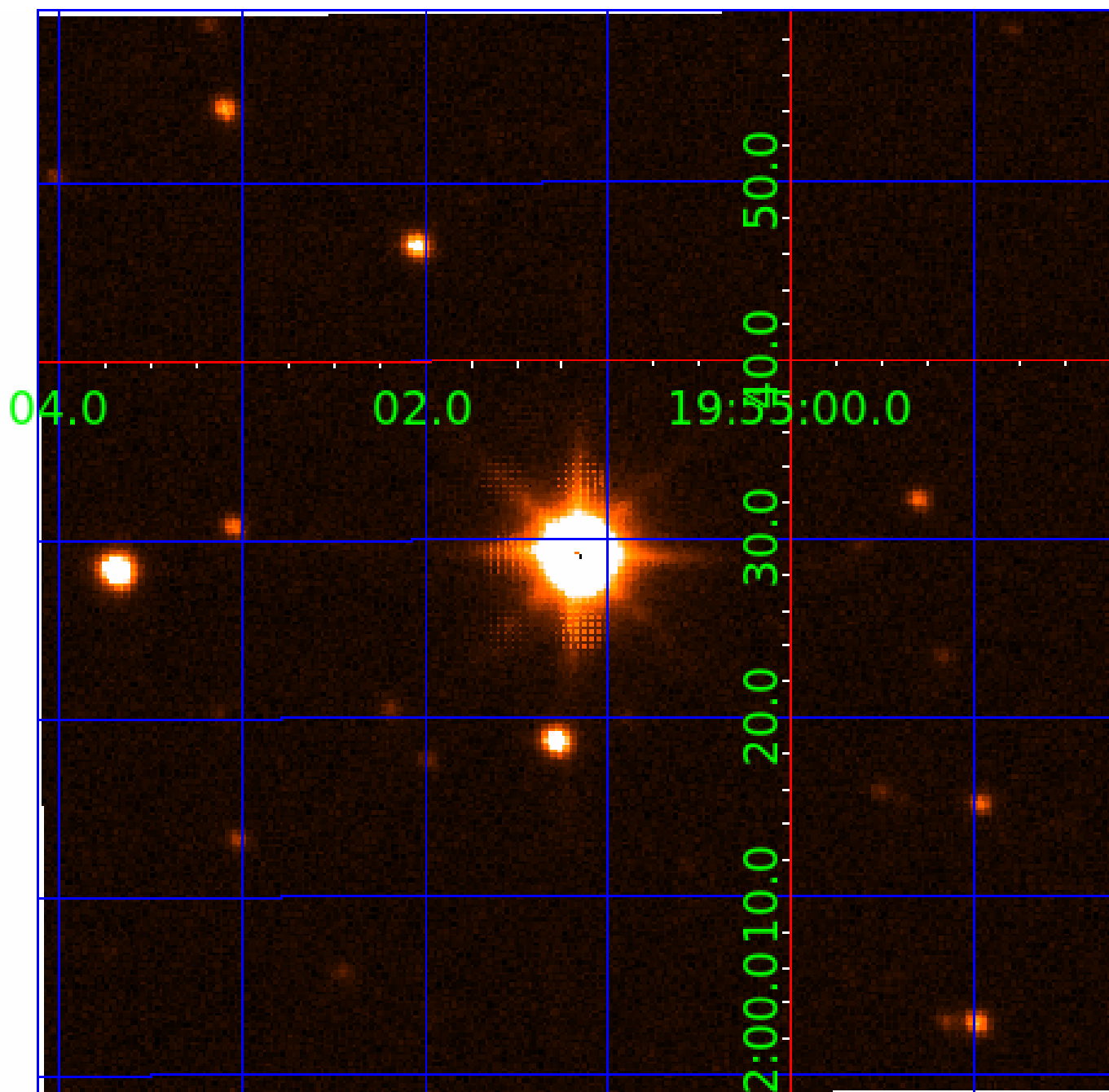


fluxWeightedCentroids, Planet 7 of 9



UKIRT Image

Declination



KIC 009970568

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})
009970568-01	OBS	No	0.761375	131.773155	86.1	4.981	11.6	7.0	3.31	8035	3.13	95374.74
009970568-02	OBS	No	6.849496	134.393510	2076.3	2.075	12.6	9.7	3.31	8035	27.48	5097.45
009970568-03	OBS	No	30.488151	135.191934	1286.3	2.736	10.7	8.8	3.31	8035	13.60	696.18
009970568-04	OBS	No	108.630100	155.707473	2355.6	3.769	10.6	9.9	3.31	8035	29.25	127.93
009970568-05	OBS	No	51.809300	179.787566	2073.0	5.115	10.3	13.0	3.31	8035	15.51	343.31
009970568-06	OBS	No	9.624401	133.642564	889.2	1.961	9.2	9.5	3.31	8035	13.06	3238.92
009970568-07	OBS	No	27.073036	138.845537	965.7	3.769	9.0	8.0	3.31	8035	10.94	815.67
009970568-08	OBS	No	14.115709	139.253007	1679.2	2.645	9.9	11.7	3.31	8035	23.27	1943.69
009970568-09	OBS	No	8.894852	132.463277	42.6	2.000	9.2	-1.0	3.31	8035	2.19	3597.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970568-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

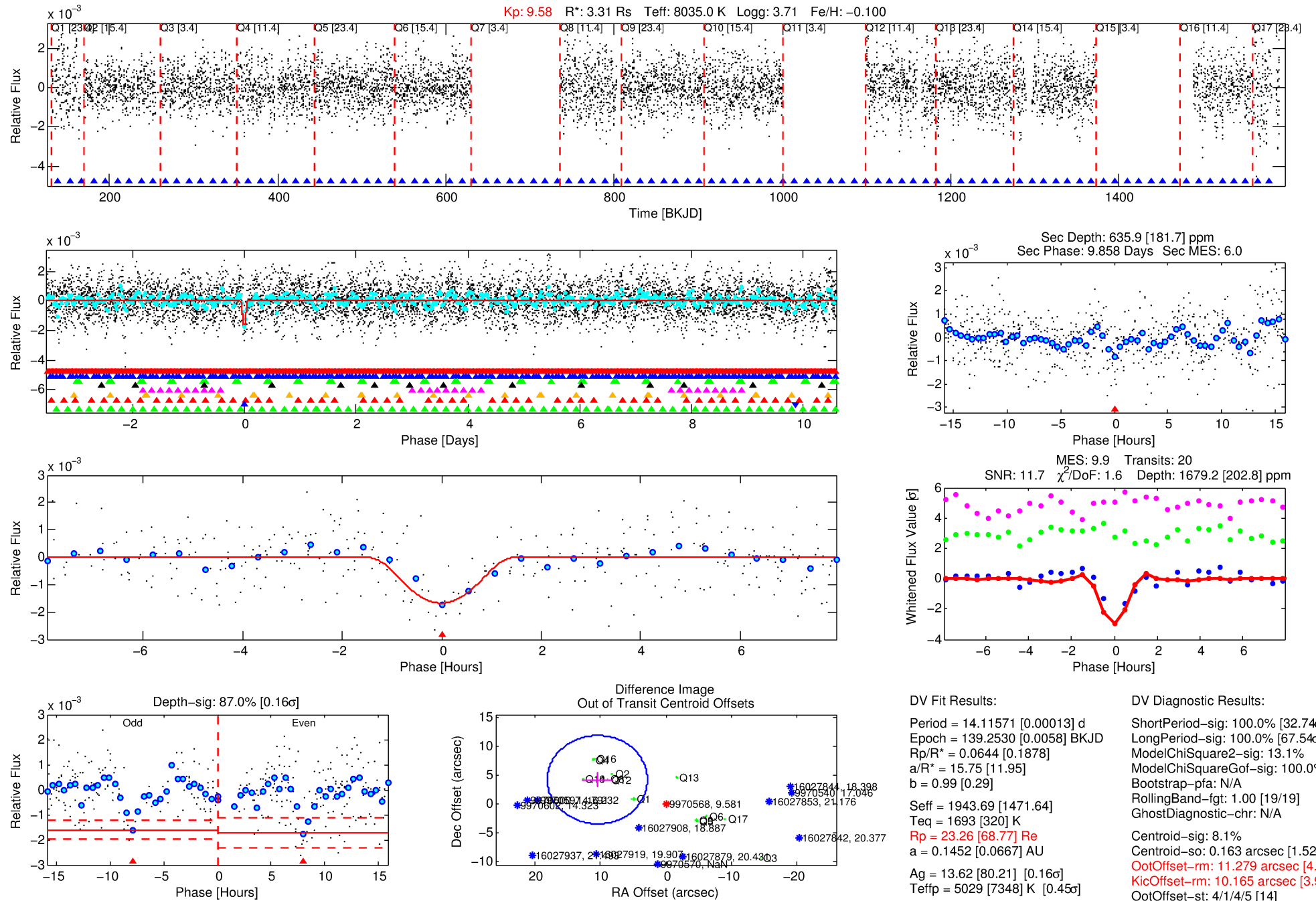
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009970568-08

No Significant Match Found

DV One-Page Summary

KIC: 9970568 Candidate: 8 of 9 Period: 14.116 d



DV Fit Results:

Period = 14.11571 [0.00013] d
Epoch = 139.2530 [0.0058] BKJD
Rp/R* = 0.0644 [0.1878]
a/R* = 15.75 [11.95]
b = 0.99 [0.29]
Seff = 1943.69 [1471.64]
Teq = 1693 [320] K
Rp = 23.26 [68.77] Re
a = 0.1452 [0.0667] AU
Ag = 13.62 [80.21] [0.16σ]
Teff = 5029 [7348] K [0.45σ]

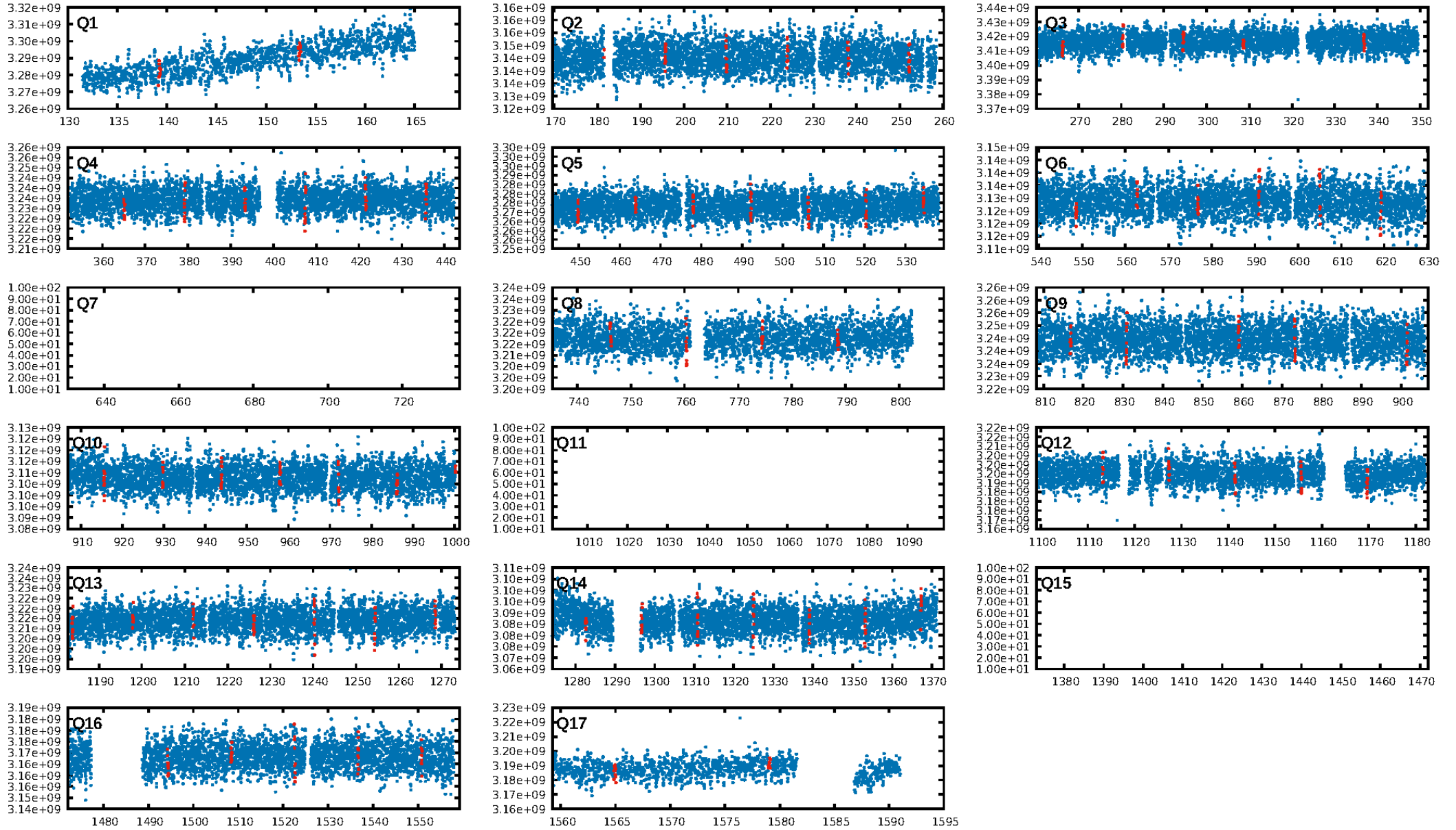
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [32.74σ]
LongPeriod-sig: 100.0% [67.54σ]
ModelChiSquare2-sig: 13.1%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [19/19]
GhostDiagnostic-chr: N/A
Centroid-sig: 8.1%
Centroid-so: 0.163 arcsec [1.52σ]
OotOffset-rm: 11.279 arcsec [4.43σ]
KicOffset-rm: 10.165 arcsec [3.94σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.07 [1/14]
DiffImageOverlap-fno: 0.00 [0/14]

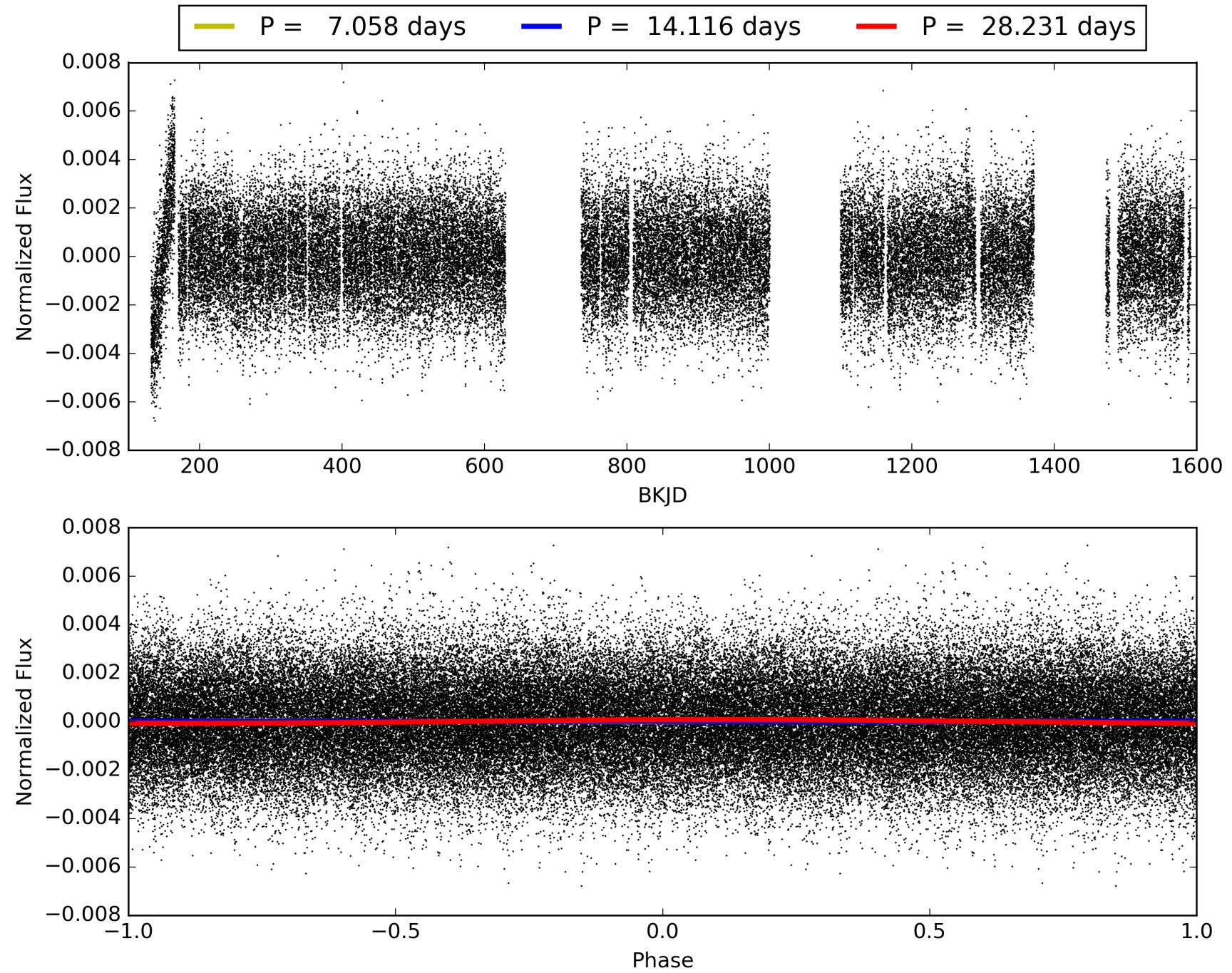
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:45 Z

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

TCE 009970568-08, PDC Light Curves

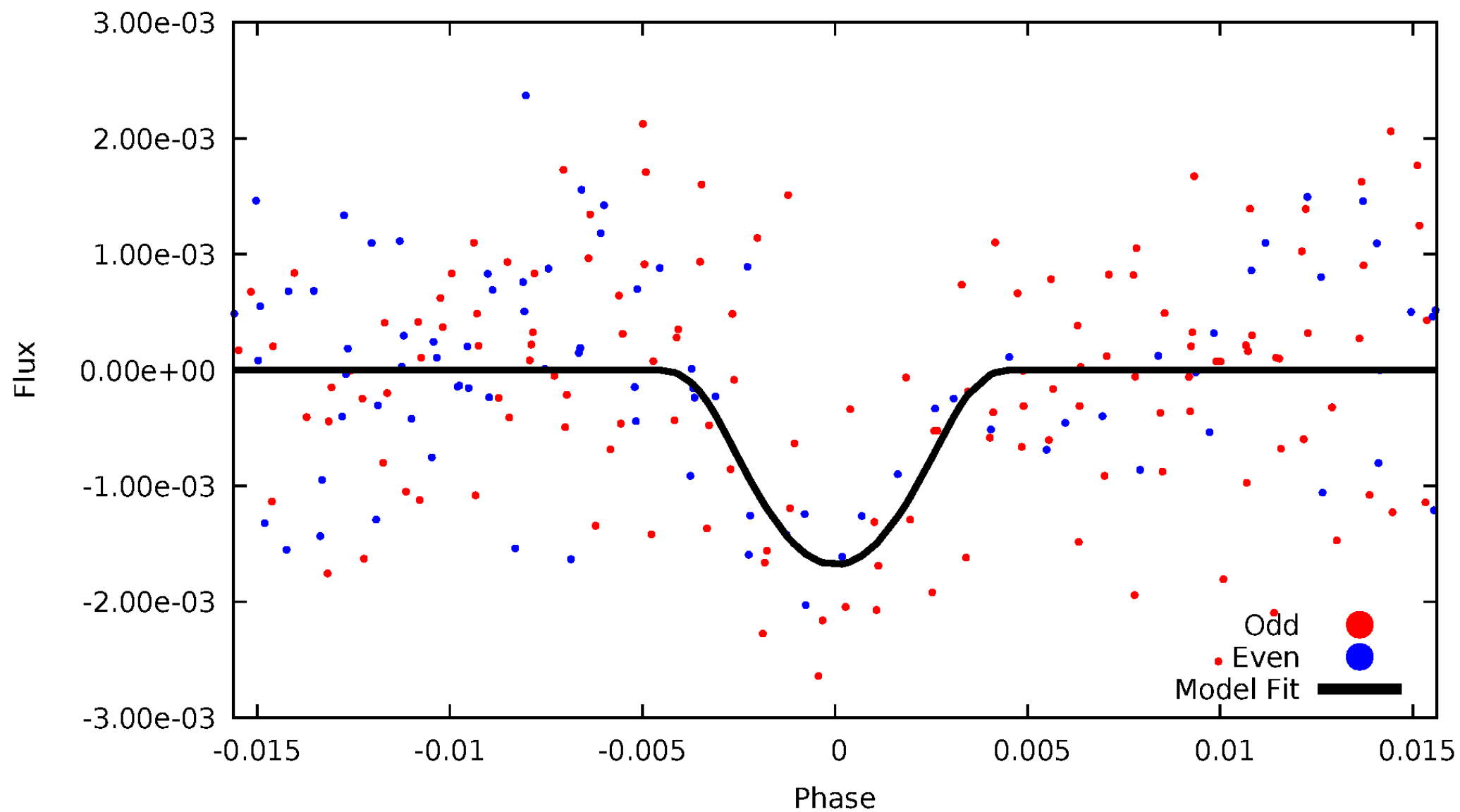


TCE 009970568-08



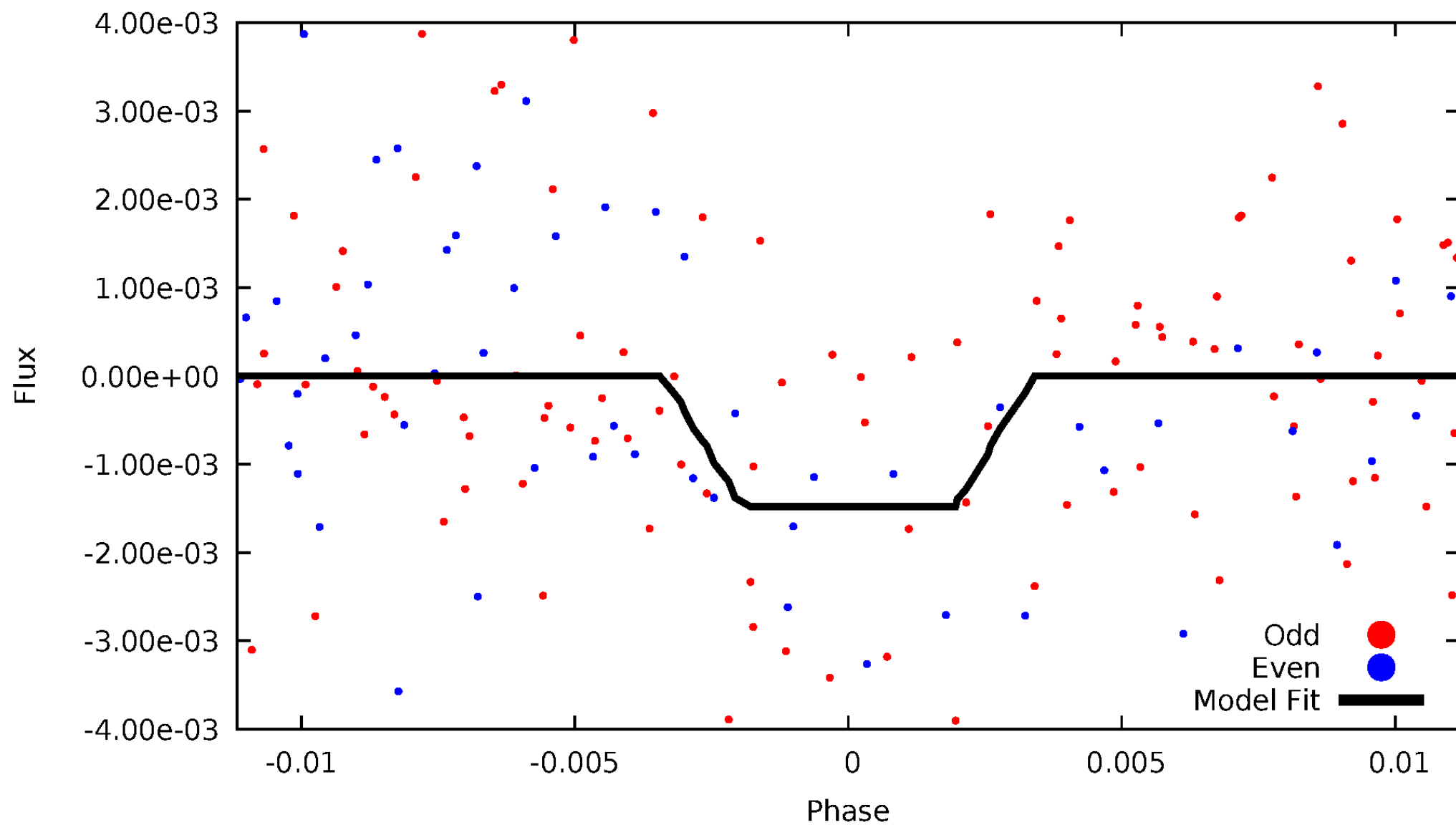
DV Odd/Even

TCE 009970568-08



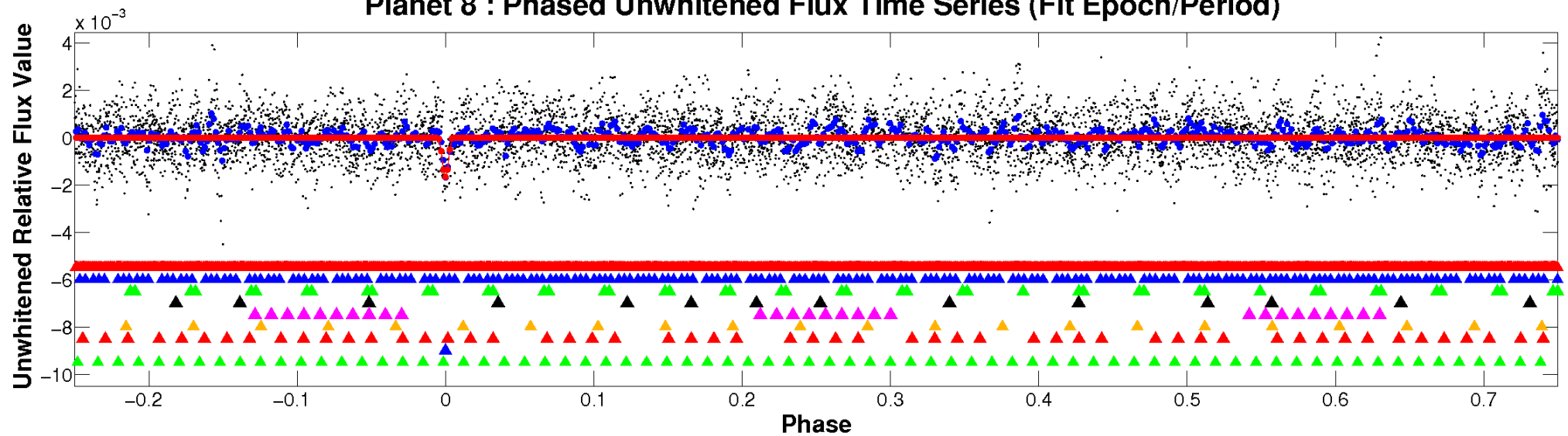
ALT Odd/Even

TCE 009970568-08

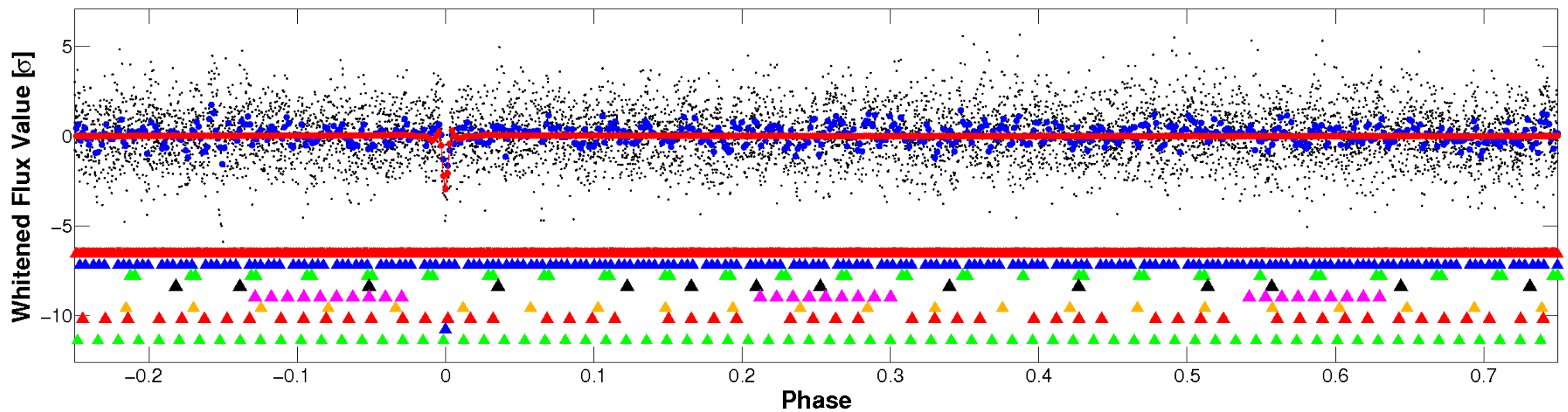


Non-Whitened Vs. Whitened Light Curve

Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

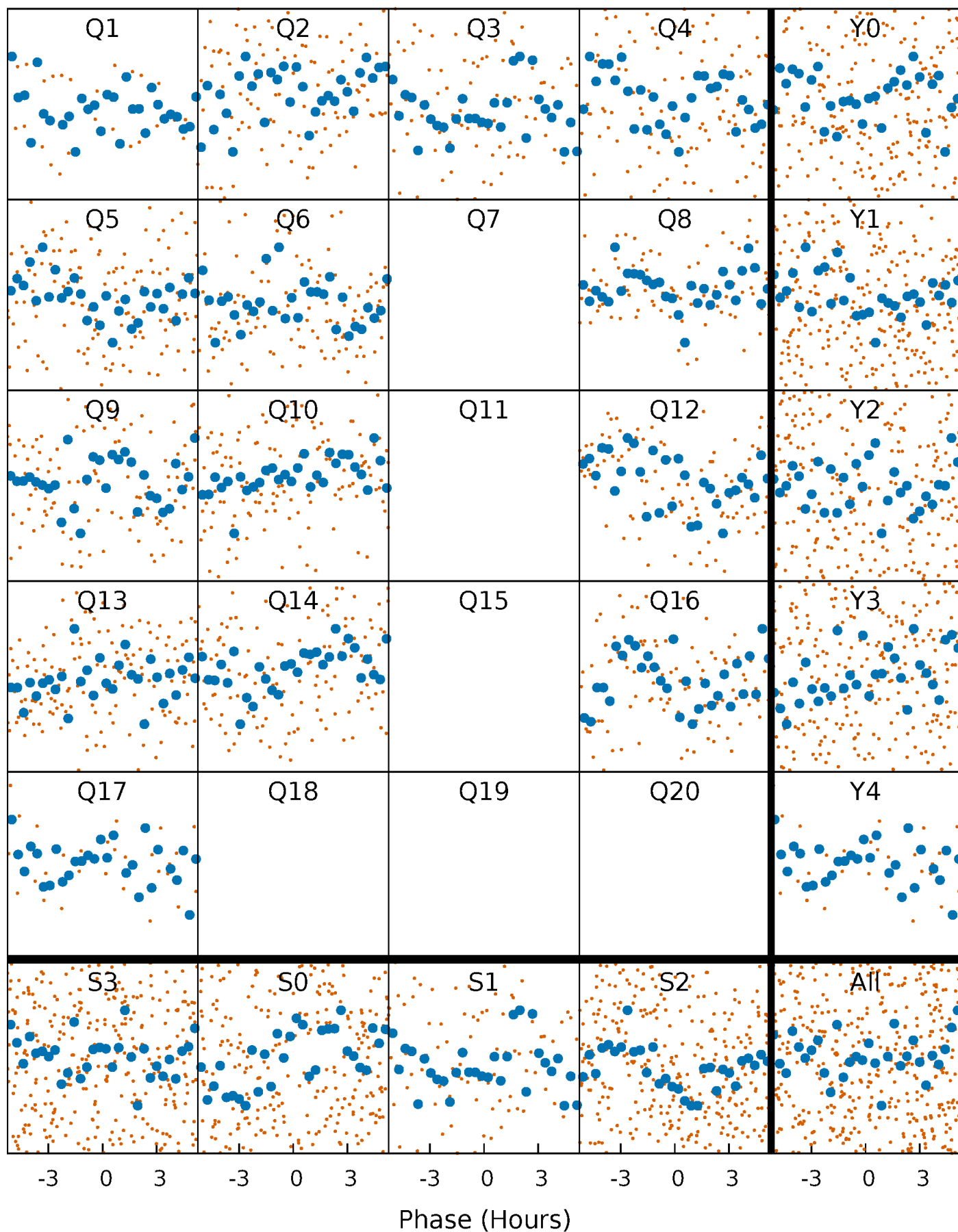


Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



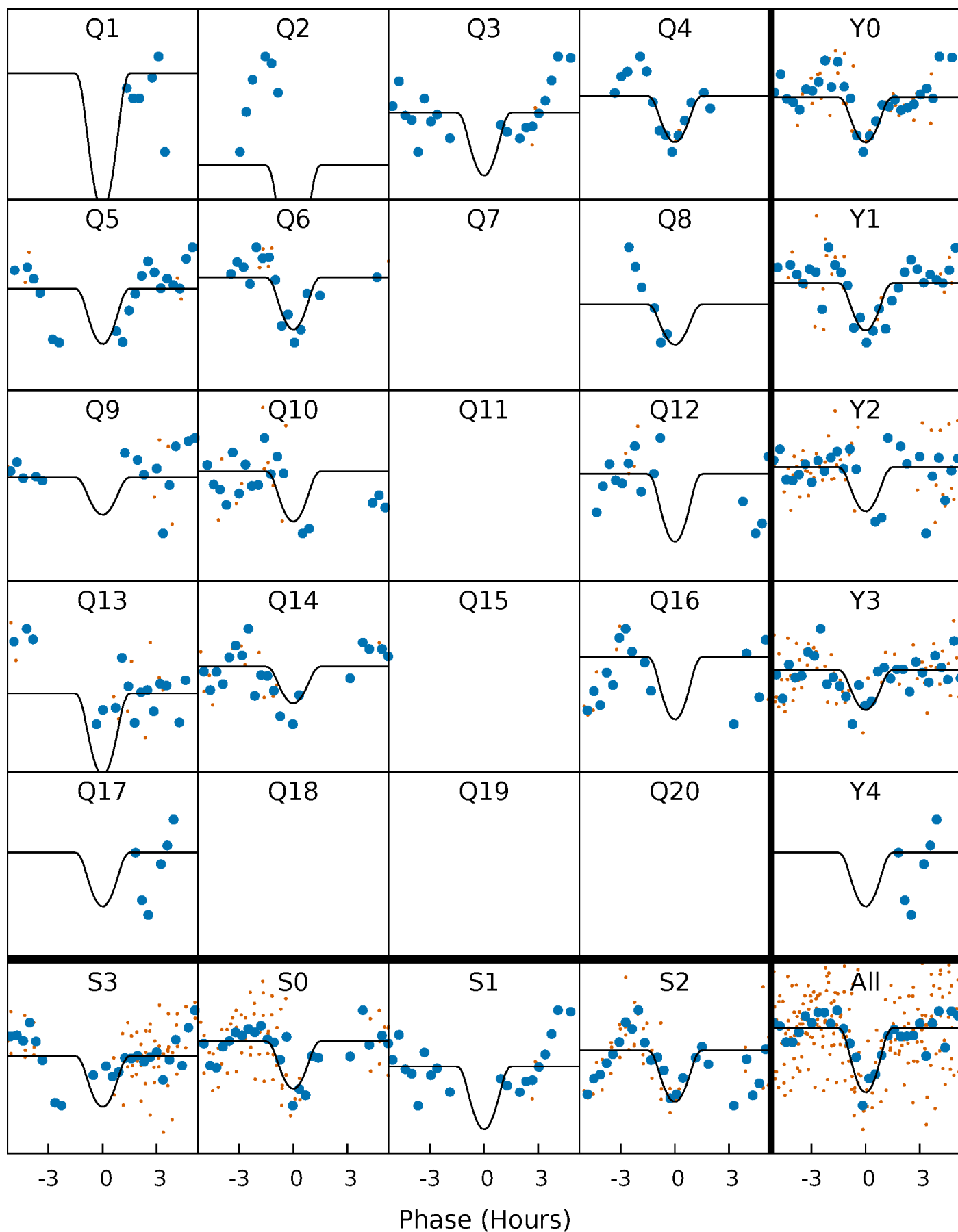
PDC Quarter-Phased Transit Curves

TCE 009970568-08 P= 14.115709 Days $T_0=139.253007$ (BKJD)



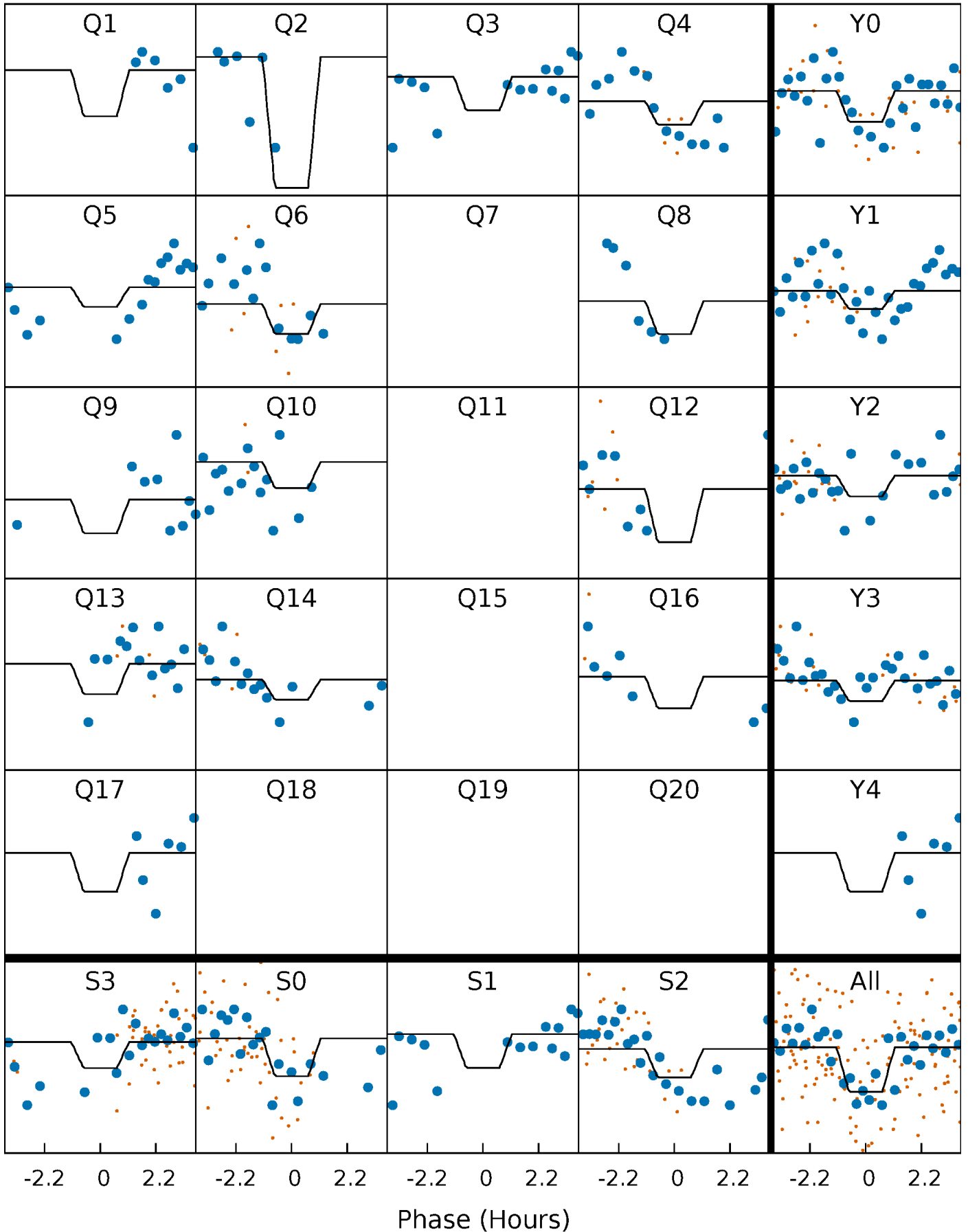
DV Quarter-Phased Transit Curves

TCE 009970568-08 P= 14.115709 Days $T_0=139.253007$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

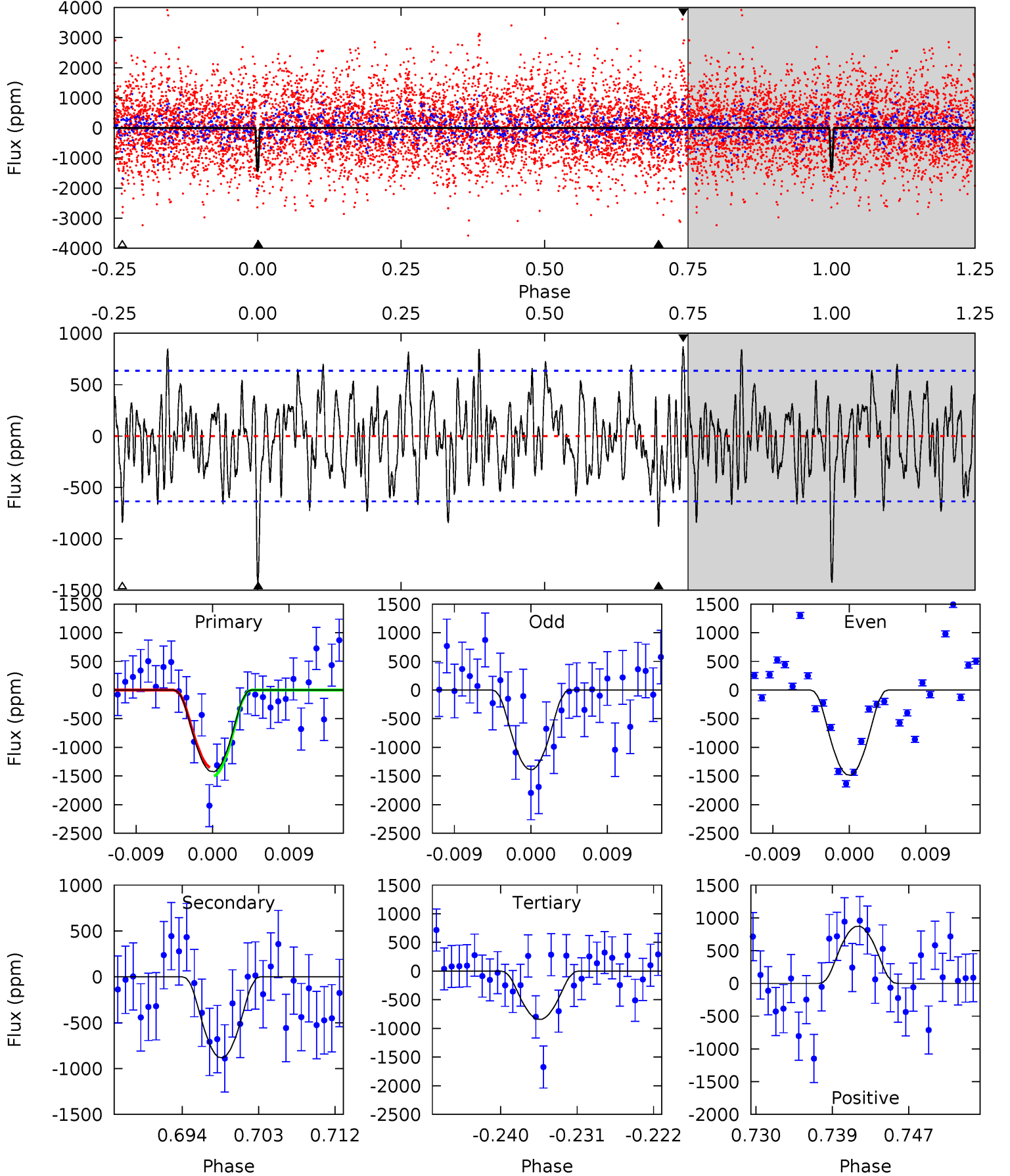
TCE 009970568-08 P= 14.115898 Days $T_0=139.247779$ (BKJD)



DV Model-Shift Uniqueness Test

009970568-08, P = 14.115709 Days, E = 125.137298 Days

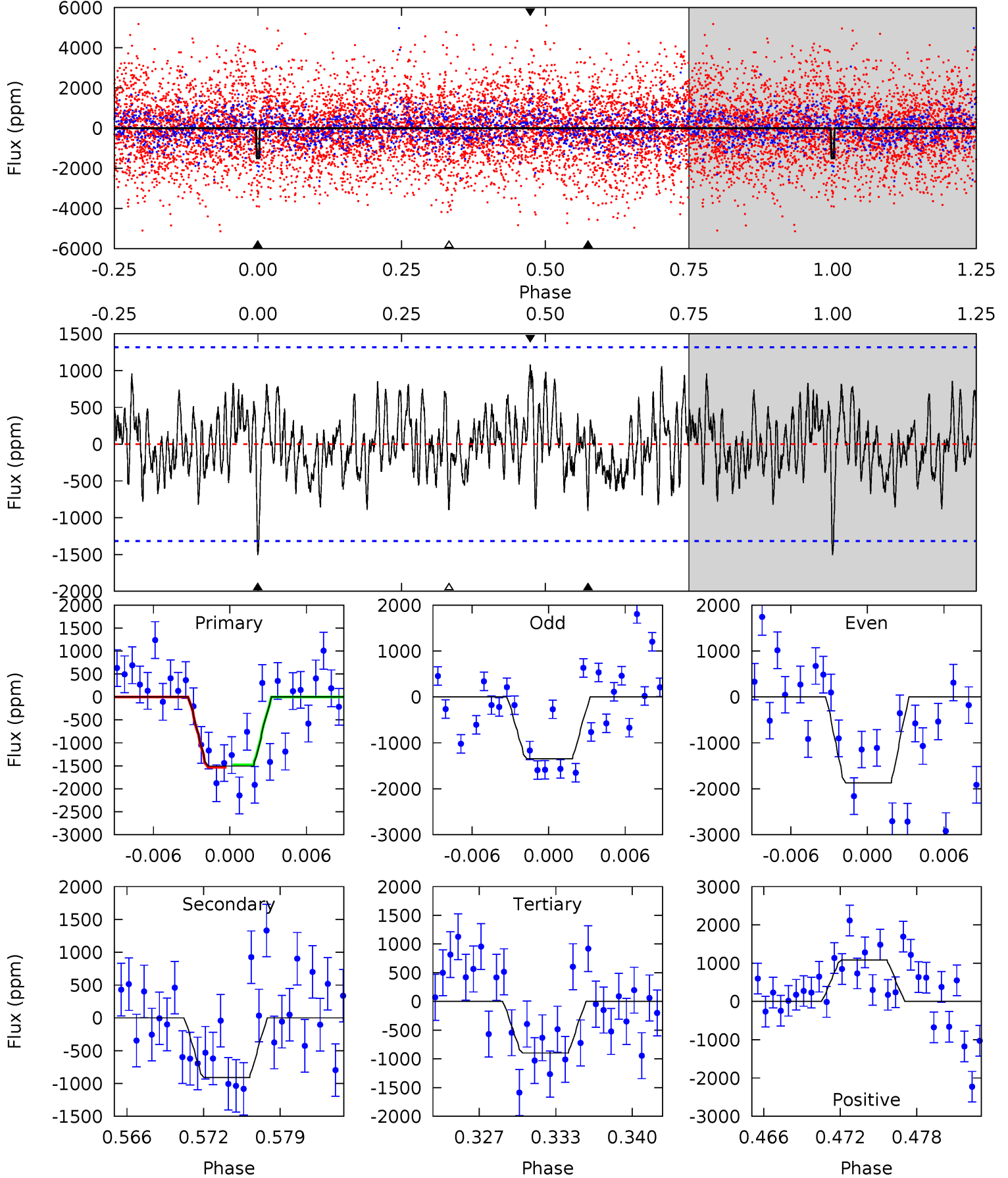
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	7.02	6.71	6.94	5.05	2.62	2.42	4.63	4.40	0.32	0.08	0.37	0.66	0.38	0.59



Alt Model-Shift Uniqueness Test

009970568-08, $P = 14.115898$ Days, $E = 125.131881$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.85	3.53	3.48	4.20	5.11	2.73	1.41	2.36	1.65	0.05	-0.67	0.98	0.91	0.42	0.10



Stellar Parameters For KIC 009970568

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	ρ_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8035^{+223}_{-362}	$3.709^{+0.432}_{-0.108}$	$-0.100^{+0.200}_{-0.350}$	$3.312^{+0.789}_{-1.579}$	$2.046^{+0.372}_{-0.538}$	$0.079^{+0.307}_{-0.028}$
	+3%/-5%	+12%/-3%	+200%/-350%	+24%/-48%	+18%/-26%	+388%/-35%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009970568-08 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-883 ± 126	$51.66^{+48.61}_{-35.33}$	2286^{+177}_{-254}	3682^{+2185}_{-768}	$3.808^{+35.423}_{-2.825}$
Alt.	-910 ± 258	$46.07^{+49.22}_{-31.53}$	2274^{+187}_{-265}	3857^{+2512}_{-883}	$4.945^{+45.401}_{-3.858}$

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

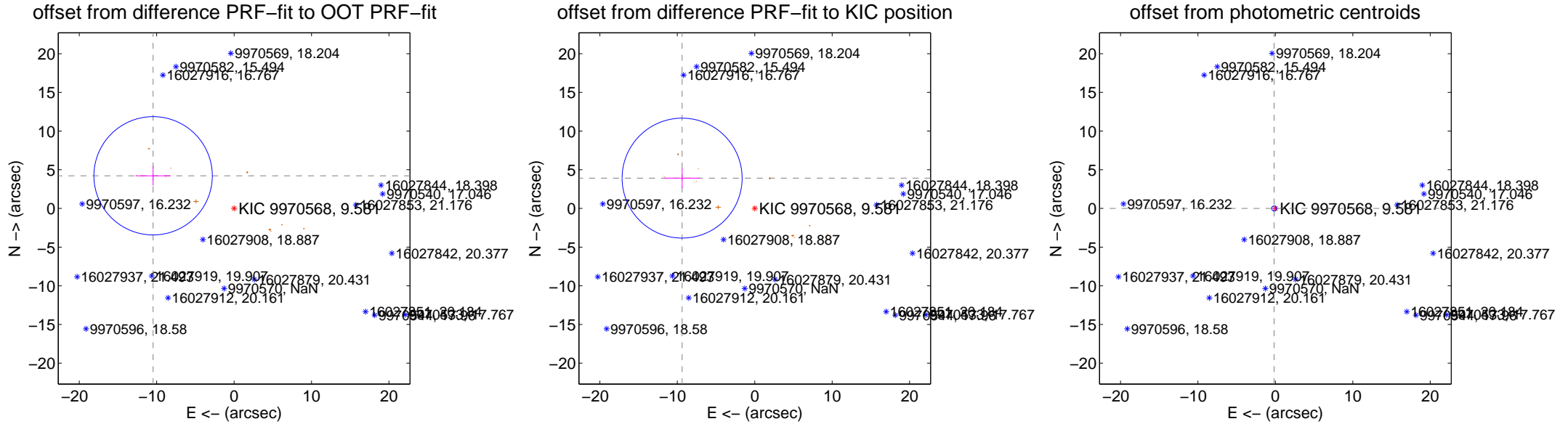
DV Centroid Data

Supplemental centroid analysis for 009970568-08. **Kepler magnitude: 9.58.** Transit SNR 11.65

There are 1 quarters with good PRF difference image offsets

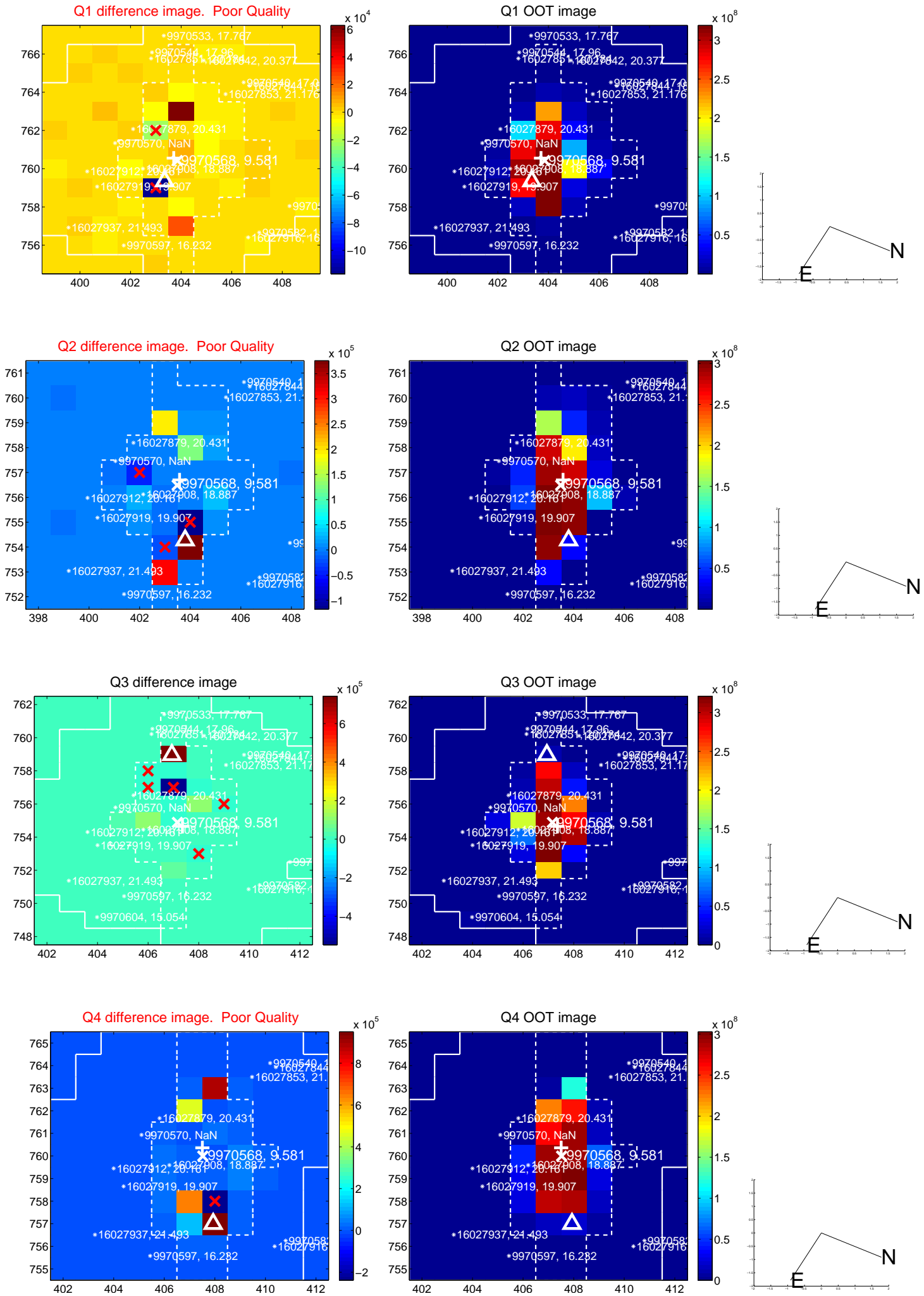
The direct PRF centroid is offset from the target star catalog position by about 0.89 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	11.279 ± 2.548	4.43	10.459 ± 2.272	4.221 ± 1.261
PRF-fit source offset from KIC position	10.165 ± 2.583	3.94	9.379 ± 2.307	3.919 ± 1.278
photometric centroid source offset	0.16 ± 0.11	1.52	0.16 ± 0.11	0.00 ± 0.05

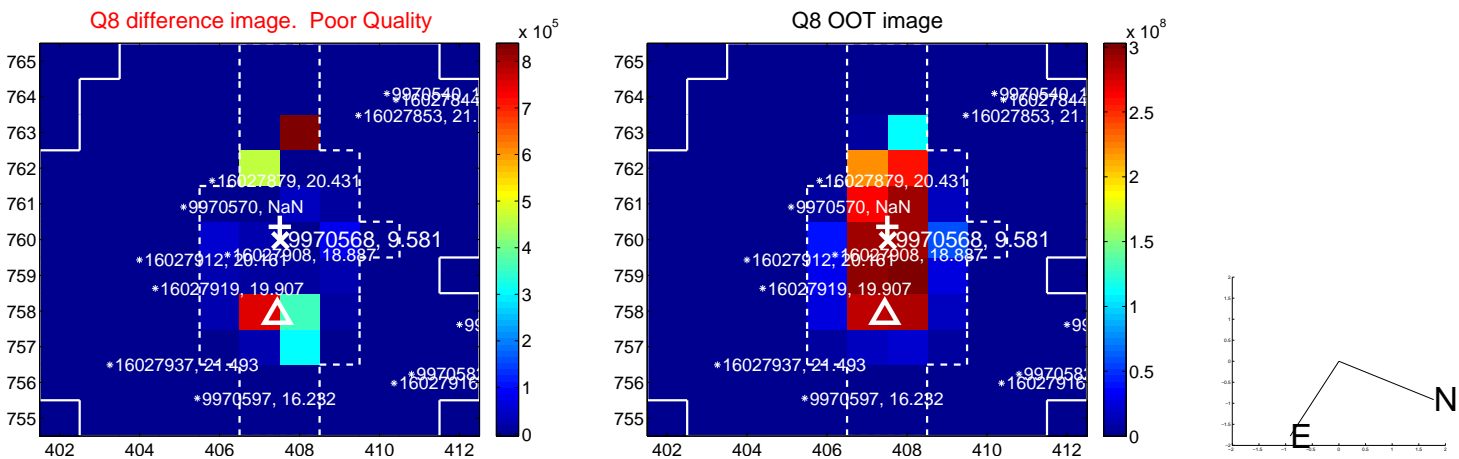
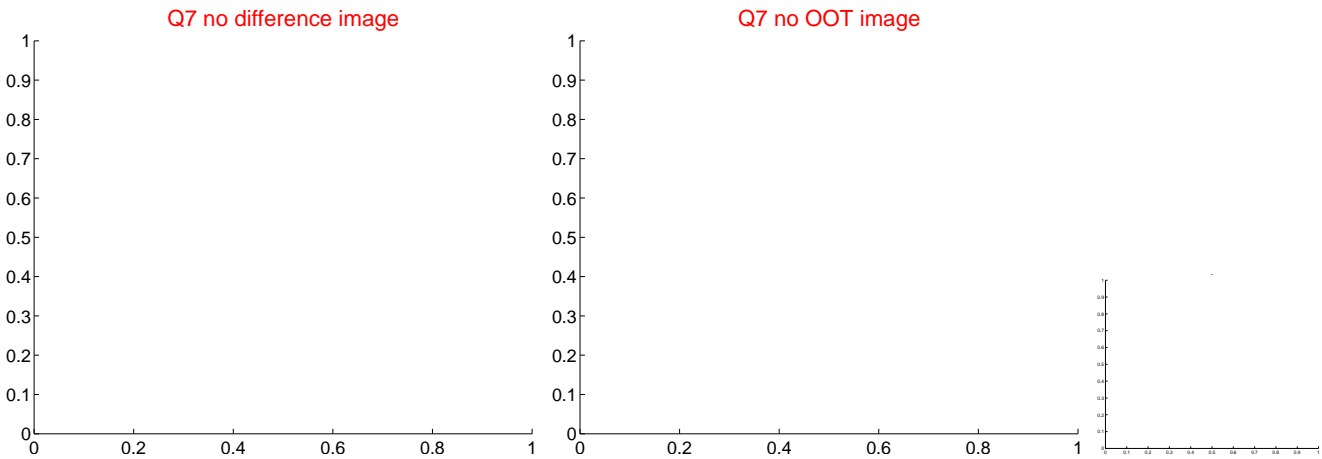
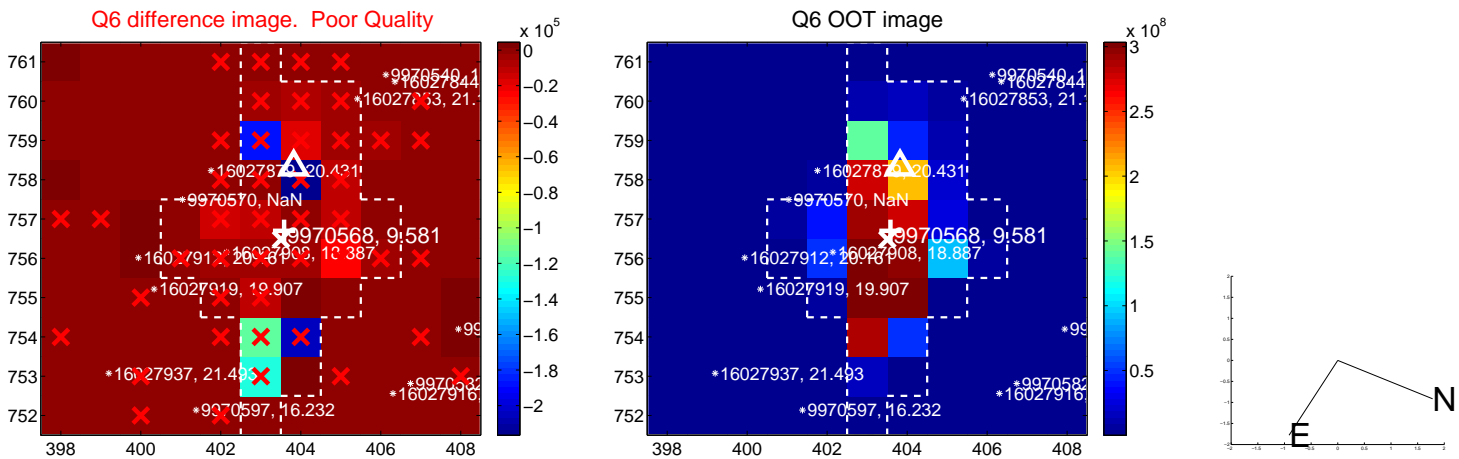
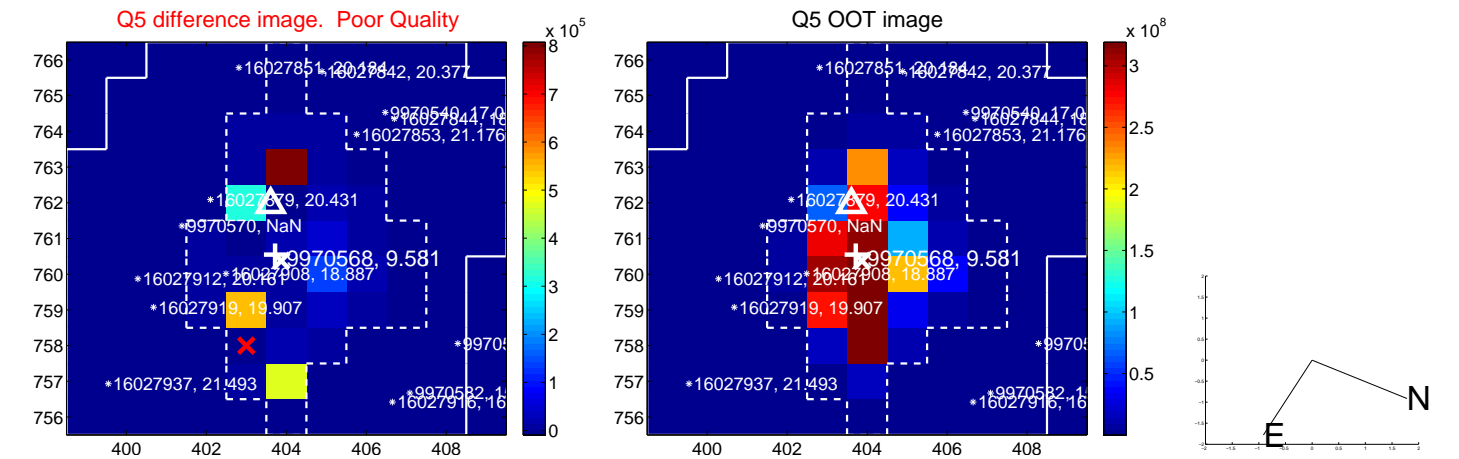


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

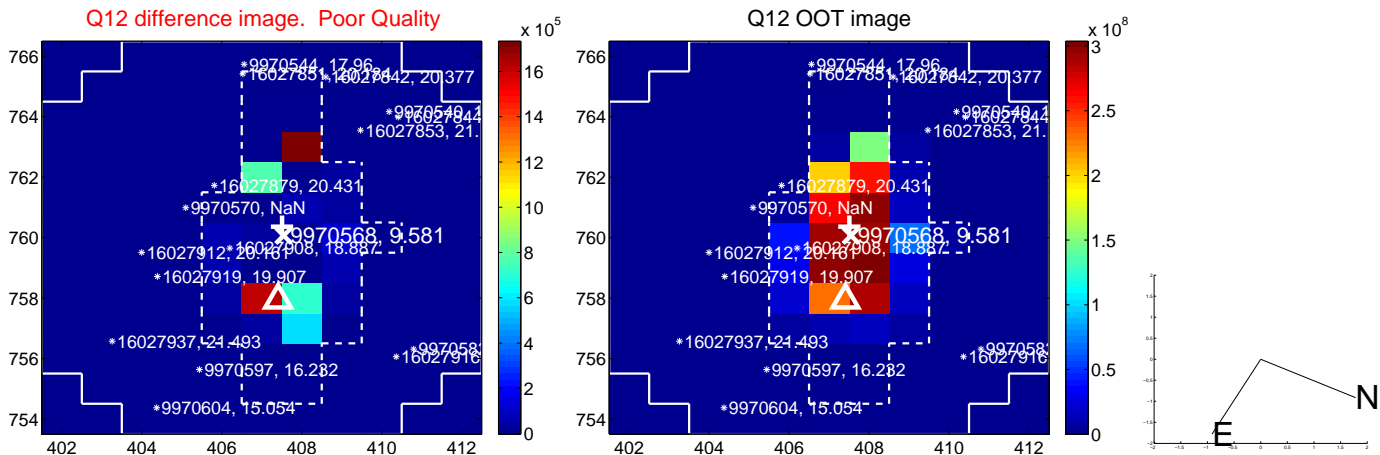
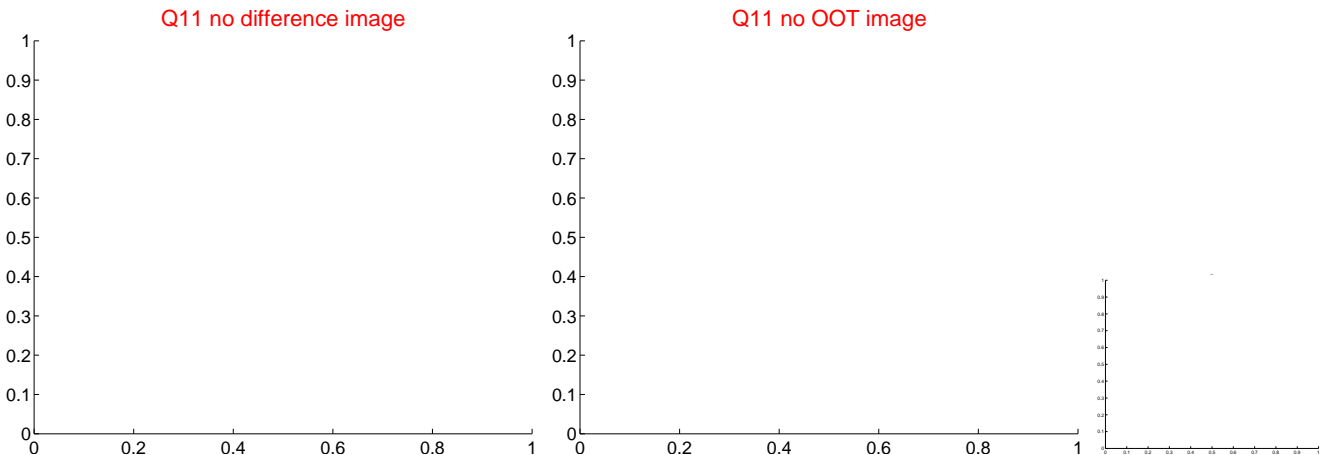
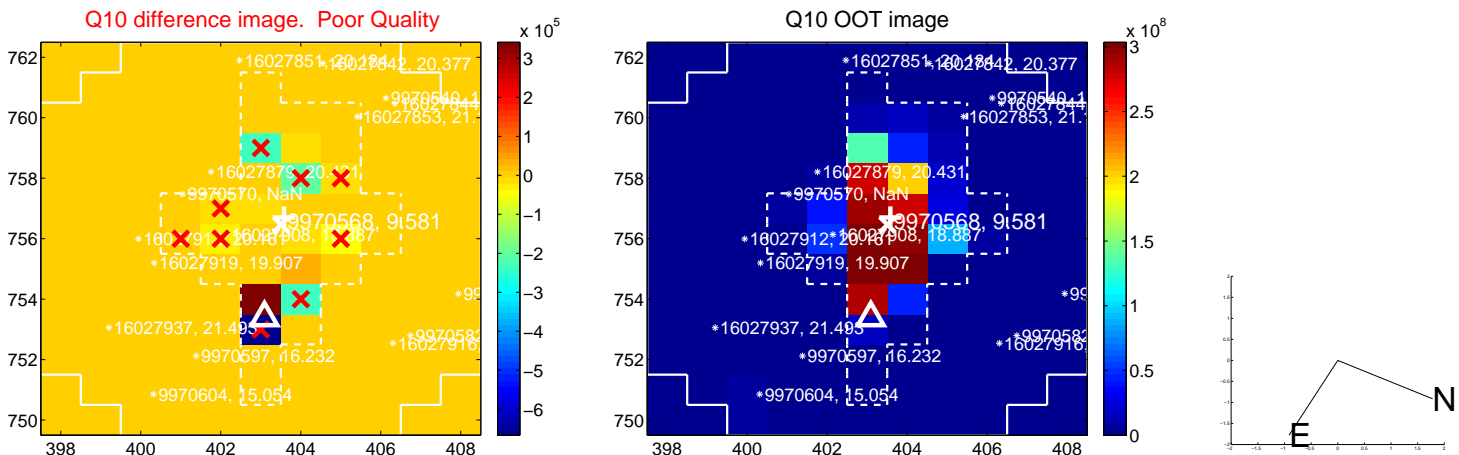
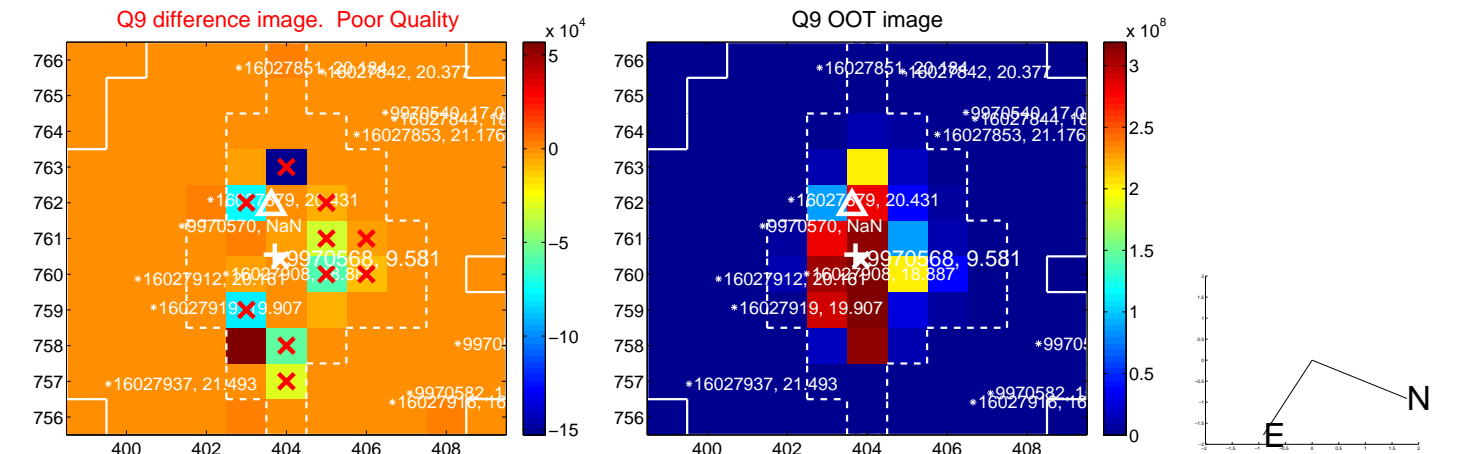
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



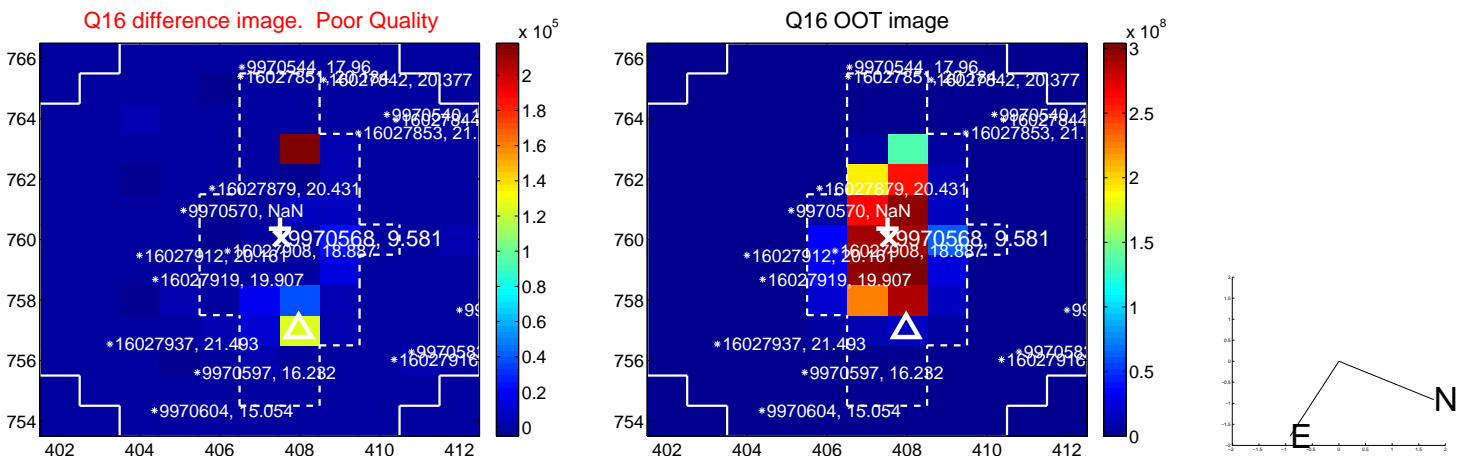
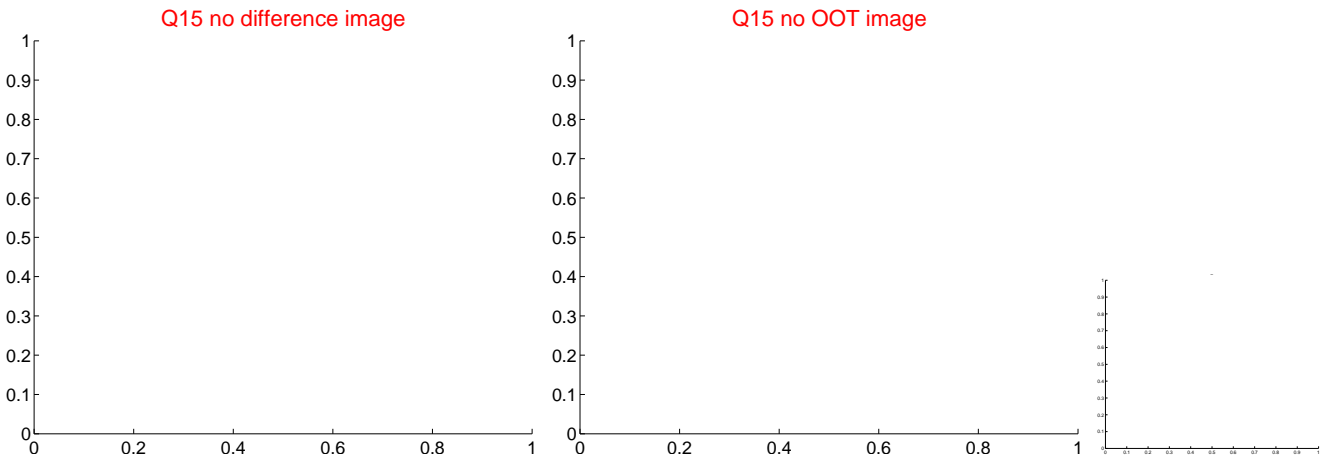
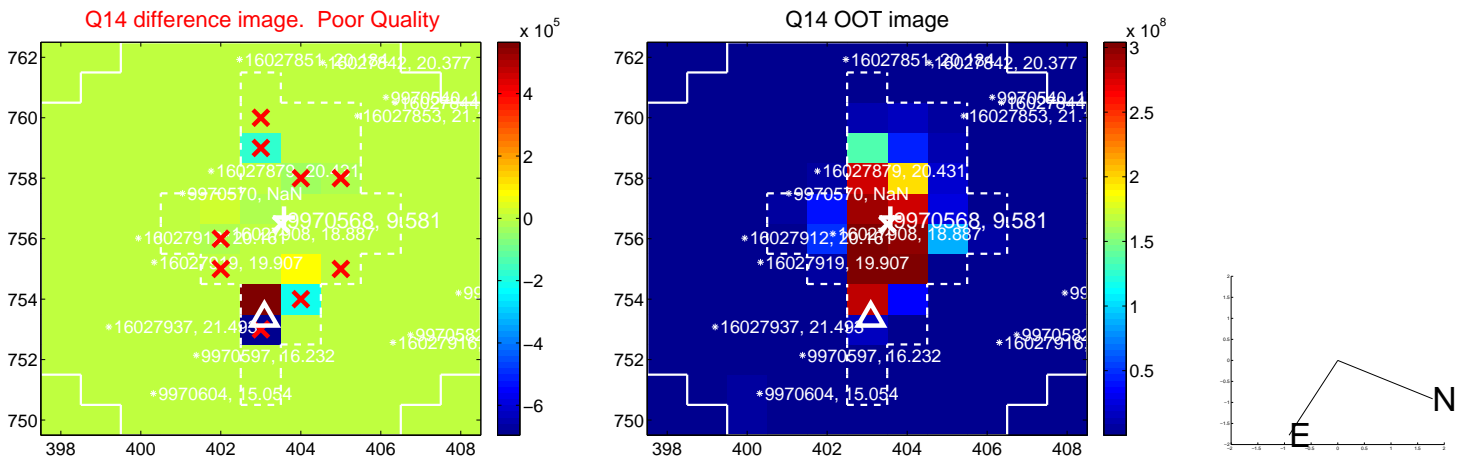
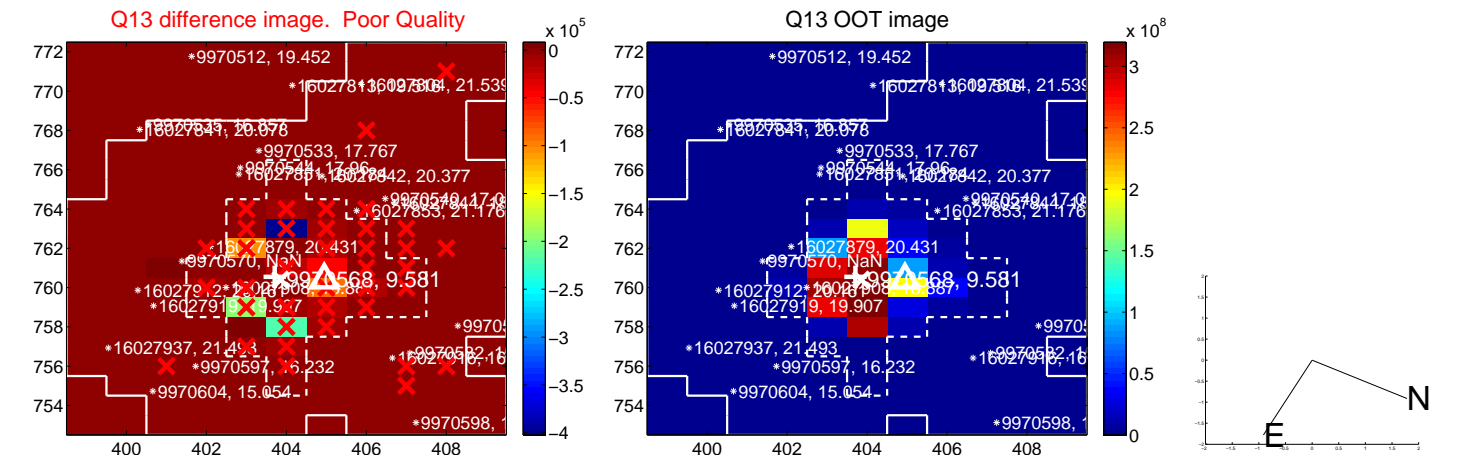
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



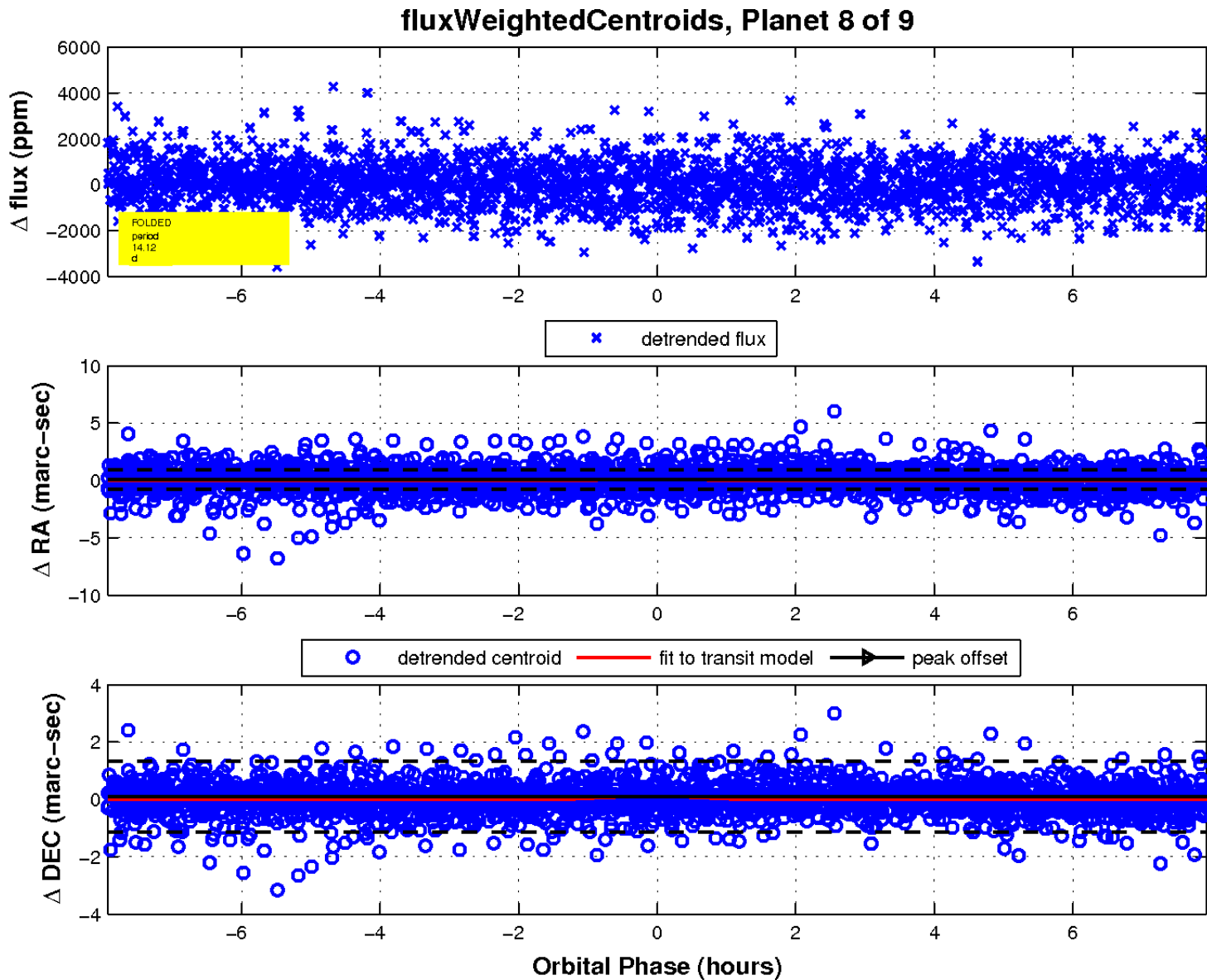
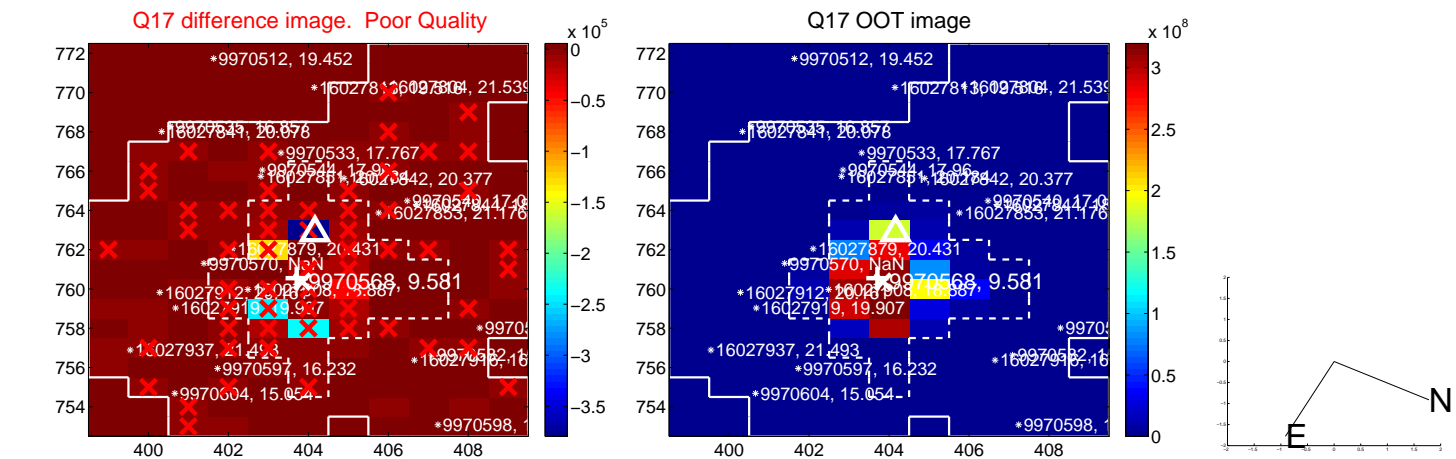
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

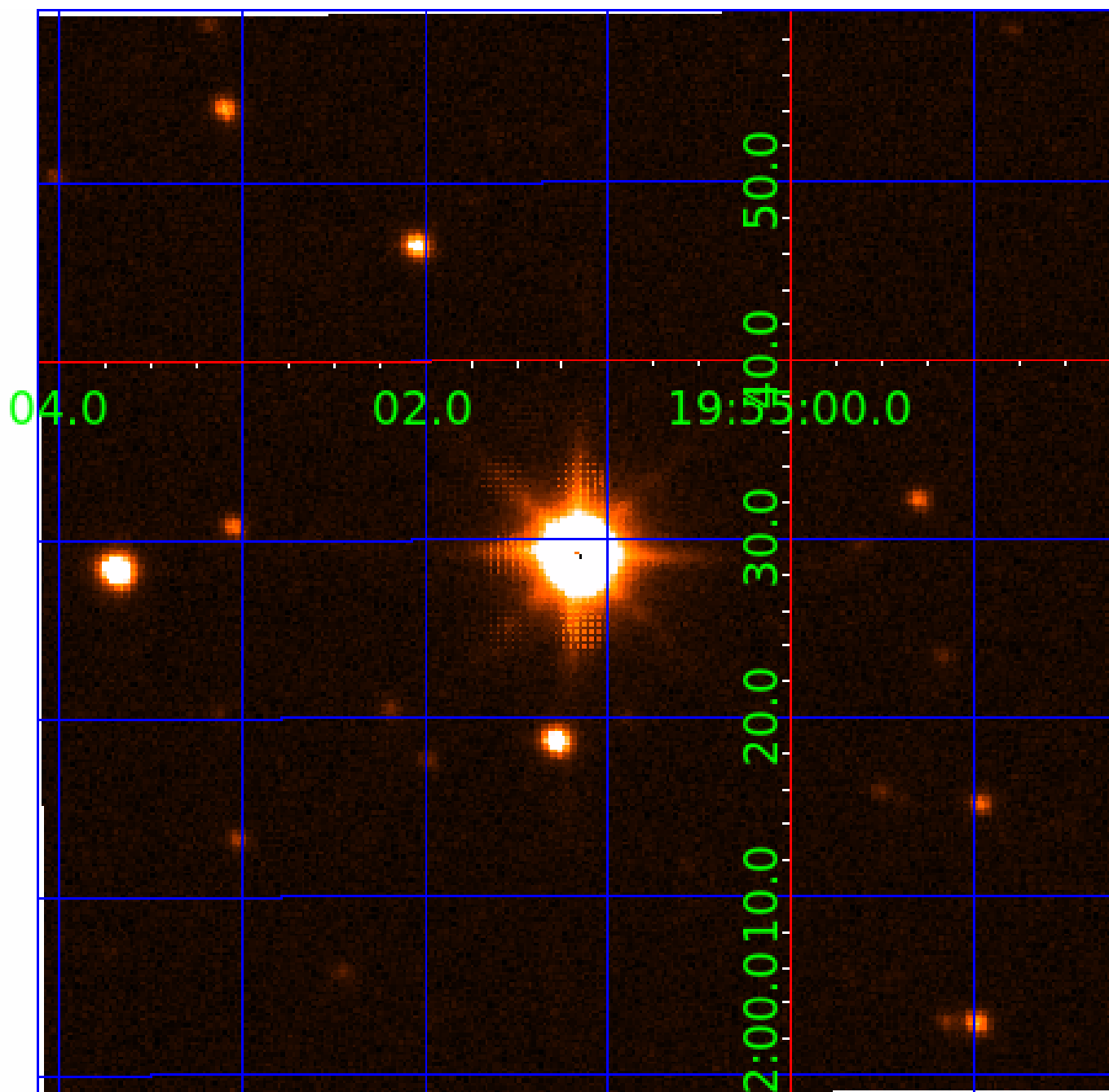


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009970568

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})
009970568-01	OBS	No	0.761375	131.773155	86.1	4.981	11.6	7.0	3.31	8035	3.13	95374.74
009970568-02	OBS	No	6.849496	134.393510	2076.3	2.075	12.6	9.7	3.31	8035	27.48	5097.45
009970568-03	OBS	No	30.488151	135.191934	1286.3	2.736	10.7	8.8	3.31	8035	13.60	696.18
009970568-04	OBS	No	108.630100	155.707473	2355.6	3.769	10.6	9.9	3.31	8035	29.25	127.93
009970568-05	OBS	No	51.809300	179.787566	2073.0	5.115	10.3	13.0	3.31	8035	15.51	343.31
009970568-06	OBS	No	9.624401	133.642564	889.2	1.961	9.2	9.5	3.31	8035	13.06	3238.92
009970568-07	OBS	No	27.073036	138.845537	965.7	3.769	9.0	8.0	3.31	8035	10.94	815.67
009970568-08	OBS	No	14.115709	139.253007	1679.2	2.645	9.9	11.7	3.31	8035	23.27	1943.69
009970568-09	OBS	No	8.894852	132.463277	42.6	2.000	9.2	-1.0	3.31	8035	2.19	3597.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970568-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
009970568-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
009970568-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

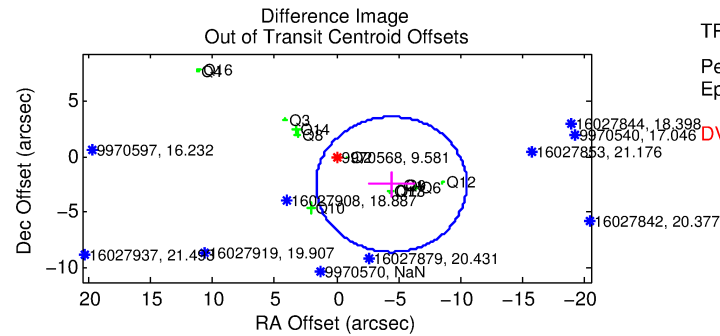
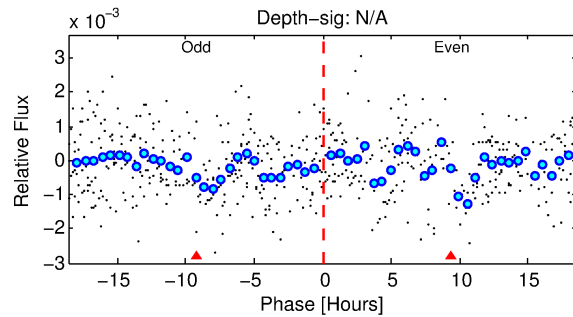
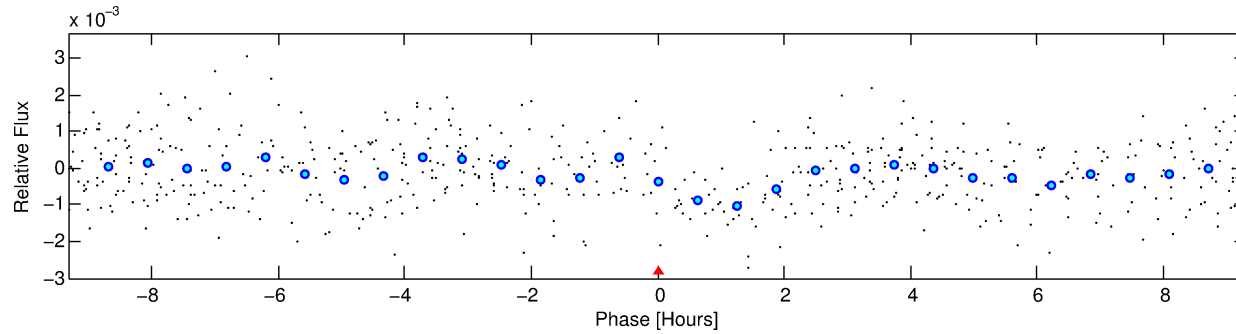
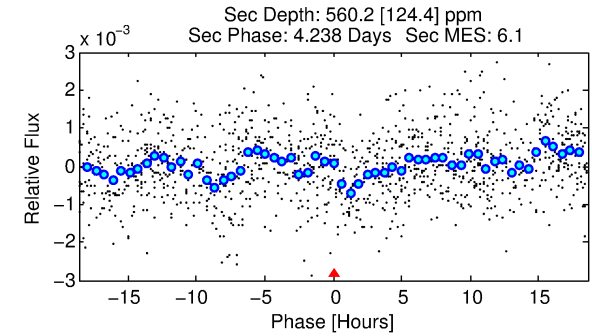
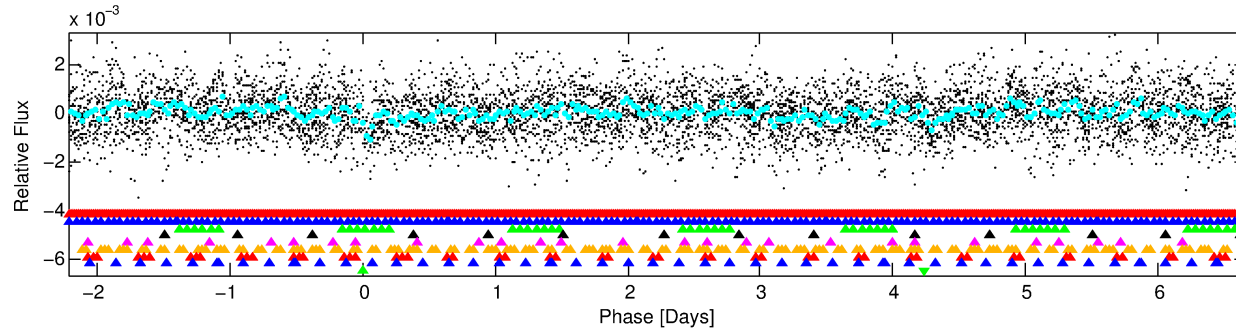
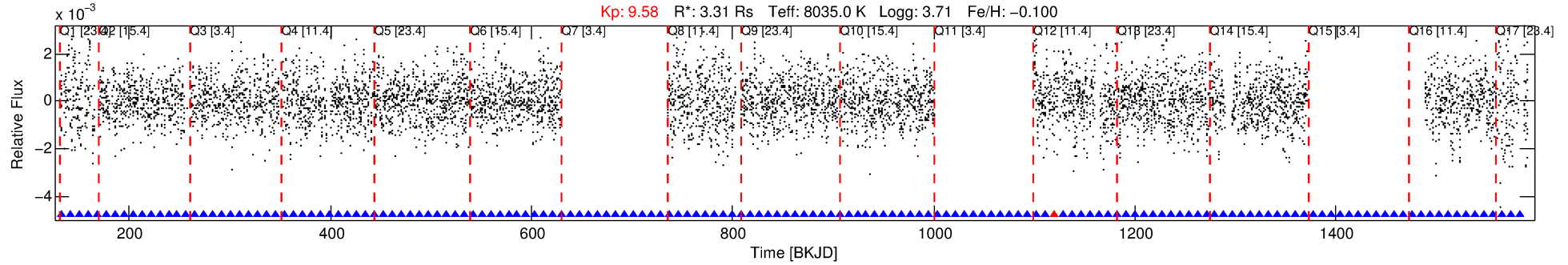
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009970568-09

No Significant Match Found

DV One-Page Summary

KIC: 9970568 Candidate: 9 of 9 Period: 8.895 d



TPS TCE Results:

Period = 8.89485 d
Epoch = 132.4633 BKJD

DV fit results are unavailable

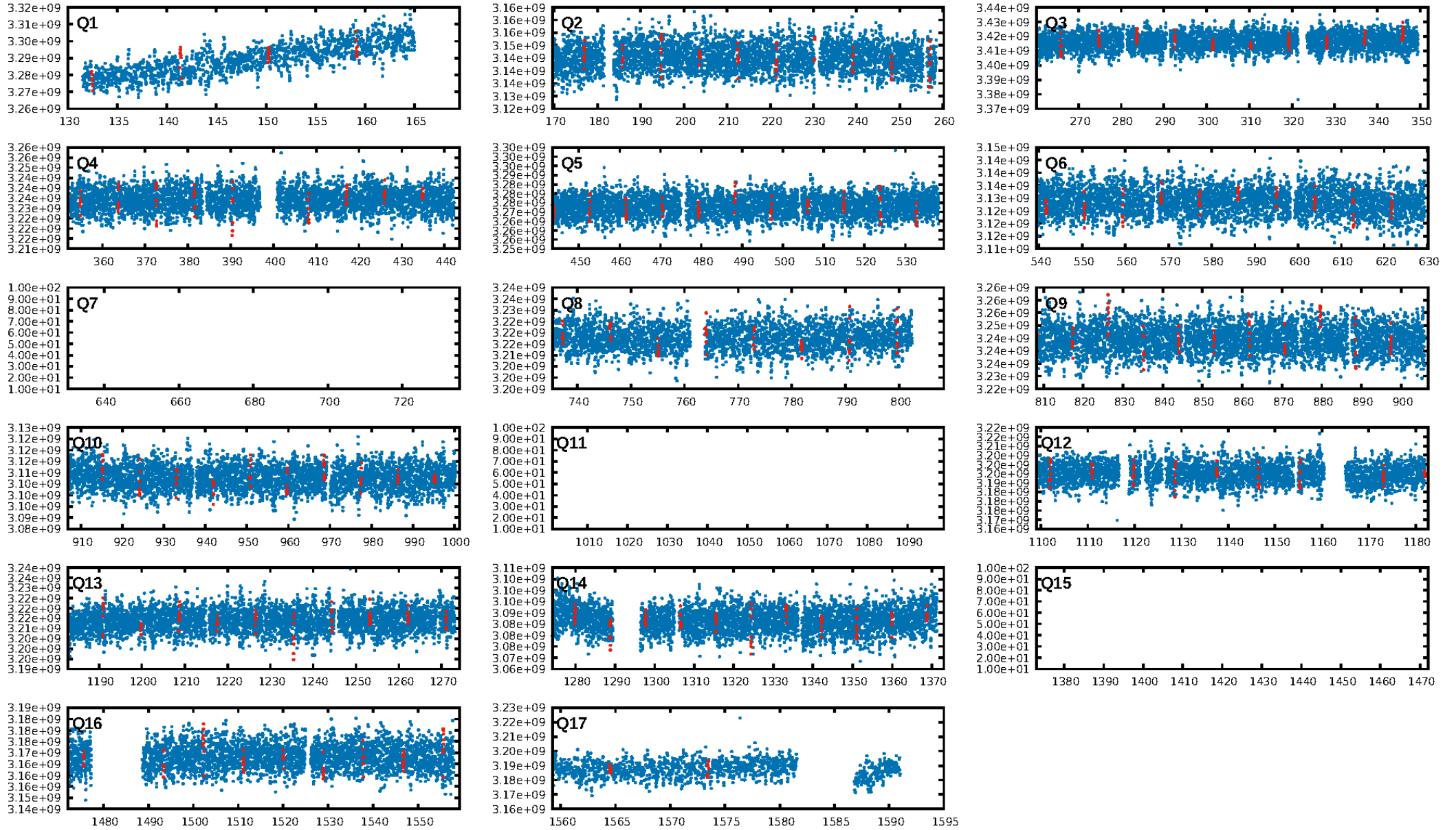
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.03 σ]
LongPeriod-sig: 100.0% [6.25 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.96 [25/26]
GhostDiagnostic-chr: N/A
Centroid-sig: 12.8%
Centroid-so: 0.160 arcsec [1.94 σ]
OotOffset-rm: 5.070 arcsec [2.51 σ]
KicOffset-rm: 6.010 arcsec [3.03 σ]
OotOffset-st: 4/1/4/4 [13]
KicOffset-st: 4/1/4/4 [13]
DiffImageQuality-fgm: 0.00 [0/13]
DiffImageOverlap-fno: 0.00 [0/14]

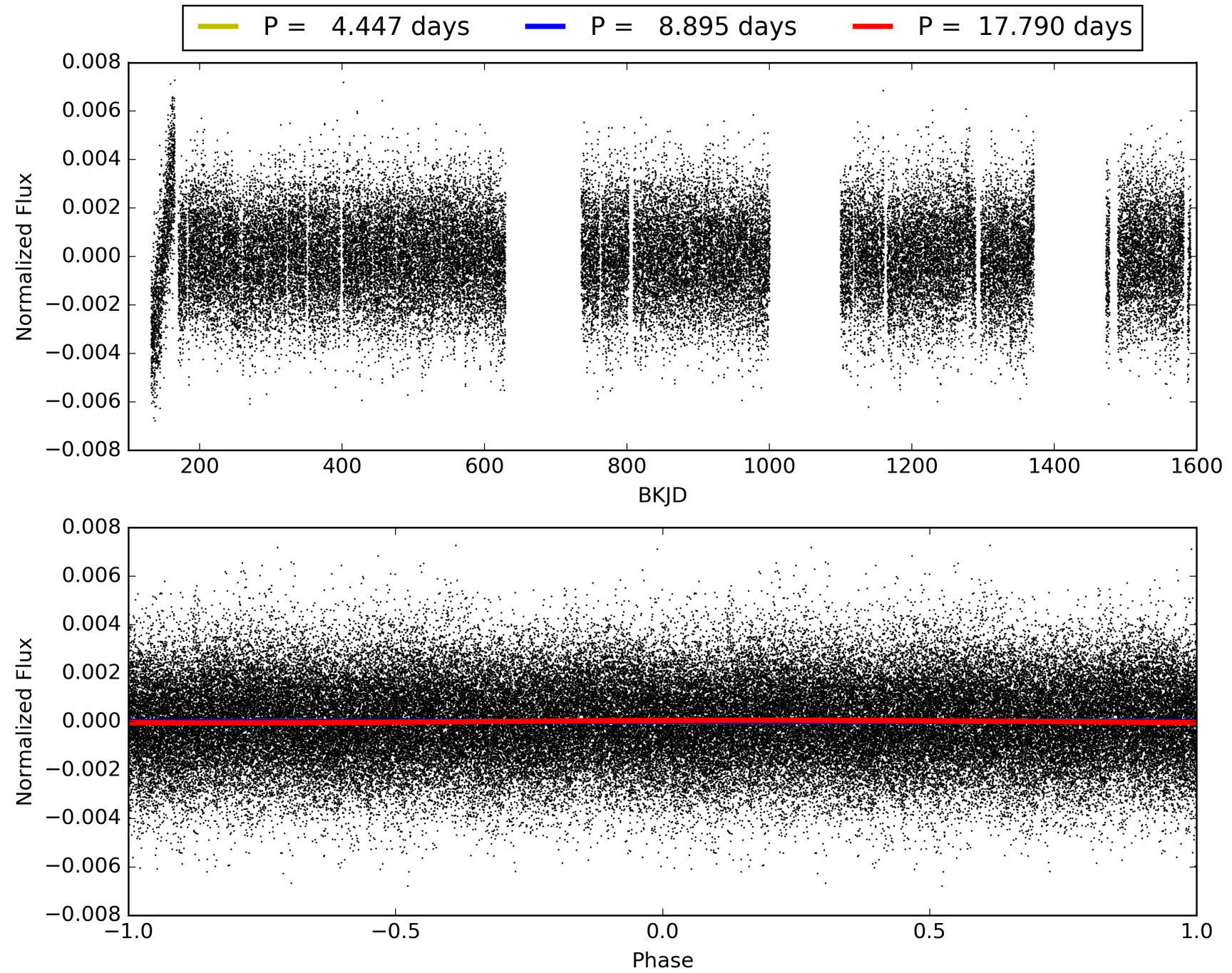
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:49 Z

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

TCE 009970568-09, PDC Light Curves

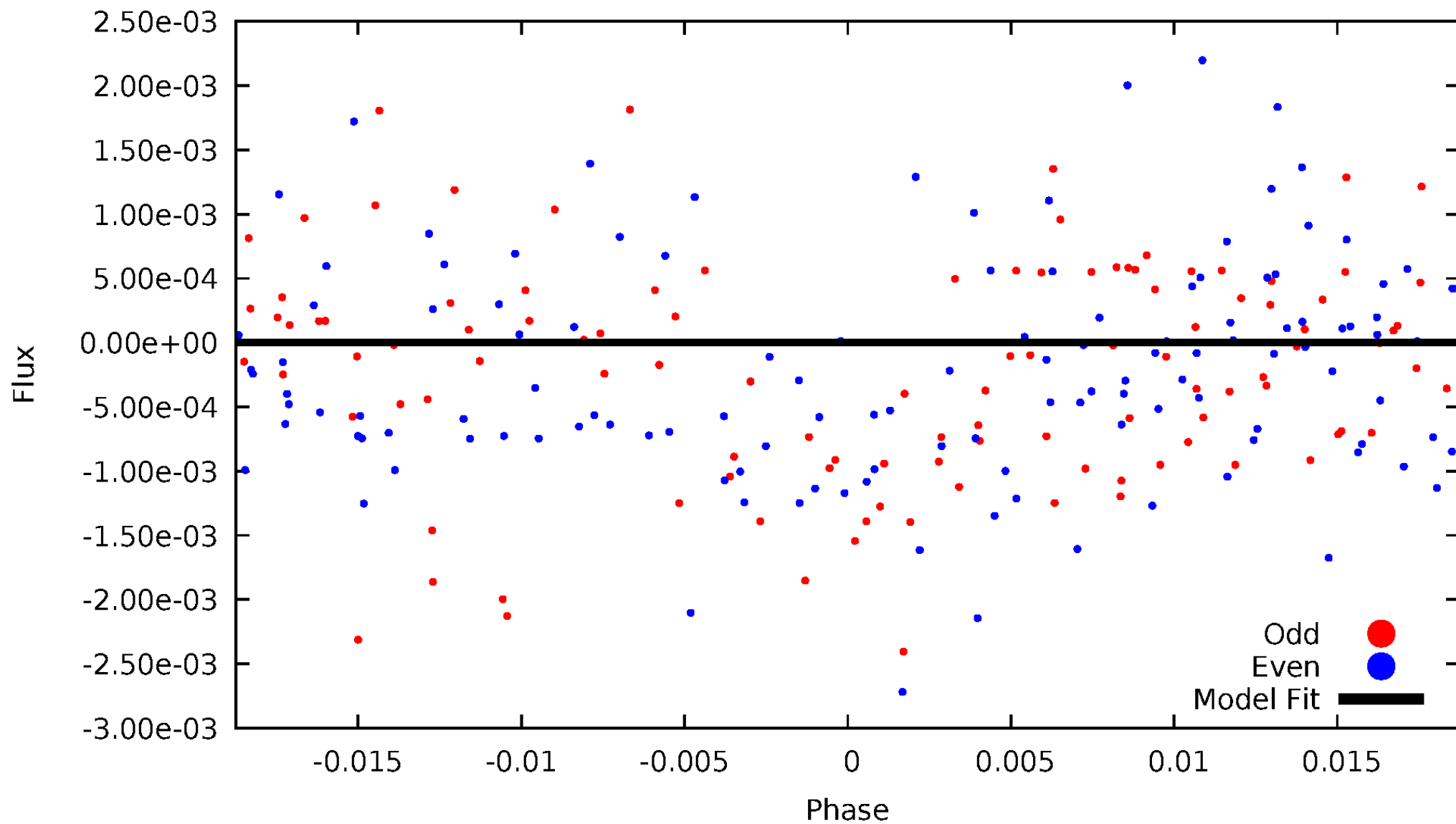


TCE 009970568-09



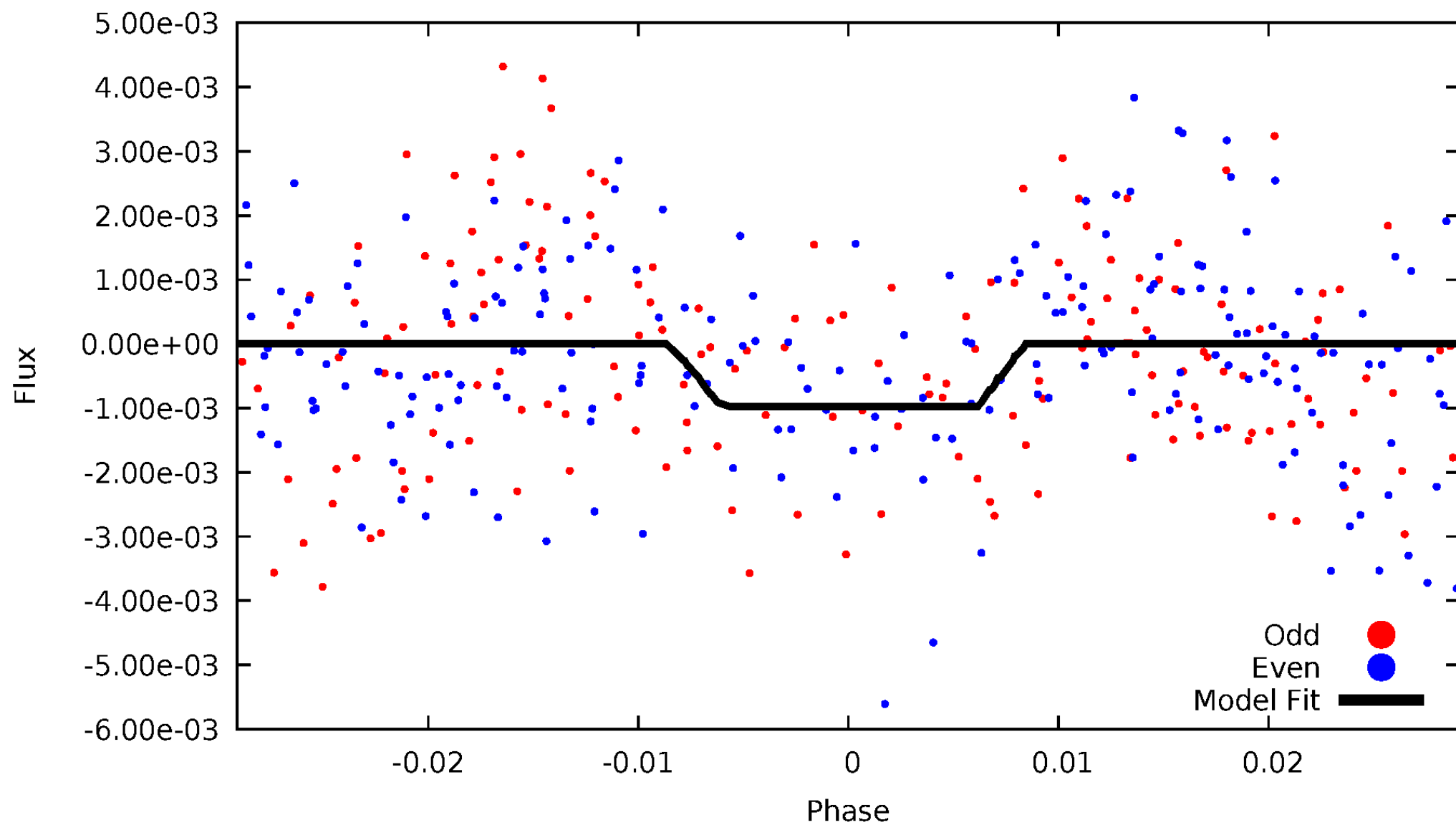
DV Odd/Even

TCE 009970568-09

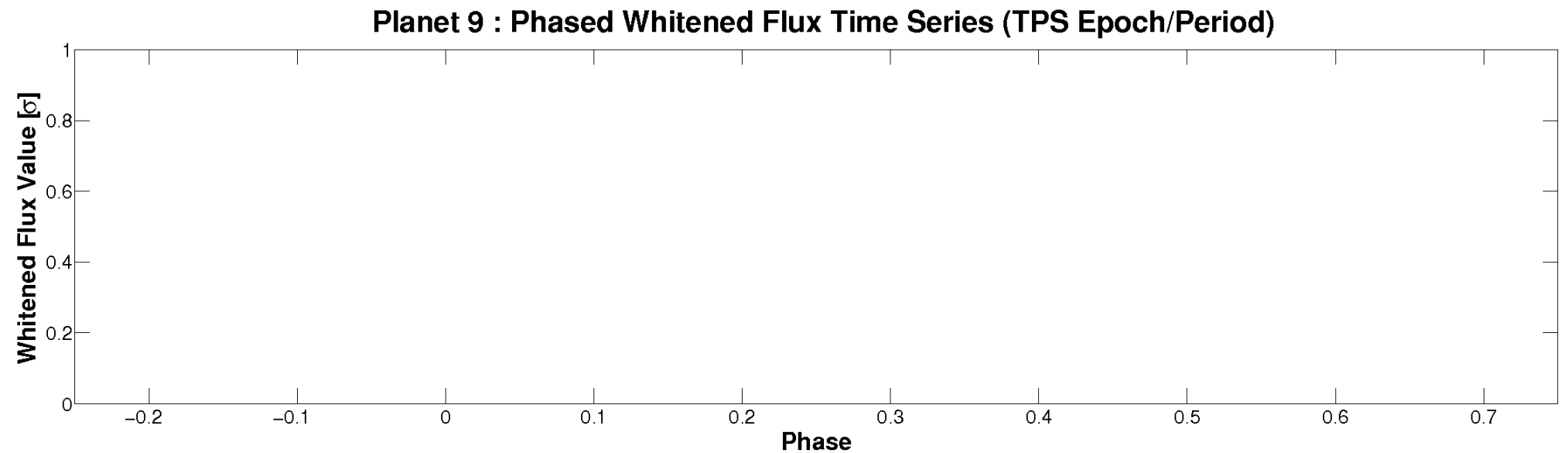
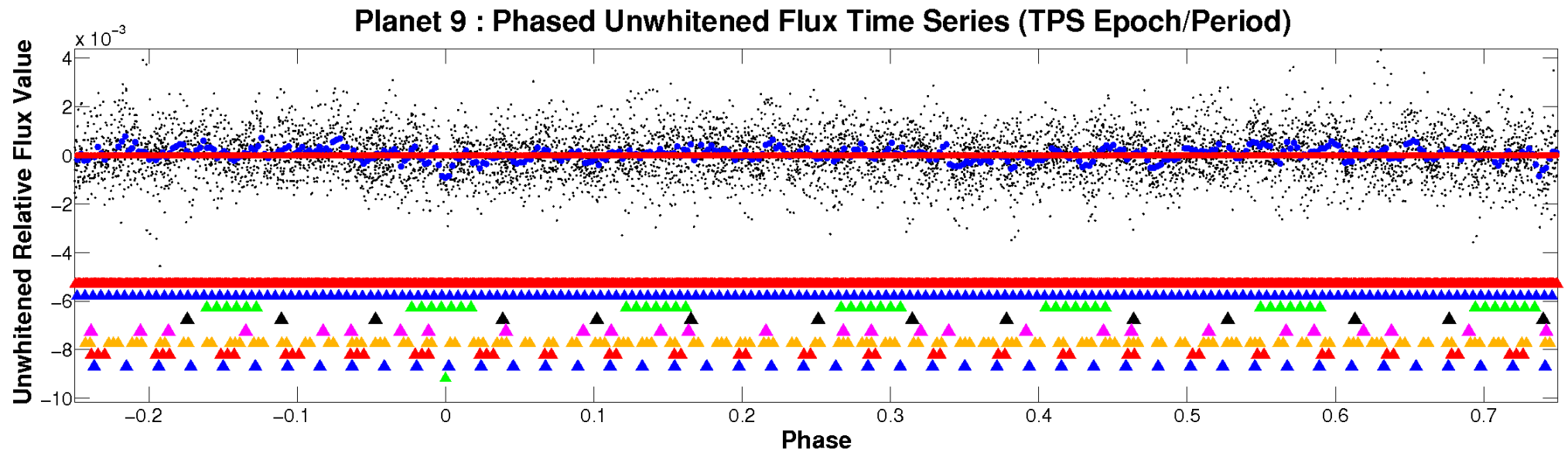


ALT Odd/Even

TCE 009970568-09

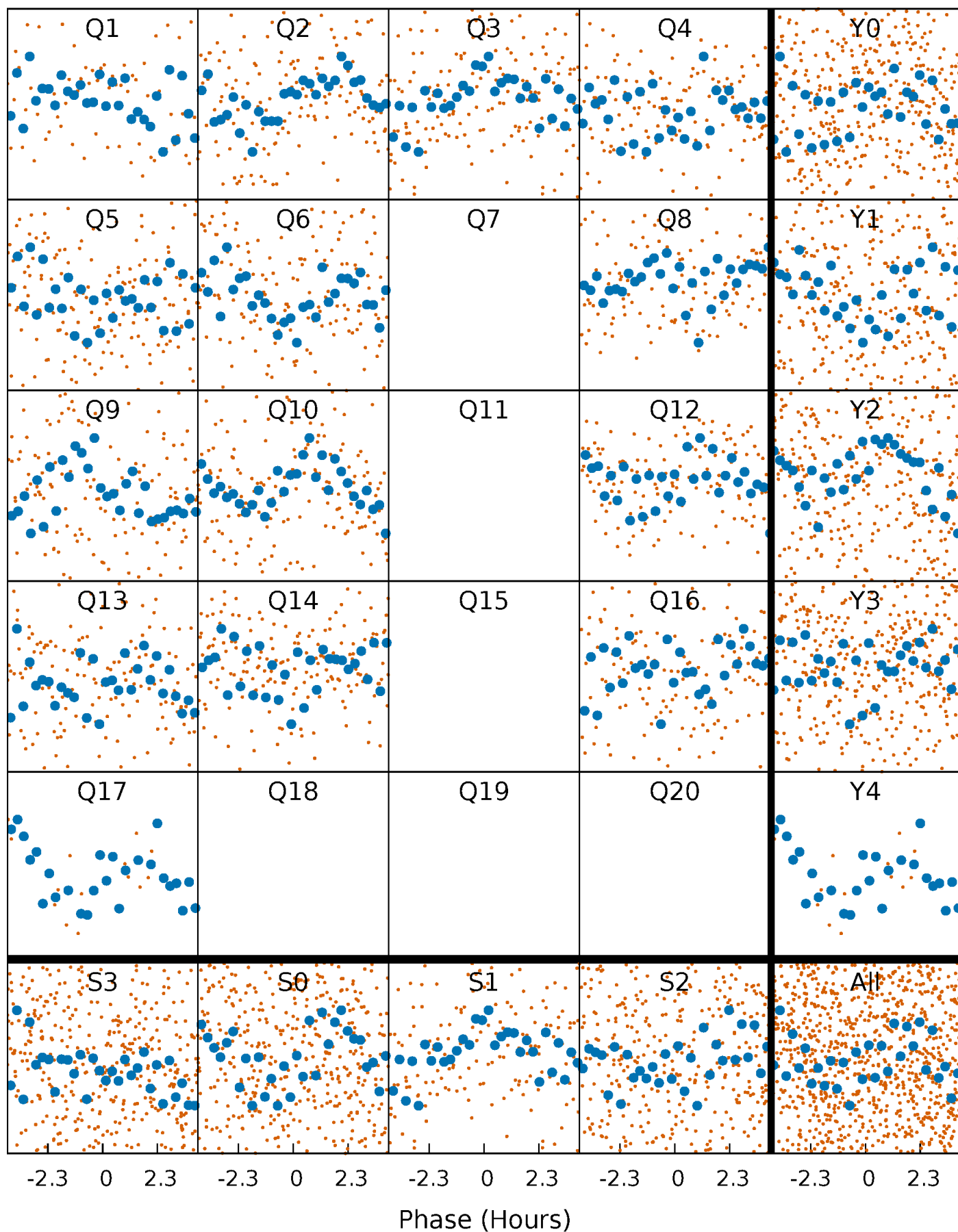


Non-Whitened Vs. Whitened Light Curve



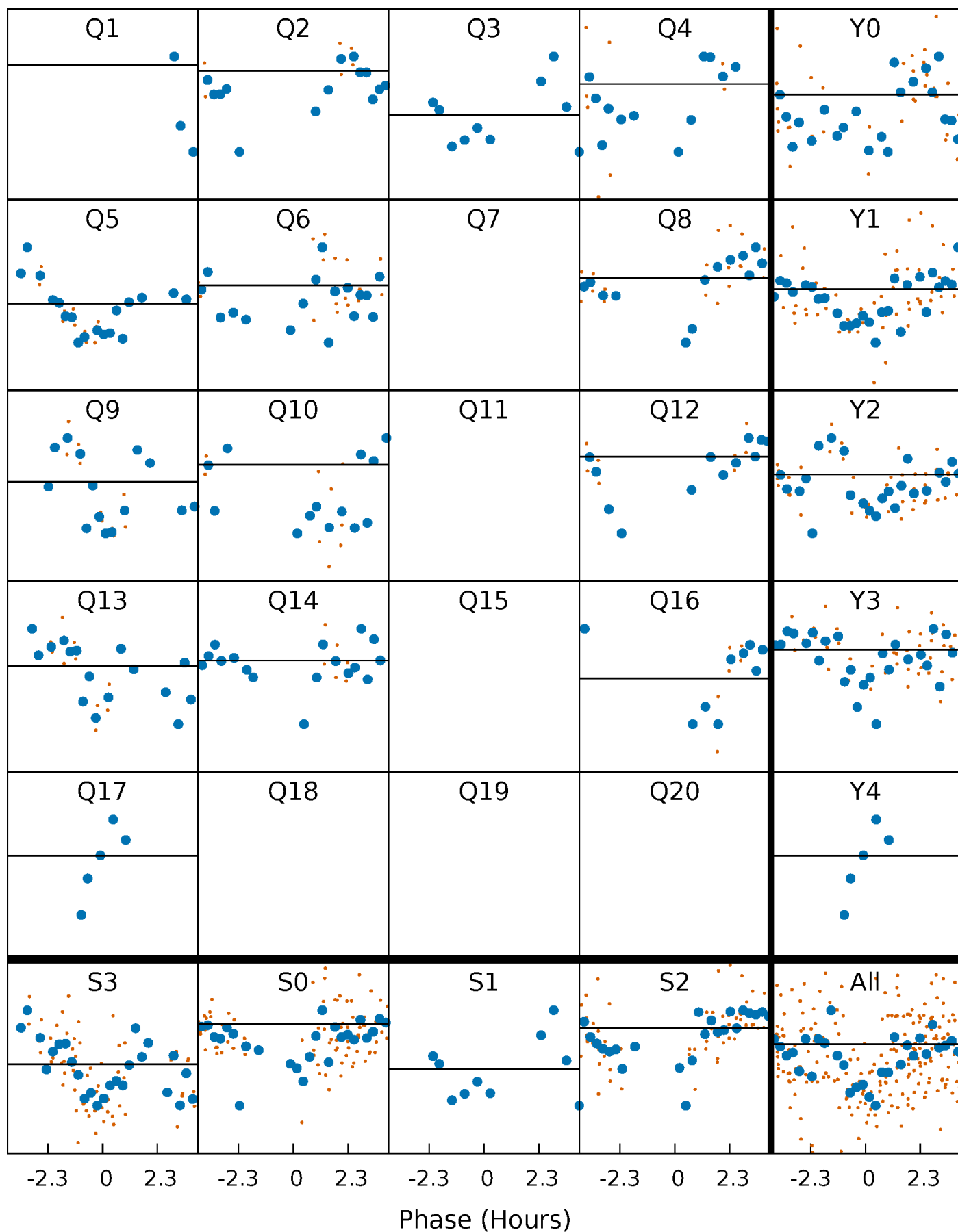
PDC Quarter-Phased Transit Curves

TCE 009970568-09 P= 8.894852 Days $T_0=132.463277$ (BKJD)



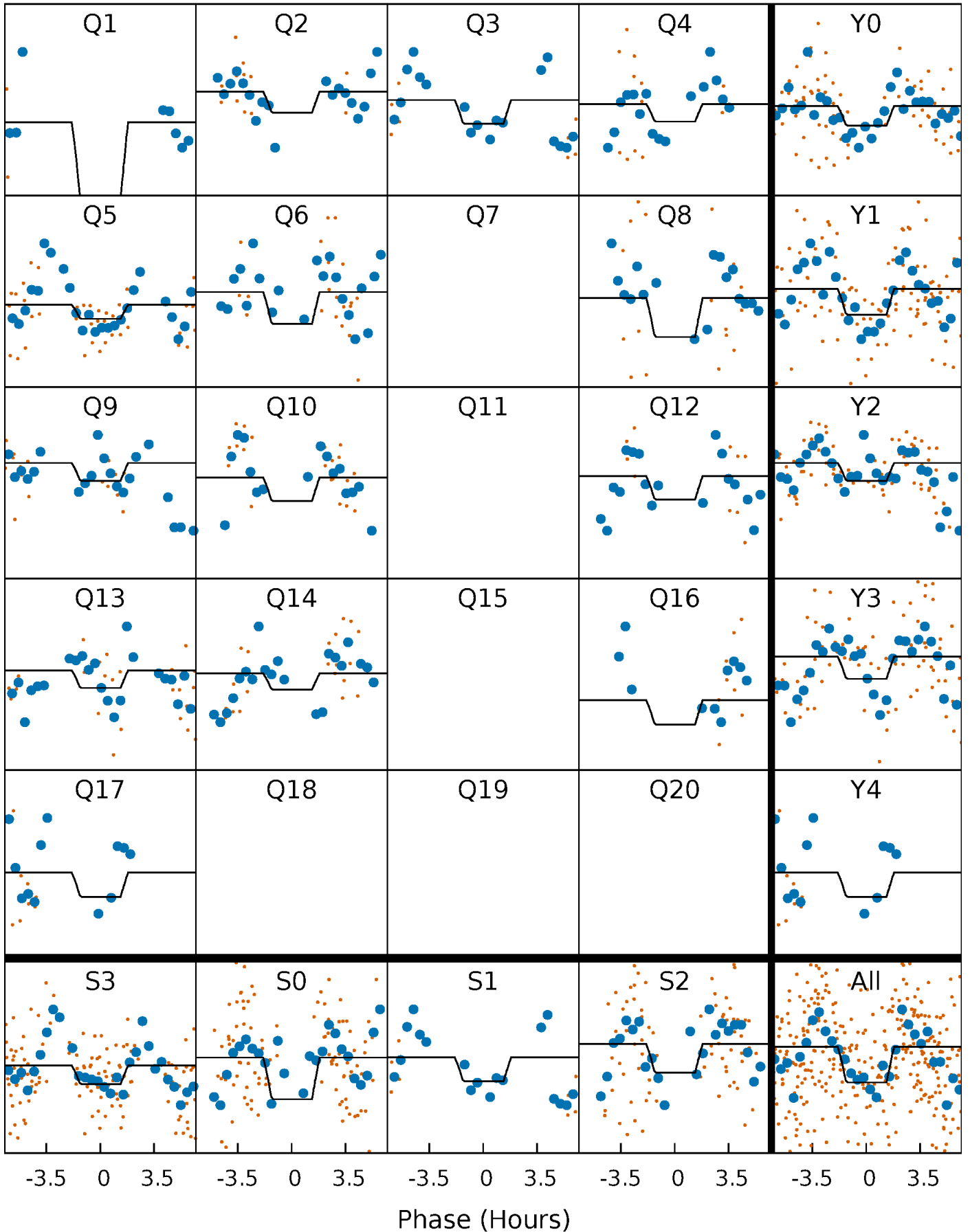
DV Quarter-Phased Transit Curves

TCE 009970568-09 P= 8.894852 Days $T_0=132.463277$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

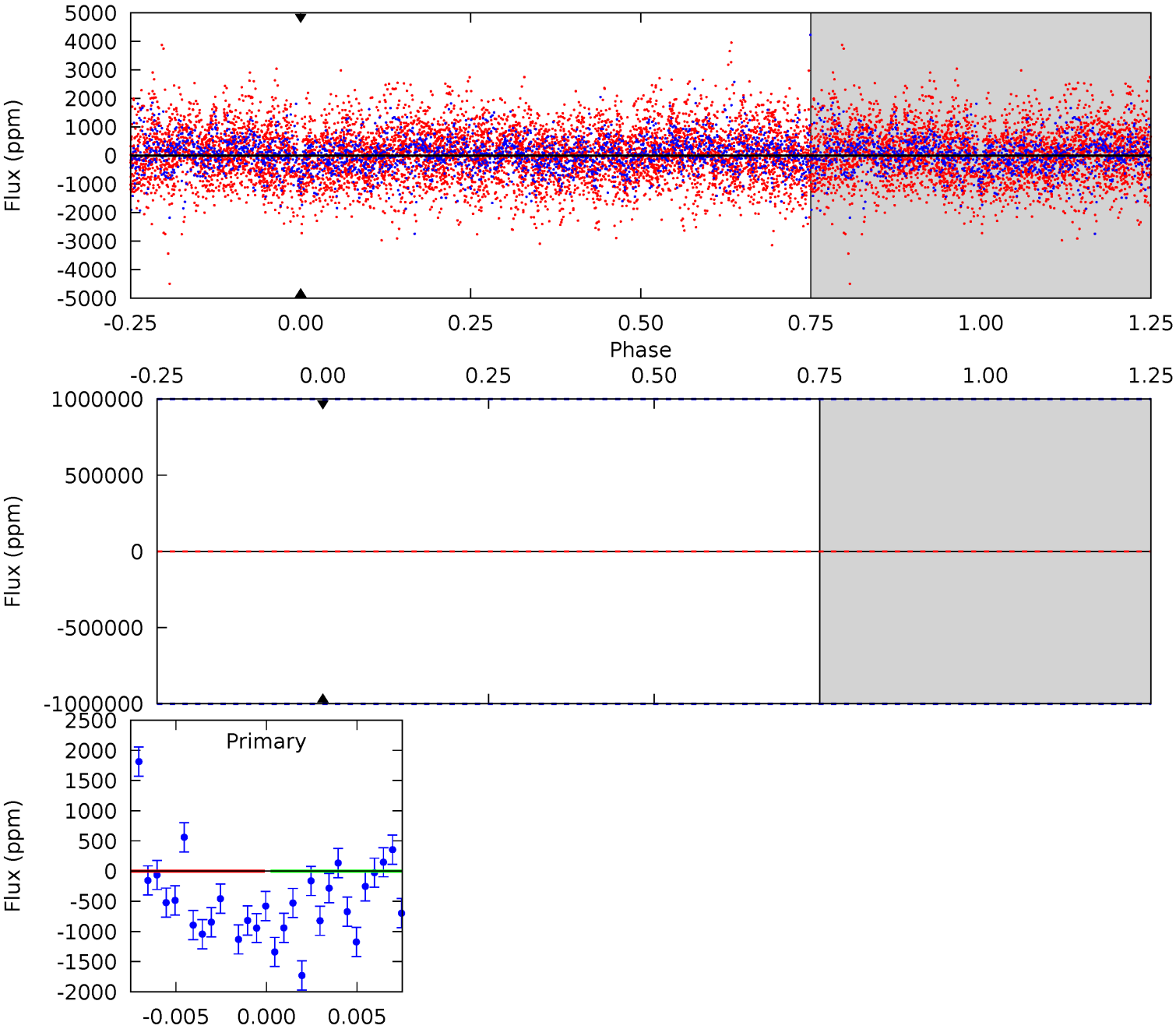
TCE 009970568-09 P= 8.894852 Days $T_0=132.418441$ (BKJD)



DV Model-Shift Uniqueness Test

009970568-09, P = 8.894852 Days, E = 123.568425 Days

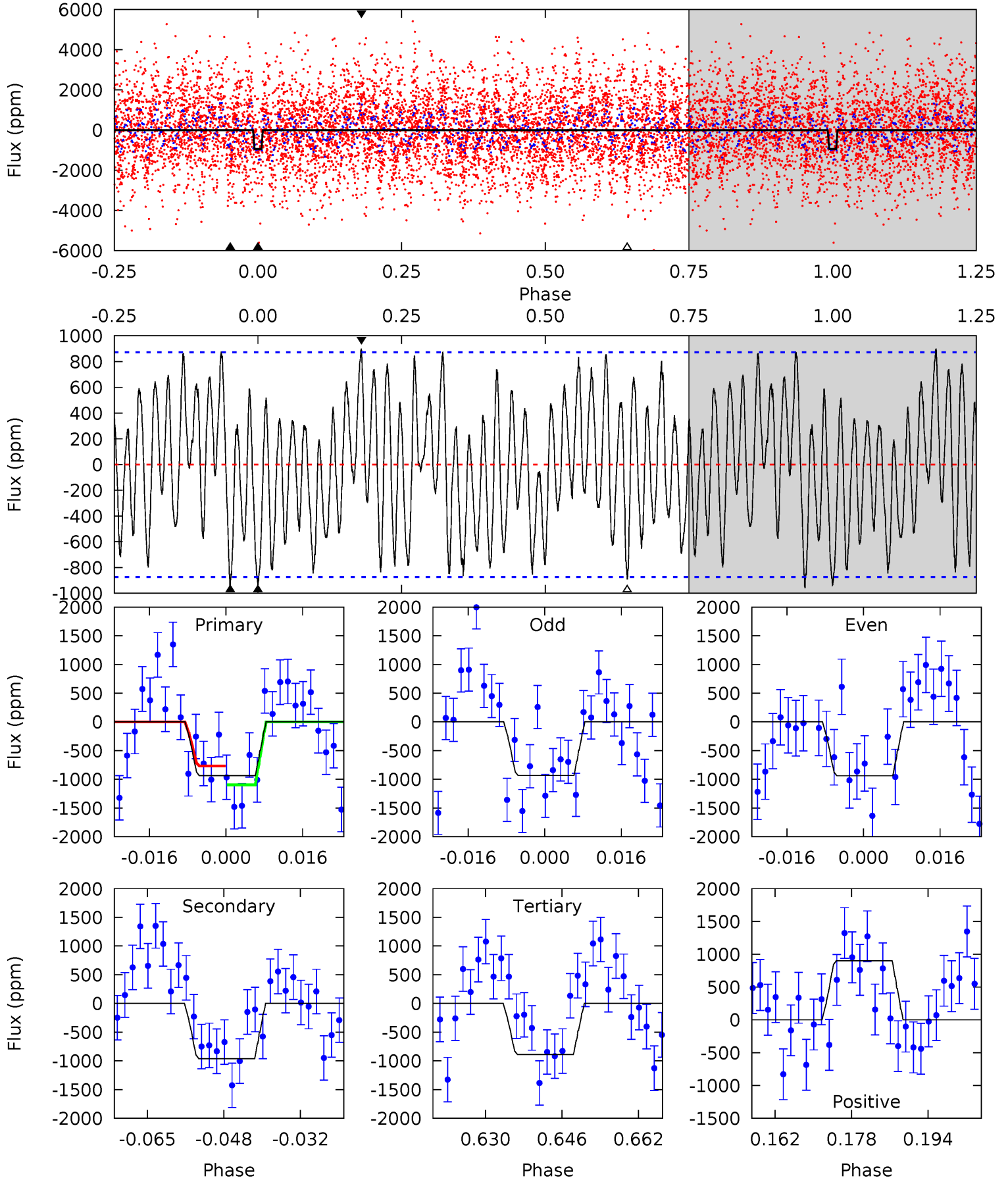
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009970568-09, P = 8.894852 Days, E = 123.523589 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.29	5.43	5.02	5.09	4.93	2.41	2.50	0.27	0.20	0.40	0.34	0.01	1.08	0.48	0.93



Stellar Parameters For KIC 009970568

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8035^{+223}_{-362}	$3.709^{+0.432}_{-0.108}$	$-0.100^{+0.200}_{-0.350}$	$3.312^{+0.789}_{-1.579}$	$2.046^{+0.372}_{-0.538}$	$0.079^{+0.307}_{-0.028}$
	+3%/-5%	+12%/-3%	+200%/-350%	+24%/-48%	+18%/-26%	+388%/-35%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009970568-09 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$21.93^{+27.44}_{-15.21}$	2648^{+239}_{-324}	7721^{+65555}_{-50179}	49^{+3499}_{-1957}
Alt.	-960 ± 177	$26.17^{+26.18}_{-18.22}$	2652^{+225}_{-321}	4873^{+4620}_{-1140}	$9.000^{+89.504}_{-6.746}$

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

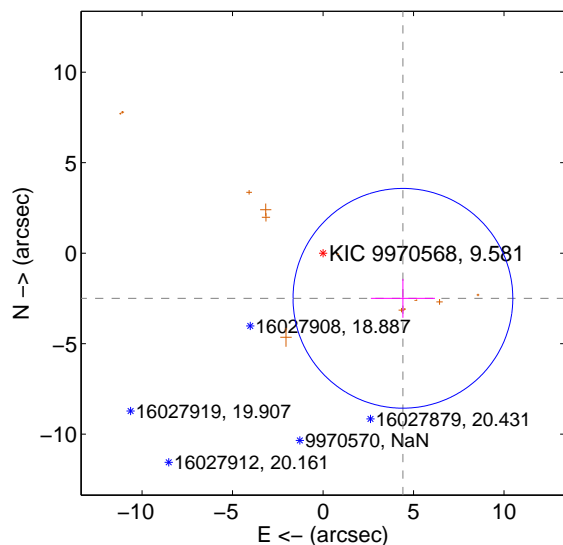
Supplemental centroid analysis for 009970568-09. **Kepler magnitude: 9.58.** Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

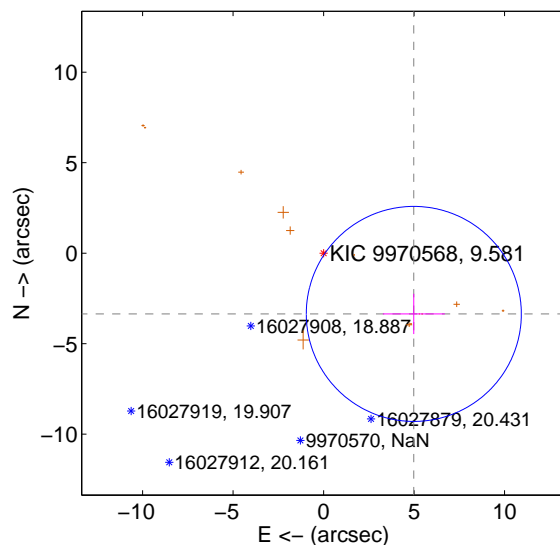
The direct PRF centroid is offset from the target star catalog position by about 0.90 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.070 ± 2.024	2.51	-4.414 ± 1.774	-2.494 ± 1.076
PRF-fit source offset from KIC position	6.010 ± 1.980	3.03	-4.985 ± 1.712	-3.356 ± 1.113
photometric centroid source offset	0.16 ± 0.08	1.94	0.12 ± 0.10	0.10 ± 0.05

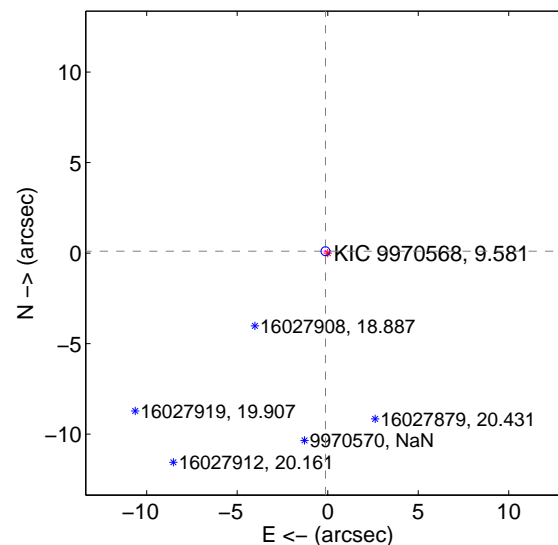
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

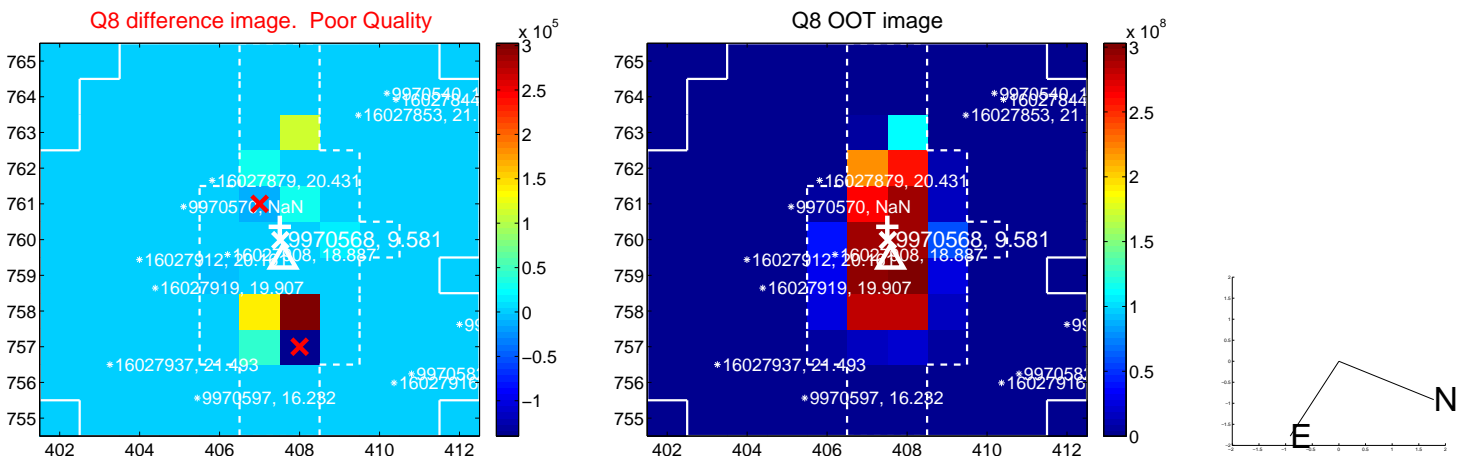
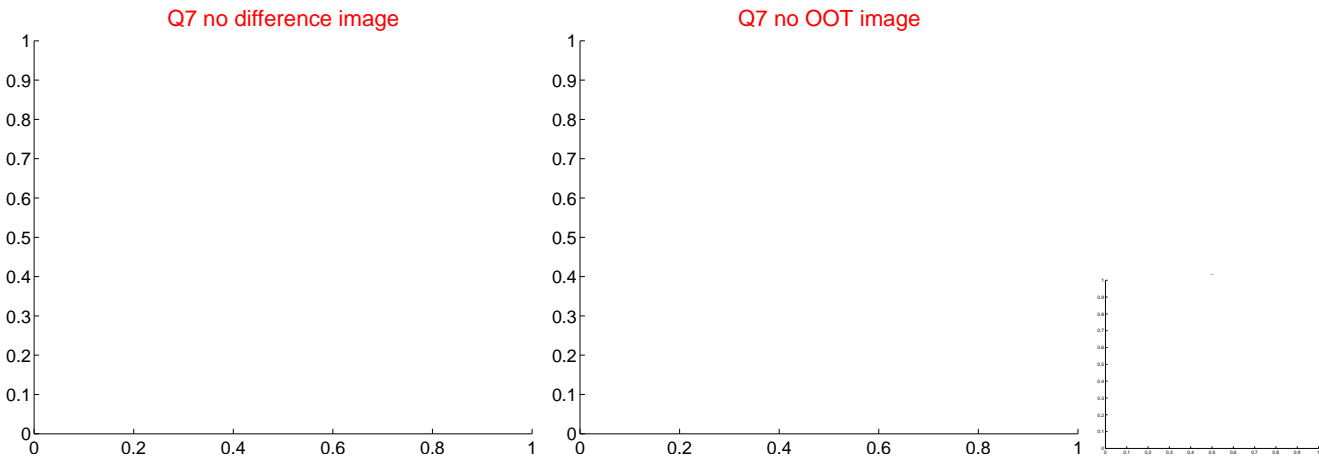
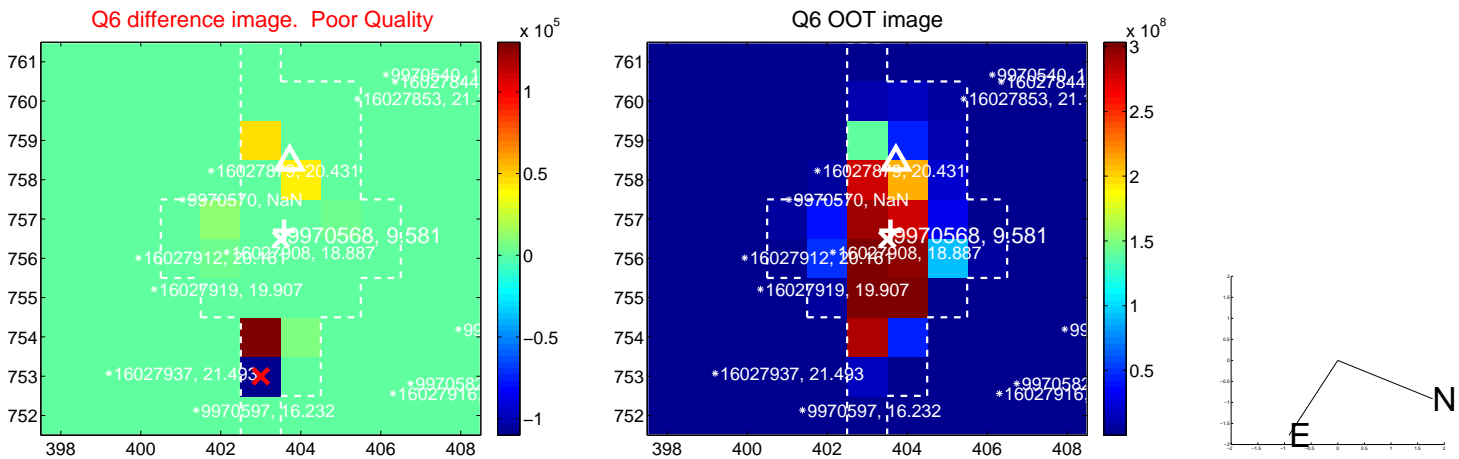
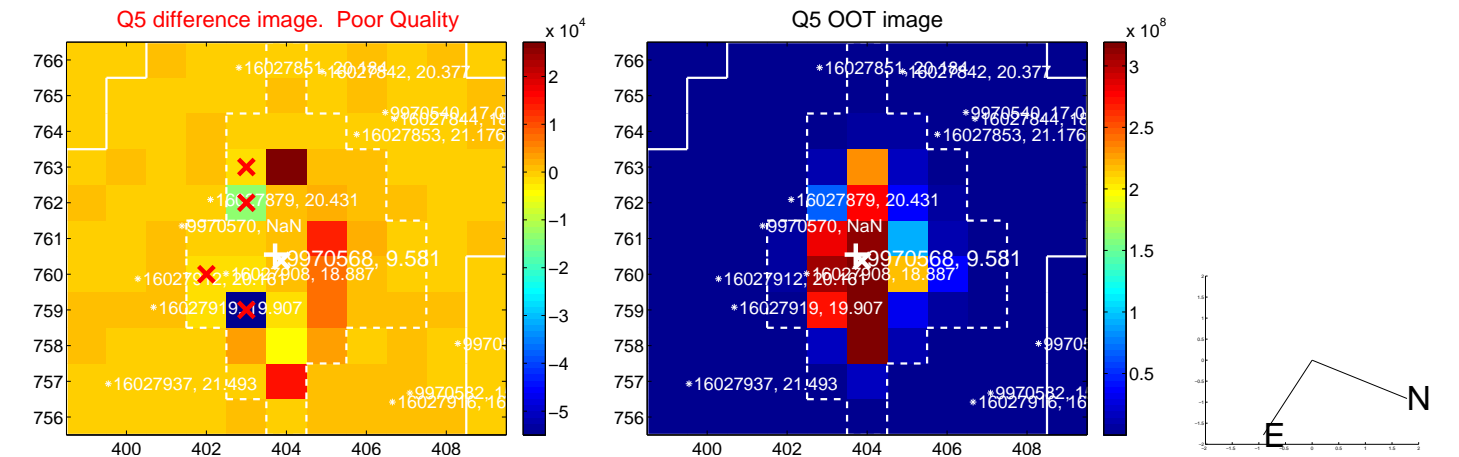


offset from photometric centroids

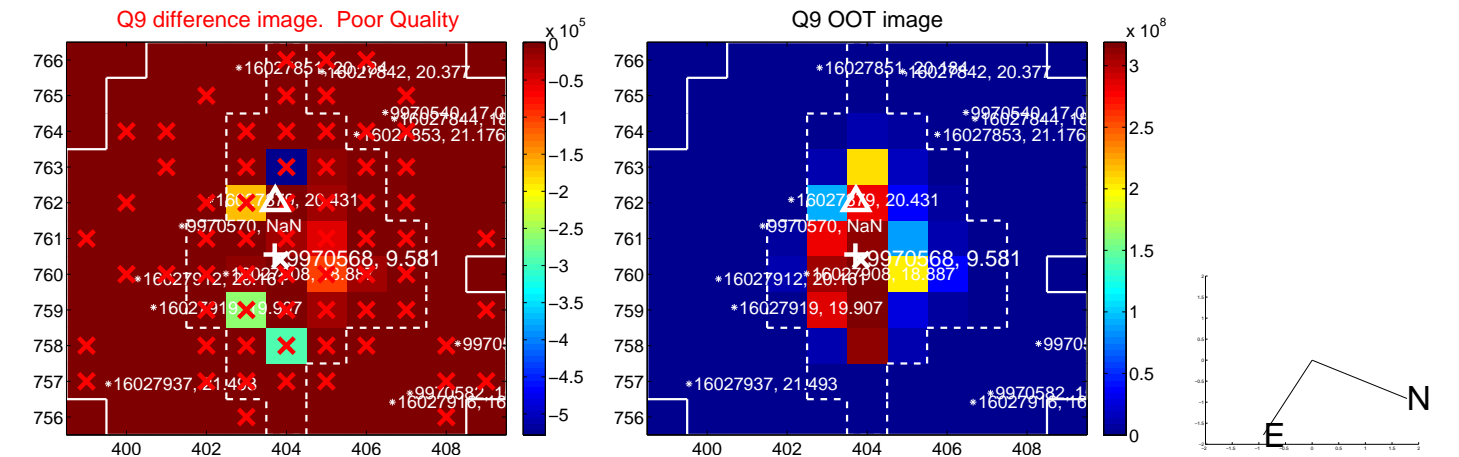


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

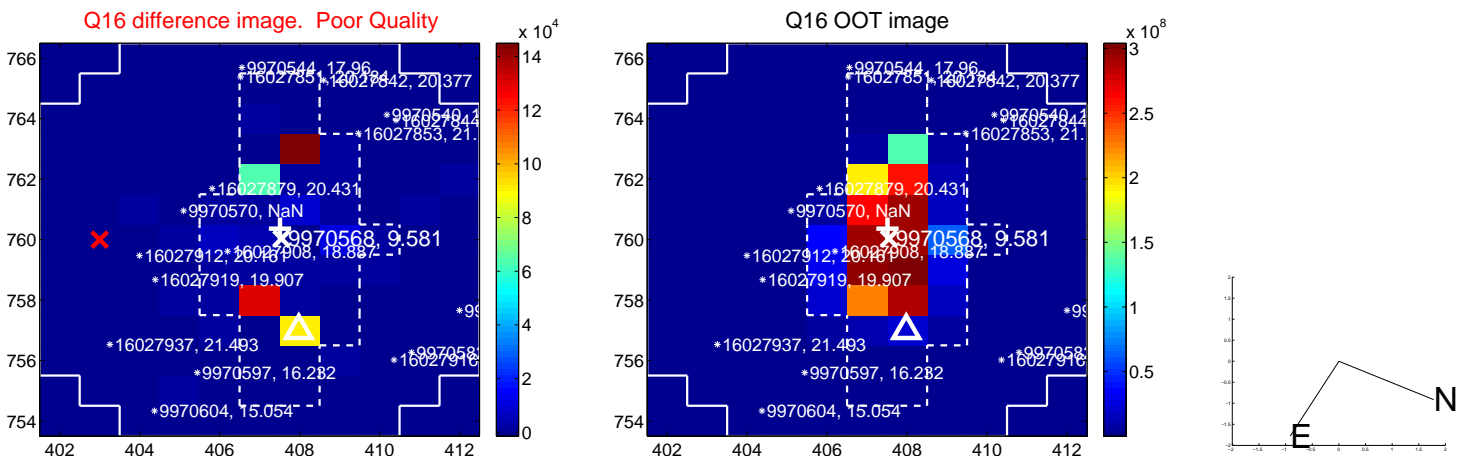
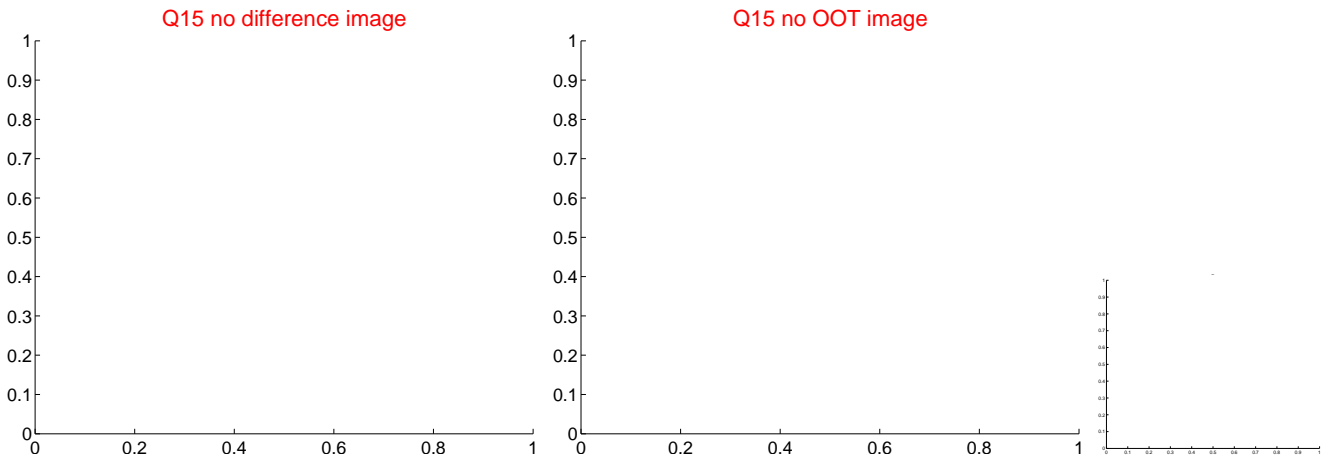
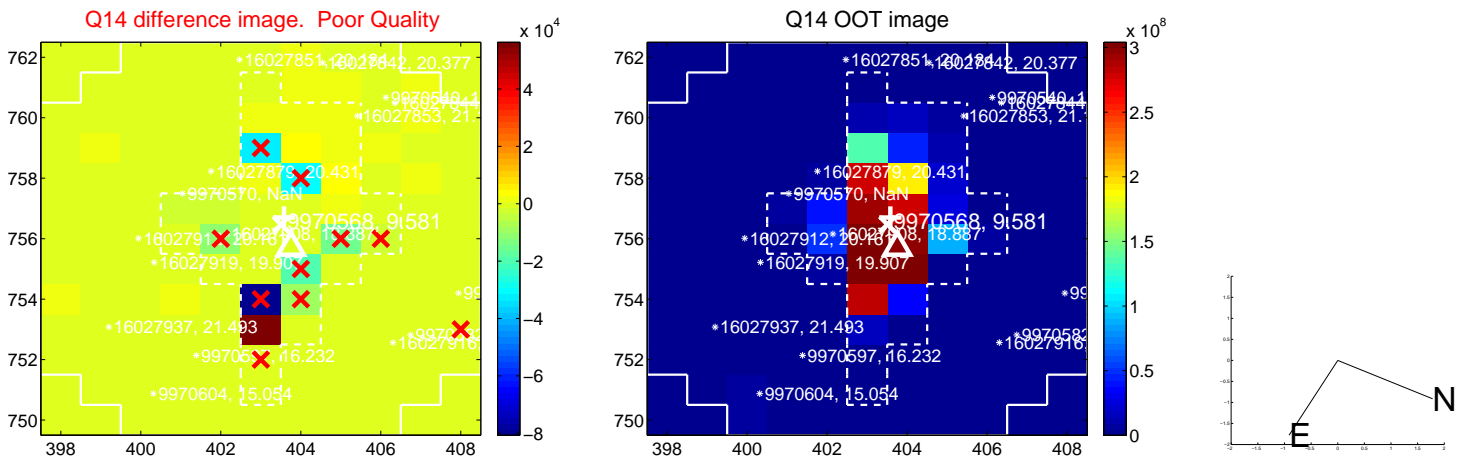
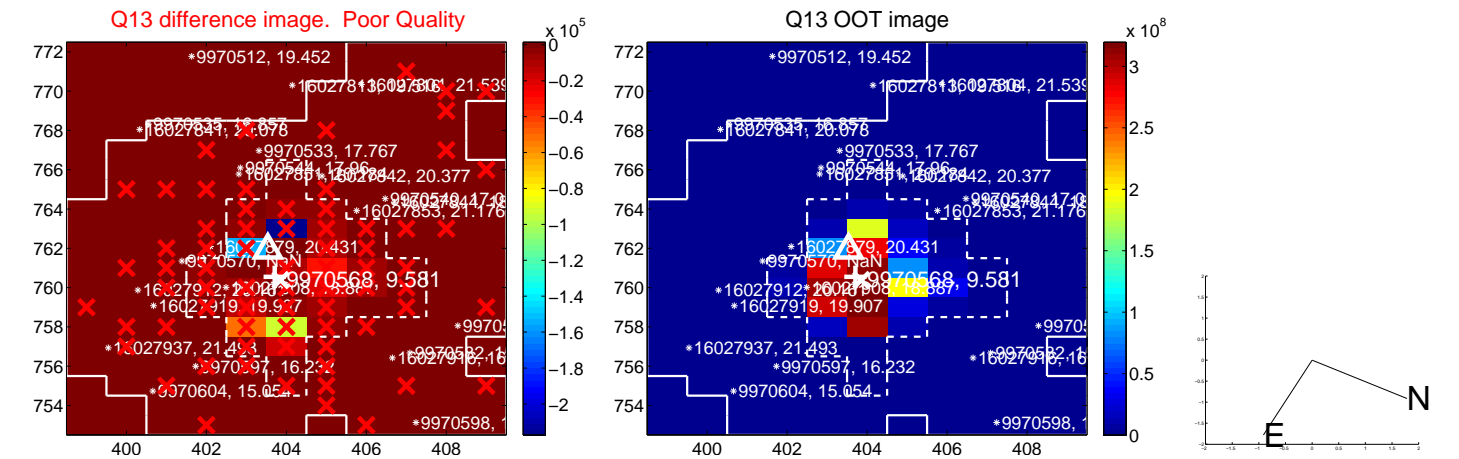
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



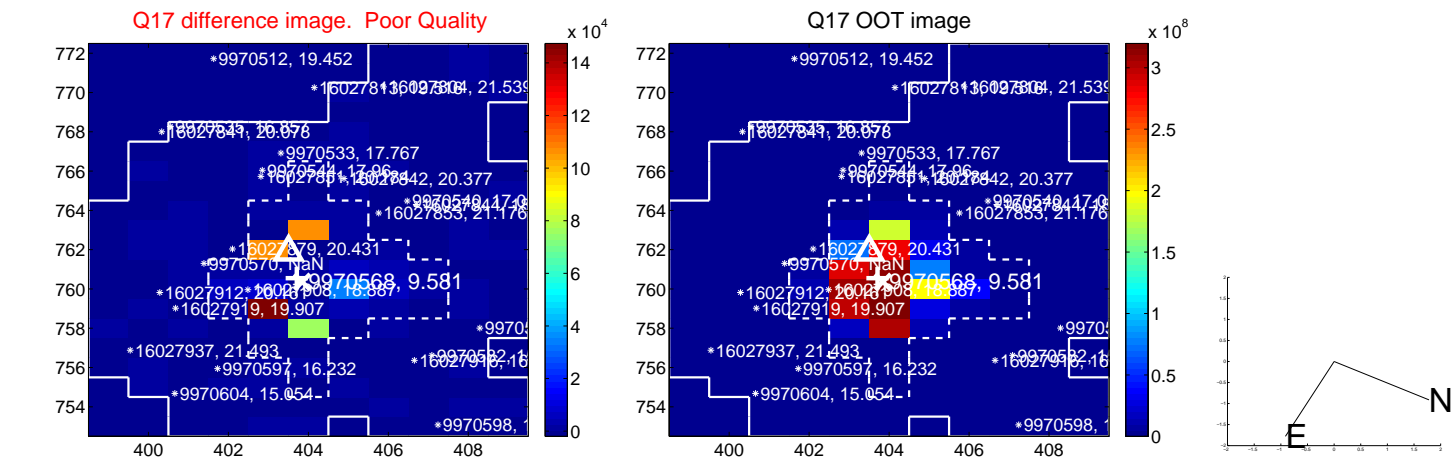
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



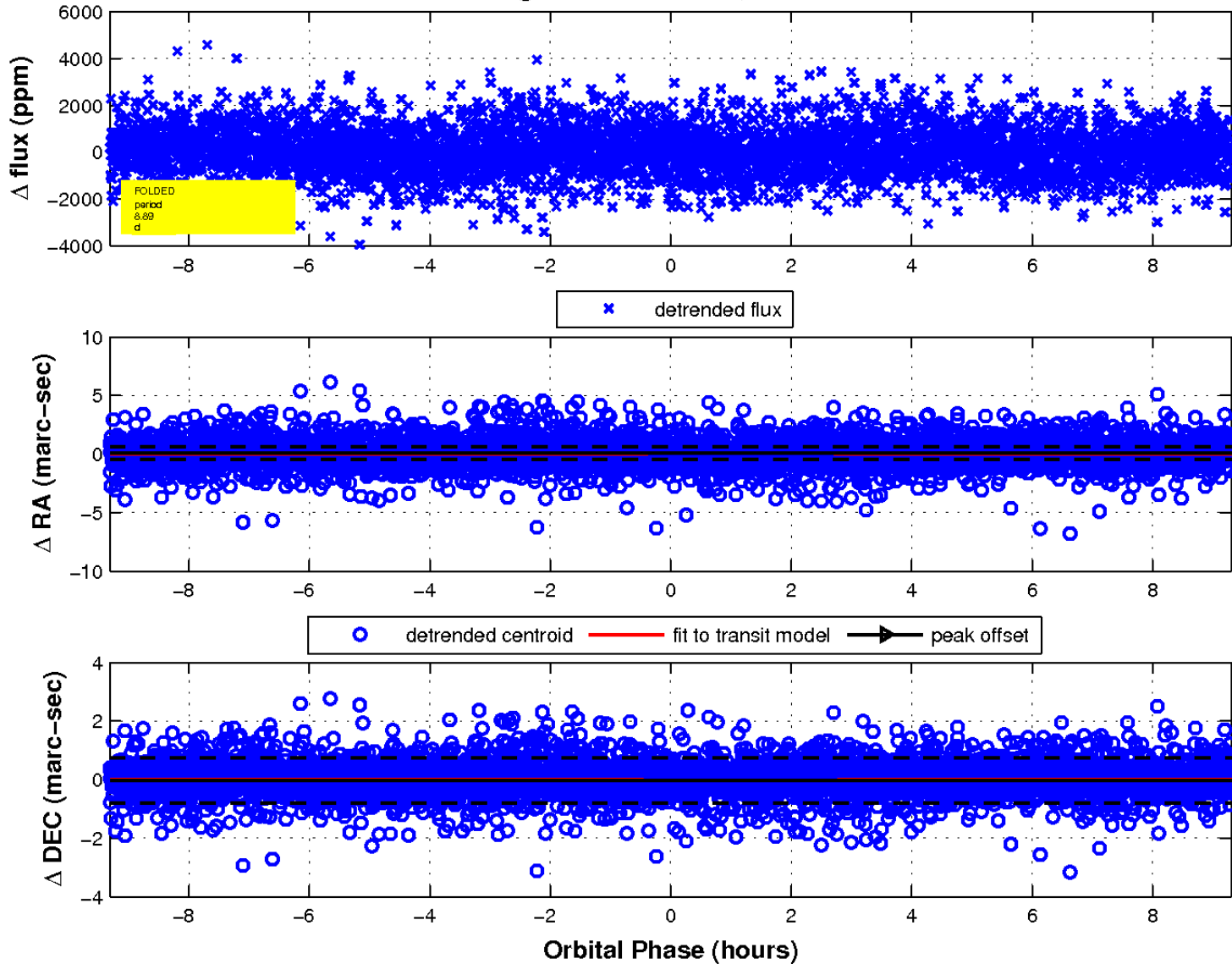
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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UKIRT Image

Declination

