

KIC 009716667

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})
009716667-01	OBS	No	0.793406	131.591484	34.3	2.436	9.6	7.9	1.92	7584	1.30	27217.33
009716667-02	OBS	No	1.174248	131.548562	58.4	5.790	10.1	10.9	1.92	7584	1.49	16137.12
009716667-03	OBS	No	3.525049	132.017709	91.4	7.418	8.5	8.7	1.92	7584	2.12	3726.37
009716667-04	OBS	No	139.688601	175.683971	494.9	3.501	8.4	7.4	1.92	7584	4.62	27.58
009716667-05	OBS	No	113.619424	138.786926	485.9	3.924	8.1	8.9	1.92	7584	4.52	36.33
009716667-06	OBS	No	49.159354	139.221257	134.2	3.500	7.3	-1.0	1.92	7584	2.26	111.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716667-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009716667-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009716667-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
009716667-04	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
009716667-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
009716667-06	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_NOFITS

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

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

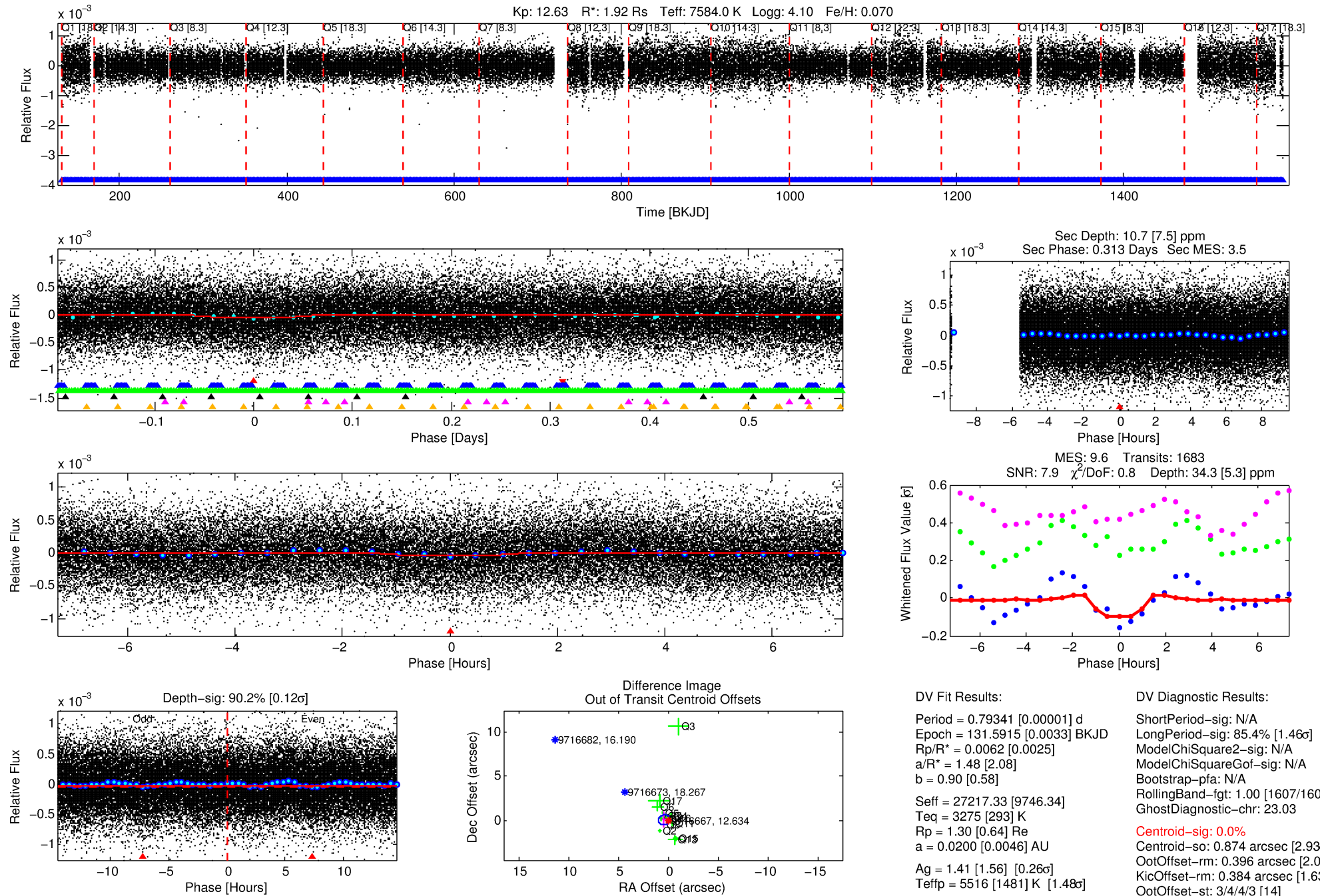
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716667-01

No Significant Match Found

DV One-Page Summary

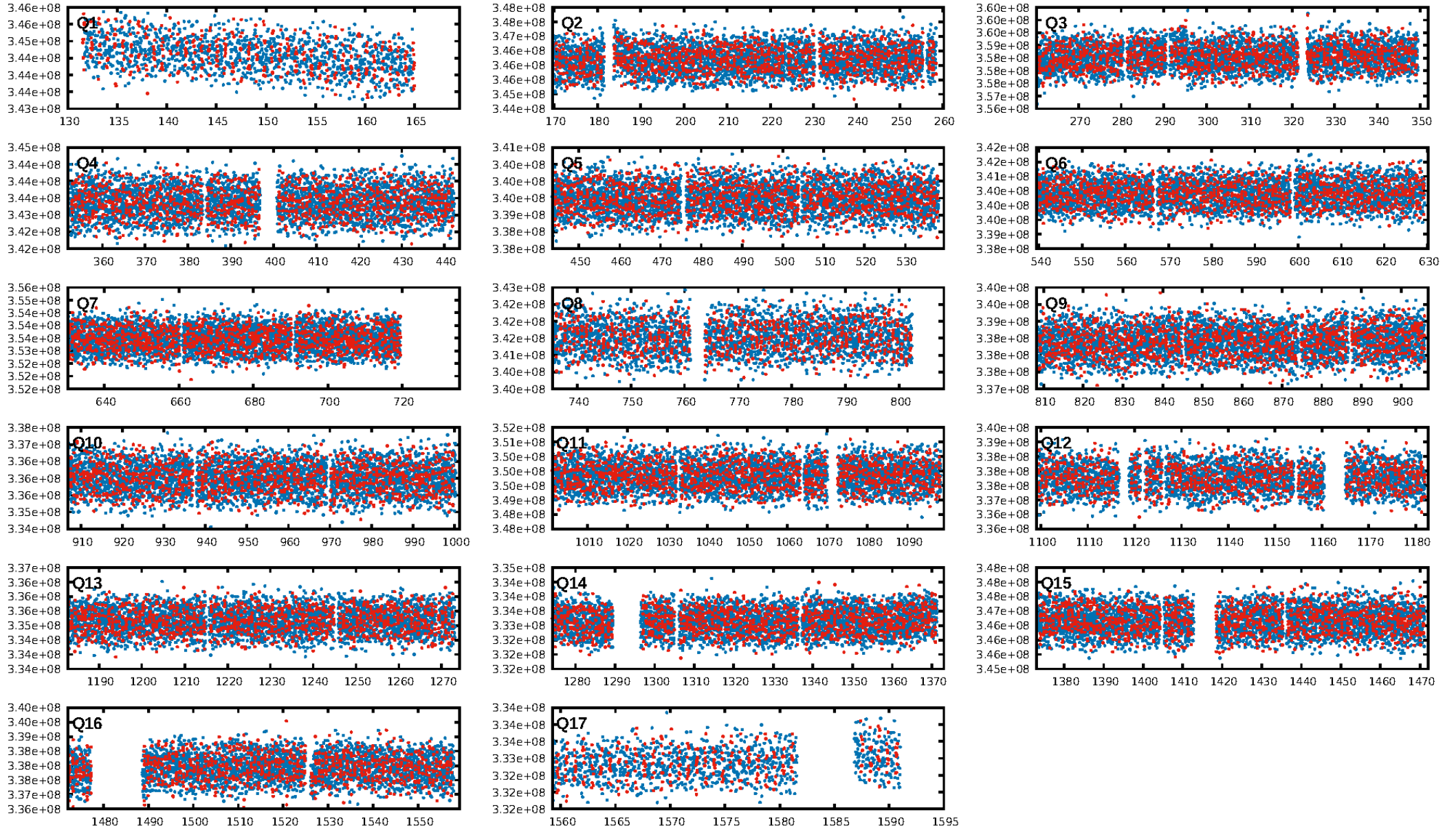
KIC: 9716667 Candidate: 1 of 6 Period: 0.793 d



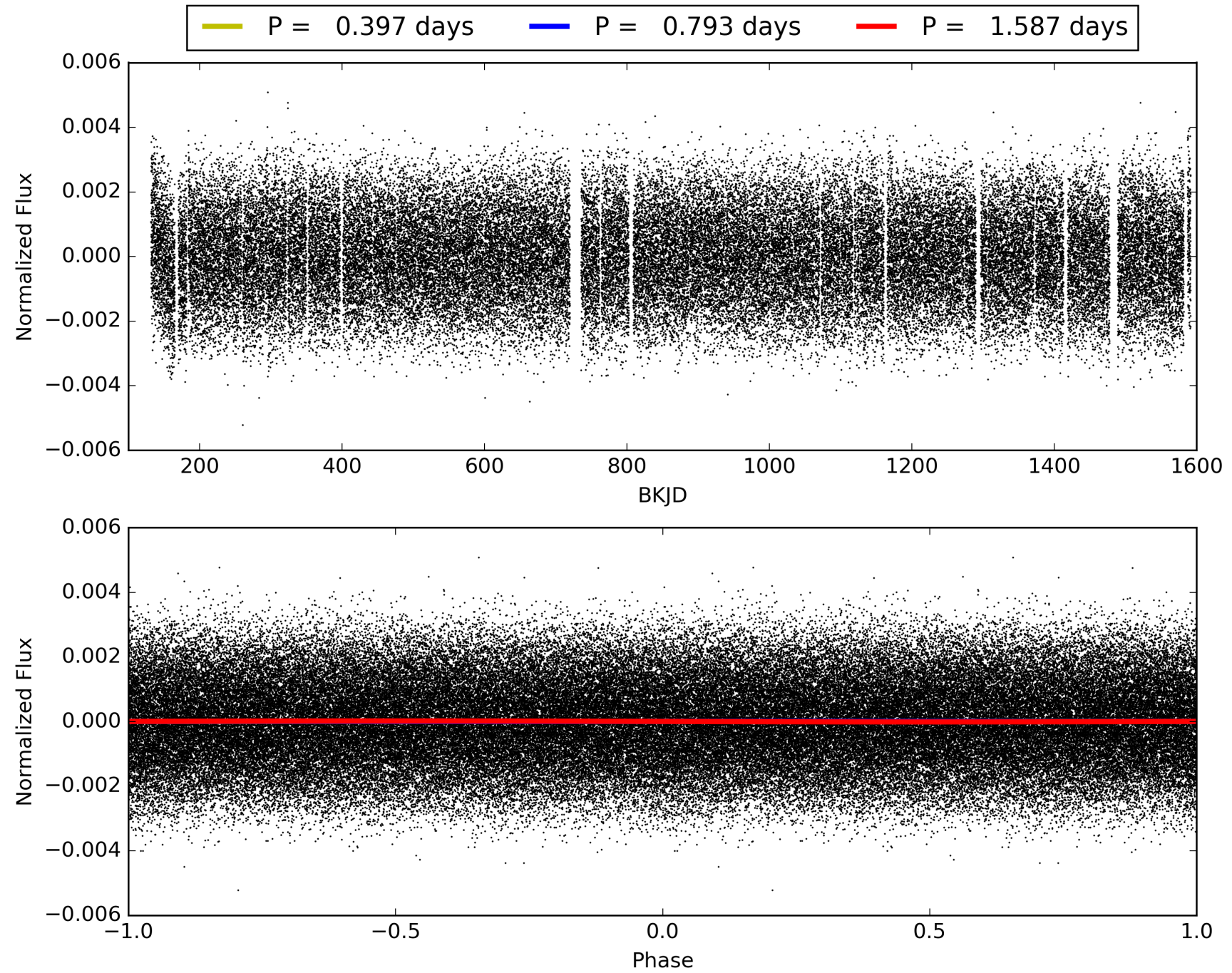
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009716667-01, PDC Light Curves

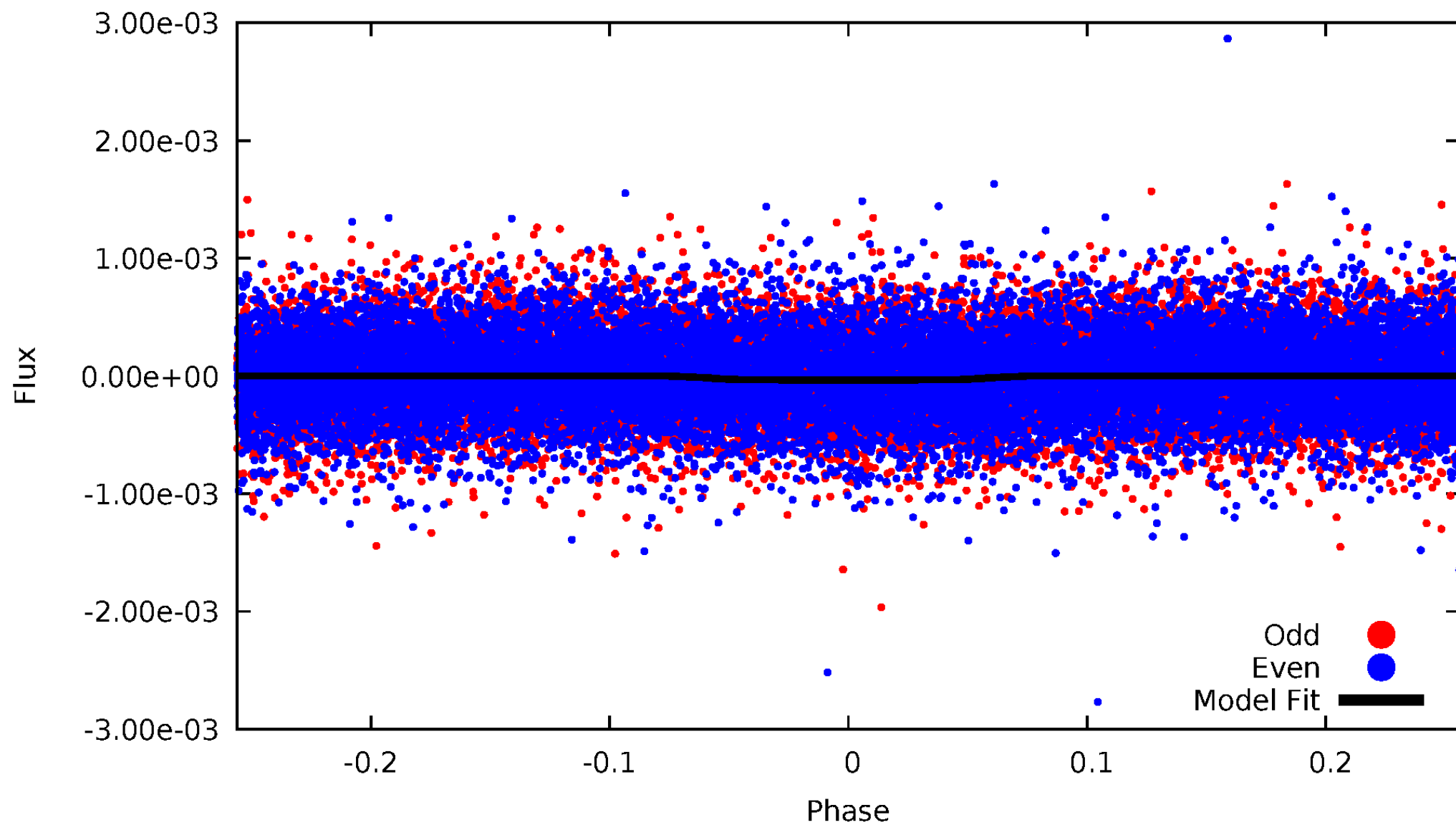


TCE 009716667-01



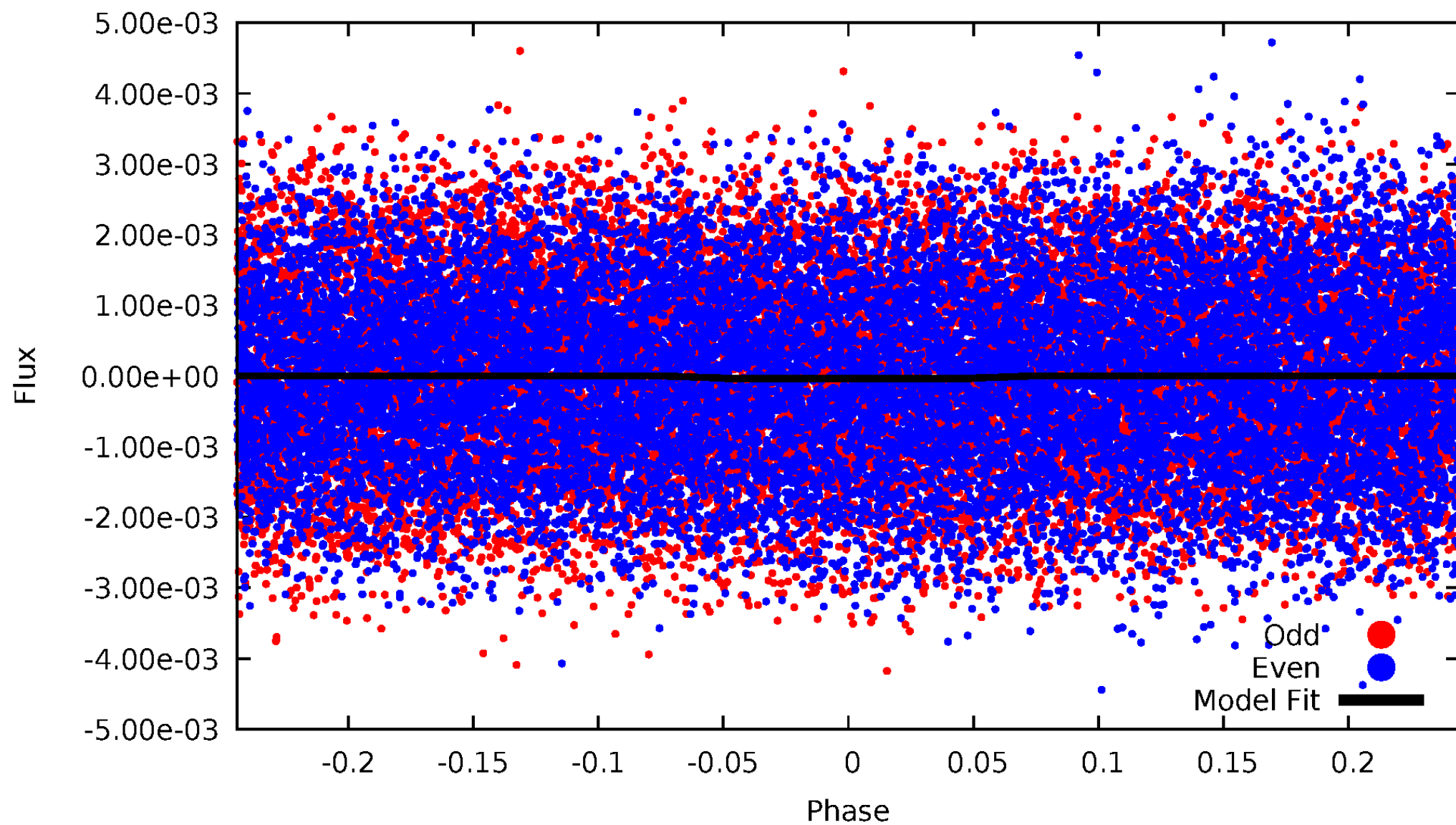
DV Odd/Even

TCE 009716667-01



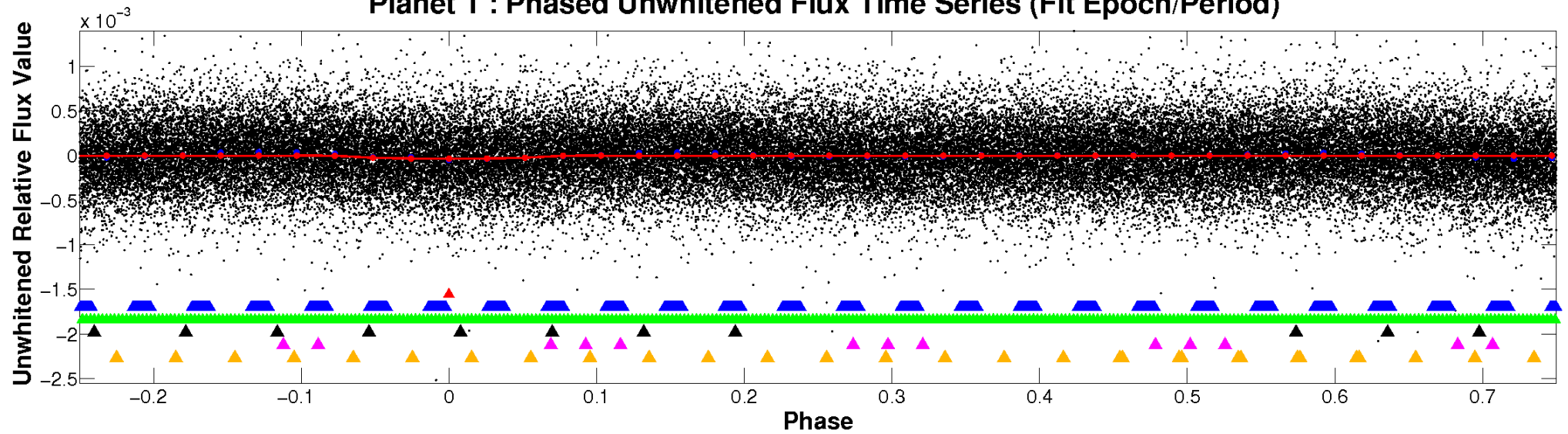
ALT Odd/Even

TCE 009716667-01

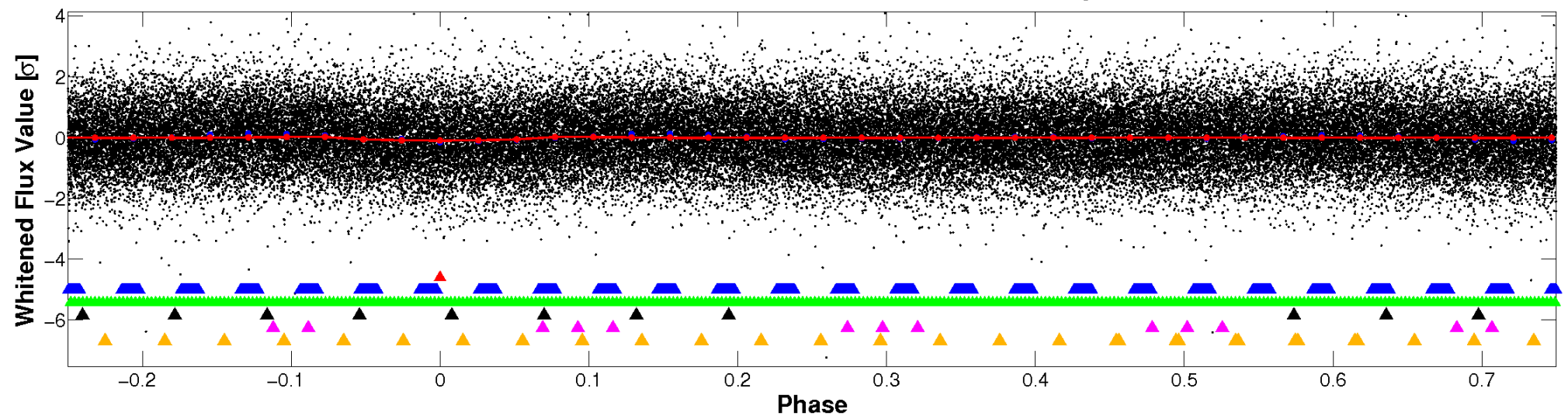


Non-Whitened Vs. Whitened Light Curve

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

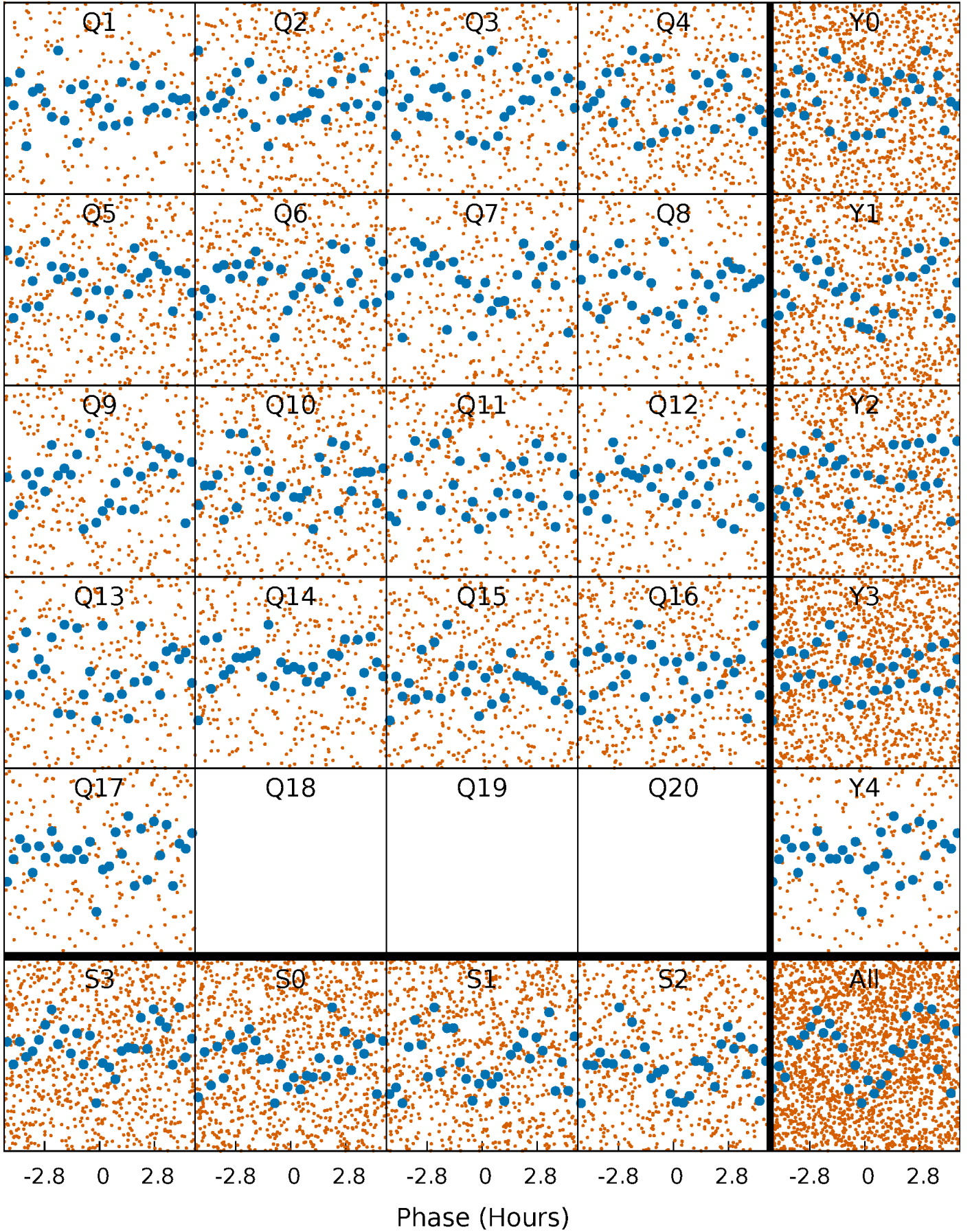


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



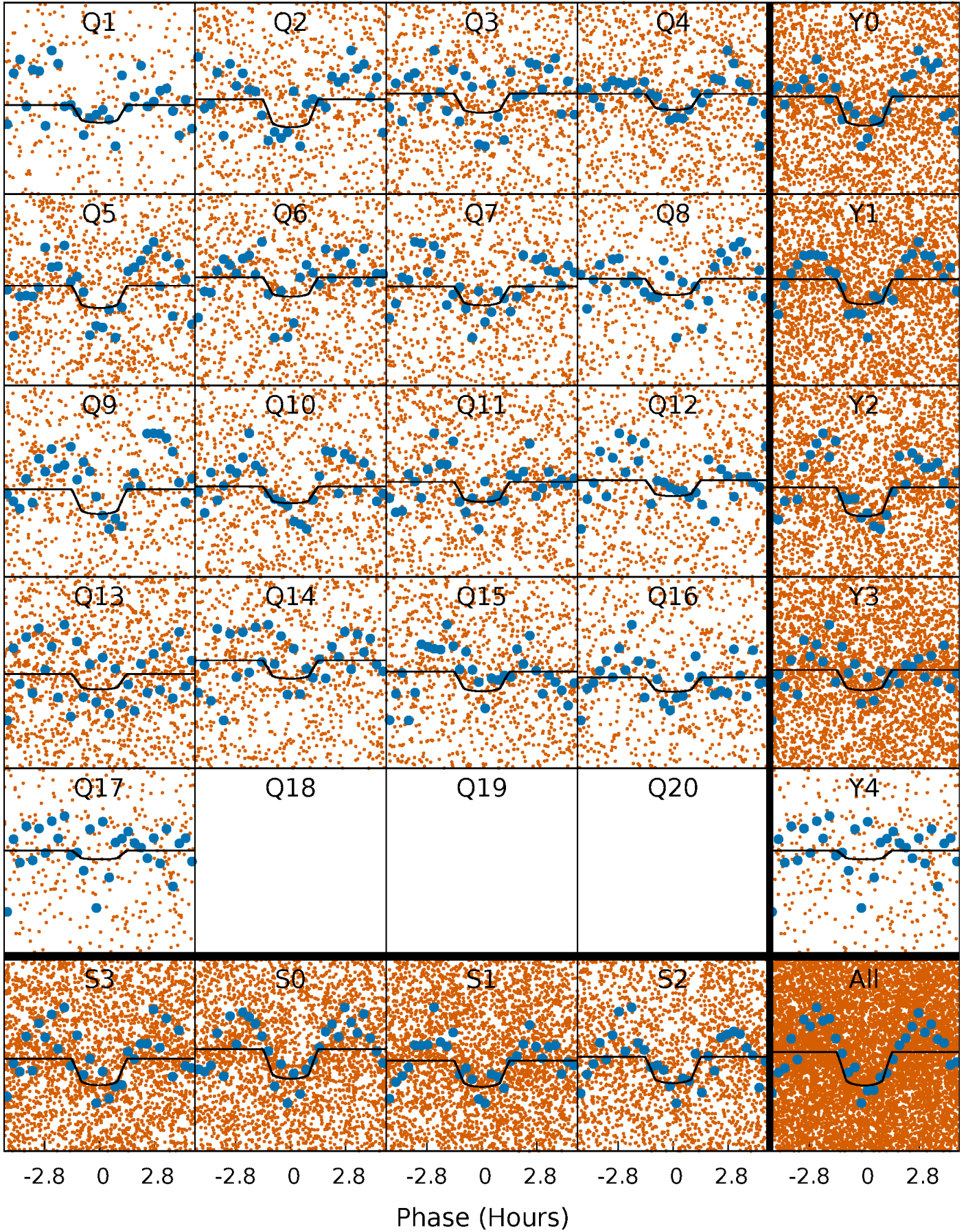
PDC Quarter-Phased Transit Curves

TCE 009716667-01 P= 0.793406 Days $T_0=131.591484$ (BKJD)



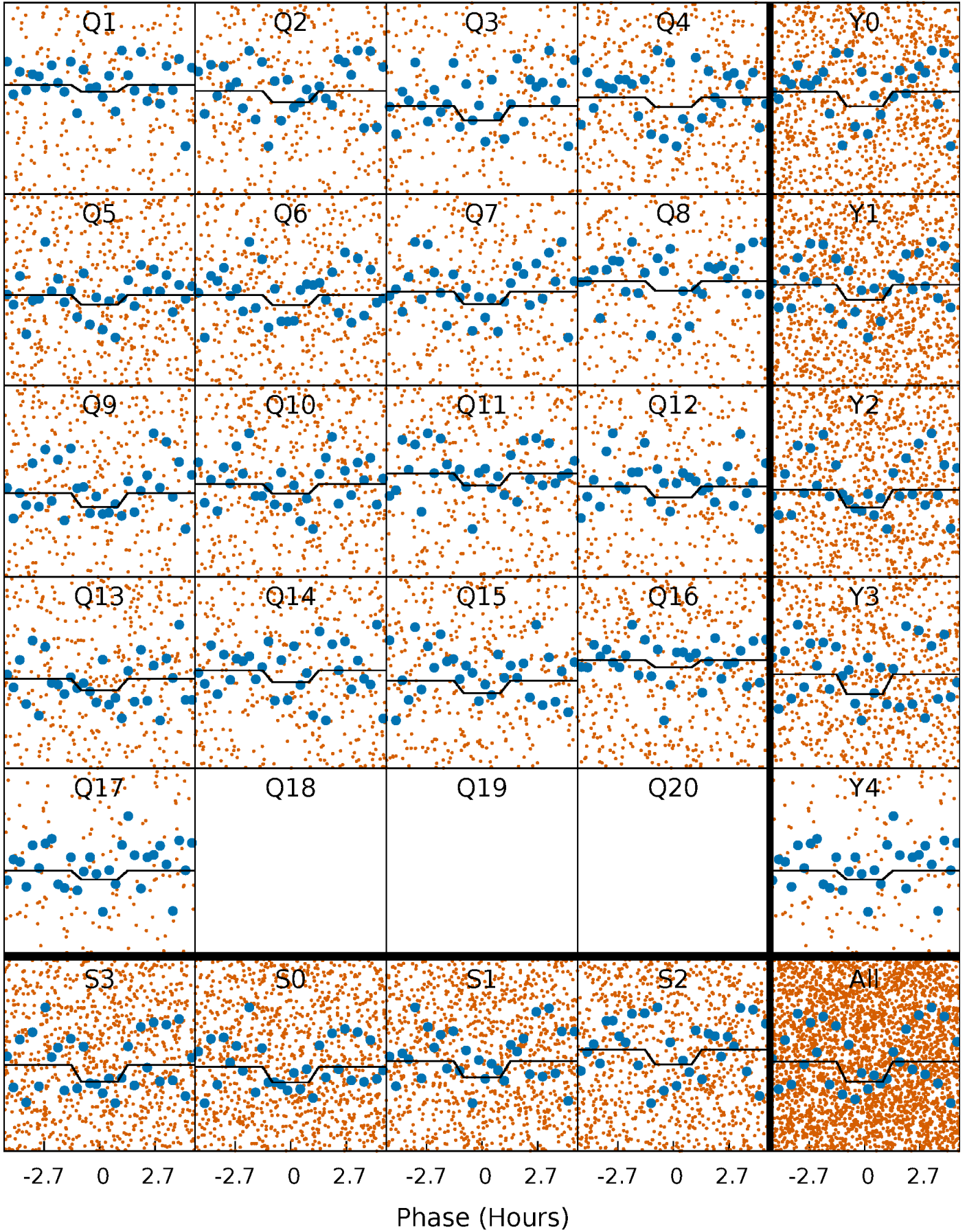
DV Quarter-Phased Transit Curves

TCE 009716667-01 P= 0.793406 Days $T_0=131.591484$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

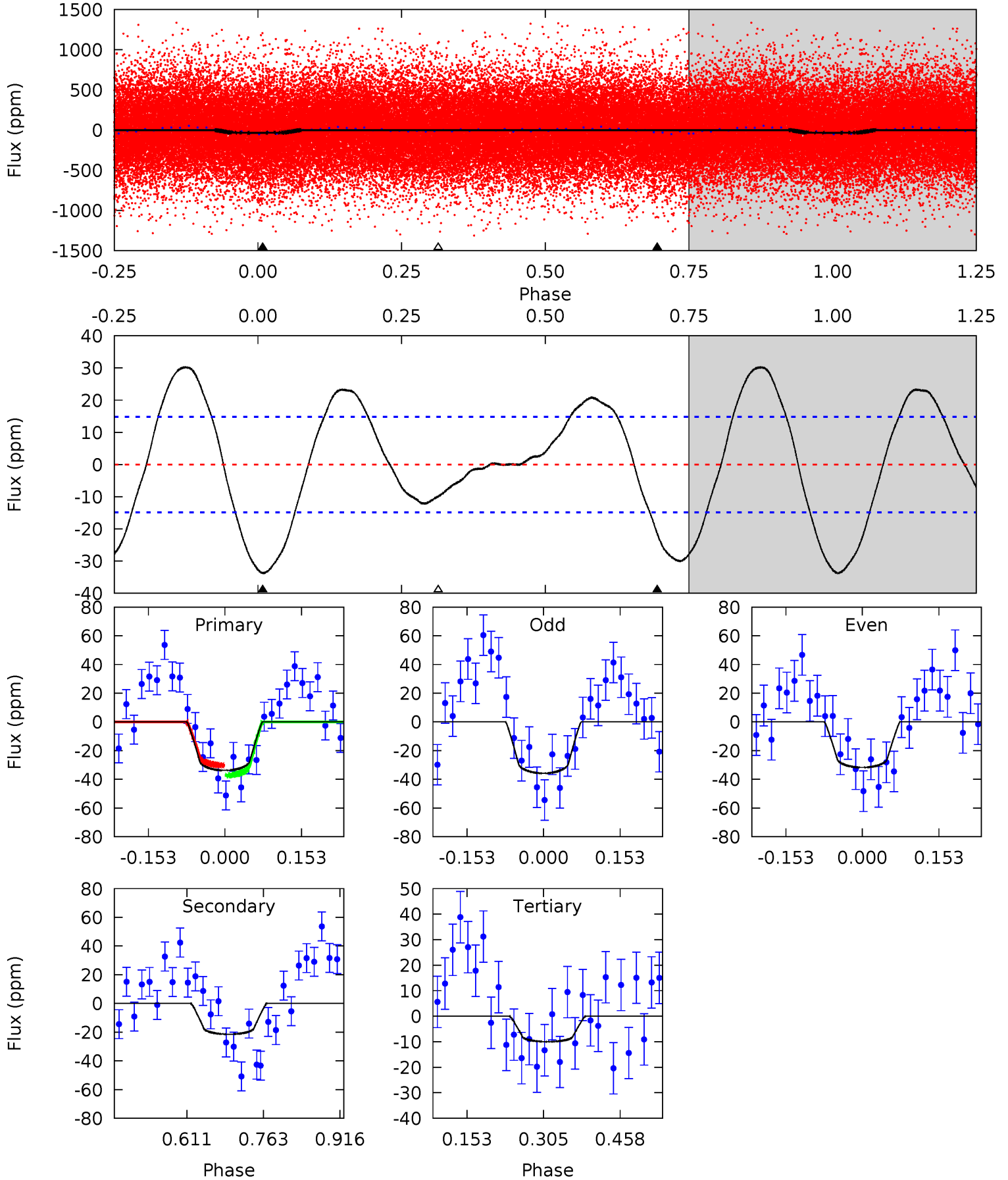
TCE 009716667-01 P= 0.793411 Days $T_0=131.590402$ (BKJD)



DV Model-Shift Uniqueness Test

009716667-01, P = 0.793406 Days, E = 130.798078 Days

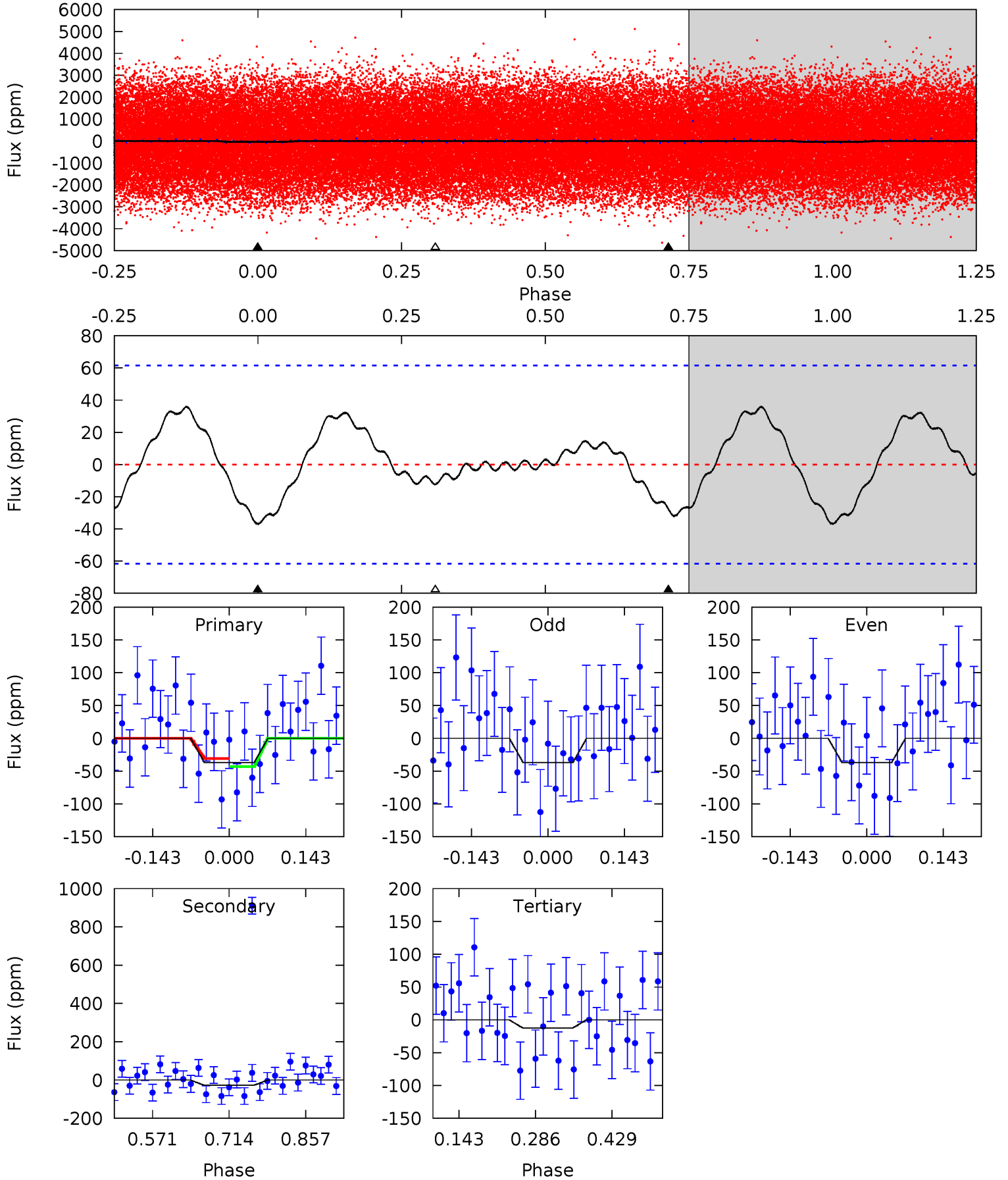
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	6.47	3.01	0	4.48	1.43	2.82	7.18	10.2	3.46	6.47	0.61	0.97	0.47	1.06



Alt Model-Shift Uniqueness Test

009716667-01, P = 0.793411 Days, E = 130.796991 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.69	2.02	0.91	0	4.49	1.47	0.79	1.78	2.69	1.11	2.02	0.01	0.85	0.49	0.45



Stellar Parameters For KIC 009716667

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7584^{+211}_{-316}	$4.103^{+0.135}_{-0.165}$	$0.070^{+0.200}_{-0.350}$	$1.921^{+0.549}_{-0.366}$	$1.705^{+0.204}_{-0.272}$	$0.339^{+0.230}_{-0.159}$
	+3%/-4%	+3%/-4%	+286%/-500%	+29%/-19%	+12%/-16%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009716667-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-21 ± 3	$1.28^{+0.56}_{-0.53}$	4570^{+326}_{-291}	6273^{+2472}_{-1187}	$2.854^{+5.685}_{-1.541}$
Alt.	-28 ± 14	$1.28^{+0.60}_{-0.53}$	4568^{+325}_{-303}	6667^{+2834}_{-1598}	$3.439^{+7.306}_{-2.163}$

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 $A_{obs} \gg 1.0$

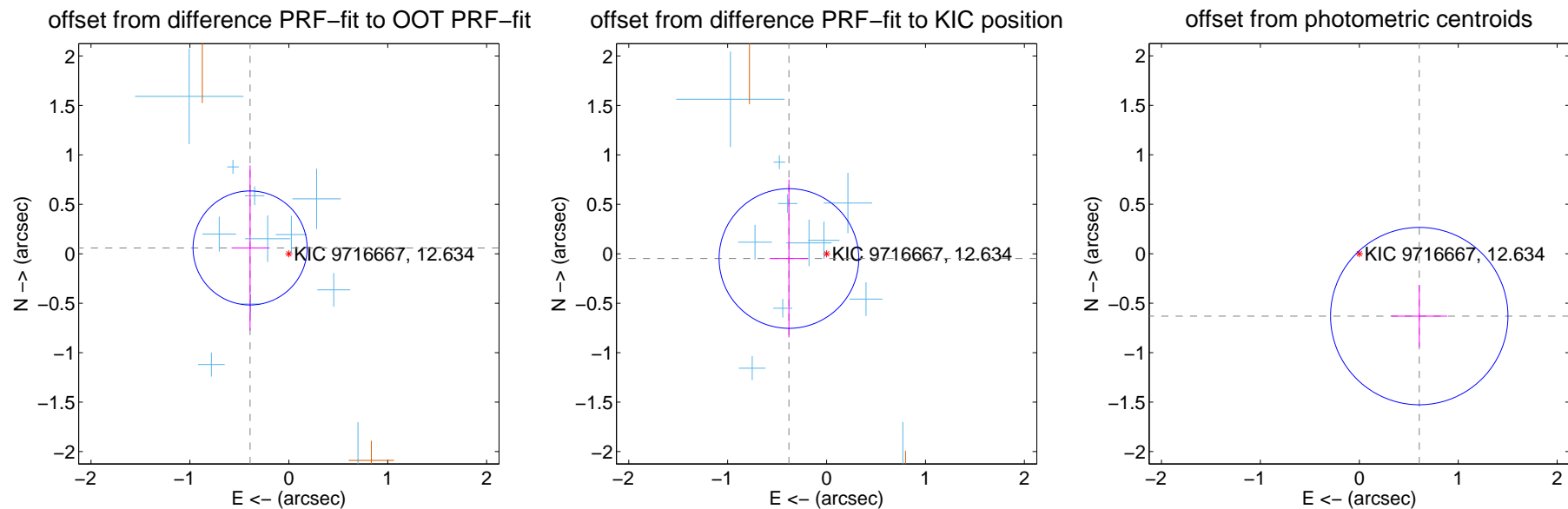
DV Centroid Data

Supplemental centroid analysis for 009716667-01. Kepler magnitude: 12.63. Transit SNR 7.87

There are 11 quarters with good PRF difference image offsets

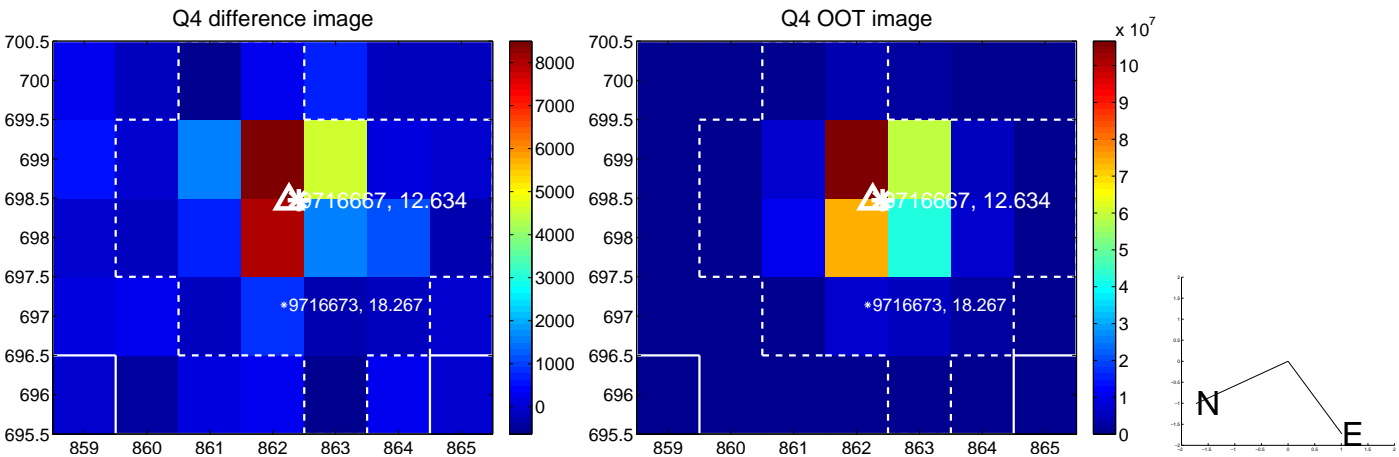
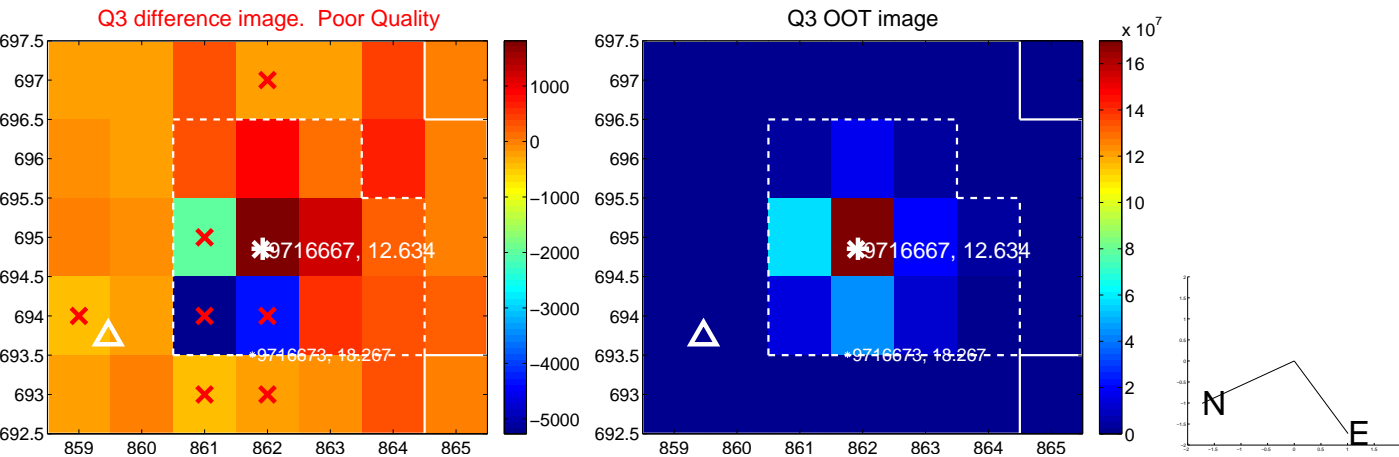
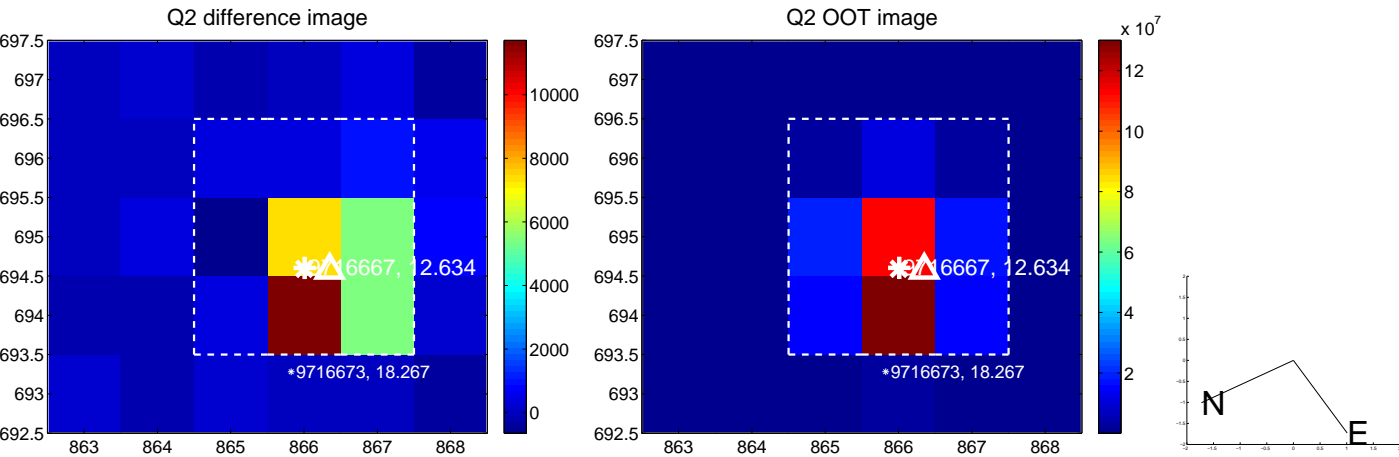
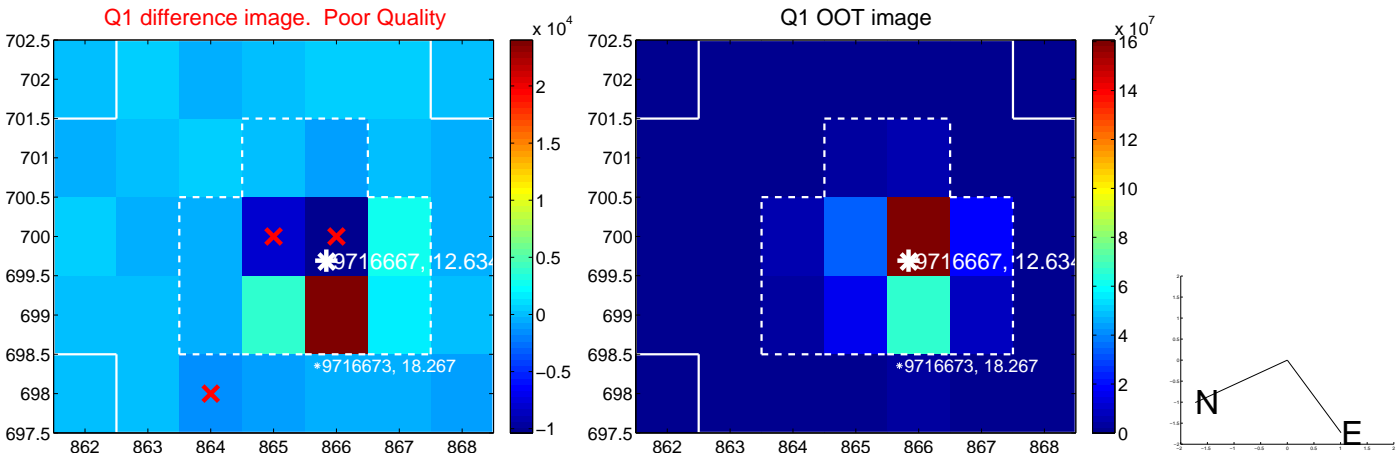
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.396 ± 0.192	2.06	0.392 ± 0.187	0.059 ± 0.835
PRF-fit source offset from KIC position	0.384 ± 0.235	1.63	0.381 ± 0.195	-0.048 ± 0.798
photometric centroid source offset	0.87 ± 0.30	2.93	-0.61 ± 0.28	-0.63 ± 0.31

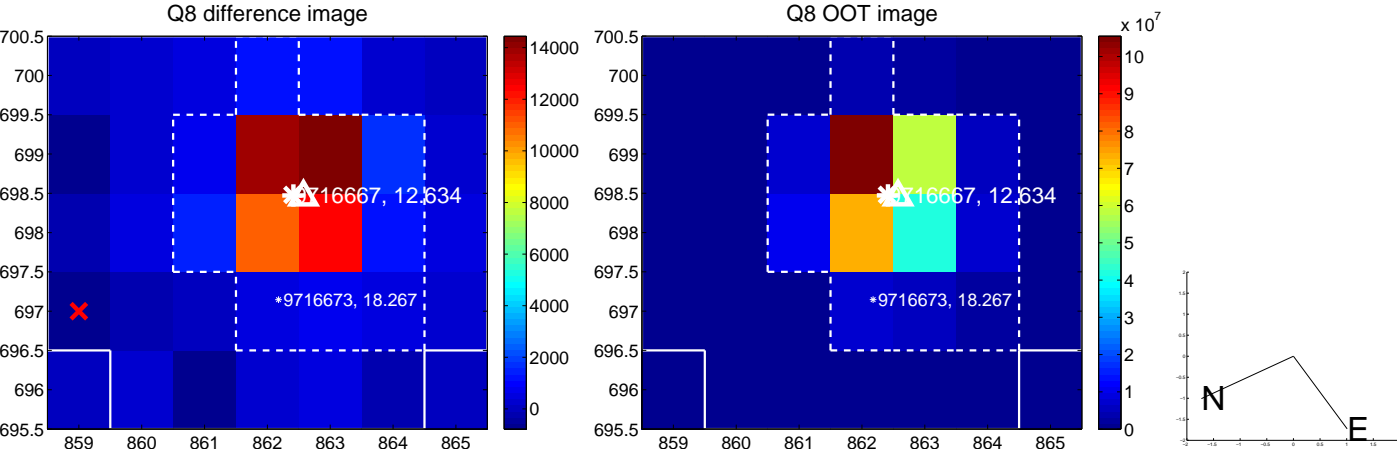
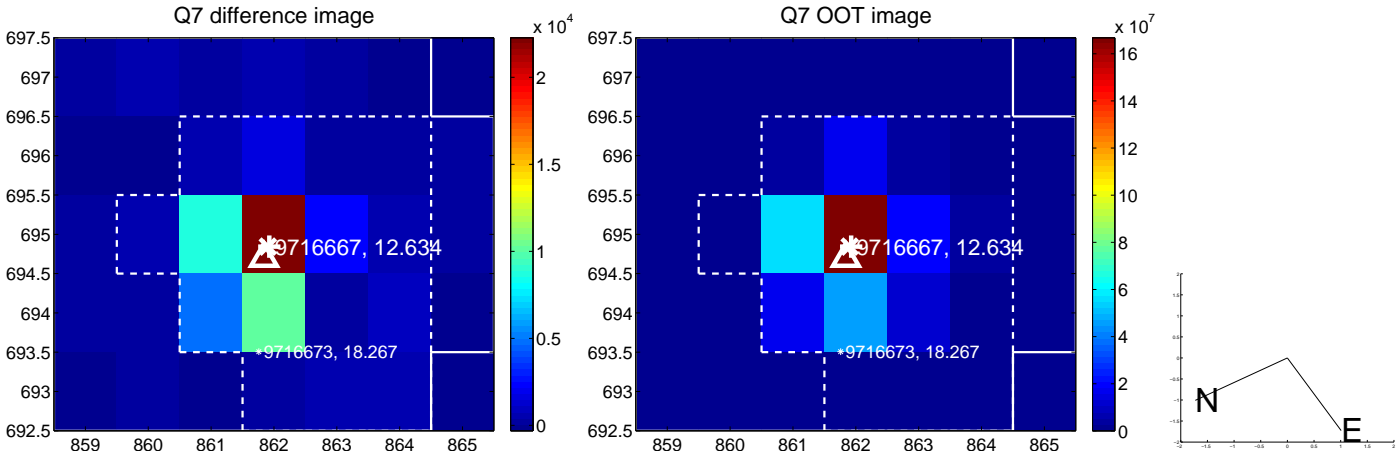
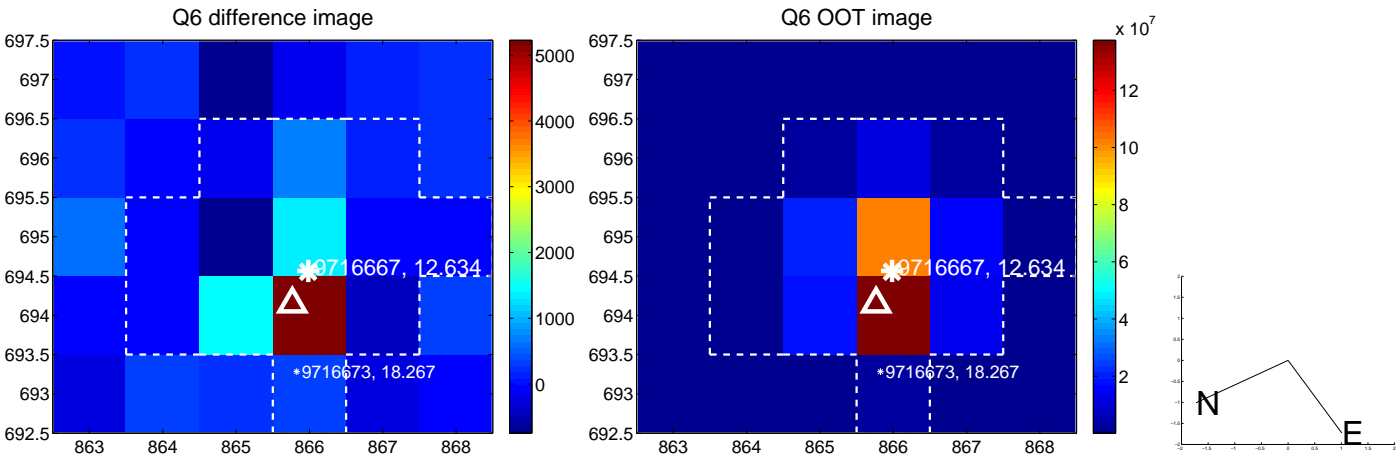
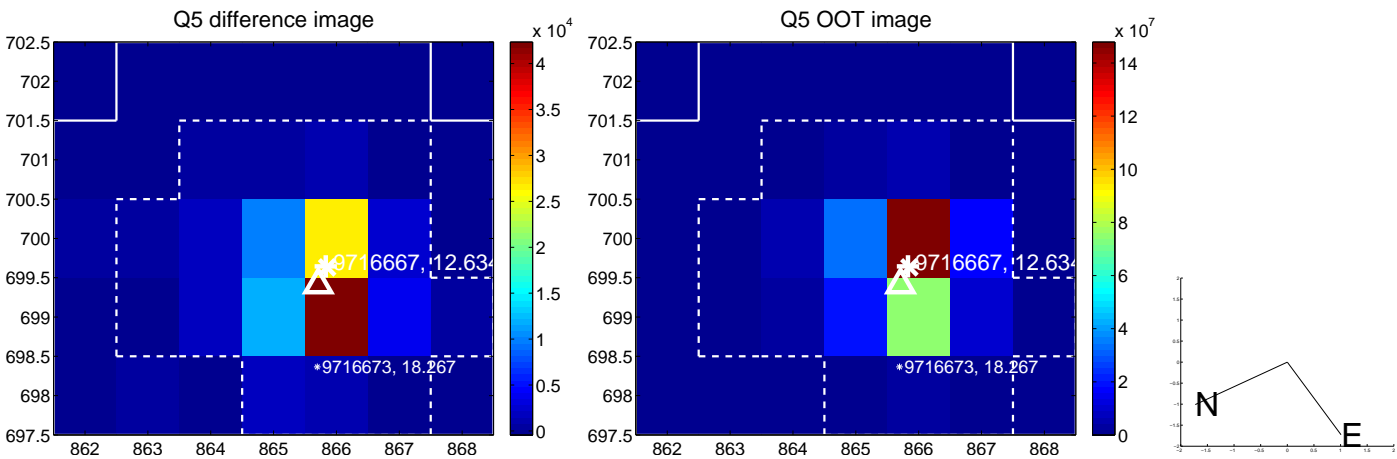


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

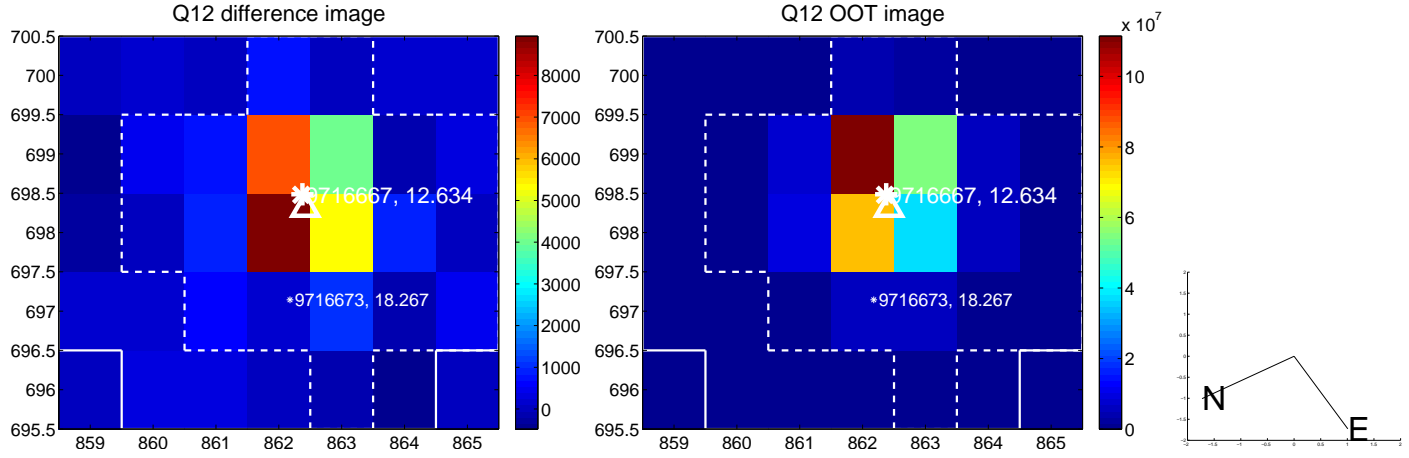
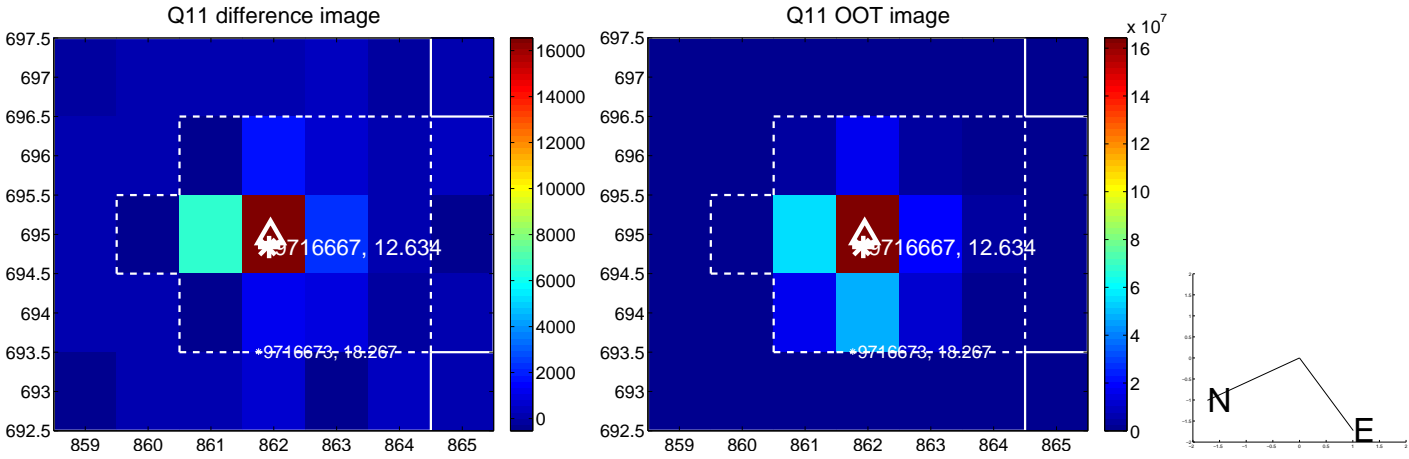
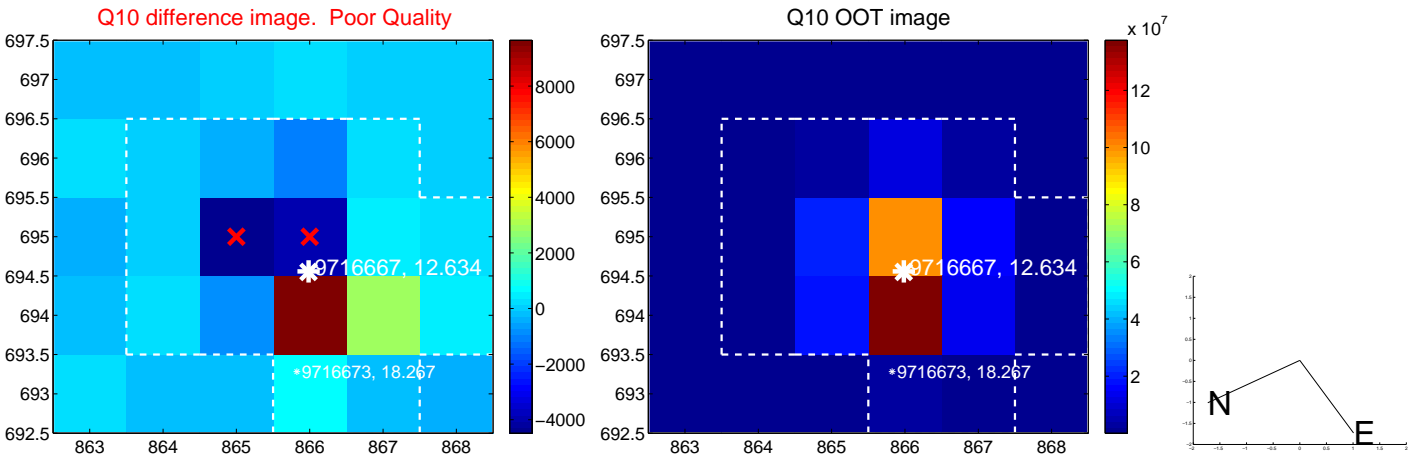
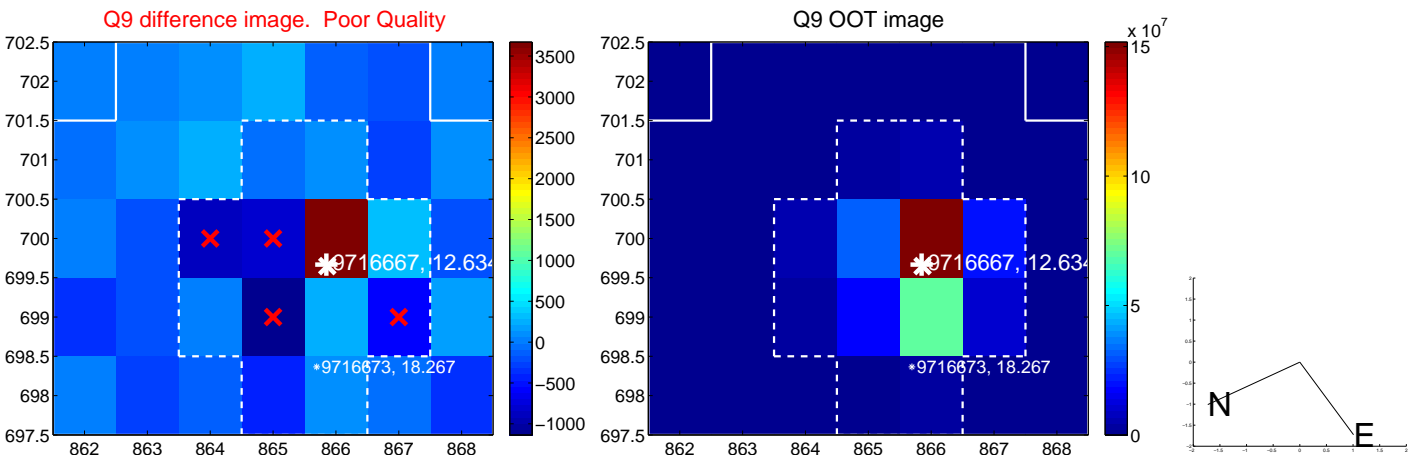
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



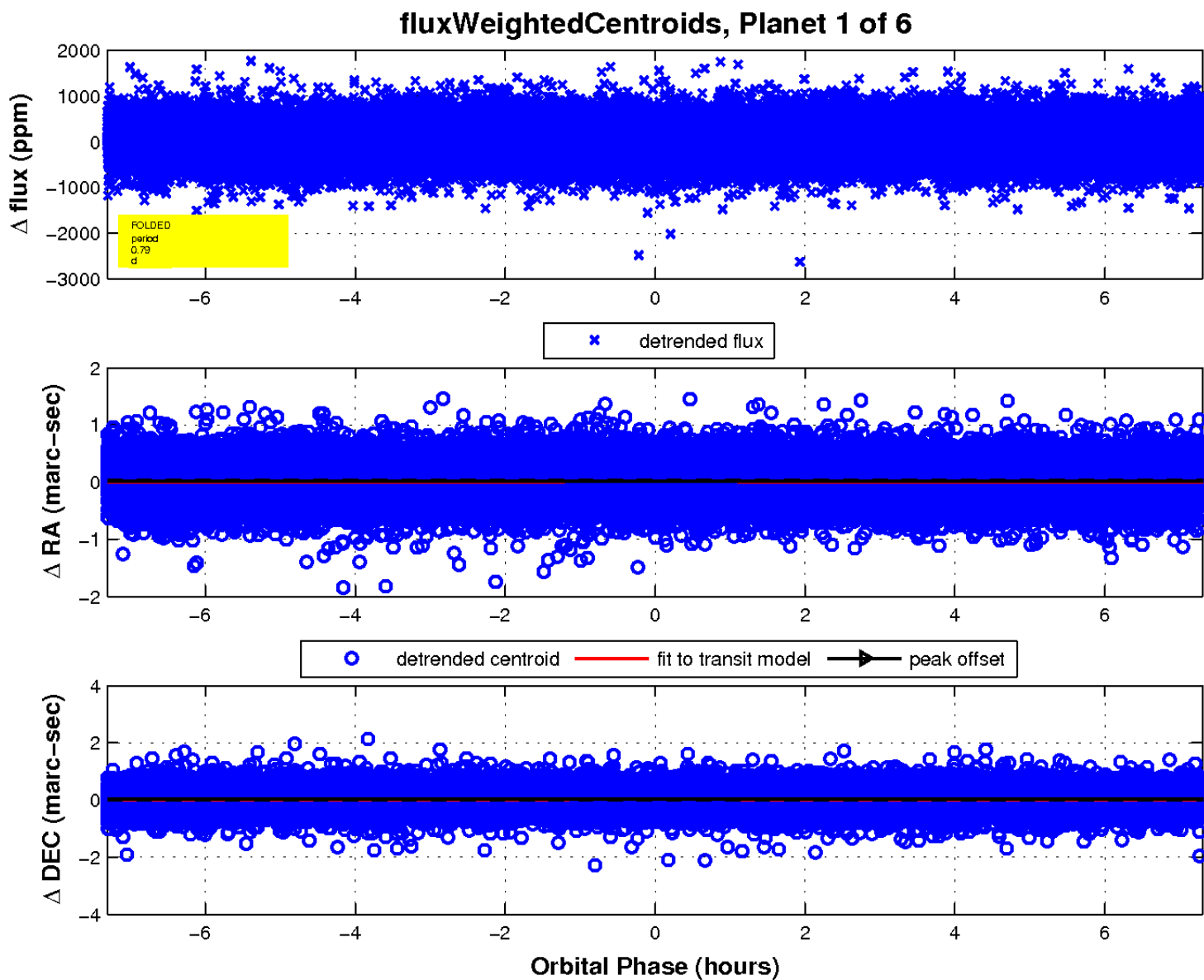
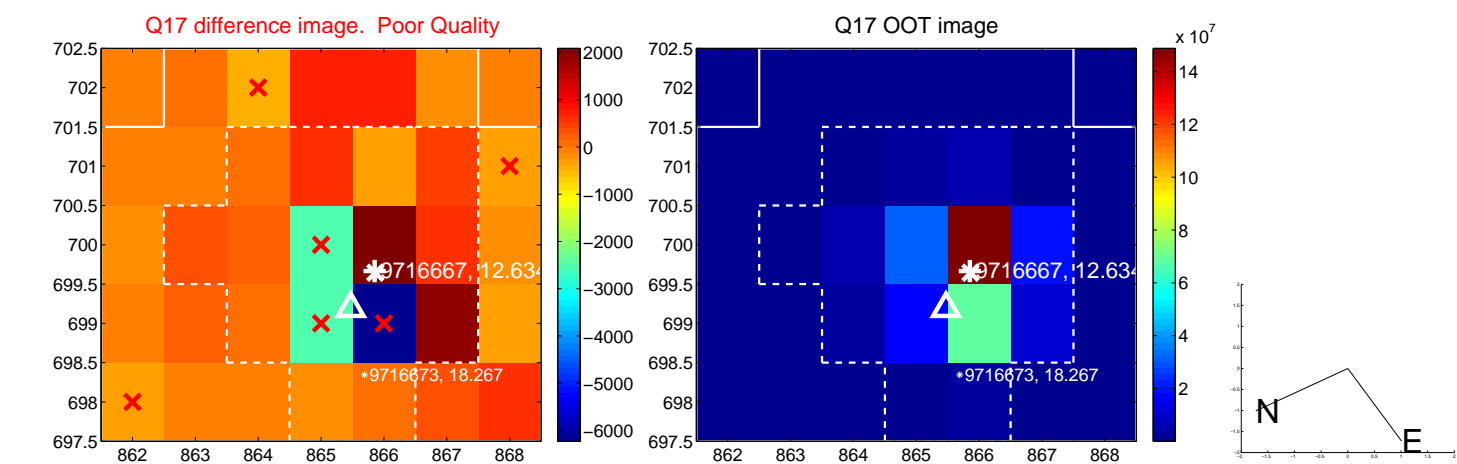
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

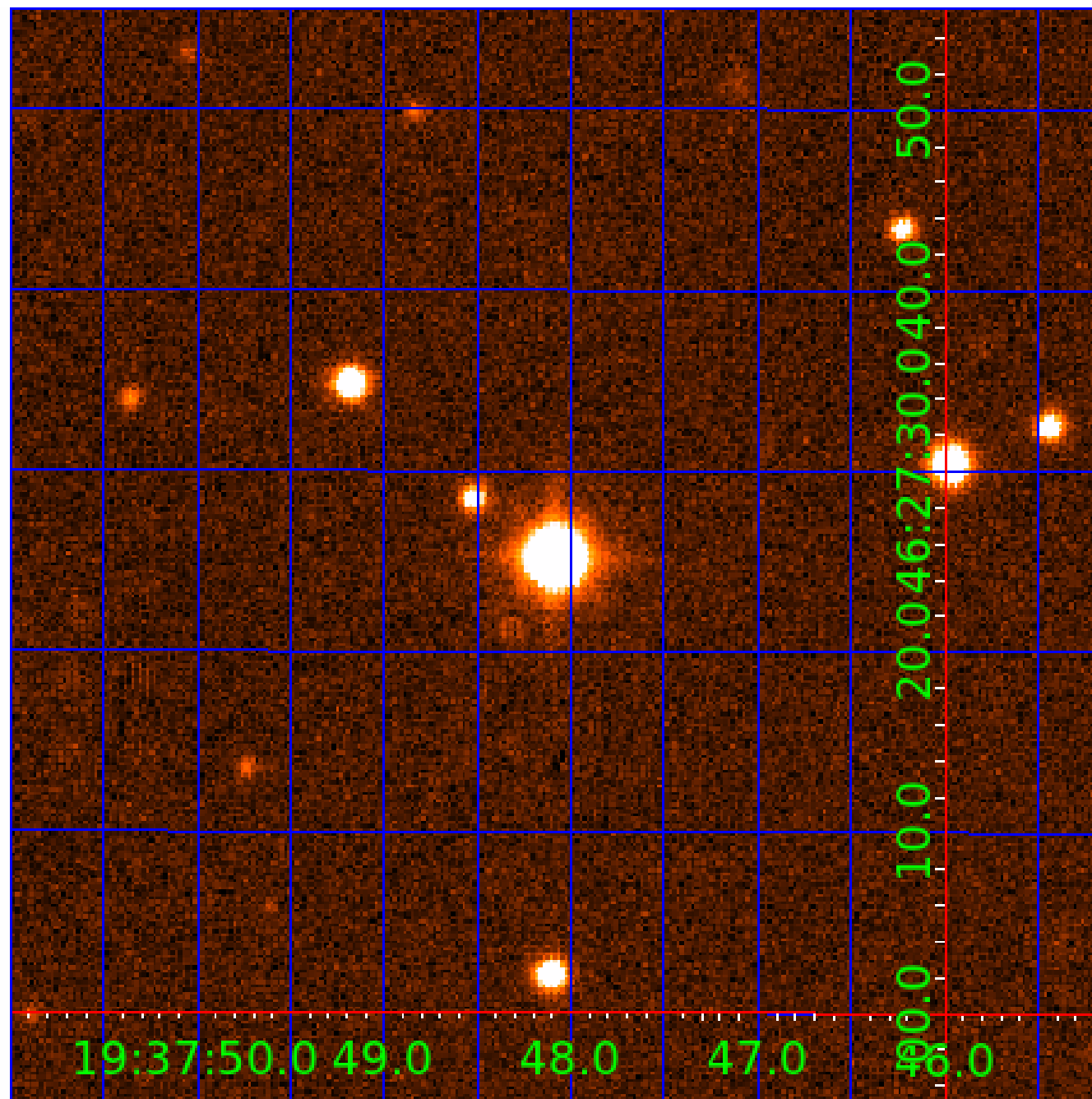


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009716667

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})
009716667-01	OBS	No	0.793406	131.591484	34.3	2.436	9.6	7.9	1.92	7584	1.30	27217.33
009716667-02	OBS	No	1.174248	131.548562	58.4	5.790	10.1	10.9	1.92	7584	1.49	16137.12
009716667-03	OBS	No	3.525049	132.017709	91.4	7.418	8.5	8.7	1.92	7584	2.12	3726.37
009716667-04	OBS	No	139.688601	175.683971	494.9	3.501	8.4	7.4	1.92	7584	4.62	27.58
009716667-05	OBS	No	113.619424	138.786926	485.9	3.924	8.1	8.9	1.92	7584	4.52	36.33
009716667-06	OBS	No	49.159354	139.221257	134.2	3.500	7.3	-1.0	1.92	7584	2.26	111.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716667-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009716667-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009716667-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
009716667-04	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
009716667-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
009716667-06	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_NOFITS

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

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

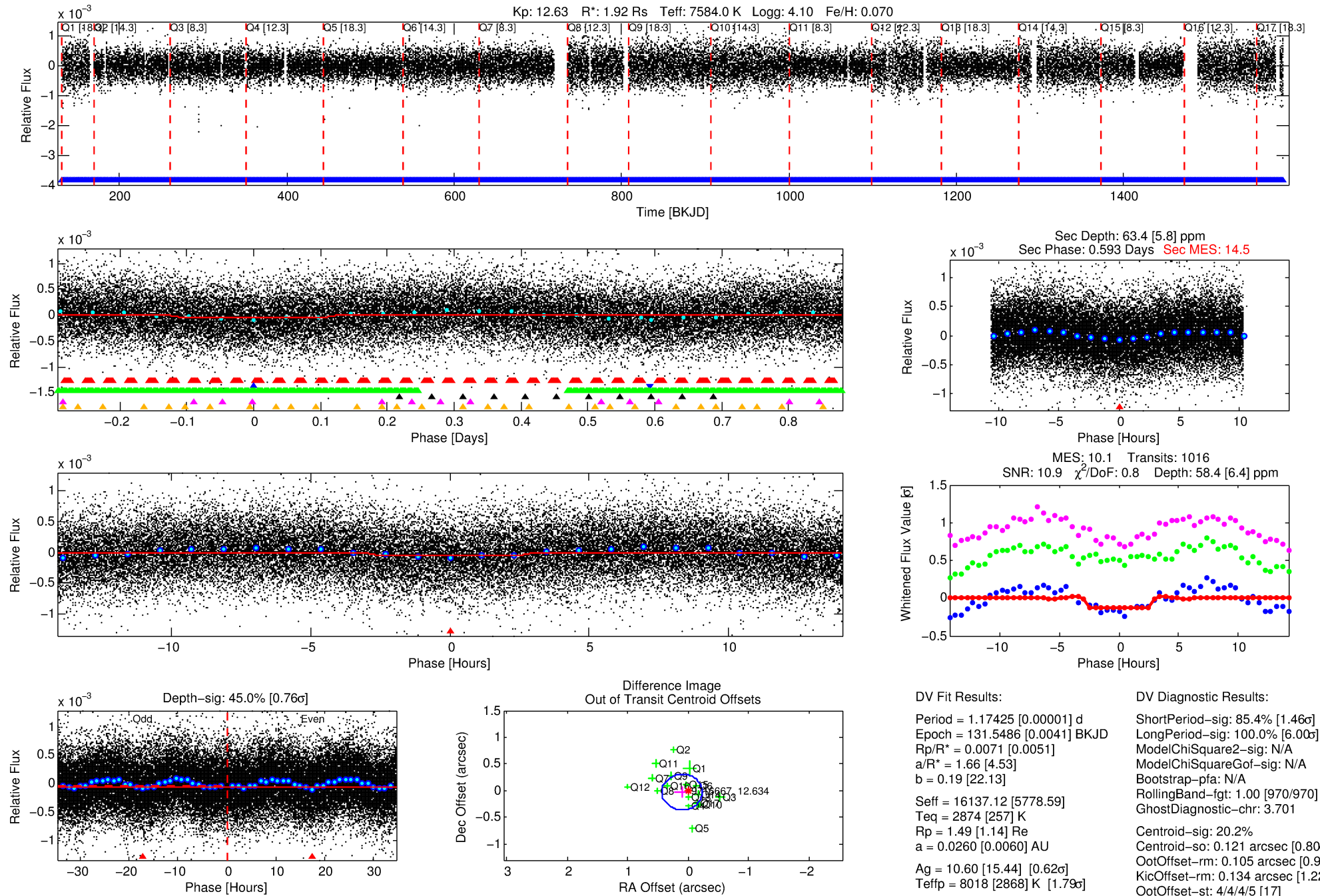
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716667-02

No Significant Match Found

DV One-Page Summary

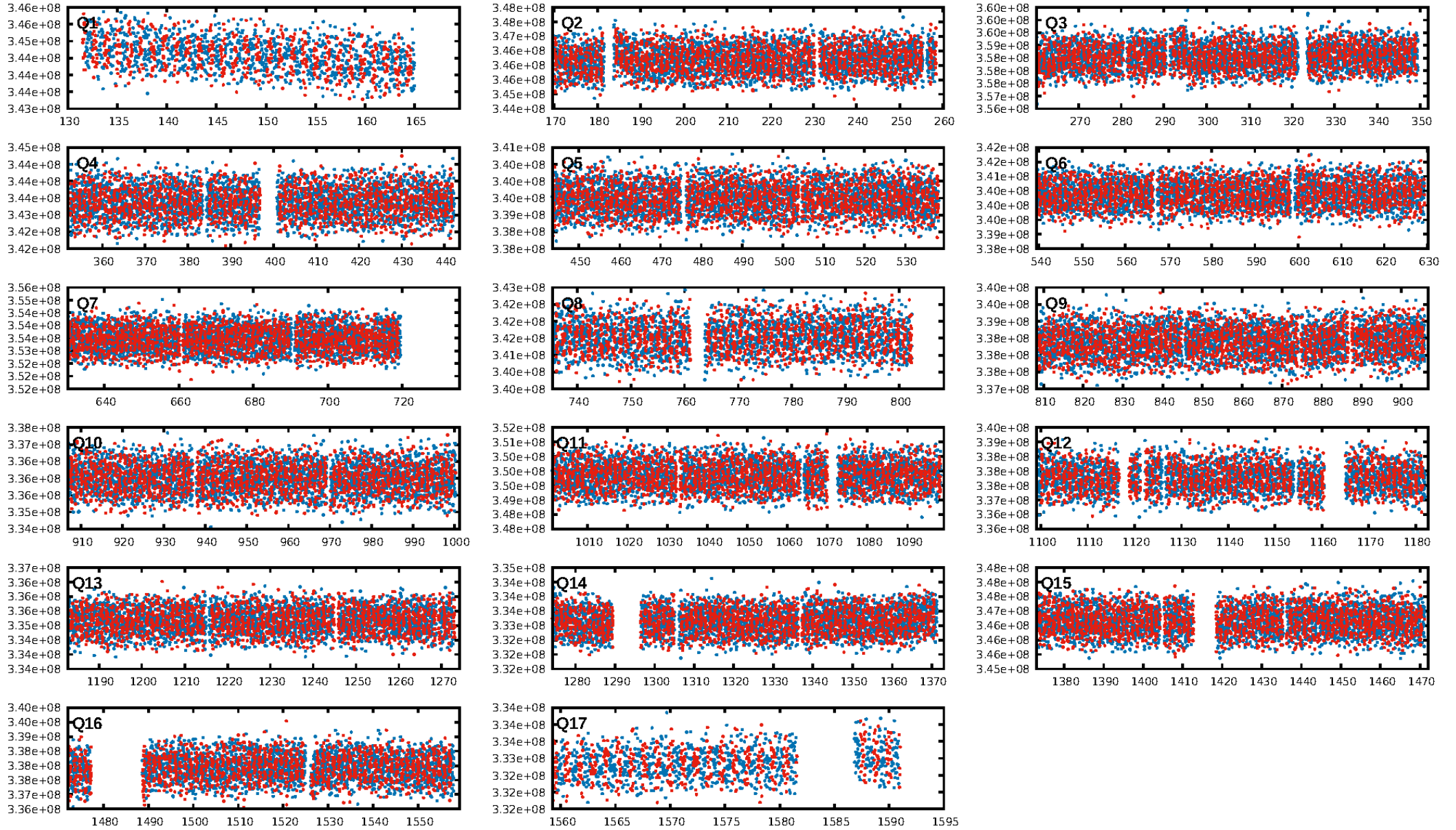
KIC: 9716667 Candidate: 2 of 6 Period: 1.174 d



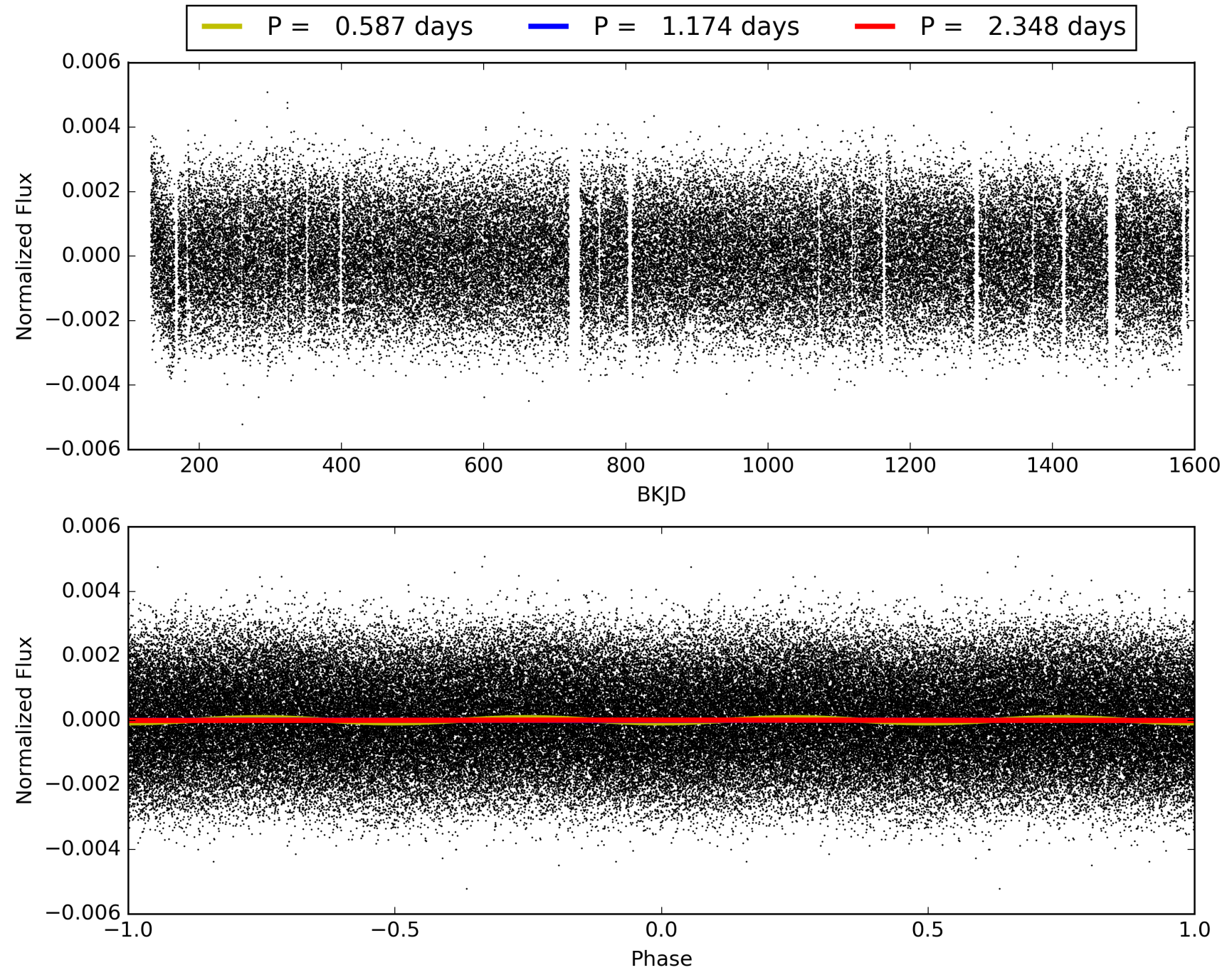
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009716667-02, PDC Light Curves

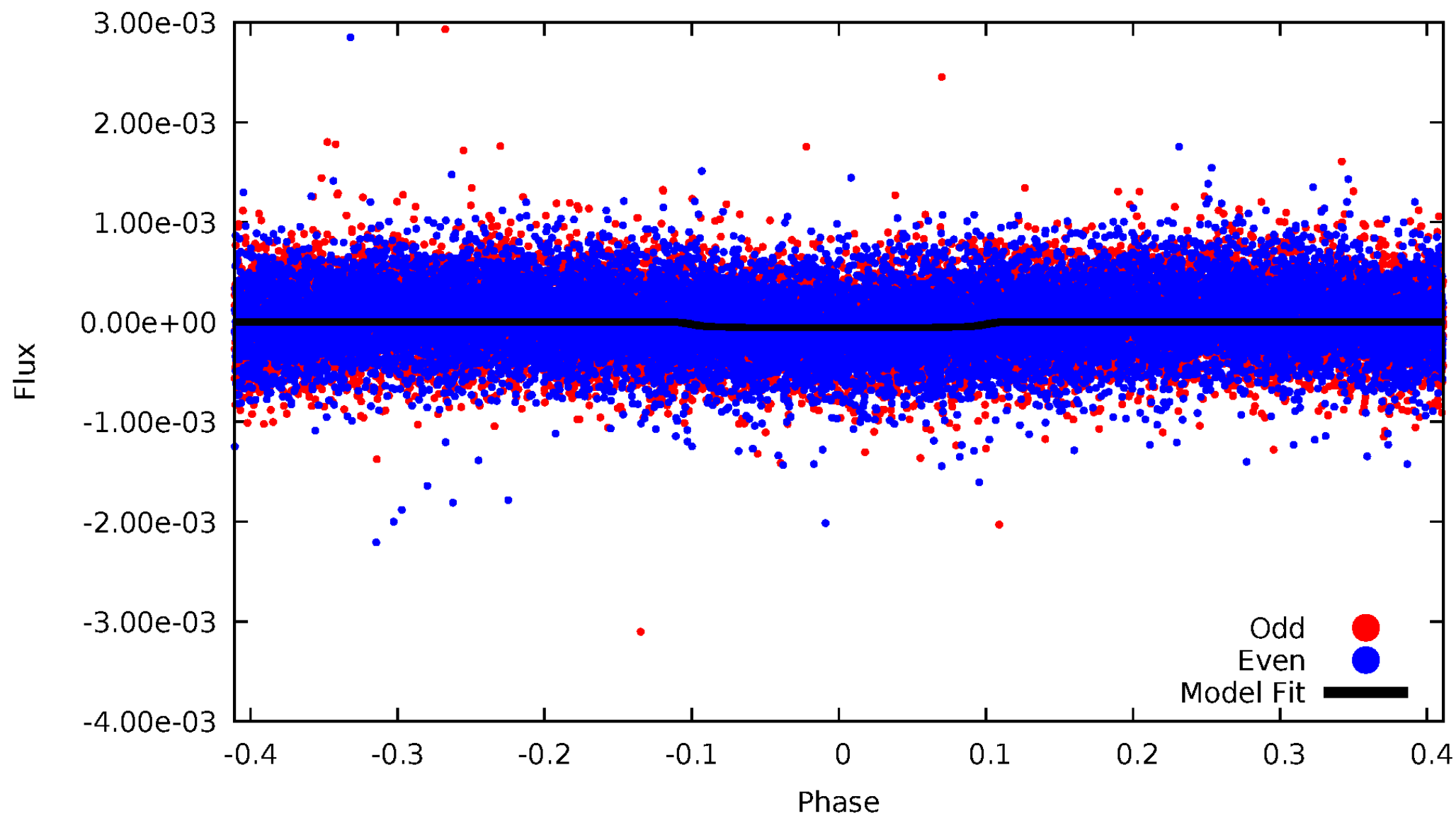


TCE 009716667-02



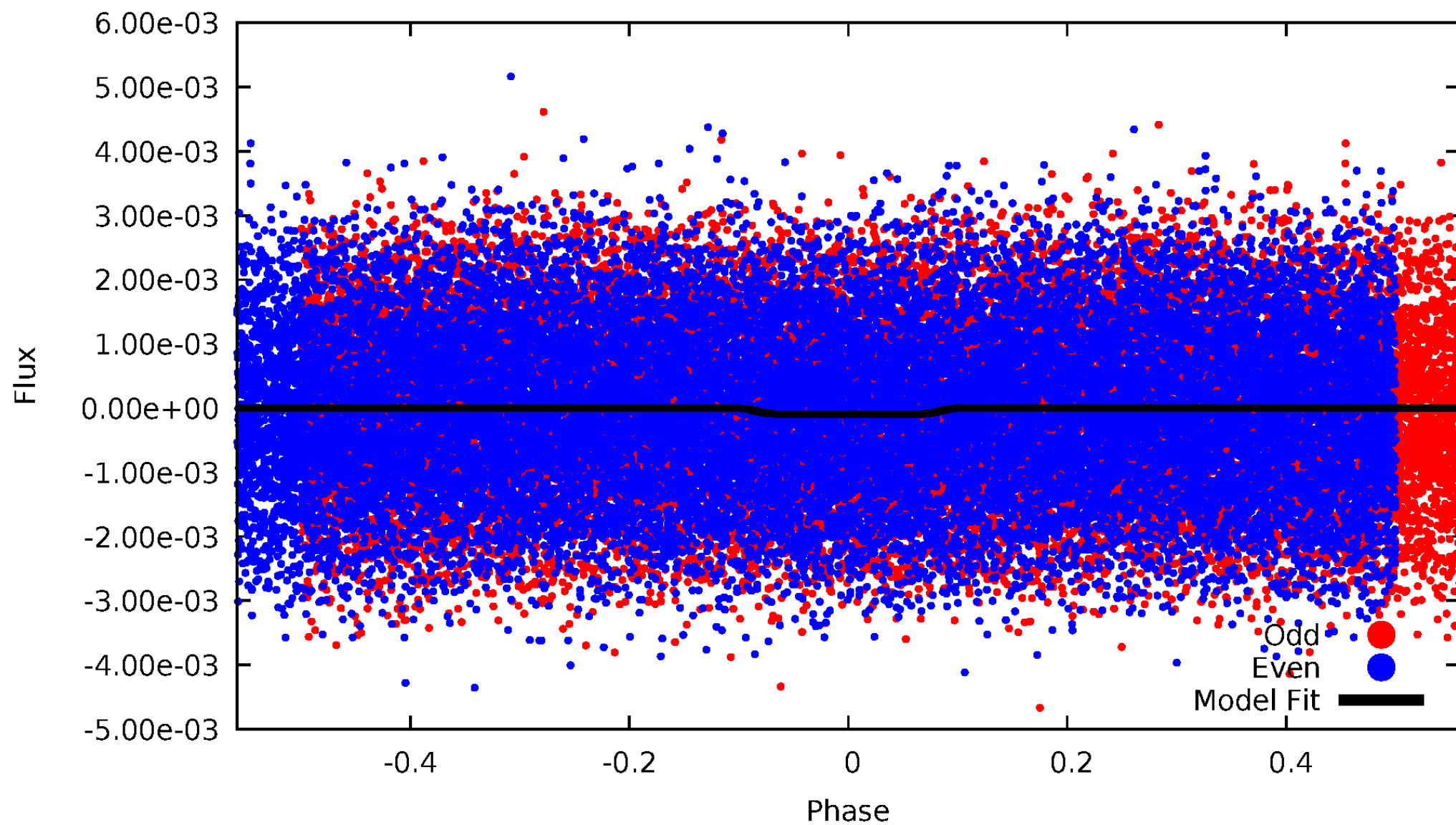
DV Odd/Even

TCE 009716667-02



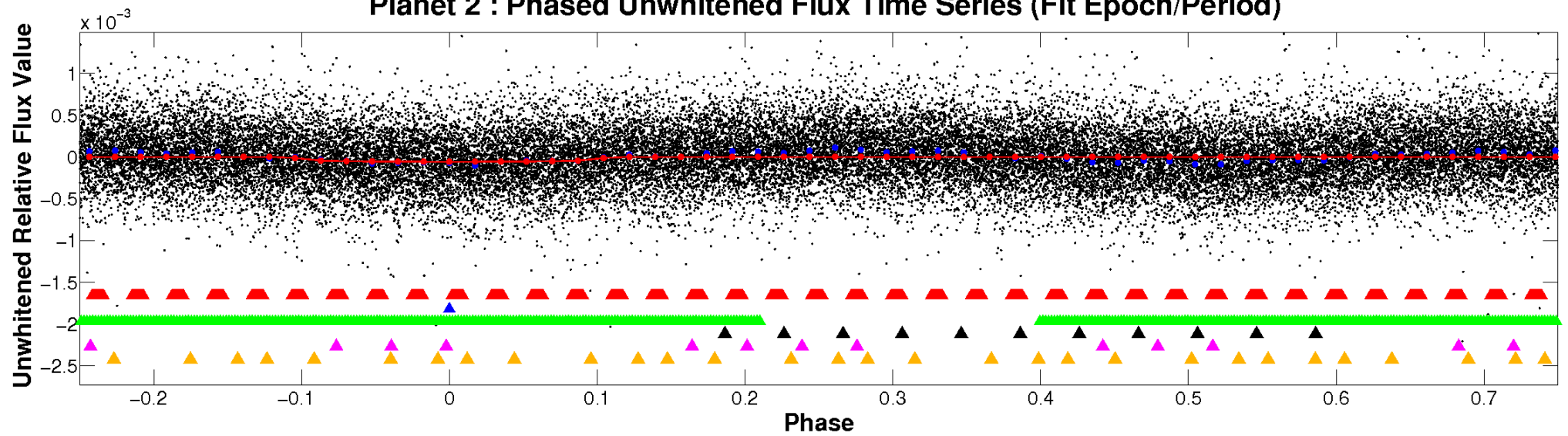
ALT Odd/Even

TCE 009716667-02

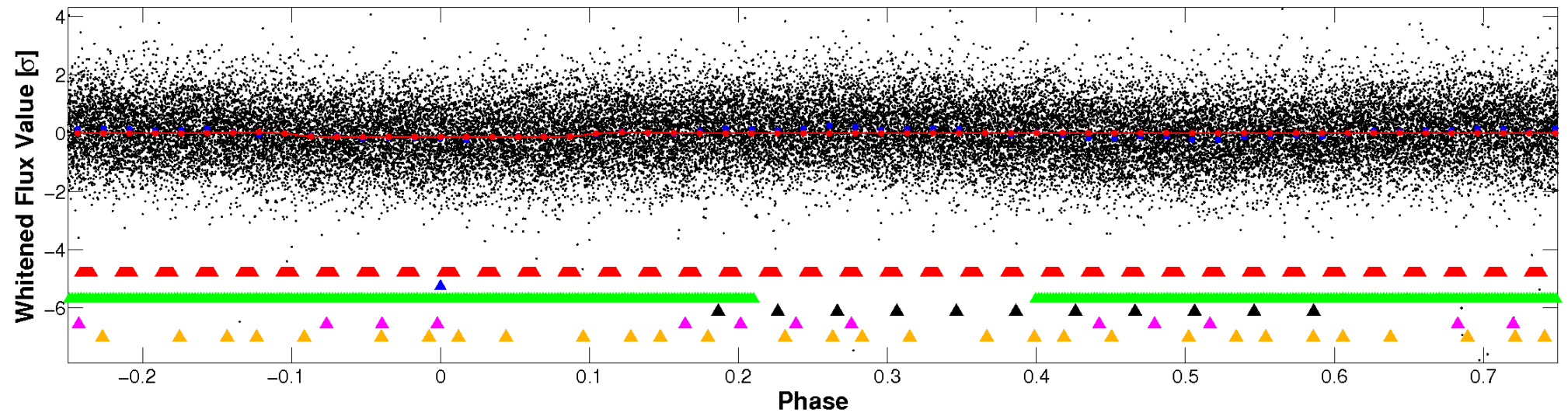


Non-Whitened Vs. Whitened Light Curve

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

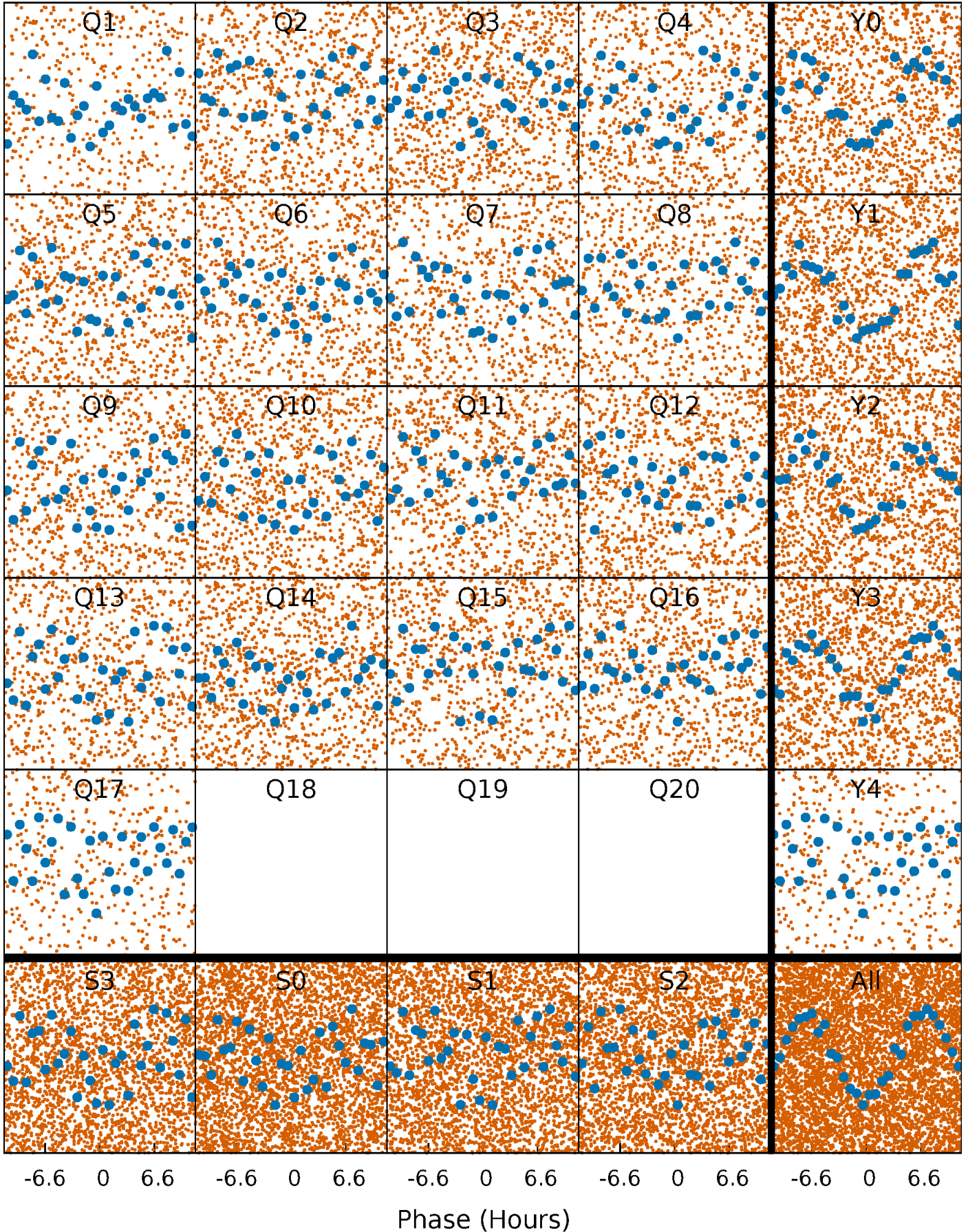


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



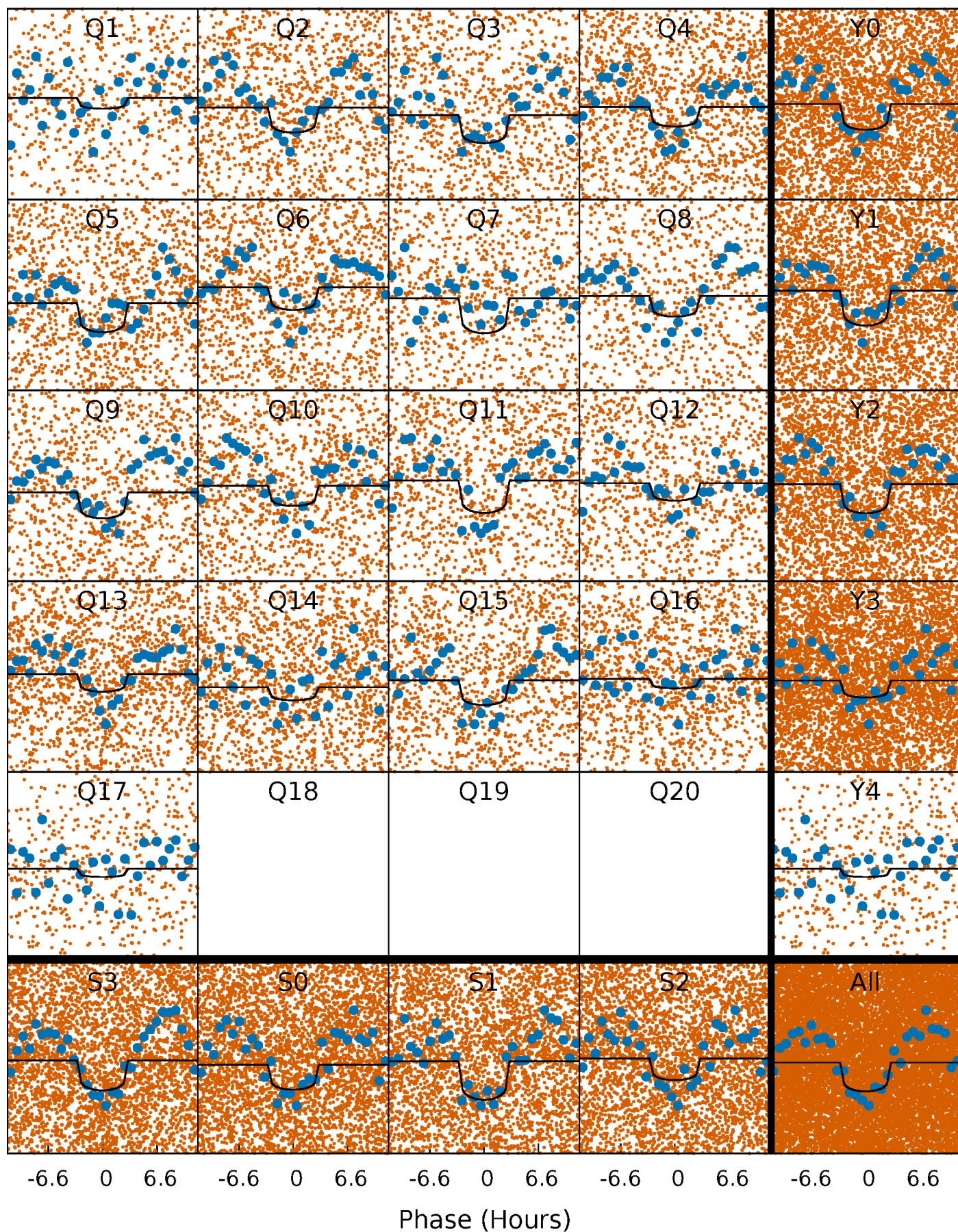
PDC Quarter-Phased Transit Curves

TCE 009716667-02 P= 1.174248 Days $T_0=131.548562$ (BKJD)



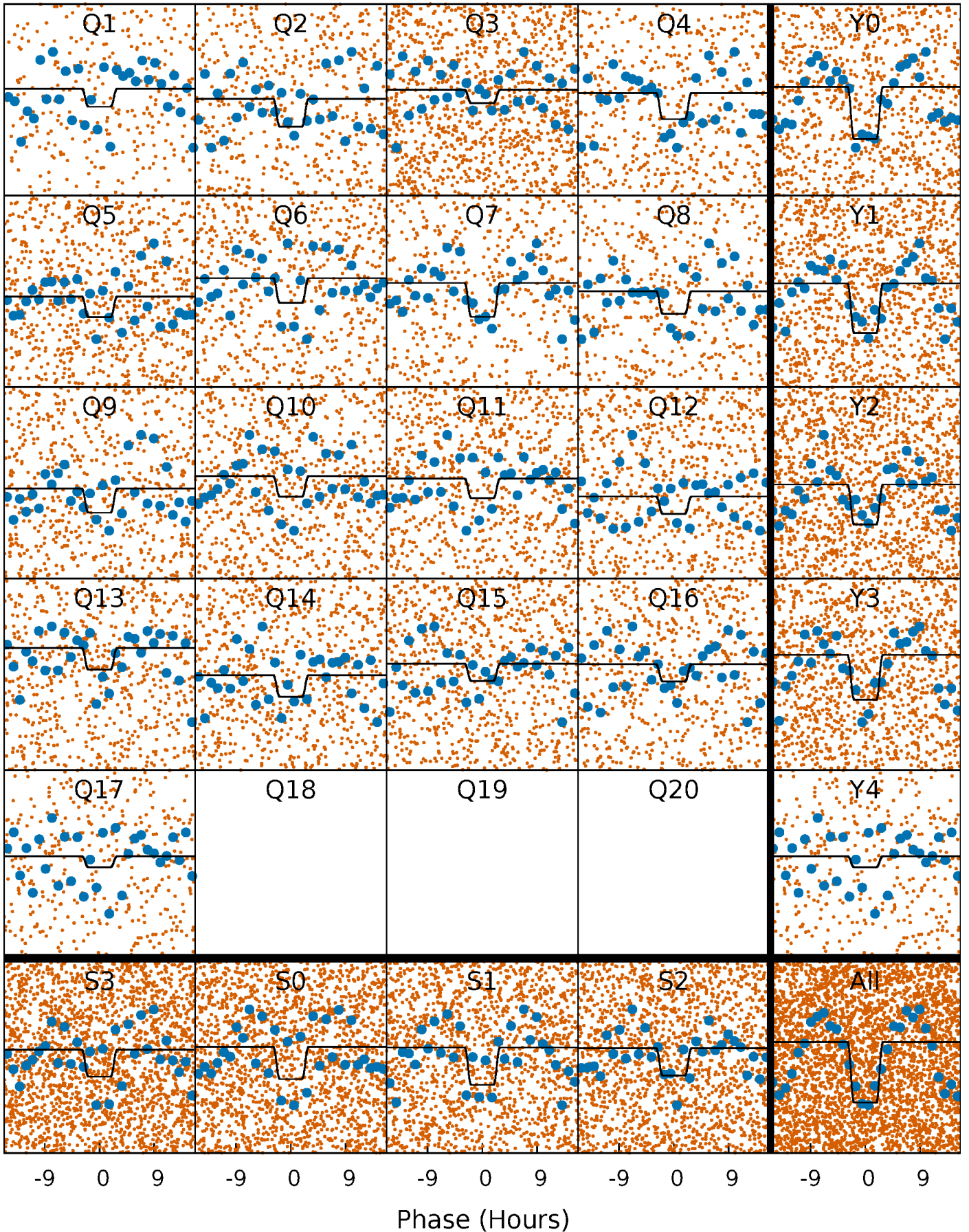
DV Quarter-Phased Transit Curves

TCE 009716667-02 P= 1.174248 Days $T_0=131.548562$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

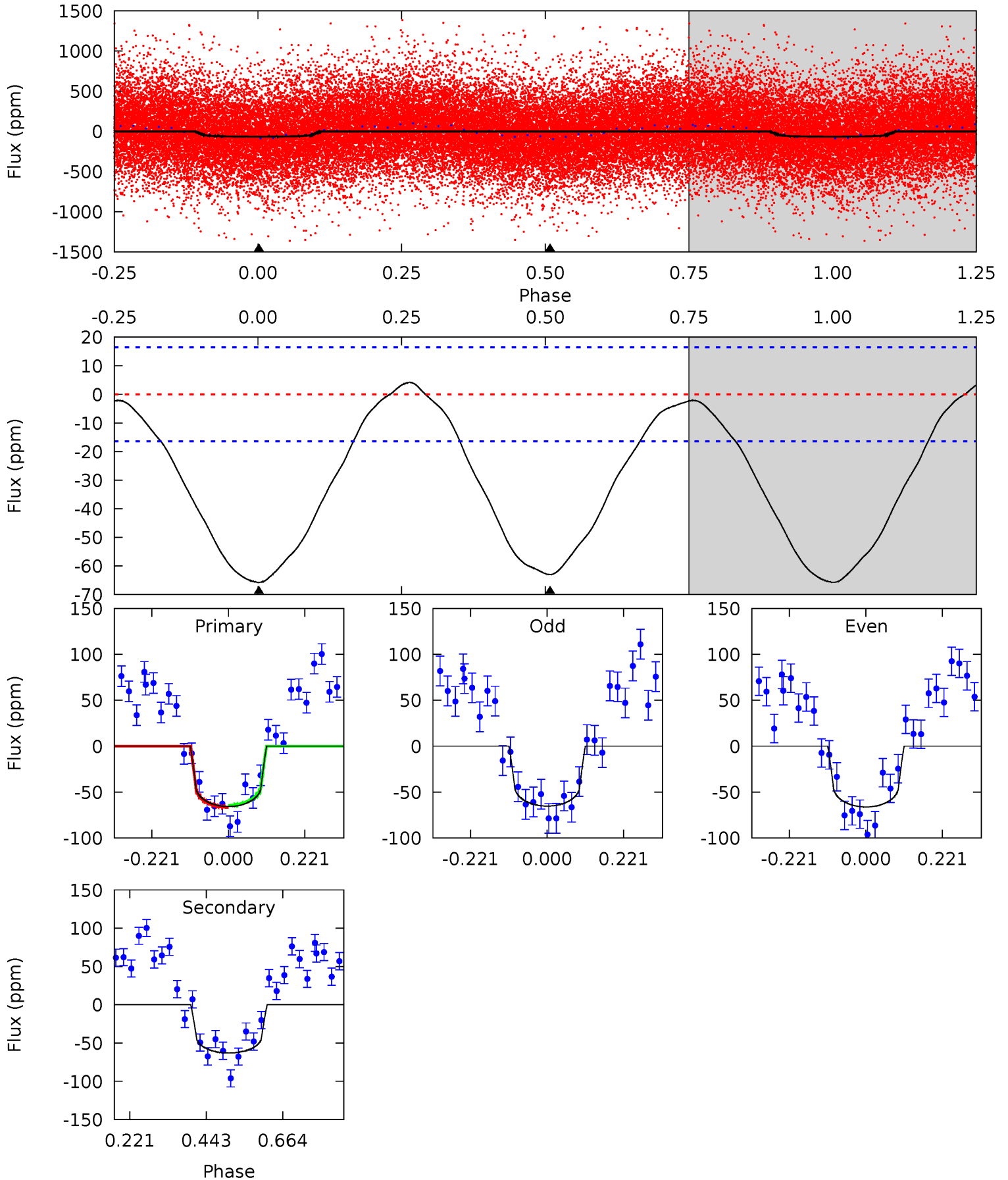
TCE 009716667-02 P= 1.174285 Days $T_0=131.515577$ (BKJD)



DV Model-Shift Uniqueness Test

009716667-02, P = 1.174248 Days, E = 131.548562 Days

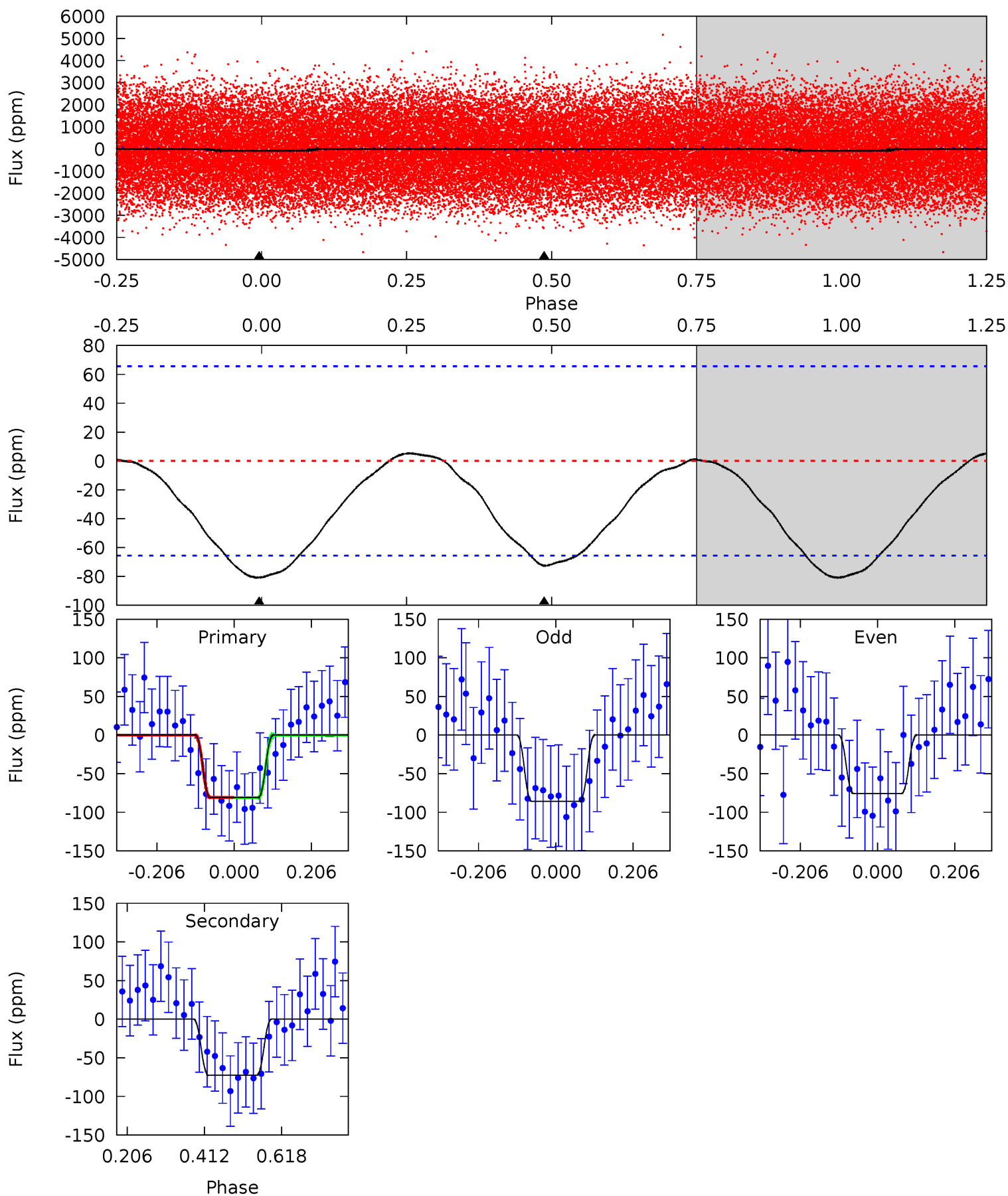
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.6	16.9	0	0	4.40	1.22	0.76	17.6	17.6	16.9	16.9	0.12	1.05	0.06	0.29



Alt Model-Shift Uniqueness Test

009716667-02, P = 1.174285 Days, E = 131.515577 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.44	4.88	0	0	4.41	1.26	0.23	5.44	5.44	4.88	4.88	0.35	1.02	0.06	0.01



Stellar Parameters For KIC 009716667

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7584^{+211}_{-316}	$4.103^{+0.135}_{-0.165}$	$0.070^{+0.200}_{-0.350}$	$1.921^{+0.549}_{-0.366}$	$1.705^{+0.204}_{-0.272}$	$0.339^{+0.230}_{-0.159}$
	+3%/-4%	+3%/-4%	+286%/-500%	+29%/-19%	+12%/-16%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009716667-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-63 ± 4	$1.59^{+1.06}_{-0.92}$	4008^{+292}_{-258}	7684^{+6510}_{-1978}	$9.284^{+41.122}_{-6.073}$
Alt.	-73 ± 15	$2.11^{+1.12}_{-1.02}$	4016^{+269}_{-258}	6786^{+3719}_{-1368}	$5.951^{+17.107}_{-3.407}$

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 $A_{obs} \gg 1.0$

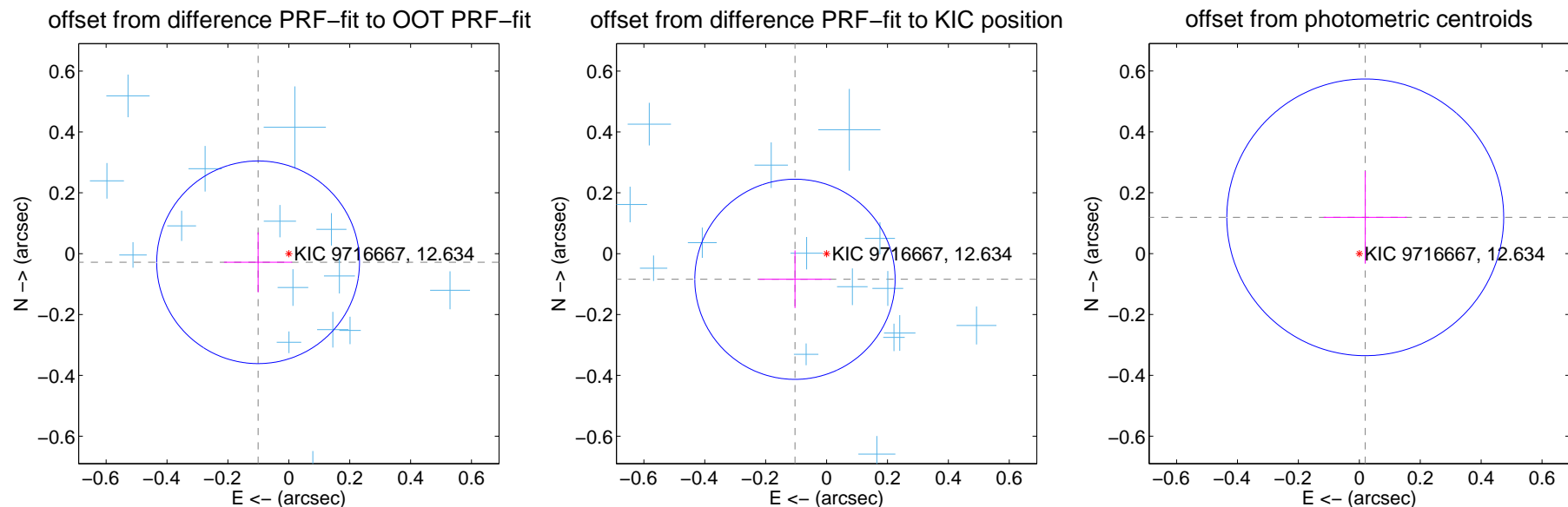
DV Centroid Data

Supplemental centroid analysis for 009716667-02. Kepler magnitude: 12.63. Transit SNR 10.91

There are 17 quarters with good PRF difference image offsets

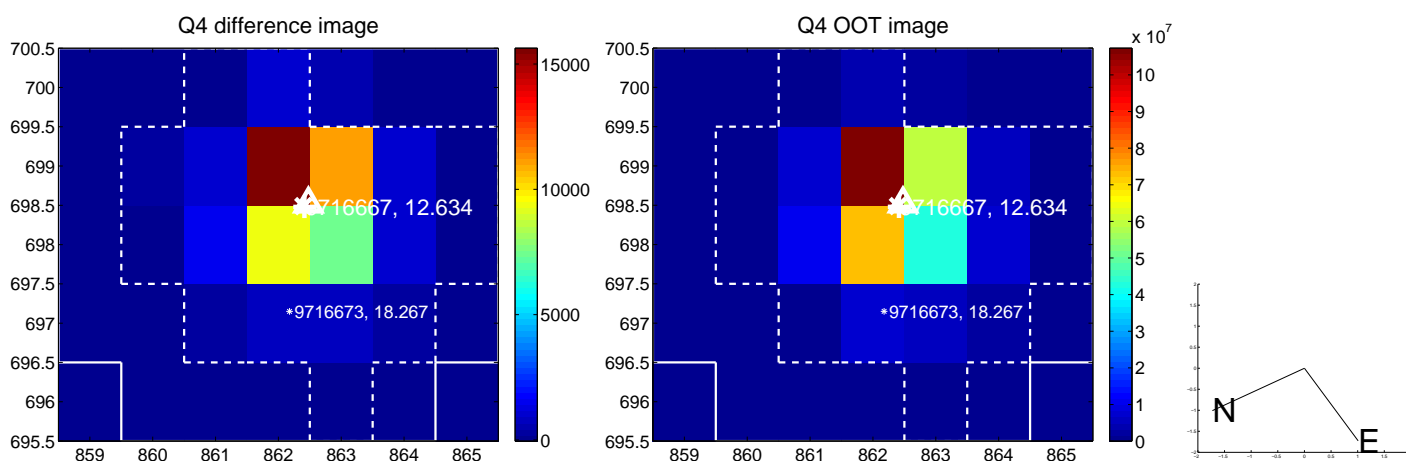
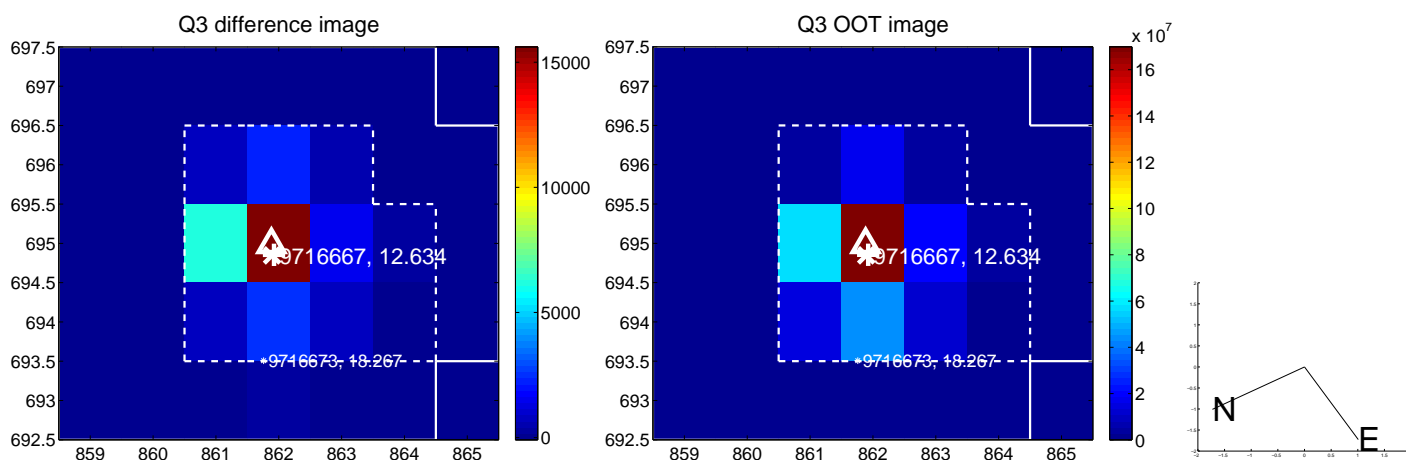
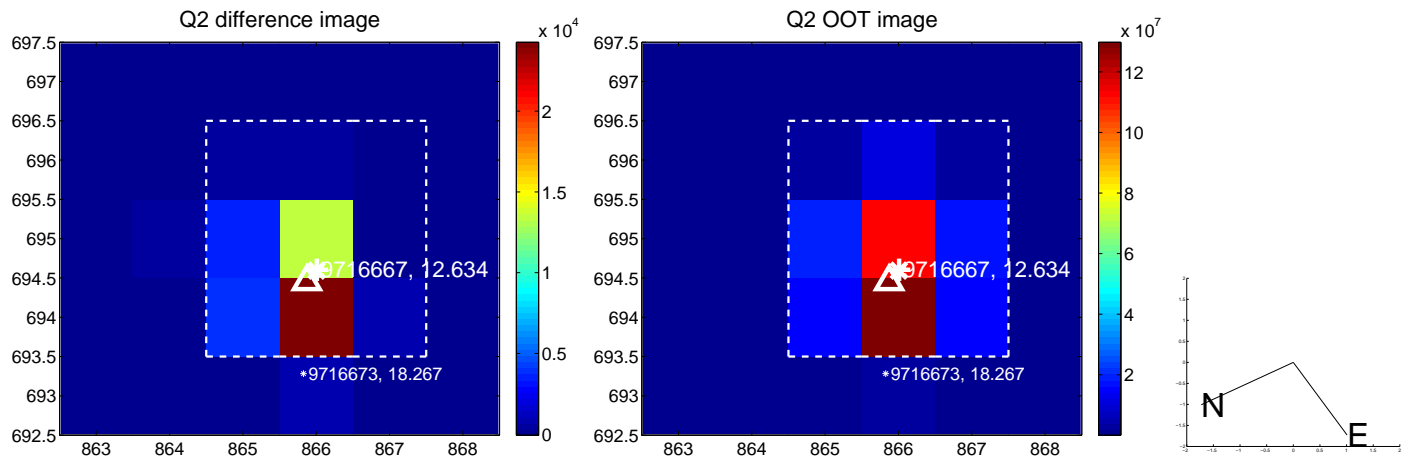
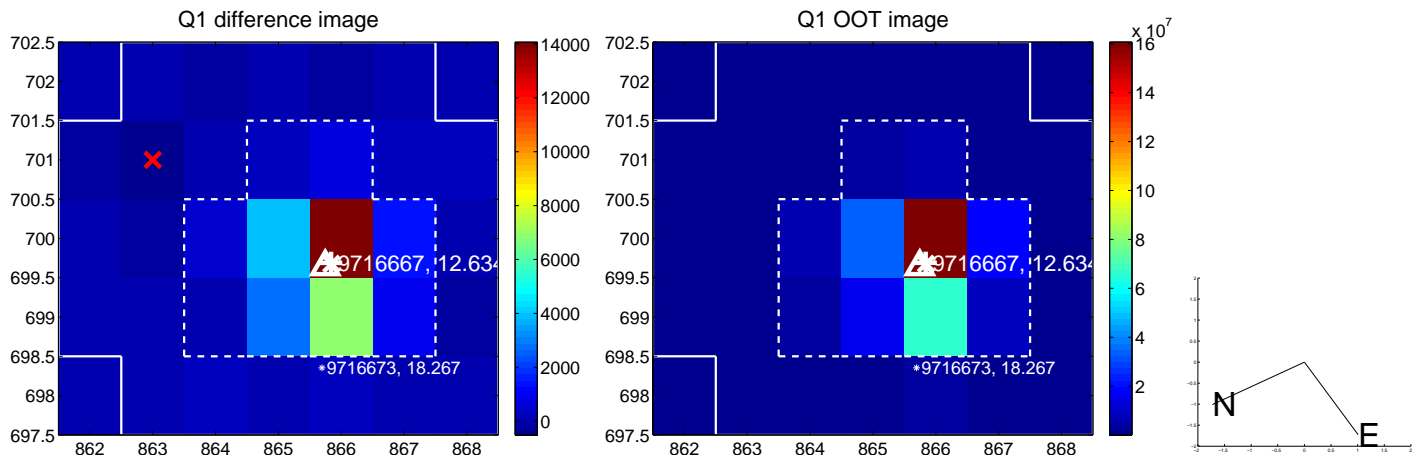
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.105 ± 0.111	0.94	0.101 ± 0.112	-0.028 ± 0.099
PRF-fit source offset from KIC position	0.134 ± 0.110	1.22	0.104 ± 0.118	-0.084 ± 0.095
photometric centroid source offset	0.12 ± 0.15	0.80	-0.02 ± 0.14	0.12 ± 0.15

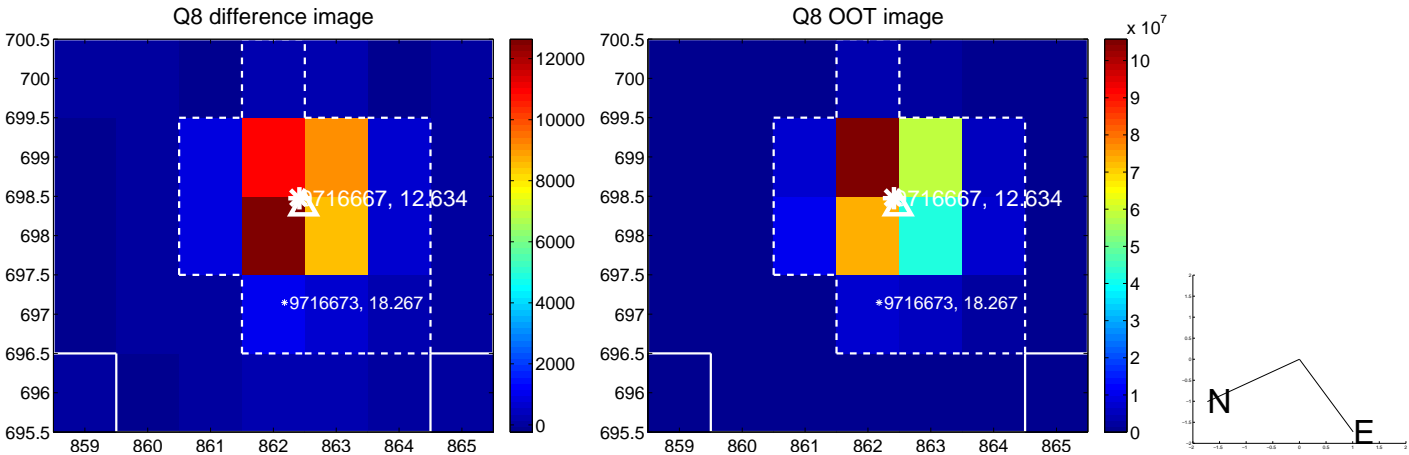
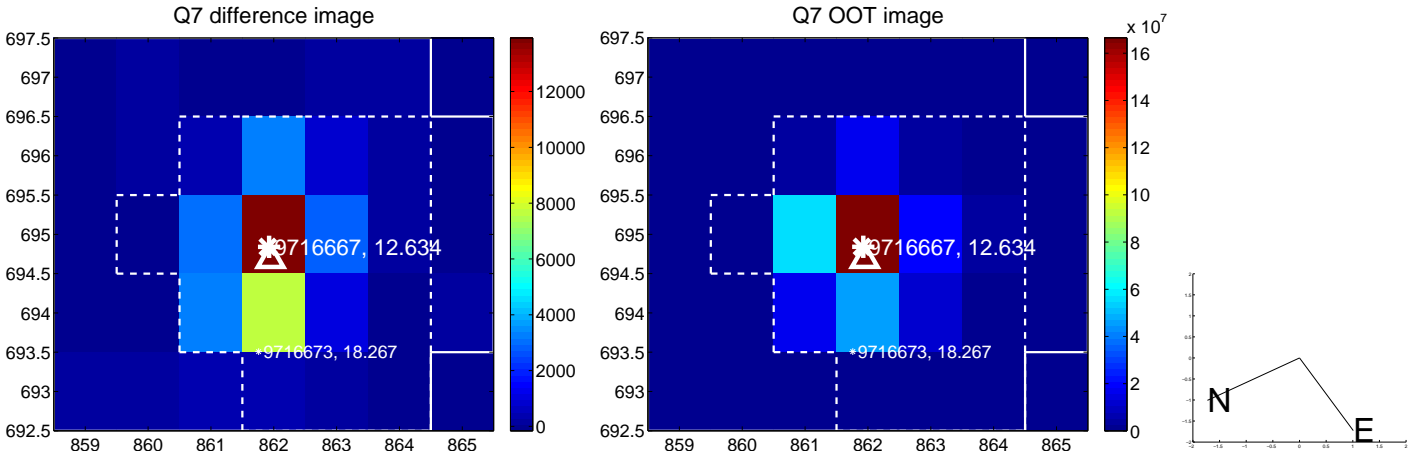
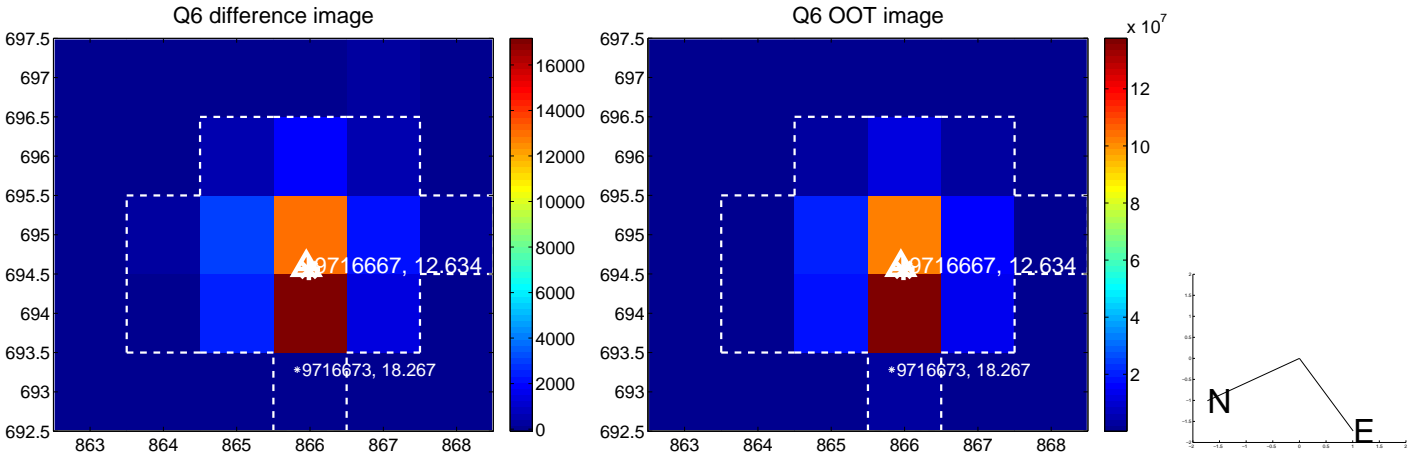
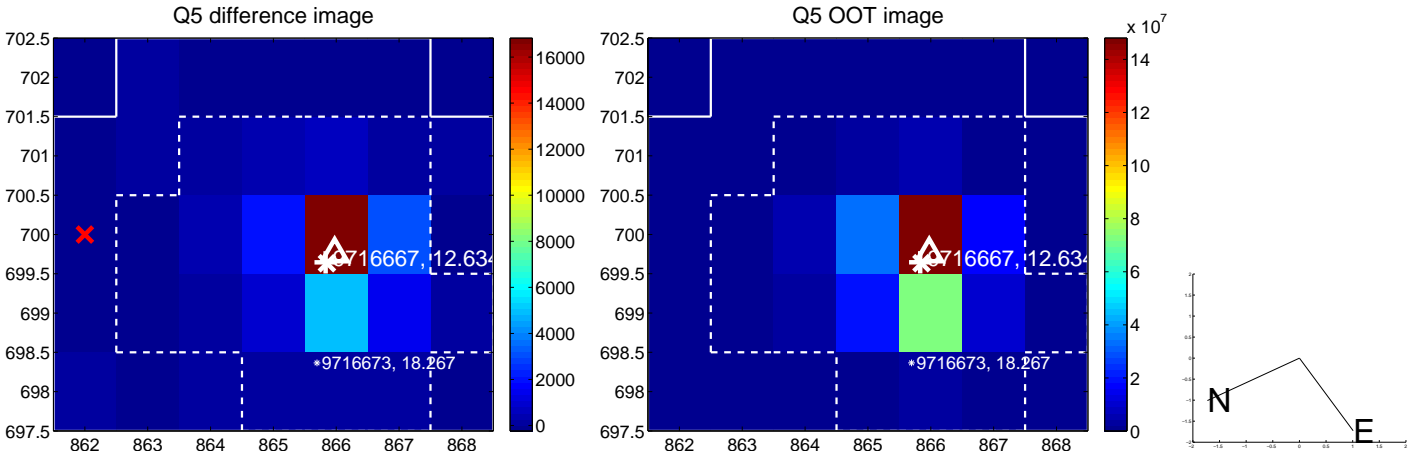


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

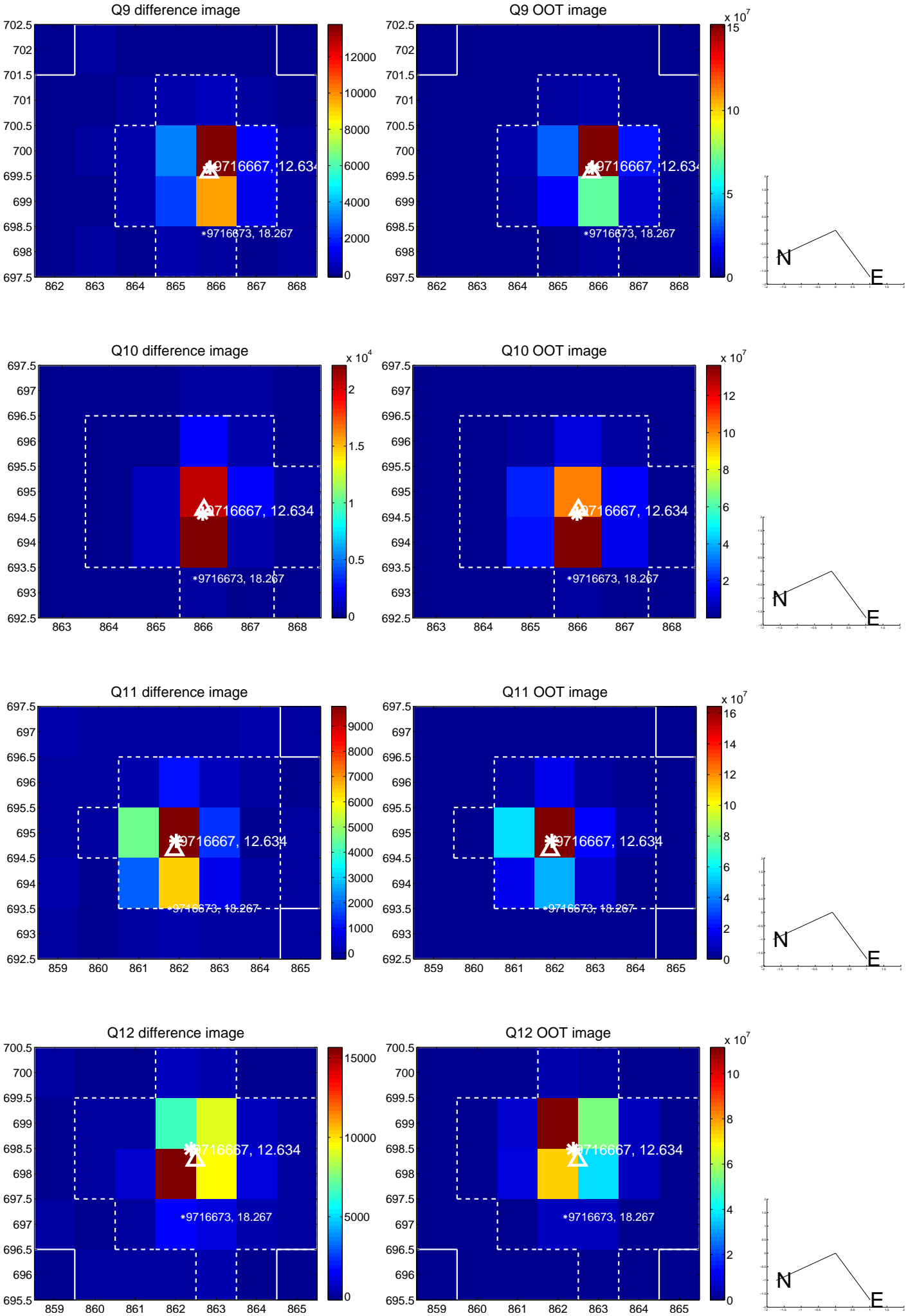
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



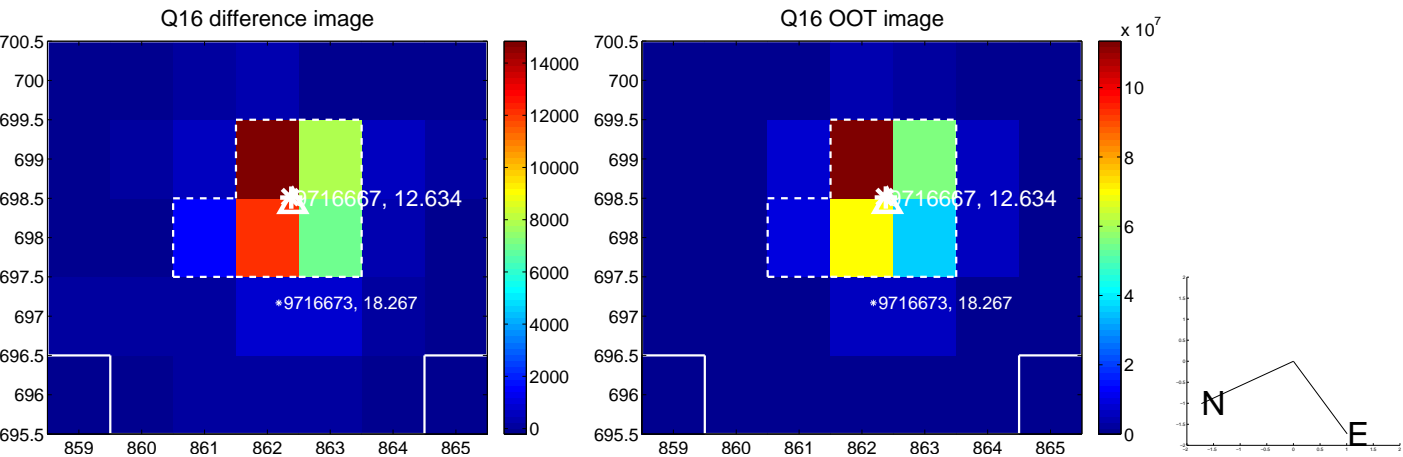
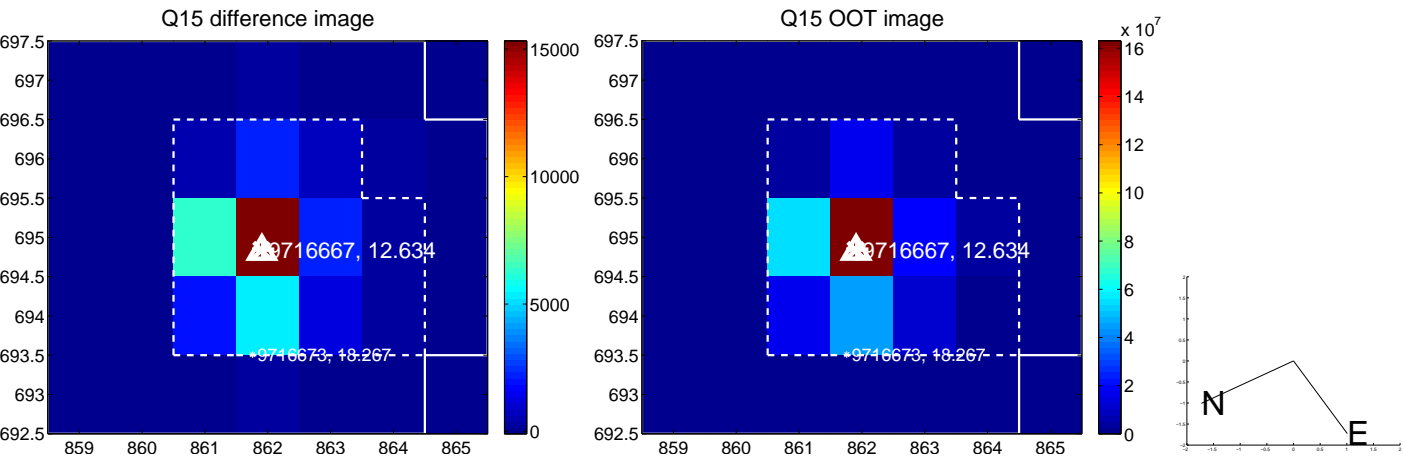
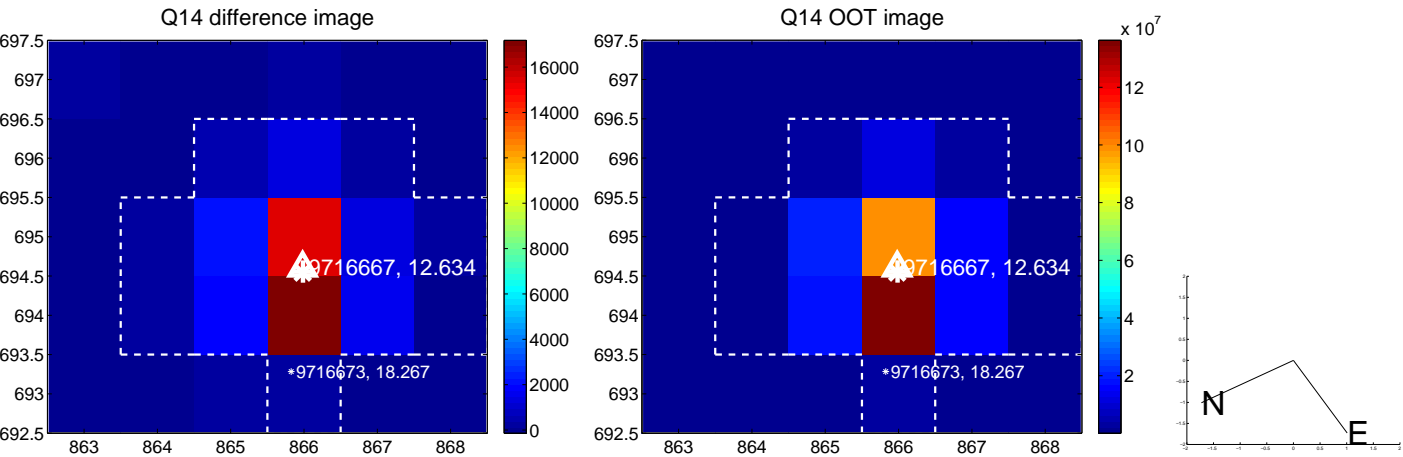
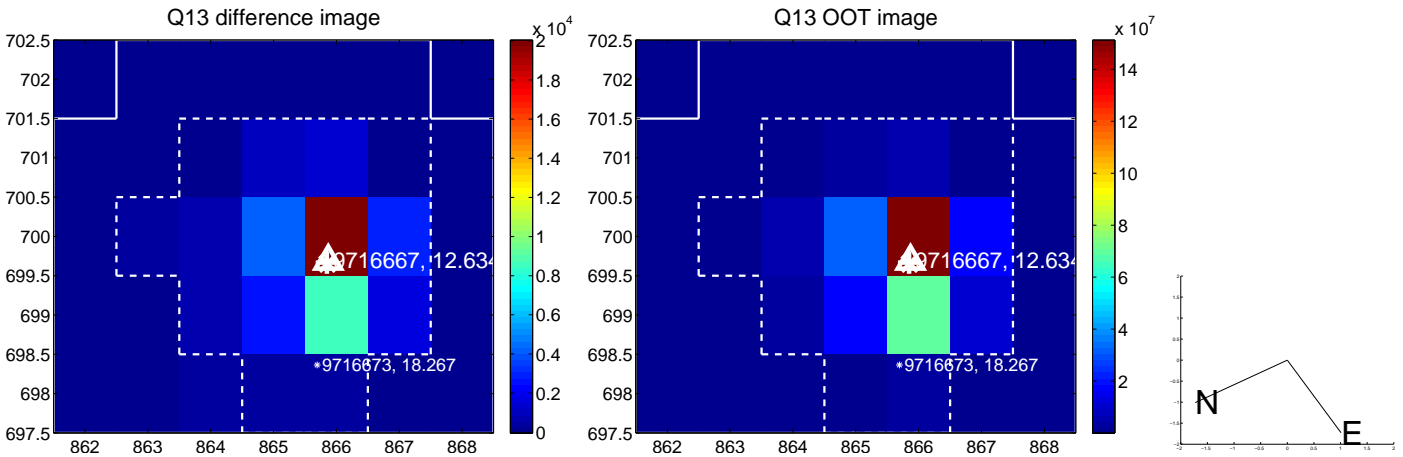
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



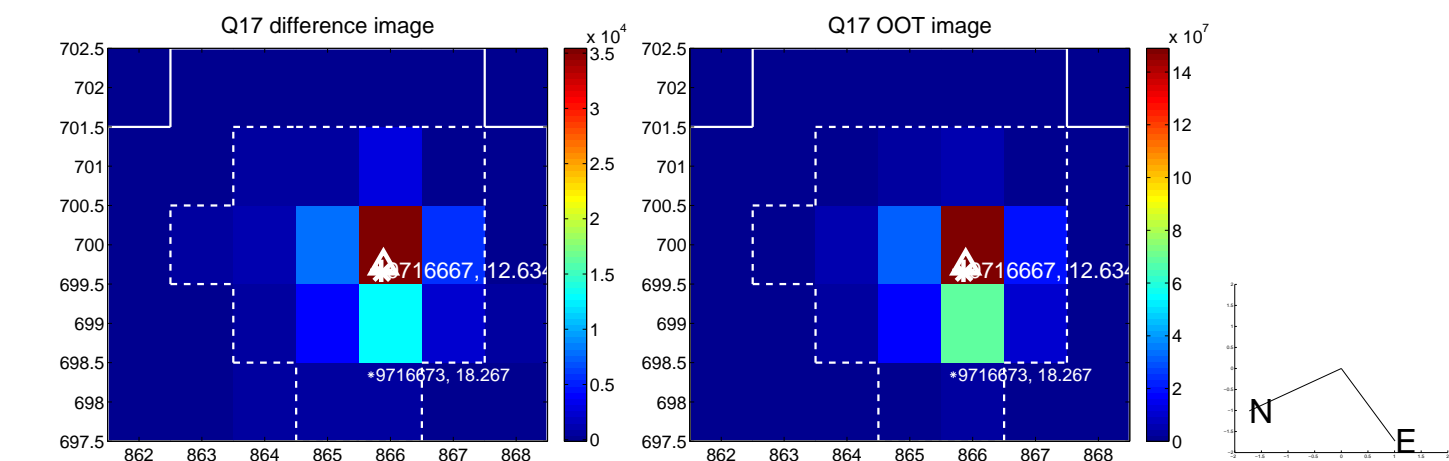
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



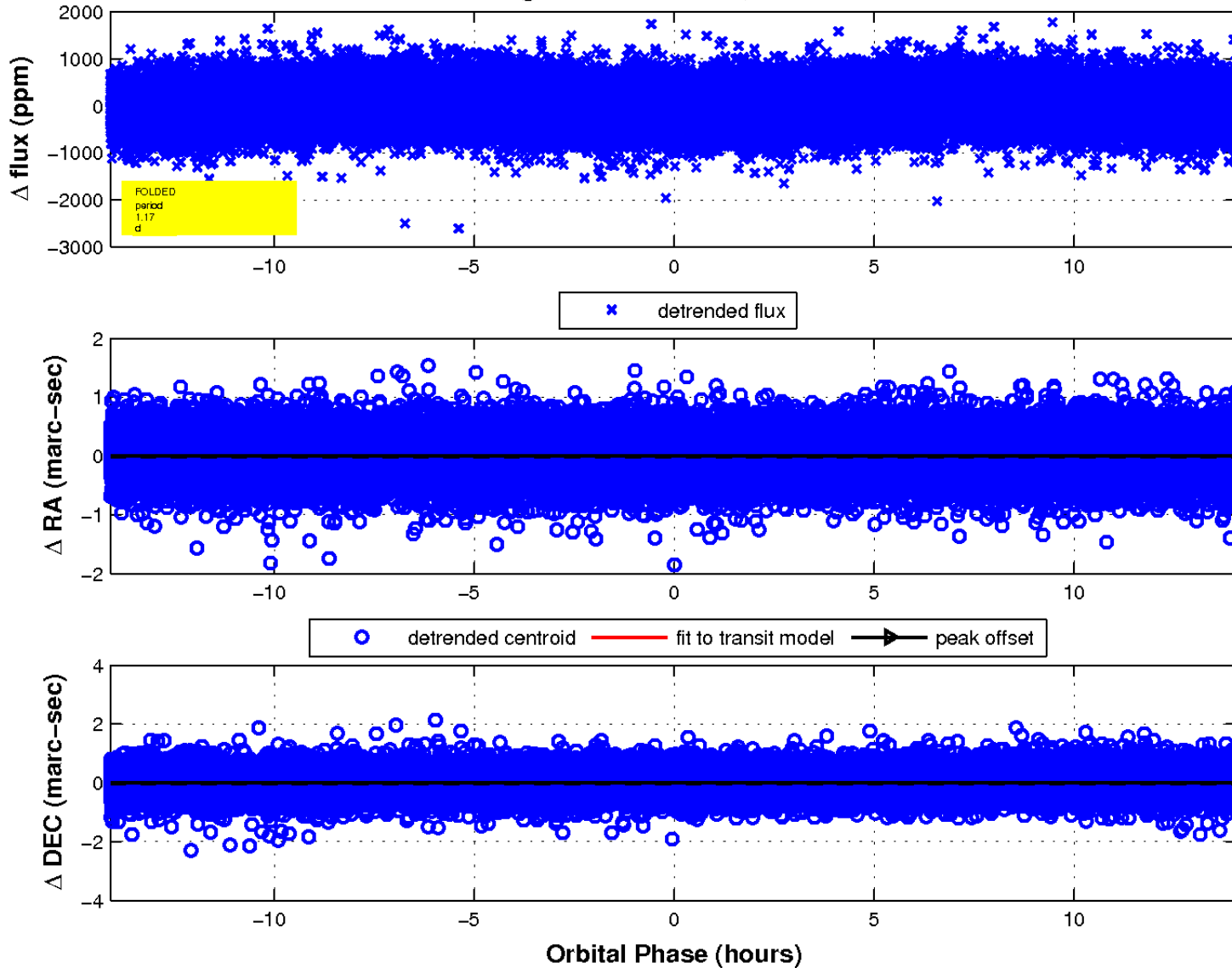
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

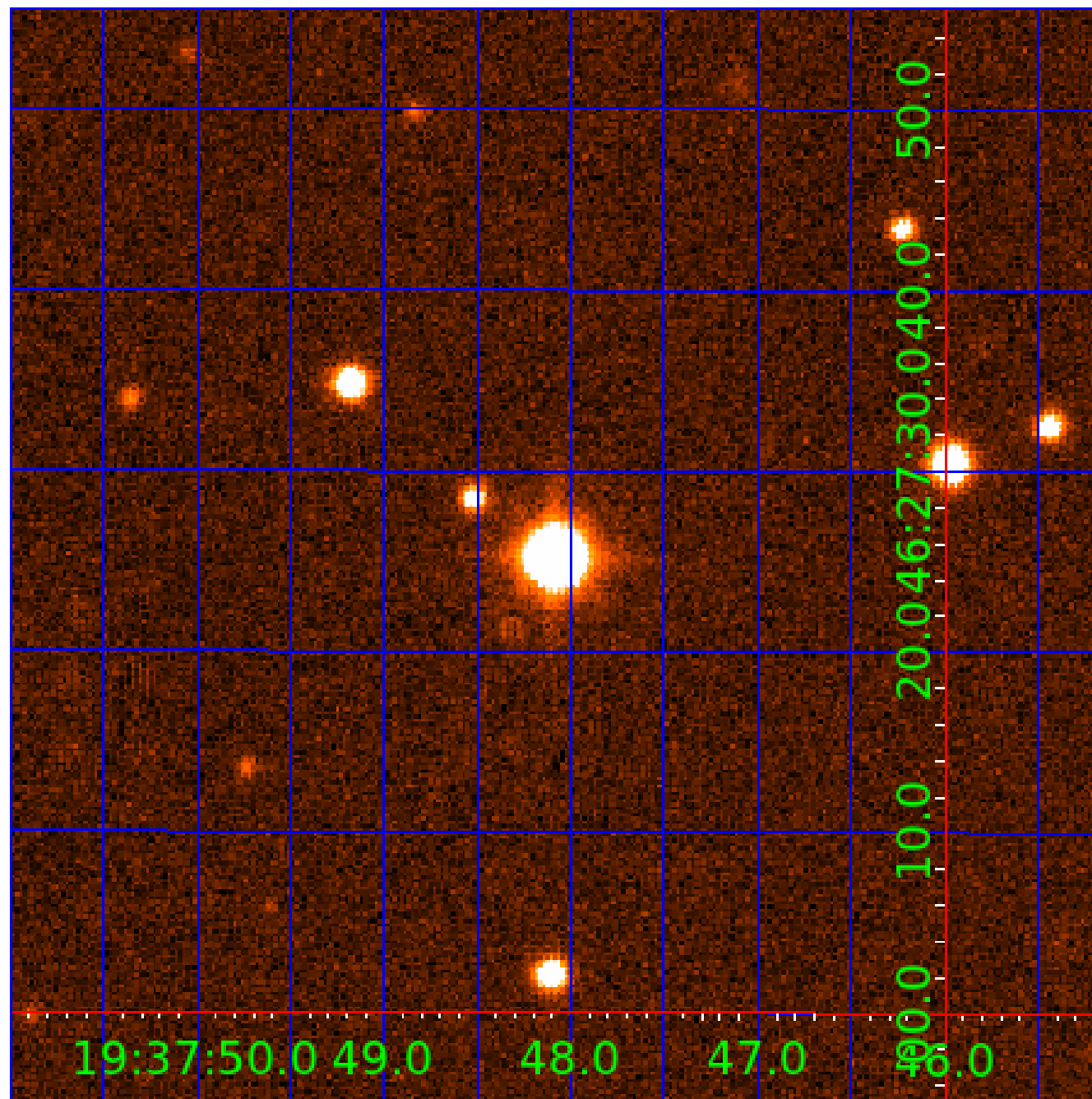


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination



KIC 009716667

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})
009716667-01	OBS	No	0.793406	131.591484	34.3	2.436	9.6	7.9	1.92	7584	1.30	27217.33
009716667-02	OBS	No	1.174248	131.548562	58.4	5.790	10.1	10.9	1.92	7584	1.49	16137.12
009716667-03	OBS	No	3.525049	132.017709	91.4	7.418	8.5	8.7	1.92	7584	2.12	3726.37
009716667-04	OBS	No	139.688601	175.683971	494.9	3.501	8.4	7.4	1.92	7584	4.62	27.58
009716667-05	OBS	No	113.619424	138.786926	485.9	3.924	8.1	8.9	1.92	7584	4.52	36.33
009716667-06	OBS	No	49.159354	139.221257	134.2	3.500	7.3	-1.0	1.92	7584	2.26	111.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716667-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009716667-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009716667-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
009716667-04	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
009716667-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
009716667-06	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_NOFITS

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

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

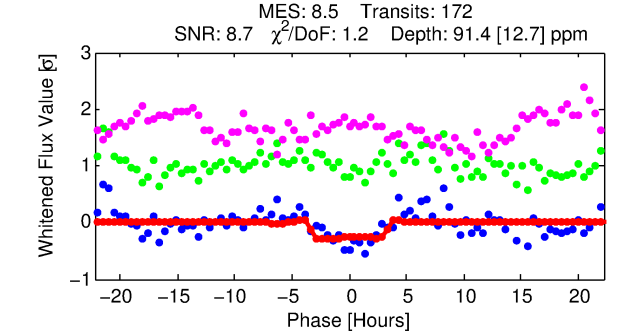
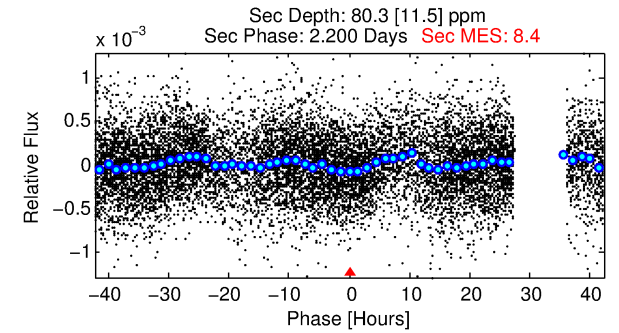
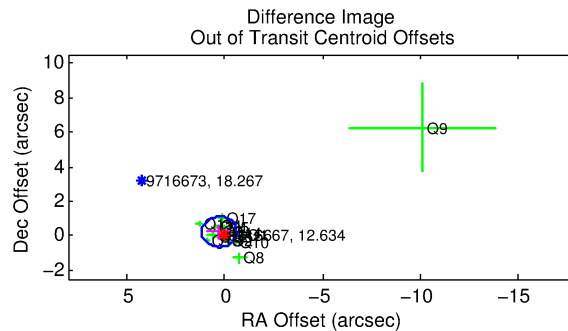
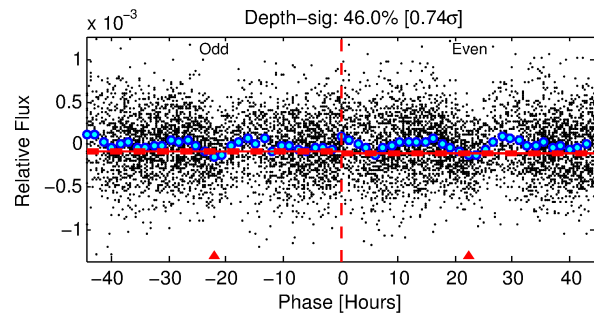
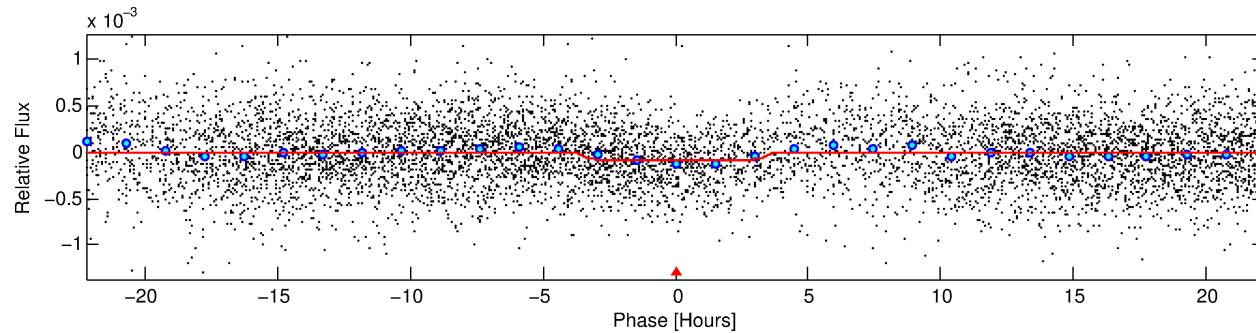
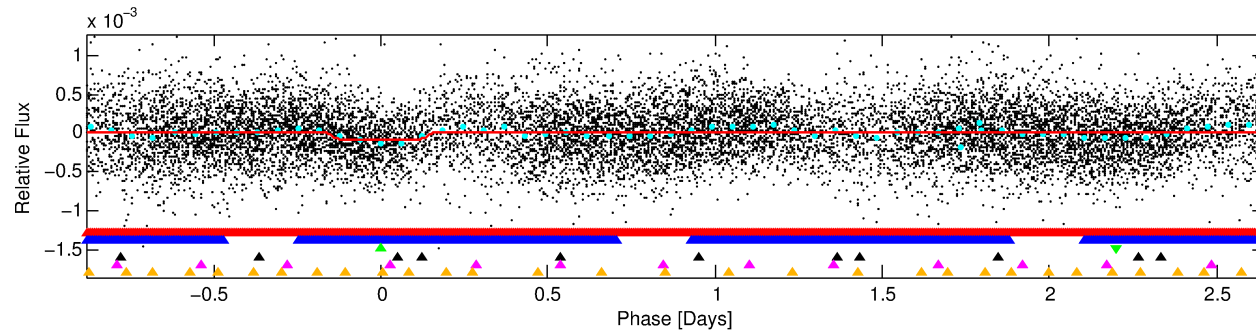
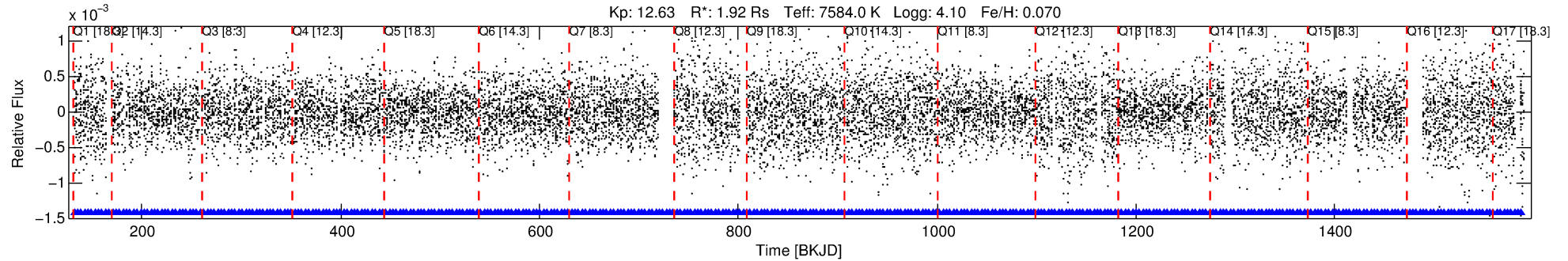
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716667-03

No Significant Match Found

DV One-Page Summary

KIC: 9716667 Candidate: 3 of 6 Period: 3.525 d



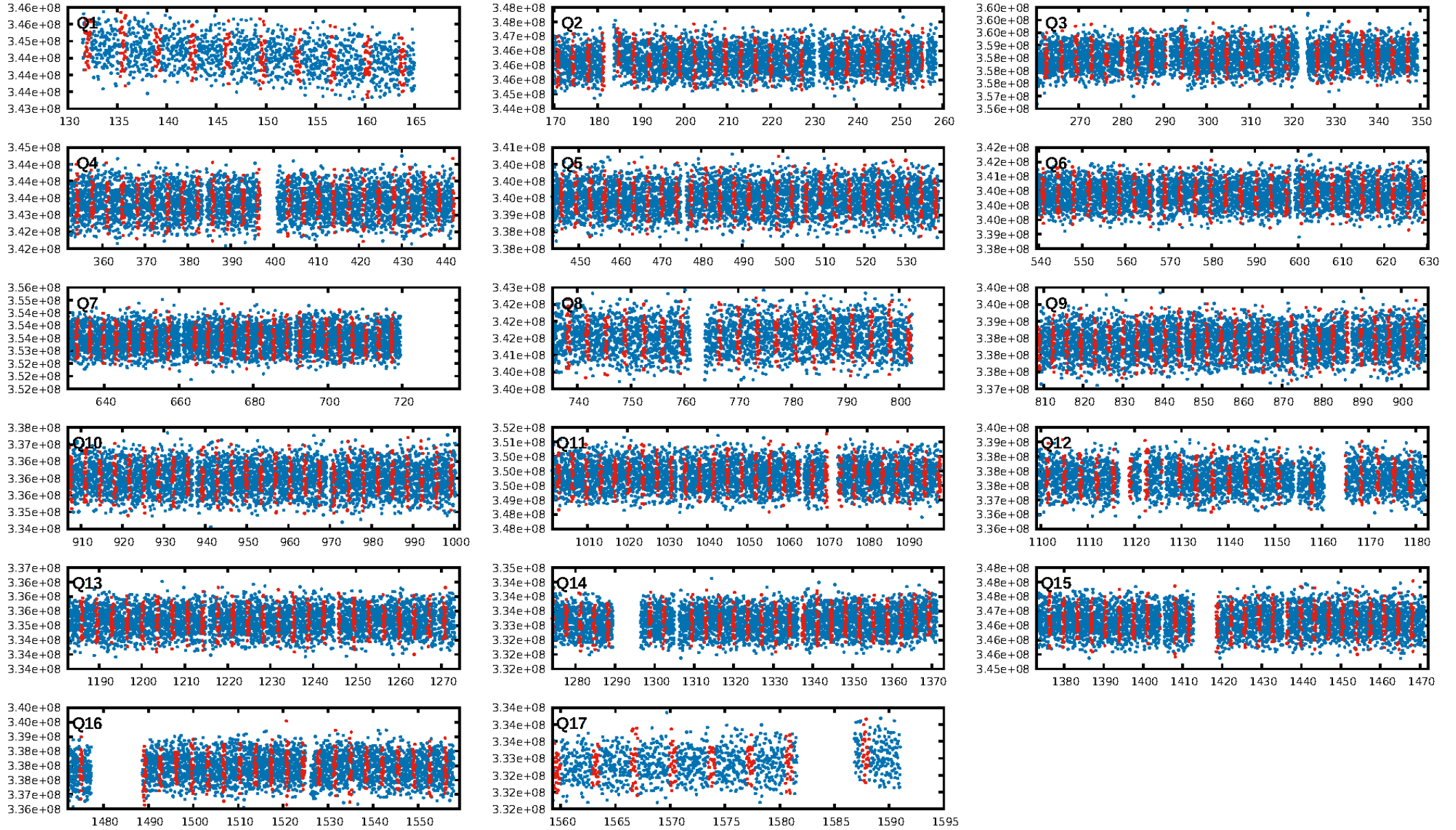
DV Fit Results:

Period = 3.52505 [0.00011] d
Epoch = 132.0177 [0.0114] BKJD
Rp/R* = 0.0101 [0.0026]
a/R* = 1.92 [2.26]
b = 0.90 [0.35]
Seff = 3726.37 [1334.39]
Teff = 1992 [178] K
Rp = 2.12 [0.82] Re
a = 0.0542 [0.0124] AU
Ag = 28.80 [17.96] [1.55 σ]
Teffp = 7136 [1003] K [5.05 σ]

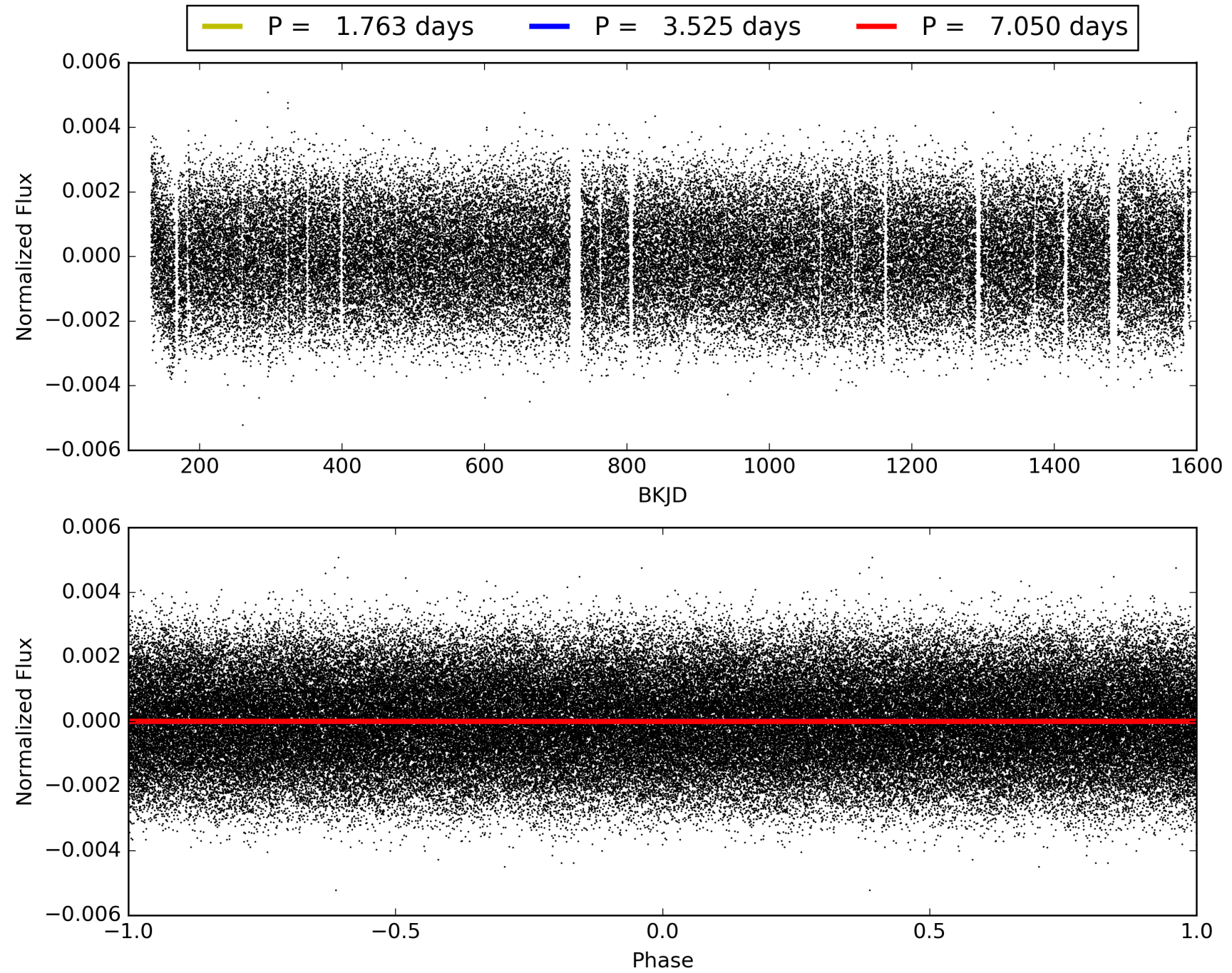
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.00 σ]
LongPeriod-sig: 100.0% [133.53 σ]
ModelChiSquare2-sig: 1.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [158/158]
GhostDiagnostic-chr: 2.117
Centroid-sig: 9.3%
Centroid-so: 0.290 arcsec [1.96 σ]
OotOffset-rm: 0.354 arcsec [1.20 σ]
KicOffset-rm: 0.316 arcsec [0.71 σ]
OotOffset-st: 4/3/4/5 [16]
KicOffset-st: 4/3/4/5 [16]
DiffImageQuality-fgm: 0.81 [13/16]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 009716667-03, PDC Light Curves

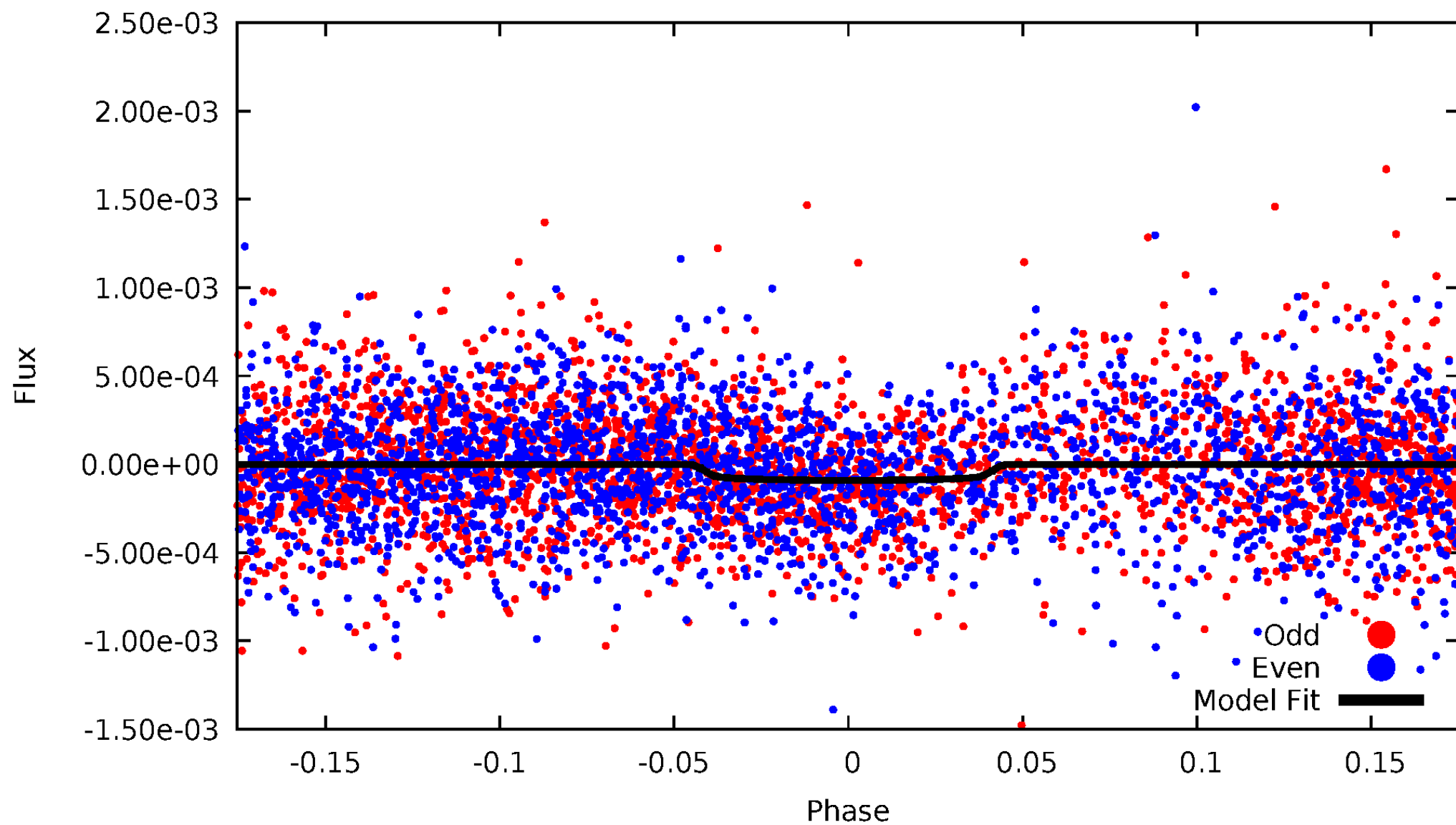


TCE 009716667-03



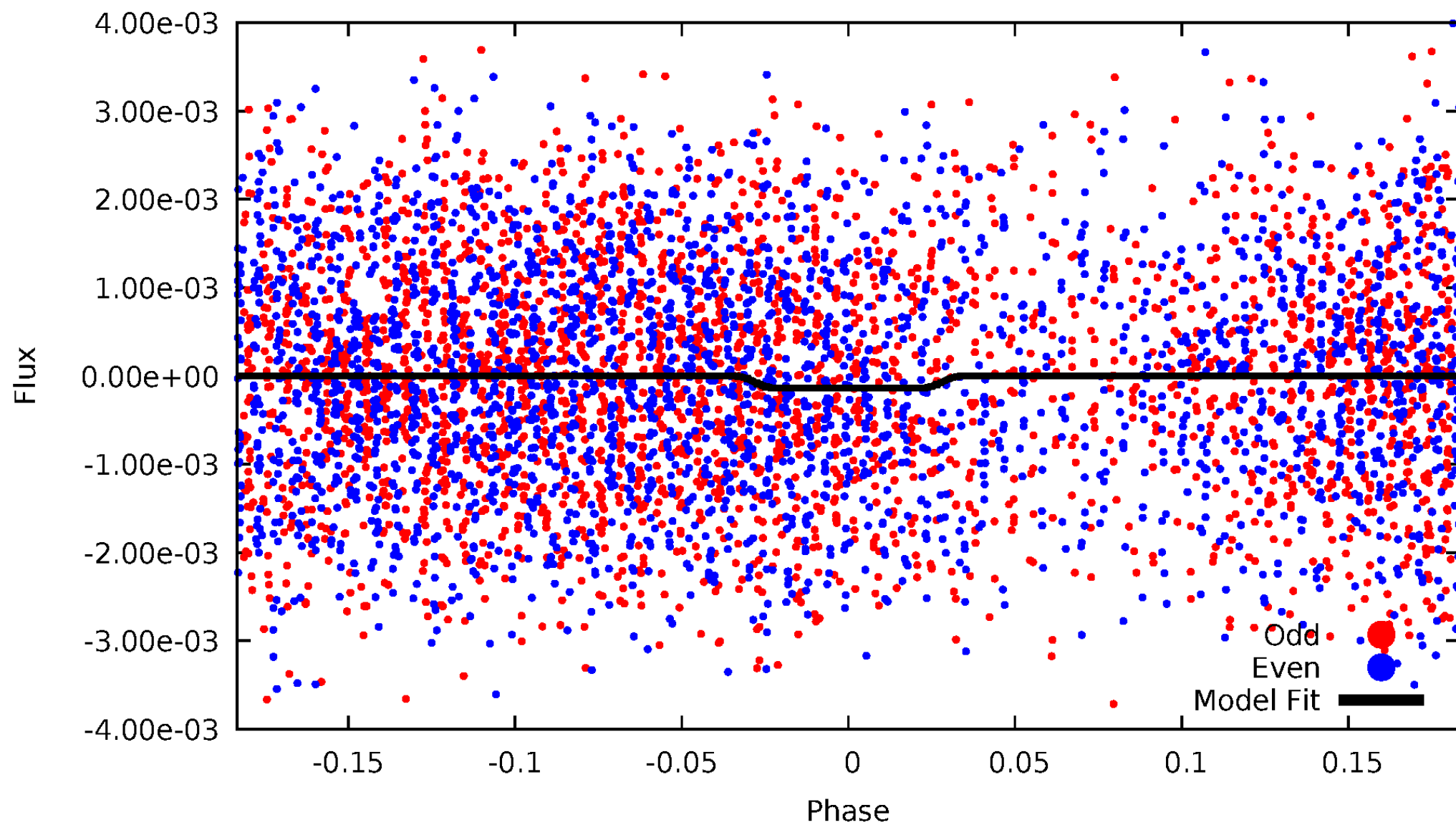
DV Odd/Even

TCE 009716667-03



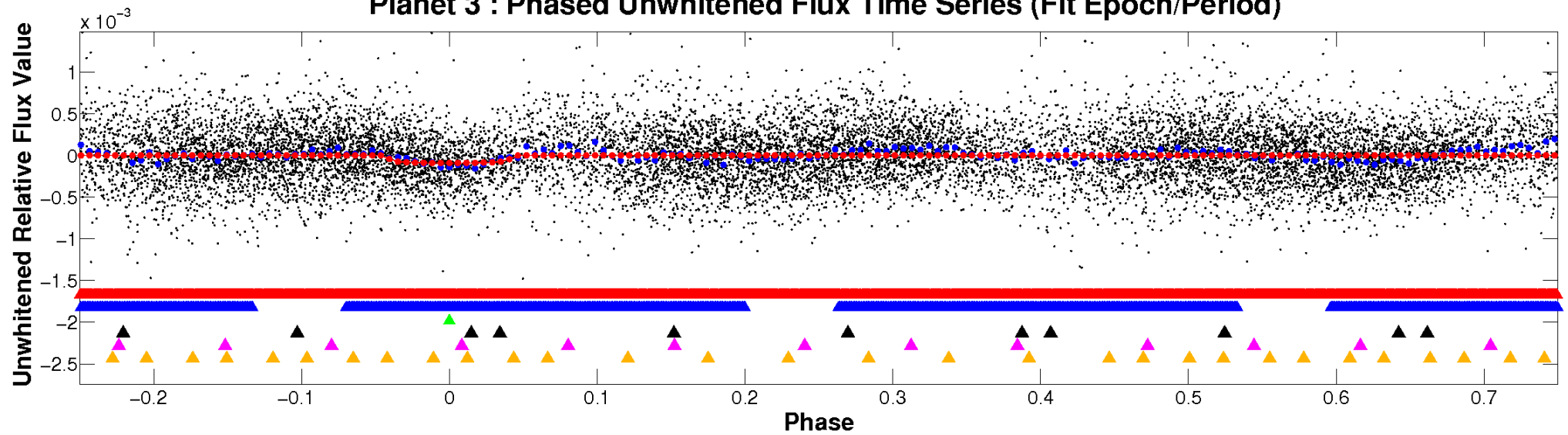
ALT Odd/Even

TCE 009716667-03

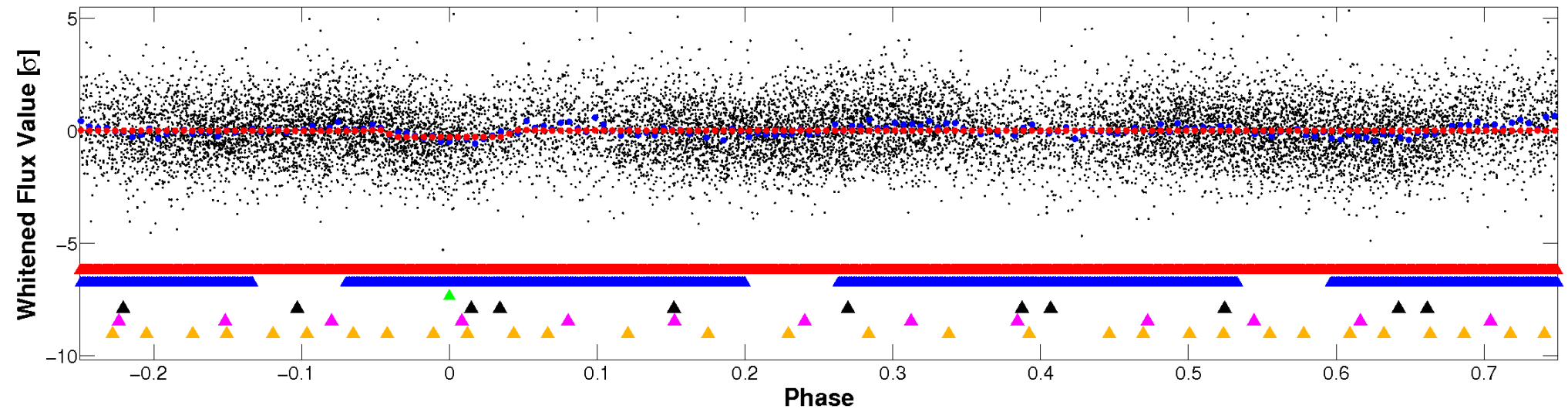


Non-Whitened Vs. Whitened Light Curve

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

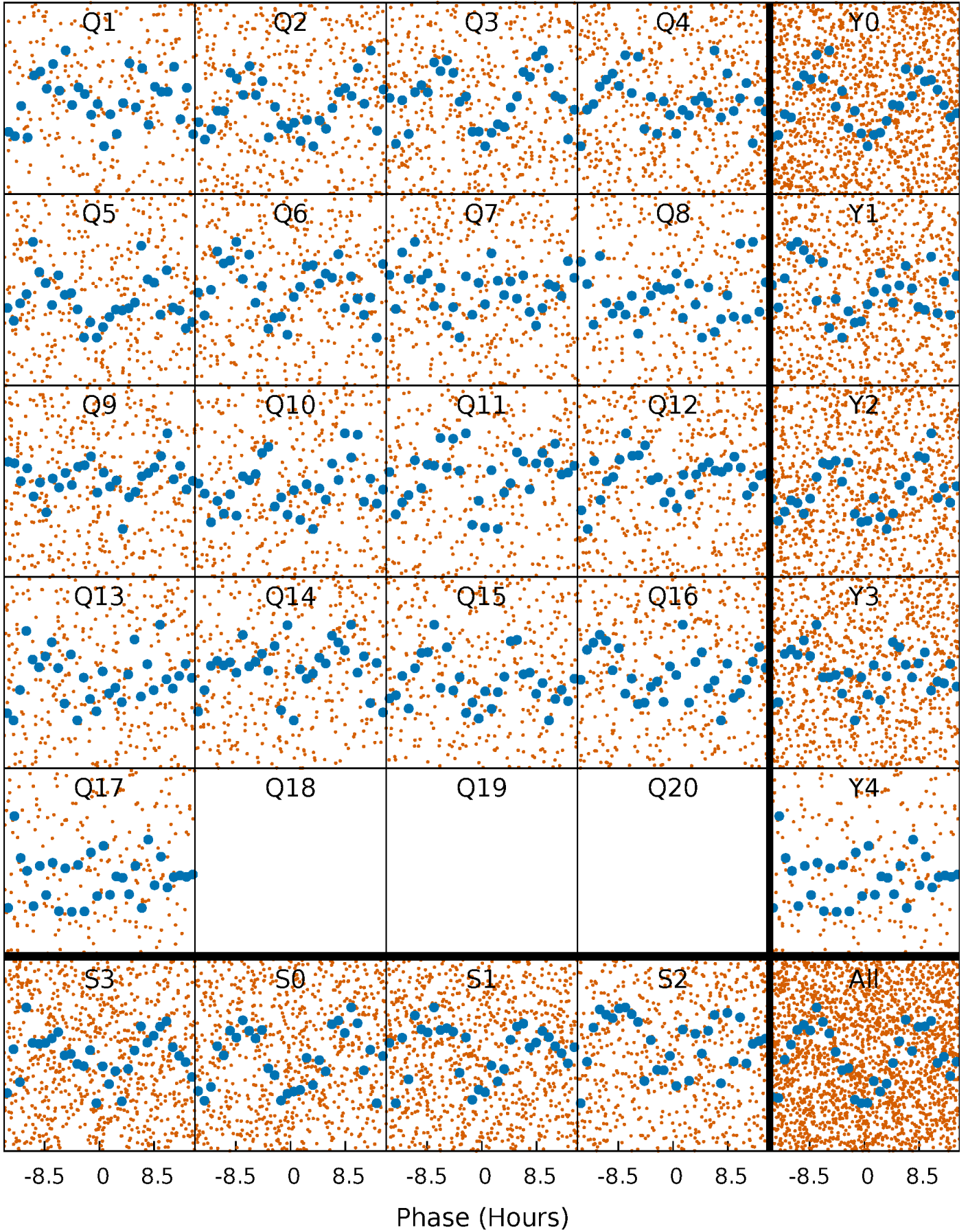


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



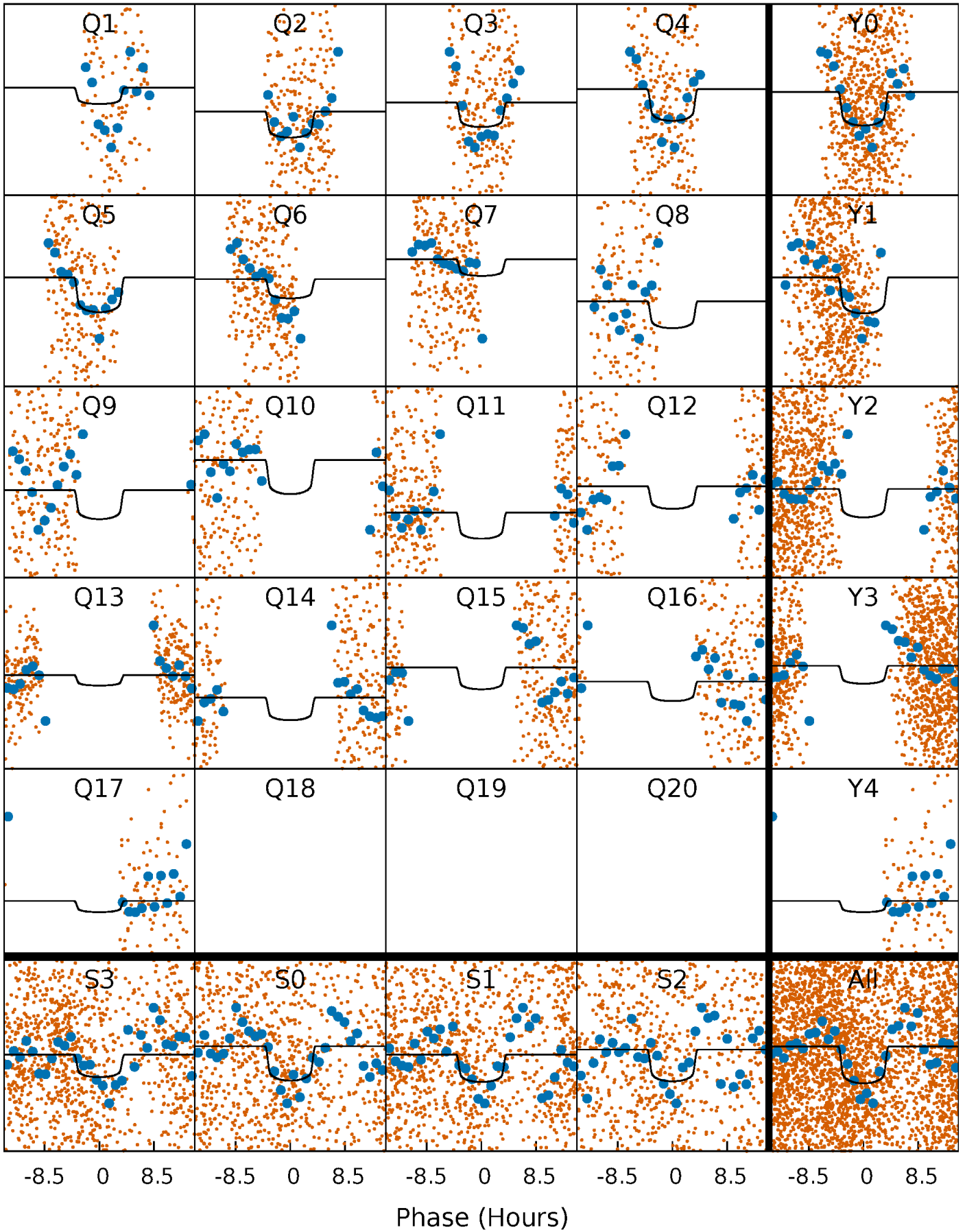
PDC Quarter-Phased Transit Curves

TCE 009716667-03 P= 3.525049 Days $T_0=132.017709$ (BKJD)



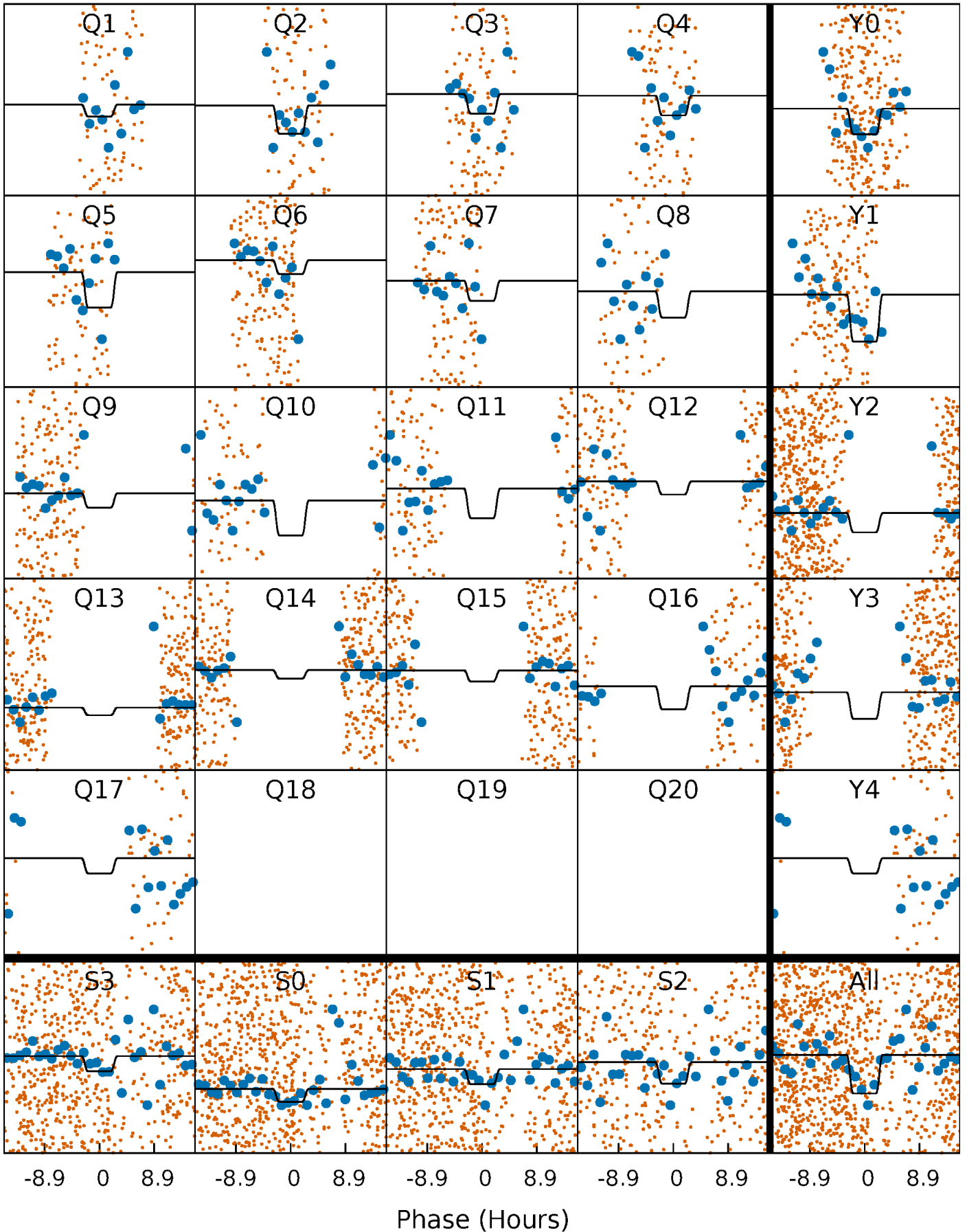
DV Quarter-Phased Transit Curves

TCE 009716667-03 P= 3.525049 Days $T_0=132.017709$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

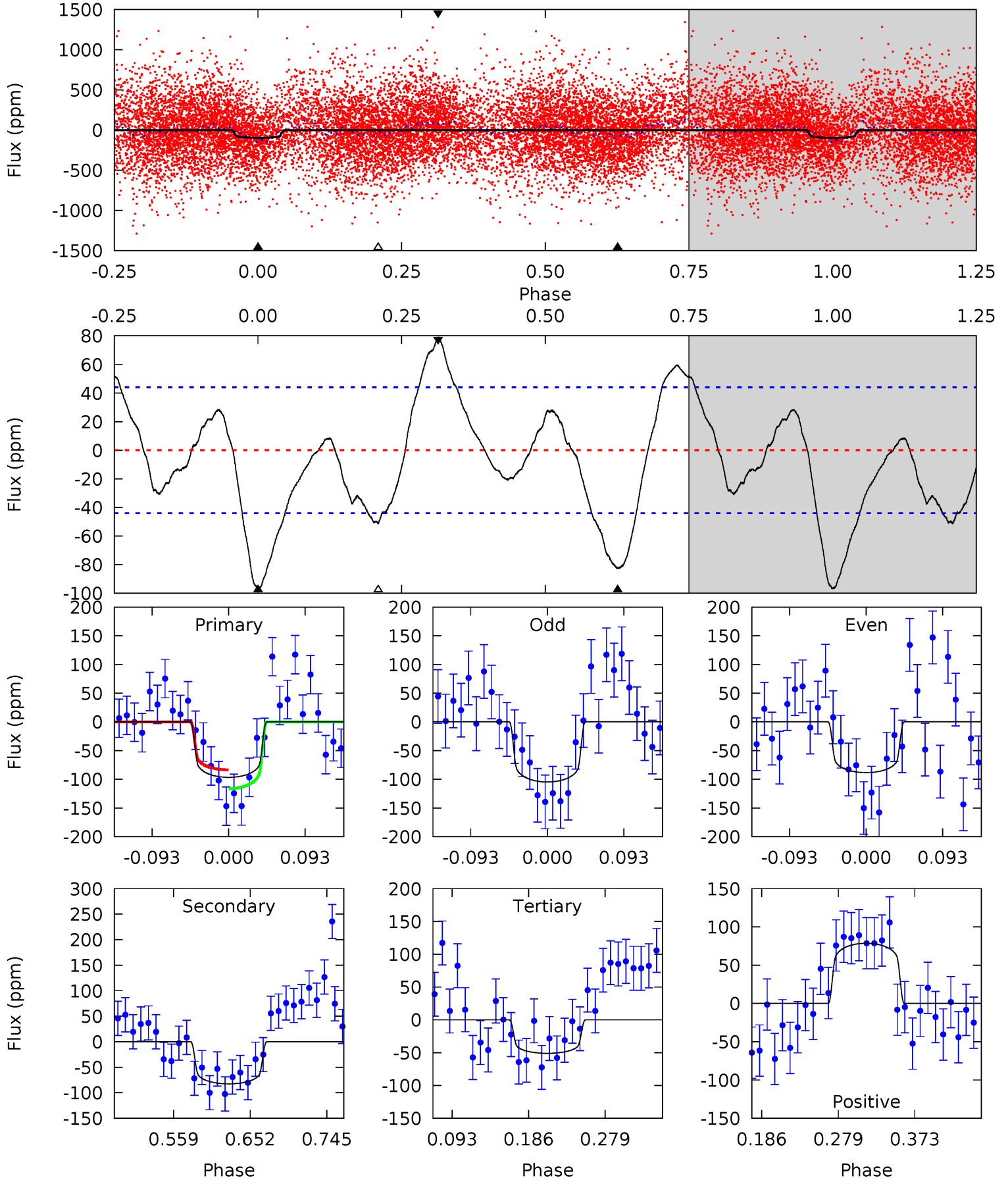
TCE 009716667-03 $P = 3.524830$ Days $T_0 = 132.042894$ (BKJD)



DV Model-Shift Uniqueness Test

009716667-03, P = 3.525049 Days, E = 128.492660 Days

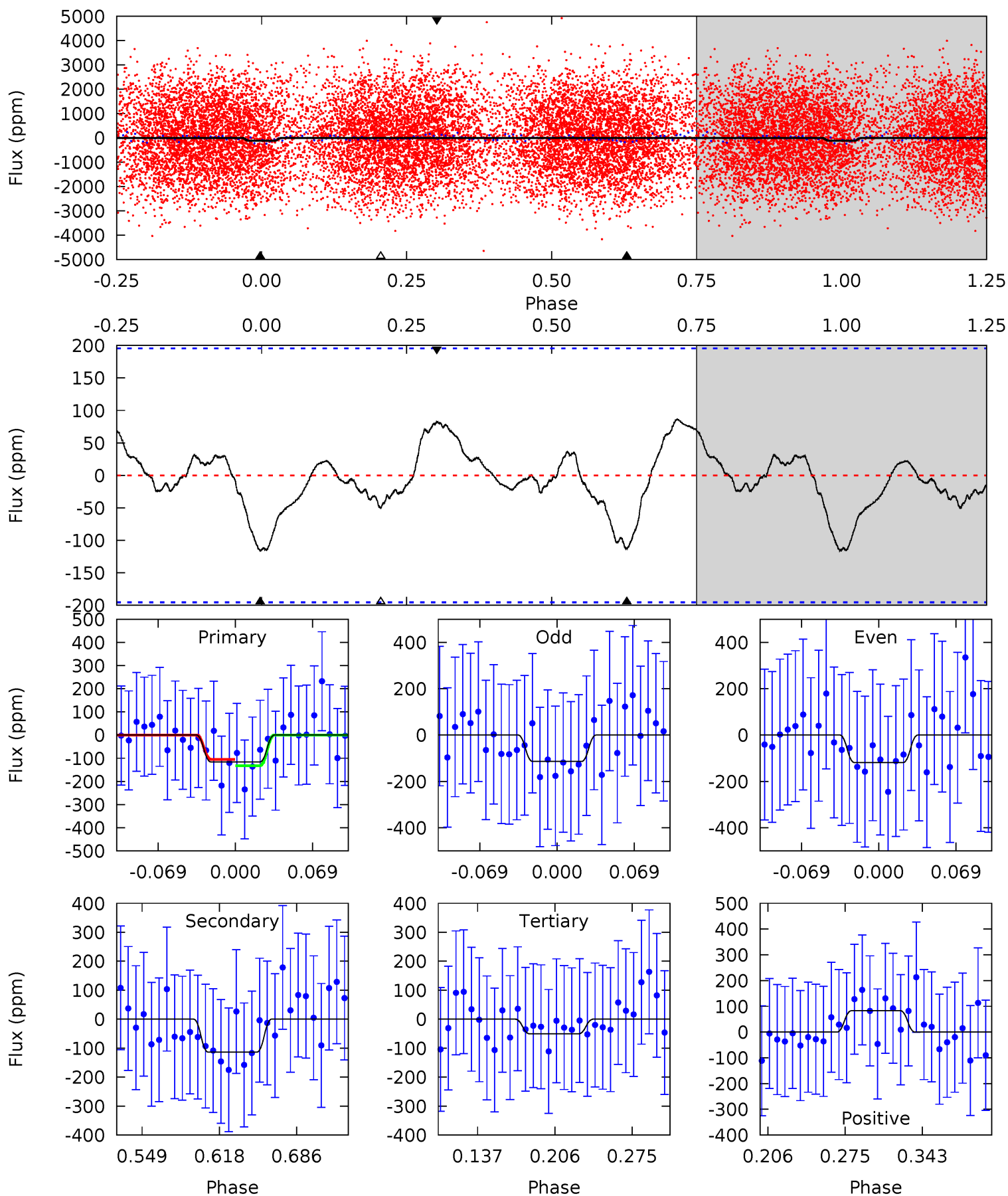
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	8.59	5.30	8.19	4.58	1.68	3.45	4.75	1.87	3.29	0.41	0.86	0.54	0.45	1.69



Alt Model-Shift Uniqueness Test

009716667-03, P = 3.524830 Days, E = 128.518064 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.76	2.69	1.20	1.97	4.64	1.82	0.80	1.56	0.79	1.49	0.72	0.05	0.86	0.43	0.32



Stellar Parameters For KIC 009716667

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7584^{+211}_{-316}	$4.103^{+0.135}_{-0.165}$	$0.070^{+0.200}_{-0.350}$	$1.921^{+0.549}_{-0.366}$	$1.705^{+0.204}_{-0.272}$	$0.339^{+0.230}_{-0.159}$
	+3%/-4%	+3%/-4%	+286%/-500%	+29%/-19%	+12%/-16%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009716667-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-83 ± 10	$2.10^{+0.68}_{-0.55}$	2784^{+201}_{-190}	7089^{+1375}_{-904}	29^{+25}_{-13}
Alt.	-113 ± 42	$2.47^{+0.66}_{-0.62}$	2791^{+177}_{-180}	7056^{+1446}_{-1071}	28^{+25}_{-14}

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

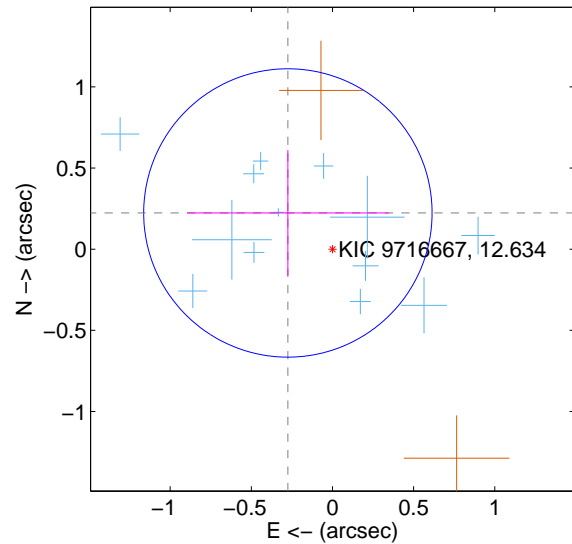
Supplemental centroid analysis for 009716667-03. Kepler magnitude: 12.63. Transit SNR 8.74

There are 13 quarters with good PRF difference image offsets

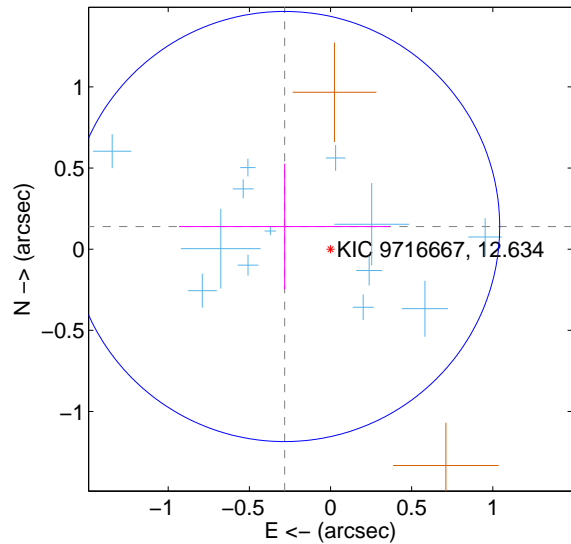
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.354 ± 0.296	1.20	0.275 ± 0.621	0.223 ± 0.387
PRF-fit source offset from KIC position	0.316 ± 0.442	0.71	0.283 ± 0.651	0.140 ± 0.387
photometric centroid source offset	0.29 ± 0.15	1.96	-0.26 ± 0.14	-0.14 ± 0.16

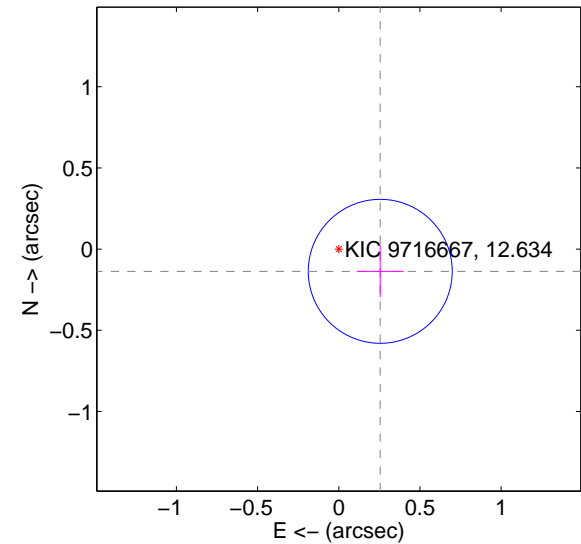
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

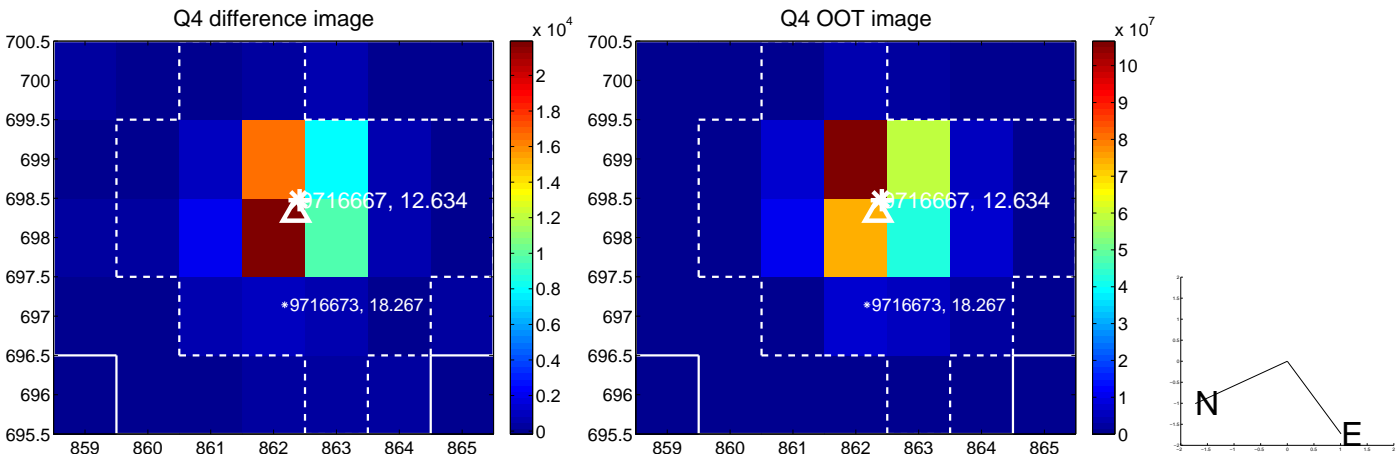
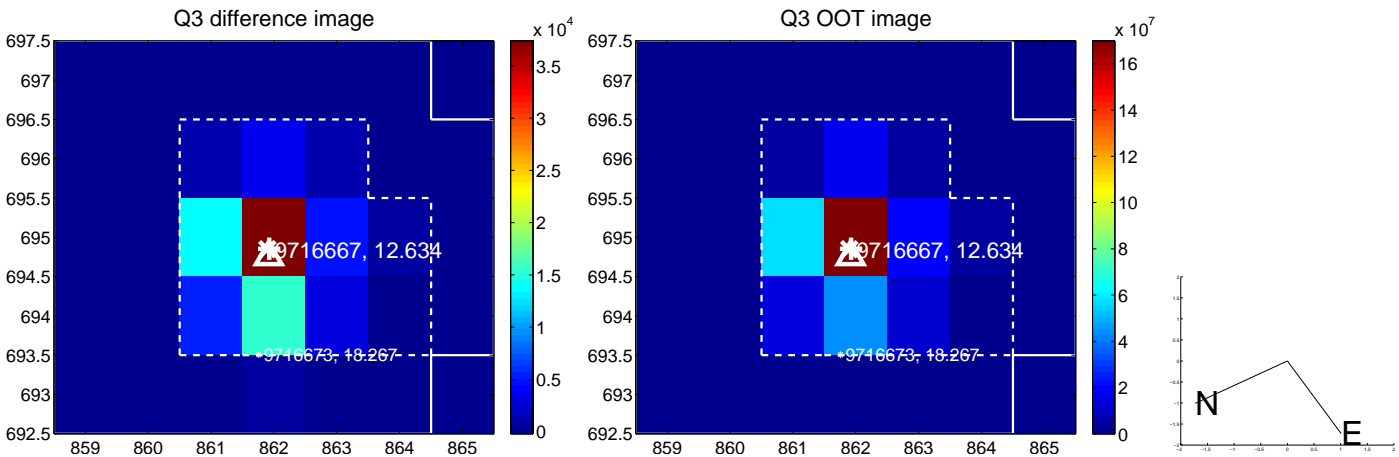
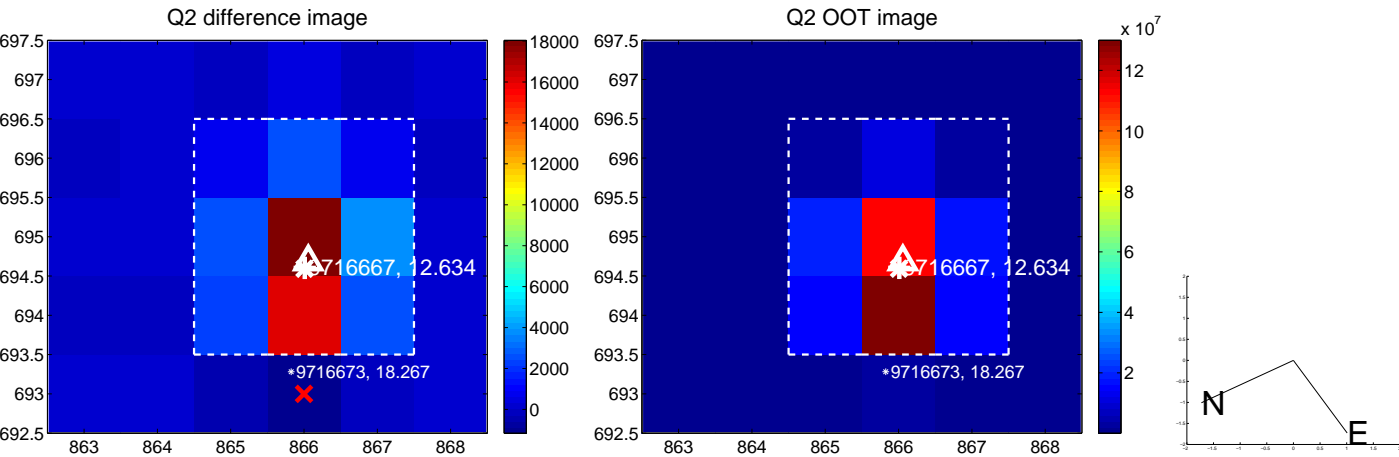
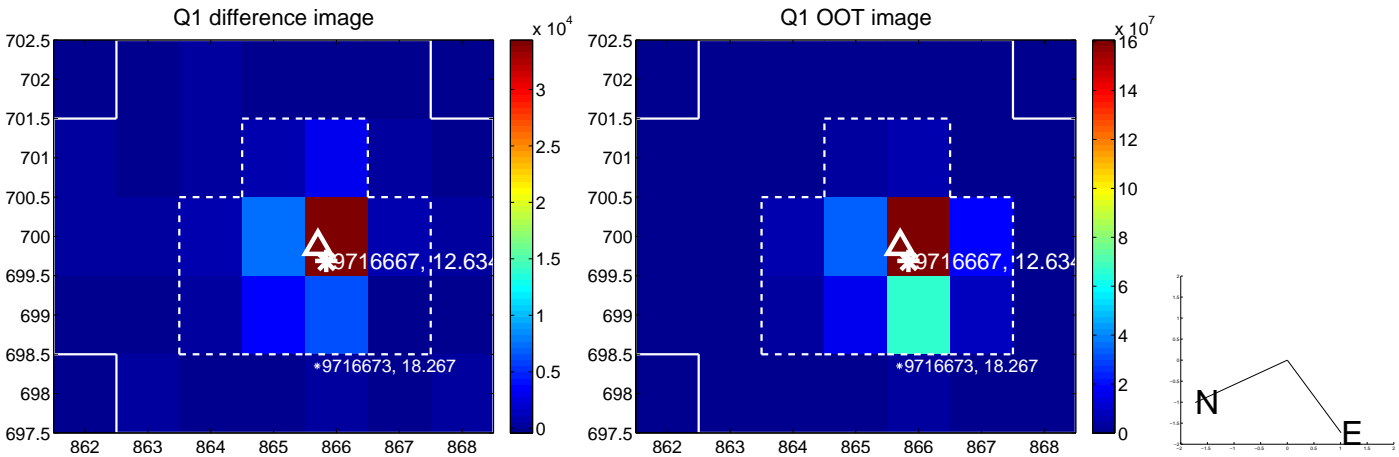


offset from photometric centroids

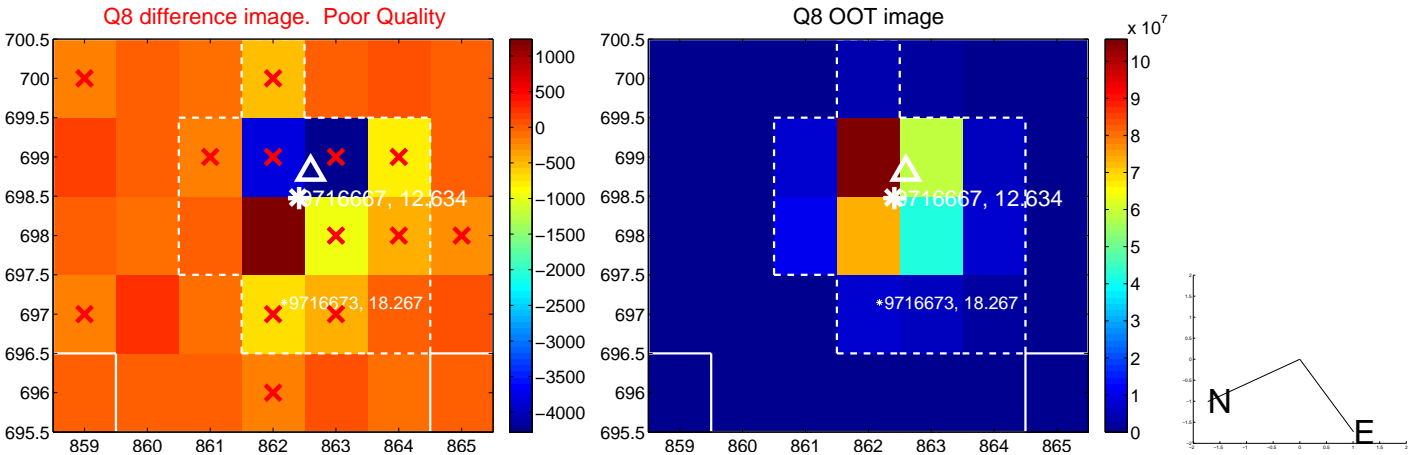
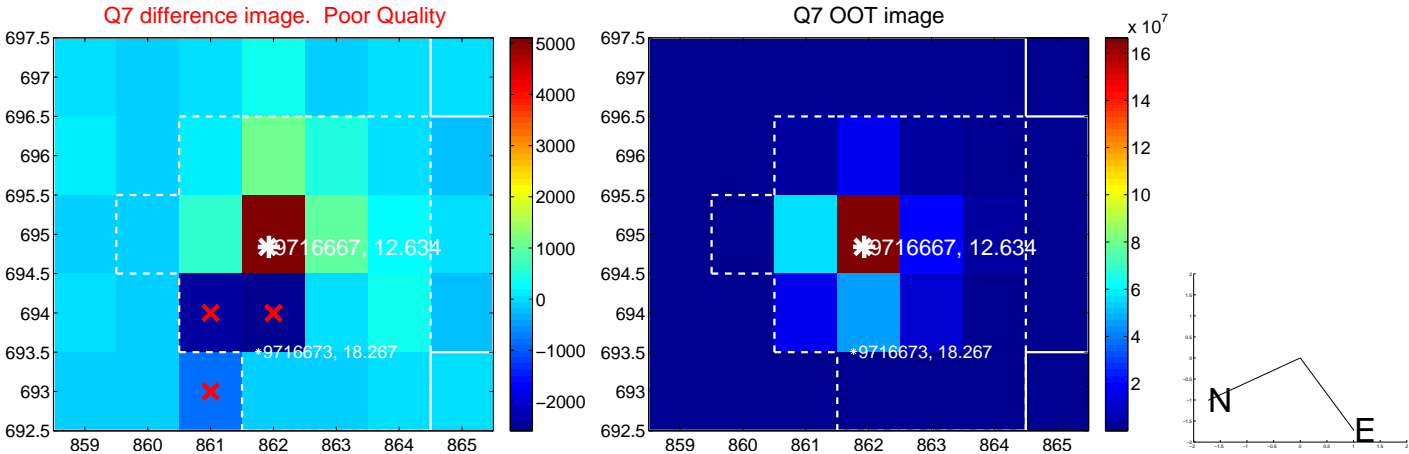
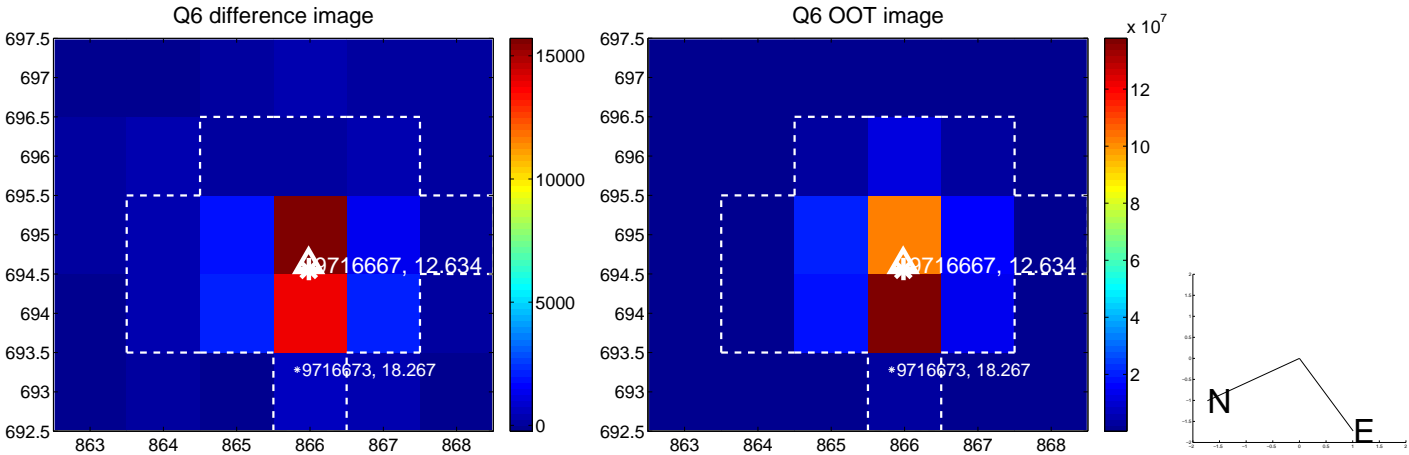
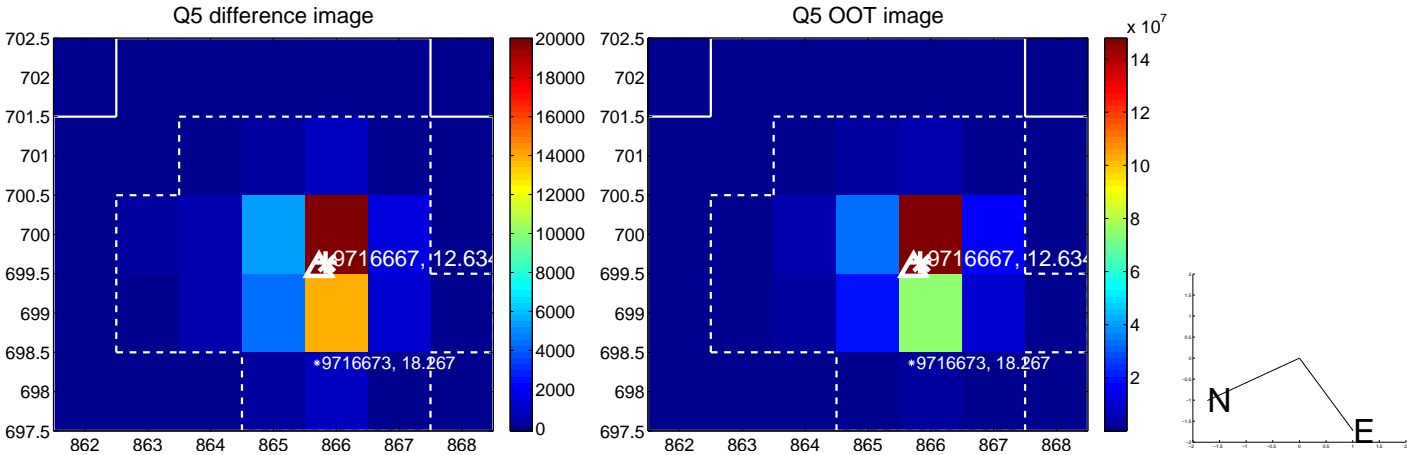


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

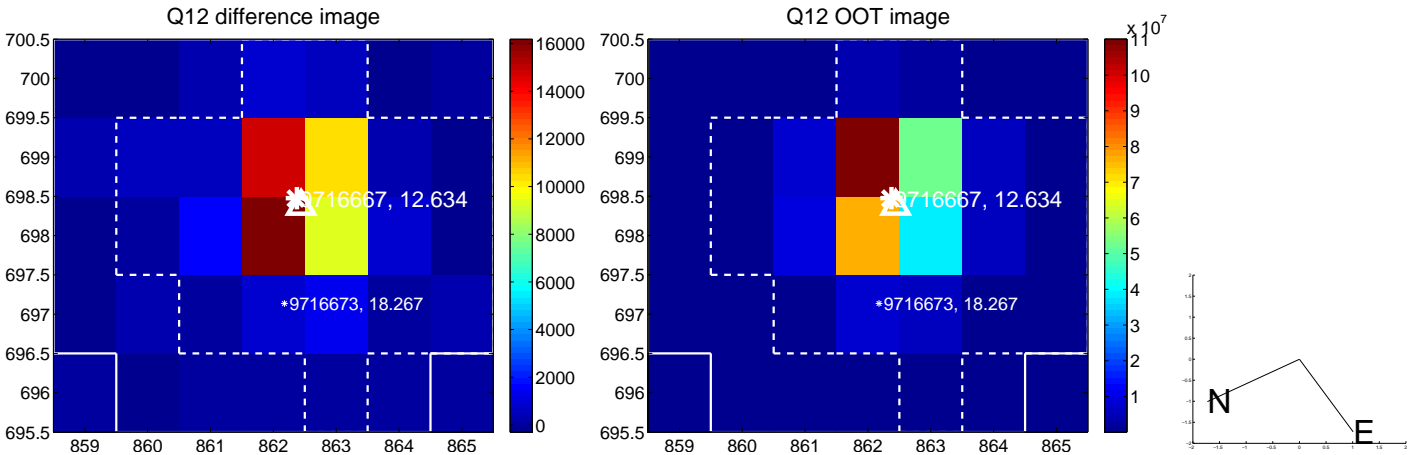
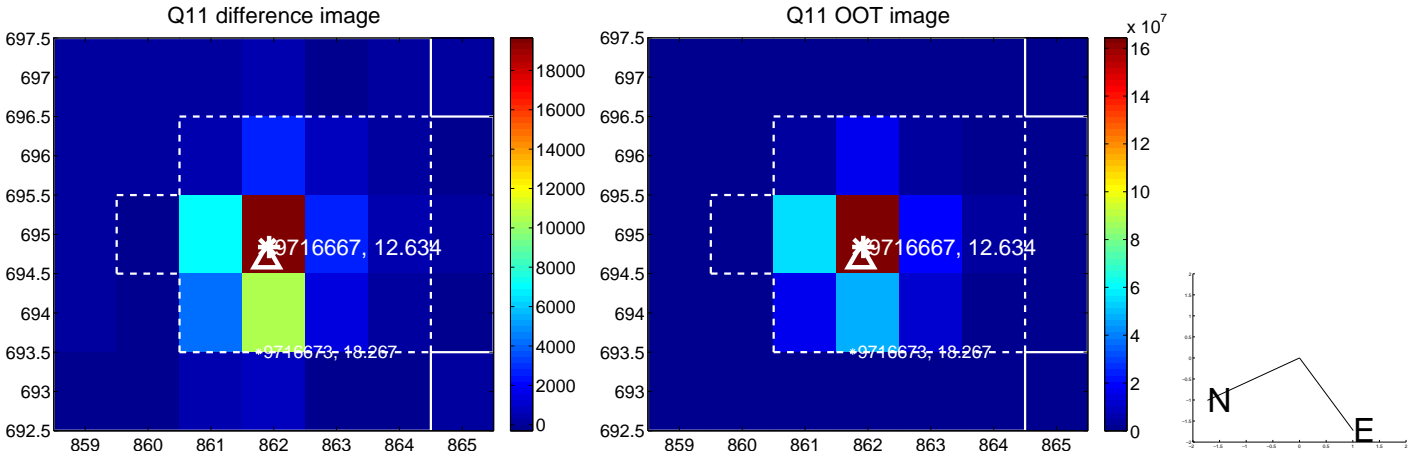
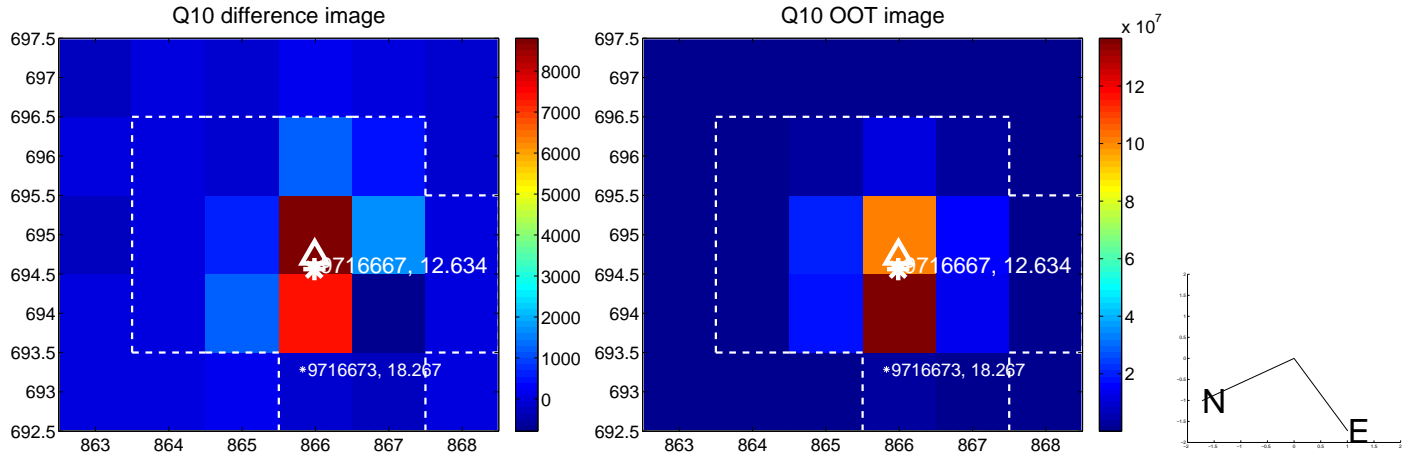
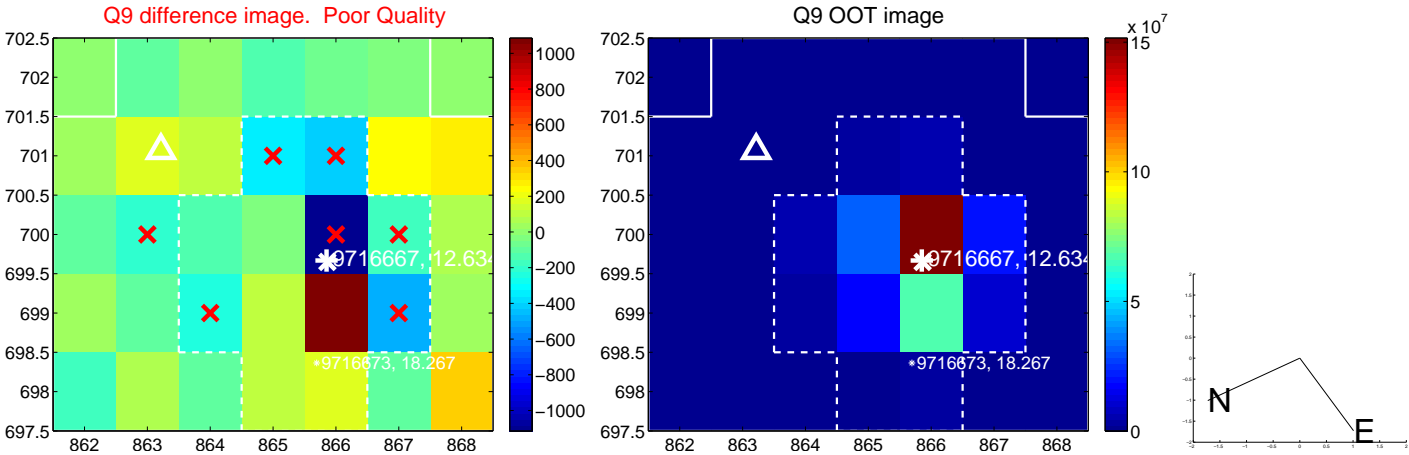
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



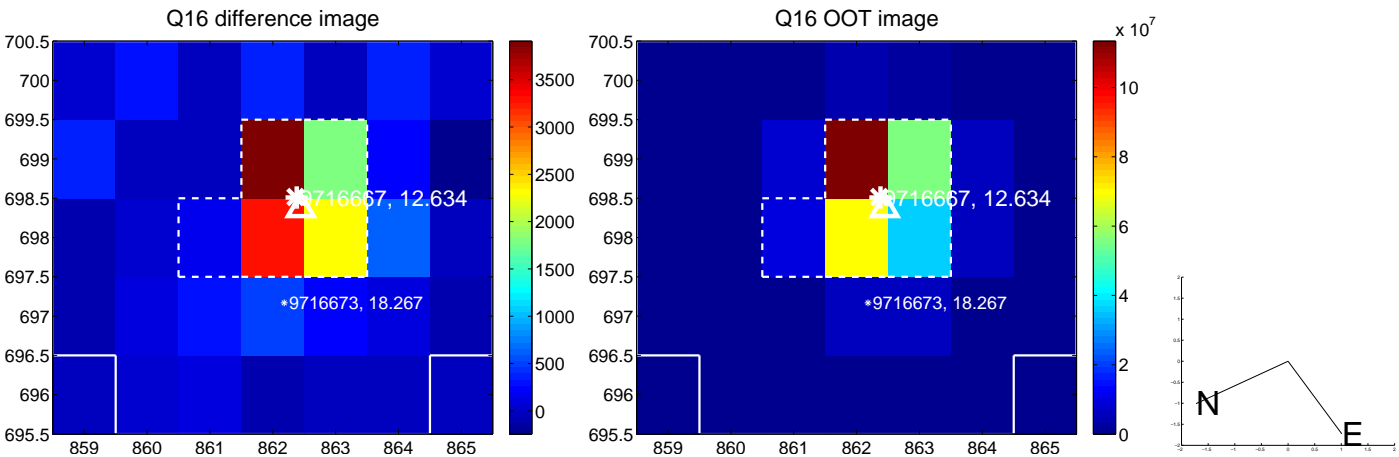
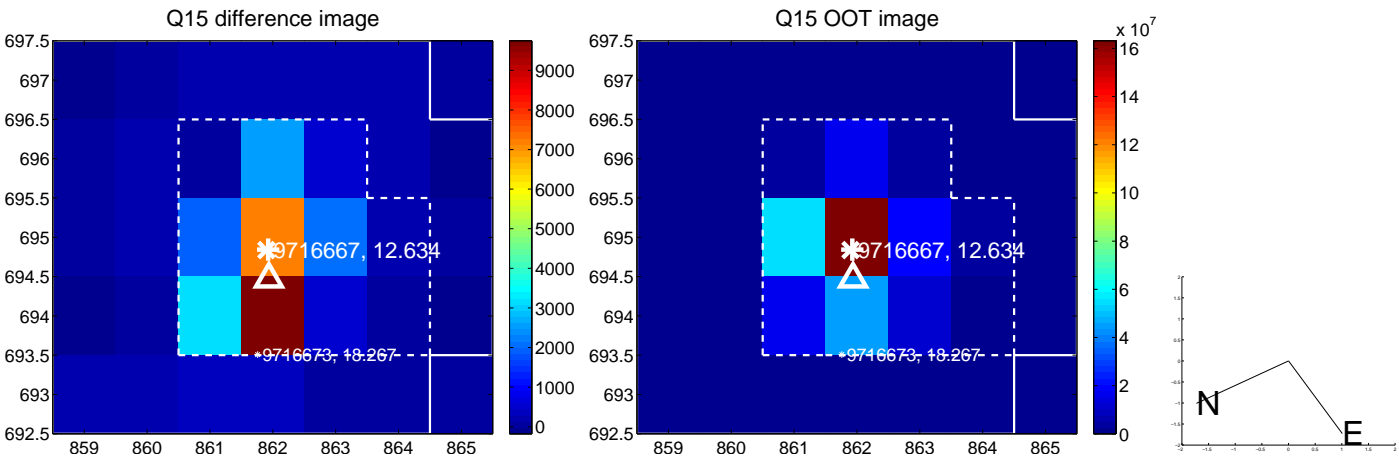
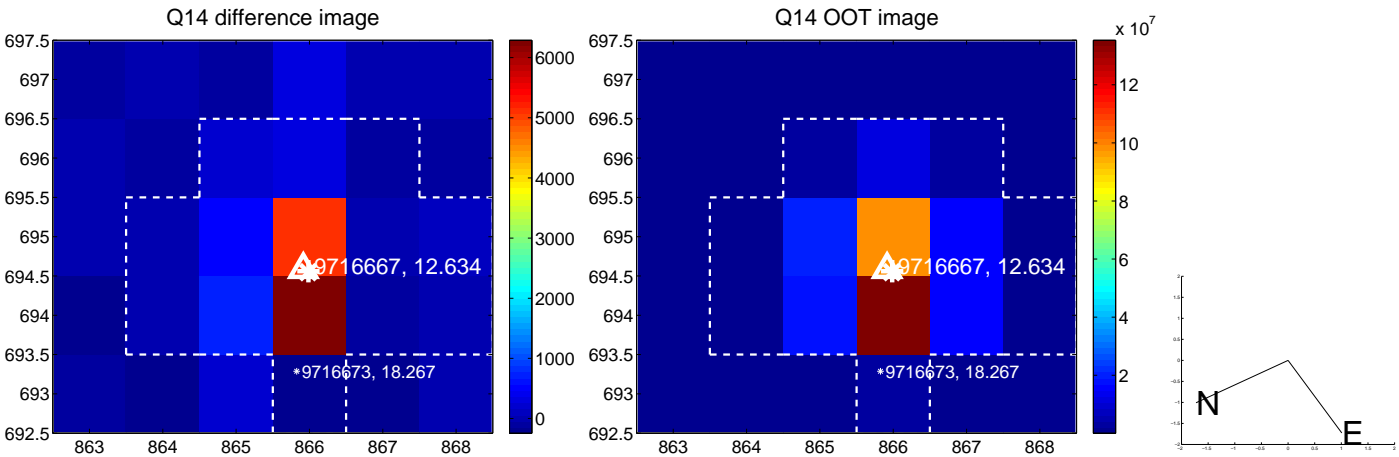
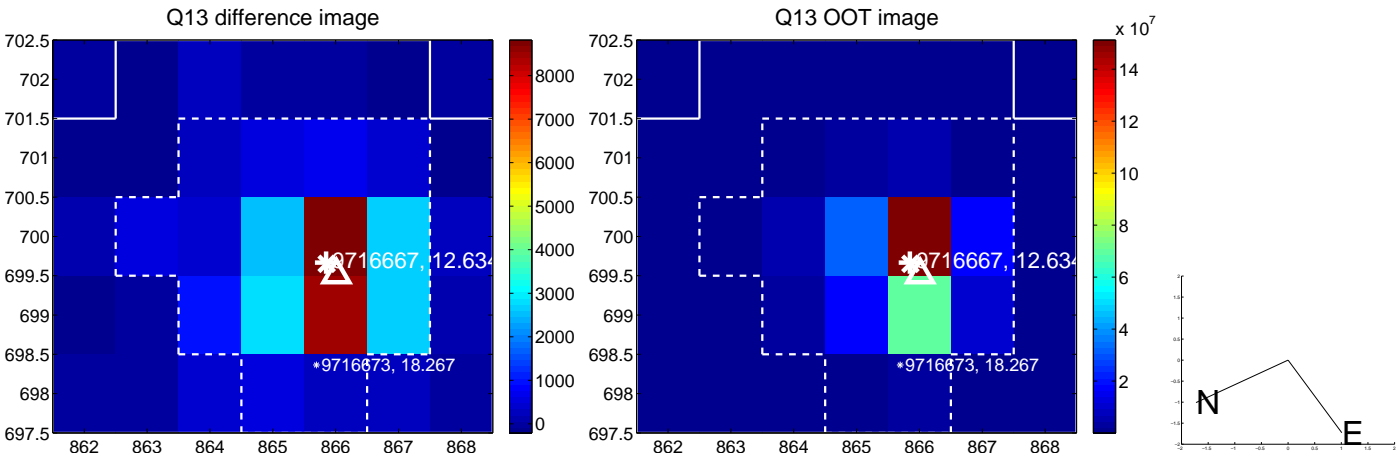
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



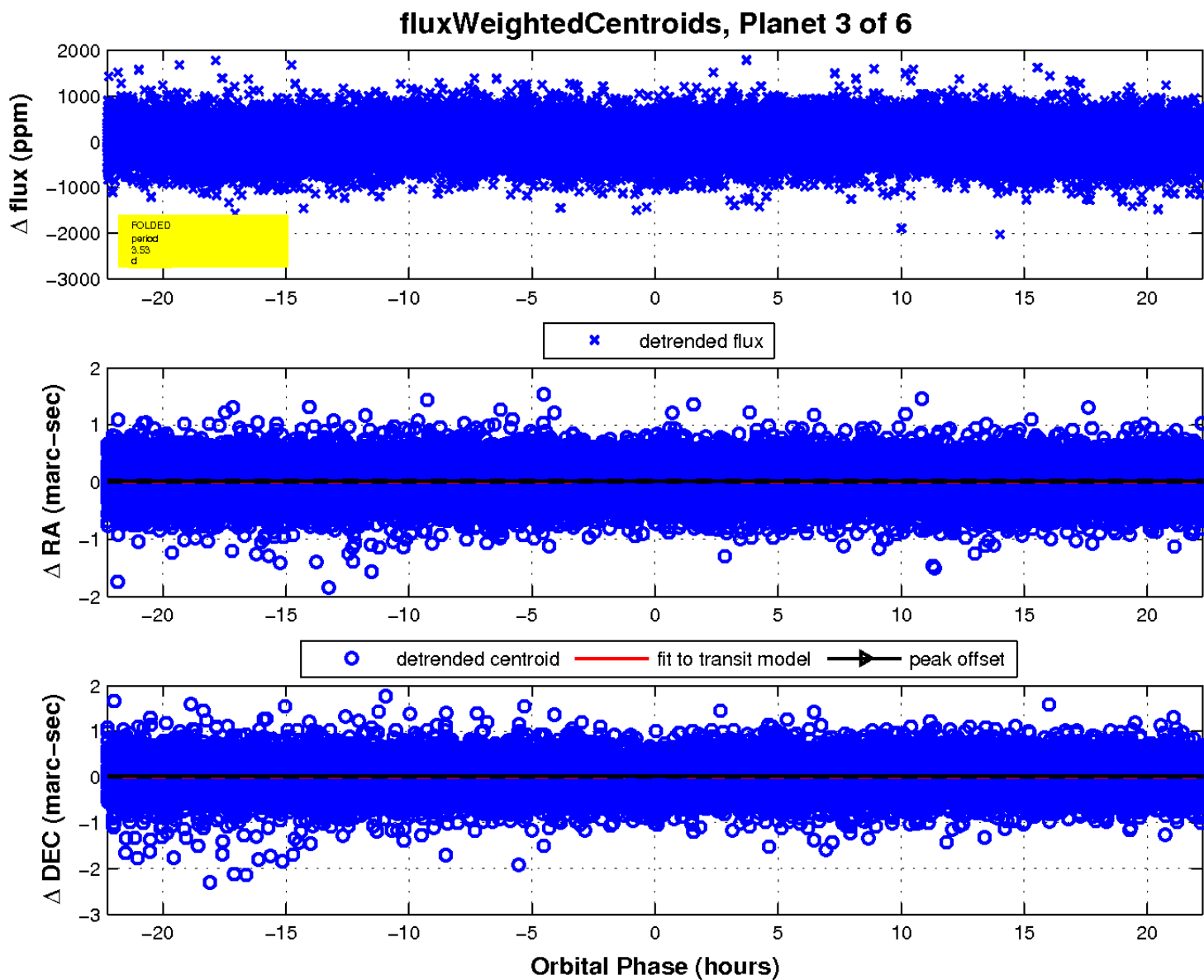
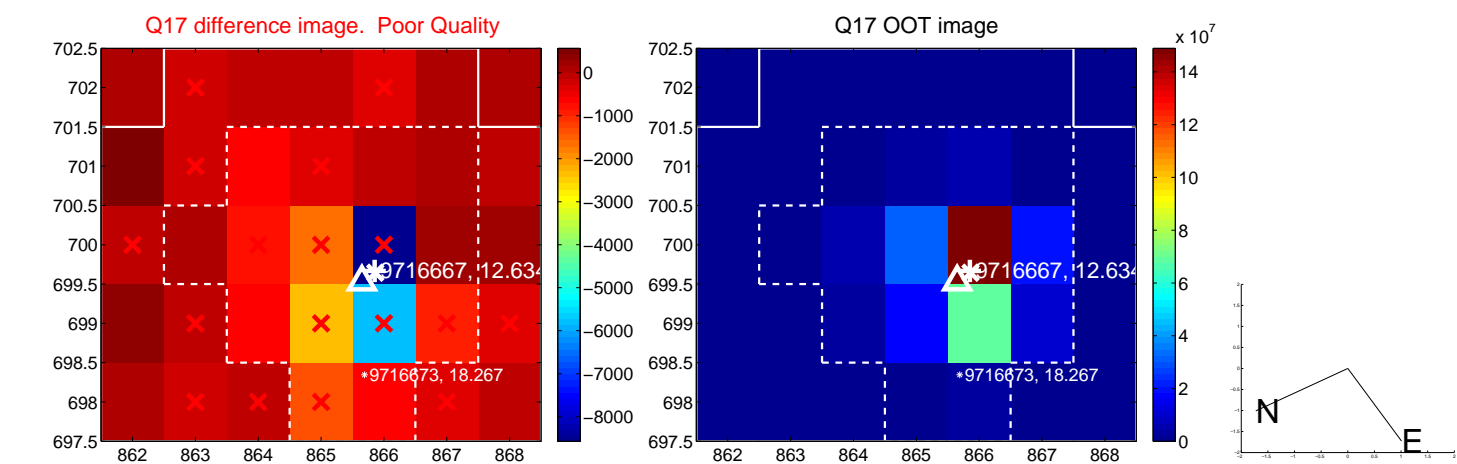
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

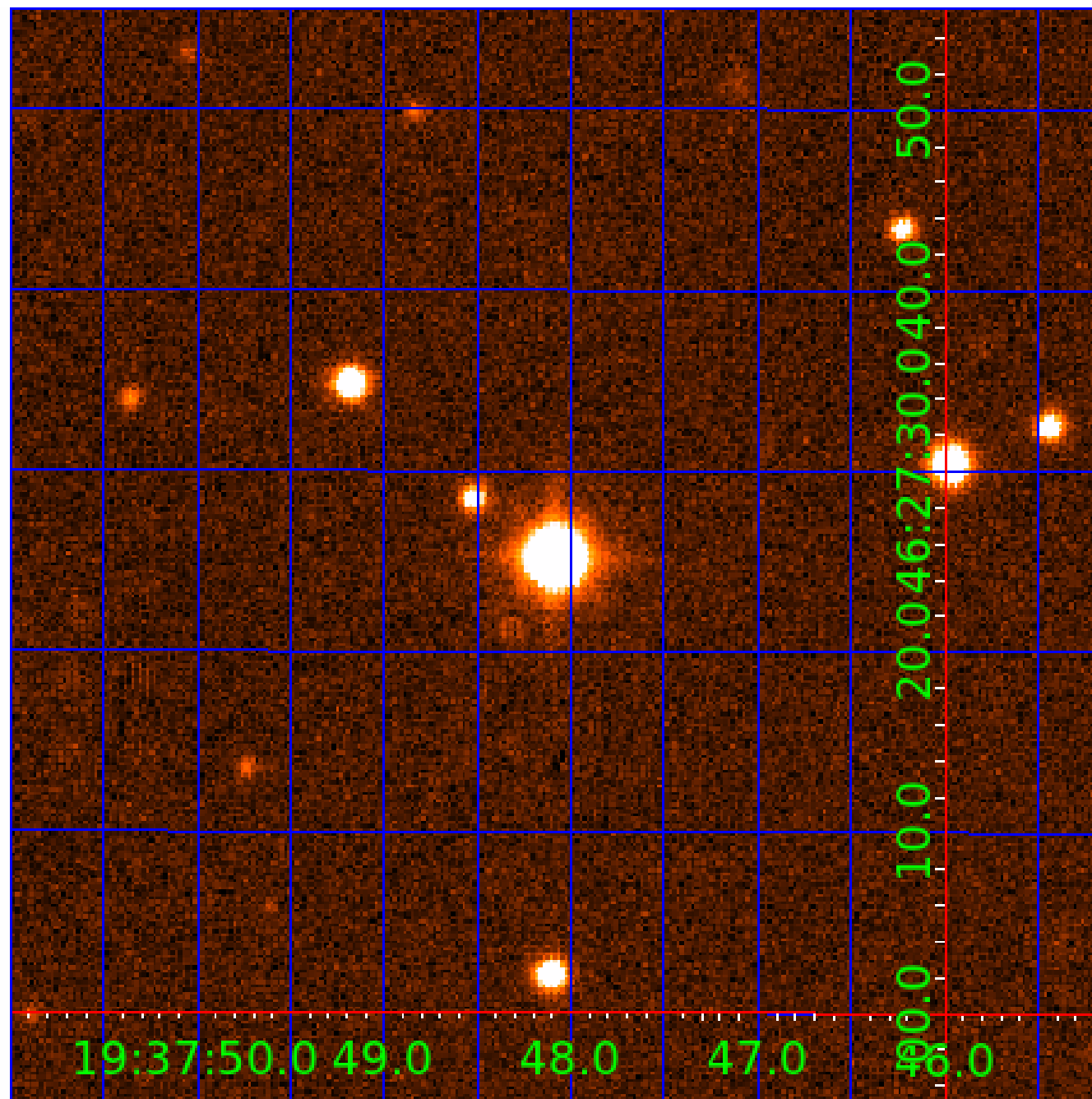


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009716667

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})
009716667-01	OBS	No	0.793406	131.591484	34.3	2.436	9.6	7.9	1.92	7584	1.30	27217.33
009716667-02	OBS	No	1.174248	131.548562	58.4	5.790	10.1	10.9	1.92	7584	1.49	16137.12
009716667-03	OBS	No	3.525049	132.017709	91.4	7.418	8.5	8.7	1.92	7584	2.12	3726.37
009716667-04	OBS	No	139.688601	175.683971	494.9	3.501	8.4	7.4	1.92	7584	4.62	27.58
009716667-05	OBS	No	113.619424	138.786926	485.9	3.924	8.1	8.9	1.92	7584	4.52	36.33
009716667-06	OBS	No	49.159354	139.221257	134.2	3.500	7.3	-1.0	1.92	7584	2.26	111.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716667-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009716667-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009716667-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
009716667-04	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
009716667-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
009716667-06	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_NOFITS

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

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

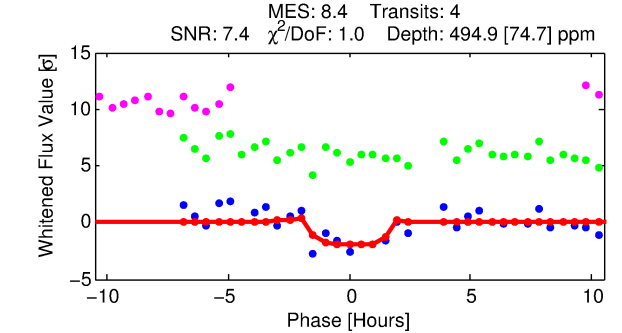
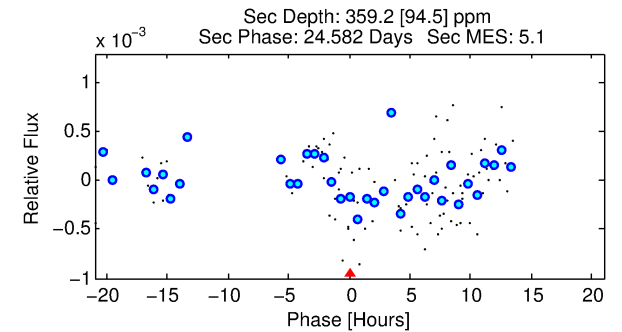
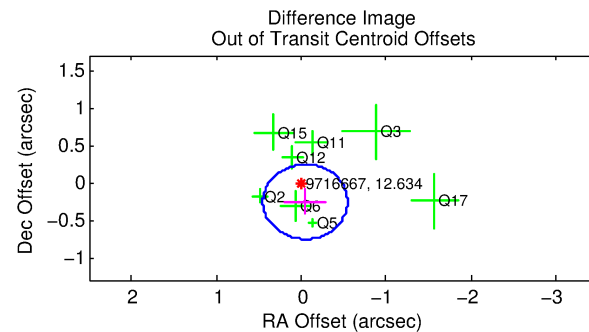
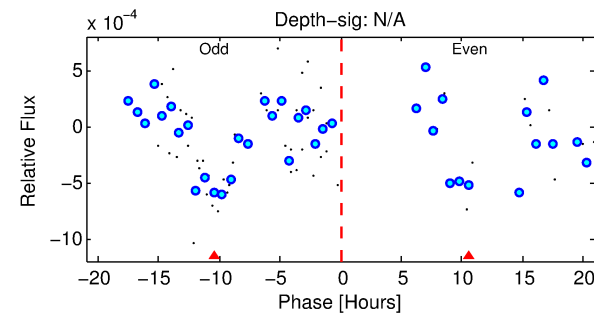
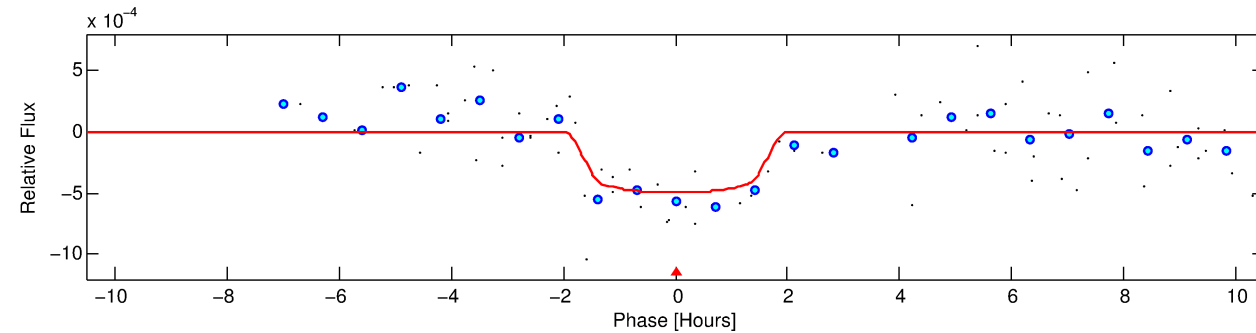
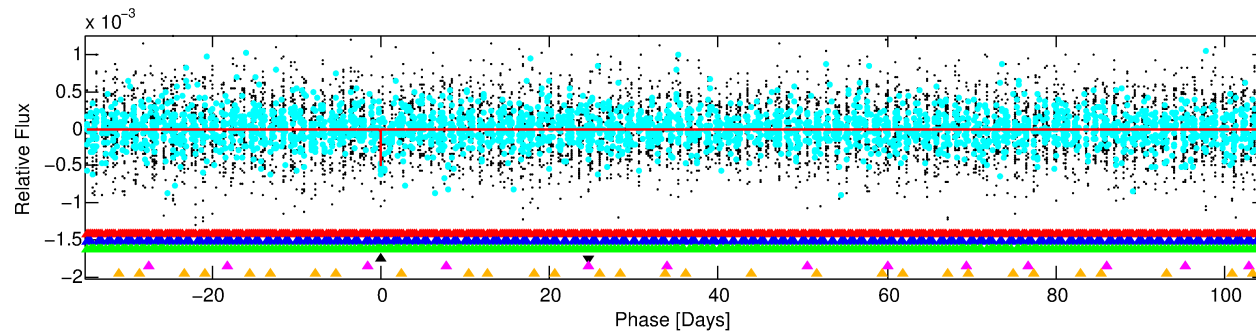
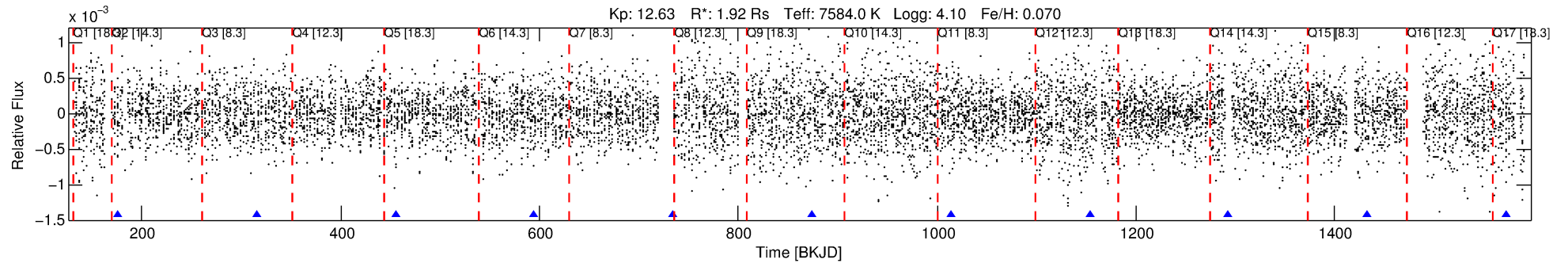
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716667-04

No Significant Match Found

DV One-Page Summary

KIC: 9716667 Candidate: 4 of 6 Period: 139.689 d



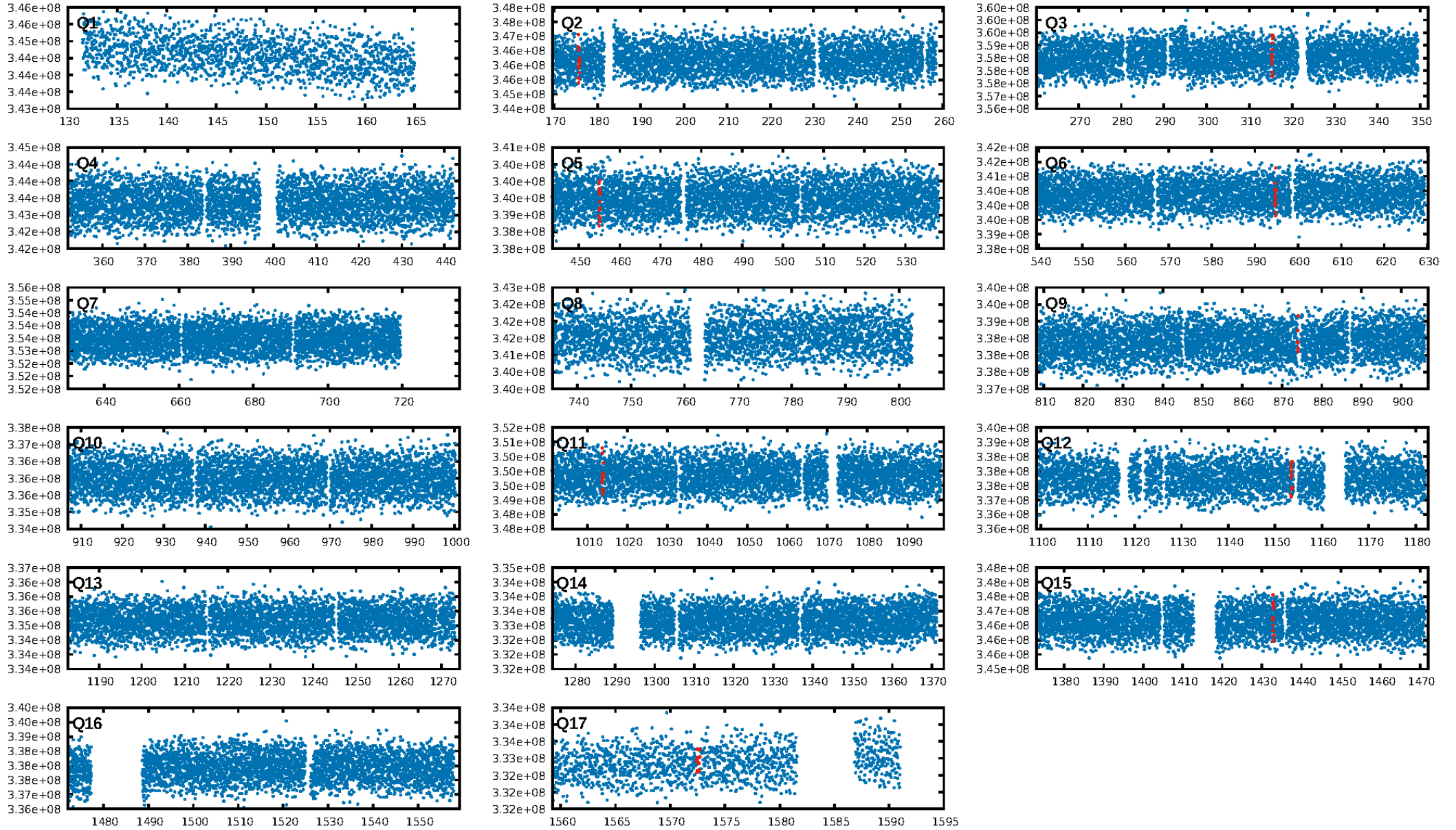
DV Fit Results:

Period = 139.68860 [0.00391] d
Epoch = 175.6840 [0.0072] BKJD
Rp/R* = 0.0220 [0.0227]
a/R* = 216.55 [1395.17]
b = 0.73 [4.08]
Seff = 27.58 [9.88]
Teq = 584 [52] K
Rp = 4.62 [4.94] Re
a = 0.6297 [0.1441] AU
Ag = 3670.86 [7706.13] [0.48σ]
Teff = 7033 [3660] K [1.76σ]

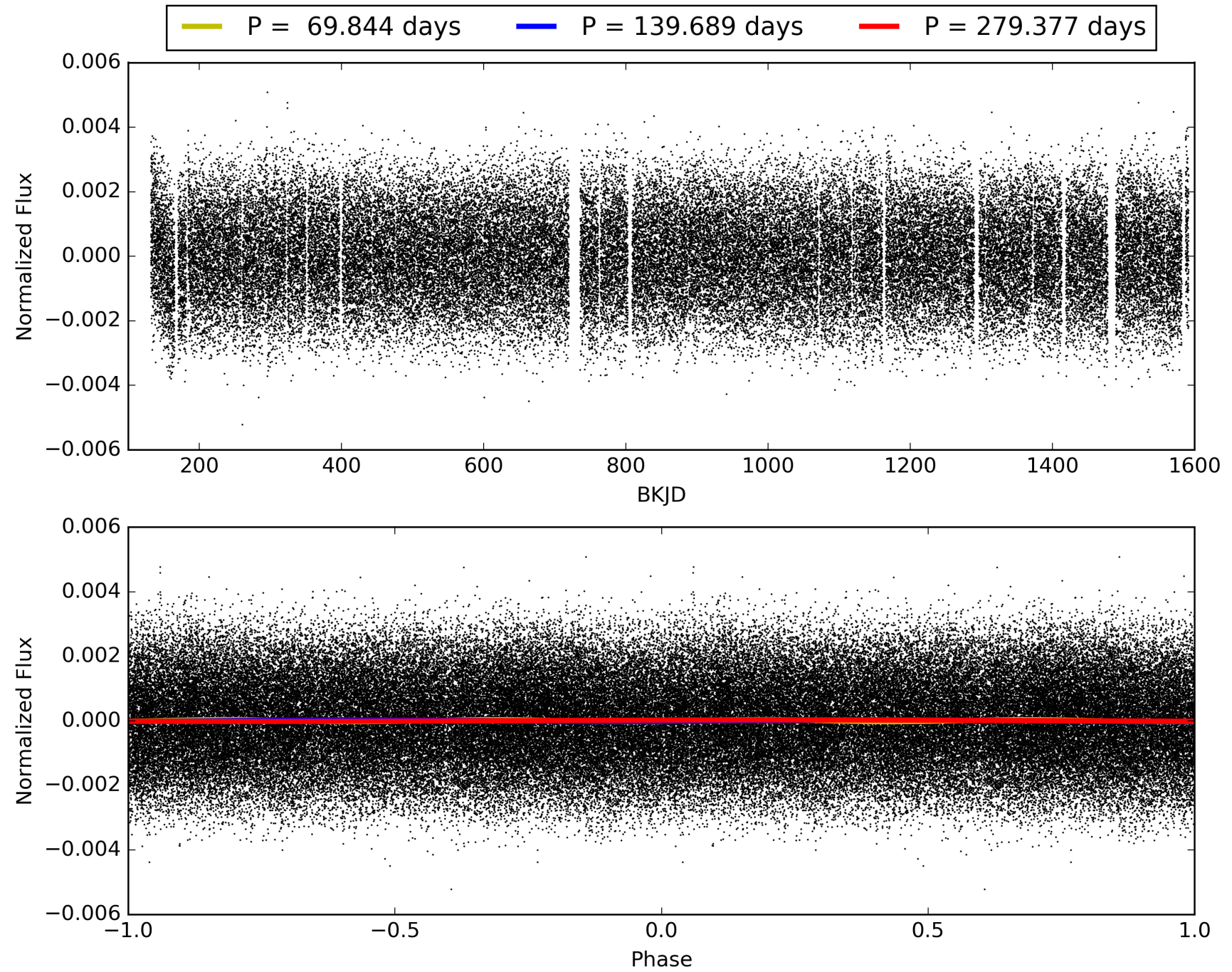
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [118.98σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 65.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -3.064
Centroid-sig: 4.9%
Centroid-so: 0.398 arcsec [1.45σ]
OotOffset-rm: 0.261 arcsec [1.57σ]
OotOffset-st: 2/3/1/2 [8]
KicOffset-rm: 0.276 arcsec [1.57σ]
KicOffset-st: 2/3/1/2 [8]
DiffImageQuality-fgm: 0.75 [6/8]
DiffImageOverlap-fno: 0.00 [0/8]

TCE 009716667-04, PDC Light Curves

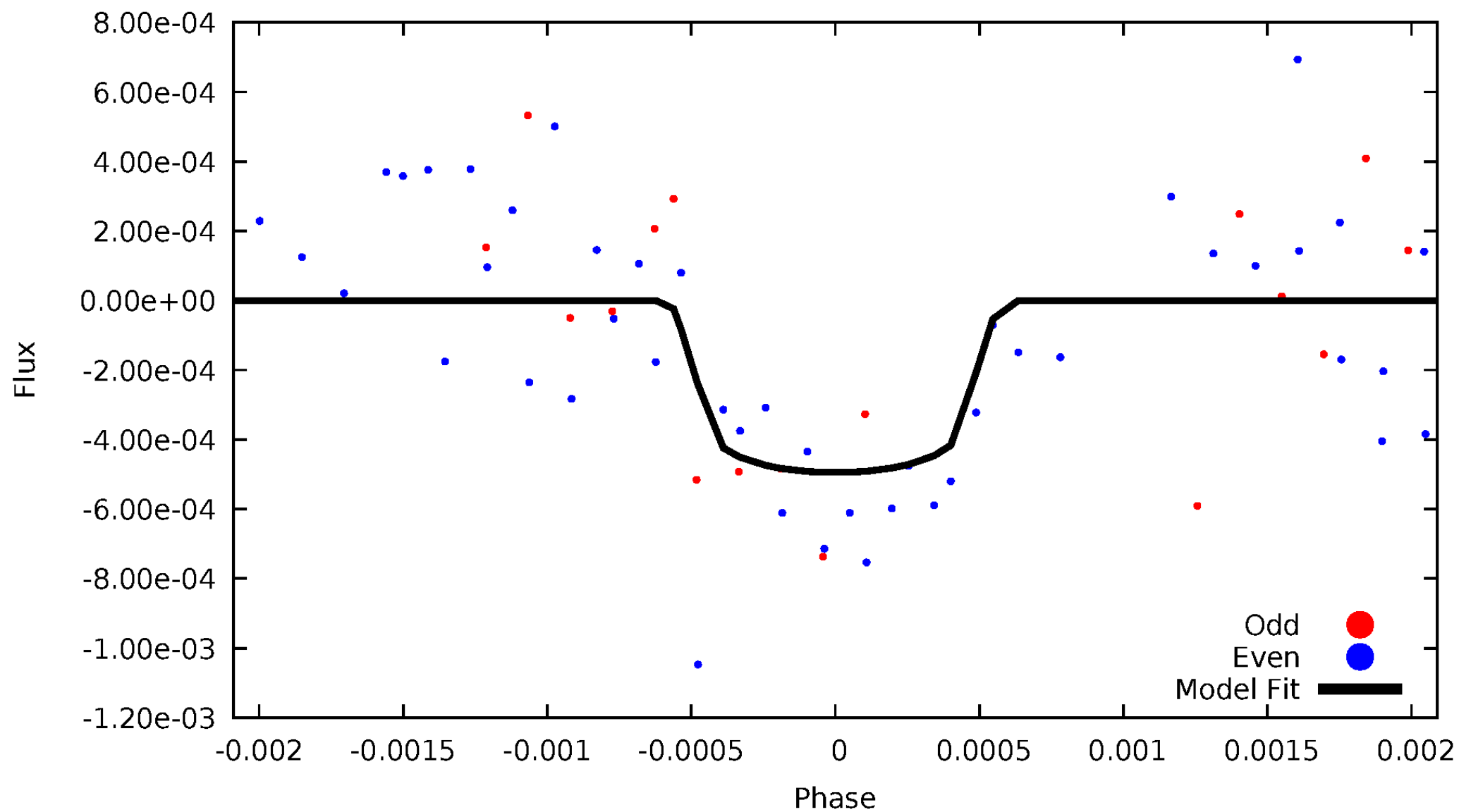


TCE 009716667-04



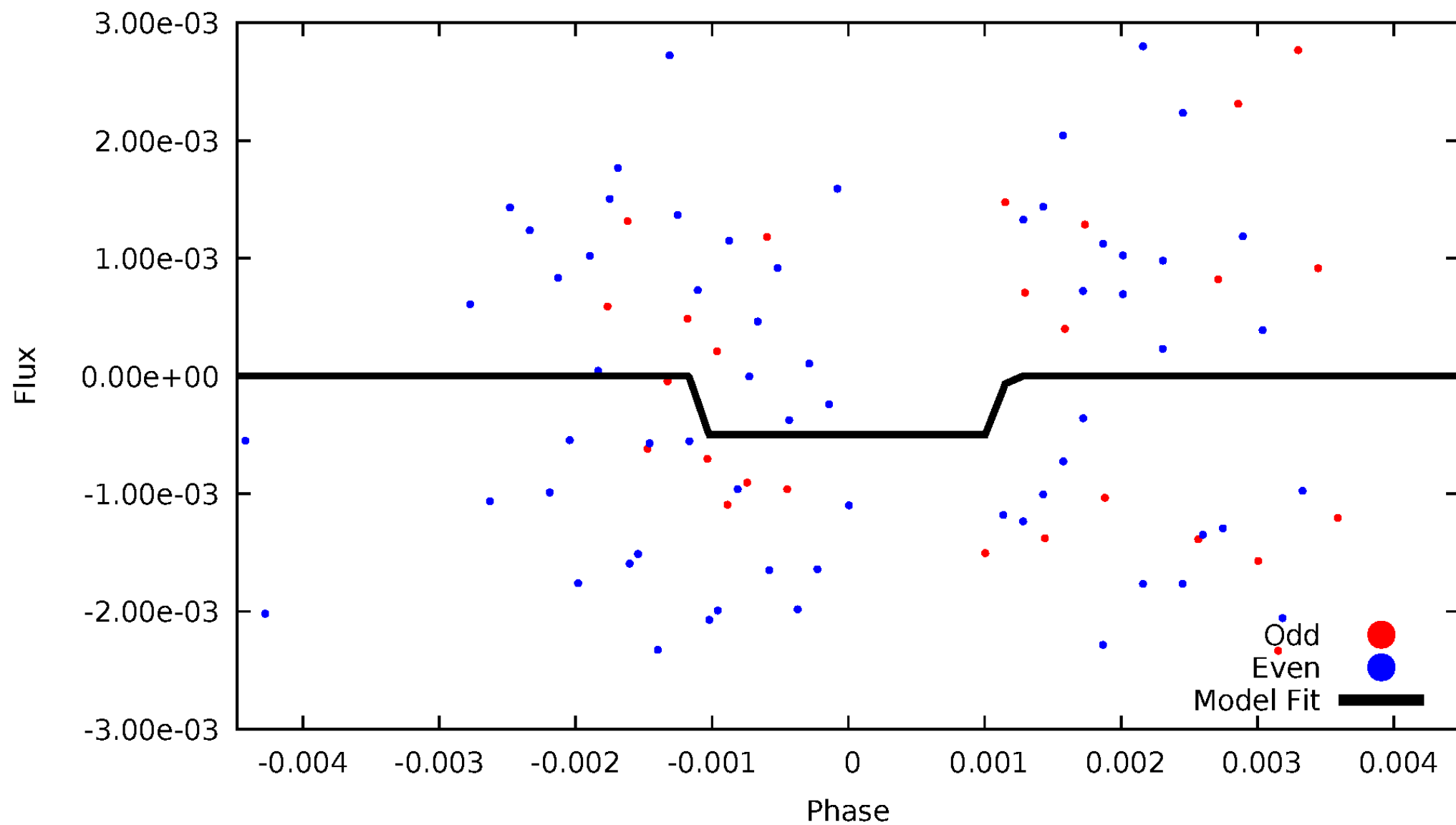
DV Odd/Even

TCE 009716667-04



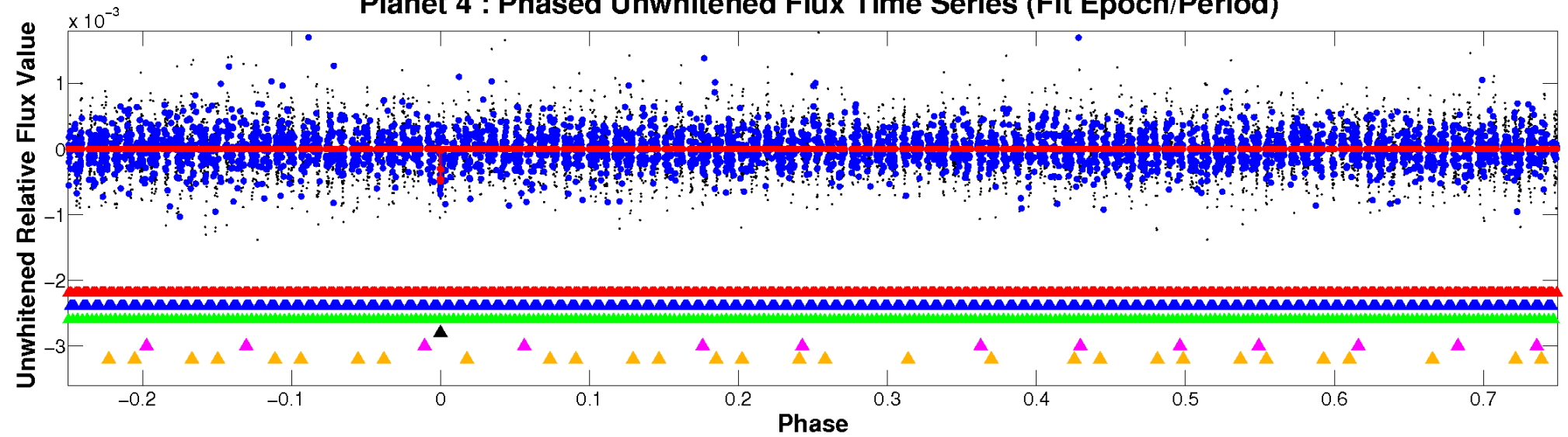
ALT Odd/Even

TCE 009716667-04

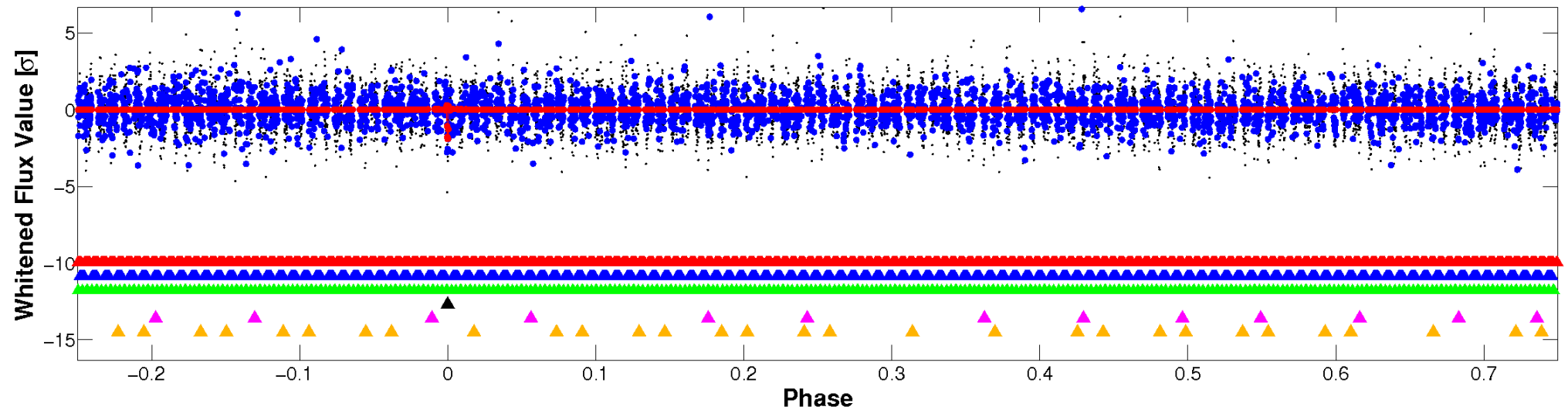


Non-Whitened Vs. Whitened Light Curve

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

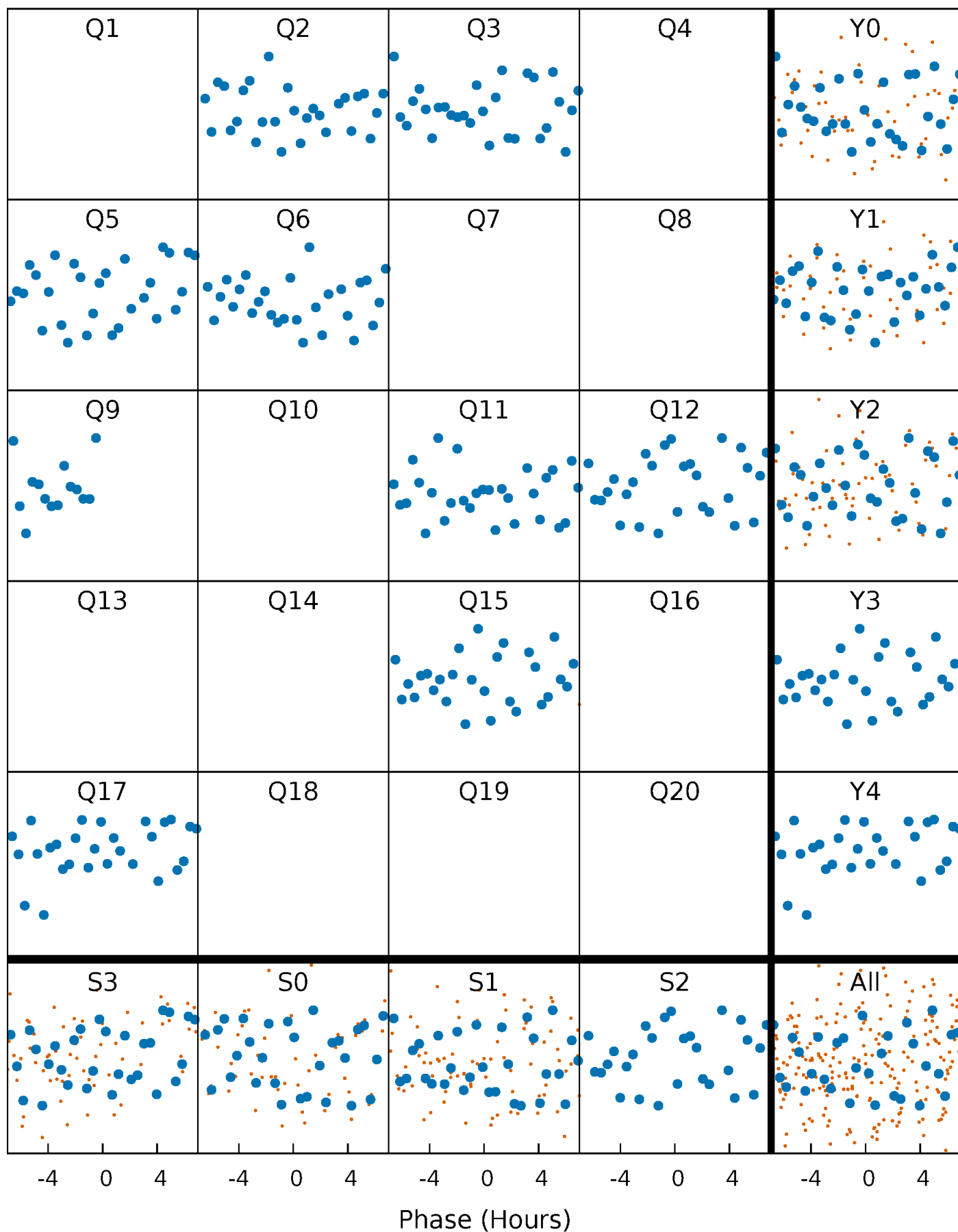


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



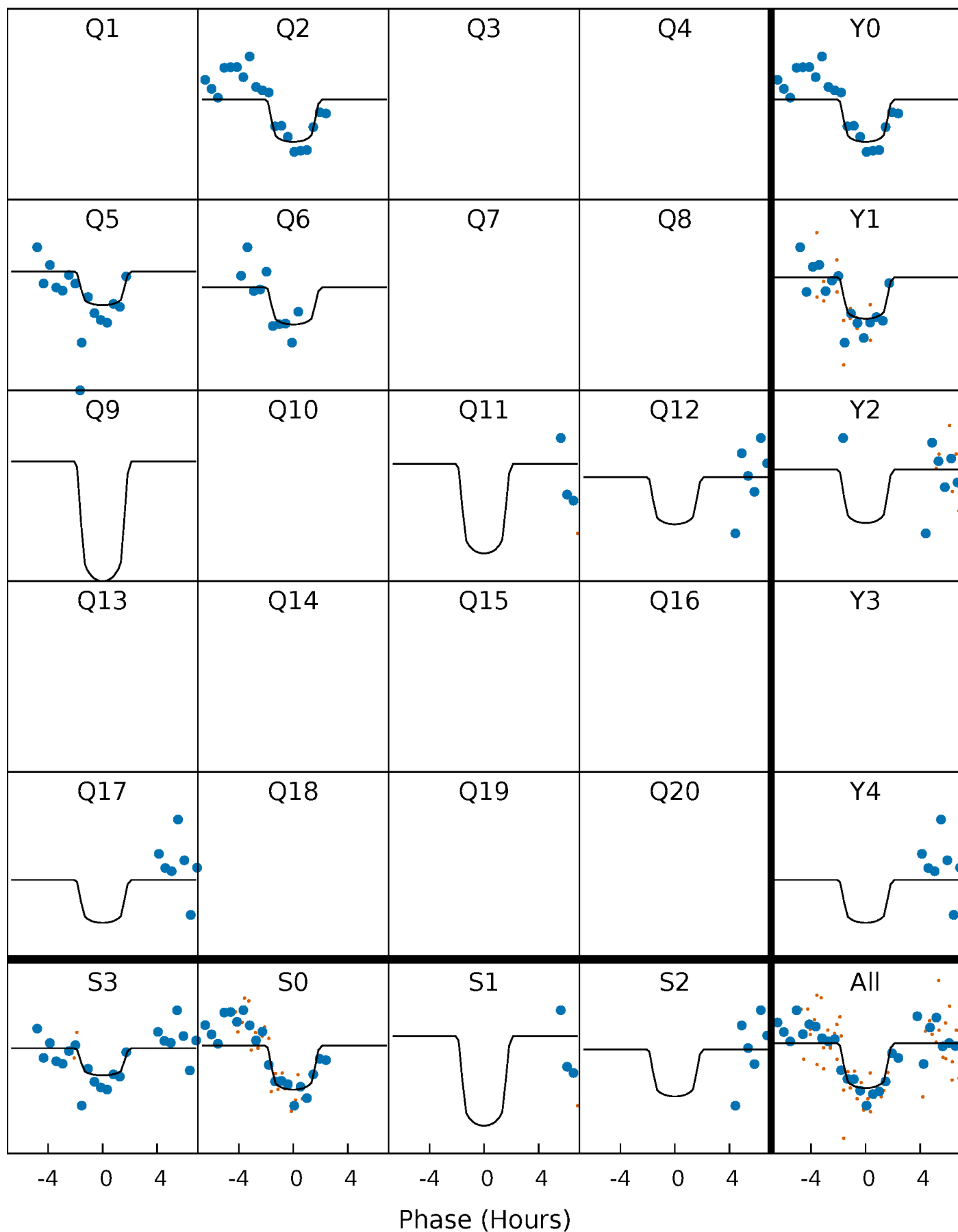
PDC Quarter-Phased Transit Curves

TCE 009716667-04 P=139.688601 Days $T_0=175.683971$ (BKJD)



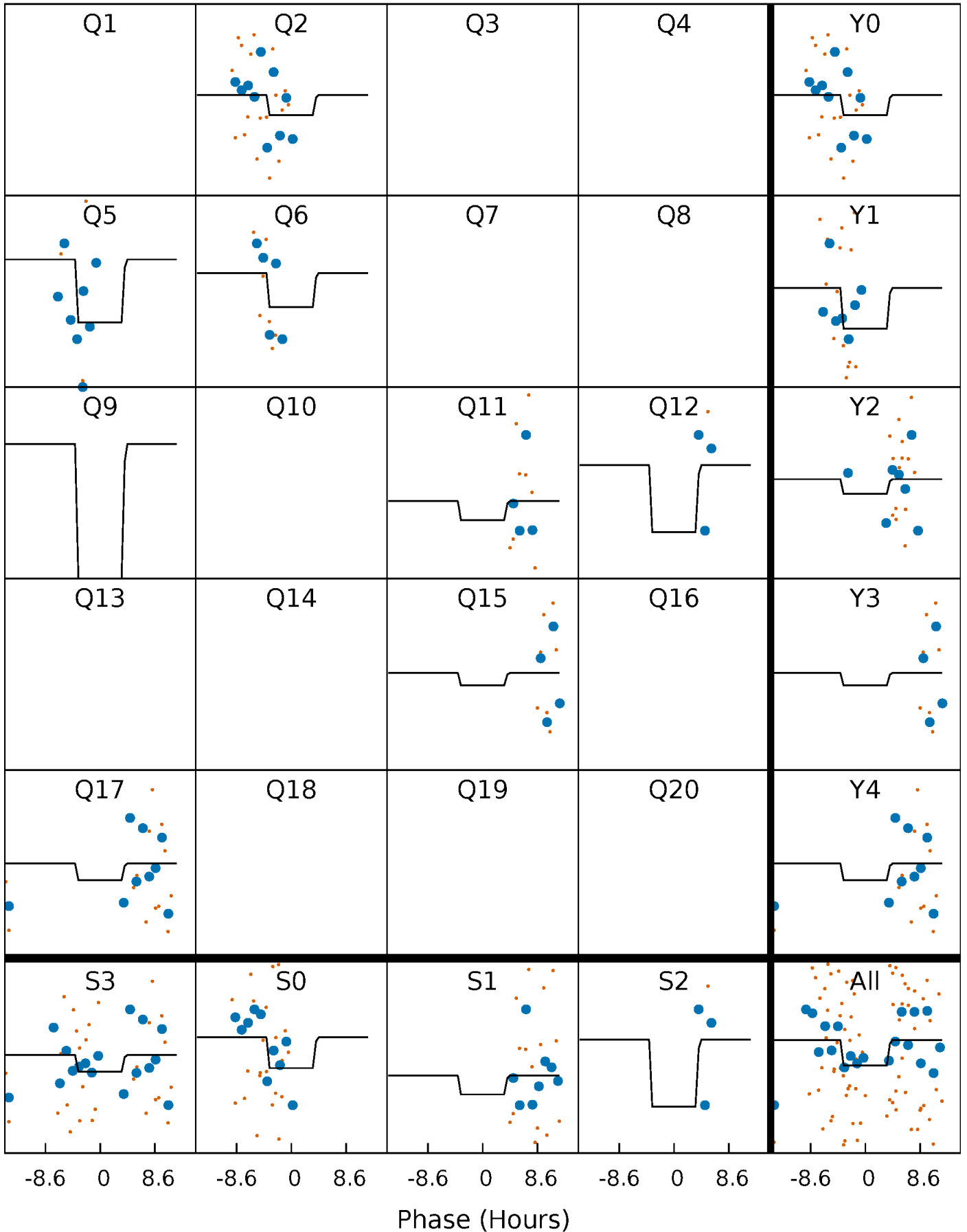
DV Quarter-Phased Transit Curves

TCE 009716667-04 P=139.688601 Days $T_0=175.683971$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

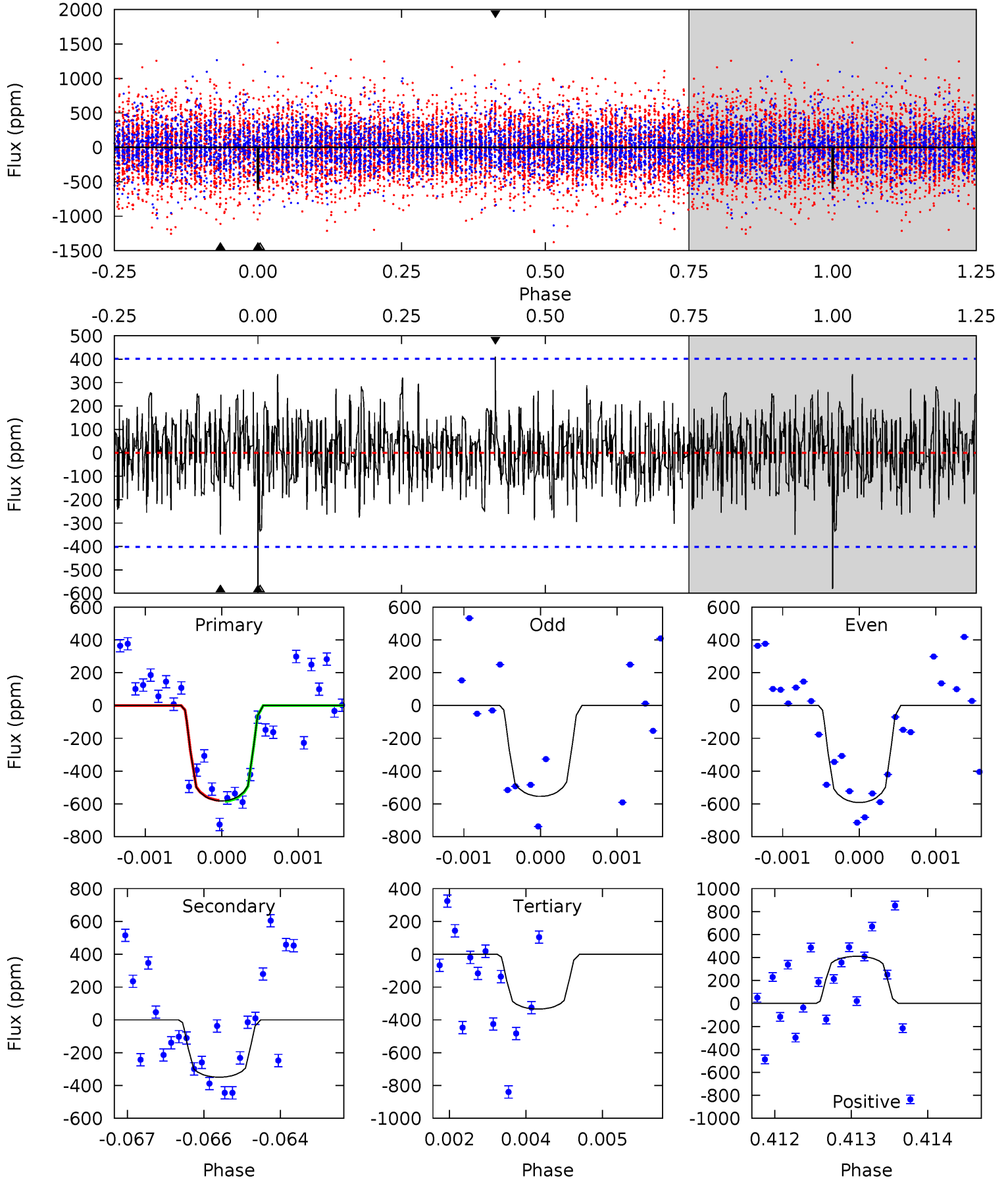
TCE 009716667-04 P=139.678173 Days $T_0=175.792392$ (BKJD)



DV Model-Shift Uniqueness Test

009716667-04, P = 139.688601 Days, E = 35.995370 Days

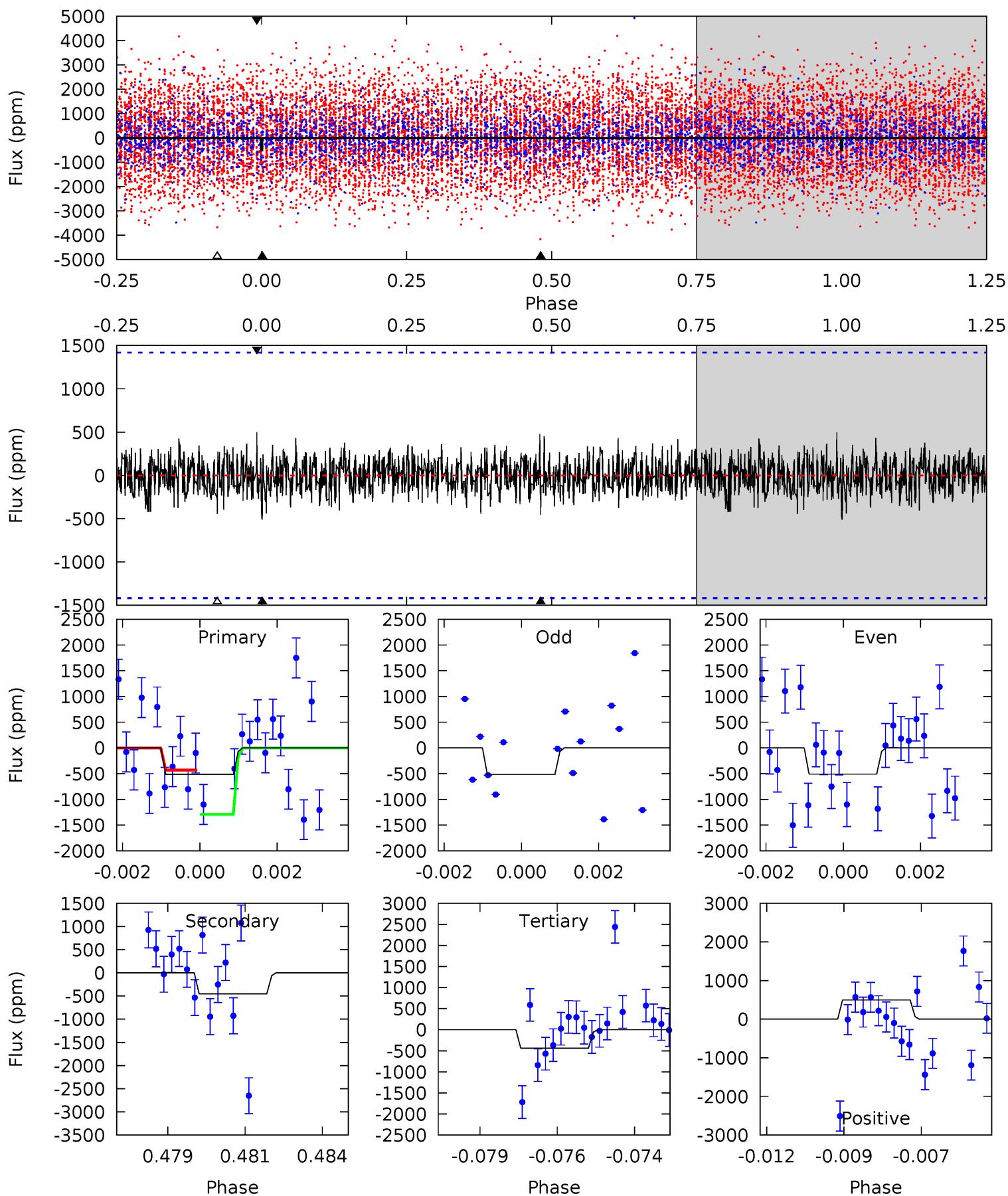
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.85	4.72	4.51	5.54	5.42	3.25	1.35	3.34	2.31	0.20	-0.83	0.22	1.04	0.41	0.05



Alt Model-Shift Uniqueness Test

009716667-04, P = 139.678173 Days, E = 36.114219 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.91	1.70	1.65	1.86	5.30	3.05	0.49	0.26	0.05	0.05	-0.16	0.01	1.35	0.49	1.07



Stellar Parameters For KIC 009716667

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7584^{+211}_{-316}	$4.103^{+0.135}_{-0.165}$	$0.070^{+0.200}_{-0.350}$	$1.921^{+0.549}_{-0.366}$	$1.705^{+0.204}_{-0.272}$	$0.339^{+0.230}_{-0.159}$
	+3%/-4%	+3%/-4%	+286%/-500%	+29%/-19%	+12%/-16%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009716667-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-349 ± 74	$5.71^{+4.29}_{-3.80}$	814^{+53}_{-50}	6148^{+5285}_{-1471}	2313^{+16295}_{-1616}
Alt.	-455 ± 267	$5.58^{+4.35}_{-3.68}$	814^{+58}_{-48}	6407^{+6825}_{-1771}	2728^{+21025}_{-2132}

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 $A_{obs} \gg 1.0$

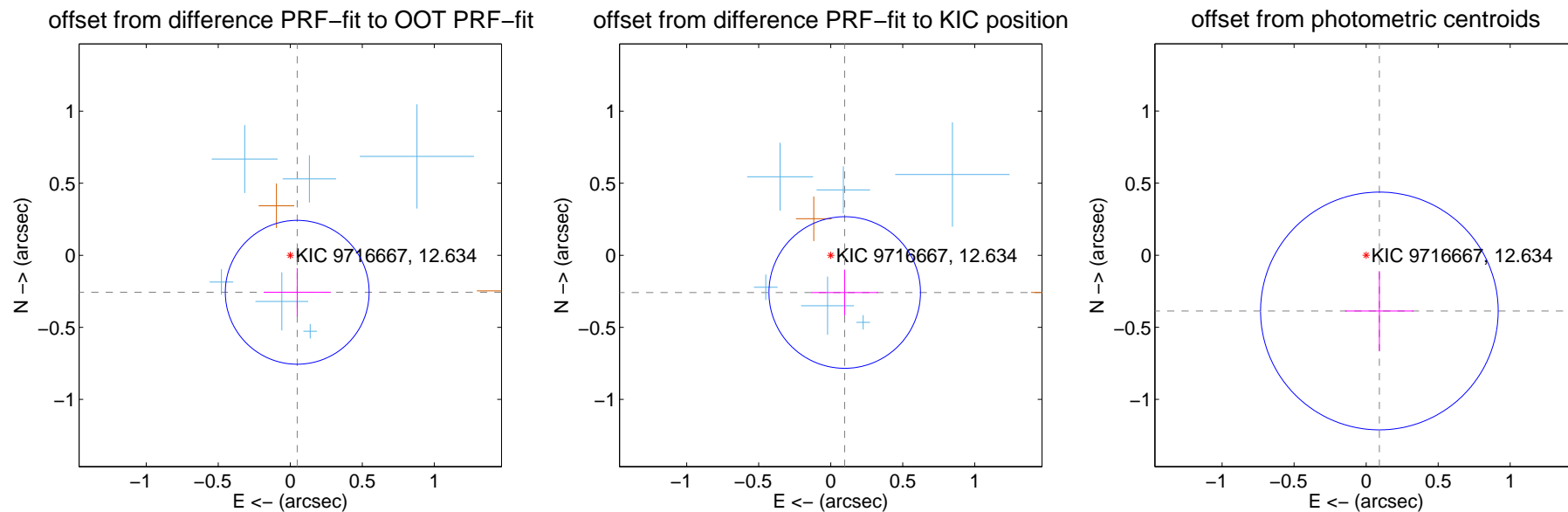
DV Centroid Data

Supplemental centroid analysis for 009716667-04. Kepler magnitude: 12.63. Transit SNR 7.44

There are 6 quarters with good PRF difference image offsets

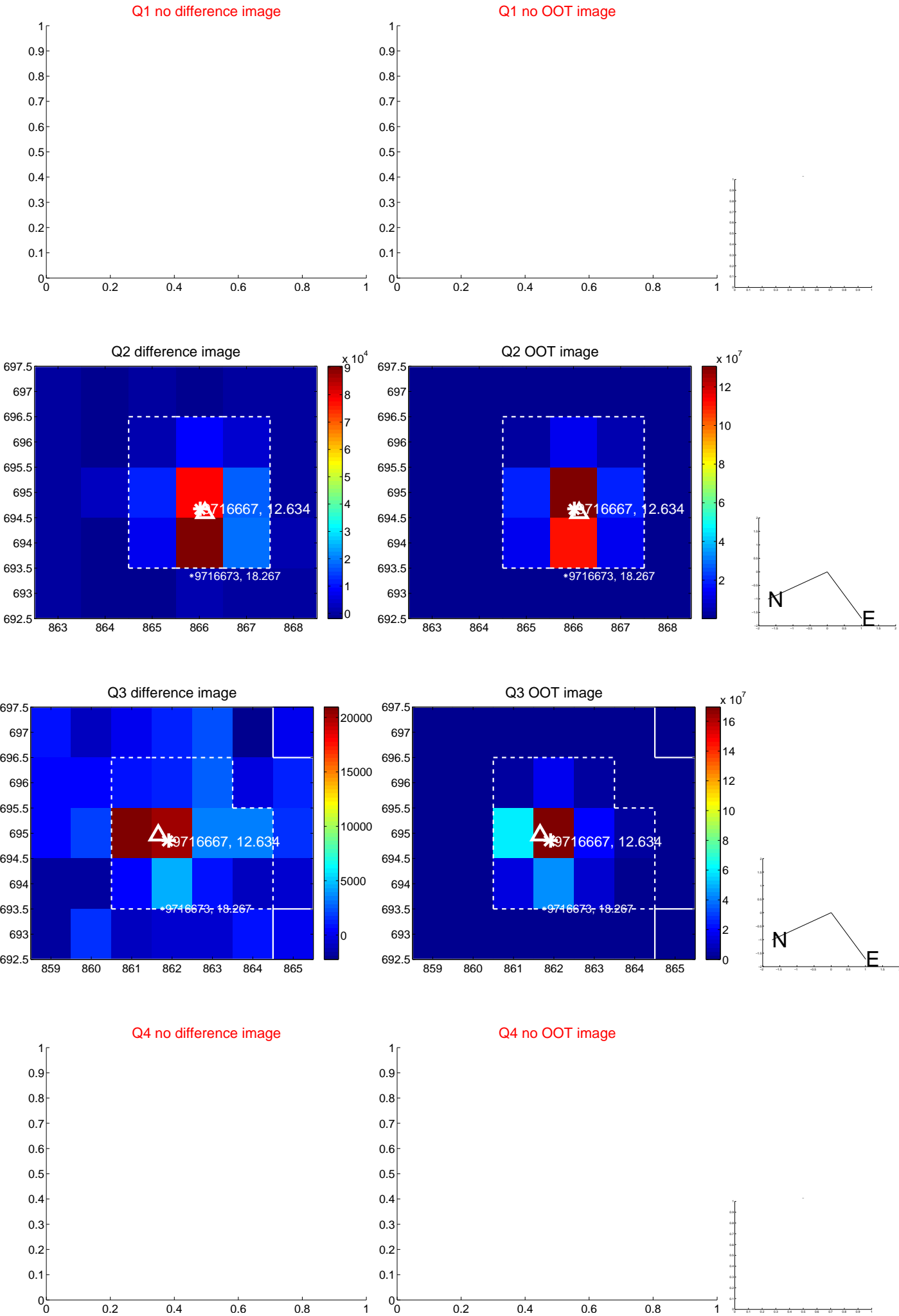
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.261 ± 0.166	1.57	-0.048 ± 0.233	-0.257 ± 0.168
PRF-fit source offset from KIC position	0.276 ± 0.175	1.57	-0.097 ± 0.232	-0.258 ± 0.159
photometric centroid source offset	0.40 ± 0.27	1.45	-0.09 ± 0.24	-0.39 ± 0.28

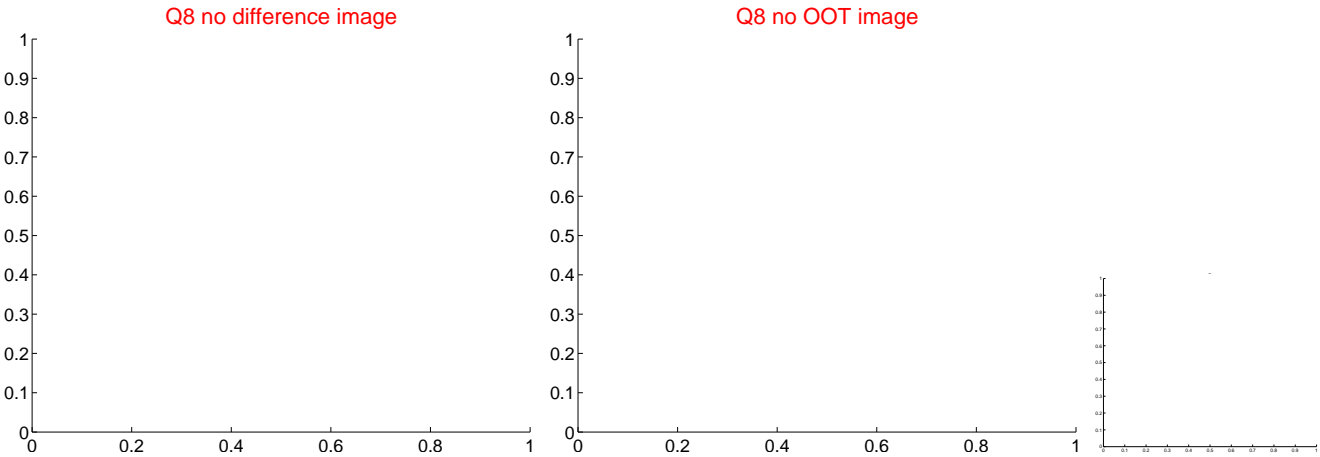
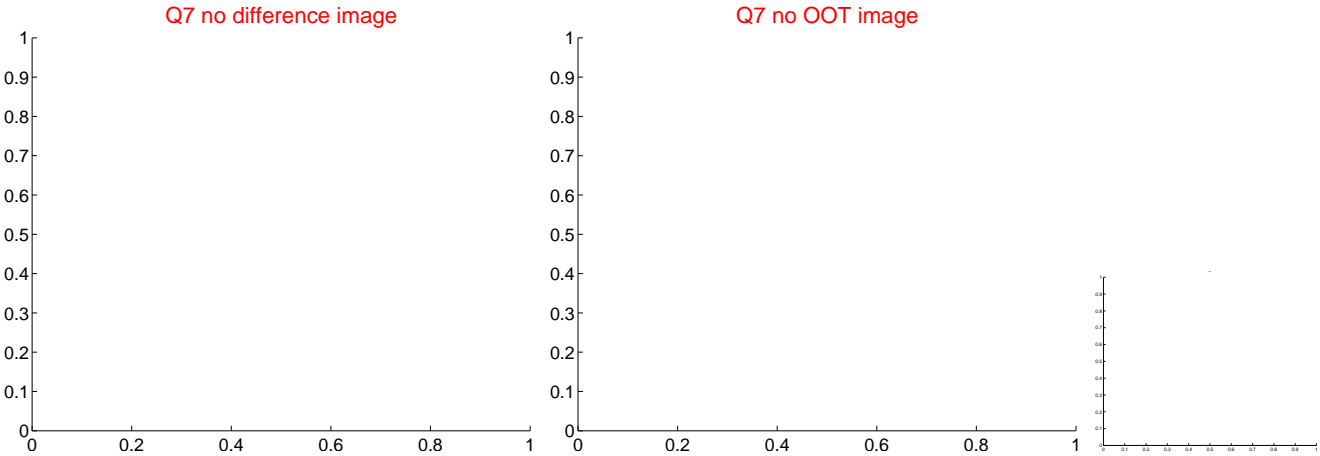
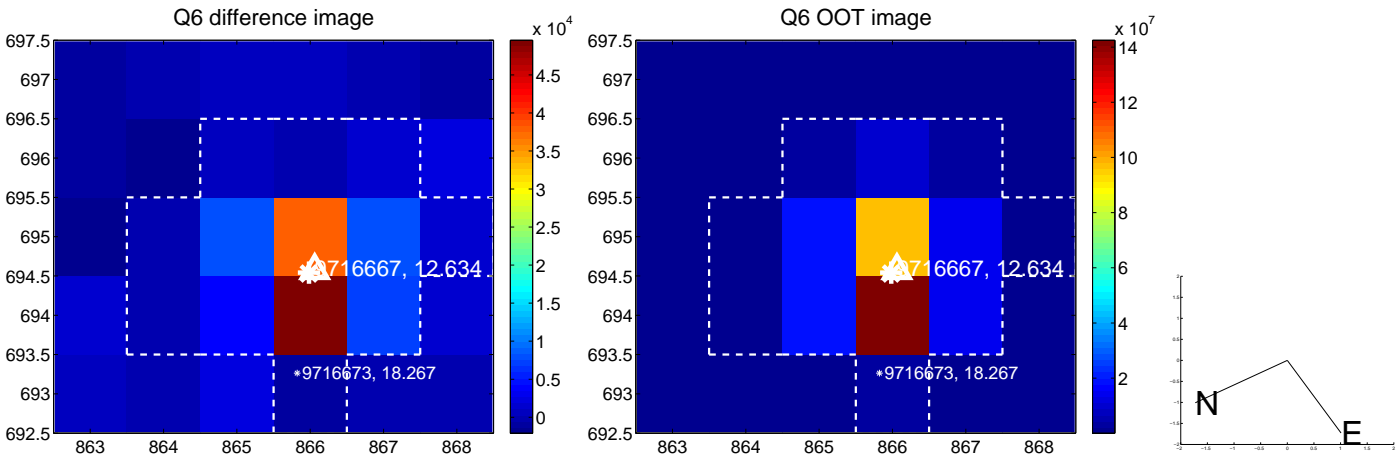
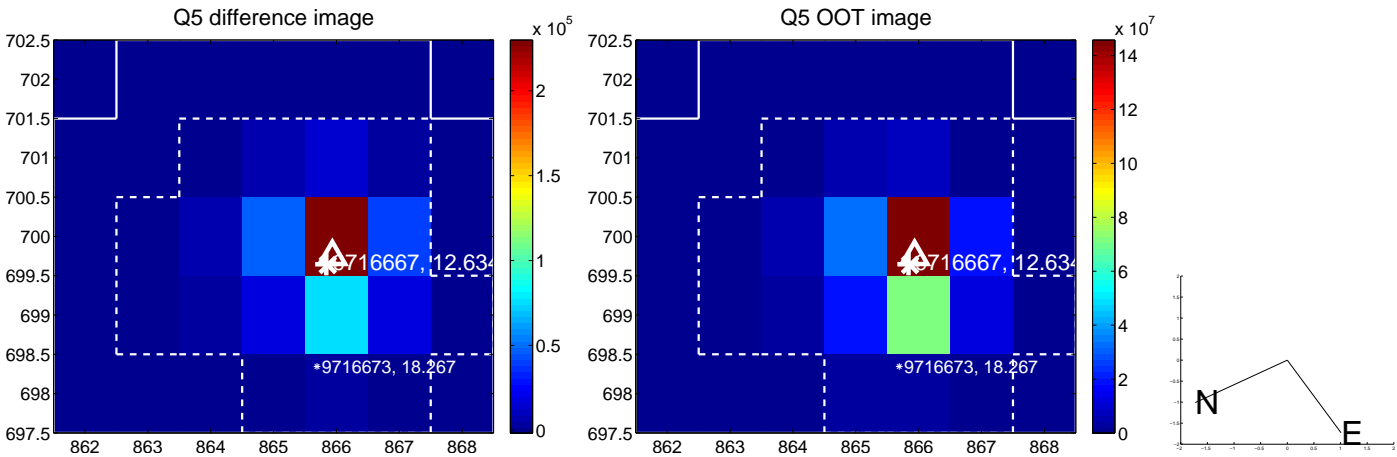


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

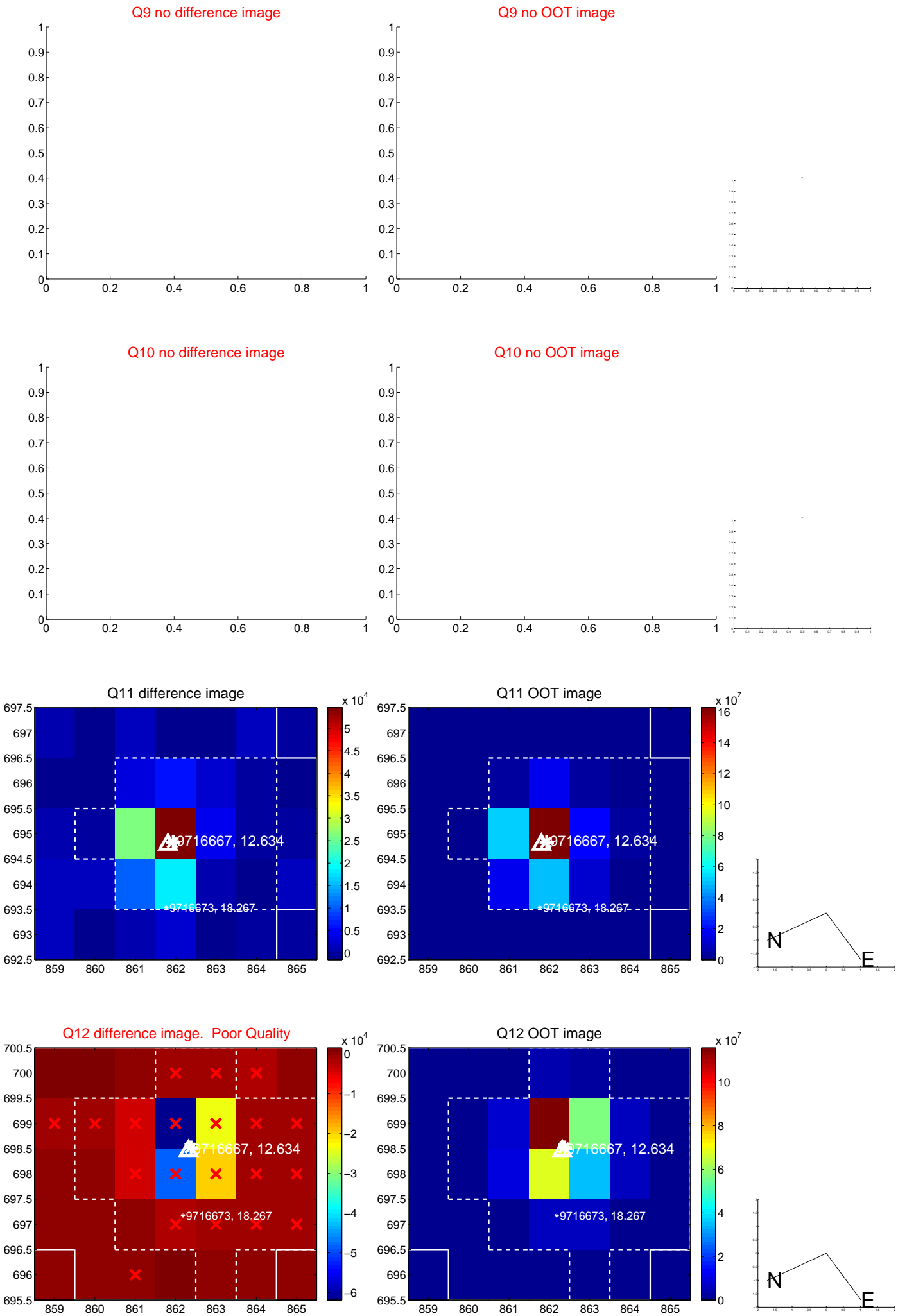
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.

Q13 no difference image



Q13 no OOT image



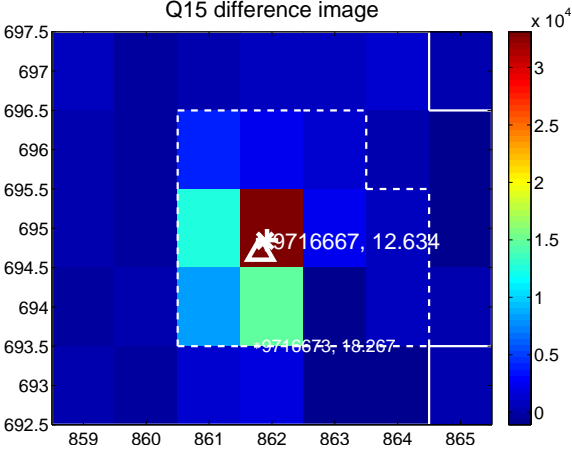
Q14 no difference image



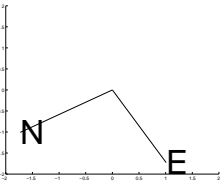
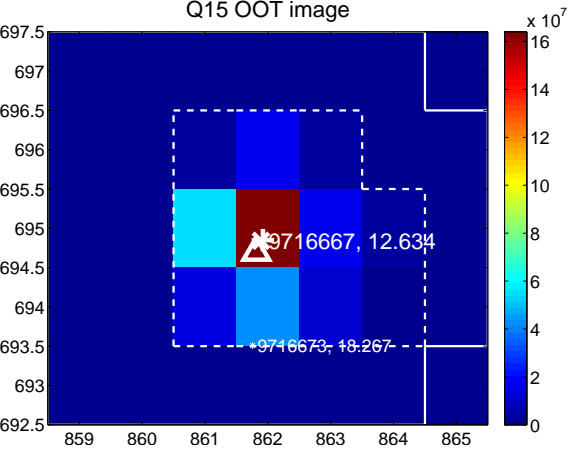
Q14 no OOT image



Q15 difference image



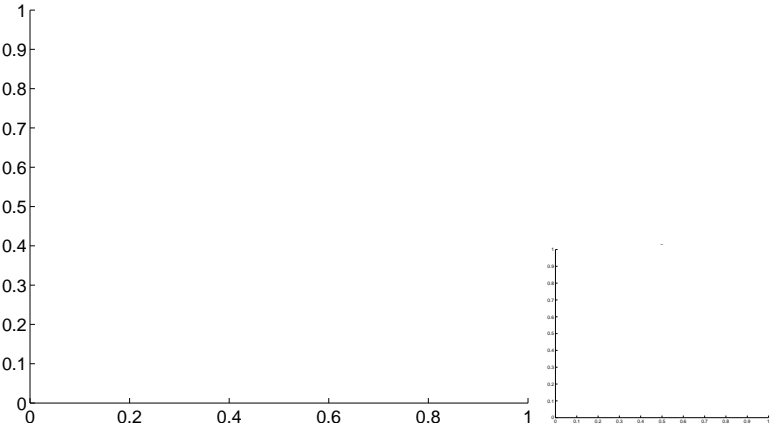
Q15 OOT image



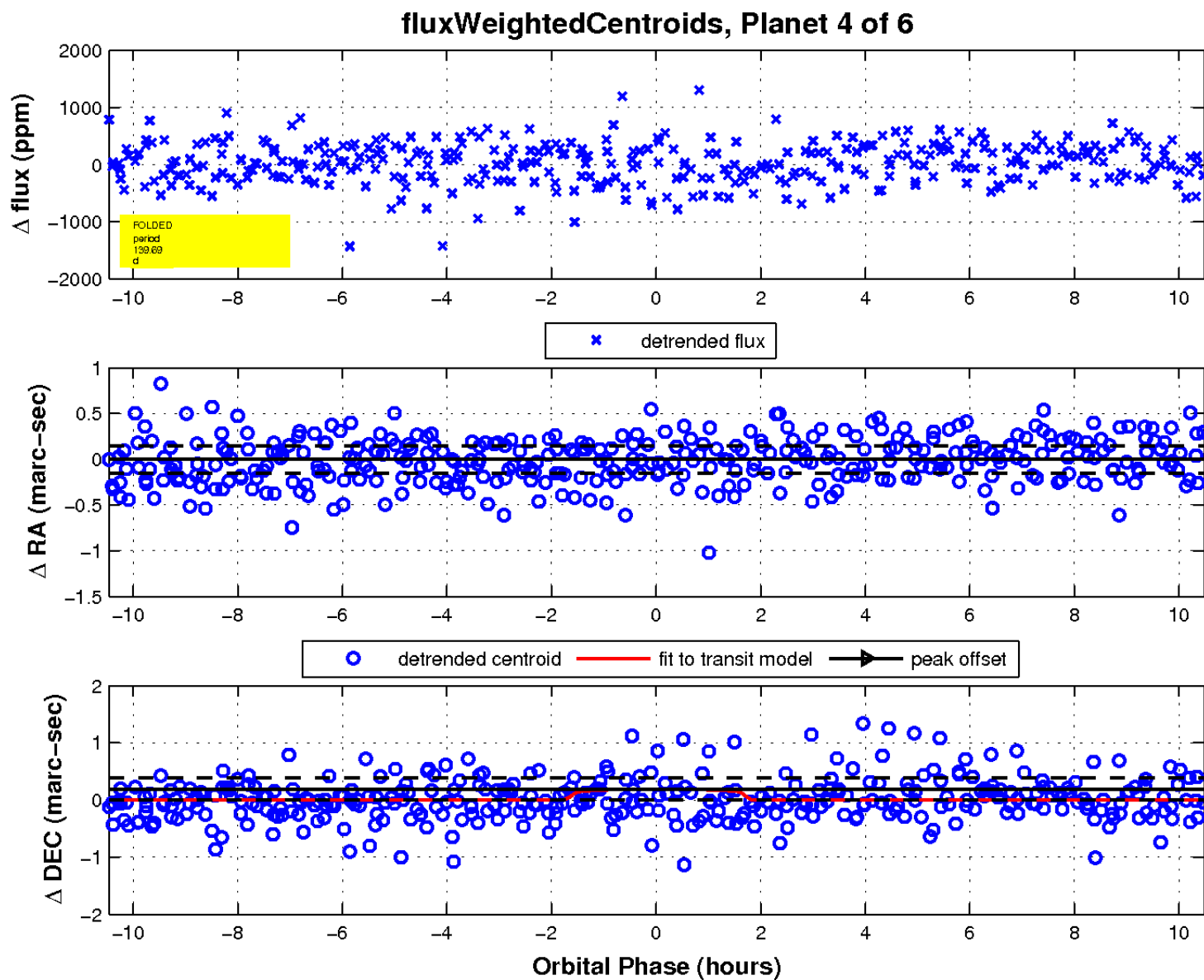
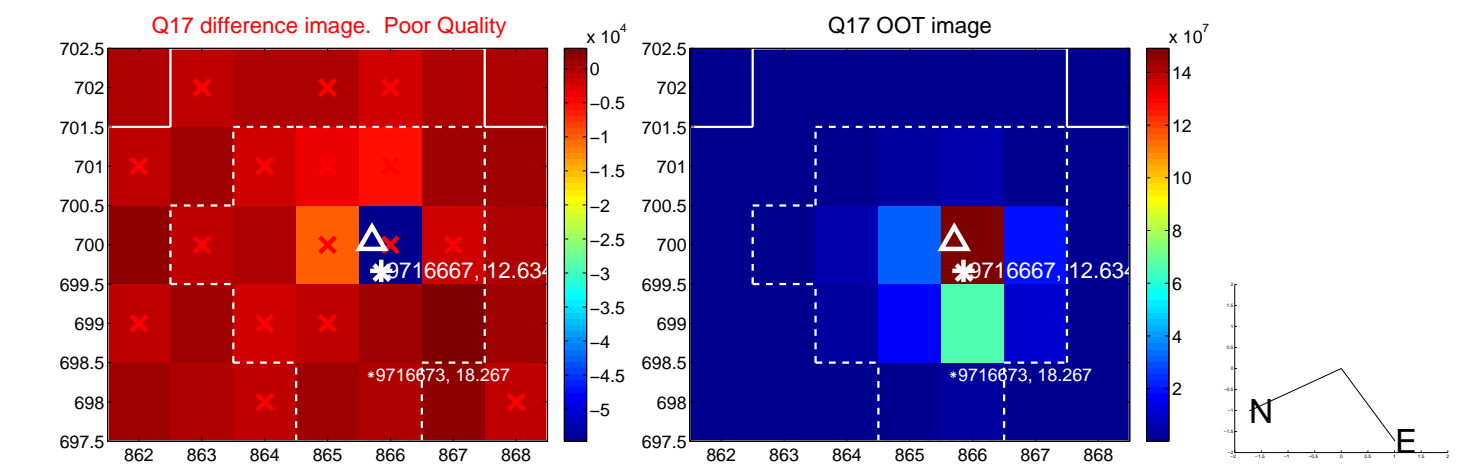
Q16 no difference image



Q16 no OOT image

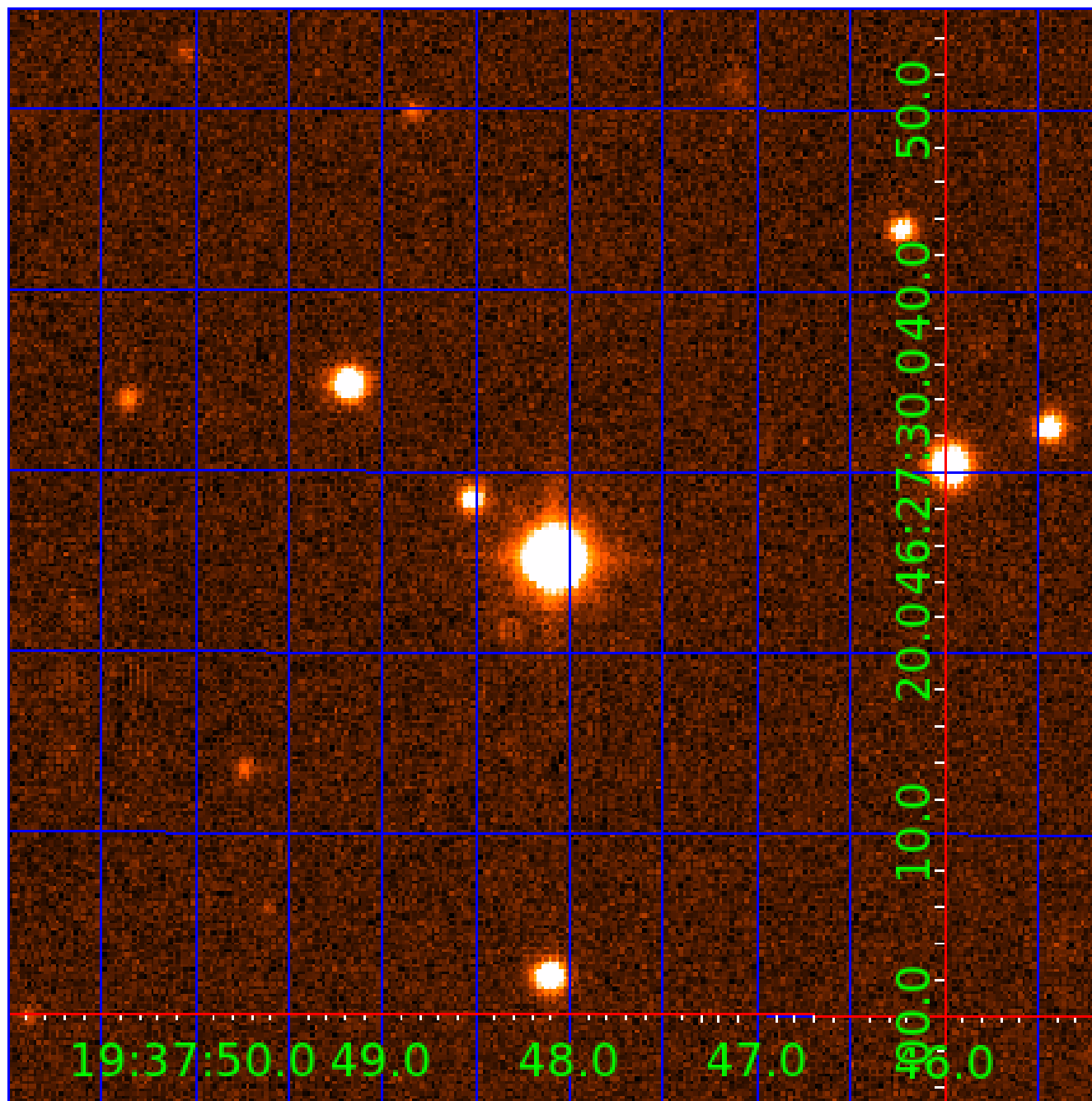


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009716667

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})
009716667-01	OBS	No	0.793406	131.591484	34.3	2.436	9.6	7.9	1.92	7584	1.30	27217.33
009716667-02	OBS	No	1.174248	131.548562	58.4	5.790	10.1	10.9	1.92	7584	1.49	16137.12
009716667-03	OBS	No	3.525049	132.017709	91.4	7.418	8.5	8.7	1.92	7584	2.12	3726.37
009716667-04	OBS	No	139.688601	175.683971	494.9	3.501	8.4	7.4	1.92	7584	4.62	27.58
009716667-05	OBS	No	113.619424	138.786926	485.9	3.924	8.1	8.9	1.92	7584	4.52	36.33
009716667-06	OBS	No	49.159354	139.221257	134.2	3.500	7.3	-1.0	1.92	7584	2.26	111.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716667-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009716667-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009716667-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
009716667-04	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
009716667-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
009716667-06	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_NOFITS

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

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

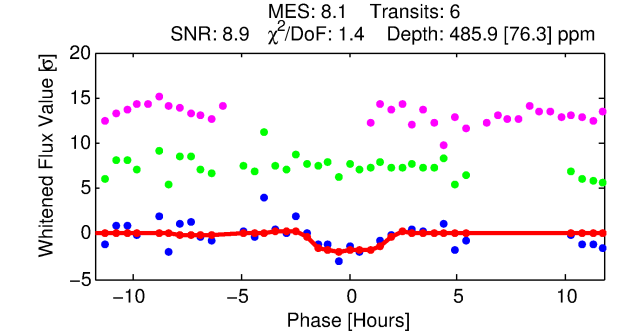
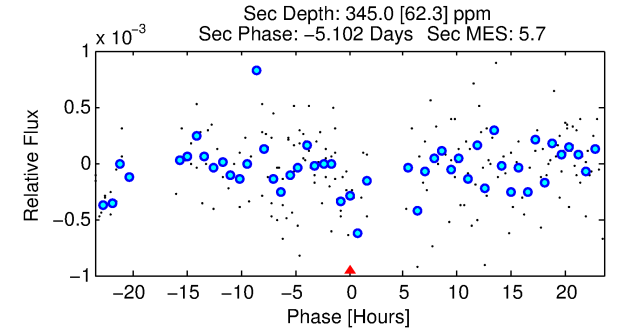
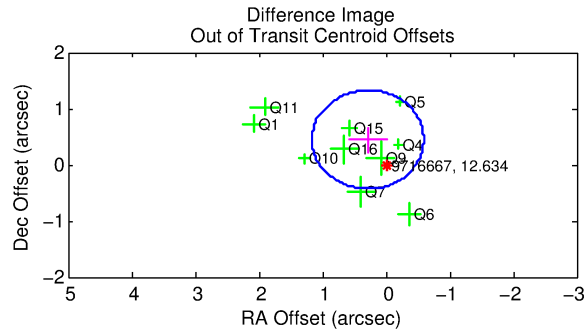
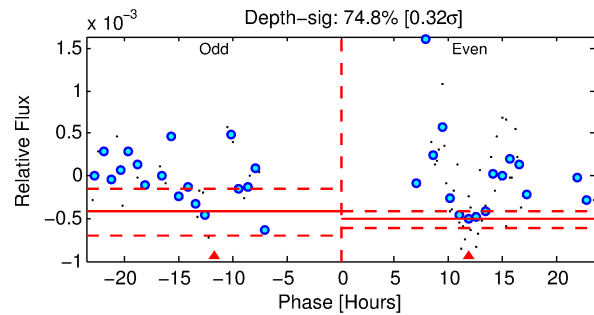
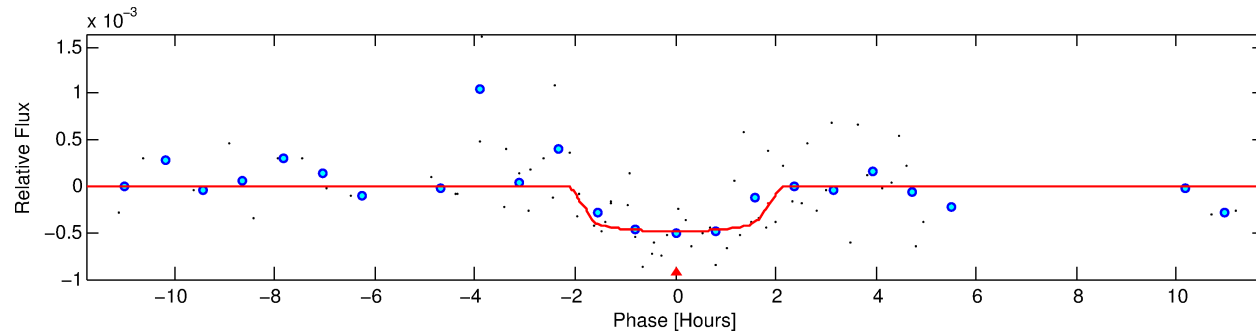
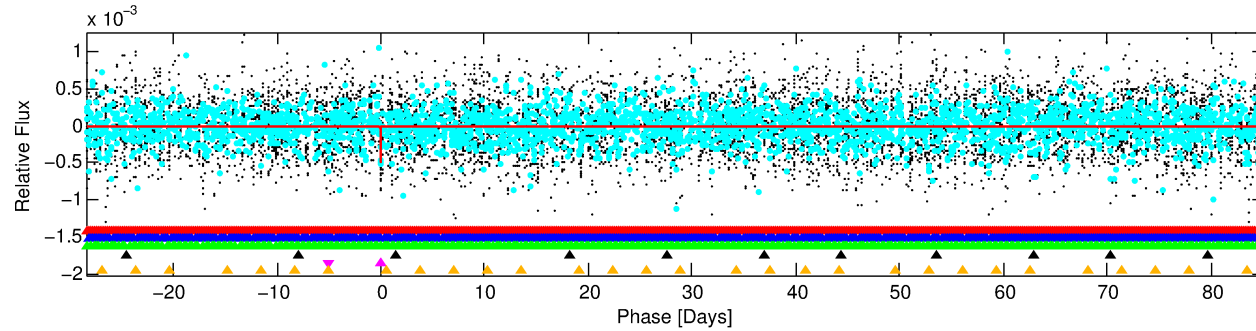
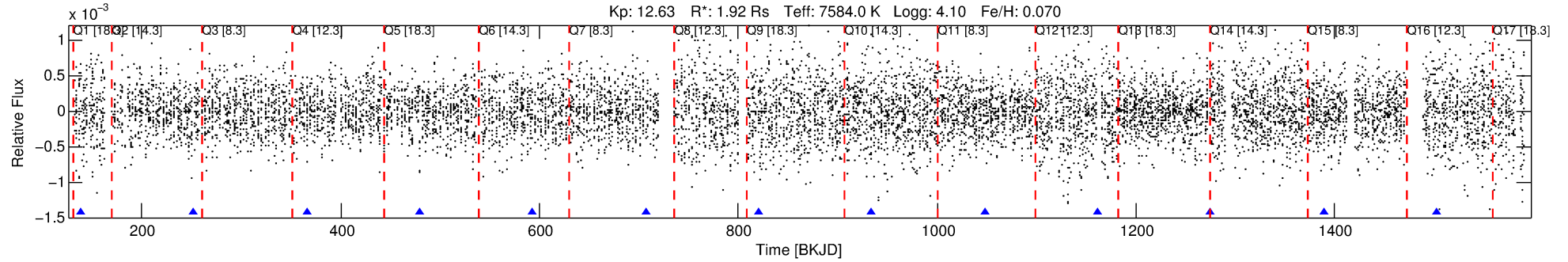
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716667-05

No Significant Match Found

DV One-Page Summary

KIC: 9716667 Candidate: 5 of 6 Period: 113.619 d



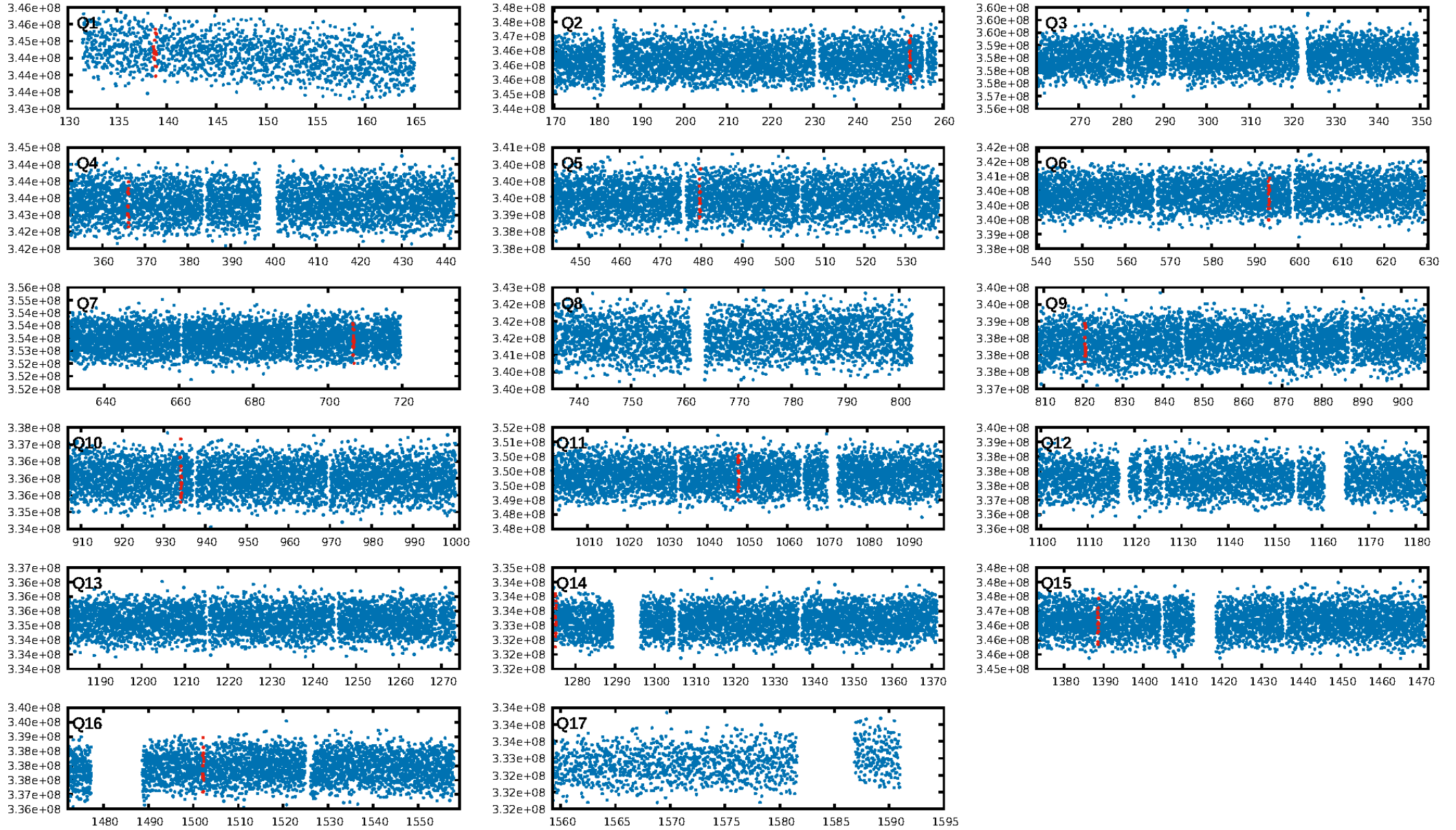
DV Fit Results:

Period = 113.61942 [0.00156] d
Epoch = 138.7869 [0.0115] BKJD
Rp/R* = 0.0216 [0.0199]
a/R* = 169.07 [974.60]
b = 0.68 [4.61]
Seff = 36.33 [13.01]
Teff = 626 [56] K
Rp = 4.52 [4.36] Re
a = 0.5487 [0.1255] AU
Ag = 2797.23 [5258.29] [0.53σ]
Teffp = 7039 [3274] K [1.96σ]

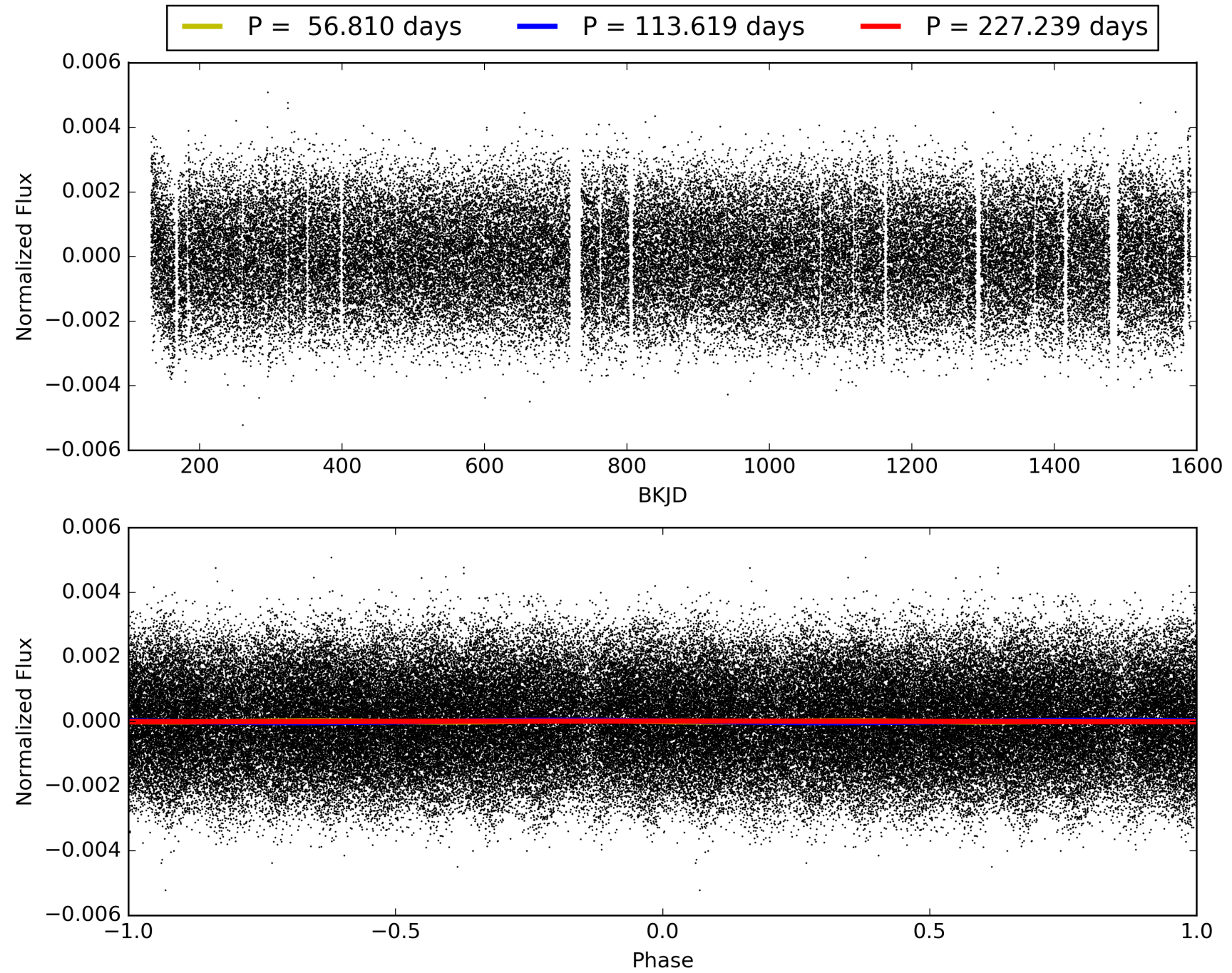
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [294.23σ]
LongPeriod-sig: 100.0% [118.98σ]
ModelChiSquare2-sig: 4.7%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 6.531
Centroid-sig: 96.8%
Centroid-so: 0.111 arcsec [0.57σ]
OotOffset-rm: 0.531 arcsec [1.81σ]
KicOffset-rm: 0.492 arcsec [1.68σ]
OotOffset-st: 2/3/2/3 [10]
KicOffset-st: 2/3/2/3 [10]
DiffImageQuality-fgm: 0.50 [5/10]
DiffImageOverlap-fno: 0.00 [0/11]

TCE 009716667-05, PDC Light Curves

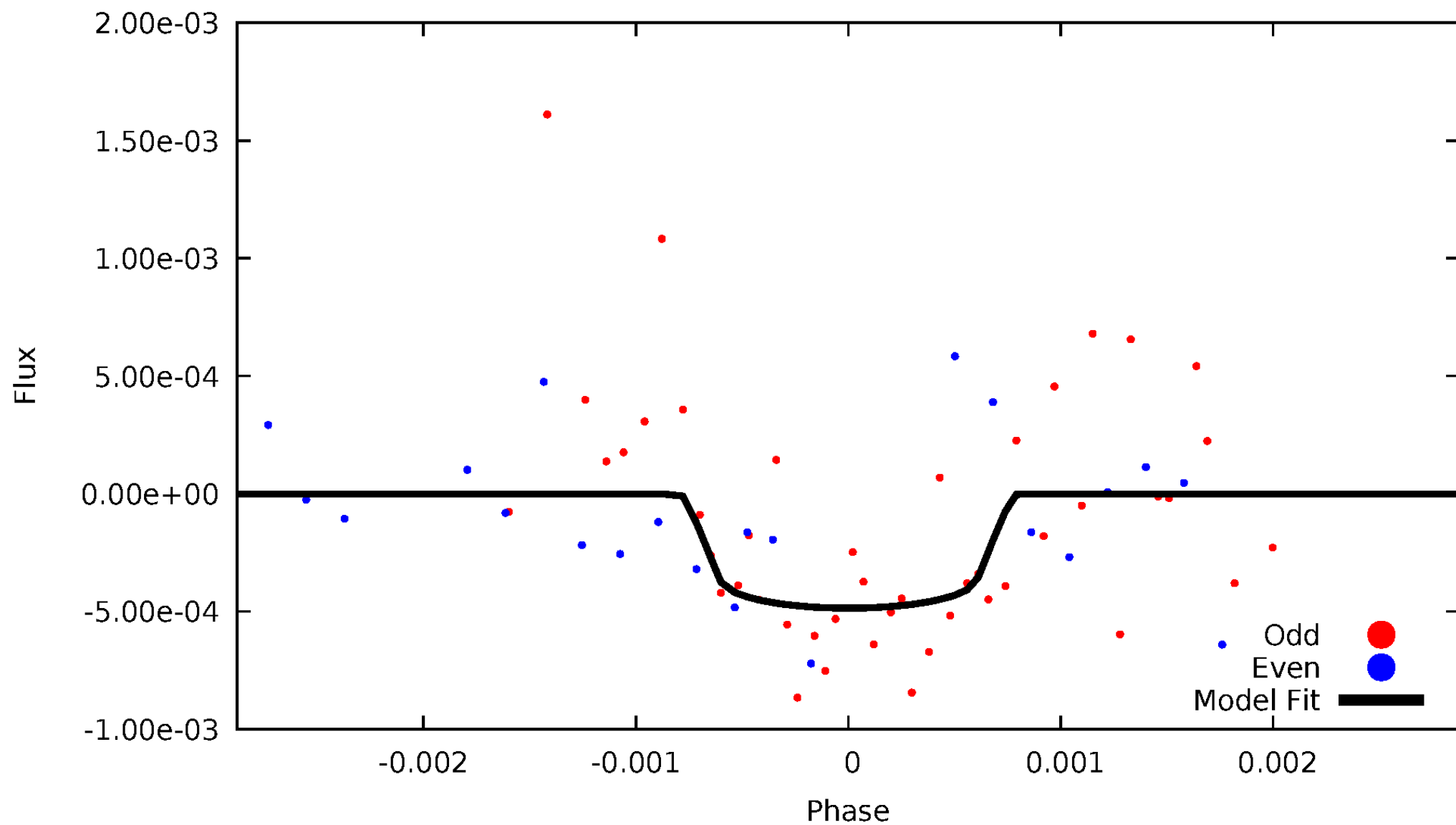


TCE 009716667-05



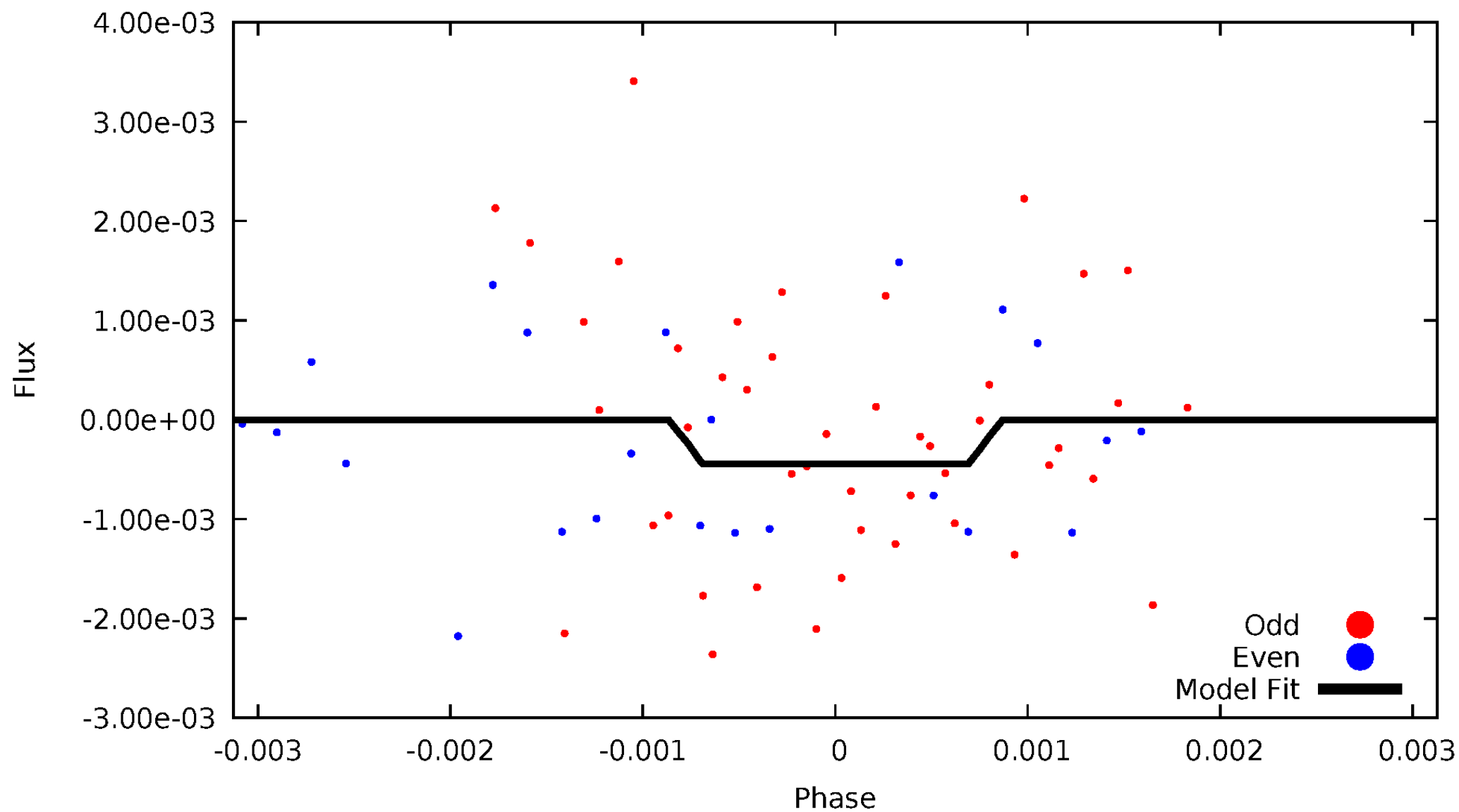
DV Odd/Even

TCE 009716667-05



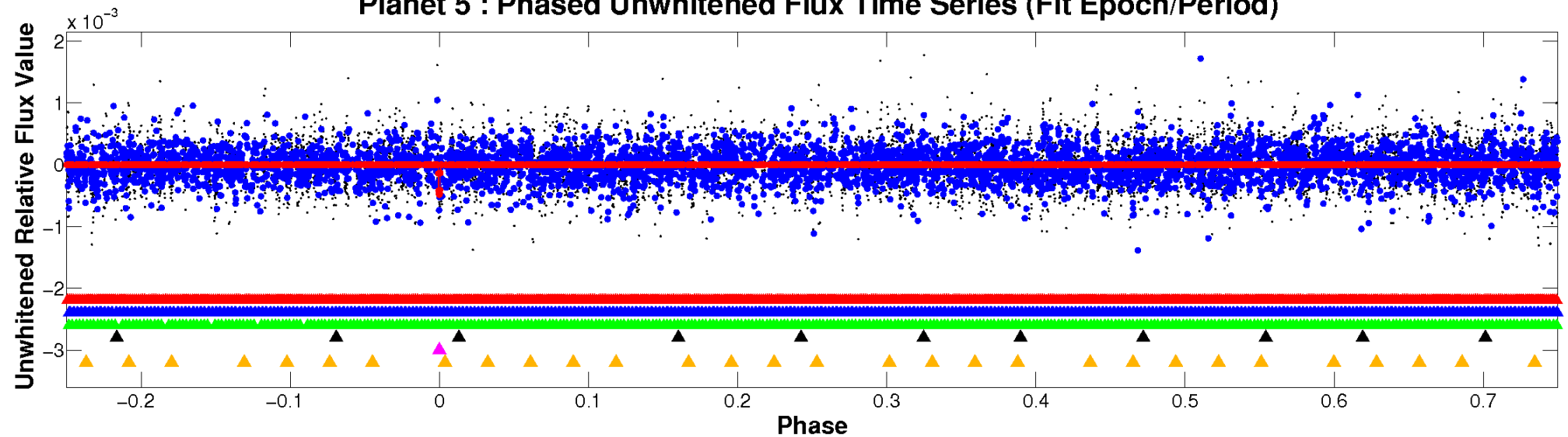
ALT Odd/Even

TCE 009716667-05

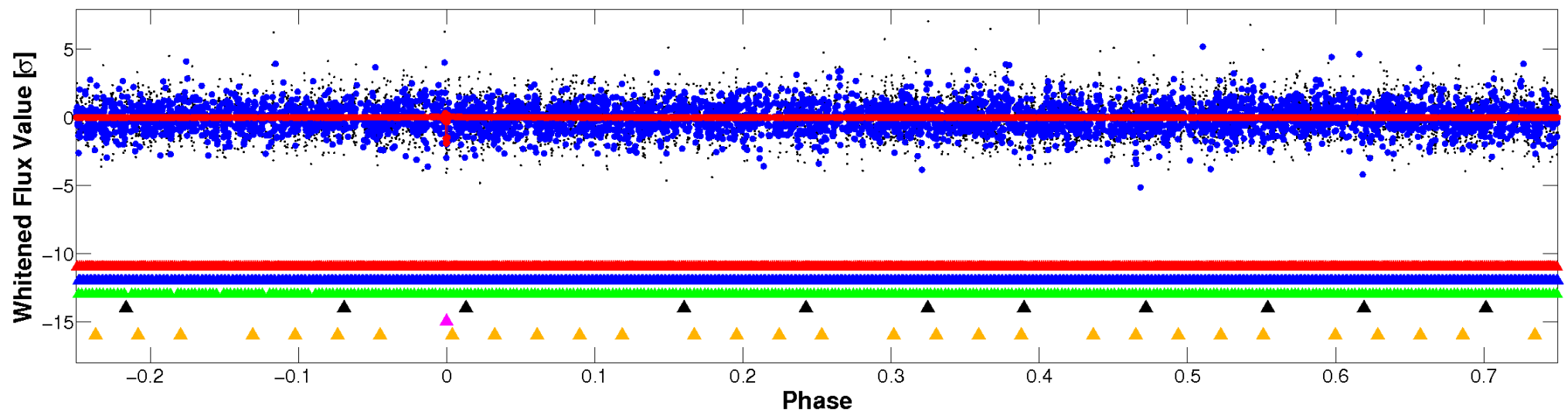


Non-Whitened Vs. Whitened Light Curve

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

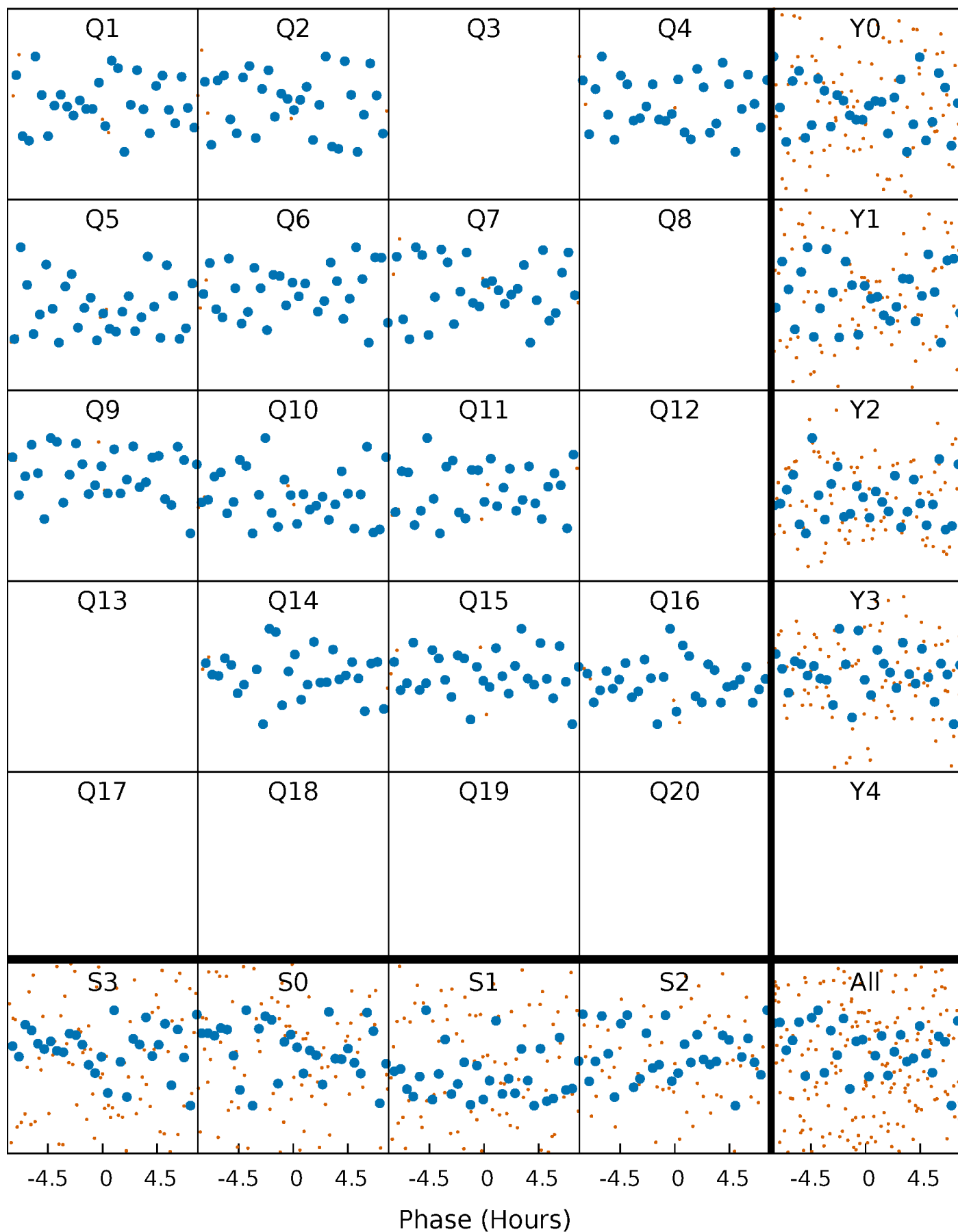


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



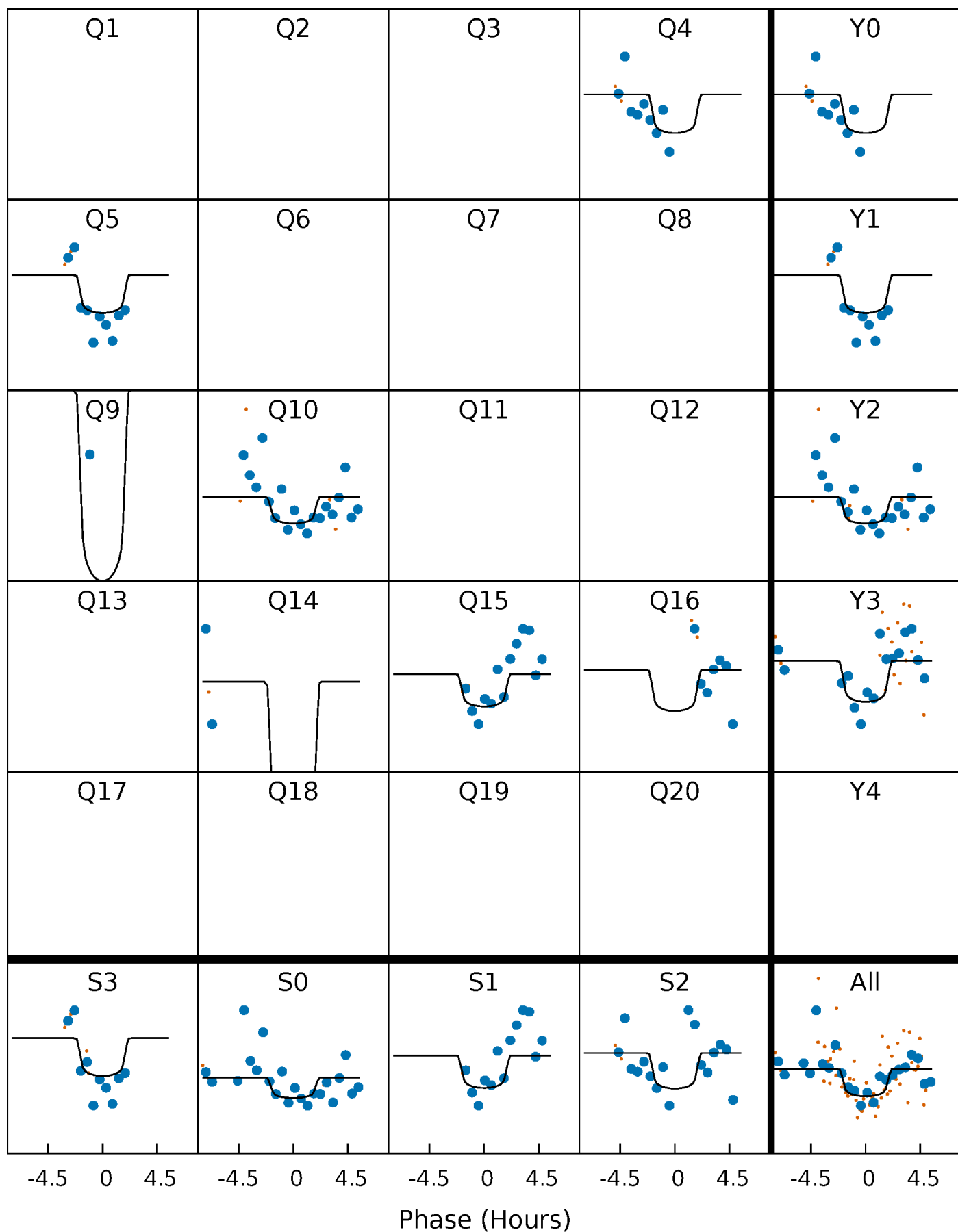
PDC Quarter-Phased Transit Curves

TCE 009716667-05 $P=113.619424$ Days $T_0=138.786925$ (BKJD)



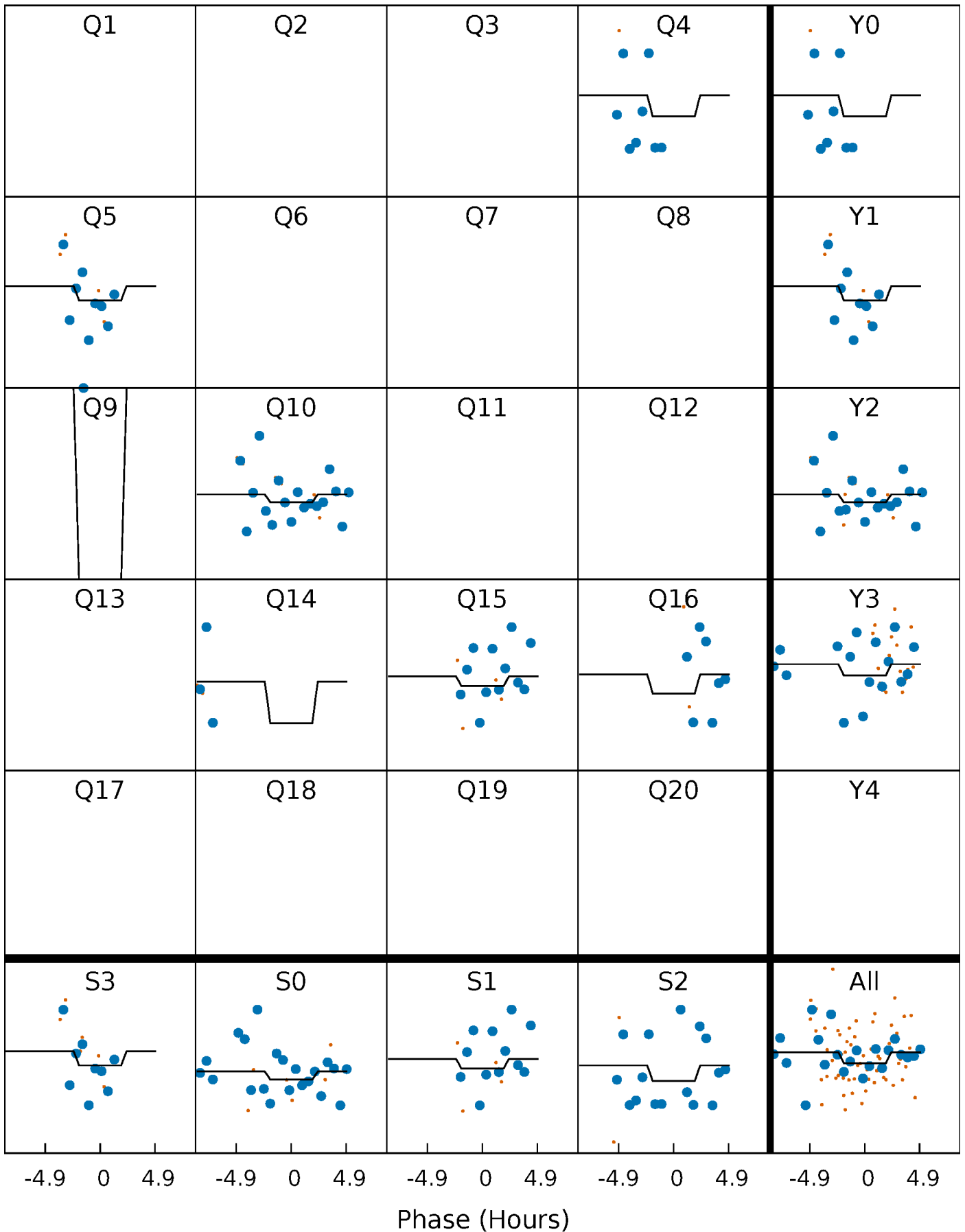
DV Quarter-Phased Transit Curves

TCE 009716667-05 $P=113.619424$ Days $T_0=138.786925$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

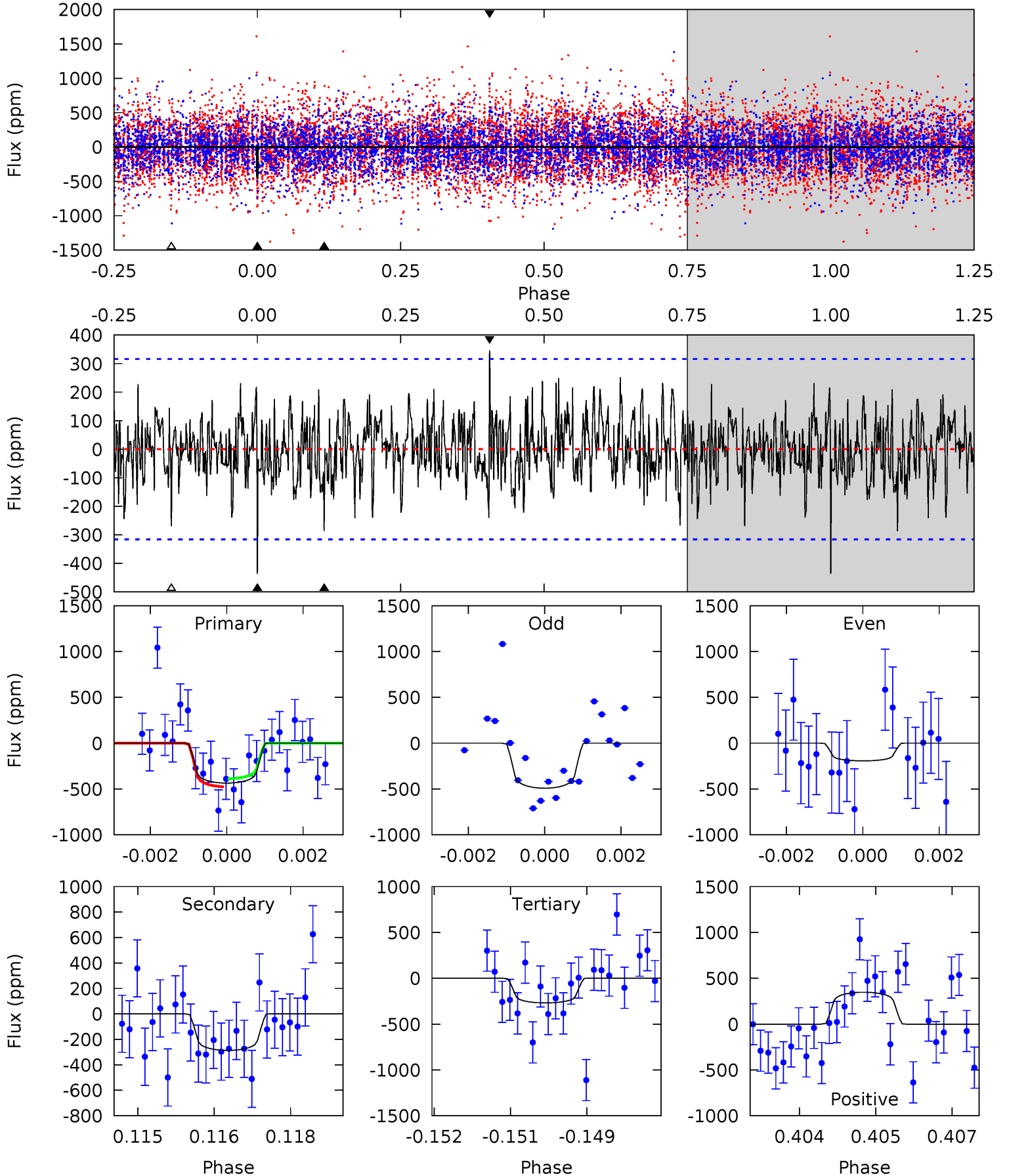
TCE 009716667-05 P=113.619474 Days $T_0=138.805675$ (BKJD)



DV Model-Shift Uniqueness Test

009716667-05, $P = 113.619424$ Days, $E = 25.167501$ Days

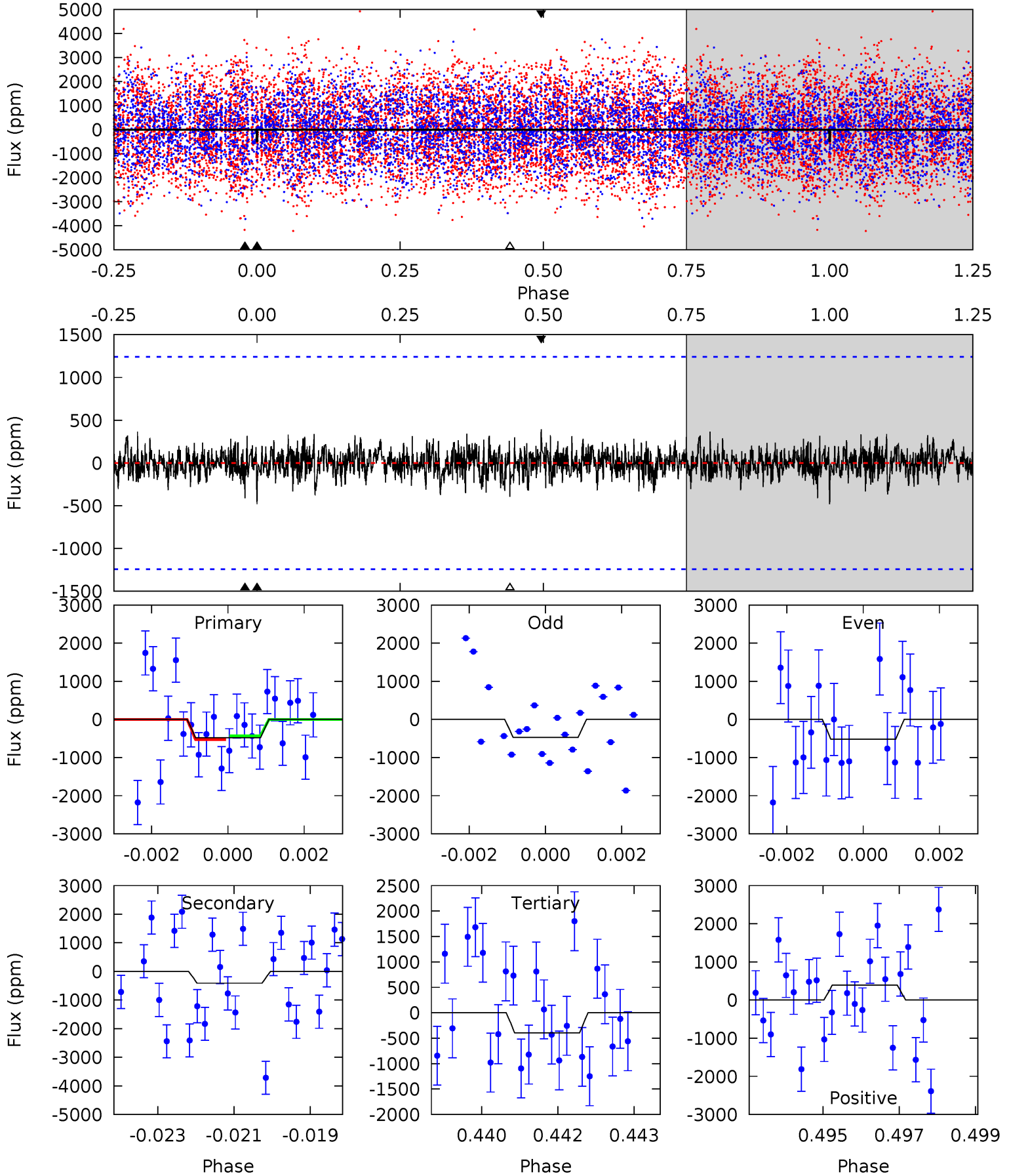
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.41	4.87	4.57	5.90	5.37	3.16	1.52	2.84	1.51	0.30	-1.03	2.12	0.63	0.44	0.75



Alt Model-Shift Uniqueness Test

009716667-05, $P = 113.619474$ Days, $E = 25.186201$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.07	1.77	1.70	1.70	5.37	3.15	0.47	0.38	0.38	0.07	0.08	0.08	1.32	0.45	0.21



Stellar Parameters For KIC 009716667

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7584^{+211}_{-316}	$4.103^{+0.135}_{-0.165}$	$0.070^{+0.200}_{-0.350}$	$1.921^{+0.549}_{-0.366}$	$1.705^{+0.204}_{-0.272}$	$0.339^{+0.230}_{-0.159}$
	+3%/-4%	+3%/-4%	+286%/-500%	+29%/-19%	+12%/-16%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009716667-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-287 ± 59	$5.13^{+4.19}_{-3.11}$	876^{+57}_{-56}	6174^{+4543}_{-1429}	1726^{+9042}_{-1204}
Alt.	-410 ± 232	$4.98^{+3.75}_{-2.90}$	875^{+59}_{-54}	6595^{+5862}_{-1797}	2304^{+12226}_{-1736}

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 $A_{obs} \gg 1.0$

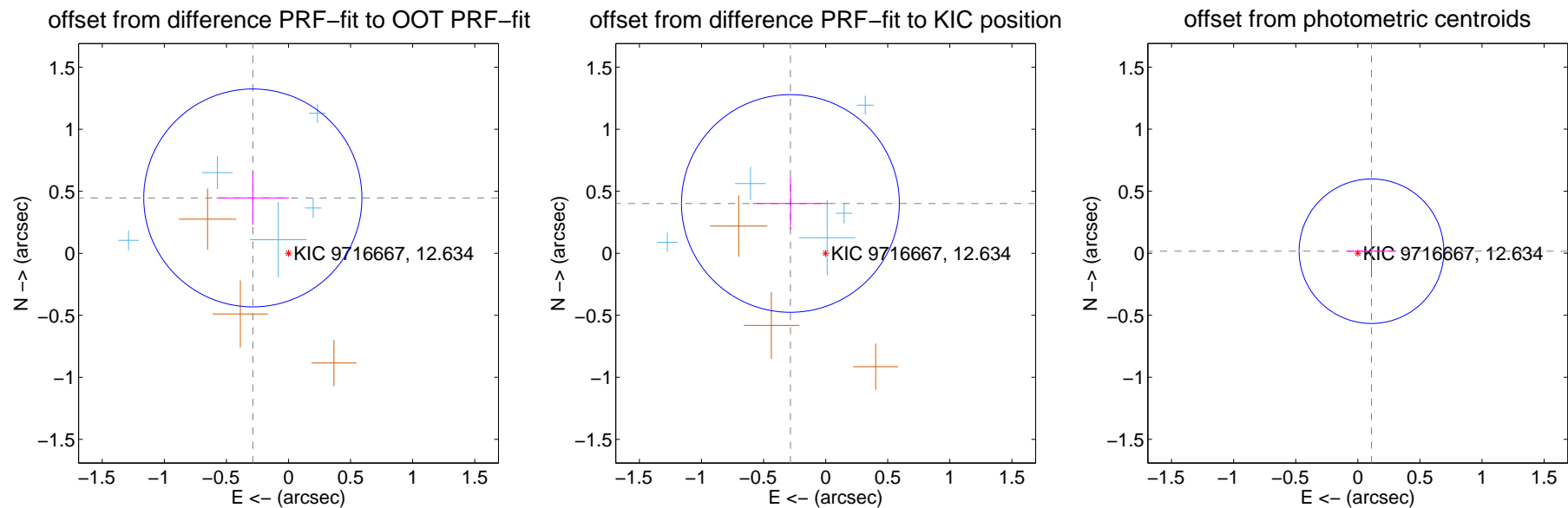
DV Centroid Data

Supplemental centroid analysis for 009716667-05. Kepler magnitude: 12.63. Transit SNR 8.93

There are 5 quarters with good PRF difference image offsets

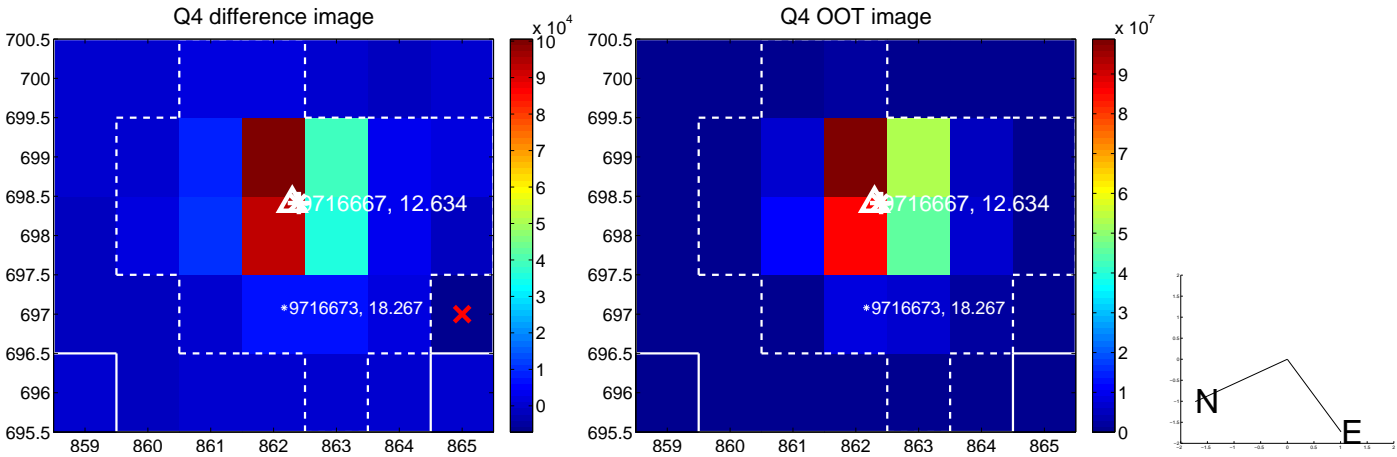
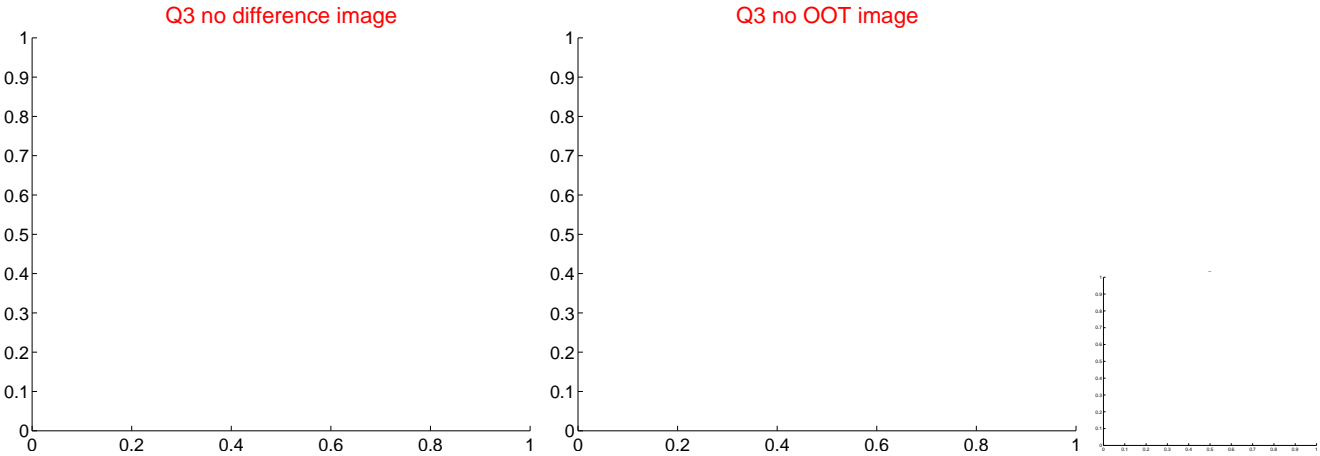
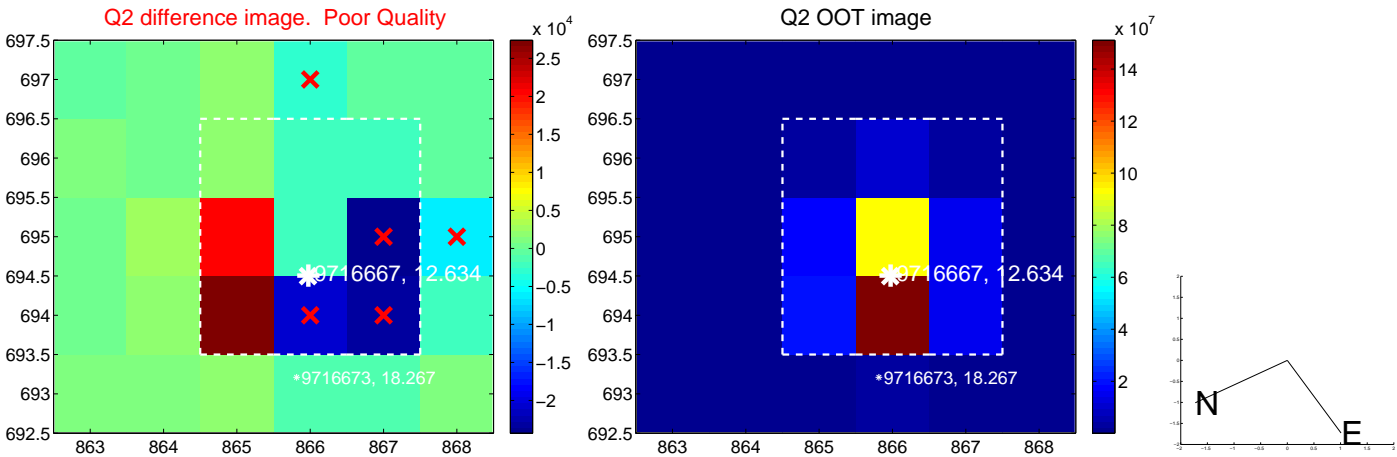
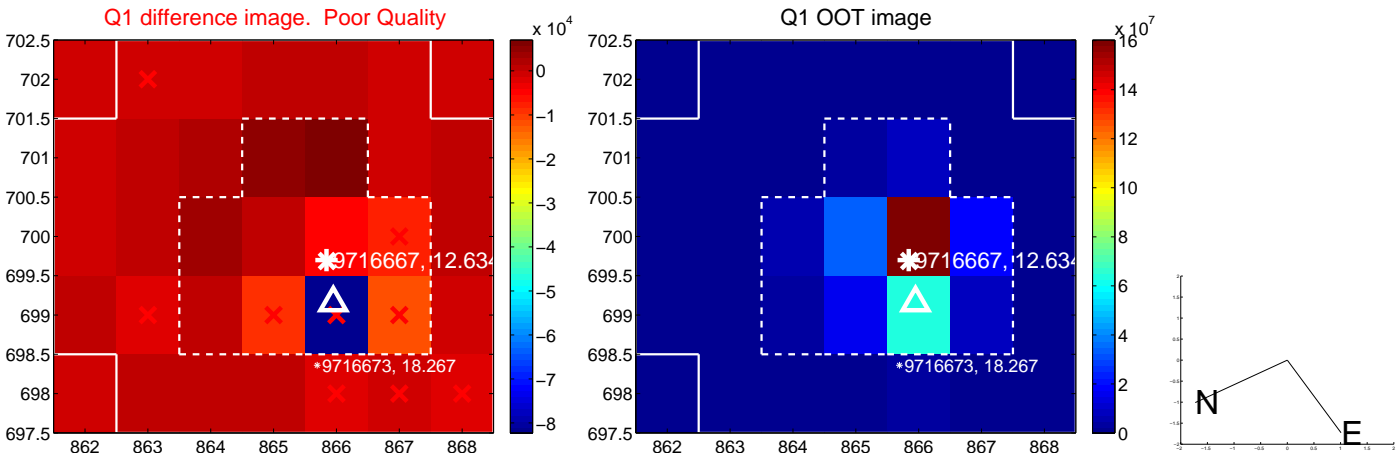
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.531 ± 0.293	1.81	0.287 ± 0.291	0.446 ± 0.218
PRF-fit source offset from KIC position	0.492 ± 0.292	1.68	0.284 ± 0.300	0.402 ± 0.211
photometric centroid source offset	0.11 ± 0.19	0.57	-0.11 ± 0.19	0.02 ± 0.21

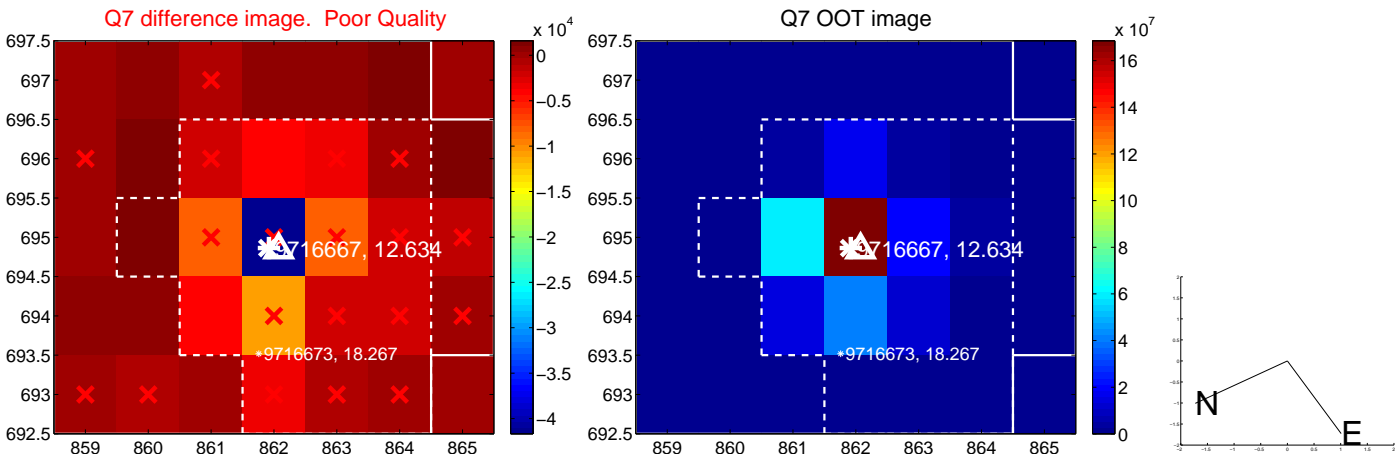
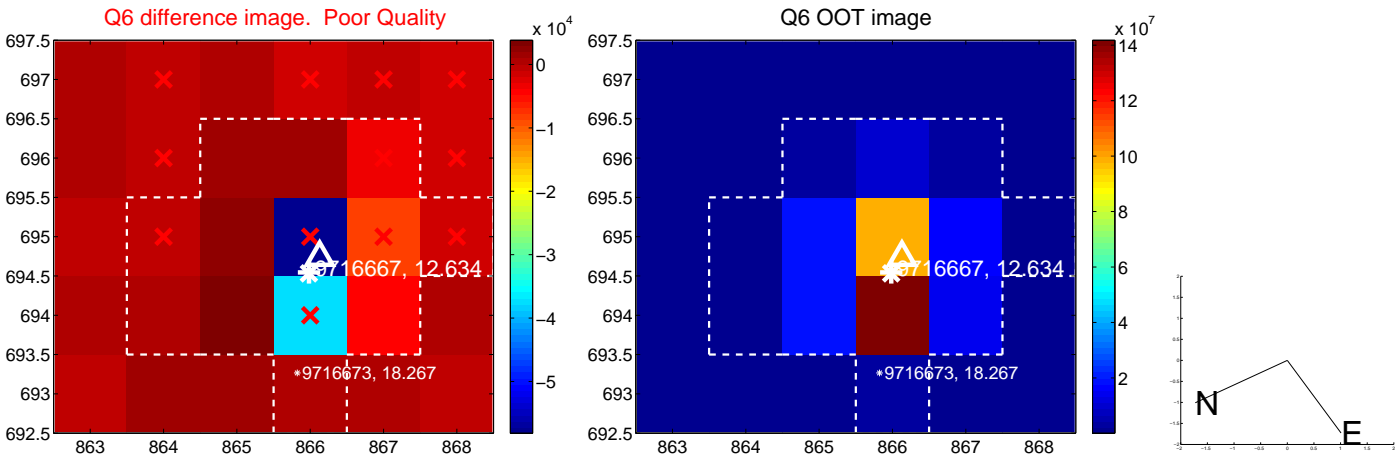
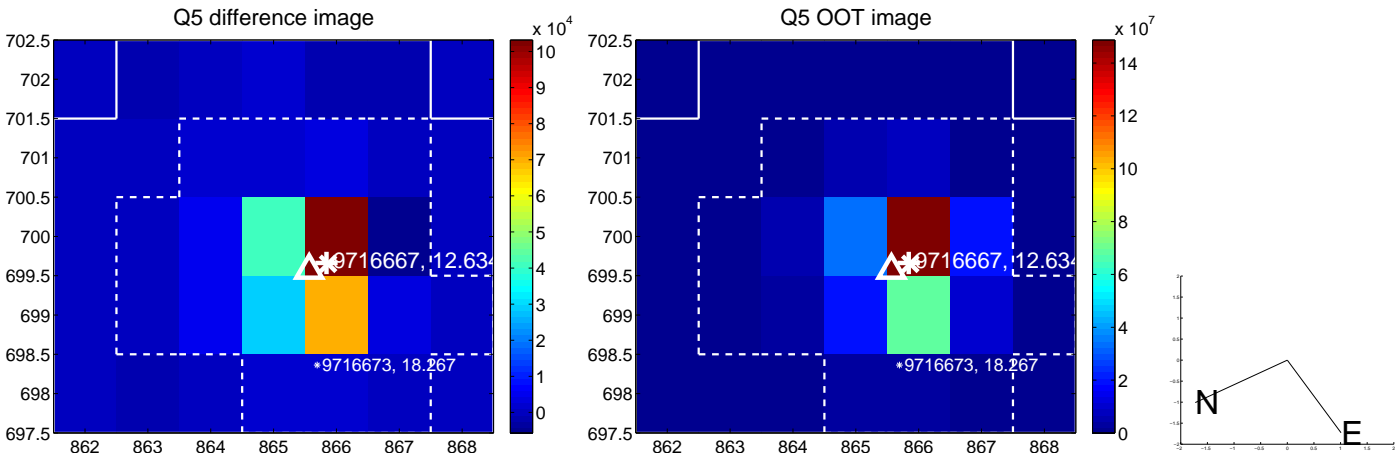


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

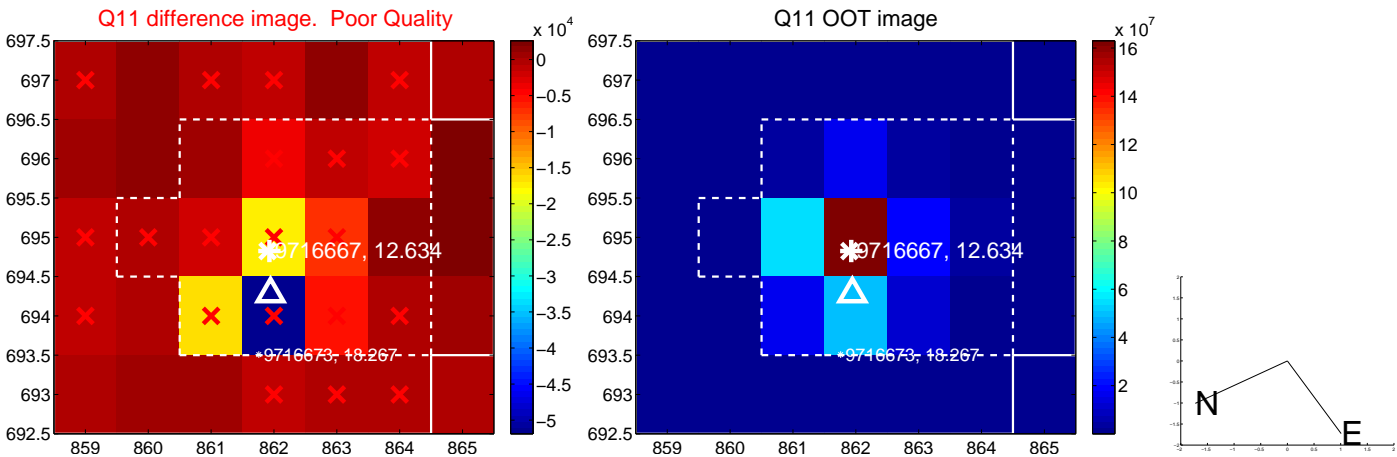
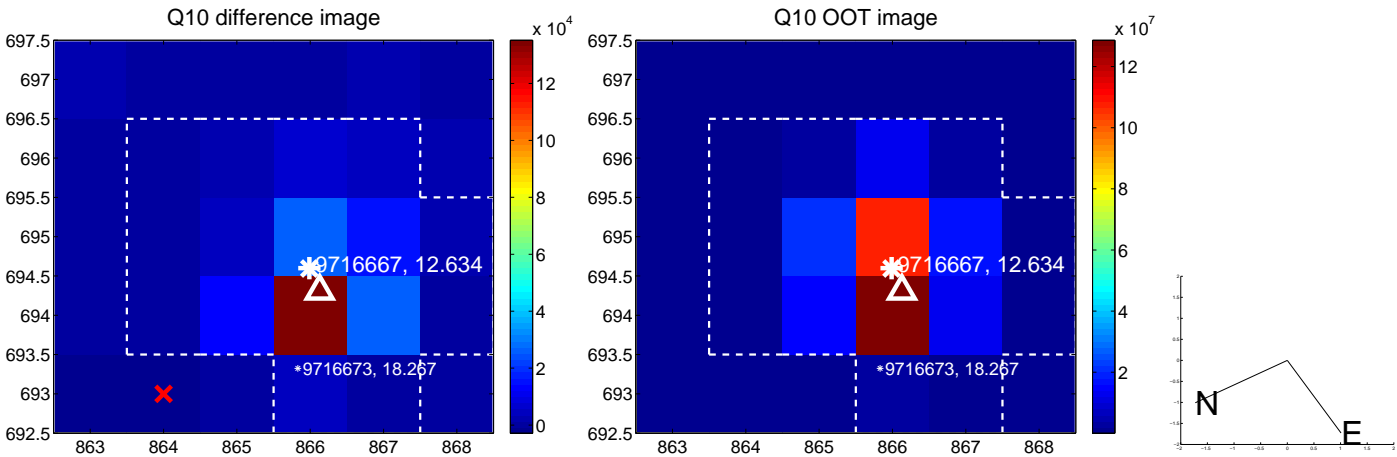
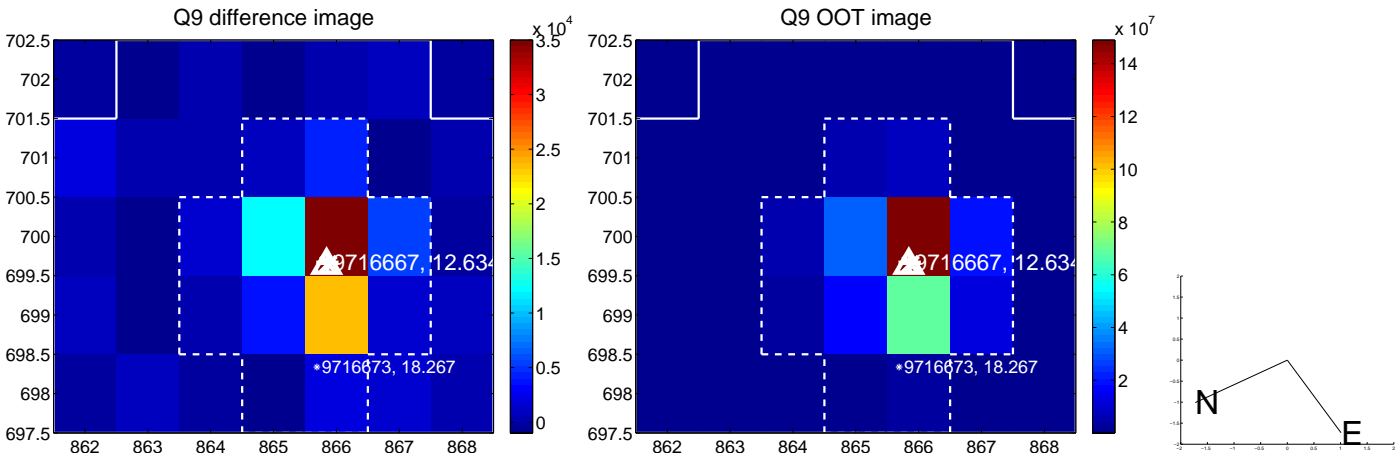
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



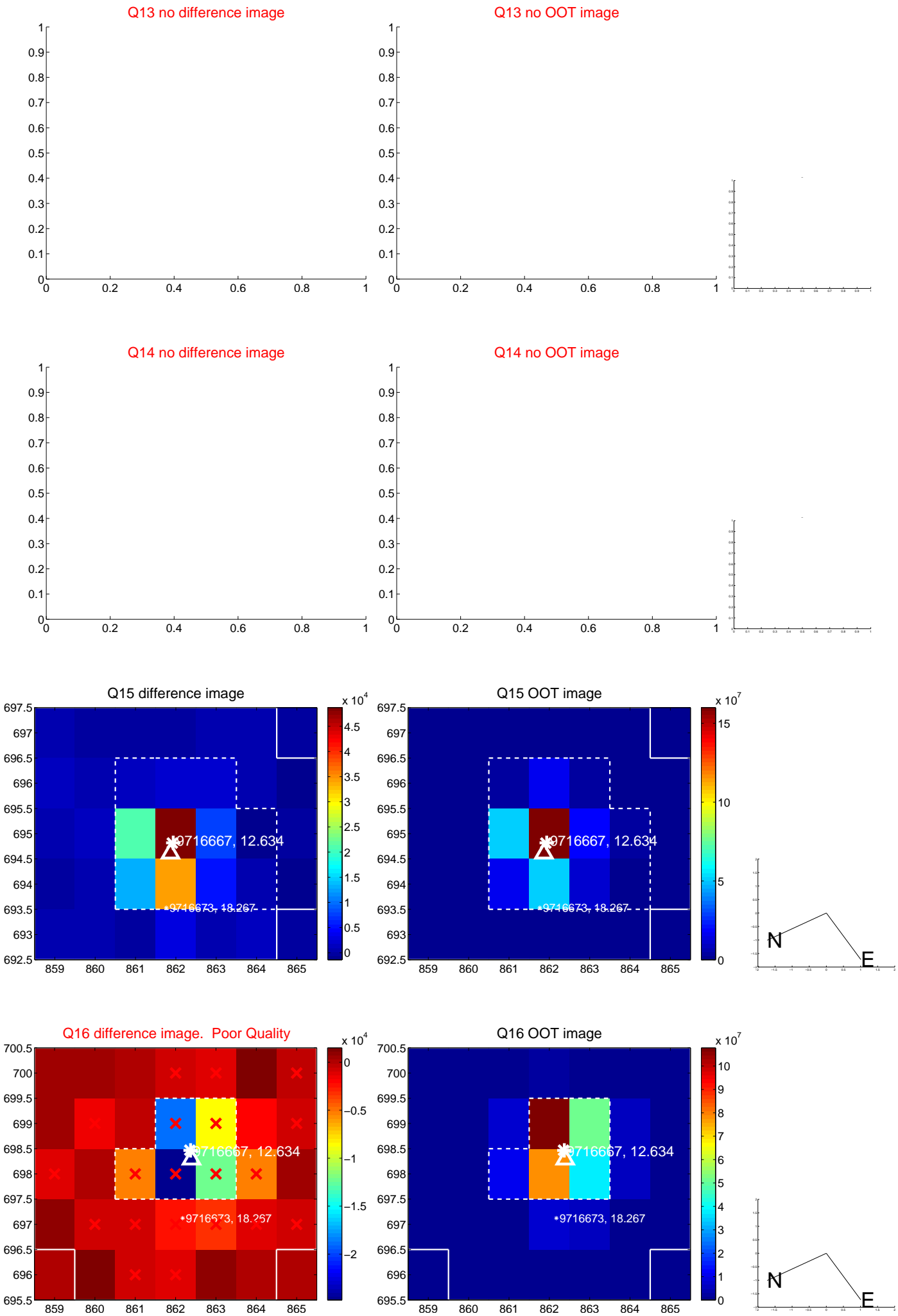
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



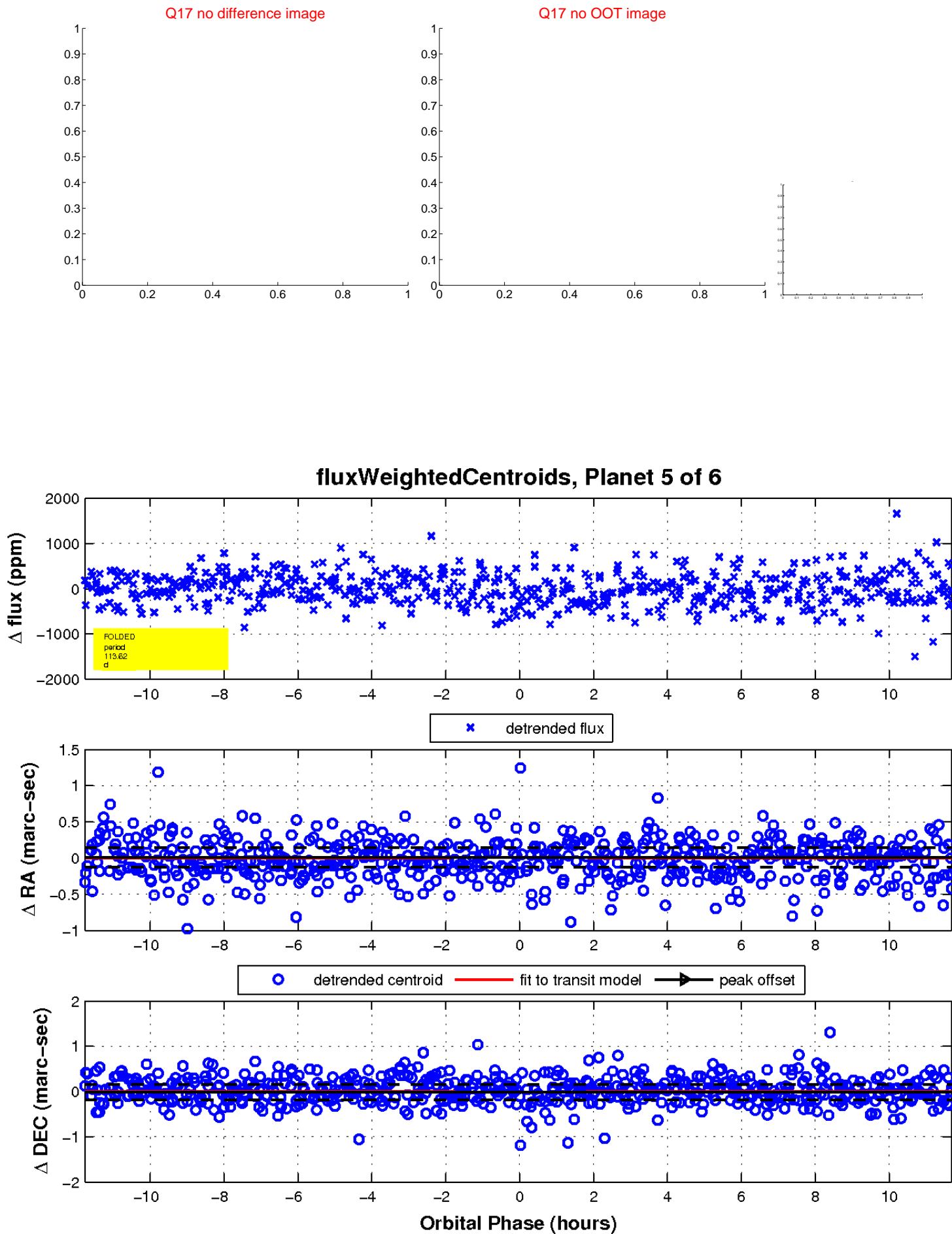
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

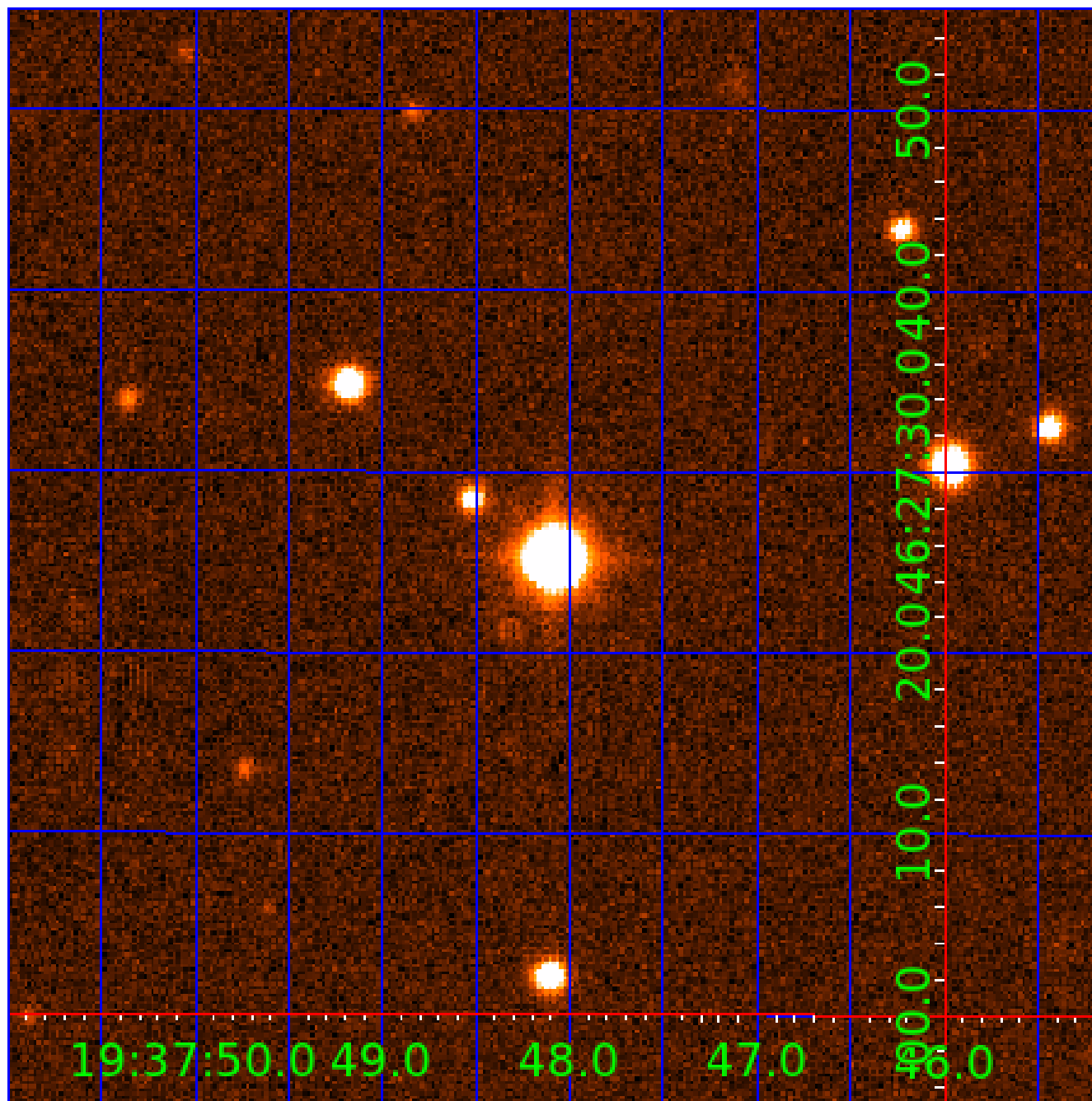


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009716667

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})
009716667-01	OBS	No	0.793406	131.591484	34.3	2.436	9.6	7.9	1.92	7584	1.30	27217.33
009716667-02	OBS	No	1.174248	131.548562	58.4	5.790	10.1	10.9	1.92	7584	1.49	16137.12
009716667-03	OBS	No	3.525049	132.017709	91.4	7.418	8.5	8.7	1.92	7584	2.12	3726.37
009716667-04	OBS	No	139.688601	175.683971	494.9	3.501	8.4	7.4	1.92	7584	4.62	27.58
009716667-05	OBS	No	113.619424	138.786926	485.9	3.924	8.1	8.9	1.92	7584	4.52	36.33
009716667-06	OBS	No	49.159354	139.221257	134.2	3.500	7.3	-1.0	1.92	7584	2.26	111.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716667-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009716667-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009716667-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
009716667-04	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
009716667-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
009716667-06	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_NOFITS

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

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

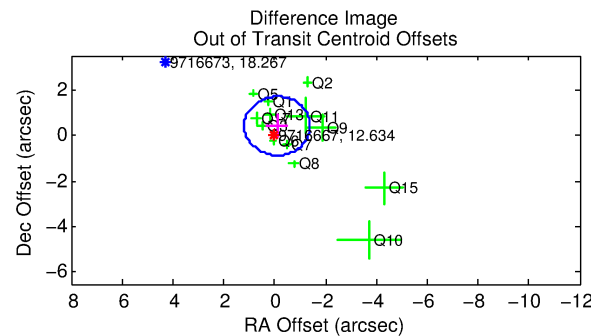
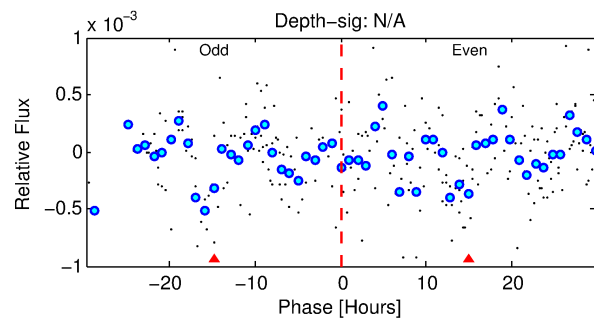
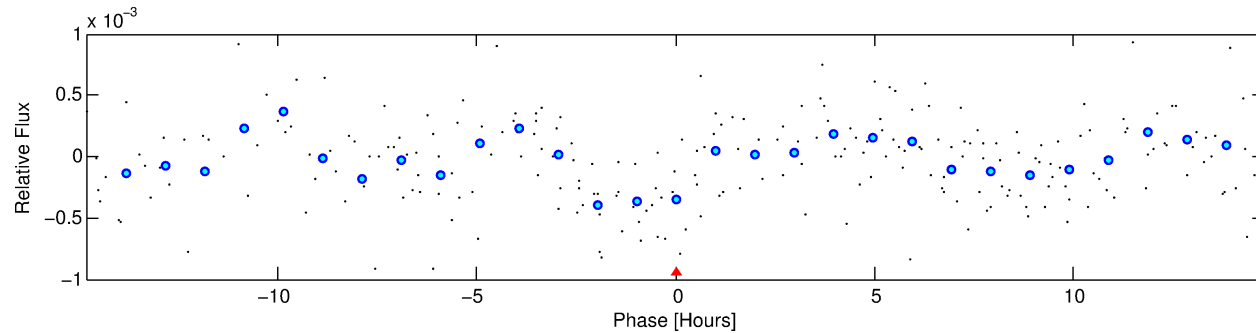
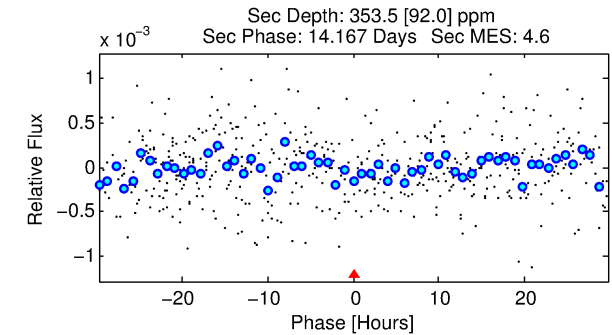
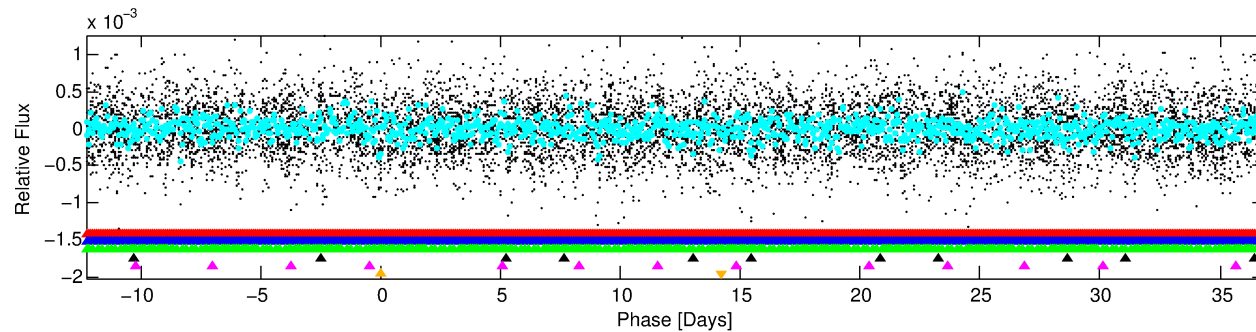
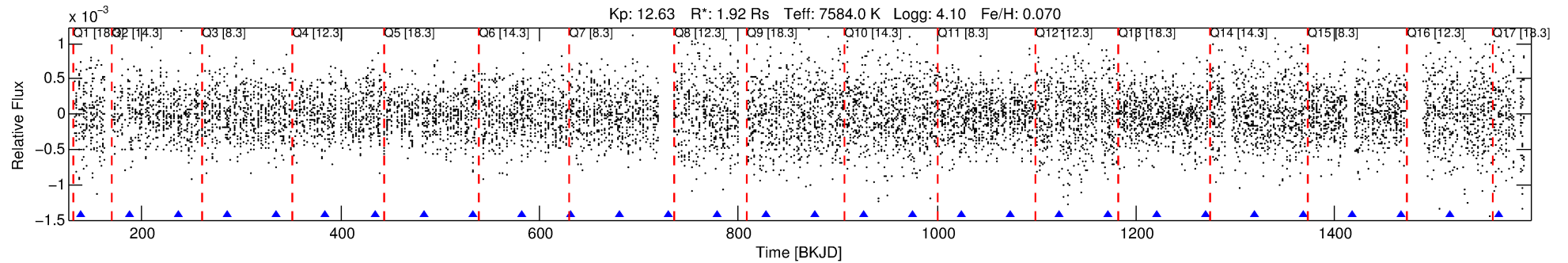
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716667-06

No Significant Match Found

DV One-Page Summary

KIC: 9716667 Candidate: 6 of 6 Period: 49.159 d



TPS TCE Results:

Period = 49.15935 d
Epoch = 139.2213 BKJD

DV fit results are unavailable

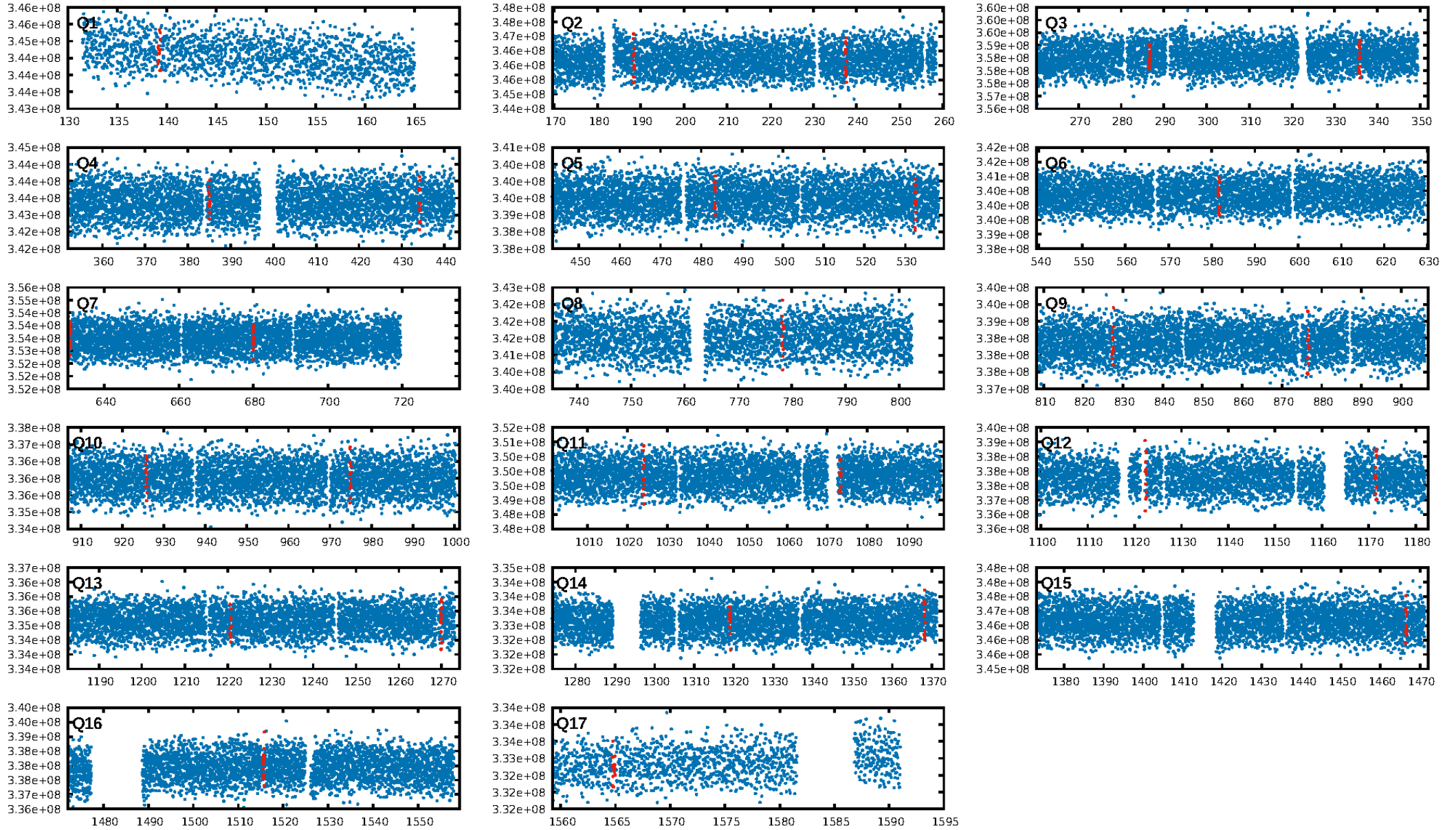
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [133.53 σ]
LongPeriod-sig: 100.0% [294.23 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: -0.7503
Centroid-sig: 0.4%
Centroid-so: 0.269 arcsec [1.78 σ]
OotOffset-rm: 0.433 arcsec [1.01 σ]
KicOffset-rm: 0.401 arcsec [0.96 σ]
OotOffset-st: 3/4/1/5 [13]
KicOffset-st: 3/4/1/5 [13]
DiffImageQuality-fgm: 0.62 [8/13]
DiffImageOverlap-fno: 0.00 [0/15]

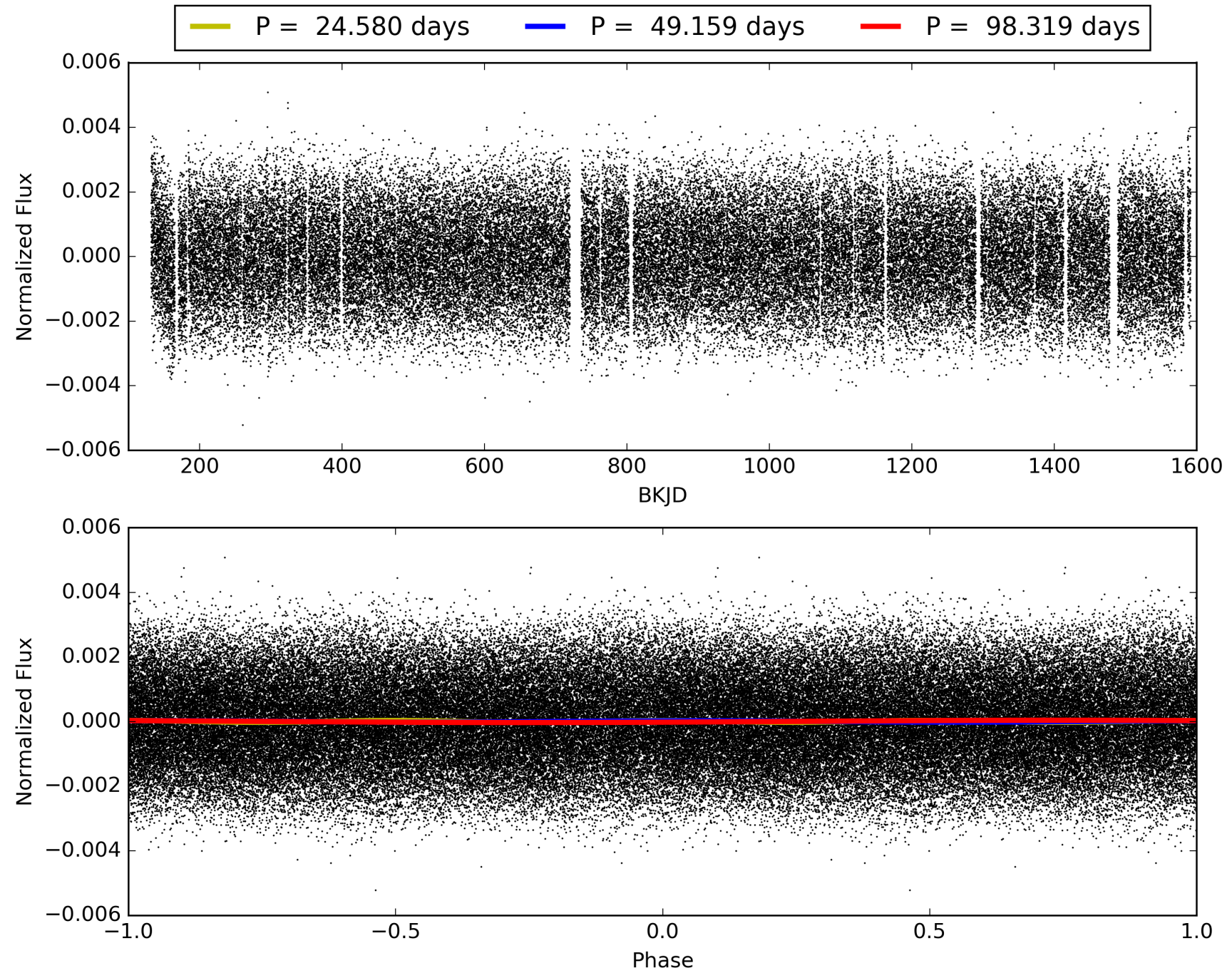
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:17:54 Z

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

TCE 009716667-06, PDC Light Curves

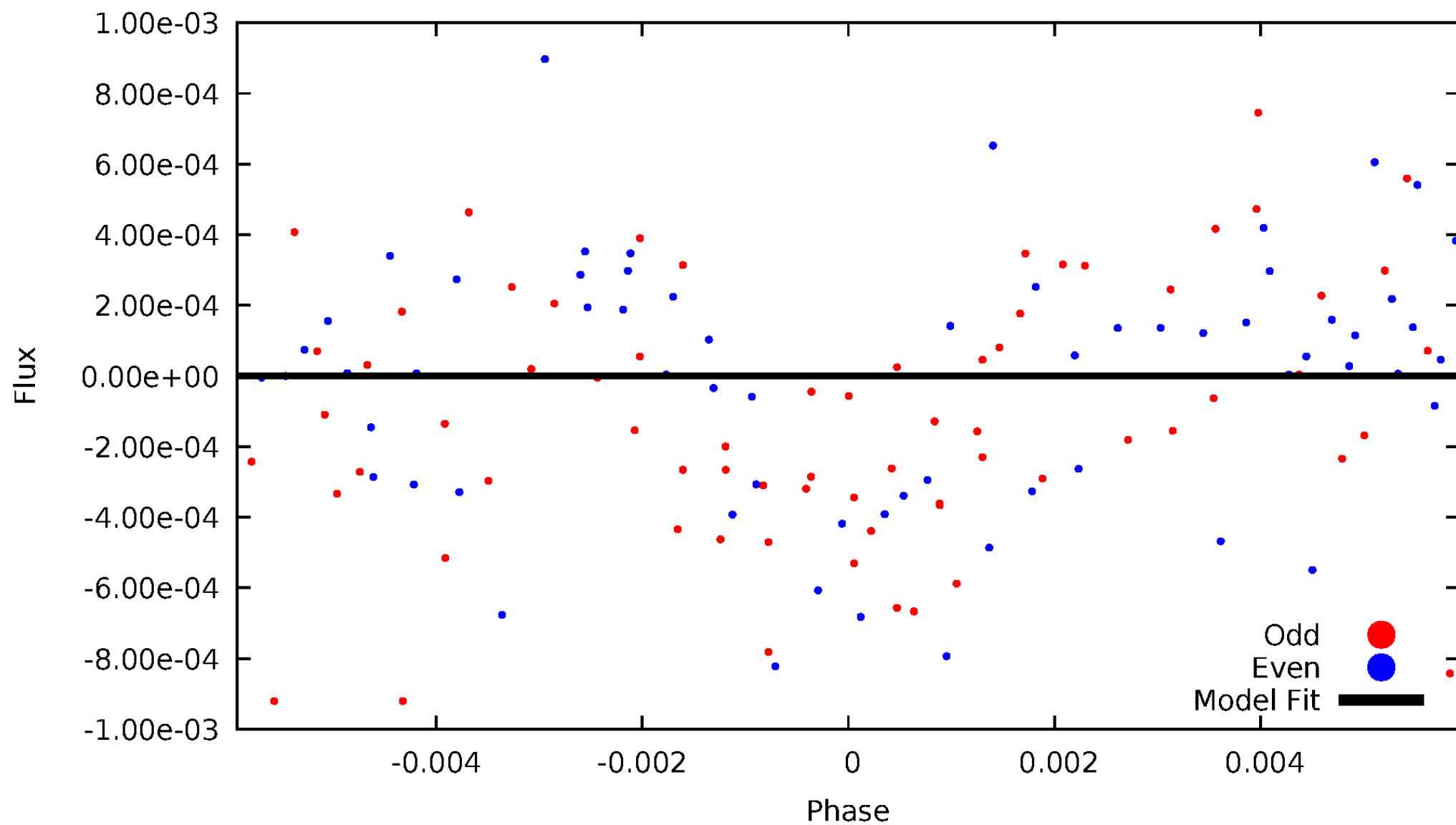


TCE 009716667-06



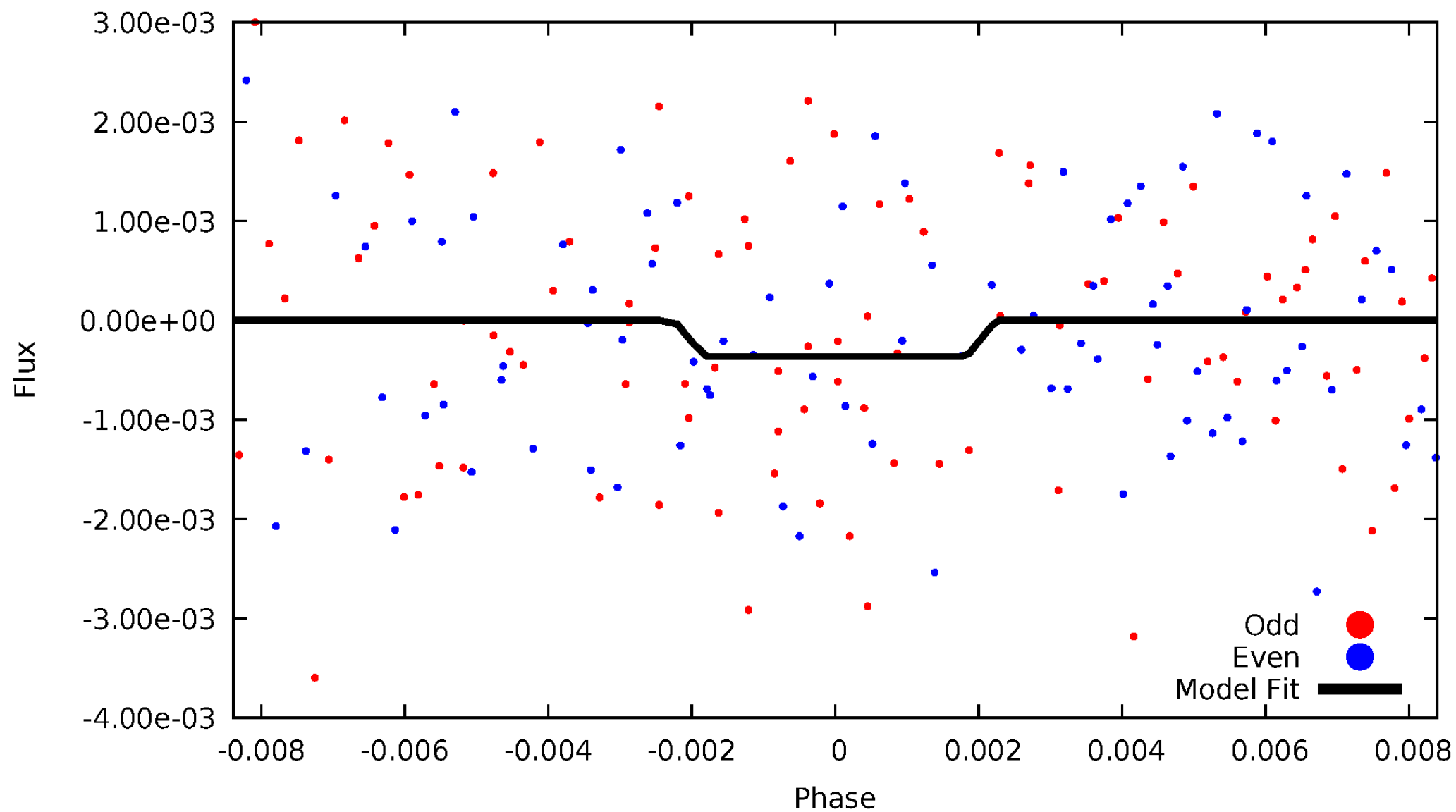
DV Odd/Even

TCE 009716667-06



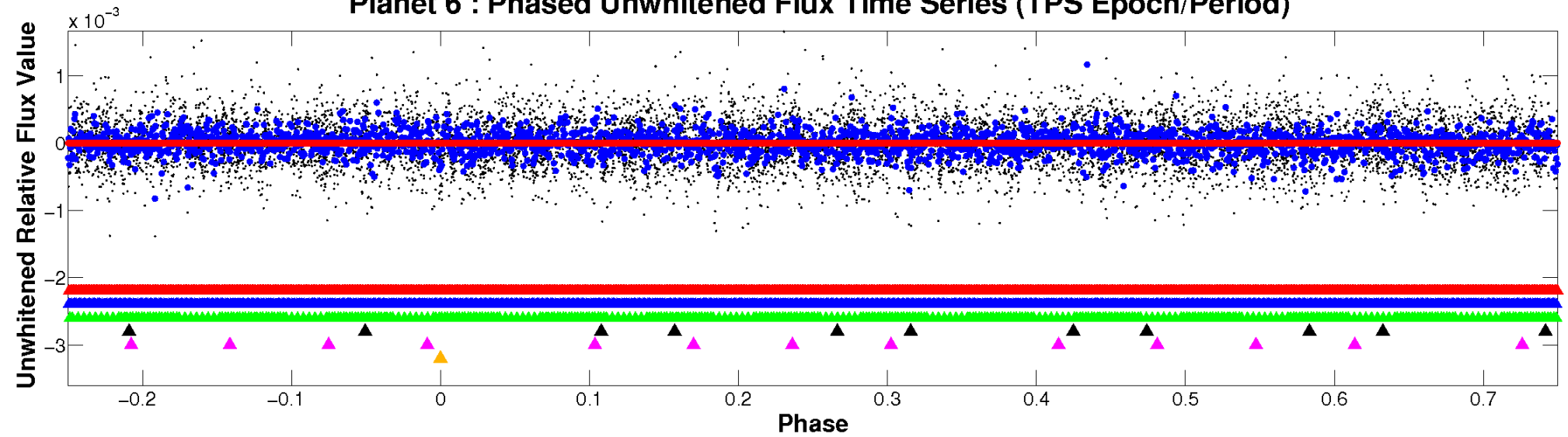
ALT Odd/Even

TCE 009716667-06

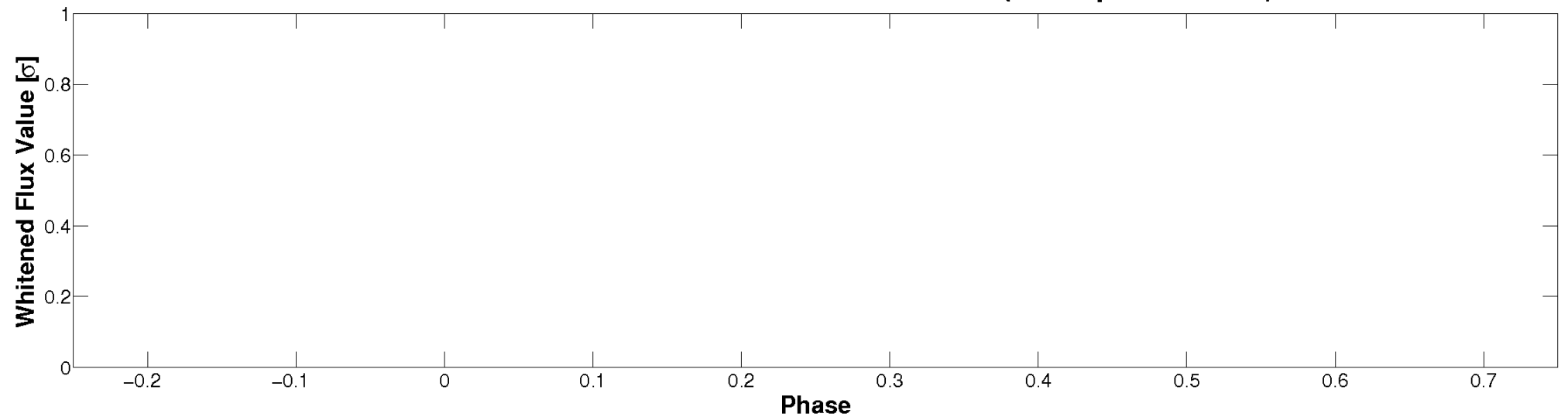


Non-Whitened Vs. Whitened Light Curve

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

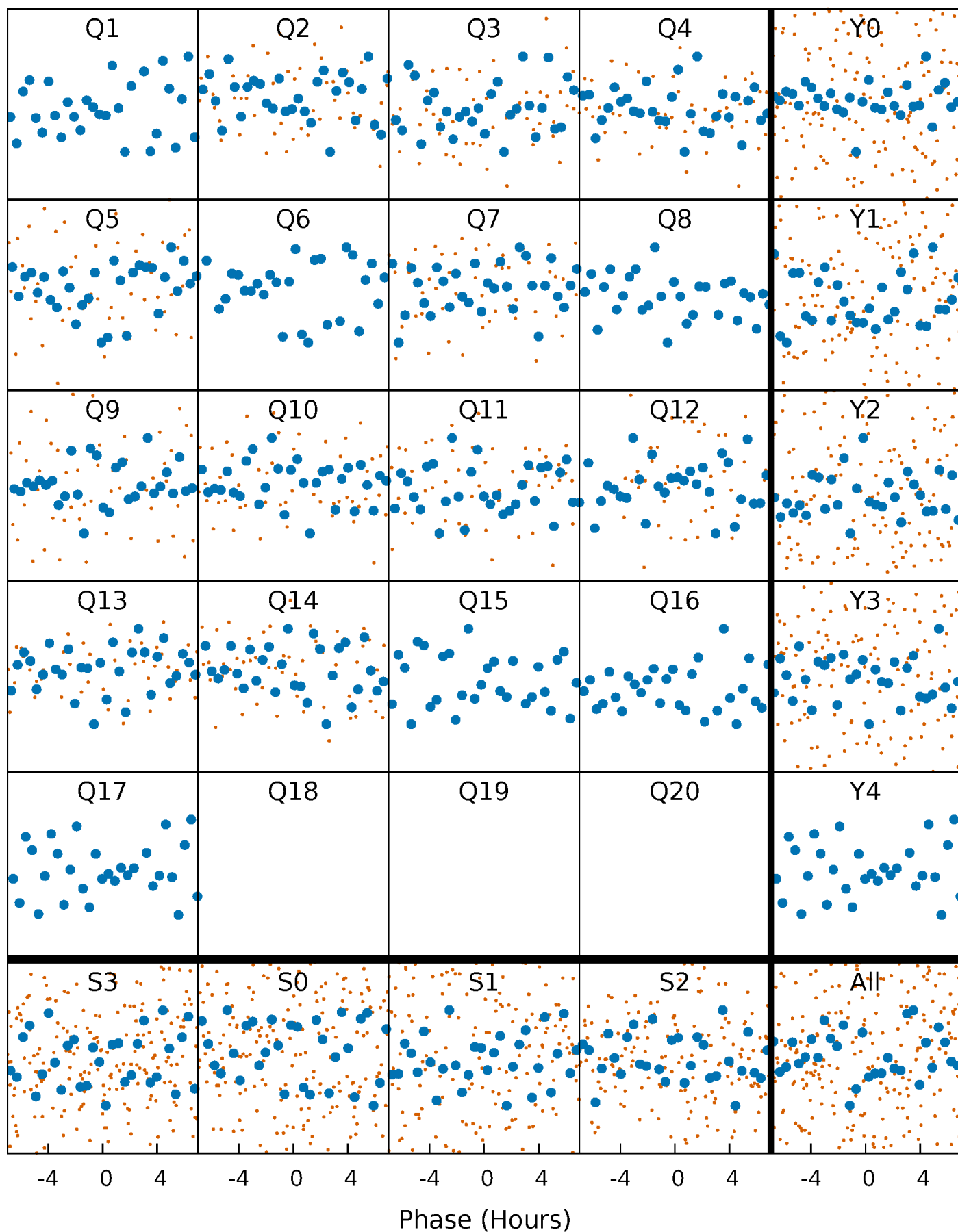


Planet 6 : Phased Whitened Flux Time Series (TPS Epoch/Period)



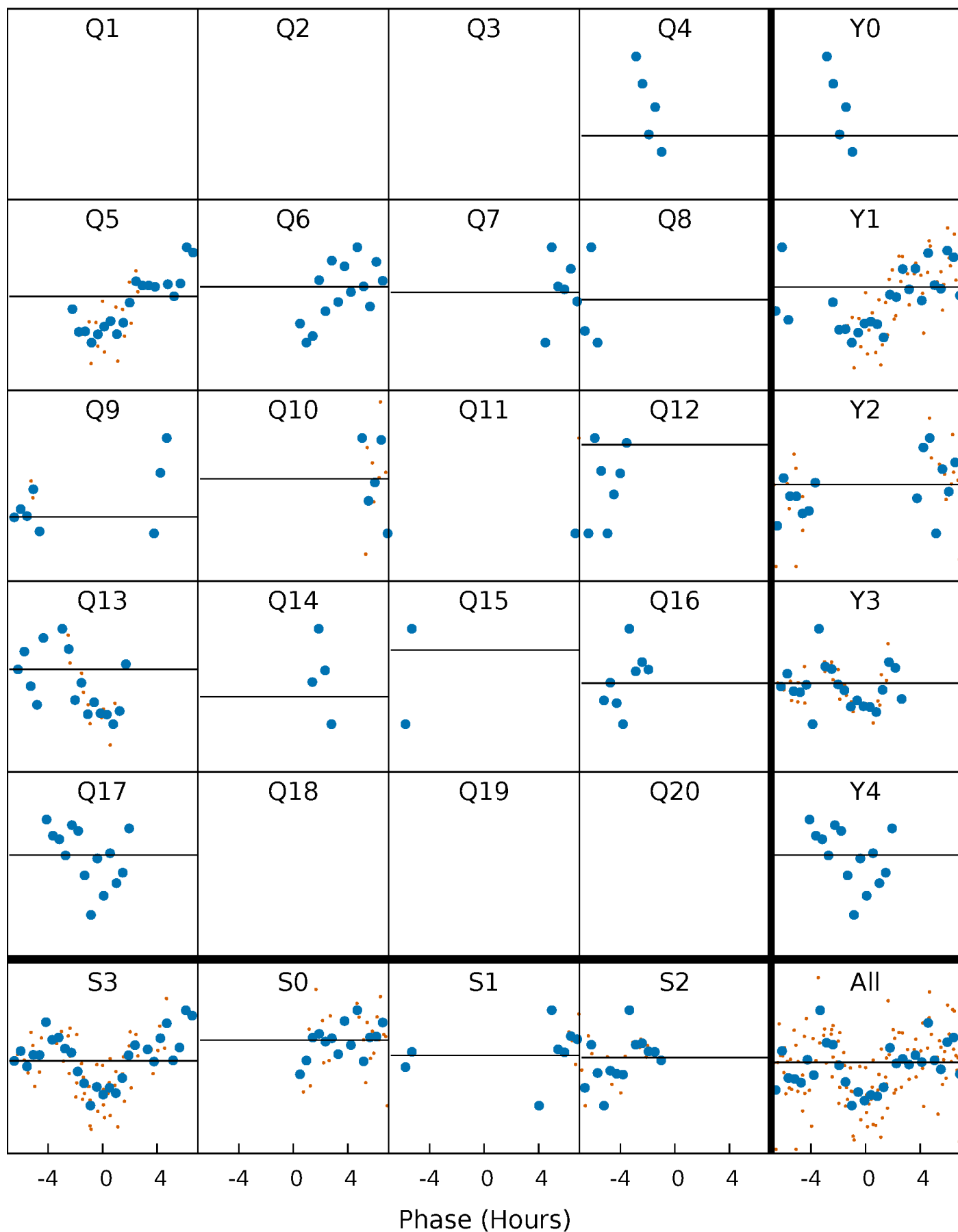
PDC Quarter-Phased Transit Curves

TCE 009716667-06 P= 49.159354 Days $T_0=139.221257$ (BKJD)



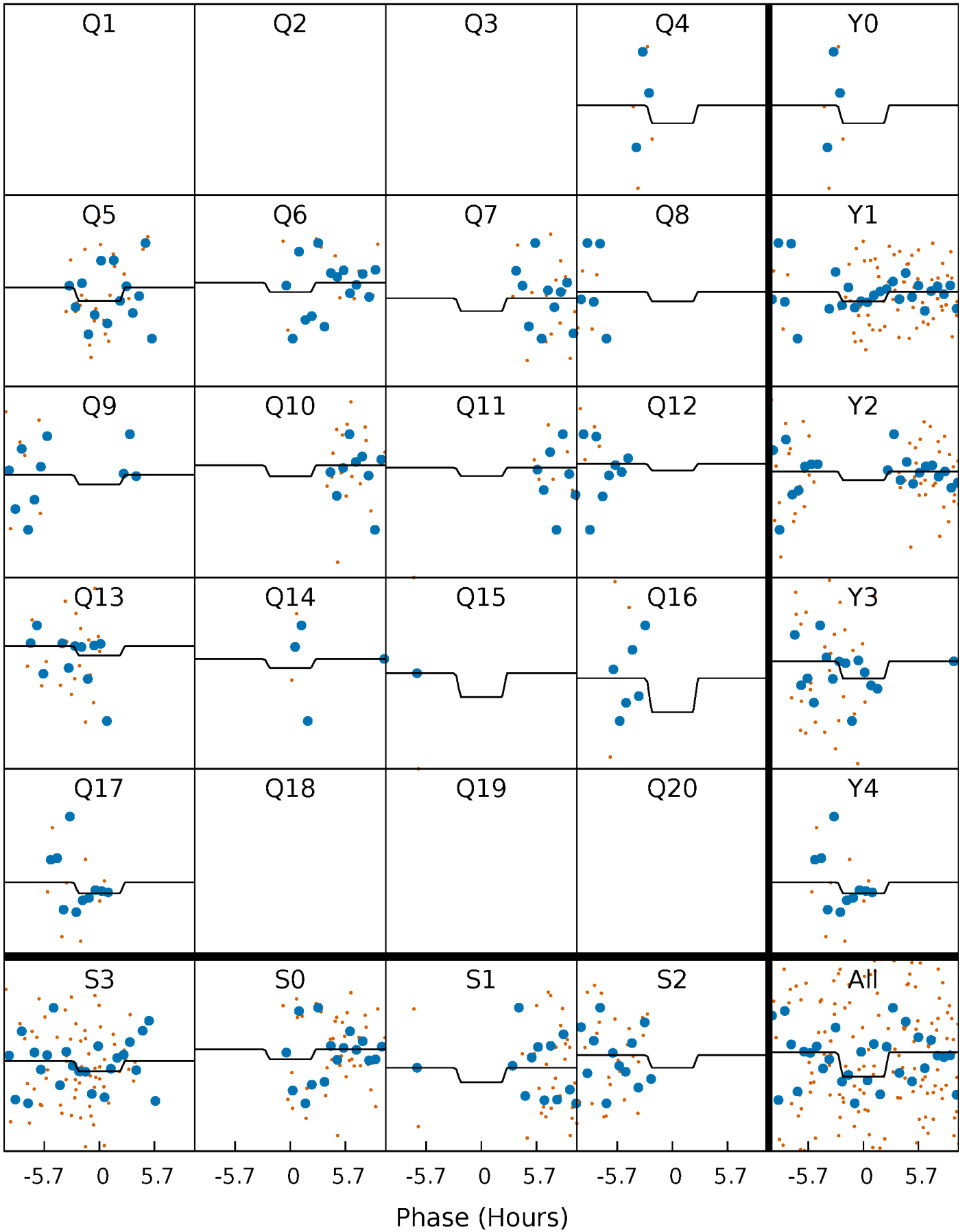
DV Quarter-Phased Transit Curves

TCE 009716667-06 $P = 49.159354$ Days $T_0 = 139.221257$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

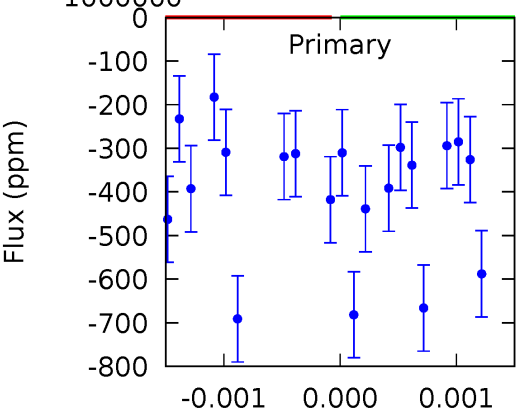
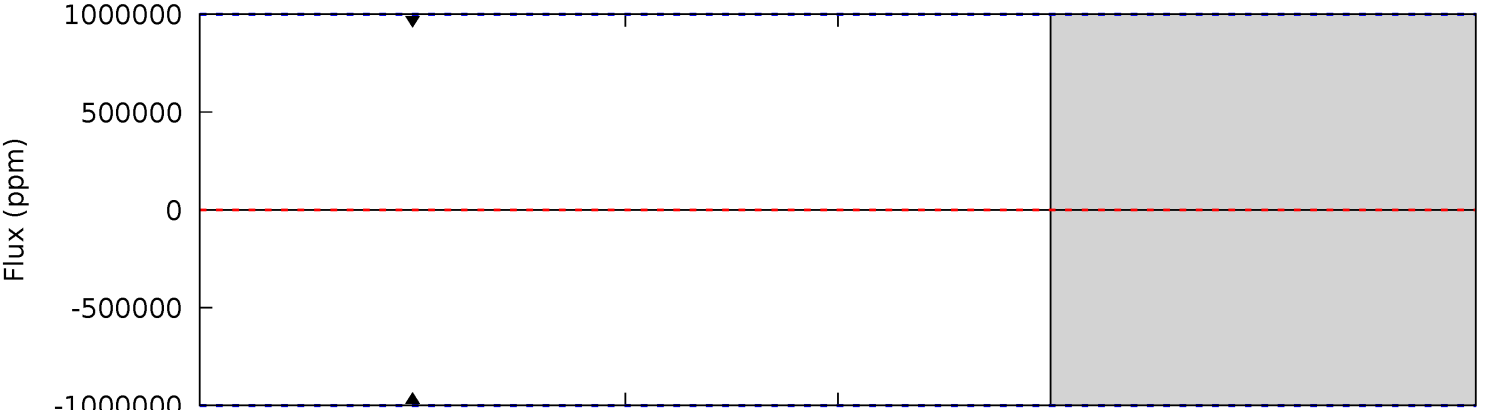
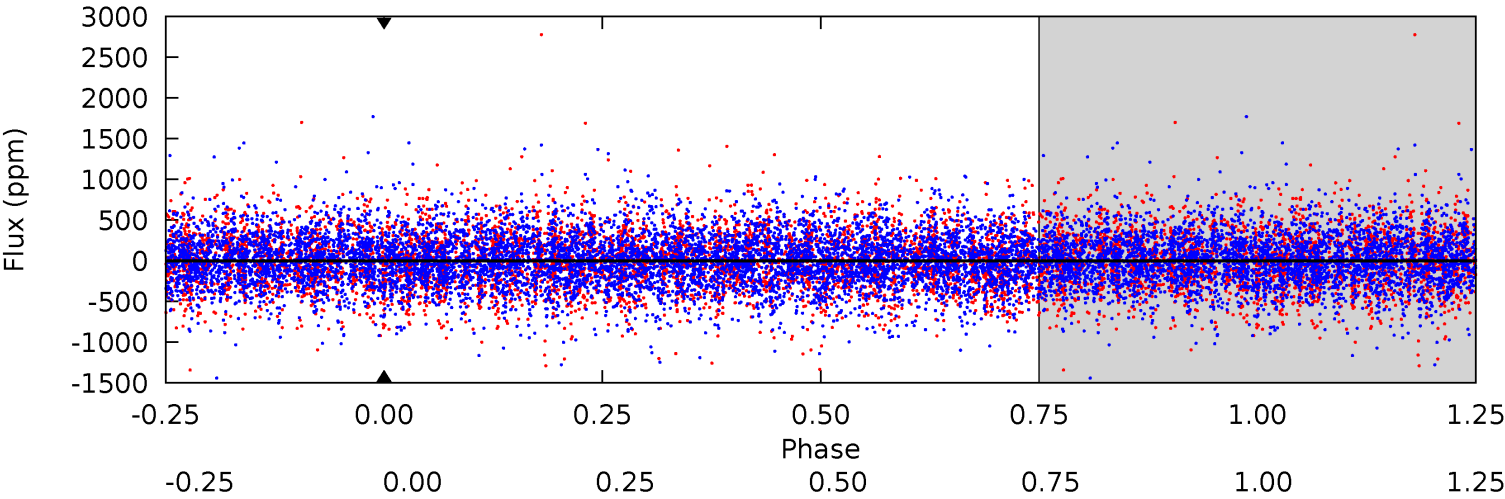
TCE 009716667-06 $P = 49.159354$ Days $T_0 = 139.263000$ (BKJD)



DV Model-Shift Uniqueness Test

009716667-06, P = 49.159354 Days, E = 90.061903 Days

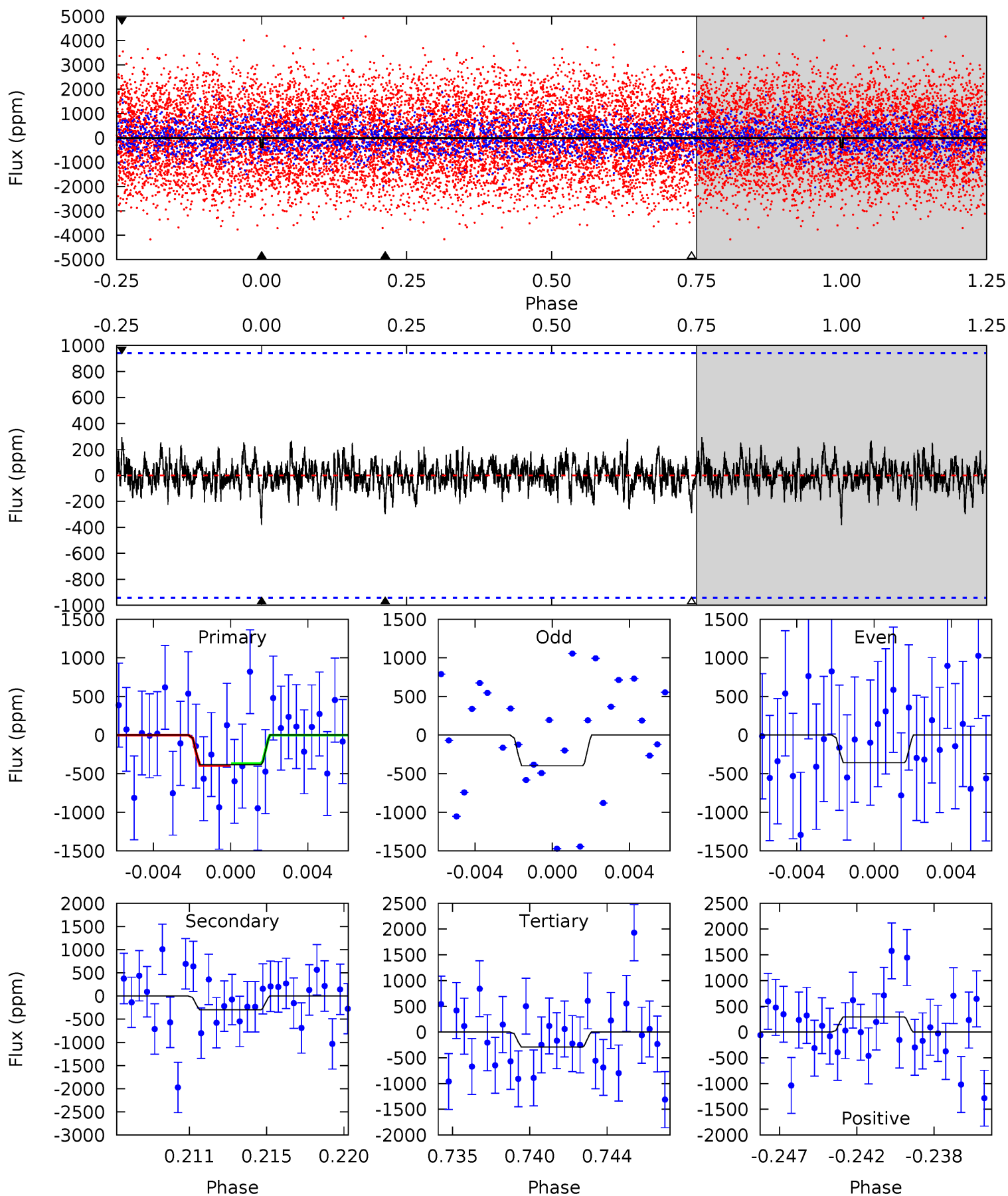
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009716667-06, P = 49.159354 Days, E = 90.103646 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.10	1.64	1.60	1.62	5.18	2.84	0.46	0.50	0.48	0.04	0.02	0.11	0.95	0.43	0.07



Stellar Parameters For KIC 009716667

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7584^{+211}_{-316}	$4.103^{+0.135}_{-0.165}$	$0.070^{+0.200}_{-0.350}$	$1.921^{+0.549}_{-0.366}$	$1.705^{+0.204}_{-0.272}$	$0.339^{+0.230}_{-0.159}$
	+3%/-4%	+3%/-4%	+286%/-500%	+29%/-19%	+12%/-16%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009716667-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$15.41^{+16.61}_{-10.98}$	1151^{+83}_{-72}	-6430^{+53805}_{-33050}	$-637.573^{+49994.945}_{-40677.603}$
Alt.	-298 ± 182	$15.71^{+17.04}_{-10.33}$	1151^{+84}_{-69}	3766^{+2188}_{-904}	52^{+457}_{-43}

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

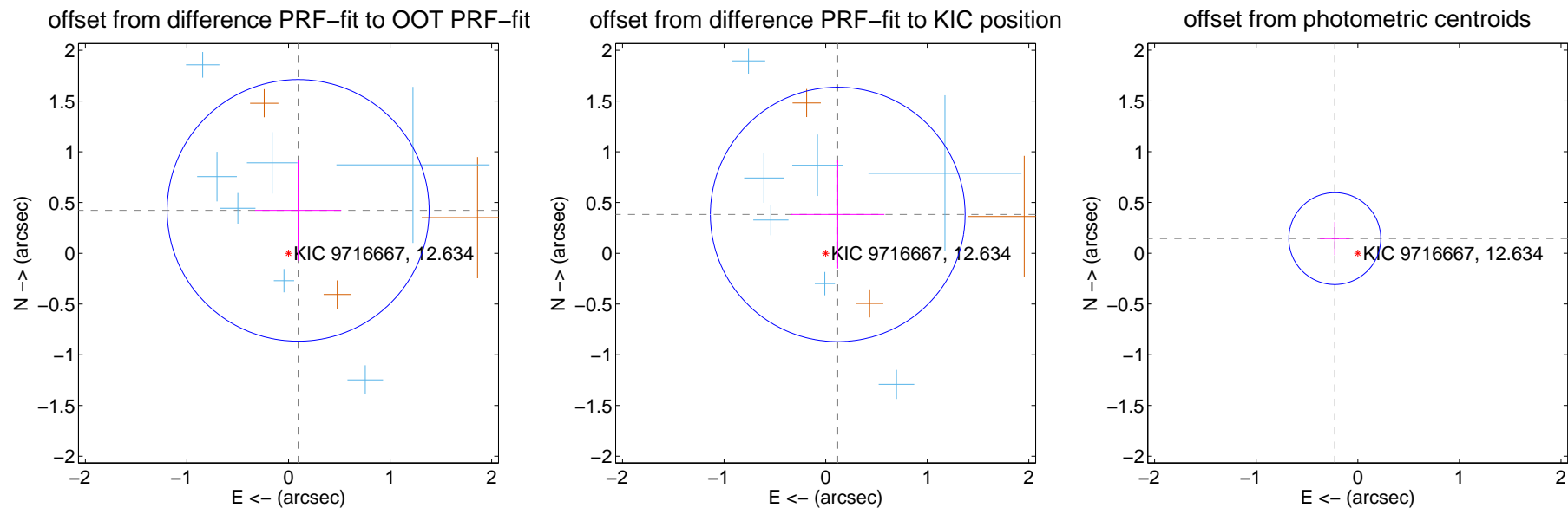
DV Centroid Data

Supplemental centroid analysis for 009716667-06. Kepler magnitude: 12.63. Transit SNR -1.00

There are 8 quarters with good PRF difference image offsets

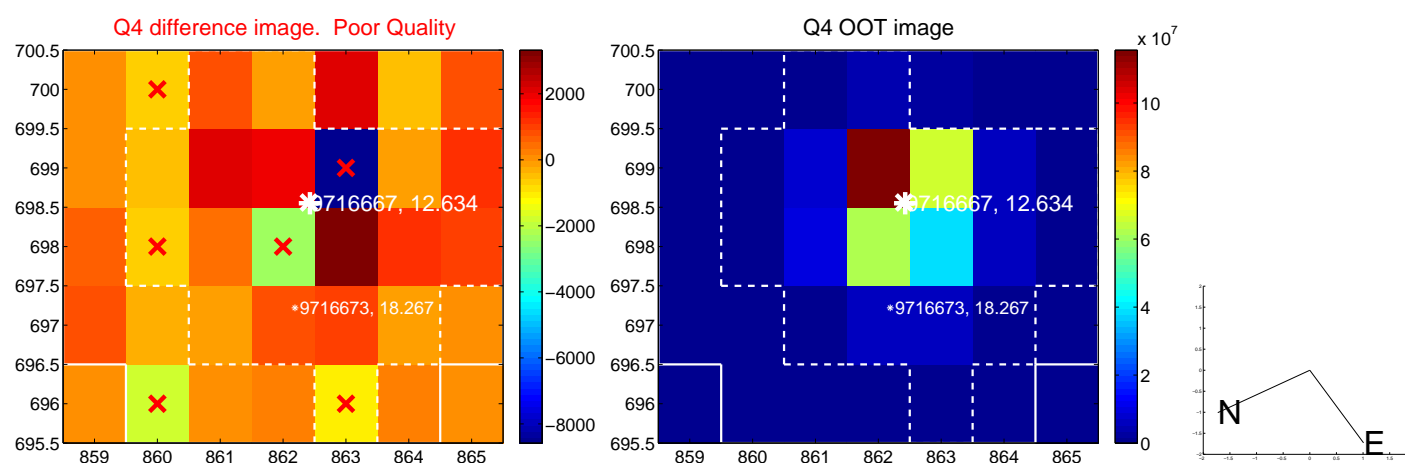
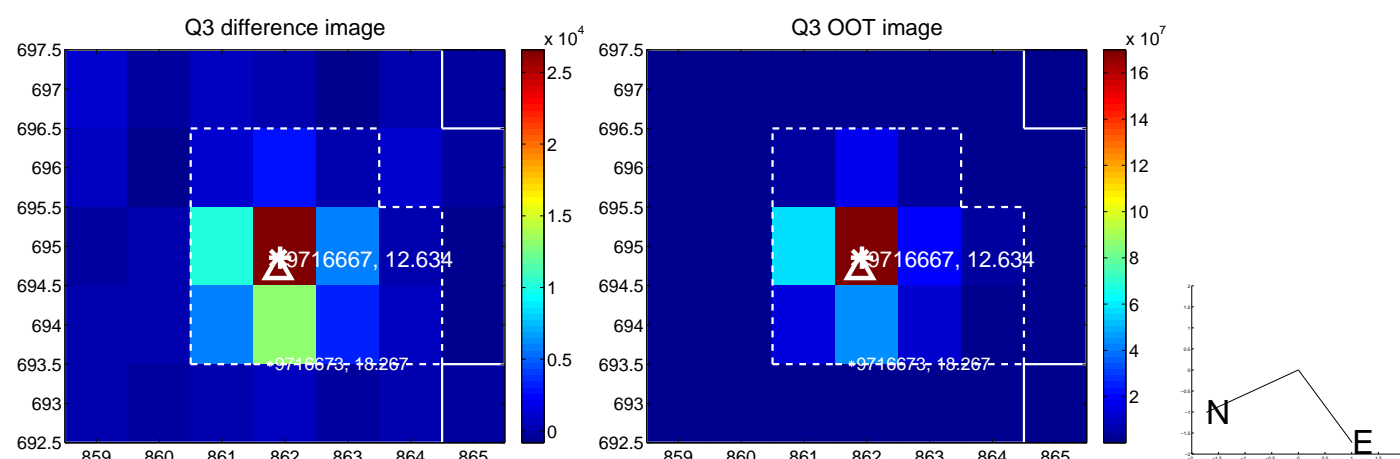
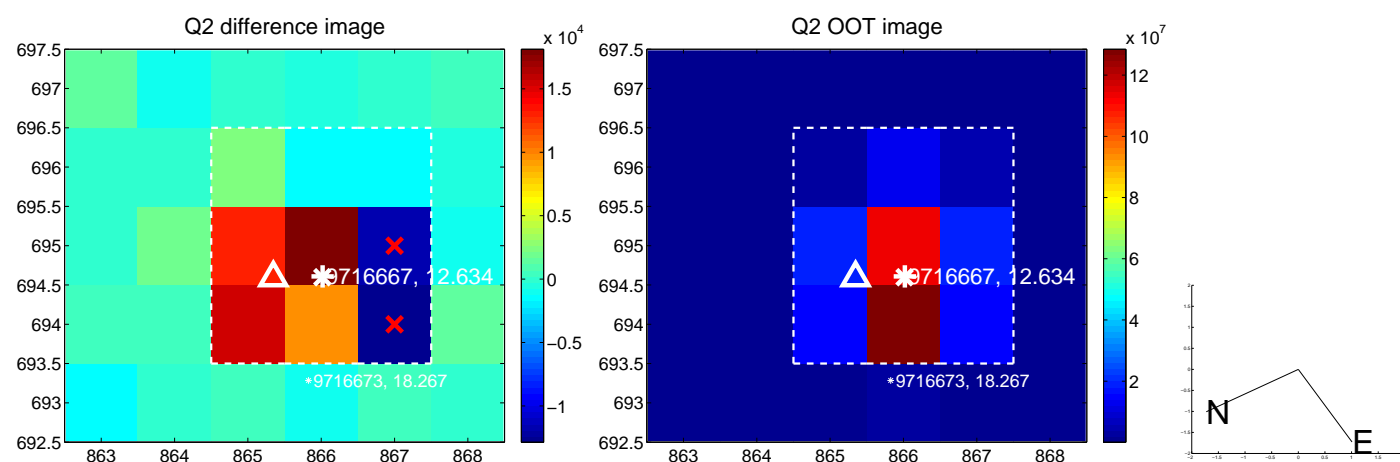
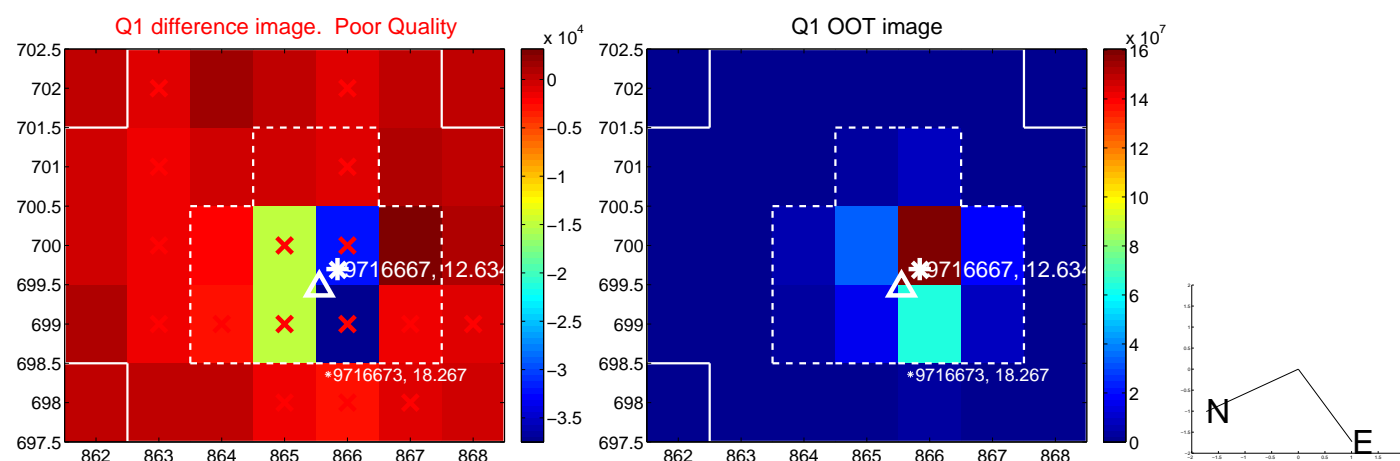
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.433 ± 0.430	1.01	-0.095 ± 0.425	0.423 ± 0.494
PRF-fit source offset from KIC position	0.401 ± 0.418	0.96	-0.119 ± 0.460	0.383 ± 0.533
photometric centroid source offset	0.27 ± 0.15	1.78	0.23 ± 0.15	0.14 ± 0.16

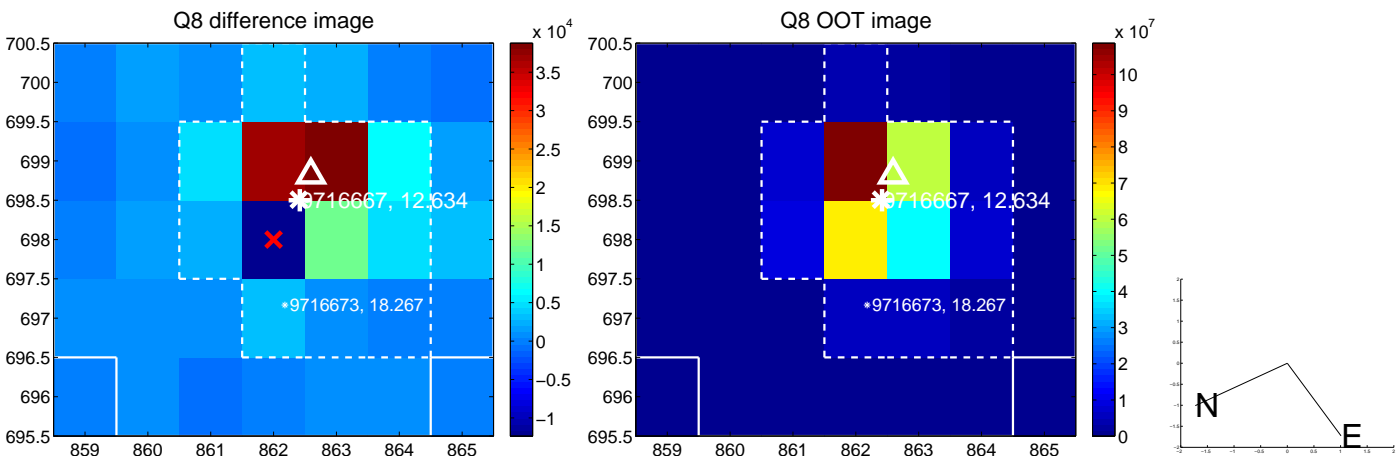
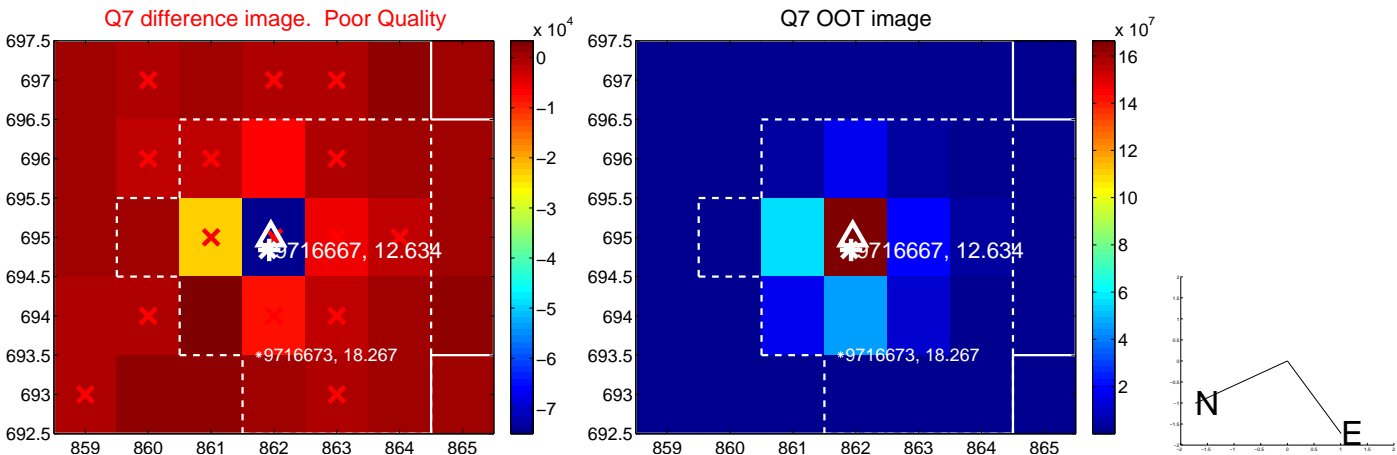
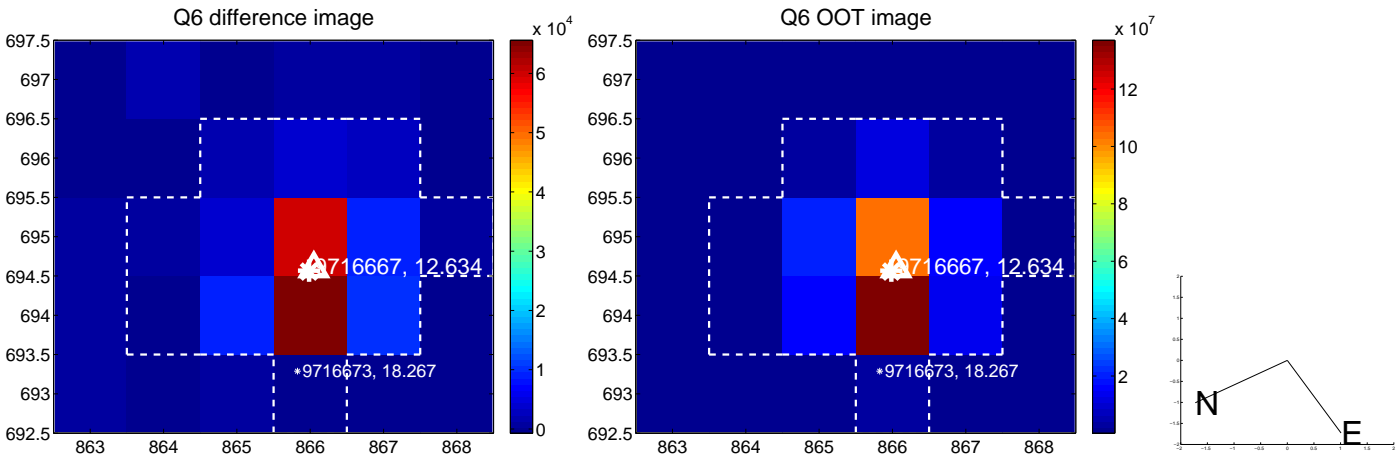
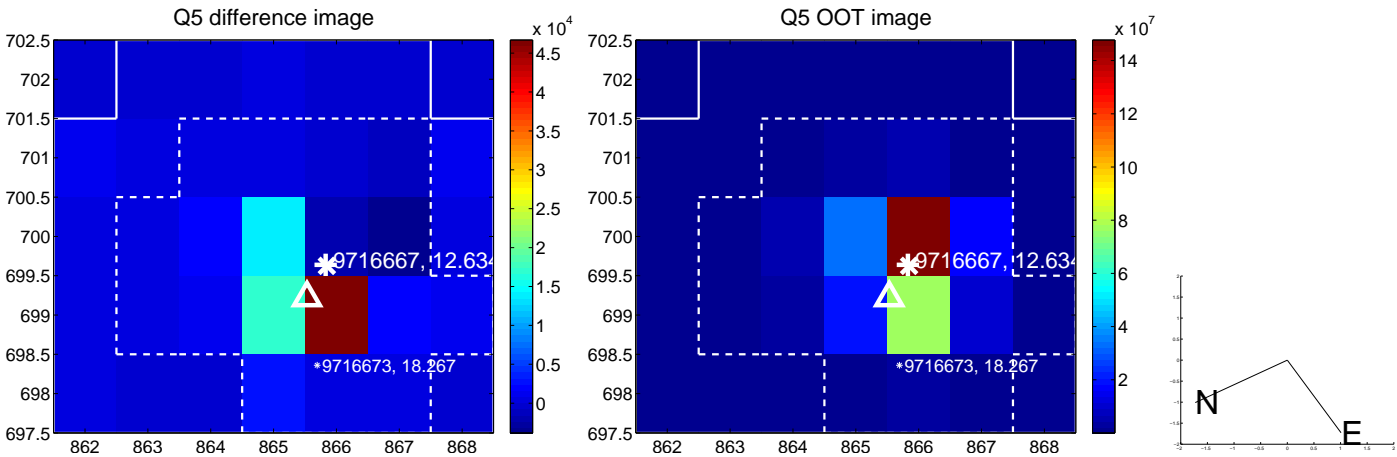


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

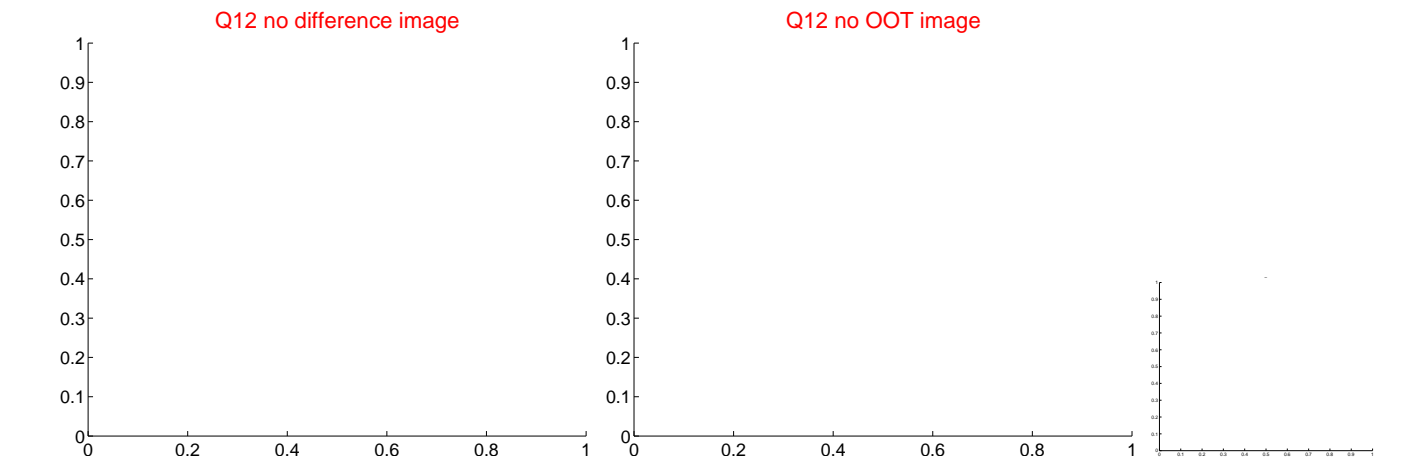
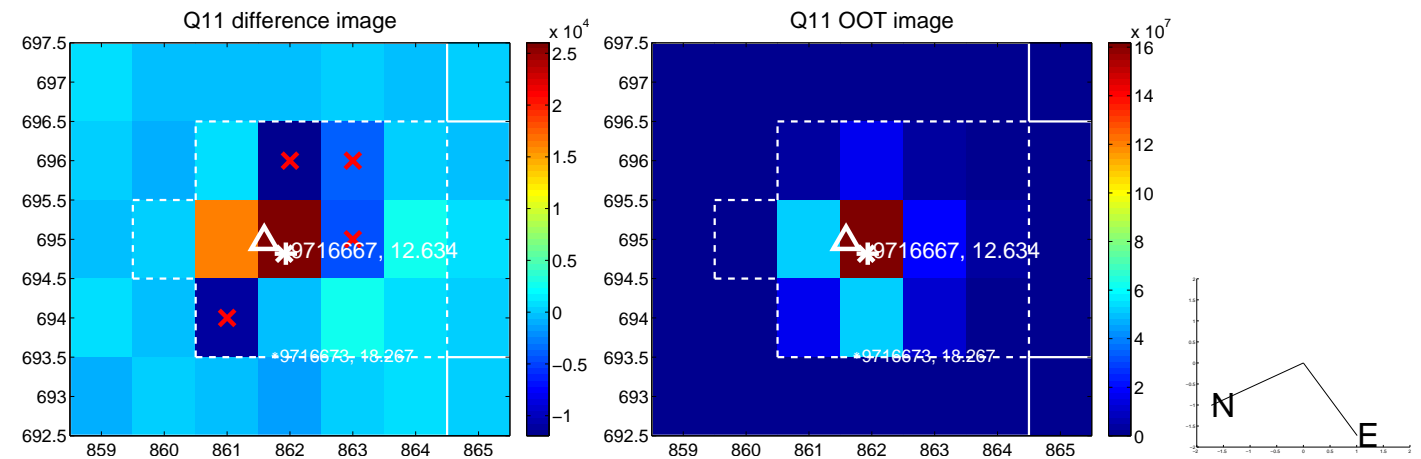
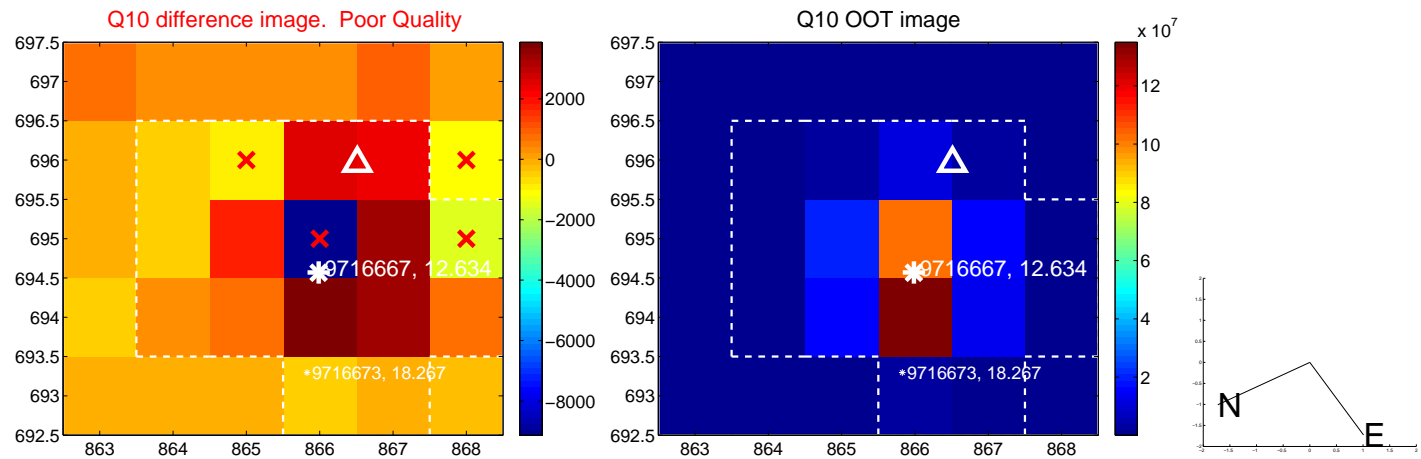
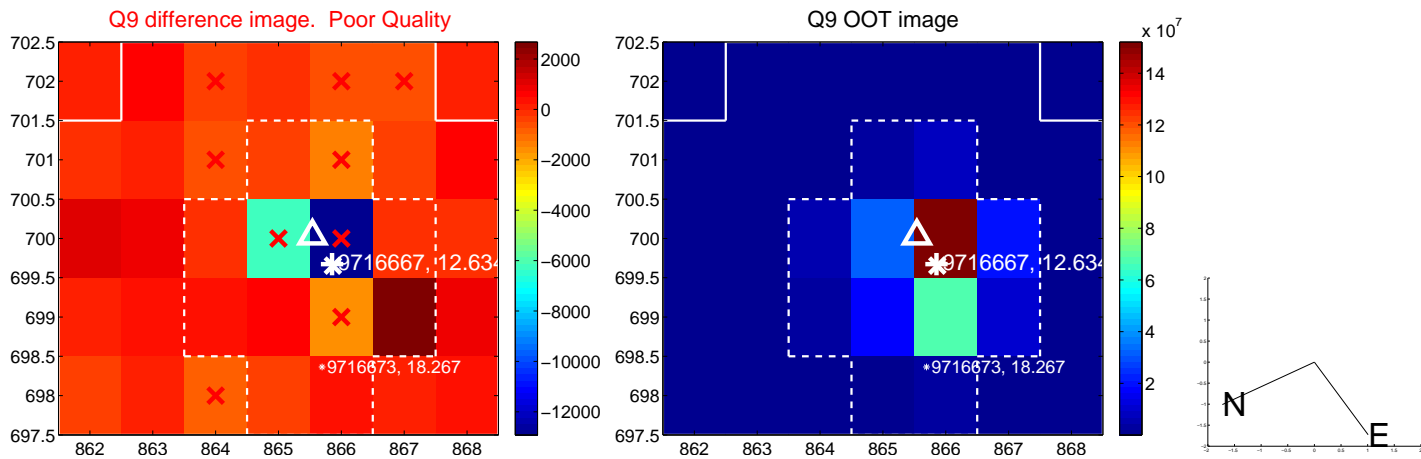
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



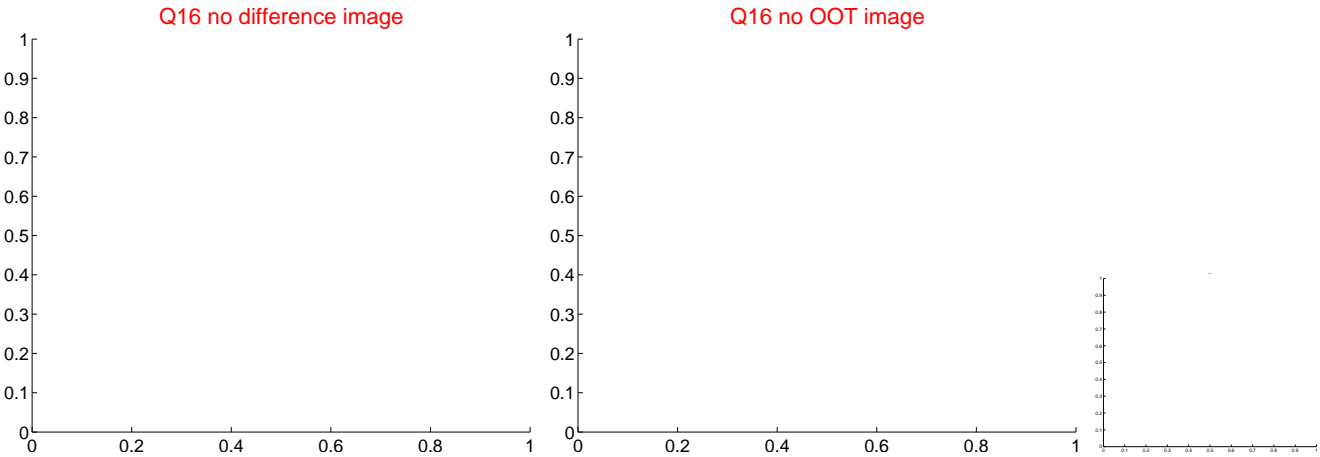
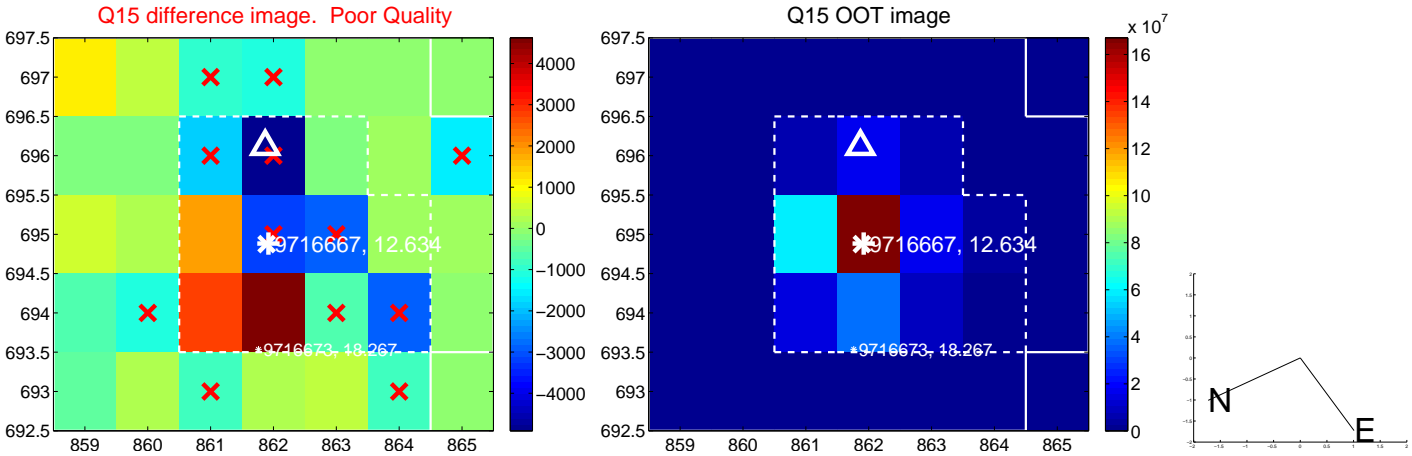
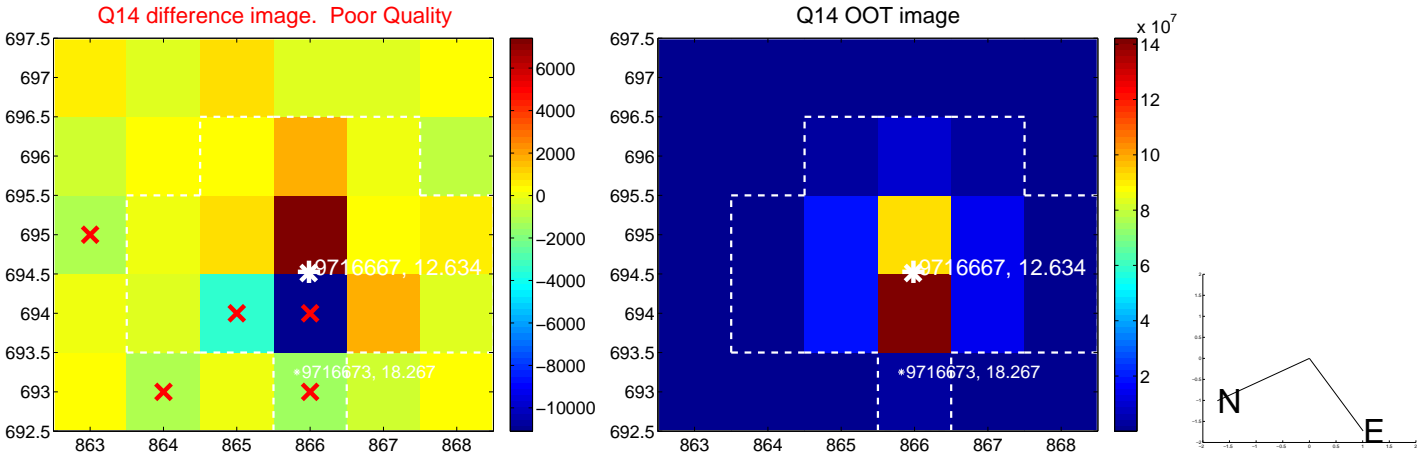
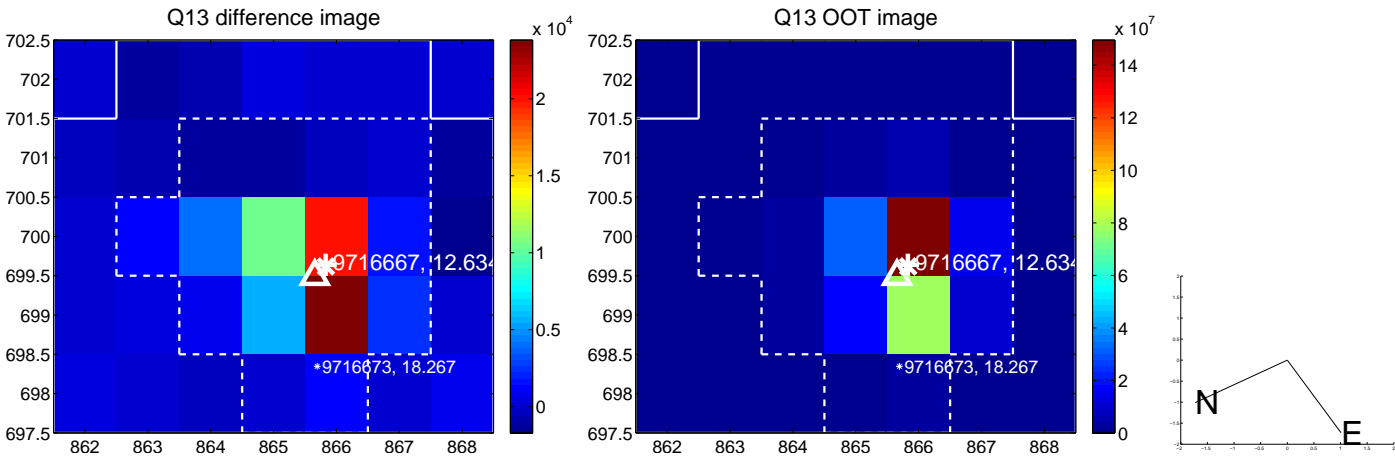
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



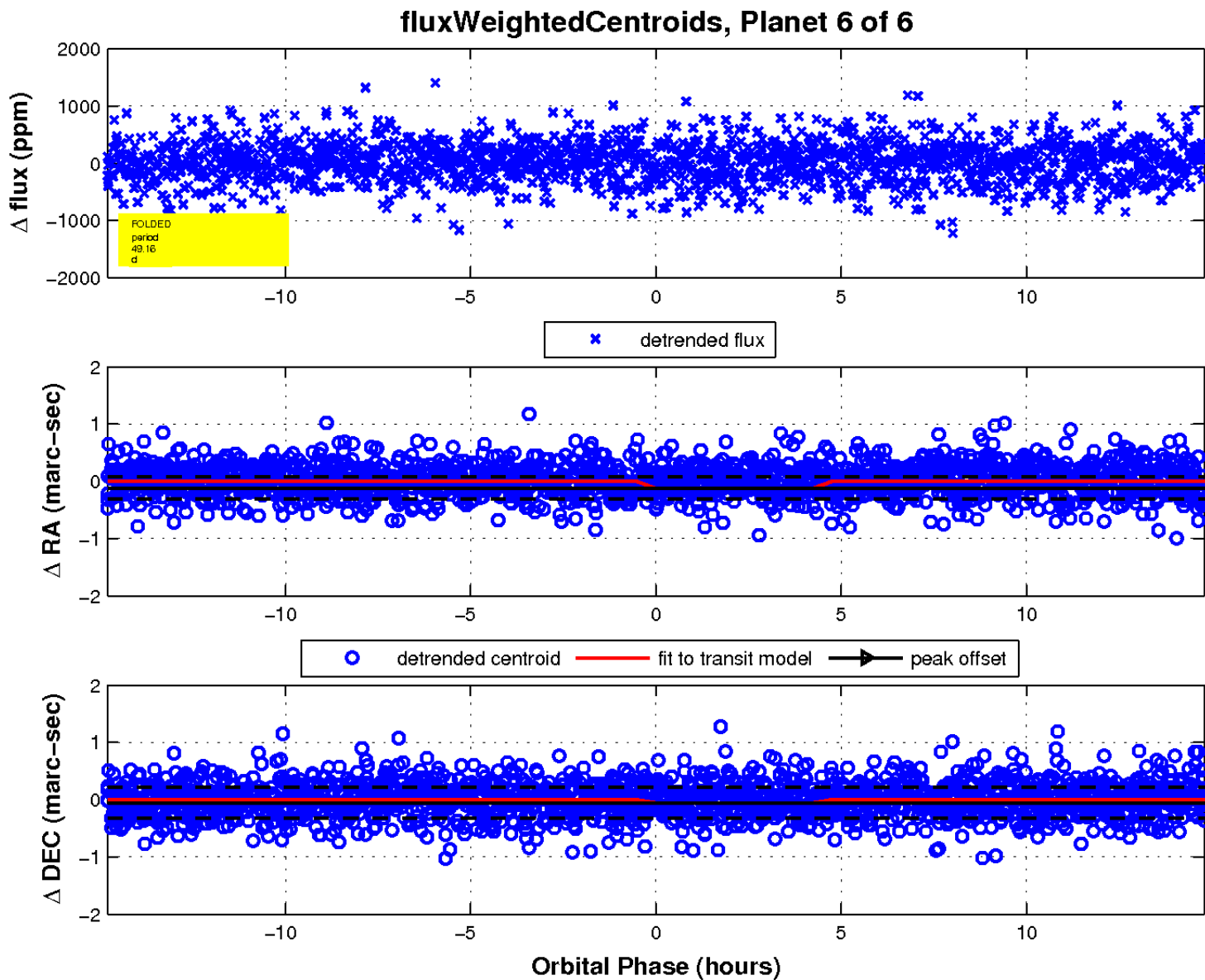
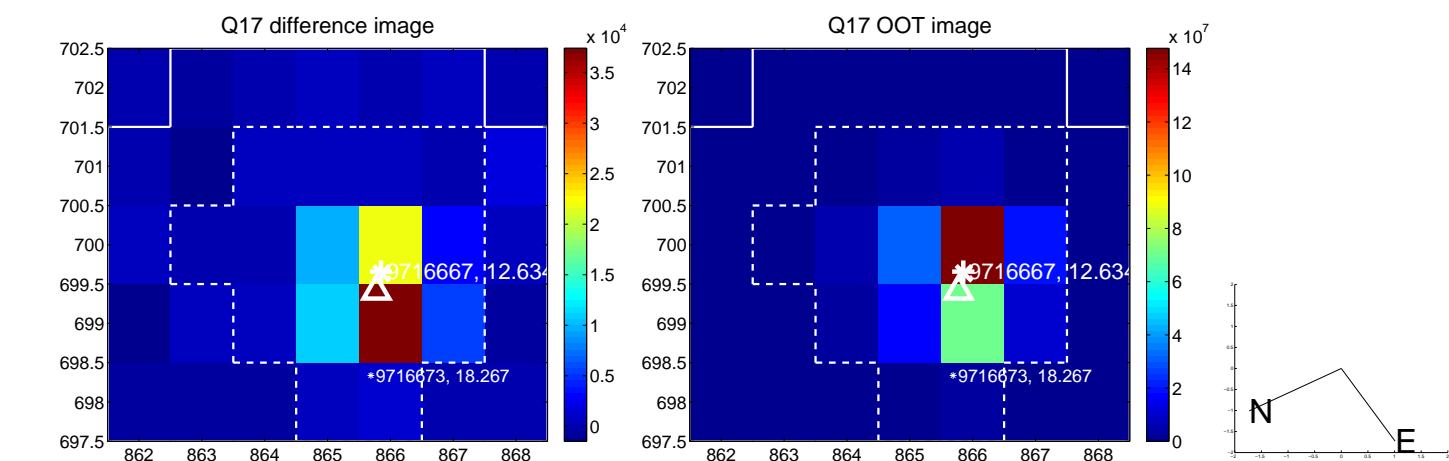
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

