

KIC 009649205

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})
009649205-01	OBS	8184.01	237.264106	315.958900	146.4	8.057	7.2	6.7	1.01	5786	1.39	1.89
009649205-02	OBS	No	215.250794	300.243323	192.4	2.331	7.6	8.1	1.01	5786	1.62	2.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009649205-01	OBS	FP	0.01	1	0	0	0	INCONSISTENT_TRANS—CENT_FEW_DIFFS
009649205-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—INCONSISTENT_TRANS—CENT_FEW_MEAS

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

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

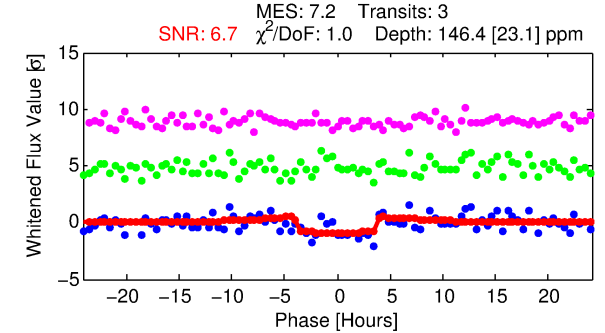
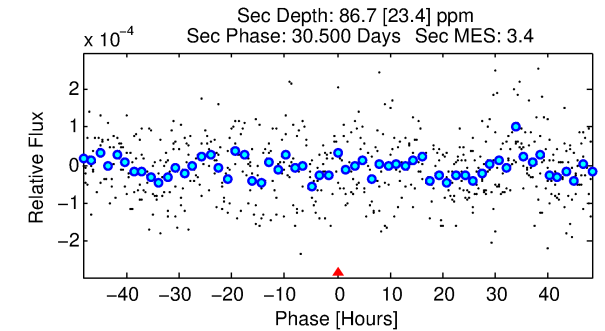
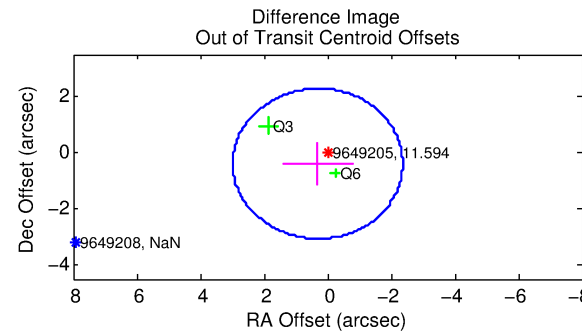
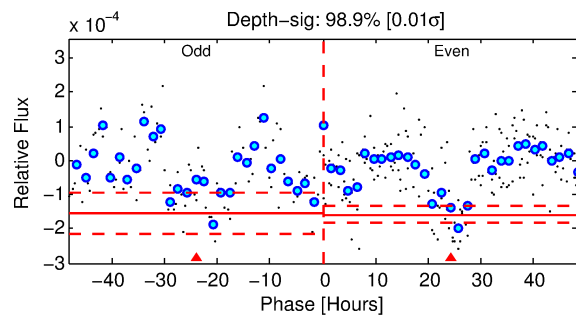
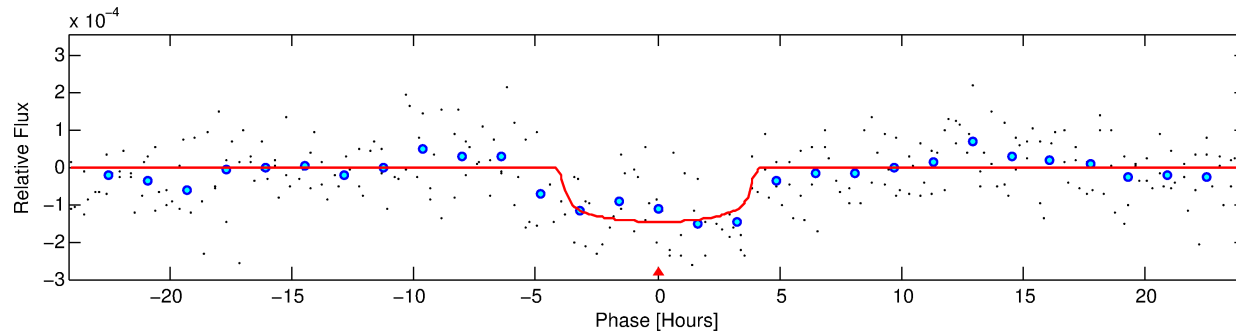
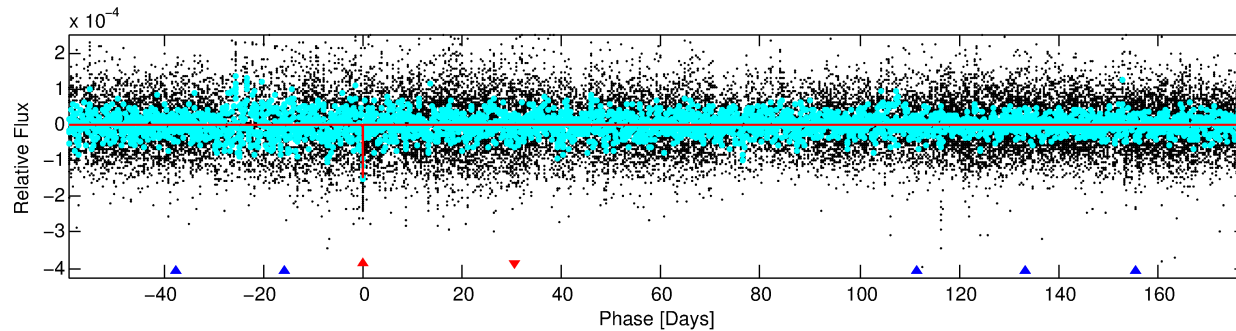
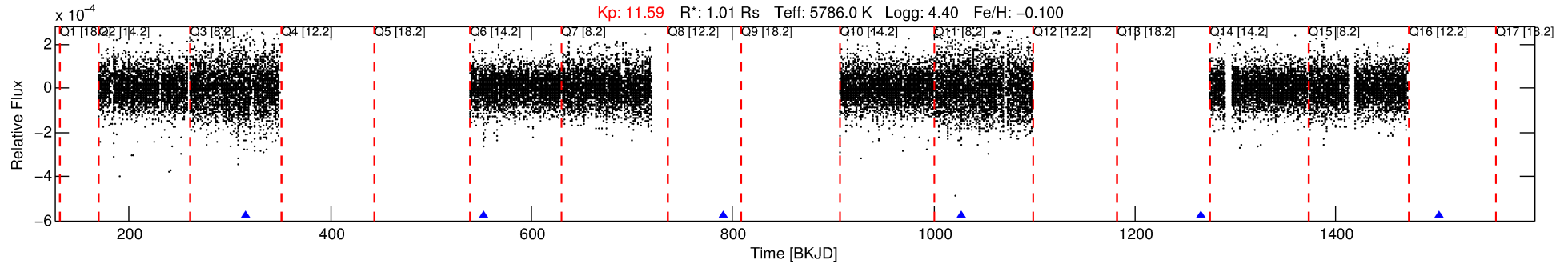
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009649205-01

No Significant Match Found

DV One-Page Summary

KIC: 9649205 Candidate: 1 of 2 Period: 237.264 d



DV Fit Results:

Period = 237.26411 [0.00632] d
Epoch = 315.9589 [0.0108] BKJD
Rp/R* = 0.0126 [0.0066]
a/R* = 123.68 [301.71]
b = 0.85 [0.80]
Seff = 1.89 [0.54]
Teq = 299 [21] K
Rp = 1.39 [0.78] Re
a = 0.7332 [0.1270] AU
Ag = 13272.60 [14653.72] [0.91σ]
Teff = 4964 [1344] K [3.47σ]

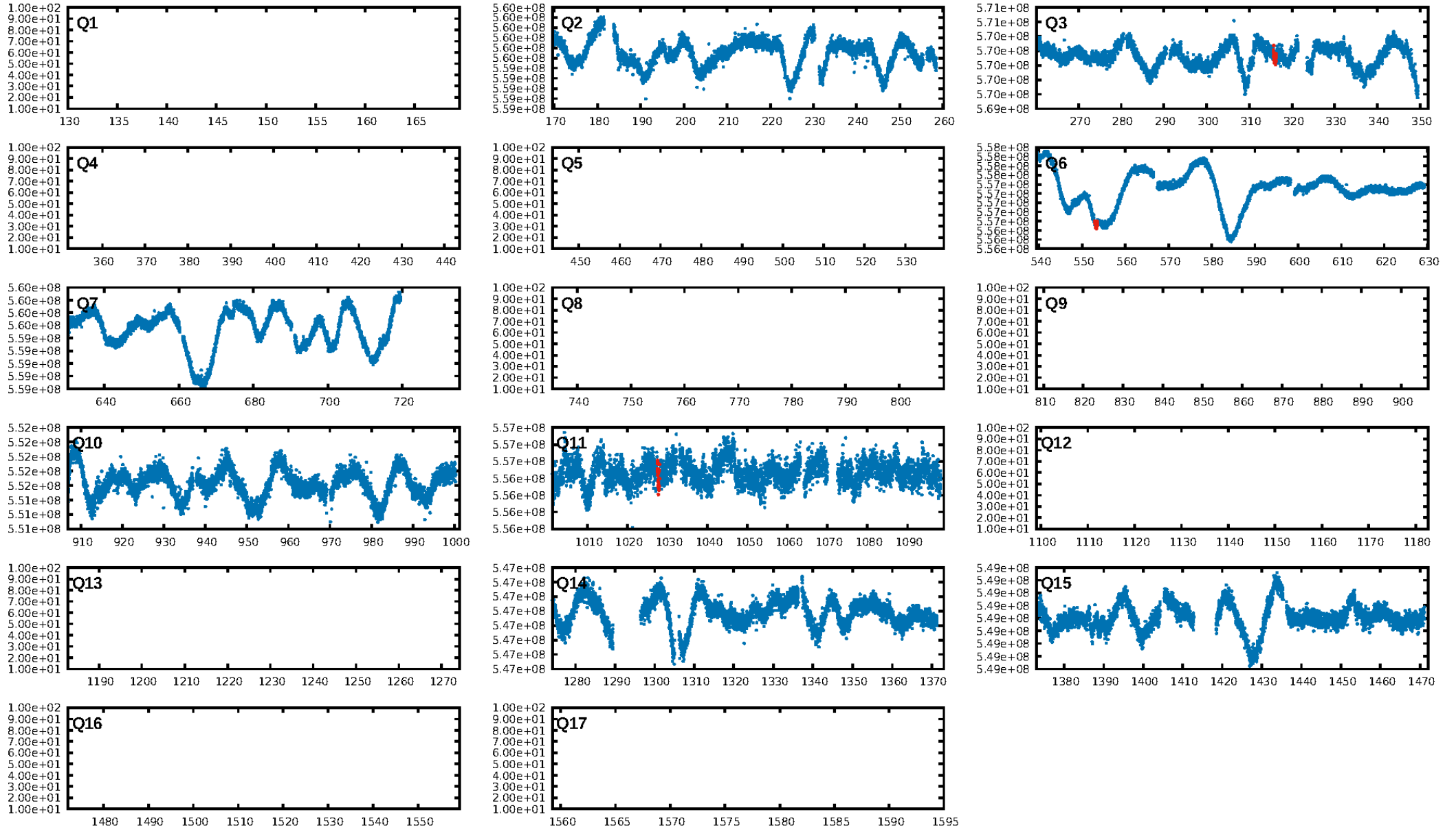
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [62.99σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 23.7%
ModelChiSquareGof-sig: 96.8%
Bootstrap-pfa: 5.61e-11
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.233
Centroid-sig: 76.3%
Centroid-so: 0.305 arcsec [0.30σ]
OotOffset-rm: 0.499 arcsec [0.56σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-rm: 0.393 arcsec [0.47σ]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

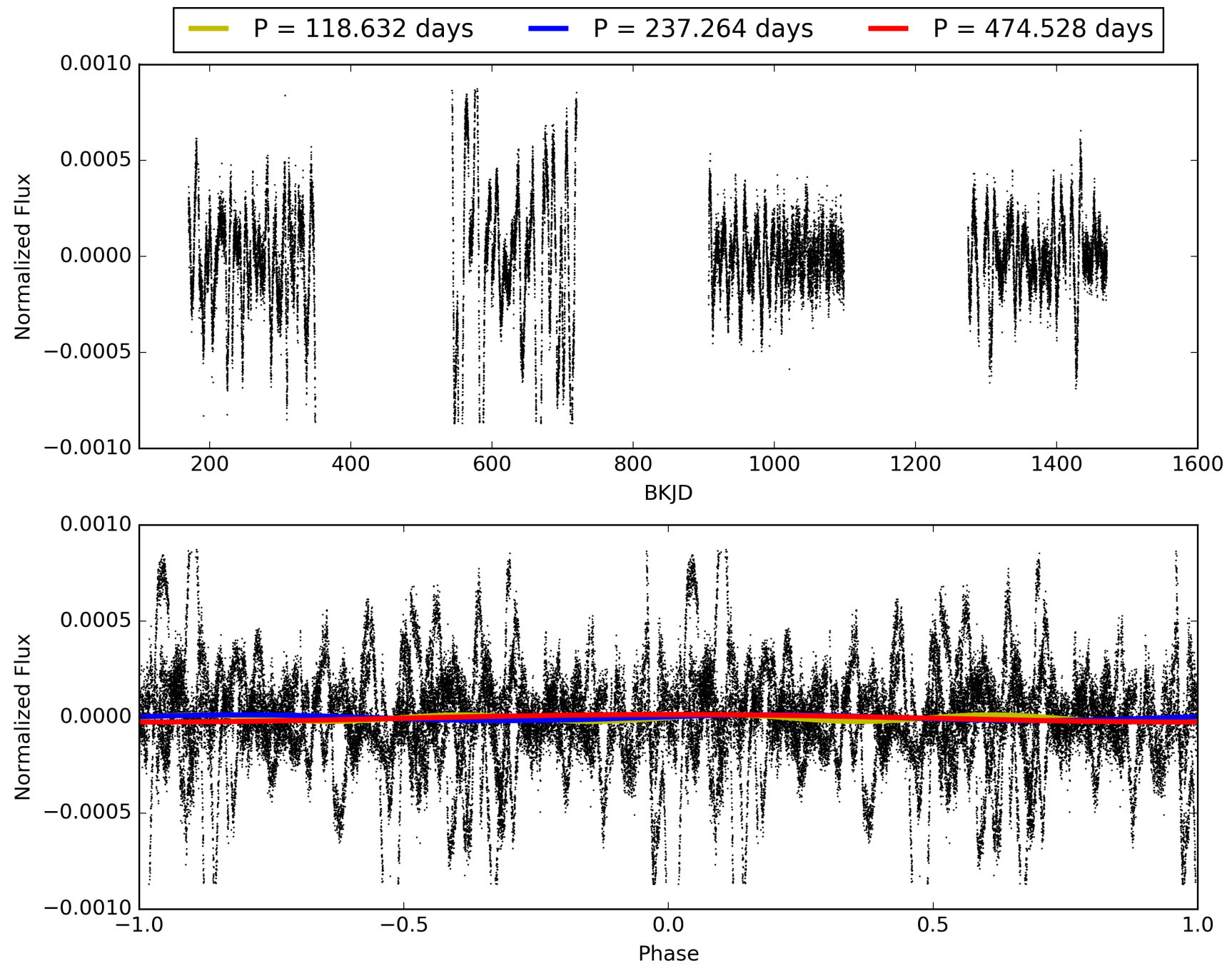
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:03:39 Z

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

TCE 009649205-01, PDC Light Curves

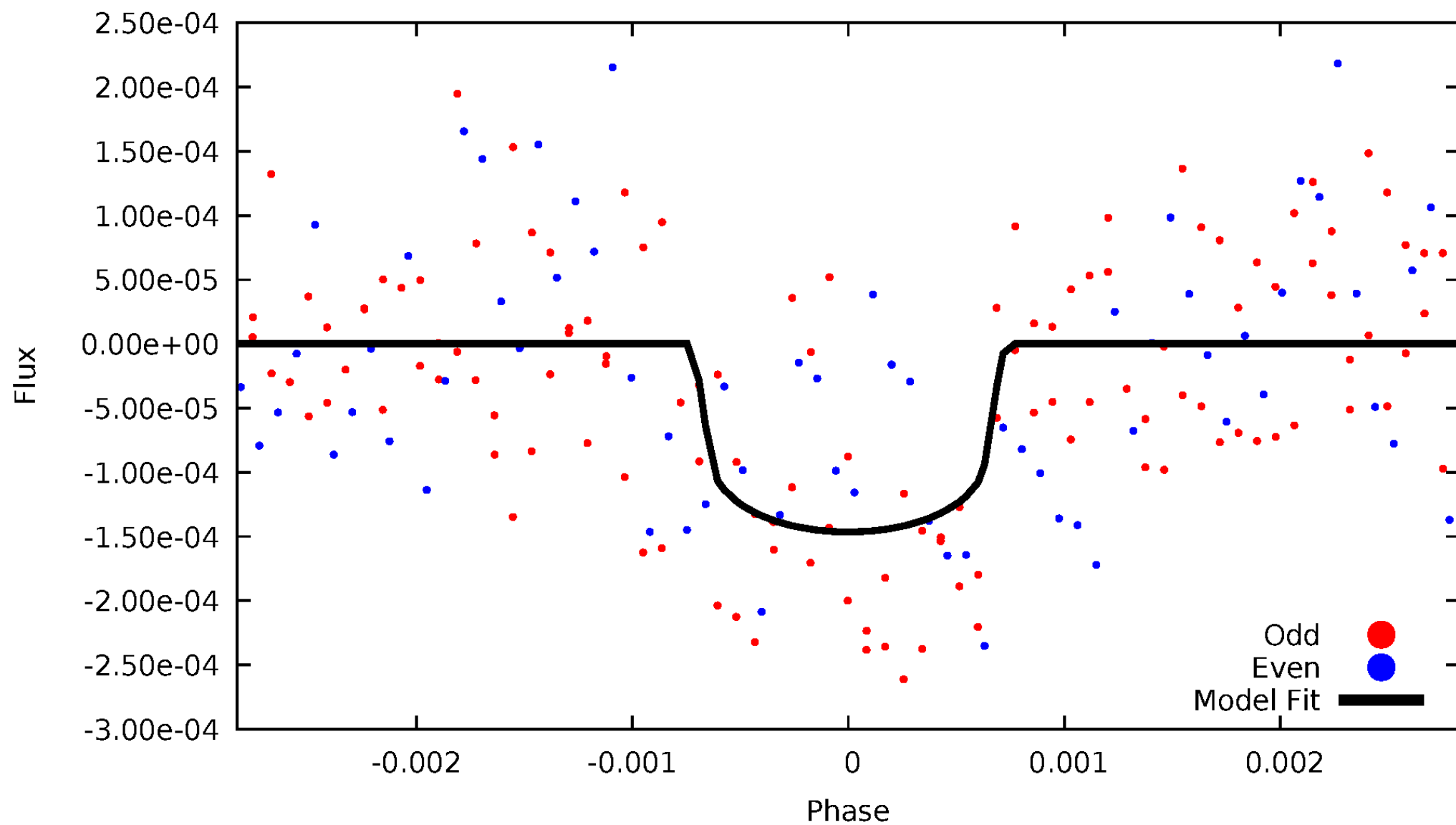


TCE 009649205-01



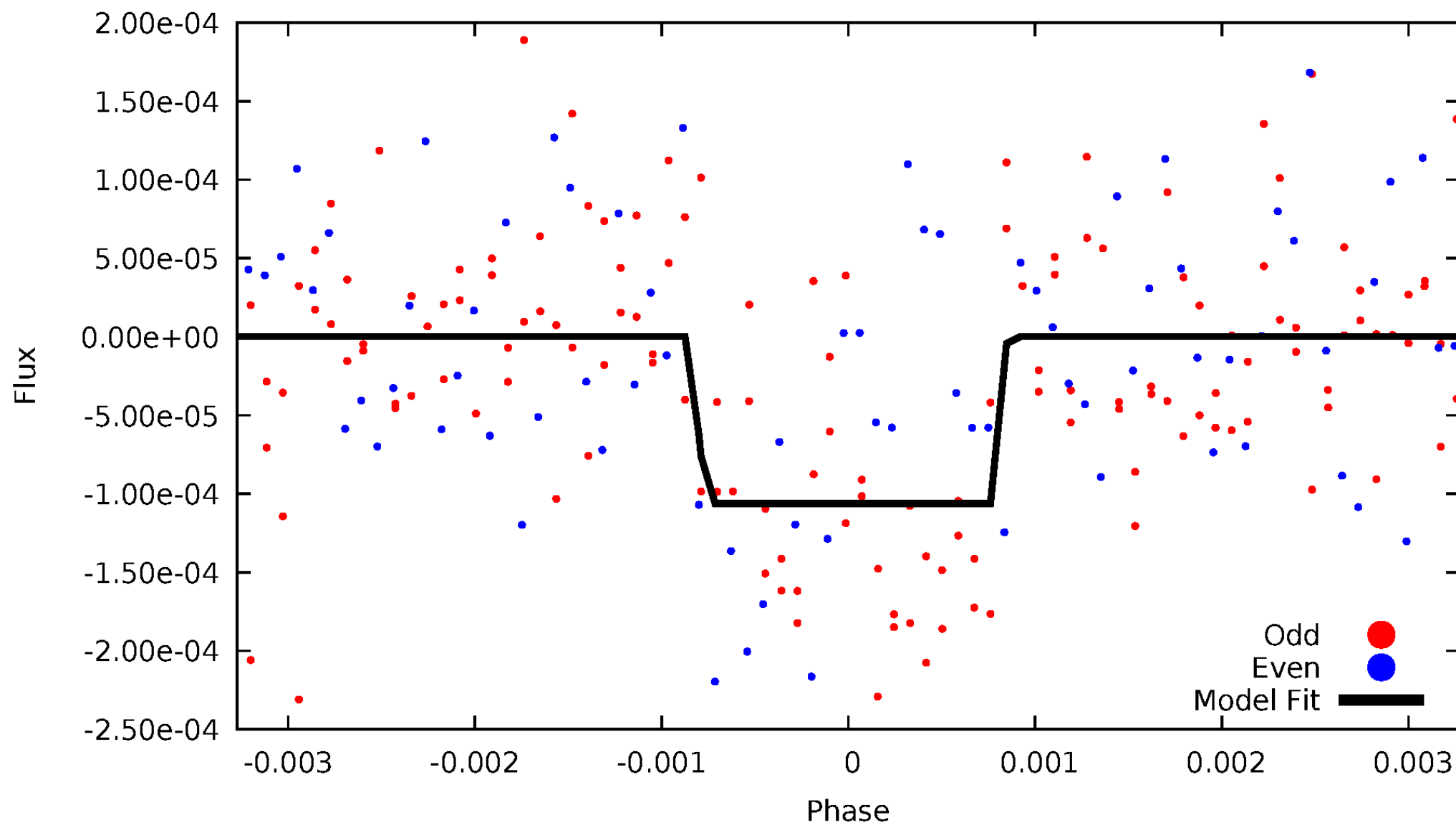
DV Odd/Even

TCE 009649205-01



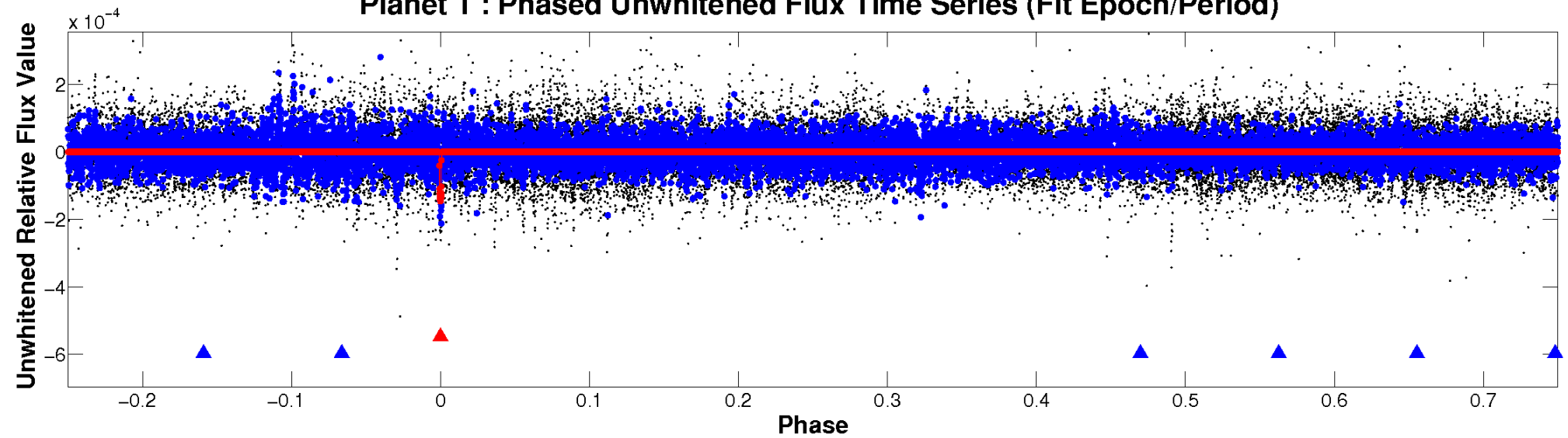
ALT Odd/Even

TCE 009649205-01

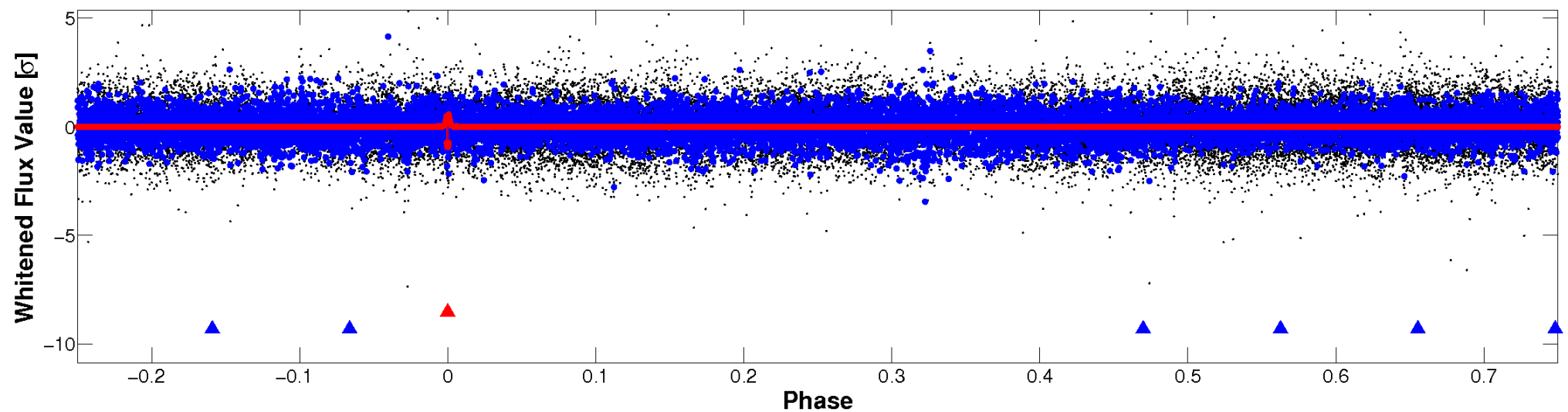


Non-Whitened Vs. Whitened Light Curve

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

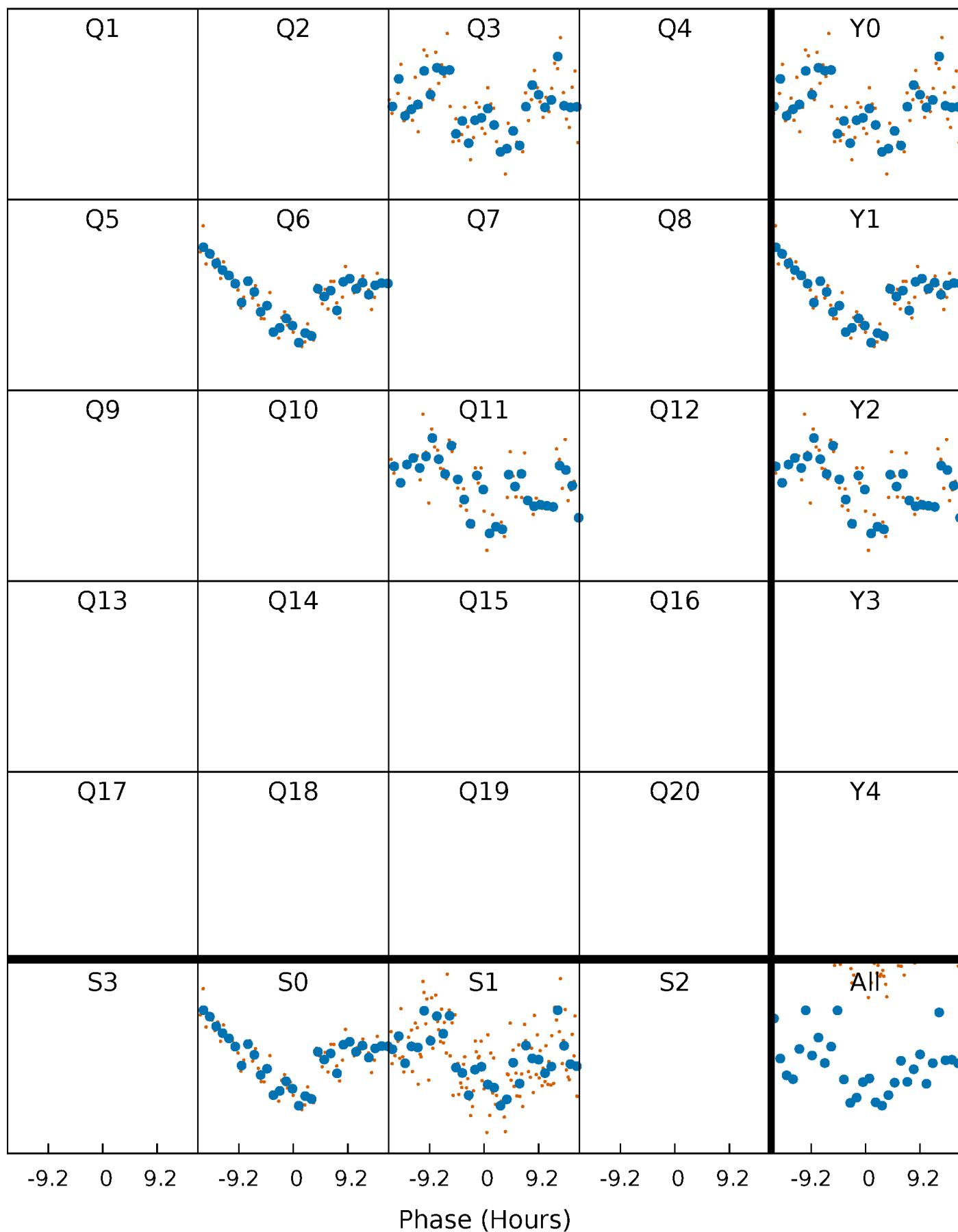


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 009649205-01 P=237.264106 Days $T_0=315.958900$ (BKJD)



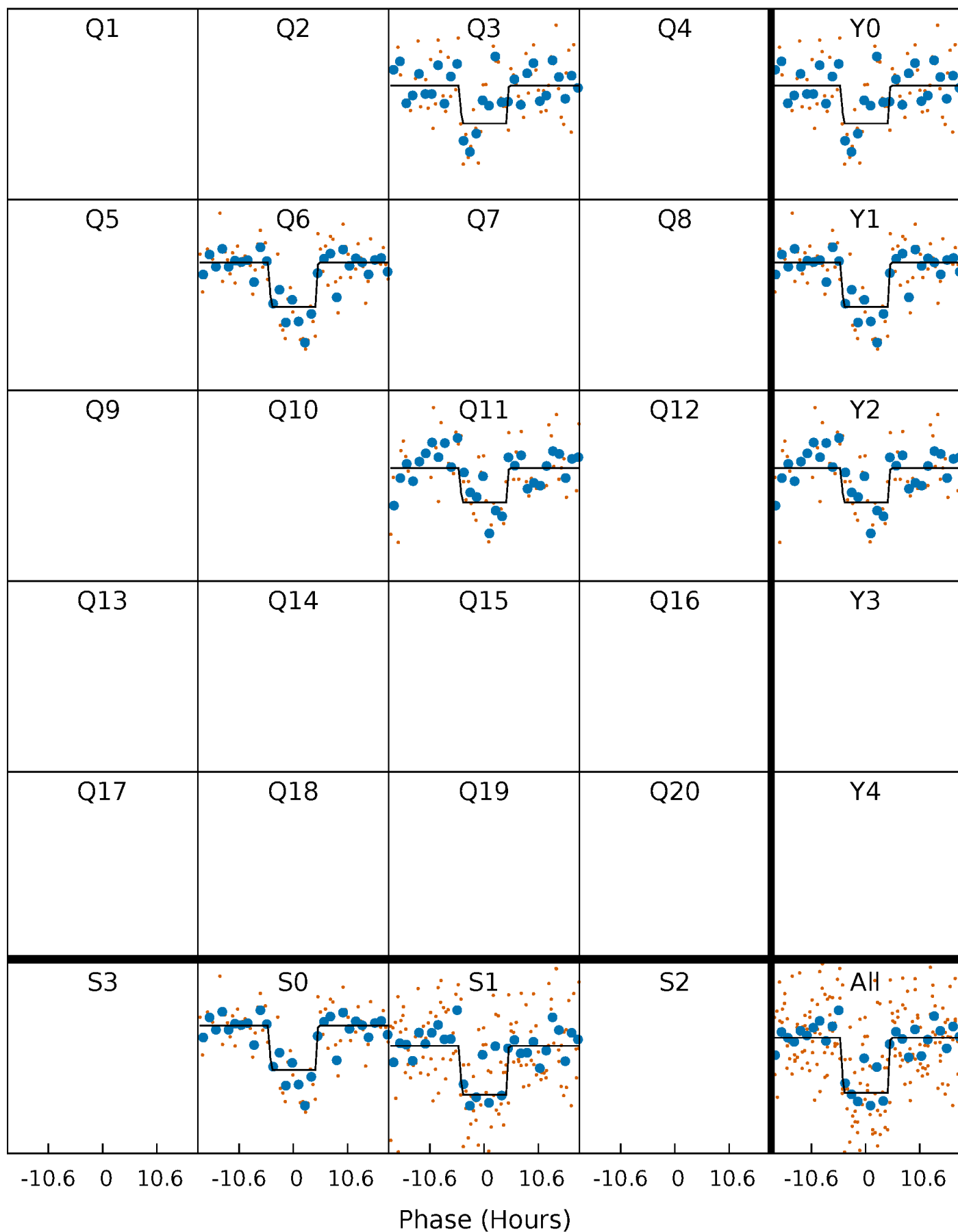
DV Quarter-Phased Transit Curves

TCE 009649205-01 P=237.264106 Days $T_0=315.958900$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

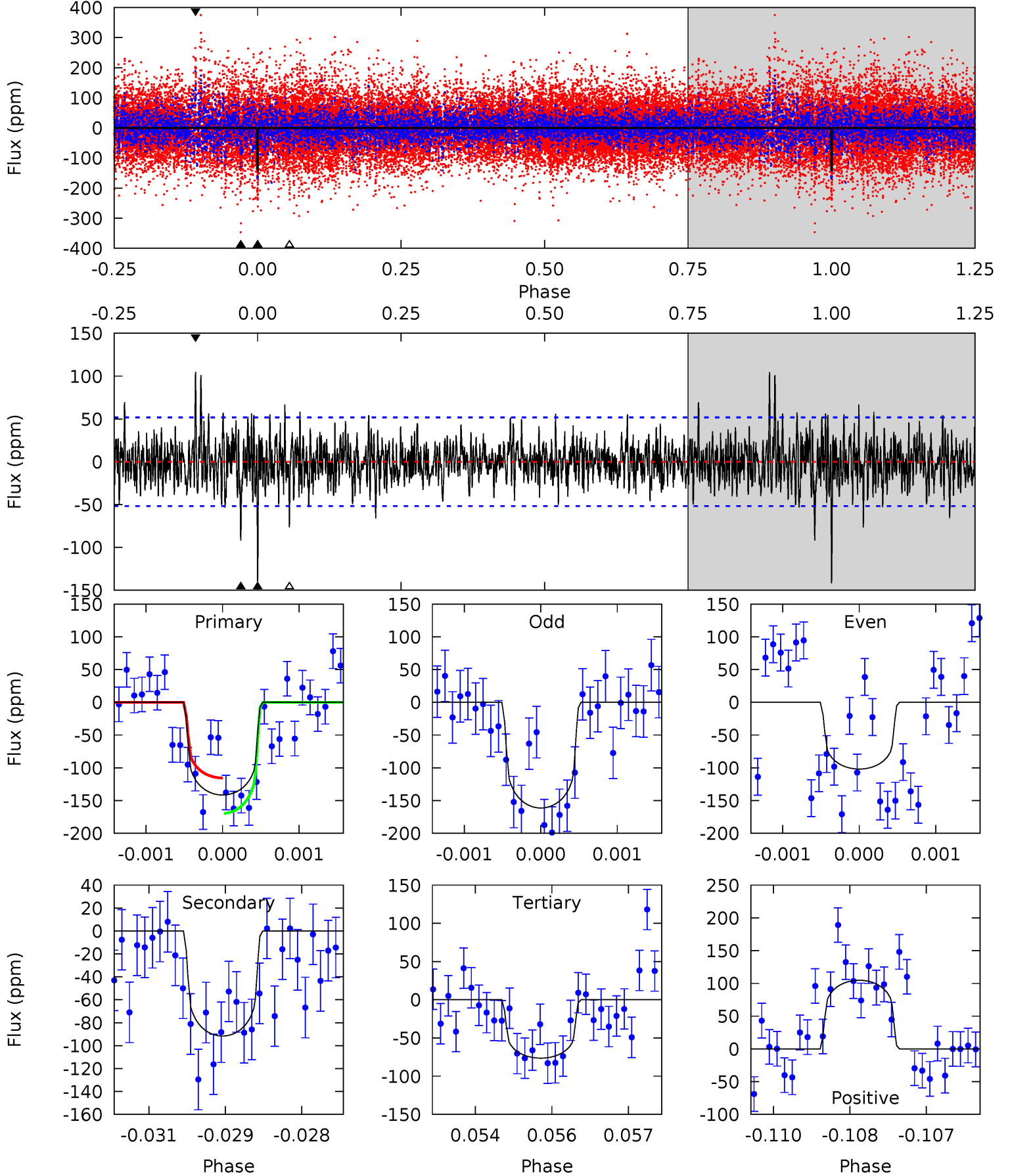
TCE 009649205-01 P=237.274499 Days $T_0=315.910292$ (BKJD)



DV Model-Shift Uniqueness Test

009649205-01, P = 237.264106 Days, E = 78.694794 Days

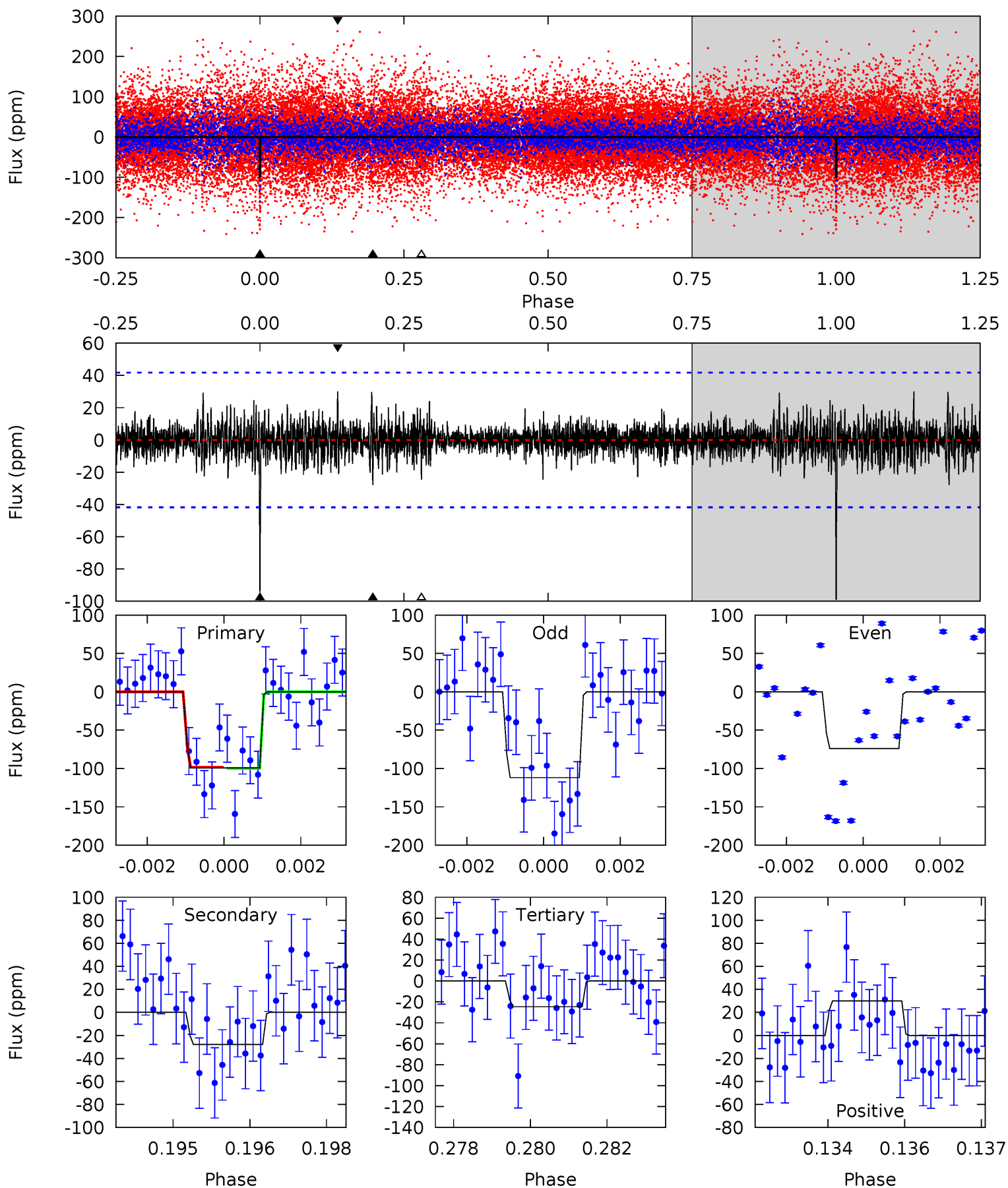
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.7	9.53	7.94	10.9	5.38	3.18	1.96	6.78	3.83	1.59	-1.36	2.90	1.26	0.43	2.82



Alt Model-Shift Uniqueness Test

009649205-01, $P = 237.274499$ Days, $E = 78.635793$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	3.59	3.16	3.85	5.36	3.15	0.83	9.57	8.88	0.42	-0.27	2.35	1.08	0.23	0.10



Stellar Parameters For KIC 009649205

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5786^{+173}_{-190}	$4.402^{+0.100}_{-0.138}$	$-0.100^{+0.300}_{-0.300}$	$1.007^{+0.207}_{-0.138}$	$0.934^{+0.114}_{-0.093}$	$1.288^{+0.656}_{-0.513}$
	+3%/-3%	+2%/-3%	+300%/-300%	+21%/-14%	+12%/-10%	+51%/-40%
Source	KIC0	FLK73	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 009649205-01 / KOI 8184.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-92 ± 10	$1.42^{+0.72}_{-0.69}$	419^{+25}_{-21}	5087^{+1896}_{-777}	13639^{+36816}_{-7615}
Alt.	-28 ± 8	$1.23^{+0.71}_{-0.69}$	419^{+22}_{-21}	4249^{+1699}_{-698}	5687^{+20279}_{-3798}

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

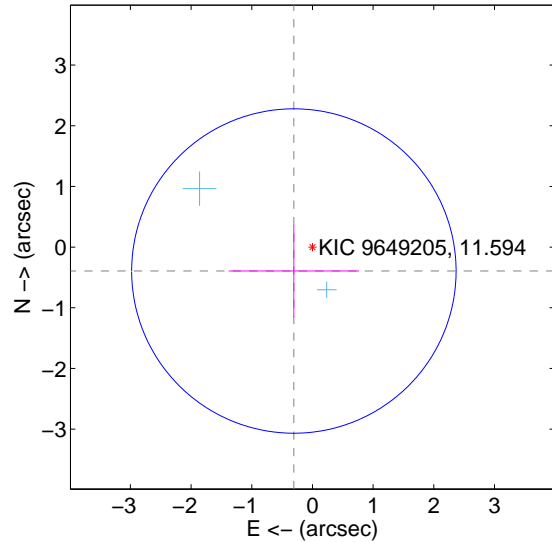
Supplemental centroid analysis for 009649205-01. **Kepler magnitude: 11.59.** Transit SNR 6.68

There are 2 quarters with good PRF difference image offsets

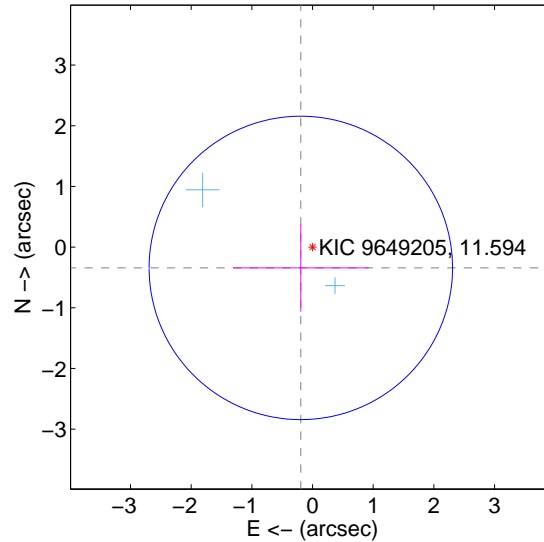
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.499 ± 0.891	0.56	0.306 ± 1.074	-0.394 ± 0.759
PRF-fit source offset from KIC position	0.393 ± 0.833	0.47	0.193 ± 1.118	-0.343 ± 0.720
photometric centroid source offset	0.30 ± 1.01	0.30	0.25 ± 1.01	-0.18 ± 1.00

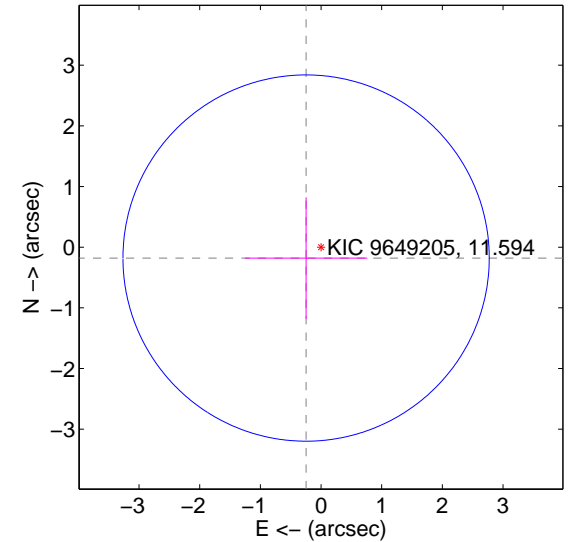
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

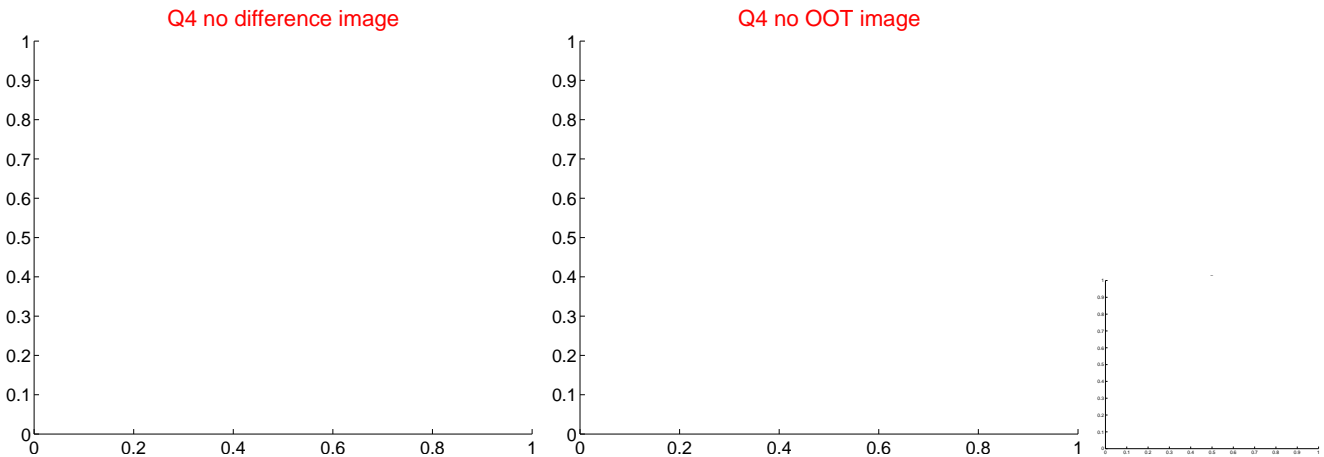
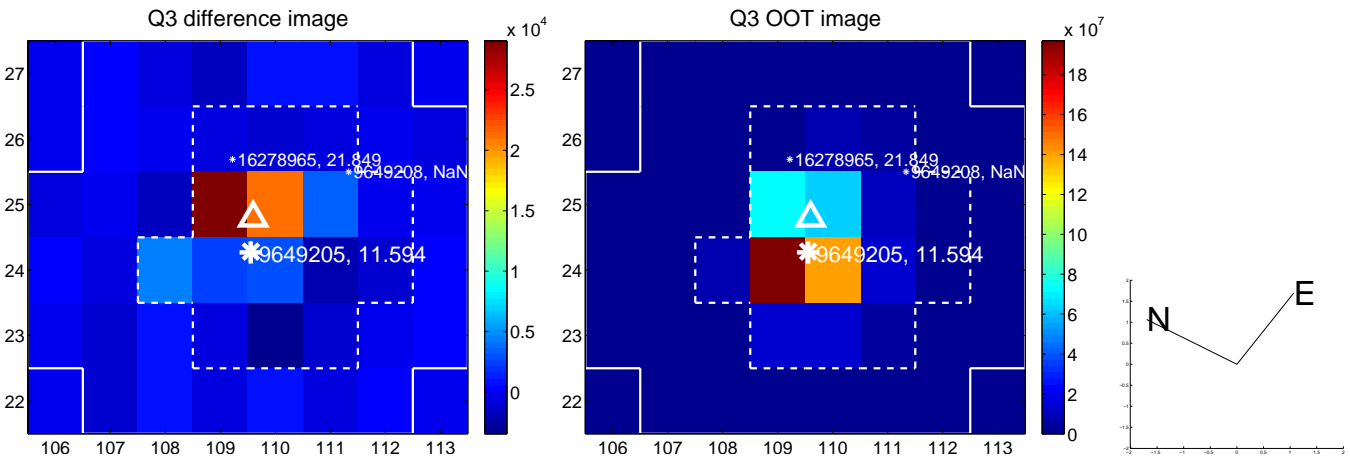
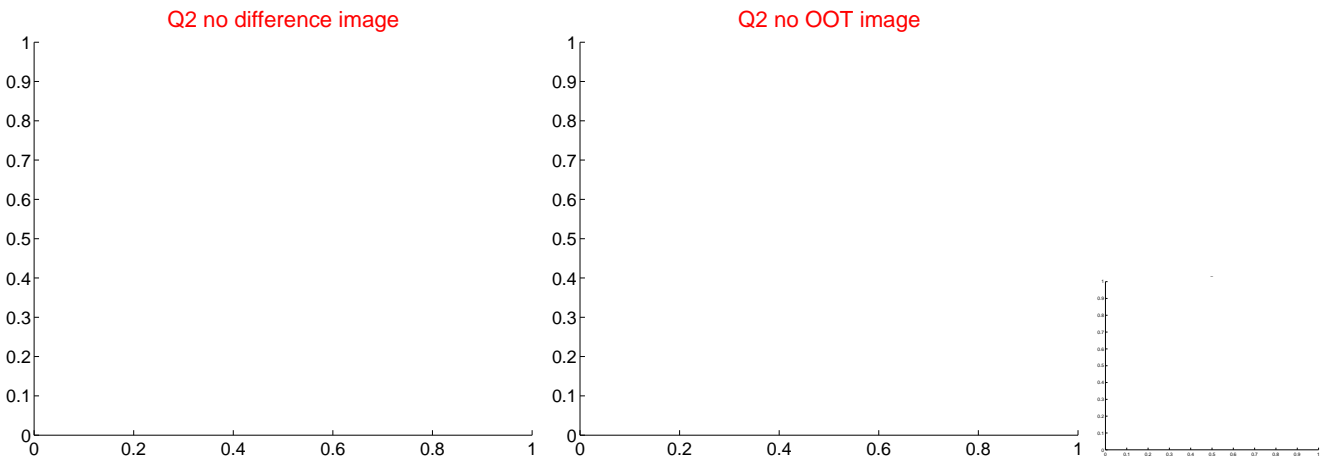
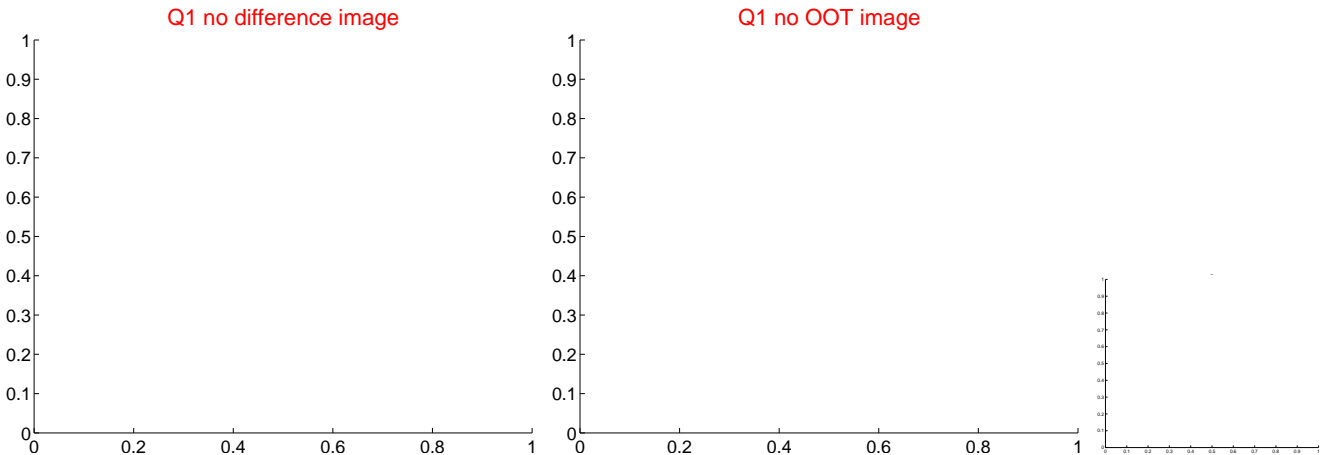


offset from photometric centroids

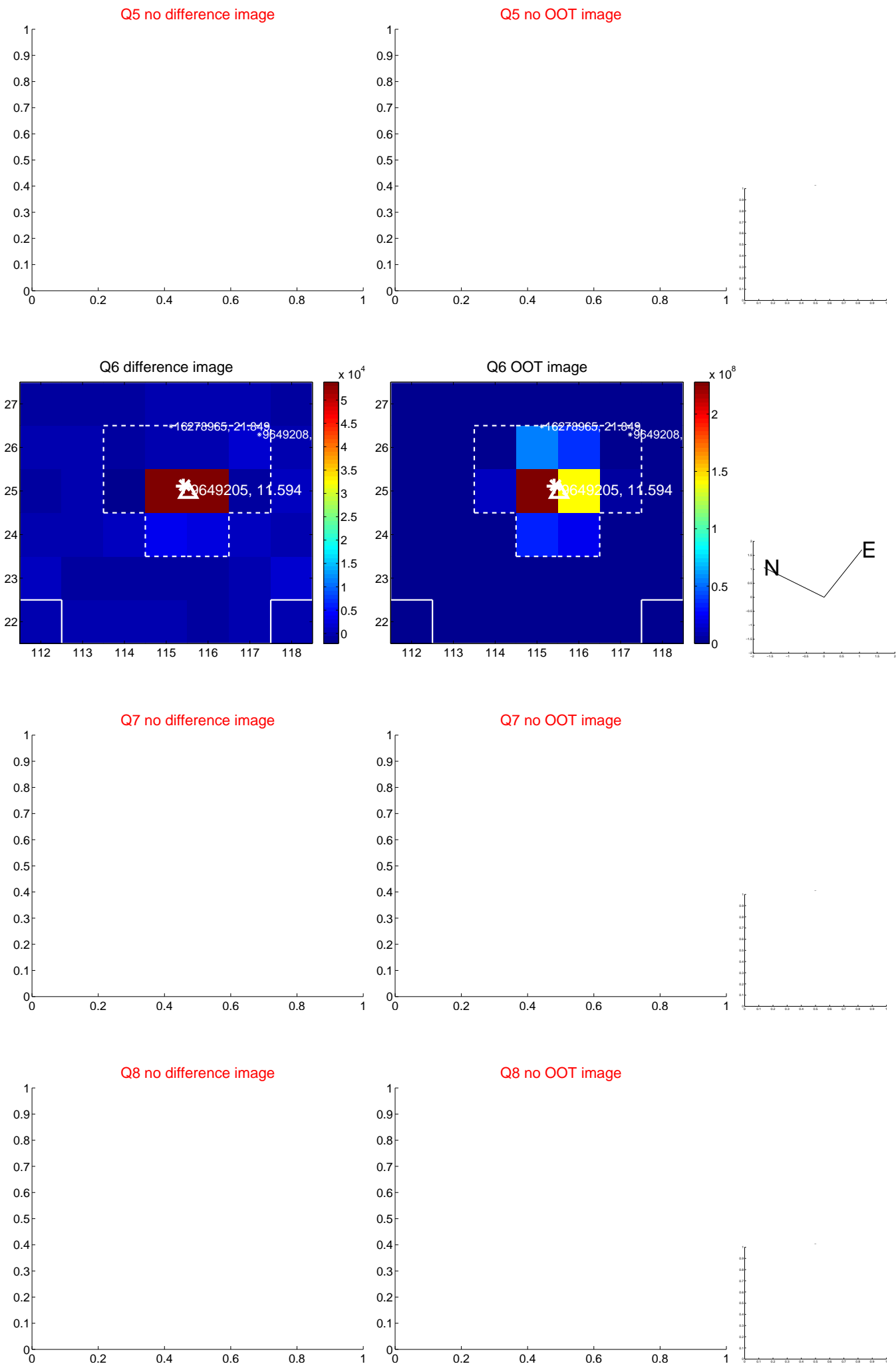


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



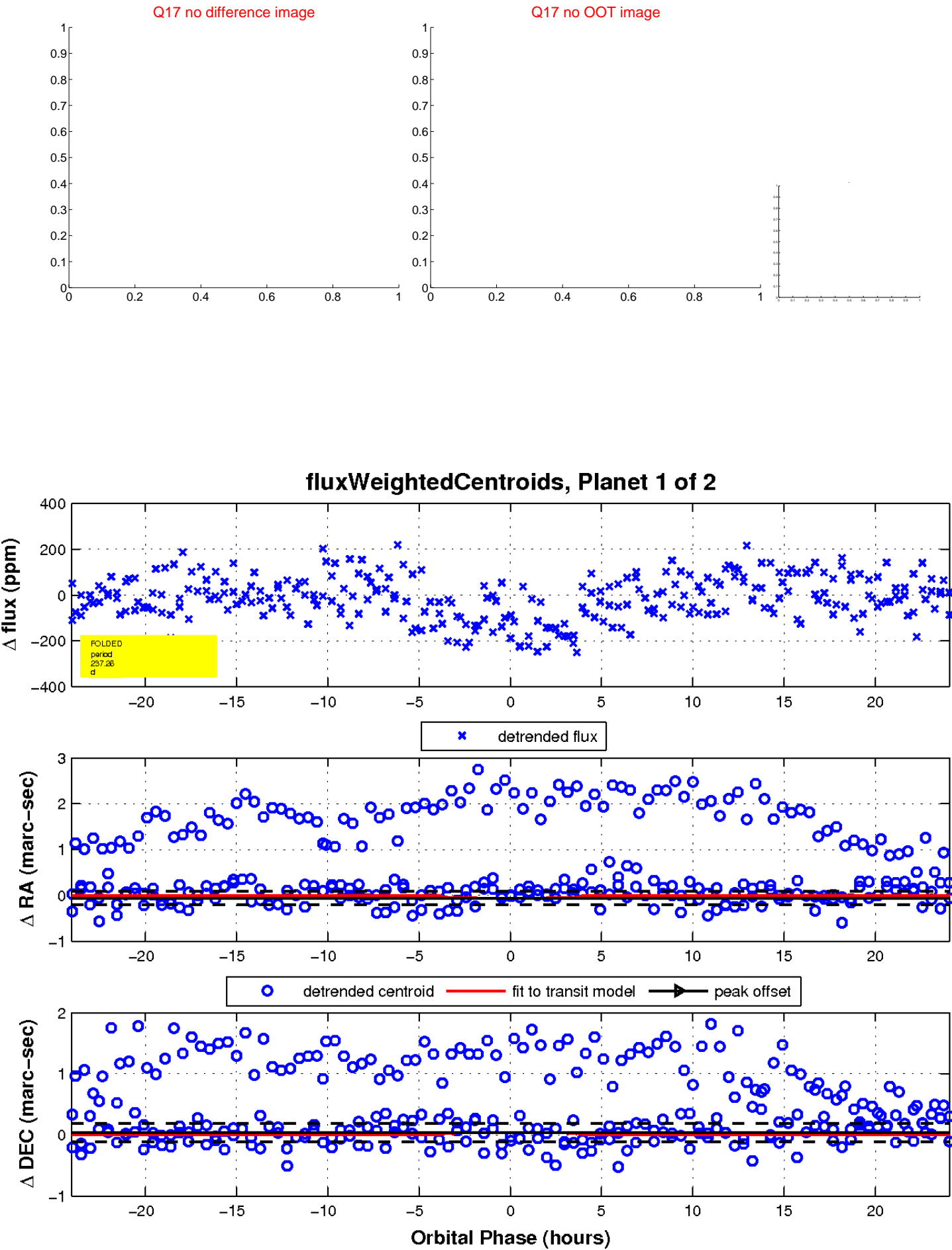
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

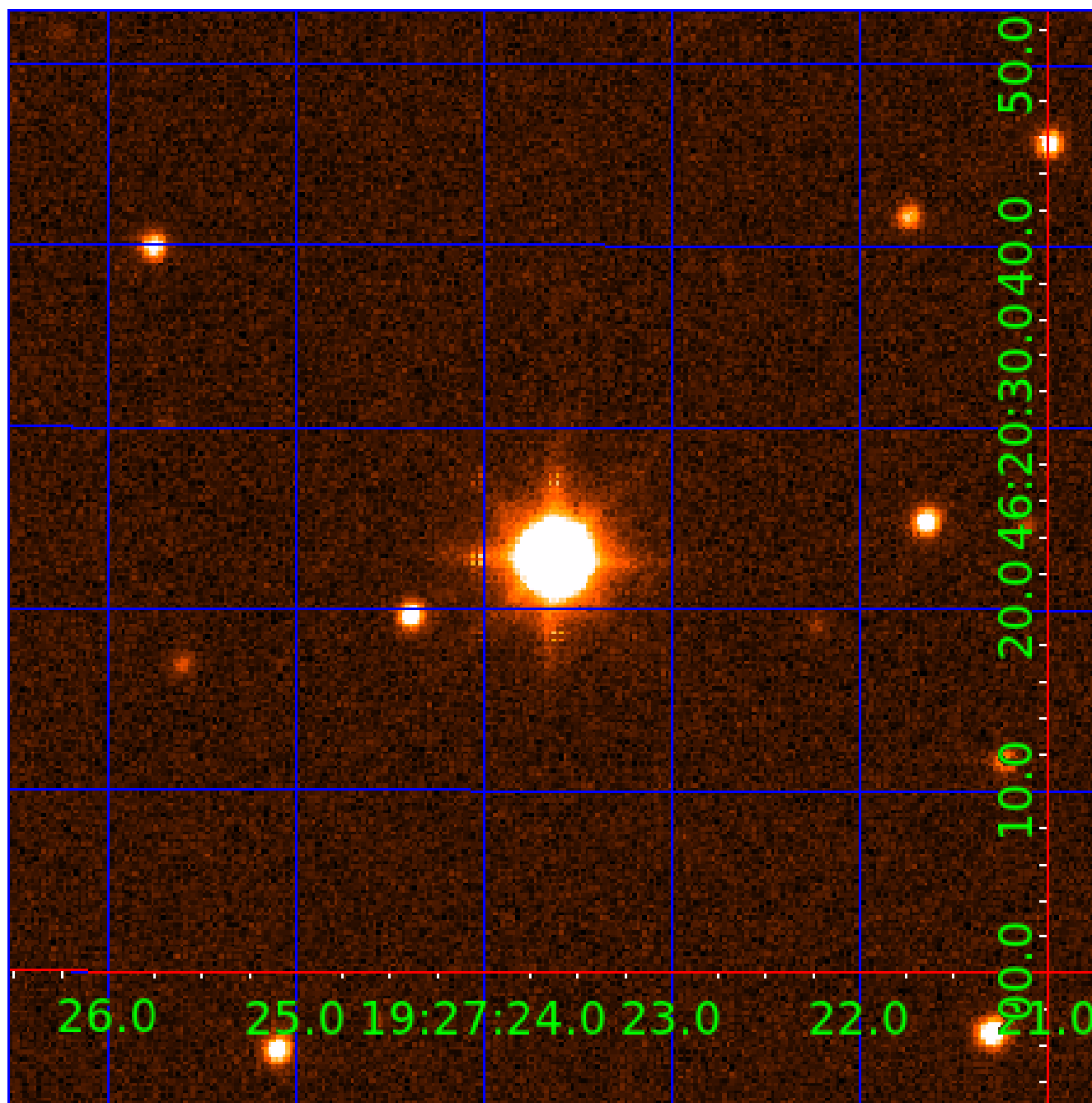


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009649205

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})
009649205-01	OBS	8184.01	237.264106	315.958900	146.4	8.057	7.2	6.7	1.01	5786	1.39	1.89
009649205-02	OBS	No	215.250794	300.243323	192.4	2.331	7.6	8.1	1.01	5786	1.62	2.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009649205-01	OBS	FP	0.01	1	0	0	0	INCONSISTENT_TRANS—CENT_FEW_DIFFS
009649205-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—INCONSISTENT_TRANS—CENT_FEW_MEAS

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

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

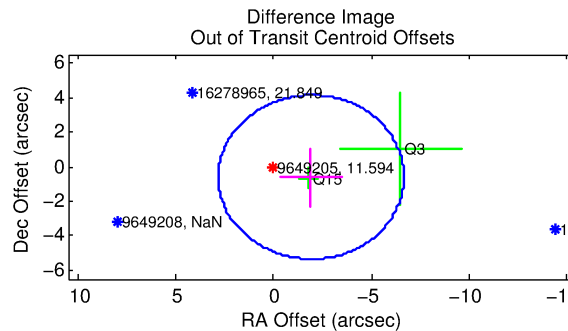
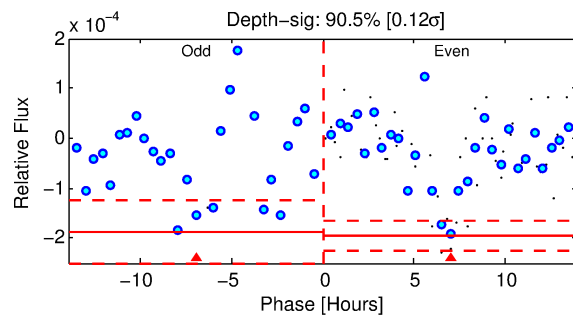
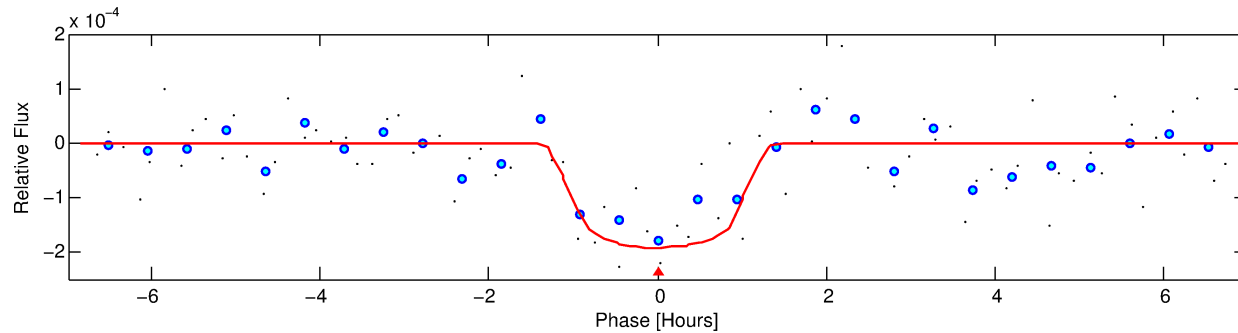
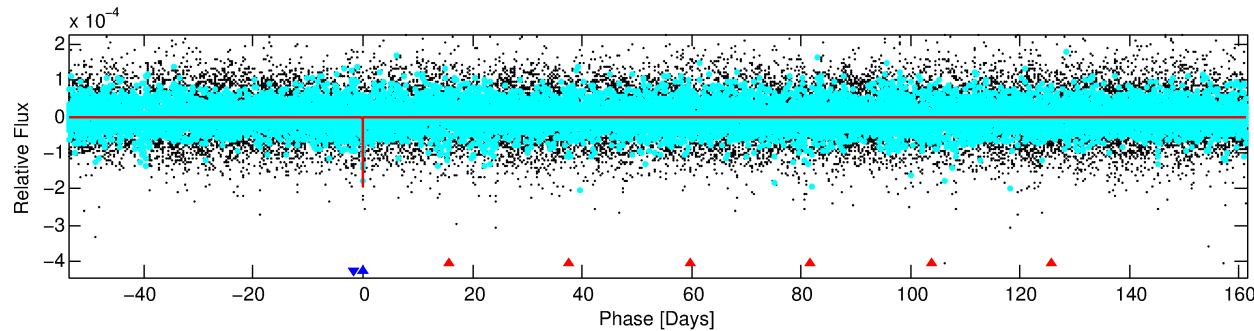
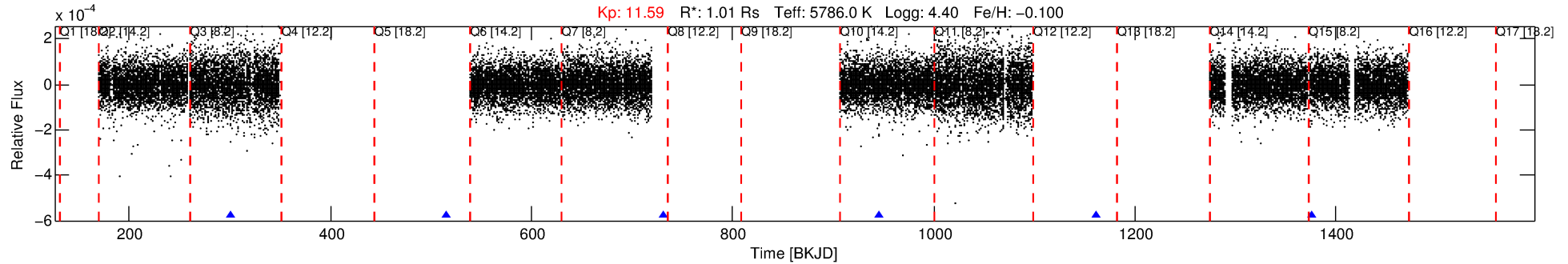
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009649205-02

No Significant Match Found

DV One-Page Summary

KIC: 9649205 Candidate: 2 of 2 Period: 215.251 d



DV Fit Results:

Period = 215.25079 [0.00174] d
Epoch = 300.2433 [0.0066] BKJD
Rp/R* = 0.0147 [0.0136]
a/R* = 367.81 [1570.13]
b = 0.87 [1.22]
Seff = 2.16 [0.61]
Teq = 309 [22] K
Rp = 1.62 [1.53] Re
a = 0.6871 [0.1190] AU
Ag = 8020.13 [15165.34] [0.53 σ]
Teff = 4521 [2123] K [1.98 σ]

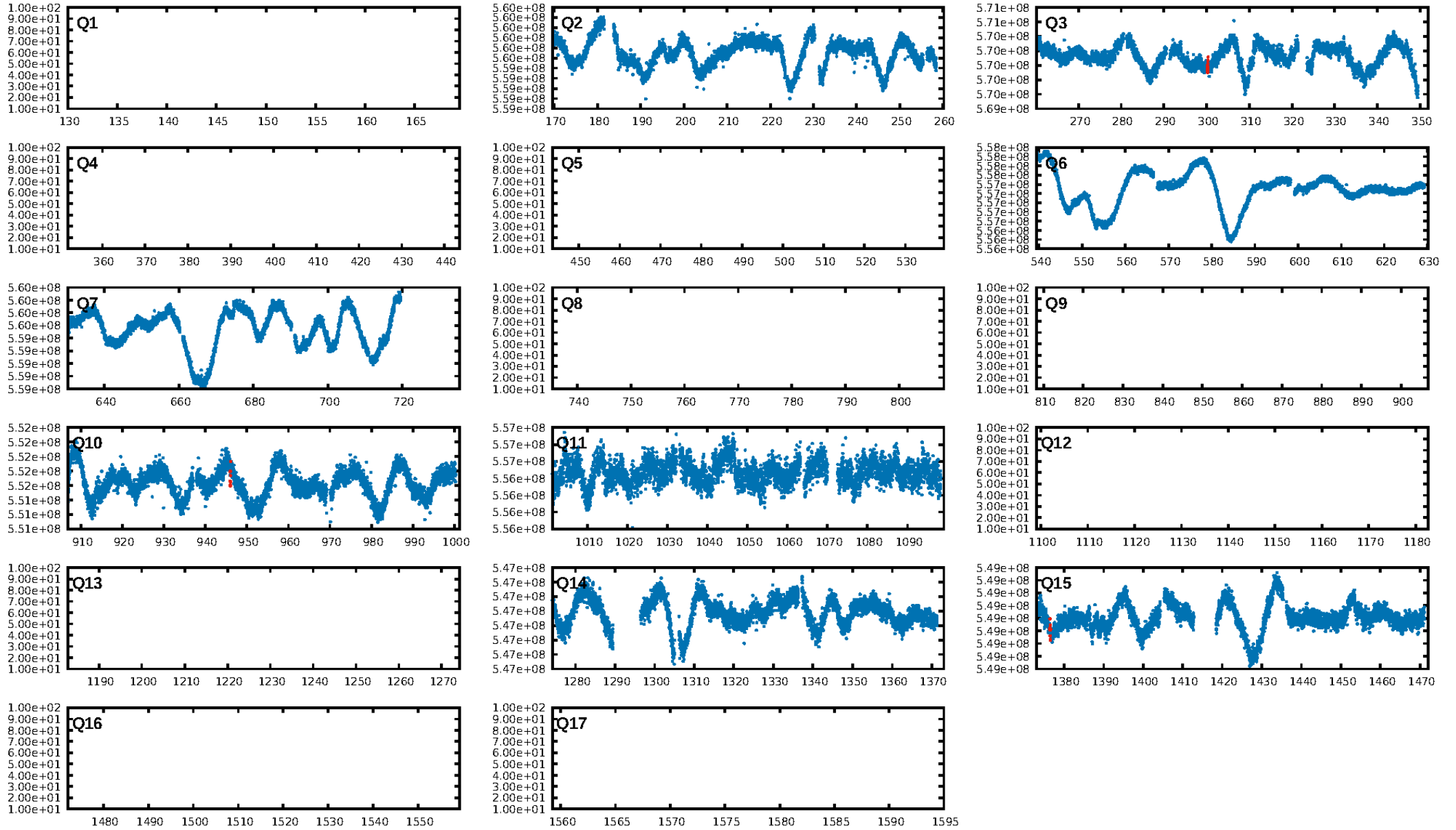
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [62.99 σ]
ModelChiSquare2-sig: 90.2%
ModelChiSquareGof-sig: 94.7%
Bootstrap-pfa: 5.24e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -5.724
Centroid-sig: 12.1%
Centroid-so: 2.274 arcsec [1.85 σ]
OotOffset-rm: 2.012 arcsec [1.27 σ]
OotOffset-st: 0/2/0/0 [2]
KicOffset-rm: 1.965 arcsec [1.25 σ]
KicOffset-st: 0/2/0/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

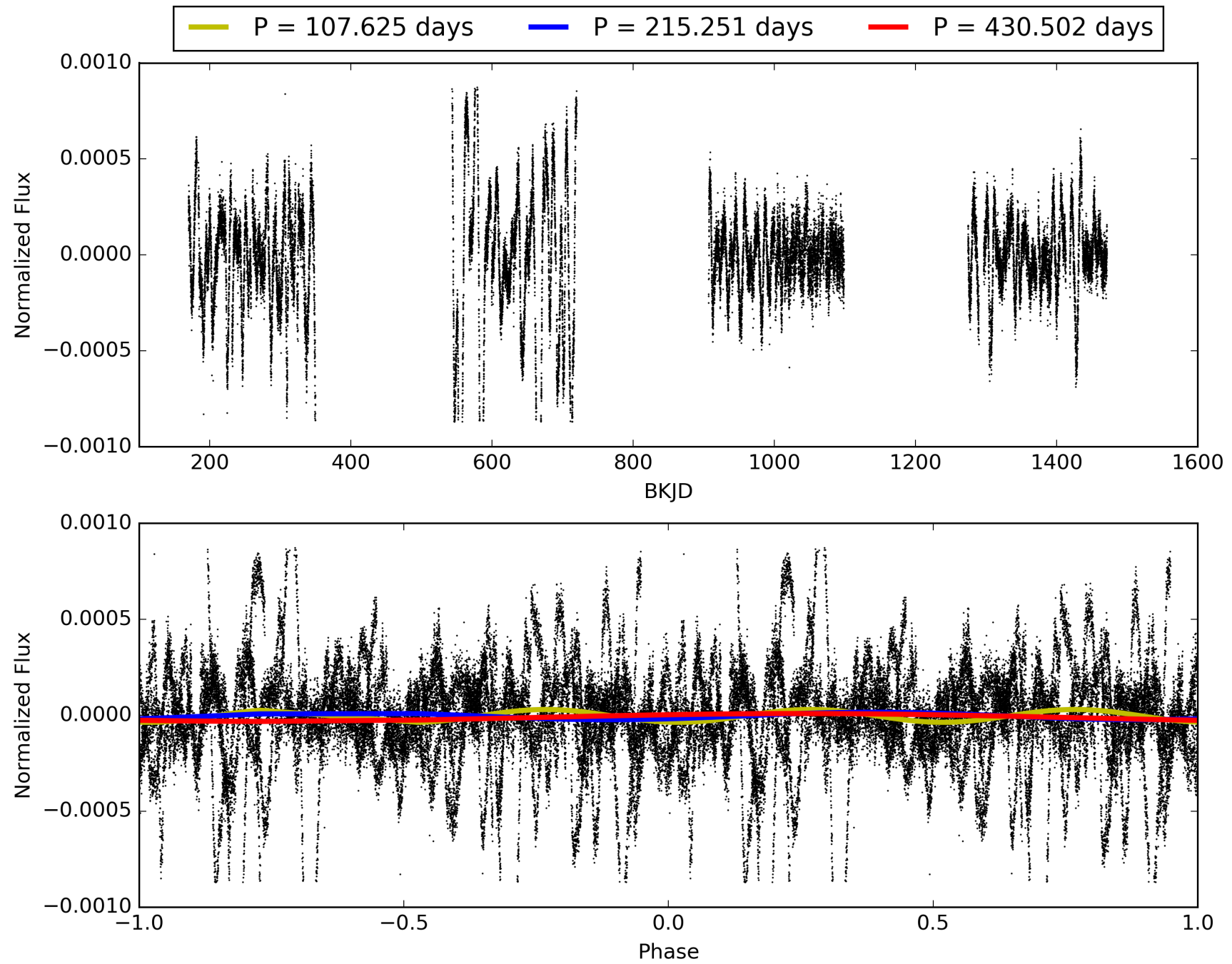
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:03:49 Z

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

TCE 009649205-02, PDC Light Curves

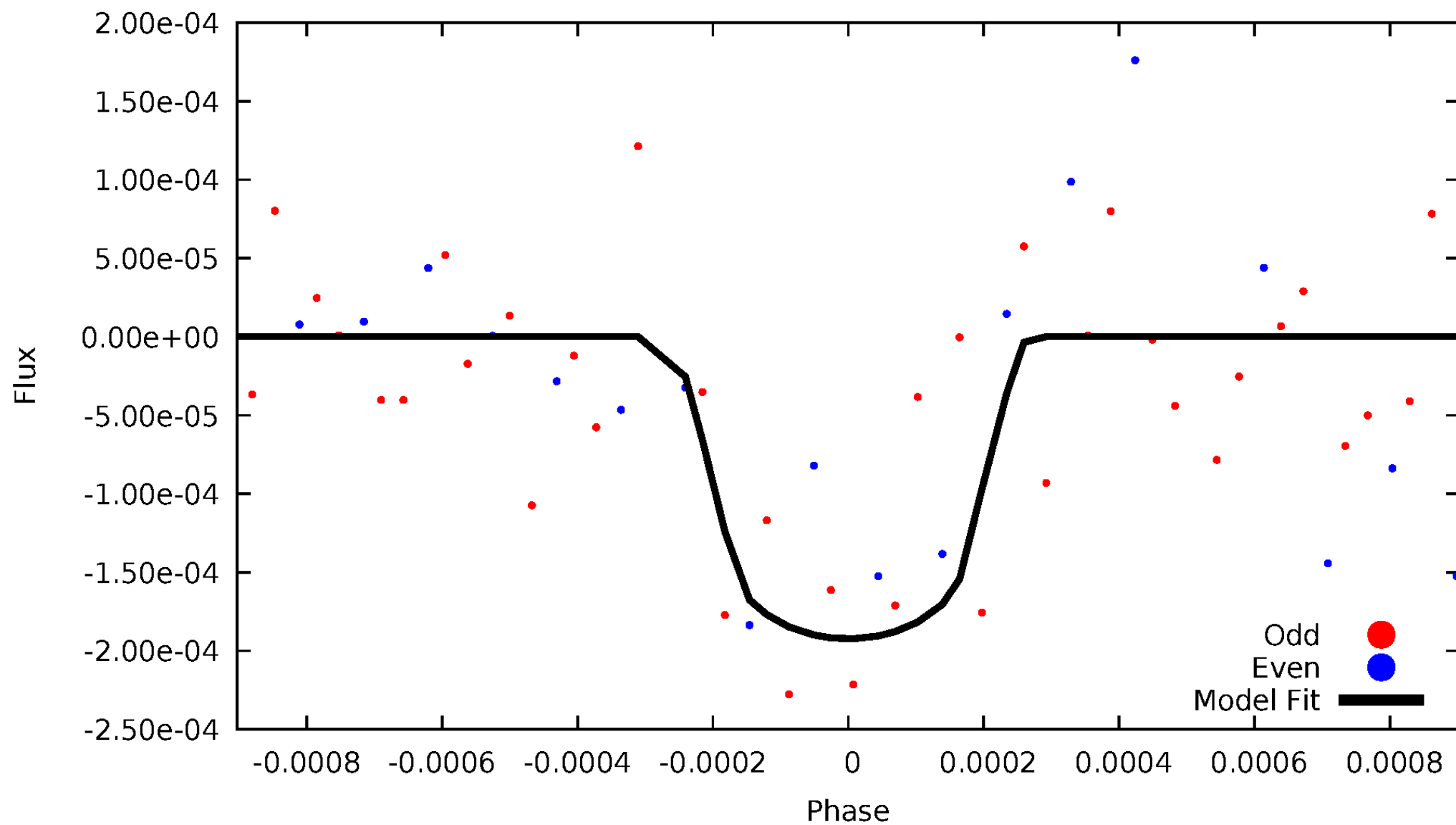


TCE 009649205-02



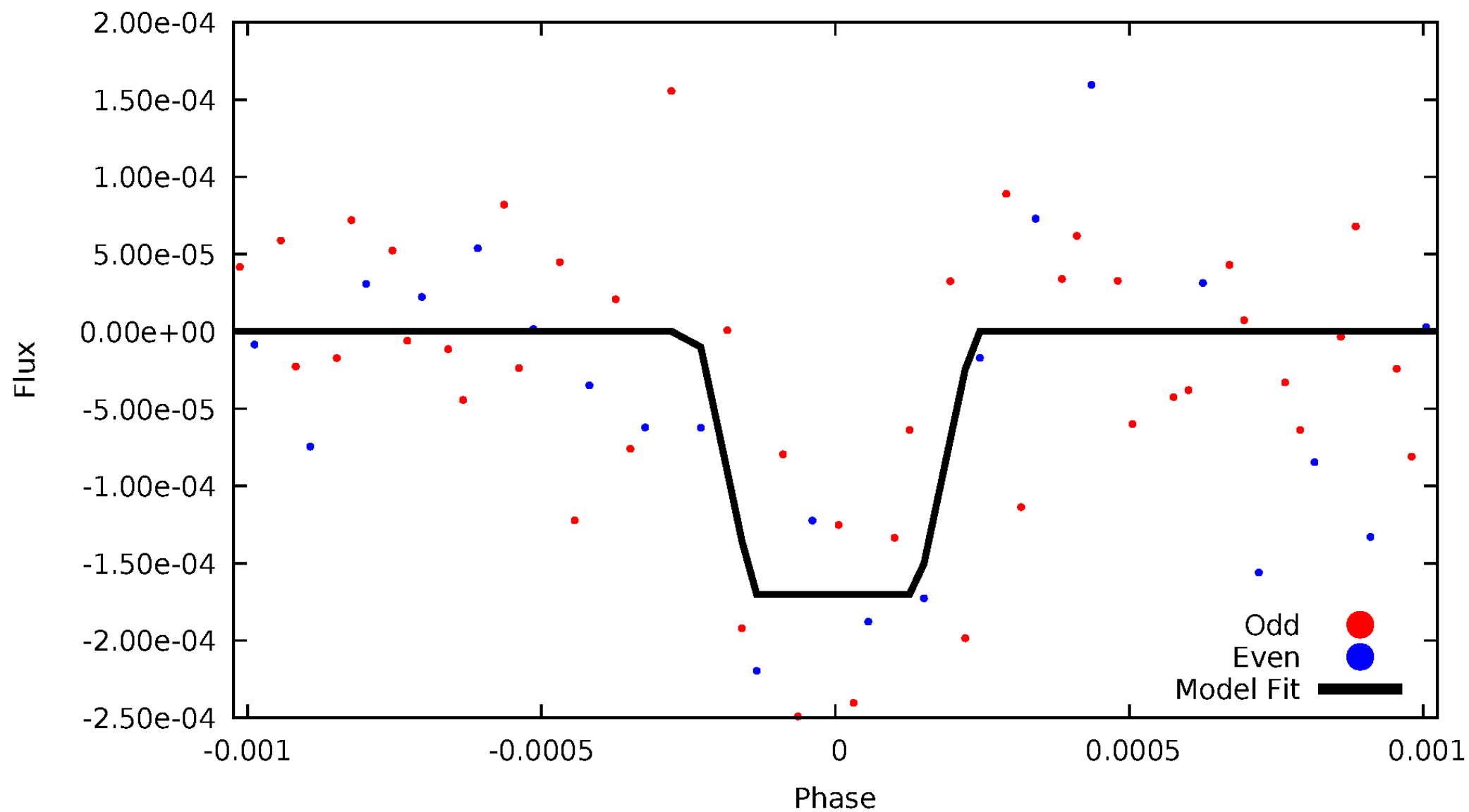
DV Odd/Even

TCE 009649205-02



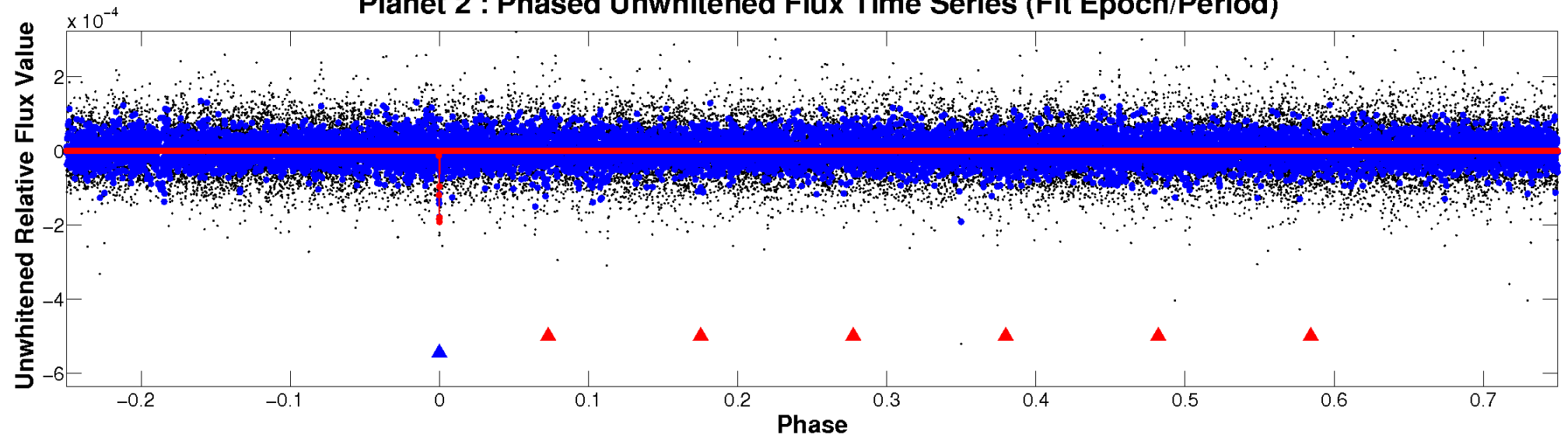
ALT Odd/Even

TCE 009649205-02

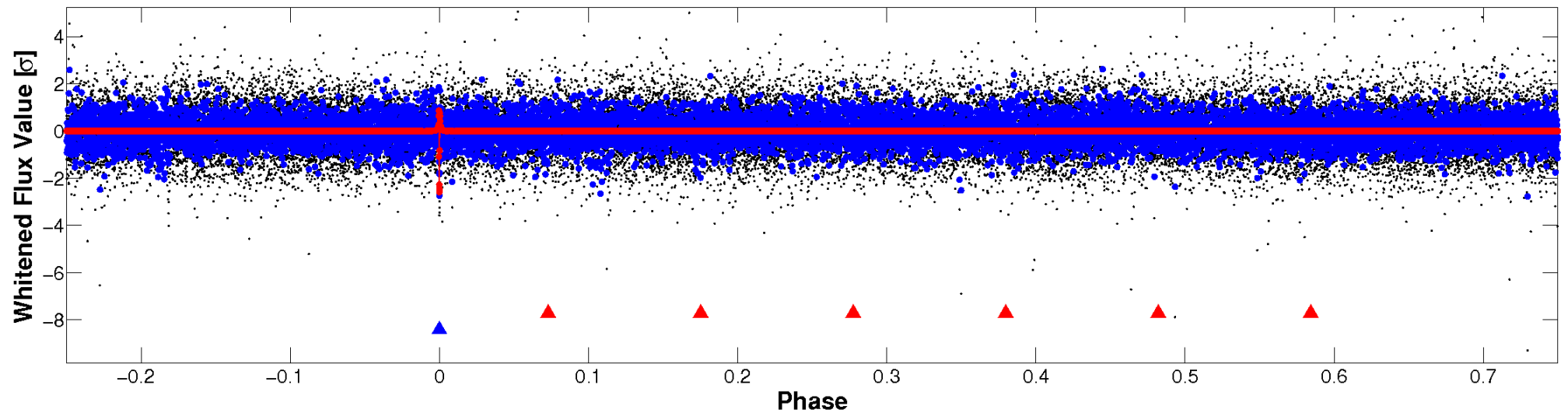


Non-Whitened Vs. Whitened Light Curve

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 009649205-02 P=215.250794 Days $T_0=300.243323$ (BKJD)



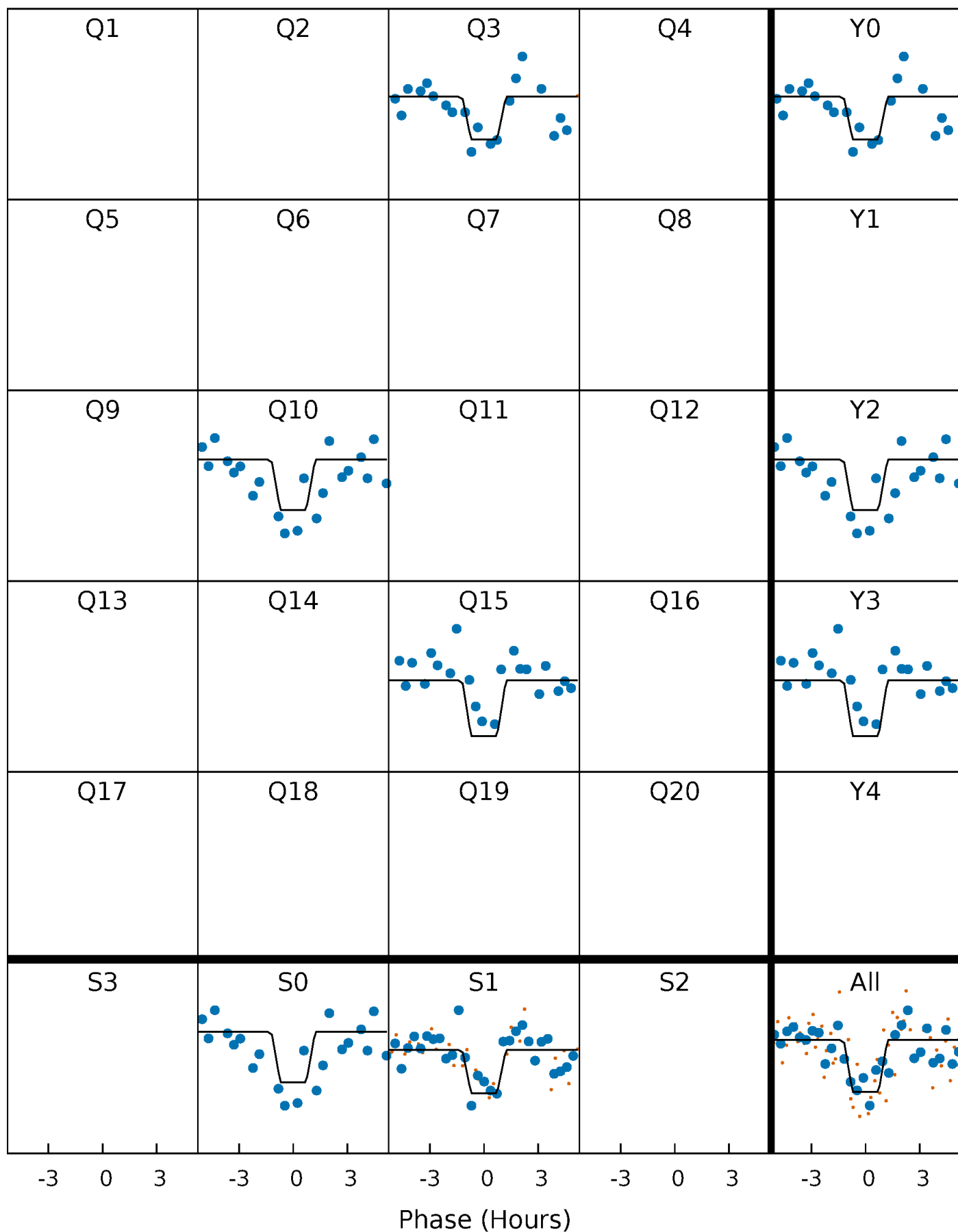
DV Quarter-Phased Transit Curves

TCE 009649205-02 P=215.250794 Days $T_0=300.243323$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

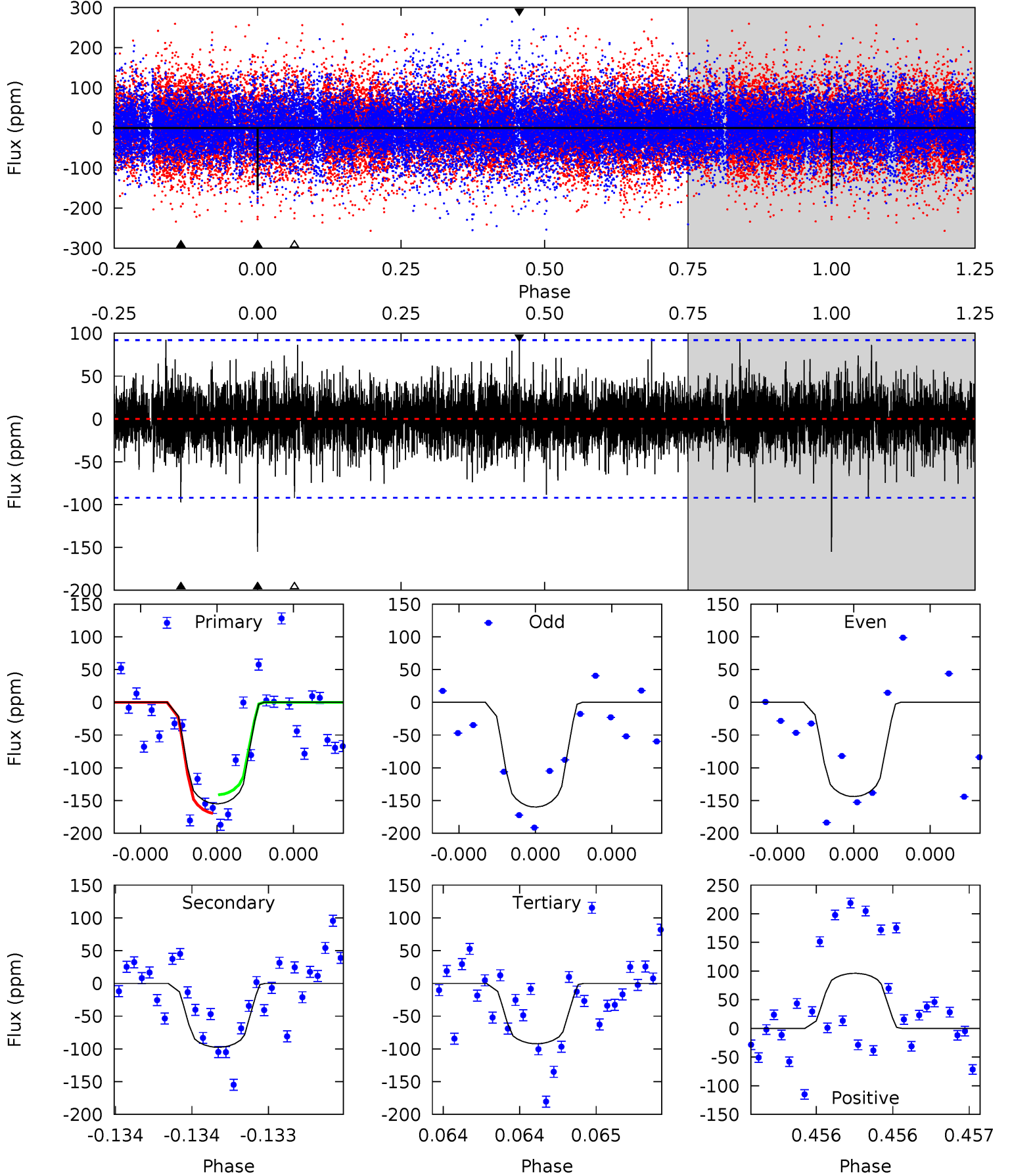
TCE 009649205-02 P=215.249956 Days $T_0=300.240746$ (BKJD)



DV Model-Shift Uniqueness Test

009649205-02, P = 215.250794 Days, E = 84.992529 Days

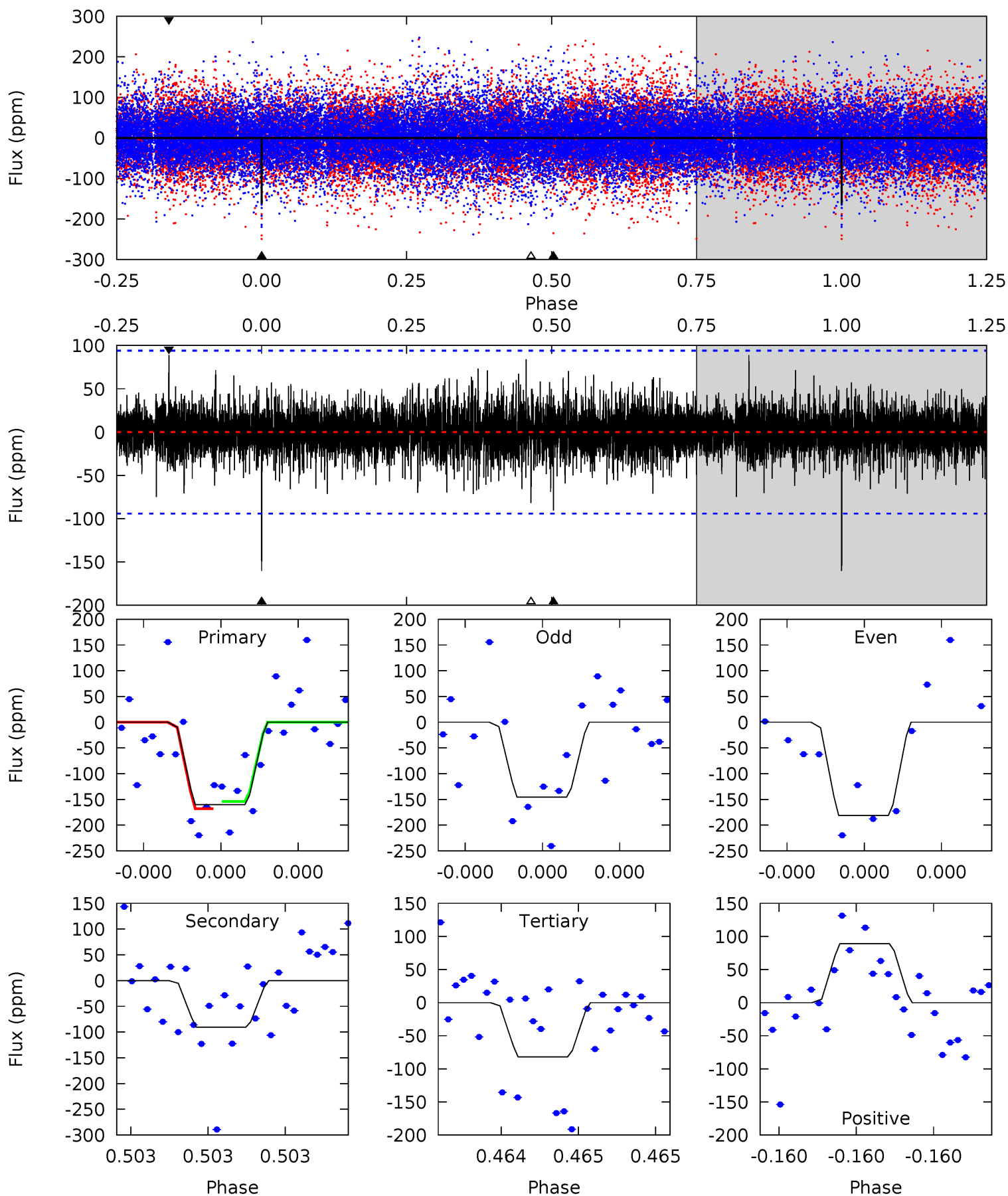
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.41	5.92	5.59	5.84	5.58	3.49	1.33	3.82	3.57	0.33	0.08	0.45	1.07	0.38	0.85



Alt Model-Shift Uniqueness Test

009649205-02, P = 215.249956 Days, E = 84.990790 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.55	5.39	4.87	5.30	5.61	3.54	1.14	4.68	4.25	0.51	0.09	1.00	0.88	0.36	0.42



Stellar Parameters For KIC 009649205

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5786^{+173}_{-190}	$4.402^{+0.100}_{-0.138}$	$-0.100^{+0.300}_{-0.300}$	$1.007^{+0.207}_{-0.138}$	$0.934^{+0.114}_{-0.093}$	$1.288^{+0.656}_{-0.513}$
	+3%/-3%	+2%/-3%	+300%/-300%	+21%/-14%	+12%/-10%	+51%/-40%
Source	KIC0	FLK73	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 009649205-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-98 ± 16	$1.94^{+1.45}_{-1.21}$	434^{+23}_{-23}	4535^{+2528}_{-857}	6805^{+41103}_{-4640}
Alt.	-90 ± 17	$1.81^{+1.37}_{-1.11}$	434^{+26}_{-22}	4631^{+2433}_{-898}	7479^{+39018}_{-5279}

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 $A_{obs} \gg 1.0$

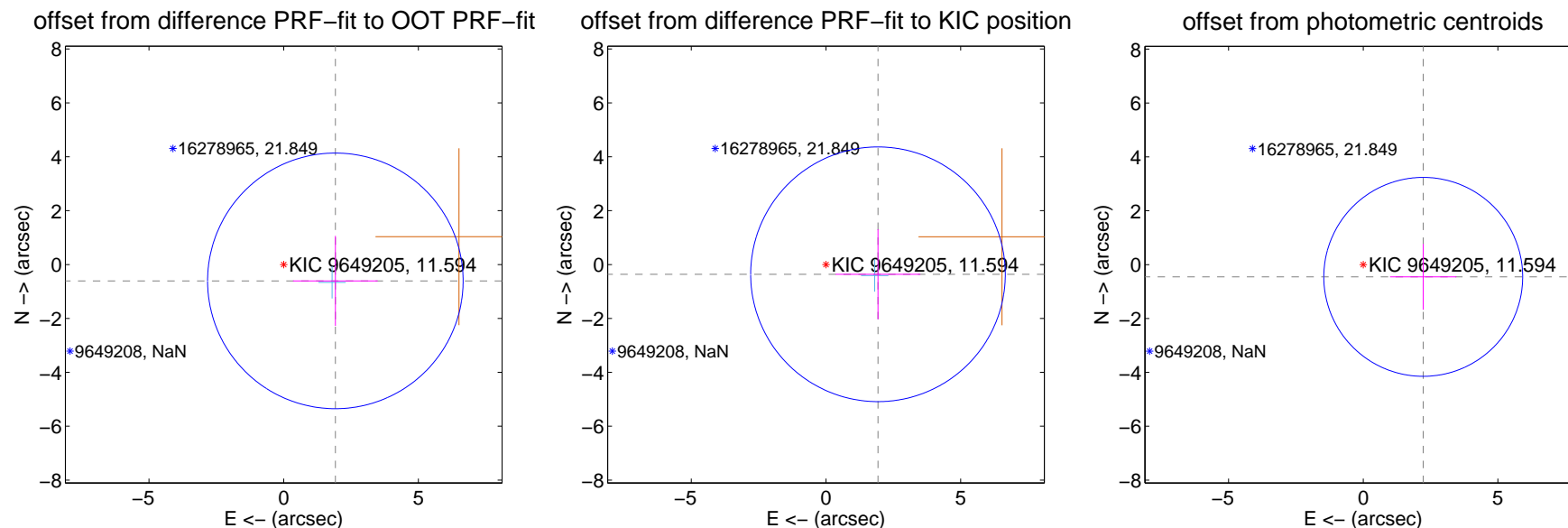
DV Centroid Data

Supplemental centroid analysis for 009649205-02. **Kepler magnitude: 11.59.** Transit SNR 8.08

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.012 ± 1.581	1.27	-1.918 ± 1.572	-0.606 ± 1.670
PRF-fit source offset from KIC position	1.965 ± 1.575	1.25	-1.931 ± 1.572	-0.362 ± 1.670
photometric centroid source offset	2.27 ± 1.23	1.85	-2.23 ± 1.23	-0.45 ± 1.22



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

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

Q1 no difference image



Q1 no OOT image



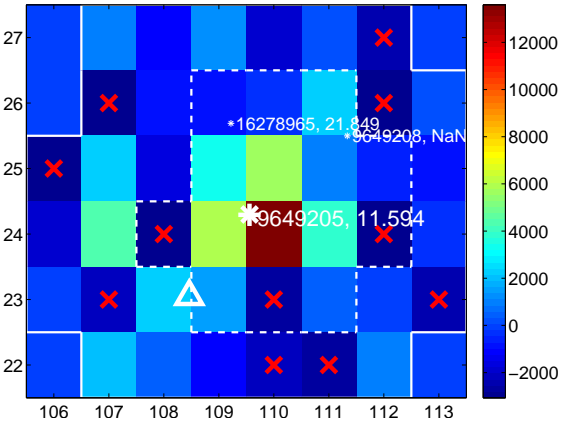
Q2 no difference image



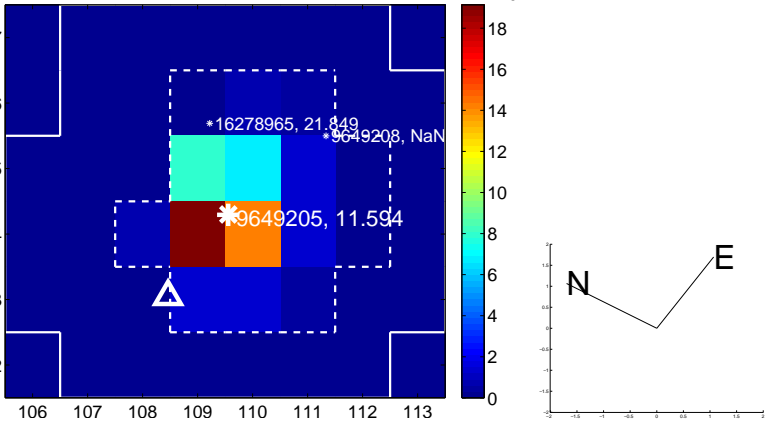
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



Q4 no difference image



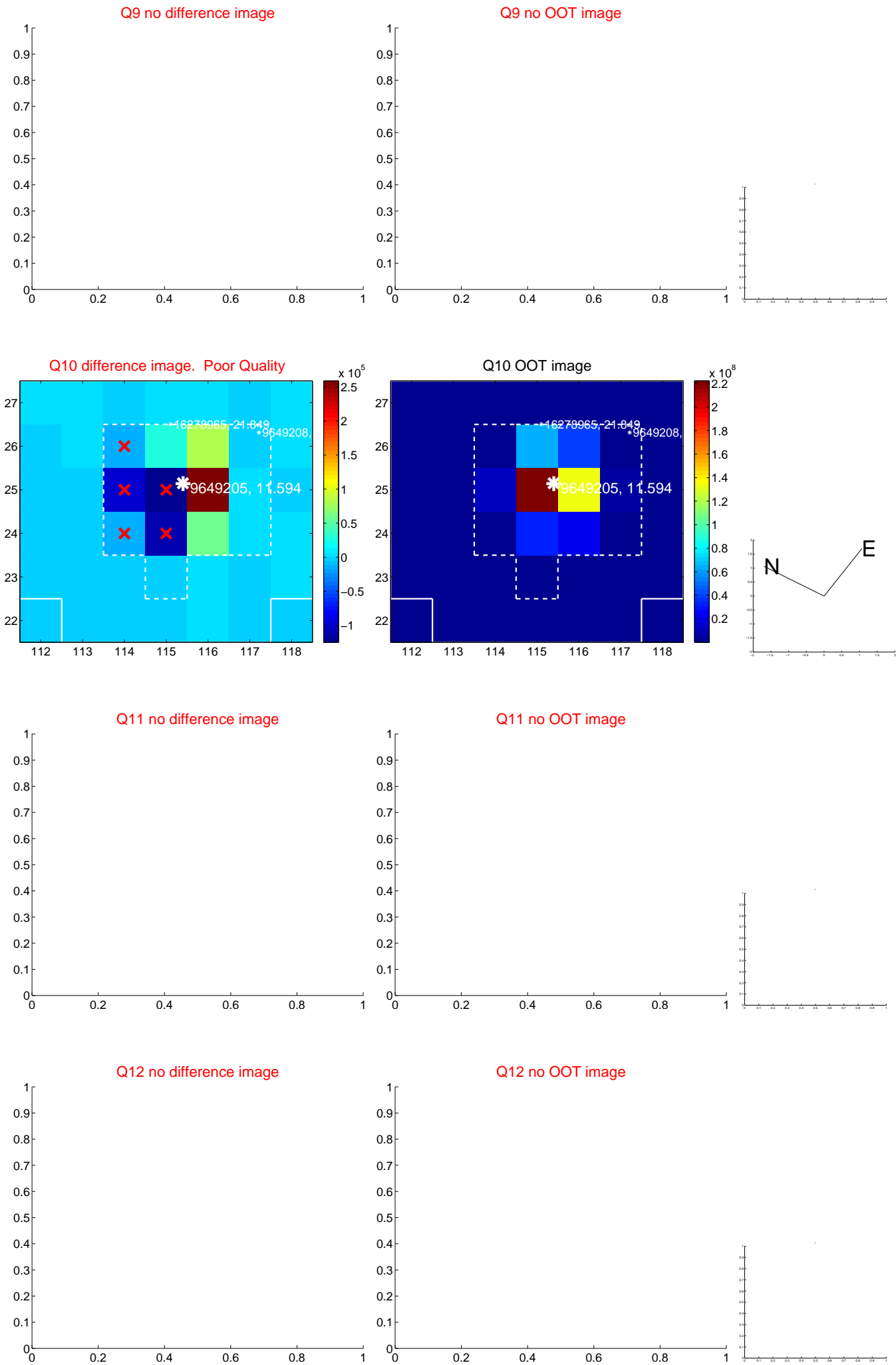
Q4 no OOT image



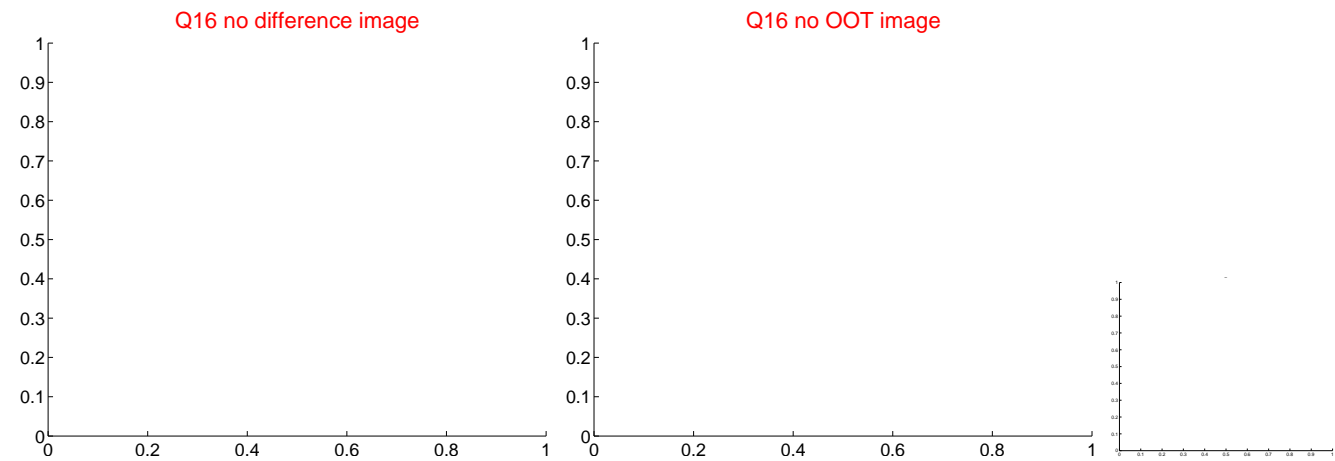
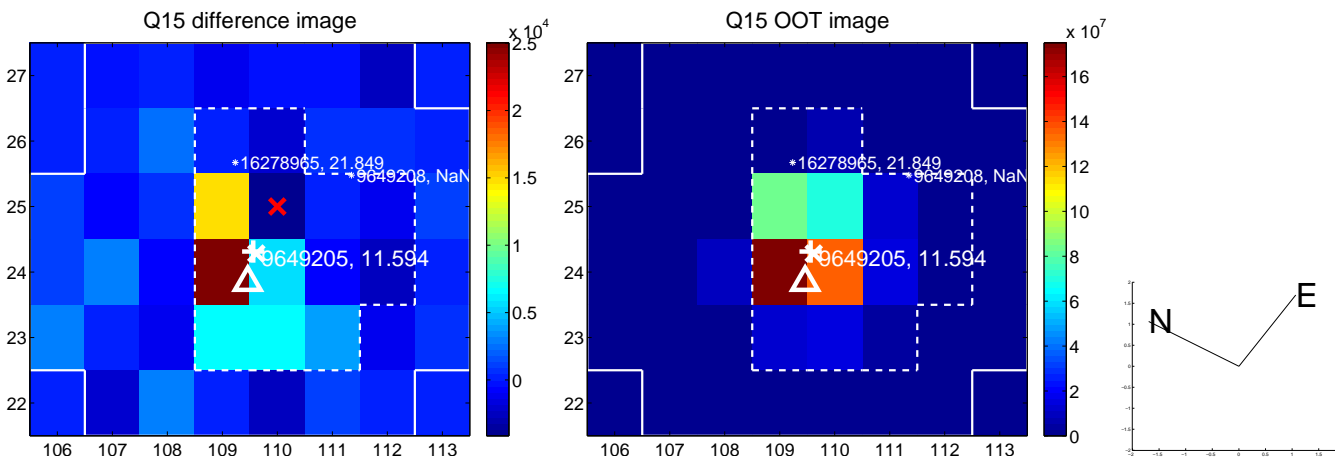
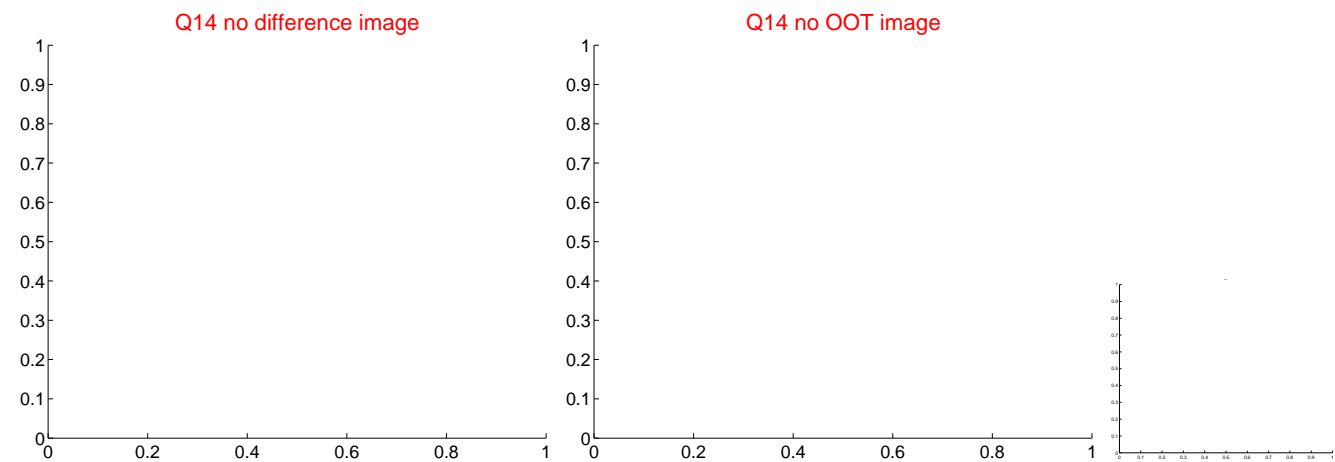
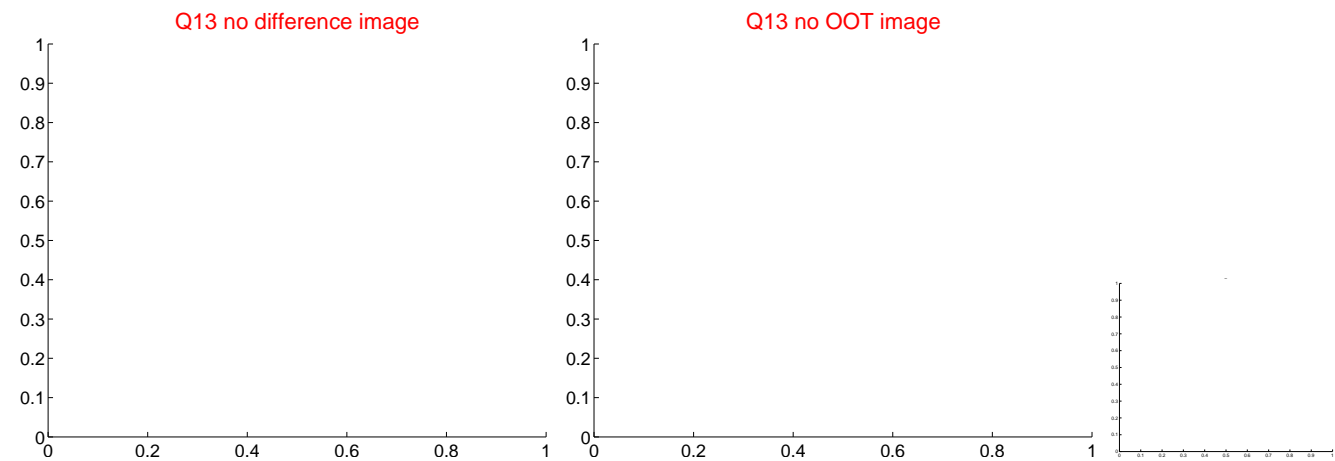
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



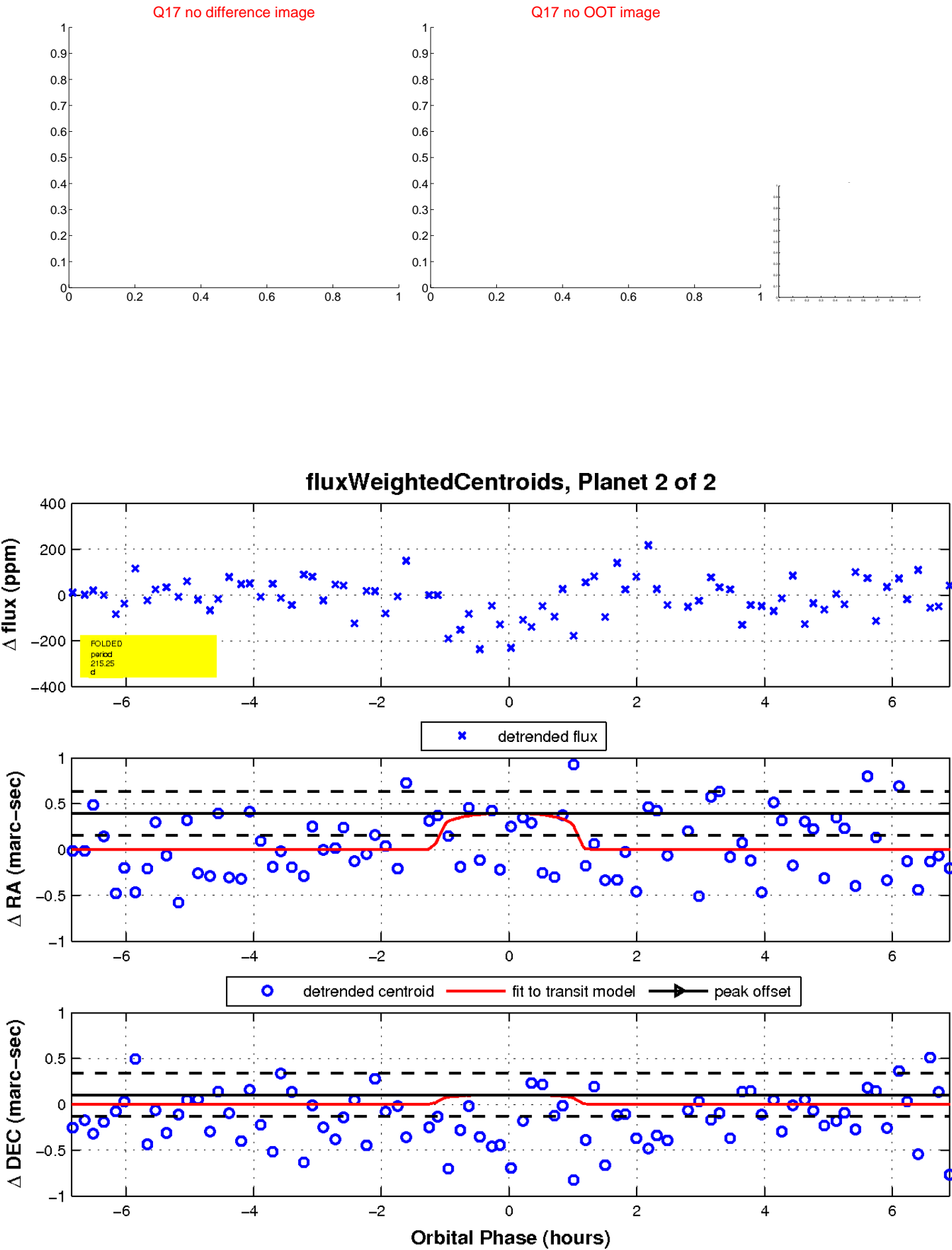
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

