

KIC 005451336

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})
005451336-01	OBS	No	180.057260	257.840341	995.1	4.295	13.3	4.5	0.84	6098	2.80	2.34
005451336-02	OBS	No	89.600105	186.114029	1508.8	2.411	12.0	5.4	0.84	6098	3.28	5.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005451336-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005451336-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT

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

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

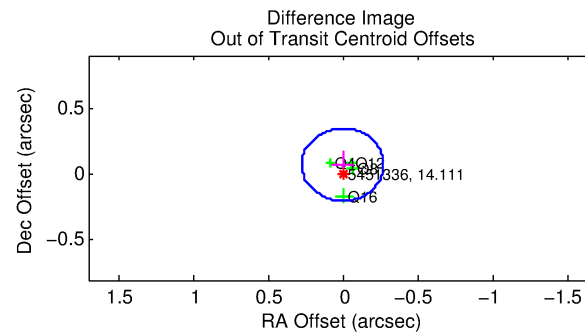
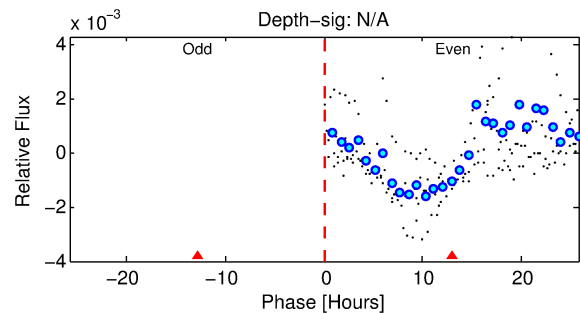
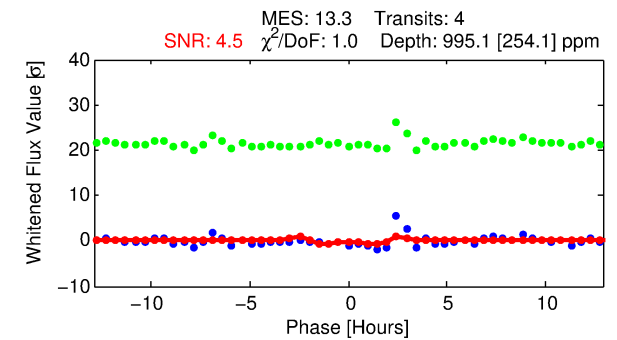
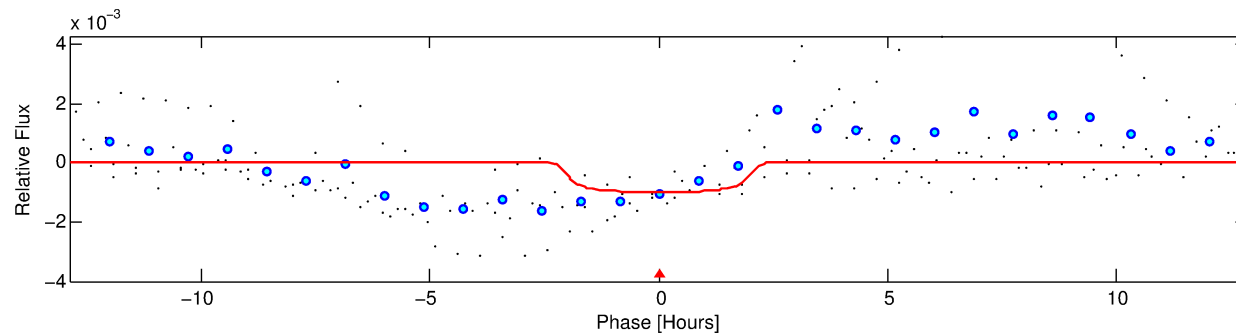
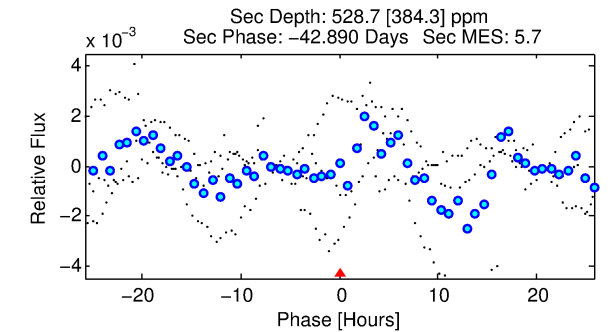
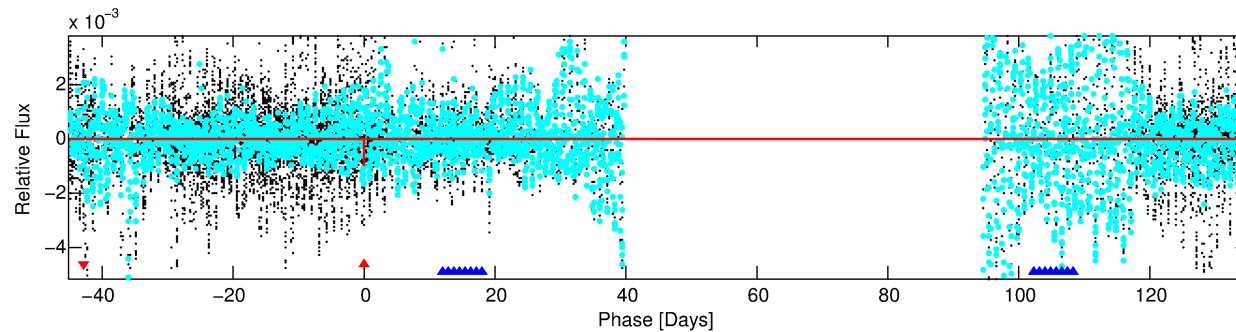
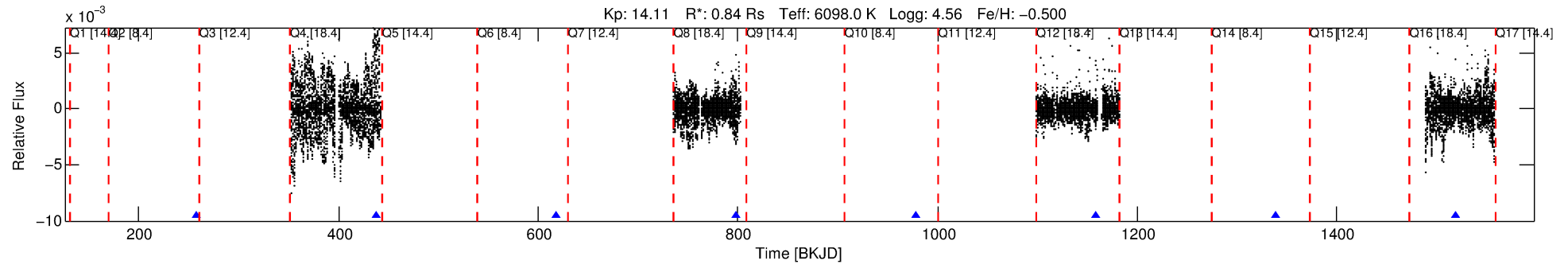
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005451336-01

No Significant Match Found

DV One-Page Summary

KIC: 5451336 Candidate: 1 of 2 Period: 180.057 d



DV Fit Results:

Period = 180.05726 [0.00195] d
Epoch = 257.8403 [0.0089] BKJD
Rp/R* = 0.0306 [0.0159]
a/R* = 254.01 [617.60]
b = 0.66 [2.10]
Seff = 2.34 [0.92]
Teq = 315 [31] K
Rp = 2.80 [1.68] Re
a = 0.6102 [0.1545] AU
Ag = 13819.61 [18220.90] [0.76] σ
Teffp = 5285 [1683] K [2.95] σ

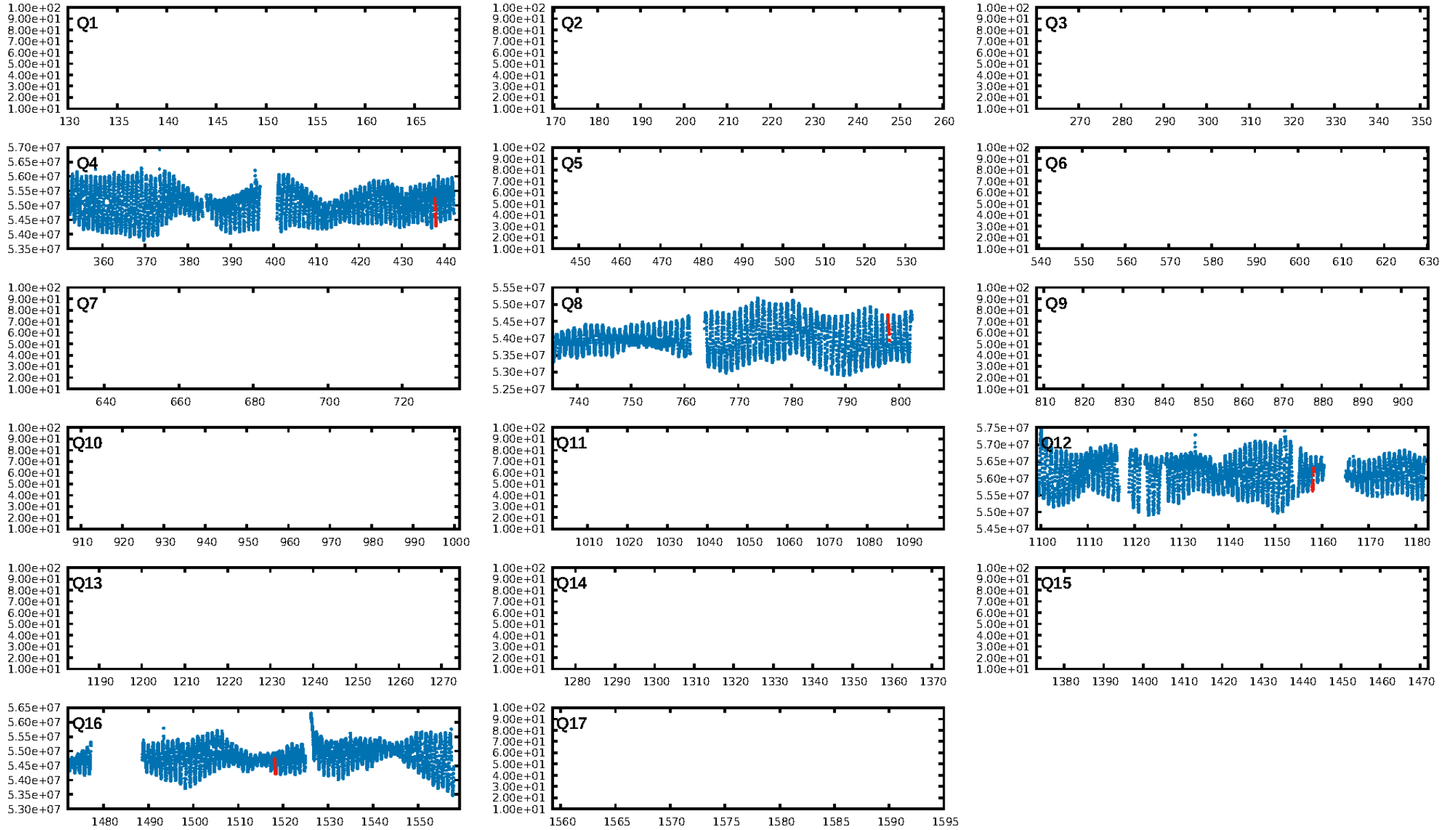
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [440.74] σ
LongPeriod-sig: N/A
ModelChiSquare2-sig: 36.0%
ModelChiSquareGof-sig: 97.5%
Bootstrap-pfa: 8.41e-13
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -2.29
Centroid-sig: 71.5%
Centroid-so: 0.258 arcsec [0.41] σ
OotOffset-rm: 0.072 arcsec [0.79] σ
OotOffset-st: 0/0/4/0 [4]
KicOffset-rm: 0.125 arcsec [1.39] σ
KicOffset-st: 0/0/4/0 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [4/4]

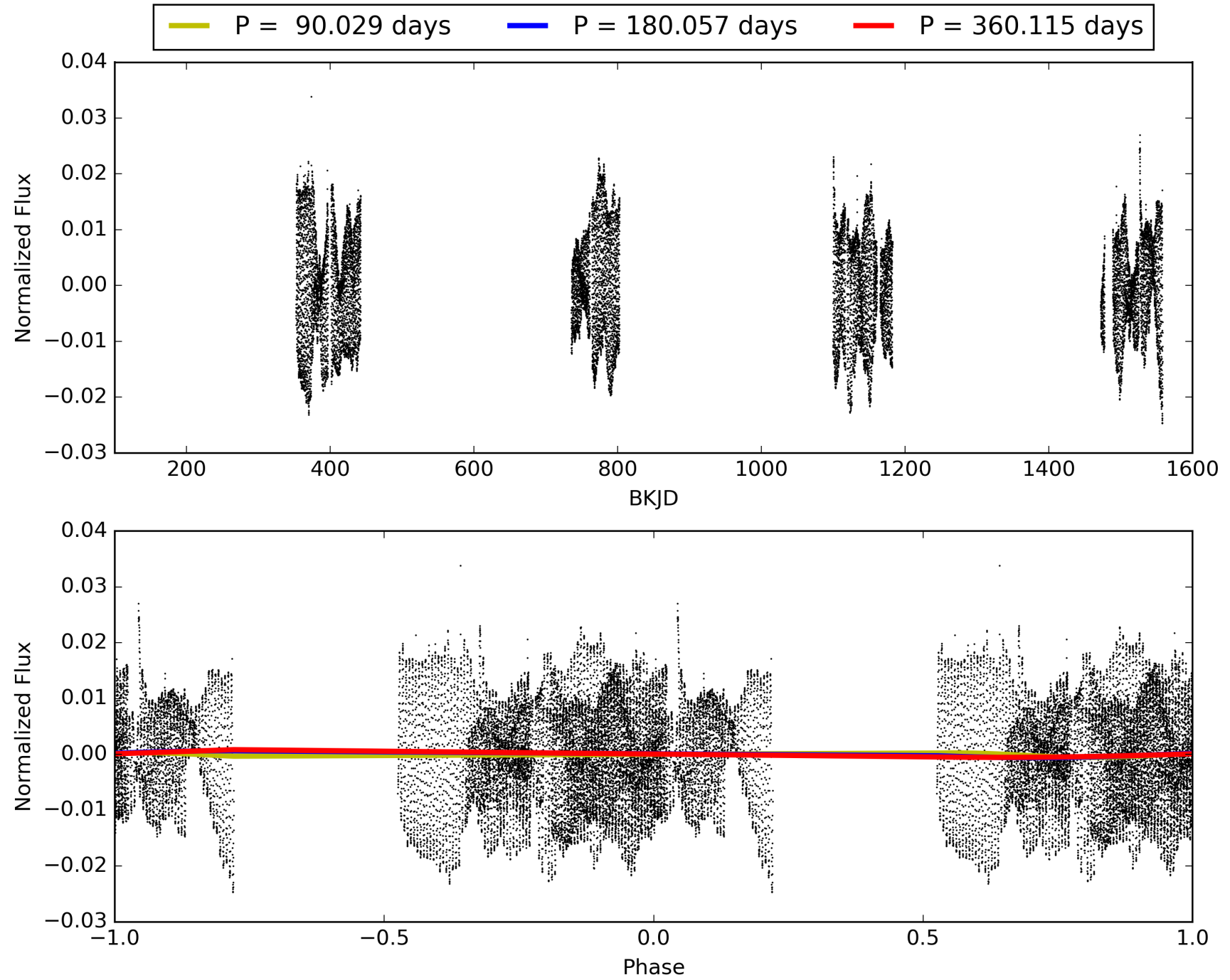
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:26:21 Z

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

TCE 005451336-01, PDC Light Curves

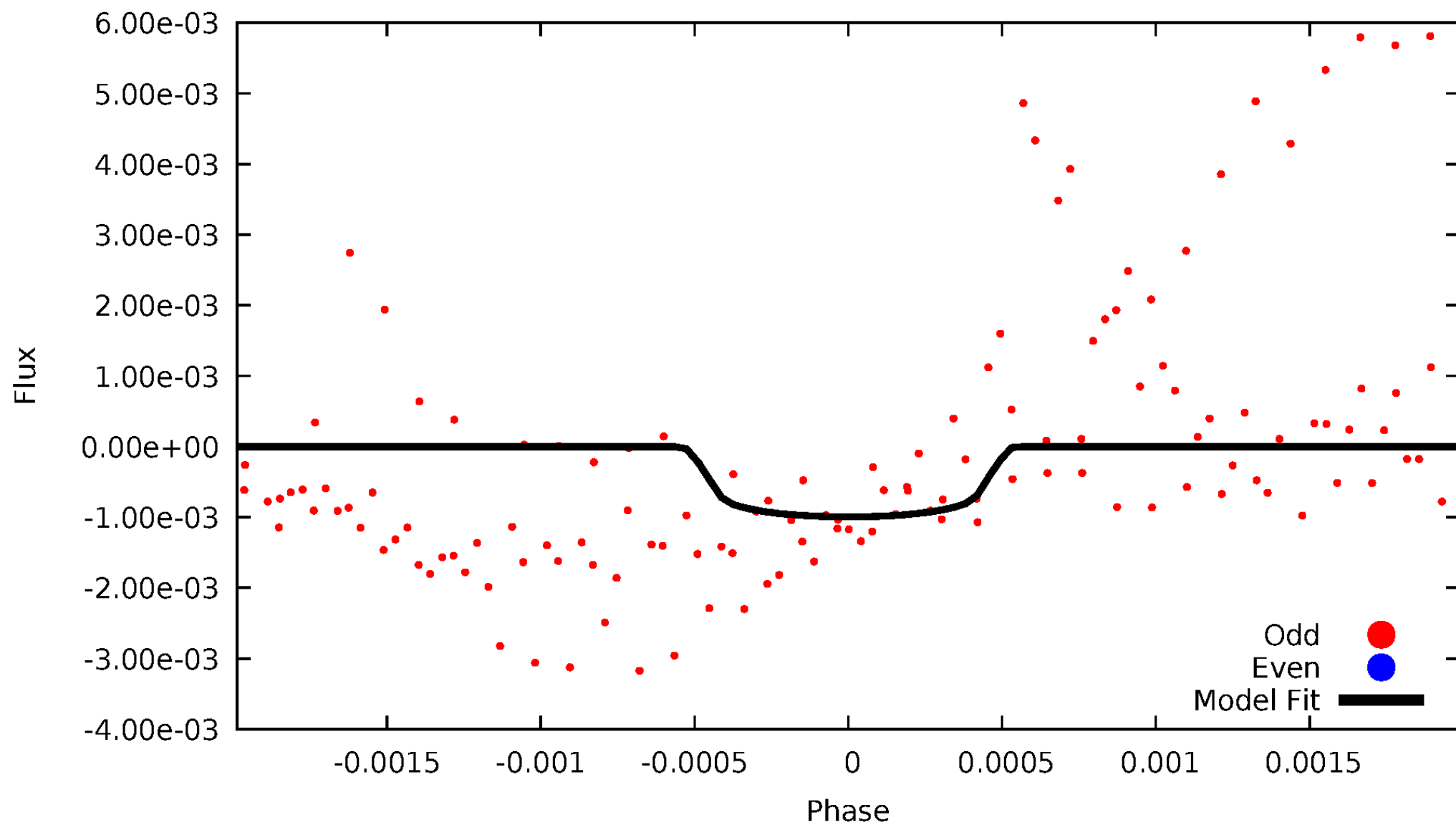


TCE 005451336-01



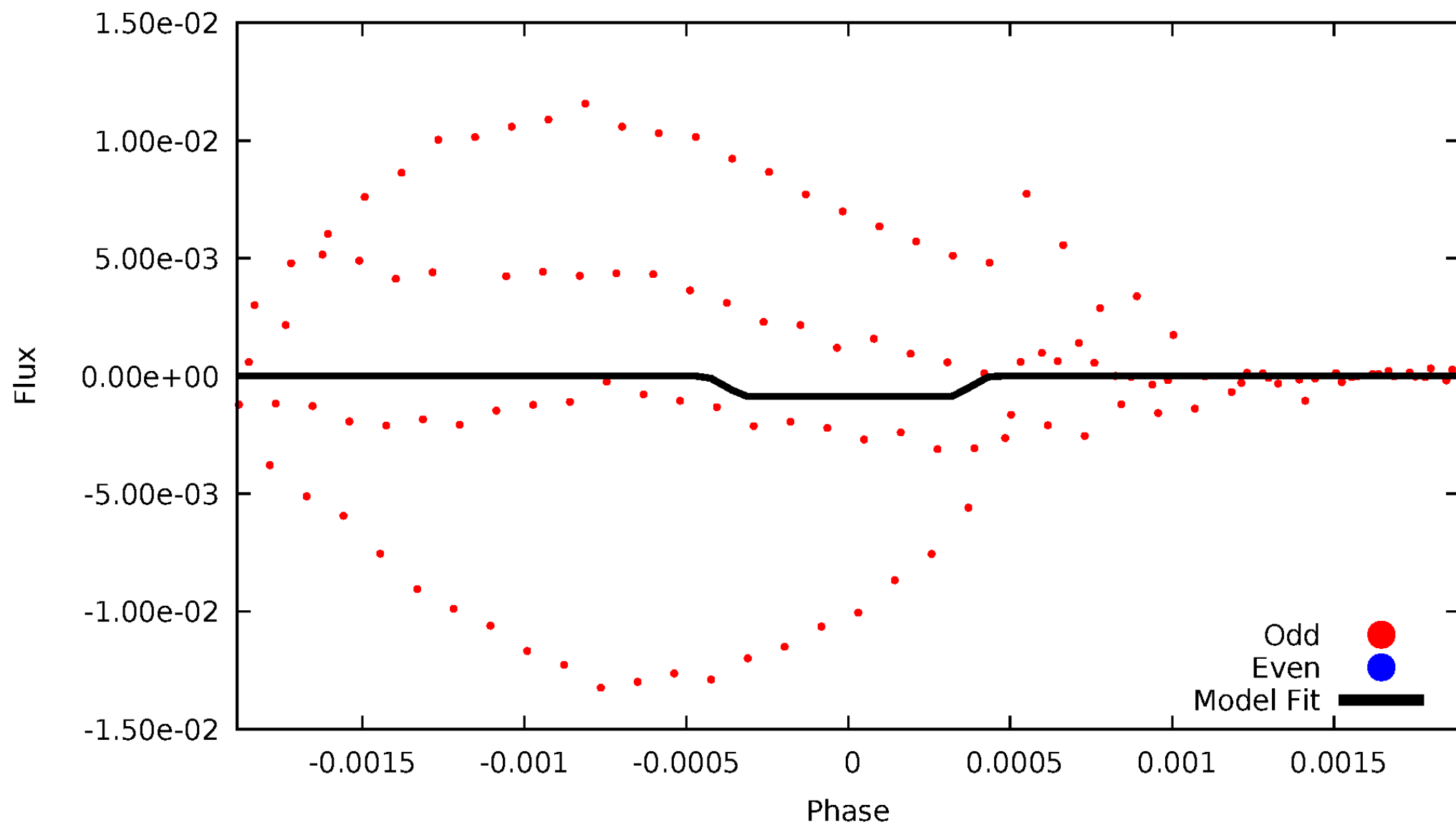
DV Odd/Even

TCE 005451336-01



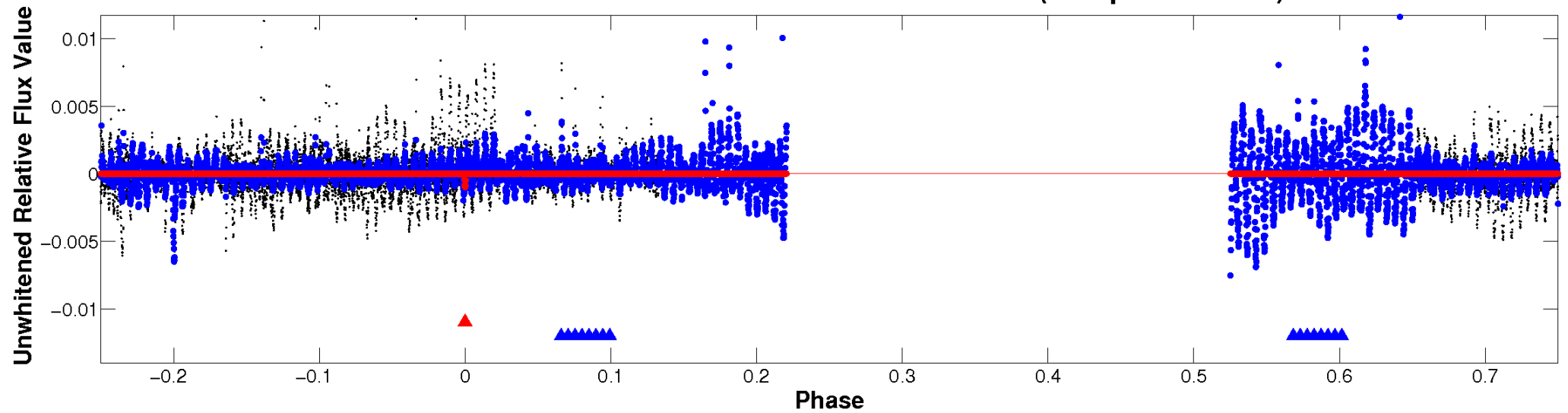
ALT Odd/Even

TCE 005451336-01

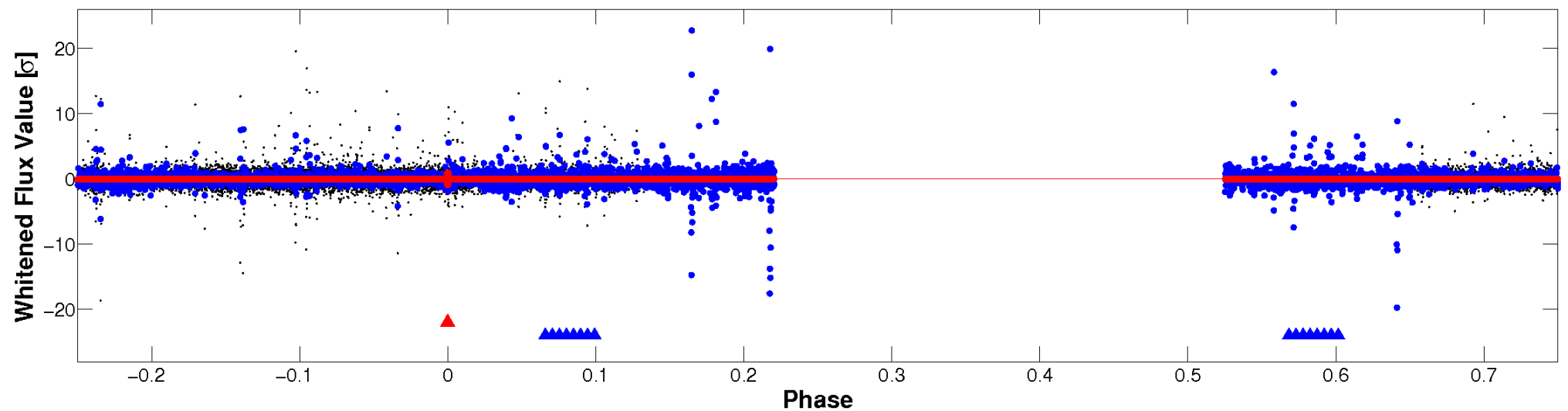


Non-Whitened Vs. Whitened Light Curve

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

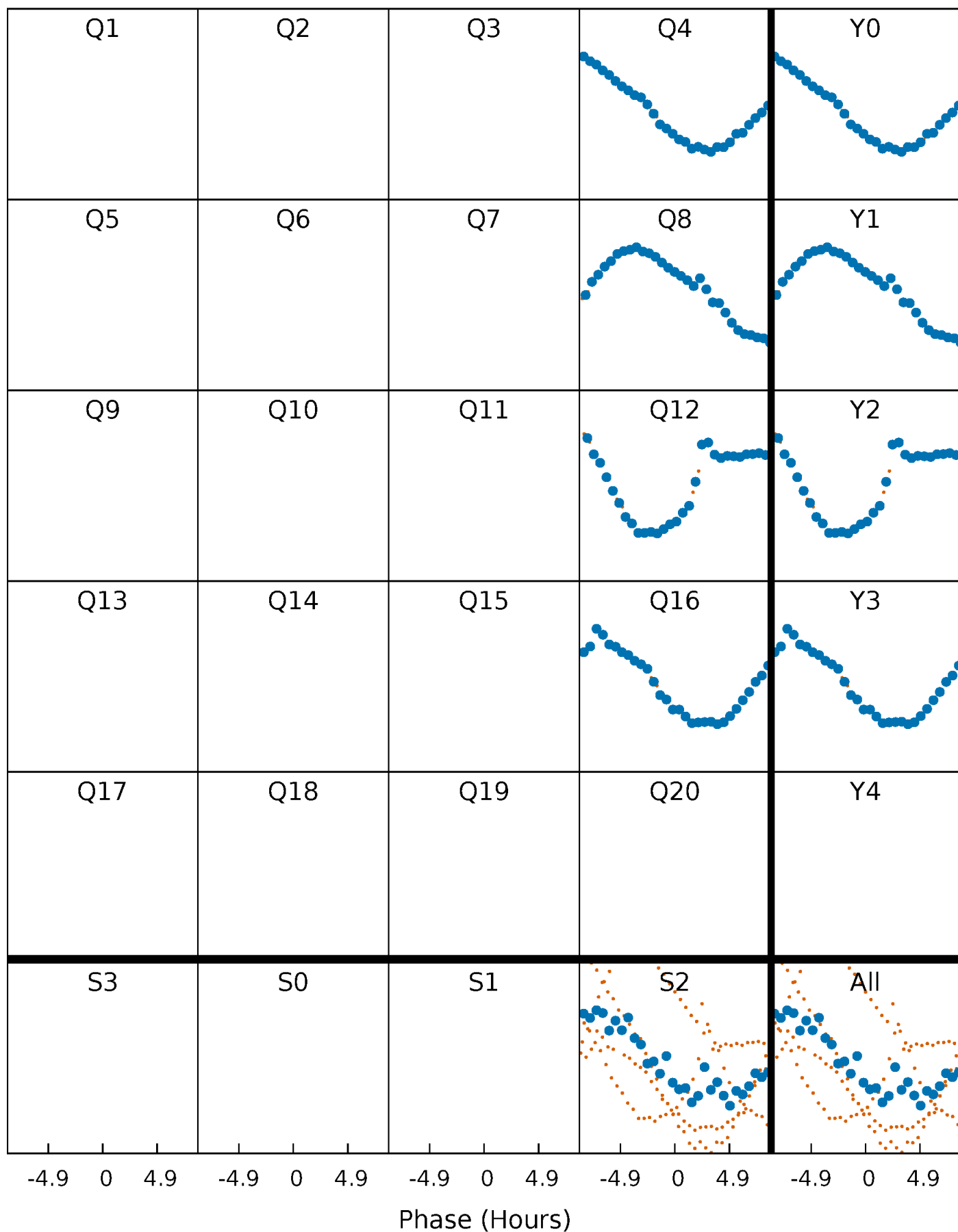


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



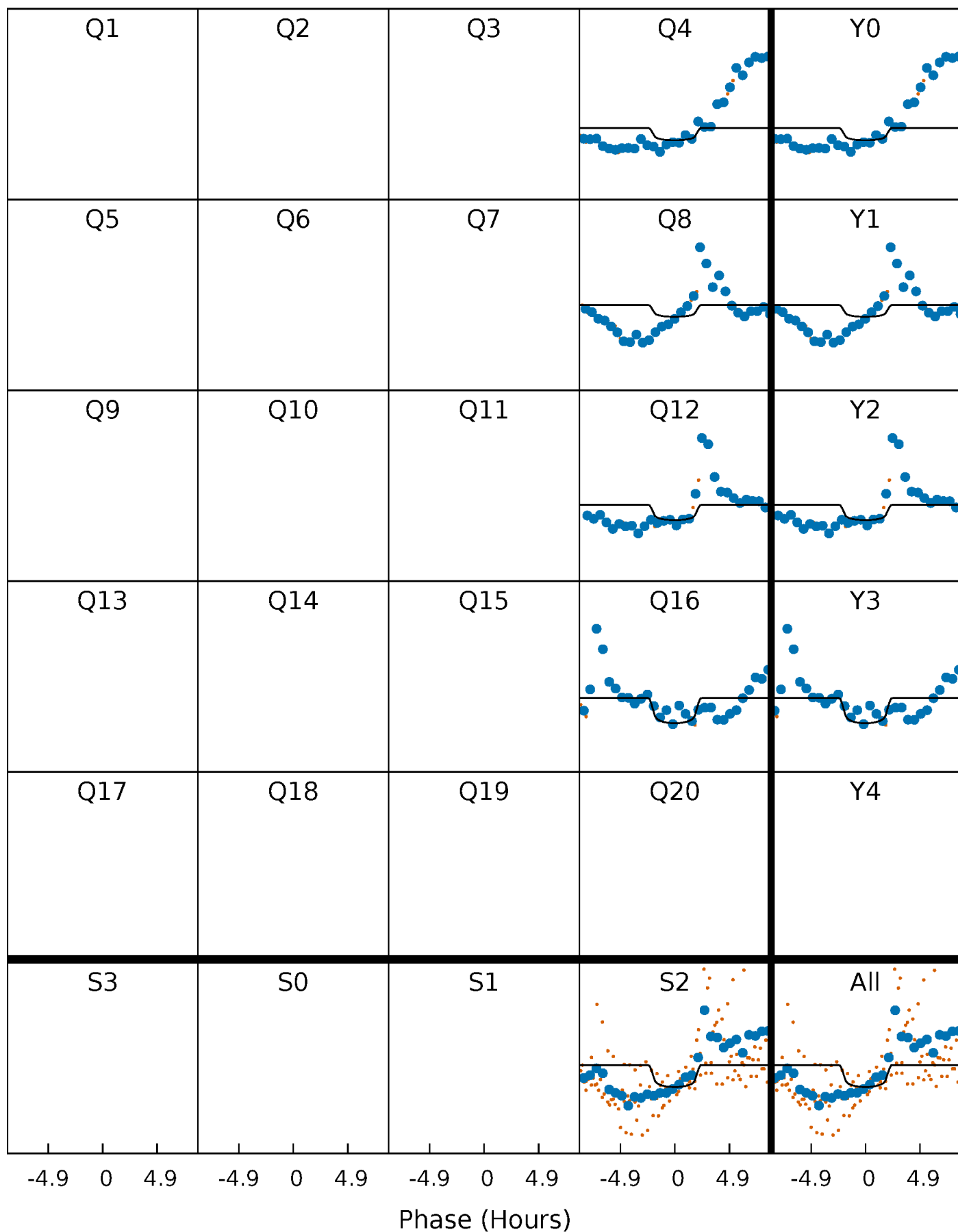
PDC Quarter-Phased Transit Curves

TCE 005451336-01 P=180.057260 Days $T_0=257.840341$ (BKJD)



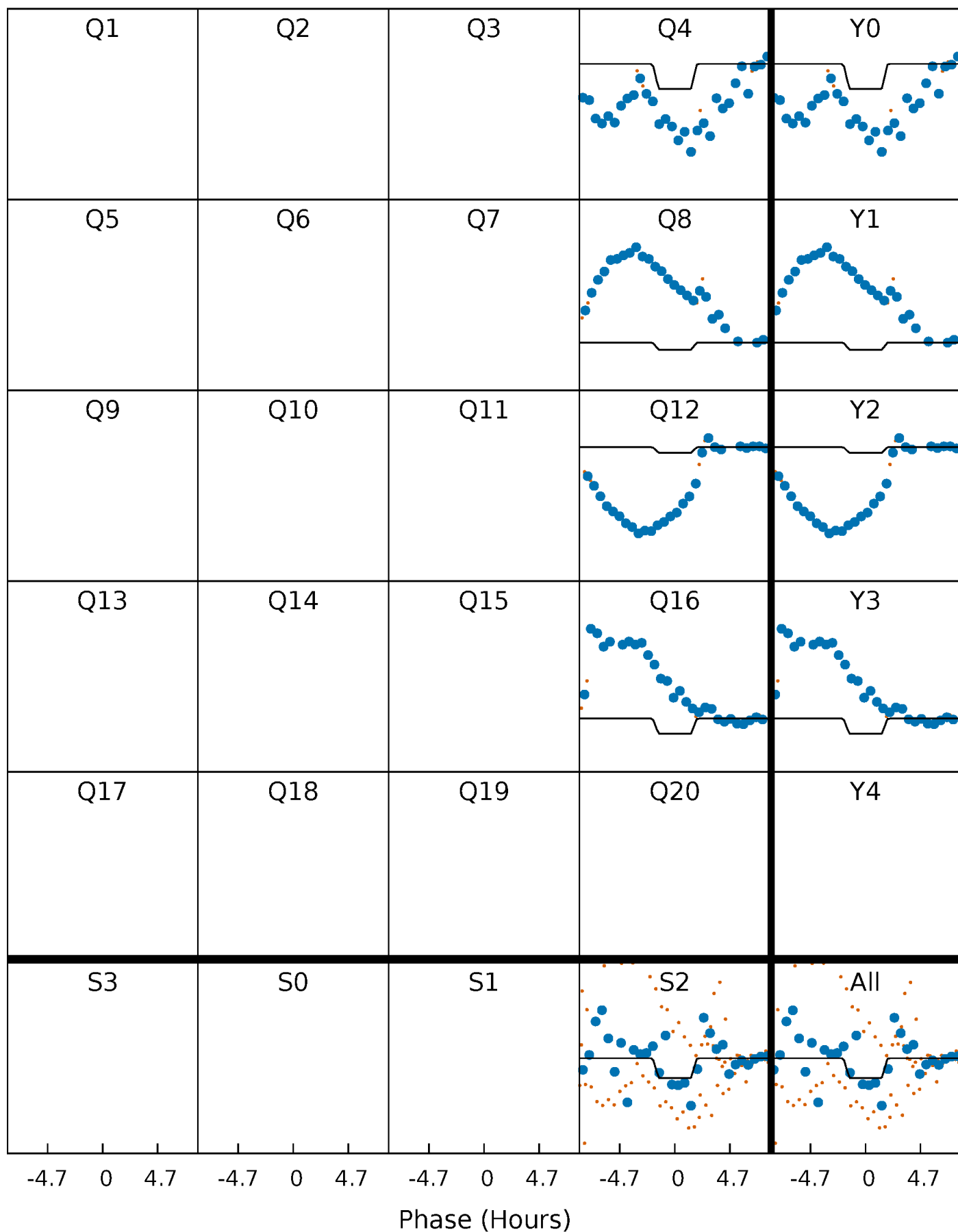
DV Quarter-Phased Transit Curves

TCE 005451336-01 P=180.057260 Days $T_0=257.840341$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

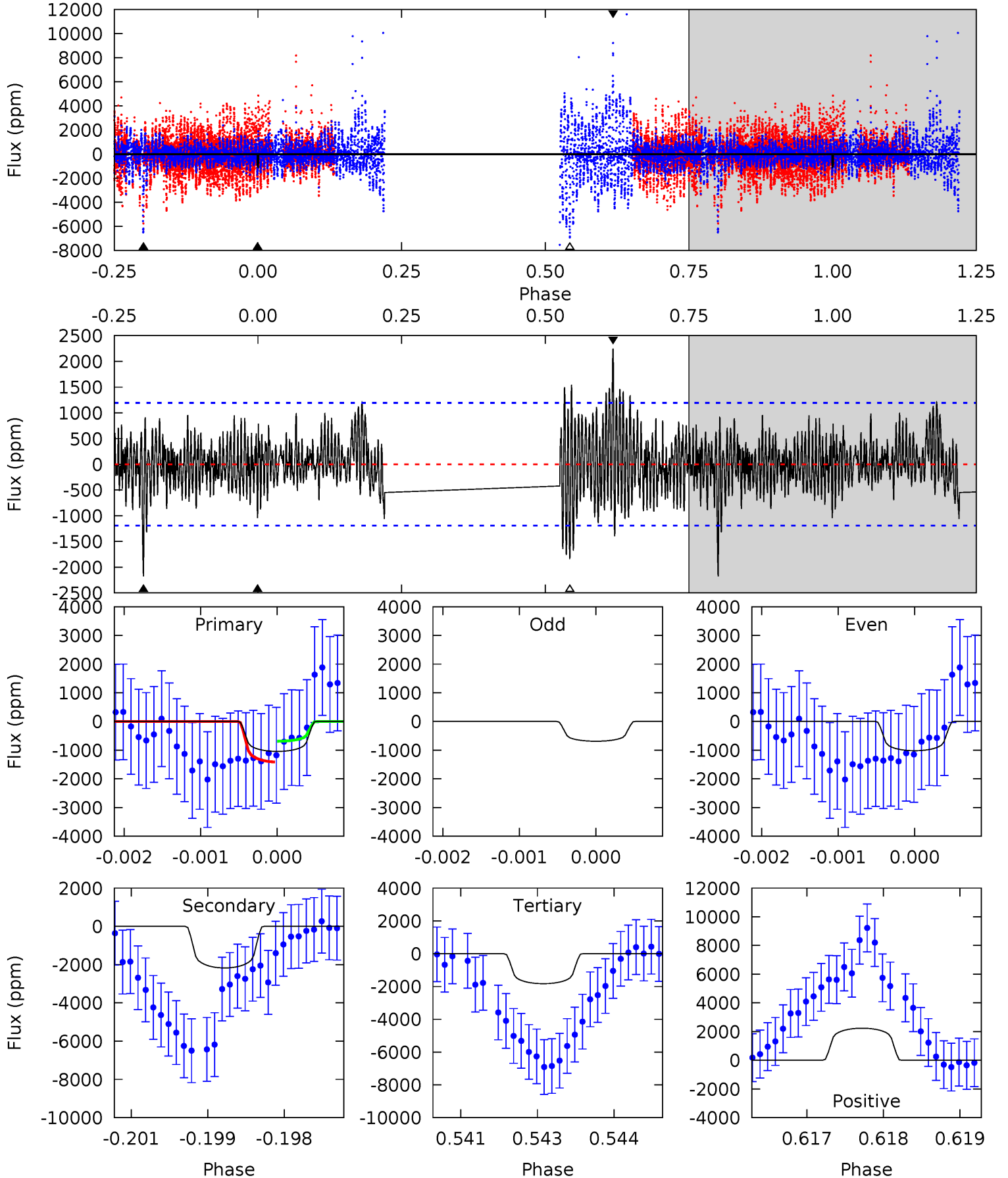
TCE 005451336-01 P=180.056445 Days $T_0=257.846305$ (BKJD)



DV Model-Shift Uniqueness Test

005451336-01, P = 180.057260 Days, E = 257.840341 Days

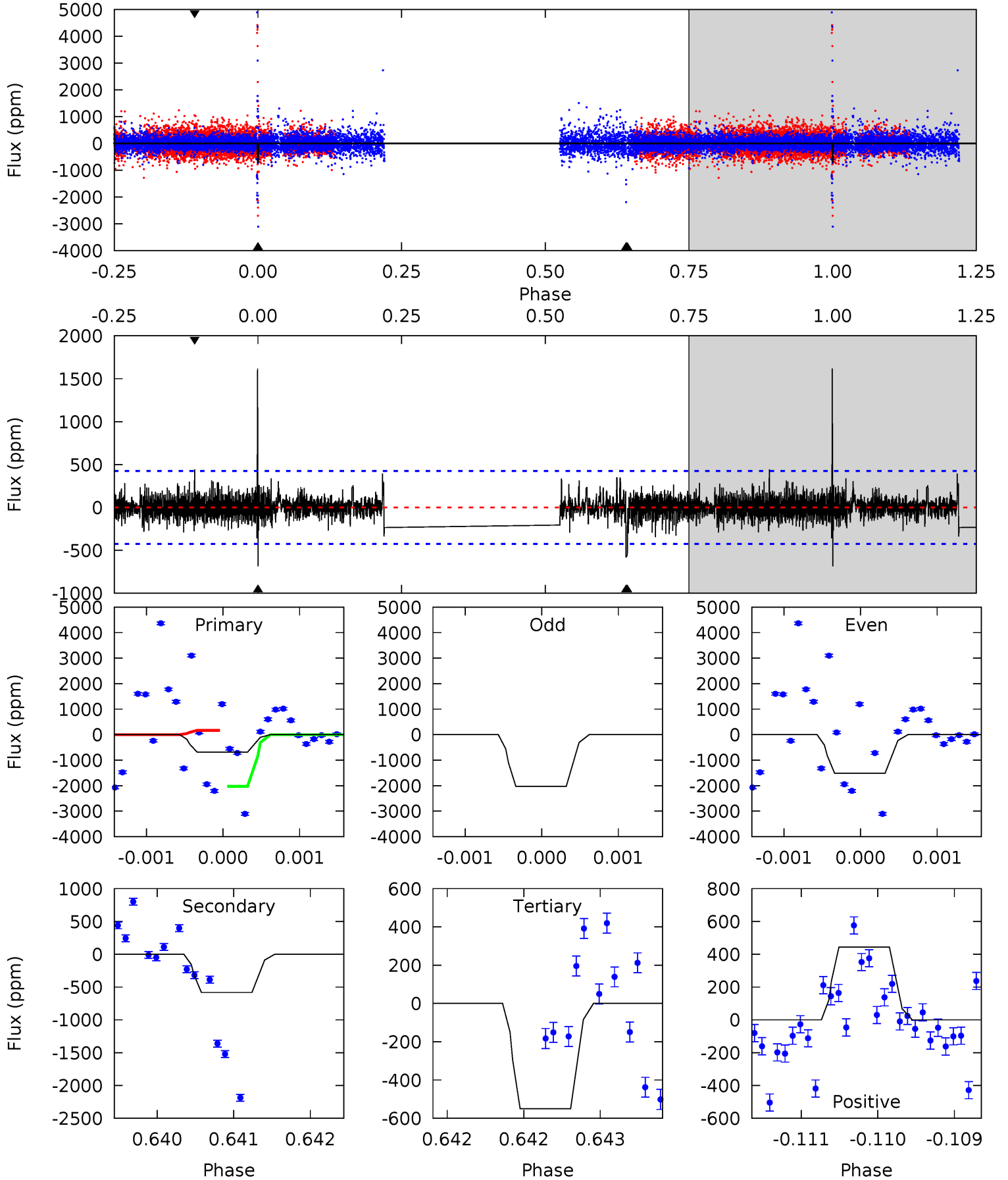
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.77	9.92	8.34	10.2	5.43	3.26	2.06	-3.58	-5.43	1.58	-0.27	1.05	0.98	0.51	1.73



Alt Model-Shift Uniqueness Test

005451336-01, P = 180.056445 Days, E = 257.846305 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.83	7.50	7.08	5.71	5.48	3.33	1.21	1.74	3.11	0.41	1.78	3.81	2.10	0.70	0



Stellar Parameters For KIC 005451336

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6098^{+190}_{-212}	$4.562^{+0.037}_{-0.200}$	$-0.500^{+0.300}_{-0.300}$	$0.838^{+0.253}_{-0.063}$	$0.938^{+0.097}_{-0.130}$	$2.248^{+0.445}_{-1.148}$
	+3%/-3%	+1%/-4%	+60%/-60%	+30%/-8%	+10%/-14%	+20%/-51%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005451336-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2175 ± 219	$3.05^{+1.54}_{-1.52}$	449^{+29}_{-20}	7498^{+4612}_{-1434}	$47114^{+146199}_{-26114}$
Alt.	-582 ± 78	$2.98^{+1.62}_{-1.44}$	451^{+29}_{-22}	5371^{+2210}_{-872}	12962^{+35183}_{-7340}

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 $A_{obs} \gg 1.0$

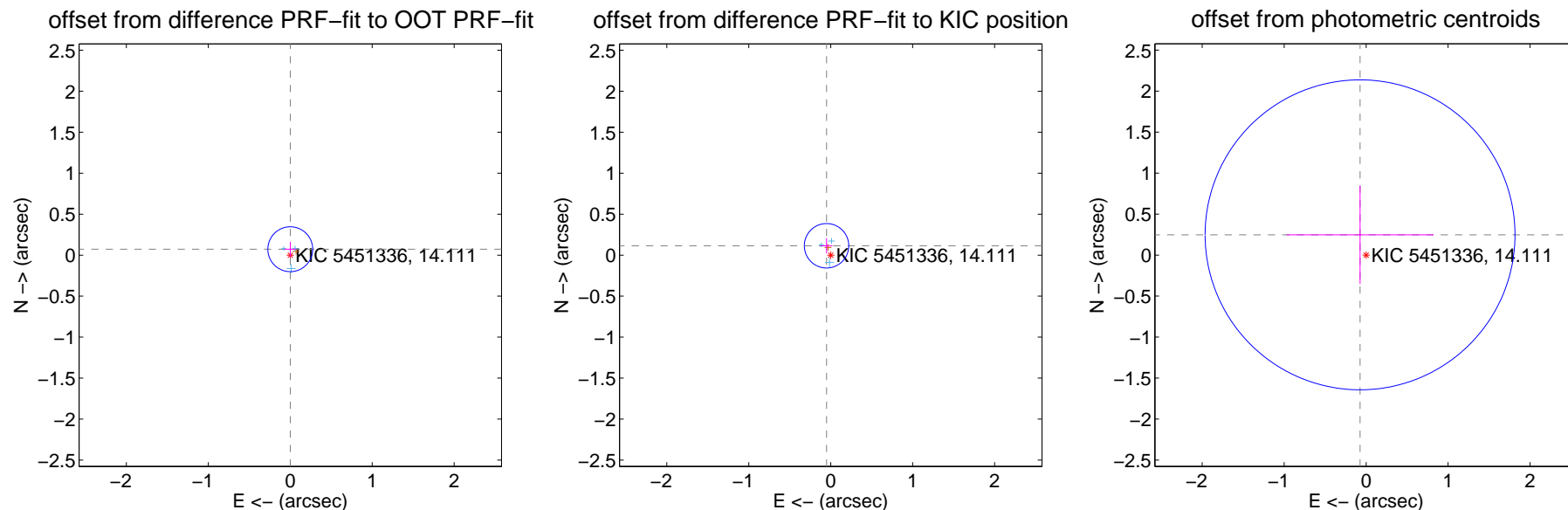
DV Centroid Data

Supplemental centroid analysis for 005451336-01. Kepler magnitude: 14.11. Transit SNR 4.47

There are 3 quarters with good PRF difference image offsets

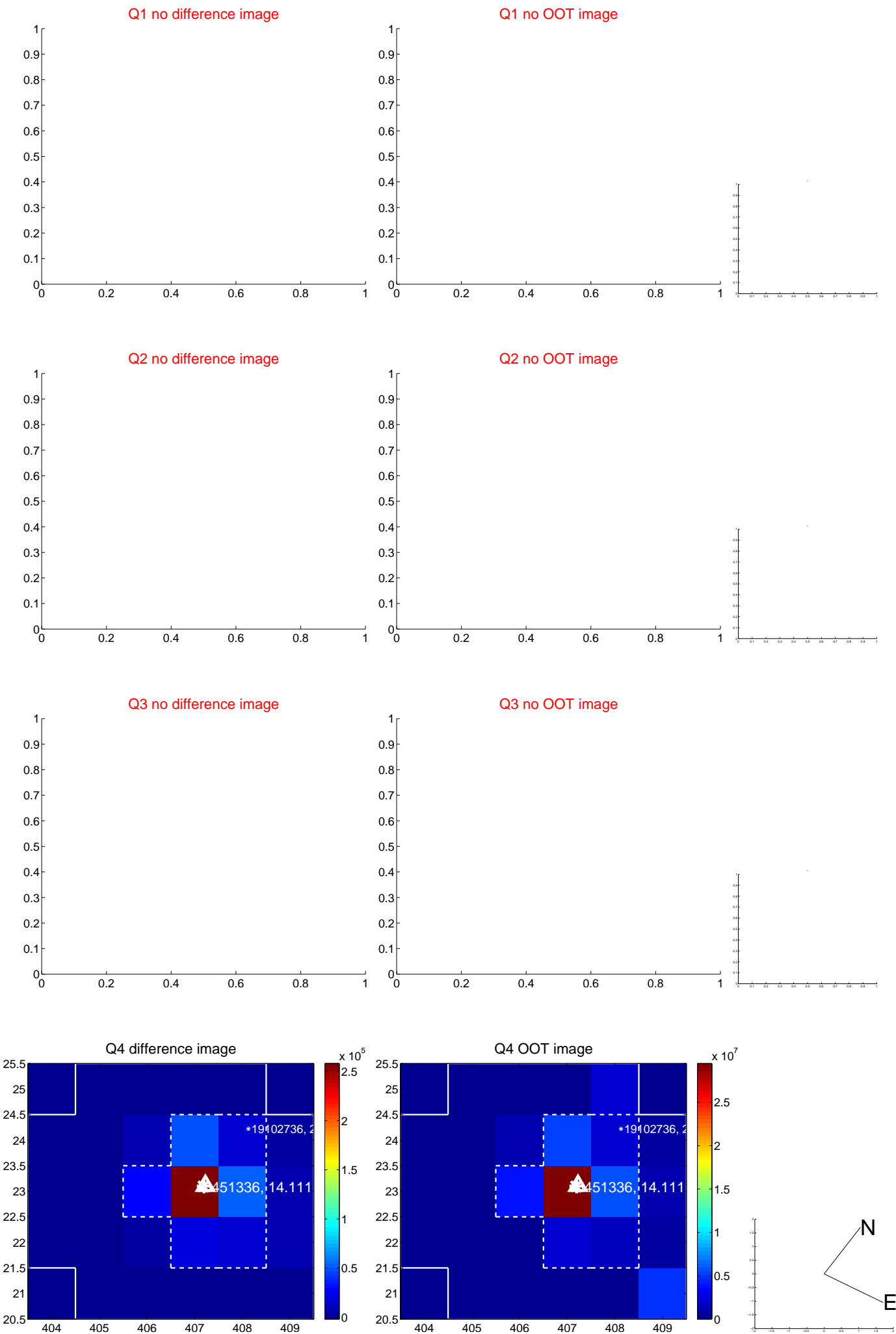
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.072 ± 0.091	0.79	-0.000 ± 0.073	0.072 ± 0.091
PRF-fit source offset from KIC position	0.125 ± 0.090	1.39	0.051 ± 0.072	0.114 ± 0.092
photometric centroid source offset	0.26 ± 0.63	0.41	0.07 ± 0.90	0.25 ± 0.60

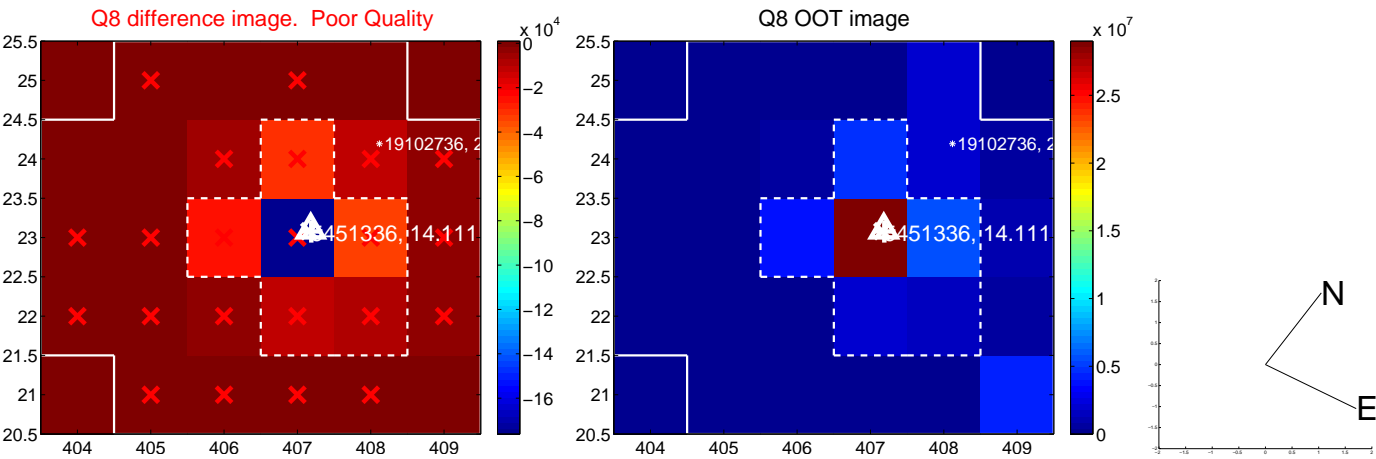


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

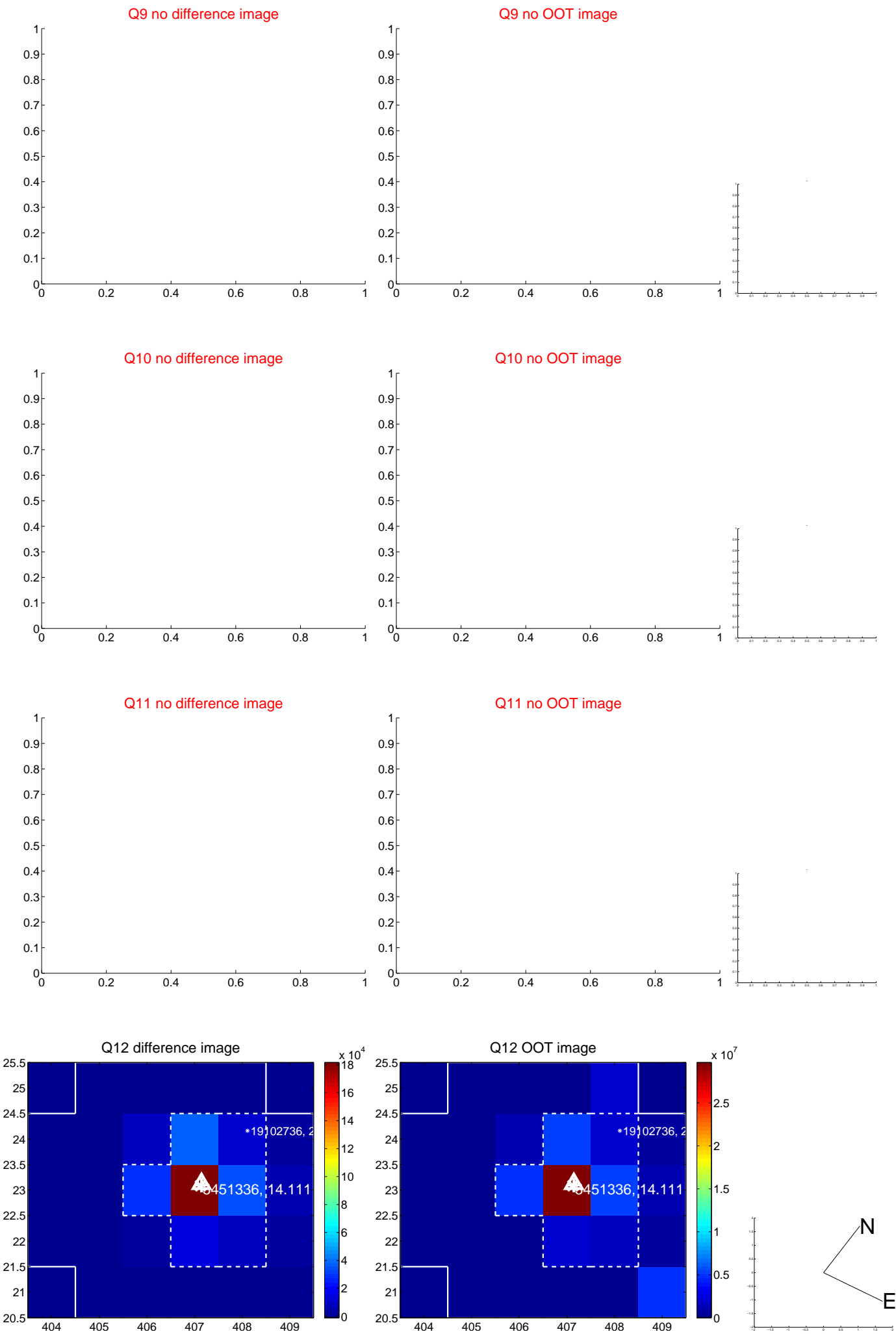
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



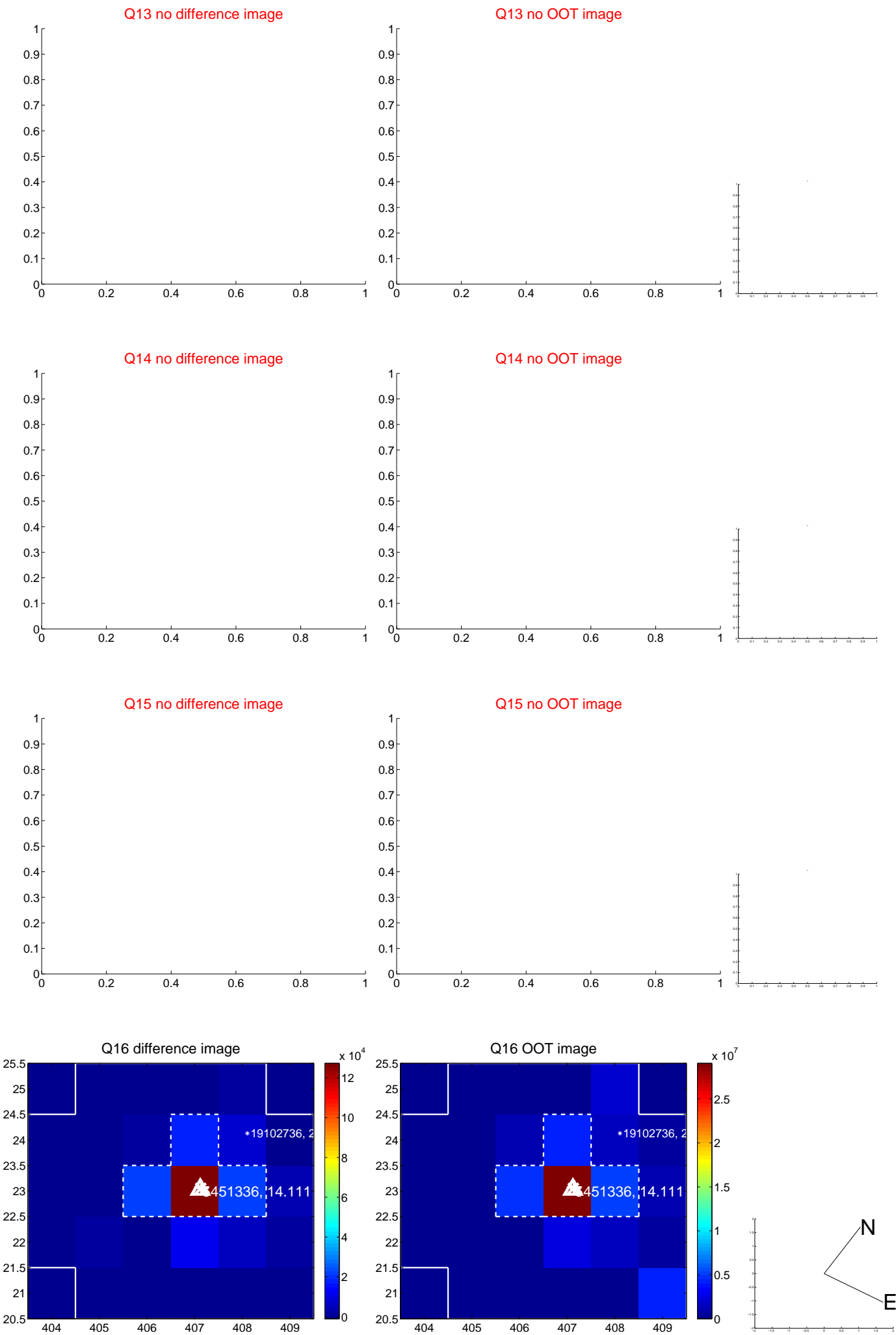
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



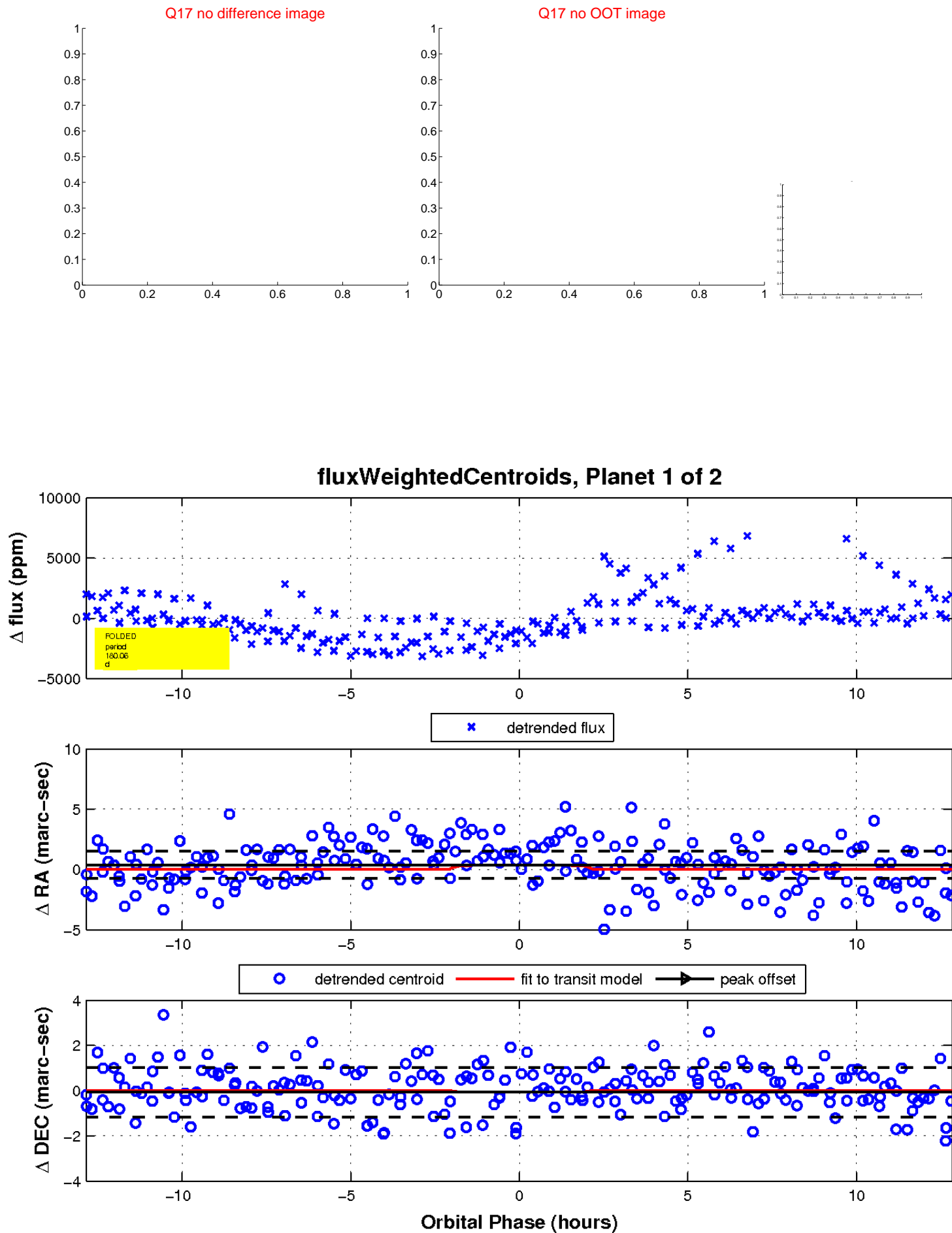
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

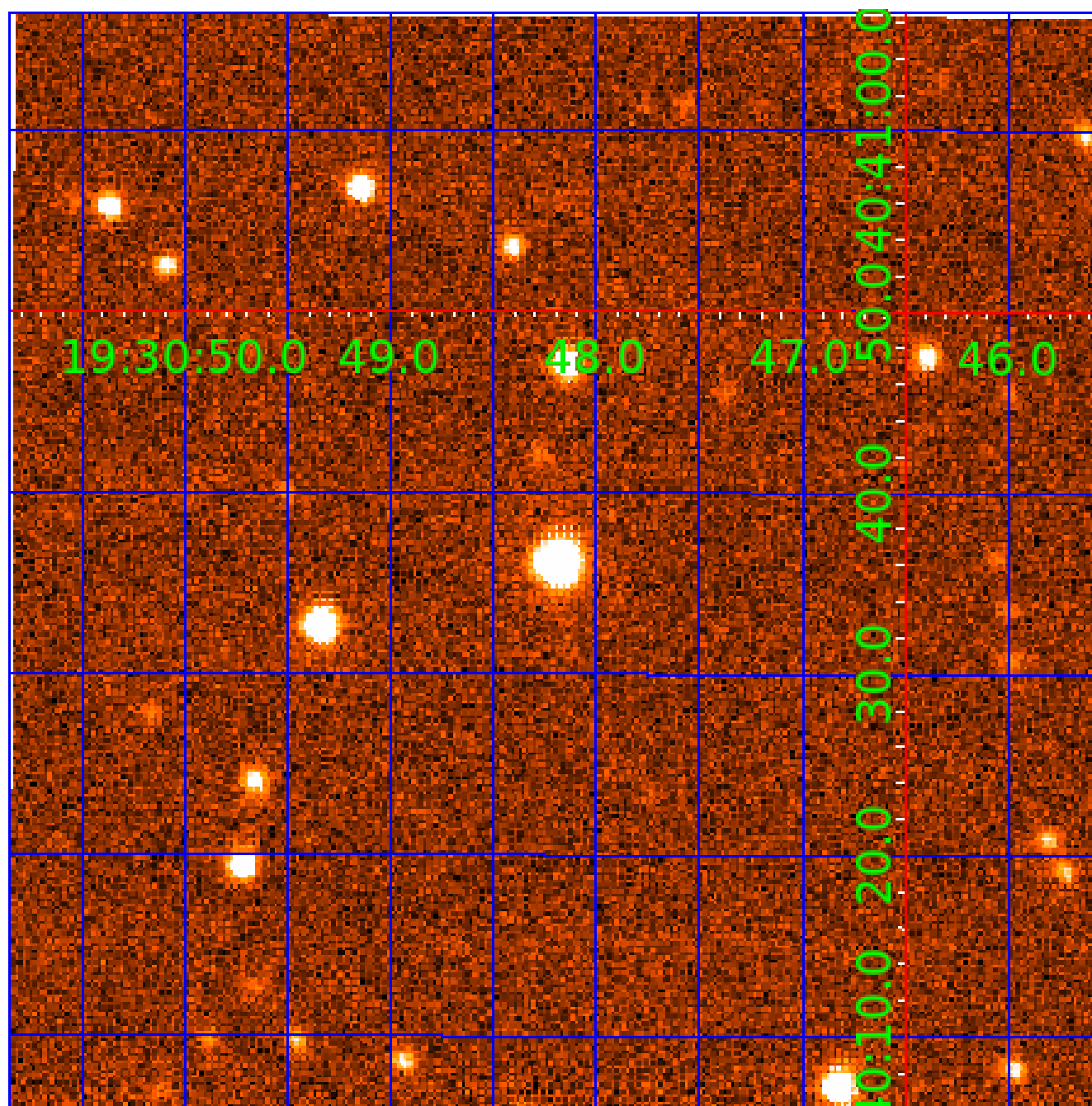


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005451336

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})
005451336-01	OBS	No	180.057260	257.840341	995.1	4.295	13.3	4.5	0.84	6098	2.80	2.34
005451336-02	OBS	No	89.600105	186.114029	1508.8	2.411	12.0	5.4	0.84	6098	3.28	5.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005451336-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005451336-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT

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

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

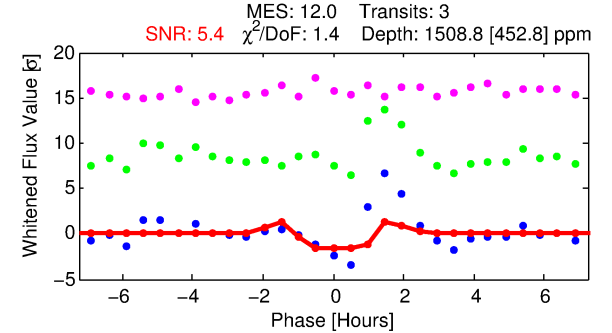
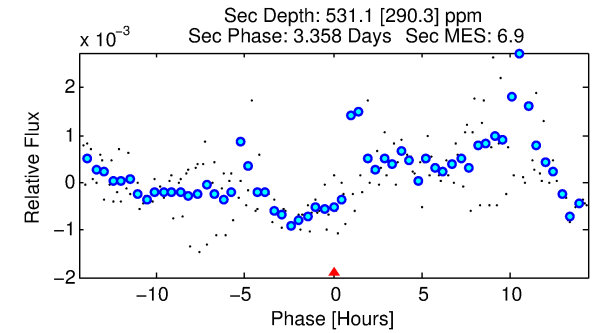
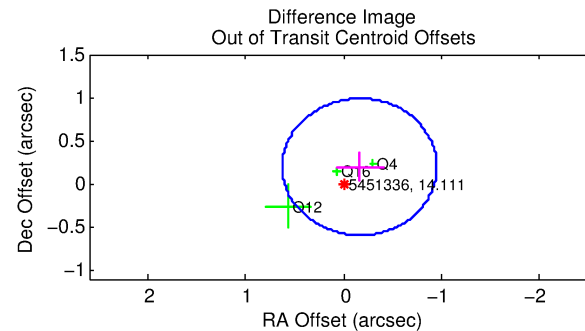
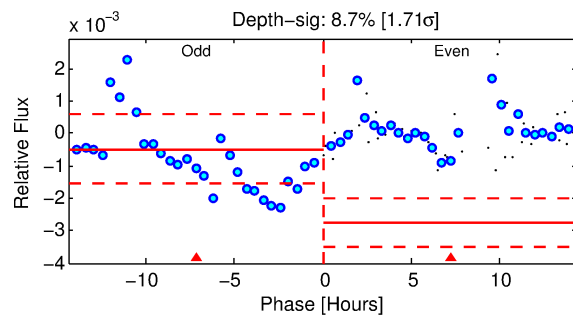
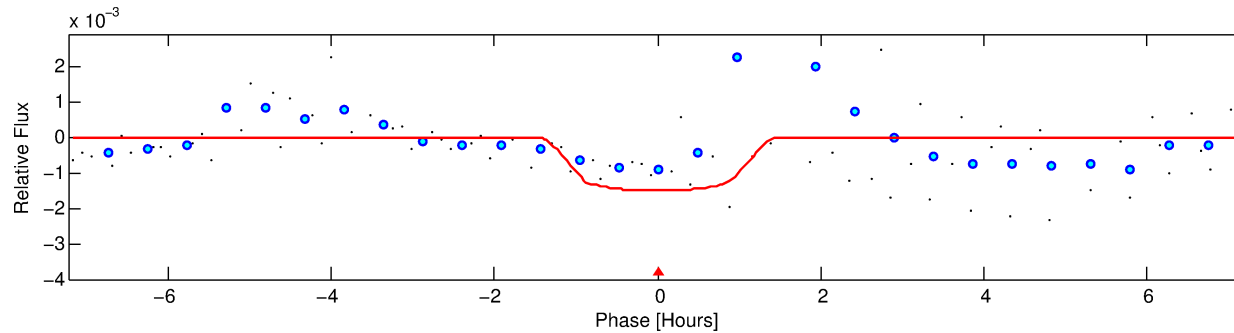
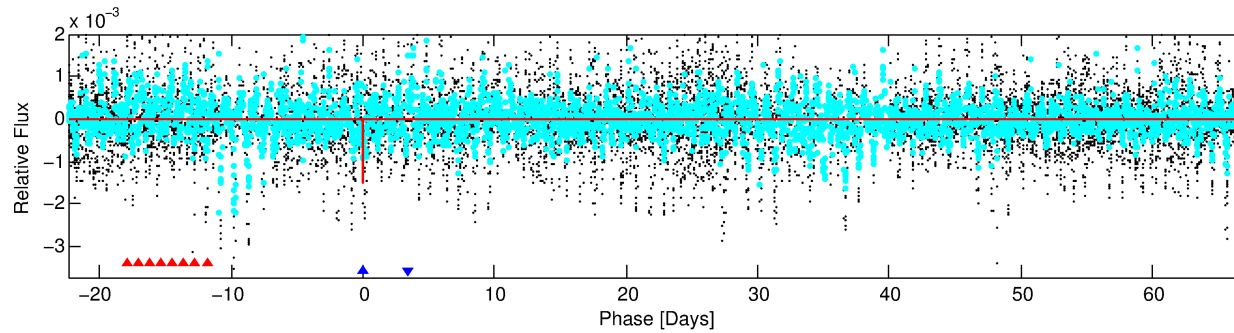
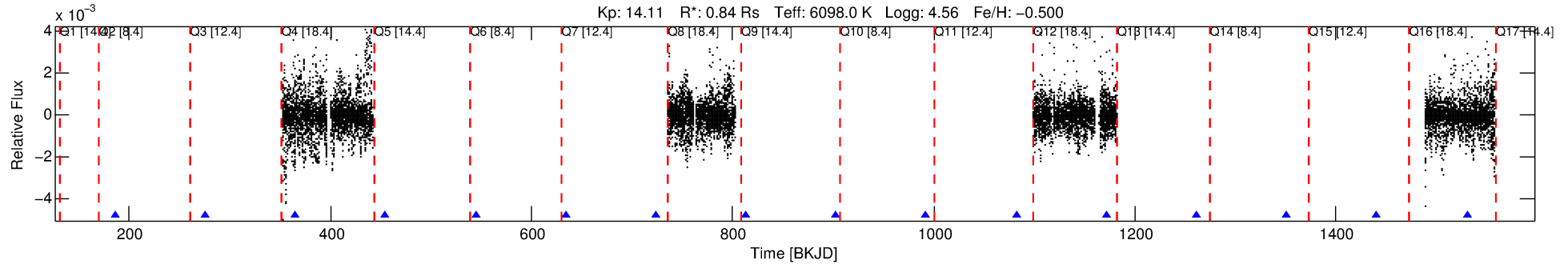
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005451336-02

No Significant Match Found

DV One-Page Summary

KIC: 5451336 Candidate: 2 of 2 Period: 89.600 d



DV Fit Results:

Period = 89.60011 [0.00090] d
Epoch = 186.1140 [0.0116] BKJD
Rp/R* = 0.0359 [0.1359]
a/R* = 286.18 [5487.43]
b = 0.24 [76.37]
Seff = 5.93 [2.33]
Teq = 398 [39] K
Rp = 3.28 [12.47] Re
a = 0.3832 [0.0970] AU
Ag = 3979.43 [30234.68] [0.13 σ]
Teffp = 4885 [9270] K [0.48 σ]

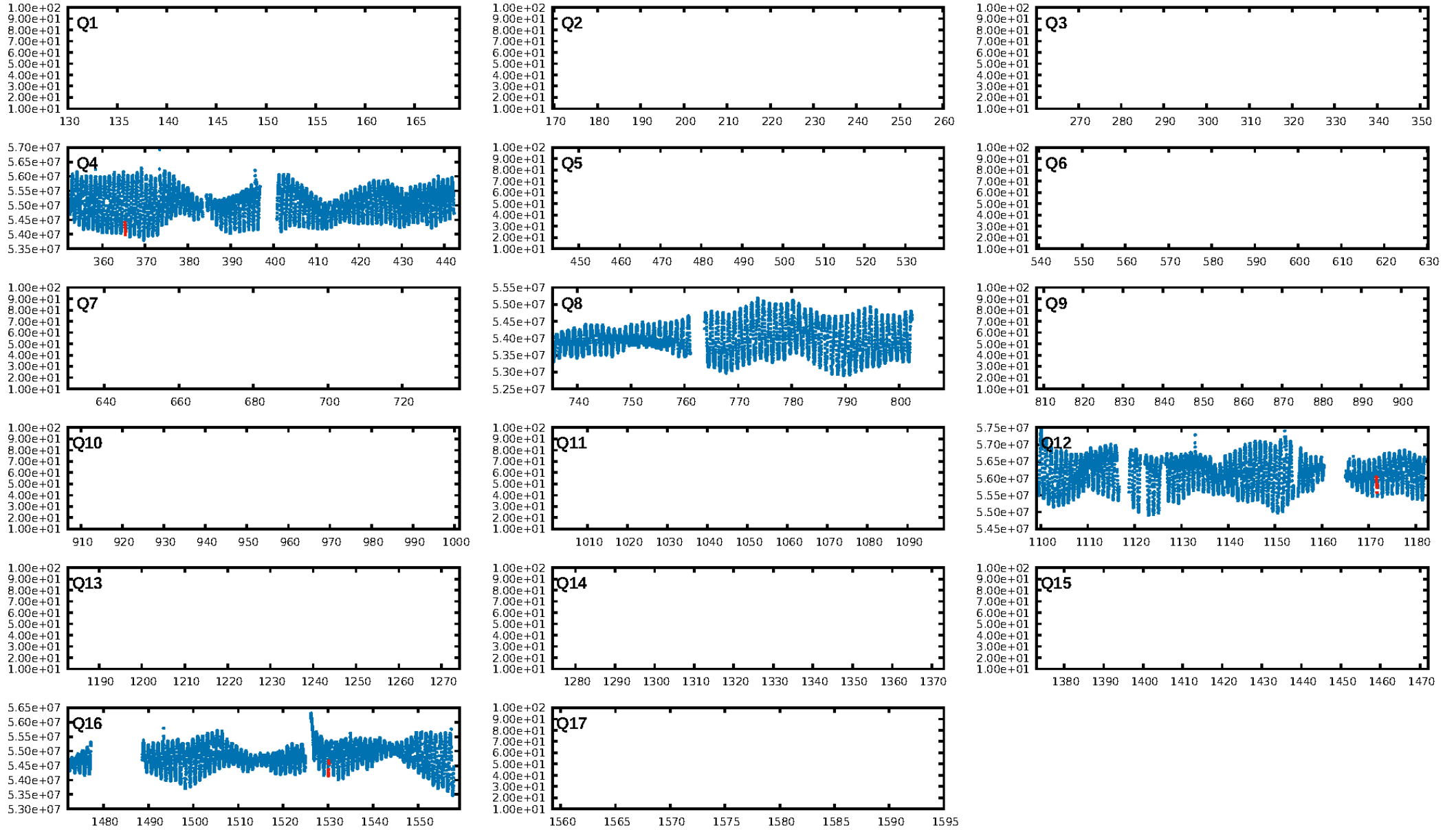
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [440.74 σ]
ModelChiSquare2-sig: 36.0%
ModelChiSquareGof-sig: 53.9%
Bootstrap-pfa: 1.40e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.838
Centroid-sig: 80.0%
Centroid-so: 0.148 arcsec [0.23 σ]
OotOffset-rm: 0.256 arcsec [0.97 σ]
OotOffset-st: 0/0/3/0 [3]
KicOffset-rm: 0.304 arcsec [1.25 σ]
KicOffset-st: 0/0/3/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

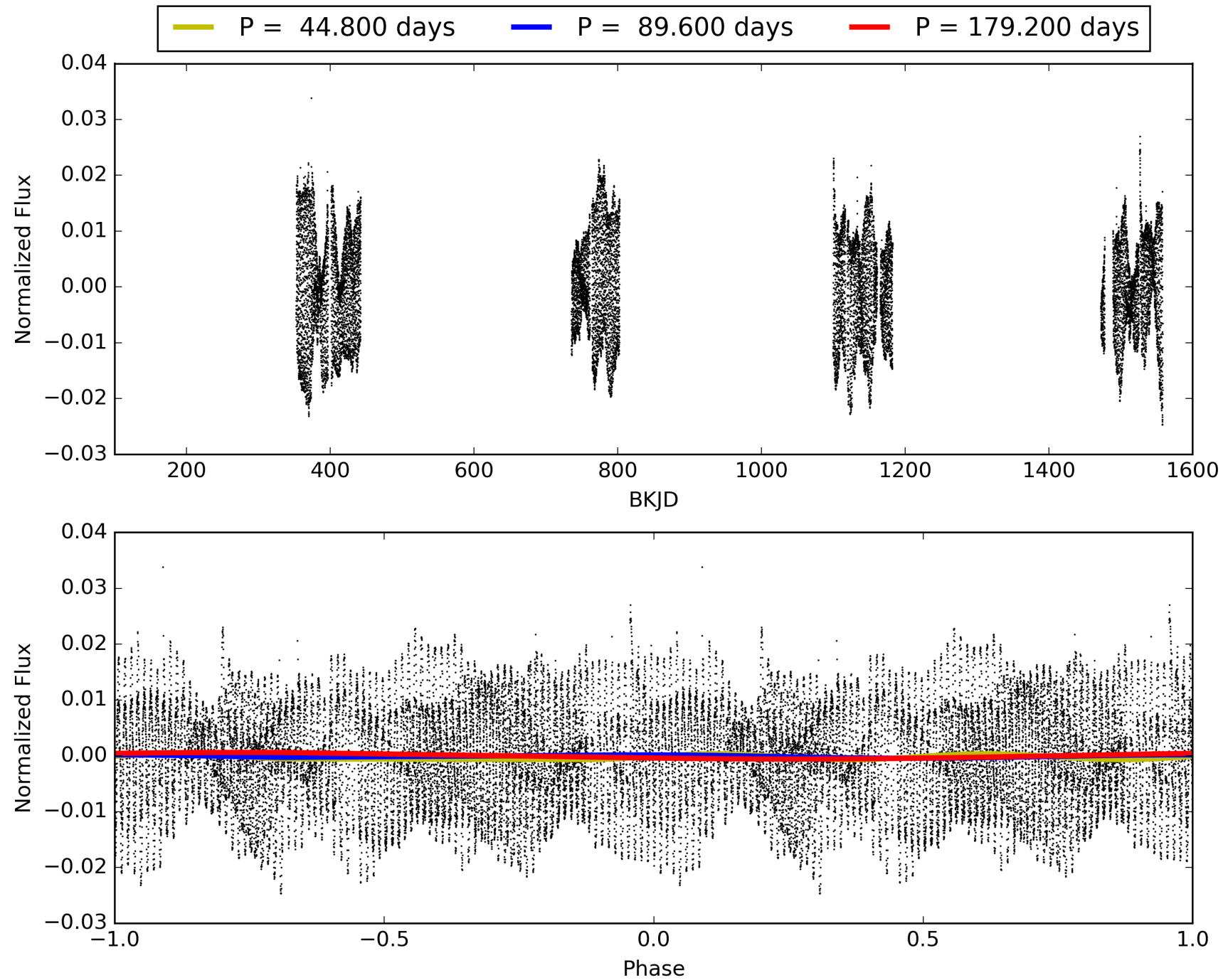
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:26:25 Z

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

TCE 005451336-02, PDC Light Curves

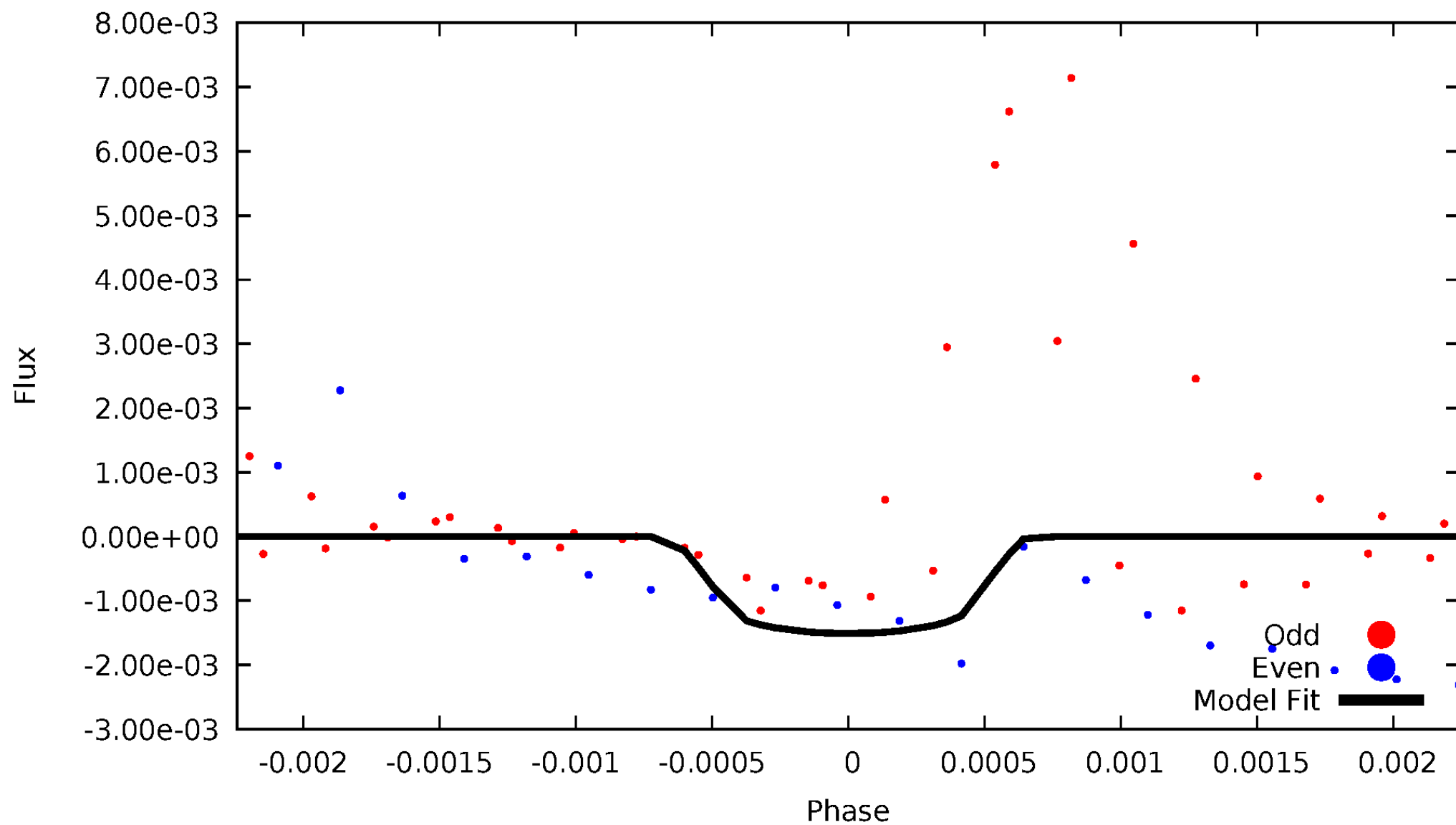


TCE 005451336-02



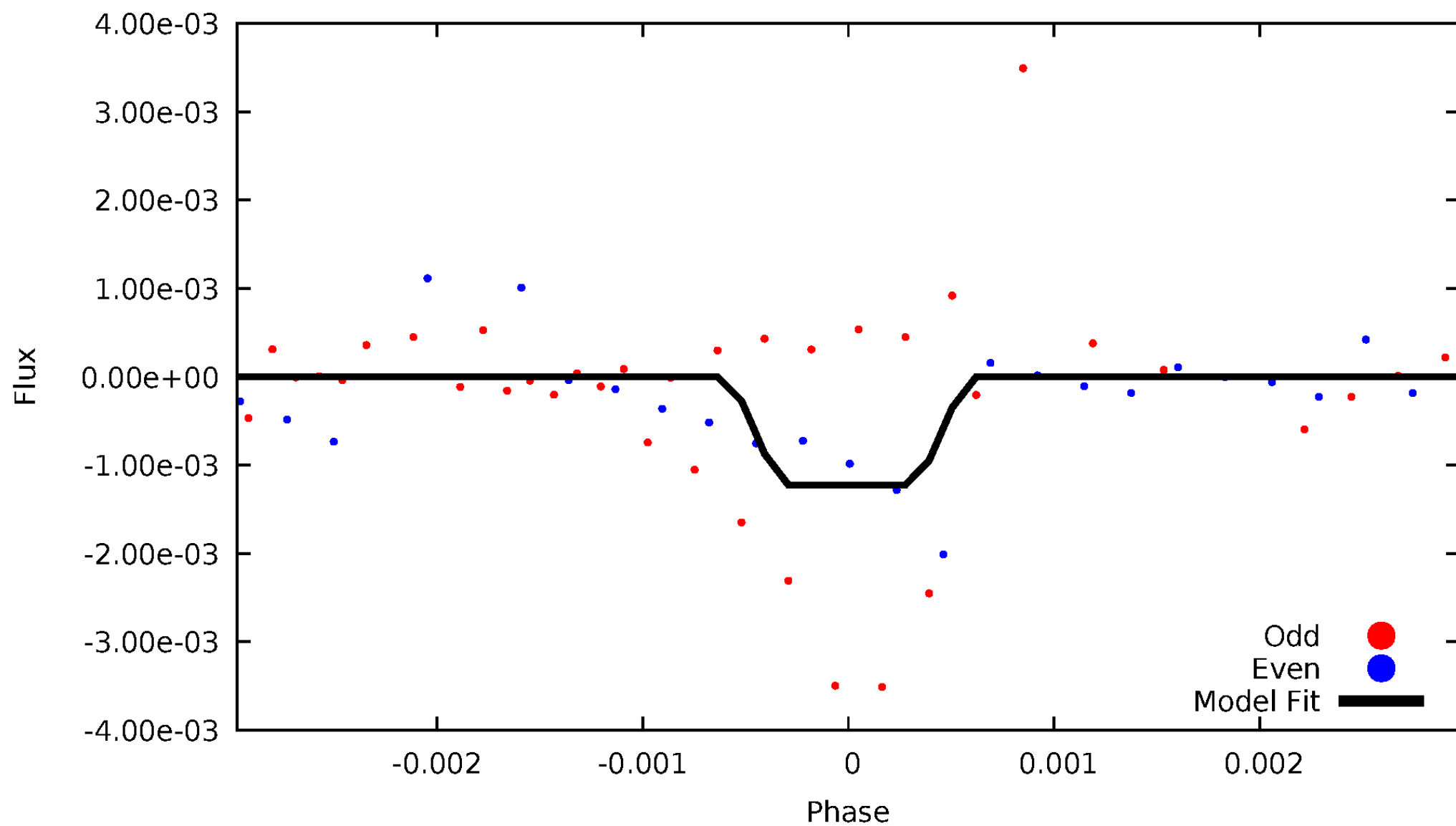
DV Odd/Even

TCE 005451336-02



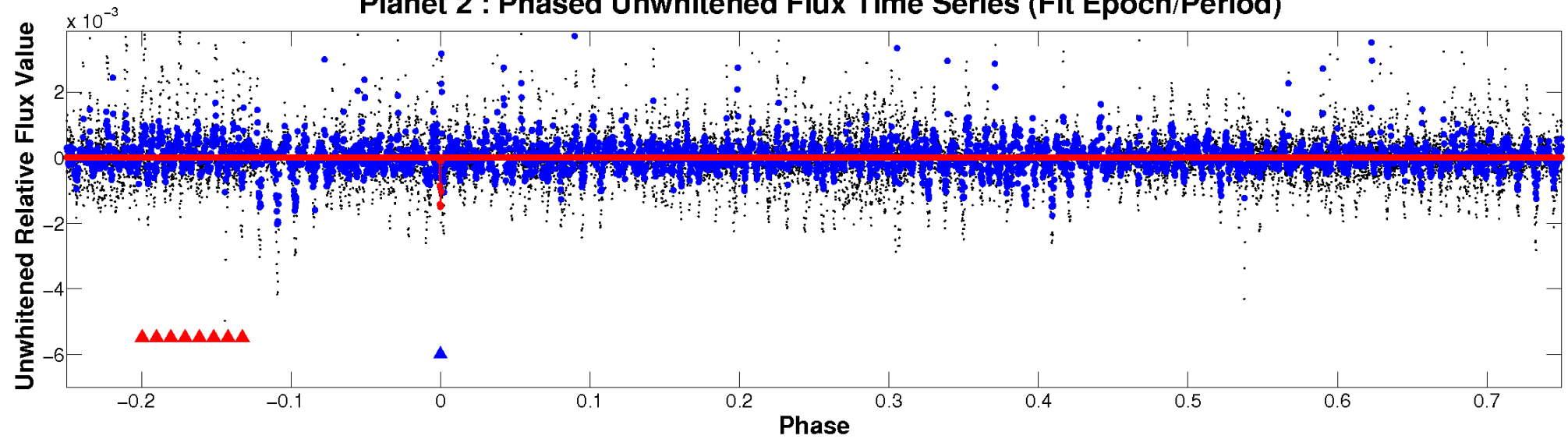
ALT Odd/Even

TCE 005451336-02

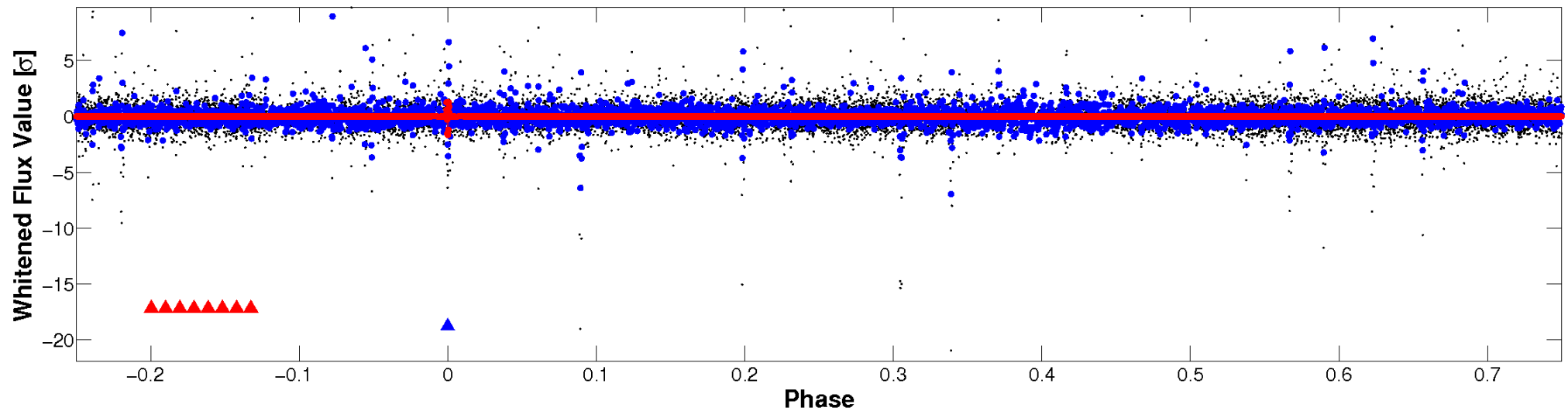


Non-Whitened Vs. Whitened Light Curve

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

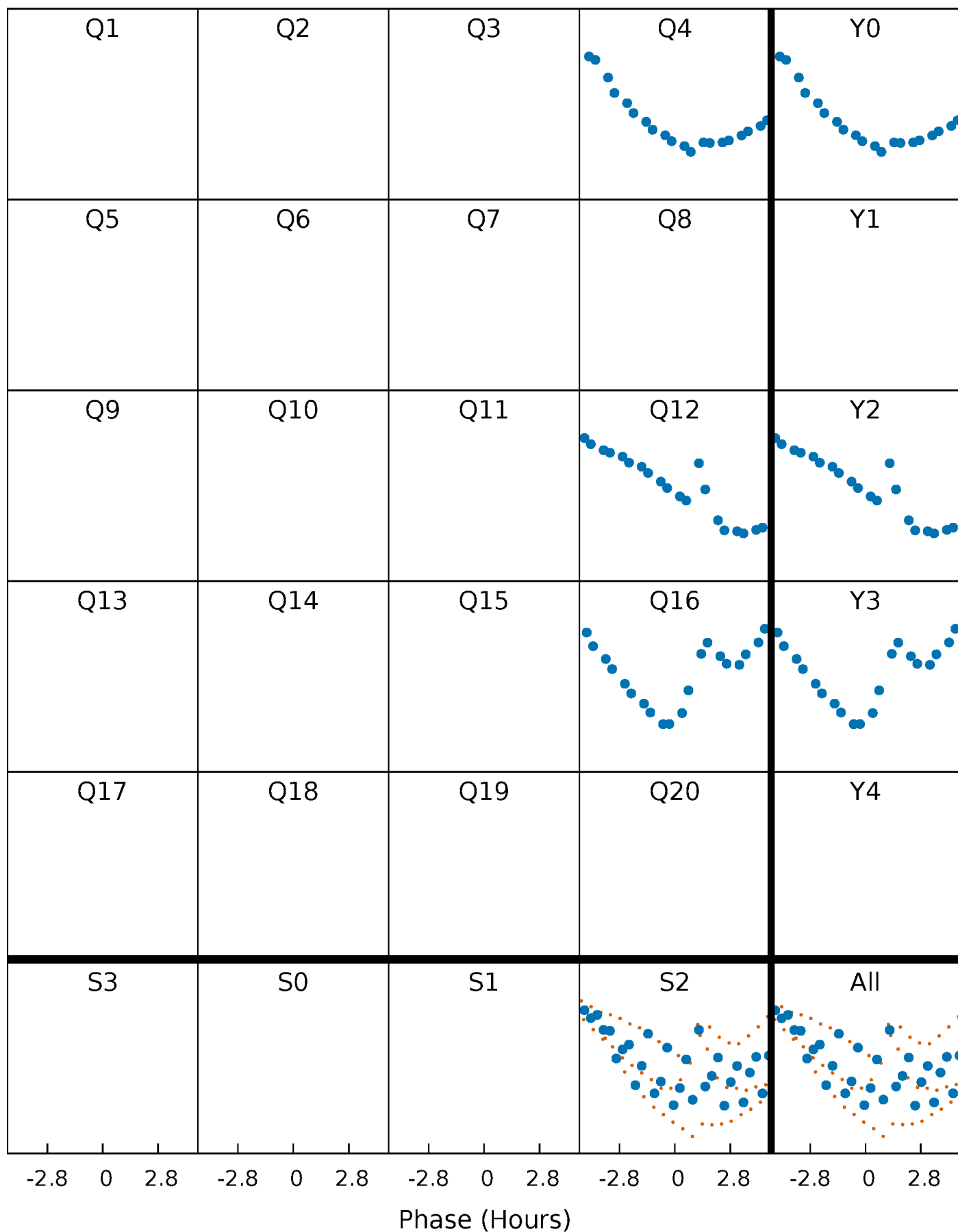


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



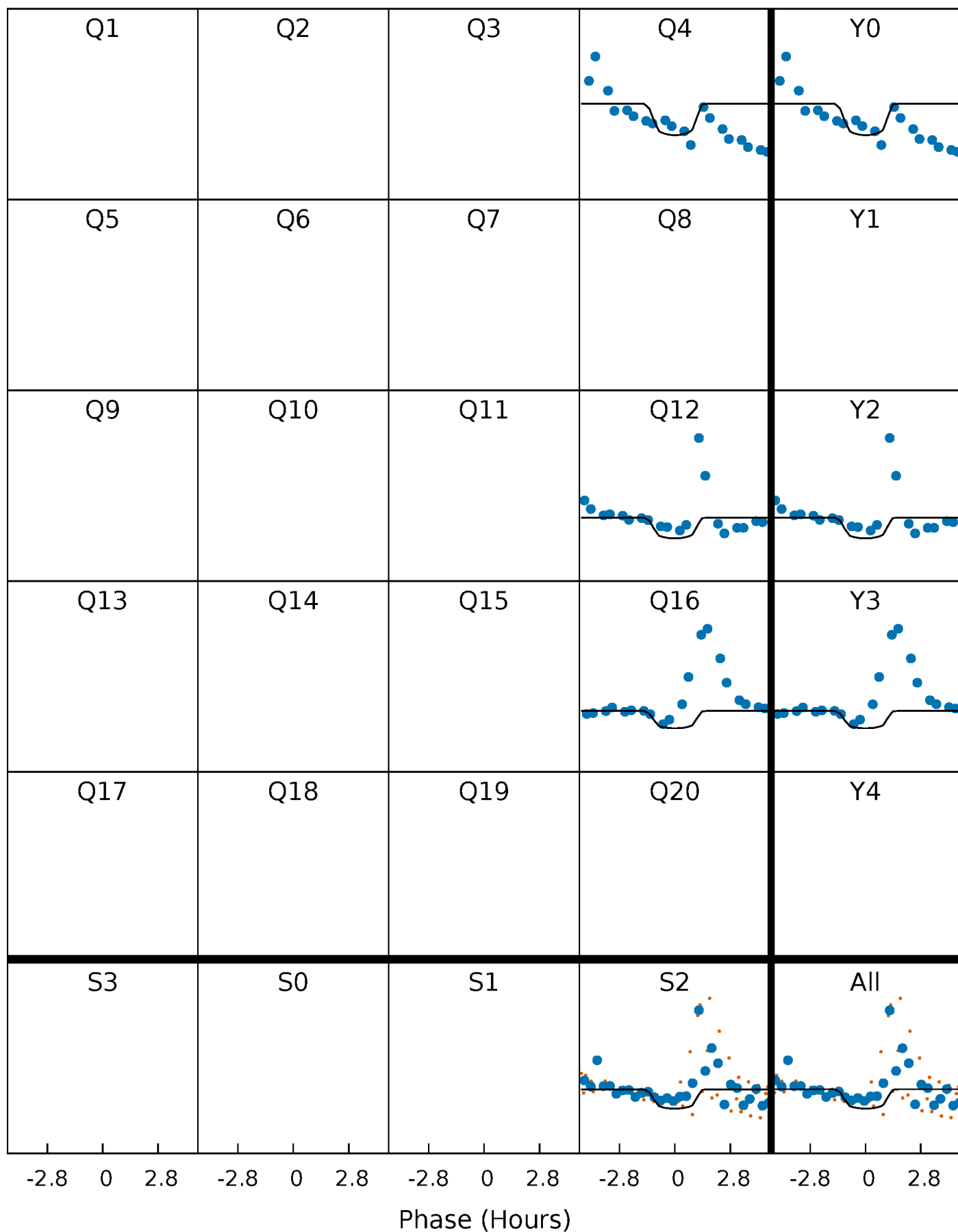
PDC Quarter-Phased Transit Curves

TCE 005451336-02 P= 89.600105 Days $T_0=186.114029$ (BKJD)



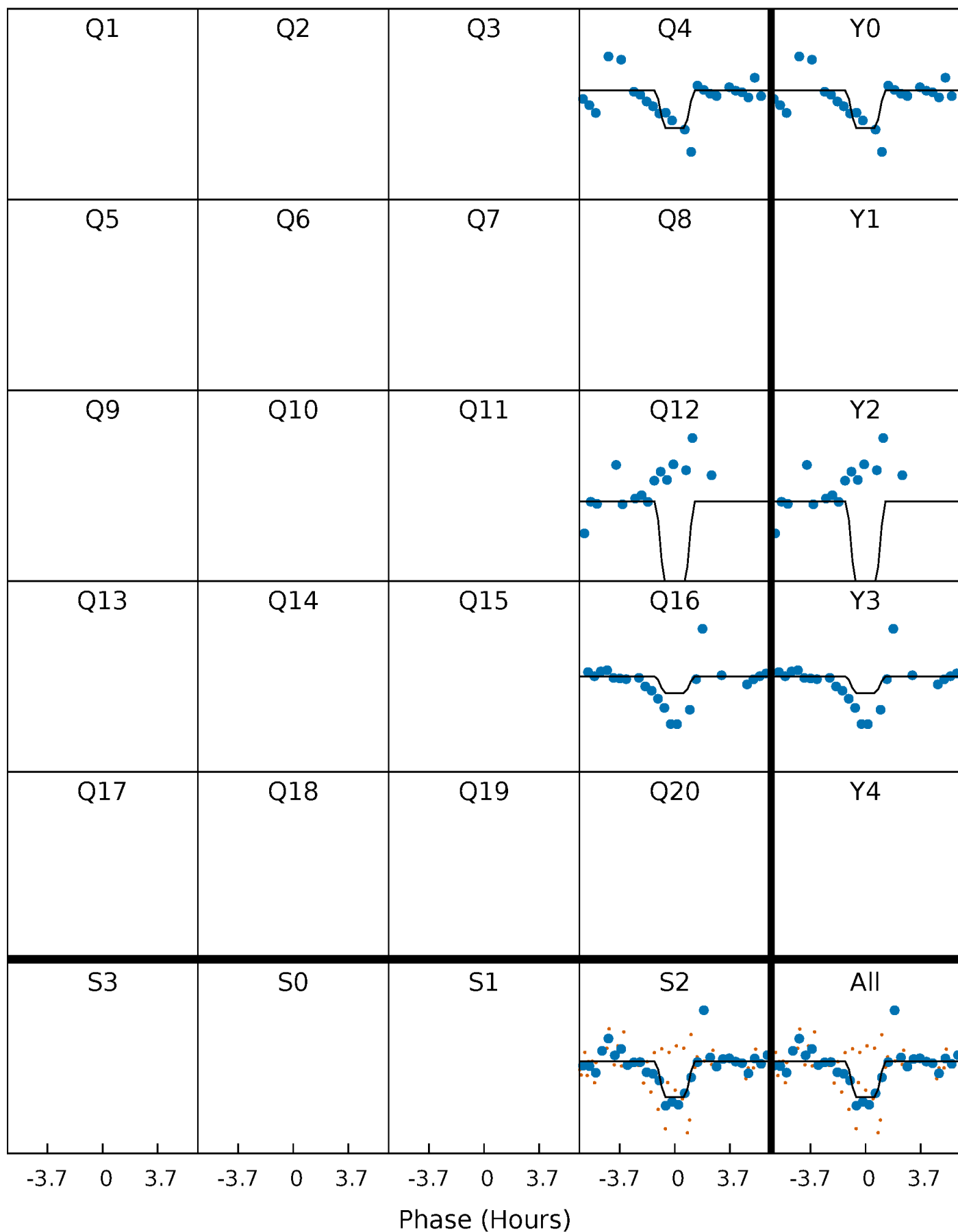
DV Quarter-Phased Transit Curves

TCE 005451336-02 P= 89.600105 Days $T_0=186.114029$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

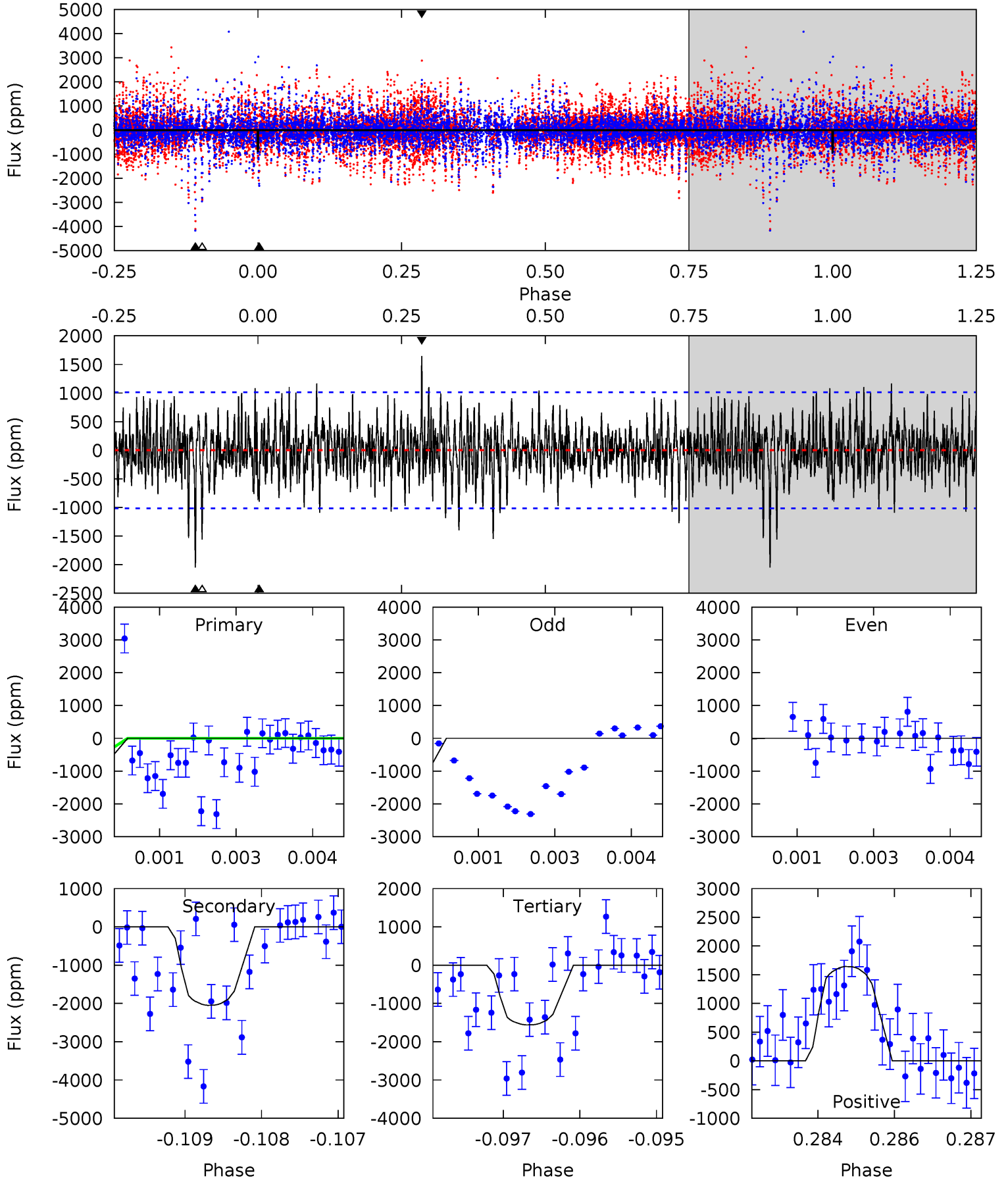
TCE 005451336-02 P= 89.598649 Days $T_0=186.112665$ (BKJD)



DV Model-Shift Uniqueness Test

005451336-02, P = 89.600105 Days, E = 186.114029 Days

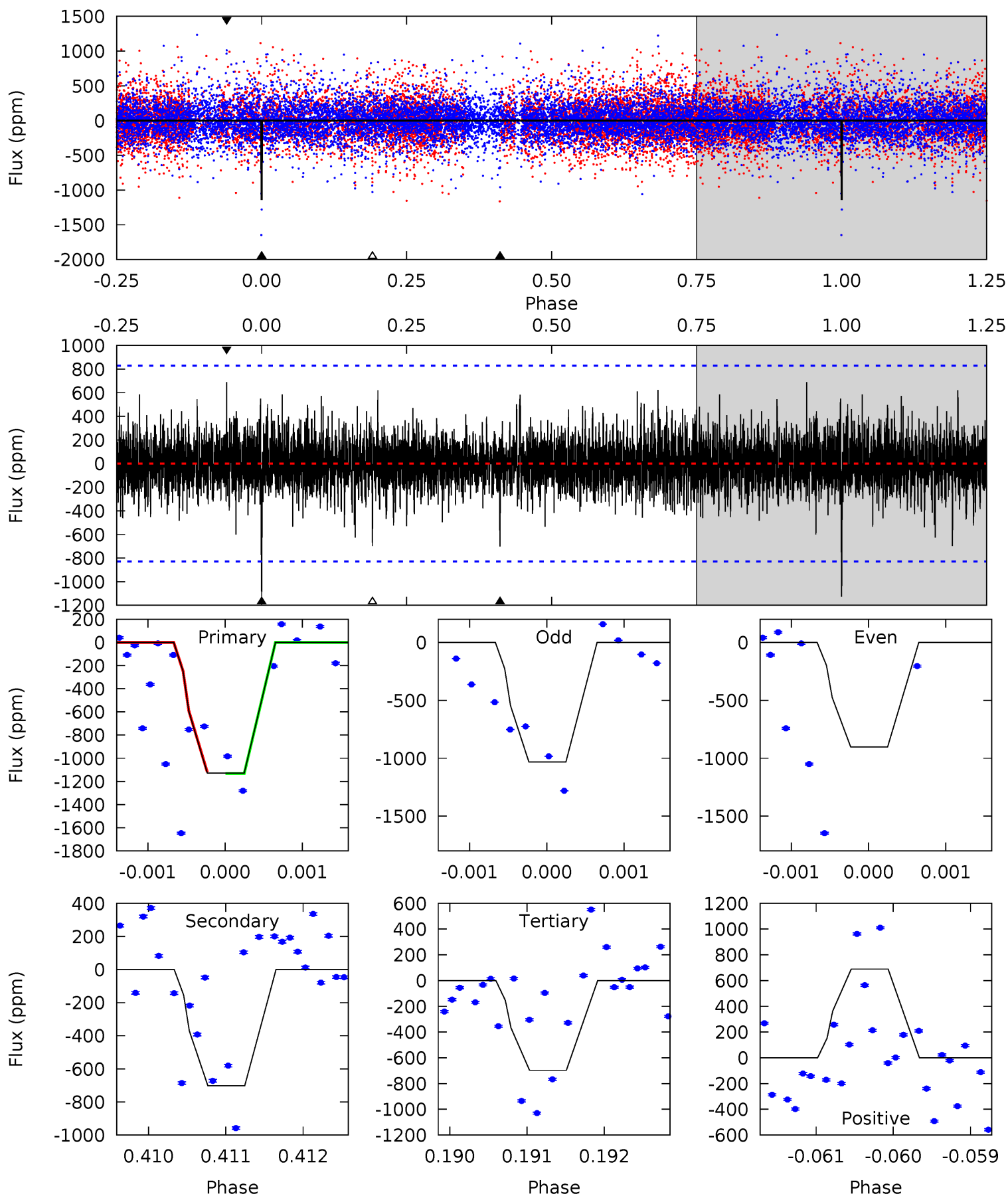
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.78	10.9	8.31	8.75	5.40	3.21	1.91	-3.53	-3.97	2.60	2.16	3.56	1.84	0.45	0.91



Alt Model-Shift Uniqueness Test

005451336-02, P = 89.598649 Days, E = 186.112665 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.42	4.62	4.59	4.54	5.46	3.30	1.01	2.83	2.88	0.04	0.08	0.67	1.05	0.38	0



Stellar Parameters For KIC 005451336

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6098^{+190}_{-212}	$4.562^{+0.037}_{-0.200}$	$-0.500^{+0.300}_{-0.300}$	$0.838^{+0.253}_{-0.063}$	$0.938^{+0.097}_{-0.130}$	$2.248^{+0.445}_{-1.148}$
	+3%/-3%	+1%/-4%	+60%/-60%	+30%/-8%	+10%/-14%	+20%/-51%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005451336-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2049 ± 188	$10.31^{+9.88}_{-7.09}$	569^{+37}_{-28}	4204^{+2858}_{-838}	1492^{+13829}_{-1103}
Alt.	-702 ± 152	$9.90^{+9.78}_{-6.99}$	566^{+39}_{-26}	3553^{+2195}_{-675}	578^{+5681}_{-440}

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 $A_{obs} \gg 1.0$

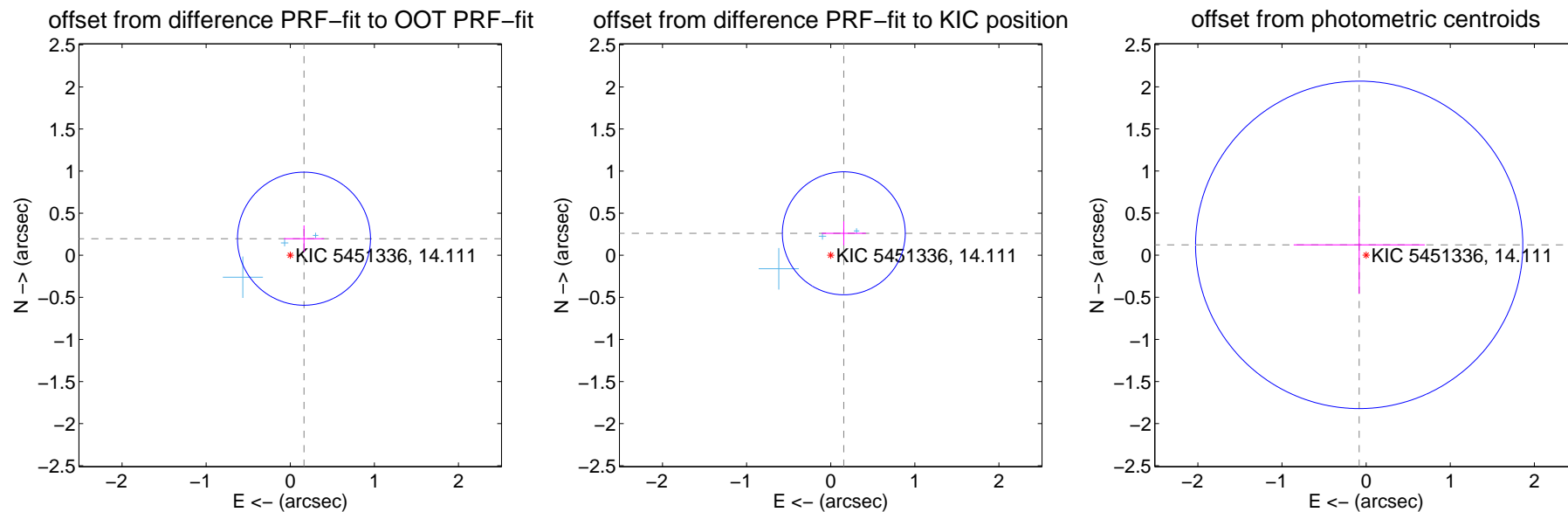
DV Centroid Data

Supplemental centroid analysis for 005451336-02. Kepler magnitude: 14.11. Transit SNR 5.42

There are 3 quarters with good PRF difference image offsets

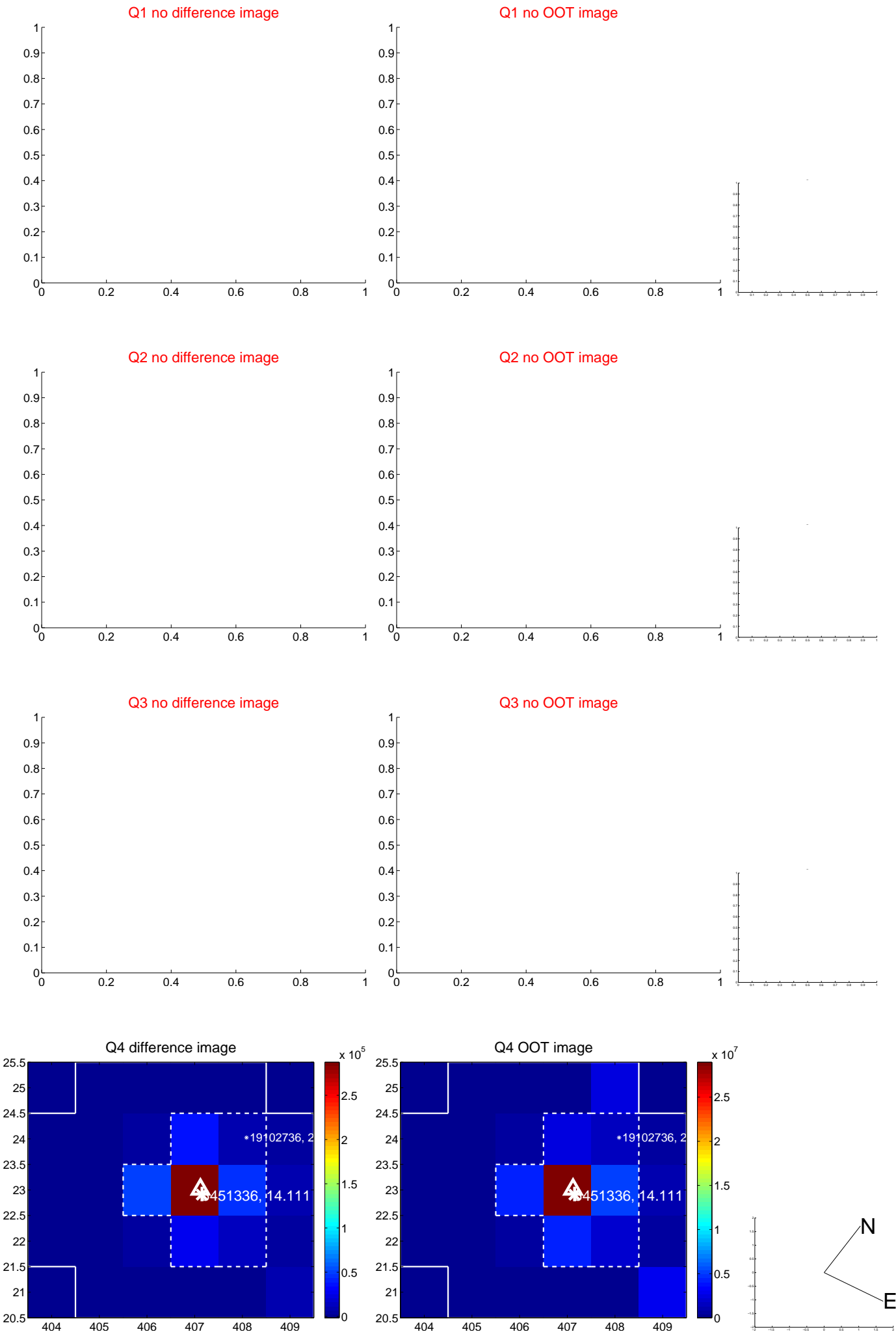
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.256 ± 0.264	0.97	-0.163 ± 0.239	0.197 ± 0.158
PRF-fit source offset from KIC position	0.304 ± 0.243	1.25	-0.156 ± 0.262	0.261 ± 0.142
photometric centroid source offset	0.15 ± 0.65	0.23	0.08 ± 0.78	0.12 ± 0.58



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.

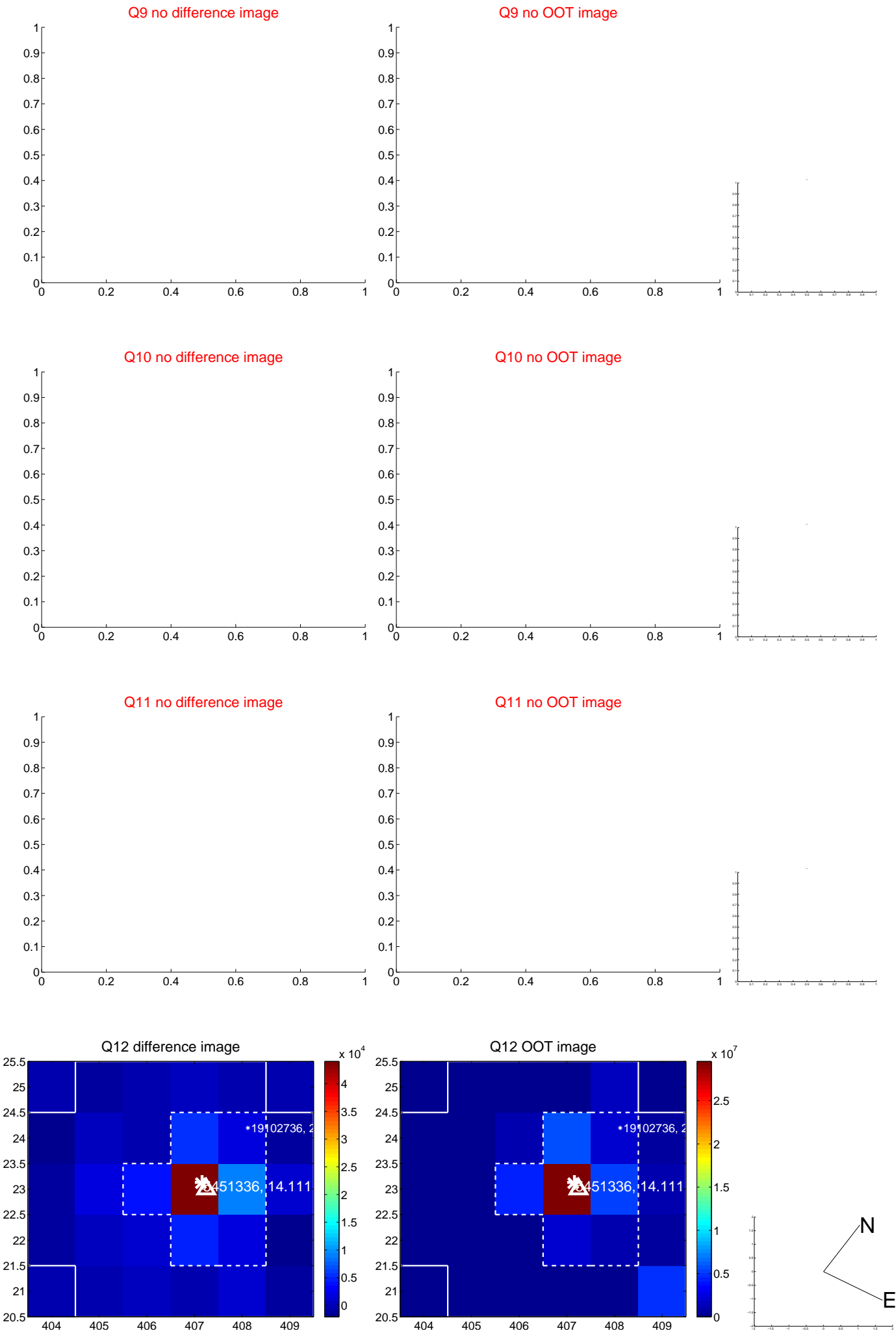
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



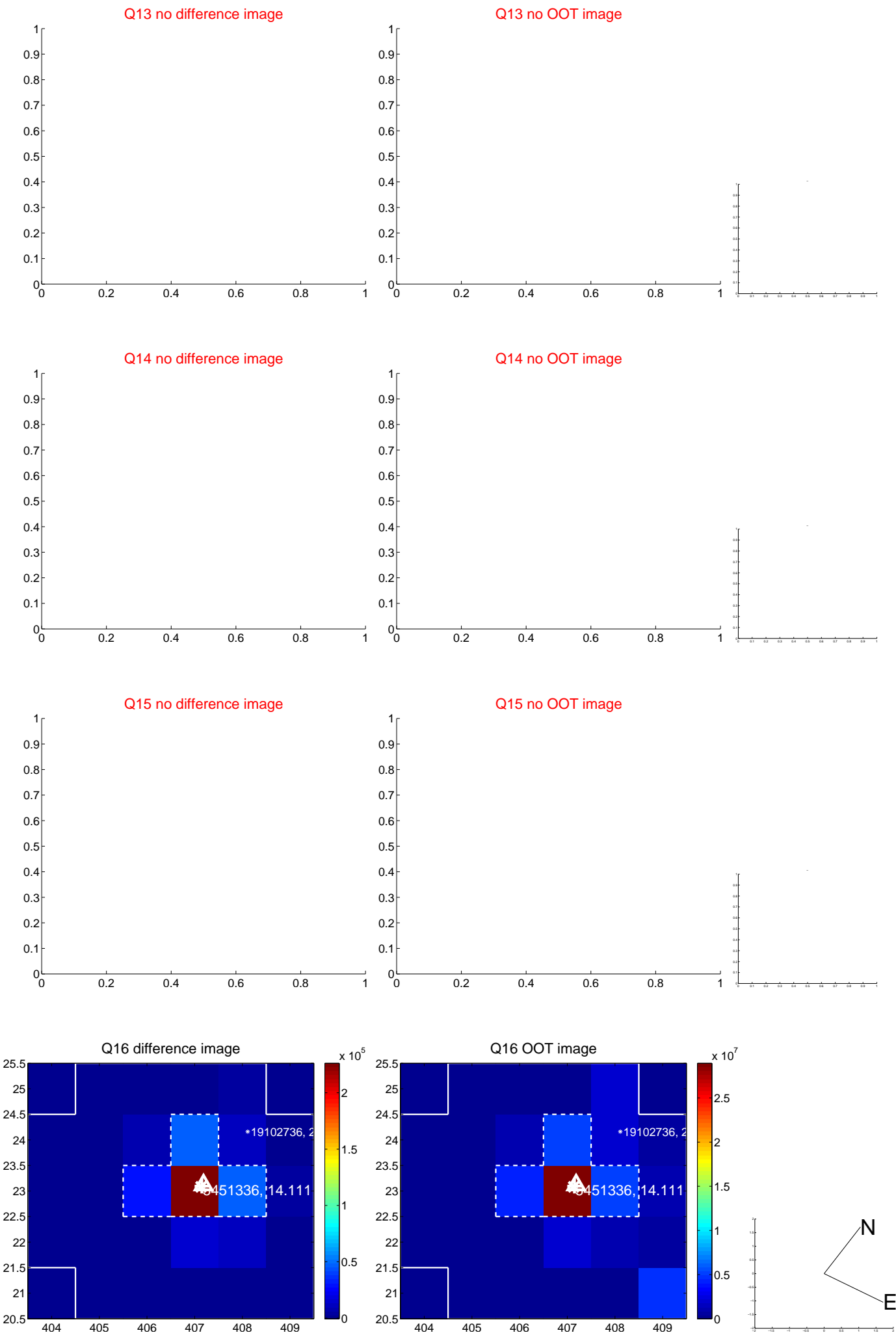
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



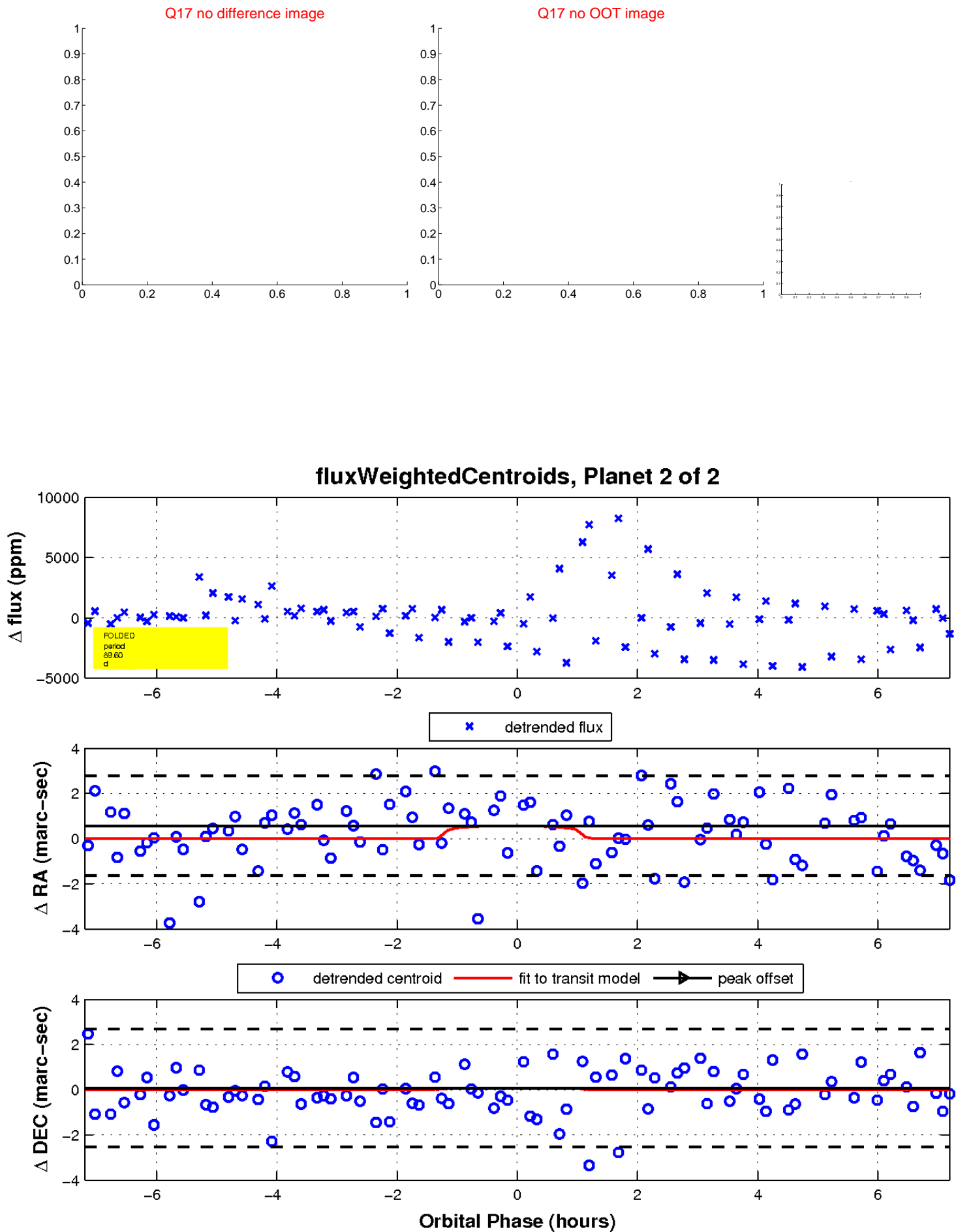
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

