

KIC 009305357

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})
009305357-01	OBS	No	448.098525	190.132981	434.0	3.159	12.5	5.9	0.64	5176	1.40	0.27
009305357-02	OBS	No	441.933974	439.666672	410.1	4.038	13.2	5.6	0.64	5176	1.43	0.27

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009305357-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009305357-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

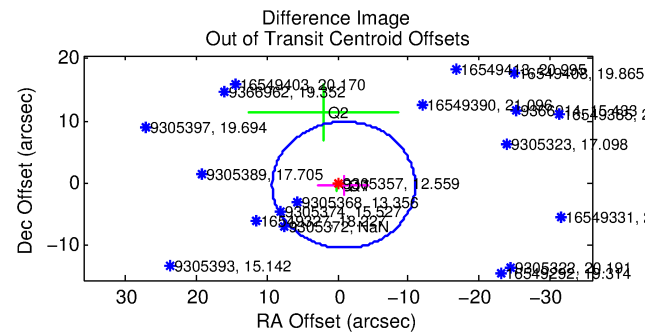
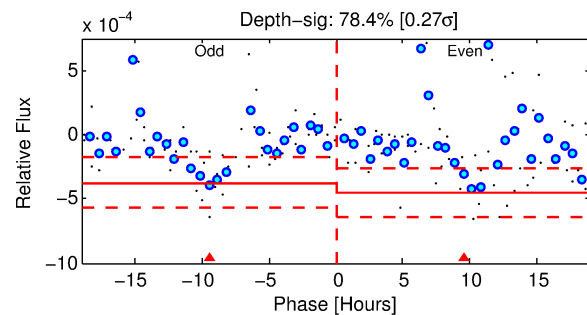
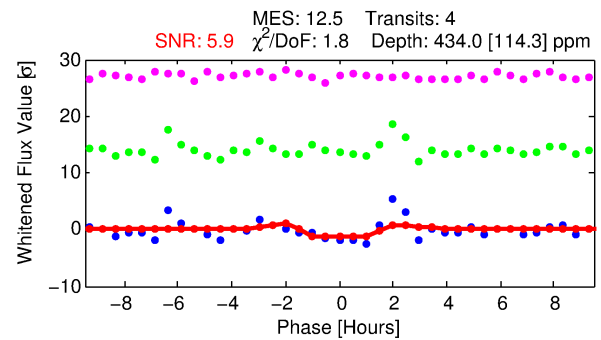
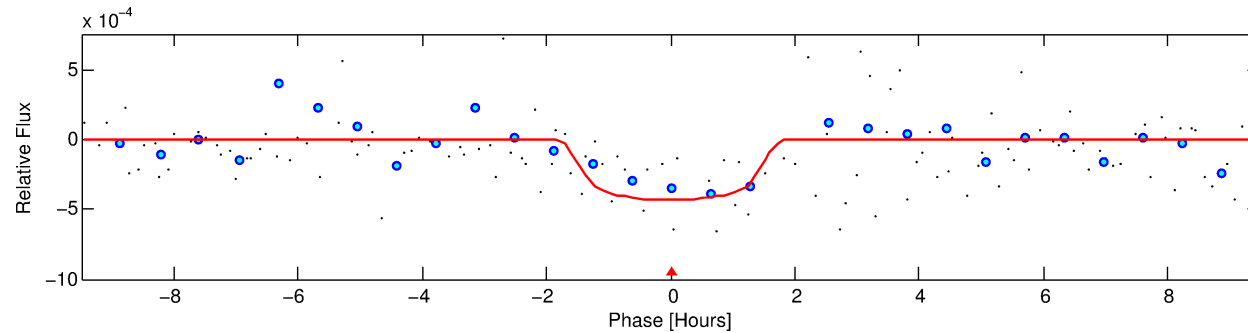
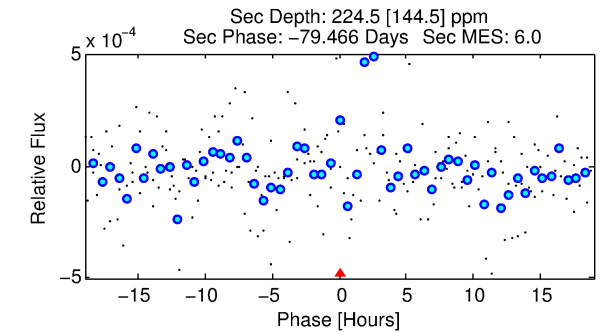
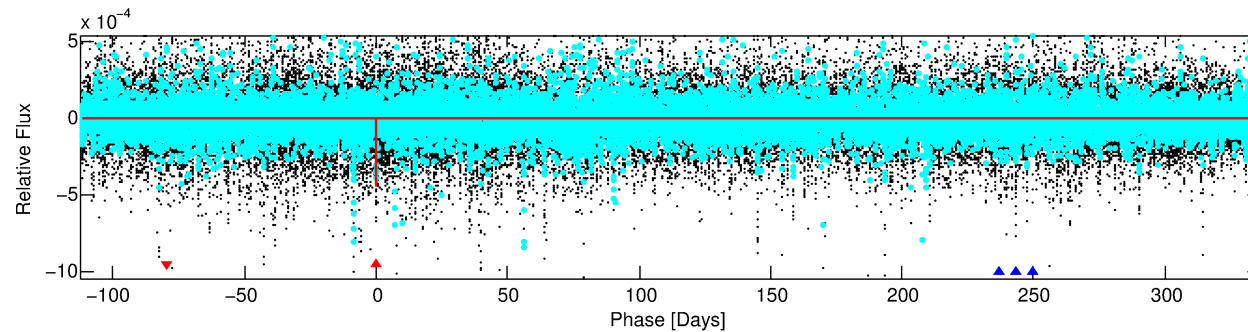
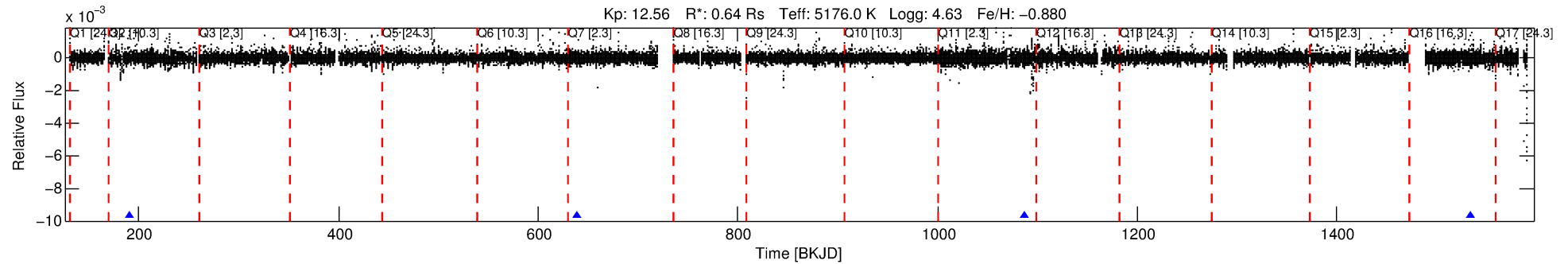
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009305357-01

No Significant Match Found

DV One-Page Summary

KIC: 9305357 Candidate: 1 of 2 Period: 448.099 d



DV Fit Results:

Period = 448.09852 [0.00635] d
Epoch = 190.1330 [0.0114] BKJD
Rp/R* = 0.0202 [0.0655]
a/R* = 833.30 [11365.13]
b = 0.67 [11.36]
Seff = 0.27 [0.05]
Teq = 184 [8] K
Rp = 1.40 [4.55] Re
a = 0.9841 [0.0757] AU
Ag = 60700.88 [395587.64] [0.15 σ]
Teffp = 4458 [7264] K [0.59 σ]

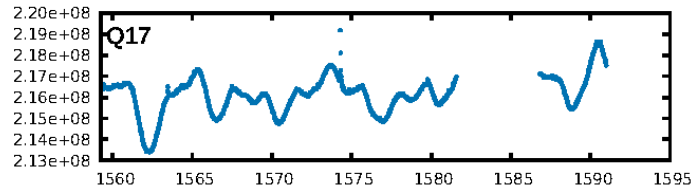
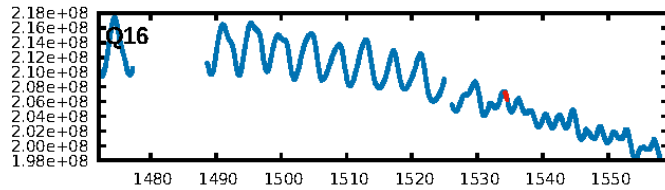
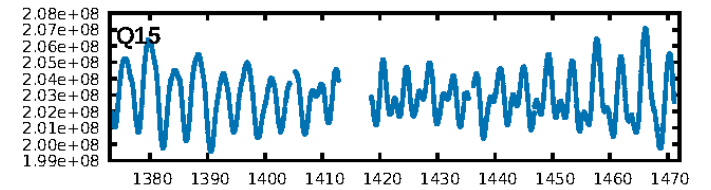
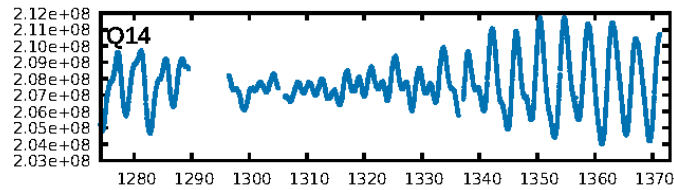
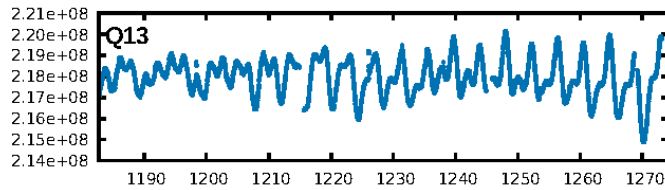
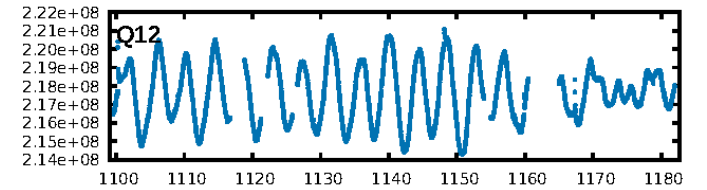
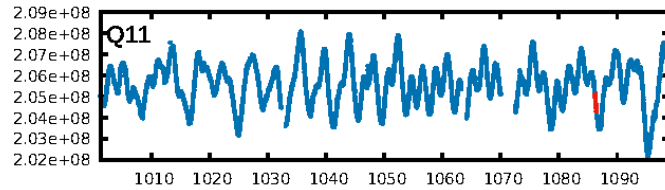
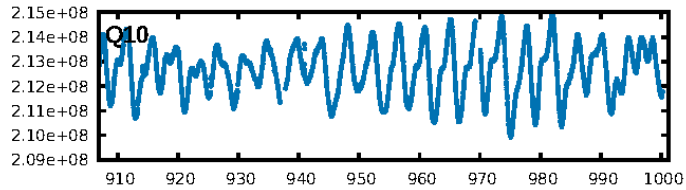
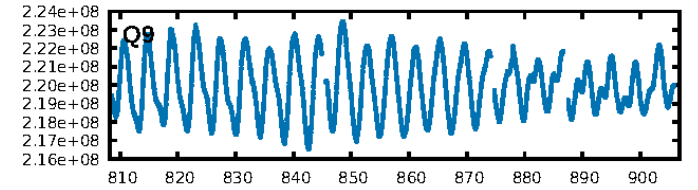
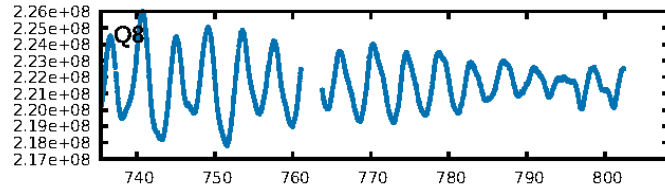
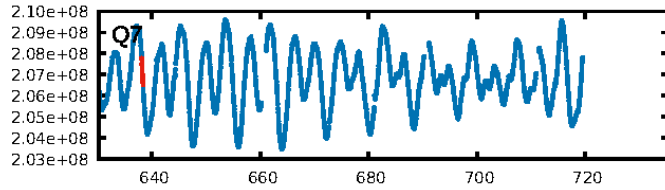
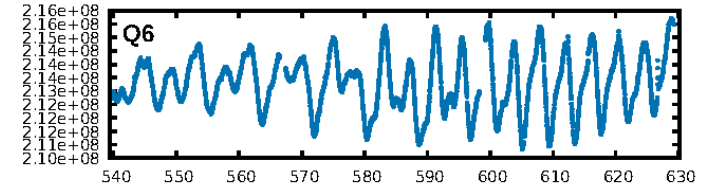
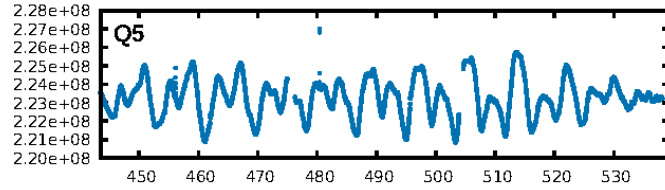
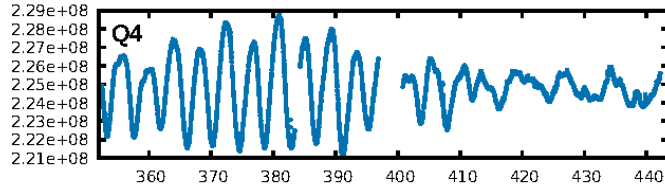
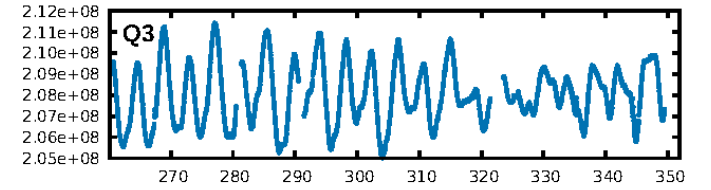
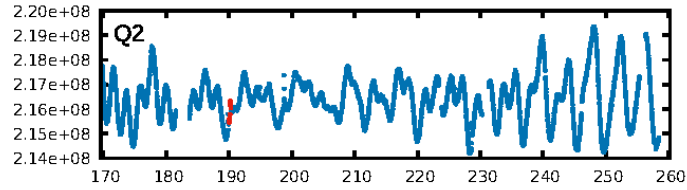
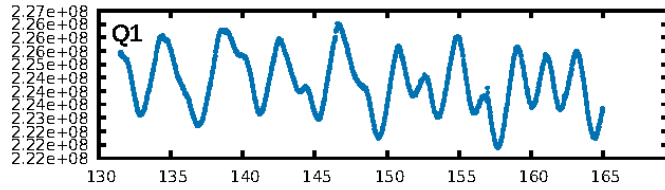
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [28.86 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.3%
ModelChiSquareGof-sig: 42.3%
Bootstrap-pfa: 1.30e-11
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.7969
Centroid-sig: 49.6%
Centroid-so: 0.849 arcsec [1.05 σ]
OotOffset-rm: 0.896 arcsec [0.27 σ]
OotOffset-st: 1/2/0/0 [3]
KicOffset-rm: 1.060 arcsec [0.35 σ]
KicOffset-st: 1/2/0/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [4/4]

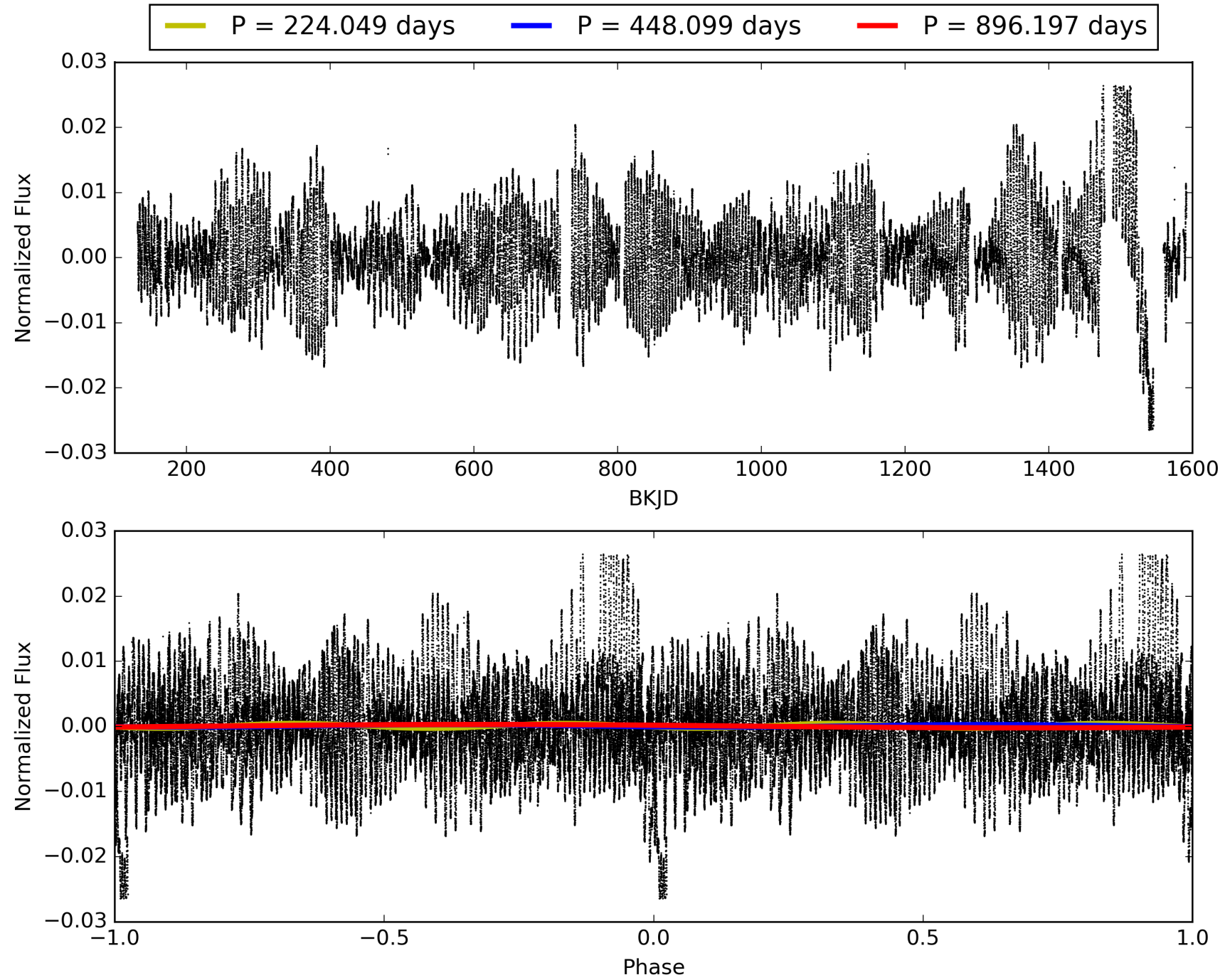
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:53:04 Z

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

TCE 009305357-01, PDC Light Curves

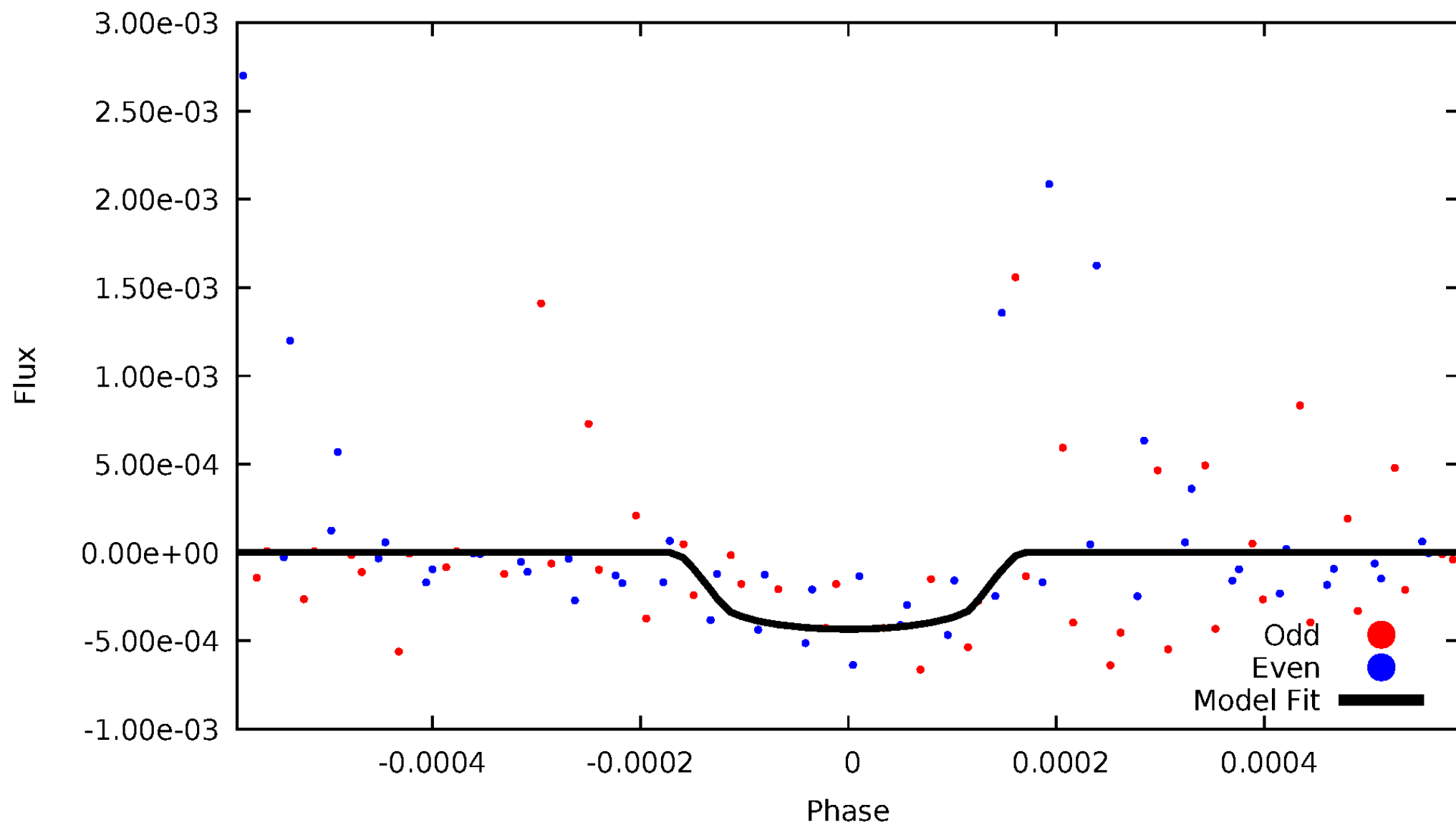


TCE 009305357-01



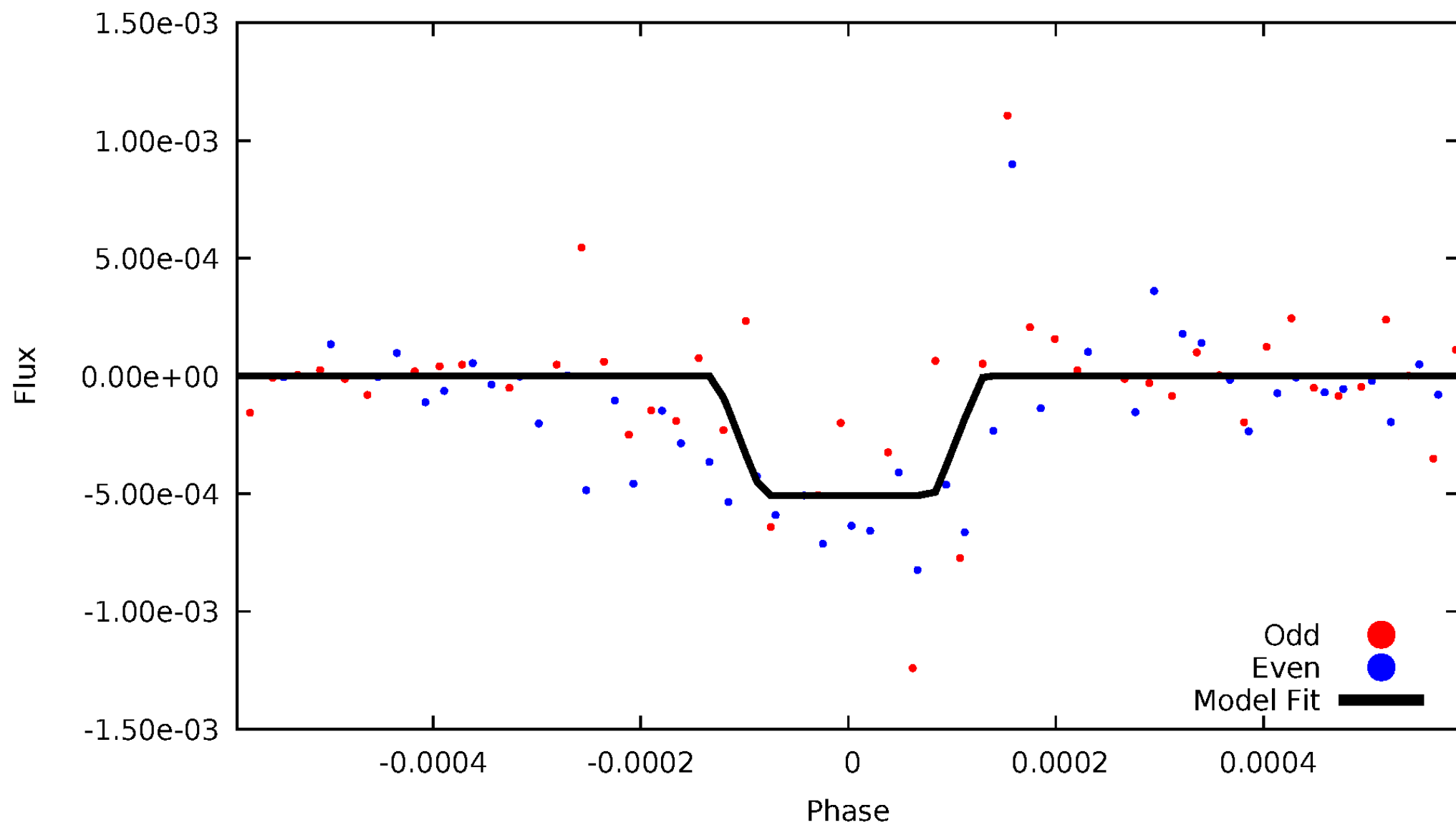
DV Odd/Even

TCE 009305357-01



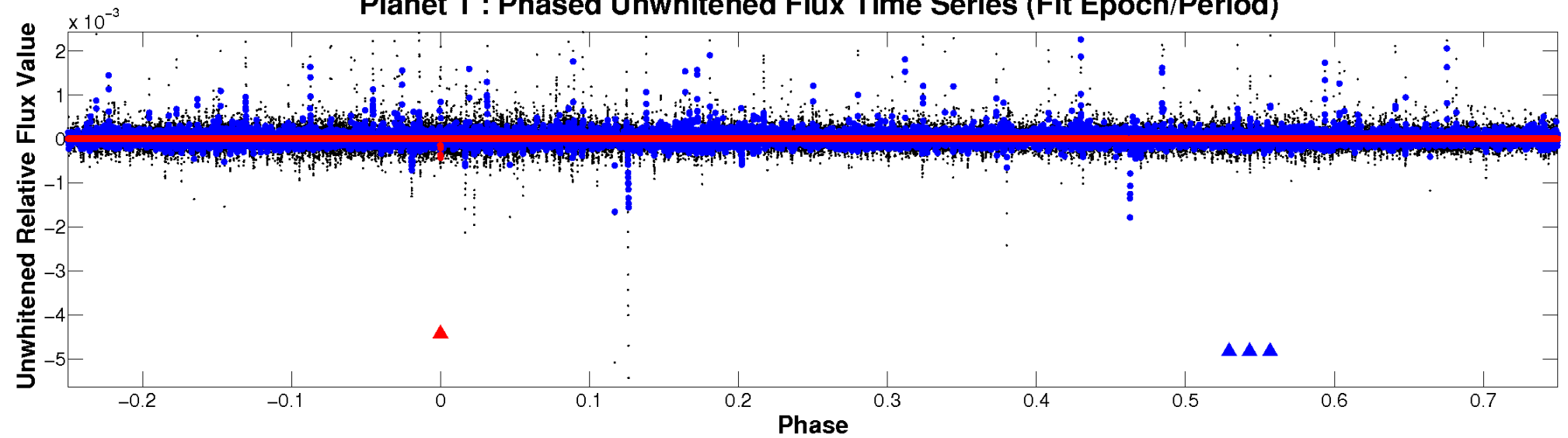
ALT Odd/Even

TCE 009305357-01

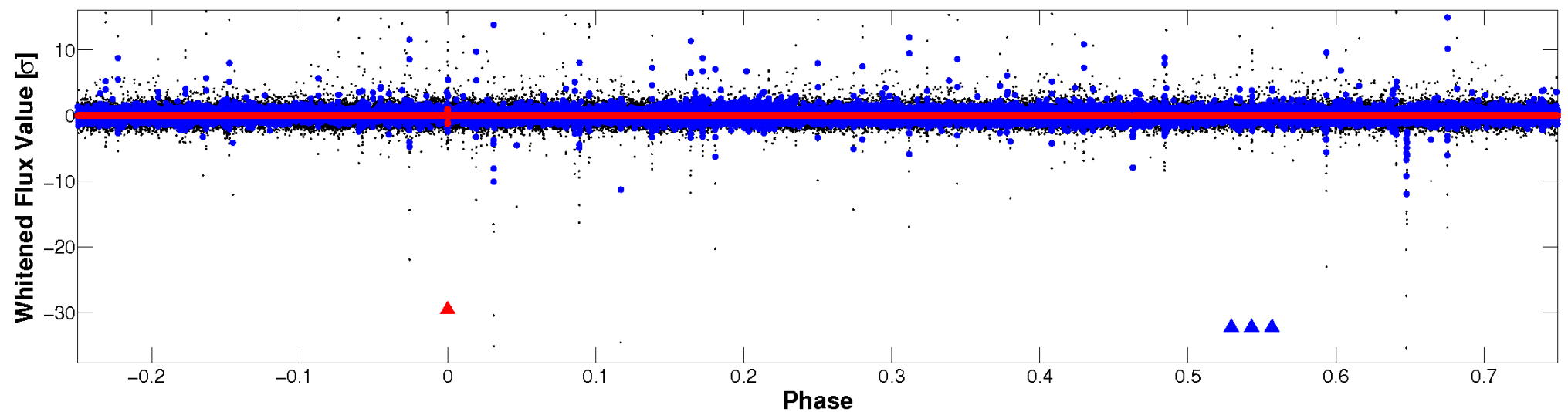


Non-Whitened Vs. Whitened Light Curve

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

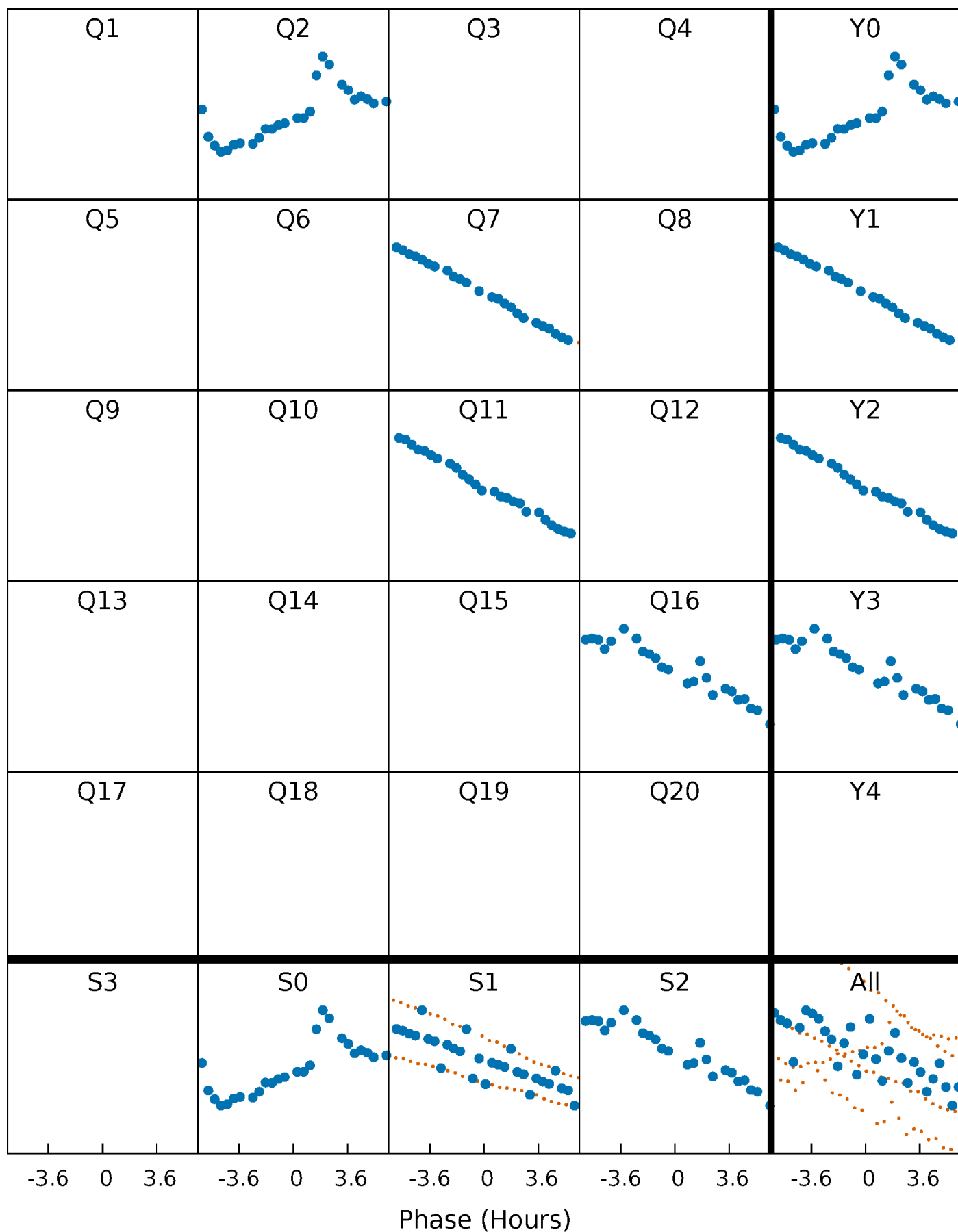


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



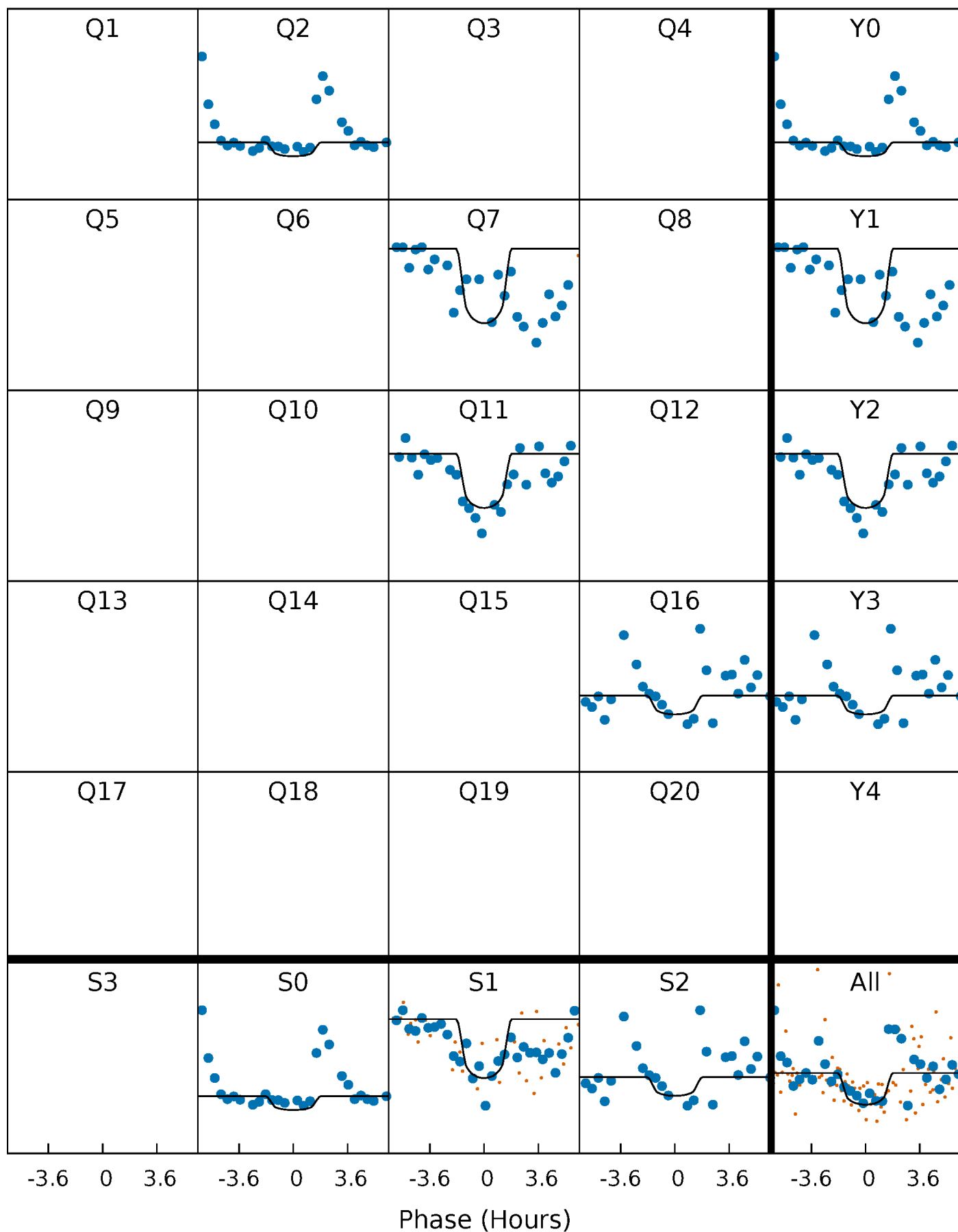
PDC Quarter-Phased Transit Curves

TCE 009305357-01 P=448.098525 Days $T_0=190.132981$ (BKJD)



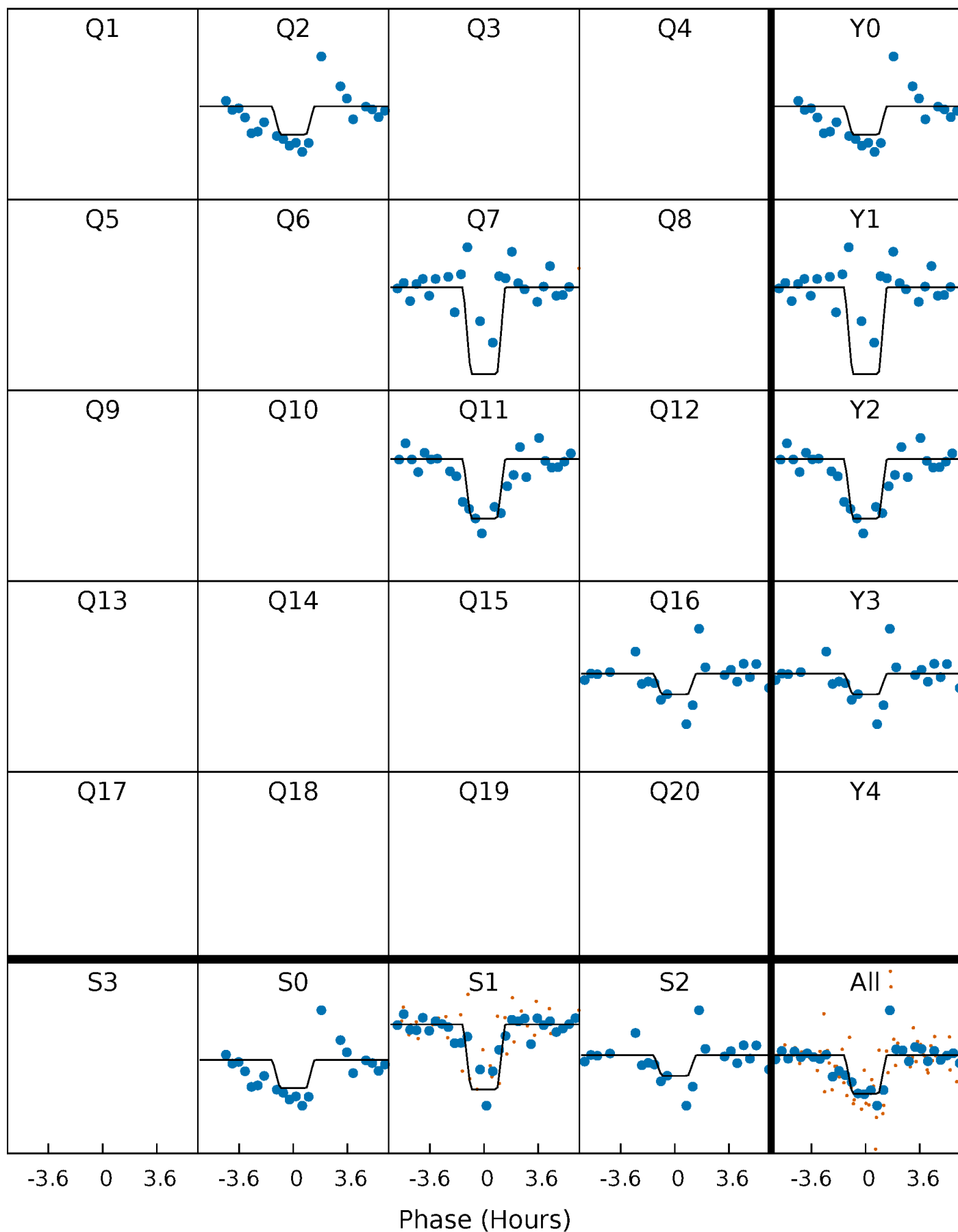
DV Quarter-Phased Transit Curves

TCE 009305357-01 P=448.098525 Days $T_0=190.132981$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

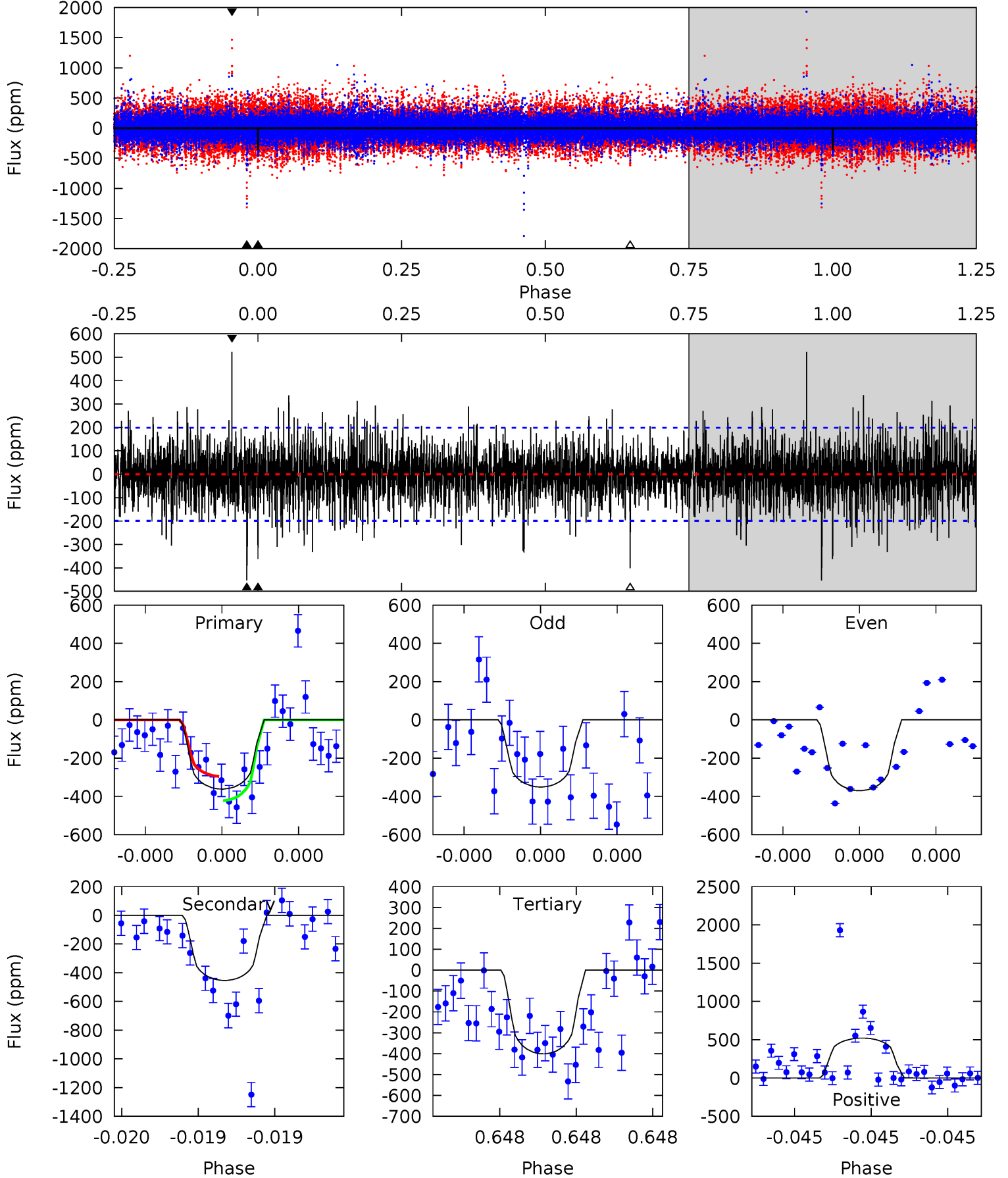
TCE 009305357-01 P=448.101160 Days $T_0=190.128376$ (BKJD)



DV Model-Shift Uniqueness Test

009305357-01, P = 448.098525 Days, E = 190.132981 Days

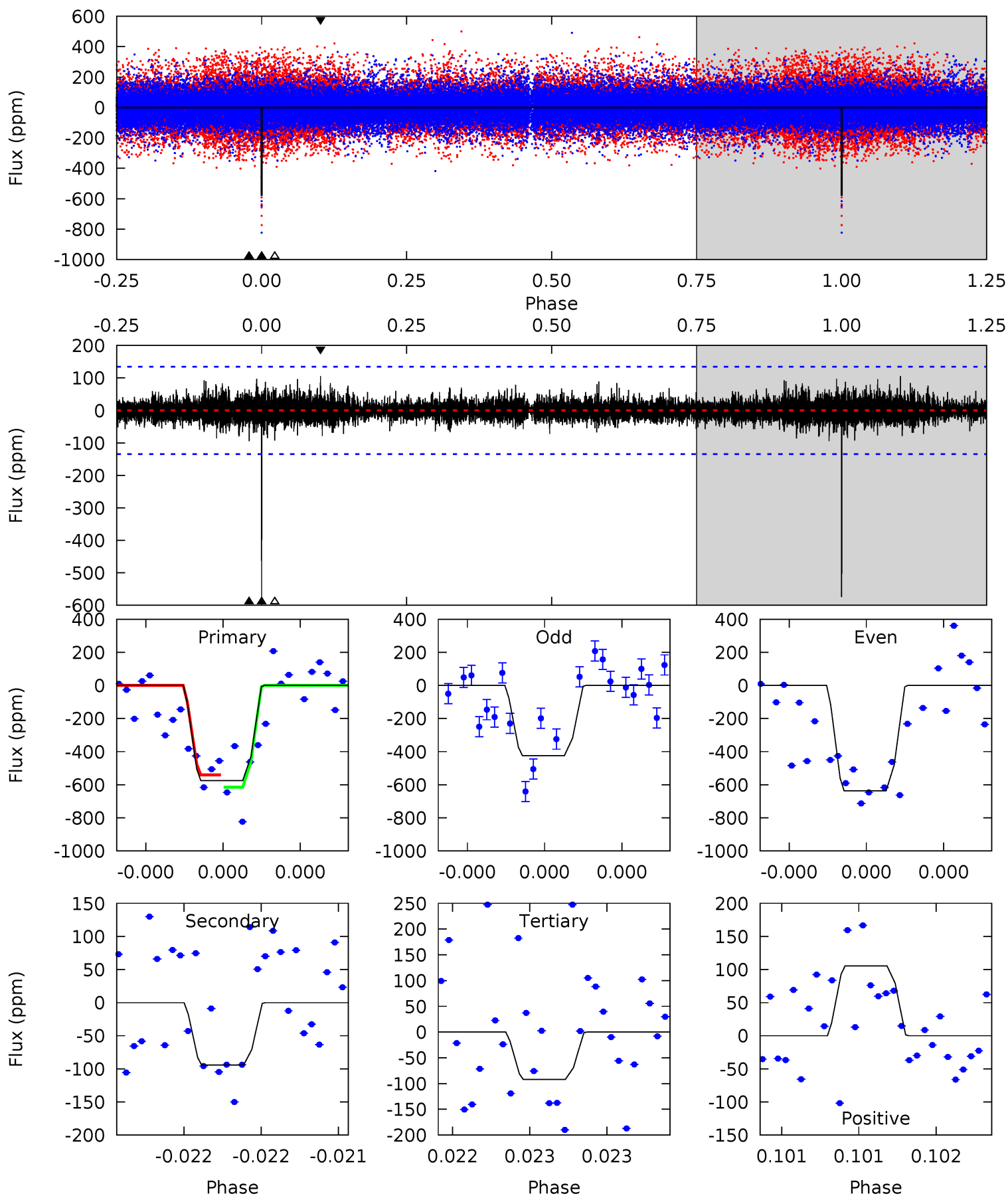
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	12.9	11.4	14.9	5.66	3.61	2.19	-1.13	-4.57	1.49	-1.95	0.24	0.99	0.54	1.82



Alt Model-Shift Uniqueness Test

009305357-01, P = 448.101160 Days, E = 190.128376 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.3	3.98	3.89	4.46	5.69	3.65	0.80	20.4	19.8	0.09	-0.47	4.24	0.87	0.16	1.58



Stellar Parameters For KIC 009305357

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5176^{+140}_{-156}	$4.631^{+0.065}_{-0.040}$	$-0.880^{+0.350}_{-0.300}$	$0.637^{+0.056}_{-0.051}$	$0.633^{+0.060}_{-0.028}$	$3.450^{+0.880}_{-0.585}$
	+3%/-3%	+1%/-1%	+40%/-34%	+9%/-8%	+9%/-4%	+25%/-17%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009305357-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-454 ± 35	$3.61^{+3.39}_{-2.36}$	255^{+9}_{-10}	3682^{+1891}_{-675}	$18682^{+134405}_{-13746}$
Alt.	-94 ± 24	$3.48^{+3.71}_{-2.44}$	255^{+8}_{-9}	2928^{+1313}_{-501}	4005^{+40786}_{-3079}

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 $A_{obs} \gg 1.0$

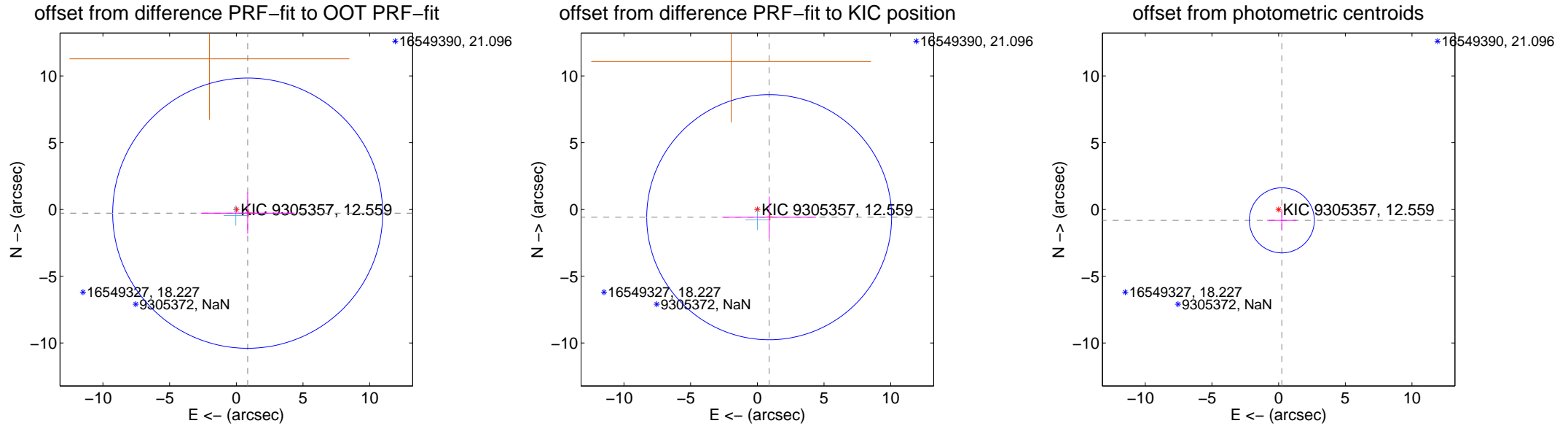
DV Centroid Data

Supplemental centroid analysis for 009305357-01. Kepler magnitude: 12.56. Transit SNR 5.92

There are 1 quarters with good PRF difference image offsets

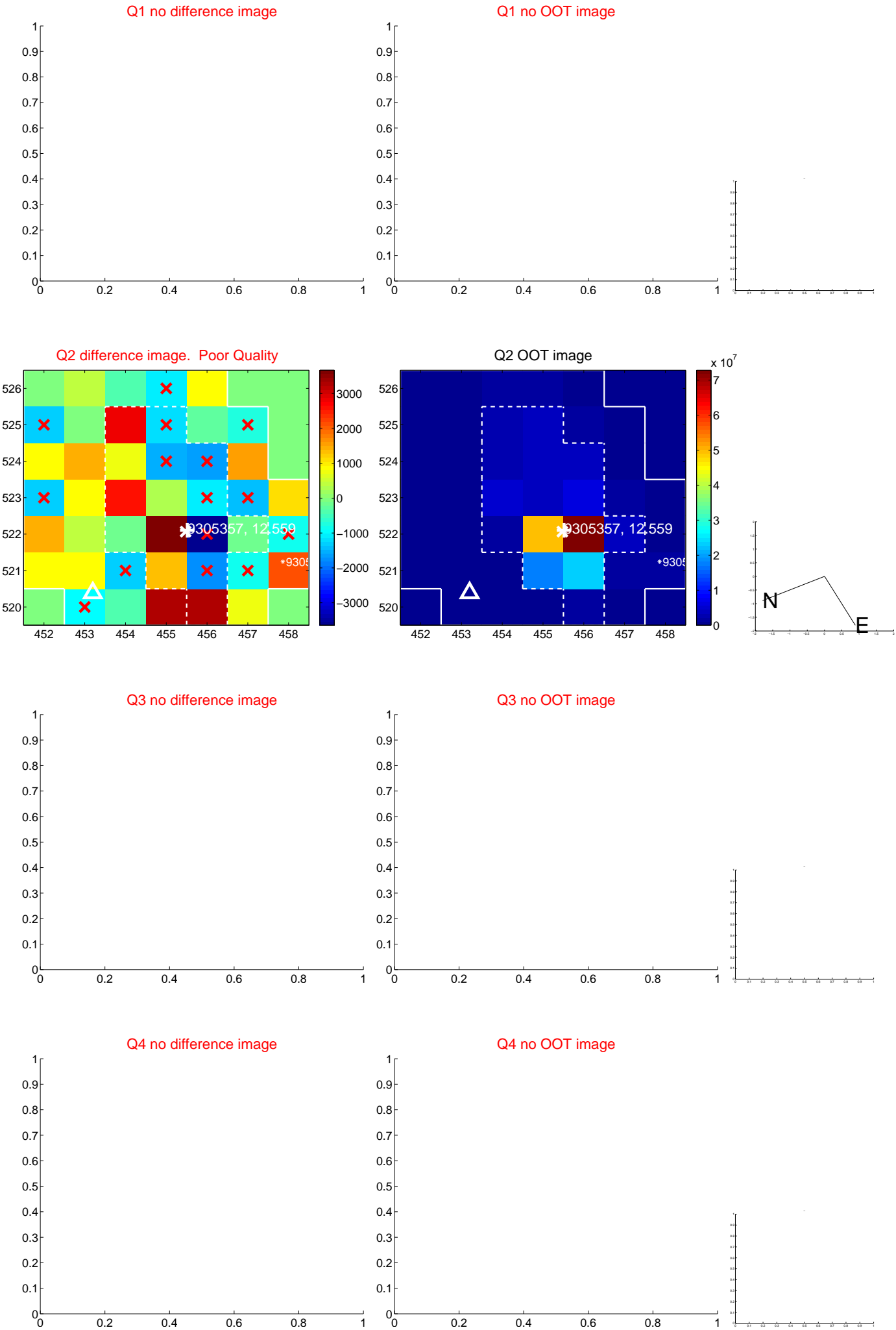
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.896 ± 3.373	0.27	-0.852 ± 3.511	-0.276 ± 1.543
PRF-fit source offset from KIC position	1.060 ± 3.060	0.35	-0.888 ± 3.511	-0.579 ± 1.543
photometric centroid source offset	0.85 ± 0.81	1.05	-0.24 ± 1.10	-0.81 ± 0.78

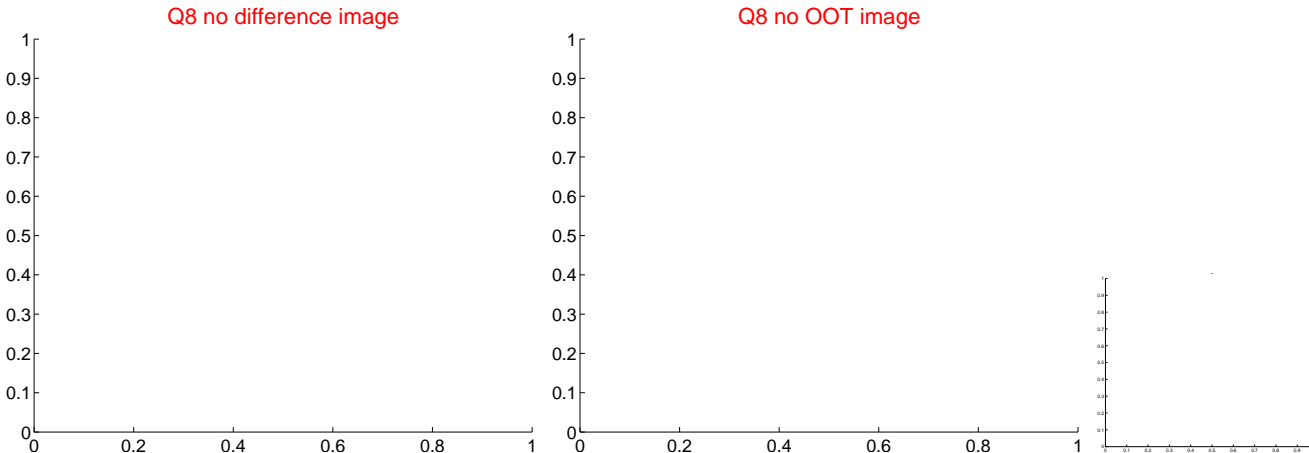
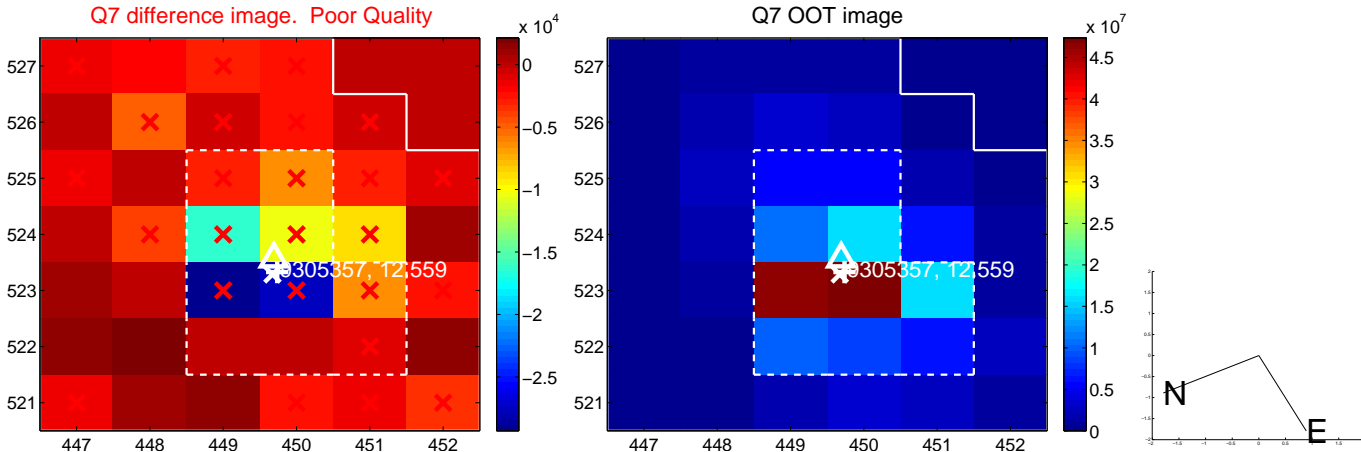
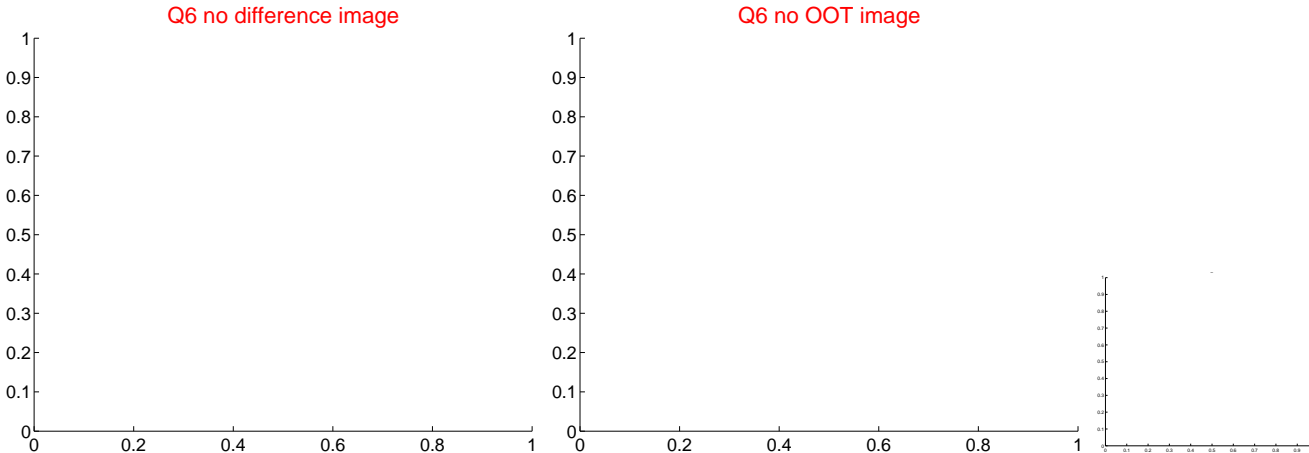
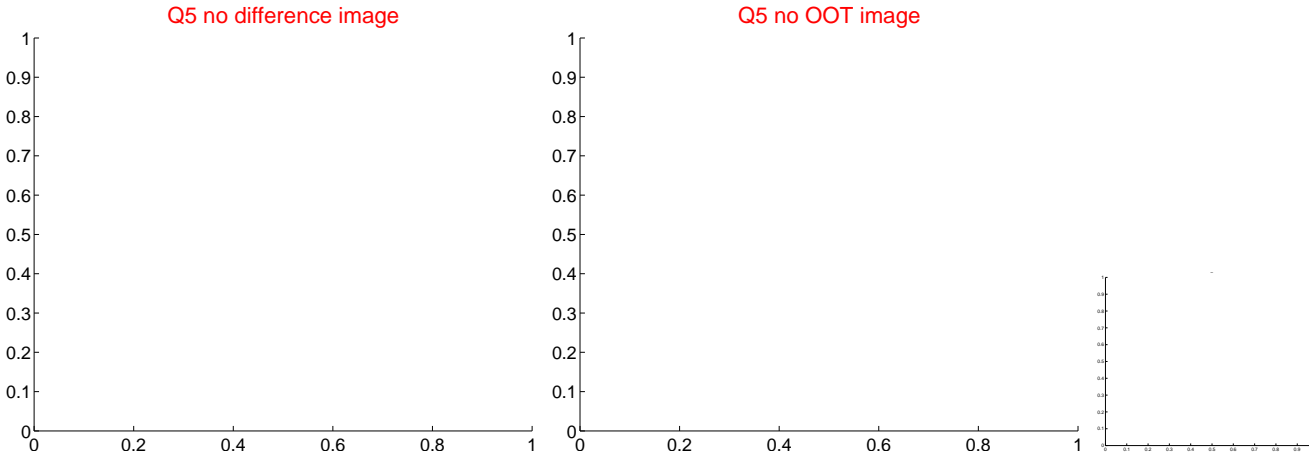


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

Q9 no difference image



Q9 no OOT image



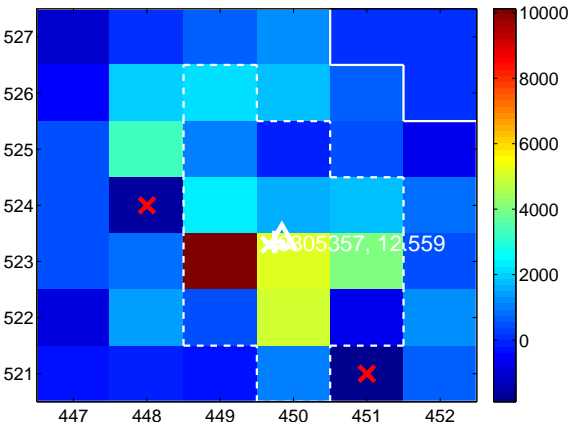
Q10 no difference image



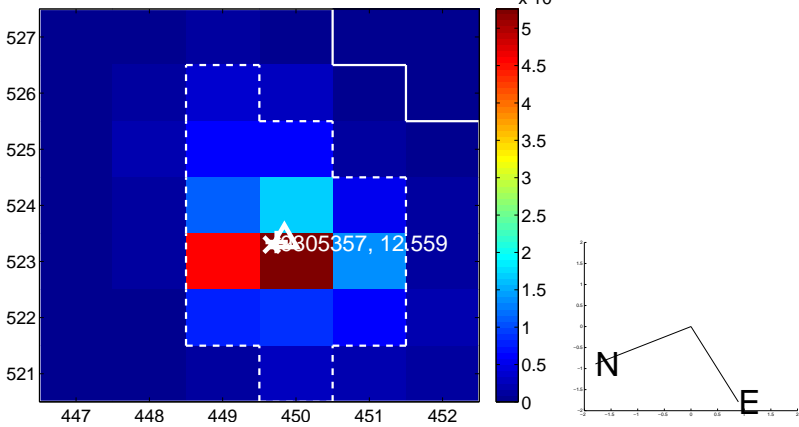
Q10 no OOT image



Q11 difference image



Q11 OOT image



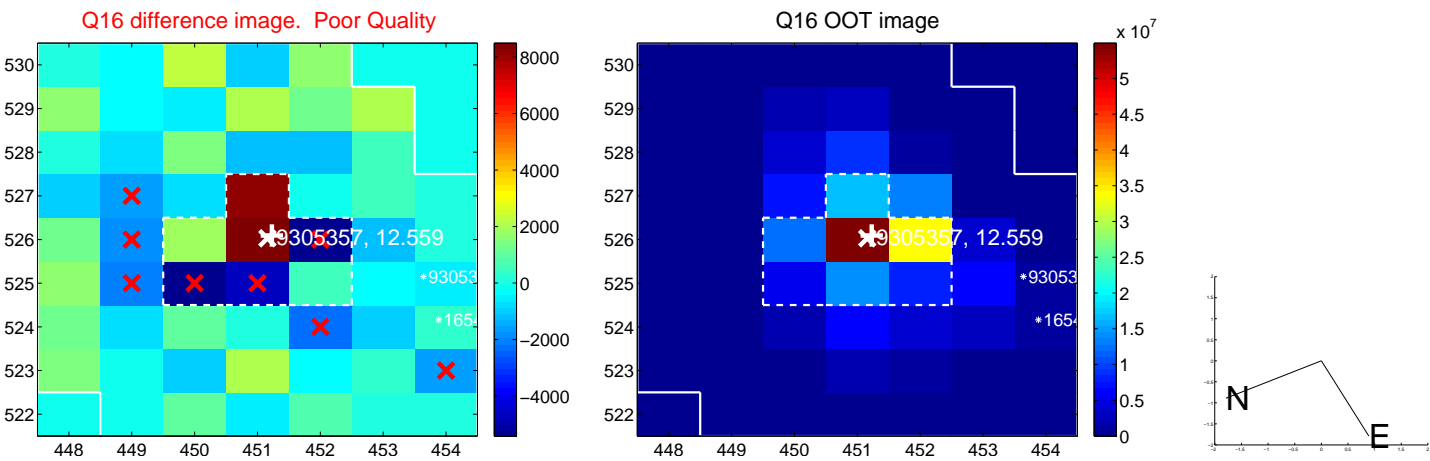
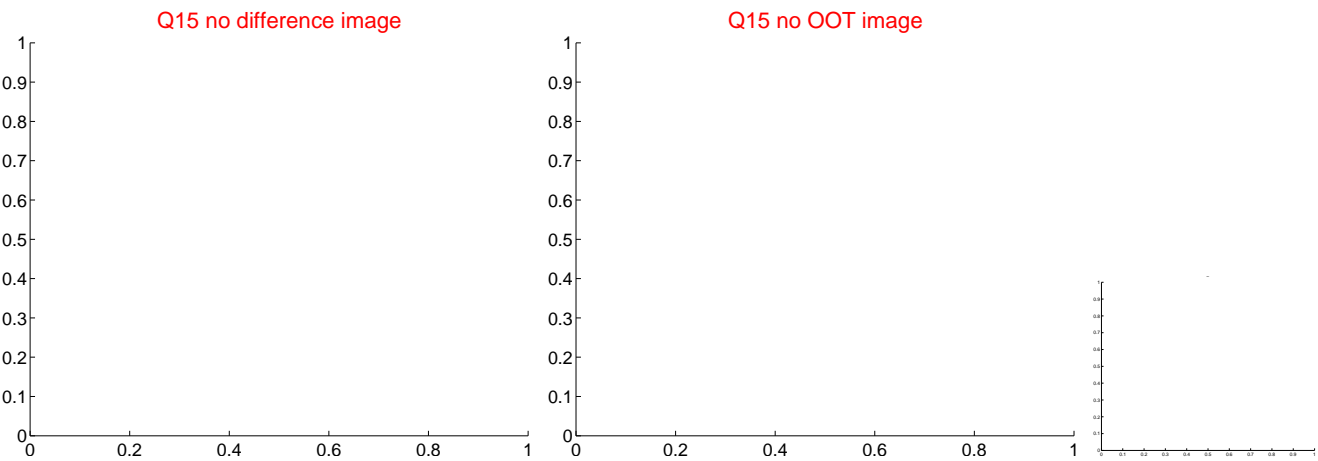
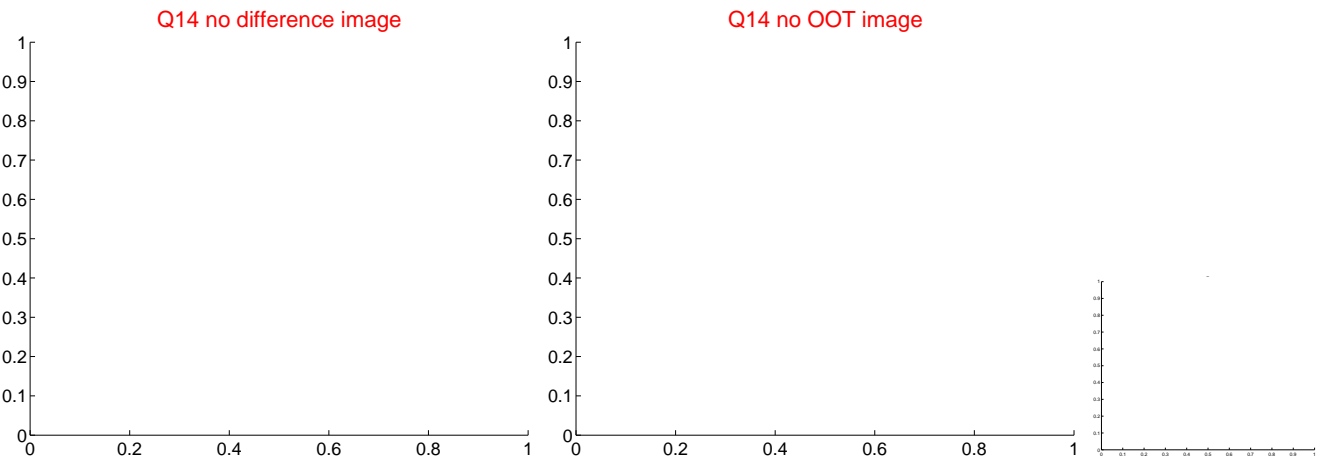
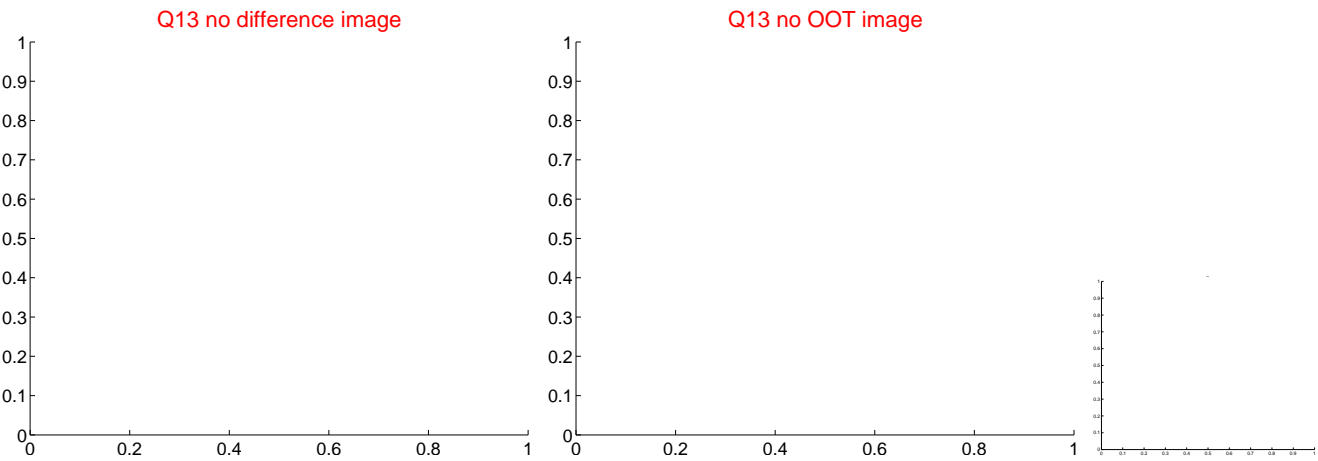
Q12 no difference image



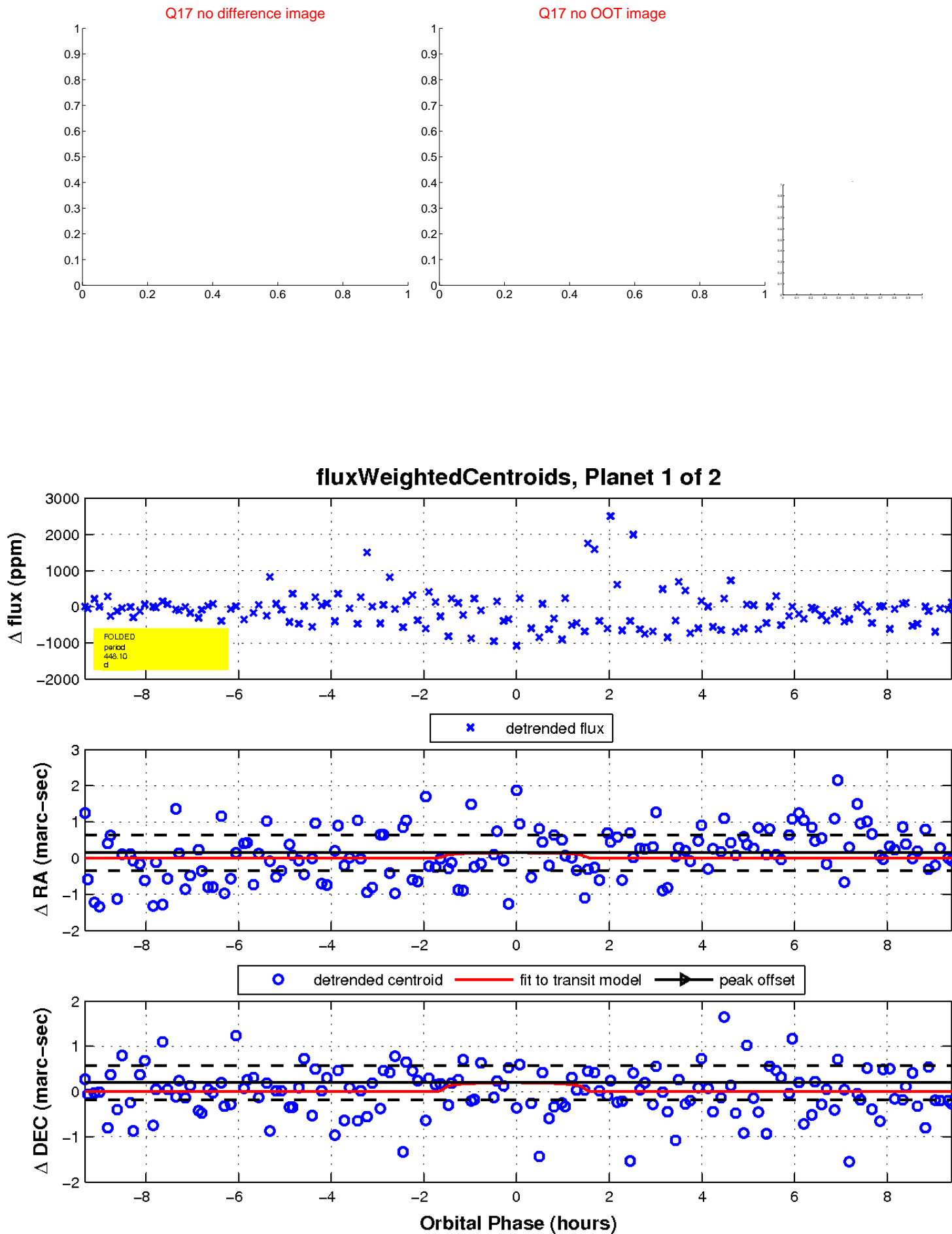
Q12 no OOT image



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

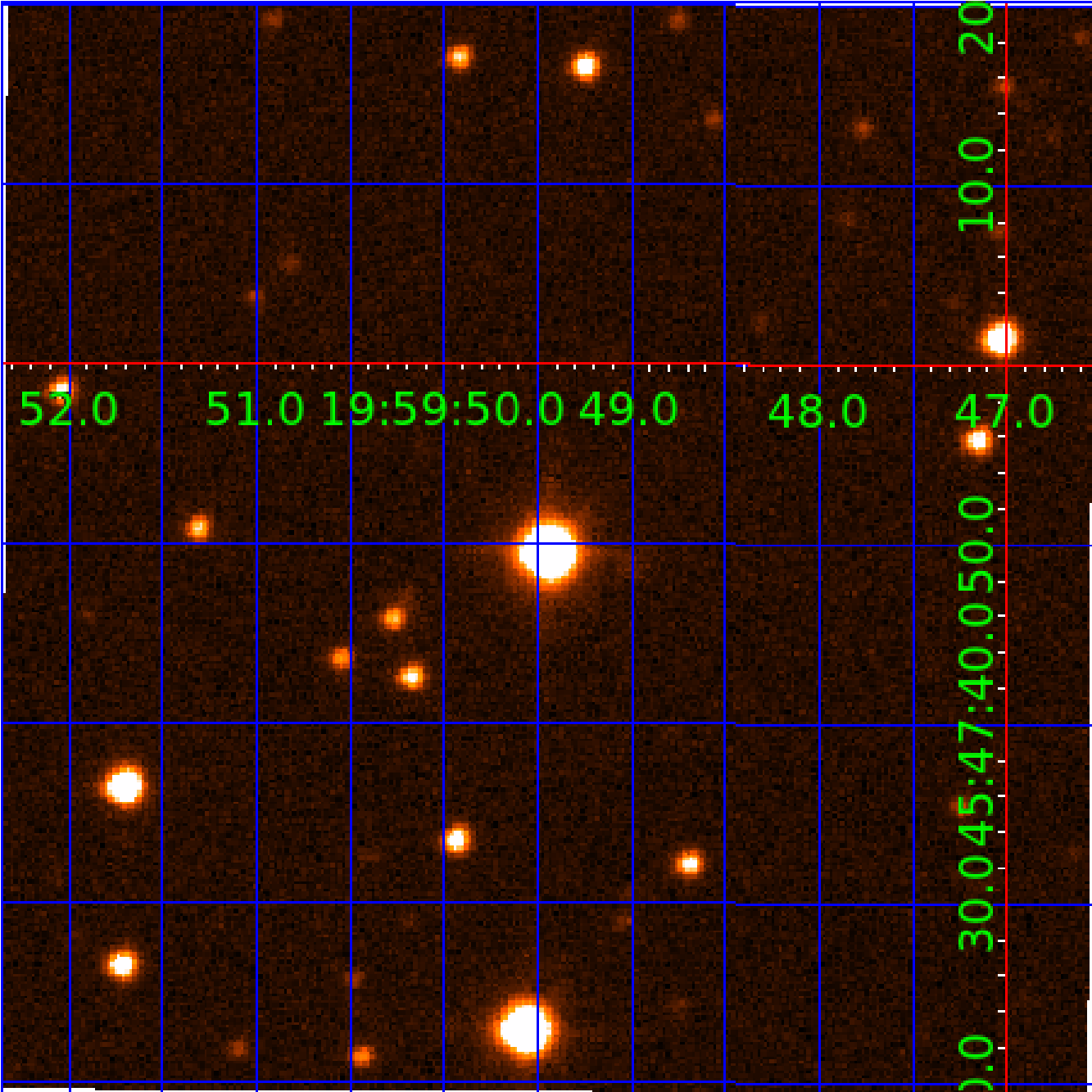


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009305357

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})
009305357-01	OBS	No	448.098525	190.132981	434.0	3.159	12.5	5.9	0.64	5176	1.40	0.27
009305357-02	OBS	No	441.933974	439.666672	410.1	4.038	13.2	5.6	0.64	5176	1.43	0.27

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009305357-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009305357-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

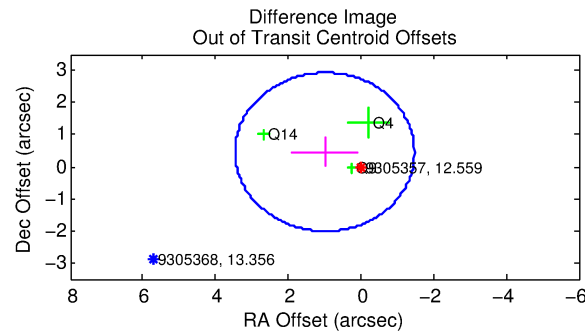
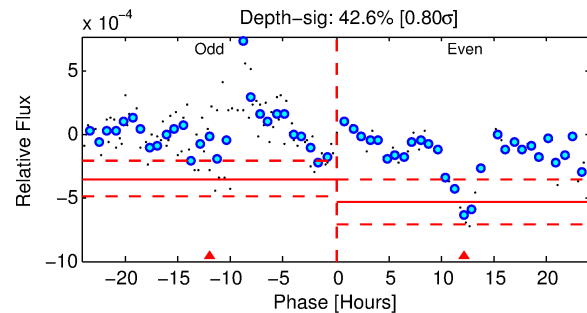
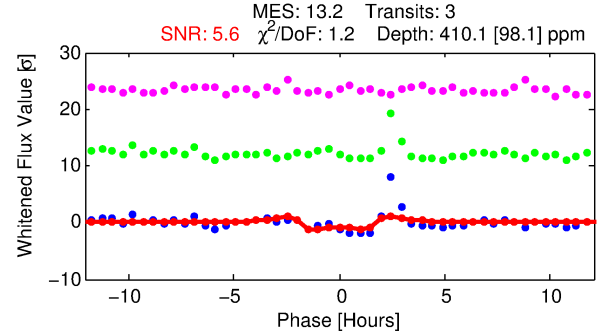
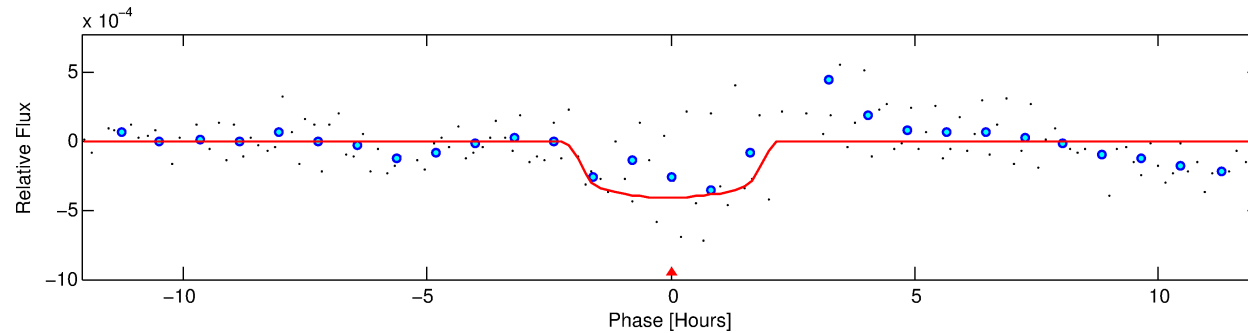
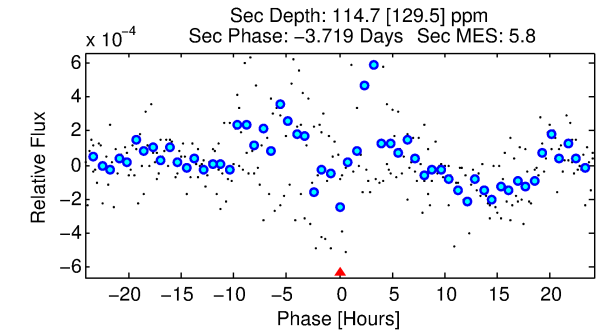
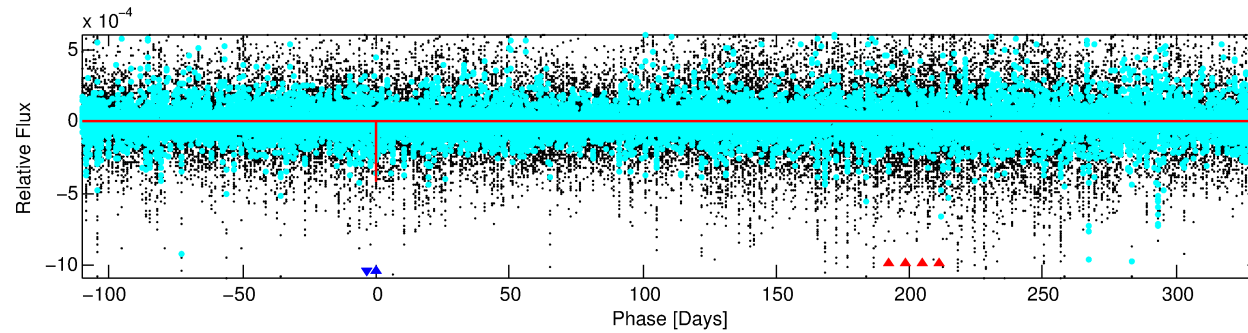
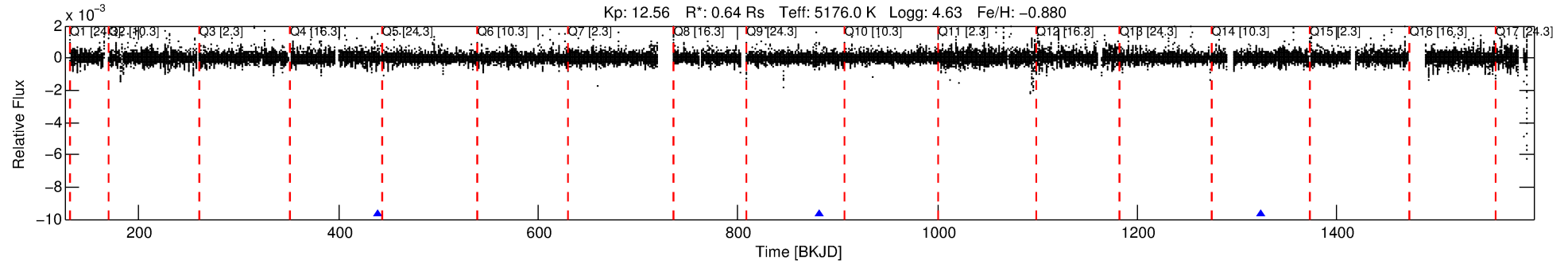
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009305357-02

No Significant Match Found

DV One-Page Summary

KIC: 9305357 Candidate: 2 of 2 Period: 441.934 d



DV Fit Results:

Period = 441.93397 [0.00749] d
Epoch = 439.6667 [0.0086] BKJD
Rp/R* = 0.0205 [0.0194]
a/R* = 542.88 [2125.44]
b = 0.79 [1.92]
Seff = 0.27 [0.05]
Teff = 185 [8] K
Rp = 1.42 [1.35] Re
a = 0.9751 [0.0750] AU
Ag = 29567.90 [65210.97] [0.45 σ]
Teffp = 3742 [2063] K [1.72 σ]

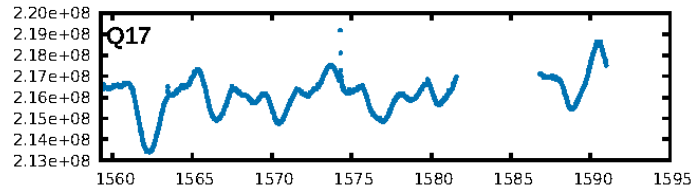
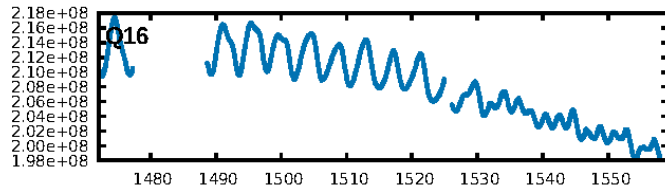
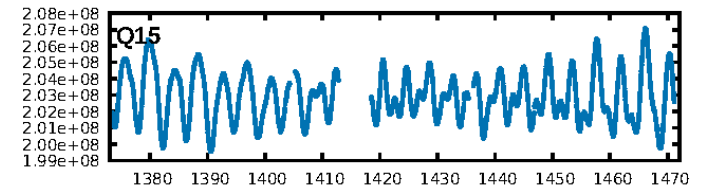
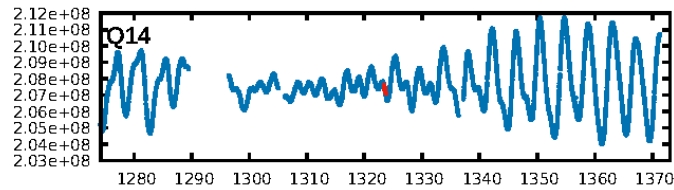
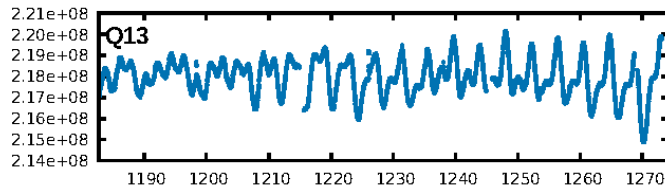
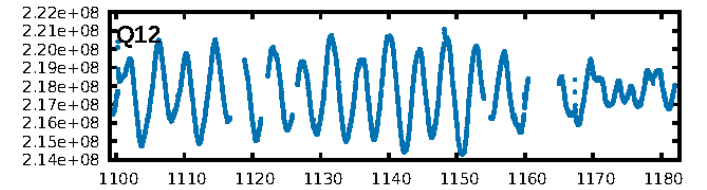
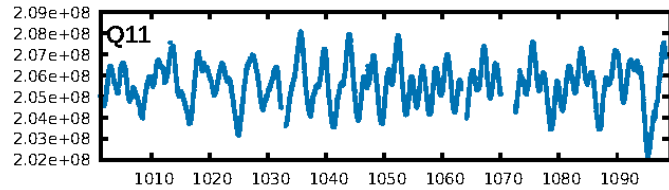
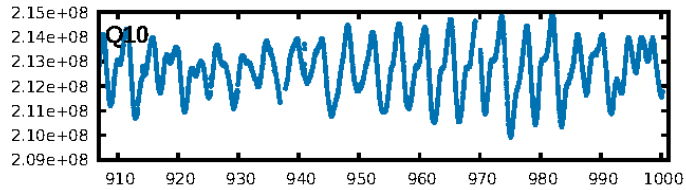
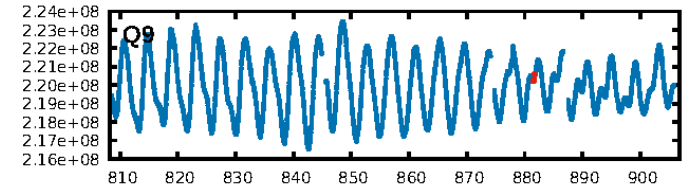
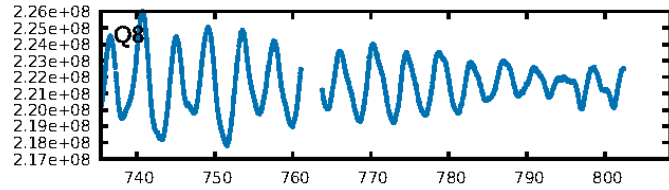
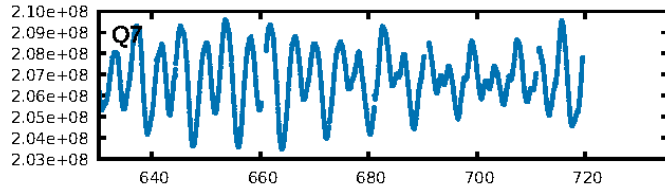
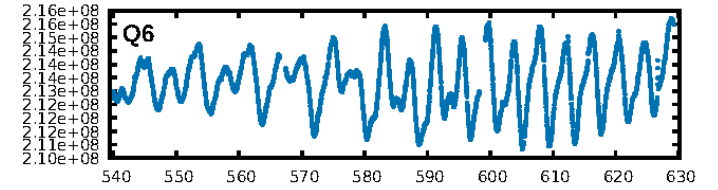
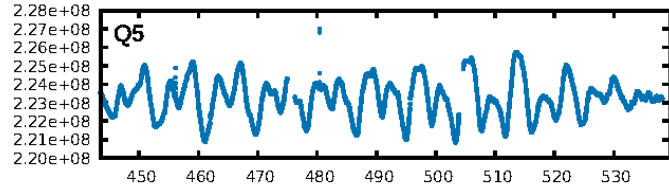
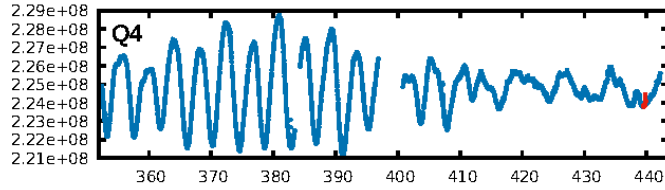
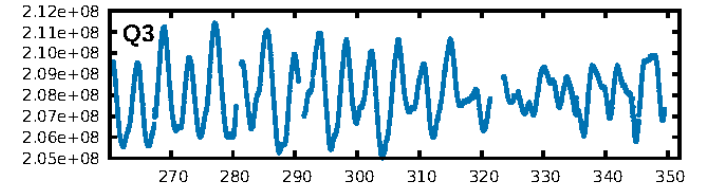
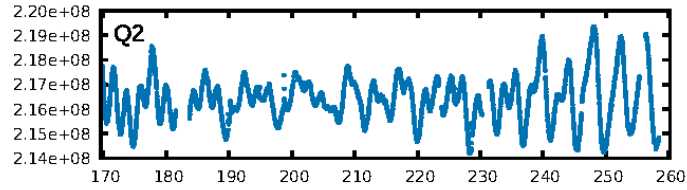
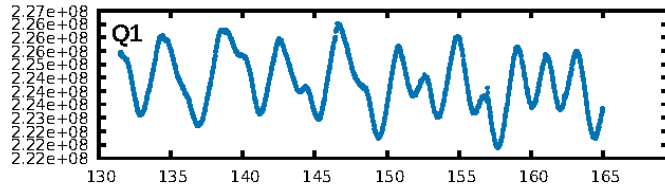
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [28.86 σ]
ModelChiSquare2-sig: 1.7%
ModelChiSquareGof-sig: 36.8%
Bootstrap-pfa: 1.22e-11
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.226
Centroid-sig: 16.1%
Centroid-so: 1.531 arcsec [1.31 σ]
OotOffset-rm: 1.094 arcsec [1.33 σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-rm: 0.951 arcsec [1.13 σ]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

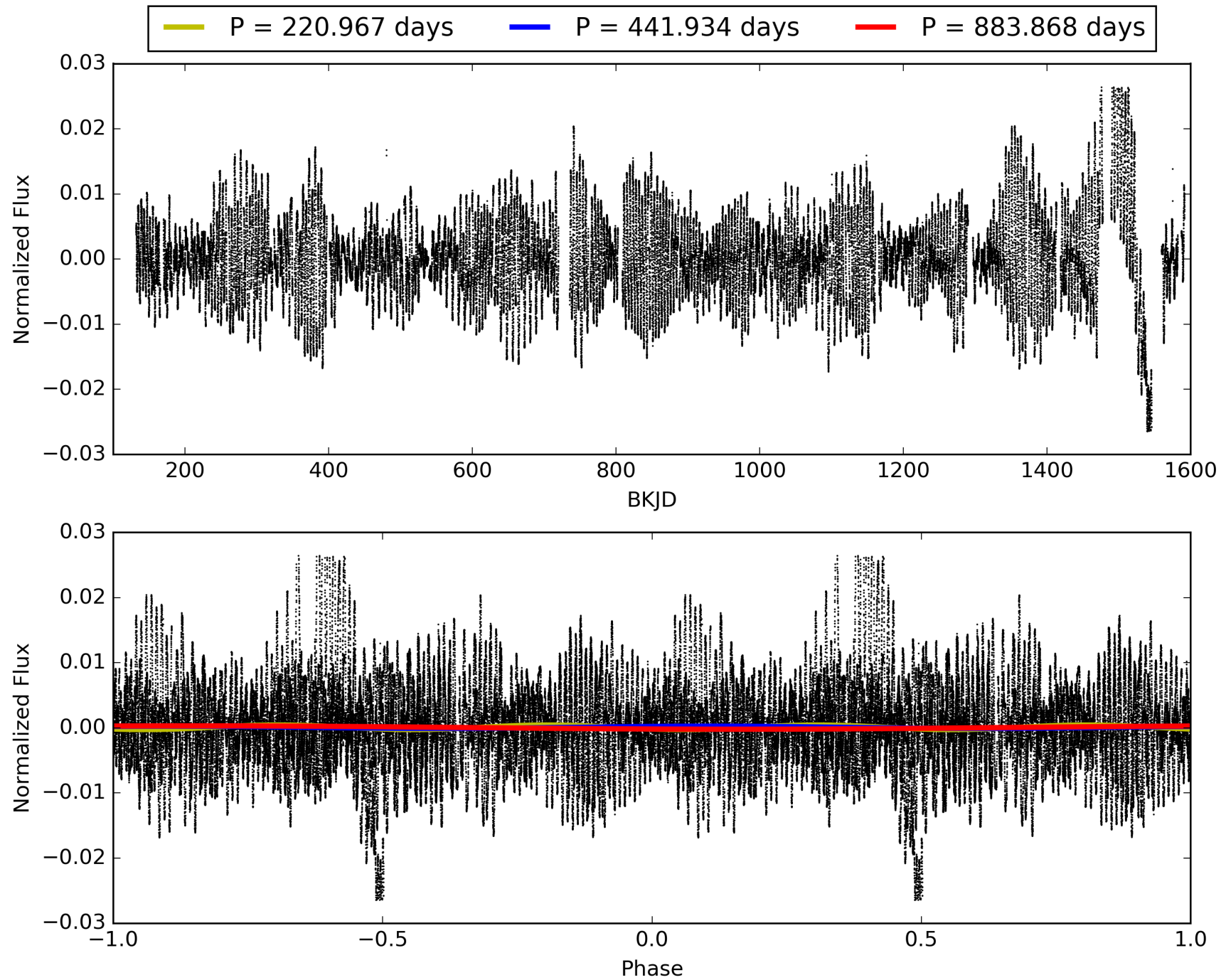
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:53:21 Z

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

TCE 009305357-02, PDC Light Curves

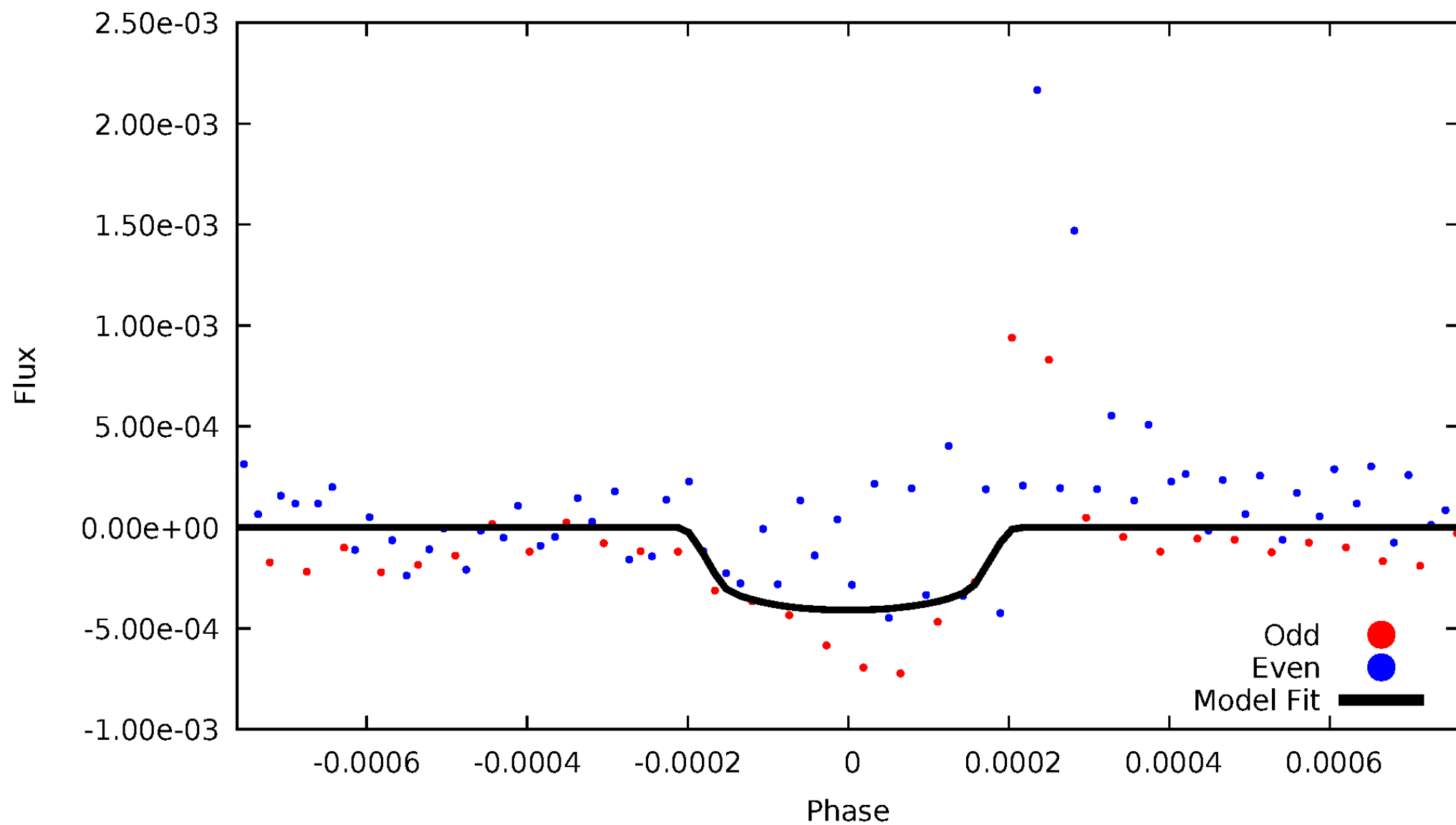


TCE 009305357-02



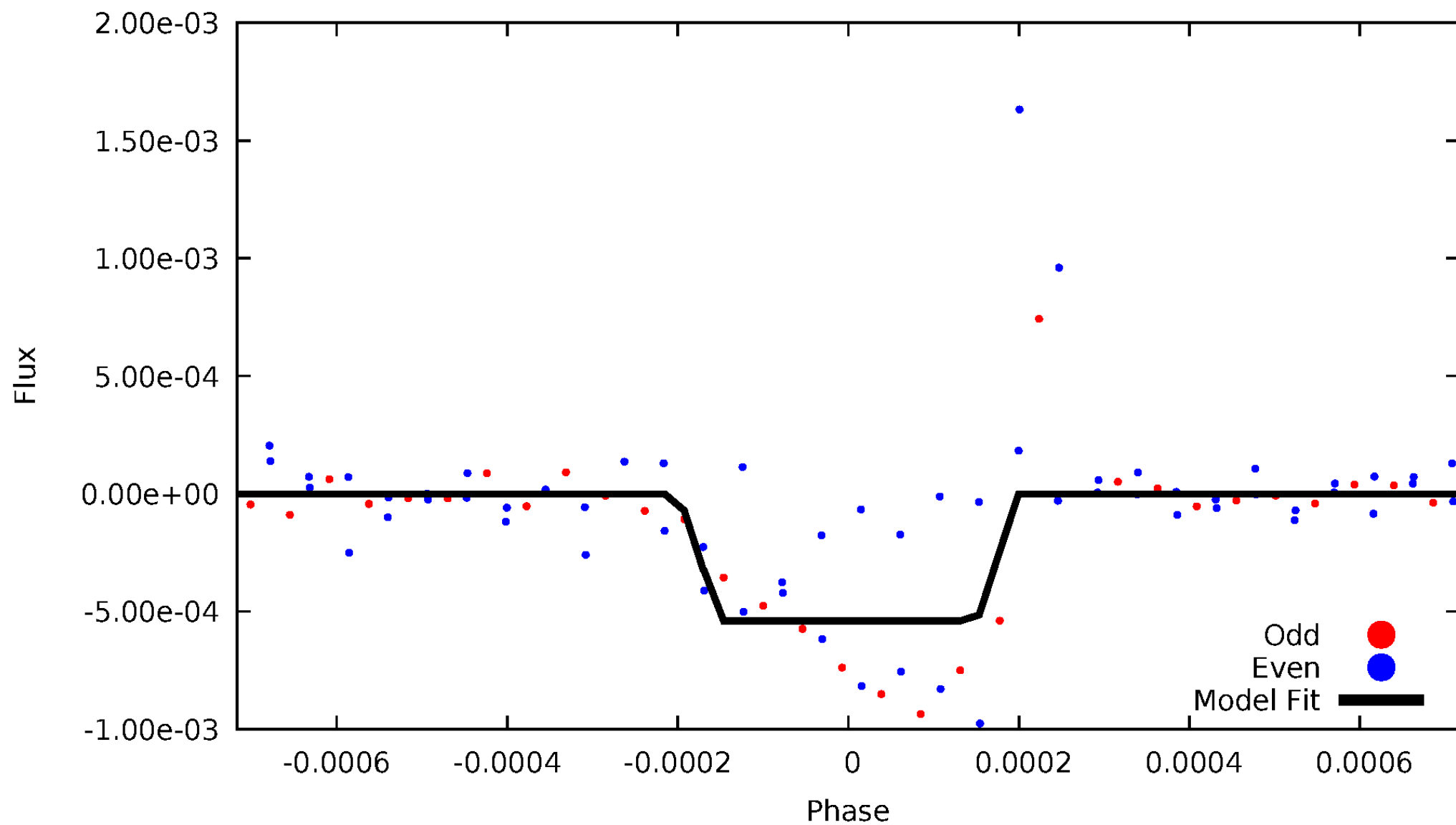
DV Odd/Even

TCE 009305357-02



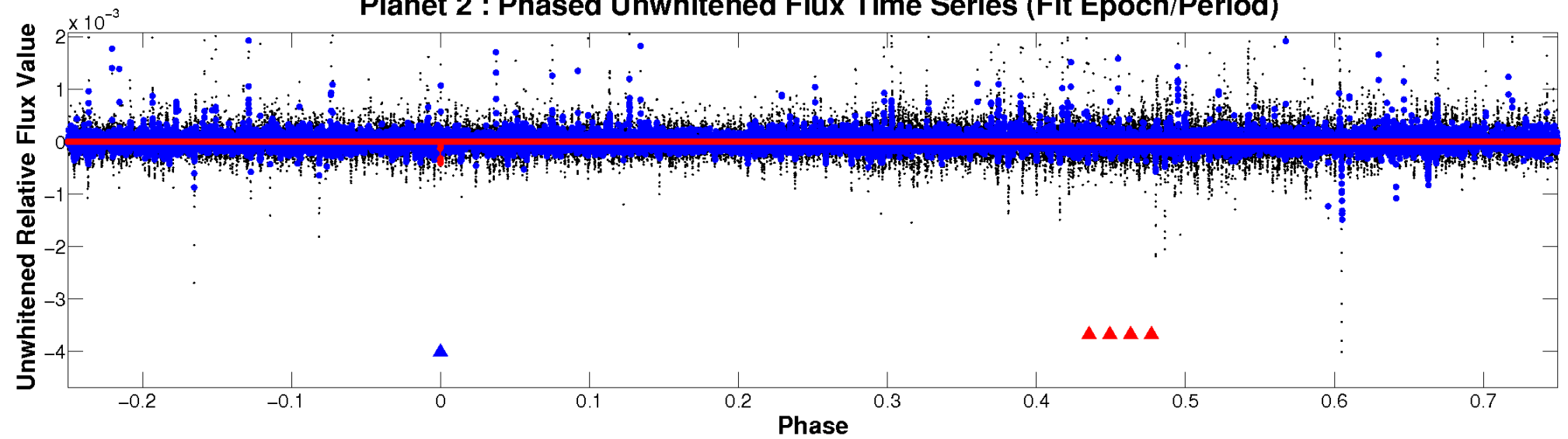
ALT Odd/Even

TCE 009305357-02

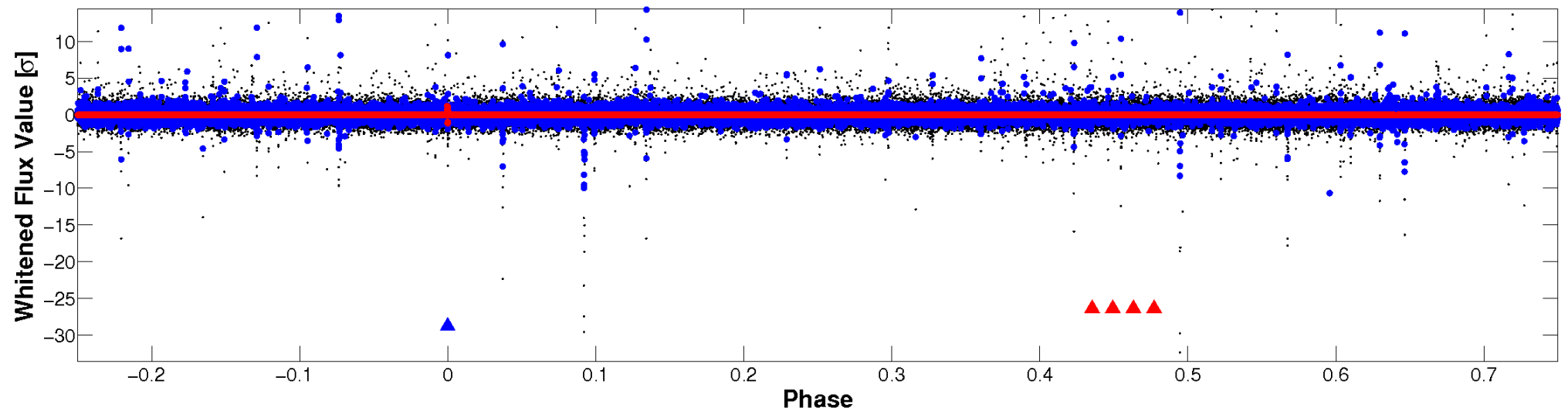


Non-Whitened Vs. Whitened Light Curve

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

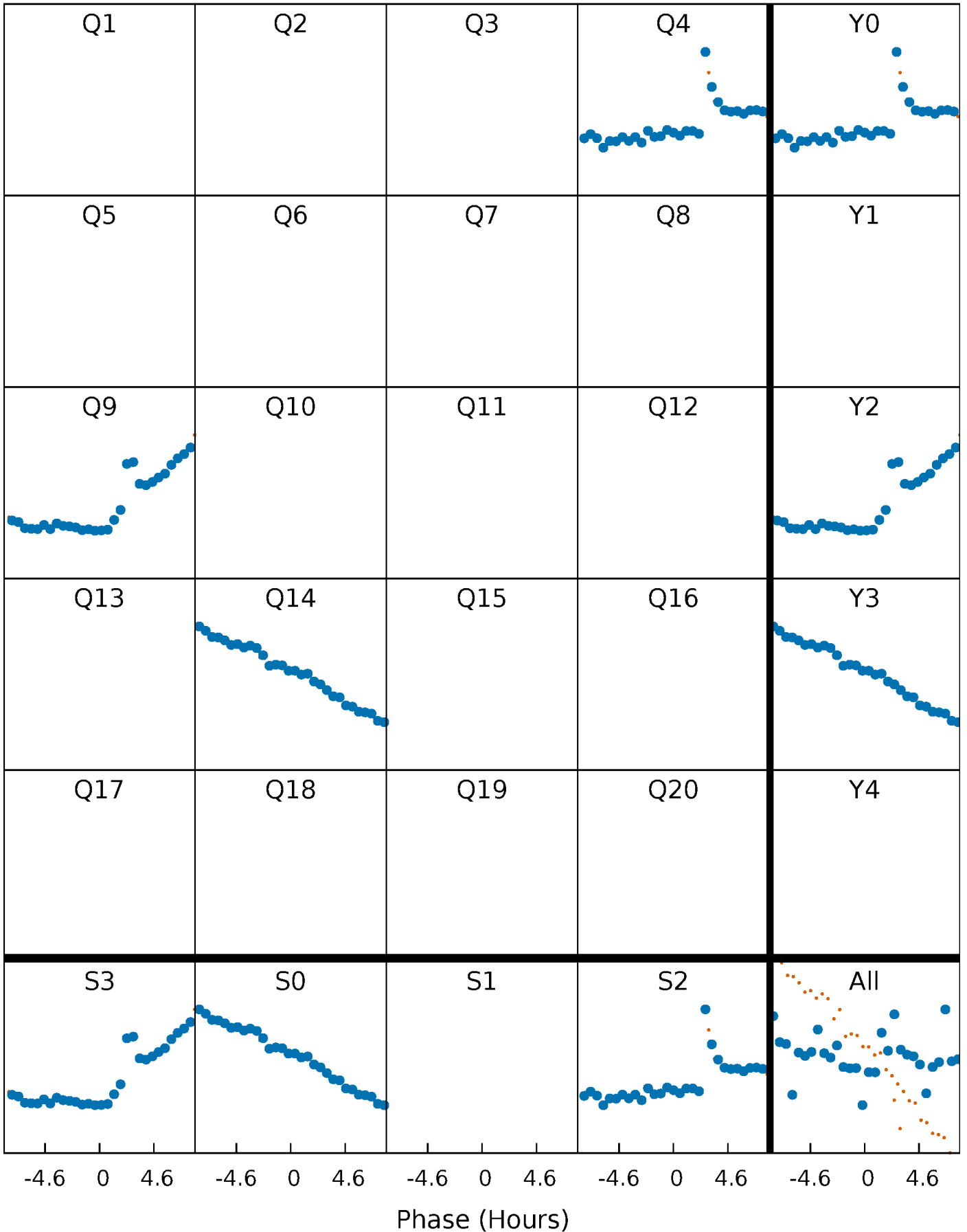


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



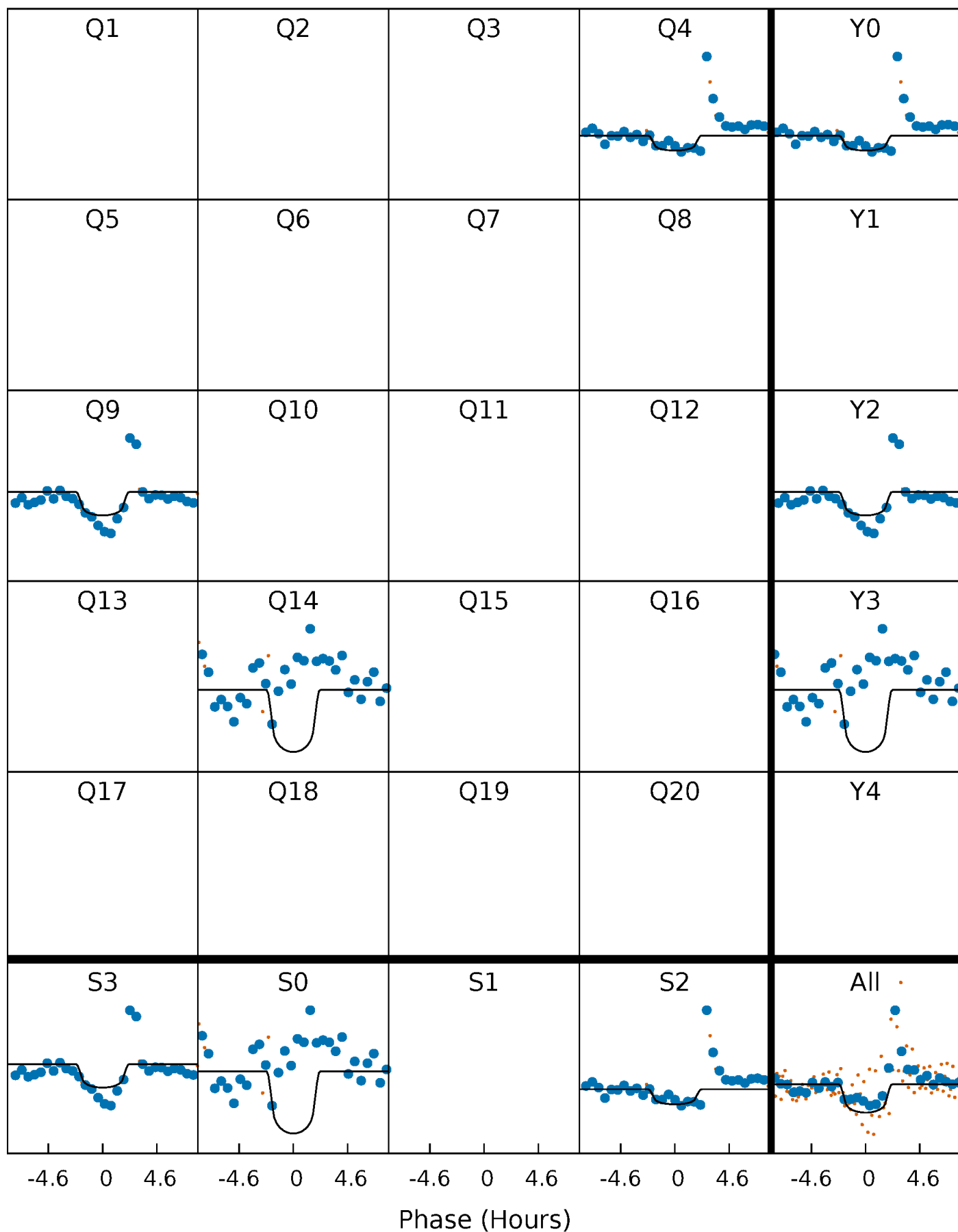
PDC Quarter-Phased Transit Curves

TCE 009305357-02 $P=441.933974$ Days $T_0=439.666672$ (BKJD)



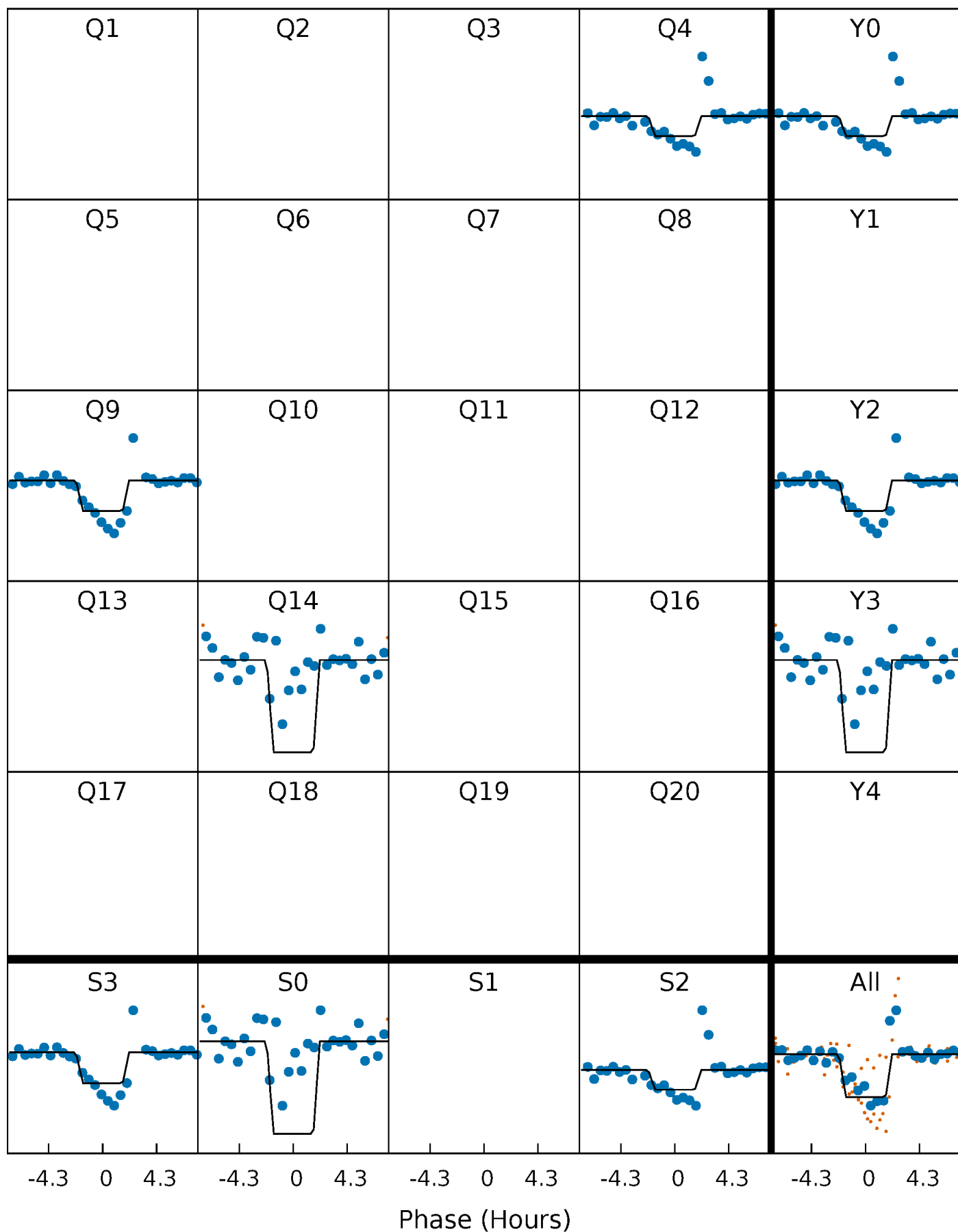
DV Quarter-Phased Transit Curves

TCE 009305357-02 P=441.933974 Days $T_0=439.666672$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

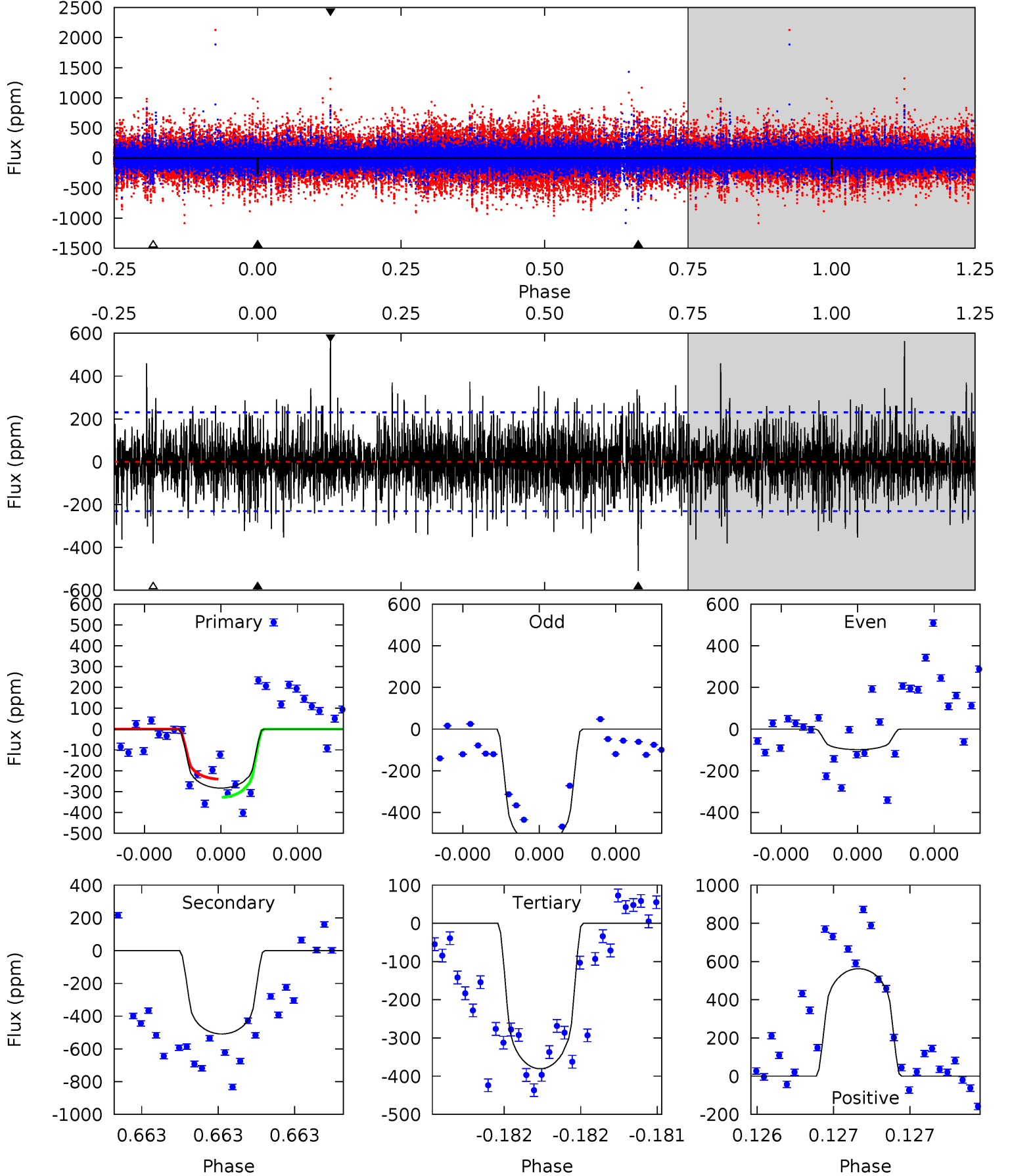
TCE 009305357-02 P=441.909791 Days $T_0=439.682068$ (BKJD)



DV Model-Shift Uniqueness Test

009305357-02, P = 441.933974 Days, E = 439.666672 Days

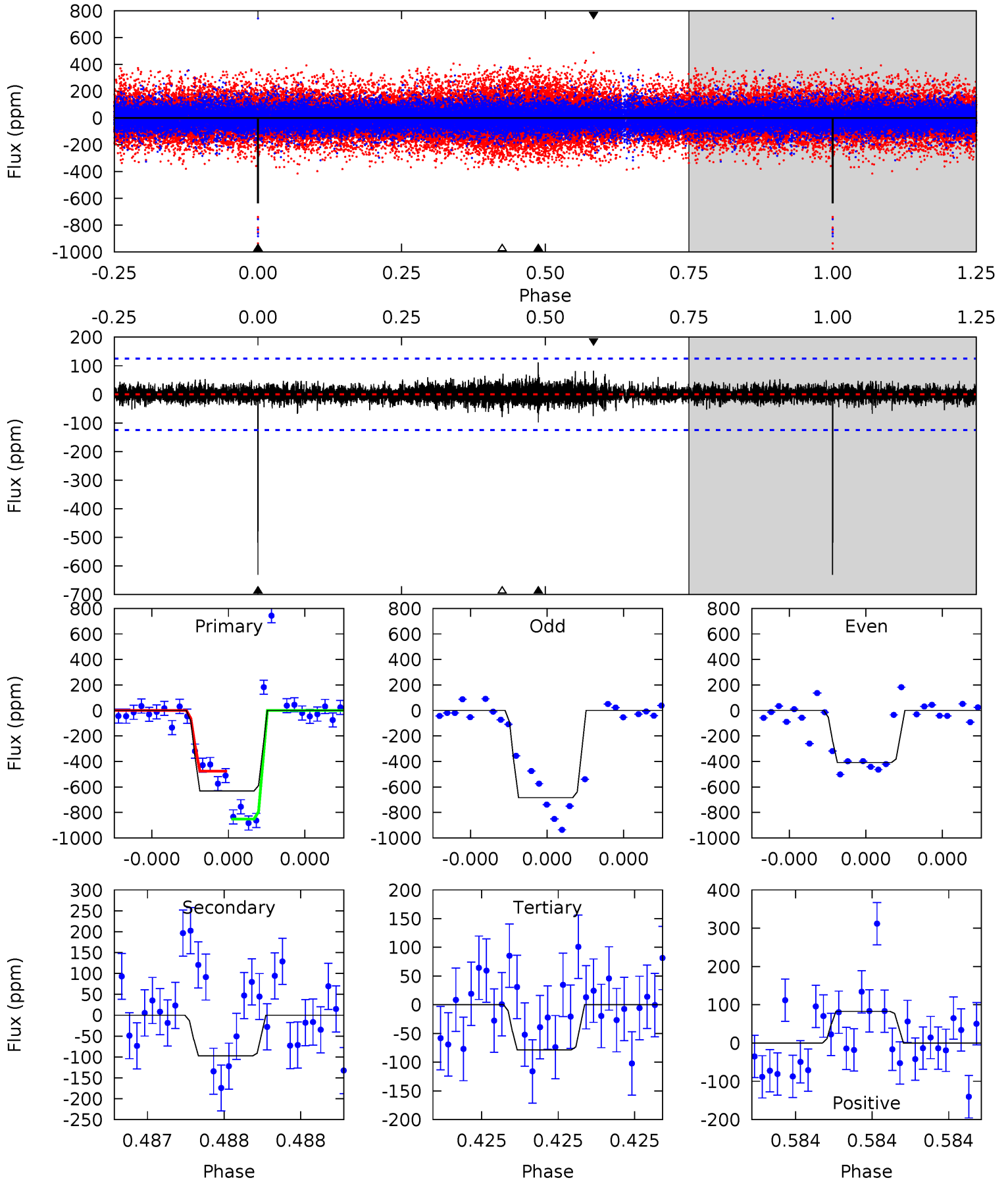
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.89	12.4	9.26	13.7	5.62	3.55	2.30	-2.37	-6.80	3.13	-1.30	4.59	0.75	0.52	1.06



Alt Model-Shift Uniqueness Test

009305357-02, P = 441.909791 Days, E = 439.682068 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.4	4.38	3.53	3.72	5.62	3.55	0.69	24.8	24.6	0.85	0.66	6.62	0.73	0.15	8.22



Stellar Parameters For KIC 009305357

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5176^{+140}_{-156}	$4.631^{+0.065}_{-0.040}$	$-0.880^{+0.350}_{-0.300}$	$0.637^{+0.056}_{-0.051}$	$0.633^{+0.060}_{-0.028}$	$3.450^{+0.880}_{-0.585}$
	+3%/-3%	+1%/-1%	+40%/-34%	+9%/-8%	+9%/-4%	+25%/-17%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009305357-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-509 ± 41	$1.61^{+1.26}_{-1.04}$	257^{+9}_{-9}	5095^{+3677}_{-1028}	$103908^{+703133}_{-71268}$
Alt.	-97 ± 22	$1.83^{+1.27}_{-1.14}$	256^{+9}_{-9}	3564^{+1507}_{-547}	15181^{+87108}_{-10135}

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

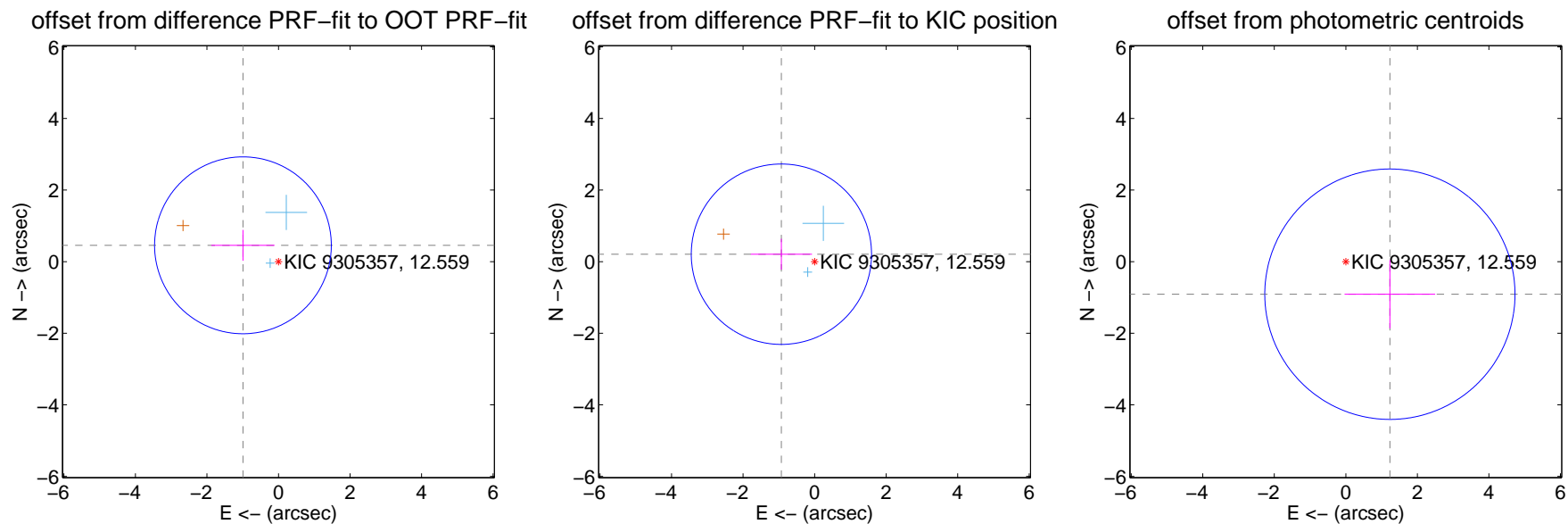
DV Centroid Data

Supplemental centroid analysis for 009305357-02. Kepler magnitude: 12.56. Transit SNR 5.64

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.094 ± 0.824	1.33	0.994 ± 0.884	0.456 ± 0.431
PRF-fit source offset from KIC position	0.951 ± 0.840	1.13	0.928 ± 0.855	0.208 ± 0.431
photometric centroid source offset	1.53 ± 1.17	1.31	-1.23 ± 1.27	-0.91 ± 0.95



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



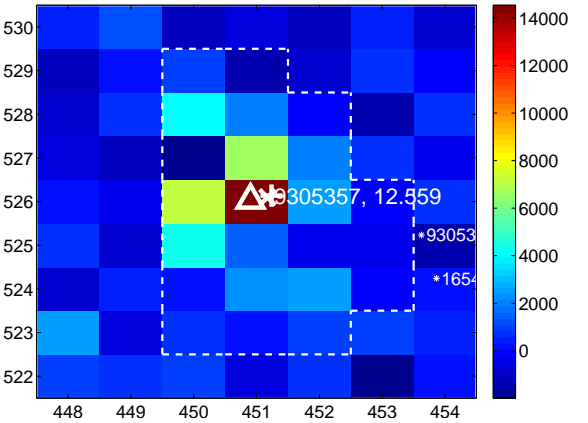
Q3 no difference image



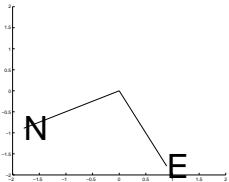
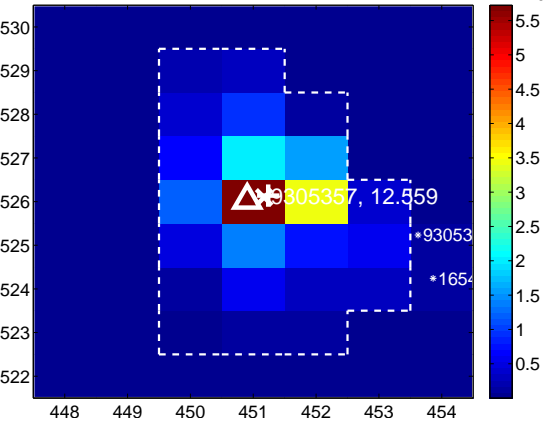
Q3 no OOT image



Q4 difference image



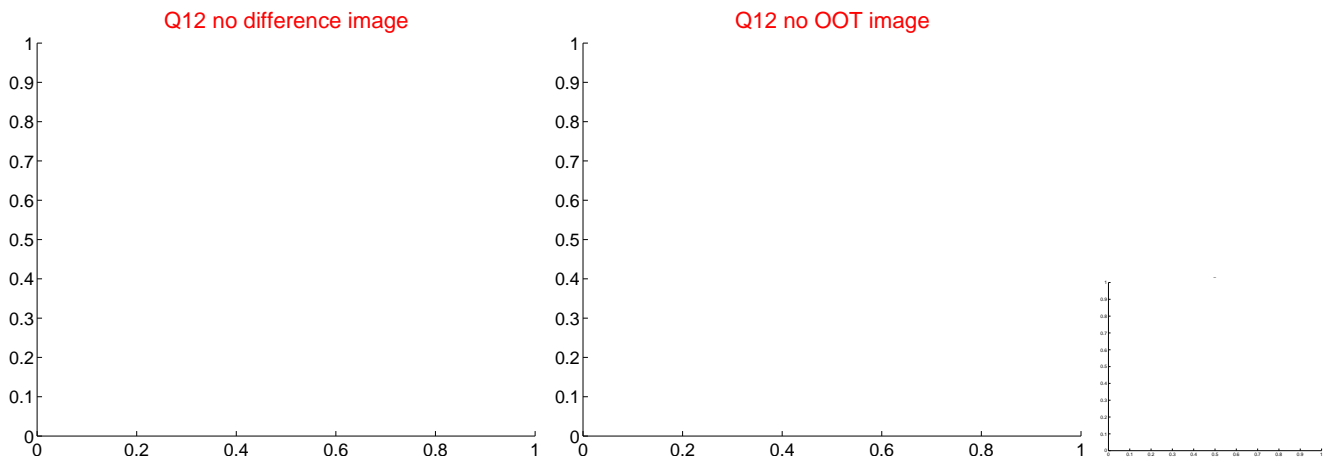
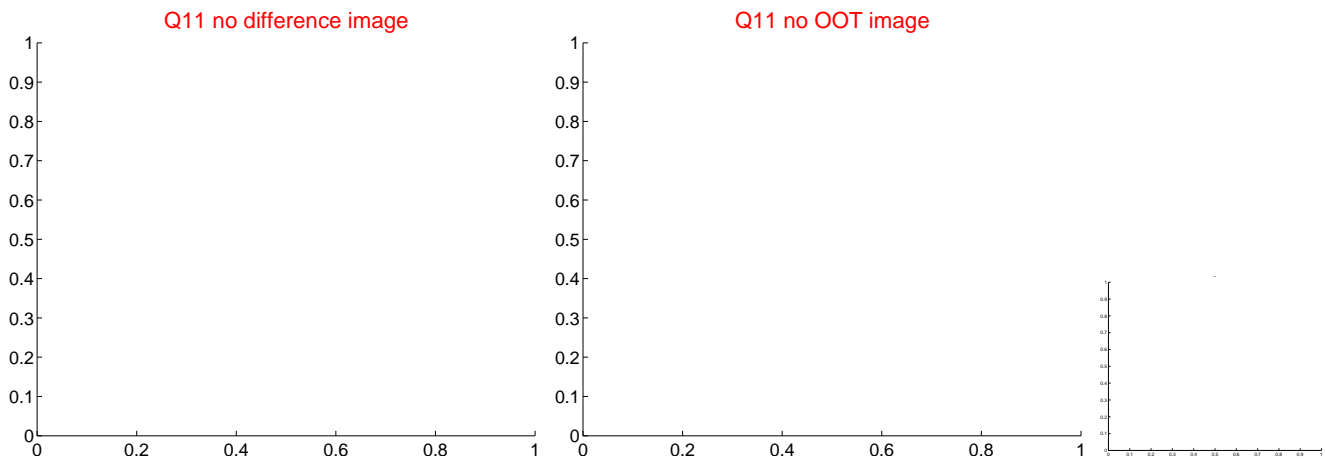
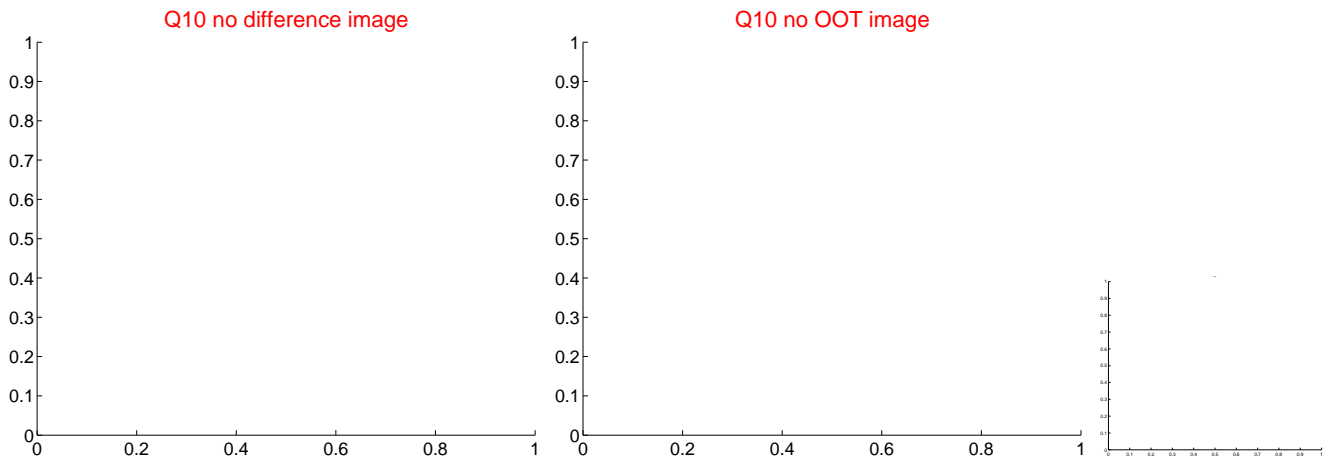
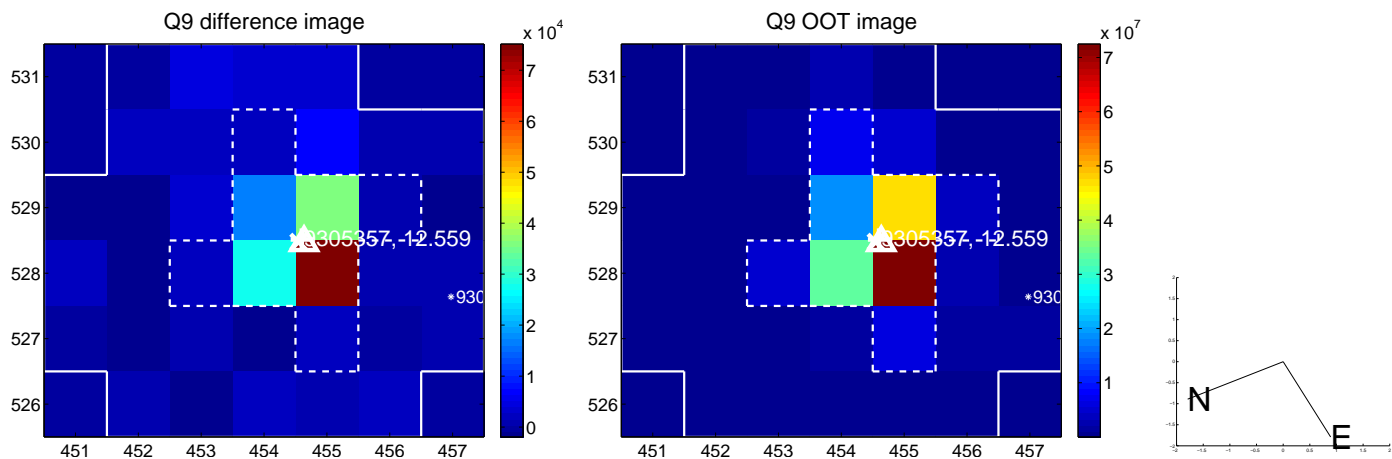
Q4 OOT image



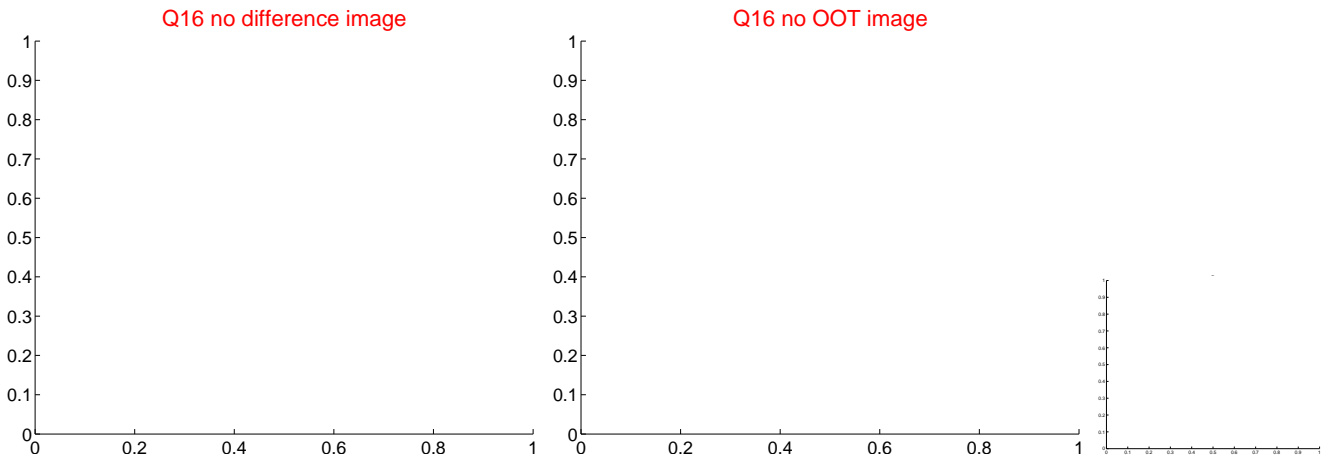
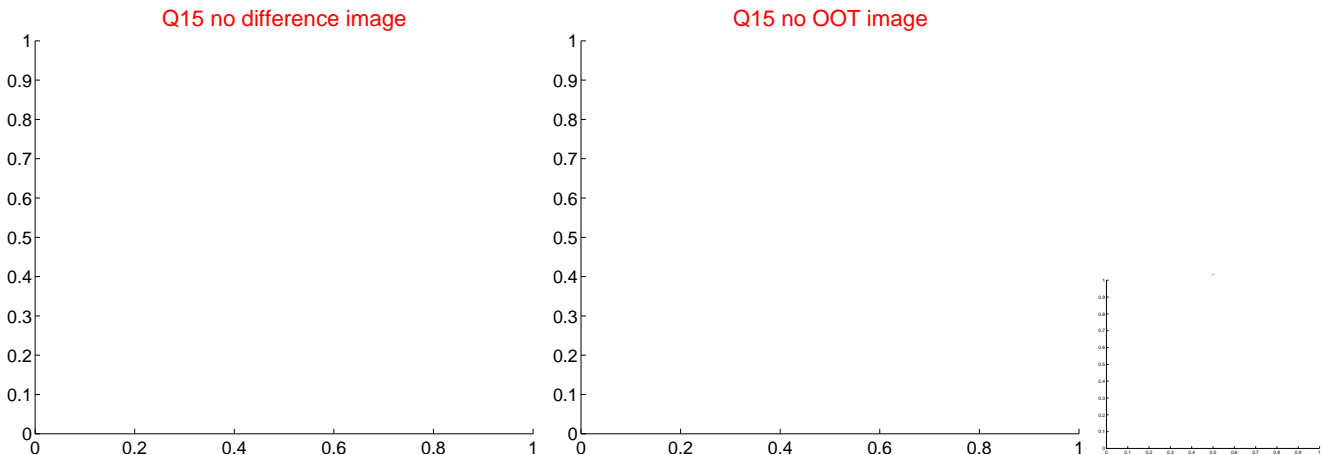
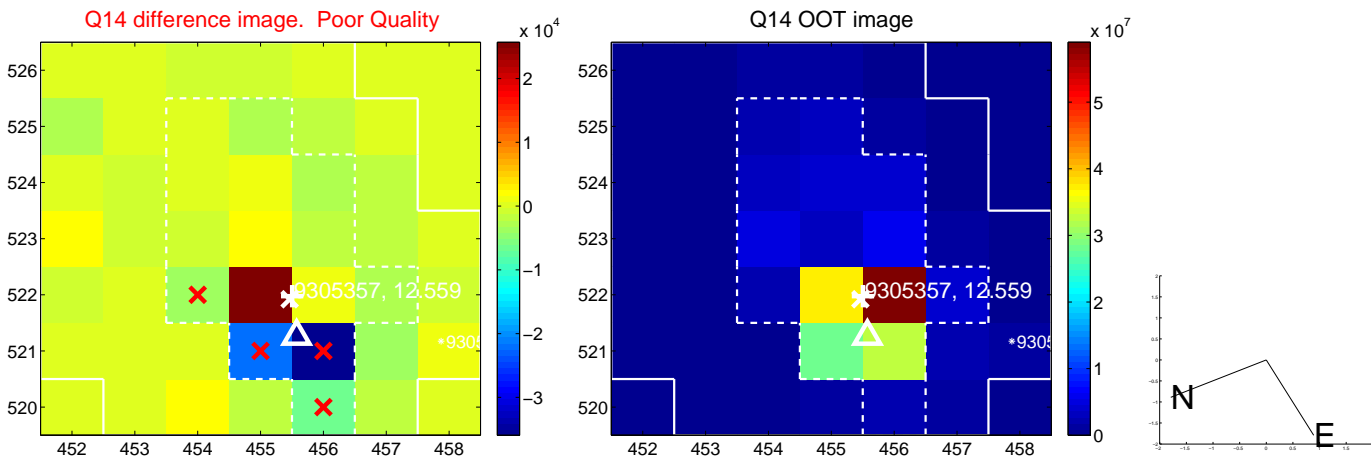
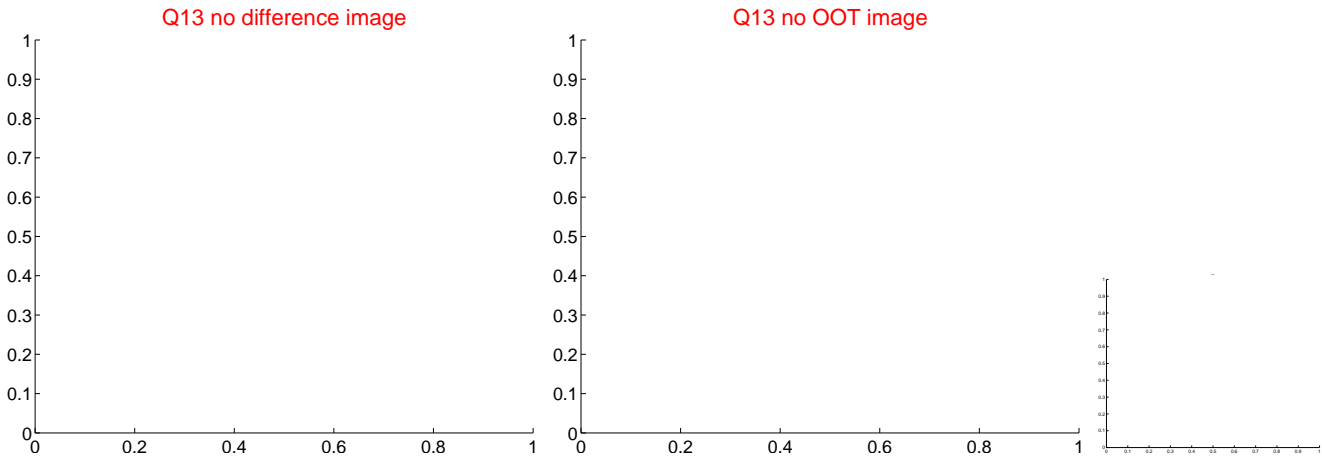
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



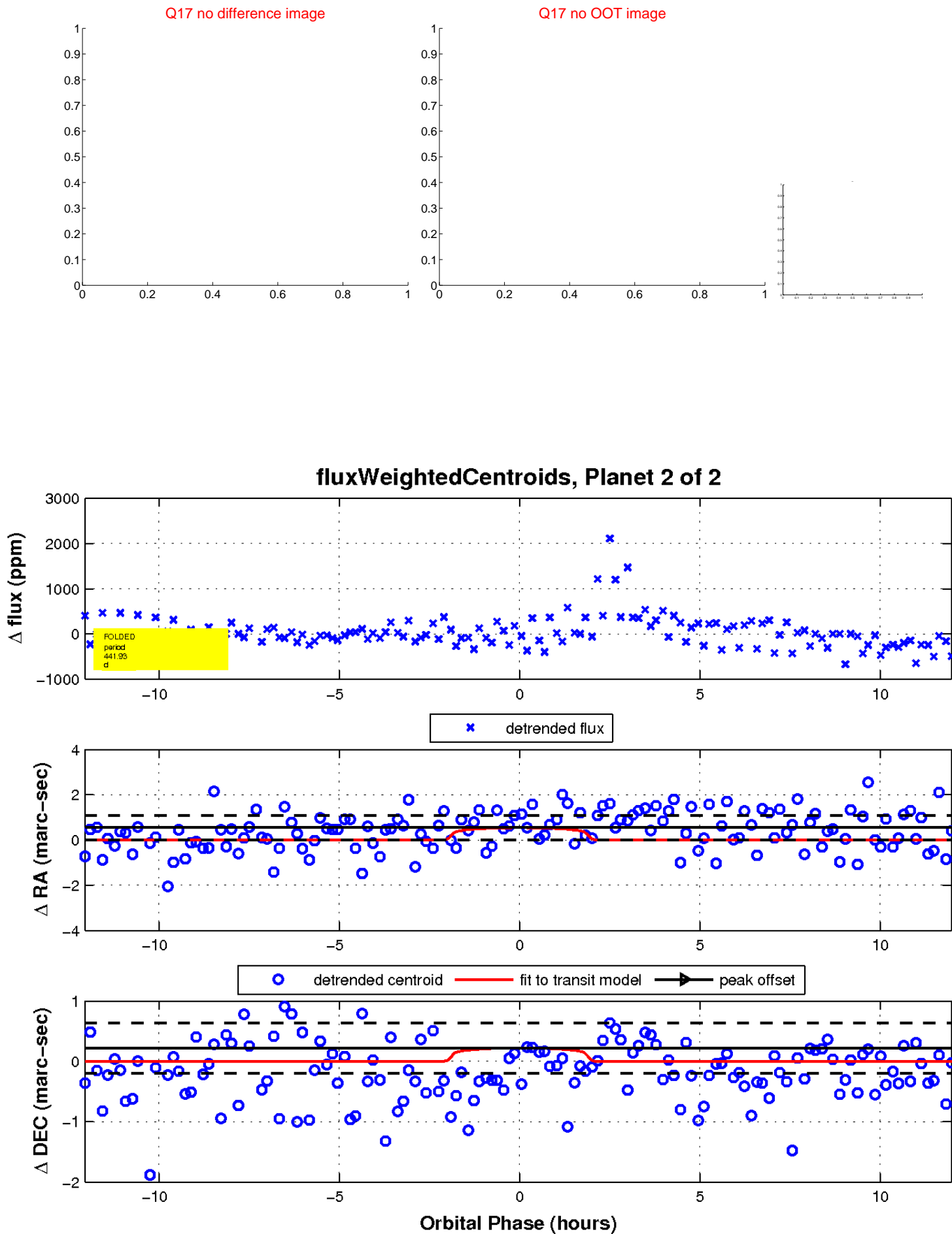
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

