

KIC 006357902

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})
006357902-01	OBS	No	266.946048	331.907417	156.0	2.293	9.4	3.9	0.60	4209	1.56	0.22
006357902-02	OBS	No	459.513784	543.934440	377.5	14.172	10.5	8.6	0.60	4209	1.27	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006357902-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
006357902-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—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.

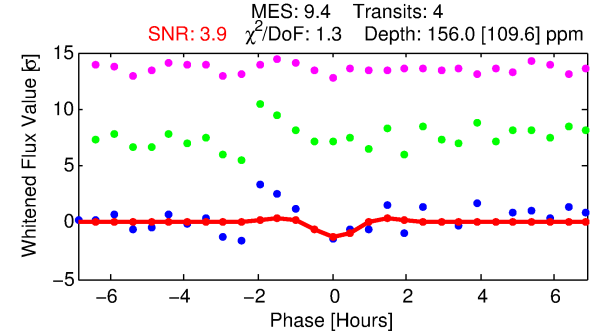
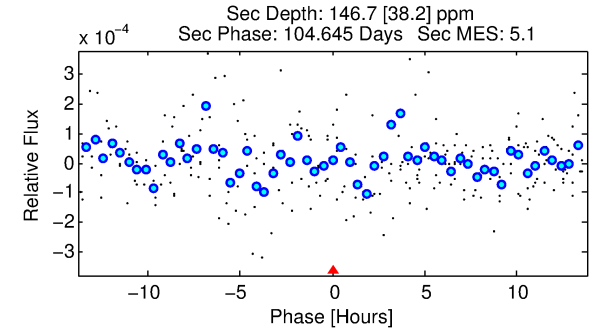
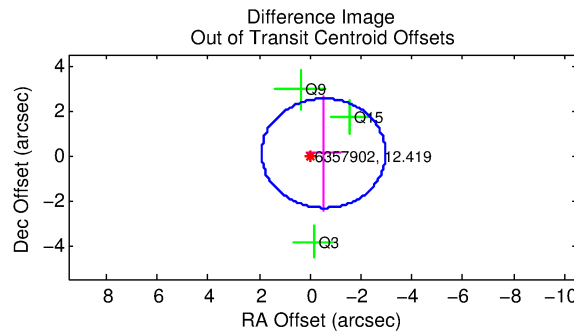
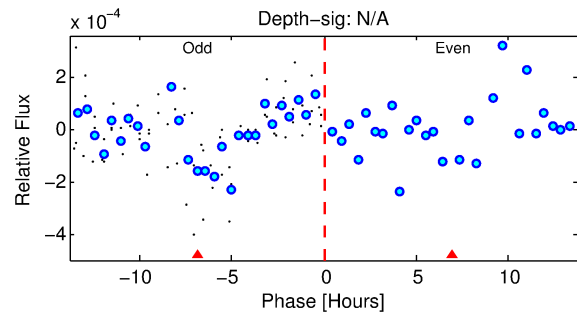
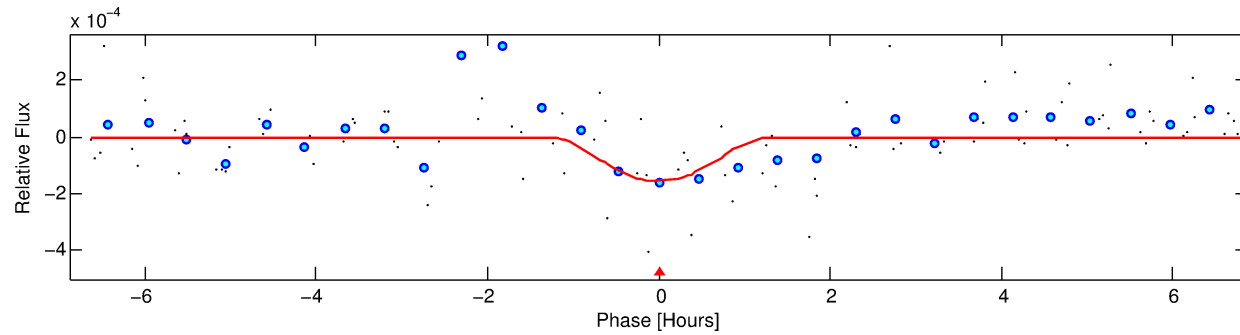
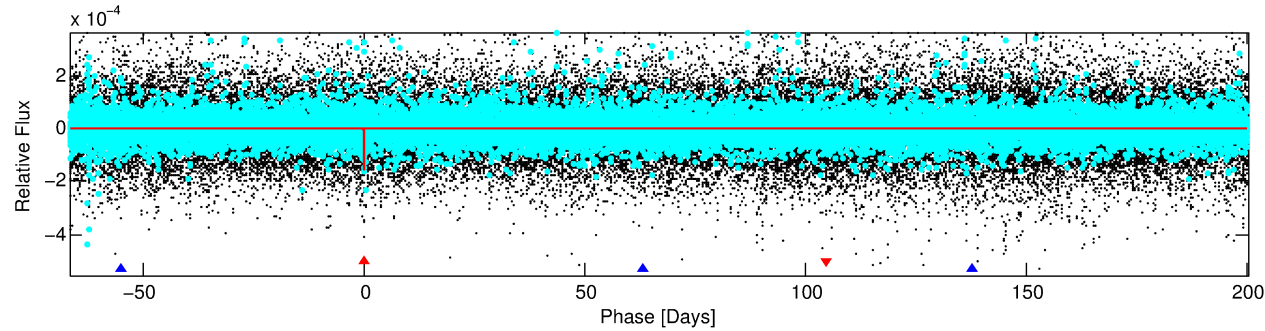
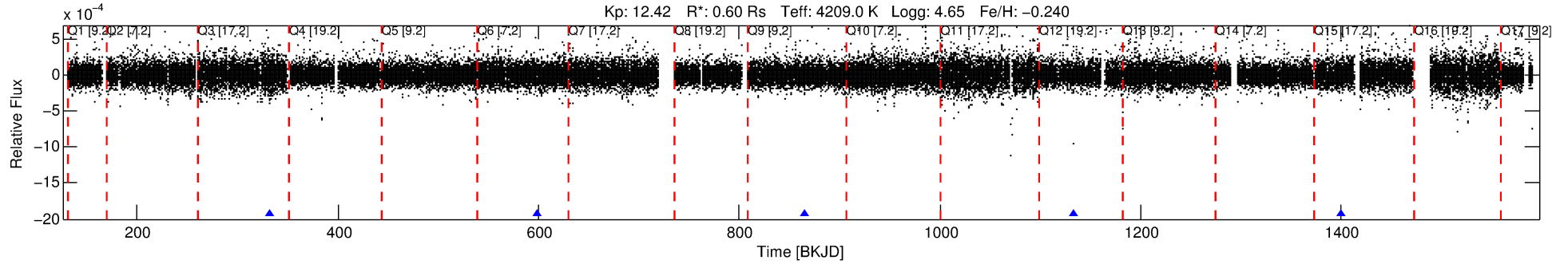
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006357902-01

No Significant Match Found

DV One-Page Summary

KIC: 6357902 Candidate: 1 of 2 Period: 266.946 d



DV Fit Results:

Period = 266.94605 [0.00519] d
Epoch = 331.9074 [0.0161] BKJD
Rp/R* = 0.0238 [0.3688]
a/R* = 203.55 [910.73]
b = 1.00 [0.57]
Seff = 0.22 [0.04]
Teq = 175 [8] K
Rp = 1.56 [24.27] Re
a = 0.6805 [0.0570] AU
Ag = 15271.35 [473762.96] [0.03]
Teffp = 3004 [23299] K [0.12]

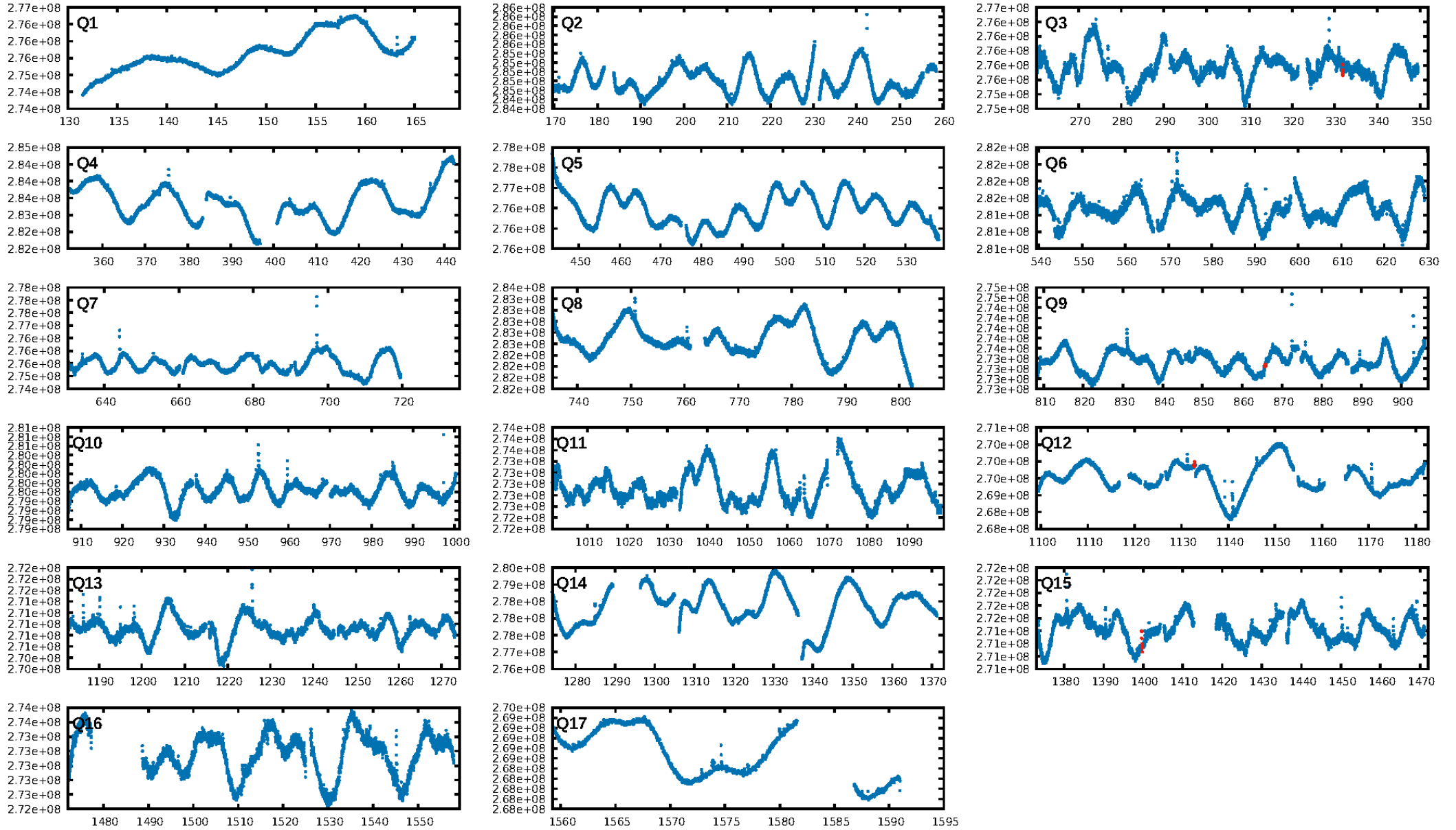
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [321.92]
ModelChiSquare2-sig: 12.8%
ModelChiSquareGof-sig: 81.4%
Bootstrap-pfa: 5.41e-10
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 5.862
Centroid-sig: 41.9%
Centroid-so: 0.190 arcsec [0.08]
OotOffset-rm: 0.547 arcsec [0.67]
OotOffset-st: 0/2/0/1 [3]
KicOffset-rm: 0.541 arcsec [0.70]
KicOffset-st: 0/2/0/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [4/4]

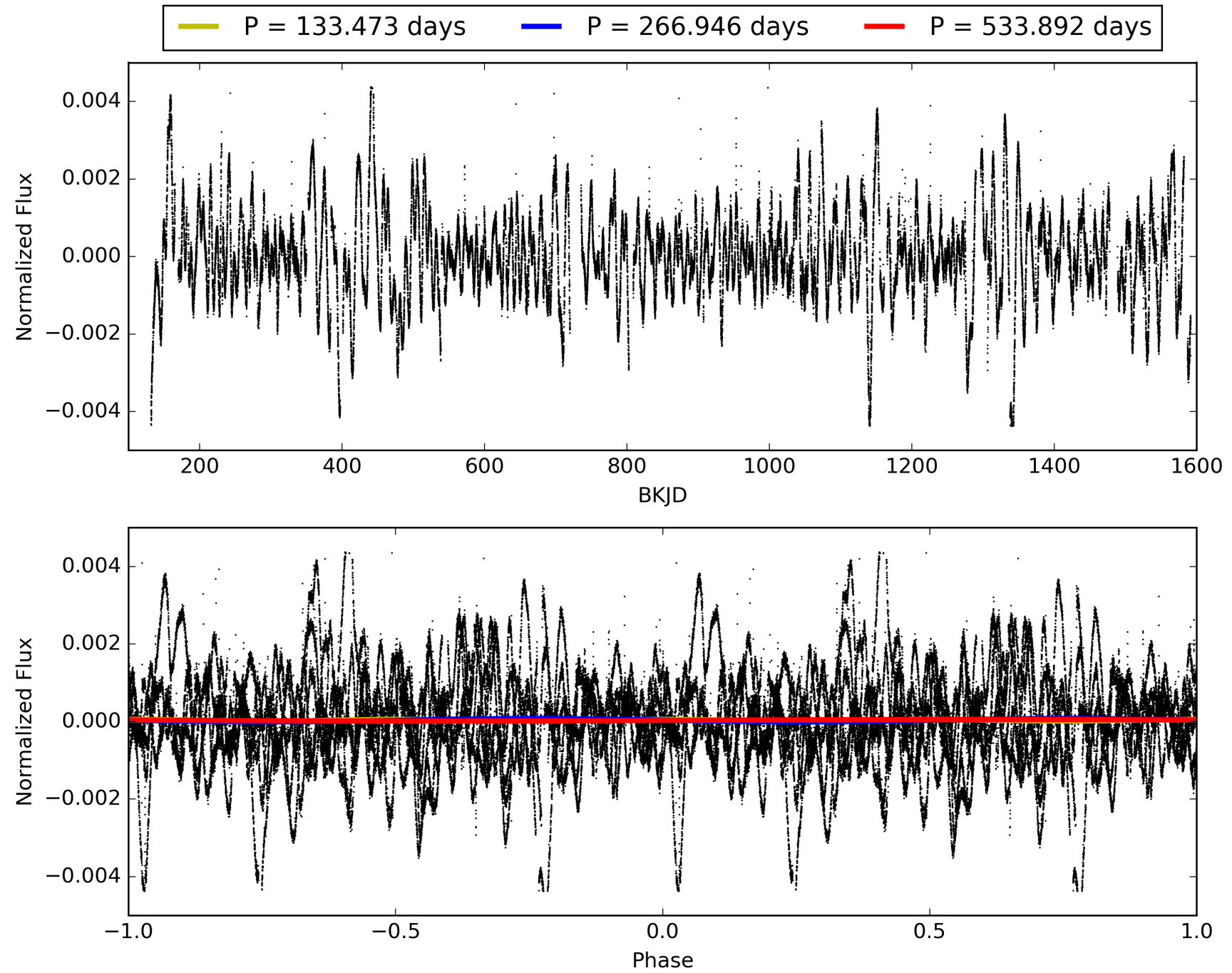
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 01:58:21 Z

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

TCE 006357902-01, PDC Light Curves

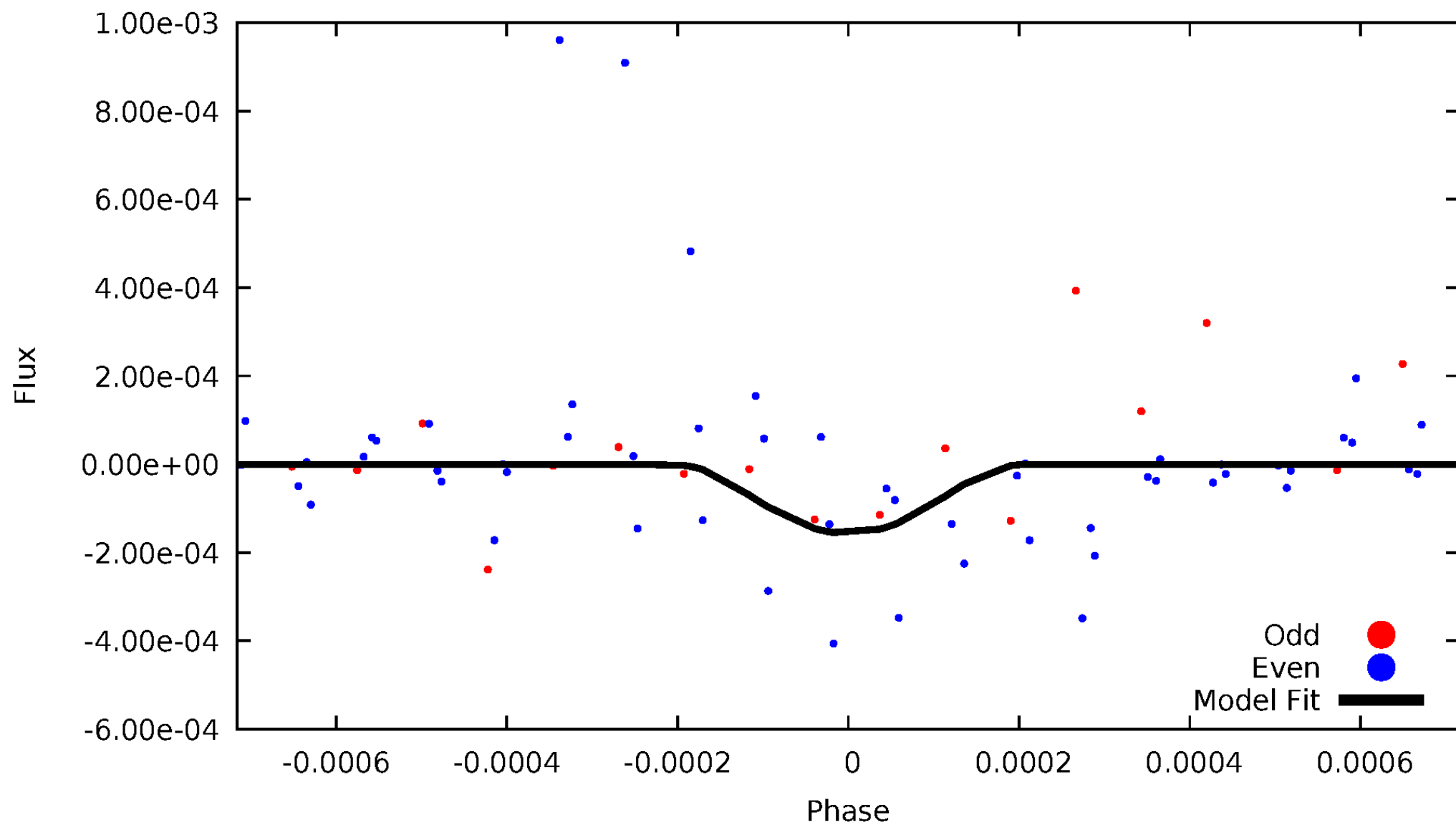


TCE 006357902-01



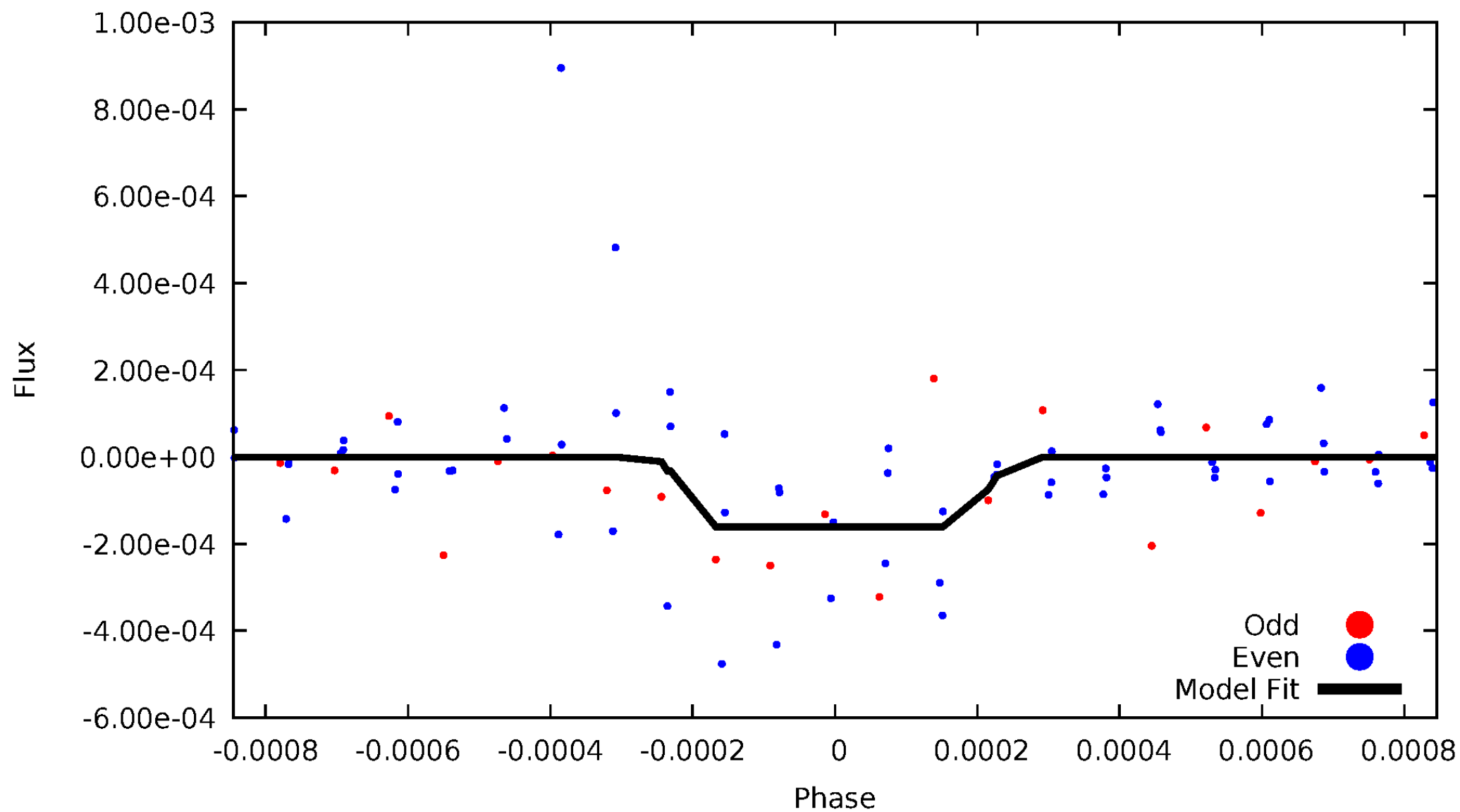
DV Odd/Even

TCE 006357902-01

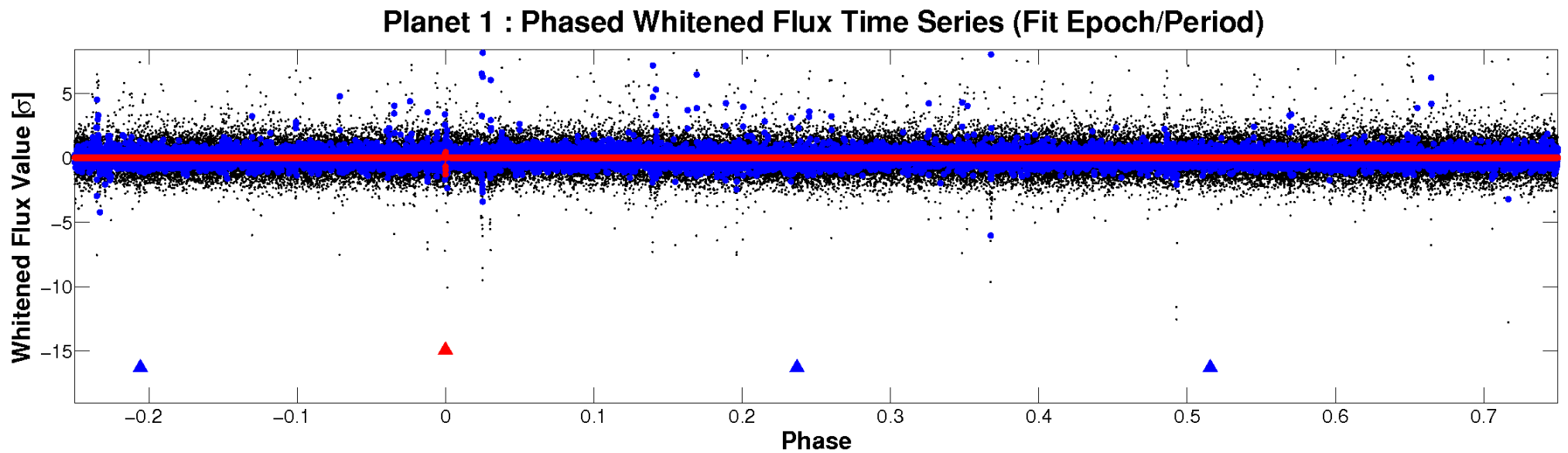
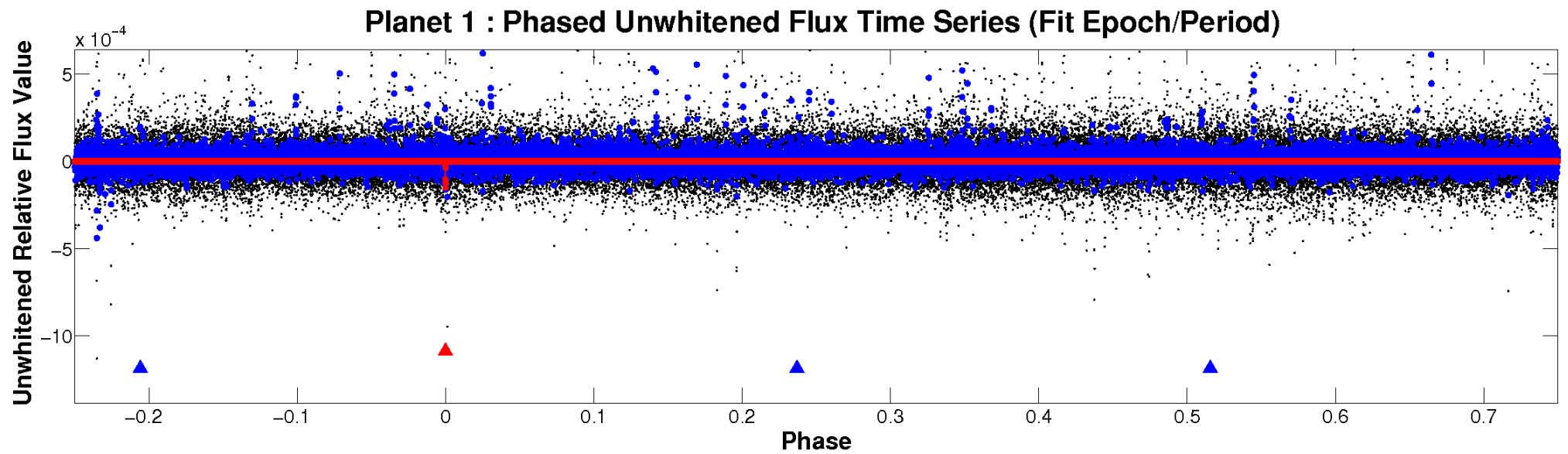


ALT Odd/Even

TCE 006357902-01

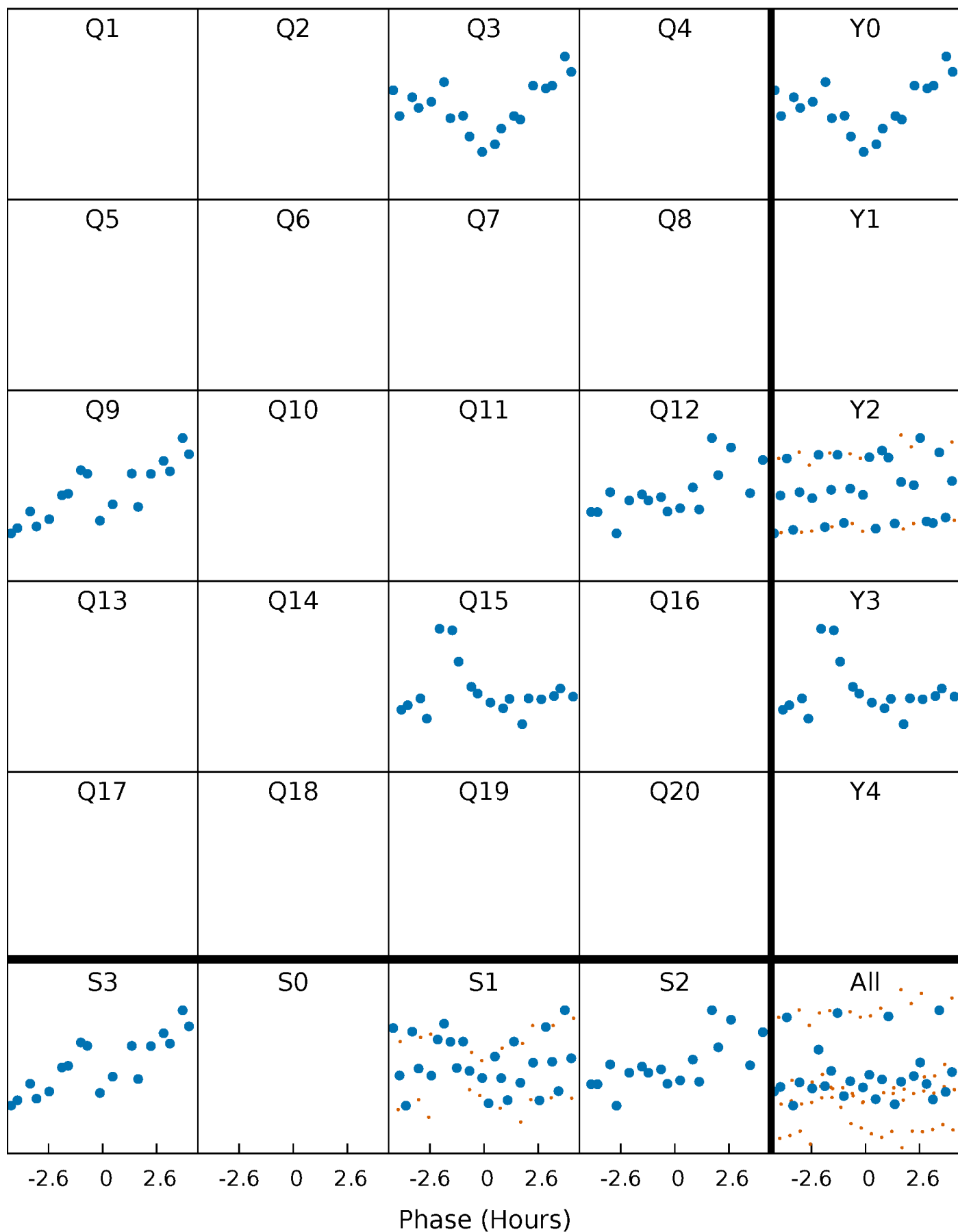


Non-Whitened Vs. Whitened Light Curve



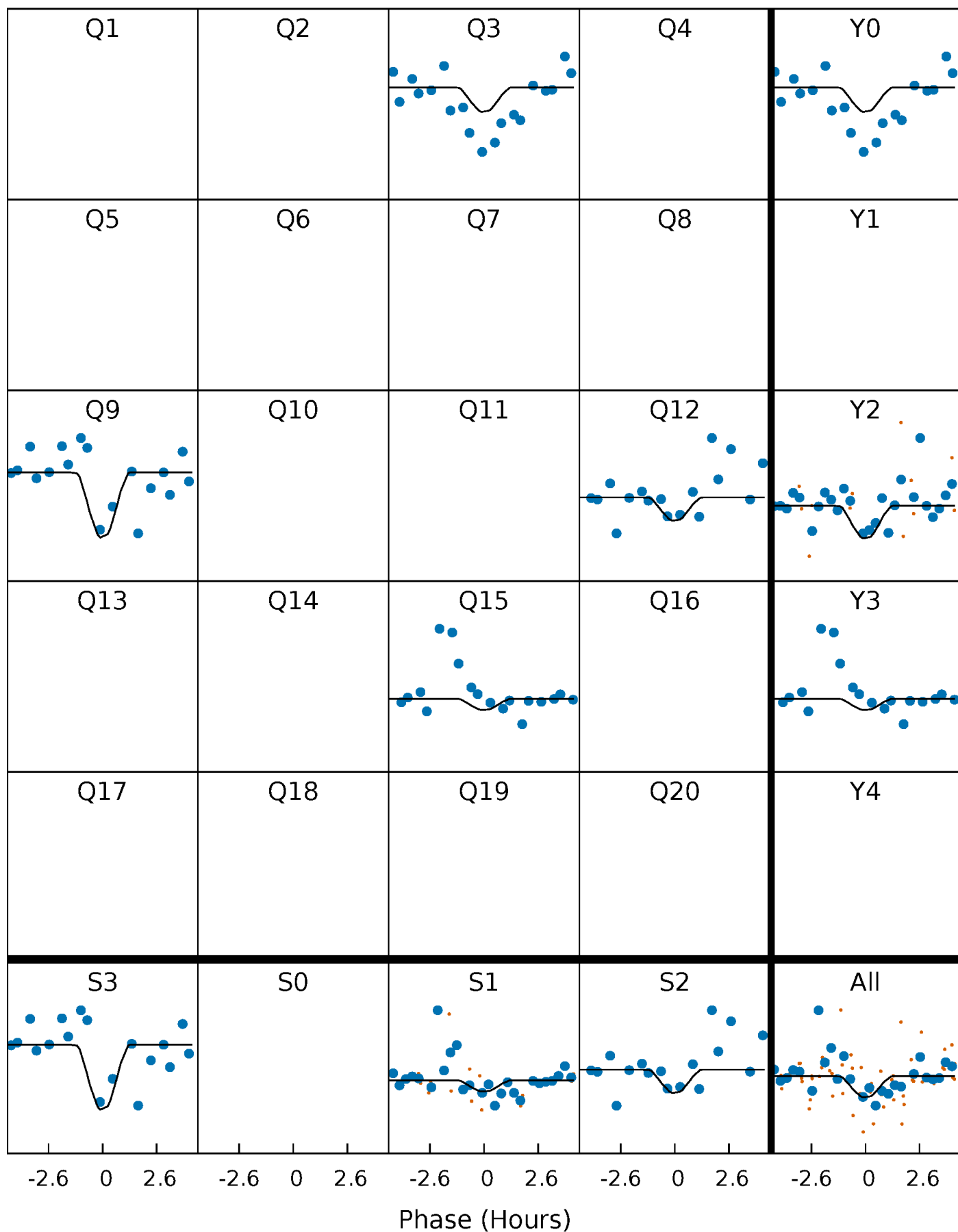
PDC Quarter-Phased Transit Curves

TCE 006357902-01 P=266.946048 Days $T_0=331.907417$ (BKJD)



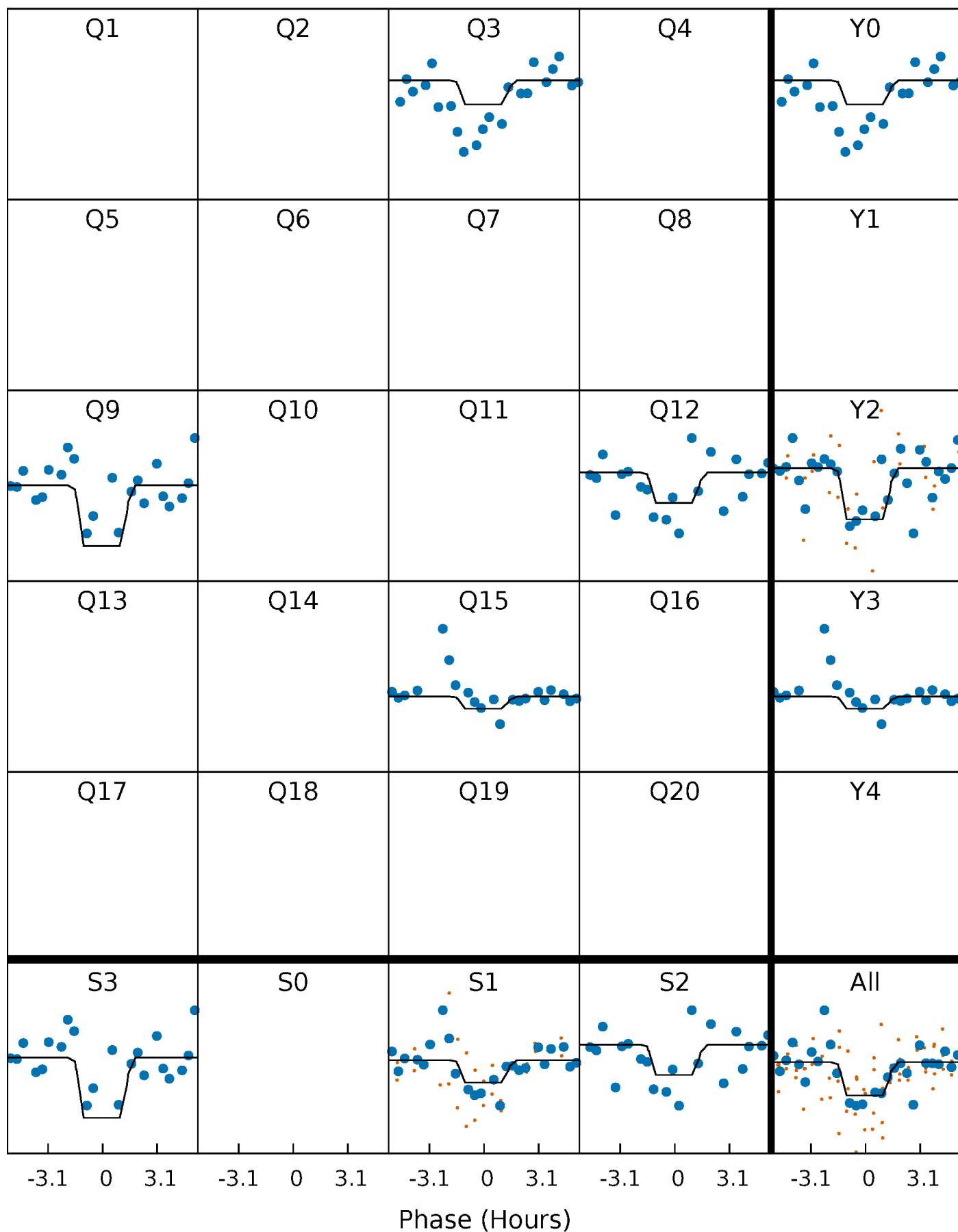
DV Quarter-Phased Transit Curves

TCE 006357902-01 $P=266.946048$ Days $T_0=331.907417$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

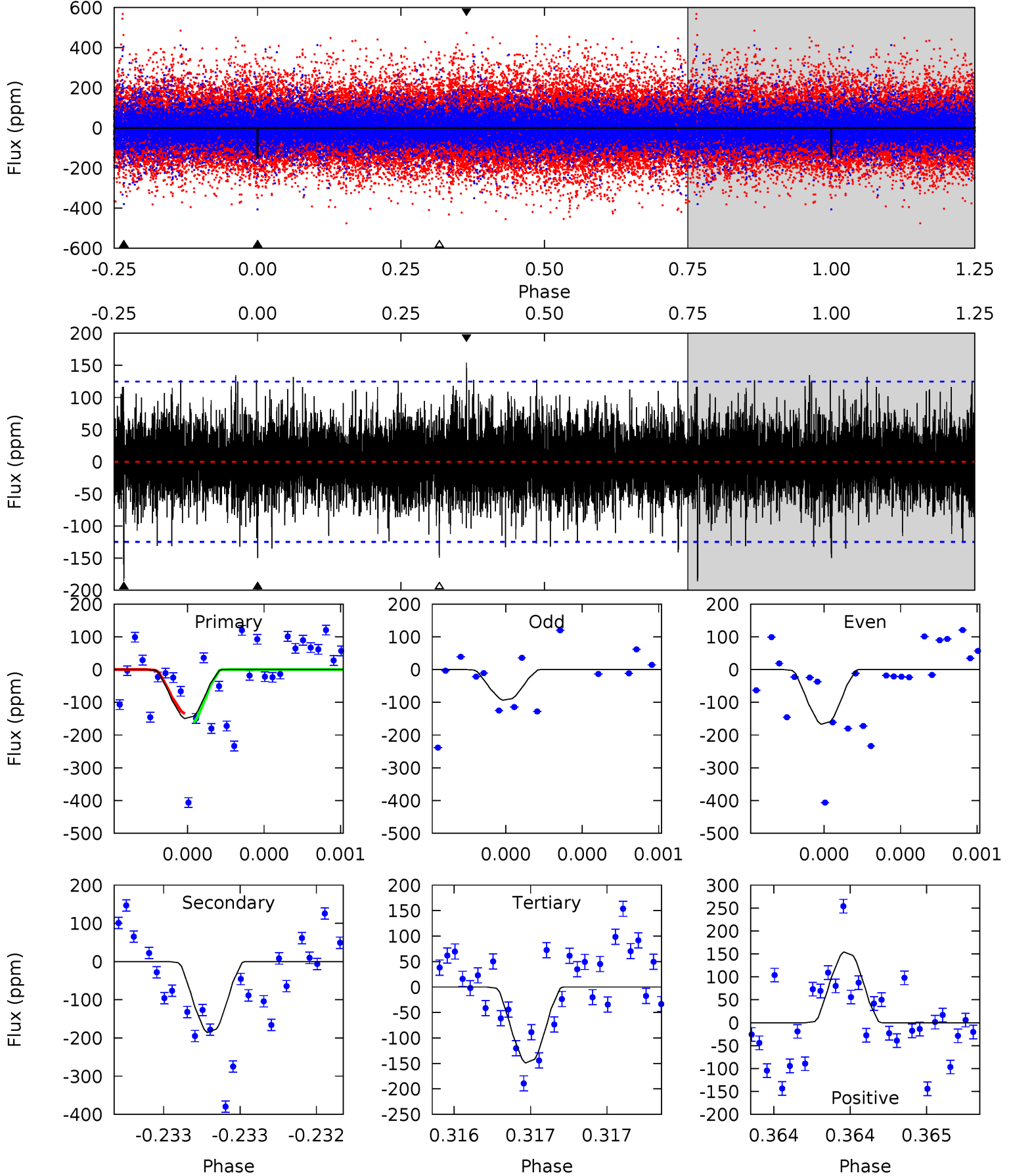
TCE 006357902-01 P=266.944830 Days $T_0=331.945218$ (BKJD)



DV Model-Shift Uniqueness Test

006357902-01, P = 266.946048 Days, E = 64.961369 Days

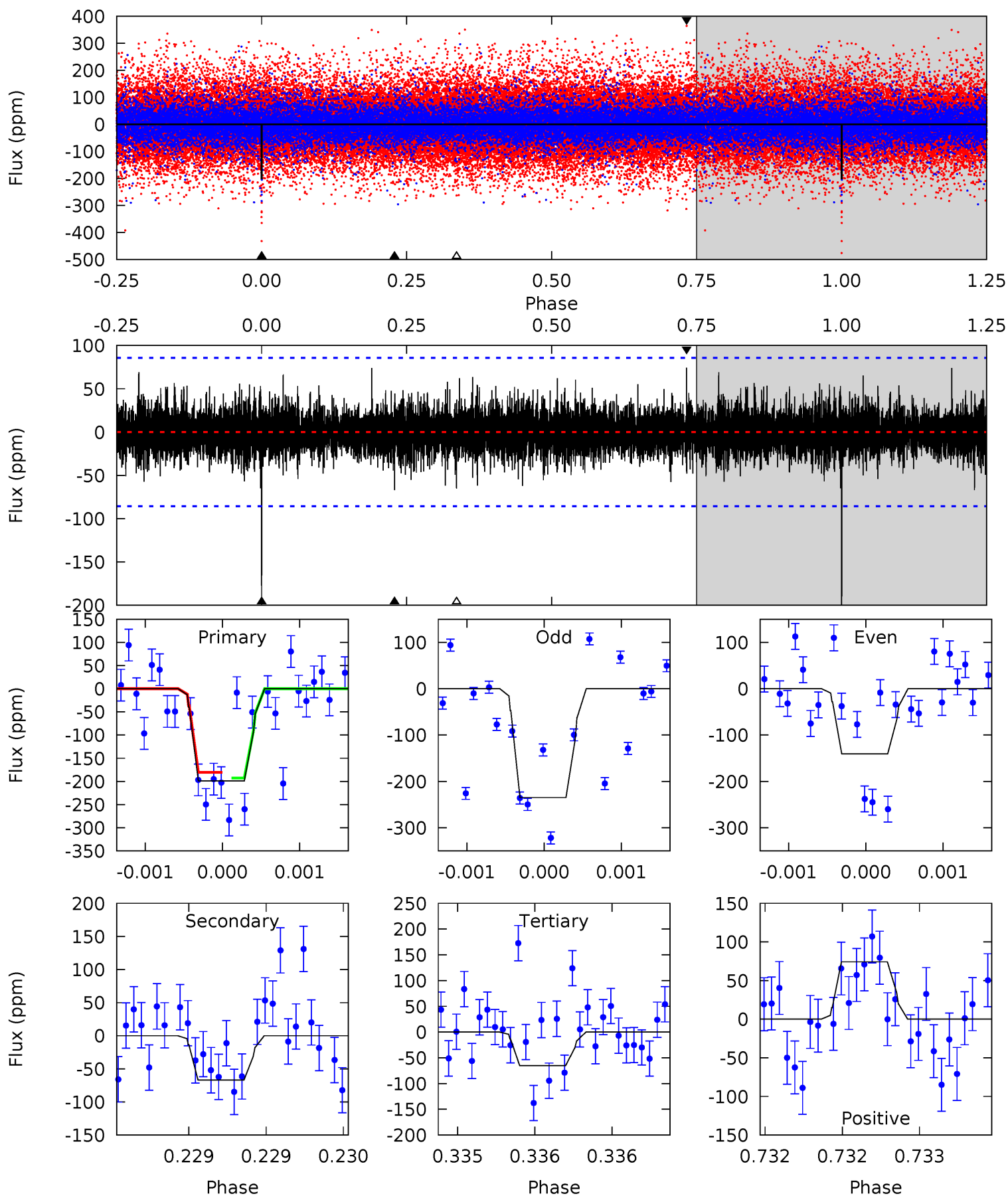
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.70	8.33	6.68	6.91	5.59	3.50	1.59	0.02	-0.21	1.64	1.41	1.35	1.66	0.45	0.61



Alt Model-Shift Uniqueness Test

006357902-01, $P = 266.944830$ Days, $E = 65.000388$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	4.34	4.23	4.82	5.56	3.46	1.03	8.70	8.11	0.11	-0.48	2.40	1.32	0.27	0.39



Stellar Parameters For KIC 006357902

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4209^{+113}_{-139}	$4.648^{+0.056}_{-0.024}$	$-0.240^{+0.300}_{-0.300}$	$0.603^{+0.043}_{-0.065}$	$0.591^{+0.059}_{-0.053}$	$3.794^{+1.033}_{-0.372}$
	+3%/-3%	+1%/-1%	+125%/-125%	+7%/-11%	+10%/-9%	+27%/-10%
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 006357902-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-186 ± 22	$16.75^{+18.26}_{-11.74}$	242^{+7}_{-9}	1917^{+590}_{-242}	174^{+1705}_{-135}
Alt.	-67 ± 15	$15.97^{+18.74}_{-10.75}$	242^{+8}_{-8}	1756^{+460}_{-230}	62^{+567}_{-49}

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

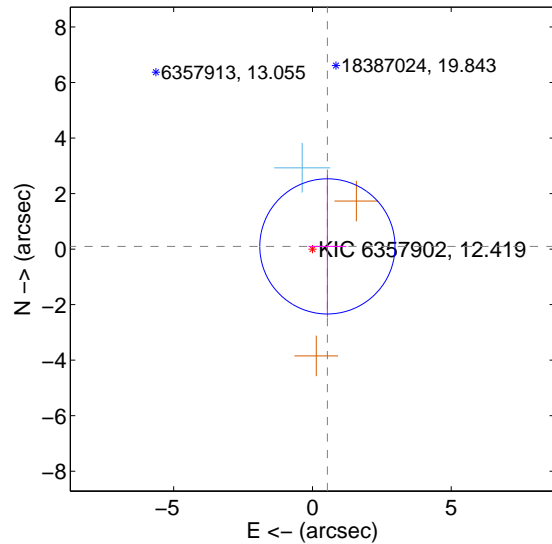
Supplemental centroid analysis for 006357902-01. Kepler magnitude: 12.42. Transit SNR 3.85

There are 1 quarters with good PRF difference image offsets

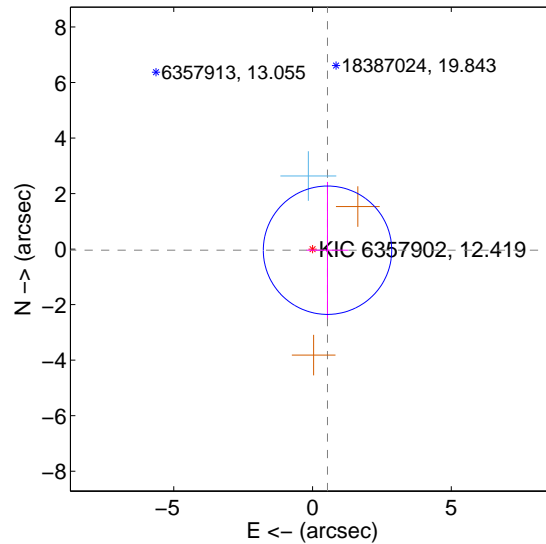
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.547 ± 0.812	0.67	-0.539 ± 0.681	0.098 ± 2.562
PRF-fit source offset from KIC position	0.541 ± 0.771	0.70	-0.540 ± 0.751	-0.040 ± 2.461
photometric centroid source offset	0.19 ± 2.36	0.08	-0.17 ± 2.33	-0.09 ± 2.45

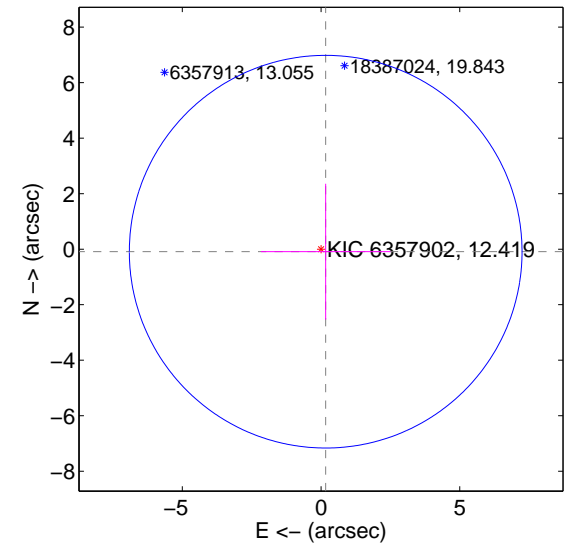
offset from difference PRF-fit to OOT PRF-fit



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.

Q1 no difference image



Q1 no OOT image



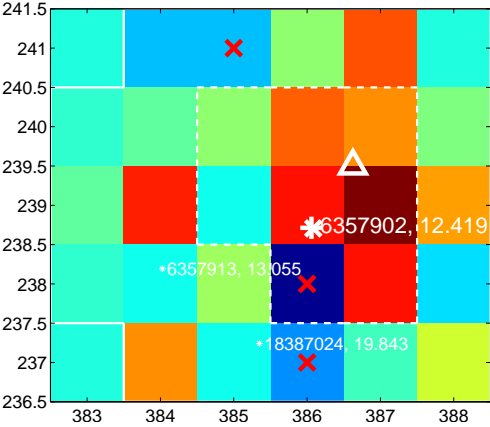
Q2 no difference image



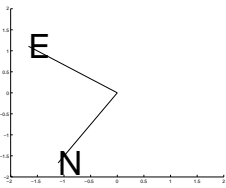
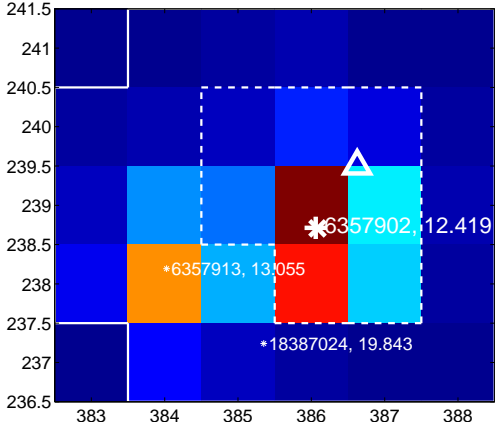
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



Q4 no difference image



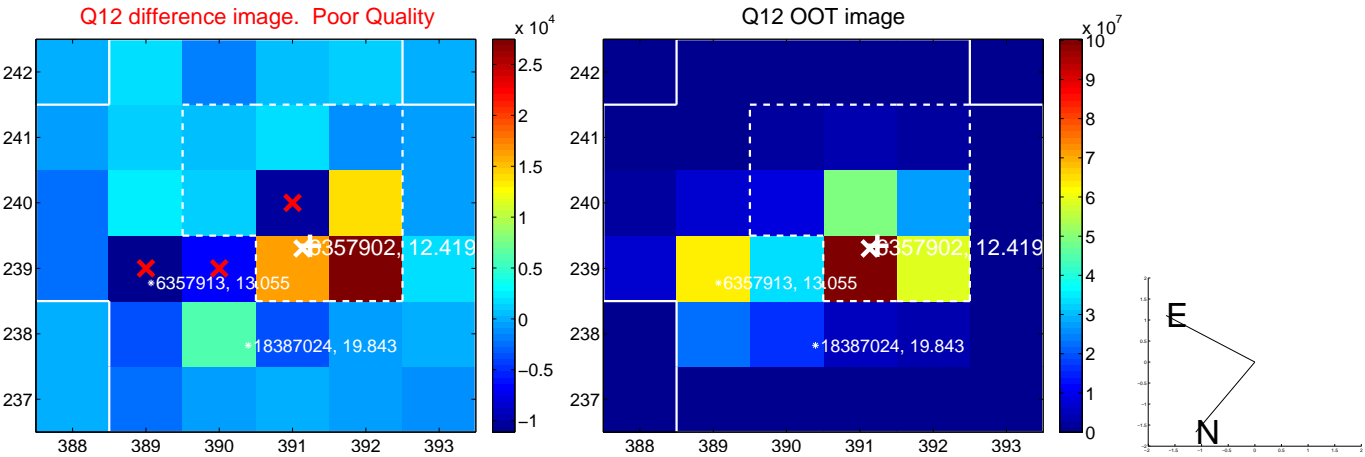
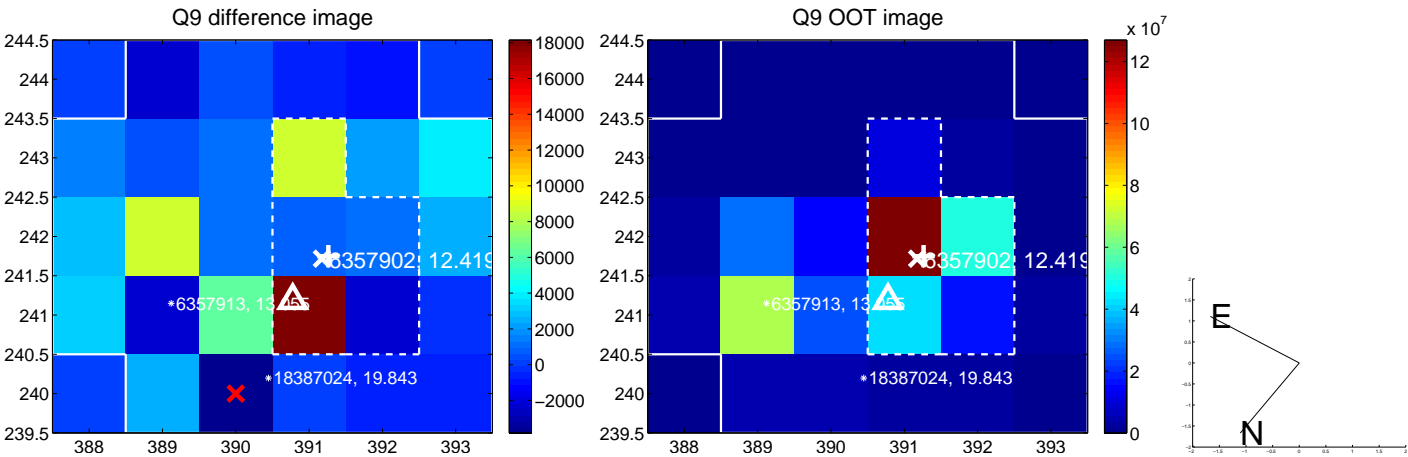
Q4 no OOT image



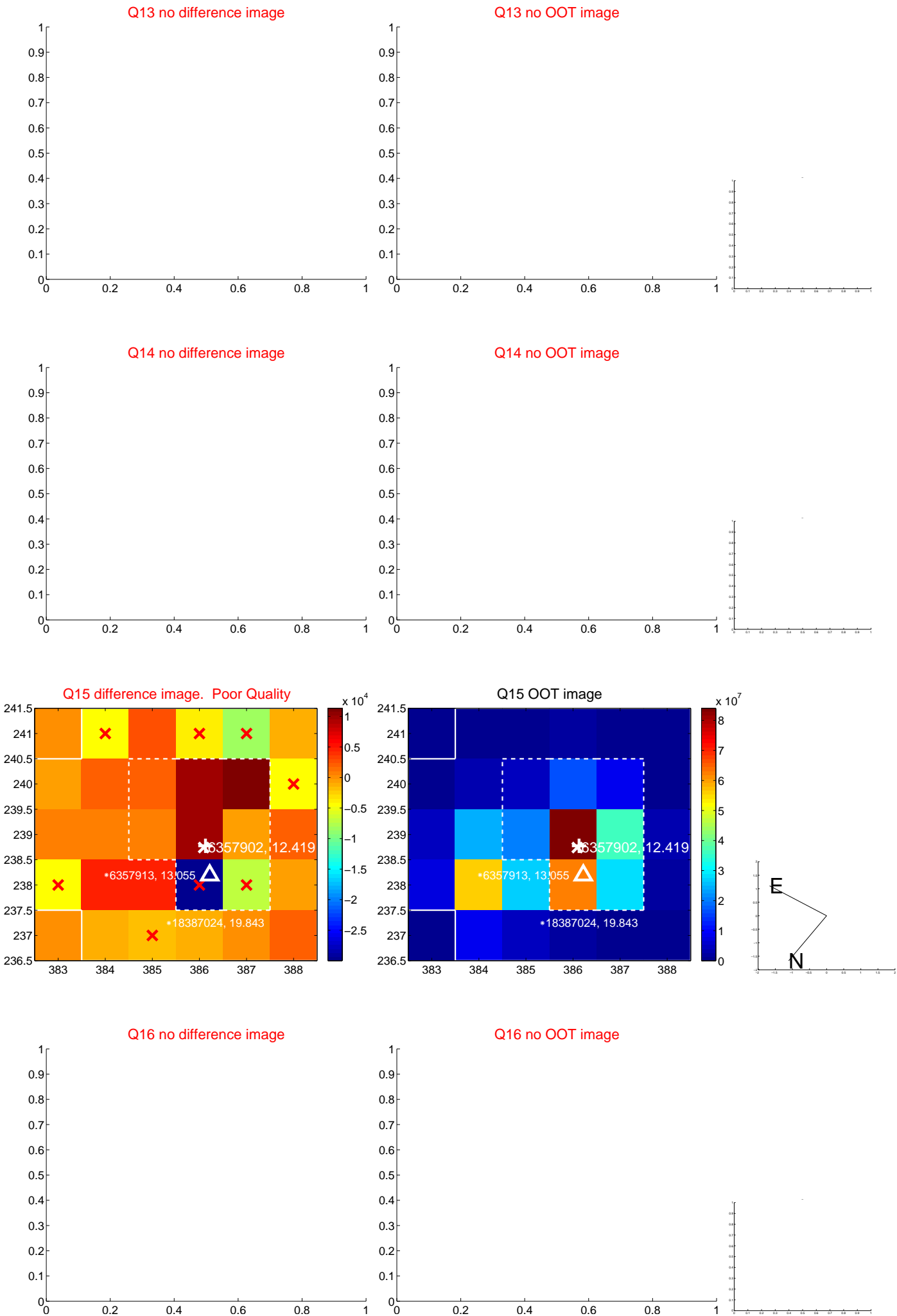
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



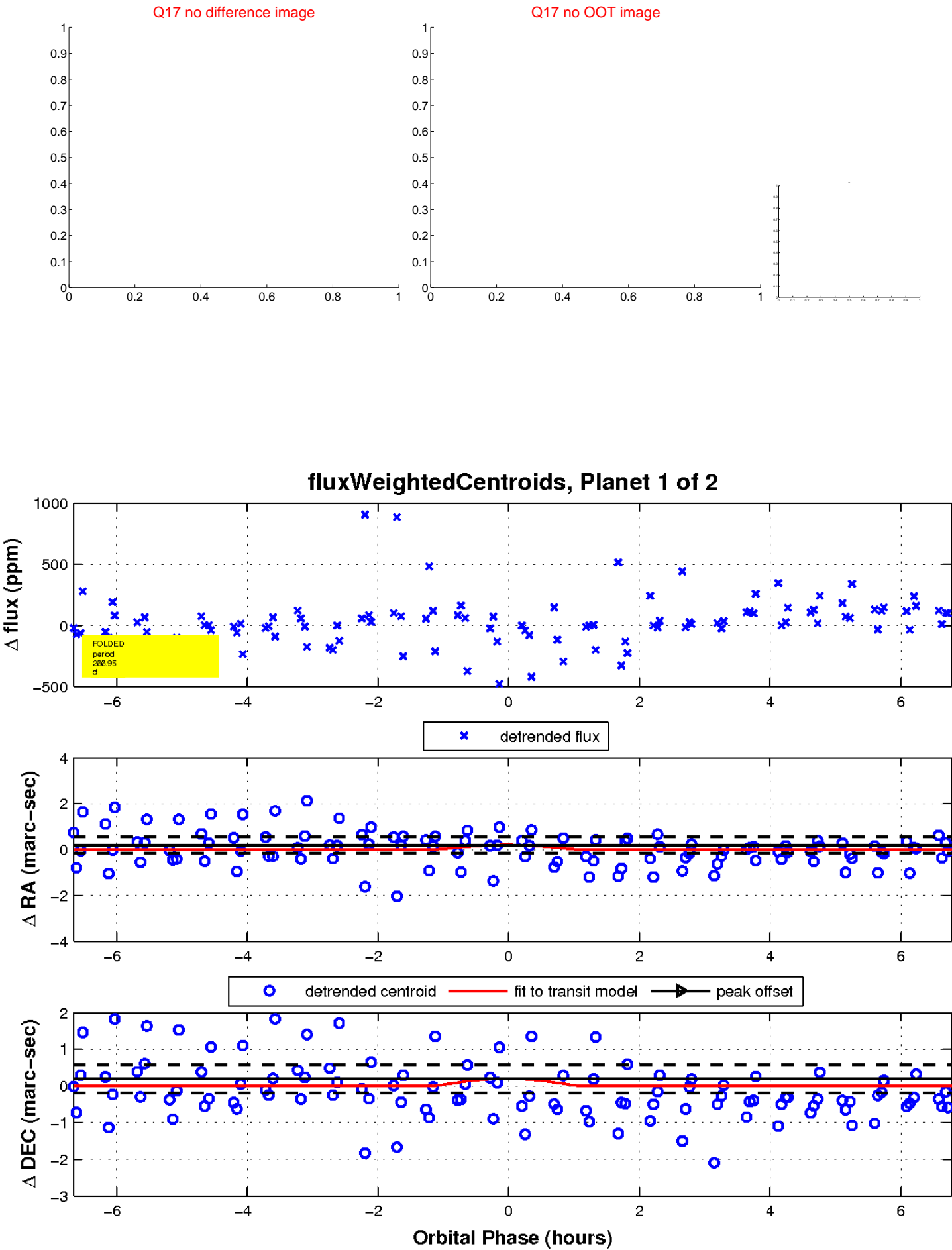
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



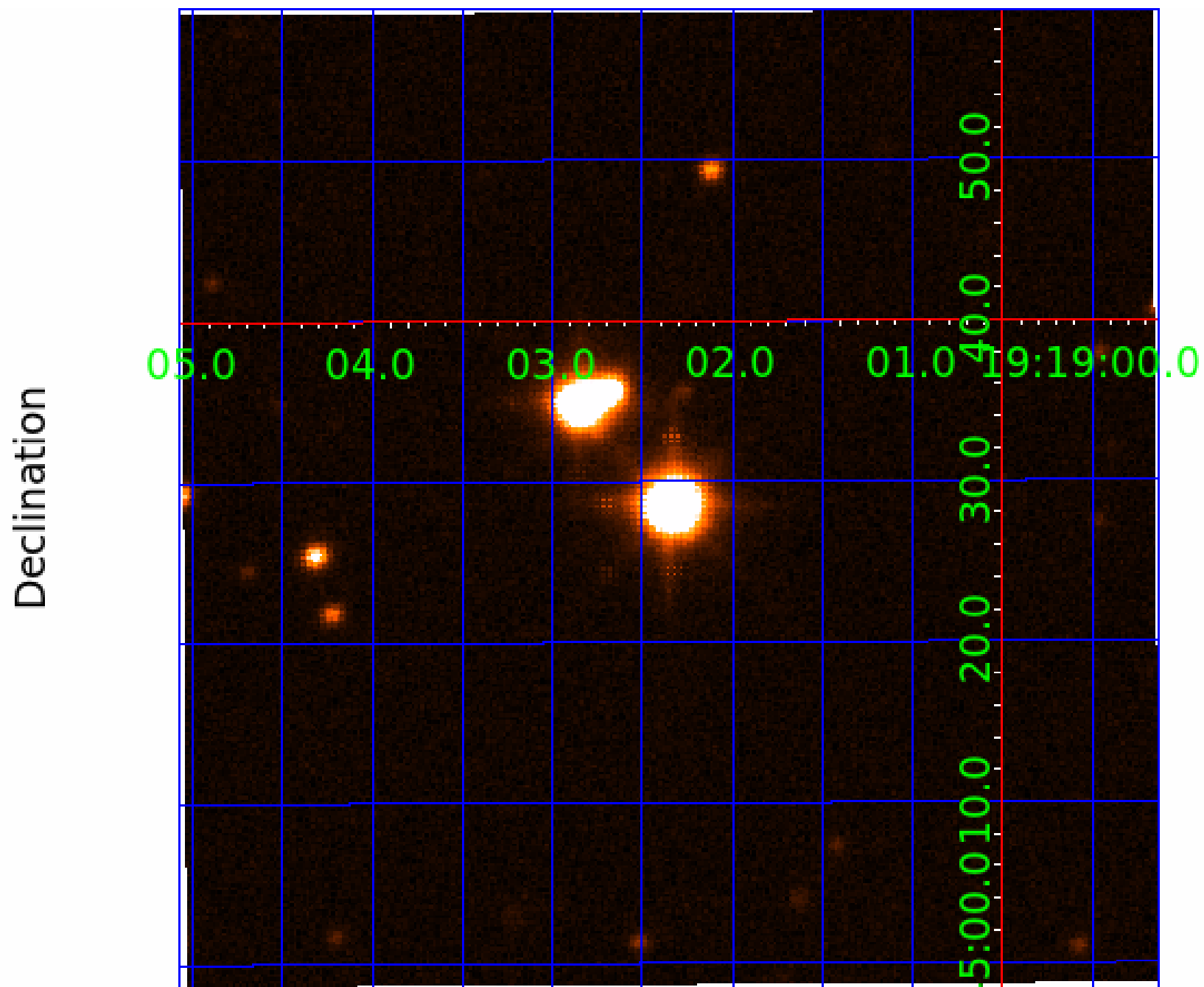
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



UKIRT Image



KIC 006357902

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})
006357902-01	OBS	No	266.946048	331.907417	156.0	2.293	9.4	3.9	0.60	4209	1.56	0.22
006357902-02	OBS	No	459.513784	543.934440	377.5	14.172	10.5	8.6	0.60	4209	1.27	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006357902-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
006357902-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—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.

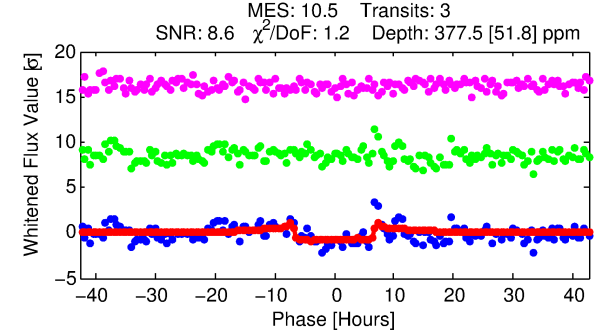
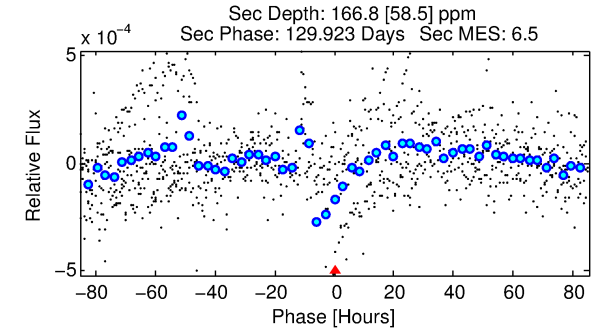
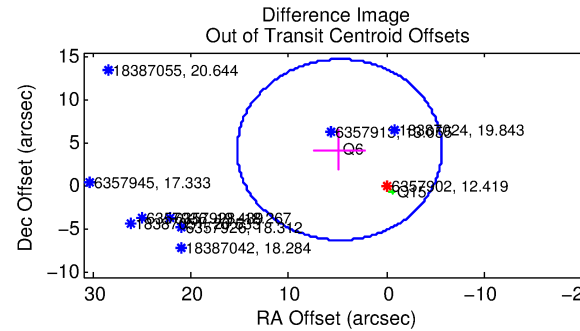
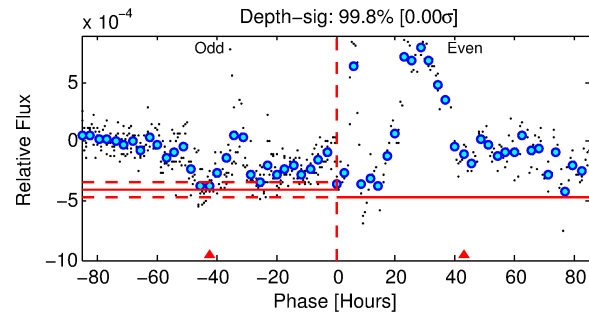
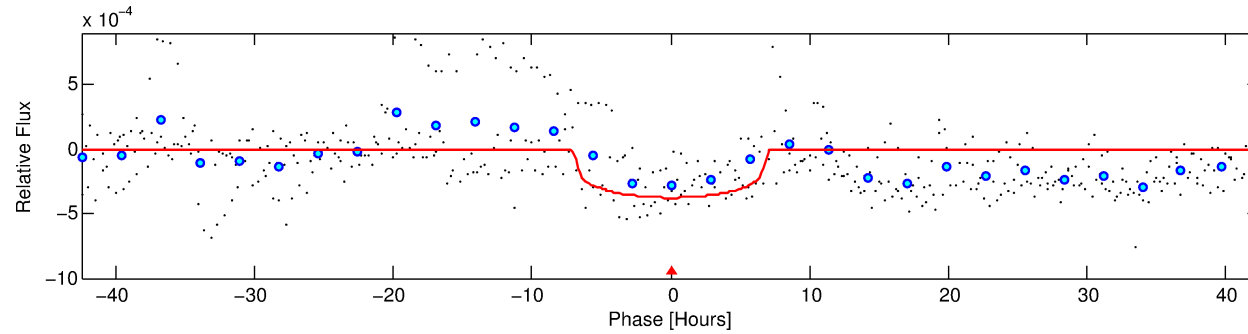
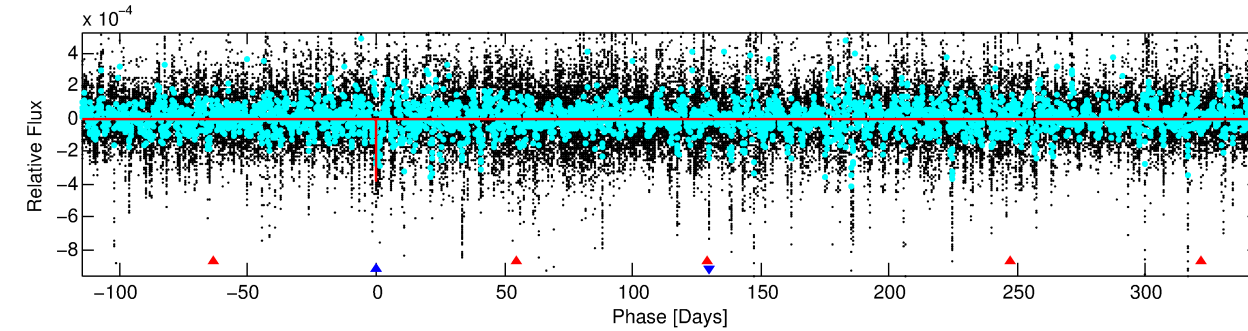
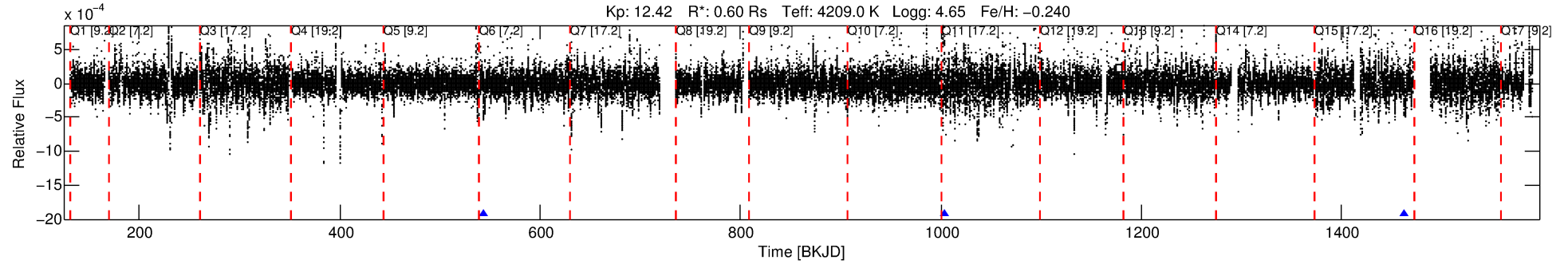
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006357902-02

No Significant Match Found

DV One-Page Summary

KIC: 6357902 Candidate: 2 of 2 Period: 459.514 d



DV Fit Results:

Period = 459.51378 [0.00902] d
Epoch = 543.9344 [0.0131] BKJD
Rp/R* = 0.0192 [0.0038]
a/R* = 175.78 [115.02]
b = 0.73 [0.42]
Seff = 0.11 [0.02]
Teq = 146 [6] K
Rp = 1.27 [0.29] Re
a = 0.9775 [0.0819] AU
Ag = 54671.41 [29532.86] [1.85σ]
Teffp = 3448 [470] K [7.03σ]

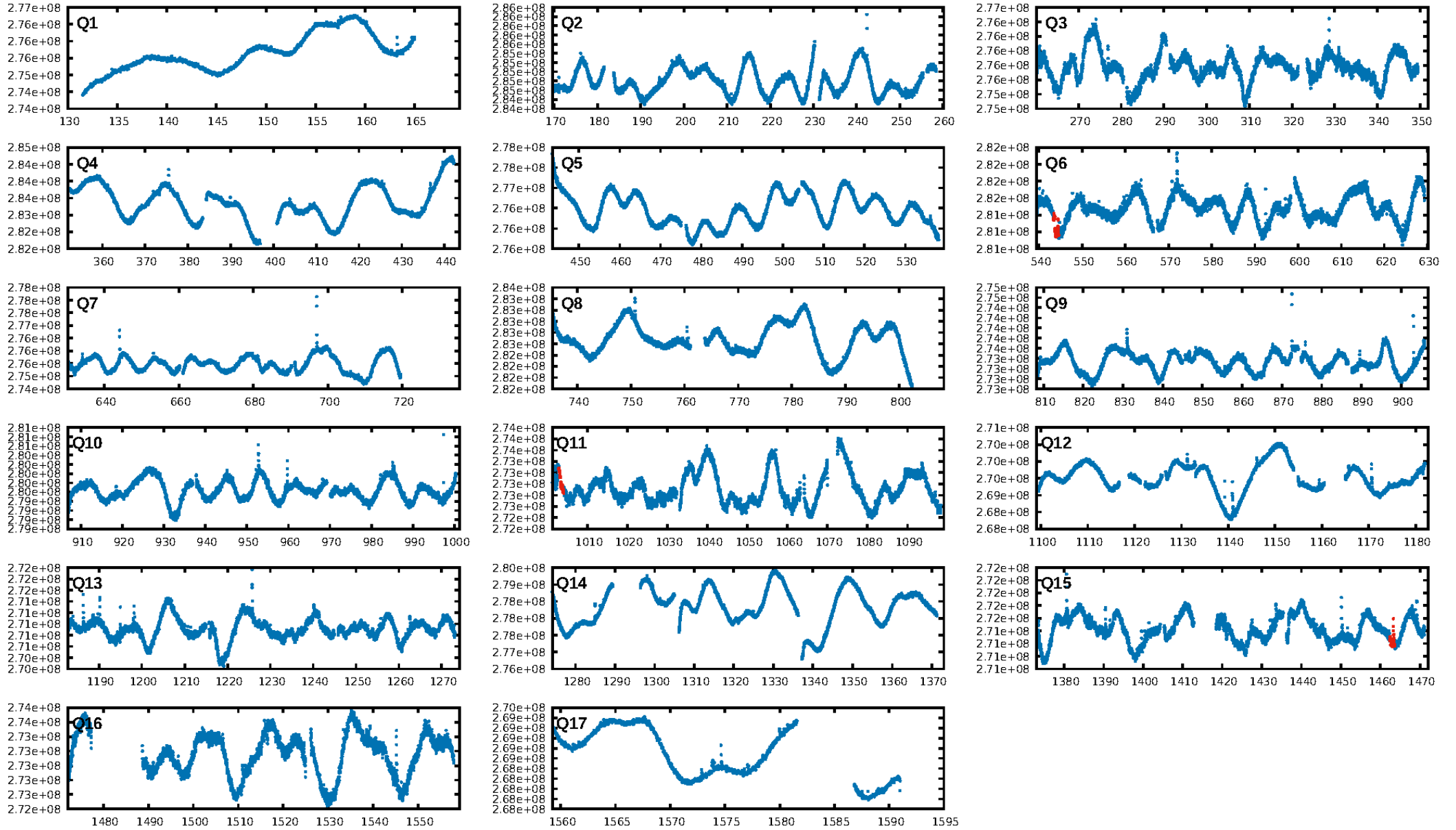
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [321.92σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 17.8%
ModelChiSquareGof-sig: 99.6%
Bootstrap-pfa: 6.03e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 8.825
Centroid-sig: 1.1%
Centroid-so: 4.621 arcsec [3.93σ]
OotOffset-rm: 6.404 arcsec [1.84σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-rm: 6.246 arcsec [1.81σ]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

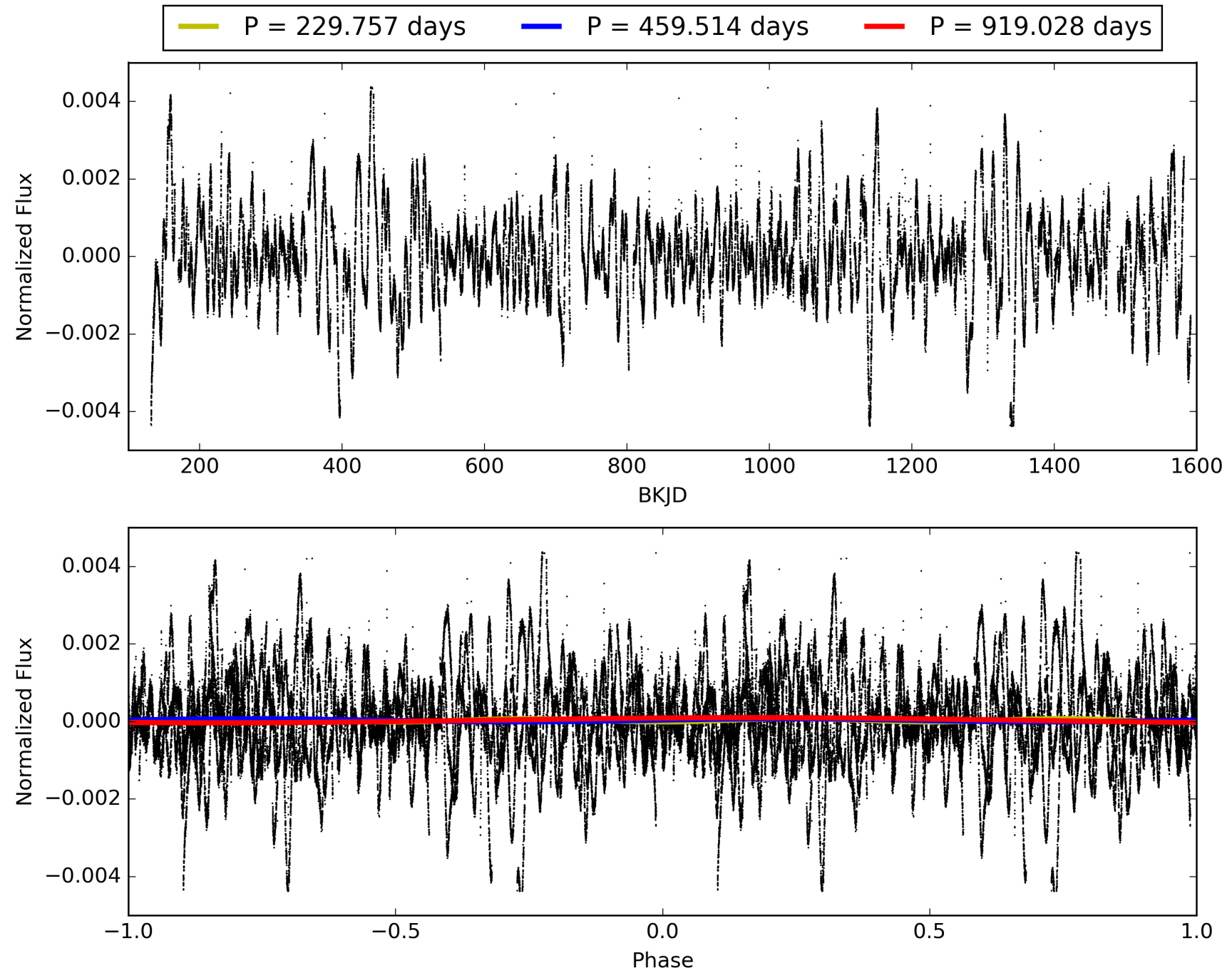
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 01:58:31 Z

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

TCE 006357902-02, PDC Light Curves

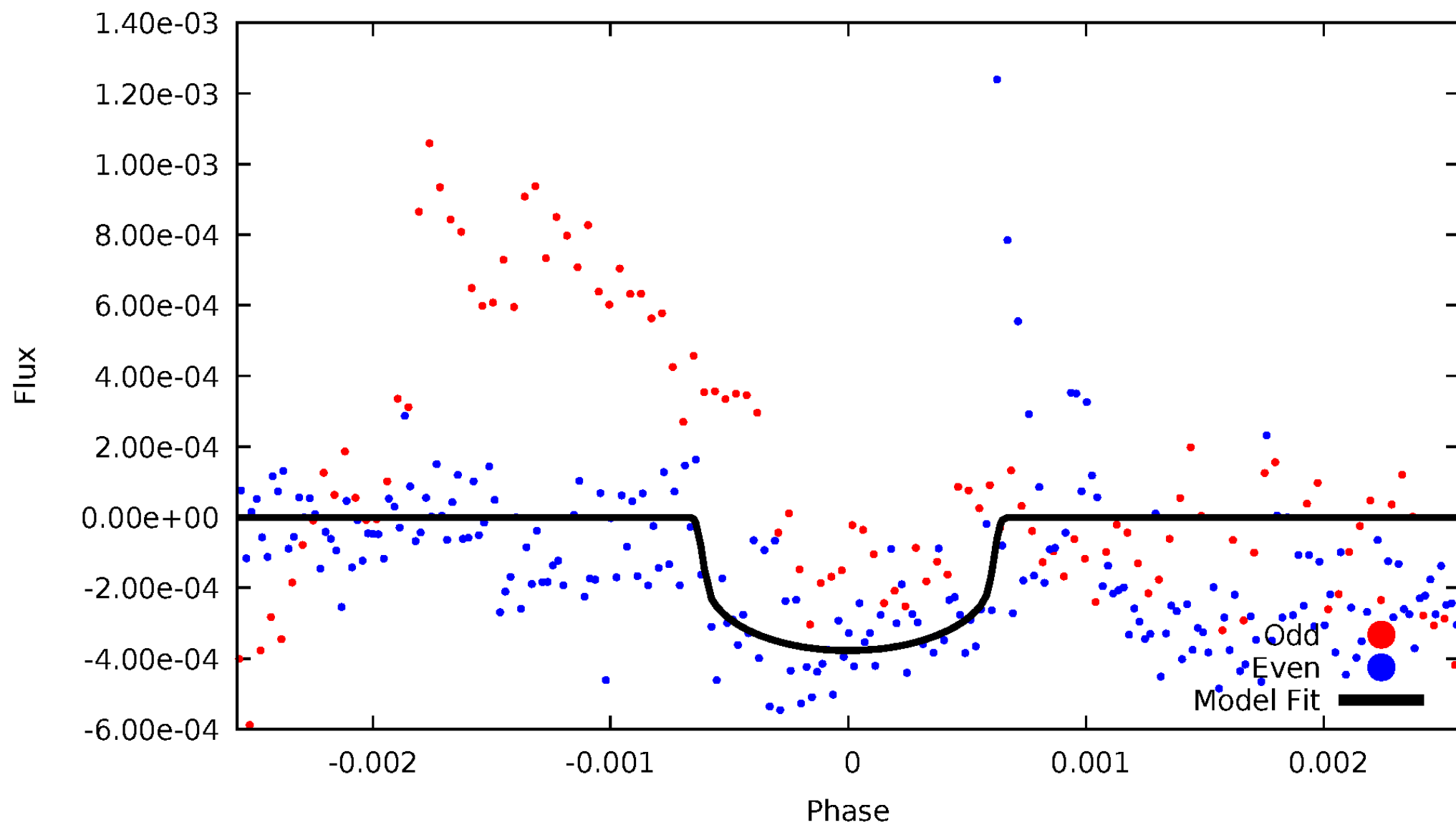


TCE 006357902-02



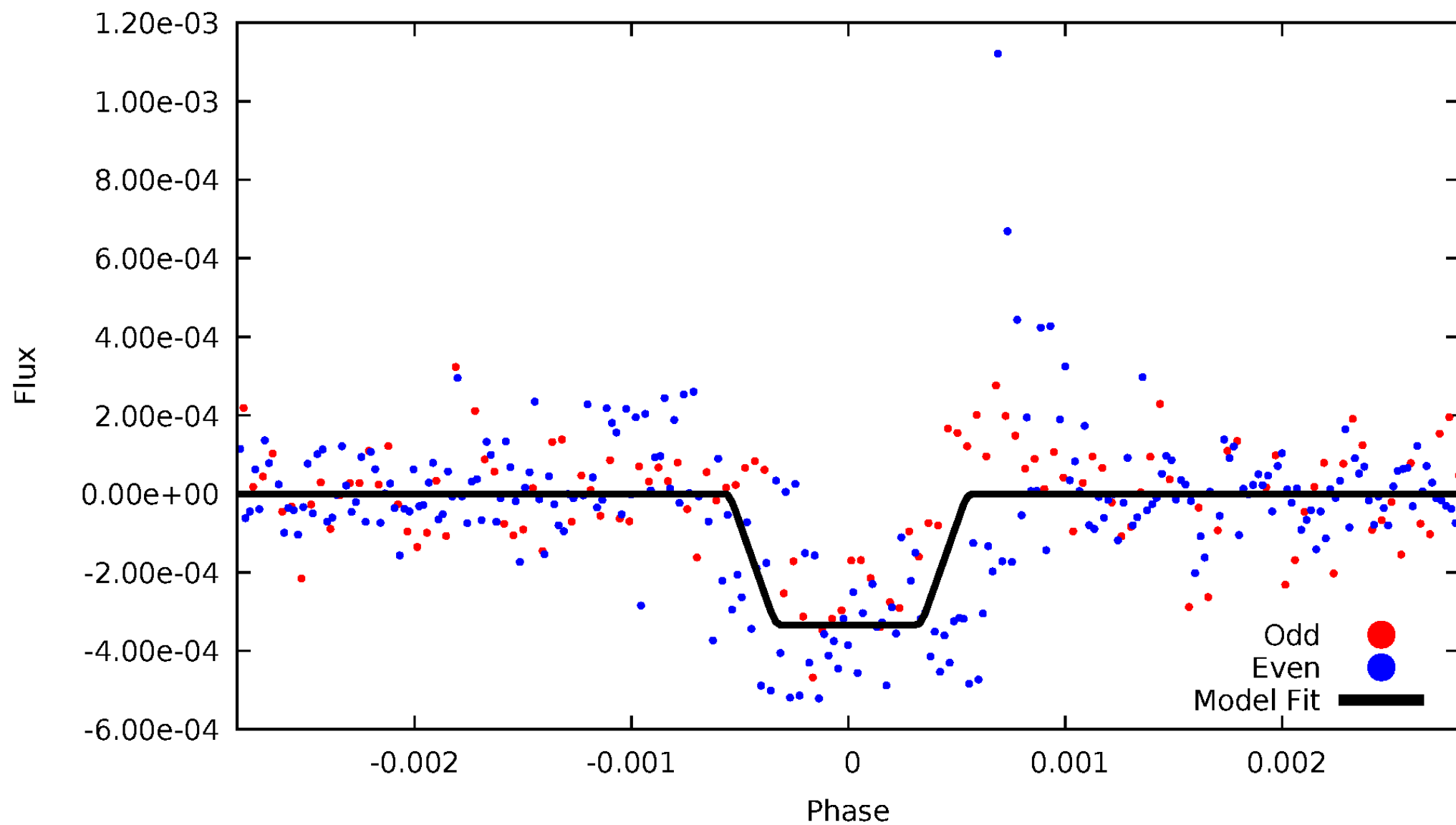
DV Odd/Even

TCE 006357902-02



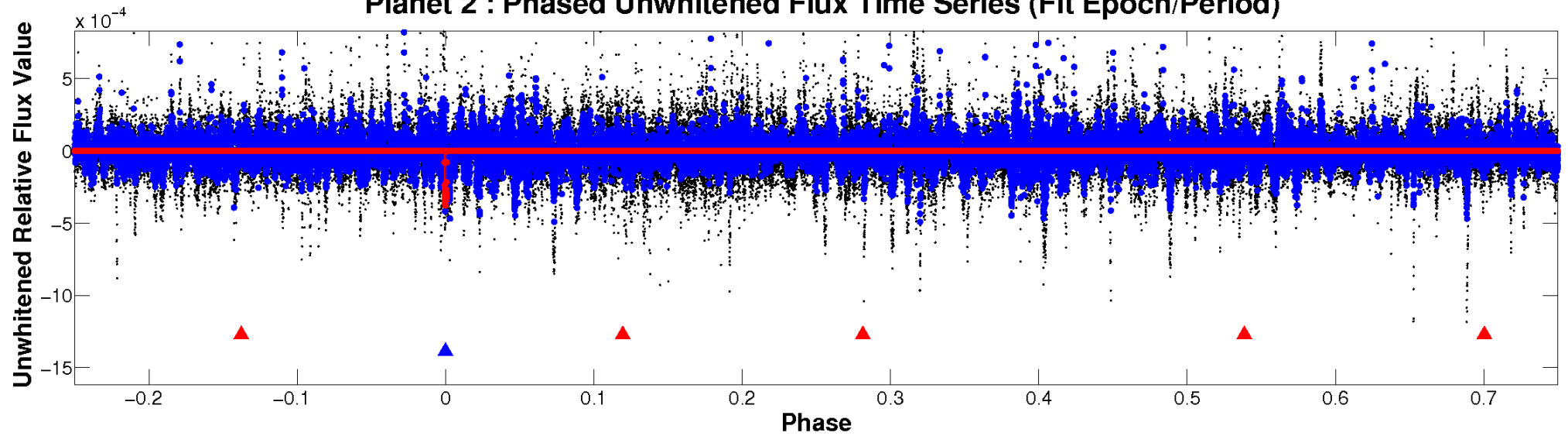
ALT Odd/Even

TCE 006357902-02

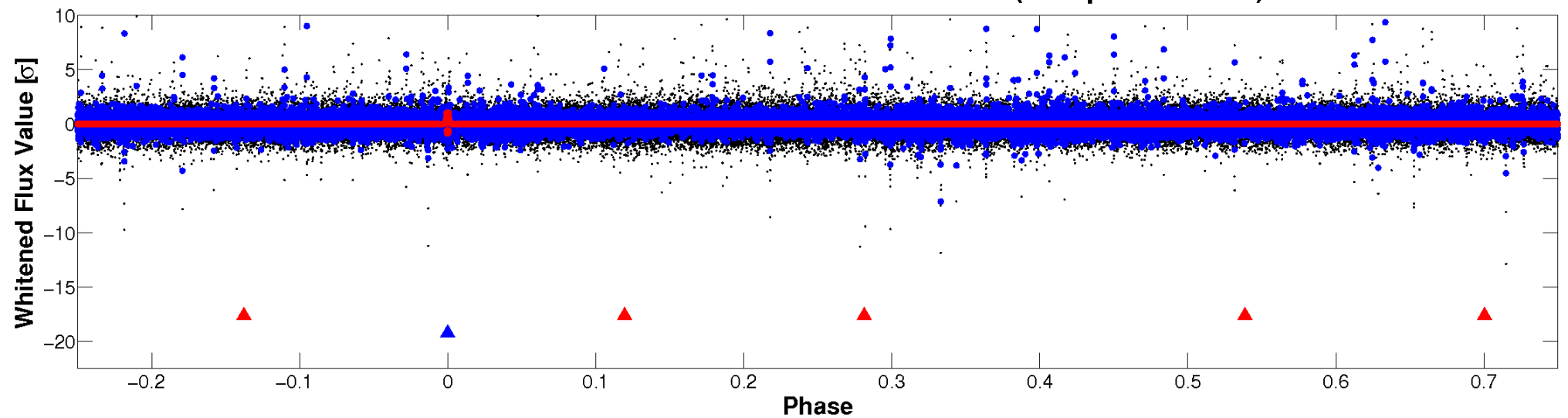


Non-Whitened Vs. Whitened Light Curve

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

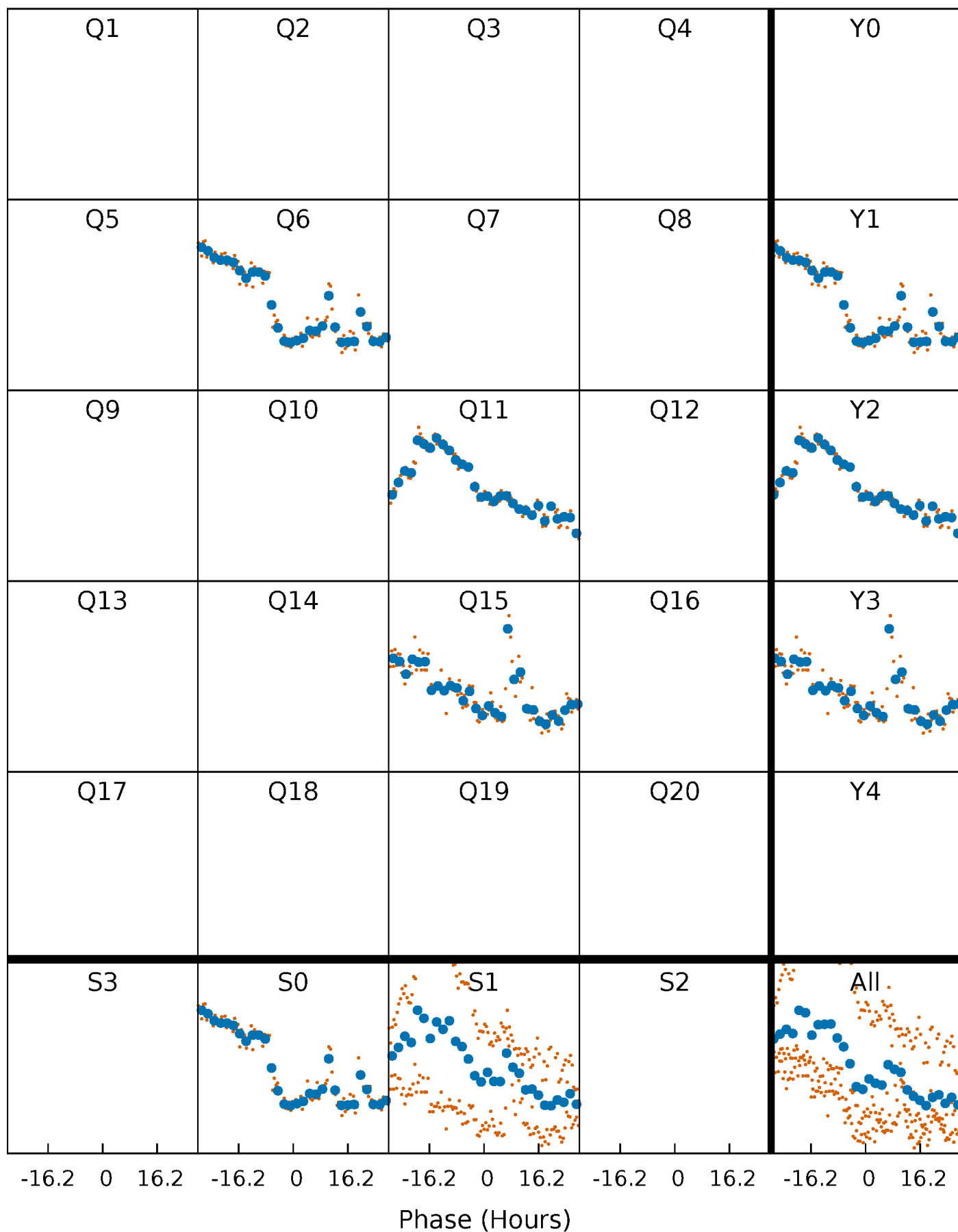


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



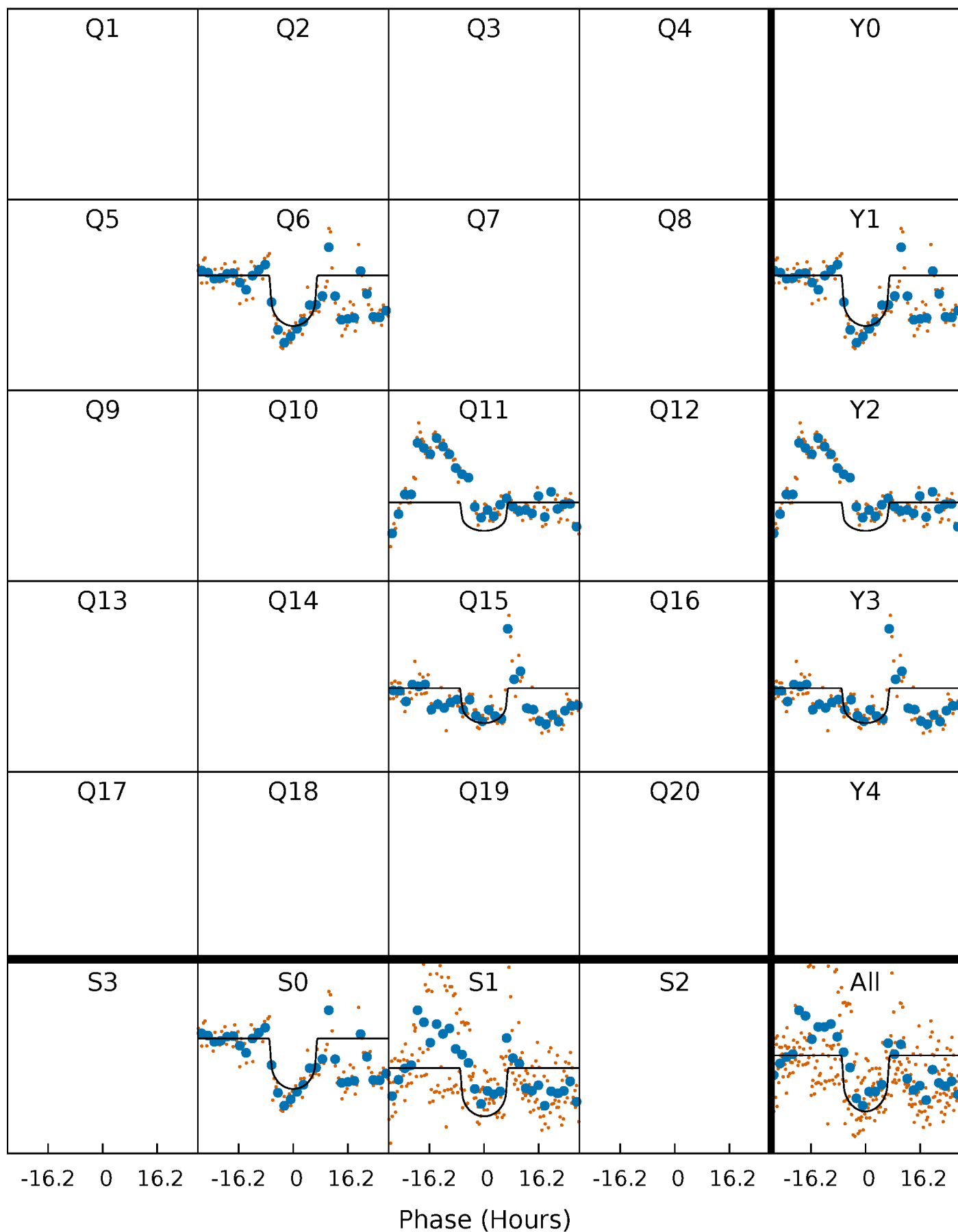
PDC Quarter-Phased Transit Curves

TCE 006357902-02 $P=459.513784$ Days $T_0=543.934441$ (BKJD)



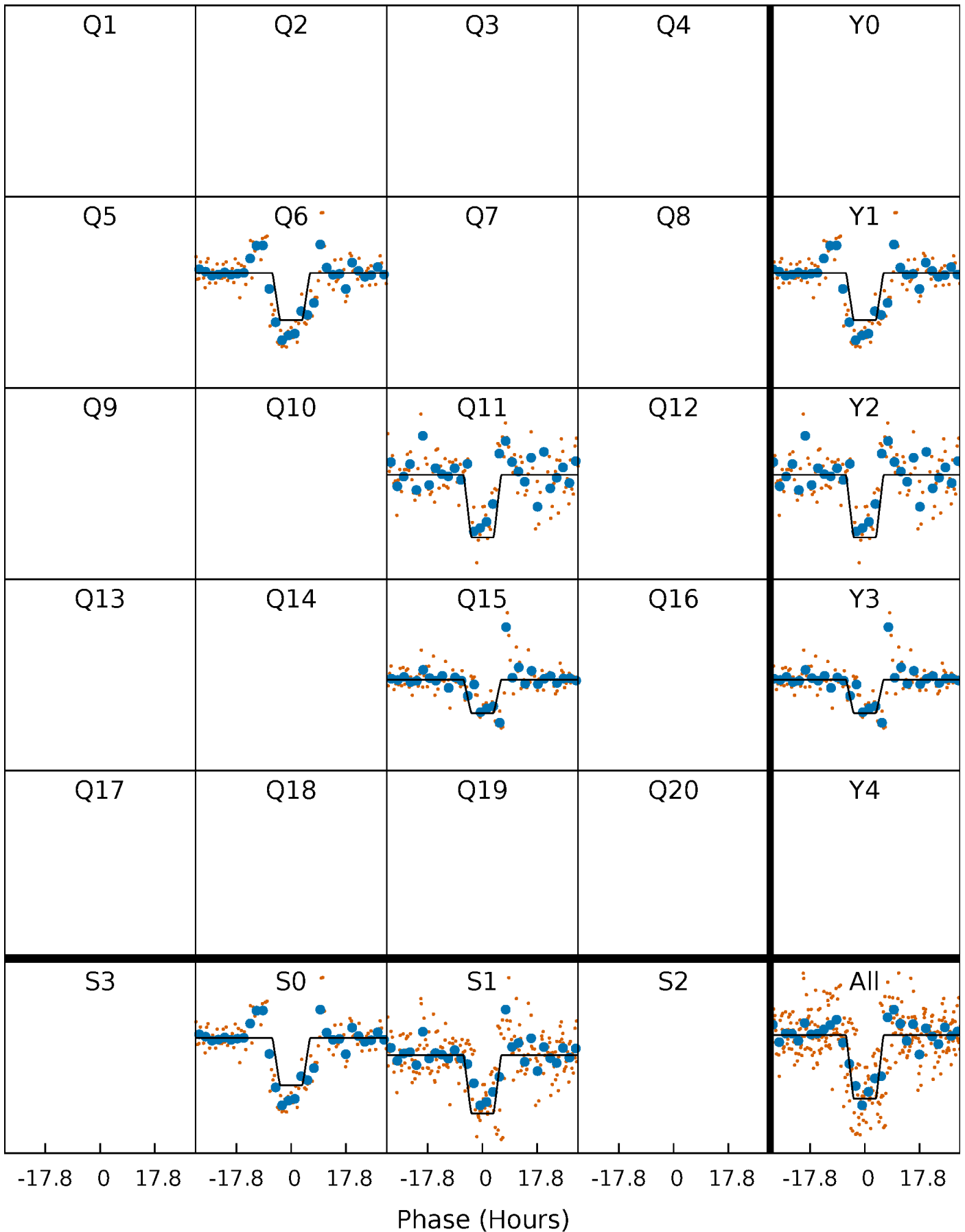
DV Quarter-Phased Transit Curves

TCE 006357902-02 $P=459.513784$ Days $T_0=543.934441$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

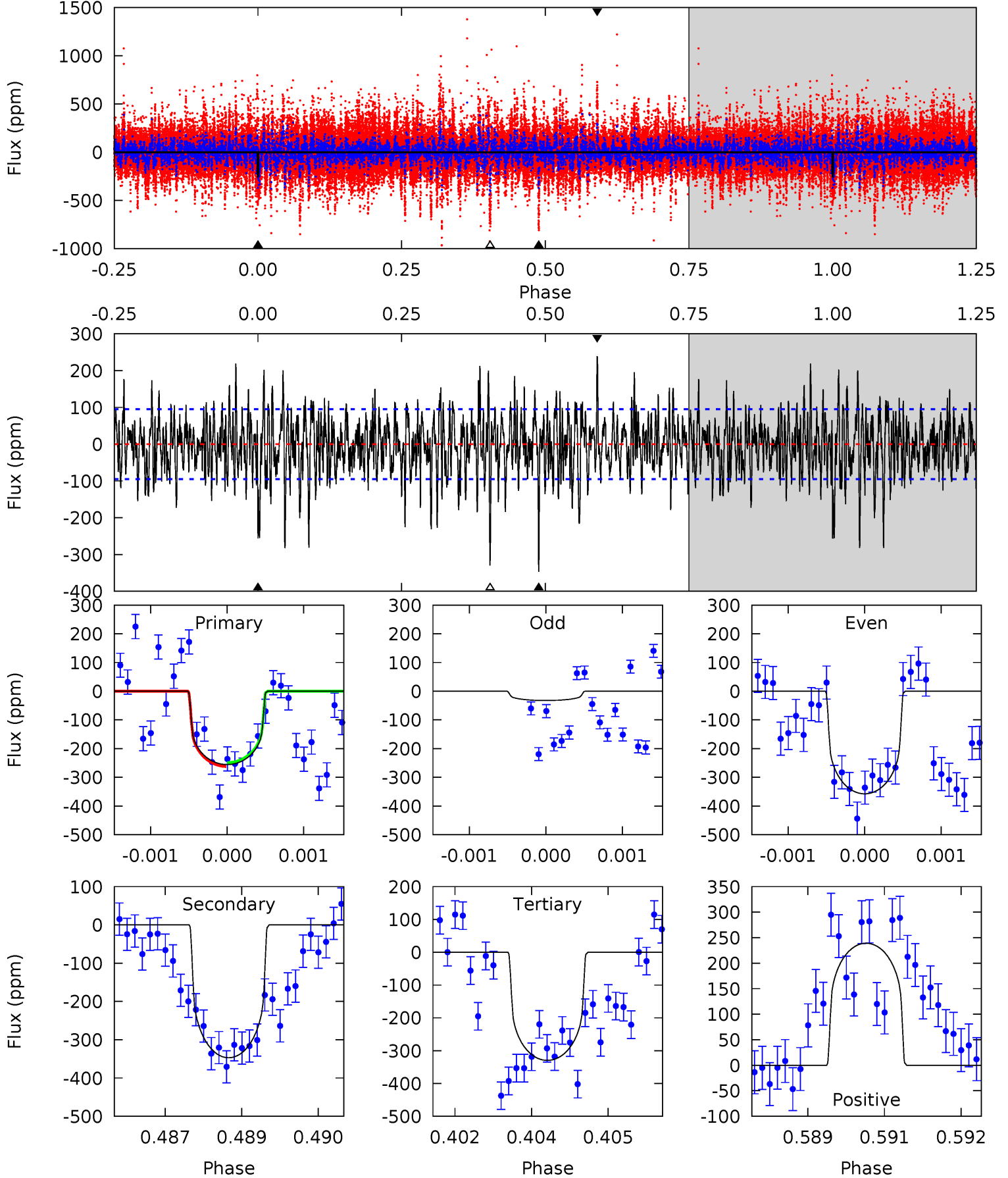
TCE 006357902-02 $P=459.482652$ Days $T_0=543.967170$ (BKJD)



DV Model-Shift Uniqueness Test

006357902-02, $P = 459.513784$ Days, $E = 84.420657$ Days

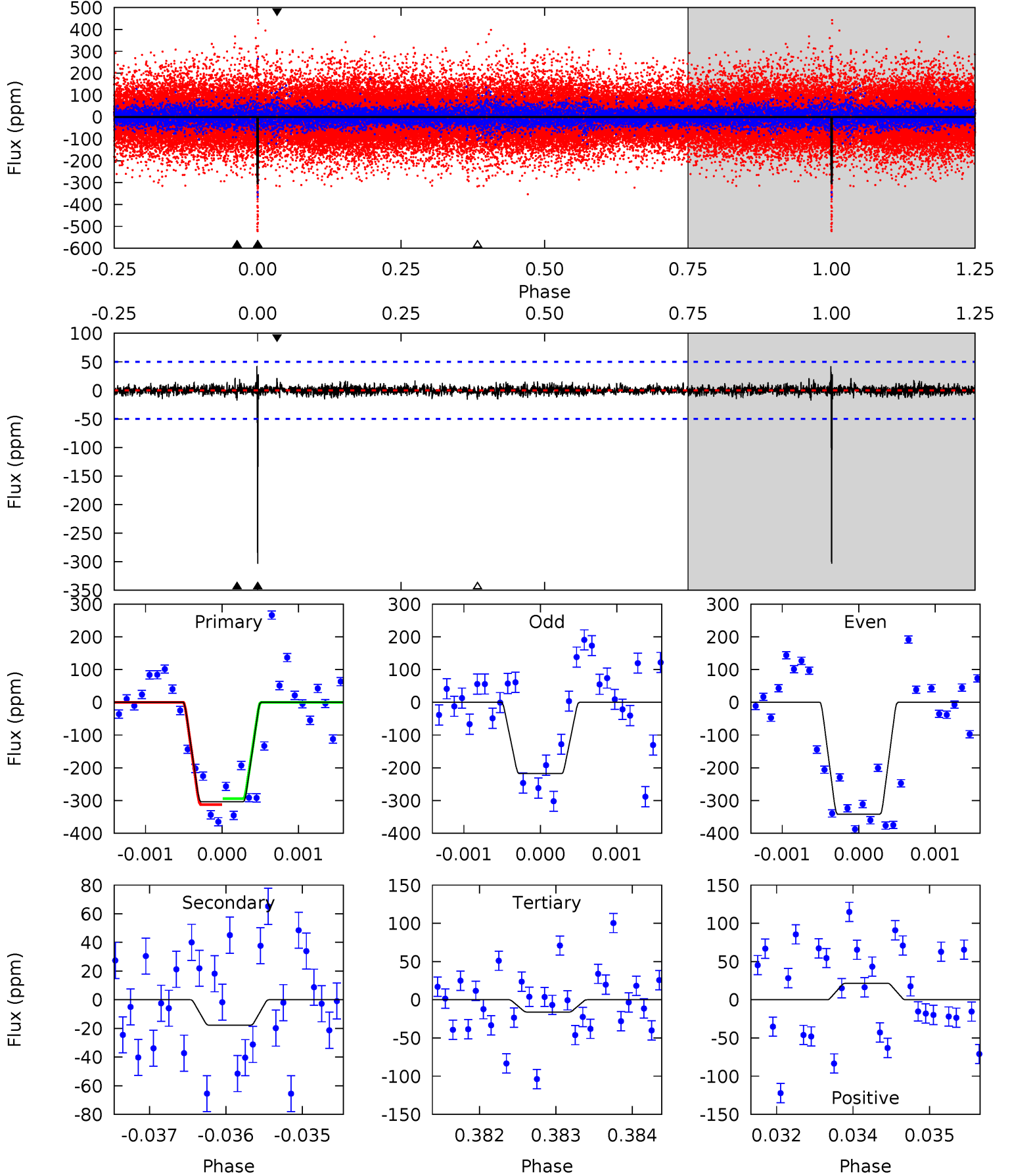
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	19.7	18.7	13.6	5.41	3.22	3.95	-4.20	0.93	0.99	6.12	8.20	0.87	0.41	0.39



Alt Model-Shift Uniqueness Test

006357902-02, P = 459.482652 Days, E = 84.484518 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.9	1.92	1.75	2.34	5.43	3.26	0.47	31.2	30.6	0.17	-0.42	6.33	1.24	0.12	1.00



Stellar Parameters For KIC 006357902

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4209^{+113}_{-139}	$4.648^{+0.056}_{-0.024}$	$-0.240^{+0.300}_{-0.300}$	$0.603^{+0.043}_{-0.065}$	$0.591^{+0.059}_{-0.053}$	$3.794^{+1.033}_{-0.372}$
	+3%/-3%	+1%/-1%	+125%/-125%	+7%/-11%	+10%/-9%	+27%/-10%
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 006357902-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-347 ± 18	$1.26^{+0.24}_{-0.24}$	202^{+7}_{-8}	4142^{+383}_{-280}	117505^{+61078}_{-35451}
Alt.	-18 ± 9	$1.19^{+0.27}_{-0.26}$	202^{+6}_{-8}	2672^{+261}_{-251}	6477^{+6175}_{-3517}

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

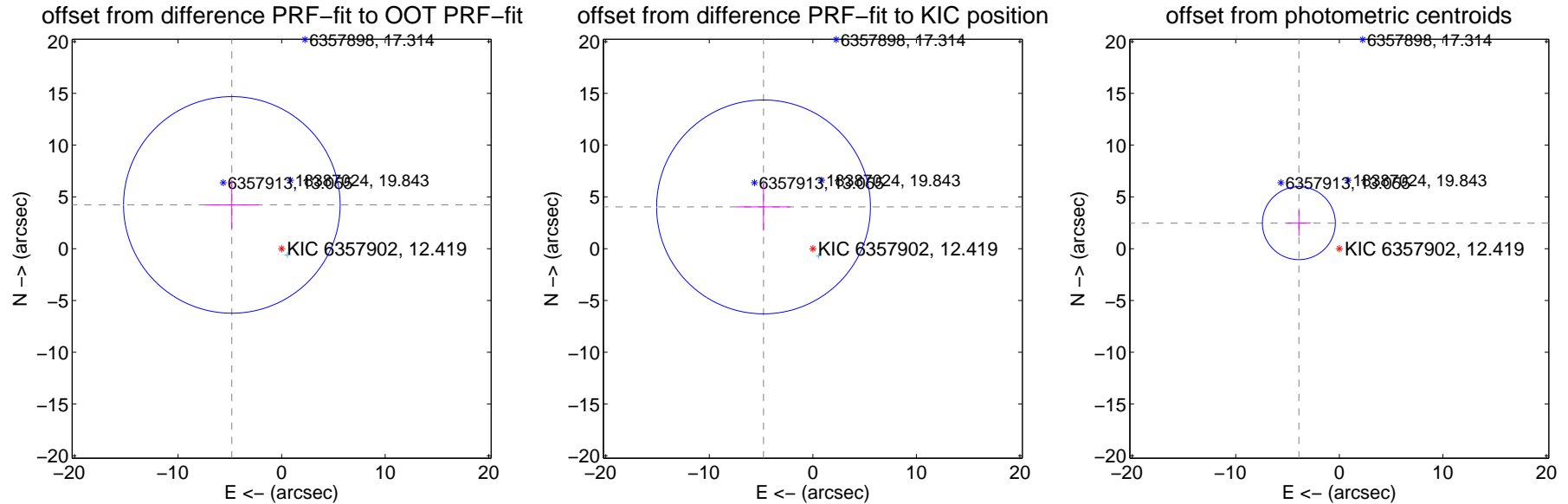
DV Centroid Data

Supplemental centroid analysis for 006357902-02. Kepler magnitude: 12.42. Transit SNR 8.58

There are 2 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.404 ± 3.487	1.84	4.810 ± 2.592	4.228 ± 2.334
PRF-fit source offset from KIC position	6.246 ± 3.443	1.81	4.766 ± 2.572	4.036 ± 2.291
photometric centroid source offset	4.62 ± 1.17	3.93	3.91 ± 1.15	2.47 ± 1.24

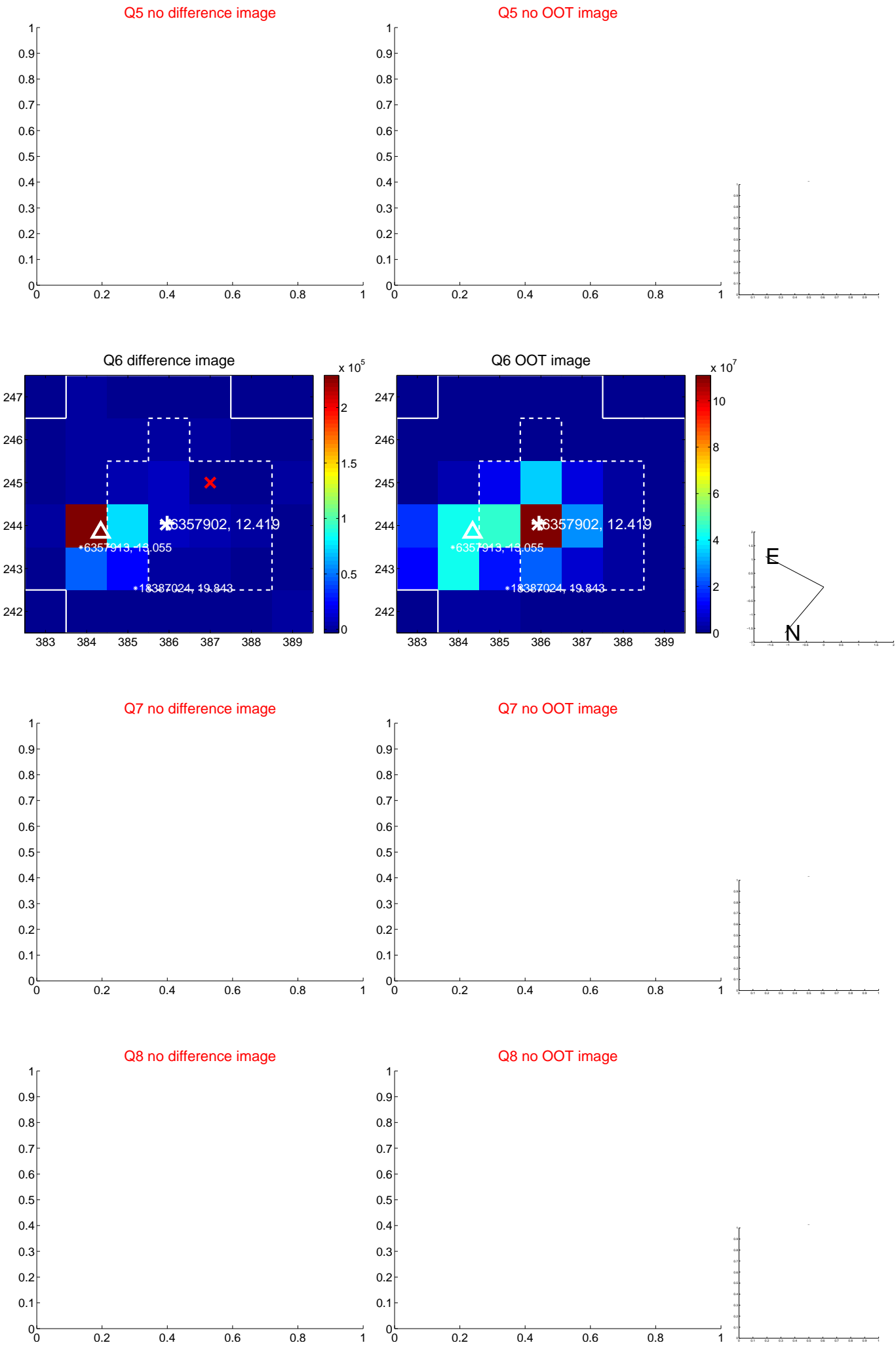


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



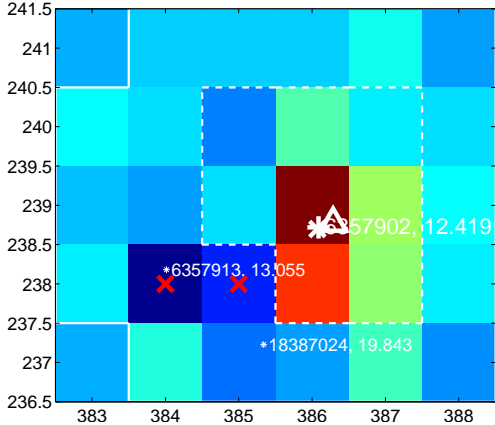
Q14 no difference image



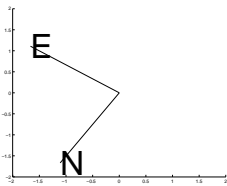
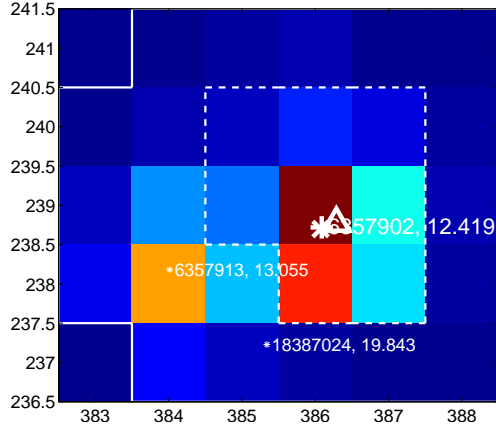
Q14 no OOT image



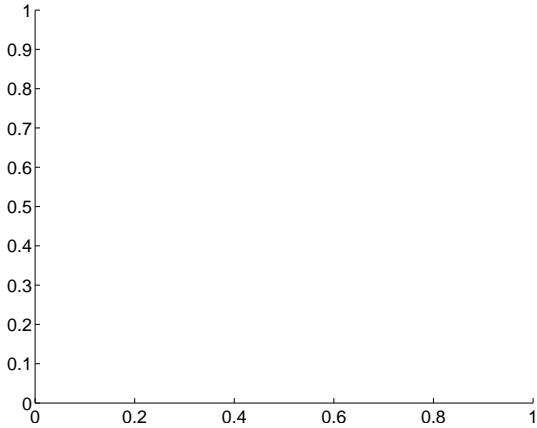
Q15 difference image



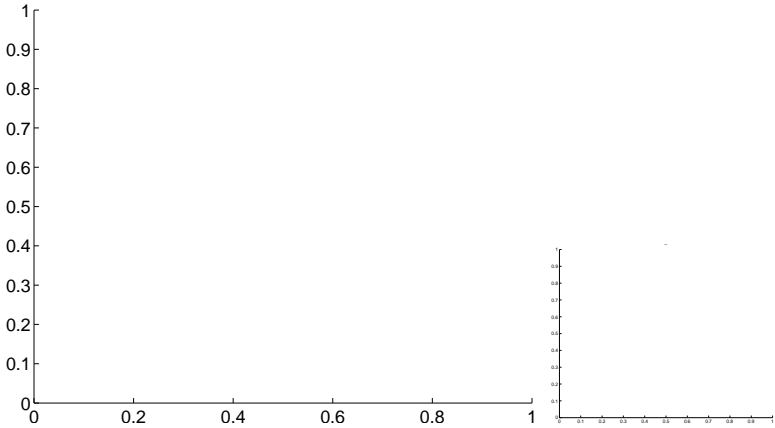
Q15 OOT image



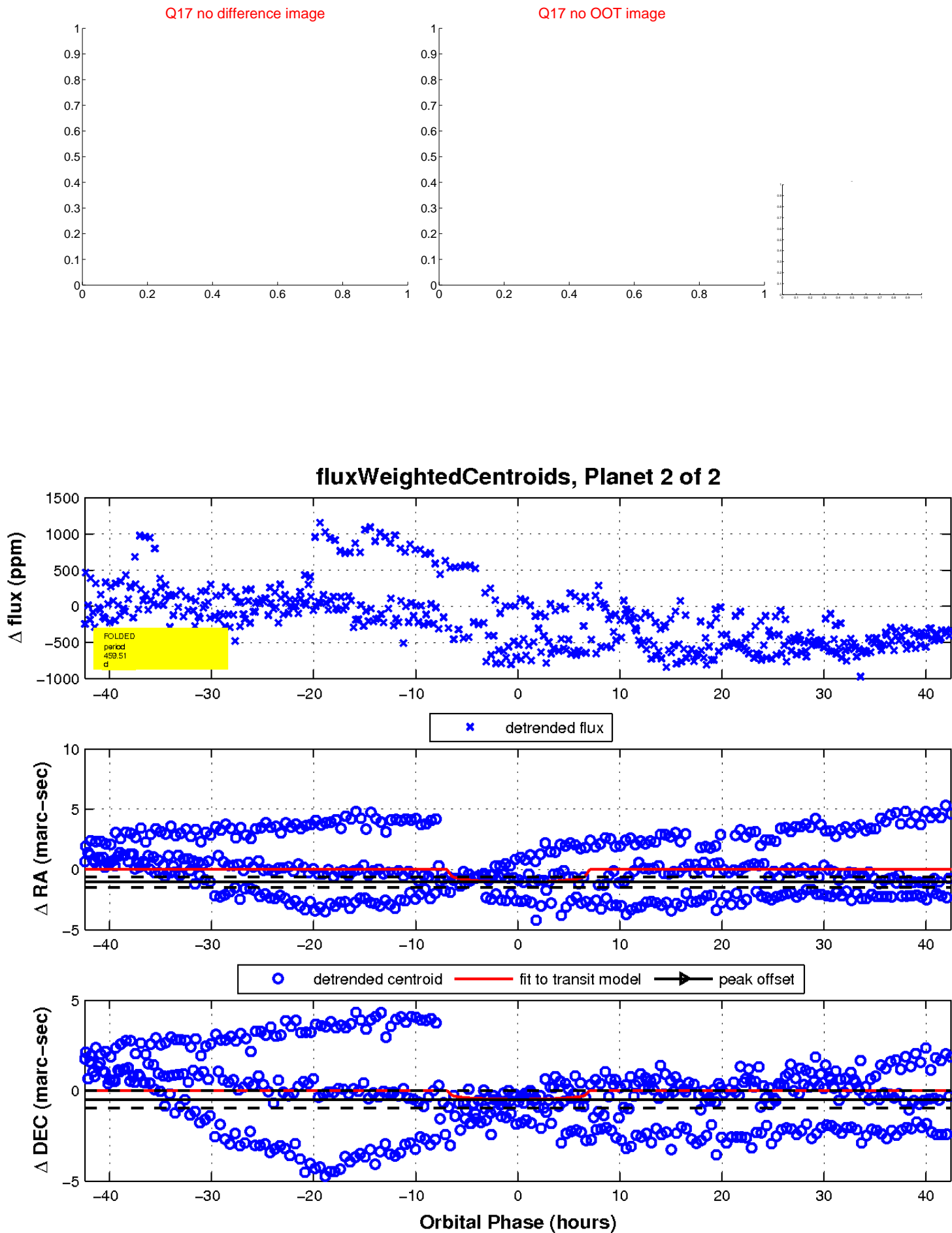
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

