

KIC 012110726

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})
012110726-01	OBS	No	560.568120	143.154529	144.2	4.727	8.1	7.8	85.80	3712	122.19	505.23
012110726-02	OBS	No	590.067397	340.396100	143.4	3.895	10.1	6.9	85.80	3712	109.97	471.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012110726-01	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
012110726-02	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

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

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

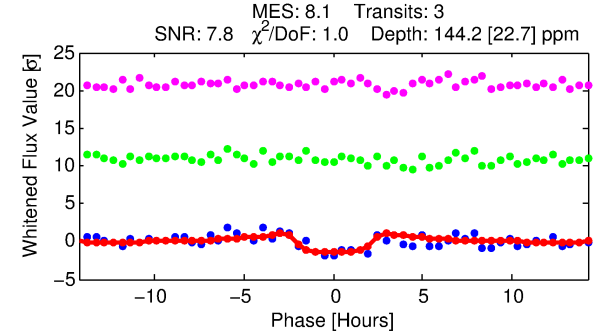
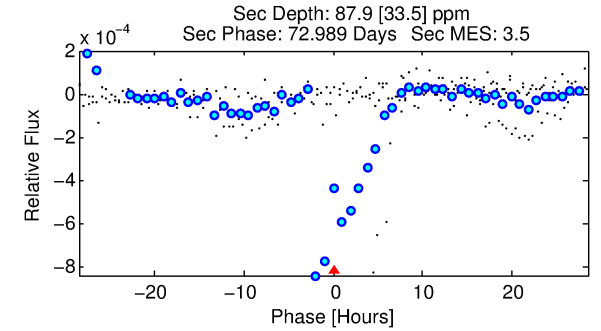
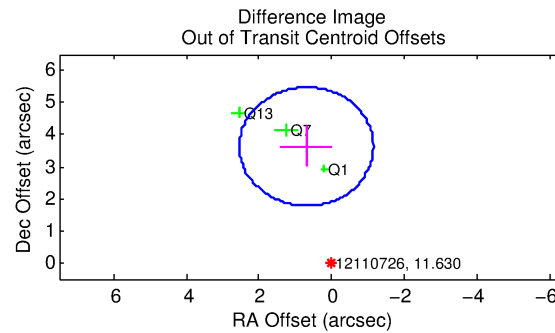
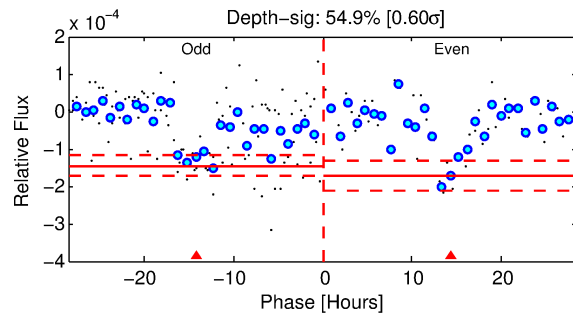
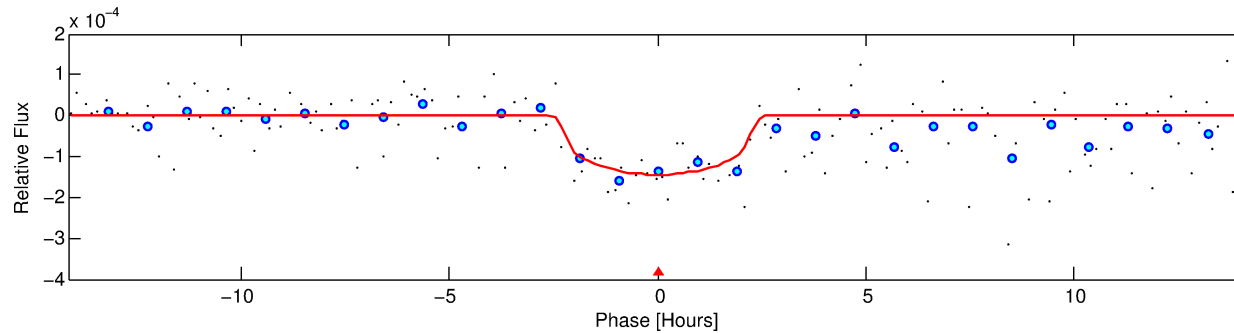
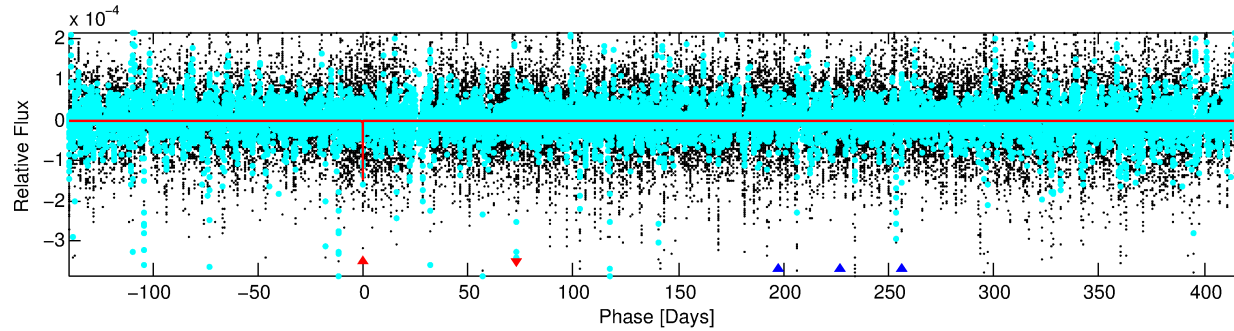
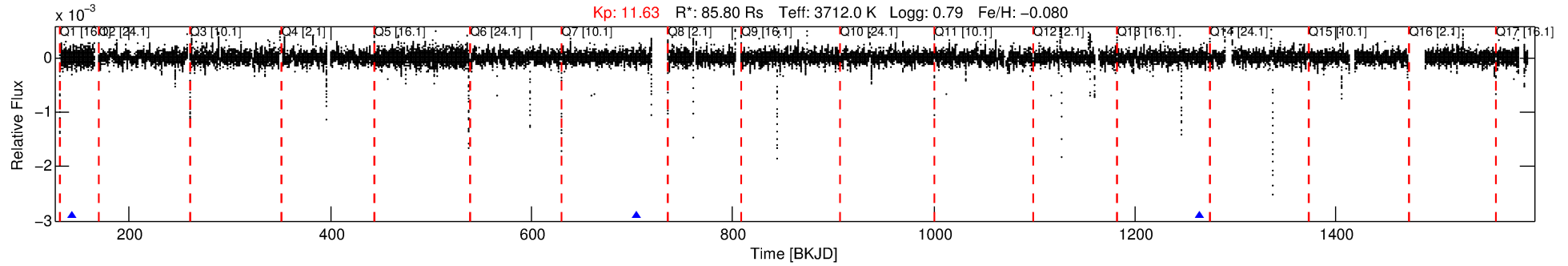
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012110726-01

No Significant Match Found

DV One-Page Summary

KIC: 12110726 Candidate: 1 of 2 Period: 560.568 d



DV Fit Results:

Period = 560.56812 [0.00821] d
Epoch = 143.1545 [0.0105] BKJD
Rp/R* = 0.0131 [0.0119]
a/R* = 512.27 [1328.35]
b = 0.84 [0.94]
Seff = 505.23 [86.11]
Teq = 1209 [52] K
Rp = 122.19 [113.38] Re
a = 1.5744 [0.1967] AU
Ag = 8.03 [14.95] [0.47 σ]
Teffp = 3146 [1464] K [1.32 σ]

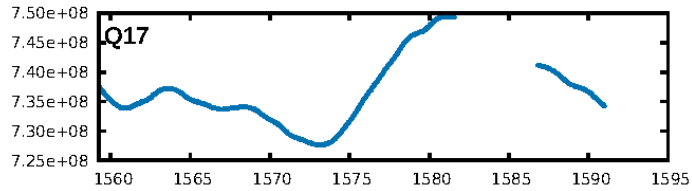
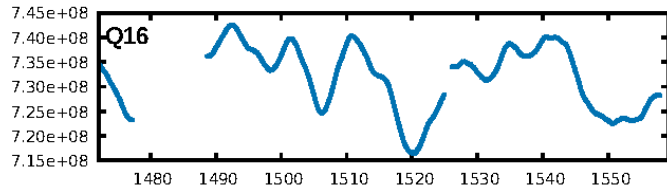
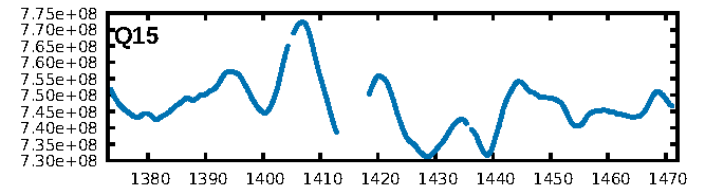
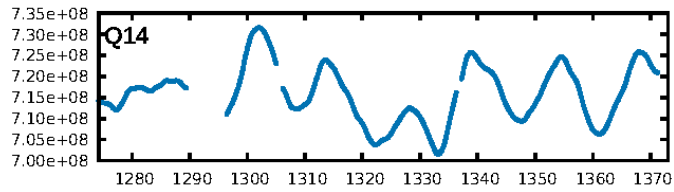
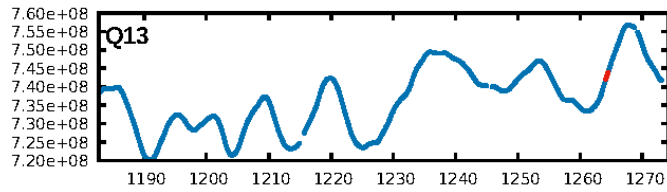
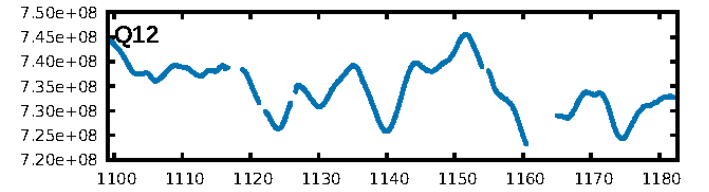
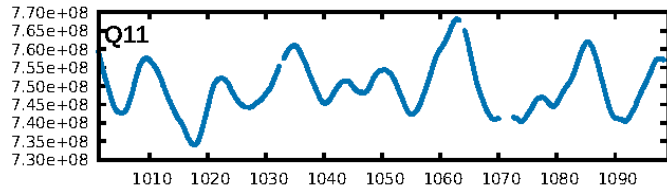
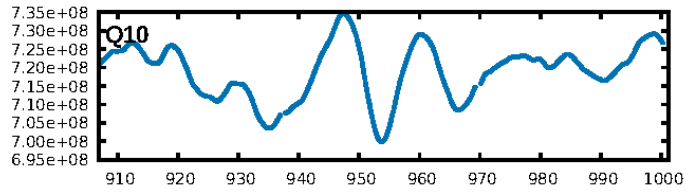
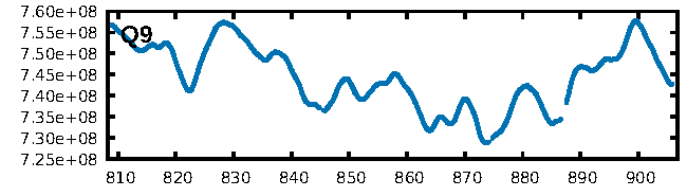
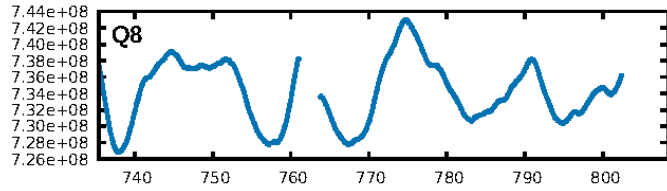
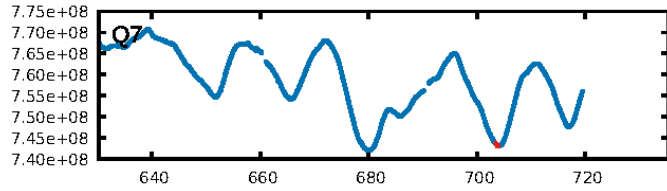
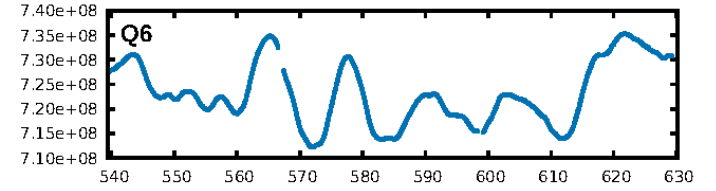
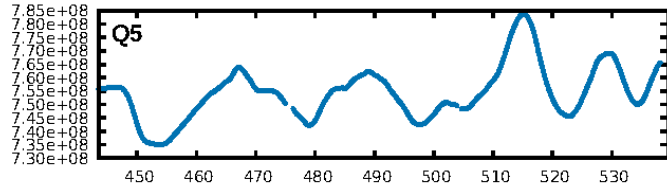
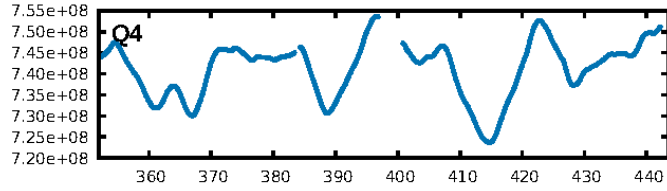
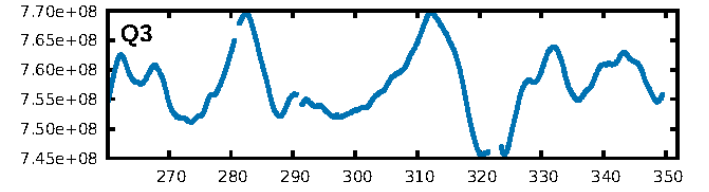
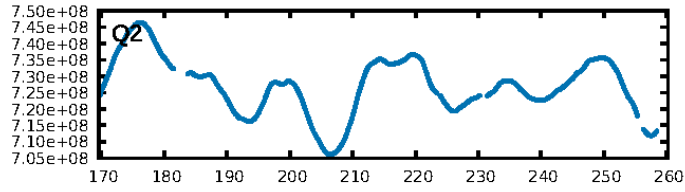
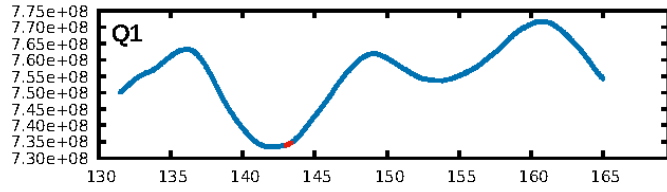
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [115.59 σ]
ModelChiSquare2-sig: 17.4%
ModelChiSquareGof-sig: 95.2%
Bootstrap-pfa: 2.41e-04
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 19.44
Centroid-sig: 0.7%
Centroid-so: 3.858 arcsec [1.87 σ]
OotOffset-rm: 3.693 arcsec [6.00 σ]
KicOffset-rm: 3.842 arcsec [6.12 σ]
OotOffset-st: 0/1/0/2 [3]
KicOffset-st: 0/1/0/2 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

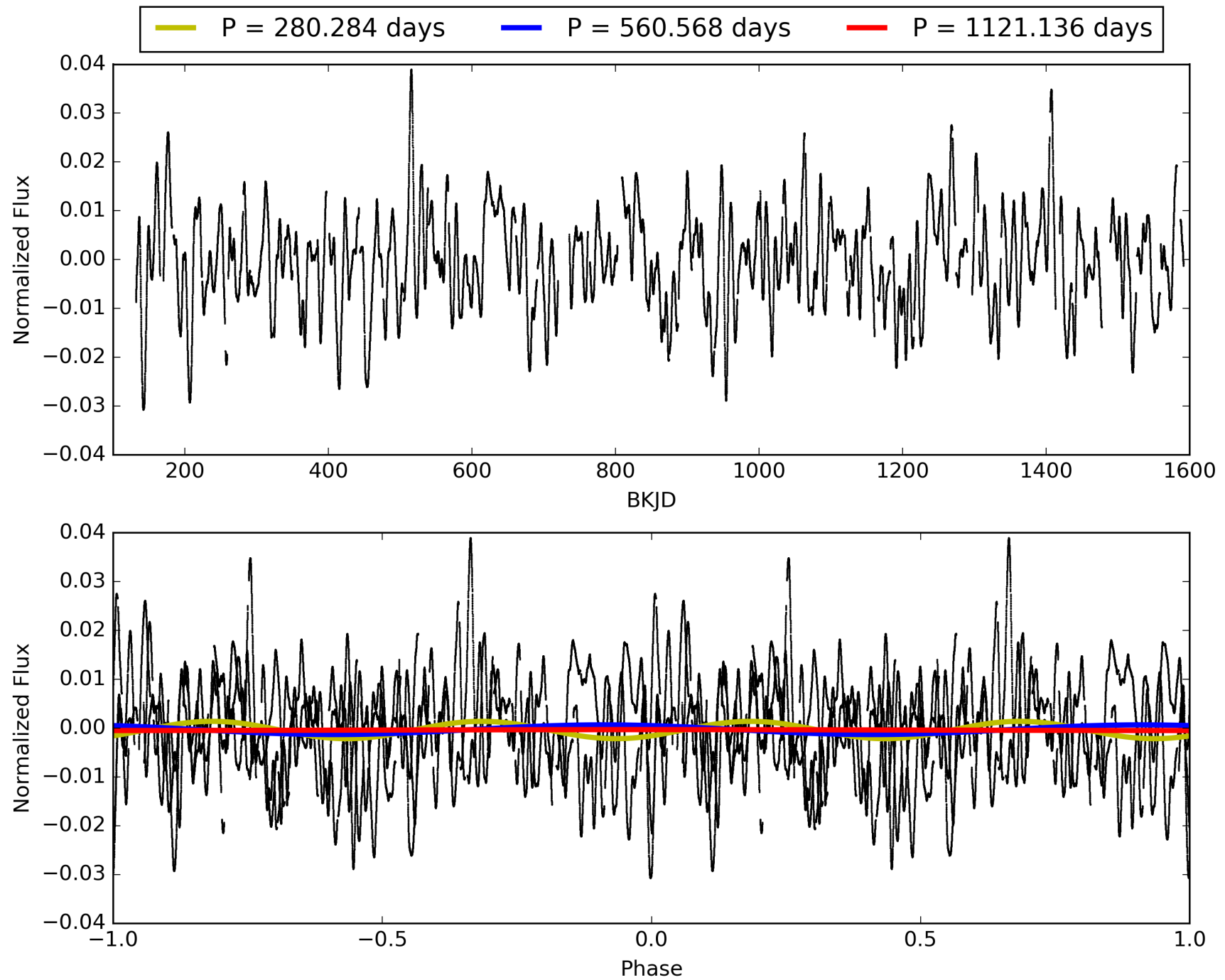
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:53:04 Z

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

TCE 012110726-01, PDC Light Curves

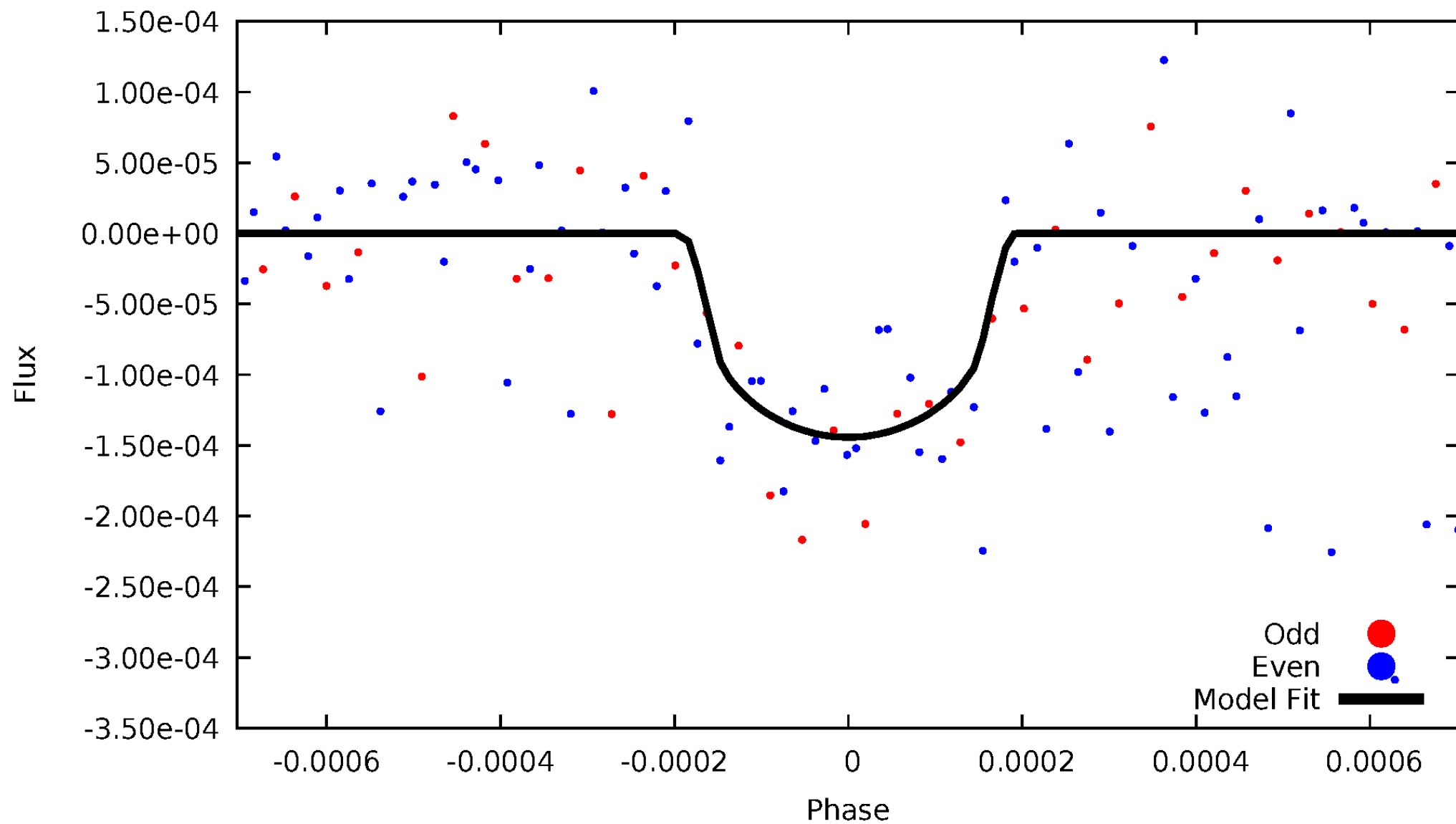


TCE 012110726-01



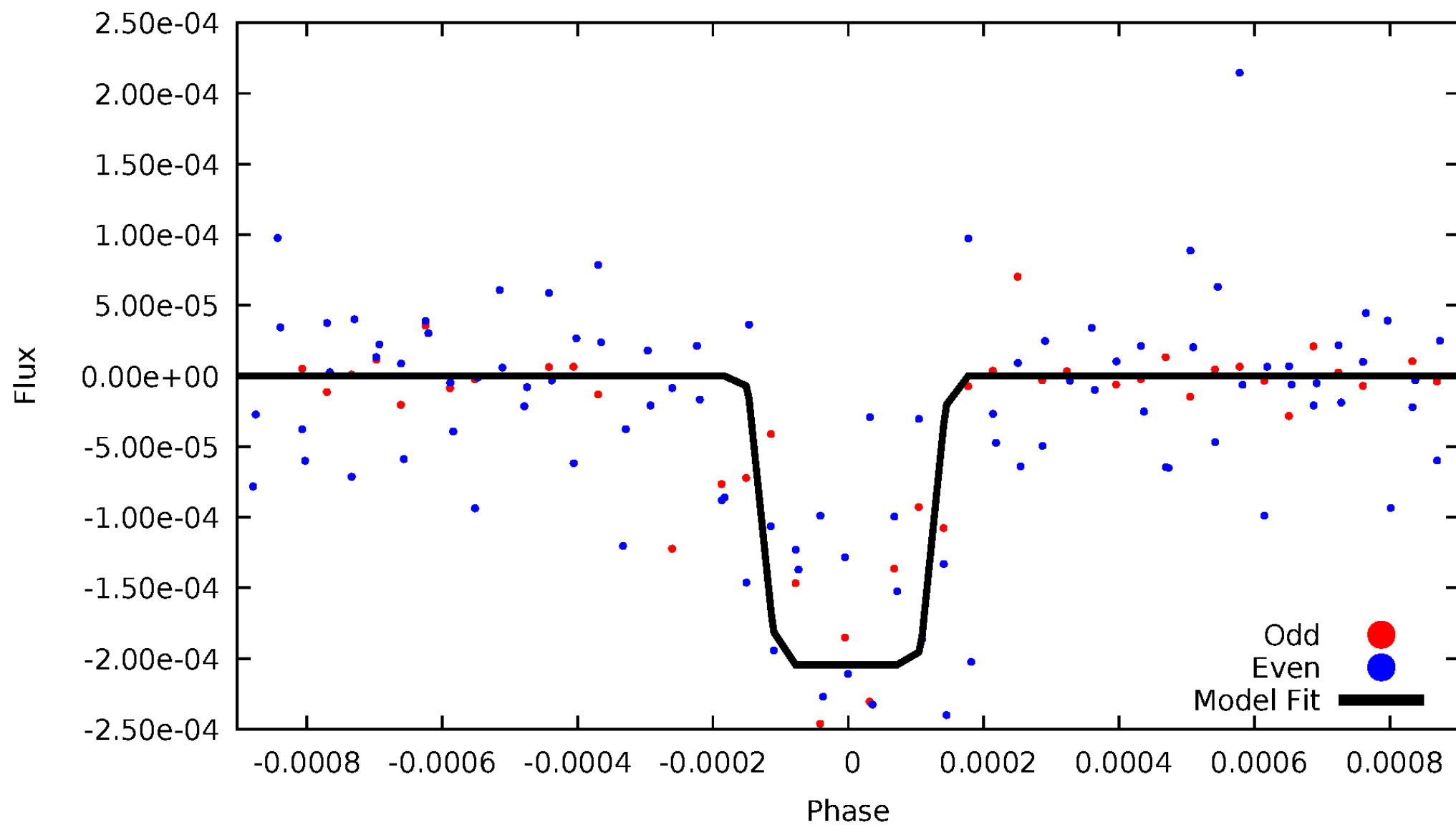
DV Odd/Even

TCE 012110726-01



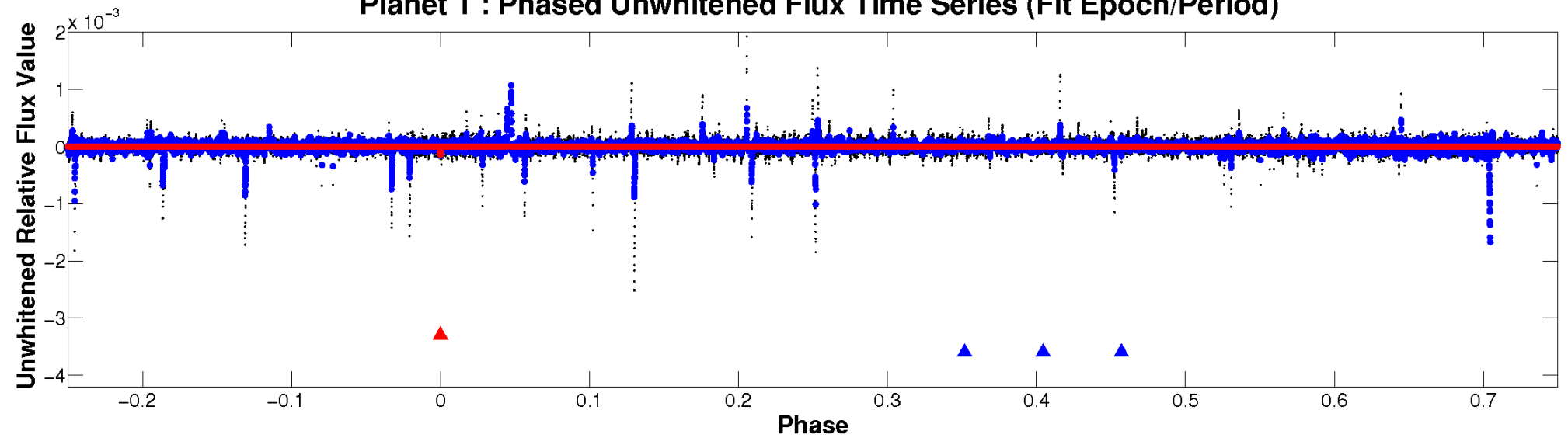
ALT Odd/Even

TCE 012110726-01

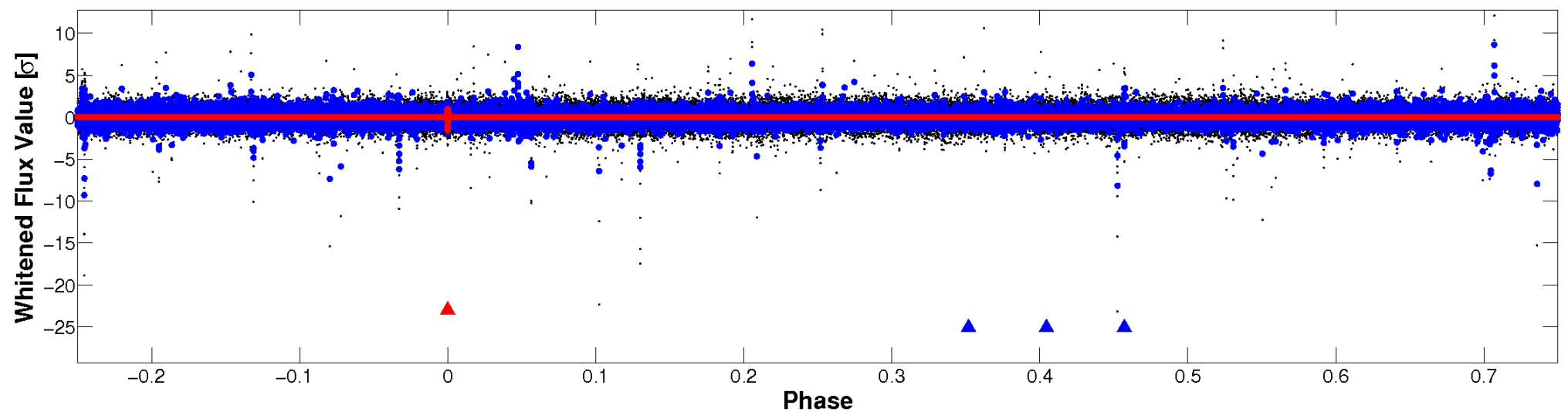


Non-Whitened Vs. Whitened Light Curve

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

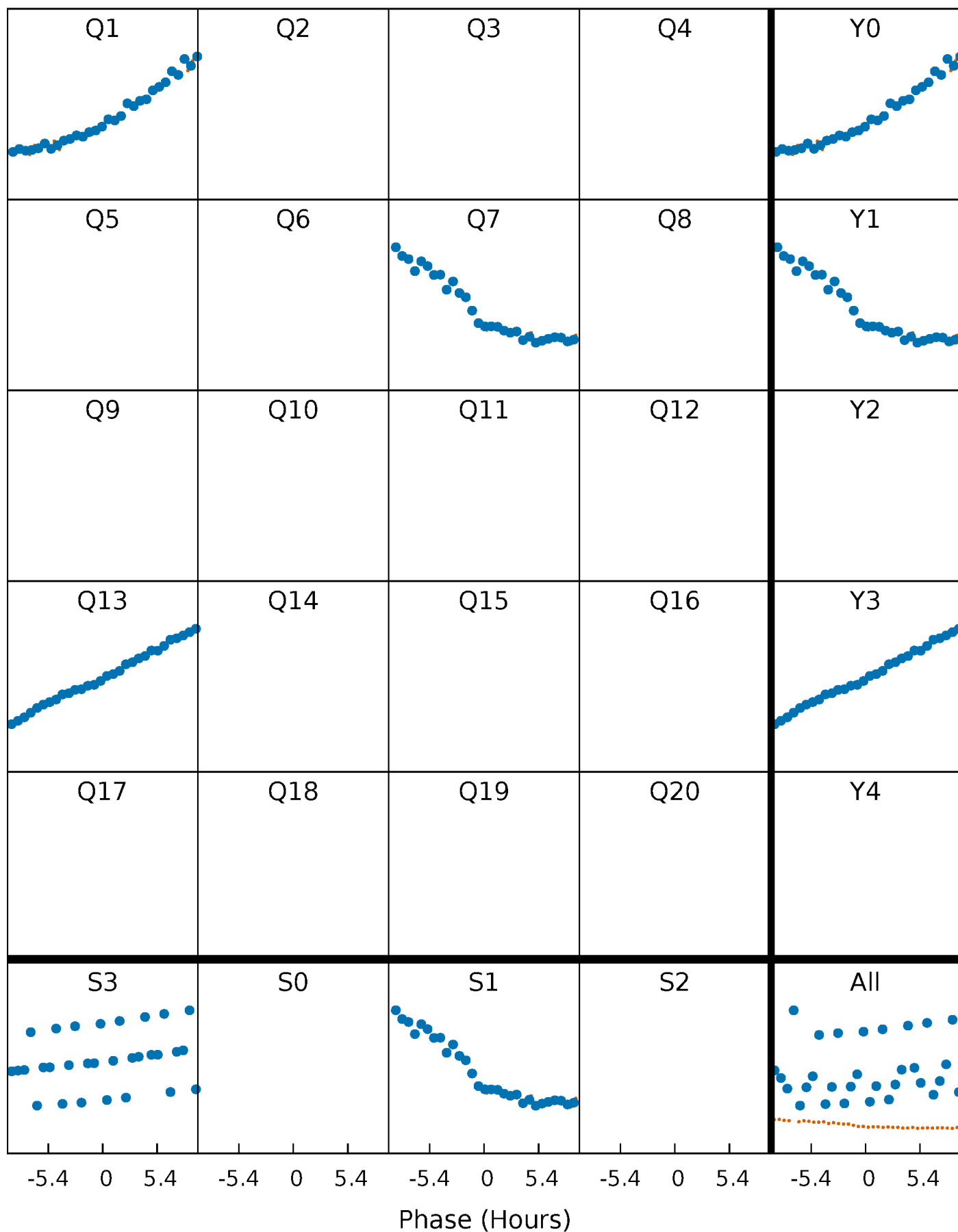


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



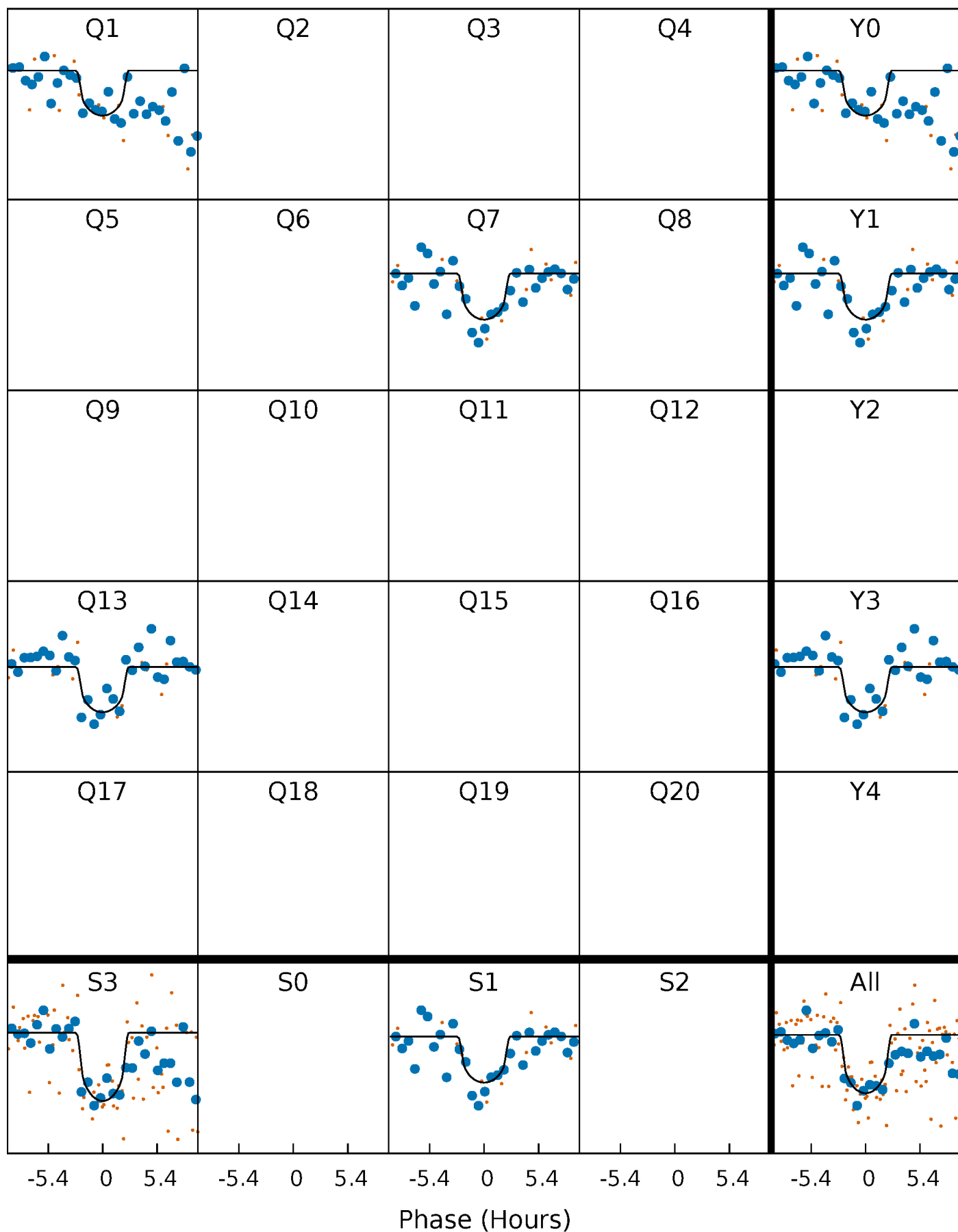
PDC Quarter-Phased Transit Curves

TCE 012110726-01 P=560.568120 Days $T_0=143.154529$ (BKJD)



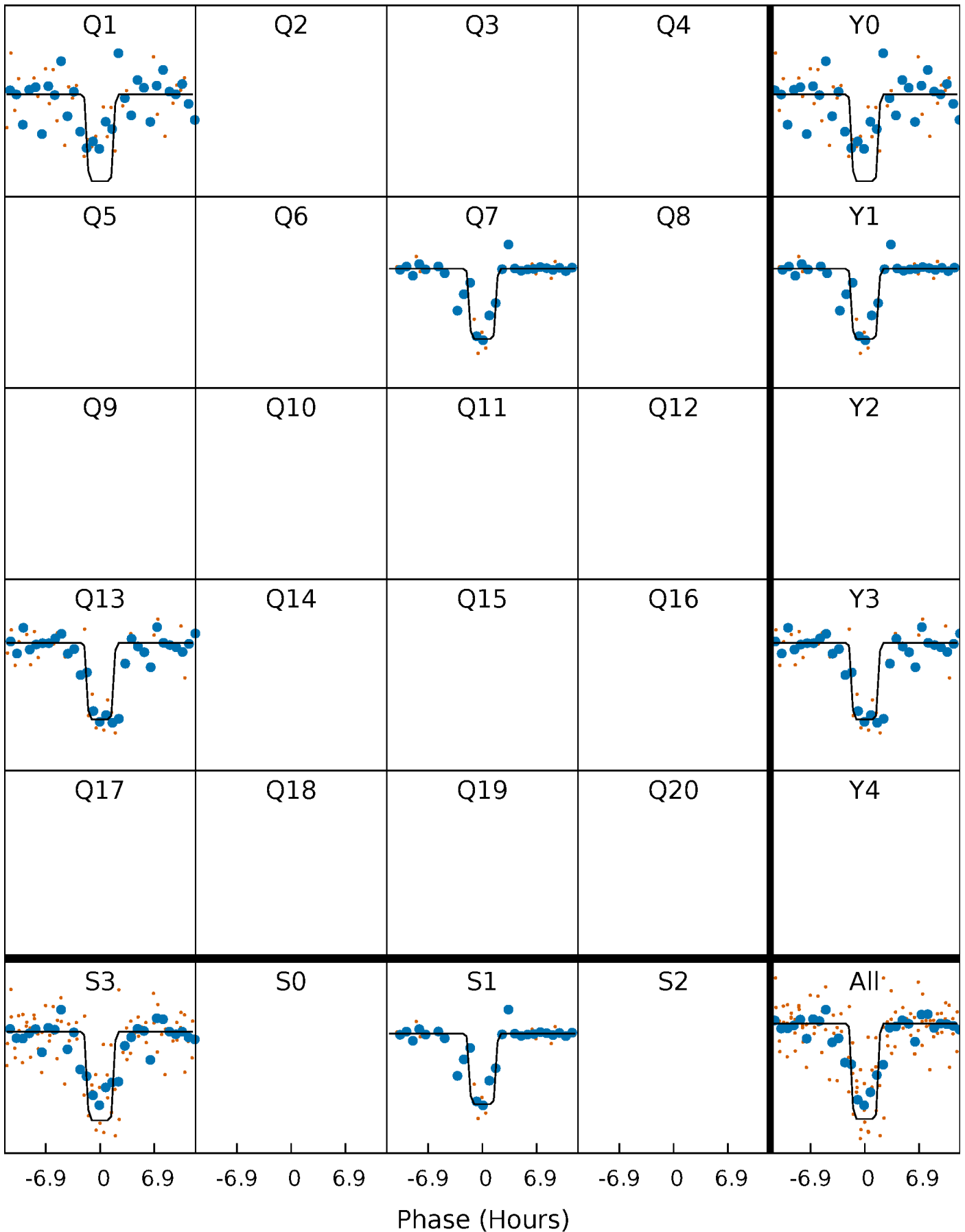
DV Quarter-Phased Transit Curves

TCE 012110726-01 P=560.568120 Days $T_0=143.154529$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

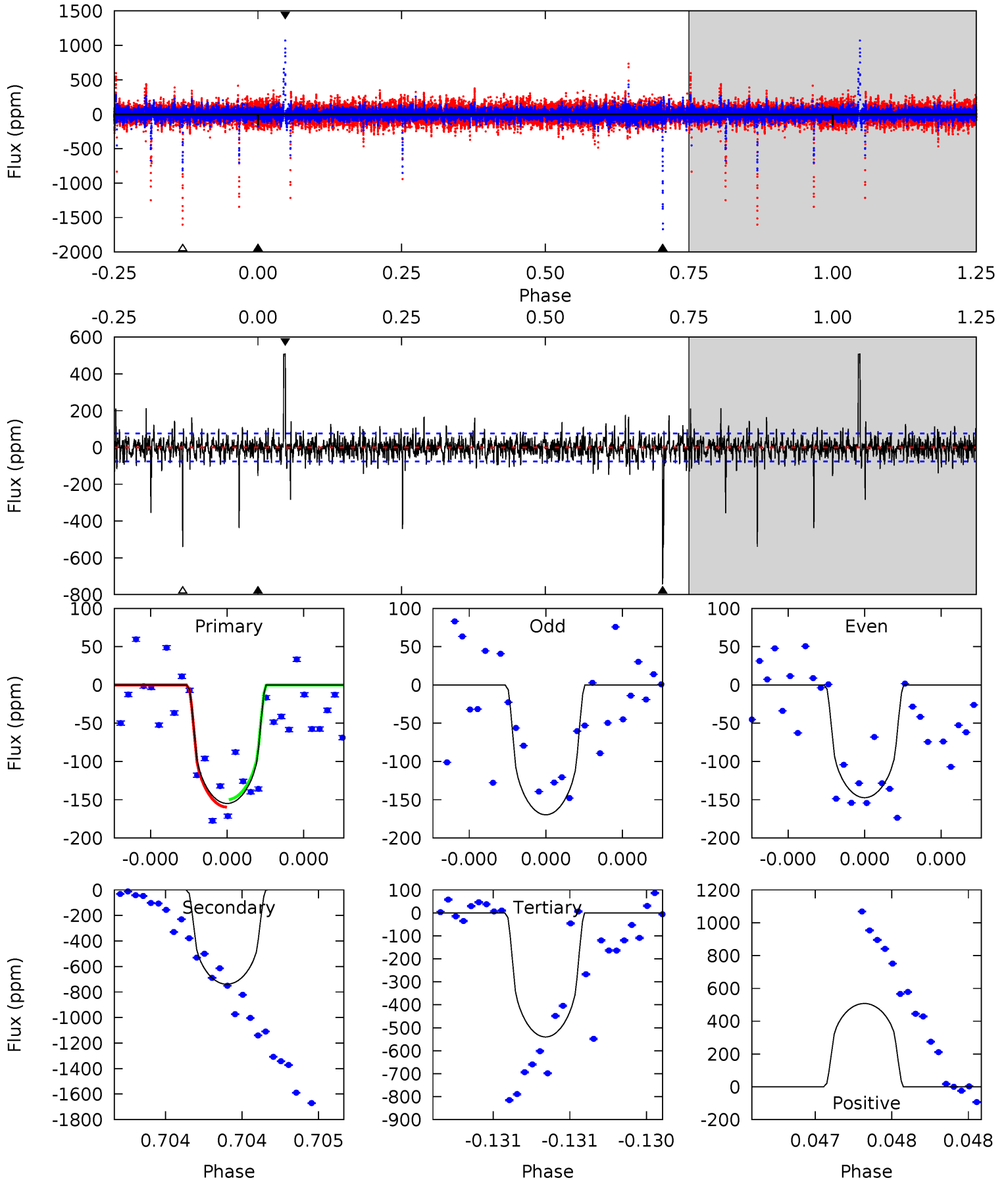
TCE 012110726-01 P=560.553851 Days $T_0=143.162220$ (BKJD)



DV Model-Shift Uniqueness Test

012110726-01, P = 560.568120 Days, E = 143.154529 Days

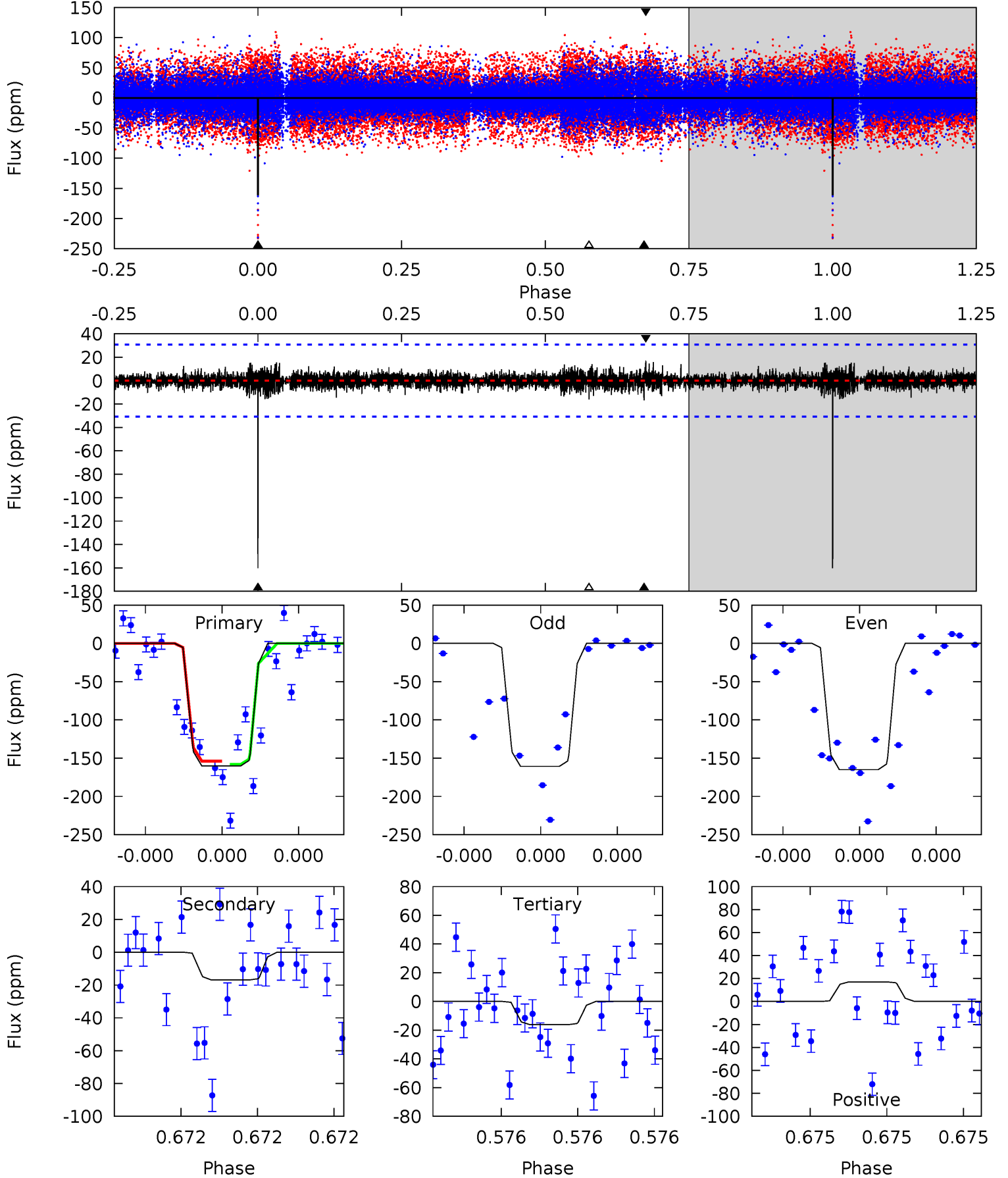
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	54.6	39.9	37.5	5.62	3.56	2.99	-28.5	-26.1	14.7	17.1	0.66	1.04	0.41	0.37



Alt Model-Shift Uniqueness Test

012110726-01, P = 560.553851 Days, E = 143.162220 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.5	3.11	2.97	3.13	5.66	3.62	0.59	26.6	26.4	0.14	-0.03	0.39	0.93	0.10	0.38



Stellar Parameters For KIC 012110726

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3712^{+83}_{-101}	$0.790^{+0.030}_{-0.030}$	$-0.080^{+0.200}_{-0.250}$	$85.803^{+2.964}_{-15.806}$	$1.656^{+0.094}_{-0.534}$	$0.000^{+0.000}_{-0.000}$
	+2%/-3%	+4%/-4%	+250%/-312%	+3%/-18%	+6%/-32%	+25%/-9%
Source	PHO54	AST54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 012110726-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-739 ± 14	$142.92^{+104.94}_{-90.93}$	1689^{+42}_{-53}	4557^{+2789}_{-812}	50^{+332}_{-33}
Alt.	-17 ± 5	$150.65^{+107.19}_{-95.44}$	1691^{+43}_{-49}	2394^{+867}_{-928}	$0.975^{+6.115}_{-0.671}$

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 $A_{obs} \gg 1.0$

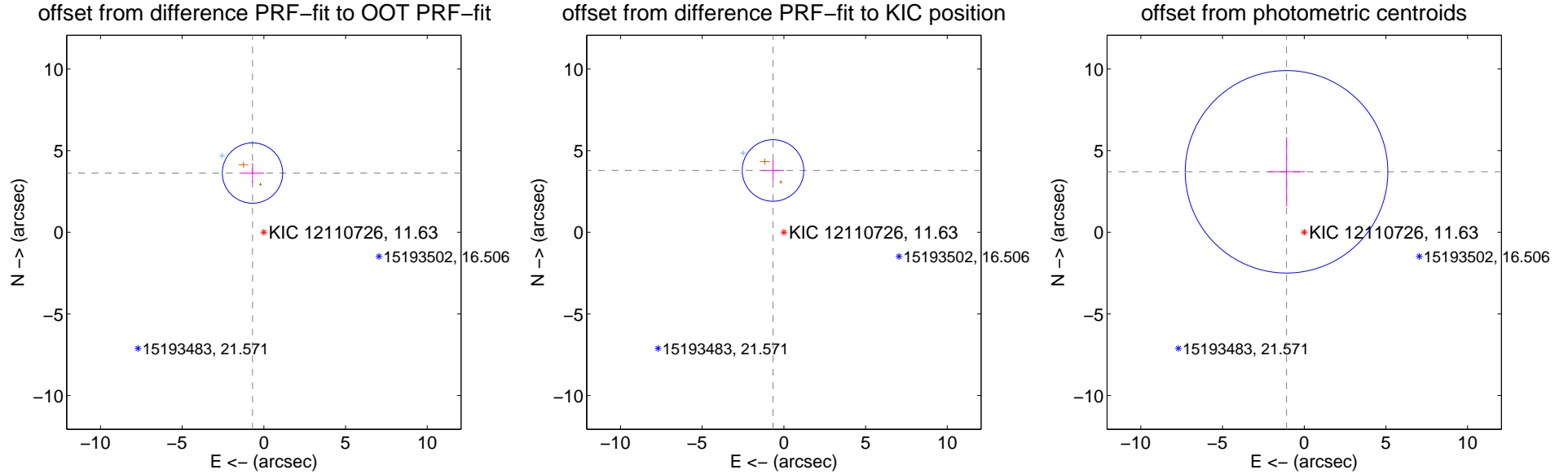
DV Centroid Data

Supplemental centroid analysis for 012110726-01. **Kepler magnitude: 11.63.** Transit SNR 7.82

There are 1 quarters with good PRF difference image offsets

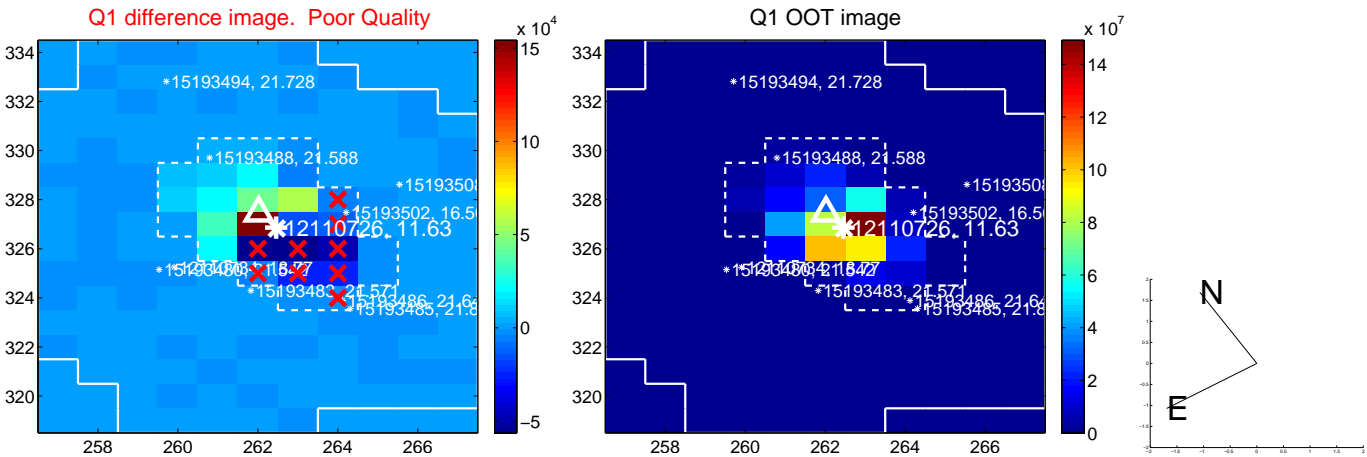
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.693 ± 0.616	6.00	0.696 ± 0.698	3.627 ± 0.612
PRF-fit source offset from KIC position	3.842 ± 0.628	6.12	0.666 ± 0.683	3.784 ± 0.626
photometric centroid source offset	3.86 ± 2.07	1.87	1.08 ± 1.12	3.70 ± 2.13

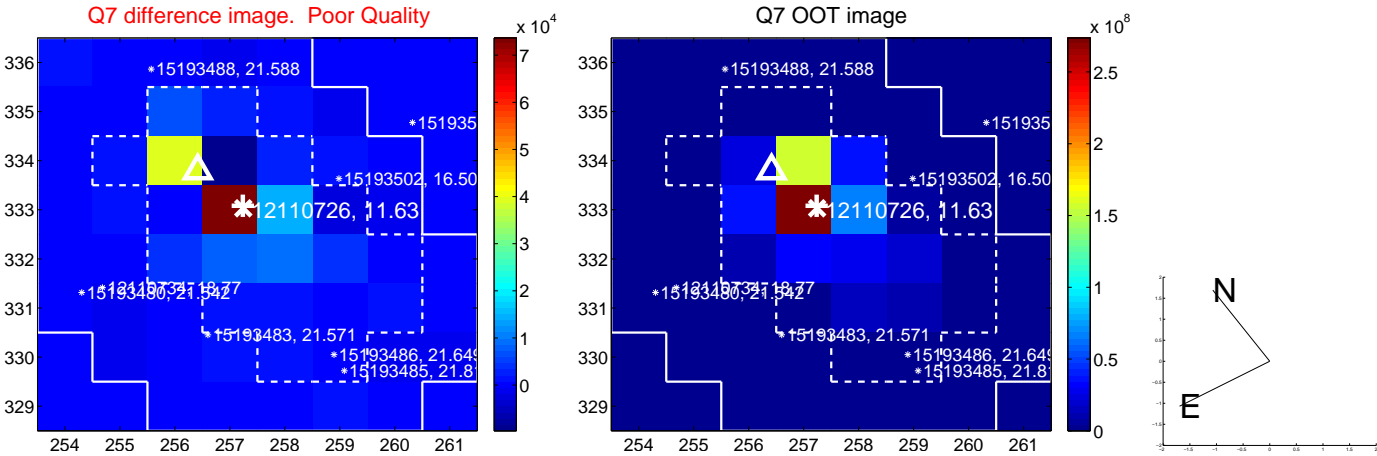


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



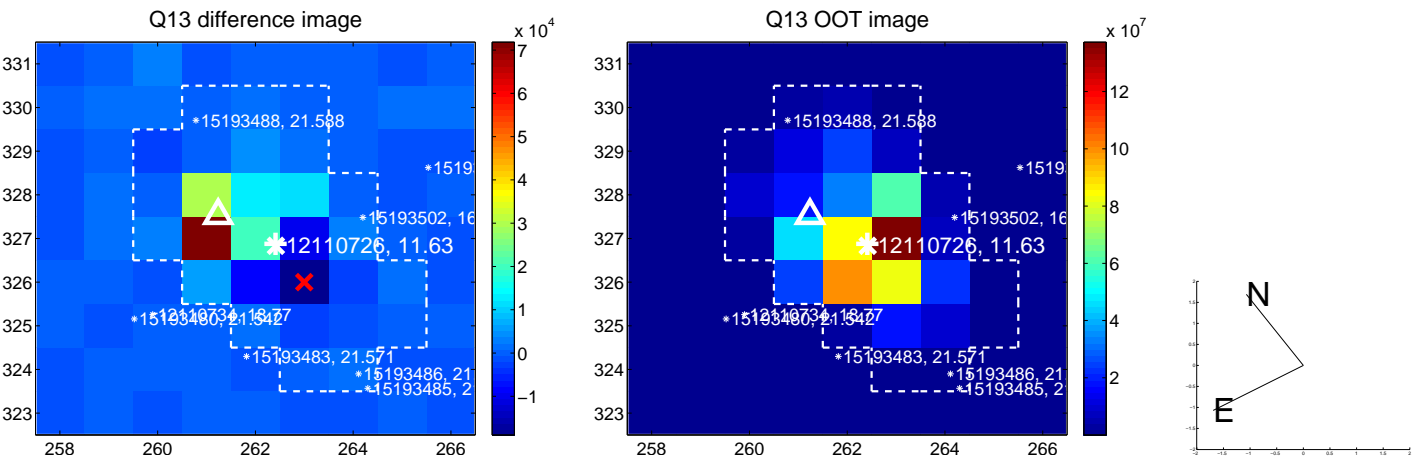
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



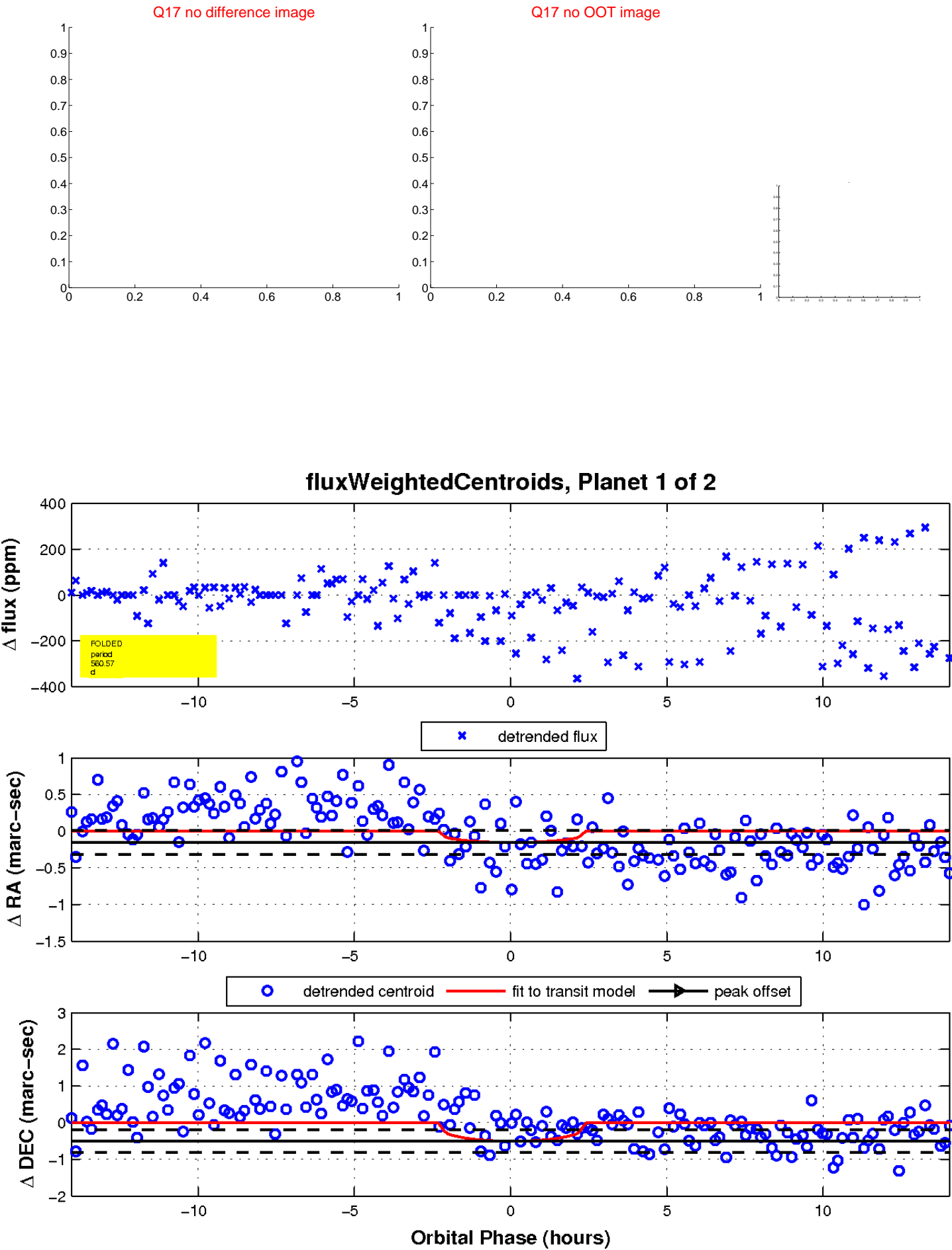
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



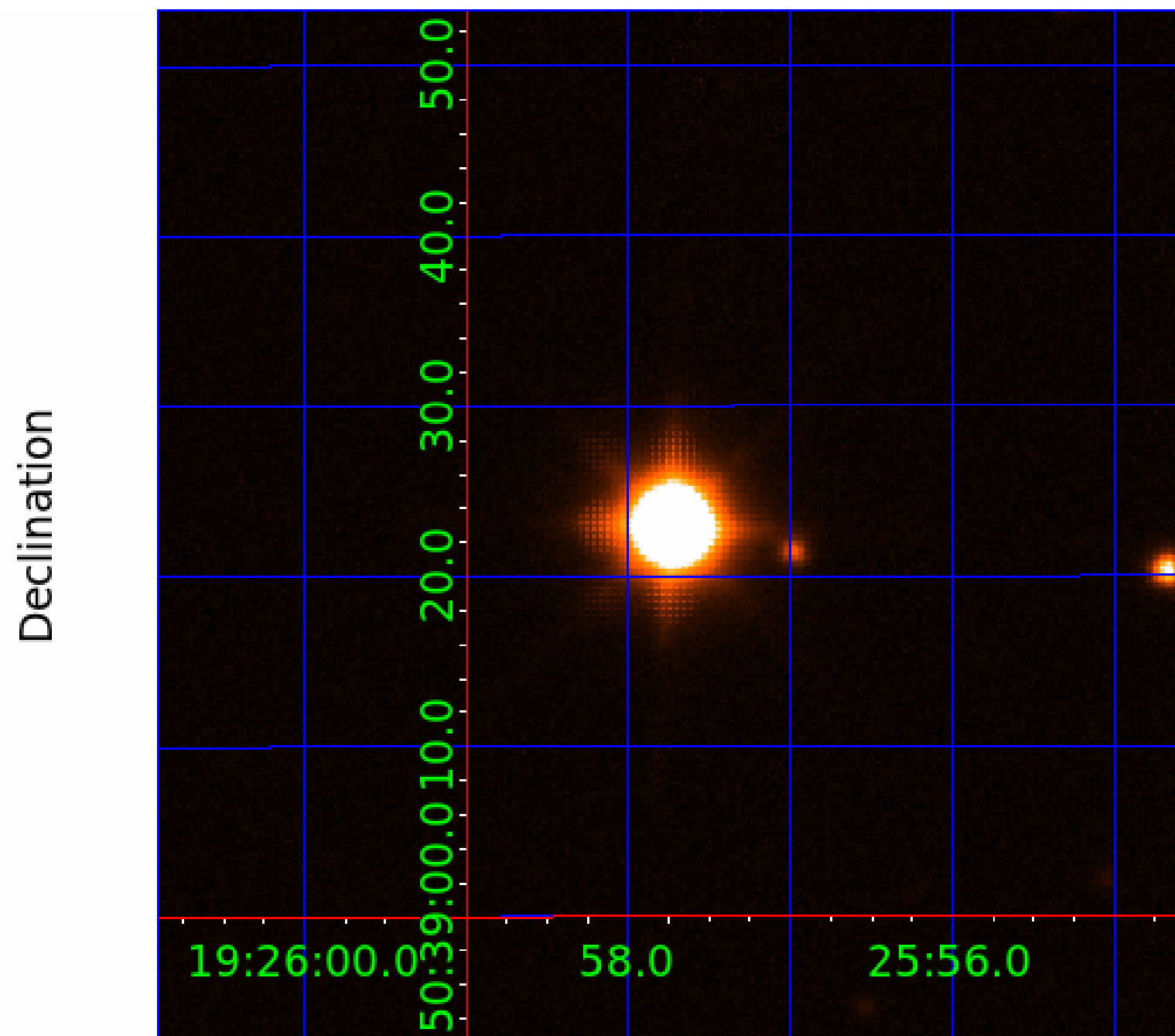
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 012110726

Q1-17 DR25 TCE Parameters

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Robovetter Results

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012110726-02	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

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

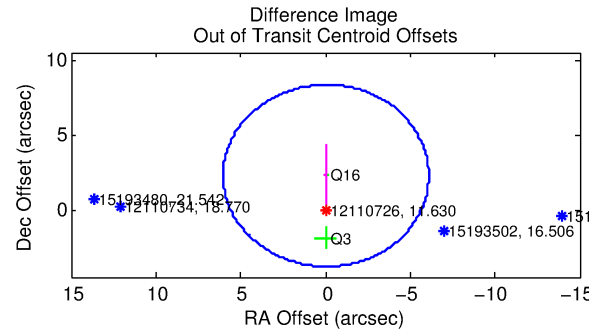
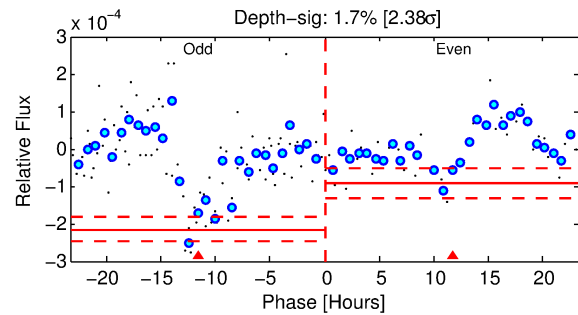
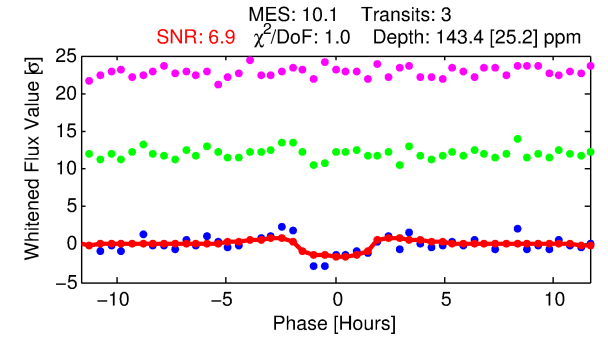
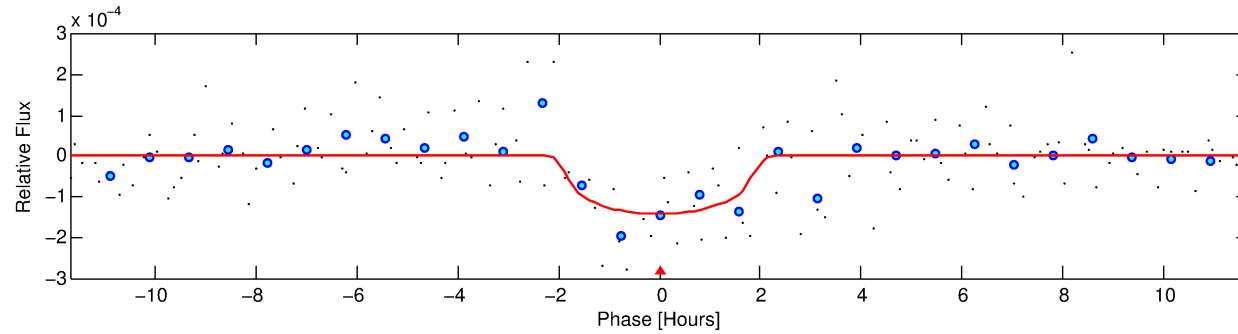
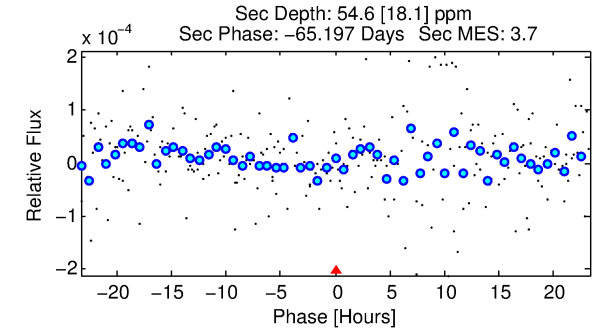
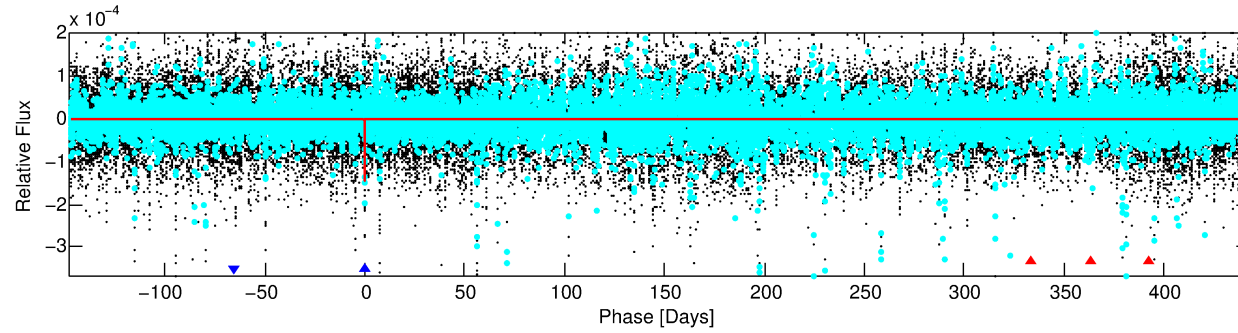
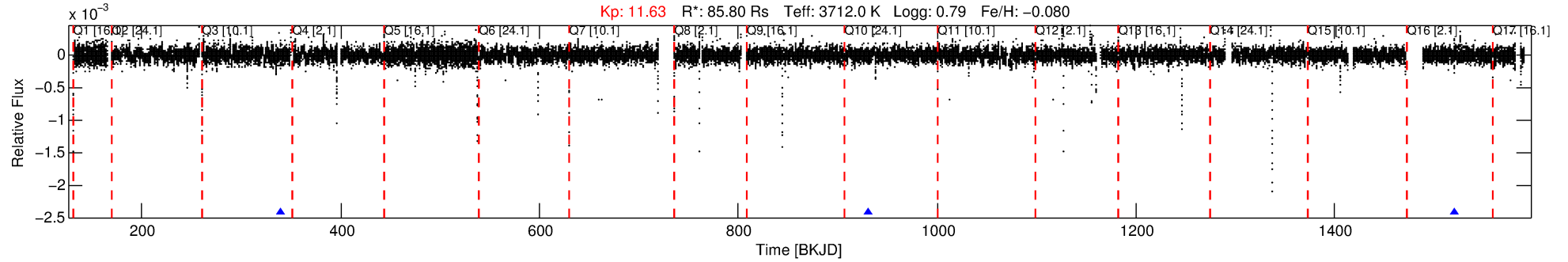
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012110726-02

No Significant Match Found

DV One-Page Summary

KIC: 12110726 Candidate: 2 of 2 Period: 590.067 d



DV Fit Results:

Period = 590.06740 [0.00762] d
Epoch = 340.3961 [0.0107] BKJD
Rp/R* = 0.0117 [0.0117]
a/R* = 843.62 [2078.19]
b = 0.70 [1.86]
Seff = 471.84 [80.42]
Teff = 1188 [51] K
Rp = 109.98 [111.11] Re
a = 1.6292 [0.2036] AU
Ag = 6.60 [13.31] [0.42σ]
Teffp = 2945 [1485] K [1.18σ]

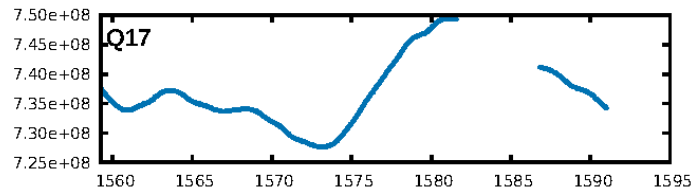
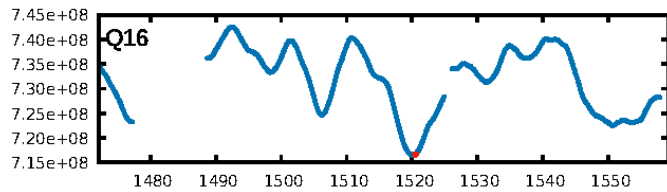
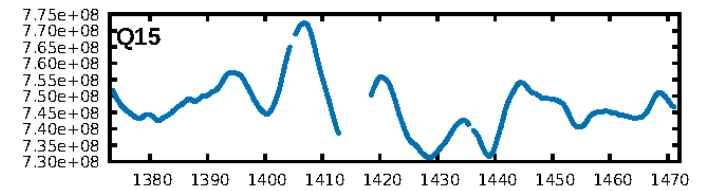
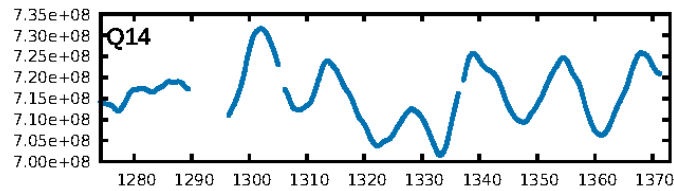
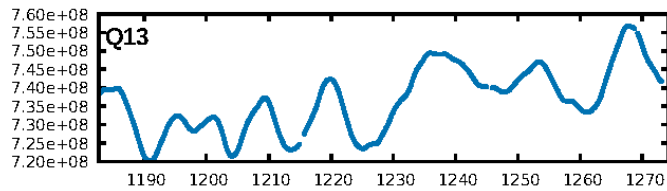
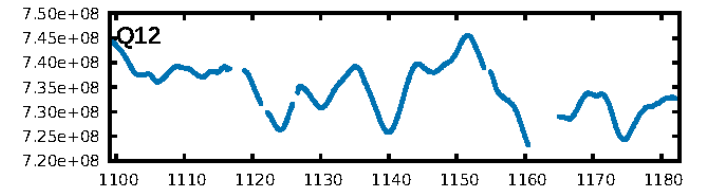
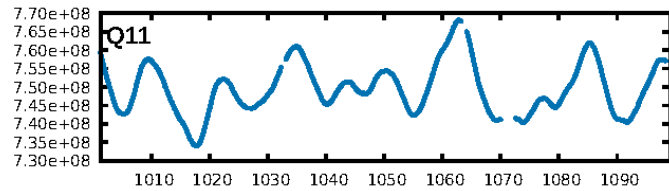
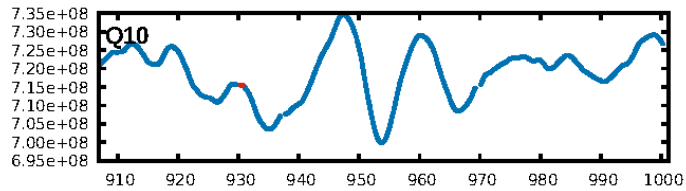
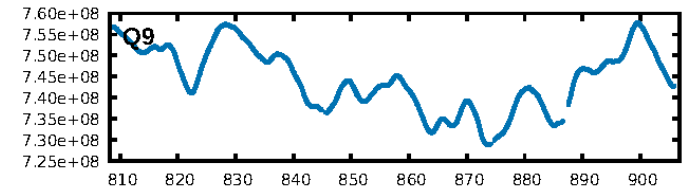
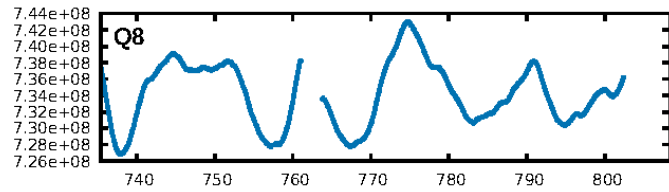
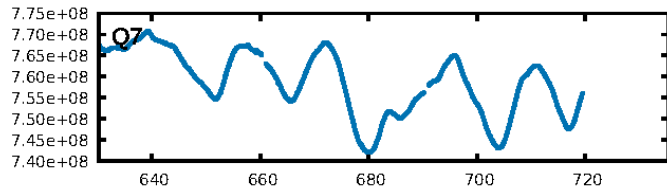
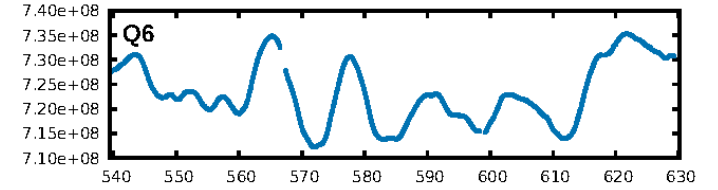
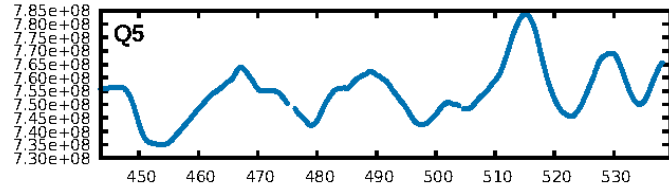
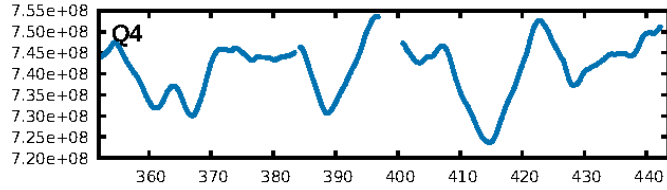
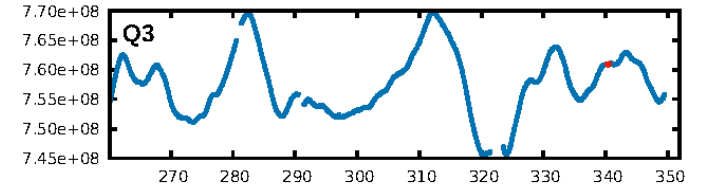
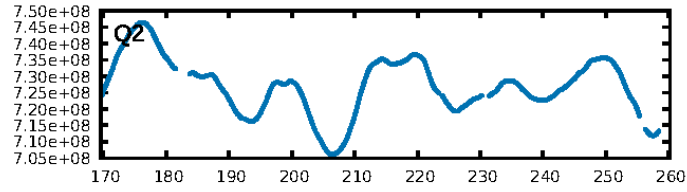
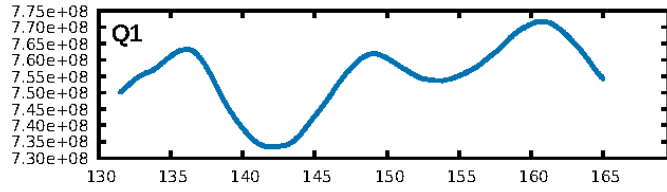
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [115.59σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 3.5%
ModelChiSquareGof-sig: 98.3%
Bootstrap-pfa: 2.63e-06
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.4191
Centroid-sig: 68.8%
Centroid-so: 0.882 arcsec [0.61σ]
OotOffset-rm: 2.265 arcsec [1.12σ]
KicOffset-rm: 2.394 arcsec [1.19σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

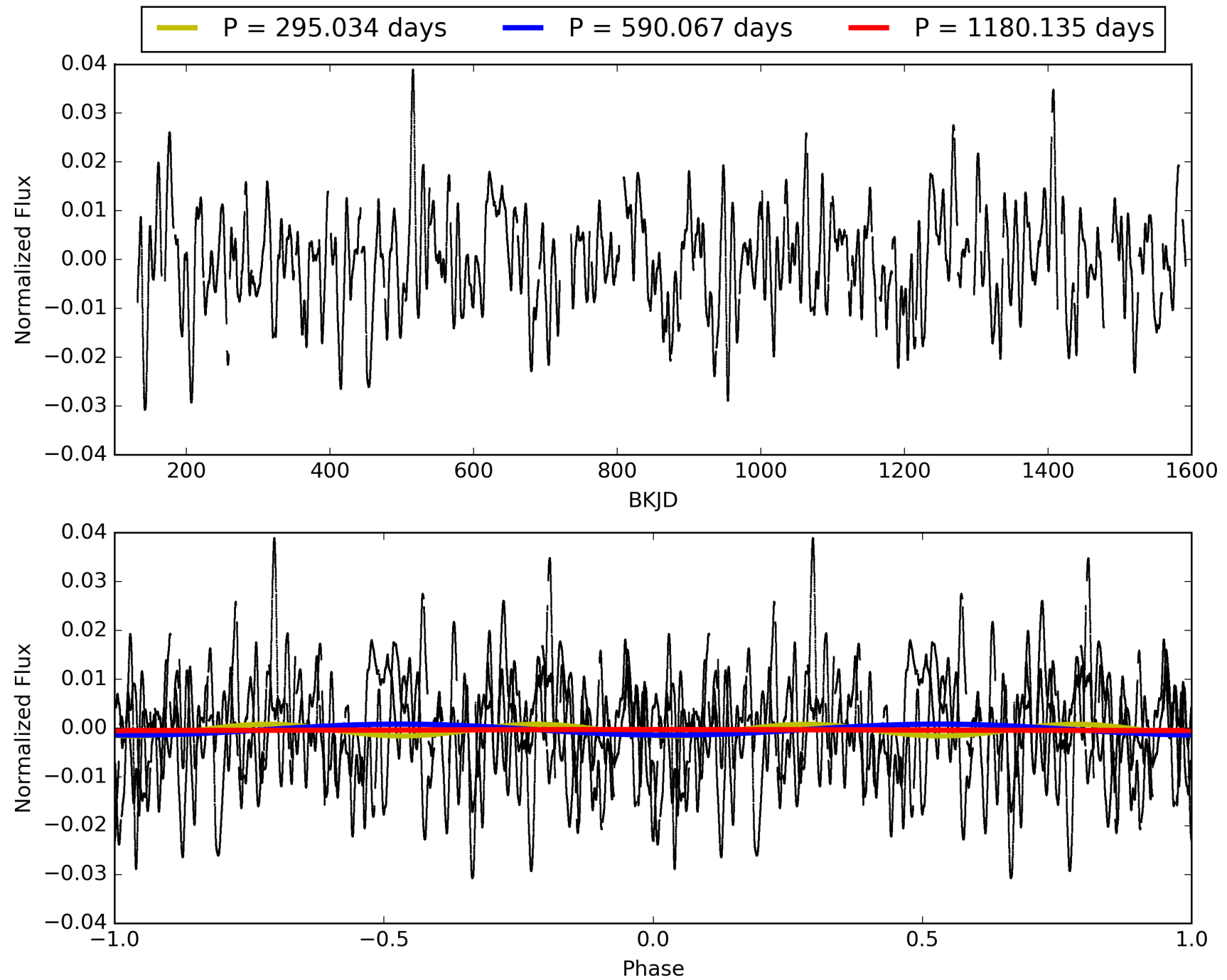
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:53:32 Z

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

TCE 012110726-02, PDC Light Curves

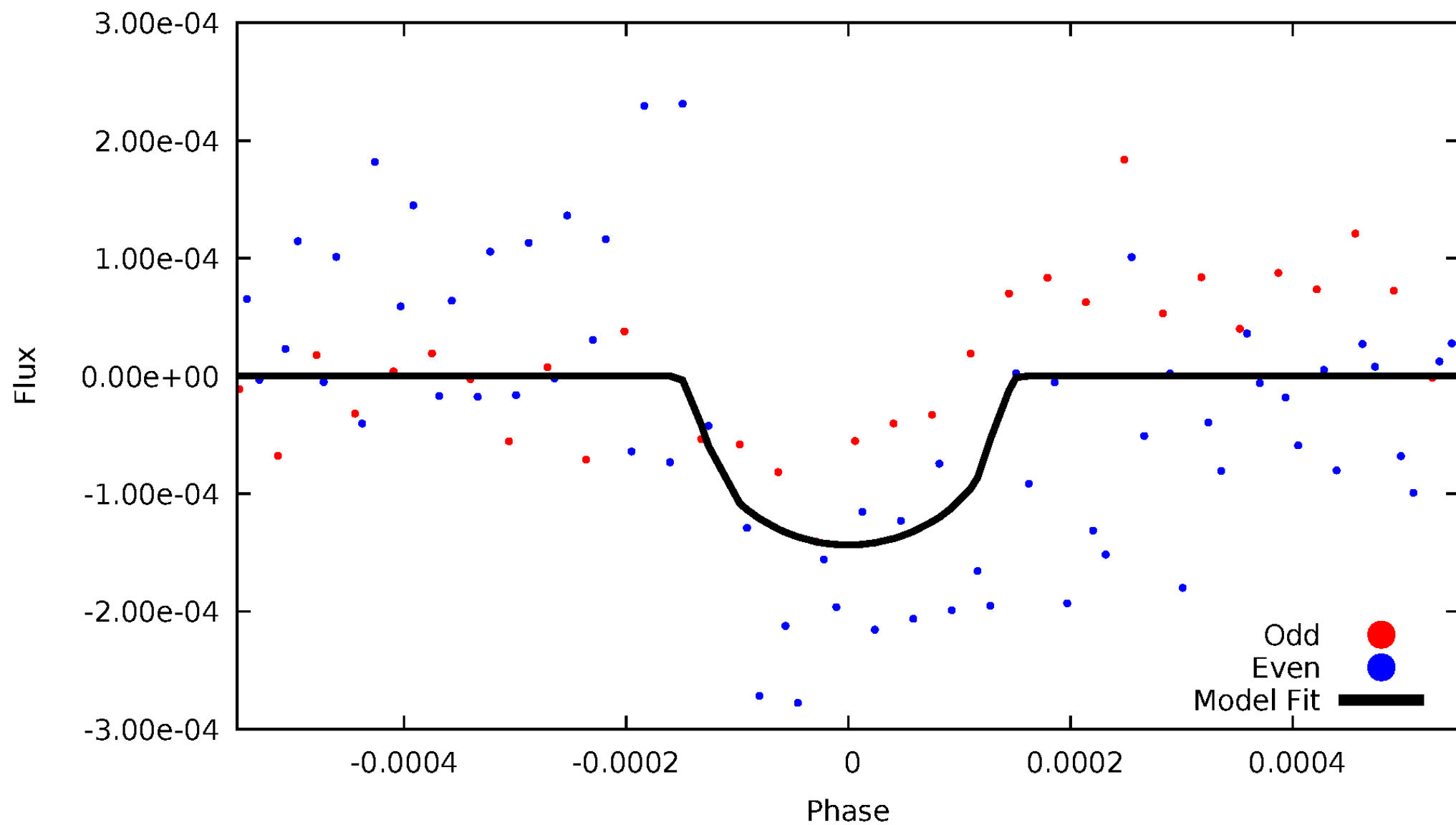


TCE 012110726-02



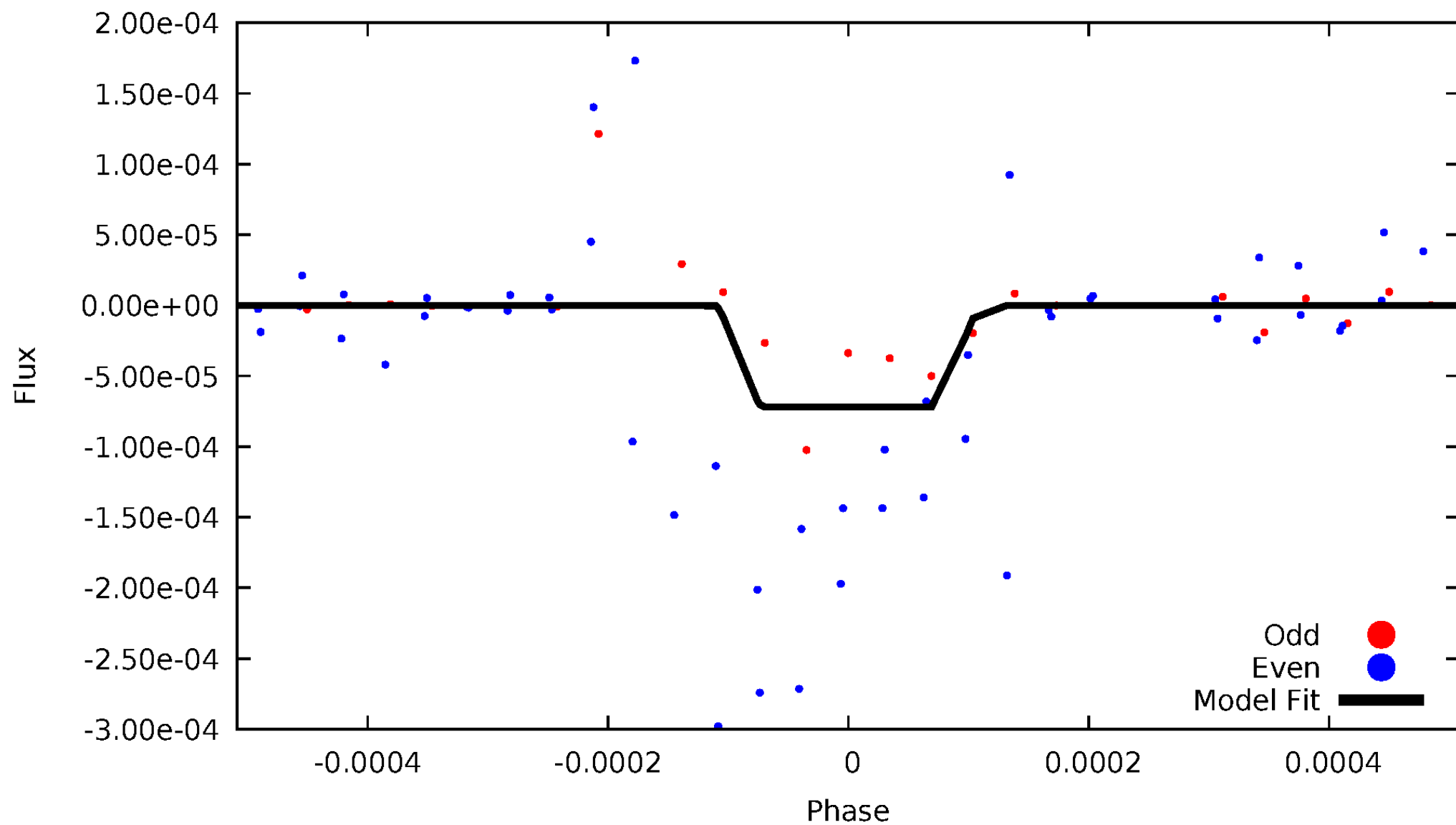
DV Odd/Even

TCE 012110726-02



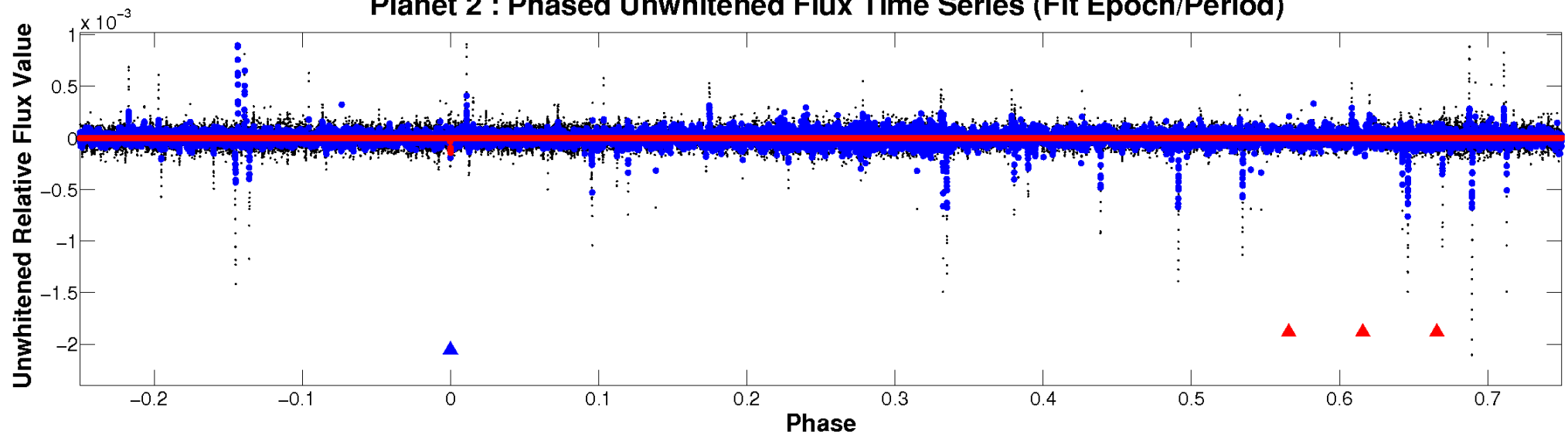
ALT Odd/Even

TCE 012110726-02

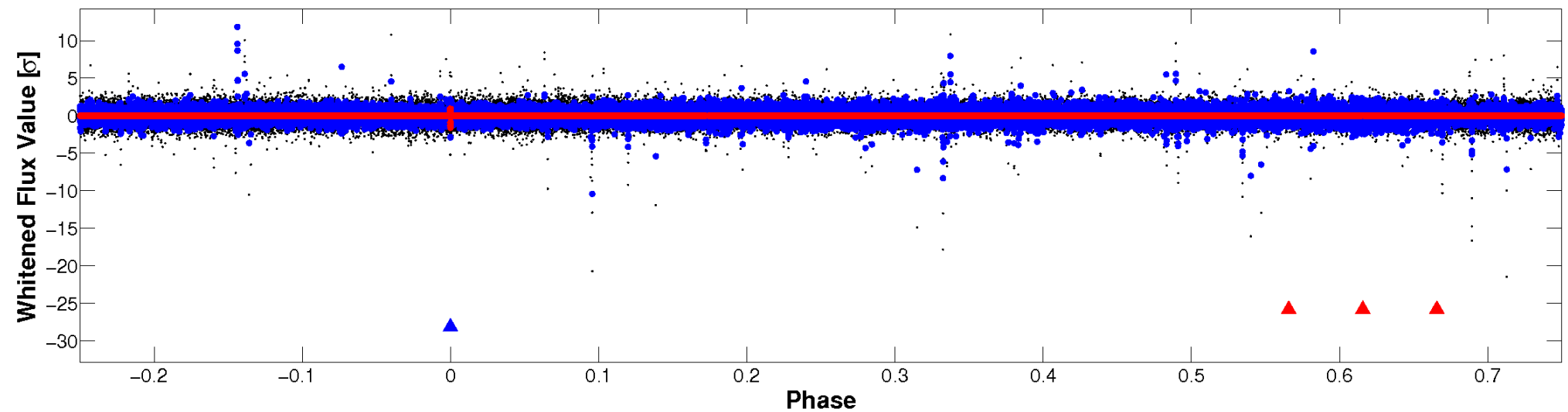


Non-Whitened Vs. Whitened Light Curve

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

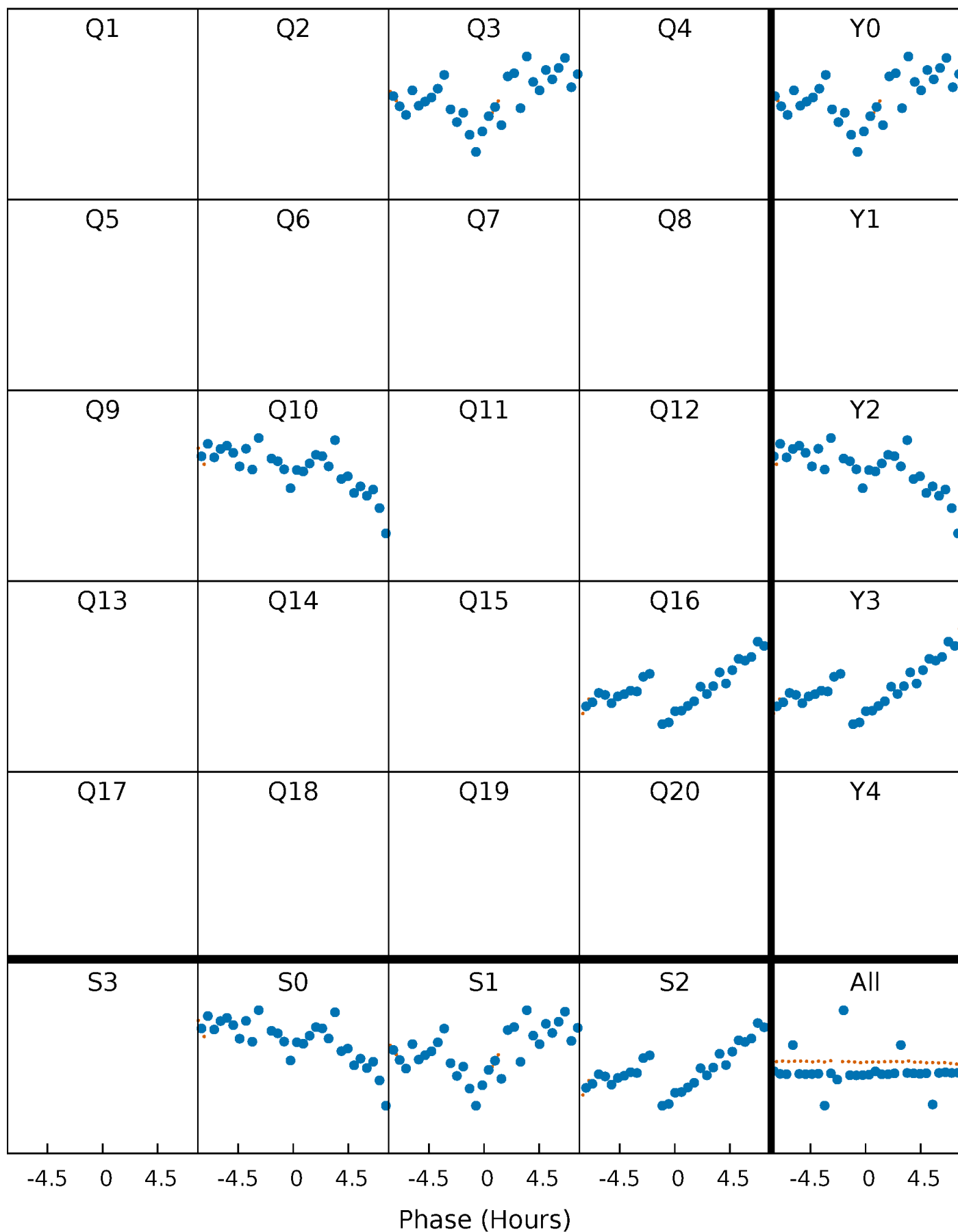


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



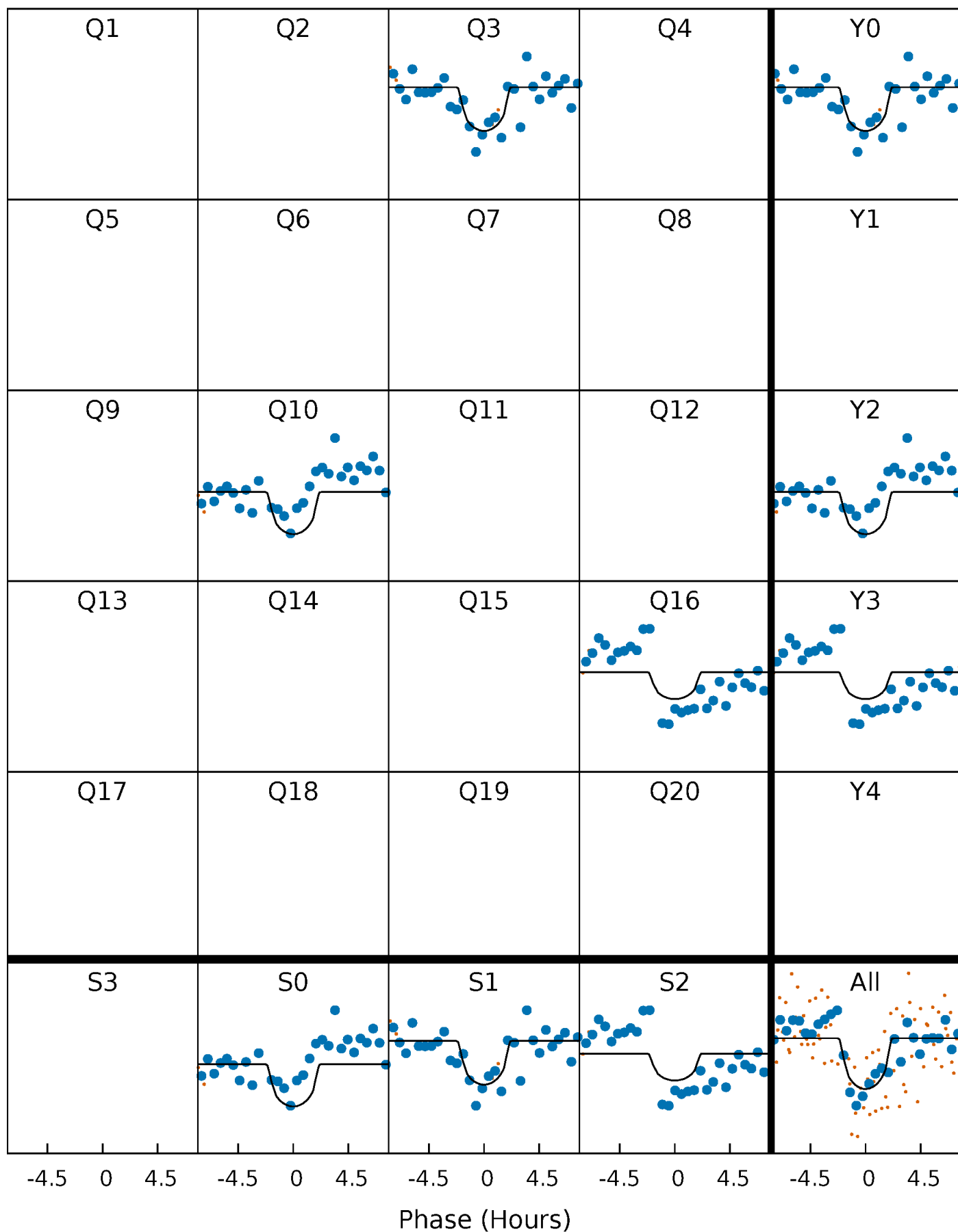
PDC Quarter-Phased Transit Curves

TCE 012110726-02 P=590.067397 Days $T_0=340.396100$ (BKJD)



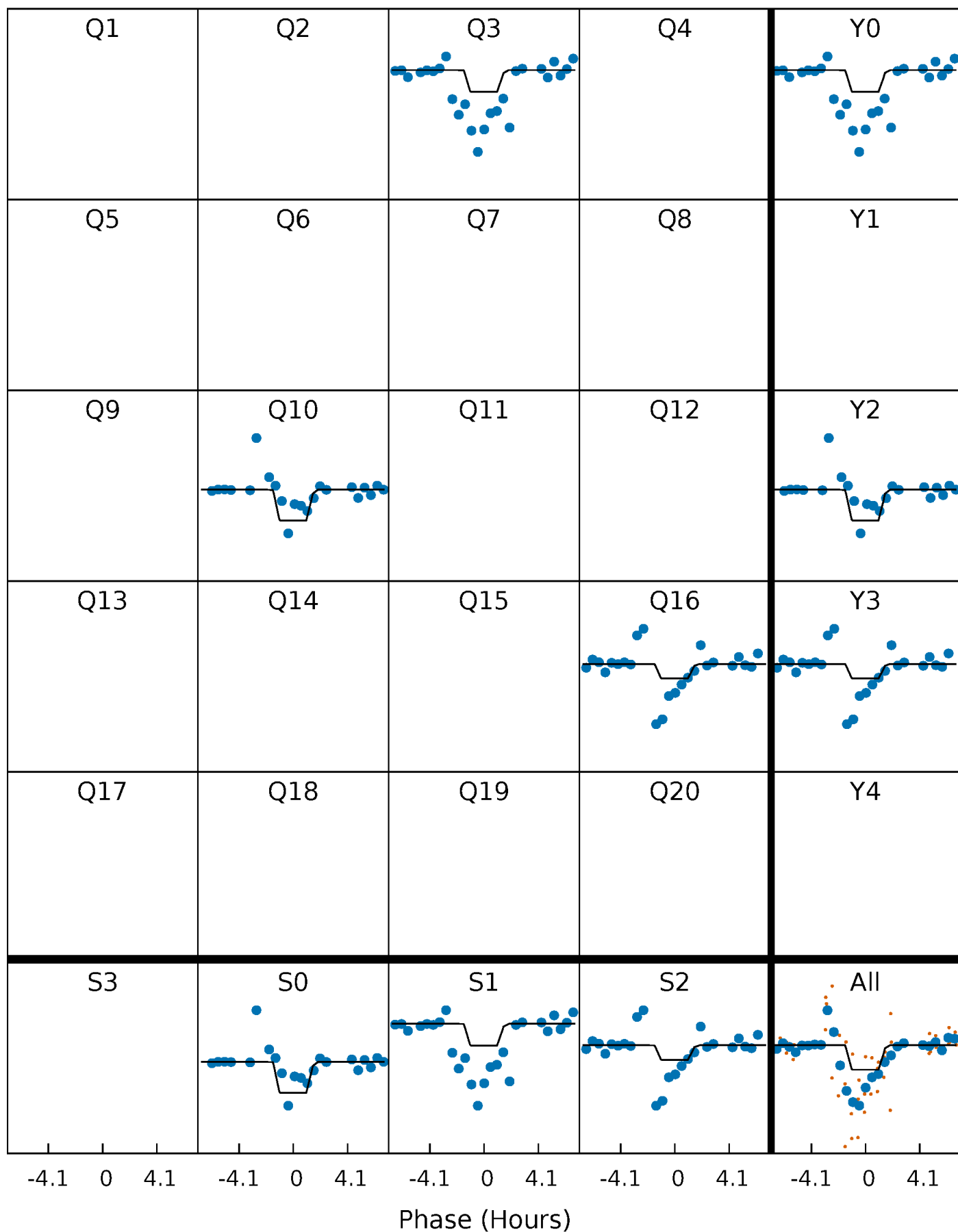
DV Quarter-Phased Transit Curves

TCE 012110726-02 P=590.067397 Days $T_0=340.396100$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

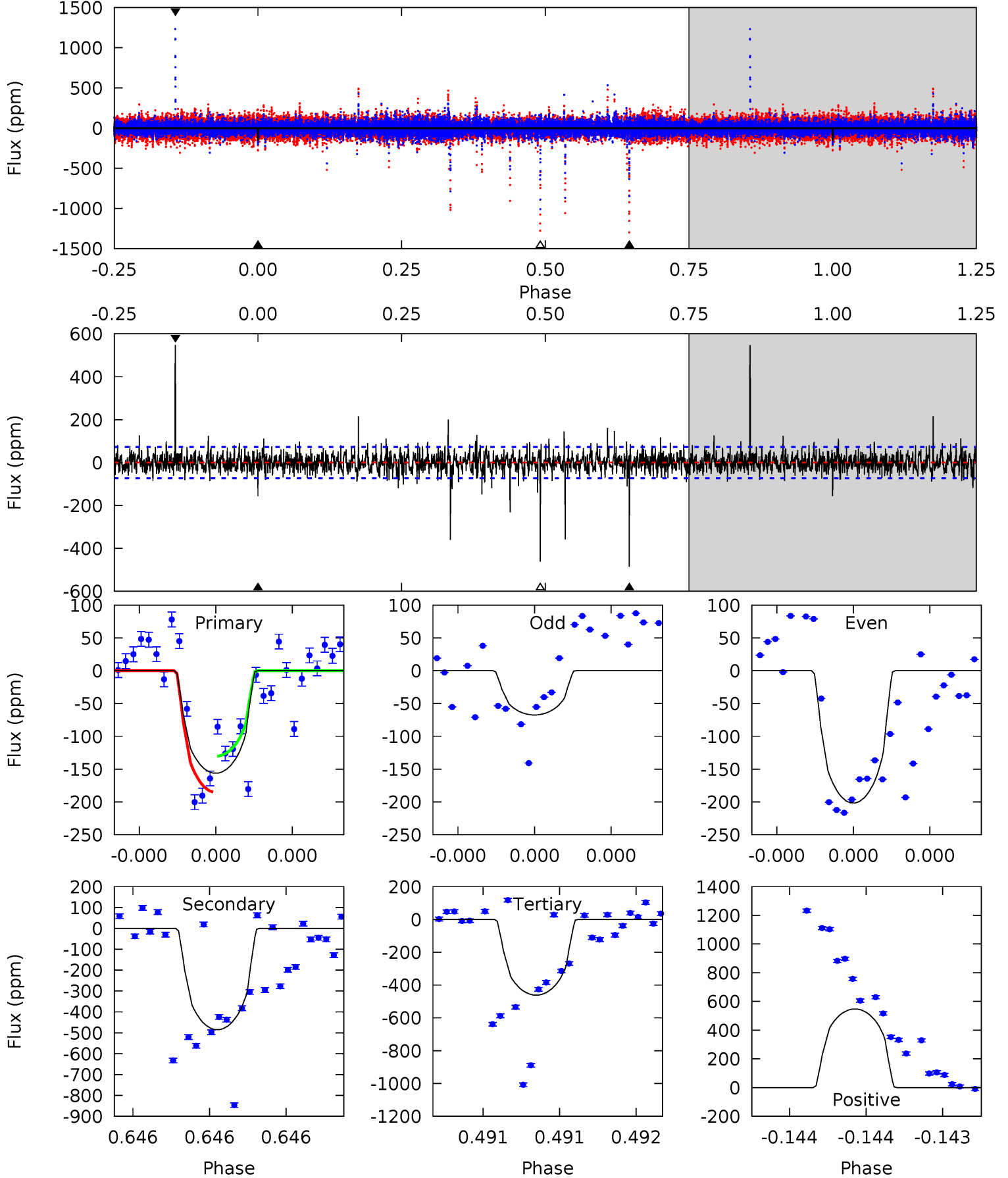
TCE 012110726-02 P=590.080346 Days $T_0=340.386861$ (BKJD)



DV Model-Shift Uniqueness Test

012110726-02, P = 590.067397 Days, E = 340.396100 Days

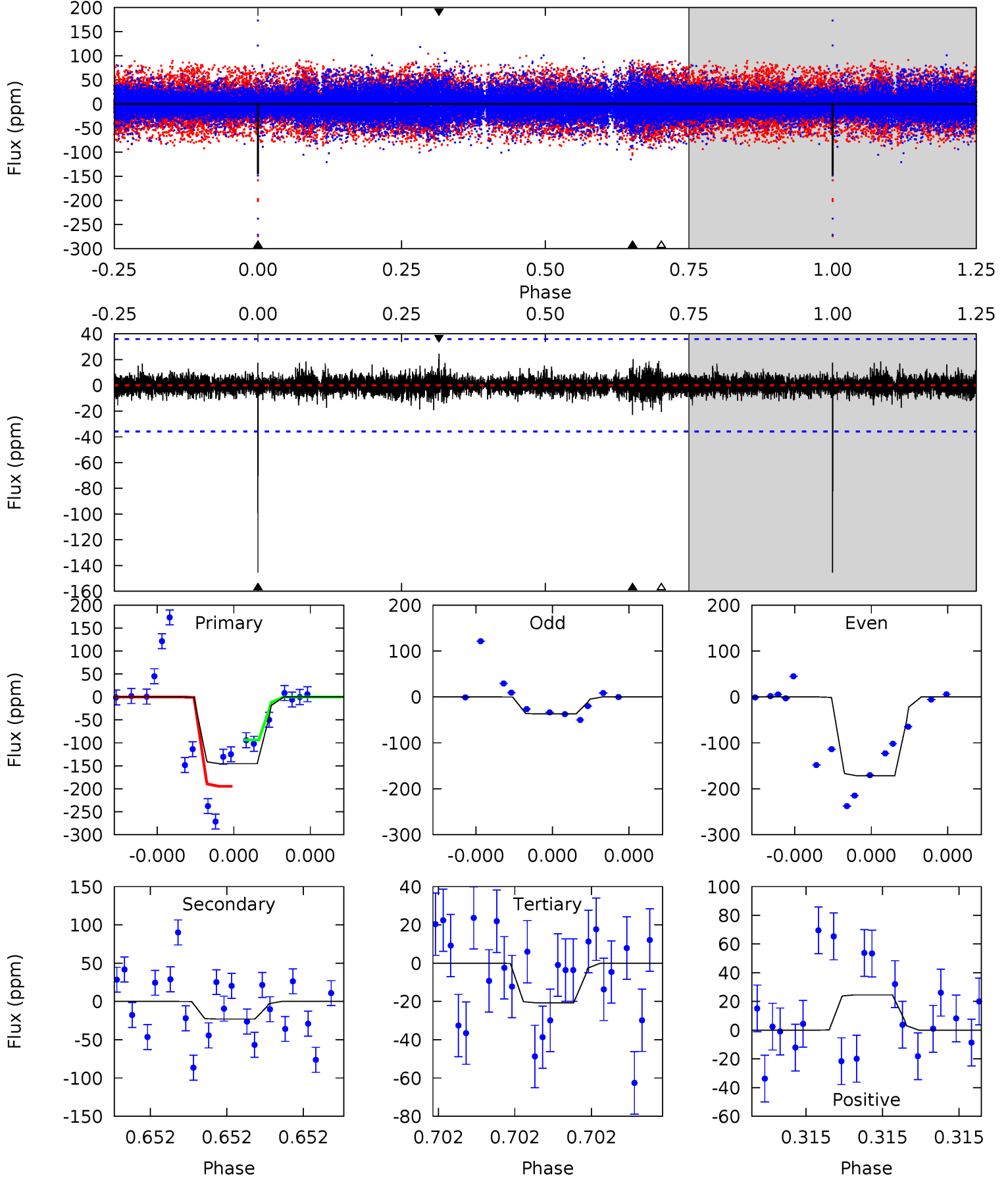
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	37.7	35.9	42.5	5.66	3.62	2.47	-23.7	-30.4	1.84	-4.85	4.53	1.03	0.53	2.14



Alt Model-Shift Uniqueness Test

012110726-02, P = 590.080346 Days, E = 340.386861 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.1	3.66	3.29	3.91	5.72	3.70	0.59	19.8	19.2	0.36	-0.25	11.4	0.87	0.14	0



Stellar Parameters For KIC 012110726

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3712^{+83}_{-101}	$0.790^{+0.030}_{-0.030}$	$-0.080^{+0.200}_{-0.250}$	$85.803^{+2.964}_{-15.806}$	$1.656^{+0.094}_{-0.534}$	$0.000^{+0.000}_{-0.000}$
	+2%/-3%	+4%/-4%	+250%/-312%	+3%/-18%	+6%/-32%	+25%/-9%
Source	PHO54	AST54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 012110726-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-485 ± 13	$135.43^{+98.95}_{-83.78}$	1664^{+43}_{-48}	4329^{+2312}_{-803}	39^{+224}_{-27}
Alt.	-23 ± 6	$104.13^{+94.86}_{-70.26}$	1658^{+46}_{-51}	2833^{+1248}_{-539}	$3.017^{+26.192}_{-2.196}$

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 $A_{obs} \gg 1.0$

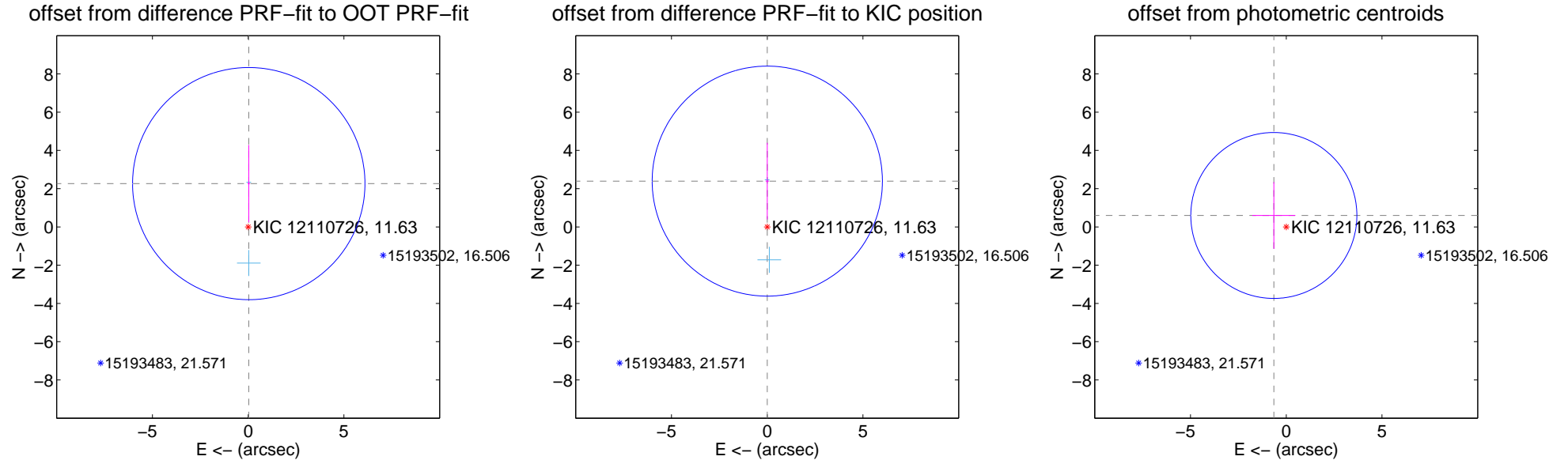
DV Centroid Data

Supplemental centroid analysis for 012110726-02. **Kepler magnitude: 11.63.** Transit SNR 6.88

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.265 ± 2.023	1.12	-0.030 ± 0.067	2.264 ± 2.023
PRF-fit source offset from KIC position	2.394 ± 2.004	1.19	-0.004 ± 0.085	2.394 ± 2.004
photometric centroid source offset	0.88 ± 1.45	0.61	0.65 ± 1.12	0.60 ± 1.75



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



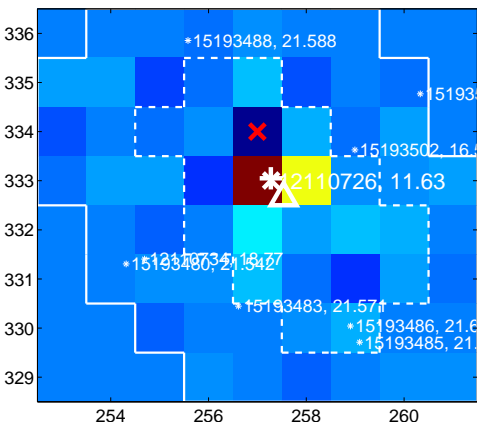
Q2 no difference image



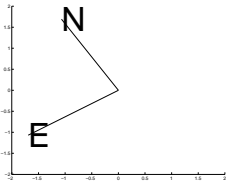
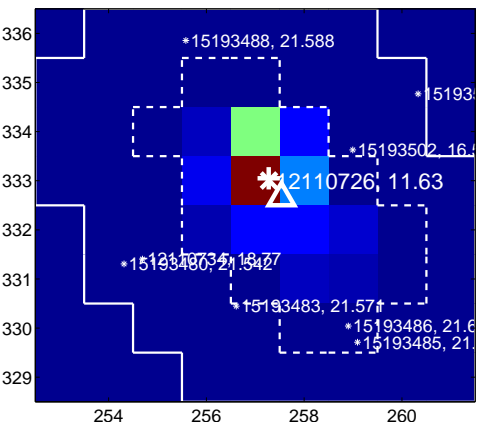
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



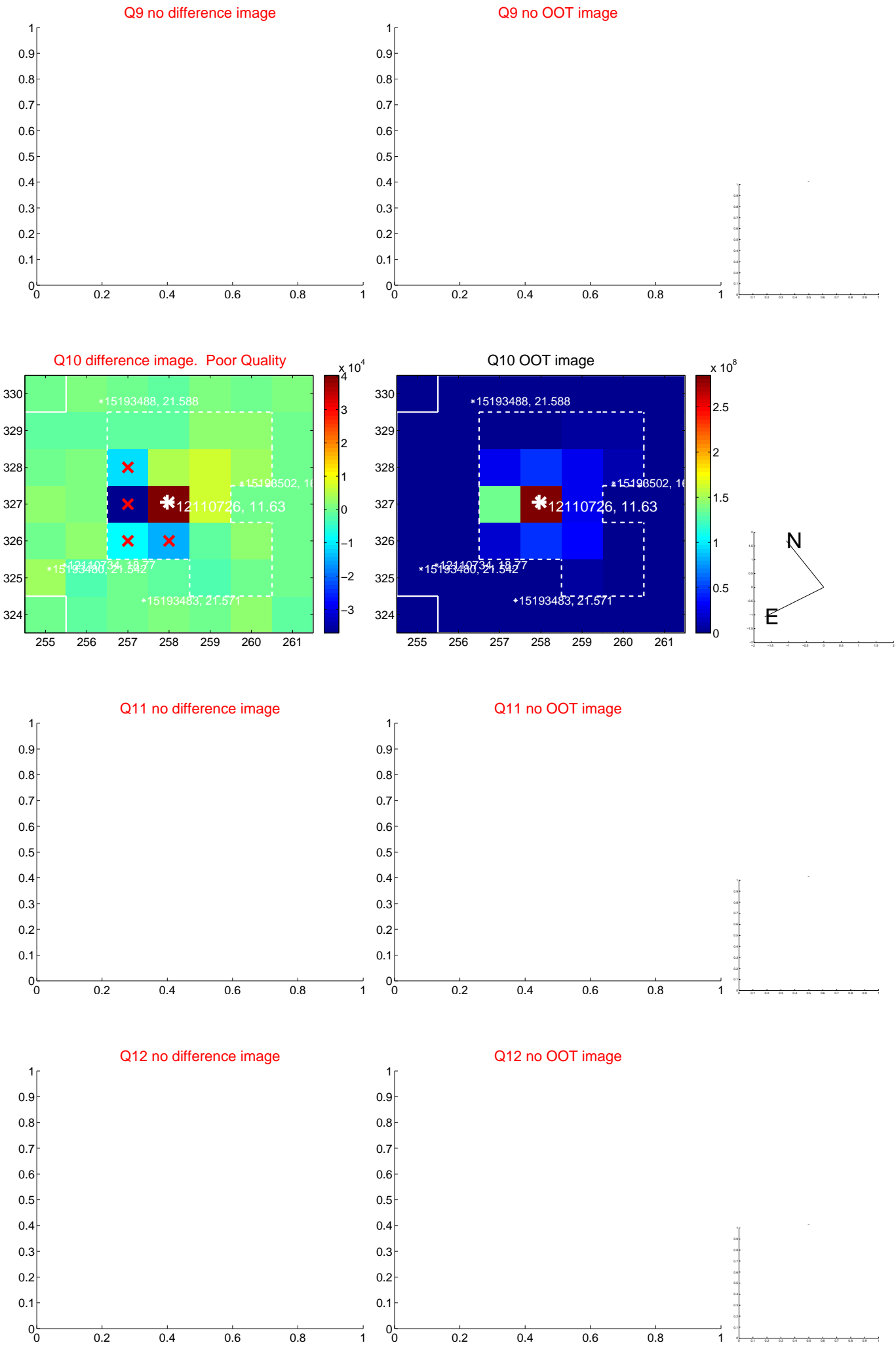
Q4 no OOT image



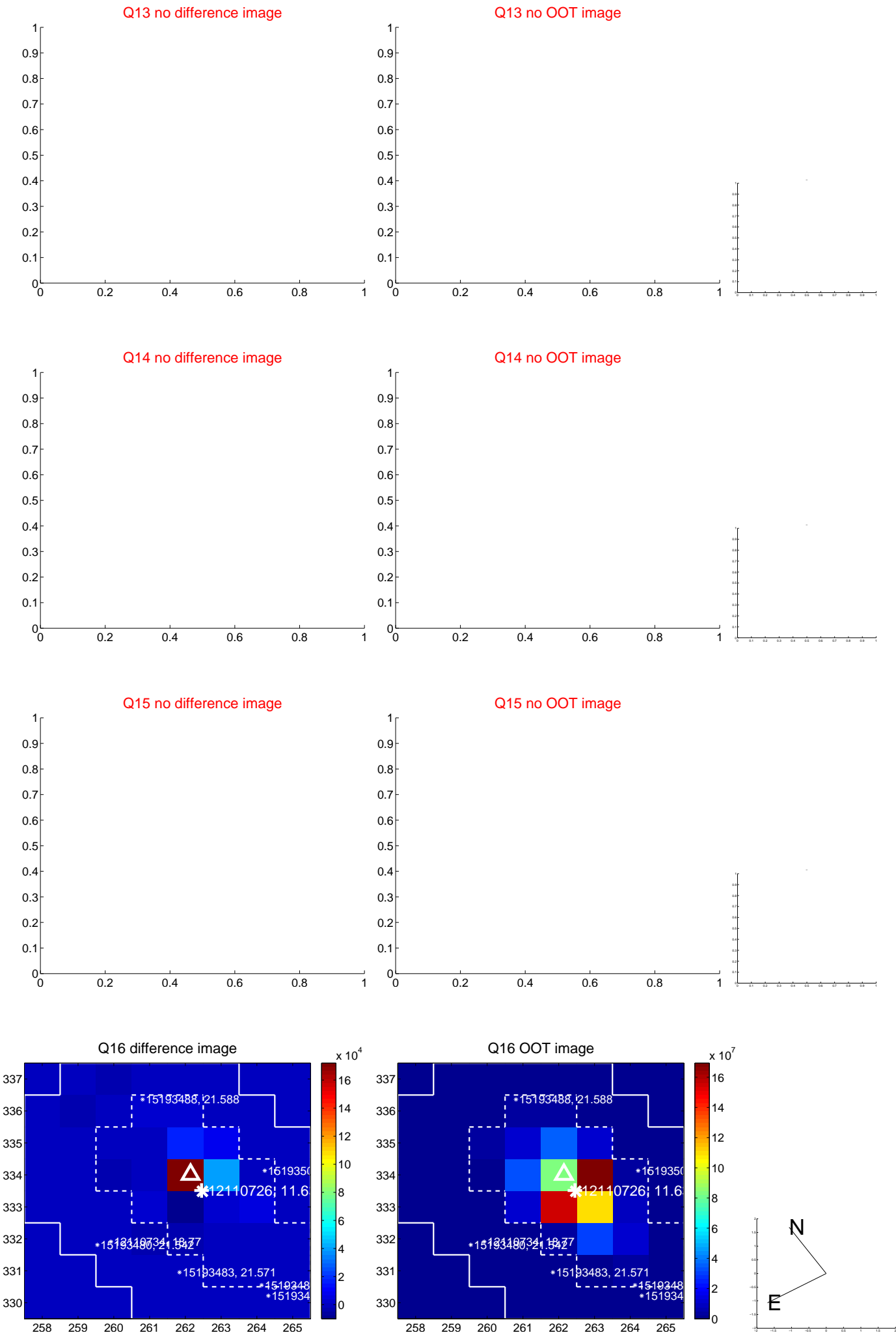
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



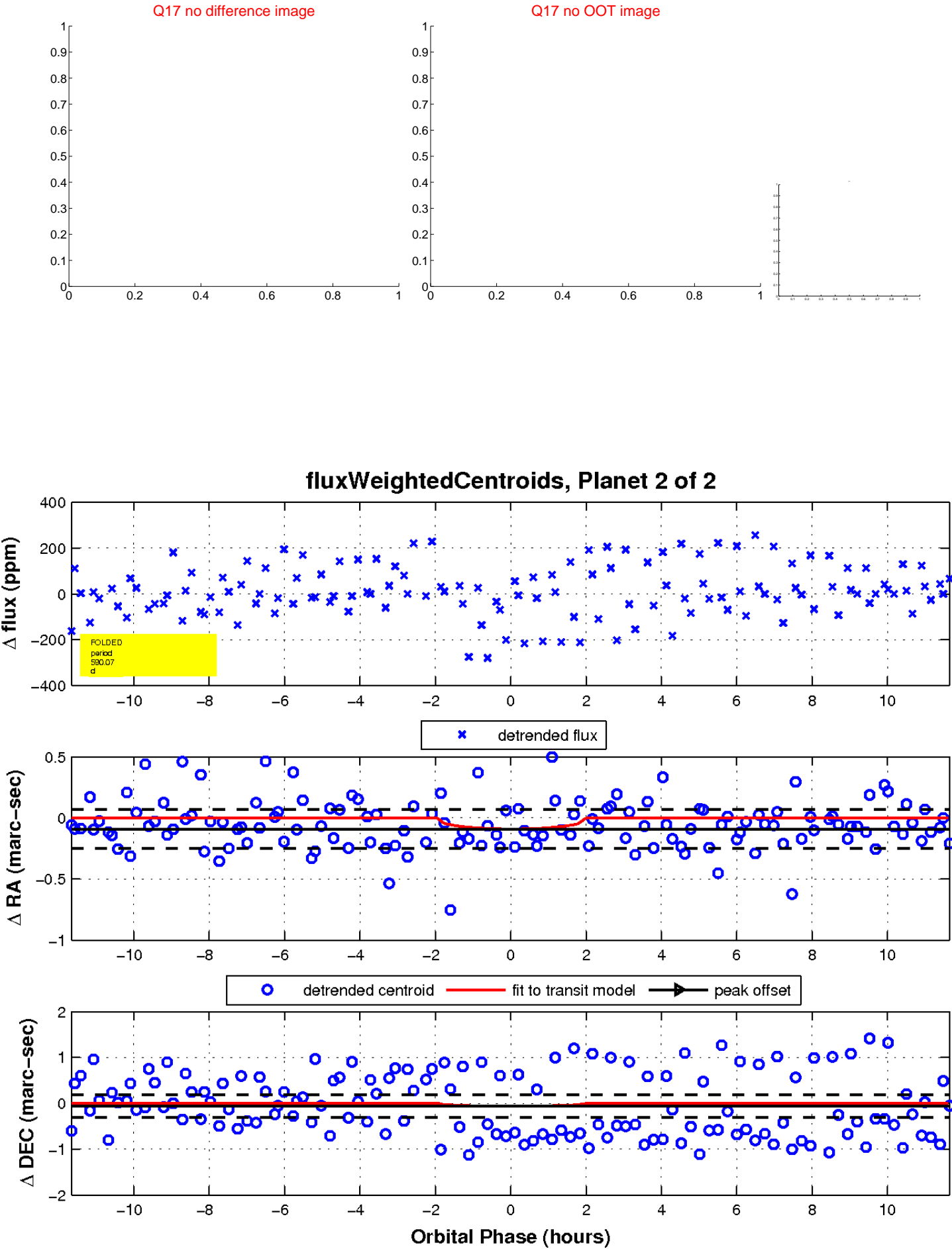
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

