

KIC 011822156

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})
011822156-01	OBS	No	397.926517	518.444341	1852.4	5.465	16.0	6.6	0.78	5282	3.33	0.47
011822156-02	OBS	No	511.956227	528.868518	1824.2	4.159	15.1	7.3	0.78	5282	3.33	0.33
011822156-03	OBS	No	275.831388	372.346511	1334.1	4.872	14.9	5.7	0.78	5282	3.19	0.76
011822156-04	OBS	No	306.578323	287.296455	1631.1	10.500	14.7	-1.0	0.78	5282	3.09	0.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011822156-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011822156-02	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
011822156-03	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
011822156-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

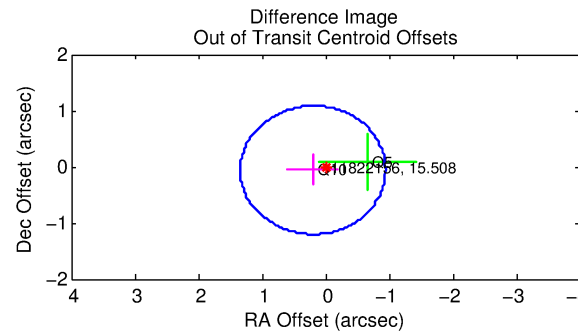
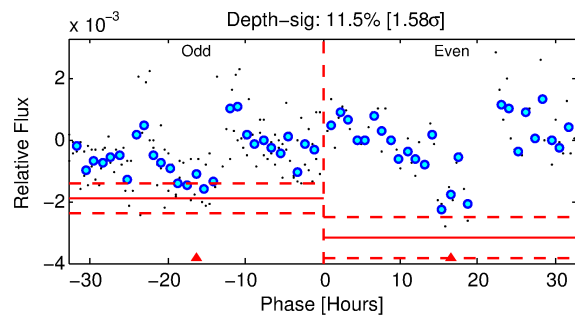
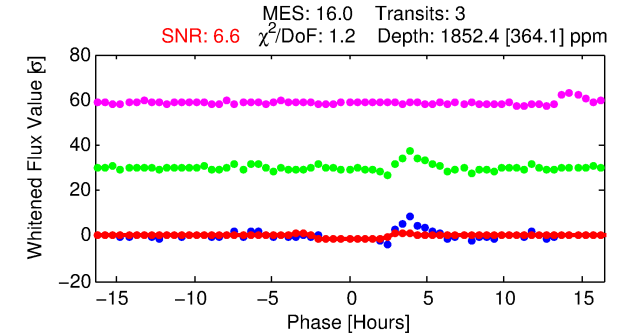
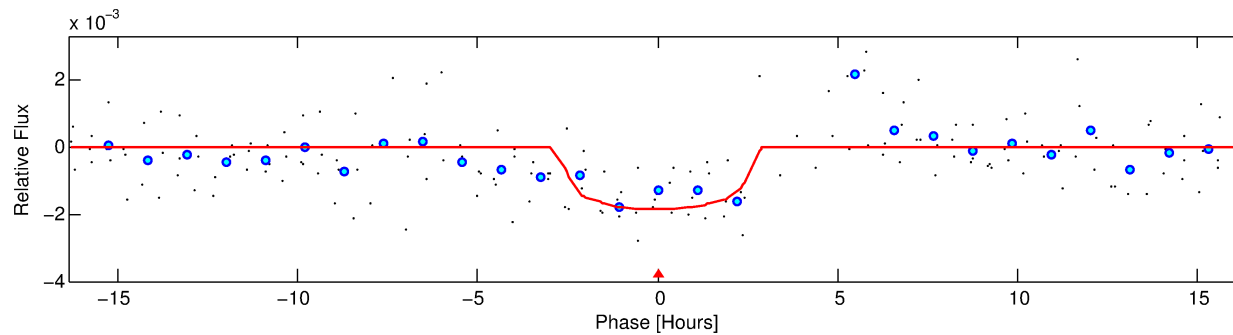
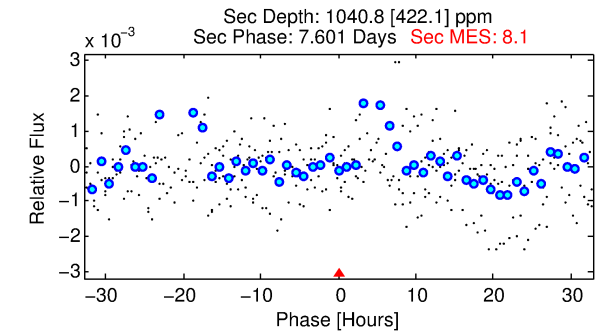
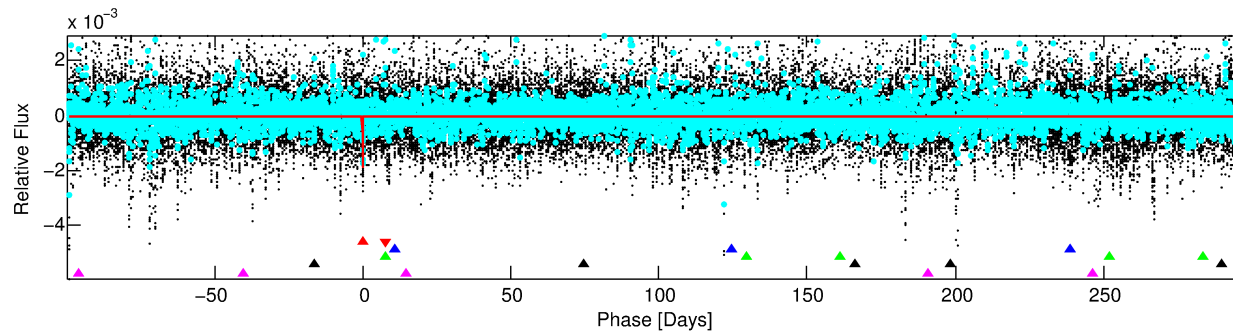
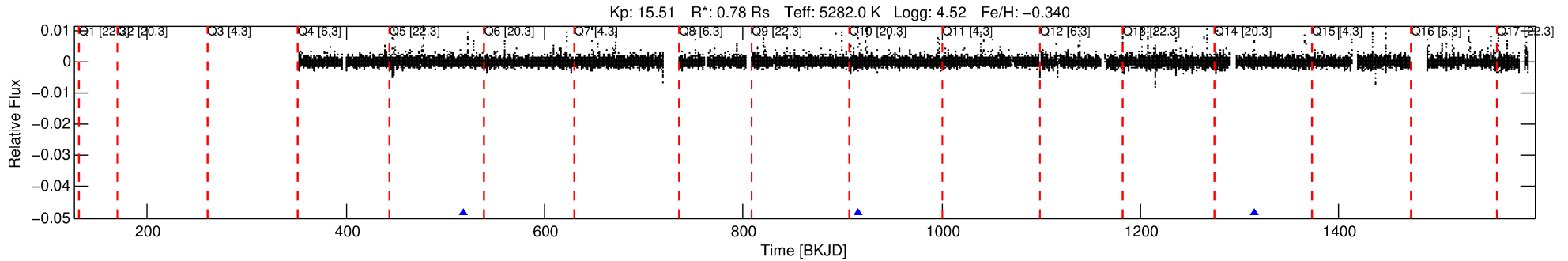
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 011822156-01

No Significant Match Found

DV One-Page Summary

KIC: 11822156 Candidate: 1 of 5 Period: 397.927 d



DV Fit Results:

Period = 397.92652 [0.00755] d
Epoch = 518.4443 [0.0105] BKJD
Rp/R* = 0.0392 [0.0555]
a/R* = 551.24 [3016.59]
b = 0.31 [15.97]
Seff = 0.46 [0.10]
Teq = 211 [11] K
Rp = 3.33 [4.74] Re
a = 0.9556 [0.1063] AU
Ag = 47074.60 [134960.39] [0.35σ]
Teffp = 4794 [3435] K [1.33σ]

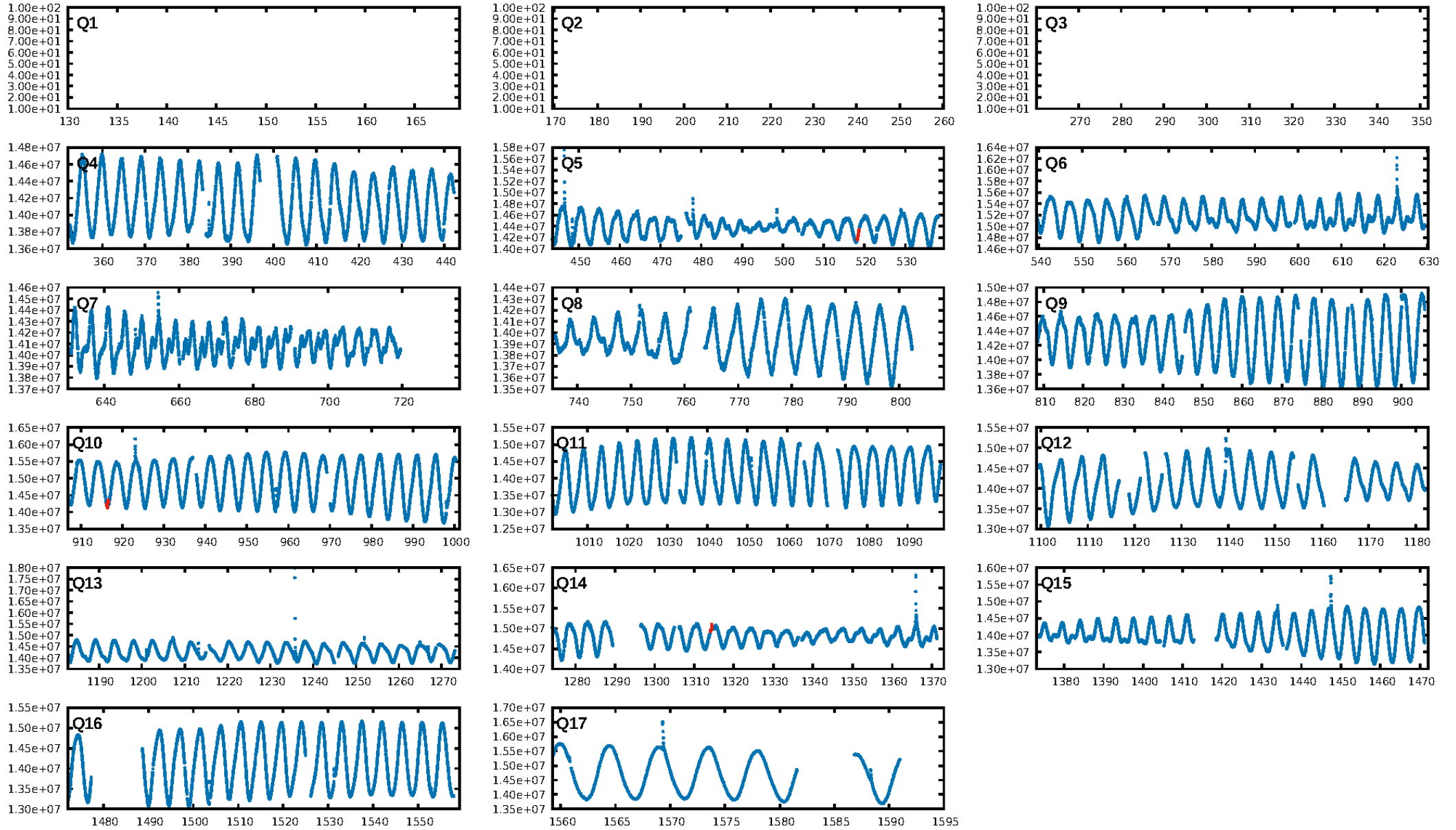
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [149.34σ]
LongPeriod-sig: 100.0% [398.47σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 32.3%
Bootstrap-pfa: 3.52e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.239
Centroid-sig: 22.7%
Centroid-so: 1.516 arcsec [1.35σ]
OotOffset-rm: 0.208 arcsec [0.55σ]
KicOffset-rm: 0.092 arcsec [0.30σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-st: 1/0/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

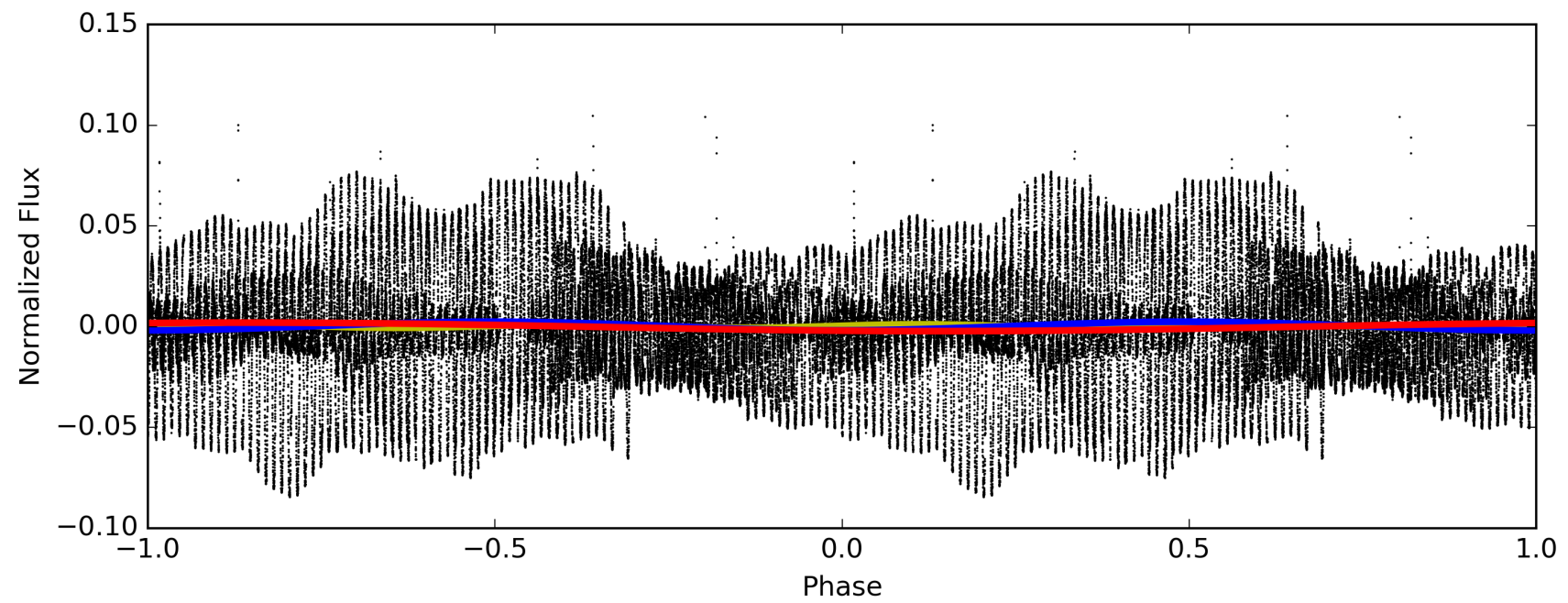
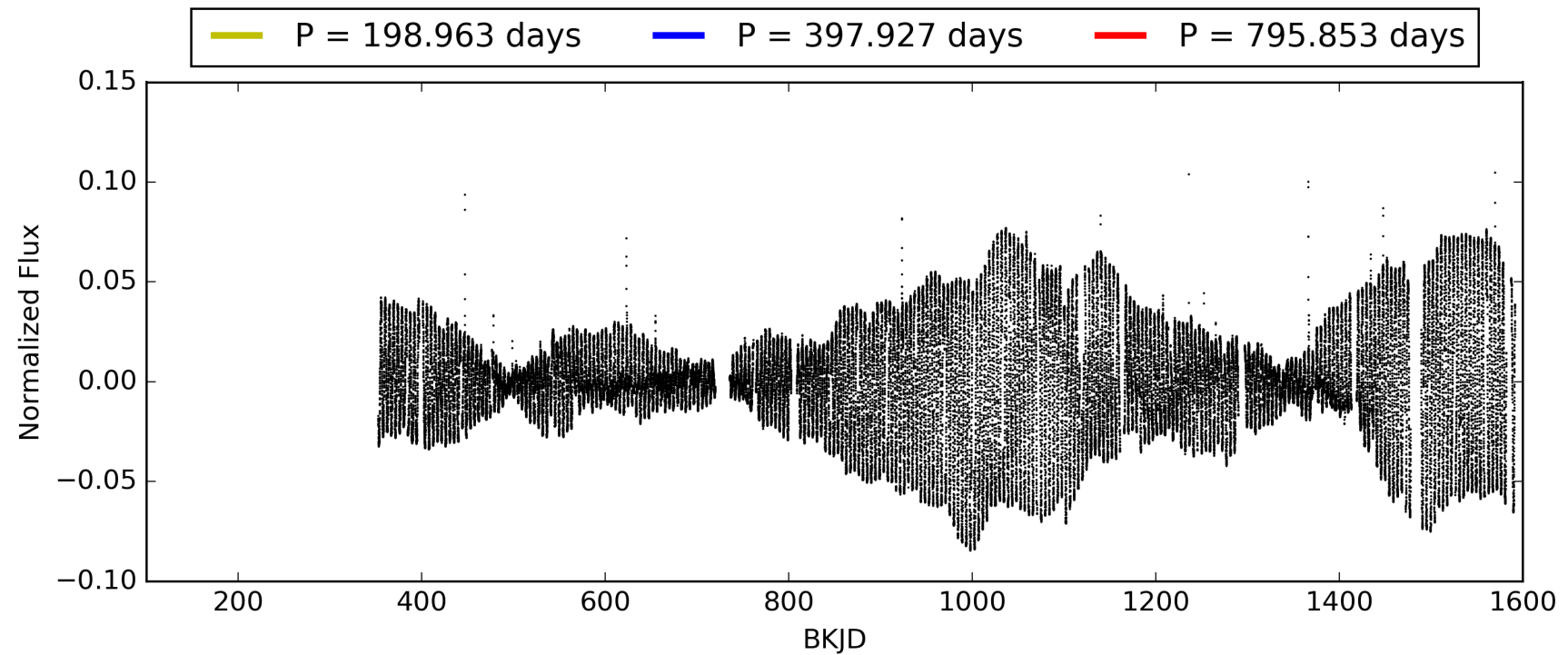
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:38:03 Z

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

TCE 011822156-01, PDC Light Curves

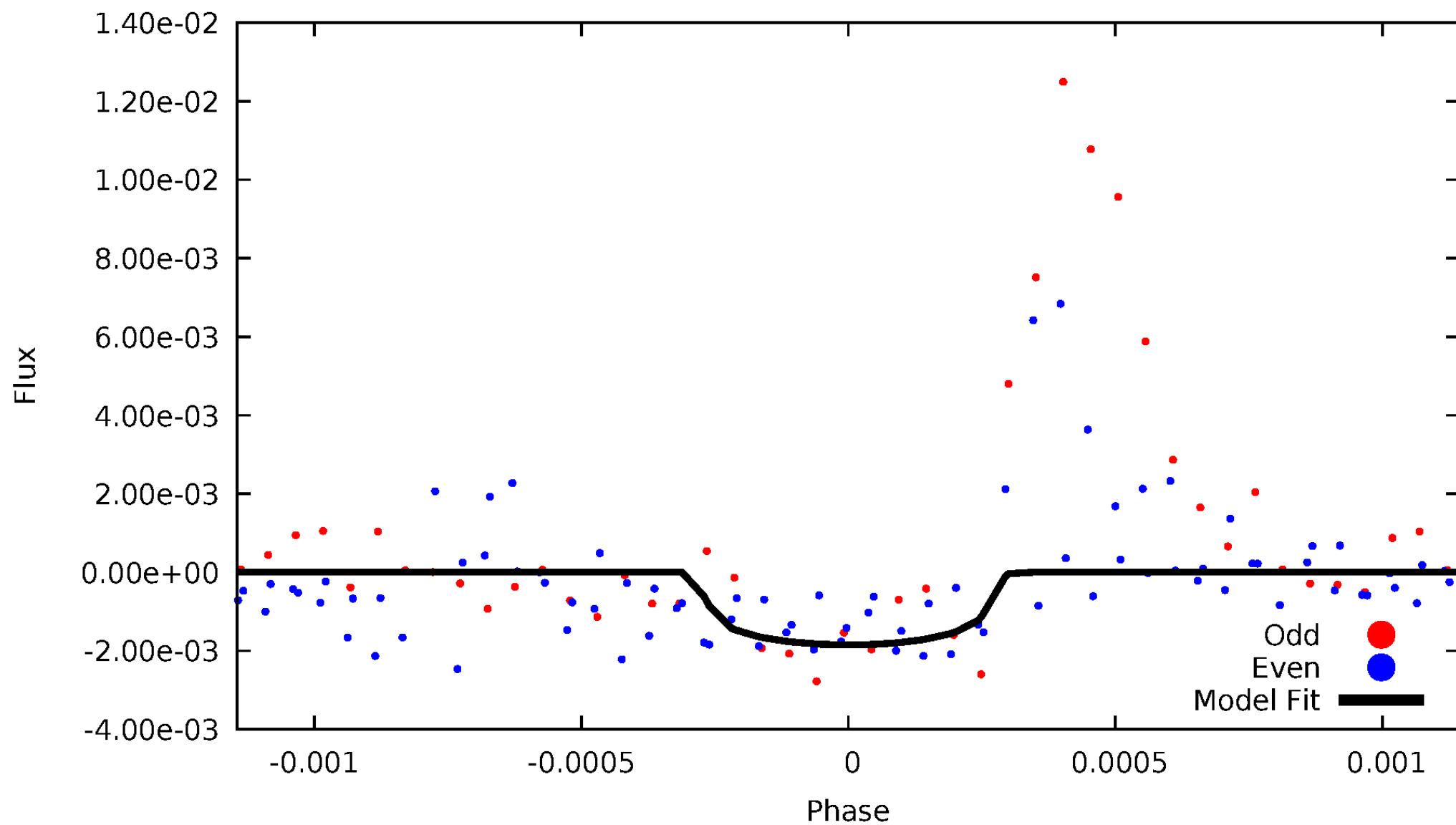


TCE 011822156-01



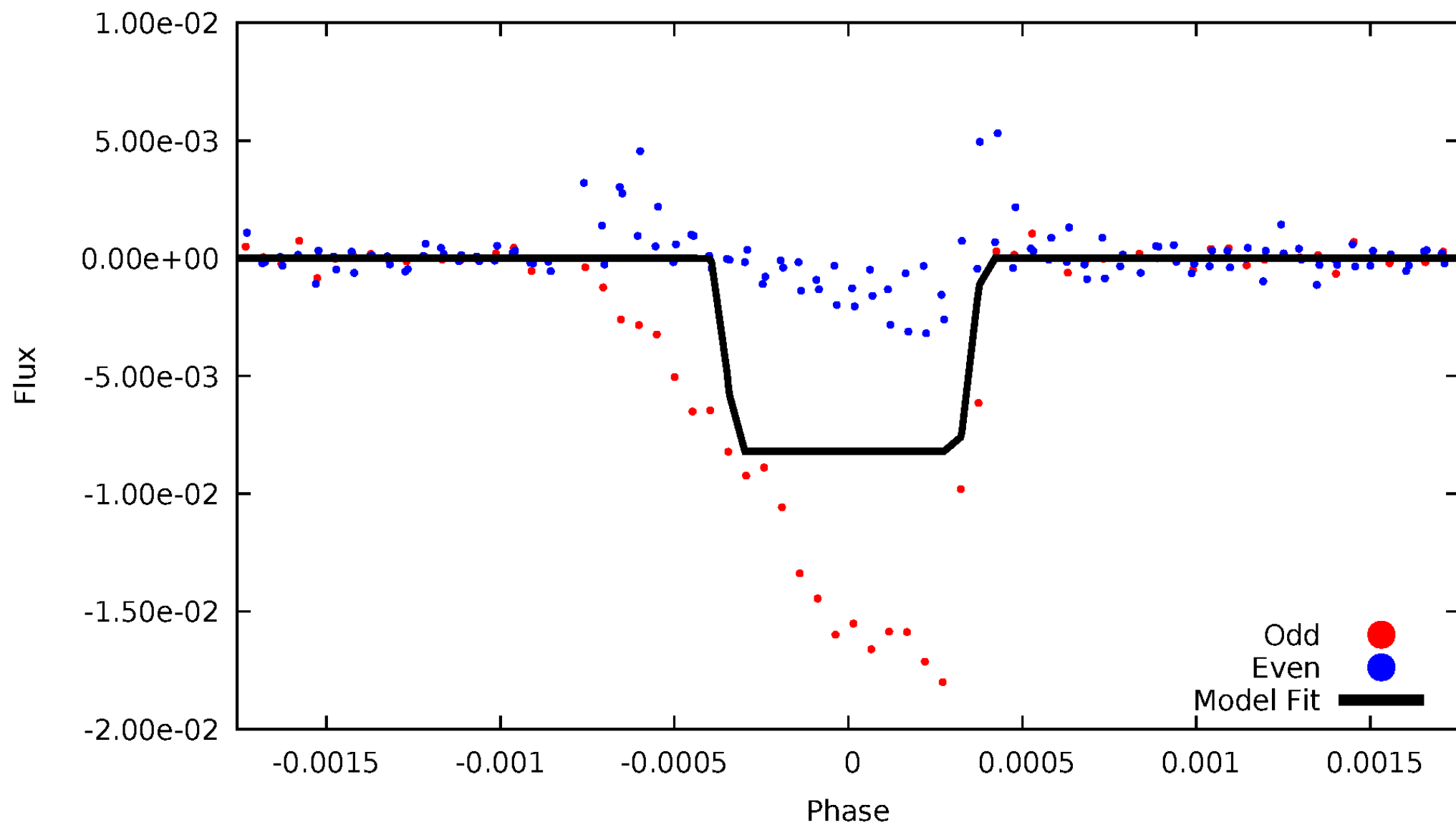
DV Odd/Even

TCE 011822156-01



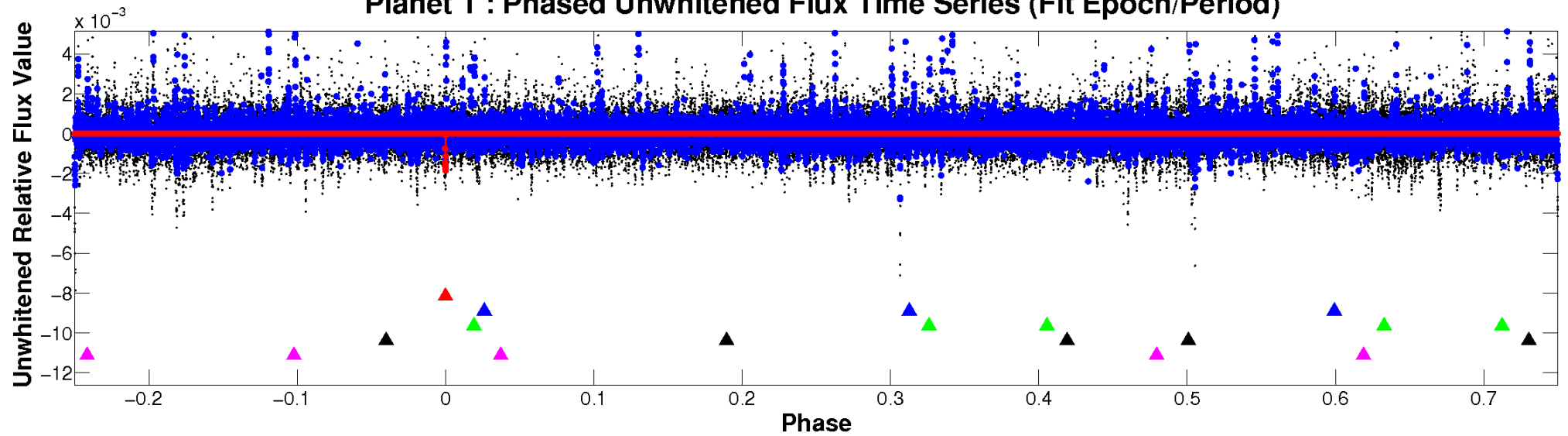
ALT Odd/Even

TCE 011822156-01

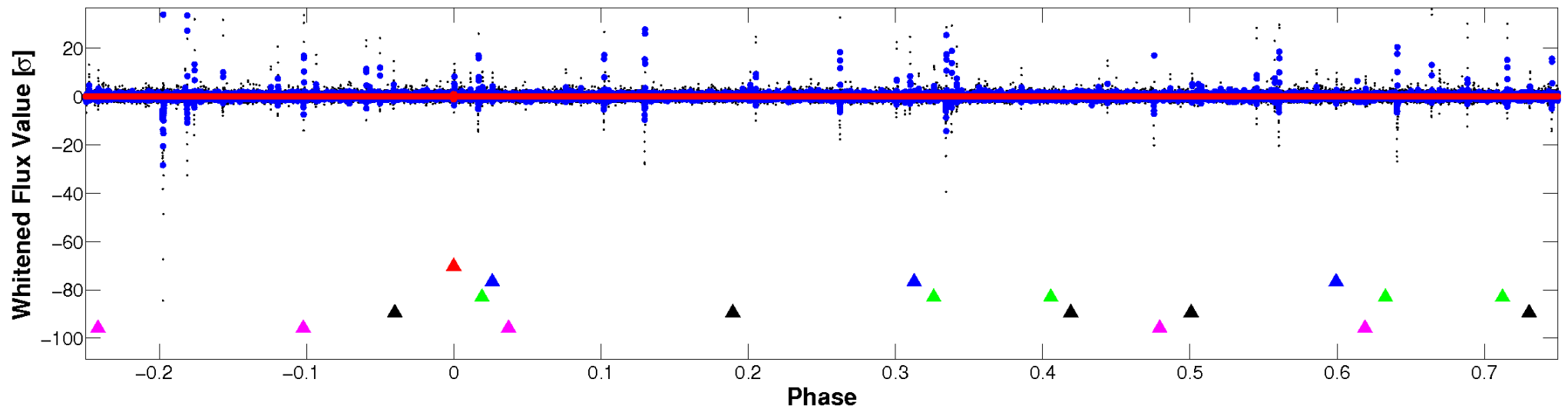


Non-Whitened Vs. Whitened Light Curve

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

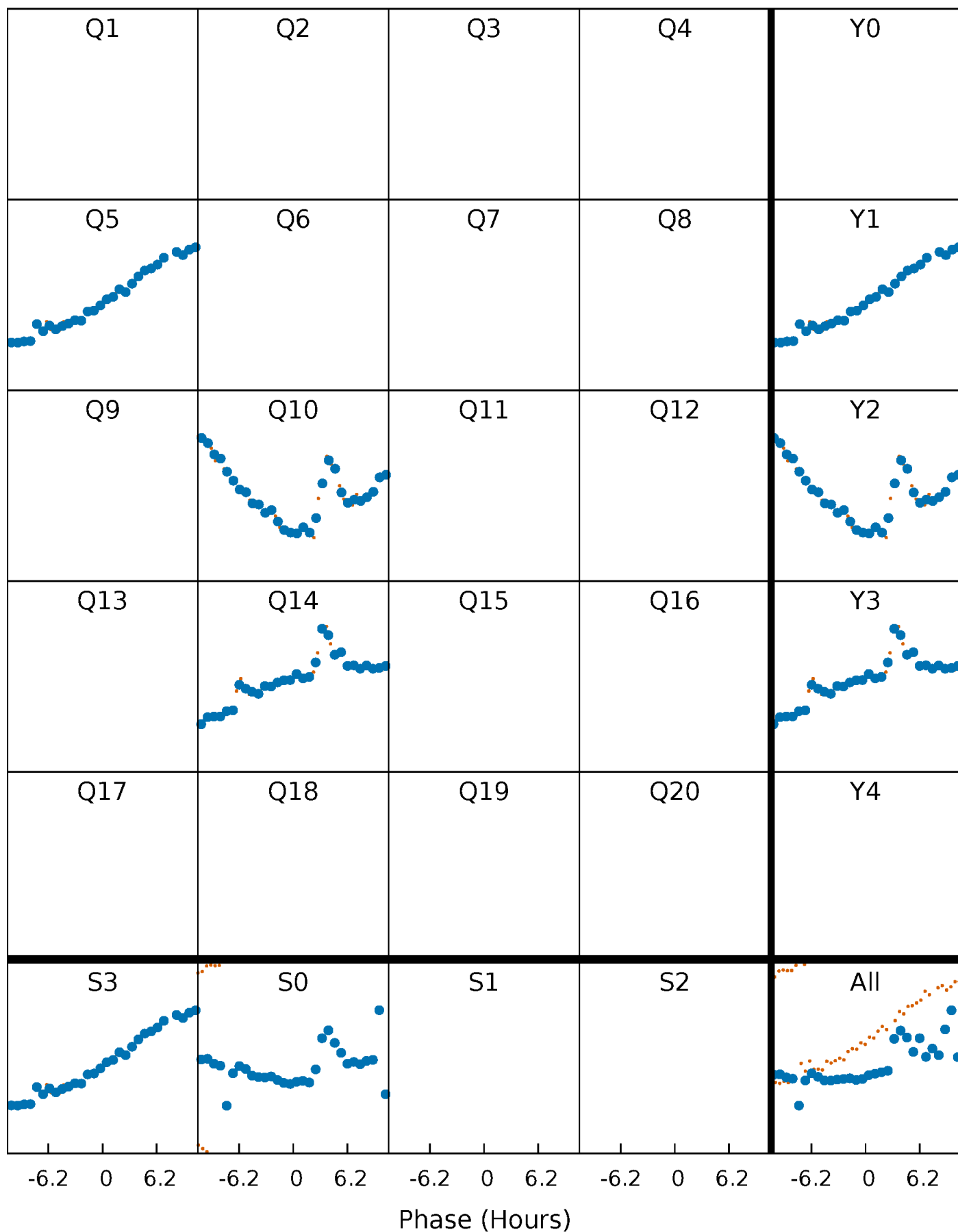


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



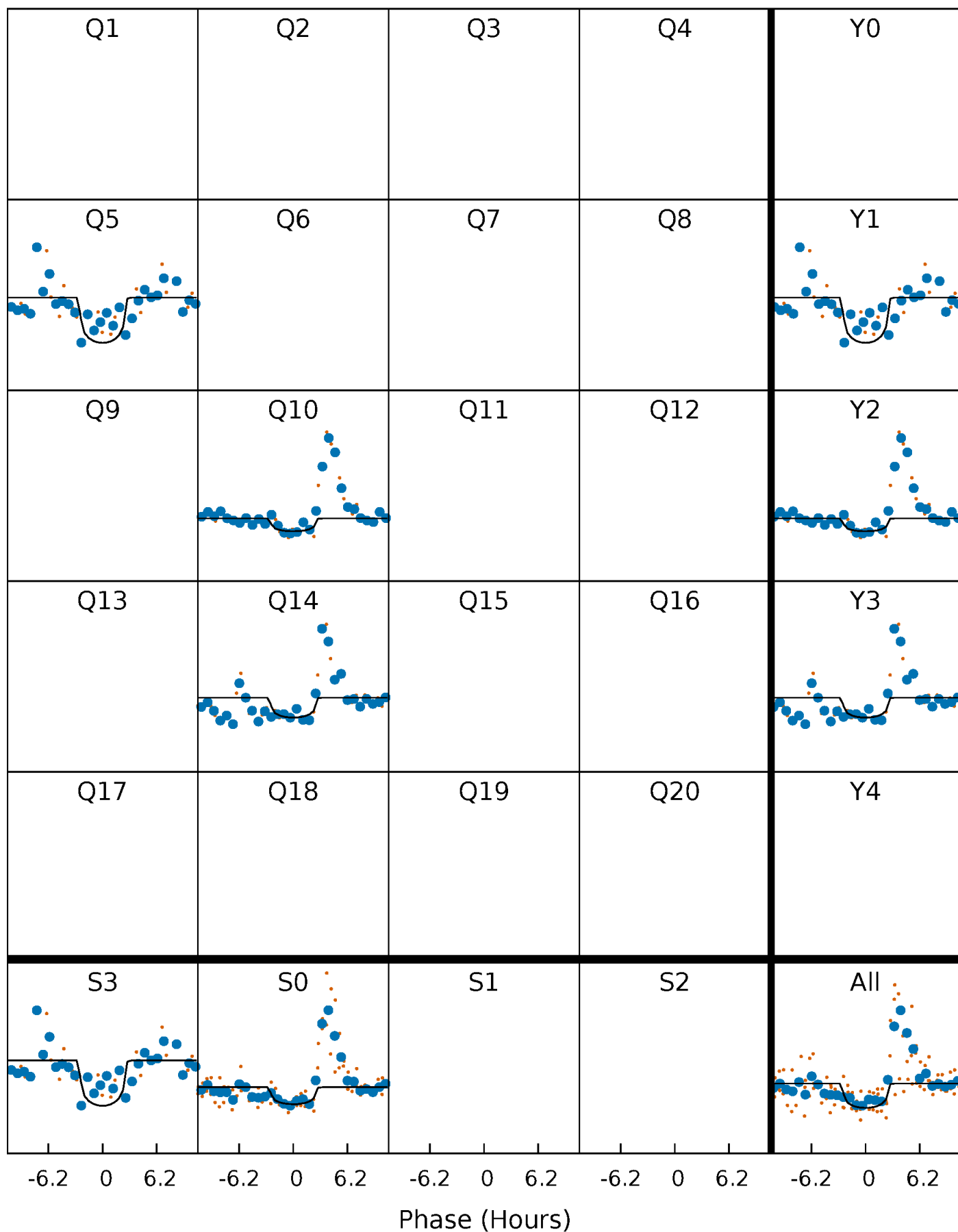
PDC Quarter-Phased Transit Curves

TCE 011822156-01 P=397.926516 Days $T_0=518.444341$ (BKJD)



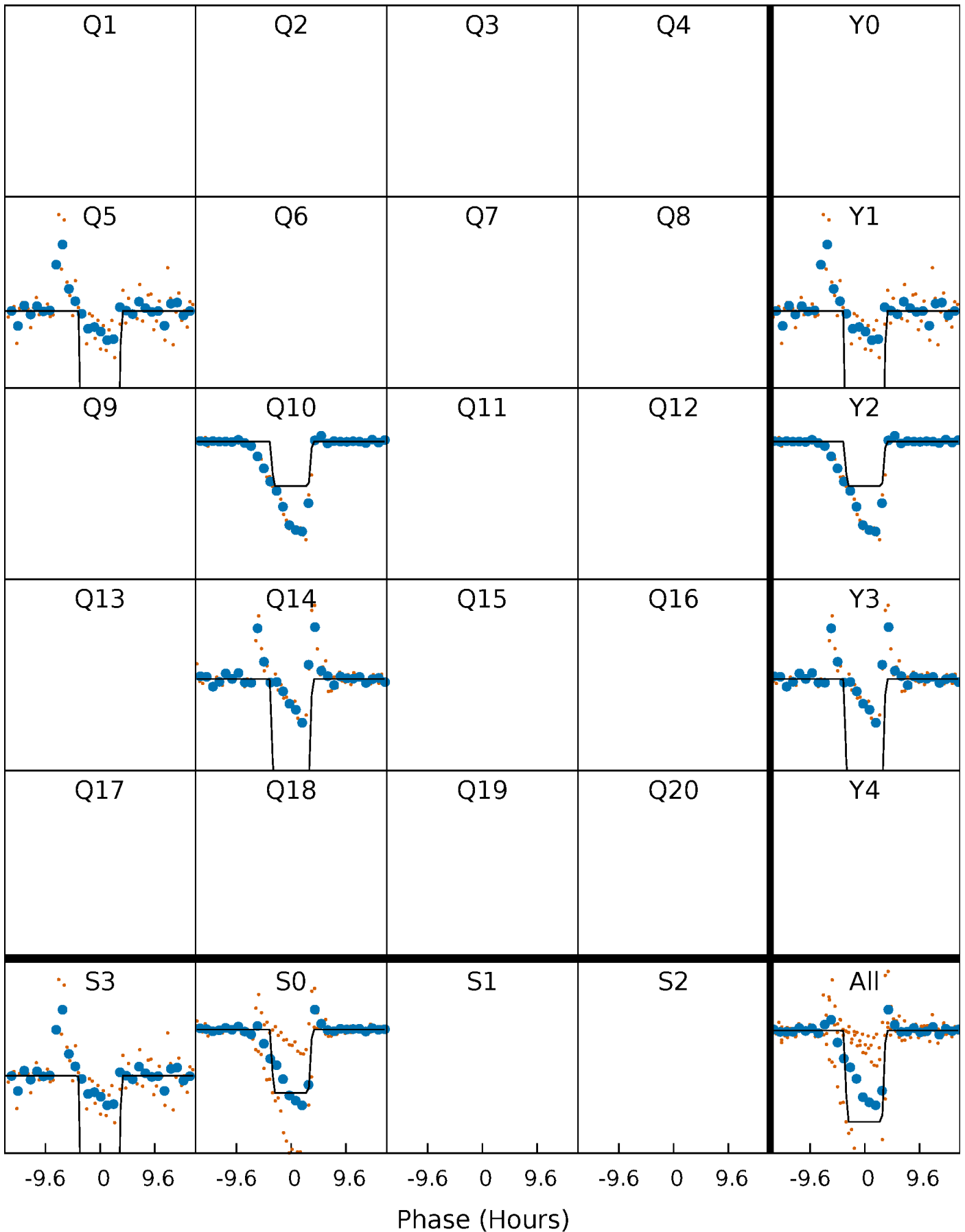
DV Quarter-Phased Transit Curves

TCE 011822156-01 P=397.926516 Days $T_0=518.444341$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

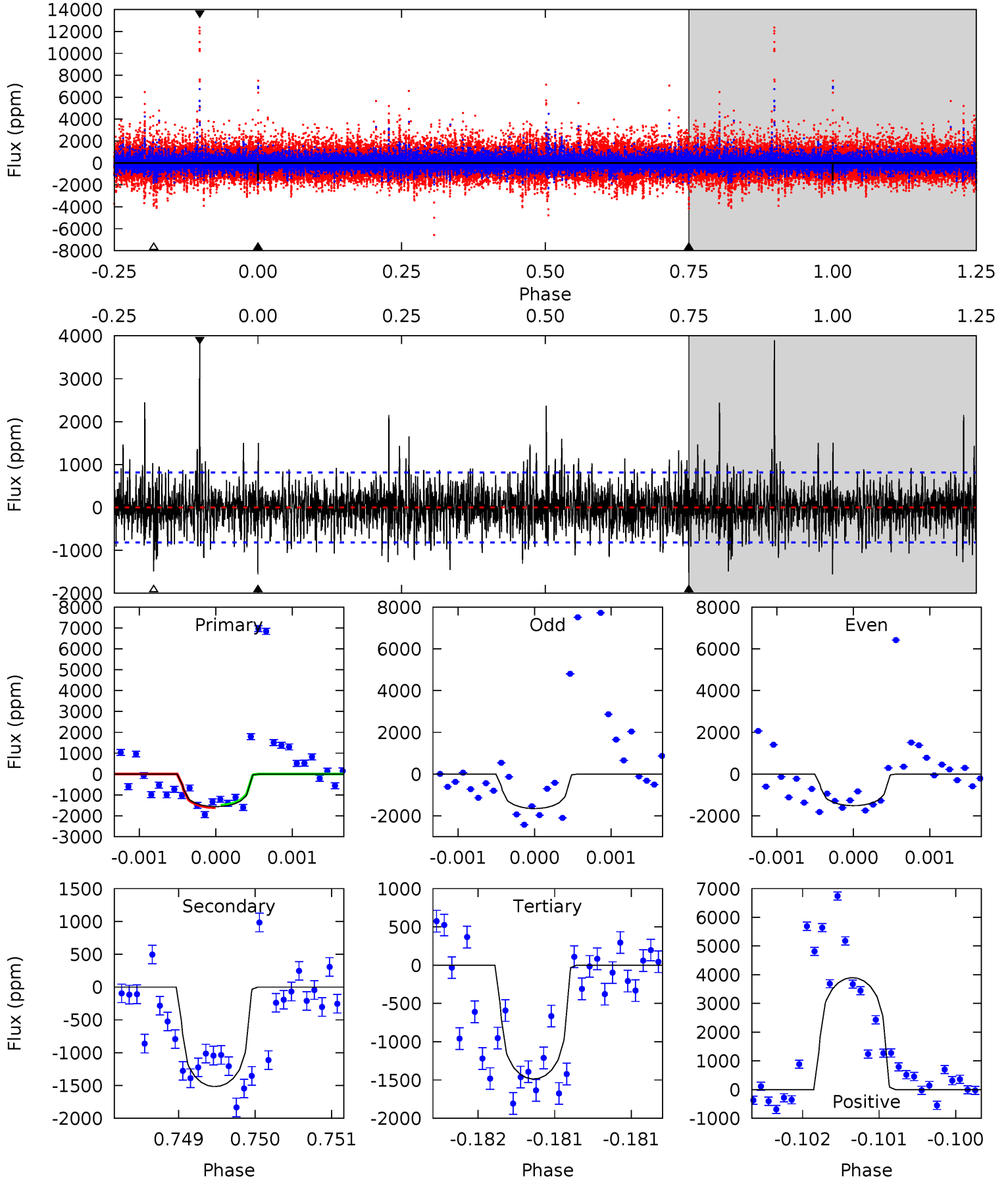
TCE 011822156-01 P=397.923147 Days $T_0=518.438646$ (BKJD)



DV Model-Shift Uniqueness Test

011822156-01, P = 397.926516 Days, E = 120.517825 Days

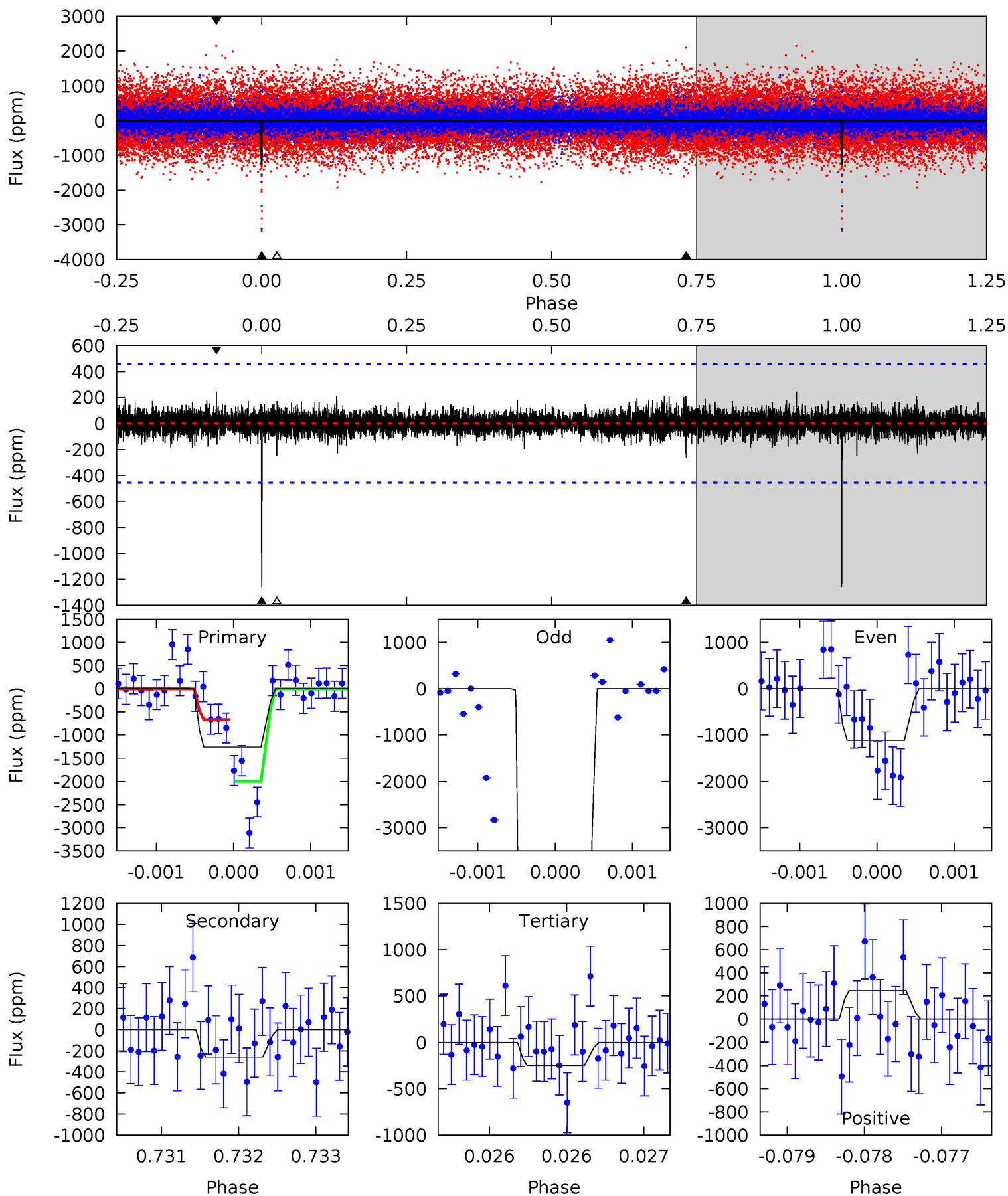
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	10.3	10.1	26.4	5.54	3.42	2.63	0.49	-15.9	0.20	-16.2	0.32	0.94	0.71	0.38



Alt Model-Shift Uniqueness Test

011822156-01, P = 397.923147 Days, E = 120.515499 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	3.13	2.99	2.94	5.50	3.36	0.55	12.2	12.2	0.13	0.19	101.9	3.67	0.16	8.06



Stellar Parameters For KIC 011822156

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5282^{+185}_{-185}	$4.520^{+0.090}_{-0.090}$	$-0.340^{+0.350}_{-0.300}$	$0.780^{+0.102}_{-0.092}$	$0.734^{+0.110}_{-0.055}$	$2.183^{+0.837}_{-0.606}$
	+4%/-4%	+2%/-2%	+103%/-88%	+13%/-12%	+15%/-7%	+38%/-28%
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 011822156-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1516 ± 147	$4.90^{+3.85}_{-2.86}$	294^{+14}_{-15}	4488^{+2238}_{-825}	$32091^{+158003}_{-21845}$
Alt.	-260 ± 83	$8.01^{+4.69}_{-4.18}$	294^{+14}_{-13}	2881^{+775}_{-360}	1969^{+7610}_{-1240}

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

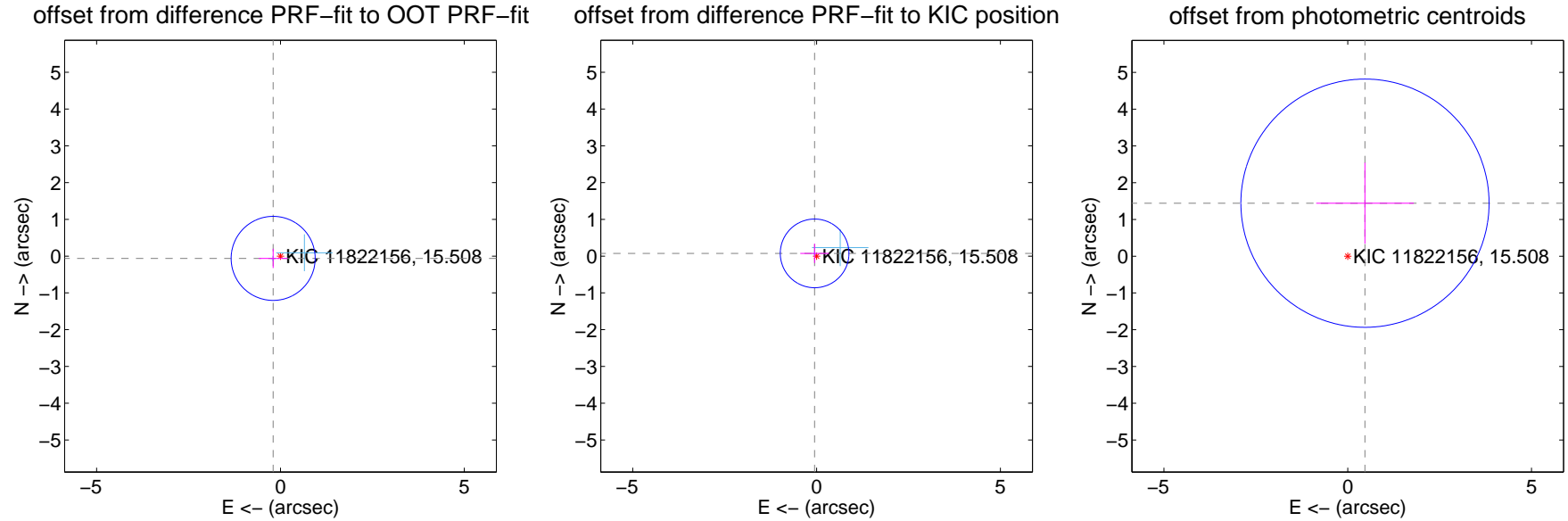
DV Centroid Data

Supplemental centroid analysis for 011822156-01. Kepler magnitude: 15.51. Transit SNR 6.62

There are 2 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.208 ± 0.381	0.55	0.199 ± 0.390	-0.061 ± 0.262
PRF-fit source offset from KIC position	0.092 ± 0.311	0.30	0.053 ± 0.390	0.075 ± 0.262
photometric centroid source offset	1.52 ± 1.13	1.35	-0.47 ± 1.33	1.44 ± 1.10

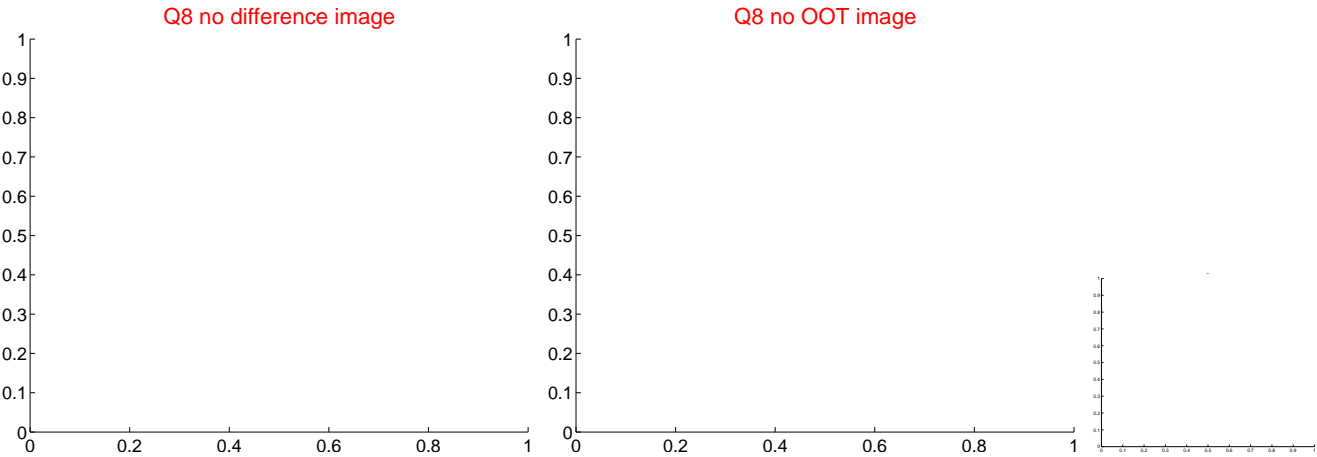
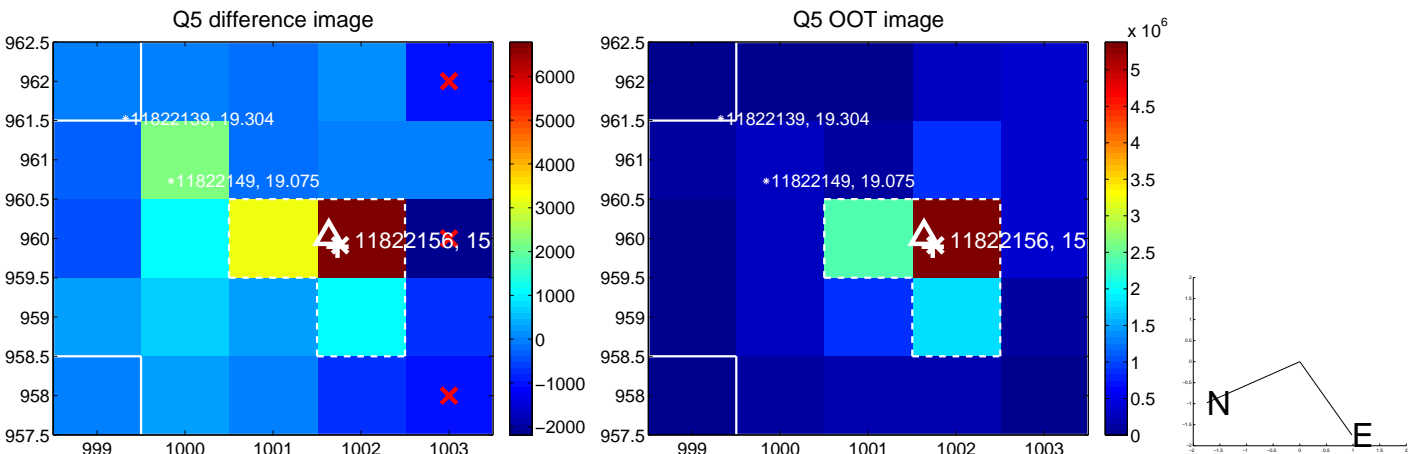


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

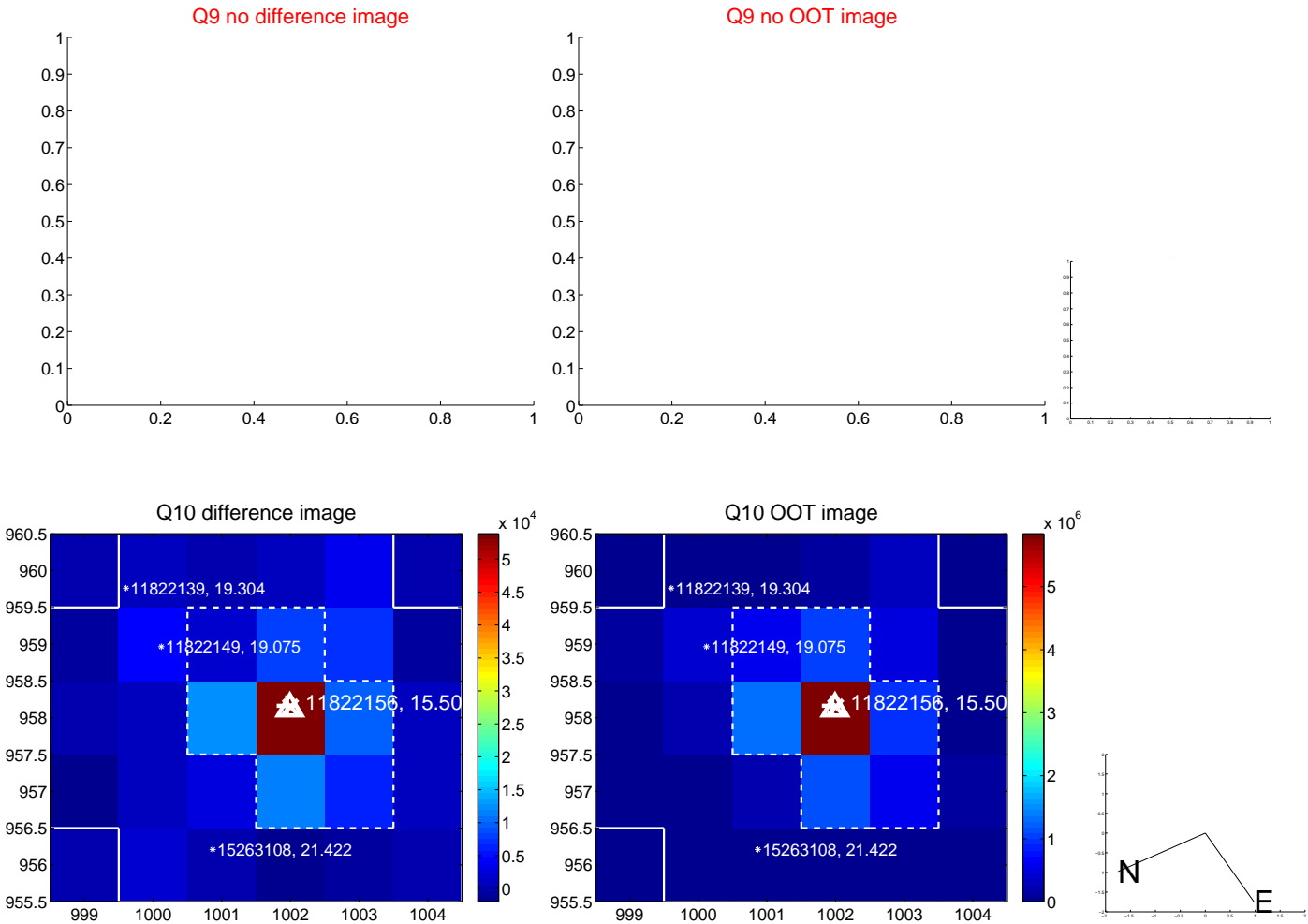
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



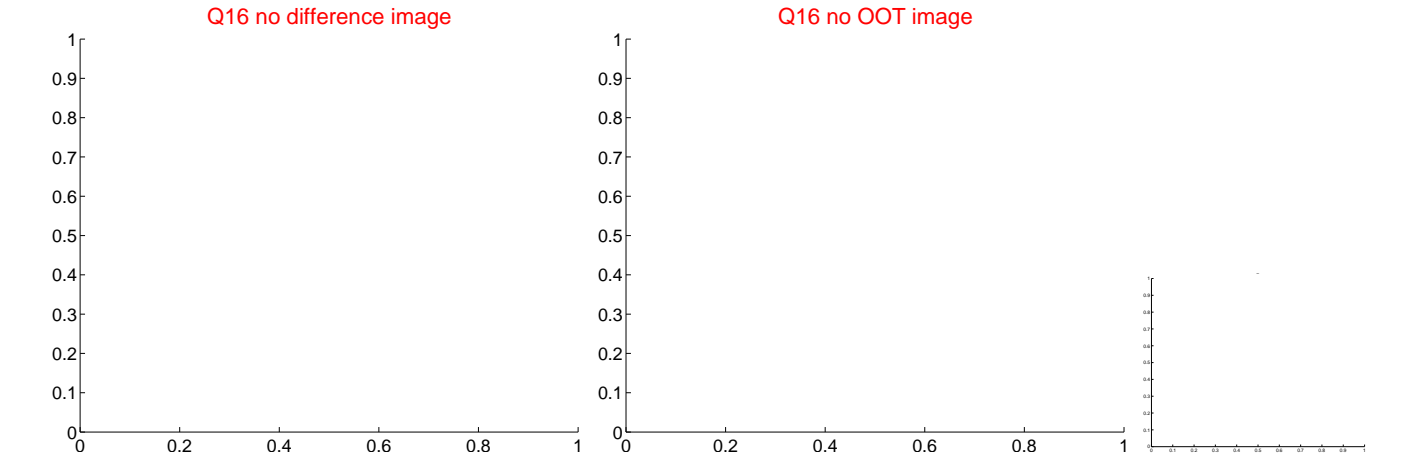
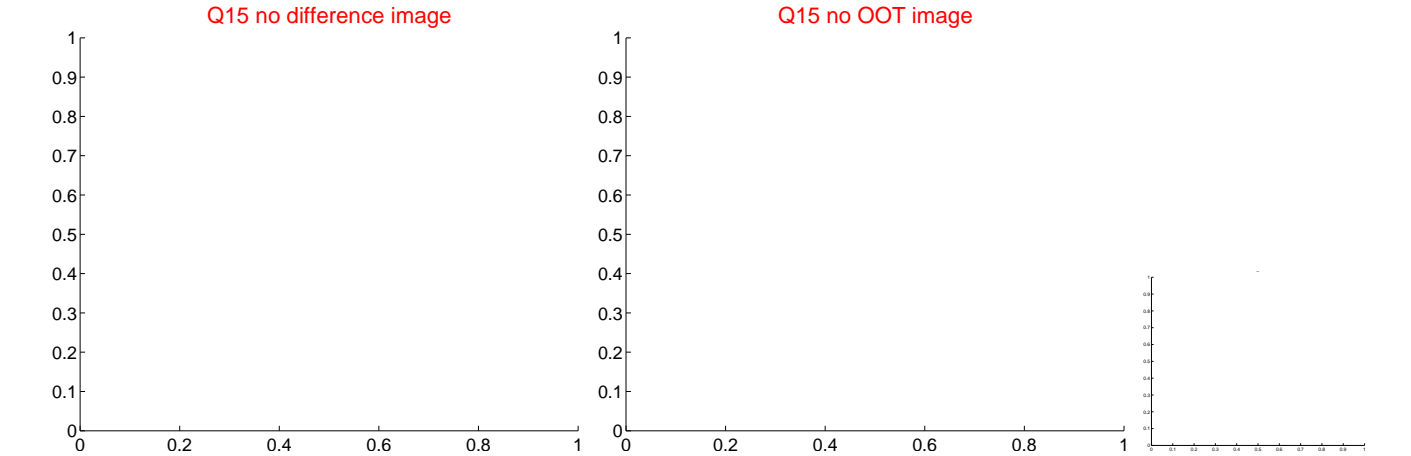
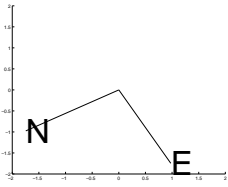
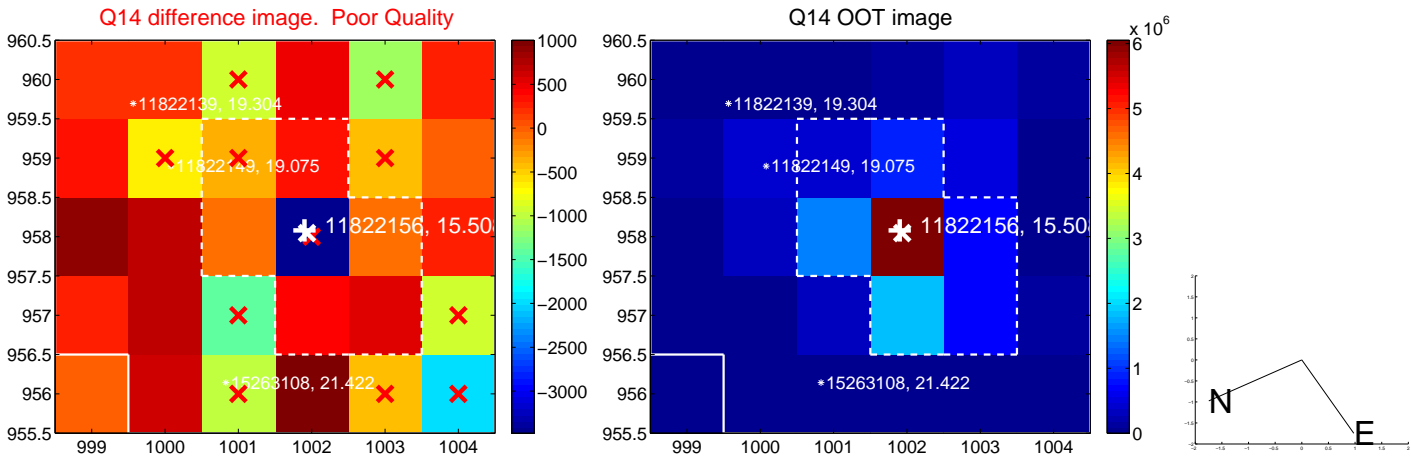
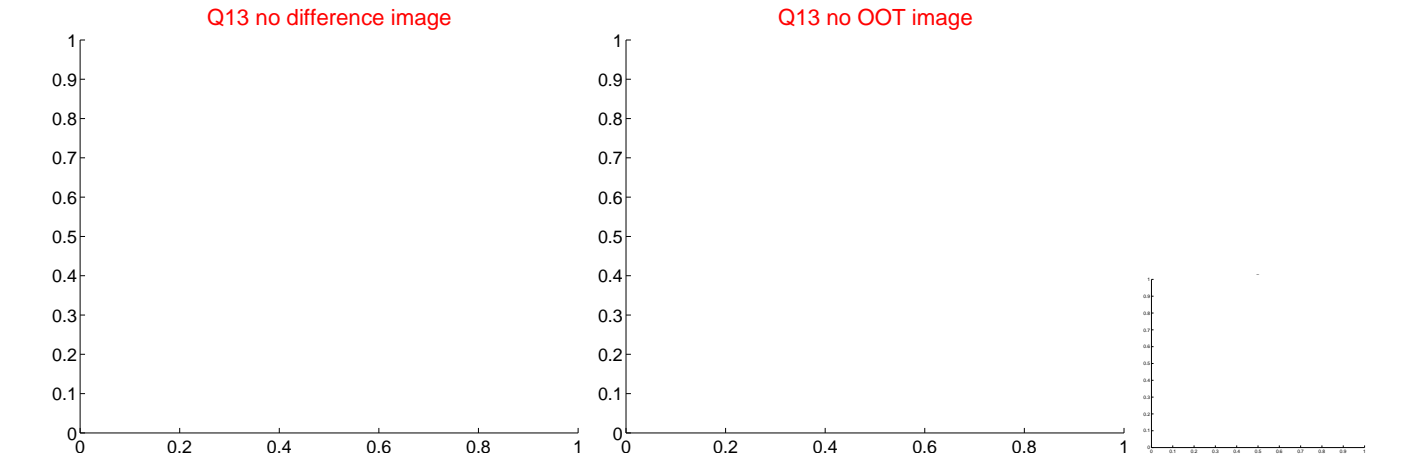
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



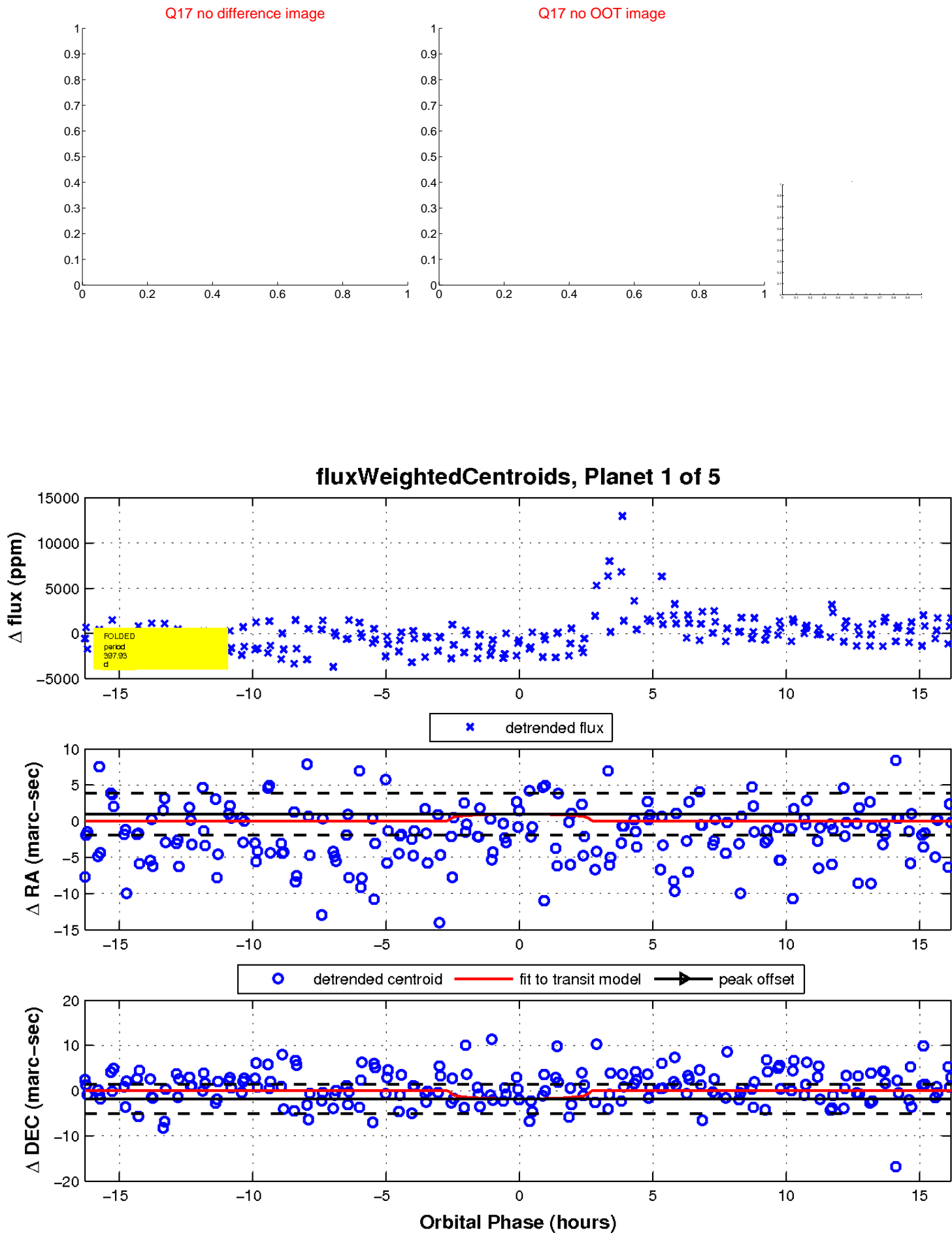
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

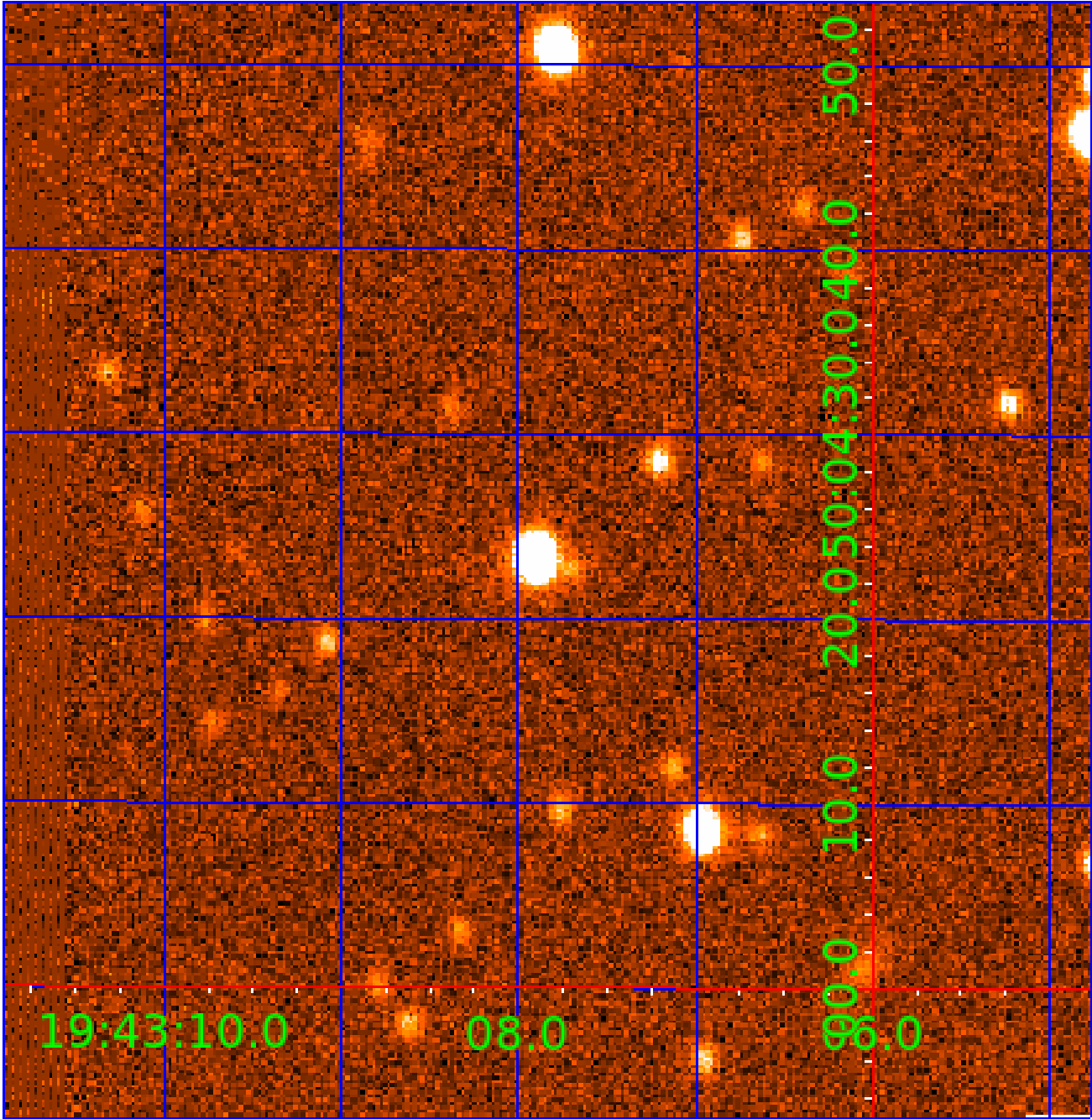


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 011822156

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})
011822156-01	OBS	No	397.926517	518.444341	1852.4	5.465	16.0	6.6	0.78	5282	3.33	0.47
011822156-02	OBS	No	511.956227	528.868518	1824.2	4.159	15.1	7.3	0.78	5282	3.33	0.33
011822156-03	OBS	No	275.831388	372.346511	1334.1	4.872	14.9	5.7	0.78	5282	3.19	0.76
011822156-04	OBS	No	306.578323	287.296455	1631.1	10.500	14.7	-1.0	0.78	5282	3.09	0.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011822156-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011822156-02	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
011822156-03	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
011822156-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

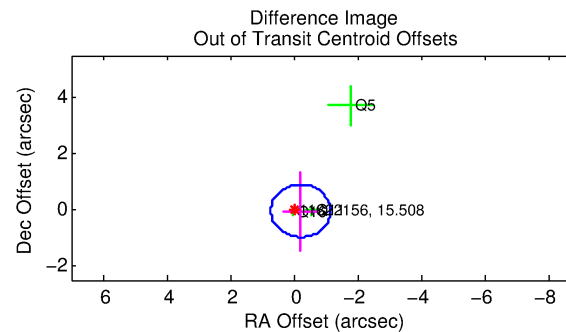
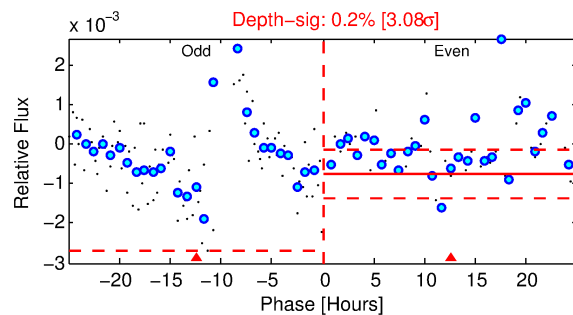
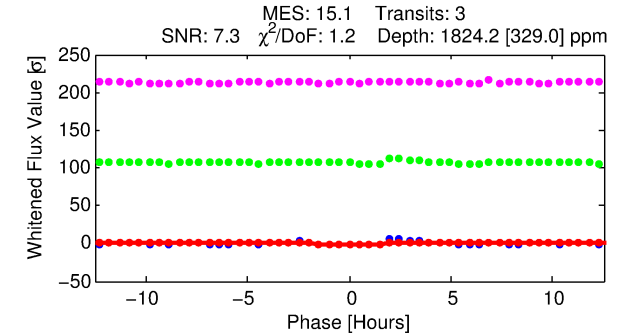
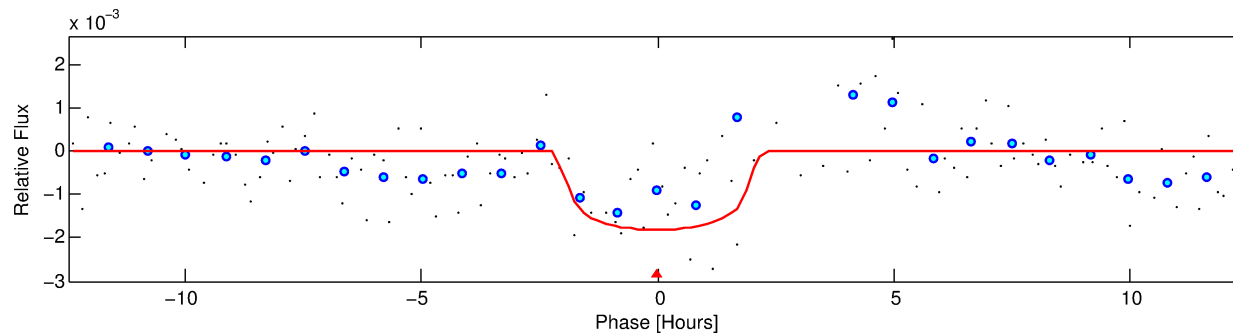
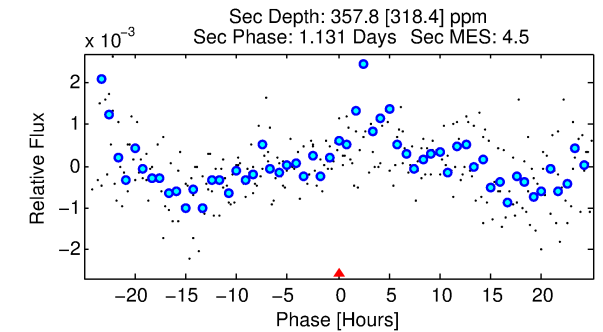
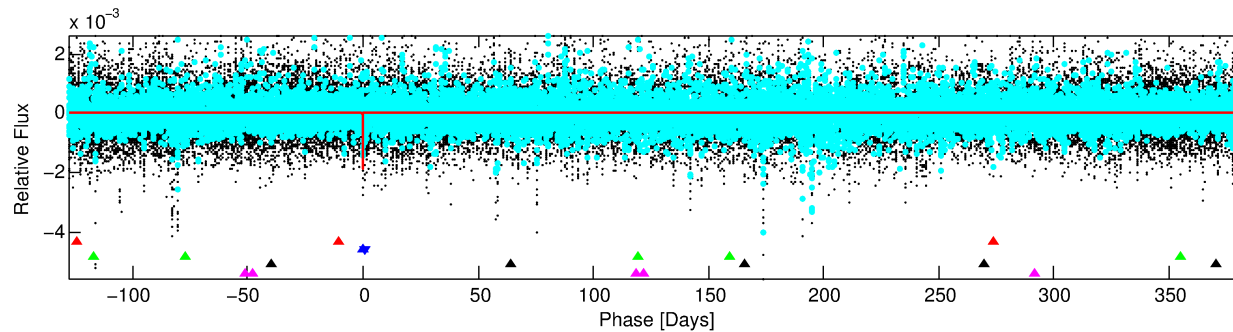
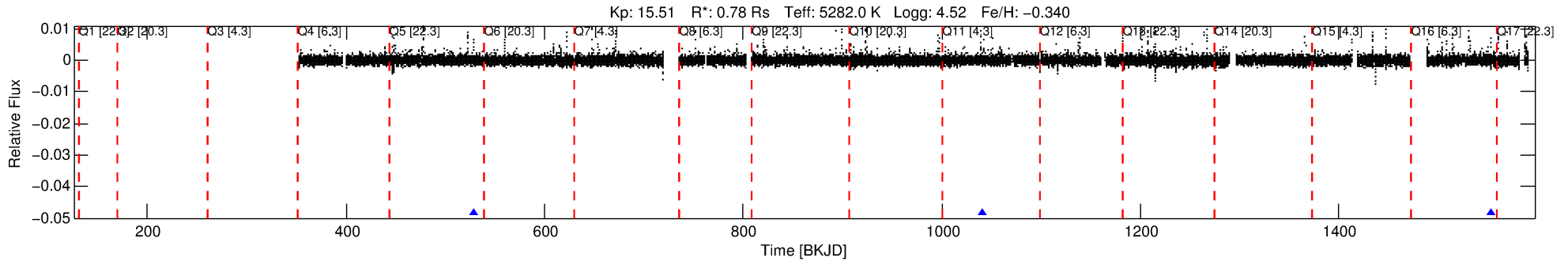
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 011822156-02

No Significant Match Found

DV One-Page Summary

KIC: 11822156 Candidate: 2 of 5 Period: 511.956 d



DV Fit Results:

Period = 511.95623 [0.00736] d
Epoch = 528.8685 [0.0084] BKJD
Rp/R* = 0.0391 [0.0845]
a/R* = 912.59 [7671.20]
b = 0.37 [19.74]
Seff = 0.33 [0.07]
Teq = 194 [10] K
Rp = 3.33 [7.21] Re
a = 1.1304 [0.1257] AU
Ag = 22714.35 [100301.94] [0.23σ]
Teffp = 3674 [4055] K [0.86σ]

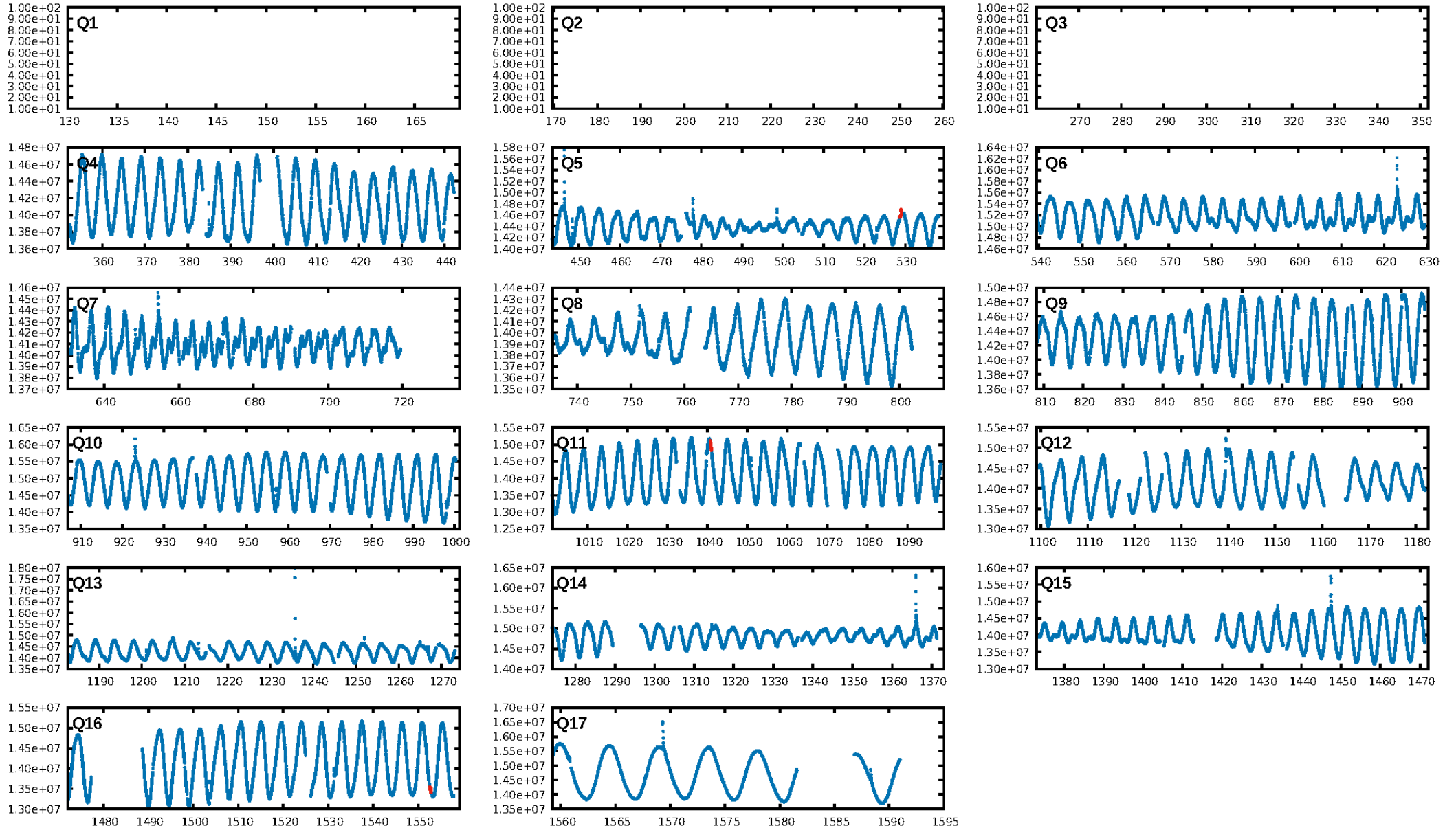
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [398.47σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 1.1%
ModelChiSquareGof-sig: 77.3%
Bootstrap-pfa: 8.32e-15
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.6859
Centroid-sig: 27.8%
Centroid-so: 0.456 arcsec [0.39σ]
OotOffset-rm: 0.218 arcsec [0.70σ]
KicOffset-rm: 0.303 arcsec [0.49σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

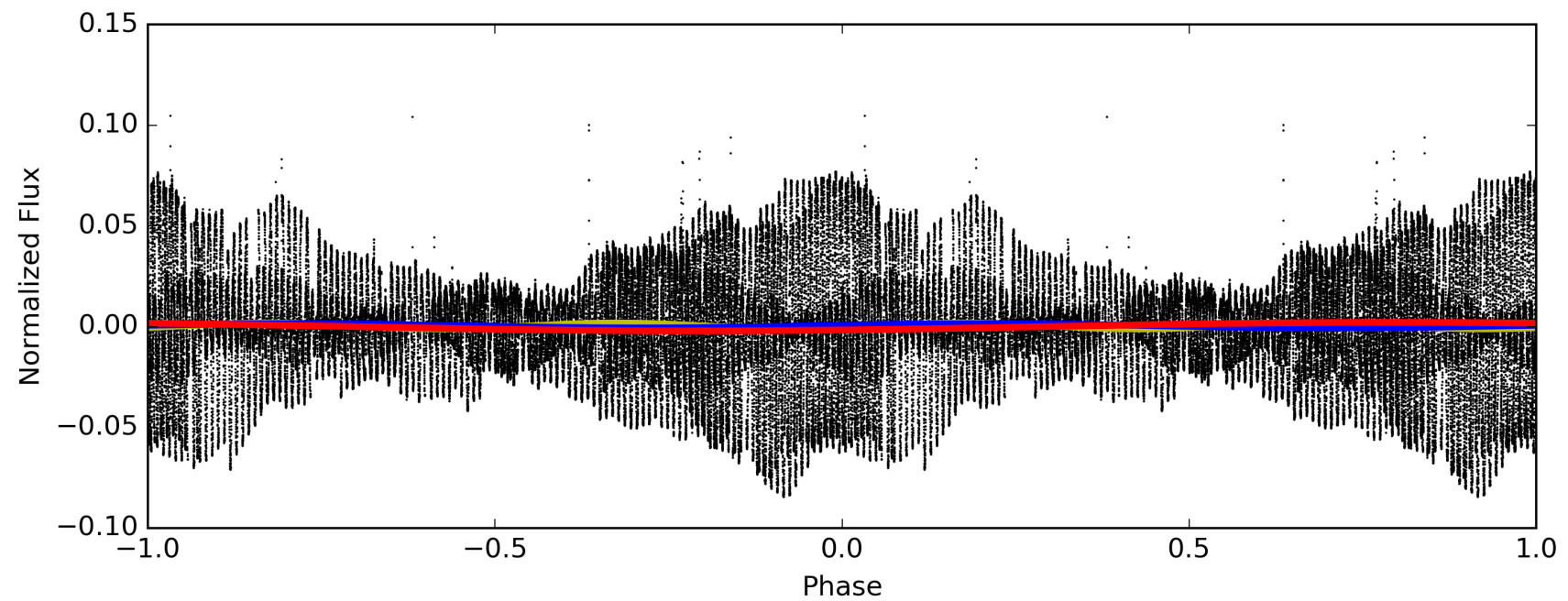
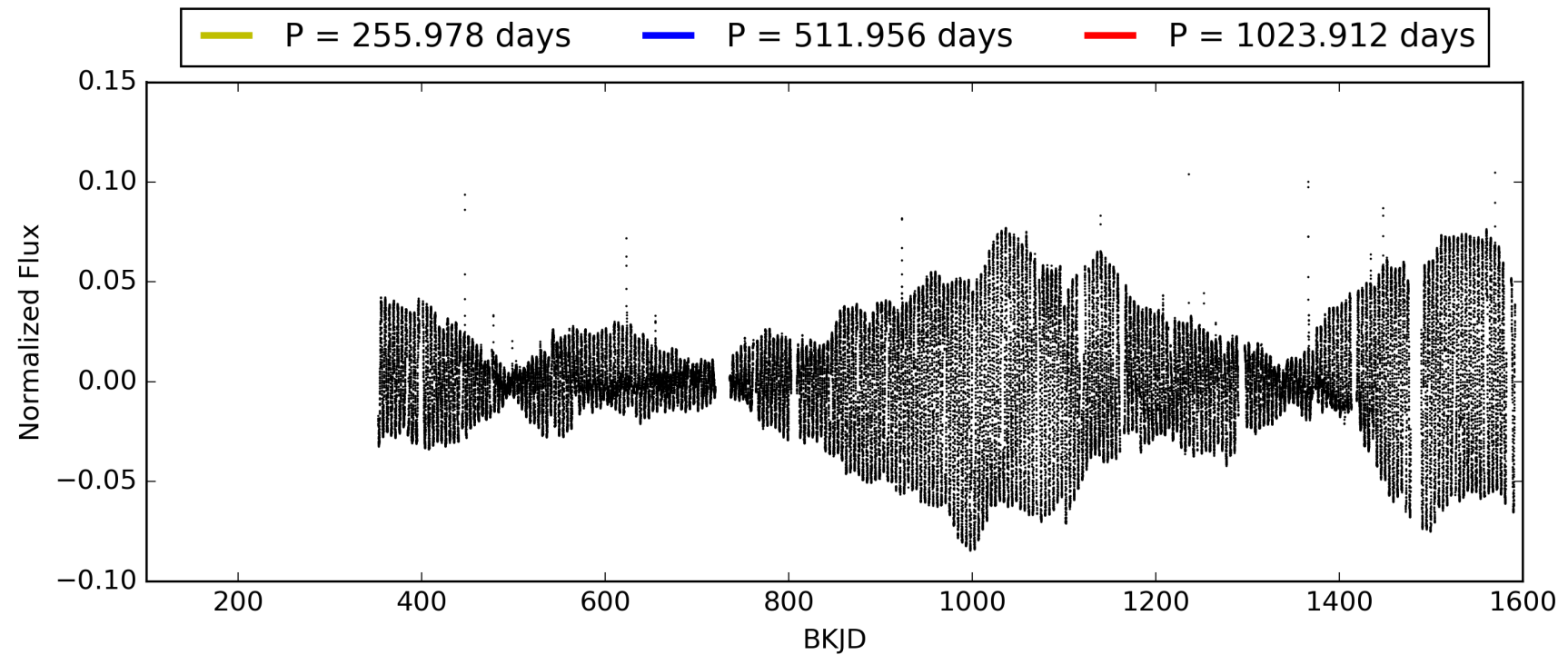
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:38:19 Z

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

TCE 011822156-02, PDC Light Curves

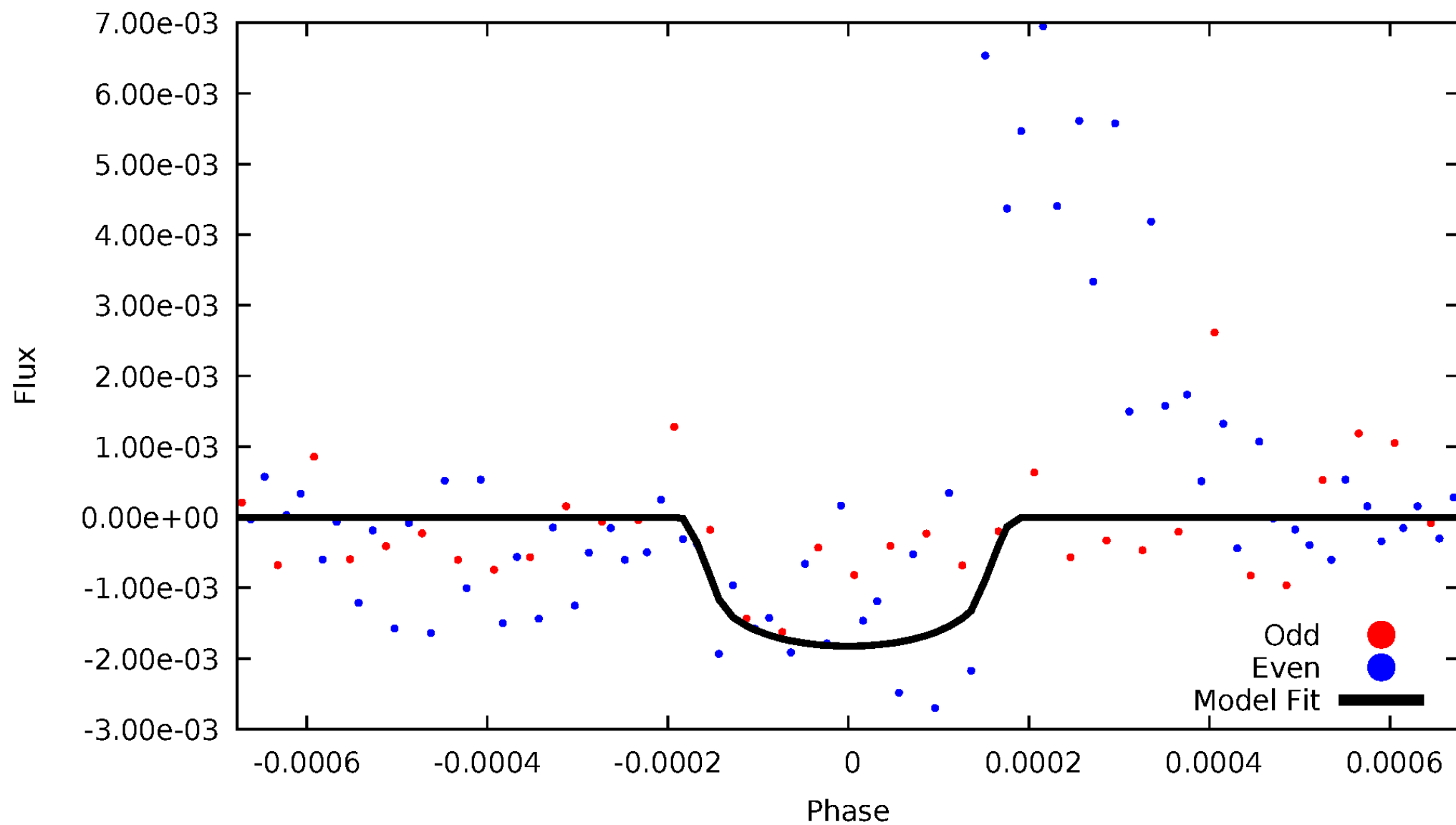


TCE 011822156-02



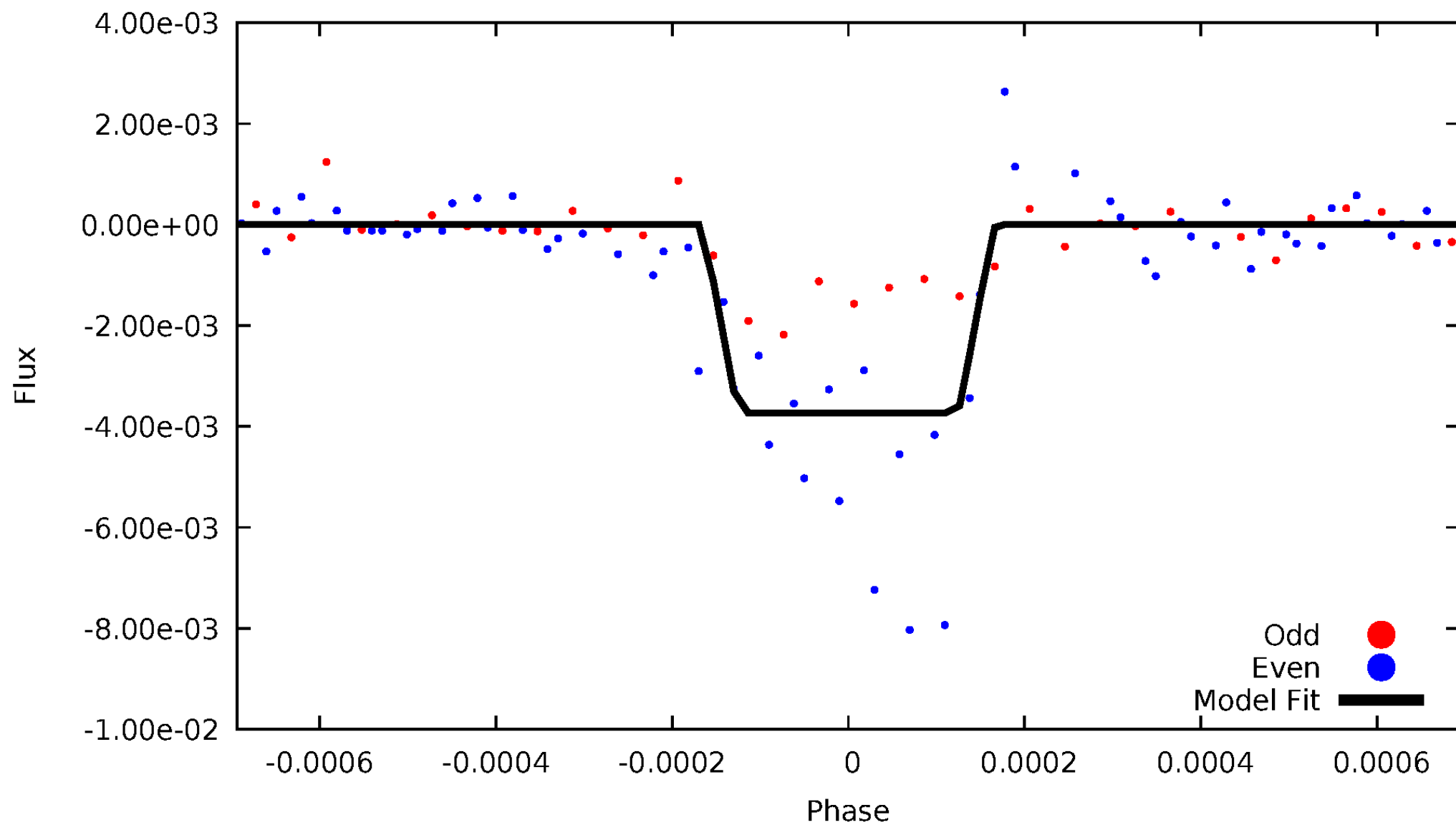
DV Odd/Even

TCE 011822156-02



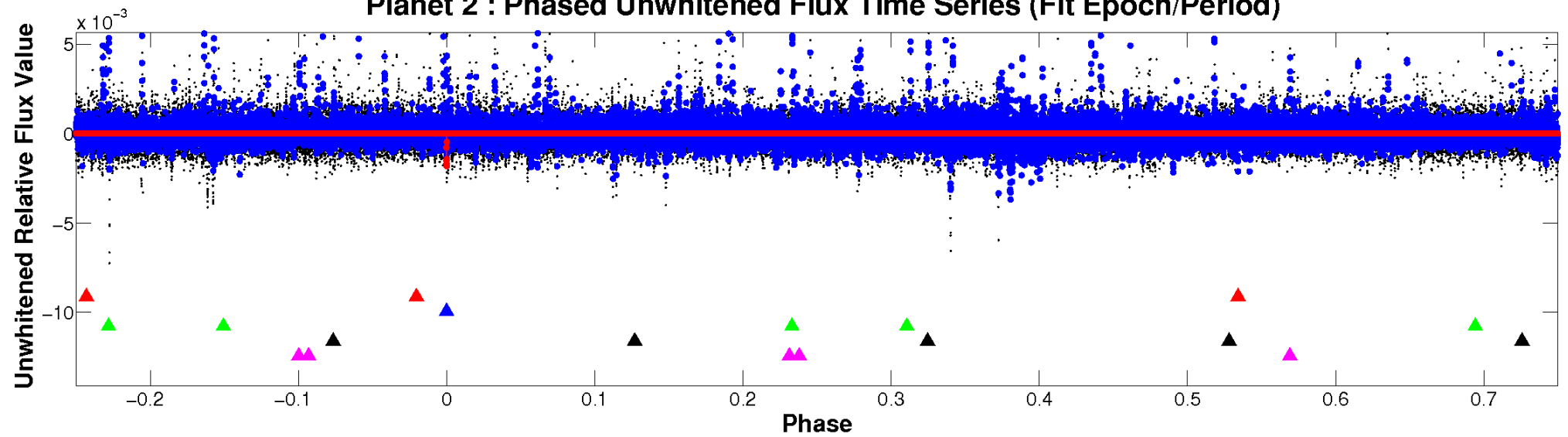
ALT Odd/Even

TCE 011822156-02

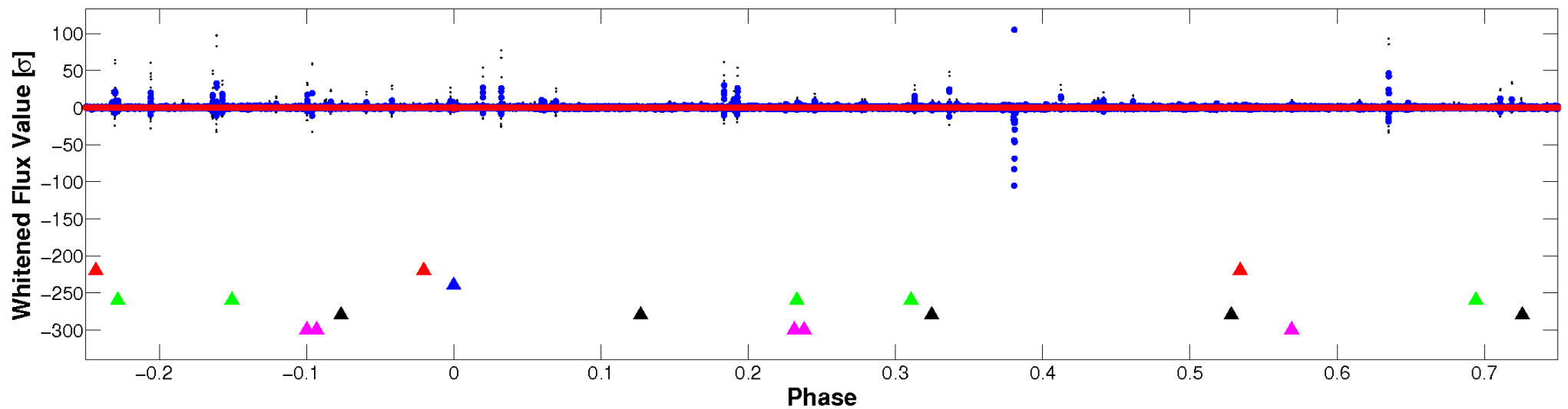


Non-Whitened Vs. Whitened Light Curve

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

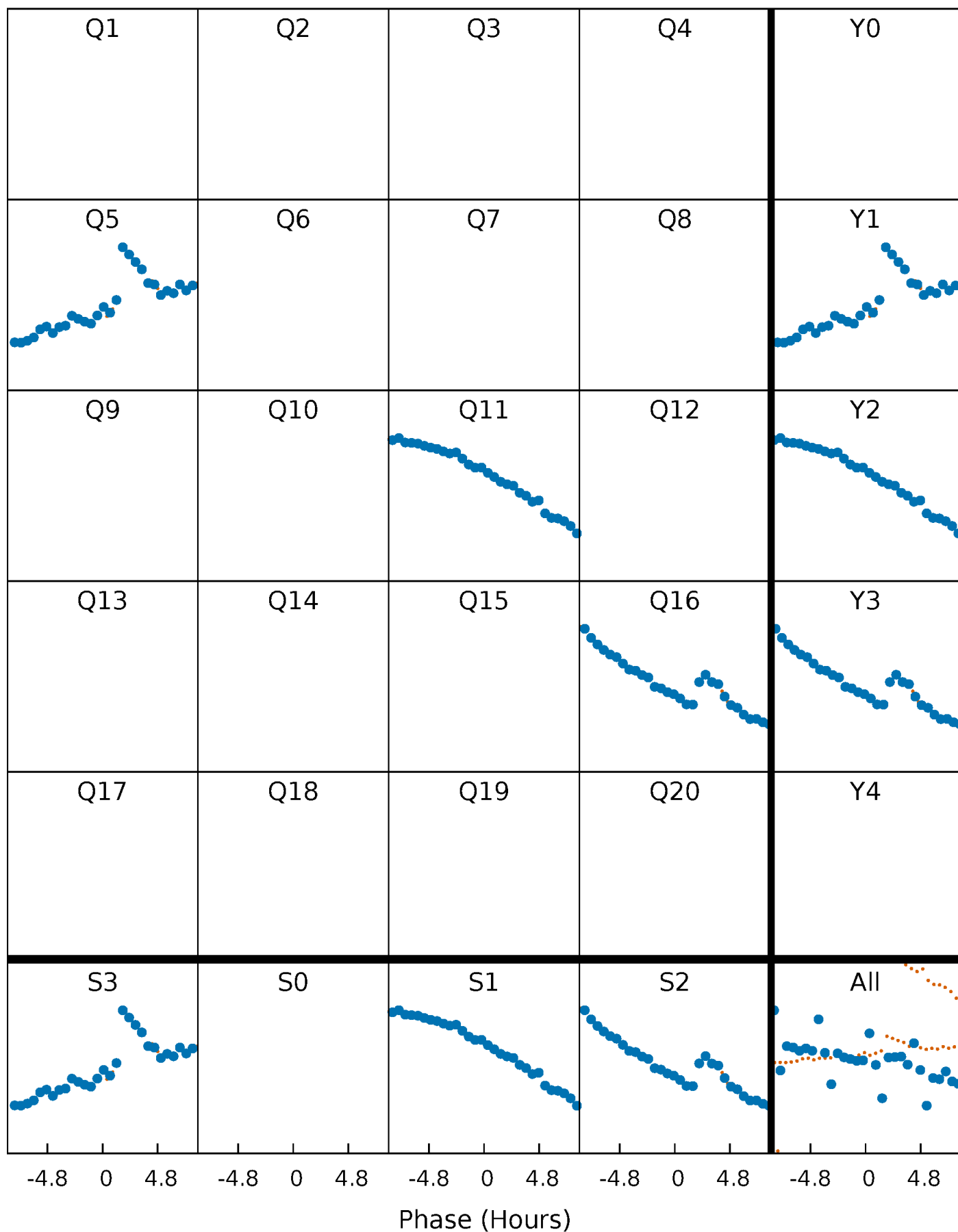


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



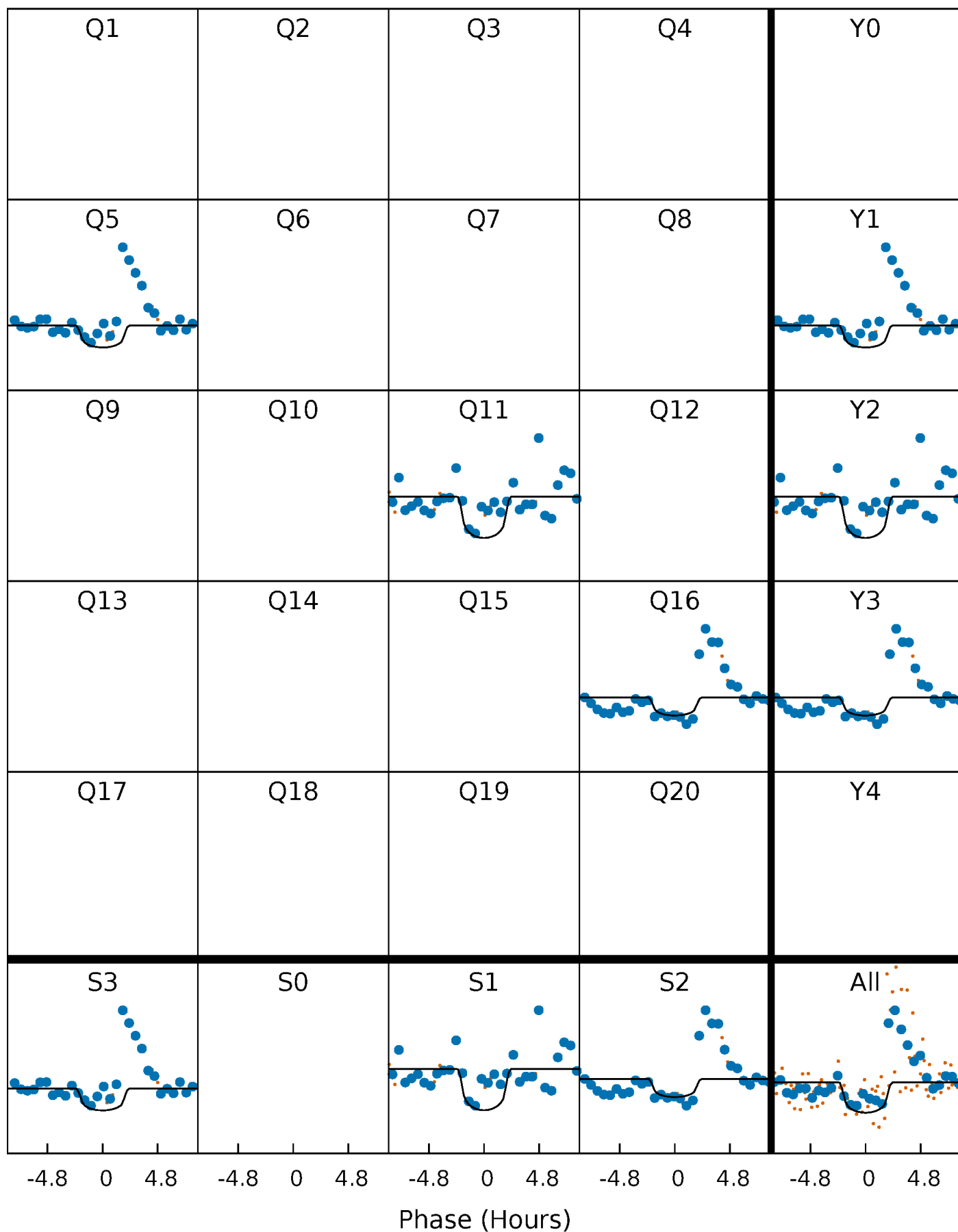
PDC Quarter-Phased Transit Curves

TCE 011822156-02 P=511.956227 Days $T_0=528.868518$ (BKJD)



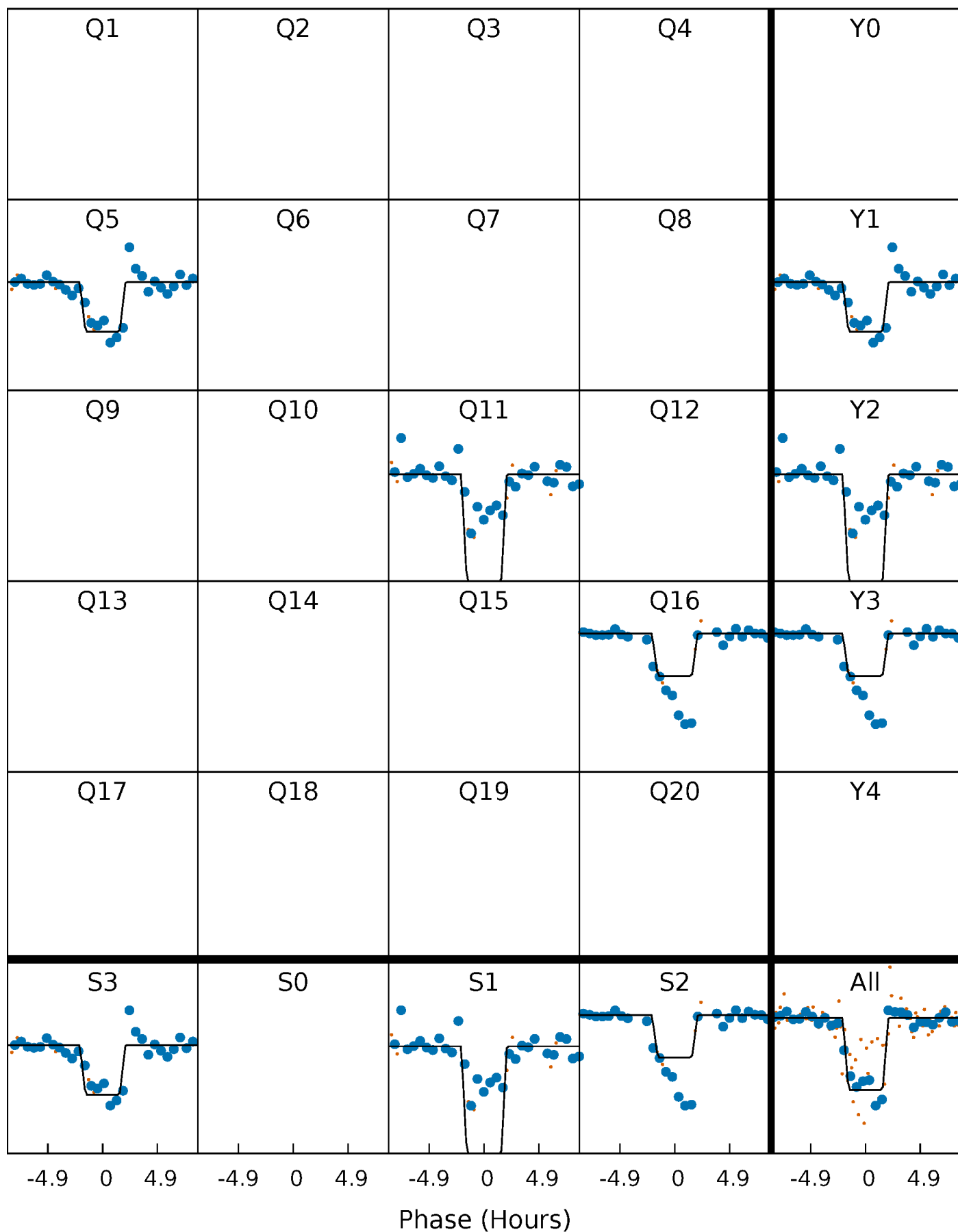
DV Quarter-Phased Transit Curves

TCE 011822156-02 $P=511.956227$ Days $T_0=528.868518$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

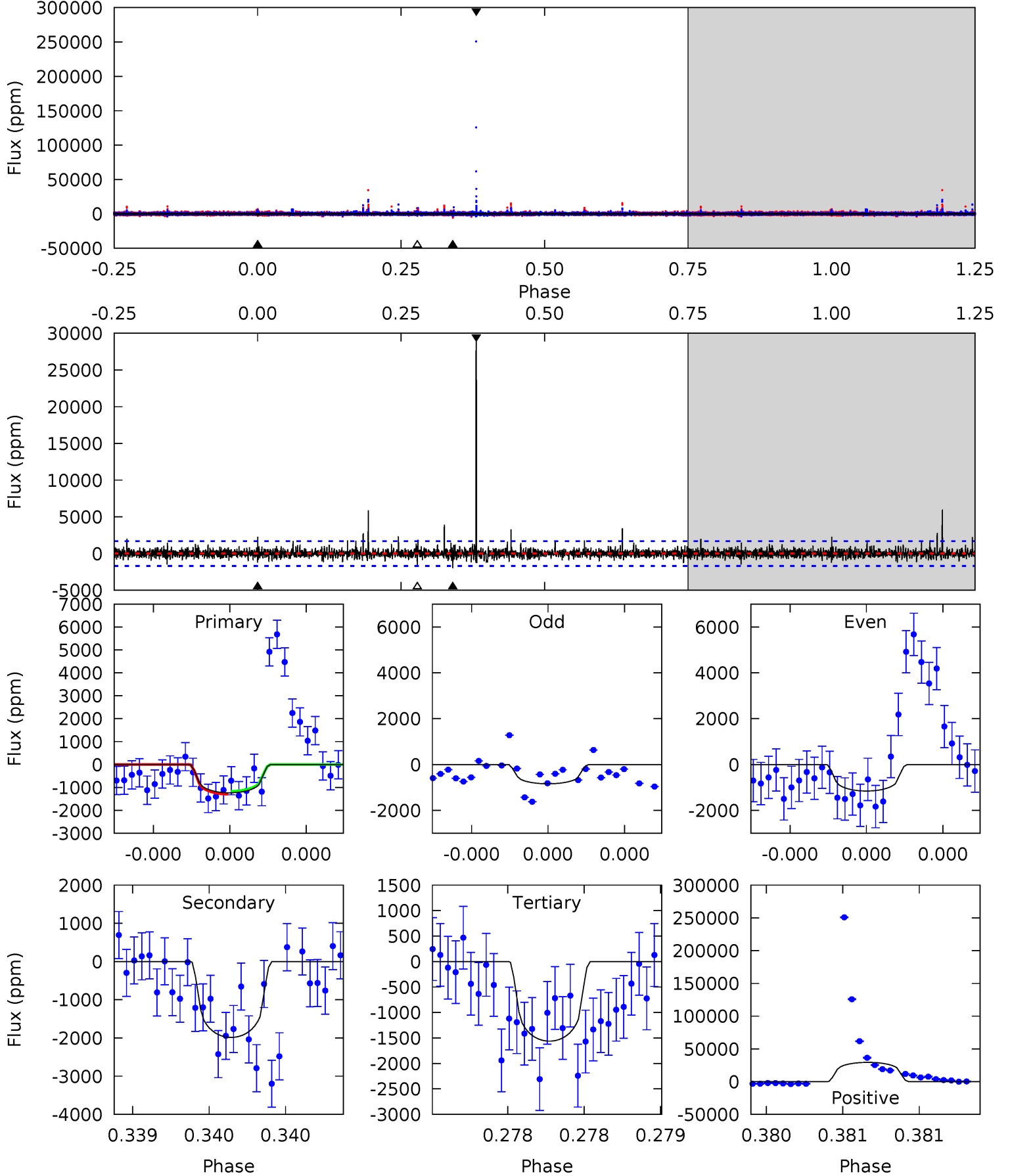
TCE 011822156-02 P=511.969657 Days $T_0=528.855186$ (BKJD)



DV Model-Shift Uniqueness Test

011822156-02, P = 511.956227 Days, E = 16.912291 Days

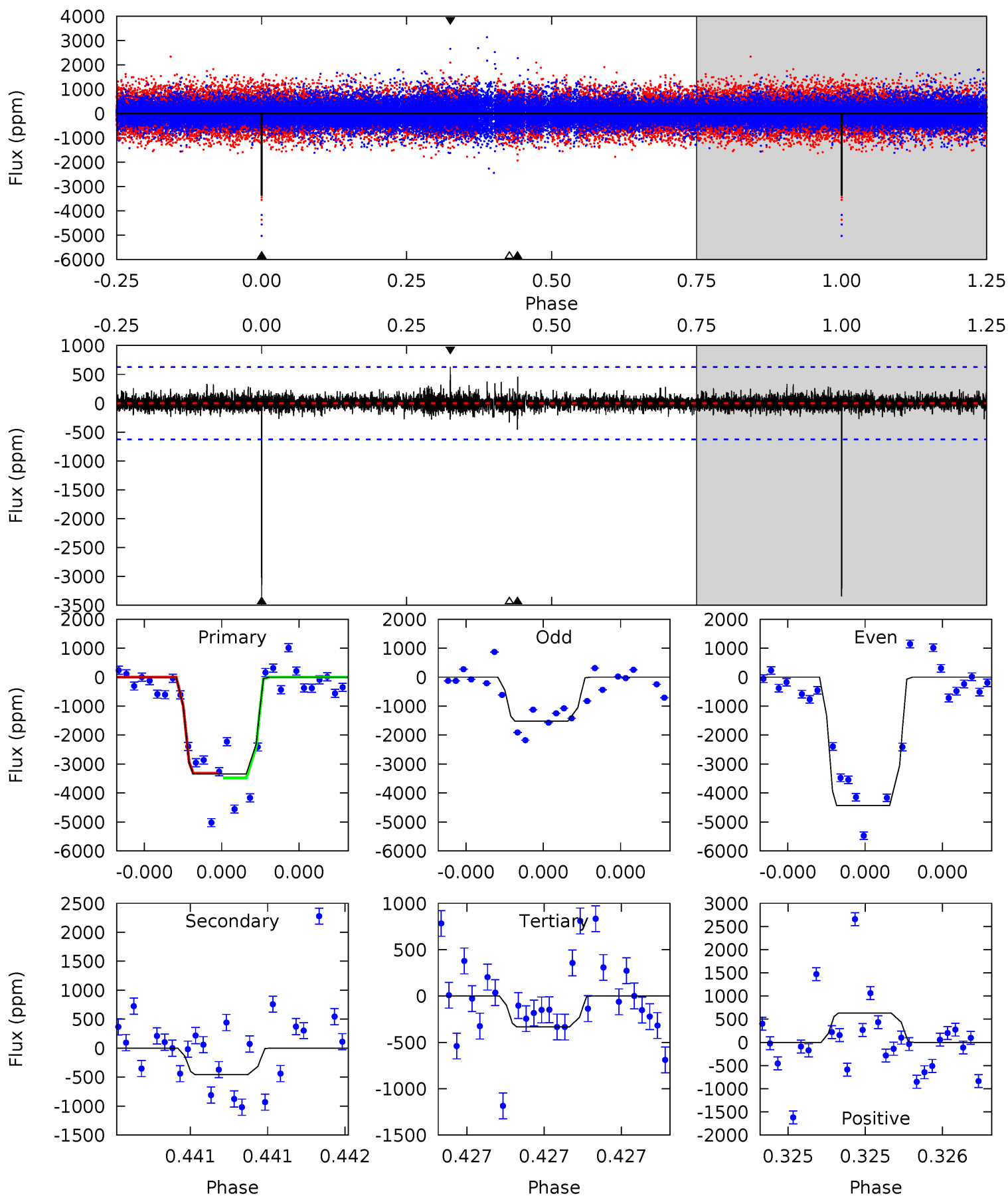
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.11	6.60	5.19	97.9	5.63	3.57	2.17	-1.09	-93.8	1.41	-91.3	0.37	1.25	0.94	0.20



Alt Model-Shift Uniqueness Test

011822156-02, P = 511.969657 Days, E = 16.885529 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.2	4.12	2.99	5.69	5.66	3.61	0.58	27.2	24.5	1.12	-1.57	14.6	1.04	0.16	0.70



Stellar Parameters For KIC 011822156

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5282^{+185}_{-185}	$4.520^{+0.090}_{-0.090}$	$-0.340^{+0.350}_{-0.300}$	$0.780^{+0.102}_{-0.092}$	$0.734^{+0.110}_{-0.055}$	$2.183^{+0.837}_{-0.606}$
	+4%/-4%	+2%/-2%	+103%/-88%	+13%/-12%	+15%/-7%	+38%/-28%
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 011822156-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1984 ± 301	$6.17^{+5.56}_{-4.06}$	270^{+13}_{-12}	4320^{+2844}_{-877}	$36321^{+282972}_{-26694}$
Alt.	-457 ± 111	$7.55^{+5.99}_{-4.86}$	270^{+14}_{-12}	3147^{+1306}_{-462}	5614^{+37577}_{-3931}

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

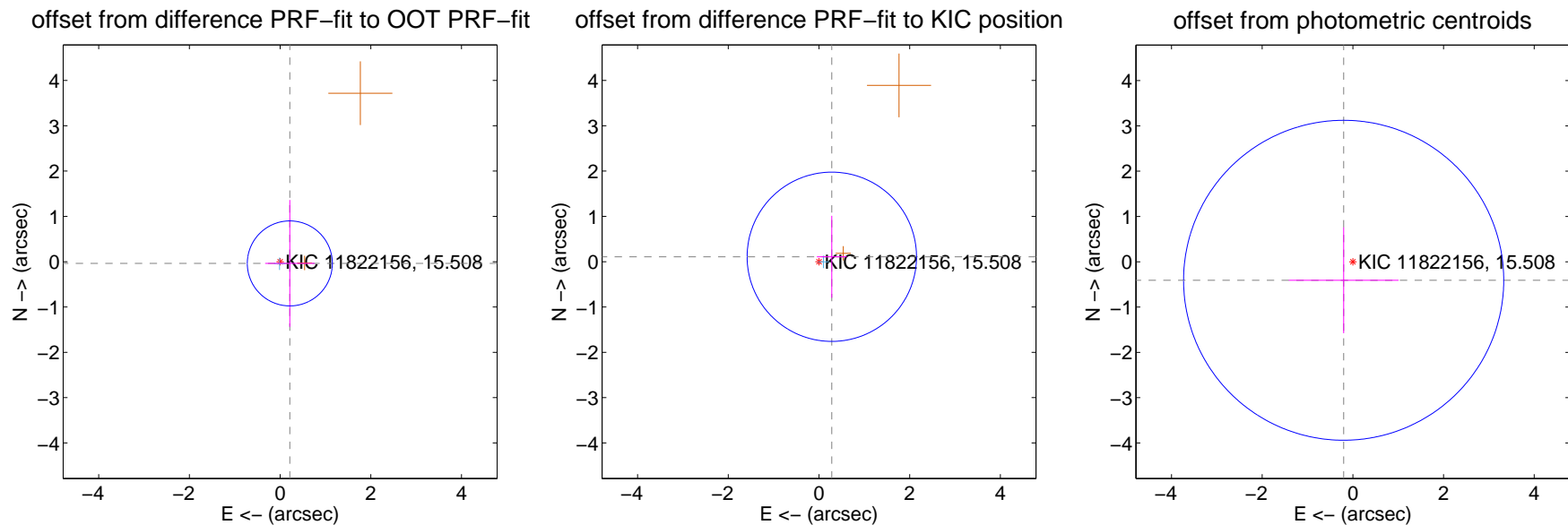
DV Centroid Data

Supplemental centroid analysis for 011822156-02. Kepler magnitude: 15.51. Transit SNR 7.30

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.218 ± 0.313	0.70	-0.214 ± 0.544	-0.038 ± 1.399
PRF-fit source offset from KIC position	0.303 ± 0.622	0.49	-0.283 ± 0.329	0.109 ± 0.905
photometric centroid source offset	0.46 ± 1.18	0.39	0.20 ± 1.21	-0.41 ± 1.17

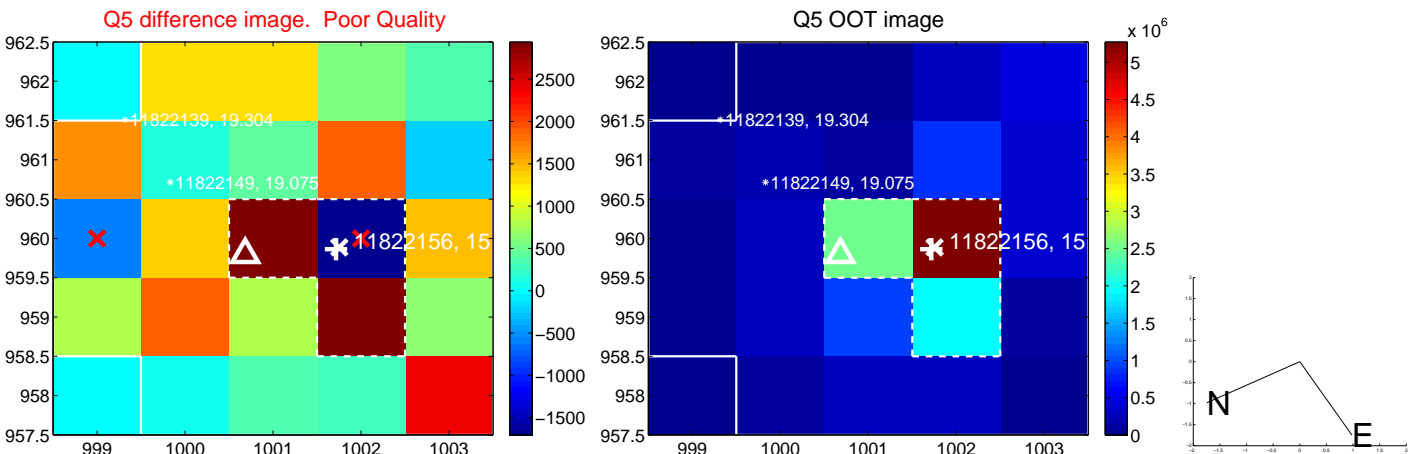


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

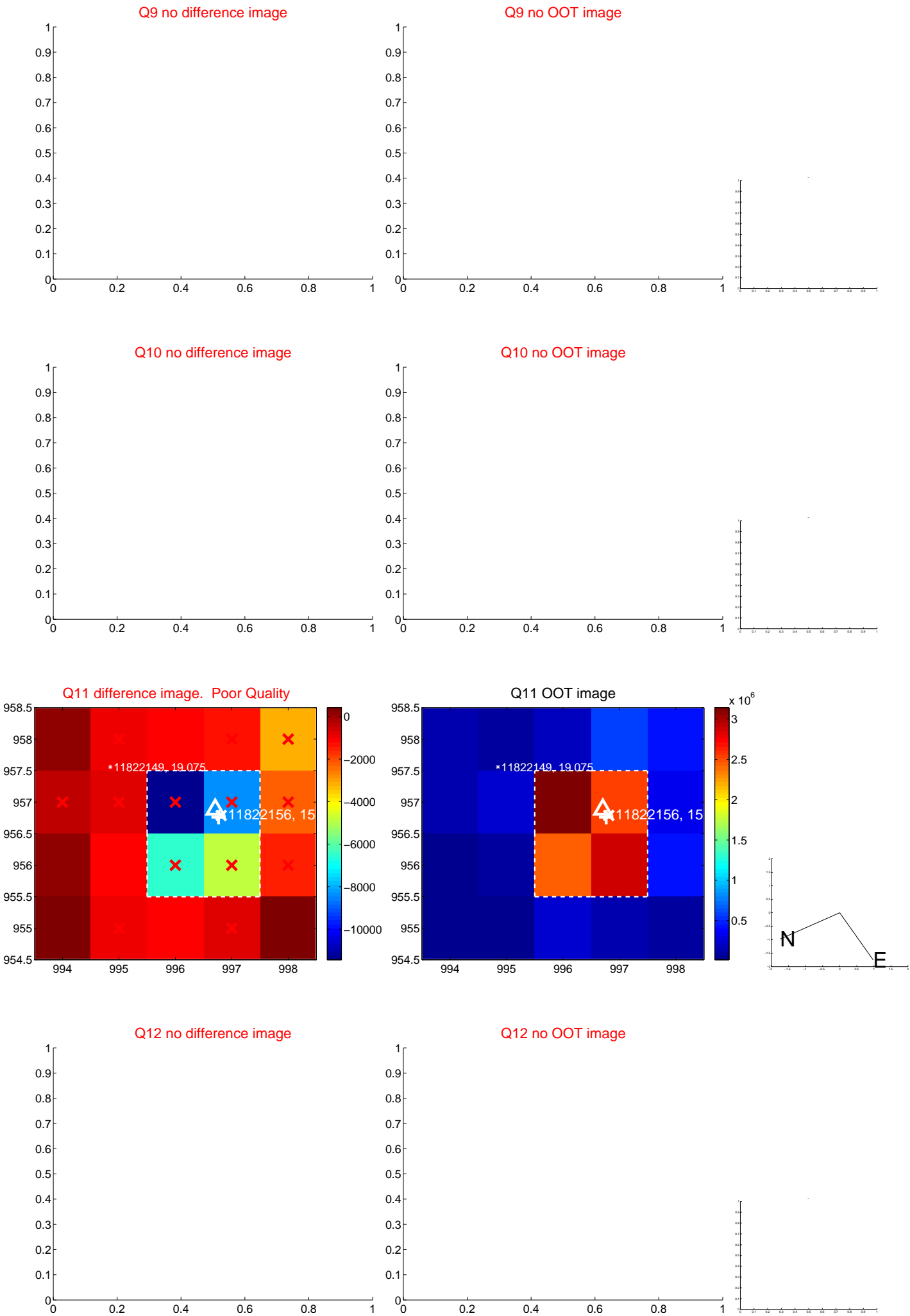
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



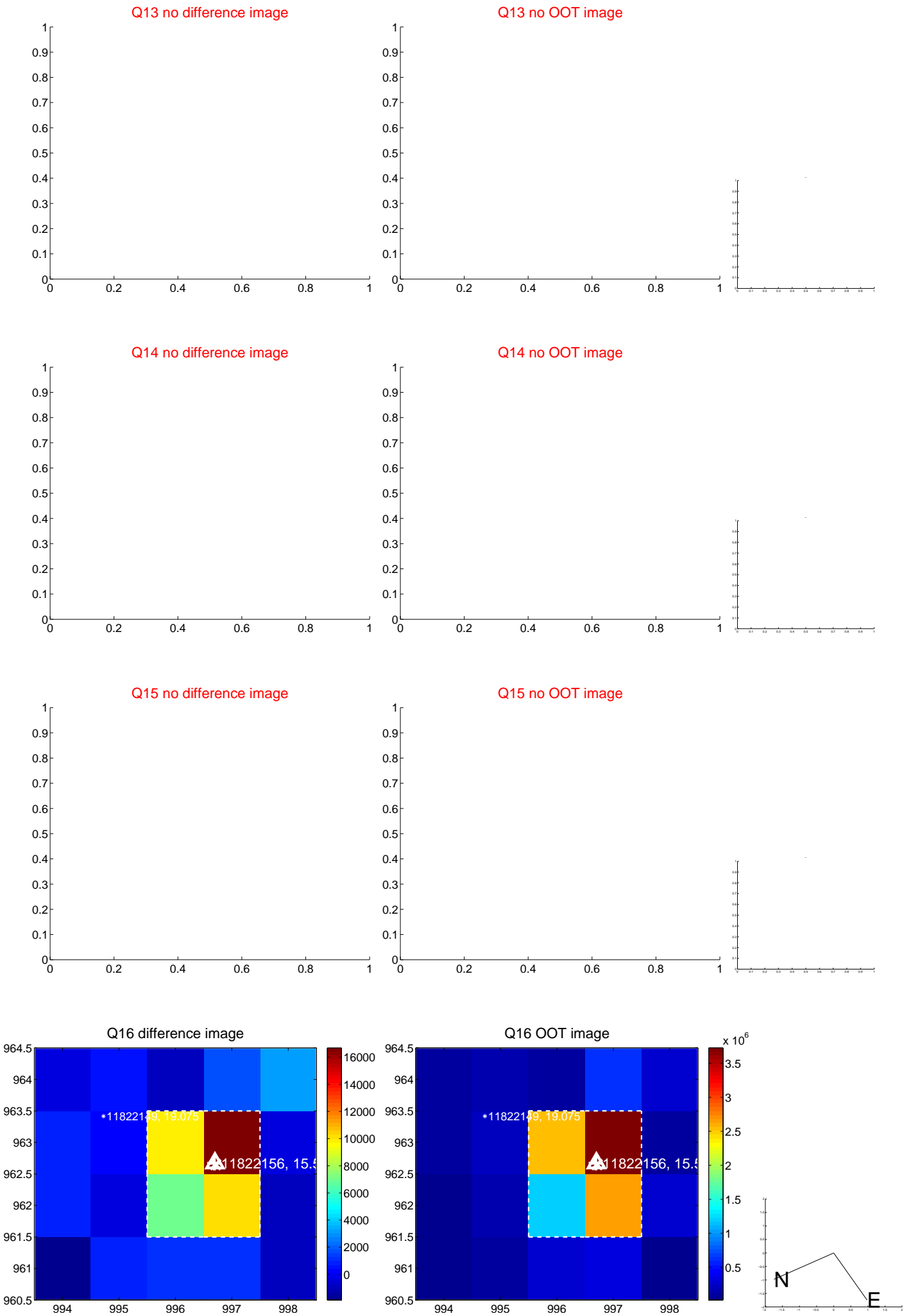
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



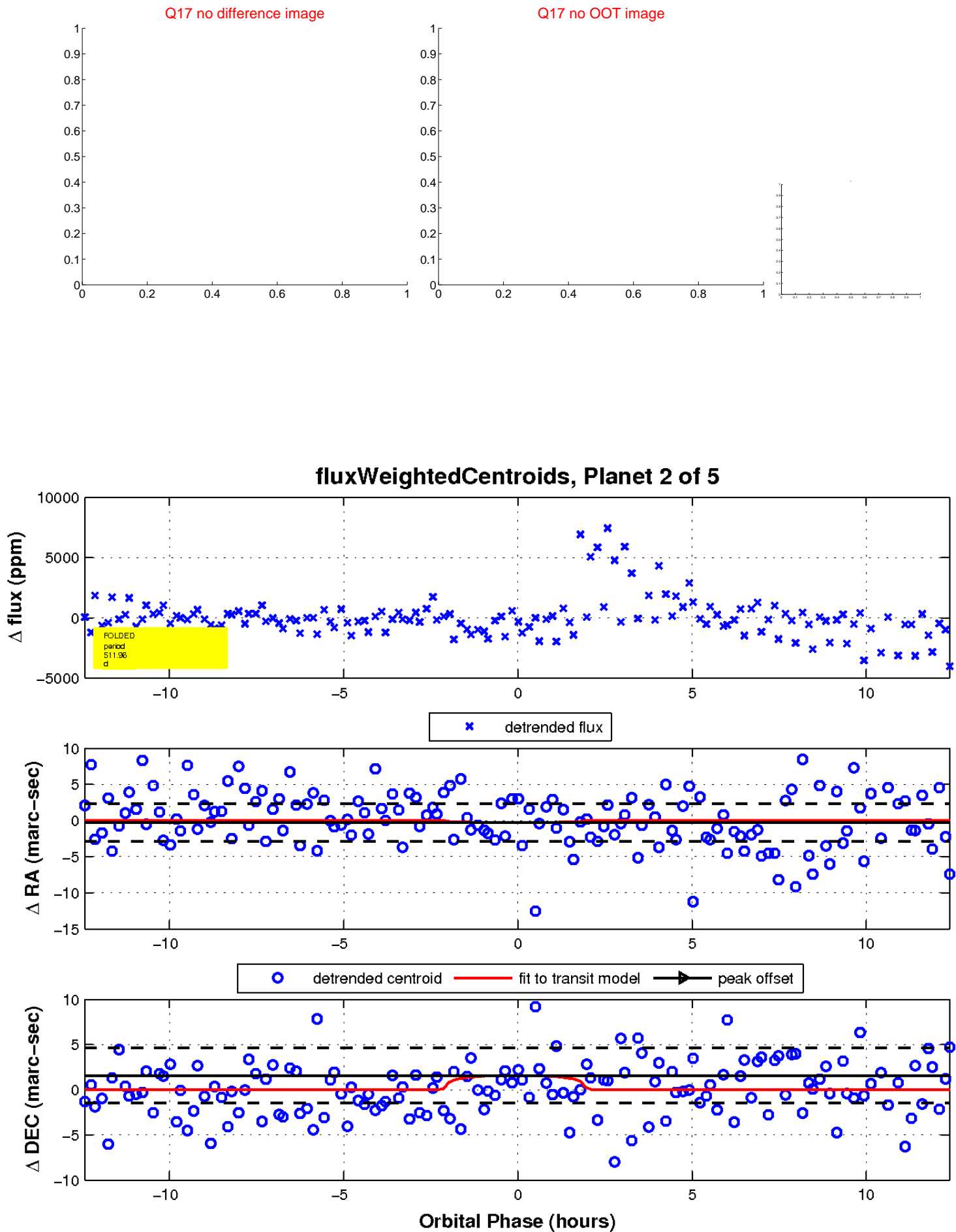
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

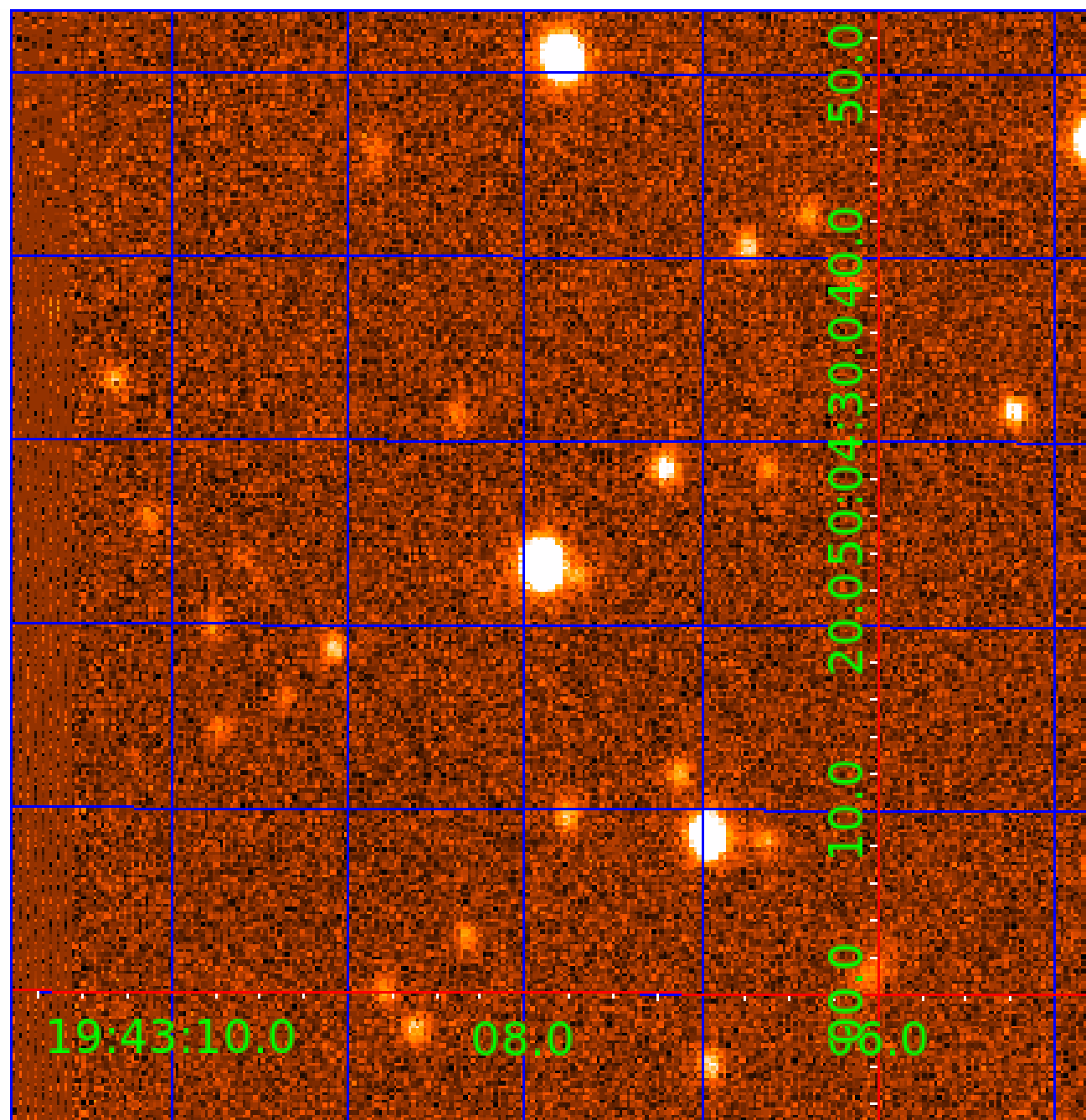


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 011822156

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})
011822156-01	OBS	No	397.926517	518.444341	1852.4	5.465	16.0	6.6	0.78	5282	3.33	0.47
011822156-02	OBS	No	511.956227	528.868518	1824.2	4.159	15.1	7.3	0.78	5282	3.33	0.33
011822156-03	OBS	No	275.831388	372.346511	1334.1	4.872	14.9	5.7	0.78	5282	3.19	0.76
011822156-04	OBS	No	306.578323	287.296455	1631.1	10.500	14.7	-1.0	0.78	5282	3.09	0.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011822156-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011822156-02	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
011822156-03	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
011822156-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

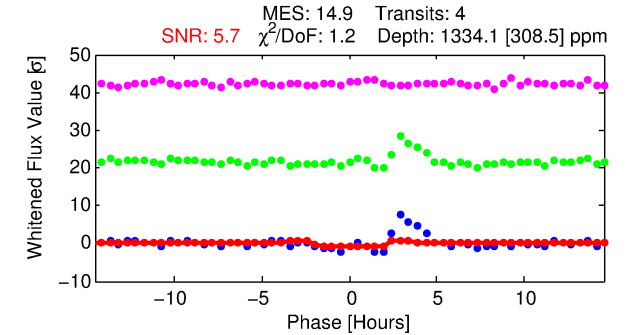
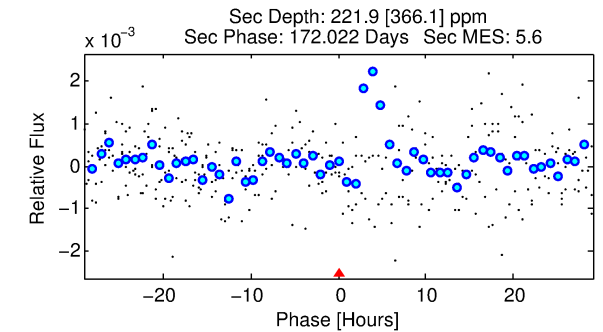
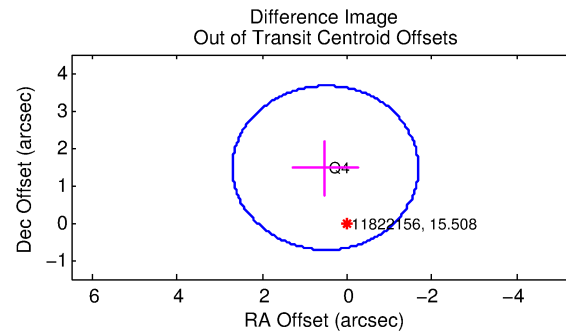
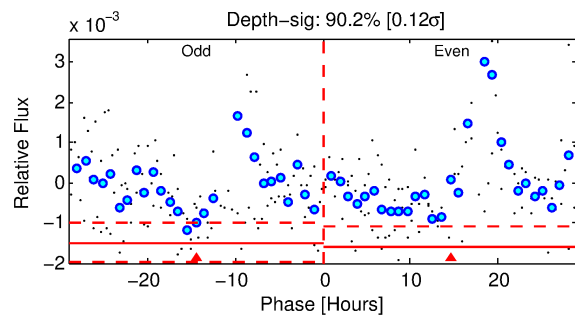
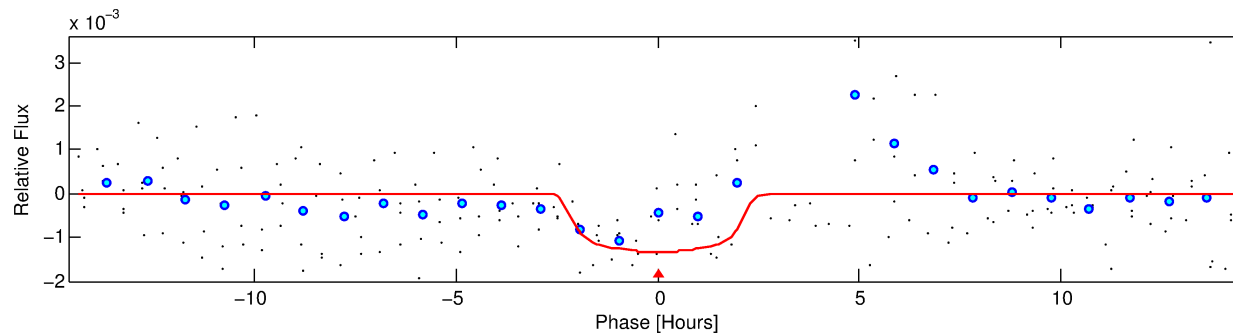
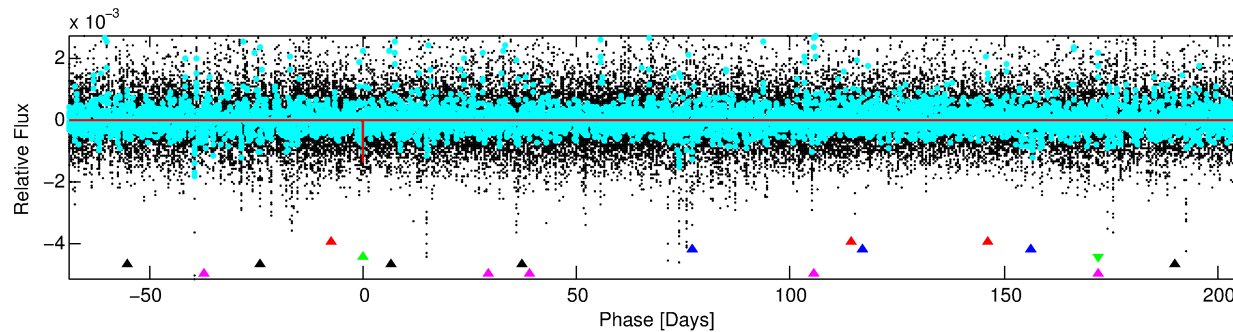
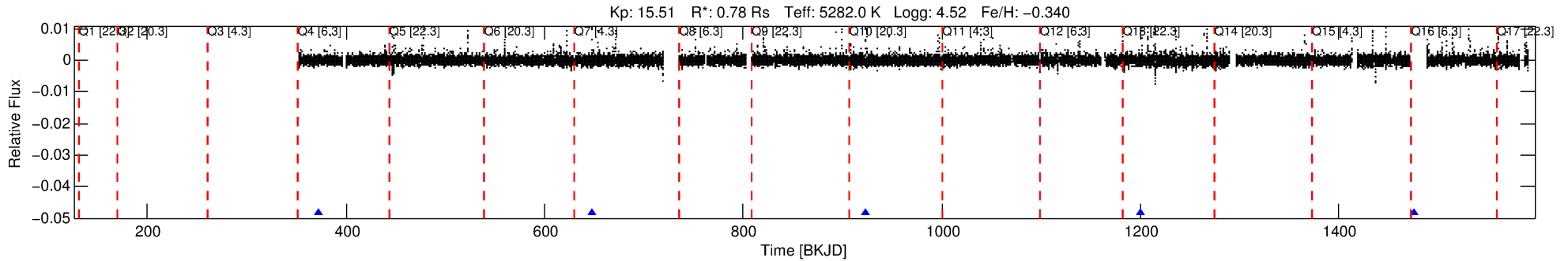
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 011822156-03

No Significant Match Found

DV One-Page Summary

KIC: 11822156 Candidate: 3 of 5 Period: 275.831 d



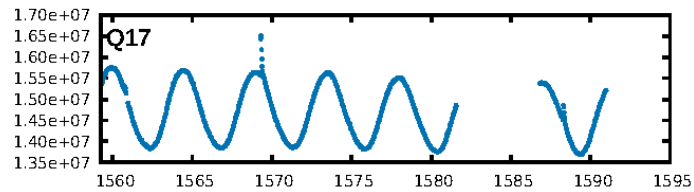
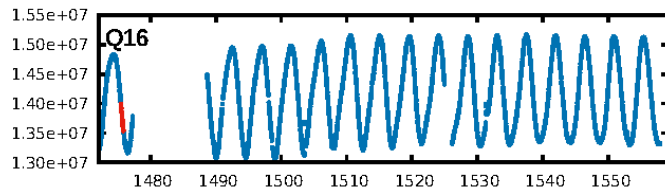
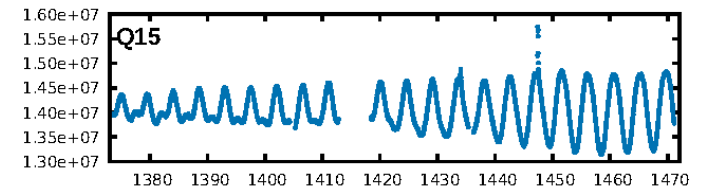
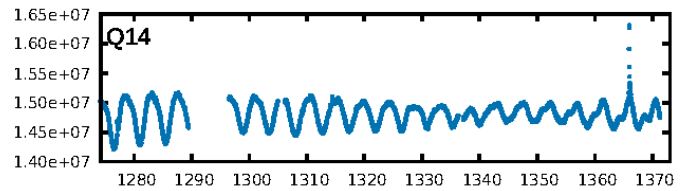
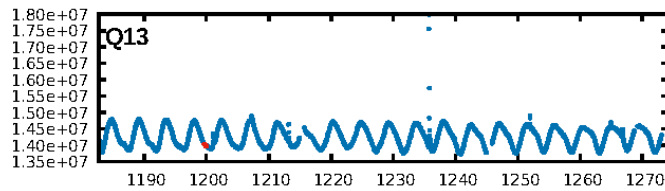
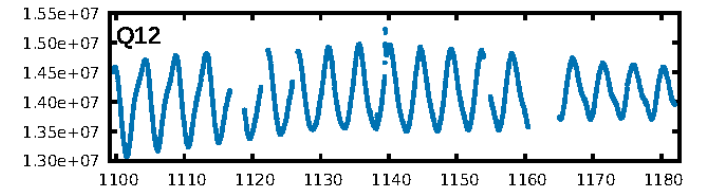
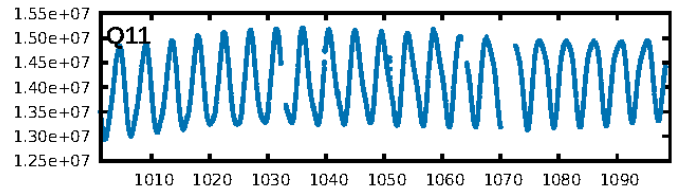
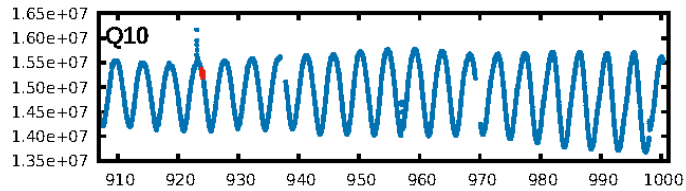
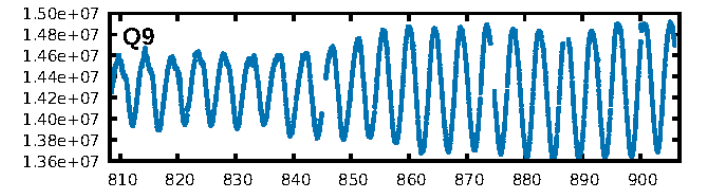
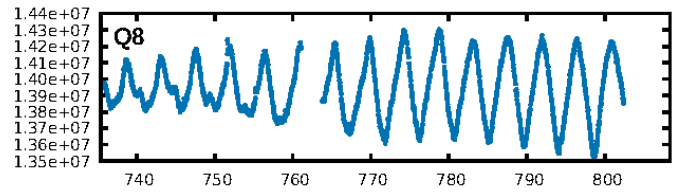
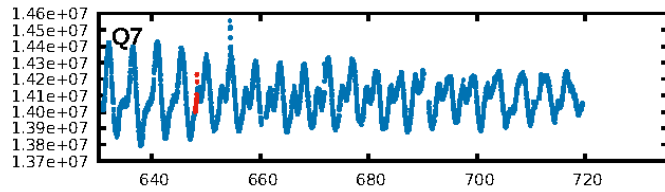
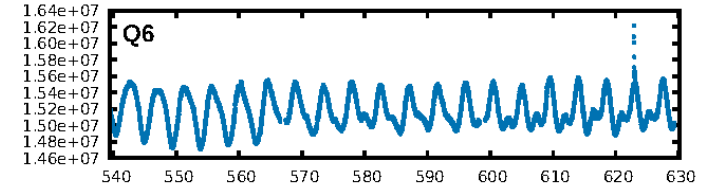
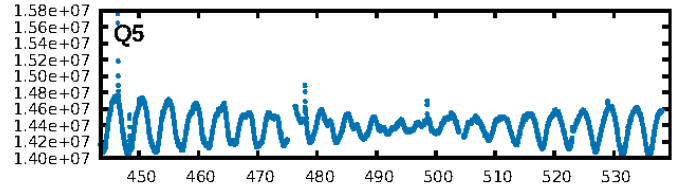
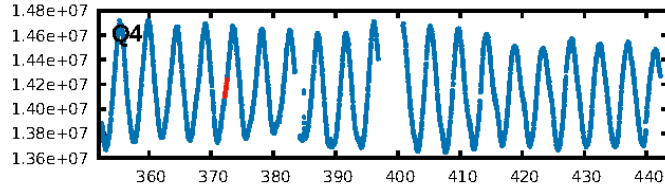
DV Fit Results:

Period = 275.83139 [0.00719] d
Epoch = 372.3465 [0.0113] BKJD
Rp/R* = 0.0374 [0.0146]
a/R* = 282.19 [392.94]
b = 0.81 [0.61]
Seff = 0.76 [0.16]
Teq = 238 [13] K
Rp = 3.19 [1.31] Re
a = 0.7485 [0.0833] AU
Ag = 6739.88 [12349.68] [0.55 σ]
Teffp = 3332 [1525] K [2.03 σ]

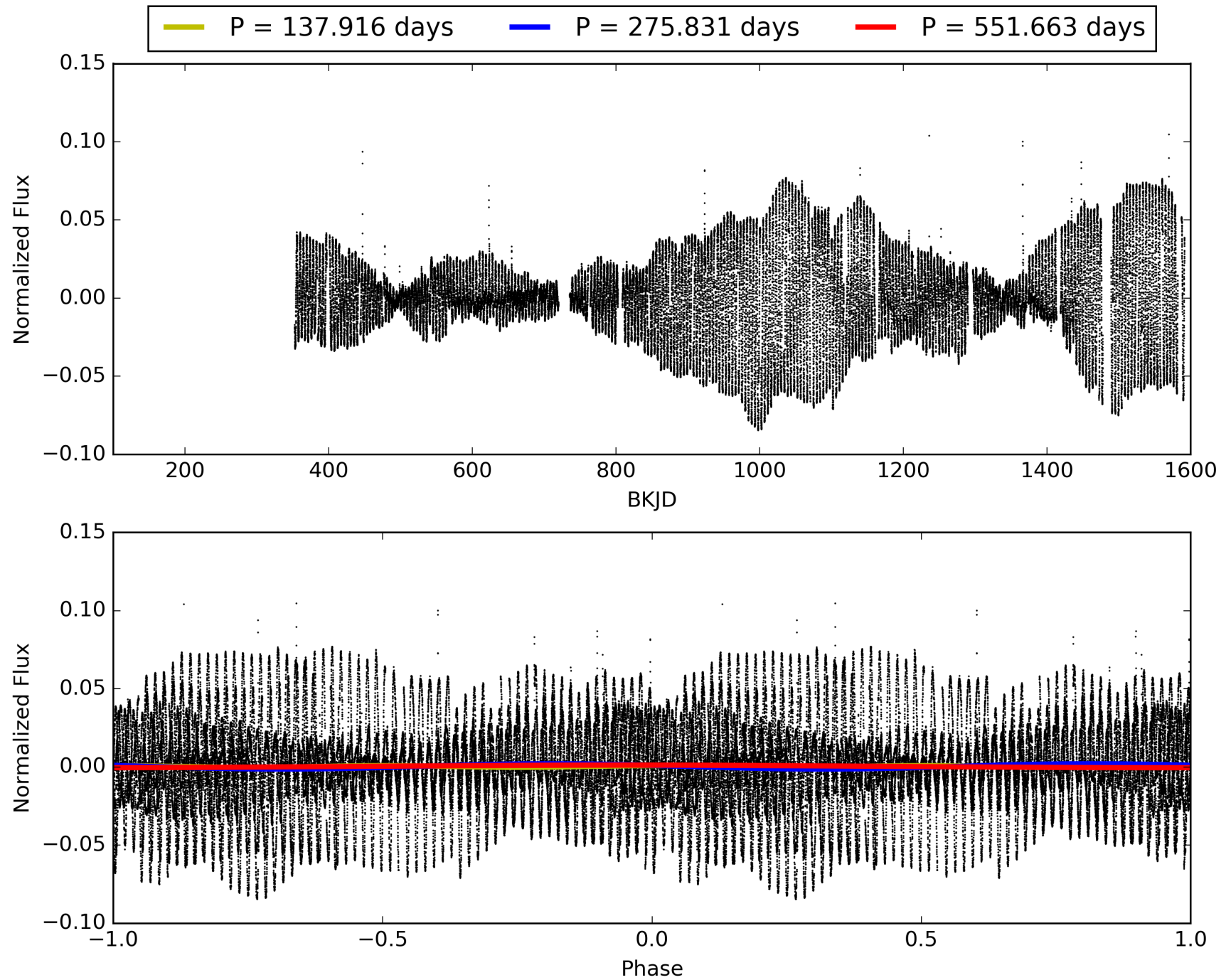
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [63.75 σ]
ModelChiSquare2-sig: 1.6%
ModelChiSquareGof-sig: 52.7%
Bootstrap-pfa: 5.06e-16
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 47.41
Centroid-sig: 24.5%
Centroid-so: 2.026 arcsec [1.48 σ]
OotOffset-rm: 1.551 arcsec [2.12 σ]
KicOffset-rm: 1.610 arcsec [2.21 σ]
OotOffset-st: 0/0/1/0 [1]
KicOffset-st: 0/0/1/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 011822156-03, PDC Light Curves

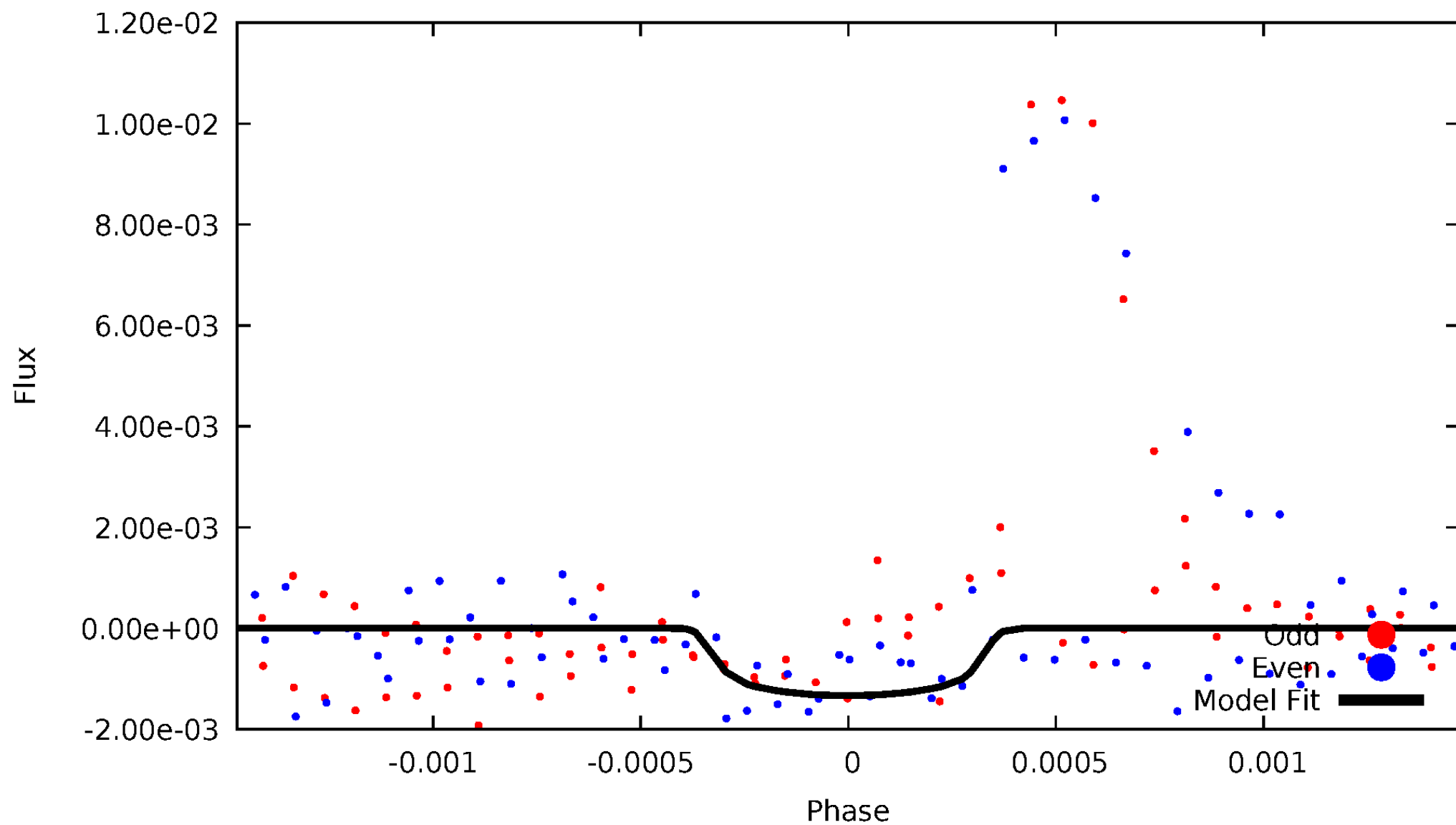


TCE 011822156-03



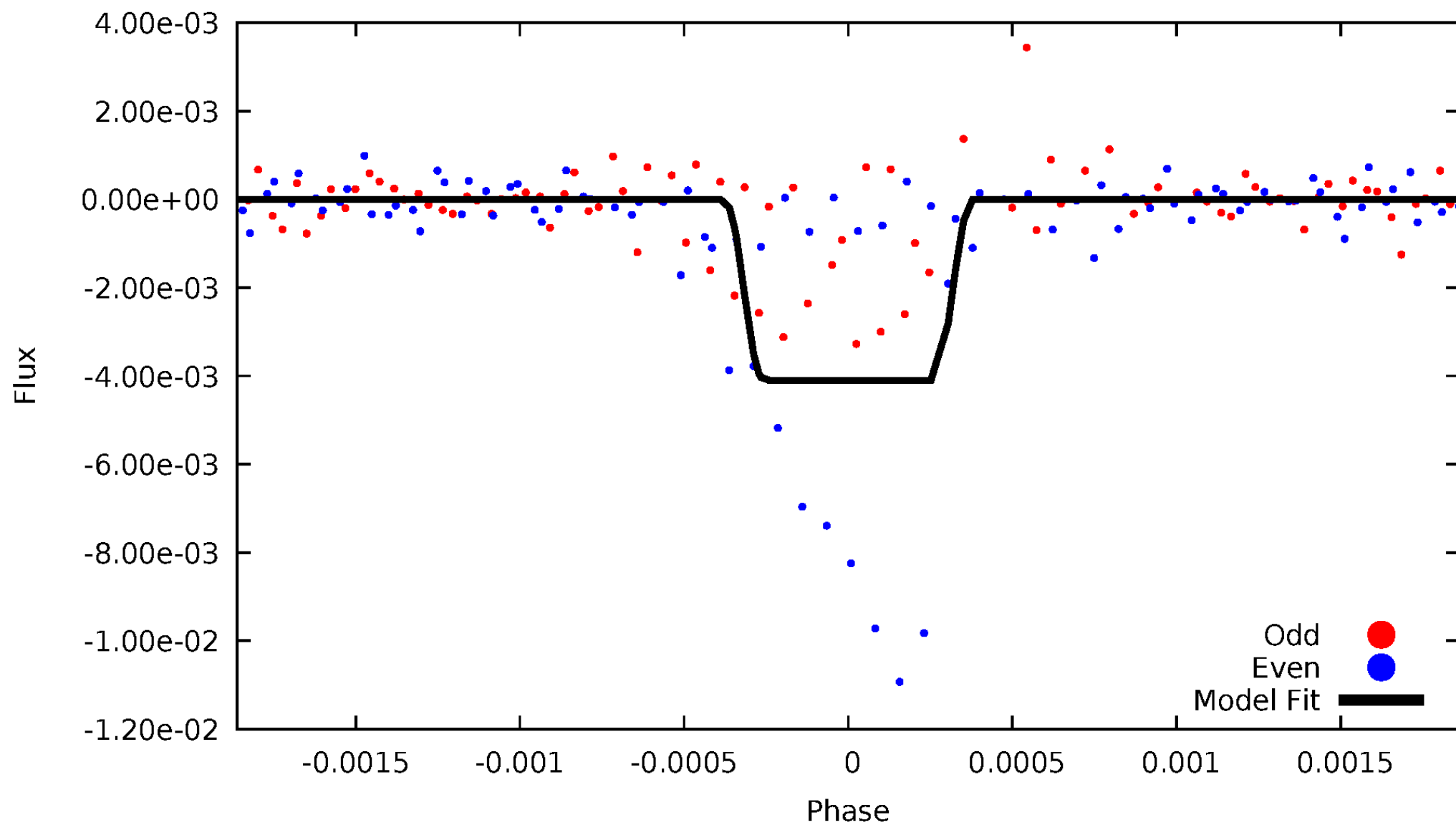
DV Odd/Even

TCE 011822156-03



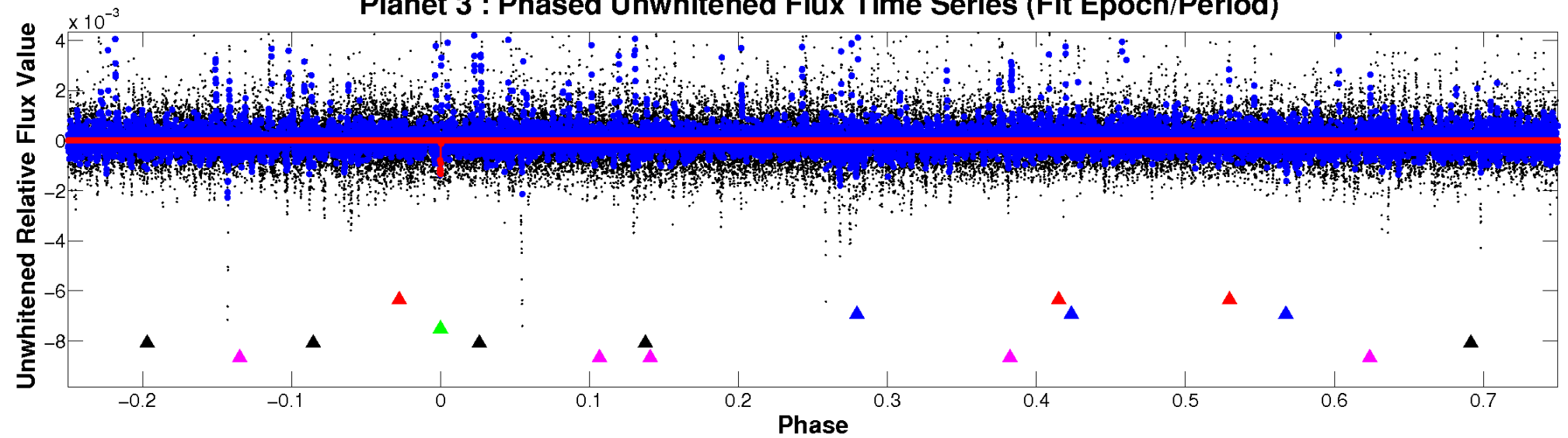
ALT Odd/Even

TCE 011822156-03

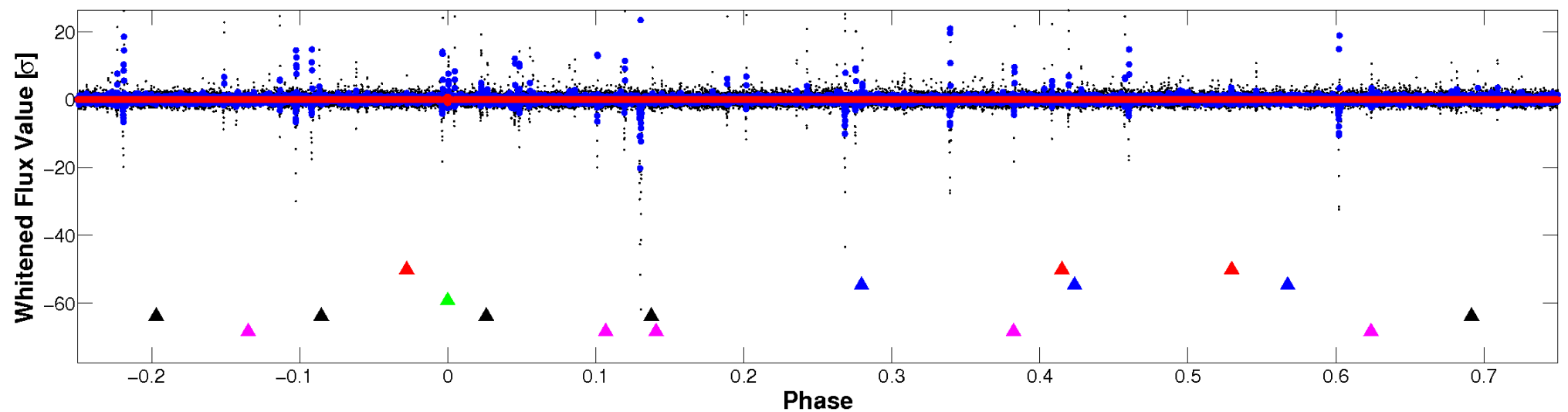


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

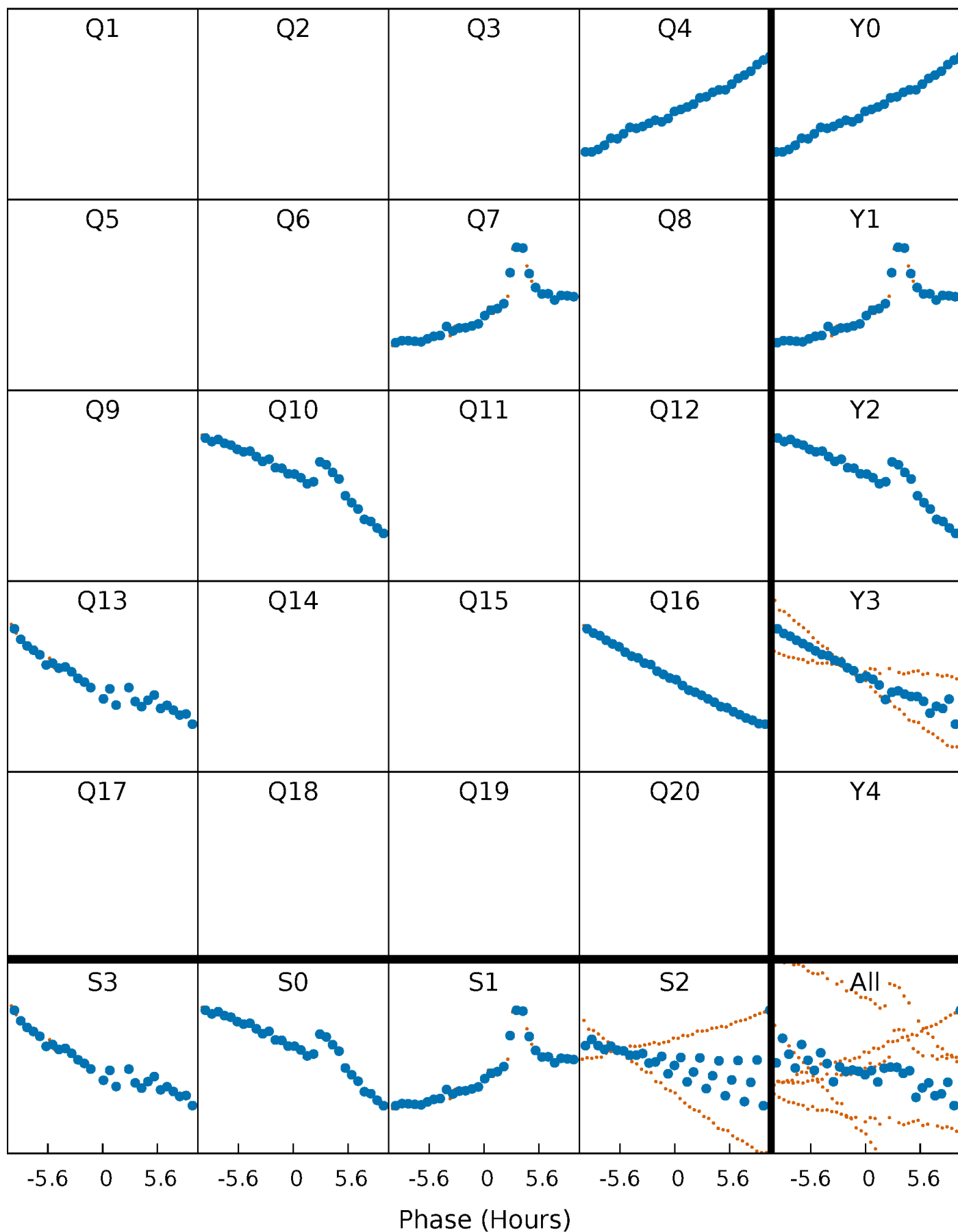


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



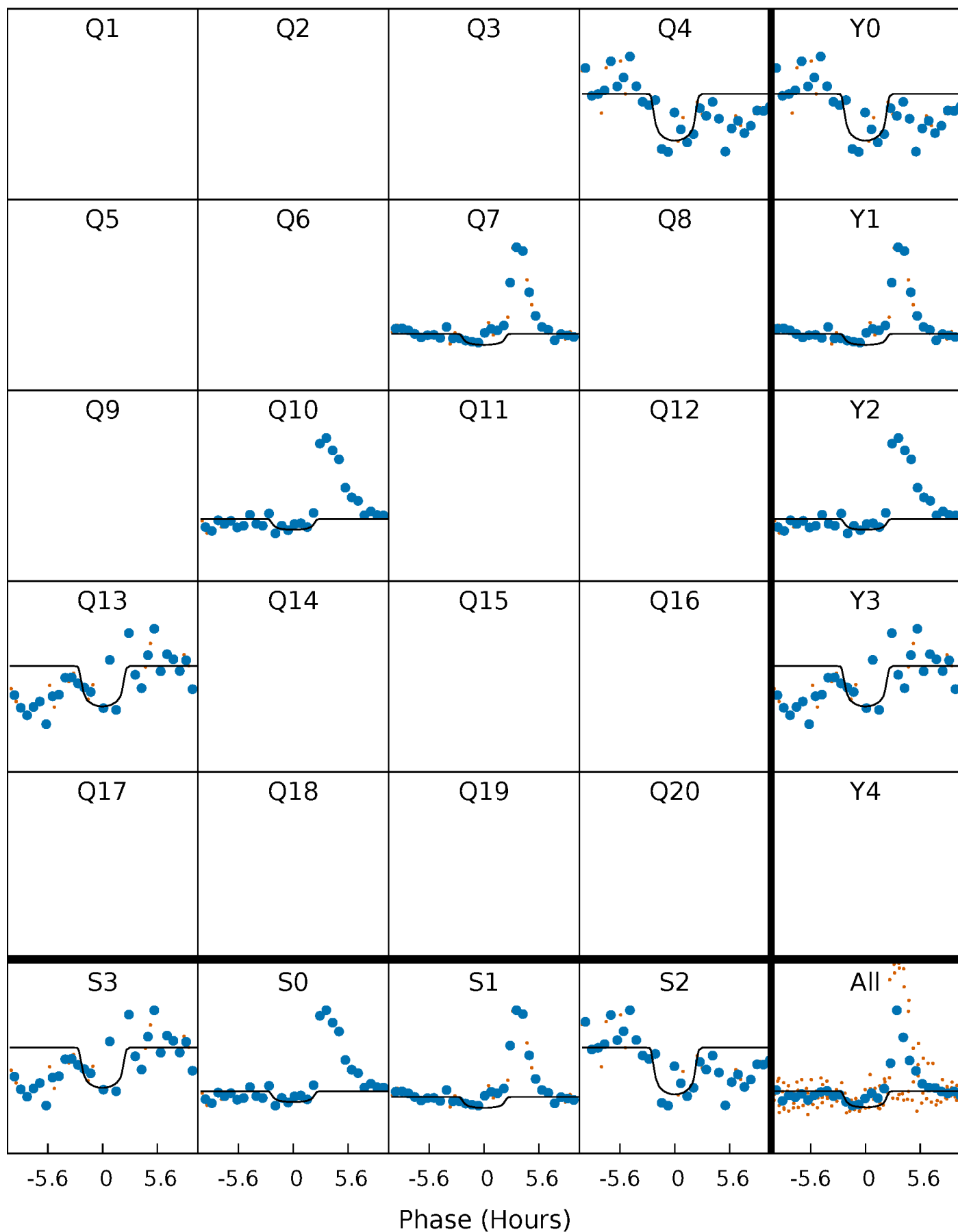
PDC Quarter-Phased Transit Curves

TCE 011822156-03 P=275.831388 Days $T_0=372.346511$ (BKJD)



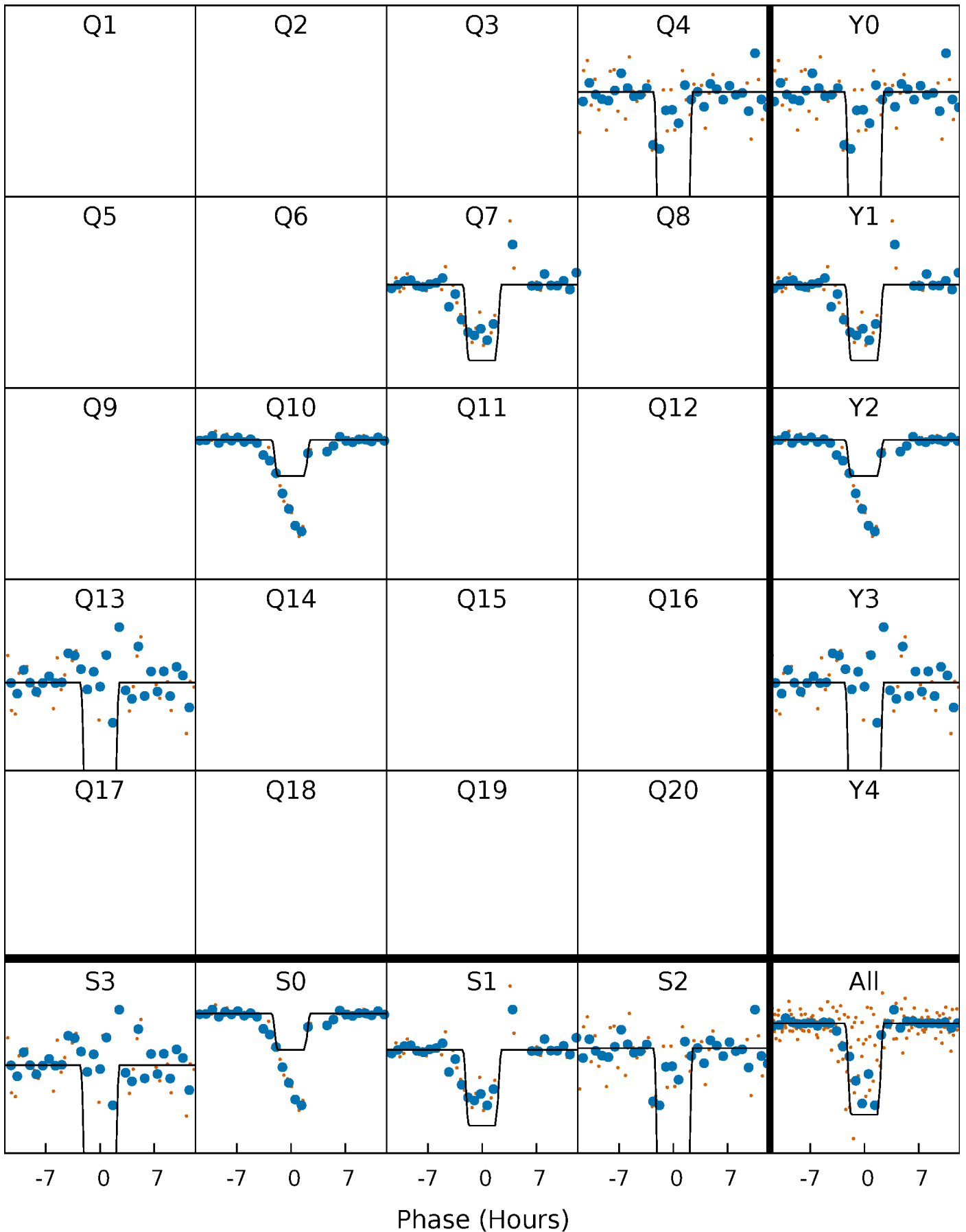
DV Quarter-Phased Transit Curves

TCE 011822156-03 P=275.831388 Days $T_0=372.346511$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

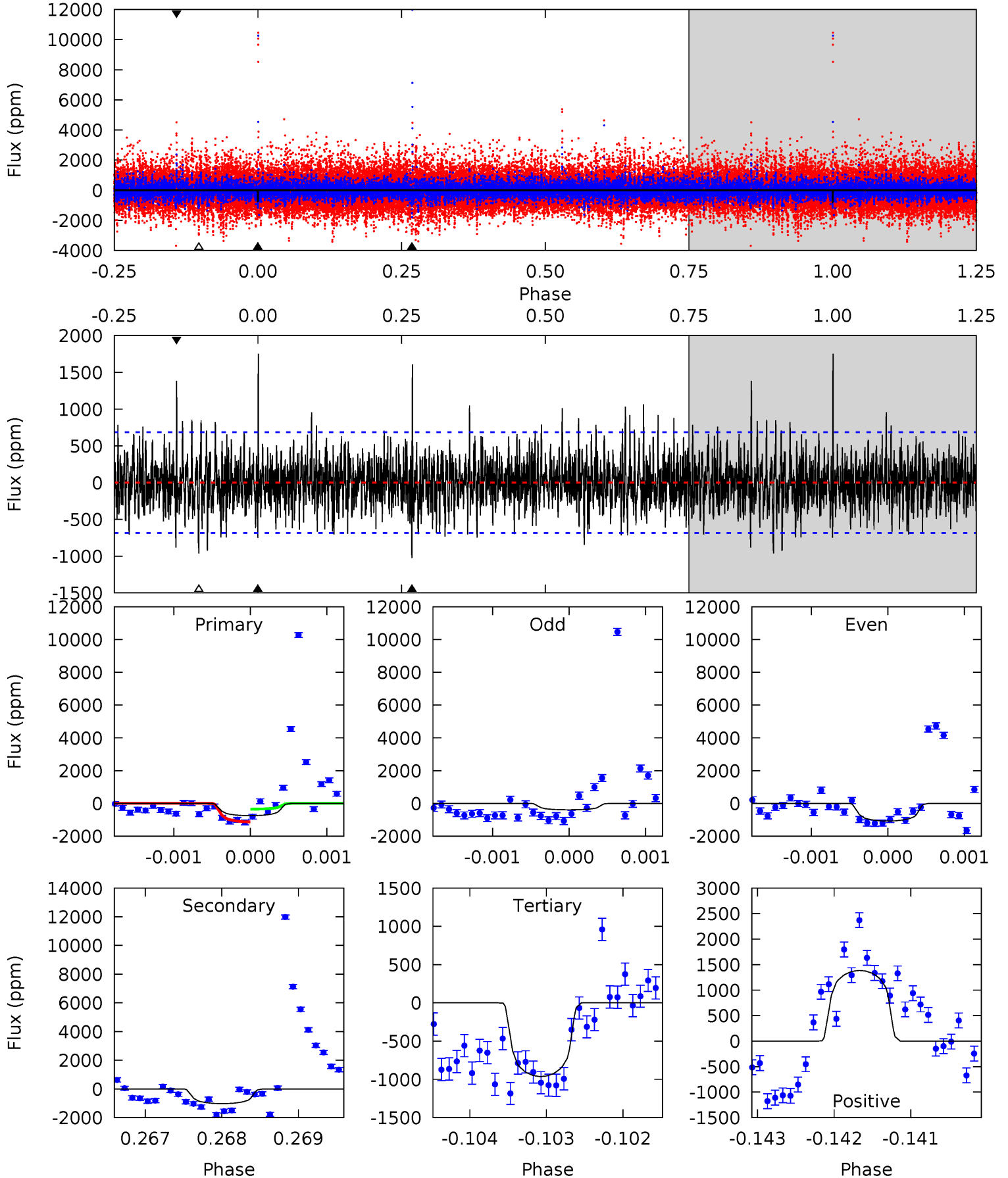
TCE 011822156-03 P=275.817302 Days $T_0=372.393592$ (BKJD)



DV Model-Shift Uniqueness Test

011822156-03, P = 275.831388 Days, E = 96.515123 Days

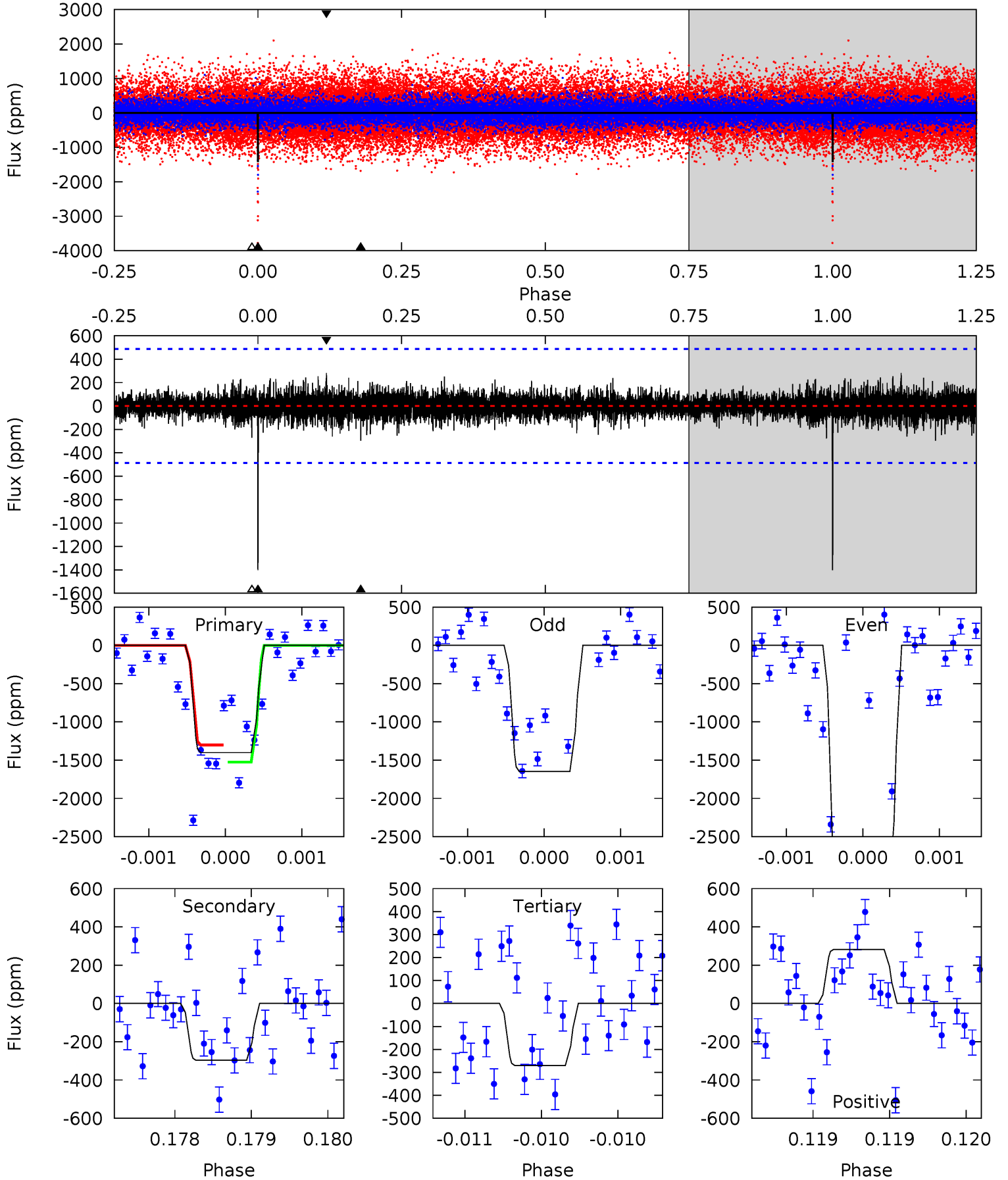
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.00	8.19	7.70	11.1	5.49	3.35	2.17	-1.70	-5.08	0.49	-2.89	2.29	0.96	0.63	3.13



Alt Model-Shift Uniqueness Test

011822156-03, P = 275.817302 Days, E = 96.576290 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.8	3.35	3.05	3.19	5.50	3.37	0.68	12.8	12.7	0.30	0.17	10.7	1.81	0.17	1.27



Stellar Parameters For KIC 011822156

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5282^{+185}_{-185}	$4.520^{+0.090}_{-0.090}$	$-0.340^{+0.350}_{-0.300}$	$0.780^{+0.102}_{-0.092}$	$0.734^{+0.110}_{-0.055}$	$2.183^{+0.837}_{-0.606}$
	+4%/-4%	+2%/-2%	+103%/-88%	+13%/-12%	+15%/-7%	+38%/-28%
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 011822156-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1023 ± 125	$3.23^{+1.17}_{-1.29}$	333^{+16}_{-15}	4920^{+1297}_{-614}	30697^{+53489}_{-15077}
Alt.	-297 ± 88	$5.50^{+1.32}_{-1.34}$	331^{+17}_{-15}	3260^{+319}_{-263}	3022^{+2372}_{-1316}

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

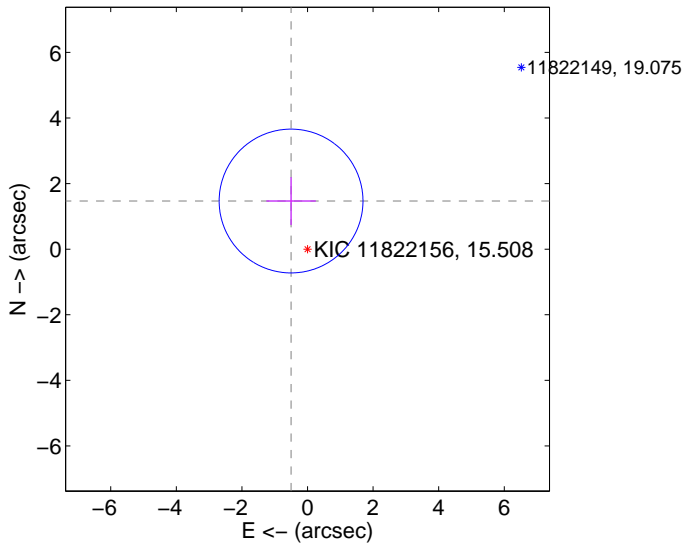
Supplemental centroid analysis for 011822156-03. Kepler magnitude: 15.51. Transit SNR 5.66

There are 1 quarters with good PRF difference image offsets

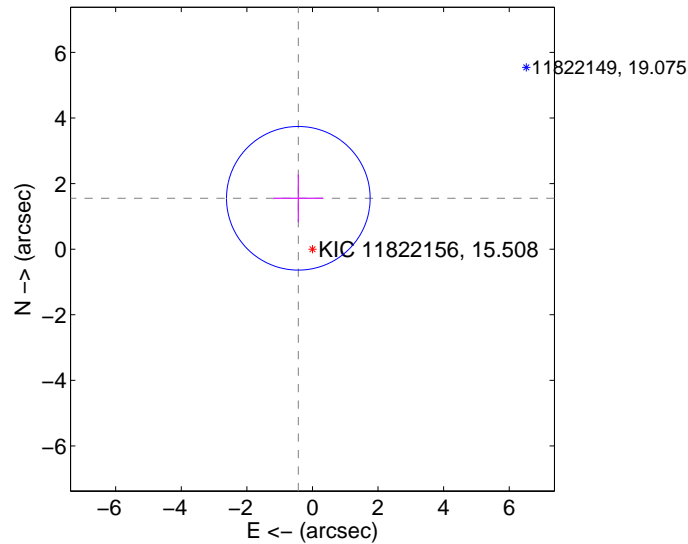
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.551 ± 0.731	2.12	0.501 ± 0.754	1.468 ± 0.728
PRF-fit source offset from KIC position	1.610 ± 0.730	2.21	0.431 ± 0.754	1.551 ± 0.728
photometric centroid source offset	2.03 ± 1.37	1.48	1.00 ± 1.42	1.76 ± 1.36

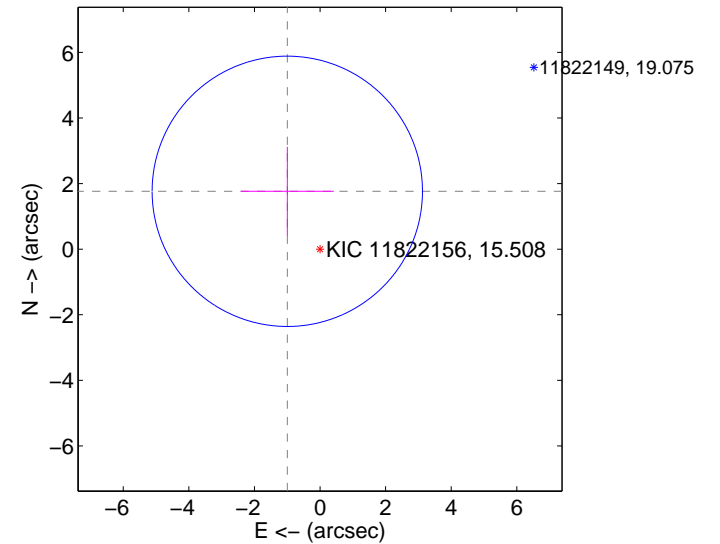
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

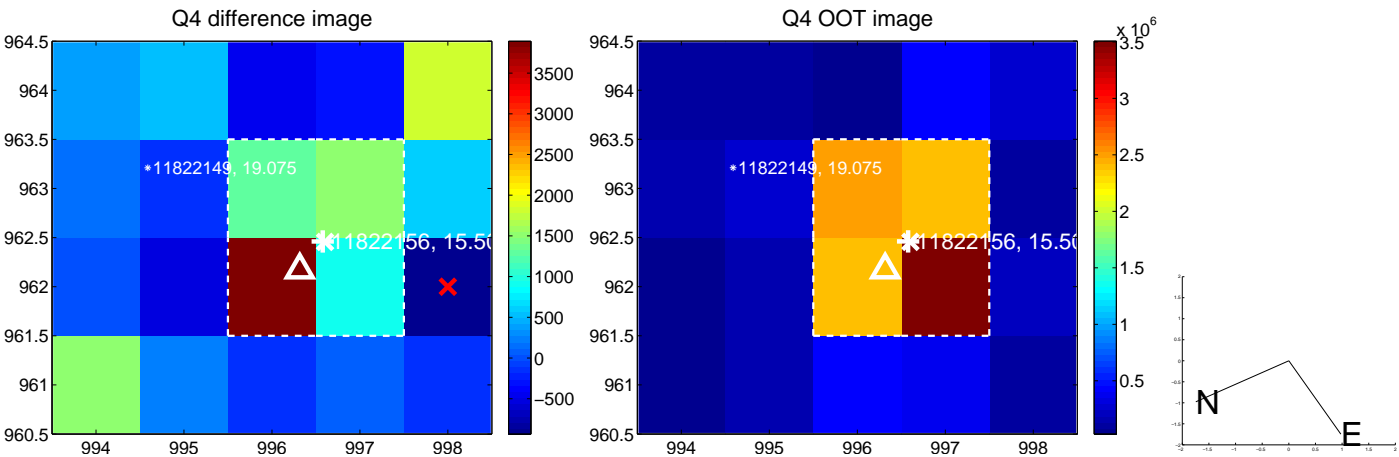
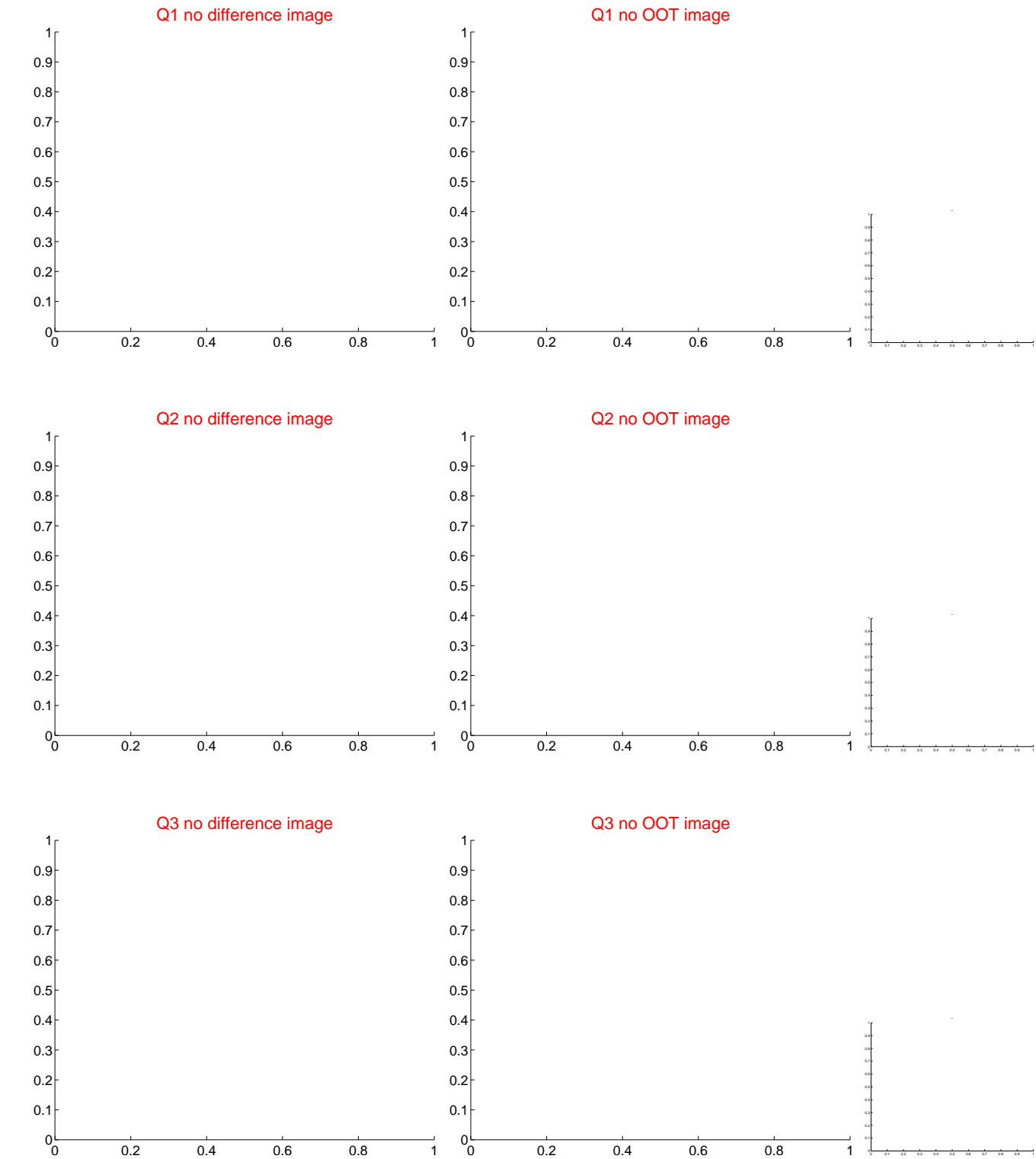


offset from photometric centroids

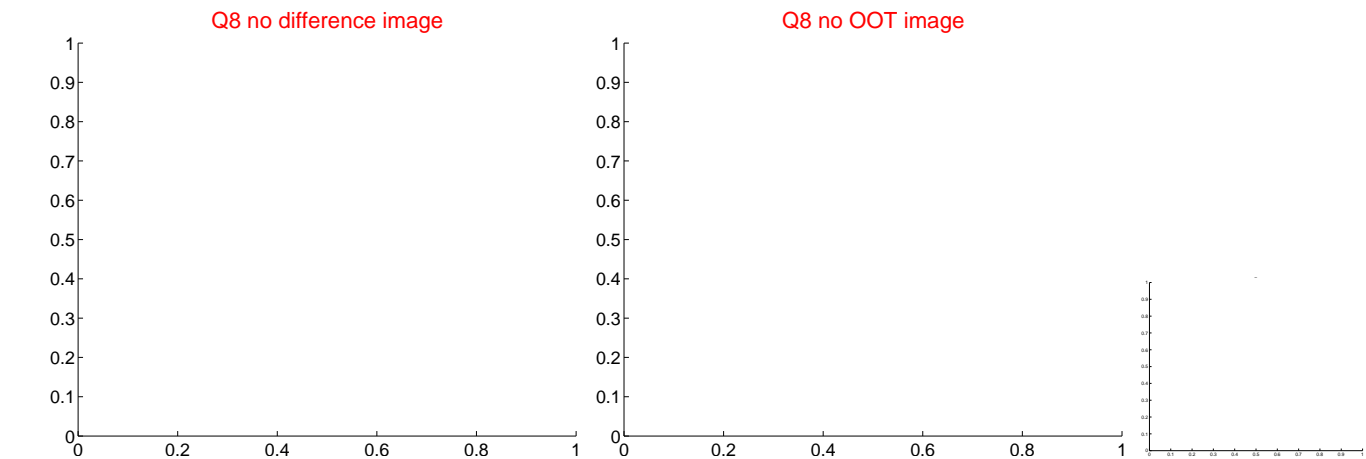
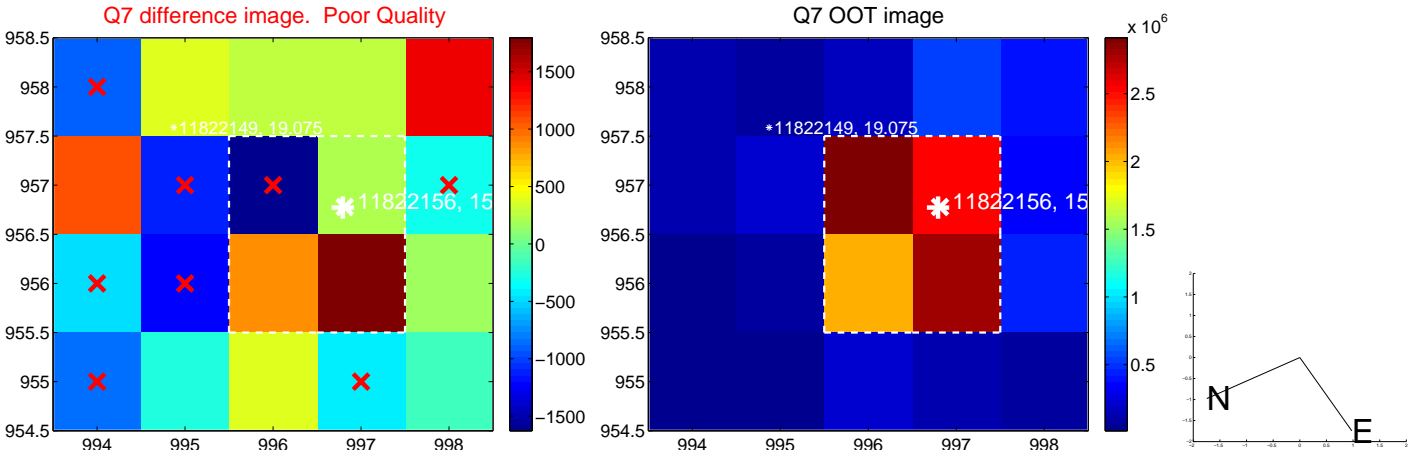
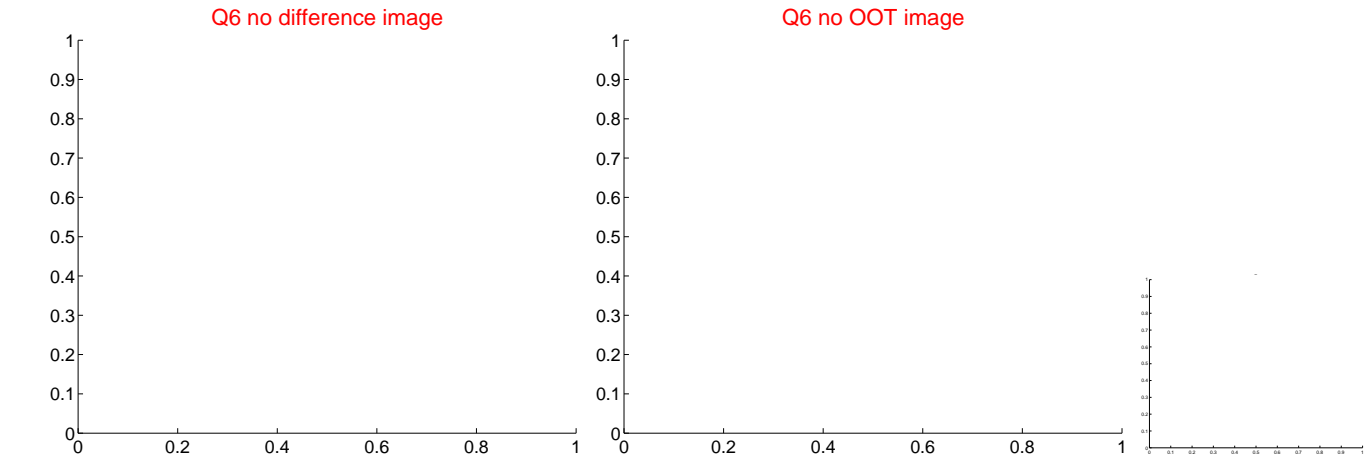
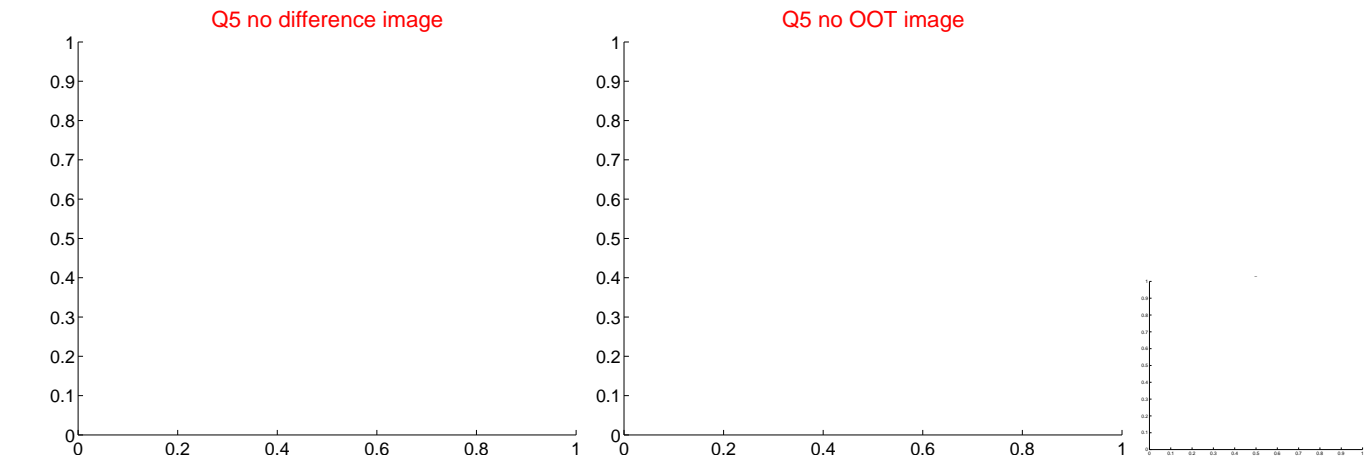


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

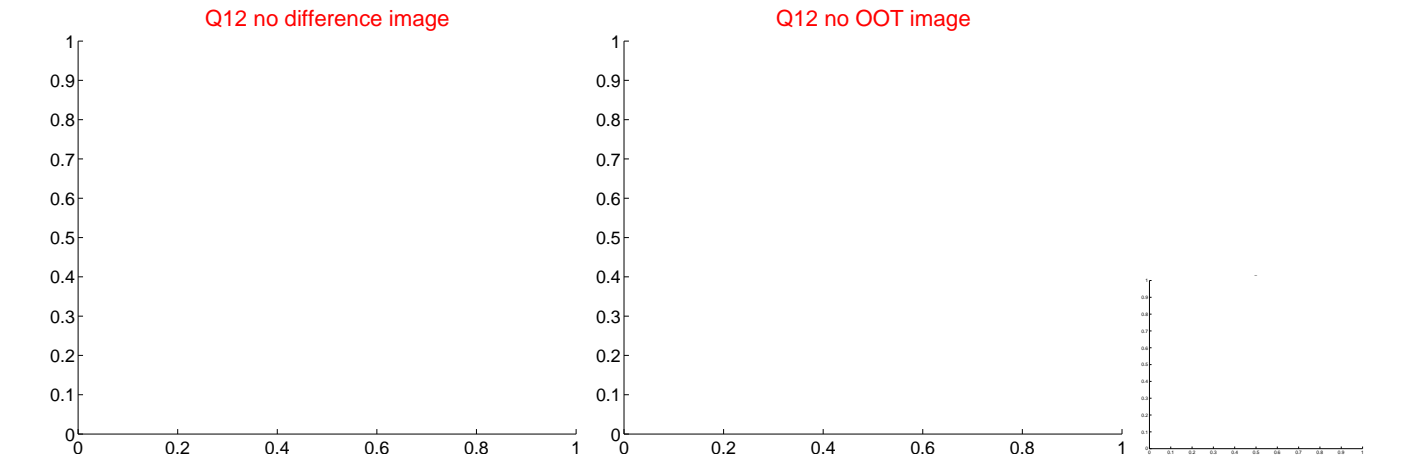
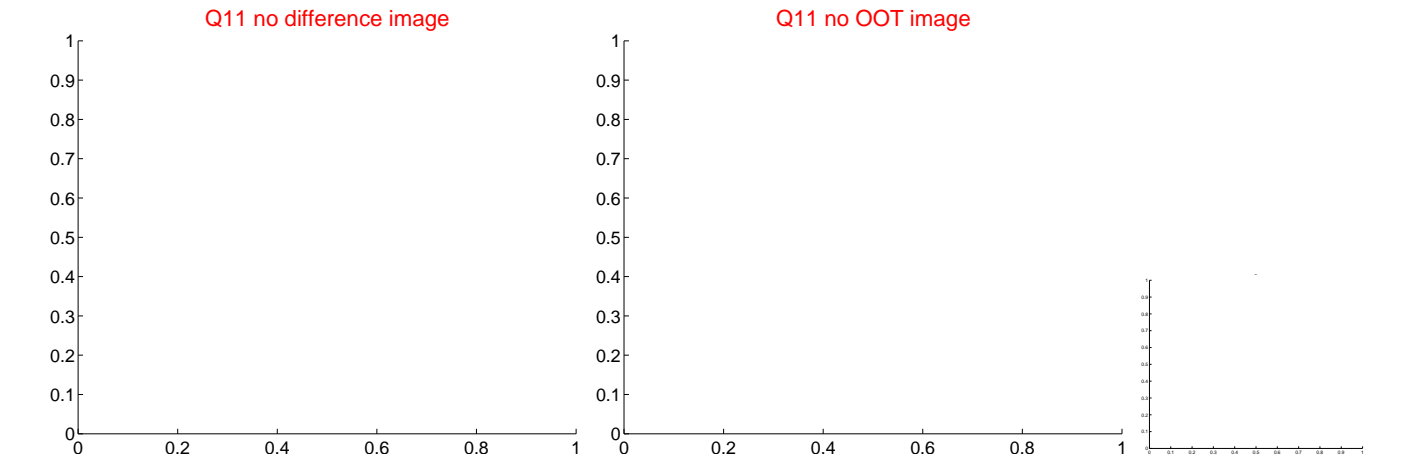
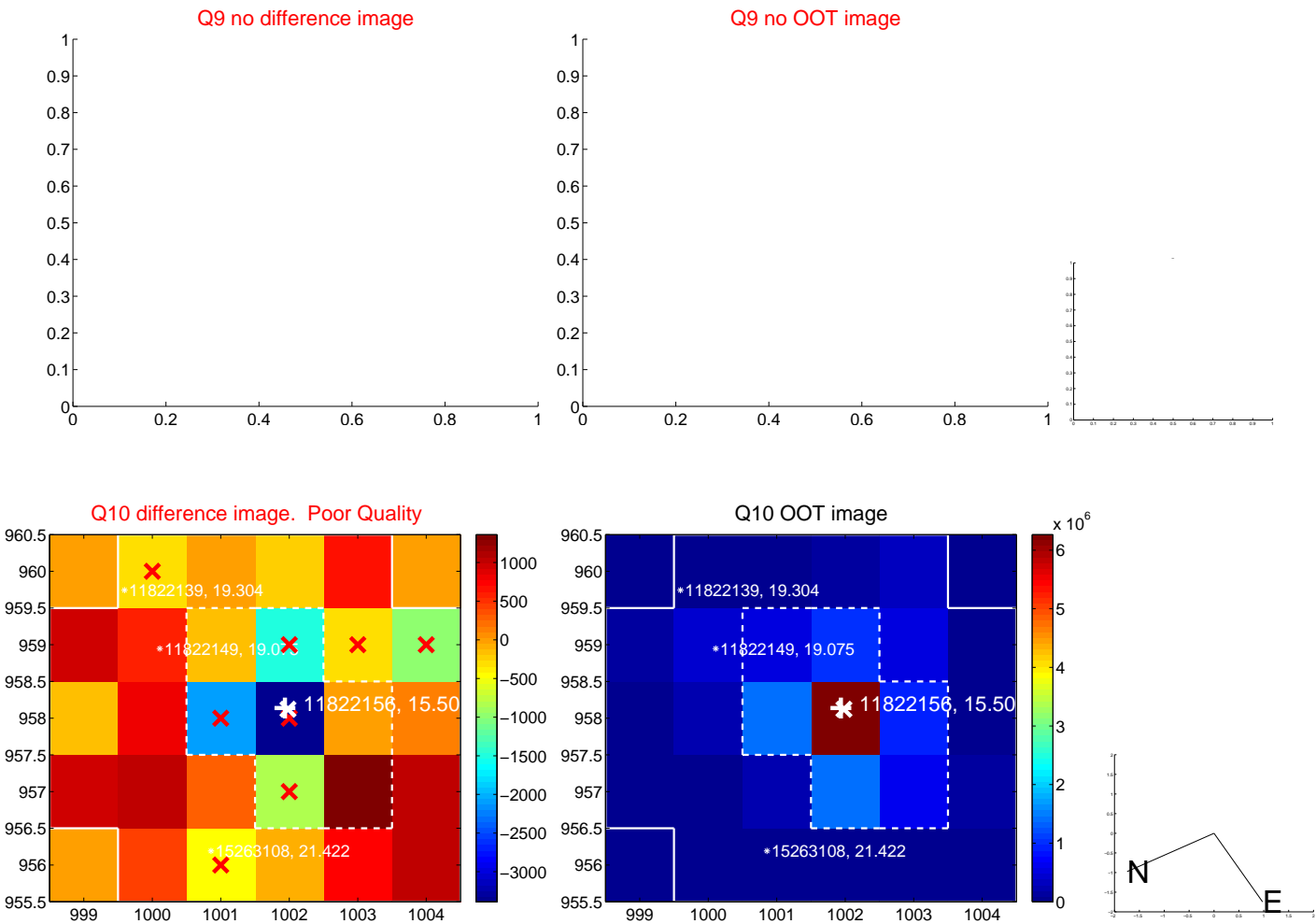
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



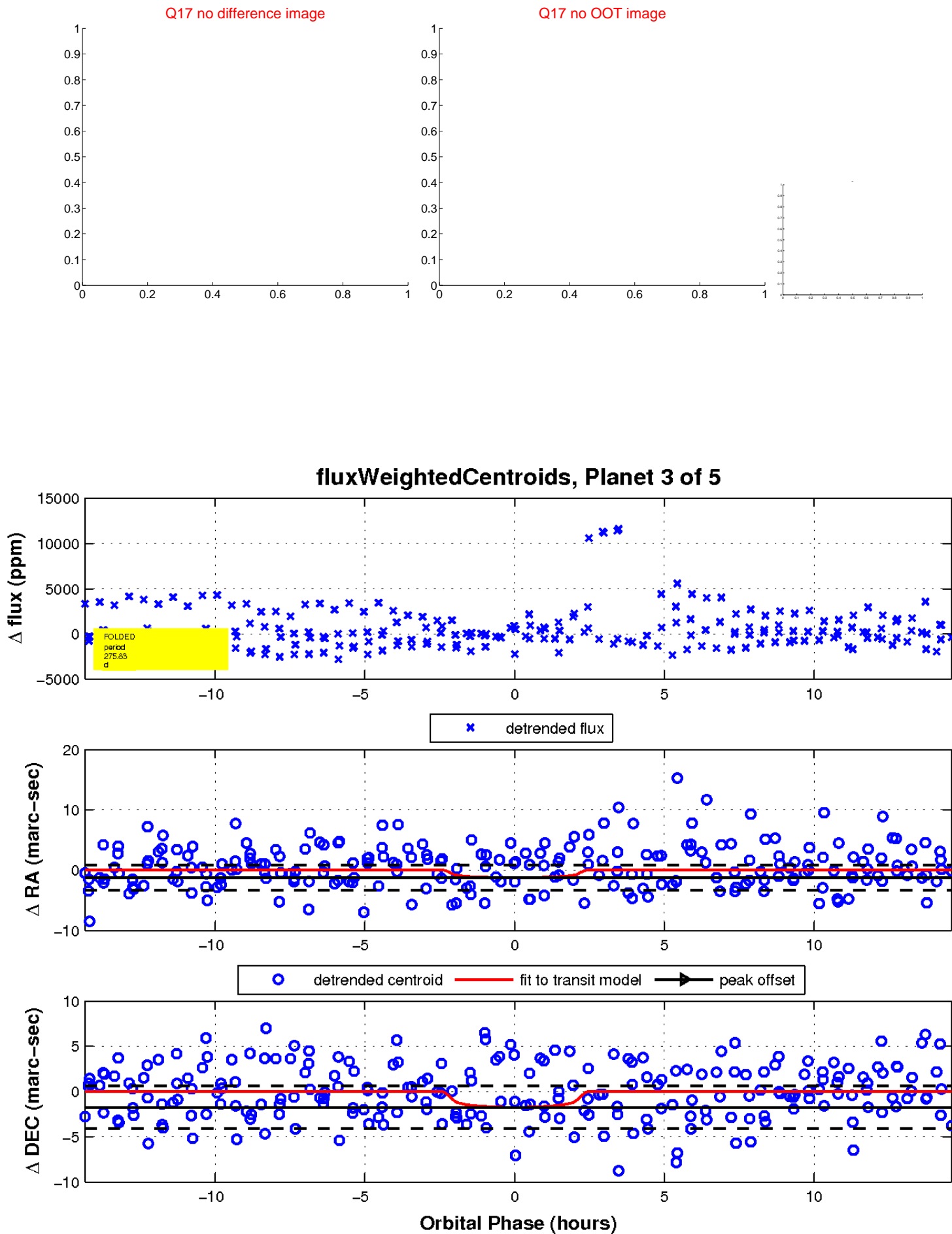
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

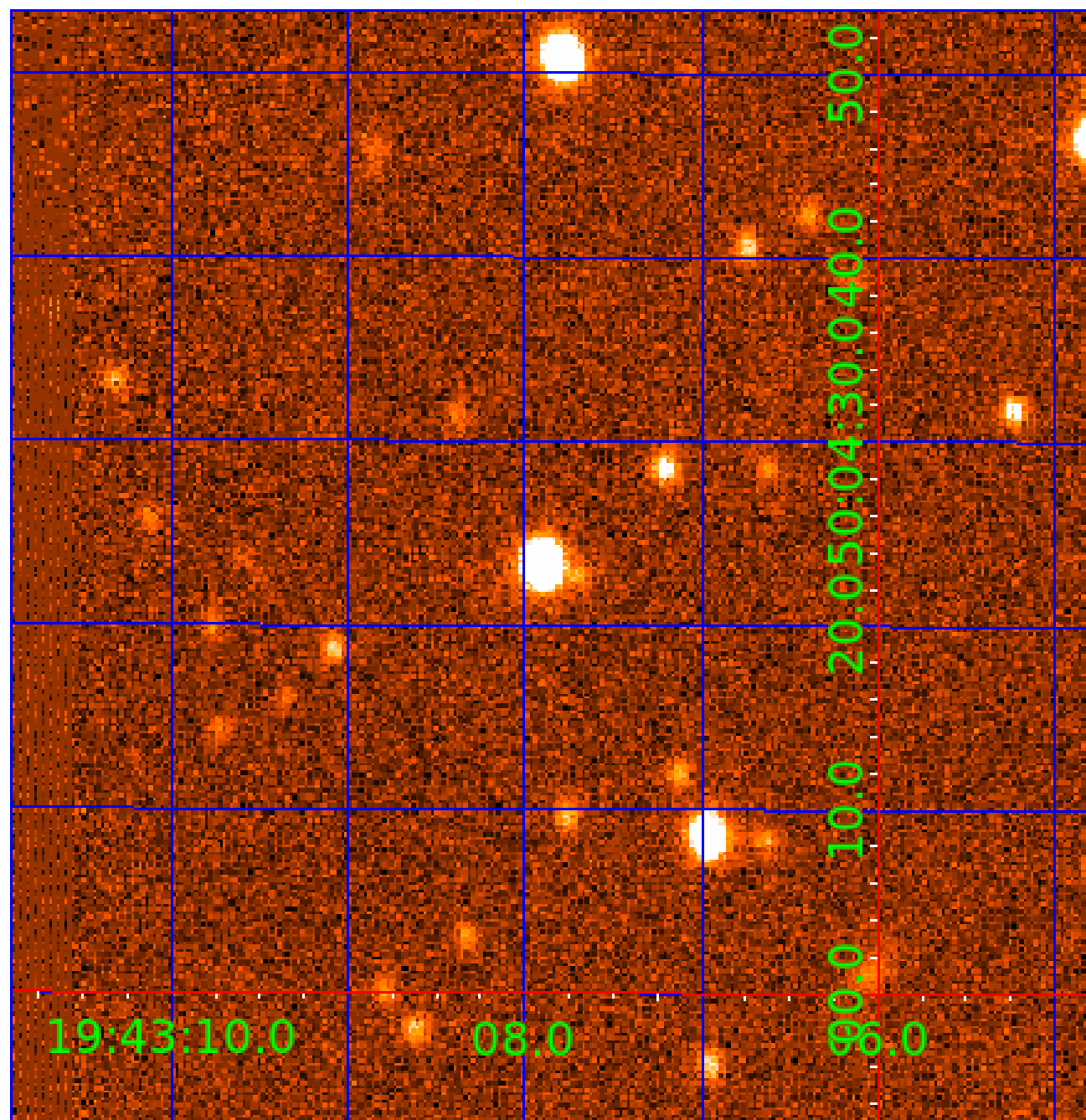


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 011822156

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})
011822156-01	OBS	No	397.926517	518.444341	1852.4	5.465	16.0	6.6	0.78	5282	3.33	0.47
011822156-02	OBS	No	511.956227	528.868518	1824.2	4.159	15.1	7.3	0.78	5282	3.33	0.33
011822156-03	OBS	No	275.831388	372.346511	1334.1	4.872	14.9	5.7	0.78	5282	3.19	0.76
011822156-04	OBS	No	306.578323	287.296455	1631.1	10.500	14.7	-1.0	0.78	5282	3.09	0.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011822156-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011822156-02	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
011822156-03	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
011822156-04	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

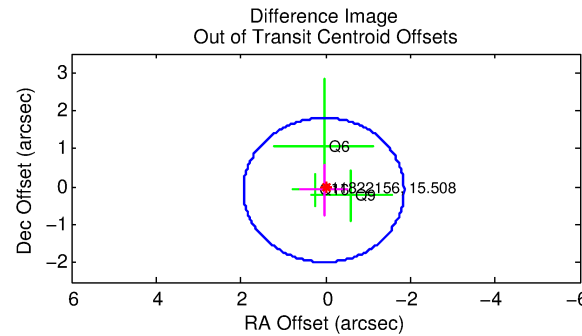
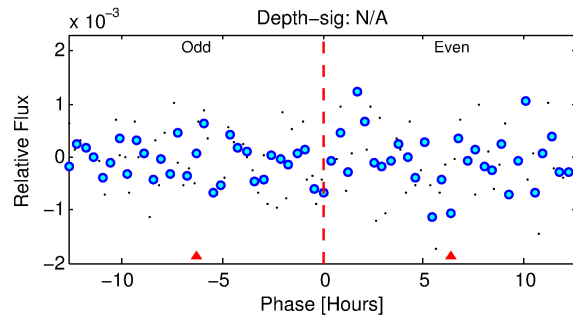
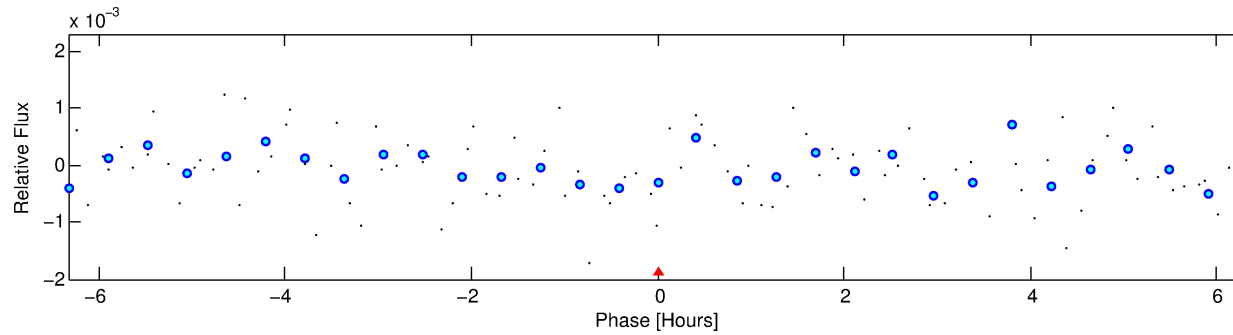
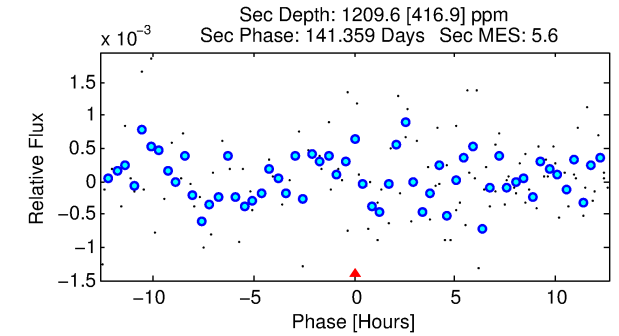
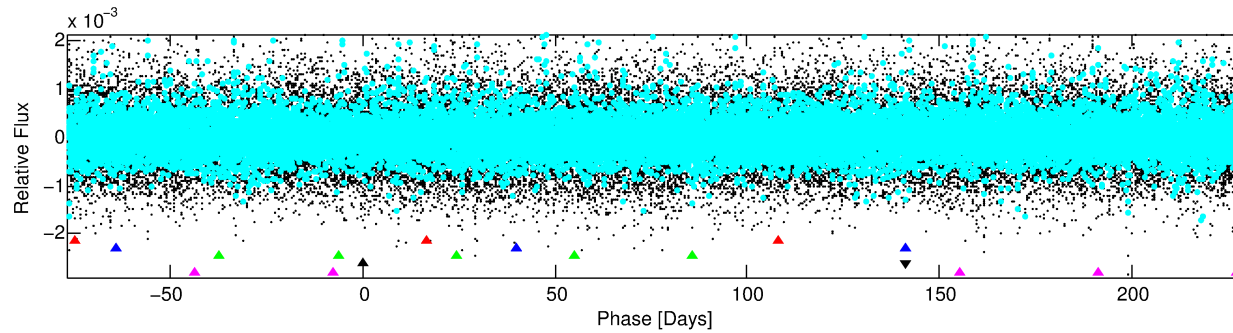
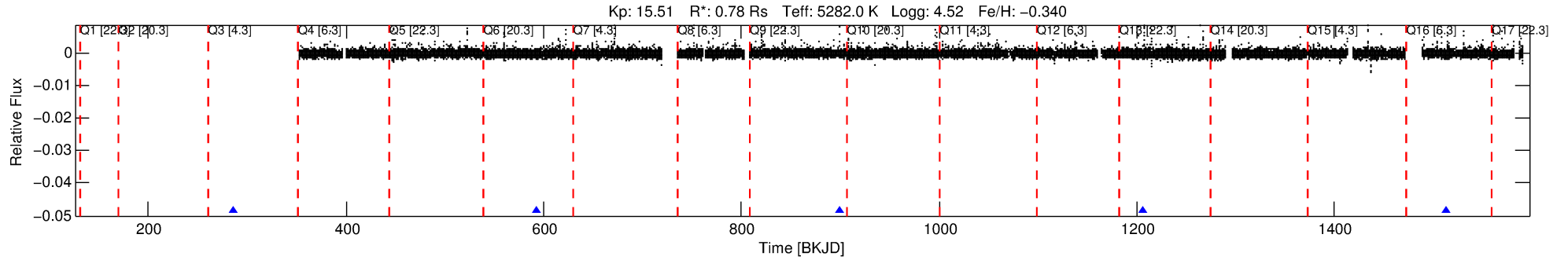
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 011822156-04

No Significant Match Found

DV One-Page Summary

KIC: 11822156 Candidate: 4 of 5 Period: 306.578 d



TPS TCE Results:

Period = 306.57832 d
Epoch = 287.2965 BKJD

DV fit results are unavailable

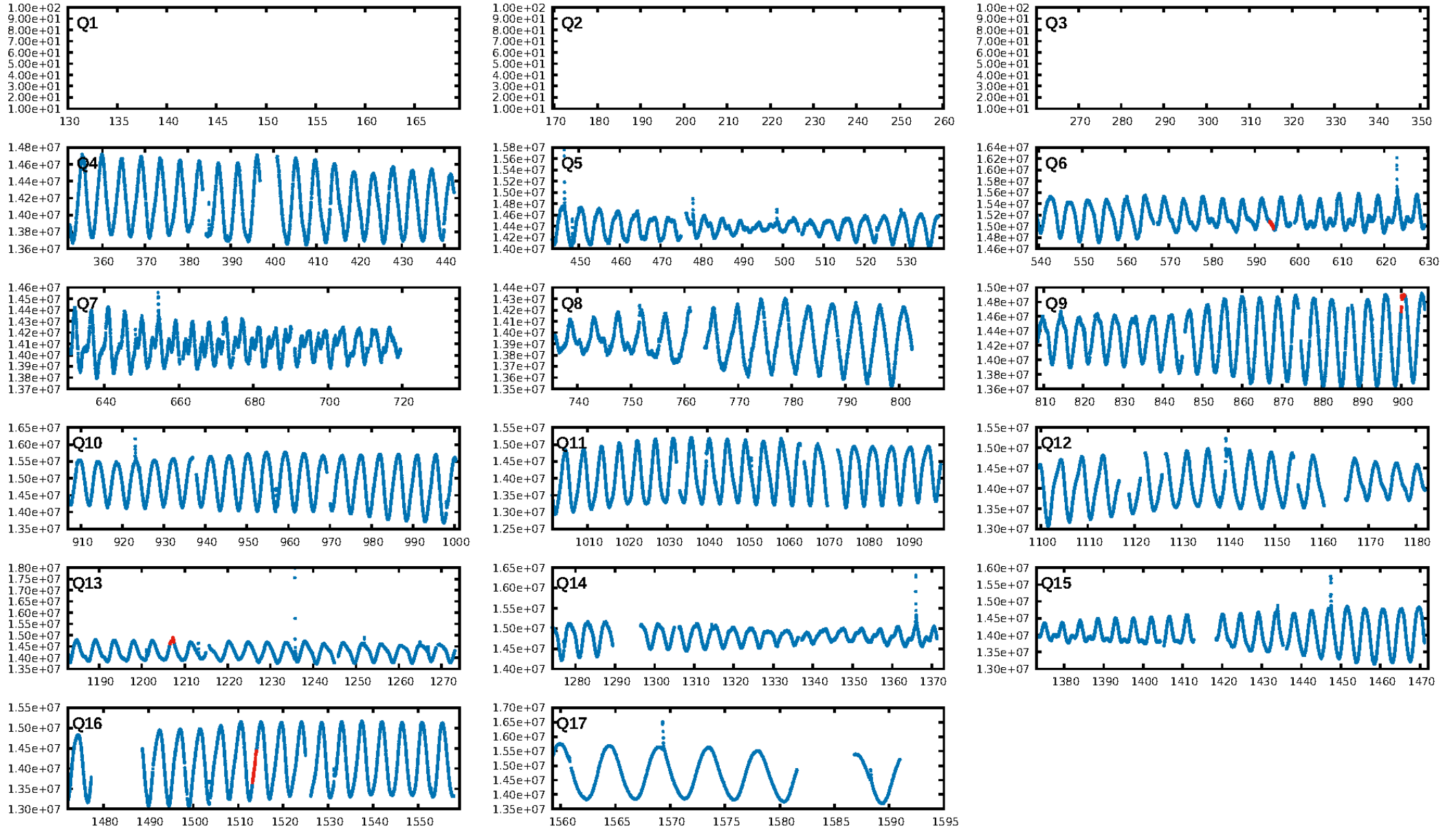
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [63.75σ]
LongPeriod-sig: 100.0% [68.07σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.98e-14
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.263
Centroid-sig: 44.1%
Centroid-so: 23.165 arcsec [0.65σ]
OotOffset-rm: 0.095 arcsec [0.15σ]
KicOffset-rm: 0.029 arcsec [0.05σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [4/4]

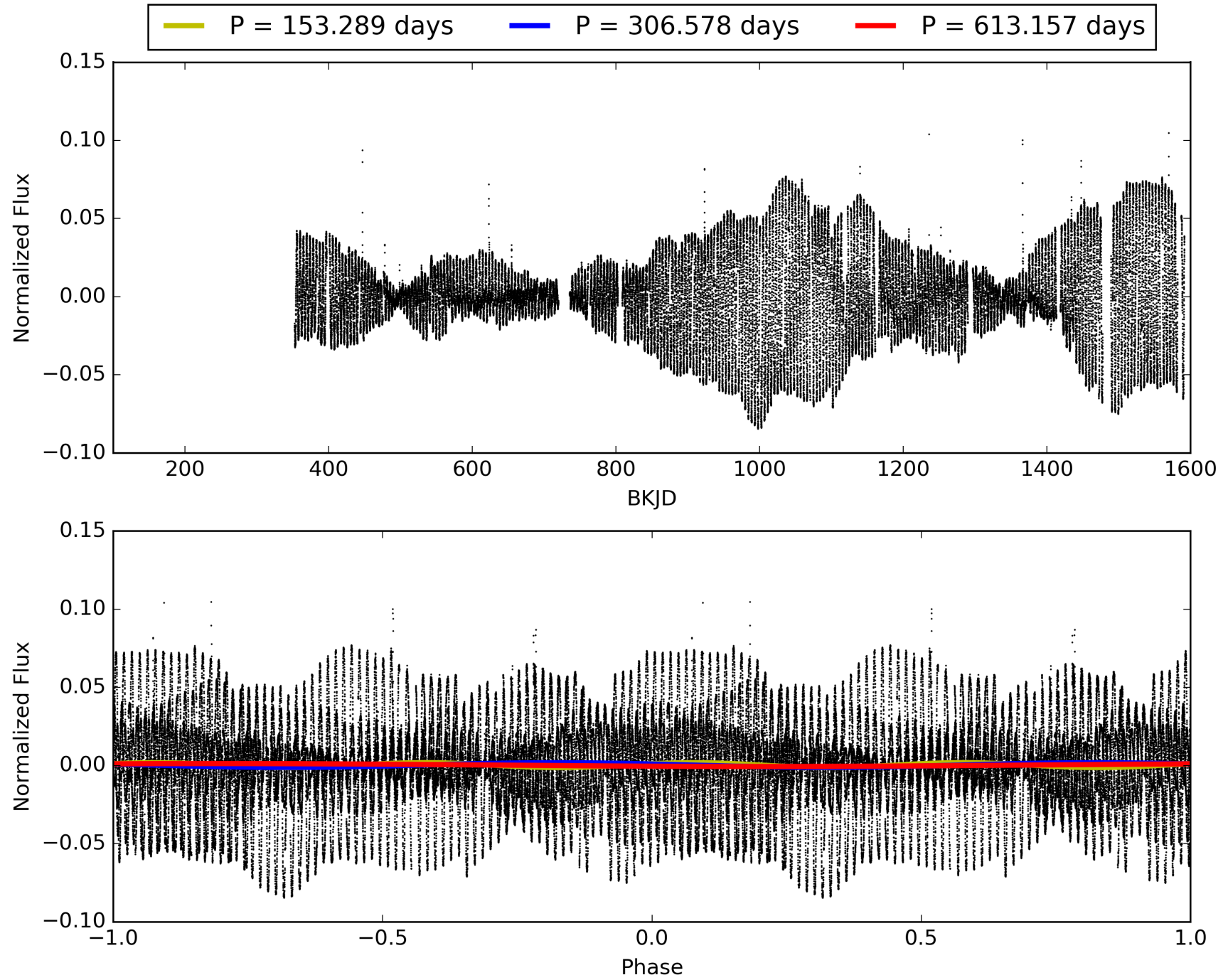
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:38:46 Z

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

TCE 011822156-04, PDC Light Curves

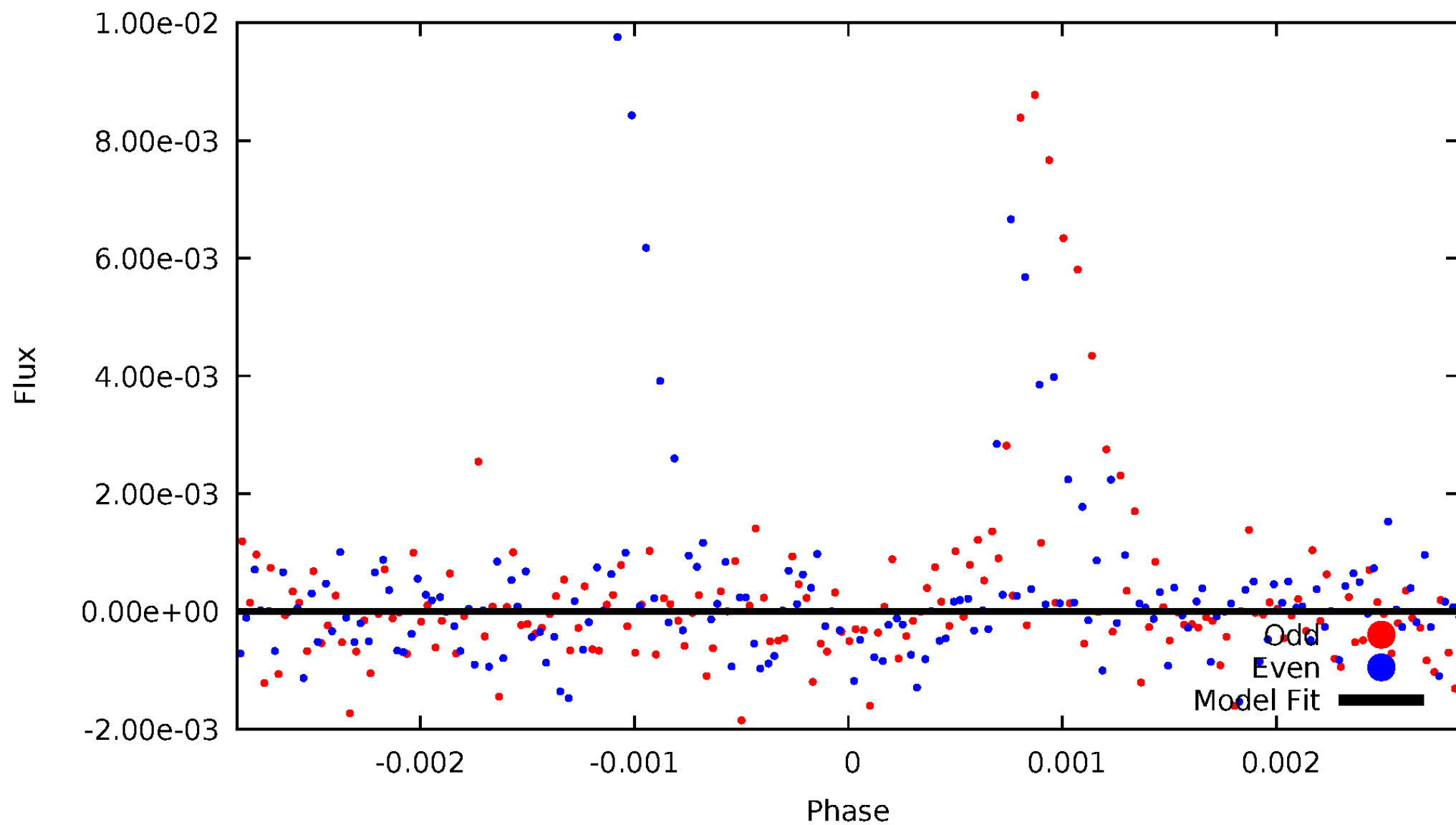


TCE 011822156-04



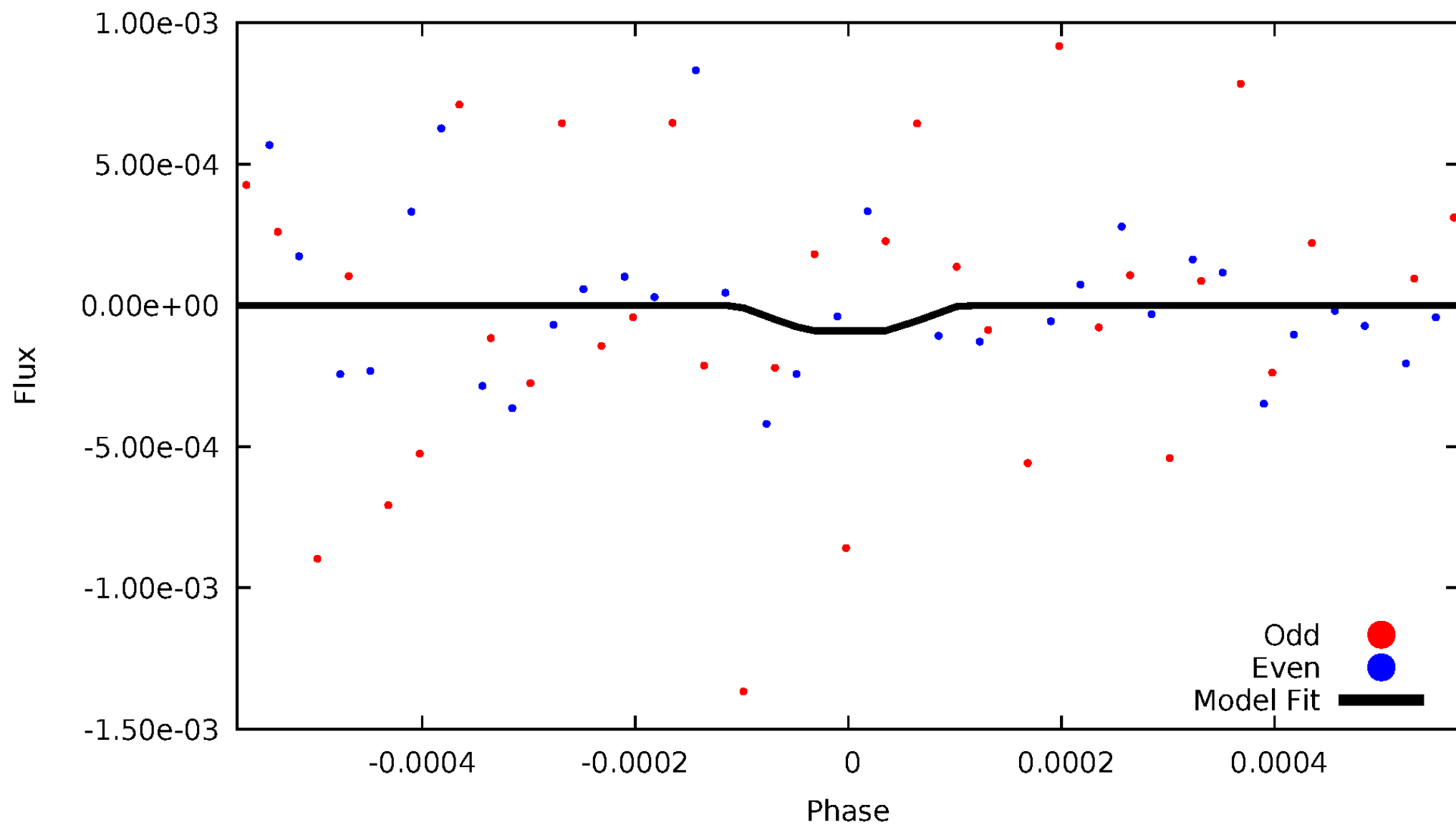
DV Odd/Even

TCE 011822156-04



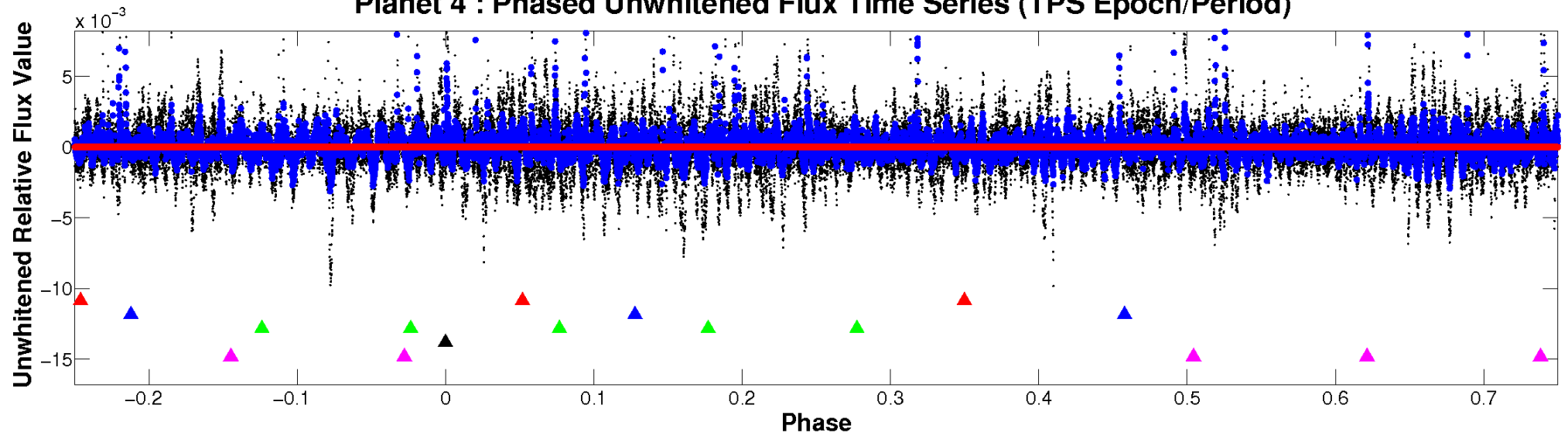
ALT Odd/Even

TCE 011822156-04



Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)

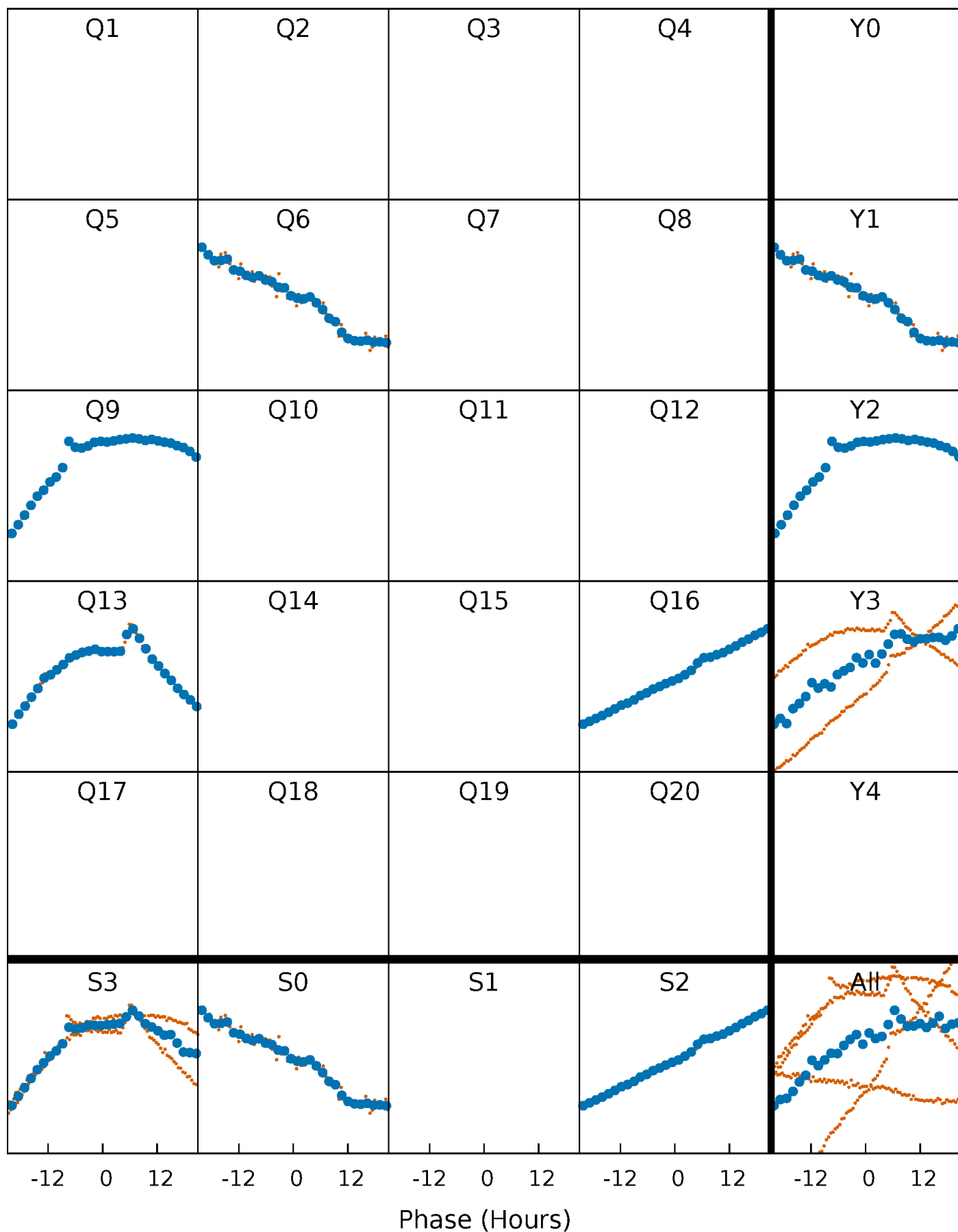


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



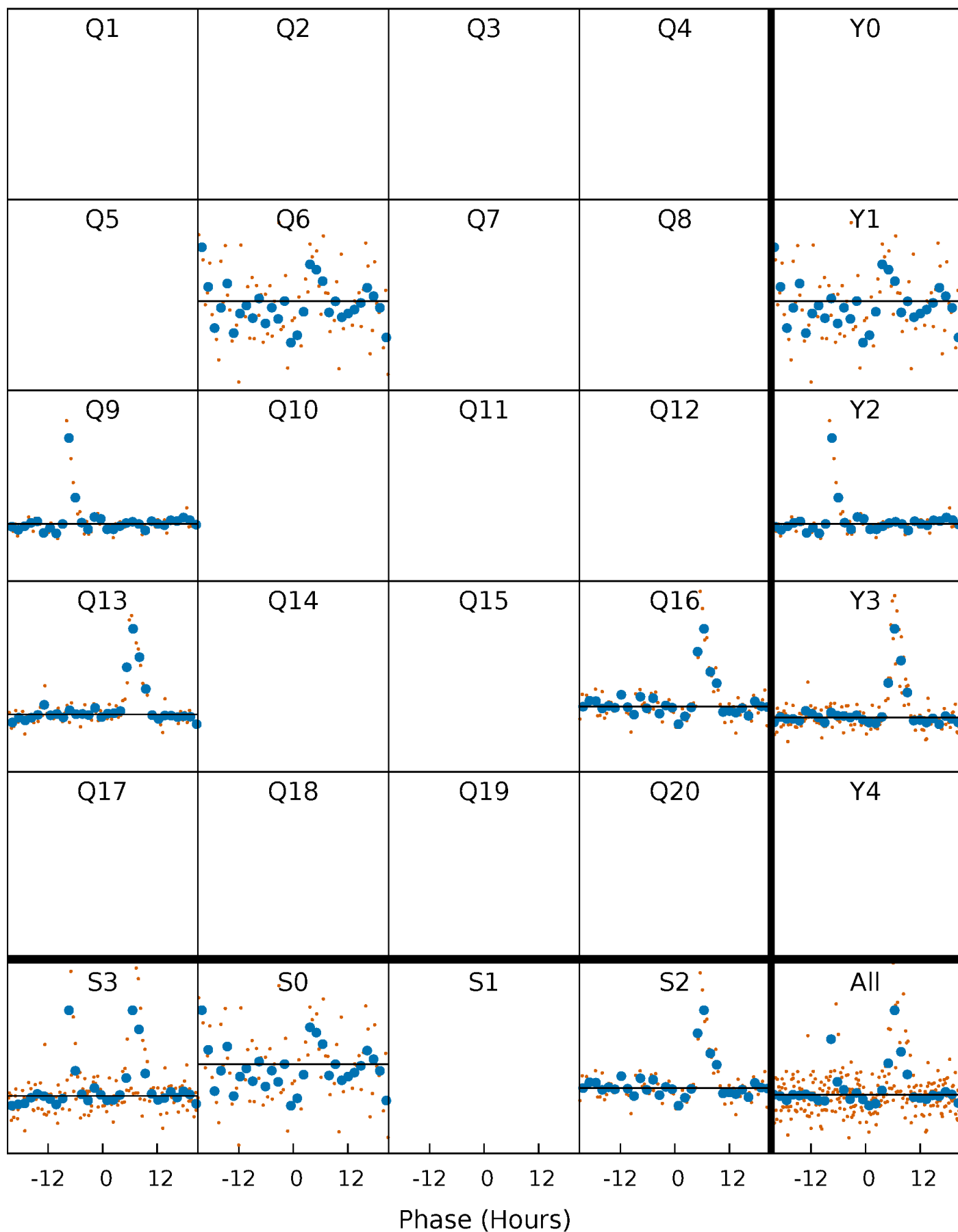
PDC Quarter-Phased Transit Curves

TCE 011822156-04 P=306.578323 Days $T_0=287.296455$ (BKJD)



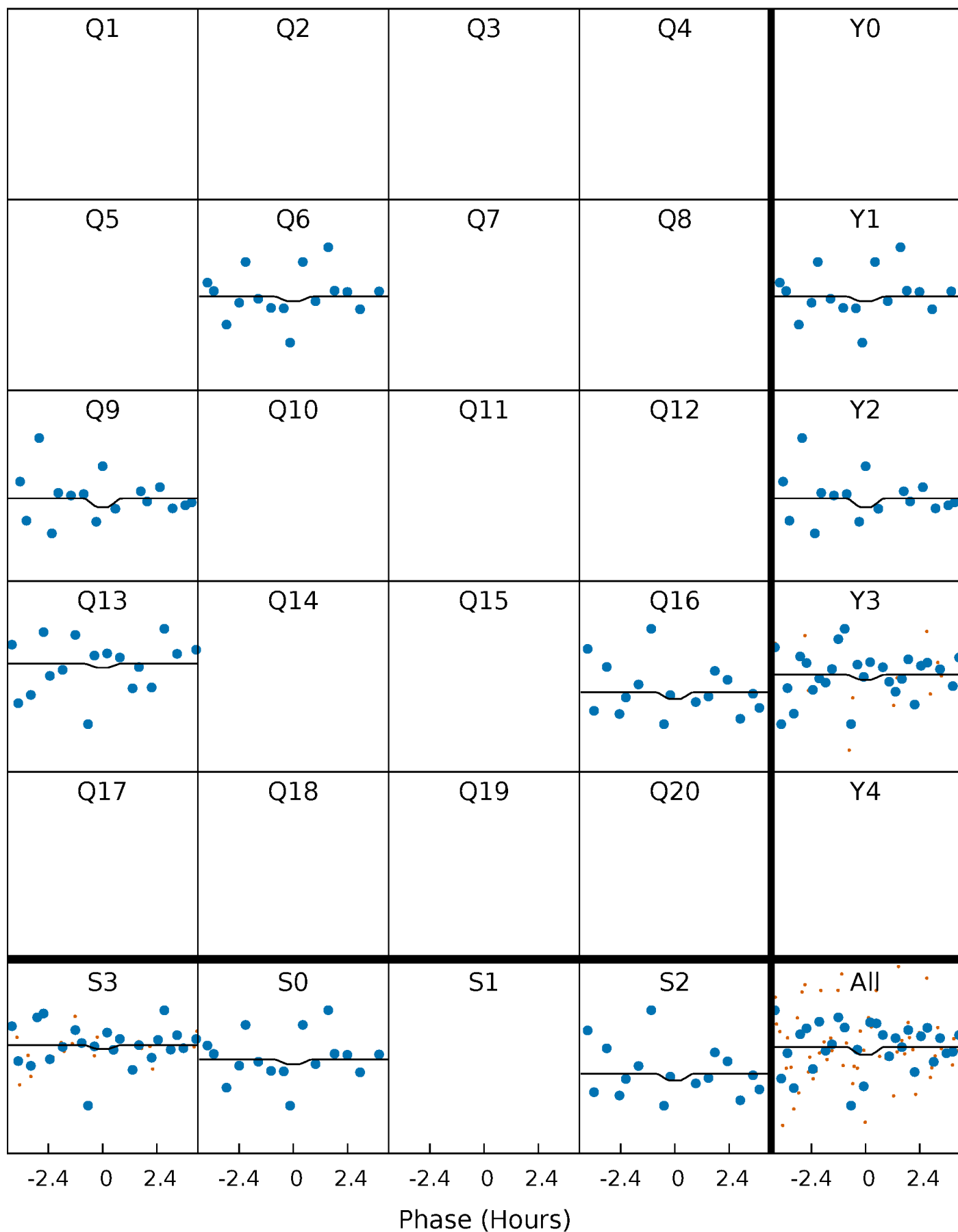
DV Quarter-Phased Transit Curves

TCE 011822156-04 $P=306.578323$ Days $T_0=287.296455$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

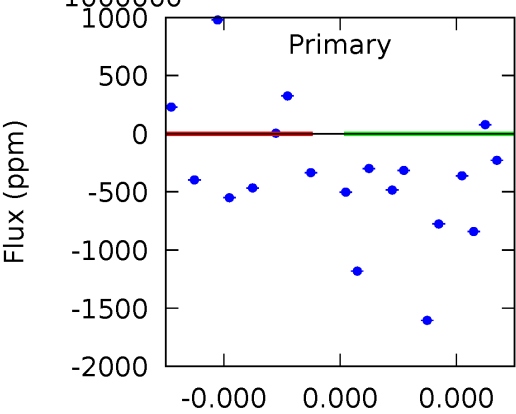
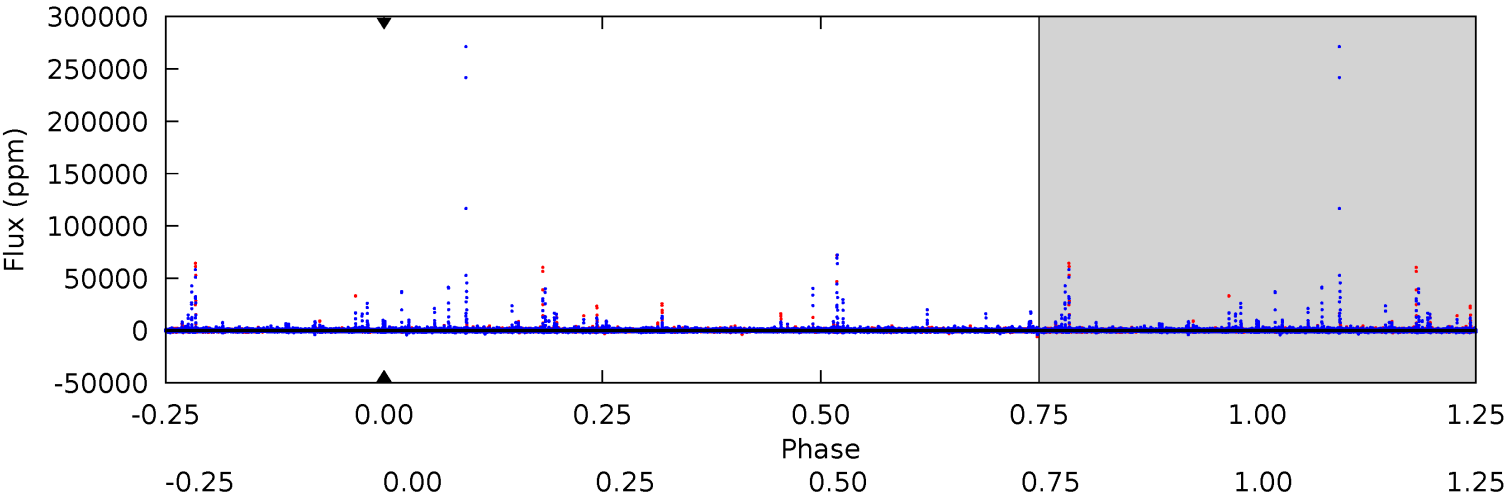
TCE 011822156-04 P=306.578323 Days $T_0=286.612920$ (BKJD)



DV Model-Shift Uniqueness Test

011822156-04, P = 306.578323 Days, E = 287.296455 Days

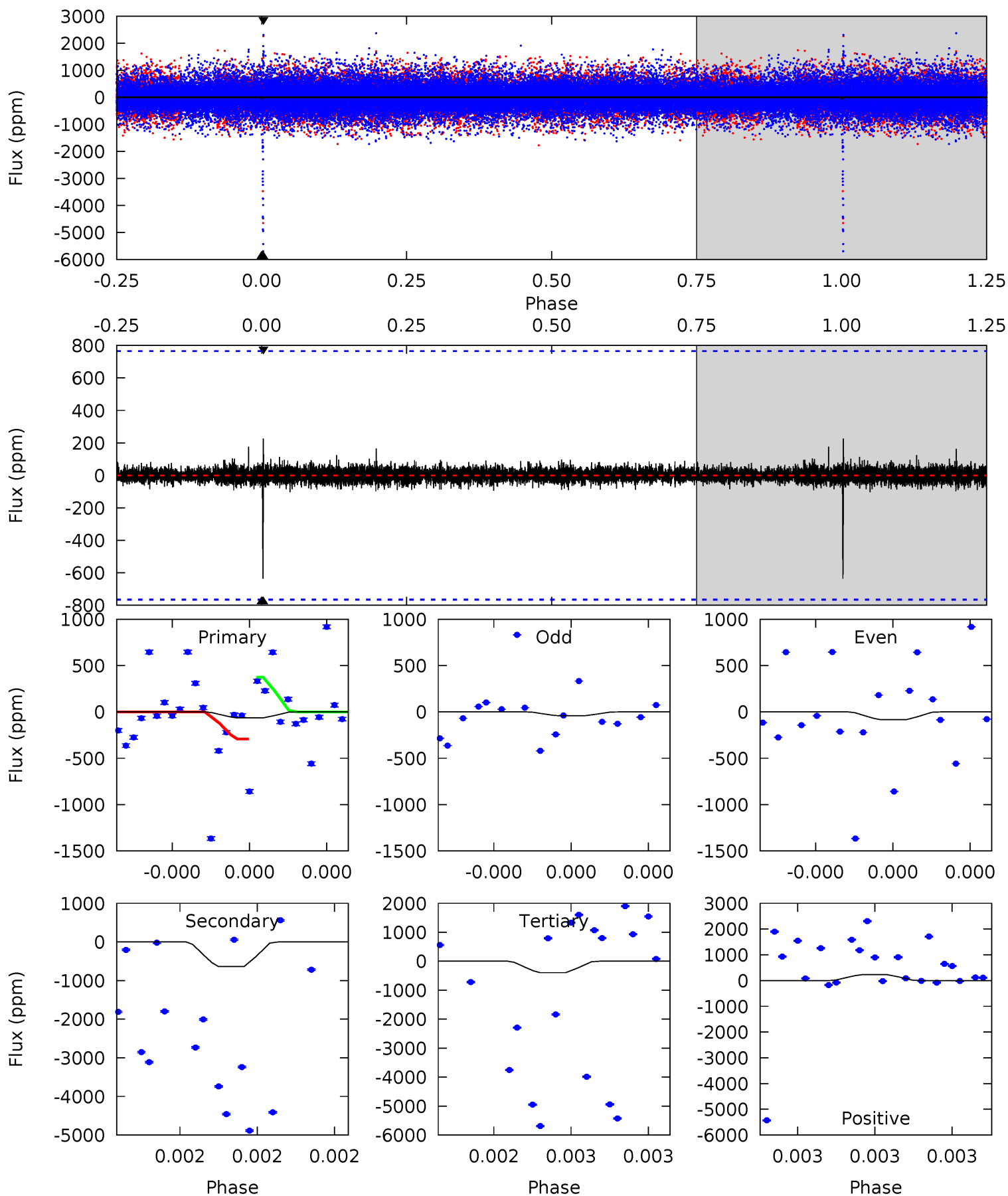
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

011822156-04, P = 306.578323 Days, E = 286.612920 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.49	4.75	2.95	1.70	5.73	3.72	0.20	-2.47	-1.21	1.80	3.06	0.15	1.30	0.26	0.30



Stellar Parameters For KIC 011822156

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5282^{+185}_{-185}	$4.520^{+0.090}_{-0.090}$	$-0.340^{+0.350}_{-0.300}$	$0.780^{+0.102}_{-0.092}$	$0.734^{+0.110}_{-0.055}$	$2.183^{+0.837}_{-0.606}$
	+4%/-4%	+2%/-2%	+103%/-88%	+13%/-12%	+15%/-7%	+38%/-28%
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 011822156-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$7.21^{+6.83}_{-5.25}$	320^{+15}_{-15}	-3763^{+19709}_{-11338}	$-8289.648^{+1343408.357}_{-1338494.769}$
Alt.	-635 ± 134	$6.00^{+6.44}_{-4.31}$	320^{+16}_{-15}	3570^{+2301}_{-719}	6128^{+73530}_{-4719}

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

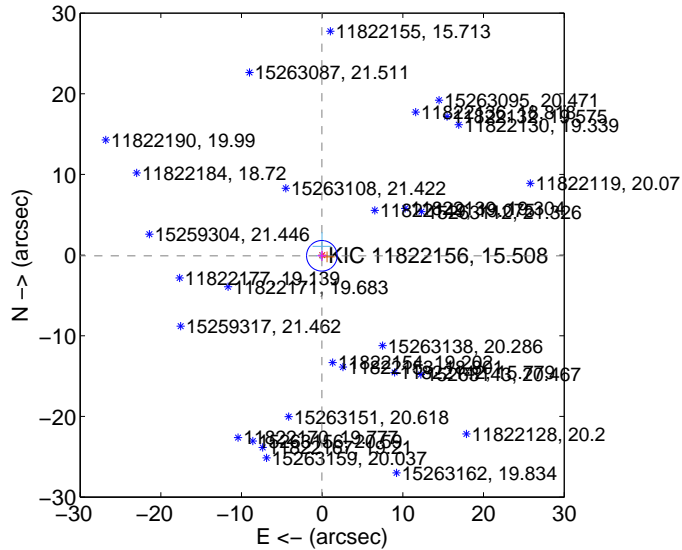
Supplemental centroid analysis for 011822156-04. Kepler magnitude: 15.51. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

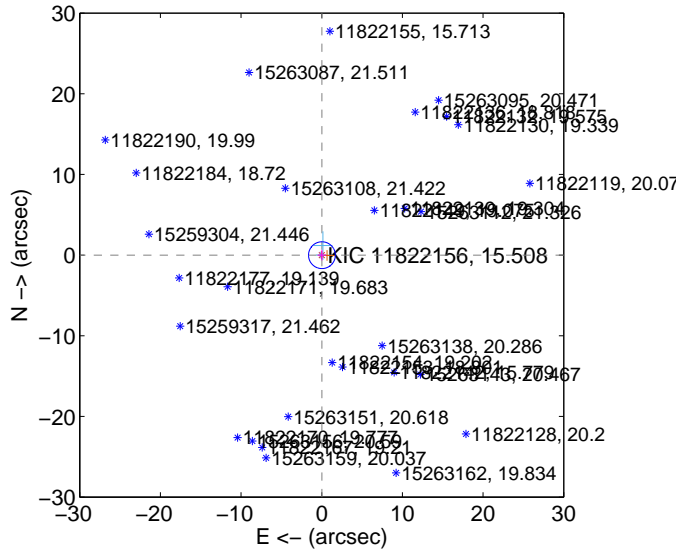
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.095 ± 0.632	0.15	0.039 ± 0.536	-0.086 ± 0.650
PRF-fit source offset from KIC position	0.029 ± 0.554	0.05	-0.027 ± 0.536	-0.011 ± 0.650
photometric centroid source offset	23.16 ± 35.68	0.65	16.27 ± 37.05	16.48 ± 34.29

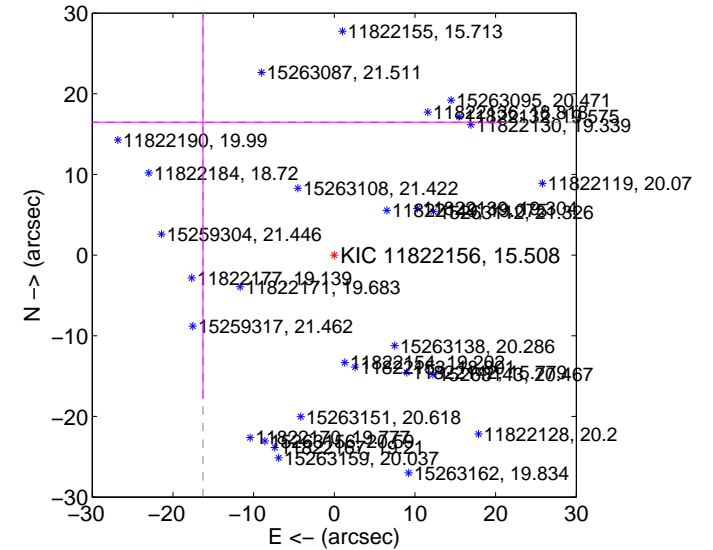
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

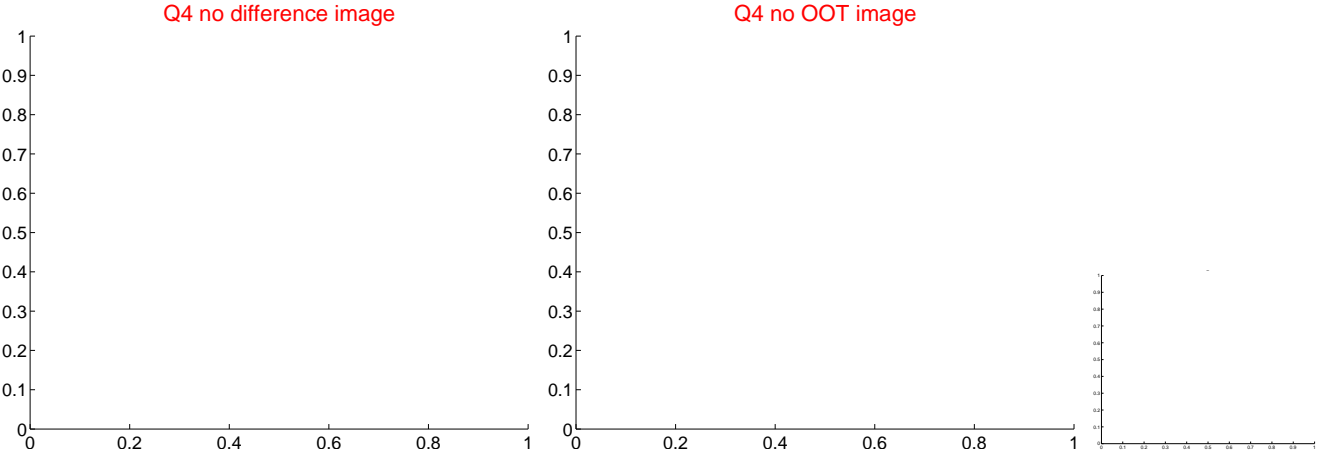
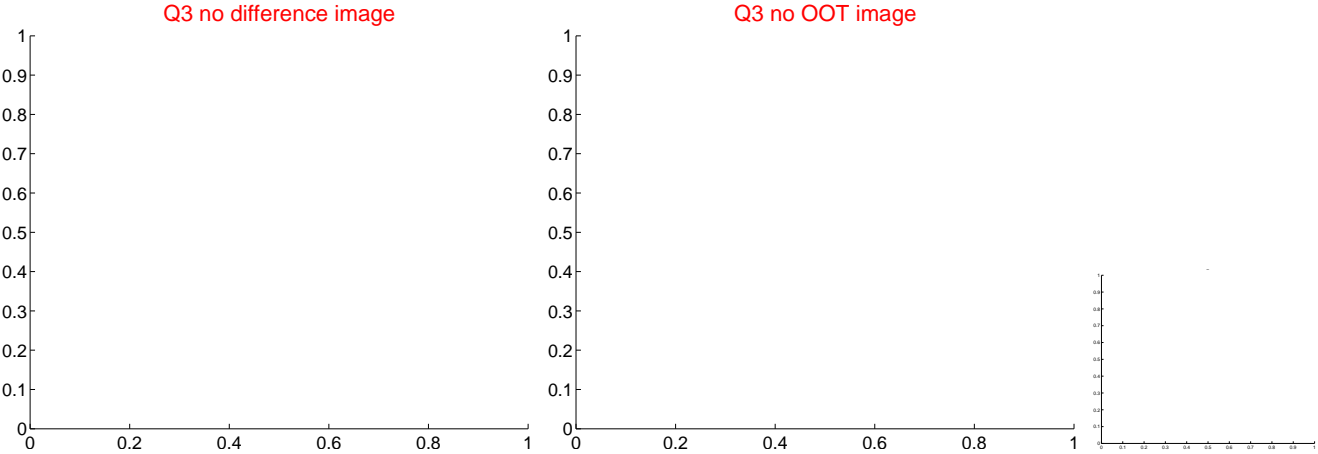
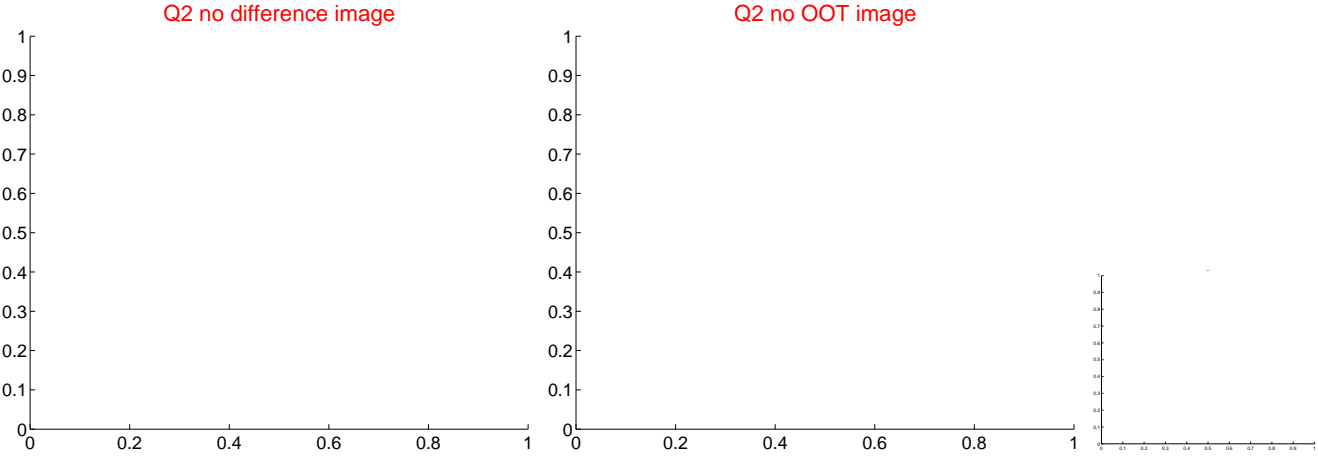
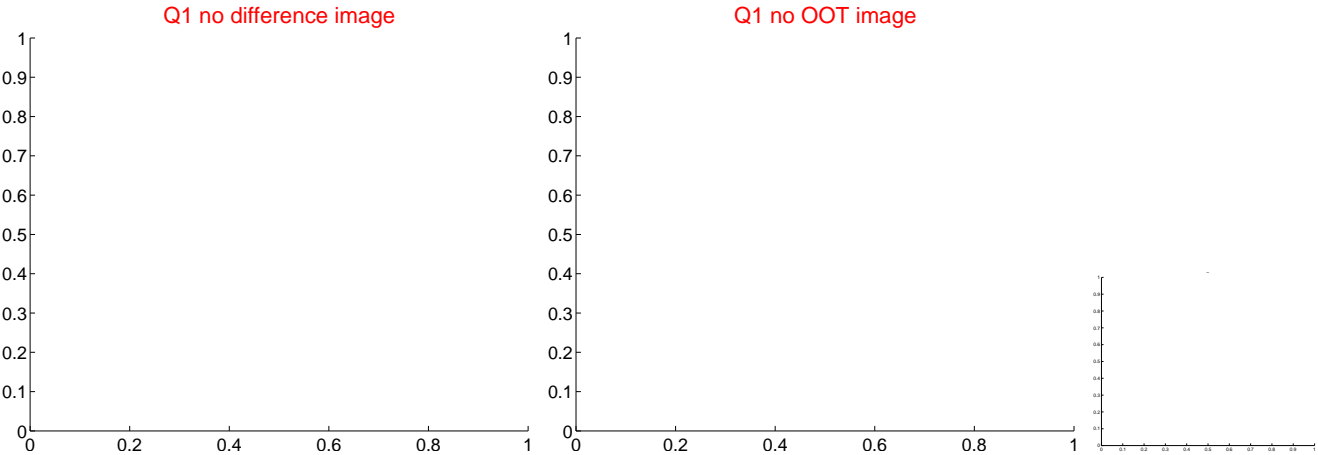


offset from photometric centroids



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

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

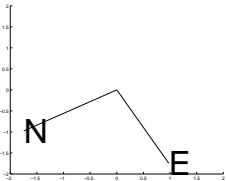
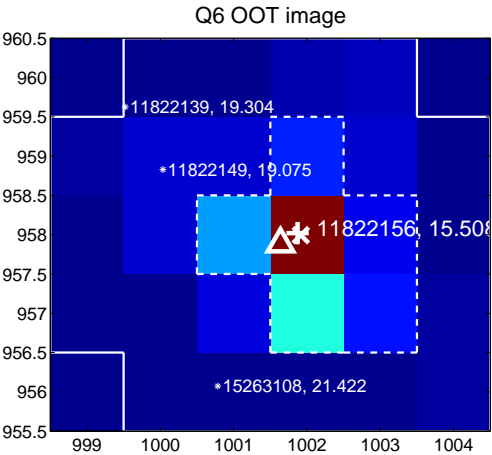
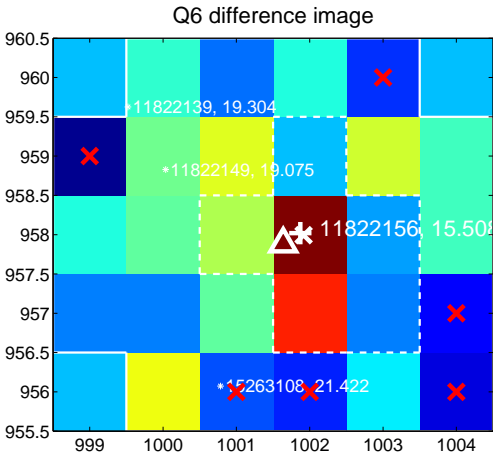


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

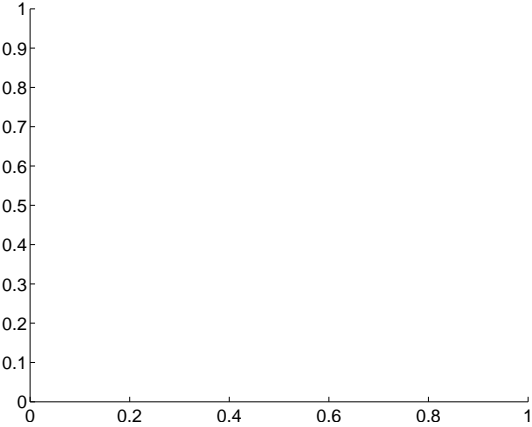
Q5 no difference image



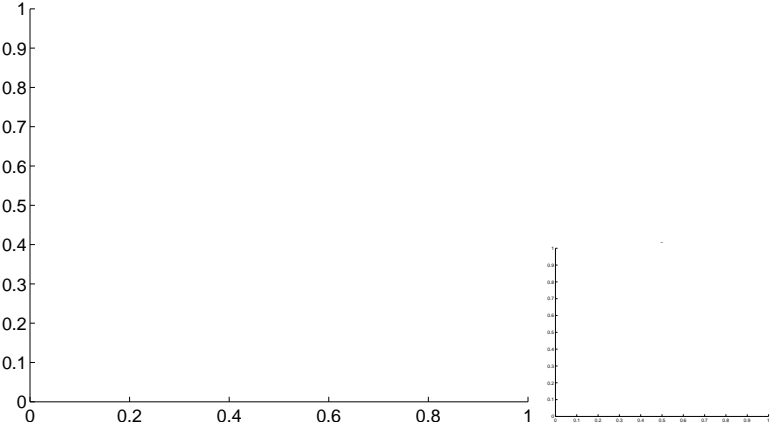
Q5 no OOT image



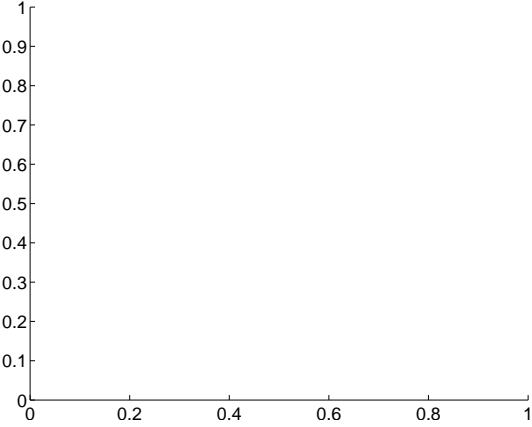
Q7 no difference image



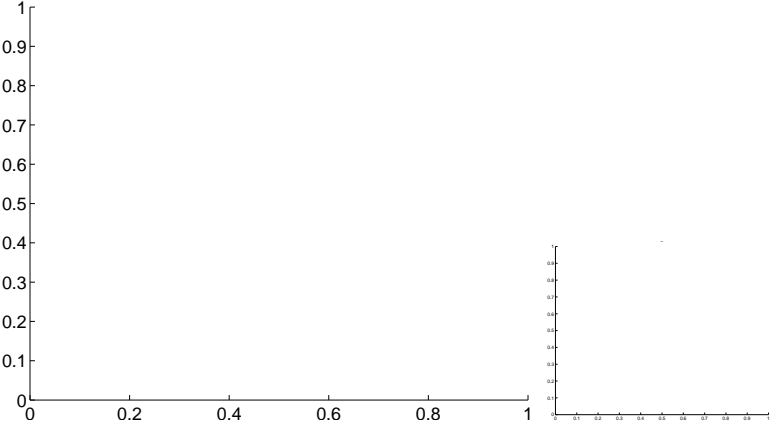
Q7 no OOT image



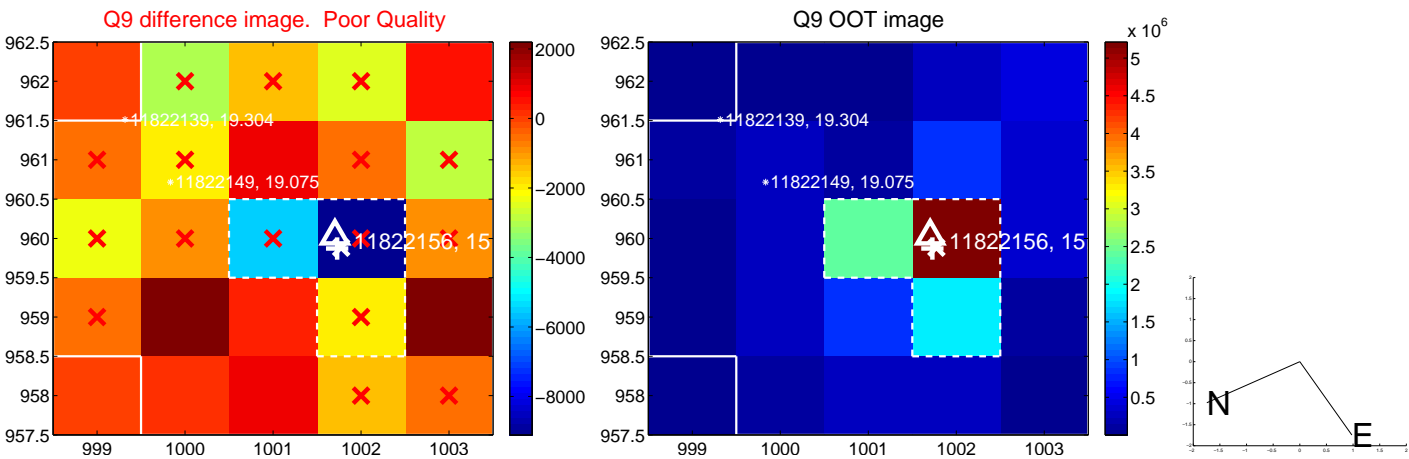
Q8 no difference image



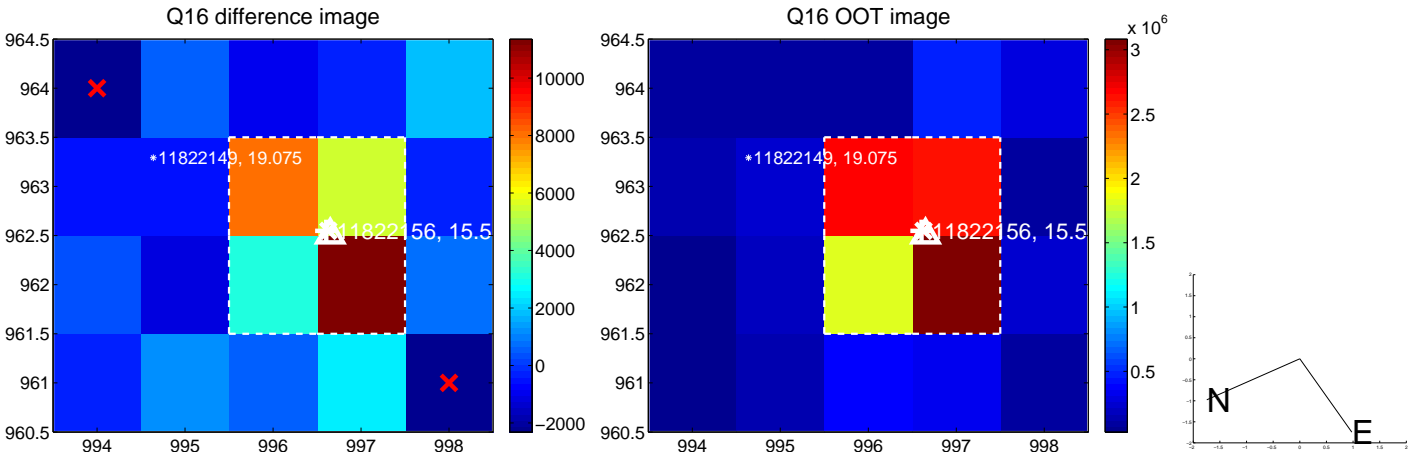
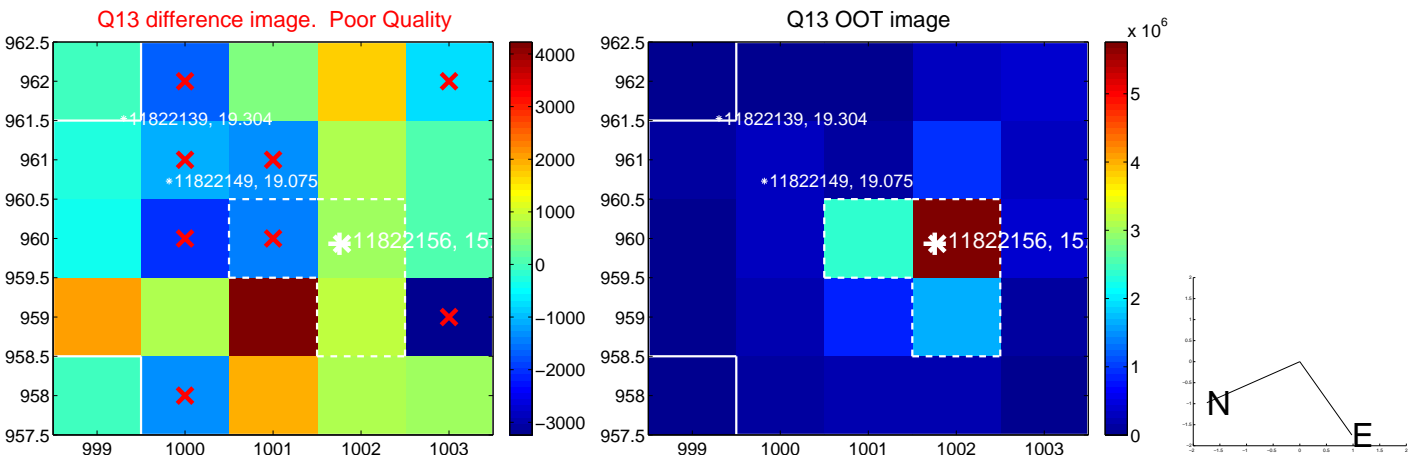
Q8 no OOT image



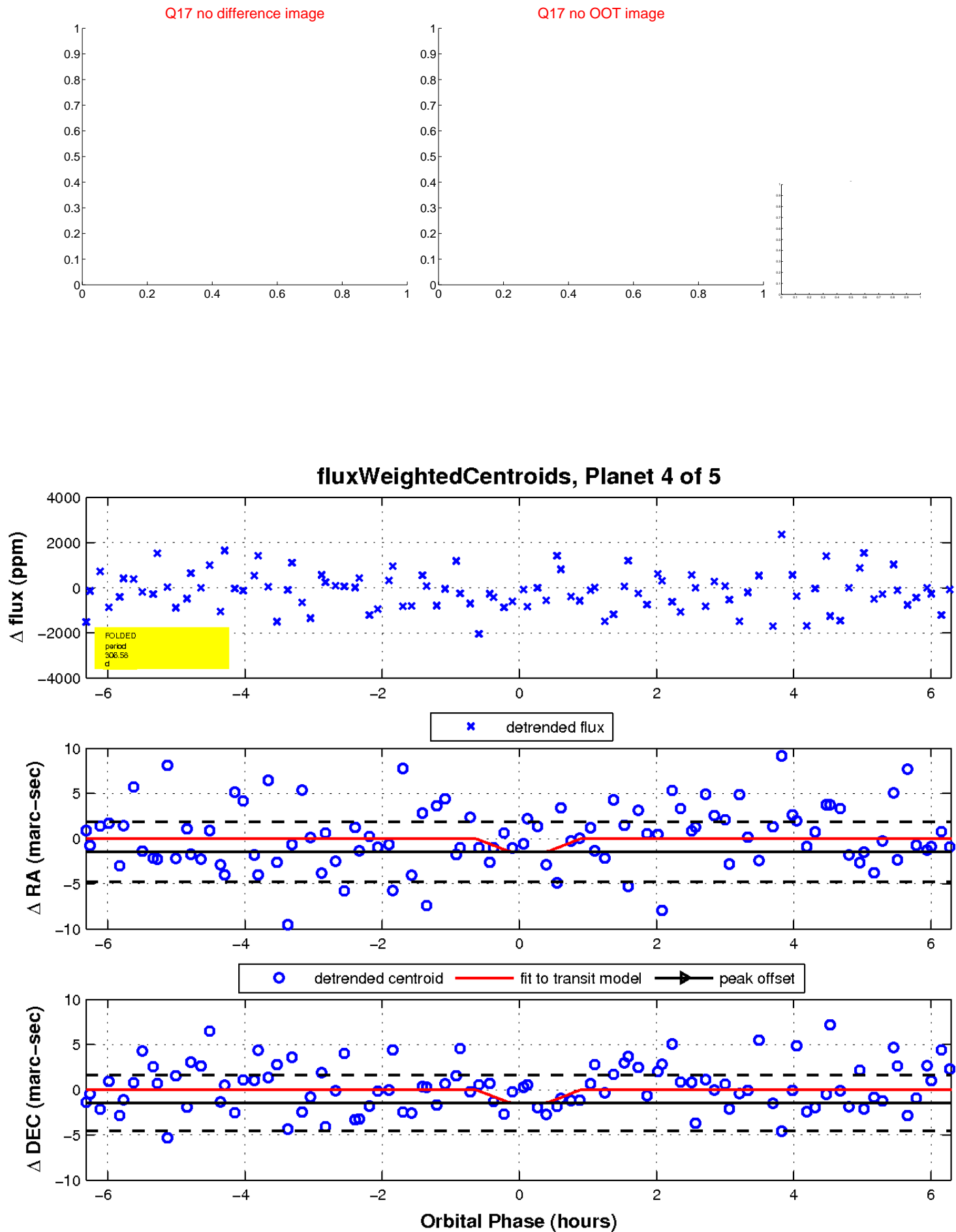
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

Declination

