

KIC 012166457

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})
012166457-01	OBS	No	531.453507	134.996381	1762.7	3.287	20.4	6.7	0.71	5158	2.93	0.25
012166457-03	OBS	No	245.190139	195.576200	1116.6	2.498	11.0	6.7	0.71	5158	2.43	0.70
012166457-04	OBS	No	526.569196	263.506922	2036.5	3.735	13.3	6.4	0.71	5158	3.22	0.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012166457-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
012166457-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012166457-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

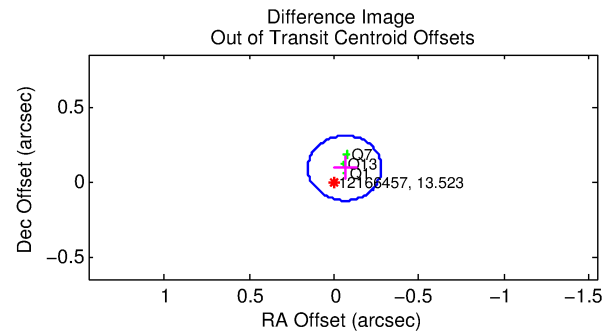
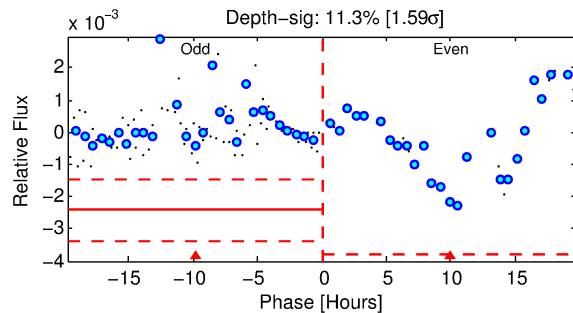
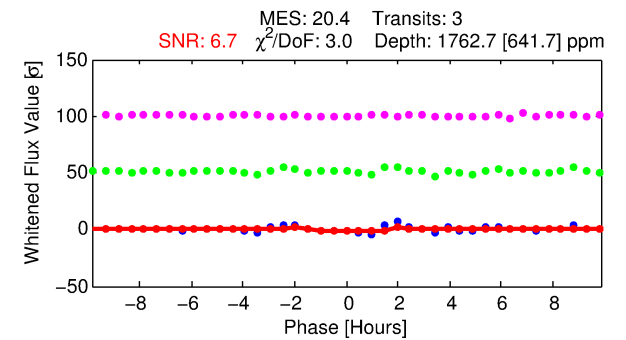
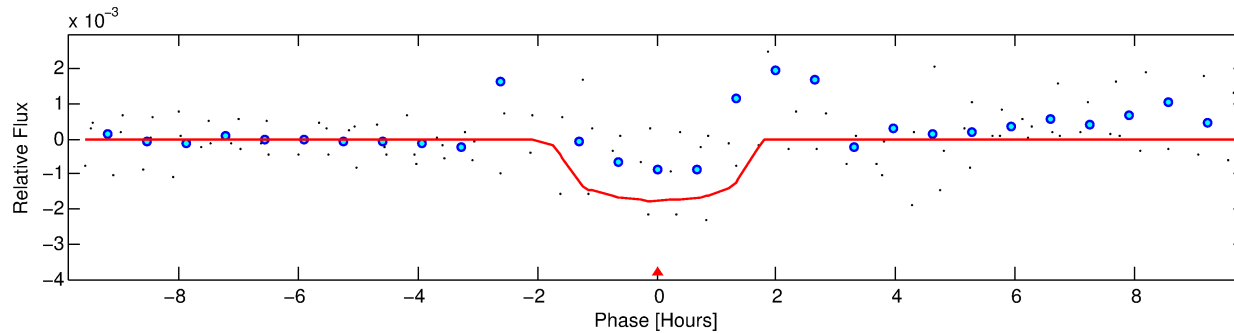
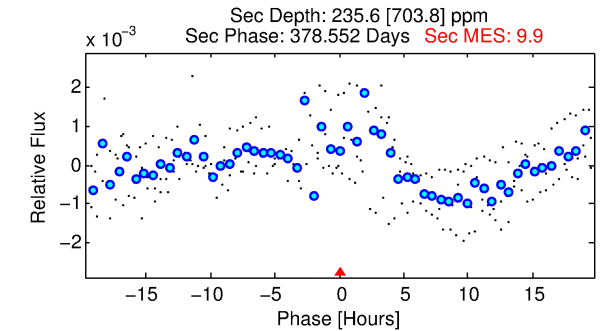
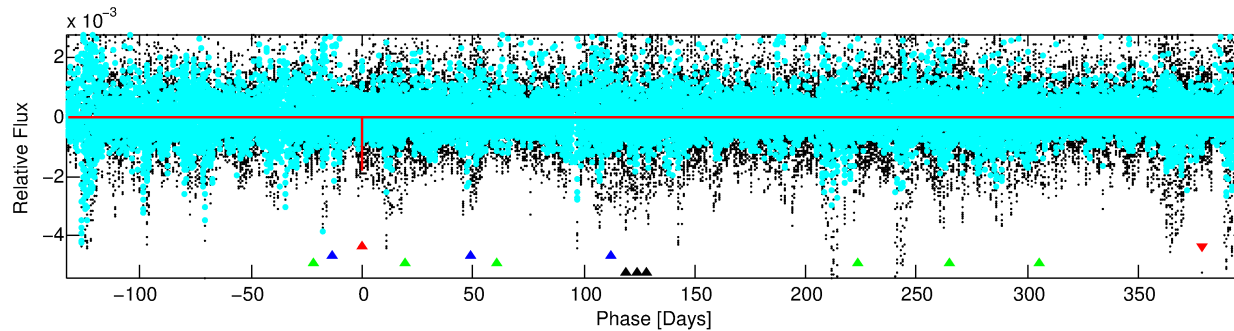
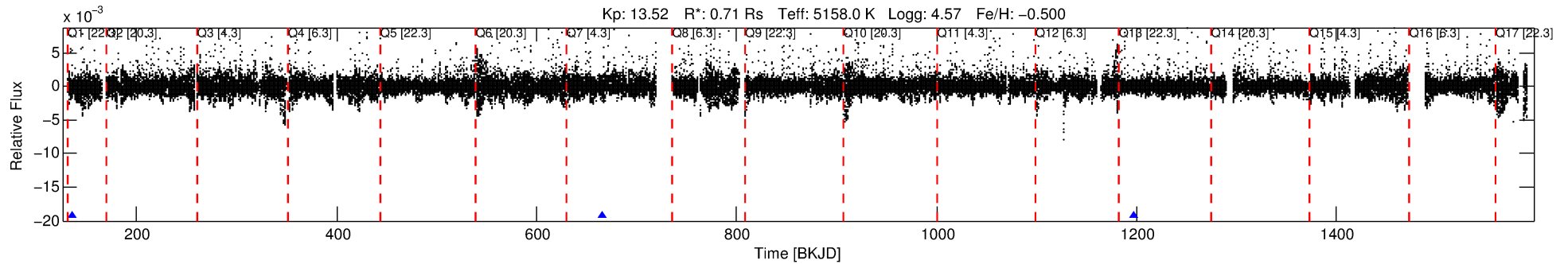
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012166457-01

No Significant Match Found

DV One-Page Summary

KIC: 12166457 Candidate: 1 of 4 Period: 531.454 d



DV Fit Results:

Period = 531.45351 [0.00653] d
Epoch = 134.9964 [0.0119] BKJD
Rp/R* = 0.0380 [0.0976]
a/R* = 1247.36 [12099.02]
b = 0.24 [38.43]
Seff = 0.25 [0.04]
Teq = 180 [8] K
Rp = 2.93 [7.55] Re
a = 1.1307 [0.0992] AU
Ag = 19250.34 [114450.80] [0.17 σ]
Teffp = 3279 [4874] K [0.64 σ]

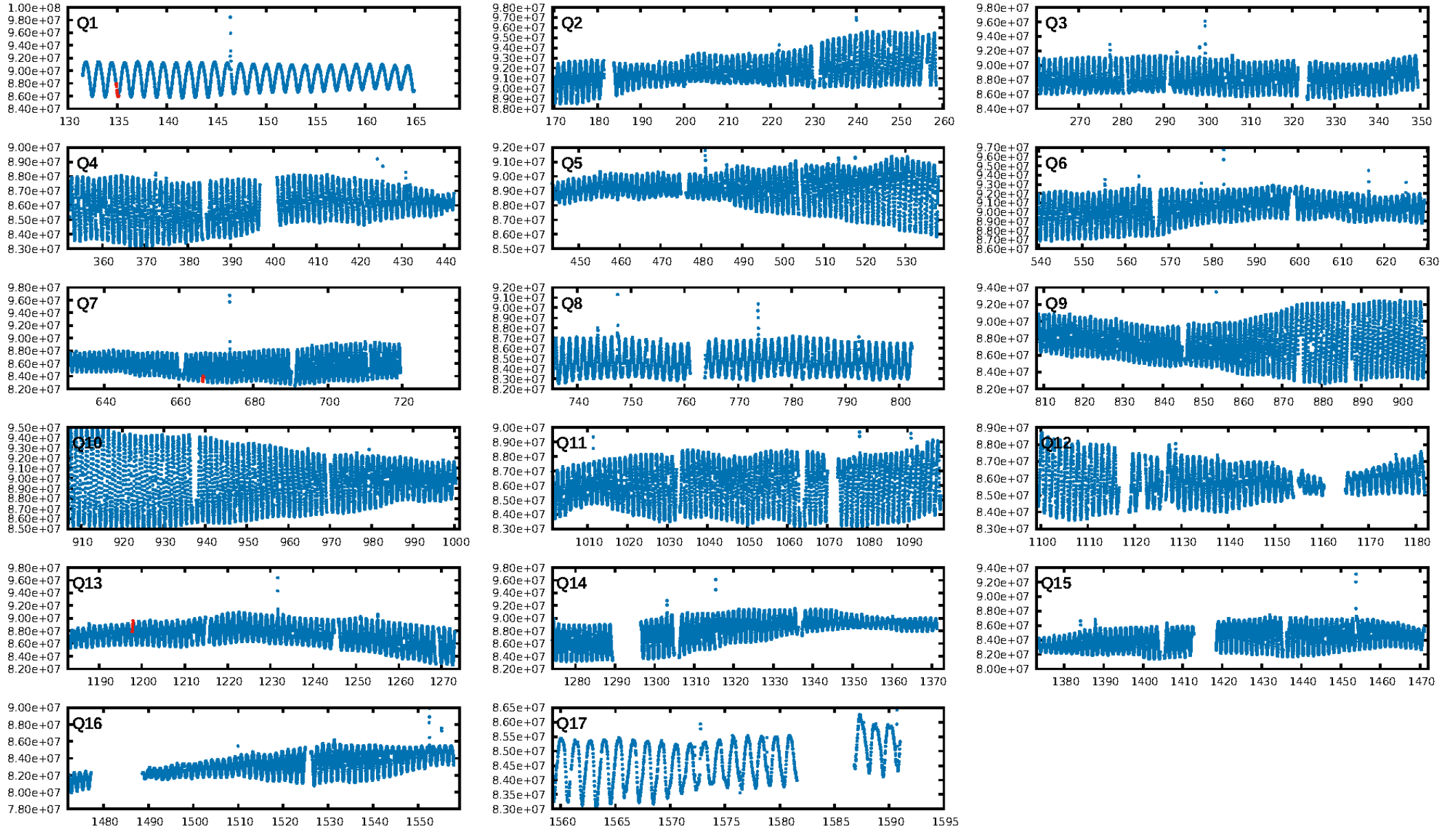
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [23.56 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 72.9%
ModelChiSquareGof-sig: 0.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 1.28
Centroid-sig: 45.7%
Centroid-so: 0.249 arcsec [0.50 σ]
OotOffset-rm: 0.110 arcsec [1.52 σ]
OotOffset-st: 0/1/0/2 [3]
KicOffset-rm: 0.065 arcsec [0.96 σ]
KicOffset-st: 0/1/0/2 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

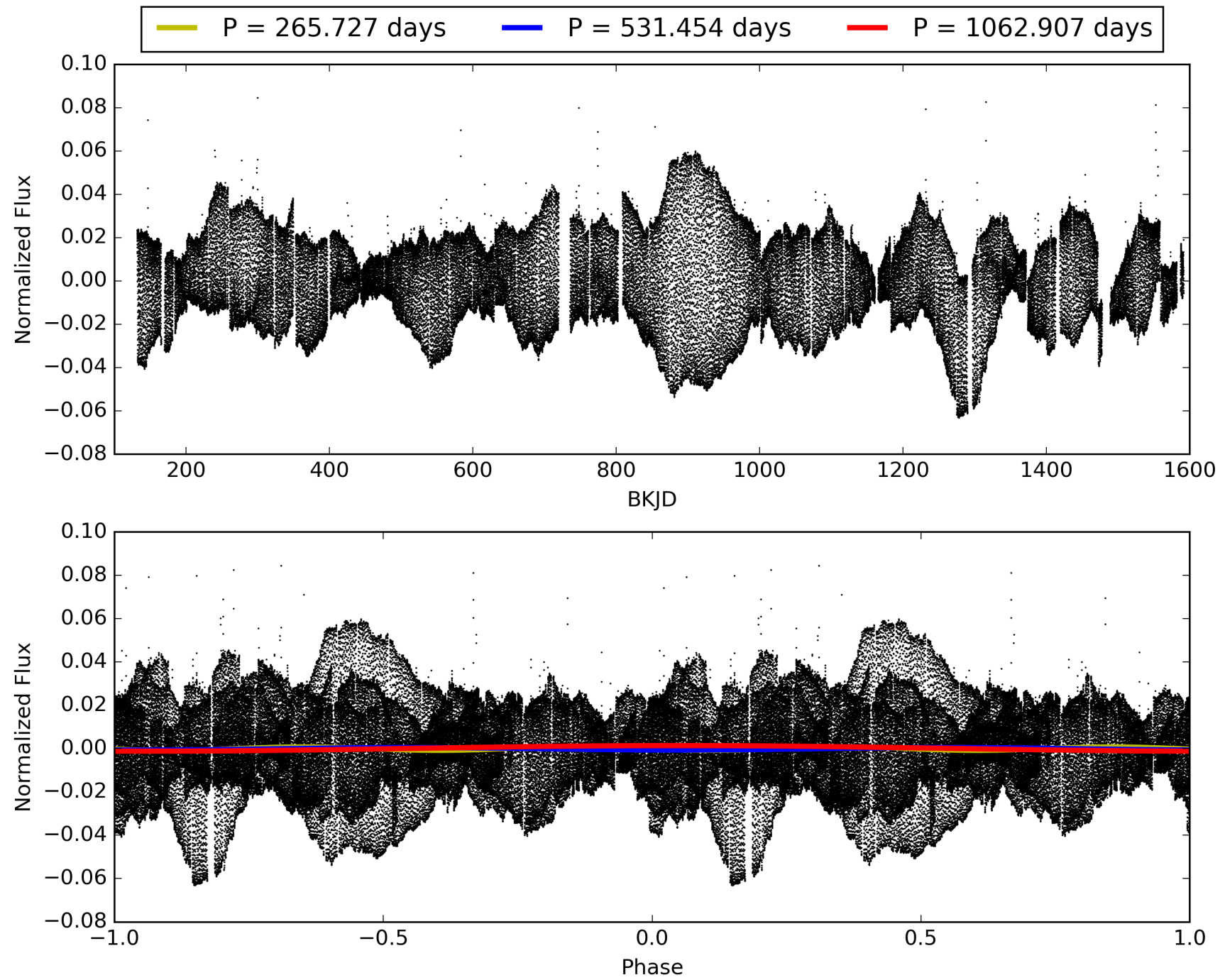
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:22:07 Z

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

TCE 012166457-01, PDC Light Curves

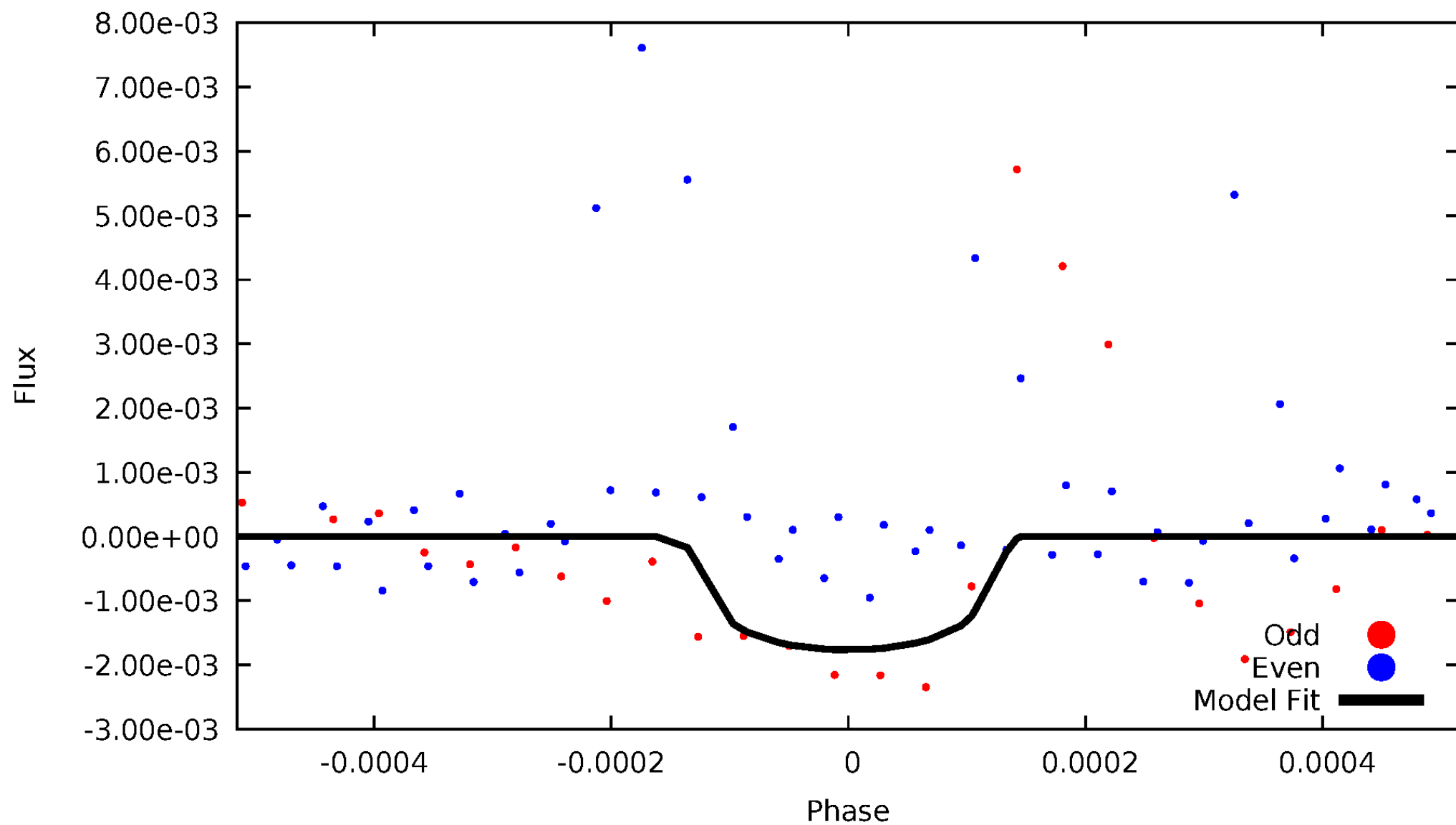


TCE 012166457-01



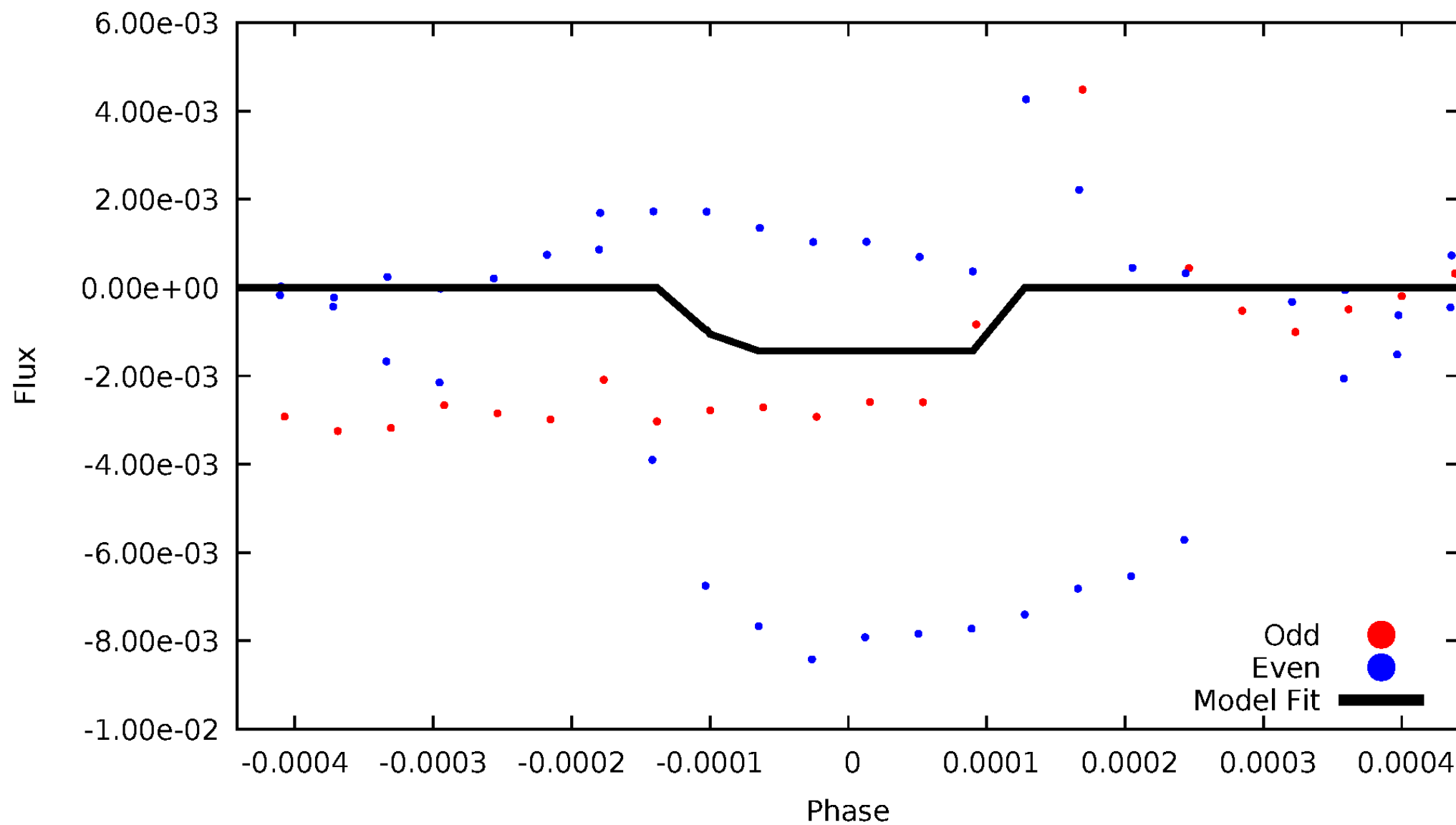
DV Odd/Even

TCE 012166457-01



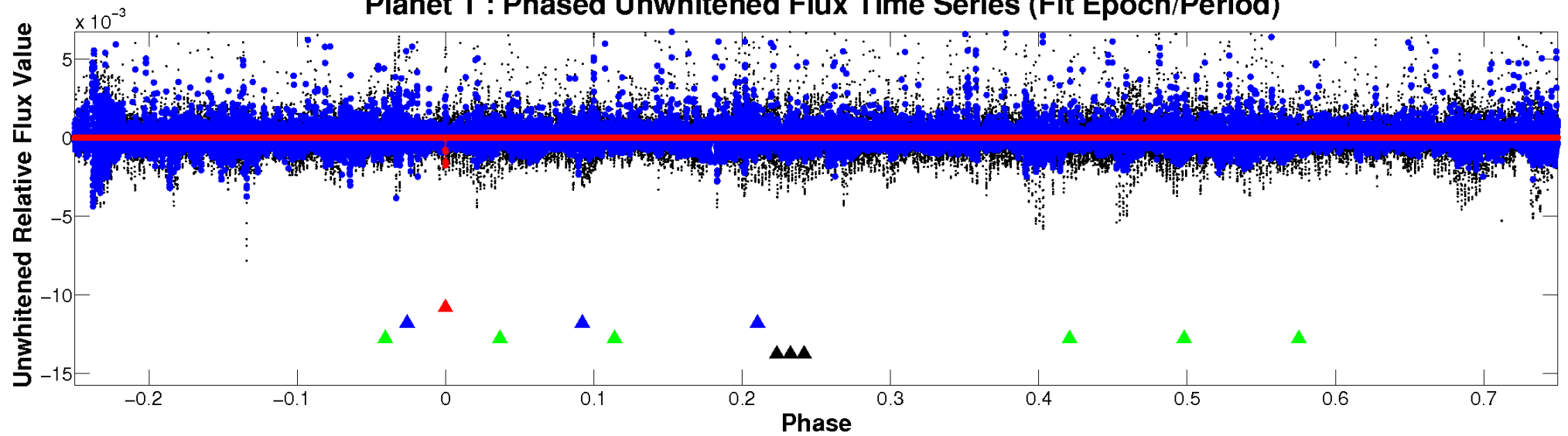
ALT Odd/Even

TCE 012166457-01

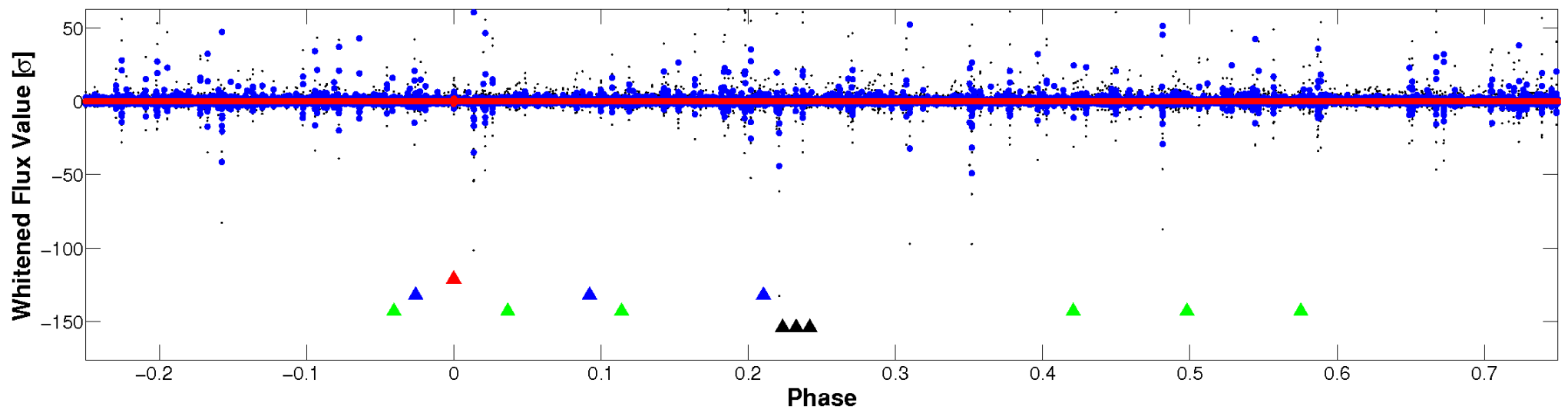


Non-Whitened Vs. Whitened Light Curve

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

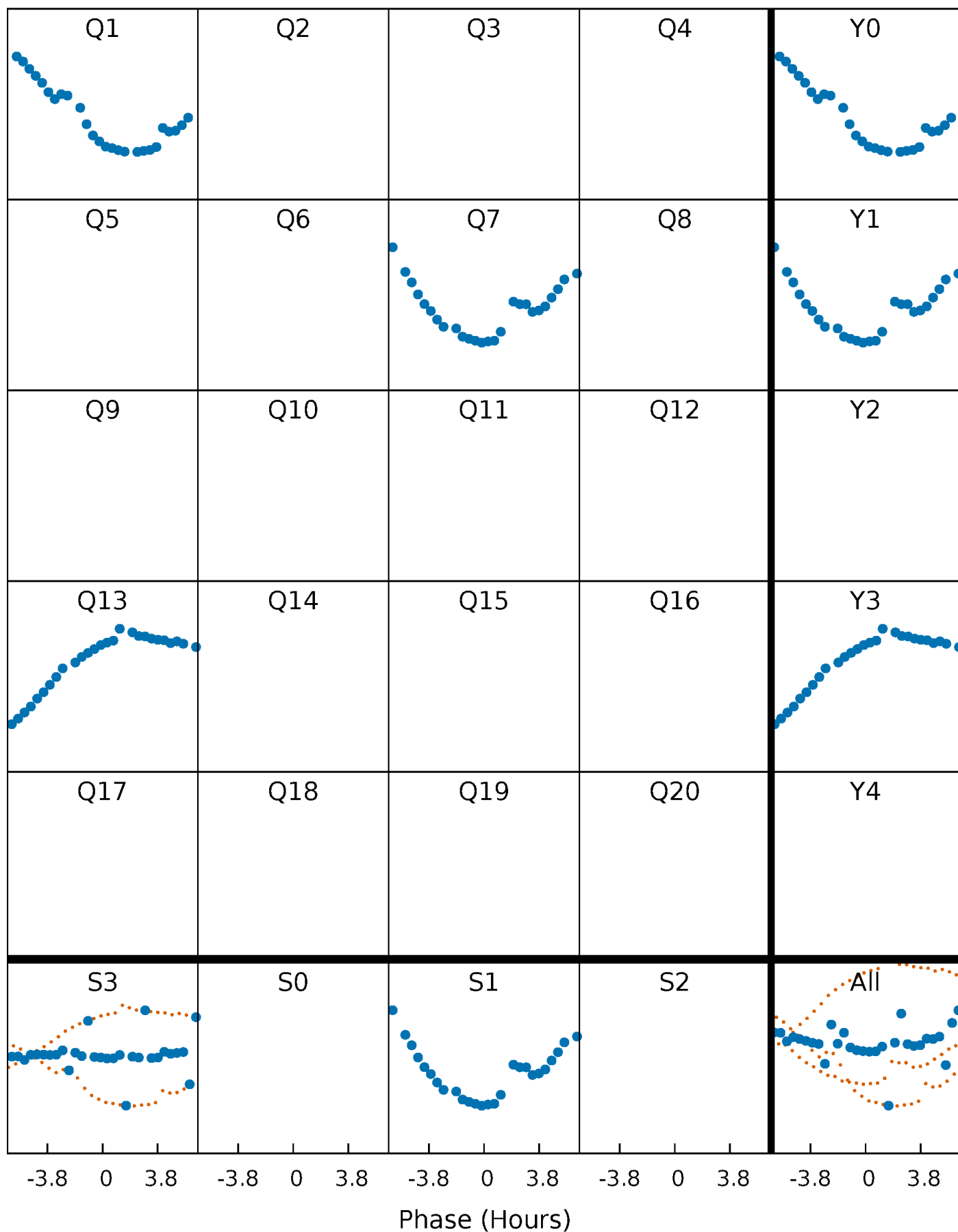


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



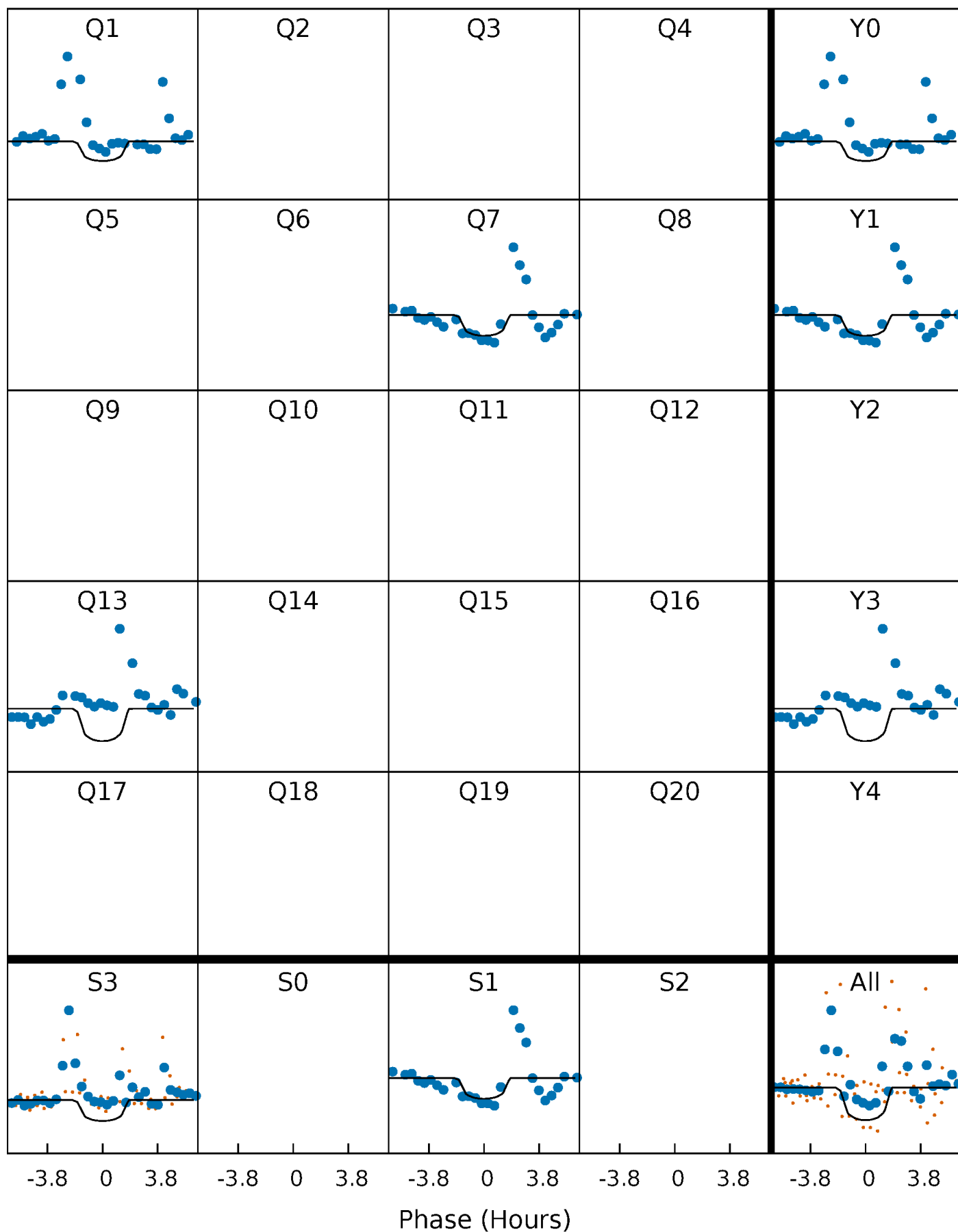
PDC Quarter-Phased Transit Curves

TCE 012166457-01 P=531.453507 Days $T_0=134.996381$ (BKJD)



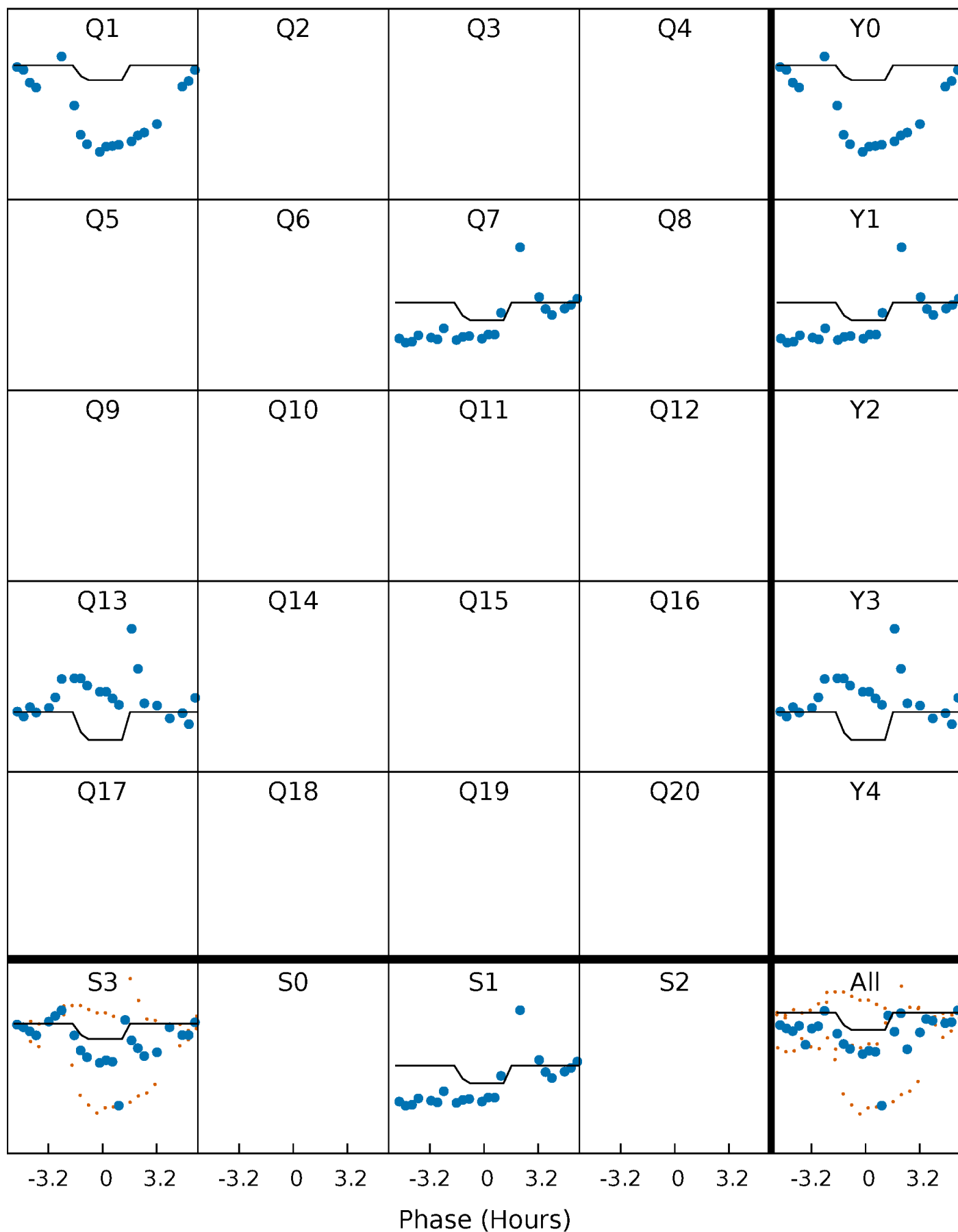
DV Quarter-Phased Transit Curves

TCE 012166457-01 P=531.453507 Days $T_0=134.996381$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

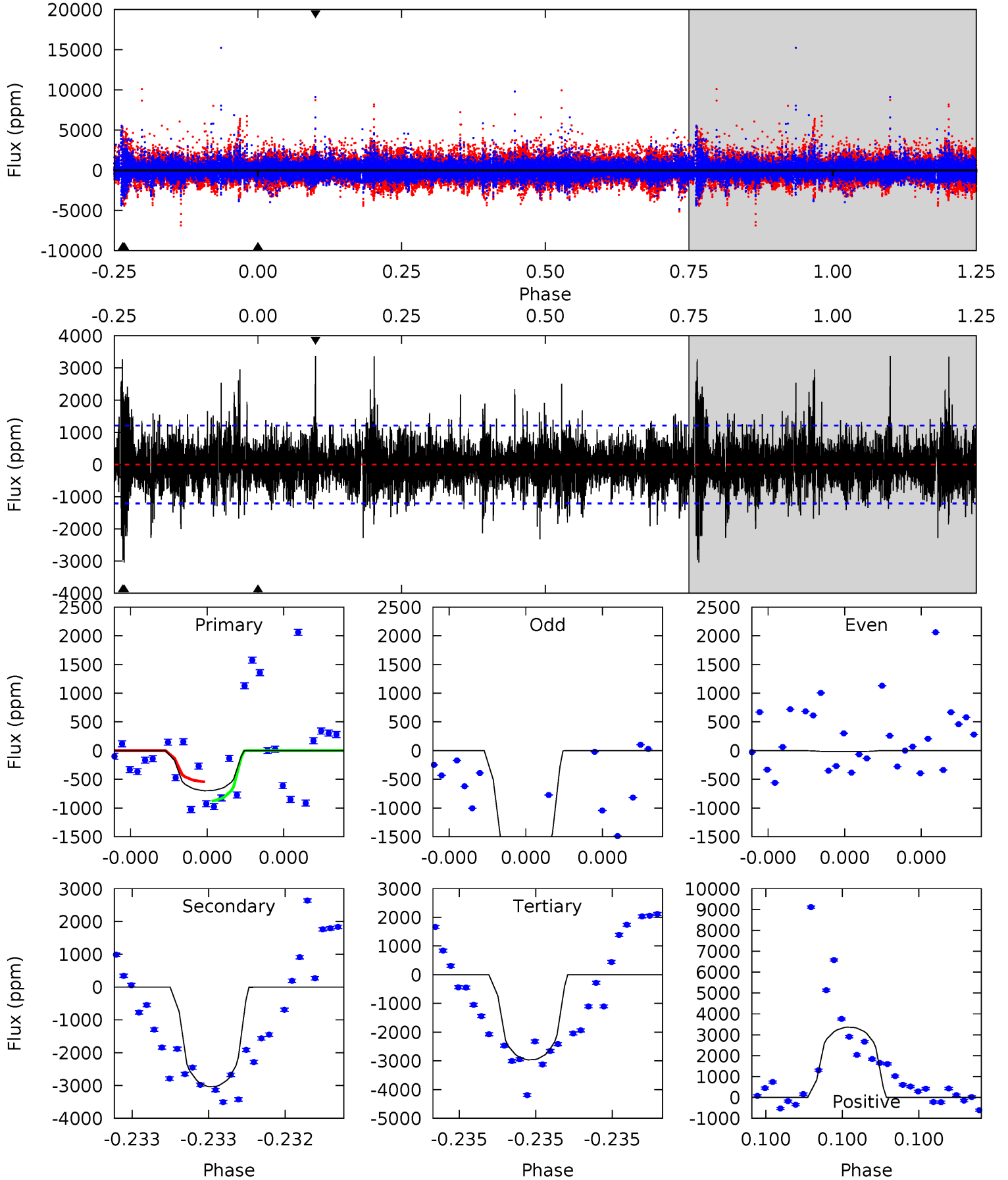
TCE 012166457-01 P=531.436029 Days $T_0=135.019958$ (BKJD)



DV Model-Shift Uniqueness Test

012166457-01, P = 531.453507 Days, E = 134.996381 Days

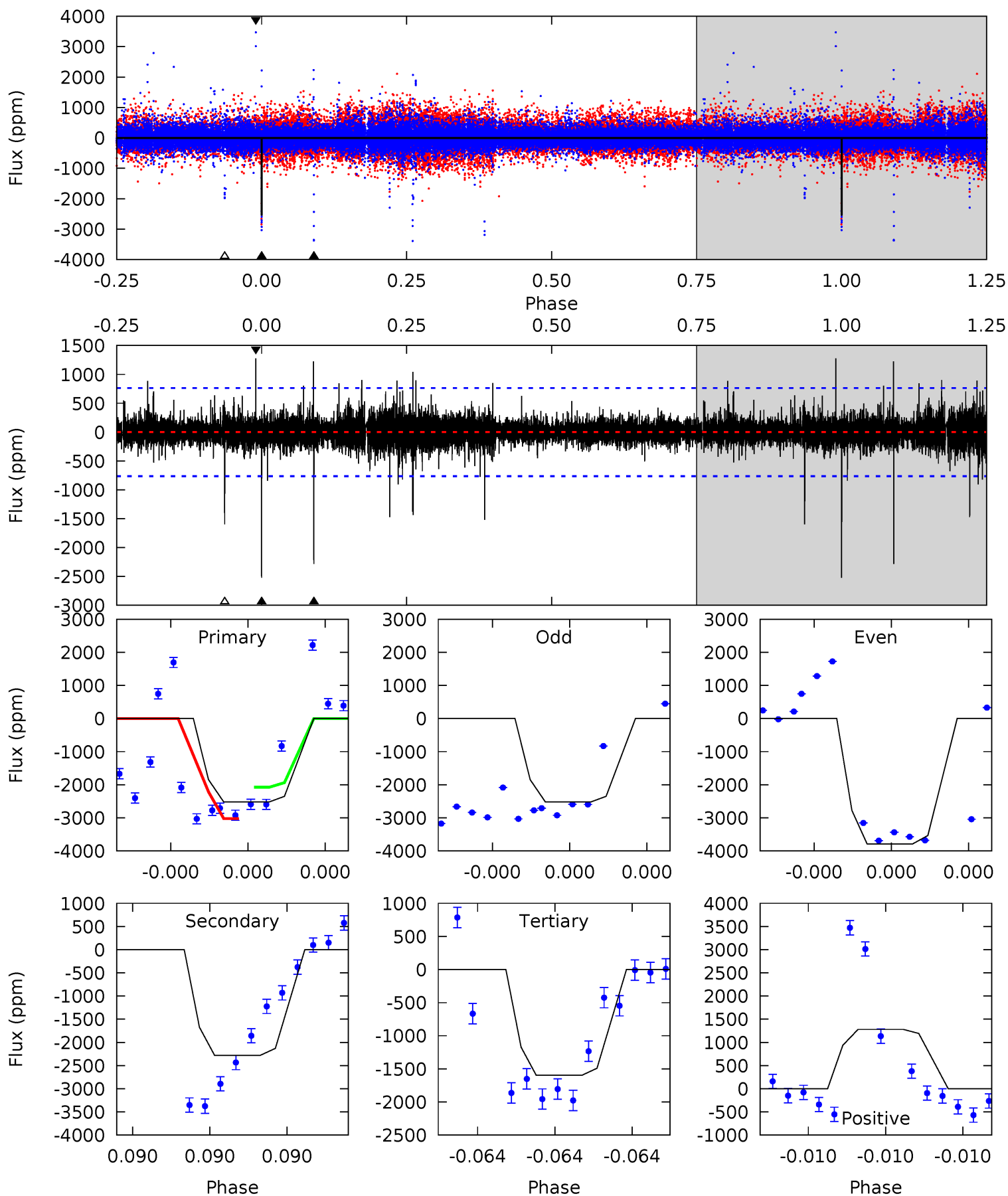
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.27	14.2	13.9	15.8	5.66	3.62	2.53	-10.6	-12.5	0.34	-1.53	3.31	5.37	0.53	0.79



Alt Model-Shift Uniqueness Test

012166457-01, P = 531.436029 Days, E = 135.019958 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.9	17.2	12.0	9.61	5.73	3.72	1.01	6.94	9.34	5.14	7.55	6.28	1.27	0.34	3.42



Stellar Parameters For KIC 012166457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5158^{+154}_{-154}	$4.572^{+0.071}_{-0.052}$	$-0.500^{+0.300}_{-0.300}$	$0.708^{+0.073}_{-0.073}$	$0.682^{+0.090}_{-0.042}$	$2.712^{+0.833}_{-0.481}$
	+3%/-3%	+2%/-1%	+60%/-60%	+10%/-10%	+13%/-6%	+31%/-18%
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 012166457-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3037 ± 214	$6.26^{+5.71}_{-4.27}$	251^{+10}_{-10}	4405^{+3044}_{-904}	$54718^{+486485}_{-39797}$
Alt.	-2282 ± 133	$5.97^{+6.17}_{-3.97}$	251^{+9}_{-9}	4249^{+2846}_{-905}	$45969^{+374785}_{-35076}$

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 $A_{obs} \gg 1.0$

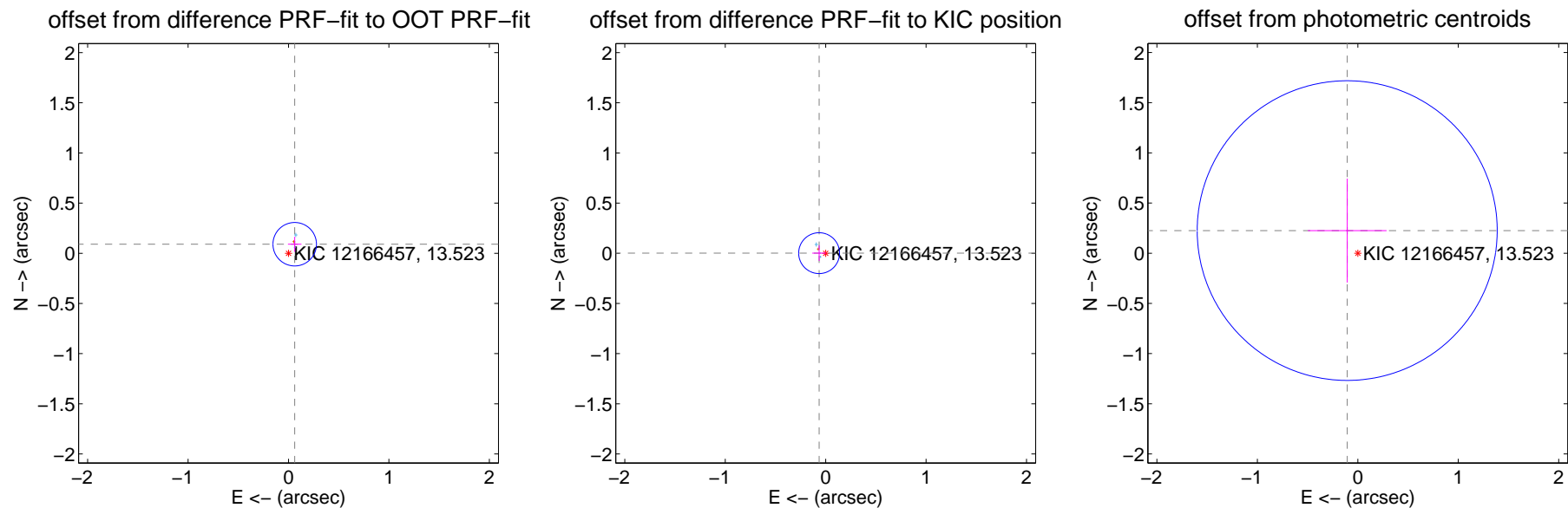
DV Centroid Data

Supplemental centroid analysis for 012166457-01. Kepler magnitude: 13.52. Transit SNR 6.70

There are 2 quarters with good PRF difference image offsets

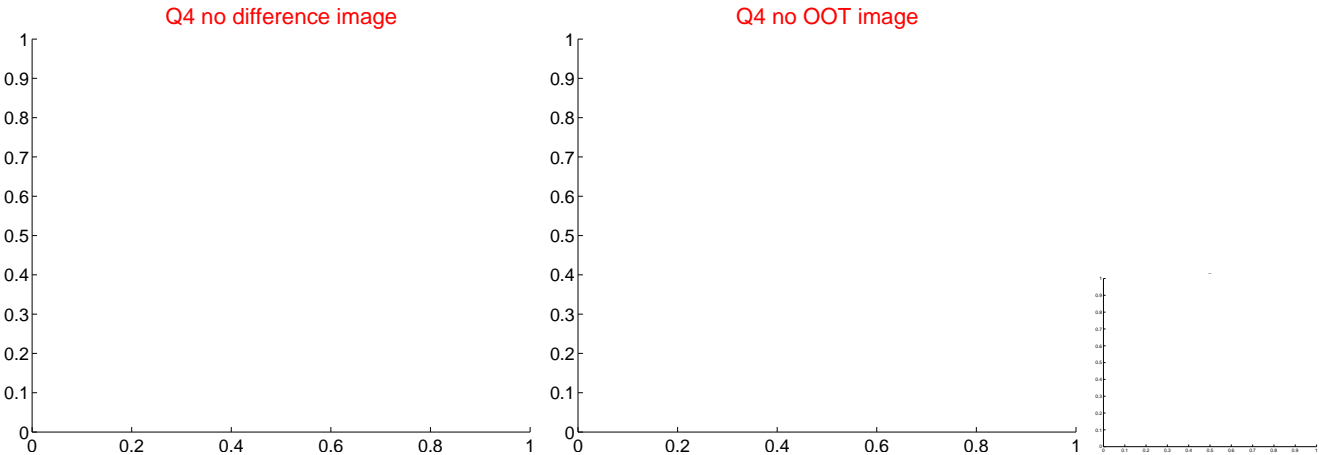
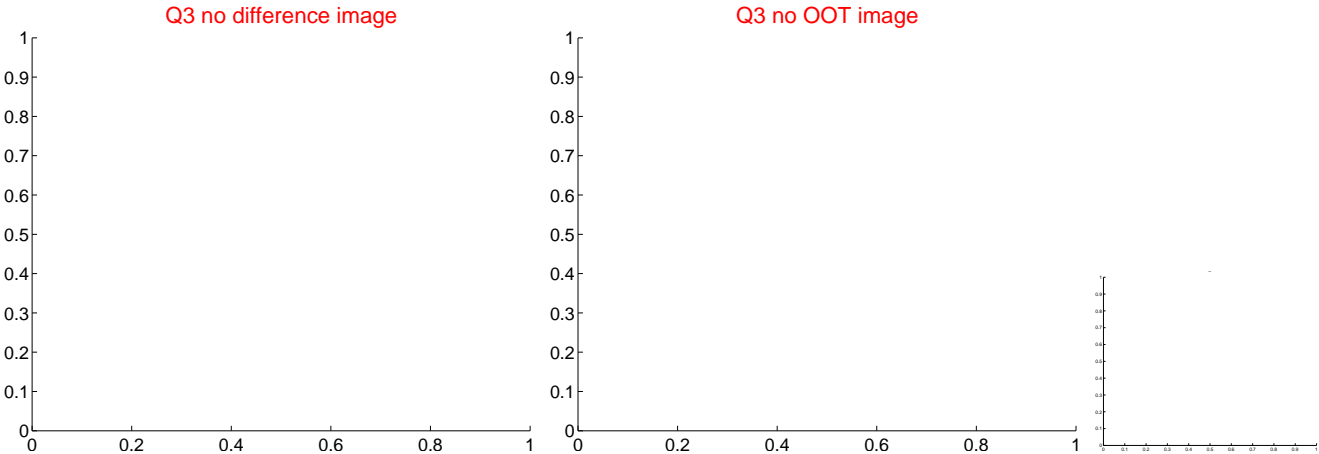
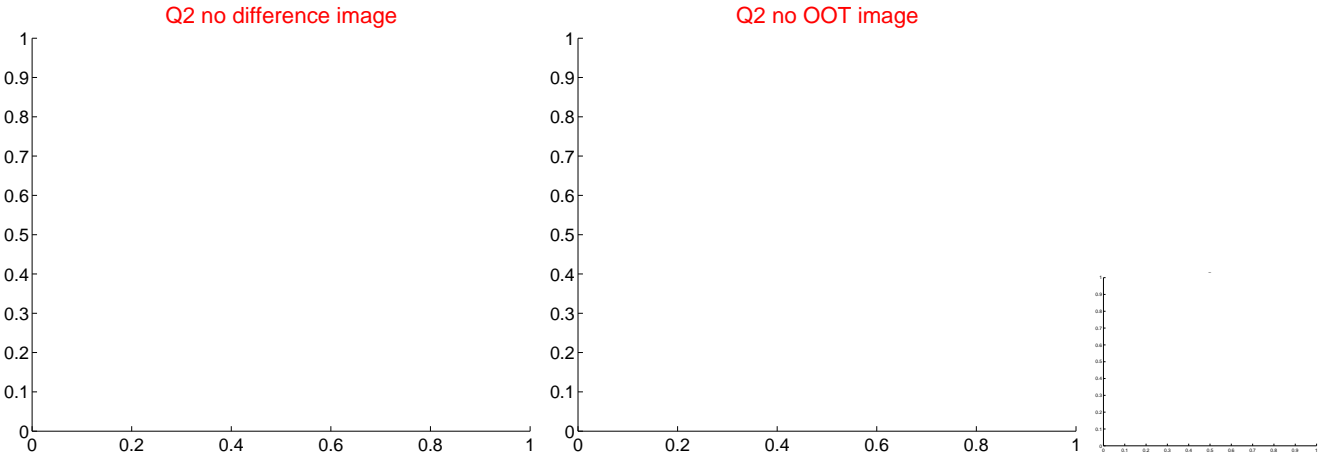
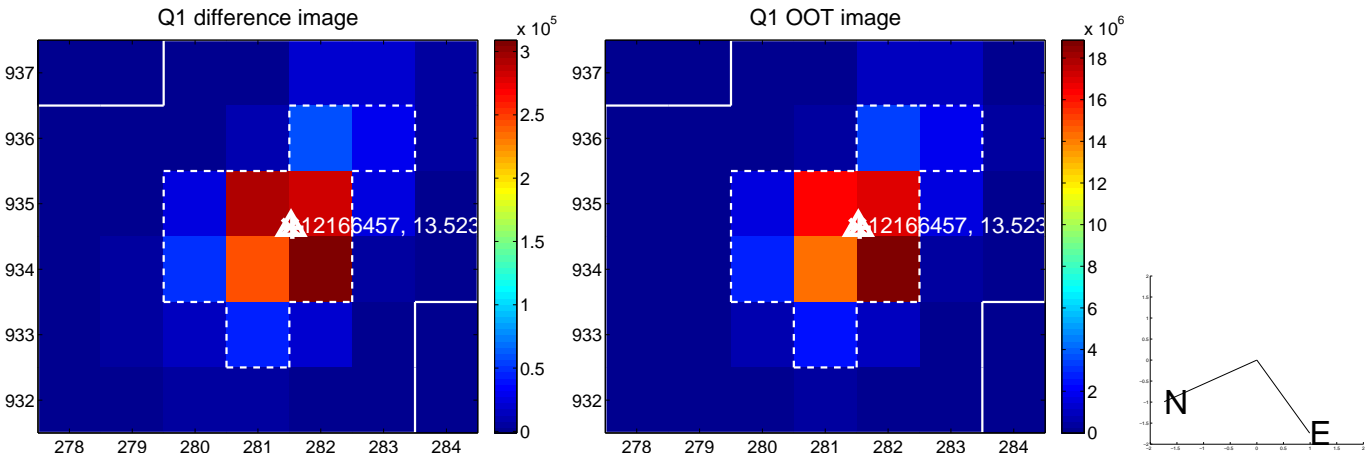
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.110 ± 0.072	1.52	-0.062 ± 0.067	0.090 ± 0.075
PRF-fit source offset from KIC position	0.065 ± 0.068	0.96	0.065 ± 0.068	0.001 ± 0.077
photometric centroid source offset	0.25 ± 0.50	0.50	0.11 ± 0.39	0.23 ± 0.52

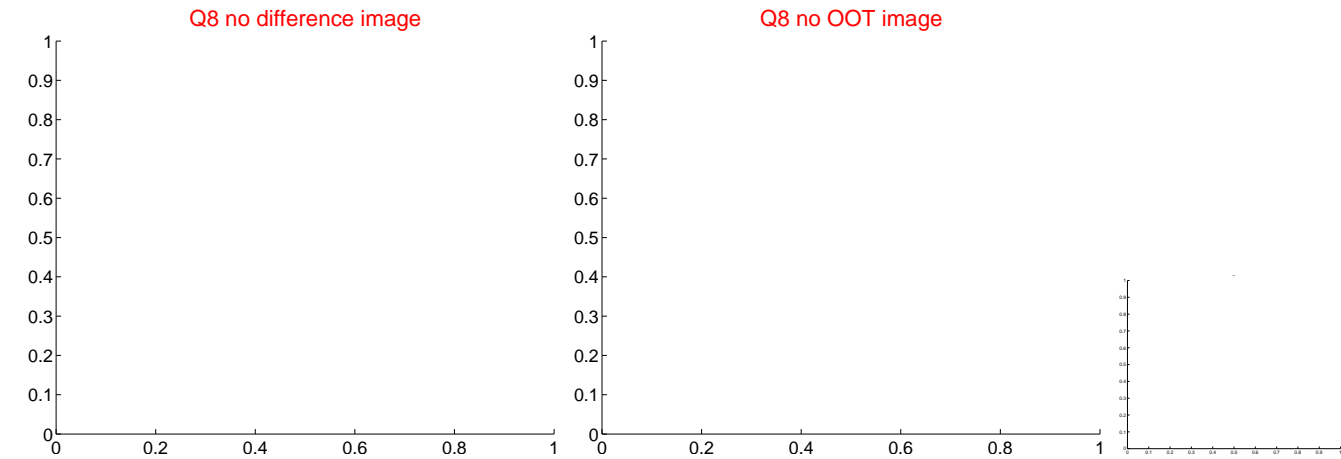
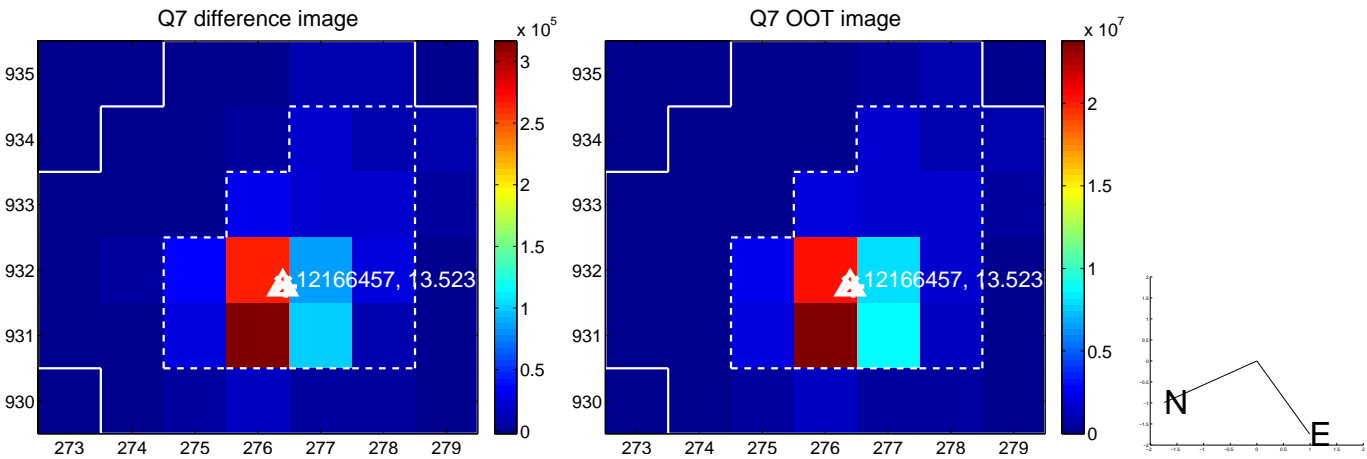
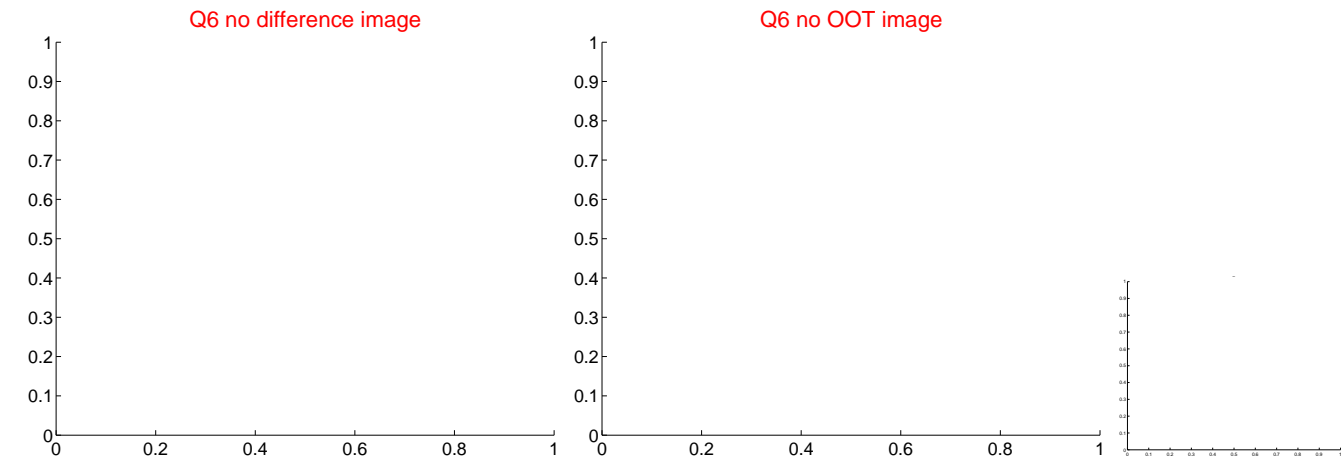
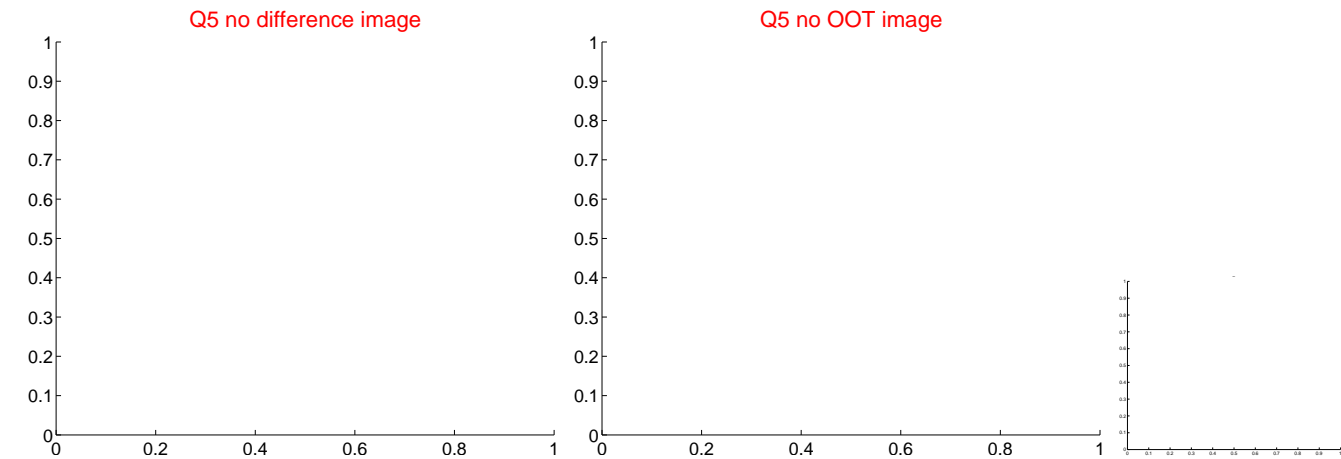


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



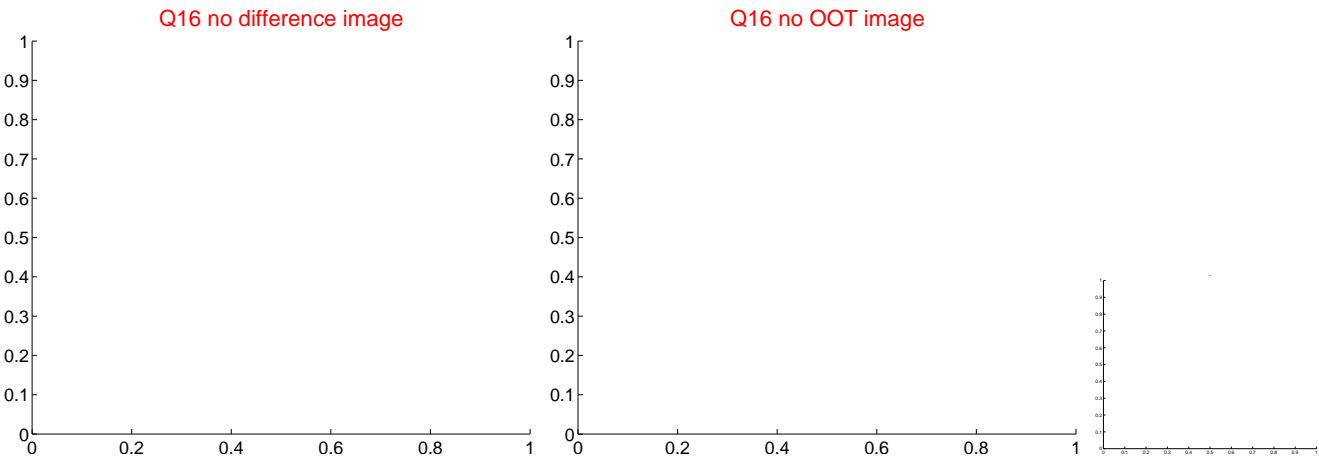
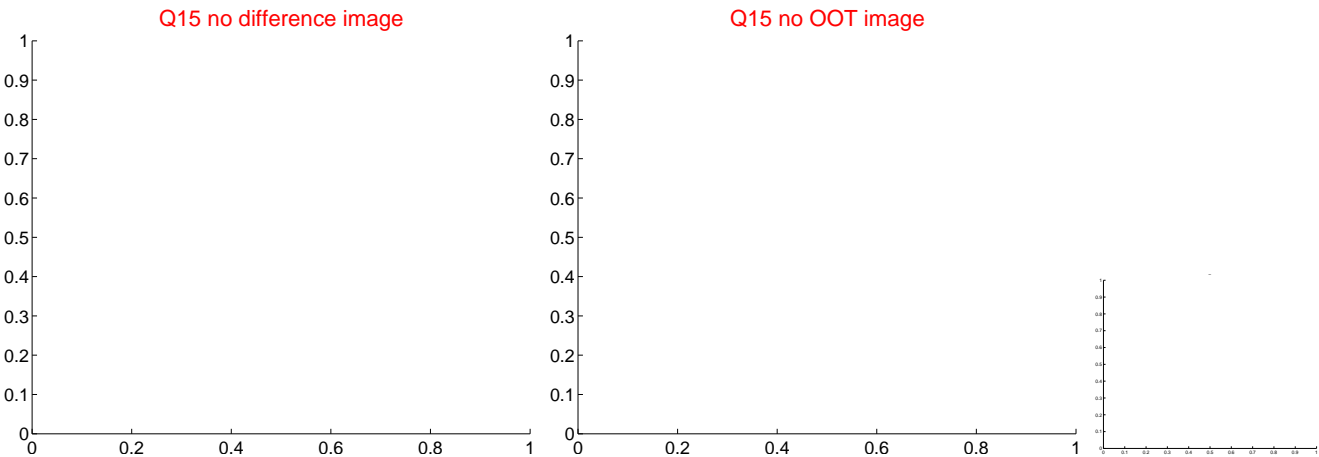
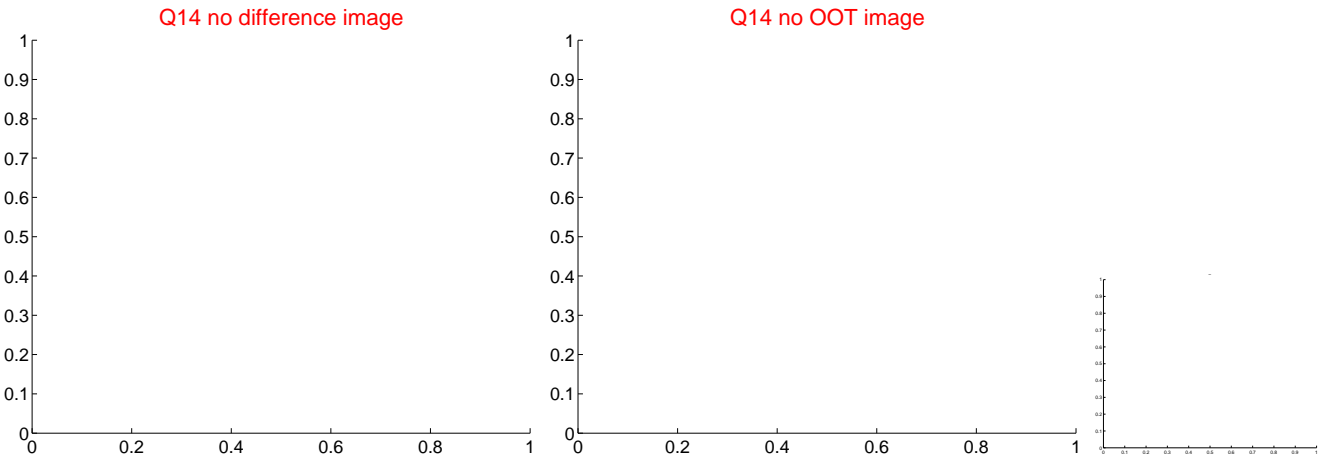
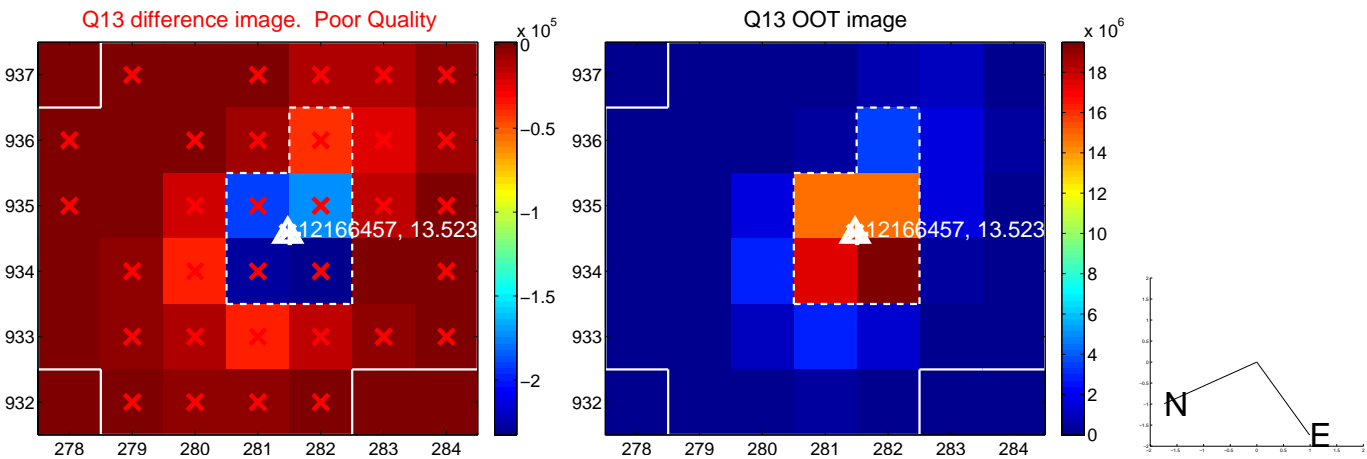
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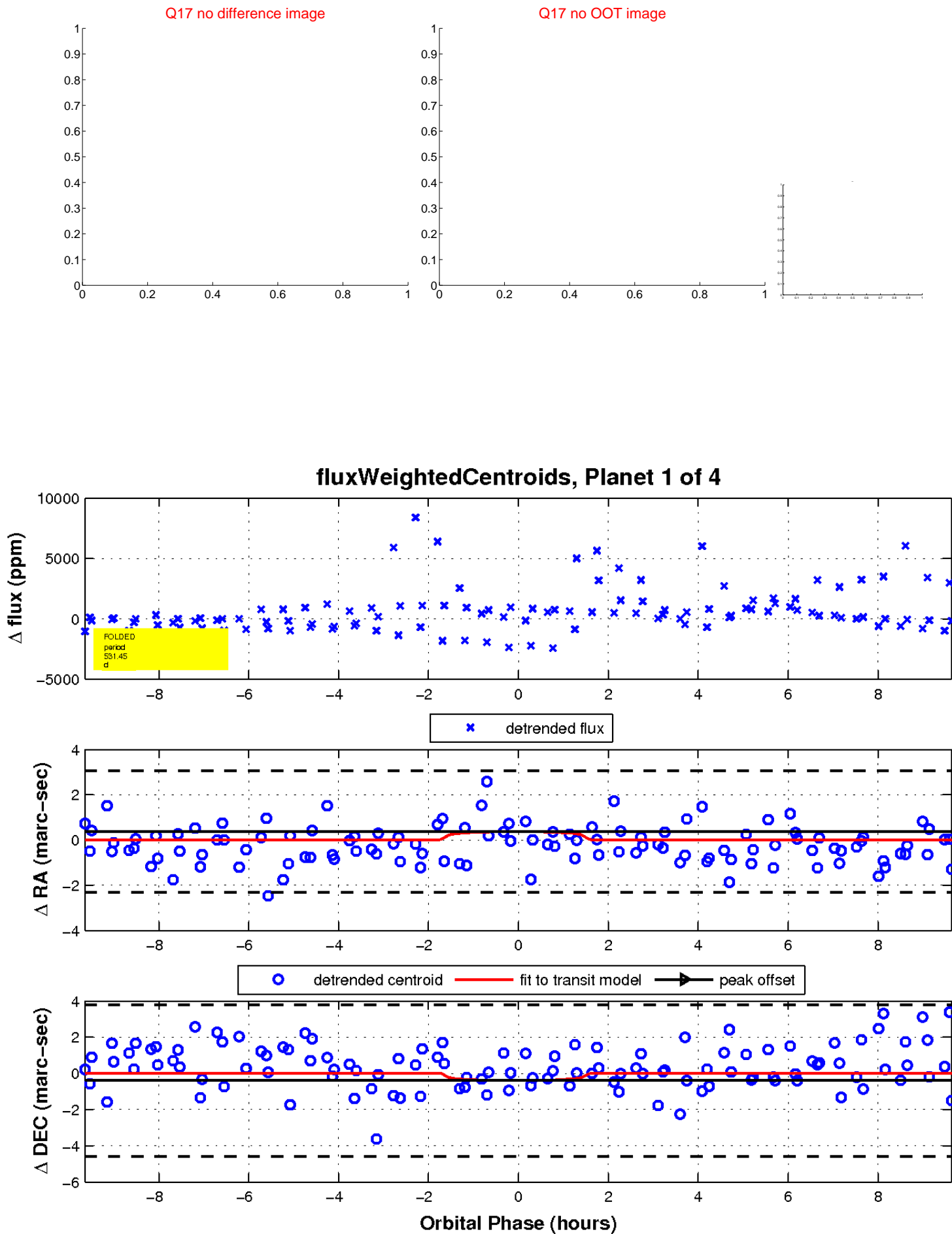
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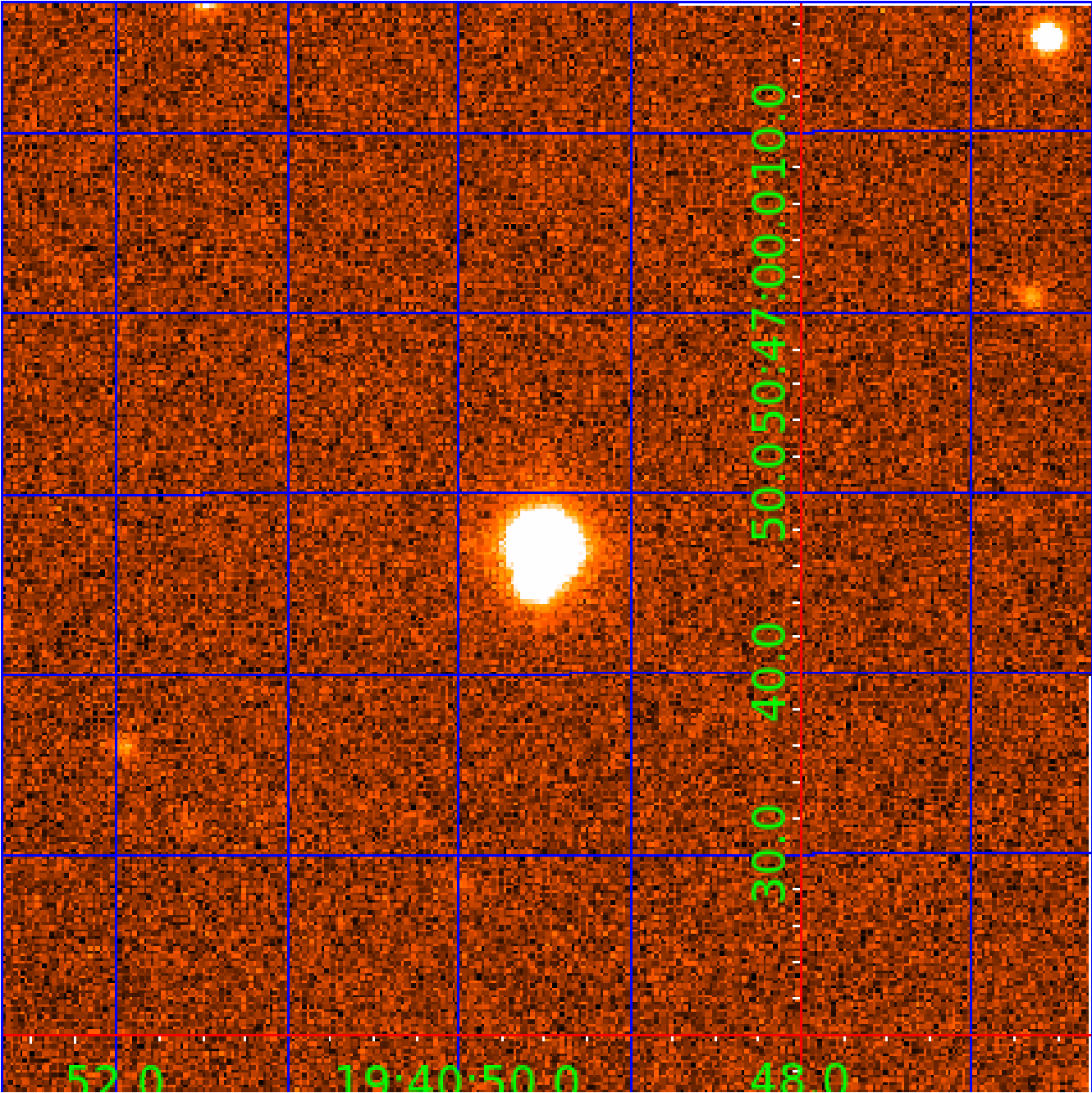


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012166457

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})
012166457-01	OBS	No	531.453507	134.996381	1762.7	3.287	20.4	6.7	0.71	5158	2.93	0.25
012166457-03	OBS	No	245.190139	195.576200	1116.6	2.498	11.0	6.7	0.71	5158	2.43	0.70
012166457-04	OBS	No	526.569196	263.506922	2036.5	3.735	13.3	6.4	0.71	5158	3.22	0.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012166457-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
012166457-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012166457-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

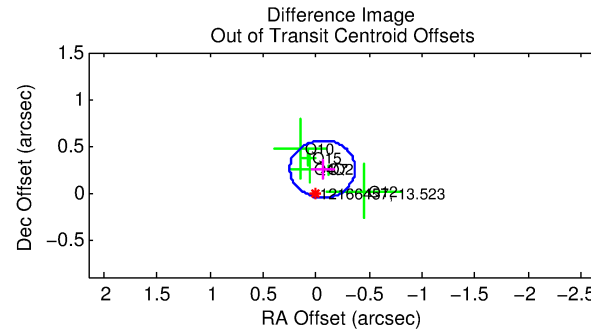
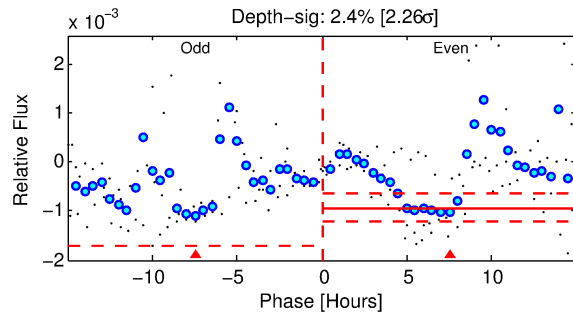
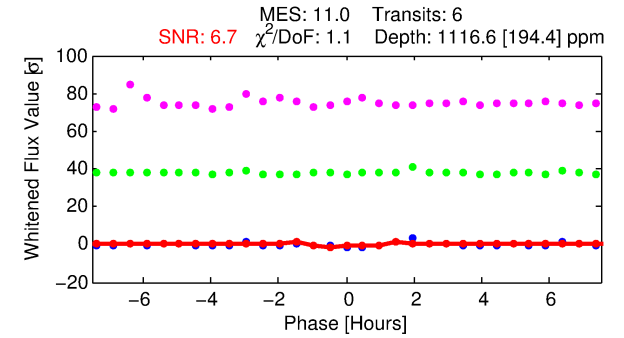
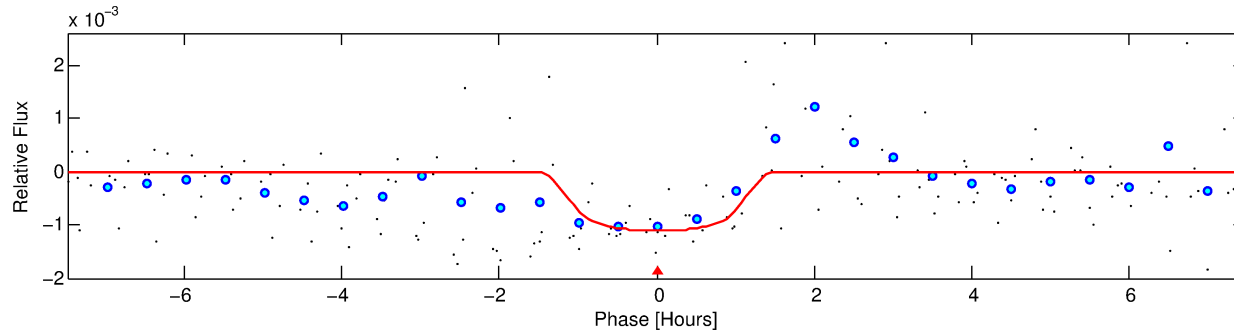
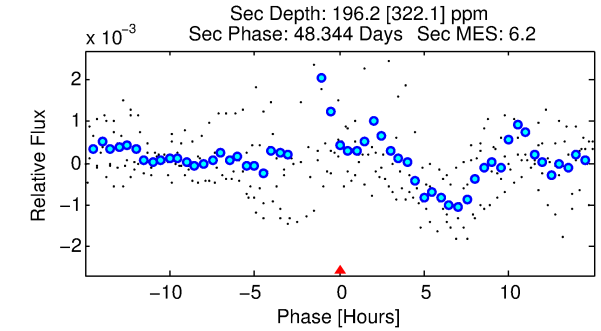
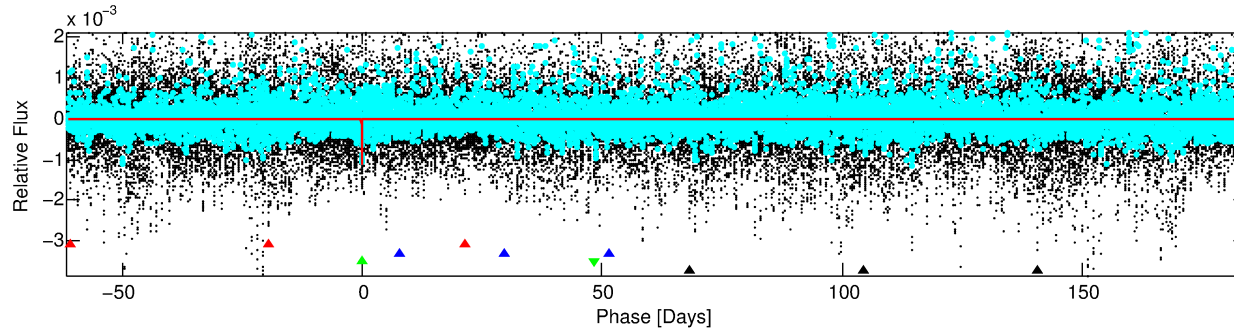
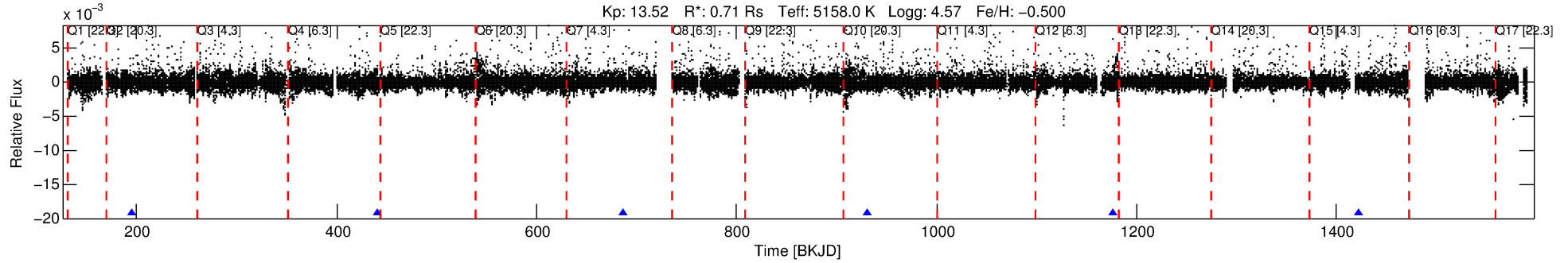
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012166457-03

No Significant Match Found

DV One-Page Summary

KIC: 12166457 Candidate: 3 of 4 Period: 245.190 d



DV Fit Results:

Period = 245.19014 [0.00128] d
Epoch = 195.5762 [0.0045] BKJD
Rp/R* = 0.0315 [0.0348]
a/R* = 648.06 [2746.92]
b = 0.56 [5.22]
Seff = 0.70 [0.12]
Teff = 233 [10] K
Rp = 2.43 [2.70] Re
a = 0.6751 [0.0592] AU
Ag = 8303.98 [22897.67] [0.36 σ]
Teffp = 3439 [2371] K [1.35 σ]

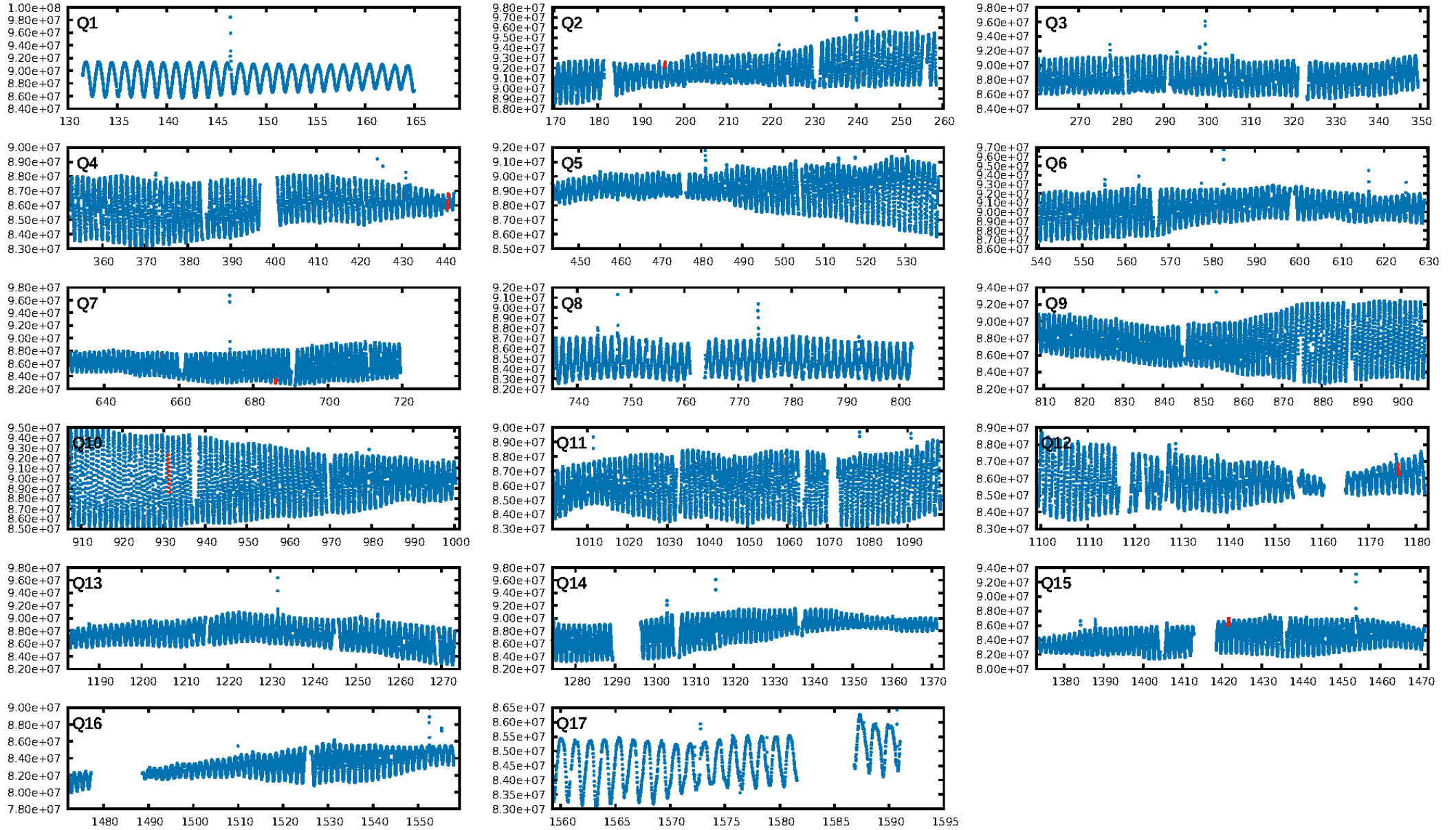
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [772.55 σ]
ModelChiSquare2-sig: 59.1%
ModelChiSquareGoF-sig: 95.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 0.6305
Centroid-sig: 33.3%
Centroid-so: 0.430 arcsec [0.66 σ]
OotOffset-rm: 0.258 arcsec [2.52 σ]
OotOffset-st: 2/2/2/0 [6]
KicOffset-rm: 0.210 arcsec [1.83 σ]
KicOffset-st: 2/2/2/0 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 1.00 [6/6]

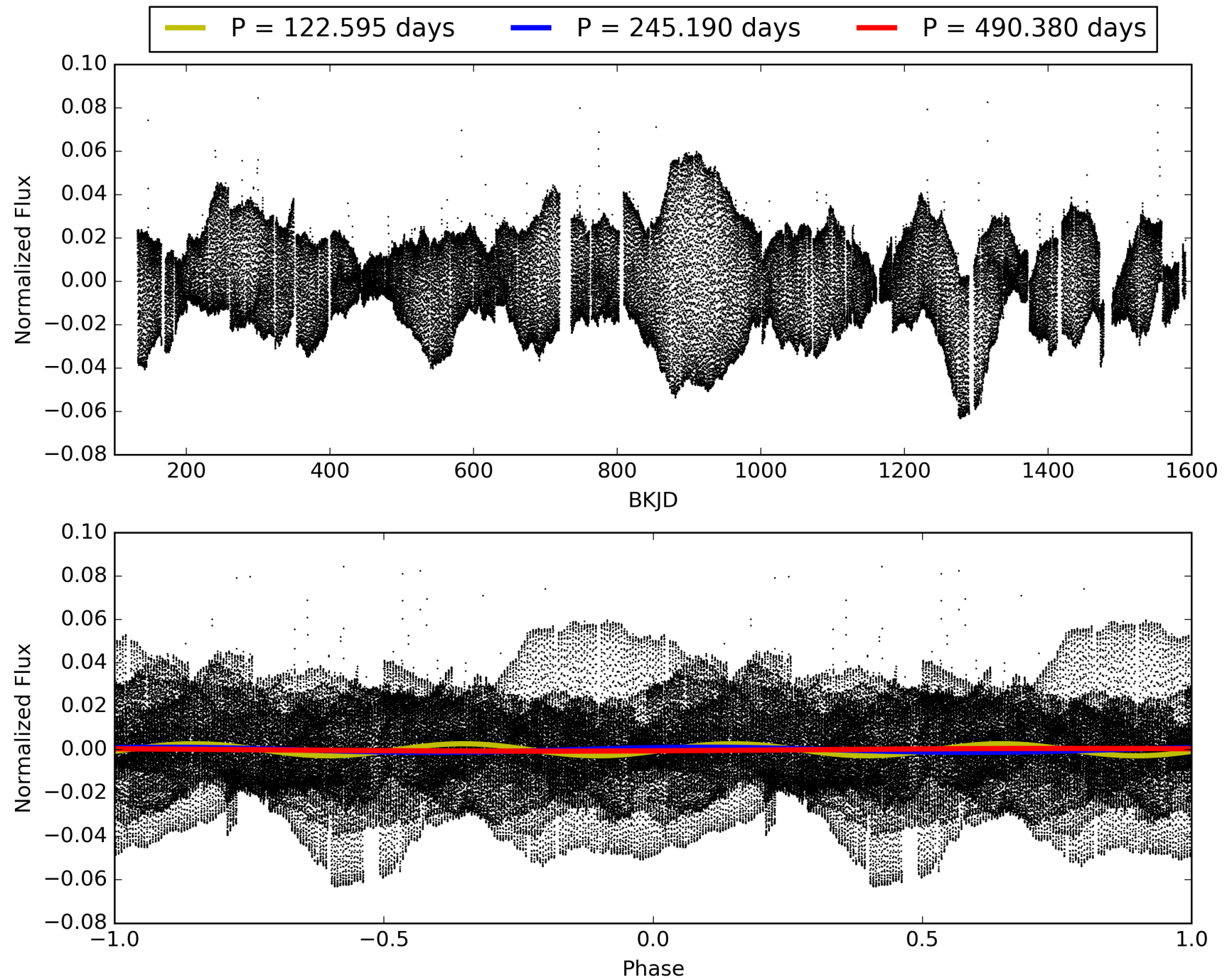
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:22:36 Z

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

TCE 012166457-03, PDC Light Curves

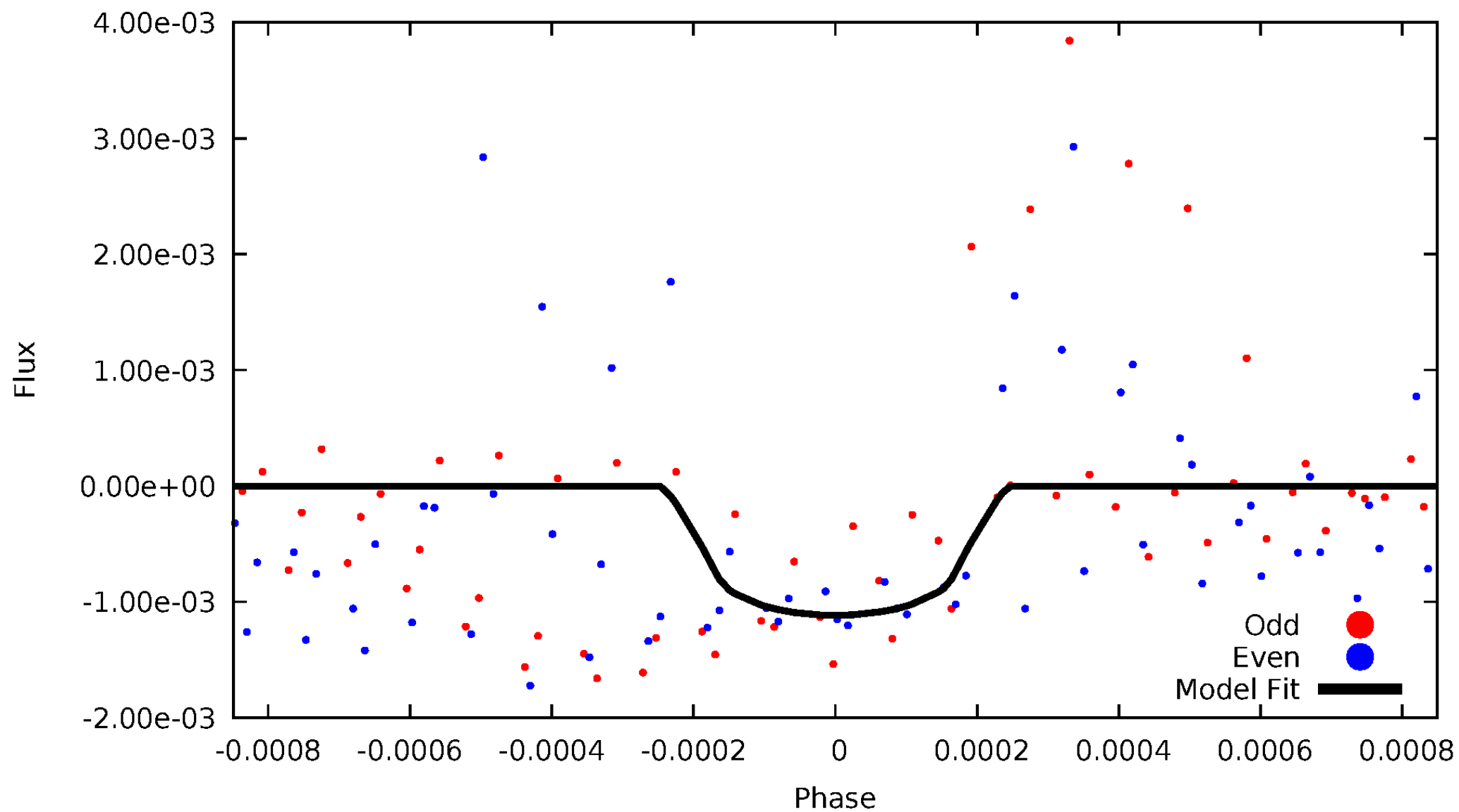


TCE 012166457-03



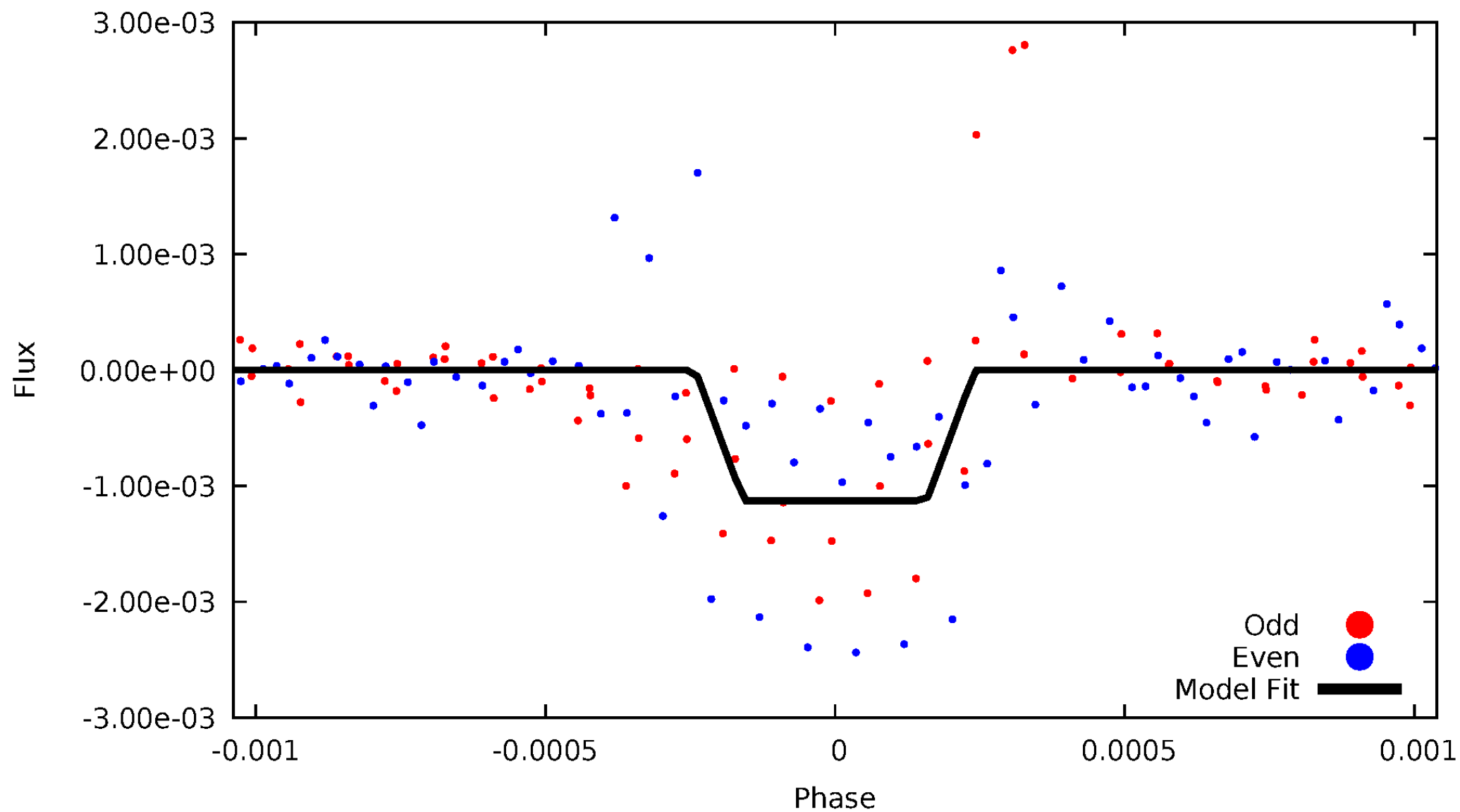
DV Odd/Even

TCE 012166457-03



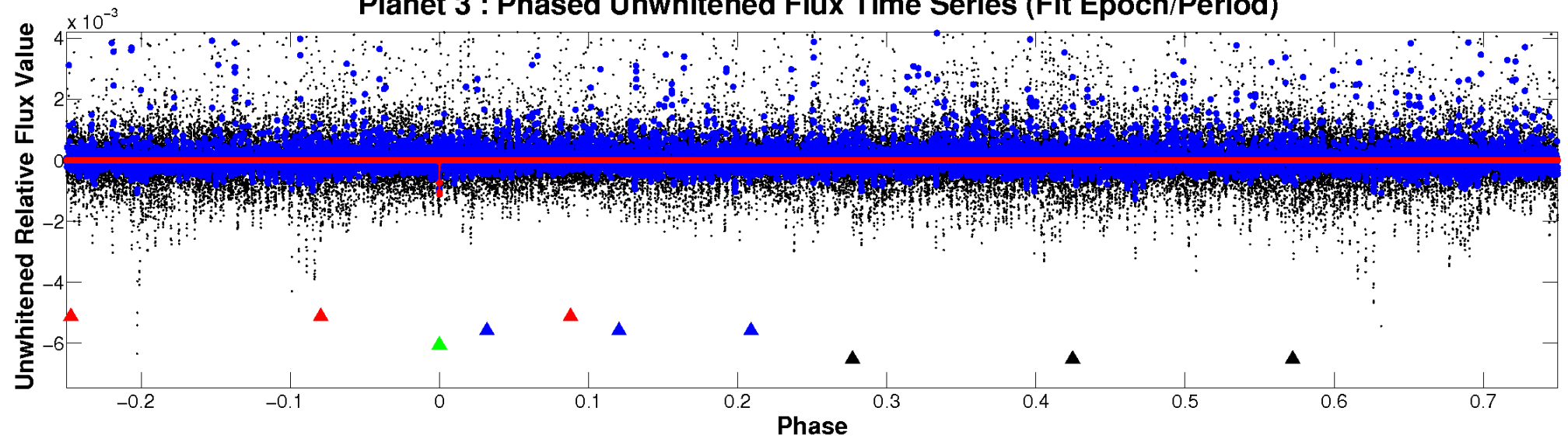
ALT Odd/Even

TCE 012166457-03

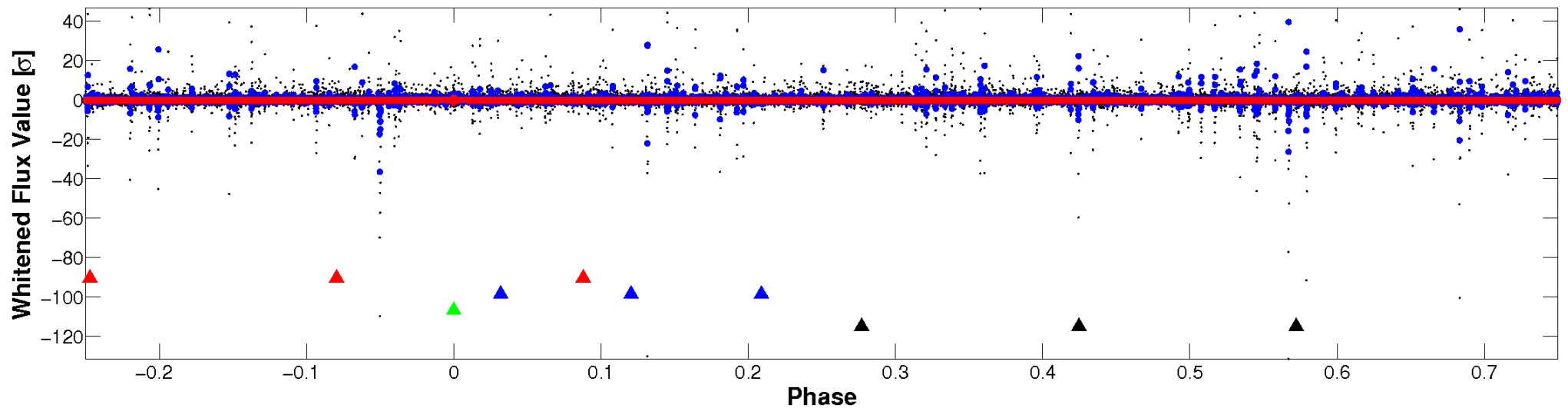


Non-Whitened Vs. Whitened Light Curve

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

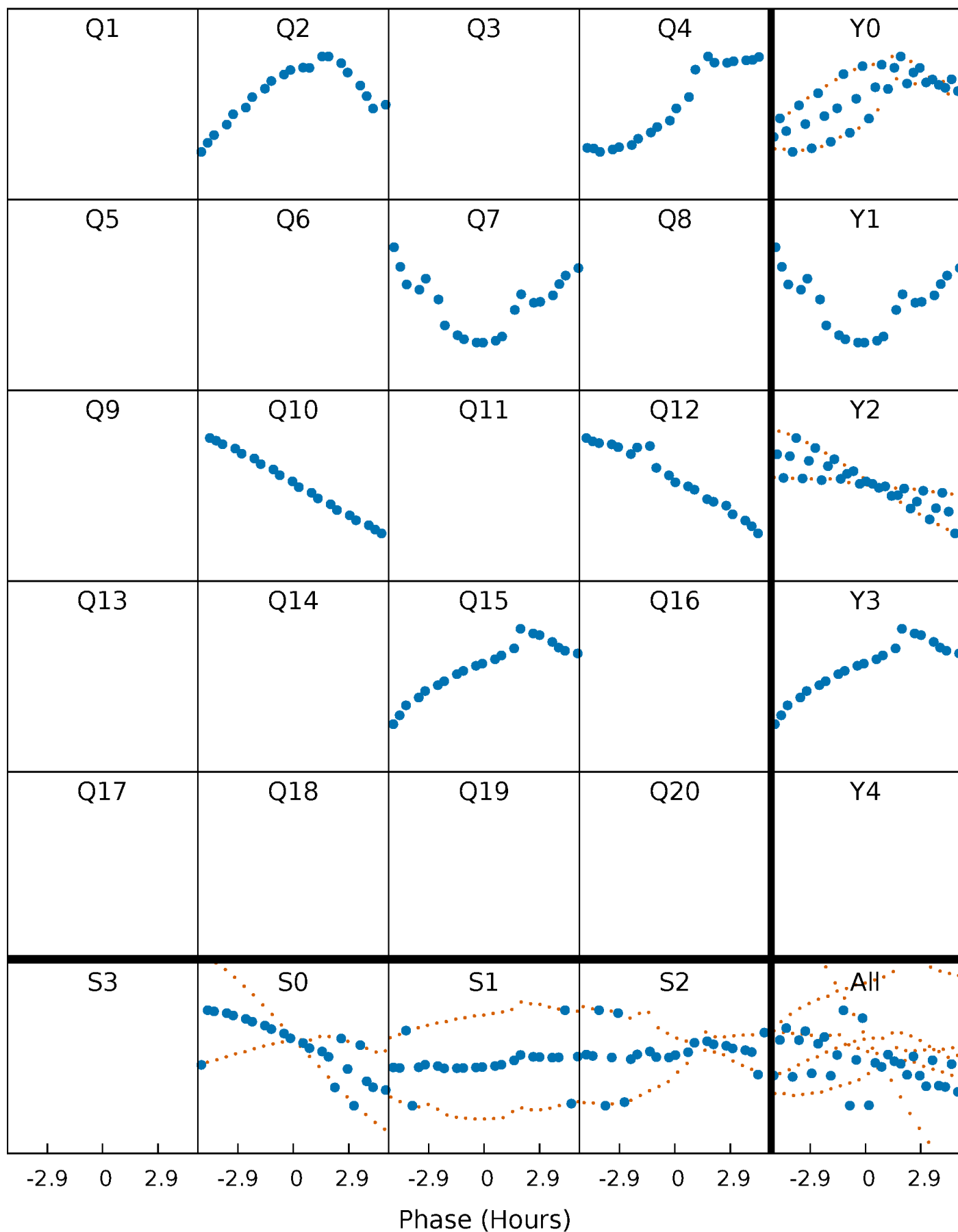


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



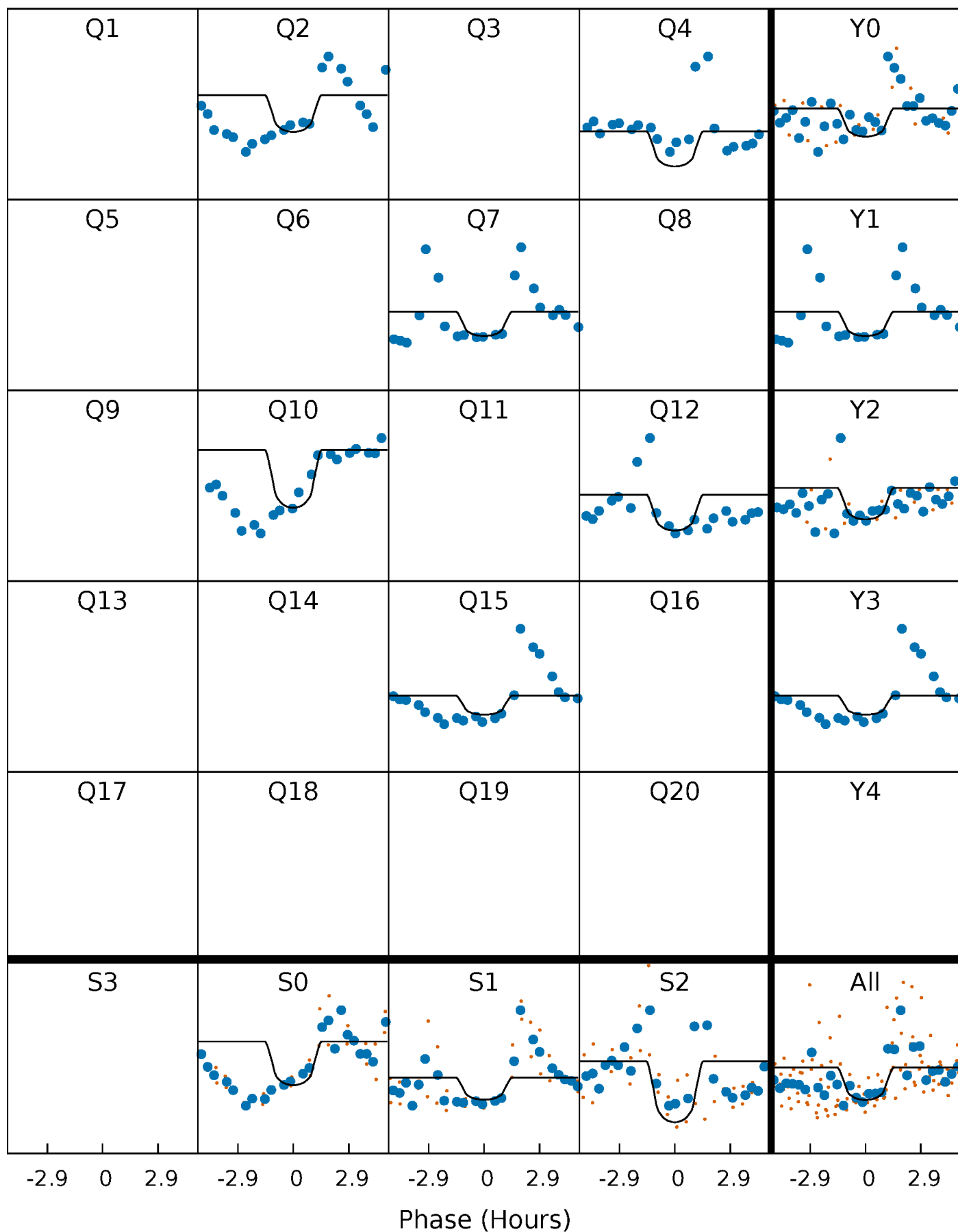
PDC Quarter-Phased Transit Curves

TCE 012166457-03 P=245.190139 Days $T_0=195.576200$ (BKJD)



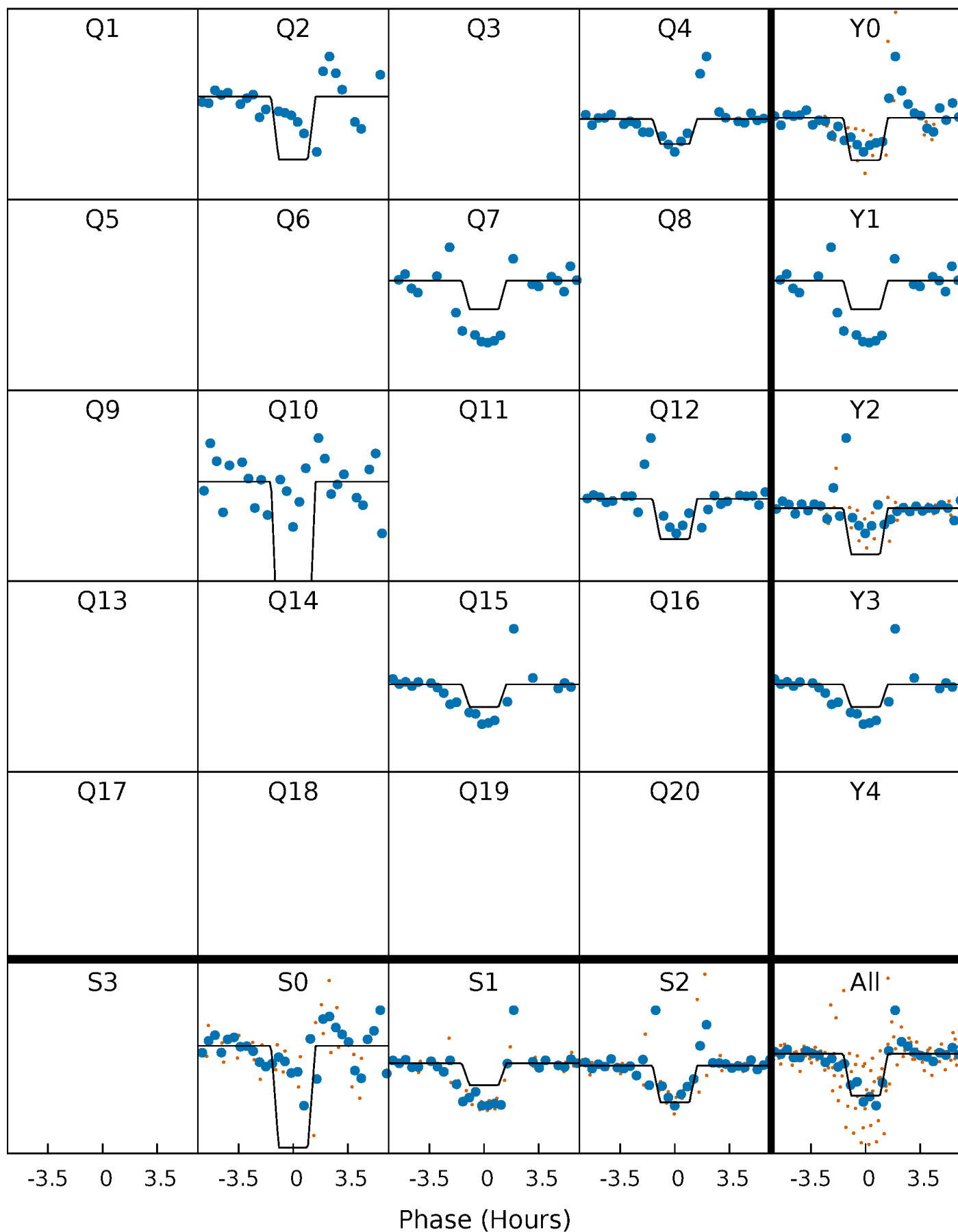
DV Quarter-Phased Transit Curves

TCE 012166457-03 $P=245.190139$ Days $T_0=195.576200$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

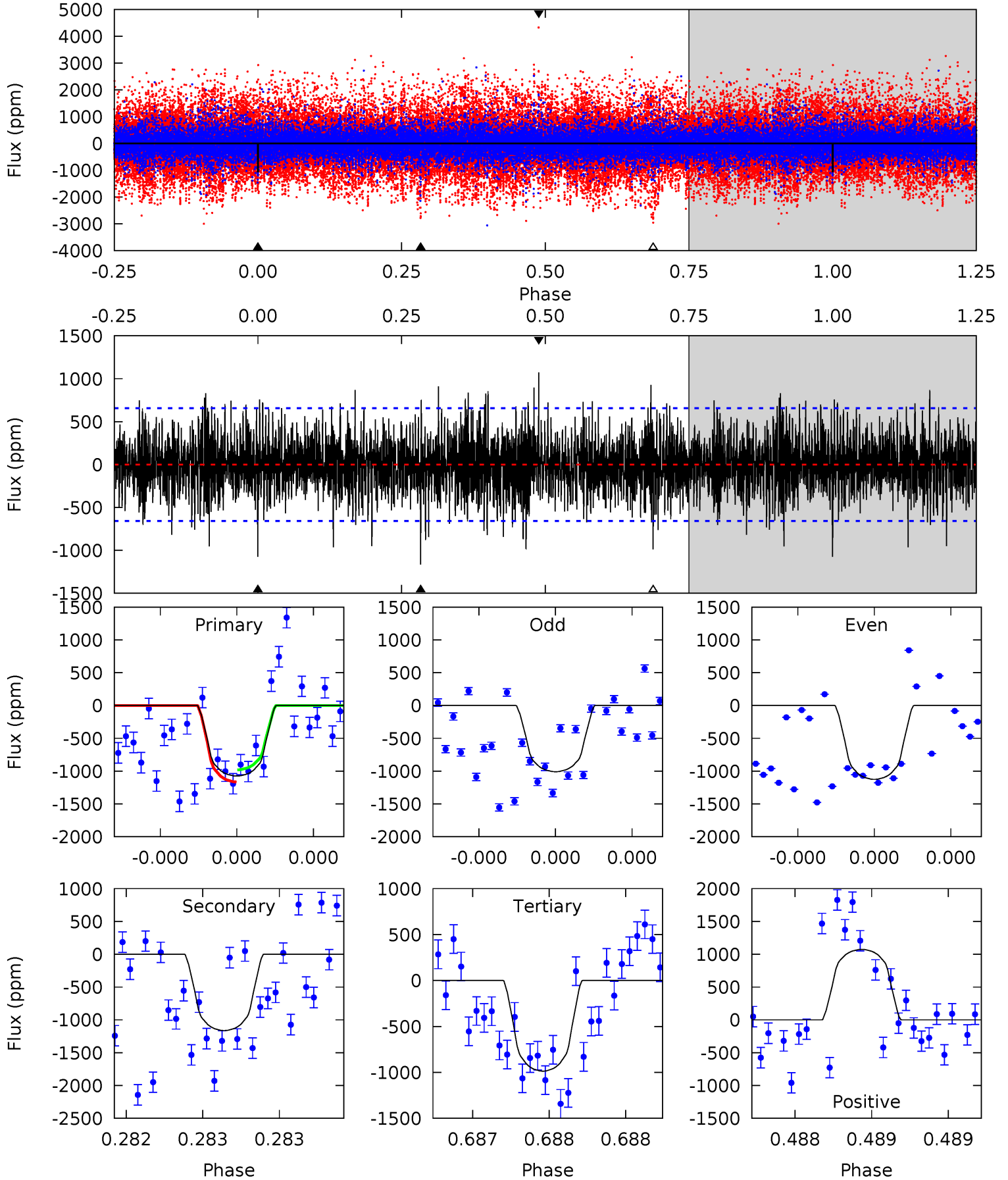
TCE 012166457-03 $P=245.194825$ Days $T_0=195.558703$ (BKJD)



DV Model-Shift Uniqueness Test

012166457-03, P = 245.190139 Days, E = 195.576200 Days

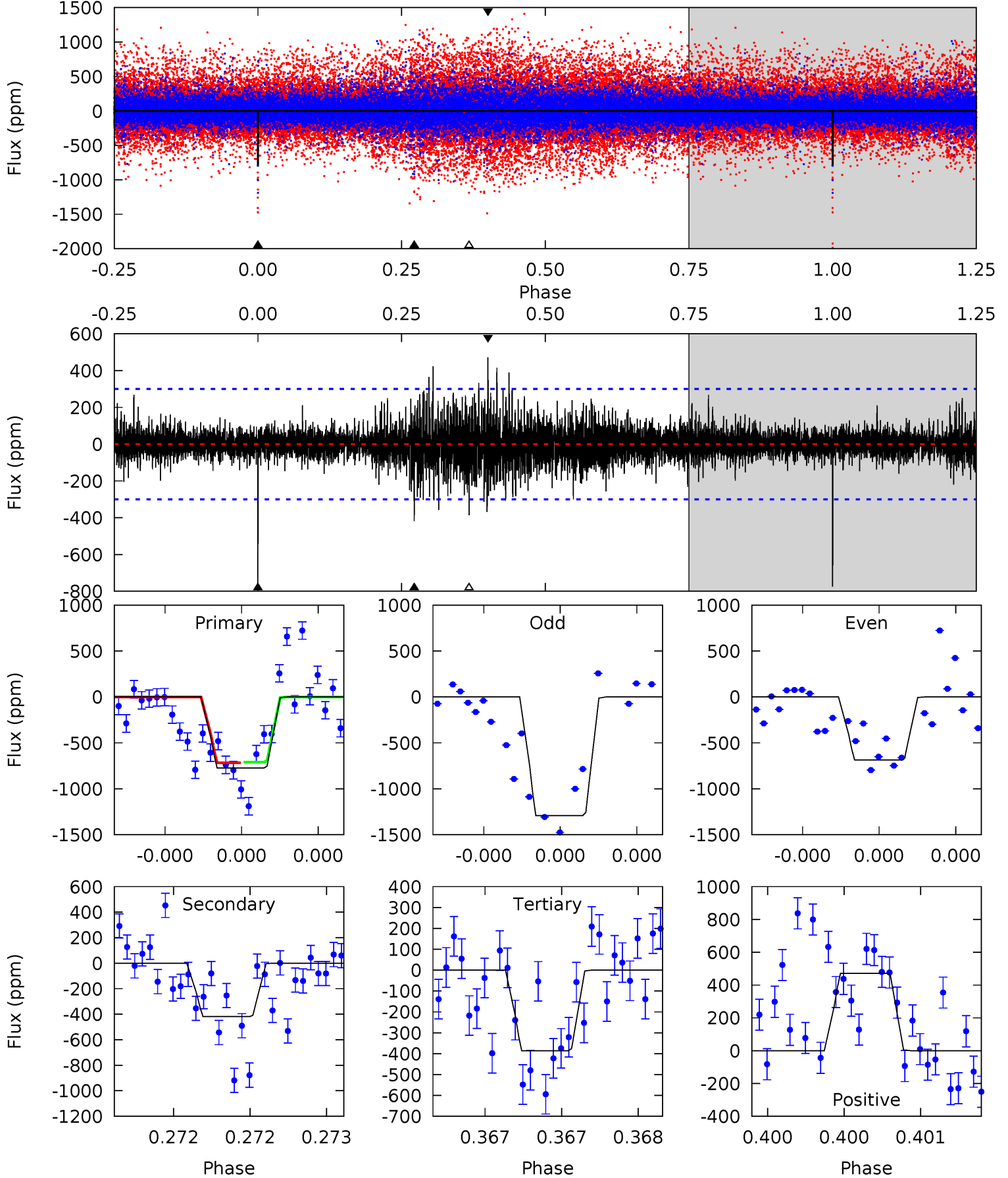
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.13	9.88	8.38	9.12	5.58	3.49	2.21	0.75	0.01	1.50	0.76	0.41	0.94	0.48	0.79



Alt Model-Shift Uniqueness Test

012166457-03, P = 245.194825 Days, E = 195.558703 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.4	7.79	7.17	8.77	5.58	3.49	1.39	7.22	5.62	0.62	-0.98	4.90	1.27	0.38	0.05



Stellar Parameters For KIC 012166457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5158^{+154}_{-154}	$4.572^{+0.071}_{-0.052}$	$-0.500^{+0.300}_{-0.300}$	$0.708^{+0.073}_{-0.073}$	$0.682^{+0.090}_{-0.042}$	$2.712^{+0.833}_{-0.481}$
	+3%/-3%	+2%/-1%	+60%/-60%	+10%/-10%	+13%/-6%	+31%/-18%
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 012166457-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1163 ± 118	$2.94^{+2.40}_{-1.92}$	325^{+13}_{-13}	4929^{+3448}_{-1042}	$34247^{+250296}_{-24187}$
Alt.	-419 ± 54	$3.39^{+2.32}_{-2.11}$	324^{+13}_{-12}	3842^{+1823}_{-617}	9454^{+54291}_{-6265}

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 $A_{obs} \gg 1.0$

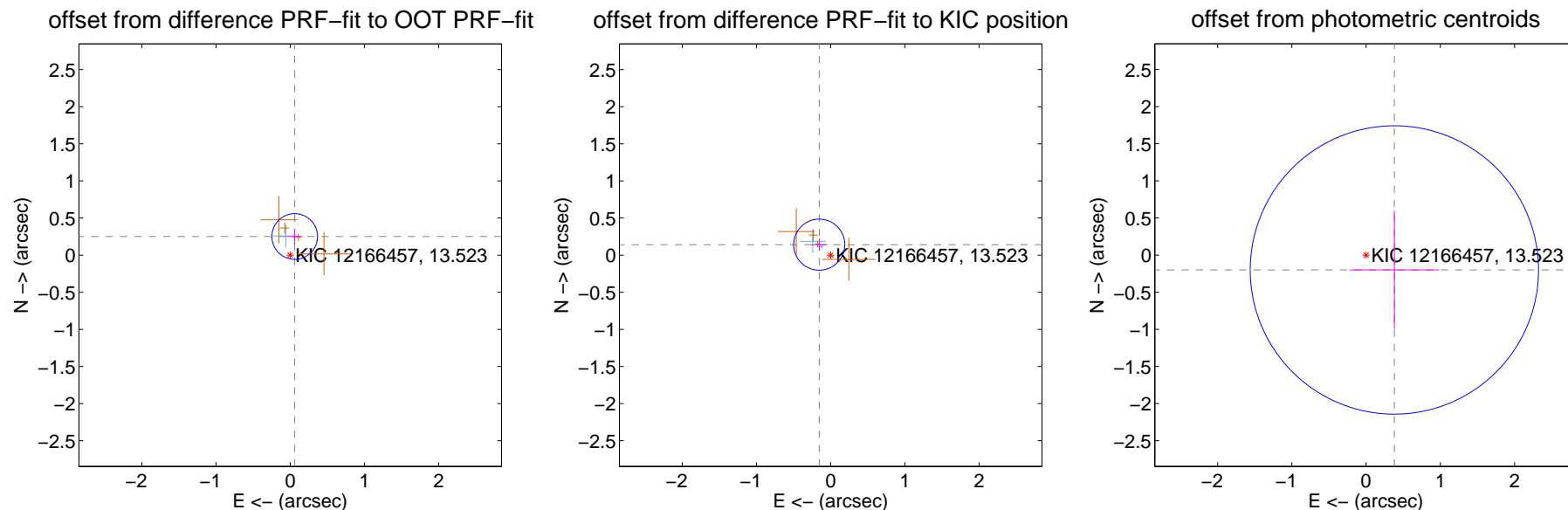
DV Centroid Data

Supplemental centroid analysis for 012166457-03. Kepler magnitude: 13.52. Transit SNR 6.71

There are 2 quarters with good PRF difference image offsets

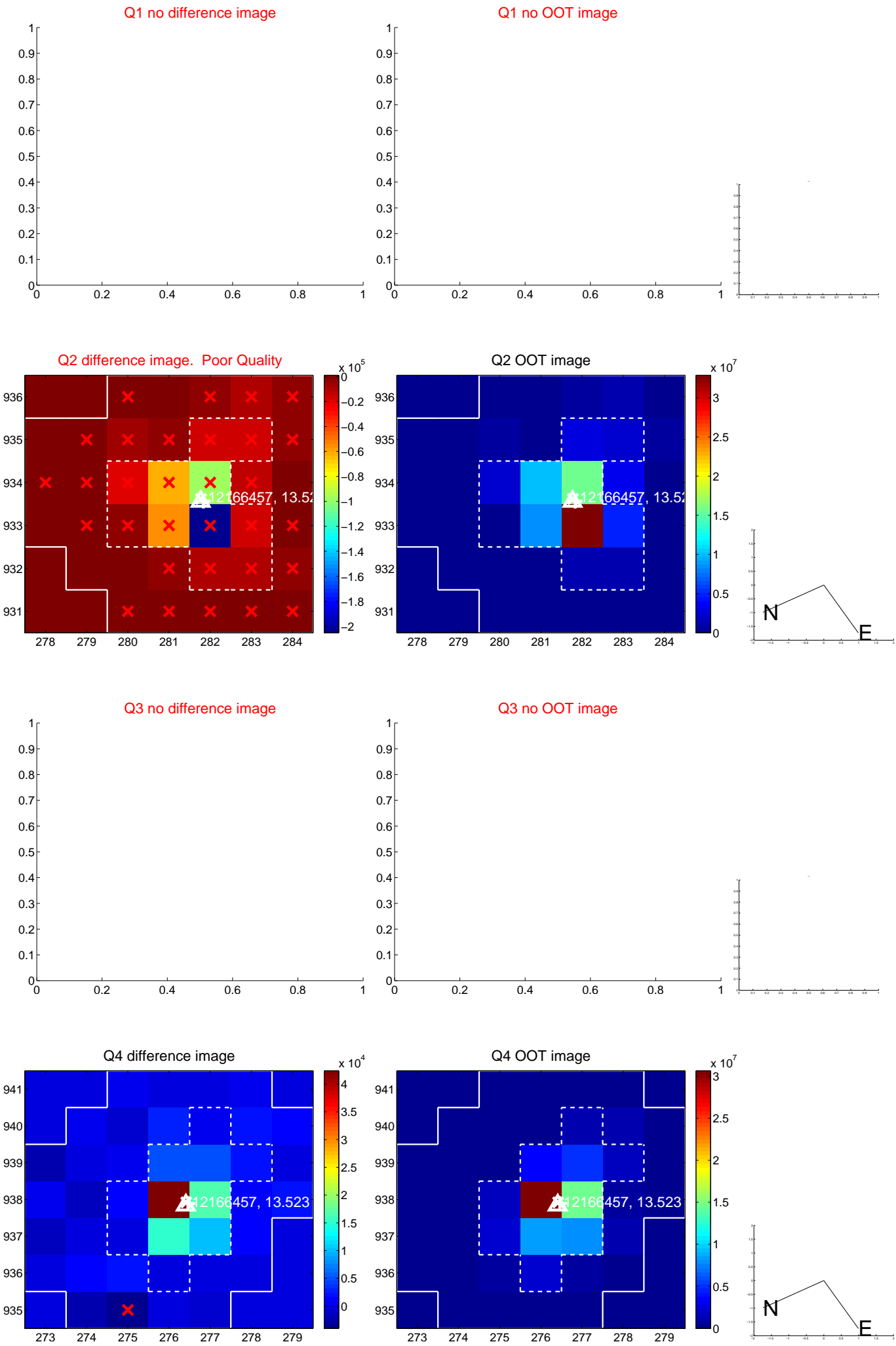
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.258 ± 0.103	2.52	-0.060 ± 0.104	0.251 ± 0.103
PRF-fit source offset from KIC position	0.210 ± 0.115	1.83	0.155 ± 0.109	0.141 ± 0.080
photometric centroid source offset	0.43 ± 0.65	0.66	-0.38 ± 0.60	-0.20 ± 0.79

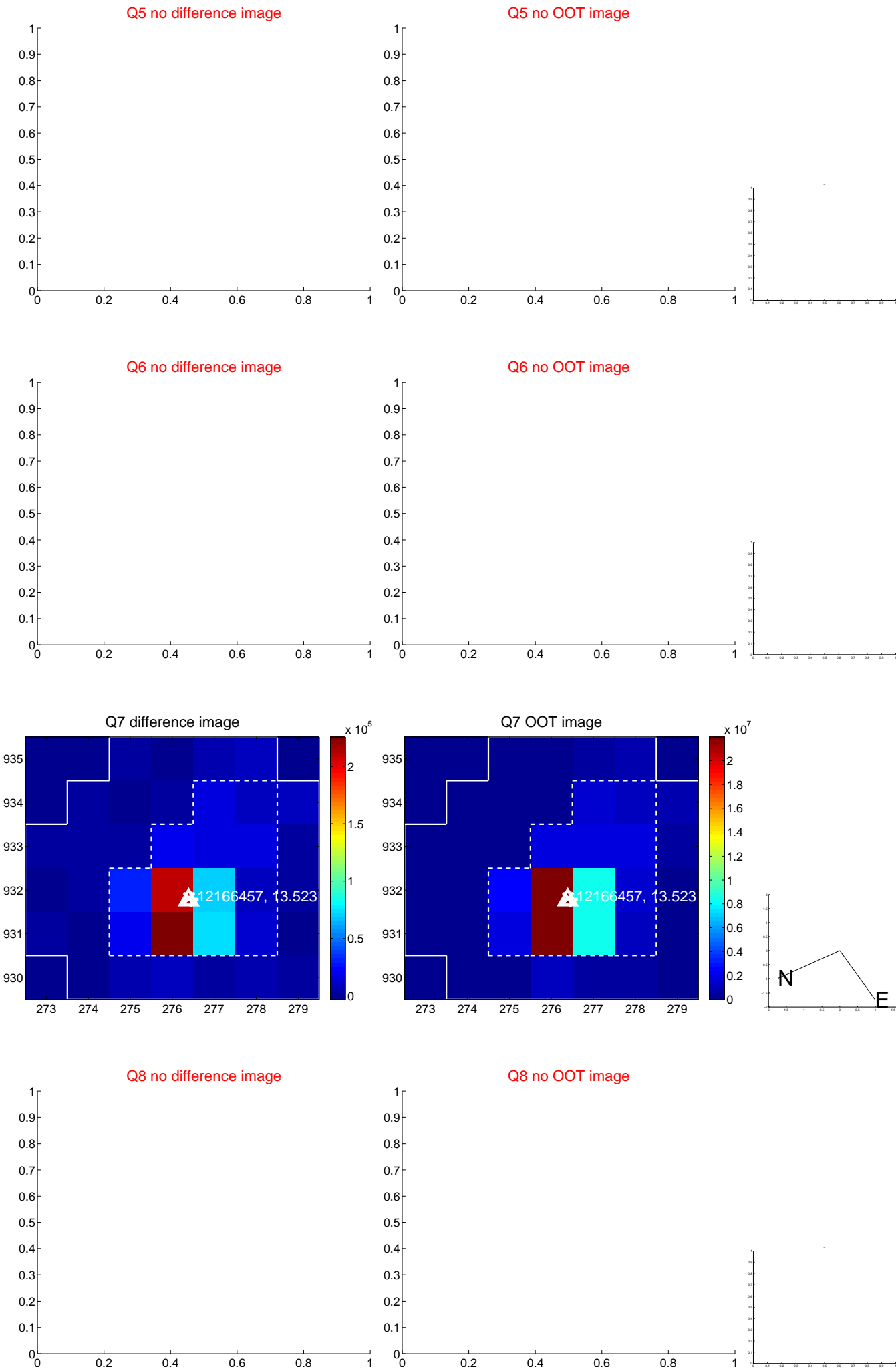


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

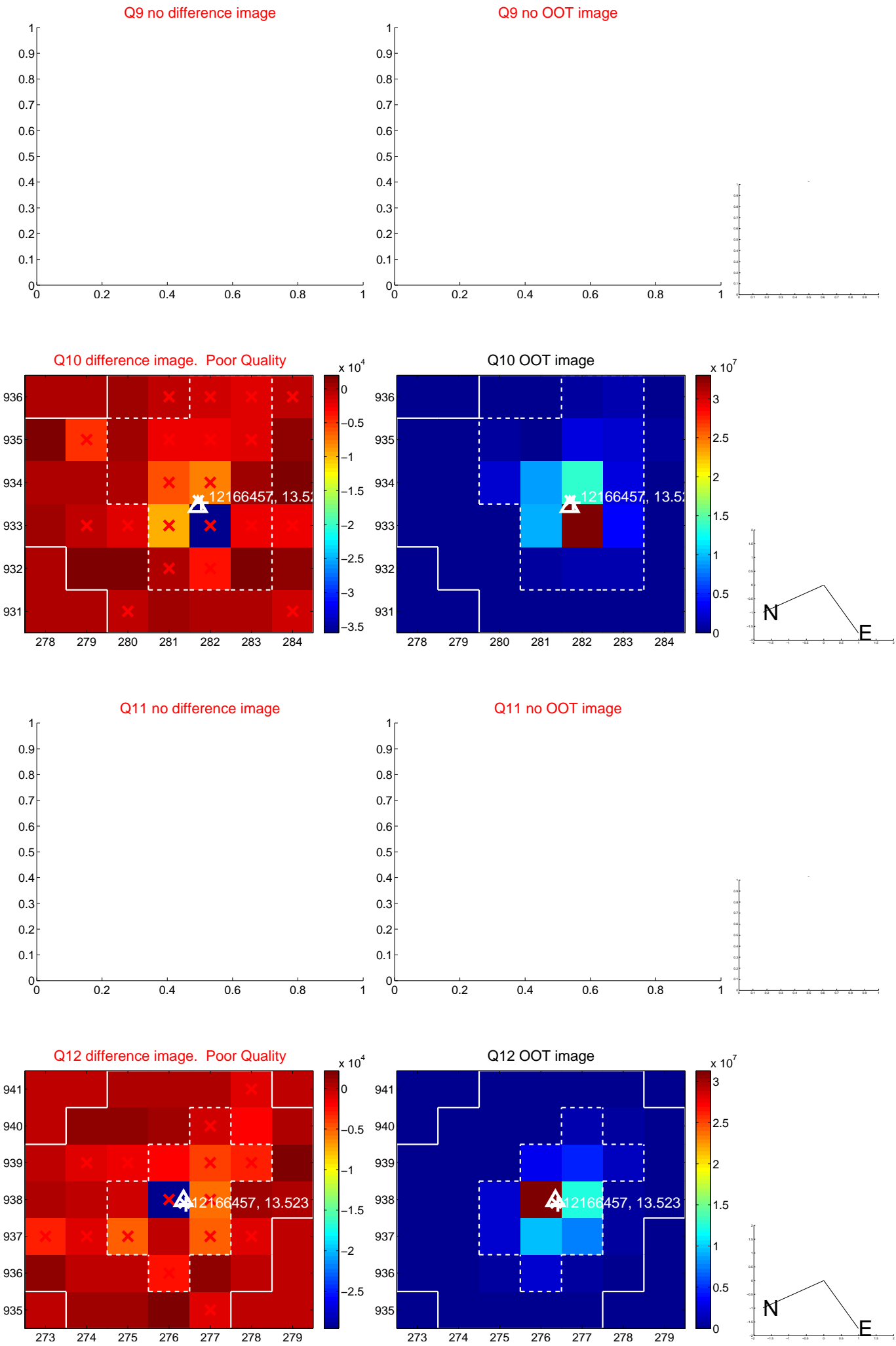
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



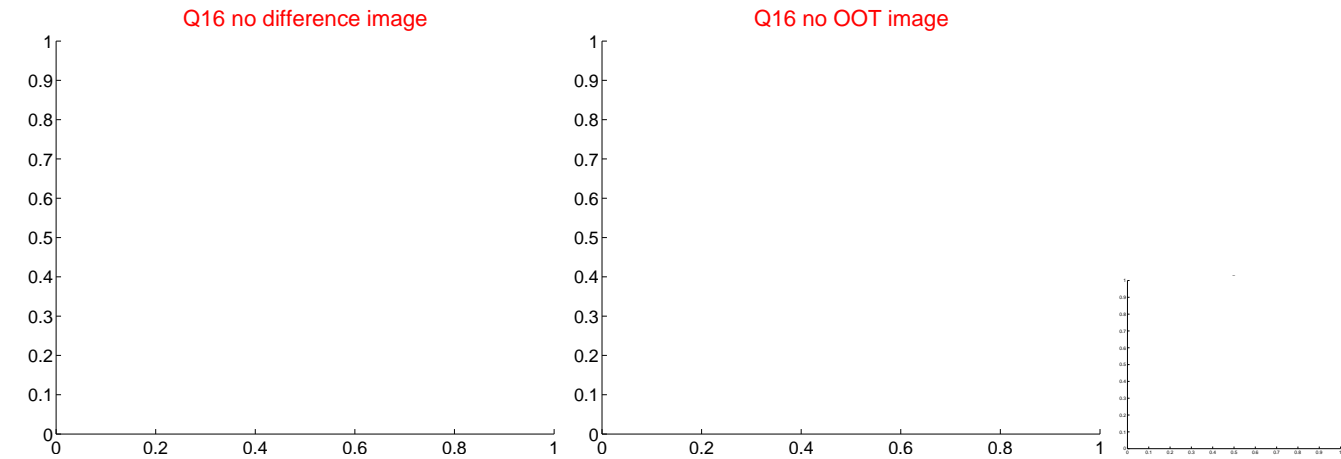
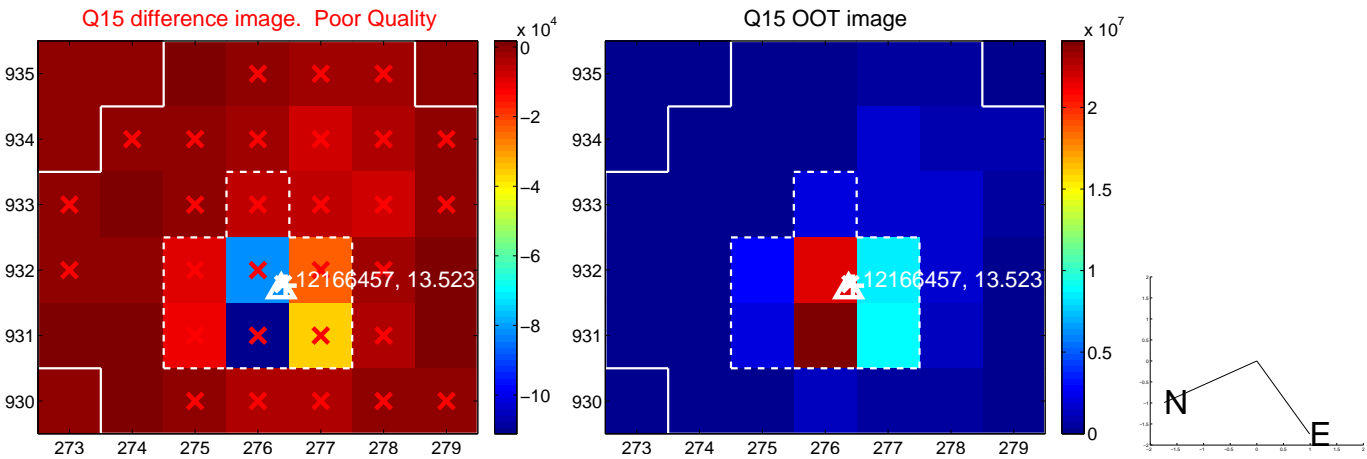
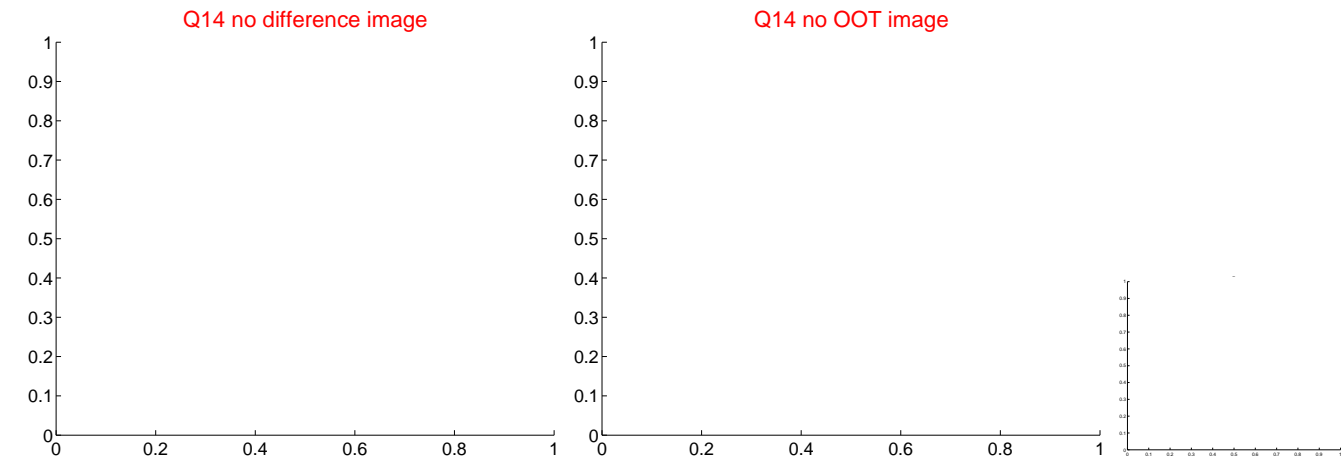
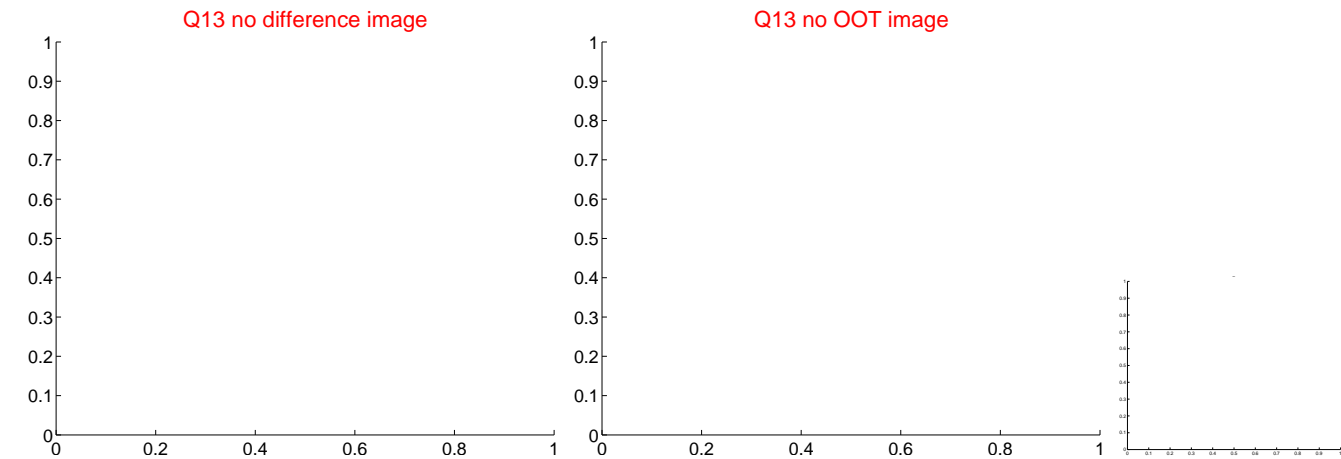
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



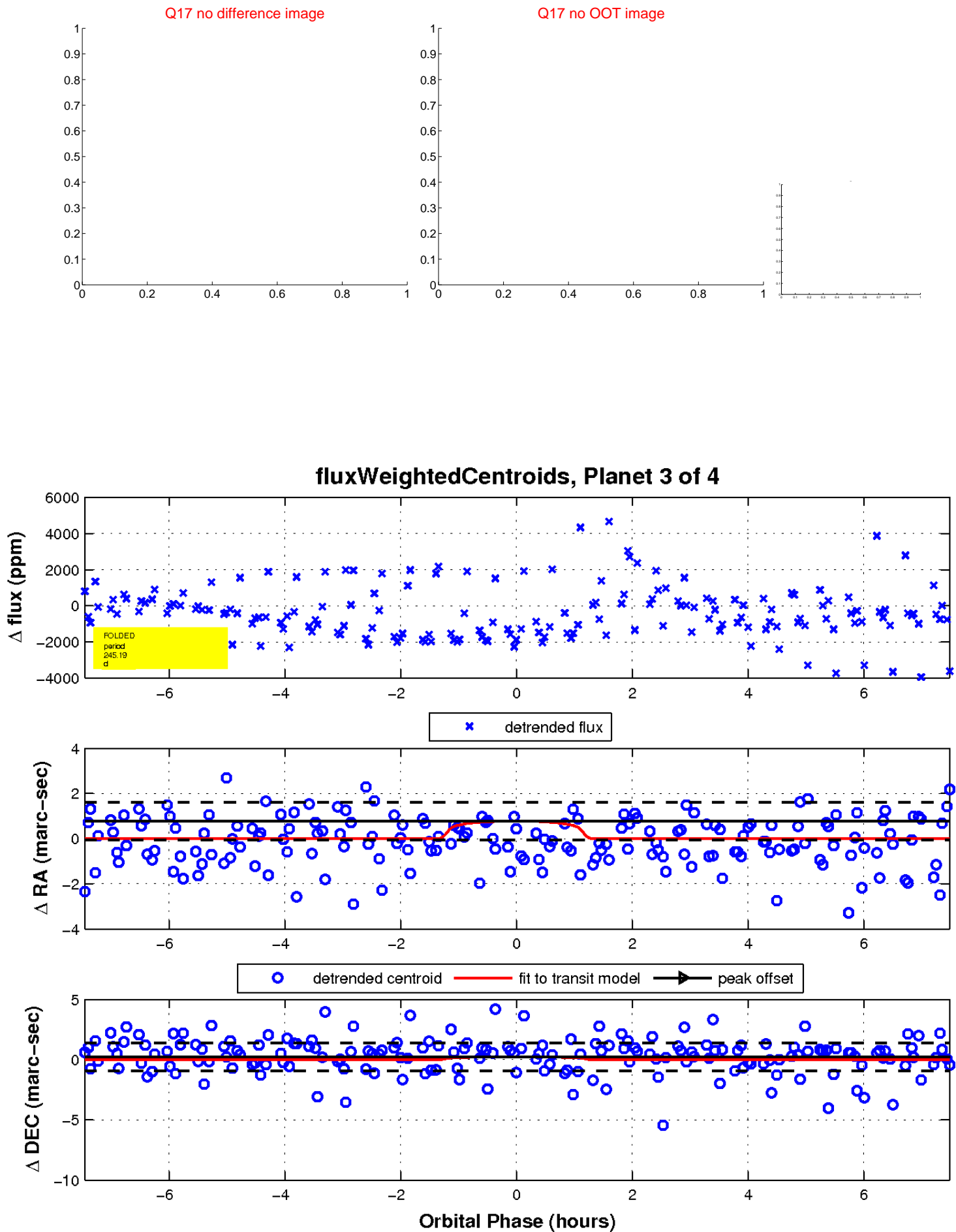
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

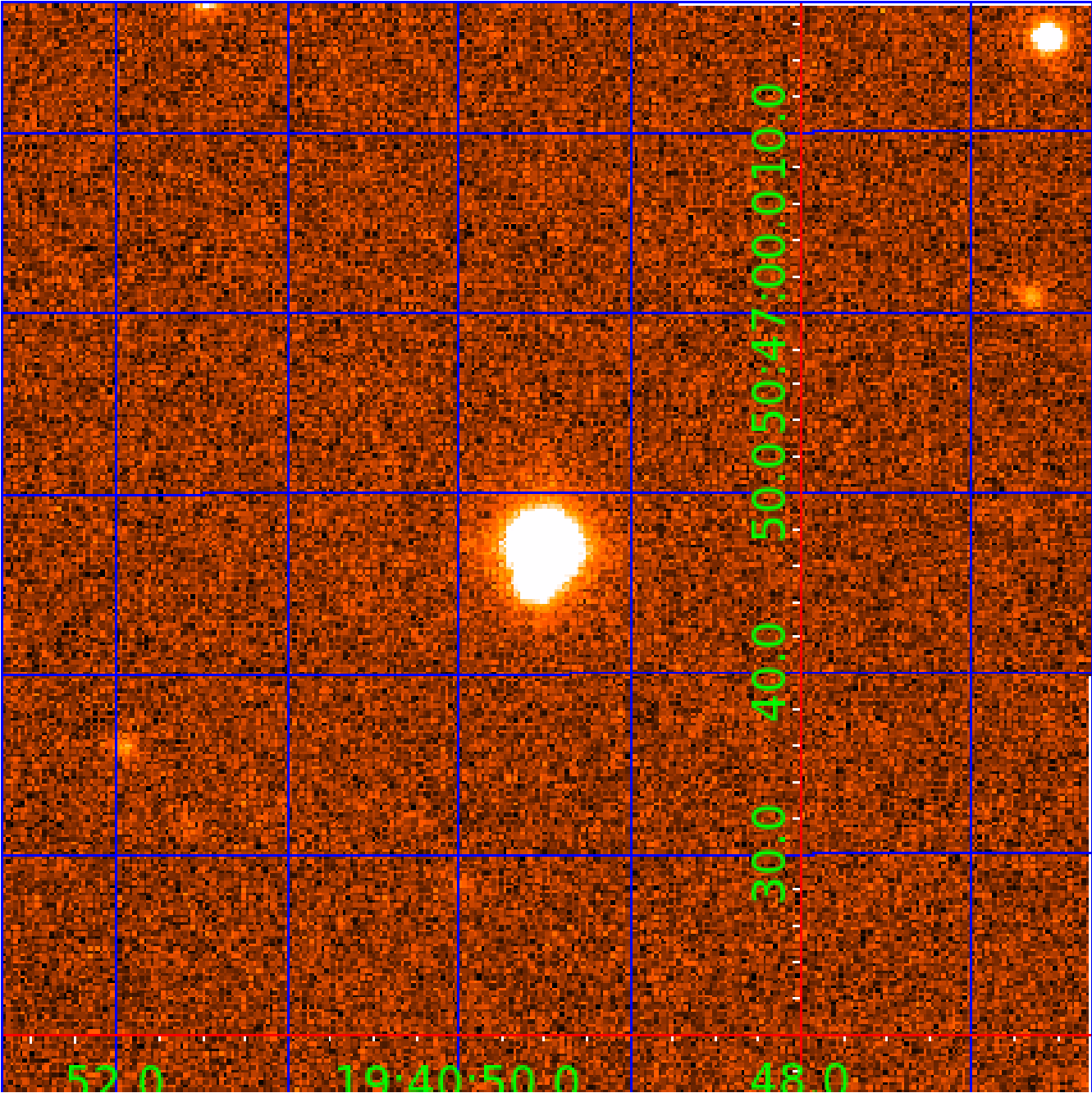


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012166457

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})
012166457-01	OBS	No	531.453507	134.996381	1762.7	3.287	20.4	6.7	0.71	5158	2.93	0.25
012166457-03	OBS	No	245.190139	195.576200	1116.6	2.498	11.0	6.7	0.71	5158	2.43	0.70
012166457-04	OBS	No	526.569196	263.506922	2036.5	3.735	13.3	6.4	0.71	5158	3.22	0.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012166457-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
012166457-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012166457-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

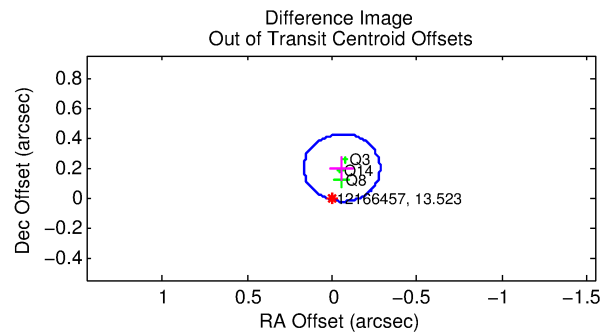
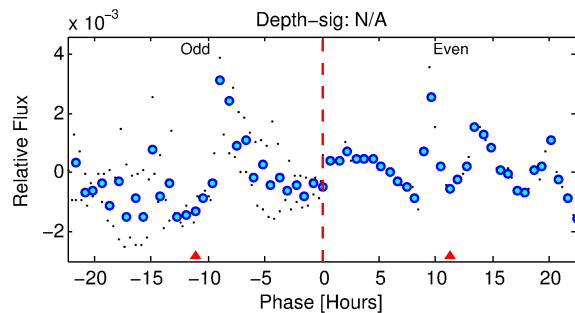
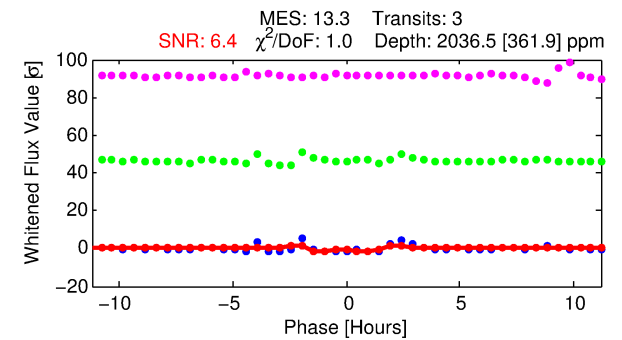
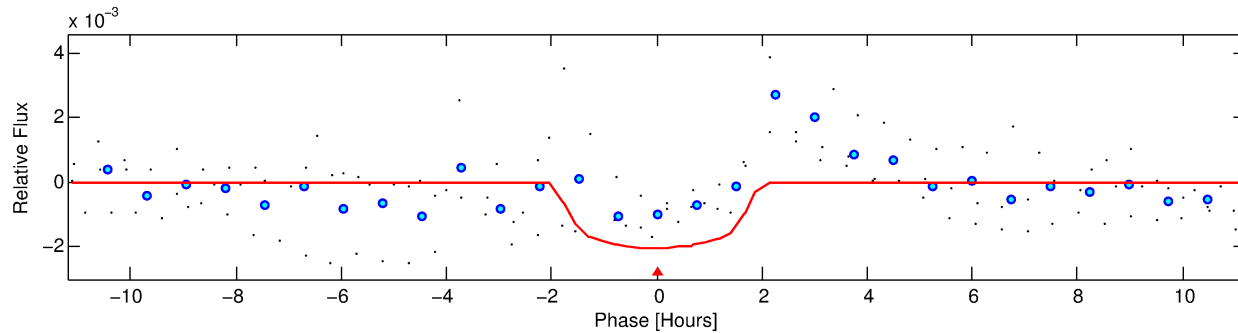
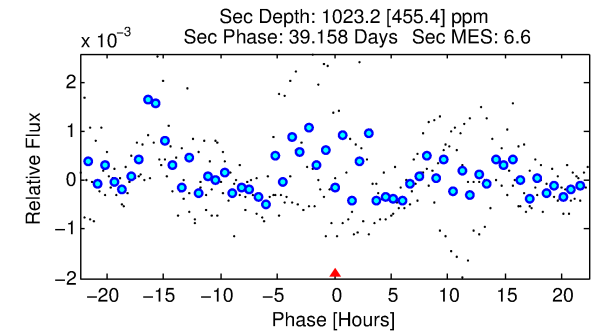
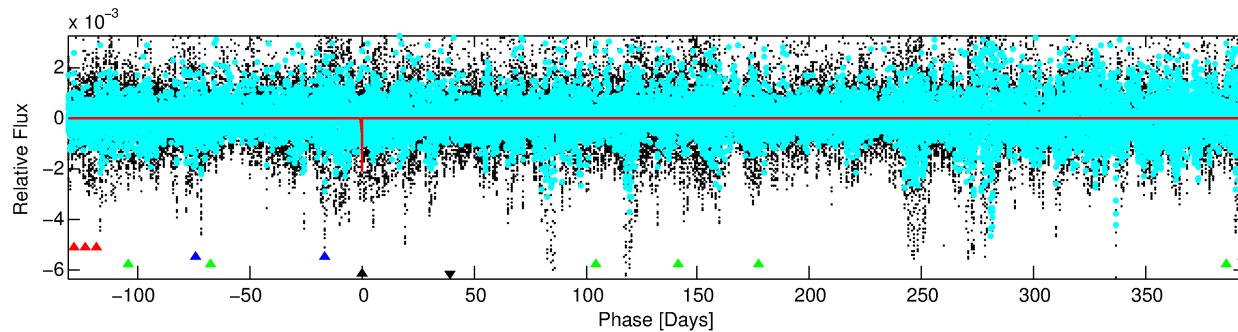
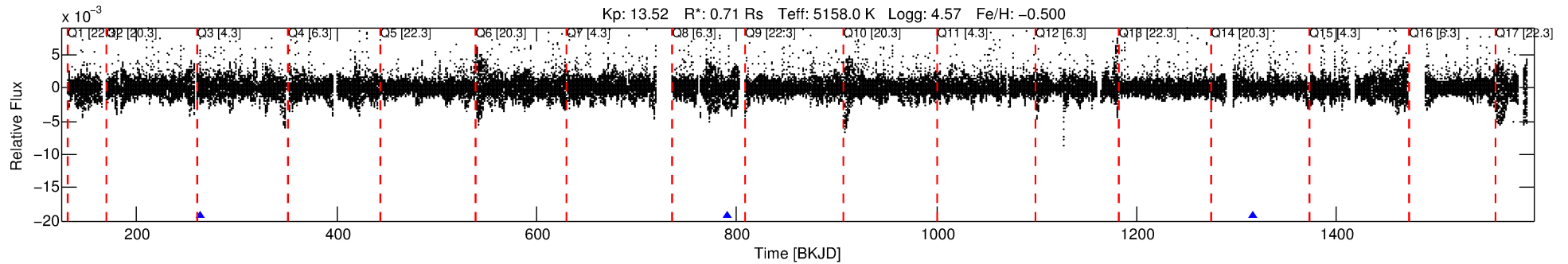
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012166457-04

No Significant Match Found

DV One-Page Summary

KIC: 12166457 Candidate: 4 of 4 Period: 526.569 d



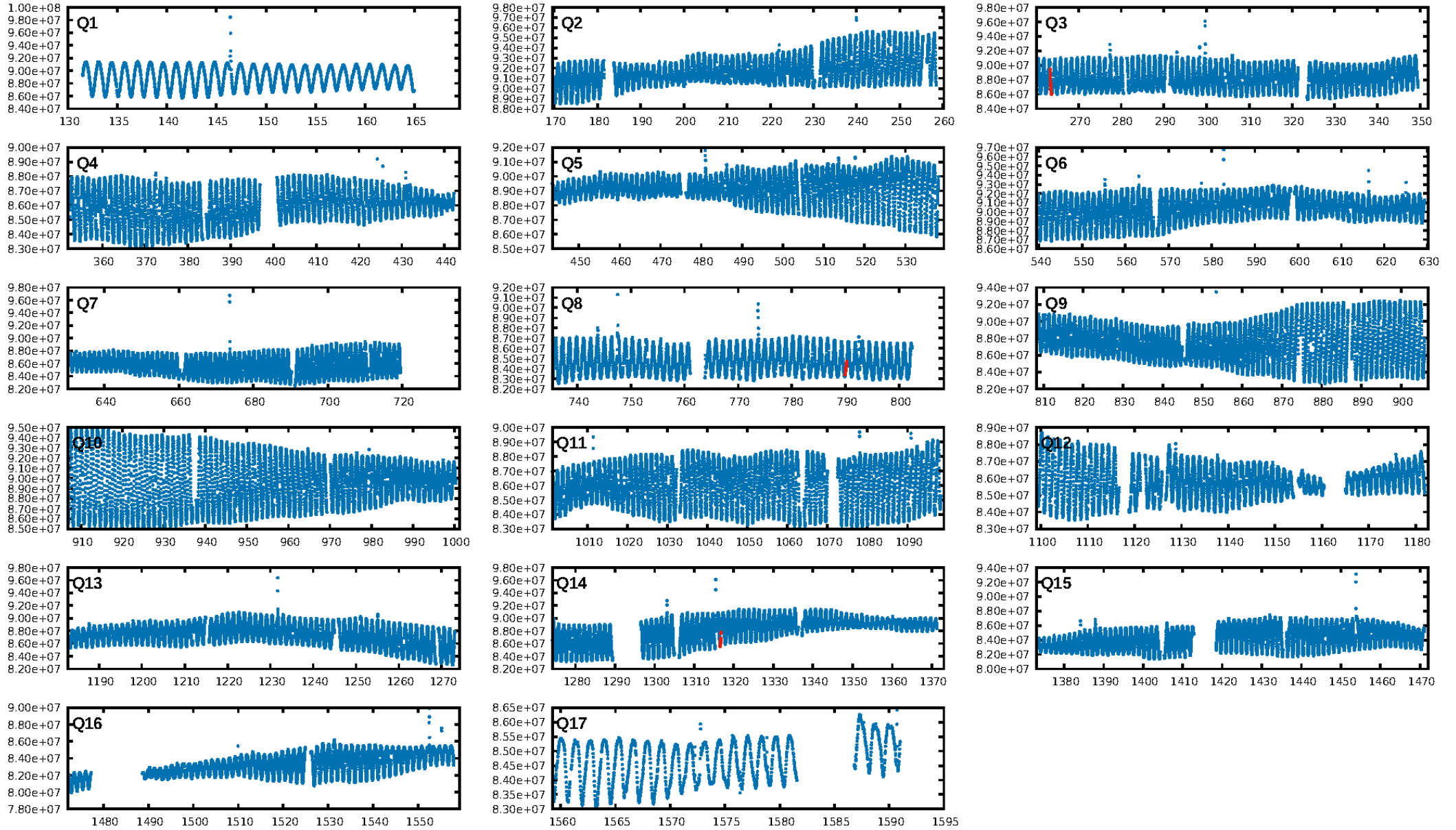
DV Fit Results:

Period = 526.56920 [0.00420] d
Epoch = 263.5069 [0.0049] BKJD
Rp/R* = 0.0417 [0.0456]
a/R* = 1007.24 [4155.57]
b = 0.46 [7.18]
Seff = 0.25 [0.04]
Teq = 181 [8] K
Rp = 3.22 [3.54] Re
a = 1.1238 [0.0986] AU
Ag = 68377.55 [152661.13] [0.45] σ
Teffp = 4516 [2520] K [1.72] σ

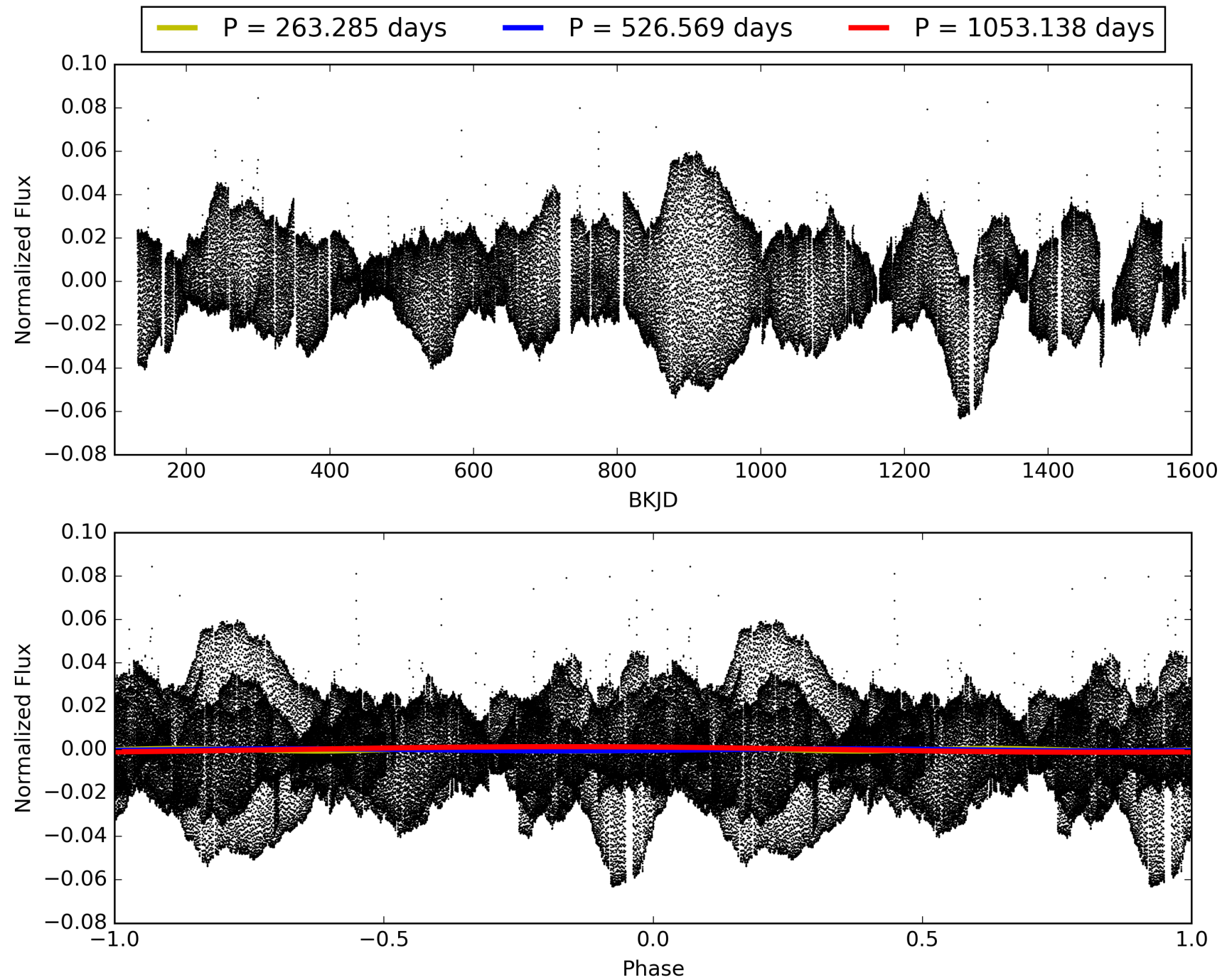
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [185.83] σ
LongPeriod-sig: 100.0% [23.56] σ
ModelChiSquare2-sig: 95.2%
ModelChiSquareGof-sig: 92.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.906
Centroid-sig: 91.8%
Centroid-so: 0.386 arcsec [0.98] σ
OotOffset-rm: 0.207 arcsec [2.76] σ
OotOffset-st: 1/1/1/0 [3]
KicOffset-rm: 0.196 arcsec [2.19] σ
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 012166457-04, PDC Light Curves

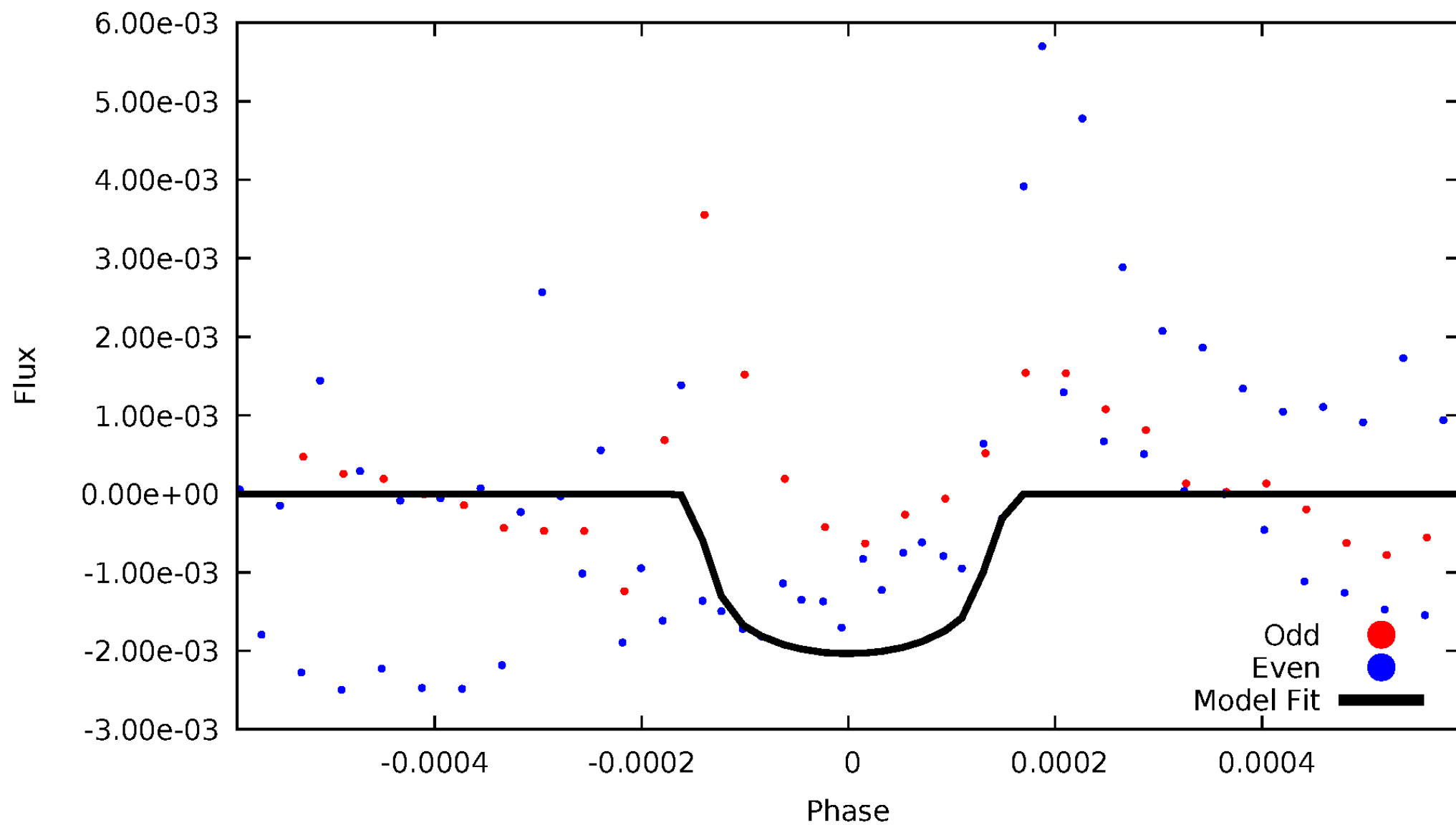


TCE 012166457-04



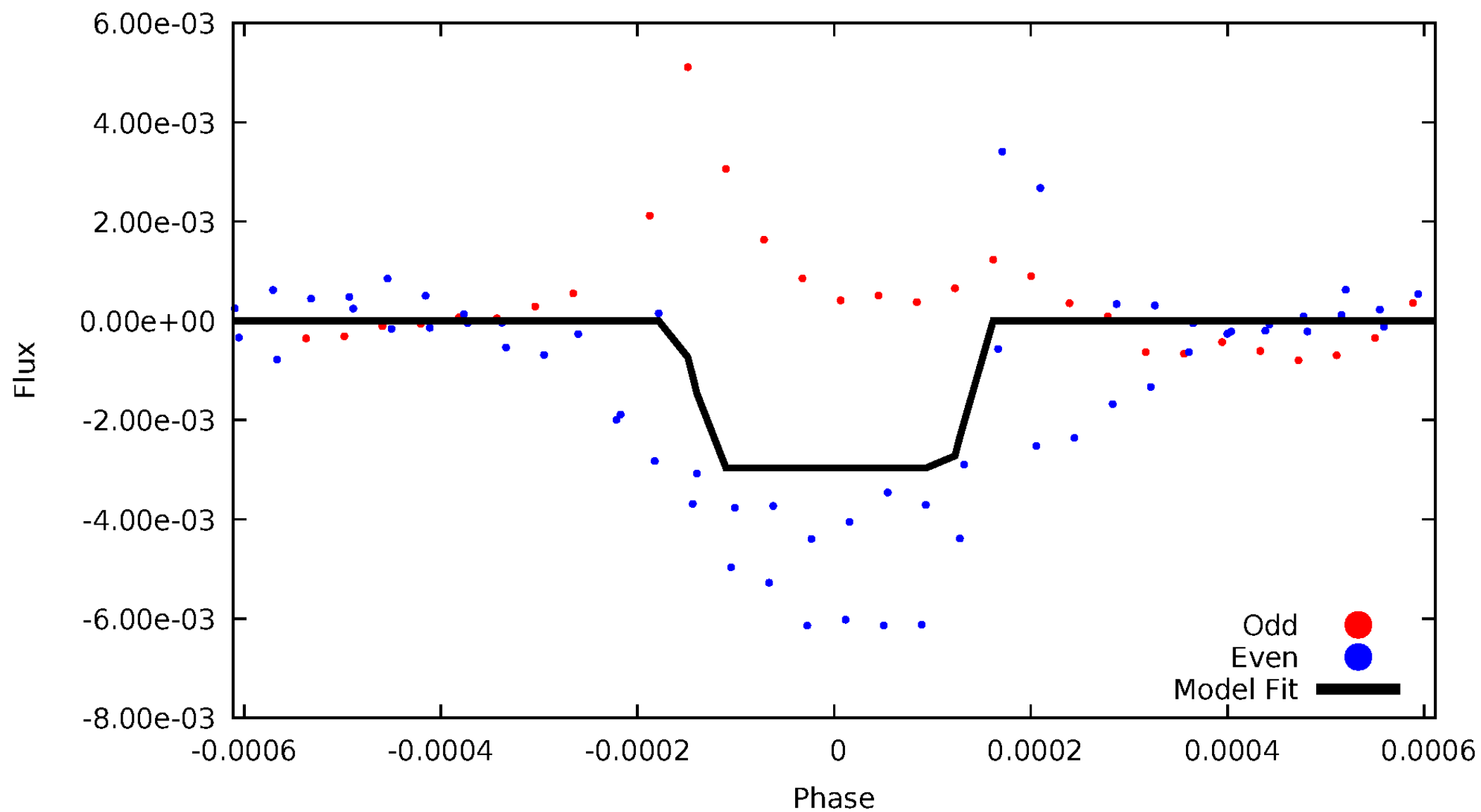
DV Odd/Even

TCE 012166457-04



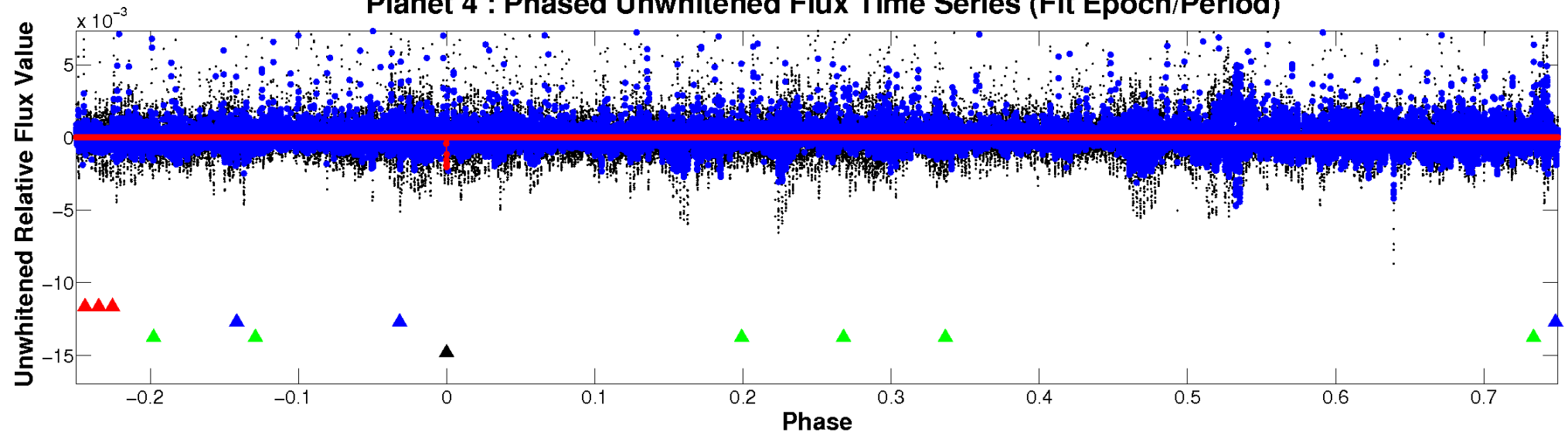
ALT Odd/Even

TCE 012166457-04

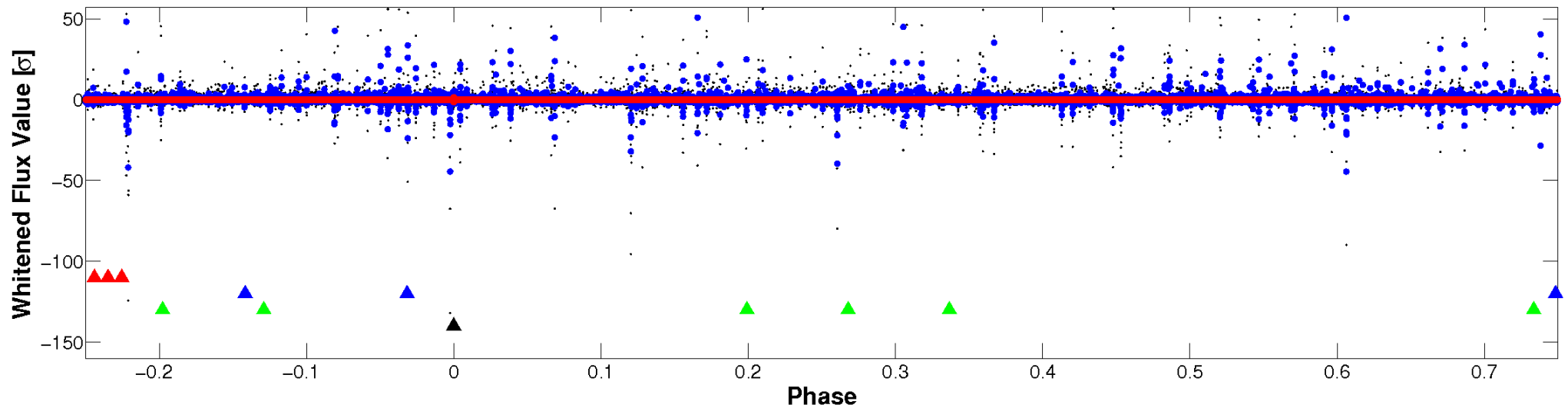


Non-Whitened Vs. Whitened Light Curve

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

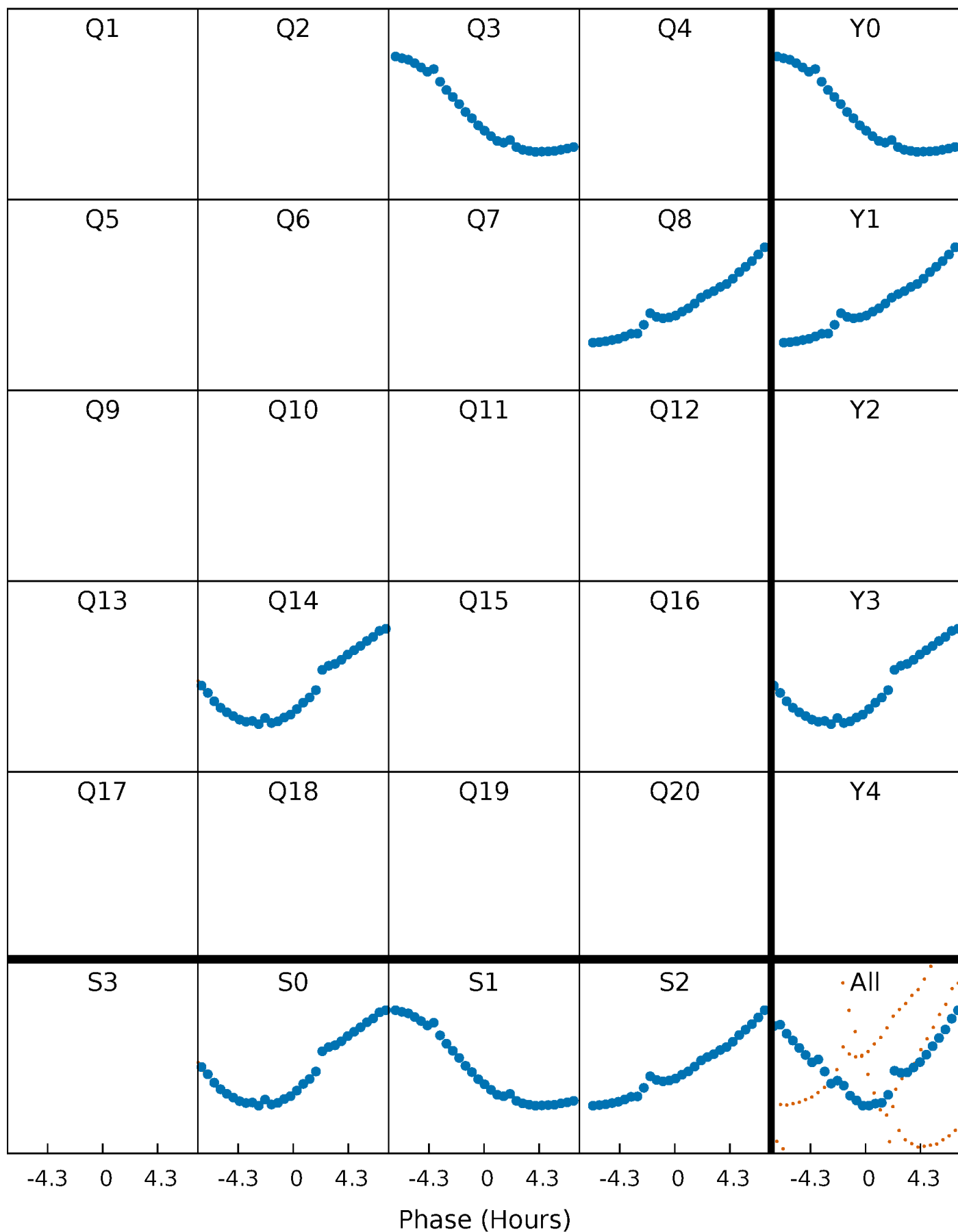


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



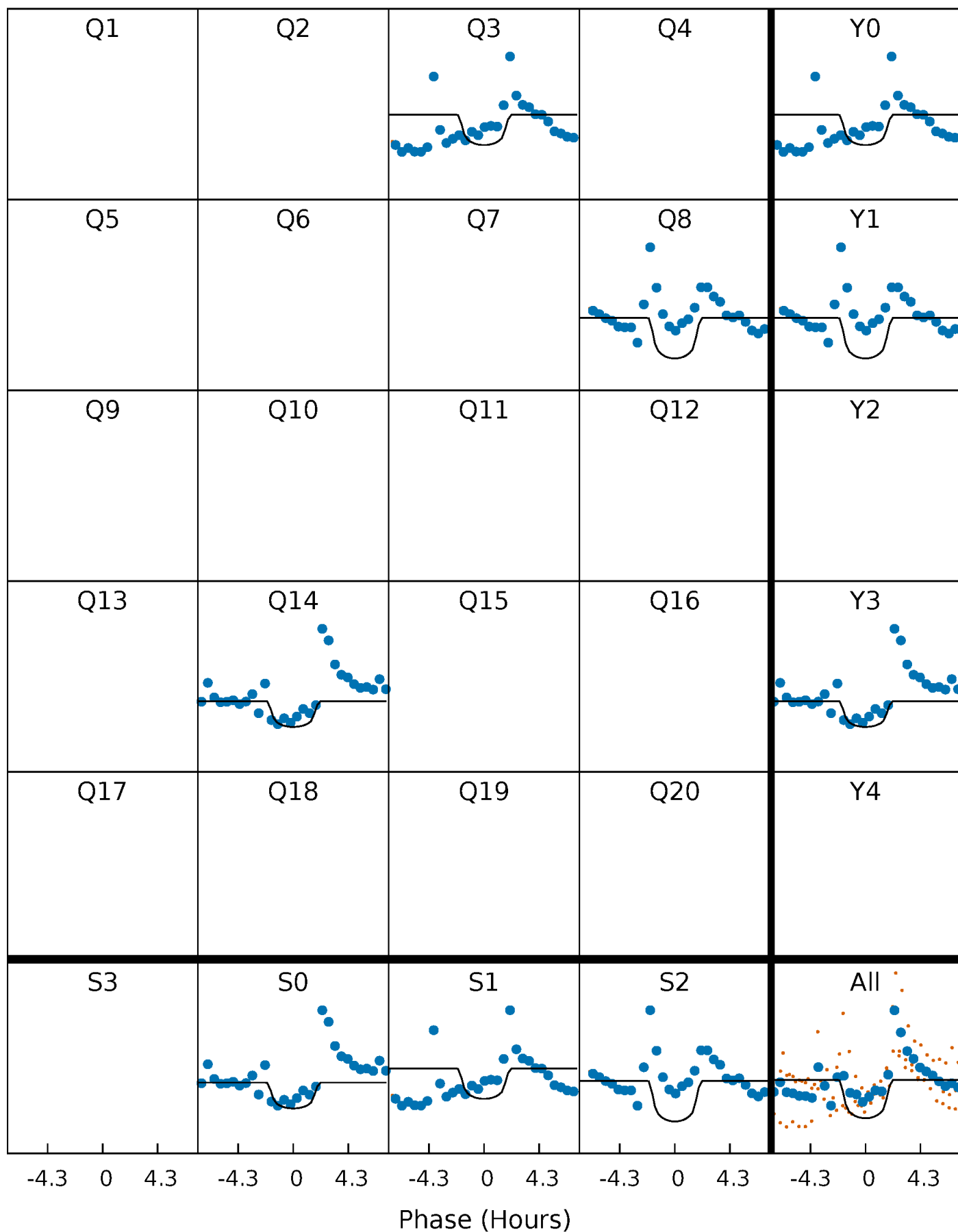
PDC Quarter-Phased Transit Curves

TCE 012166457-04 P=526.569196 Days $T_0=263.506922$ (BKJD)



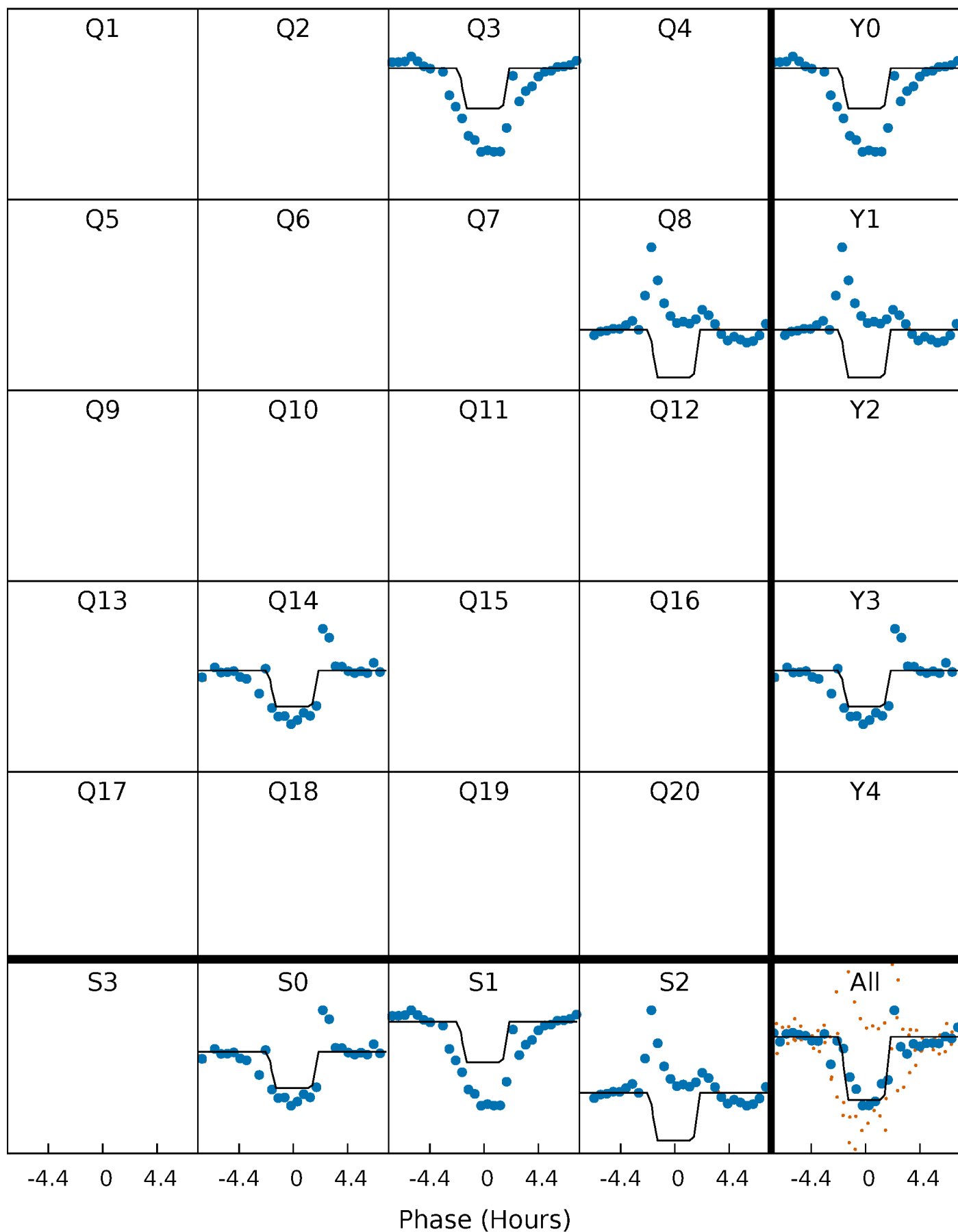
DV Quarter-Phased Transit Curves

TCE 012166457-04 $P=526.569196$ Days $T_0=263.506922$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

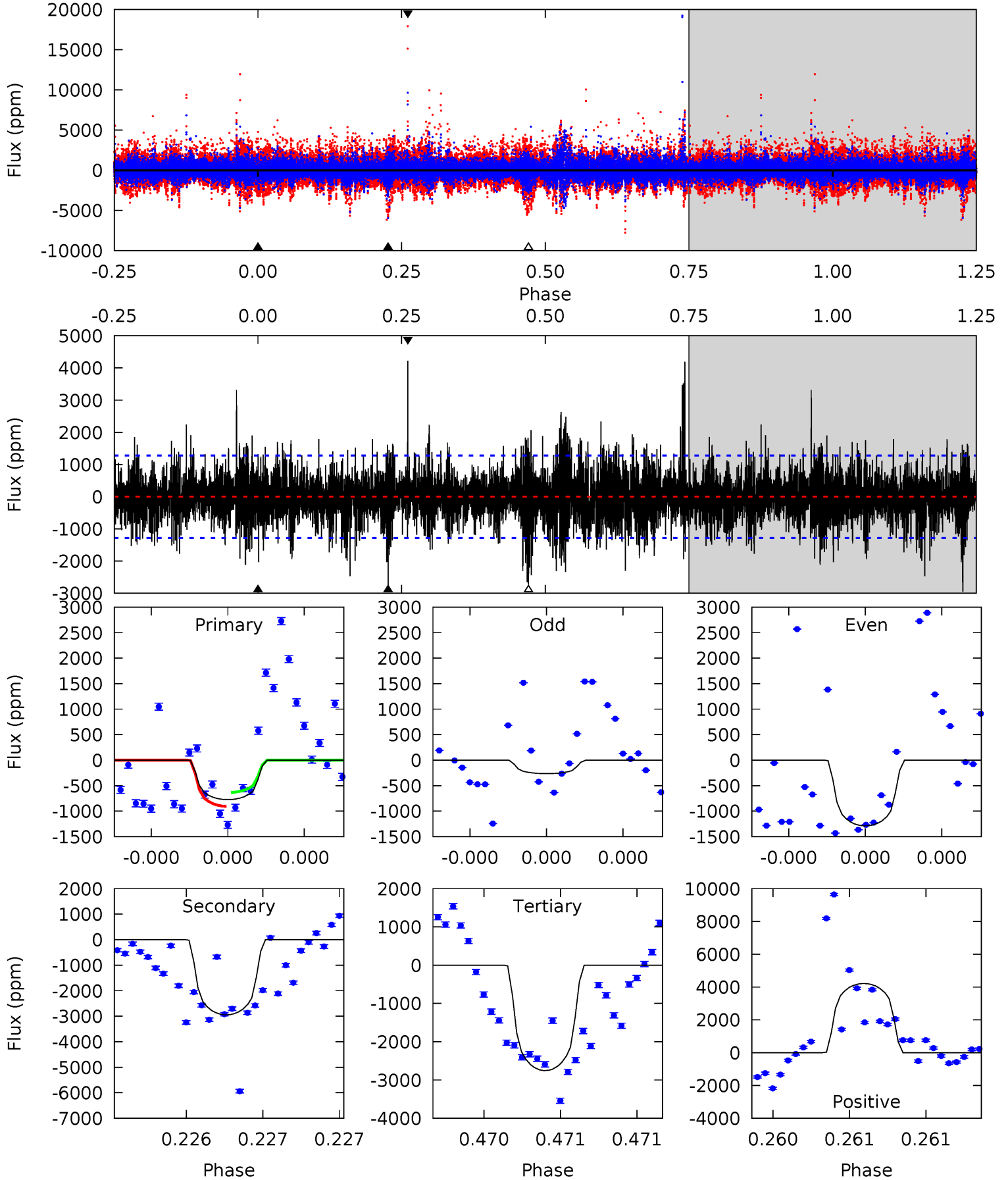
TCE 012166457-04 $P=526.572841$ Days $T_0=263.508424$ (BKJD)



DV Model-Shift Uniqueness Test

012166457-04, P = 526.569196 Days, E = 263.506922 Days

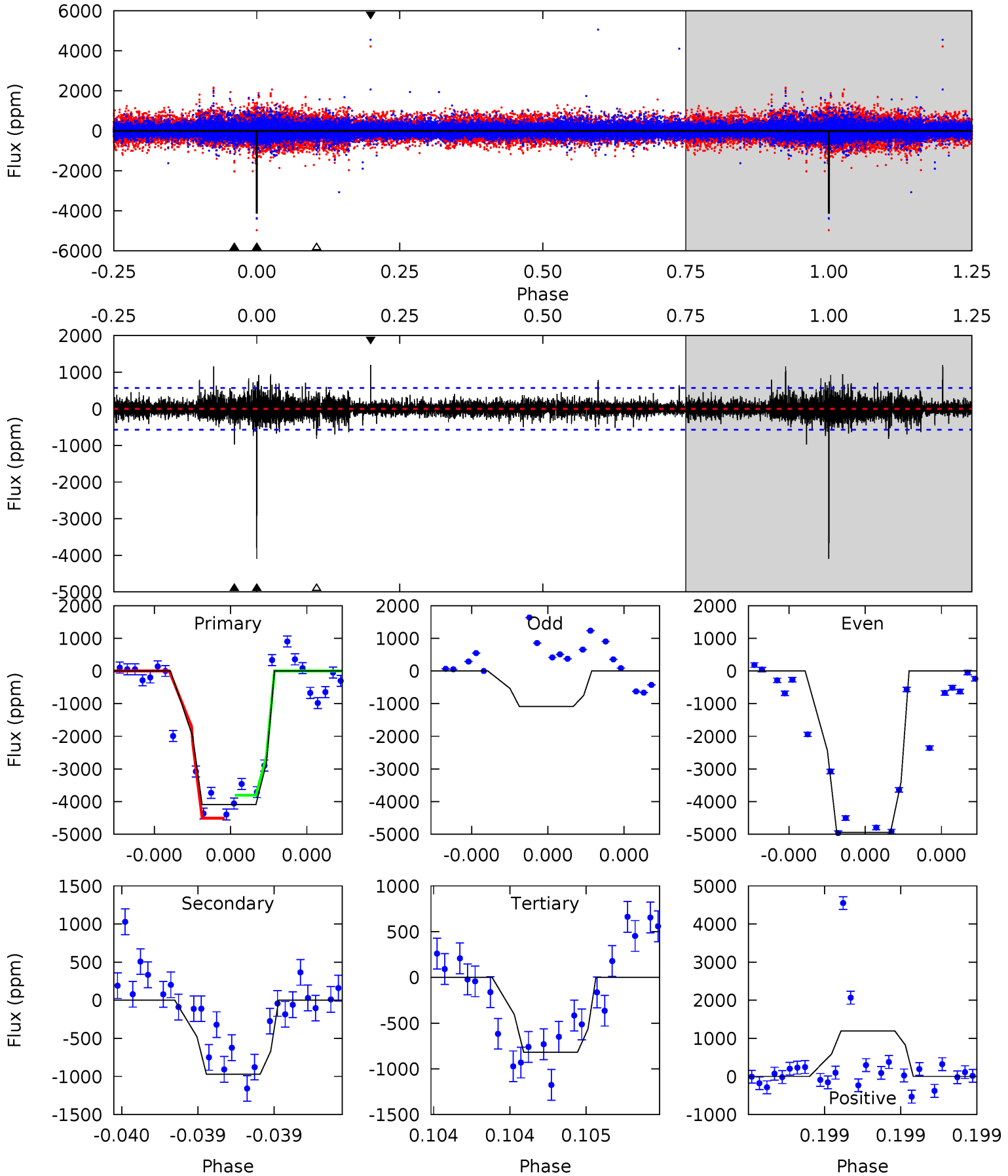
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.40	13.0	12.1	18.6	5.64	3.59	2.74	-8.72	-15.2	0.85	-5.60	1.65	0.69	0.59	0.60



Alt Model-Shift Uniqueness Test

012166457-04, P = 526.572841 Days, E = 263.508424 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.7	9.65	8.14	11.9	5.67	3.63	1.24	32.5	28.8	1.51	-2.25	22.5	0.72	0.23	3.52



Stellar Parameters For KIC 012166457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5158^{+154}_{-154}	$4.572^{+0.071}_{-0.052}$	$-0.500^{+0.300}_{-0.300}$	$0.708^{+0.073}_{-0.073}$	$0.682^{+0.090}_{-0.042}$	$2.712^{+0.833}_{-0.481}$
	+3%/-3%	+2%/-1%	+60%/-60%	+10%/-10%	+13%/-6%	+31%/-18%
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 012166457-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2946 ± 227	$3.76^{+3.36}_{-2.30}$	252^{+9}_{-9}	5437^{+3932}_{-1260}	$149189^{+847689}_{-107756}$
Alt.	-971 ± 101	$4.62^{+3.38}_{-2.82}$	252^{+9}_{-10}	3976^{+1890}_{-648}	$31482^{+184136}_{-21048}$

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

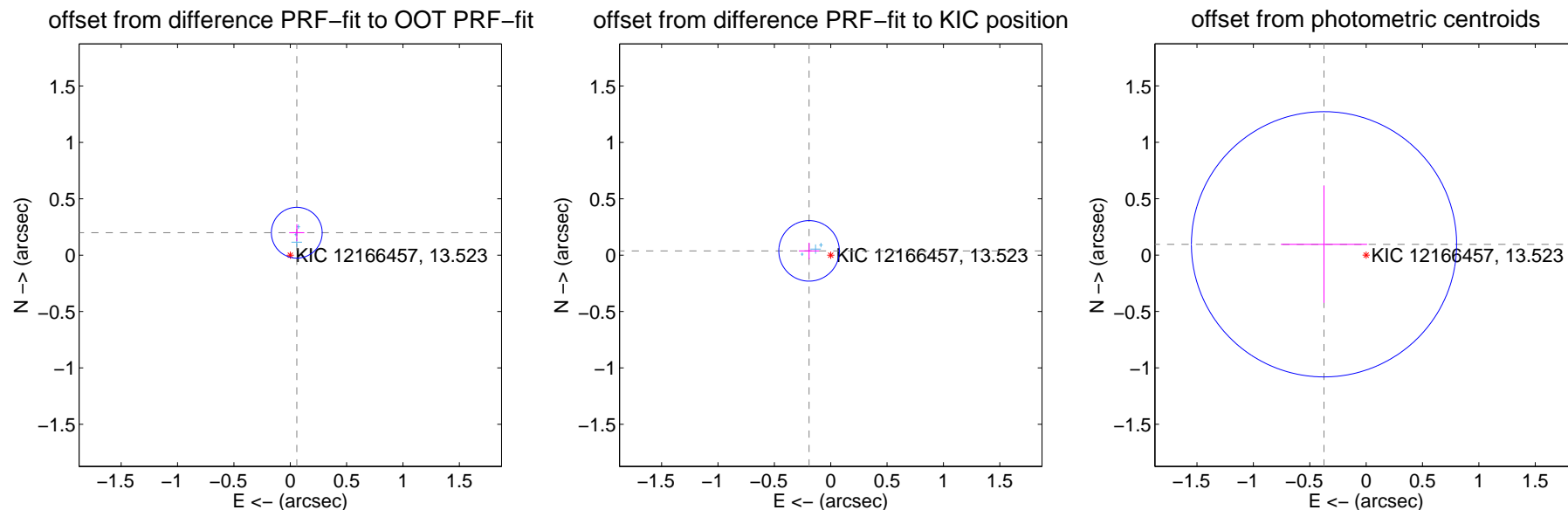
DV Centroid Data

Supplemental centroid analysis for 012166457-04. Kepler magnitude: 13.52. Transit SNR 6.37

There are 3 quarters with good PRF difference image offsets

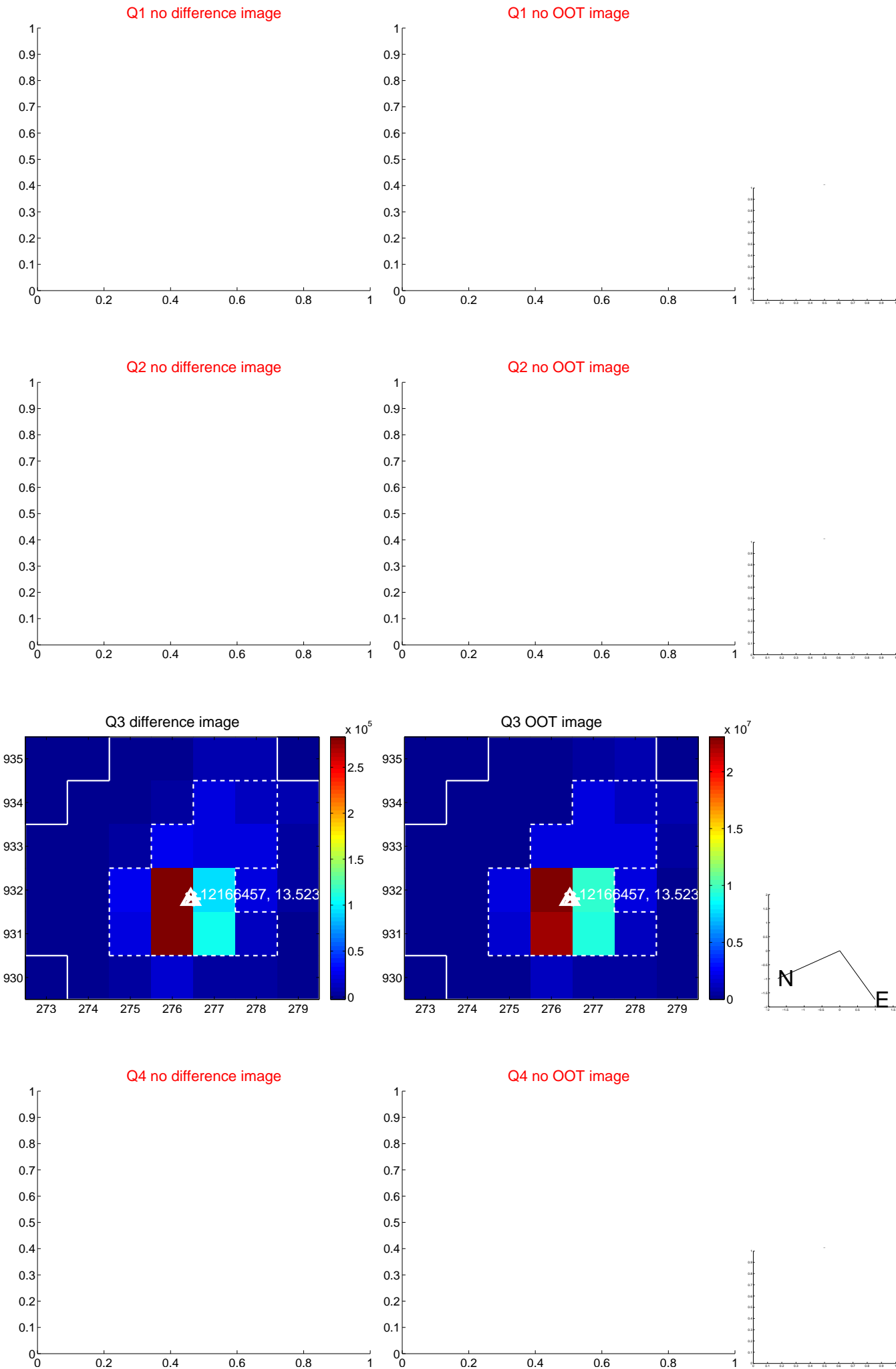
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.207 ± 0.075	2.76	-0.058 ± 0.067	0.199 ± 0.075
PRF-fit source offset from KIC position	0.196 ± 0.089	2.19	0.192 ± 0.090	0.038 ± 0.073
photometric centroid source offset	0.39 ± 0.39	0.98	0.37 ± 0.38	0.10 ± 0.52

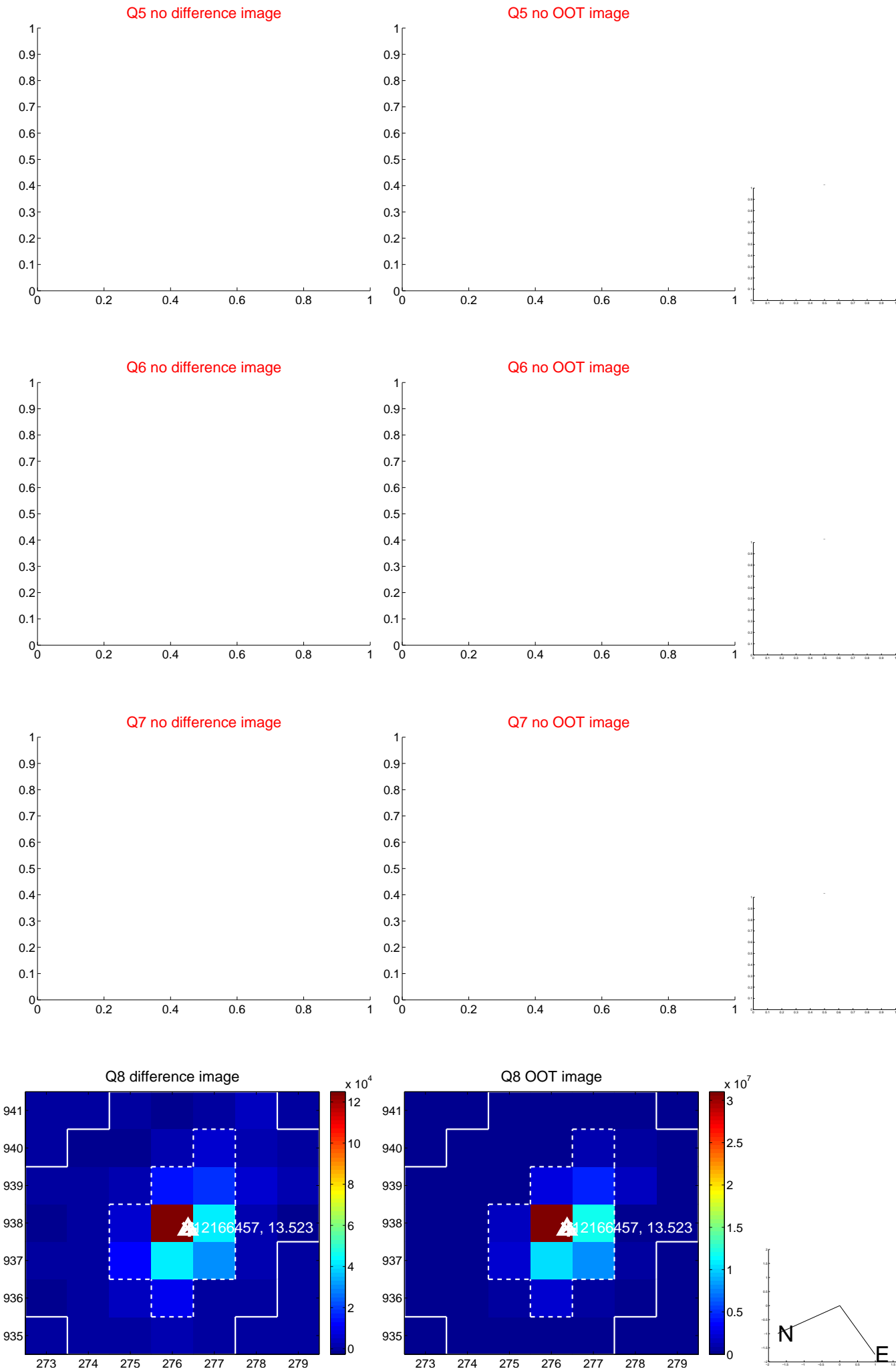


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

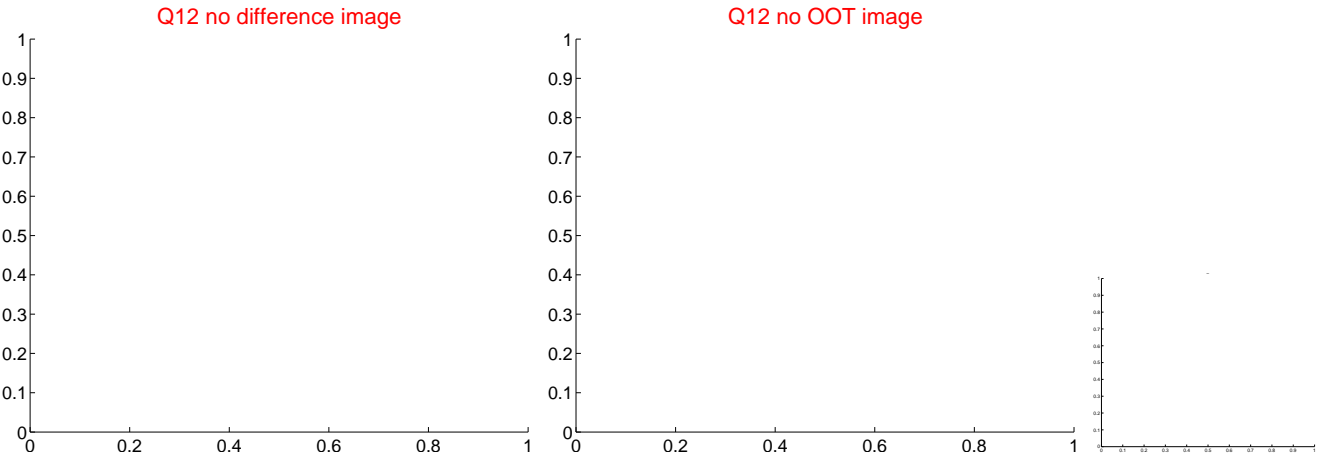
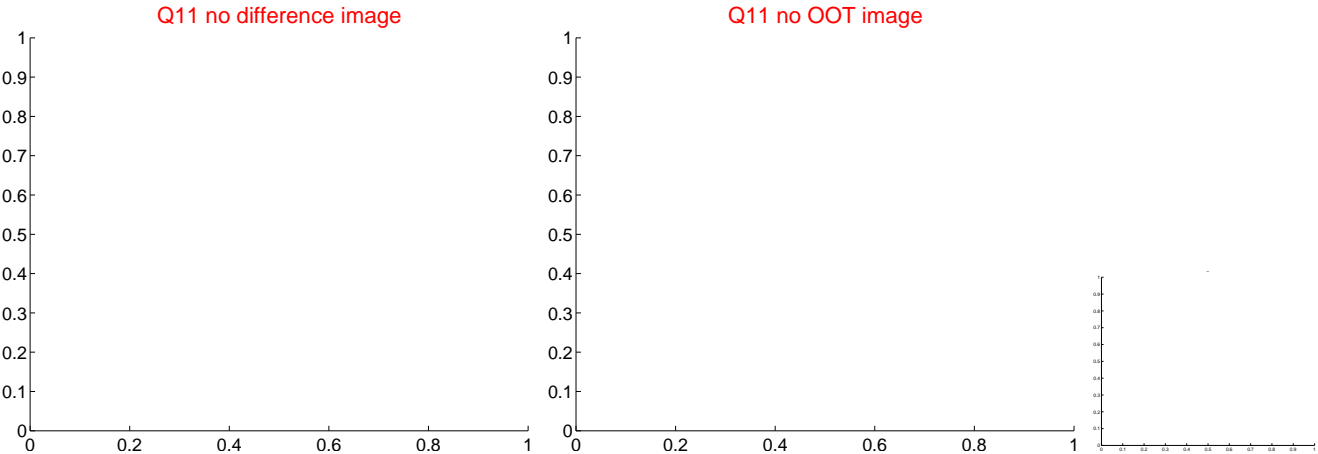
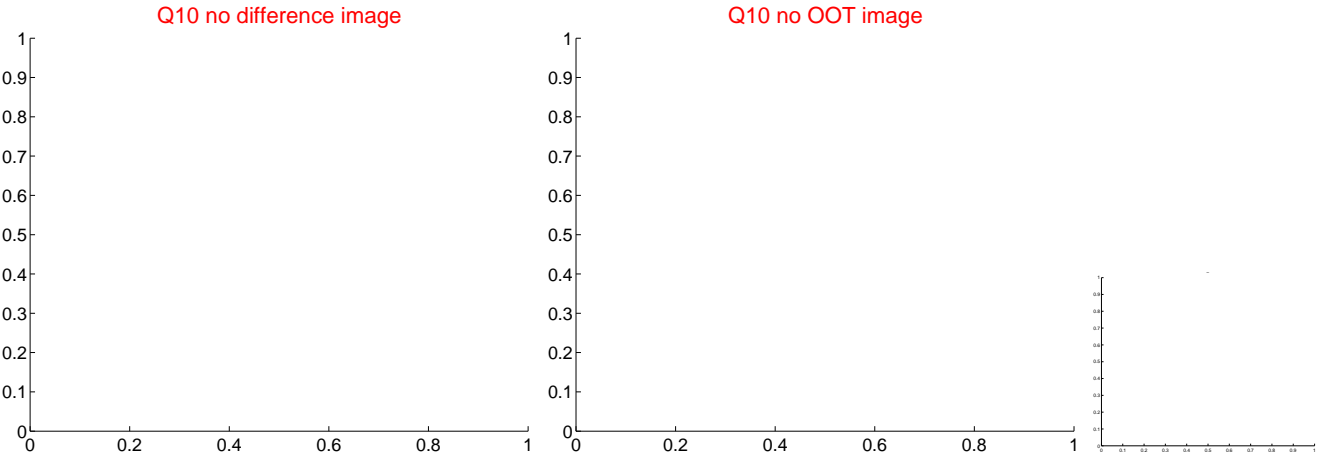
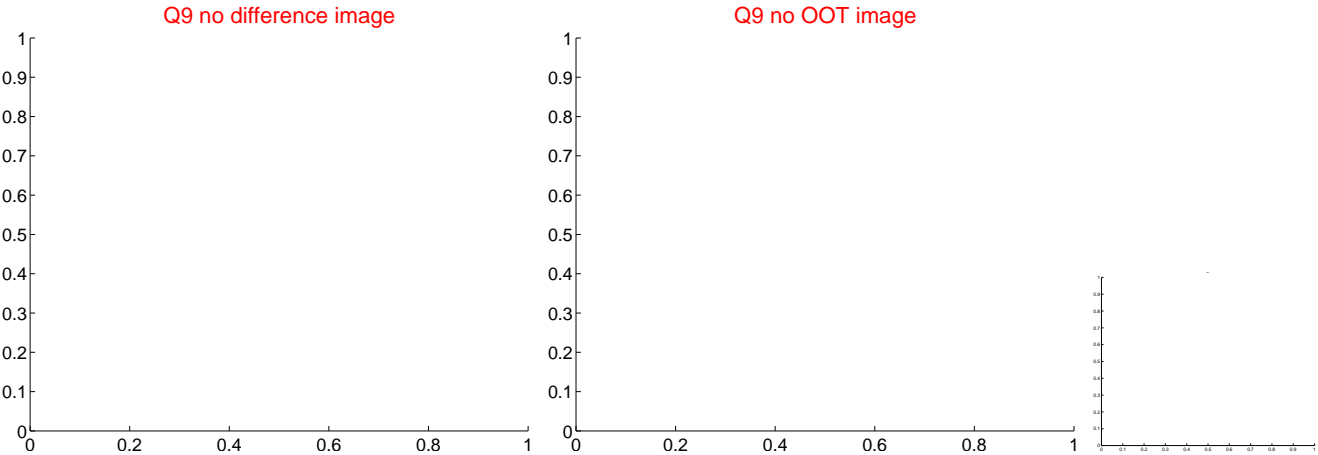
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



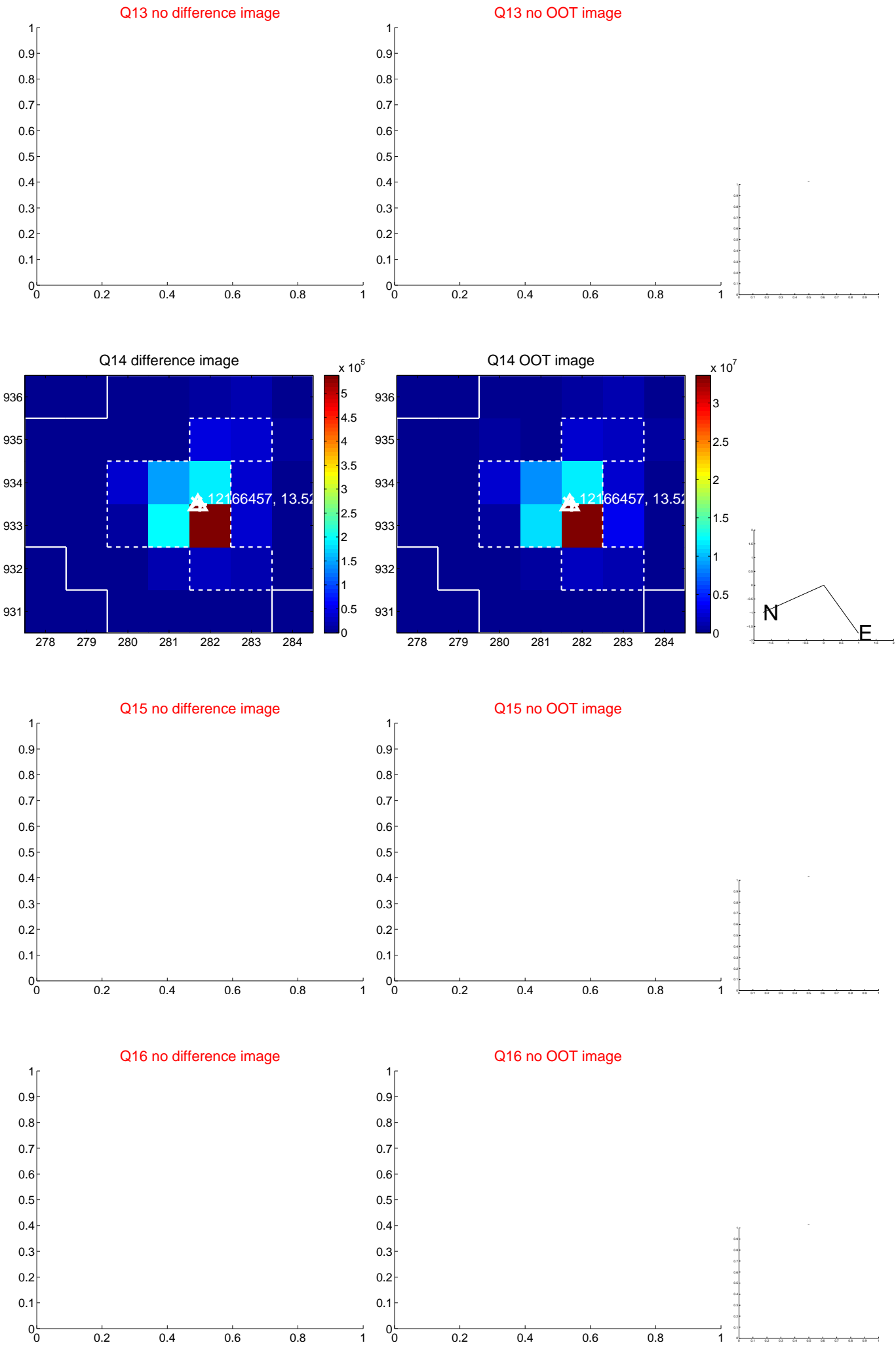
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



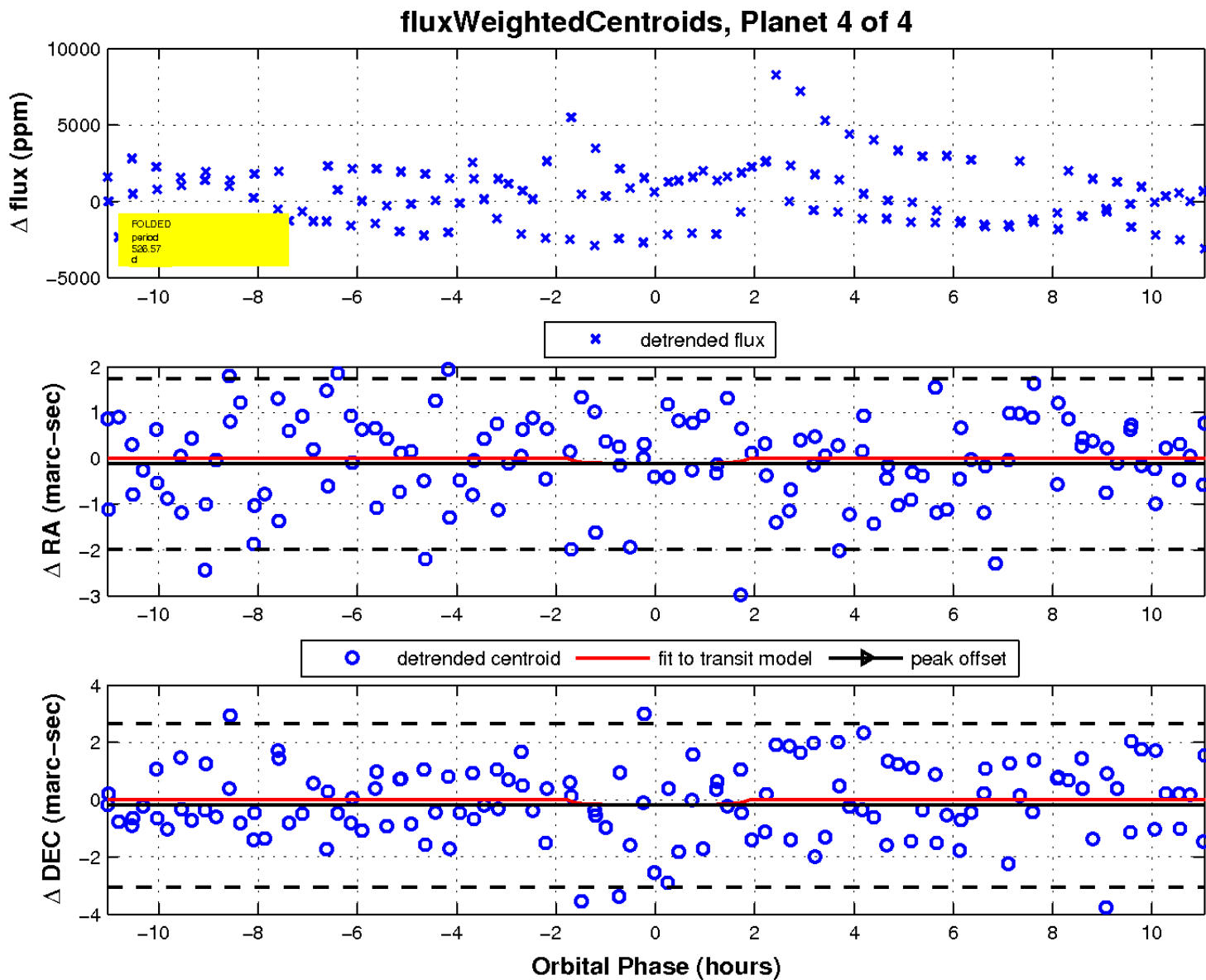
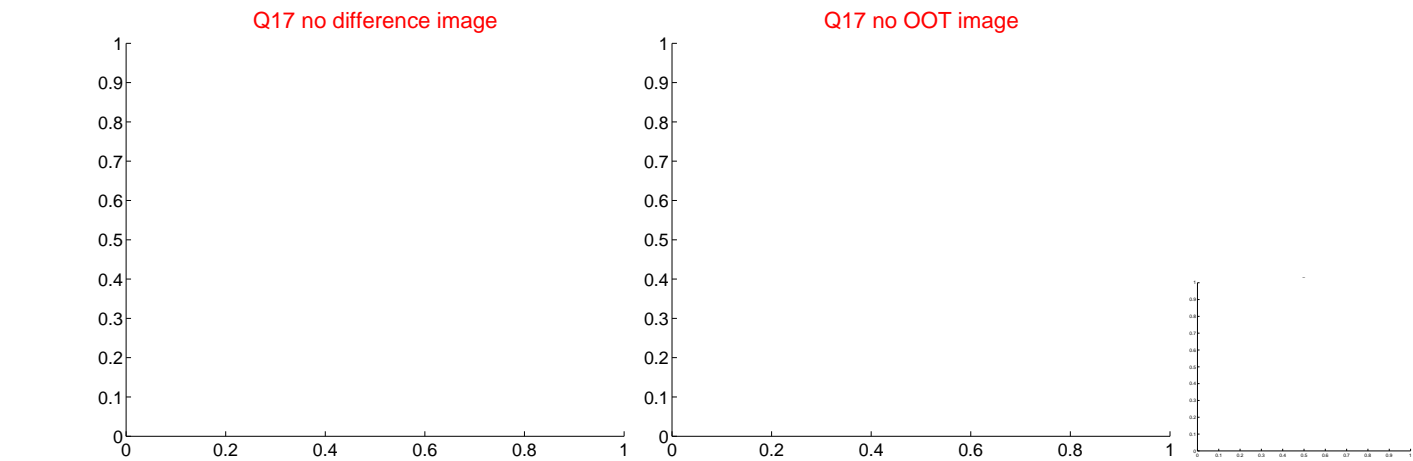
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

