

KIC 006129451

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})
006129451-01	OBS	No	416.696519	453.699913	3026.2	12.685	16.5	5.7	0.59	3891	3.15	0.09
006129451-02	OBS	No	290.061096	339.720848	2678.3	3.426	13.6	8.0	0.59	3891	3.02	0.14
006129451-03	OBS	No	489.884846	560.520893	3174.9	10.996	14.8	7.7	0.59	3891	3.25	0.07
006129451-04	OBS	No	295.612097	189.292130	2582.8	2.932	14.8	8.9	0.59	3891	3.61	0.14

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006129451-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
006129451-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
006129451-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006129451-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS

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

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

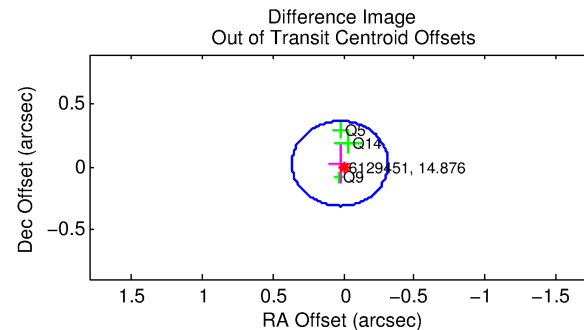
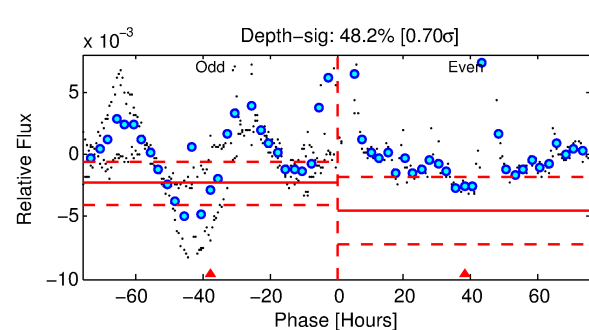
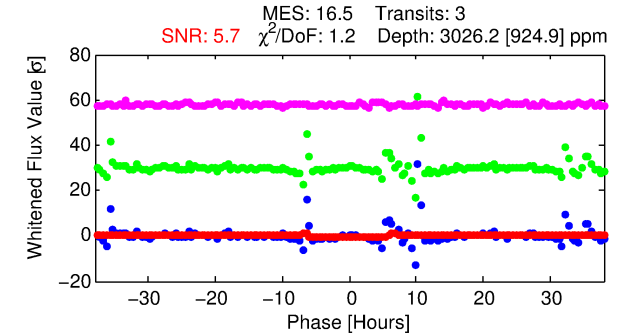
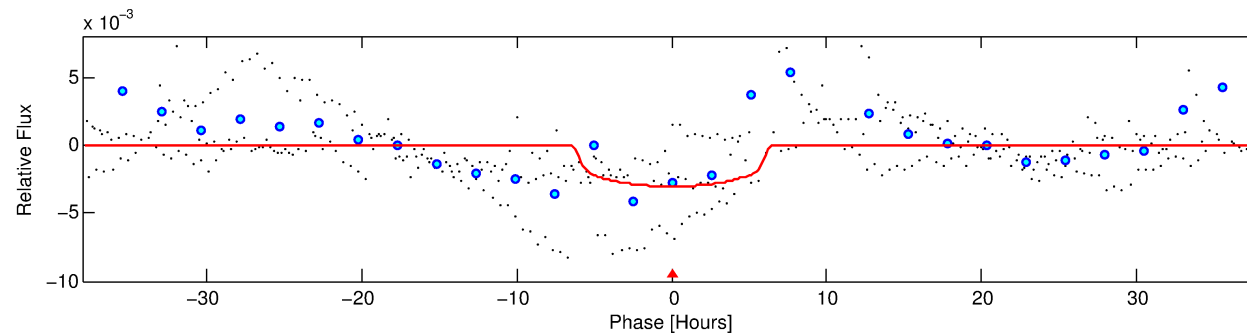
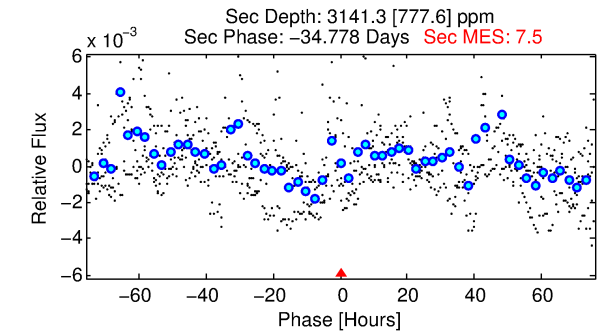
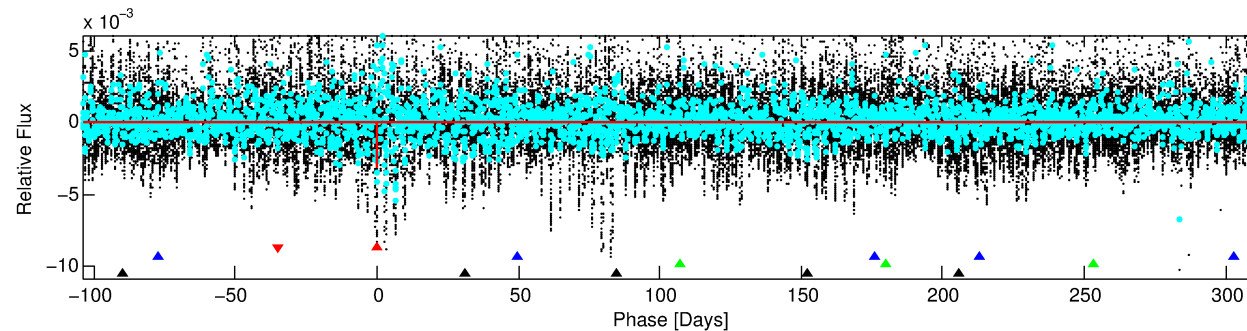
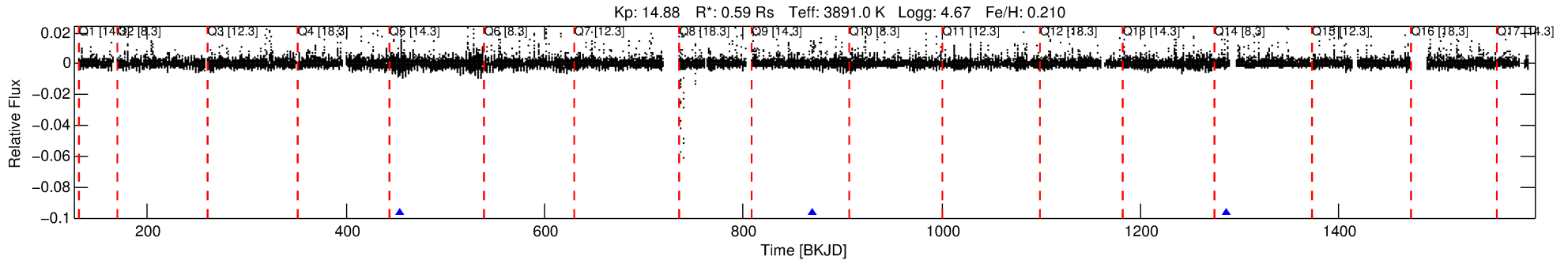
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006129451-01

No Significant Match Found

DV One-Page Summary

KIC: 6129451 Candidate: 1 of 4 Period: 416.697 d



DV Fit Results:

Period = 416.69652 [0.01018] d
Epoch = 453.6999 [0.0141] BKJD
Rp/R* = 0.0490 [0.0193]
a/R* = 259.16 [297.05]
b = 0.18 [6.03]
Seff = 0.09 [0.02]
Teq = 138 [7] K
Rp = 3.16 [1.30] Re
a = 0.9165 [0.0867] AU
Ag = 145799.17 [121721.74] [1.20σ]
Teffp = 4161 [873] K [4.61σ]

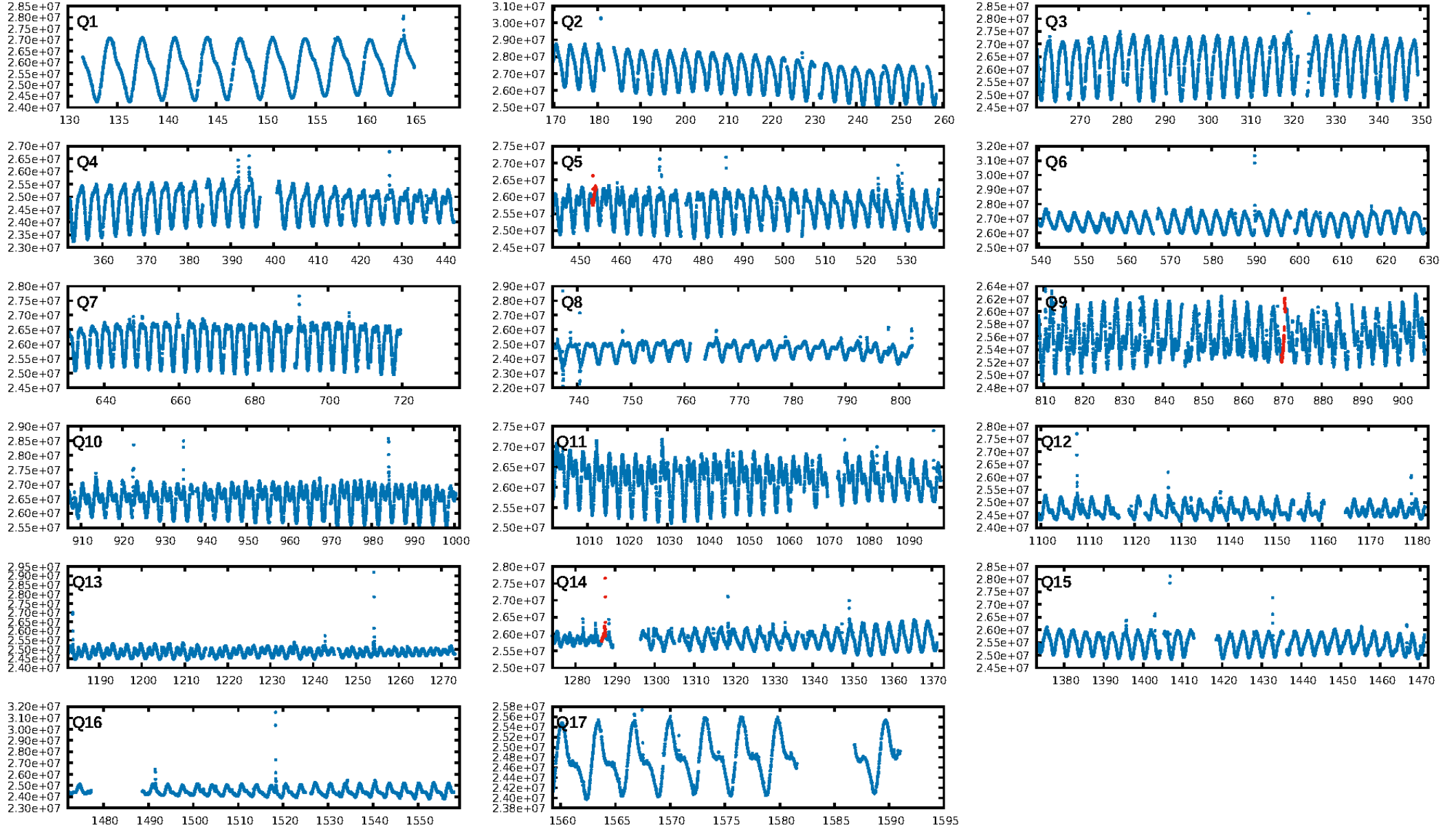
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [223.21σ]
LongPeriod-sig: 100.0% [104.63σ]
ModelChiSquare2-sig: 1.4%
ModelChiSquareGof-sig: 99.4%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.65
Centroid-sig: 8.3%
Centroid-so: 0.453 arcsec [1.45σ]
OotOffset-rm: 0.036 arcsec [0.32σ]
OotOffset-st: 1/0/0/2 [3]
KicOffset-rm: 0.119 arcsec [0.96σ]
KicOffset-st: 1/0/0/2 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

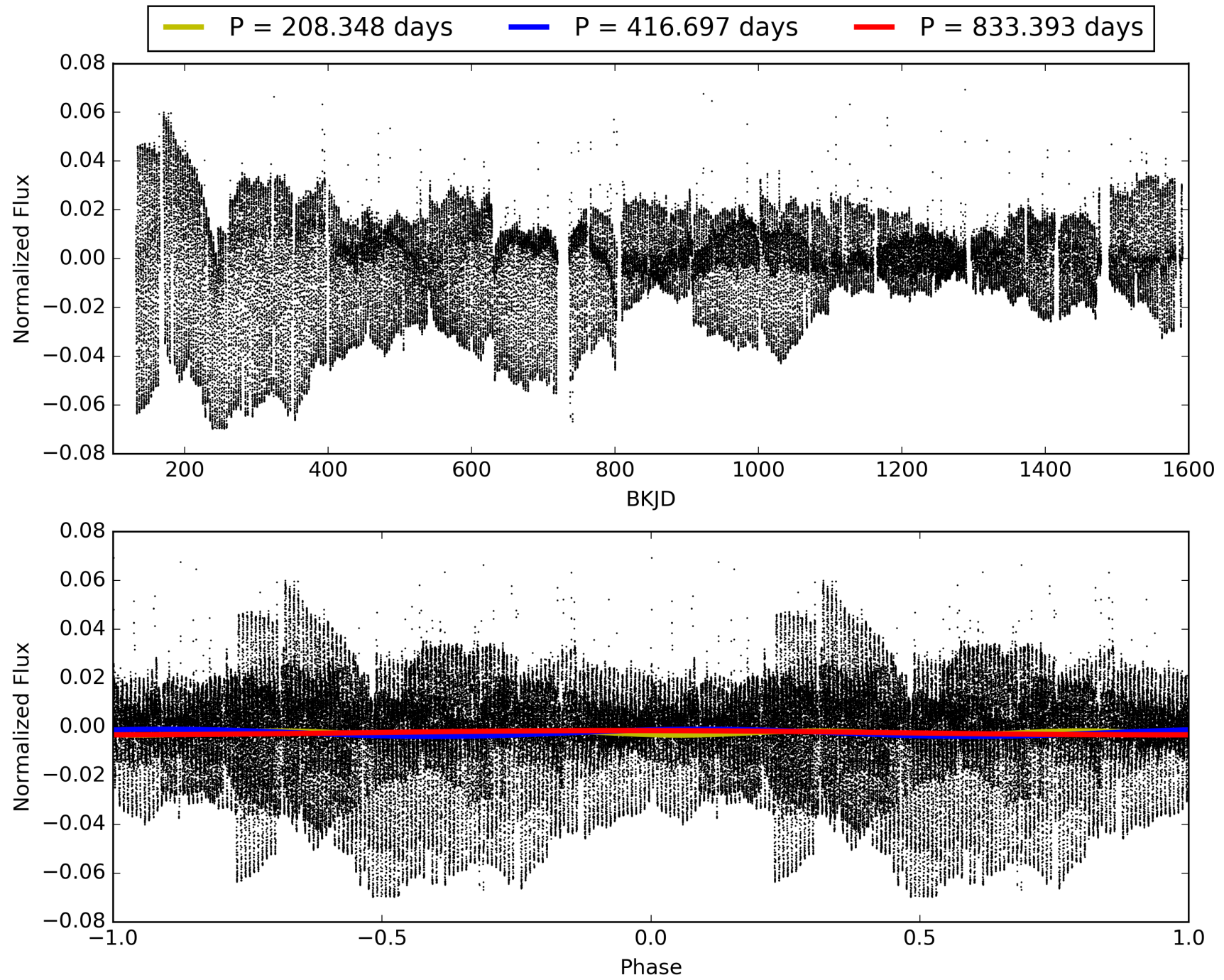
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:00:15 Z

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

TCE 006129451-01, PDC Light Curves

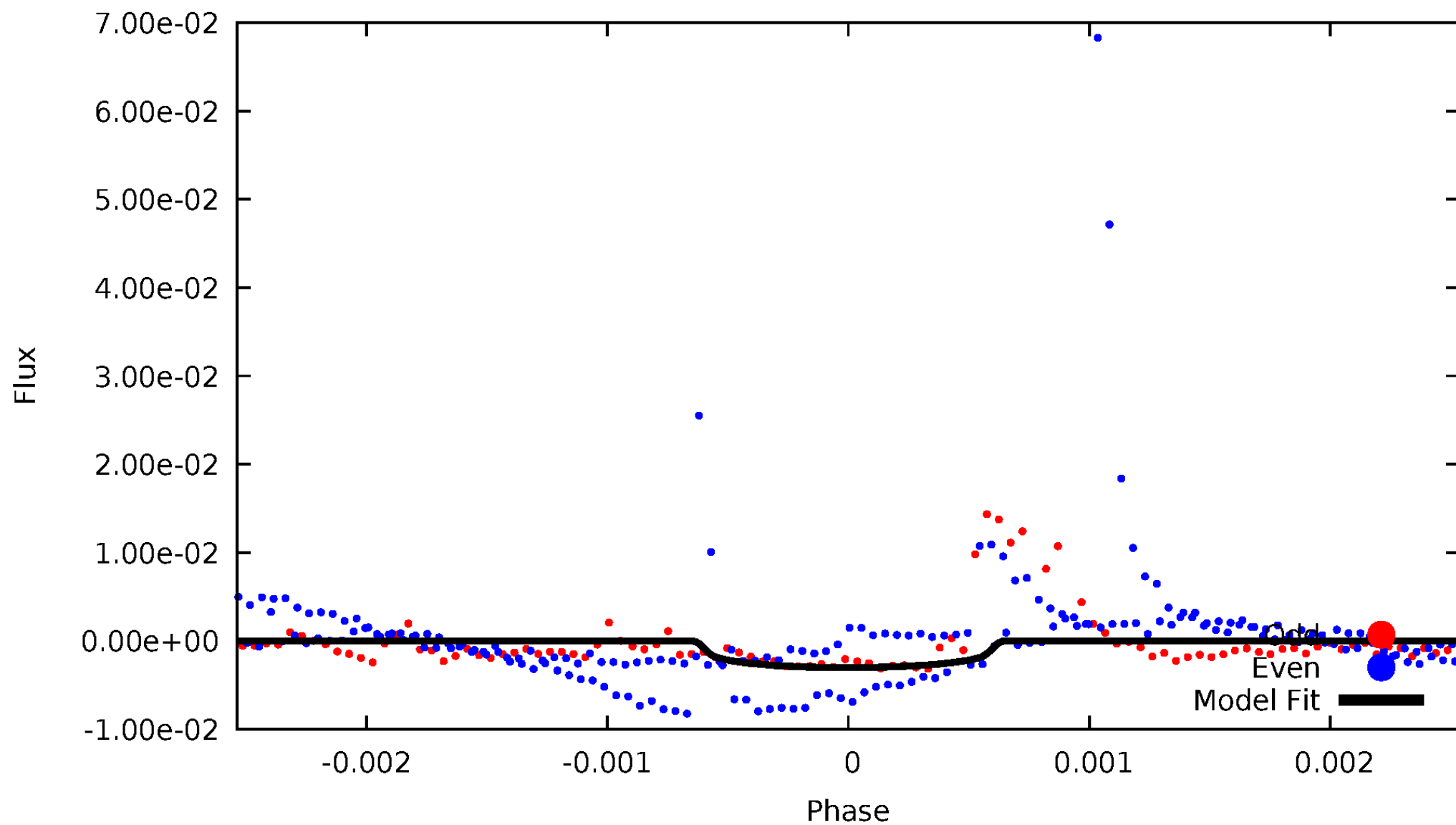


TCE 006129451-01



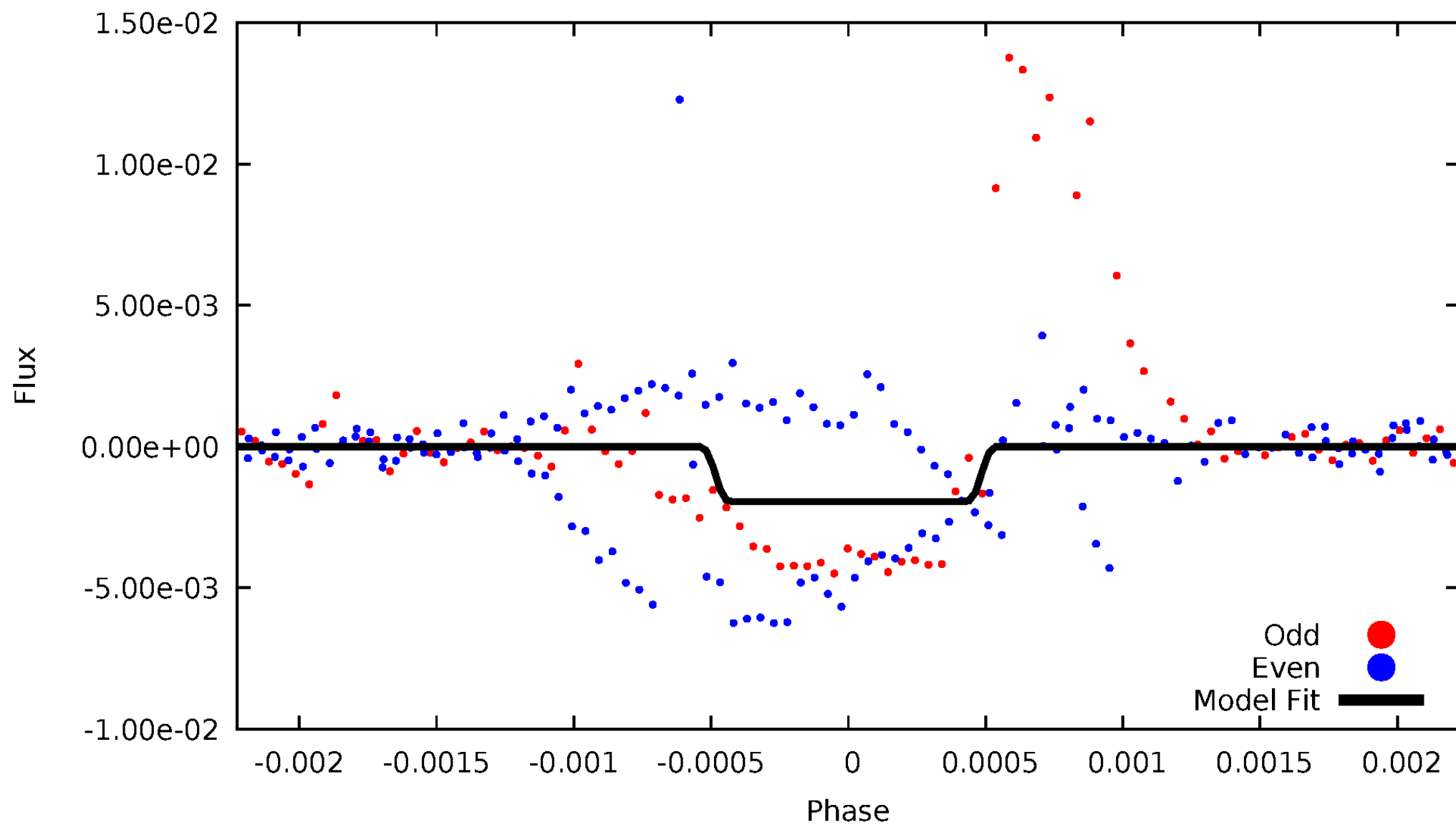
DV Odd/Even

TCE 006129451-01



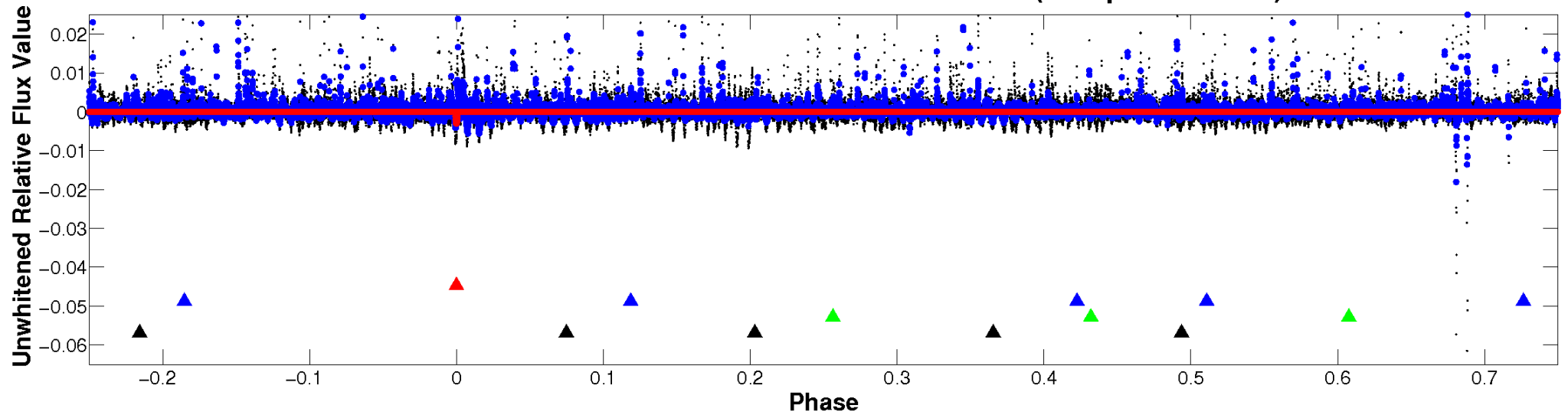
ALT Odd/Even

TCE 006129451-01

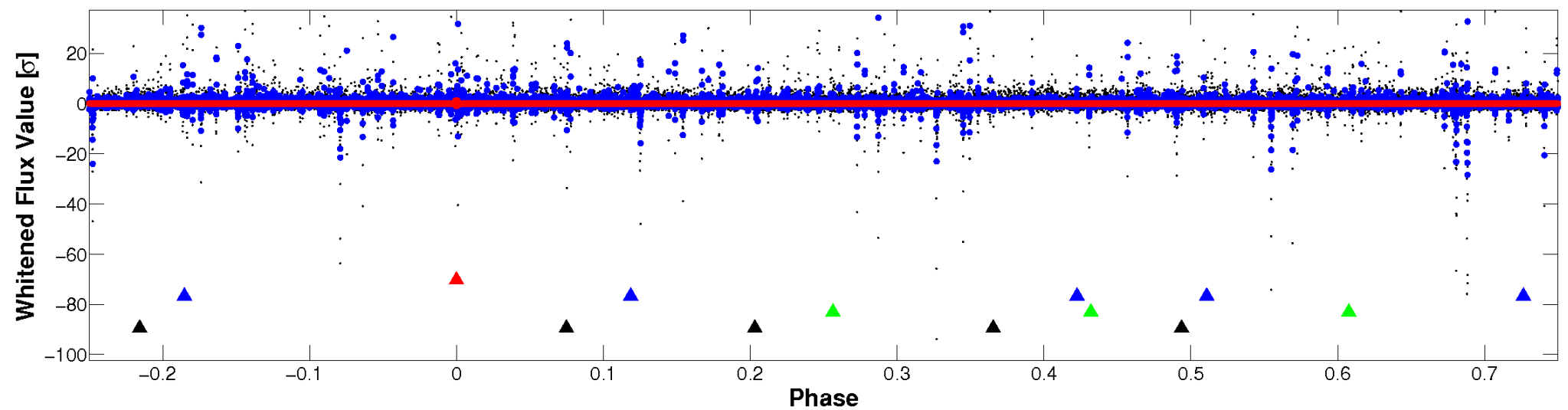


Non-Whitened Vs. Whitened Light Curve

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

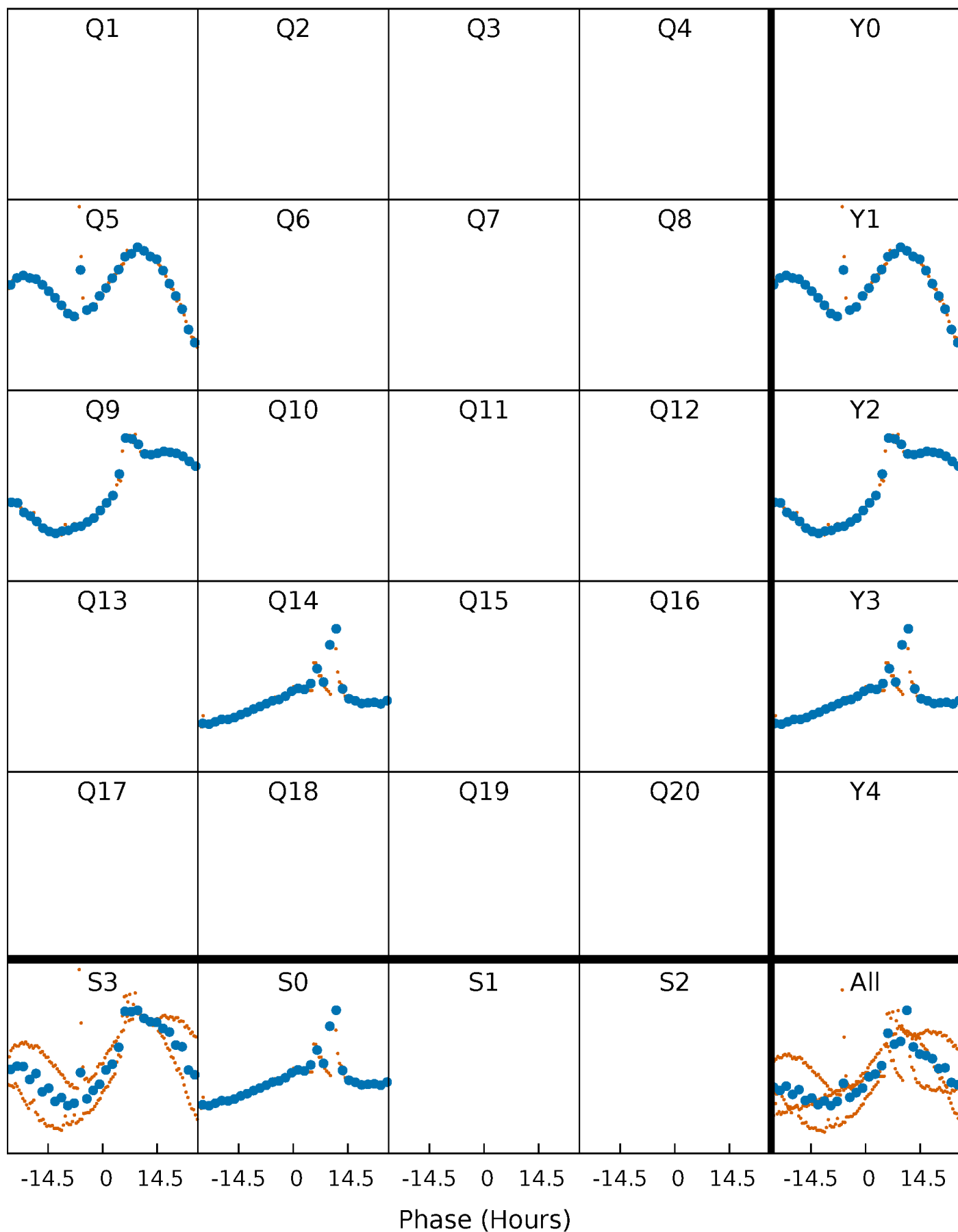


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



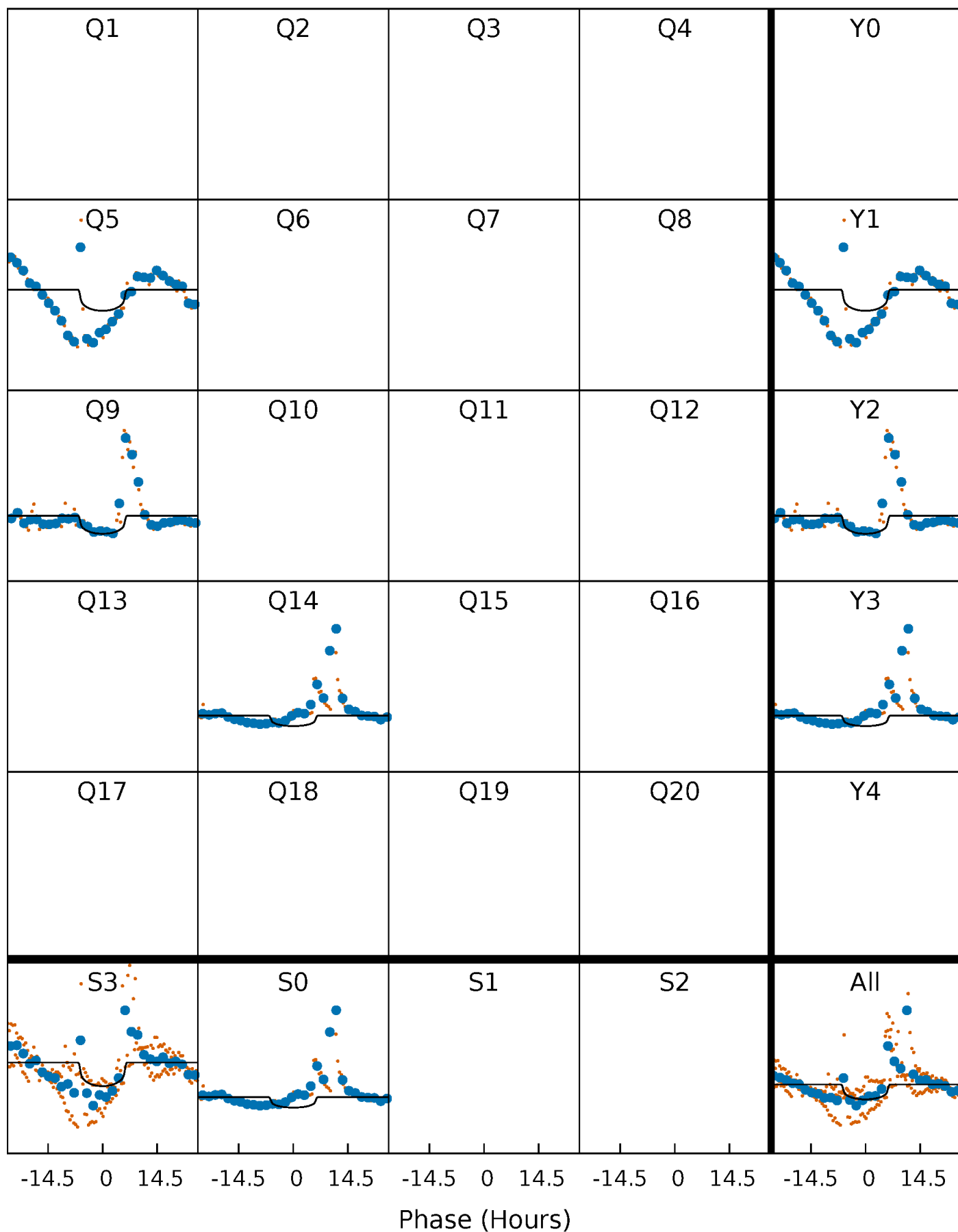
PDC Quarter-Phased Transit Curves

TCE 006129451-01 P=416.696519 Days $T_0=453.699913$ (BKJD)



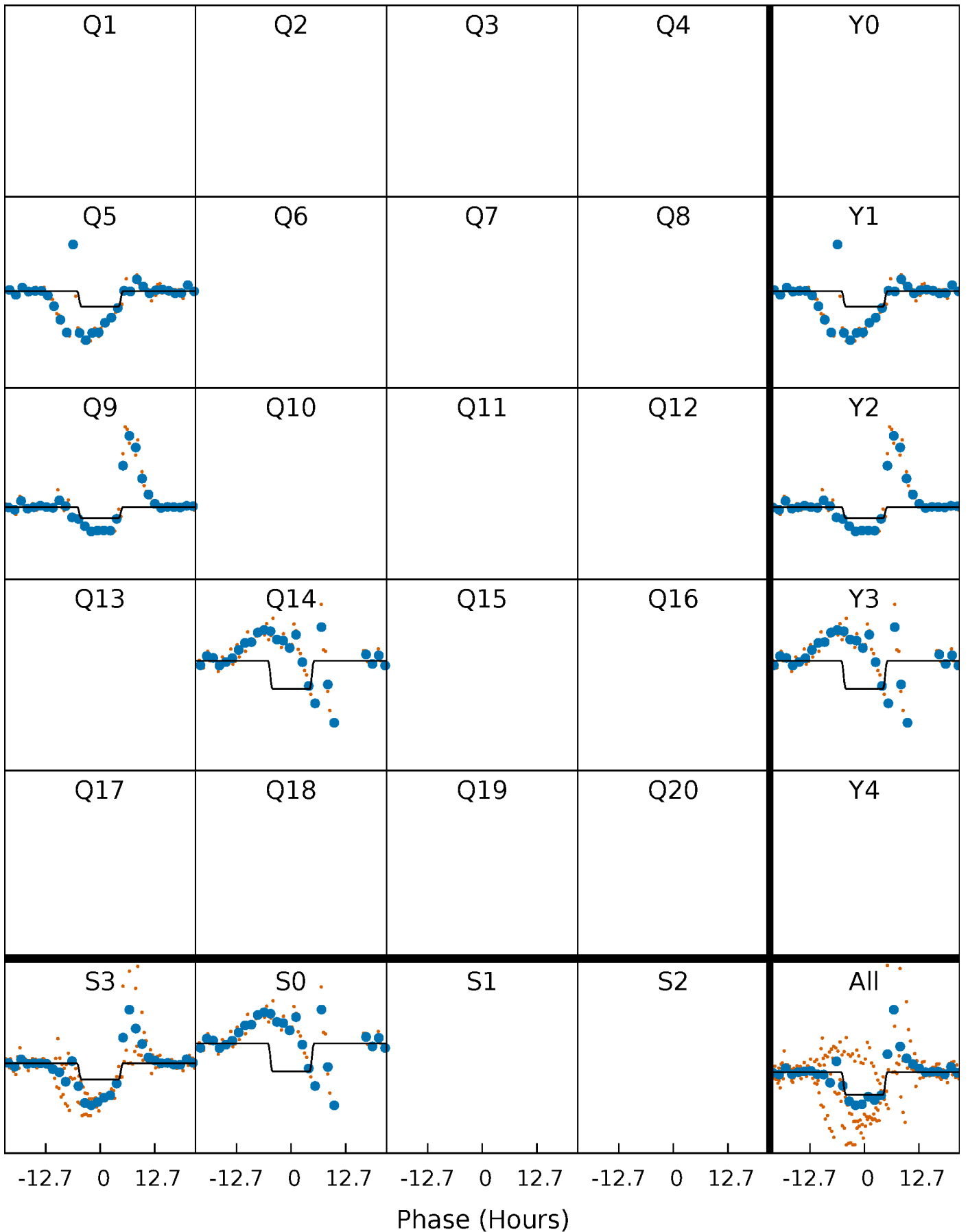
DV Quarter-Phased Transit Curves

TCE 006129451-01 P=416.696519 Days $T_0=453.699913$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

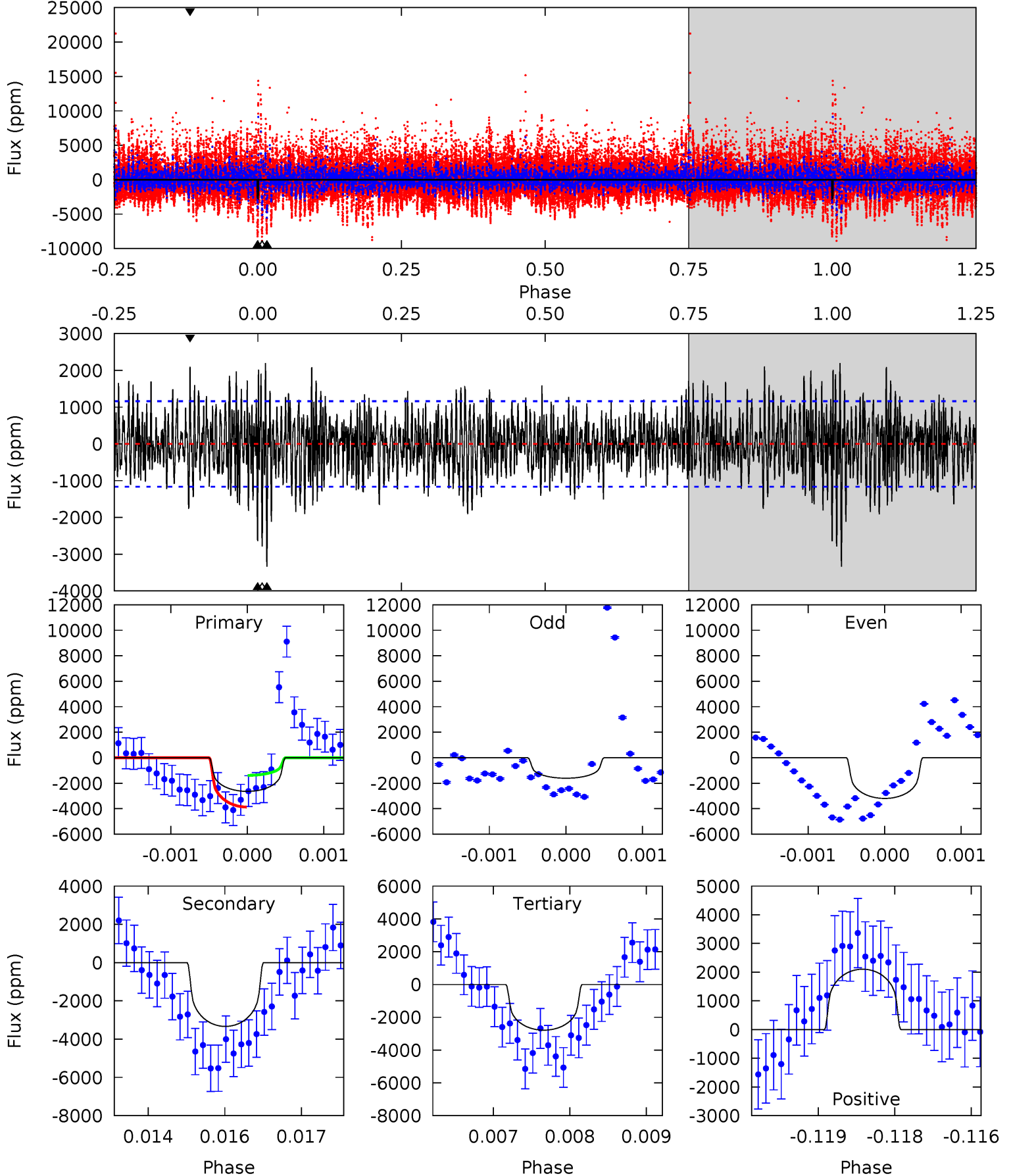
TCE 006129451-01 P=416.674344 Days $T_0=453.717842$ (BKJD)



DV Model-Shift Uniqueness Test

006129451-01, P = 416.696519 Days, E = 37.003394 Days

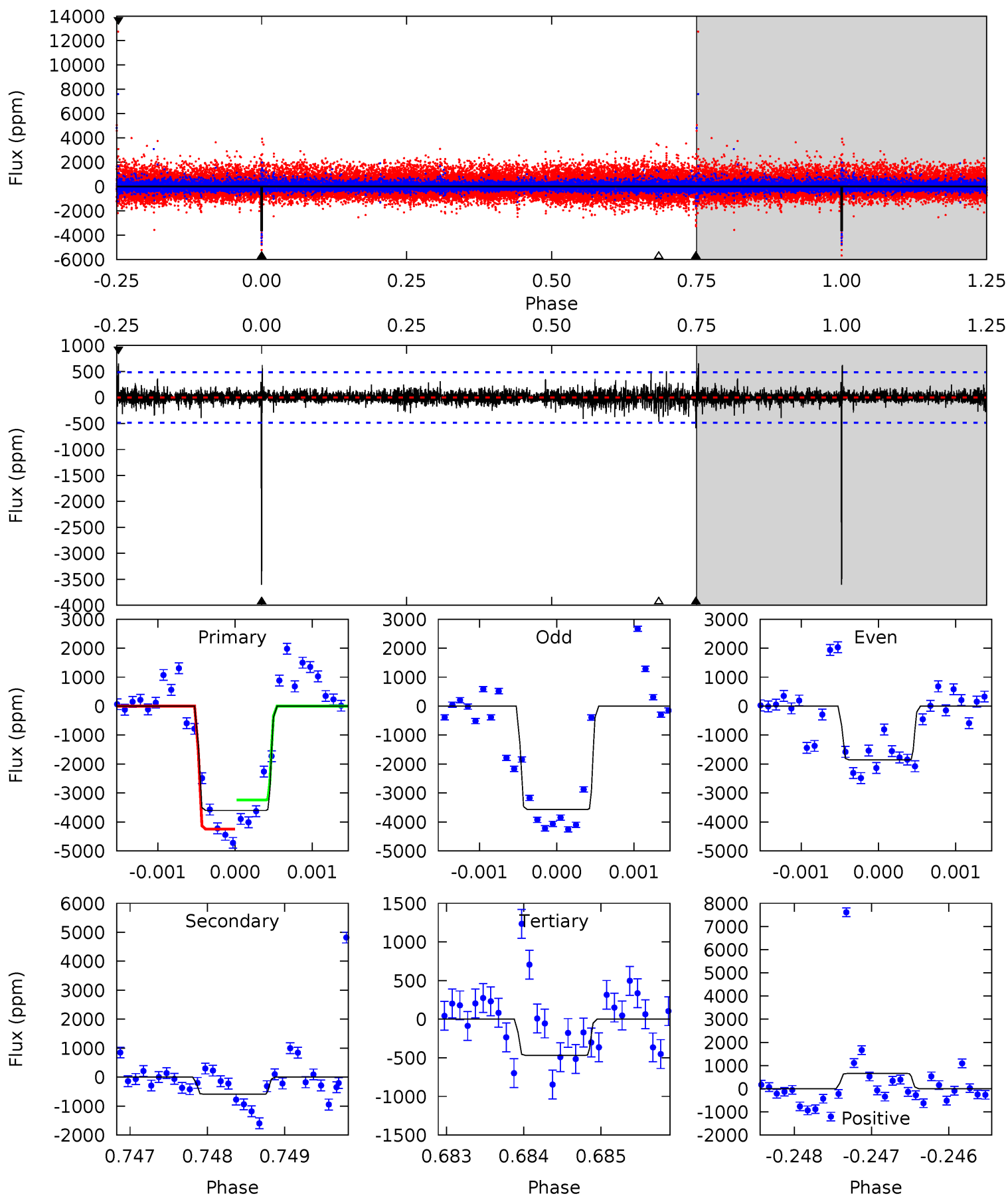
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	15.5	13.0	9.78	5.40	3.21	2.98	-0.67	2.50	2.55	5.72	2.78	1.49	0.40	5.81



Alt Model-Shift Uniqueness Test

006129451-01, P = 416.674344 Days, E = 37.043498 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.5	6.62	5.25	7.36	5.45	3.28	0.90	35.2	33.1	1.37	-0.74	9.76	0.70	0.15	5.52



Stellar Parameters For KIC 006129451

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3891^{+122}_{-150}	$4.668^{+0.063}_{-0.022}$	$0.210^{+0.200}_{-0.300}$	$0.590^{+0.033}_{-0.072}$	$0.592^{+0.041}_{-0.067}$	$4.053^{+1.286}_{-0.452}$
	+3%/-4%	+1%/-0%	+95%/-143%	+6%/-12%	+7%/-11%	+32%/-11%
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 006129451-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3335 ± 215	$3.11^{+1.25}_{-1.19}$	190^{+7}_{-8}	4125^{+860}_{-480}	$162083^{+255840}_{-80951}$
Alt.	-589 ± 89	$2.82^{+1.24}_{-1.22}$	190^{+8}_{-8}	3186^{+675}_{-320}	34169^{+75119}_{-17382}

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

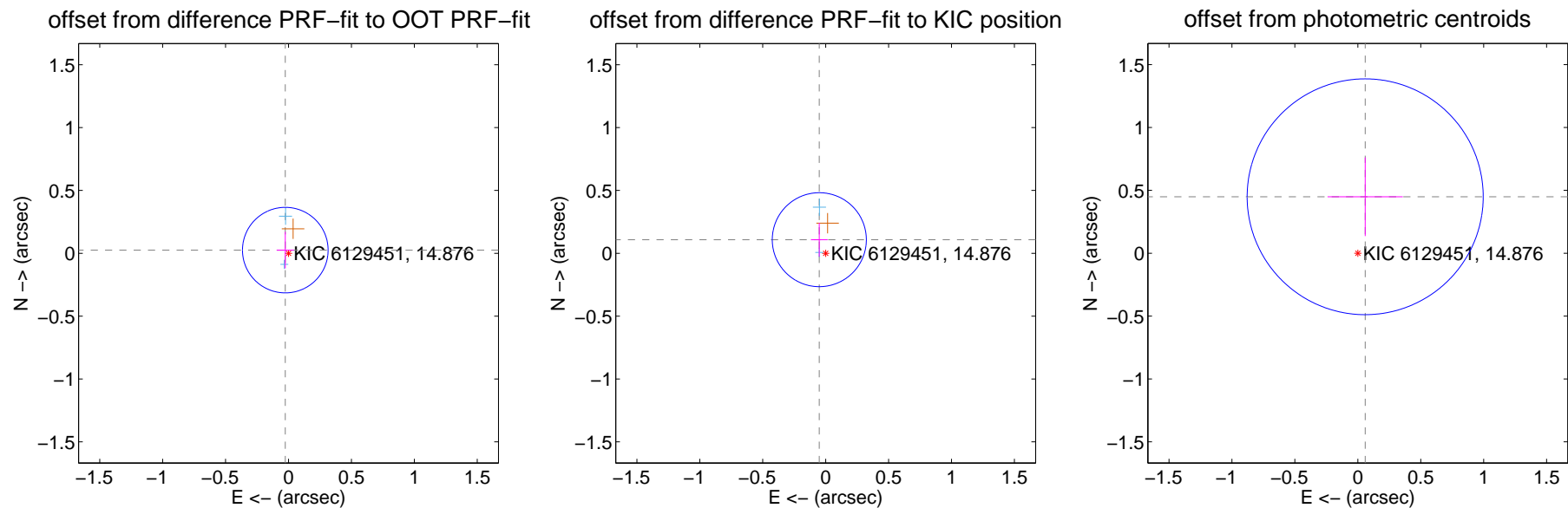
DV Centroid Data

Supplemental centroid analysis for 006129451-01. Kepler magnitude: 14.88. Transit SNR 5.68

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.036 ± 0.113	0.32	0.025 ± 0.068	0.025 ± 0.146
PRF-fit source offset from KIC position	0.119 ± 0.125	0.96	0.051 ± 0.067	0.108 ± 0.134
photometric centroid source offset	0.45 ± 0.31	1.45	-0.06 ± 0.30	0.45 ± 0.31

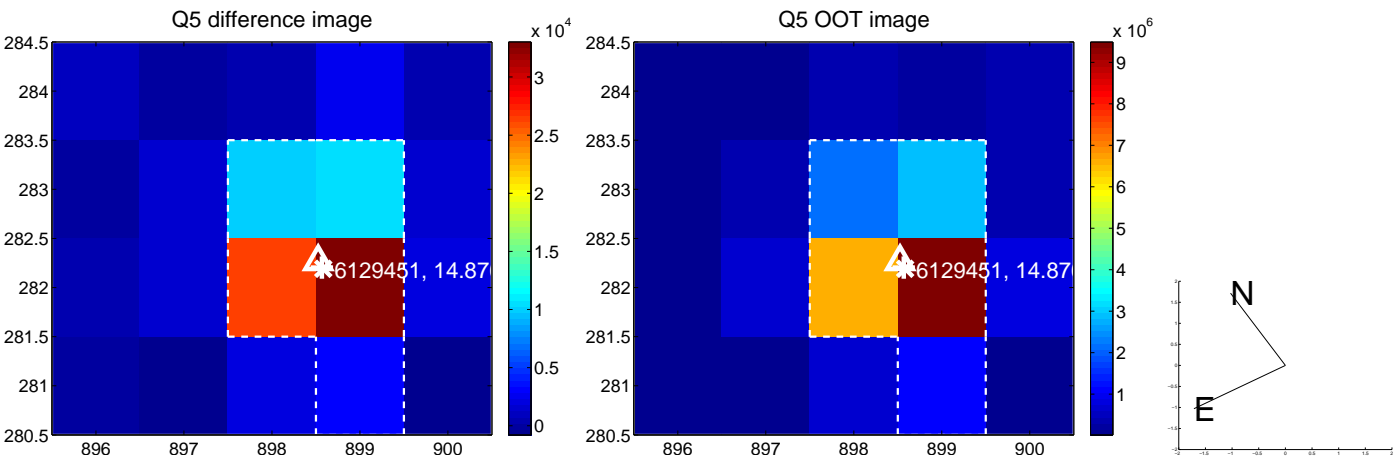


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

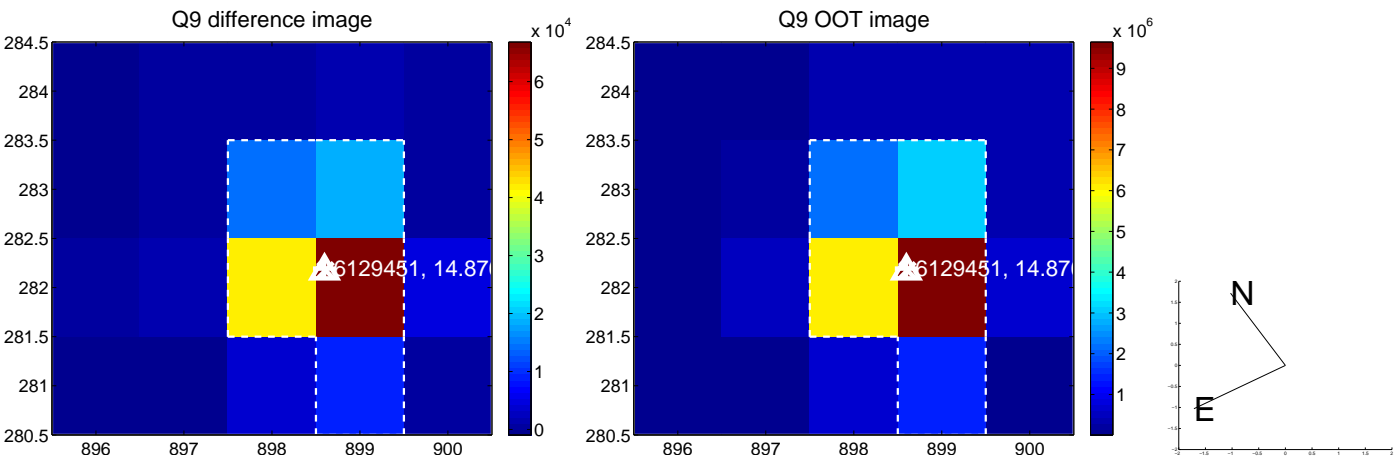
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

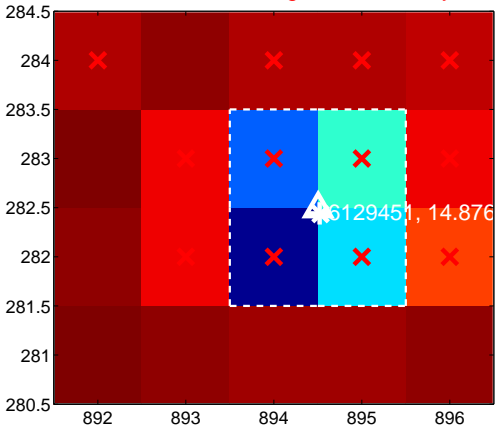
Q13 no difference image



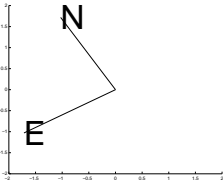
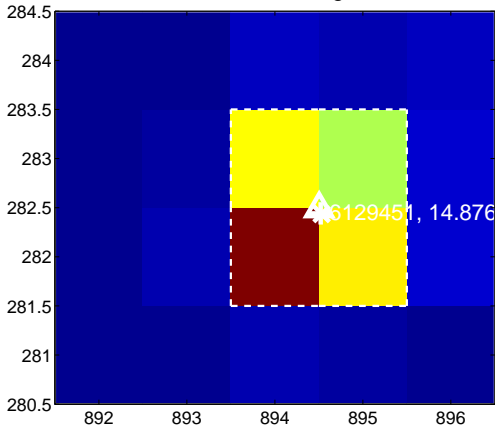
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



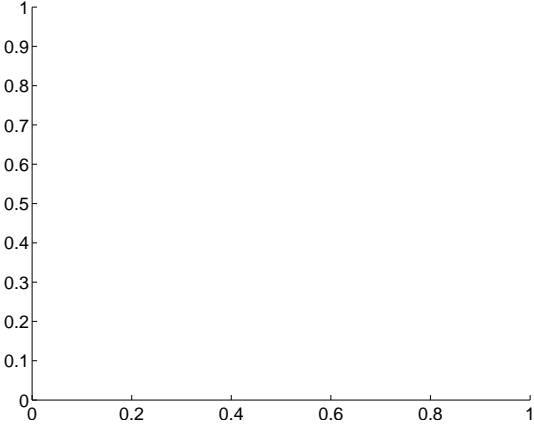
Q15 no difference image



Q15 no OOT image



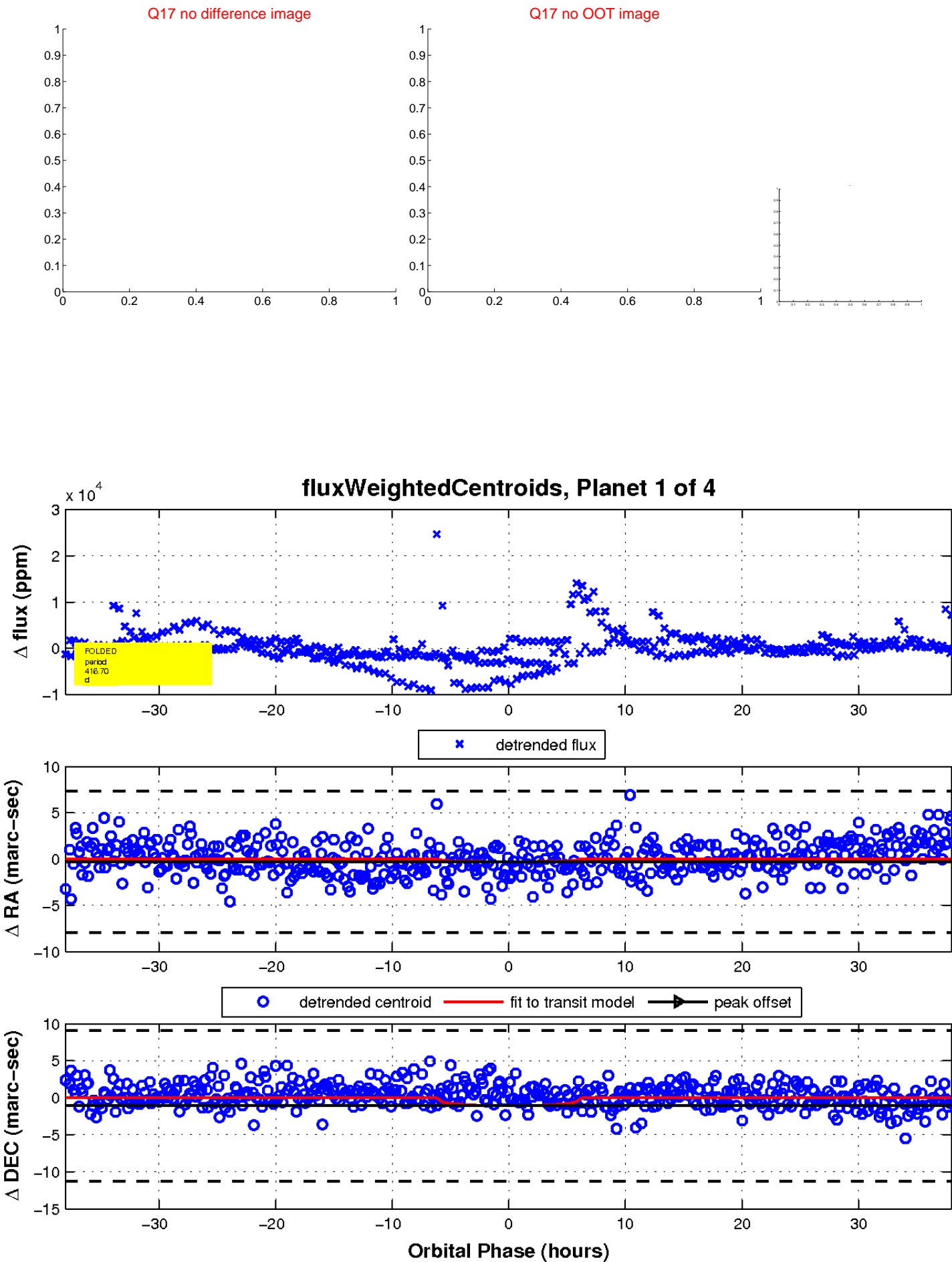
Q16 no difference image



Q16 no OOT image

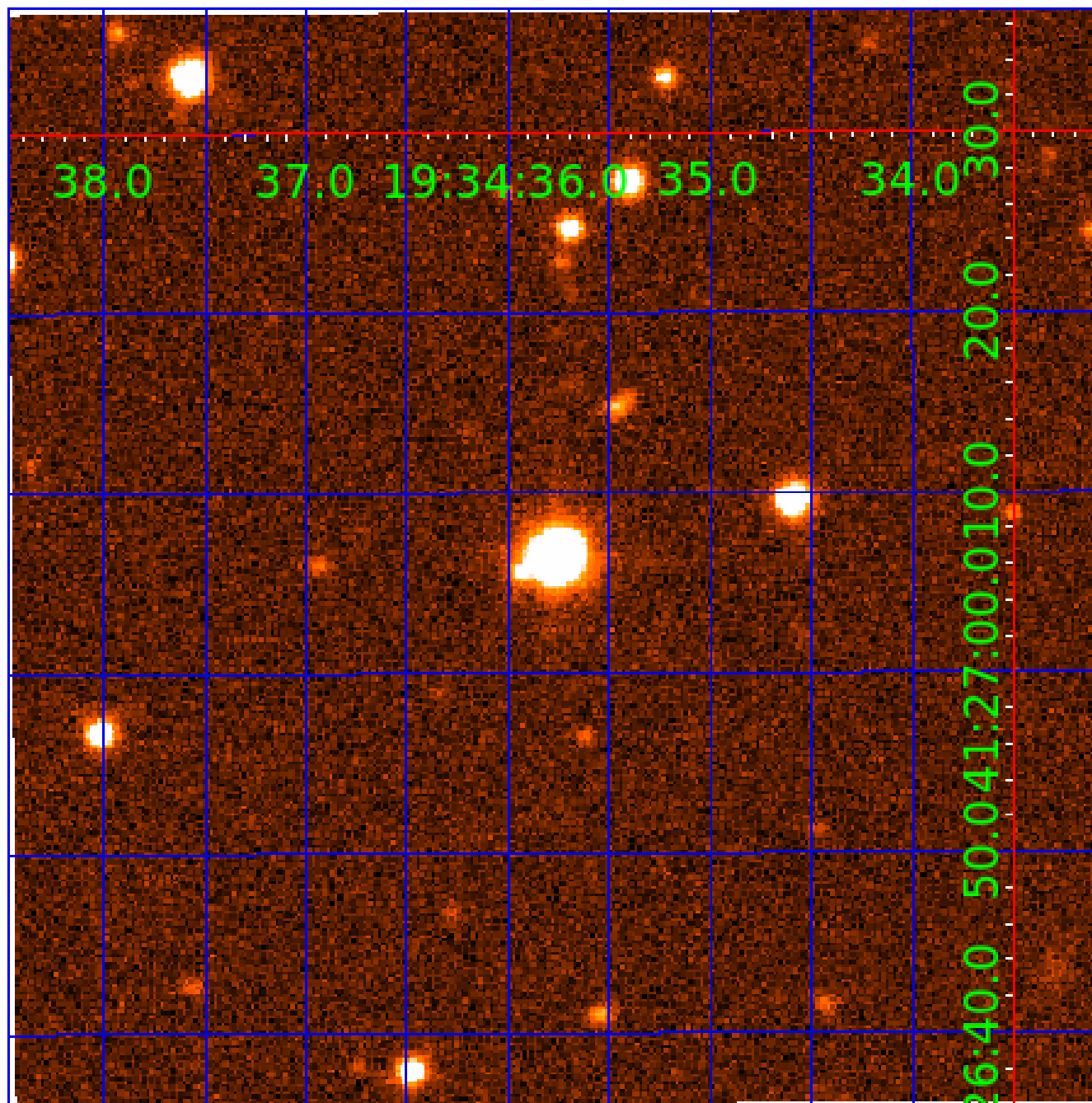


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006129451

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})
006129451-01	OBS	No	416.696519	453.699913	3026.2	12.685	16.5	5.7	0.59	3891	3.15	0.09
006129451-02	OBS	No	290.061096	339.720848	2678.3	3.426	13.6	8.0	0.59	3891	3.02	0.14
006129451-03	OBS	No	489.884846	560.520893	3174.9	10.996	14.8	7.7	0.59	3891	3.25	0.07
006129451-04	OBS	No	295.612097	189.292130	2582.8	2.932	14.8	8.9	0.59	3891	3.61	0.14

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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006129451-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
006129451-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006129451-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS

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

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

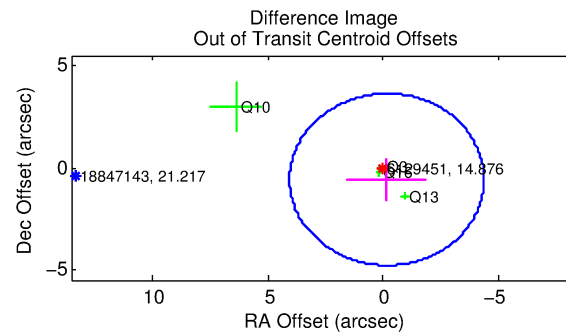
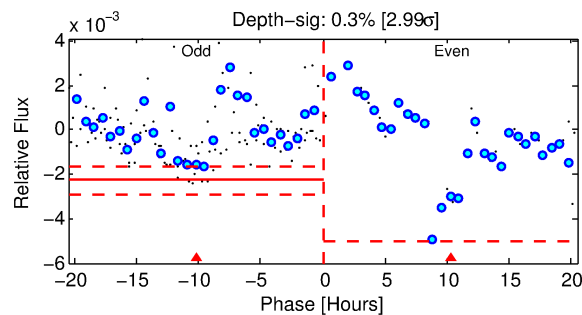
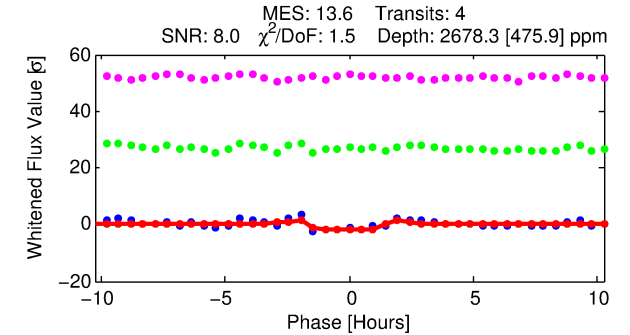
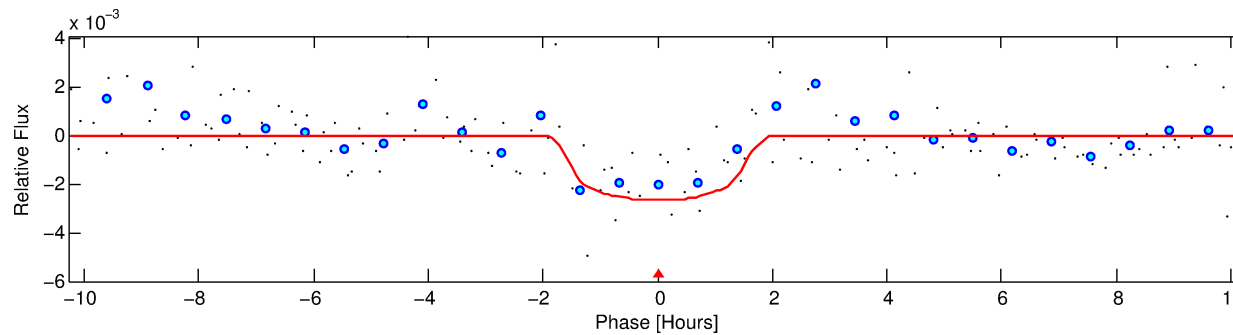
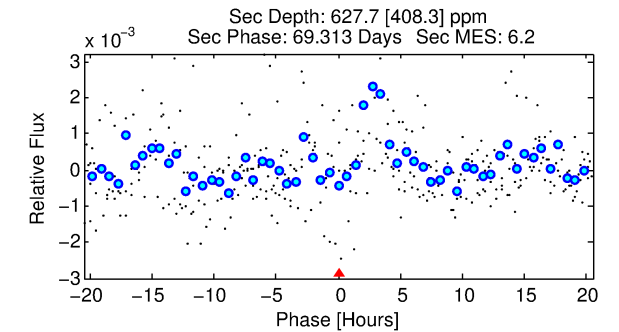
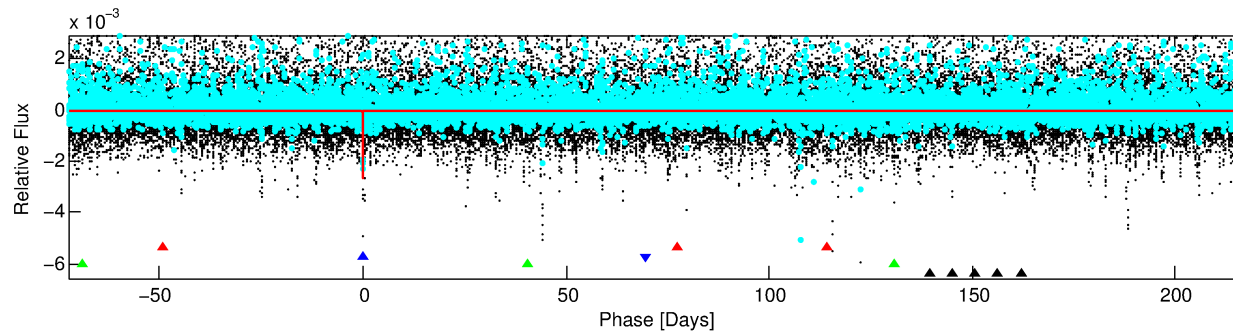
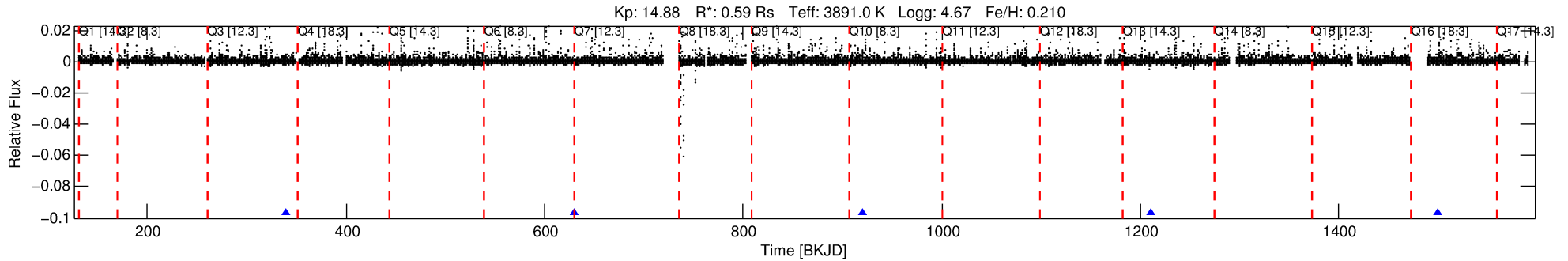
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006129451-02

No Significant Match Found

DV One-Page Summary

KIC: 6129451 Candidate: 2 of 4 Period: 290.061 d



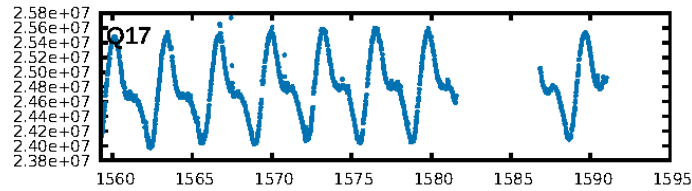
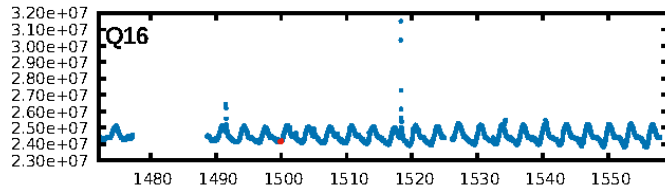
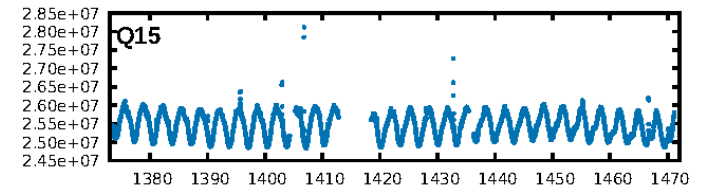
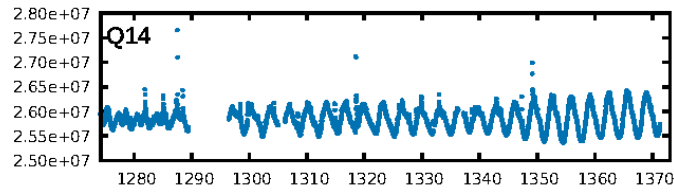
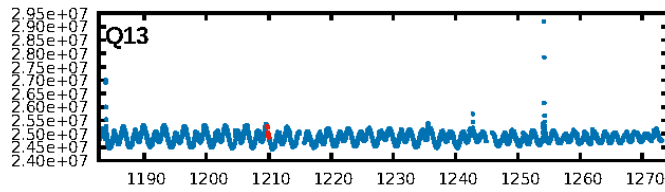
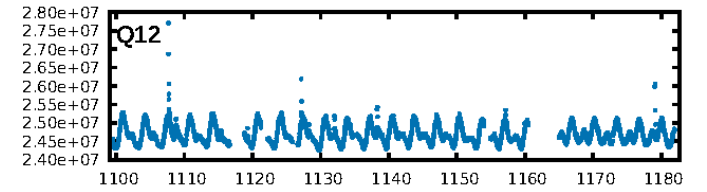
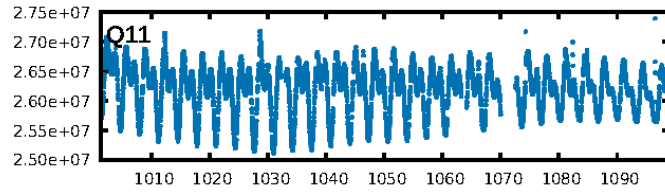
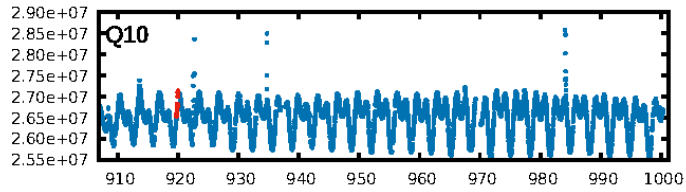
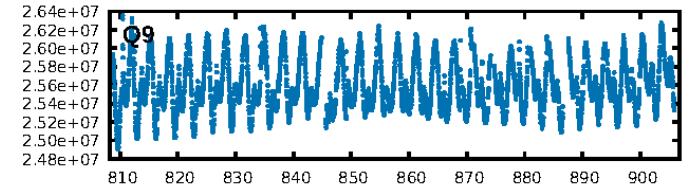
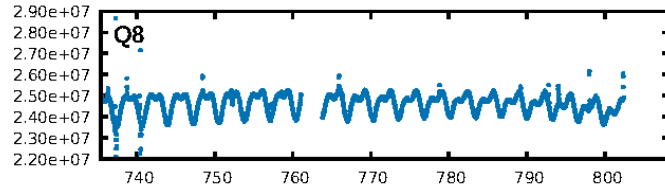
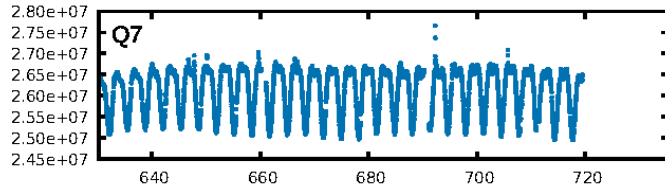
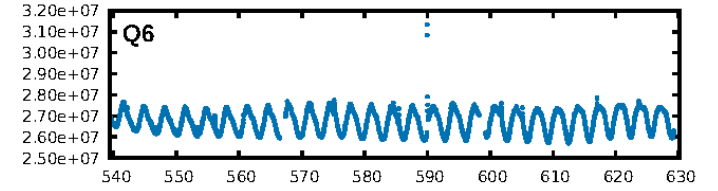
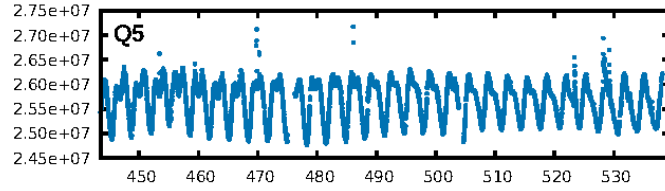
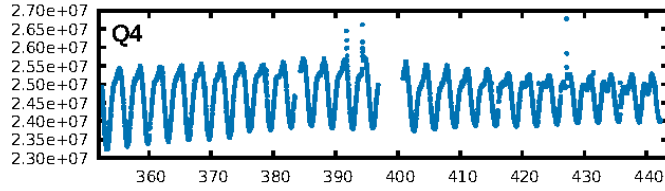
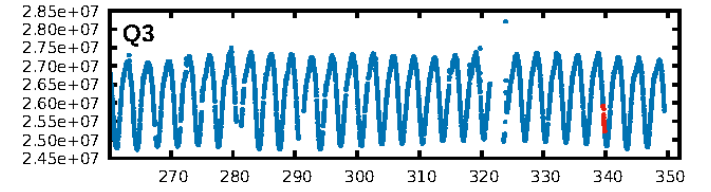
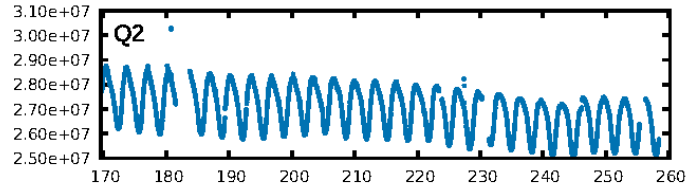
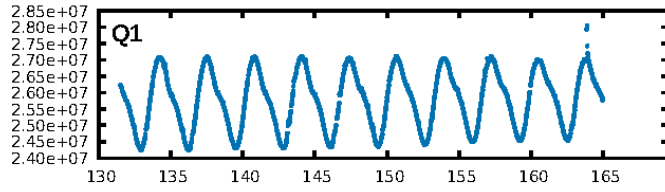
DV Fit Results:

Period = 290.06110 [0.00231] d
Epoch = 339.7208 [0.0058] BKJD
Rp/R* = 0.0469 [0.0741]
a/R* = 636.66 [3423.28]
b = 0.36 [13.38]
Seff = 0.14 [0.03]
Teq = 155 [8] K
Rp = 3.02 [4.78] Re
a = 0.7199 [0.0681] AU
Ag = 19668.25 [63552.96] [0.31σ]
Teffp = 2845 [2299] K [1.17σ]

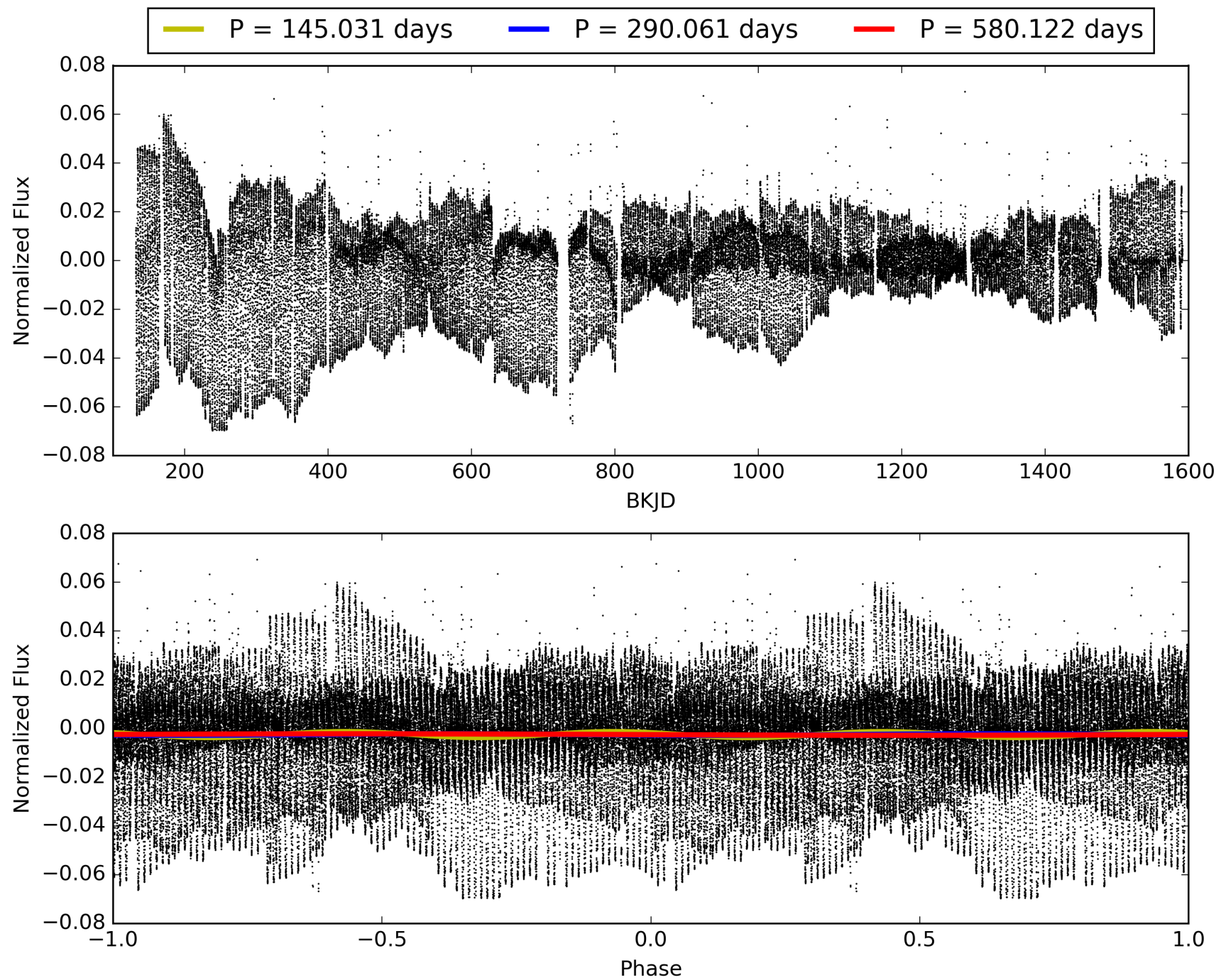
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [29.55σ]
ModelChiSquare2-sig: 0.5%
ModelChiSquareGof-sig: 54.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 2.114
Centroid-sig: 0.4%
Centroid-so: 0.661 arcsec [1.70σ]
OotOffset-rm: 0.599 arcsec [0.43σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-rm: 0.539 arcsec [0.67σ]
KicOffset-st: 1/1/1/1 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [4/4]

TCE 006129451-02, PDC Light Curves

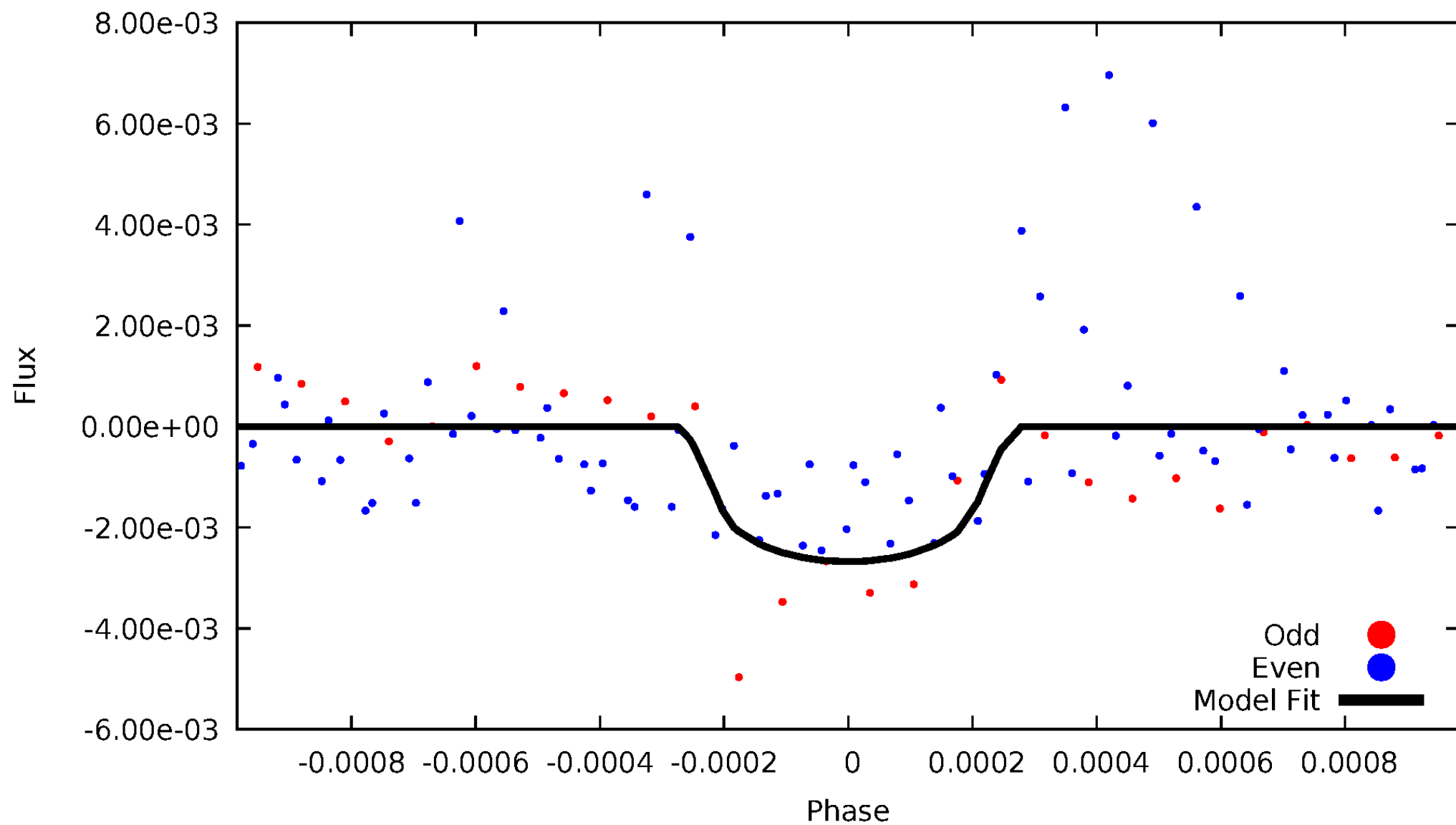


TCE 006129451-02



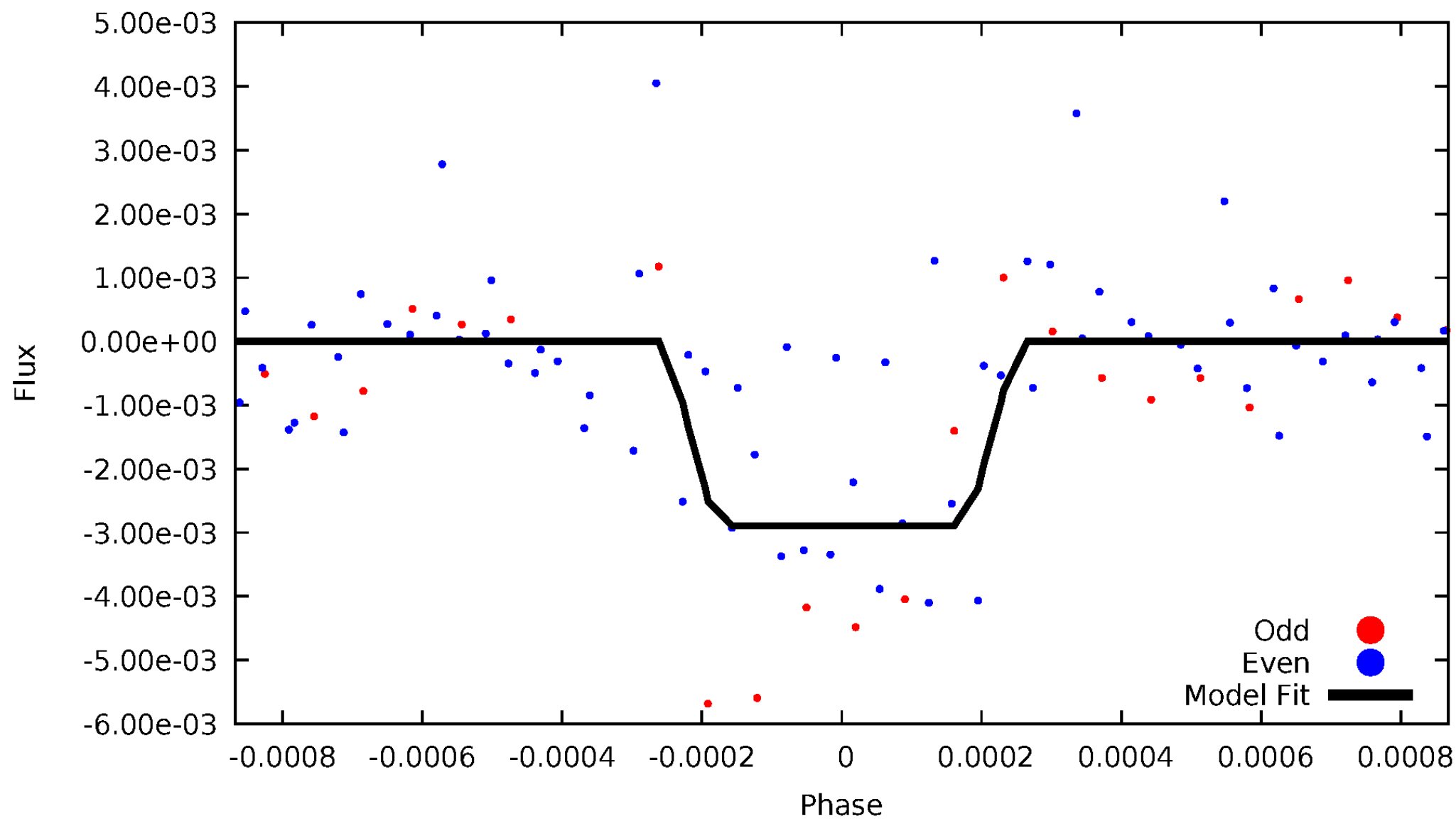
DV Odd/Even

TCE 006129451-02



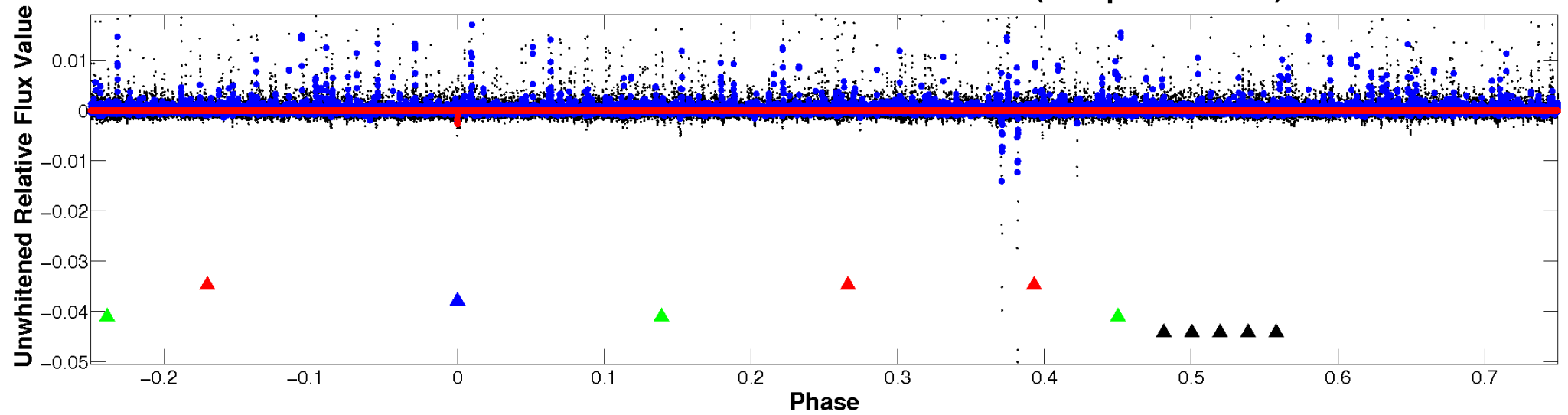
ALT Odd/Even

TCE 006129451-02

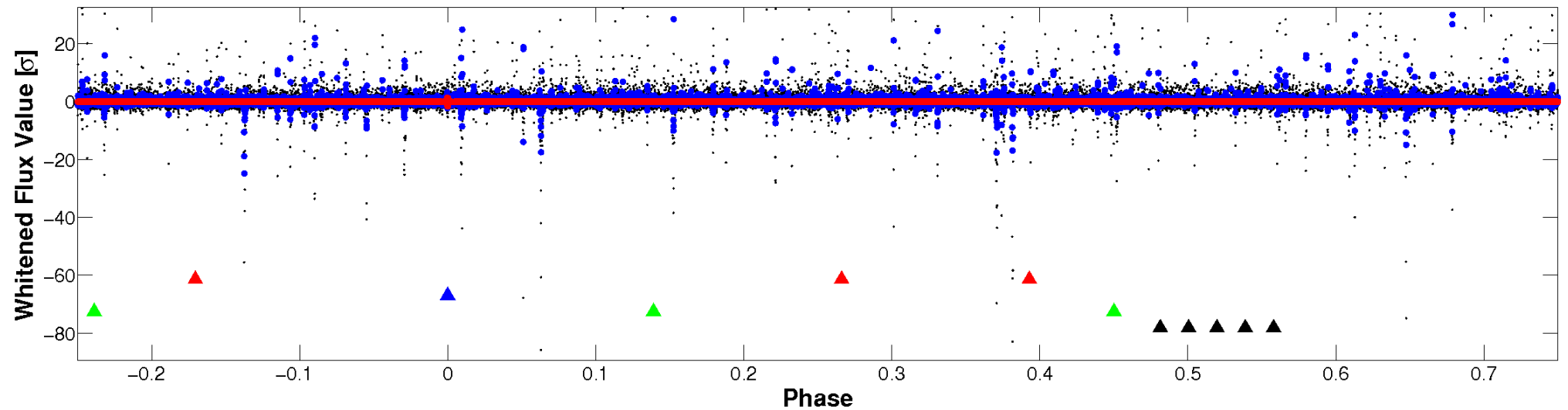


Non-Whitened Vs. Whitened Light Curve

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

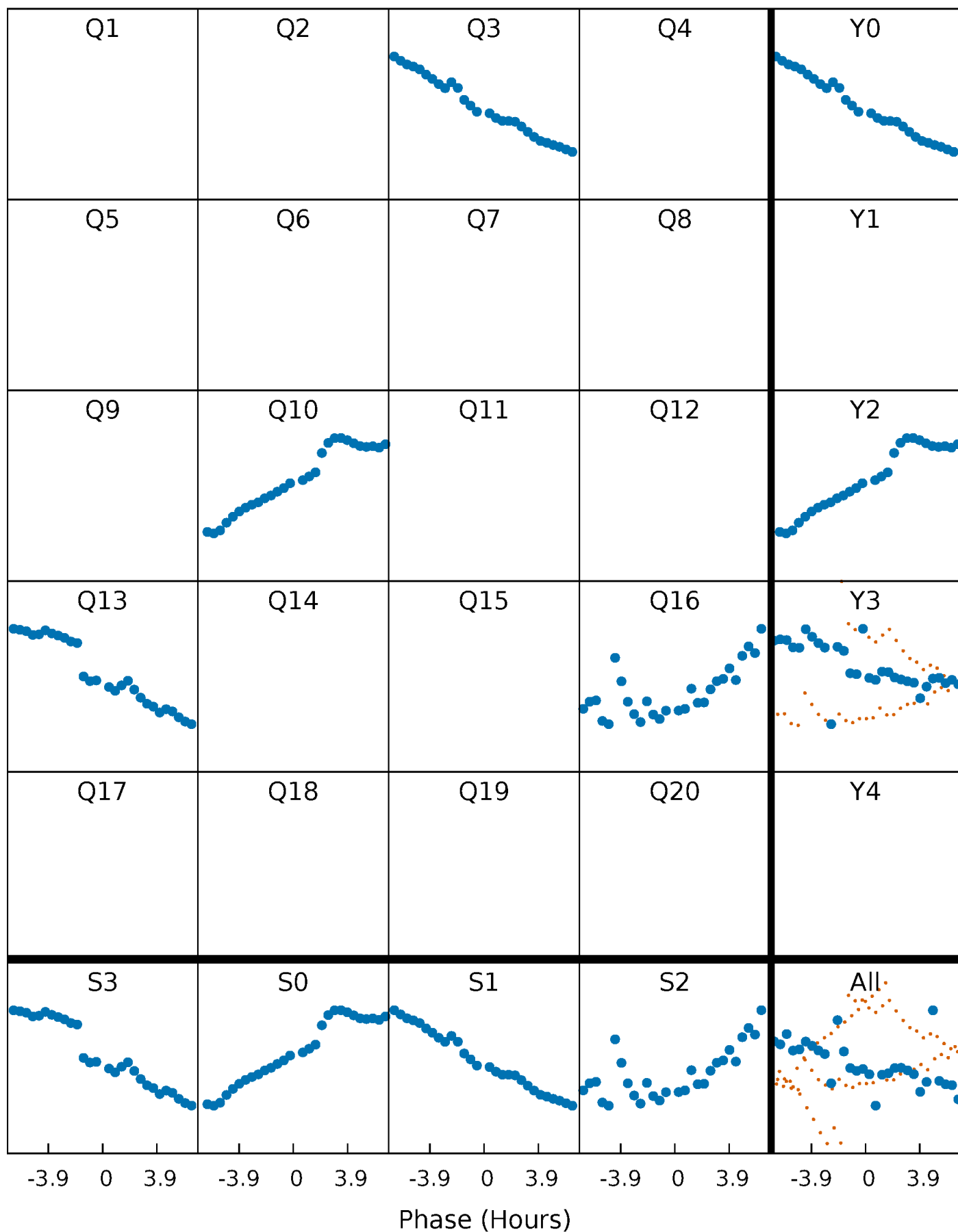


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



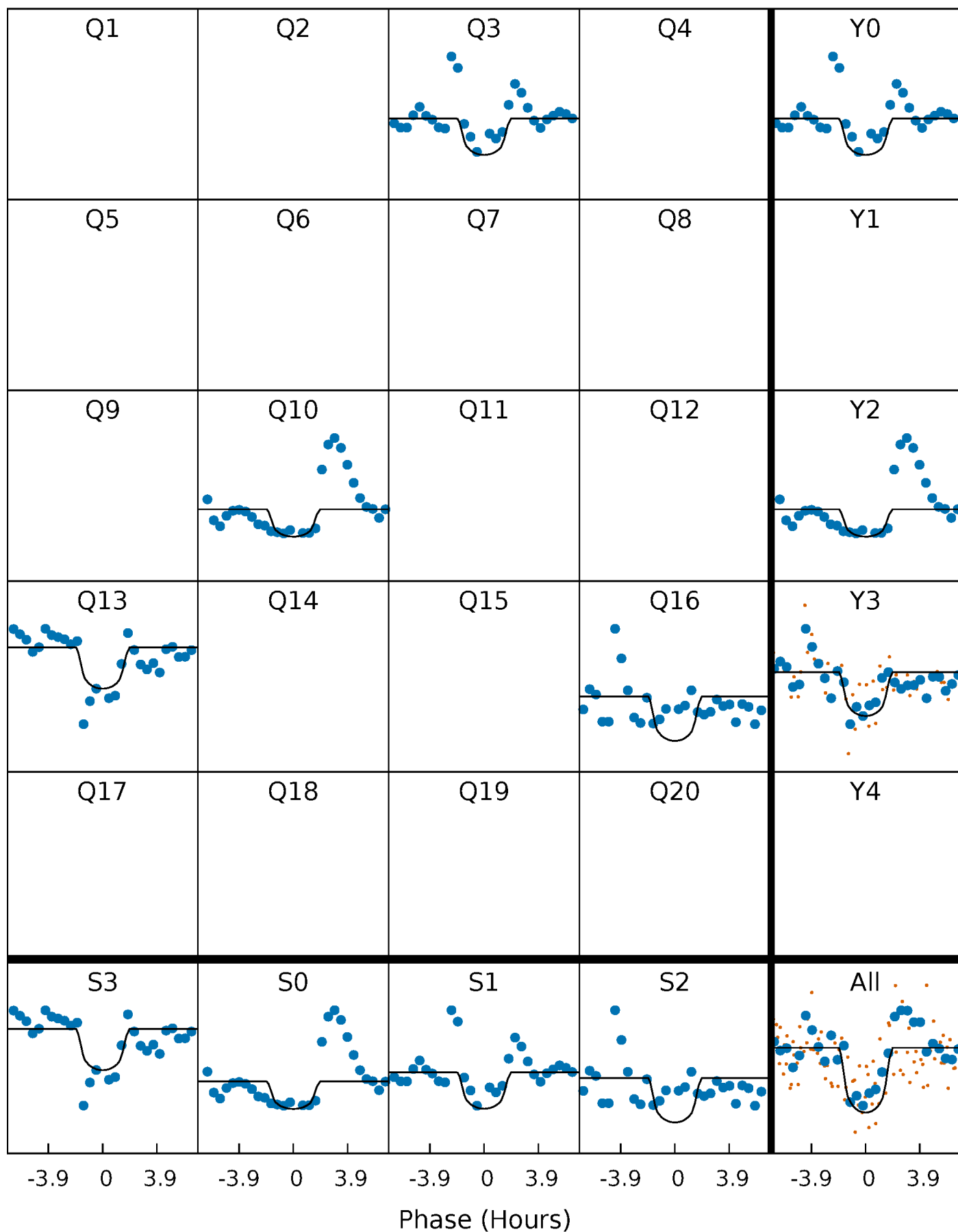
PDC Quarter-Phased Transit Curves

TCE 006129451-02 P=290.061096 Days $T_0=339.720848$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 006129451-02 $P=290.061096$ Days $T_0=339.720848$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

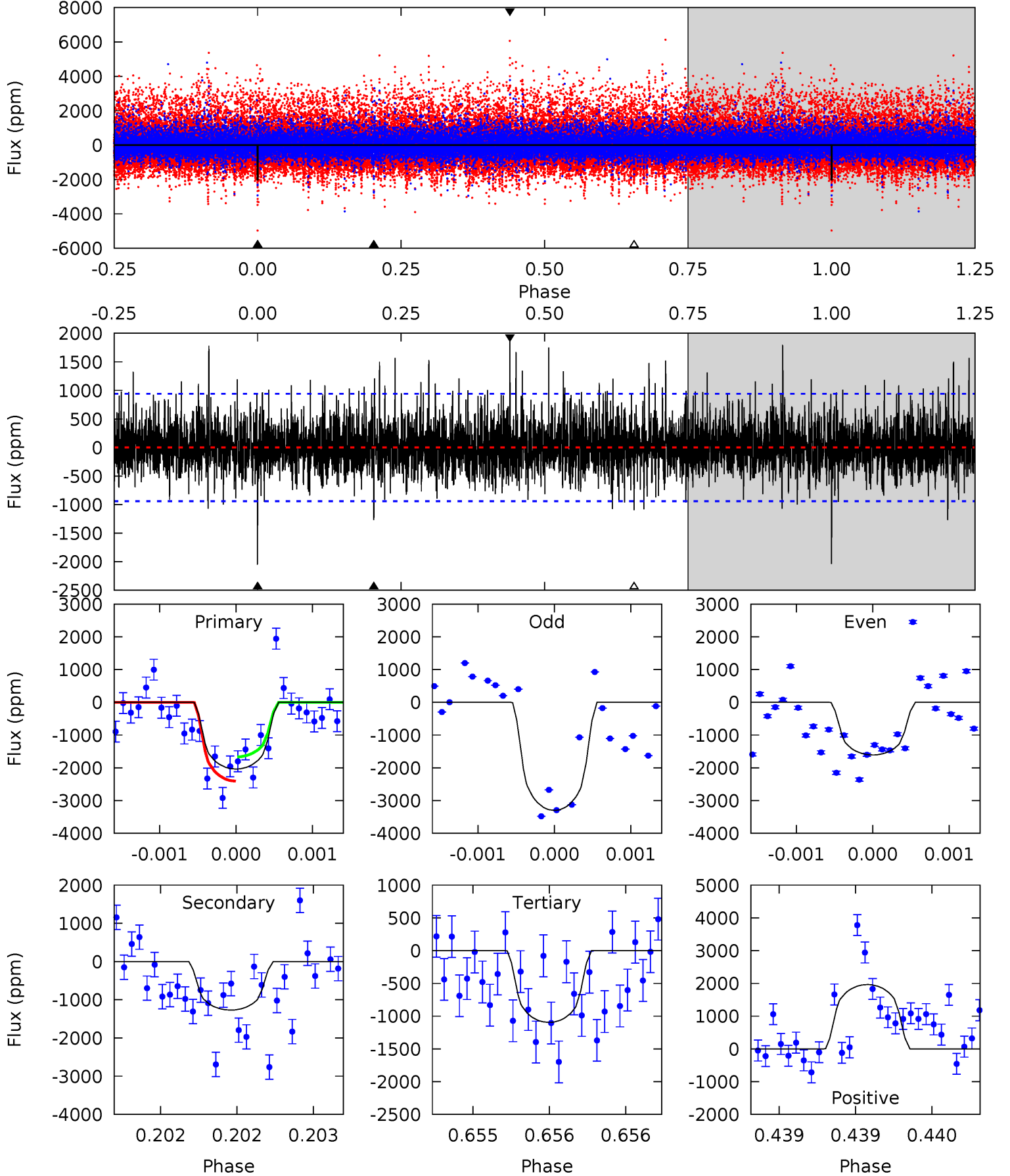
TCE 006129451-02 P=290.061502 Days $T_0=339.723957$ (BKJD)



DV Model-Shift Uniqueness Test

006129451-02, P = 290.061096 Days, E = 49.659752 Days

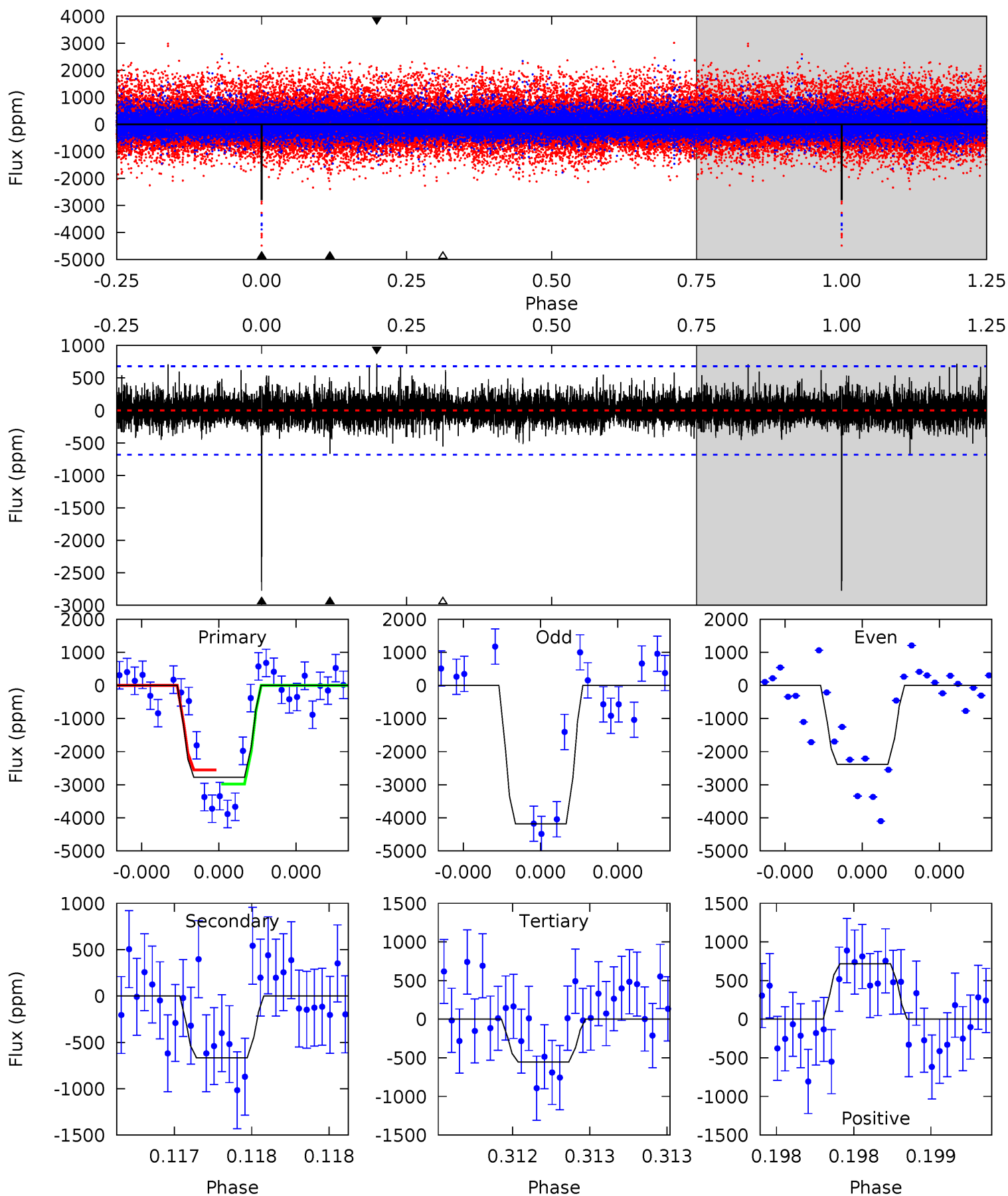
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	7.54	6.50	11.7	5.57	3.48	2.03	5.59	0.44	1.03	-4.12	3.46	1.04	0.49	2.22



Alt Model-Shift Uniqueness Test

006129451-02, P = 290.061502 Days, E = 49.662455 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.7	5.46	4.54	5.86	5.58	3.49	1.14	18.2	16.9	0.92	-0.40	6.93	0.85	0.20	0



Stellar Parameters For KIC 006129451

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3891^{+122}_{-150}	$4.668^{+0.063}_{-0.022}$	$0.210^{+0.200}_{-0.300}$	$0.590^{+0.033}_{-0.072}$	$0.592^{+0.041}_{-0.067}$	$4.053^{+1.286}_{-0.452}$
	+3%/-4%	+1%/-0%	+95%/-143%	+6%/-12%	+7%/-11%	+32%/-11%
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 006129451-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1270 ± 169	$4.60^{+4.12}_{-3.02}$	215^{+8}_{-8}	3097^{+1278}_{-499}	$17188^{+123726}_{-12610}$
Alt.	-667 ± 122	$4.98^{+4.12}_{-3.39}$	215^{+8}_{-9}	2778^{+1185}_{-402}	7776^{+69658}_{-5551}

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 $A_{obs} \gg 1.0$

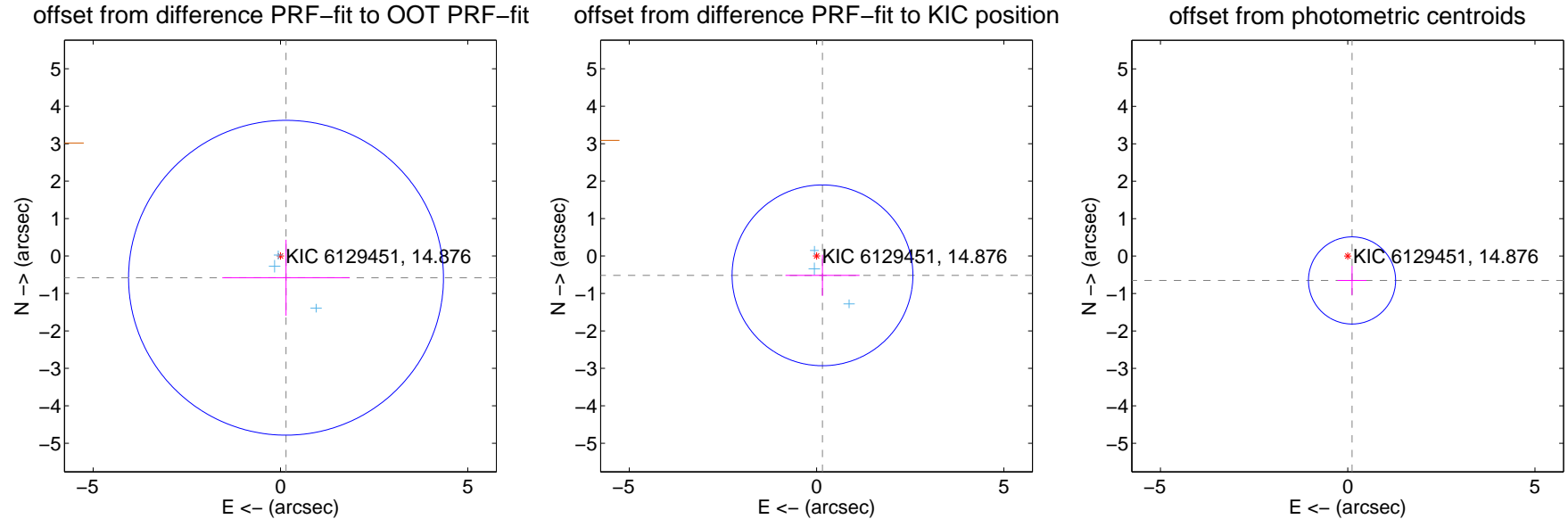
DV Centroid Data

Supplemental centroid analysis for 006129451-02. Kepler magnitude: 14.88. Transit SNR 8.00

There are 3 quarters with good PRF difference image offsets

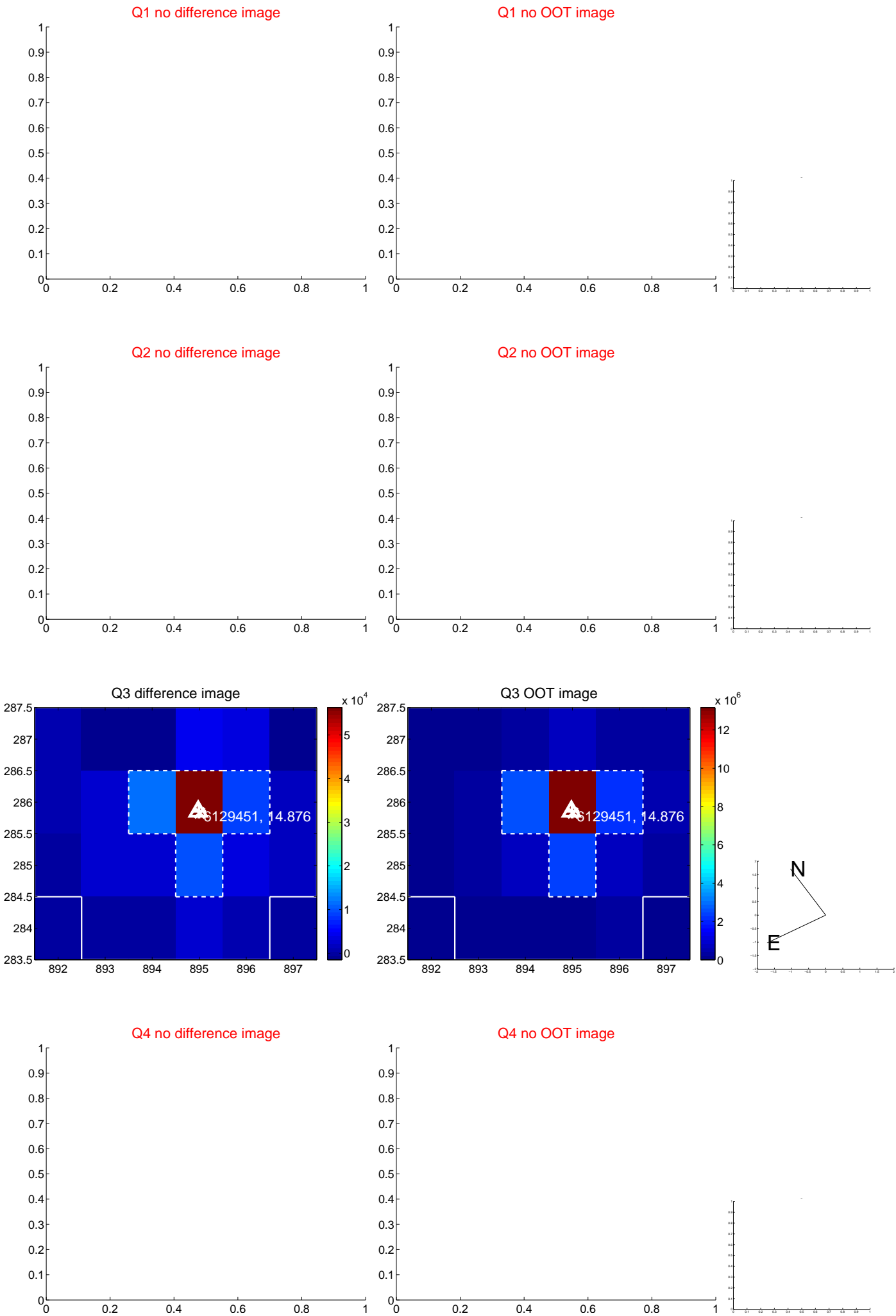
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.599 ± 1.401	0.43	-0.149 ± 1.703	-0.580 ± 1.016
PRF-fit source offset from KIC position	0.539 ± 0.805	0.67	-0.158 ± 0.988	-0.516 ± 0.549
photometric centroid source offset	0.66 ± 0.39	1.70	-0.12 ± 0.39	-0.65 ± 0.39



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.

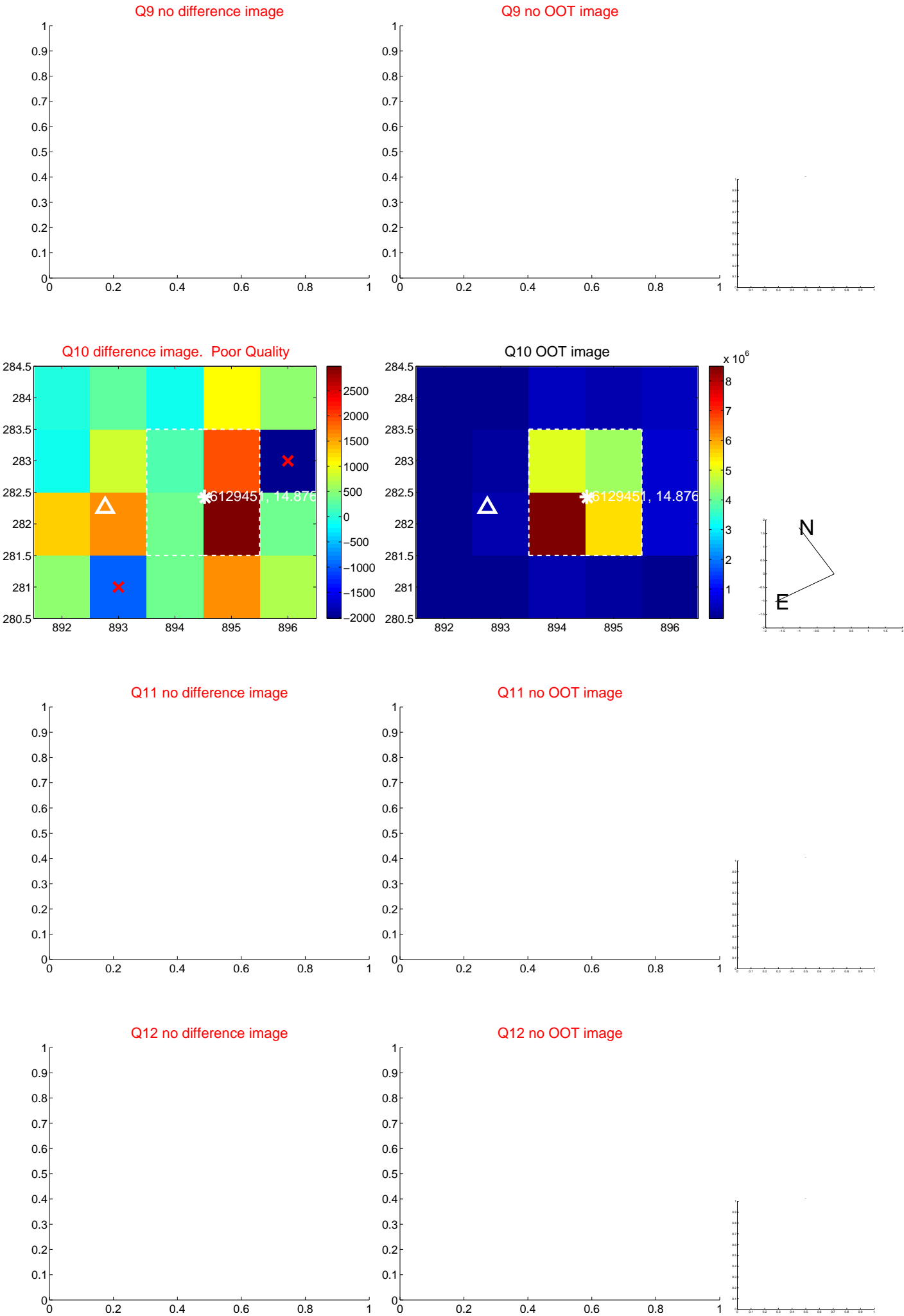
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



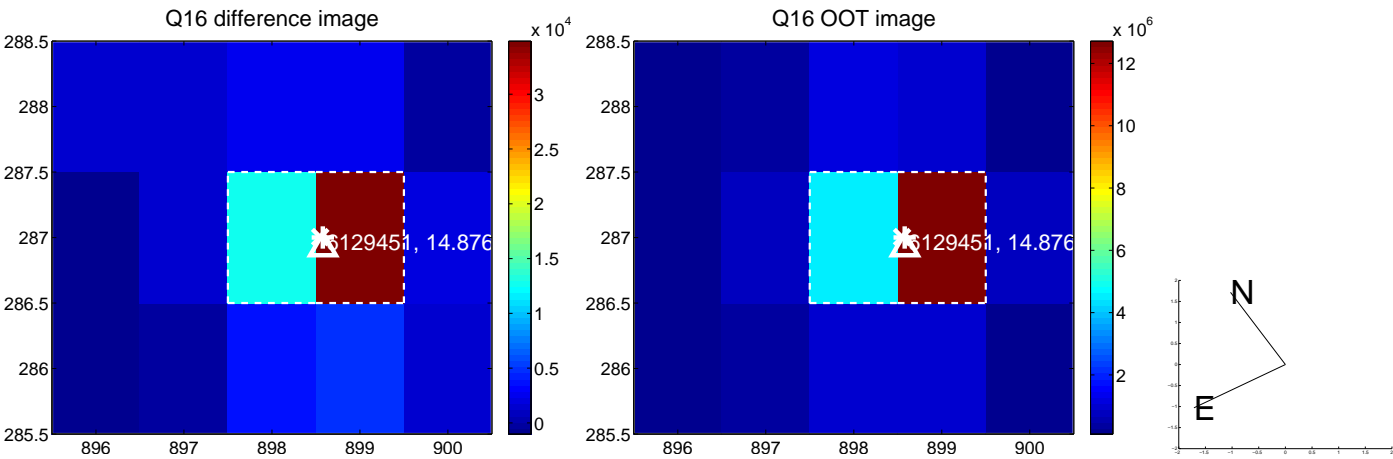
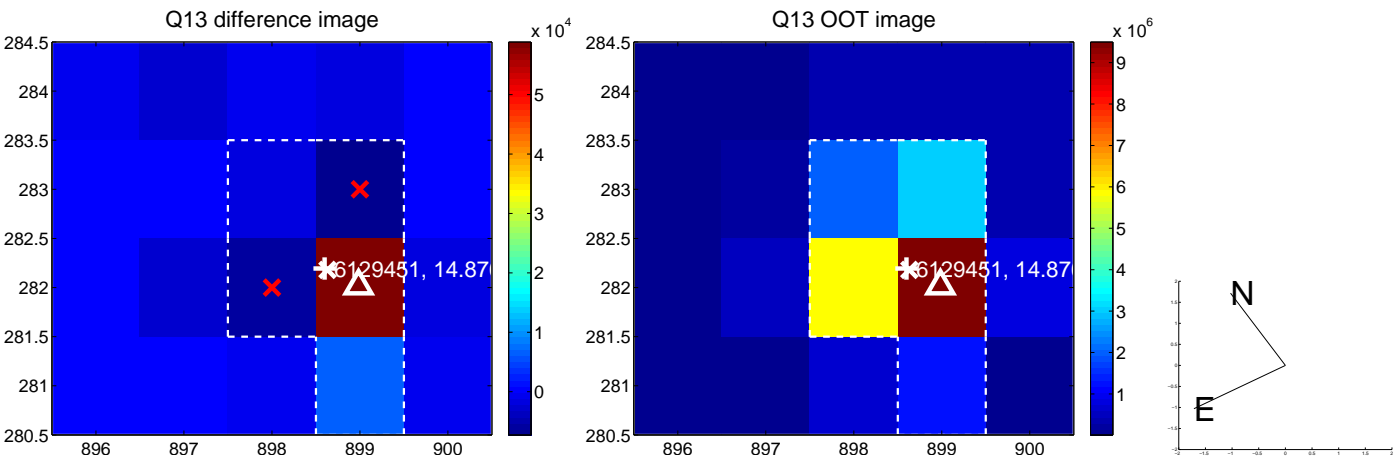
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



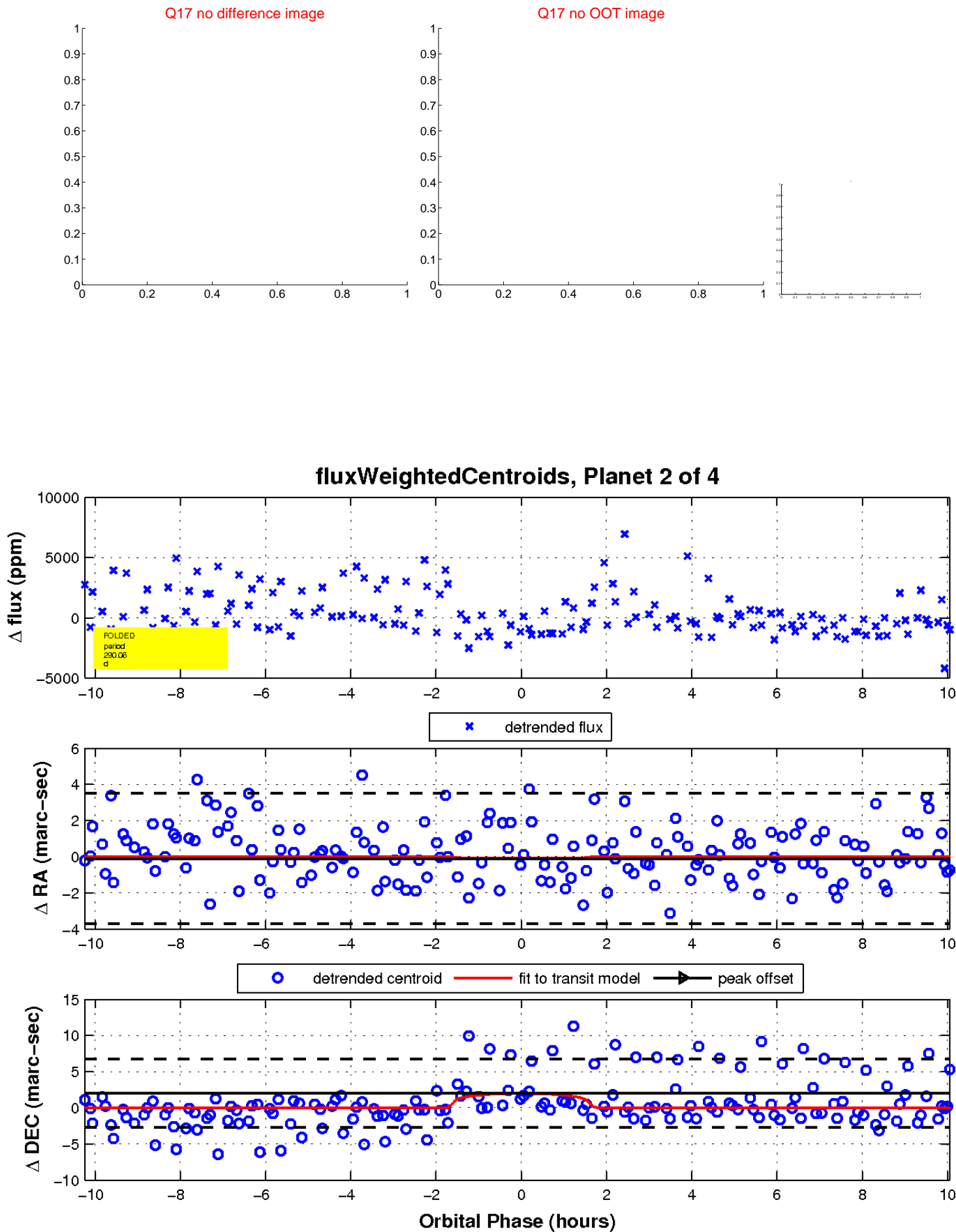
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

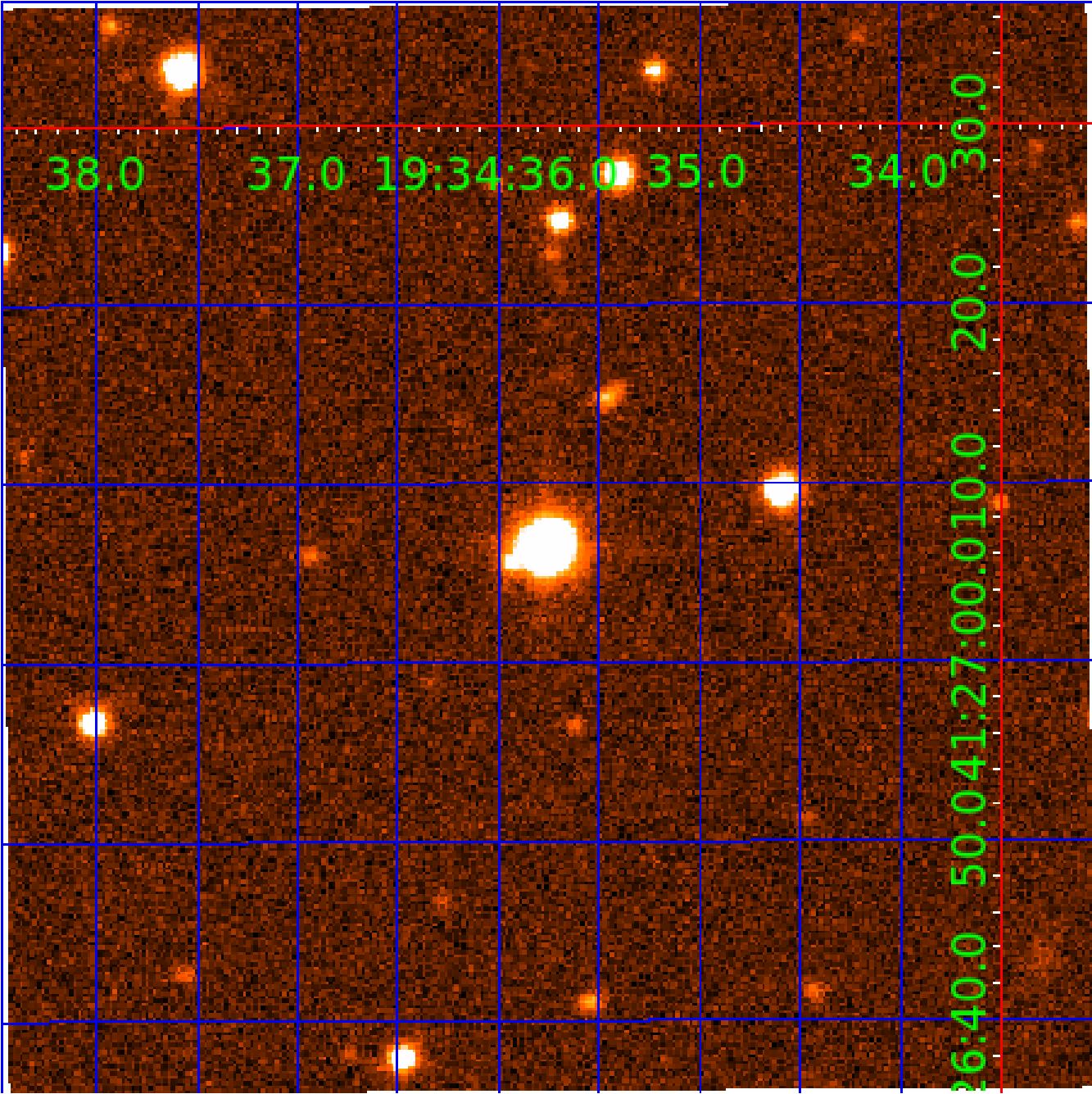


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006129451

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})
006129451-01	OBS	No	416.696519	453.699913	3026.2	12.685	16.5	5.7	0.59	3891	3.15	0.09
006129451-02	OBS	No	290.061096	339.720848	2678.3	3.426	13.6	8.0	0.59	3891	3.02	0.14
006129451-03	OBS	No	489.884846	560.520893	3174.9	10.996	14.8	7.7	0.59	3891	3.25	0.07
006129451-04	OBS	No	295.612097	189.292130	2582.8	2.932	14.8	8.9	0.59	3891	3.61	0.14

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006129451-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
006129451-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
006129451-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006129451-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS

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

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

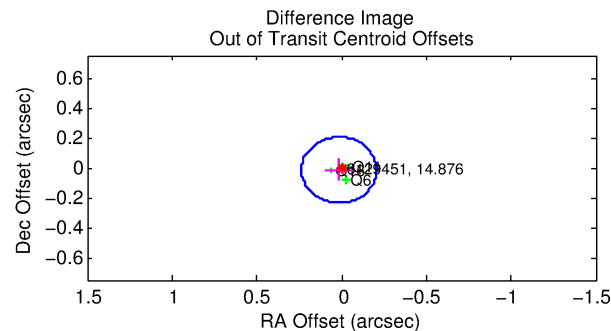
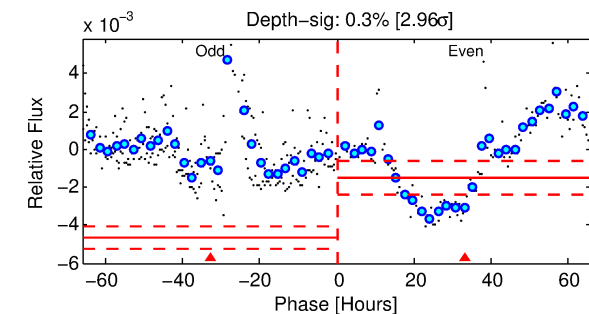
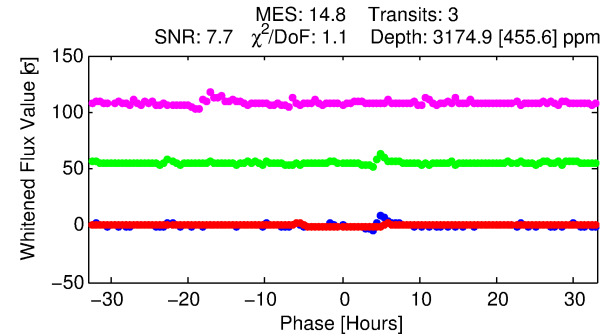
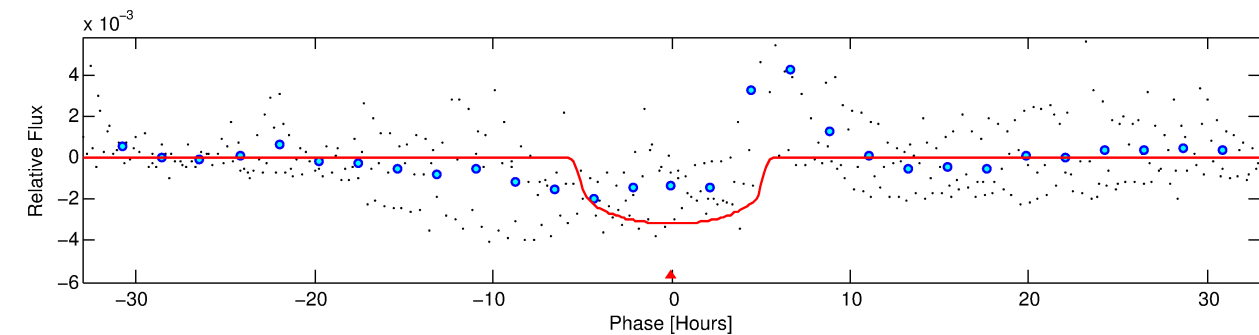
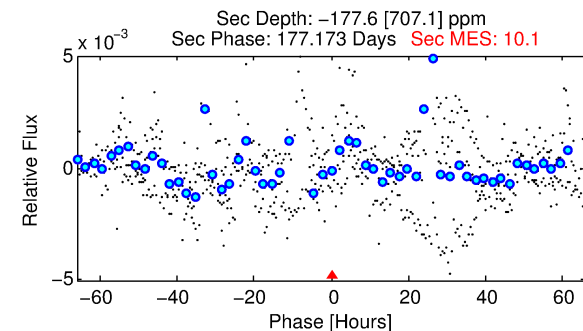
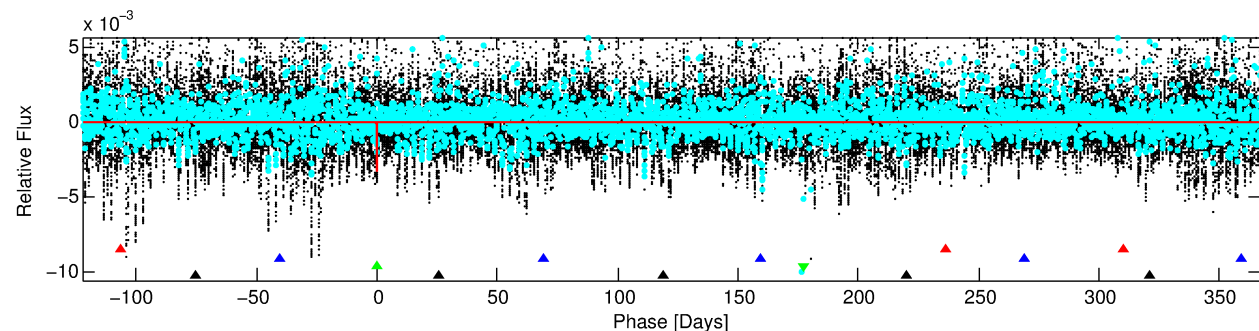
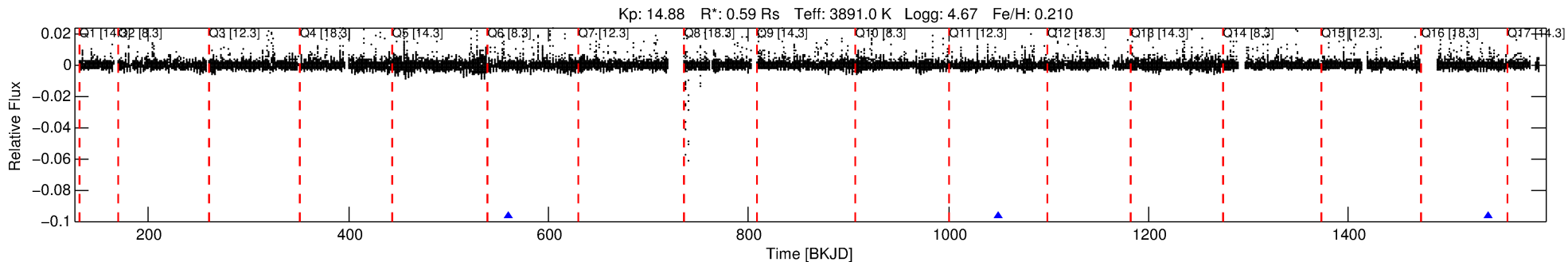
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006129451-03

No Significant Match Found

DV One-Page Summary

KIC: 6129451 Candidate: 3 of 4 Period: 489.885 d



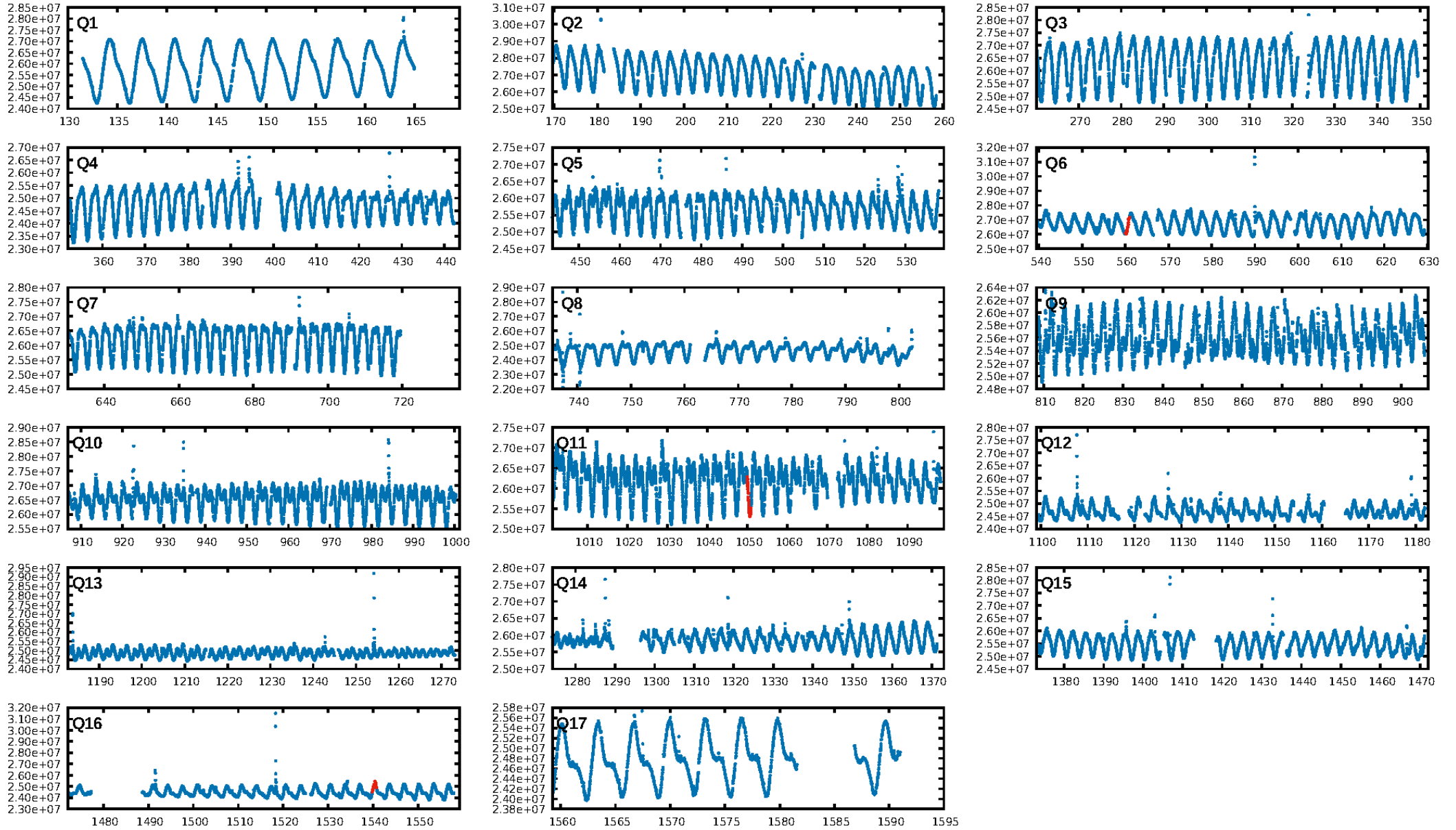
DV Fit Results:

Period = 489.88485 [0.00577] d
Epoch = 560.5209 [0.0076] BKJD
Rp/R* = 0.0505 [0.0115]
a/R* = 346.65 [243.41]
b = 0.26 [2.58]
Seff = 0.07 [0.01]
Teq = 130 [7] K
Rp = 3.25 [0.84] Re
a = 1.0209 [0.0966] AU
Ag = N/A
Teffp = N/A

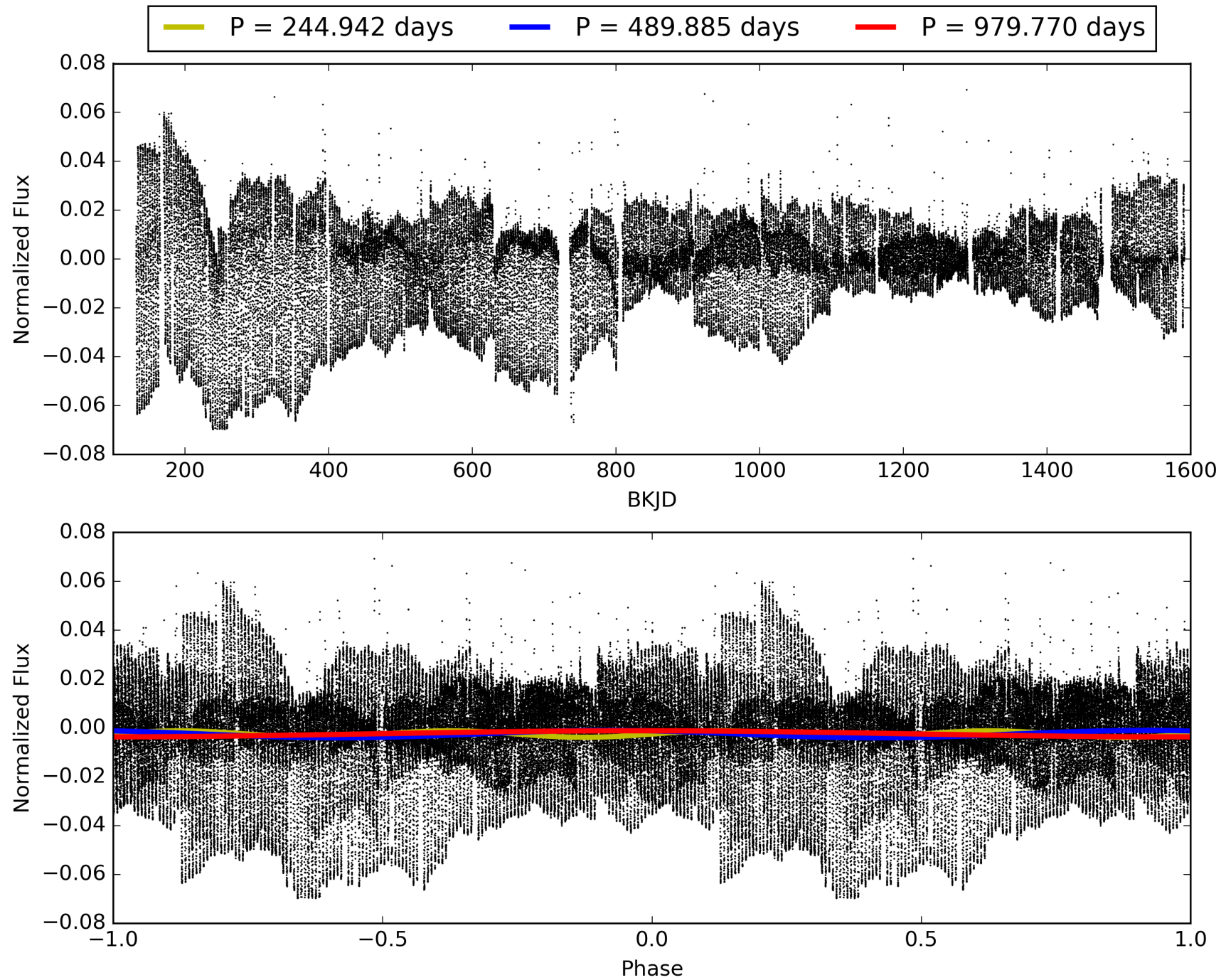
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [104.63σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 42.0%
ModelChiSquareGof-sig: 95.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.008057
Centroid-sig: 39.9%
Centroid-so: 0.062 arcsec [0.26σ]
OotOffset-rm: 0.022 arcsec [0.30σ]
KicOffset-rm: 0.021 arcsec [0.31σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 006129451-03, PDC Light Curves

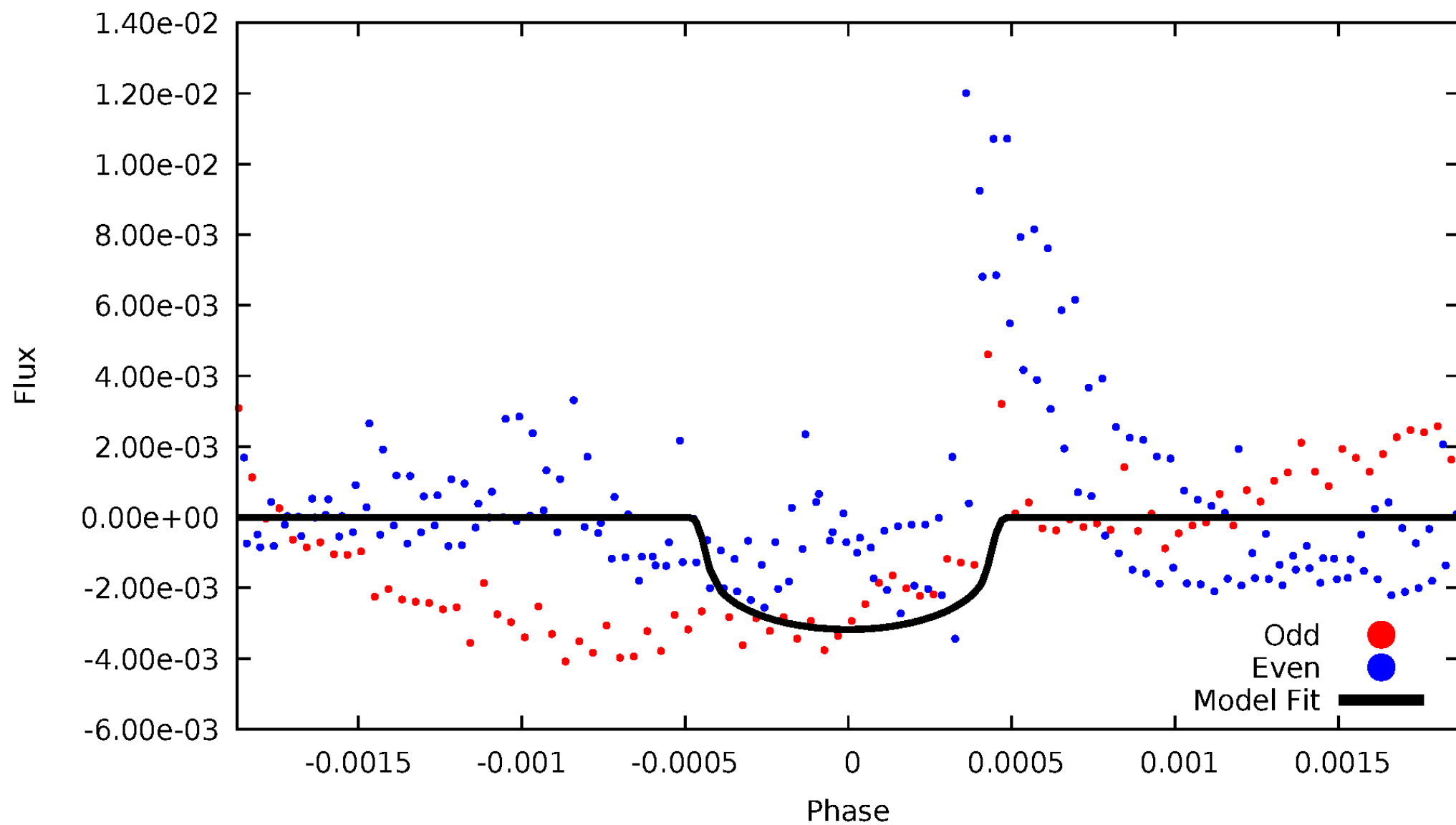


TCE 006129451-03



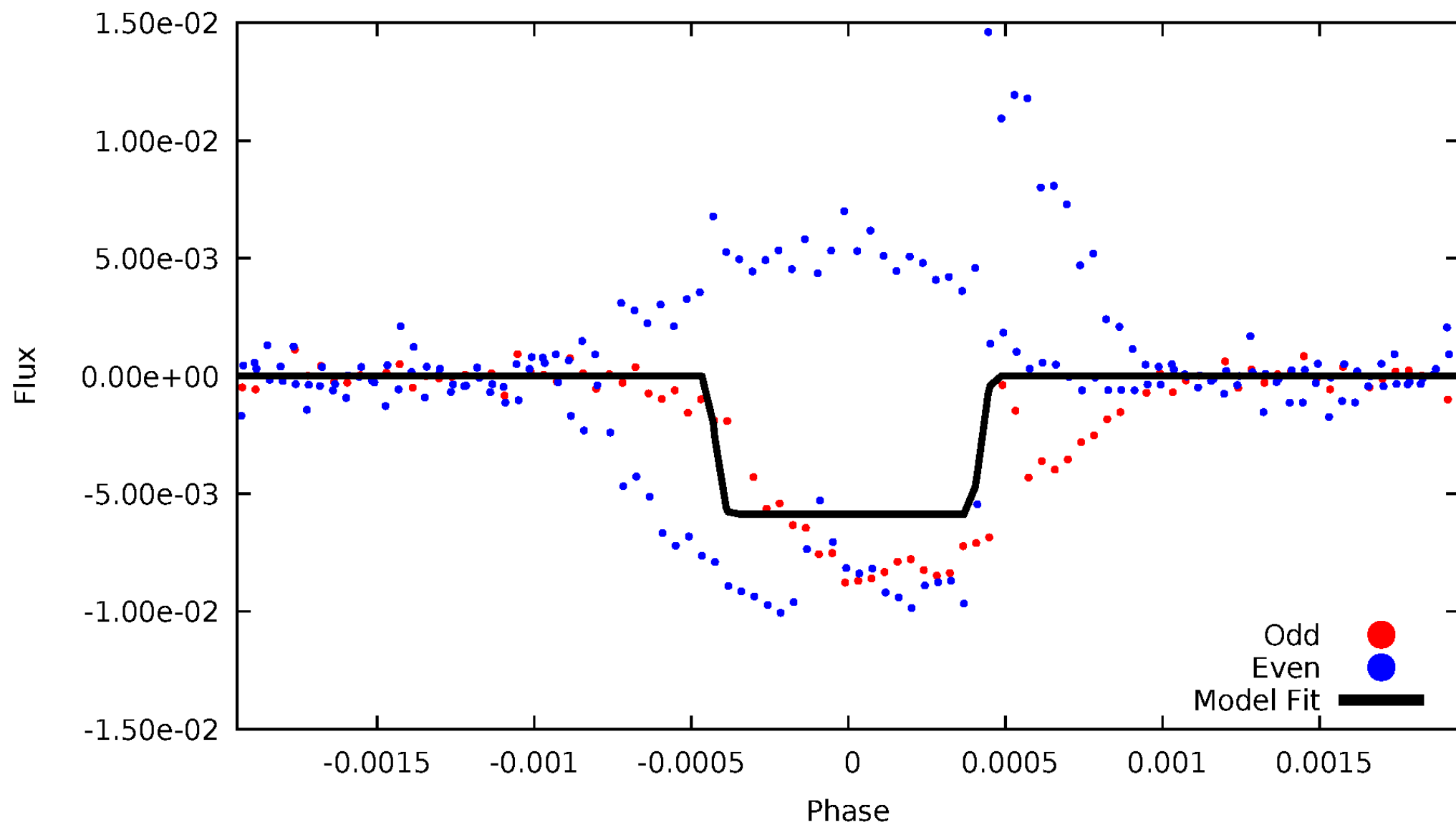
DV Odd/Even

TCE 006129451-03



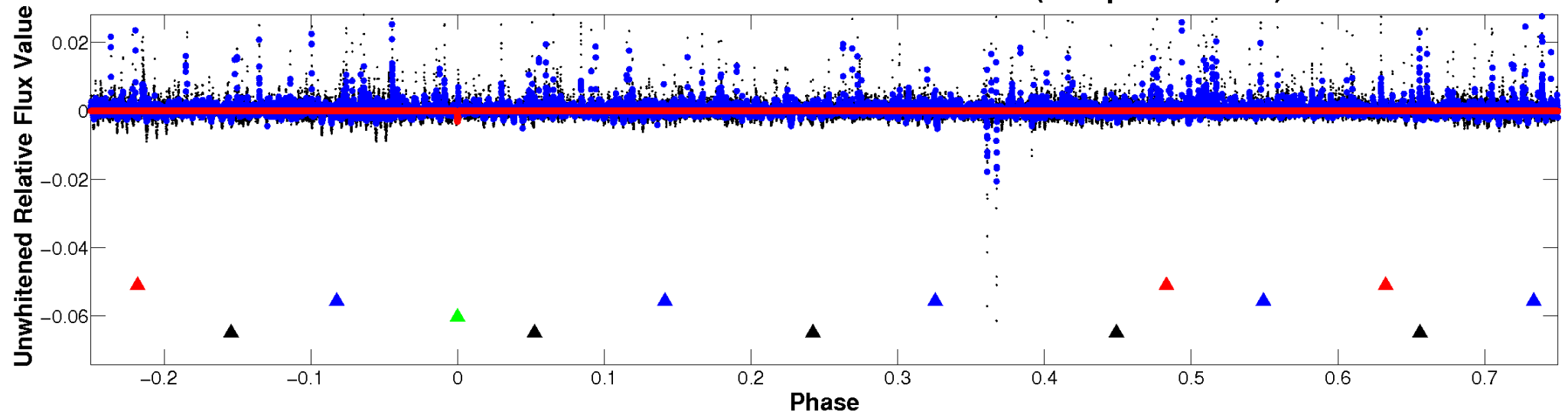
ALT Odd/Even

TCE 006129451-03

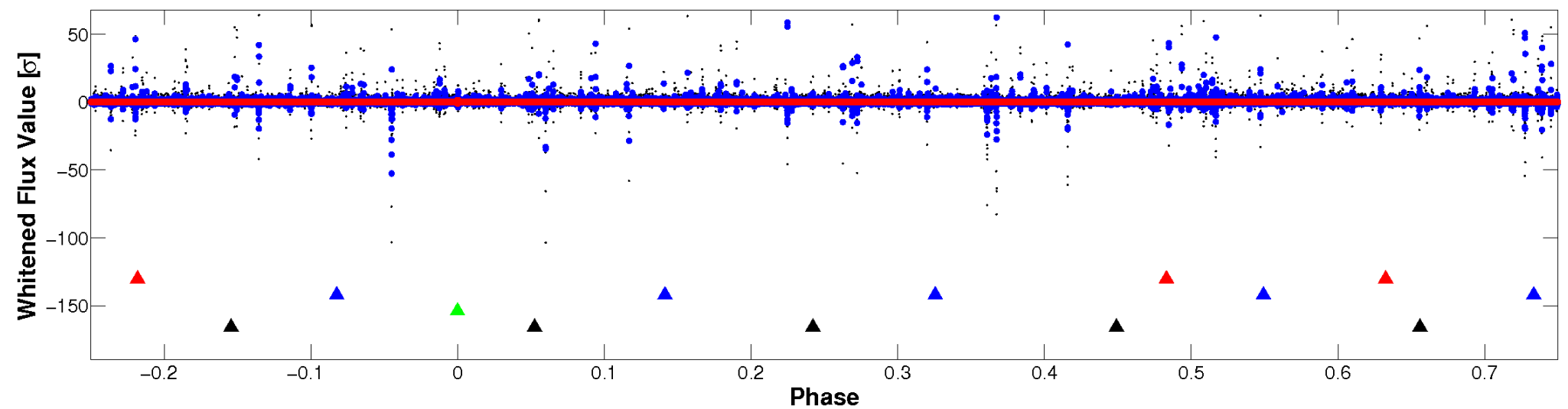


Non-Whitened Vs. Whitened Light Curve

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

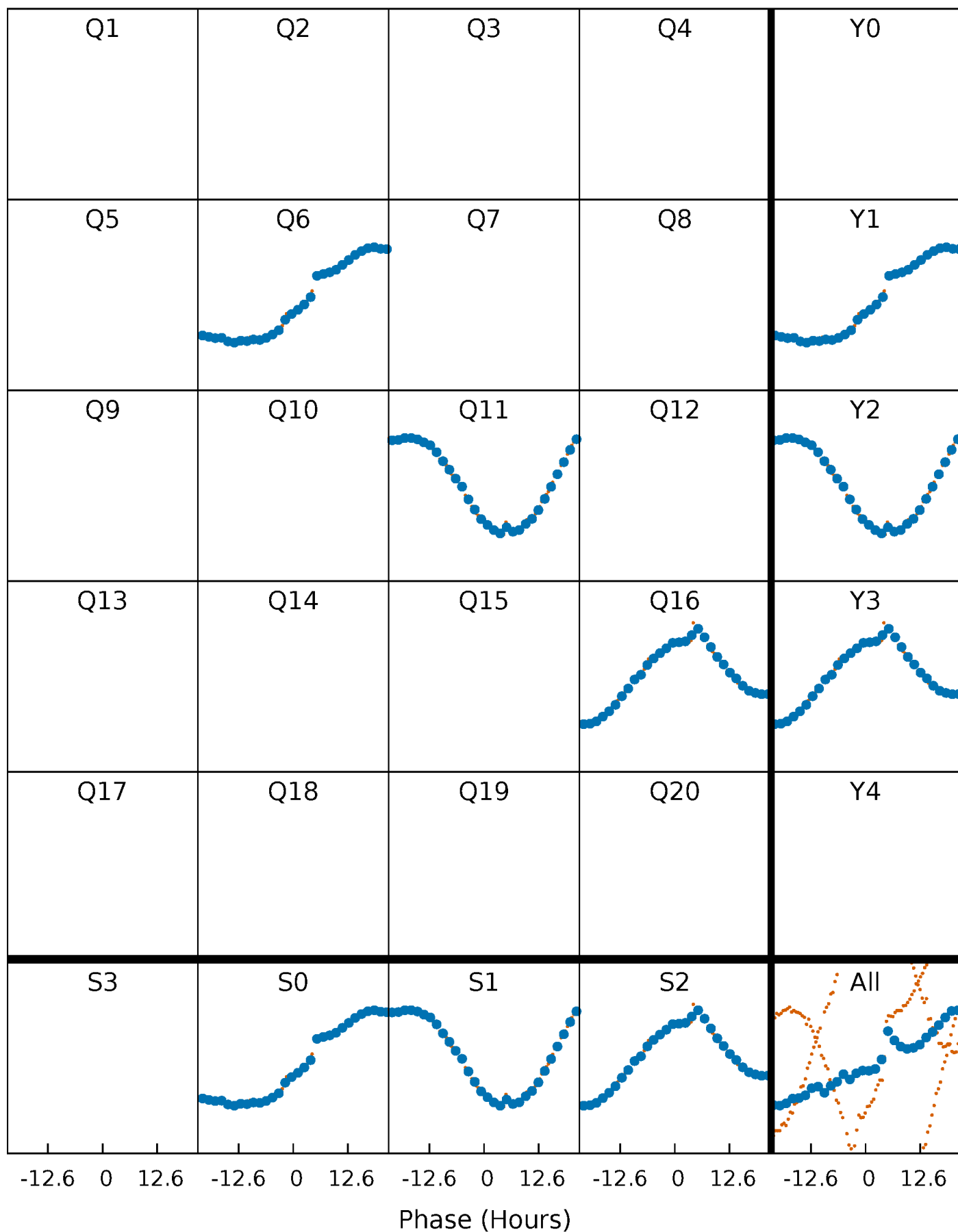


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



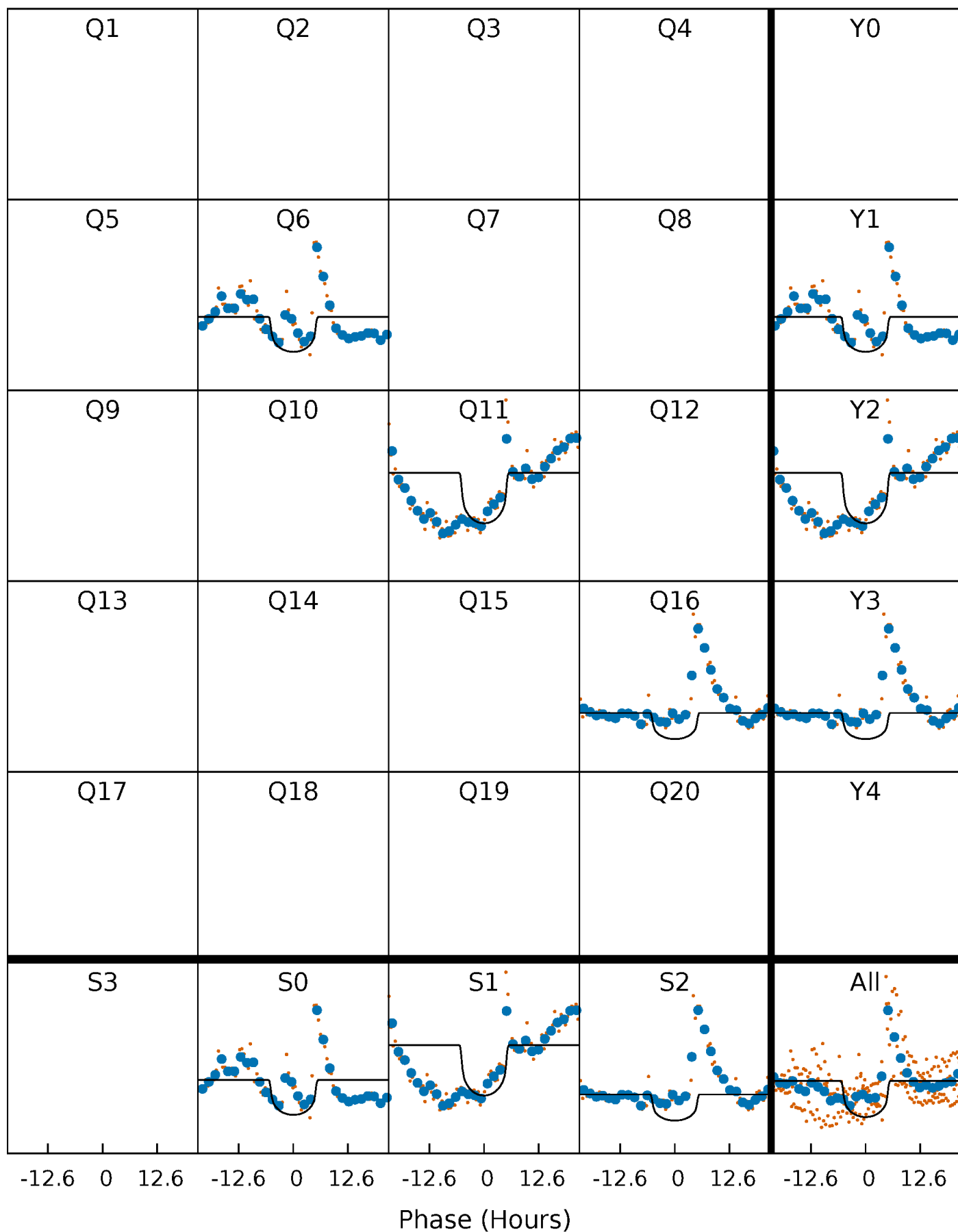
PDC Quarter-Phased Transit Curves

TCE 006129451-03 P=489.884846 Days $T_0=560.520894$ (BKJD)



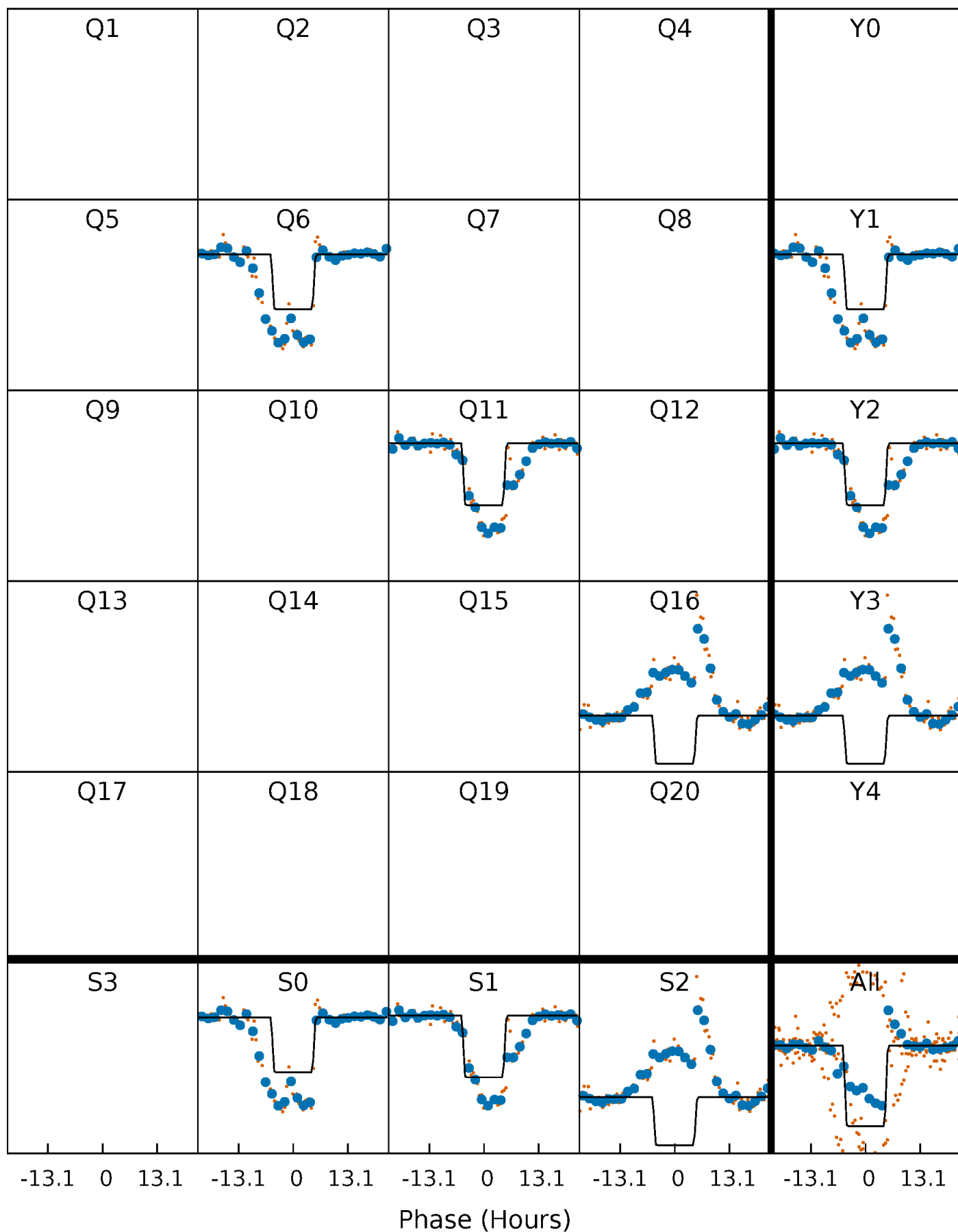
DV Quarter-Phased Transit Curves

TCE 006129451-03 $P=489.884846$ Days $T_0=560.520894$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

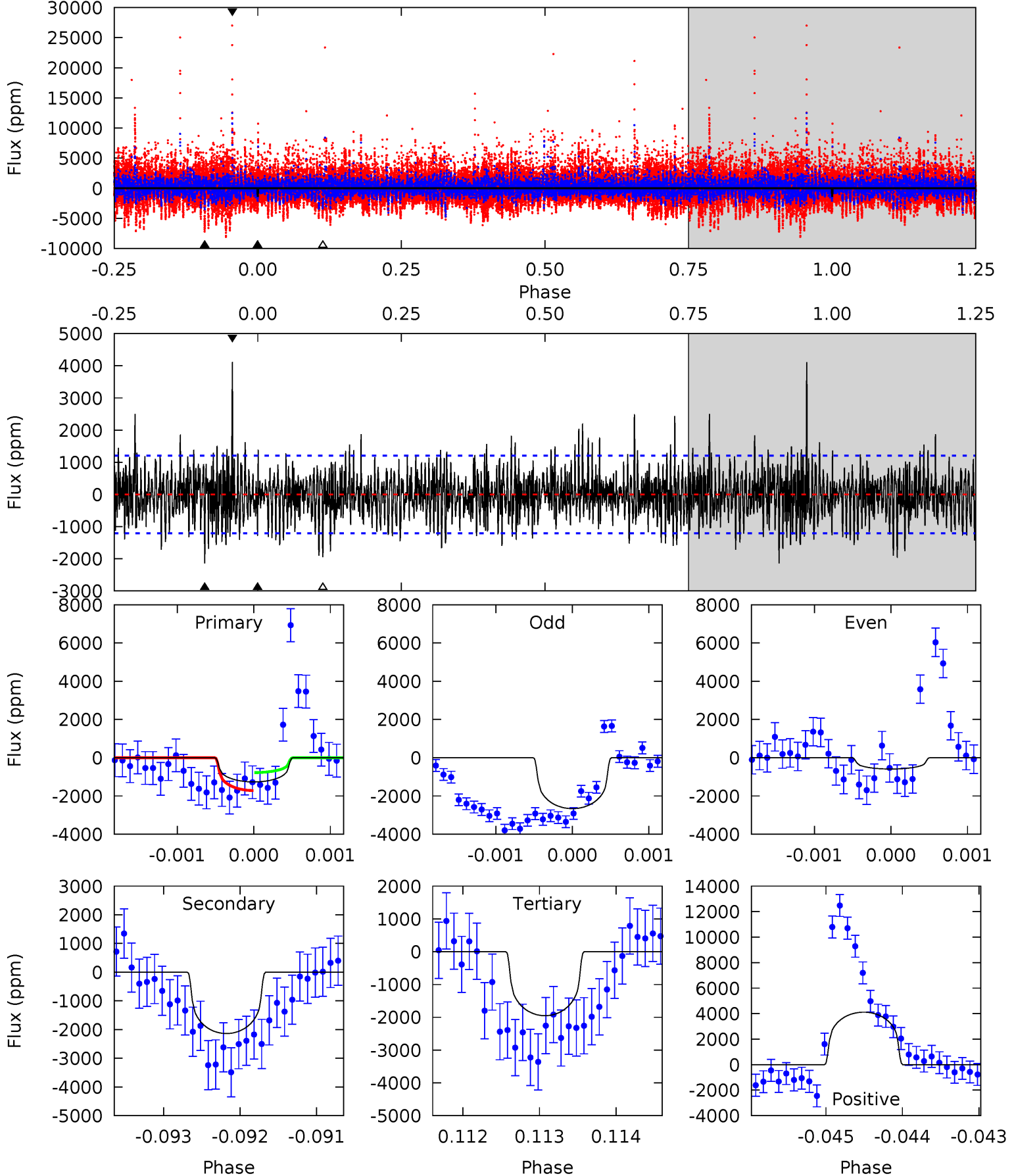
TCE 006129451-03 P=489.874167 Days $T_0=560.500687$ (BKJD)



DV Model-Shift Uniqueness Test

006129451-03, P = 489.884846 Days, E = 70.636048 Days

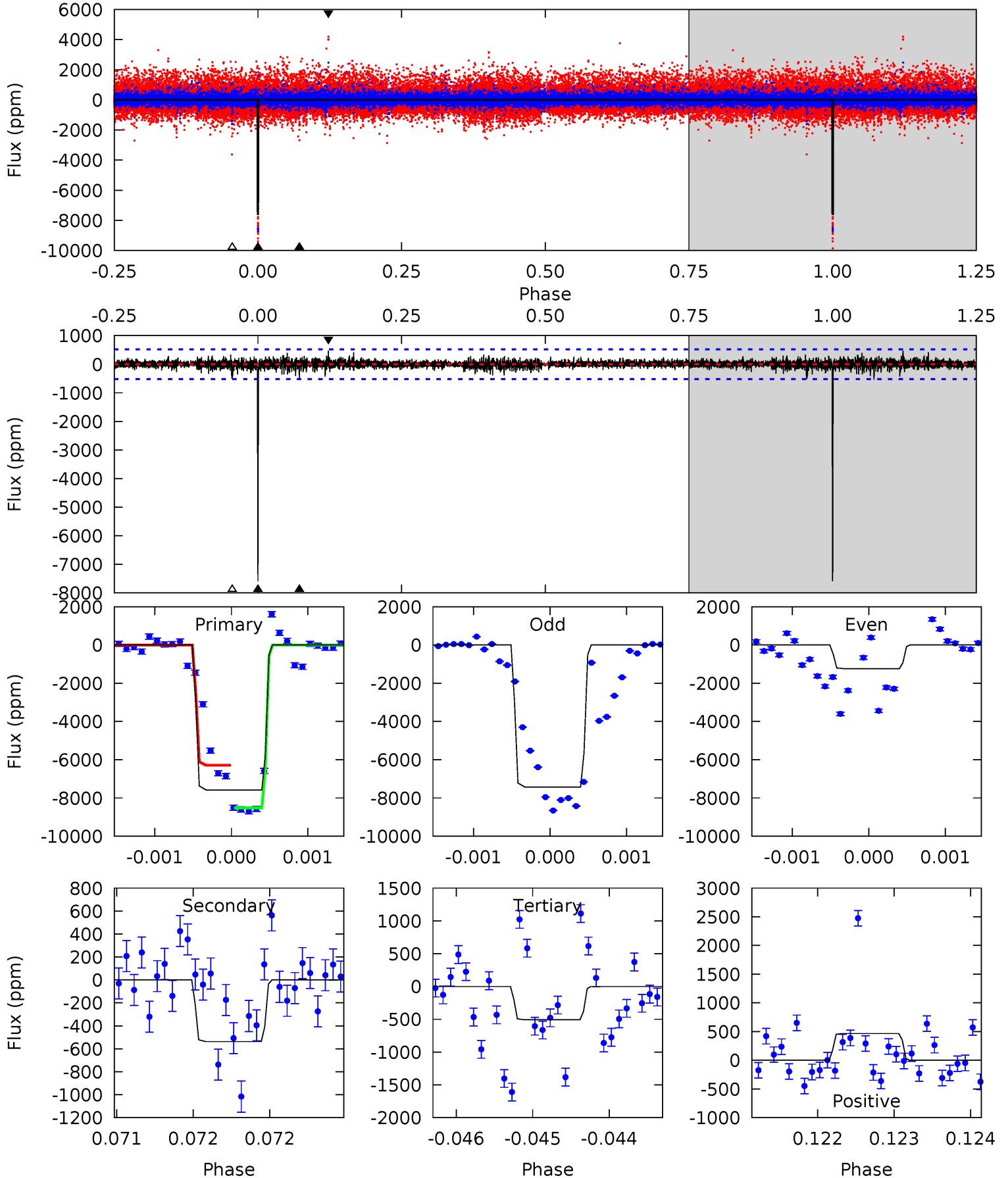
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.73	9.67	8.83	18.6	5.46	3.30	2.71	-3.10	-12.9	0.84	-8.94	3.13	0.97	0.66	2.12



Alt Model-Shift Uniqueness Test

006129451-03, P = 489.874167 Days, E = 70.626520 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
79.9	5.66	5.34	4.90	5.47	3.31	0.86	74.5	75.0	0.32	0.76	36.6	0.50	0.06	11.7



Stellar Parameters For KIC 006129451

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3891^{+122}_{-150}	$4.668^{+0.063}_{-0.022}$	$0.210^{+0.200}_{-0.300}$	$0.590^{+0.033}_{-0.072}$	$0.592^{+0.041}_{-0.067}$	$4.053^{+1.286}_{-0.452}$
	+3%/-4%	+1%/-0%	+95%/-143%	+6%/-12%	+7%/-11%	+32%/-11%
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 006129451-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2138 ± 221	$3.19^{+0.77}_{-0.69}$	181^{+7}_{-8}	3762^{+369}_{-276}	121654^{+77867}_{-43033}
Alt.	-537 ± 95	$4.89^{+0.77}_{-0.77}$	181^{+7}_{-8}	2718^{+141}_{-130}	13305^{+5162}_{-3855}

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 $A_{obs} \gg 1.0$

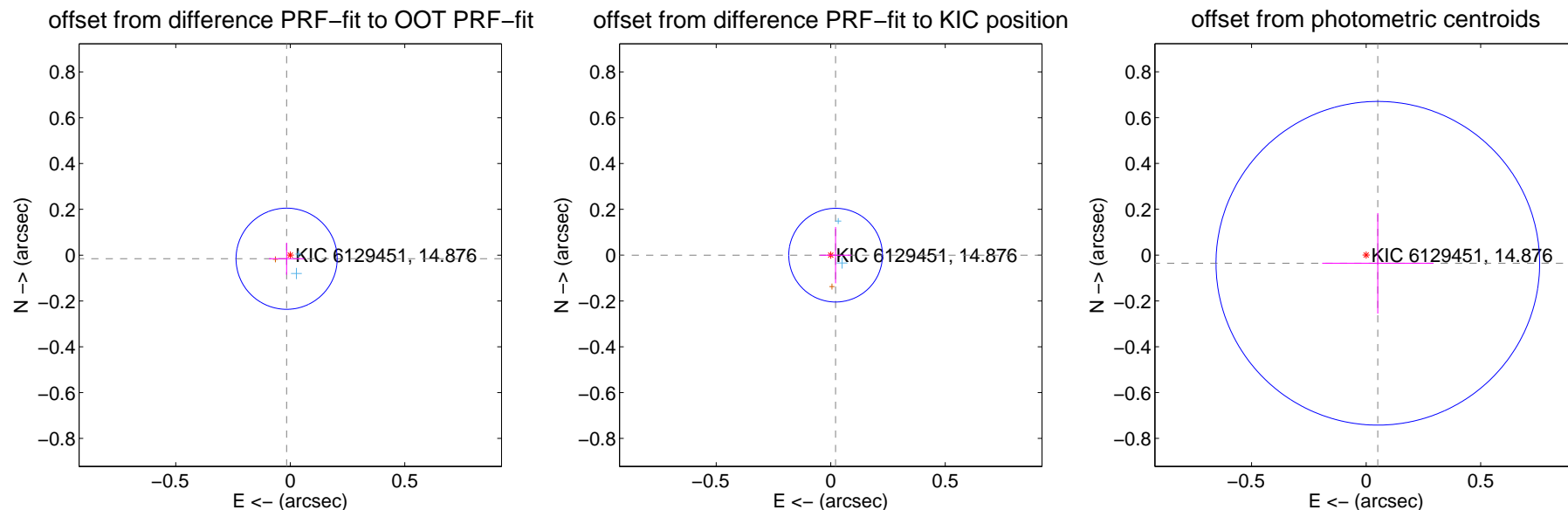
DV Centroid Data

Supplemental centroid analysis for 006129451-03. Kepler magnitude: 14.88. Transit SNR 7.66

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.022 ± 0.074	0.30	0.016 ± 0.077	-0.016 ± 0.070
PRF-fit source offset from KIC position	0.021 ± 0.068	0.31	-0.021 ± 0.068	-0.000 ± 0.123
photometric centroid source offset	0.06 ± 0.24	0.26	-0.05 ± 0.24	-0.04 ± 0.22



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.

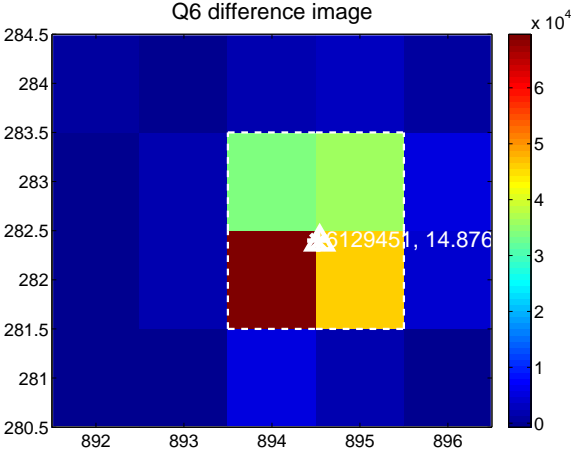
Q5 no difference image



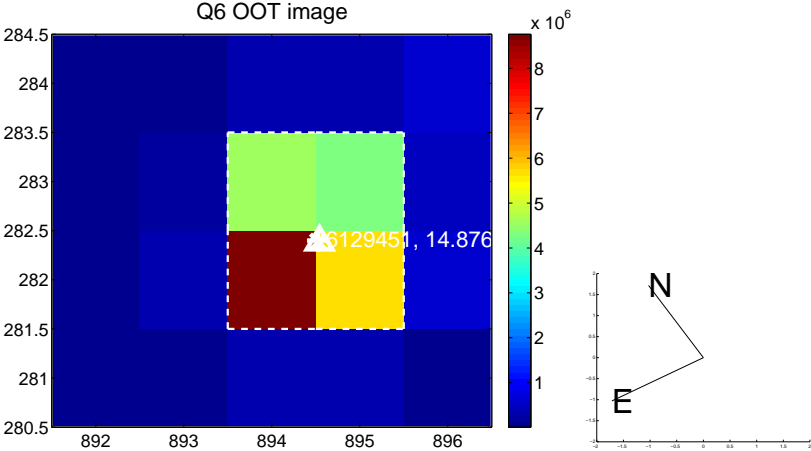
Q5 no OOT image



Q6 difference image



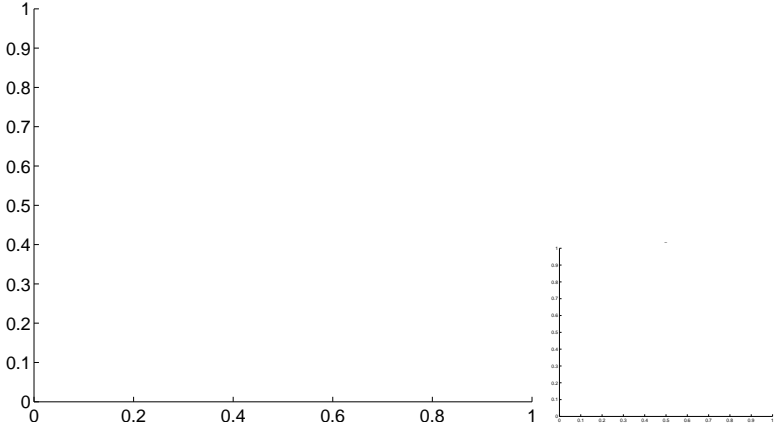
Q6 OOT image



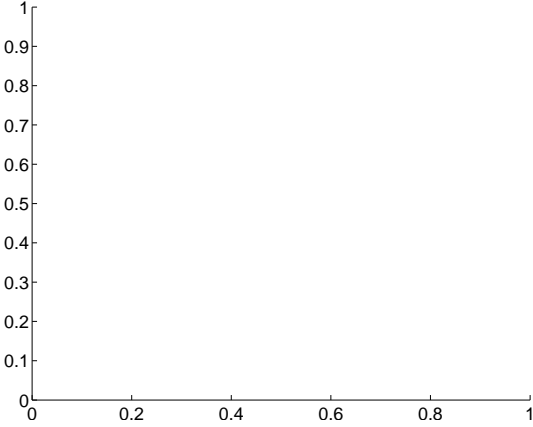
Q7 no difference image



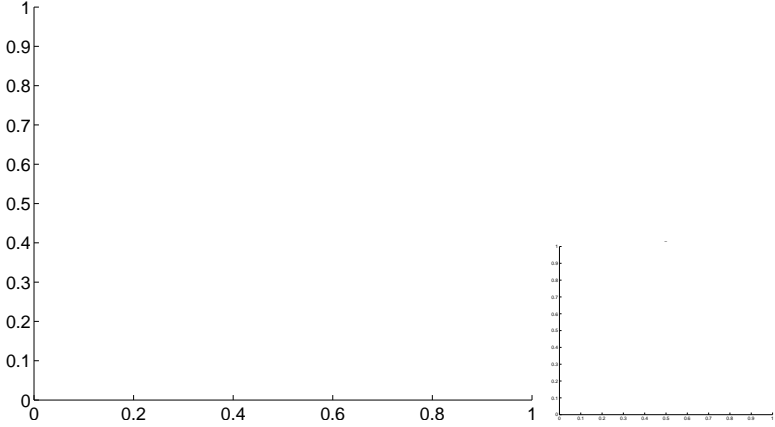
Q7 no OOT image



Q8 no difference image



Q8 no OOT image



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

Q9 no difference image



Q9 no OOT image



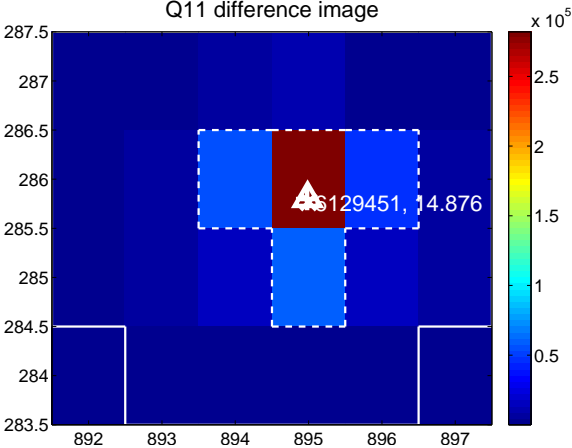
Q10 no difference image



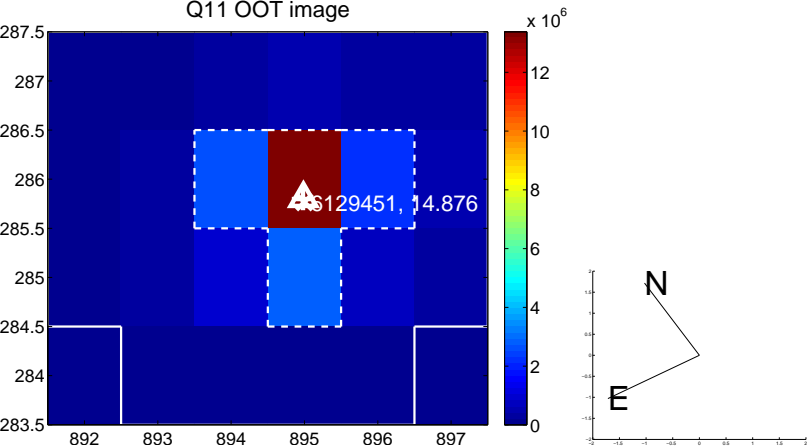
Q10 no OOT image



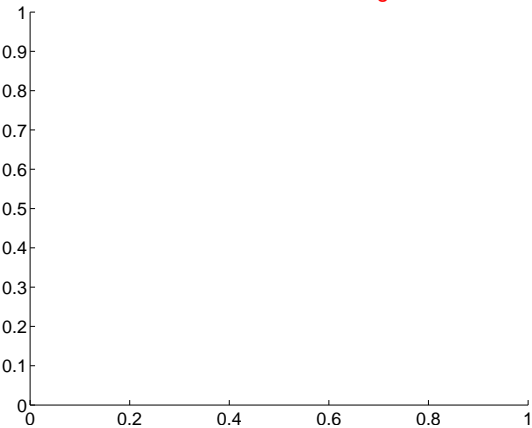
Q11 difference image



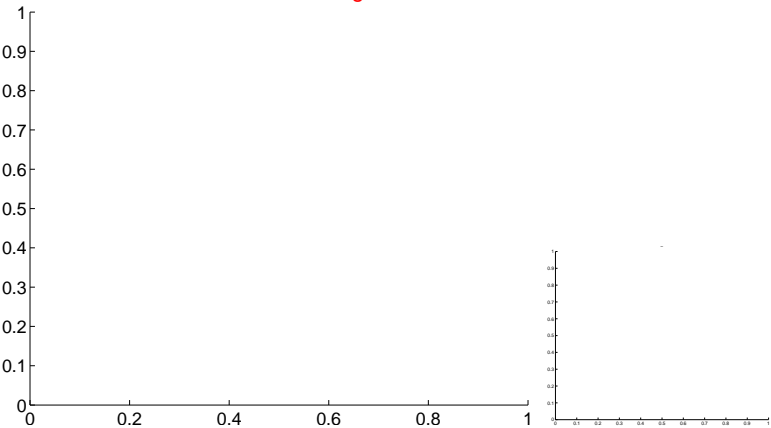
Q11 OOT image



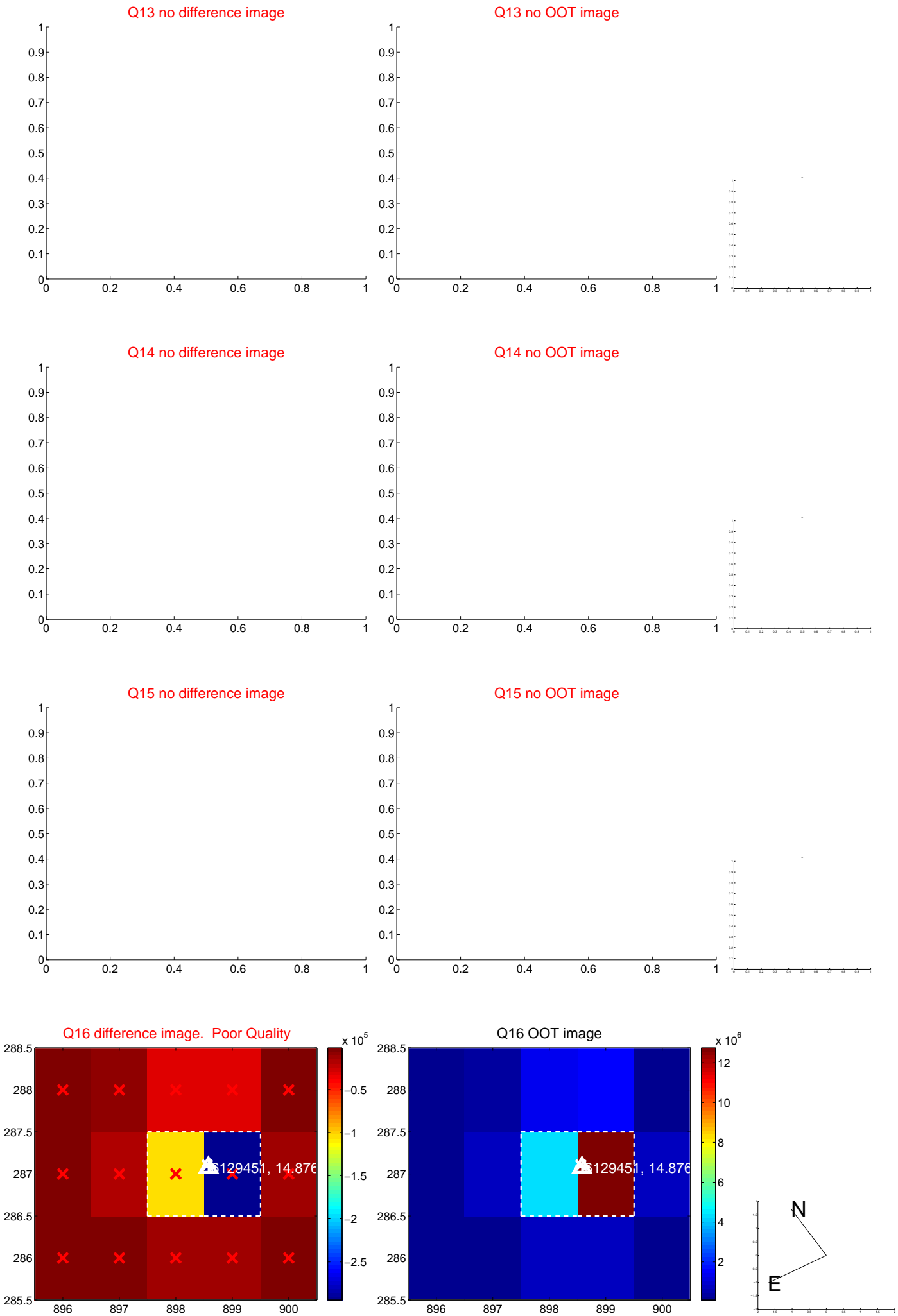
Q12 no difference image



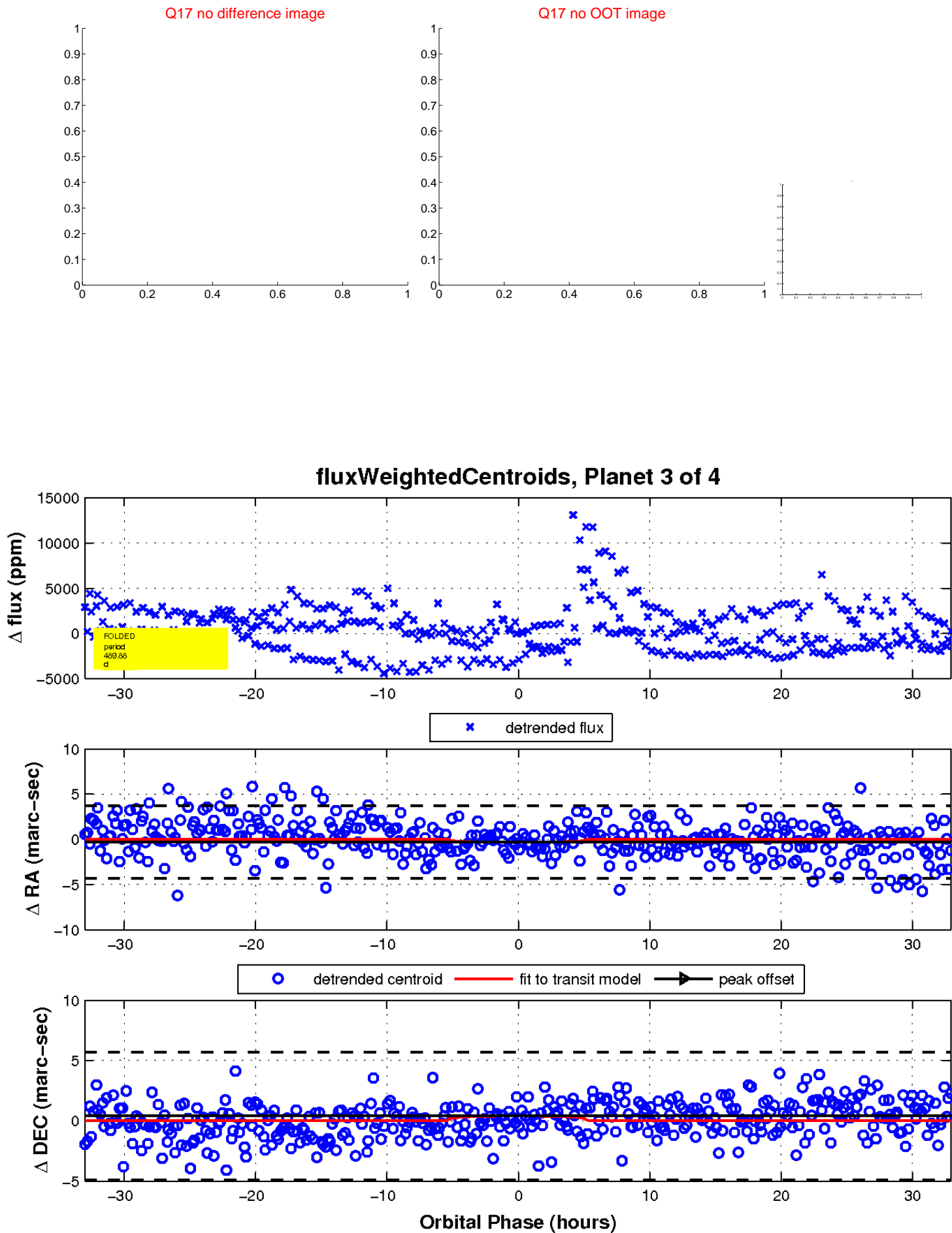
Q12 no OOT image



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

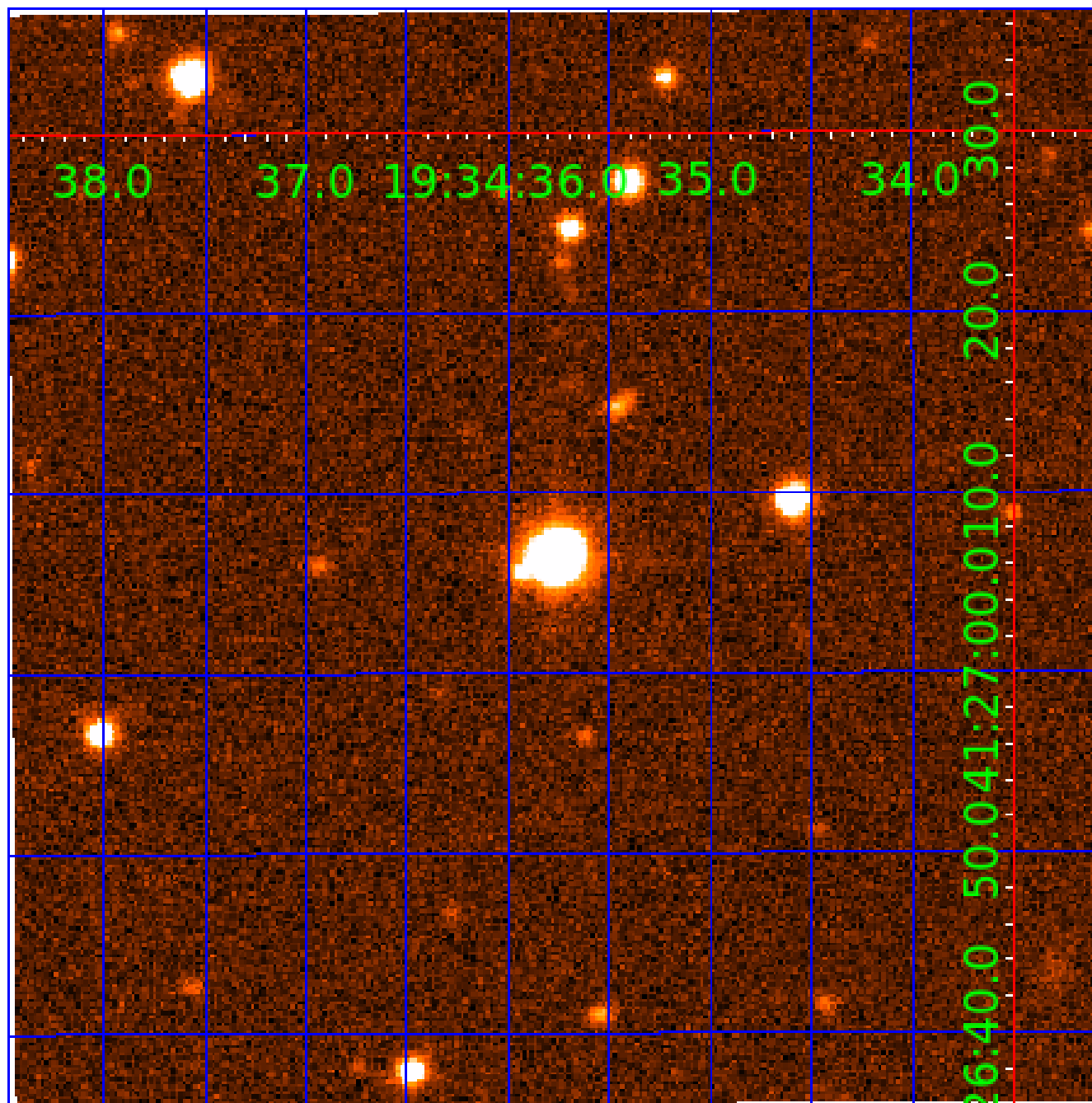


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006129451

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})
006129451-01	OBS	No	416.696519	453.699913	3026.2	12.685	16.5	5.7	0.59	3891	3.15	0.09
006129451-02	OBS	No	290.061096	339.720848	2678.3	3.426	13.6	8.0	0.59	3891	3.02	0.14
006129451-03	OBS	No	489.884846	560.520893	3174.9	10.996	14.8	7.7	0.59	3891	3.25	0.07
006129451-04	OBS	No	295.612097	189.292130	2582.8	2.932	14.8	8.9	0.59	3891	3.61	0.14

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006129451-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
006129451-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
006129451-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006129451-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS

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

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

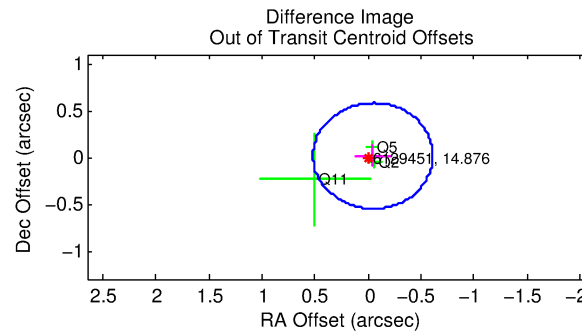
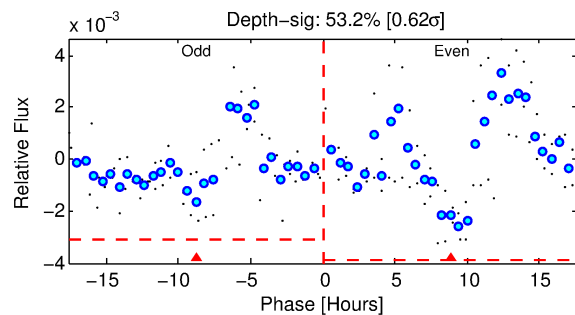
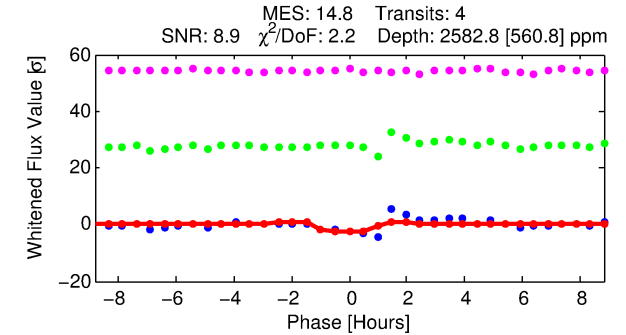
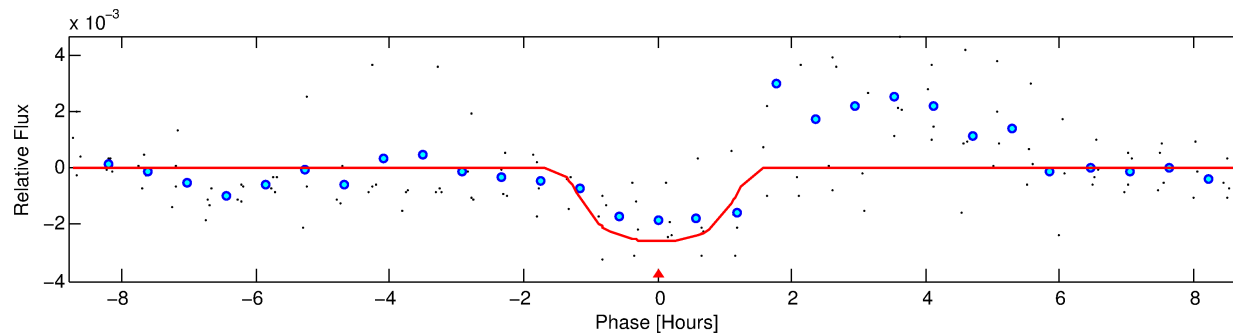
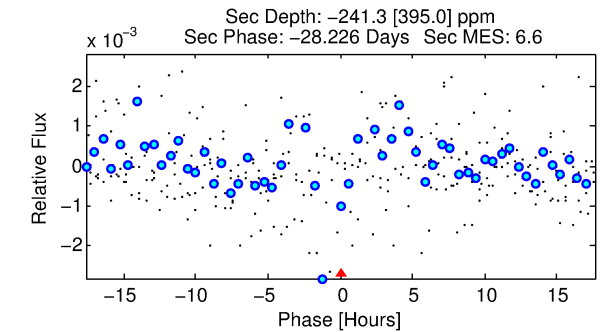
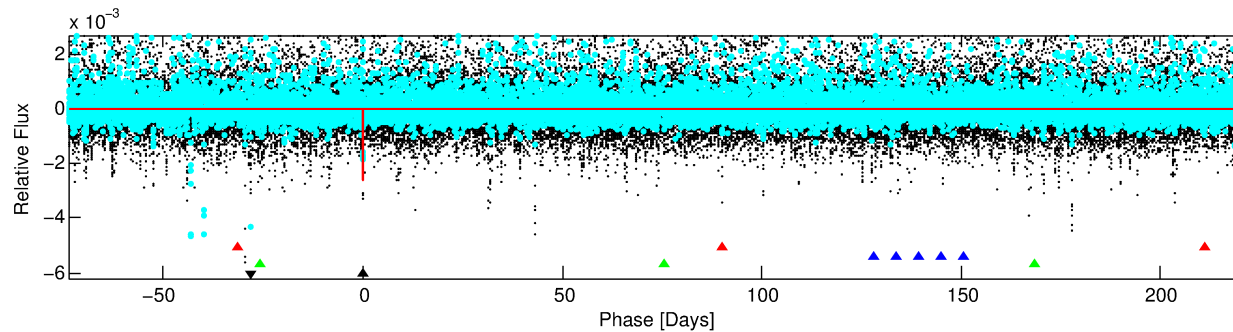
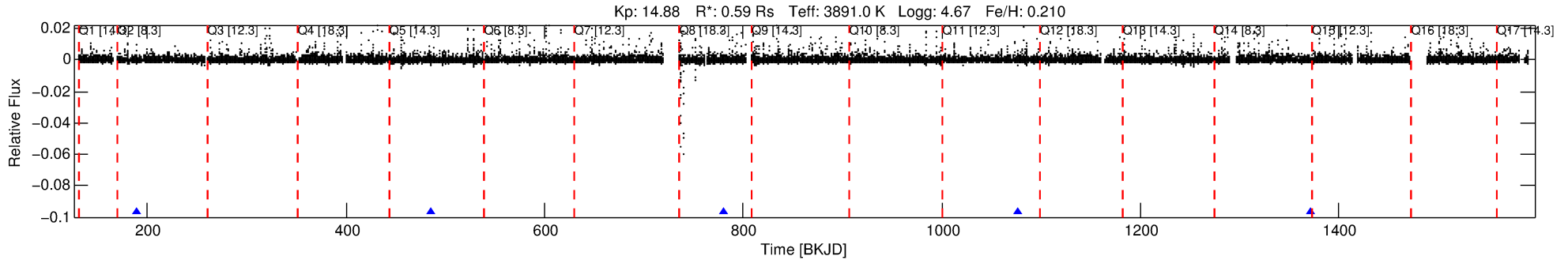
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006129451-04

No Significant Match Found

DV One-Page Summary

KIC: 6129451 Candidate: 4 of 4 Period: 295.612 d



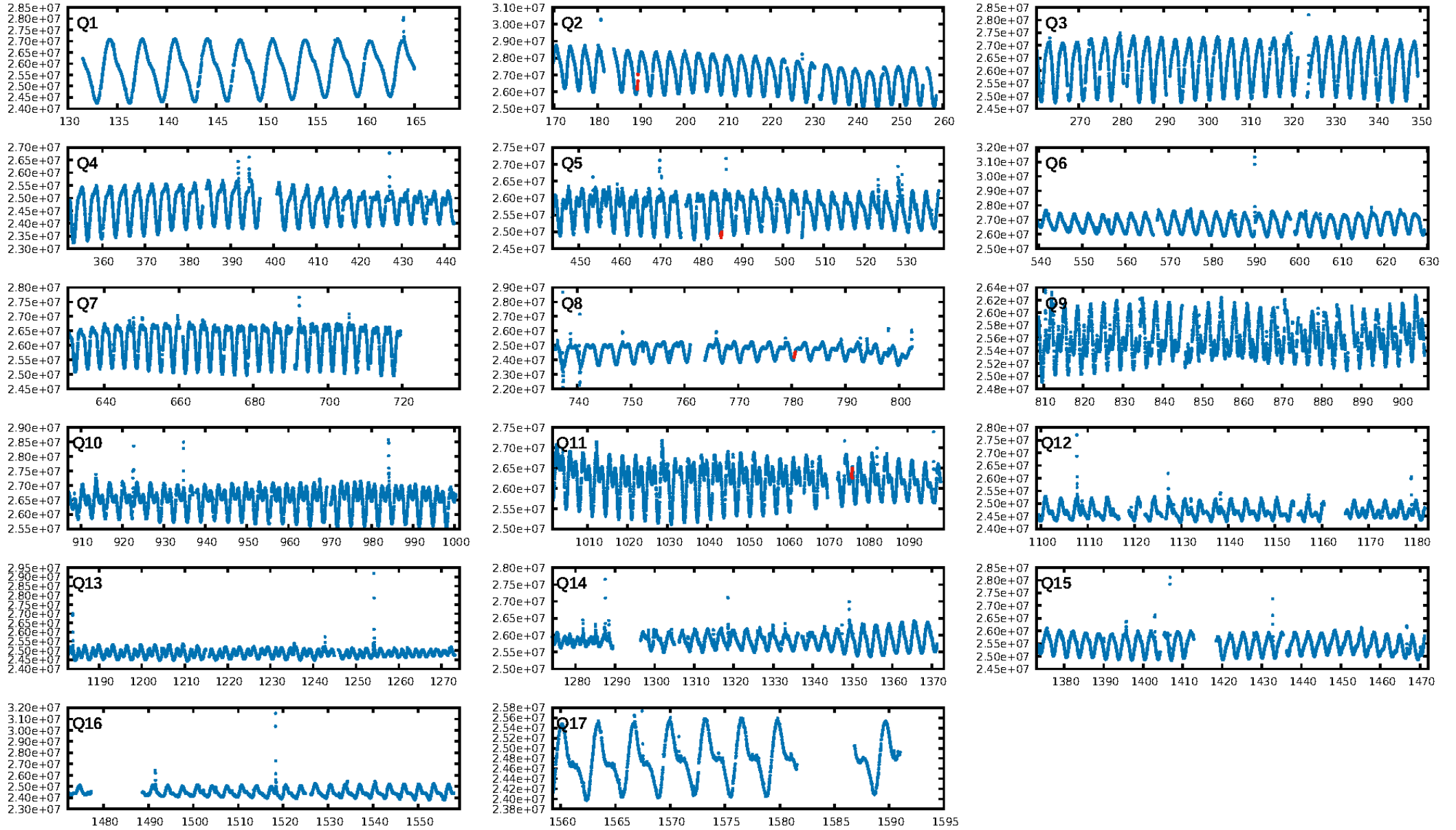
DV Fit Results:

Period = 295.61210 [0.00375] d
Epoch = 189.2921 [0.0072] BKJD
Rp/R* = 0.0560 [0.0144]
a/R* = 442.20 [305.48]
b = 0.89 [0.18]
Seff = 0.13 [0.03]
Teq = 154 [8] K
Rp = 3.61 [1.02] Re
a = 0.7290 [0.0690] AU
Ag = N/A
Teffp = N/A

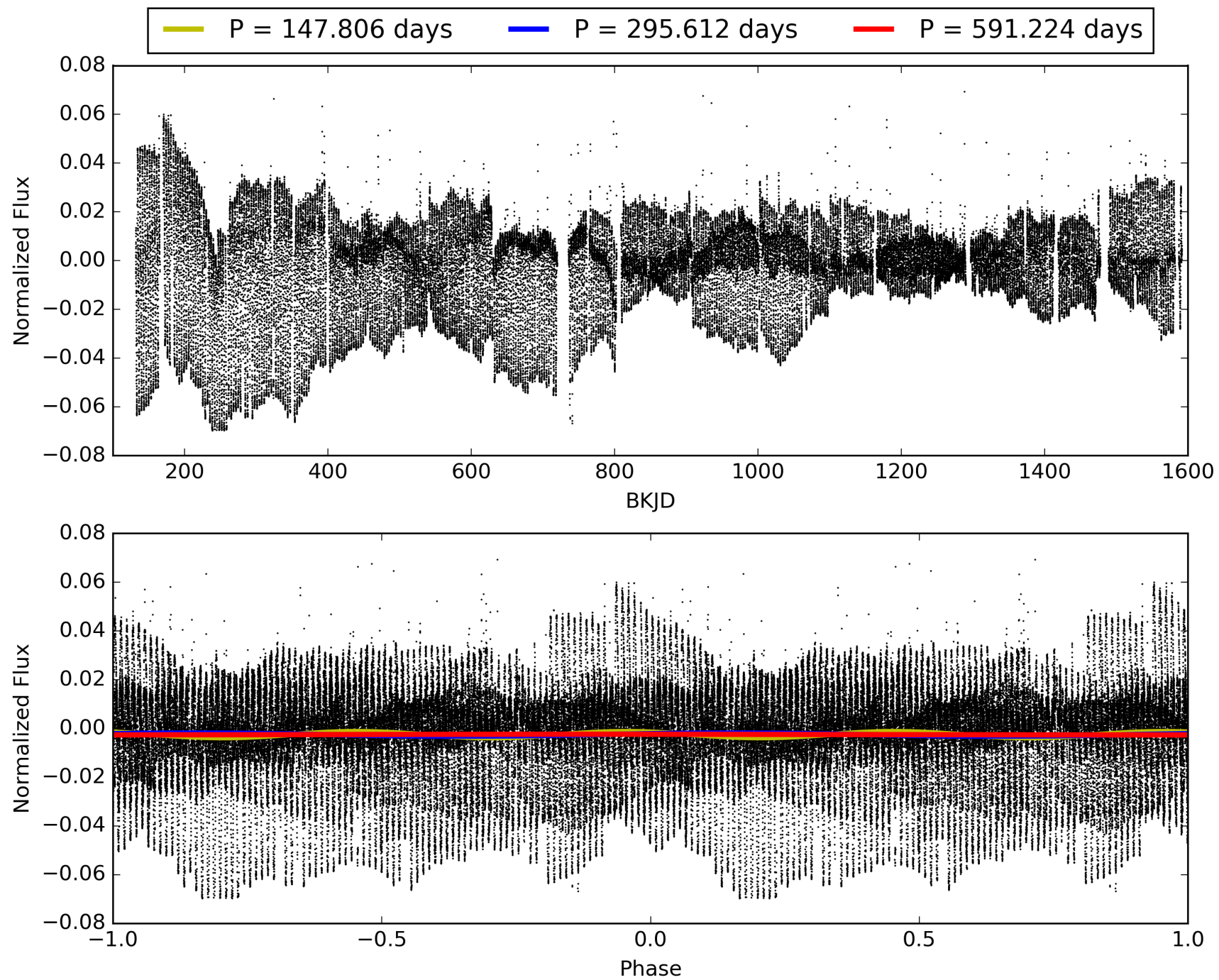
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [29.55σ]
LongPeriod-sig: 100.0% [223.21σ]
ModelChiSquare2-sig: 0.3%
ModelChiSquareGof-sig: 23.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.6796
Centroid-sig: 76.9%
Centroid-so: 0.357 arcsec [0.75σ]
OotOffset-rm: 0.048 arcsec [0.25σ]
KicOffset-rm: 0.087 arcsec [0.48σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [4/4]

TCE 006129451-04, PDC Light Curves

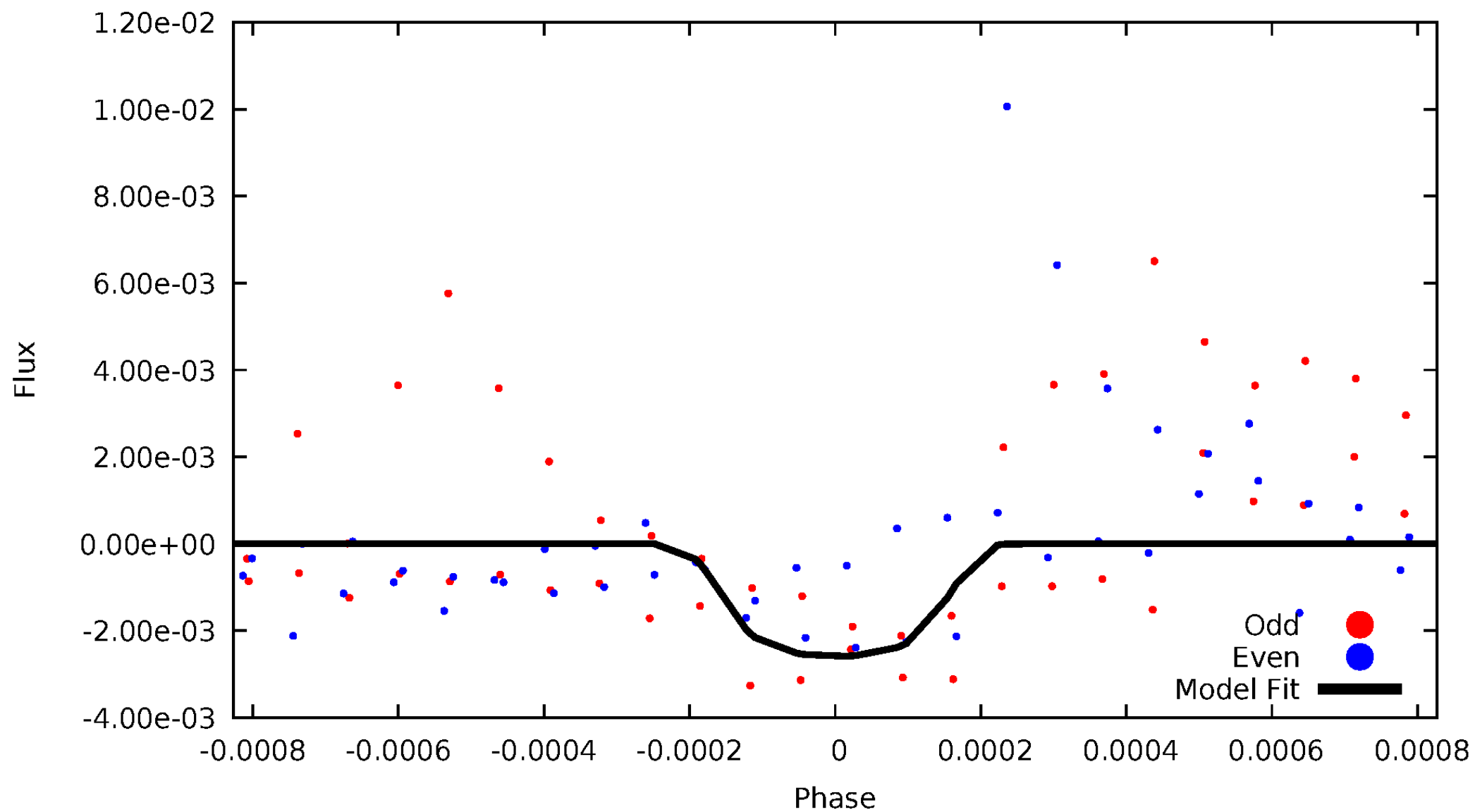


TCE 006129451-04



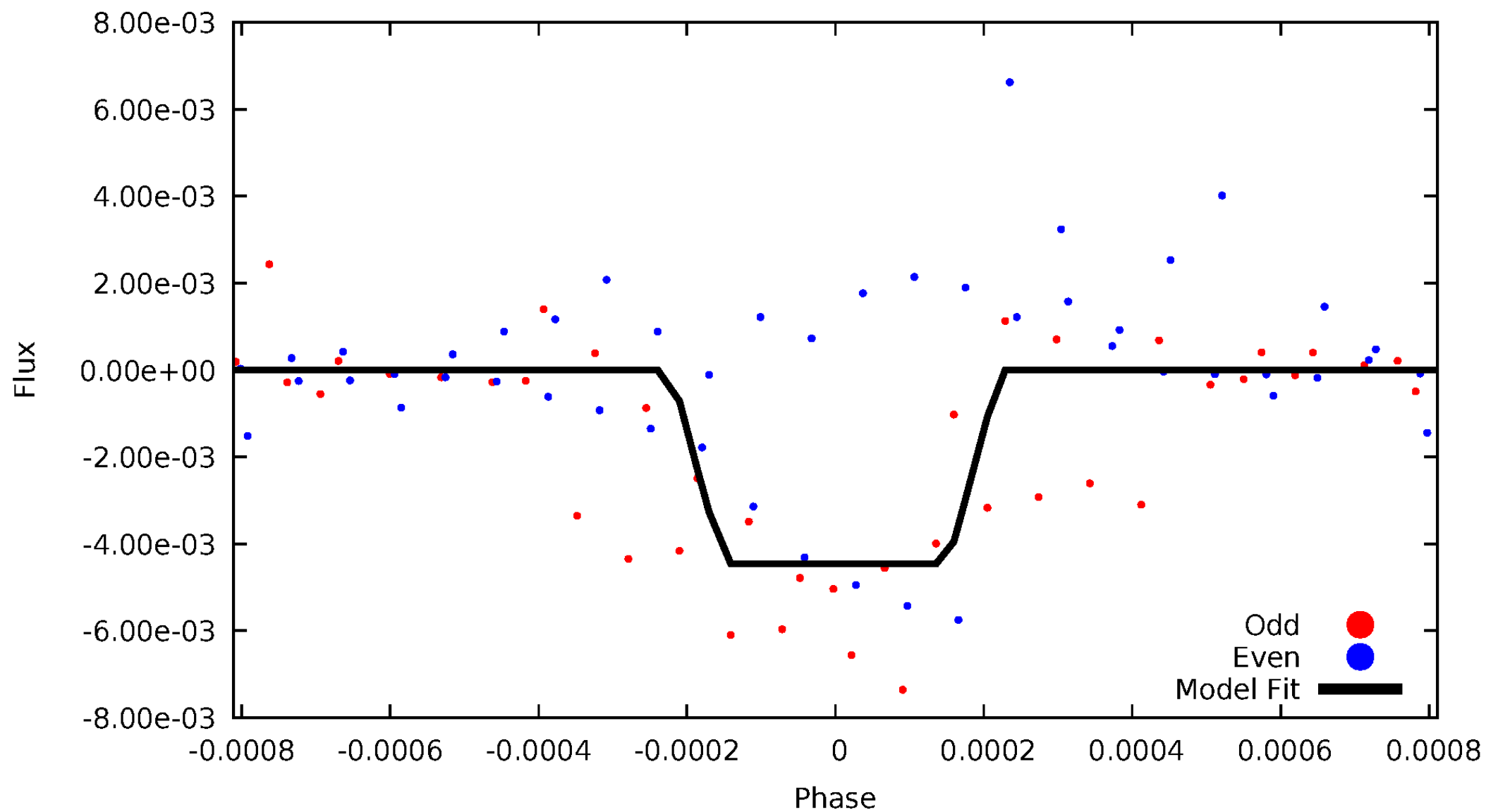
DV Odd/Even

TCE 006129451-04



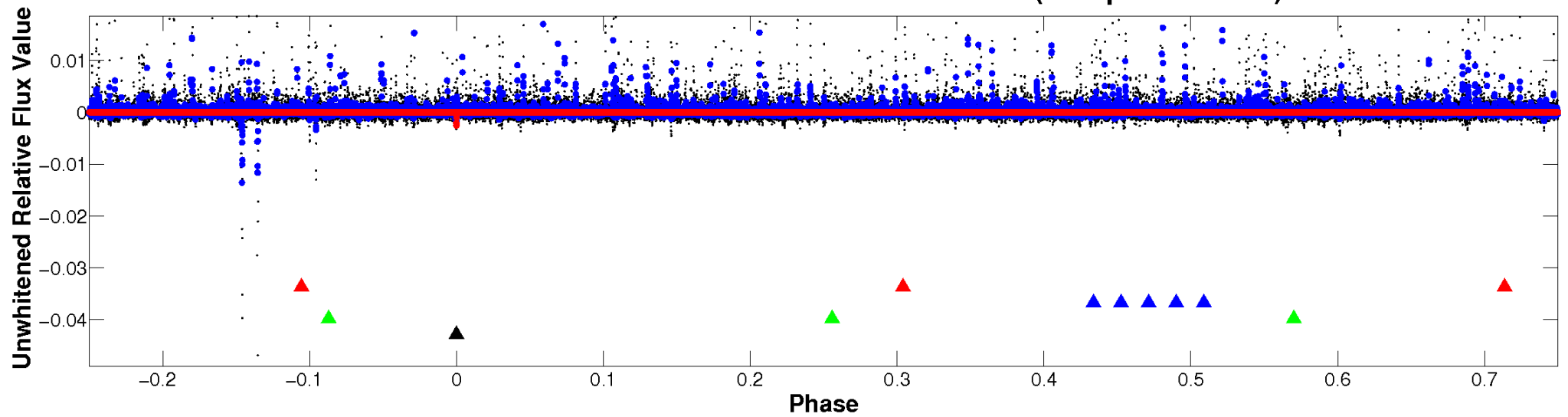
ALT Odd/Even

TCE 006129451-04

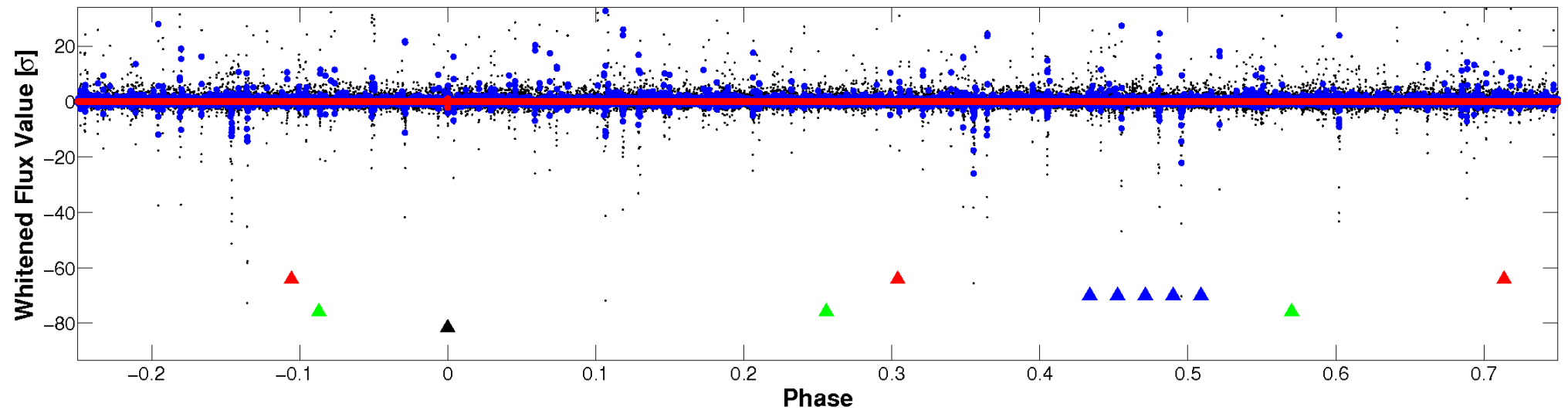


Non-Whitened Vs. Whitened Light Curve

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

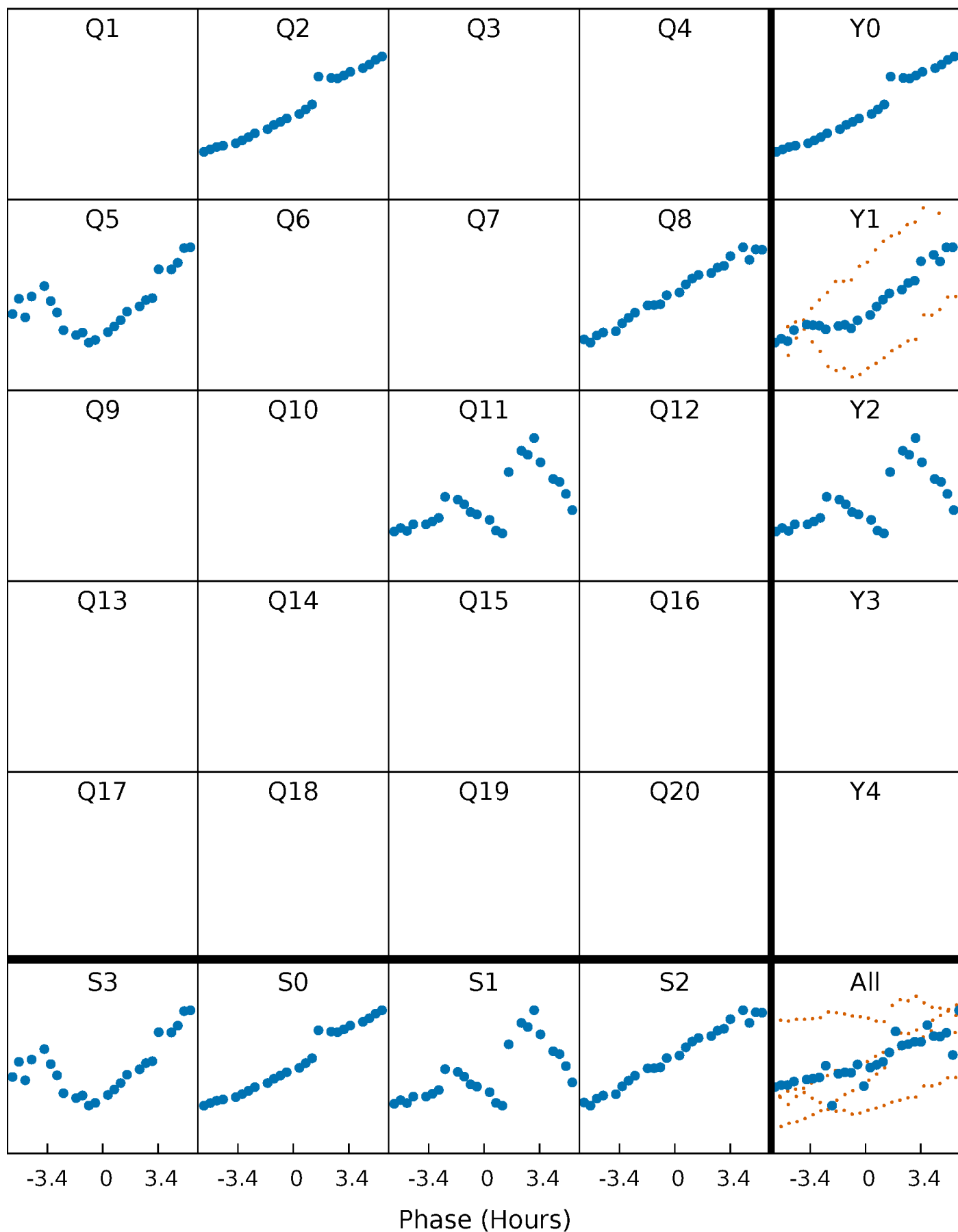


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



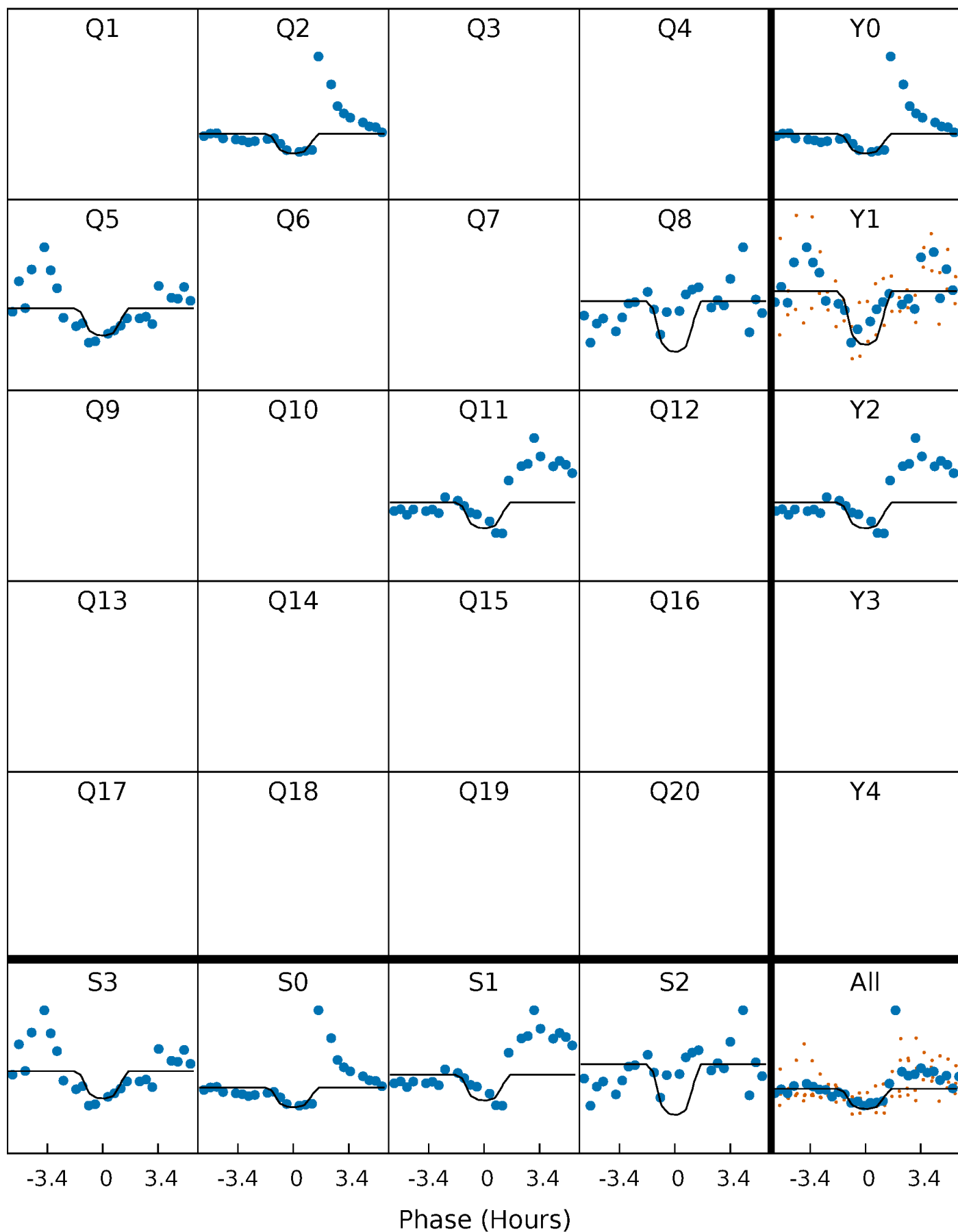
PDC Quarter-Phased Transit Curves

TCE 006129451-04 $P=295.612097$ Days $T_0=189.292130$ (BKJD)



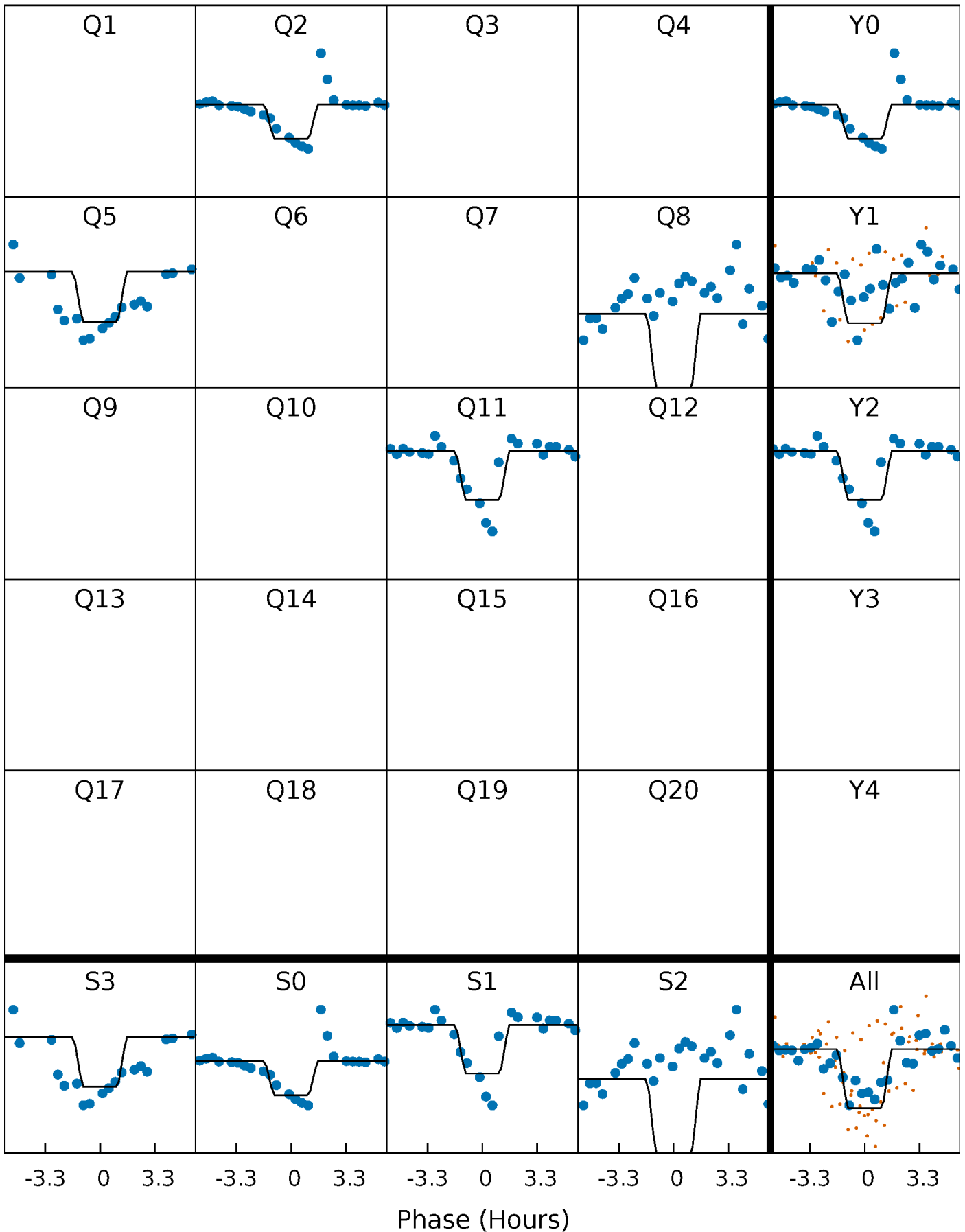
DV Quarter-Phased Transit Curves

TCE 006129451-04 P=295.612097 Days $T_0=189.292130$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

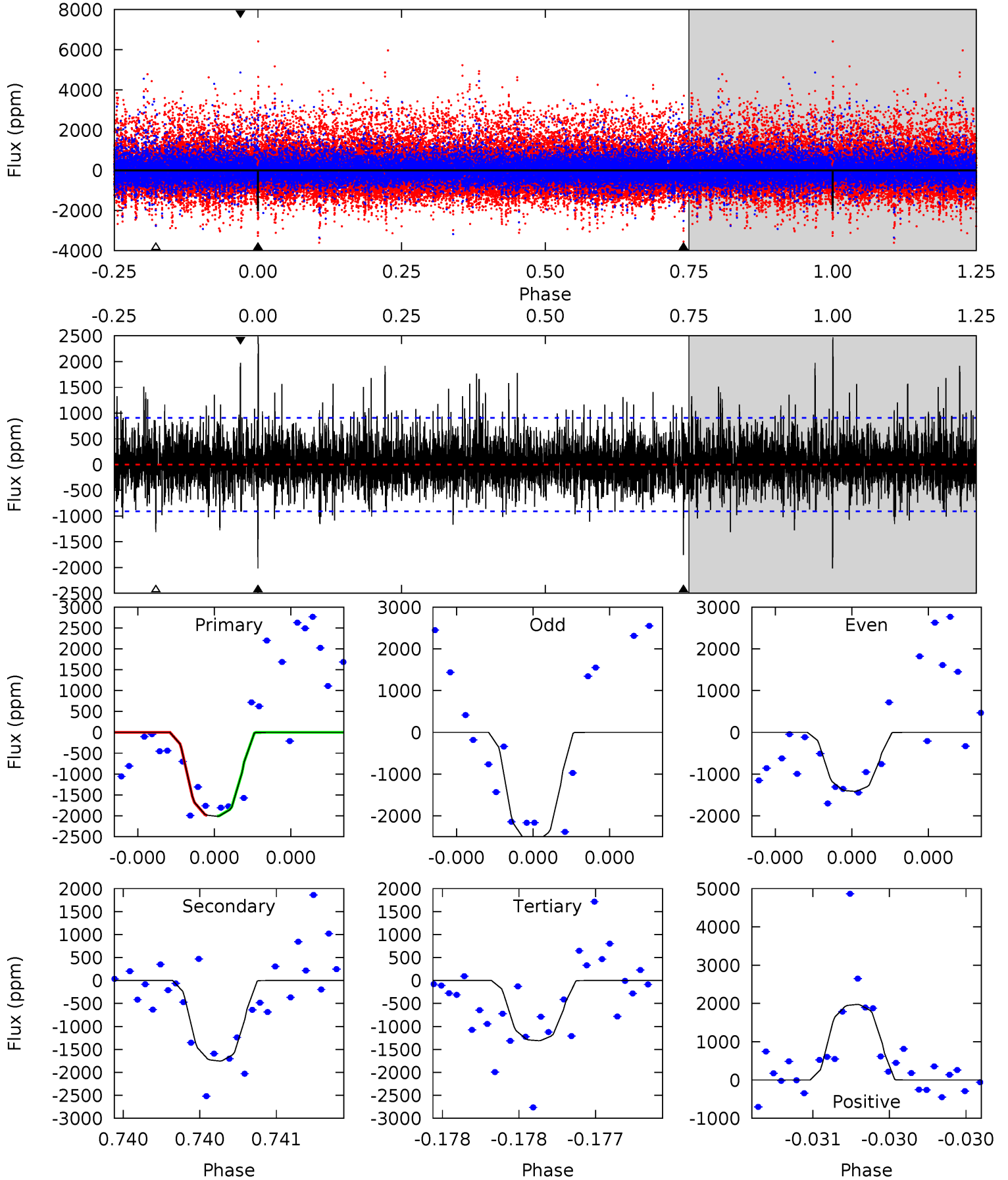
TCE 006129451-04 $P=295.619064$ Days $T_0=189.292345$ (BKJD)



DV Model-Shift Uniqueness Test

006129451-04, P = 295.612097 Days, E = 189.292130 Days

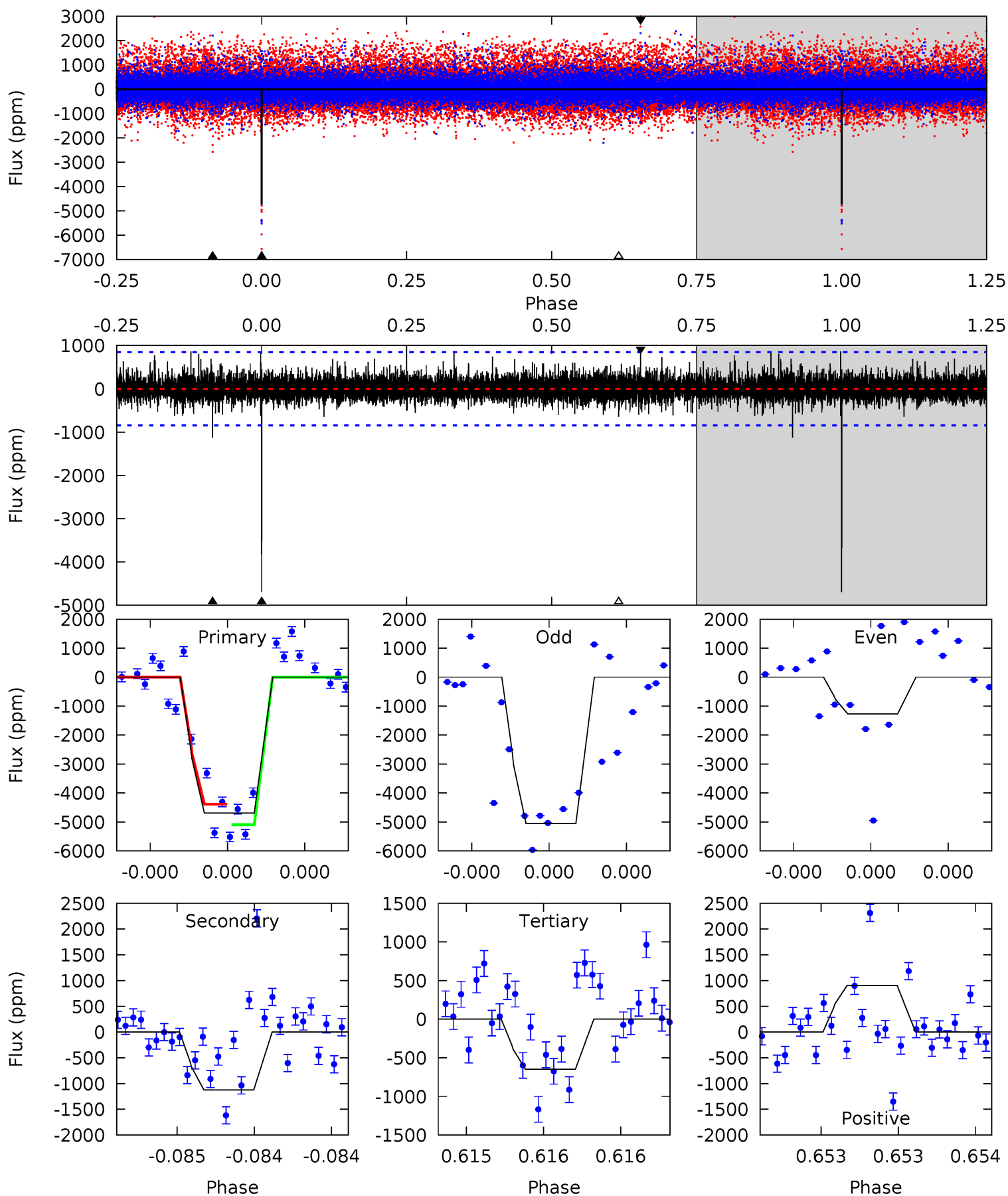
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	10.8	8.10	12.2	5.60	3.52	2.12	4.33	0.24	2.73	-1.36	3.13	0.89	0.55	0.04



Alt Model-Shift Uniqueness Test

006129451-04, P = 295.619064 Days, E = 189.292345 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.1	7.44	4.29	6.00	5.62	3.55	1.09	26.8	25.1	3.15	1.44	15.2	0.71	0.16	2.35



Stellar Parameters For KIC 006129451

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3891^{+122}_{-150}	$4.668^{+0.063}_{-0.022}$	$0.210^{+0.200}_{-0.300}$	$0.590^{+0.033}_{-0.072}$	$0.592^{+0.041}_{-0.067}$	$4.053^{+1.286}_{-0.452}$
	+3%/-4%	+1%/-0%	+95%/-143%	+6%/-12%	+7%/-11%	+32%/-11%
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 006129451-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1755 ± 162	$3.62^{+0.89}_{-0.96}$	214^{+8}_{-9}	3501^{+384}_{-244}	39428^{+30921}_{-14717}
Alt.	-1123 ± 151	$4.14^{+0.96}_{-0.83}$	214^{+7}_{-9}	3134^{+254}_{-214}	18931^{+11537}_{-6729}

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 $A_{obs} \gg 1.0$

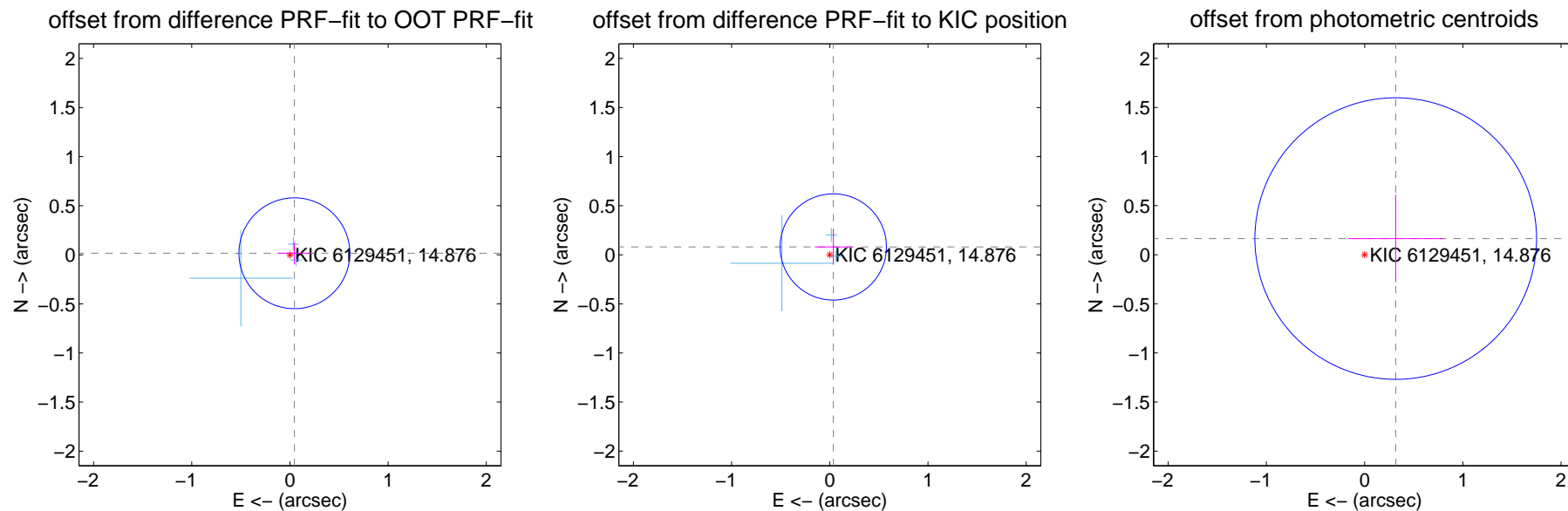
DV Centroid Data

Supplemental centroid analysis for 006129451-04. Kepler magnitude: 14.88. Transit SNR 8.91

There are 3 quarters with good PRF difference image offsets

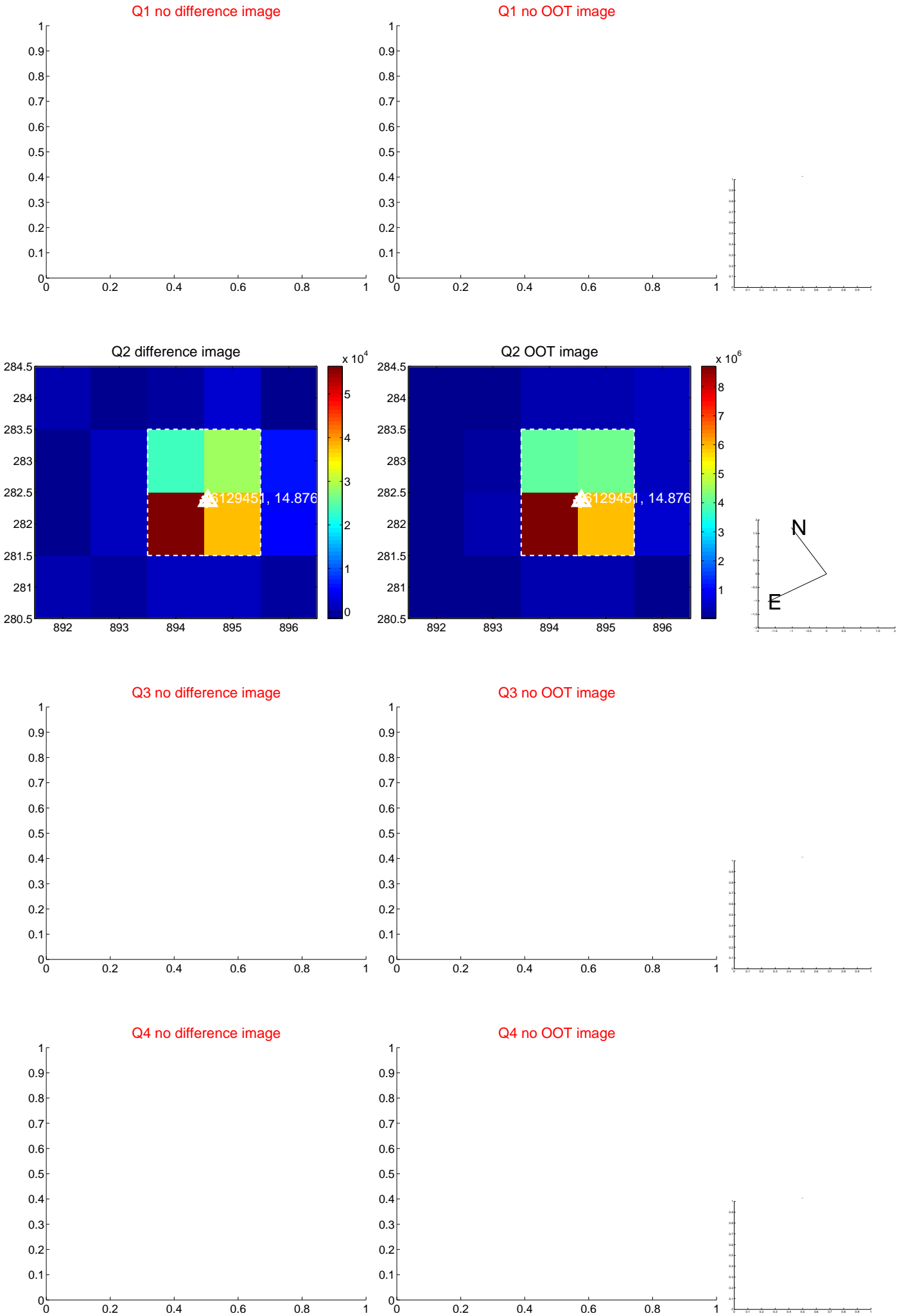
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.048 ± 0.188	0.25	-0.045 ± 0.171	0.015 ± 0.111
PRF-fit source offset from KIC position	0.087 ± 0.180	0.48	-0.036 ± 0.189	0.080 ± 0.179
photometric centroid source offset	0.36 ± 0.48	0.75	-0.32 ± 0.49	0.16 ± 0.45

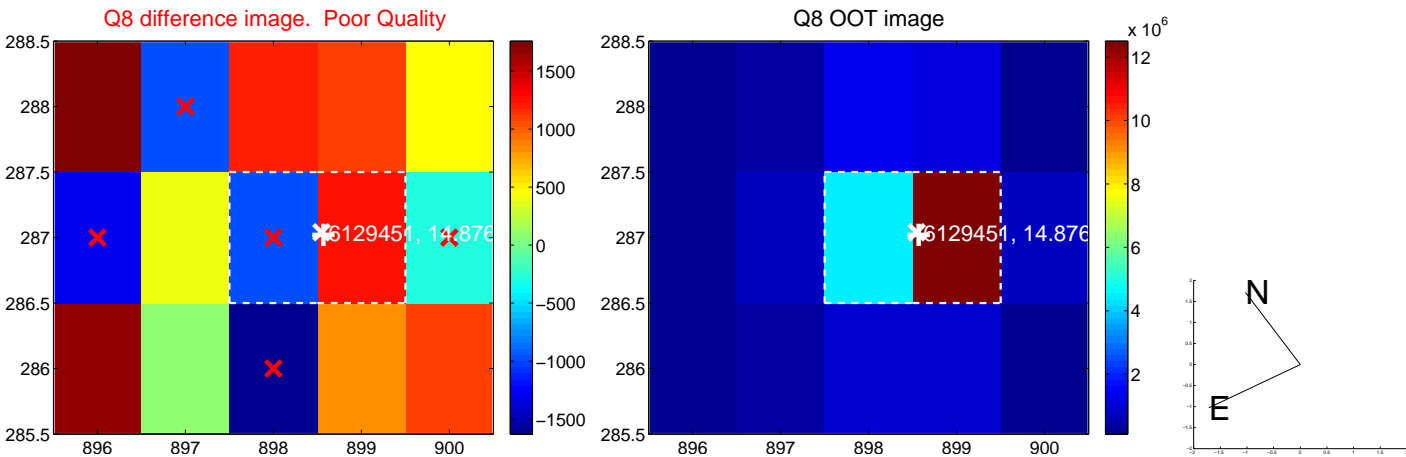
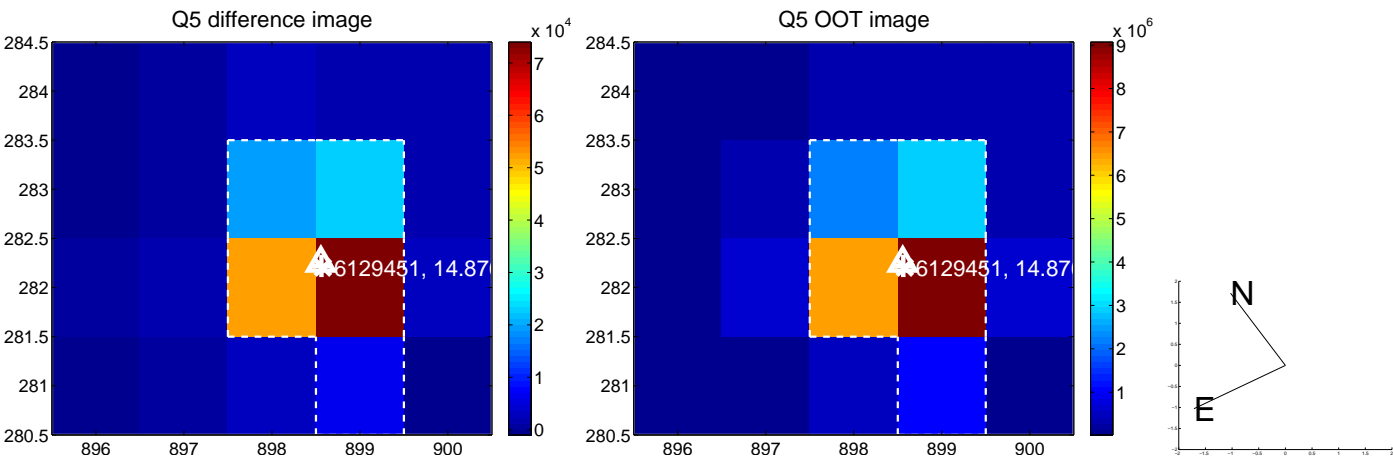


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

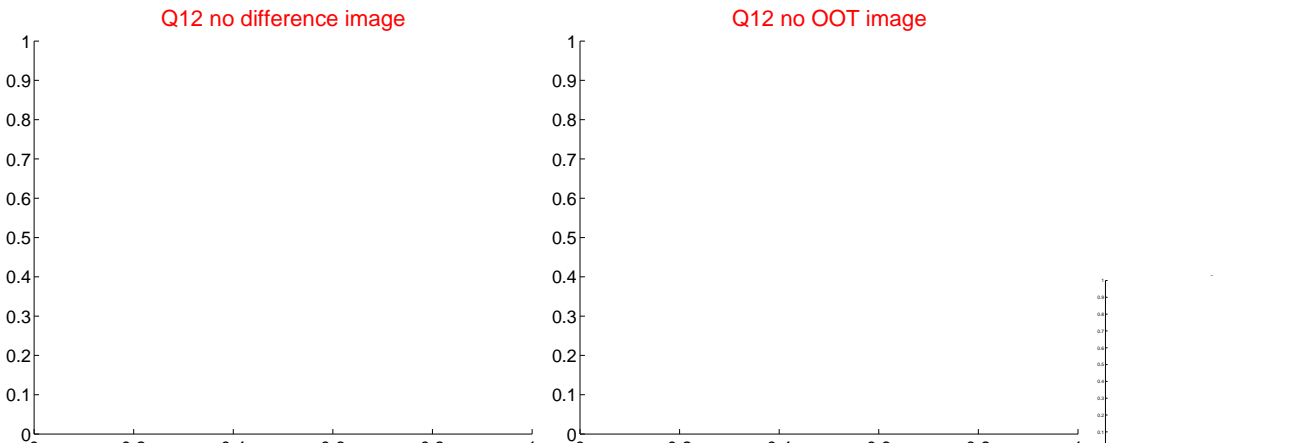
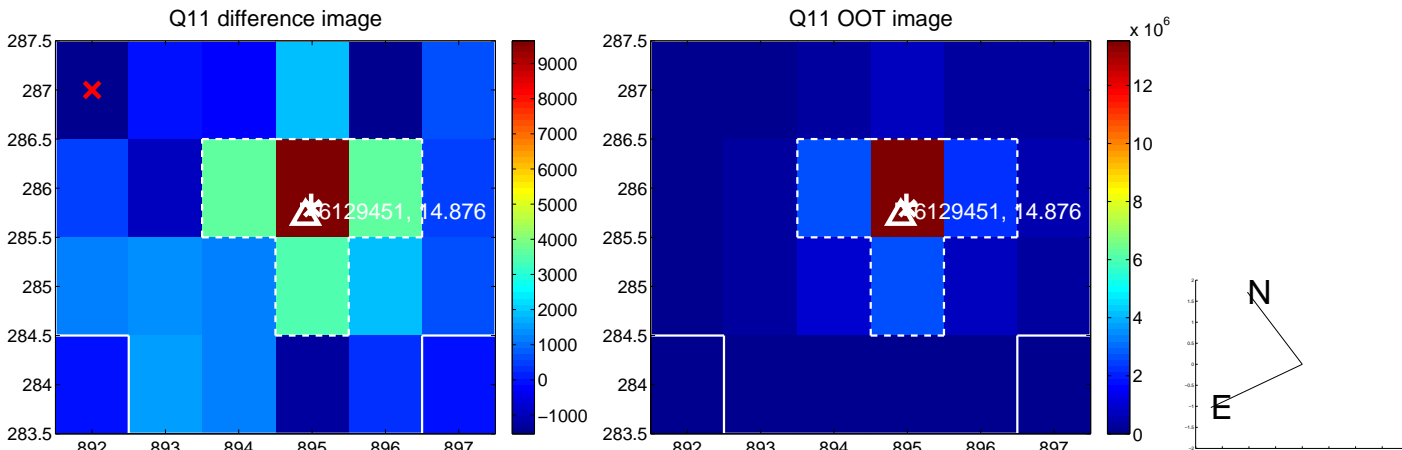
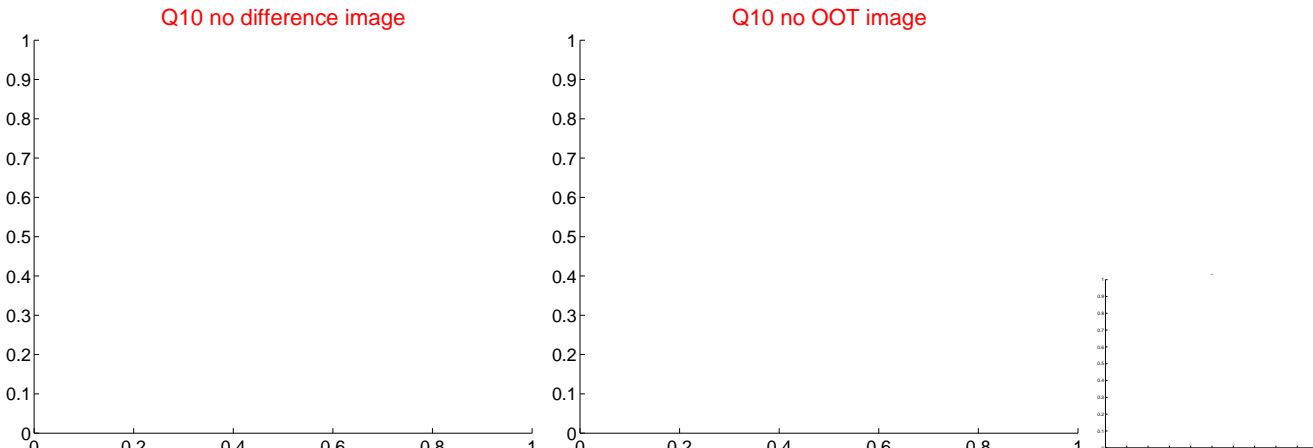
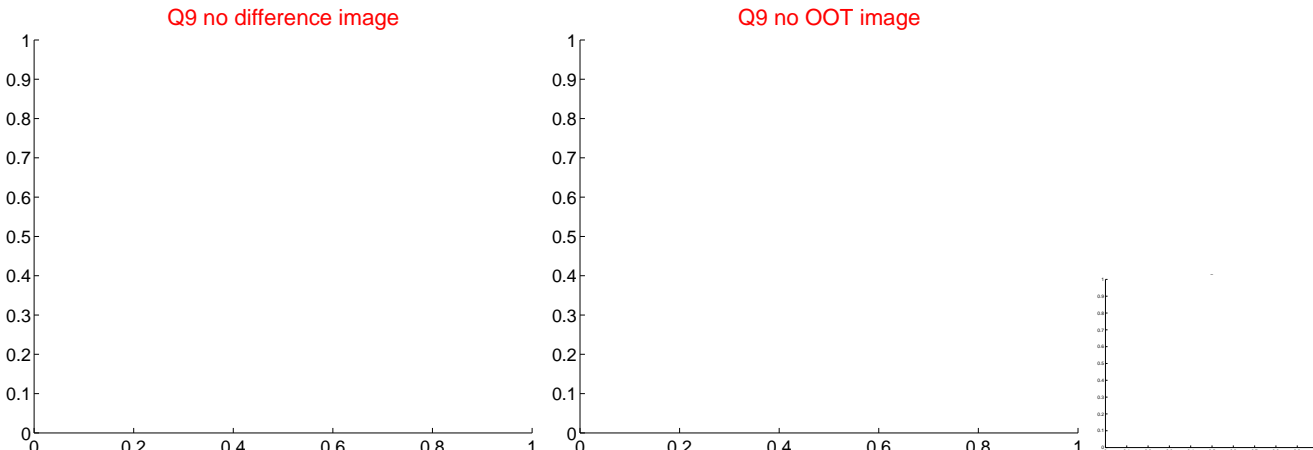
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



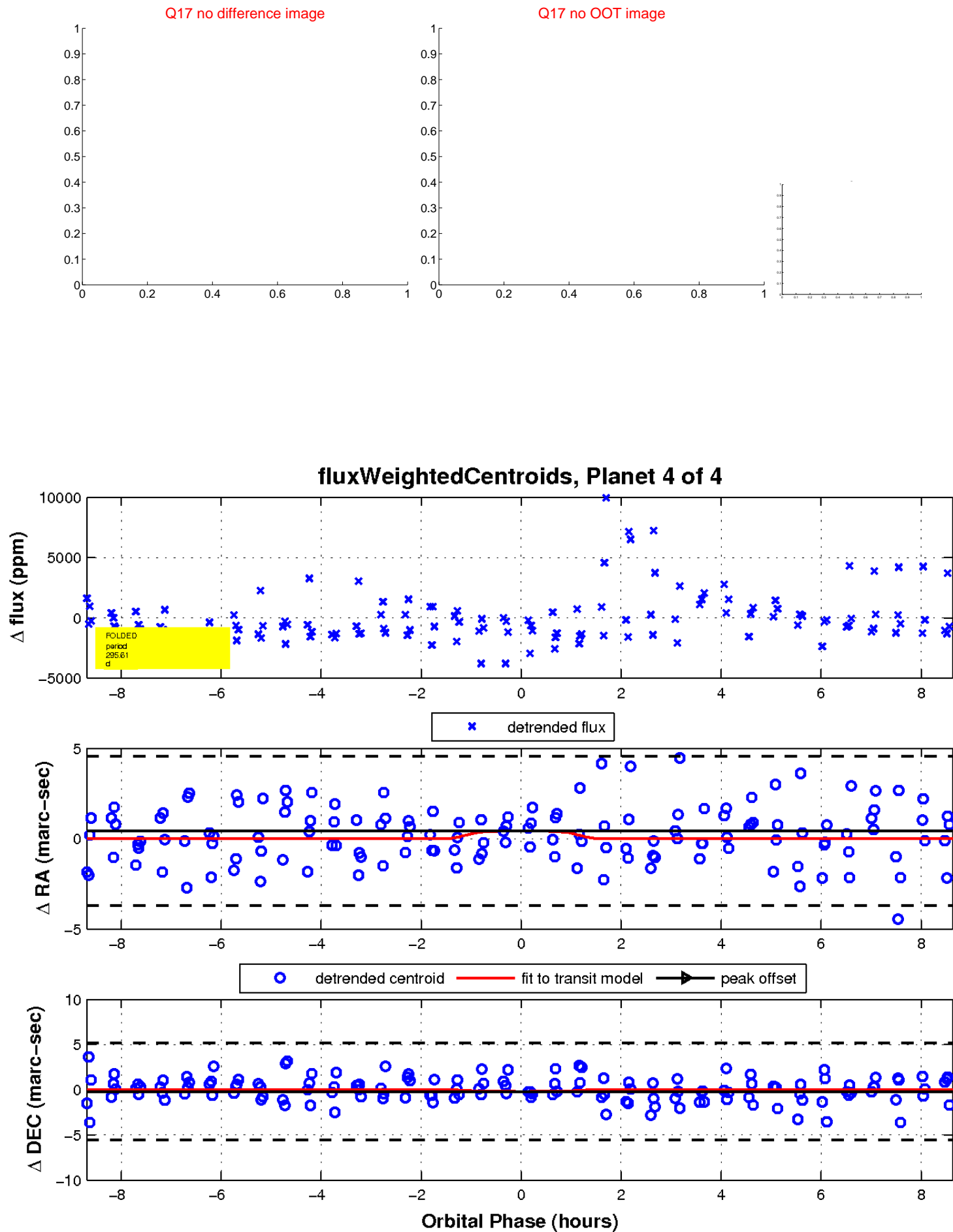
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

