

KIC 008431229

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})
008431229-01	OBS	No	301.820763	409.987422	704.9	2.017	12.8	5.8	2.27	5547	6.42	4.79
008431229-02	OBS	No	401.200217	315.288471	1376.7	9.198	18.2	5.6	2.27	5547	8.54	3.28
008431229-04	OBS	No	467.918634	157.387681	312.3	1.807	12.4	3.0	2.27	5547	4.33	2.67
008431229-05	OBS	No	344.374075	334.579713	371.6	3.500	12.2	-1.0	2.27	5547	4.31	4.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008431229-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
008431229-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008431229-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008431229-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

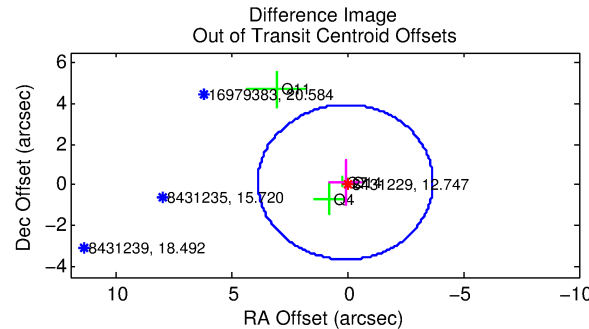
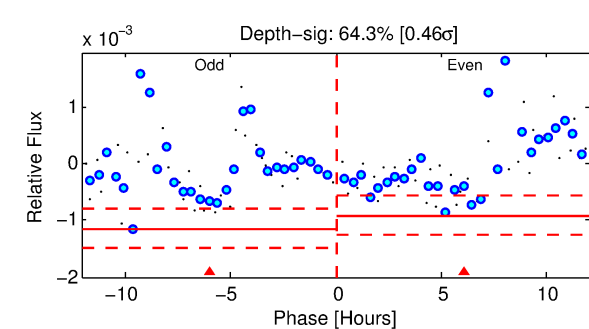
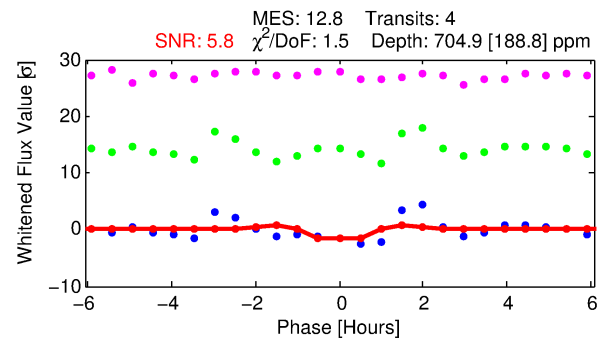
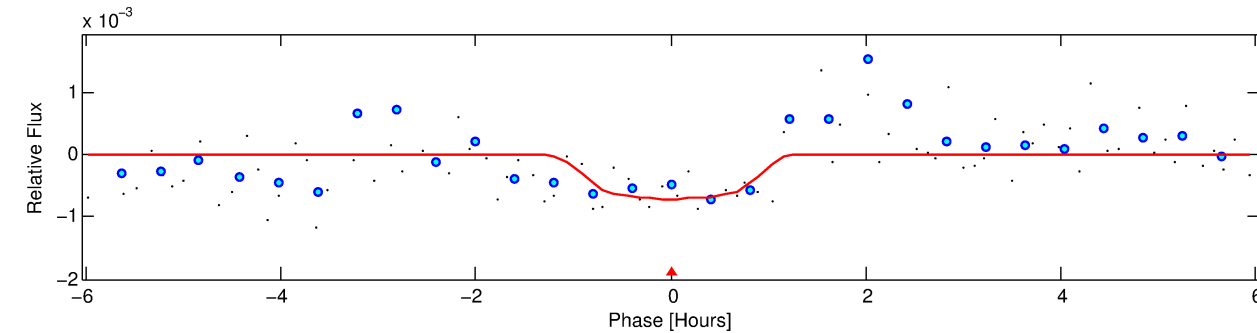
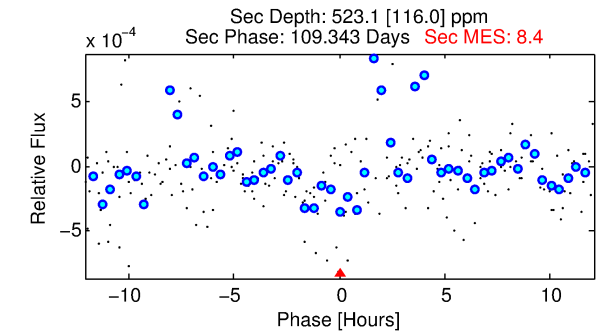
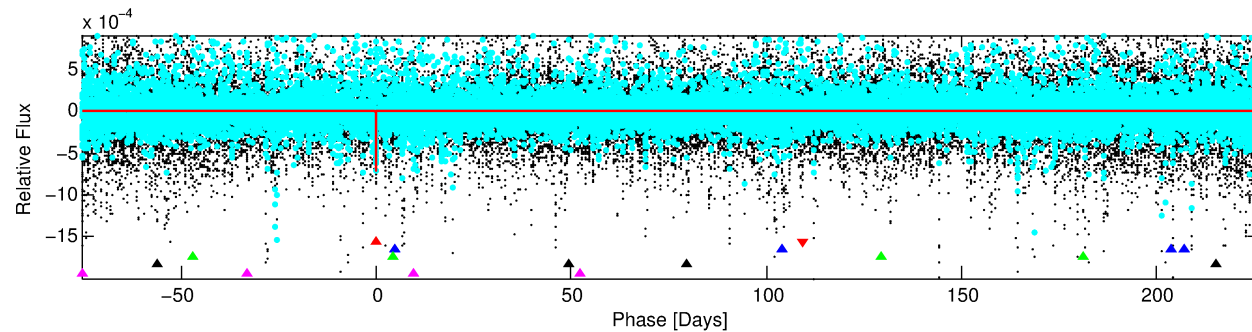
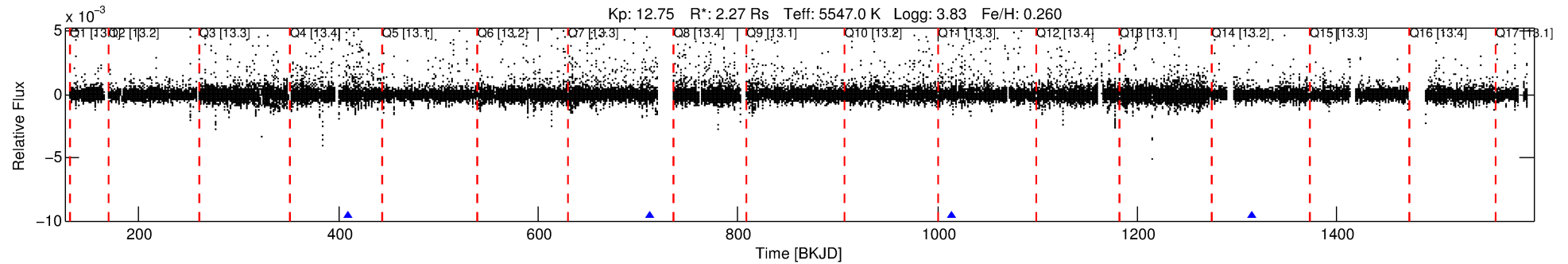
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008431229-01

No Significant Match Found

DV One-Page Summary

KIC: 8431229 Candidate: 1 of 5 Period: 301.821 d



DV Fit Results:

Period = 301.82076 [0.00466] d
Epoch = 409.9874 [0.0090] BKJD
Rp/R* = 0.0258 [0.0639]
a/R* = 881.34 [8537.83]
b = 0.68 [7.93]
Seff = 4.79 [2.07]
Teq = 377 [41] K
Rp = 6.42 [16.01] Re
a = 0.9576 [0.2716] AU
Ag = 6412.13 [31875.39] [0.20 σ]
Teffp = 5219 [6462] K [0.75 σ]

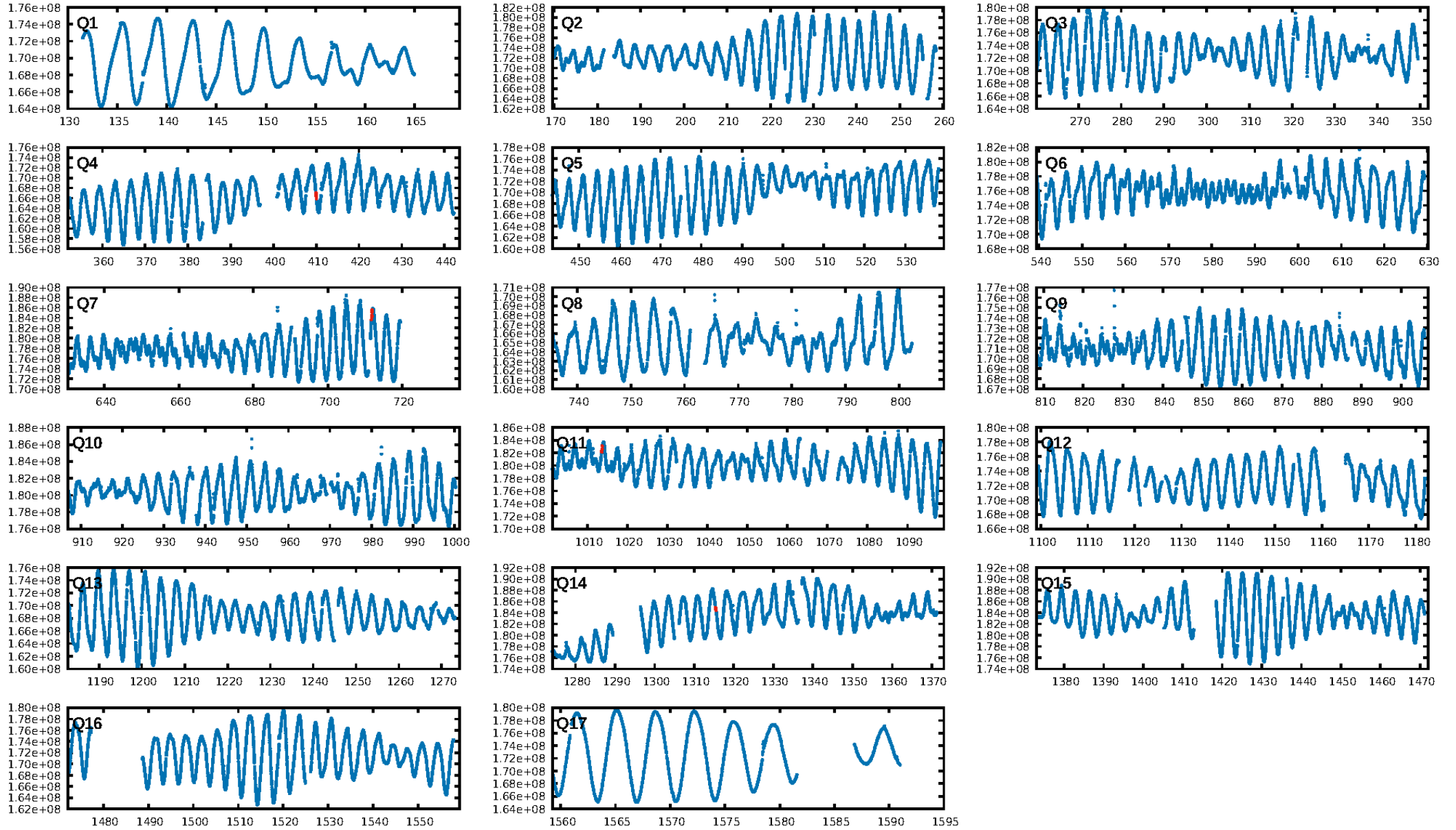
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [252.83 σ]
ModelChiSquare2-sig: 75.7%
ModelChiSquareGof-sig: 60.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 6.999
Centroid-sig: 80.6%
Centroid-so: 0.947 arcsec [0.87 σ]
OotOffset-rm: 0.174 arcsec [0.14 σ]
OotOffset-st: 1/2/1/0 [4]
KicOffset-rm: 0.358 arcsec [0.43 σ]
KicOffset-st: 1/2/1/0 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 1.00 [4/4]

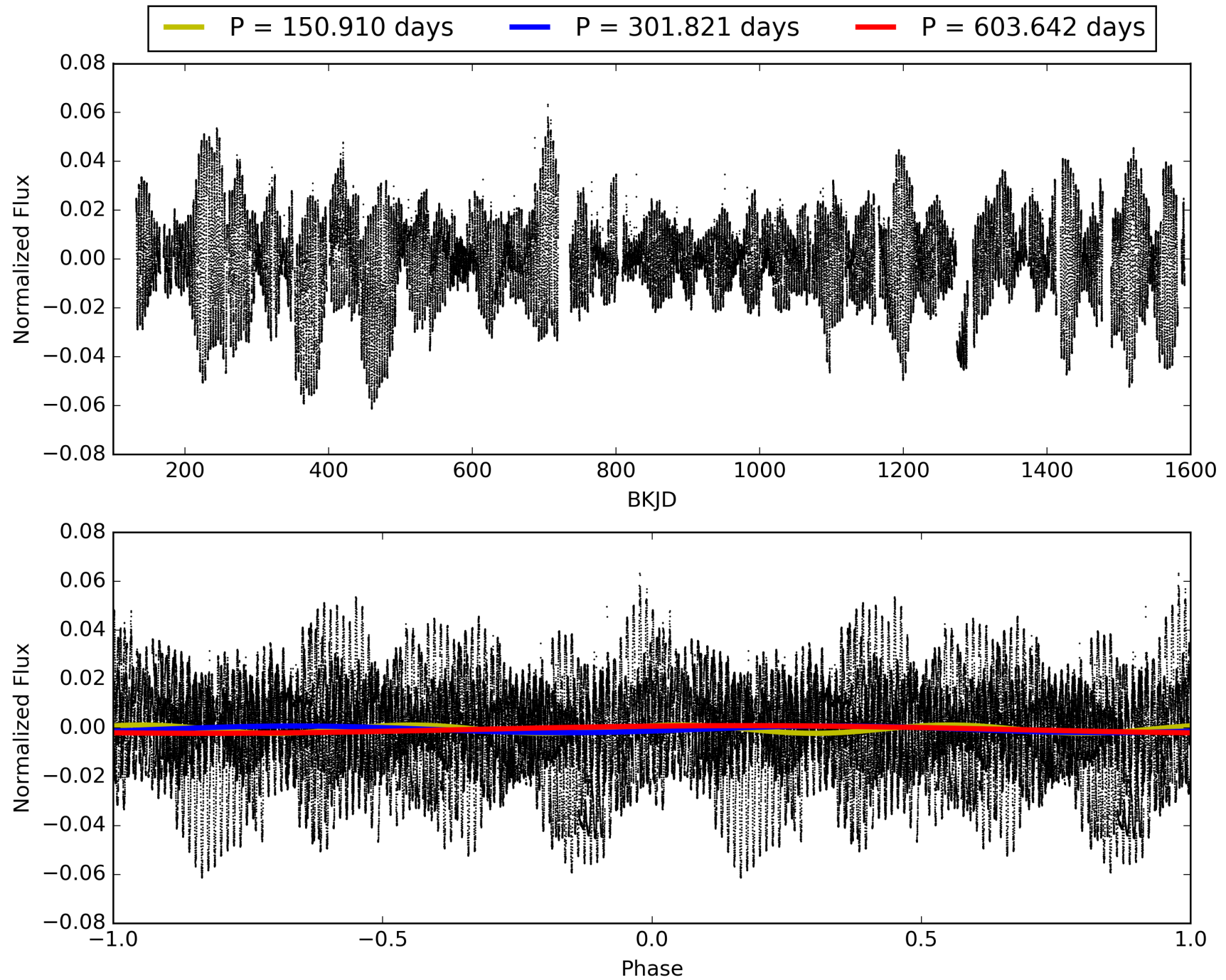
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:49:03 Z

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

TCE 008431229-01, PDC Light Curves

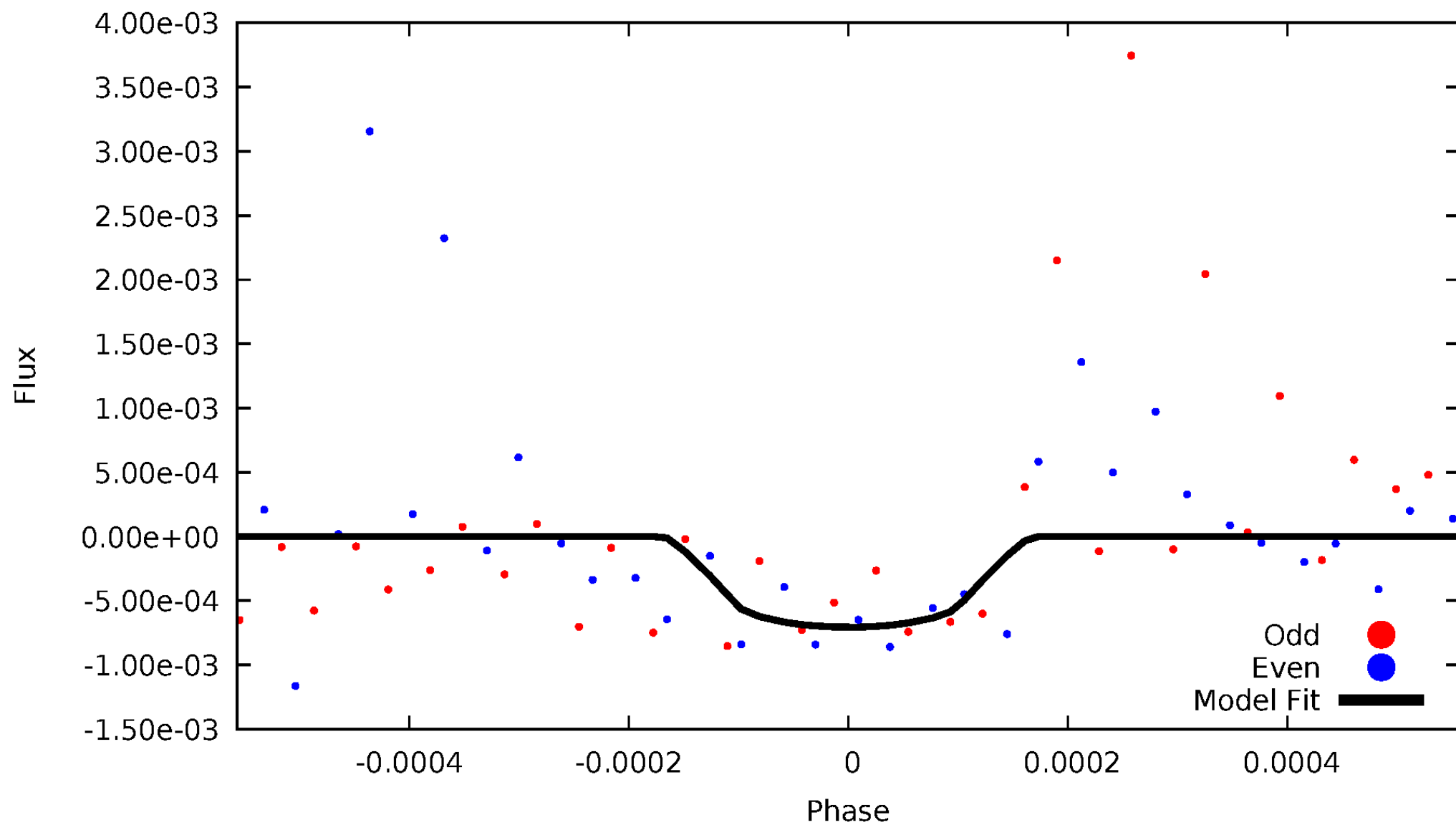


TCE 008431229-01



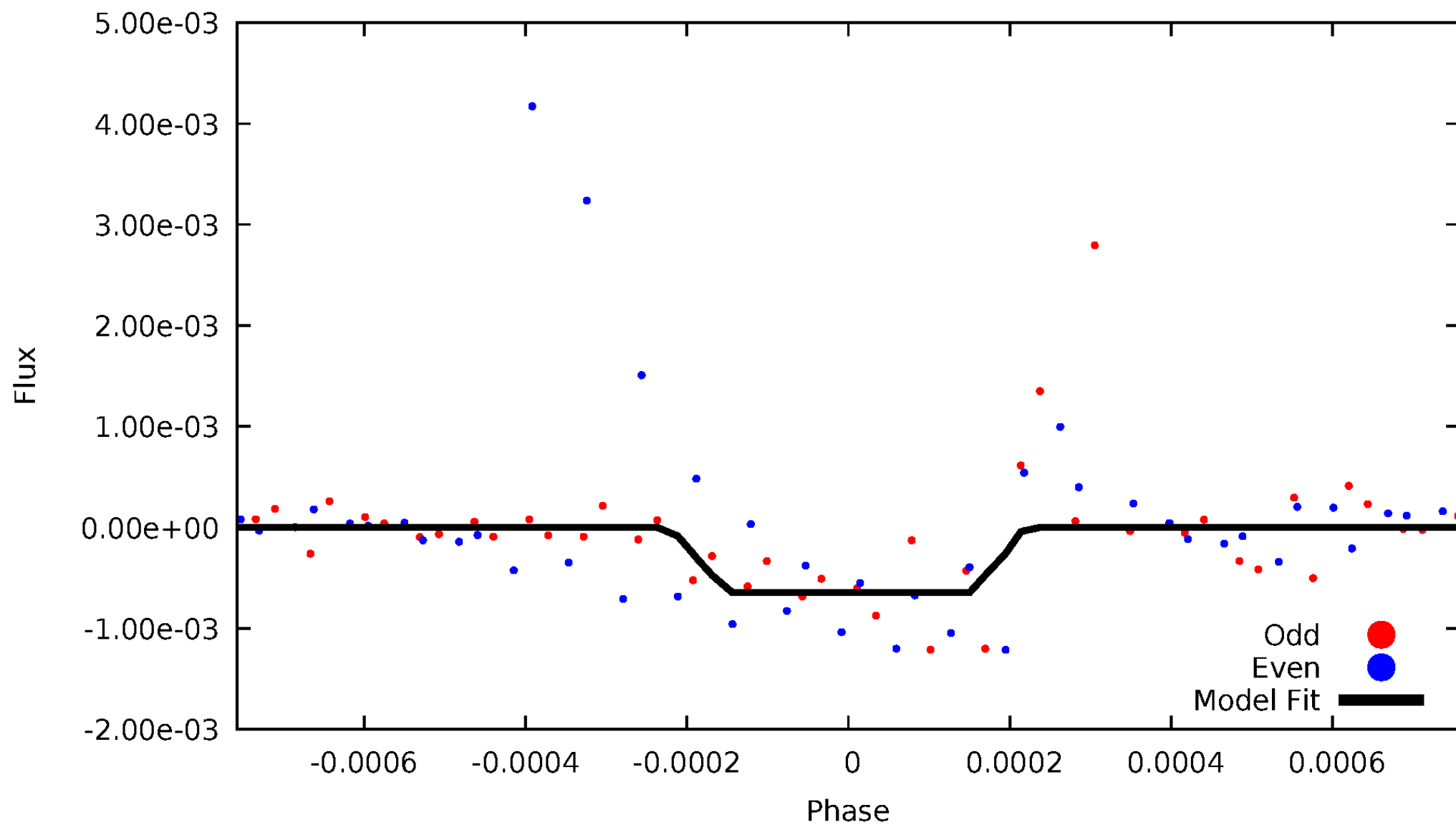
DV Odd/Even

TCE 008431229-01



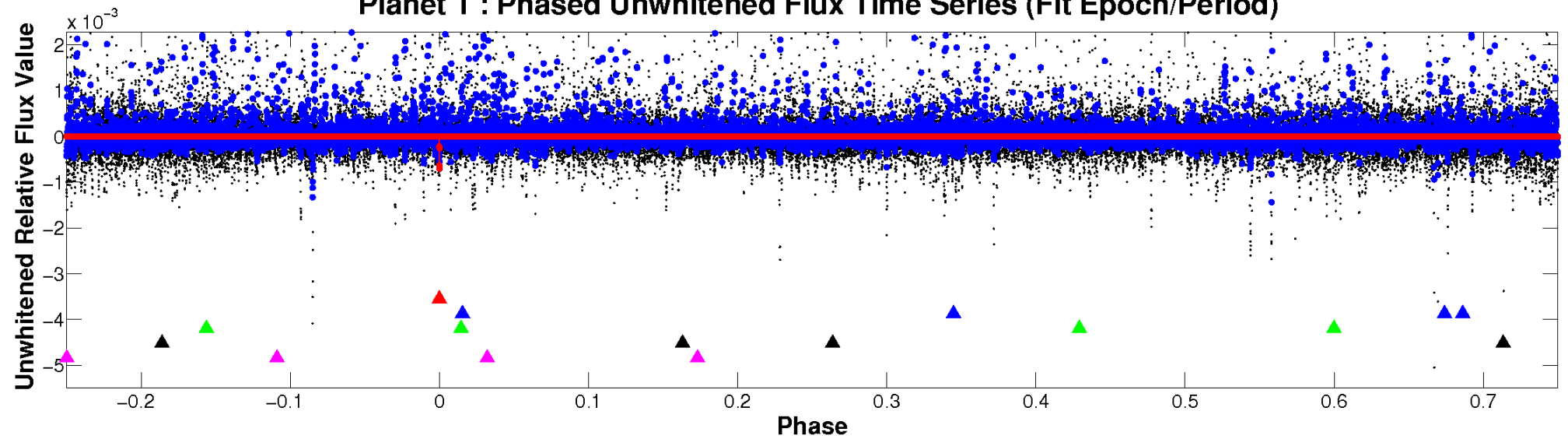
ALT Odd/Even

TCE 008431229-01

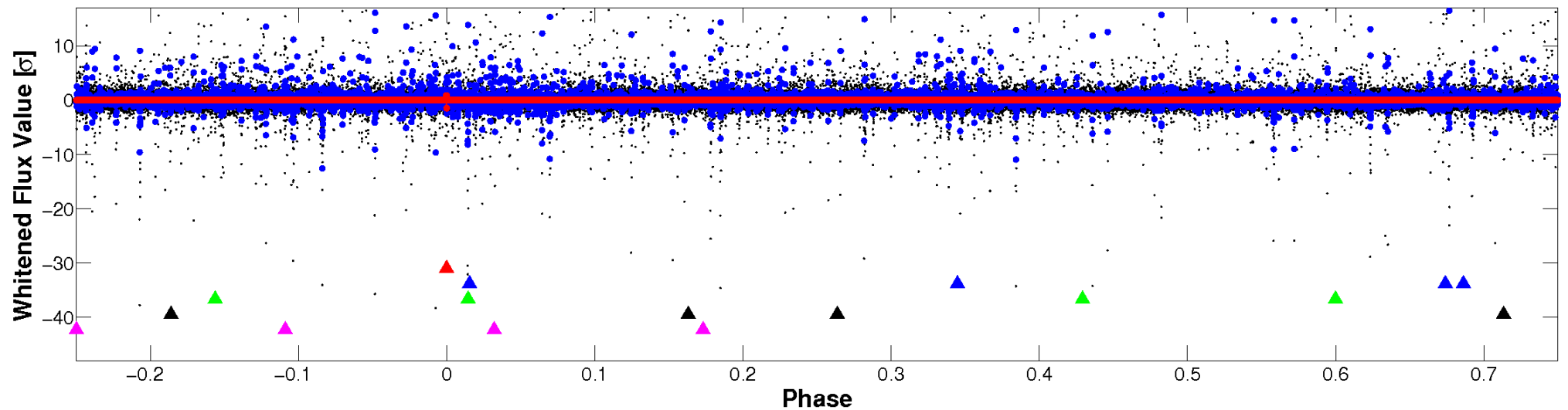


Non-Whitened Vs. Whitened Light Curve

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

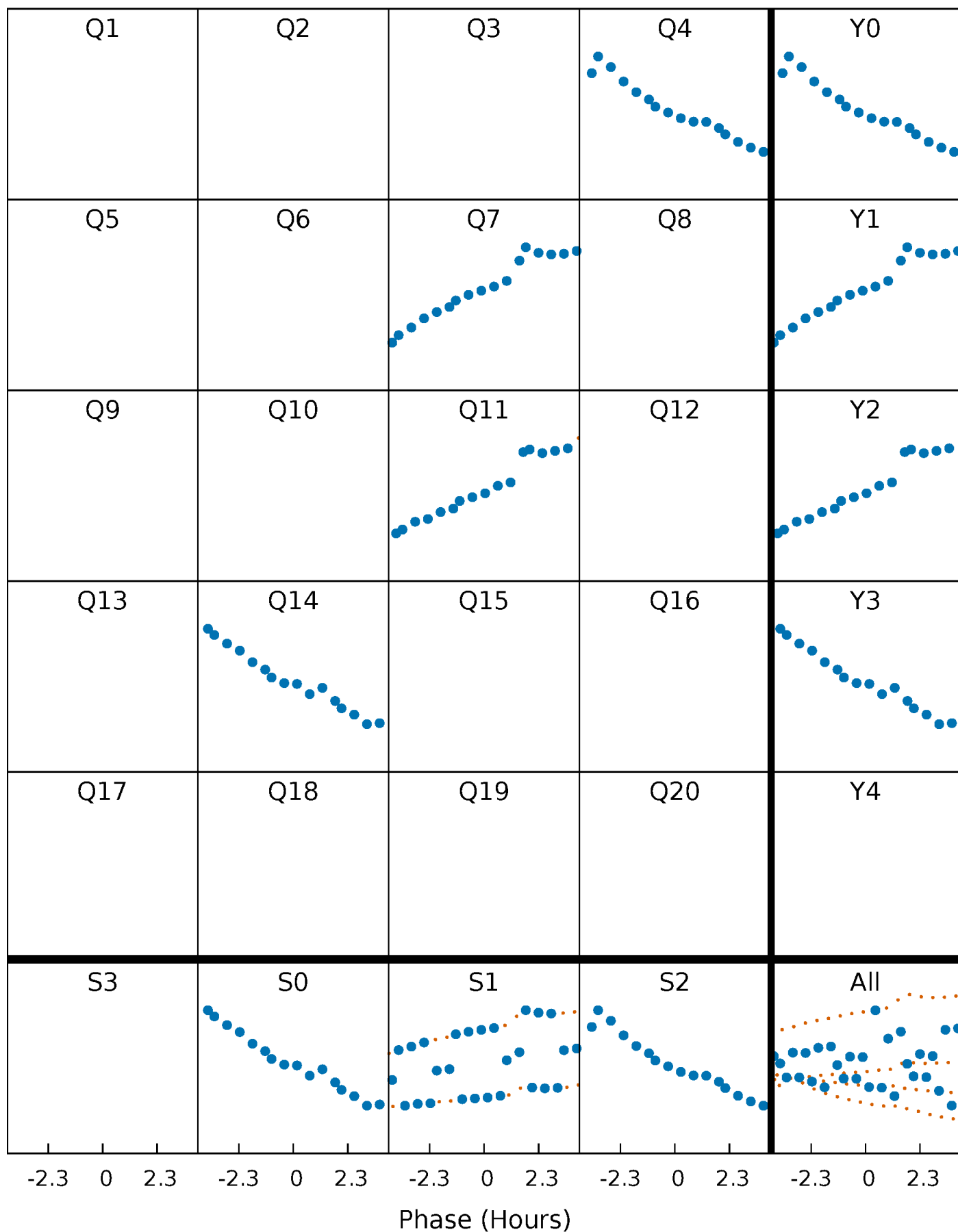


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



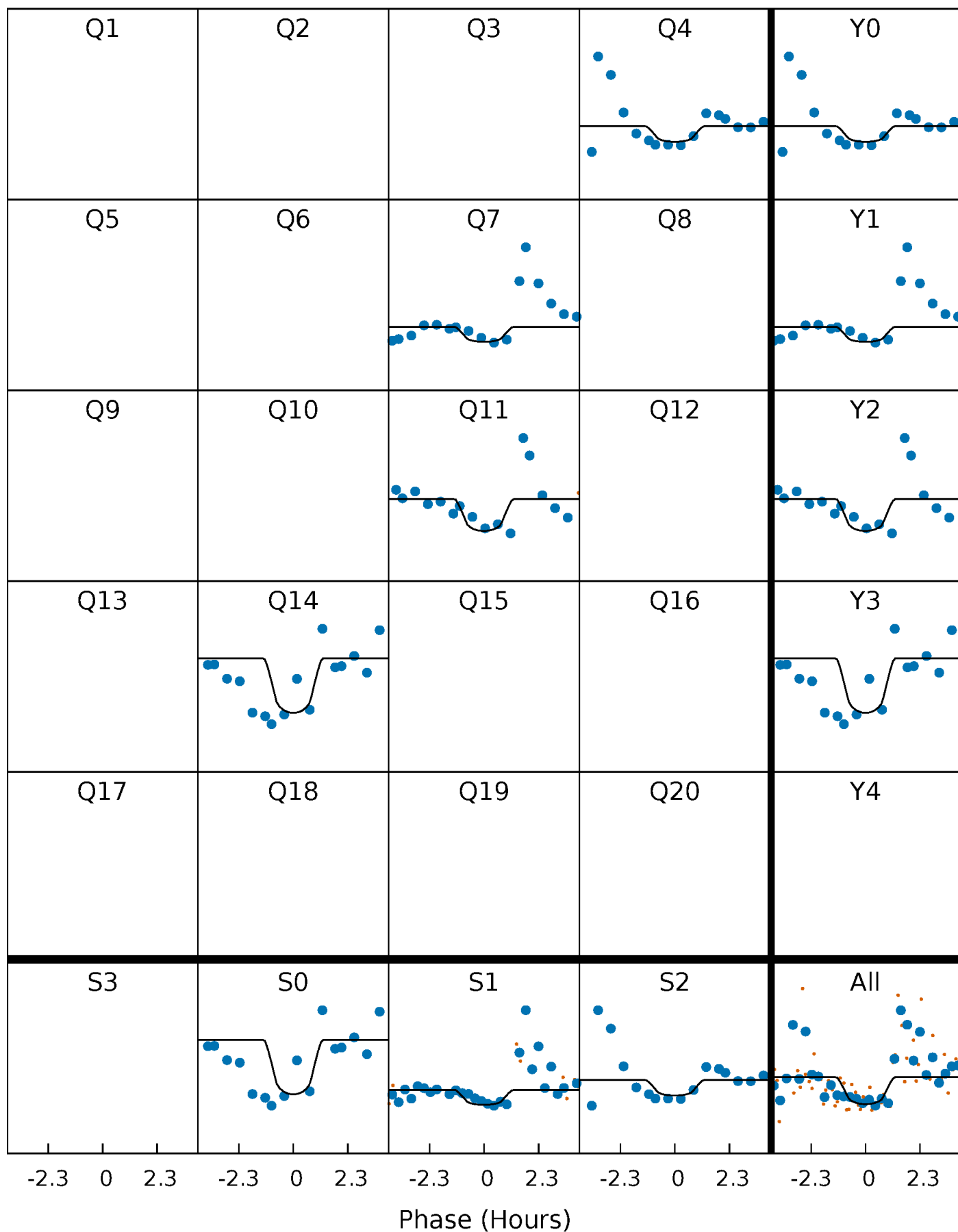
PDC Quarter-Phased Transit Curves

TCE 008431229-01 P=301.820763 Days $T_0=409.987422$ (BKJD)



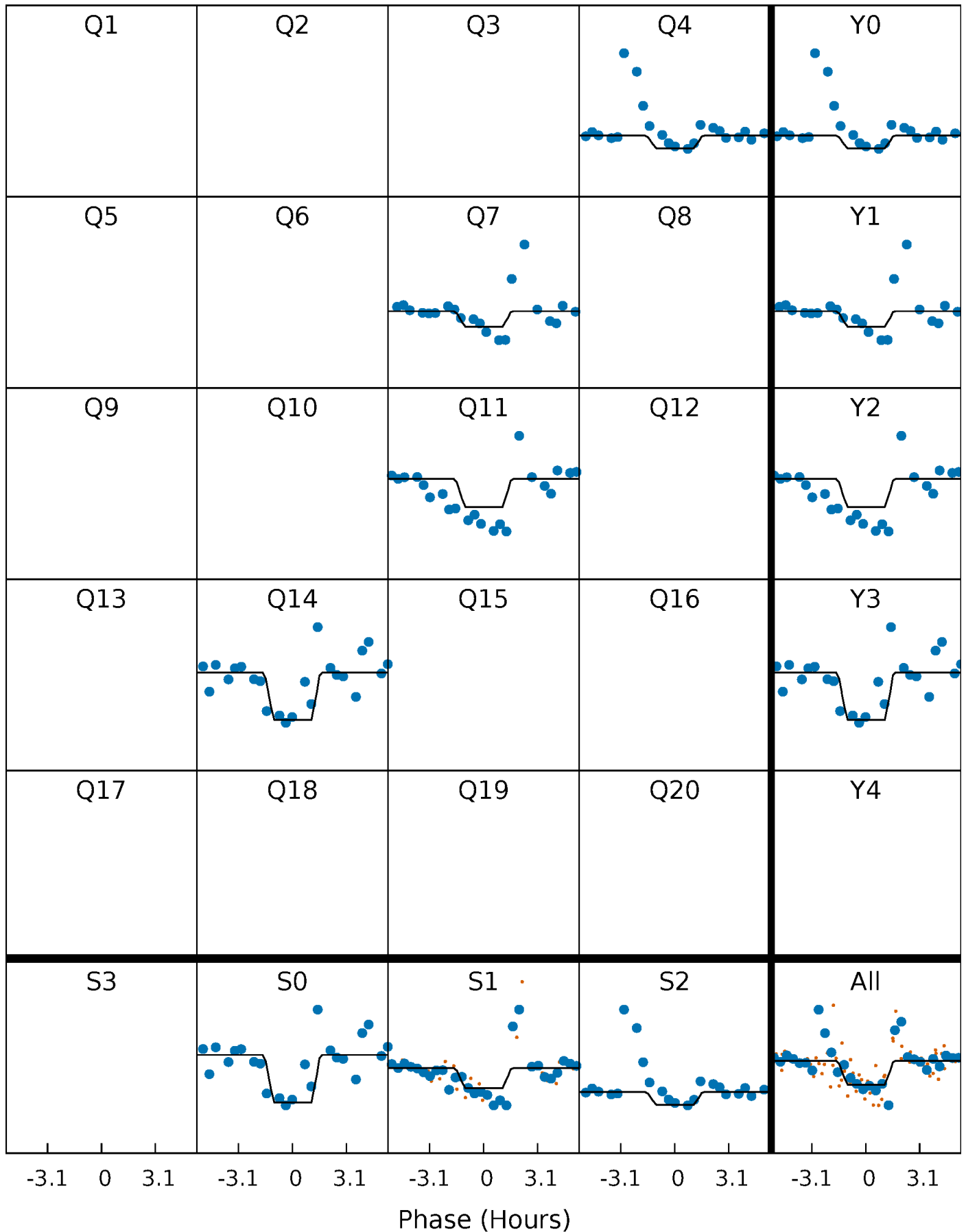
DV Quarter-Phased Transit Curves

TCE 008431229-01 P=301.820763 Days $T_0=409.987422$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

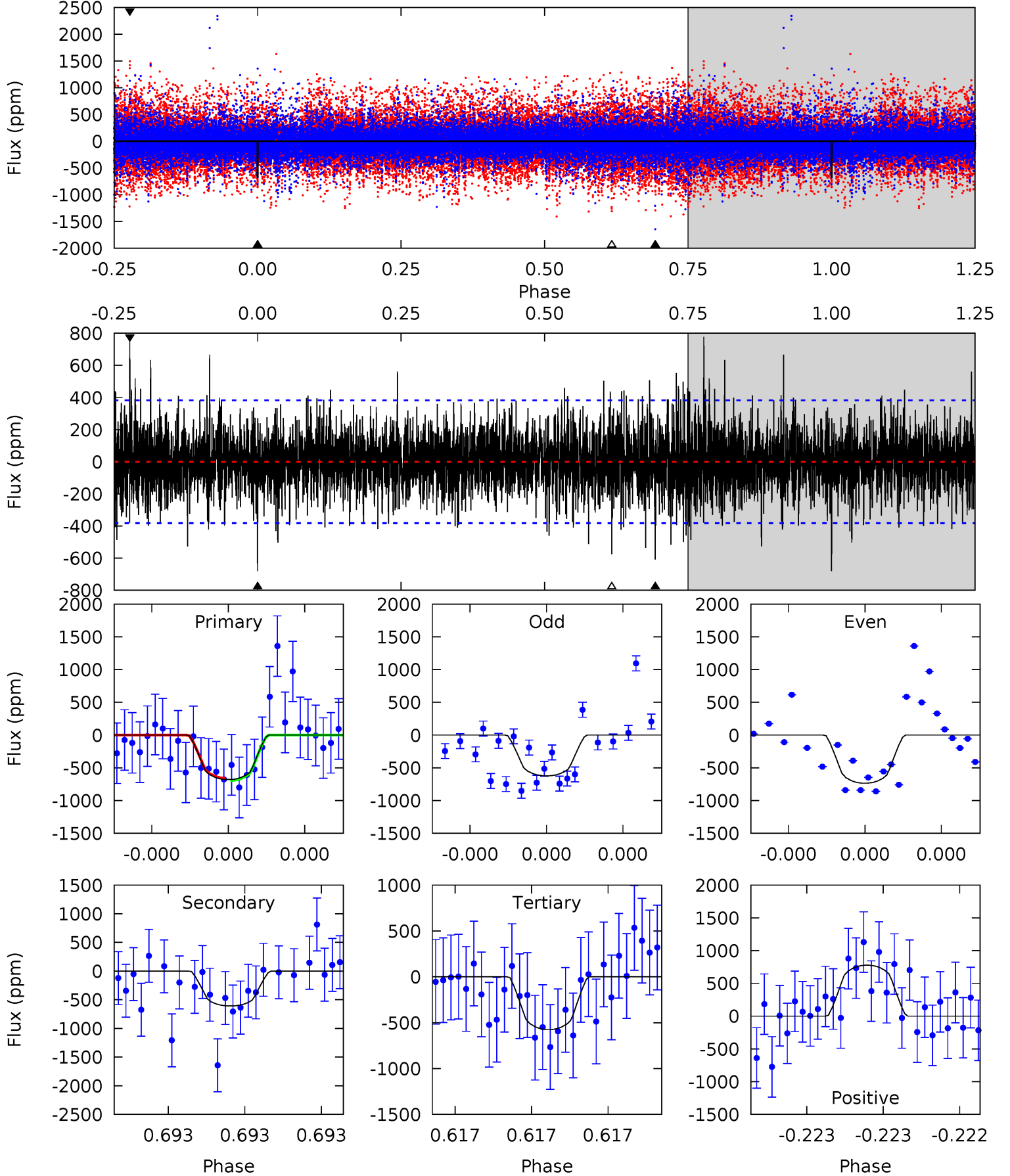
TCE 008431229-01 P=301.819898 Days $T_0=409.974004$ (BKJD)



DV Model-Shift Uniqueness Test

008431229-01, P = 301.820763 Days, E = 108.166659 Days

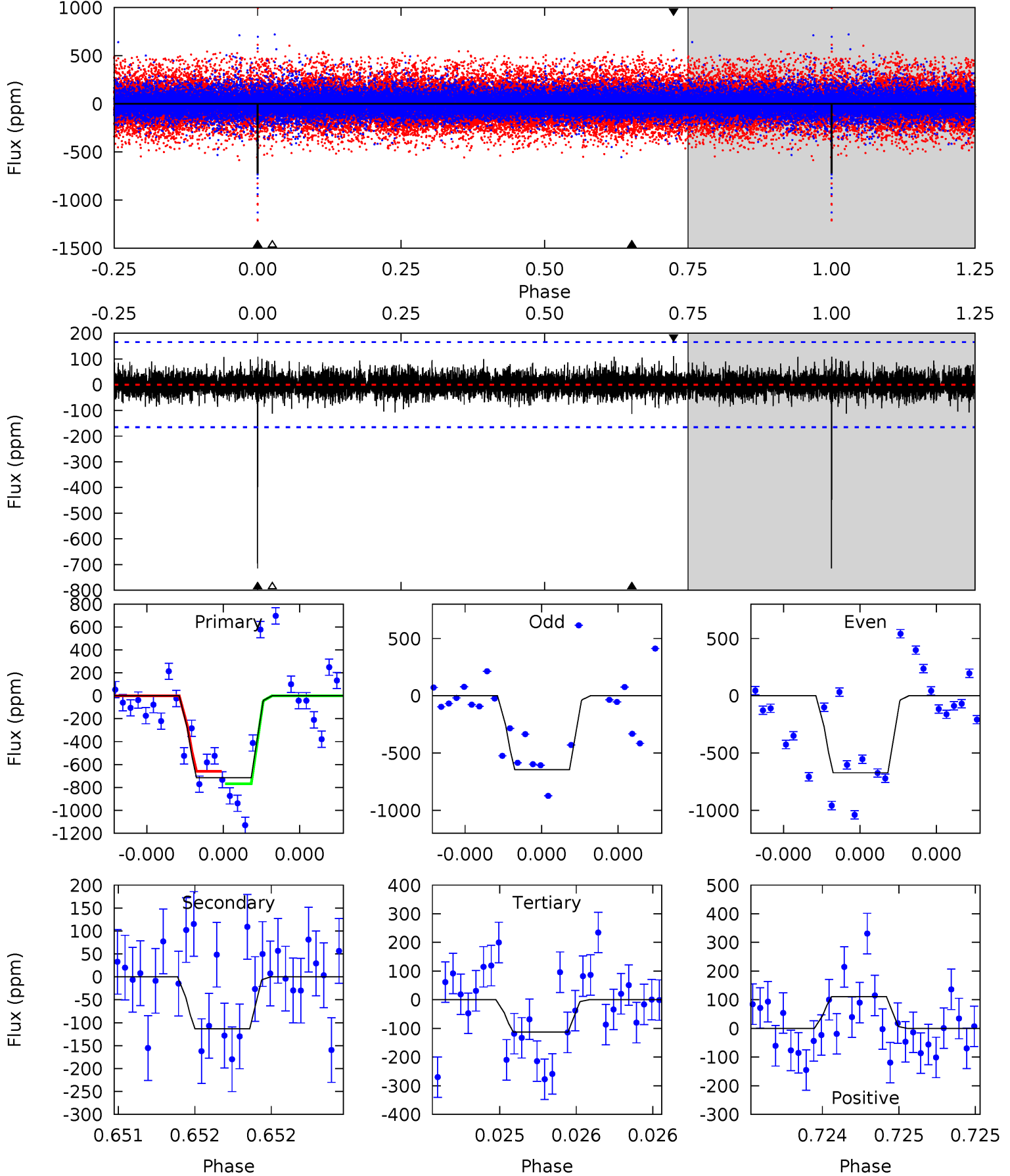
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.0	8.98	8.49	11.5	5.65	3.59	1.98	1.55	-1.44	0.49	-2.49	0.71	1.07	0.53	0.25



Alt Model-Shift Uniqueness Test

008431229-01, P = 301.819898 Days, E = 108.154106 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.2	3.83	3.80	3.75	5.61	3.53	0.85	20.4	20.4	0.03	0.07	0.48	1.05	0.13	1.85



Stellar Parameters For KIC 008431229

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5547^{+77}_{-88}	$3.833^{+0.240}_{-0.080}$	$0.260^{+0.150}_{-0.150}$	$2.275^{+0.316}_{-0.736}$	$1.284^{+0.101}_{-0.254}$	$0.154^{+0.249}_{-0.043}$
	+1%/-2%	+6%/-2%	+58%/-58%	+14%/-32%	+8%/-20%	+162%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 008431229-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-608 ± 68	$12.58^{+13.36}_{-8.88}$	520^{+22}_{-39}	4012^{+2950}_{-798}	1831^{+20364}_{-1383}
Alt.	-113 ± 30	$13.01^{+12.02}_{-8.73}$	521^{+21}_{-41}	3070^{+1193}_{-518}	346^{+2505}_{-260}

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

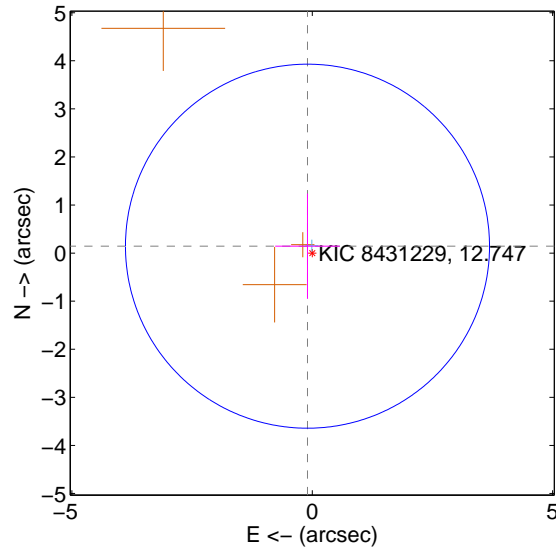
Supplemental centroid analysis for 008431229-01. Kepler magnitude: 12.75. Transit SNR 5.80

There are 1 quarters with good PRF difference image offsets

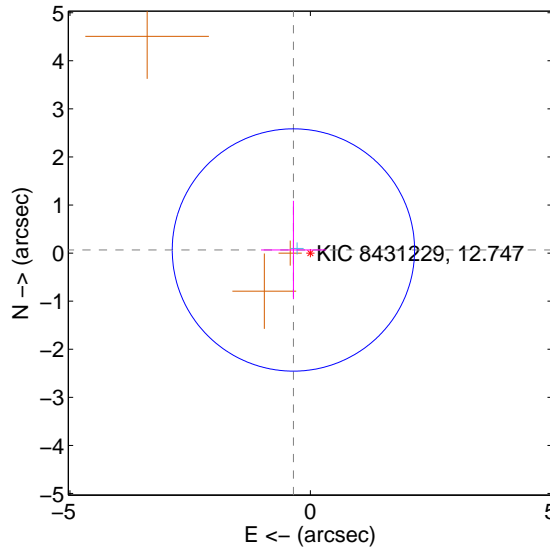
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.174 ± 1.262	0.14	0.099 ± 0.673	0.144 ± 1.095
PRF-fit source offset from KIC position	0.358 ± 0.840	0.43	0.352 ± 0.674	0.065 ± 1.024
photometric centroid source offset	0.95 ± 1.08	0.87	0.95 ± 1.08	-0.03 ± 0.66

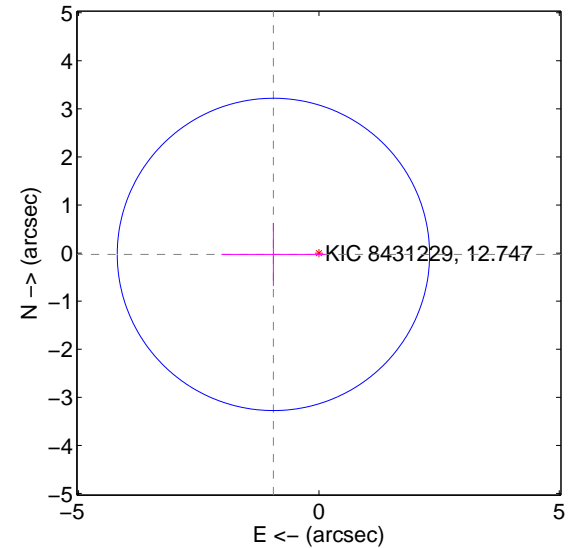
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

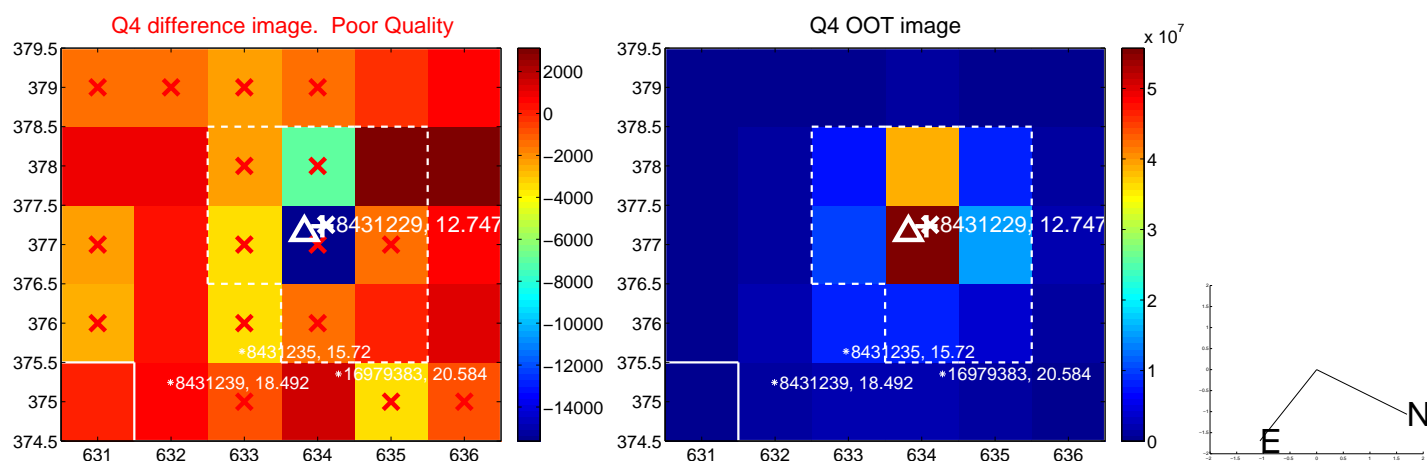
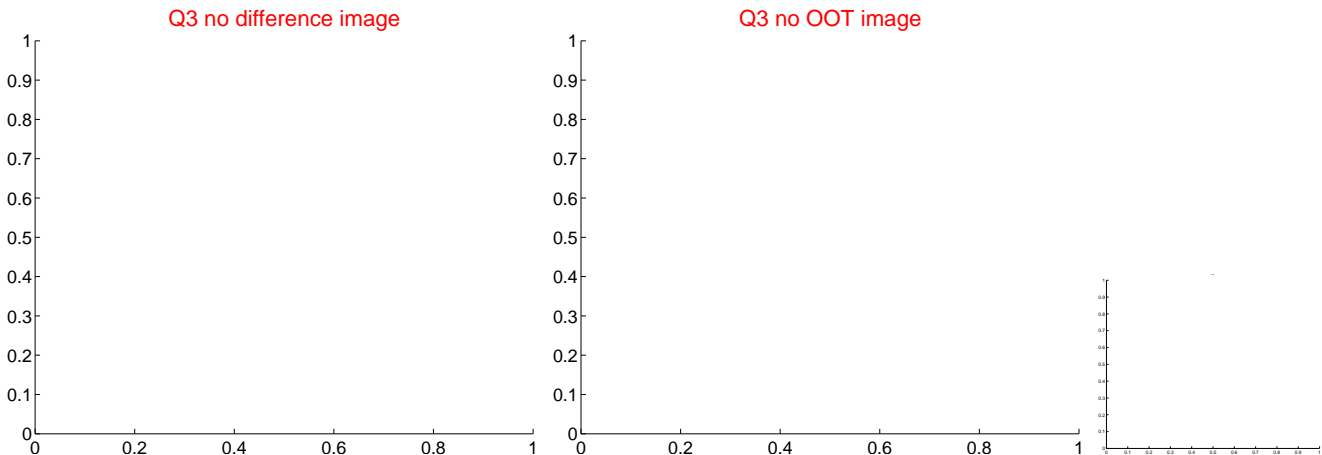
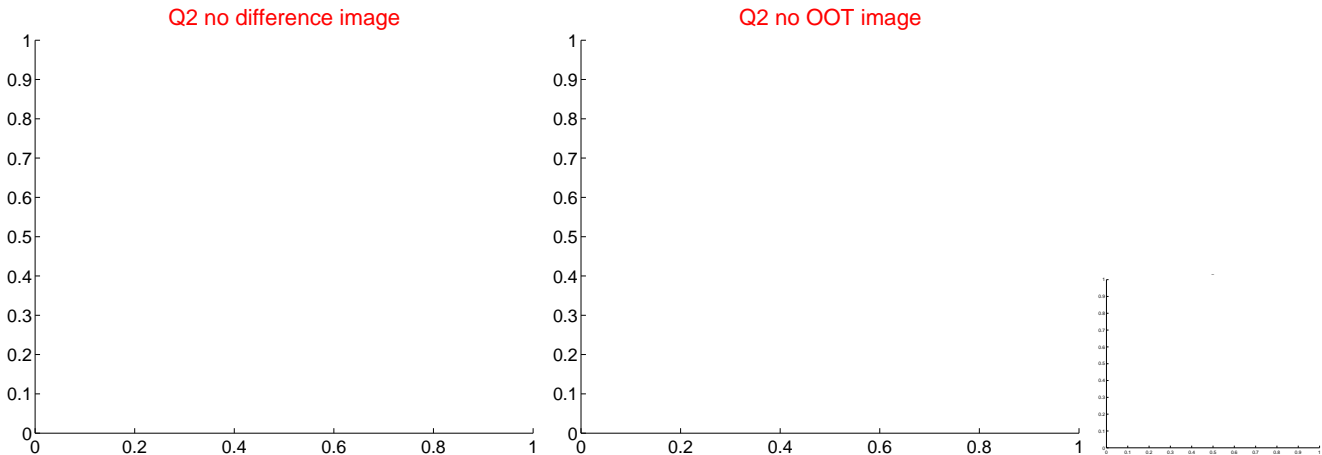
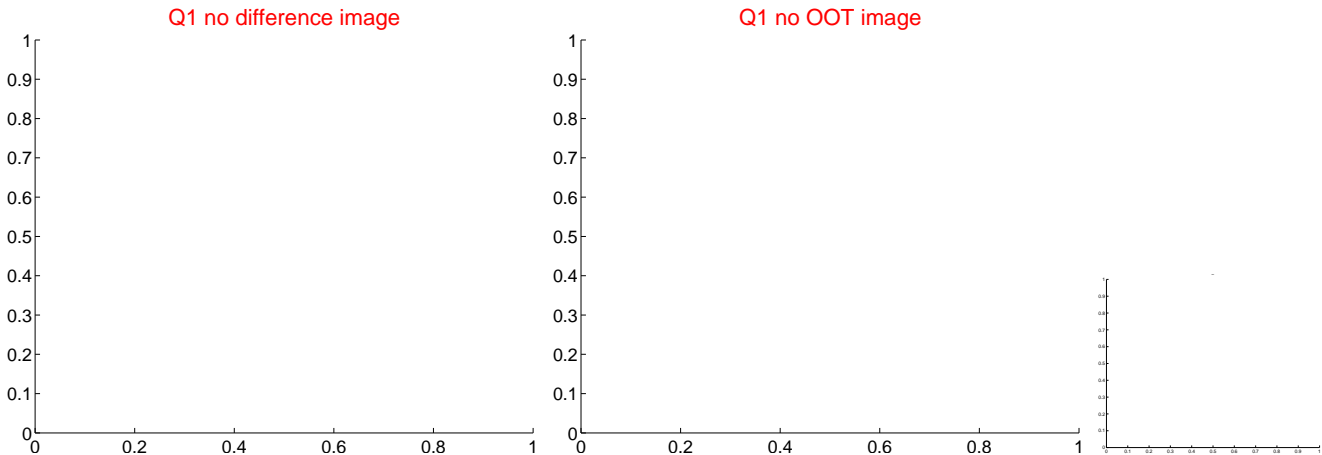


offset from photometric centroids

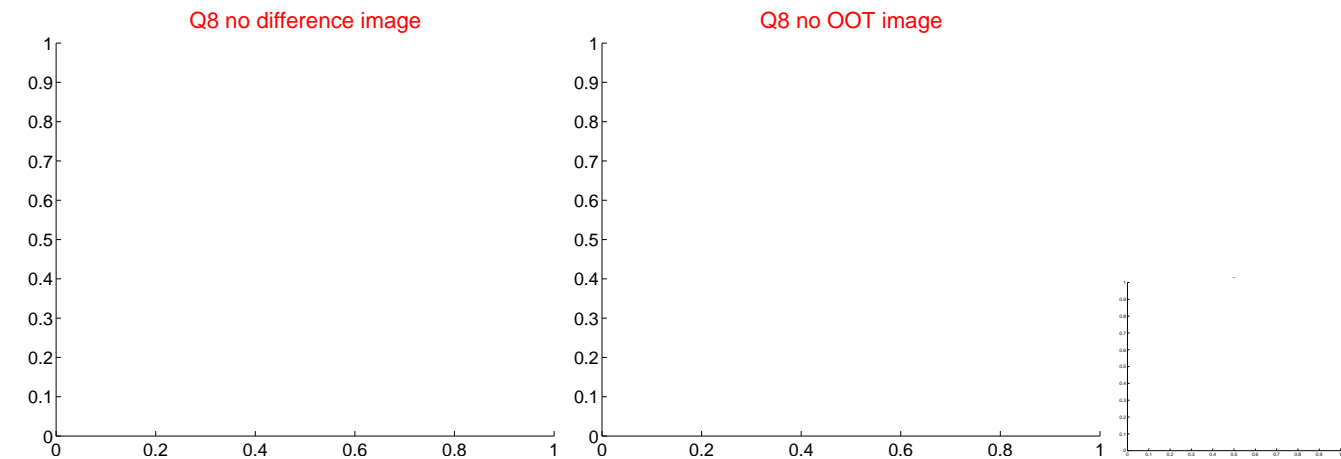
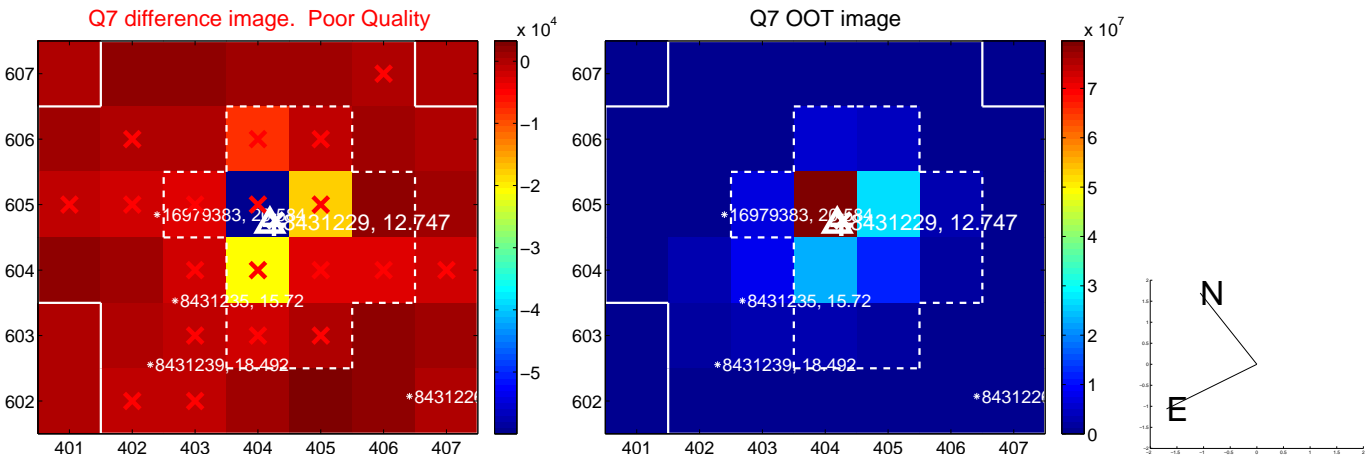
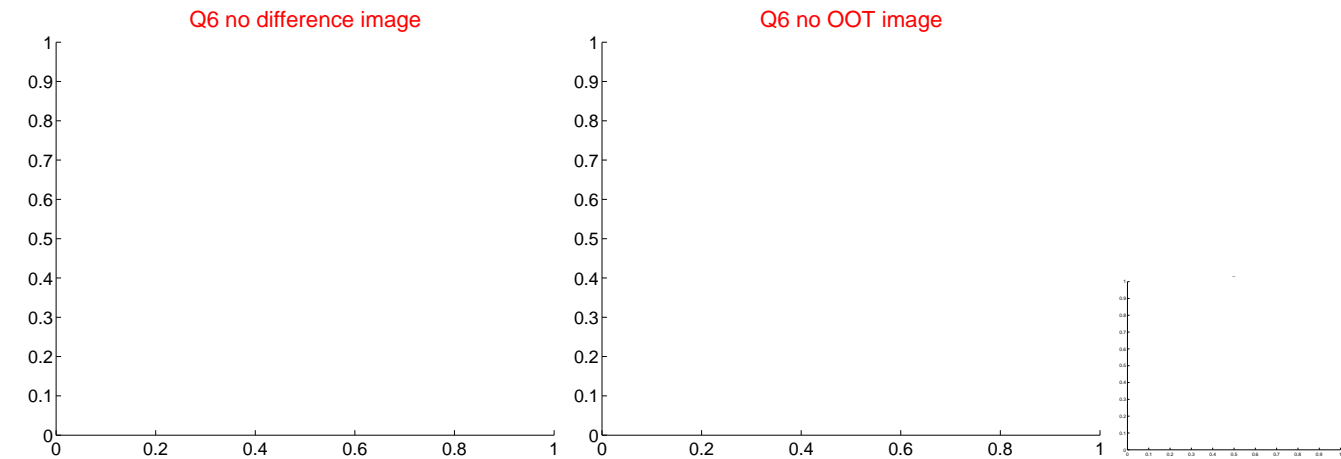


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



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

Q9 no difference image



Q9 no OOT image



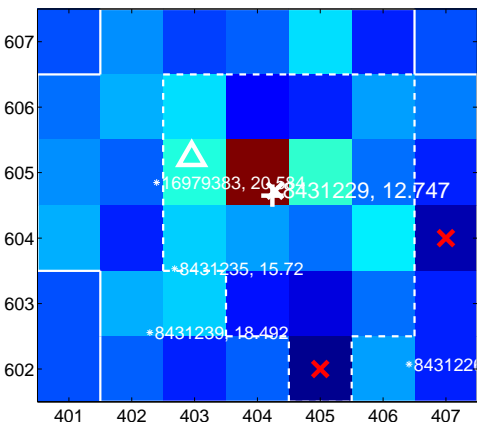
Q10 no difference image



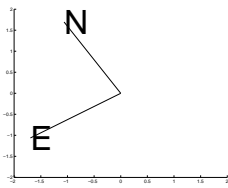
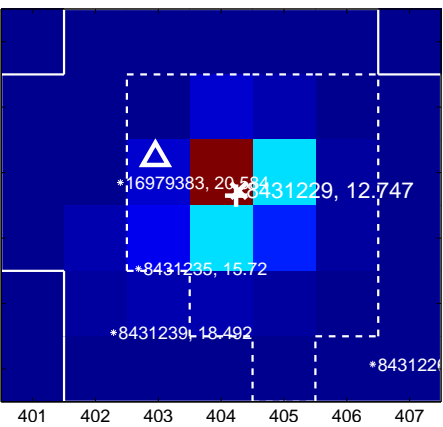
Q10 no OOT image



Q11 difference image. Poor Quality



Q11 OOT image



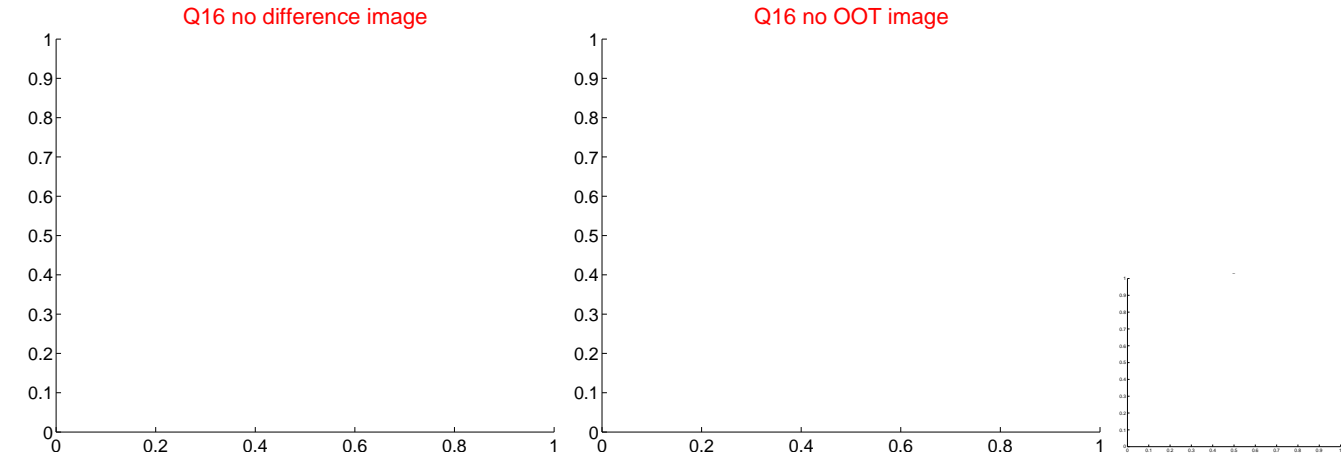
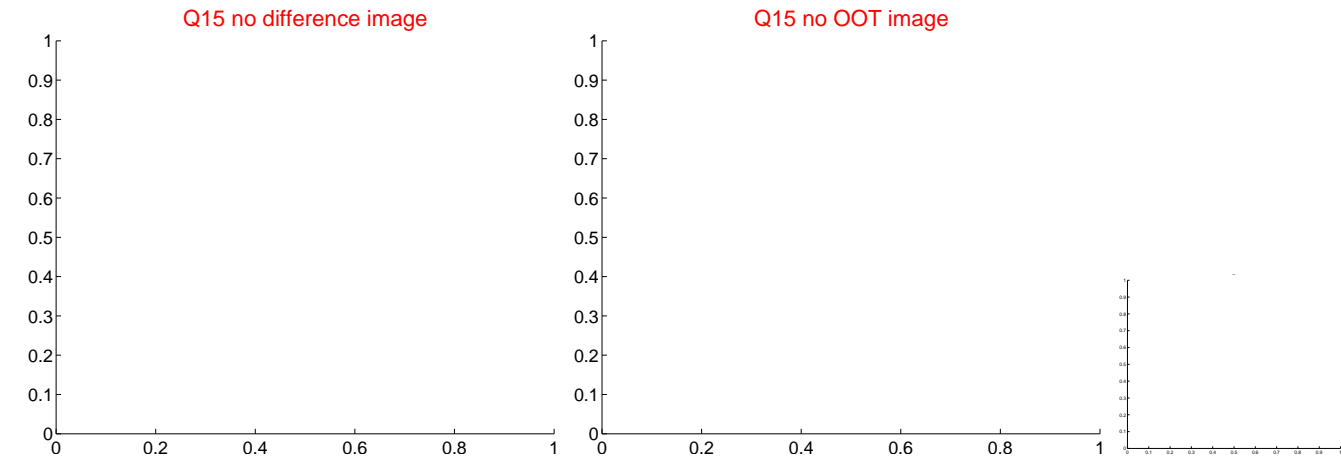
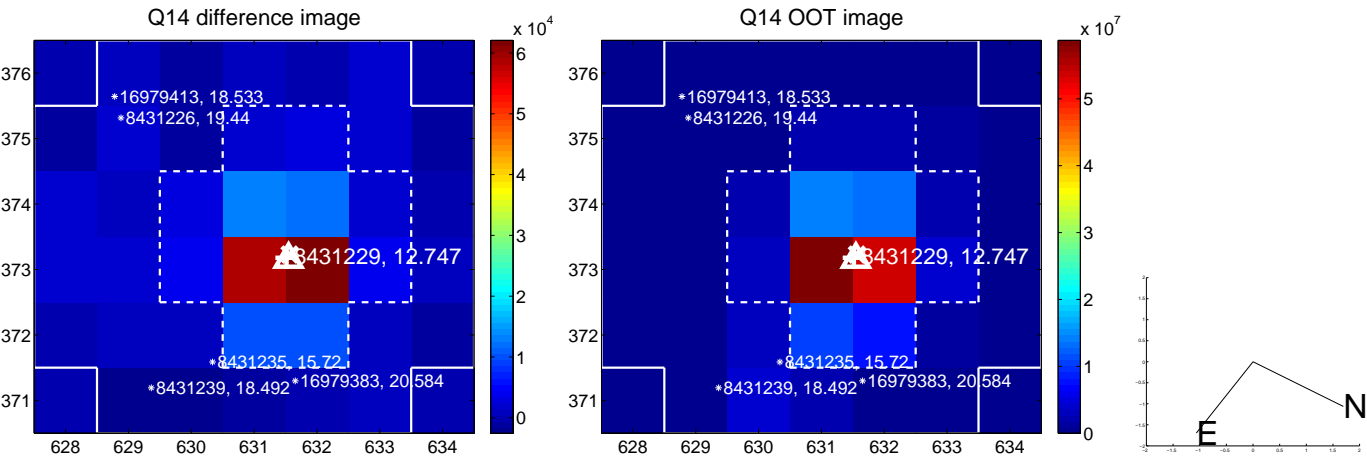
Q12 no difference image



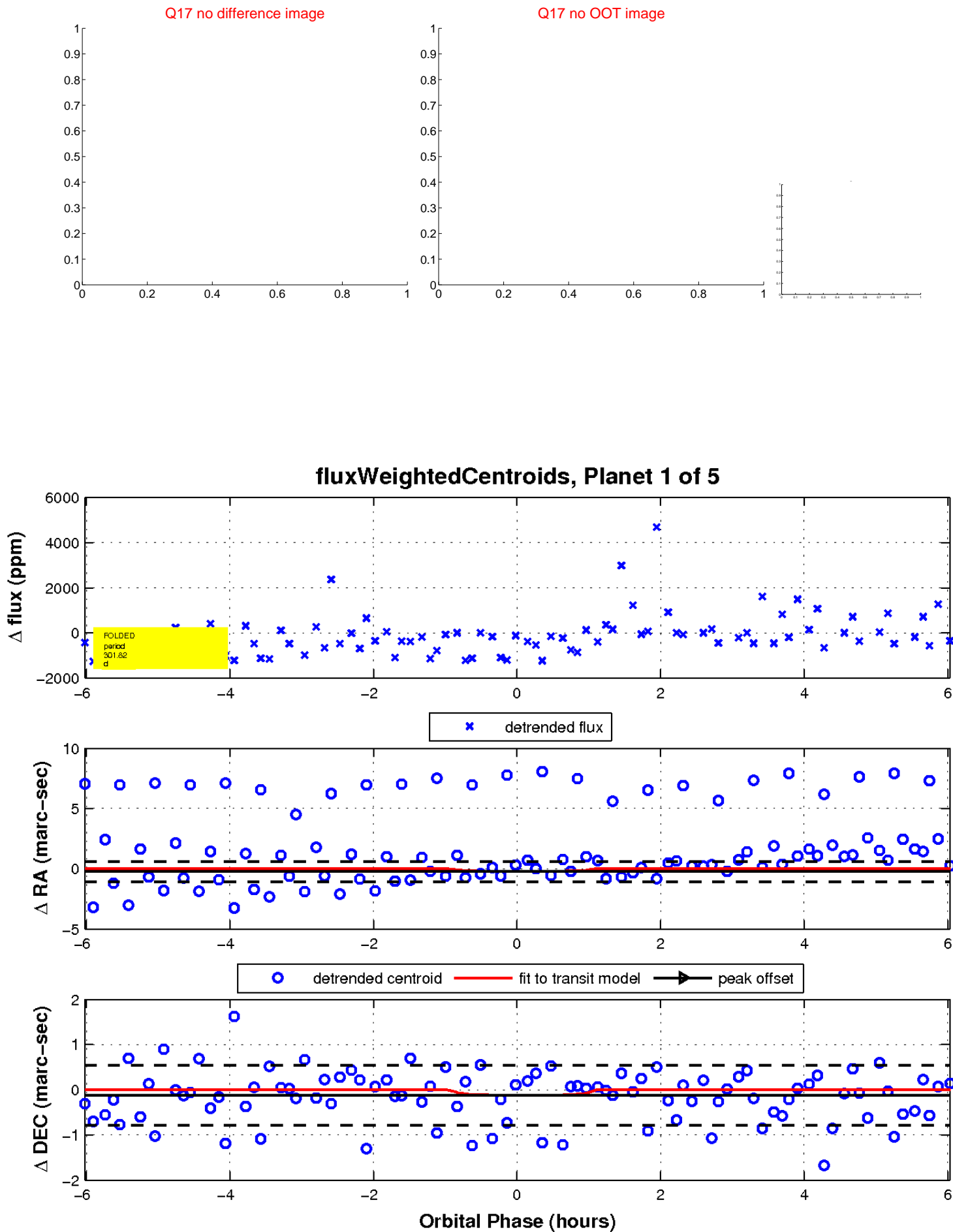
Q12 no OOT image



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

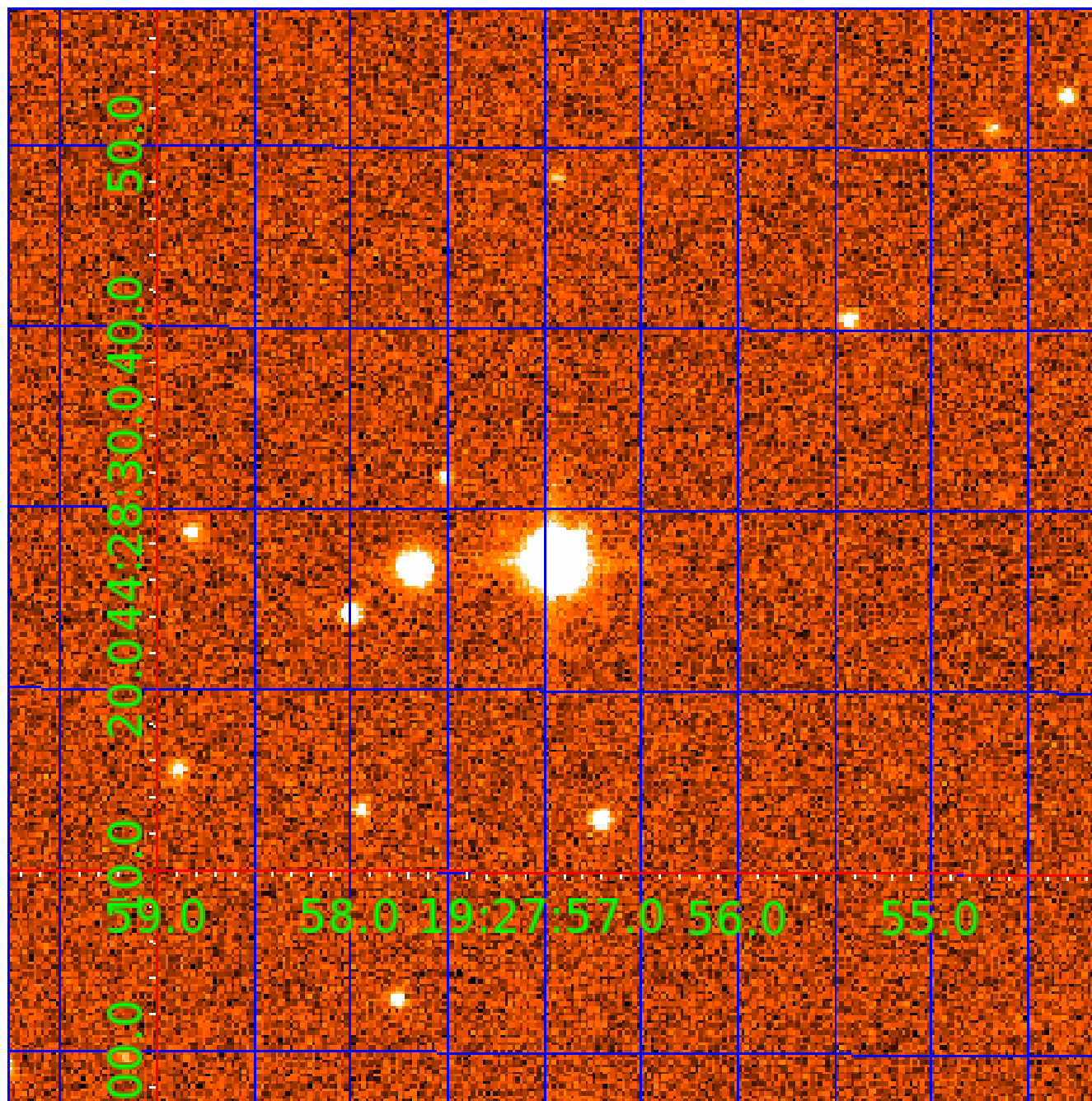


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008431229

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})
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Robovetter Results

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008431229-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008431229-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008431229-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

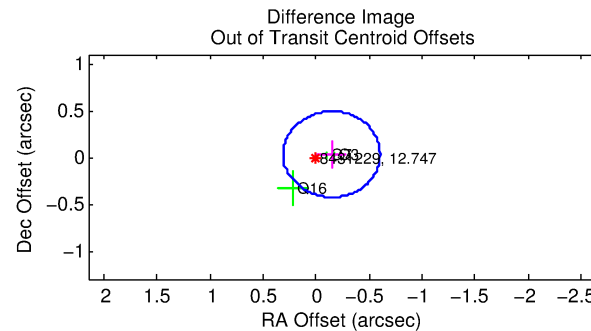
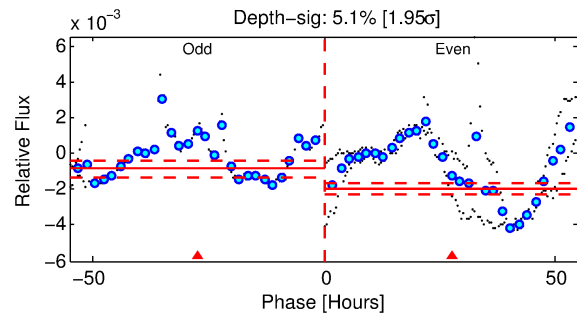
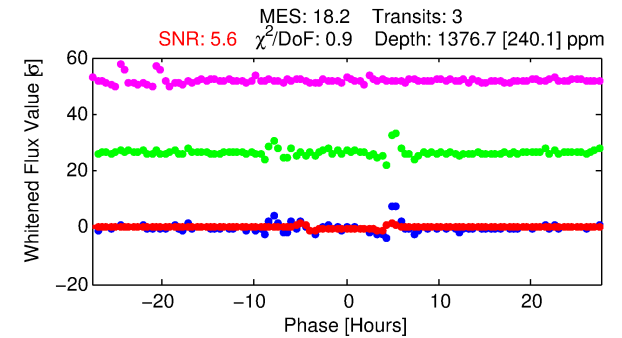
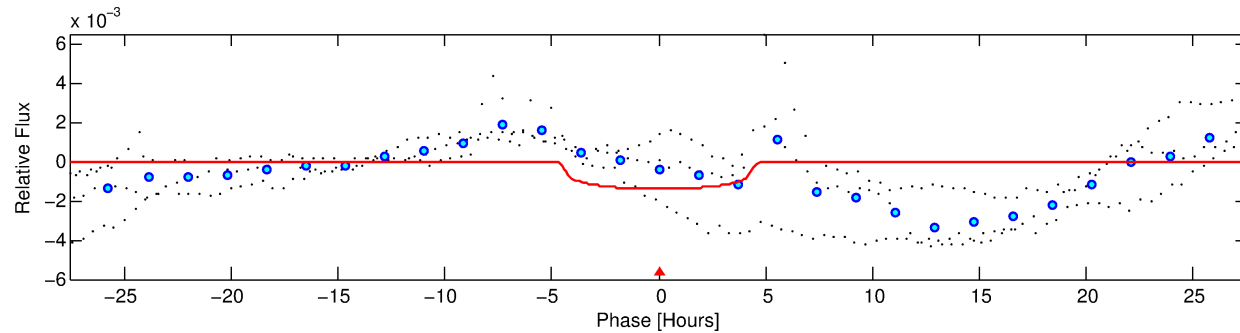
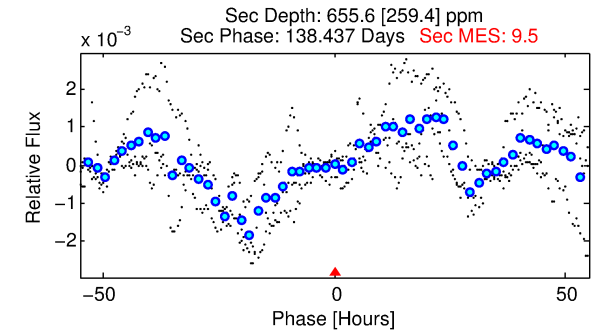
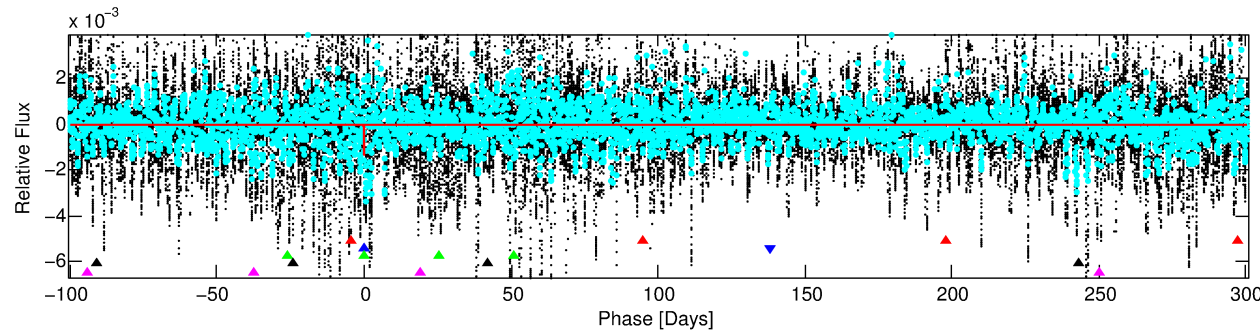
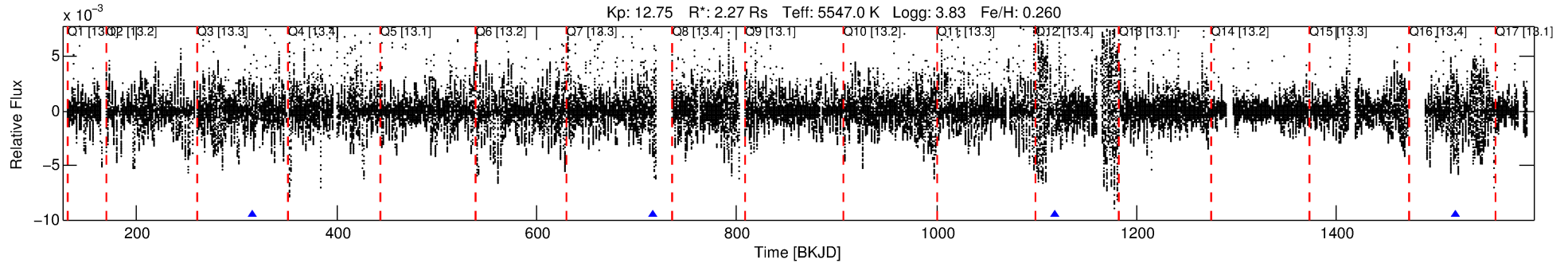
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008431229-02

No Significant Match Found

DV One-Page Summary

KIC: 8431229 Candidate: 2 of 5 Period: 401.200 d



DV Fit Results:

Period = 401.20022 [0.00200] d
Epoch = 315.2885 [0.0041] BKJD
Rp/R* = 0.0344 [0.0116]
a/R* = 306.82 [374.05]
b = 0.47 [2.03]
Seff = 3.28 [1.41]
Teq = 343 [37] K
Rp = 8.54 [4.00] Re
a = 1.1577 [0.3284] AU
Ag = 6628.81 [5914.39] [1.12 σ]
Teffp = 4786 [940] K [4.72 σ]

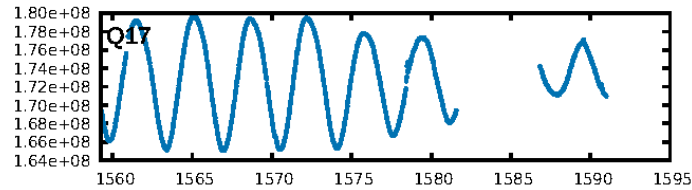
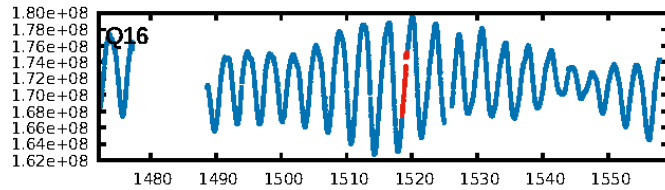
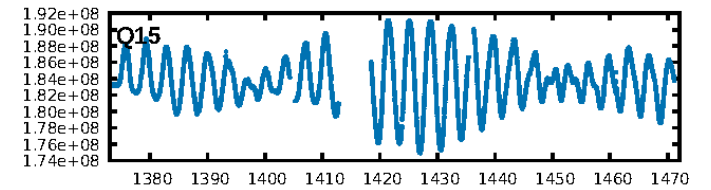
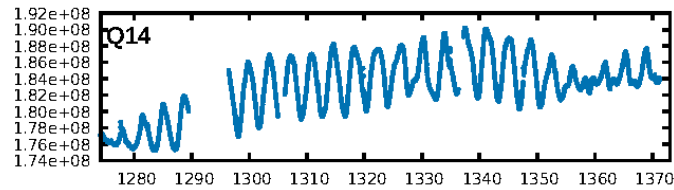
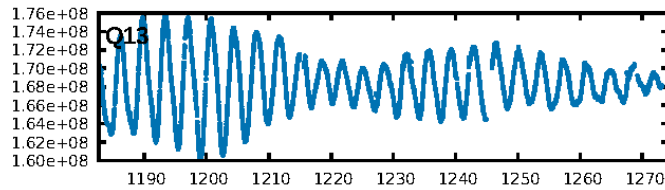
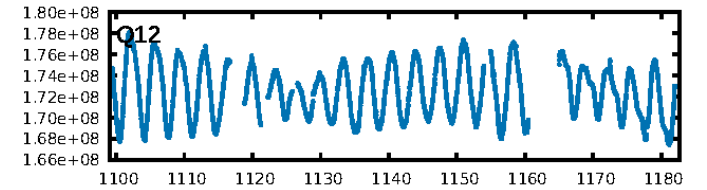
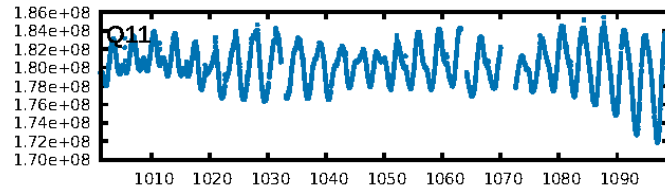
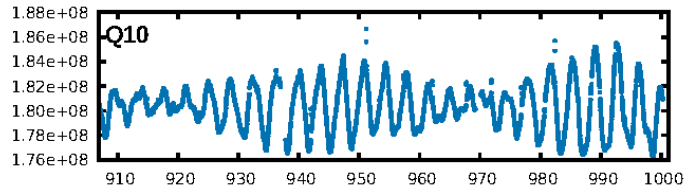
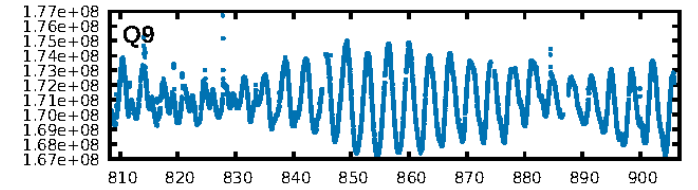
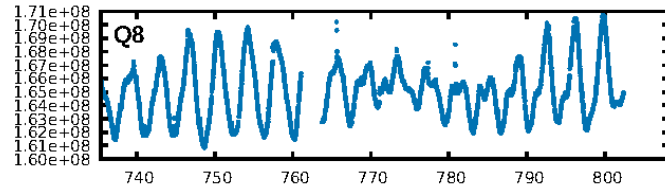
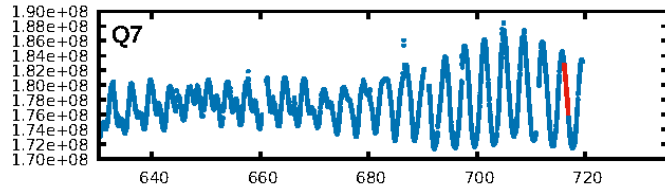
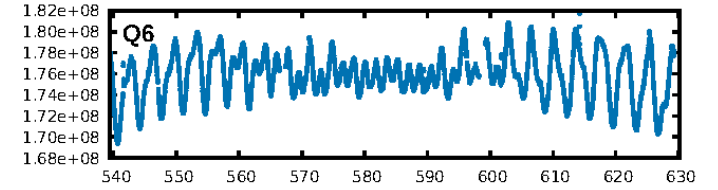
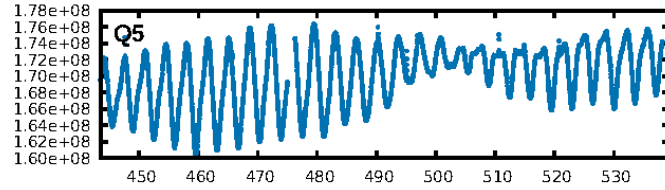
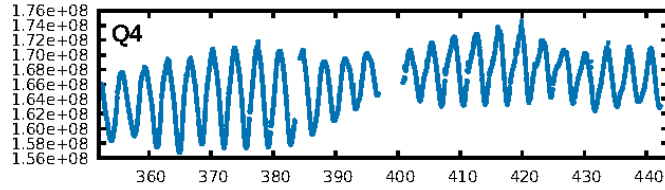
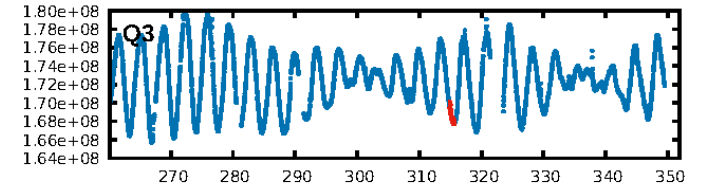
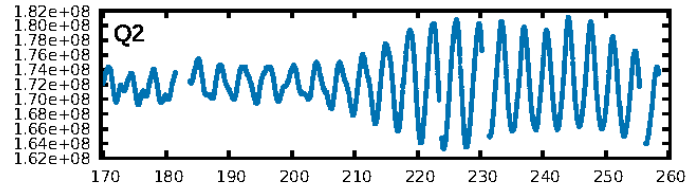
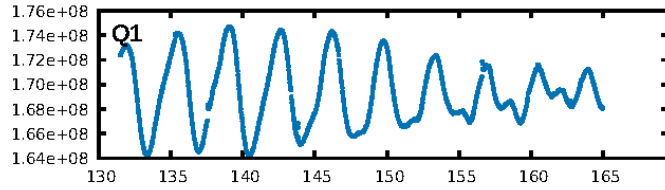
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [138.58 σ]
LongPeriod-sig: 100.0% [63.60 σ]
ModelChiSquare2-sig: 68.6%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 3.076
Centroid-sig: 75.1%
Centroid-so: 0.999 arcsec [0.97 σ]
OotOffset-rm: 0.149 arcsec [0.98 σ]
OotOffset-st: 0/2/1/0 [3]
KicOffset-rm: 0.145 arcsec [1.30 σ]
KicOffset-st: 0/2/1/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.67 [2/3]

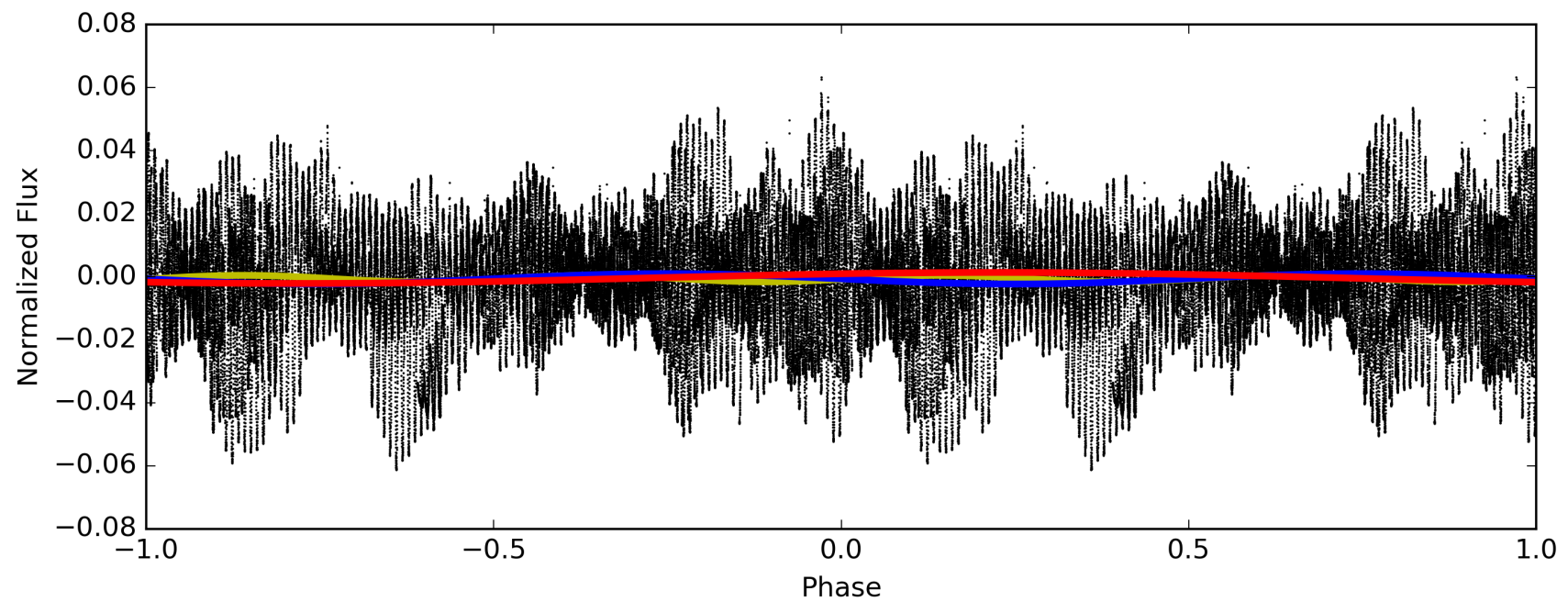
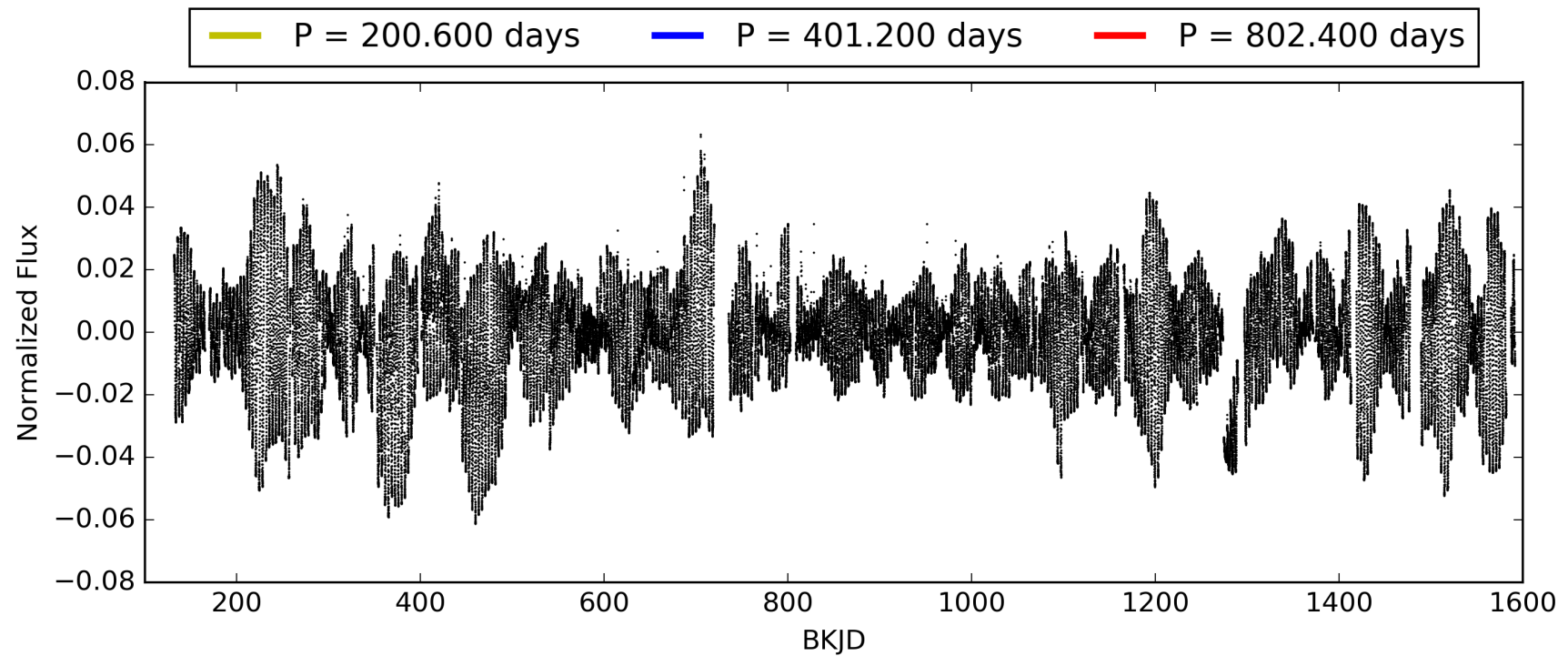
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:49:14 Z

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

TCE 008431229-02, PDC Light Curves

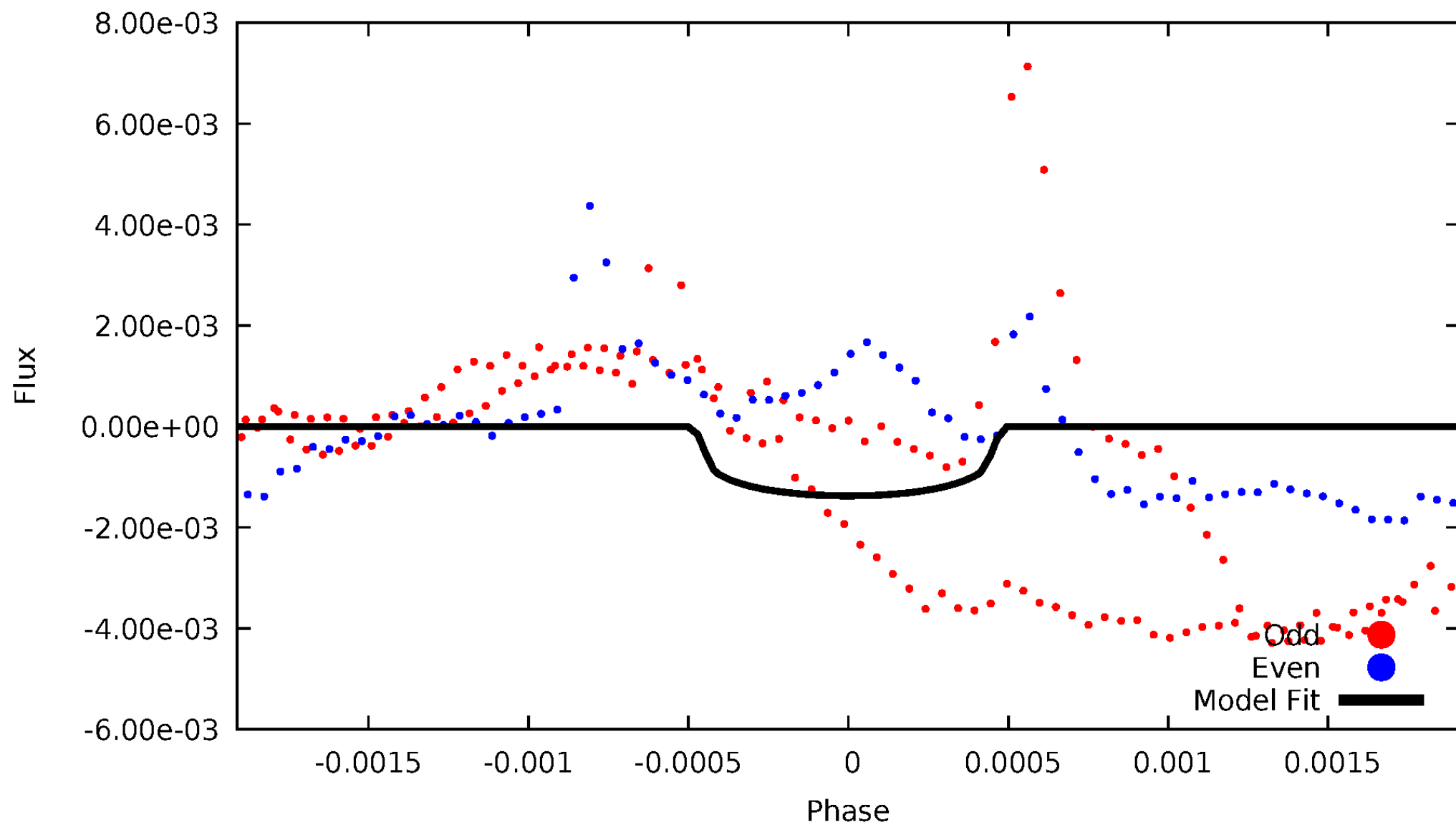


TCE 008431229-02



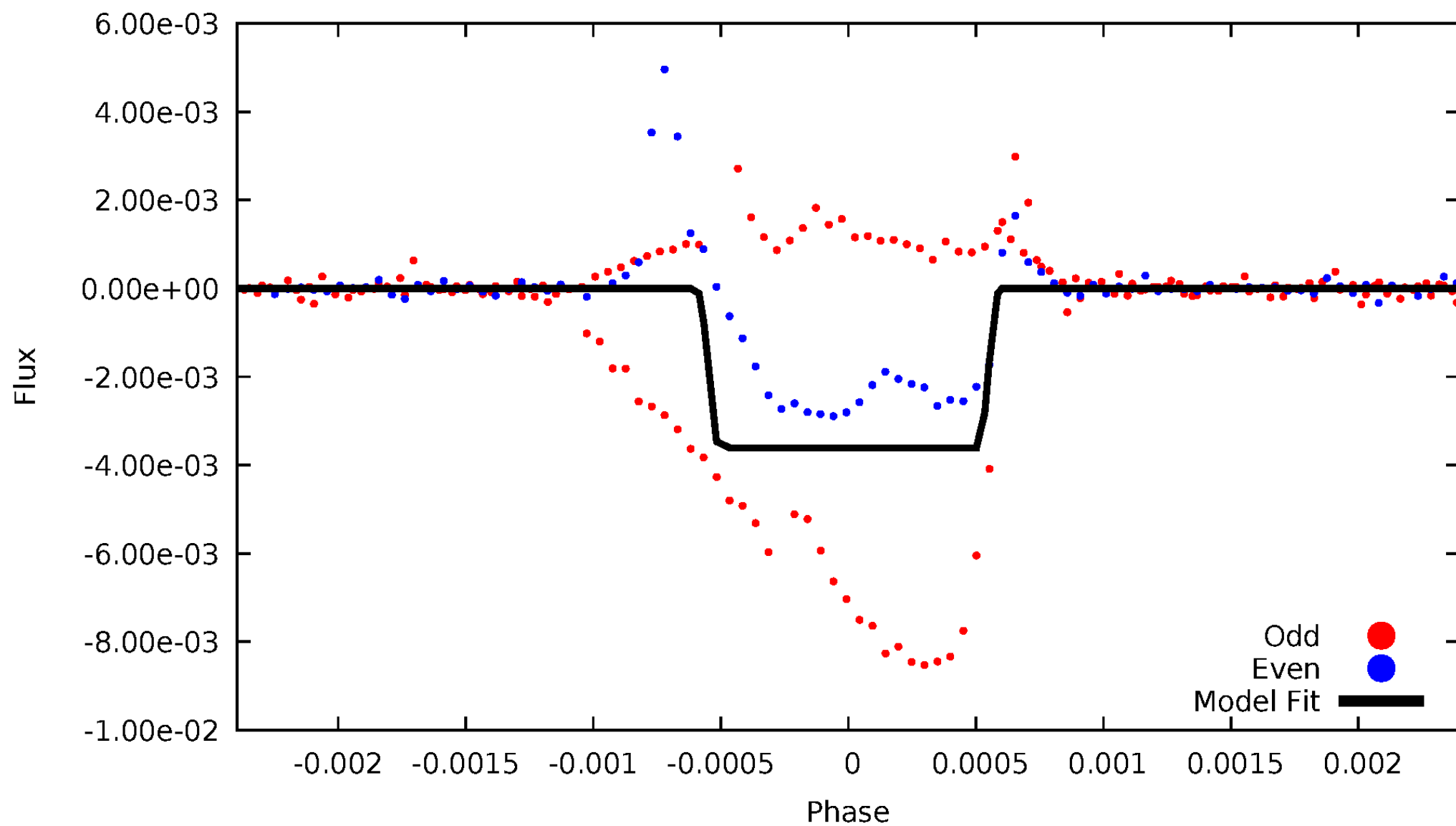
DV Odd/Even

TCE 008431229-02



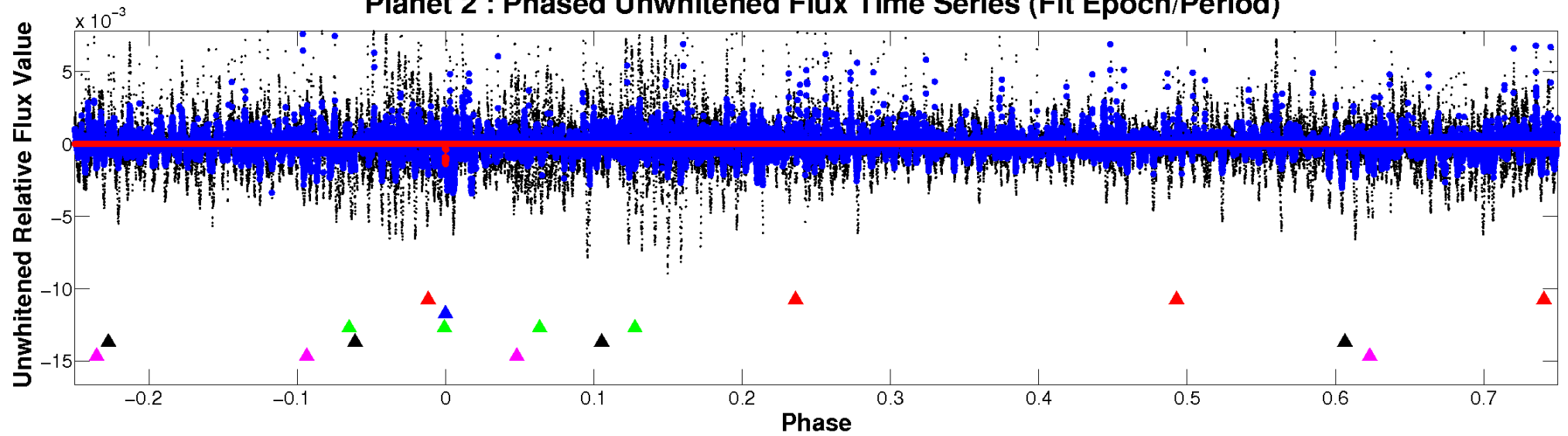
ALT Odd/Even

TCE 008431229-02

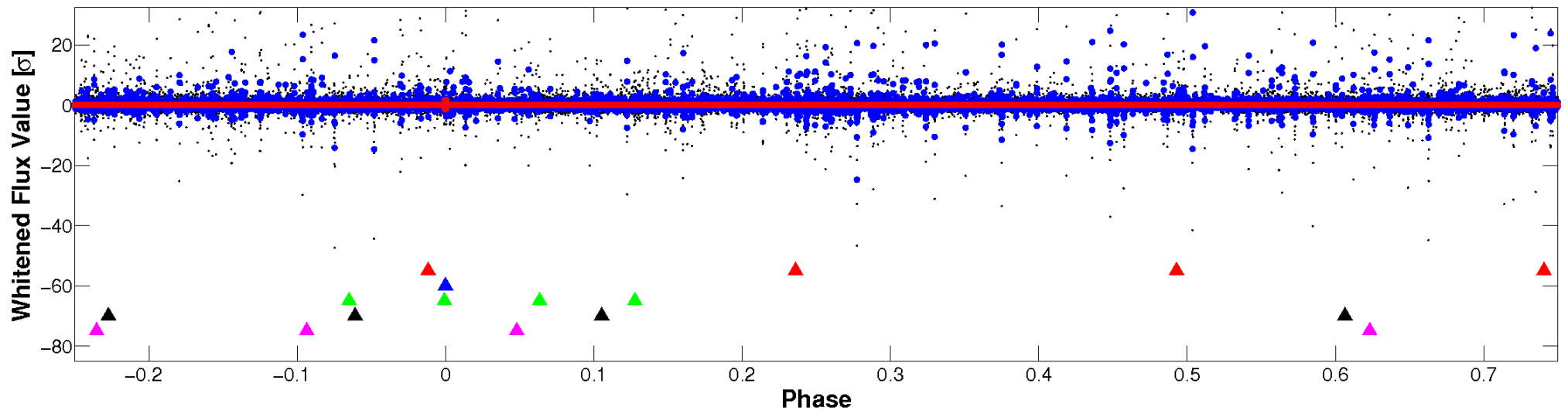


Non-Whitened Vs. Whitened Light Curve

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

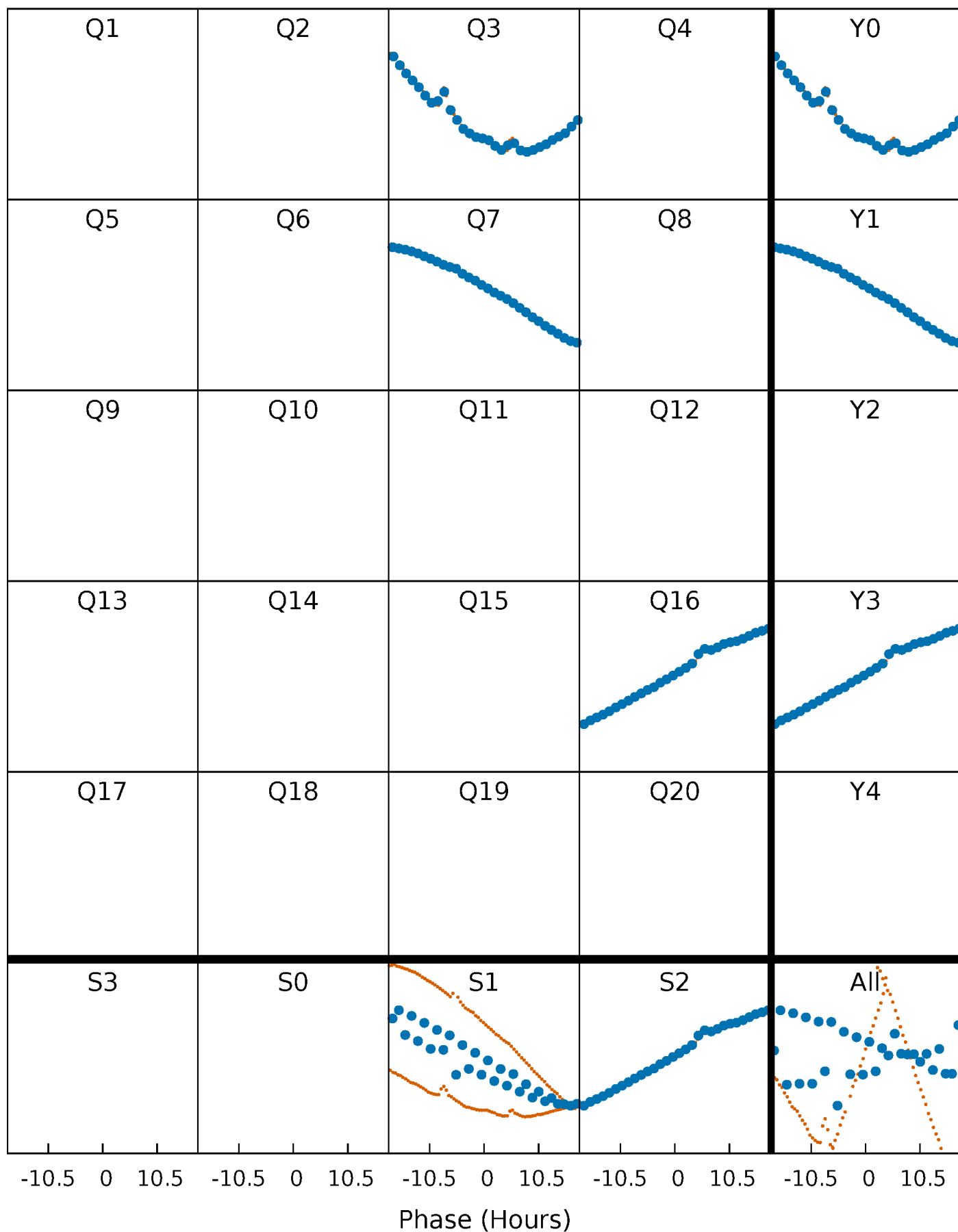


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



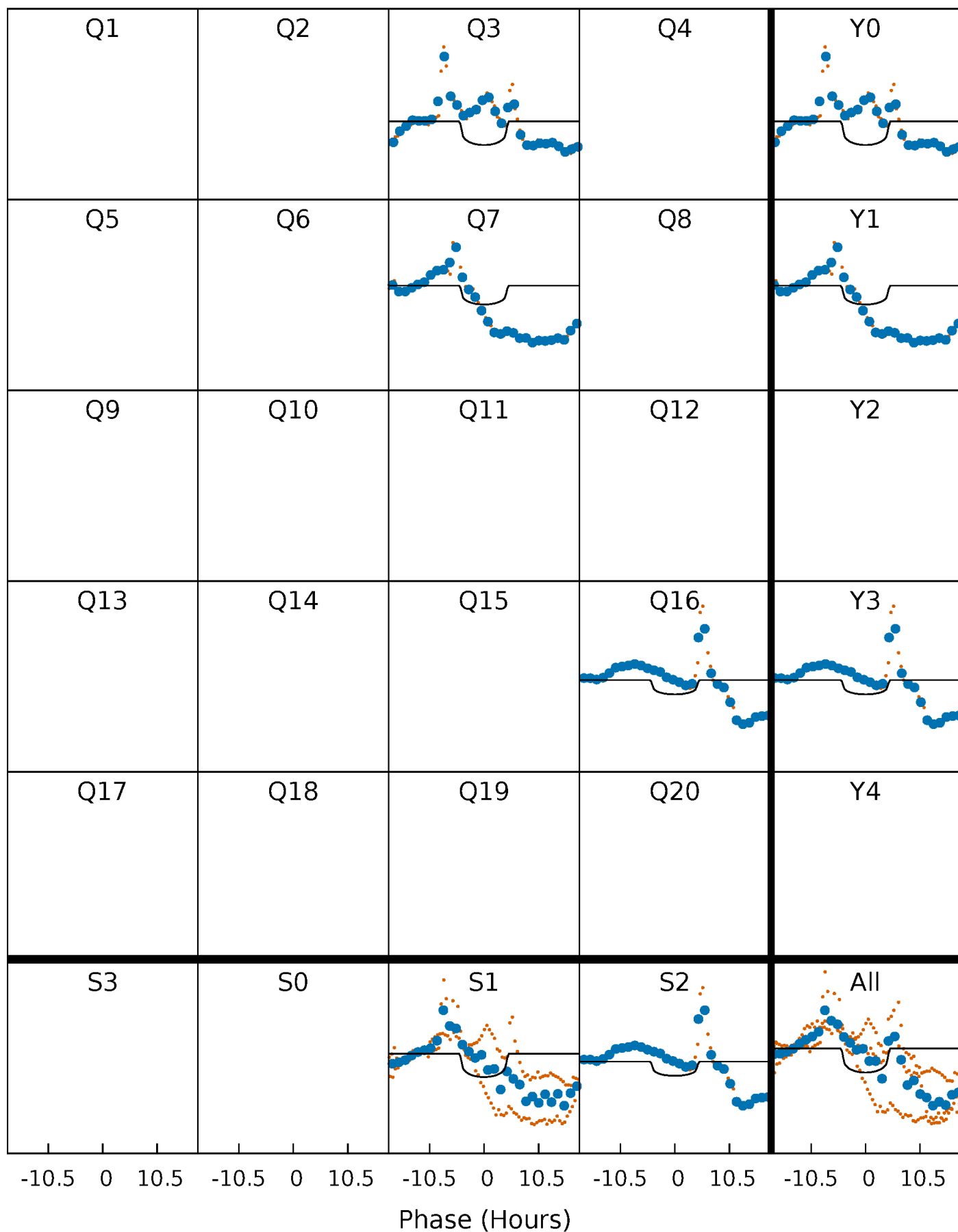
PDC Quarter-Phased Transit Curves

TCE 008431229-02 $P=401.200217$ Days $T_0=315.288471$ (BKJD)



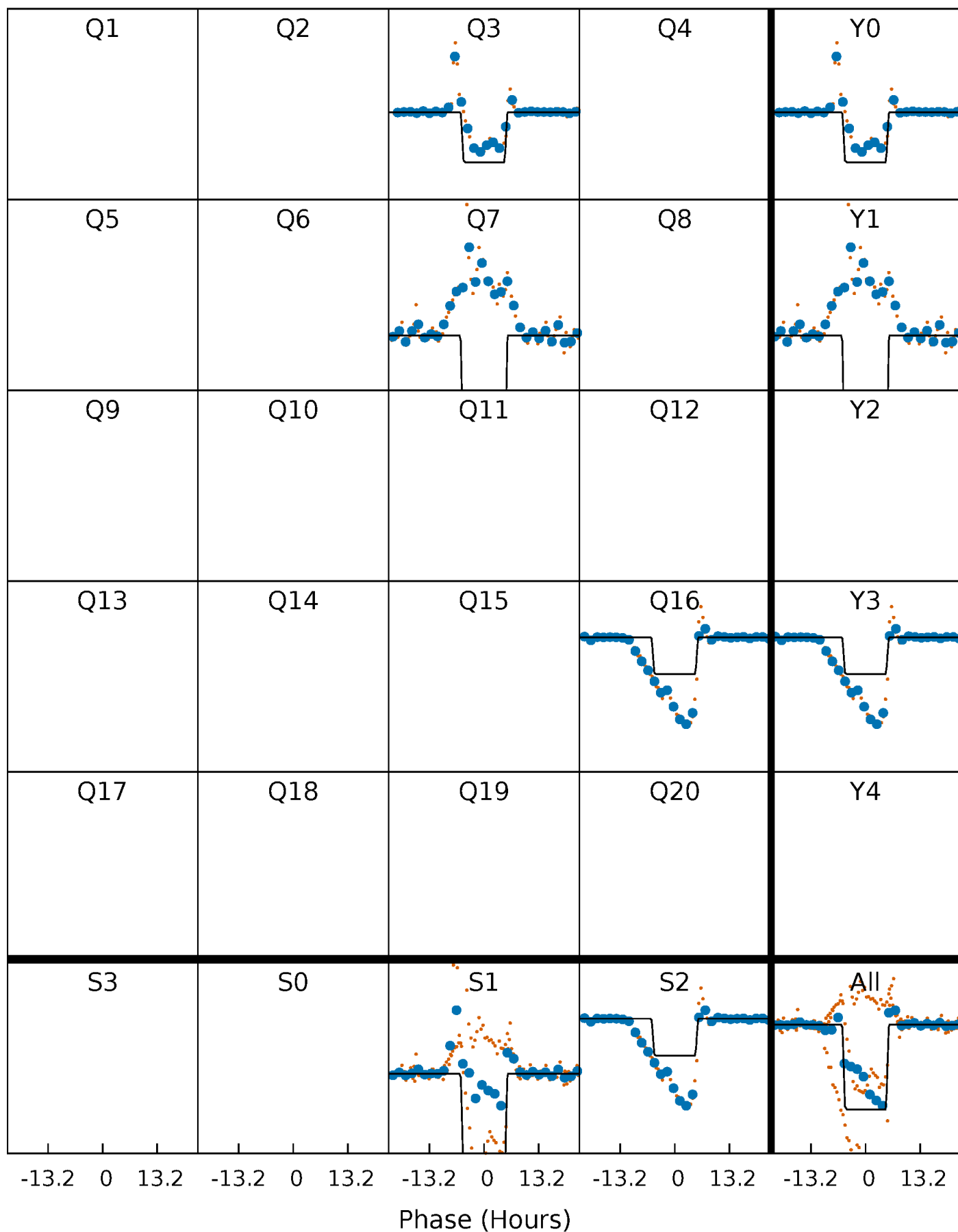
DV Quarter-Phased Transit Curves

TCE 008431229-02 P=401.200217 Days $T_0=315.288471$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

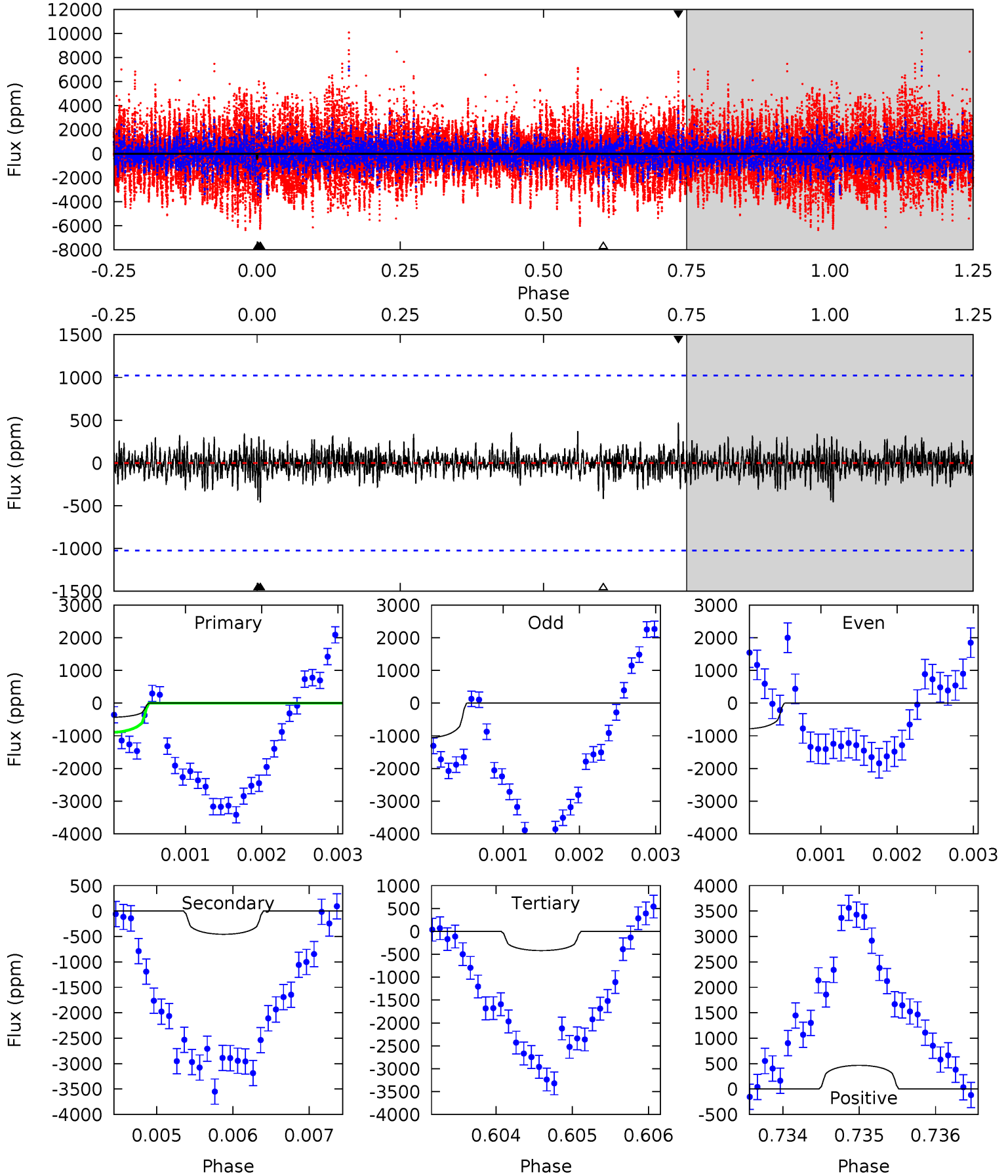
TCE 008431229-02 P=401.199328 Days $T_0=315.253399$ (BKJD)



DV Model-Shift Uniqueness Test

008431229-02, P = 401.200217 Days, E = 315.288471 Days

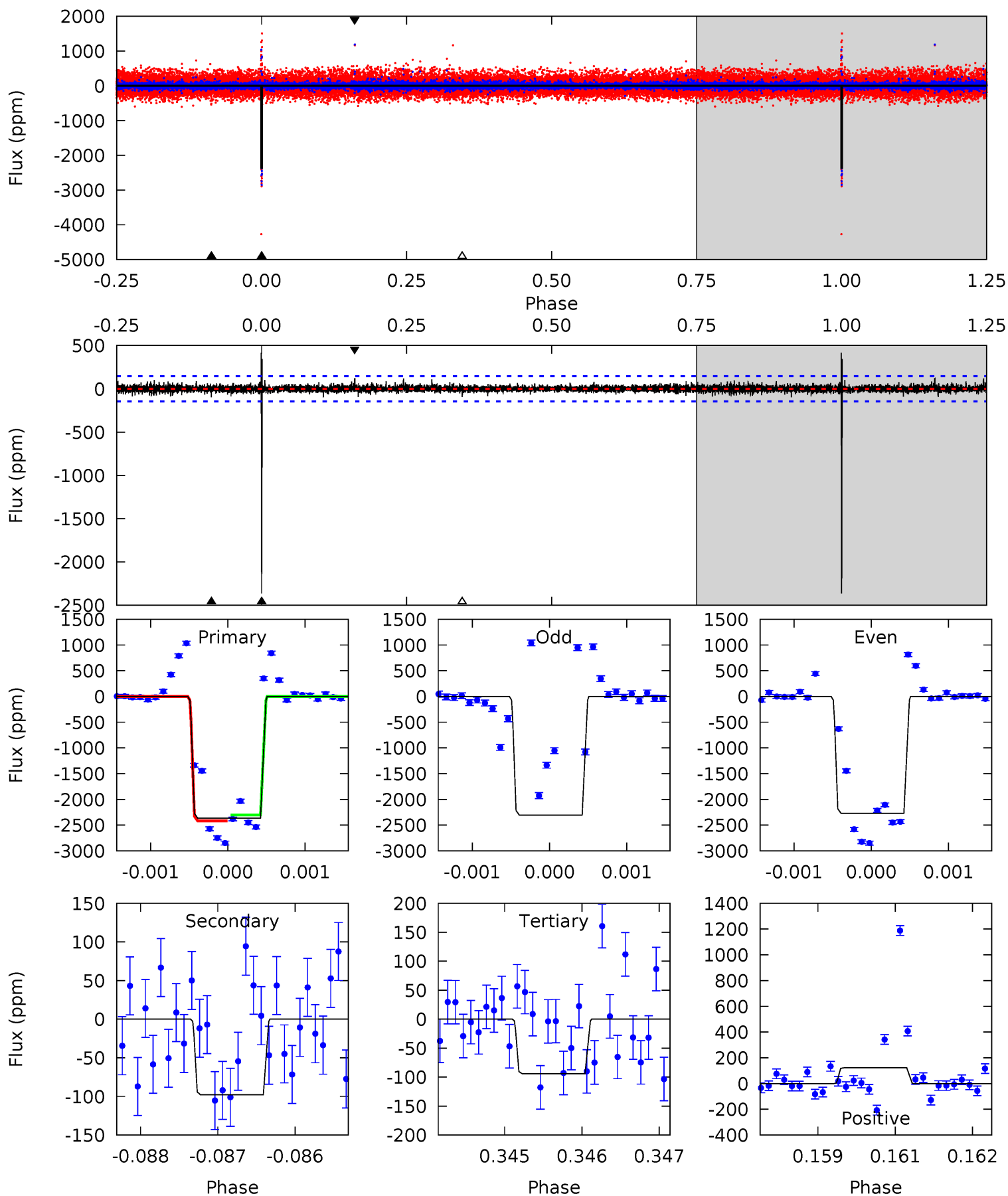
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.32	2.44	2.24	2.49	5.46	3.30	0.56	0.08	-0.17	0.20	-0.05	0.62	-5.79	0.51	2.23



Alt Model-Shift Uniqueness Test

008431229-02, P = 401.199328 Days, E = 315.253399 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
87.2	3.61	3.47	4.52	5.42	3.24	0.72	83.7	82.6	0.14	-0.91	0.92	1.18	0.15	0



Stellar Parameters For KIC 008431229

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5547^{+77}_{-88}	$3.833^{+0.240}_{-0.080}$	$0.260^{+0.150}_{-0.150}$	$2.275^{+0.316}_{-0.736}$	$1.284^{+0.101}_{-0.254}$	$0.154^{+0.249}_{-0.043}$
	+1%/-2%	+6%/-2%	+58%/-58%	+14%/-32%	+8%/-20%	+162%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 008431229-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-457 ± 187	$8.10^{+3.27}_{-2.79}$	473^{+21}_{-34}	4484^{+851}_{-600}	4923^{+6638}_{-2873}
Alt.	-98 ± 27	$13.78^{+3.73}_{-3.13}$	474^{+21}_{-37}	2933^{+236}_{-173}	361^{+273}_{-147}

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

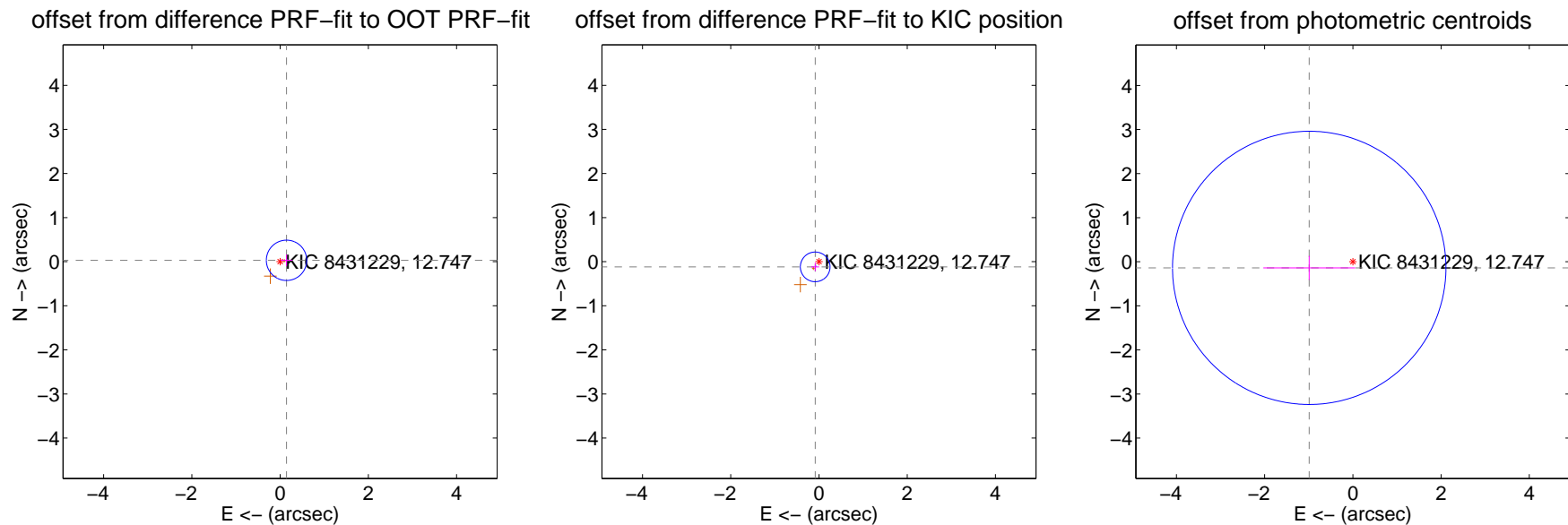
DV Centroid Data

Supplemental centroid analysis for 008431229-02. Kepler magnitude: 12.75. Transit SNR 5.62

There are 1 quarters with good PRF difference image offsets

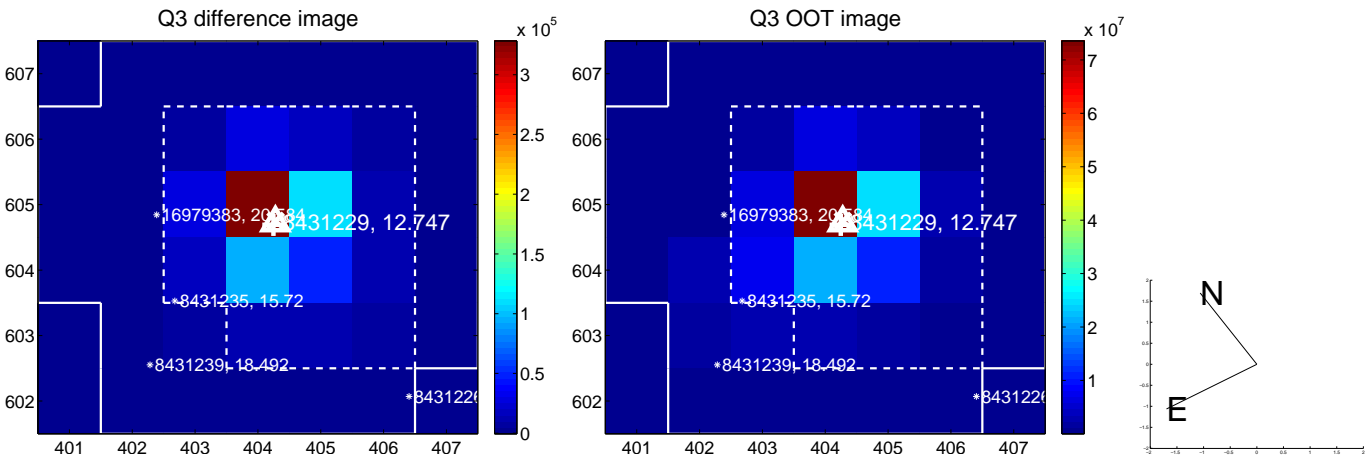
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.149 ± 0.153	0.98	-0.145 ± 0.133	0.031 ± 0.133
PRF-fit source offset from KIC position	0.145 ± 0.112	1.30	0.086 ± 0.089	-0.117 ± 0.096
photometric centroid source offset	1.00 ± 1.03	0.97	0.99 ± 1.04	-0.14 ± 0.27

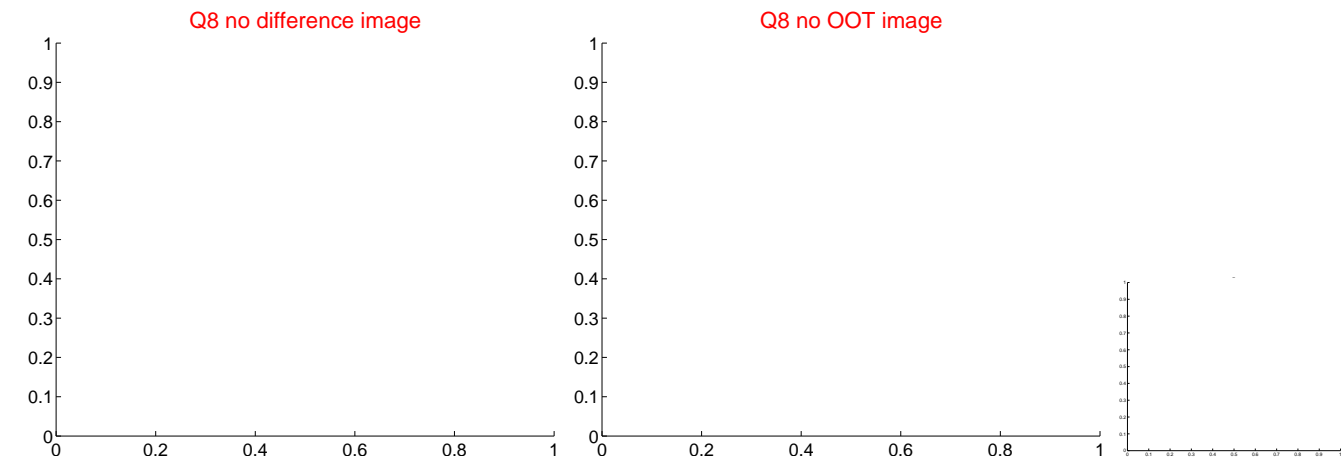
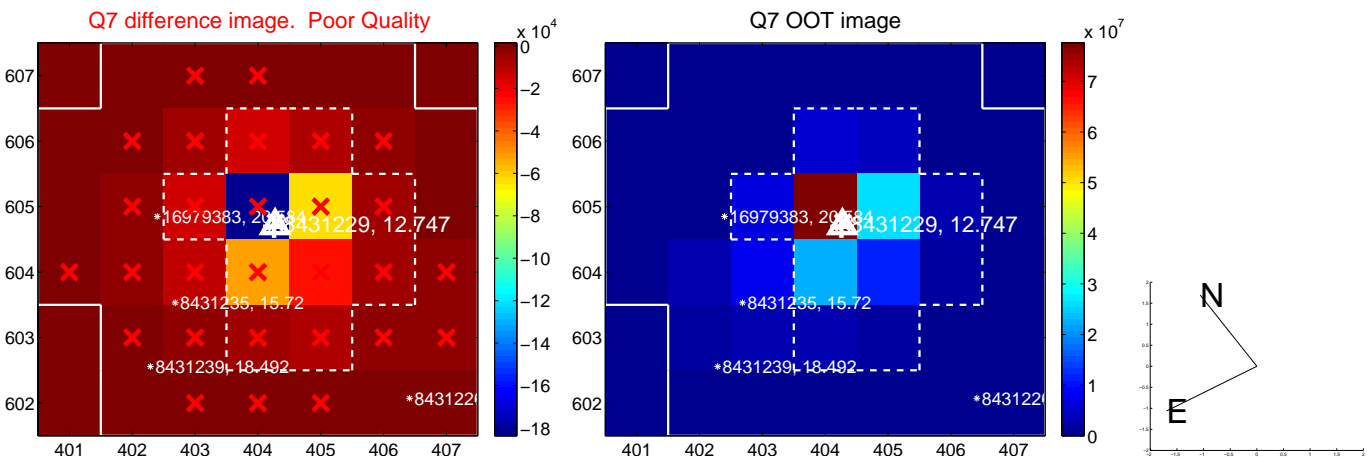


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



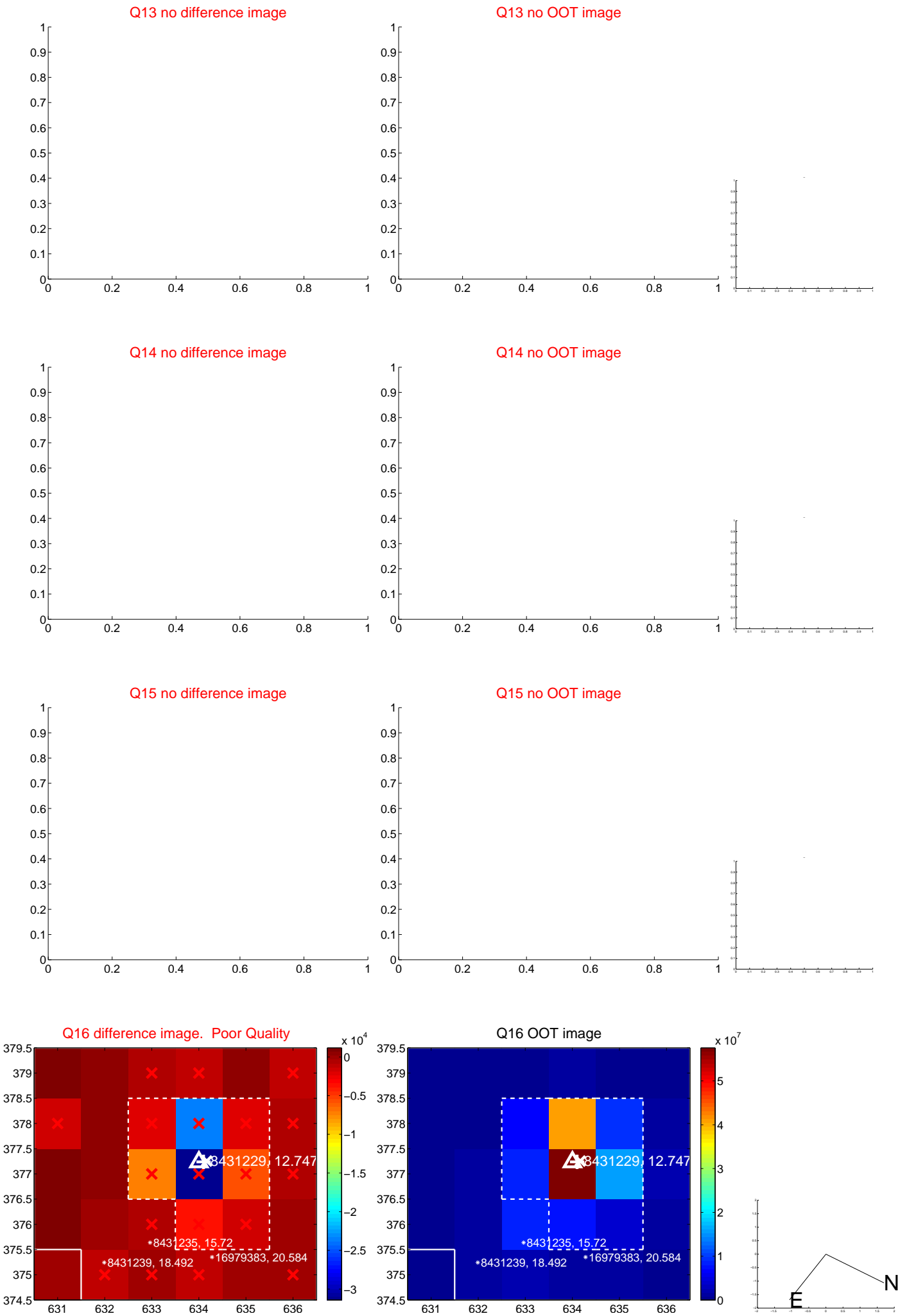
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



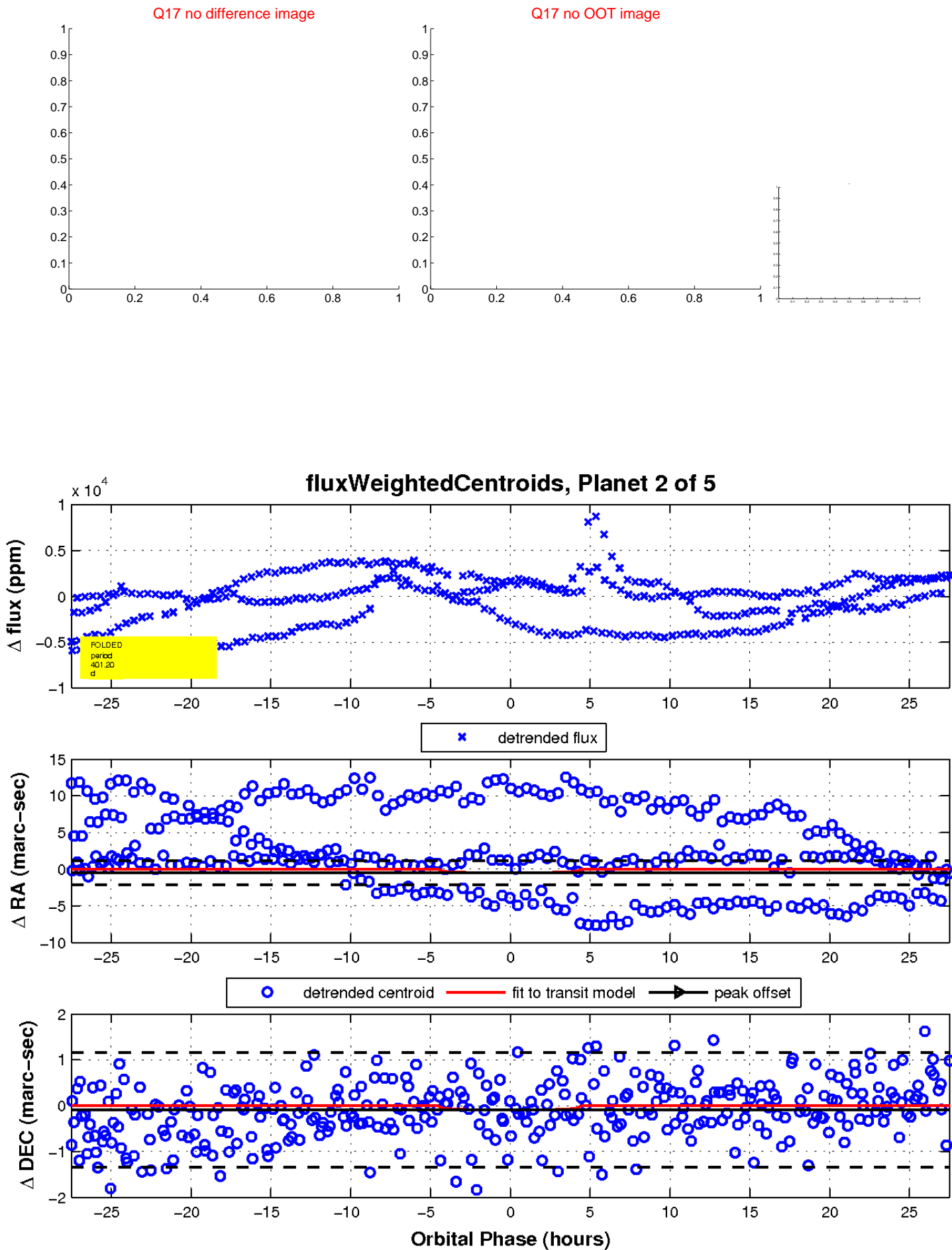
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

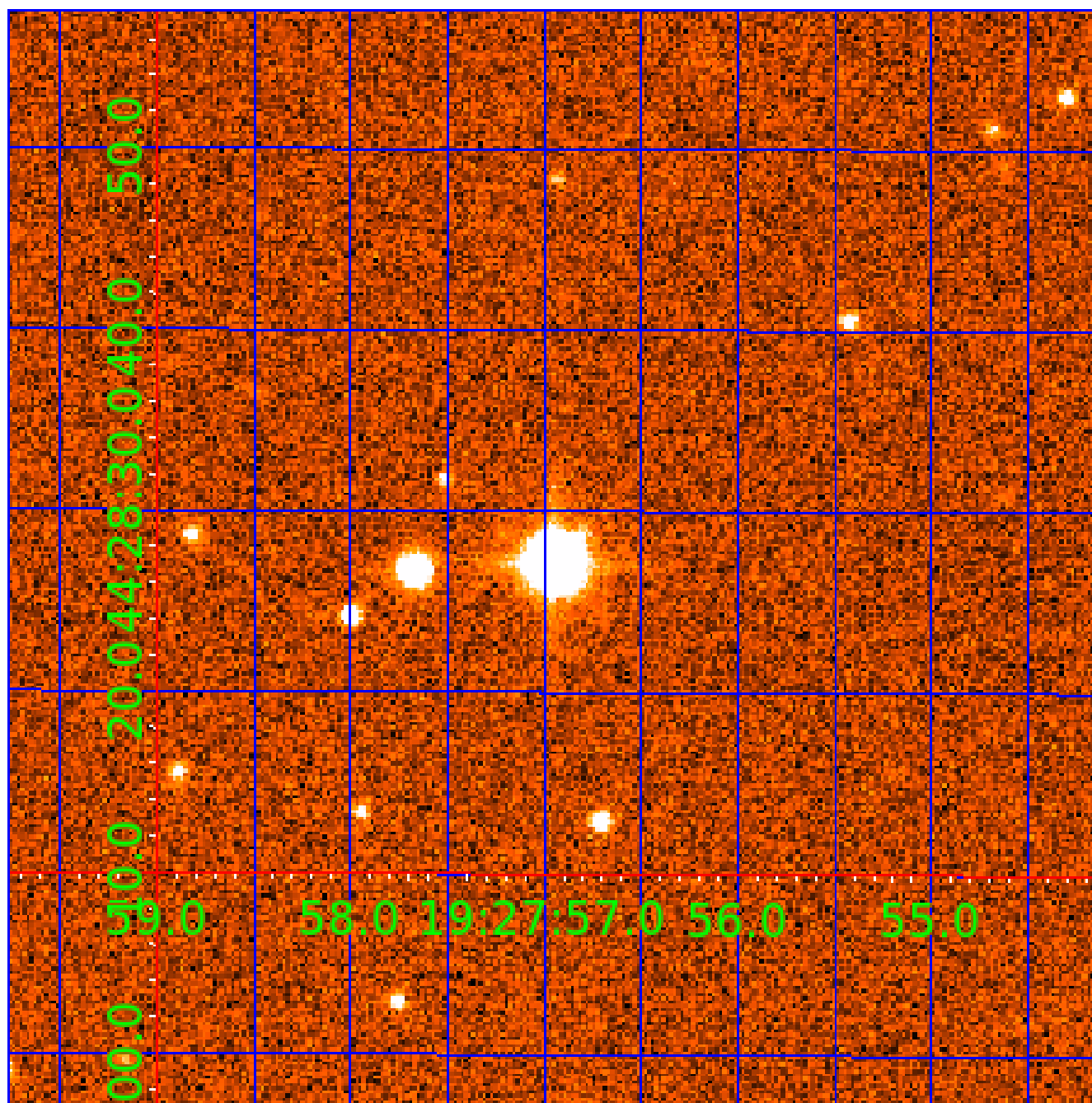


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008431229

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})
008431229-01	OBS	No	301.820763	409.987422	704.9	2.017	12.8	5.8	2.27	5547	6.42	4.79
008431229-02	OBS	No	401.200217	315.288471	1376.7	9.198	18.2	5.6	2.27	5547	8.54	3.28
008431229-04	OBS	No	467.918634	157.387681	312.3	1.807	12.4	3.0	2.27	5547	4.33	2.67
008431229-05	OBS	No	344.374075	334.579713	371.6	3.500	12.2	-1.0	2.27	5547	4.31	4.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008431229-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
008431229-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008431229-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008431229-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

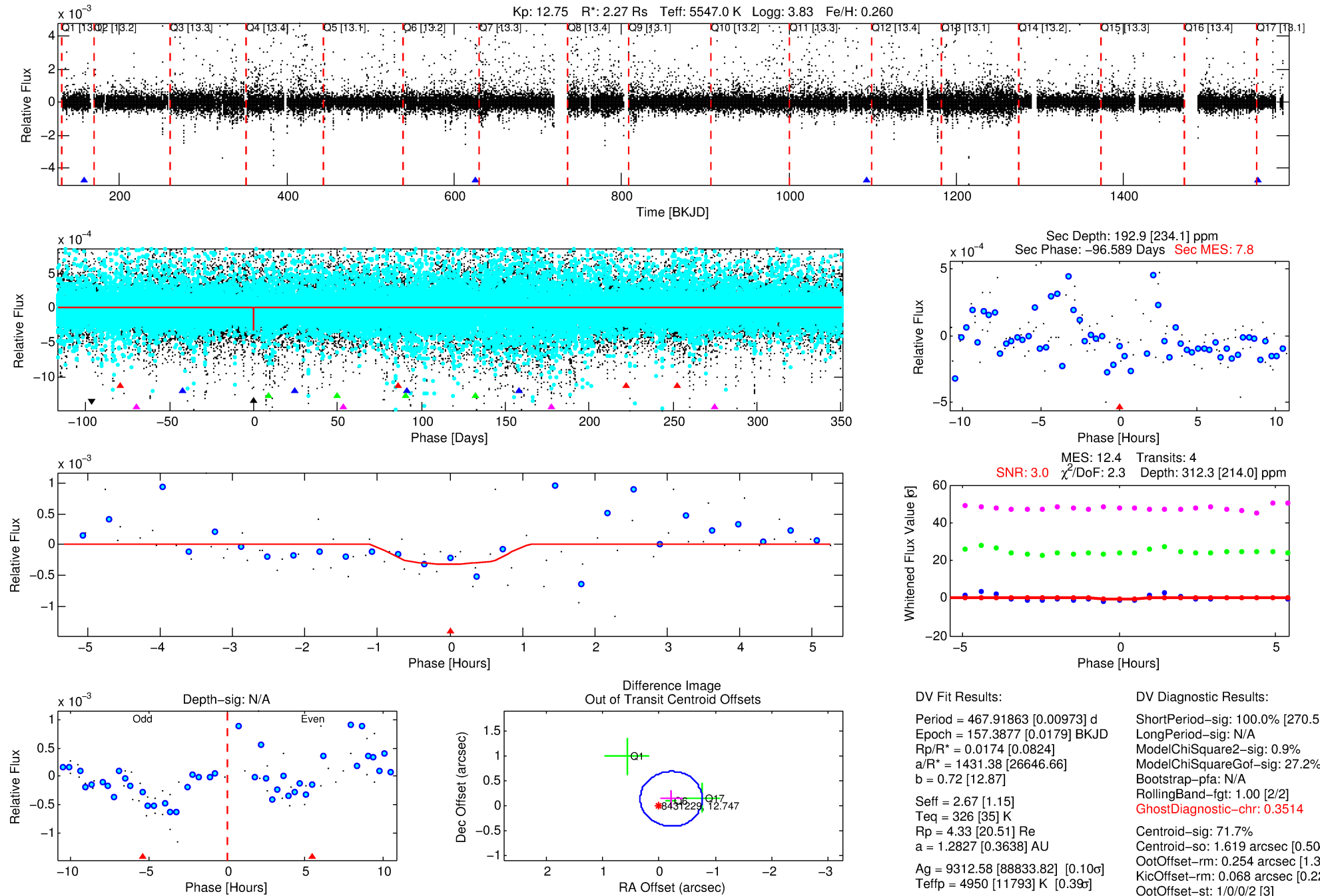
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008431229-04

No Significant Match Found

DV One-Page Summary

KIC: 8431229 Candidate: 4 of 5 Period: 467.919 d



DV Fit Results:

Period = 467.91863 [0.00973] d
Epoch = 157.3877 [0.0179] BKJD
Rp/R* = 0.0174 [0.0824]
a/R* = 1431.38 [26646.66]
b = 0.72 [12.87]
Seff = 2.67 [1.15]
Teff = 326 [35] K
Rp = 4.33 [20.51] Re
a = 1.2827 [0.3638] AU
Ag = 9312.58 [88833.82] [0.10] σ
Teffp = 4950 [11793] K [0.39] σ

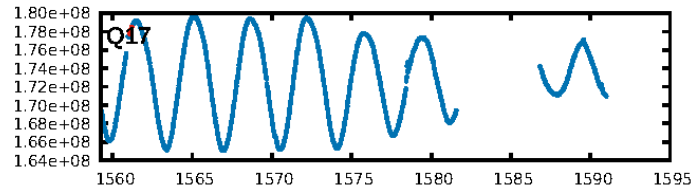
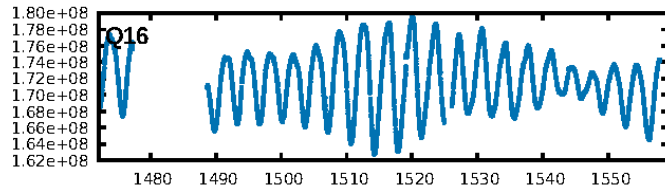
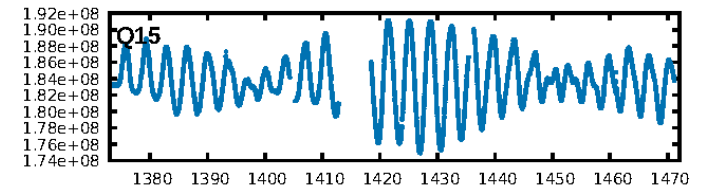
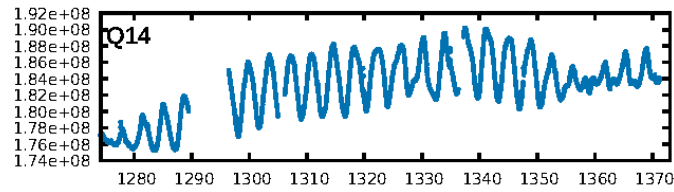
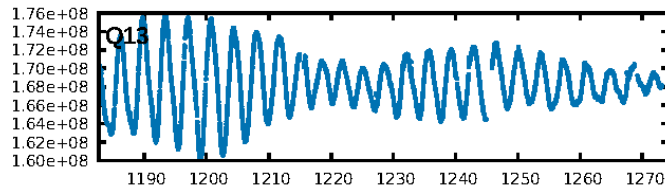
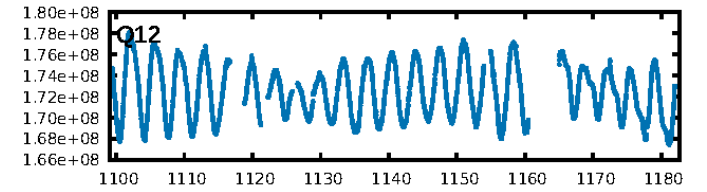
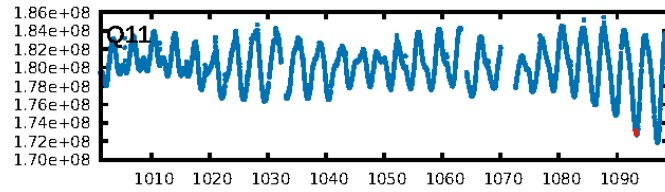
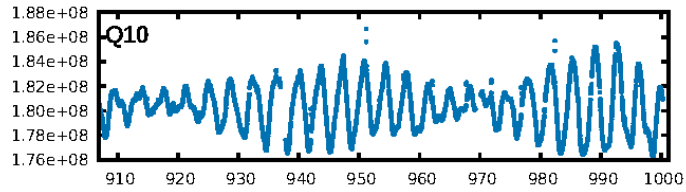
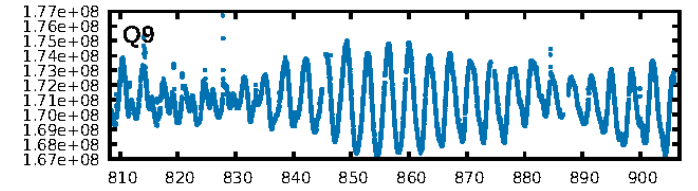
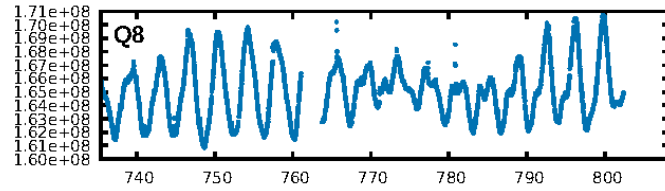
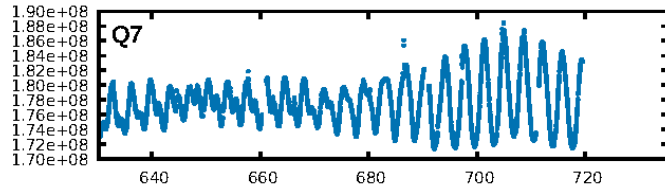
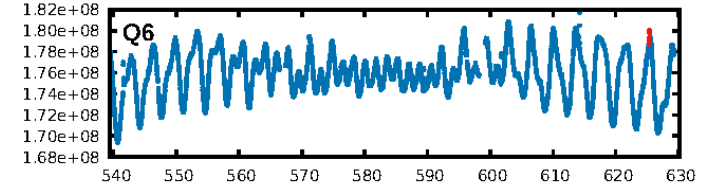
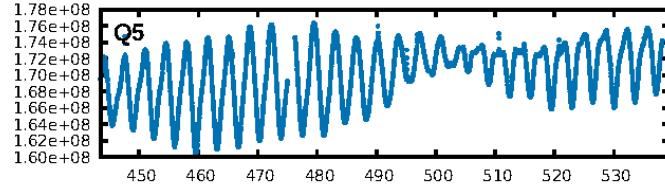
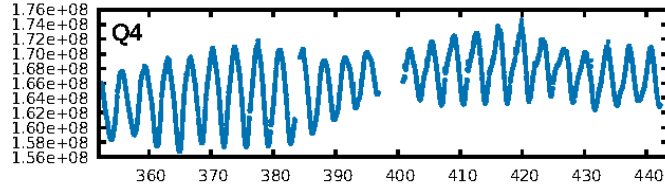
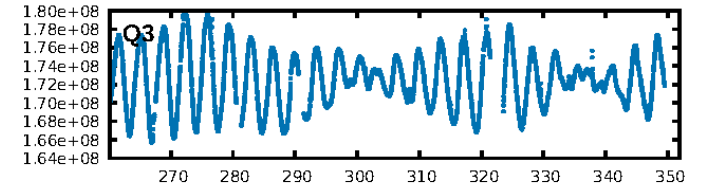
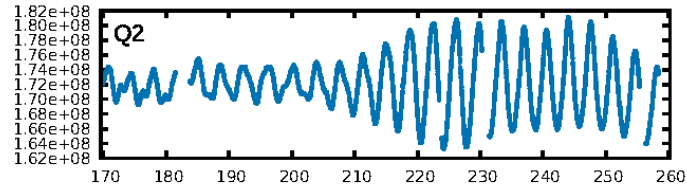
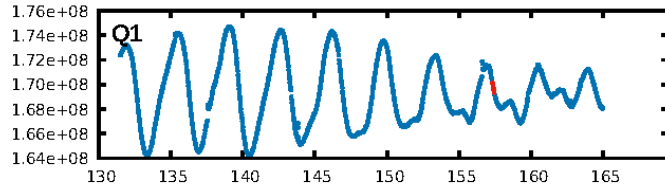
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [270.59] σ
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.9%
ModelChiSquareGof-sig: 27.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.3514
Centroid-sig: 71.7%
Centroid-so: 1.619 arcsec [0.50] σ
OotOffset-rm: 0.254 arcsec [1.38] σ
OotOffset-st: 1/0/0/2 [3]
KicOffset-rm: 0.068 arcsec [0.22] σ
KicOffset-st: 1/0/0/2 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 1.00 [3/3]

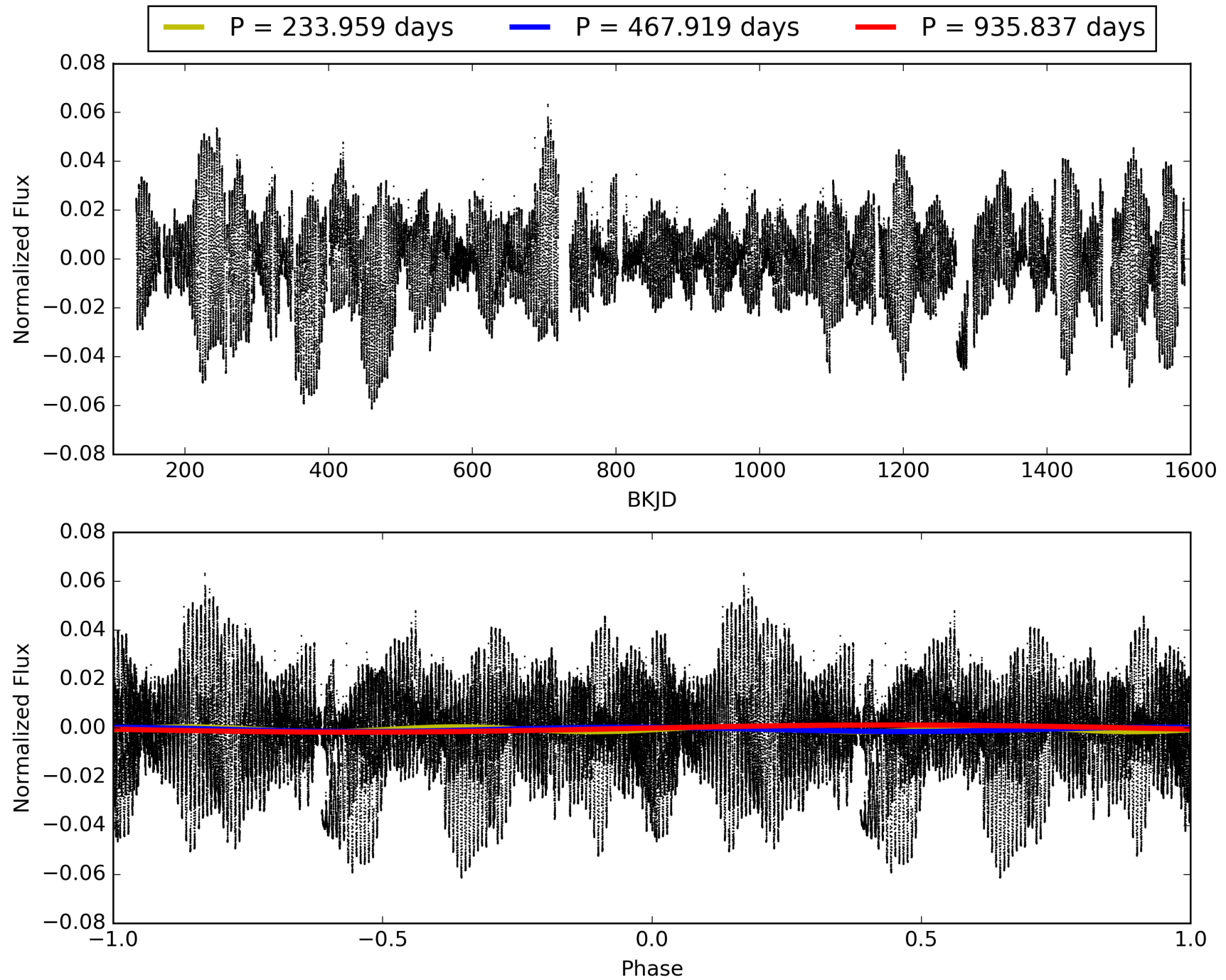
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:50:05 Z

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

TCE 008431229-04, PDC Light Curves

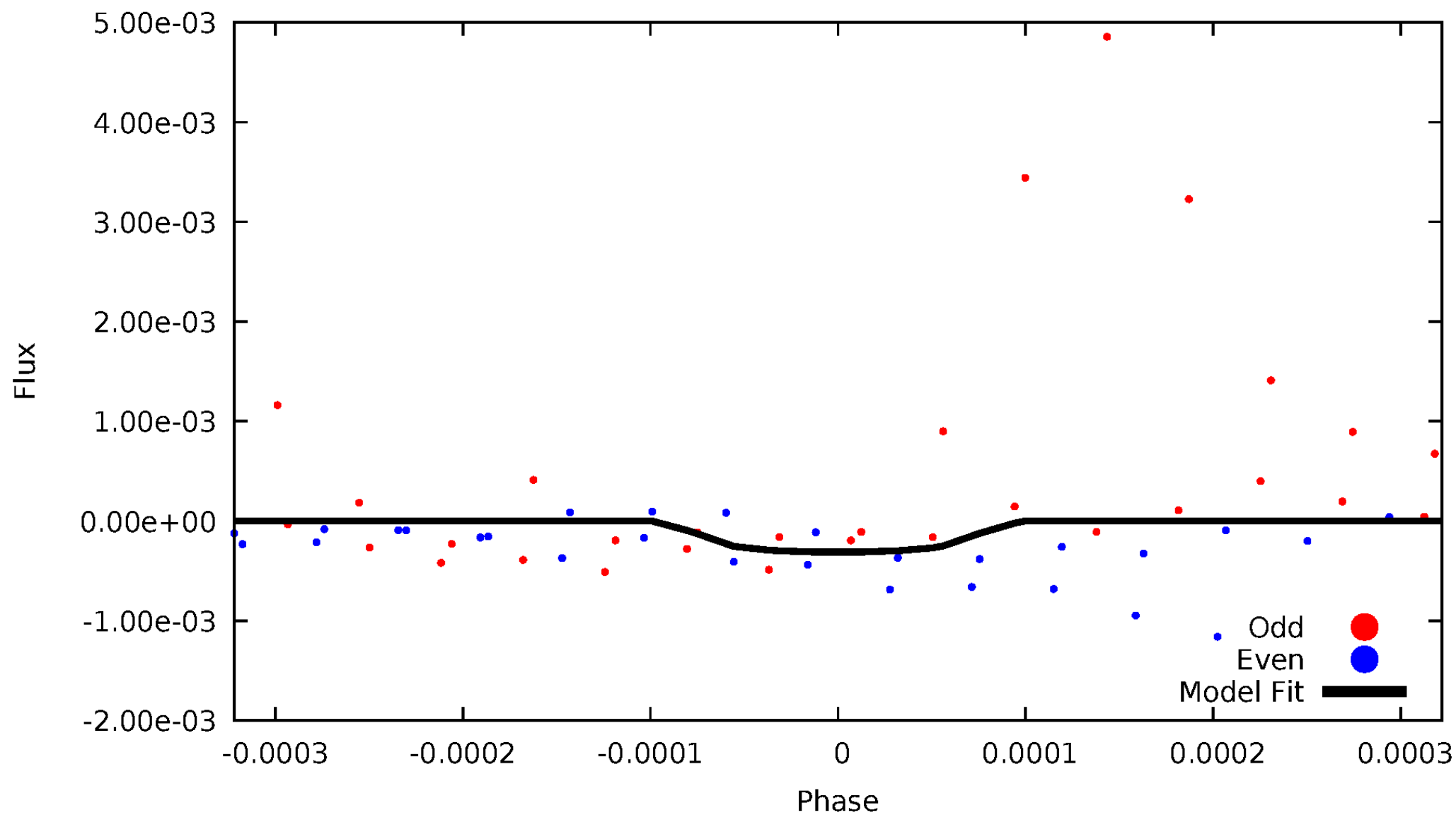


TCE 008431229-04



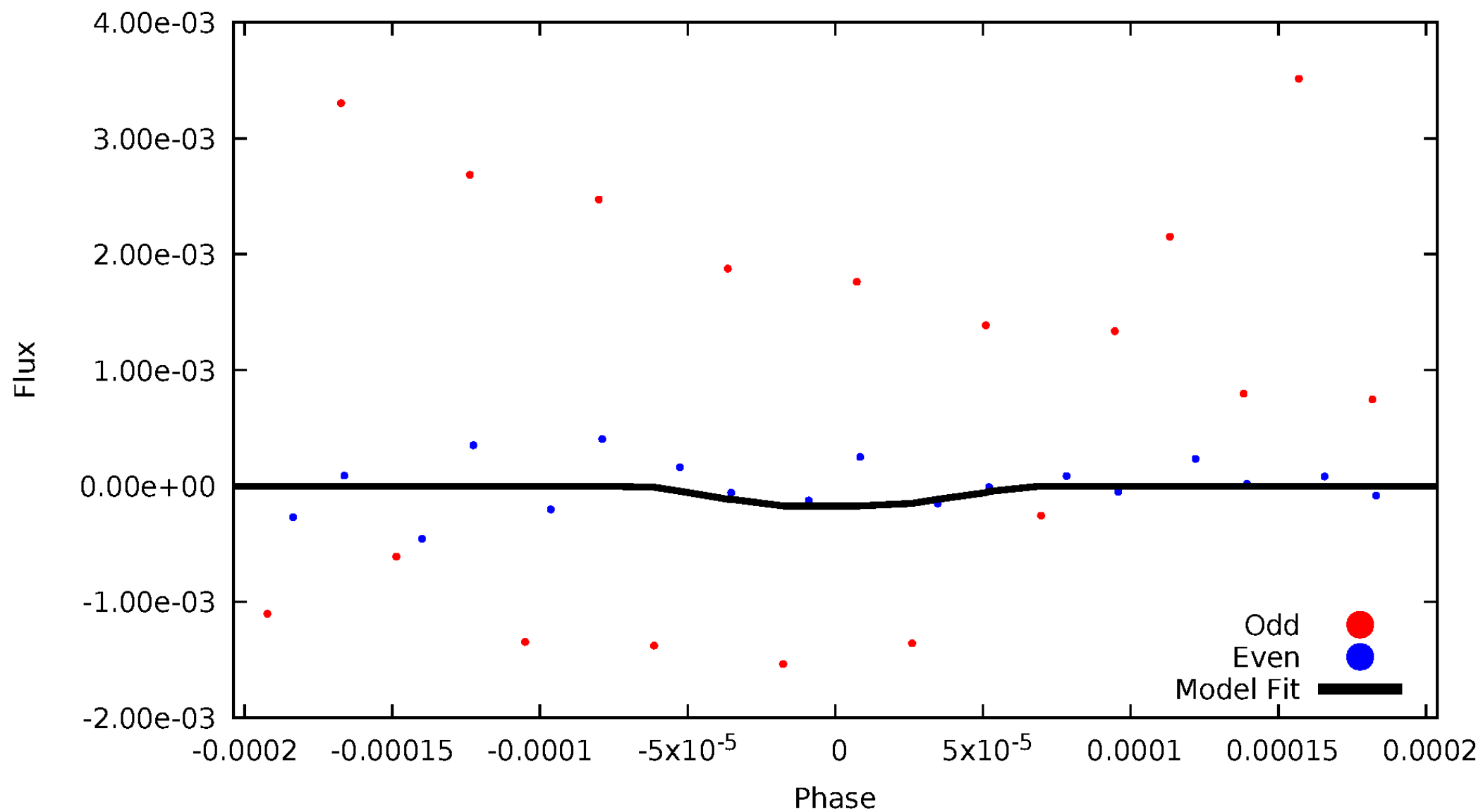
DV Odd/Even

TCE 008431229-04



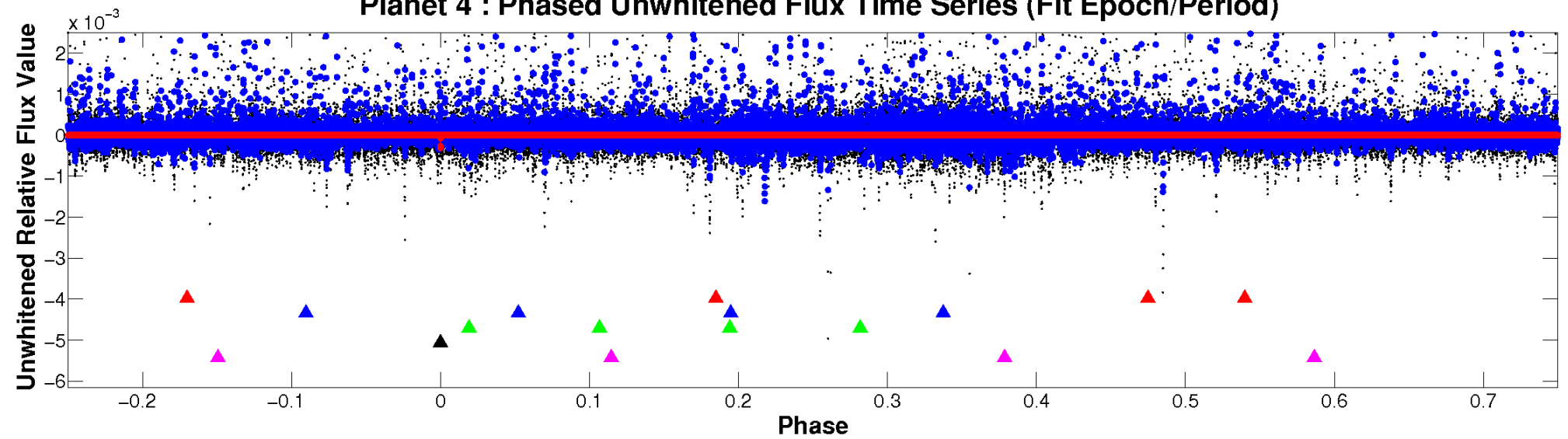
ALT Odd/Even

TCE 008431229-04

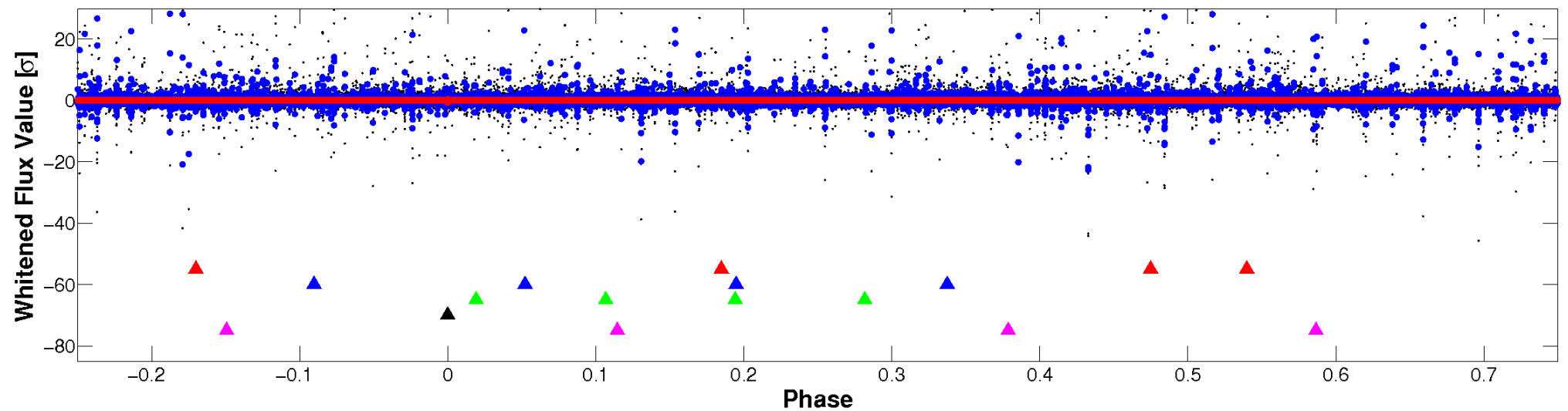


Non-Whitened Vs. Whitened Light Curve

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

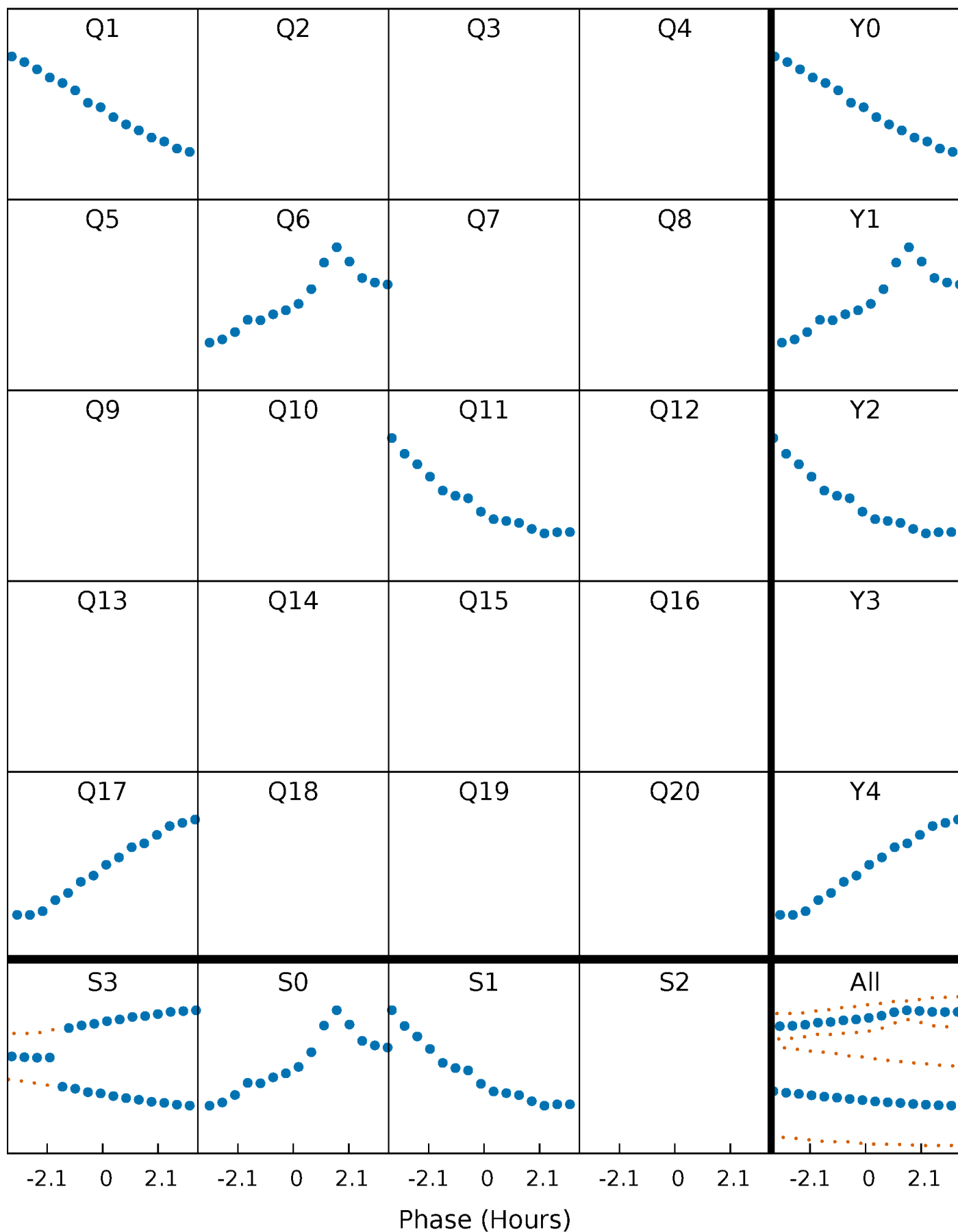


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



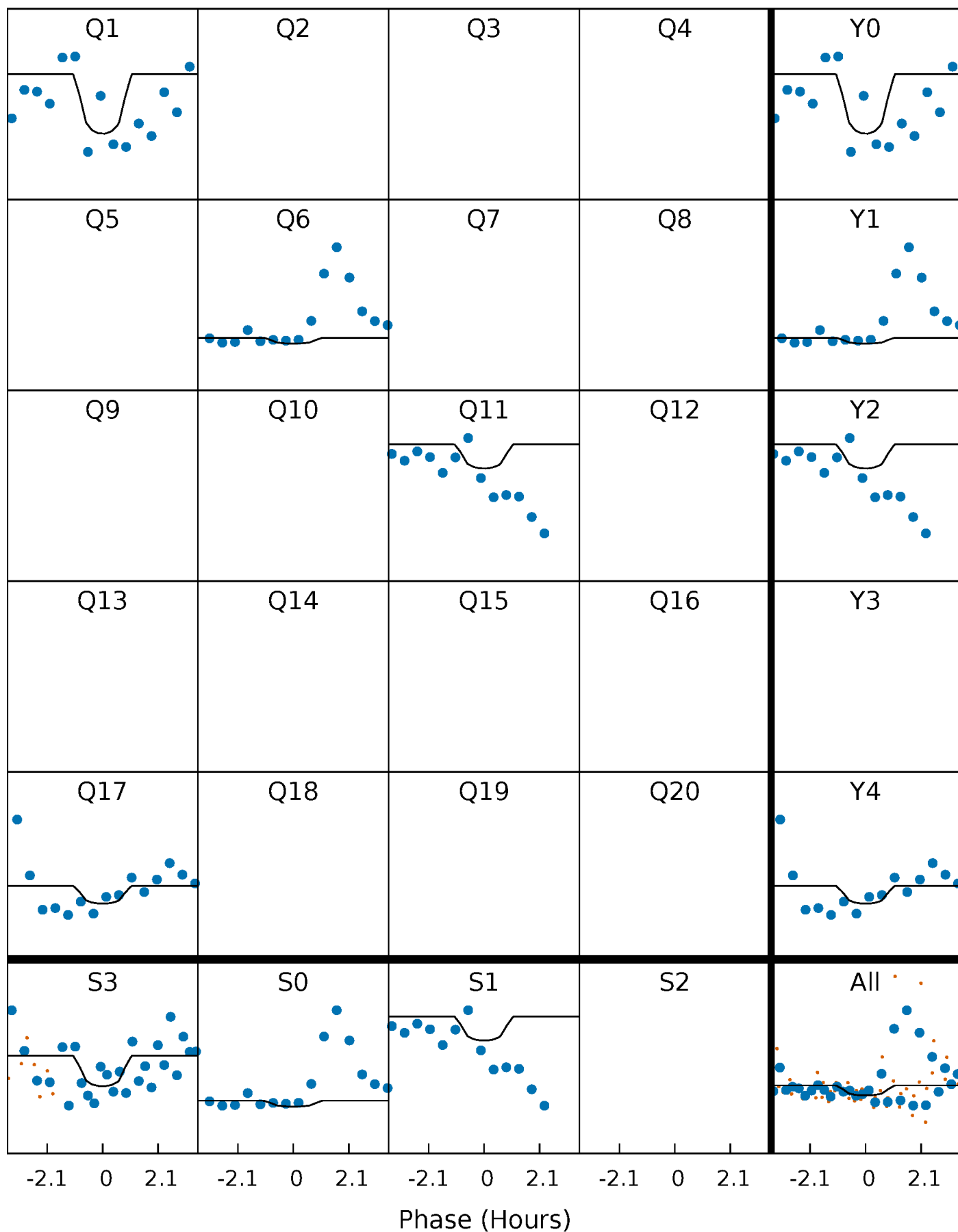
PDC Quarter-Phased Transit Curves

TCE 008431229-04 $P=467.918634$ Days $T_0=157.387681$ (BKJD)



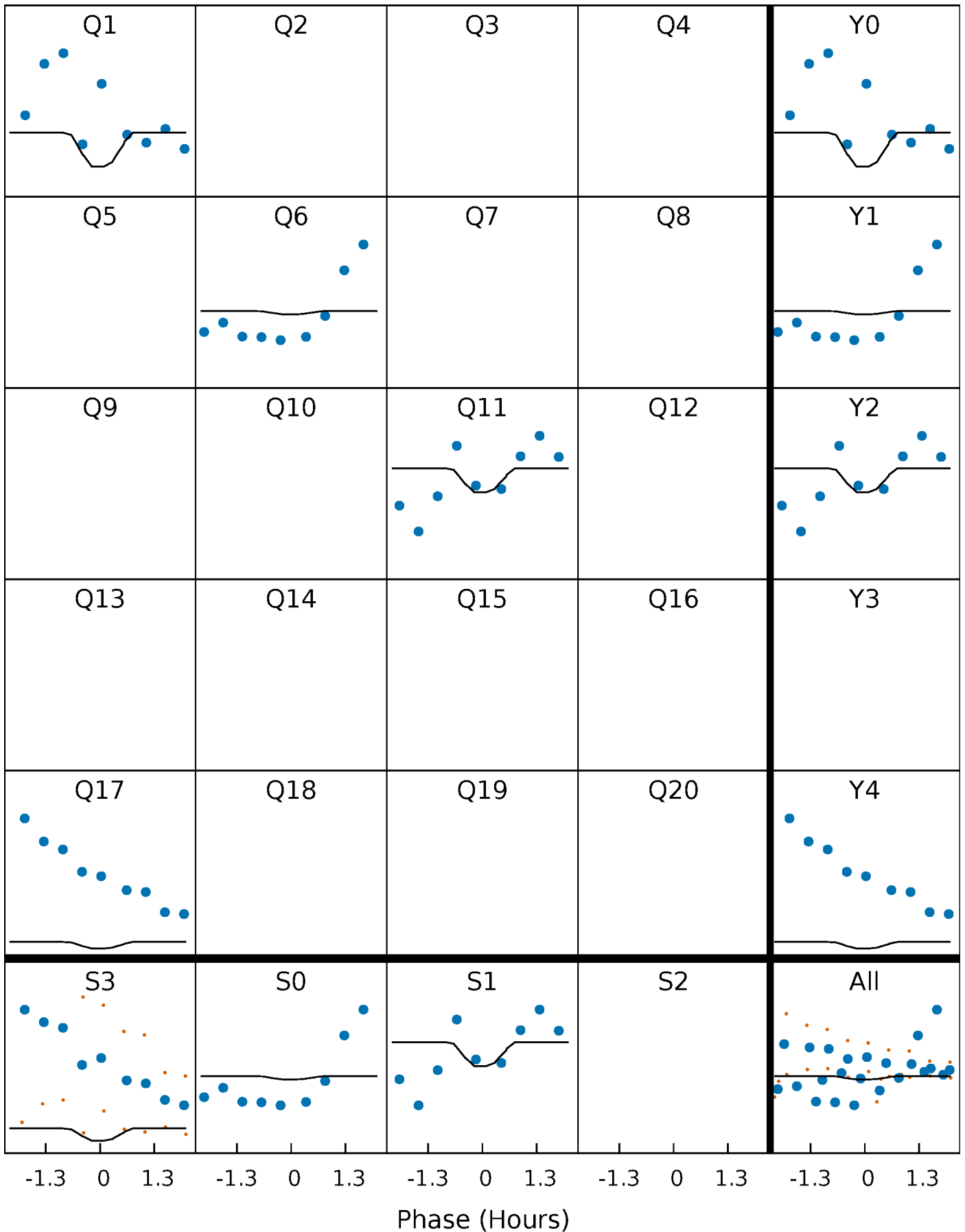
DV Quarter-Phased Transit Curves

TCE 008431229-04 P=467.918634 Days $T_0=157.387681$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

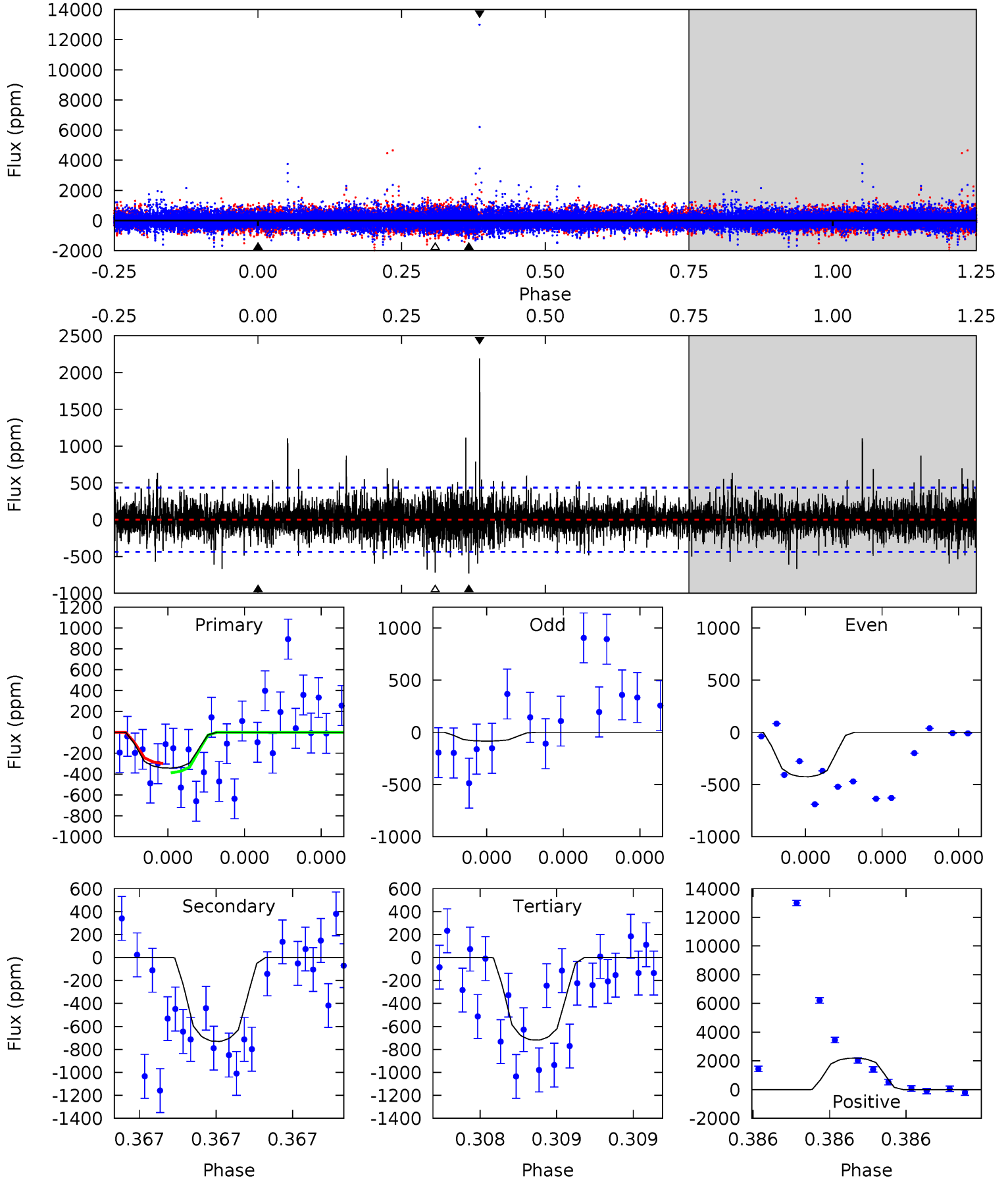
TCE 008431229-04 $P=467.921713$ Days $T_0=157.378224$ (BKJD)



DV Model-Shift Uniqueness Test

008431229-04, P = 467.918634 Days, E = 157.387681 Days

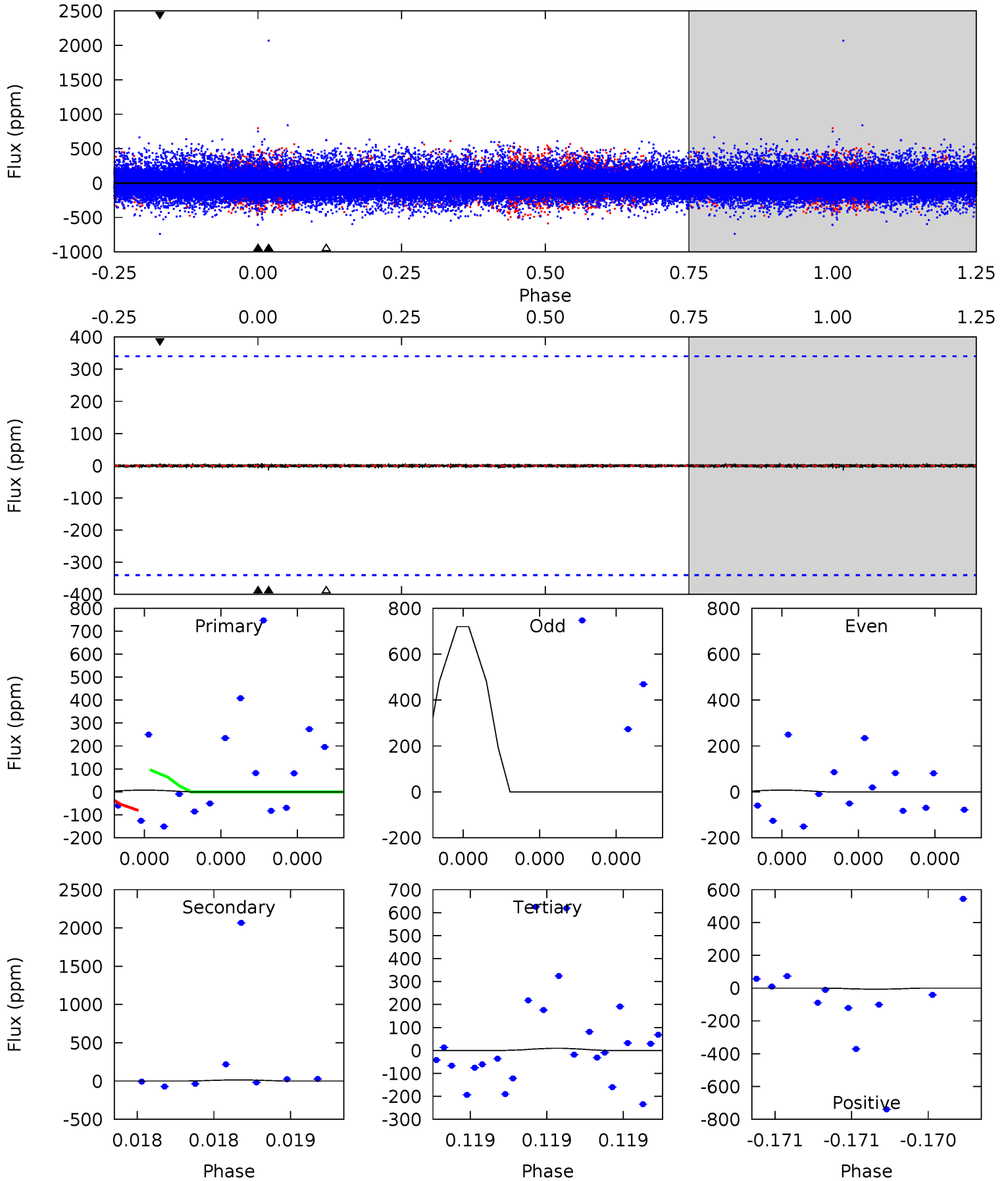
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.51	9.63	9.48	28.9	5.75	3.75	1.74	-4.96	-24.4	0.15	-19.2	1.51	0.76	0.75	0.59



Alt Model-Shift Uniqueness Test

008431229-04, P = 467.921713 Days, E = 157.378224 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.14	0.25	0.16	0.12	5.83	3.86	0.03	-0.02	0.02	0.10	0.13	7.21	20.5	0.32	0.13



Stellar Parameters For KIC 008431229

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5547^{+77}_{-88}	$3.833^{+0.240}_{-0.080}$	$0.260^{+0.150}_{-0.150}$	$2.275^{+0.316}_{-0.736}$	$1.284^{+0.101}_{-0.254}$	$0.154^{+0.249}_{-0.043}$
	+1%/-2%	+6%/-2%	+58%/-58%	+14%/-32%	+8%/-20%	+162%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 008431229-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-731 ± 76	$14.23^{+16.32}_{-9.53}$	451^{+19}_{-33}	4004^{+2335}_{-859}	3152^{+25192}_{-2463}
Alt.	-15 ± 58	$14.46^{+15.81}_{-9.76}$	451^{+20}_{-35}	2095^{+992}_{-4786}	26^{+624}_{-266}

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

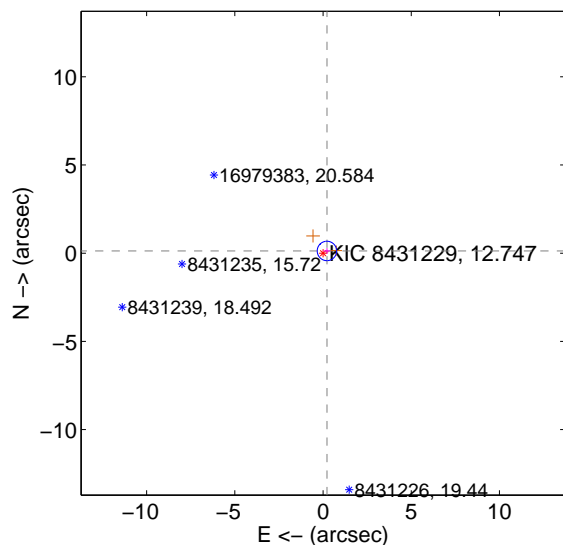
Supplemental centroid analysis for 008431229-04. Kepler magnitude: 12.75. Transit SNR 3.04

There are 0 quarters with good PRF difference image offsets

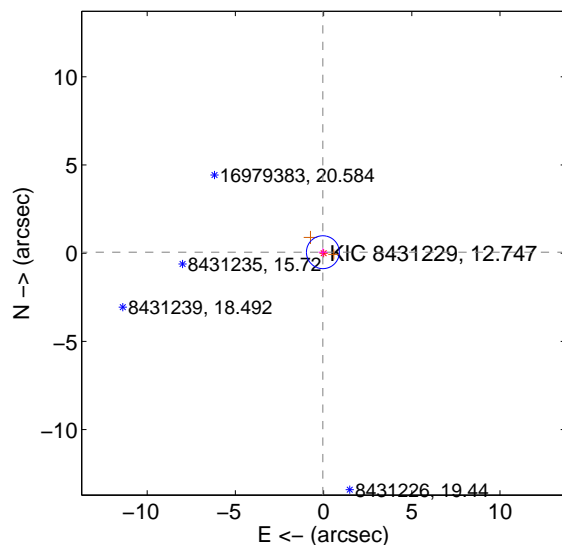
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.254 ± 0.184	1.38	-0.221 ± 0.190	0.126 ± 0.162
PRF-fit source offset from KIC position	0.068 ± 0.311	0.22	0.040 ± 0.243	0.055 ± 0.230
photometric centroid source offset	1.62 ± 3.27	0.50	-1.62 ± 3.27	-0.05 ± 1.57

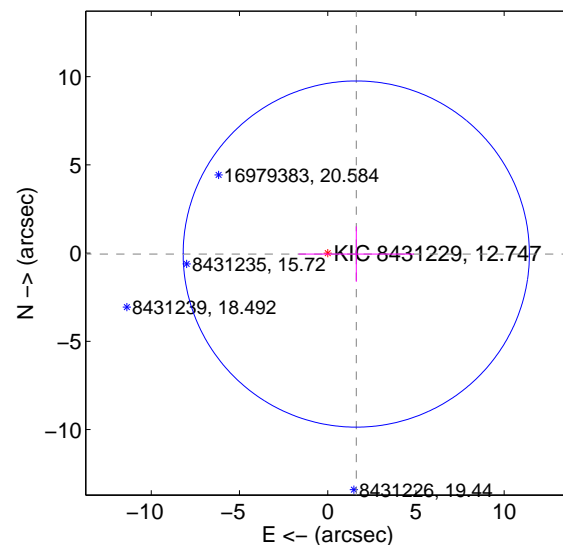
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

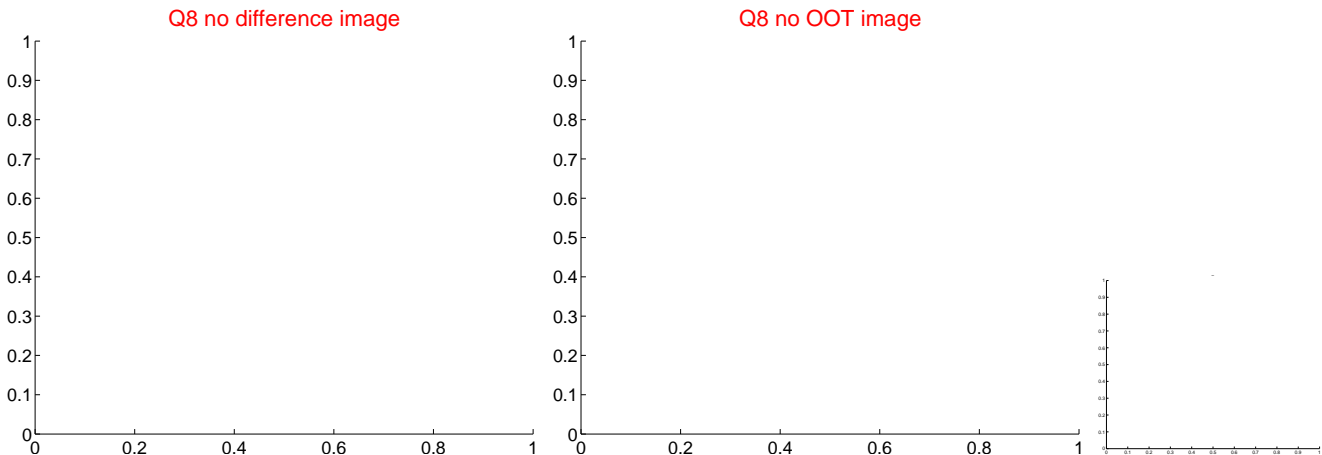
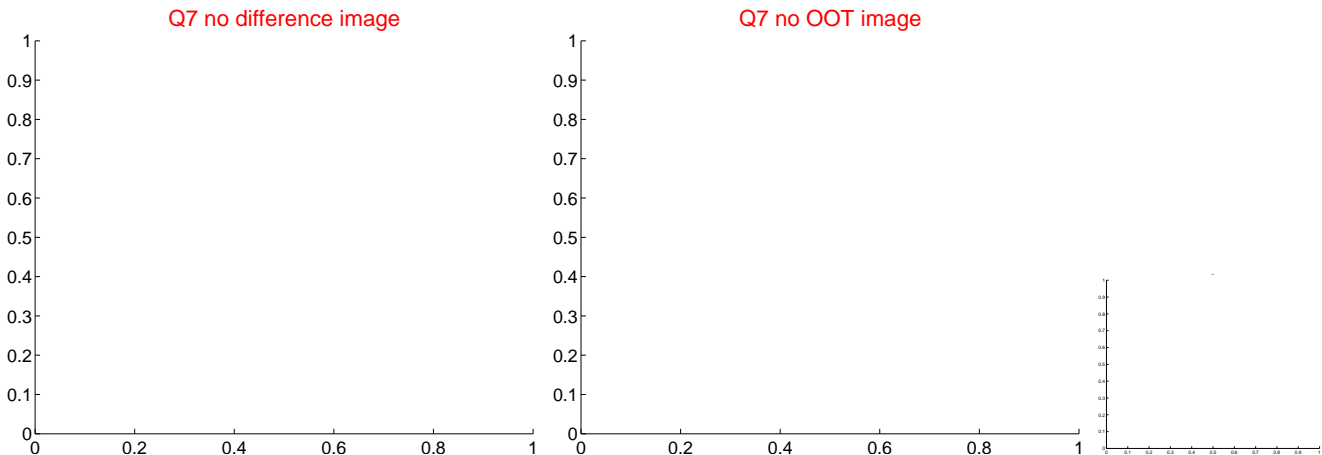
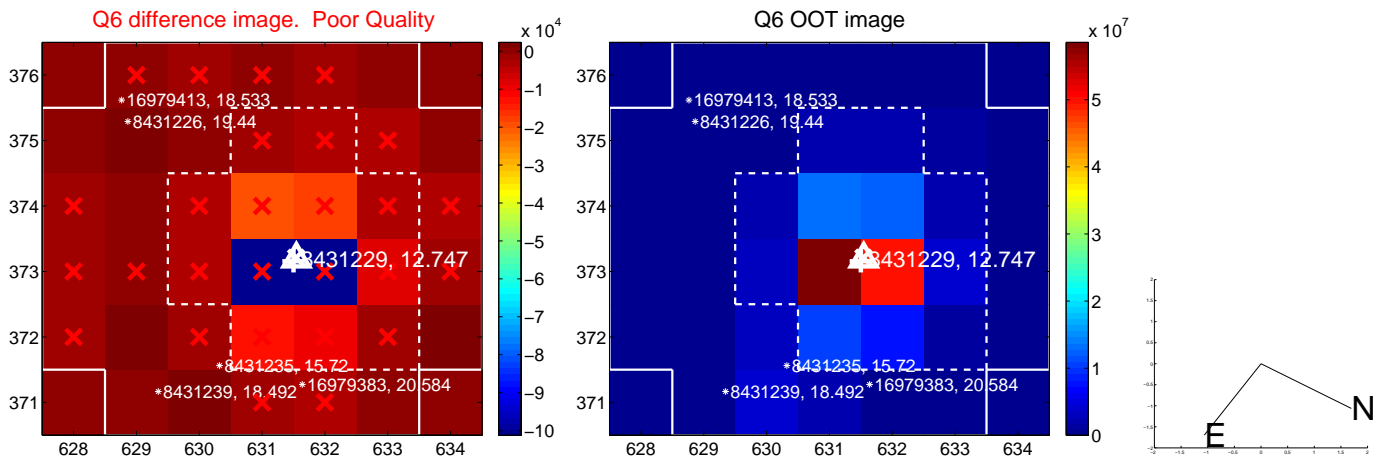
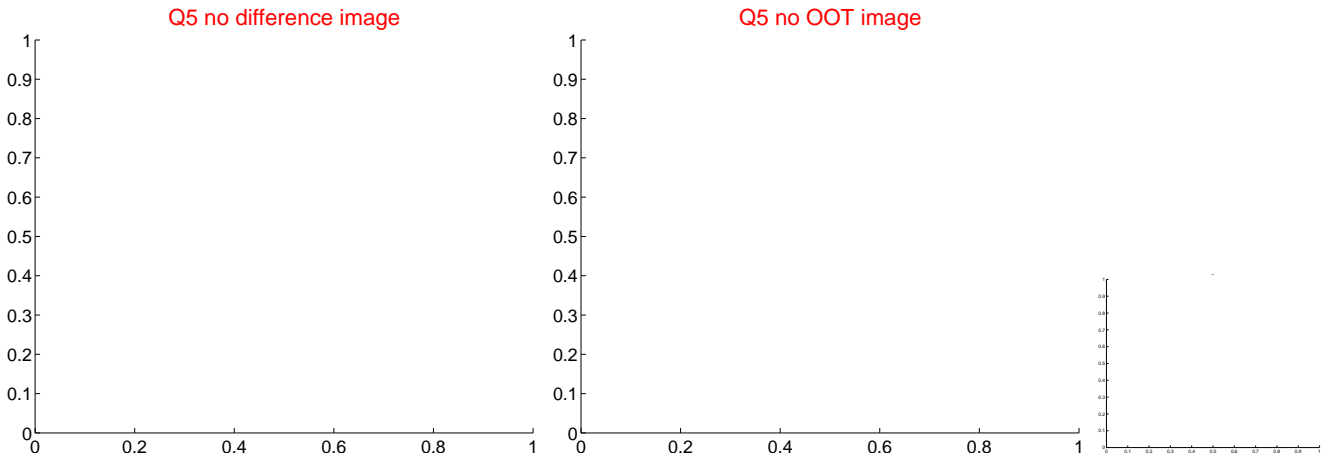


offset from photometric centroids



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



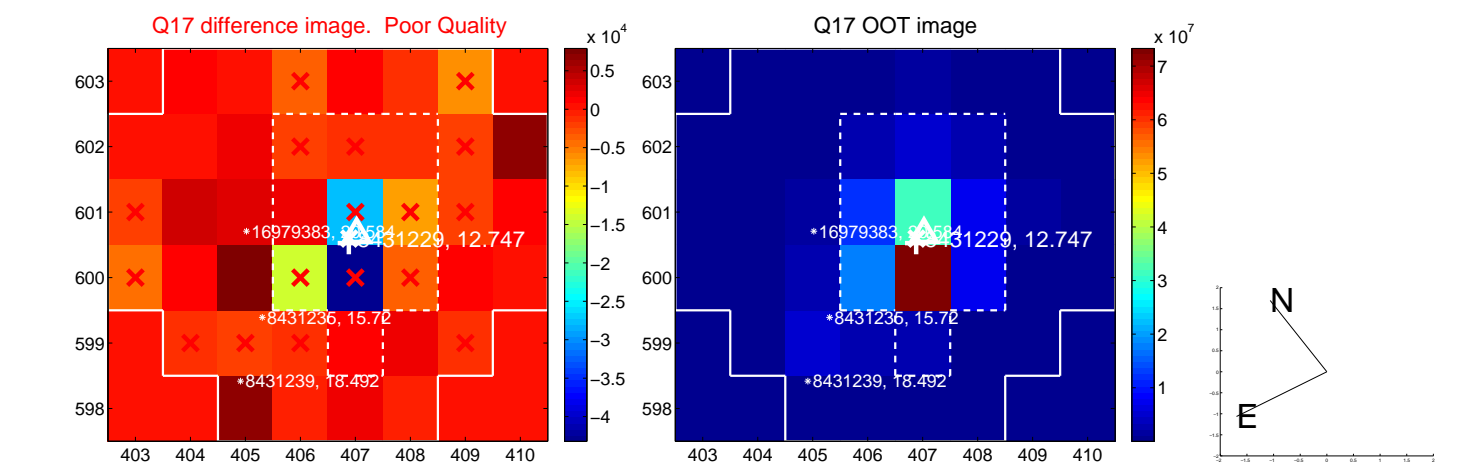
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



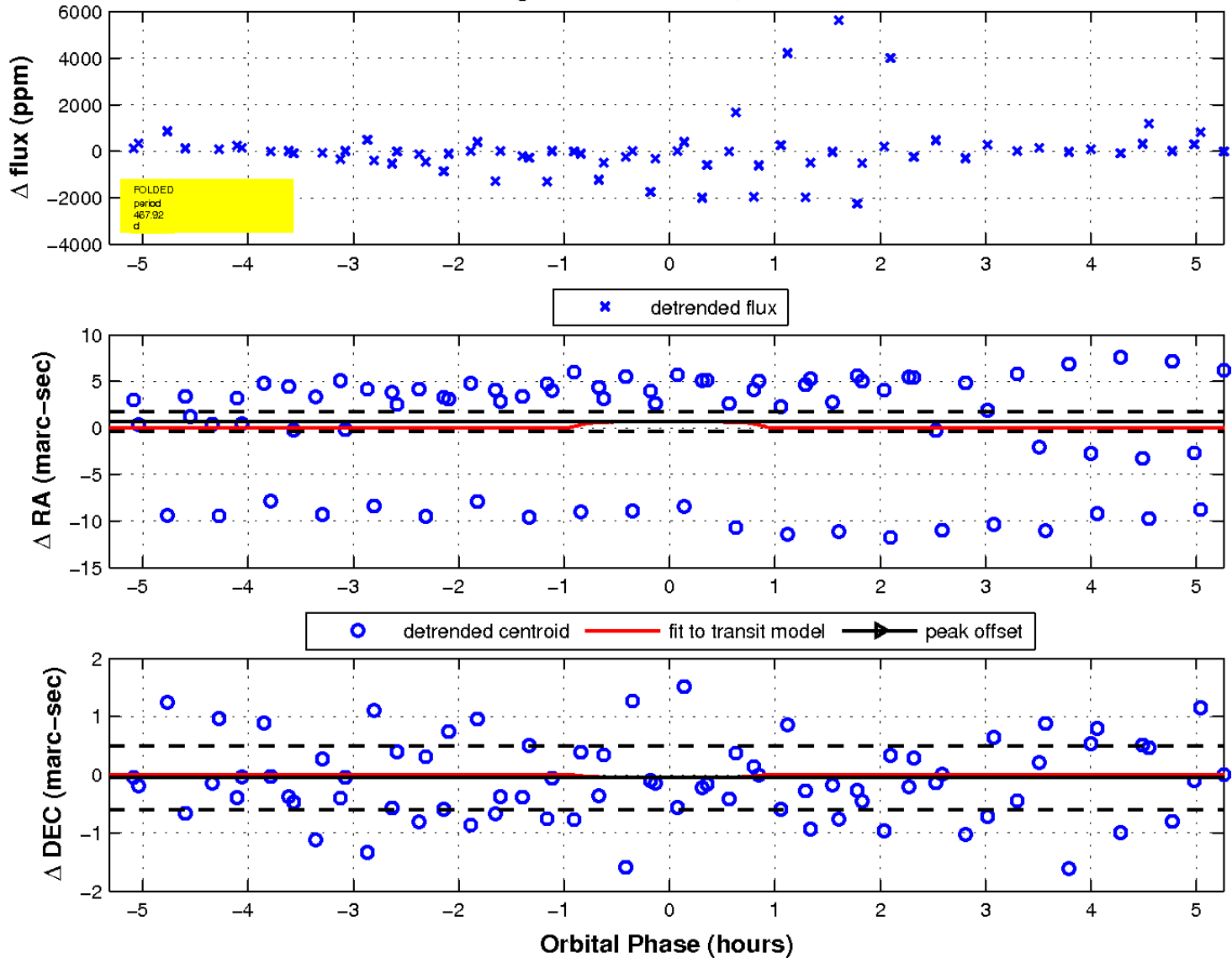
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

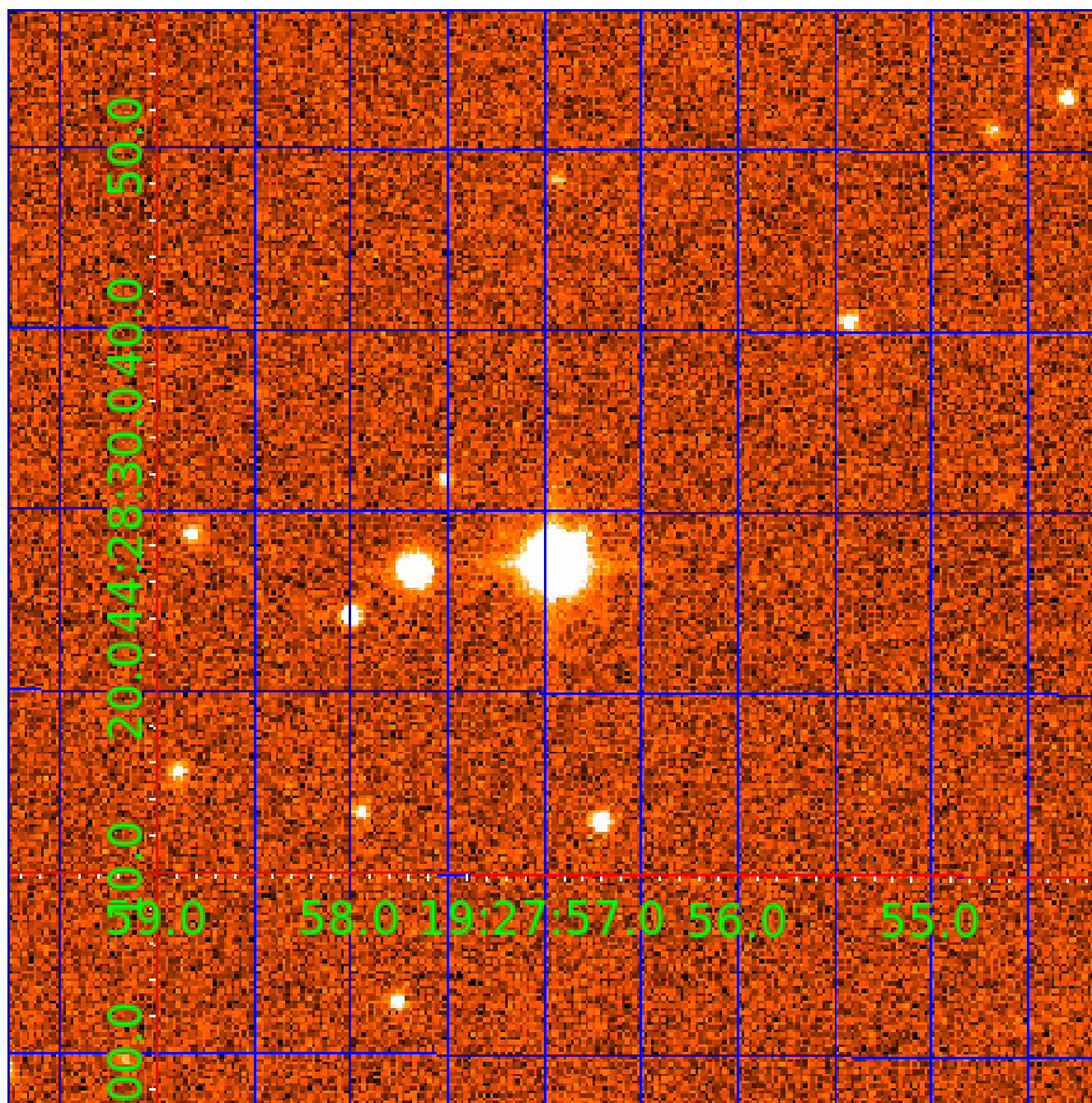


fluxWeightedCentroids, Planet 4 of 5



UKIRT Image

Declination



KIC 008431229

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})
008431229-01	OBS	No	301.820763	409.987422	704.9	2.017	12.8	5.8	2.27	5547	6.42	4.79
008431229-02	OBS	No	401.200217	315.288471	1376.7	9.198	18.2	5.6	2.27	5547	8.54	3.28
008431229-04	OBS	No	467.918634	157.387681	312.3	1.807	12.4	3.0	2.27	5547	4.33	2.67
008431229-05	OBS	No	344.374075	334.579713	371.6	3.500	12.2	-1.0	2.27	5547	4.31	4.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008431229-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
008431229-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008431229-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008431229-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

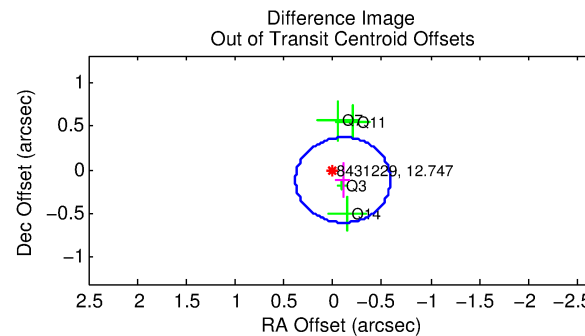
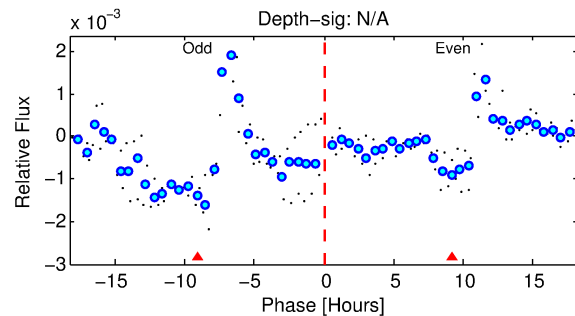
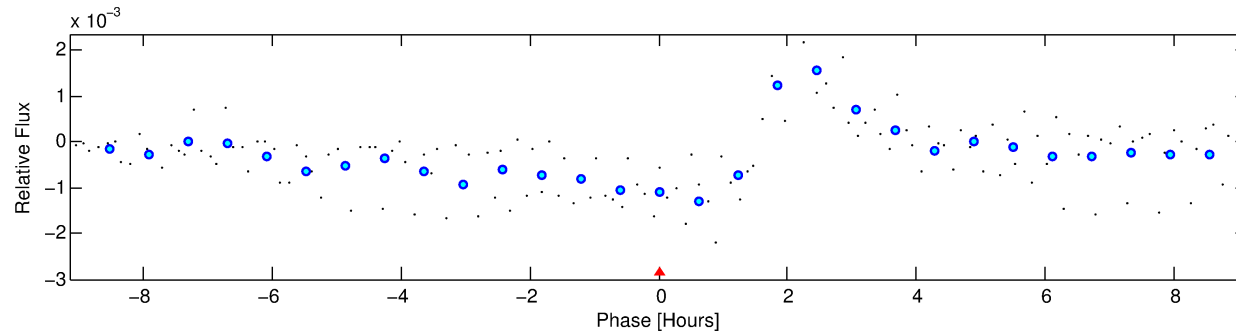
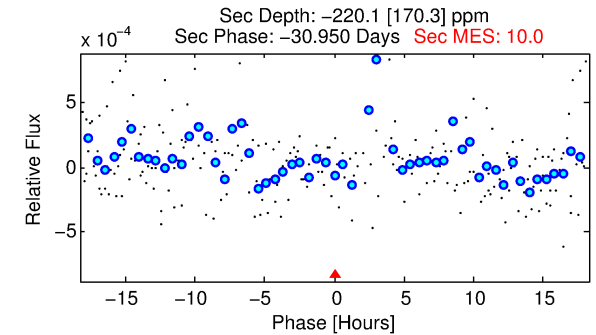
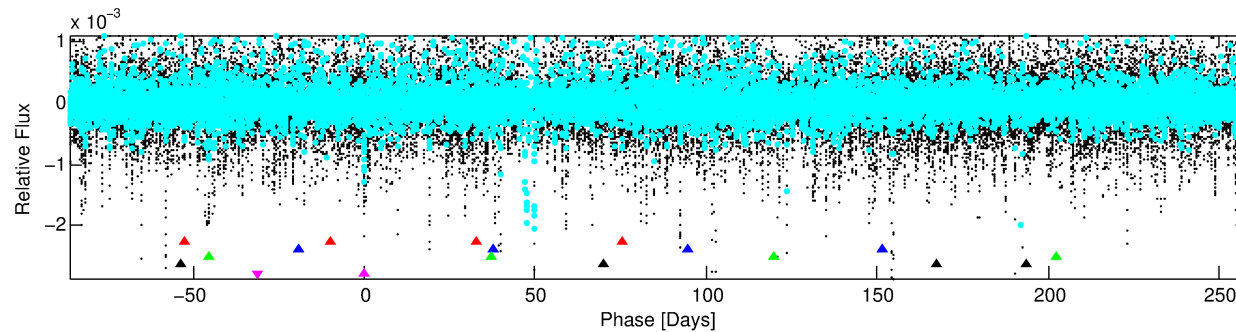
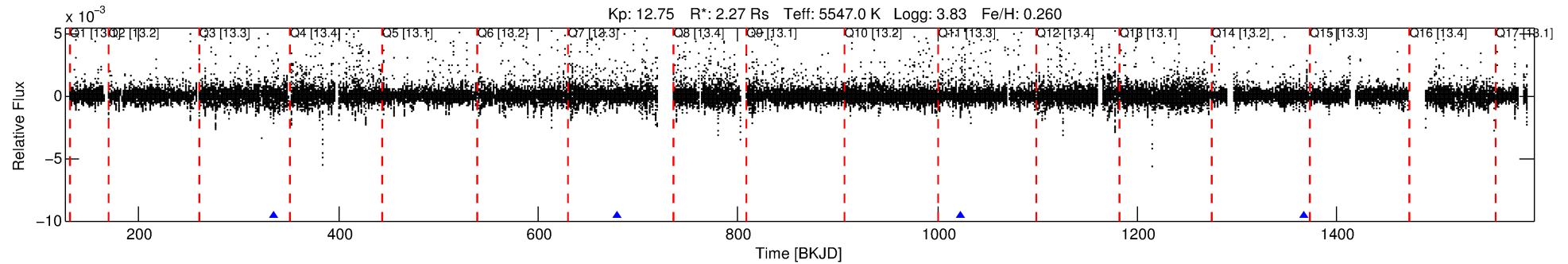
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008431229-05

No Significant Match Found

DV One-Page Summary

KIC: 8431229 Candidate: 5 of 5 Period: 344.374 d



TPS TCE Results:

Period = 344.37408 d
Epoch = 334.5797 BKJD

DV fit results are unavailable

DV Diagnostic Results:

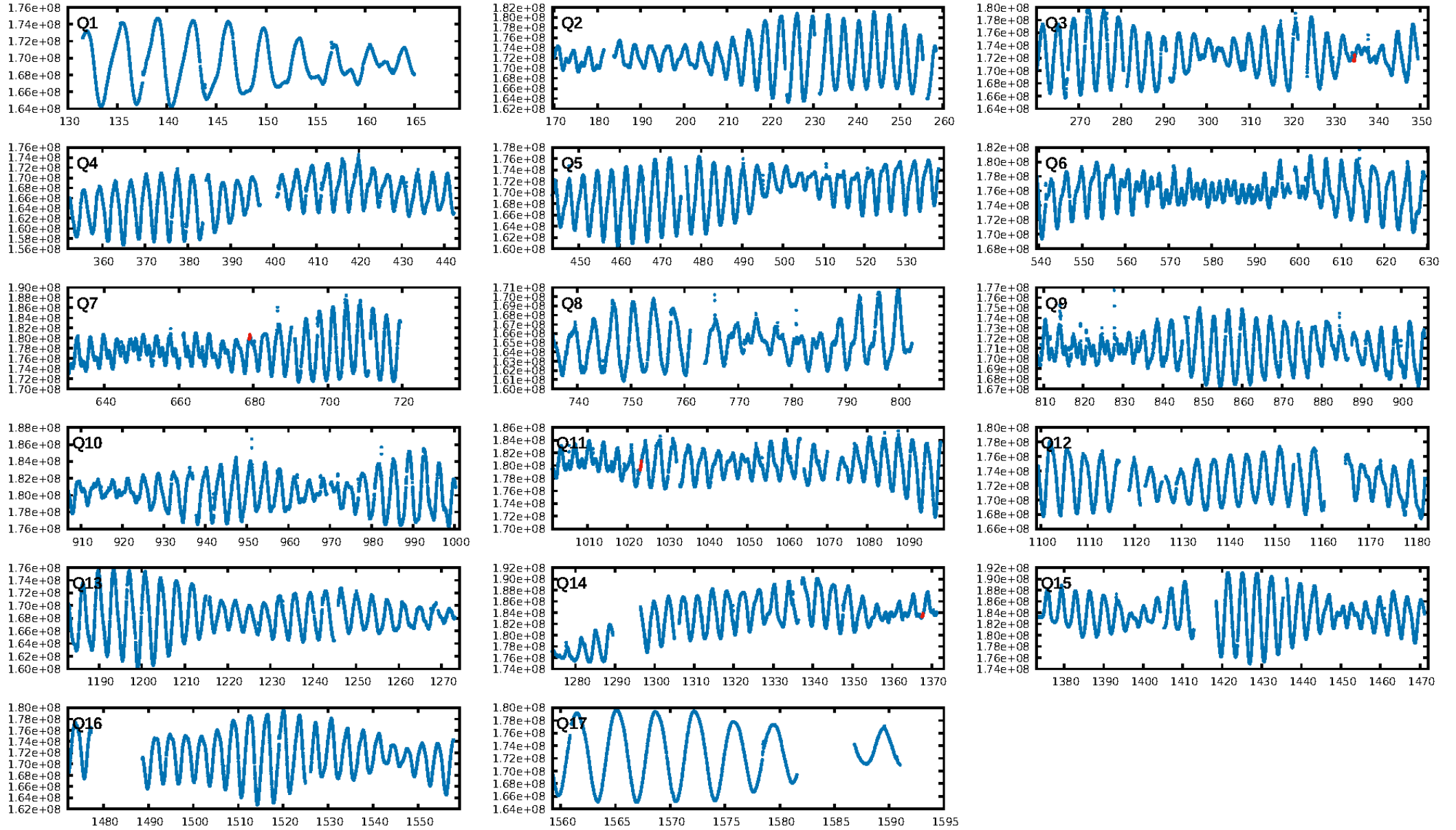
ShortPeriod-sig: 100.0% [252.83σ]
LongPeriod-sig: 100.0% [138.58σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.9608

Centroid-sig: 0.6%
Centroid-so: 0.342 arcsec [0.62σ]
OotOffset-rm: 0.156 arcsec [0.96σ]
KicOffset-rm: 0.286 arcsec [1.64σ]
OotOffset-st: 1/3/0/0 [4]
KicOffset-st: 1/3/0/0 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [4/4]

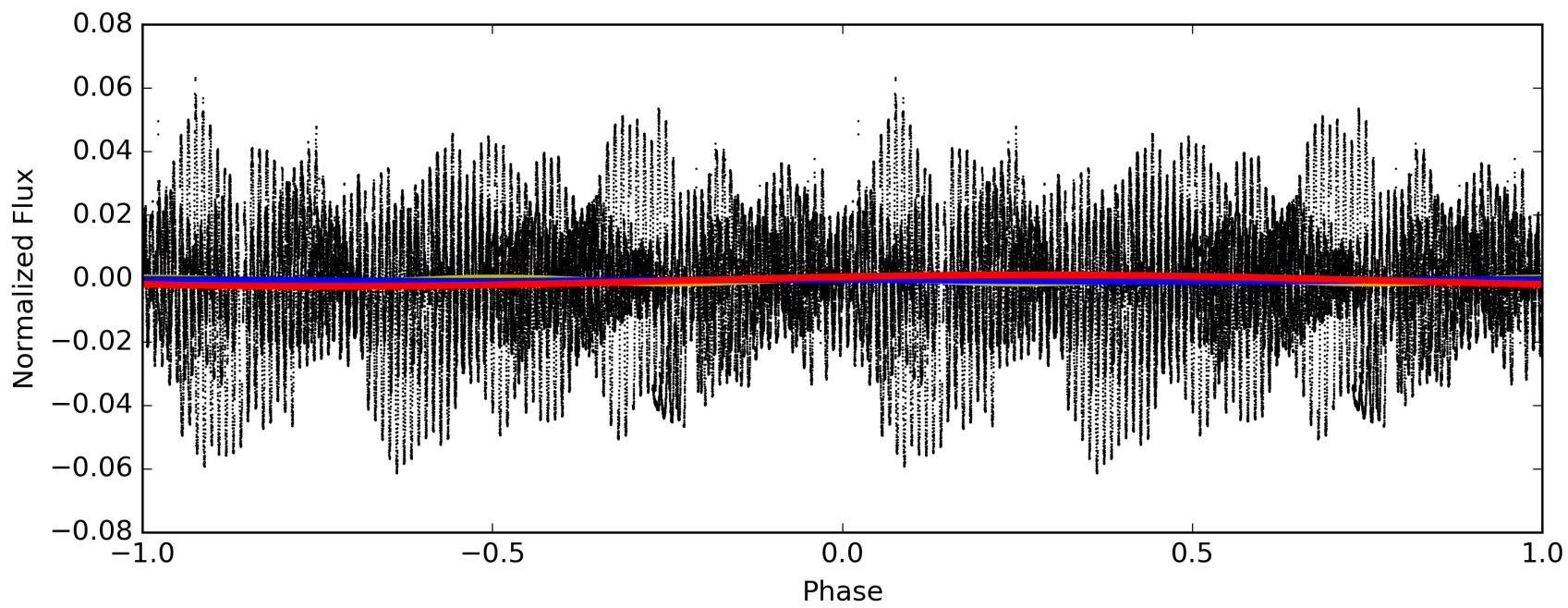
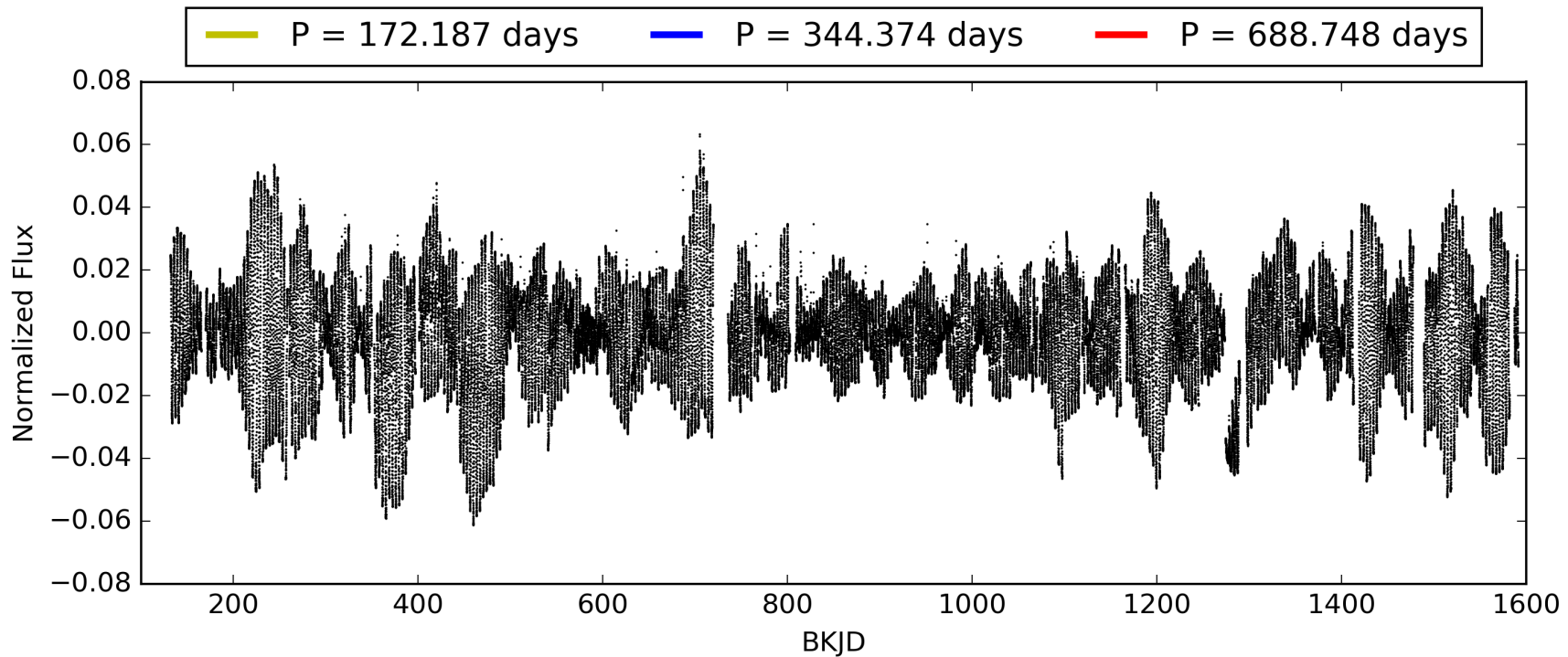
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:50:22 Z

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

TCE 008431229-05, PDC Light Curves

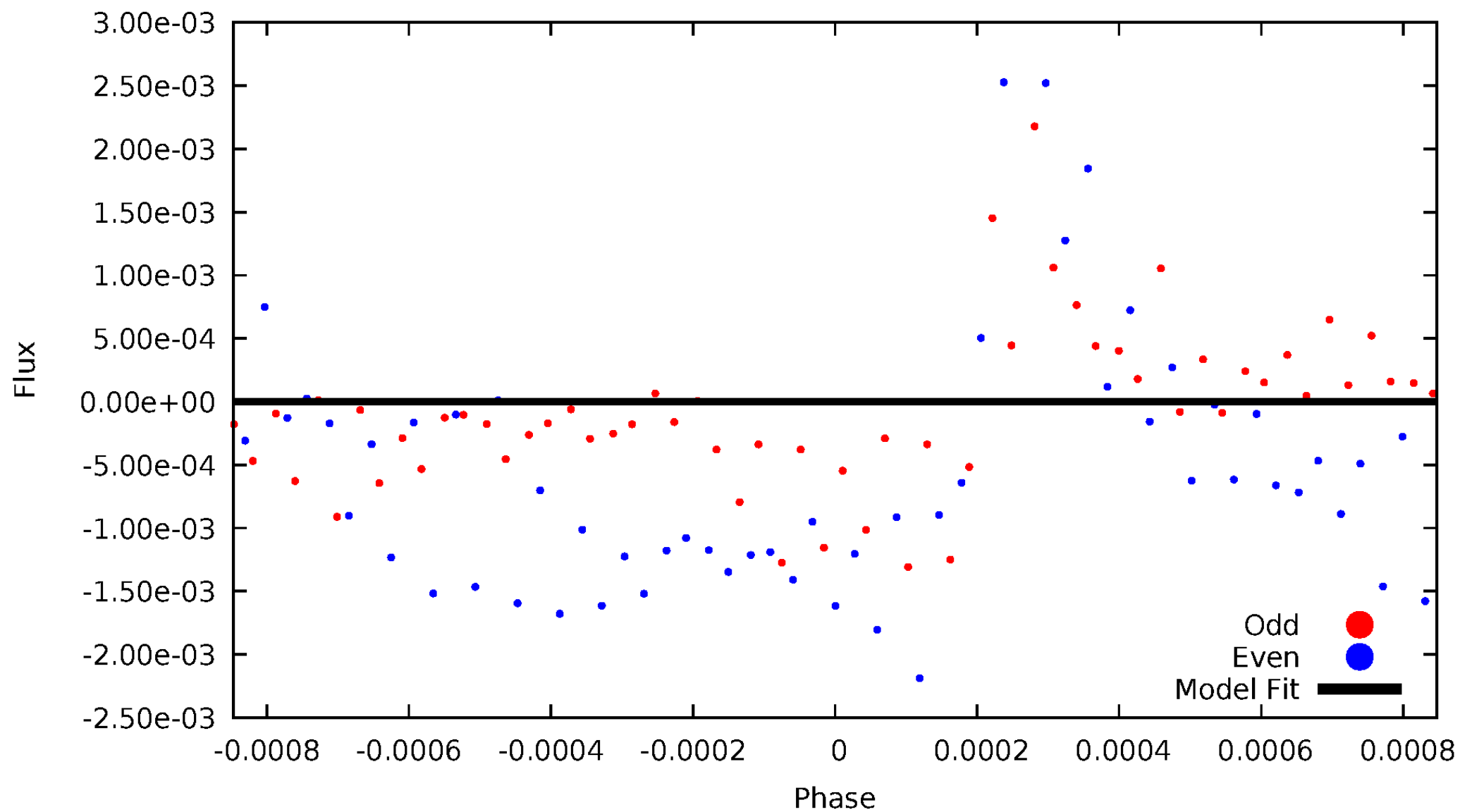


TCE 008431229-05



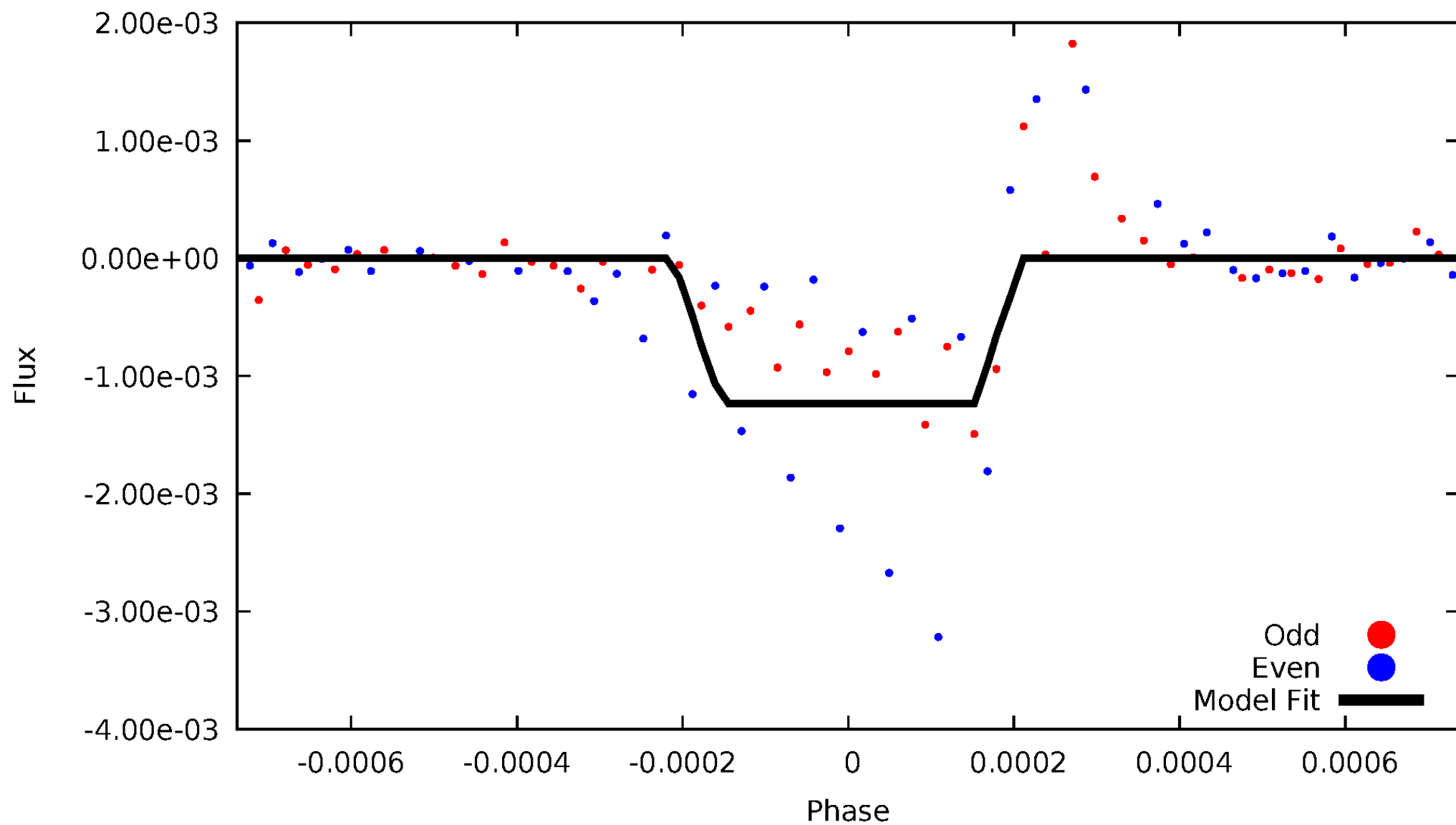
DV Odd/Even

TCE 008431229-05

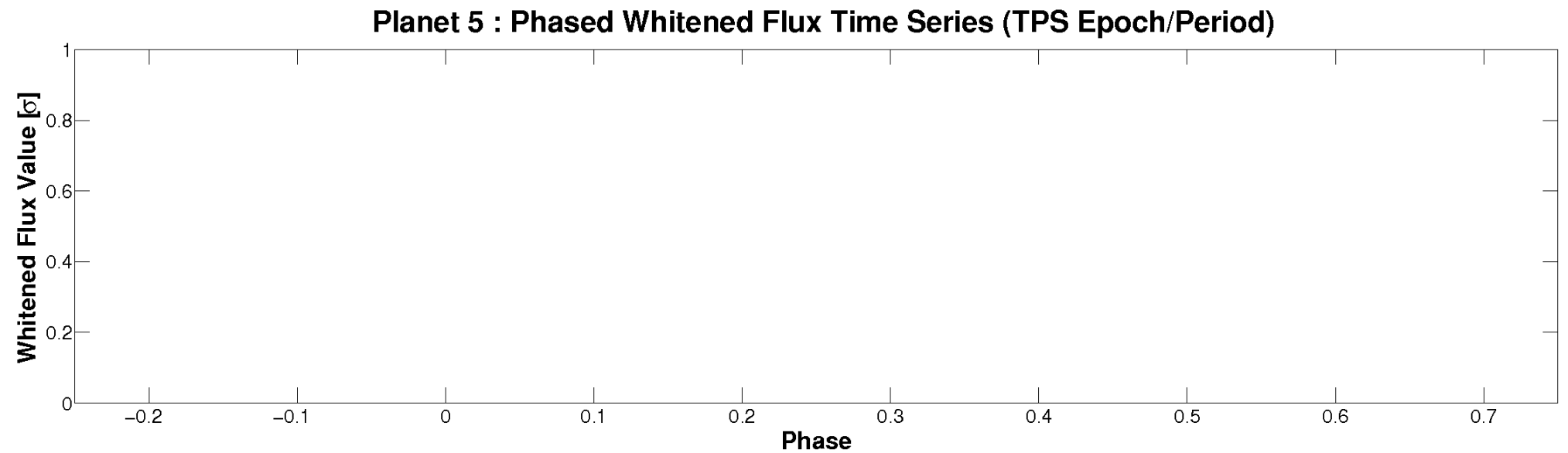
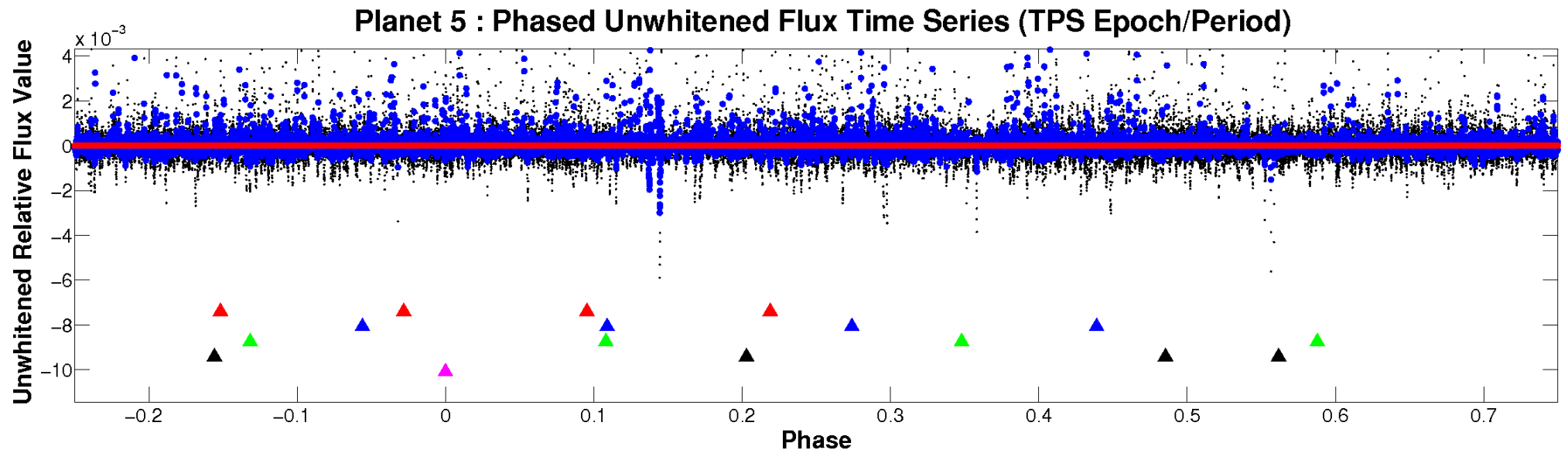


ALT Odd/Even

TCE 008431229-05

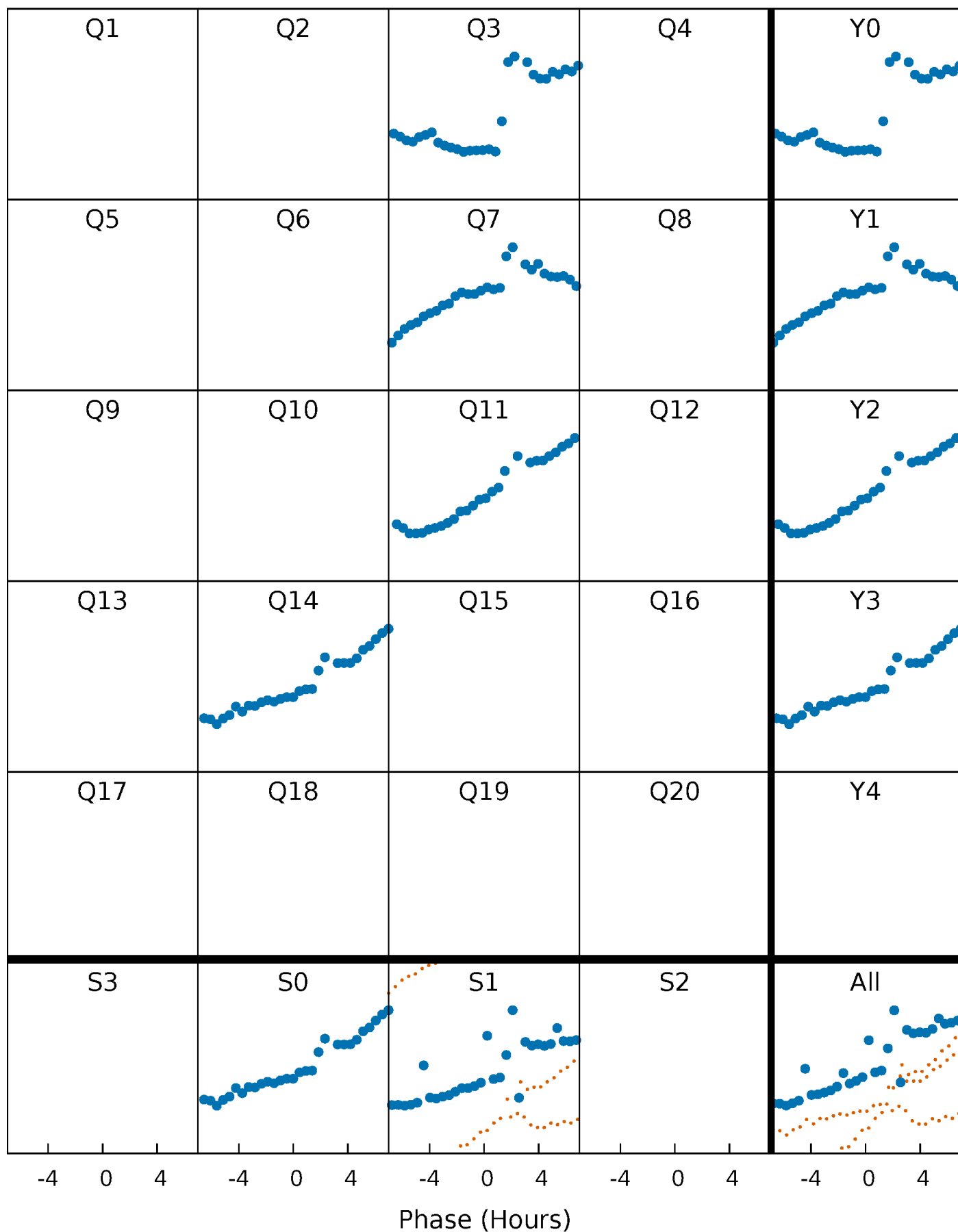


Non-Whitened Vs. Whitened Light Curve



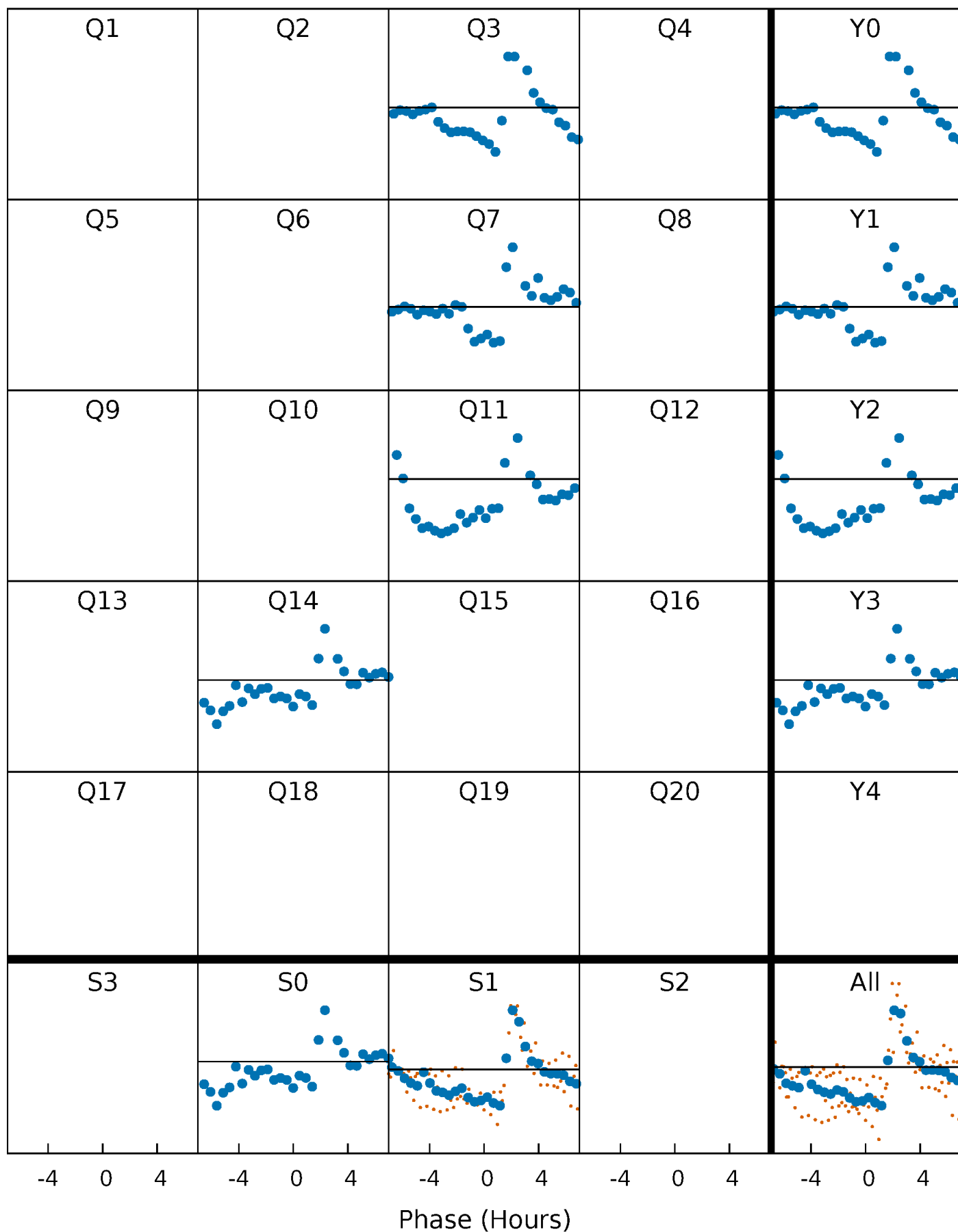
PDC Quarter-Phased Transit Curves

TCE 008431229-05 $P=344.374075$ Days $T_0=334.579713$ (BKJD)



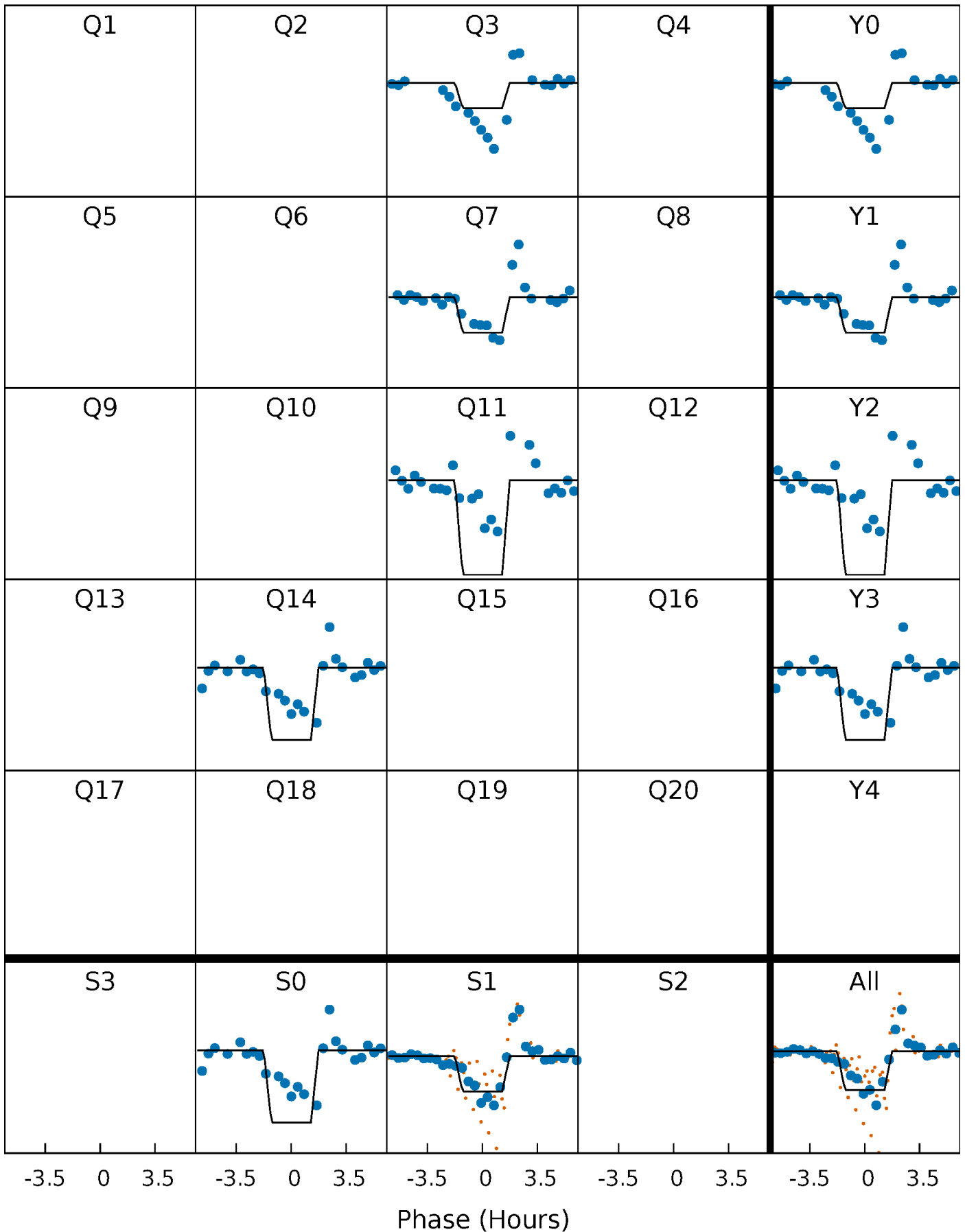
DV Quarter-Phased Transit Curves

TCE 008431229-05 $P=344.374075$ Days $T_0=334.579713$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

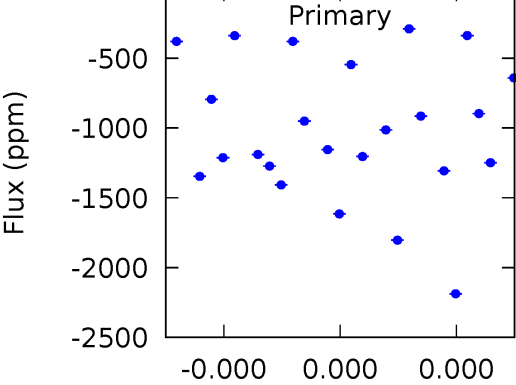
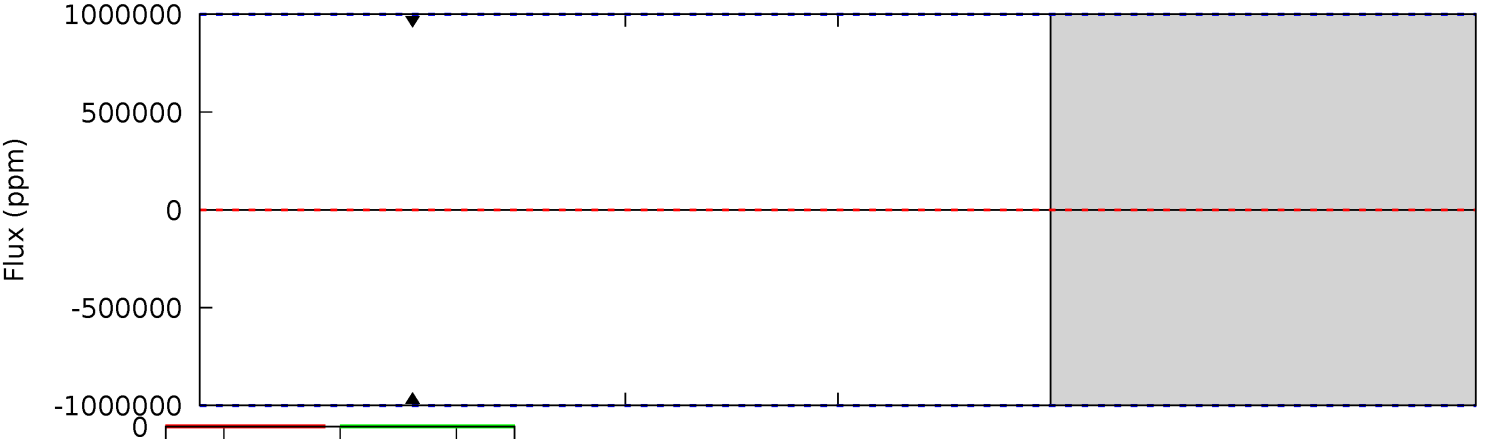
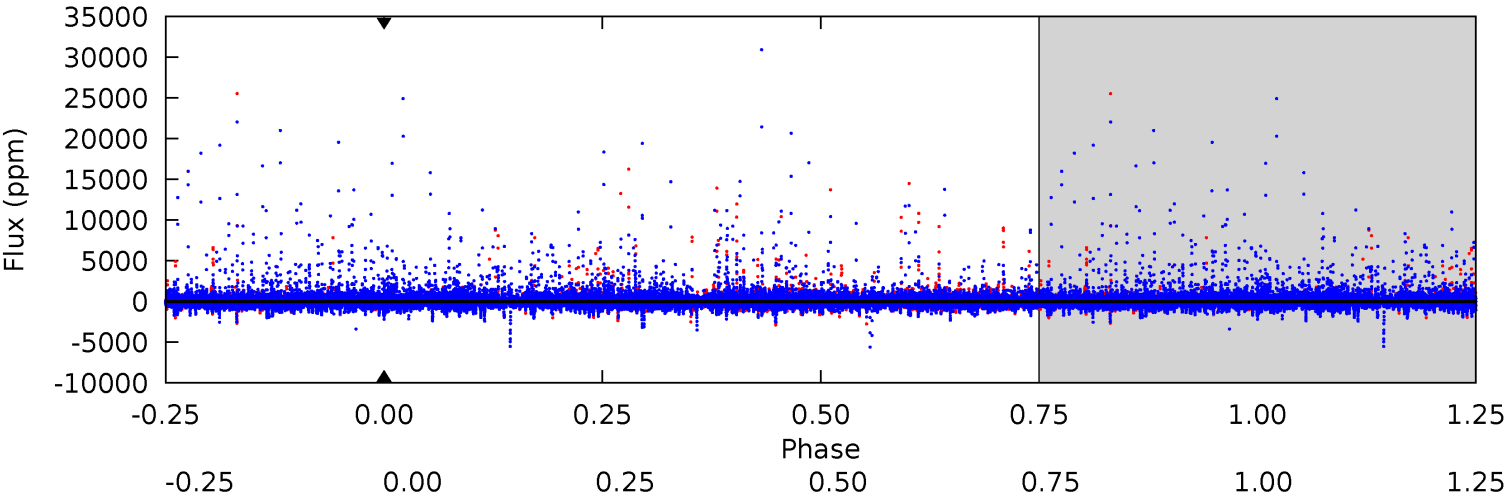
TCE 008431229-05 $P=344.374075$ Days $T_0=334.583259$ (BKJD)



DV Model-Shift Uniqueness Test

008431229-05, P = 344.374075 Days, E = 334.579713 Days

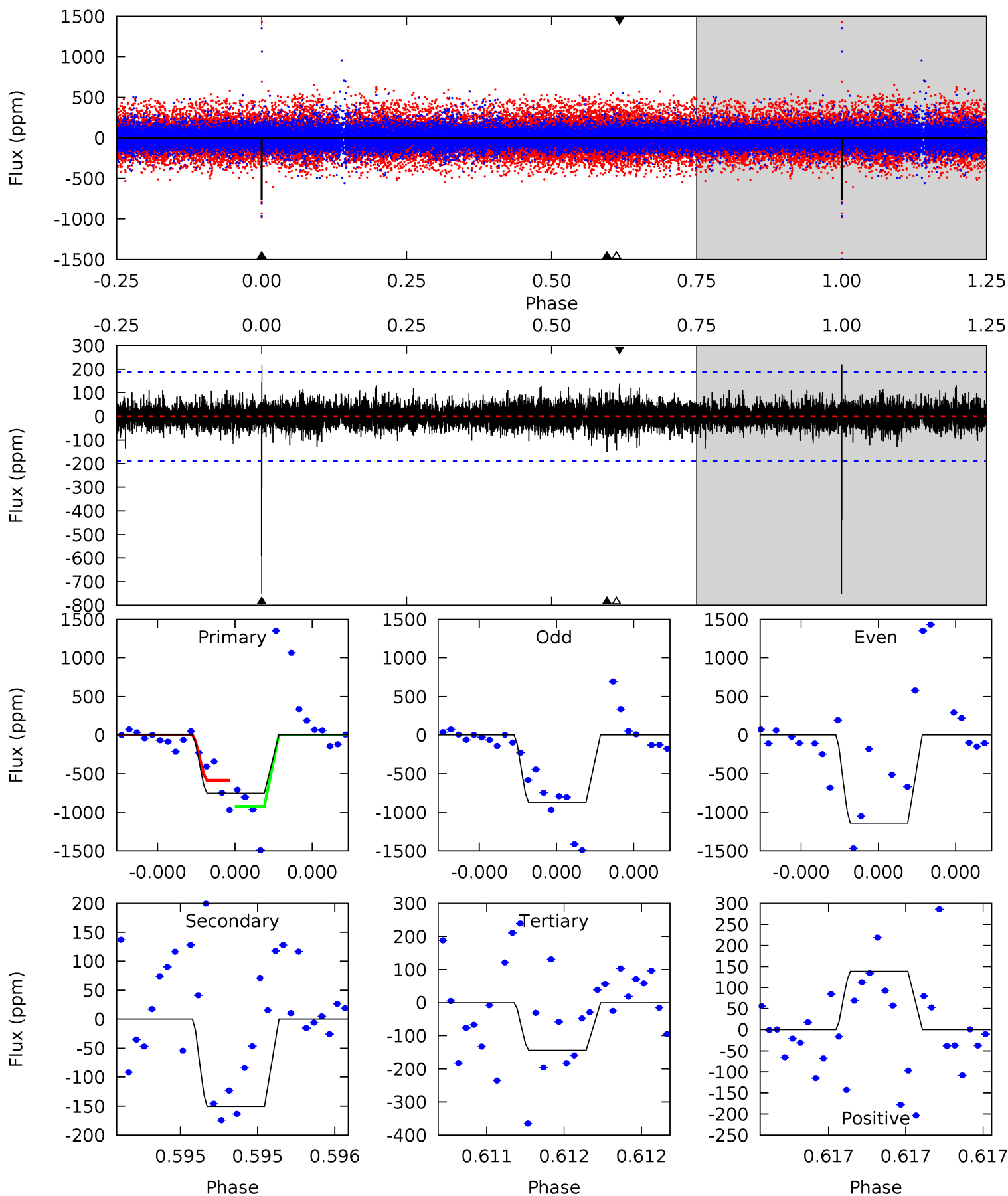
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

008431229-05, P = 344.374075 Days, E = 334.583259 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.3	4.47	4.28	4.11	5.61	3.54	0.89	18.0	18.2	0.19	0.36	4.33	1.28	0.23	0



Stellar Parameters For KIC 008431229

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5547^{+77}_{-88}	$3.833^{+0.240}_{-0.080}$	$0.260^{+0.150}_{-0.150}$	$2.275^{+0.316}_{-0.736}$	$1.284^{+0.101}_{-0.254}$	$0.154^{+0.249}_{-0.043}$
	+1%/-2%	+6%/-2%	+58%/-58%	+14%/-32%	+8%/-20%	+162%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 008431229-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$17.43^{+18.80}_{-11.78}$	497^{+24}_{-36}	-4099^{+23336}_{-15756}	$-2318.255^{+374580.990}_{-415477.915}$
Alt.	-151 ± 34	$19.00^{+19.66}_{-12.60}$	497^{+24}_{-37}	2850^{+1233}_{-461}	240^{+2006}_{-182}

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

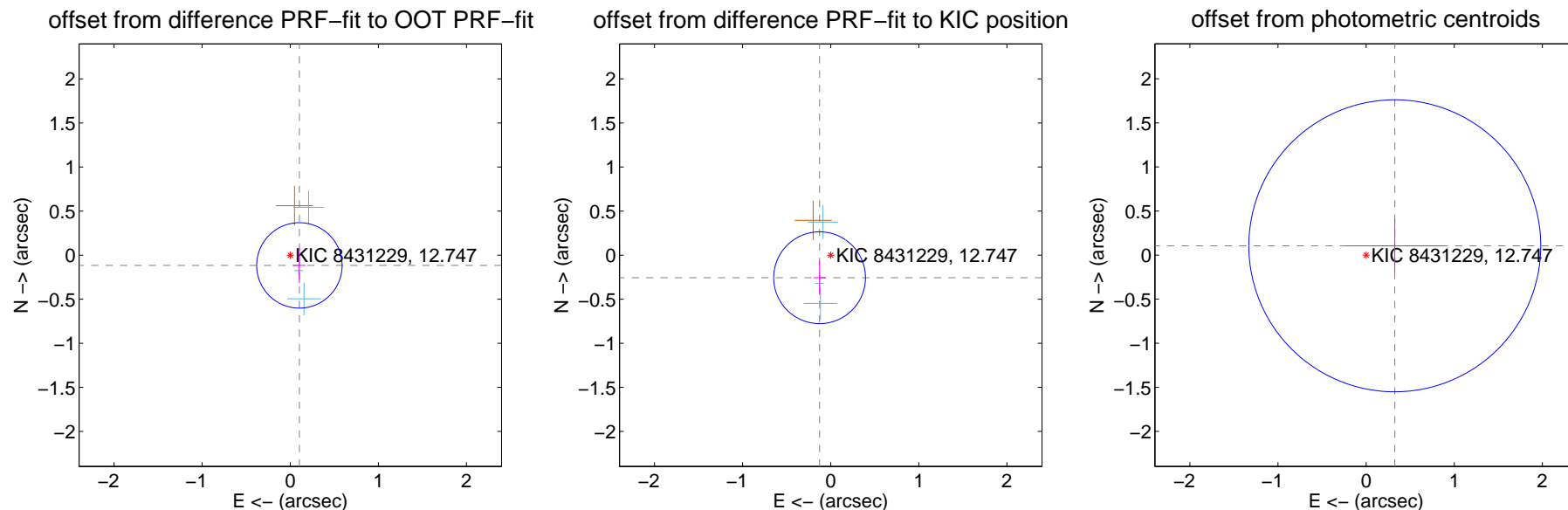
DV Centroid Data

Supplemental centroid analysis for 008431229-05. Kepler magnitude: 12.75. Transit SNR -1.00

There are 3 quarters with good PRF difference image offsets

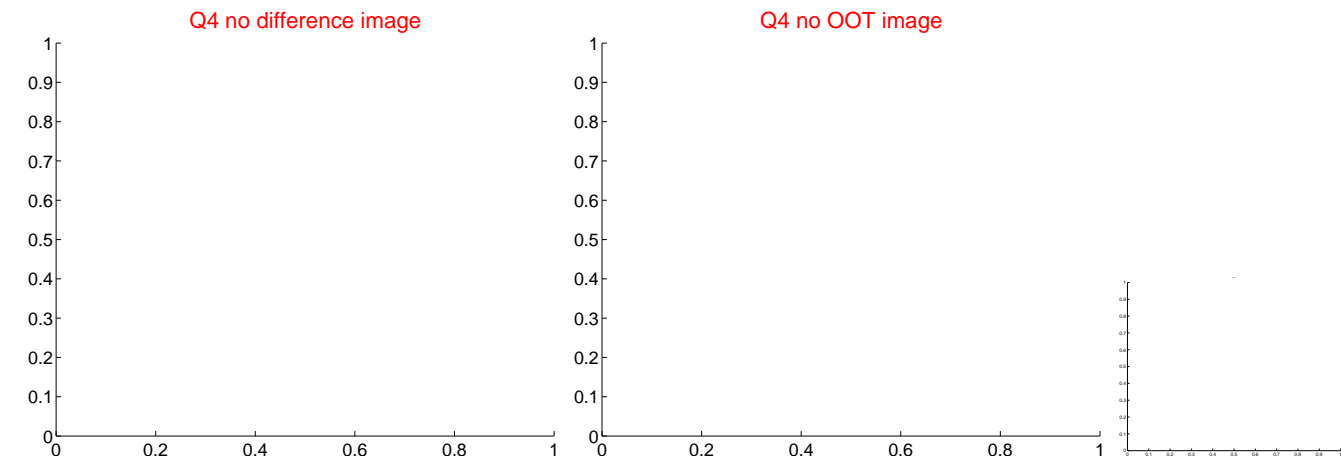
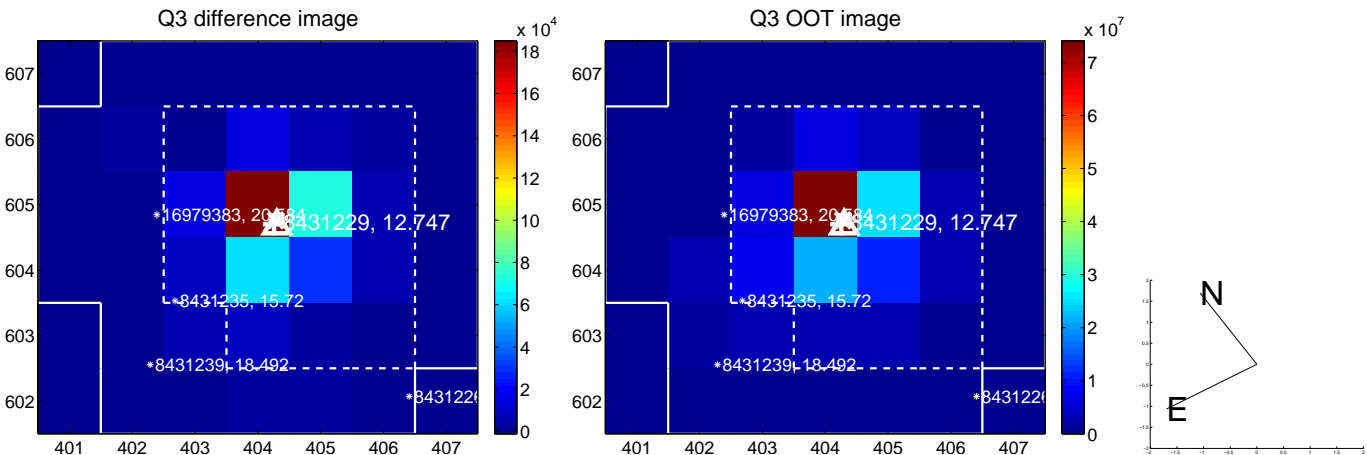
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.156 ± 0.162	0.96	-0.104 ± 0.072	-0.116 ± 0.201
PRF-fit source offset from KIC position	0.286 ± 0.174	1.64	0.126 ± 0.070	-0.256 ± 0.195
photometric centroid source offset	0.34 ± 0.55	0.62	-0.33 ± 0.57	0.11 ± 0.30

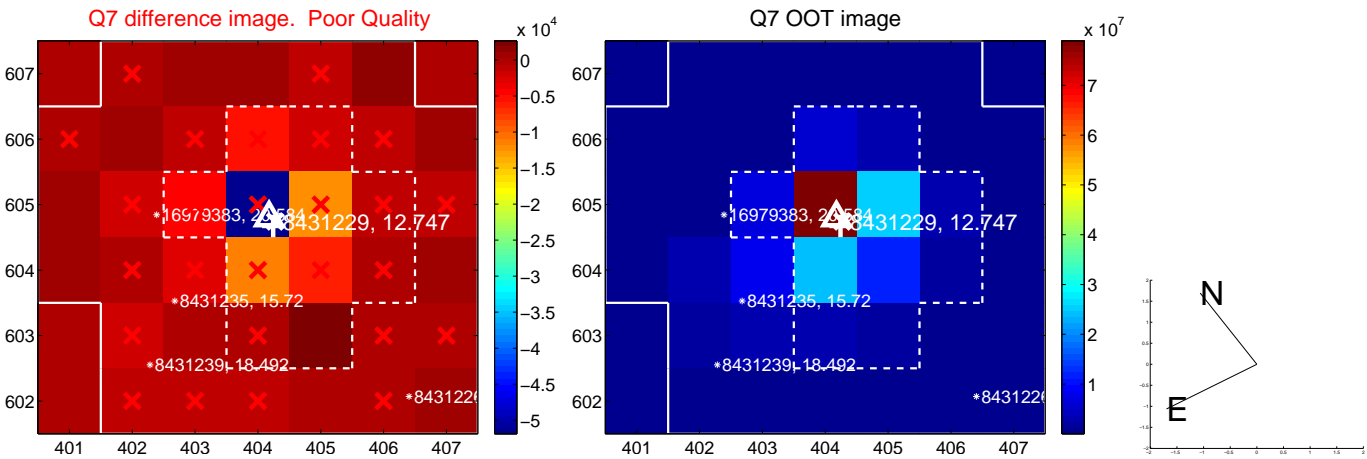


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

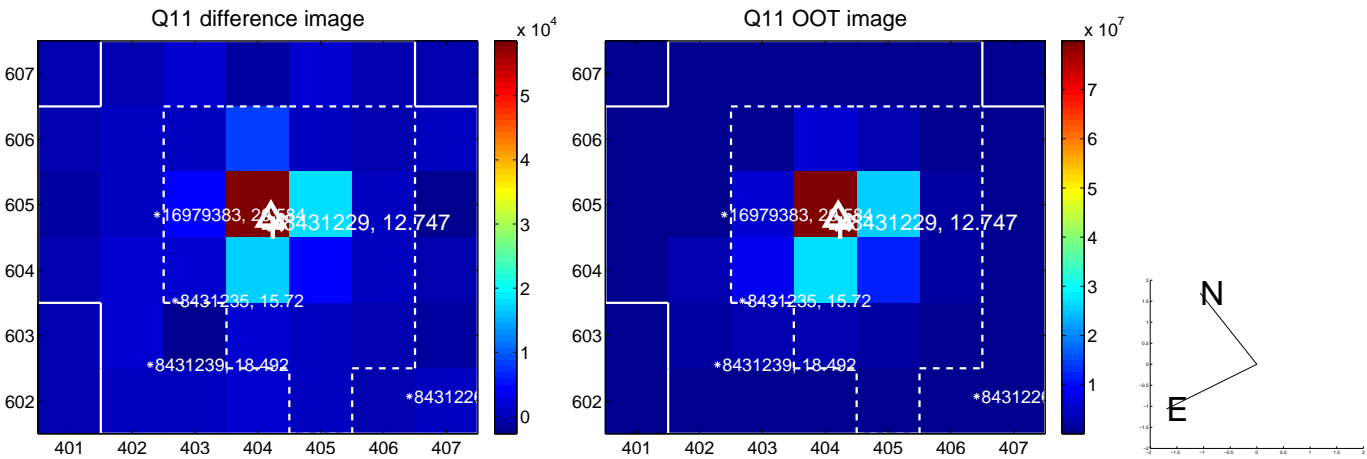
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



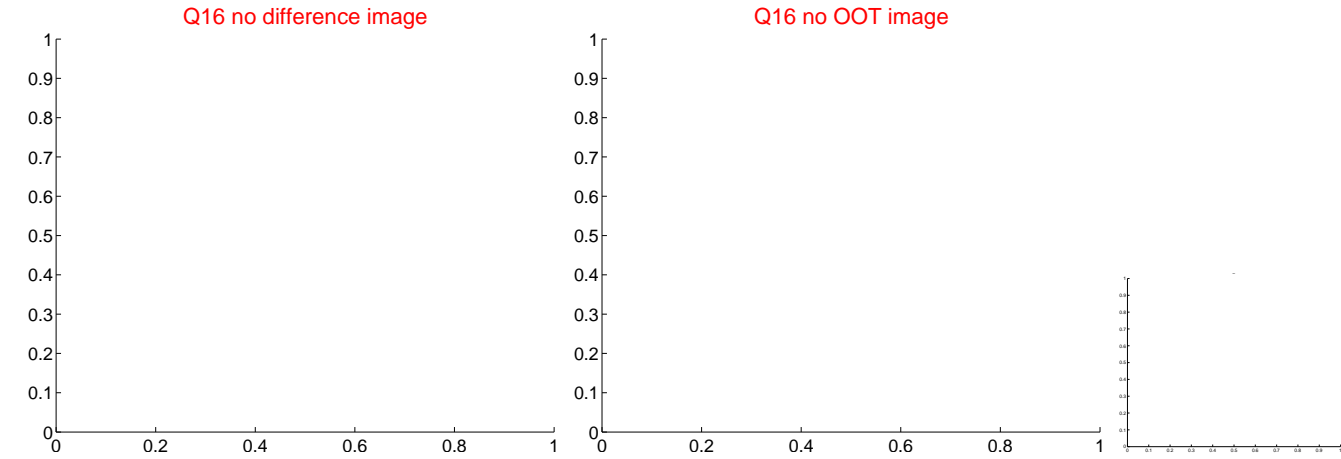
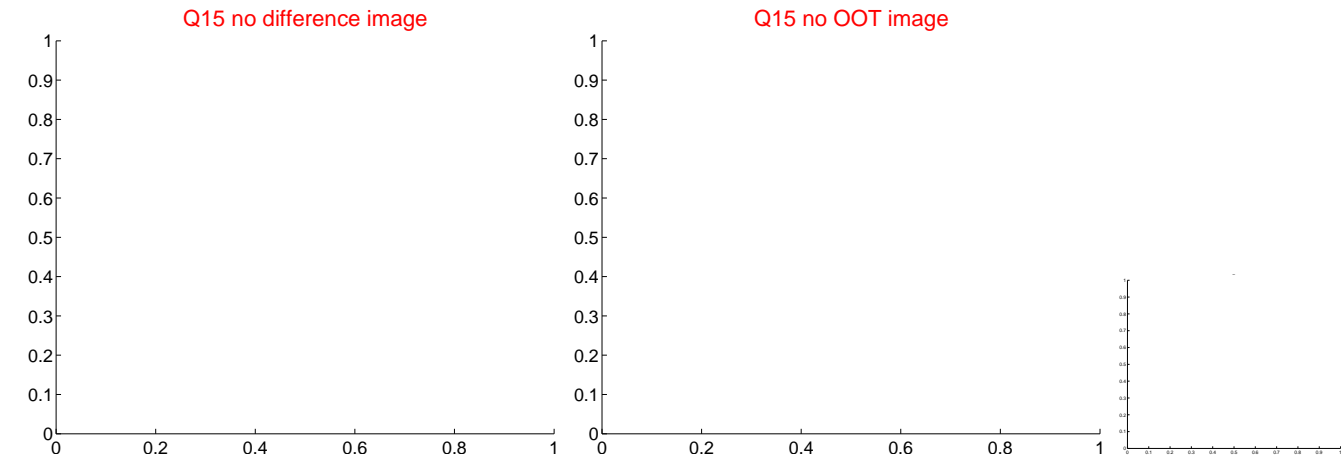
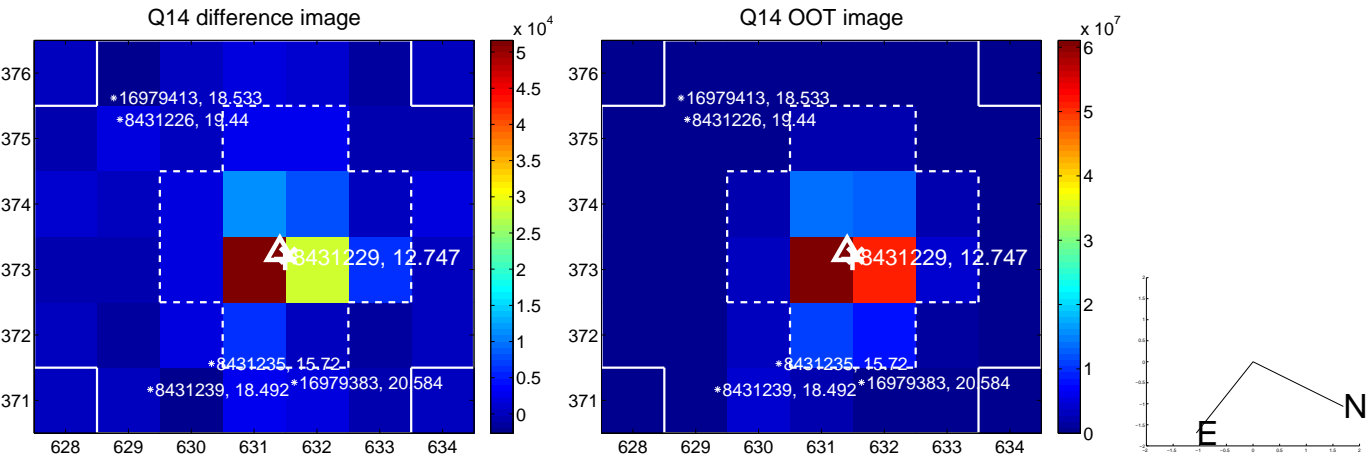
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



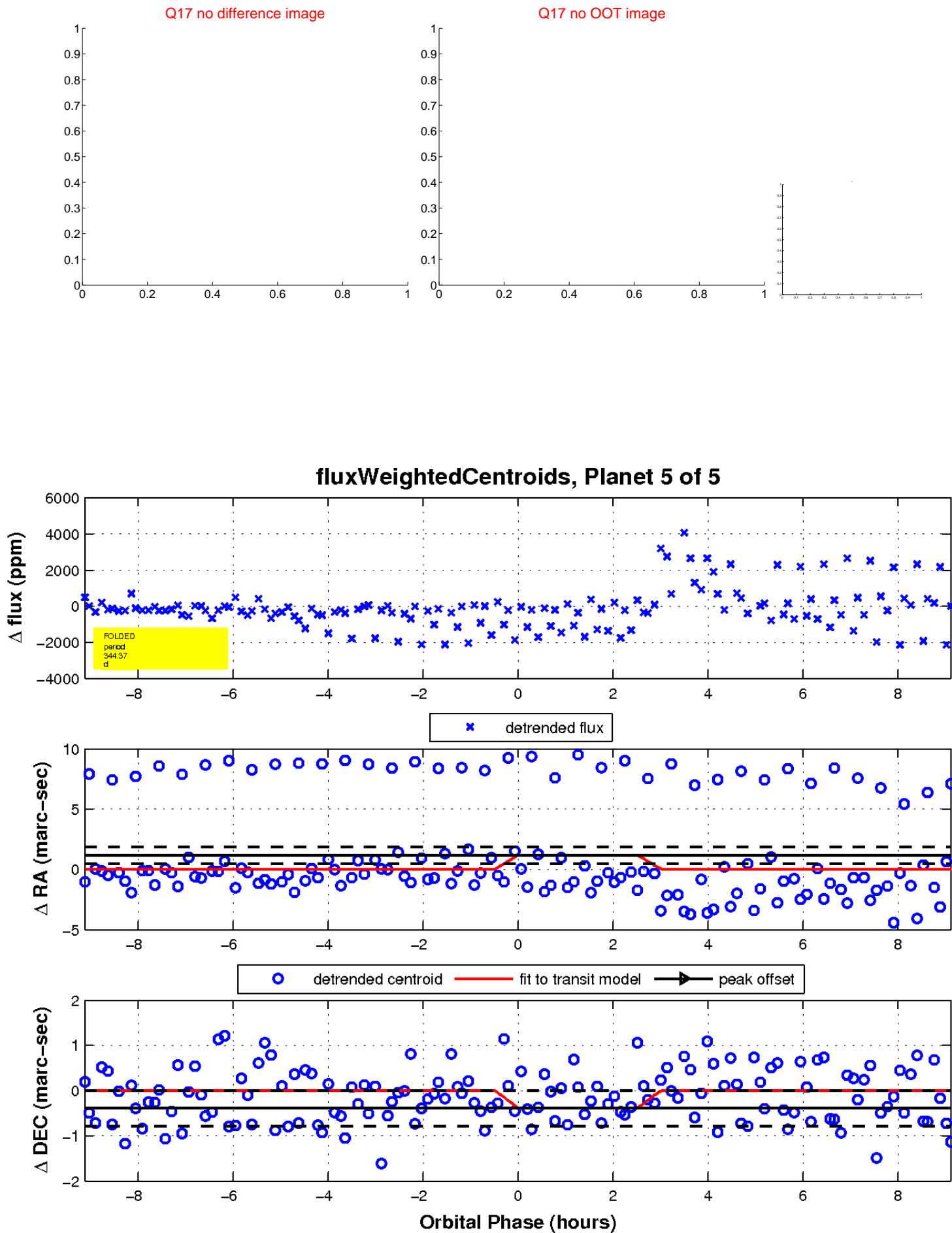
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



white \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

