

KIC 010357831

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})
010357831-01	OBS	6221.01	1.721539	131.727273	39991.2	2.175	258.7	229.0	0.67	4535	14.34	282.60
010357831-02	OBS	No	1.722416	131.974803	1415.9	2.784	10.9	11.3	0.67	4535	3.09	282.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010357831-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—SEASONAL_DEPTH_DV—CENT_KIC_POS
010357831-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

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

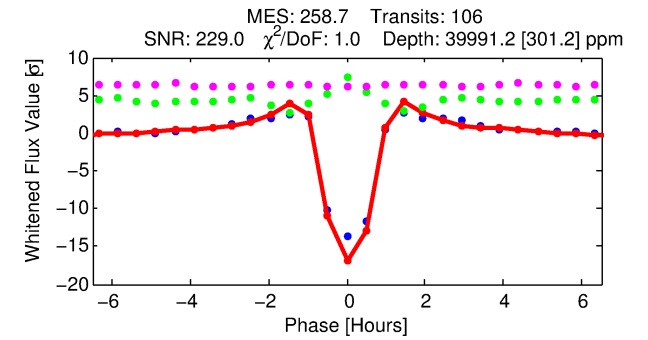
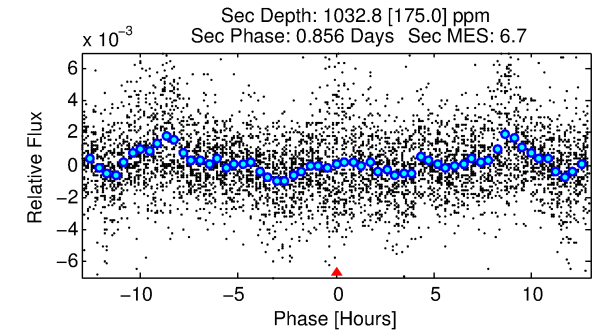
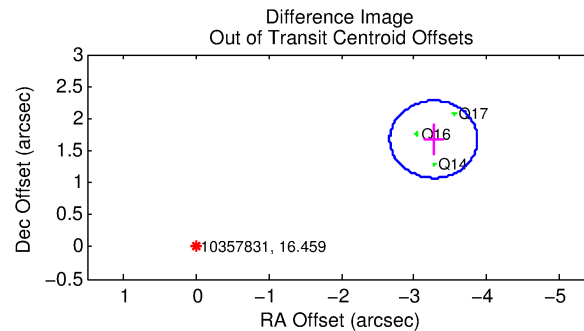
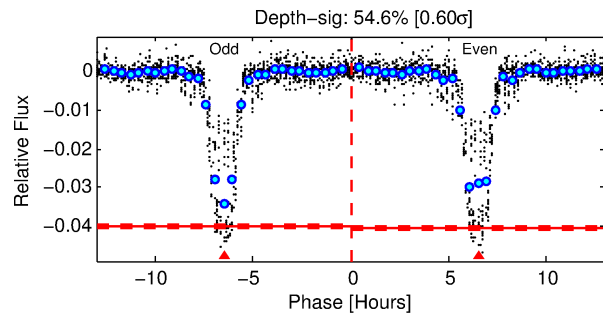
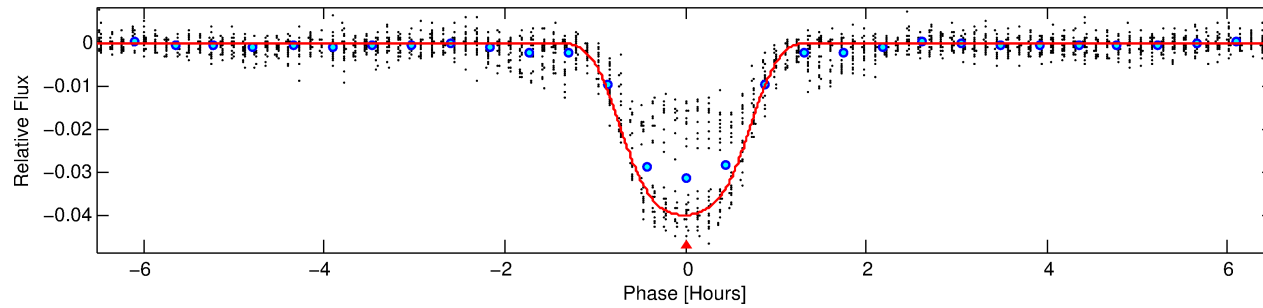
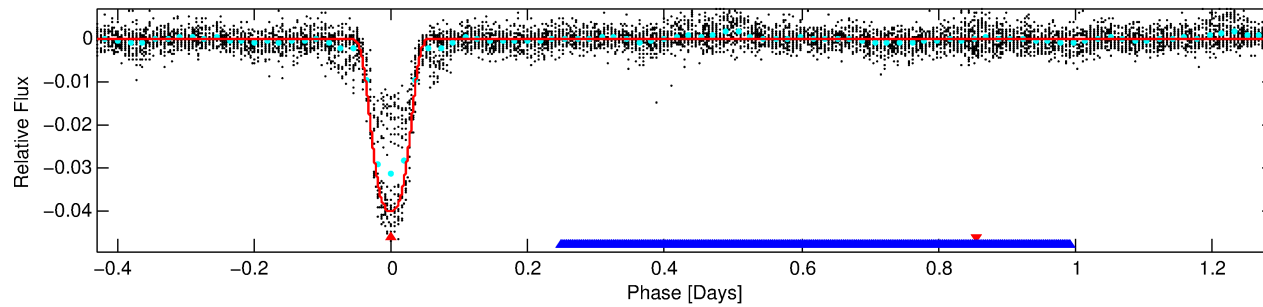
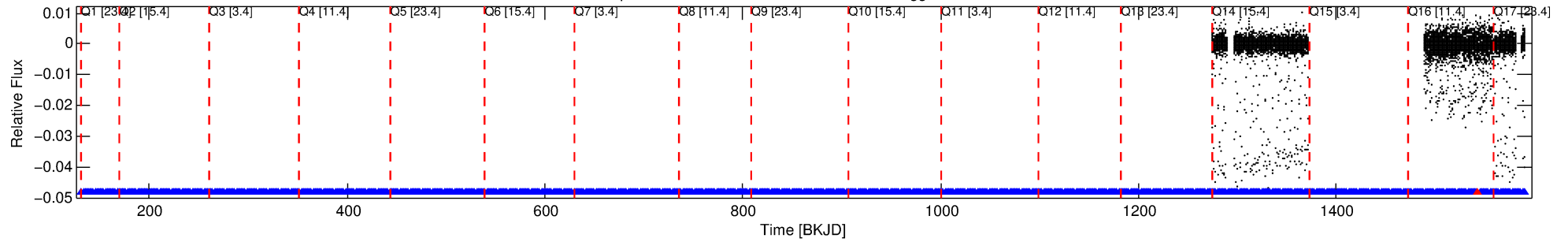
Ephemeris Match Information For 010357831-01

No Significant Match Found

DV One-Page Summary

KIC: 10357831 Candidate: 1 of 2 Period: 1.722 d
KOI: K06221.01 Corr: 0.955

Kp: 16.46 R*: 0.67 Rs Teff: 4535.0 K Logg: 4.61 Fe/H: -0.160



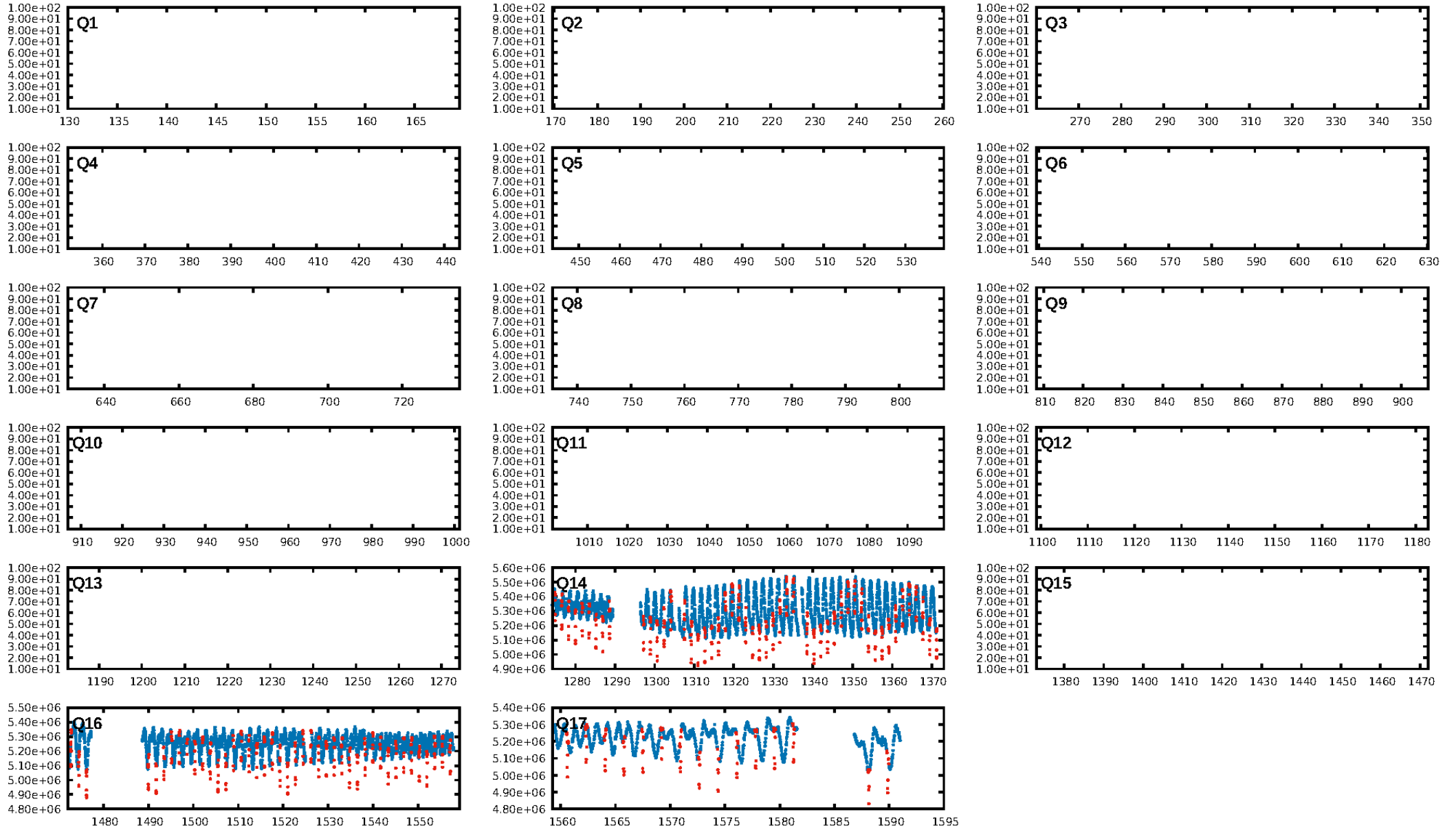
DV Fit Results:

Period = 1.72154 [0.00000] d
Epoch = 131.7273 [0.0001] BKJD
Rp/R* = 0.1968 [0.0016]
a/R* = 6.01 [0.09]
b = 0.68 [0.01]
Seff = 282.60 [49.05]
Teff = 1045 [45] K
Rp = 14.34 [1.29] Re
a = 0.0245 [0.0018] AU
Ag = 1.65 [0.33] [1.99σ]
Teffp = 1833 [101] K [7.11σ]

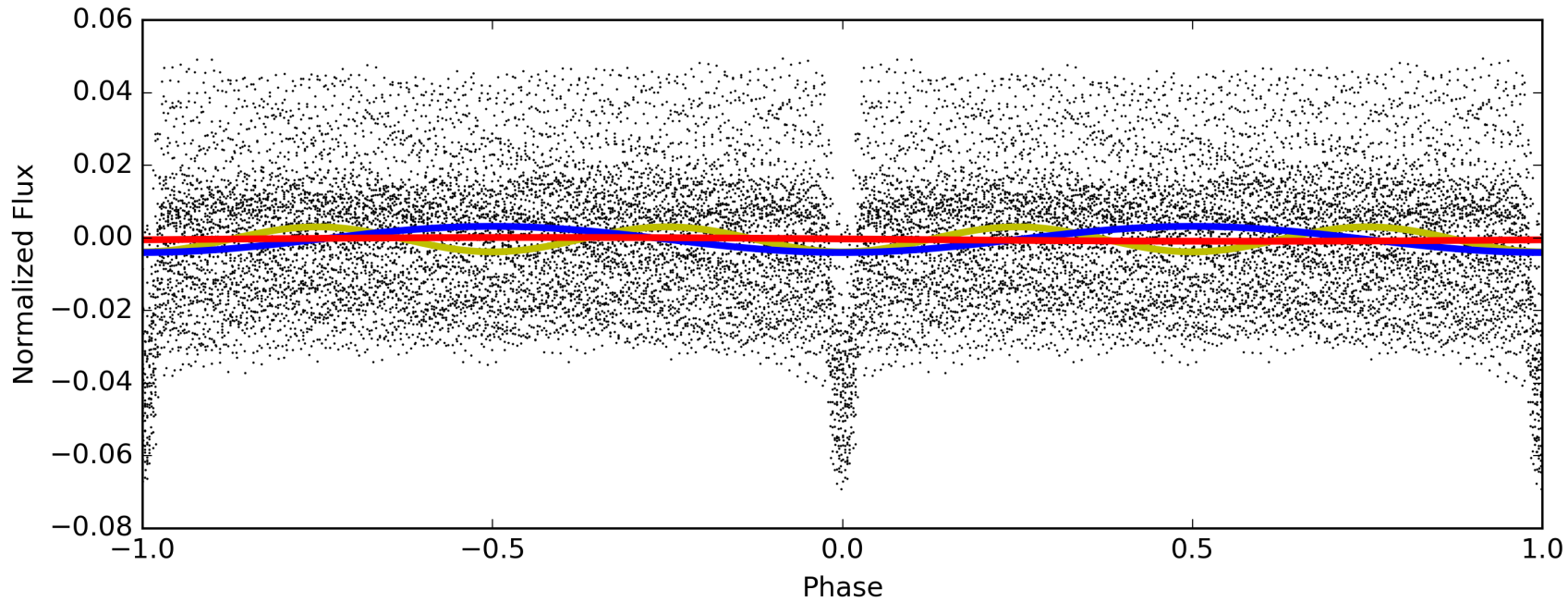
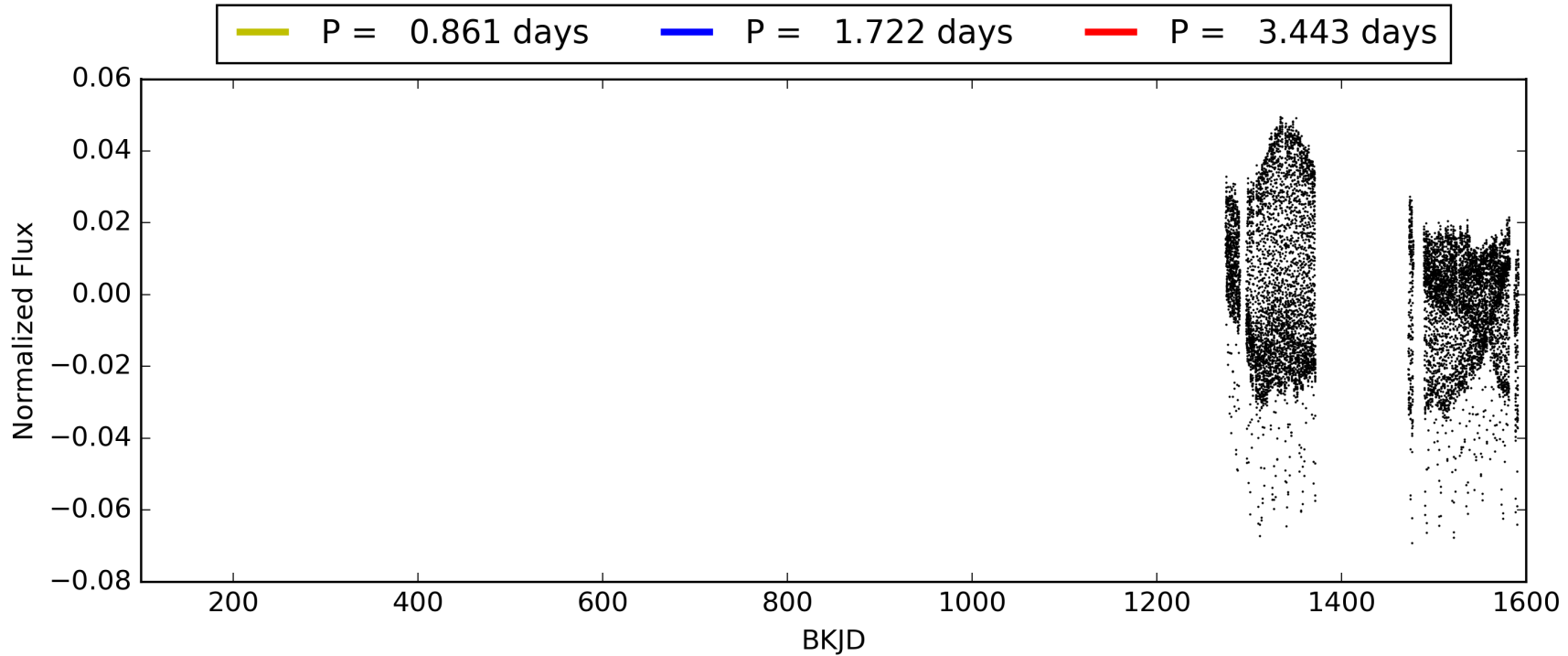
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.5% [0.01σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [90/91]
GhostDiagnostic-chr: 3.788
Centroid-sig: N/A
Centroid-so: 1.998 arcsec [107.61σ]
OotOffset-rm: 3.673 arcsec [18.29σ]
KicOffset-rm: 0.155 arcsec [1.72σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 010357831-01, PDC Light Curves

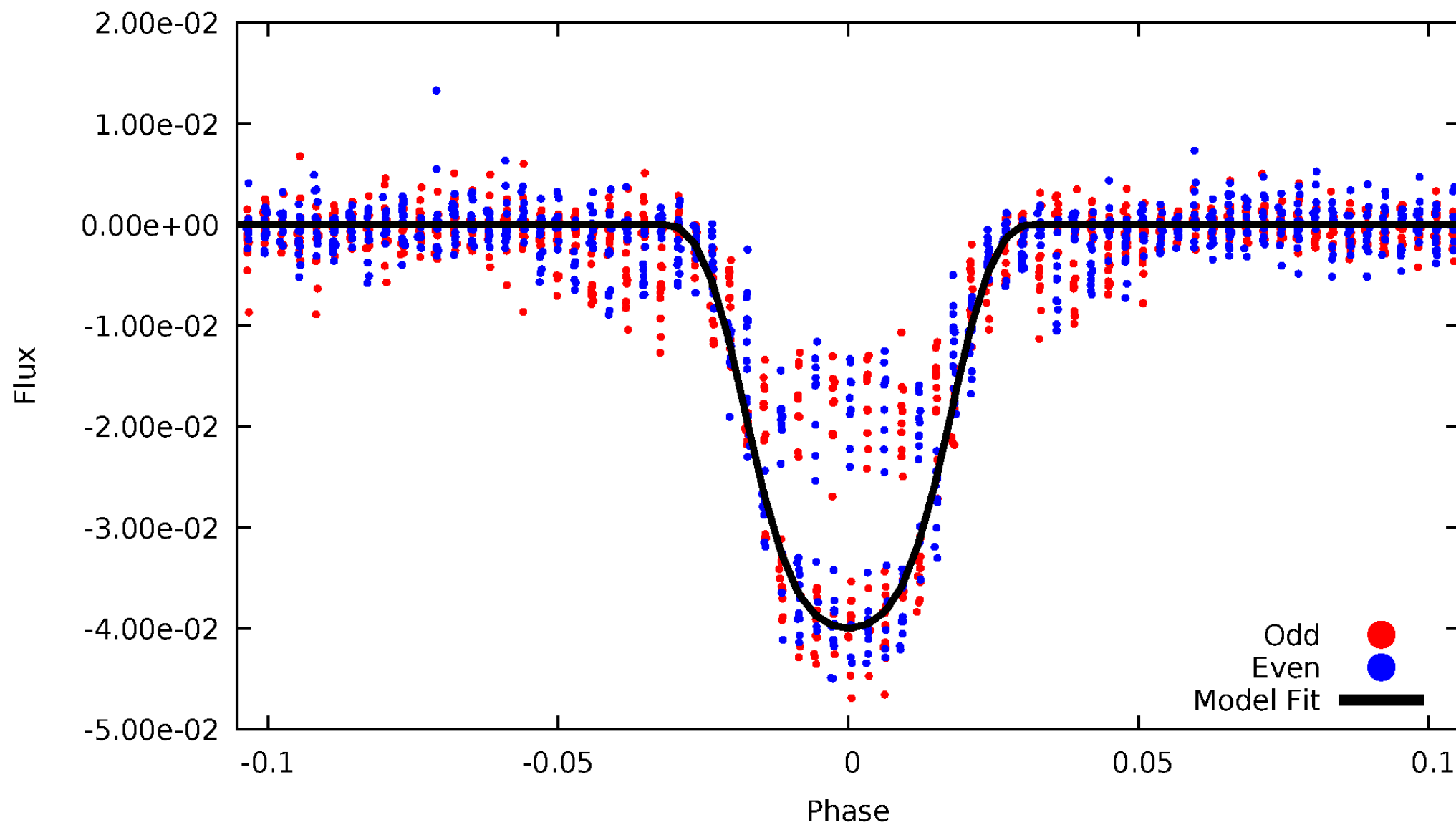


TCE 010357831-01



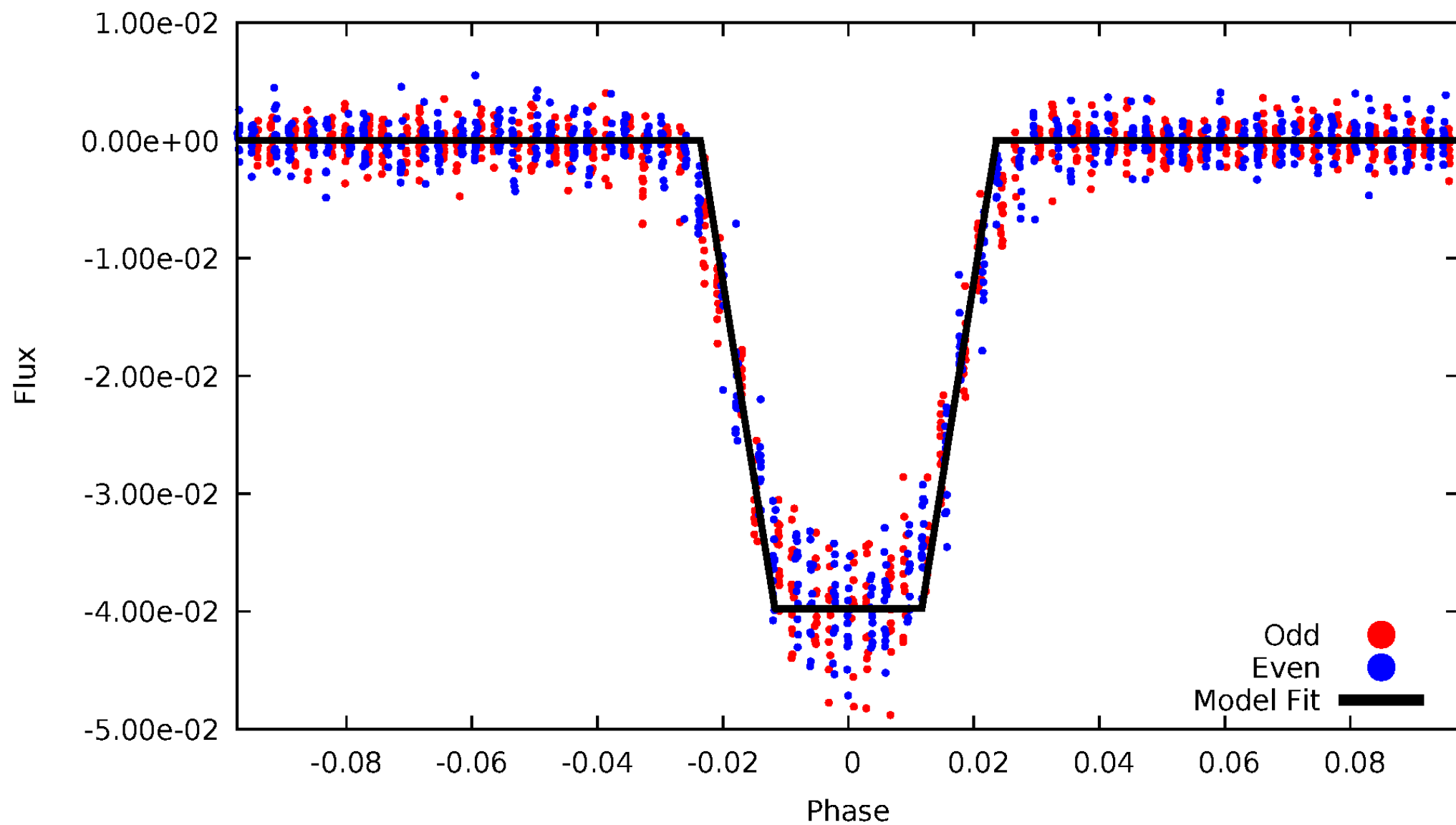
DV Odd/Even

TCE 010357831-01



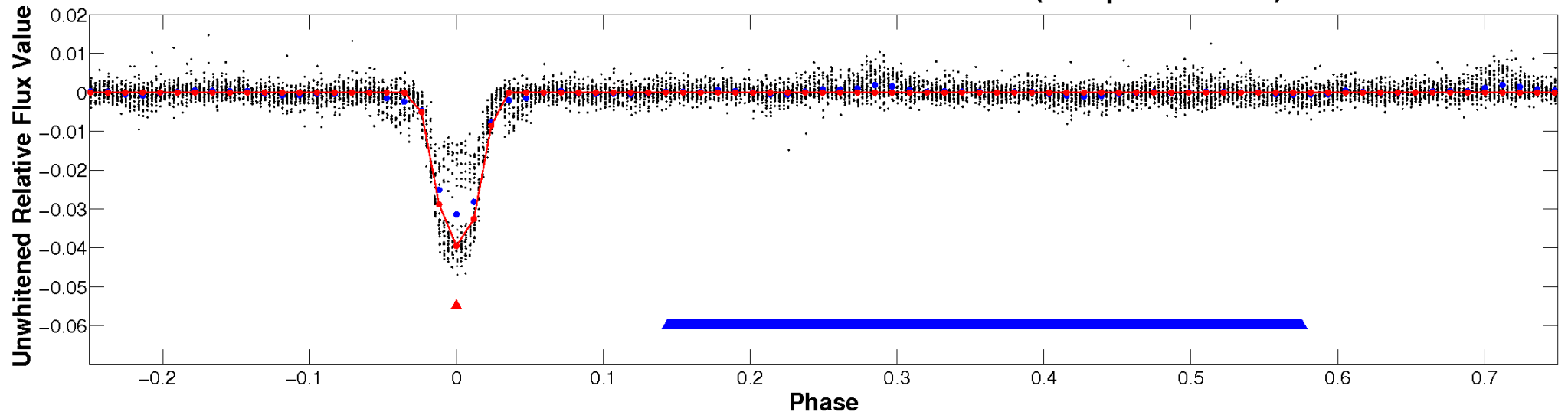
ALT Odd/Even

TCE 010357831-01

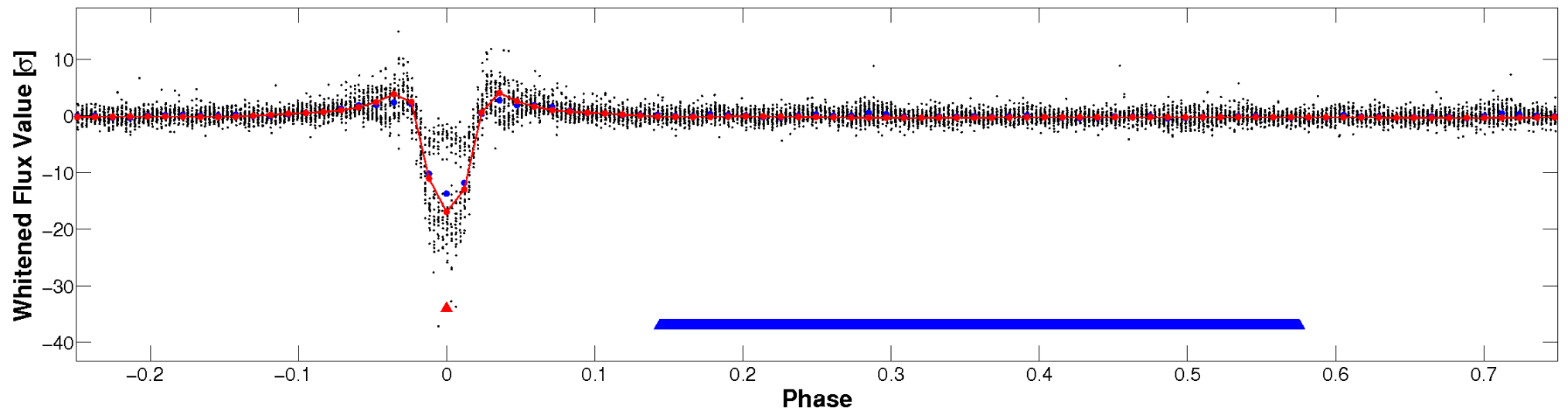


Non-Whitened Vs. Whitened Light Curve

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

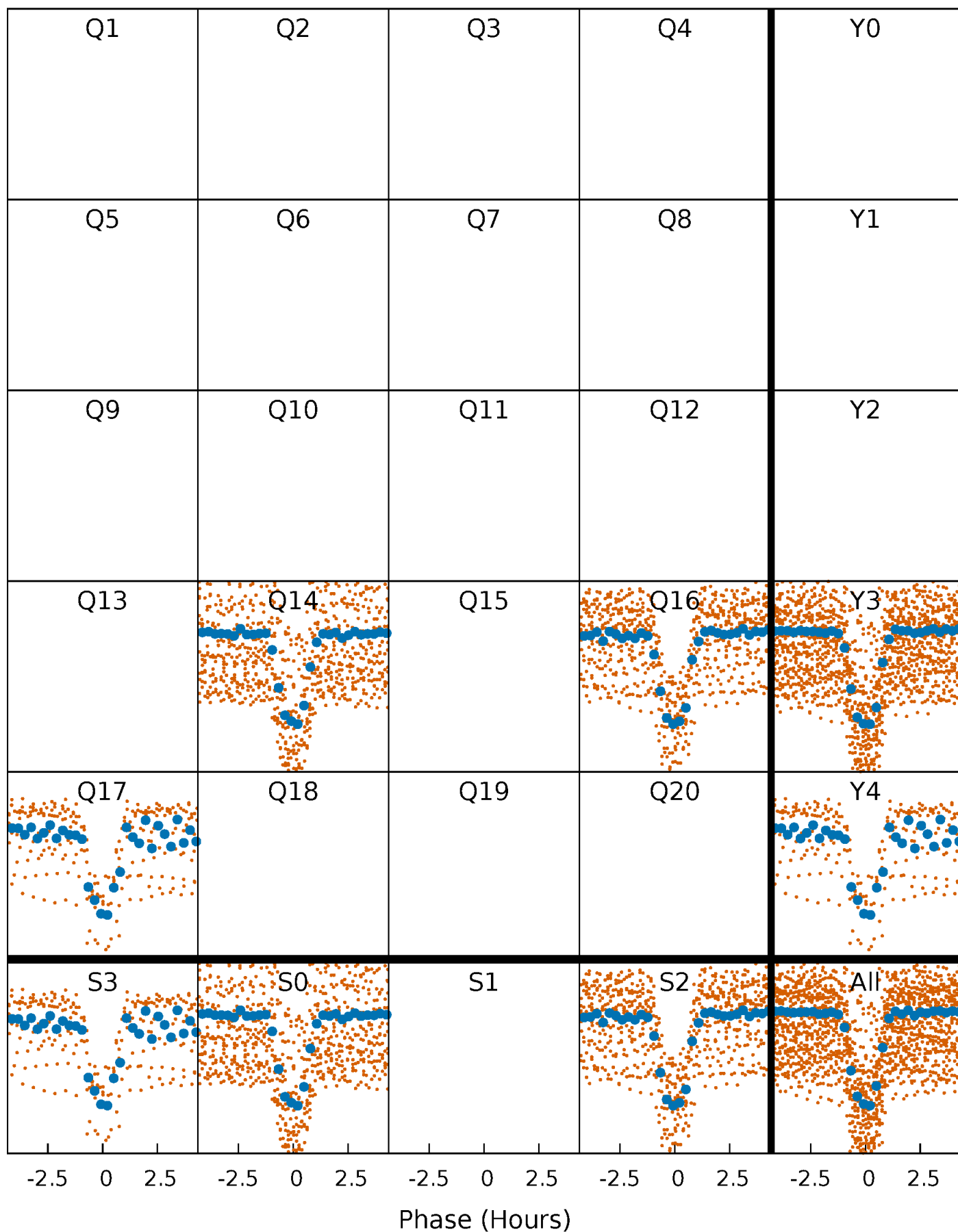


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



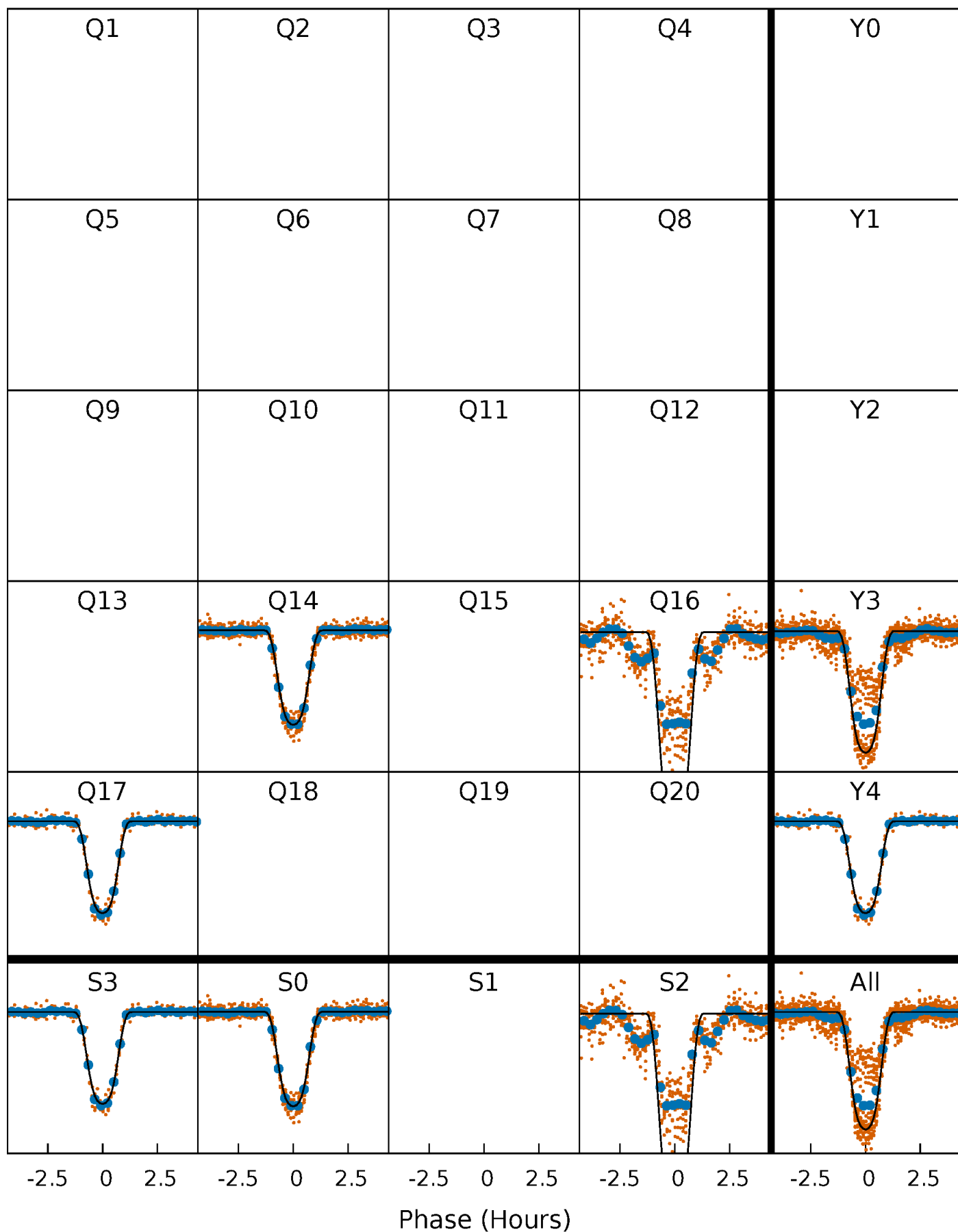
PDC Quarter-Phased Transit Curves

TCE 010357831-01 P= 1.721539 Days $T_0=131.727273$ (BKJD)



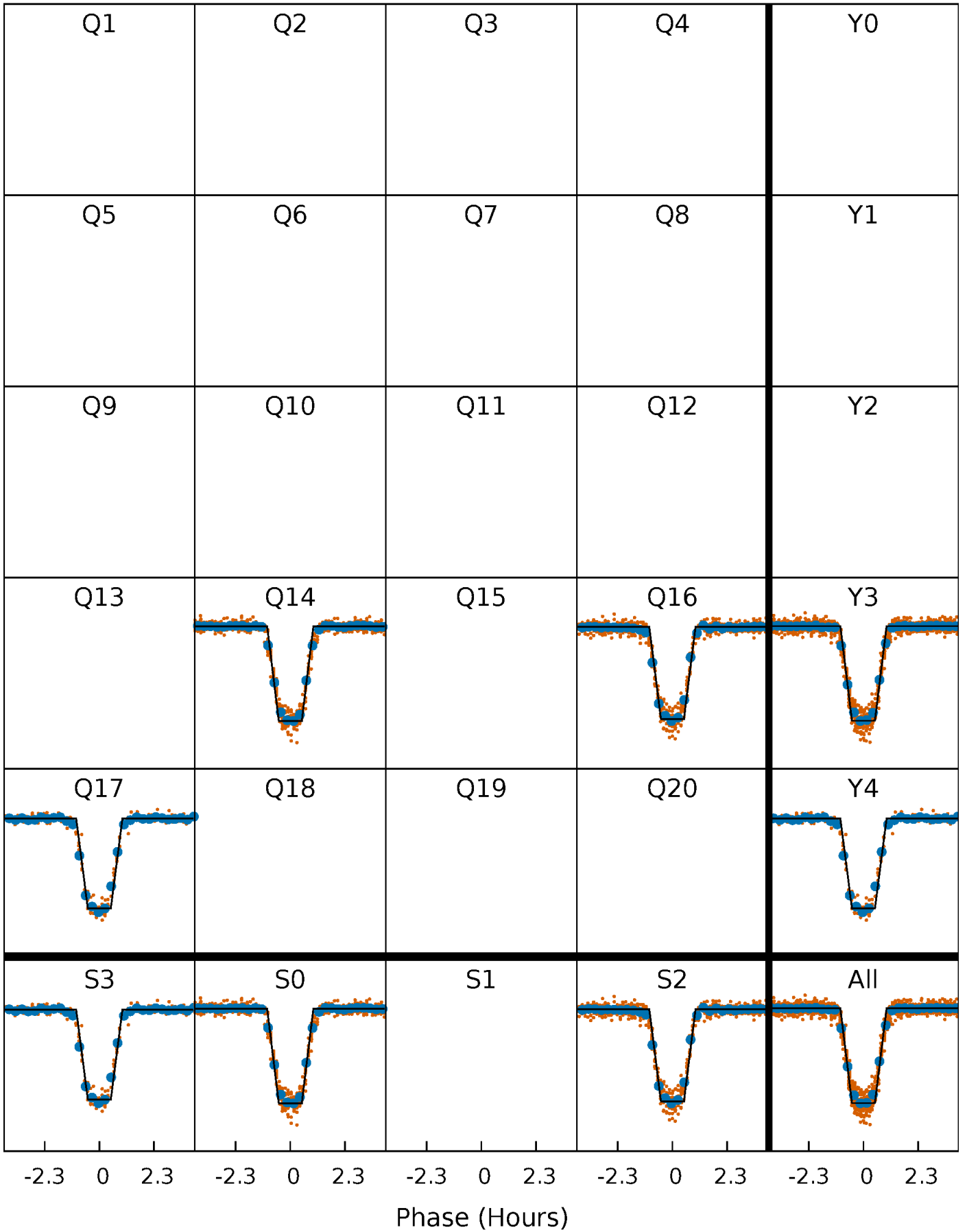
DV Quarter-Phased Transit Curves

TCE 010357831-01 P= 1.721539 Days $T_0=131.727273$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

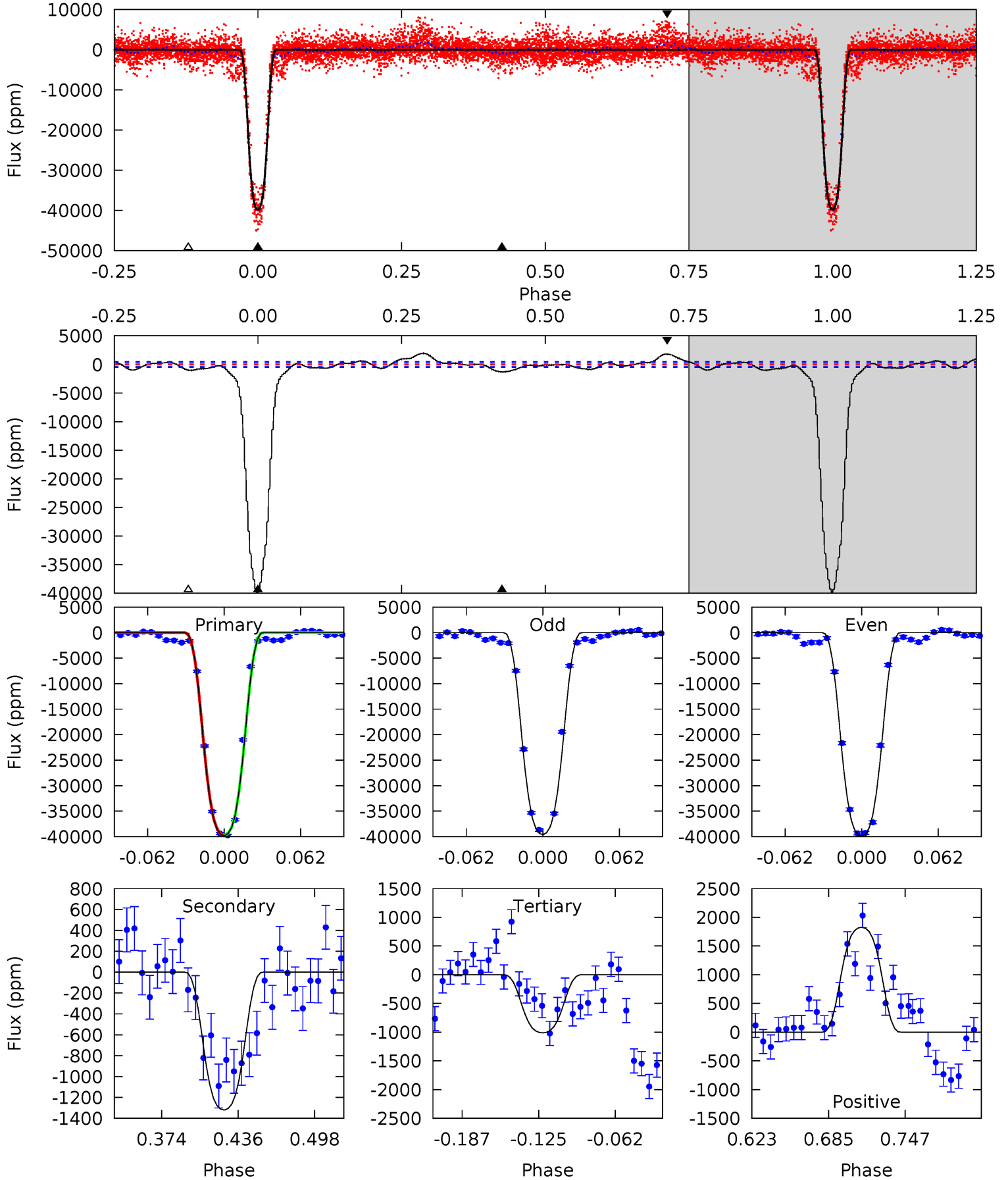
TCE 010357831-01 P= 1.721549 Days $T_0=131.719290$ (BKJD)



DV Model-Shift Uniqueness Test

010357831-01, P = 1.721539 Days, E = 131.727273 Days

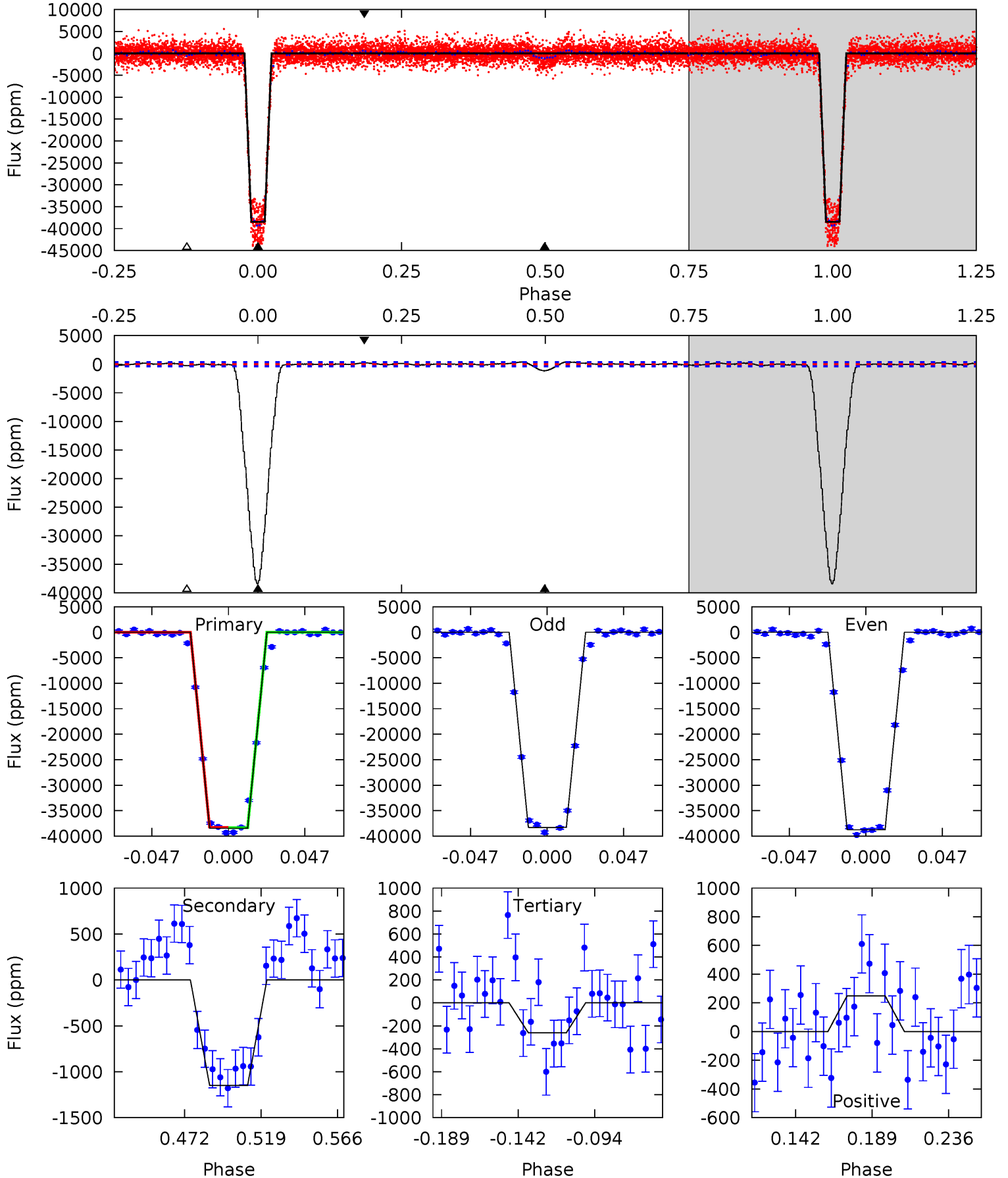
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
413.6	13.7	10.5	19.0	4.66	1.86	7.13	403.1	394.6	3.21	-5.25	1.63	0.84	0.05	0.30



Alt Model-Shift Uniqueness Test

010357831-01, P = 1.721549 Days, E = 131.719290 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
503.8	15.1	3.42	3.26	4.72	1.98	1.37	500.4	500.5	11.7	11.8	2.88	1.00	0.01	0.30



Stellar Parameters For KIC 010357831

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} \text{ (g}\cdot\text{cm}^{-3})$
	4535^{+159}_{-159}	$4.607^{+0.054}_{-0.027}$	$-0.160^{+0.300}_{-0.300}$	$0.668^{+0.048}_{-0.060}$	$0.659^{+0.075}_{-0.054}$	$3.111^{+0.717}_{-0.355}$
	+4%/-4%	+1%/-1%	+188%/-188%	+7%/-9%	+11%/-8%	+23%/-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 010357831-01 / KOI 6221.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} \text{ (K)}$	$T_{obs} \text{ (K)}$	A_{obs}
DV	-1320 ± 96	$14.36^{+0.60}_{-0.82}$	1455^{+55}_{-57}	2620^{+67}_{-68}	$2.156^{+0.231}_{-0.204}$
Alt.	-1150 ± 76	$14.48^{+0.68}_{-0.69}$	1453^{+56}_{-56}	2556^{+61}_{-62}	$1.838^{+0.173}_{-0.167}$

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

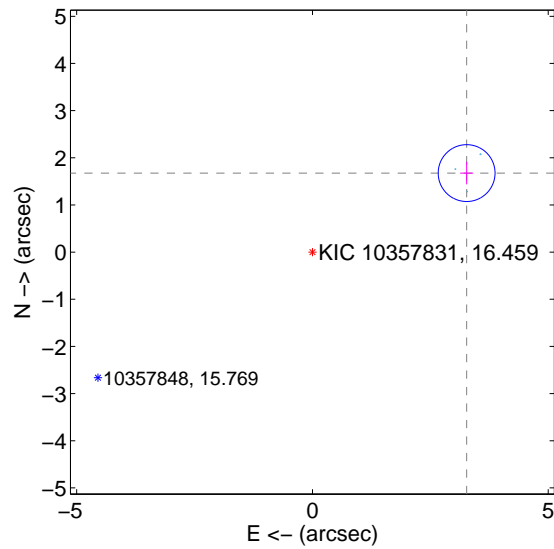
Supplemental centroid analysis for 010357831-01. Kepler magnitude: 16.46. Transit SNR 228.99

There are 3 quarters with good PRF difference image offsets

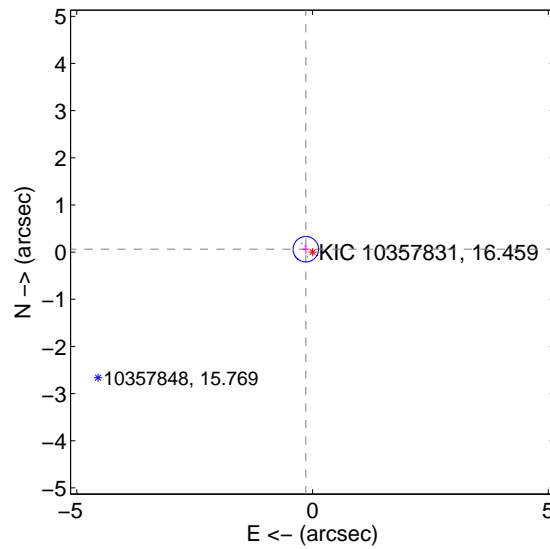
The OOT PRF centroid is offset from the target star catalog position by about 4.24 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.673 ± 0.201	18.29	-3.269 ± 0.137	1.675 ± 0.239
PRF-fit source offset from KIC position	0.155 ± 0.090	1.72	0.142 ± 0.076	0.061 ± 0.099
photometric centroid source offset	2.00 ± 0.02	107.61	1.99 ± 0.02	0.19 ± 0.01

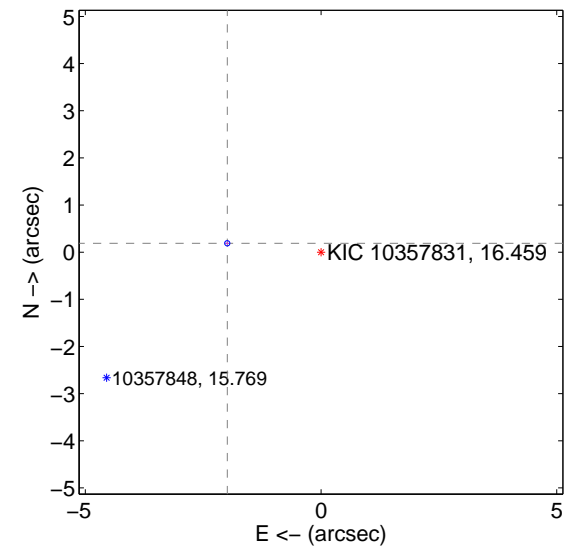
offset from difference PRF-fit to OOT PRF-fit



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.



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

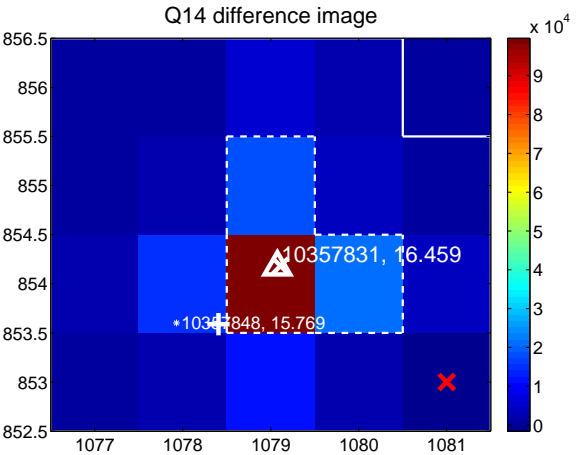
Q13 no difference image



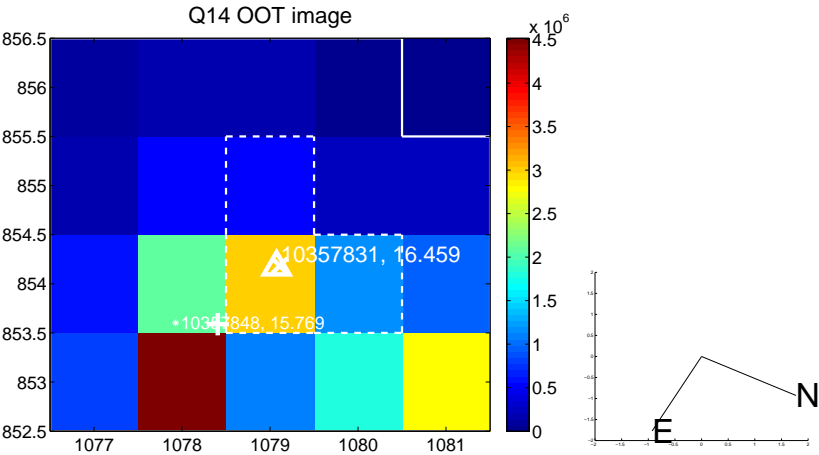
Q13 no OOT image



Q14 difference image



Q14 OOT image



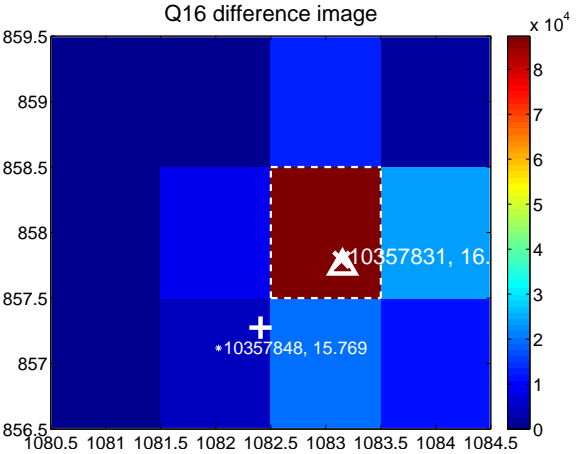
Q15 no difference image



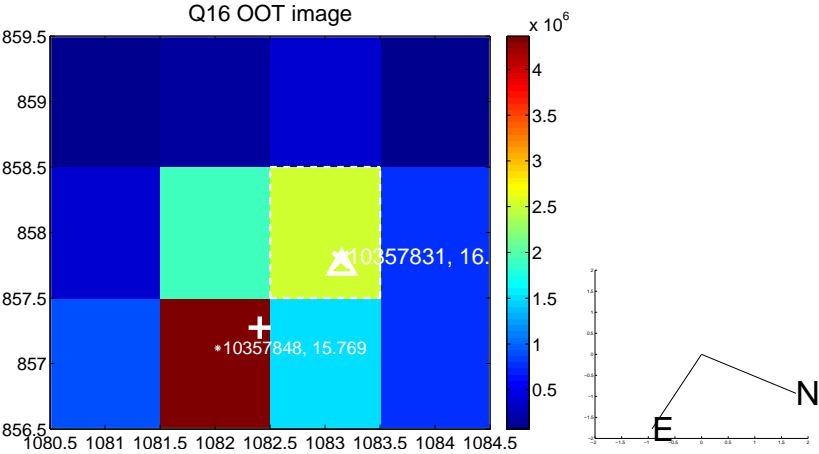
Q15 no OOT image



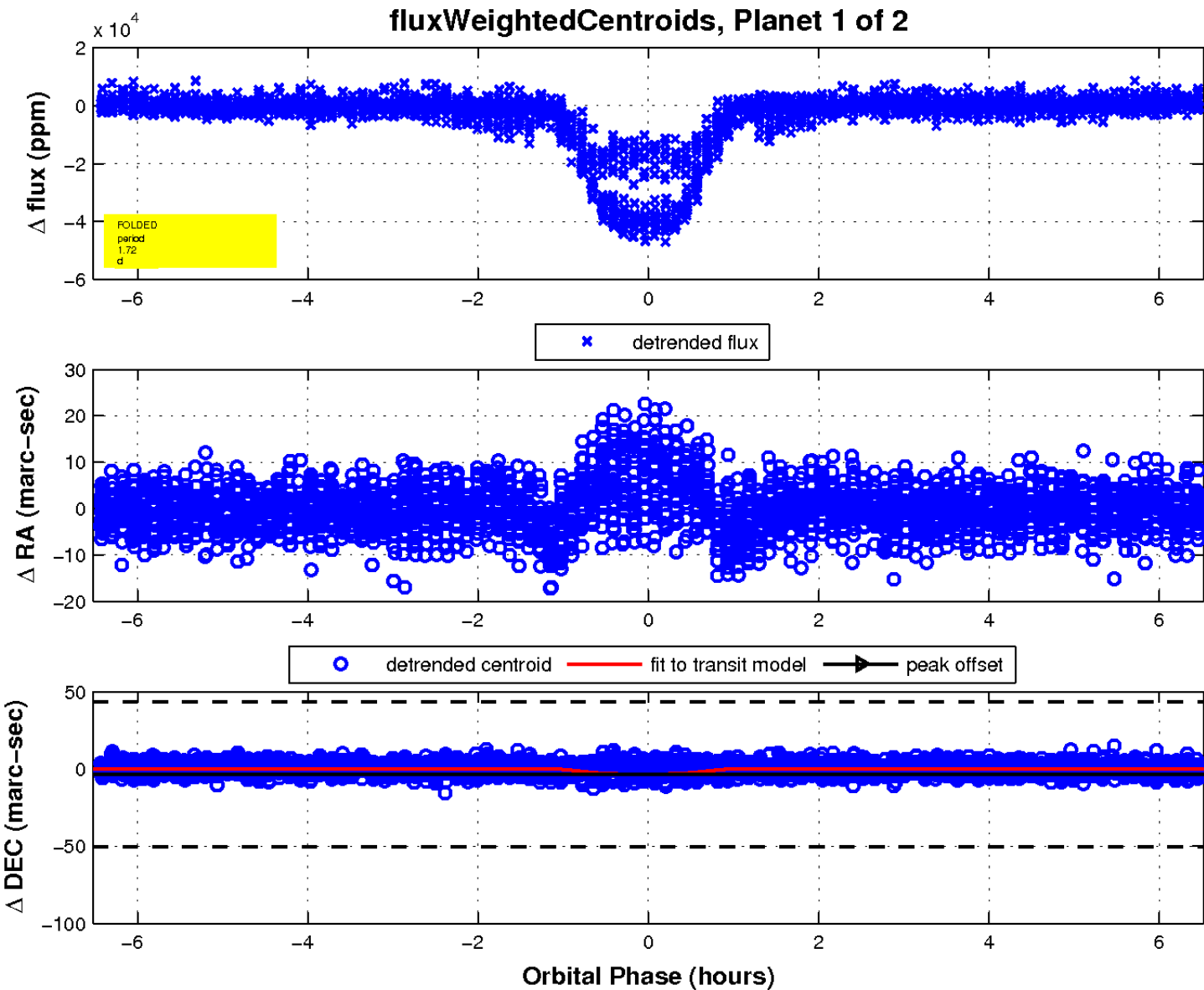
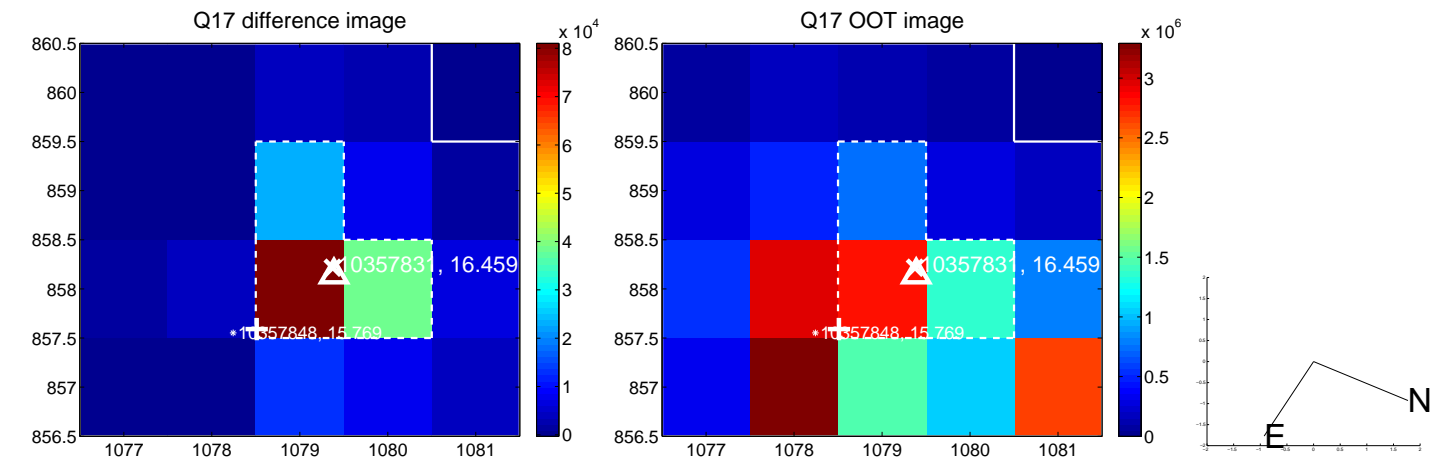
Q16 difference image



Q16 OOT image

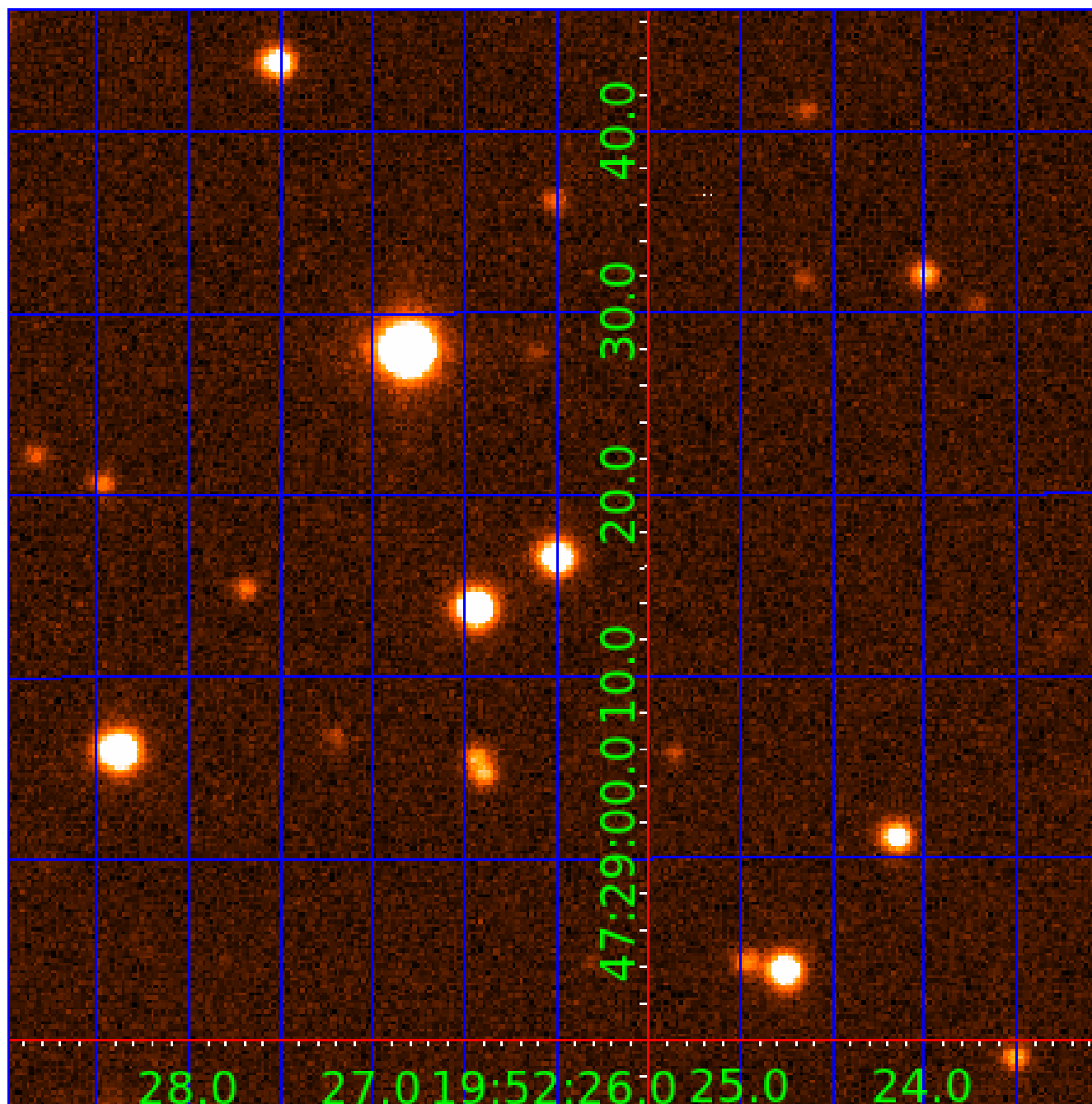


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010357831

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})
010357831-01	OBS	6221.01	1.721539	131.727273	39991.2	2.175	258.7	229.0	0.67	4535	14.34	282.60
010357831-02	OBS	No	1.722416	131.974803	1415.9	2.784	10.9	11.3	0.67	4535	3.09	282.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010357831-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—SEASONAL_DEPTH_DV—CENT_KIC_POS
010357831-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

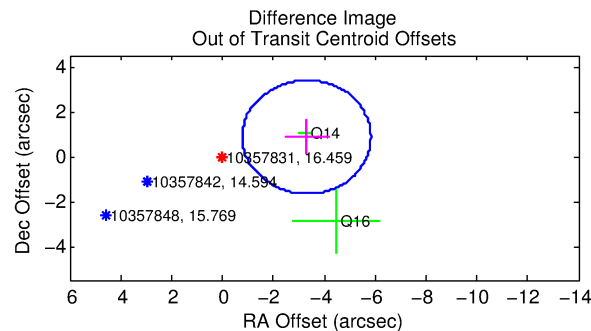
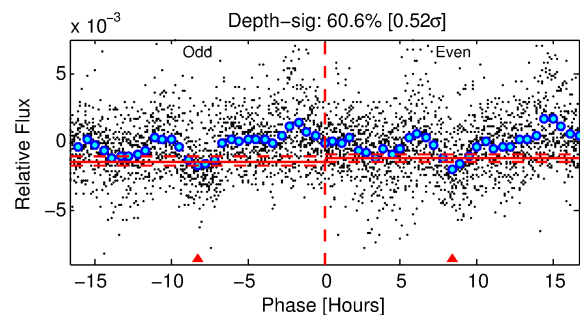
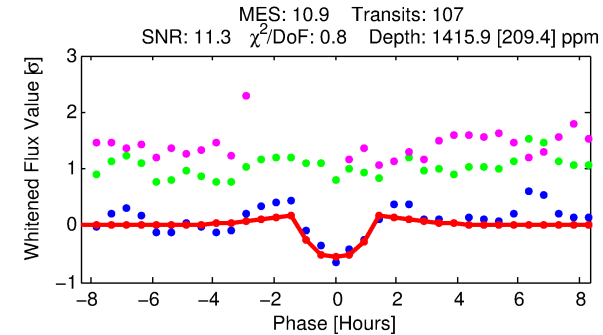
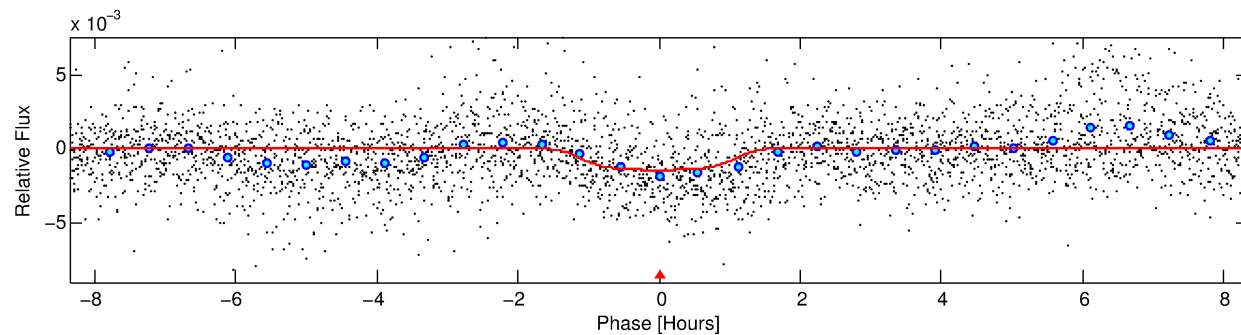
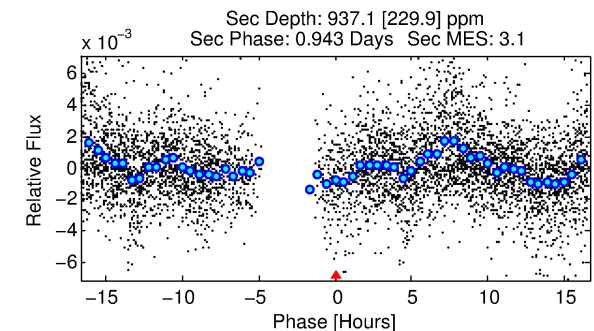
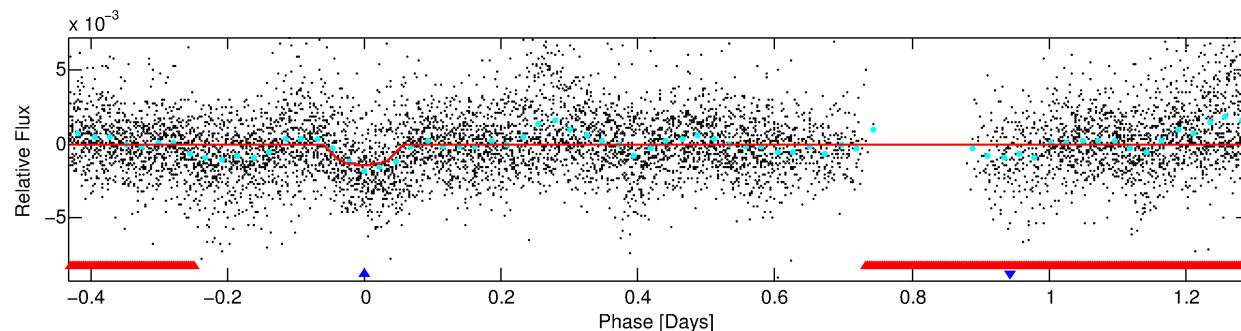
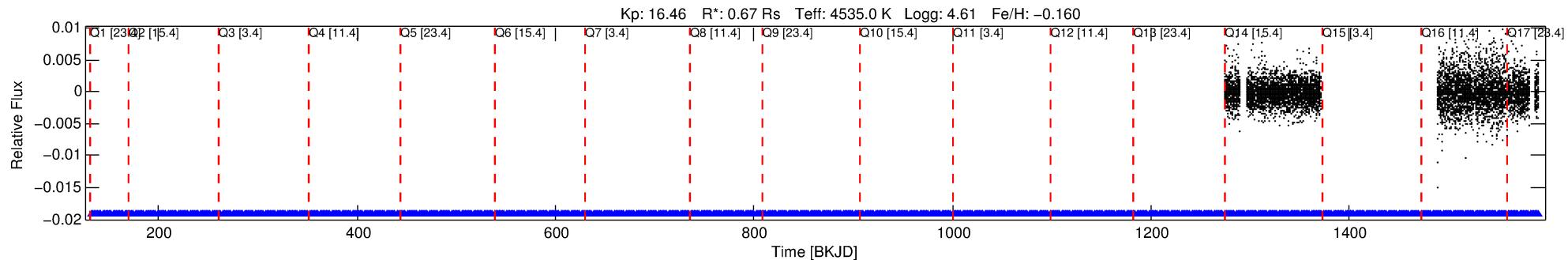
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010357831-02

No Significant Match Found

DV One-Page Summary

KIC: 10357831 Candidate: 2 of 2 Period: 1.722 d
KOI: K06221 Corr: No Ephemeris Match



DV Fit Results:

Period = 1.72242 [0.00001] d
Epoch = 131.9748 [0.0024] BKJD
Rp/R* = 0.0423 [0.0071]
a/R* = 2.70 [1.13]
b = 0.89 [0.11]
Seff = 282.40 [49.02]
Teq = 1045 [45] K
Rp = 3.09 [0.59] Re
a = 0.0245 [0.0018] AU
Ag = 32.42 [13.86] [2.27σ]
Teffp = 3856 [423] K [6.62σ]

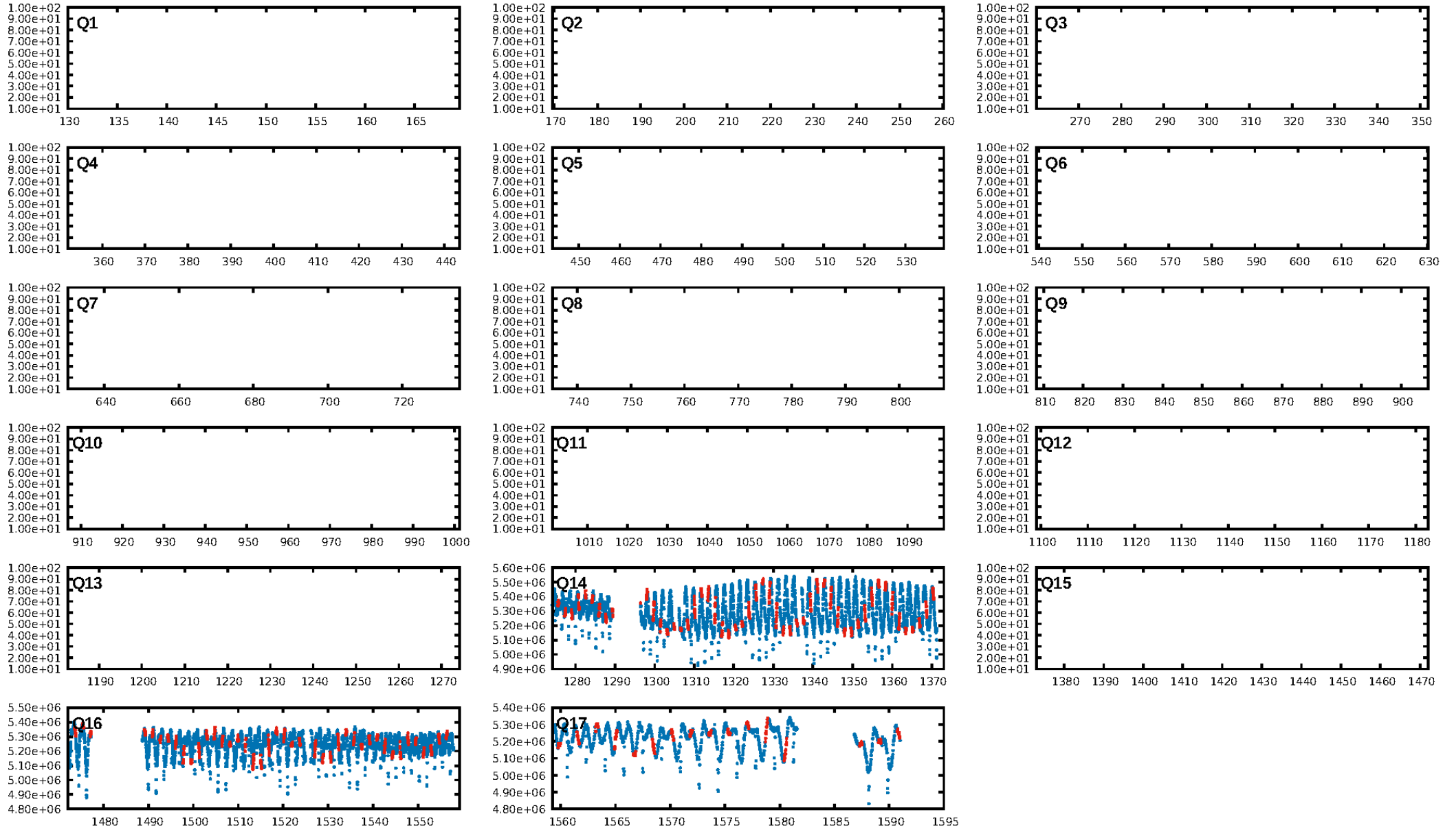
DV Diagnostic Results:

ShortPeriod-sig: 0.5% [0.01σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [91/91]
GhostDiagnostic-chr: -1.698
Centroid-sig: N/A
Centroid-so: 2.057 arcsec [4.66σ]
OotOffset-rm: 3.423 arcsec [4.06σ]
KicOffset-rm: 0.538 arcsec [0.55σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

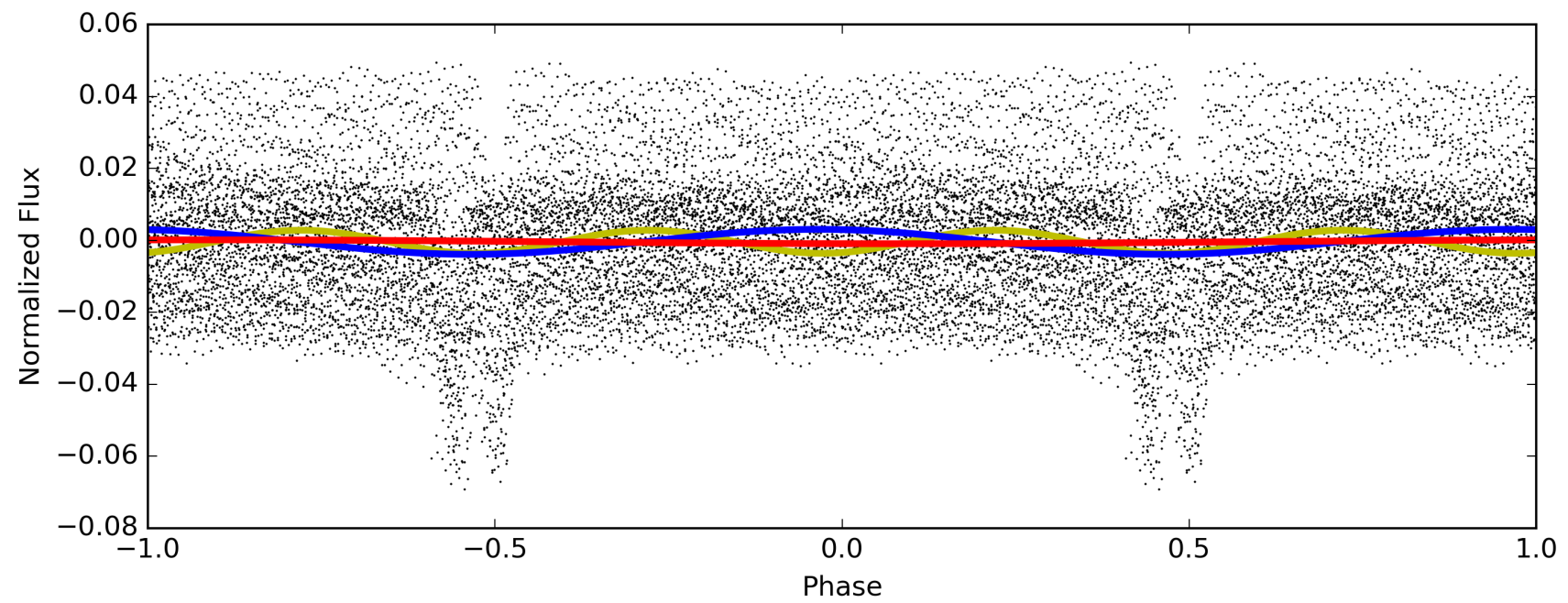
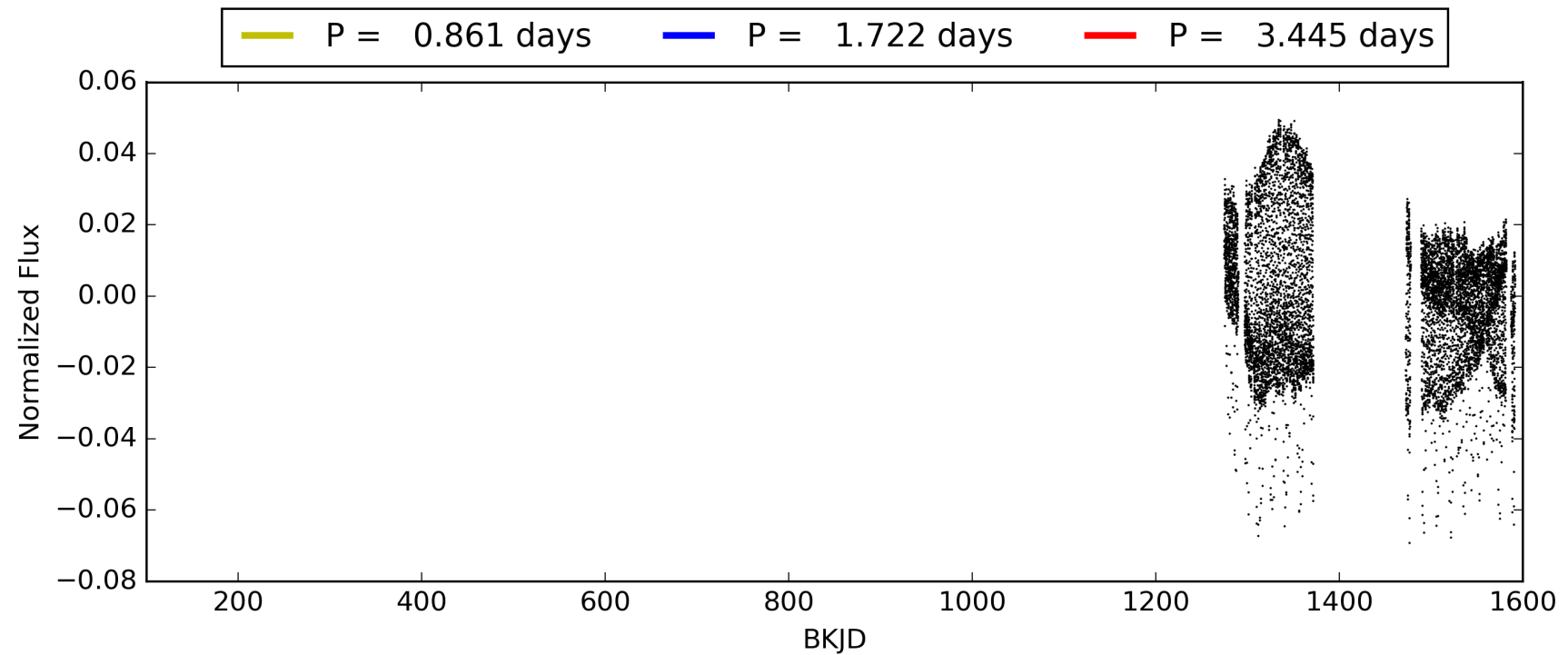
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:07:25 Z

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

TCE 010357831-02, PDC Light Curves

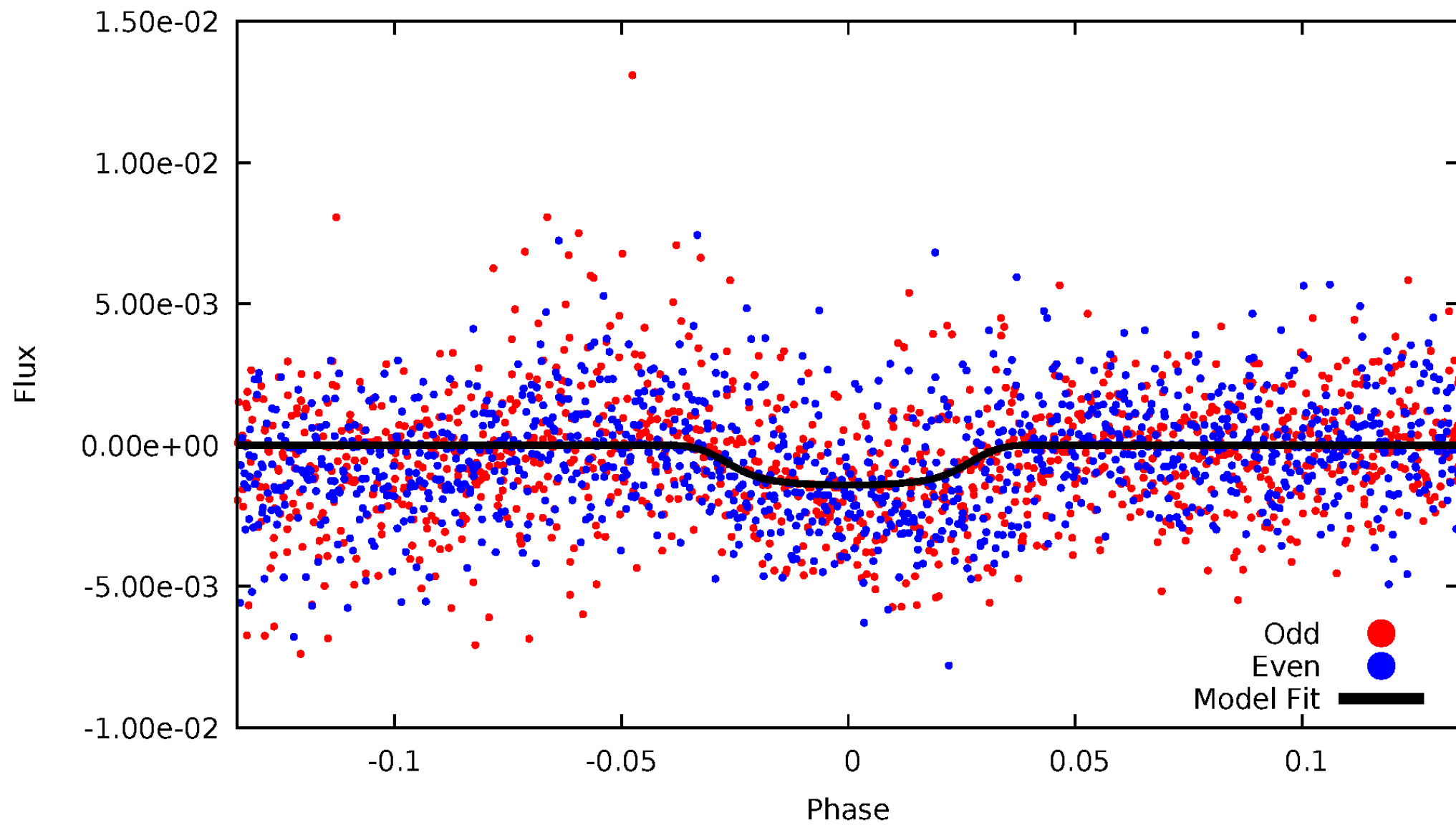


TCE 010357831-02



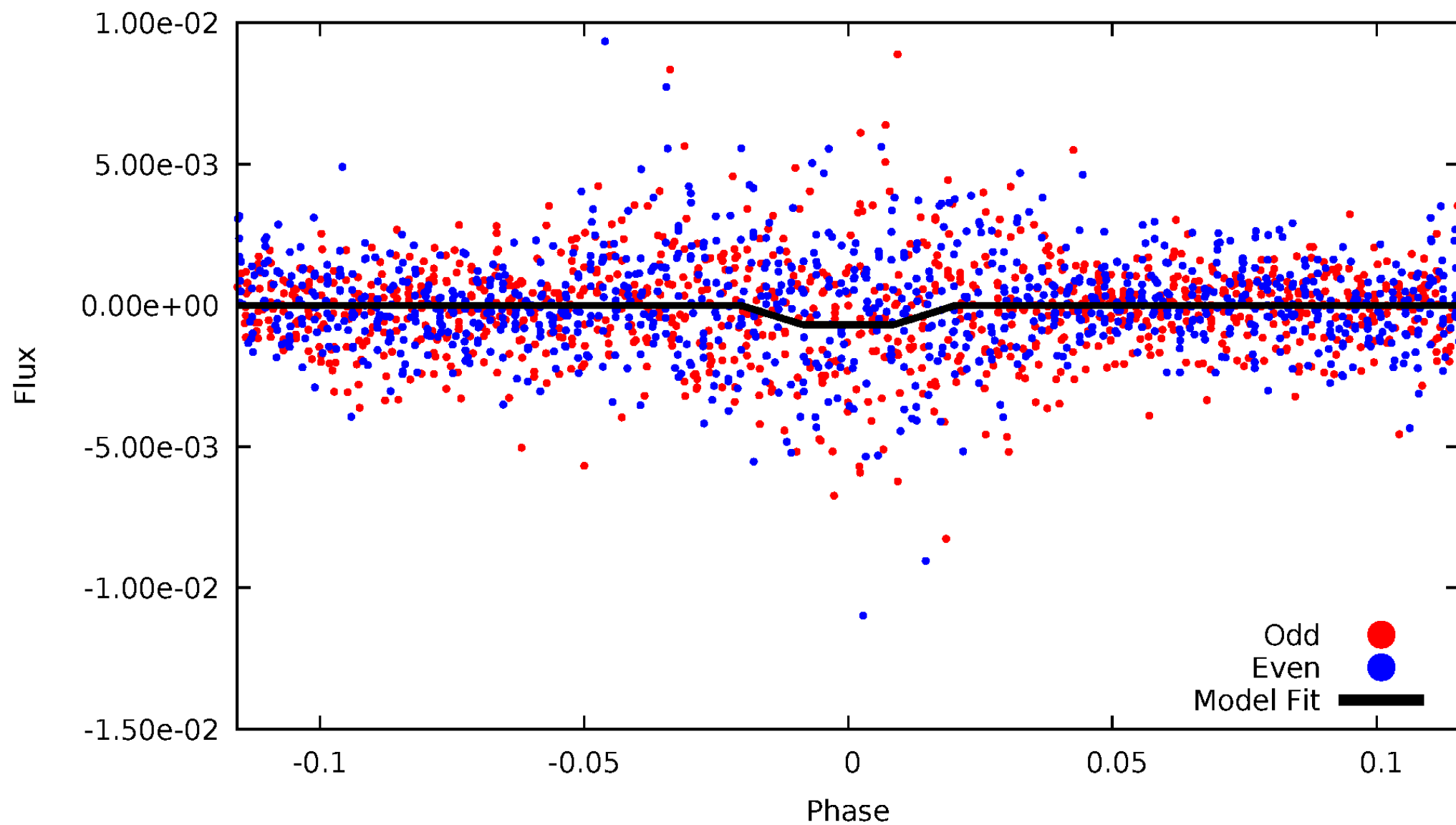
DV Odd/Even

TCE 010357831-02



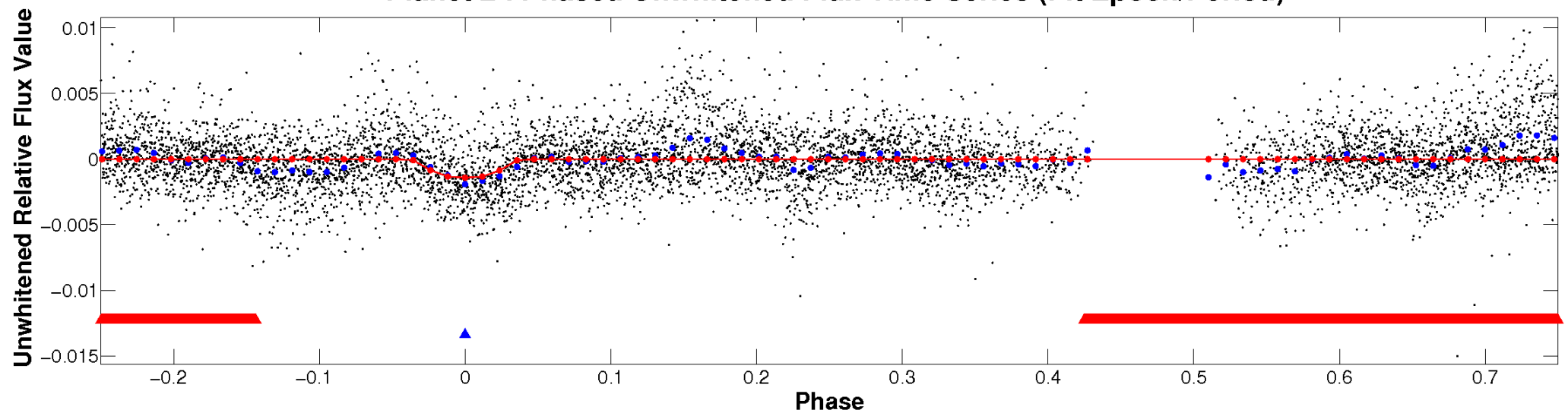
ALT Odd/Even

TCE 010357831-02

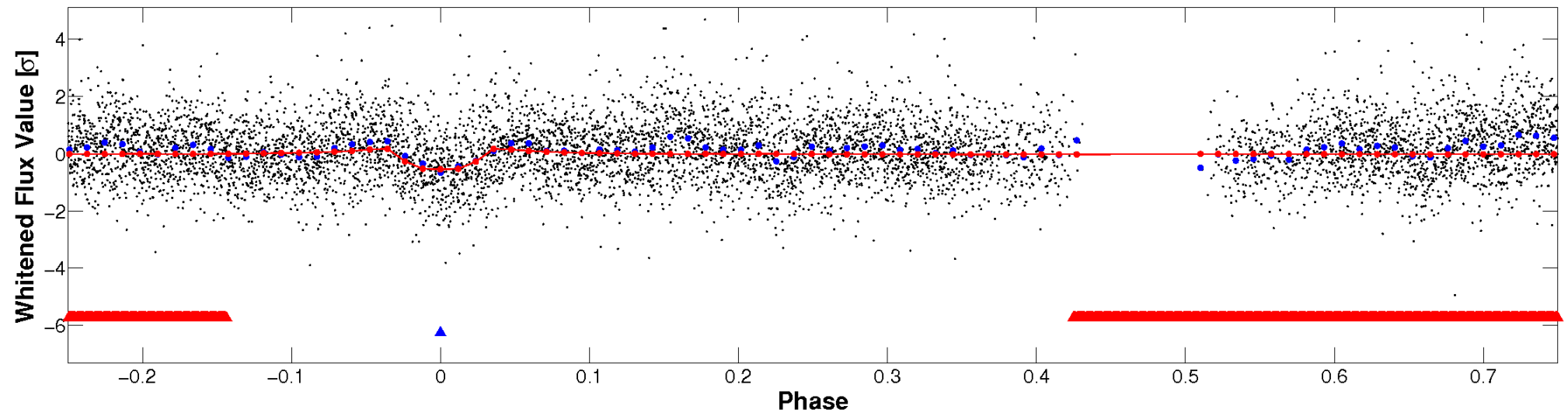


Non-Whitened Vs. Whitened Light Curve

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

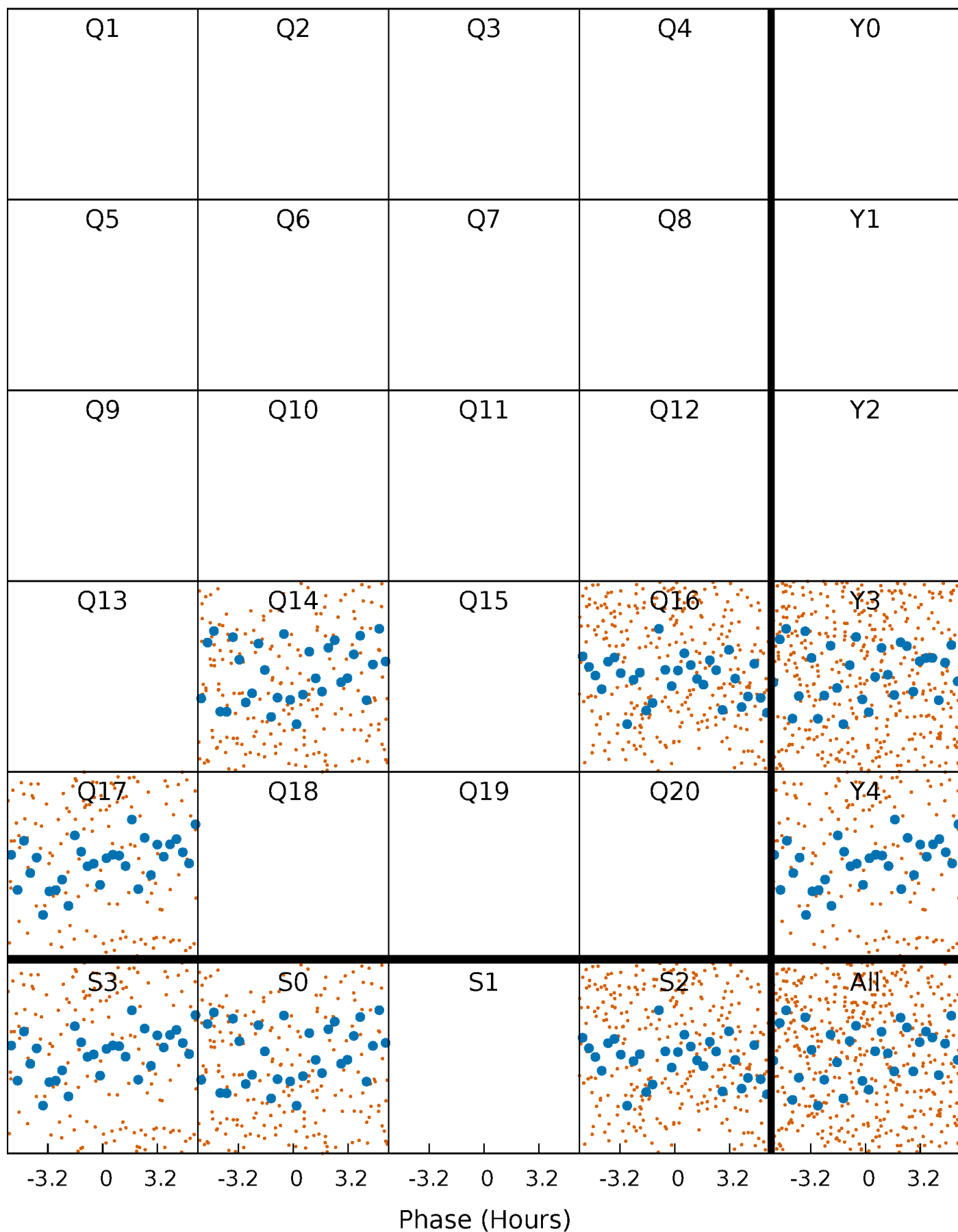


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



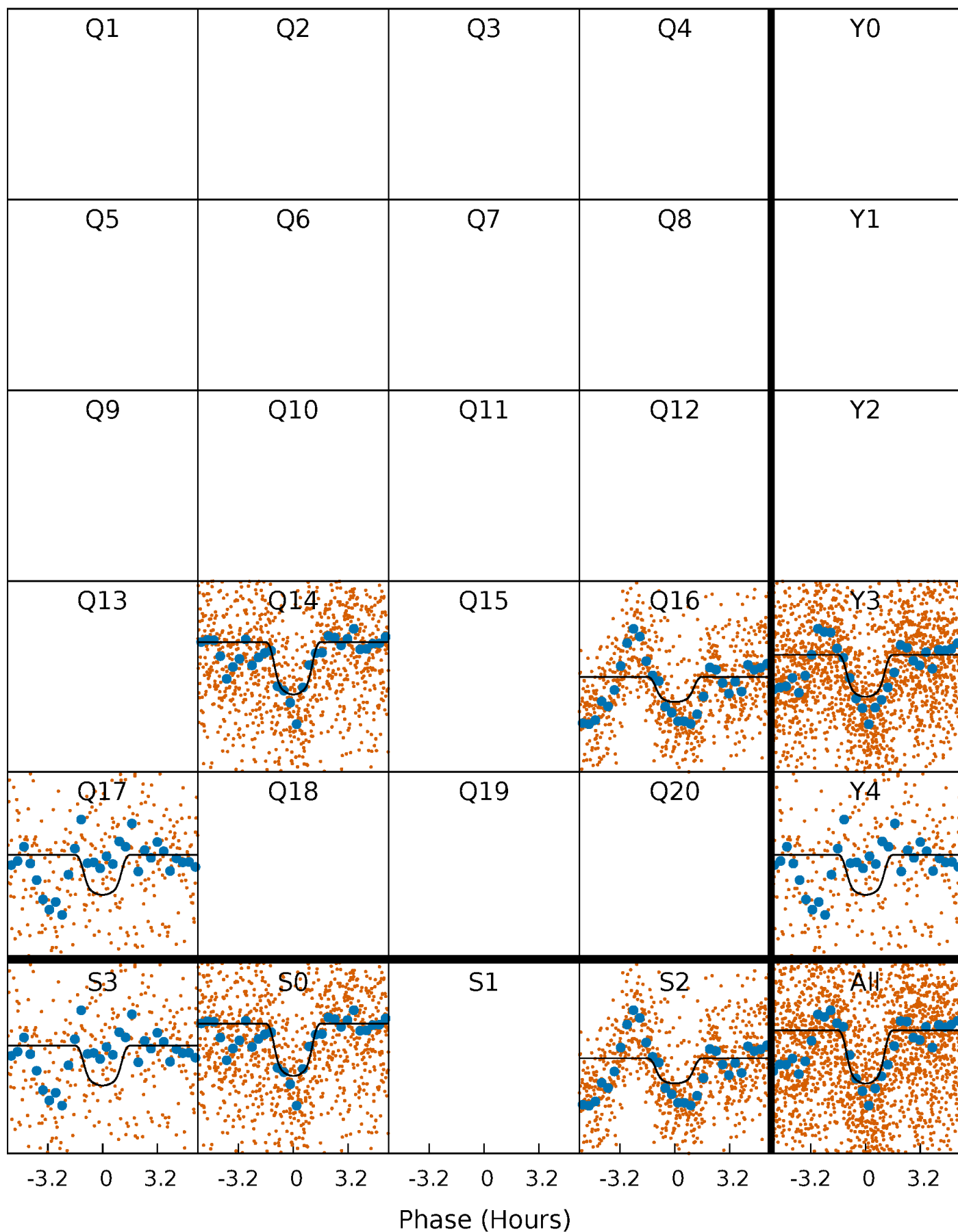
PDC Quarter-Phased Transit Curves

TCE 010357831-02 P= 1.722416 Days $T_0=131.974803$ (BKJD)



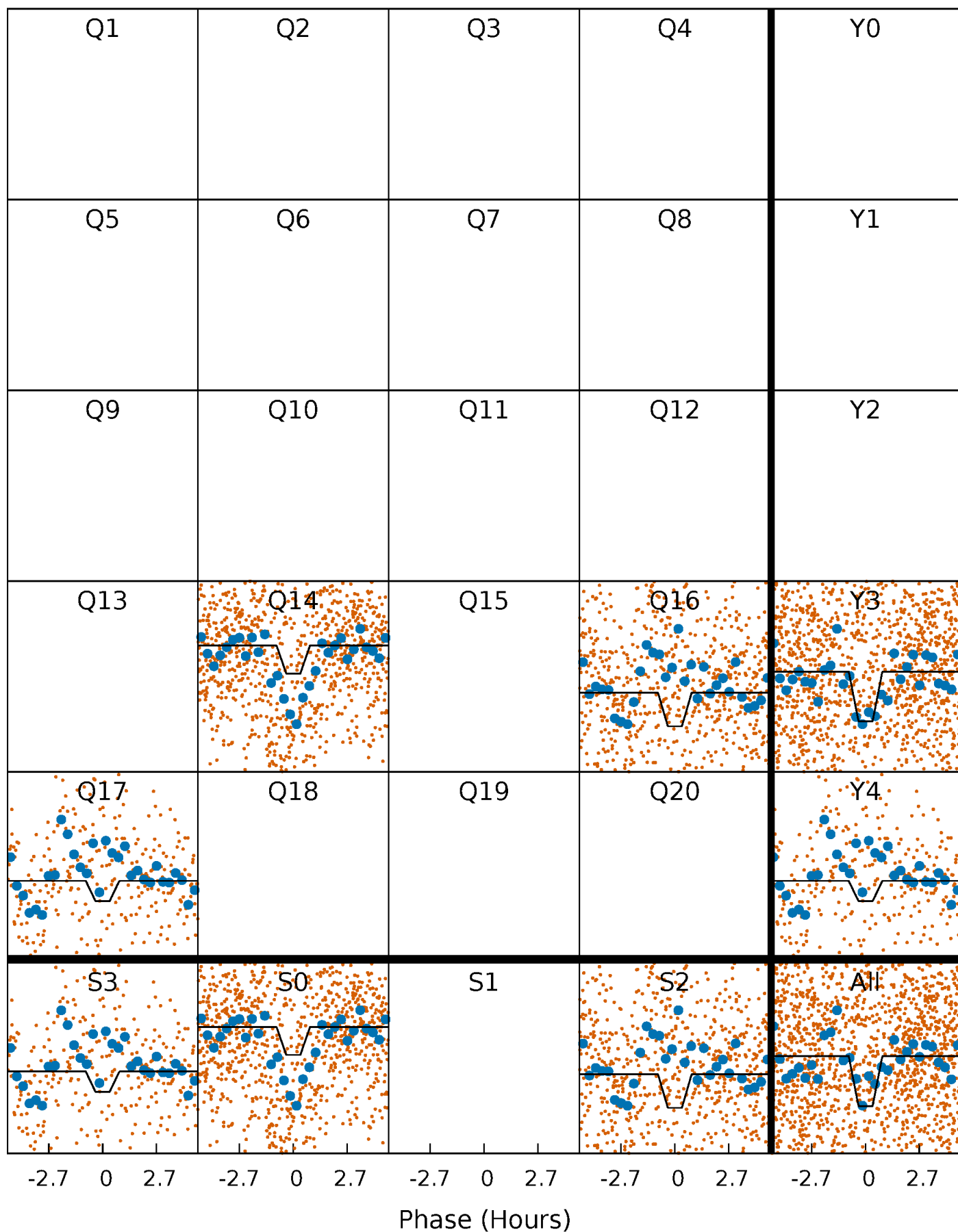
DV Quarter-Phased Transit Curves

TCE 010357831-02 P= 1.722416 Days $T_0=131.974803$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

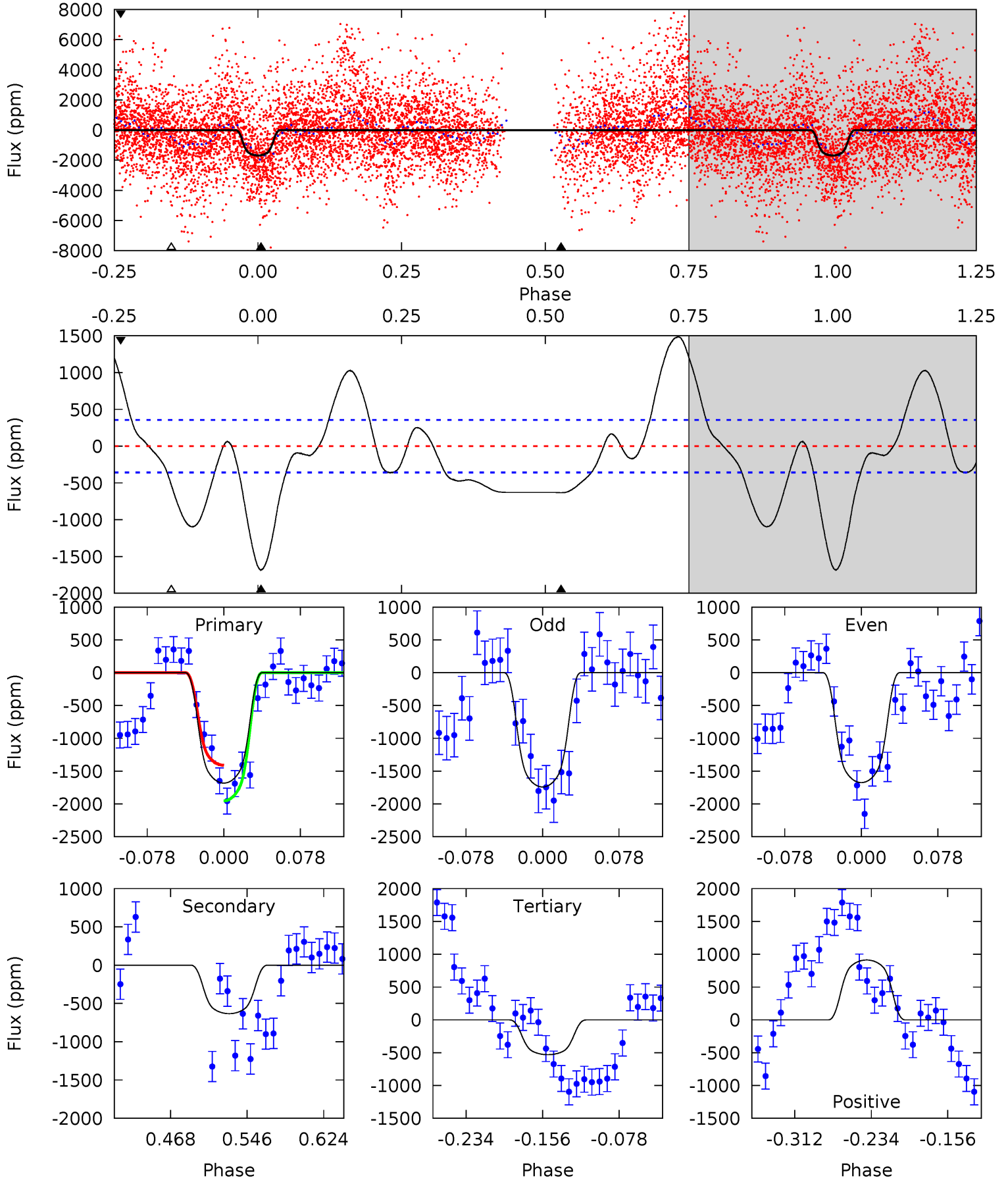
TCE 010357831-02 $P = 1.722546$ Days $T_0 = 131.888491$ (BKJD)



DV Model-Shift Uniqueness Test

010357831-02, P = 1.722416 Days, E = 131.974803 Days

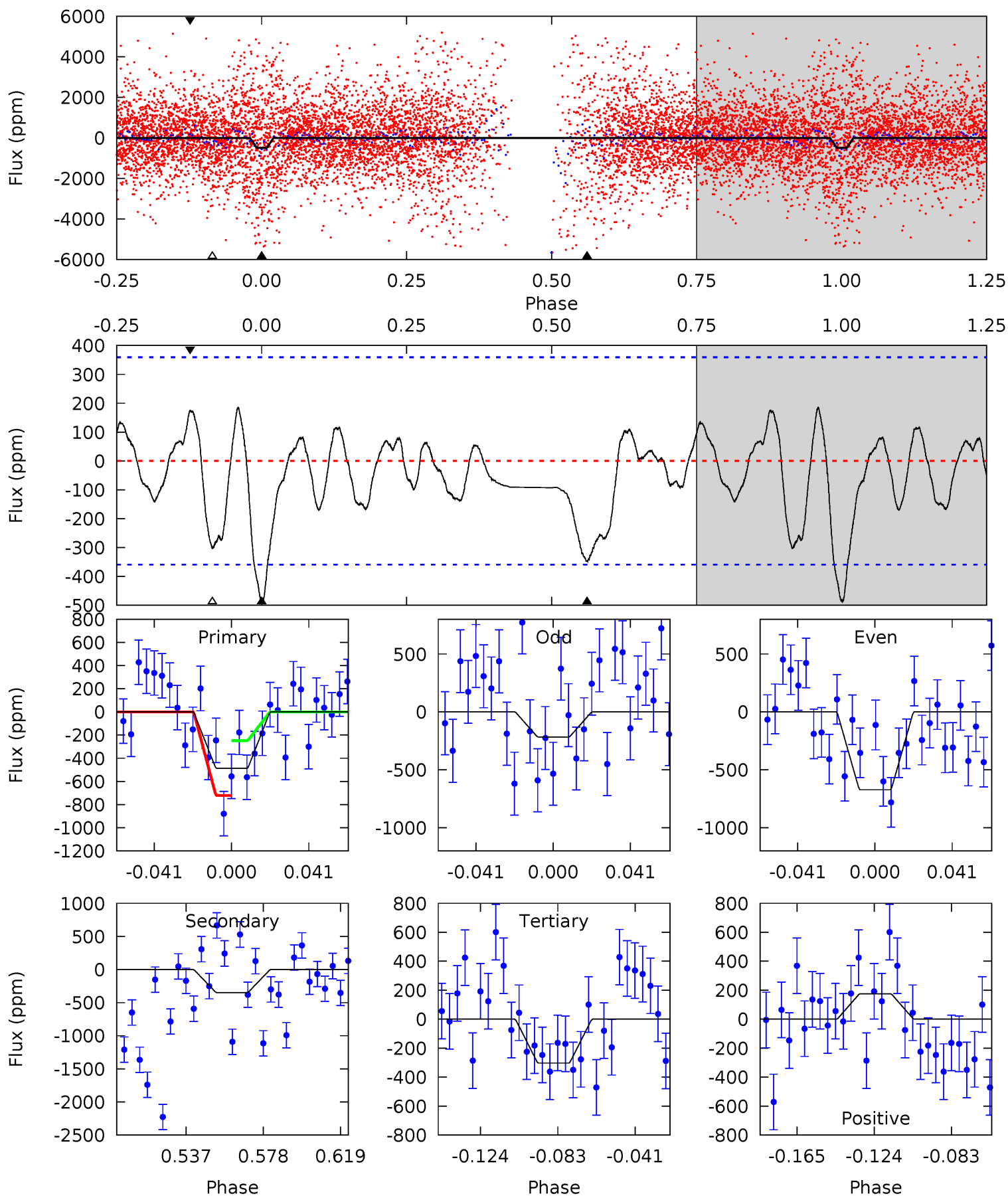
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.8	8.20	6.87	11.8	4.62	1.76	8.16	14.9	9.97	1.33	-3.61	0.43	0.88	0.47	3.51



Alt Model-Shift Uniqueness Test

010357831-02, P = 1.722546 Days, E = 131.888491 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.45	4.61	4.00	2.32	4.75	2.04	1.32	2.44	4.13	0.61	2.29	2.88	1.65	0.28	3.12



Stellar Parameters For KIC 010357831

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4535^{+159}_{-159}	$4.607^{+0.054}_{-0.027}$	$-0.160^{+0.300}_{-0.300}$	$0.668^{+0.048}_{-0.060}$	$0.659^{+0.075}_{-0.054}$	$3.111^{+0.717}_{-0.355}$
	+4%/-4%	+1%/-1%	+188%/-188%	+7%/-9%	+11%/-8%	+23%/-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 010357831-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-633 ± 77	$3.07^{+0.54}_{-0.57}$	1451^{+59}_{-57}	3746^{+296}_{-228}	22^{+11}_{-6}
Alt.	-349 ± 76	$1.89^{+0.51}_{-0.51}$	1450^{+58}_{-59}	3970^{+524}_{-346}	32^{+30}_{-12}

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 $A_{obs} \gg 1.0$

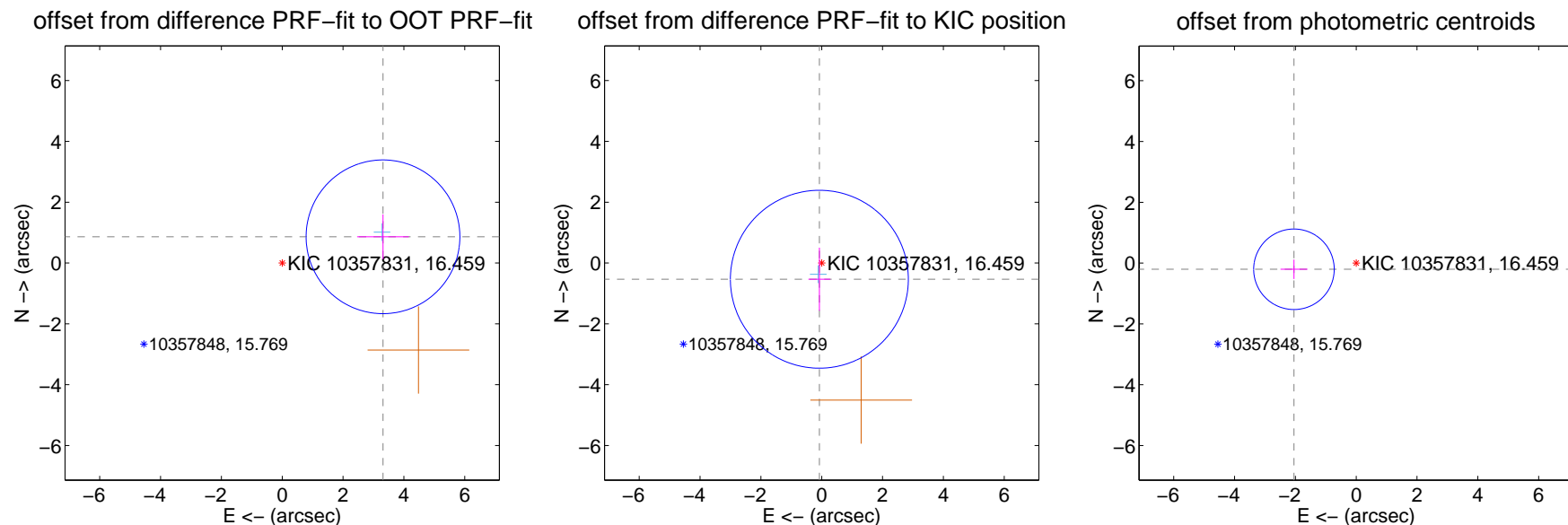
DV Centroid Data

Supplemental centroid analysis for 010357831-02. Kepler magnitude: 16.46. Transit SNR 11.28

There are 1 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 3.58 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.423 ± 0.842	4.06	-3.312 ± 0.849	0.863 ± 0.734
PRF-fit source offset from KIC position	0.538 ± 0.975	0.55	0.077 ± 0.359	-0.532 ± 1.036
photometric centroid source offset	2.06 ± 0.44	4.66	2.05 ± 0.44	-0.20 ± 0.32



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.

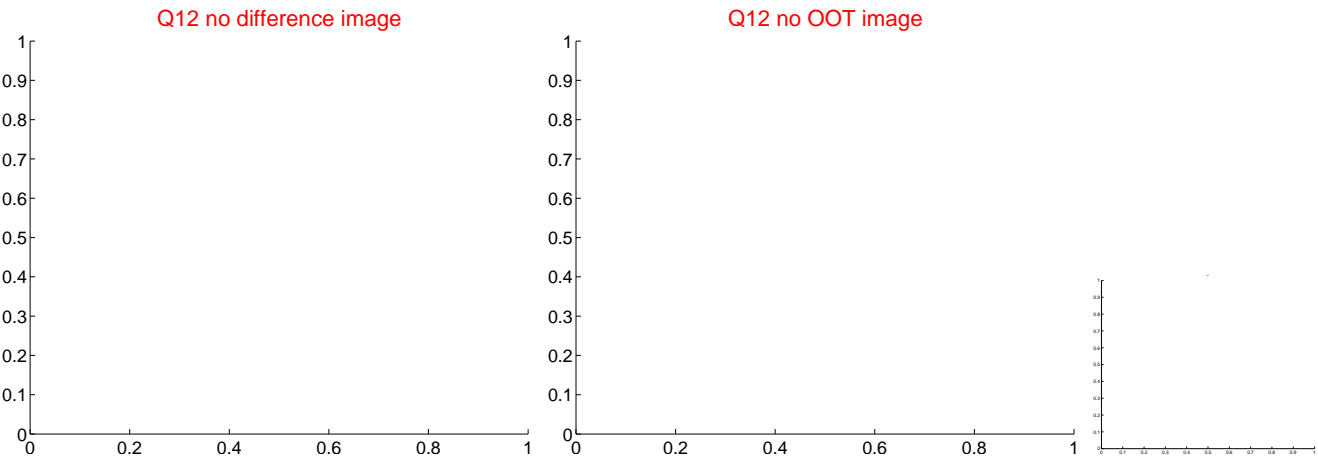
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



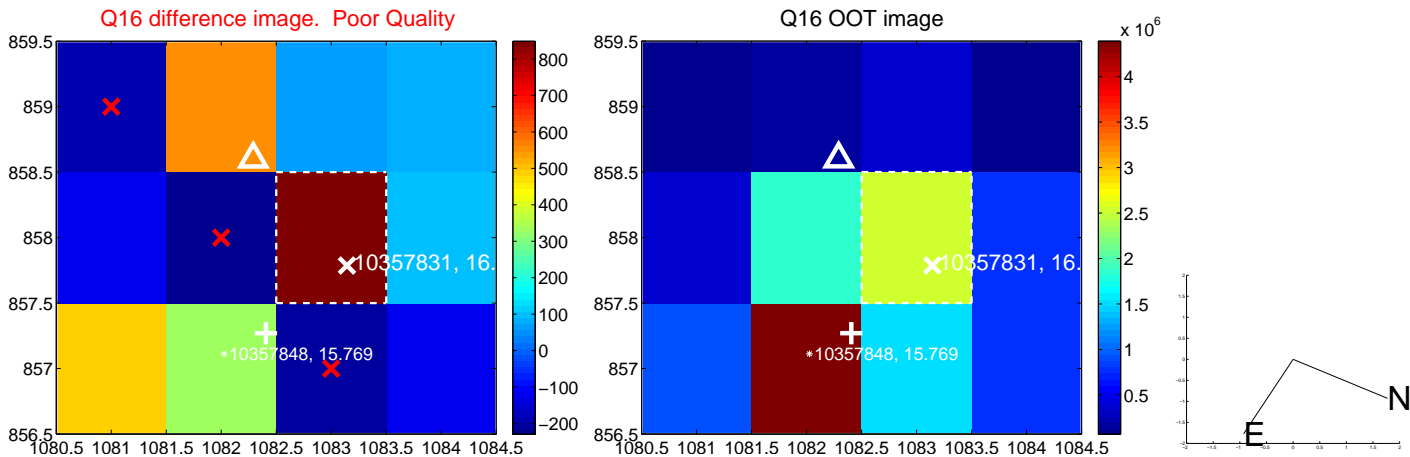
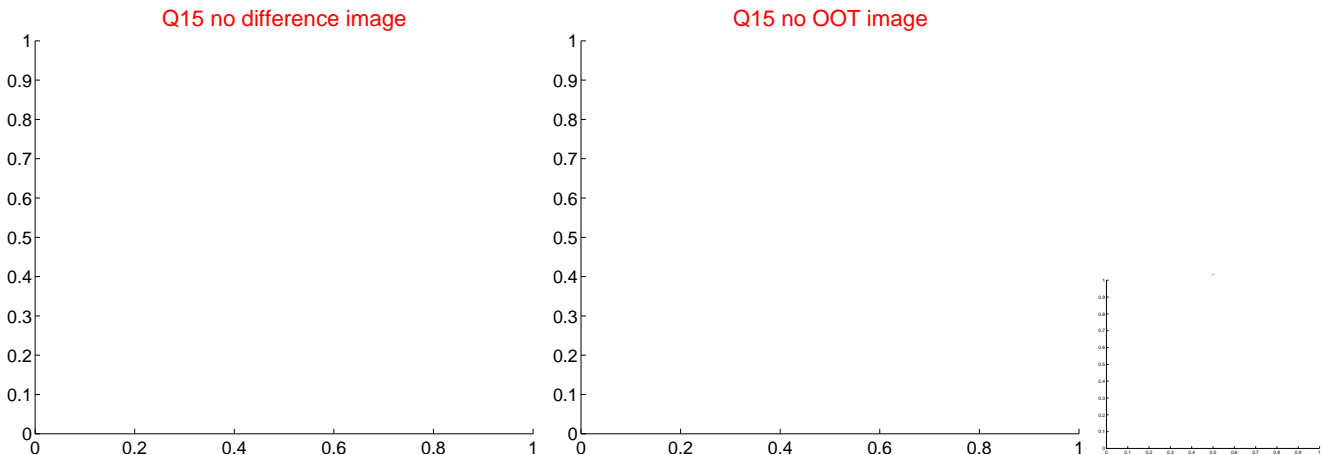
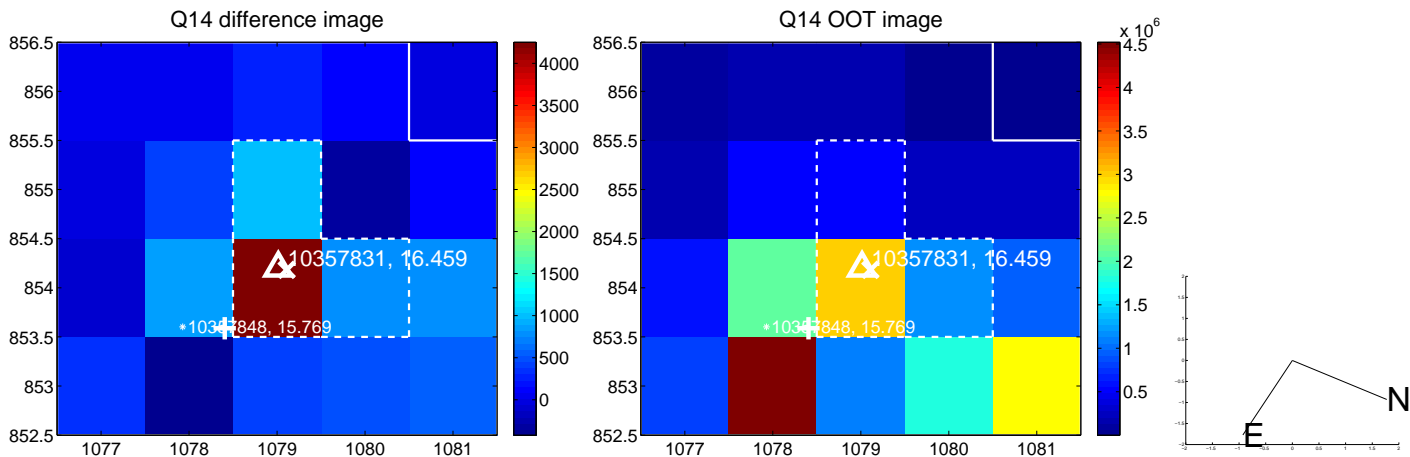
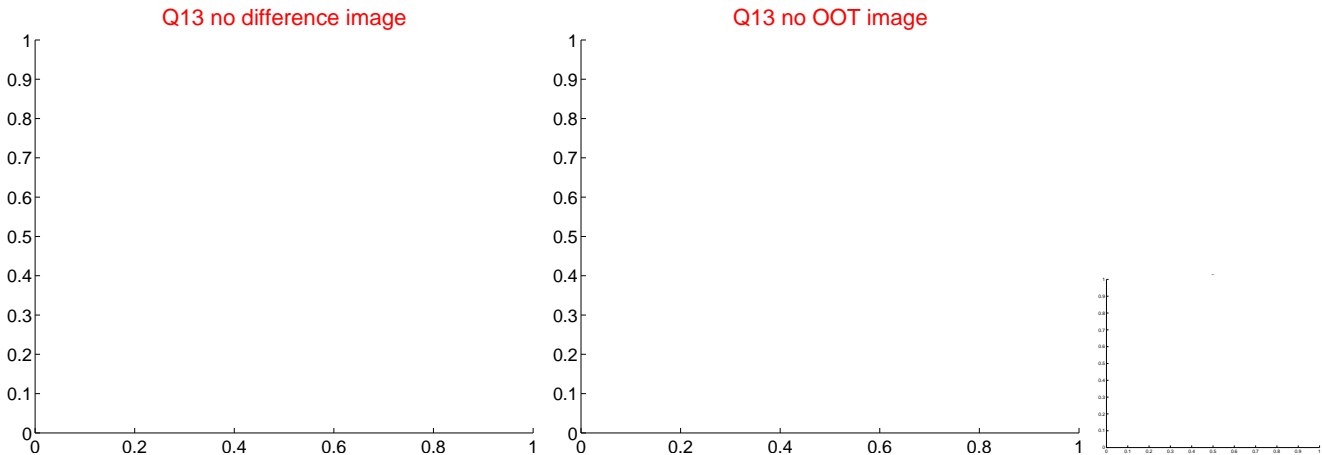
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



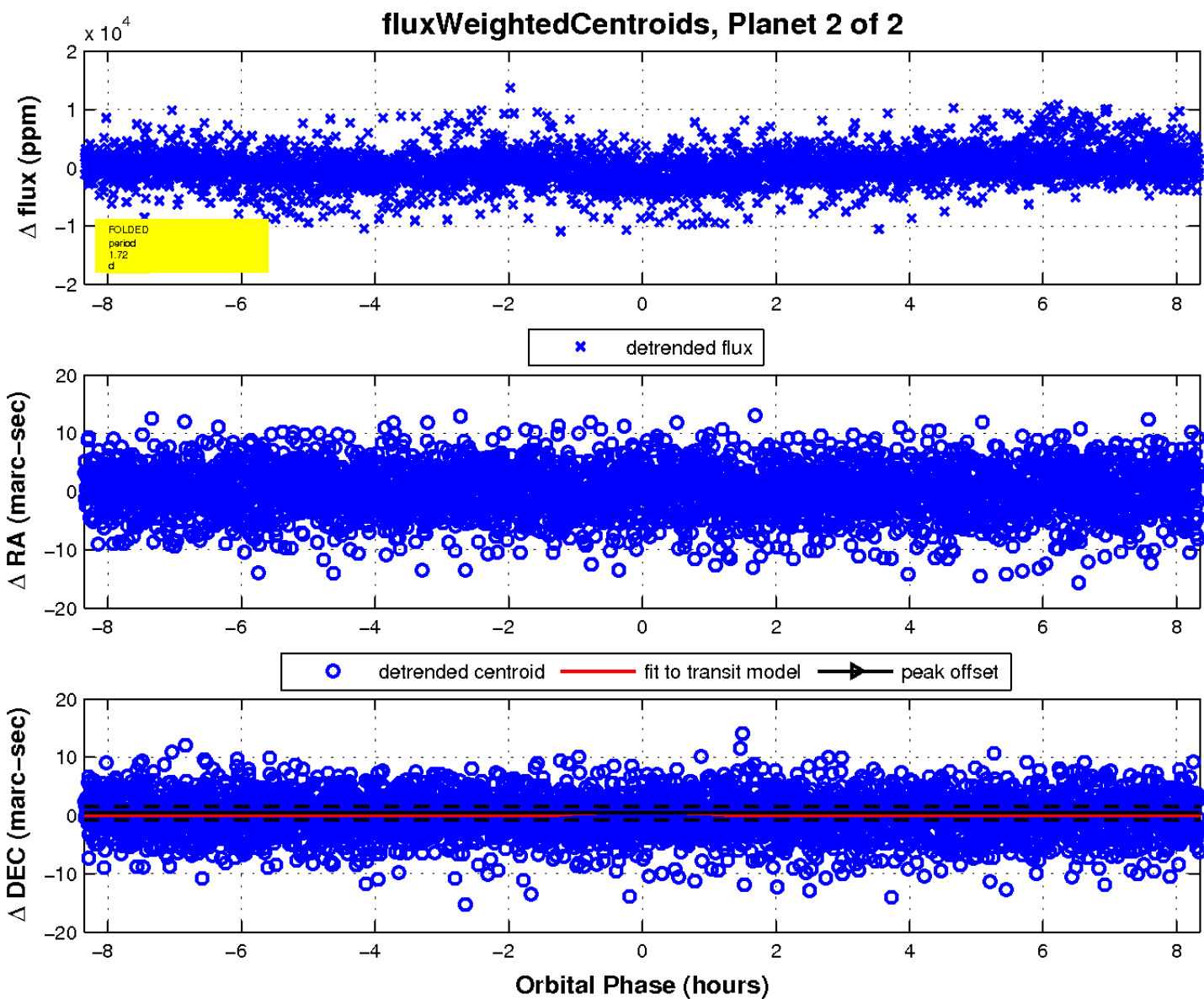
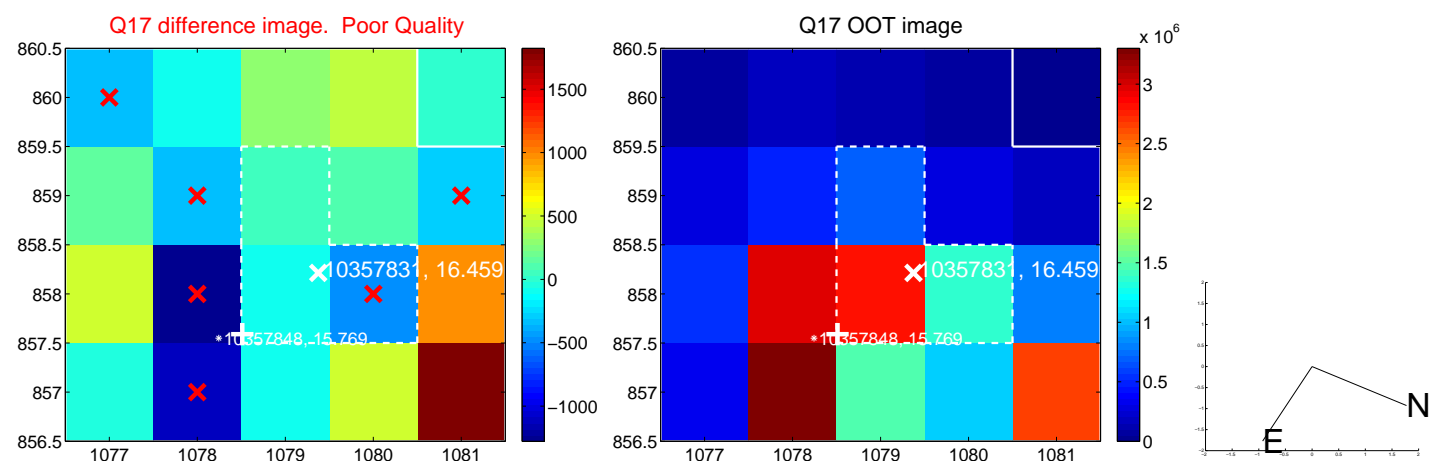
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UKIRT Image

Declination

