

KIC 012066335

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})
012066335-01	OBS	0784.01	19.271528	148.229306	1186.4	3.427	28.5	30.7	0.56	4077	2.42	5.66
012066335-02	OBS	0784.02	10.065278	136.287079	937.7	1.695	21.7	25.7	0.56	4077	2.21	13.47

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012066335-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012066335-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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.

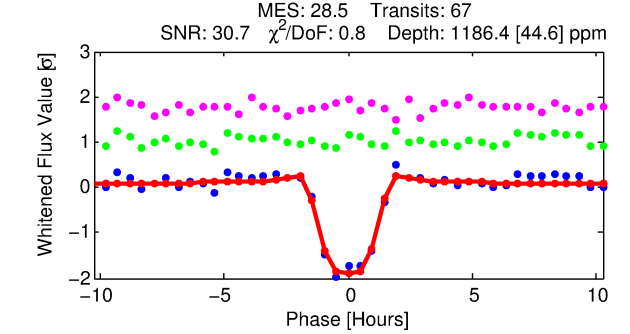
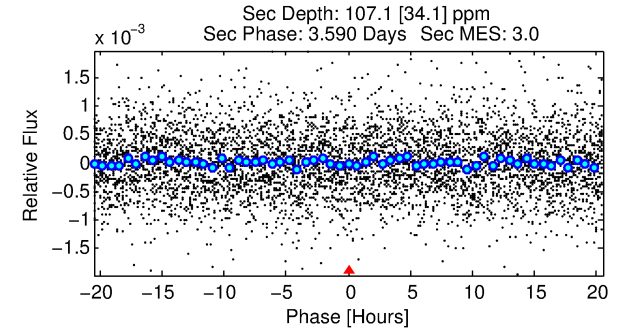
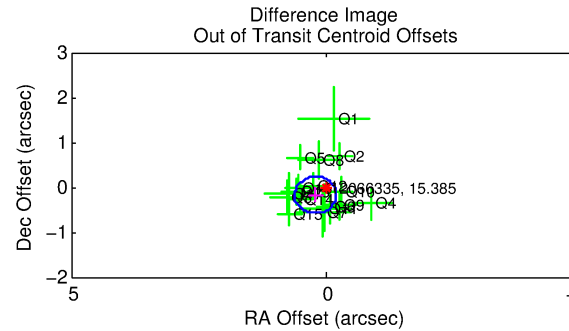
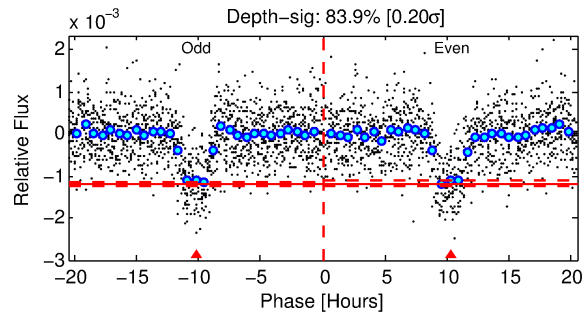
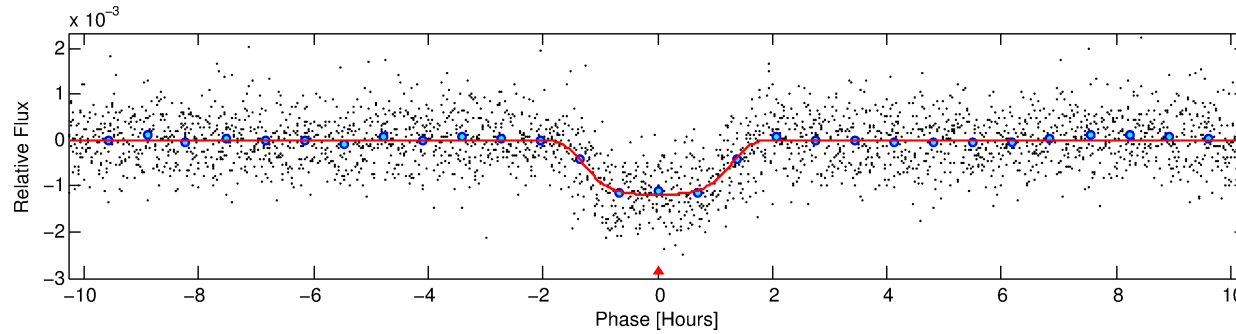
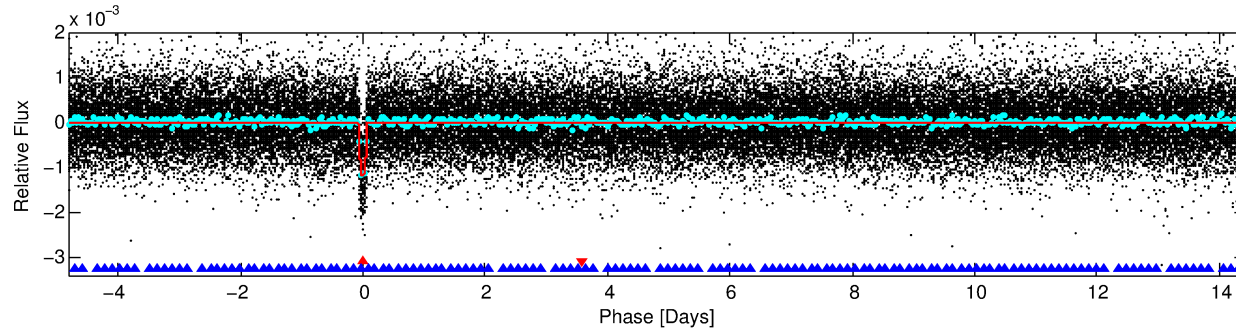
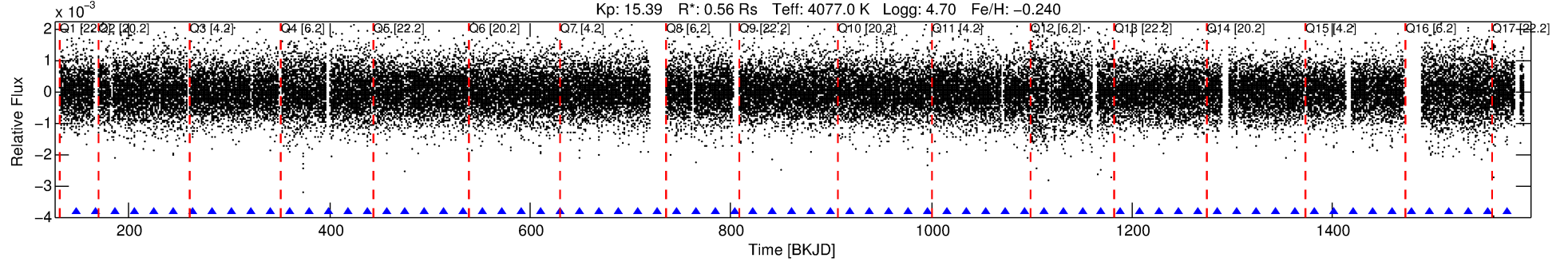
Ephemeris Match Information For 012066335-01

No Significant Match Found

DV One-Page Summary

KIC: 12066335 Candidate: 1 of 2 Period: 19.272 d
KOI: K00784.01 Name: Kepler-231c Corr: 0.909

Kp: 15.39 R*: 0.56 Rs Teff: 4077.0 K Logg: 4.70 Fe/H: -0.240



DV Fit Results:

Period = 19.27153 [0.00006] d
Epoch = 148.2293 [0.0025] BKJD
Rp/R* = 0.0396 [0.0015]
a/R* = 19.65 [2.17]
b = 0.93 [0.02]
Seff = 5.66 [0.56]
Teq = 393 [10] K
Rp = 2.42 [0.17] Re
a = 0.1171 [0.0053] AU
Ag = 137.83 [45.84] [2.99σ]
Teffp = 2084 [176] K [9.61σ]

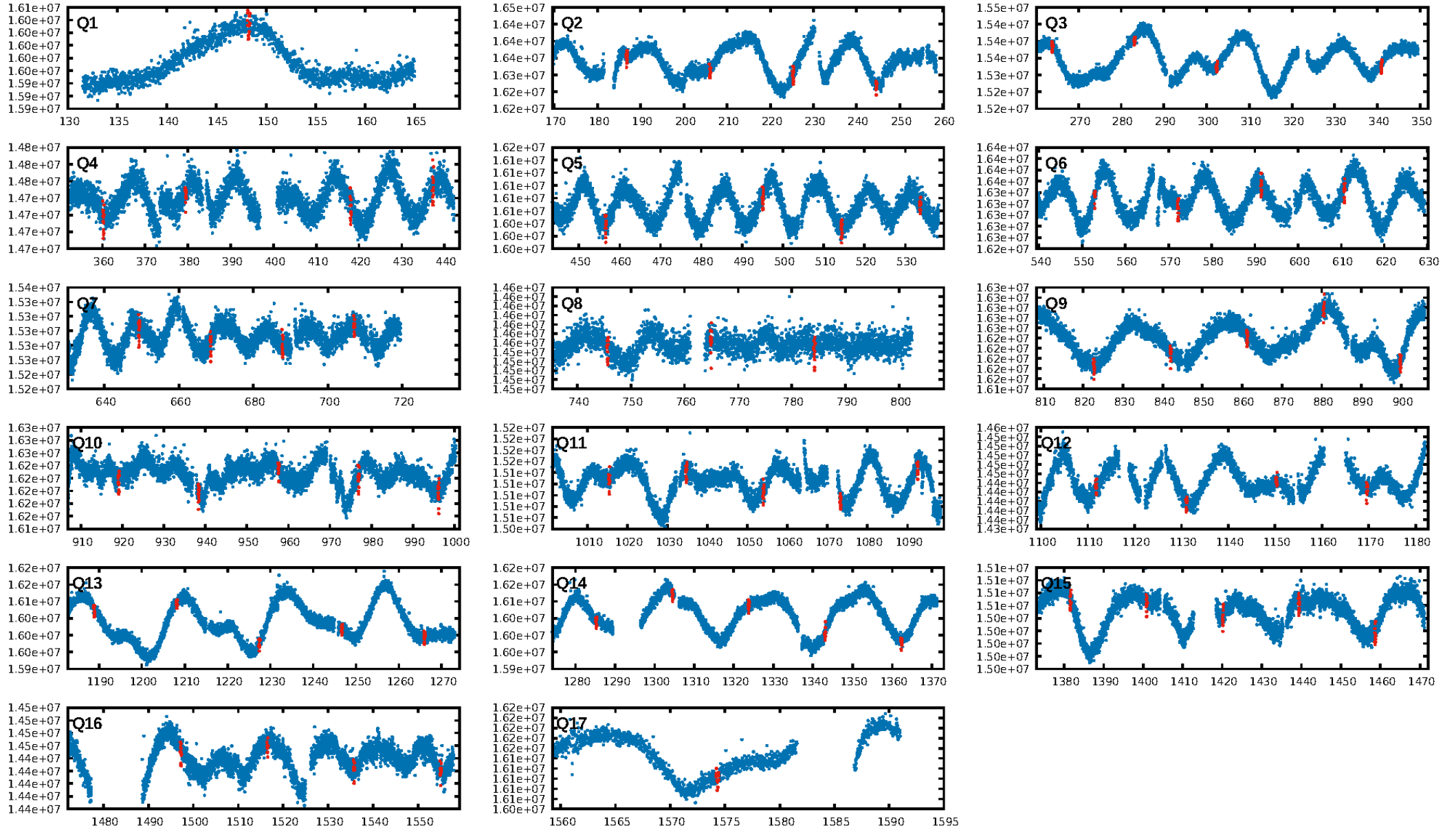
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [57.79σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 8.79e-162
RollingBand-fgt: 1.00 [65/65]
GhostDiagnostic-chr: 2.623
Centroid-sig: 0.0%
Centroid-so: 0.784 arcsec [2.18σ]
OotOffset-rm: 0.263 arcsec [1.94σ]
KicOffset-rm: 0.361 arcsec [2.83σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

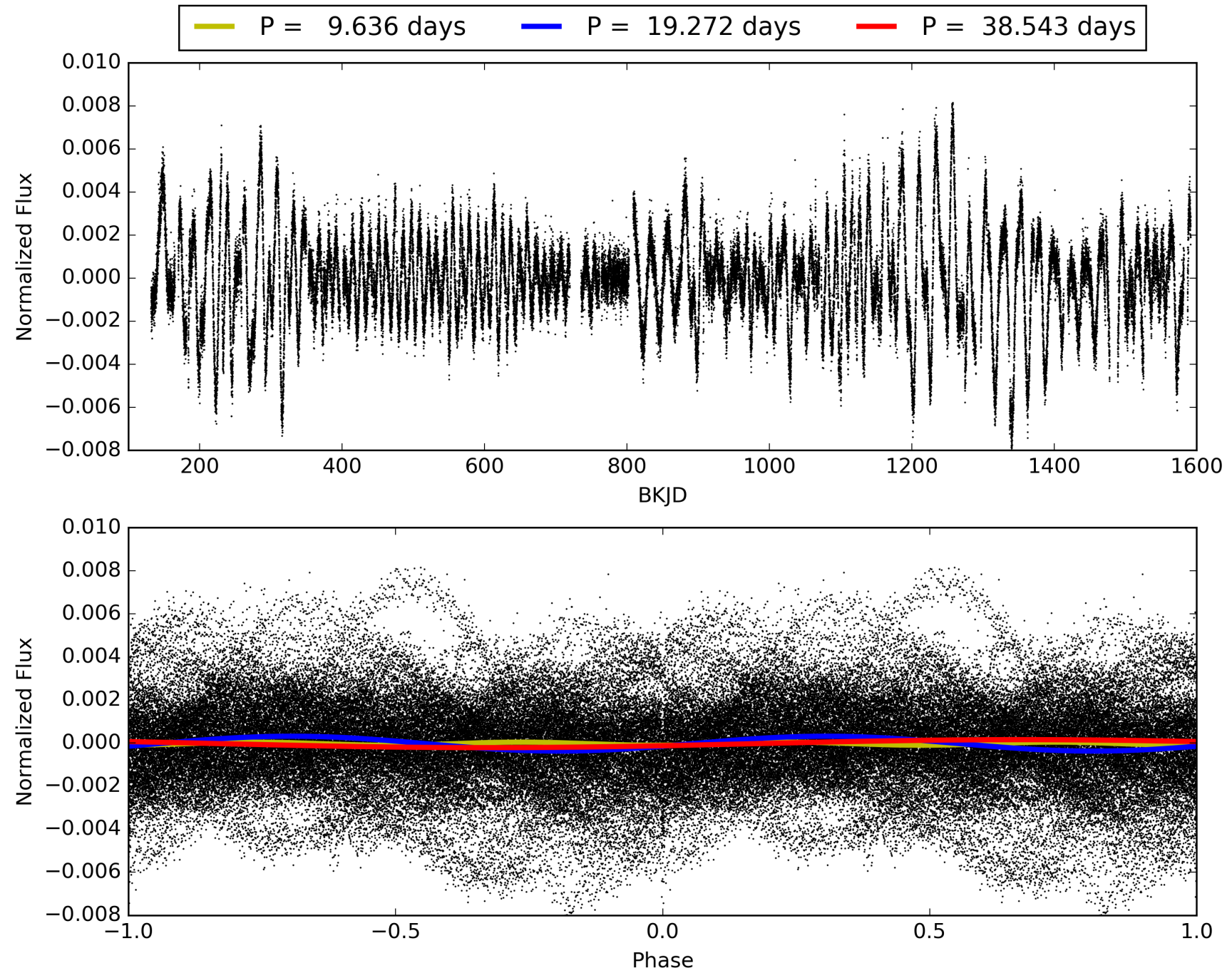
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:32:00 Z

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

TCE 012066335-01, PDC Light Curves

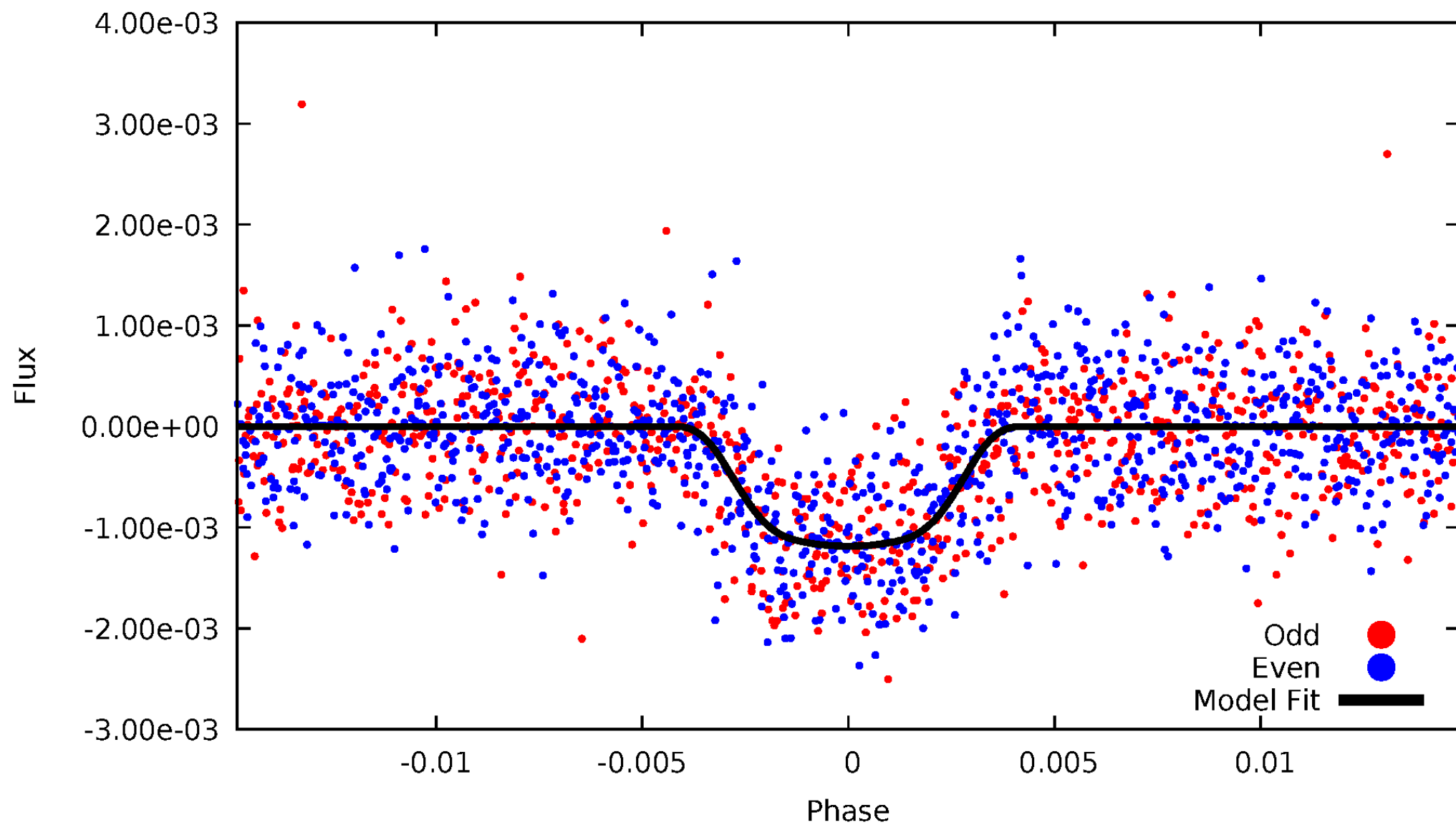


TCE 012066335-01



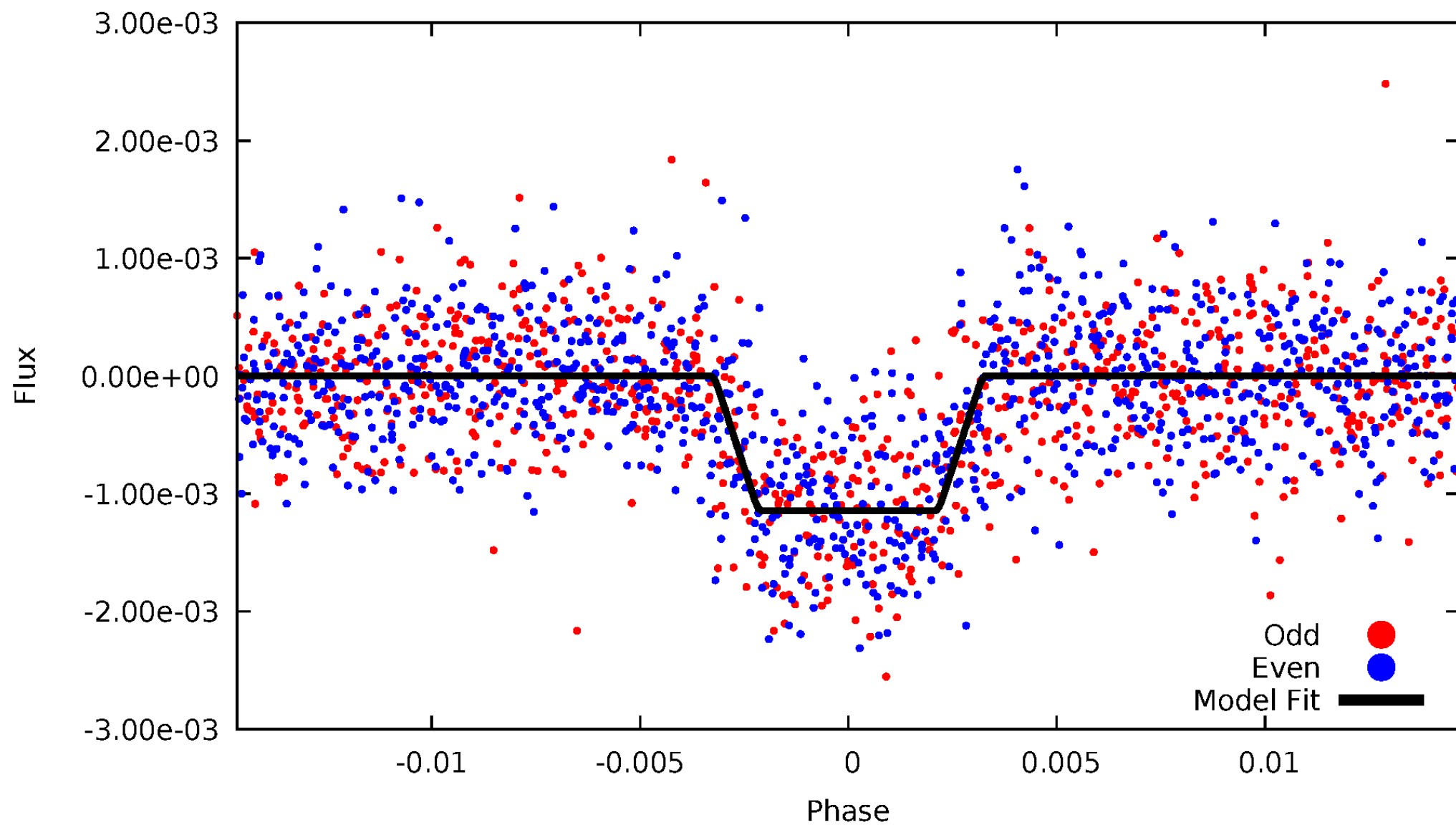
DV Odd/Even

TCE 012066335-01

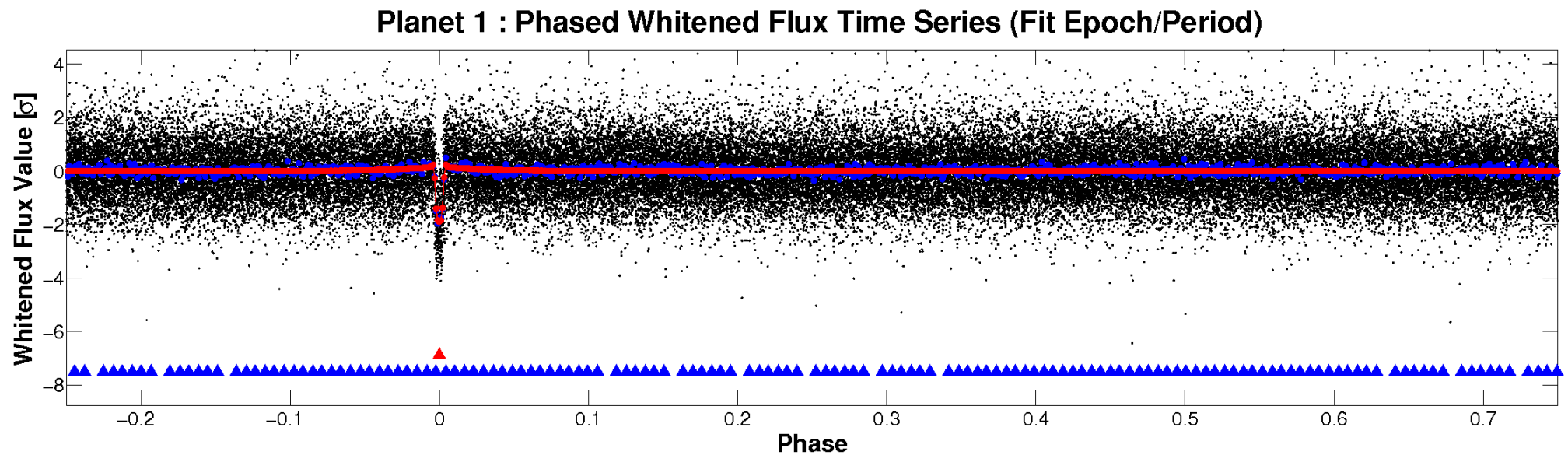
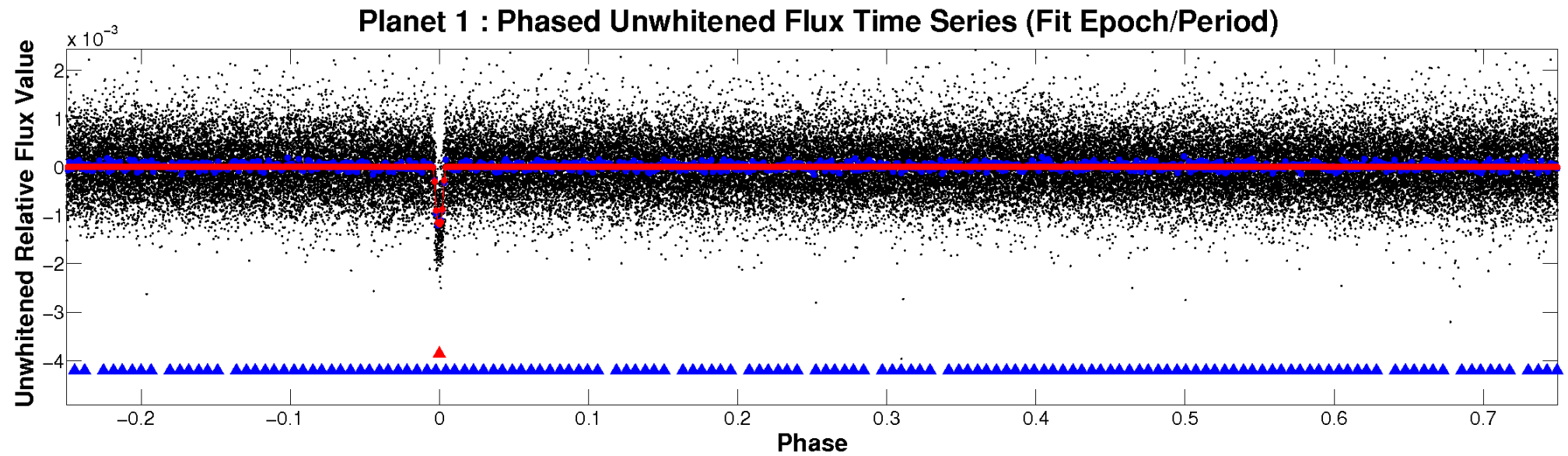


ALT Odd/Even

TCE 012066335-01

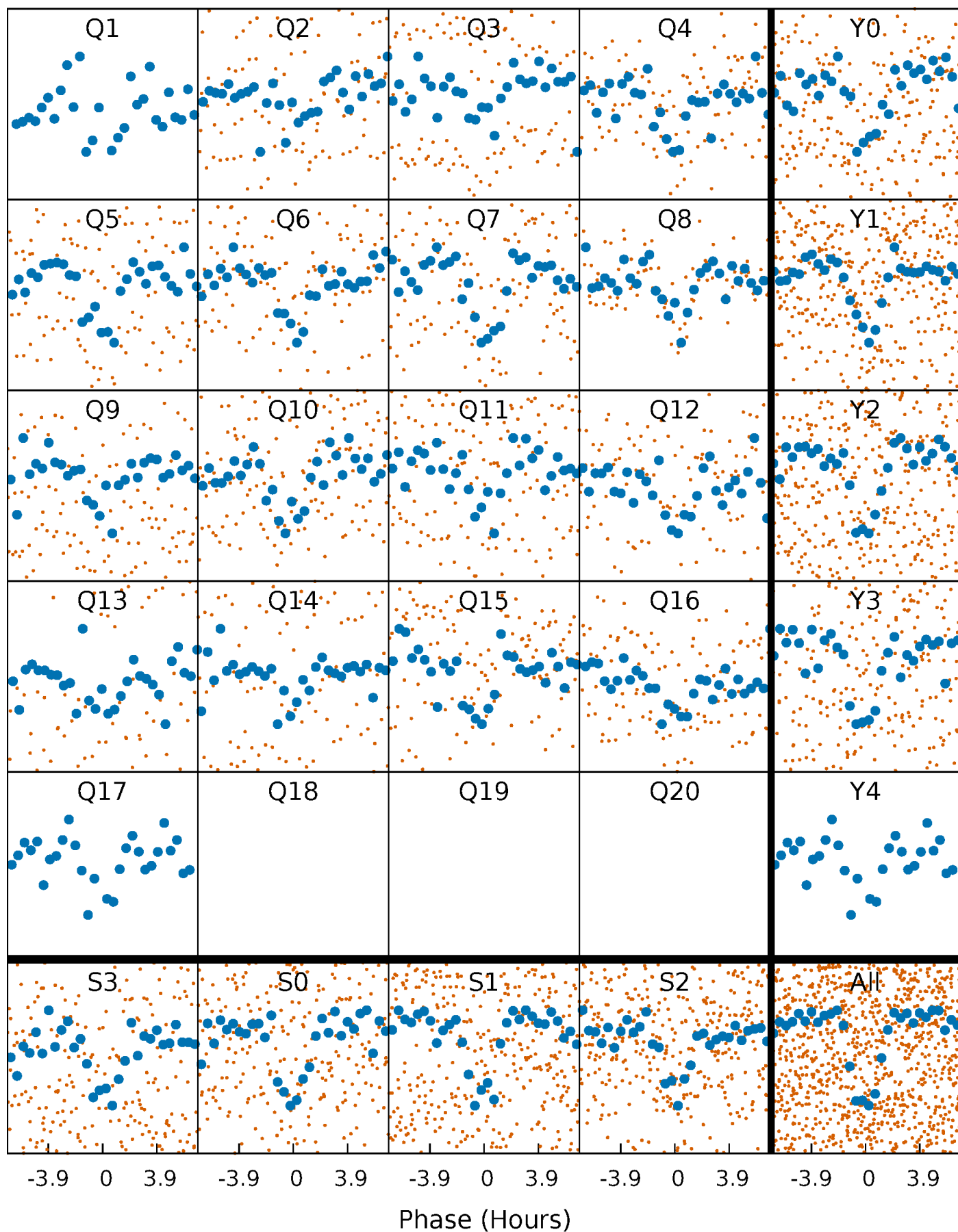


Non-Whitened Vs. Whitened Light Curve



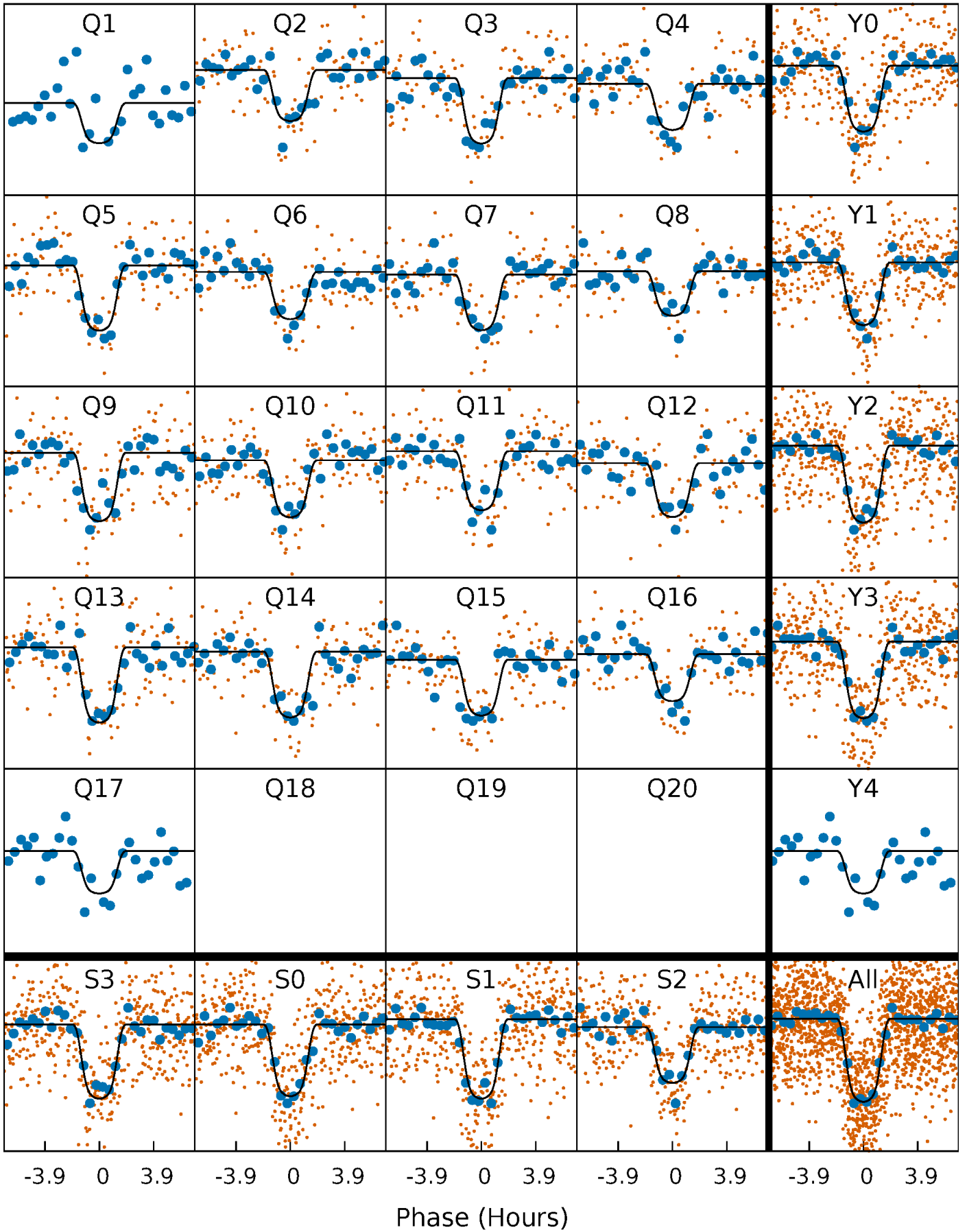
PDC Quarter-Phased Transit Curves

TCE 012066335-01 P= 19.271528 Days $T_0=148.229306$ (BKJD)



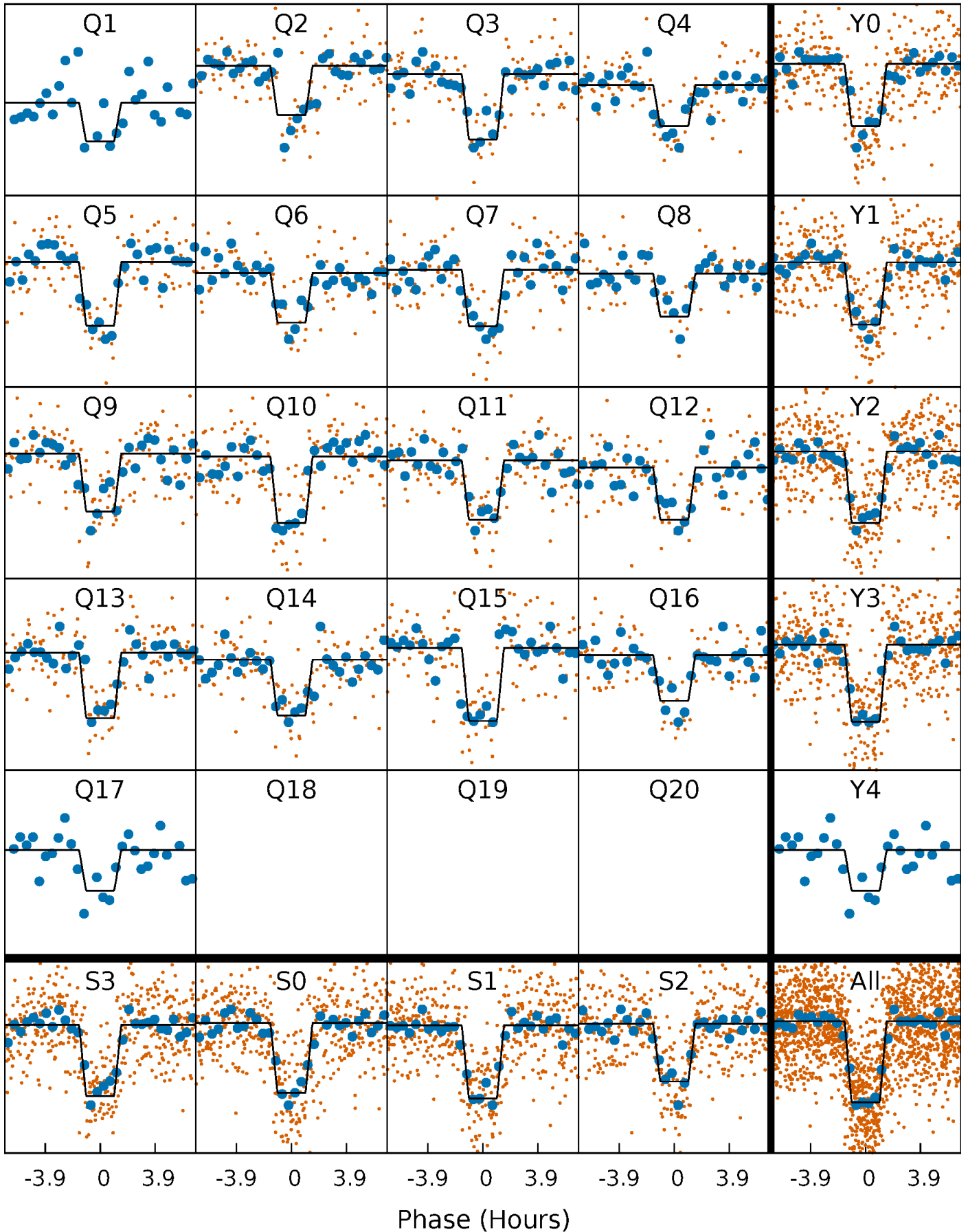
DV Quarter-Phased Transit Curves

TCE 012066335-01 P= 19.271528 Days $T_0=148.229306$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

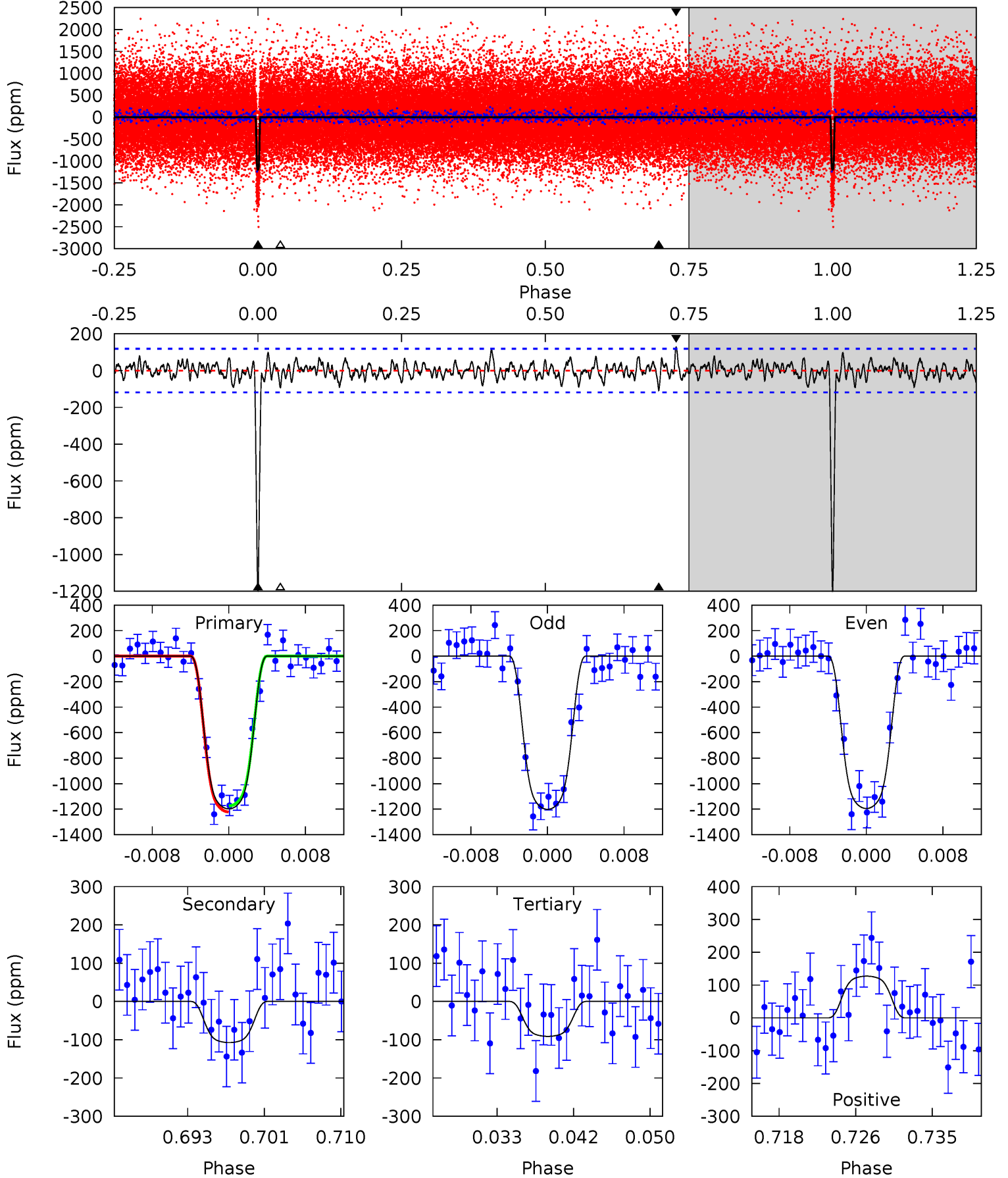
TCE 012066335-01 P= 19.271644 Days $T_0=148.224211$ (BKJD)



DV Model-Shift Uniqueness Test

012066335-01, $P = 19.271528$ Days, $E = 128.957778$ Days

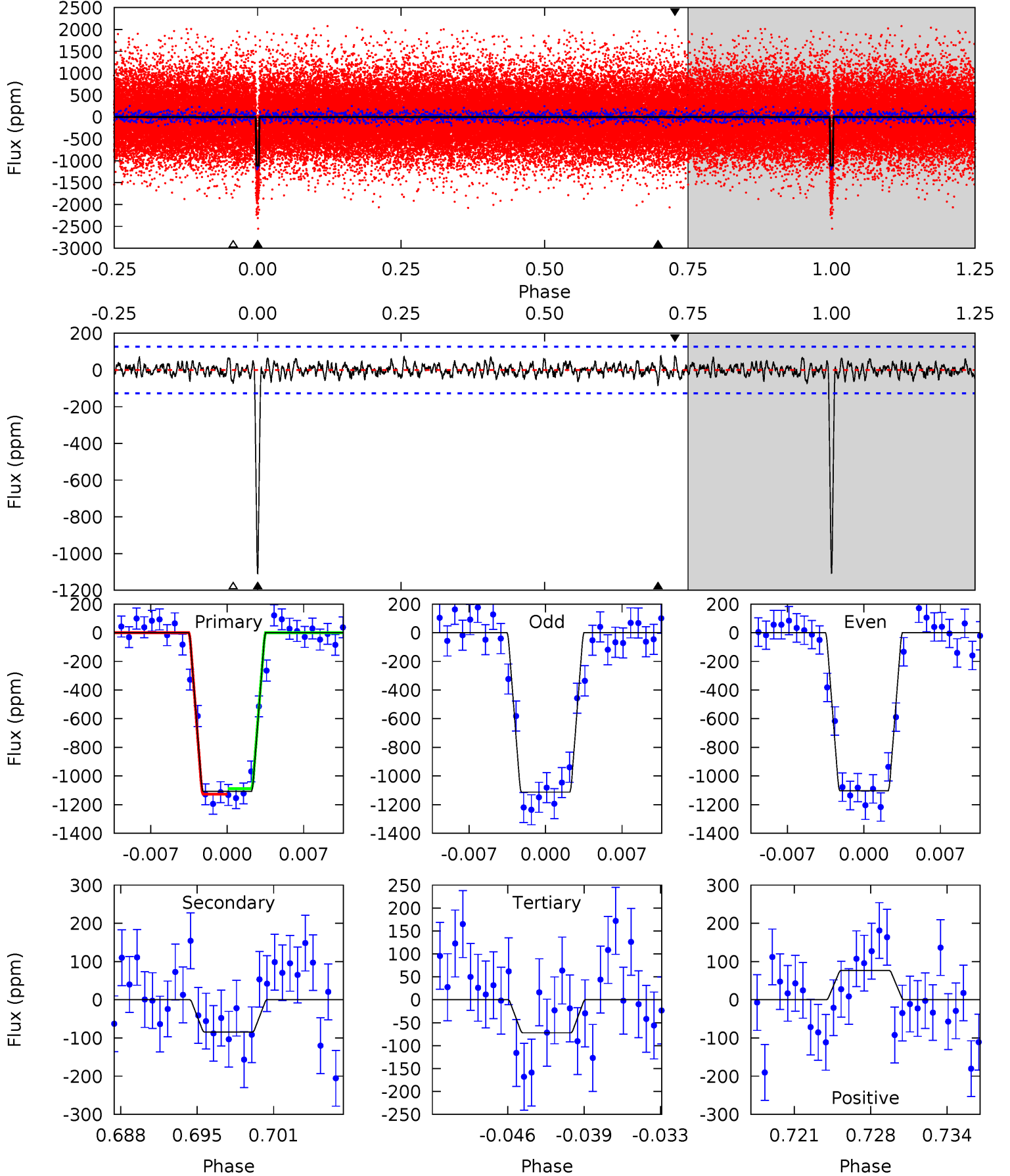
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
51.2	4.59	3.90	5.43	5.06	2.64	1.44	47.3	45.7	0.69	-0.84	0.14	1.01	0.10	1.01



Alt Model-Shift Uniqueness Test

012066335-01, $P = 19.271644$ Days, $E = 128.952567$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
44.6	3.39	2.90	3.08	5.11	2.72	1.00	41.7	41.5	0.50	0.31	0.19	0.96	0.07	0.78



Stellar Parameters For KIC 012066335

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4077^{+81}_{-81}	$4.702^{+0.027}_{-0.027}$	$-0.240^{+0.150}_{-0.150}$	$0.560^{+0.030}_{-0.034}$	$0.576^{+0.031}_{-0.035}$	$4.610^{+0.565}_{-0.503}$
	+2%/-2%	+1%/-1%	+62%/-62%	+5%/-6%	+5%/-6%	+12%/-11%
Source	SPE60	SPE60	SPE60	DSEP		

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

Secondary Eclipse Parameters for KIC 012066335-01 / KOI 0784.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-107 ± 23	$2.42^{+0.12}_{-0.12}$	550^{+13}_{-12}	2709^{+92}_{-97}	137^{+35}_{-32}
Alt.	-84 ± 25	$2.07^{+0.11}_{-0.11}$	550^{+13}_{-12}	2734^{+113}_{-136}	146^{+49}_{-45}

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

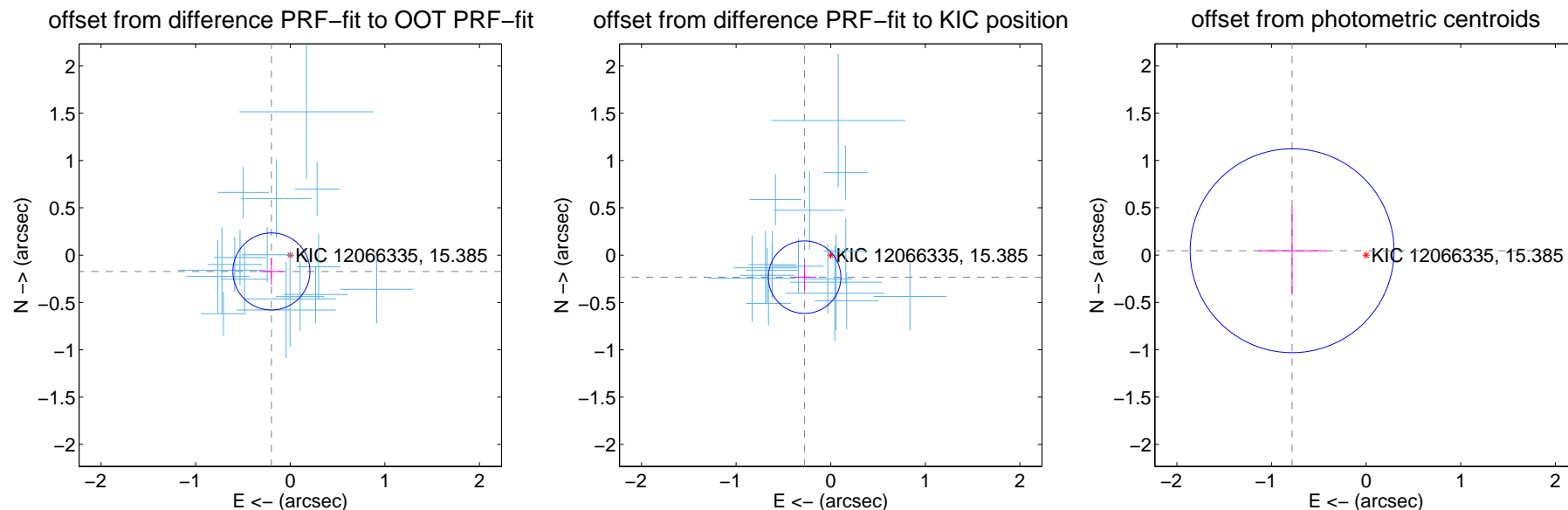
DV Centroid Data

Supplemental centroid analysis for 012066335-01. Kepler magnitude: 15.38. Transit SNR 30.73

There are 17 quarters with good PRF difference image offsets

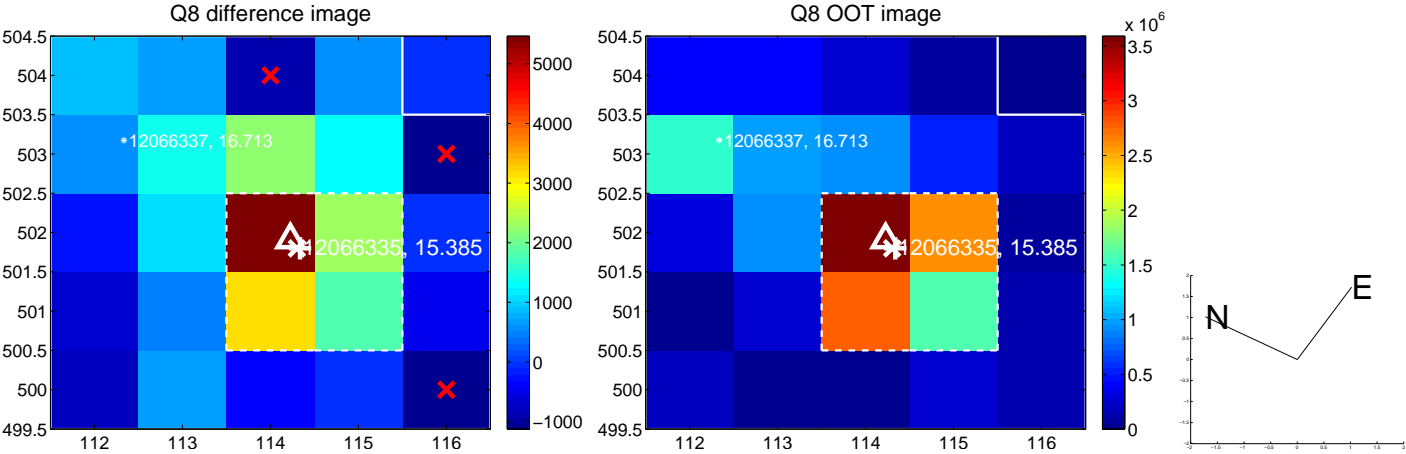
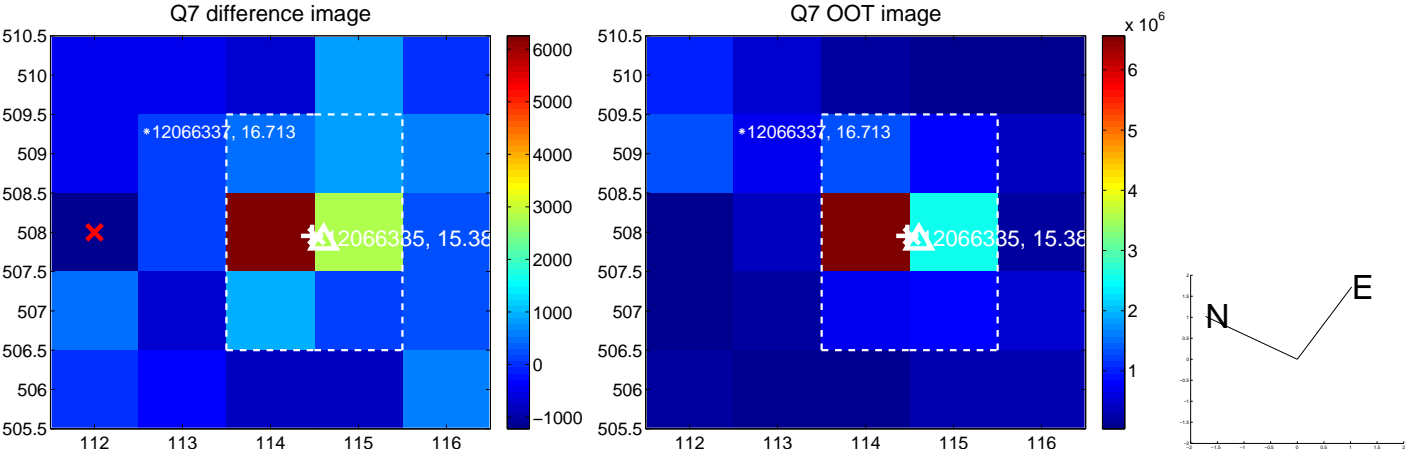
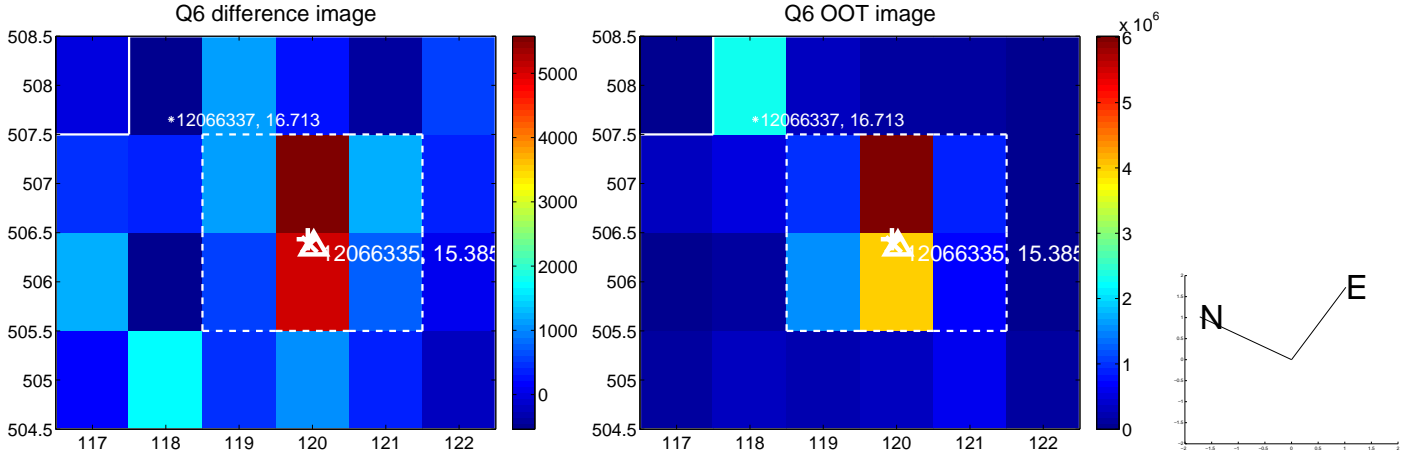
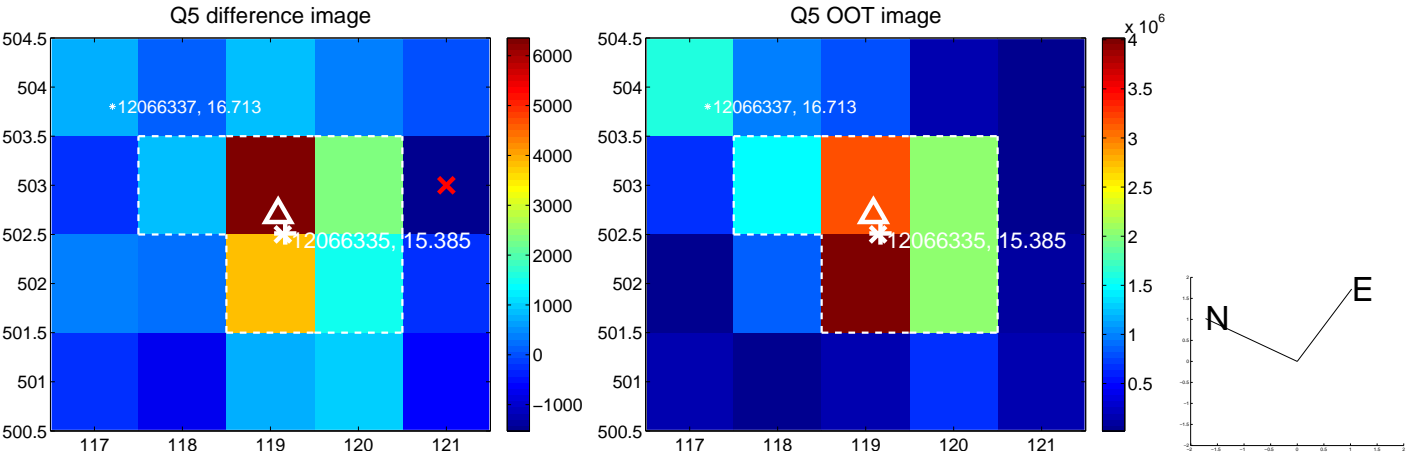
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.263 ± 0.136	1.94	0.199 ± 0.127	-0.172 ± 0.142
PRF-fit source offset from KIC position	0.361 ± 0.128	2.83	0.276 ± 0.122	-0.233 ± 0.139
photometric centroid source offset	0.78 ± 0.36	2.18	0.78 ± 0.36	0.05 ± 0.47

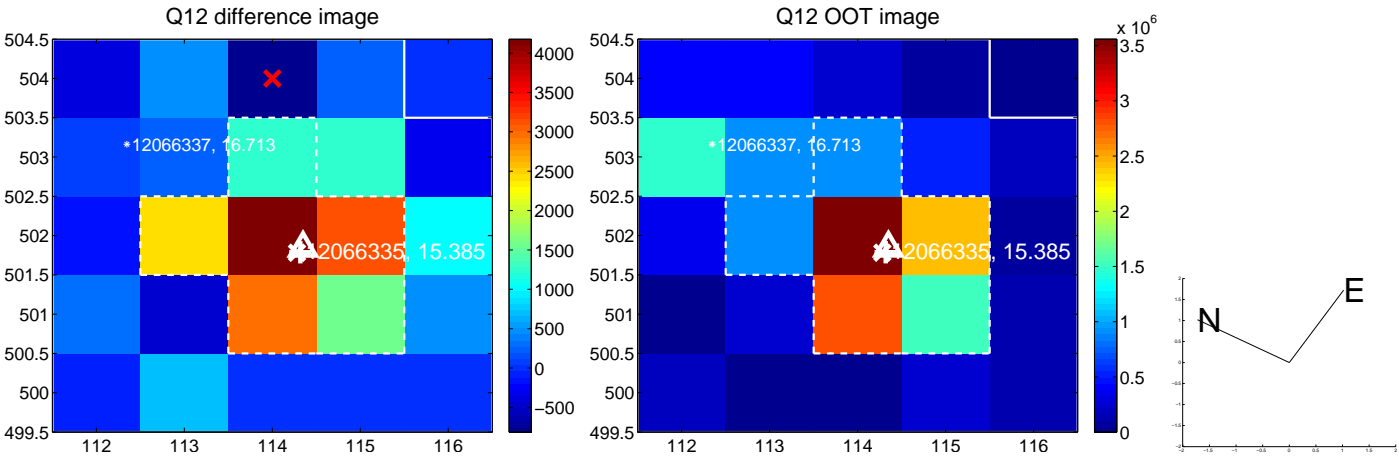
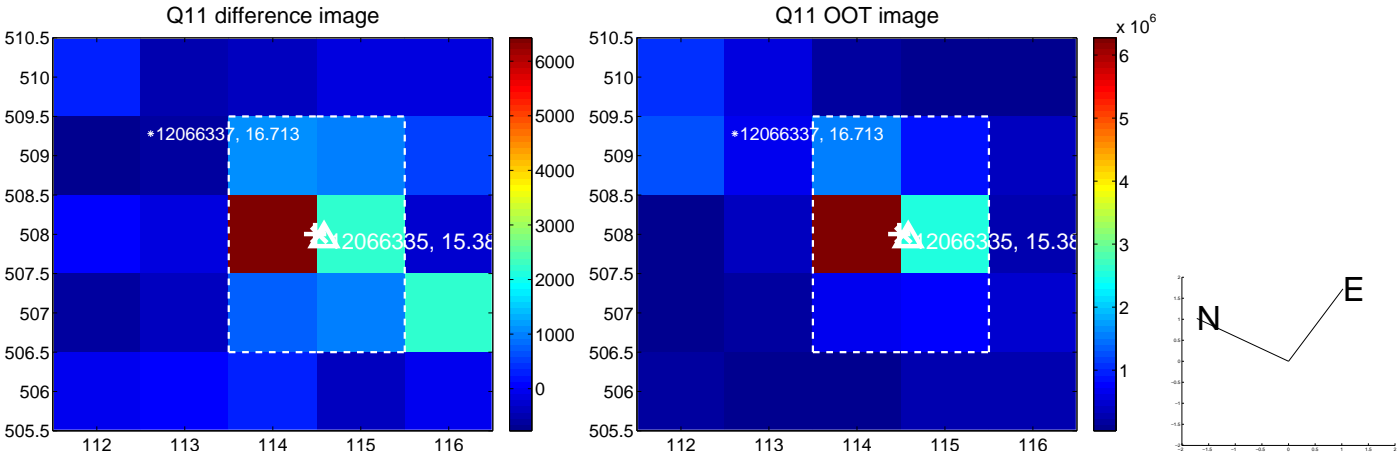
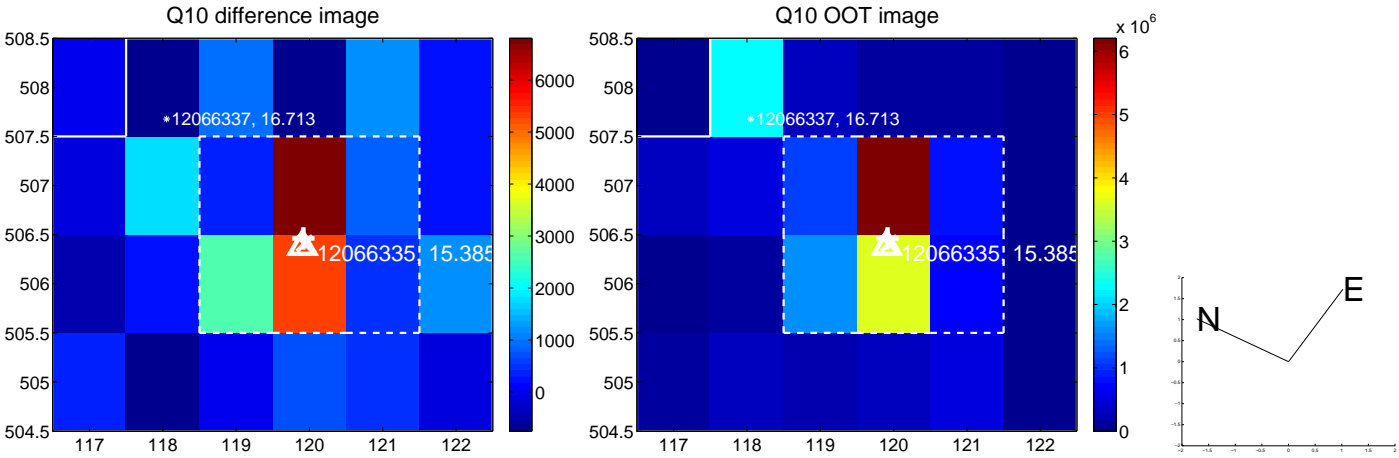
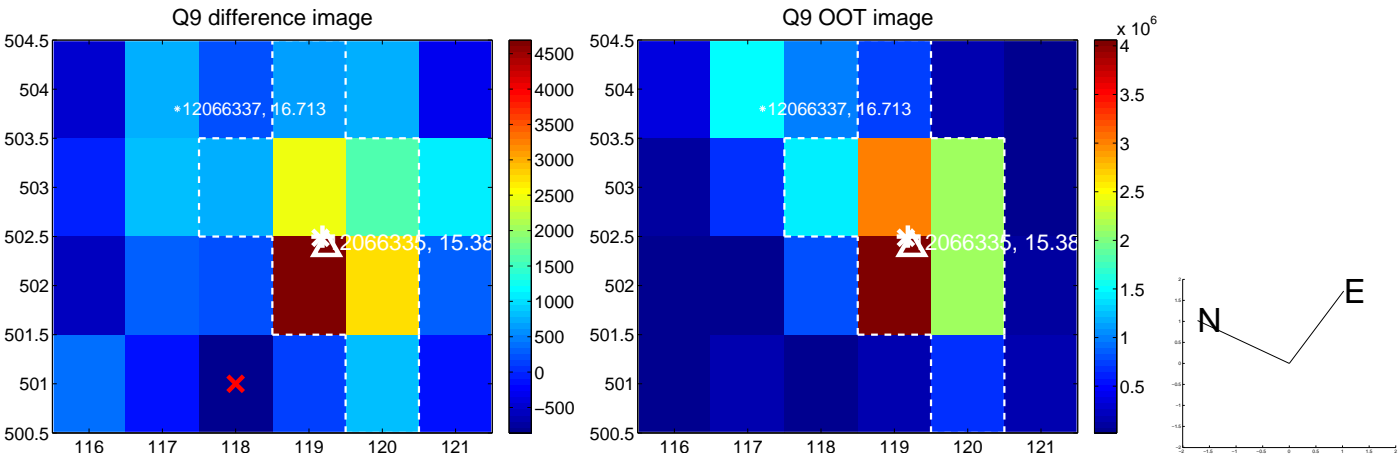


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

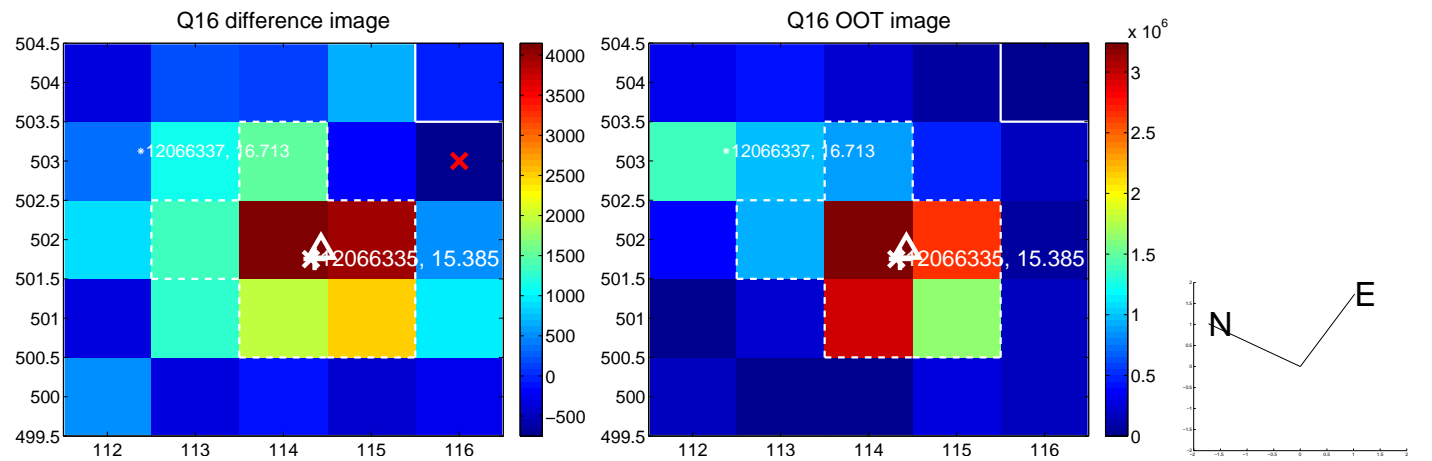
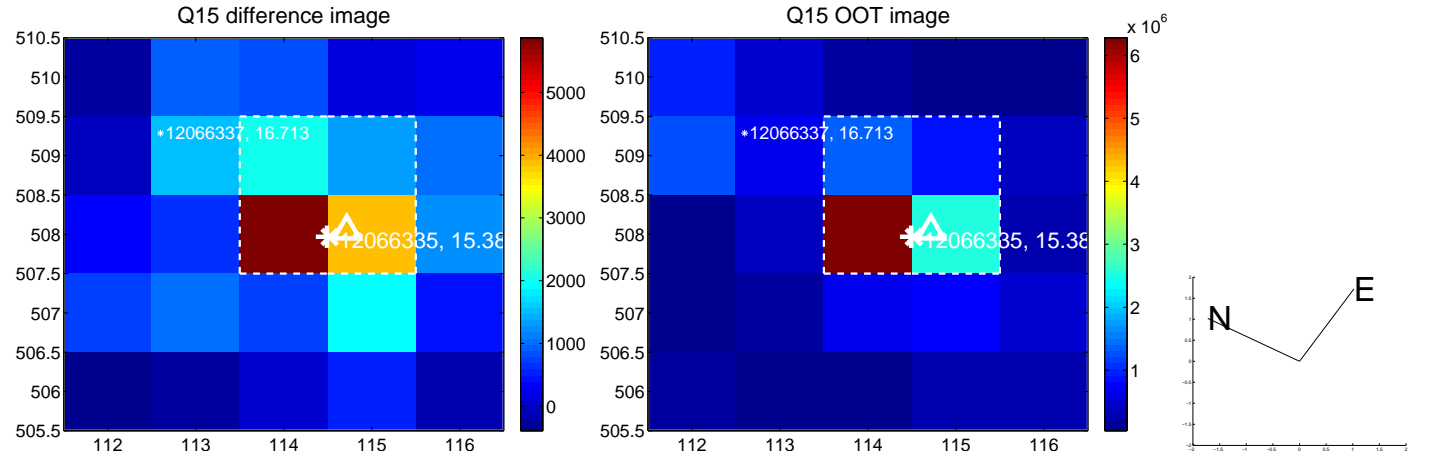
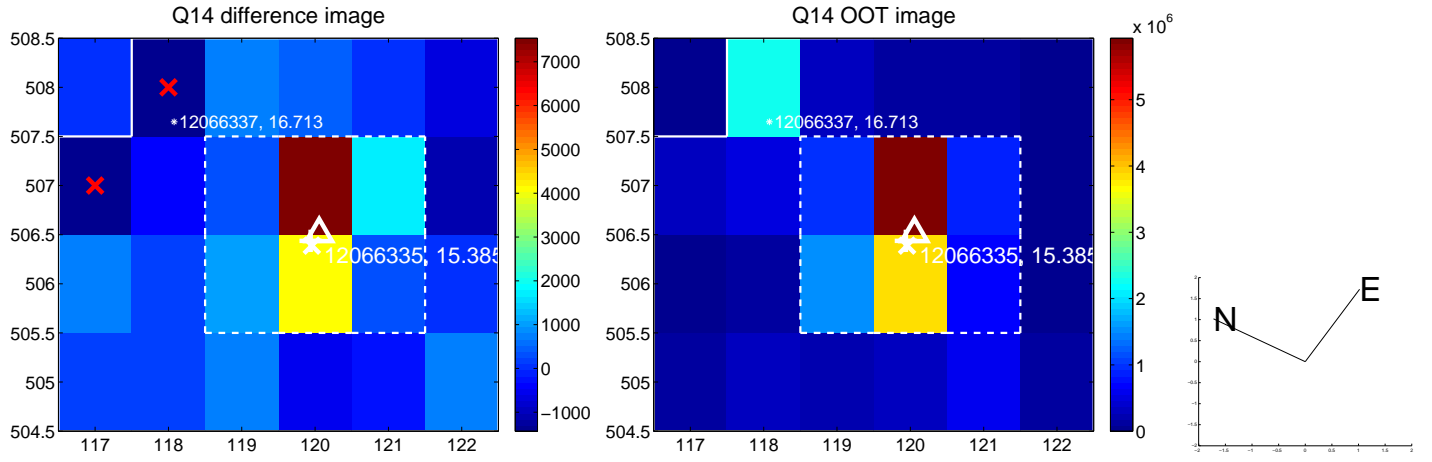
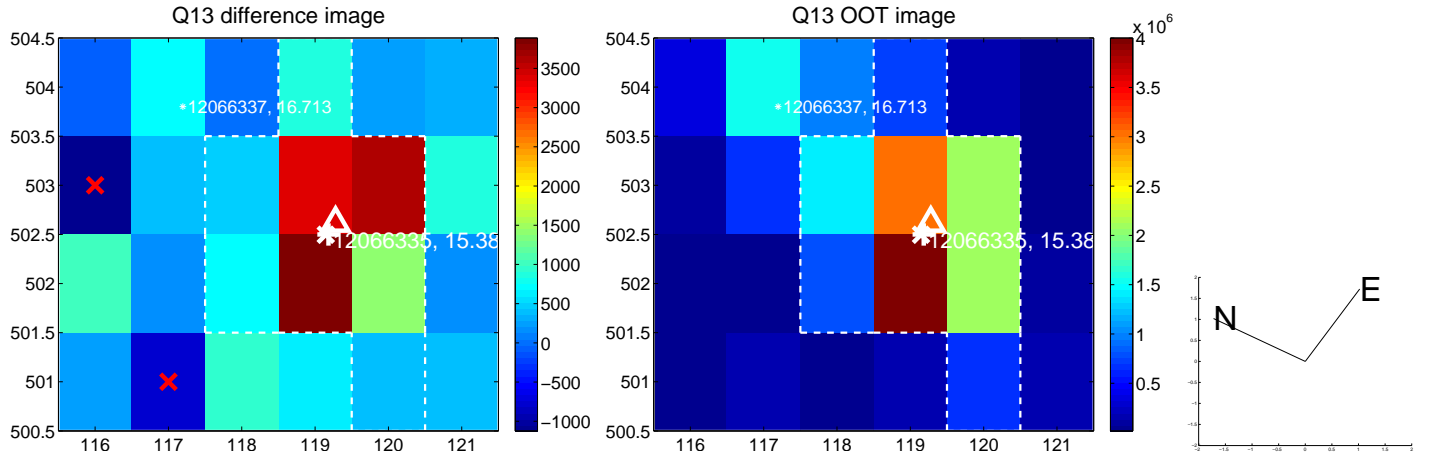
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



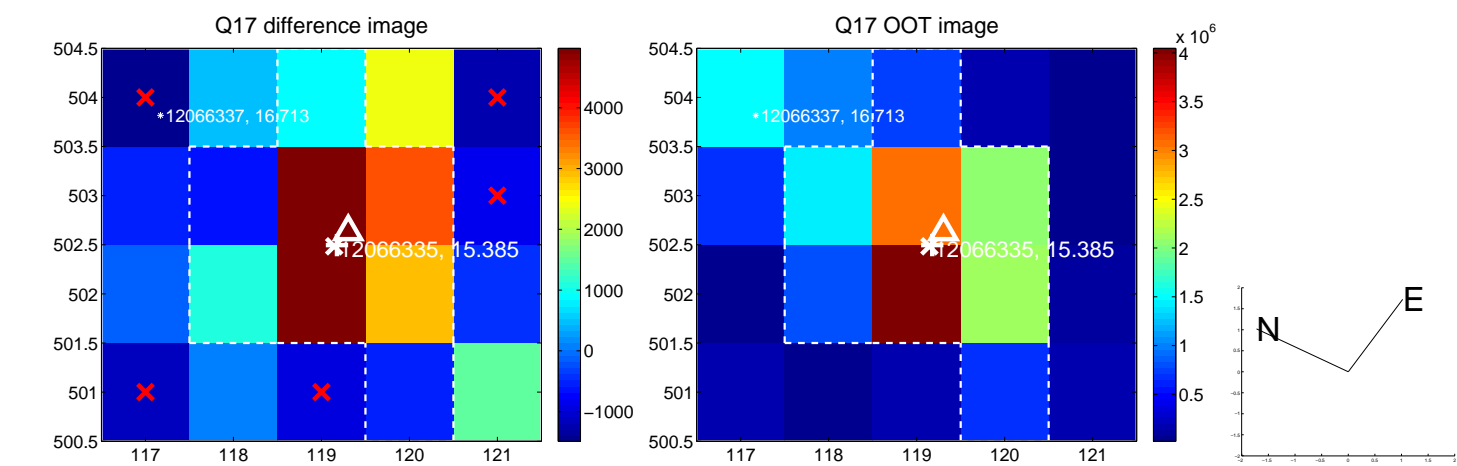
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



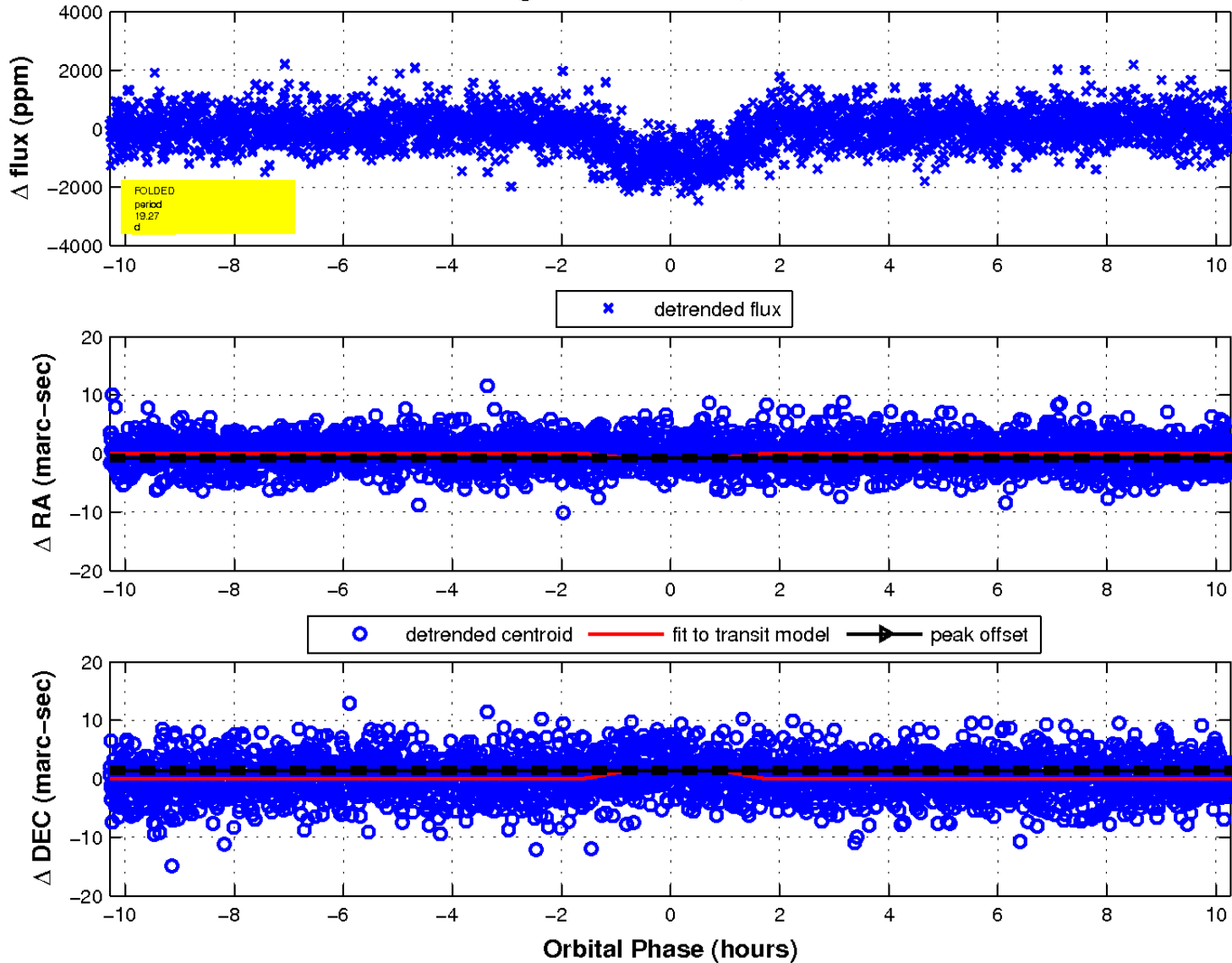
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

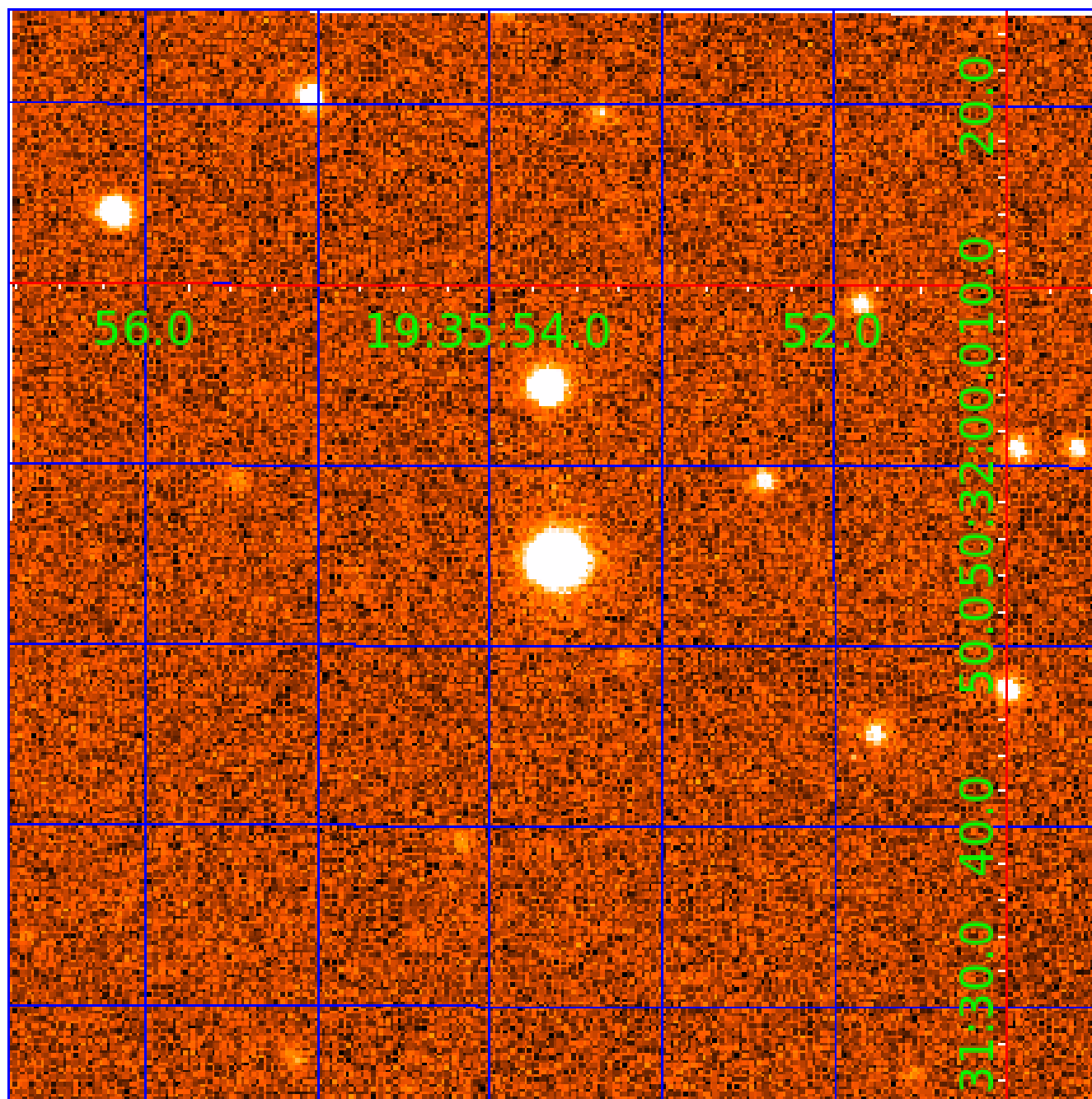


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 012066335

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})
012066335-01	OBS	0784.01	19.271528	148.229306	1186.4	3.427	28.5	30.7	0.56	4077	2.42	5.66
012066335-02	OBS	0784.02	10.065278	136.287079	937.7	1.695	21.7	25.7	0.56	4077	2.21	13.47

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012066335-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012066335-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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.

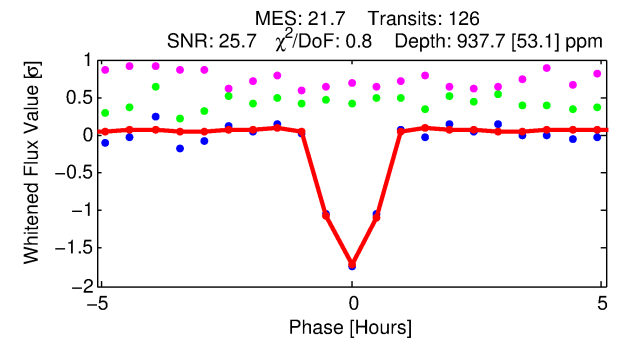
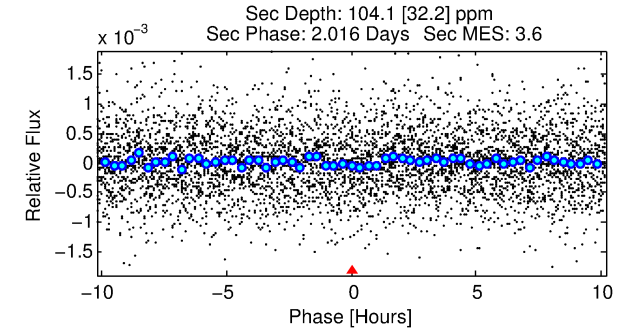
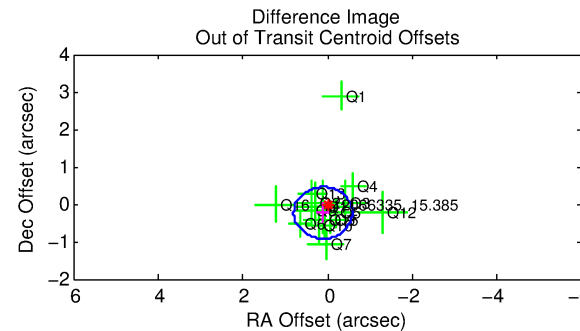
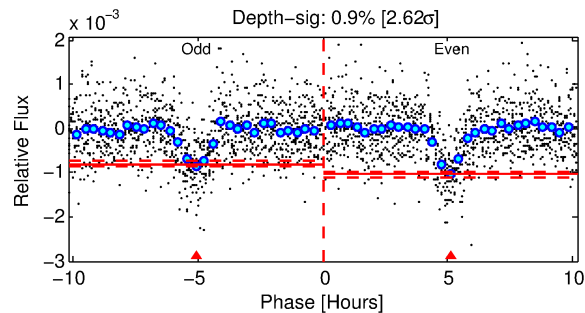
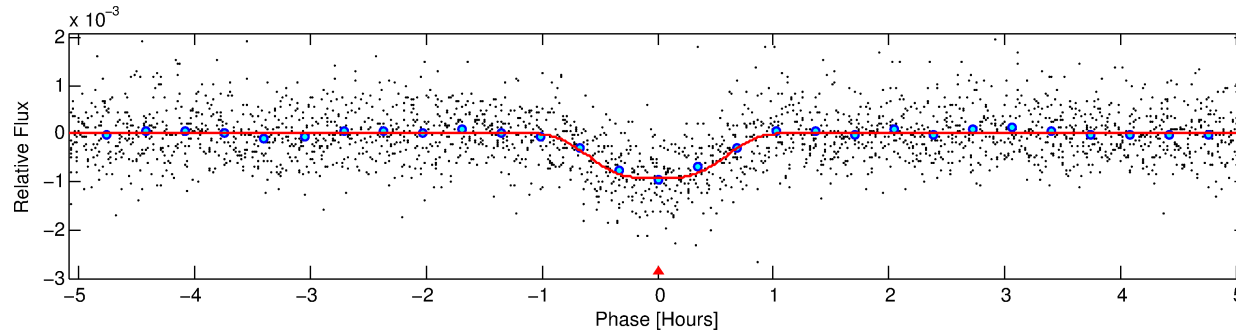
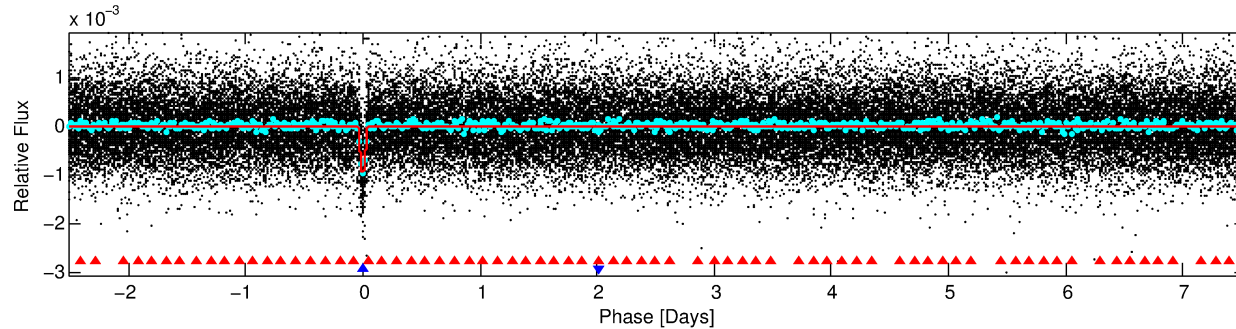
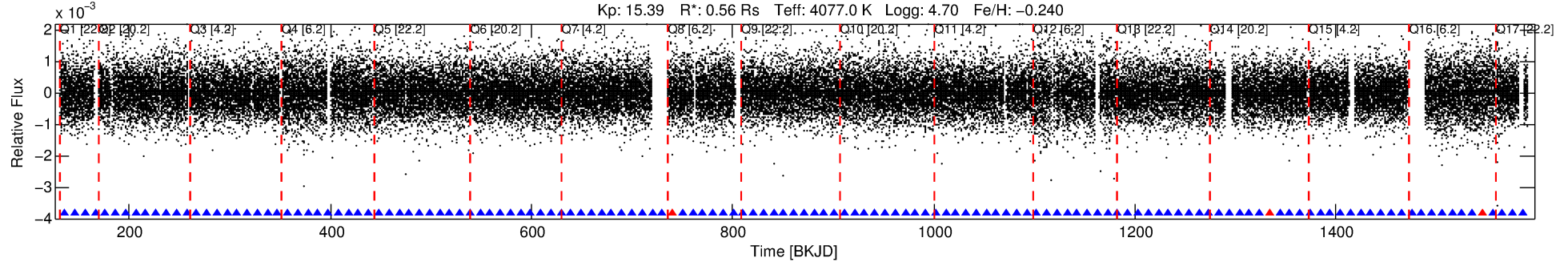
Ephemeris Match Information For 012066335-02

No Significant Match Found

DV One-Page Summary

KIC: 12066335 Candidate: 2 of 2 Period: 10.065 d
KOI: K00784.02 Name: Kepler-231b Corr: 0.911

Kp: 15.39 R*: 0.56 Rs Teff: 4077.0 K Logg: 4.70 Fe/H: -0.240



DV Fit Results:

Period = 10.06528 [0.00002] d
Epoch = 136.2871 [0.0016] BKJD
Rp/R* = 0.0362 [0.0026]
a/R* = 19.11 [4.26]
b = 0.95 [0.03]
Seff = 13.47 [1.32]
Teq = 488 [12] K
Rp = 2.21 [0.21] Re
a = 0.0759 [0.0035] AU
Ag = 67.49 [23.41] [2.84σ]
Teffp = 2165 [190] K [8.80σ]

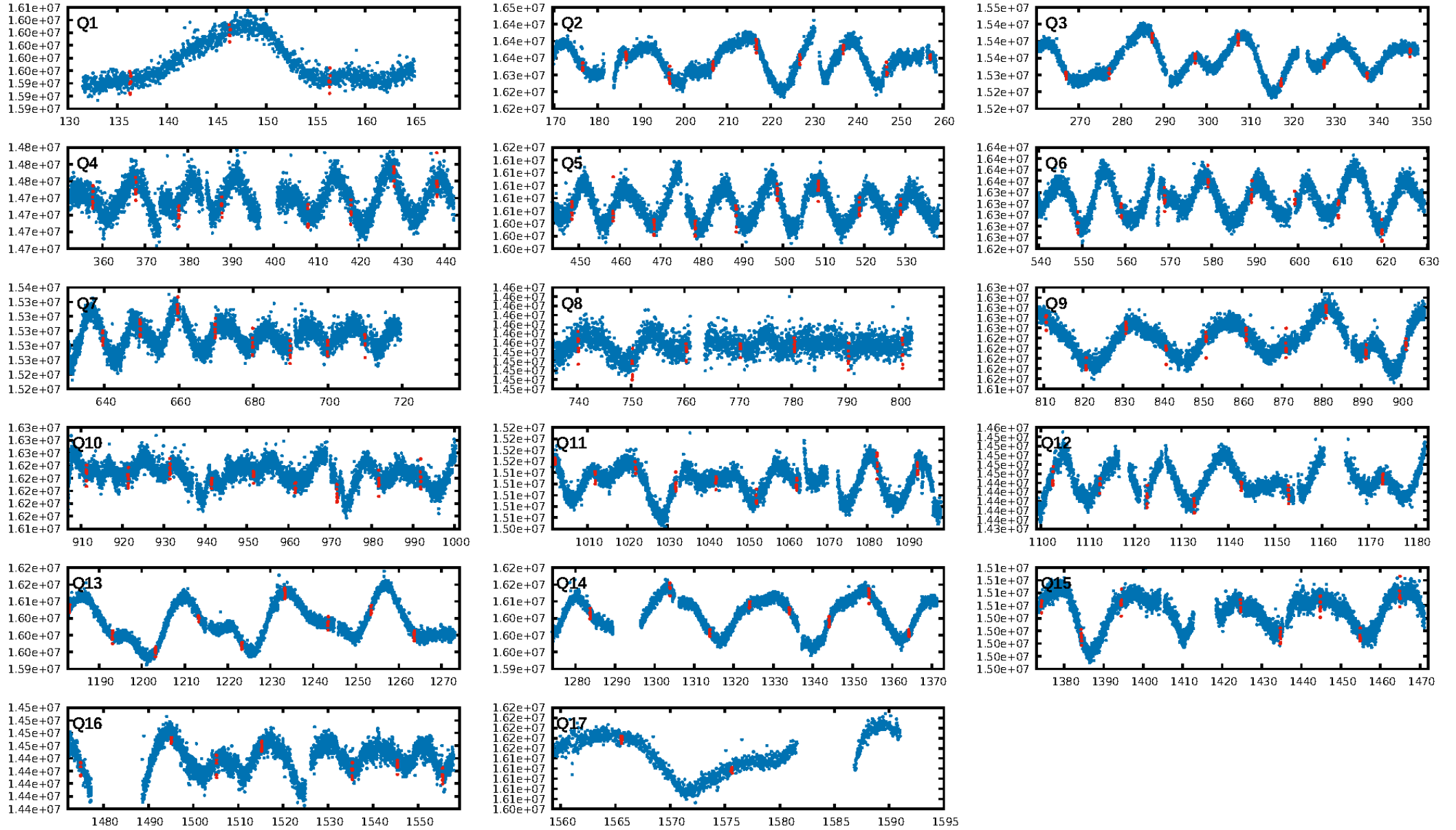
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [57.79σ]
ModelChiSquare2-sig: 96.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.71e-97
RollingBand-fgt: 0.98 [118/121]
GhostDiagnostic-chr: 3.521
Centroid-sig: 0.0%
Centroid-so: 0.421 arcsec [0.90σ]
OotOffset-rm: 0.255 arcsec [1.11σ]
KicOffset-rm: 0.283 arcsec [1.33σ]
OotOffset-st: 3/4/4/4 [15]
KicOffset-st: 3/4/4/4 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 1.00 [17/17]

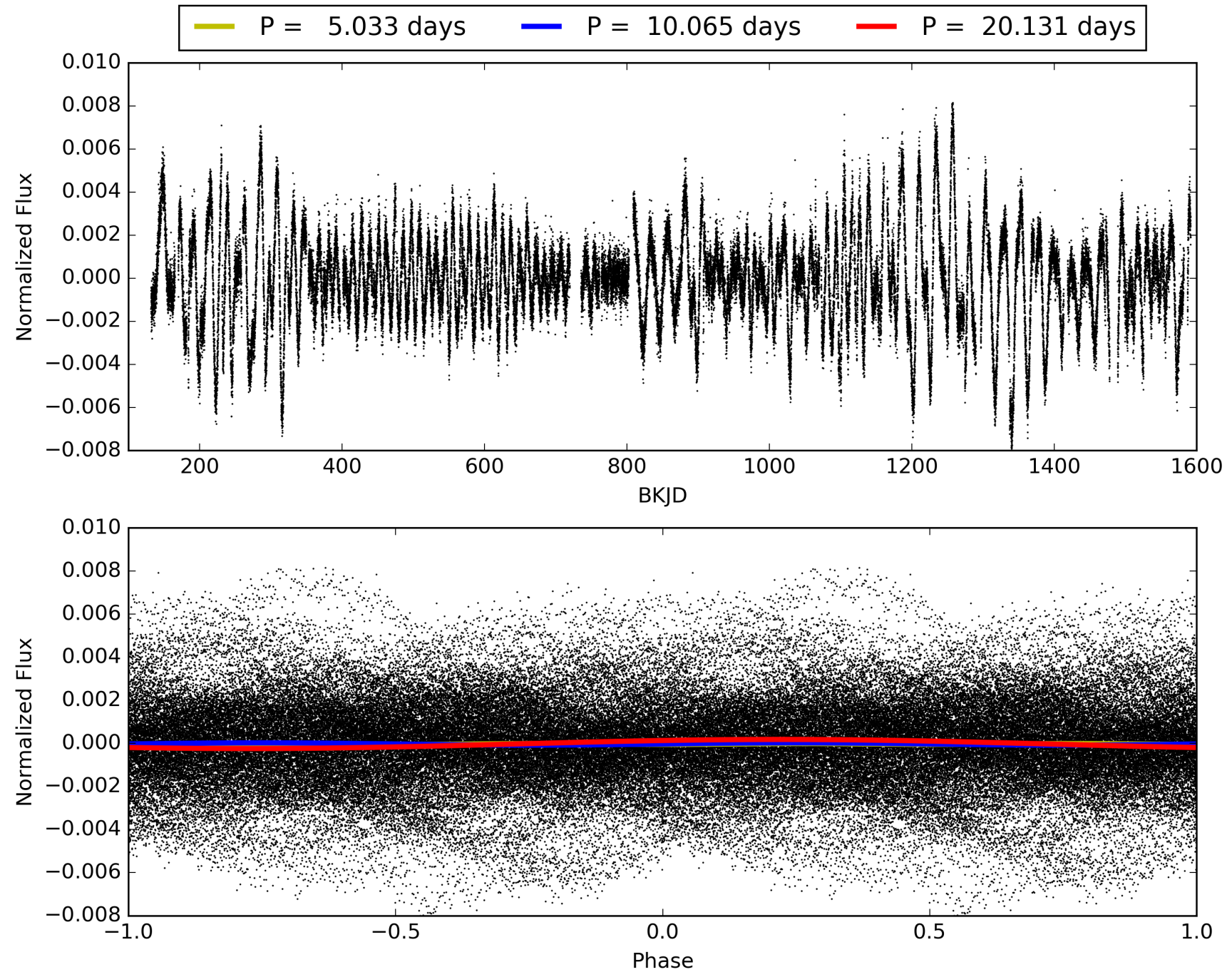
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:32:07 Z

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

TCE 012066335-02, PDC Light Curves

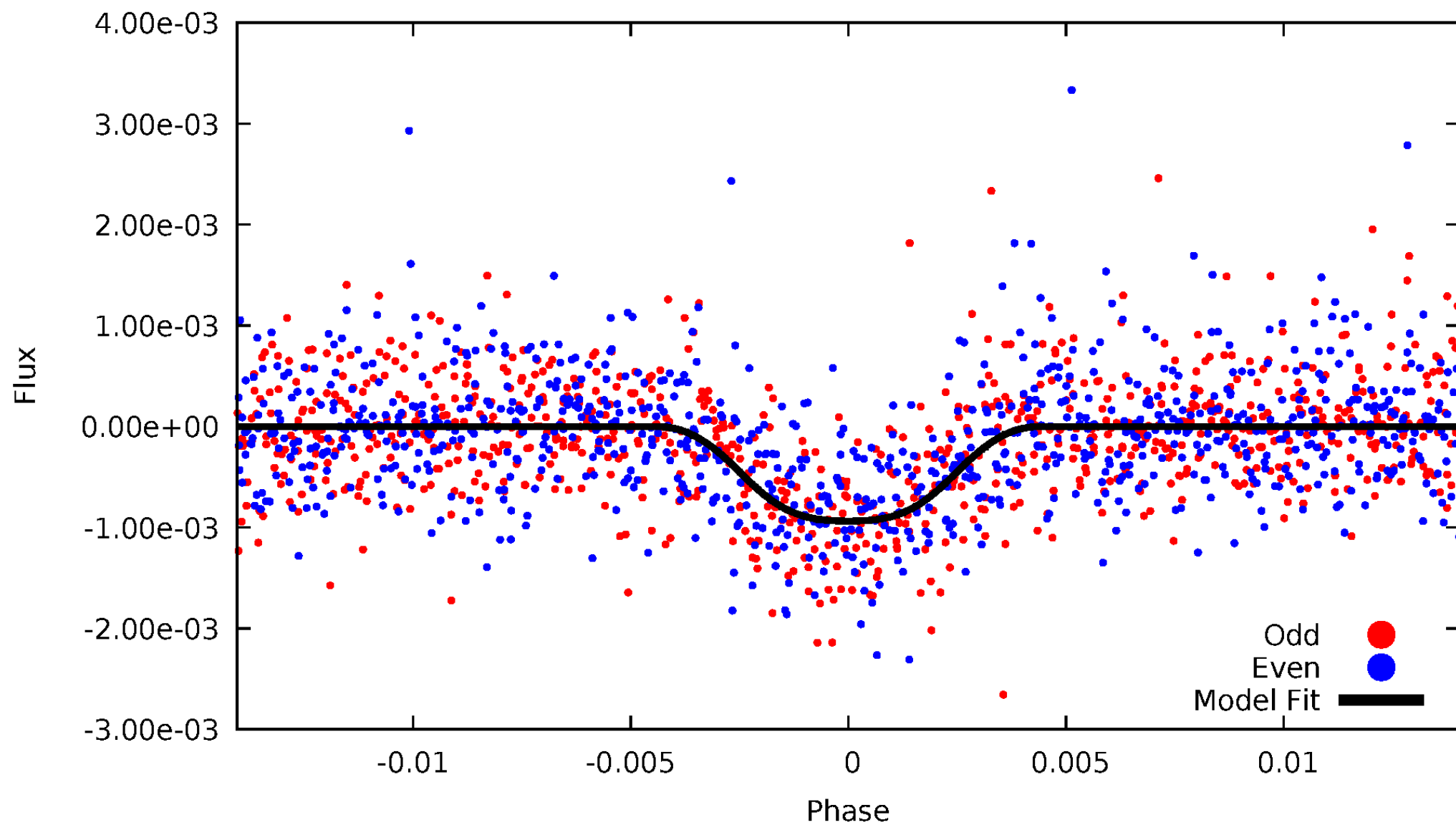


TCE 012066335-02



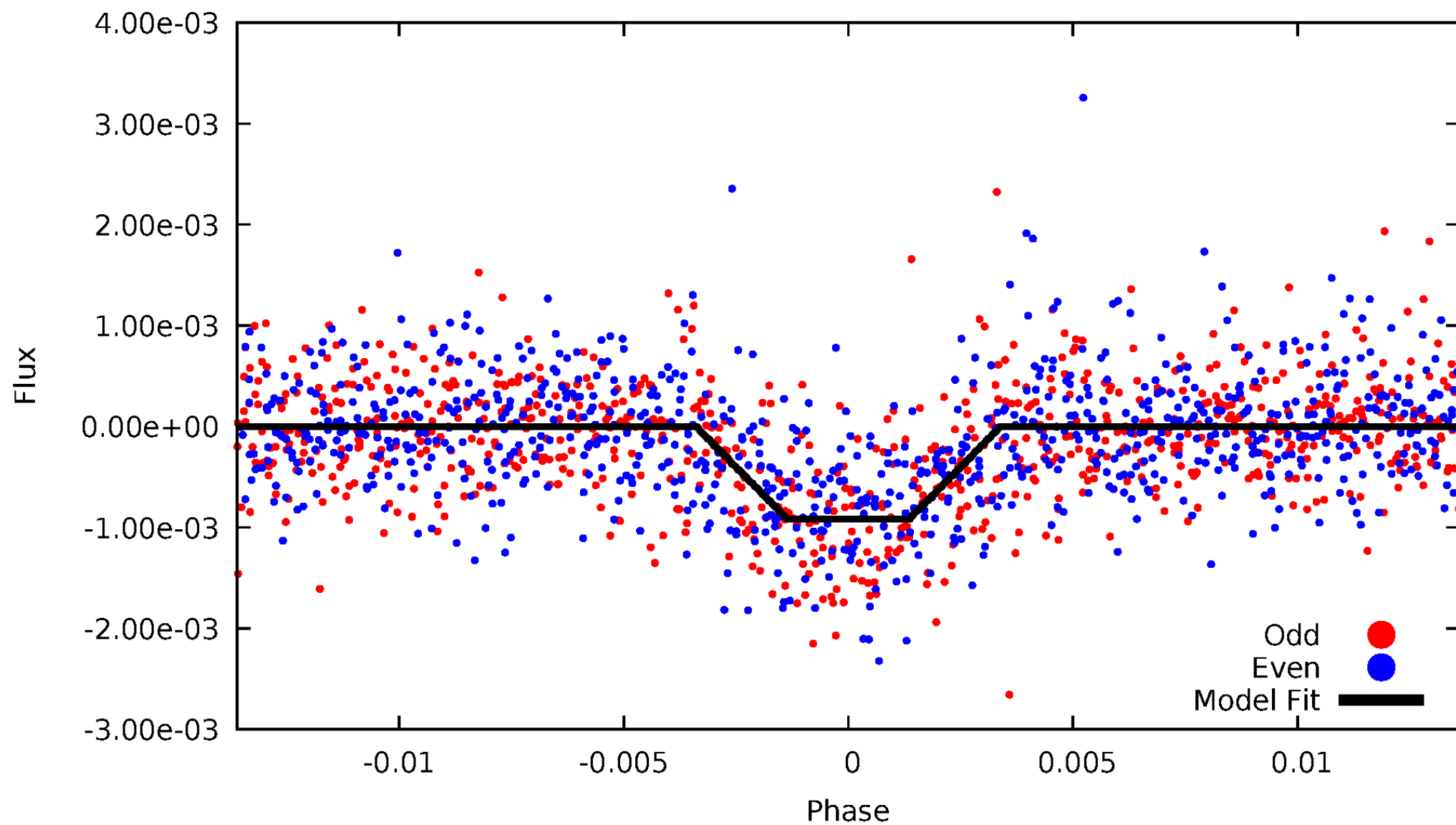
DV Odd/Even

TCE 012066335-02



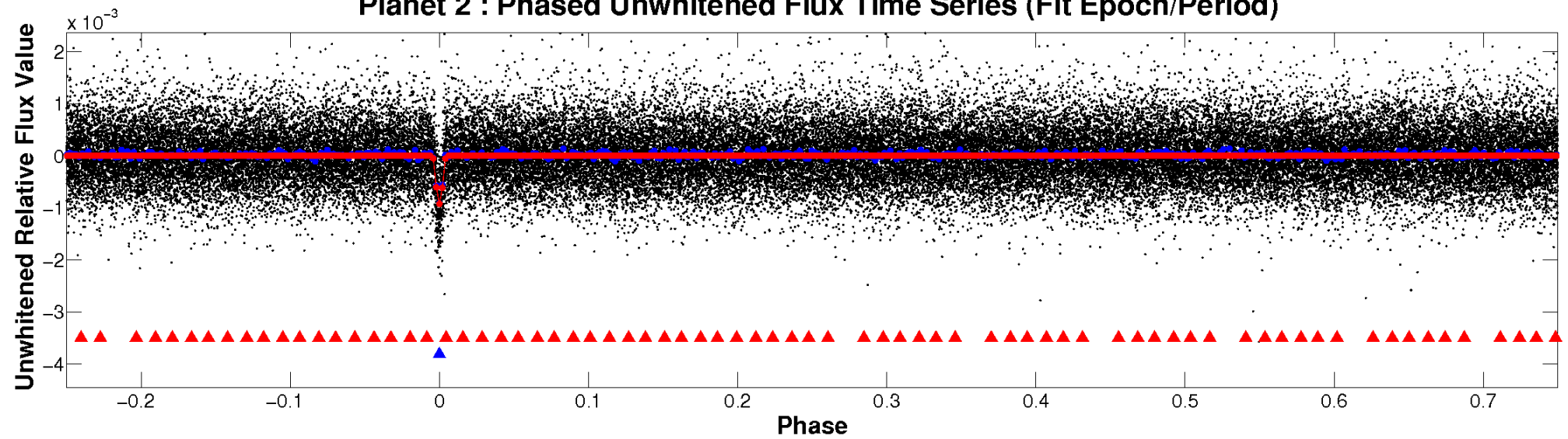
ALT Odd/Even

TCE 012066335-02

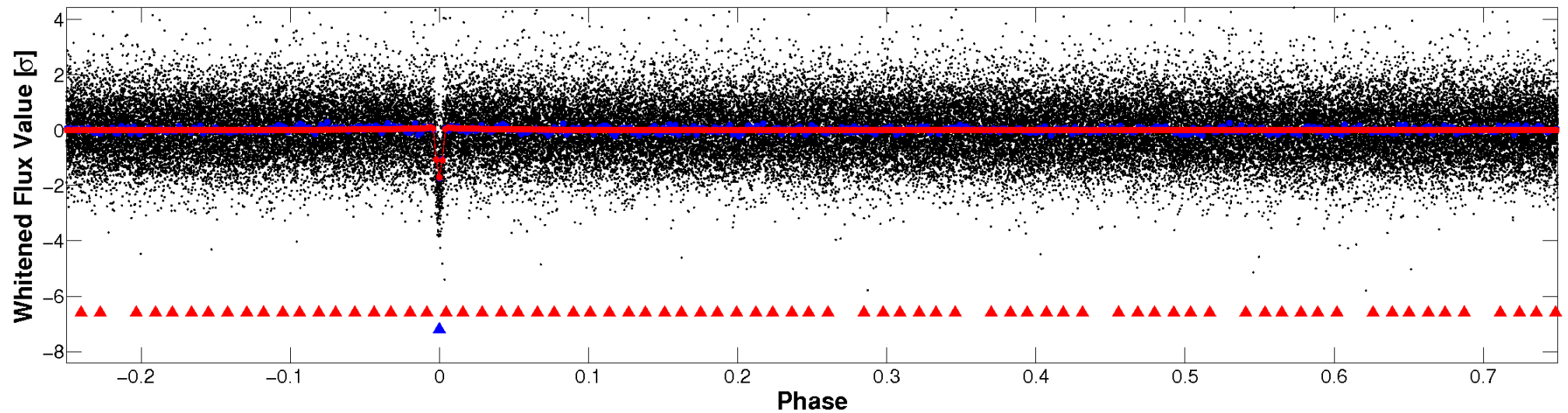


Non-Whitened Vs. Whitened Light Curve

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

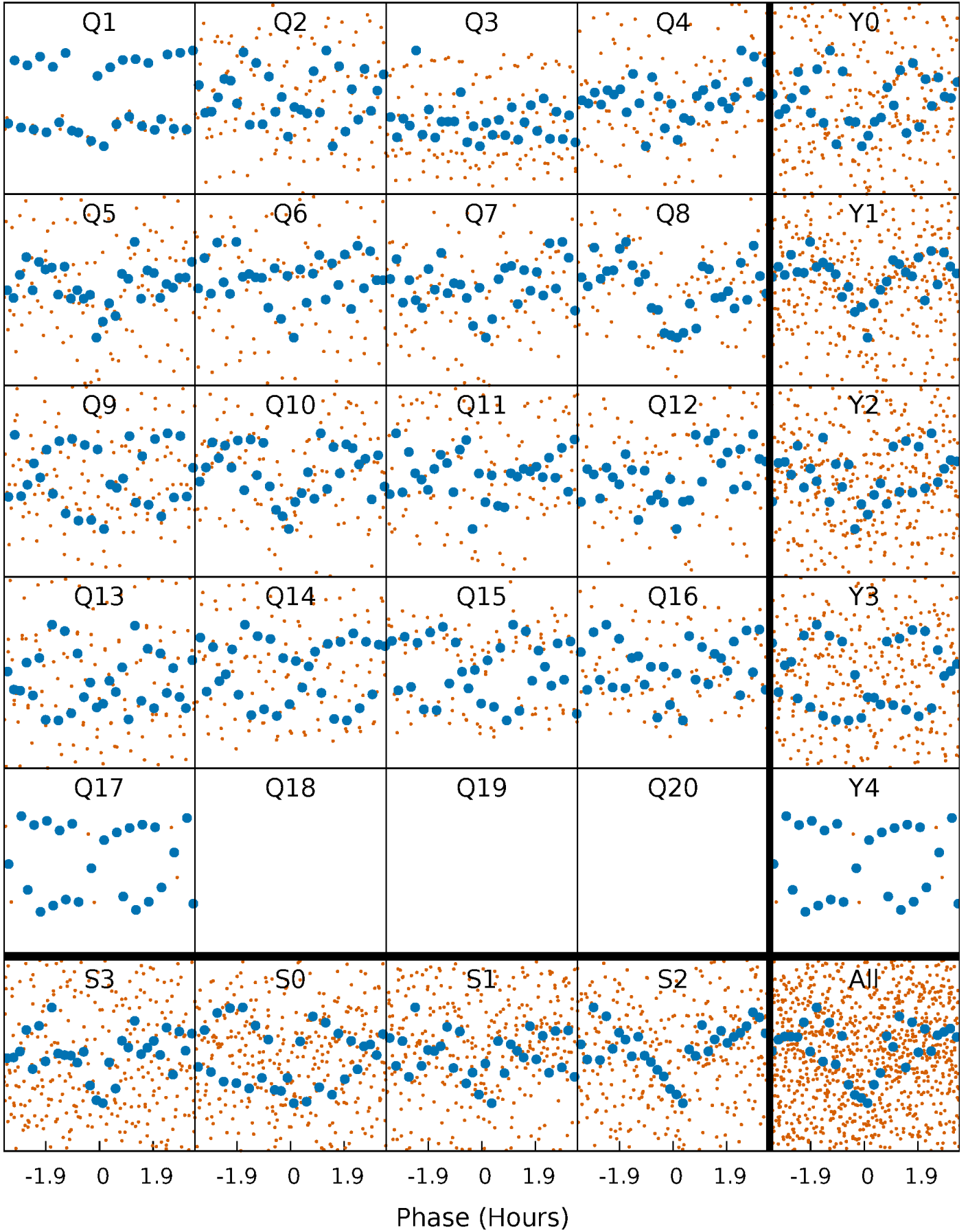


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



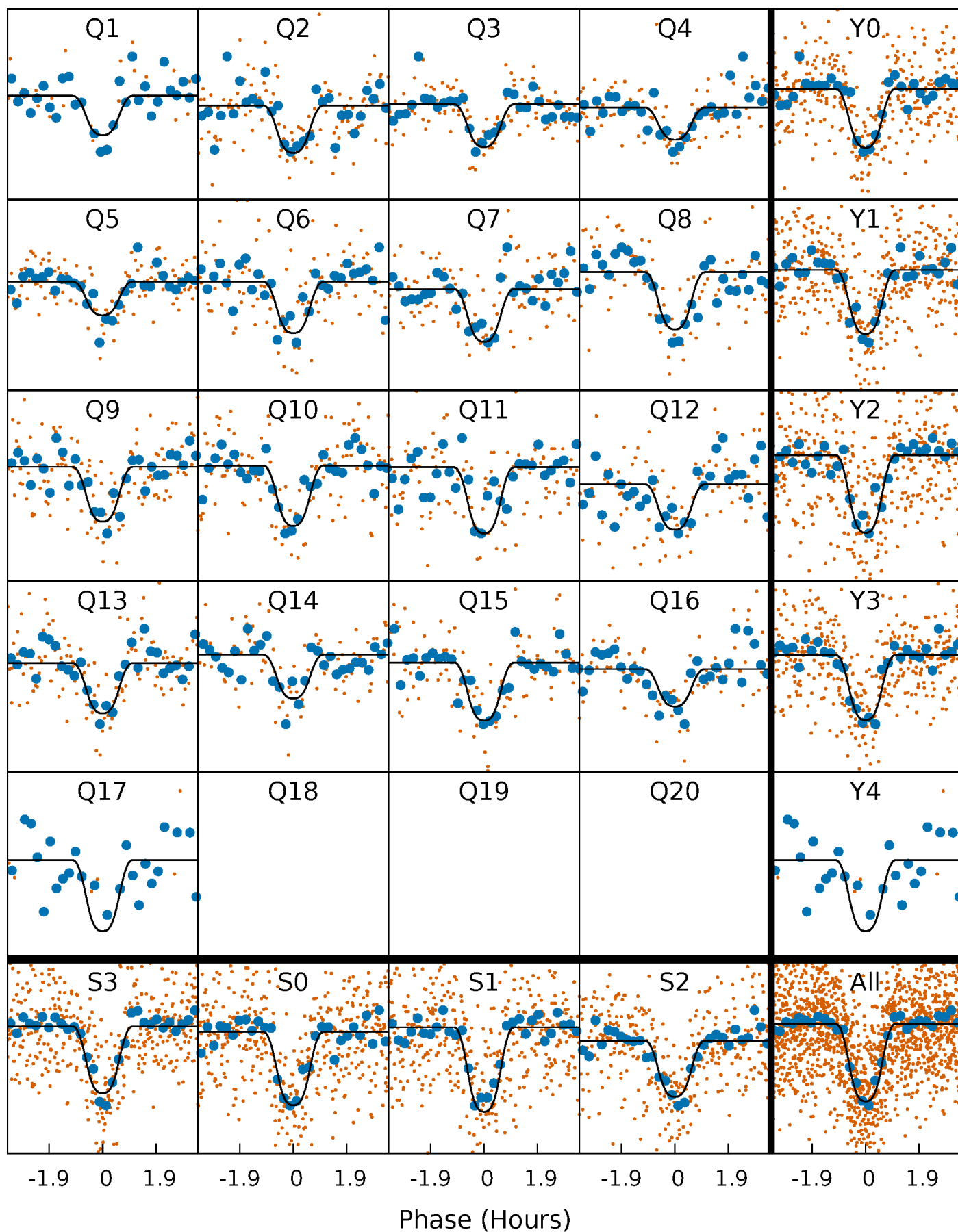
PDC Quarter-Phased Transit Curves

TCE 012066335-02 P= 10.065278 Days $T_0=136.287079$ (BKJD)



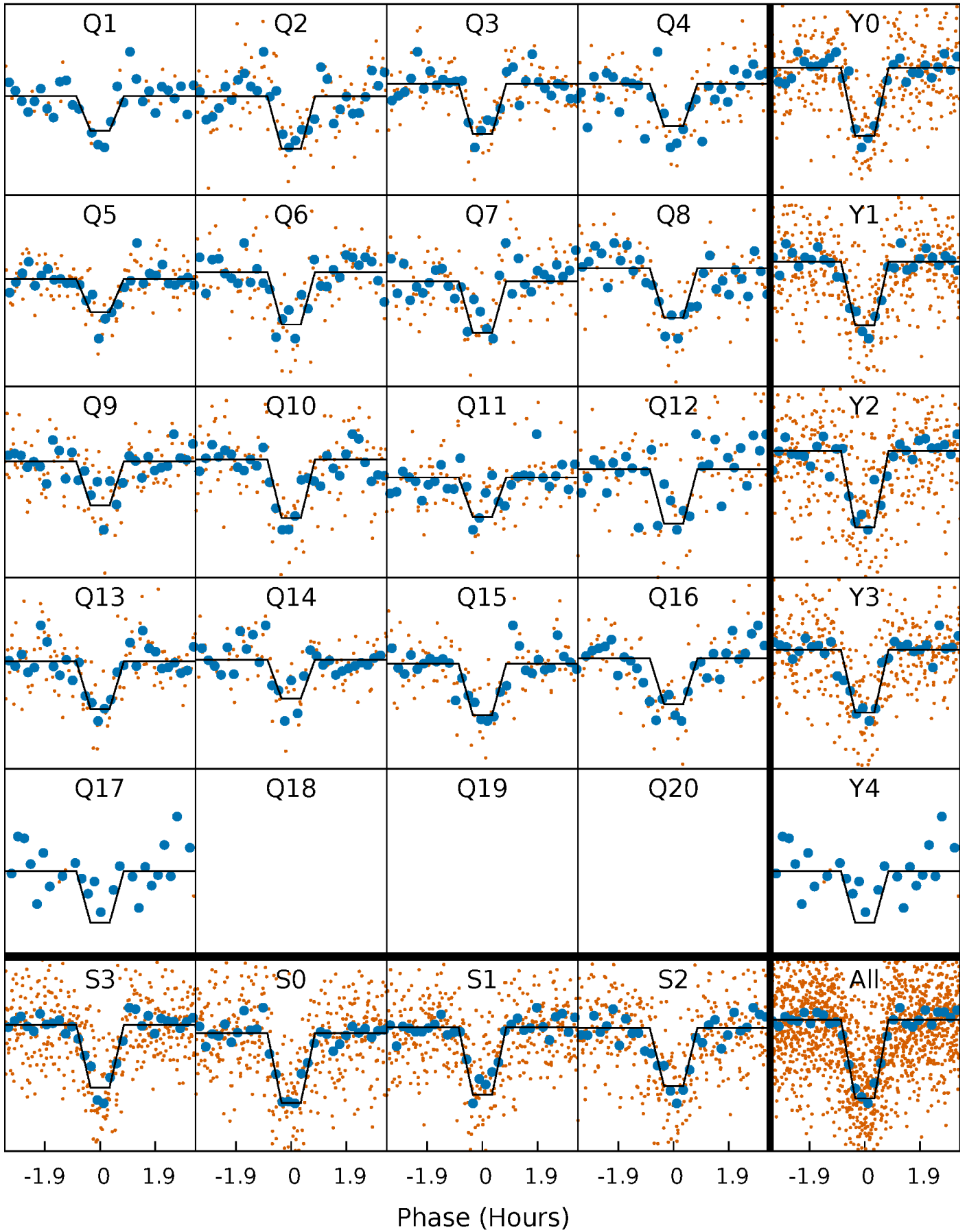
DV Quarter-Phased Transit Curves

TCE 012066335-02 P= 10.065278 Days $T_0=136.287079$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

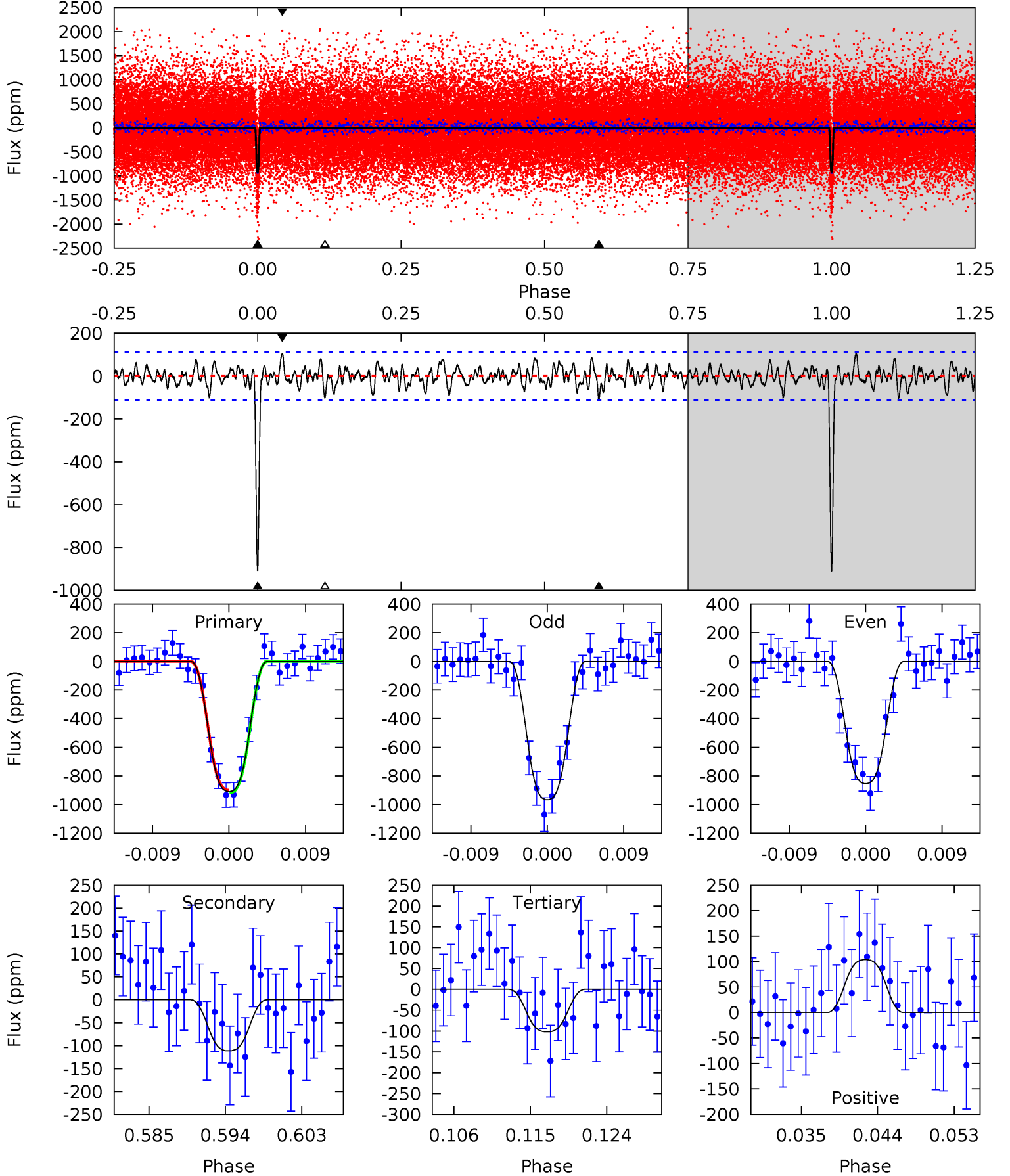
TCE 012066335-02 P= 10.065297 Days $T_0=136.285477$ (BKJD)



DV Model-Shift Uniqueness Test

012066335-02, $P = 10.065278$ Days, $E = 126.221801$ Days

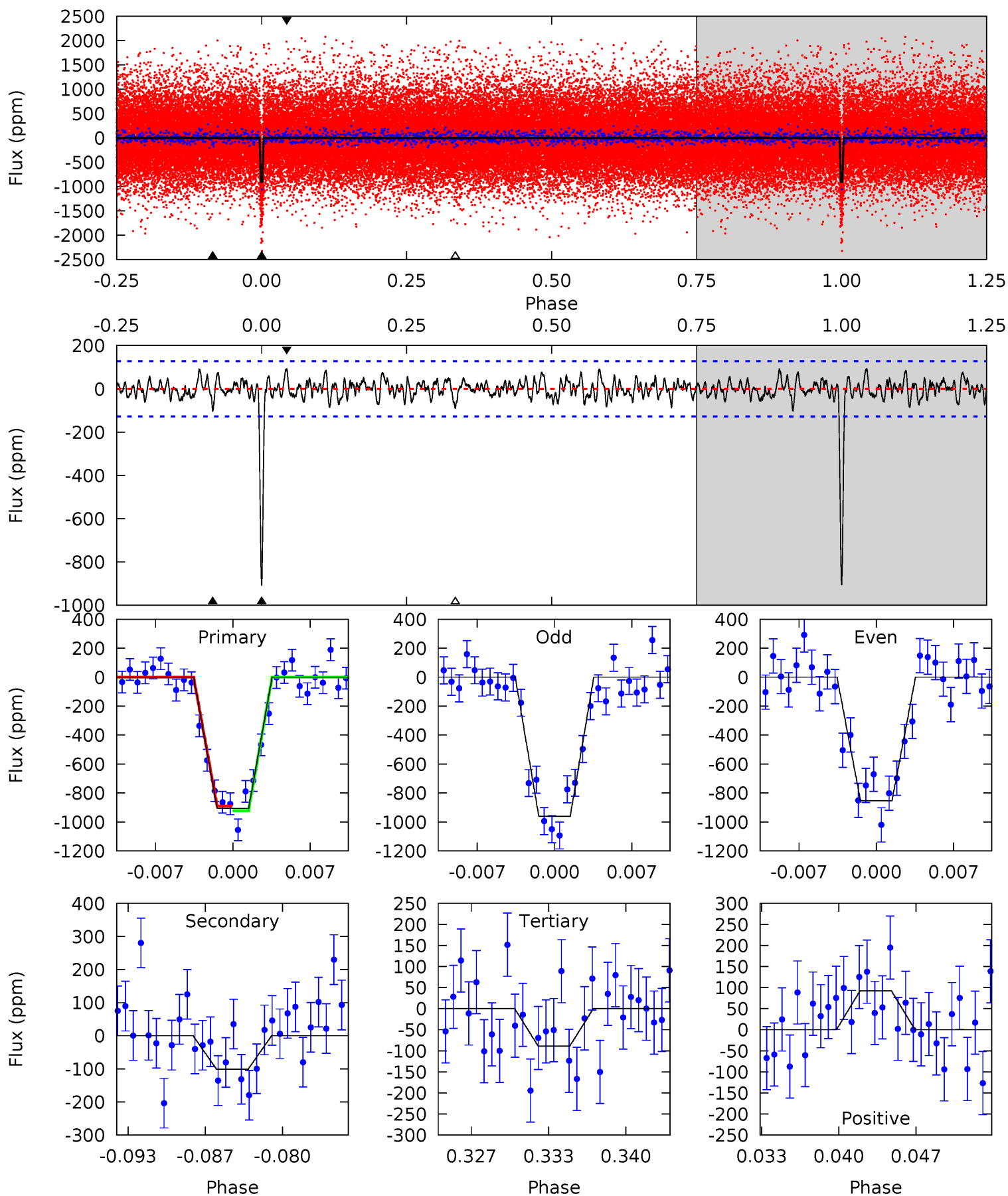
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.5	4.96	4.54	4.62	5.05	2.62	1.52	35.9	35.8	0.42	0.34	2.51	1.01	0.10	0.42



Alt Model-Shift Uniqueness Test

012066335-02, P = 10.065297 Days, E = 126.220180 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.3	4.07	3.57	3.69	5.10	2.71	1.30	32.7	32.6	0.50	0.37	2.15	0.98	0.09	0.62



Stellar Parameters For KIC 012066335

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4077^{+81}_{-81}	$4.702^{+0.027}_{-0.027}$	$-0.240^{+0.150}_{-0.150}$	$0.560^{+0.030}_{-0.034}$	$0.576^{+0.031}_{-0.035}$	$4.610^{+0.565}_{-0.503}$
	+2%/-2%	+1%/-1%	+62%/-62%	+5%/-6%	+5%/-6%	+12%/-11%
Source	SPE60	SPE60	SPE60	DSEP		

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

Secondary Eclipse Parameters for KIC 012066335-02 / KOI 0784.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-111 ± 22	$2.21^{+0.18}_{-0.18}$	683^{+15}_{-16}	2789^{+99}_{-106}	71^{+21}_{-16}
Alt.	-102 ± 25	$1.86^{+0.18}_{-0.18}$	684^{+16}_{-16}	2893^{+118}_{-140}	93^{+33}_{-28}

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 $A_{obs} \gg 1.0$

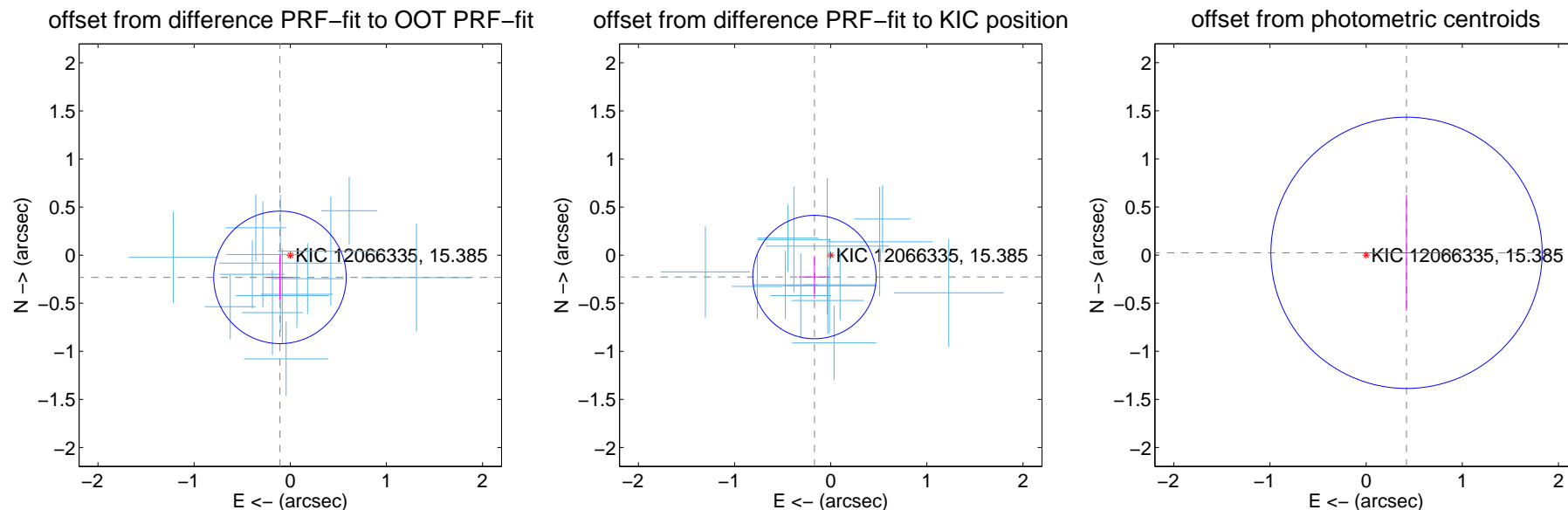
DV Centroid Data

Supplemental centroid analysis for 012066335-02. Kepler magnitude: 15.38. Transit SNR 25.69

There are 15 quarters with good PRF difference image offsets

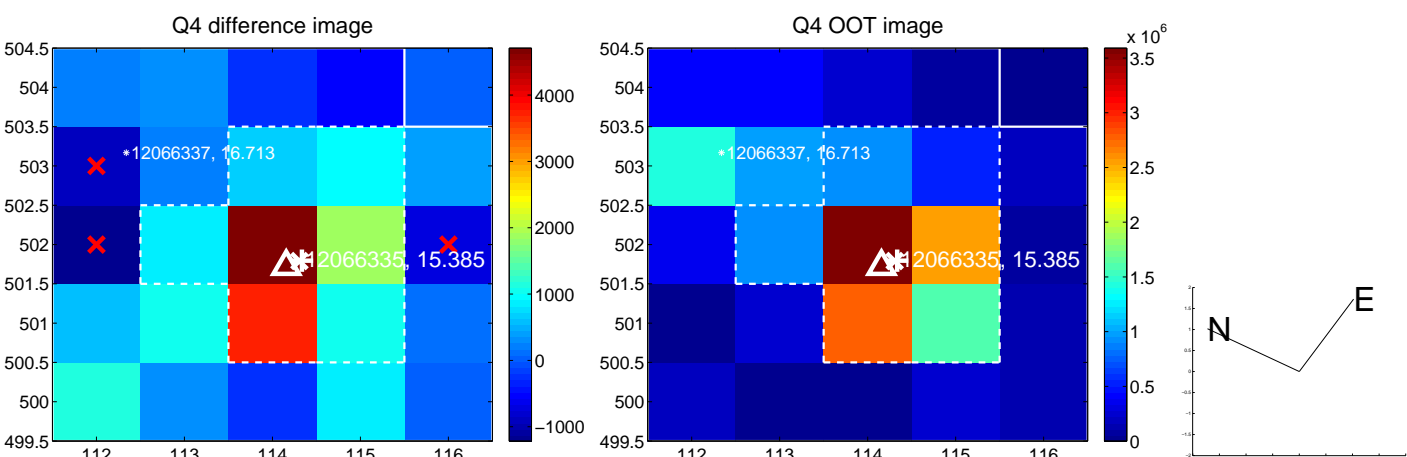
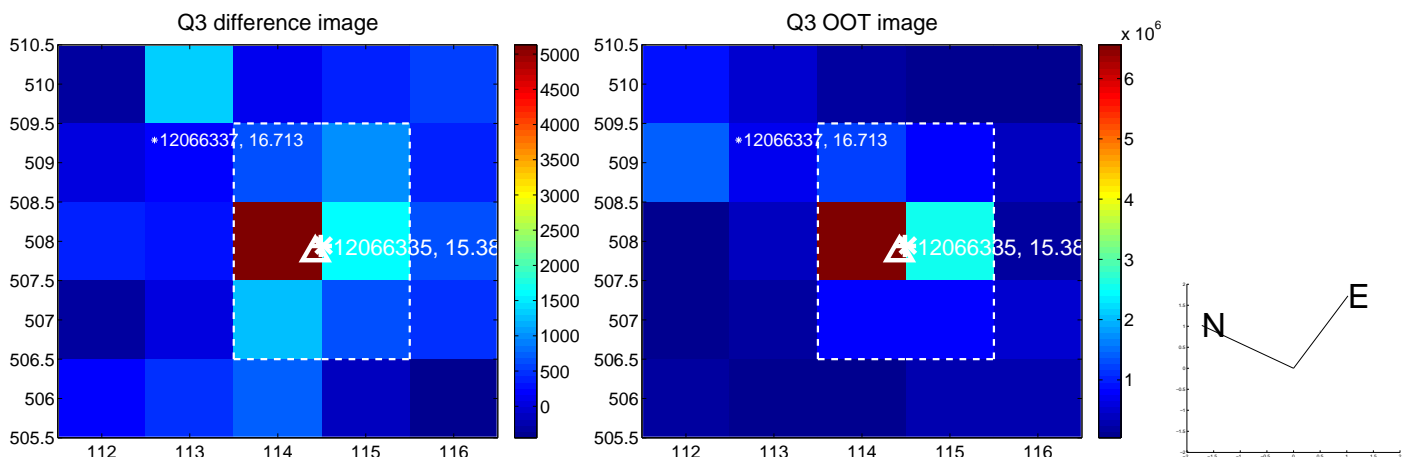
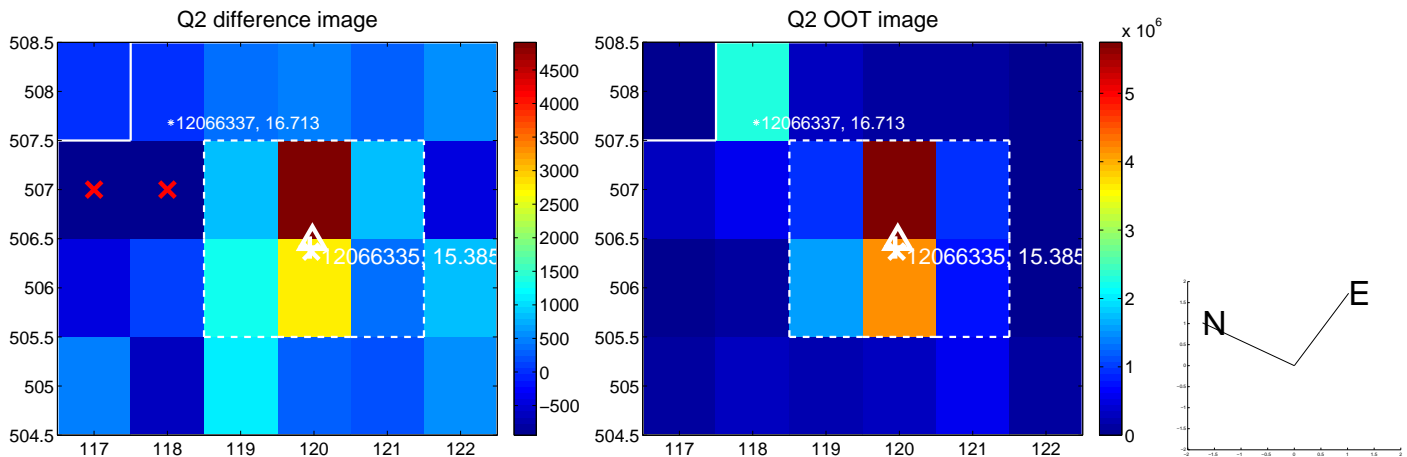
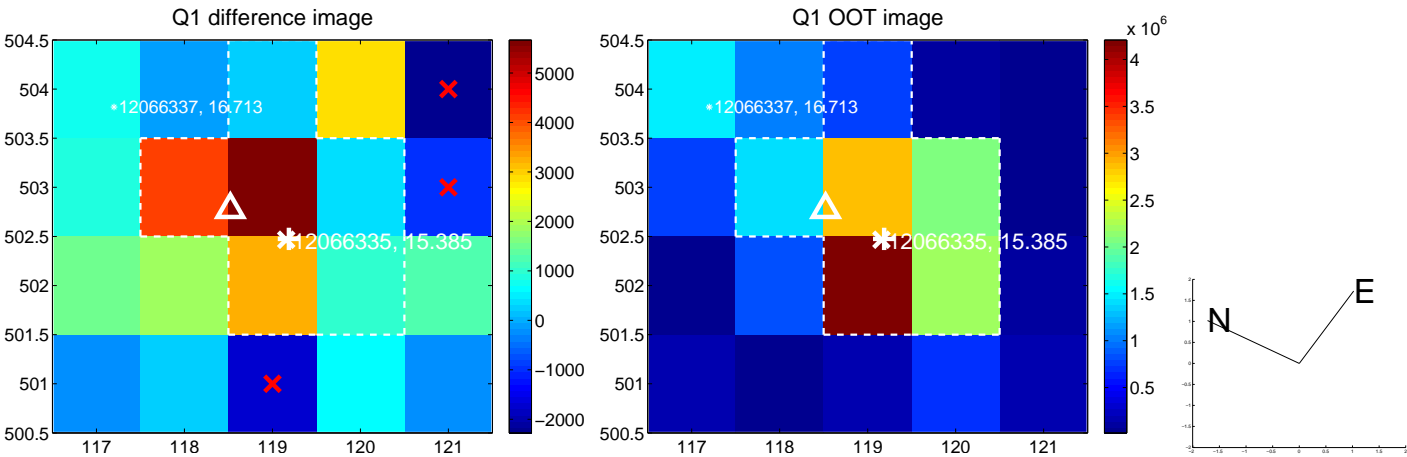
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.255 ± 0.230	1.11	0.107 ± 0.136	-0.231 ± 0.236
PRF-fit source offset from KIC position	0.283 ± 0.214	1.33	0.169 ± 0.165	-0.228 ± 0.220
photometric centroid source offset	0.42 ± 0.47	0.90	-0.42 ± 0.47	0.02 ± 0.60

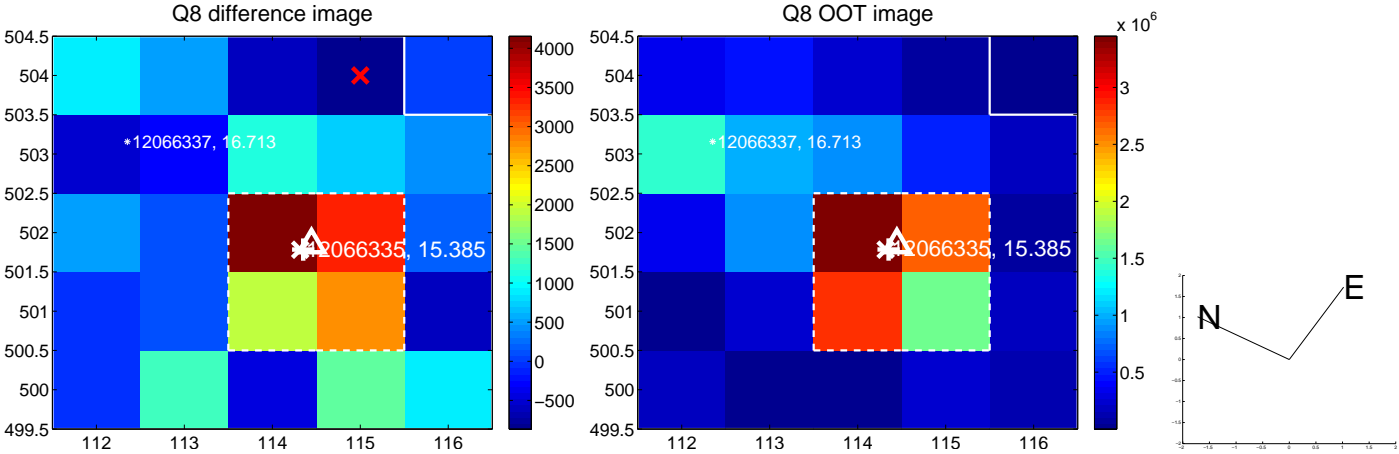
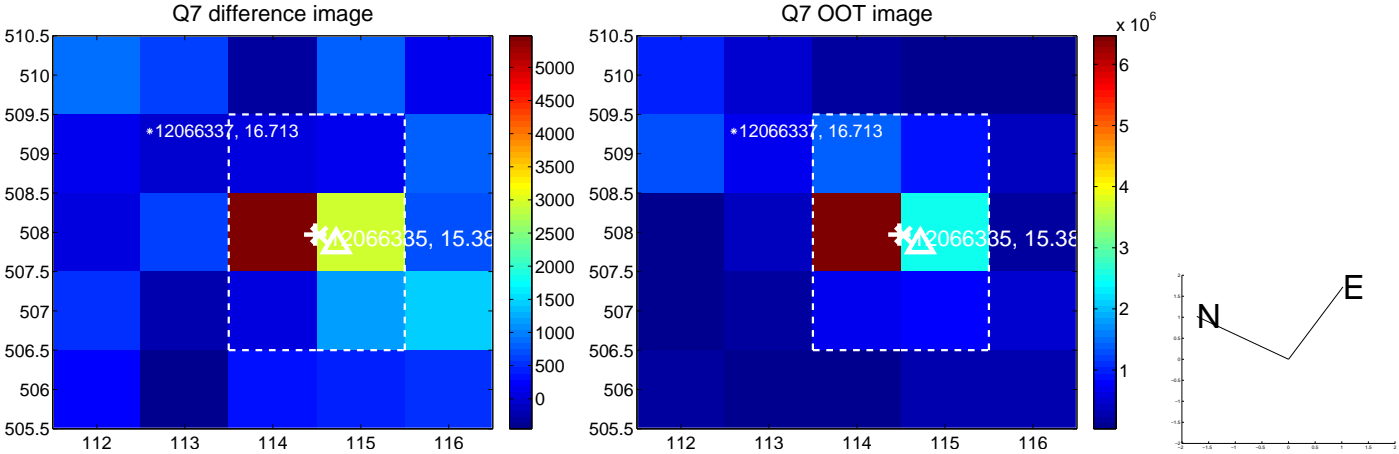
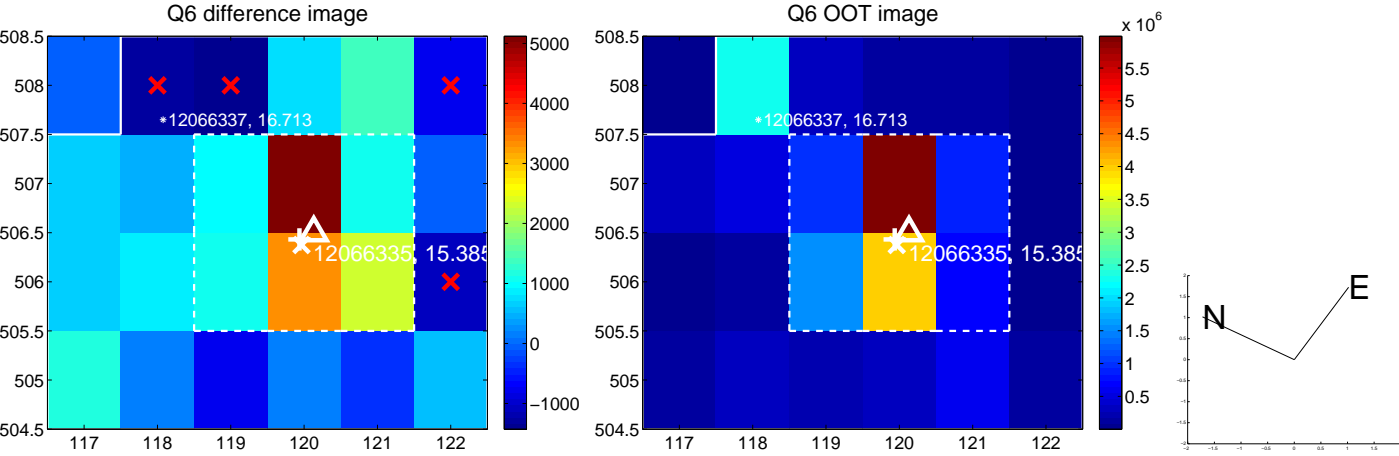
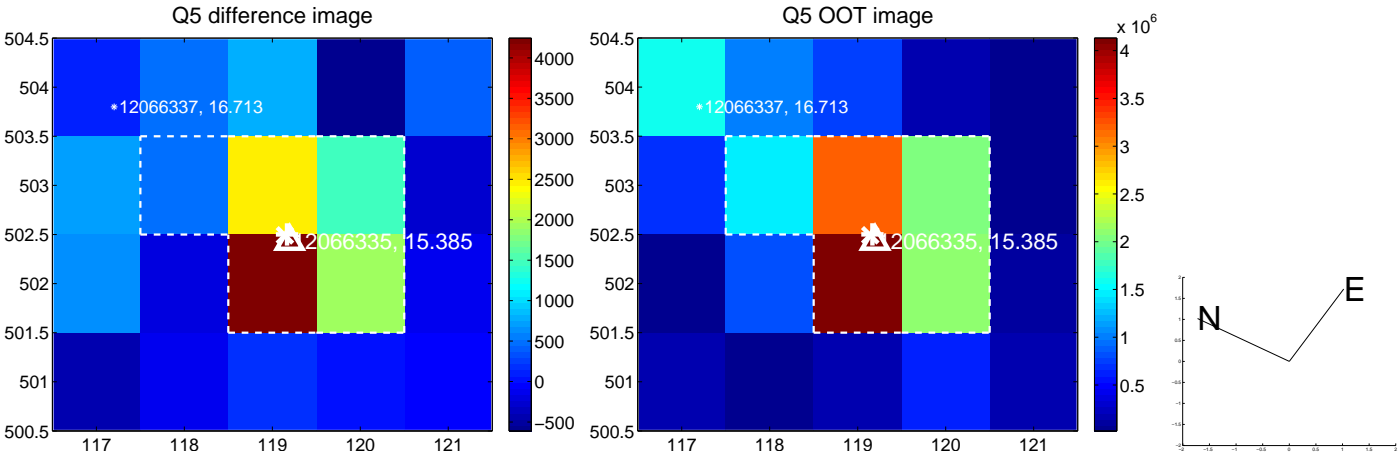


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

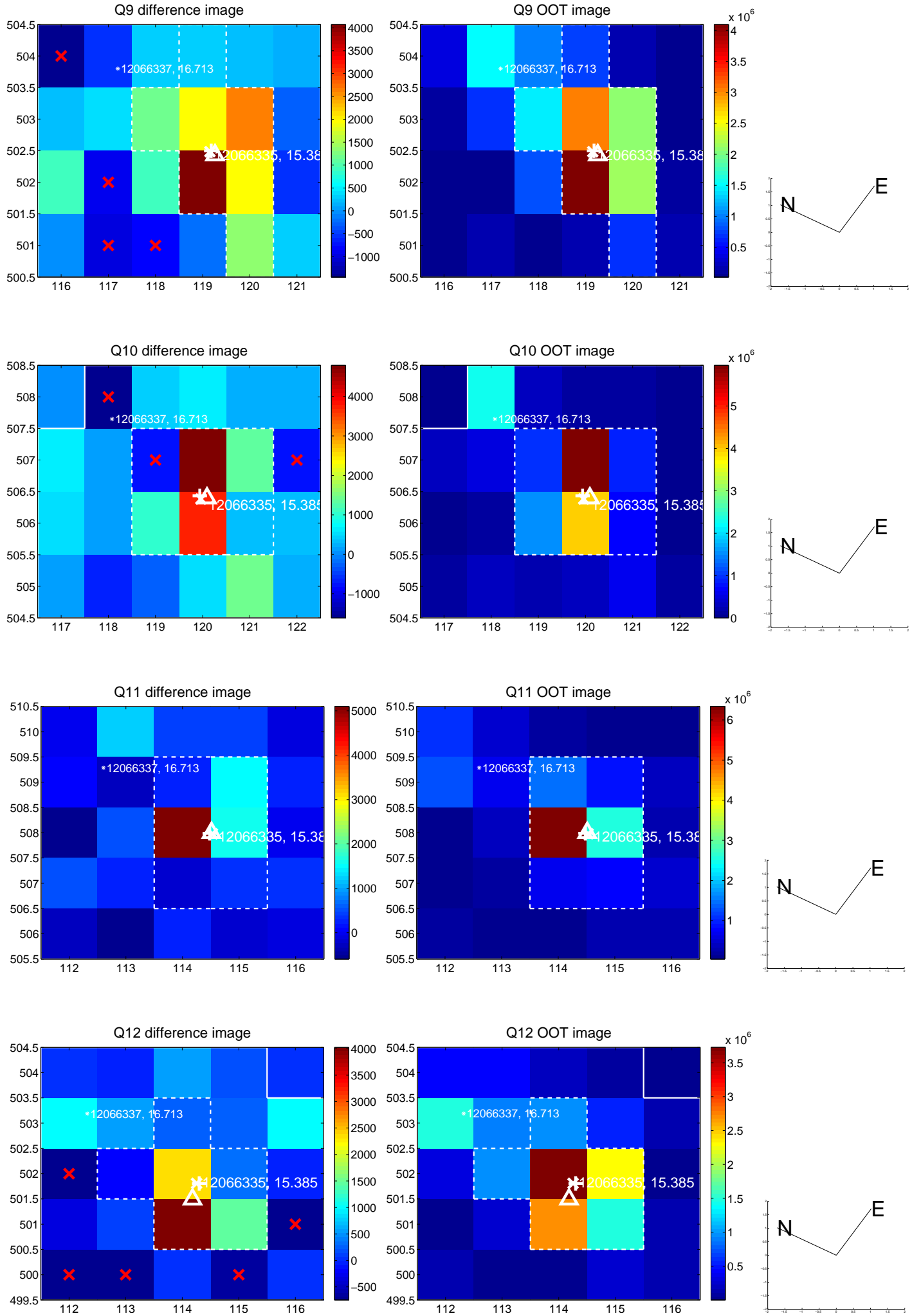
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



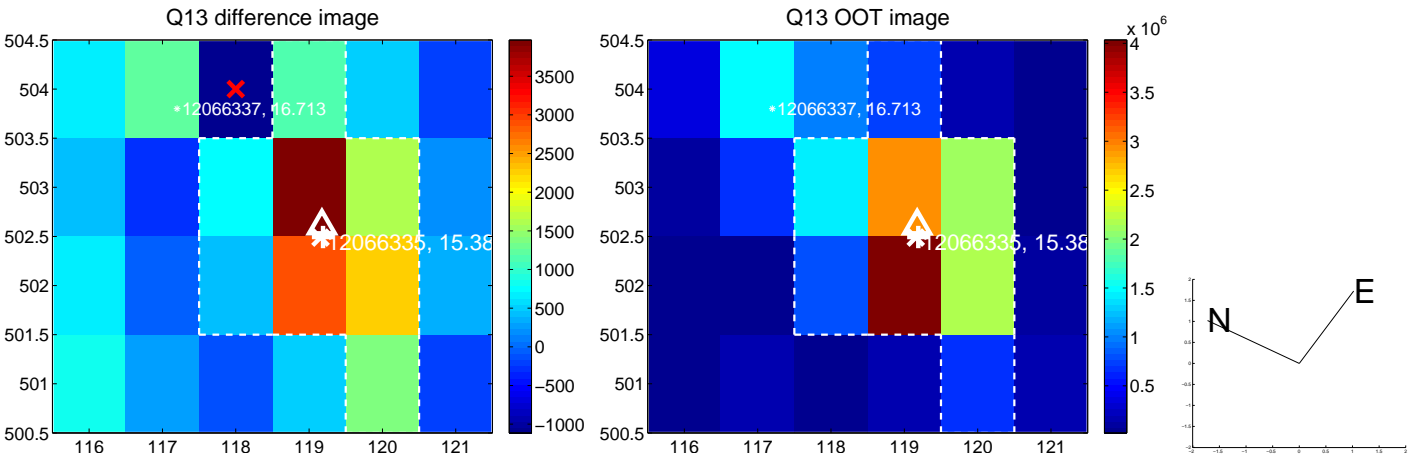
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



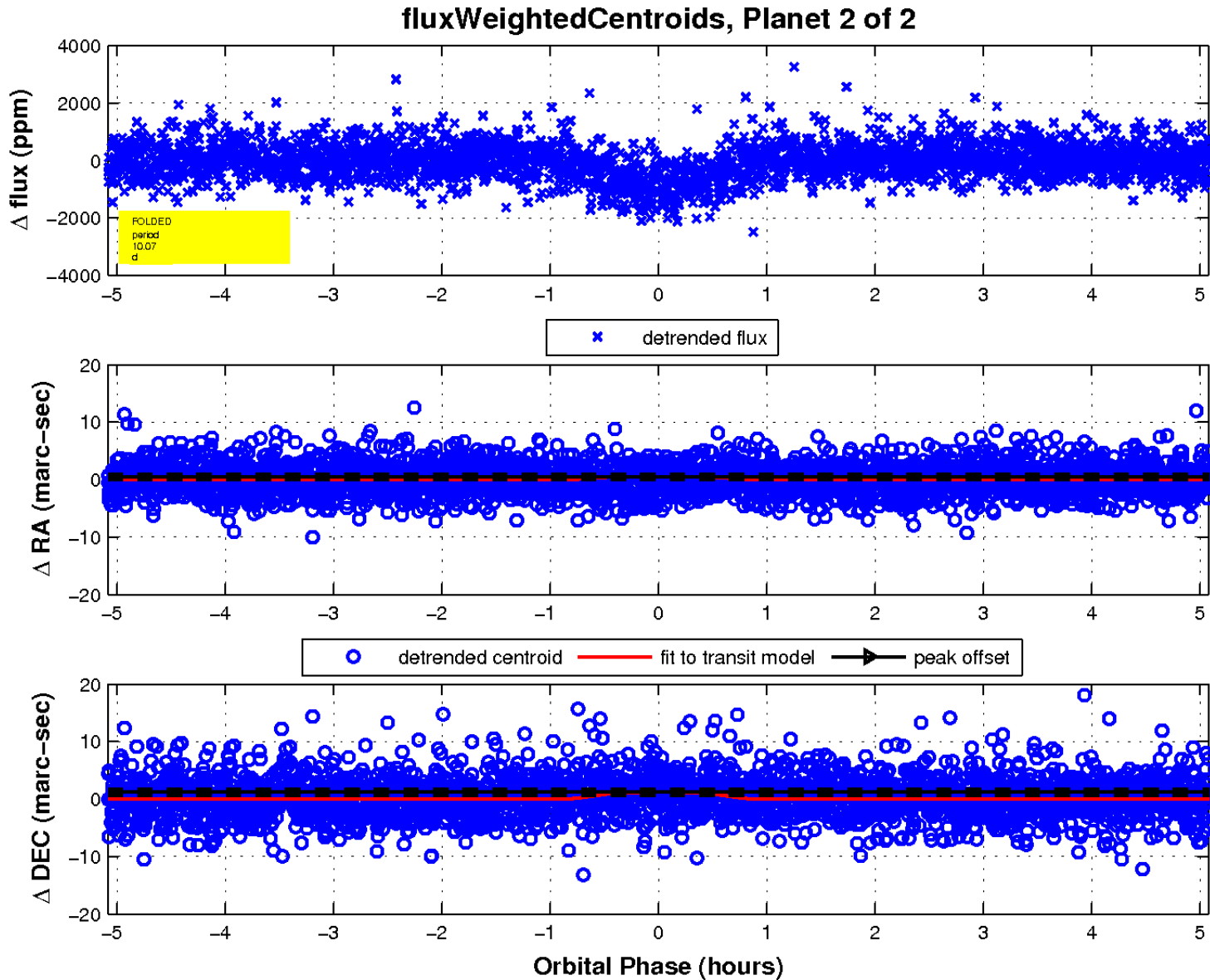
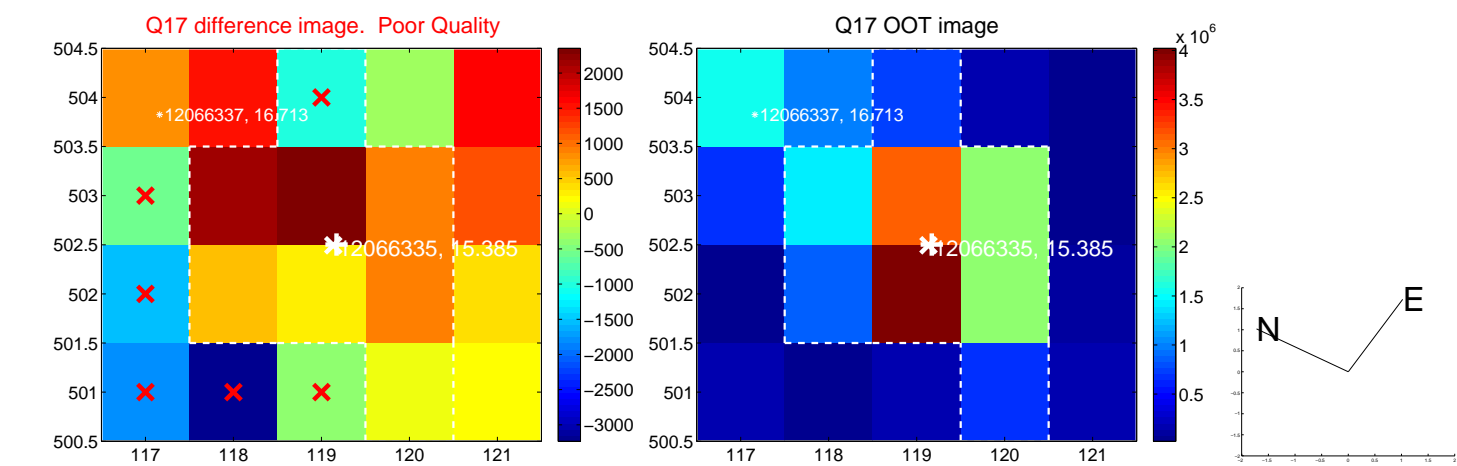
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

