

KIC 012106929

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})
012106929-01	OBS	0359.01	5.937189	135.954362	354.9	4.772	44.6	49.5	0.71	5857	1.77	151.29
012106929-02	OBS	No	5.937224	132.978090	64.3	4.683	10.2	10.7	0.71	5857	0.65	151.29

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012106929-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
012106929-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET—EPHEM_MATCH

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.

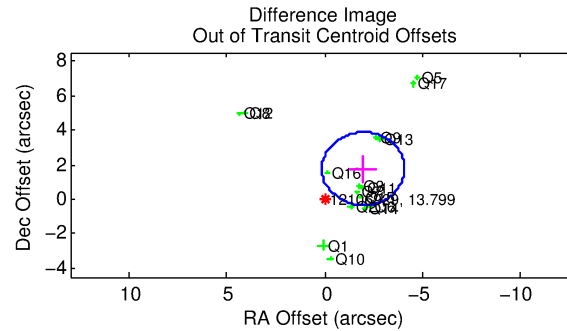
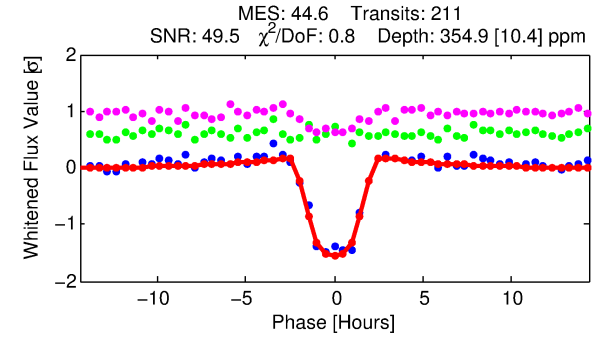
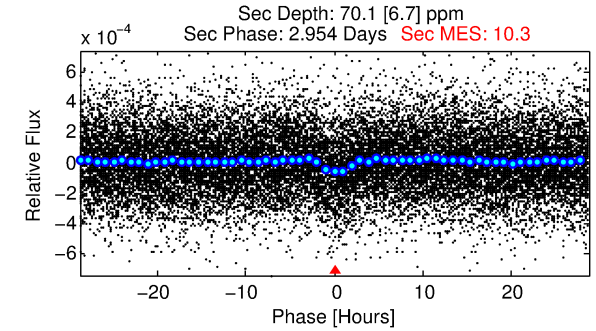
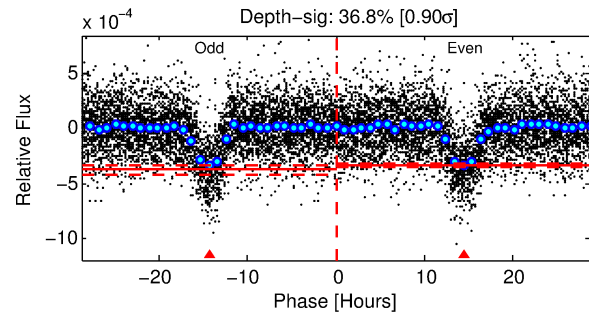
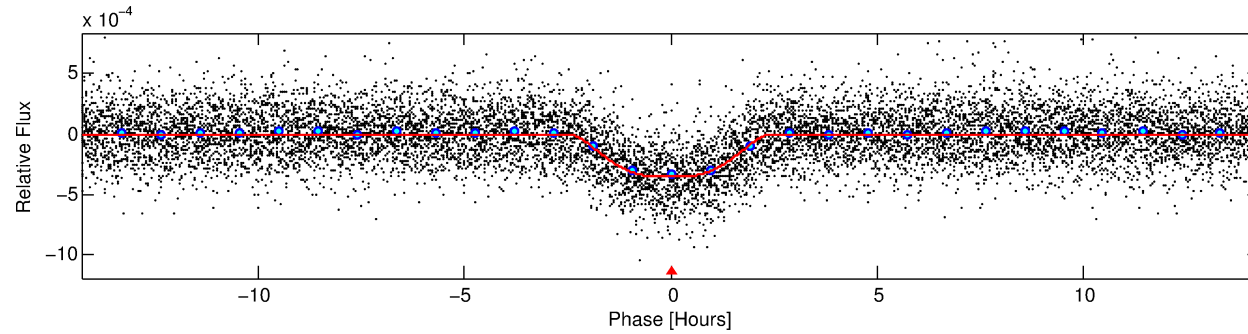
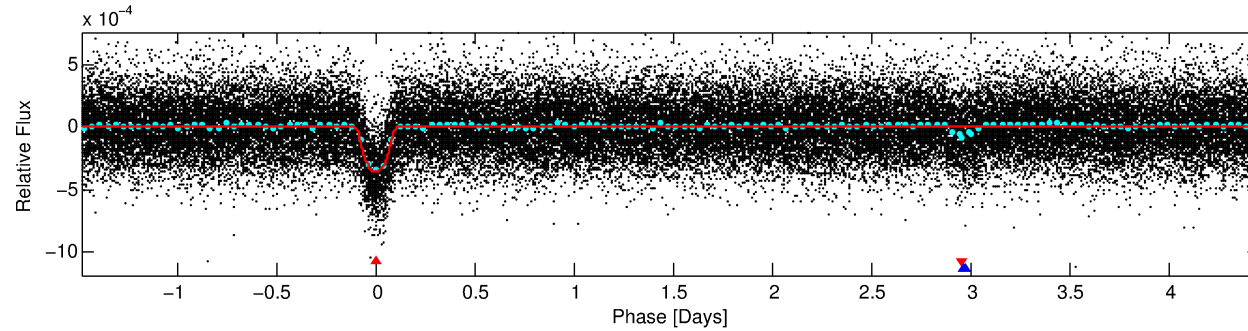
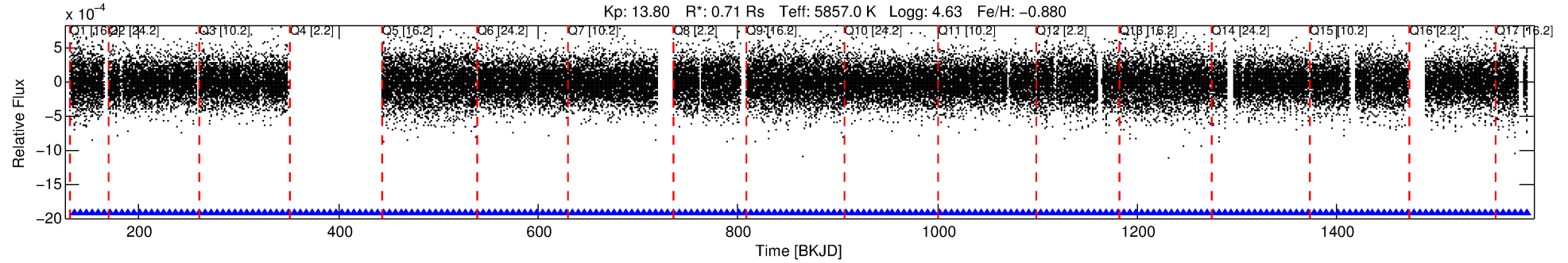
Ephemeris Match Information For 012106929-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	ΔRow	ΔCol	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
012106929-01	12106929	3895.01	12106934	1:1	12.0	-1	-2	18.36	13.80	127.63	Direct-PRF	0	0.04	0.06

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 12106929 Candidate: 1 of 2 Period: 5.937 d
KOI: K00359.01 Corr: 0.986



DV Fit Results:

Period = 5.93719 [0.00002] d
Epoch = 135.9544 [0.0021] BKJD
Rp/R* = 0.0228 [0.0005]
a/R* = 3.10 [0.12]
b = 0.97 [0.00]
Seff = 151.29 [38.19]
Teq = 894 [56] K
Rp = 1.77 [0.31] Re
a = 0.0594 [0.0090] AU
Ag = 43.34 [10.87] [3.90 σ]
Teffp = 3548 [133] K [18.38 σ]

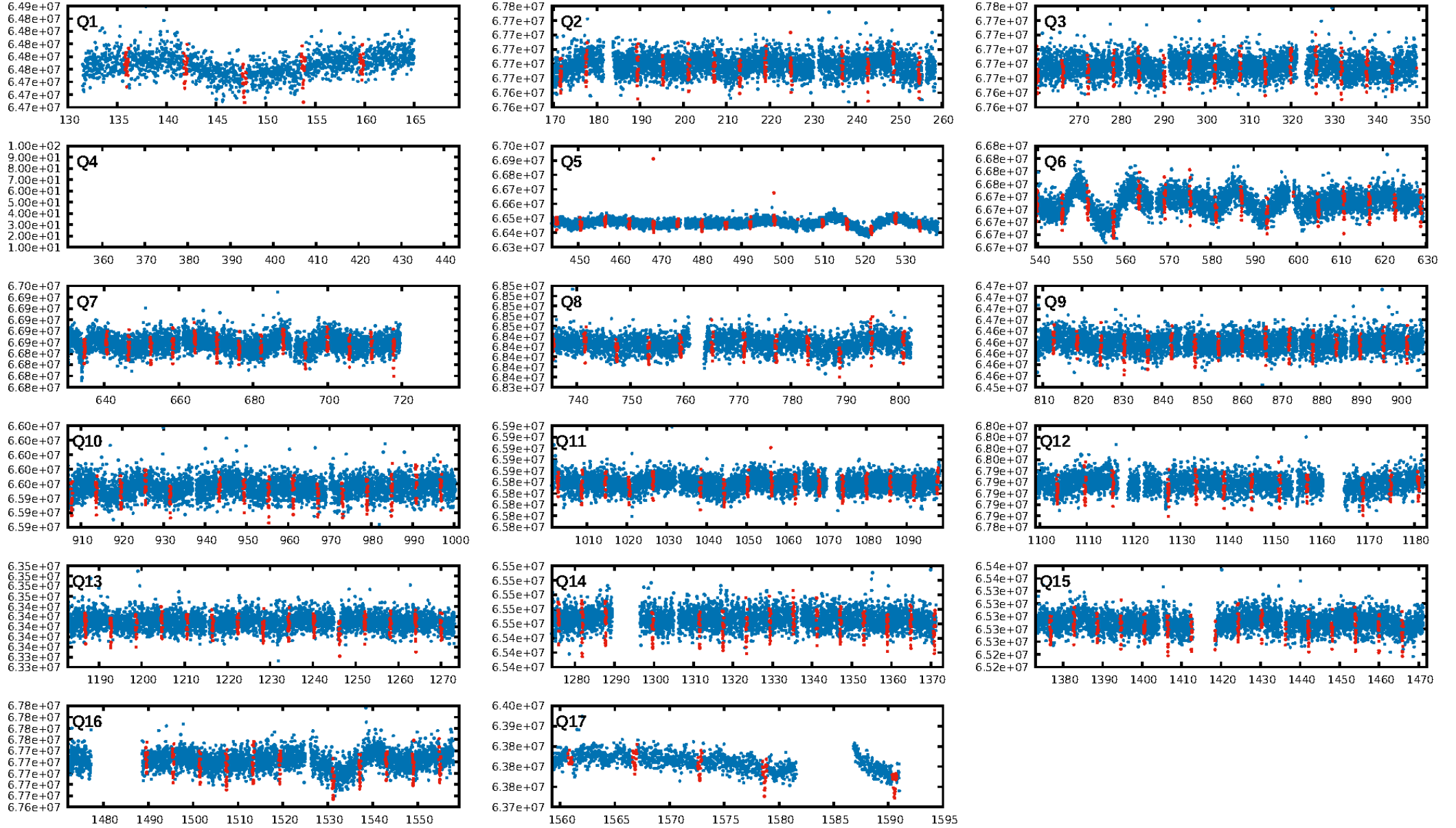
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [201/201]
GhostDiagnostic-chr: 0.05792
Centroid-sig: 0.0%
Centroid-so: 3.273 arcsec [12.34 σ]
OotOffset-rm: 2.642 arcsec [3.76 σ]
KicOffset-rm: 2.827 arcsec [4.01 σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 0.00 [0/16]
DiffImageOverlap-fno: 1.00 [16/16]

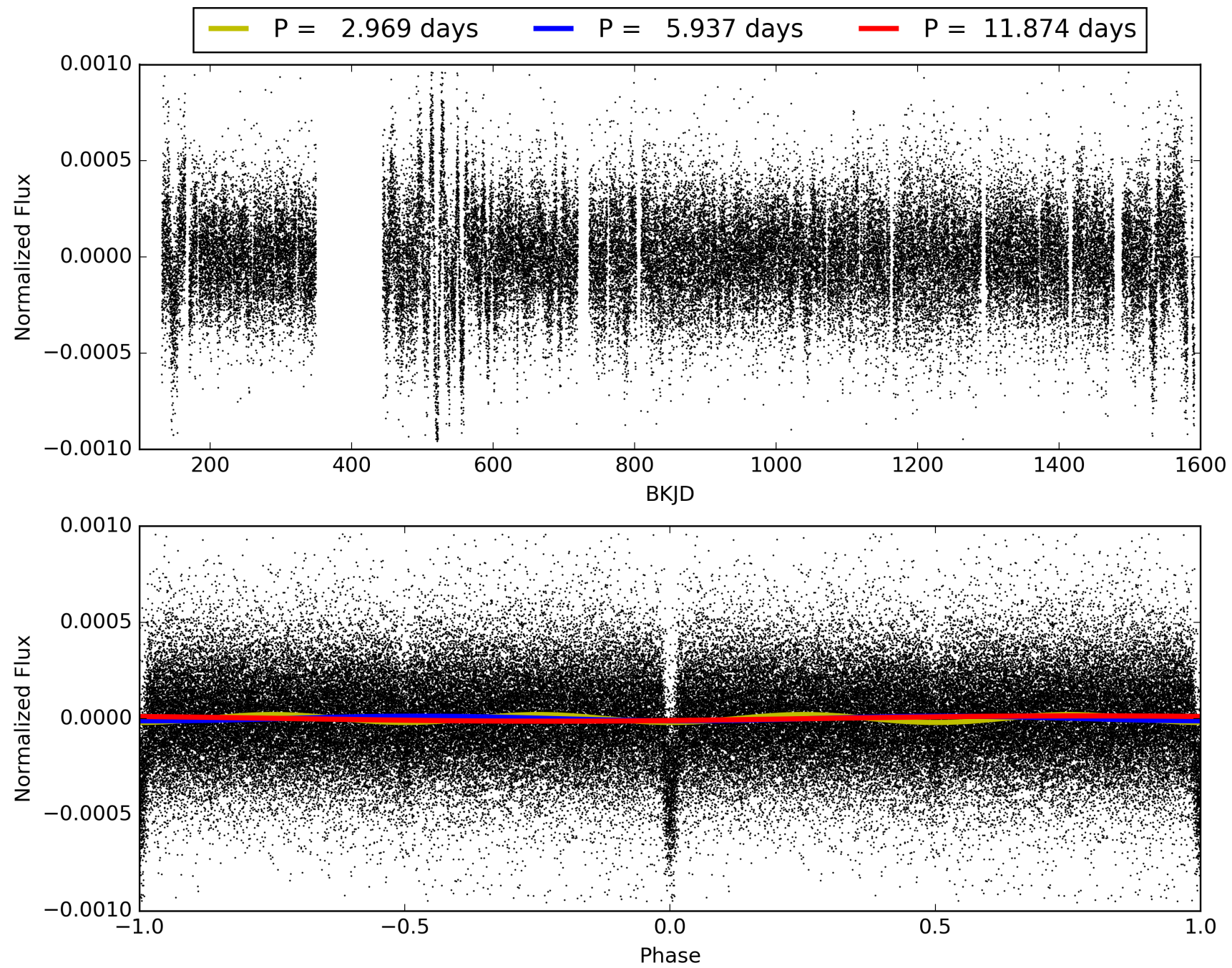
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012106929-01, PDC Light Curves

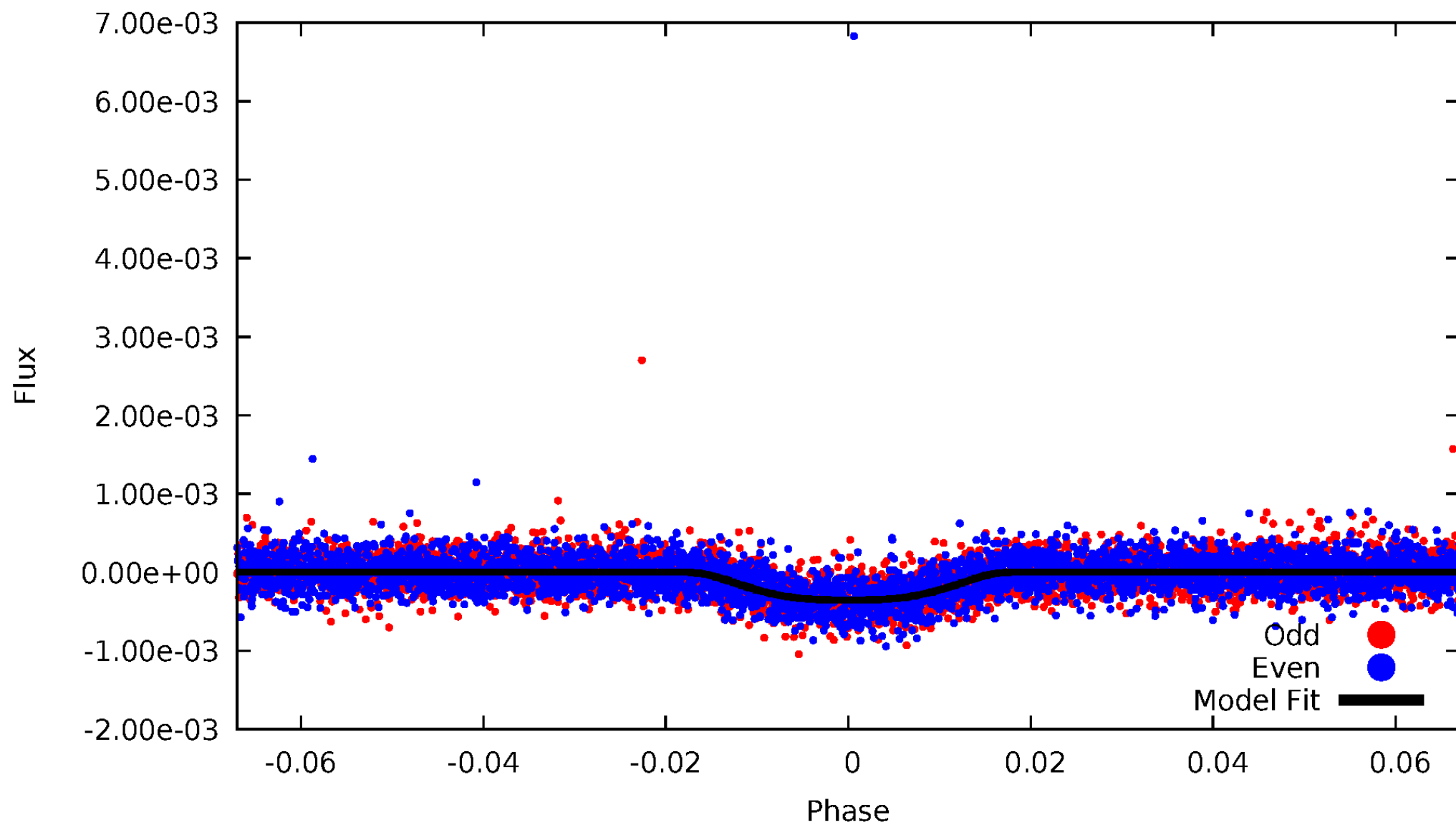


TCE 012106929-01



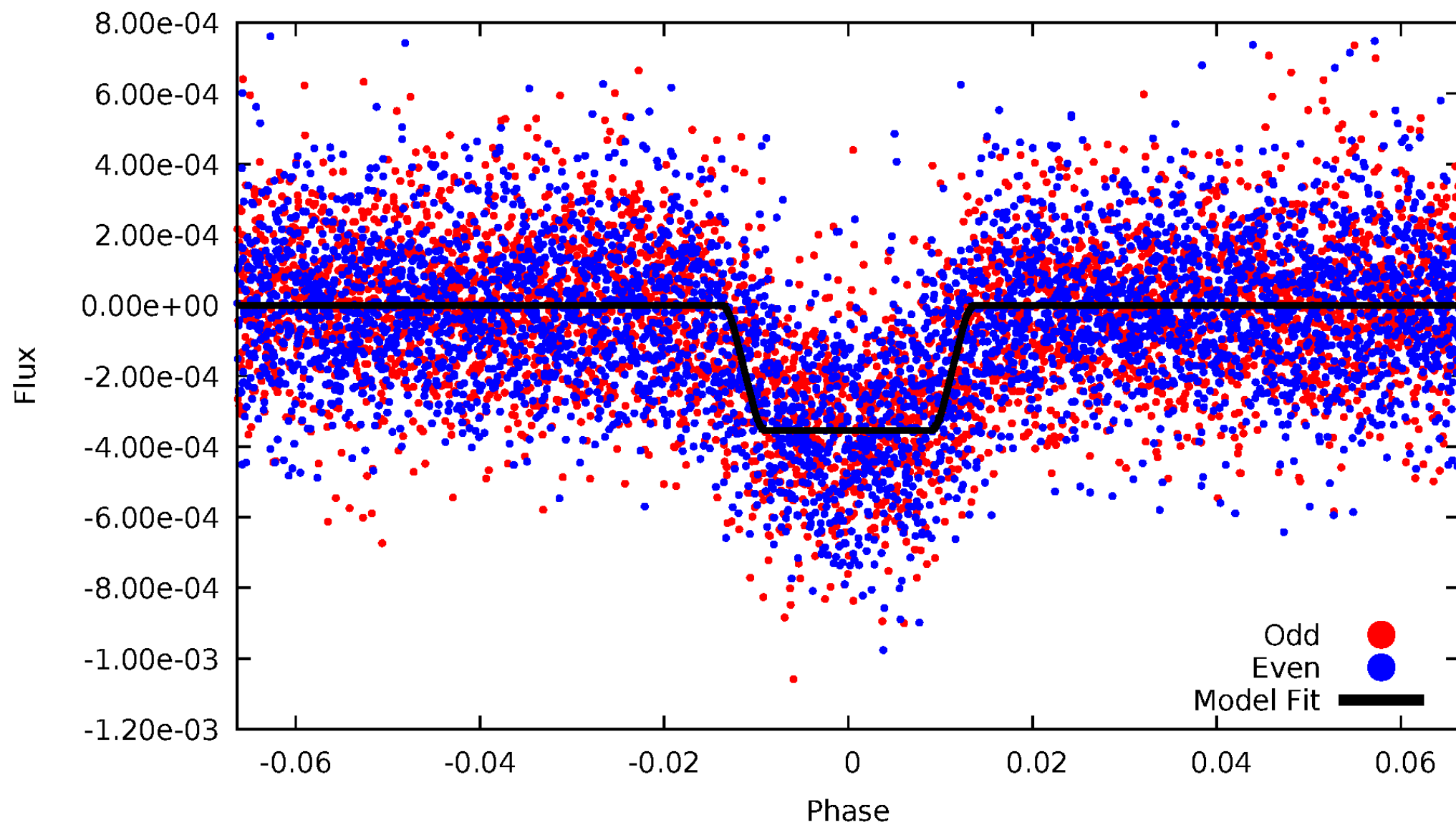
DV Odd/Even

TCE 012106929-01



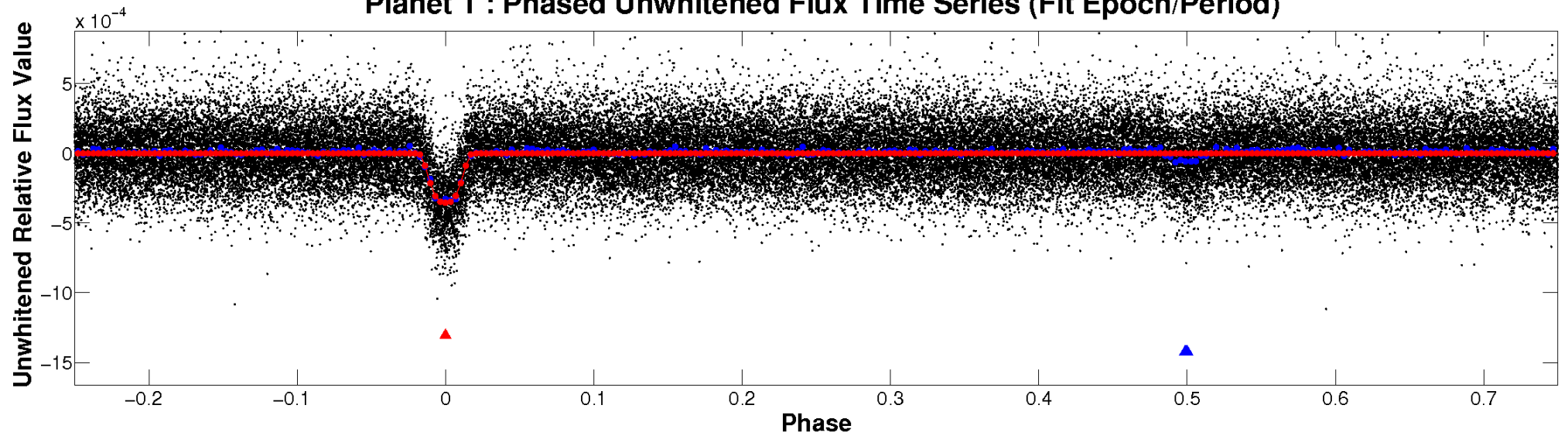
ALT Odd/Even

TCE 012106929-01

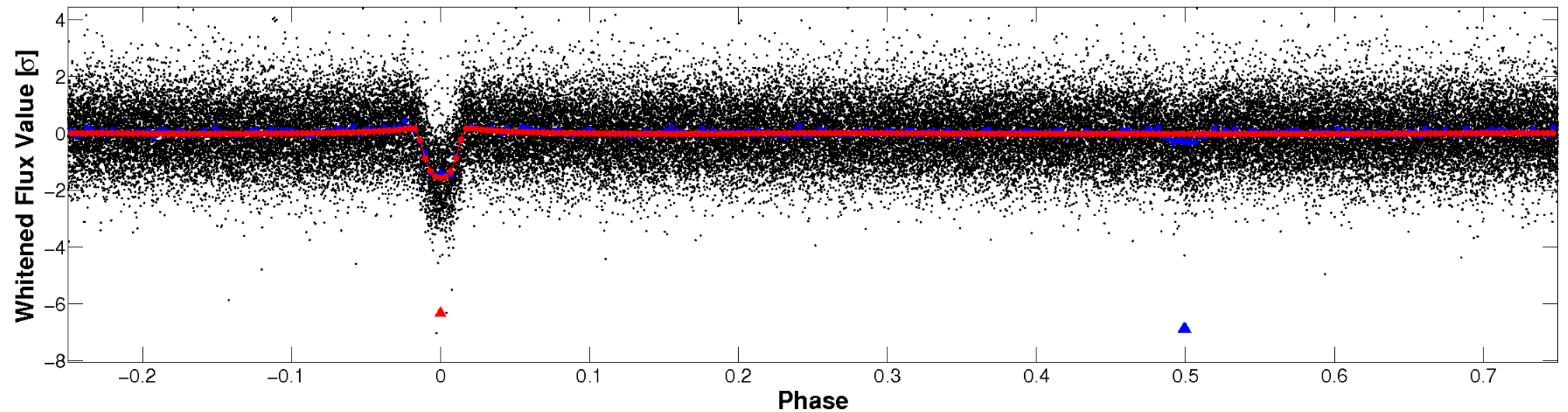


Non-Whitened Vs. Whitened Light Curve

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

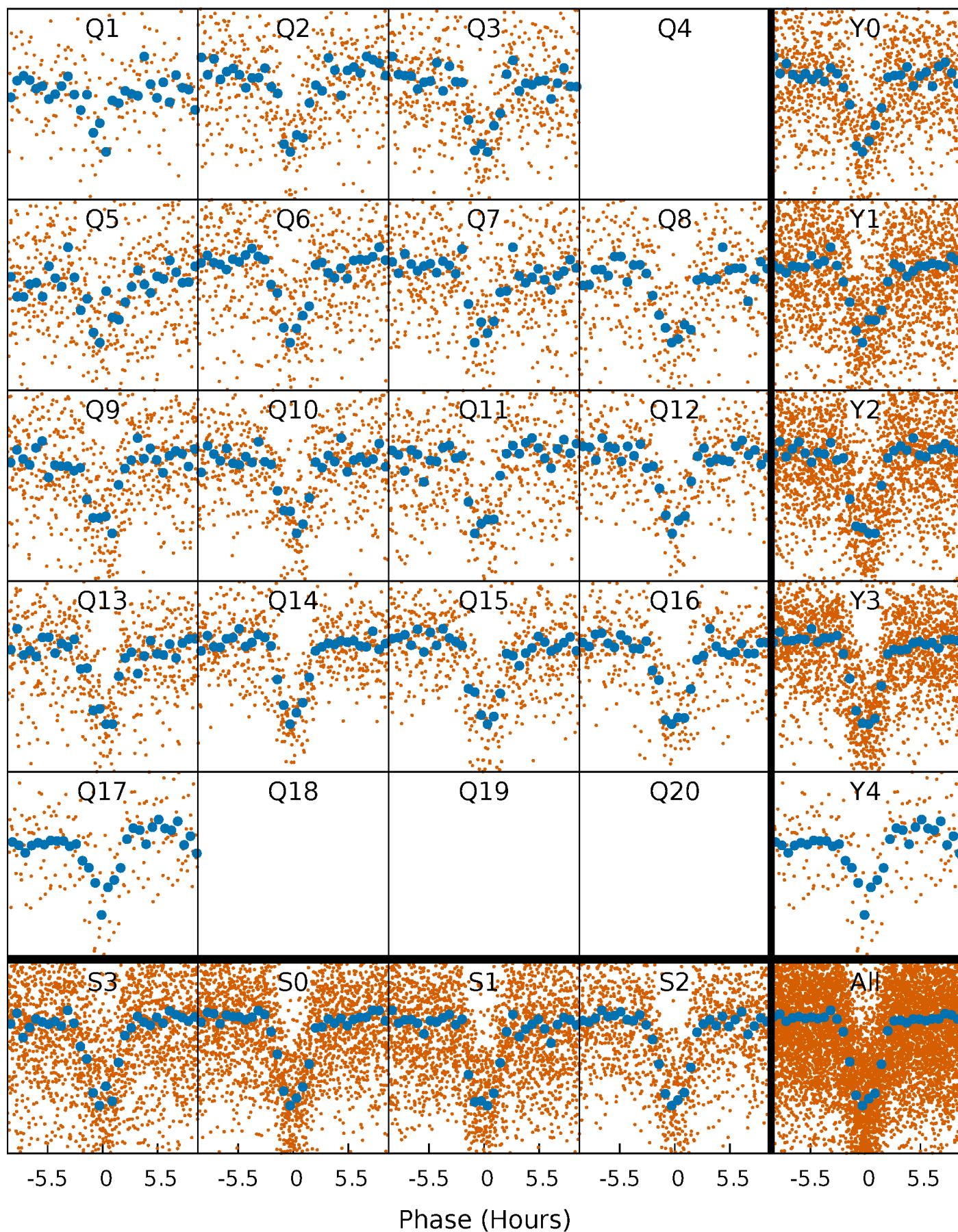


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



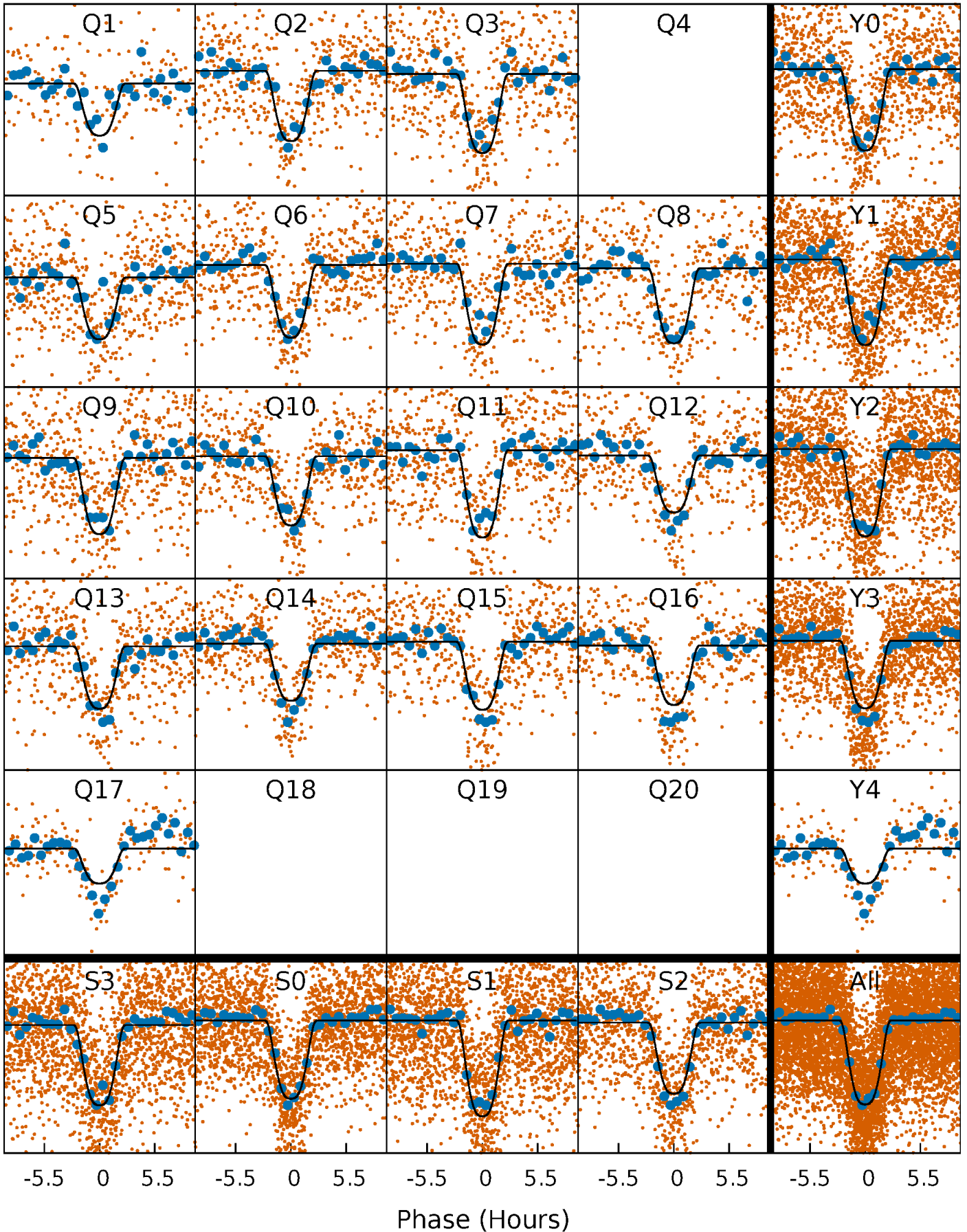
PDC Quarter-Phased Transit Curves

TCE 012106929-01 P= 5.937189 Days $T_0=135.954362$ (BKJD)



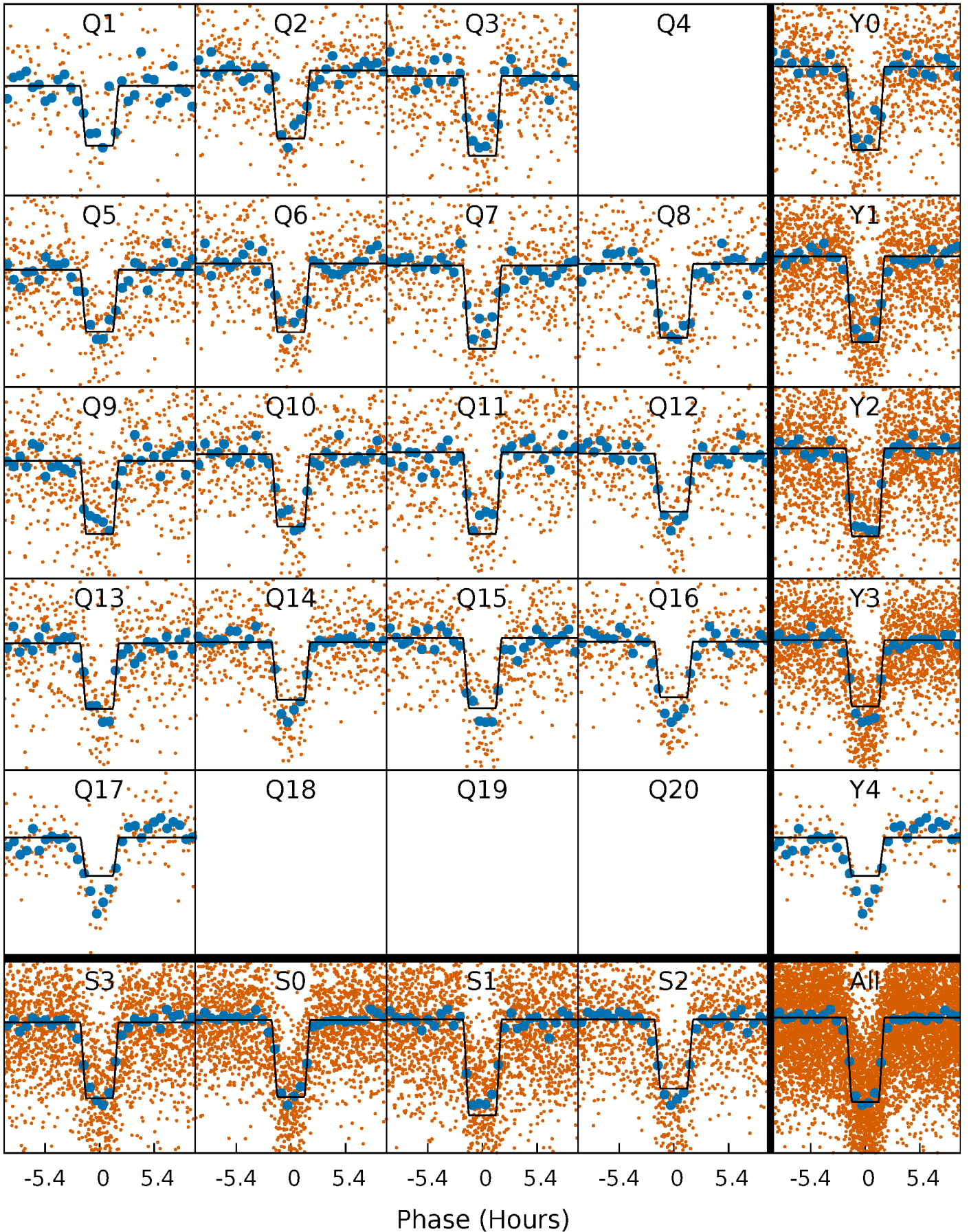
DV Quarter-Phased Transit Curves

TCE 012106929-01 P= 5.937189 Days $T_0=135.954362$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

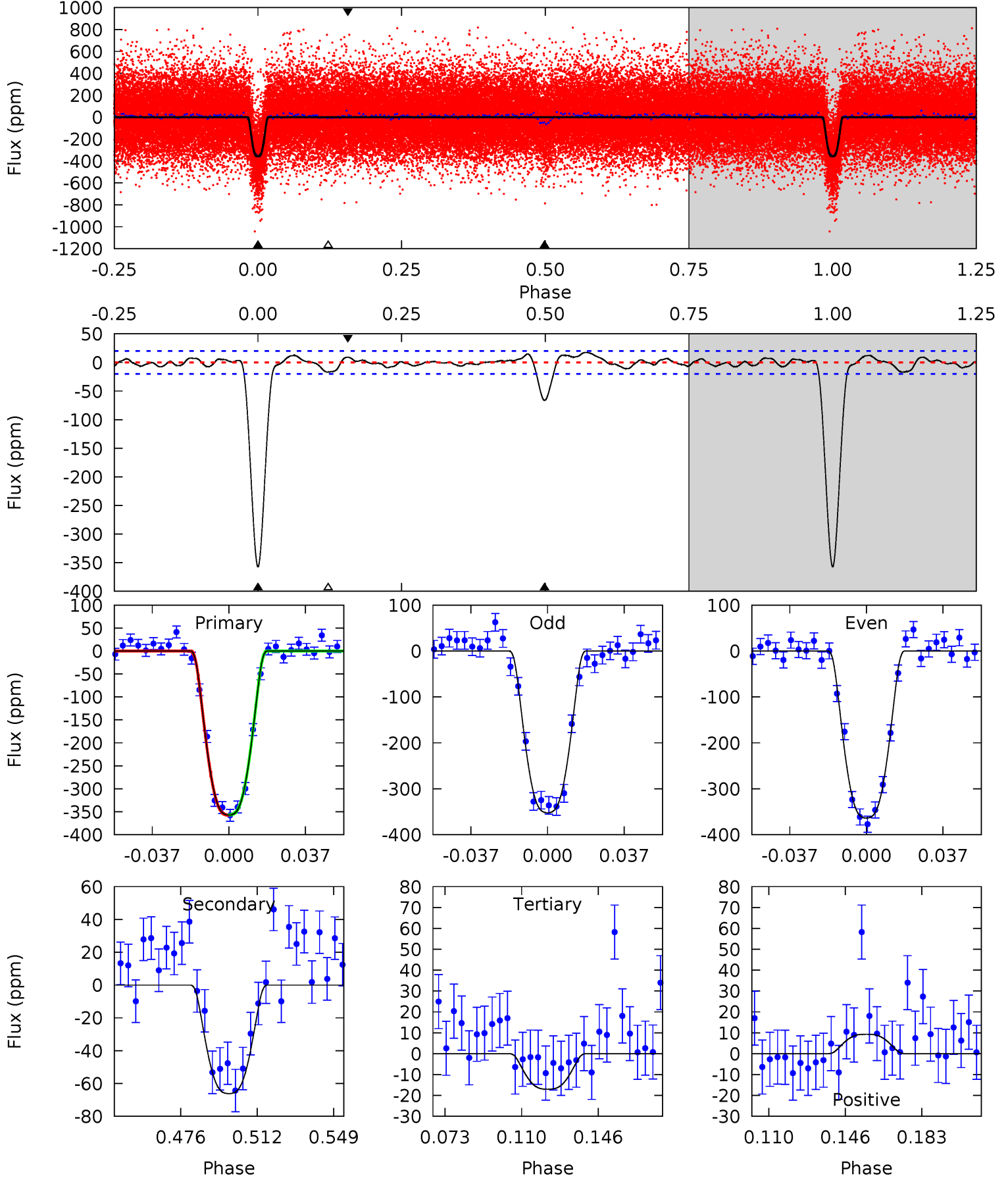
TCE 012106929-01 P= 5.937214 Days $T_0=135.951731$ (BKJD)



DV Model-Shift Uniqueness Test

012106929-01, P = 5.937189 Days, E = 130.017173 Days

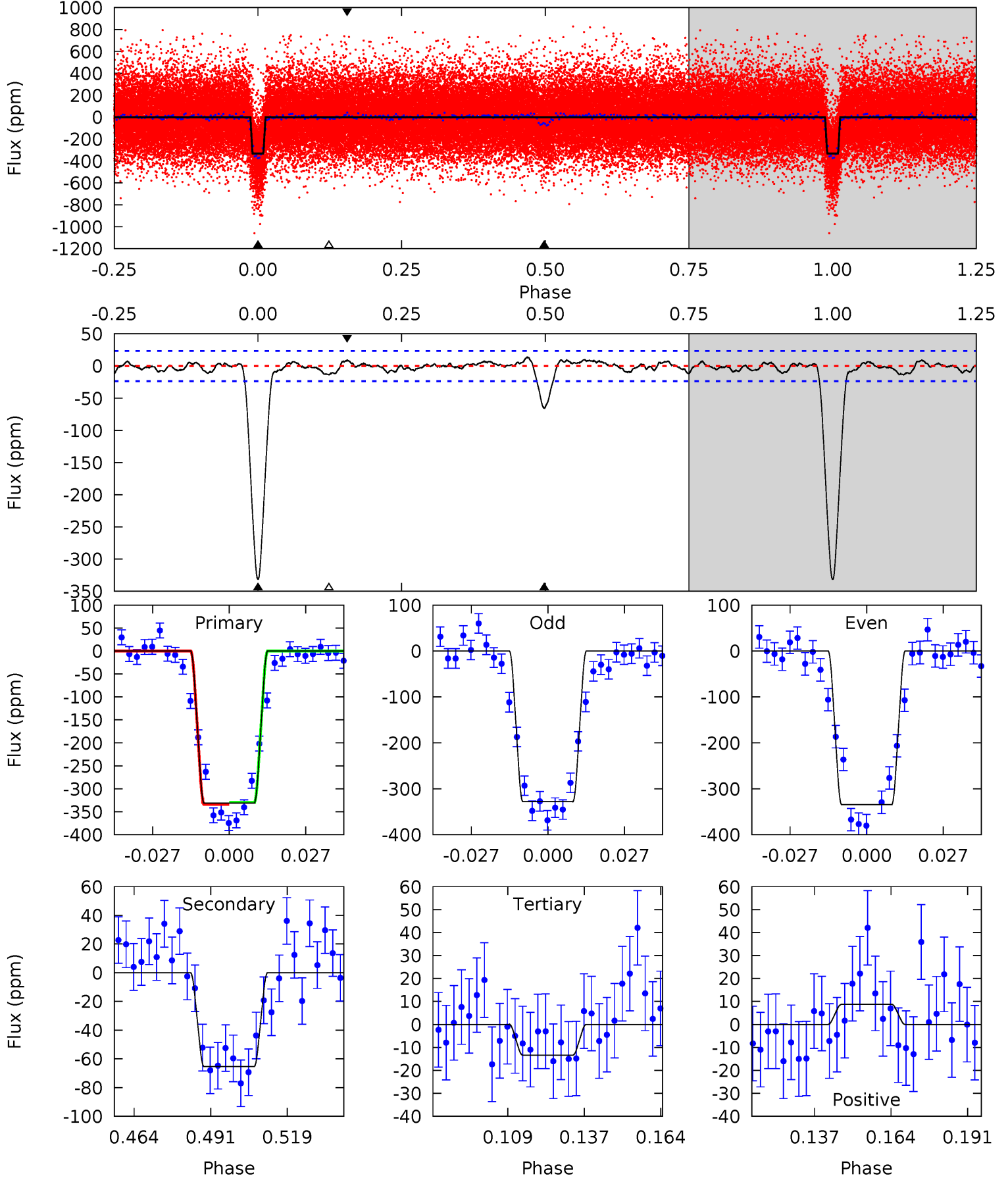
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
85.1	15.8	4.06	2.22	4.77	2.09	1.50	81.1	82.9	11.7	13.6	1.36	0.98	0.05	0.08



Alt Model-Shift Uniqueness Test

012106929-01, P = 5.937214 Days, E = 130.014517 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
68.2	13.5	2.76	1.80	4.83	2.21	1.08	65.5	66.4	10.7	11.7	0.70	1.00	0.04	0.46



Stellar Parameters For KIC 012106929

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5857^{+158}_{-158}	$4.633^{+0.032}_{-0.128}$	$-0.880^{+0.300}_{-0.300}$	$0.712^{+0.124}_{-0.041}$	$0.802^{+0.056}_{-0.077}$	$3.135^{+0.387}_{-1.169}$
	+3%/-3%	+1%/-3%	+34%/-34%	+17%/-6%	+7%/-10%	+12%/-37%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 012106929-01 / KOI 0359.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-66 ± 4	$1.80^{+0.18}_{-0.10}$	1268^{+54}_{-43}	3857^{+87}_{-89}	39^{+5}_{-6}
Alt.	-65 ± 5	$1.49^{+0.15}_{-0.09}$	1268^{+54}_{-48}	4116^{+110}_{-109}	56^{+7}_{-9}

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

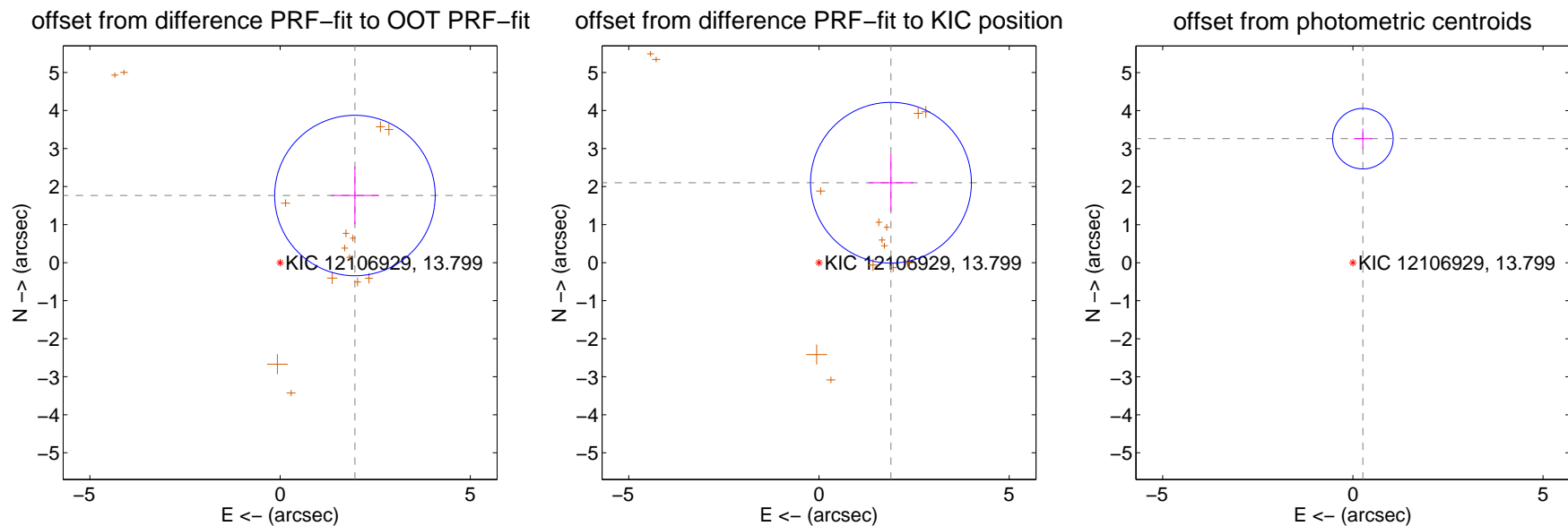
DV Centroid Data

Supplemental centroid analysis for 012106929-01. Kepler magnitude: 13.80. Transit SNR 49.51

There are 0 quarters with good PRF difference image offsets

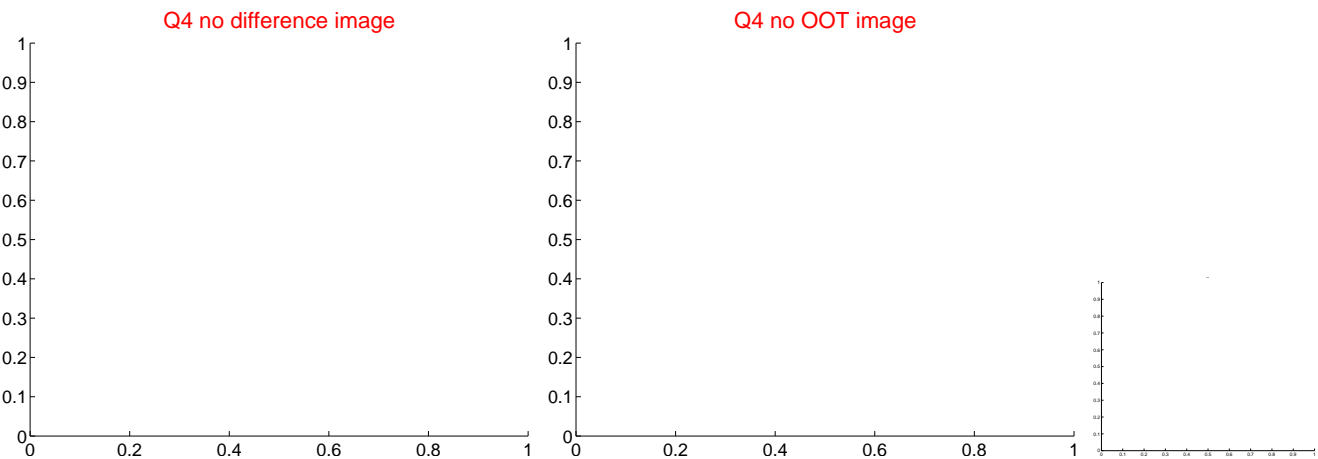
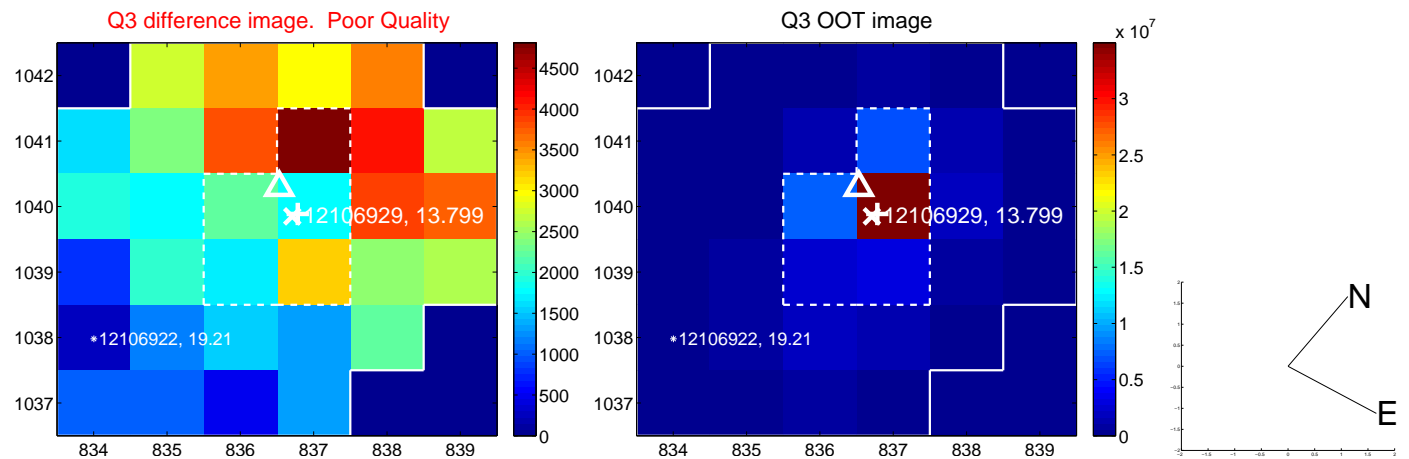
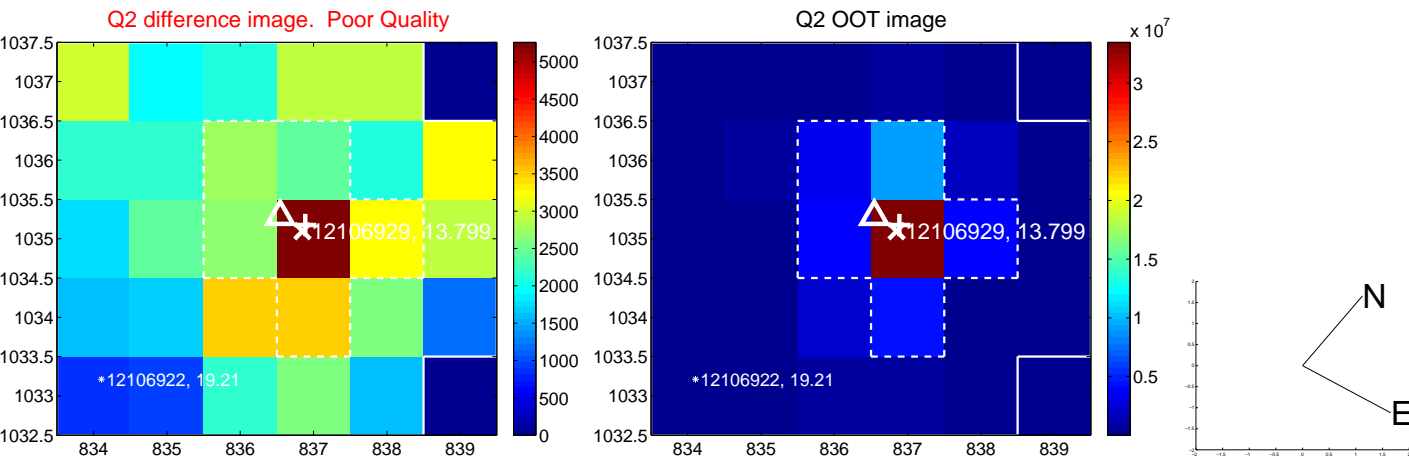
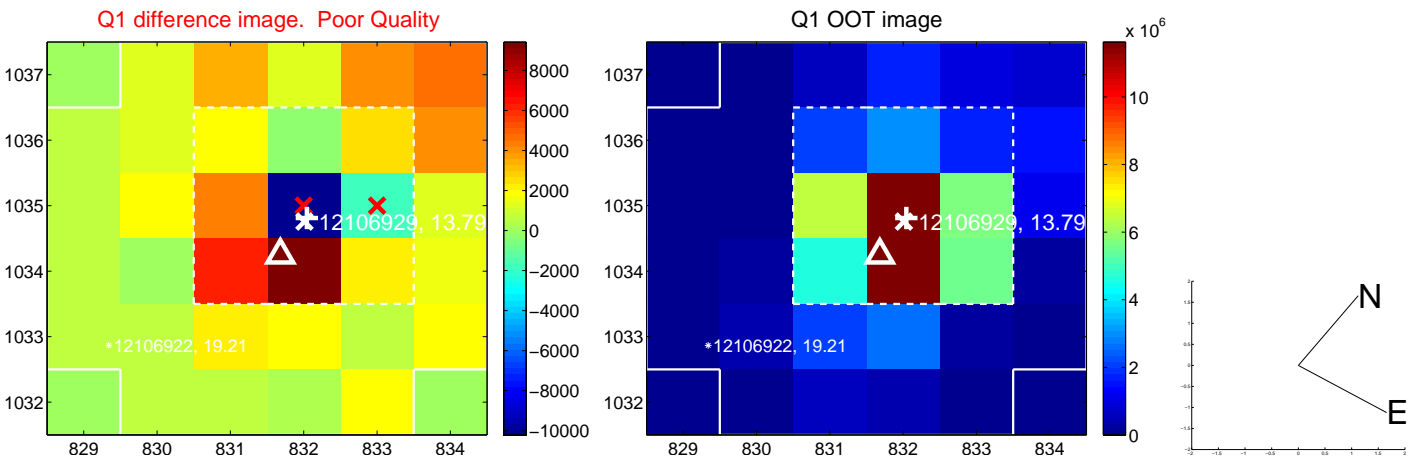
The direct PRF centroid is offset from the target star catalog position by about 0.45 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.642 ± 0.703	3.76	-1.966 ± 0.632	1.765 ± 0.759
PRF-fit source offset from KIC position	2.827 ± 0.705	4.01	-1.892 ± 0.589	2.101 ± 0.753
photometric centroid source offset	3.27 ± 0.27	12.34	-0.26 ± 0.24	3.26 ± 0.27

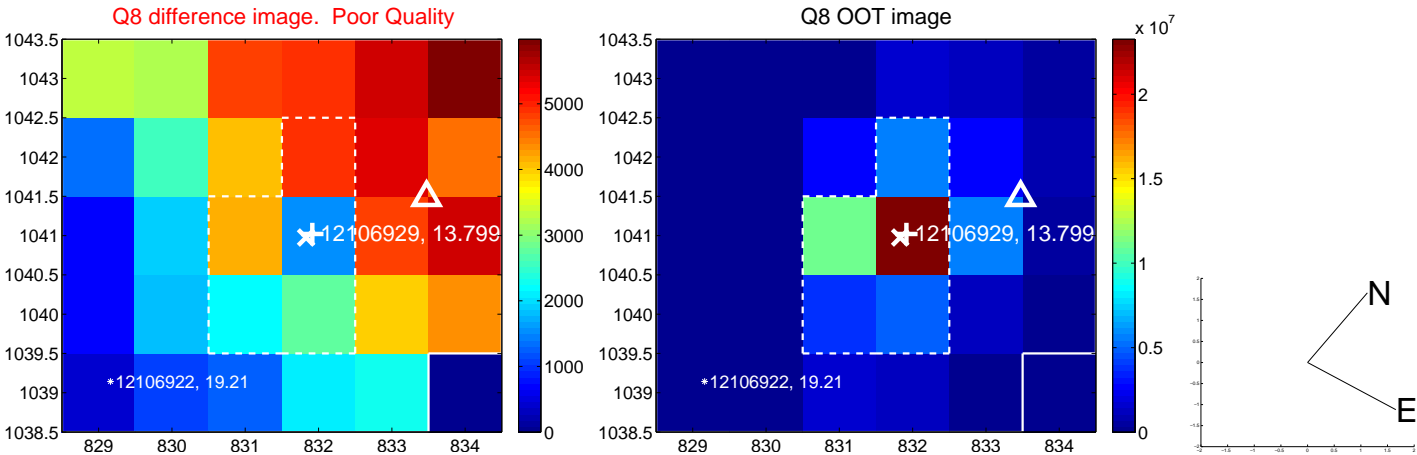
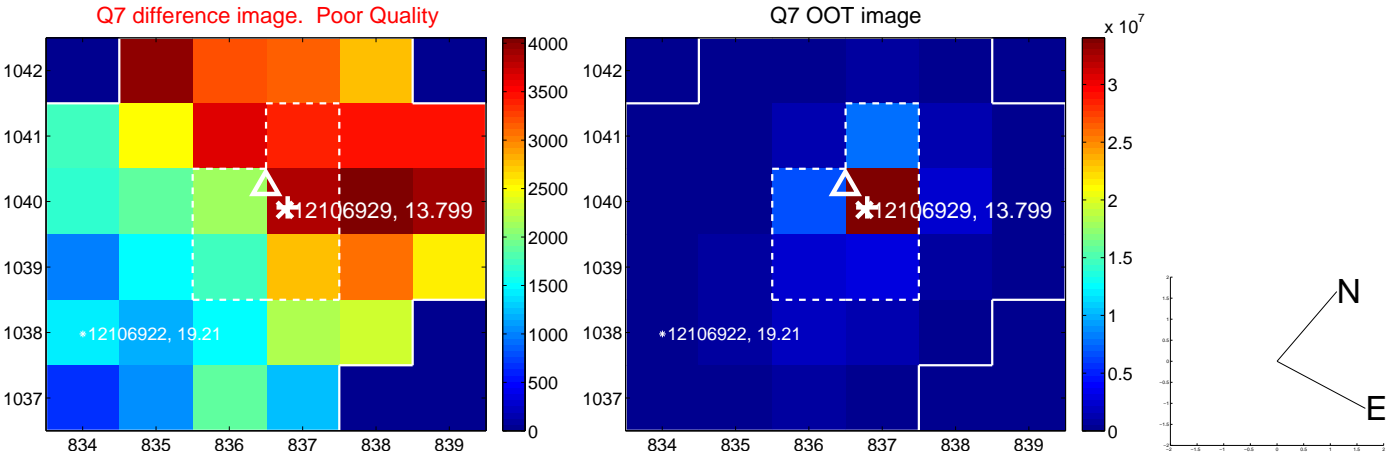
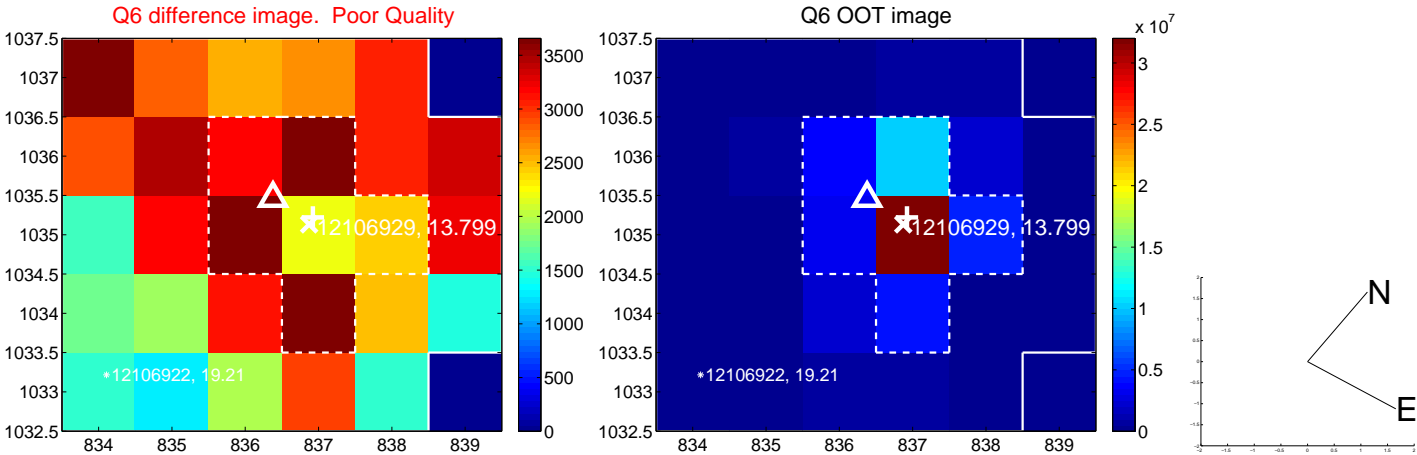
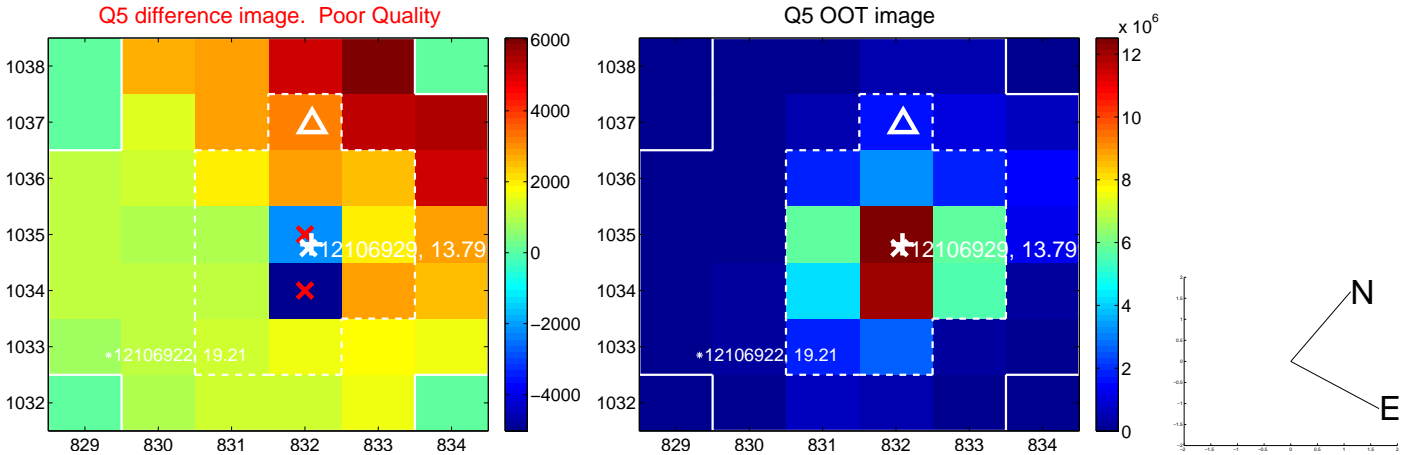


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

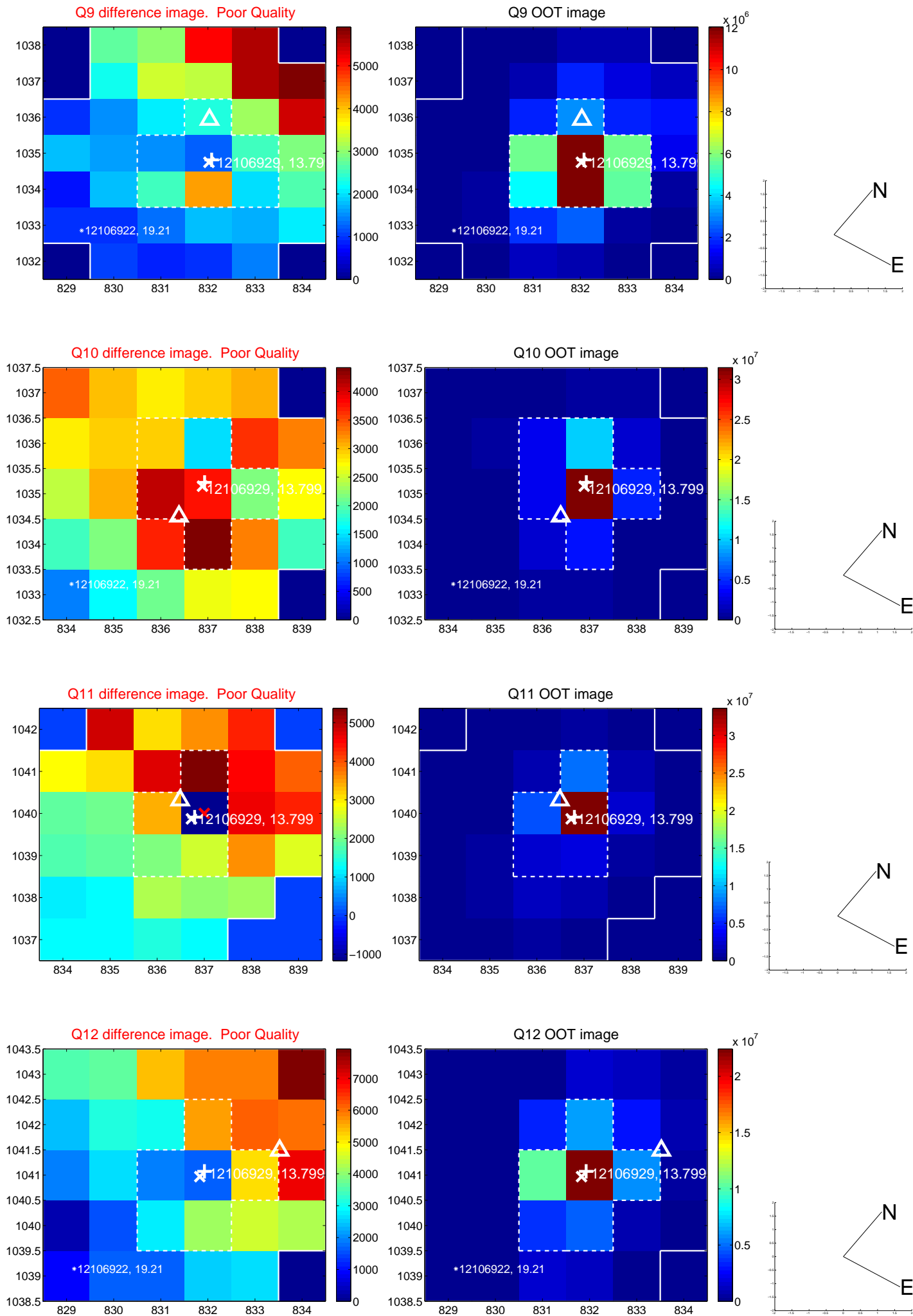
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



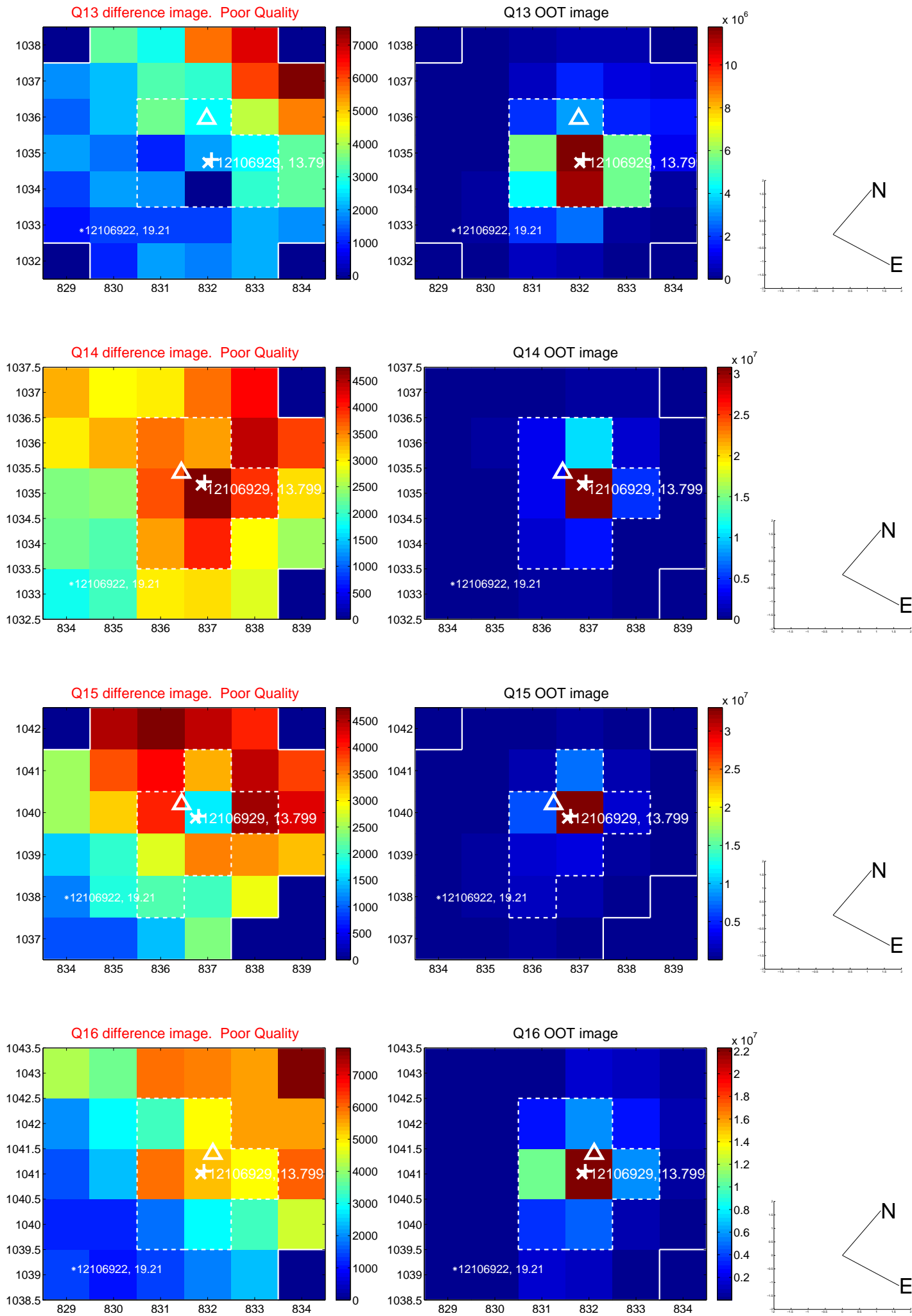
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



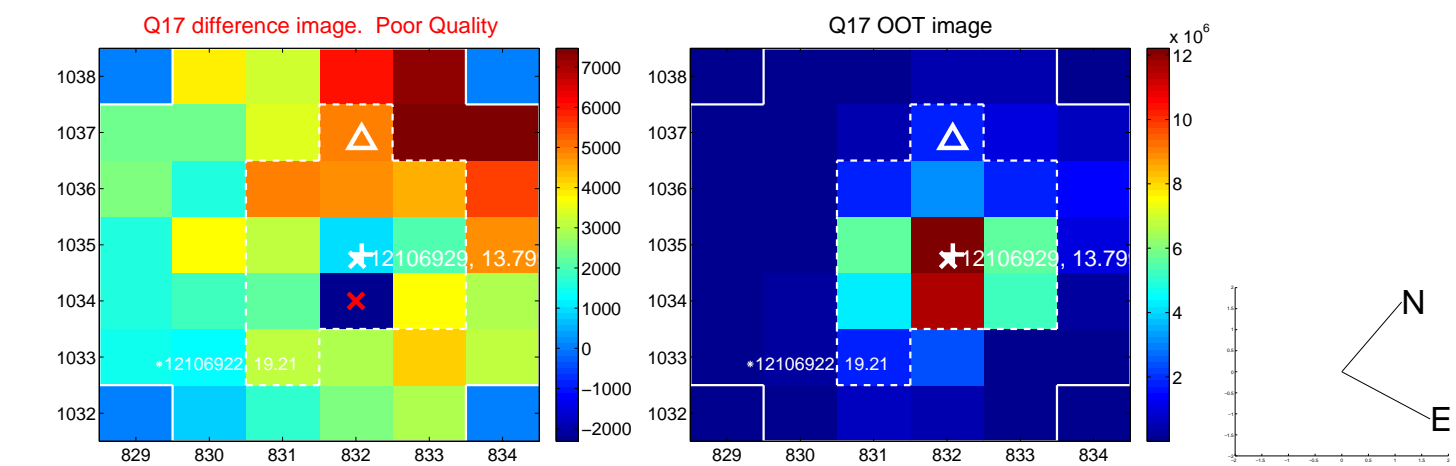
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



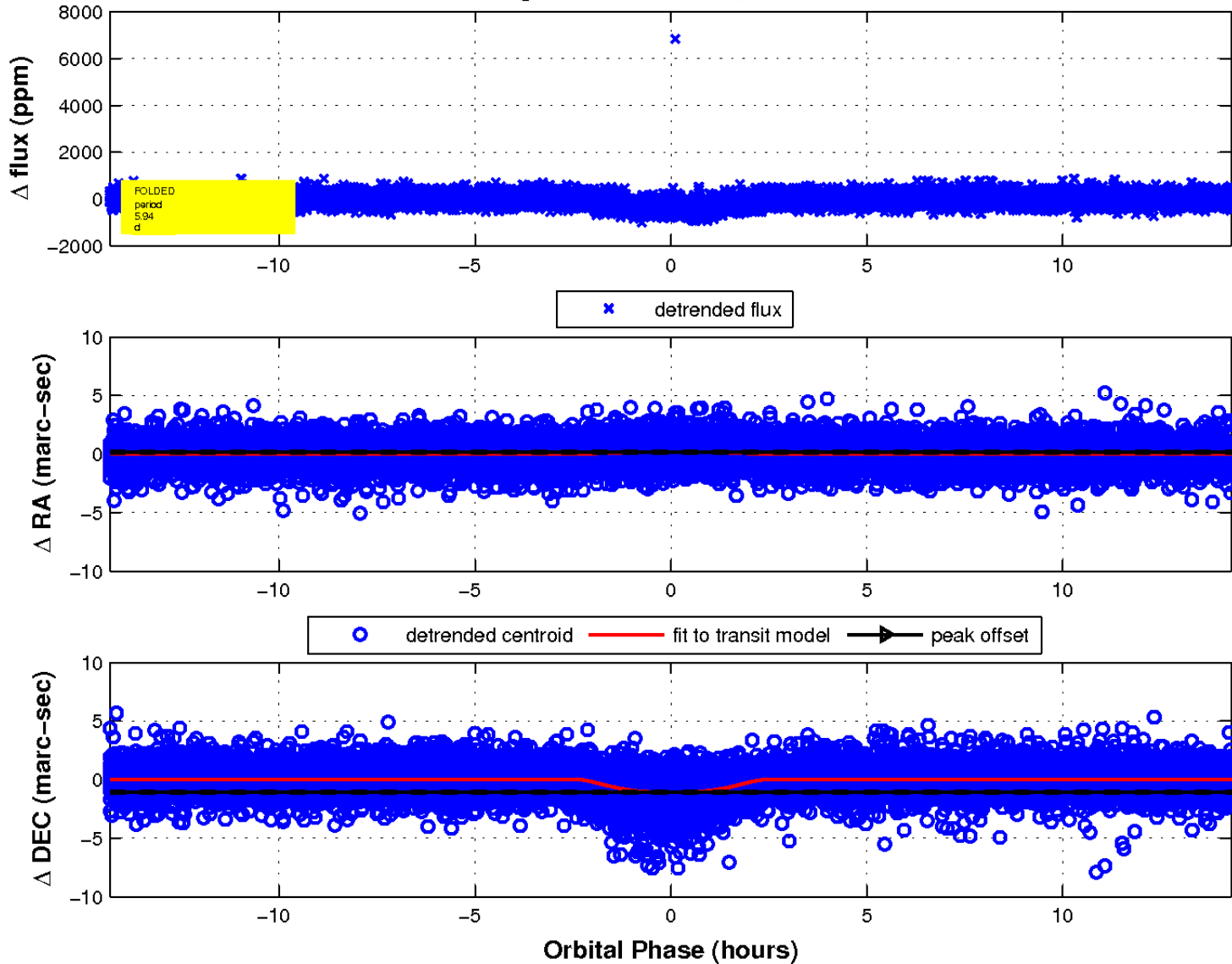
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

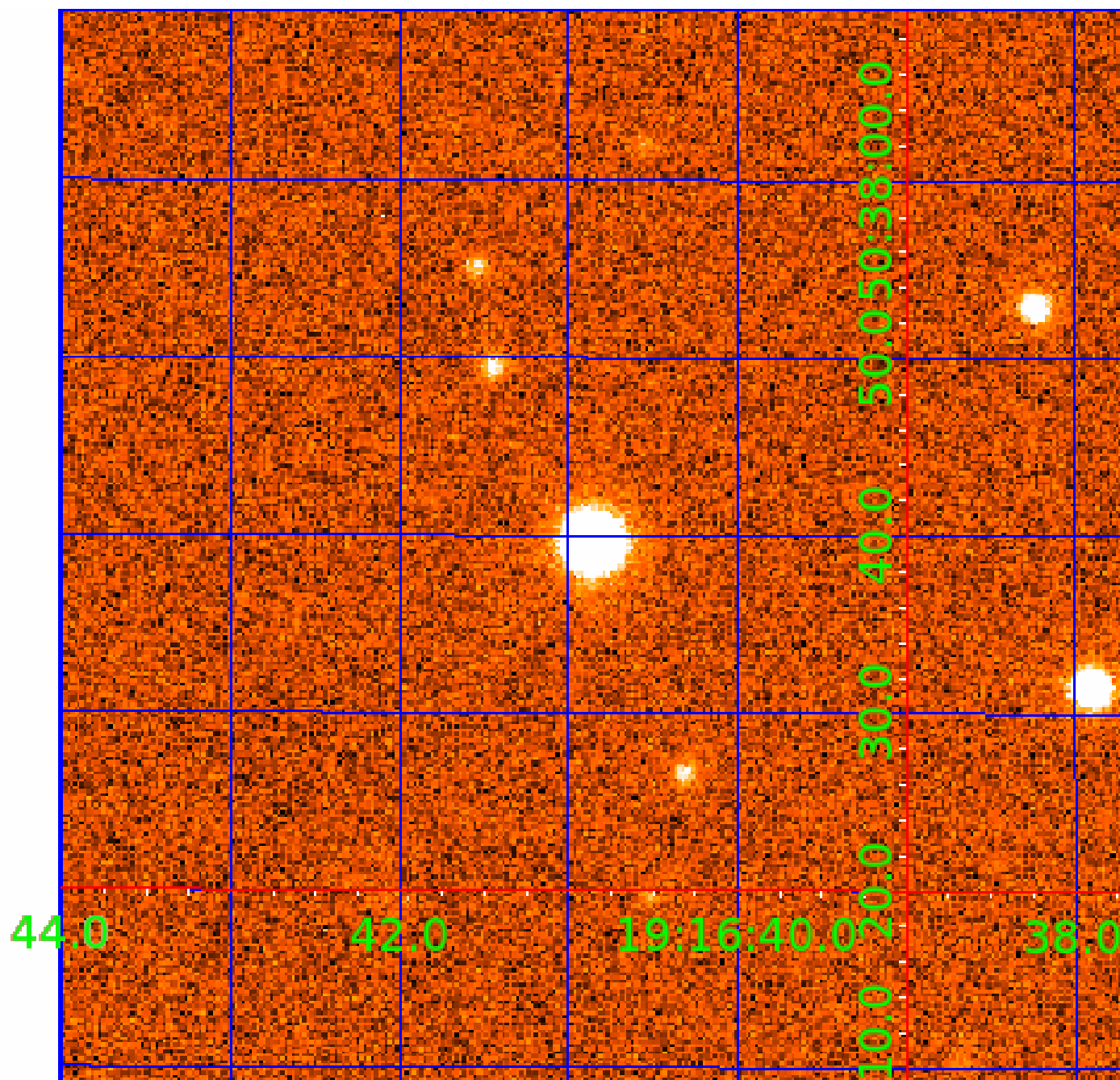


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 012106929

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})
012106929-01	OBS	0359.01	5.937189	135.954362	354.9	4.772	44.6	49.5	0.71	5857	1.77	151.29
012106929-02	OBS	No	5.937224	132.978090	64.3	4.683	10.2	10.7	0.71	5857	0.65	151.29

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012106929-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
012106929-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET—EPHEM_MATCH

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 012106929-02

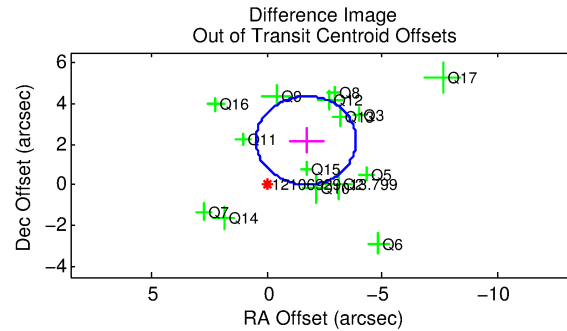
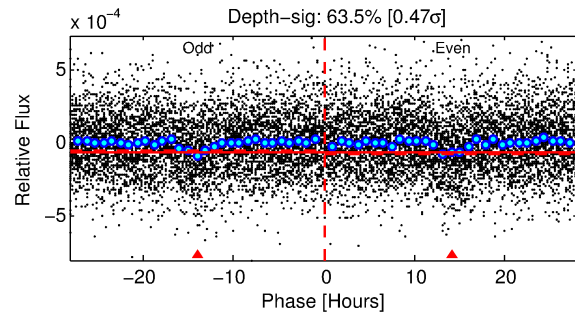
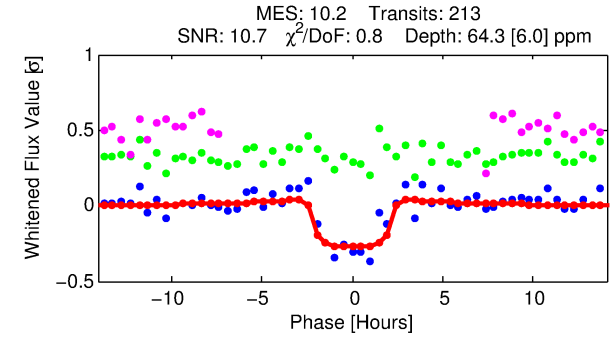
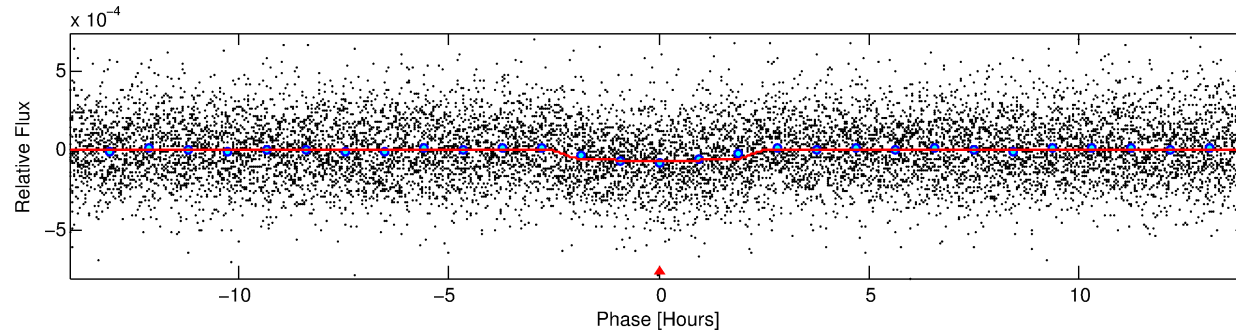
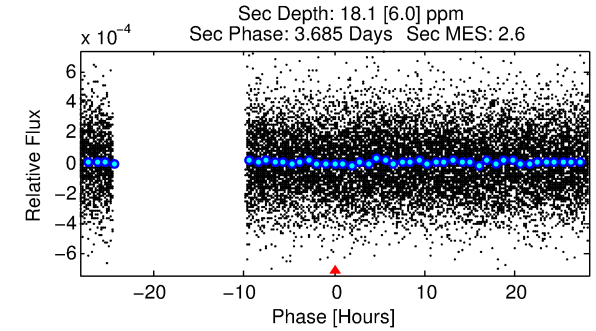
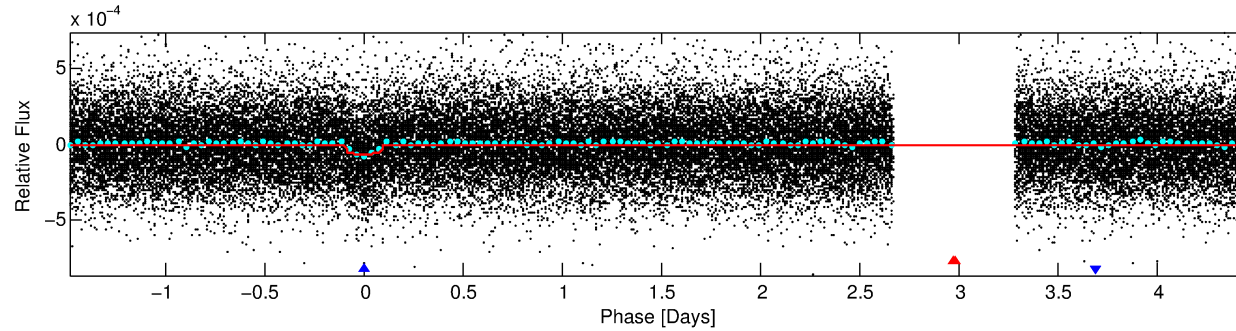
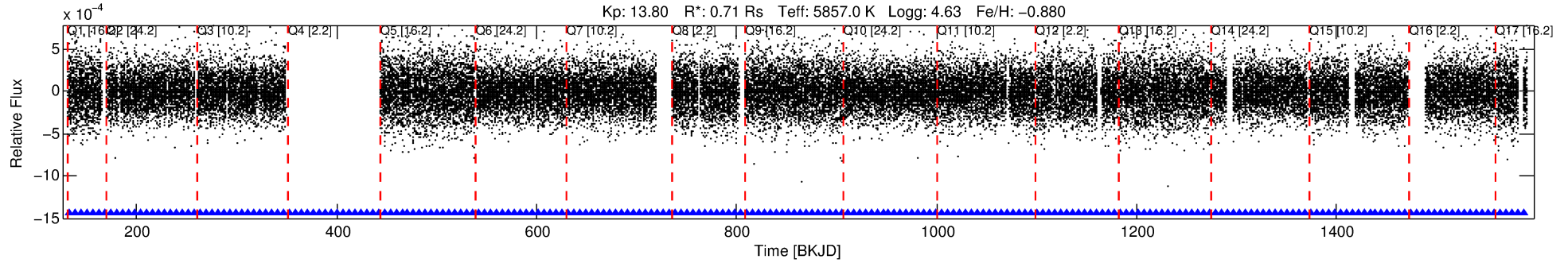
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist (μ)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
012106929-02	12106929	012106934-02	12106934	1:1	12.0	-1	-2	18.36	13.80	46.97	Direct-PRF	0	0.39	0.23

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 12106929 Candidate: 2 of 2 Period: 5.937 d

KOI: K00359 Corr: No Ephemeris Match



DV Fit Results:

Period = 5.93722 [0.00005] d
Epoch = 132.9781 [0.0062] BKJD
Rp/R* = 0.0084 [0.0037]
a/R* = 5.12 [11.60]
b = 0.86 [0.70]
Seff = 151.29 [38.19]
Teff = 894 [56] K
Rp = 0.65 [0.31] Re
a = 0.0594 [0.0090] AU
Ag = 82.70 [79.65] [1.03σ]
Teffp = 4170 [982] K [3.33σ]

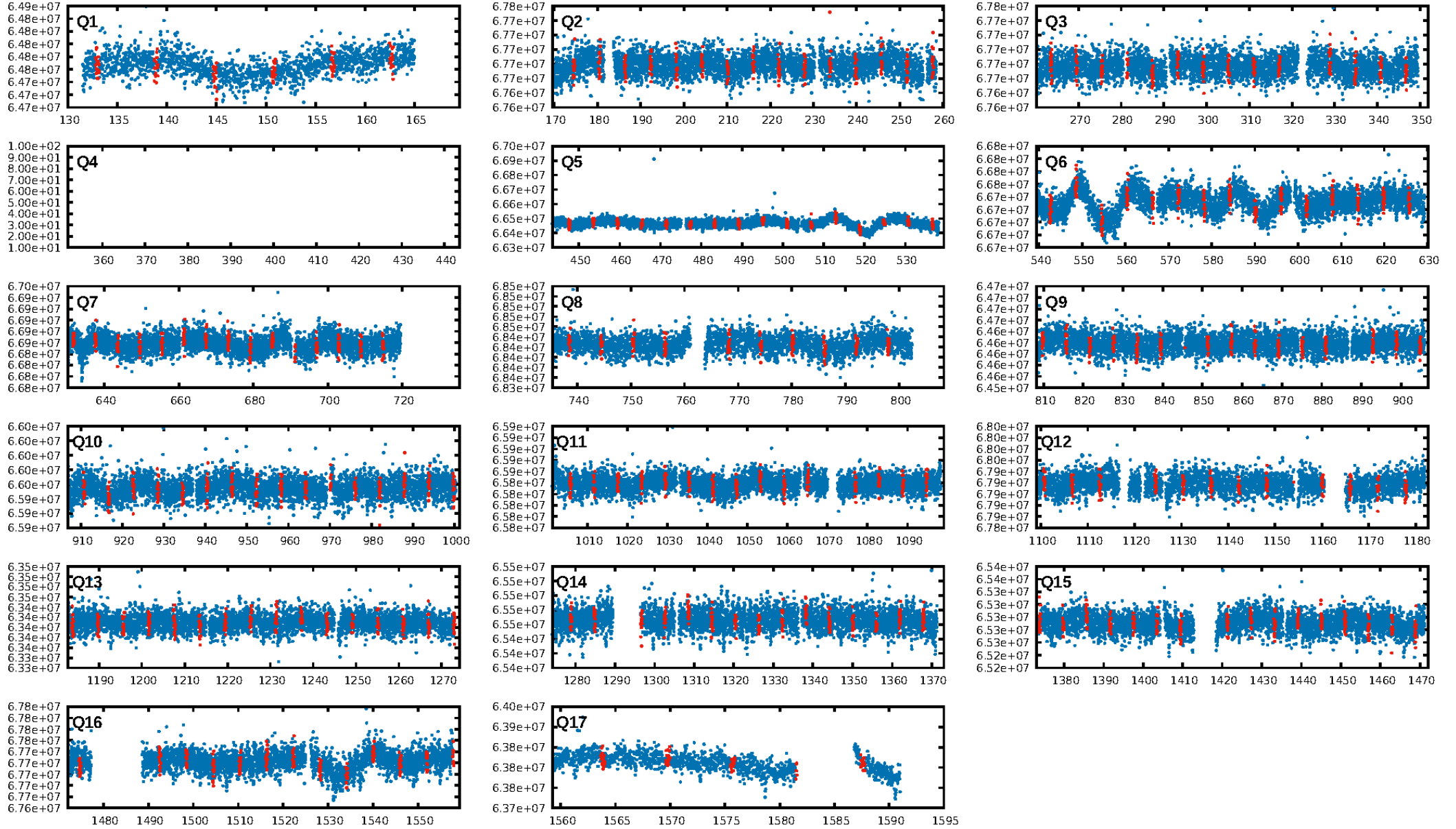
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 2.19e-23
RollingBand-fgt: 1.00 [202/202]
GhostDiagnostic-chr: 0.2637
Centroid-sig: 74.1%
Centroid-so: 0.672 arcsec [0.57σ]
OotOffset-rm: 2.768 arcsec [3.83σ]
KicOffset-rm: 2.988 arcsec [3.94σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.00 [0/15]
DiffImageOverlap-fno: 1.00 [16/16]

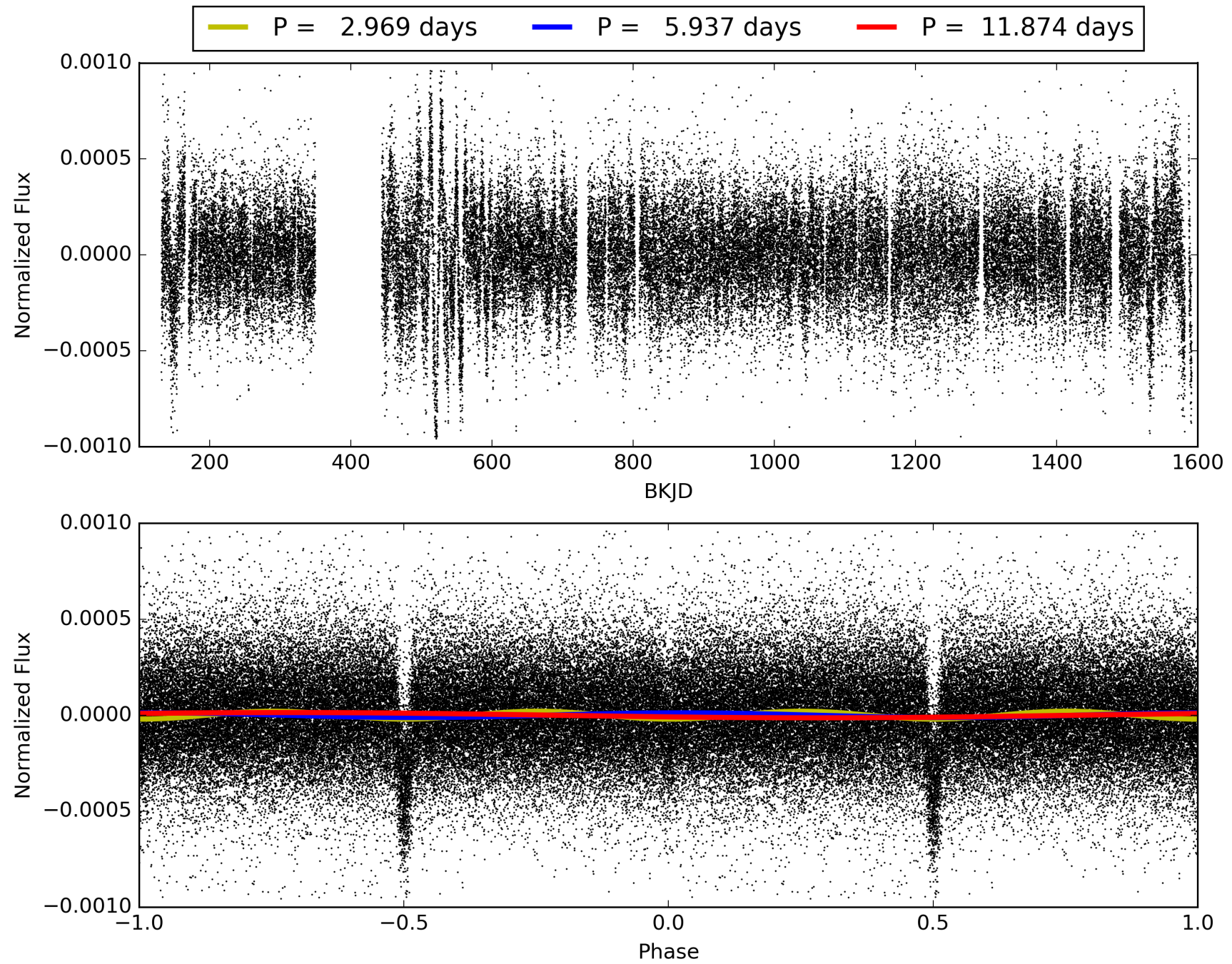
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:25:52 Z

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

TCE 012106929-02, PDC Light Curves

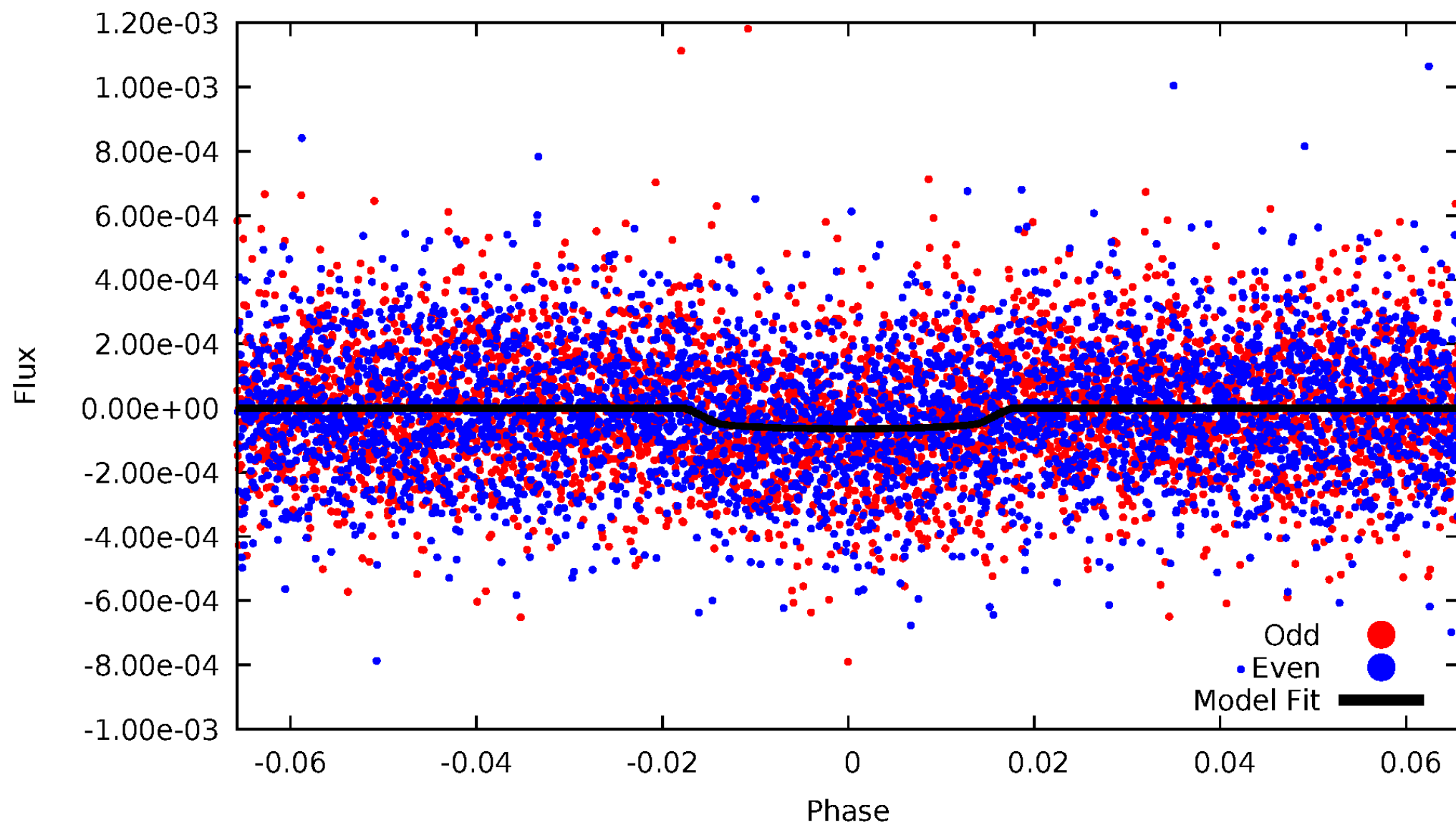


TCE 012106929-02



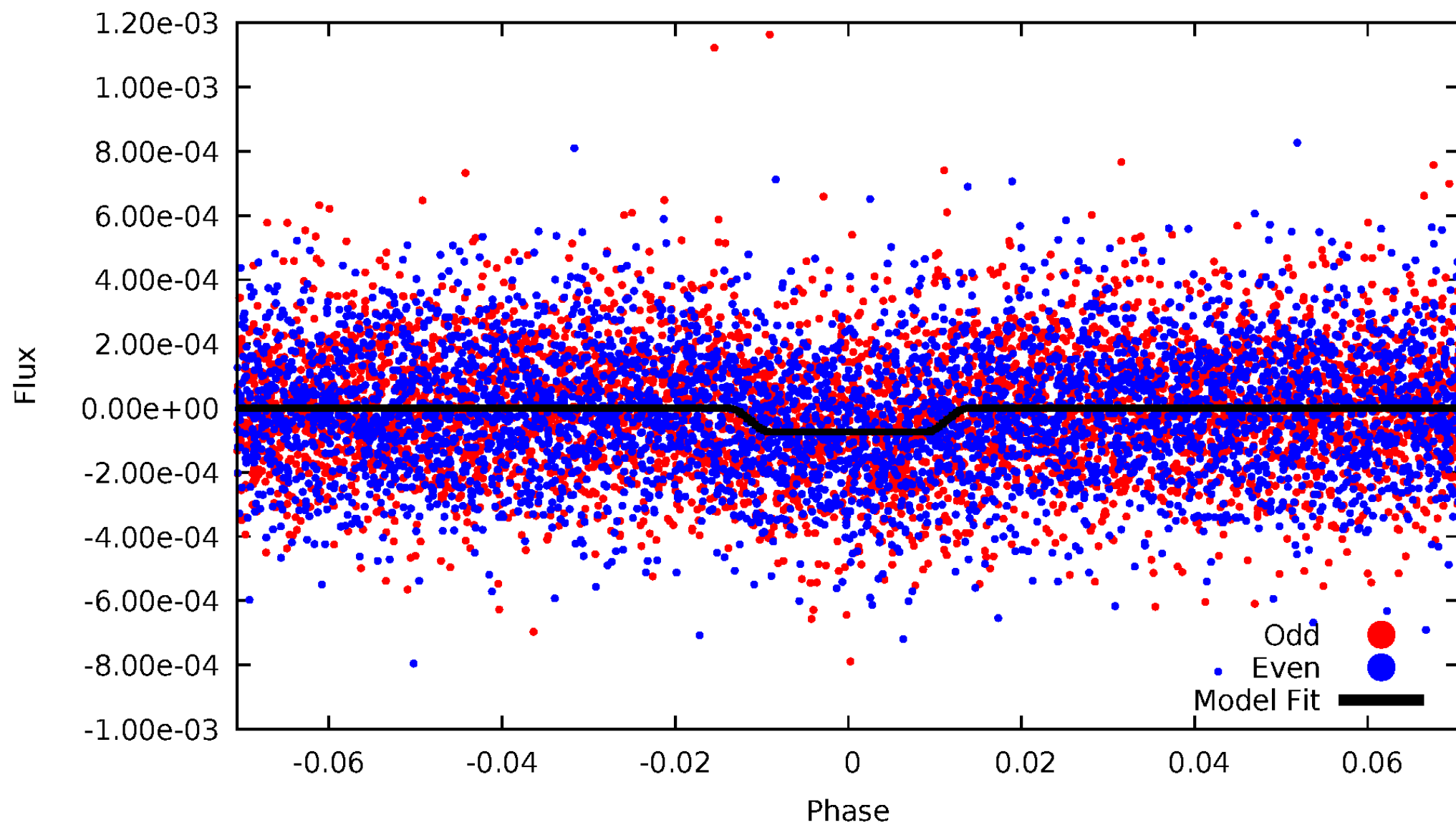
DV Odd/Even

TCE 012106929-02



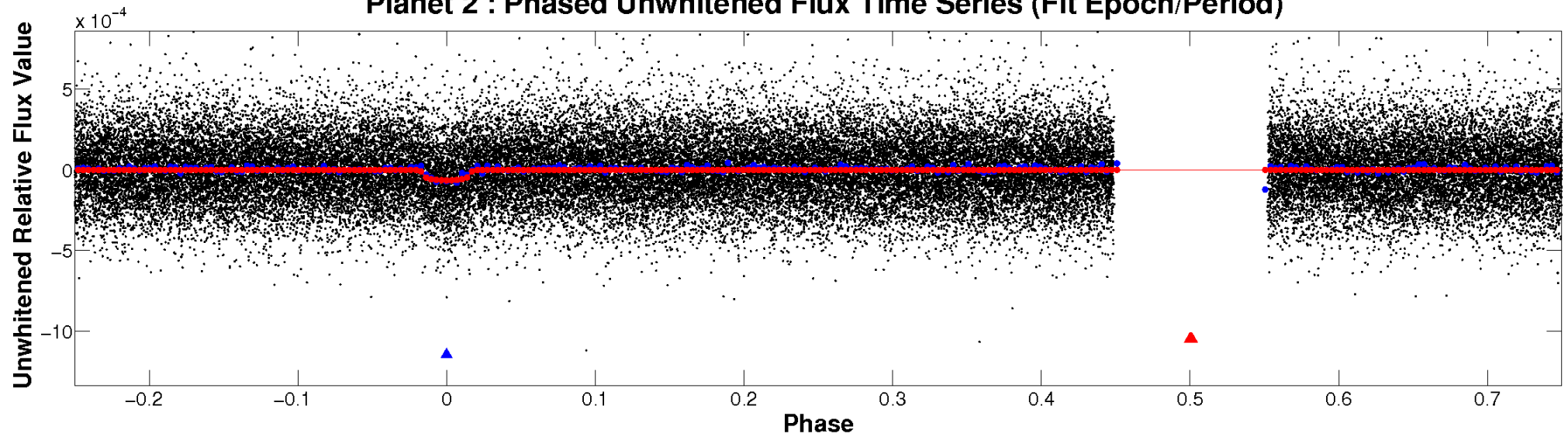
ALT Odd/Even

TCE 012106929-02

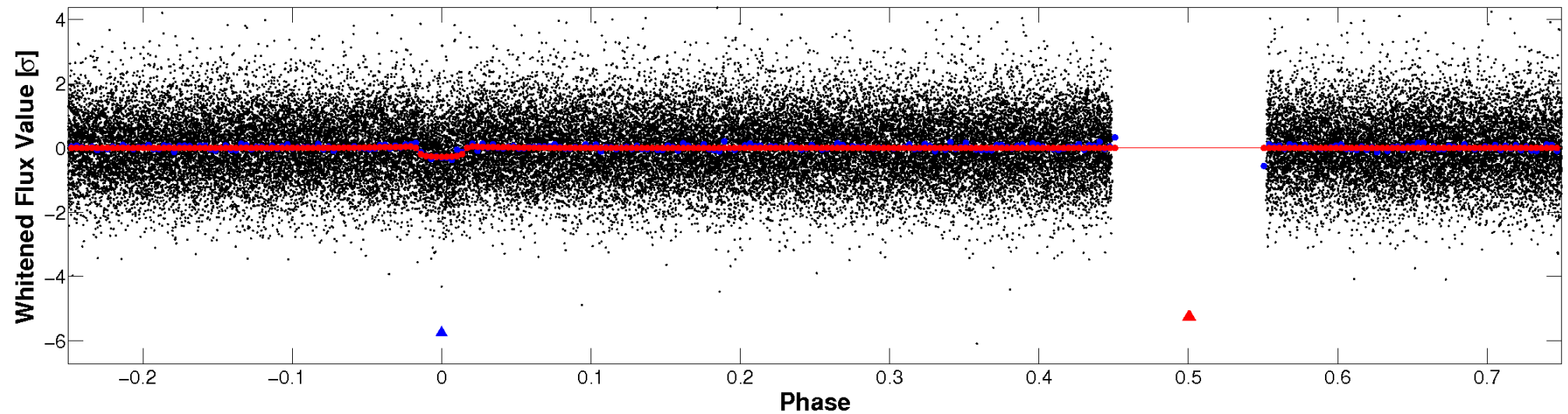


Non-Whitened Vs. Whitened Light Curve

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

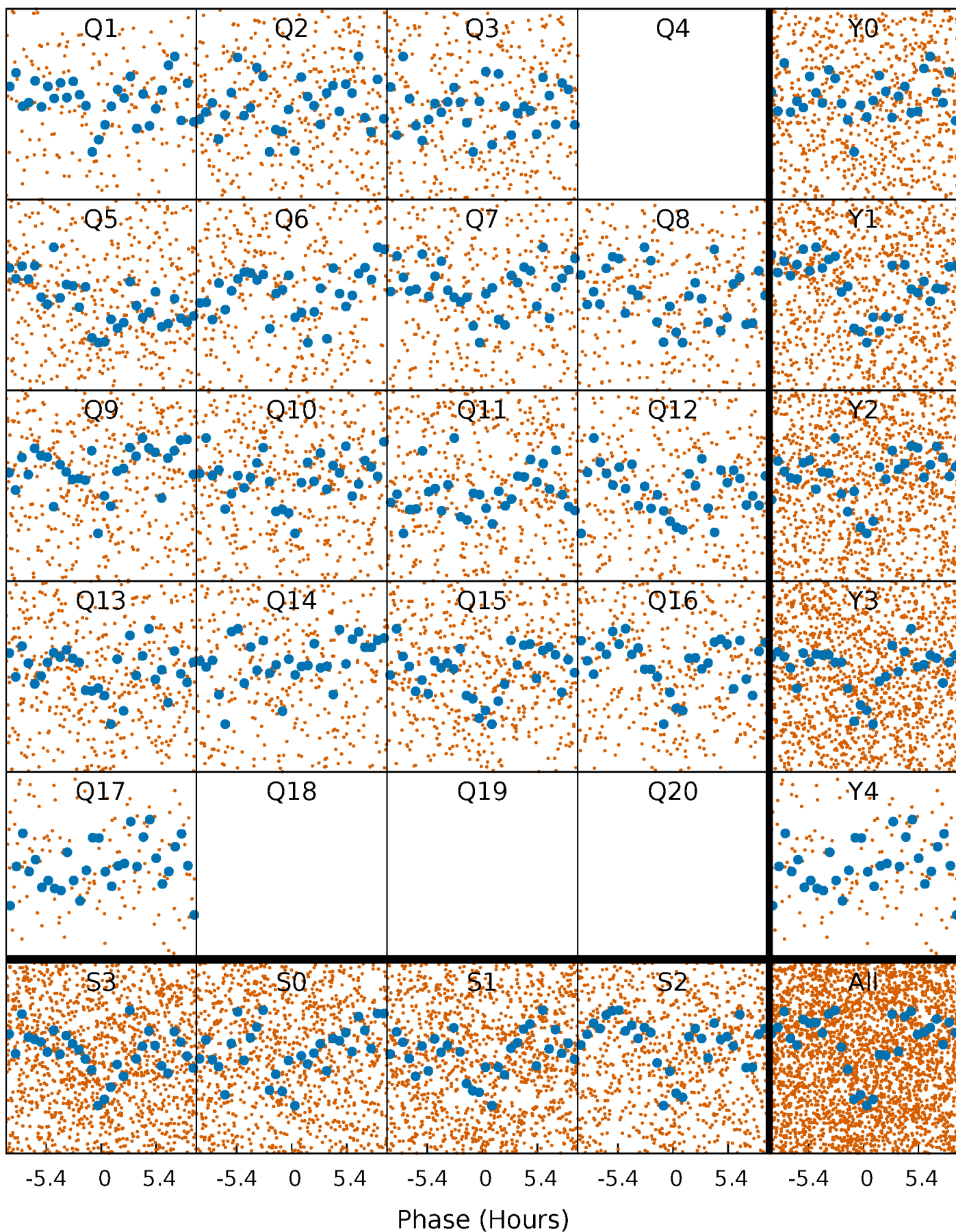


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



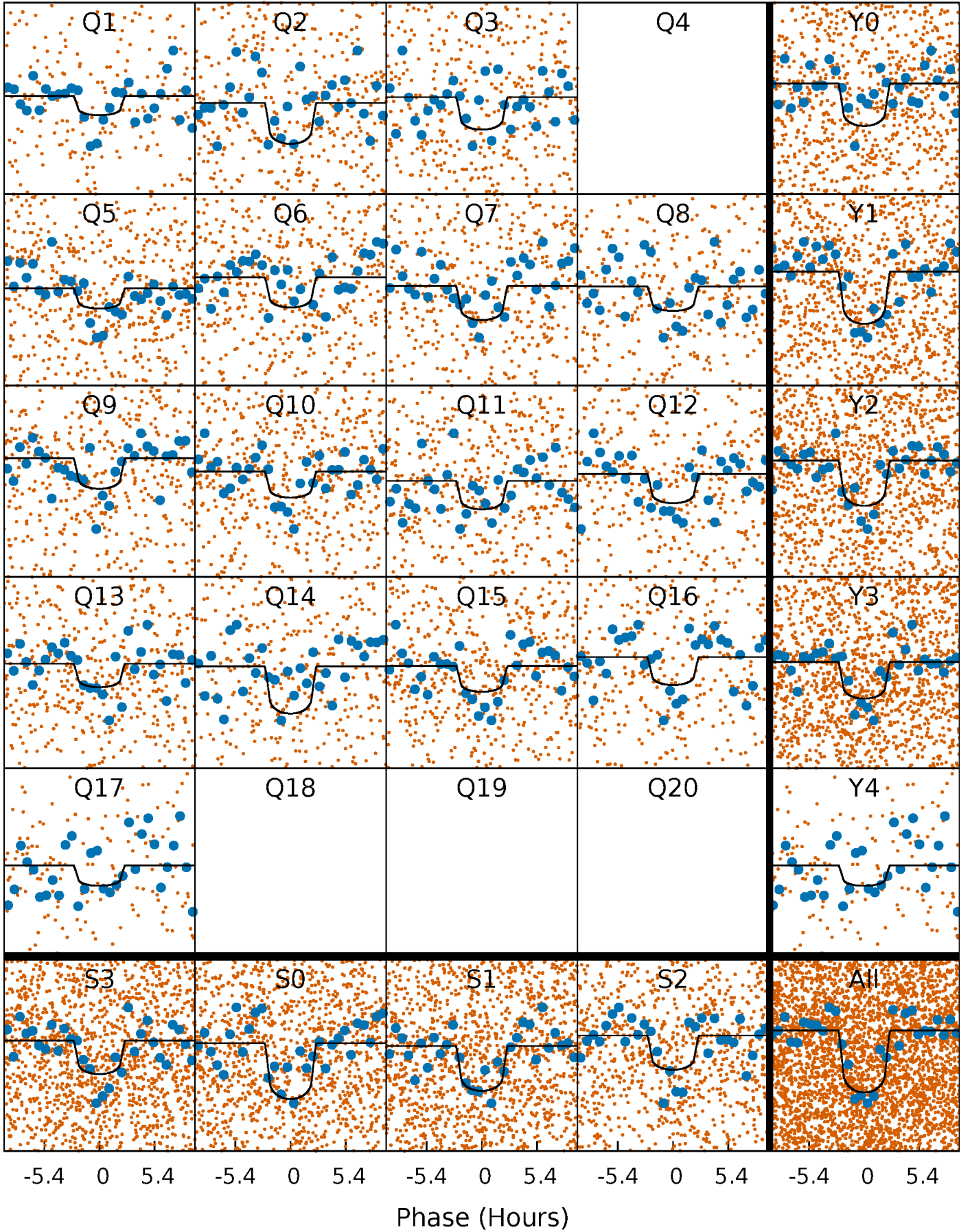
PDC Quarter-Phased Transit Curves

TCE 012106929-02 P= 5.937224 Days $T_0=132.978090$ (BKJD)



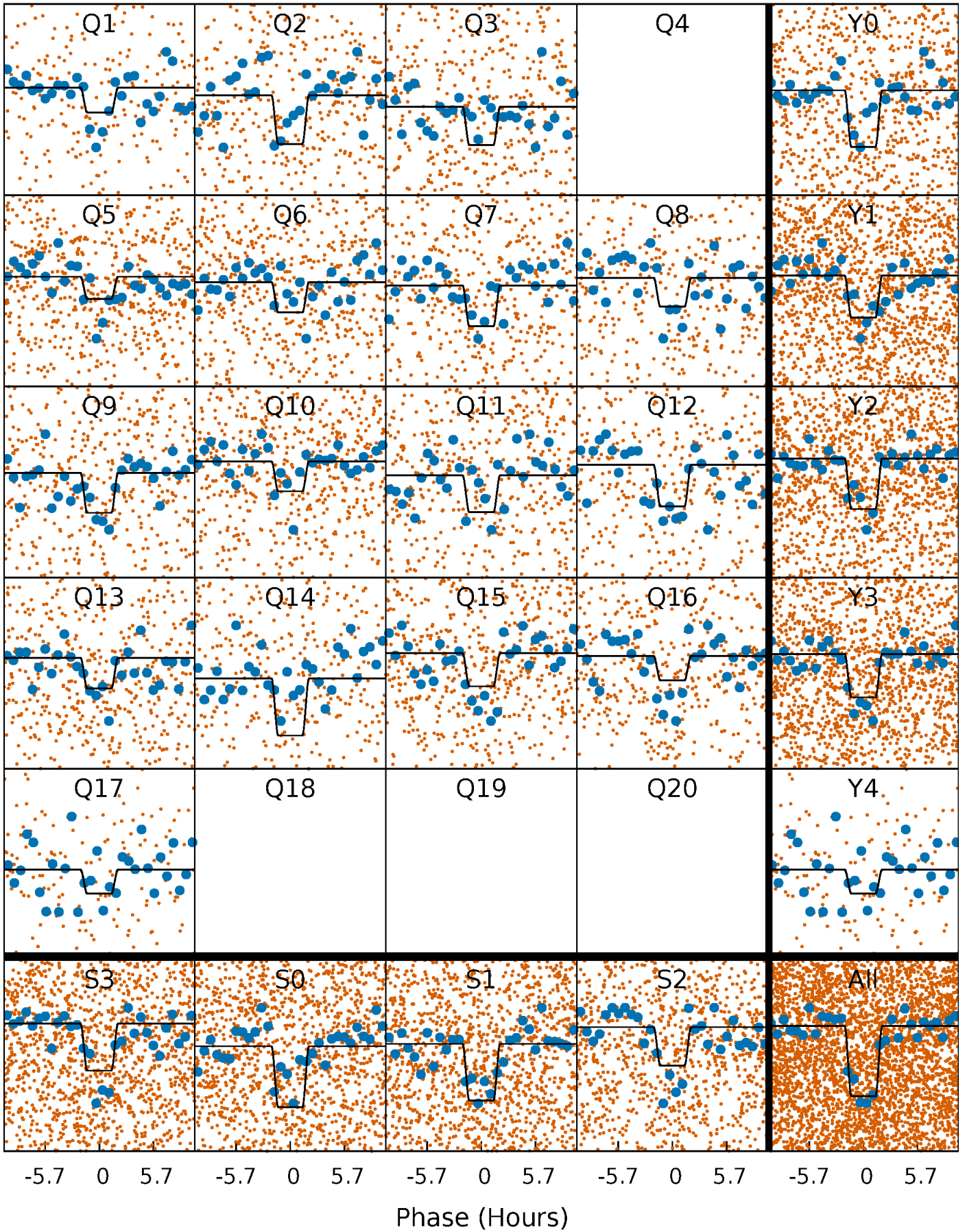
DV Quarter-Phased Transit Curves

TCE 012106929-02 P= 5.937224 Days $T_0=132.978090$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

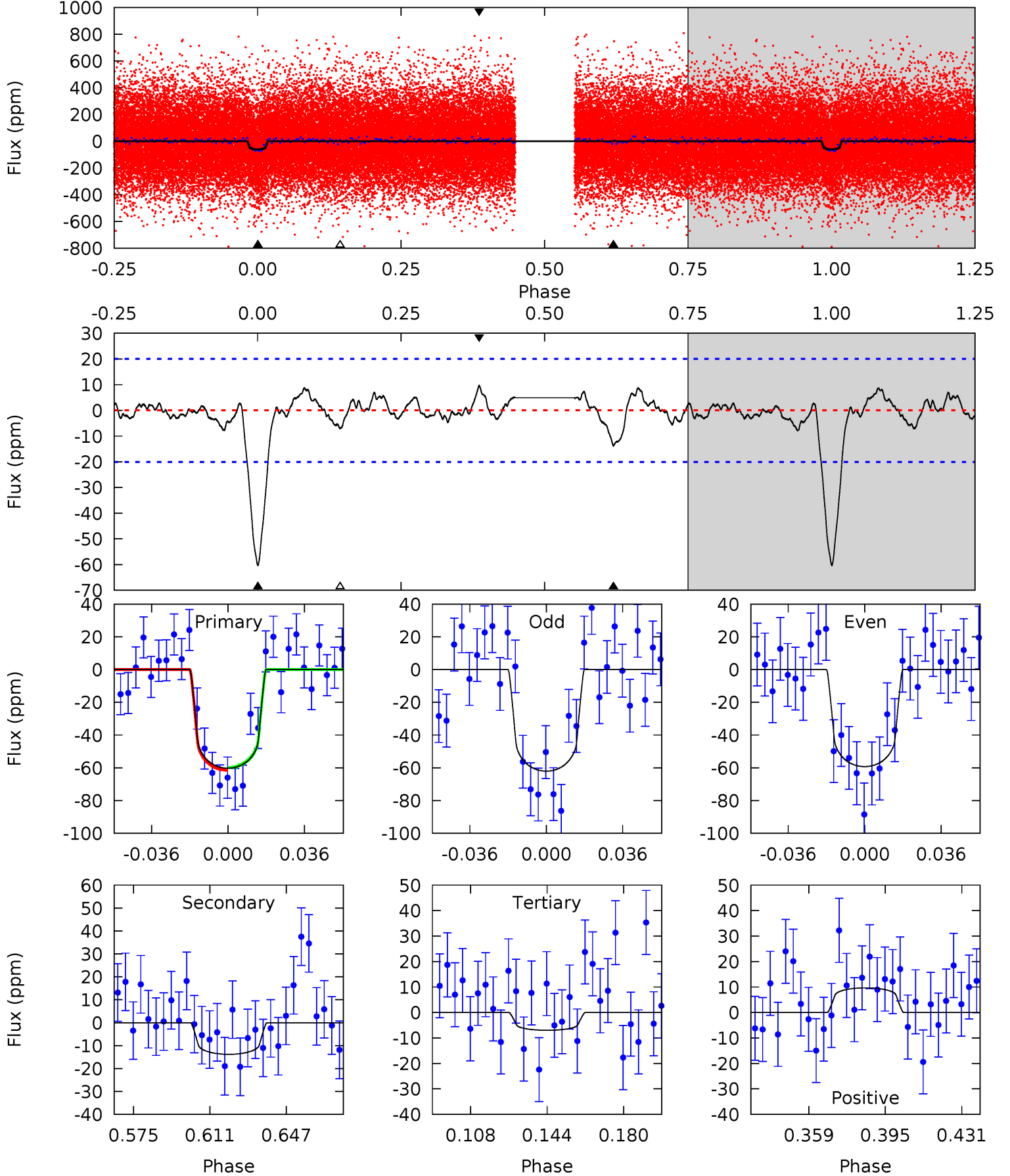
TCE 012106929-02 P= 5.937327 Days $T_0=132.961502$ (BKJD)



DV Model-Shift Uniqueness Test

012106929-02, P = 5.937224 Days, E = 127.040866 Days

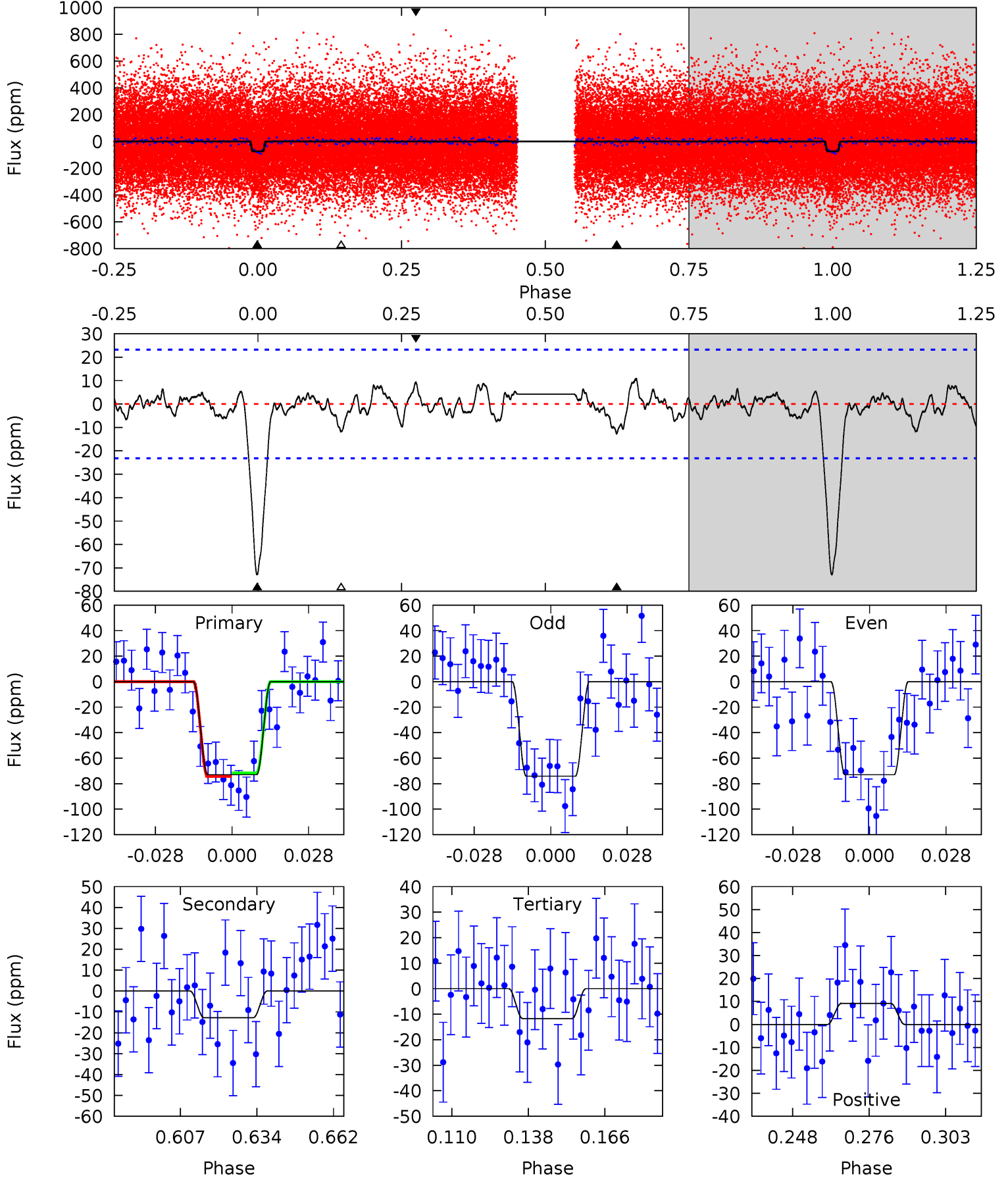
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.3	3.28	1.66	2.30	4.77	2.10	0.83	12.7	12.0	1.62	0.98	0.33	1.01	0.14	0.19



Alt Model-Shift Uniqueness Test

012106929-02, P = 5.937327 Days, E = 127.024175 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	2.66	2.44	1.91	4.83	2.20	0.83	12.7	13.3	0.22	0.75	0.12	0.95	0.13	0.29



Stellar Parameters For KIC 012106929

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5857^{+158}_{-158}	$4.633^{+0.032}_{-0.128}$	$-0.880^{+0.300}_{-0.300}$	$0.712^{+0.124}_{-0.041}$	$0.802^{+0.056}_{-0.077}$	$3.135^{+0.387}_{-1.169}$
	+3%/-3%	+1%/-3%	+34%/-34%	+17%/-6%	+7%/-10%	+12%/-37%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 012106929-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-14 ± 4	$0.67^{+0.30}_{-0.28}$	1266^{+58}_{-44}	4153^{+1000}_{-556}	57^{+118}_{-32}
Alt.	-13 ± 5	$0.69^{+0.30}_{-0.31}$	1270^{+59}_{-48}	4024^{+1070}_{-515}	49^{+115}_{-27}

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

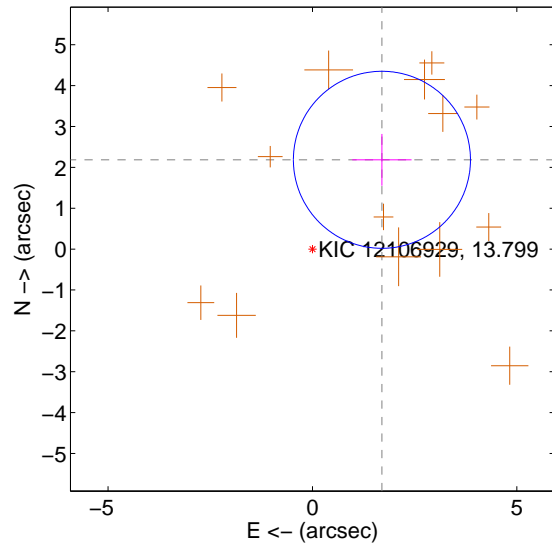
Supplemental centroid analysis for 012106929-02. Kepler magnitude: 13.80. Transit SNR 10.70

There are 0 quarters with good PRF difference image offsets

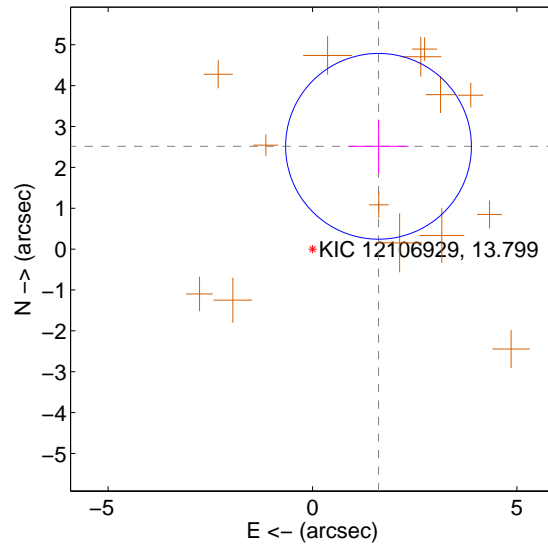
The direct PRF centroid is offset from the target star catalog position by about 0.45 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.768 ± 0.722	3.83	-1.700 ± 0.725	2.184 ± 0.633
PRF-fit source offset from KIC position	2.988 ± 0.757	3.94	-1.614 ± 0.736	2.514 ± 0.654
photometric centroid source offset	0.67 ± 1.17	0.57	-0.56 ± 1.14	0.37 ± 1.25

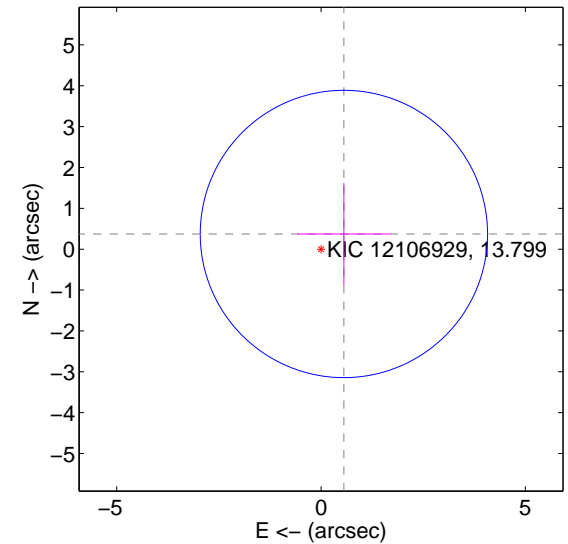
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

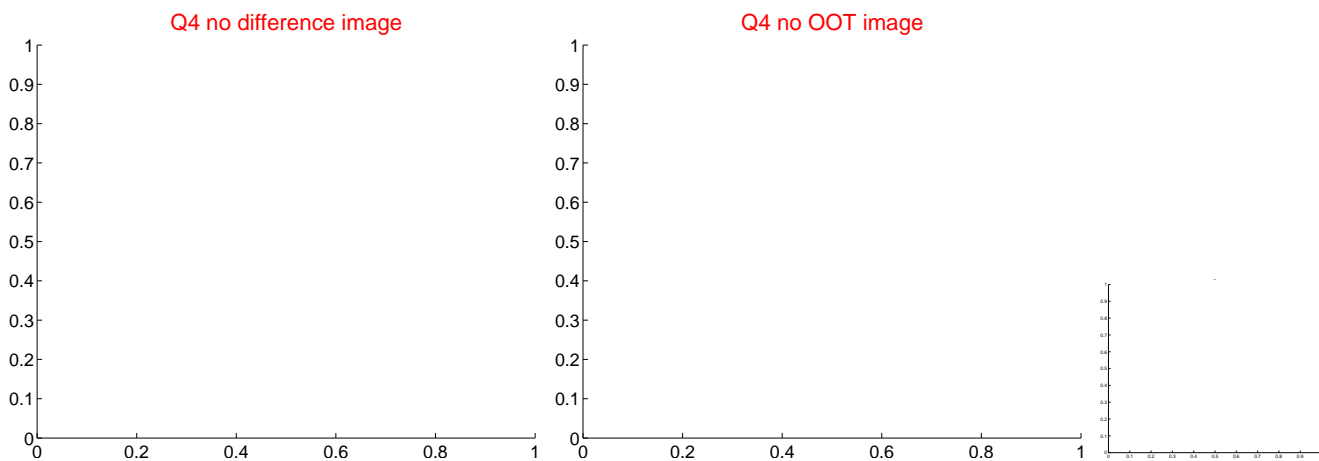
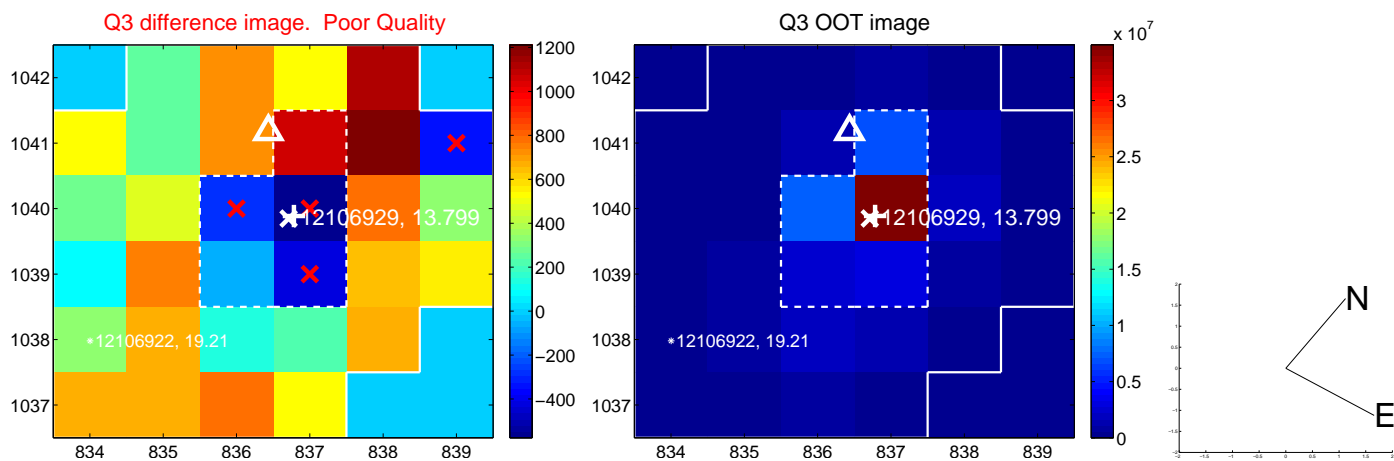
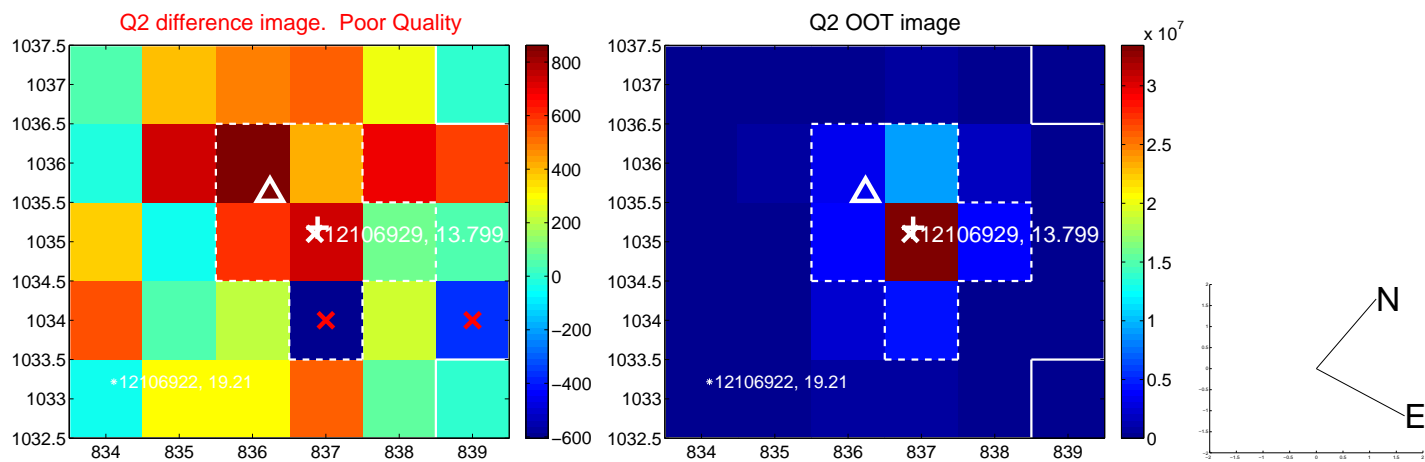
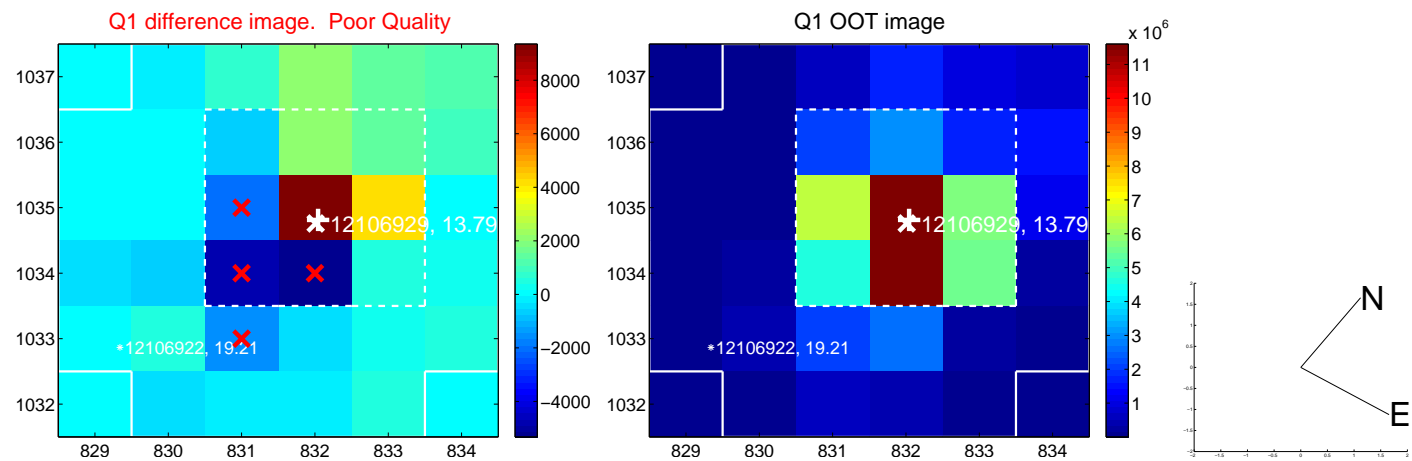


offset from photometric centroids

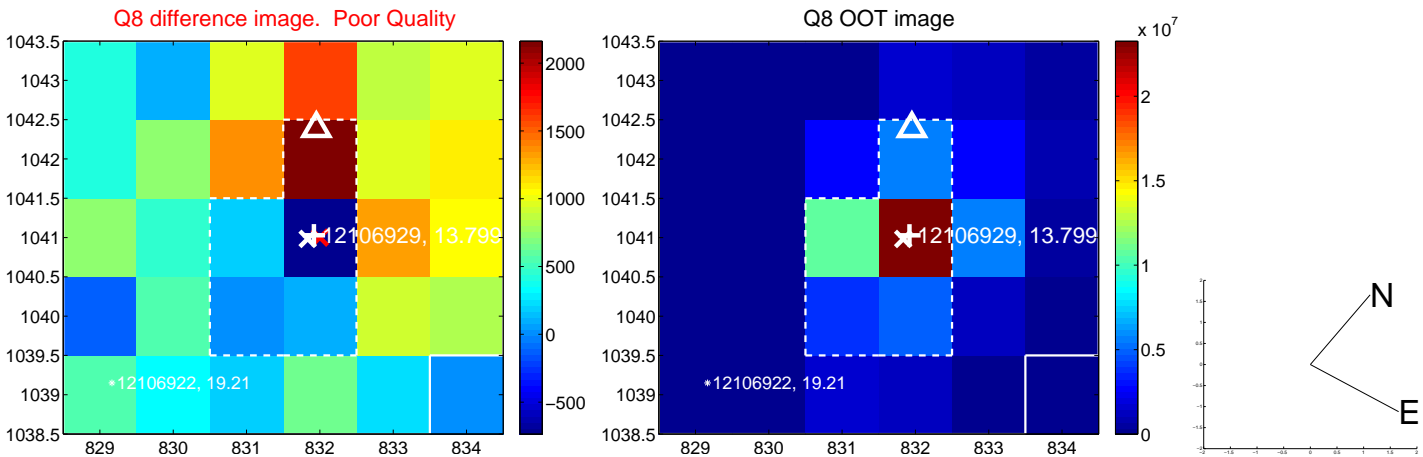
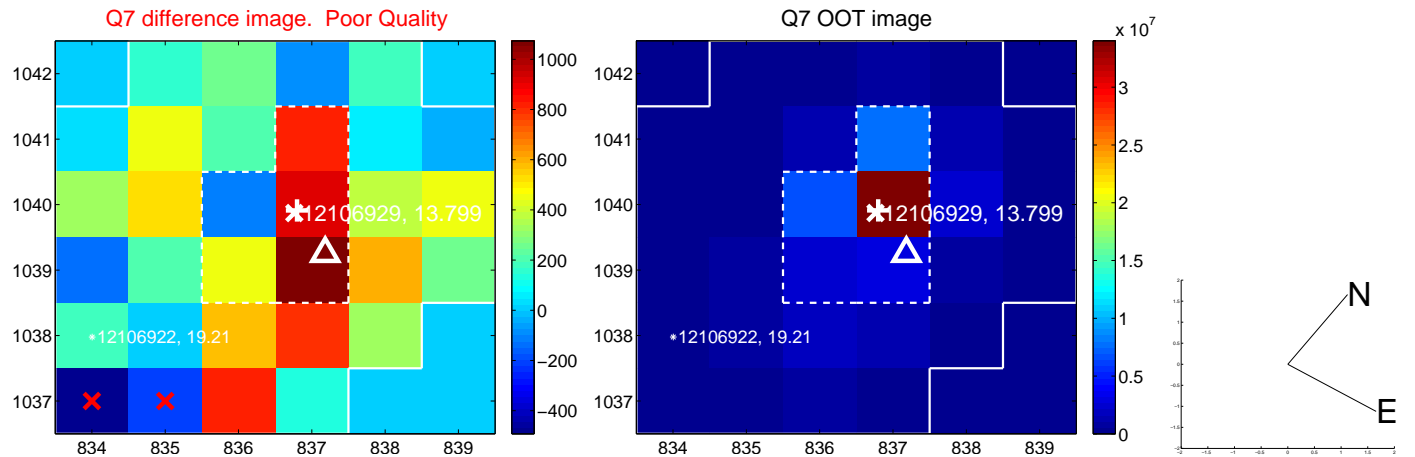
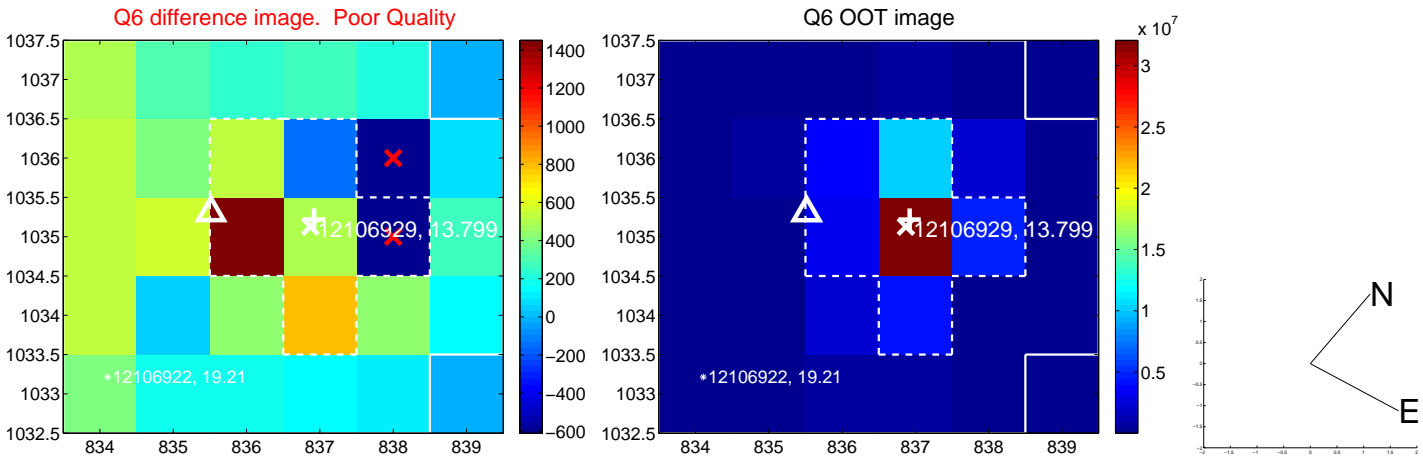
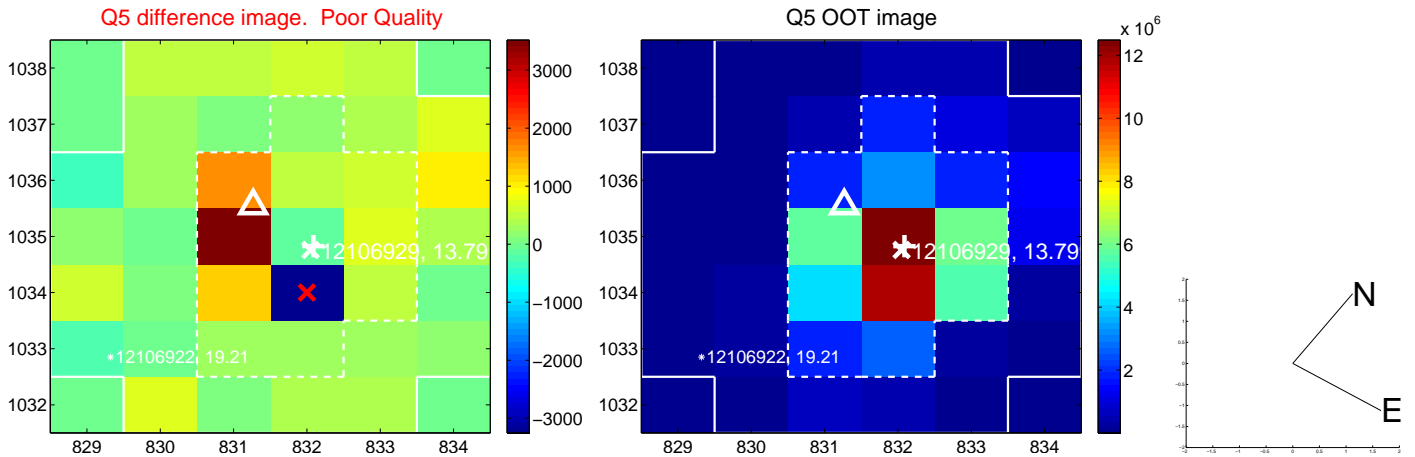


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

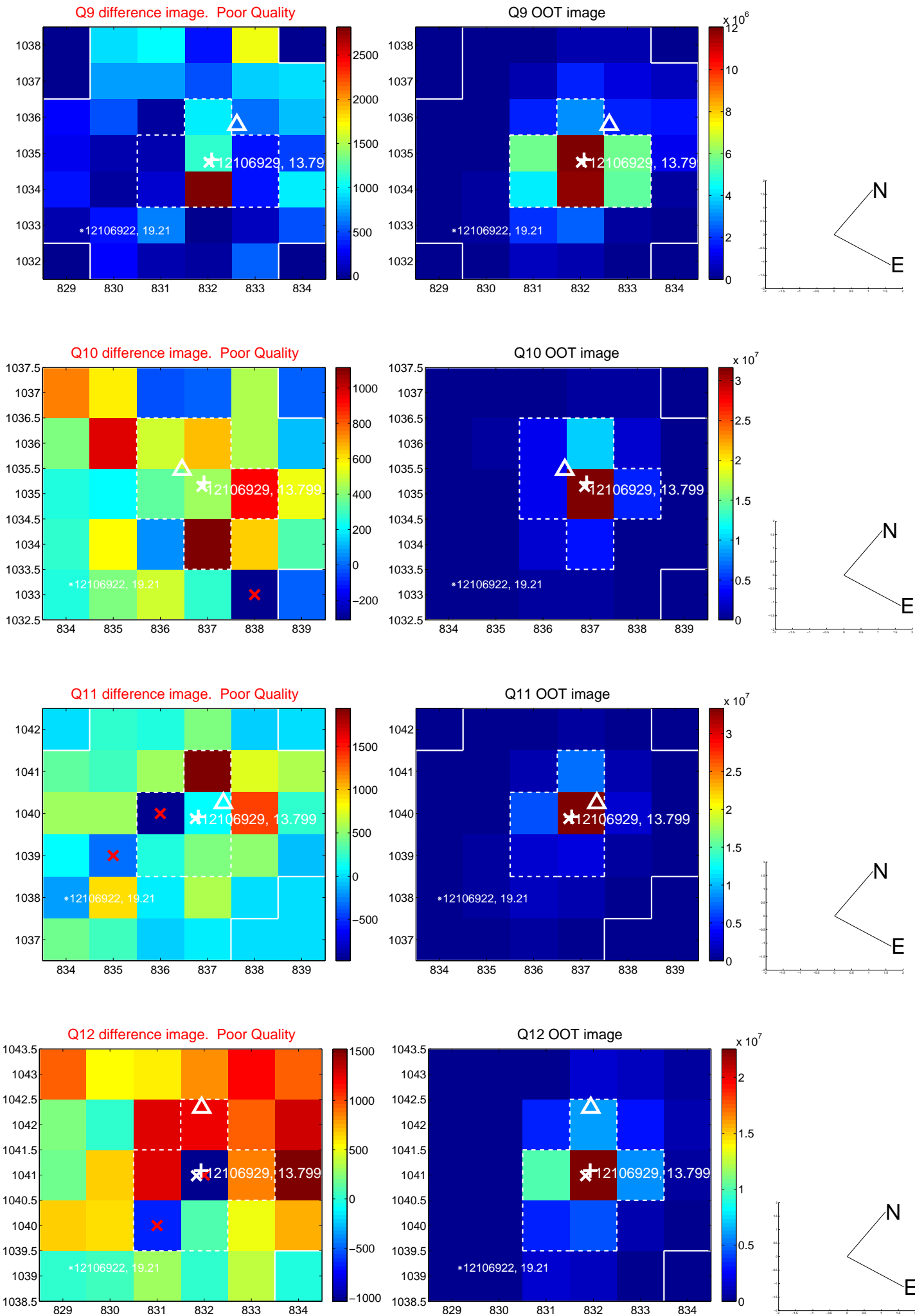
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



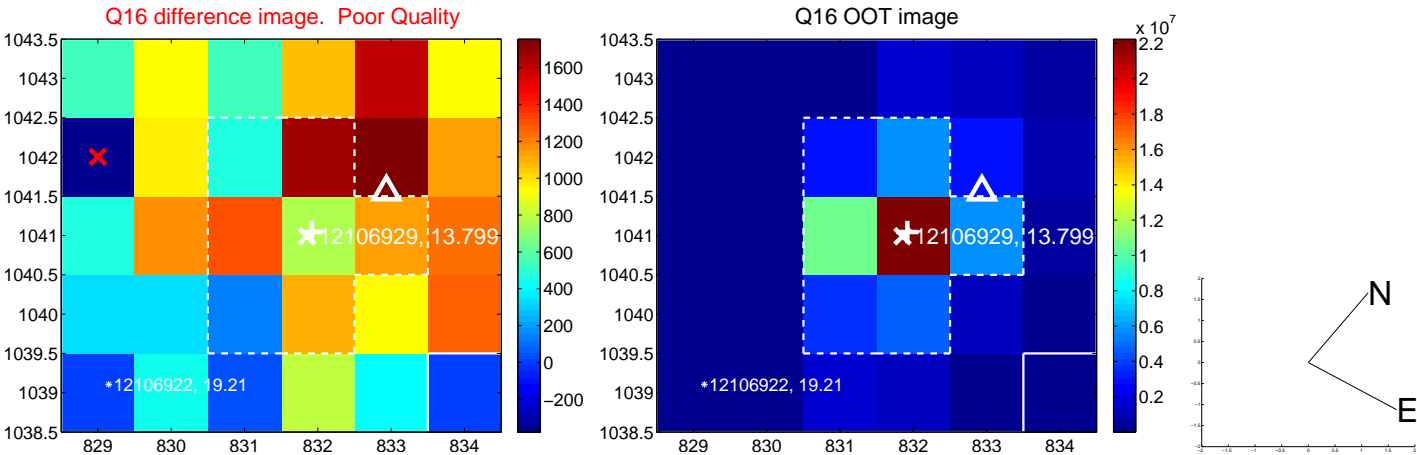
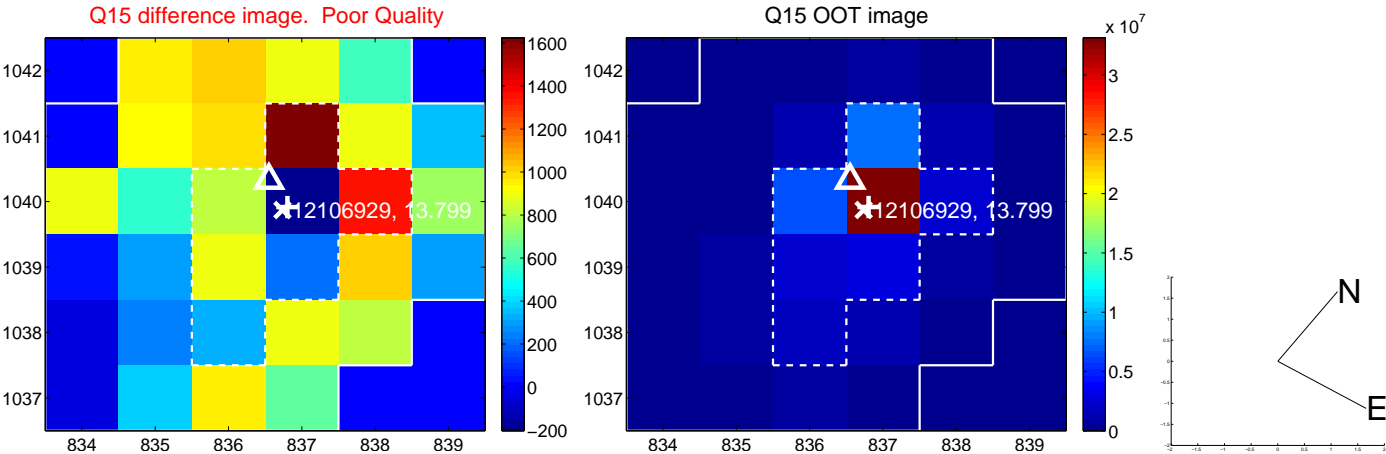
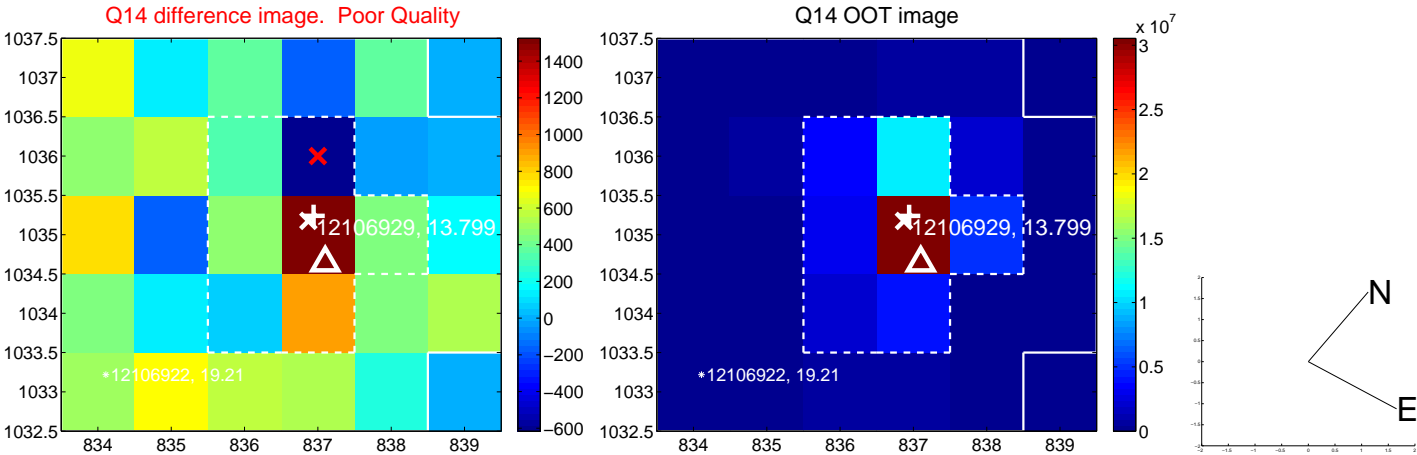
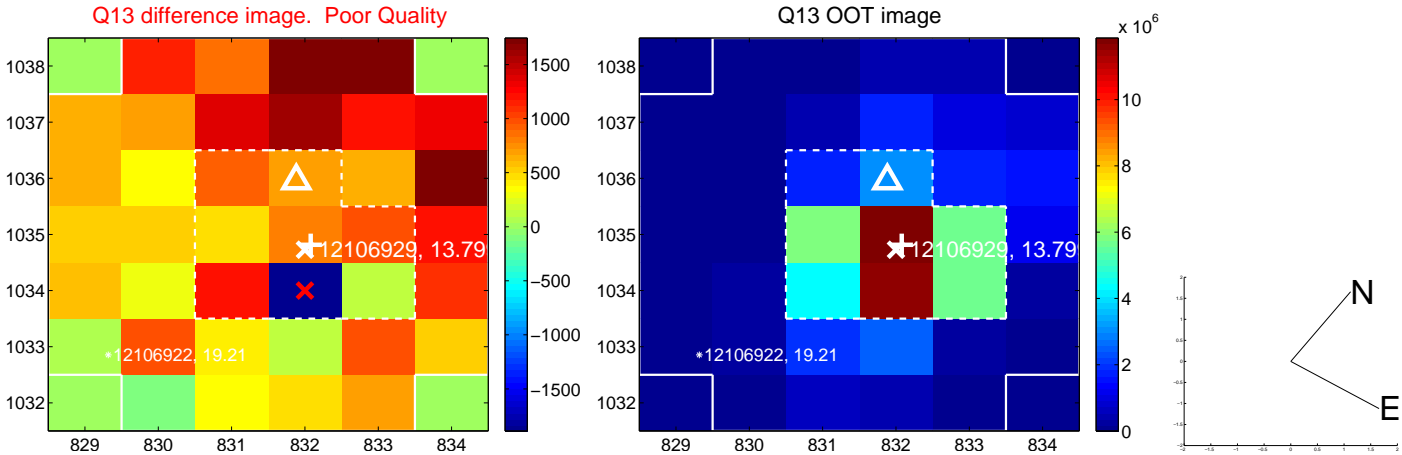
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



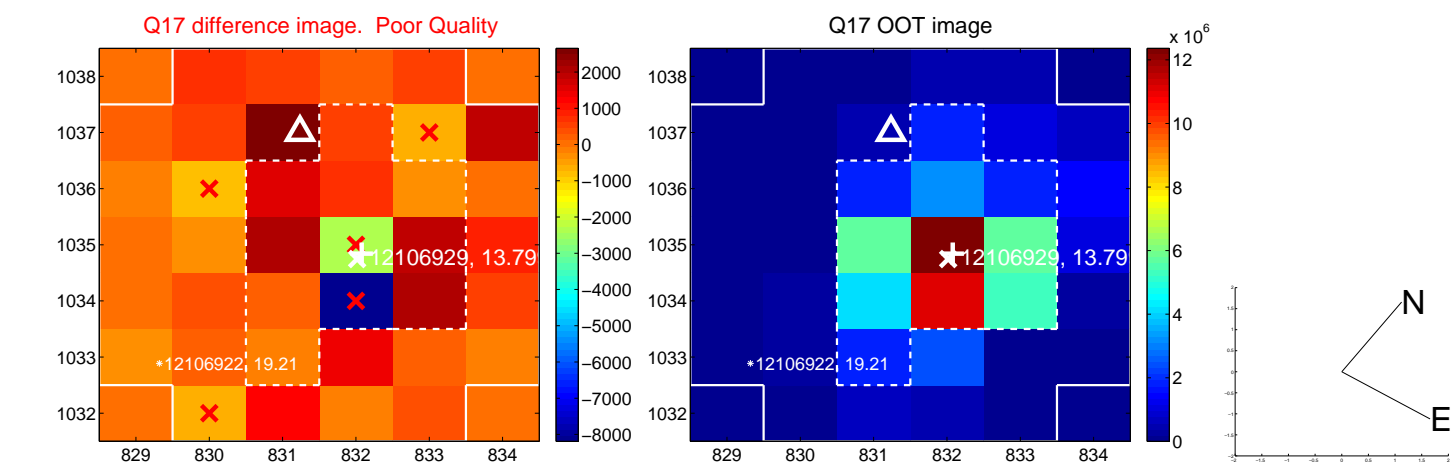
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



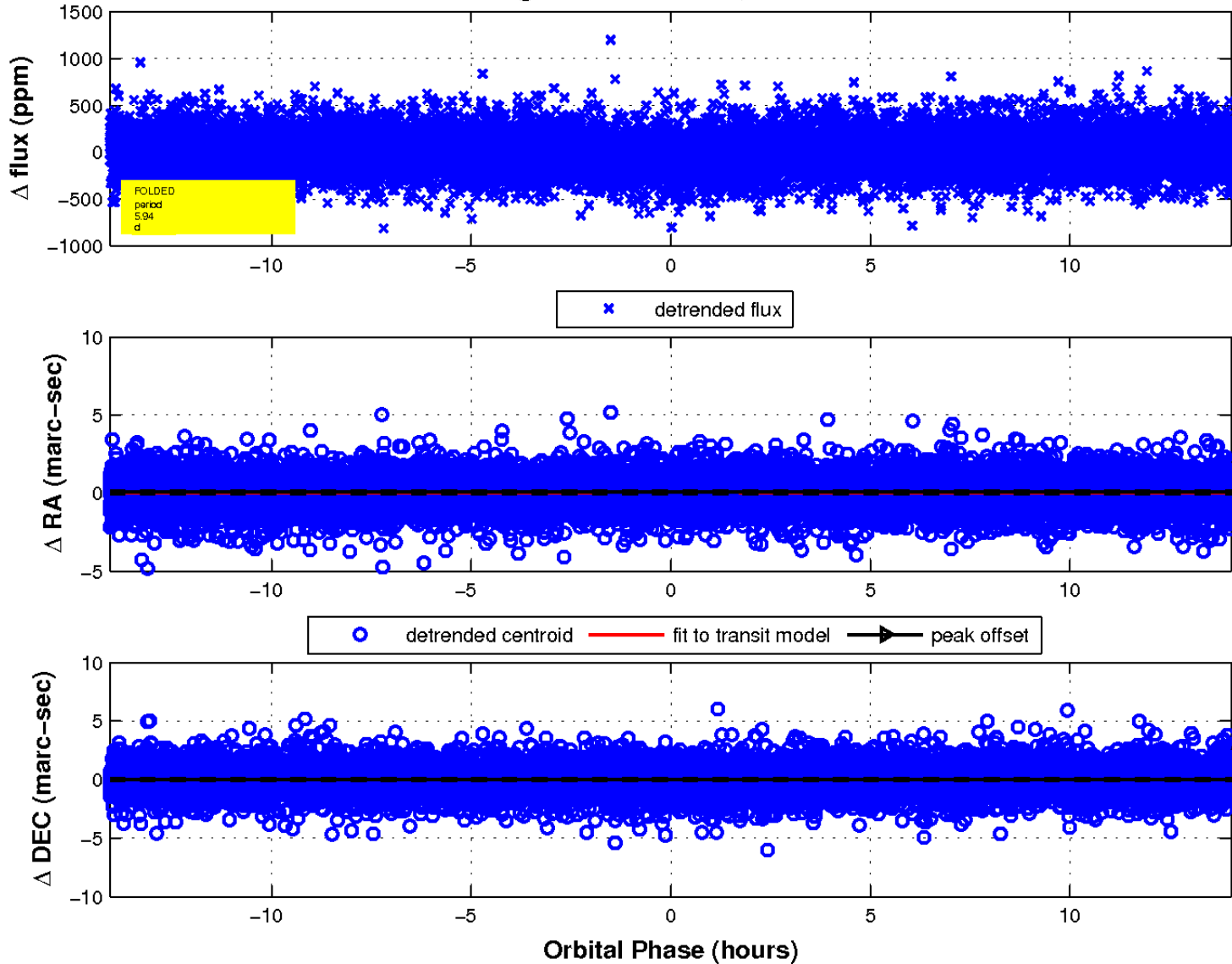
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

