

KIC 010518725

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})
010518725-01	OBS	0336.01	19.515006	136.213186	121.8	3.408	14.2	13.2	2.56	7004	3.17	490.71
010518725-02	OBS	No	19.514877	132.604546	93.6	3.134	9.7	10.3	2.56	7004	2.88	490.72

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010518725-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
010518725-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—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 010518725-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
010518725-01	10518725	3612.01	10518735	1:1	14.6	4	1	16.74	13.12	2470.90	Direct-PRF	0	0.01	0.07

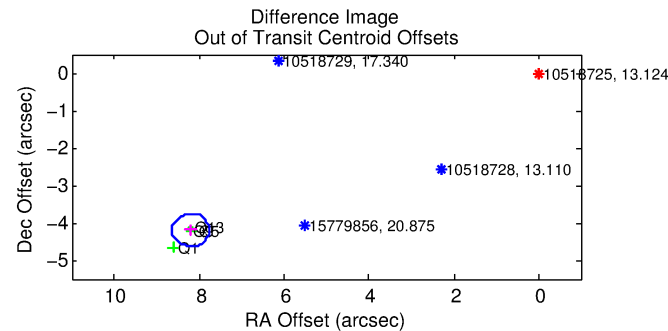
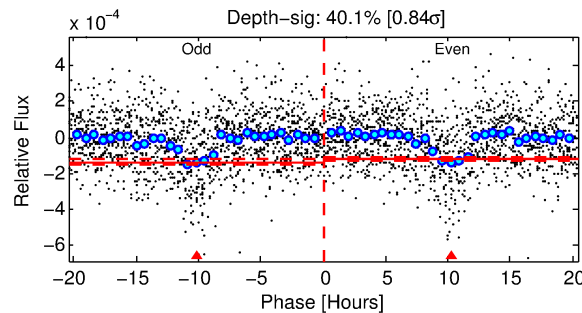
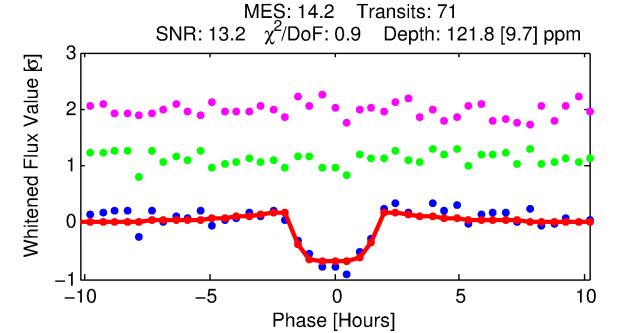
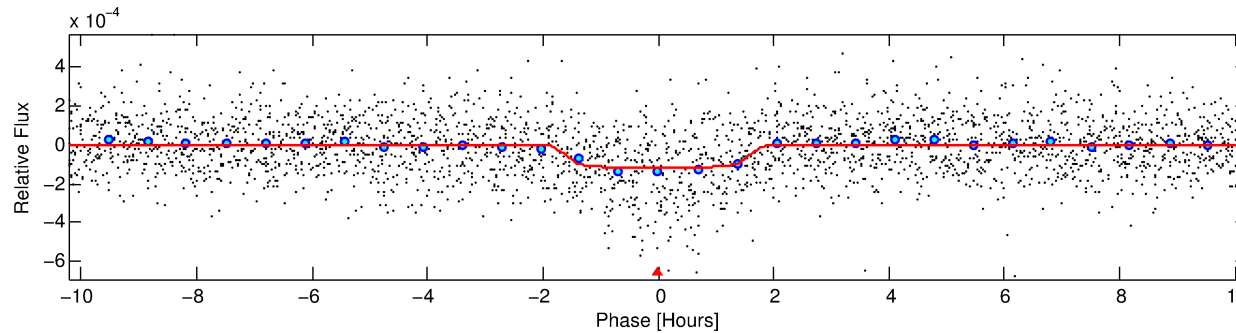
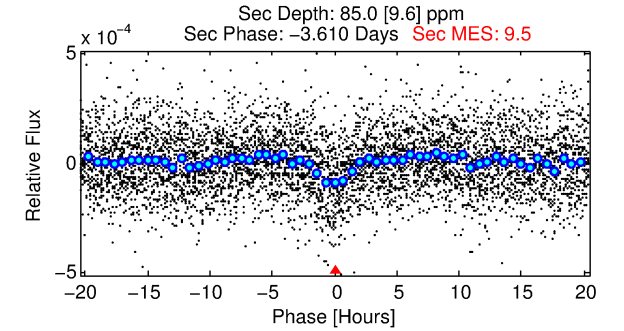
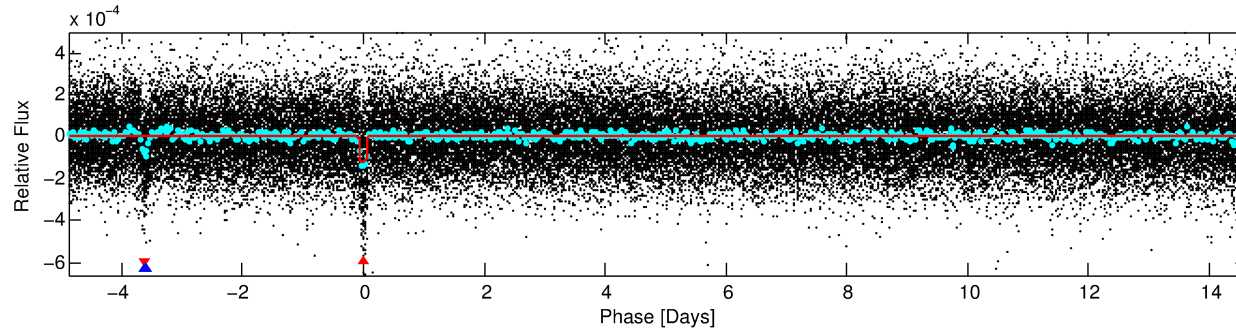
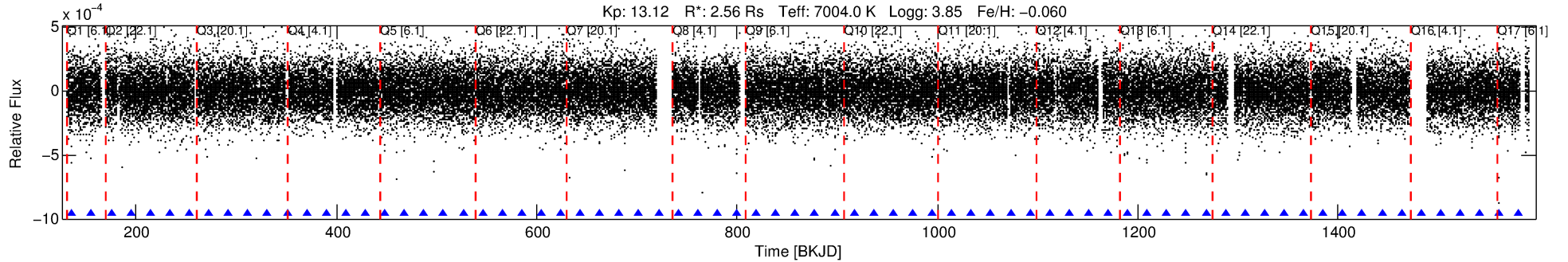
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 10518725 Candidate: 1 of 2 Period: 19.515 d

KOI: K00336 Corr: No Ephemeris Match

Kp: 13.12 R*: 2.56 Rs Teff: 7004.0 K Logg: 3.85 Fe/H: -0.060



DV Fit Results:

Period = 19.51501 [0.00012] d
Epoch = 136.2132 [0.0049] BKJD
Rp/R* = 0.0114 [0.0036]
a/R* = 24.28 [46.54]
b = 0.85 [0.65]
Seff = 490.71 [218.37]
Teq = 1200 [134] K
Rp = 3.17 [1.41] Re
a = 0.1694 [0.0467] AU
Ag = 133.28 [103.06] [1.28σ]
Teffp = 6305 [1046] K [4.84σ]

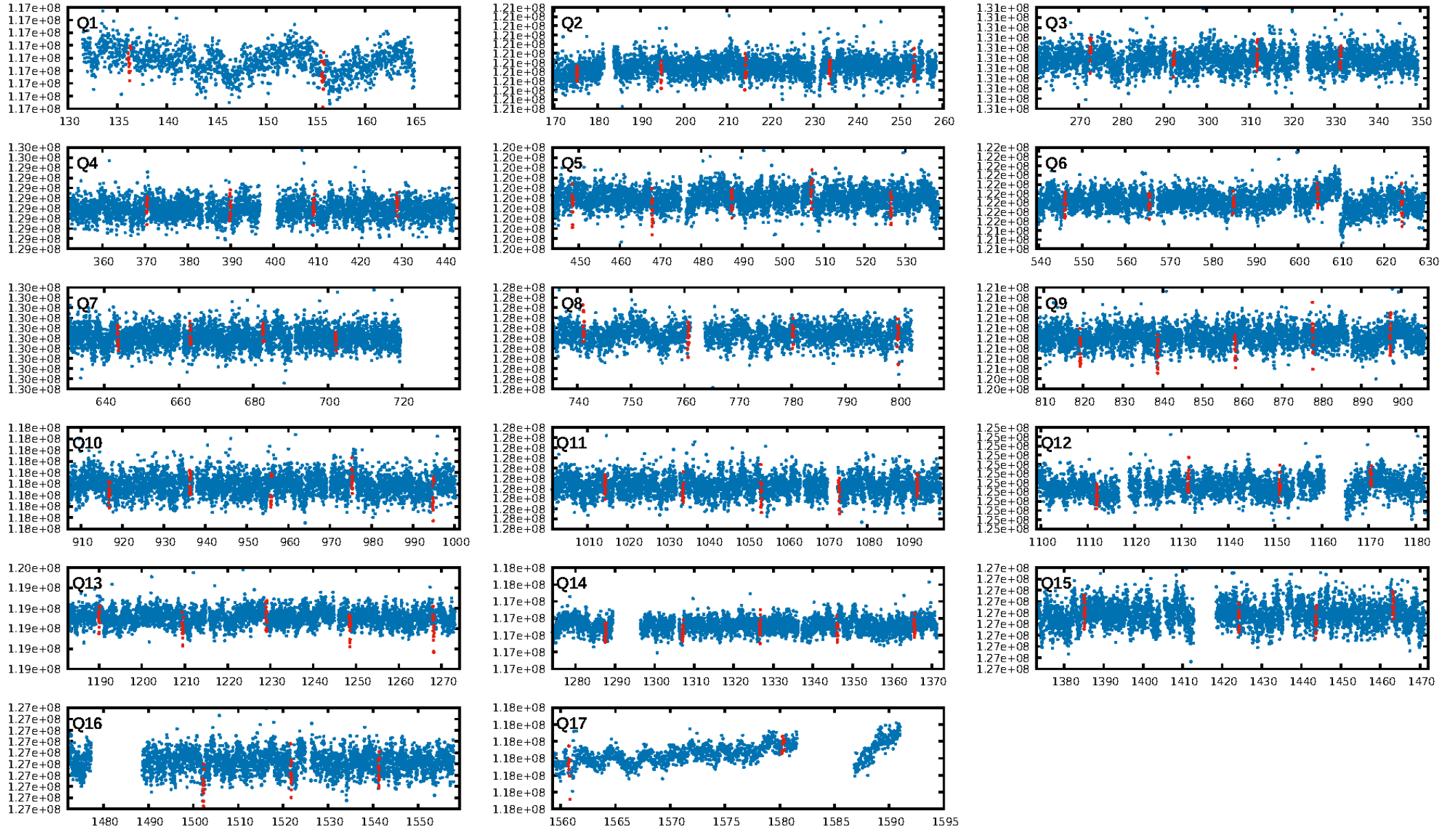
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.02e-43
RollingBand-fgt: 1.00 [67/67]
GhostDiagnostic-chr: -0.1337
Centroid-sig: 0.0%
Centroid-so: 38.542 arcsec [51.95σ]
OotOffset-rm: 9.205 arcsec [63.09σ]
KicOffset-rm: 9.199 arcsec [64.96σ]
OotOffset-st: 0/0/0/4 [4]
KicOffset-st: 0/0/0/4 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [17/17]

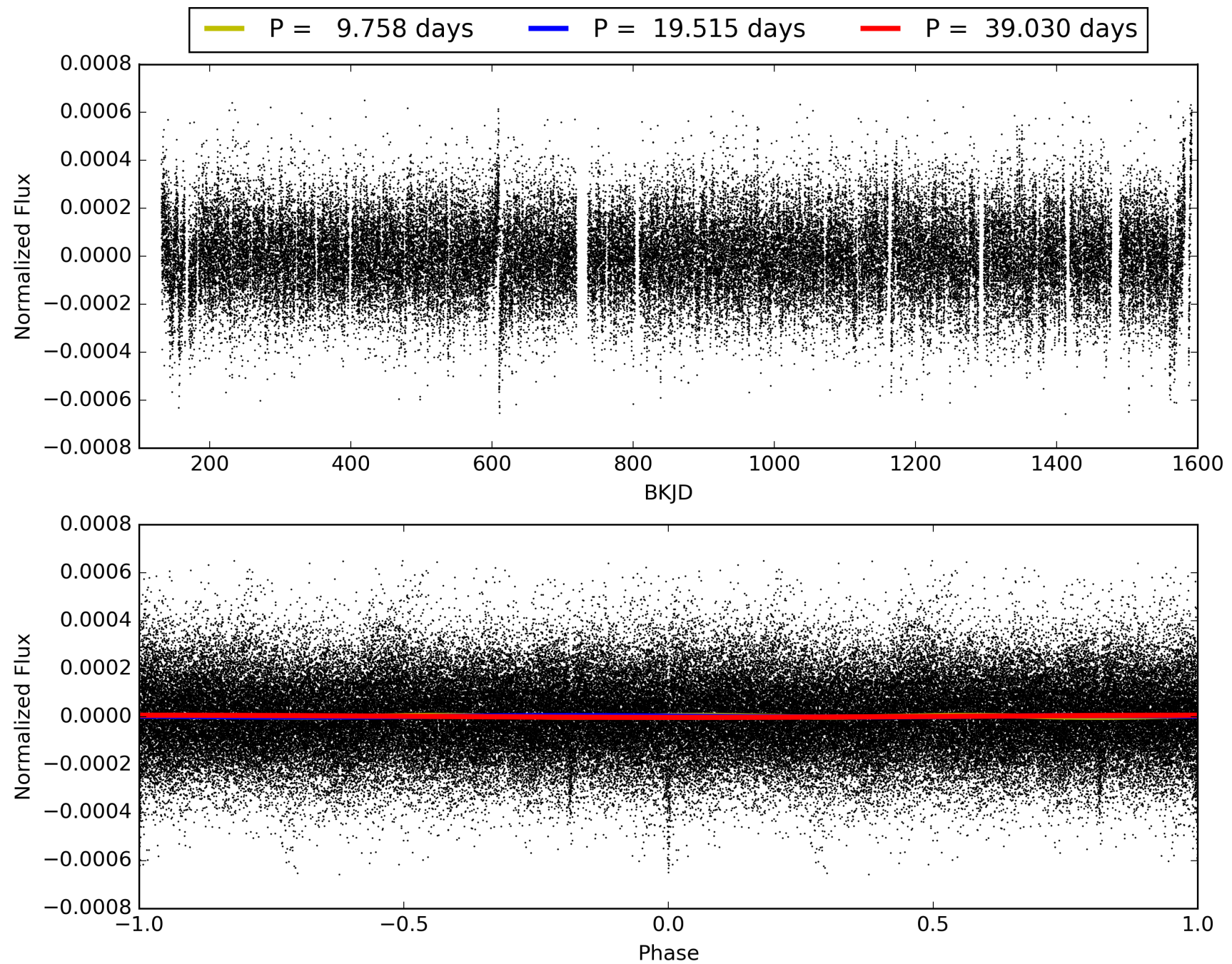
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:40:44 Z

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

TCE 010518725-01, PDC Light Curves

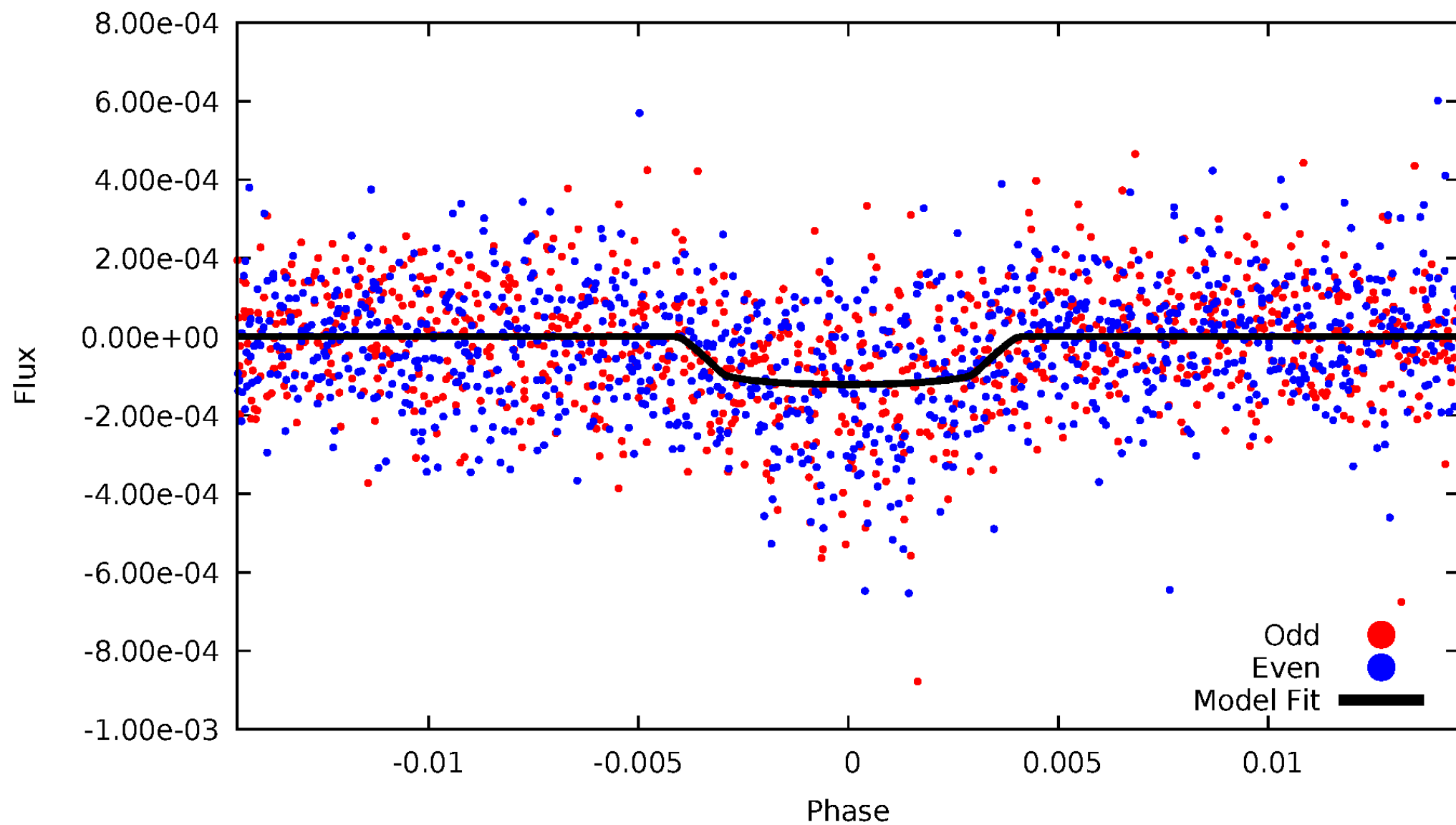


TCE 010518725-01



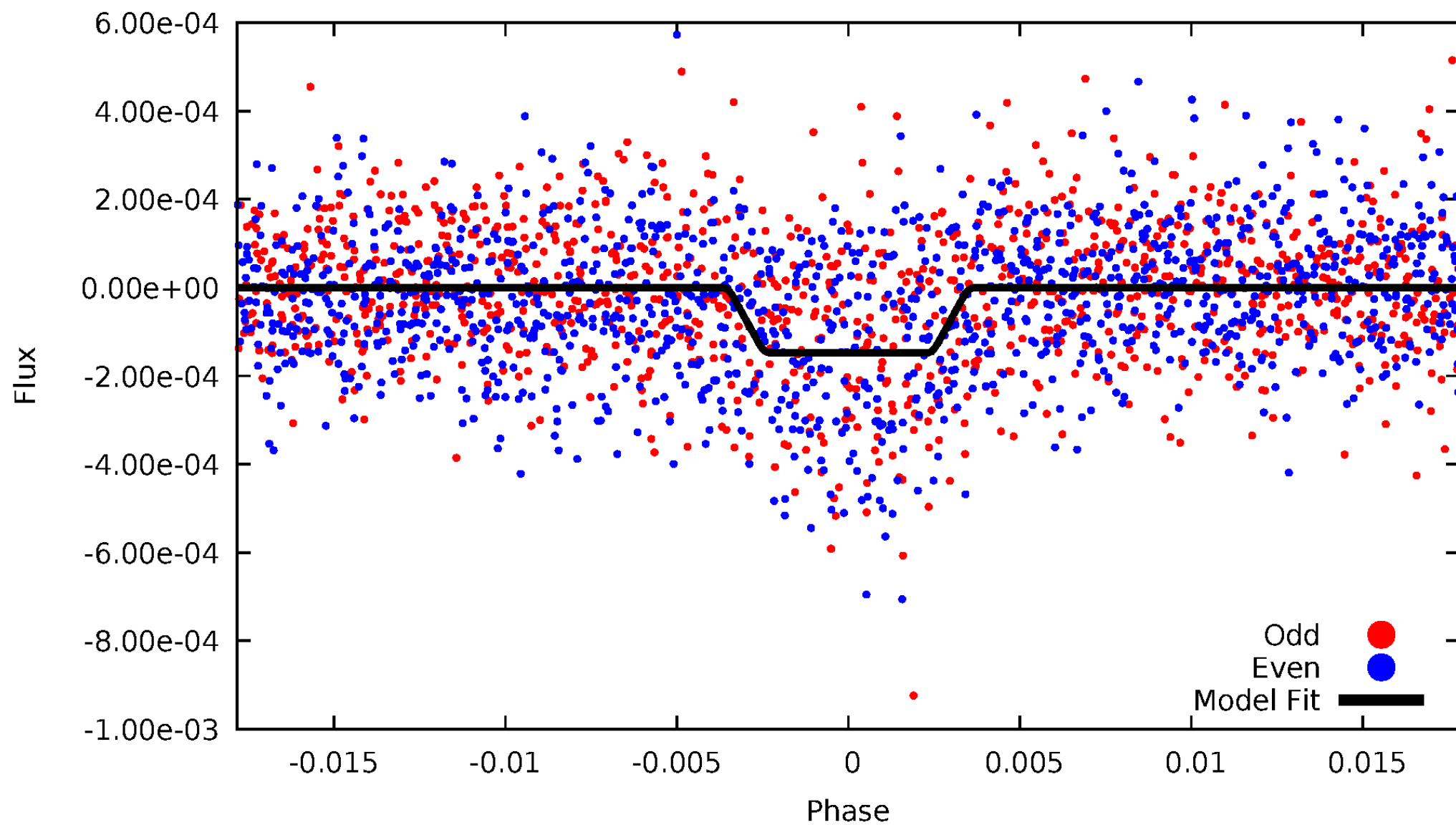
DV Odd/Even

TCE 010518725-01



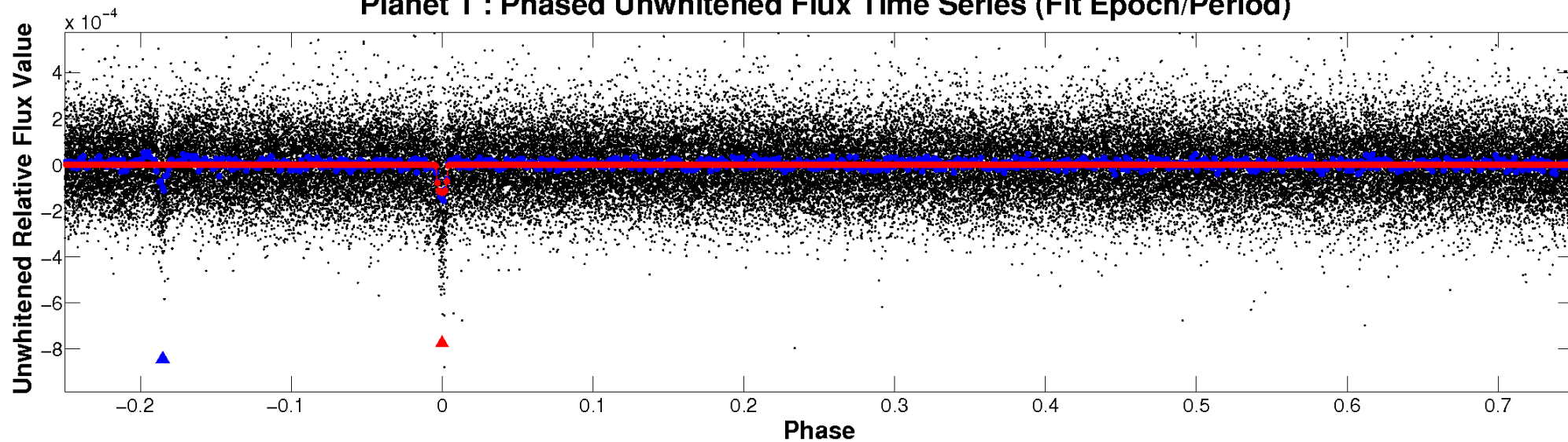
ALT Odd/Even

TCE 010518725-01

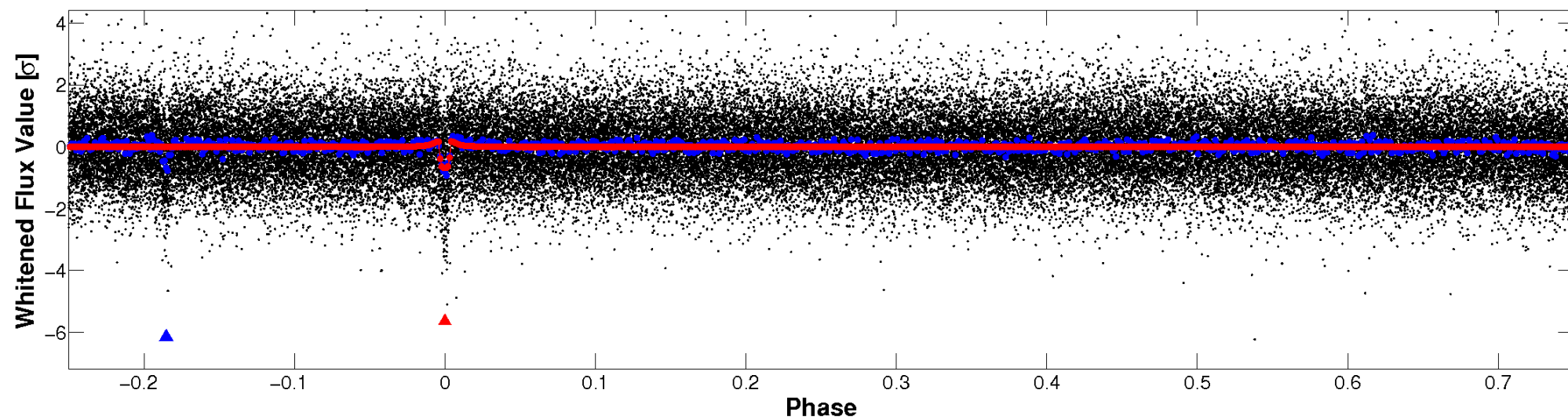


Non-Whitened Vs. Whitened Light Curve

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

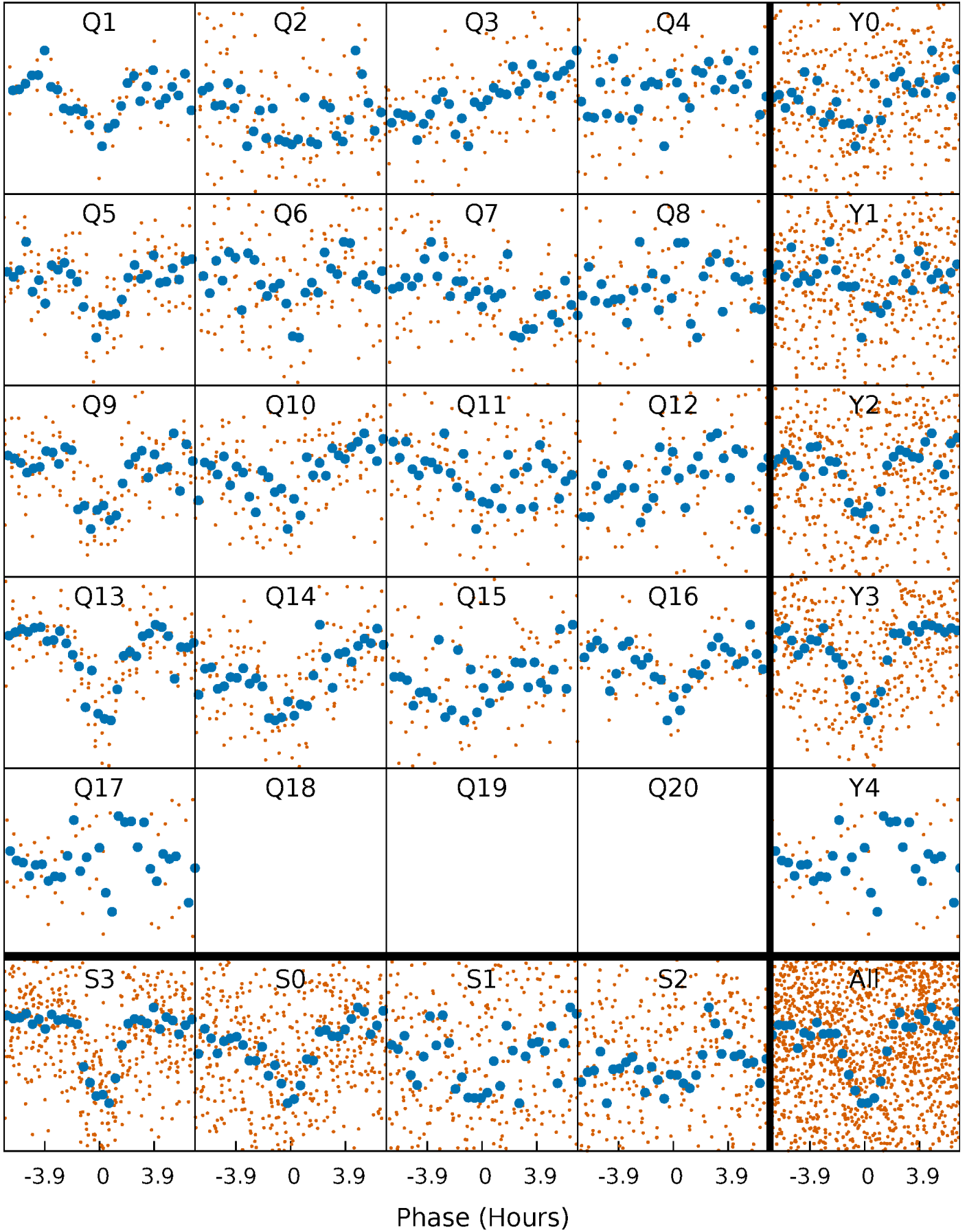


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



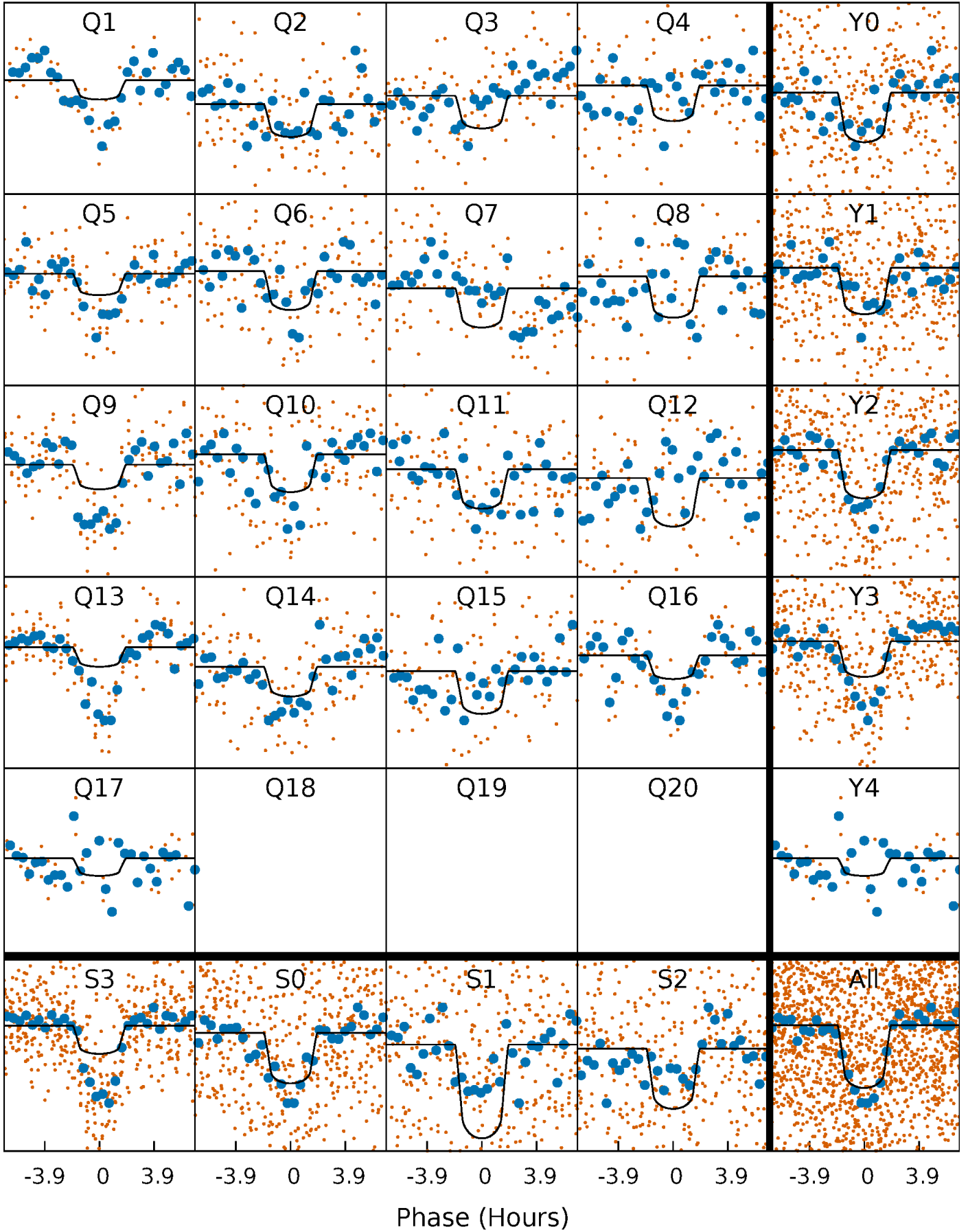
PDC Quarter-Phased Transit Curves

TCE 010518725-01 P= 19.515006 Days $T_0=136.213186$ (BKJD)



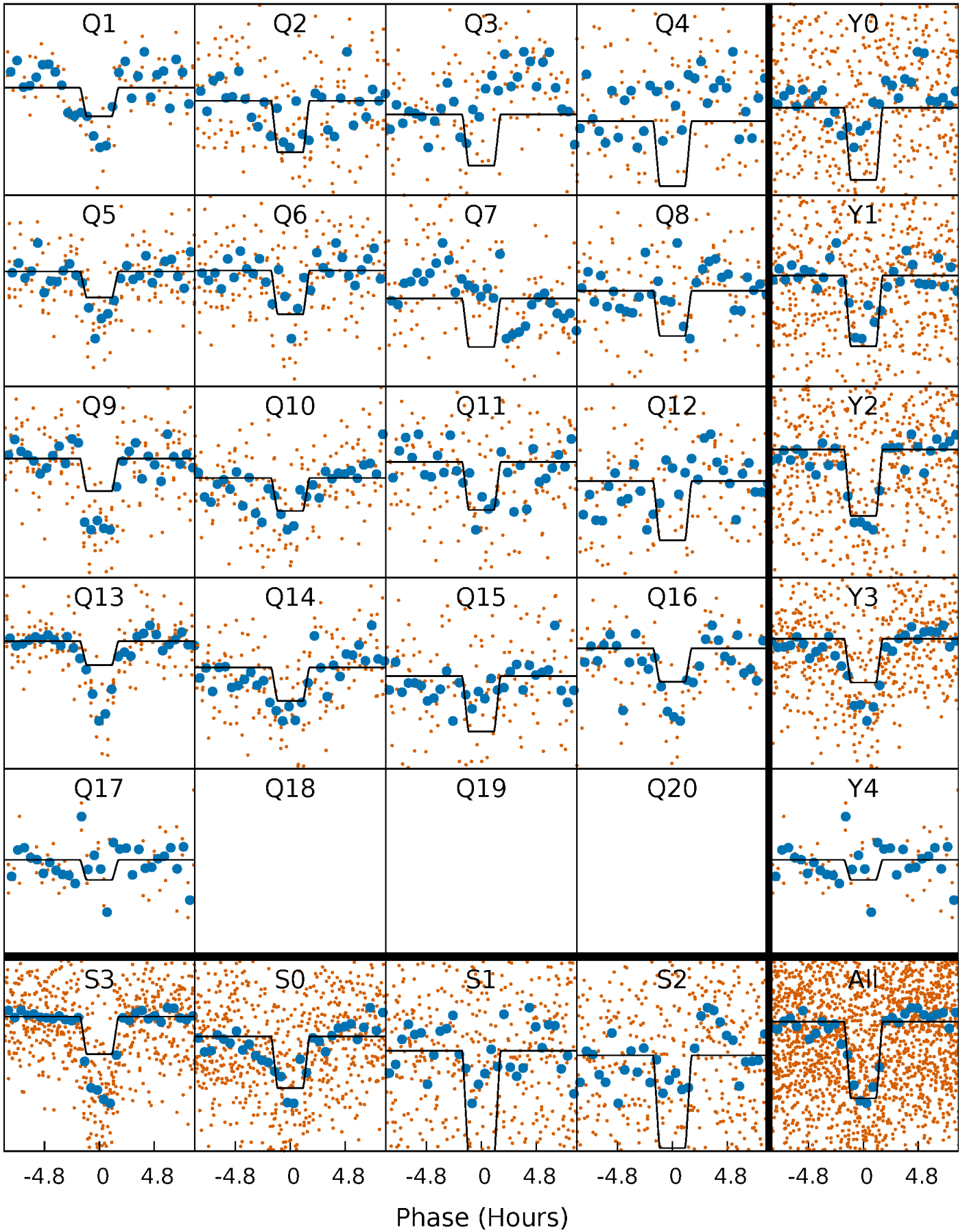
DV Quarter-Phased Transit Curves

TCE 010518725-01 P= 19.515006 Days $T_0=136.213186$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

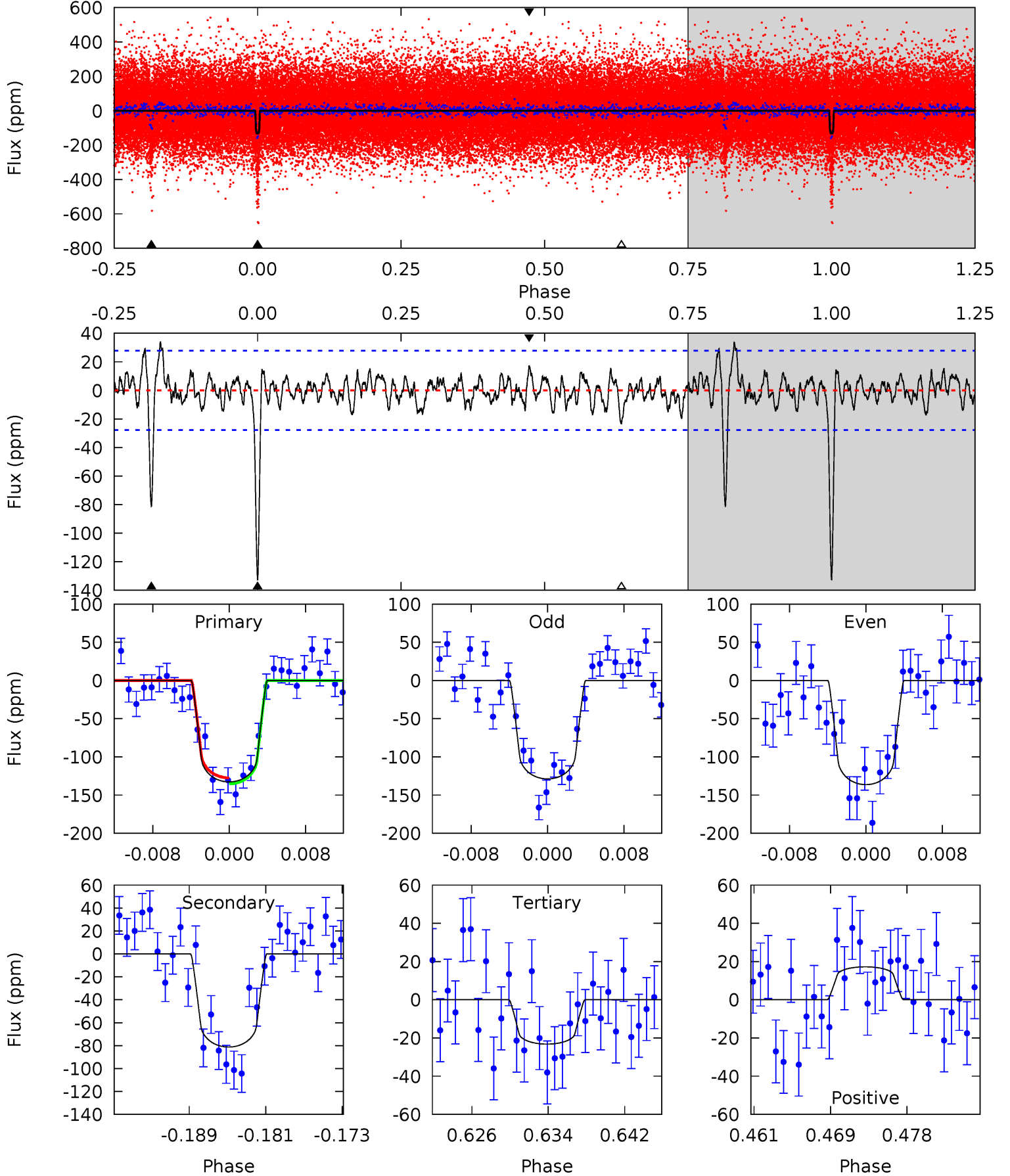
TCE 010518725-01 P= 19.514857 Days $T_0=136.219311$ (BKJD)



DV Model-Shift Uniqueness Test

010518725-01, $P = 19.515006$ Days, $E = 116.698180$ Days

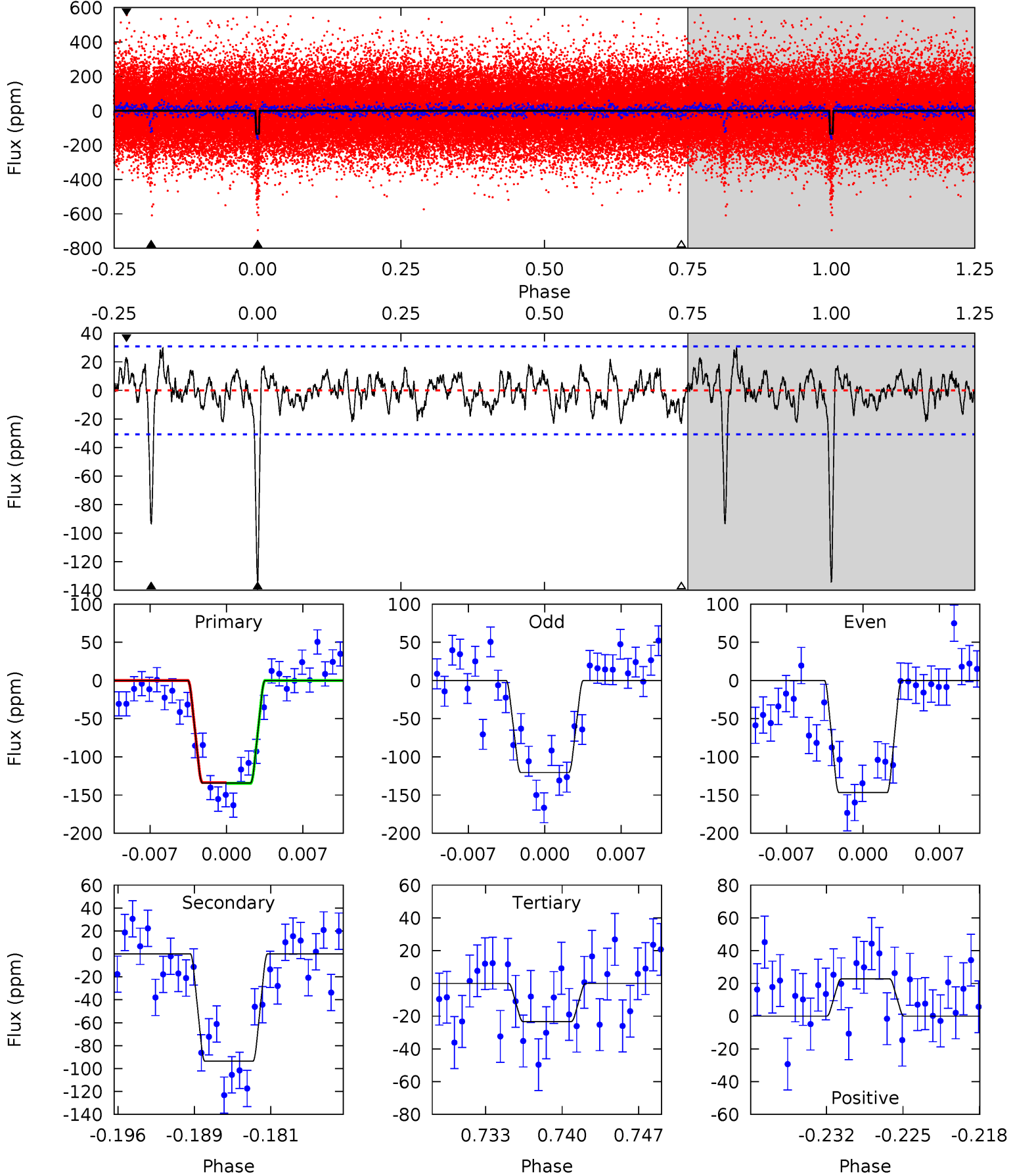
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.2	14.8	4.23	3.14	5.06	2.64	1.46	20.0	21.1	10.6	11.7	0.68	1.17	0.20	0.70



Alt Model-Shift Uniqueness Test

010518725-01, P = 19.514857 Days, E = 116.704454 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.2	15.4	3.85	3.77	5.09	2.68	1.48	18.3	18.4	11.6	11.7	2.17	1.04	0.18	0.08



Stellar Parameters For KIC 010518725

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7004^{+187}_{-250}	$3.854^{+0.240}_{-0.111}$	$-0.060^{+0.250}_{-0.300}$	$2.556^{+0.524}_{-0.785}$	$1.700^{+0.174}_{-0.324}$	$0.143^{+0.231}_{-0.048}$
	+3%/-4%	+6%/-3%	+417%/-500%	+21%/-31%	+10%/-19%	+161%/-34%
Source	PHO1	FLK73	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 010518725-01 / KOI 0336.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-81 ± 5	$3.00^{+1.04}_{-0.90}$	1653^{+103}_{-121}	6185^{+1367}_{-781}	142^{+149}_{-65}
Alt.	-94 ± 6	$3.22^{+1.13}_{-1.08}$	1655^{+104}_{-129}	6149^{+1444}_{-760}	141^{+171}_{-64}

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

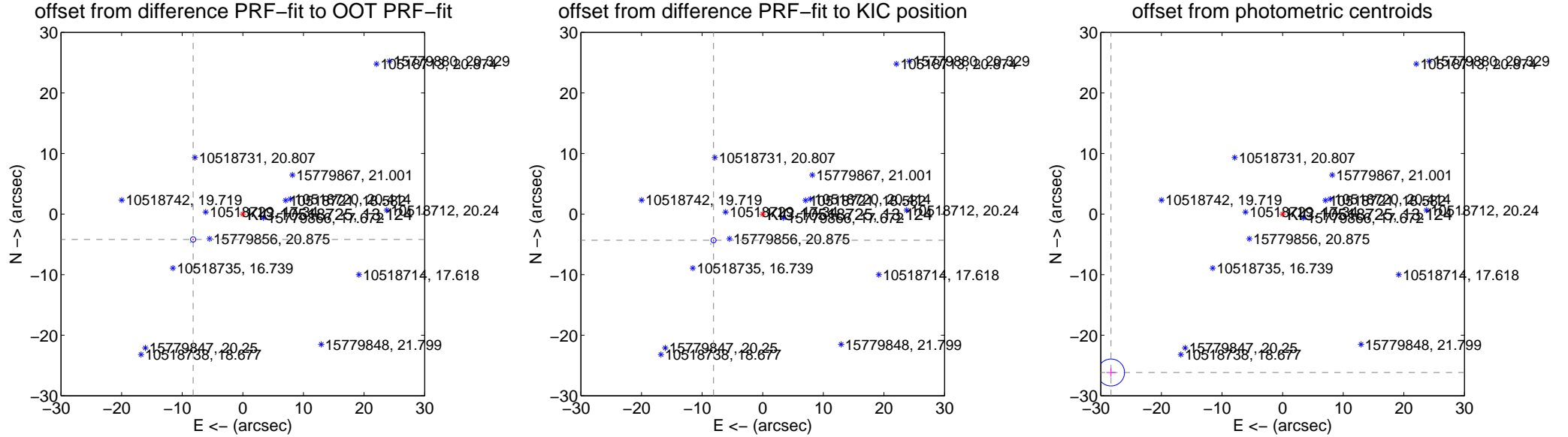
DV Centroid Data

Supplemental centroid analysis for 010518725-01. Kepler magnitude: 13.12. Transit SNR 13.16

There are 4 quarters with good PRF difference image offsets

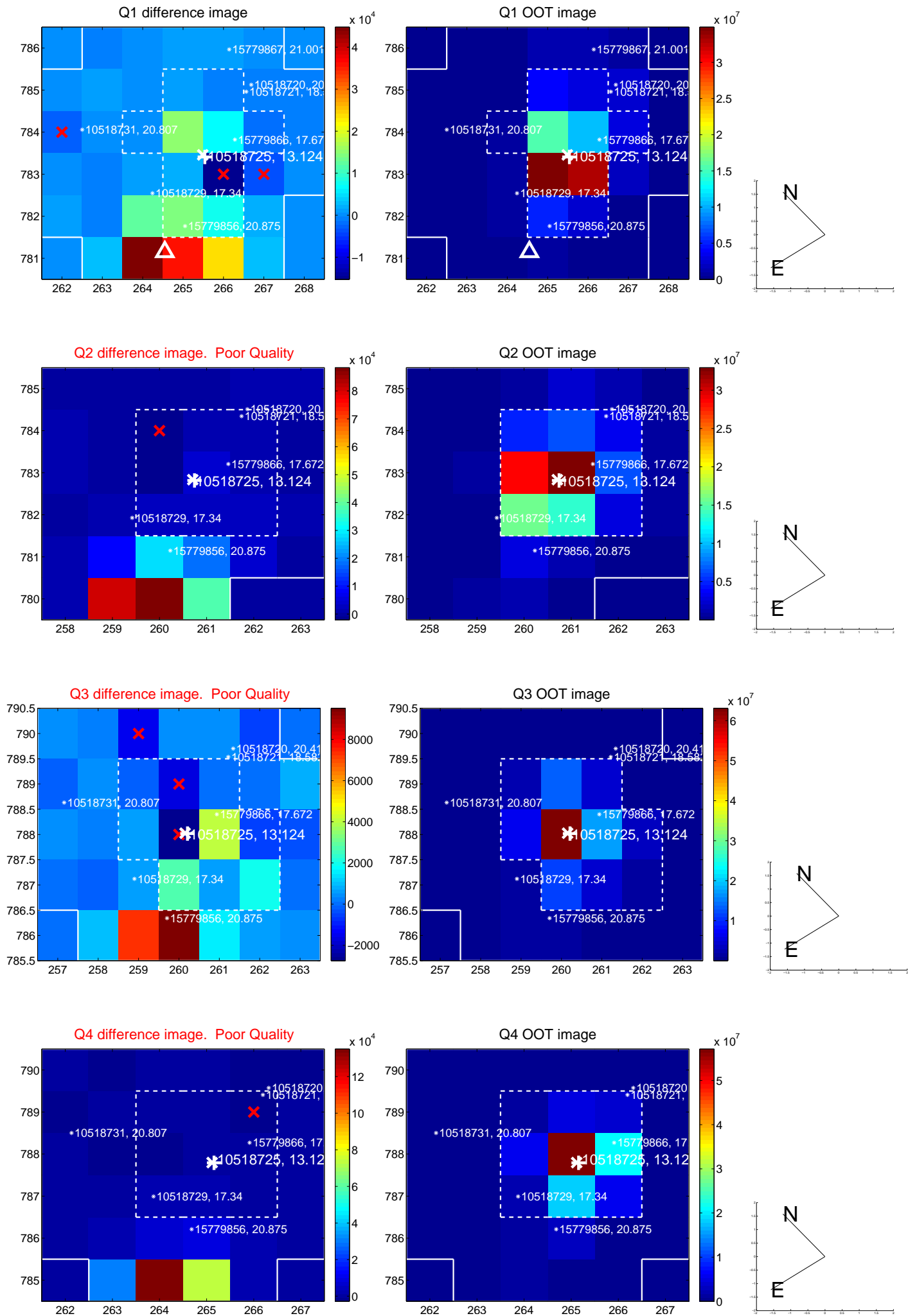
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.205 \pm 0.146	63.09	8.196 \pm 0.116	-4.191 \pm 0.121
PRF-fit source offset from KIC position	9.199 \pm 0.142	64.96	8.119 \pm 0.103	-4.326 \pm 0.138
photometric centroid source offset	38.54 \pm 0.74	51.95	28.31 \pm 0.77	-26.15 \pm 0.71

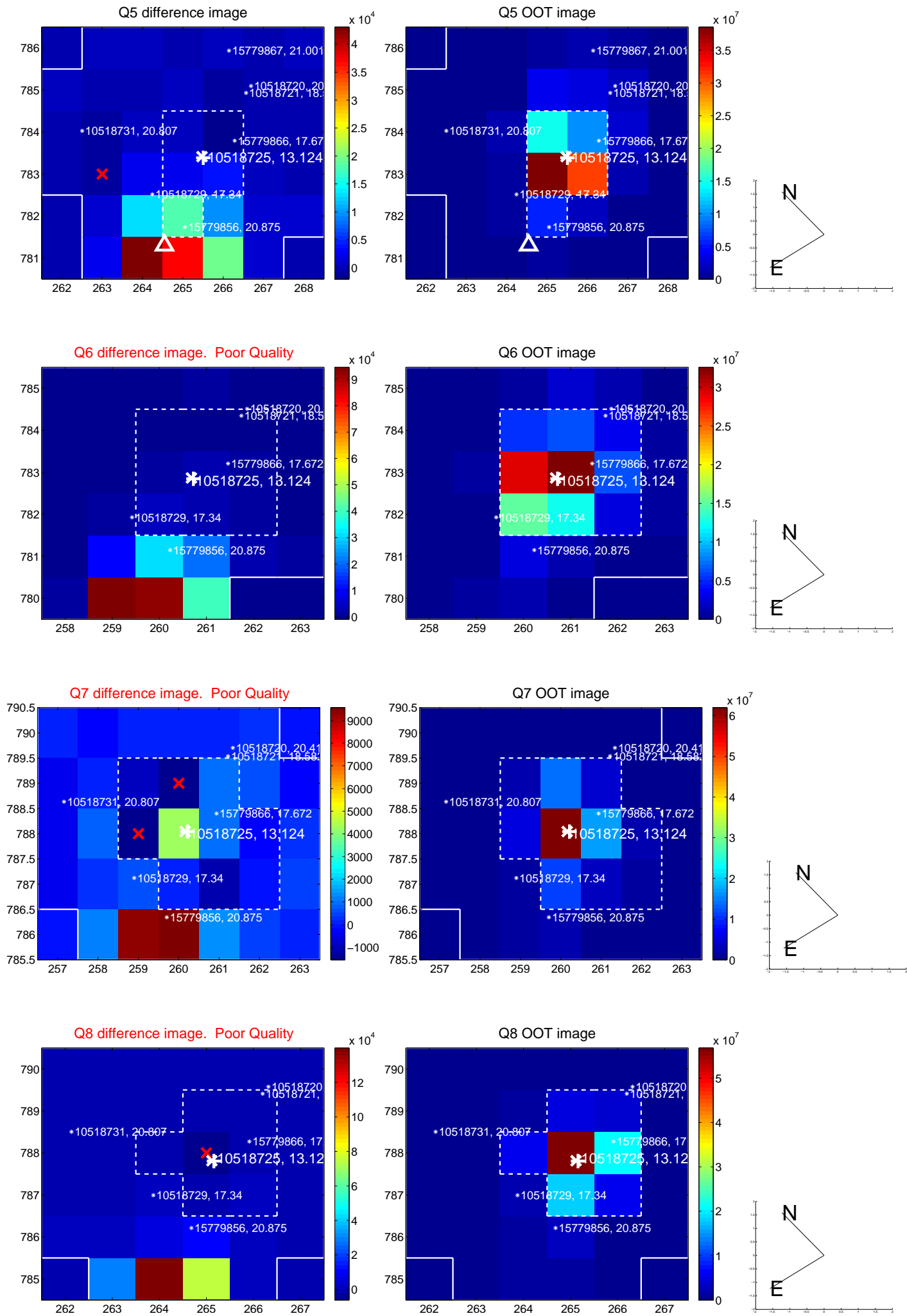


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

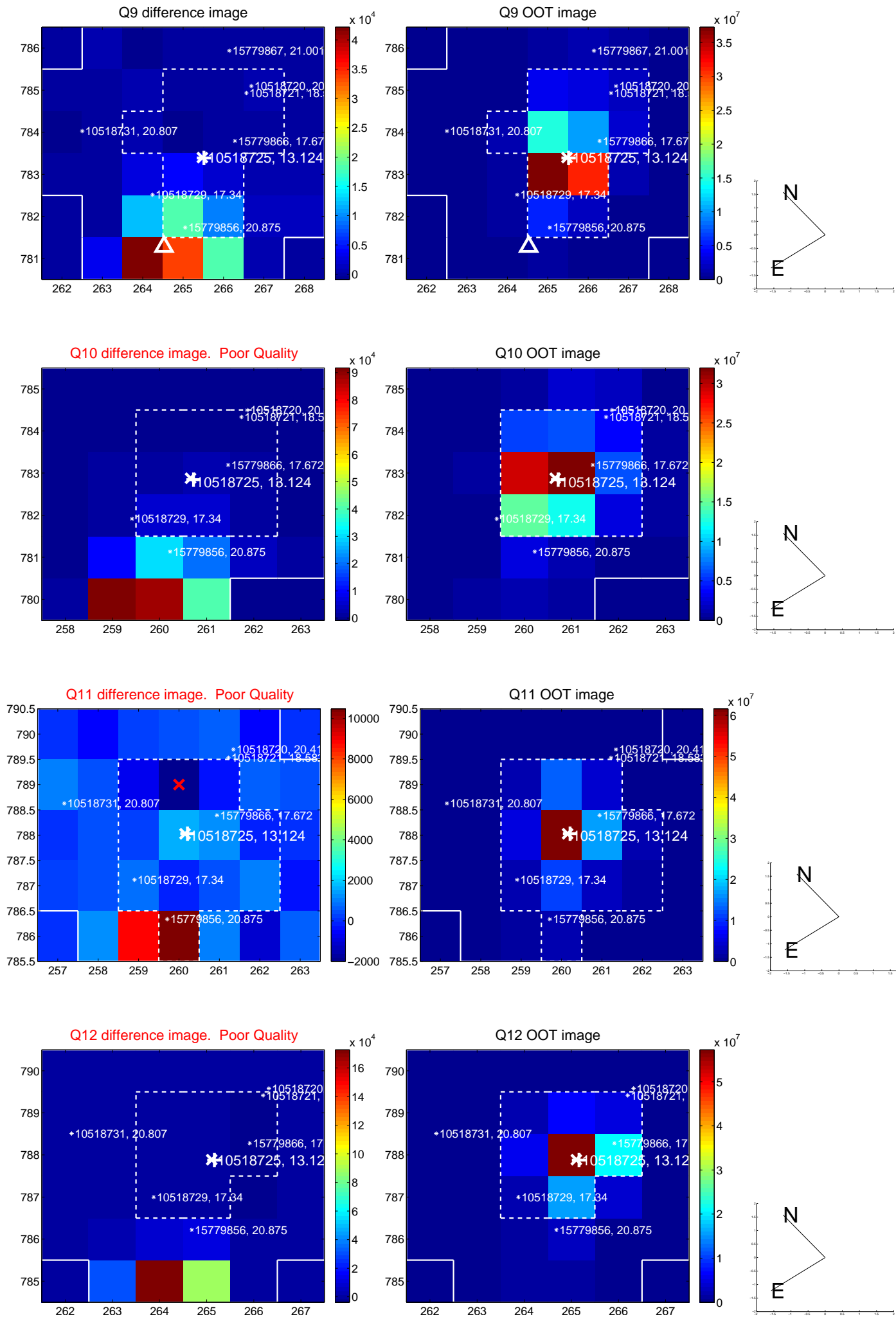
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



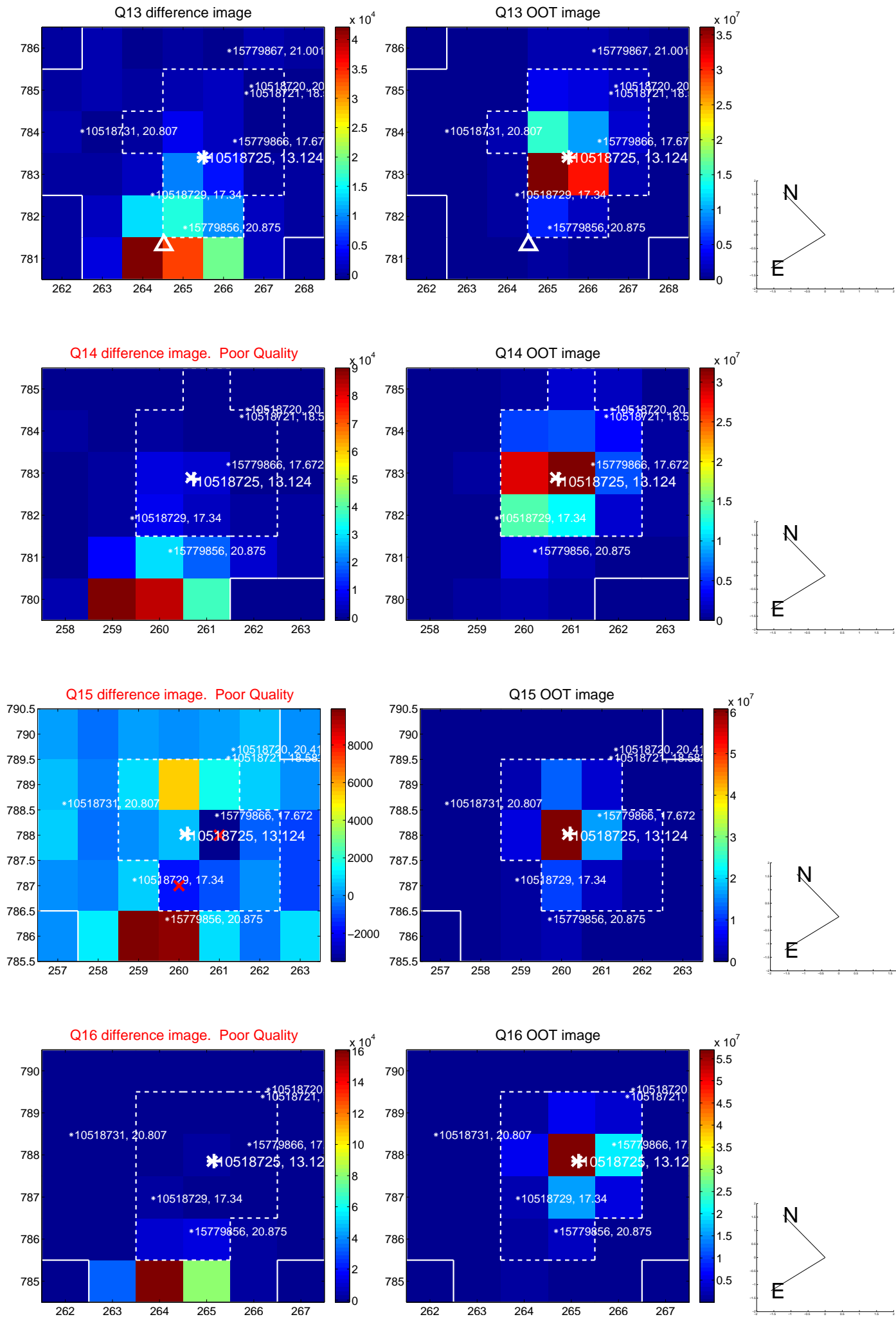
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



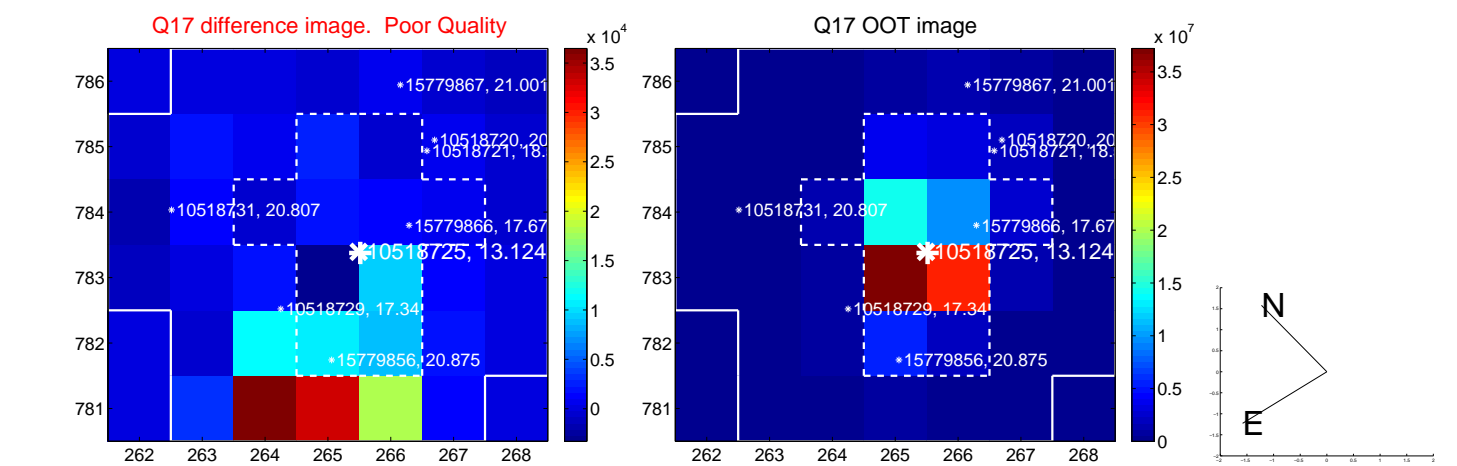
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



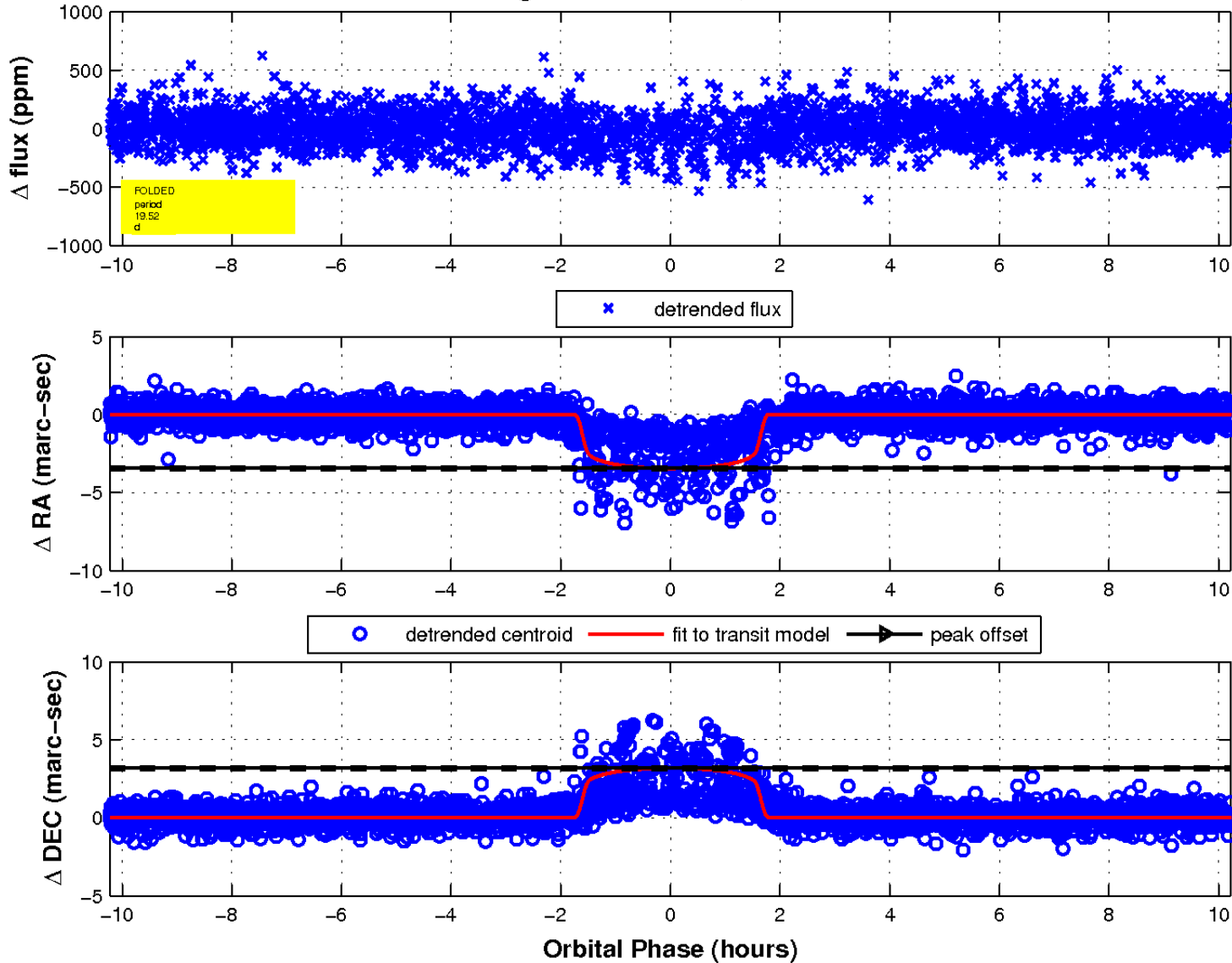
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

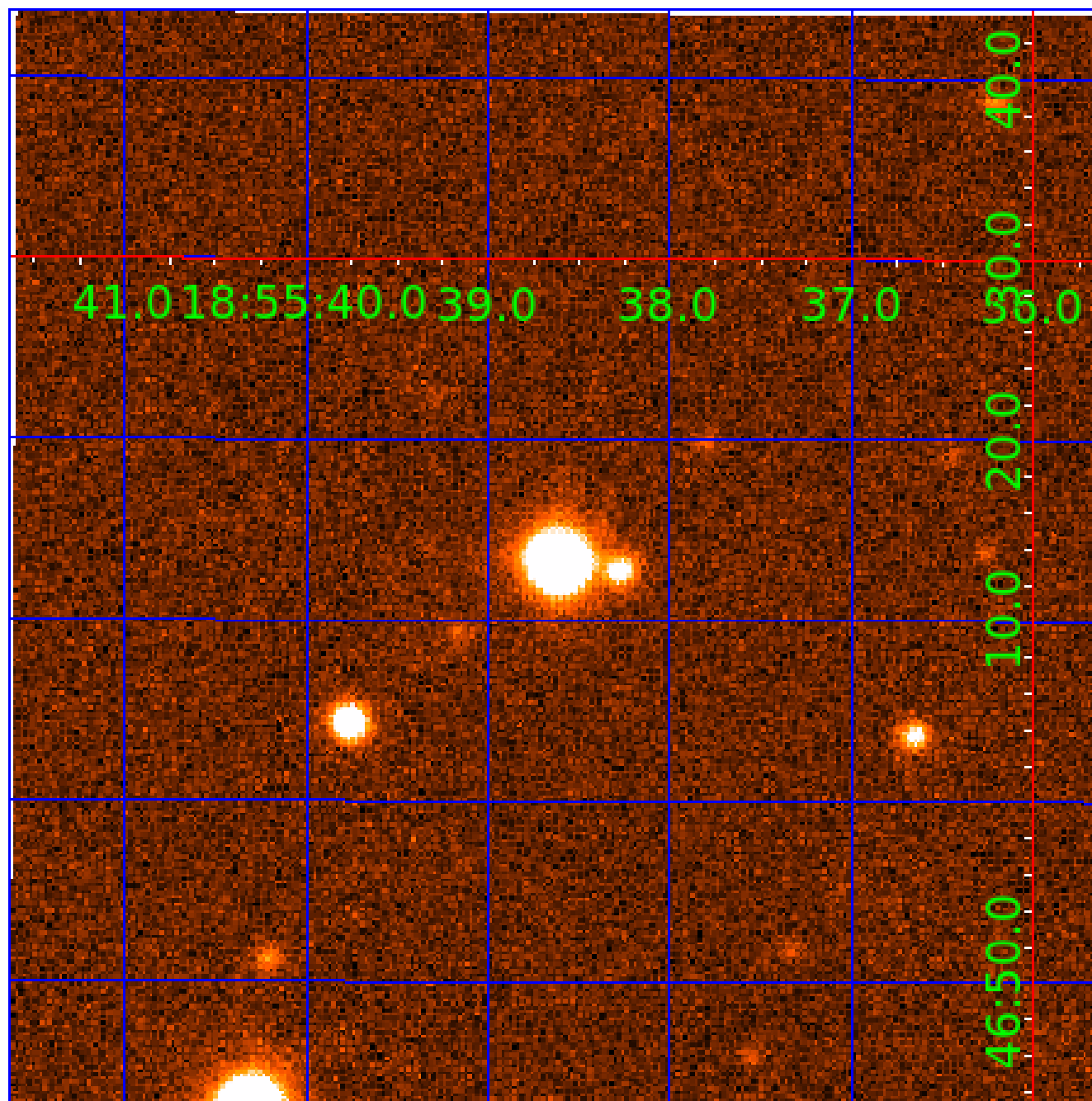


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010518725

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})
010518725-01	OBS	0336.01	19.515006	136.213186	121.8	3.408	14.2	13.2	2.56	7004	3.17	490.71
010518725-02	OBS	No	19.514877	132.604546	93.6	3.134	9.7	10.3	2.56	7004	2.88	490.72

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010518725-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
010518725-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—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 010518725-02

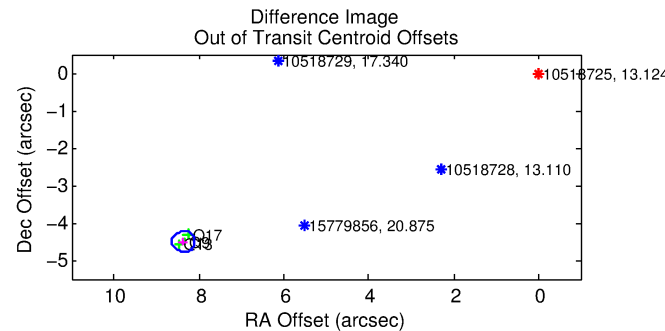
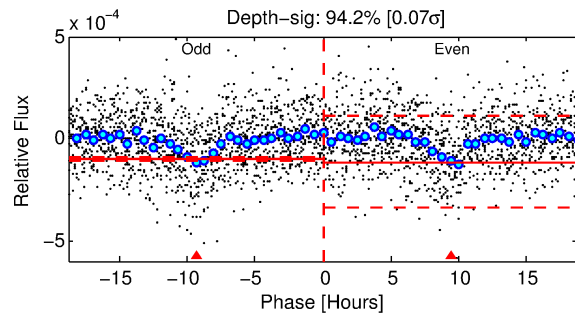
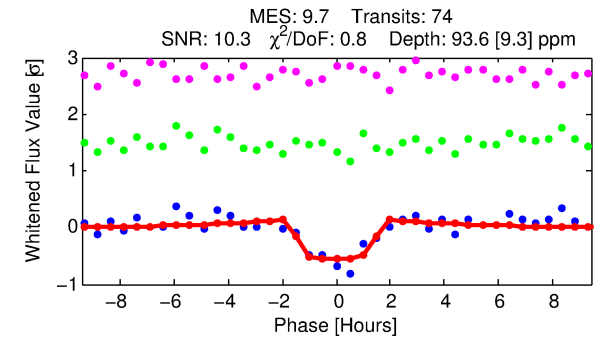
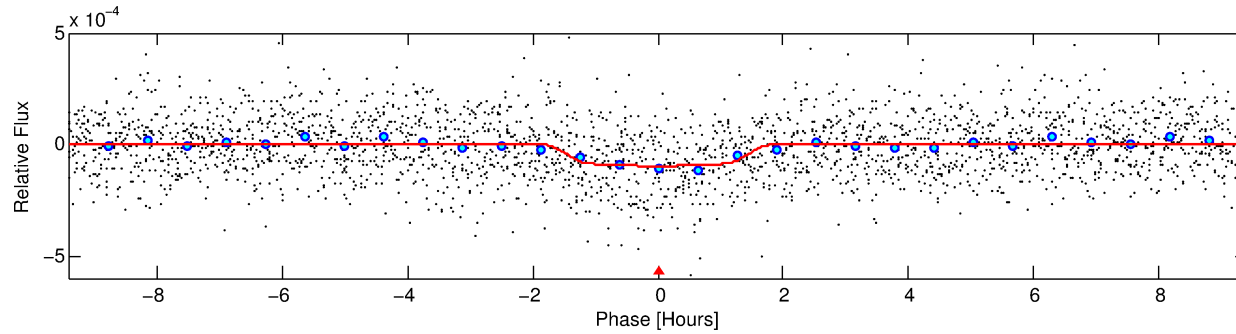
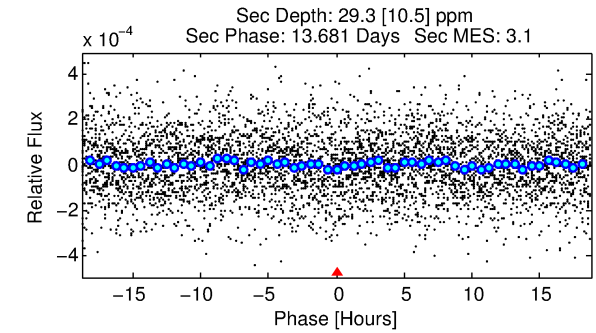
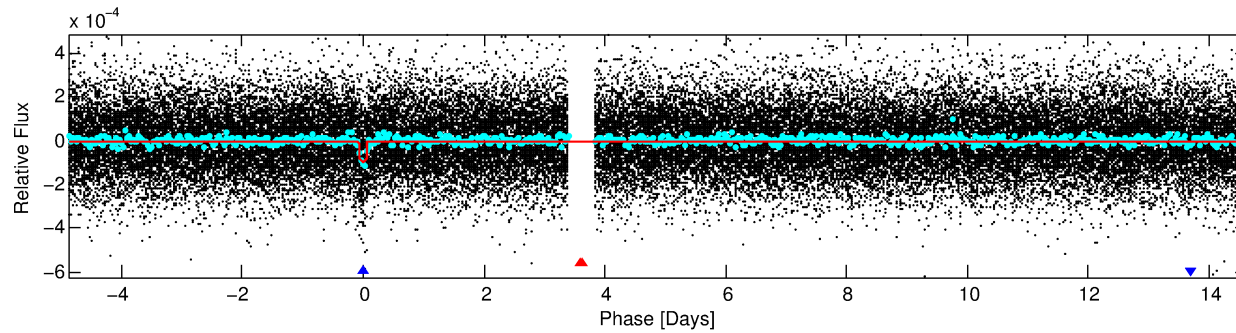
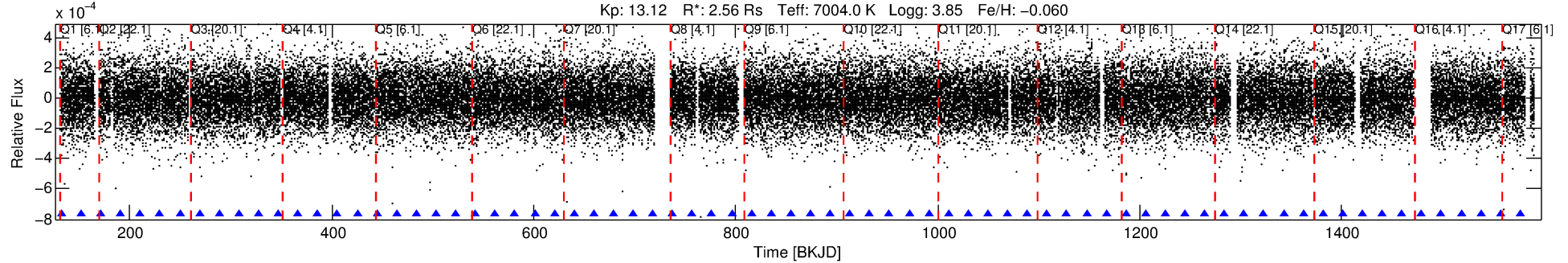
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist (")	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
010518725-02	10518725	010518735-02	10518735	1:1	14.6	4	1	16.74	13.12	1784.50	Direct-PRF	0	0.23	0.17

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: 10518725 Candidate: 2 of 2 Period: 19.515 d
KOI: K00336.01 Corr: 0.990

Kp: 13.12 R*: 2.56 Rs Teff: 7004.0 K Logg: 3.85 Fe/H: -0.060



DV Fit Results:

Period = 19.51488 [0.00014] d
Epoch = 132.6045 [0.0057] BKJD
Rp/R* = 0.0103 [0.0035]
a/R* = 21.43 [44.29]
b = 0.90 [0.42]
Seff = 490.72 [218.37]
Teq = 1200 [134] K
Rp = 2.88 [1.32] Re
a = 0.1694 [0.0467] AU
Ag = 55.75 [48.89] [1.12σ]
Teff = 5070 [992] K [3.87σ]

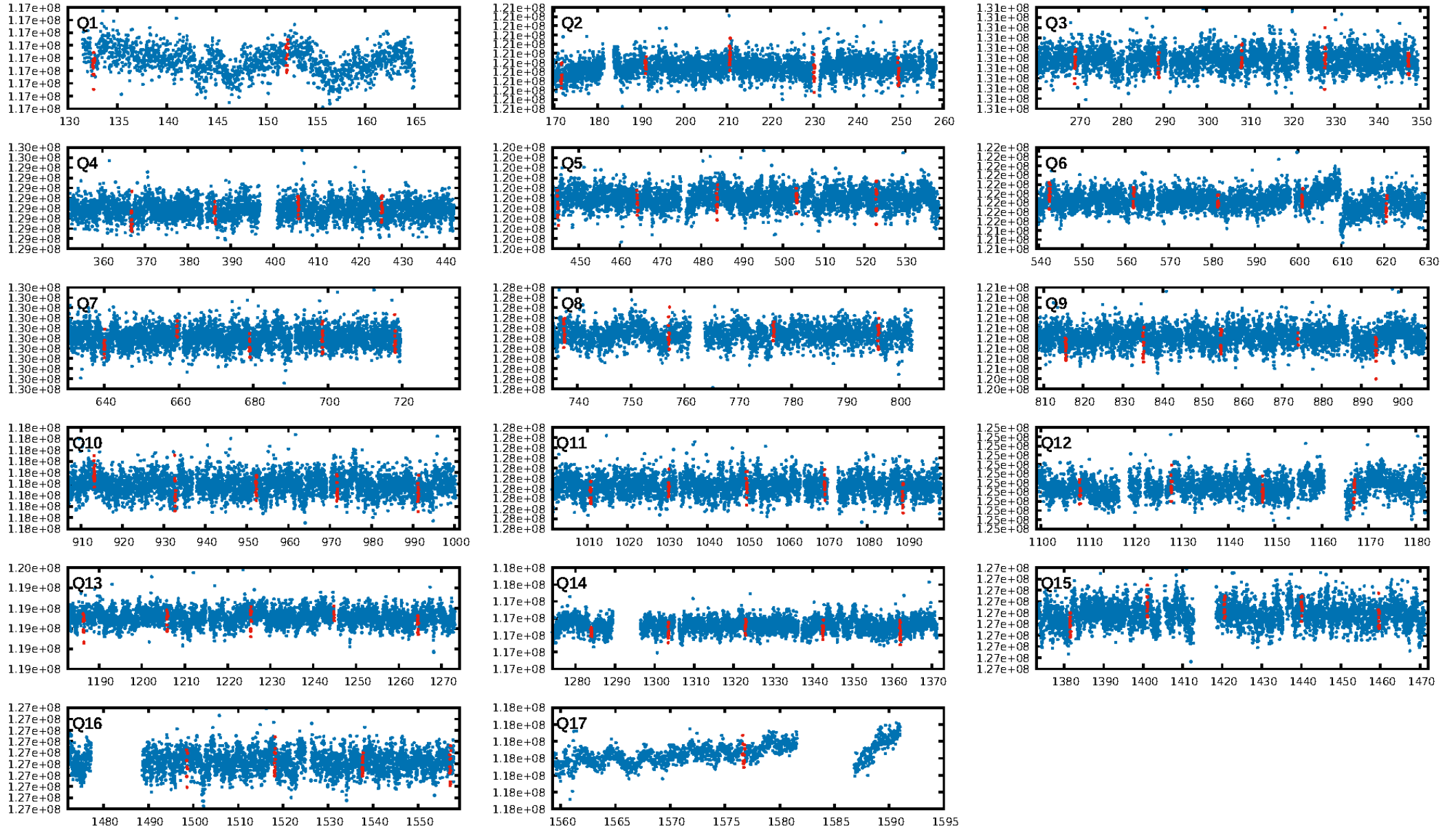
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: 33.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.30e-21
RollingBand-fgt: 1.00 [71/71]
GhostDiagnostic-chr: -0.1677
Centroid-sig: 0.0%
Centroid-so: 25.101 arcsec [25.06σ]
OotOffset-rm: 9.497 arcsec [104.21σ]
KicOffset-rm: 9.483 arcsec [104.06σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [17/17]

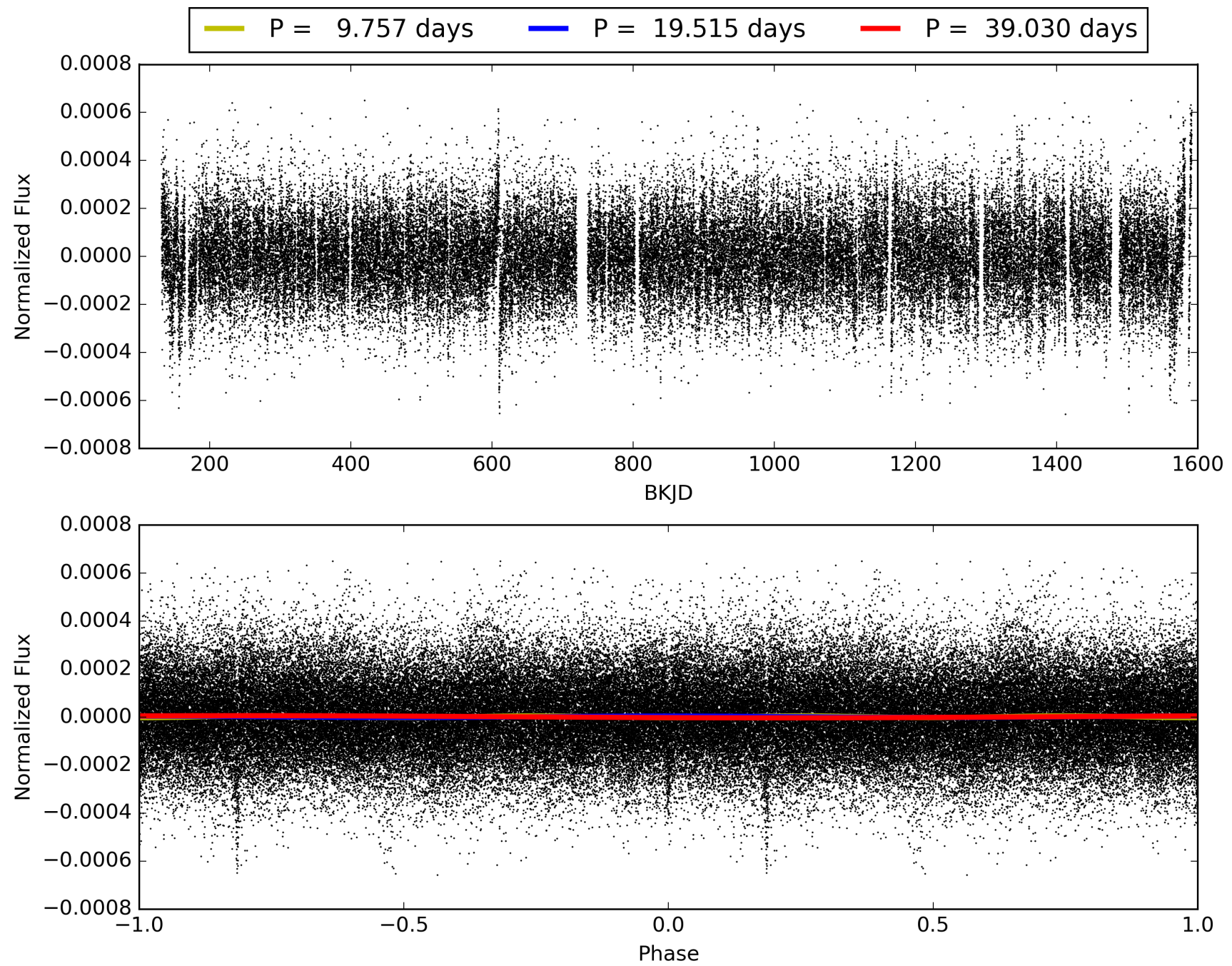
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:40:51 Z

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TCE 010518725-02, PDC Light Curves

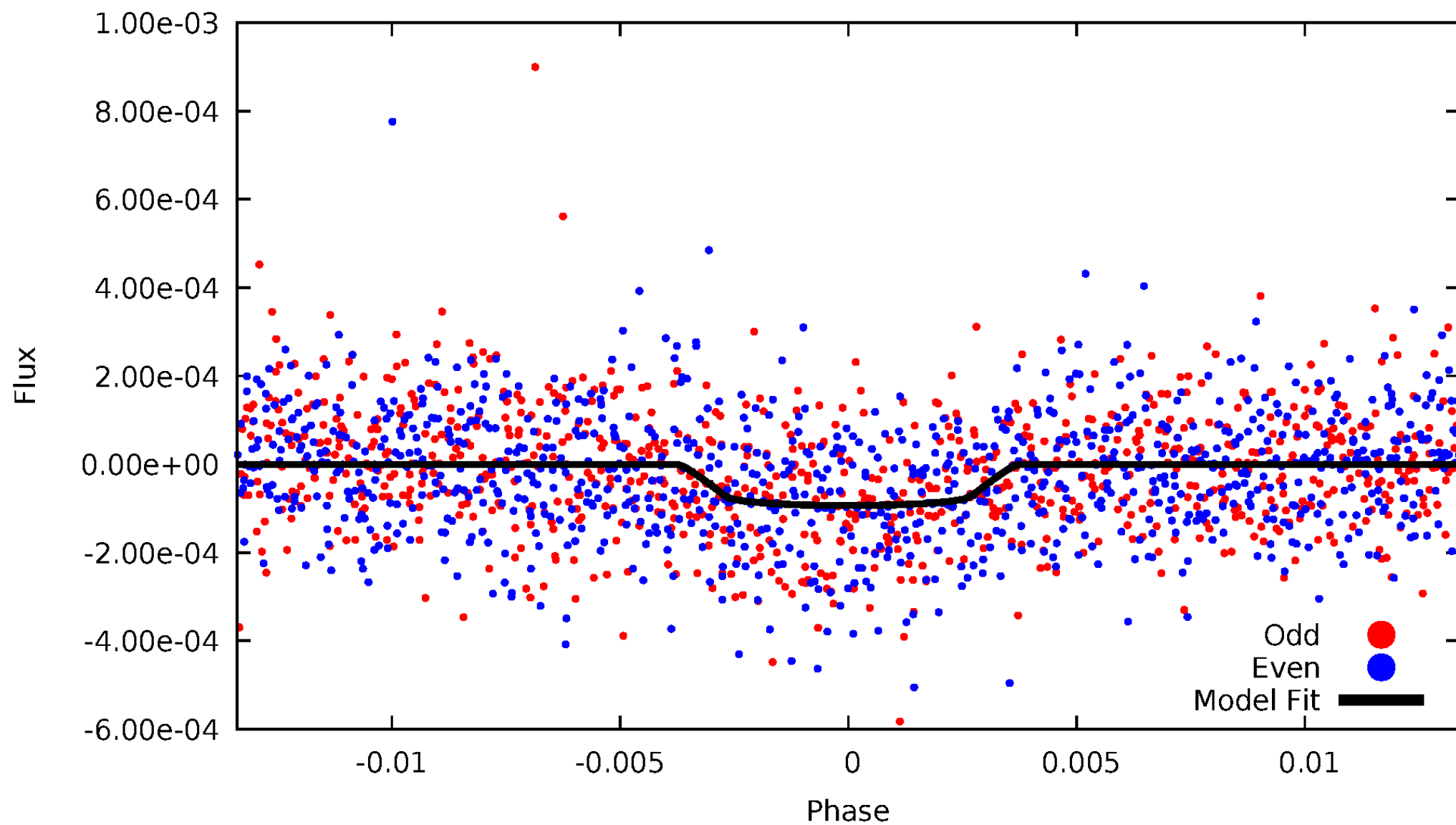


TCE 010518725-02



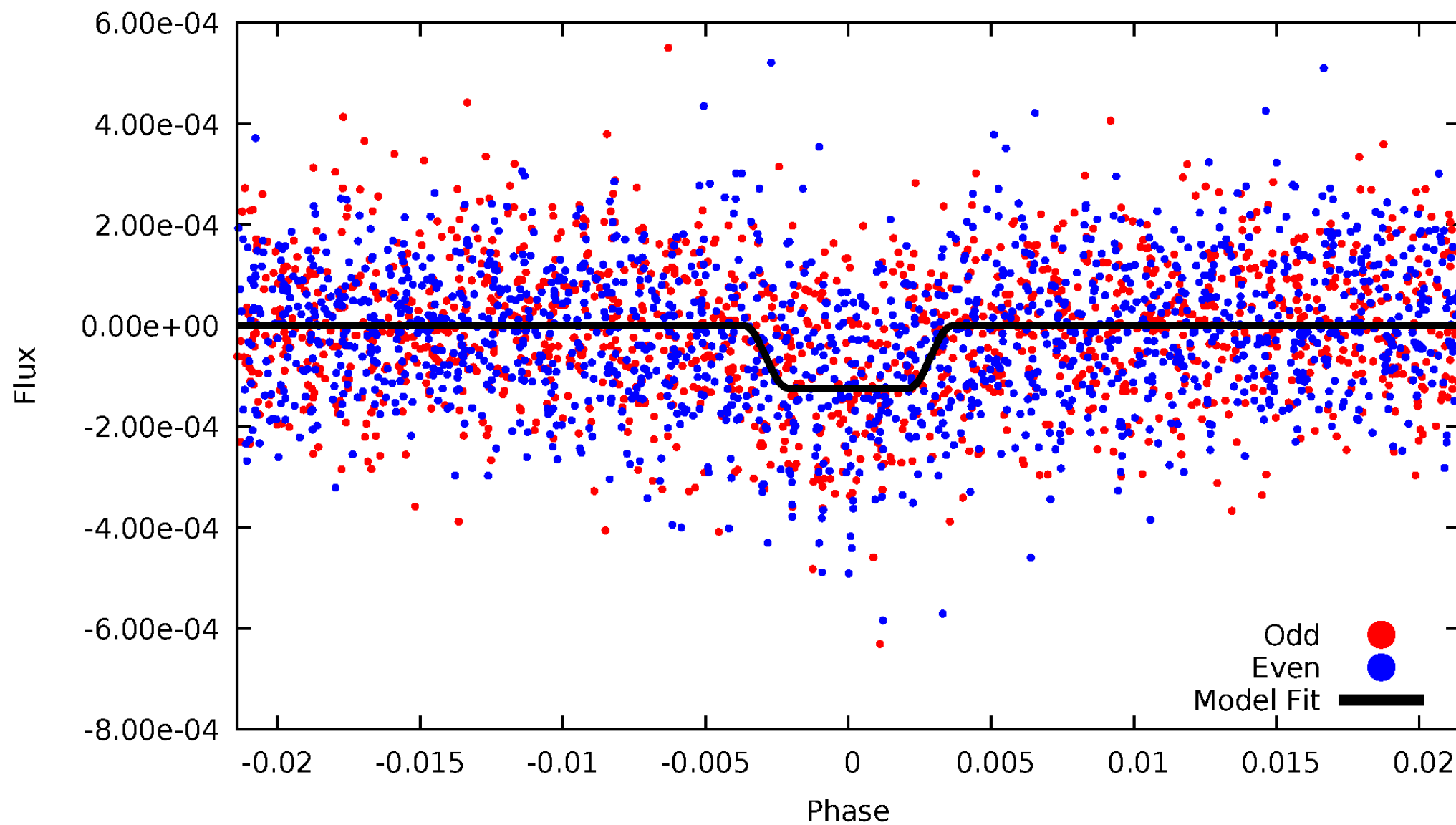
DV Odd/Even

TCE 010518725-02



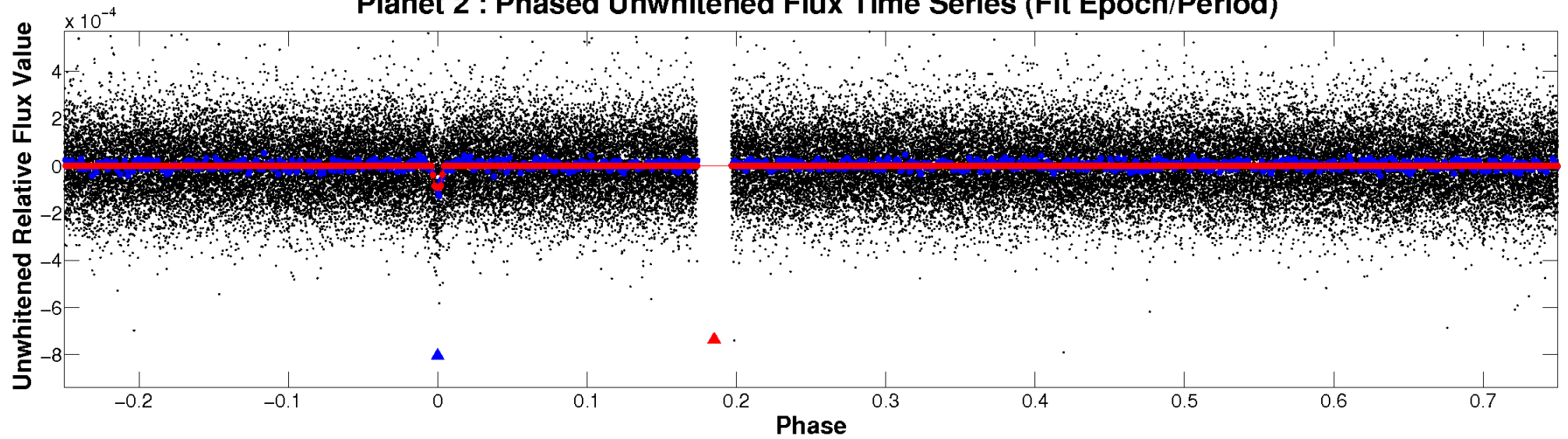
ALT Odd/Even

TCE 010518725-02

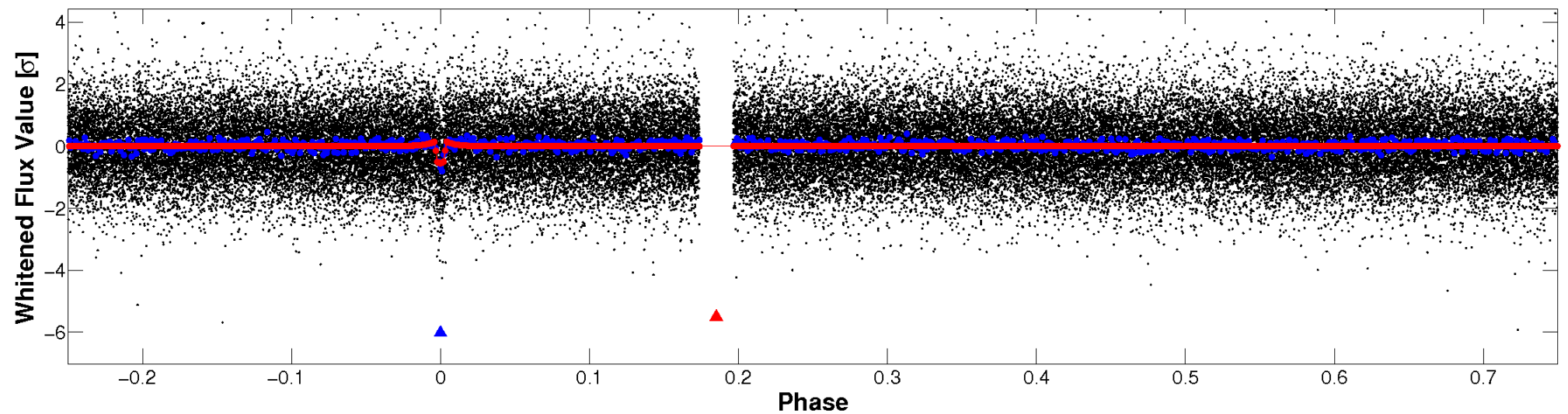


Non-Whitened Vs. Whitened Light Curve

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

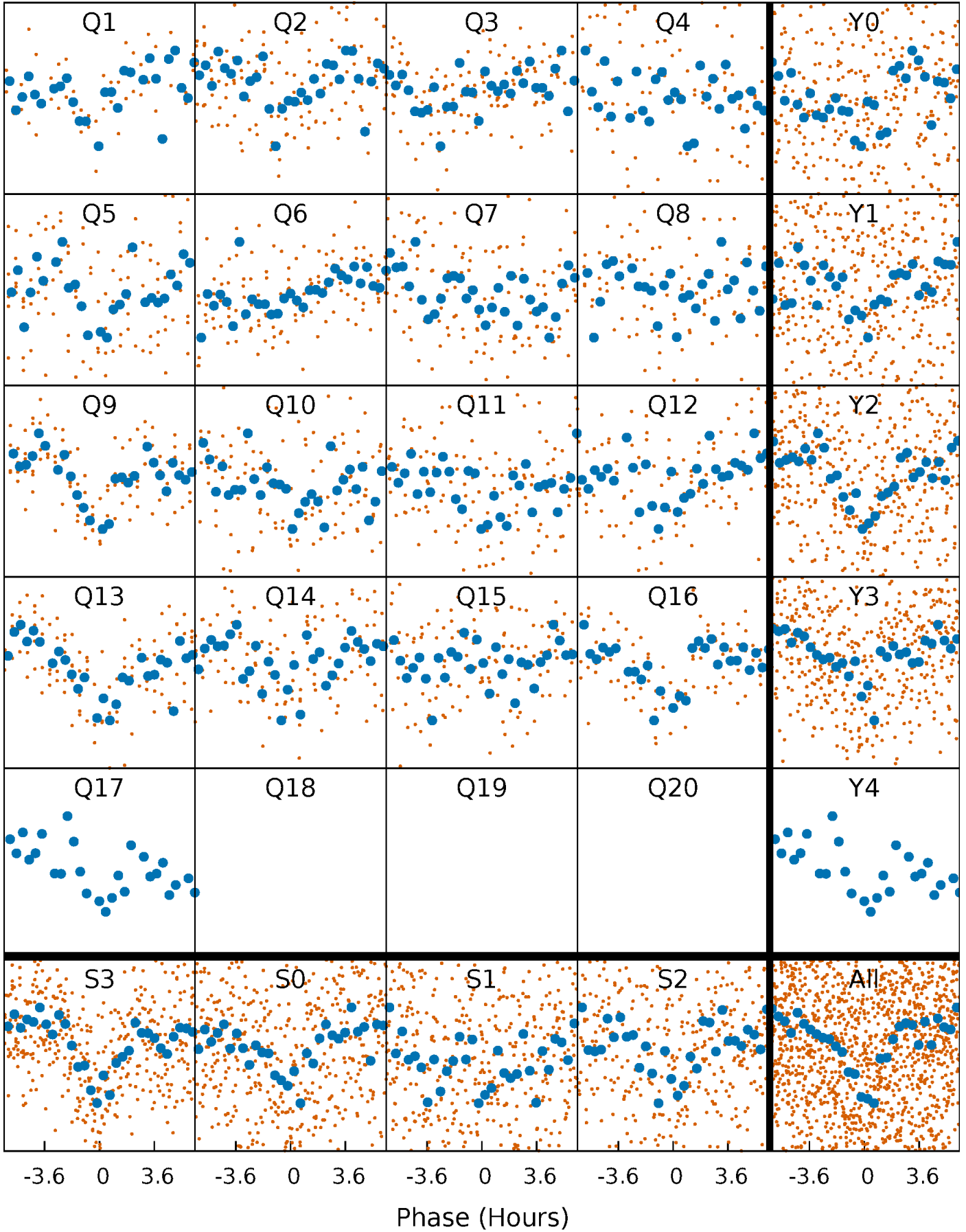


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



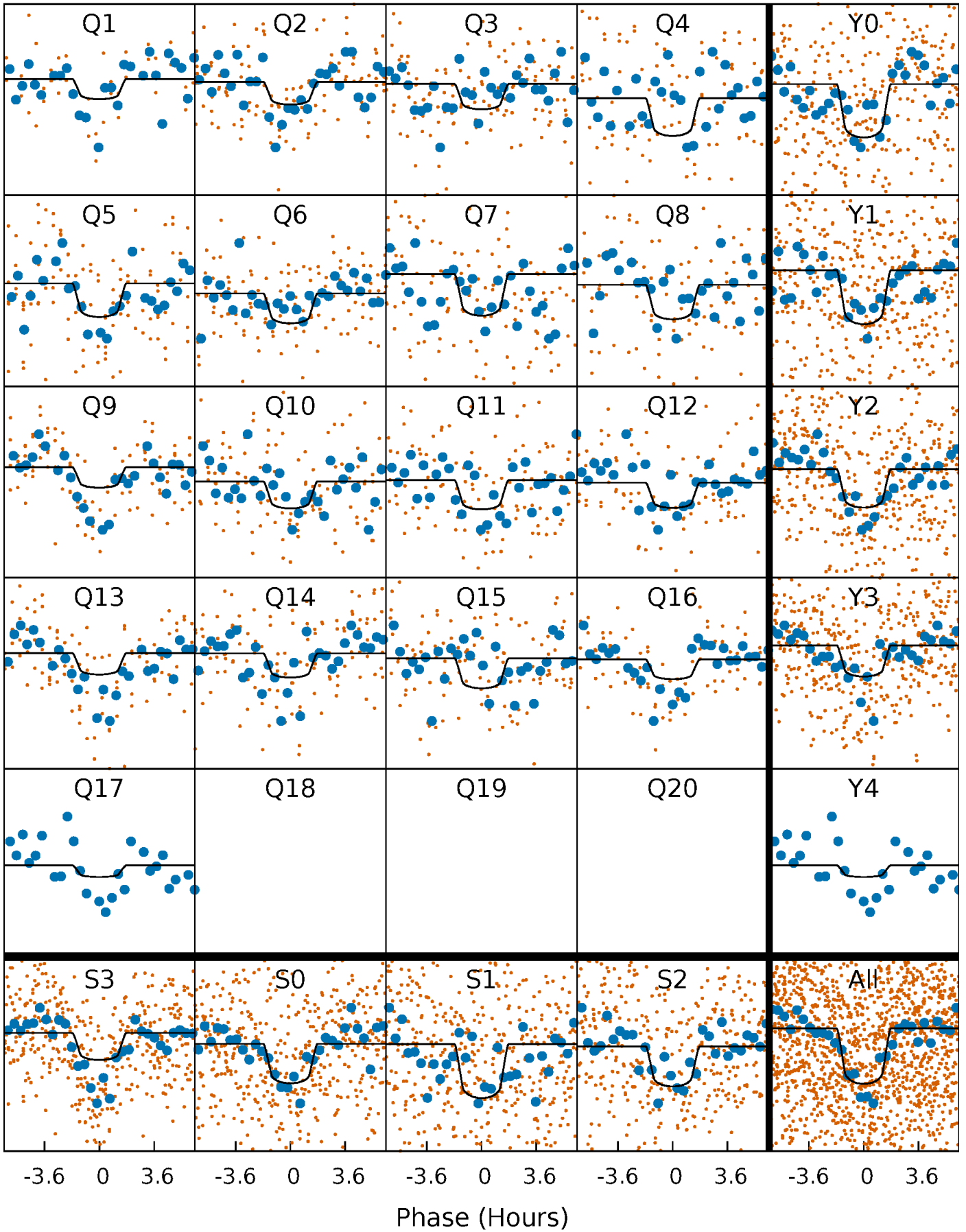
PDC Quarter-Phased Transit Curves

TCE 010518725-02 P= 19.514877 Days $T_0=132.604546$ (BKJD)



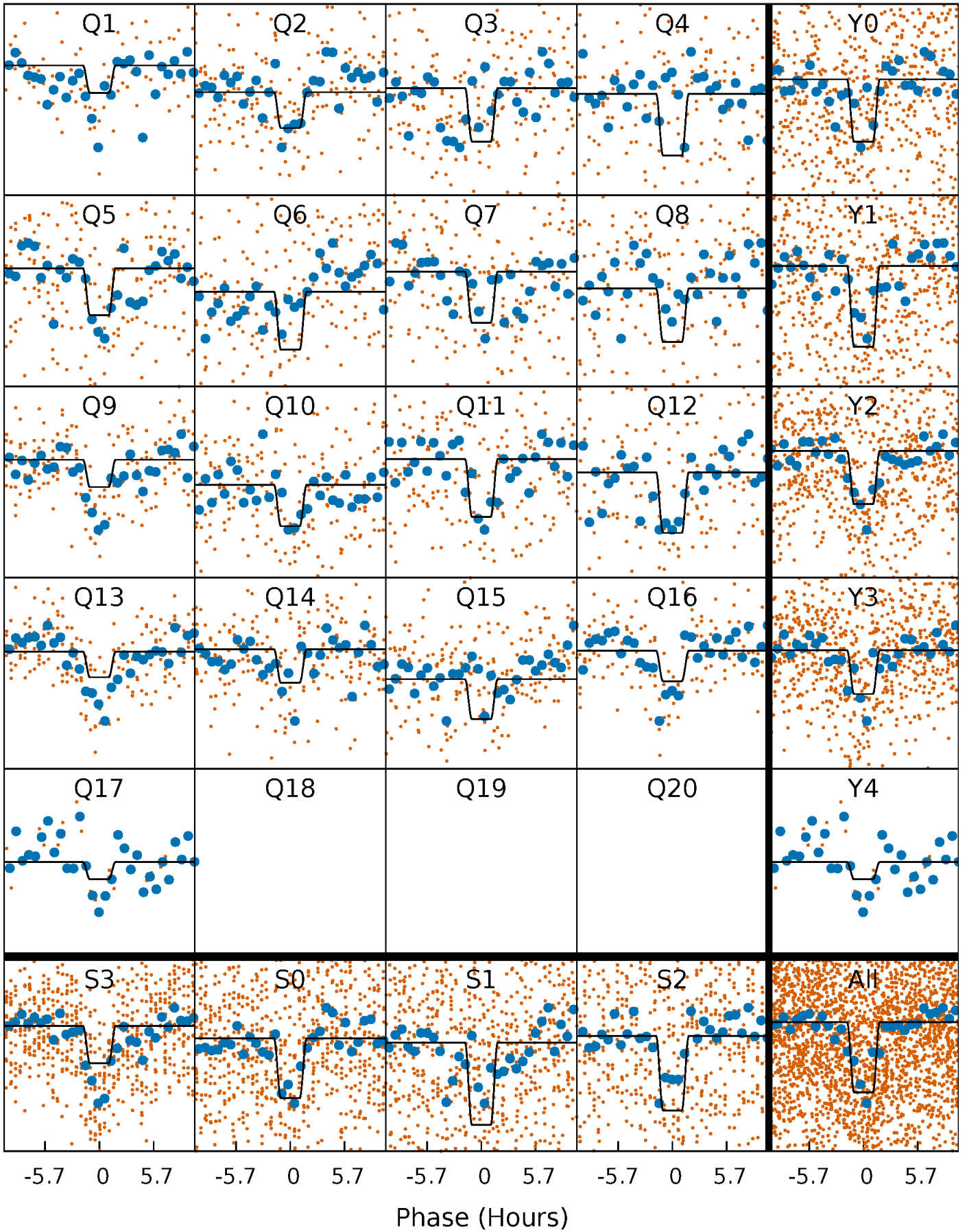
DV Quarter-Phased Transit Curves

TCE 010518725-02 P= 19.514877 Days $T_0=132.604546$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

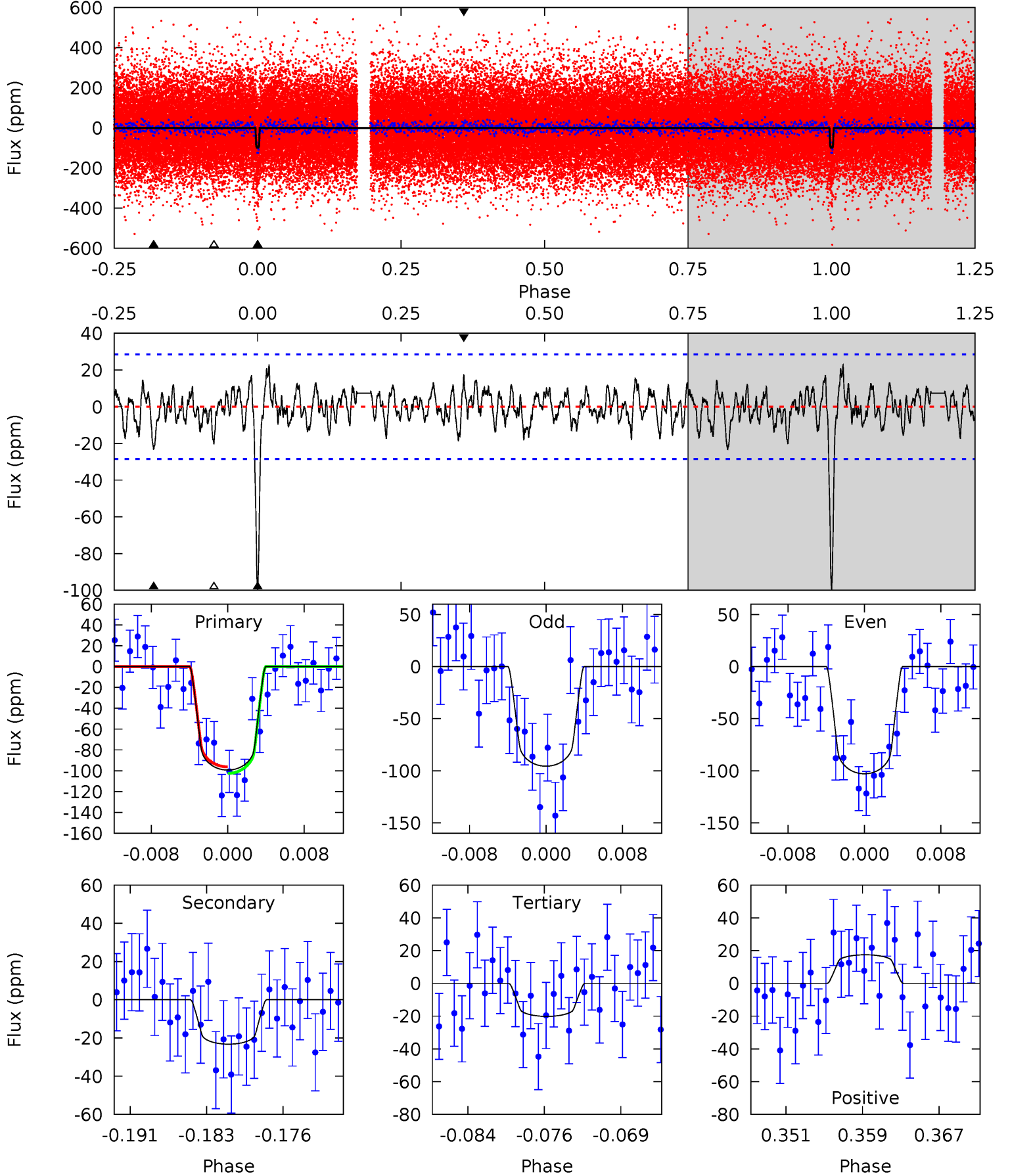
TCE 010518725-02 P= 19.515131 Days $T_0=132.595211$ (BKJD)



DV Model-Shift Uniqueness Test

010518725-02, $P = 19.514877$ Days, $E = 113.089669$ Days

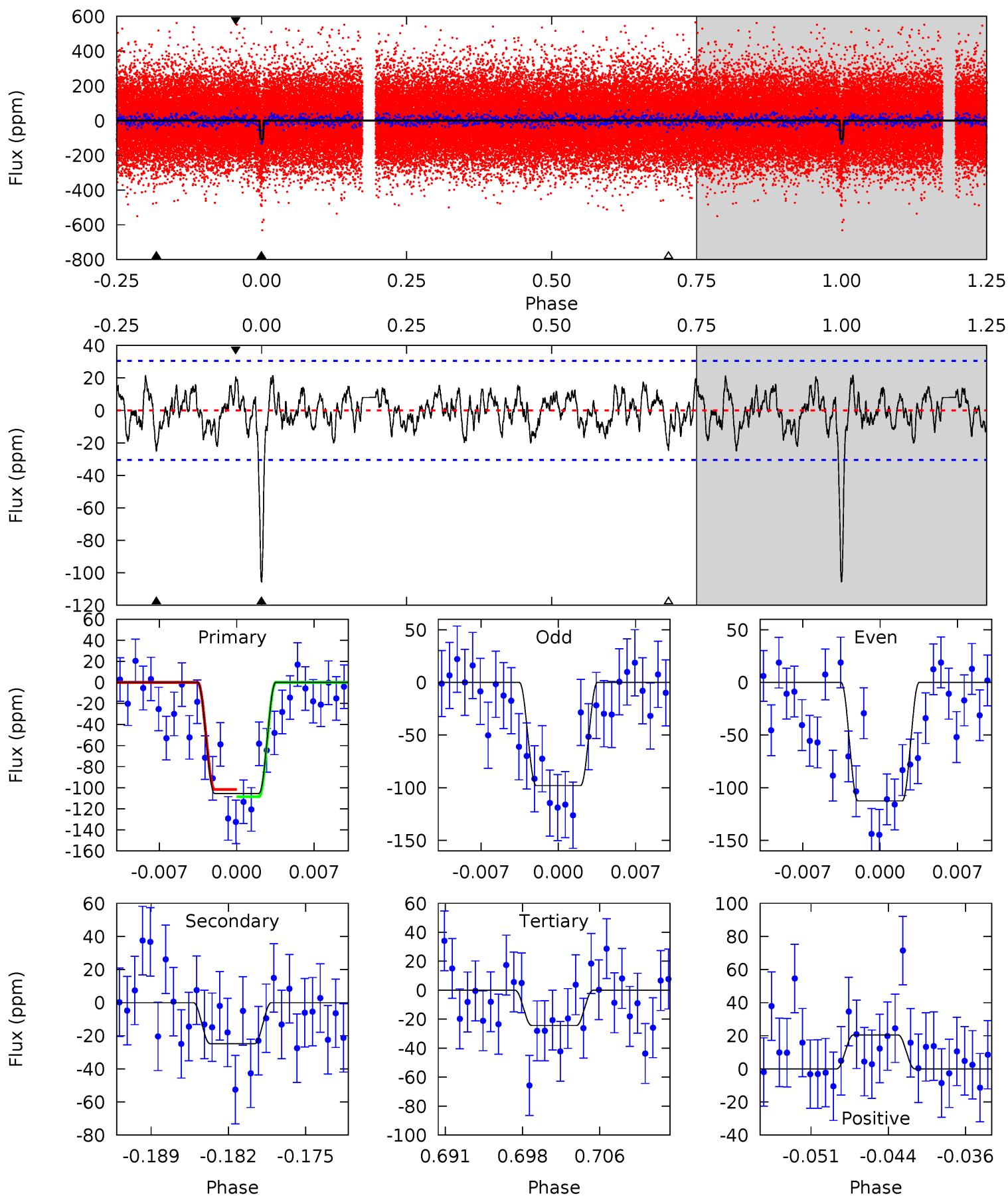
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.7	4.14	3.59	3.11	5.08	2.67	1.27	14.1	14.6	0.55	1.03	0.65	1.03	0.19	0.56



Alt Model-Shift Uniqueness Test

010518725-02, P = 19.515131 Days, E = 113.080080 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.6	4.14	4.06	3.42	5.09	2.68	1.41	13.5	14.1	0.08	0.72	1.21	1.10	0.17	0.57



Stellar Parameters For KIC 010518725

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7004^{+187}_{-250}	$3.854^{+0.240}_{-0.111}$	$-0.060^{+0.250}_{-0.300}$	$2.556^{+0.524}_{-0.785}$	$1.700^{+0.174}_{-0.324}$	$0.143^{+0.231}_{-0.048}$
	+3%/-4%	+6%/-3%	+417%/-500%	+21%/-31%	+10%/-19%	+161%/-34%
Source	PHO1	FLK73	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 010518725-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-23 ± 6	$2.68^{+1.18}_{-0.95}$	1643^{+102}_{-131}	4846^{+1035}_{-645}	50^{+71}_{-27}
Alt.	-25 ± 6	$2.93^{+1.13}_{-0.96}$	1657^{+104}_{-137}	4774^{+893}_{-562}	45^{+57}_{-23}

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

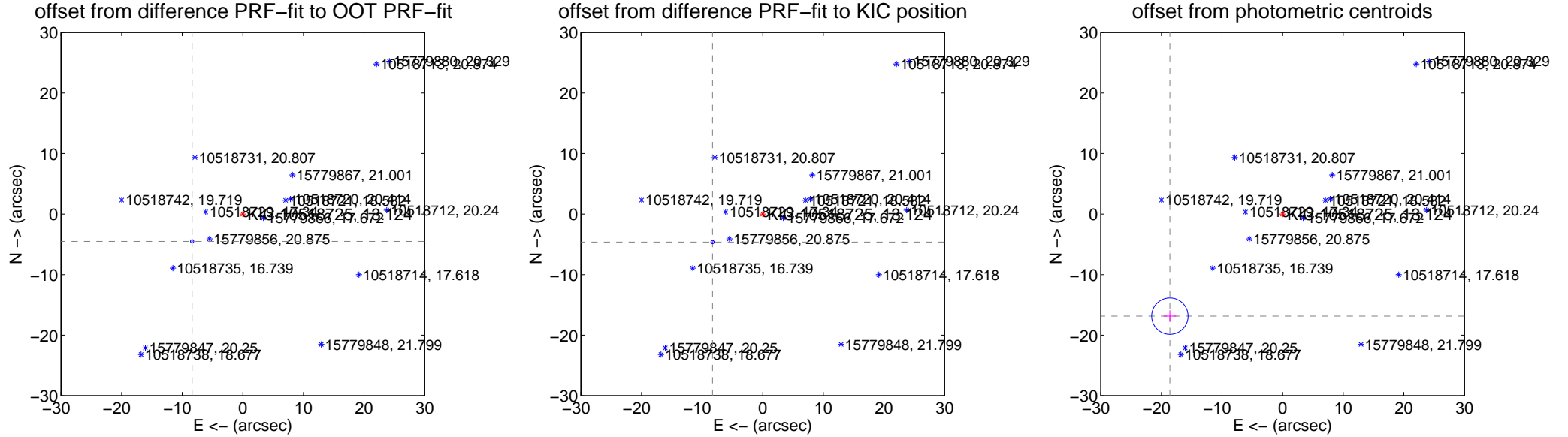
DV Centroid Data

Supplemental centroid analysis for 010518725-02. Kepler magnitude: 13.12. Transit SNR 10.31

There are 3 quarters with good PRF difference image offsets

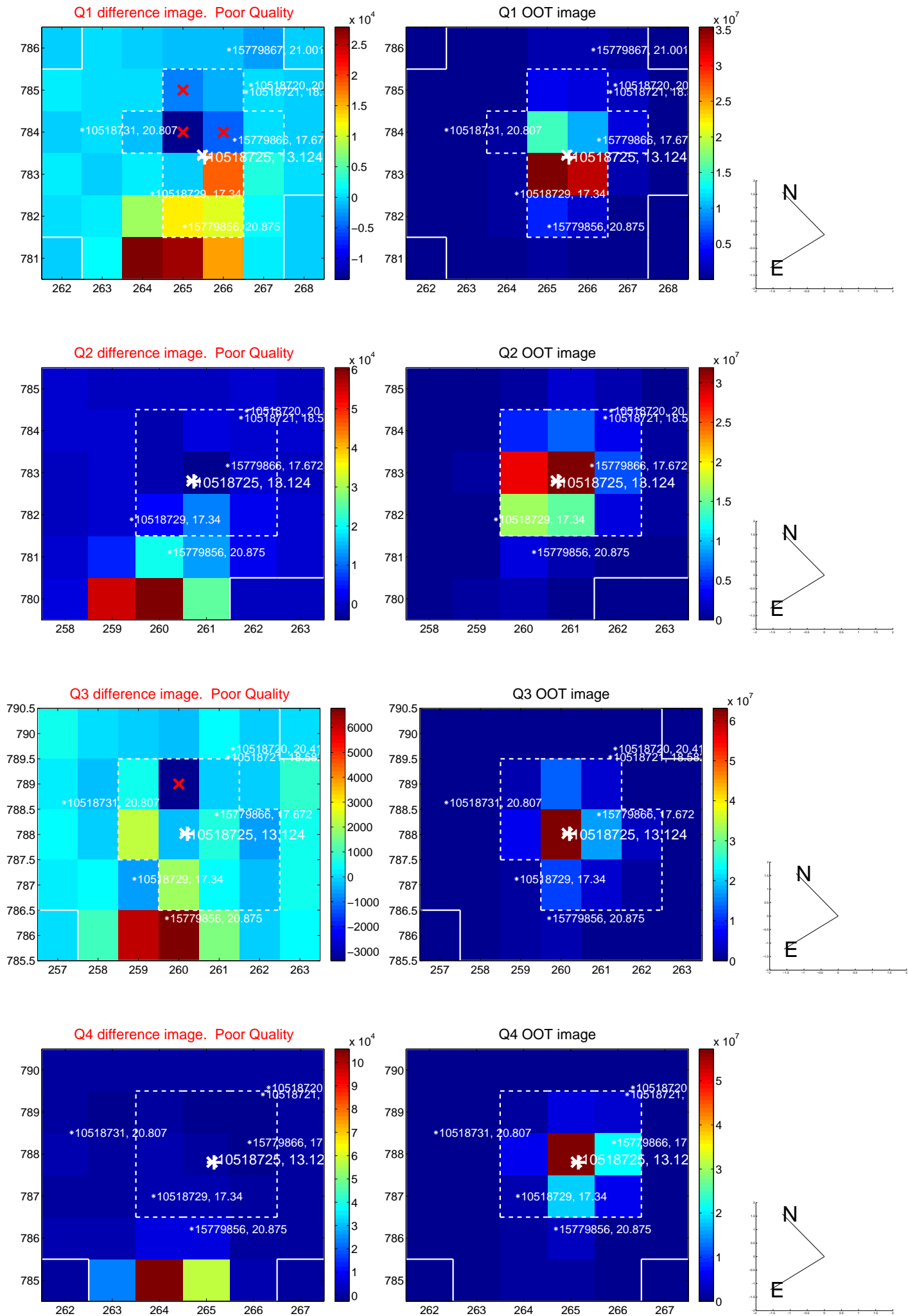
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.497 \pm 0.091	104.21	8.363 \pm 0.091	-4.501 \pm 0.091
PRF-fit source offset from KIC position	9.483 \pm 0.091	104.06	8.280 \pm 0.091	-4.622 \pm 0.091
photometric centroid source offset	25.10 \pm 1.00	25.06	18.61 \pm 1.04	-16.85 \pm 0.96

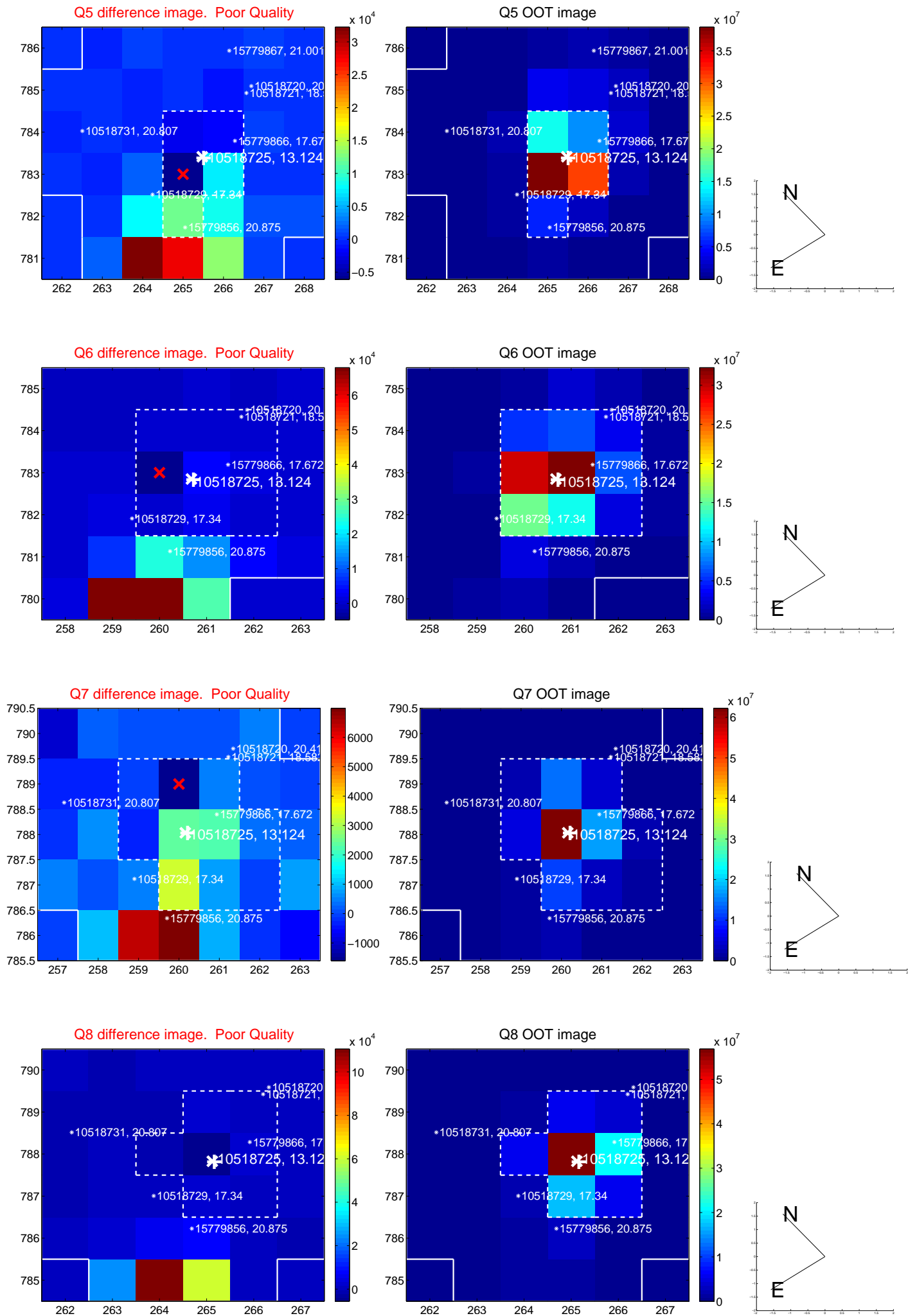


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

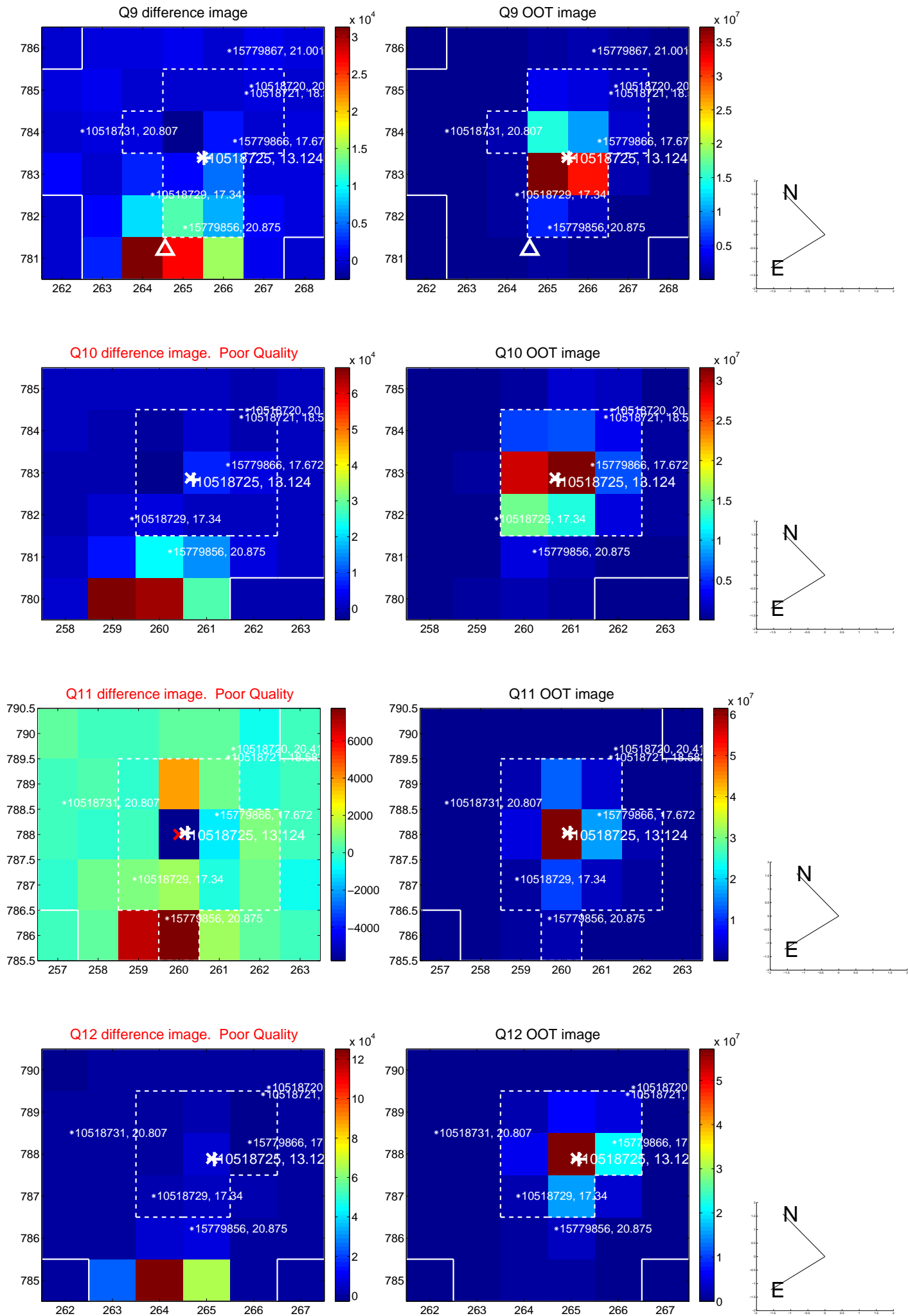
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



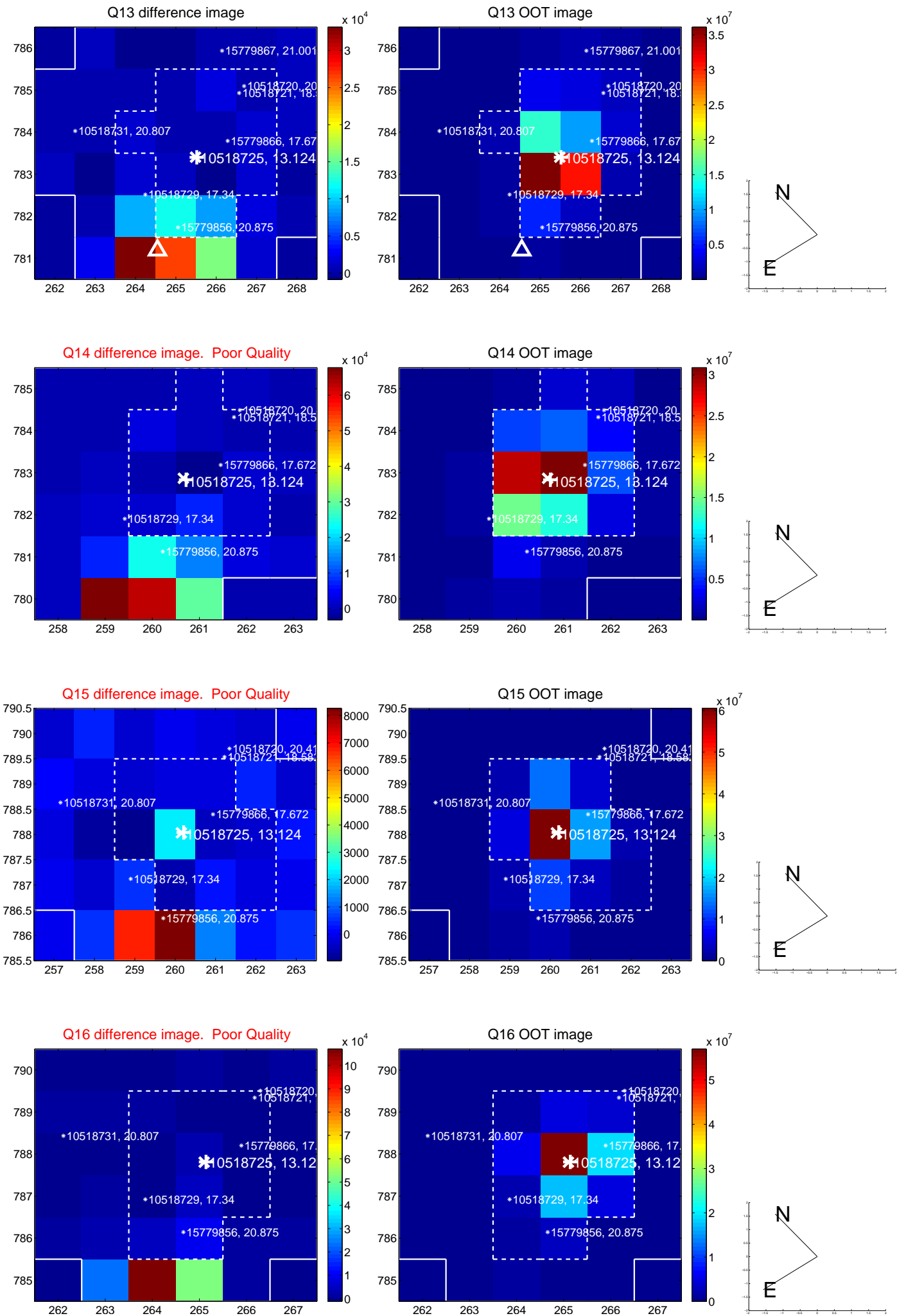
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



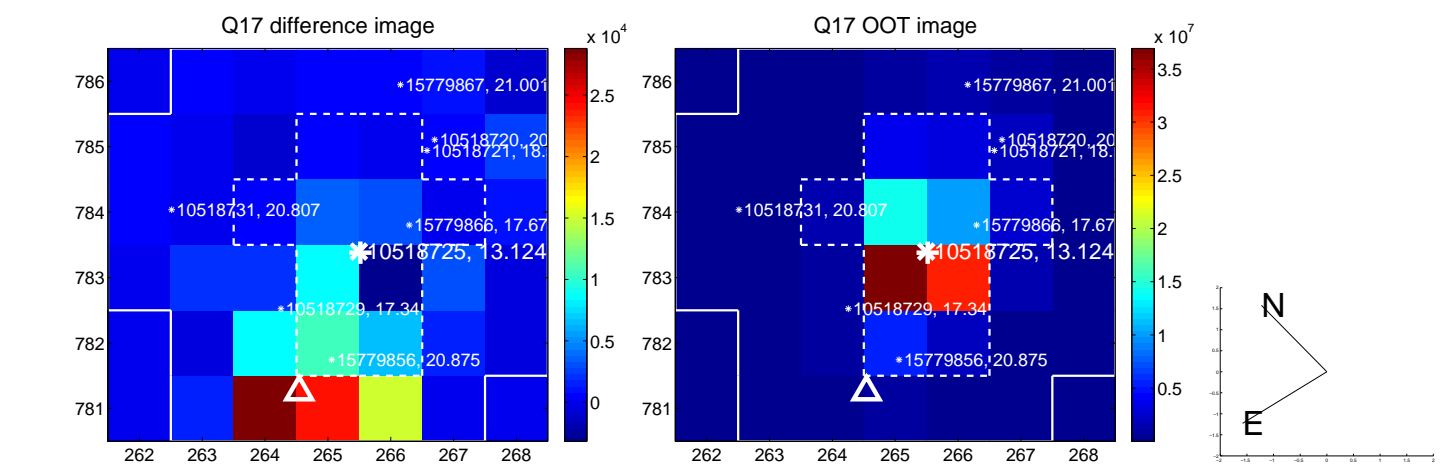
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



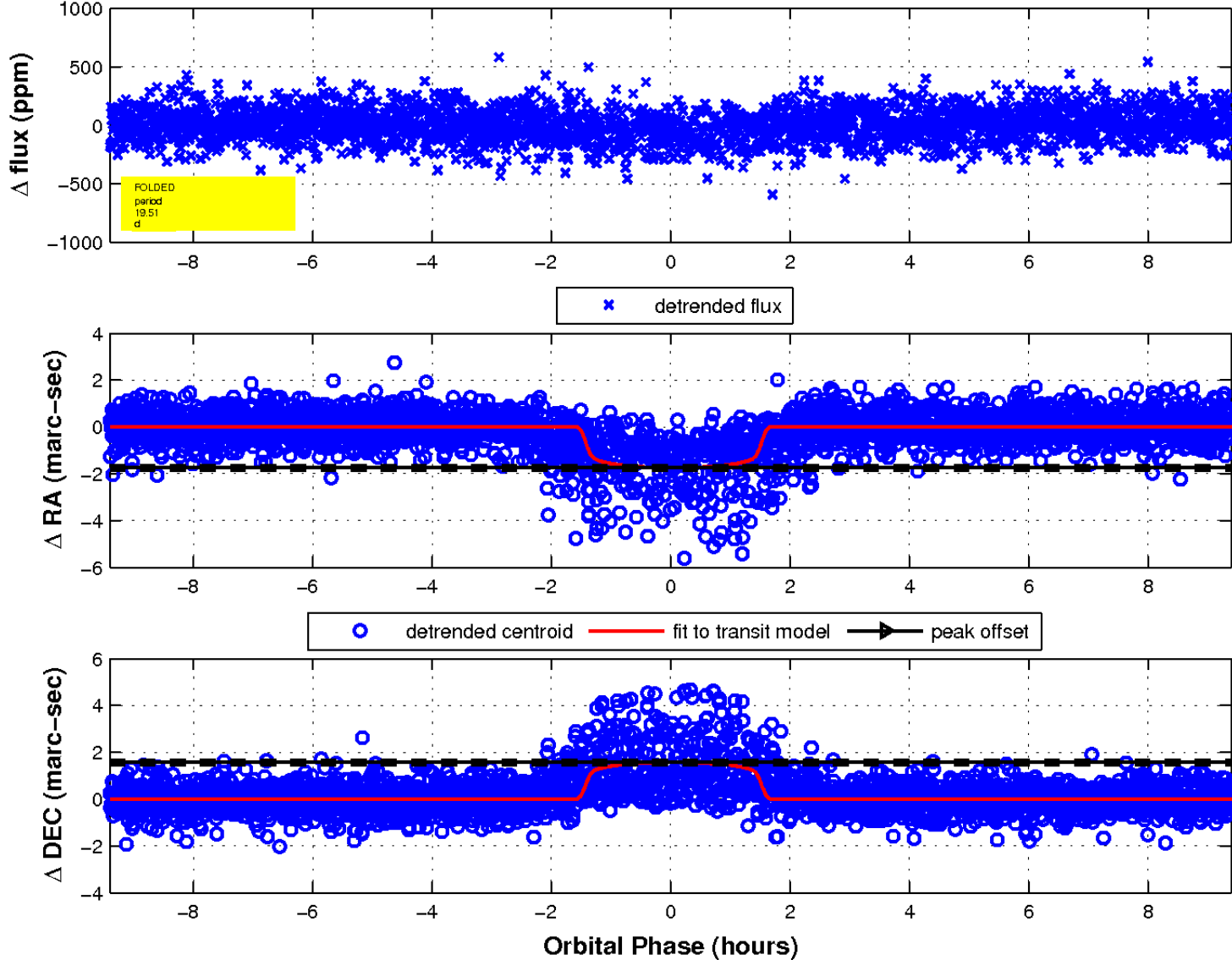
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

