1. Introduction. The generalized squared radial Ornstein–Uhlenbeck process, also known as the Cox–Ingersoll–Ross process, is the strong solution of the stochastic differential equation

$$dX_t = (a + bX_t) \, dt + 2\sqrt{X_t} \, dB_t$$

(1.1)

with the initial state $X_0 = x \geq 0$, the dimensional parameter $a > 0$, the drift coefficient $b \in \mathbb{R}$ and $(B_t)$ a standard Brownian motion. The behavior of the process was widely investigated and depends on the values of both coefficients $a$ and $b$. We restrict ourselves to the most tractable situation, where $a > 2$ and $b < 0$. In this case, the process is ergodic and never reaches zero.

We estimate parameters $a$ and $b$ at the same time using a trajectory of the process over the time interval $[0, T]$. The maximum likelihood estimators (MLE) of $a$ and $b$ are given by

$$\hat{a}_T = \frac{\int_0^T X_t \, dt \int_0^T \frac{1}{X_t} \, dX_t - T(X_T - x)}{\int_0^T X_t \, dt \int_0^T \frac{1}{X_t} \, dt - T^2},$$

$$\hat{b}_T = \frac{(X_T - x) \int_0^T \frac{1}{X_t} \, dt - T \int_0^T \frac{1}{X_t} \, dX_t}{\int_0^T X_t \, dt \int_0^T \frac{1}{X_t} \, dt - T^2}. \tag{1.2}$$