ERRATA

Erratum: First-passage-time statistics for diffusion processes with an external random force [Phys. Rev. E 53, 3240 (1996)]

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In this paper we dealt with a one-dimensional system driven simultaneously by Gaussian white noise $\xi(t)$ and Markovian dichotomous noise $F(t)$ in the absence of any deterministic field. Thus, the system obeys the Langevin equation

$$\dot{X}=f(X)+F(t)+\xi(t),$$

with $f(x)=0$. When we extended the work of this paper to the general case, $f(x)\neq 0$, we realized that Eq. (16), Eq. (22), and the equation after Eq. (A5) should be replaced by the following ones.

(1) Equation (16):

$$\left[\frac{D}{2}\mathcal{L}-\frac{D}{2}\frac{\partial}{\partial x}f(x)-f^2(x)+a^2\right]\frac{\partial S}{\partial x}\bigg|_{x=z_i}=f(x)\,\delta(t).$$

(2) Equation (22):

$$\left[\frac{D}{2}\mathcal{L}_D+\frac{D}{2}\frac{\partial}{\partial x}f(x)+f^2(x)-a^2\right]T_n'(x)\bigg|_{x=z_i}=-\frac{nD}{2}T_{n-1}'(z_i)-\delta_{n,1}f(x),$$

where $\delta_{n,1}=1$ if $n=1$ or otherwise $\delta_{n,1}=0$.

(3) The equation after Eq. (A5):

$$\mathcal{L}S|_{x=z_i}=-\left[f(x)\frac{\partial S}{\partial x}+\frac{D}{2}\frac{\partial^2 S}{\partial x^2}\right]\bigg|_{x=z_i}-\delta(t).$$

This slight modification (it only introduces the δ term in the three equations above) is a consequence of the singular behavior of the total survival probability density function $S(x,t)$ at the absorbing boundaries. Equation (12) for the boundary condition at a trapping point z_i, S+(zi,t)=S−(zi,t)=0, holds strictly for $t>0$. At $t=0$, the initial condition requires that

$$S^+(z_i,0)=S^-(z_i,0)=1.$$

The instantaneous change from 1 to 0 at the boundary implies that $S(x,t)$ satisfies

$$\frac{\partial}{\partial t}S(x,t)\bigg|_{x=z_i}=-\delta(t).$$

As a consequence, a δ term appears in $\mathcal{L}S|_{x=z_i}$ and Eqs. (16) and (22) must be modified accordingly. These changes do not affect any of the results presented in the paper because only the unbound case, $f(x)=0$, was analyzed.

In addition, the following typographical errors appeared in the final version of the paper. In the first sentence after Eq. (A3), the reference to Eq. (40) should be a reference to Eq. (A3), and the second equation after Eq. (A3) should read

$$\frac{\partial S}{\partial t}\bigg|_{t=0}=0,$$

without any term $S|_{t=0}$ in it. Equation (3) should be $\langle\xi(t)\xi(t')\rangle=2k_BT\delta(t\text{-}t')$, and, therefore, $D=2k_BT$ throughout the paper.

