Tsironis *et al.* Reply: The numerical calculations presented in Ref. 1 were aimed at bridging *two exact limits within the Fokker-Planck (FP) approximation.* In the limit of short correlation times τ, this approximation reduces to a standard stationary FP equation thereby recovering standard results with increasing accuracy as the intensity of noise decreases,[2] whereas in the large-τ region, the slope of the logarithm of the mean first-passage time (MFPT) as a function of τ was shown to coincide with exact predictions.[1,3] The bridging of the two extremes was accomplished in the context of a local linearization (LL) theory which is locally exact and satisfies simultaneously the constraints at short and long τ. The new Fokker-Planck-type theory retains the nonstationary character of the process, which is essential for the region $\tau > \tau_c$ ($\alpha\tau_c \equiv 1$), and circumvents the appearance of either negative diffusion coefficients or that of negative friction parameters. It is noteworthy to point out that the approach referred in the previous Comment[4] belongs in the latter category (Ref. 3 of Ref. 4), which has the additional shortcoming of not providing exact dynamical properties.

The LL theory is a FP approximation whose equilibrium distribution, even in the unstable case, leads, in the intermediate-τ region, to quantitative disagreement with digital simulations.[5] When studying escape processes, these kinds of discrepancies are enhanced exponentially, without conflicting, however, with the constraint of recovering the TG prediction[1] for $\tau \to \infty$. This asymptotic agreement was reestablished recently by de la Rubia *et al.*[6] who showed that although the TG prediction on the MFPT is smaller than the true one for large but finite τ's because barrier crossings can occur at noise values other than the critical one, the TG prediction is recovered for $\tau \to \infty$ [Eq. (13) of Ref. 6]. Along these lines, a further improved TG theory has been shown by Mannella and Palleschi[7] to lead to a very accurate *quantitative* agreement with digital simulation results (Fig. 1). We thus conclude that the TG theory does indeed provide a reliable bridging between two exact limits and is a proper reference point for ongoing theoretical work.

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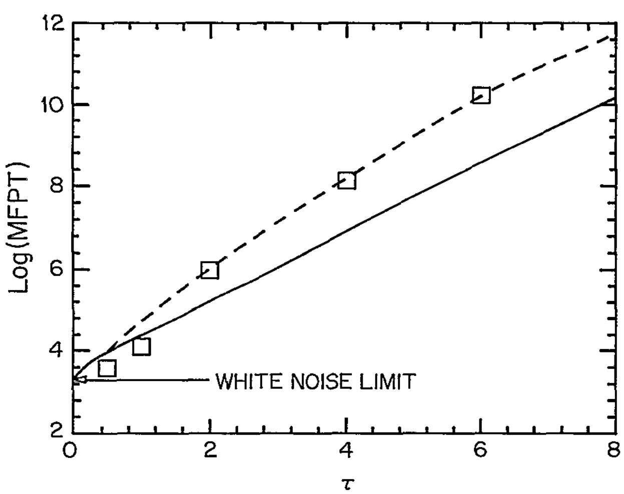

FIG. 1. The TG relaxation time $T(\tau)$ (solid line) is compared to the result of numerical simulations (dashed line) and to the improved TG theory (Ref. 7) (squares) obtained by averaging the expression in p. 8 of Ref. 1 over the statistical distribution of ξ_c, which marks the actual noise value at which the transition to the other well takes place. In Refs. 6 and 7 it is shown that for $\tau \to \infty$ this expression tends to the abovementioned TG formula. The digital simulation has been carried out with diffusion coefficient $D = 0.1$ (Ref. 7).

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[1]G. P. Tsironis and P. Grigolini, Phys. Rev. Lett. **61**, 7 (1988).

[2]J. Masoliver, B. J. West, and K. Lindenberg, Phys. Rev. A **35**, 3086 (1987); T. Leiber and H. Risken, Phys. Rev. A **38**, 3789 (1988).

[3]J. F. Luciani and A. D. Verga, J. Stat. Phys. **50**, 567 (1988).

[4]P. Jung, F. Marchesoni, and P. Hänggi, preceding Comment, Phys. Rev. Lett. **63**, 216 (1989).

[5]S. Faetti and P. Grigolini, Phys. Rev. A **36**, 441 (1987).

[6]F. J. de la Rubia, E. Peacock López, G. P. Tsironis, K. Lindenberg, L. Ramirez-Piscina, and J. M. Sancho, Phys. Rev. A **38**, 3827 (1988).

[7]R. Mannella and V. Palleschi, Phys. Rev. A (to be published).