

**Bunde *et al.* Reply:** We have recently investigated the occurrence of stretched exponential behavior in finite systems, in cases where the relaxation arises due to two competing exponential processes [1]. We have found that (1) the size of the system plays a dominant role in the relaxation time pattern, leading to an exponential decay at long times; (2) the crossover time to the exponential depends logarithmically on the system size; (3) the rate of the exponential decay also depends logarithmically on the size, and (4) in the special examples of the trapping and the hierarchically constrained dynamics models the exponential relaxation may enter before the stretched exponential is reached. These results are of relevance to experiments in confined systems and to Monte Carlo simulations. The Comment by Phillips, Rasiaiah, and Hubbard (PRH) [2] criticizes our statement that the origin of stretched exponential relaxations is not always clear, and claims that our results for the trapping model disagree with their previous findings.

In reply, we would like to emphasize that there are various models for various stretched-exponential phenomena, but no unified theory exists [3], and the challenge remains. In our recent Letter [1] we have focused particularly on the case of two competing exponential processes. The disagreement concerning our results for the trapping model is based mainly on Ref. [4], which is rather inconclusive and does not clarify the issue. Let us address some of the weak points in Ref. [4], which have misled PRH to believe that all of the previous careful studies on the trapping problem, including the experience with analyzing rare events, are erroneous. Examples for earlier studies on the problem that disagree with PRH are listed in [5].

Reference [4] investigates, in addition to the trapping model, the annihilation/trapping model which, as claimed by the authors, “forces” the survival probability  $A(t)$  to follow a stretched exponential at earlier times. However, at a very low trap concentration it is clear that the annihilation dominates in short times and masks the role of the rare trap-free regions. In the time window considered in [4] one, therefore, expects a *power law* rather than a stretched exponential, and indeed, the data (Fig. 4 in [4]), which extend over roughly a decade in time and less than a factor of 2 in  $\ln[A(t)]$ , bend upwards and are consistent with a *power law*.

In addition, a close inspection of Fig. 6 in [4], which is the only figure that relates to the trapping case, clearly demonstrates a too narrow time and survival probability ranges, and a poor analysis of the existing data. For the case of low trap concentrations, only about half a

decade in time and less than a factor of 2 in  $\ln[A(t)]$  have been considered, which is clearly *not* sufficient to detect a stretched exponential behavior. Moreover, as seen in the figure, the curves do not display straight lines, but keep bending downwards in contradiction with the assumption of stretched exponential. For the high trap concentration, the claim of PRH of a breakdown of the stretched exponential decay has no substance. It is in contradiction (i) to exact numeration calculations that clearly display an approach to a stretched exponential and (ii) to the scaling representation of  $A(t)$  at different trap concentrations, which implies the same asymptotic behavior for all trap concentrations. This scaling for both high and low trap concentration has been clearly demonstrated by Anlauf [6] for the exact solvable one-dimensional case, and there is no physical reason for a breakdown of scaling in higher dimensions.

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