Zapperi *et al.* Reply: The criticisms of Ref. [1] to our paper concern the validity of mean-field theory to describe the behavior of the two dimensional fuse model. The authors point out that the yield stress f_c and the final concentration of broken bonds ϕ_c tend to zero in the limit of large lattice size $L \to \infty$ (as already shown in Ref. [2]). This is in contrast with mean-field theory where ϕ_c and f_c are intensive parameters.

In Ref. [3] we have discussed briefly this point, noting that the curves in Fig. 1 do not superimpose since f_c decreases with L. This fact does not affect any of our conclusions since we did not claim that mean-field theory was exact in two dimensions. We have shown that the scaling observed before breakdown in two dimensional simulations can be predicted by mean-field theory. This is true for any lattice size L, although one has to scale f_c and ϕ_c by logarithmic factors in order to obtain intensive parameters (see Fig. 2 of Ref. [4] where a more detailed discussion is presented). The coexistence of precursor events, showing mean-field scaling, and a global failure process due to extreme values statistics [1] is another way to rephrase the first-order transition scenario discussed in our paper [3,4].

The remark of Ref. [1] that the dynamics is "trivial" in the limit $L \to \infty$ could suggest that large precursor events are not observable in real systems, described by what might be called the "thermodynamic limit" [1]. We note that the reference to the thermodynamic limit in the context of fracture is dangerous since the dynamics is irreversible, the interactions long range, and the system far from thermal equilibrium. Acoustic emission experiments [5] show indeed a precursor avalanche activity which is close to the one observed in two dimensional simulations and in mean-field theory. In Fig. 1 we compare the experimental data of Ref. [5] for the released acoustic energy before failure in a disordered material with the results of mean-field theory, showing that the experimental behavior is qualitatively captured by mean-field theory. In order to have a quantitative explanation of the experiments, one should probably consider three dimensional models with a more realistic fracture mechanics. In this respect, we note that three dimensional simulations of the random fuse model [6] revealed a power law distribution of precursor events with exponents $\tau \simeq 2$ which agrees with experiments [5].

In conclusion, despite the problems related with the nonextensive nature of the limit $L \to \infty$, mean-field theory and numerical simulations for lattice of finite size can contribute to clarify some important features of precursor phenomena seen in experiments.

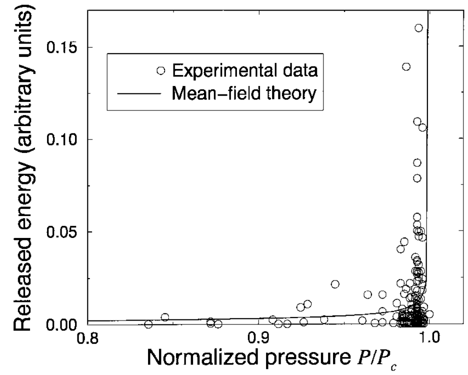

FIG. 1. The released energy during the loading of a wood specimen plotted as a function of the normalized applied pressure. The data are taken from Ref. [5] and are compared with mean-field theory in order to emphasize the rapid increase in the activity before global failure.

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