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A self-organized critical forest fire model

We study a simple forest fire model introduced by physicists Drossel and Schwabl. In a certain limiting case, the model is expected to behave similarly to critical statistical physics systems. Extensive simulation results are available in the literature, but hardly anything seems to be known rigorously, especially in dimensions two and higher. We analyze the one-dimensional model, which already shows quite non-trivial behaviour. We are able to give bounds on the cluster size distribution that suggest that this distribution shows interesting behaviour on two separate scales. For “small” clusters we expect a power law, and for “large” clusters another non-trivial distribution.

Joint work with Jacob van den Berg.