# Asymptotic behavior of a one-dimensional avalanche model through a particular stochastic process

Oana Lupaşcu-Stamate

*Gheorghe Mihoc–Caius Iacob Institute of Mathematical Statistics
and Applied Mathematics of the Romanian Academy,
Calea 13 Septembrie 13, RO-050711 Bucharest, Romania
and Research Group of the Project PN-III-P4-PCE-2021-0921
Simion Stoilow Institute of Mathematics of the Romanian Academy,
Bucharest, Romania*

oana.lupascu_stamate@yahoo.com

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In this work we develop the study of a binary coagulation-fragmentation equation which describes the avalanches phenomena. We construct first an adapted stochastic process and obtain its behaviour to the equilibrium. Our model is based on self-organized critical (SOC) systems and in particular on a simple sand pile model introduced in Bressaud and Fournier, [1]. Furthermore, we define a stochastic differential equation for this process and propose a numerical method in order to approximate the solution. The key point of our work is a new interpretation of the avalanches phenomena by handling stochastic differential equations with jumps and the analysis of the invariant behaviour of the stochastic process.

# Références

[1] X. Bressaud, N. Fournier, On the invariant distribution of a one-dimensional avalanche process, *Annals of Probability* **37** (2009), 48–77.