

# The Olami-Feder-Christensen model on a small-world topology

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We study the effects of the topology on the Olami-Feder-Christensen (OFC) model, an earthquake model of self-organized criticality. In particular, we consider a 2D square lattice and a random rewiring procedure with a parameter  $0 < p < 1$  that allows to tune the interaction graph, in a continuous way, from the initial local connectivity to a random graph. The main result is that the OFC model on a small-world topology exhibits self-organized criticality deep within the non-conservative regime, contrary to what happens in the nearest-neighbors model. The probability distribution for avalanche size obeys finite size scaling, with universal critical exponents in a wide range of values of the rewiring probability  $p$ . The pdf's cutoff can be fitted by a stretched exponential function with the stretching exponent approaching unity within the small-world region. [1]

[1] F. Caruso, A. Rapisarda, V. Latora and B. Tadić, *to be submitted* (2005)