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Waiting-time statistics of SOC systems:
From the dynamics of solar flares
to turbulent plasma transport.

by

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ABSTRACT

Dynamical models based on the ideas of self-organized criticality (SOC) have found wide application in the physical and earth sciences since it was proposed in the late eighties. Two examples are provided by the dynamics of turbulent plasma transport in magnetic confinement devices of great interest for fusion energy, and the flaring process that takes place in the Sun. However, some controversy has arisen in the last few years regarding the applicability of these models. The experimentally observed shape of the PDF of waiting-times between flares or transport bursts has been found to exhibit power-laws over several decades, but SOC models seemed instead to require exponential distributions. In this talk, it will be shown that the observations are in fact not in contradiction with this type of model. As a matter of fact, the observed behaviour might suggest some of the hidden characteristics of the physical mechanism controlling the system dynamics.

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3:45 pm