



## **Dimension boundaries for spatially extended fields and implications for climate extremes**

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By using the link between extreme value theory and Poincaré recurrences, we compute the attractor dimension - namely the effective number of degrees of freedom - when the dynamics consist of  $n$  non-interacting particles with a stochastic behavior. We derive the theoretical expression in terms of finite size limits and test its validity and applicability with numerical experiments. We find that the effective number of degrees of freedom in a stochastic lattice is noticeably lower than the lattice size itself. We then estimate the attractor dimension of a collection of time-series issued from finance and climate, and find that they are below the theoretical stochastic limit.