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SmartData@PoliTO

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Equations for data: methodology and limits

ABSTRACT

In many situations, it is not trivial write evolutionary equations starting from general theories. A typical situation is present while analyzing ecological used to describe a particular phenomenon are unknown, and we have only a single historic series of observable, we have to use a methodology created by Takens.

This methodology, under specific hypotheses, allows "reconstructing the space of the phases". In principle, this methodology allows finding (at least approximately) the evolutionary equations. However, one of the results of the ergodic theory (Kac's lemma), shows that exploit this kind of methodologies has several difficulties when the number of variables exceeds a particular threshold (around 5). This limit seems a problem, especially in the Big Data era.

BIOGRAPHY

Angelo Vulpiani is a Professor of Theoretical Physics at the University of Rome Sapienza, and is a Fellow of the Institute of Physics. His research interests are statistical mechanics, dynamical systems, turbulence, transport and reaction-diffusion in fluids.

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