Introduction: “One can say without much controversy that the present knowledge and understanding of what is known as chaotic behavior is essentially due to the study of simple discrete dynamical systems. From numerical experiments and, sometimes, subsequent rigorous analysis to the sophisticated techniques of symbolic dynamics, it has been the iteration of maps in the interval that has allowed one to characterize the dynamical complexity of deterministic chaos. However, since partial differential equations are an extremely successful mathematical model for both natural and engineering systems, one can easily understand why the study of the complexity of their solutions, in spite of its enormous difficulty, has been one of the most exciting subjects of research for the last two decades.

“In recent years, some attempts have been made to distinguish a class of partial differential equations (PDEs) whose solutions are essentially determined by the iteration of a map. The advantages are clear, since even the notion of chaos can be taken from discrete dynamical systems: we say that such a PDE system is chaotic if the map that determines its solution exhibits chaos as a discrete dynamical system.


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