Grafos de visibilidad y fractalidad en series de tiempo

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Abstract

The visibility graph algorithm [1], has become an interesting strategy for the study of time series of non-linear phenomena. In this technique, the points of the time series are associated with the nodes of a complex network, which are connected if the points satisfy a visibility criterium, namely, two nodes are connected to each other if it is possible to trace a straight line between them which is always above the time series.

Several studies have shown that the visibility graph is capable of discriminating time series with different statistical properties, such as time series given by random, chaotic, reversible, etc. processes [2–4]. Previously, a visibility graph study on light curves of pulsating variable stars (Cepheids, δ-Scuti, RR Lyrae) has been carried out, suggesting that some of the network metrics can discriminate between types of pulsating stars. [5] On the other hand, for the specific case of δ Scuti stars, evidence of fractality in the time series has been shown [6]. This motivates our work, where we study the possible correlation between the metrics of a visibility graph of a time series and its fractal properties, studying both artificial time series and light curves of pulsating variable stars as in Ref. [5].

Referencias

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