Application of non-linear time series analysis in physics and engineering

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In the present lecture we review briefly several methods of temporal and non-linear time series analysis, mainly based on phase space reconstruction such as recurrence plots as well as complex network transformed time series. We discuss the main characteristics of the methods and the insight they can provide of the underlying physical or engineering system with special focus on system identification and transition detection. Several applications from river water level [1] to turbulent flows [2] and car flow incident detection [3] are presented and discussed.

References

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[4]   A.D. Fragkou, T.E. Karakasidis, E. Nathanail, Detection of traffic incidents using nonlinear time series analysis, *Chaos,* **28**, 063108 (2018).