

Abstract Submitted
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Lagrangian Descriptors: A Method for Revealing Phase Space Structures of General Time Dependent Dynamical Systems¹ ANA M. MANCHO, ICMAT, CSIC, STEPHEN WIGGINS, University of Bristol, JEZABEL CURBELO, ICMAT, UAM, CAROLINA MENDOZA, Universidad Politecnica de Madrid — Lagrangian descriptors are a recent technique which reveals geometrical structures in phase space and which are valid for aperiodically time dependent dynamical systems. We discuss a general methodology for constructing them and we discuss a “heuristic argument” that explains why this method is successful. We support this argument by explicit calculations on a benchmark problem. Several other benchmark examples are considered that allow us to assess the performance of Lagrangian descriptors with both finite time Lyapunov exponents (FTLEs) and finite time averages of certain components of the vector field (“time averages”). In all cases Lagrangian descriptors are shown to be both more accurate and computationally efficient than these methods.

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