Abstract Submitted
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The phase portrait of aperiodic non-autonomous dynamical systems[1] ANA M. MANCHO, CAROLINA MENDOZA, ICMAT, CSIC — Geometry has been a very useful approach for studying dynamical systems. At the basis are Poincaré ideas of seeking structures on the phase space that divide it into regions corresponding to trajectories with different dynamical fates. We present a methodology to build global Lagrangian descriptors for arbitrary time dependent flows based on the intrinsic geometrical and physical properties of trajectories. Our new Lagrangian descriptors are applied to flows with general time dependence as those in geophysics. They succeed in detecting simultaneously, with great accuracy, invariant manifolds, hyperbolic and non-hyperbolic flow regions. We analyze convenience of different descriptors from several points of view: regularity conditions requested on the vector field, rate at which the Lagrangian information is achieved and computational performance. Comparisons with other traditional methods such as Finite Time Lyapunov Exponents (FTLE) will be also discussed.

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