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The Lagrangian description of time dependent aperiodic flows: applications in the Ocean and the Atmosphere[1] ANA M. MANCHO, ICMAT, CSIC — Geometry has been a very useful approach for studying dynamical systems. At the basis are Poincare ideas of seeking structures on the phase space that divide it into regions corresponding to trajectories with different dynamical fates. These ideas have demonstrated to be very powerful for the description of transport in purely advective flows and important applications have been found in geophysics. However realistic flows as those obtained by altimeter satellites or from numerical simulations are highly non-periodic and to deal with these flows is a challenge because traditional methods can be used only in autonomous and time periodic dynamical systems. We describe new Lagrangian tools that are applied to general time dependent flows. In particular we discuss results on oceanic datasets taken from altimeter satellites on the Kuroshio region. We also discuss an application on reanalysis data on the Antarctic polar vortex.

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