

Abstract Submitted  
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**Applications the Lagrangian description in aperiodic flows<sup>1</sup>** CAROLINA MENDOZA, Universidad Politecnica de Madrid, ANA MARIA MANCHO, ICMAT (CSIC-UAM-UC3M-UCM) — We use several recently developed Lagrangian tools for describing transport in general aperiodic flows. In our approach the first step is based in a Lagrangian descriptor (the so called function  $M$ ). It measures the length of particle trajectories on the ocean surface over a given interval of time. We describe its output over satellite altimetry data on the Kuroshio current. The technique is combined with the direct computation of manifolds of Distinguished Hyperbolic trajectories and a very detailed description of transport is achieved across an eddy and a jet on the Kuroshio current [1,2]. A second velocity data set is examined with the  $M$  function tool. These are obtained from the HYCOM project on the Gulf of Mexico during the time of the oil-spill. We have identified underlying Lagrangian structures and dynamics. We acknowledge to the hospitality of the university of Delaware and the assistance of Bruce Lipphardt and Helga Huntley in accessing the model data sets.

[1] C. Mendoza, A.M. Mancho. Physical Review Letters 105 (2010), 3, 038501-1-038501-4.

[2] C. Mendoza, A.M. Mancho. The Lagrangian description of aperiodic flows: a case study of the Kuroshio Current. accepted in Nonlinear Proc. Geoph

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