عنوان مقاله:

CALCULATION OF FINITE SIZE LYAPUNOV EXPONENTS AND LAGRANGIAN COHERENT STRUCTURES IN THE ADRIATIC SEA

نویسندگان:

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خلاصه مقاله:

Ocean is a complex system because of its movement patterns, since it changes from thousands of kilometers to the sub-mesoscales. Transport by Surface Ocean is animportant issue that has become an area of intensive research (see for instance, [1-3]). In addition, the processes of mass transport depend strongly on the conditions ofmotion of the ambient fluid. The fundamental basis for the study of the mixing processes is related to the Eulerian flow field. Considering that the mass transport is aLagrangian phenomenon and associated with coherent structures, it is necessary the preparation of tools for dispersion modeling based on Lagrangian quantities.During last decade powerful tools have been introduced to better understanding of transport barriers in ocean; and one of the useful methods for describing localdispersion properties in time dependence flows is Finite- Size Lyapunov Exponent (FSLE) which is based on the time dependent velocity field with good accuracy. It shouldbe noted that the fundamental definition of Lyapunov exponent is a global measure of the diverge rates of nearby trajectories. Furthermore, hyperbolic Lagrangian Coherent Structures (LCSs), that define transport pathways in ocean, especially over the mesoscale range, would be defined as ridges of the Finite-Size Lyapunov Exponent (FSLE) fields, although mathematical link between the FSLE and LCSs has been missing. Investigating relative dispersion based on Finite Scale Lyapunov Exponents (FSLEs) has been addressed in many works such as [4-8].

کلمات کلیدی:

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https://civilica.com/doc/814952