

Abstract Submitted
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Lagrangian coherent structures in the Gulf Stream YI LIU, Department of Mechanical and Aerospace Engineering, Syracuse University, Syracuse, NY, USA, CHRIS WILSON, National Oceanography Centre, Liverpool, UK, MELISSA GREEN, Department of Mechanical and Aerospace Engineering, Syracuse University, Syracuse, NY, USA — Finite-time Lyapunov exponent (FTLE) is calculated to identify Lagrangian coherent structures in the Gulf Stream region. The velocity fields are determined using the geostrophic velocities derived from satellite altimetry data. The coherent structures in and around the Gulf Stream are delineated by the both positive and negative FTLE ridges, and represent boundaries between dynamically distinct regions that are important to investigate transport and mixing processes in the ocean. Alternating positive and negative FTLE ridge patterns are found to line the meandering jet, which indicate the regions of entrainment and detrainment along the jet. Results compare well with the Bower kinematic model of a meandering jet, although it is clear that the kinematic model is an over-simplification of the jet dynamics, and studying the dynamics of vortex interaction with the jet is important for understanding fluid transfer in the Gulf Stream region.

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