

Surface Transport and Mixing in Monterey Bay

II. Synoptic Summaries of Particle Motions

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Abstract: In the past five years there have been significant advances in dynamical systems theory to the point where the framework can now be utilized in the context of "real" problems. In this talk we will briefly describe the dynamical systems framework for Lagrangian transport and the new analysis tools it gives us for obtaining synoptic summaries of particle motion. Our focus will be on transport in a coastal system (i.e., Monterey Bay) using a velocity field obtained from high frequency (HF) radar measurements.

In this talk we describe two new analytical techniques for studying transport: synoptic Lagrangian maps (SLMs) and incoming/exiting regions. SLM's is a method for compressing the information contained in millions of trajectories and, at the same time, reveals detailed, time-dependent, Lagrangian structures. The incoming/exiting regions reveal the time varying, geometrical structures in the flow responsible for controlling access to the bay. Both methods also provide novel ways to compute certain statistical quantities related to transport.