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Quasi-turbulent stirring and Lagrangian coherent structures

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Most geophysical flows are turbulent enough to induce a tangled mess of trajectories, but not enough to warrant statistical transport studies. I will show that particle stirring in the quasi-turbulent regime is governed mostly by velocity gradient stretching. Associated Lagrangian Coherent Structures (LCS) provide a simple and robust framework for studying transport in the ocean. In particular, they perform well in the context of real problems, such as surface transport in regions mapped by satellite or sampled by coastal radar.