Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Oceanic Sub-mesoscale Wave-Vortical Interactions and Their Effect on Scalar Transport[1] GERARDO HERNANDEZ-DUENAS, National Autonomous University of Mexico, PASCALE LELONG, NorthWest Research Associates, LESLIE SMITH, Department of Mathematics, University of Wisconsin - Madison — The mechanisms driving lateral dispersion in the ocean on scales of $100\ m - 10km$ remain, by and large, not well identified. Dominant motions in this regime, known as the submesoscale, are internal waves and vortical motions. These two components have similar spatial scales but evolve on different temporal scales. Small-scale vortical mode are susceptible to instabilities and may not be as long-lived as their larger-scale geostrophic counterparts. While vortices are more efficient at dispersing a passive tracer than waves, the role of the latter remains less well understood. In this talk, we will present simulations using a set of intermediate models to identify the role of various non-linear interactions between vortical and wave motions. These intermediate models range from the quasi-geostrophic model which only includes PV/PV/PV nonlinearities and GGG model with only wave/wave/wave nonlinearities to the full Boussinesq model which retains all. Statistics such as energy transfer spectra and diffusivity will be shown to identify the effect of different non-linear interactions on scalar transport.

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Date submitted: 31 Jul 2019 Electronic form version 1.4