Strong particle dispersion by weakly dissipative random internal waves

Oliver Buhler, Nicolas Grisouard, and Miranda Holmes-Cerfon

Courant Institute, New York University, United States (obuhler@cims.nyu.edu)

Simple stochastic models and direct nonlinear numerical
simulations of three-dimensional internal waves are combined in
order to understand the strong horizontal particle dispersion
at second order in wave amplitude that arises when
small-amplitude internal waves are exposed to weak dissipation.
This is contrasted with the well-known results for perfectly
inviscid internal waves, in which such dispersion arises only
at fourth order in wave amplitude. Possible implications for small-scale ocean dynamics in the context of tracer
release experiments are discussed.