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**Particle dispersion induced by random internal waves**[1] OLIVER BUHLER, Courant Institute of Mathematical Sciences, New York University, NICOLAS GRISOUARD, Stanford University, MIRANDA HOLMES-CERFON, Courant Institute of Mathematical Sciences, New York University — This is a theoretical and numerical study of quasi-horizontal particle dispersion along stratification surfaces induced by random internal waves at small amplitude. The original motivation was small-scale particle dispersion in the deep ocean, but the theory is more general. The novelty is the realization that a small amount of wave dissipation can have a large impact on the dispersion process as measured by the Taylor diffusivity, for example. Basically, weak dissipation greatly strengthens the Taylor diffusivity, a fact that had been mostly overlooked in the literature so far. Here we present a combination of simple linear and nonlinear stochastic models as well as of fully nonlinear 3d simulations of the continuously stratified Boussinesq equations that explore this new situation. Particular attention is paid to the different power-law scalings of the Taylor diffusivity with wave amplitude that are obtained under different models for the wave dissipation, eg either due laminar viscous dissipation or due to nonlinear wave breaking.

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