Horizontal dispersion of particles by random gravity waves

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The horizontal dispersion of particles along stratification
surfaces is considered theoretically and numerically by combining
the nonlinear methods of wave-mean interaction theory with Monte-Carlo
simulations for a random wave field.

Detailed results are presented for a shallow water test model and
for a three-dimensional Boussinesq model aimed at mid-ocean
conditions. In both cases the Coriolis force is seen to have a
crucial impact on the effective diffusivity of the particle dispersion.

Finally, the results are used to assess the
contribution of this process to the sub-mesoscale horizontal
particle dispersion observed during the North Atlantic Tracer
Release Experiment.