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A Solvable Model of "Shear Dispersion"

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ABSTRACT

Shear dispersion results from vertical shear of horizontal velocity and vertical mixing, features which cannot be included explicitly in one-layer, vertically integrated models. The parametric description of shear dispersion as effective horizontal diffusion in one-layer models is investigated by comparing analytic solutions of two-layer dispersion equations to the corresponding solutions of a one-layer diffusion equation. The diffusion description is found to be poor for times comparable with or shorter than the vertical mixing time but excellent for longer times.

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