Abstract View

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Evaluation of Vertical Structure Functions for the Analysis of Oceanic Data

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ABSTRACT

It is feasible to construct vertical structure functions for the analysis of oceanic data, from the gravest scales sustained by the water column to fine-structure scales. The short scales need not be treated separately by Fourier transforms in a WKB stretched coordinate. The structure functions—with depth as coordinate—are numerically sound and can be defined for the entire water column (normal modes) or a selected part of it. It is shown how to derive a numerical algorithm from a variational principle in such a way that the orthogonality of the eigen-solutions is guaranteed. The errors introduced by the discrete algorithm are discussed, for both the linear eigenvalues (separation constants) and the overlapping integrals (used in the evaluation of nonlinear coupling coefficients). The uncertainty of the modal amplitudes, calculated from experimental data, is also discussed. The method is illustrated with some preliminary applications to PEQUOD data.