Abstract View

Energy Diagnostics in a 1½-Layer, Nonisopycnic Mod

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ABSTRACT

The development of a pointwise (in the horizontal) energy diagnostic scheme applicable to a 1½-layer, nonisopycnic, primitive equation model is presented. The scheme utilizes the concept of available gravitational energy to replace the conventional potential energy. This gives a total energy (kinetic plus potential) that is zero and a minimum with respect to a given reference state (a positive definite quantity) locally. Mean and eddy components of the kinetic and available gravitational energy forms are defined by introducing a thickness-weighted mean for velocity and density. Finally, mathematical formulations for the conversion terms, that is, those terms responsible for a reversible exchange of energy between the four energy compartments, are derived.

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