Title

Estimations of Vertical Velocities Using the Omega Equation in Different Flow Regimes in Preparation for the High Resolution Observations of the SWOT Altimetry Mission

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Abstract

Vertical velocities (w) associated with meso and submesoscale processes play an essential role in ocean dynamics and physical-biological coupling due to their impact on the upper ocean vertical exchanges. However, their small intensity (O 1 cm/s) compared to horizontal motions and their important variability in space and time makes them very difficult to measure. Estimations of these velocities are thus usually inferred using a generalized approach based on frontogenesis theories. These estimations are often obtained by solving the diagnostic omega equation. This equation can be expressed in different forms from a simple quasi geostrophic formulation to more complex ones that take into account the ageostrophic advection and the turbulent fluxes. The choice of the method used generally depends on the data available and on the dominant processes in the region of study.