

Acoustic remote sensing of ocean mixing

*Tetjana Ross¹, Andone Lavery², Doris Leong³, Rolf Lueck⁴

1. Institute Of Ocean Sciences, Fisheries and Oceans Canada, 2. Woods Hole Oceanographic Institution, 3. British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 4. Rockland Scientific International

Based on data collected in a number of environments, from coastal fjords to the north Atlantic, from the laboratory to Antarctica, we present evidence for sound scattering from turbulent and double diffusive microstructure in the ocean. We discuss the advantages of using acoustics to observe ocean mixing (i.e. inexpensive, fast and remote). We also discuss the limitations (e.g. ambiguity in source of scattering) and some methods for dealing with it. We illustrate how one of these ambiguities can even be turned into a strength for observing zooplankton in turbulence, through the use of broadband acoustics.

Keywords: oceanic turbulence and mixing, underwater acoustics , ocean observation, bio-physical interactions