Volume sound scattering in the Pacific Sector of the Antarctic

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The primary purpose of this report is to present the result of acoustic observations made in the Pacific Sector of the Antarctic and to make the attempt to analyze them in connections with oceanographic and remote sensing data collected in the same study. Acoustic measurements were made at 113 stations located along $67°$S transect from Adelaide Island to Pennella Coast. Observations were conducted from a board of R/V "Akademik Ioffe" from February to March of 1992 within the frame work of WOCE international program. Acoustic data were collected at 12 kHz and 24 kHz with a help of modified vessel mounted sonars down to 1200 m depth. The acoustic locating systems included a Deep Sea ELAC echo sounder and ELAC Color Sonar FS3700. To obtain absolute values of sound scattering strength both units were calibrated. The results showed that the region as a whole was characterized by complex pattern of sound scattering. The measured values of sound scattering strength Sv were in the limits from -96 dB to -68 dB. Maximal values of average vertical dSv/dH and horizontal dSv/dR gradients were about 0.2 dB/m and 2 dB/100km correspondently. Large-scale horizontal variability of sound scattering field with typical scale about 250 km was found in the region. Geographical variability of sound scattering was revealed for the Bellingshausen Sea, Amundsen Sea and for the North-Eastern and North-Western peripheries of the Ross Sea. The major result of the investigations was that the variations in scattering pattern were related with the variability of the type of water masses. As a result, the areas between different water masses were clearly distinguished as acoustic fronts.