# SEA-SALT OPTICAL PROPERTIES OVER THE REMOTE OCEANS:

# THEIR VERTICAL PROFILES AND VARIATIONS WITH WIND SPEED

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## ABSTRACT

The size distribution and scattering coefficient of the marine aerosol was measured over the Southern Ocean during the First Aerosol Characterization Experiment (ACE 1) and over the tropical Pacific Ocean during the Second Pacific Exploratory Mission in the Tropics (PEMT-B). Thermal analysis of particles at near ambient temperature (40 °C), 150 °C, and 300 °C enabled us to estimate size distributions of the volatile (mostly sulfate and organic) and refractory (mostly sea-salt) modes as well as their contributions to optical depth and cloud condensation nuclei. When averaged spatially and temporally, sea-salt concentrations show dependence upon wind speed over the Southern Ocean up to an altitude of 1200 m. Their median contribution to column optical depth is 0.057, 0.033, and 0.021 at wind speed >10 m/s, 5 – 10 m/s, and ≤ 5 m/s, respectively, and the median over all wind speed categories is 0.041. However, on a case-by-case basis, the physical and optical properties show a large variance due to other meteorological conditions. The scales of this variability are also discussed along with examples of processes that contribute to them such as cloud processing and vertical wind speed gradient.