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In situ measurement of Antarctic krill density contrast and its application to estimate target strength

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As a very important method employed in the biomass estimation of Antarctic krill, the accuracy of acoustic technology, to a large extent, depends on the study of target strength (TS). Based on in situ experiment, the mean value of the Antarctic krill's density contrast was measured, and the value is 1.0291 ± 0.0047 , the density contrast of Antarctic krill increases with the decreasing of size. Moreover, using the distorted-wave Born approximation scattering model (SDWBA), the present study calculate the TS of krill, and the ranges of TS values are [-97, -79] and [-87, -76] dB at 38 and 120 kHz, respectively, for the krill size ranged from 24mm to 51mm. The differences between SDWBA and empirical formula are also compared in this study. The results derived from this study is aimed to be used to estimate biomass of acoustic survey and further to provide data for feedback management on krill fishery.