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### Acoustic characteristics of vertically migrating and non-migrating organisms observed in the North Pacific Ocean

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Acoustic characteristics of vertically migrating and non-migrating organisms in a day were investigated for species identification. In July 27-30, 2004, both organisms were observed using ship echosounders (38 kHz and 120 kHz) and a tethered acoustic-optical composite system (J-QUEST) from several hours before sunset to several hours after the sunrise, drifting a research vessel, Shunyo-maru, in the North Pacific Ocean. The J-QUEST is an instrumental package composed of a split-beam echosounder (70 kHz) and a stereo TV camera system. The J-QUEST depth was changed from 220 m to 25m to observe vertical migration. Boreopacific gonate squids were observed by the stereo TV camera and they are considered to conduct diurnal vertical migration to feed migrating organisms. Average TS of the ascending layer and Boreopacific squid were measured in situ using the J-QUEST. Average area scattering strength (SA) values of the ascending layer, non-migrating layer, descending layer, aggregation of Boreo pacific squids, and that of Japanee anchovy were measured at 38 kHz and 120 kHz, There was a constant and different SA difference between the two frequencies at each layer except migrating layer. The ascending and the descending layer have almost the same SA differences. It indicates that the both layers composed of the same organisms.