

ON THE MEASUREMENT OF OKHOTSK SEA ICE BY
THE PATROL SHIP SOYA (ABSTRACT)

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We have conducted full scale experiments with the patrol ship SOYA in the Okhotsk sea in winter since 1991, with the cooperation of the Maritime Safety Agency of Japan. In this experiment, an onboard VTR system is used to record sea ice conditions around SOYA while she sails in the pack ice region of the Okhotsk sea. This paper presents the measured sea ice data obtained from late January to early February 1994.

A VTR camera is mounted at the mast in order to obtain images of ice conditions in the forward direction of SOYA. These are processed to obtain the sea ice compactness data. Another VTR camera is used to obtain information on ice and snow thickness distribution. The data are collected for 7 days and a data base system for Okhotsk sea ice, which consists of sea ice compactness, ice and snow thickness together with the measured position by the Global Positioning System at time intervals of one minute, is newly developed. The following results are obtained in this paper.

Ice compactness data are compared with the values from ice charts which are mainly derived from remote sensing data by satellite (GMS, LANDSAT and NOAA) and distributed by the Maritime Safety Agency. It is found that the typical spatial variation of the order of 10 km, which is clearly shown by onboard observation, is not expressed by the ice chart although the averaged ice compactness shows relatively good agreement.

The histograms of ice thickness data clearly have three peaks. The first peak is within 20 and 25 cm, which is mainly observed at the ice edge region with low ice compactness. The next peak is within 30 and 35 cm, which is thought to be a typical value of ice thickness near the coast of Hokkaido during this period. The last one is within 45 and 50 cm, which is observed prominently off the east coast of Sakhalin near lat. 47°N. It is also found that the ice thickness increases with latitude at the rate of 4.14 cm/degree.

At present the only limited data are available for ice thickness. Therefore this data base is thought to be effective both for ground truth for microwave remote sensing data and for validation for simulation of the heat flux balance in the sea ice region.

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