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DETECTION OF MELT POND DISTRIBUTION ON THE ARCTIC SEA ICE FROM SATELLITE MICROWAVE DATA

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A number of melt ponds are formed by melting the snow and ice on the Arctic sea ice during summer. This melt pond has lower albedo than snow and ice, process of the ice-albedo feedback accelerates to increase the amount of solar absorption. Hence these accelerate the decay of Arctic sea ice. We analyzed for the detection of open water, sea ice and melt pond using the forward-looking camera image obtained by the Arctic voyage observations during summer and autumn, and long-term melt pond fraction in the arctic ocean using brightness temperature (*T_B*) data from the AMSR-E passive microwave sensor. These data were then used to compare in situ data along HOTLAX2005 cruise track with AMSR-E data. The used AMSR-E data is the ice concentration and *T_B* in four frequency bands ranging between 6.0 GHz and 89.0 GHz at both horizontal and vertical polarization.

Analysis of in situ (HOTLAX2005) data showed the highly ice-covered area (over 90%) successively from 78°N to 84°N of section and melt pond is formed to around north pole. In addition, once the cruise reached 79°N, multiyear ice became dominant from ice watch observation data ¹.

The results compared in situ data with AMSR-E data, the relationship between melt pond fraction of in situ and AMSR-E data has high the correlation at 6GHz-H and 89GHz-V channels. Thus, the detection of melt pond have effective the remainder of 6GHz and 89GHz. Melt pond fraction was 30% in maximum on 2011.

¹ Perovich, D. K., T. C. Grenfell, B. Light, B. C. Elder, J. Harbeck, C. Polashenski, W. B. Tucker III, and C. Stelmach (2009), Transpolar observations of the morphological properties of Arctic sea ice, *J. Geophys. Res.*, 114, C00A04, doi:10.1029/2008JC004892.