

Estimation of summer sea ice concentration in the Chukchi Sea using AMSR2 observation and numerical weather prediction data

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Sea ice concentration (SIC) is the primary data for the investigation of global climate change and development of the Northern Sea Route. Passive microwave (PM) sensors such as AMSR2 have observed sea ice in polar region and provided SIC every day since 1970s. However, the SIC from the PM observations is typically inaccurate in Arctic summer due to similar microwave radiation characteristics of sea ice and open water, which is mainly attributed to the atmospheric effects. Inclusion of information of atmospheric effects into PM observations can improve the accuracy of SIC estimation in summer. In this study, summer SIC estimation model for the Chukchi Sea in Arctic Ocean based on machine learning approach is developed by using AMSR2 brightness temperatures, ERA-Interim reanalysis data and KOMPSAT-5 SAR images. The brightness temperatures measured by AMSR2 and atmospheric effects predicted by the ERA-Interim are used as input variables for the SIC estimation. The SIC retrieved from KOMPSAT-5 SAR images obtained for the Chukchi Sea in summer is used as reference data. We will evaluate the performance of the SIC estimation model by using optical and SAR images. We will also compare the performance of developed model with that of existing sea ice algorithms for PM sensors.