A machine learning approach on SMOS thin sea ice thickness retrieval

Passive microwave radiometers have been used to observe sea ice since the launch of the first Earth Observation satellites in the 1970s, and are still in use today with the European Space Agency (ESA) mission Soil Moisture and Ocean Salinity (SMOS), among others, and will be continued with the future Copernicus Imaging Microwave Radiometer (CIMR). Nowadays, there exist two SMOS thin sea ice thickness algorithms for the non-melting period, i.e., from October to April. The first is the ESA's official product, which is a semi-empirical algorithm developed by the Alfred Wegener Institute (AWI). A notable drawback is its failure to account for the presence of snow above sea ice, which is a major limitation given its relevant effect on emitted L-band radiation. The second product is distributed by the University of Bremen (UB) and it uses an empirical approach. The primary shortcoming of the UB product lies in its limited sensitivity, extending only up to 0.5 m. This study proposes a machine learning based methodol

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