**Seminar on Physics and Chemistry
of the Atmosphere
05.04.2019, SoSe 2019, IUP Bremen**

Distinguishing Sea Ice Types in the Antarctic using Microwave Satellite Observations

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Abstract

Sea ice can be classified into several types, such as young ice (YI, thin/smooth new ice), first-year ice (FYI, formed during one cold season), and multiyear ice (MYI, which has survived at least one melt season). As the physical properties of sea ice differ significantly for the different ice types, knowledge of the sea ice type is essential for properly modelling the ice-ocean-atmosphere system.

Here we apply a new satellite-based retrieval of sea ice type in the Antarctic. This retrieval has originally been developed for the Arctic, where it can distinguish YI, FYI and MYI. Applying it in the Antarctic is useful because although there is MYI in the Antarctic, its distribution has not yet been investigated much, and there are sea ice types in the Antarctic which rarely occur in the Arctic.

The retrieval uses input data from radar scatterometer and microwave radiometers and in addition corrects for, e.g., the effect of melt-refreeze or sea ice drift. The needed satellite data have been available since 1999 with daily coverage (but: retrieval impossible during summer melt), spatial resolution is about 25 km. I resent and discuss results of this new retrieval applied to Antarctic sea ice.