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Assimilating Cyrosat2 freeboard into a coupled ice-ocean model

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This presentation introduces a method to assimilate freeboard from radar satellite observations.

Many studies have shown that the skill and memory of sea ice models using sea ice thickness as initial condition improve compared to model runs only initializing sea ice concentration. The only Arctic wide sea ice thickness data which could be used for initialization is coming from satellite observations. Since sea ice can't directly be measured from space freeboard data is used to derive sea ice thickness. Freeboard is converted under assumption of hydrostatic equilibrium to sea ice thickness. For this conversion snow thickness is needed. Due to a lack of Arctic wide snow cover observations most products use a snow climatology or a modification of one. This has proved to introduce errors. To avoid the errors introduced by this method the presented work aims to assimilate freeboard directly. This presentation will introduce the method and show first results. The assimilation period overlaps with ICESat2 mission. We present a comparison between the presented freeboard assimilation and ICESat2 sea ice thickness products of a first winter season.