DATA ASSIMILATION OF ARCTIC ICE DRIFT USING SINGLE EVOLUTIVE INTERPOLATED KALMAN FILTER IN A SEA ICE MODEL

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ABSTRACT

Sea ice drift is measured by deploying buoys and is deriveable from satellite data. These can be used to improve the dynamics of numerical sea ice models. We will use the Single Evolutive Interpolated Kalman filter (SEIK) to assimilate arctic ice drift into a dynamic-thermodynamic Sea Ice Model (SIM) with a viscous-plastic rheology. Observations will be used to evaluate the sea ice model's performance. How significant are the differences between modelled ice drift and observations? We will also test how long ice drift can be forecasted in practice.

We want to assimilate daily and three-daily drift fields taken from satellite scatterometry and passive microwave sensors. Additionally drift data from buoys are available which were deployed by the International Arctic Buoy Programme. We will attempt to reach a more realistic ice dynamics representation consistent with observations and to reduce the model error statistics using these data for assimilation.

The implementation of the SEIK into the SIM delivers a new feature to assimilate data of several parameters in space and time simultaneously. Therefore it is planned to additionally assimilate ice thickness data from CryoSat.