



## **Monitoring of thin ice in the Laptev Sea Polynya**

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It is estimated that a considerable fraction of new ice formation on Arctic shelf areas takes place in the Laptev Sea polynyas. However, the different studies reveal strong discrepancies in ice production rates. For an accurate monitoring of surface heat loss and hence, ice production within polynyas it is important to know the thin ice distribution within the polynya. We use an established thin-ice algorithm with several modifications to retrieve the thin ice thickness distribution up to 50 cm based on MODIS ice surface temperatures and atmospheric data from model simulations. We verify the MODIS ice surface temperatures with a data set measured during a field campaign in the Laptev Sea. For the calculation of thin ice thicknesses we use NCEP reanalyses, GME analyses and COSMO simulations in comparison as different atmospheric forcing data. We find that from the several atmospheric variables the air temperature at 2 m has the greatest impact on the ice thickness calculation. At ice thicknesses above 20 cm the algorithm responds sensitively to errors in the atmospheric data. In regions of very thin ice the errors in the atmospheric data are masked due to larger temperature differences between surface and atmosphere. However, a reliable atmospheric data set is necessary for the calculation of accurate thin ice thicknesses.