



## **The evolution of sea ice in polynya: application of conceptual thermodynamical model**

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The process of sea ice forming and evolution in circumpolar flow leads was studied using conceptual thermodynamic model. The model is based on the non-stationary heat and mass transfer equations with moving interfaces applied for mushy (skeletal) zone that is transforming at the top into solid ice and takes into account the energy exchange processes at the air-ice surface. As the atmospheric forcing the NCEP/NCAR reanalysis data for the Northeastern Taimyr area and Southern Beaufort Sea were used. The model computations were carried out for the two scenarios, the continuous growth and the interruptible one for the periods of open water forming. The last scenarios is characterized by rapid ice growth in the beginning of determined periods and more intensive total ice production. The periods of open water forming were taken on the basis of the exceeding by the wind component perpendicular to ice edge of some critical value, calculated with regards to the width of fast-ice and the ice breaking tension. The results of calculations gave quantitative estimations of young ice growth under intensive air-sea energy exchange taking place in polynyaas well as a role of newly forming ice in generation of average heat flux through sea ice cover.