

Dynamics of Hibler's sea-ice model

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Sea ice is a material with a complex mechanical and thermodynamical behaviour. Freezing sea water forms a composite of pure ice, liquid brine, air pockets and solid salt. The details of this formation depend on the laminar or turbulent environmental conditions. The governing equations of large-scale sea ice dynamics that form the basis of many sea ice models in climate science were suggested in a seminal paper by Hibler in 1979. We show that Hibler's sea ice model that couples a 2D-velocity and two parameters for thickness and compactness of sea ice based on viscous-plastic rheology is locally strongly well-posed and globally strongly well-posed for initial data close to constant equilibria.