



Using elastic ice fracture parameterizations to model land-fast ice bridges

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Land-fast ice is an important component of the Arctic system, yet its representation in large-scale sea ice models remains a challenge, partly due to the difficult parameterization of the ice fracture. This project focuses on both the observation and modelling of ice bridges in narrow channels in the absence of grounded ice ridges. MODIS brightness temperature imagery is used to show the succession of ice bridge stabilisations that shapes the land-fast ice in the Parry Channel. A 2D linear elastic model is also developed to simulate the ice fracture in an idealised channel. The model is able to produce ice bridges that are sensitive to the choice of failure criterion. The different conditions that lead to the formation of a stable ice arch downstream of a channel (in divergent stress conditions) or unstable arches upstream of a channel (in convergent stress conditions) are also presented.