Helmholtz Imaging Annual Conference 2024



Contribution ID: 51

Type: Talk

Estimation of Calving Law Parameters from Satellite Images

Wednesday 15 May 2024 11:10 (15 minutes)

Capturing the calving front motion is critical for simulations of ice shelves and tidewater glaciers. Multiple physical processes, including sliding, water pressure and failure need to be understood to accurately model the front. Calving is particularly challenging due to its discontinuous nature and modellers require more tools to examine it.

A common technique for capturing the front in ice simulations is the level-set method. The front is represented implicitly by the zero isoline of a function. The movement of the front is described by an advection equation, where the velocity of the front is a combination of ice velocity and frontal ablation rate.

We develop methods to estimate parameters of calving laws from satellite images based on inverse level-set problems. The method is adaptable to different forms of calving laws as well as other interface tracking problems and handles temporal sparsity of observations and coupling with an ice sheet model.

Primary authors: ABELE, Daniel (Alfred-Wegner-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, Deutsches Zentrum für Luft- und Raumfahrt); HUMBERT, Angelika (Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung); BURGER, Martin (DESY, FS-CI and Helmholtz Imaging)

Presenter: ABELE, Daniel (Alfred-Wegner-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, Deutsches Zentrum für Luft- und Raumfahrt)

Session Classification: Thematic Session: Data Acquisiton / Image Format - part III

Track Classification: Data handling: Thematic focus: Data handling