Séminaire jeudi le 08 nov 2018 10:00 / Seminar Thursday Nov 8th 2018 10:00h

Sujet/Subject: Fixing EVP — Solving the Momentum Equations of Dynamic Sea Ice Models

Langue/language : Français / French

Conférenciers/Lecturers: Martin Losch (Alfred Wegener Institut)

Résumé/Abstract

Most dynamic sea ice models for climate type simulations are based on the viscous-plastic (VP) rheology. The most common methods of solving the momentum equations with VP-rheologies and elliptic yields curves include implicit methods with different flavors of Picard (or fixed point iterative) solvers, Newton methods, and different variants of the explicit Elastic-Viscous-Plastic (EVP) solver. The EVP solver, in particular, is now used in many Earth system models and forced ice-ocean models, because it is easier to implement than implicit methods and generally cheaper on massively parallel computer. In its original form, however, it leads to noisy solutions that do not converge to the solution of the momentum equations. Simple and easy to implement modifications recover the full momentum equations. The improved EVP-solutions correspond to those obtained with implicit methods, still at comparatively low cost. At very high resolution, the effect of the correction is particularly striking.