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EISMINT model intercomparison experiments with higher order mechanics

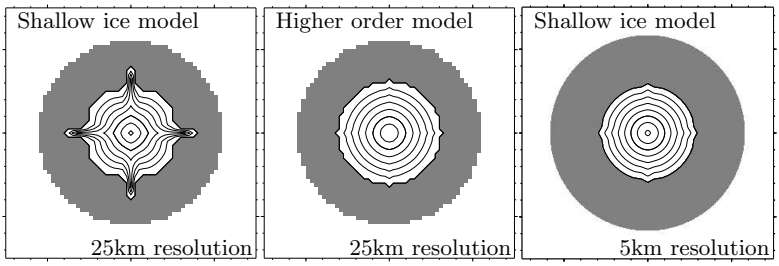
FUYUKI SAITO[1], AYAKO ABE-OUCHI[1], HEINZ BLATTER[2]

[1] *Center for Climate System Research, University of Tokyo*
[2] *Institute for Atmospheric and Climate Science, Swiss Federal Institute of Technology, Zurich*

The EISMINT intercomparison experiments with thermomechanical coupling (Payne et al., 2000) are repeated with an ice sheet model that applies the higher order approximation (Saito et al., 2003) for computing the flow field. The experiments impose radially symmetric boundary conditions (left, middle figures). The observed loss of radial symmetry in the EISMINT experimens is also observed in the presented higher order model results. The analysis of different experiments, including higher resolution experiments (right), indicates that this pattern is most likely a numerical artifact, primarily triggered by the discretization scheme and reflects the grid symmetry. Extreme care has to be taken in the interpretation of such patterns in model results.

Keywords: Ice sheet model; Higher order mechanics; Thermomechanical coupling;

Figure 1. Simulated basal temperature by different models. Horizontal domain spans 1500km. Contor interval is 2K. Shading area shows the pressure-melting point.



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