

Performance of RCIP scheme on 1-d age computation of ice sheet.

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Generally the evolution of ice-sheet thickness, temperature and age in an ice-sheet model are formulated using the transport or advection equation. There are many variation of the formulation, which differ in numerical aspects such as stability, accuracy, numerical diffusivity, conservation and/or computational costs.

Rational Constrained Interpolation Profile scheme (RCIP, Xiao et al. 1996) is a variation of semi-Lagrangian scheme, which has properties in suppressing numerical oscillation and diffusion near large gradients.

In this study, RCIP scheme is implemented on 1d age computation of ice sheet, which is a typical numerical study of ice-core related topics. Comparison with the results of RCIP scheme and those of classical upwind scheme shows that the former keeps fine information (i.e., surface mass balance) recorded at the deposit.

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