Lateral boundary conditions in RCMs: study of the usual relaxation scheme

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In grid-point Regional Climate Models (RCMs), the lateral boundary conditions are usually provided by the procedure called “relaxation”. In this paper, we complement the preceding theoretical studies in order to assess the practical choices of model relaxation coefficients. Several profiles of coefficients used in RCMs are then evaluated. The complexity of actual model numerics makes any definite choice of the coefficients out of reach of such simple theoretical considerations, but these provide practical guidelines. The latter are confirmed by pragmatic considerations such as minimizing discontinuities and keeping relaxation rates in the range of the represented physical processes. We then present a sensitivity study with the Modèle Atmosphérique Régional (MAR) regional model. As a next step in our research, we began comparative RCM - GCM experiments using a nudged version of the LMDz GCM.

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