

Richardson Extrapolated Numerical Methods for One-Dimensional Advection Schemes

Tz. Ostromsky, I. Dimov, A. Havasi, I. Farago, Z. Zlatev

The numerical treatment of the advection part of any large-scale air pollution model is normally very difficult. Improving the accuracy of the computed results can be done either by refinement of the discretization grid (which is usually rather expensive in terms of computation resources) or by increasing the order of accuracy of the numerical method in use. The latter can often be done by a careful implementation of Richardson Extrapolation in conjunction with the numerical method chosen. In the paper, it is described how the Richardson Extrapolation can be combined with a particular numerical method (the Crank-Nicolson scheme). Three test-examples are introduced and the numerical results obtained by applying the combination of the Crank-Nicolson scheme and the Richardson Extrapolation are compared with the results obtained when the Crank-Nicolson scheme is used directly.