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15. Numerical Analysis and Scientific Computing

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Odd - even difference shemes for the Schrodinger problem

A stability analysis is given for three classes of odd–even finite diffrence schemes, which approximate the 2D Schrodinger problem. Sufficient and necessary stability conditions are derived for the von Neumann stability. The case of variable coefficients is investigated by the energy method. We propose to carry out the Fourier analysis directly for the OE schemes. Aplli- cation of the stability results for the nonlinear problem is also given. The results of numerical experiments are presented.

Reference: Raim. Čiegis, Rem. Čiegis, O. Štikoniene, On the generalization of one method for the investigation of nonlinear finite–diferenece shemes *Lith. Math. Journal* **31** (1997), 139–167.