

Fredholm solvability of periodic problems for general first-order hyperbolic systems

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Abstract:

The talk is devoted to the general linear first-order hyperbolic system in a single spatial variable with periodicity conditions in time and reflection boundary conditions in space. We construct two Banach spaces (for the solutions and for the right hand sides of equations) so that the problem is modeled as a Fredholm operator from one space to another. Previously such a result was obtained in the particular case of time-independent coefficients.

Our approach is based on constructing a right parametrix of the problem and using a general criterion for Fredholmness in Banach spaces.