

Presentation of the factorization method in a simple situation: study of the Riccati equation

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This talk is intended as an introduction to the session. We will present the general idea of the method in a basic situation of a cylindrical domain. We will see how to factorize a second order boundary value problem into a system of uncoupled first order initial value problems, together with a nonlinear Riccati type equation for functional operators. This factorization uses either the Neumann to Dirichlet (NtD) operator or the Dirichlet to Neumann (DtN) operator, which satisfy a Riccati equation. We will review some of the main difficulties of this Riccati Equation. This method can be also viewed as an infinite dimensional generalization of the block Gauss LU factorization.

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