Self-adjoint operator polynomials and their application in optimal control

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We discuss the operators associated with discrete and continous time optimal control problems for high order linear differential-algebraic systems with variable coefficients and their discrete-time analogs. We show that the optimality boundary value problems are associated with a self-adjoint differential-algebraic operator. We discuss the properties of these operators and show that the corresponding resriction to constant coefficient system leads to odd/even or palindromic/anti-palindromic operators.

We also discuss discretization methods that approximate continuous-time self-adjoint operators with discrete-time self-adjoint operators.

This is joint work with L. Scholz.