

Matrix-valued Finite Elements for Solids, Structures and Fluids

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Vector-valued function spaces, their finite element sub-spaces, and relations between these spaces are well understood within the de Rham complex. The framework of differential forms and Hilbert complexes provides a unified framework for any space dimension. Various matrix-valued finite element spaces have been introduced and analyzed more or less independently. In this presentation we put these spaces into a so called 2- complex. We show applications in solid mechanics, plates and shell, curvature computation and fluid dynamics.

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