New Finite Elements by using Potential Maps - With Applications to Linear Elasticity

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In this talk we consider simplex-meshes and we use potential maps to construct the local polynomial finite element spaces for different interesting differential operators. These local finite element spaces obtained by this construction principle automatically fulfill the exact sequence property. Moreover we show a techique to easily obtain the local degrees of freedom. We apply this techique to the elasticity complex resulting, in the lowest order case, in conforming linear elements for the symetric stress tensor. By using regular decompositions we are also able to construct preconditioners by following the work by Hiptmair and Xu.

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