

Sparsity Optimized High Order Finite Element Functions on Simplices

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This talk reports several results on sparsity optimized basis functions for hp -FEM on triangular and tetrahedral finite element meshes. We give an overview on the sparsity pattern for mass and stiffness matrix in the space L_2 , H_1 , $H(\text{div})$ and $H(\text{curl})$. The construction relies on a tensor-product based construction with properly weighted Jacobi polynomials. In the last part of the talk, an recursive algorithm in order to compute the nonzero entries of the stiffness matrix is presented. The talk is the result of collaborations with V. Pillwein (Linz), S. Welter (Bonn) and S. Zaglmayr (Darmstadt).

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