

# Adaptive approximation of time-dependent functions with discontinuous anisotropic space-time finite elements

Nick Schneider (FAU Erlangen-Nürnberg)

January 17, 2025

We study the approximation of real-valued functions  $f : [0, T] \times \Omega \rightarrow \mathbb{R}$  with different smoothness in time and space for  $T \in (0, \infty)$  and a  $d$ -dimensional, simplicial Lipschitz domain  $\Omega$ .

Starting with a tensor product partition consisting of prisms, we apply a certain sequence of iterations of spacial and temporal bisections, that we call anisotropic bisection method, to refine the initial partition. On the refined partition, we approximate the given function  $f$  with discontinuous anisotropic finite elements.

This is used in order to give an almost characterization of the corresponding approximation classes in terms of anisotropic Besov spaces.

The talk is based on joint work with Pedro Morin (Universidad Nacional del Litoral, Santa Fe) and Cornelia Schneider (Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen).