Error estimates for anisotropic finite elements.

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The classic theory for finite element error estimates is based on regularity assumptions, i.e., bounded ratio between outer and inner diameter. However, it is now well known that this regularity assumption can be relaxed, in particular several results for anisotropic elements have been proved in the last 30 years.

This talk deals with error estimates for quadrilateral elements, explaining the difference between 2d and 3d and the necessity of approximations other than the Lagrange interpolation. We also show some applications to the approximation of problems with boundary layers.