# A POSTERIORI ERROR ESTIMATION ON ANISOTROPIC MESHES

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Our main goal in this talk is to present residual-type a posteriori error estimates in the maximum norm, as well as in the energy norm, on anisotropic meshes, i.e. we allow mesh elements to have extremely high aspect ratios [2, 4]. The error constants in these estimates are independent of the diameters and the aspect ratios of mesh elements. Note also that, in contrast to some a posteriori error estimates on anisotropic meshes in the literature, our error constants do not involve so-called matching functions (that depend on the unknown error and, in general, may be as large as mesh aspect ratios).

To deal with anisotropic elements, a number of technical issues have been addressed in [2, 4]. For example, an inspection of standard proofs for shape-regular meshes reveals that one obstacle in extending them to anisotropic meshes lies in the application of a scaled traced theorem when estimating the jump residual terms (this causes the mesh aspect ratios to appear in the estimator). For maximum norm estimates, the analysis also employs sharp bounds on the Greens function from [1]. For the estimation in the energy norm, a special quasi-interpolation operator is constructed on anisotropic meshes, which may be of independent interest [4].

We shall also touch on that certain perceptions need to be adjusted for the case of anisotropic meshes. In particular, it is not always the case that the computed-solution error in the maximum norm is closely related to the corresponding interpolation error [3].

## References

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