Conditioning of Linear Finite Element Equations with Arbitrary Anisotropic Grids

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There is a concern that anisotropic grids containing elements of high aspect ratio may dramatically increase the conditioning of the finite element equations. Classic results for isotropic adaption are not useful for anisotropic grids since they lead to an excessive overestimation of the real condition number of the stiffness matrix. Thus, a new analysis was necessary. This talk presents an overview of the available results as well as recent achievements, which show that the conditioning of the finite elements is not necessarily as bad as it is generally assumed.

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