# A Robust Method of Anisotropic Grid Generation

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A method of unstructured adaptive grid generation is proposed. It is suitable for solution of a wide range of problems with an anisotropic behavior of unknown functions (boundary and shear layers in fluid dynamics, sharp fronts in convection diffusion problems and plasma physics etc.). The method is based upon a simultaneous application of the hierarchical isotropic refinement of 2D and 3D grid cells (which is a well-known and robust approach) and the refinement of the cell edges followed by a local adaptive triangulation. The corresponding class of grids is sufficiently wide to provide nearly optimal grid generation without any restriction on cell aspect ratio. At the same time, basic adaptive grid generator operations including grid de-refinement and quality control can be efficiently implemented within the frames of the proposed grid class.

Examples of convection diffusion problem solutions for low values of diffusion coefficient with the use of the 2D and 3D adaptive grids are presented. The error indicator choice based upon interpolation error estimates for scalar function given at the grid nodes are discussed.

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