Stabilization Methods for Convection-Diffusion Problems on Layer-Adapted Meshes

Hans-G. Roos, TU Dresden

The use of layer adapted meshes allows to prove robust convergence results of Galerkin finite element methods for convection-diffusion problems. However, the robust solution of the generated discrete problems which are in general nonsymmetric is a nontrivial task.

The situation improves if one uses some stabilization, but there are many known stabilization techniques. We compare streamline-diffusion stabilization, discontinuous Galerkin and edge stabilization with special emphasis on superconvergence properties.