Convergence of adaptive FEM on anisotropic meshes for singularly perturbed reaction-diffusion equation

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Singularly perturbed reaction-diffusion problems exhibit in general solutions with anisotropic features, e.g. strong boundary and/or interior layers. This anisotropy is reflected in the discretization by using meshes with anisotropic elements. By means of a posteriori error estimation we develop an adaptive Finite Element Method, employing special anisotropic adaptive partitions. This algorithm produces well-suited meshes; we show that it converges uniformly in the energy norm.

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