

Analysis of finite element methods for convection-diffusion problems in 2D on Bakhvalov-type meshes

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ABSTRACT

So far optimal error estimates on Bakhvalov-type meshes are only known for finite difference and finite element methods solving linear convection-diffusion problems in the one-dimensional case. We prove (almost) optimal error estimates for problems with exponential boundary layers in two dimensions. We also discuss supercloseness properties and SDFEM stabilization.

In the second part of the talk we investigate locally uniform meshes. Starting from a Bakhvalov-Shishkin mesh we present two classes of locally uniform meshes which allow error estimates where the arising constants extremely weakly depend on the perturbation parameter.

References

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