A UNIFORMLY ACCURATE FINITE VOLUME DISCRETIZATION FOR A CONVECTION-DIFFUSION PROBLEM *

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Abstract. A singularly perturbed convection-diffusion problem is considered. The problem is discretized using an inverse-monotone finite volume method on Shishkin meshes. We establish first-order convergence in a global energy norm and a mesh-dependent discrete energy norm, no matter how small the perturbation parameter. Numerical experiments support the theoretical results.

Key words. convection-diffusion problems, finite volume methods, singular perturbation, Shishkin mesh.

AMS subject classifications. 65N30.