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Maximum norm a posteriori error estimates for time-dependent convection-diffusion equations[†]

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ABSTRACT

We consider a singularly perturbed time-dependent convection-diffusion equation in one dimension subject to an initial and Dirichlet boundary conditions. For this problem we derive a maximum norm a posteriori error estimate that holds true uniformly in the small diffusion parameter. This result is obtained by combining (i) sharp bounds on derivatives of the Green's function for the continuous differential operator in the L_1 norm, and (ii) a special representation of the residual in terms of the current mesh and the current computed solution. This work extends the a posteriori estimates of [1] to a time-dependent case.

References

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