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ON RESTRICTION OF THE RICHARDSON TECHNIQUE TO IMPROVE ACCURACY OF GRID SOLUTIONS FOR SINGULARLY PERTURBED REACTION-DIFFUSION EQUATIONS [1]

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In the case of singularly perturbed problems for parabolic convection-diffusion equations, order of the ε-uniform convergence rate for solutions of classical difference schemes on special grids (Bakhvalov, Shishkin), as a rule, is *not higher than one* in spatial and temporal variables. Earlier, for such a problem, using a Richardson technique, a difference scheme with *improved accuracy order* in *spatial and temporal variables* was constructed, namely, with the order close to 2 in x and 2 in t.

However, the Richardson technique turns out to be restrictedly applicable for the construction of difference schemes with *high accuracy order*. Here, on an example of a Dirichlet problem for a singularly perturbed parabolic convection-diffusion equation it is shown that for the Richardson method the rate of the ε-uniform *convergence in* x with order *higher than two* is unachievable.

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