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UNIFORM CONVERGENCE OF MONOTONE ITERATIVE METHODS FOR SEMILINEAR SINGULARLY PERTURBED PROBLEMS OF ELLIPTIC AND PARABOLIC TYPES *

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Abstract. This paper deals with discrete monotone iterative methods for solving semilinear singularly perturbed problems of elliptic and parabolic types. The monotone iterative methods solve only linear discrete systems at each iterative step of the iterative process. Uniform convergence of the monotone iterative methods are investigated and rates of convergence are estimated. Numerical experiments complement the theoretical results.

Key words. singular perturbation, reaction-diffusion problem, convection-diffusion problem, discrete monotone iterative method, uniform convergence

AMS subject classifications. 65M06, 65N06

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