

**PARAMETER-UNIFORM FITTED OPERATOR B-SPLINE COLLOCATION  
METHOD FOR SELF-ADJOINT SINGULARLY PERTURBED TWO-POINT  
BOUNDARY VALUE PROBLEMS\***

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**Abstract.** In this paper, we develop a B-spline collocation method for the numerical solution of a self-adjoint singularly perturbed boundary value problem of the form

$$-\varepsilon(a(x)y')' + b(x)y(x) = f(x), \quad a(x) \geq a^* > 0, \quad b(x) \geq b^* > 0, \quad a'(x) \geq 0, \quad y(0) = \alpha, \quad y(1) = \beta.$$

We construct a fitting factor and use the B-spline collocation method, which leads to a tridiagonal linear system. The method is analyzed for parameter-uniform convergence. Several numerical examples are reported which demonstrate the efficiency of the proposed method.

**Key words.** B-spline collocation method, self-adjoint singularly perturbed boundary value problem, parameter-uniform convergence, boundary layer, fitted operator method

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