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Numerical study of self-adjoint singularly perturbed two-point boundary value problems using collocation method with error estimation

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Highlights

- In this paper, a numerical treatment of self-adjoint singularly perturbed second order two point boundary value problems using trigonometric quintic B-splines.
- Trigonometric quintic B-spline collocation method has a truncation error of $O(h^6)$ and converges to the exact solution with $O(h^4)$.
- From the computational results, the proposed method demonstrates efficient solutions of the considered problems at different values of n and perturbation parameter ϵ .
- Four numerical examples are presented, which compare with the analytic solutions by finding the maximum absolute errors.
- The numerical examples show that our method is very effective and the maximum absolute error is acceptable.

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