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Section:

15. Numerical Analysis and Scientific Computing

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Polynomial spline functions of even degree approximating the solution of differential equations
Spline theory is nowadays a very active field of approximation theory and many desirable advantages exist for differential equation problems. Almost all papers in enormous spline literature underline the fundamental properties of natural spline functions of odd degree, namely the minimum norm property, the best approximation property, the convergence properties, etc. In this paper, changing the interpolation conditions, we shall define a natural spline function of even degree which keeps all remarcable properties od odd degree one and we shall develop a very efficient procedure to use this spline for the numerical solution of (delayed) differential equations with initial conditions. Some numerical examples illustrate the practical applicability and the efficiency of the given method.