

Collocation by Singular Splines

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Abstract. Splines determined by the kernel of the differential operator $D^2(D\sqrt{x}D)$ are known to be useful in the solution of the singular boundary-value problems of the form $D\sqrt{x}Du = f(x, u)$; more recently, they have also proven as a valuable tool for solving Volterra-type integral equations. The most successive method seems to be the collocation method based on special Chebyshev splines. We investigate properties of the associated B-splines, knot-insertion algorithms for their evaluation, and their application in collocation at generalized Gaussian points.

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