

TOTALLY POSITIVE MATRICES IN THE METHODS OF CONSTRUCTING INTERPOLATION SPLINES OF ODD DEGREE

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The problem is considered of constructing the *complete* interpolation spline of degree $2n - 1$ by calculating the coefficients of the decomposition of a derivative of the spline in the normalized B -splines of the corresponding degree. It is demonstrated that the construction reduces to solving a system of equations with a totally positive band matrix. Some practical methods are discussed of calculating the entries of the matrix of the system. The possibility is studied of estimating the condition number of totally positive matrices. A bound is found for the condition number of the system of equations for constructing a quintic spline via the coefficients of the decomposition of the second derivative in the B -splines of degree three which is independent of the mesh; this guarantees stable calculation of the quintic spline. Uniform convergence is established of the second derivative of the quintic spline to the second derivative of the interpolant function for twice differentiable functions.

Key words and phrases: spline of odd degree, interpolation, construction algorithms, totally positive matrix, quintic spline.

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