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Abstracts of Short Communications and Posters

Section:

15. Numerical Analysis and Scientific Computing

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Adaptive by monotonicity interpolating splines

For given data x_i, f_i, $i = 1, \dots, n$, and partition $\xi_o \le x_1 < \xi_1 < x_2 < \dots < \xi_{n-1} < x_n \le \xi_n$ an adaptive spline S is a linear/linear rational function or quadratic polynomial in each interval $[\xi_{i-1}, \xi_i]$, $i = 1, \dots, n$, satisfies $S(x_i) = f_i$, $i = 1, \dots, n$, boundary conditions $S(x_0) = \alpha$, $S(x_0) = \beta$ or $S'(x_0) = \alpha$, $S'(x_0) = \beta$ and belongs to $C^1[a, b]$. It has maximal number of rational intervals to preserve locally the monotonicity of data. The uniqueness and existence of such adaptive splines are proved. Similar quadratic/linear and cubic combined adaptive splines of class C^2 preserving local convexity or concavity are known to exist only if an additional condition concerning the data holds.