A new fourth-order accurate monotone interpolant

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Monotonicity-preserving approximation methods have been used in several applications. These methods consist in reconstructing a function from a discrete set of data preserving its monotonicity. In the last years, different piecewise cubic Hermite interpolants have been designed using non-linear techniques as Essentially Non- Oscillatory interpolation (see [1]) or using a weighted harmonic mean (see [2, 3]). An important property of these methods is the order of accuracy. In this work, we propose a new non-linear and non-uniform fourth order monotone interpolant using the power-p average developed by Marquina and Serna in [4]. We study the properties of the method and we perform several numerical experiments to compare our algorithm against some classical methods.

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