3-dimensional Weakly Admissible Meshes: interpolation and cubature∗

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Abstract

In the paper by Calvi and Levenberg [3], it has been recognized that the so-called Admissible Meshes (AM) play a central role in the construction of multivariate polynomial approximation processes on compact sets of $\mathbb{R}^d$. The concept is essentially a matter of polynomial inequalities.

Since for many compacts the computational use of such admissible meshes becomes difficult or even impossible for $d = 2, 3$ already at moderate polynomial degrees, one can consider Weakly Admissible Meshes (WAM), which have lower cardinality than admissible ones.

In the present work, we concentrate on the construction of WAMs for 3-dimensional domains, such as, cones and toroidal sections, with two main applications in mind:

1. polynomial interpolation at the so called Approximate Fekete Points (AFP) and/or Discrete Leja Points (DLP) (cf. [1, 2]);
2. cubature at AFP or DLP.

References


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