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Basics on high order polynomial interpolation of physical fields on simplices

Francesca Rapetti
Nizza Cote d'Azur

Polynomial interpolation is a key aspect in numerical analysis, used in very classical settings as reconstructing a physical field from measures, defining quadrature formulas to compute integrals or expressing the high-order basis functions in finite element methods. We will review the roles of the three main characters featuring in polynomial interpolation, namely, the representation of the domain by a mesh, the polynomial basis, the Vandermonde matrix. We will present a framework for the interpolation of differential k-forms on simplices that allows to generalize fundamentals concepts featuring in the classical scalar case. The Lebesgue constant pops up naturally to measure the stability of the interpolation and the Runge phenomenon may appear in case of instability.

E–mail: Francesca.RAPETTI@univ-cotedazur.fr.
venerdì 8 settembre, ore 17.00, Aula Magna Polo Carmignani