

Comparison results for first-order FEMs

Mira Schedensack¹ Carsten Carstensen² Daniel Peterseim³

This talk establishes the equivalence of conforming Courant finite element method, nonconforming Crouzeix-Raviart finite element method, and several first-order discontinuous Galerkin finite element methods in the sense that the respective energy error norms are equivalent up to generic constants and higher-order data oscillations in a Poisson model problem. The Raviart-Thomas mixed finite element method is better than the previous methods whereas the conjecture of the converse relation is proved to be false.

This talk completes the analysis of comparison initiated by Braess in *Calcolo* (2010).

¹ Humboldt-Universität zu Berlin, Institut für Mathematik, Berlin,
schedens@math.hu-berlin.de

² Humboldt-Universität zu Berlin, Institut für Mathematik, Berlin,
cc@math.hu-berlin.de

³ Humboldt-Universität zu Berlin, Institut für Mathematik, Berlin,
peterseim@math.hu-berlin.de