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Special Guest Lectures

Superconvergent Discontinuous Galerkin Methods**Johnny Guzman, University of Minnesota**

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Johnston Hall 338

January 17, 2008 - 03:30 pm

Abstract:

We identify discontinuous Galerkin methods for second-order elliptic problems having superconvergence properties similar to those of the Raviart-Thomas and the Brezzi-Douglas-Marini mixed methods. These methods use polynomials of degree k for both the potential as well as the flux. We show that the approximate flux converges with the optimal order of $k+1$, and that the local averages of the approximate potential superconverge to the averages of the potential, with order $k+2$. We also apply an element-by-element postprocessing of the approximate solution to obtain a new approximation of the potential. The new approximate solution of the potential converges with order $k+2$. We provide numerical experiments that support our theoretical results.

