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Computational Mathematics Seminar Series

Higher Order Estimates in Time for the Arbitrary Lagrangian Eulerian Formulation in Moving Domains**Andrea Bonito, Texas A&M University**

Assistant Professor

Johnston Hall 338
August 23, 2011 - 03:30 pm**Abstract:**

Arbitrary Lagrangian Eulerian (ALE) formulations arise naturally in the context of parametric representations of deformable domains. As an illustration, we first provide numerical simulations of red blood cell with emphasis on the need for ALE formulations, higher order methods, and a-posteriori error control in time. Then, we present a discontinuous Galerkin methods in time for advection-diffusion problems on moving domains. This approach leads to unconditionally stable numerical schemes with optimal a-priori and a-posteriori error estimates. We also discuss the critical role of integration in time and give a sufficient condition for preserving the stability and the accuracy of the numerical schemes. The latter is a generalization of the Geometric Conservation Law. This is joint work with I. Kyza and R.H. Nochetto.

Speaker's Bio:

Andrea Bonito received his PhD degree from the Ecole Polytechnique Federale de Lausanne in 2006. After his two postdoctoral years at the University of Maryland, he joined the Department of Mathematics at Texas A&M University as assistant professor.

