UNIVERSITY OF CALIFORNIA
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APPLIED MATHEMATICS SEMINAR 291

Rosenbrock-Krylov Methods for Large Systems of Differential Equations

Date: **8/30/2019**
Time: **3:00 PM**
Location: **COB1 265**

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Abstract

Classically, most time integration methods are categorized as either explicit or implicit. There exists a large range of problems of interest, however, for which explicit methods are inadequate and implicit methods are too costly. This presentation discusses the development of Rosenbrock-Krylov methods, a family of time integration schemes which seek to find a middle ground. Rosenbrock-Krylov methods treat the time integrator and linear system solver as a single computational process and the Krylov space properties of the iterative method are an integral part of the Rosenbrock-Krylov order condition theory. These methods require only a small number of basis vectors, determined solely by the temporal order of accuracy, and the subspace size is independent of the ODE under consideration. A presentation of the underlying order condition theory, as well as practical extensions of these methods will be presented.

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