MESHFREE AND GENERALIZED/EXTENDED FINITE ELEMENT METHODS

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ABSTRACT

Meshfree and Generalized/Extended Finite Element methods have undergone substantial development and have received much attention since mid 1990's. The most significant advantage of Meshfree and Generalized/Extended Finite Element methods is the flexibility in customizing approximation functions for desired accuracy or for capturing essential physics and features of the particular problems of interest. This symposium aims to promote collaboration among engineers, mathematicians, computer scientists, and national laboratory and industrial researchers to address development, mathematical analysis, and application of Meshfree and Generalized/Extended Finite Element methods. While contributions in all aspects of Meshfree methods are invited, some of the topics to be featured are

- Mathematical theory of Meshfree and Generalized/Extended Finite Element methods
- Coupling of Meshfree methods, Finite Element methods, and Finite Difference methods

- Local (such as moving least-squares, reproducing kernel) approximations vs. nonlocal (such as radial basis functions) approximation
- Application of Meshfree and Generalized/Extended Finite Element methods
- Fast and stable domain integration methods
- Enhanced treatment of boundary conditions
- Temporal stability analysis
- Parallel computation in Meshfree methods
- Identification and characterization of problems where Meshfree, Generalized/Extended Finite Element, and related methods have clear advantage over classical approaches.