ADVANCES AND APPLICATIONS OF RADIAL BASIS FUNCTION-BASED MESHLESS METHODS

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ABSTRACT

This minisymposium on Radial Basis Function (RBF)-based meshless/meshfree methods aims to explore recent advancements and applications of RBF techniques in computational science and engineering. Meshless methods, particularly those utilizing RBFs, have gained significant attention due to their flexibility in handling complex geometries and their robustness in solving partial differential equations (PDEs) without the need for a classical computational mesh/grid. Such methods include, but are not limited to, RBF-Finite Difference (RBF-FD), RBF-Partition of Unity (RBF-PUM), RBF-Differential Quadrature (RBF-DQ), Local RBF Collocation (LRBFCM), Radial Point Interpolation (RPIM), Kansa's (global) RBF, RBF-Hermite Finite-Difference (RBF-HFD) methods. This session will cover a range of topics including the theoretical foundations of RBFs, algorithmic developments, computational aspects, coupling with other techniques/approaches, and practical implementations in various fields such as fluid dynamics, heat transfer and solid mechanics. By bringing together experts and researchers, the minisymposium seeks to foster discussions on the latest innovations, challenges, and future directions in the development and application of RBF-based meshless methods.