

The Meshless Local Petrov-Galerkin (MLPG) Method for Domain & BIE Discretizations

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Abstract

This talk will discuss how the Meshless Local Petrov Galerkin Method [Atluri and Zhu(1998), Atluri and Shen (2002 a,b)] is the basis of a variety of meshless methods, based on the use of a variety of trial functions and a variety of test functions, for both domain-solution approaches [Atluri and Shen(2003)], as well as boundary solution approaches using integral equations [Atluri, Han, and Shen (2003)].

Some new and recent results for 3-dimensional solid mechanics problems involving strong singularities [Li, Shen, Han and Atluri (2003)], 3-dimensional non-planar fatigue crack-growth in complexly loaded solids and structures [Han and Atluri (2003 a, b)], and in strain-gradient theories of material inelasticity [Tang, Shen and Atluri (2003)], will be presented and critically examined.

The novel use of the MLPG method in generating $O(N)$ algorithms for molecular dynamics, and for multiple-length&-time scale simulations, is illustrated.

References

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