

METHODS AND TOOLS FOR PARALLEL ANISOTROPIC MESH ADAPTATION AND ANALYSIS

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Abstract. It is well known that adaptive methods are the most effective means to obtain reliable solutions and control the amount of computation required. However, for many classes of problems the best adaptive method still requires a level of computation that demands massively parallel computing. The evolving nature of adaptive simulations constantly changes the computational balance, thus requiring general structures and dynamic load balancing based on those structures. This paper will discuss recent advances on the development of methods and software components to execute and support the effective anisotropic mesh adaptation on massively parallel computers. One area to be discussed is parallel mesh adaptation on general unstructured anisotropic meshes considering various aspects of dynamic load balancing and parallel communication minimization. Another area to be considered is the development of general methods to support the execution, including dynamic load balancing, of adaptive computations.