

A Study on h-Adaptivity for the Spectral Element Method

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The spectral element method (SEM) is well suited for many applications. Combining the SEM with adaptive techniques can lead to accurate, flexible, and efficient methods. However, practical implementations face difficulties due to the complexity of the programming involved. We present an implementation which integrates the SEM on tetrahedral grids, h-adaptivity, and parallelization. We study the efficiency of the approach by applying the method to a model problem and evaluate the reductions in computational complexity and run-time. The scalability of the implementation is analyzed by considering speed-up and parallel efficiency.