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A Spectral Adaptive Mesh Refinement Method for the Burgers equation LEILA NASR AZADANI, Graduate Student, ANNE STAPLES, Assistant Professor — Adaptive mesh refinement (AMR) is a powerful technique in computational fluid dynamics (CFD). Many CFD problems have a wide range of scales which vary with time and space. In order to resolve all the scales numerically, high grid resolutions are required. The smaller the scales the higher the resolutions should be. However, small scales are usually formed in a small portion of the domain or in a special period of time. AMR is an efficient method to solve these types of problems, allowing high grid resolutions where and when they are needed and minimizing memory and CPU time. Here we formulate a spectral version of AMR in order to accelerate simulations of a 1D model for isotropic homogenous turbulence, the Burgers equation, as a first test of this method. Using pseudo spectral methods, we applied AMR in Fourier space. The spectral AMR (SAMR) method we present here is applied to the Burgers equation and the results are compared with the results obtained using standard solution methods performed using a fine mesh.

Leila Nasr Azadani
Graduate Student

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