Abstract Submitted
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An Eigen-based Spectral Element Method[1] SUCHUAN DONG, XIAONING ZHENG, Purdue University — We present an efficient high-order spectral element method. The method employs a novel numerically-constructed expansion basis within an element, which represents an optimal set of basis functions and simultaneously diagonalizes the mass and stiffness operators. We compare the new method with the Jacobi polynomial-based spectral element method that is commonly used in computational fluid dynamics. Results demonstrate that the new method enjoys a considerably superior numerical efficiency in terms of numerical conditioning and the number of iterations to convergence for iterative solvers.

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