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Legendre-Chebyshev spectral element method for heat conduction equations on polygonal domain. (Chinese. English summary) Zbl 1424.65200

Summary: The Legendre-Chebyshev spectral element method is developed to solve the heat conduction equations on the polygonal domain. By partitioning the domain into convex quadrangle subdomains, the scheme is formulated in the Legendre-Galerkin form, but the term on the right-hand side is approximated by the Chebyshev collocation method. The method can be implemented in parallel. The stability and the convergence of the method are proved. Numerical examples show the efficiency of the method.

MSC:
65M70 Spectral, collocation and related methods for initial value and initial-boundary value problems involving PDEs
65M12 Stability and convergence of numerical methods for initial value and initial-boundary value problems involving PDEs

Keywords:
polygonal domain; Legendre-Chebyshev spectral element method; implementation in parallel

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