Spectral methods in fluid dynamics

Springer-Verlag - Numerical methods in fluid mechanics

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Spectral Methods in Fluid Dynamics (eBook, 1988) [metrics.learnindialearn.in]

Domain Decomposition Methods -- 13.

Numerical methods in fluid mechanics

The cross-stream basis leads to a standard eigenvalue problem for the frequencies of Poiseuille flow instability waves. First, there is the Hybrid-Collocation-Galerkin method HCGM , which applies collocation at the interior Lobatto points and uses a Galerkin-like integral procedure at element interfaces. Accessible to both the seasoned researcher and the graduate student alike, this book provides readers with a single source of content that addresses spectral methods in transition metal complexes.

Fundamentals of Spectral Methods for PDEs

Besides these shortcomings, our aim is to treat algorithmic and computational aspects of spectral stochastic methods with details suf? With this combination, simplifications result such that mass lumping occurs at all nodes and a collocation procedure results at interior points.

Spectral Methods in Fluid Dynamics

All of the essential components of spectral algorithms currently employed for large-scale computations in fluid mechanics are described in detail. The design of flux-corrected transport algorithms for structured grids. Spectral methods with other basis functions Spectral methods can be constructed with other orthogonal polynomials rather than the Fourier basis functions.

A spectral element method for fluid dynamics: Laminar flow in a channel expansion

Spectral methods use the idea of global representations to find high order approximations. Their major drawback is in their geometric inflexibility which complicates their applications to general complex domains. For more complicated situations like a nonlinear right hand side or a system of equations, a nonlinear system of equations may have to be inverted.

A spectral element method for fluid dynamics: Laminar flow in a channel expansion

For slowly varying functions, the use of local polynomial interpolants based on a small number of interpolating grid points is very reasonable. The Eigenvalues of Basic Spectral Operators -- 4.

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