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SEMINAR ANNOUNCEMENT

Why spectral methods are preferred in PDE eigenvalue computations in some cases?

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Time: 3.30pm – 4.30pm
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School of Physical and Mathematical Sciences

Abstract

When approximating PDE eigenvalue problems by numerical methods such as finite difference and finite element, it is common knowledge that only a small portion of numerical eigenvalues are reliable. As a comparison, spectral methods may perform extremely well in some situation, especially for 1-D problems. In addition, we demonstrate that spectral methods can outperform traditional methods and the state-of-the-art method in 2-D problems even with singularities.

Speaker Biography

Zhimin Zhang received his B.S. (1982) and M.S. (1985) from University of Science and Technology of China, and his Ph.D. from University of Maryland at College Park (1991). He was appointed Visiting Assistant Professor and Assistant Professor (Tenure-track) in the Department of Mathematics at Texas Tech University in 1991 and 1993, respectively, and promoted to Associate Professor with tenure in 1997. He joined Wayne State University (WSU) as an Associate Professor in the Department of Mathematics in 1999 and was promoted to a full Professor in 2002. He is a Charles H. Gershenson Distinguished Faculty Fellow of WSU (2014). He was Changjiang Scholar Chair Professor at Sun Yat-sen University (2010-2012). He joined Beijing Computational Science Research Center (CSRC) as a "1000 Talent" Chair Professor in 2012. He is/was serving on editorial boards of eight professional journals including "Mathematics of Computation" and "Journal of Scientific Computing". His research interests include numerical PDEs, finite element methods, spectral methods, finite volume methods, etc. He has published 140 journal articles and edited half dozen special issues. His polynomial preserving recovery (PPR) post-processing has been adopted by COMSOL Multiphysis since 2008.

Host: Associate Professor Wang Li-Lian
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