



CSC Seminar

SPEAKER

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TITLE

The (block) rational Lanczos method and applications

ABSTRACT

For an Hermitian A , the rational Lanczos method can be used to build an orthonormal basis - in exact arithmetic - of the rational Krylov subspace $K_m(A, B, \xi)$ for a given $B \in \mathbb{C}^{n \times s}$ and a set of shifts ξ . Similarly to its polynomial counterpart, the rational Lanczos method allows us to store only a couple of basis blocks in place of the whole basis. However, in the rational context such a memory-saving feature comes with a peculiar toll. Indeed, two linear systems have to be solved at each iteration during the basis construction. Due to this drawback, the rational Arnoldi method where a single linear system per iteration is solved is generally preferred.

In this talk we illustrate a novel, computational-appealing implementation of the rational Lanczos method where, e.g., a single linear system with multiple right-hand sides has to be solved at each iteration. A panel of diverse examples is presented to illustrate the broad applicability of the rational Lanczos method.

Tuesday, February 9, 2021 at 2 pm

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