

Asymptotic spectral analysis: two non-normal applications

The study of the asymptotic properties of the spectrum of a matrix sequence with a specific structure and increasing order has been a rich field of research and of great interest in applications, since they arise from approximation of integro-differential equations, also of fractional order (see e.g. [4, 5, 3] and references therein). This kind of approach leads most of the times to a huge linear system, whose dimension is related to the precision of the approximation. For this reason, researchers focused their attention on properties of clustering and symbol analysis of the eigenvalues of the sequence, since those are connected with fast convergence of iterative procedures for solving linear systems, such as Krylov-type methods [2, 6]. While classical results are often efficient in the case of a sequence of normal matrices, a wilder behavior should be expected in non-normal settings. In this poster, two such cases [9, 10] are presented and specific tools as long as complex analysis and quite new literature are involved to obtain the main results.

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