

Exponentials of essentially non-negative matrices: entry-wise perturbation analysis and accurate computation

Jungong Xue

Fudan University

Abstract: A real square matrix is said to be essentially non-negative if all of its off-diagonal entries are non-negative. We establish entrywise relative perturbation bounds for the exponential of an essentially non-negative matrix. Our bounds are sharp and contain a condition number that is intrinsic to the exponential function. Some algorithms for accurate computation of these exponentials are developed.