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*Queueing Theory, Rouché's Theorem, Localization Theorem*

Traditionally, in the analysis of queueing models based on complex analysis method and the associated Skip Free Markov chain based models, Rouché's Theorem is invoked to determine the eigenvalues of the recursion matrix, called rate matrix which is the solution of a matrix polynomial/matrix power series equation. In this research paper, we provide a simple proof of the Localization Theorem using the linear algebraic arguments. We also prove a generalized Perron Theorem associated with a polynomial matrix.