Y. Langlois and T. J. Ransford, **Counterexample to a conjecture of Elsner on the spectral variation of matrices**, *Linear Algebra Appl.*, 349 (2002), 193–195.

Abstract

In 1985, Elsner proved that the Hausdorff distance Δ between the spectra of two $n \times n$ matrices A and B satisfies

$$\Delta\big(\sigma(A), \sigma(B)\big)^n \leq \big(\|A\| + \|B\|\big)^{n-1} \|A - B\|,$$

where $\|\cdot\|$ denotes the operator norm with respect to the Euclidean norm on $\mathbf{C}^n$. He further conjectured that the same inequality holds for all operator norms. We disprove this conjecture, and also the weaker conjecture where $(\|A\| + \|B\|)$ is replaced by $2\max(\|A\|, \|B\|)$.