

# Norm estimates for eigenvalues of Riesz operators and matrices

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## Abstract

We will give a brief survey concerning recent joint work with A. Defant and C. Michels. Using abstract interpolation theory, we study eigenvalue distribution problems for Riesz operators on complex symmetric Banach sequence spaces. We prove eigenvalue estimates for matrices. Combining the results with some geometrical estimates for Kronecker's matrices, we show applications to Orlicz sequence spaces  $\ell_\varphi$ . For the power function  $\varphi(t) = t^p$  with  $2 \leq p < \infty$ , we obtain a celebrated result of W.B. Johnson, H. König, B. Maurey and J.R. Retherford from 1979 which says that each complex  $n \times n$  matrix  $T = [\tau_{ij}]$  satisfies the following eigenvalue estimate:

$$\left( \sum_{i=1}^n |\lambda_i(T)|^p \right)^{1/p} \leq \left( \sum_{j=1}^n \left( \sum_{i=1}^n |\tau_{ij}|^q \right)^{p/q} \right)^{1/p},$$

where  $\{\lambda_i(T)\}_{i=1}^n$  is a sequence of eigenvalues of  $T$  and  $2 \leq p < \infty$ ,  $1/p + 1/q = 1$ .