

TENSOR TRICK FOR PERTURBED OPERATORS

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Let A be a bounded self-adjoint operator in a Hilbert space and let K be a perturbation which is of trace class. Assume that for any $\varepsilon > 0$ there exists a constant $C(\varepsilon) > 0$ such that

$$\sum_{\lambda \in \sigma_d(A+K)} \text{dist}(\lambda, \sigma(A))^{1+\varepsilon} \leq C(\varepsilon) \|K\|_{1+\varepsilon}^{1+\varepsilon}.$$

Open problem: Does it follow that there exists $C > 0$ such that

$$\sum_{\lambda \in \sigma_d(A+K)} \text{dist}(\lambda, \sigma(A)) \leq C \|K\|_1?$$