Eigenfunctions of generalized Hilbert matrices

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Abstract

We study Hilbert-type infinite matrices of the form $H_\lambda = \left(\frac{1}{m+n+\lambda}\right)_{m,n\geq 0}$ where $\lambda \in \mathbb{C} \setminus \mathbb{Z}$. These matrices extend to bounded operators on H^2 or on the Korenblum classes $A^{-\tau}$. We investigate eigenfunctions of these operators using their commutant with certain differential operators. The results we obtain match those proved earlier by M. Rosenblum for the case $\lambda \in \mathbb{R}$.