Matrices of operators

Vladimir Müller

Let T be a linear operator on a separable infinite-dimensional Hilbert space H. Then T allows for a variety of matrix representations $(\langle Tu_j, u_n\rangle)_{n,j=1}^{\infty}$ induced by the set of all orthonormal bases (u_n) in H. We discuss the following problem:

Problem: Let $B \subset \mathbf{N} \times \mathbf{N}$ be a subset and $a_{nj} \quad (j,n) \in B$ given complex numbers. What are natural assumptions on B and a_{nj} to ensure that there exists an orthonormal basis (u_n) such that

$$\langle Tu_j, u_n\rangle = a_{nj} \qquad (n,j) \in B?$$

(joint work with Yu. Tomilov)