Spectra of Jacobi operators: Analysis and approximation

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We look at bounded linear operators on vector-valued ℓ^p spaces and study their spectrum (in particular the essential spectrum) and pseudospectra. Our operators are given by infinite matrices with finitely many diagonals. We give a formula for the essential spectrum which will be discussed for concrete examples of matrices with almost periodic, slowly oscillating or random diagonals. For the case of tridiagonal matrices, we moreover give upper bounds on spectrum and pseudospectrum of the infinite matrix A in terms of pseudospectra of certain finite matrices of order n that are connected to submatrices of A. The latter sets approximate the (pseudo-)spectrum of A as n goes to infinity.

This is joint work with S. N. Chandler-Wilde and R. Chonchaiya.