

Hankel operators with band spectra and elliptic functions

mardi 25 juin 2024 09:00 (55 minutes)

I will discuss spectral properties of bounded self-adjoint Hankel operators H , realised as integral operators on the positive semi-axis, that commute with dilations by a fixed factor. In analogy with the spectral theory of periodic Schroedinger operators, the Hankel operators H of this class admit the Floquet-Bloch decomposition, which represents H as a direct integral of certain compact fiber operators. As a consequence, operators H have band spectra (the spectrum of H is the union of disjoint intervals). A striking feature of this model is that flat bands (i.e. intervals degenerating into points, which are eigenvalues of infinite multiplicity) may co-exist with non-flat bands; I will discuss some simple explicit examples of this nature. Key to the spectral analysis of this class of Hankel operator is the theory of elliptic functions; I will explain this connection. This is joint work with Alexander Sobolev (University College London).

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