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Title:

Descriptive analysis of self-adjoint operators and the Weyl-von Neumann equivalence relation

Abstract:

In a previous work, we studied the space $SA(H)$ of all (possibly unbounded) self-adjoint operators on a separable Hilbert space H and in particular showed that the relation of unitary equivalence modulo compacts (Weyl-von Neumann equivalence) is unclassifiable by countable structures. Moreover, for a closed set F of the real line, there may or may not be self-adjoint operators A, B for which the essential spectrum coincide with F but A, B are not Weyl-von Neumann equivalent.

In this talk, we characterize which F satisfies the conclusion of Weyl-von Neumann theorem. We also discuss the Borel complexity of Schatten class perturbations of unbounded self-adjoint operators, and see that they are all Borel reducible to the universal essentially $K_{\{\sigma\}}$ equivalence relation ℓ^∞ .

This is joint work with Yasumichi Matsuzawa (Shinshu University).