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8. Analysis

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Elliott, George A., University of Copenhagen, University of Toronto, and The Fields Institute, and Dan Kucerovsky, The Fields Institute
An abstract Weyl–von Neumann theorem

The Weyl–von Neumann Theorem states that any self-adjoint operator on a separable Hilbert space is, after a compact perturbation, diagonalizable.
Brown, Douglas, and Fillmore reformulated this statement in the language of C*-algebras—as the first step in their theory of extensions.
Voiculescu obtained the following generalization:
Every essential extension of the compact operators by a given separable C*-algebra is equivalent to the sum of itself and any trivial extension.
Such an extension is said to be absorbing.
Recently, Kirchberg showed that the algebra of compacts can be replaced by a purely infinite simple separable nuclear C*-algebra.
In general, when one considers instead an arbitrary stable separable nuclear C*-algebra (as the ideal), there exist non-absorbing essential extensions.
There is, however, a simple criterion for an extension to be absorbing. It is easily checked in the cases considered by Voiculescu and Kirchberg.