

Siegfried Beckus - *Spectral approximation via an approach from C^* -algebras*

When do the spectra of operators vary continuously? How to show such a continuity if the operators depend on a underlying geometry and dynamics that changes? These questions are addressed during the talk.

The theory of continuous fields of C^* -algebras has a long history and goes back to the works of Kaplansky and Fell [6, 7, 4, 5]. Already Kaplansky [7] realized that this notion implies continuity of the spectra of self-adjoint elements with respect to the Hausdorff metric. However, this approach was just rarely used so far to show the convergence of the spectra. In recent elaborations [1, 2] with J. Bellissard we show that less requirements lead to a characterization of the convergence of the spectra. Moreover, we show that the rate of convergence depends on the behavior of certain norms of the operators.

Involving the theory of groupoid C^* -algebras, this approach provides a powerful tool to characterize the convergence of the spectra for Schrödinger operators [2, 3]. A particular interesting case is the class of Schrödinger operators associated with dynamical systems. Our result delivers an approximation theory for Schrödinger operators by approximating their underlying geometry and dynamics having applications in mathematical physics.

REFERENCES

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