Null-Controllability for Parabolic Equations

Christian Seifert
Technische Universität Hamburg
christian.seifert@tuhh.de

In this talk we study various notions of null-controllability of systems in Banach spaces. In an abstract Banach space setting we show that an uncertainty relation together with a dissipation estimate implies a so-called final state observability estimate with explicit dependence on the model parameters. This estimate applied to the dual system in turn is in general equivalent to an approximate notion of null-controllability, and in special cases also to null-controllability of the original system. Our approach unifies and generalizes the respective advantages from earlier results obtained in the context of Hilbert spaces. As an application we consider parabolic equations induced by strongly elliptic operators on L_p spaces for $1 \leq p < \infty$.

The talk is based on joint work with Clemens Bombach, Dennis Gallaun and Martin Tautenhahn.