

David Seifert

Title:

Optimal rates of decay for operator semigroups and damped waves

Abstract:

Semigroup theory has long played a central role in the study of damped waves and other linear evolution equations. One of the most influential results of recent times has been a theorem due to Borichev and Tomilov (Math. Annalen, 2010), which yields optimal polynomial rates of decay for classical semigroup orbits given a suitable polynomial resolvent bound along the imaginary axis. In this talk I will present an extension of the Borichev-Tomilov theorem beyond the purely polynomial case to a much larger class of resolvent bounds. The result is optimal in several ways which I will explain. I will also describe, by giving relevant examples, how the abstract result can be used to obtain sharp rates of energy decay in one-dimensional wave equations subject to different types of damping. The talk is based on joint work with Jan Rozendaal and Reinhard Stahn (Advances in Mathematics, 2019).