
COMPLEX ANALYSIS, THICK SETS, AND SPECTRAL INEQUALITIES

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It is a well-known fact in control theory, that null-controllability in time T of a control system given by an inhomogeneous Cauchy problem is equivalent to final-state-observability of the associated dual system. A key ingredient to show the latter property is the availability of a spectral inequality for elements in the range of the spectral projection of an appropriate operator up to a certain energy value. In this talk we explain what a spectral inequality is and we present a general framework based on complex analytical technique to obtain them for a certain class of domains and operators. Moreover, we will expand our results to the realm of graphs. The main ideas are a generalization of techniques first exploited by Kovrijkine to study functions with compactly supported Fourier Transform. This talk is based on a joint work with Ivan Veselic (TU Dortmund), Albrecht Seelmann (TU Dortmund) and Delio Mugnolo (FernUni Hagen).