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DK Seminar

May 20, 2015, 14:00 - 15:30

University of Vienna

Oskar-Morgenstern-Platz 1, WPI, 8th floor, Seminarroom.

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Spectral analysis of forward operator in photoacoustic tomography in weak attenuation case

The degree of ill-posedness of an inverse problem, which is usually defined using eigenvalues, is useful in the investigations of said inverse problem. For example, it tells us about the approximate difficulty of the inversion process, as well as giving an idea of what the error estimate will look like. When considering the ill-posedness of PAT inverse problem with attenuation, the forward operator is an integral operator, and it's hard to prove differentiability properties of the kernel.

In this talk, I will introduce the result of our spectrum analysis, which is divided into 3 parts. During my first DK talk I have introduced our result on the *strong attenuation* case, which is severely ill-posed. This time I will focus on the other case - called *Weak attenuation*, which can be shown to be mildly ill-posed. The idea to get the decay rates of spectrum has two main ingredients: one is a general result concerning the spectrum of integral operators with C^k kernel, and the other is that why our integral kernel has a continuous first-order derivative. I will also talk about the difficulties, and some other possible ideas, along with the proof.