

Stability estimates for a random inverse source problem

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We consider the inverse random source problem to determine the strength of a random acoustic sound source by correlation data generated from the observation of the pressure signal of the emitted time harmonic acoustic waves. This model can be applied to aeroacoustics where regularisation methods for the inverse source problem constitute the best approach to determine a sound source. After uniqueness has been recently proven for this problem, we now investigate the stability properties. This presentation hence contains as one of the main result a rigorous proof of a logarithmic stability estimate as well as logarithmic convergence rates for spectral regularisation methods applied to the inverse source problem. These two results are obtained by verifying a variational source condition by methods developed by Hohage and Weidling. Therefore, we establish stability estimates using geometrical optics solutions. In this talk we will present numerical experiments as well which suggest logarithmic convergence rates.

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