Shape Optimization using Wavelet BEM

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This talk is concerned with the numerical solution of shape optimization problems for linear elliptic boundary value problems. In particular, we treat shape problems from planar elasticity and electromagnetics.

The underlying state function satisfies a Poisson equation on the actual domain, the so-called state equation. For application of first and second order optimization algorithms the state function itself as well as its higher order normal and tangential derivatives must be computed.

The state equation has to be solved very often during the optimization process. Therefore, fast methods are indispensible for its solution. We use a boundary integral formulation which is solved by wavelet-based BEM-methods.