MATHEMATIKKOLLOQUIUM

Das Institut für Mathematik lädt zu folgendem Vortrag ein:

Liliana Borcea

Computational & Applied Mathematics, Rice University, USA

Edge illumination and imaging of extended reflectors

I will talk about an inverse scattering problem for the acoustic wave equation, where the goal is to image reflectors given measurements of echoes at a remote, finite aperture array of receivers. In such problems it is important to recover well the shape of the reflectors, and in particular to emphasize their edges. I will discuss how to use the singular value decomposition of the array response matrix, frequency by frequency, to image selectively the edges of extended reflectors in a homogeneous medium. I will present theory in the Fraunhofer diffraction regime, which explains that information about the edges is contained in the singular vectors for singular values that are intermediate between the large ones and zero. These transition singular vectors beamform selectively from the array onto the edges of the reflector cross-section facing the array, so that these edges are enhanced in imaging with travel time migration. I will also show numerical simulations that illustrate the behavior of our algorithms in an extended Fraunhofer regime, which is more appropriate for ultrasound applications.

Zeit: **Donnerstag, den 13. November 2008 um 17:15 Uhr**

Ort: **ICT-Gebäude, Technikerstraße 21a/2. Stock, Raum 3W04**

Otmar Scherzer

Gäste sind herzlich willkommen!