

Abstract of the dissertation:

**Stark gerichtete Audio-Beschallung
mit parametrischem Ultraschall-Lautsprecher**

Dirk Olszewski

A highly directional audible sound beam shall be generated in order to be targeted at selected individuals without disturbing others. For this purpose, miscellaneous conventional approaches are at first compared concerning their adequacy for directional audio. Because of their mostly insufficient results, a parametric ultrasound loudspeaker is used instead. The latter allows generating a highly directional audio sound beam by using a sound emitter whose dimensions are small compared to audio wavelengths. The ultrasound loudspeaker's functional principle and the according physical fundamentals are examined in detail. Based on the acquired knowledge, miscellaneous prototypes for different applications have been realized. These are presented and evaluated regarding the problem. Although inherent to its functional principle, the ultrasound loudspeaker's disadvantages compared to conventional systems have been sufficiently compensated. While applying the ultrasound loudspeaker fails within small distances due to miscellaneous reasons, it can be realized at sufficiently high distances, leading to satisfying results.