



ACOUSTIC ANALYSIS OF LOUDSPEAKERS CAVITY INCLUDING VISCOTHERMAL EFFECTS

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Presentation

Spring 2006

Report

will be published as
report TVSM-5142

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Background

The requirements on the mobile phones of today make it hard to predict their acoustic behaviour. The reason is that there are a lot of components that compete about the space, and the loudspeaker cavity often gets a very complex geometry with small ducts and narrow spaces. For these kinds of shapes the energy loss plays an important role in the acoustic behaviour, especially for the acoustic response close to the eigenfrequencies. The energy loss depends on the viscosity and the heat conduction. In commercial finite element programs these parameters cannot be treated in a satisfactory way

Purpose

The purpose of this master thesis is to make a physical evaluation of the sound pressure in small cavities of a mobile phone, considering the effects of viscosity and thermal conduction. The idea is to use acoustic and thermal elements in Calfem, and include the loss of energy by means of the Stokes-Navier equation and thermodynamic relationships. The results will be compared with simulations in ABACUS.



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