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On the prediction of absorption coefficient of porous materials
with Finite Elements

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The absorption coefficient gives the relation between incident and reflected sound power on a surface and is a measure for the damping properties of materials. Experimentally it can be investigated by using the impedance tube for perpendicular excitation and the echo chamber in the case of a diffuse sound field as is known.

To optimize the sound absorption properties of materials in the pre-prototype stage, numerical simulation can support the design of materials. A detailed finite element simulation based on Biot's Theory for poroelastic media is used to predict the absorption coefficient of materials with open-pored surfaces. Prospects and limits of this strategy are discussed.