

Two sound sources in implanted middle ear – numerical analysis

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Abstract: In this paper a lumped biomechanical model of the middle ear with an implant is presented. The model of healthy ear (without implant) is modified through a new element that represents an implant transducer. The transducer is a small electro-magnetic generator which stimulate the incus to improve hearing. However, sound approaching from surroundings to the tympanic membrane excites middle ear structure to motion, similarly like the transducer. An interaction between natural sound excitation and transducer stimuli can cause unexpected middle ear behaviour, That problem will be investigated in the paper. During numerical research different configurations of gains of both excitations will be tested. As a result, changes in implant settings can be modeled.

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