

**Congress „MikroSystemTechnik 2019”
28-30 October 2019, Berlin, Germany,**

Audio-Transducer for In-Ear-Applications based on CMOS-compatible electrostatic actuators

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<https://ieeexplore.ieee.org/abstract/document/9012783>

Abstract

Recently an innovative mSpeaker technology, based on a novel kind of CMOS compatible small gap electrostatic actuators for large deflection, has been introduced. In this paper, we devise methods to model such speakers in terms of lumped parameters using the deflection of the beam centre as sole dynamic variable. Optical, acoustical and finite element methods (FEM) are used to validate the non-linear lumped parameter model (LPM). The experimental evaluation and LPM simulations of the total harmonic distortion reveal deeper insights into the mechanisms governing linearity.