

# Numerical Simulation of Acoustic Properties of Porous Metals Under High Sound Pressure Level Conditions

B. Zhang<sup>1</sup>, X. Wang<sup>2</sup>, L. Ni<sup>2</sup>

<sup>1</sup>School of mechanical engineering, Ningxia University, China

<sup>2</sup>School of Mechanical Engineering, Ningxia University, China

## Abstract

The sound propagation and absorption properties in porous media under high sound pressure level conditions have been reported elsewhere. Also several analytical and semi-analytical solutions have been developed; however, these solutions are relatively complicated and the provided results are not accurate enough yet. In this work, the simulated results for the study of the sound absorption properties of porous metals under the high sound pressure level conditions are presented by using COMSOL Multi-physics to clearly explore the nonlinear coupling behaviors in sound field. While simulating, firstly, the amplitude of incidence wave is kept relatively low level, e.g. less than 90dB. Then, the amplitude of incidence wave are gradually raised from 90 to 170dB. In the simulation, a rough nonlinear coupling relation is accepted for simplicity. Finally, the simulated results for the sound fields and sound absorption properties are put forward to provide references for future works

## Figures used in the abstract

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**Figure 1**

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**Figure 2**

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**Figure 3**

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**Figure 4**