

The effective Equations for the Ultrasonic Response of Wet Cortical Bone

Mischa Blaszczyk¹, Robert Gilbert², and Klaus Hackl¹

¹Ruhr-University Bochum Faculty for Mechanical Engineering

²University of Delaware

November 23, 2020

Abstract

We outline the mathematical model of the ultrasonic response of wet cortical bone and its time harmonic formulation. We employ an energetic approach based on the Reuss-bound of the free energy of a porous material consisting of a piezo-electric solid and a conducting fluid part. Magnetic effects are taken into consideration. Corresponding boundary value problems are stated and associated theorems established. A conclusion is included concerning future developments of this formulation.

\keywords{wet bone, ultrasonic response, Maxwell equations}

Hosted file

Wet-Bone-November-2020.pdf available at <https://authorea.com/users/378166/articles/494711-the-effective-equations-for-the-ultrasonic-response-of-wet-cortical-bone>

Hosted file

Wet-Bone-November-2020.tex available at <https://authorea.com/users/378166/articles/494711-the-effective-equations-for-the-ultrasonic-response-of-wet-cortical-bone>

