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Ana Vasilic* (vasilic@math.udel.edu), 213 Ewing Hall, University of Delaware, Newark, DE 19711. *Homogenizing the Acoustics of Cancellous Bone.*

One of clinical methods of screening for osteoporosis and measuring bone density is ultrasound. Although ultrasound has been used to characterize the elastic properties of bone for some time, there is still a need for a better mathematical background for understanding and optimizing the use of this methodology. In this work, mathematical model describing the acoustic behavior of cancellous bone is presented. Bone is approximated by a porous material with periodic micro-structure. The solid part (bone trabeculae) is represented by a visco-elastic porous matrix while the blood-marrow mixture inside the pores is assumed to be a non-Newtonian shear thinning fluid. Using the method of 2-scale convergence, we obtain the equations describing the effective properties of bone capturing the effects of micro-scale. (Received August 26, 2008)