1093-35-341 **Philippe Guyenne*** (guyenne@math.udel.edu), 15 Orchard Rd, 501 Ewing Hall, Newark, DE 19716. *A viscoelastic model for ultrasound propagation in cancellous bone.*

A composite viscoelastic model for ultrasound propagation through cancellous bone in the time domain is proposed. More specifically, the trabecular matrix of cancellous bone is described as an isotropic viscoelastic material, while the interstitial fluid is modeled by Stokes flow. To simulate realistic bone samples with complicated microstructure, a representative volume element of cancellous bone is constructed by using a two-dimensional random distribution of fluid and solid particles. The system of equations is solved numerically by a staggered-grid finite-difference scheme. Motivated by laboratory experiments, ultrasound attenuation through cancellous bone is examined with the model, and comparison is made with homogenization results. This is joint work with Robert P. Gilbert and Jing Li (University of Delaware). (Received August 20, 2013)