

1056-74-650

Robert J Ronkese* (bob.ronkese@usma.edu), Dept of Mathematical Sciences, United State Military Academy, West Point, NY 10996. *2-D Biharmonic Equation for the Displacement of an Isotropic Kelvin-Voigt Viscoelastic Plate*. Preliminary report.

The plate and the rod are two geometric solids than can be used to model the trabeculae of bone. TRABUCHO and VIA NO in 1996 and FIGUEIREDO and TRABUCHO in 2004 have used the adaptive elastic rod to model the deposition and reabsorption, or remodeling, of trabecular bone. GILBERT and RONKESE in 2008 have formulated this for the case of the isotropic Kelvin-Voigt viscoelastic rod with numerical simulations of displacement and bone growth under loading. Recently, RONKESE has gone further to derive equations for a 2-D biharmonic equation for the displacement of an isotropic Kelvin-Voigt viscoelastic plate. Force balances involving the stress and strain tensors as well as a remodeling rate equation that depends on strain tensors will be presented. Asymptotic relationships due to the thinness of the plate will be included. (Received September 15, 2009)