Meeting: 1006, Lubbock, Texas, SS 16A, Special Session on Partial Differential Equation and its Application in Biomedical Study

1006-92-38 **Caroline Essex-Torcaso** (`essex@isrmail.isr.umd.edu`), Institute for Systems research, Unversity of Maryland, College Park, MD 21045, and **William S Levine*** (`wsl@eng.umd.edu`), Dept. of ECE, University of Maryland, College Park, MD 21045. *A Nonlinear Incompressible Elastic Mathematical Model of the Human Tongue.* Preliminary report.

A nonlinear mathematical model of the human tongue is described. The tongue model is based on a new mathematical model for mammalian striated muscle that generalizes the Hill-type models to include the dynamics of the muscle shape. This model is also developed in detail. Some applications of these models to simplified problems, including the pure shear due to muscle activation of a planar pinnate muscle, will be presented. Some simulation results from a simpler model of the tongue will also be shown, both for their intrinsic interest and to demonstrate that a nonlinear model is essential if realistic tongue motions are to be described. (Received January 19, 2005)