

**A UNIQUE IDENTIFIABILITY OF ELASTIC PARAMETERS
FROM TIME DEPENDENT INTERIOR DISPLACEMENT MEASUREMENT**

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We consider the question: What can be determined about the stiffness distribution in biological tissue from indirect measurements? This leads us to consider an inverse problem for the identification of coefficients in the second-order hyperbolic system that models the propagation of elastic waves. The measured data for our inverse problem is the time dependent interior vector displacement. In the isotropic case, we establish sufficient conditions for the unique identifiability of wave speeds and the simultaneous identifiability of both density and the Lamé parameters. In the anisotropic case, counterexamples are presented to exhibit the nonuniqueness and to show the structure of the set of shear tensors corresponding to the given data.