

Meeting: 1003, Atlanta, Georgia, SS 4A, AMS-SIAM Special Session on Theoretical and Computational Aspects of Inverse Problems, I

1003-34-372 **Tuncay Aktosun*** (aktosun@math.msstate.edu), Department of Mathematics and Statistics, Mississippi State University, Mississippi State, MS 39762. *Inverse scattering for vowel articulation with frequency-domain data.*

An inverse scattering problem is analyzed for vowel articulation in the human vocal tract. When a unit amplitude, monochromatic, sinusoidal volume velocity is sent from the glottis towards the lips, various types of scattering data are used to examine whether the cross sectional area of the vocal tract can uniquely be determined by each data set. Among the data sets considered are the absolute value of the pressure measured at a microphone placed at some distance from the lips, the pressure at the lips, and the transfer function from the glottis to the lips. In case of nonuniqueness, it is indicated what additional information may be used for the unique determination. (Received September 13, 2004)