

Mechanical Properties Evaluation of Biological Tissues by an Ultrasonic Method

Simona Lago^S, Rugiada Cuccaro^C, Chiara Musacchio and P. Alberto Giuliano Albo
INRiM, Thermodynamics Division, Turin, Italy
r.cuccaro@inrim.it

In recent times, metrological applications of ultrasonic techniques in the field of medical diagnostics, such as imaging analysis and densimetry, increased, mainly if used for the mechanical properties investigation of biological tissues. The main property of ultrasounds is to penetrate materials returning a signal complete with important information for the characterization of the structure of the sample under study. For example ultrasounds allow the measurement of the tissue elastic modulus, which can be an important indicator of pathologies. In this work the elastic properties of animal bones *in vitro* and of tissue-mimicking materials, obtained by an accurate measure of the acoustical wave sound speed, are presented. In fact the reported ultrasonic technique provides an excellent, non-destructive method to characterize the elastic stiffness of bones, providing useful support to the diagnostic analysis. Moreover, this ultrasound quantitative analysis offers a sound base to be a non-invasive method of acoustic evaluation of tissues by means of the longitudinal and transversal velocity measurement.