Acoustic waves propagating through irrotational current cause a travel time difference between the reciprocal transmission paths. When they propagate through turbulence, they are scattered and a part of the propagating acoustic wave energy becomes incoherent. The two acoustical principles lead to the two corresponding acoustic tomography methods for imaging current and turbulence. The acoustic cross-array tomography (ACT) experiment was conducted at the Kammon Strait on 17–20 March 2003. Eight ACT measurement units were distributed on both sides of the strait. Gold codes having a carrier frequency of 5.5 kHz were transmitted as source signals. The data obtained from the experiment were used in the travel time difference tomography for imaging the current field and in the incoherent acoustic intensity tomography for imaging turbulence in the strait water. The comparisons between the current fields and the turbulence fields reveal that the turbulence intensity is nearly proportional to the current strength. This indicates that the turbulence in the very shallow (roughly 11 m deep) strait water is generated within and may be transported outside the bottom boundary layer. [Work supported by ONR.]

Biomedical Ultrasound/Bioresponse to Vibration: Acoustic Bioeffects

Yuri A. Pishchalnikov, Chair
Department of Anatomy and Cell Biology, Indiana University, 635 Barnhill Drive, Indianapolis Indiana 46202-5126

Contributed Papers

8:00


New insights into the disease-altered properties of the heart may be provided through the study of genetically manipulated mice. To extend methods developed for studies of the hearts of patients to the hearts of mice, we report the observation of anisotropy of backscattered ultrasound in the parasternal short-axis view of normal mouse hearts, the cyclic variation of backscatter from the hypertrophic hearts of nine mice will be measured in order to clarify the mechanisms of altered ultrasonic scattering and attenuation of the disease-altered myocardium in the presence of myocardial anisotropy. [Work supported by NIH R37HL40302.]