

31st Annual John Cameron Lecture

Monday, April 30, 2018 4:00 p.m.

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Spatial Coherence in Medical Ultrasound:

Opportunities for Improved Imaging and Measurement

Modern diagnostic ultrasonic scanner beamformers allow access to and processing of echoes backscattered from tissue and received at individual elements in an imaging array. The spatial coherence of these echoes, as described by the van Cittert-Zernike, is currently neither measured nor utilized in image formation. The spatial coherence carries information on the focal properties of the transmitted pulse and also encodes information on the magnitude and sources of image degradation, such as multiple scattering, temporal noise, and off-axis scattering.

We present results from several ongoing studies utilizing spatial coherence. First, we describe a beamforming method based on measurement of the local spatial coherence and compare it to traditional delay-and-sum beamforming methods. Second, we describe an automated method to select imaging parameters, such as the transducer frequency, focus, and intensity, based on the spatial coherence. Finally, we present a method to characterize the dynamic stiffness of the heart using spatial coherence to trigger measurements.



1325 Health Science Learning Center (HSLC) 4:00 - 5:30 P.M.