CICLO DE SEMINARIOS 2013

SMAT-C Soft Matter Research and Technology Center

"Axial-Shear Strain Elastography: Progress and Prospects"

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Elastography is an imaging technique that applies a small, quasi-static, compression to detect stiffness variations within ultrasonically scanned tissues and create strain elastograms. The axial (along the direction of compression) strain elastograms have been well-established during the last fifteen years. There are now several commercial ultrasound systems available with Axial Strain elastography (ASE) software capabilities that are undergoing clinical evaluation and routine use.

However, when an inhomogeneous elastic material is subjected to a quasi-static uniaxial compression (as in elastography), shear strains are generated at and near the boundaries between the inhomogeneities and the embedding material. There is a paucity of literature regarding imaging shear strains and the information that shear strain elastograms may convey. In particular, we have focused on Axial-shear strain elastography, estimating and imaging the local axial-shear strain distributions resultant due to quasi-static compression. We have demonstrated in a series of publications in the past 6 years the technical feasibility of generating Axial-Shear Strain Elastograms (ASSEs) at clinically useful image quality.

Although most of the work to-date have been in breast lesion classification application, the practical ability to image the axial-shear strains at or near tumor boundaries *in vivo* at diagnostic ultrasound resolutions, gives rise to a novel contrast mechanism that may also find broader applications in various areas of medicine such as tumor detection, sensitive tumor boundary detection for ultrasonically-guided needle biopsy or High Intensity Focused Ultrasound (HIFU) treatments, cardiovascular muscle function, wound healing and vulnerable plaque characterization. Some initial results from HIFU treatment monitoring application and others will also be presented.

Jueves 18 JULIO 2013, 13:00 horas

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