

CFA '18 LE HAVRE ■ 23-27 avril 2018
14^{ème} Congrès Français d'Acoustique



Active and passive elastography: elastic waves for medicine

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Elastography, sometimes referred as seismology of the human body, is an imaging modality recently implemented on medical ultrasound systems. It allows to measure shear waves within soft tissues and gives a tomography reconstruction of the shear elasticity. This elasticity map is useful for early cancer detection. A general overview of this field is given in the first part of the presentation as well as latest developments. The second and last part is devoted to the application of noise correlation technique in the field of elastography. The idea, as in seismology, is to take advantage of shear waves naturally present in the human body due to muscles activities to construct shear elasticity map of the liver, the thyroid, the brain and the cornea. It is thus a passive elastography approach since no shear wave sources are used.