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Dual confocal ultrasound system for shear wave elastography

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A dual confocal transducer system for ultrasound-based elastography is presented. The system is intended to non-invasively measure the complex shear speed in cetacean head tissues, including brain, jaw fat, and melon. The system instrumentation features a pair of dual-element confocal ultrasound transducers, one of which is used to remotely generate low frequency (100-1000 Hz) shear waves in soft tissues via radiation force, and the other is used to measure the resulting shear wave displacements using Doppler techniques. One transducer is configured as an open ring into which the other transducer can be placed and translated. The relative positions of the transducers are mechanically manipulated in order to measure short-path propagation and estimate shear wave speed and loss. Work supported by ONR.