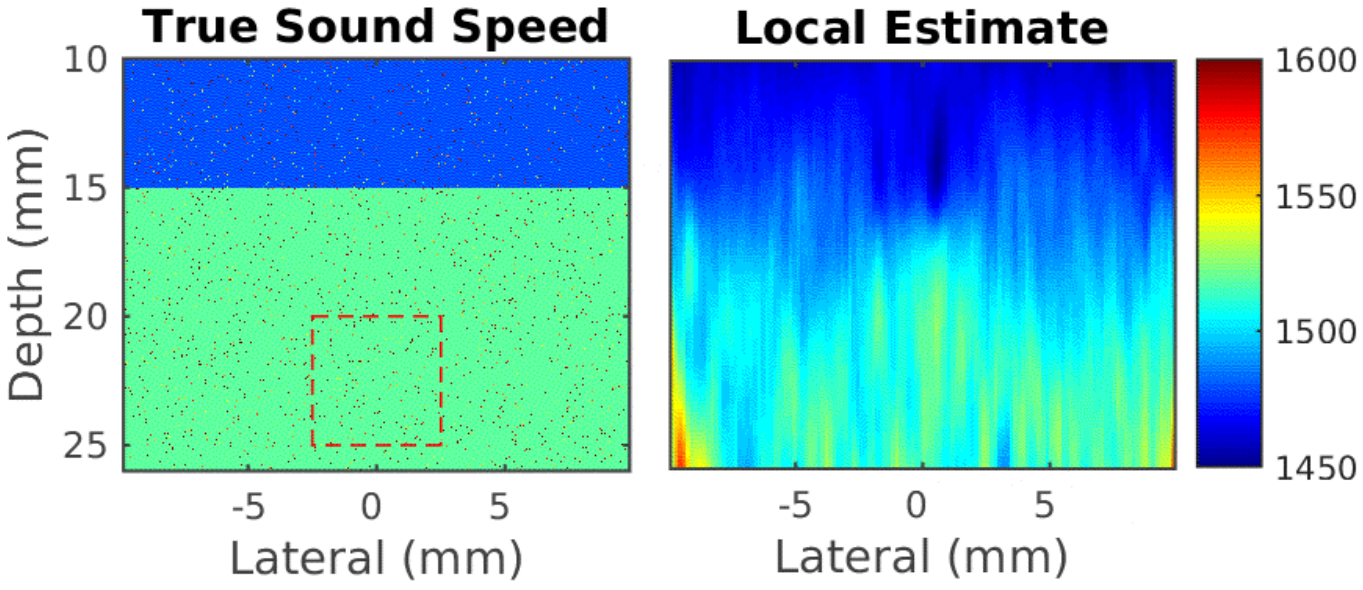
Docket #: S16-402

Quantifying Speed of Sound in Tissue for Medical Ultrasound

Stanford researchers developed an ultrasound method to estimate the local speed of sound of tissue, regardless of the tissue overlying the target location. The method uses existing pulse-echo transducer arrays and ultrasound hardware, and does not require any specialized equipment. It is also more accurate than existing estimators. Since the method provides a quantitative measure of speed of sound - a parameter that is often related to disease state - it may aid the diagnosing and assessing of non alcoholic fatty liver disease (NAFLD), nonalcoholic steatohepatitis (NASH), cancer, tumors, and inflammation.



Localized speed of sound estimation and quantification example

Stage of Research

Researchers have demonstrated the method reduces bias and variance compared to existing speed of sound estimation methods and systems.

Applications

- **Ultrasound imaging**
- **Quantitative assessment** of nonalcoholic fatty liver disease (NAFLD) and nonalcoholic steatohepatitis (NASH)
- **Quantitative assessment** of cancer and non-cancerous tumors, and inflammation

Advantages

- **Compatible with existing clinical ultrasound scanners** (e.g. pulse-echo ultrasound) and does not require custom-designed pulse sequences, such as synthetic aperture acquisition techniques.
- **More accurate** than current speed of sound estimation methods (approximately half the uncertainty in estimation)
- **Improves acoustic source localization** (i.e. of bubble cavitation in passive cavitation imaging)

Patents

- Published Application: 20180143165
- Issued: 11,397,167 (USA)

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