

Abstract Submitted
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Measurements of Ultrasound Backscatter Coefficient TIMOTHY STILES, Kettering University — Quantitative ultrasound imaging can produce images based on underlying physical properties of tissue. Of the various parameters that are available for imaging, the backscatter coefficient (BSC) has been of particular interest as it relates to tissue microstructure and may indicate the presence or progression of various conditions. Despite being a basic physical parameter of tissue, measurements of BSC remain difficult in practice. Interlaboratory comparisons have yielded results that vary by up to two orders of magnitude for identical samples of tissue-mimicking materials. This investigation seeks to characterize two possible reasons for such discrepancies: nonlinear propagation and errors arising from data reduction. BSC was measured for a tissue-mimicking material consisting of glass microspheres embedded in agar gel. Data were collected over a range of peak acoustic pressures and using a variety of data reduction and analysis schemes. Results indicate that data reduction methods yield comparable results and that BSC can depend dramatically on input pressure, with difference of an order of magnitude for results collected at pressures ranging from 0.15 to 1.5 MPa in water.

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