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A sound speed phantom for hybrid photoacoustic-ultrasound transmission tomography

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A composite test object comprising regions with different sound speeds was developed to evaluate the ultrasound-transmission tomography component of the PAM3 system. The system is capable of hybrid photoacoustic-ultrasound transmission tomography. The test object is made of various materials such as olive oil, copolymer-in-oil and water, and has values of sound speed as expected in breast. The object does not share any inner morphological likeness to the breast other than the outer shape. The different materials used were independently characterized using a reference method to measure speed of sound and acoustic attenuation. We discuss the fabrication, characterization and validation of the test object. We present the images acquired of the test object using the PAM3 system.

Authors: BOSMAN, Esther (University of Twente); Ms BULTHUIS, Rianne (University of Twente); Dr DE SANTI, Bruno (University of Twente); Dr LUCKA, Felix (Centrum Wiskunde & Informatica); Prof. MANOHAR, Srirang

Presenter: BOSMAN, Esther (University of Twente)

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