Fraunhofer IPMS

Demonstrator of Fraunhofer IPMS' ultrasound technology for medical applications

Next generation ultrasound imaging for medical applications

Medical ultrasound devices are already well established for imaging diagnostics in many medical disciplines. Fraunhofer IPMS is working on miniaturized micromachined ultrasound transducers (MUTs) that open up new avenues for medical diagnostics. For example, ultrasound-based diagnosis of middle ear infections and minimally invasive endoscopic ultrasound imaging. In this context, Fraunhofer IPMS has developed a demonstrator which showcases next-generation medical ultrasound imaging.

Demonstrator

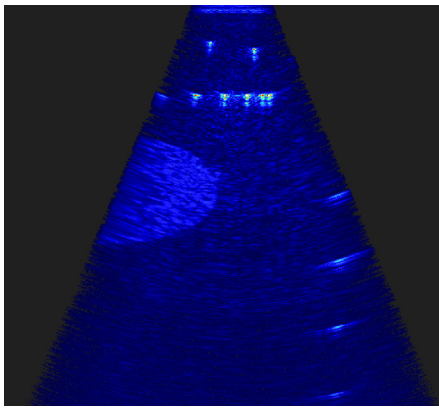
The demonstrator consists of a multi-channel ultrasound probe with capacitive micromachined ultrasound transducers (CMUTs) on a medical phantom representing the acoustic properties of a liver. Inside the phantom are thin nylon filaments with a size of 100 µm – a typical size of blood vessels.

When the probe is moved over the medical phantom, the imaging is displayed on an external screen. The goal is for our technology to provide significantly more compact and more energy efficient imaging systems with higher sensitivity compared to state-of-the-art.

Benefits

Fraunhofer IPMS' silicon-based technology enables the mass production of complex transducer arrays with high precision and at moderate cost. Additional benefits include:

- Efficient and reproducible batch fabrication
- Integration of digital and analog circuits (ASICs)
- Miniaturization for hand-held and point-of-care applications
- Arrays for 3D imaging
- Flexible, customer-specific design options
- Materials fully compliant with environmental standards (RoHS)



Imaging at a medical ultrasound phantom

Contact

Dr. Sandro Koch
+49 351 8823-239
sandro.koch@ipms.fraunhofer.de

Fraunhofer Institute for
Photonic Microsystems IPMS
Maria-Reiche-Str. 2
01109 Dresden
Germany

www.ipms.fraunhofer.de

Forschungsfabrik Mikroelektronik Deutschland

0821055DB_CS_Body-Phantom-Imaging_EN_2026-04