专业英语随堂作业一

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The authors who from Technical University of Munich and Institute of Biological and Medical Imaging, Helmholtz Zentrum Munich, Neuherberg in Germany , introduct an optomechanical ultrasound sensor which is sensitive, small, broadband and scalable in silicon photonics.

Next, I'll give you some background on this work. Ultrasonography and photoacoustic (optoacoustic) tomography recently have been complete progress in hardware and algorithms. However, current high-end systems still use a matrix of piezoelectric sensor elements, and new applications require sensors with high sensitivity, broadband detection, small size and scalability to a fine-pitch matrix.

Given this background, the authors demonstrate an ultrasound sensor in silicon photonic technology with extreme sensitivity owing to an innovative optomechanical waveguide. This waveguide has a tiny 15 nm air gap between two movable parts, which the authors fabricated using new CMOS-compatible processing. The 20 μm small sensor has a noise equivalent pressure below 1.3 mPa Hz −1/2 in the measured range of 3–30 MHz, dominated by acoustomechanical noise. This is two orders of magnitude better than for piezoelectric elements of an identical size4 . The demonstrated sensor matrix with on-chip photonic multiplexing 5–7 offers the prospect of miniaturized catheters that have sensor matrices interrogated using just a few optical fibres, unlike piezoelectric sensors that typically use an electrical connection for each element.

This letter presents an optomechanical ultrasound sensor (OMUS) on a silicon photonic chip.The rest of this paper introduces the concept of new OMUS and innovative split-rib waveguide.Then the authors introduces the functional principle of the OMUS.

After the experiment, the result shows that the presented sensor can enable new clinical and biomedical applications of ultrasonic and photoacoustic imaging.