

Intravascular forward-looking ultrasound probe using piezoelectric single crystal PMN-PT

In catheter treatment for vascular lesions such as atherosclerosis, imaging of the lesion will enable treatment secure (Fig.1). Ultrasound measurement is more appropriate than optical measurement because diffuse reflection of light by the blood cells will occur in the intravascular. We develop a forward-looking ultrasound imager able to 3-dimensional imaging of intravascular (Fig.2). We aim for diameter reduction (outer diameter 2.5mm), higher frequency (20MHz), and multi-element (24 elements) of the probe. We use a piezoelectric single crystal (PMN-PT). The device has a structure equipped with a backing material to the short pulse and to reduce vibration in the rear direction (Fig.3). We are using sandblasting, which can be processed into an arbitrary shape PMN-PT (Fig.4).

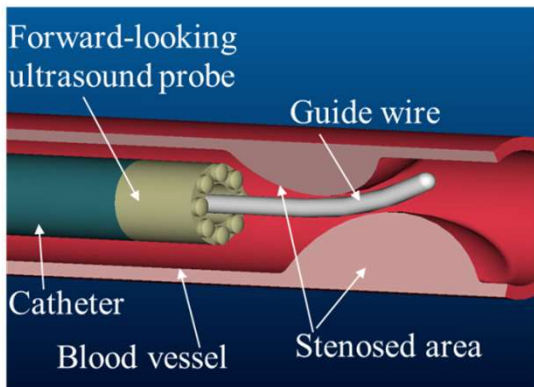


Fig.1 Forward-looking ultrasound probe

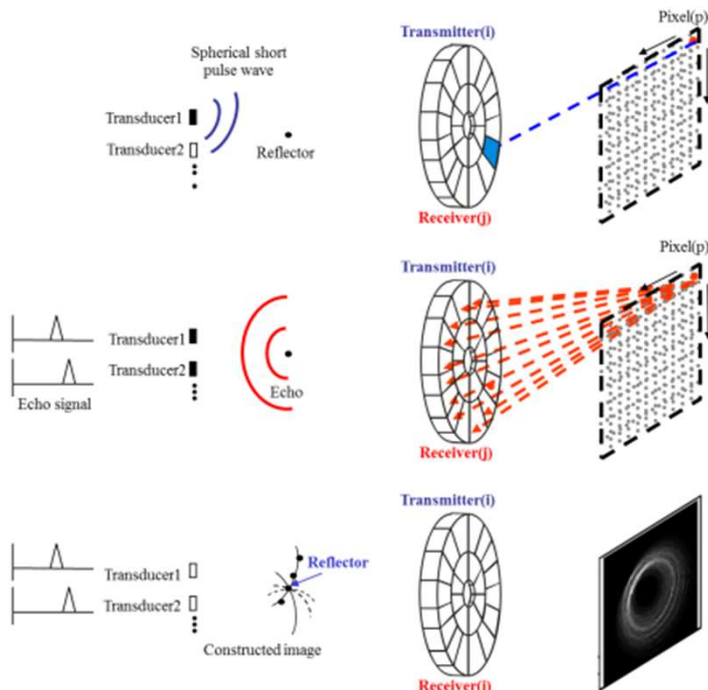


Fig.2 Principle of imaging

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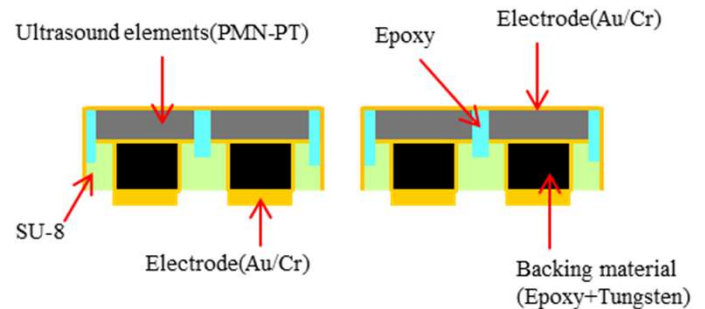


Fig.3 Sectional view of the ultrasound element

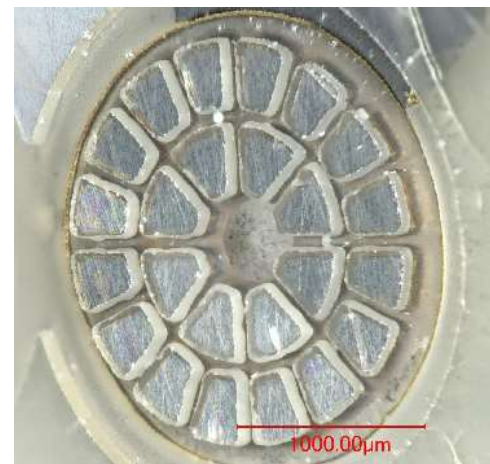


Fig.4 Sandblasting of PMN-PT

<Reference>

J.-J.Chen, R.Kashu, M.Esashi, Y. Haga,
“Forward-looking Intravascular Ultrasound
Probe Using PMN-PT Single Crystal,” The 4th
Asia Pacific Conf. on Transducers and
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