

Piezoelectric transducers sound based on bimorph elements

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Piezoelectric transducers are widely used in underwater acoustics, electroacoustics in ultrasound, medical and measuring equipment. The methods of improvement of descriptions of piezoelectric acoustic transducers are considered in this work [1]. To reduce the resonance frequency of the easiest way is to increase the size of piezoelectric element, however, this method has its limitations and technological constructive. Compound piezoelectric element with the metal plate with a piezoelectric element or piezoelectric element or other piezoelectric elements with two metal plate leads to a decrease of the flexural oscillations and by an order or increasing resonant frequencies. Reduce the resonant frequency for the symmetric bimorph element can be achieved if you move relative to one another piezoelectric elements (Fig. 1).



Fig. 1 – Symmetric bimorph element with a shift piezo elements (a) and the amplitude-frequency characteristics (b)

As can be seen from Fig. 1, the use of the bimorph piezoelectric element could substantially reduce the resonant frequency of the transducer[2].

1. Sharapov V. *Piezoceramic sensors* (Springer Verlag, 2011, 498 p.).
2. Sharapov V., Sotula Zh., Kunickaya L. *Piezo-Electric Electro-Acoustic Transducers* (Springer Verlag, 2014, 230 p.).