

一种MEMS同振柱型仿生矢量水听器的研制

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摘 要：

本文提出了一种结合MEMS技术和仿生原理、压阻原理的同振柱型矢量水听器，即由二维仿生水听器和声压水听器组合而成的柱体。在声学理论上详细介绍了该水听器的封装设计及制作过程，该矢量水听器在国防水声一级计量站进行了校准实验，实验结果表明：该同振型矢量水听器的工作频带范围为0-3KHz；X通道灵敏度-177.9dB（2KHz），Y通道灵敏度-175.4dB（2KHz），声压通道灵敏度-175.8dB（2KHz）；具有很好的“8”字指向性；可承受3MPa压力。此新型MEMS同振矢量水听器适用于民用船只避障，渔业捕捞，海洋勘探等领域。

关键词：MEMS;同振柱型；仿生；矢量水听器

Research of the MEMS Resonant-column TyPe Bionic Vector

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Abstract:

A Resonant-column TyPe Vector Hydrophone based on MEMS technology and bionic principle was presented in this paper, which consists of two-dimensional bionic hydrophone and pressure hydrophone. Based on acoustic theory, the design and manufacture of the vector hydrophone are detailed. In order to verify the function of the hydrophone, preliminary characterization tests of the hydrophone were performed. Results show that working frequency band of the Resonant-column Type Bionic Vector hydrophone is 0-3KHz; X-channel sensitivity is -177.9dB (2KHz), Y-channel sensitivity is -175.4dB (2KHz), pressure channel sensitivity is -175.8dB (2KHz); And also the Resonant-column Type Bionic Vector hydrophone not only possesses good “8” directional pattern but also can withstand 3MPa pressure. The application of this novel MEMS Resonant-column Type Bionic vector hydrophone is broad, from civil ships' evading bonds, fishery to hydrospace detection and so on.

Keywords: MEMS; Resonant-column TyPe; Bionic ; Vector Hydrophone

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