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# Experimental Study of Vibration of Prototype Auditory Membrane

Harto Tanujaya[1, a] and Satoyuki Kawano[2]

[1] Department of Mechanical Engineering,
Faculty of Engineering, Tarumanagara University, Jakarta - Indonesia

[2]Department of Mechanical Science and Bioengineering, Graduate School of Engineering Science, Osaka University, Osaka - Japan

[a]hart_tan18@yahoo.com, harto@tarumanagara.ac.id

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**Abstract.** This experiment report the vibration of Prototype Auditory Membrane (PAM) for a novel implantable auditory membrane. PAM made of PVDF which is fabricated using MEMS technology. The vibration are measured as a response of a pulse sine wave which are applied from one of side of the membrane. The vibrations are analyzed experimentally based on the Fourier analyze theory.

## Introduction

Ear is one of the five sense of human and part of auditory system. Ear is also one of the important organs of human for activity. It is not only to hear and receive a sound but also assist in balance and body positions.

Hearing is one of part the communication language to increase the skills of children and human to growth. Children can not make a communication with the other if they have some trouble with their hearing. There are many cause about hearing loss. The malfunction of the inner hairs cell is one of them [1][2]. The inner hair cells that are located inside the cochlea usually can not be repaired. Many researcher and company develop and research about cochlear implant to solve the problem. The problem of frequency selectivity is one of the important things in this case. Manufacturing of the device to realize of the selectivity which are related with cochlea have been reported. Kenji Tanaka et al. (1998) and Fang Yi Chen et al. (2006) report the results of fabricated a trapezoidal beam arrays which are fixed over a trapezoidal channel. The problem of their research about the mechanical strength of the beams structure is not strong enough. Robert D. White and Karl Grosh (2005) also make an experiment of the cochlear model using materials of silicon-nitride $Si_3N_4$ beams and compared with the biological materials. In this paper we discuss and analyze the behavior of the