

Accepted Manuscript

Title: A method of broadening the bandwidth by tuning the proof mass in a piezoelectric energy harvesting cantilever

Author: Kyuchang Moon Jungho Choe Hyunchang Kim
Dahoon Ahn Jaehwa Jeong



PII: S0924-4247(18)30135-3
DOI: <https://doi.org/doi:10.1016/j.sna.2018.04.004>
Reference: SNA 10717

To appear in: *Sensors and Actuators A*

Received date: 23-1-2018
Revised date: 26-3-2018
Accepted date: 6-4-2018

Please cite this article as: Kyuchang Moon, Jungho Choe, Hyunchang Kim, Dahoon Ahn, Jaehwa Jeong, A method of broadening the bandwidth by tuning the proof mass in a piezoelectric energy harvesting cantilever, *Sensors & Actuators: A. Physical* (2018), <https://doi.org/10.1016/j.sna.2018.04.004>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

A method of broadening the bandwidth by tuning the proof mass in a piezoelectric energy harvesting cantilever

Kyuchang Moon^a, Jungho Choe^a, Hyunchang Kim^b, Dahoon Ahn^c, Jaehwa Jeong^{a,*}

^a*Department of Control and Instrumentation Engineering, Korea University, South Korea*

^b*Department of Printed Electronics, Korea Institute of Machinery and Materials, South Korea*

^c*High-speed Railroad Systems Research Center, Korea Railroad Research Institute, South Korea*

Abstract

We propose and demonstrate a new method for broadening the bandwidth of a piezoelectric energy harvesting cantilever by tuning a proof mass. Our approach is to make the bandwidth broad by decreasing the difference between two consecutive flexural resonance frequencies of the cantilever. The prototype broadband energy harvesting device consists of a cantilever with double piezoelectric patch and a tuned proof mass, which is composed of two different materials: aluminium and brass. We tuned resonance frequencies of the device based on the optimal design framework. In order to prove the effectiveness of the proposed device, prototypes of two cantilevers, one with a tuned proof mass and the other with a conventional proof mass, were manufactured and the same bimorph cantilever were used in prototypes. Per-

*Corresponding author

Email address: jaehwa@korea.ac.kr (Jaehwa Jeong)

Download English Version:

<https://daneshyari.com/en/article/7133438>

Download Persian Version:

<https://daneshyari.com/article/7133438>

[Daneshyari.com](https://daneshyari.com)