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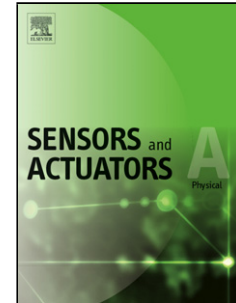
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Multi-mode Vibration based Electromagnetic type Micro Power Generator for Structural Health Monitoring of Bridges

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Revised Highlights

- 1. A multi-mode vibration based electromagnetic type micro power generator is developed**
- 2. A planar movable coil is used to increase the number of modes and to lowered the resonant frequencies**
- 3. The prototype is characterized for power output at its all four modes as well as in random vibration**
- 4. The comparison to the state of the art reveals that the developed prototype has the highest power density**

Abstract

This article presents the development of multi-mode vibration based electromagnetic type micro power generator (MPG). Along the stainless steel planar spring (SPS) and magnet assembly, a movable coil (MC) is a novel addition to the resonant frequencies of the device. The design with MCs on either side of the magnet provide higher power generation for the same footprint of the device at multiple modes. Computer numerical control (CNC) milling machine, wire-cut electric discharge machine (EDM) and 3D printer are used to fabricate the MCs, SPS and spacers respectively to yield a MPG with an overall volume of 29.03 cm³. The developed MPG is characterized to generate power at four different resonant frequencies below 100 Hz. At 3rd mode

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