

ABSTRACT

This research is about the design of flat springs or membranes used in microgenerator for Electrodynamics Vibration Energy Harvesting (EVEH) devices. EVEH devices are composed of thin membranes of Polydimethyl Siloxane (PDMS) as planar springs, coils, and Neodymium Ferit Boron (NdFeB) magnets. The device is specially designed with dimensions of 2,5 x 2,5 cm², expected to harvest low vibration energy from 30 Hz to hundreds of Hertz. Before fabrication process, the membrane was simulated using Comsol Multiphysics 4.3, the initial result of modeling the membrane used to fabrication reference to be made. Two types of membranes are made of square and circle type using molding technique and spin coating with different thickness. With thick variations of membranes and magnets as inertia mass will result in different resonance frequencies. The results showed that the molding and spin coating technique produced membranes with thickness of 0,1, 0,2, and 0,3 mm. For circular membrane type 10 mm diameter, 0.25 mm membrane thickness, 6.5 mm magnetic diameter, and 3 mm thick magnet can produce up to 81.4 mV.

Keywords: EVEH, resonance frequency, molding, PDMS, planar springs, spin coating.