

ABSTRACT

This research is about design and fabrication of planar spring based on Electrodynamic Vibration Energy Harvesting (EVEH) device. This device is consisted of two titanium membranes as planar spring with dimensions of 25 x 25 mm², coils using copper wire, and Neodymium Iron Boron (NdFeB) as source of magnet. For the first, the membrane is simulated using Finite Element Analysis (FEA) Comsol 4.3 to determine the eigenfrequency of the membrane. After that, the membrane is fabricated with laser cutting technique to form the pattern of the planar spring. The last step is the characterization of the device for comparing between the eigenfrequency obtained through simulation in FEA Comsol 4.3 and the eigenfrequency obtained through direct testing. Furthermore, the characterization is conducted to find the output voltage of the EVEH device. The output voltage of the devices are around 32-314 mV at 277-662 Hz. In general, eigenfrequency is inversely proportional to the output voltage. It can be concluded that titanium is a good material for spring.

Keywords : EVEH, electrodynamic, double planar spring, eigenfrequency, laser cutting.