

Abstract: Low cost electrostatic vibration energy harvesters based on negatively-charged polypropylene cellular films with a folded structure were designed in this study. Strips of such energy harvesters were excited by applying mechanical stress in length direction. A current in a terminating resistor was generated due to the capacitance variation of the samples. For a typical double-periodic folded-structure electrostatic vibration energy harvester sample whose effective length and width were 30 mm and 10 mm, respectively, the generated power across a matching resistor at a resonance frequency of 36 Hz amounts to 641  $\mu\text{W}$  for a seismic mass of 4 g and an acceleration of 1 g (g is the gravity of the Earth). Similar structures which were designed and fabricated in this study were also tested for energy harvesting and high output power in the order of a few hundred microwatt was gained. Following the presentation of a theoretical model allowing for the calculation of the power generated in a load resistance at the resonance frequency of the harvesters, experimental results are shown and compared to theoretical prediction. It turns out that the experiment results accord well with the theoretical predictions.