

Harvesting Energy Using Piezoelectrics Excited by Helmholtz Resonance

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Abstract

We present research on a new device for generating power from the wind that couples a piezoelectric element to a Helmholtz resonator. Our experiments have shown that such a resonator can generate up to 6 W/m^2 of available energy, and the energy density is expected to increase with device optimization. We envision that our resonators can be used as an alternative energy source for small and large-scale power needs, such as powering remote sensors, providing the energy needs of a single house, augmenting local energy needs by mounting them on the roofs of buildings in city environments, or using them in large arrays to enhance the power density of conventional wind farms.