

## Feasibility Study of the Quadcopter Propeller Vibrations for the Energy Production

**Authors :** Nneka Osuchukwu, Leonid Shpanin

**Abstract :** The concept of converting the kinetic energy of quadcopter propellers into electrical energy is considered in this contribution following the feasibility study of the propeller vibrations, theoretical energy conversion, and simulation techniques. Analysis of the propeller vibration performance is presented via graphical representation of calculated and simulated parameters, in order to demonstrate the possibility of recovering the harvested energy from the propeller vibrations of the quadcopter while the quadcopter is in operation. Consideration of using piezoelectric materials in such concept, converting the mechanical energy of the propeller into the electrical energy, is given. Photographic evidence of the propeller in operation is presented and discussed together with experimental results to validate the theoretical concept.

**Keywords :** energy harvesting, piezoelectric material, propeller vibration, unmanned aerial vehicle

**Conference Title :** ICMAE 2017 : International Conference on Mechanical and Aerospace Engineering

**Conference Location :** London, United Kingdom

**Conference Dates :** February 16-17, 2017