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Corresponding author: Taha Soleymani
e-mail of corresponding author: Tahasoleymani@yahoo.com
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Title

Energy harvesting from a rotary sandwich structure with magnetorheological core under aerodynamic pressure

Authors

Taha Soleymani ^{1*}

^{*} Corresponding author

¹ Kashan University, Kashan, Iran, Tahasoleymani@yahoo.com

Abstract

External voltage and power from a rotary sandwich structure subjected to aerodynamic pressure is studied in this paper. The core is a magnetorheological elastomer and a thin layer of piezoelectric is attached to face layers. The piezoaeroelastic equations of motion are obtained based on energy relations and Lagrange equations. The layerwise theory for writing the component of displacement is considered. Aerodynamic force is assumed accordance with. To solve the governing equations the assumed mode method is considered. Validity of obtained results is compared with literature. The effect of vital parameters of research on the external voltage and power is investigated. The results show that the number of blades, geometrical properties and magnetic field play a key role on the harvested energy from this structure. The results shown that presented approach in this paper has more advantages rather than previous approaches.

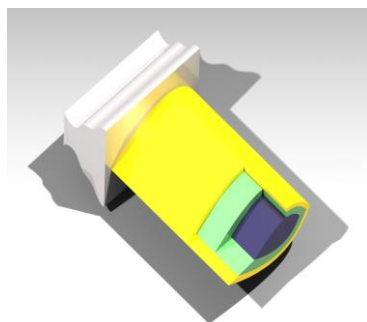


Fig. 1: Schematic description of presented energy harvester

References

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