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Reema Gupta, Lokesh Rana, Monika Tomar, Vinay Gupta

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Characterization of Lead Zirconium Titanate thin films based multifunctional energy harvesters

Reema Gupta[1], Lokesh Rana[1], Monika Tomar[2], and Vinay Gupta[1]*

[1]Department of Physics & Astrophysics, University of Delhi, Delhi-110007, India

[2]Physics Department, Miranda House, University of Delhi, Delhi-110007, India

*Corresponding email id: drguptavinay@gmail.com

Abstract: The present work focuses on the fabrication of Lead Zirconium Titanate (PZT) thin film based multifunctional energy harvester for power generation using mechanical vibrations and magnetic energy. To realize the harvesters, single phase PZT thin films are deposited using pulsed laser deposition (PLD) technique under different growth conditions on the surface of cantilevers of Ni metal (PZT/Ni). The harvester having optimized PZT thin film exhibits a relatively high value of induced voltage of 5.9 mV when subjected to mechanical vibrations of 1 g acceleration. The same system (PZT/Ni), results in an induced voltage of about 1.53 mV on application of 1.6×10^{-4} T Direct current (DC) magnetic field superimposed with 1×10^{-4} T alternating current (AC) magnetic field, confirming the development of a multifunctional energy harvester.

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