Magnetoelectric sensor for microtesla magnetic-fields based on (Fe80Co20)78Si12B10/PZT laminates

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Abstract: The magnetoelectric sensor based on (Fe80Co20)78Si12B10/PZT laminates is designed, fabricated and characterized for determining dc and ac magnetic-field strengths as well as field orientations. At low dc magnetic-fields, a ME-voltage response (dVME/dH) as high as 2 mV/Oe is achieved. The linear relation VME(hac) with a slope of dVME/dhac of 17 mV/Oe shows a great ability to self-powered detecting low ac magnetic-fields. The field orientation can be detected by using the sinusoidal dependence of the magnetoelectric voltage. The sensor is promising not only for microtesla magnetic-field sensing but also for magnetic biosensor applications.

Author Keywords: Magnetic sensor; Magnetoelectric; Magnetostrictive; Multiferroics; Piezoelectric

Year: 2009
Source title: Sensors and Actuators, A: Physical
Volume: 149
Issue: 2
Page : 229-232
Cited by: 3
Link: Scorpus Link
Document Type: Article
Source: Scopus

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