Geomagnetic sensor based on giant magnetoelectric effect

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Abstract: Here, the authors report a new type of geomagnetic field sensor based on the giant magnetoelectric effect in Metglas/piezoelectric-fiber laminates that are wrapped with a coil. These sensors can measure quite precisely the value of both the Earth's magnetic field and its inclination. The geomagnetic field sensor does not require a dc magnetic bias and is driven by a 10 mA ac. Highly sensitive dc magnetic field variations of less than 10-9 T and angular inclinations of ≤ 10-5 deg can be detected, potentially offering opportunities for a small global positioning device. © 2007 American Institute of Physics.

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