

Planar Hall bead array counter microchip with NiFe/IrMn bilayers

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Abstract: The planar Hall effect (PHE) magnetic bead array counter microchip integrating 24 of single sensors based on a simple NiFe/IrMn bilayer structure with a patterned size of $3 \times 3 \mu\text{m}^2$ has been fabricated and characterized. Single PHE sensors exhibit a sensitivity of about 2.5 m/Oe. It was well applied for single Dynabeads[®] M-280 detection, where one bead can induce a signal change, $\Delta V 2.2 \text{ mV}$, under the applied magnetic field of 20 Oe and a sensing current of 2 mA. This type of microchip is promising for quickly detecting and identifying multiple biological agents in the environment. © 2008 American Institute of Physics.

Index Keywords: Electric currents; Galvanomagnetic effects; Hall effect; Magnetic field effects; Magnetic fields; Sensor networks; Sensors; Applied magnetic fields; Bead array counters; Biological agents; Dynabeads; Magnetic beads; NiFe/IrMn bilayers; Planar Hall effects; Sensing currents; Signal changes; Single sensors; Integrated circuits

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