# Effect of spin-valve sensor magnetostatic fields on nanobead detection for biochip applications

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Abstract: Spin valves are being used in biochip applications via the detection of biomolecular recognition using magnetic nanoparticles as labels. The magnetic moment of the labels and the sensor response depend on the magnetic fields involved. A calculation based on an external magnetizing field, incorporating the contribution from the magnetostatic fields created by the free and pinned layers of the sensor and the field due to the sensing current, showed that these fields are important. Experimental detection signals of high particle numbers agree with the model, showing that reasonable detection signals are possible even in the absence of an external field. © 2005 American Institute of Physics.

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