

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Superparamagnetic bead assembly via biomolecular recognition and detection using micro Hall sensor¹ PRADEEP MANANDHAR, GORAN MIHAJLOVIC, STEPHEN VON MOLNAR, PENG XIONG, MARTECH & Department of Physics, Florida State University, KEITA OHTANI, HIDEO OHNO, Laboratory for Nanoelectronics and Spintronics, Tohoku University, MARK FIELD, GERARD J. SULLIVAN, Teledyne Scientific Company — Specific binding of biological molecules onto a selectively functionalized area is a necessary key step in biological sensing with a solid state device. Here we present our results on the directed self-assembly of streptavidin coated superparamagnetic micron and submicron sized beads onto selectively biotinylated solid-state surfaces with organic molecular templates. Large-scale high-yield assembly of 130nm streptavidin-coated beads onto biotinylated micro-patterns with little nonspecific binding is realized using molecular template generated by micro-contact printing. Specific binding of similar beads onto a semiconductor micro-Hall cross can be realized using high-spatial registry functionalization with dip-pen nanolithography, and the binding can be detected using phase sensitive Hall magnetometry with InAs quantum well micro-Hall sensors.²

¹Work supported by NSF NIRT grant ECS-0210332.

²G. Mihajlović et al., APL 87, 112502 (2005).

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Date submitted: 30 Nov 2006

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