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Optical Manipulation of Paramagnetic Particles with On-Chip Detection Using Spin Valve Sensors LENA WAI-YI LUI, National University of Singapore, KE BIN LI, Data Storage Institute, SEAN O'SHEA, Institute of Materials Research and Engineering, CHORNG-HAUR SOW, National University of Singapore — In this work, we present a new combinatory approach where an optical tweezers was used to trap and position a single super-paramagnetic particle over a Spin Valve sensor, with the particle then detected by the sensor. This approach is demonstrated using super-paramagnetic particles of $2 \mu\text{m}$ (Micromer[®]-M, Micro-mod) together with a Spin Valve sensor with dimensions of $2 \times 4 \mu\text{m}^2$ whereby a single magnetic particle was positioned over the sensor and a corresponding drop in the voltage across the sensor was detected. The results are explained using a simple model where the particle is treated as a pure dipole.

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