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Magnetic Switching In Permalloy Ellipses By Field Pulse[1] HYUK-JAE JANG, PETE EAMES, E. DAN DAHLBERG, Dept. of Physics, Univ. of Minnesota, DOUG STONE, Physics Dept., St. Olaf College — The switching behavior of patterned $Ni_{81}Fe_{19}$(permalloy) particles induced by a magnetic field pulse has been studied using magnetic force microscopy (MFM). Arrays of permalloy elliptical elements, 340 nm×130 nm with a thickness of 40 nm, were patterned directly onto a copper microstrip line. The magnetization of the ellipses was first saturated in one direction and then a pulsed magnetic field was applied along their hard axis with a constant bias field (348 Oe), which was lower than their switching field H_s ($\sim 0.85H_s$), along their easy axis. The switching probabilities $P(t)$ of the elements were measured repeating the process 100 times at room temperature with various durations and amplitudes of the field pulse. The ellipses showed quite different behaviors in $P(t)$ even though their static switching fields had a similar angular dependence. The data will be discussed in terms of a model for the thermally activated switching and the Stoner-Wohlfarth model.

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