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Transport Properties of Patterned Magnetic Tunnel Junctions Using Lift-Off Method

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Abstract

We develop a new process of fabricating MTJs which avoids the short circuit of the trilayers induced by the redeposit effect in etching process. The junction structures studied were prepared by UHV DC/RF magnetron sputtering. All MTJs have the same structure: Al (60)/Co50FE50 (25)/Al + oxidation (1.2)/Ni20Fe80 (3O)/A1 (60), with all thickness given in nanometers. The thickness of AlOx correspond to the effective barrier width determined by fitting I–V curve to Simmons Equation. The magnetization hysteresis (MH) loops are measured by a SQUID system at 298K. All MR measurements are taken at 180mV with 20×50 (μm2) junction areas.