

Abstract Submitted
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Self-Assembly and Tunneling Magneto Resistance of Magnetic Nanoparticle Superlattices¹ CHAITANYA LEKSHMI INDIRA, CONCETTA NOBILE, RAFFAELLA BOUNSANTI, ELIANA D'AMONE, DAVIDE COZZOLI, GIUSEPPE MARUCCIO, National Nanotechnology Laboratory, 73100 Lecce — Template assisted self-assembly of magnetic oxide nanostructures into systematically ordered superlattices in presence of magnetic field can offer controlled interfaces and useful properties for the fabrication of magnetically engineered tunnel junctions with application in high performance magnetic random access memories. In our work we employ magnetite, an important class of half-metallic material showing super paramagnetic behavior close to room temperature and valuable coercivity at low temperatures, as nanoparticles. The self-assembly of nanoparticle superlattices on metallic non-magnetic substrates is demonstrated. Further, enhanced spin-dependent electron transport and tunneling magneto resistance in devices with crossbar geometry is discussed.

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