

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Crystalline γ -Al₂O₃ barrier for magnetite-based Magnetic Tunnel Junctions ALEXANDRE M. BATAILLE, JEAN-BAPTISTE MOUSSY, SUSANA GOTA, MARIE-JO GUITTET, MARTINE GAUTIER-SOYER, DRECAM/SPCSI, CEA Saclay, 91191 Gif-sur-Yvette, France — Magnetite Fe₃O₄ is an interesting material for spintronics because it is expected to exhibit a very high spin polarization at room temperature. In this framework, we have developed an Oxygen Plasma Assisted Molecular Beam Epitaxy setup well suited to the growth of Fe₃O₄/Al₂O₃ bilayers. We have successfully grown highly insulating, 1.5 to 2 nm-thick crystalline γ -Al₂O₃ layers free of pinholes. The Fe₃O₄ layer is unaffected by the deposition of the Al₂O₃ barrier as evidenced by thorough magnetic, chemical and structural characterizations. These breakthroughs pave the way to all-oxide Fe₃O₄/Al₂O₃/Fe₃O₄ fully epitaxial magnetic tunnel junctions.

Alexandre M. Bataille

Date submitted: 30 Nov 2004

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