

**Structure and perpendicular magnetic anisotropy in Fe-Ni thin films**

Mario S. A. Filho, José Domingos Adirson, Waldemar A. A. Macedo  
*Serviço de Nanotecnologia, CDTN*

In this work we study the influence of concentration and preparation condition on the perpendicular magnetic anisotropy of  $Fe_xNi_{100-x}$  ( $13 < x < 70$ ) films grown on Si. The Fe-Ni films were deposited on Si(100) substrates at room temperature via DC sputtering. Fe-Ni targets with composition  $x = 13, 27, 42, 59,$  and  $70$  at. % were produced by compacting powders of iron and nickel, as confirmed by x-ray fluorescence. The films were prepared in a vacuum chamber with a base pressure better than  $5 \times 10^{-6}$  mbar, using an argon process pressure of  $1,8 \times 10^{-1}$  mbar and different sample to target distances. The film thicknesses varied from 10 to 110 nm. The composition and crystalline structure of the films were investigated by using x-ray fluorescence and x-ray diffraction. Structural and magnetic properties were investigated by  $^{57}Fe$  Conversion Electron Mössbauer at room temperature. Magneto-optical Kerr effect magnetometry was also applied. Our results show that optimizing the sample-to-target distance it is possible to obtain Fe-Ni films with almost perpendicular magnetic anisotropy for all the investigated concentration range. The structural and magnetic properties of the Fe-Ni films will be presented and discussed in details.

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