Giant magnetostriction in amorphous $(Tb_{1-x}Dy_x)(Fe_{0.45}Co_{0.55})_y$ films

Duc N.H., Mackay K., Betz J., Givord D.

Lab. de Magnetisme Louis N??el, CNRS, BP166, 38042 Grenoble Cedex 9, France; Cryogenic Laboratory, University of Hanoi, Viet Nam

Abstract: The magnetization and magnetostriction have been studied in amorphous $(Tb_{1-x}Dy_x)(Fe_{0.45}Co_{0.55})_y$ films. A well-defined easy axis is created by magnetic field annealing and the sperimagnetic cone structure, characteristic of these amorphous alloys, is reduced. The anisotropy has a minimum at x=0.73 as in the R Fe_2 Laves phase. This points to the similarity between the local environments in the amorphous and crystalline states. A giant magnetoelastic coupling coefficient b of 60 MPa is developed at 300 K in low applied field for x=0, optimally annealed films. Assuming a Young's modulus and a Poisson ratio of 80 GPa and 0.31, respectively, the magnetostriction is evaluated at $1020X10^{-6}$. This is much larger than previously reported values in other amorphous films. ?? 1996 American Institute of Physics.

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Correspondence Address: Mackay, K.; Lab. de Magnetisme Louis N??el, CNRS, BP166, 38042 Grenoble Cedex 9, France; email: ken@labs.polycnrs-gre.fr

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Authors with affiliations:

1. Duc, N.H., Lab. de Magnetisme Louis N??el, CNRS, BP166, 38042 Grenoble Cedex 9, France, Cryogenic Laboratory, University of Hanoi, Viet Nam
2. Mackay, K., Lab. de Magnetisme Louis N??el, CNRS, BP166, 38042 Grenoble Cedex 9, France
3. Betz, J., Lab. de Magnetisme Louis N??el, CNRS, BP166, 38042 Grenoble Cedex 9, France
4. Givord, D., Lab. de Magnetisme Louis N??el, CNRS, BP166, 38042 Grenoble Cedex 9, France

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