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

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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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- THe values given in Ref. 1 are for somewhat textured samples. Here we calculate bγ,2 for an isotropic polycrystalline sample of TbFe2, using single-crystal data. bγ,2=3Gλs, with 1/(2G) = 2/5sγ+3/5sε and λs=0.5λ111. E du Trémolet de Lacheisserie (private communication)Hansen, P., (1991) Ferromagnetic Materials, 6, p. 289. , edited by K. H. J. Buschow North-Holland, Amsterdam
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