

Combining large magnetostriction and large magnetostrictive susceptibility in TbFeCo/Y_xFe_{1-x} exchange-spring-type multilayers

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Abstract: The fabrication of magnetostrictive exchange-spring multilayers, in which the nanostructure was formed in the YFe softlayers by controlling the Y concentration was described. The method was applied to sputtered $\{\text{Tb}(\text{Fe}_{0.55}\text{Co}_{0.45})^{1.5}(\text{Y}_x\text{Fe}_{1-x})^0\}$ multilayers. It was found that the TbFeCo layers were in the amorphous state in the as-deposited samples while the microstructure of the Y_xFe_{1-x} layers was not the same. A crystalline state was also observed in pure Fe layers, while body-centered-cubic-Fe nanocrystals were found to coexist within an YFe amorphous matrix in Y_{0.1}Fe_{0.9} layers.

Index Keywords: Amorphous materials; High resolution electron microscopy; Magnetic couplings; Magnetostriction; Magnetron sputtering; Microactuators; Microsensors; Multilayers; Sputter deposition; Terbium compounds; Transition metal alloys; Giant magnetostriction; Magnetocrystalline anisotropy; Magnetostrictive susceptibility; Rare-earth magnetism; Magnetic susceptibility

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References:

- Clark, A.E., (1980) *Ferromagnetic Materials*, 1, p. 531. , edited by E. P. Wohlfarth (North-Holland, Amsterdam)
- Duc, N.H., (2002) *J. Magn. Magn. Mater.*, 242, p. 1411
- Duv, N.H., Brommer, P.E., (2002) *Handbook of Magnetic Materials*, 14, p. 89. , edited by K. H. J. Buschow (Elsevier Science, North-Holland, Amsterdam)
- Schatz, F., Hirscher, M., Schnell, M., Flik, G., Kronmüller, H., (1994) *J. Appl. Phys.*, 76, p. 5380
- Duc, N.H., Mackay, K., Betz, J., Givord, D., (1996) *J. Appl. Phys.*, 79, p. 973
- Dann, T.M., Duc, N.H., Thanh, H.N., Teillet, J., (2000) *J. Appl. Phys.*, 87, p. 7208
- Quandt, E., Ludwig, A., Betz, J., Mackay, K., Givord, D., (1997) *J. Appl. Phys.*, 81, p. 5420
- Ludwig, A., Quandt, E., (2000) *J. Appl. Phys.*, 87, p. 4691
- Givord, D., Betz, J., Mackay, K., Toussaint, J.C., Voiron, J., Wüchner, S.D., (2004) *J. Magn. Magn. Mater.*, 159, p. 71
- Duc, N.H., Giang, D.T.H., Thuc, V.N., Davoli, I., Richomme, F., (2004) *J. Magn. Magn. Mater.*, 272, pp. E1597
- Hansen, P., (1991) *Handbook of Magnetic Materials*, 6, p. 289. , edited by K. H. J. Buschow (Elsevier Science, North-Holland, Amsterdam)
- Duc, N.H., Giang, D.T.H., Thuc, V.N., Hong, N.T.M., Chau, N., (2003) *Physica B*, 327, p. 328
- De Lacheisserie, E.T., Gignoux, D., Schlenker, M., (2002) *Magnetism*, 2, p. 227. , Kluwer, Dordrecht