Novel exchange-spring configuration for excellent magnetic and magnetostrictive softness

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Abstract: Magnetization and magnetostriction data are reported for discontinuous type exchange-spring $Tb(Fe_{0.55}Co_{0.45})_{1.5}/(Y_{0.1}Fe_{0.9})$ multilayers, in which nanograins coexist with amorphous phase in soft YFe layers. This novel exchange-spring configuration exhibits an excellent magnetic and magnetostrictive softness: low magnetic coercivity (?0HC=1mT), large magnetostriction (???,2= 720??10-6) and large parallel magnetostrictive susceptibility ($??_{?||};=d?_{||}/d?_0H=29.\ 7??10^{-2}T^{-1}$). In addition, the observed phenomena of the negative contribution to magnetostriction, the formation of the extended domain wall at the interfaces and the exchange-bias are discussed. ?? 2004 Elsevier B.V. All rights reserved.

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