

Abstract Submitted
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Micromagnetic Simulation of Amorphous TbFeCo Thin Films with Self Exchange Bias.¹ CHUNG MA, XIAOPU LI, JIWEI LU, JOSEPH POON, Univ of Virginia — Amorphous ferrimagnetic TbFeCo thin films are found to exhibit self exchange bias effect near compensation temperature by magnetic hysteresis loop measurement. Atom probe tomography, scanning transmission electron microscopy, and energy dispersive spectroscopy mapping have revealed two nanoscale amorphous phases with different Tb concentrations distributed within the amorphous films. The observed exchange anisotropy originates from the exchange interaction between the two nanoscale amorphous phases. Here, we present a computational model of TbFeCo with two nanoscale amorphous phases using micromagnetic simulation. To obtain a structure similar to the two nanoscale amorphous phases, two kinds of cells with different Tb concentration are distributed within the simulated space. Each cell contains separated Tb and FeCo components, forming two antiferromagnetically coupled sublattices. Using this model, we show exchange bias effect near compensation temperature, in agreement with experimental results. The effect can be tuned by controlling the microstructure and composition.

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