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Experimental and Modeling Study of Thickness Dependence of Amorphous TbFeCo Compensation XIAOPU LI, CHUNG T. MA, University of Virginia, HOWARD SHENG, George Mason University, S. JOSEPH POON, University of Virginia, DEPARTMENT OF PHYSICS, UNIVERSITY OF VIRGINIA TEAM, DEPARTMENT OF PHYSICS AND ASTRONOMY, GEORGE MASON UNIVERSITY COLLABORATION — Amorphous TbFeCo thin films with strong perpendicular magnetic anisotropy are found to exhibit significant thickness-dependent ferrimagnetic compensation. The compensation temperature varies over 100 K for film thickness ranging from 15 to 100 nm. Amorphous structure with depth-dependent short-range order has been proposed to explain this thickness-dependence. A micromagnetic model has been built based on an ab-initio atomistic calculation by molecular dynamics of TbFe metallic glass. Micromagnetic simulation with Landau-Lifshitz-Bloch equation agrees quantitatively with the experimental results. Our study provides a way of tuning ferrimagnetic compensation through thickness control, which is useful for application of amorphous TbFeCo thin film in ultrafast spintronics.

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