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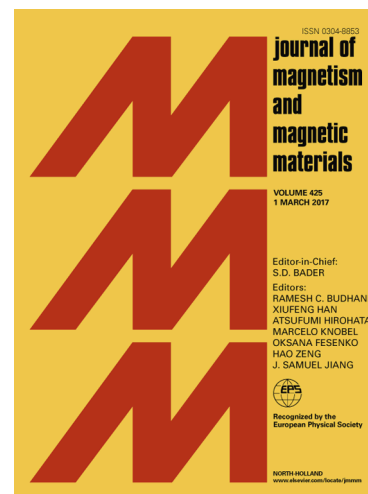
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Magnetically tunable bipolar switching of the exchange-bias field in Co_2TiO_4 A. Wei¹, S. Tao¹, Y. Fang^{1*}, Z. D. Han¹, B. Qian^{1*}, X. F. Jiang¹, H. Zhou², R. J. Tang², and D. H.Wang³

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Abstract

Coupling at the interfaces between antiferromagnetic and ferromagnetic constituents is known to be responsible for the exchange-bias effect, where external stimulus like temperature, electric or magnetic fields are supposed to influence the associated phenomenology. In this paper, we prepare the polycrystalline Co_2TiO_4 and investigate its temperature- and field-dependent magnetization, from which an unusual exchange-bias effect associated with magnetic reversals is extracted. At low temperature, a continuous crossover from negative to positive exchange-bias fields can be obtained with increment of the cooling magnetic field, showing a magnetically tunable effect. The bipolar switching of exchange-bias field in this compound depends on the relative orientation between Co^{2+} and $[\text{Co}^{3+}\text{Ti}^{3+}]$ magnetic moments.

Keywords: Spinel; Ferrimagnetic; Spin-flip; Exchange bias*Corresponding author E-mail: fangyong@cslg.cn (Y. Fang) and njqb@cslg.cn (B. Qian)

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