



Comment on “Cluster glass induced exchange biaslike effect in the perovskite cobaltites” [Appl. Phys. Lett.90, 162515 (2007)]

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Citation: [Applied Physics Letters](#) **93**, 176101 (2008); doi: 10.1063/1.3009550

View online: <http://dx.doi.org/10.1063/1.3009550>

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Comment on “Cluster glass induced exchange biaslike effect in the perovskite cobaltites” [Appl. Phys. Lett. 90, 162515 (2007)]

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(Received 25 August 2008; accepted 8 October 2008; published online 29 October 2008)

[DOI: [10.1063/1.3009550](https://doi.org/10.1063/1.3009550)]

Recently, Luo and Wang¹ reported that magnetization hysteresis loops of bulk Ba-doped LaCoO₃ shifted both along the field and the magnetization axes. As previously commented^{2,3} the shift away from the zero-field axis, which is the most known manifestation of the exchange bias effect,^{4–6} is estimated from a loop of a magnetically saturated system. In the letter of Luo and Wang,¹ however, one reads that magnetic fields as high as 100 kOe are still not sufficient to saturate the samples at low temperatures (see also their Fig. 4) and it is clearly seen in Fig. 2 that the loop traced using the maximum measurement field of 3 kOe is not closed. Ignoring these facts, the authors attributed the shifts to exchange bias effect due to freezing properties of local anisotropy in a cluster glass system.

Actually, since both shifts have been extracted from minor (nonsaturated) hysteresis loops, one cannot affirm that the displacement from the origin evidences exchange bias manifestation. Minor loops traced after saturation are naturally displaced along both the field and magnetization axes. Figure 4 in the letter commented here is a typical example of a sequence of minor hysteresis loops. Detailed discussion on this subject can be found in Ref. 3.

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One notes that the letter of Luo and Wang¹ refers to a work of Pi *et al.*⁷ on SrRuO₃ where similar “exchange biaslike” behavior has been reported. In a subsequent erratum,⁸ however, Pi *et al.*⁷ admitted that it is incorrect to associate the observed shifts with exchange bias, the reason being the nonsaturation of their samples. Apparently, this erratum has remained unnoticed by Luo and Wang.¹

In summary, the present comment asserts that the work of Luo and Wang¹ does not provide sufficient proofs that the measured displacements along the field and the magnetization axes are manifestations of the exchange bias effect in their bulk Ba-doped LaCoO₃. All observed characteristics are consistent with the typical behavior of minor hysteresis loops.

This work was supported by CNPq, Brazil.

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