Erratum: Circularly Polarized X Rays as a Probe of Noncollinear Magnetic Order in Multiferroic $TbMnO_3$ [Phys. Rev. Lett. 102, 237205 (2009)]

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The electric polarization **P** in Fig. 1(c) and electric field in Fig. 2(a) should be reversed. In Fig. 2(a), the $+/-$ sign in violet (online) about the sample indicates correctly the electric potential. The cycloid drawn as "domain 1" in Fig. 1(c) is associated to an electric polarization **P** directed towards $-\mathbf{c}$, while for "domain 2" it is towards $+\mathbf{c}$, opposite to what is shown in the drawing. Throughout the whole article, $\mathbf{E} > 0$ ($\mathbf{E} < 0$) should be understood as the field **E** towards $-\mathbf{c}$ ($+\mathbf{c}$). With this definition, the sentence 15 lines from the bottom of first column p. 4 is kept unchanged: "We conclude that cooling in a positive electric field led to ... transverse spiral of the Mn atoms is anticlockwise ..." In the third paragraph of the second column p. 3, the third sentence should be amended as "Consider one Mn ... along $\pm\mathbf{c}$ (sign determined according to the direction *opposite* to the electric polarization)." With this reversal of the electric polarization, our result agrees with the erratum [1] published after Ref. [17].

The magnetic structure factor was calculated along the formulas given by Blume and Gibbs, Ref. [22]. They use a scattering vector as $\mathbf{q} = \mathbf{k} - \mathbf{k}'$ and a sign of imaginaries such that the waves are as $\exp(-i\omega t)$. We consistently used the same wave form for the light. In the Letter presentation instead, we name the peaks according to the crystallographer's convention $\mathbf{q} = \mathbf{k}' - \mathbf{k}$. Using the vector $\mathbf{A}''$ from Ref. [22], we observed that its definition at the top of p. 1781 is erroneous. Instead, we used its definition Eq. (4a), which we checked and found to be correct.

[1] Y. Yamasaki, H. Sagayama, T. Goto, M. Matsuura, K. Hirota, T. Arima, and Y. Tokura, Phys. Rev. Lett. **100**, 219902(E) (2008).

