

Correction

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## Erratum: Varied domain structures in $0.7\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ - $0.3\text{PbTiO}_3$ single crystals

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The authors want to make the following corrections to this paper<sup>[1]</sup>.

After carefully rechecking the orientation of the sample, it has been discovered that the sample used in this experiment is (001) oriented rather than the previously stated (100) oriented.

Therefore, the y axis in the coordinate system of [Figure 1](#), [Figure 2](#), and [Figure 3](#) should be  $[\bar{1}00]$  instead of [001]. The corrected figures are shown below:

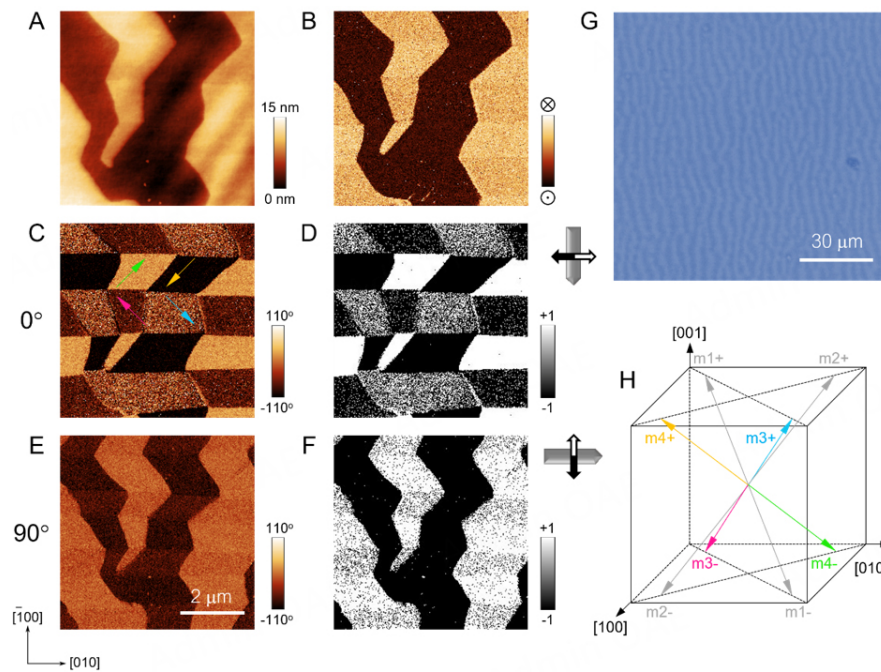
All the corresponding corrections are summarized below in the main text:

Original text: PMN-30PT single crystals with (100) orientation were obtained from MTI Corporation, China.

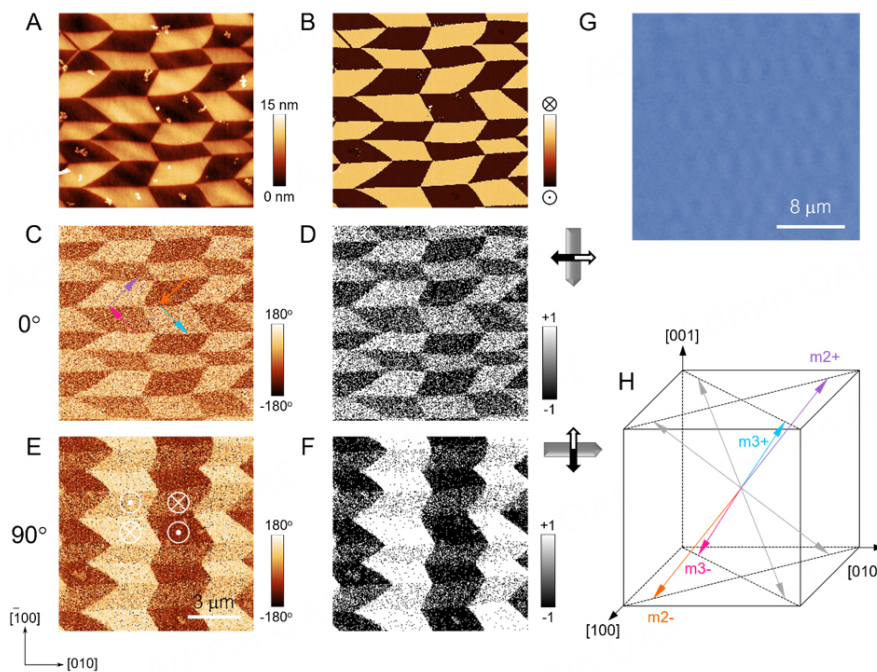


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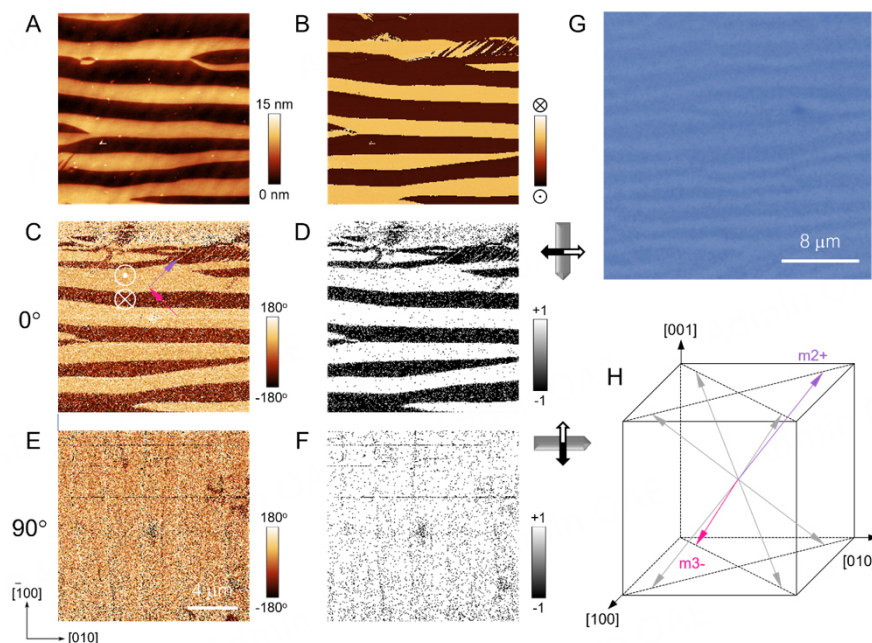




**Figure 1.** Type 1 domain structure. (A) Topography of type 1 domain structure. (B) The corresponding OOP phase signal. (C) IP phase signal measured at a tip-sample orientation of 0. The IP polarization variants are denoted on each domain. (D) The binarized version of (C). (E) IP phase signal measured at a tip-sample orientation of 90. (F) The binarized version of (E). (G) The optical image of type 1 domain. (H) The reconstructed three-dimensional polarization vectors for type 1 domain.



**Figure 2.** Type 2 domain structure. (A) Topography of type 2 domain structure. (B) The corresponding OOP phase signal. (C) IP phase signal measured at a tip-sample orientation of 0. The IP polarization variants are denoted on each domain. (D) The binarized version of (C). (E) IP phase signal measured at a tip-sample orientation of 90. (F) The binarized version of (E). (G) The optical image of type 2 domain. (H) The reconstructed three-dimensional polarization vectors for type 2 domain.



**Figure 3.** Type 3 domain structure. (A) Topography of type 3 domain structure. (B) The corresponding OOP phase signal. (C) IP phase signal measured at a tip-sample orientation of 0. The IP polarization variants are denoted on each domain. (D) The binarized version of (C). (E) IP phase signal measured at a tip-sample orientation of 90. (F) The binarized version of (E). (G) The optical image of type 3 domain. (H) The reconstructed three-dimensional polarization vectors for type 3 domain.

Revised text: PMN-30PT single crystals with (001) orientation were obtained from MTI Corporation, China.

Original text: A twofold and a threefold peak splitting were observed around 301 and 311 reflections, respectively, confirming a monoclinic A ( $M_A$ ) structure [Supplementary Figure 1]<sup>[2,3]</sup>.

Revised text: A twofold and a threefold peak splitting were observed around 103 and 113 reflections, respectively, confirming a monoclinic A ( $M_A$ ) structure [Supplementary Figure 1].

Original text: By combining the two IP directions as denoted in Figure 1D and F, the polarization vectors for each domain can be established in this (100) oriented  $M_A$  PMN-PT sample.

Revised text: By combining the two IP directions as denoted in Figure 1D and F, the polarization vectors for each domain can be established in this (001) oriented  $M_A$  PMN-PT sample.

Original text: The domain structure shows a  $4M_A$  domain configuration with non-charged head-to-tail  $71^\circ$  domain walls ( $m_{1+}$  and  $m_{2+}$ ,  $m_{1-}$  and  $m_{2-}$ ) and  $180^\circ$  domain walls ( $m_{2+}$  and  $m_{2-}$ ,  $m_{1+}$  and  $m_{1-}$ ), which can be seen from the reconstructed four polarization vectors shown in Figure 1H.

Revised text: The domain structure shows a  $4M_A$  domain configuration with non-charged head-to-tail  $71^\circ$  domain walls ( $m_{3+}$  and  $m_{4+}$ ,  $m_{3-}$  and  $m_{4-}$ ) and  $180^\circ$  domain walls ( $m_{4+}$  and  $m_{4-}$ ,  $m_{3+}$  and  $m_{3-}$ ), which can be seen from the reconstructed four polarization vectors shown in Figure 1H.

Original text: Compared to the type I domain structure,  $71^\circ$  domains are non-existent, but  $109^\circ$  domain walls emerge ( $m_{1+}$  and  $m_{3+}$ ,  $m_{1-}$  and  $m_{3-}$ ) in addition to the  $180^\circ$  domain walls that are present in both type 1 and type 2 domain structures.

Revised text: Compared to the type I domain structure,  $71^\circ$  domains are non-existent, but  $109^\circ$  domain walls emerge ( $m_{2+}$  and  $m_{3-}$ ,  $m_{3+}$  and  $m_{2-}$ ) in addition to the  $180^\circ$  domain walls that are present in both type 1 and type 2 domain structures.

Original text: The reconstructed polarization vectors with only two allowed directions, sharing the same  $m_{1+}$  and  $m_{3+}$  variants as compared to the type 2 domain, are shown in the schematic in [Figure 3H](#).

Revised text: The reconstructed polarization vectors with only two allowed directions, sharing the same  $m_{2+}$  and  $m_{3-}$  variants as compared to the type 2 domain, are shown in the schematic in [Figure 3H](#).

Original text: The divergence is likely due to the different polarization variants in type 1,  $m_1$  and  $m_2$ , in contrast to  $m_1$  and  $m_3$  in type 2 and 3 domain structures. The resultant vectors  $m_{1+}$  and  $m_{2+}$  or  $m_{1-}$  and  $m_{2-}$  are closer to the OOP direction of the electric field along the  $[100]$  directions than  $m_1$  and  $m_3$  pairs, which allows the electrical switching at a lower voltage.

Revised text: The divergence is likely due to the different polarization variants in type 1,  $m_3$  and  $m_4$ , in contrast to  $m_2$  and  $m_3$  in type 2 and 3 domain structures. The resultant vectors  $m_{3+}$  and  $m_{4+}$  or  $m_{3-}$  and  $m_{4-}$  are closer to the OOP direction of the electric field along the  $[001]$  directions than  $m_2$  and  $m_3$  pairs, which allows the electrical switching at a lower voltage.

[Supplementary Figures 3 and 5-7](#) are also corrected for the sample orientations.

The authors confirm that the scientific conclusions are unaffected. The original publication has also been updated.

## REFERENCES

1. Zhang D, Wang L, Li L, Sharma P, Seidel J. Varied domain structures in  $0.7\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ - $0.3\text{PbTiO}_3$  single crystals. *Microstructures* 2023;3:2023046. [DOI](#)
2. Liu HJ, Chen HJ, Liang WI, et al. Structural study in highly compressed  $\text{BiFeO}_3$  epitaxial thin films on  $\text{YAlO}_3$ . *J Appl Phys* 2012;112:052002. [DOI](#)
3. Christen HM, Nam JH, Kim HS, Hatt AJ, Spaldin NA. Stress-induced  $R$ - $M_A$ - $M_C$ - $T$  symmetry changes in  $\text{BiFeO}_3$  films. *Phys Rev B* 2011;83:144107. [DOI](#)