

Electronic properties at domain walls in multiferroic BiFeO₃

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The multiferroic materials have attracted a great attention, owing to different properties in manifestation. BiFeO₃ (BFO) has unique ferroelectric and antiferromagnetic properties in the room temperature. The domains and domain walls are produced since ferroelectric polarization variants in BFO. Recently, the electronic conductivity at ferroelectric domain walls of the oxide BFO multiferroics has been successfully demonstrated in the room-temperature.¹ In the work, by cross-sectional scanning tunneling microscopy, a combination of scanning tunneling spectroscopy and analysis of the ferroelectric domain walls on electronic structures demonstrates that domain walls in the oxide BiFeO₃ multiferroics reveals a significant decrease in the band gap.

Ref:

1. J. Seidel and et al., “ Conducting domain walls in oxide multiferroics ” , Nature Mater. 8, 229 (2009).