

Abstract Submitted
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**Conduction at domain walls in insulating
 $\text{Pb}(\text{Zr}_{0.2}\text{Ti}_{0.8})\text{O}_3$ thin films**

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versity of Geneva — Ferroic domain walls are intrinsically nanoscale and
often present functional properties beyond those of their parent material.
One of the most striking examples is the recent discovery of electrical
conduction¹ at domain walls in multiferroic BiFeO_3 . Different scenarios
have been proposed to explain the observed conduction, generally relat-
ing it to the complex nature of domain walls specific to BiFeO_3 .² Here,
we report on scanning probe microscopy studies of domain-wall-specific
conduction in thin films of tetragonal ferroelectric (PZT). Our measure-
ments show nonlinear asymmetric current-voltage characteristics with
strong thermal activation at $T > 150$ K. Moreover, the average cur-
rent signals remain stable over the duration of measurement (up to four
days). In light of recent transmission electron microscopy measurements
at 180° domain walls in PZT,³ we discuss the possible conduction mech-
anisms, highlighting the role of electrode asymmetry and microscopic
domain wall structure promoting local defect segregation.

¹Seidel et al., Nat. Mat. **8**, 229 (2009)

²Lubk et al., PRB **80**, 104110 (2009); Chiu et al., Adv. Mat. **23**, 1530
(2011); Farokhipoor et al., PRL **107**, 127601 (2011)

³Jia et al., Sci. **331**, 1420 (2011)

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