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Institute of Applied Physics

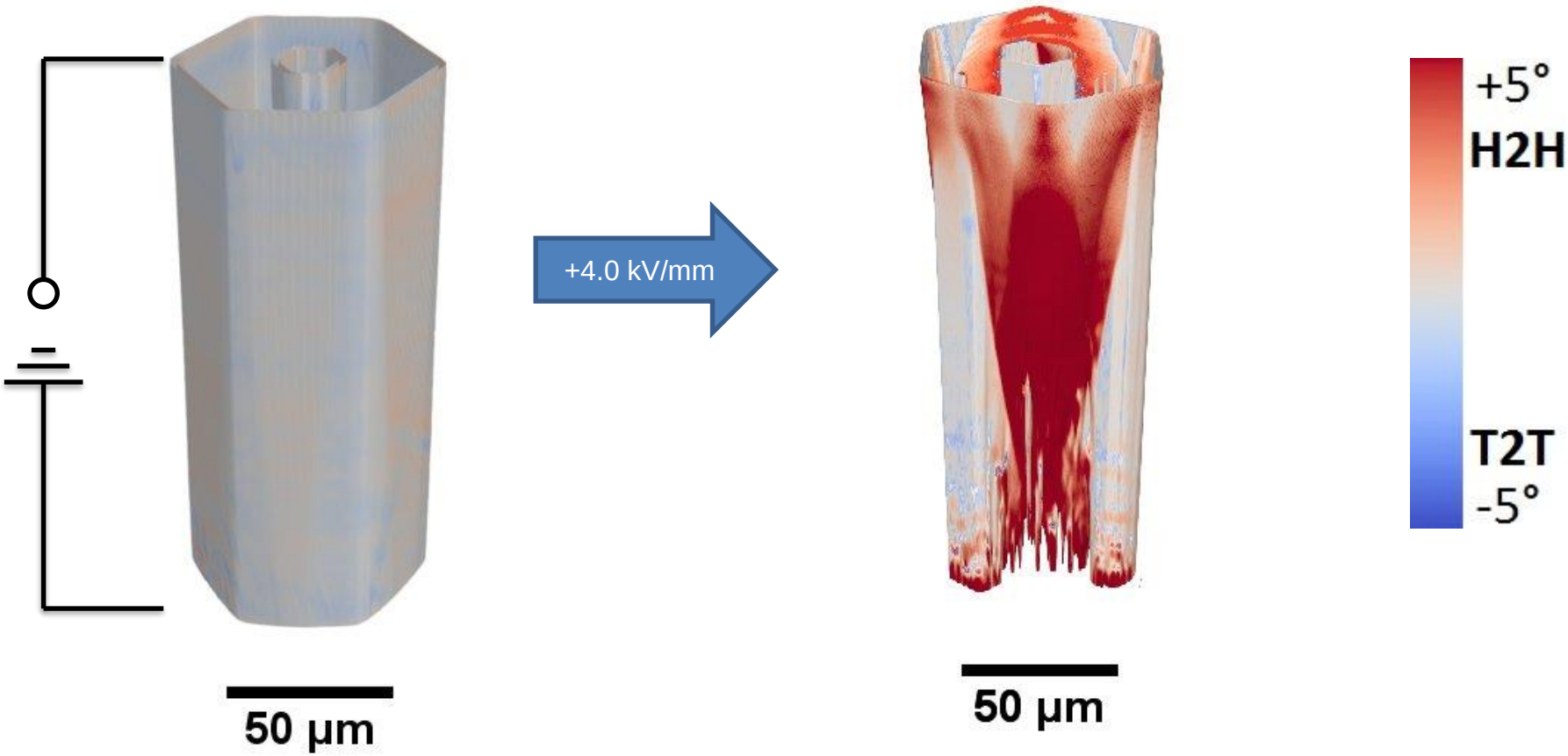
Supporting Information

Real-Time 3D-Imaging of Nanoscale Ferroelectric Domain Wall Dynamics in Lithium Niobate Single Crystals under Electric Stimuli: Implications for Domain-Wall-Based Nanoelectronic Devices

Benjamin Kirbus[1,*], Christian Godau[1], Lukas Wehmeier[1], Henrik Beccard[1], Elke Beyreuther[1], Alexander Haußmann[1] and Lukas M. Eng[1]

* benjamin.kirbus@tu-dresden.de
[1] Institute of Applied Physics, Technical University Dresden, 01062 Dresden, Germany

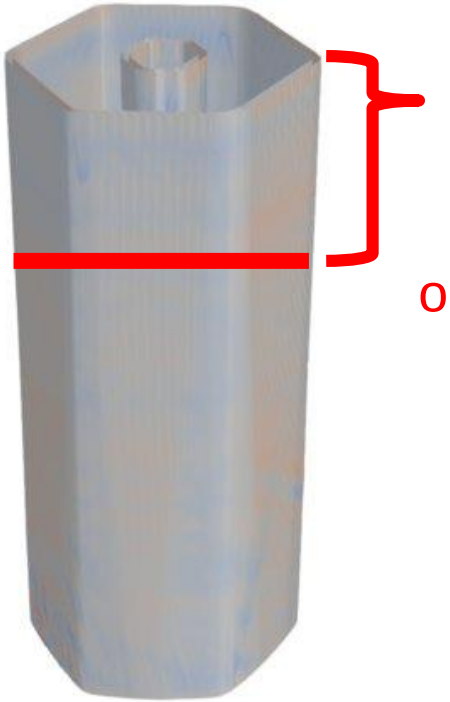
Application of a positive electric field



S1

- Adopted from **Fig. 2 a)**

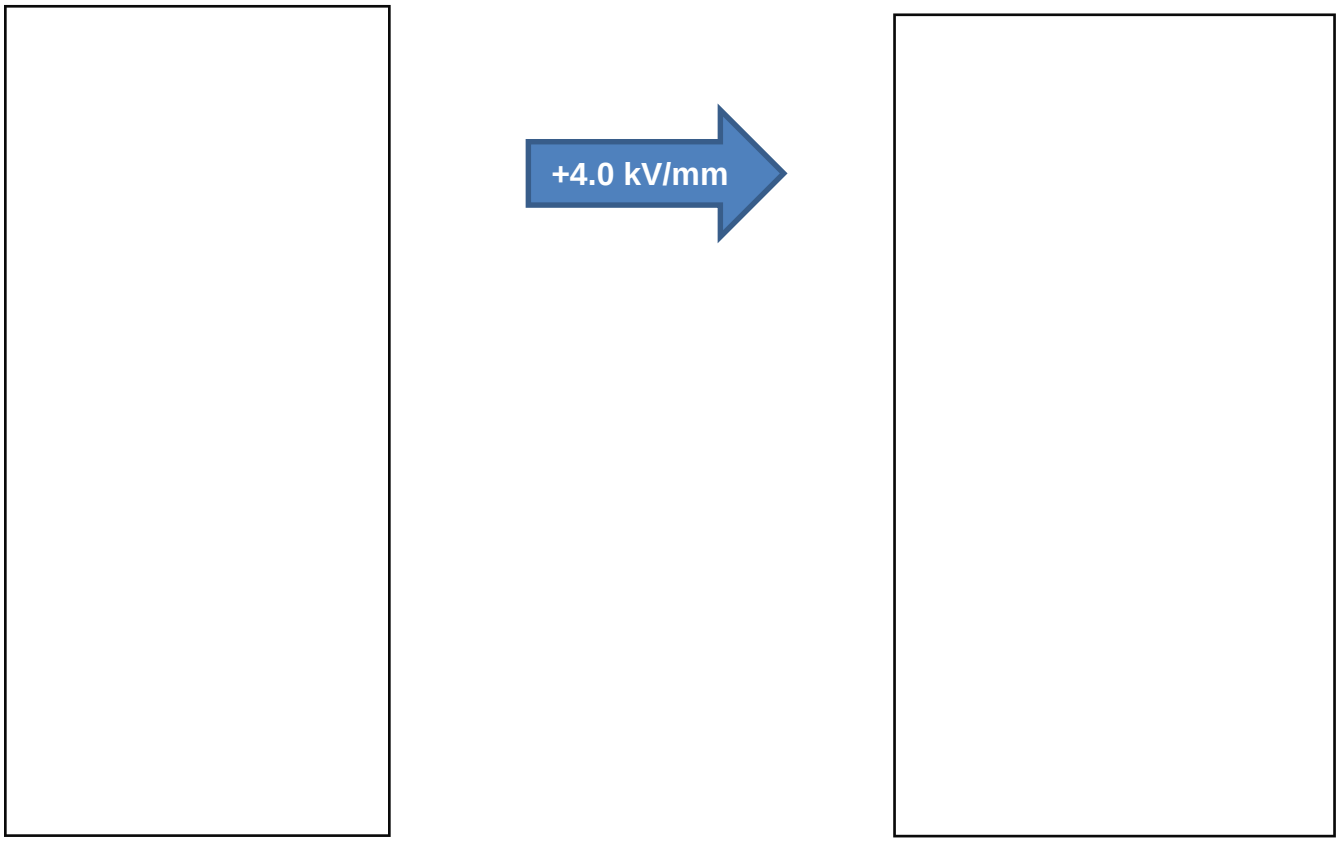
Application of a positive electric field



S2

- Recording for 0 kV/mm to +1.75 kV/mm
- Rapid DW movement at about +1.40 kV/mm

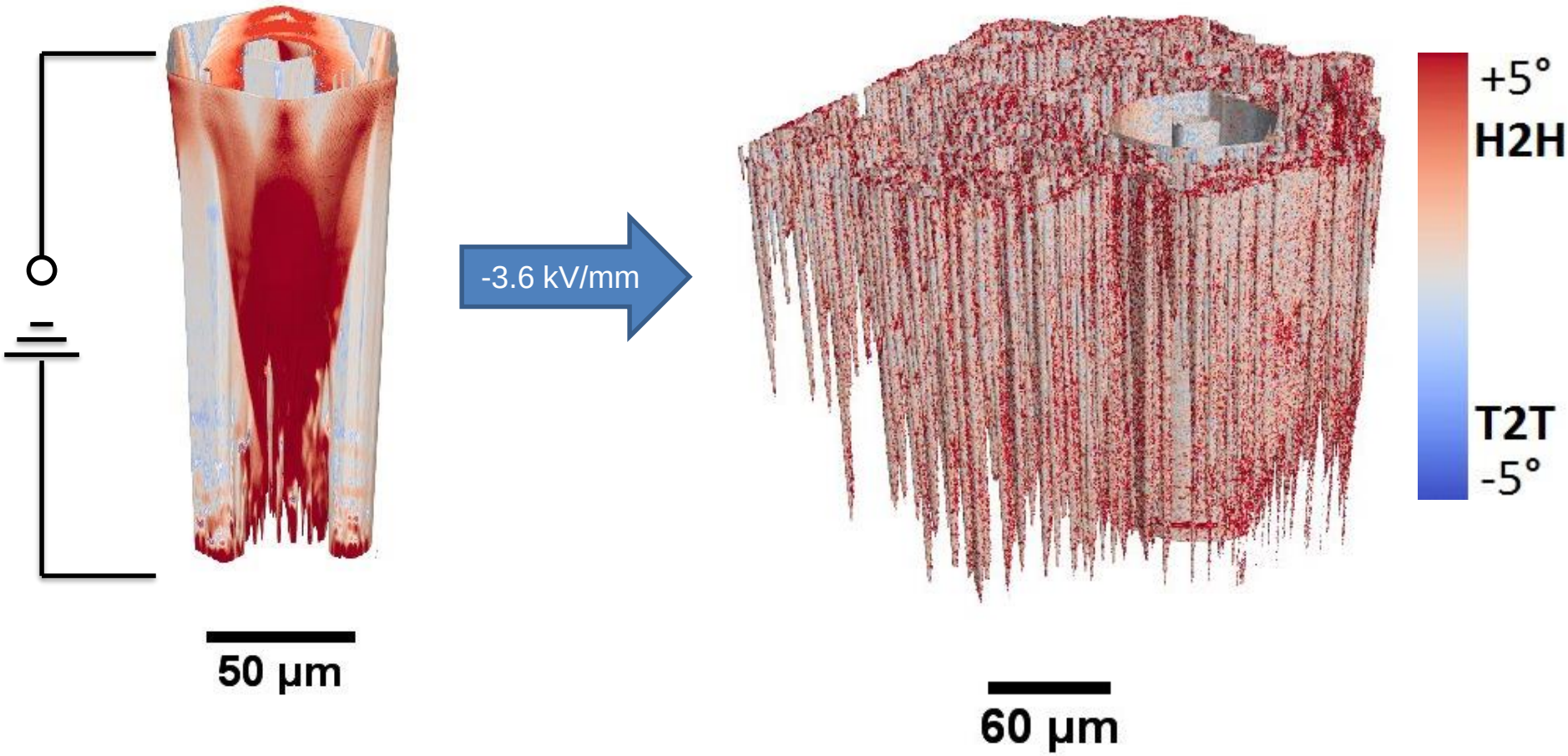
Application of a positive electric field



S3

- The hexagonal domain collapsed
- A cone-like structure was formed
- Head-to-head DWs dominated

Application of a negative electric field



S4

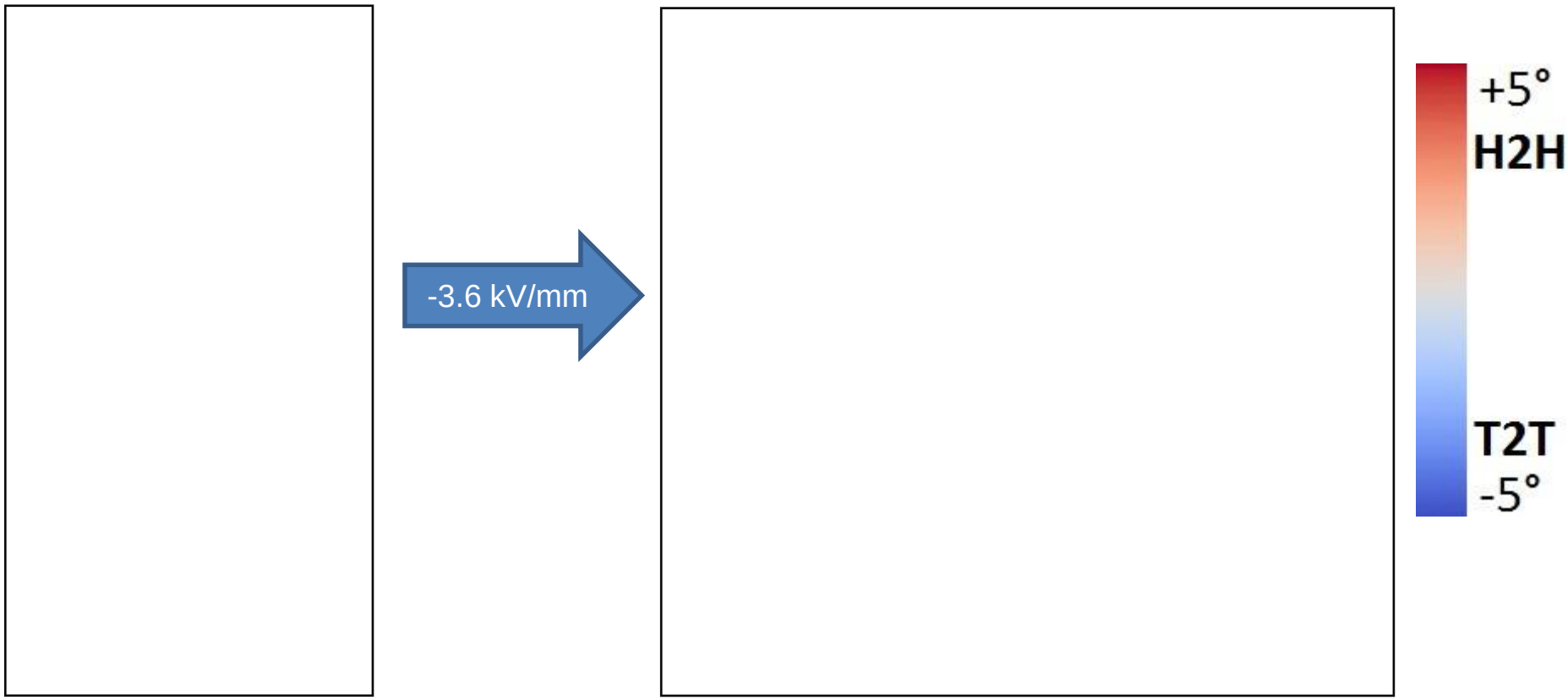
- Adopted from **Fig. 4 a)**

Application of a negative electric field

S5

- Recording for 0 V to -3.6 kV/mm
- Rapid domain transition at about -3.5 kV/mm

Application of a negative electric field



S6

- The cone-like structure underwent rapid transition
- Many spike domains were nucleating
- Head-to-head DWs still dominated