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PROCEEDINGS

Probing Multi-Field Couplings of Smart Materials at the Nanoscale

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ABSTRACT

Multi-field coupling affects the evolution of microstructures in smart materials, and also determines the macroscopic performance and application of smart materials. Scanning probe microscopy has emerged as one of the most powerful tools for characterizing and manipulating multi-field coupling responses of smart materials at the nanoscale. In this presentation, I will talk about some new experimental methods developed based on scanning probe microscopy and quantitative analysis, such as local excitation piezoresponse force microscopy method for mechanical properties of multiferroic nanostructures, the high fidelity direct measurement of local electrocaloric effect by scanning thermal microscopy, and the simultaneously direct measurements of local electrocaloric and electrostrain responses.

KEYWORDS

Multi-field coupling; smart material

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