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Scanning Probe Microscopy Applications of Ferroelectric Materials

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Poster Presentation 17

SCANNING PROBE MICROSCOPY APPLICATIONS OF
FERROELECTRIC MATERIALS

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Ferroelectric materials have recently gotten a great deal of attention due to their use as capacitors for integration into non-volatile ferroelectric random access memories (RAMs), and as high dielectric layers in compact capacitors for manufacturing planar dynamic RAMs. The superior piezoelectric property of ferroelectric ceramics also makes them ideal materials for microelectromechanical systems (MEMS). The strong piezoelectric effect allows electromechanical sensing and actuation. Thin films of Ferroelectric materials have been successfully used in a variety of MEMS applications, however, their advantageous properties of have not been fully utilized in scanning probe microscopy (SPM) applications. Furthermore, thin films have been used rather than single crystals due to the difficulty in micromachining single crystal ferroelectric samples. We present some creative device applications of single crystal ferroelectric materials in the context of SPM.