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Polarization switching in Ferroelectric capacitors ASIF KHAN, UC Berkeley, RAMAMOORTHY RAMESH, SALAHUDDIN SAYEED, UC Berkeley — A capacitor is an electrical circuit element that stores energy in the form of electric field. A ferroelectric is essentially analogous to an ordinary capacitor with an electrically switchable built-in polarization. The properties of ferroelectrics had been well described by Landau's phenomenological framework. However, during polarization switching in realistic ferroelectrics, switching occurs via "non-ideal" defect mediated domain nucleation and domain wall movement. It can be argued that, within the framework of nucleation based models of FE switching, energy injected into the FE is not stored in the form of electric field, which makes capacitor like description of FE during switching "unclear." In this talk, we will revisit the different switching based models of ferroelectrics and discuss the properties of FE as a circuit element during switching.

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