Y7. Characteristics of Localized Ferroelectric Domains in BaTiO₃ Single Crystals. M. Shabana and R. V. Jones, Harvard University.—The characteristics of localized domains in BaTiO₃ single crystals have been studied by means of a microprobe-polarizing microscope arrangement. It is found that localized "ε domains" in "δ domain" crystals have elliptical shapes with the major axis of the ellipses parallel to the polarization axis of the crystal. Such a ε domain is surrounded by a broad-strain pattern that manifests itself as a series of confocal colored ellipses due to photoelastic effects. The minimum electric field for localized domain formation is about 16 kV/cm, which is in fairly good agreement with calculated values. The shape of these domains may be understood in terms of a thermodynamic model of the domain-wall energies involved. The time of decay of the localized ε domains is of the order of a few minutes, while that of the associated strain pattern is the order of hours. Similar experiments have been performed to form localized reversed ε domains in ε-domain crystals. The localized reversed domains are surrounded by a symmetrical set of δ domains. The time of decay of these domain patterns varies between seconds and minutes.

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