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Atomic Force Microscopy Imaging Techniques for Piezoelectric Materials JEREMY KUNZ, COLIN INGLEFIELD, Physics Department, Weber State University — Using an Atomic Force Microscope (AFM) and a Lock-in Detector we investigated the effectiveness of two different methods of local piezoelectricity within a standard commercial piezoelectric material, Pb(Ti, Zr)O_3 (PIC 151). In the first method, sometimes known as piezo-mode AFM, we applied an AC voltage to the sample locally through the tip of the AFM; we were able to image the local piezoelectric response while taking a topographical image. For the second set of measurements, we used a sample of the PIC 151 material with a uniform silver electrode over the entire surface. The voltage was applied to the entire sample through the electrodes and the AFM cantilever measured local response. Images based on the two techniques will be compared along with the methods themselves.

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