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**Inelastic Tunneling Spectroscopy Through a Macromolecule** K.Ø. RASMUSSEN, JIAN-XIN ZHU, A.V. BALATSKY, A.R. BISHOP, Theoretical Division, Los Alamos National Laboratory — We propose inelastic electron tunneling spectroscopy scanning tunneling microscopy (IETS-STM) as a means of exciting and observing localized modes in a macromolecule. As a demonstration, inelastic tunneling features of the density of states are calculated for a nonlinear elastic Morse chain. We typically investigate the role of vibration modes from the anharmonic potential in the tunneling spectrum. The general formalism we have developed for the IETS is applicable to other nonlinear extended objects, such as DNA on a substrate.

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