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**Determining Film Thickness and Probing Buried Interface Structure with Characteristic Scanning Tunneling Spectroscopy** SHIN-MING LU, Institute of Physics, Academia Sinica, Republic of China and Department of Physics, Taiwan University, W.B. SU, C.L. JIANG, H.T. SHIH, C.S. CHANG, TIEN T. TSONG, Institute of Physics, Academia Sinica, Republic of China — Structural and electronic properties of atomic-scale flat Ag films grown on Si (111)-77 are measured with scanning tunneling microscopy and spectroscopy. Spectroscopy for each film thickness not only reveals the features of transmission resonance and distinct quantized bound states, but can also probe the buried interface structure. First, the energy levels of those states vary with the film thickness and can serve as the fingerprints. The film thickness can thus be determined with the characteristic spectrum, which is especially useful as the film covers the entire substrate. Secondly, the spectra manifest a shift of electronic resonance and quantized bound states due to varied reflection strength at the buried interface. With this effect, the buried interface structure can be probed.

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