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Fermion Pairing in a One-Dimension Optical Lattice[1] ARIEL SOMMER, LAWRENCE CHEUK, MARK KU, WASEEM BAKR, MARTIN ZWIERLEIN, Department of Physics, MIT-Harvard Center for Ultracold Atoms, and Research Laboratory of Electronics, MIT, Cambridge, Massachusetts 02139, USA — Strongly correlated fermions in an array of two-dimensional planes coupled via tunneling serve as an important model system for high-temperature superconductors and layered organic conductors. We realize this model using ultracold fermionic ^{6}Li atoms in a one-dimensional optical lattice near a Feshbach resonance. The depth of the lattice controls the interlayer coupling, and tunes the system between three and two dimensions. Pairing between fermions is studied using radio-frequency spectroscopy. The binding energy of fermion pairs is determined along the dimensional crossover and for different interaction strengths through the BEC-BCS crossover. Probes of superfluidity in the coupled layer system are also discussed.

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Ariel Sommer
Dept of Physics, MIT-Harvard Center for Ultracold Atoms, and Research Laboratory of Electronics, MIT, Cambridge, Massachusetts 02139, USA

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