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ARPES Measurements of the Effects of Strain on the Electronic Structure of Sr_2RuO_4 and $Sr_3Ru_2O_7$ JOHN HARTER, CAROLINA ADAMO, DAWEI SHEN, ERIC MONKMAN, DANIEL SHAI, Cornell University, YING LIU, Penn State University, DARRELL SCHLOM, KYLE SHEN, Cornell University — We report ARPES studies of the evolution of the Fermi surface of both single-layer (Sr_2RuO_4) and bilayer ($Sr_3Ru_2O_7$) strontium ruthenate as a function of strain. The technique of molecular beam epitaxy allows films of these materials to be grown on substrates with mismatched lattice constants, producing novel strained crystal states that can be probed *in situ* with ARPES. These two materials have attracted attention recently for the correlated electronic states they support (spin-triplet superconductivity and an electronic nematic phase, respectively). In particular, $Sr_3Ru_2O_7$ contains a number of low-lying bands with hybridization gaps near E_F that form a complex manifold of Fermi surface sheets. The evolution of these sheets with strain has implications for the microscopic origin of metamagnetism and nematicity in this material. Finally, for comparison with our measurements, we present density functional theory calculations of the electronic band structure of the crystals under compressive and tensile epitaxial strain.

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