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Photoemission study of doping in the strontium ruthenate family TIM KIDD, University of Northern Iowa, TONICA VALLA, JOHN RAMEAU, PETER JOHNSON, Brookhaven National Laboratory — How dopants are incorporated into low dimensional correlated electron systems and their effects on such materials remain open questions despite an intense research effort over the past few decades. We have used photoemission spectroscopy to investigate the effects of dopants in these systems to measure their influence on electronic properties and phase transitions. In systems such as the high-T_c superconductors, disorder in the spatial distribution of dopants leads directly to nanoscale electronic disorder in the system. Despite this seeming randomness, photoemission studies have shown the electronic states become more well-defined with increasing concentration of dopants. In these systems, however, the dopants are usually incorporated outside the copper oxygen planes important for conduction and superconductivity. Here, we present photoemission data from the strontium ruthenate family that incorporate dopants directly into the conducting planes. Our results indicate that even relatively high dopant concentrations do not necessarily cause a large degree of disorder based broadening in the spectra. We have also detailed the influence of dopants like titanium on the associated magnetic and superconducting phase transitions in these materials.

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