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The structure of the (001) surface of $\mathbf{Sr_3(Ru_{1-x}Mn_x)_2O_7}$ VON BRAUN NASCIMENTO, BIAO HU, RONGYING JIN, E. WARD PLUMMER, Dept of Physics and Astronomy, Louisiana State University — It has become quite clear that small structural distortions at the surface of complex materials like the transition-metal-oxides can have profound effects on the physical properties at the surface. We have investigated the surface structure of $Sr_3(Ru_{1-x}Mn_x)_2O_7$as a function of Mn substitution for Ru. Analysis of $Sr_3Ru_2O_7$ indicates an unexpected tilt (4°) as well as a larger rotation for the top RuO_6 octahedron (12°). Preliminary results indicate the tilted structural phase seems to be progressively suppressed by the substitution of Ru for Mn in the doped system. Electron diffraction patterns for a Mn doping level of only 10%, already indicate a very small tilt angle at the surface ($\sim 1^\circ$). The question is what effect this structural change will have on the magnetic ordering in the bilayered manganite. Extensive studies on the single-layered (Sr,Ca)2RuO_4 system reveal that rotation and tilt of RuO_6 octahedra plays a critical role in their physical properties, both in bulk and at the surface.

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