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Performing Many Simultaneous Measurements—Combinatorial Hall and Resistivity Studies on Oxide Films JEFFREY CLAYHOLD, Miami University, OSHRI PELLEG, ANTHONY BOLLINGER, GENNADY LOGVENOV, IVAN BOZOVIC, Brookhaven National Laboratory — Recent reports of sharp changes of transport properties with small variations of stoichiometry in cuprate superconductors have motivated us to look for similar behavior in optimally- and over-doped $La_{2-x}Sr_xCuO_{4+\delta}$, using a recently completed system for creating and measuring samples with ultrafine stoichiometry resolution. The system can measure 31 different Hall effect signals simultaneously as well as 30 different resistance signals. The data are from MBE films grown with a linear stoichiometry gradient. We will show new data for x ranging from 0.15 to 0.30 which show systematic gradations in physical properties such as carrier density, resistance, and the superconducting transition temperature.

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