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Constraints on Models of Electrical Transport in Optimally Doped $La_{2-x}Sr_xCuO_4$ from Precise Measurements of Radiation-Induced Defect Resistance JEFFREY CLAYHOLD, Miami University, OSHRI PELLEG, Brookhaven National Laboratory, DAVID INGRAM, Ohio University, ANTHONY BOLLINGER, GENNADY LOGVENOV, Brookhaven National Laboratory, DAVID RENCH, BRYAN KERNS, MICHAEL SCHROER, Miami University, ROBERT SUNDLING, ZenSoft, Inc., IVAN BOZOVIC, Brookhaven National Laboratory — Recent studies of normal-state magnetotransport in overdoped cuprate superconductors have shed much light on charge carrier transport, showing that both linear T and T^2 scattering rates are distributed around the Fermi surface. Unfortunately, the most discerning magnetotransport probes are not easily applied for the most interesting, optimally-doped cuprates. We have been able to characterize anisotropic scattering in $La_{1.83}Sr_{0.17}CuO_4$ by using a mostly overlooked but powerful resource—measuring the temperature dependence of the defect scattering resistance. When different regions of the Fermi surface contribute to conduction with different temperature dependences, then the gradual degradation of each contribution via added scattering alters the balance in a characteristic way that reveals much about how transport varies around the Fermi surface. Careful new measurements and a new analysis show how both T and T^2 scattering rates coexist as separate parallel conductance channels in $La_{1.83}Sr_{0.17}CuO_4$.

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