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Investigating Simultaneous Suppression of Superfluid and Resistivity in Ultrathin, Severely Underdoped YBCO¹ STANLEY STEERS, THOMAS LEMBERGER, BRIAN BAKER, The Ohio State University — Recent results in ultrathin, severely underdoped $Y_1Ba_2Cu_3O_{7-x}$ show an unusual offset between the low temperature scale at which the superfluid density vanishes and a higher temperature where resistivity vanishes, resulting in a simultaneous suppression of the superfluid density and the resistivity in a given temperature domain (Steers et. al, PRB 94, 094525 (2016)). This offset domain can be tens of kelvin in severely underdoped samples, and numerical studies rule out spatially random inhomogeneity as the sole cause of the offset. We present transport measurements in ultrathin YBCO and compare with thick film and bulk measurements from the literature to shed light on the offset. We also discuss the offset vis a vis the proposed pair density wave (PDW) state suggested for $La_{2-x}Ba_xCuO_4$ at $x = \frac{1}{8}$ doping.

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