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Electrical transport properties of ultrathin superconducting Pb films. R.P. PANGULURI, Department of Physics and Astronomy, Wayne State University, Detroit, MI 48201, M.M. OZER, Department of Physics and Astronomy, The University of Tennessee, Knoxville, TN 37996, J.R. THOMPSON, H.H. WEITERING, Department of Physics and Astronomy, The University of Tennessee, Knoxville, TN 37996;Condensed Matter Sciences Division, ORNL, Oak Ridge, TN 37831, B.E. NADGORNY, Department of Physics and Astronomy, Wayne State University, Detroit, MI 48201 — We present electrical transport properties of metallic ultra thin epitaxially grown Pb (111) films on Si (111) substrate. We observed a reduced superconducting transition temperature from bulk Pb using electrical resistivity measurements and deduced the temperature dependence of out-of-plane critical magnetic fields from the sheet resistance R as a function of the applied magnetic field. These results are consistent with M. M. Ozer et al.,[1] obtained by magnetic techniques. We identified the mean field critical temperature and current densities from I-V curves in zero magnetic field. We explored the possible presence of Kosterlitz-Thouless transition (T_{KT}) in this system. We discuss these results based on the Ginzburg-Landau Coloumb-Gas (GLCG) model for 2D vortex fluctuations. 1. M. M. Ozer, J. R. Thompson, and H. H. Weitering, Nature Physics, **2**, 173 (2006).

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