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2D Superconductivity of Ultra-thin Pb Films on Si(111)[1] JUNGDAE KIM, SHENGYONG QIN, HYUNGDO NAM, C. K. SHIH, Department of Physics, The University of Texas at Austin — The thickness dependence of superconductivity for globally flat ultra-thin Pb films is studied by using in-situ low temperature Scanning Tunneling Microscope / Spectroscopy (STM/S). Superconducting transition temperature (Tc) of each thickness is calibrated by fitting STS with BCS-like density of states. Superconductivity is found to be quite robust down to 5 monolayer films. In addition to the thickness dependence, this work focuses on how lateral size influences the superconducting gap measurements. Moreover, we investigate the lateral proximity effect between local superconducting regions.

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