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Interface Engineering of Thin Film Superconductor Heterostructures[1] CHENDONG ZHANG, Department of Physics, UT Austin; Institute of Physics, CAS, JISUN KIM, JUNGDAE KIM, HYOUNGDO NAM, Department of Physics, UT Austin, HONGJUN GAO, Institute of Physics, CAS, CHIH-KANG SHIH, Department of Physics, UT Austin — Thin film superconductivity is a subject with great scientific and technological importance. The previous works demonstrated that the superconductivity exits in extreme two-dimensional lead film with a thickness of only two atomic layers. Most strikingly, the Tc is only slightly suppressed from the bulk value. However, when the film is pseudomorphically strained, the Tc is suppressed further, implying the importance of the interface. In this work we explore thin film superconductivity in a new direction by engineering superconductor/normal metal heterostructures with atomically flat interface. Using in-situ scanning tunneling microscopy/spectroscopy, we explore the superconductivity of the Pb/Ag heterostructure by independently tuning the thicknesses of the atomically flat Ag films and superconducting Pb films respectively. The intriguing role of the Ag thin films on the superconductivity of Pb thin films will be reported.

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