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Anisotropic superconducting properties of nanowires at the $LaAlO_3/SrTiO_3$ (110) interface[1] PATRICK IRVIN, MENGCHENG HUANG, ANIL ANNADI, GUANGLEI CHENG, JEREMY LEVY, University of Pittsburgh, KALON GOPINADHAN, THIRUMALAI VENKATESAN, ARIANDO ARIANDO, National University of Singapore — The superconducting properties of nanowires created on anisotropic $SrTiO_3$ (110) surfaces were investigated. Nanowires are created using conductive AFM (c-AFM) lithography at the $LaAlO_3/SrTiO_3$(110) interface along the (001) and (1$\bar{1}$0) crystallographic directions. In these devices we observe anisotropic superconductivity. The upper critical magnetic field along the (001) and (1$\bar{1}$0) directions are found to be markedly different with a superconducting dome that is shifted for the two orientations. These observations can be explained by anisotropic orbital binding of Ti and O atoms or the differences in the spin-orbit coupling along the two different directions.

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