

Abstract Submitted
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Generic Superconducting Inhomogeneity in Single Crystal $\text{Fe}(\text{Te}_{1-x}\text{Se}_x)$ Probed by Nanostructure-transport CHUNLEI YUE, JIN HU, XUE LIU, ZHIQIANG MAO, JIANG WEI, Tulane University — We have investigated the nano-scale electronic properties of the iron-based unconventional superconductor $\text{Fe}(\text{Te}_{1-x}\text{Se}_x)$ with optimal Se content $x = 0.5$. Using the microexfoliation method and ion milling thinning, we successfully produced $\text{Fe}(\text{Te}_{1-x}\text{Se}_x)$ devices with thickness varying from 90nm down to 12nm. Our transport measurements revealed a suppression of superconductivity coinciding with the loss of normal state metallicity. Through the simulation of the formation of superconducting region in nano-scale thin flakes, we show that our observation is in line with the nano-scale inhomogeneity proposed for this material; therefore it provides a more direct evidence for the nano-scale inhomogeneous superconductivity in $\text{Fe}(\text{Te}_{1-x}\text{Se}_x)$.

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