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Superconductivity in $Fe_{1.08}Te:O_x$ Epitaxial Thin Films WEIDONG SI, QING JIE, LIJUN WU, JUAN ZHOU, GENDA GU, PETER JOHNSON, QIANG LI, BNL — Superconducting thin films of $Fe_{1.08}Te:O_x$ have been epitaxially grown on $SrTiO_3$ substrates by pulsed-laser deposition in controlled oxygen atmosphere. Although the bulk $Fe_{1.08}Te$ is not superconducting, thin films with oxygen are superconducting with an onset and a zero resistance transition temperature around 12 K and 8 K respectively. Oxygen was found to be crucial to the superconducting properties of these films, suggesting the oxygen can induce superconductivity possibly through substitution of Te. A metal-insulator transition is found at about 60 K, lower than that of bulk ($\sim$70 K). From magnetoresistive measurements, we obtained the irreversibility line and the upper critical field.

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