

Abstract Submitted  
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**Phase Transition from a Spin-Glass Metal to Superconductor in  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$  ( $x \leq 0.05$ ) Single Crystalline Films by Epitaxial Strain** ATM NAZMUL ISLAM, SATOSHI WATAUCHI, ISAO TANAKA, Center for Crystal Sci. and Tech. University of Yamanashi, Kofu, Japan — Epitaxial growth of films is an effective way to induce high anisotropic pressure on films. In this work we have grown  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$  (LSCO) ( $0.03 < x < 0.05$ ) films, having metallic behavior in bulk, by liquid phase epitaxy technique along the  $\langle 100 \rangle$  direction. For the desired kind of strain we have chosen overdoped LSCO ( $\sim x=0.19$ ) as the substrate. We observed that the resistance versus temperature measurement, in a configuration where the film and substrate are in series, shows a two-step superconducting transition. We suggest that the other transition, which does not coincide with the  $T_c$  of substrate, is due to superconductivity in film. The  $T_c$  of the films with  $x=0.034$ ,  $0.040$  and  $0.045$  are found to be 25K, 30K and 34K, respectively. Where as the  $x=0.0$  film is not superconducting. In our work we have shown possible transition of a spin-glass metallic phase to a superconducting phase in LSCO ( $0.03 < x < 0.05$ ) films induced by epitaxial strain.

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