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Interface superconductivity in bi-layers of insulating and overdoped metallic $\mathbf{La_{2-x}Sr_xCuO_{4+\delta}}$ ADRIAN GOZAR, GENNADY LOGVENOV, ANTHONY BOLLINGER, IVAN BOZOVIC, Brookhaven National Laboratory — We report on properties of thin superconducting (SC) sheets obtained in $La_{2-x}Sr_xCuO_{4+\delta}$ bi-layers of overdoped, non-superconducting ($x = 0.45$) and insulating ($x = 0$) films grown by molecular beam epitaxy. Superconductivity is confined to a thickness of ≈ 2 nm from the interface. The observed transition temperatures have values $T_c \approx 15$ K, 30 K and 50 K depending on the layering sequence and oxidation state of the insulating material. Transport measurements are used to determine the screening properties of the quasi-2D SC sheets and the data in bi-layers are compared to results from single-phase films and bulk crystals.

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