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Electron-hole cuprates for a possible Bose condensation? CAROLINA ADAMO, Stanford University, H. YUANG, Sstanford University, Z. CHEN, H. HWANG, Stanford University, DARRELL SCHLOM, Cornell University, MALCOLM BEASLEY, Stanford University — Bose condensation, by promoting quantum behavior from the microscopic to the macroscopic world, can produce some spectacular effects: like include superconductivity, superfluidity, and coherent matter waves. This work proposes to achieve the Bose condensation of bound electron-hole pairs (excitons) in a solid at a temperature that is high compared to other Bose condensates. The route we will explore to achieve a BEC of bound excitons utilizes a modulation-doped infinite-layer CuO2-based compound. Using a molecular-beam epitaxy we will grow bilayer (or trilayer) of SrCuO2/La2CuO4 thin films. Structural and electrical data will be discussed.

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