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The influence of the SrTiO₃ capping layer to the two-dimensional electron liquid at the interface of LaAlO₃/SrTiO₃. AKHILESH SINGH, MINGYUAN SONG, CHI-SHEN LEE, WEI-LI LEE, Institute of Physics, Academia Sinica, NANOSPINLAB TEAM — The discovery of 2-dimensional electron liquid (2DEL) at the interface of LaAlO₃/SrTiO₃ (LAO/STO) has attracted enormous interests due to its fascinating behaviours, such as magnetism, superconductivity, and unexpectedly coexistence of the two. Inspired by earlier works, a STO capping layer on LAO/STO can largely affect the electronic reconstruction at the interface, possibly giving rise to a parallel 2D electron-hole bilayer. In this work, we used oxide molecular beam epitaxy technique to grow high-quality films of STO(x nm)/LAO(y nm)/STO(001)(substrate) heterostructures with different x and y values. Influences of the capping layer on 2DEL and related magnetotransport properties will be systematically studied and discussed.

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