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**A direct measurement of built-in potential across LaAlO<sub>3</sub>/SrTiO<sub>3</sub>(001) heterojunctions** YANG ZHOU, DI WU, Nanjing Univ — The quasi-two-dimensional electron gas (q2DEG) at the oxide interface LaAlO<sub>3</sub>/SrTiO<sub>3</sub> has attracted a lot of attention in recent years due to its rich phenomena. The ‘polar catastrophe’ model is one of the conducting mechanisms, which relies on the polar potential built-in LaAlO<sub>3</sub> layer. Although several experiments have been tried to measure the electrostatic potential in LaAlO<sub>3</sub>, the magnitude of the polar potential is still under debate.[1][2][3] We present a systematically study on the electronic transport properties of the LaAlO<sub>3</sub>(5 unit cells)/SrTiO<sub>3</sub> interfaces capping with several different metals, whose work functions vary from 4.28 to 5.6 eV. The barrier height between the capping layer and the q2DEG estimated by the tunneling resistance shows strong correlation with the metal work function. The carrier density of q2DEG increases as decreasing the capping metal work function. These results strongly suggest the existence of the built-in potential in LaAlO<sub>3</sub> and the residual polar potential in five-unit-cell LaAlO<sub>3</sub> is estimated to be 1.3 eV. [1]E. Slooten, et al, Phys. Rev. B 87, 085128 (2013). [2]H. Liang, et al, Sci. Rep. 3, 1975 (2013). [3]G. Berner, et al, Phys. Rev. B 88, 115111 (2013).

Yang Zhou  
Nanjing Univ

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