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Effect of $LaInO_3$ layer thickness on the conductance enhancement at the $LaInO_3/Ba_{1-x}La_xSnO_3$ polar interface CHULKWON PARK, USEONG KIM, JUYEON SHIN, YOUNG MO KIM, YOUJUNG KIM, KOOKRIN CHAR, Seoul National University — We have recently reported on the high performance thin film transistors based on La-doped $BaSnO_3$ (BLSO), which has high electron mobility and thermal stability, with $LaInO_3$ (LIO) gate dielectric [1, 2]. During the course of this research we have observed 10^4 times enhancement of the sheet conductance of BLSO channel layer, which implies formation of 2DEG, after the interface formation with LIO. Detailed further study revealed that the La concentration in the BLSO channel layer critically affects the enhancement of sheet conductance on the LIO/BSO interface [3]. We investigated the LIO thickness dependence on the conductance of LIO/BSO interface and will discuss the origin of this phenomenon in terms of the intrinsic interface polarization in the LIO layer. This understanding is the first step towards the device application of the perovskite oxide heterostructures and may potentially lead to new interface states. [1] H. J. Kim, U. Kim *et al.*, Appl. Phys. Express **5**, 061102 (2012). [2] U. Kim *et al.*, APL Mat. **3**, 036101 (2015). [3] U. Kim *et al.*, preprint.

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