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Potential profiling of the nanometer-scale charge-depletion layer in n-ZnO/p-NiO junction using photoemission spectroscopy YUKIAKI ISHIDA[1], U. of Tokyo, Japan, HIROMICHI OHTA[2], Nagoya U., Japan, MASAHIRO HIRANO, ERATO-SORST, JST, in Frontier Collaborative Research Center, Tokyo Institute of Technology, Japan, ATSUSHI FUJIMORI, U. of Tokyo, Japan, HIDEO HOSONO[3], Frontier Collaborative Research Center, Tokyo Institute of Technology, Japan — We have performed a depth-profile analysis of an all-oxide $p-n$ junction n-ZnO/p-NiO [1] using photoemission spectroscopy combined with Ar-ion sputtering, and investigated the potential profile of the space-charge region embedded at the interface [2]. Systematic core-level shifts were observed during the gradual removal of the ZnO overlayer, and were interpreted using a model based on charge conservation. Spatial profile of the potential around the interface was deduced, including the charge-depletion width of 2.3 nm extending on the ZnO side and the built-in potential of 0.54 eV. [1] H. Ohta, *et al.*, APL **83**, 1029 (2003). [2] Y. Ishida, *et al.*, APL **89**, 153502 (2006).

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