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Understanding enhanced UV photo-response of Pd nanoparticle-coated $\text{LaAlO}_3/\text{SrTiO}_3$ using ambient control Kelvin probe force microscopy DONG-WOOK KIM, HAERI KIM, Department of Physics, Ewha Womans University, NGAI YUI CHAN, JIYAN DAI, Department of Applied Physics, The Hong Kong Polytechnic University — Significant enhancement in photoresponse of Pd nanoparticle-coated $\text{LaAlO}_3/\text{SrTiO}_3$ (LAO/STO) heterstructure is observed under UV illumination compared with a bare LAO/STO sample. Clear ambient dependence suggests crucial roles of gas adsorption/desorption and resulting carrier transfer in the enhanced UV response. In this work, we have measured surface work function of the samples with and without UV light using Kelvin probe force microscopy (KPFM). We perform both transport and the surface potential measurements at the same time. Such simultaneous measurements can help us to improve our understanding regarding the light sensing and strong ambient dependence of the LAO/STO heterointerface.

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