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Mechanisms for the enhancement of the lateral photovoltage in perovskite heterostructures KUI-JUAN JIN, CHEN GE, HUIBIN LU, GUOZHEN YANG, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China — The mechanisms for greatly enhanced lateral photovoltaic effect in the perovskite oxide heterostructures are studied by solving *time-dependent* two-dimensional drift-diffusion equations self-consistently. By our calculations, we find that the lateral photovoltage of p type material is larger than that of n type material owing to the larger drift electric field induced in the p type material than that in the n type material. Moreover, the built-in electric field at the interface between the thin film and substrate can also enhance the lateral photovoltage. The above two mechanisms can well explain one-order-of-magnitude enhancement of the LPV in the perovskite heterostructures. In addition, we find that the materials with larger mobility ratio have stronger Dember effect. Such an understanding of the mechanisms for the enhancement of lateral photovoltage in oxide heterostructures should be useful in further designing of the structures of position-sensitive detectors and new THz sources.

Kui-juan Jin
Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China

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