

Abstract Submitted  
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**Spin Hall effect by surface roughness**<sup>1</sup> LINGJUN ZHOU, VAHRAM GRIGORYAN, Fudan University, China, SADAMICHI MAEKAWA, Japan Atomic Energy Agency, Japan, XUHUI WANG, King Abdullah University of Science and Technology, Saudi Arabia, JIANG XIAO, Fudan University, China — spin Hall effect and its inverse effect, caused by the spin orbit interaction, provide the interconversion between spin current and charge current. Since the effects make it possible to and manipulate spin current electrically, how to realize the large effects is an important in both physics and applications. To do so, materials with heavy elements, which have strong spin orbit interaction, have been examined so far. Here, we propose a new mechanism to enhance the spin Hall effect without heavy elements, i.e. surface roughness in metallic thin films. We examine Cu and Al thin films with surface roughness and find that they give the spin Hall effect comparable to that in bulk Au. We demonstrate that the spin Hall effect induced by surface roughness has the side jump contribution but not skew scattering.

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