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Spin Hall Effect Driven Non-Local Spin Diffusion at Oxide Heterointerfaces. MIJIN JIN, SEON YOUNG MOON, JUNGMIN PARK, VIJAYAKUMAR MODEPALLI, JUNHYEON JO, SHIN-IK KIM, HYUN CHEOL KOO, BYOUNG-CHUL MIN, None, HYUN-WOO LEE, Department of Physics, Pohang University of Science and Technolog, Korea, SEUNG-HYUB BAEK, Center for Electronic Materials and Spintronics, Korea Institute of Science and Technology(KIST), Korea, JUNG-WOO YOO, School of Materials Science and Engineering, Ulsan National Institute of Science and Technology(UNIST), Korea — The conductive interface at LaAlO3/SrTiO3 (LAO/STO) can be designed to exhibit high mobility with tunable carrier concentration and exhibits various unique electronic behaviors. This interface could be also interesting playground for ''spin-orbitronics" as the structure itself strongly couple the spin and orbital degree of freedom through the Rashba spin-orbit interaction. We report the non-local spin diffusion at LAO/STO interface induced by the spin Hall effect. The Hall-bar (H-bar) like geometry was employed to generate a transverse spin polarized current, which in turn can be detected by the inverse spin Hall effect. Our results clearly demonstrated the non-local spin diffusion as well as effective spin charge conversion at this oxide heterointerface. The analysis on the non-local spin voltage displays that both D"yakonov-Perel" and Elliott-Yafet mechanisms involve in the spin relaxation. Our results show that the oxide heterointerface is highly efficient in spin-charge conversion with exceptionally strong spin Hall coefficient γ ˜0.24 and could be an outstanding platform for the study of coupled charge and spin transport phenomena and their electronic applications.

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