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Non-Local Signal in Quasi-2DEG of LAO/STO[1] MI-JIN JIN, Ulsan Natl Inst of Sci & Tech, SEON YOUNG MOON, Korea Institute of Science Technology (KIST), VIJAYAKUMAR MODEPALLI, JUNHYEON JO, JUNGMIN PARK, Ulsan Natl Inst of Sci & Tech, SEUNG-HYUB BAEK, Korea Institute of Science Technology (KIST), JUNG-WOO YOO, Ulsan Natl Inst of Sci & Tech — Electron gas arizen at the insulating oxide interfaces exhibits high electron mobility, tunable carrier densities and related unique behaviors such as coexistence of superconductivity and ferromagnetism, Kondo resistance, etc. Itinerant electrons at the oxide hetero-interface are predicted to have long spin diffusion length, while they are under the relatively strong Rashba-type spin orbit coupling due to inversion symmetry breaking. We studied non-local spin signal induced by spin orbit coupling with additional gate-controlled Rashba field in quasi-2DEG of $LaAlO_3$/SrTiO (LAO/STO) interface. We fabricated simple hall-bar like geometry to measure non-local signal with the variation of channel length ($2 \sim 10\mu$m). Cleaned sample was patterned using e-beam lithography and reactive ion etching followed by oxygen treatment to anneal out oxygen vacancies. When an electric current flows one line of the hall bar structure, spin orbit coupling will induce the current flow away from the source current channel via spin hall and inverse spin hall effects. The non-local signals were studied under different angles of magnetic field and the variation of applied gate voltage.

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