

Abstract Submitted
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Observation of the cubic Rashba effect in a SrTiO₃ two-dimensional electron gas HIROYUKI NAKAMURA, Osaka University, HISASHI INOUE, SLAC National Accelerator Laboratory and Stanford University, MINU KIM, SLAC National Accelerator Laboratory and Seoul National University, CHRIS BELL, SLAC National Accelerator Laboratory, MASAYUKI HOSODA, SLAC National Accelerator Laboratory and the University of Tokyo, YASUYUKI HIKITA, SLAC National Accelerator Laboratory, HIROSHI KOHNO, Osaka University, TAKAAKI KOGA, Hokkaido University, HAROLD HWANG, SLAC National Accelerator Laboratory and Stanford University, TSUYOSHI KIMURA, Osaka University — Induced spin-orbit coupling effects at oxide interfaces, where *d*-orbitals form the conduction bands, are recently attracting much interest [1-4]. Here, we report magnetotransport of normally-off SrTiO₃ field-effect transistors with parylene gate insulator at a dilution refrigerator temperatures (50 mK - 1 K). An enlarged contribution of the weak antilocalization /weak localization (WL/WAL) effect in the magnetoconductance compared to that at 2 K [4] is used to analyze the Rashba effect in detail. It will be shown that a theoretical model with effective magnetic field configuration based on the cubic Rashba term perfectly matches the observed WL/WAL data.

- [1] H. Nakamura *et al.*, Phys. Rev. B, **80**, 121308(R) (2009).
- [2] M. Ben Shalom *et al.*, Phys. Rev. Lett. **104**, 126802 (2010).
- [3] A. D. Caviglia *et al.*, Phys. Rev. Lett. **104**, 126803 (2010).
- [4] H. Nakamura *et al.*, Phys. Rev. Lett., **108**, 206601 (2012).

Hiroyuki Nakamura
Osaka University

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