

Abstract Submitted  
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**Spin blocking effect in symmetric double quantum well due to Rashba spin-orbit coupling**<sup>1</sup> SATOFUMI SOUMA, MATSUTO OGAWA, Department of Electrical and Electronic Engineering, Kobe University, YOSHI-AKI SEKINE, NTT Basic Research Laboratories, NTT Corporation, ATSUSHI SAWADA, TAKA-AKI KOGA, Division of Electronics for Informatics, Graduate School of Information Science and Technology, Hokkaido University — We report a theoretical study of the spin-dependent electronic current flowing laterally through the  $\text{In}_{0.53}\text{Ga}_{0.47}\text{As}/\text{In}_{0.52}\text{Al}_{0.48}\text{As}$  double quantum well (DQW) structure, where the values of the Rashba spin-orbit parameter  $\alpha_R$  are opposite in sign but equal in magnitude between the constituent quantum wells [1]. By tuning the channel length of DQW and the magnitude of the externally applied in-plane magnetic field, one can block the transmission of one spin (e.g., spin-up) component, enabling us to obtain a spin-polarized current. Our experimental progress toward realizing the proposed device is also reported [2]. [1] T. Matsuura, S. Faniel, N. Monta, and T. Koga, *Physica E* **42**, 2707 (2010). [2] T. Koga, T. Matsuura, S. Faniel, S. Souma, S. Mineshige, Y. Sekine, and H. Sugiyama, *IEICE Trans. Electron.* **E95-C**, 770 (2012).

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