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**Proposal of Spin Interference Experiment Using GaAs/AlGaAs Heterostructures** KAZUAKI NISHIO, LI ZHANG, TAKAAKI KOGA[1], GSIST and CRIS (SOUSEI), Hokkaido University, Sapporo, Japan, TOSHIYUKI KOBAYASHI, TATSUSHI AKAZAKI[1], NTT BRL, NTT Corporation, Atsugi, Japan — We propose a spin interference (SI) experiment [1] using GaAs/AlGaAs system, where the zero-field spin-splitting ($\Delta_0$) is caused by the Dresselhaus term predominantly. GaAs/AlGaAs has the advantage in gating stability and long carrier mean free path relative to the other III-V materials, making it a standard semiconductor in mesoscopic physics experiment. It is shown theoretically as well as experimentally that values of $\Delta_0$ are generally smaller in GaAs/AlGaAs than in InGaAs/InAlAs. In the present work, however, we suggest that the gate-controllability of spins in GaAs/AlGaAs, $\beta \equiv \Delta_0/k$ being the relevant parameter, should also be as good as that in InGaAs/InAlAs based on our simulations, which makes the SI experiment possible even with GaAs/AlGaAs. We fabricated a series of quantum nanowires on GaAs/AlGaAs wafers with various wire widths. We discuss their transport properties and the prospective for the future SI experiment. [1] Koga *et al.*, PRB **70**, 161302(R) (2004); *ibid.* **74**, 041302(R) (2006).

[1]also with CREST, JST.

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