

Abstract Submitted
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Enhancement of the Spin Conductance of a Magnetic Superlattice¹ NAMMEE KIM, HEESANG KIM KIM, Department of Physics, Soongsil University, JINWOO KIM, Research Center for Integrative Basic Science, Soongsil University — For a spin device application of a magnetic superlattice, we investigate the optimal condition to get a fully spin-polarized current with sizable ballistic conductance. We consider a quasi-one dimensional magnetic superlattice, formed by a periodic magnetic field and a split gate technique on a two dimensional electron gas system. We obtain such a condition by analyzing an energy mini-band dispersion and a spin dependent transmission probability for each channel. The transfer matrix theory and Bloch's theorem are used in the detailed calculation. From the results, we propose an optimized aspect ratio of size parameters of a quasi-one dimensional magnetic superlattice as a spin filter to generate currents having simultaneous full spin-polarization and sizable ballistic conductance.

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