

Abstract Submitted
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Spin polarization amplification within nonmagnetic semiconductors at room temperature SOON-WOOK JUNG, HYUN-WOO LEE, Department of Physics, Pohang University of Science and Technology — We show theoretically that the spin polarization of current can be electrically controlled within nonmagnetic semiconductors by exploiting the fact the spin current, compared to the charge current, is weakly perturbed by electric driving forces. In particular, in a T-shaped current branching geometry made entirely of a nonmagnetic semiconductor, the spin polarization can be amplified to 100% by tuning current branching ratios properly. The proposed amplification scheme does not use ferromagnets or magnetic field, and does not require low temperature operation, providing an efficient way to generate a highly spin polarized current in nonmagnetic semiconductors at room temperature.

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