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Enhancement of Spin Polarization by Spin Anisotropic Scattering¹ DONGRIN KIM, GEJIEN ZHAO, BOCHAO LI, JI ZHANG, JESSICA GIFFORD, TINGYONG CHEN, Arizona State University — Highly spin-polarized current is desirable for spintronics, but spin is often required to be injected from a spin source to another material via an interface. This often significantly reduces spin polarization of the current. Some materials can scatter spin-up and spin-down electrons very differently, and they can be utilized to create a spin-filtering interface; this actually enhances spin polarization. At a normal metal/superconductor interface, Andreev reflection occurs. This can be utilized to measure spin polarization of the normal metal. In this work, we theoretically calculate the Andreev reflection spectroscopy of an interface with spin anisotropic scattering. We will show that the Andreev spectra is symmetrical as a function of the bias voltage, and that the spin polarization value can still be determined. With a proper interface (with spin filtering), the spin polarization value can be significantly enhanced, and this will aid in an enhanced performance of spintronic devices.

¹Enhancement of Spin Polarization by Spin Anisotropic Scattering

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