Summary
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Magnetotransport of hot electrons and holes in the spin-valve transistor

The conventional electronics uses the charge property of the electrons and holes. The building blocks are semiconductors which can be tuned to change the properties of the devices. In the field of spintronics, the spin property of the charge carriers is added to the functionality of the devices. The spin-valve transistor (SVT) is one of the spintronics devices which allows us to study the spin-dependent transport characteristic of non-equilibrium electrons and holes in semiconductor/ferromagnetic hybrid structures. The SVT uses Schottky barriers to inject and collect hot-carriers. In the metal base of the device, two ferromagnetic metals separated by a nonmagnetic metal are utilized to analyze the spin-dependent transport of the electrons and holes. In this thesis, one of the motivations is to understand the role of interfaces in the hot-electron transport. Another motivation is to study the spin relaxation in metals which is crucial for adding the functionality of spin property. Finally, it is important to understand the hot-hole transport since the devices working with holes and electrons offer better performances.

In chapter 2, the experimental procedures to fabricate and electrically charac-