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Non-adiabatic effect on spin pumping KAZUNARI HASHIMOTO, University of Yamanashi, GEN TATARA, RIKEN, CHIKAKO UCHIYAMA, University of Yamanashi — The spin pumping is a standard method to generate spin polarized electron current (spin current) in ferromagnetic-normal metal junctions. Typically, spin current is considered to be induced by precession of the magnetization in the ferromagnetic layer into the normal metal. Most of theoretical studies of the spin pumping are performed in an adiabatic regime where precession of magnetization is sufficiently slow compared to system relaxation time. However, since the magnetization precesses with finite frequency (several gigahertz) in actual experiments, it is necessary to study validity of adiabatic approximation. For this purpose, we investigate non-adiabatic effect on spin pumping by analyzing electron dynamics due to precession of the magnetization. To this end, we introduce a minimum model of the spin pumping, which consists of a magnetic quantum dot contacting with an electron lead, and analyze it by means of the full counting statistics.

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