

ECS 521/641: Spintronics and Nanomagnetism

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HW #10

Problem 1

Derive the expression for ferromagnetic resonance with damping and a transverse AC field by linearizing the Landau-Lifshitz equation for small rotations.

Problem 2

Derive the expression of effective spin mixing conductance and the inverse spin Hall voltage due to spin pumping using spin circuit theory.

Problem 3

Consider an electron with x -polarized spin placed in a magnetic field directed along the z -axis. Show using quantum mechanics that if there are no dissipative processes, the spin will precess about the magnetic field.