Modification of Spin Wave Propagation by Current Injection
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We studied the effect of an electric current on the spin wave propagation in magnetic wires, and found the following two effects. (i) Current injection changes the velocity of spin wave; the velocity is increased or decreased depending on the current polarity. (ii) Current injection modifies the attenuation length of spin wave; the attenuation length of spin wave can increase when the spin waves and electrons move in the same direction. The first finding can be interpreted as the time-domain observation of the spin-wave Doppler shift by current injection [1]. The second effect is thought to be affected by the nonadiabaticity of the spin transfer torque and thus can be used to estimate the nonadiabaticity [2].