

Spin torque switching of antiferromagnets

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For a long time, there have been no efficient ways of controlling antiferromagnets. Quite a strong magnetic field was required to manipulate the magnetic moments because of a high molecular field and a small magnetic susceptibility [1-3]. It was also difficult to detect the orientation of the magnetic moments since the net magnetic moment is effectively zero. For these reasons, research on antiferromagnets has not been progressed as drastically as that on ferromagnets which are the main materials in modern spintronic devices.

Although antiferromagnets have no net magnetization, the microscopic magnetic moments can in principle exhibit a similar spintronic effect, such as various magnetoresistance effects and the spin torque effect, as seen in ferromagnets [4,5].

In this talk, we show on our recent results of the spin torque switching and magnetoresistive detection of the magnetic moments in antiferromagnets such as NiO, CoO, and FeRh, leading to novel antiferromagnetic spintronic applications.

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