

# IFCAM Seminar

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Date : Sep. 9 (Tue.) 16 : 00 ~

Room : 2nd floor, IMR Prefab Bldg

## Current induced Domain Wall Motion in Ferromagnetic Wires

Recent experiments have shown that a Bloch wall formed in a micron sized ferromagnetic wire can be moved by the application of a current pulse. This talk will explain a possible theoretical approach to explain these experiments. The theory considers the double exchange model in the limit of large Hund's rule coupling  $J_H$  and large Coulomb repulsion  $U$ . In the absence of pinning it can be showed that any magnetic profile, including a Bloch wall, will be uniformly and non-dispersively displaced with velocity  $v$  which is proportional to the applied current. This calculation shows that, in the absence of a pinning potential and for a half-metal relevant for this limit, the angular momentum of the electrons is transferred to the Bloch wall with 100% efficiency. It is also possible to consider the situation when the wall is pinning by a single pinning centre. It is then possible to show that the Bloch wall organizes itself so that the angular momentum destroyed by the pinning center just balances that which is transferred to the Bloch wall. A possible description of a wall moving in the presence of pinning will be outlined.

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