Seminář oddělení magnetik a supravodičů
Fyzikální ústav Akademie věd České republiky, v. v. i.

Knihovna FZÚ, Cukrovarnická 10, Praha 6
Čtvrtek, **7. 3. 2013** ve **14:00** hod.

Coercivity mechanism of Nd-Fe-B sintered magnets

Hiroki Tsuchiura

Department of Applied Physics, Tohoku University, Japan

Abstract. We first study the electronic structure of several surfaces of crystalline $Nd_2Fe_{14}B$ and estimate the crystal field parameters at the Nd sites based on first principles calculations. It is found that Nd ions exposed on the (001) surface exhibit an c-plane magnetic anisotropy. On the basis of this observation, we propose a mechanism that exhibits the coercivity reduction of Nd–Fe–B magnets. The model employed here is a micromagnetic model involving the anisotropy- and exchange-fields obtained by the first-principles calculations; it has a c-plane magnetic anisotropy around the surface, in contrast to the bulk c-axis anisotropy. We find that the local c-plane anisotropy drastically affects the coercivity, resulting in a reduction by half of the bulk anisotropy field H_c.