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EINLADUNG zum IFP-SEMINAR

Role of the granular microstructure on coercivity of Nd-Fe-B magnets

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Host:	Josef Fidler
Termin:	Mittwoch, 07. Dezember 2016, 16:00 Uhr
Ort:	Institut für Festkörperphysik, TU Wien
	Wiedner Hauptstraße 8-10, 1040 Wien
	Seminarraum DC rot 07 (roter Bereich, 7. OG)

Abstract:

The hysteresis properties of melt-spun and sintered Nd-Fe-B magnets strongly depend on the size of the hard magnetic grains, their misalignment and the magnetic properties of intergranular phases. The nanoanalytical high resolution TEM/STEM investigation of the intergranular grain boundary phase of anisotropic sintered and rapidly quenched heavy rare earth free Nd-Fe-B magnet materials revealed a difference in composition for grain boundaries parallel (large Fe-content) and perpendicular (low Fe content) to the alignment direction [1]. The numerical finite element micromagnetic simulations are based on the anisotropic compositional behaviour of GBs and show a decrease of the coercive field with an increasing thickness of the grain boundary layer. Soft magnetic grains further reduce the coercivity significantly. Depending on the characterized microstructure the calculated values of the coercive field are in the range of $\mu_0 H_{cJ}$ = 1.8 T - 2.1 for aligned sintered magnets and for isotropic melt-spun magnets between 0.6 T and 2.3 T, which agrees perfectly with the measured data.