

SEMINAR

Thursday, 13.2.2025, 13:00, Kolar's Lecture Hall

Mechanical Aspects of Nd-Fe-B Magnets: From Sintering to Hot Plastic Deformation

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The talk focuses on the mechanical aspects that influence the magnetic properties of Nd-Fe-B, particularly in the processes of sintering and hot plastic deformation. By understanding and modeling the stress-strain behavior in polycrystalline systems, it becomes possible to optimize technological parameters and improve the performance characteristics of magnets.

The first part of the talk will explore the origins of residual stresses and strains during sintering and their effect on magnetocrystalline anisotropy. It will discuss state-of-the-art modeling approaches and computational tools for evaluating thermal residual stresses, as well as strategies for their reduction.

The second part will delve into the mechanics of hot plastic deformation, where texturing is crucial for producing anisotropic magnets. Key challenges include developing material models that connect process mechanics to magnetic properties and defining principles to use these insights for optimizing manufacturing processes. The talk will also cover approaches for the characterization of plastic properties, process modeling, and the analysis of inhomogeneity and formability.

The talk aims to bridge theoretical and practical approaches, examining these challenges through the lens of mechanical aspects, and paving the way for advancements in the production technologies of Nd-Fe-B magnets with enhanced functional characteristics.

Kindly invited.