

Material characterization in highest magnetic fields

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In this presentation, I will show the characterization of materials in extremely high magnetic fields, reaching up to nearly 100 T. Within the ReMade@ARI project, two high-field facilities are participating: the High Field Magnet Laboratory (HFML) in Nijmegen, capable of generating static fields up to about 38 T, and the Dresden High Magnetic Field Laboratory (HLD), which can provide pulsed fields up to about 95 T. I will provide an overview of the experimental techniques available at these facilities for the characterization of new materials. Furthermore, I will present methods for characterizing materials with potential applications in cooling technology. Specifically, I will focus on measurements of the magnetocaloric effect, which can be used to investigate the adiabatic temperature change in a material under high magnetic fields, such as for example Gd [1]. These experiments are instrumental in identifying materials suitable for use in cooling devices.

[1] T. Gottschall, M. D. Kuz'min, K. P. Skokov, Y. Skourski, M. Fries, O. Gutfleisch, M. Ghorbani Zavareh, D. L. Schlagel, Y. Mudryk, V. Pecharsky, and J. Wosnitza, Phys. Rev. B **99**, 134429 (2019)