



VIRTUAL SEMINAR

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Ferrite-based magnets: taking a glance beyond the state of the art

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Permanent magnets (PM) are crucial elements in modern devices and enabling technologies as they allow storing, delivering and converting energy. The figure of merit of the PM is the maximum energy product (BH_{max}). The best PMs are based on rare-earths (RE) and reach BH_{max} values between 200-400 kJ/m³. The other two families of magnets (ferrites and Alnicos), barely grasp 45 kJ/m³. After the RE crisis has the criticality of RE brought forward the realisation that it is of great strategic, geographic and socio-economic importance to consider alternative magnets to fill this gap of moderate BH_{max} values. A novel, low-cost hybrid magnets based on ferrites/alnicos or any of their combinations with a BH_{max} between 50-200 kJ/m³ represent an interesting and viable solution to this challenge. On the one hand, the ferrite-based magnets could solve the problem of RE-free magnets with moderate BH_{max} values, but on the other, the brittleness of sintered ferrites is one of the significant drawbacks of this kind of magnets. The mechanical resistance of sintered ferrites is up till now in a way solved by production of bonded ferrites. But this leads to a lower BH_{max} values when comparing with the sintered magnets of the same volume. What if we would be able to exploit the best of both system? Employing toughening mechanisms to sintered hybrid ferrite-based magnets will lead to the low-cost magnets with improved mechanical resistance, thus taking another step toward the (partial) replacement of low-performance RE magnets.

Kindly invited.