Abstract Submitted
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Towards enhanced magnetocaloric effects: a combined experimental / computational methodology[1] KARL SANDEMAN, Imperial College London — A simple thermodynamic analysis shows that there is scope to double the adiabatic temperature change of d-metal magnetocaloric materials in a fixed change of magnetic field [1]. If found in a a real material, such an improvement in the MCE will have two important effects: to increase the final efficiency of the cooling device and to reduce the use of rare earth materials in the magnet that is used to drive the MCE. I will give examples of a methodology for the search for new magnetocaloric materials, combining neutron scattering studies with materials modelling. We have used this approach to understand magneto-elastic coupling at a fundamental level in both Mn-based and Fe-based tricritical metamagnets [2,3].

[1] K.G. Sandeman, Scr. Mater. 67 566 (2012).
[2] Z. Gercsi, K. Hono and K.G. Sandeman, Phys. Rev. B 83 174403 (2011) and references therein.
[3] Z. Gercsi et al., Phys. Rev. B 88 024417 (2013).

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