Abstract Submitted
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Tailored inter and intra layer exchange coupled superlattices for optimized magnetocaloric effect[1] TATHAGATA MUKHERJEE, S. MICHALSKI, R. SKOMSKI, D.J. SELLMYER, CH. BINEK, Department of Physics & Astronomy and the Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, NE, 68588-0111 — We explore Magnetocaloric (MC) properties of Fe/Cr superlattices with tailored inter- and intra-layer interaction using simple 3d metals. Our multilayers are fabricated by pulsed-laser deposition with emphasis on maximizing magnetic entropy changes near room temperature. Nanostructuring[2] allows tailoring ferromagnetic and antiferromagnetic coupling. This in concert with finite size scaling of the ferromagnetic Fe films has the potential to lead to optimized MC materials. Thermodynamic and MC properties of such Fe/Cr superlattices are studied with the help of SQUID magnetometry. Entropy changes are deduced via the Maxwell relation in single phase regions, X-ray diffraction and X-ray reflectivity are used to correlate structural data with the magnetic properties.

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[2]T. Mukherjee, S. Sahoo, R. Skomski, D. J. Sellmyer, and Ch. Binek, Phys. Rev. B **79**, 144406 (2009).

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