Abstract Submitted
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Order and topology in antiferromagnets with surfaces[1] MICHALIS CHARILAOU[2], FRANCES HELLMAN[3], Physics Department, University of California, Berkeley — We show using Monte Carlo simulations and mean-field theory that the antiferromagnetic (AFM) magnetization, arising from uncompensated spins, exhibits a unique thermodynamic behavior that differs from that of ferromagnets or of the Néel vector. More importantly, the net uncompensated magnetization is lower than that of the surface due to finite size effects. This phenomenon can be is manifested in thin films but it is in fact the same even in infinite systems with free surfaces, suggesting a topological order in uncompensated antiferromagnets. Moreover, we investigate the effects of defects and roughness on the magnetization of AFM and show that with increasing roughness the magnetization decreases non-monotonically and reaches values of only a few percent.

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