Abstract Submitted
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Thermodynamics of the 2D t-J Model WILLIAM PUTIKKA, Physics Department, The Ohio State University — Very accurate calculations for the temperature dependence of the energy of the 2D Heisenberg AF on a square lattice have been done recently. By combining the results of these calculations with the known low temperature behavior of the Heisenberg entropy and results from high temperature series expansions at higher temperatures the Heisenberg entropy can be accurately calculated for all temperatures. This allows the Heisenberg entropy to be used as a known quantity in the calculation of the doped t-J model entropy. The high temperature series for the entropies of the t-J, Heisenberg and spinless fermion models can be combined as $S_{tJ} - S_{AF}(J^*) - S_{SF}(n^*)$ to produce a small difference which can then be extrapolated to low temperatures. Here $S_{AF}(J^*)$ is the Heisenberg entropy evaluated at a shifted value of J and $S_{SF}(n^*)$ is the spinless fermion entropy evaluated at a modified density. By choosing J^* and n^* appropriately very good convergence for the series of the entropy differences can be obtained. The final t-J entropy is then found by readding the known functions $S_{AF}(J^*)$ and $S_{SF}(n^*)$. The integrated entropy is then fit to the high temperature free energy to find the ground state energy and the full temperature dependent free energy.

William Putikka
Physics Department, The Ohio State University

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