Talk 4, 16:40–

Ferromagnetic behaviour in the strongly interacting two-component spinor Bose gas

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Experiments with quantum atomic gases are opening up exciting possibilities to test many-body effects in low-dimensional quantum systems. In this talk I will discuss our recent investigation of the low temperature behaviour of the 1D strongly interacting two-component spinor Bose gas using the formalism of the thermodynamic Bethe Ansatz. The thermal properties of this model are influenced by spin ferromagnetic states, which are described by an effective ferromagnetic Heisenberg chain at low temperatures. The free energy, specific heat, susceptibility and local pair correlation are calculated in terms of temperature and interacting strength for various physical regimes. These thermodynamic properties reveal novel spin effects which are significantly different from those of the spinless Lieb-Lininger gas. The zero-field susceptibility for finitely strong repulsion exceeds that of the free spin paramagnet. Our results are consistent with predictions by Eisenberg and Lieb for polarized spinor bosons.