

Abstract Submitted  
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**Fluctuations in a Spin Chain and the Entanglement Hamiltonian**

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— How are quantum fluctuations and thermal fluctuations different in many-body systems? I will compare the variance of the fluctuations of spin in a segment of a spin chain in the ground state and at a finite temperature, showing that fluctuations in the ground state are much more correlated than in the thermal state. The full distribution function of spin can also be determined, and is non-Gaussian. These effects could possibly be measured in a chain of sodium atoms in an optical lattice. The method involves mapping the system to an imaginary thermal system called the “entanglement Hamiltonian.” Measuring the ground state fluctuations of the spin chain gives an indirect way of measuring the entanglement Hamiltonian.

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