A NEURAL NETWORK MODEL OF AN ISING SPIN GLASS

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The behaviour of an Ising spin glass (S = $\frac{1}{2}$) with infinite range interactions is modelled using a numerical simulation based on a neural network. Thermodynamic variables are defined on the network, and are found to obey the Thouless-Anderson-Palmer (TAP) theory when the applied field is zero. When a magnetic field is applied along the spin direction, complex field- dependent behaviour results, including a state in which the Edwards-Anderson order parameter is independent of temperature below the critical temperature.

9.7 cm

13.4 cm

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