

## Phase transitions in Ising chains

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An open question in the study of the spin-1/2 Ising model is the solution of the two-dimensional case in the presence of a magnetic field. A possible answer is based on the study of  $N$ -coupled linear chains in the limit of large  $N$ . Results reported in the literature show that a dimensional crossover from the one to the two dimensional model does not exist. However, what happens if one considers open boundary conditions (BC)? In this talk I show that, for an appropriate choice of the BC, a system of  $N$ -chains exhibits a ferromagnetic order characterized by a critical temperature which tends to the Onsager's one as  $N$  increases. It is then possible to study the phase diagram in the  $(T, h)$  plane and obtain a solution for finite magnetic field.