

Phase transitions for layered systems

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Abstract: I will discuss some of the results of a research project in collaboration with L.R. Fontes, D. Marchetti, I. Merola, and E. Presutti. We consider a system of Ising spins on $\mathbb{Z} \times \mathbb{Z}$, where on each horizontal line $\{(x, i), x \in \mathbb{Z}\}$ the interaction is given by a ferromagnetic Kac potential with coupling strength $J_\gamma(x, y) \sim \gamma J(\gamma(x - y))$. We then add a nearest neighbor ferromagnetic vertical interaction of small strength and investigate the occurrence of phase transition provided $\gamma > 0$ is small enough. Open questions and difficulties to treat more general systems will be discussed at the end.