



Numerical Analysis Seminar

A New Correlation Inequality for Ising models with external fields

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Abstract

We study ferromagnetic Ising models on finite graphs with an inhomogeneous external field, where a subset of vertices is designated as the boundary. We show that the influence of boundary conditions on any given spin is maximised when the external field is identically 0. One corollary is that spin-spin correlations are maximised when the external field vanishes and the boundary condition is free, which proves a conjecture of Shlosman. In particular, the random field Ising model on Z^d , $d \geq 3$ exhibits exponential decay of correlations in the entire high temperature regime of the pure Ising model. Another corollary is that the pure Ising model in $d \geq 3$ satisfies the conjectured strong spatial mixing property in the entire high temperature regime. This is a joint work with Jian Ding and Rongfeng Sun.

Date: November 2, 2021 (Tuesday)

Time: 4:00 - 5:00pm (Hong Kong Time)

Venue: Room 210, Run Run Shaw Bldg., HKU
and

ZOOM: <https://hku.zoom.us/j/>

Meeting ID: 913 6532 3891

Password: 310656



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