

1114-81-207

Amanda Young* (amyoun@math.ucdavis.edu) and **Bruno Nachtergaele**. *Applications of a Modified Martingale Method for Estimating Spectral Gaps*. Preliminary report.

We introduce a form of the martingale method for estimating the spectral gap of a quantum spin system that relies on an increasing sequence of frustration free Hamiltonians rather than an increasing sequence of finite volumes. In particular, this new form is more easily applied to systems with periodic boundary conditions and we use it to prove a non-vanishing spectral gap for finitely correlated state models with periodic boundary conditions and a unique ground state. Further applications to AKLT type models in one and two dimensions with both open and periodic boundary conditions are in progress. This research is supported in part by the National Science Foundation under Grant DMS-1515850. (Received August 27, 2015)