

GIBBSIAN APPROACH TO SOME MODELS OF ANHARMONIC CRYSTALS

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I will discuss a class of gradient models with anharmonic potentials that defy a number of results that are known to hold in the convex case. This includes the possibility of having multiple ergodic measures for a given tilt or failure of convexity of the surface tension as a function of the tilt. Other results—e.g., convergence of fluctuations to Gaussian Free Field in the usual scaling limit—in turn hold (but with a distinct limit for each coexisting ergodic gradient Gibbs measure). The key step in understanding these models will be the characterization of ergodic measures by means of a Gibbs variational principle.

The talk is based on joint papers with R. Kotecky and H. Spohn, and on a recent work by the presenter.