Spin chains of Haldane-Shastri type and a generalized central limit theorem

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Abstract:
We shall discuss how the density of energy levels of a wide class of finite-dimensional quantum systems tends to a Gaussian distribution as the number of degrees of freedom increases. Our result will be based on a variant of the central limit theorem which is especially suited to models whose partition function is explicitly known. In particular, we shall prove that the level density of several spin chains of Haldane–Shastry type is asymptotically Gaussian when the number of sites tends to infinity, as suggested by previous numerical experiments.

References: