

Simple Quantum-Chaotic toy system mimic a range of real nuclear phenomena.

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Small quantum mechanical systems like the atomic nucleus exhibit a wide range of phenomena that are easily described by intuitive models. We see nuclei sometimes behave as deformed spinning charge distributions, or rigid objects vibrating. We can see them behave as clusters of alpha particles. These phenomena are inferred from the spectra of the nucleus. However, a toy model of N bosons on a one or two level system experiencing random 2-body interactions, exhibits the same spectral signatures [1]. In this talk we will start with a simple introduction to the relevant nuclear spectroscopic ideas, and then introduce the toy model and see the results. Hopefully the open questions can be discussed and maybe even answered!

- [1] *Order, collectivity, structured yrast lines, and correlated energies in random bosonic systems*, Phys. Rev. C 112, 014319