

Nuclear level densities

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Atomic nuclei at low excitation energy are characterized by the motion of pairs of nucleons, known as Cooper pairs, moving in time reversed orbitals. This picture becomes much more complicated as Cooper pairs are broken by collective (Coriolis force) or intrinsic (temperature) excitations. In this talk we will focus on the statistical properties of the system as function of the number of excited nucleons.

The Oslo group has investigated level densities for ~30 nuclei, from silicon and up to lead. The so-called Oslo method is based on particle-gamma coincidences in light ion reactions with one charged ejectile. By the use of the Brink-Axel hypothesis, the level density can be extracted from the primary gamma-ray spectra, which are measured at all initial excitation energies up to the neutron binding energy.

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