

Nuclear Level Density at High Spin and Excitation Energy

A.N. Behkami and Z. Kargar

Physics Department, Shiraz University, Shiraz 71454, Iran

(Received: 2001-2-15; Revised:)

Abstract: The intensive studies of equilibrium processes in heavy-ion reaction have produced a need for information on nuclear level densities at high energies and spins. The Fermi gas level density is often used in investigation of heavy-ion reaction studies. Some papers have claimed that nuclear level densities might deviate substantially from the Fermi gas predications at excitations related to heavy-ion reactions. The formulae of calculation of the nuclear level density based on the theory of superconductivity are presented, special attention is paid to the dependence of the level density on the angular momentum. The spin-dependent nuclear level density is evaluated using the pairing interaction. The resulting level density for an average spin of $52 \hbar$ is evaluated for ^{155}Er and compared with experimental data. Excellent agreement between experiment and theory is obtained.

PACS: 21.10.Ma

Key words: Level density, high spin and excitation energy

[\[Full text: PDF\]](#)

Close