PAIRING FLUCTUATIONS IN ATOMIC NUCLEI

J. LUIS EGIDO

Departamento de Física Teórica, Universidad Autónoma de Madrid
E-28049 Madrid, Spain

Pairing fluctuations are self-consistently incorporated at the same footing as the quadrupole deformations in present state of the art calculations including particle number and angular momentum conservation as well as configuration mixing. The approach is complemented by the use of the finite range density dependent Gogny force which, with a unique source for the particle-hole and particle-particle interactions, guarantees a self-consistent interplay in both channels.
We have applied our formalism to study the role of the pairing degree of freedom in the description of the most relevant observables like spectra, transition probabilities, separation energies, etc. We find that the inclusion of pairing fluctuations mostly affects the description of excited states, depending on the excitation energy and the angular momentum. $E0$ transition probabilities experiment rather big changes while $E2$'s are less affected.
Genuine pairing vibrations are thoroughly studied with the conclusion that deformations strongly inhibits their existence.
These studies have been performed for a selection of nuclei: spherical, deformed and with different degrees of collectivity.