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HFB3+CHICON: Large-scale PES generation with an axial HFB solver for structure and fission studies.

In this talk, a new open-source solver for the nuclear Hartree-Fock-Bogoliubov (HFB) equations will be presented. This solver uses a double set of HO solutions as its basis, allowing an accurate description of highly elongated nuclear states using a relatively small number of basis states. The implemented nucleon-nucleon effective interactions are of D1x, D2x Gogny types. The solver is written in C++, and can be used from the command line or from Python scripts.

Then the new CHICON tool will be presented. This tool computes large-scale Potential Energy Surfaces (PES) for any number of collective coordinates. PESs with up to 3 collective coordinates generated on CEA's supercomputers will be showcased.

Finally, we will discuss the physical results concerning the microscopic description of nuclear fission: static results related to the PES itself (barrier heights, fission paths, fragment properties, ...) and dynamical ones computed using the TDGCM+GOA method with the FELIX code (fission yields, ...).

This toolchain has been used to interpret some of the experimental results obtained during SOFIA's latest measurement campaign.

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