

Internship in experimental nuclear physics

Kinematics reconstruction and acceptance determination of the fission fragments in the VAMOS++ & FALSTAFF combined setup

The fission process is a violent reaction in which a heavy nucleus is split in two fission fragments. More than 300 different isotopes are produced from one fissioning system and their relative production is strongly determined by the nuclear structure along with the nuclear dynamics that drives the system from an initial state to the final split break-up through different states of deformation.

Nowadays, the experimental access to the complete identification of fission fragments is still very challenging and this prevents a complete understanding of the fission process. The FALSTAFF spectrometer offers a new opportunity to identify fission fragments in terms of mass, nuclear charge and velocity vector.

An experiment using FALSTAFF at the VAMOS++ spectrometer will be performed in March 2022 aiming at the study of the fission process of minor actinides produced in inverse kinematics. This experiment will benefit from the combined setup to measure both fragments at the same time from different incoming channels, either fusion-fission or transfer-fission. The main goal of the M2 internship will be the reconstruction of the kinematics of the reactions, on an event basis, through the inversion of the magnetic transport of VAMOS++ and the determination of the acceptance of the setup.

Expected skills

nuclear and particle physics, C++

This work can be pursued by a PhD-thesis

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