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Experimental Fission Campaigns at VAMOS++

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The fission process has intrigued physicists for a long time from both experimental and theoretical perspectives. From a qualitative point of view, it is well established that nuclear structure strongly influences the production of fission fragments at low excitation energies. However, the large deformations reached by the system and the complex fission dynamics that drive it from a single object to two separated fragments have so far prevented a quantitative microscopic description of the process.

Considerable effort has been devoted over the past decades to modeling nuclear fission. In this context, the ongoing inverse-kinematics fission program at GANIL, using the VAMOS++ magnetic spectrometer, has contributed by providing new and unique experimental data. These data combine information from the entrance channel—such as measurements of the excitation energy of the fissioning system—with information from the exit channel, including isotopic fission-fragment yields.

The experimental setup has undergone continuous improvements, allowing increased accuracy in the measured observables and providing access to new quantities, such as pre-neutron evaporation data. In addition, new experimental techniques have been implemented to expand the range of accessible fissioning systems.

A global overview of the experimental techniques used at VAMOS to study both actinide and pre-actinide fission will be presented, together with the most significant results obtained so far.

Type of contribution

Invited Speaker

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