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Fission Studies with VAMOS and FALSTAFF Spectrometers.

The experimental investigation of fission was focused on neutron-induced fission, in which flux of neutrons is sent to a stable heavy target where the fission process takes place. In the direct kinematics, because of the fission fragments' low velocity, only the full identification of mass distribution of the fragments was possible. In 1994, K.-H. Schmidt, et al.[1] introduced a new technique, inverse kinematics, in which a heavy nuclei beam will be sent to a light target. In this manner, the fission process takes place in flight. In VAMOS (VAriable MOde Spectrometer) at GANIL, the inverse kinematics technique is used to access the nuclear charge information and high-resolution fragment mass. With the VAMOS magnetic spectrometer, only one fission fragment can be identified at a time. In experiment e826 (which took place in March 2022), the FALSTAFF (Four Arm cLover for the Study of Actinide Fission Fragments) spectrometer had used to detect the second fission fragment. The FALSTAFF spectrometer is a new setup based on low-pressure gaseous detectors and offers a new opportunity to identify fission fragments in terms of mass, nuclear charge and velocity vector. With the help of both spectrometers, both fission fragments can be measured simultaneously. In this experiment, a 238U beam was used as a projectile impinging into an Al and a Be target. This poster will present the analysis performed in the VAMOS and FALSTAFF spectrometers in order to determine the full identification of both fission fragments and the resolutions achieved in both cases.

[1] K.-H. Schmidt et al. "Low-energy fission studies of neutron-deficient projectile fragments of 238 U". Phys. Lett. B, 325:313, 1994.

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Classification de thématique: Nuclear Dynamics