

## Development of low pressure TPC within the FIPPS project.

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The FIPPS (Fission Product Prompt gamma-ray Spectrometer) project was presented during the Vision 2020 conference in Grenoble in 2010 and is now part of the ILL ENDURANCE program. It addresses two fundamental domains of nuclear physics: fission of heavy elements and structure of neutron rich matter. Neutron capture induced reactions provide a valuable way to investigate these domains. The present ILL instruments Lohengrin and GAMS have over the years made a valuable contribution to this field. Since these very specific instruments have limitations in solid angle, access to time scales and sample environment, a complementary instrument would overcome these limitations and complement the existing Nuclear Physics instrument suite at the ILL.

FIPPS consists of a high efficiency gamma detector array surrounding a fission target with a thick backing, coupled to a fission fragment spectrometer based on a gas filled magnetic (GFM) device. The new instrument will be positioned at an external neutron beam at the ILL. The combined spectrometer will give access to new nuclear spectroscopy information of neutron-rich nuclides by tagging the complementary fragment and new insight into the fission process via combined measurements of mass A, nuclear charge Z, kinetic energy  $E_k$  and excited states .

The final design of the magnet is ongoing. It includes the possibility to accommodate different additional instrumentation for particle tracking (positioning, TPC,  $dE/dx$ , TOF) inside the magnet itself. In particular, the TPC option would allow the individual 3D tracking of the fragments maximizing the angular acceptance of the spectrometer without compromising the mass resolution. However, the working principal of a gas-filled magnet requires for TPC to be used with light gases at low pressure (10-50 mbar). Such a possibility is under study and preliminary results of experiments with a Micromegas TPC prototype performed at the Lohengrin mass spectrometer will be discussed. A conceptual design of the new FIPPS instrument will also be presented.

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