

## **Fission Product Prompt gamma-ray Spectrometer, a new instrument for the ILL**

The FIPPS (Fission Product Prompt gamma-ray Spectrometer) project is 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 suitable way to investigate these domains. FIPPS will complement the existing Nuclear Physics instrument suite at the ILL.

FIPPS consists of a high efficiency Ge 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 a finely collimated halo-free thermal 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 population of excited states.

The magnet design includes the possibility to accommodate different additional instrumentation for particle tracking (positioning, TPC,  $dE/dx$ , TOF) inside the magnet itself. In particular, the TPC (time projection chamber) option would allow the individual 3D tracking of the fragments maximizing the angular acceptance of the spectrometer without compromising the mass resolution. In addition, the magnet is designed to be moveable to other facilities such as the IFMIF/ELAMAT facility for studies using fast neutrons. The new ILL instrument FIPPS as well as the working principle of a gas-filled magnet with a TPC option will be discussed.