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# Development of Gas Filled Magnet for FIPPS phase2

The future upgrade of the FIPPS [1] (FIPPS phase2) aims to i) explore the exotic neutron-rich nuclei region of the nuclear chart with higher selectivity ii) explore the dynamics of the fission process such as generation of spin in fission. To achieve this goal, detection and identification of the fragments produced after neutron induced fission is necessary independent from multiple gamma-ray coincidences.
Thus a new ancillary detector is required to detect the mass of the fission fragments with good resolution (δA< 4 amu at A = 150), while maintaining a large geometrical and momentum acceptance (> 50 msr and ΔP/P > 10%).
The Gas-Filled-Magnet (GFM) technique has been proposed based on experiment at LOHENGRIN [2], to obtain a good mass resolution (< 4 amu at A=150) and a large geometrical and momentum acceptance (> 50 msr and Δ P/P > 10%). An innovative design consisting of a 1/r magnetic field index and Thales circle-shaped entrance and exit magnet edges is proposed which reduces the need for complicated tracking detectors. Current stage feasibility study of realistic magnet design and optimization of the fission fragment separation, magnet size and weight are being carried out. The characteristic of the magnet will be presented using realistic magnetic field calculations using and GEANT4 Monte-Carlo simulations.
[1]Michelagnoli, C, et al., EPJ Web of Conf. 193 (2018) 04009
[2]A. Chebboubi, et al., Nucl. Instr. Meth. B 376 (2016) 120

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