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DEVELOPMENT OF NEW PASTIS COILS BASED ON A HALBACH RING PAIR

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The existing XYZ field system for PASTIS at TOPAS (FRM-2) has several disadvantages. It has residual blind spots, a limited vertical acceptance angle, and limited access for ^3He cell installation. To solve these disadvantages, a prototype of a Halbach ring pair for the horizontal X and Y fields, is currently under development. This prototype will be used with a Helmholtz coil for the Z field to provide a holding field for the wide-angle ^3He analyzer cells. Two Halbach rings are planned, each of which will provide a field in the horizontal plane. The rings can be rotated relative to each other to cancel the horizontal field.

The goal of this project is to develop a prototype of a Halbach ring pair and a Helmholtz coil that is compatible with the TOPAS detector tank and sample environment geometry. This will enable us to determine the feasibility of the mechanical design and whether the actual field gradients measured in our magnet laboratory align with the developed FEM models.

Additionally, we can directly test the T_1 lifetime of the polarized ^3He cell.

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