Status on the development of the ^{3}He-LIG system

M. Holloway, G. Tabacaru, D. Melconian, G.E. Morgan, D. McClain,
B.M. Vargas-Calderon, and V.E. Iacob

The He-LIG is a system to produce and transport radioactive isotopes for use in TAMUTRAP. Isotope production takes place in a gas cell and the ions are then injected into a sextupole ion guide (SPIG) by the gas pressure.

The design for the He-LIG/p-LIG insulating table has been completed (see Fig. 1). The current design fulfills the insulating requirements for the necessary high voltage while maintaining alignment capabilities for beam entry and exit. The needed off-the-shelf parts and remaining raw materials have been ordered.

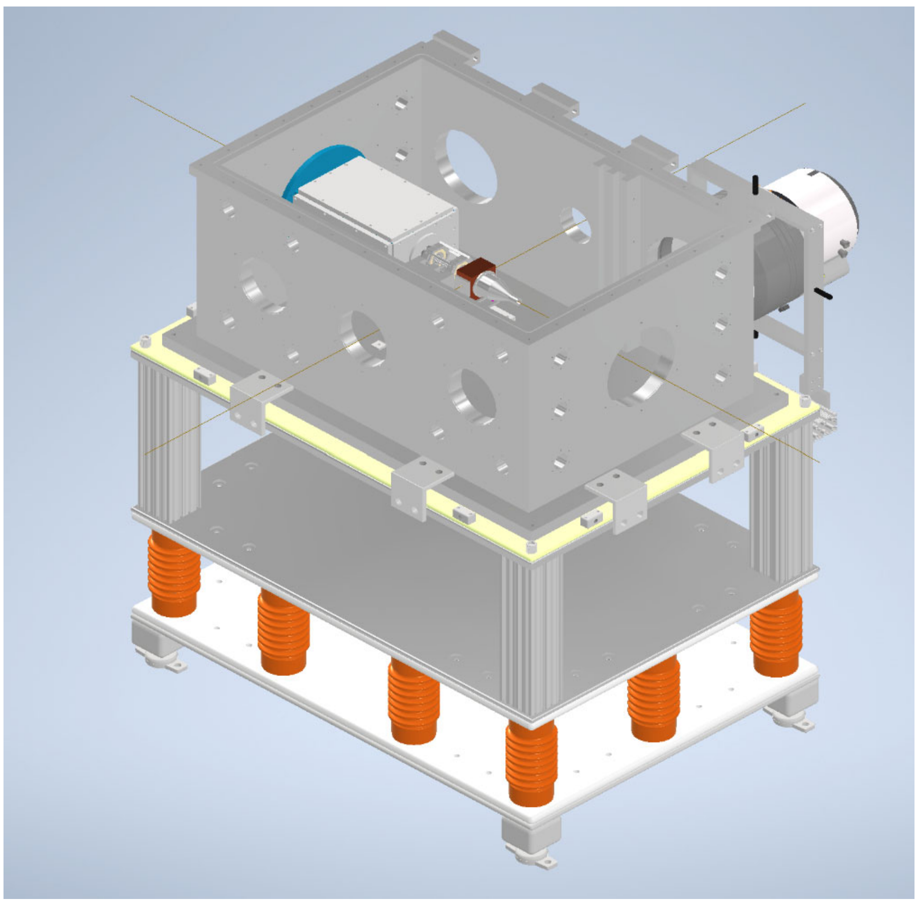

Fig. 1. The He-LIG/p-LIG box and insulating support structure.

Design work has also been completed for the He-LIG Gas Cell, the primary SPIG, and the first differential pumping chamber (Fig. 2). The remaining beamline design work involves combining SPIGs for ion transport to LSTAR with a second differential pumping system after the He-LIG box.

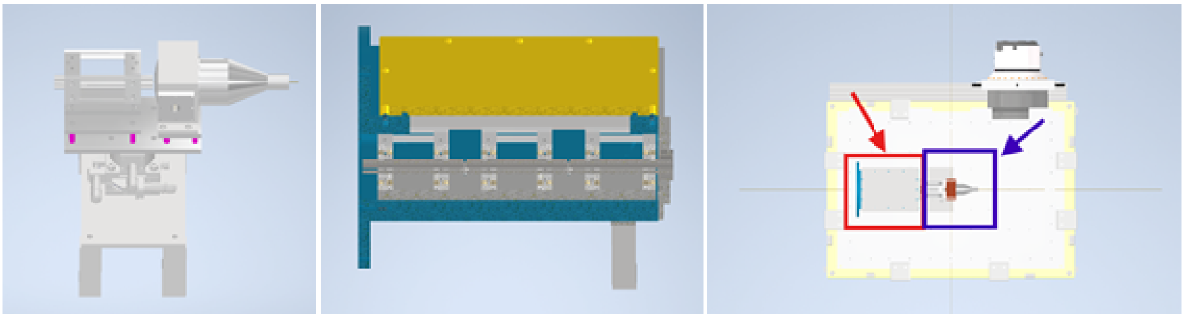

Fig. 2. AutoCAD drawings of the gas cell with SPIG inside of the He/p-LIG chamber. Shown is a zoom in of the gas cell and SPIG (left) to transport the RIB to a differentially-pumped chamber housing a 2nd SPIG (middle). On the right is a top view of the two within the He/p-LIG chamber.

The final issue to address for the He-LIG is the removal of the helium used in the gas cell. The large footprint of the current roots blower pumps combined with the space constraints of Cave 5 are obstacles to providing the necessary insulation for floating the roots blowers to the 75kV needed for LSTAR. There are two paths to remedy this that are currently being explored in parallel: Purchasing a suitable new roots blower with a smaller footprint that can be properly insulated or constructing a step-down voltage pumping pipe to connect the current pumps to the vacuum system that will be floated to high voltage. A prototype pipe has been constructed and testing is currently ongoing.