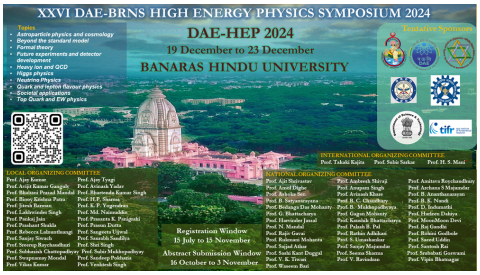

Contribution ID: **417** Type: **Postar**

Study of MPGD based Micromegas Detectors using Ansys and Garfield++

Micro pattern gaseous detectors (MPGDs) represents cutting edge technology in particle detection that is crucial for applications in medical imaging, security screening, and particle physics. These detectors improve the accuracy and efficiency of gas-based particle detection by using electrodes with fine scale patterns, usually on the range of tens to hundreds of micrometers. One kind of MPGD that provides a high level of sensitivity and spatial resolution is called MICRO MEsh GAseous Structure (MICROMEGAS). The detector is made up of two areas divided by a micromesh, a type of metal mesh. The micromegas detector's control parameters include the kind of gas, shape, and materials employed. The detector has a number of issues that need to be fixed, including ion backflow, gain stability, discharge, and lower transparency. Geometry of micromegas has been replicated with the help of simulation software Ansys Maxwell and Ansys Mechanical APDL. Analysis related to the electric field has been done using Ansys Maxwell. For the study related to ion-backflow and gain of the detector, Mechanical APDL and Garfield^{++} has been used. Variation of electric field is studied for the different geometrical parameters like hole diameter, pitch size and strip width. Same analysis has been done for the ion-backflow and the gain of the detector. These findings provides insights into optimizing the detector's geometry for improved performance.

Field of contribution

Experiment

Author: RANA, Sachin (Tata Inst. of Fundamental Research (IN))

Presenter: RANA, Sachin (Tata Inst. of Fundamental Research (IN))

Track Classification: Future experiments and detector development