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Development of glass Resistive Plate Chambers for INO experiment

The India-based Neutrino Observatory (INO) collaboration is planning to build a massive 50kton magnetised Iron Calorimeter (ICAL) detector, to study atmospheric neutrinos and to make precision measurements of the parameters related to neutrino oscillations. Since ICAL will be able to distinguish neutrino events from anti-neutrino events by detecting the sign of the produced muon, it will also be possible to study the earth matter effect and thereby the neutrino mass hierarchy problem. This detector is also being planned to use as a very long base line detector during the neutrino factory era.

Glass Resistive Plate Chambers (RPCs) of about 2m $\Box$ 2m in size are going to be used as active elements for the ICAL detector. We have fabricated a large number of glass RPC prototypes of 1m $\Box$ 1m in size and have studied their performance and long term stability. In the process, we have also developed and produced a number of components required for fabrication of RPCs such as polycarbonate spacers, buttons and gas nozzles as well as pickup strip panels. We have also designed and optimised a number of fabrication and quality control procedures such as a pneumatic jig for assembling gas gaps. A suitable structure to house the gas gap along with its pickup panels, front-end electronics etc. is also being designed.

In this talk we will review our various activities towards development of glass RPCs for the INO ICAL detector. We will present results of the characterisation studies of the RPCs and discuss our plans to prototype 2m $\Box$ 2m sized RPCs.

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