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Preliminary results on optimization of gas flow rate for RPCs

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The India-based Neutrino Observatory (INO) collaboration is planning to build a 50kt magnetized iron calorimeter (ICAL) detector using glass Resistive Plate Chambers (RPCs) as active detector elements. A stack of 12 glass RPCs of 1mx1m in area was developed to study and characterize the performance of the RPCs. In this paper, we describe the study carried out for the optimization of gas flow using this prototype stack. The gas flow was stopped up to about 3 months and RPC parameters were studied during this period. Rate of increase in the RPC's strip rate and their dark current was found to be correlated with the leak rate of its gas gap. With leak free RPCs, reducing the refreshing frequency by a factor of 30 was found possible, without compromising on the RPC performances.

Primary author: Mr KALMANI, Suresh (Tata Institute of Fundamental Research)

Co-authors: Dr SAMUEL, Deepak (Tata Institute of Fundamental Research); Mr BHUYAN, Manas (Tata Institute of Fundamental Research); Prof. MONDAL, Naba (Tata Institute of Fundamental Research); Mr SHINDE, Ravindra (Tata Institute of Fundamental Research); Dr BHEESETTE, Satyanarayana (Tata Institute of Fundamental Research); Mr PAL, Sumanta (Tata Institute of Fundamental Research)

Presenter: Mr KALMANI, Suresh (Tata Institute of Fundamental Research)

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