Effect of relative humidity on the long-term operation of a single mask triple GEM chamber

S. Chatterjee*, A. Sen, S. Das, S. K. Ghosh, S. Biswas
Department of Physics, Bose Institute, Kolkata, India

- **Long-term stability study is performed with a Single Mask triple GEM chamber**
  - → Drift gap, transfer gaps and induction gap are kept at 3 mm, 2 mm and 2 mm respectively
  - → Operated with Ar/CO_2 gas mixture in 70/30 volume ratio
  - → Irradiated with Fe^{55} X-ray source (~ 20 mCi) of characteristic energy 5.9 keV at a rate of 2 kHz/mm^2
  - → ΔV across each of the GEM foils ~ 405 V
- **Normalisation of gain and energy resolution is performed to eliminate the effects of temperature (T = t+ 273 in K) and pressure (p in atm) variations**
- **No significant correlation is obtained with the T/p normalised gain and energy resolution with the relative humidity (RH)**
- **Data taking with longer period of time is ongoing and any possible correlation of detector performance with RH will be investigated**