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Experiments using VECC Penning trap, cryogenic operation and future outlook

The Penning trap has become an essential component of Radioactive Ion Beam facilities due to its potential to manipulate ions, resulting in high-resolution beam purification. It is an incredibly powerful tool for high-precision mass measurement and trap-assisted spectroscopy. The techniques employed in trap-assisted studies are highly efficient and sensitive, allowing for the separation and isolation of a small number of ions of interest for further study. In this context, a detailed understanding of the basic principles and techniques employed in trap-assisted studies will be presented.

A cryogenic (4K) Penning Trap is operational at VECC. Experiments performed with trapped electron cloud using Penning trap assembly at both room temperature and 4K will be presented. Indigenous developments and modifications have led to trapping of electron cloud upto 800 seconds at a pressure 5x 10-10 mbar in VECC Penning Trap. Spin-off from this developmental work and future steps to utilize exotic ions from ANURIB will be discussed.

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