

Retarding Potential Analyzer: a versatile tool to measure effects of ion beam interactions with background gas

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The High Current experiment (HCX) is a 1 MeV linear DC accelerator that provides a K^+ ion beam current of 180 mA for 5 μ s. It constitutes an excellent platform to measure beam interaction with walls and background gas. We placed a Retarding Potential Analyzer (RPA) inside a gap between quadrupole magnets, where the beam potential of ≈ 2200 V traps electrons and expels ions (from ionized gas). The trapped electrons are then expelled at the end of the pulse, when the beam potential decreases. We will show that the RPA is a versatile tool to measure particle balance and study the effects of electron accumulation.

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