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Title

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Beam-background gas total cross-section measurements with a retarding field analyzer*

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The High-Current Experiment (HCX) at LBNL is a driver scale single beam injector that provides a 1 MeV K^+ ion beam current of 0.2 A during 5 μ s for high energy density physics and heavy ion fusion. We developed a new technique to measure the beam-background gas total cross-section in a high-current accelerator using a retarding field analyzer. The beam-background gas interaction will produce cold ions by ionization and charge exchange. The ions are radially expelled in few hundreds of microseconds by the space-charge beam potential of ~ 2000 V. Due to the lack of data in the literature at the energy range of interest (1 MeV K^+), we intentionally leaked different gases and measured the total cross-sections. The experimental data will be compared with theoretical predictions.

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