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Pulse Stretching Out of the CANREB EBIS

The CANadian Rare isotope facility with Electron-Beam ion source (CANREB) at TRIUMF is set to deliver rare isotope beams in high charge states. In the Electron Beam Ion Source (EBIS) ions are charge-bred by collisions with an electron beam of up to 500 mA. A strong magnetic field (up to 6T) maximizes the overlap between ions and electron beam and increases the breeding efficiency. Ion confinement is maintained by a combination of an electrostatic field and the electron beam space-charge potential. Ions are released by lowering the trapping potential with a step function. The system is operated at a pulse repetition frequency up to 100 Hz. Due to the short trap length, this fast extraction scheme produces pulses shorter than 10 μ s with high instantaneous rates that can saturate detectors in experiments. Stretching the pulse can be done using a slowly varying voltage function to modify trap electrode potentials instead of a step function. The ideal function produces a pulse with a flat top distribution and can be calculated by knowing the ion energy distribution inside the trap. The latest pulse stretching results will be discussed including the latest pulse durations up to 1.4 ms that have been produced. The slow extraction scheme has also been used for a measurement of the effective energy distribution of the ions inside the trap.

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Yes

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