

Charge Exchange Extraction at the Experimental Storage Ring ESR at GSI, K. BECKERT, H. EICKHOFF, B. FRANZKE, F. NOLDEN, H. REICH, M. STECK, T. WINKLER, GSI Darmstadt -

At the storage ring ESR the charge exchange extraction of an electron cooled beam of highly charged heavy ions was successfully demonstrated. Fully stripped Gold ions were injected with an energy of 300 MeV/u, decelerated to 80 MeV/u and cooled with the electron cooler. Due to radiative recombination with free electrons inside the cooler, hydrogen like Gold is breded continuously. These ions are of higher rigidity and therefore circulating on a different orbit inside the storage ring. This well separated orbit offers the opportunity to deflect specifically the hydrogen like Gold ions with a small movable septum magnet and afterwards extract them out of the storage ring. This method allows a slow extraction whereby the rate can be controlled over a wide range by varying the electron current in the cooler. For a given rate the emittance and the momentum spread of 0.01 % of the extracted beam is one order of magnitude smaller than for a direct extraction out of the heavy ion synchrotron SIS.