Contribution ID: **204**   Type: **Oral presentaion**

On-line Operation of the EBIT Charge Breeder of the ReA Post-Accelerator

Friday 20 October 2017 09:30 (20 minutes)

The electron-beam ion trap (EBIT) charge breeder of the ReA post-accelerator at the National Superconducting Cyclotron Laboratory (Michigan State University) started on-line operation in September 2015. During the past years, the EBIT charge bred many pilot beams of stable isotopes (e.g., ^{39}K, ^{85}Rb) and several rare-isotope beams (e.g., ^{46}Ar, ^{46}K, ^{34}Ar, ^{47}K, ^{37}K) for the nuclear-physics program. A unique operating aspect of the ReA EBIT is the breeding of high charge states to reach high re-accelerated beam energies. Efficiencies in single charge states of more than 20% were measured with ^{47}K^{17+} and ^{34}Ar^{15+} with efficiencies integrated over all charge states of more than 65%. Breeding high charge states demands long breeding times, increasing the ejected ion number per pulse. Another unique operating aspect is the ability to spread the distribution in time of the ejected ions to lower the instantaneous rate delivered to experiments. Pulse widths were stretched from 25 microseconds up to 70 milliseconds. This presentation summarizes the current status of the ReA EBIT system and shows the results of charge-breeding efficiency measurements and time stretching of ejected pulses obtained with stable- and rare-isotope beams over the first two years of on-line operation.

Author: Dr LAPIERRE, Alain (National Superconducting Cyclotron Laboratory (Michigan State University))

Co-authors: Dr VILLARI, Antonio C. C. (National Superconducting Cyclotron Laboratory (Michigan State University)); Dr SUMITHRARACHCHI, Chandana (National Superconducting Cyclotron Laboratory (Michigan State University)); Mr CRISP, Daniel (National Superconducting Cyclotron Laboratory (Michigan State University)); Dr BOLLEN, Georg (National Superconducting Cyclotron Laboratory (Michigan State University)); Dr LUND, Kasey (National Superconducting Cyclotron Laboratory (Michigan State University)); Dr LINHARDT, Laura E. (National Superconducting Cyclotron Laboratory (Michigan State University)); Dr STEINER, Mathias (National Superconducting Cyclotron Laboratory (Michigan State University)); Dr ZHAO, Qiang (National Superconducting Cyclotron Laboratory (Michigan State University)); Dr RINGLE, Ryan (National Superconducting Cyclotron Laboratory (Michigan State University)); Mr NASH, Samuel (National Superconducting Cyclotron Laboratory (Michigan State University)); Dr WILLIAMS, Scott J. (National Superconducting Cyclotron Laboratory (Michigan State University)); Dr SCHWARZ, Stefan (National Superconducting Cyclotron Laboratory (Michigan State University)); Ms SUMMERS, Tasha (National Superconducting Cyclotron Laboratory (Michigan State University))

Presenter: Dr LAPIERRE, Alain (National Superconducting Cyclotron Laboratory (Michigan State University))

Session Classification: 11th Session

Track Classification: Radioactive ion beams, charge breeders and polarized beams