



Contribution ID: 45

Type: **Talk**

## Transmission for high intensity heavy ion beams in the AGOR cyclotron

*Thursday, 10 May 2012 15:15 (20 minutes)*

Experiments with short-lived Ra nuclides require high intensity heavy ion beams such as  $^{206}\text{Pb}$  at 8.5 MeV/amu. During acceleration charge exchange with rest gas occurs. Charge exchanged particles eventually hit the walls of the cyclotron, leading to desorption, which in turn gives rise to vacuum degradation. This positive feedback process leads to a deterioration of the transmission, limiting the maximum extracted intensity. To define a mitigation strategy we investigated the beam loss dynamics. Charge exchange cross-sections are calculated using semi-empirical models. Orbit calculations were done to track lost ions. Simulations show for a single charge exchange near extraction, particles hit the perimeter at shallow angles of incidence. Remaining particles require multiple charge exchanges before they too hit the perimeter. Ion induced desorption was measured for different beams at an energy of 8 MeV/amu, incident on materials representative of the cyclotron interior. We will discuss simulation and experiment results, comparison of ion-induced desorption data with existing models, and a new model being developed.

### Please indicate preferred presentation (poster or talk?)

Talk

**Primary author:** Mr SEN, Ayanangsha (Kernfysisch Versneller Instituut)

**Co-authors:** Dr GOETHEM, Marc Jan van (Kernfysisch Versneller Instituut , Groningen); Dr HOFSTEE, Mariet (Kernfysisch Versneller Instituut , Groningen); Prof. BRANDENBURG, Sytze (Kernfysisch Versneller Instituut , Groningen)

**Presenter:** Mr SEN, Ayanangsha (Kernfysisch Versneller Instituut)

**Session Classification:** Technology