

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Modeling the FTICR-MS signal of a ${}^7\text{Be}$ Ion Plasma using a 2D PIC code M. TAKESHI NAKATA, GRANT W. HART, BRYAN G. PETERSON, ROSS L. SPENCER, Brigham Young University — Beryllium-7 (${}^7\text{Be}$) decays only by electron capture into Lithium-7 (${}^7\text{Li}$) with a half life of 53 days. As a result, changing its electronic structure will affect its decay rate. We desire to study the effect of ionization on its decay rate. We will do this by trapping a ${}^7\text{Be}$ ion plasma in a Malmberg-Penning Trap and measuring its and ${}^7\text{Li}$'s concentration as a function of time by using Fourier transform ion cyclotron resonance mass spectrometry (FTICR-MS). We use this ratio as a function of time to directly measure the decay rate of the confined ion plasma rather than using gamma detection. We have modeled these signals in a 2-dimensional electrostatic particle-in-cell (PIC) code. The two spectrum peaks coalesce at high densities and at low densities they can be resolved. The coalesced peak linearly shifts with the relative abundances of each species. We have also modeled ${}^7\text{BeH}$ and ${}^7\text{Li}$ at high densities. These two spectrum peaks shift with the relative abundances of the two species. The progress of this investigation will be presented.

M. Takeshi Nakata
Brigham Young University

Date submitted: 14 Jul 2008

Electronic form version 1.4