Abstract Submitted for the 4CF07 Meeting of The American Physical Society

Modeling the FTICR-MS signal of a ⁷Be Ion Plasma using a 2D PIC code M. TAKESHI NAKATA, GRANT W. HART, BRYAN G. PETERSON, ROSS L. SPENCER, Brigham Young University — Beryllium-7 (⁷Be) decays only by electron capture into Lithium-7 (⁷Li) 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 ⁷Be ion plasma in a Malmberg-Penning Trap and measuring its and ⁷Li'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 merges at high densities and at low densities they can be resolved. We also plan to model ⁷BeH⁺ and ⁷Li at high densities to see if we can differentiate between them. The preliminary results of these investigations will be presented.

M. Takeshi Nakata Brigham Young University

Date submitted: 14 Sep 2007

Electronic form version 1.4