



Contribution ID: 22

Type: **Poster Presentation**

Towards sympathetic cooler for HCl using laser-cooled Ca ions

Tuesday, 12 May 2015 17:00 (0 minutes)

The long-term goal of the Penning trap system of RAON is to obtain an order of magnitude higher mass accuracy for short-lived rare isotopes. For that purpose, we are developing a sympathetic cooler for highly charged ions exploiting laser-cooled Ca ions. We chose the Ca ions as the coolant because the light sources for cooling Ca ions are readily available in the markets. We installed a prototype octagon chamber with Ca atom source, Paul trap, and helical resonator for high voltage RF supply etc. Laser system is composed of three extended cavity diode lasers (423, 397, 866 nm) plus one UV laser (375 nm). Optical frequency stabilization setup is made up of wavelength meter, multichannel fiber switch and PXI system with 8-channel analog outputs. Resonant ionization experiment for Ca atomic beam was performed. With the ionization signal against the laser frequency, we were able to deduce the atomic velocity distribution and the temperature of the atom source. After the successful observation of photoionization signal, we applied RF voltage to the trap electrode and cooling lasers directing to the center of the trap at 45 degree with respect to the trap axis. The number of laser cooled Ca ions was estimated to be about 100,000 from the image of laser-cooled ion bunch. Our experimental setup and the preliminary results for Ca cooling experiment will be presented in detail at the conference.

Primary author: Dr PARK, Young-Ho (Institute for Basic Science)

Co-authors: Dr KIM, Gi Dong (Institute for Basic Science); Dr YOON, Jin Woo (RISP, Institute for Basic Science); Dr IM, Kang-Bin (Institute for Basic Science); Prof. KIM, Yong Kyun (Institute for Basic Science)

Presenter: Dr PARK, Young-Ho (Institute for Basic Science)

Session Classification: Poster Session B