The current status of 28 GHz ECR ion source at KBSI

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Introduction

- VIBA (Versatile Ion Beam Accelerator) is a compact linear accelerator facility using 28GHz ECR ion source developed at KBSI (Korea Basic Science Institute).
- VIBA gives the researchers a chance to collaborate in low-energy ion beams application.

Upgrade of 28 GHz ECR ion source system

Bias disk

- After first operation, the bias disk was damaged by a high temperature of the plasma.
- Replace the bias disk with a cooling system.

Extraction system

- Changed the extraction system, because the arc was produced in 1 part and changed the electrode(2) to increase a beam efficiency.

Electro-magnetic force issues in SC magnet for ECRIS

- After FEM simulation, we recognized that it is necessary to reinforce the structure at the coil ends of the hexapole coil. So the end of the hexapole coils was fixed with an aluminum ring.

Changed of SC magnet system

- By inserting the inner yoke in the hexapole magnet, the radial field of SC magnet was increased from 2.0T to 2.3 T.
- The operating current was lowered from 263 A to 230 A by using the inner yoke.

Preliminary result of ion beam at ECRIS

- We successfully produced heavy ions beams in a multi-charged state using 1 kW of microwave power at 28 GHz gyrotron. Spectrums were measured by new diagnosis system (see poster #166)

Building construction

- VIBA building construction project was started from 2015. If VIBA is installed in this site until 2018, we hope to support various researchers using low-energy ion beams.

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