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## **First Results of the 2.45 GHz Oshima Electron Cyclotron Resonance Ion Source**

Toyohisa Asaji,<sup>1</sup> Natsuki Murakami,<sup>2</sup> Yuta Nakahara,<sup>2</sup> Takeshi Hitobo,<sup>3</sup> Tsubasa Nakamura,<sup>2</sup> Muneo Furuse,<sup>2</sup> Takashi Uchida,<sup>4</sup> Masayuki Muramatsu,<sup>5</sup> and Yushi Kato<sup>6</sup>

<sup>1</sup>*National Institute of Technology, Toyama College, Toyama, Japan*

<sup>2</sup>*National Institute of Technology, Oshima College, Yamaguchi, Japan*

<sup>3</sup>*Tateyama Machine Co. Ltd., Toyama, Japan*

<sup>4</sup>*Bio-Nano Electronics Research Centre, Toyo University, Kawagoe, Japan*

<sup>5</sup>*National Institute of Radiological Sciences (NIRS), Chiba, Japan*

<sup>6</sup>*Graduate School of Engineering, Osaka University, Osaka, Japan*

*Corresponding Author: Toyohisa Asaji, e-mail address: asaji@nc-toyama.ac.jp*

A new electron cyclotron resonance ion source has been built at Oshima College (Oshima-ECRIS). The design was described in the previous paper [1]. A 2.45 GHz magnetron microwave source and permanent magnets were adopted as basic components. Since we focus on industrial applications using middle charged ions, it is necessary to develop high-efficiency techniques of the ion production with a low-cost and low-power ion source. In addition, a solid-state amplifier at 2.5-6.0 GHz was installed to study two-frequency plasma heating. Three solenoid coils were set up for adjusting axial magnetic fields. We have conducted argon plasma generation and the ion beam production for the first year. Ion saturation current densities in the ECR plasma were measured with a biased disk. For 2.45 GHz and 4.65 GHz two-frequency plasma heating, the ion density was 1.4 times higher than 2.45 GHz single-frequency heating. The difference of plasma emission regions due to ECR zones is clear from those plasma photos. After that, we have extracted Ar ion beams and the mass spectra of those have been analyzed with a sector magnet. The details will be reported.

[1] T. Asaji, et al., Rev. Sci. Instrum. 85, 02A940 (2014).