Contribution ID: **195** Type: **Poster presentation**

A Study on the Dielectric Design of High Voltage Platform for Developing 28 GHz ECRIS at KBSI

Monday 16 October 2017 18:45 (15 minutes)

Currently, the 28 GHz electron cyclotron resonance ion source (ECRIS) has been developed to produce a high current heavy ion at korea basic science institute (KBSI). The high voltage platform of 28 GHz ECRIS is essential to deliver an ion beam to the next acceleration stage. In order to ensure the electrical safety, the high voltage platform has been designed considering dielectric characteristics. In this paper, a study on the dielectric characteristics of glass fiber reinforced plastic (GFRP) is performed to determine the thickness of GFRP tube located between plasma chamber and inner bore of cryostat. The dielectric experiments on GFRP tube are conducted under DC voltage. Sphere-to-plane electrode systems are used to examine the dielectric characteristics. Also, the relationship between the dielectric characteristics of GFRP tube and the distribution of electric field intensity is calculated and analyzed by the finite elements method (FEM).

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Session Classification: Poster Session 1

Track Classification: Production of highly charged ion beams