

Production of carbon ion at electron cyclotron resonance ion source for high energy carbon ion radiotherapy

Tuesday, 12 November 2019 10:30 (1h 30m)

Carbon-ion radiotherapy (C-ion RT) using Heavy Ion Medical Accelerator in Chiba (HIMAC) has been carried out in National Institute of Radiological Sciences (NIRS-QST) since 1994. Over 12000 cancer patients have been treated with carbon beams having energies of between 56-430 MeV/u. A 10 GHz electron cyclotron resonance ion source, named NIRS-ECR, is used for production of carbon ion at HIMAC. There is a carbon stacking in the plasma chamber and insulator for beam extraction. Therefore, we needed cleaning of NIRS-ECR two times per year until September 2018. In order to increase an operation time for C-ion RT, we change operation parameters for production carbon ion. Usually, CH₄ gas is used for production of carbon ion. We decreased the gas flow with enough beam current for medical use. As a result, we could operate during one year with small stacking of carbon to the insulator compared previous parameters. However, we found new problem about starting of the NIRS-ECR. Plasma is not turn on during about 10 minutes in starting. We increase the gas flow a little since September 2019. Improvement of carbon ion production with long life time at NIRS-ECR for C-ion RT will be described.

Primary author: Dr MURAMATSU, Masayuki (National Institutes for Quantum and Radiological Science and Technology)

Presenter: Dr MURAMATSU, Masayuki (National Institutes for Quantum and Radiological Science and Technology)

Session Classification: Poster Session