



MT 26
International Conference
on Magnet Technology
Vancouver, Canada | 2019

Contribution ID: 795

Type: **Poster Presentation**

Tue-Af-Po2.24-10 [109]: A hybrid compensation method for ICT high voltage power supply

Tuesday 24 September 2019 14:00 (2 hours)

Insulated core transformer (ICT) electron accelerator offers many advantages including high efficiency of energy conversion, high-power output, low cost, and high reliability. It is a superior type of E-beam systems for the radiation processing applications in the low energy region (<1MeV). The ICT power supply is the core component of the electron accelerator. The structure of the ICT cores is segmented, and it results in large magnetic flux leakage at the gaps of the cores. Therefore, the output voltages of different disks are non-uniform, which highly affected the performance of the ICT power supply. In order to reduce the non-uniformity caused by the magnetic flux leakage, a hybrid compensation method with optimizing the turns of the secondary coils and using dummy primary coils mounted on the top of the ICT is presented in this paper. For an 800keV/50mA ICT power supply, the compensation scheme is designed, and the parameters are also optimized. The result shows the consistent output high voltage of each disk is achieved and the non-uniformity is better than 5% from no-load to full-load when the output high voltage is 800kV. This design effectively improves the uniformity of the electrical field distribution, increases the utilization of the rectifier components and reduces the size of the power supply.

Author: JIANG, Can (Huazhong University of Science and Technology)

Co-authors: YANG, Jun (Huazhong University of Science and Technology); Mr LIU, Tao (Huazhong University of Science and Technology); Mr XI, Cheng (Huazhong University of Science and Technology); Mr LIANG, Hui (Huazhong University of Science and Technology)

Presenter: JIANG, Can (Huazhong University of Science and Technology)

Session Classification: Tue-Af-Po2.24 - Novel and Other Applications II