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

Contribution ID: **770** Type: **Poster Presentation**

# Wed-Mo-Po3.04-03 [23]: Structure Optimization of The Fast Scanning Magnets for Proton Therapy

*Wednesday 25 September 2019 09:30 (1h 45m)*

A new proton therapy facility is under development in Huazhong University of Science and Technology.Scanning magnets play an important part in this facility, which affect the size of the radiation field by controlling the trajectory of the proton beam.Two independent dipole magnets, magnet X and magnet Y, scan the beam in horizontal and vertical, respectively.In order to reduce the temperature rise of the coil, the tapered air gap of magnet Y which is compatible with the envelope of the proton beam deflected by the magnet X is considered.In this paper, Software simulation have carried out to design two dipole magnets, mainly on the tapered air gap structure optimization of magnet Y.The local and integrated field quality have been optimized.As two dipole magnets are excited by alternating currents, excitation current and repetition frequency should be taken into account, which can cause the temperature rise of the magnets.The static and dynamic electromagnetic simulation were carried out.The thermal simulation was also carried out to analyze the effect of the eddy current.The dynamic behaviors of the two dipole magnets were analyzed and the way to reduce the effects of the eddy currents was proved to be useful.

**Author:** ZHANG, Zhongqi (Huazhong University of Science and Technology)

**Co-authors:** TAN, Ping (Huazhong University of Science and Technology); LI, Xingyu (Huazhong University of Science and Technology)

**Presenter:** ZHANG, Zhongqi (Huazhong University of Science and Technology)

**Session Classification:** Wed-Mo-Po3.04 - Medical Applications