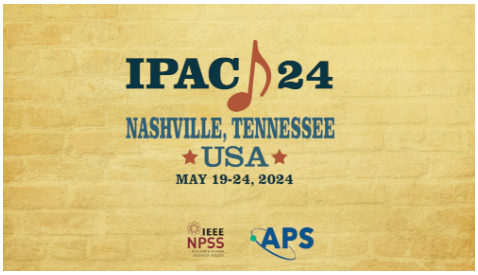

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Measurements of hysteretic effects and eddy currents on a FeCo magnet for the design of a novel ion gantry

Tuesday, 21 May 2024 16:00 (2 hours)

Hadron therapy uses scanning magnets to precisely deliver therapeutic beams, minimizing the damage to healthy tissues and reducing side effects. A collaboration between CNAO, CERN, INFN and MedAustron is developing an innovative gantry design with superconducting magnets and a downstream scanning system. The project features two compact scanning dipoles, each with a central field of 1 T –about three times higher than current magnets used in clinical practice. The heightened magnetic field, together with the large rate of varying currents required for operation during treatments, prompts an investigation into non-linearities, necessitating a careful study of their impact on the performances of the system. This contribution provides insights into the dynamic behavior of a prototype scanning magnet with a FeCo yoke, with measurements of saturation, hysteretic effects, and eddy currents performed at Frascati National Laboratories, elucidating the feasibility of the proposed model. Additionally, in view of clinical implementation, the study explores methods of fast degaussing.

Footnotes

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