



Contribution ID: 2334 Contribution code: THPM008

Type: **Poster Presentation**

Status of the field mapping system design for the C400 cyclotron

Thursday, 11 May 2023 16:30 (2 hours)

NHa and IBA are collaborating to develop a new cyclotron dedicated to hadron therapy. The manufacturing of the magnet is in an advanced stage. In parallel, extensive studies are carried out to develop an accurate field mapping system. It is required to perform the high precision magnetic field measurement (75 ppm) that will provide the final isochronous field after the well-known shimming procedure.

Due to the wide pole diameter (1.8 m), the large magnetic field amplitude and the numerous shims, a technology based solely on Hall probe would request too much time of operation and a mismatch to perform a full mapping of the magnetic field in what is considered a reasonable time.

For this reason, a new system based on a dual search coil is under design. The two coil geometries will enable to match the different gradient regimes and granularity requirements present over the pole surfaces. In addition to the moving coils, an NMR probe will be included to provide the reference absolute measurement together with a Hall probe to confirm the data recorded through the search coils.

In this report, the status of the new mechanical system providing the probe motion will be presented but the article focuses on the modelling of the search coil response as a function of its geometrical form factor. The aim is to evaluate and control the potential errors induced by the measurement of such averaged flux over the coil inner volume in case of very inhomogeneous fields.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: MAUNOURY, Laurent (Normandy Hadrontherapy)

Co-authors: CAILLIAU, Philippe (Ion Beam Applications SA); DEPRES, Sebastien (Ion Beam Applications SA); KOFFEL, Laurent (Ion Beam Applications SA); MANDRILLON, Jerome (Ion Beam Applications SA); MINE, Nicolas (Ion Beam Applications SA); NUTTENS, Vincent (Ion Beam Applications SA); PARADIS, Yves (Ion Beam Applications SA); Dr VELTEN, Philippe (Normandy Hadrontherapy)

Presenters: MAUNOURY, Laurent (Normandy Hadrontherapy); Dr VELTEN, Philippe (Normandy Hadrontherapy)

Session Classification: Thursday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T31: Subsystems, Technology and Components, Other