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Dimensional and thermal design of the electrostatic chopper for the new ISIS MEBT

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The electrostatic chopper for the new ISIS MEBT is a fast deflecting device to create gaps in the beam coming out of the RFQ, which will improve the trapping efficiency when injecting the beam into the ISIS synchrotron. The electromagnetic design of the chopper was initially developed to define its functional specifications, shape and dimensions, and it was presented elsewhere. A dimensional sensitivity study was developed to estimate the maximum acceptable thermal loads due to the beam loss (used later in the thermal model) and to ensure that the electric field shape and strength were still valid. Dimensional tolerances were defined based on the sensitivity study. Thermal calculations and models were required to ensure that the electrodes were properly cooled for the expected beam loss in the diverse working and failure situations, and to ensure that the hot beam dump inside the chopper was not indirectly overheating the electrodes. The mechanical design and manufacturing were carried out according to the results from the previous analyses, and the details are presented elsewhere.

Footnotes

Funding Agency

Paper preparation format

Word

Region represented

Europe

Primary author: Dr RODRIGUEZ, Iker (Science and Technology Facilities Council)

Co-authors: SPEED, Jonathan (Science and Technology Facilities Council); LAWRIE, Scott (Science and Technology Facilities Council)

Presenter: Dr RODRIGUEZ, Iker (Science and Technology Facilities Council)

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