

# Study of manufacturing errors in 750 MHz RFQ using electromagnetic simulations

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As an initial part of a future linac for hadron therapy, two 750 MHz Radio Frequency Quadrupoles (RFQs) have been preliminarily designed by CERN, based on the compact HF-RFQ model. These RFQs aim to accelerate carbon ions from 15 KeV/u to 5 MeV/u. Each RFQ is composed of four individual modules.

Manufacturing imperfections and misalignments can result in local variations in the frequency and electromagnetic field distribution within the RFQs. In this study, we focus on analyzing the electromagnetic sensitivity to possible modifications in the structure of a single RFQ module. Additionally, we evaluate how the combination of these irregularities can generate significant dipole errors, even when they remain within the specified dimensional tolerances. For this purpose, electromagnetic simulations are conducted using CST Studio.

## Footnotes

## Funding Agency

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