



Contribution ID: 5

Type: **Parallel Session (Contributed Oral) talk**

Optimization of Ion Transport in a Combined RFQ Cooler with Axial Magnetic Field

Tuesday 21 September 2021 07:15 (20 minutes)

The accurate mass spectrometry (with resolution goal 1:20000) of exotic ions requests beams with low energy spread (goal is about 0.5 eVrms or lower) and low transverse emittance; so it is necessary to cool ions produced by a spallation source of a factor from 5 to 10. In a radiofrequency (rf) quadrupole cooler (RFQC), collisions decrease ion kinetic energy, while rf and bias voltages confine and reaccelerate ions towards the extraction, where the cold ion beam is formed. Operation is based on carefully chosen voltage tunings, and among others: the dependence on ion species and gas pressure, which requests an adequate pumping system; the difficult design of an efficient ion extraction, which critically depends on residual ion speed. Progresses in the experimental setup are described. Indications from simple ion tracing, ion+collision tracing and some limited Monte Carlo simulations are compared. Results are applied to the comparison of triode and tetrode design of the extraction system.

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