

Measurement of phase-space density evolution in MICE, the Muon Ionization Cooling Experiment.

Authorship annotation

The author is the chair of the speakers bureau of the MICE Collaboration and will identify a member of the collaboration to present the contribution, if accepted-

Session and Location

Wednesday Session, Poster Wall #64 (Auditorium Gallery Right)

Abstract content

MICE will demonstrate feasibility of the ionization cooling technique proposed to cool the muon beam at a future neutrino factory or muon collider. Position and momentum reconstruction of each muon in a sample by high precision sci-fibre trackers in a solenoid, before and after the cooling cell, provides several alternative figures of merit in addition to beam emittance. Contraction of the phase-space volume of the sample, or equivalently increase in phase-space density at its core, is an unequivocal cooling signature. Single-particle amplitude, defined as a weighted distance to the sample centroid, can be used to probe the change in density in the core of the beam. Alternatively, non-parametric statistics provide reliable methods to estimate the entire phase-space density distribution and reconstruct probability contours. These techniques, robust to transmission losses and sample non-linearities, are ideal candidates for a cooling measurement. Preliminary results are presented here.

Poster included in proceedings:

yes

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