## IPAC'24 - 15th International Particle Accelerator Conference



Contribution ID: 1494 Contribution code: WEPR34

Type: Poster Presentation

# An engineering prototype of a late stage ionization cooling cell for a muon collider

Wednesday 22 May 2024 16:00 (2 hours)

Achieving the low emittances necessary for a muon collider requires ionization cooling. Much of that cooling occurs in compact cooling cells where superconducting coils and conventional RF cavities are closely interleaved [1]. The real challenges for these cooling cells reside in their engineering challenges: high field solenoids, RF cavities, and absorbers, often designed near technological limits, placed in close proximity to each other. We thus propose to build a prototype ionization cooling cell to demonstrate the capability of constructing an ionization cooling channel reaching the lowest emittances and to provide engineering input for the design of such beamlines. The magnets and cavities will be powered at their design values, and an absorber will be included along with a mechanism for heating the absorber similarly to how a beam would.

### Footnotes

[1] D. Stratakis and R. B. Palmer, "Rectilinear six-dimensional ionization cooling channel for a muon collider: A theoretical and numerical study", Phys. Rev. ST Accel. Beams 83, 031003 (2015).

# **Funding Agency**

This work has been supported by the U.S.\ Department of Energy under contract nos.\ DE-SC0012704, DE-AC02-07CH11359, DE-AC02-05CH11231, and DE-AC02-76SF00515.

## Paper preparation format

LaTeX

#### **Region represented**

North America

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Session Classification: Wednesday Poster Session

**Track Classification:** MC1: Colliders and other Particle and Nuclear and Physics Accelerators: MC1.A09 Muon Accelerators, Neutrino Factories, Muon Colliders