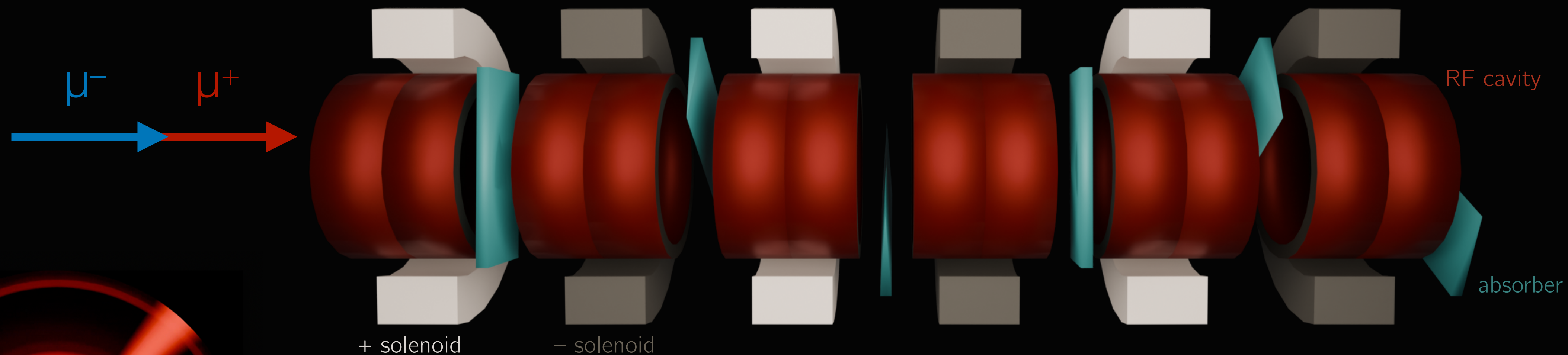
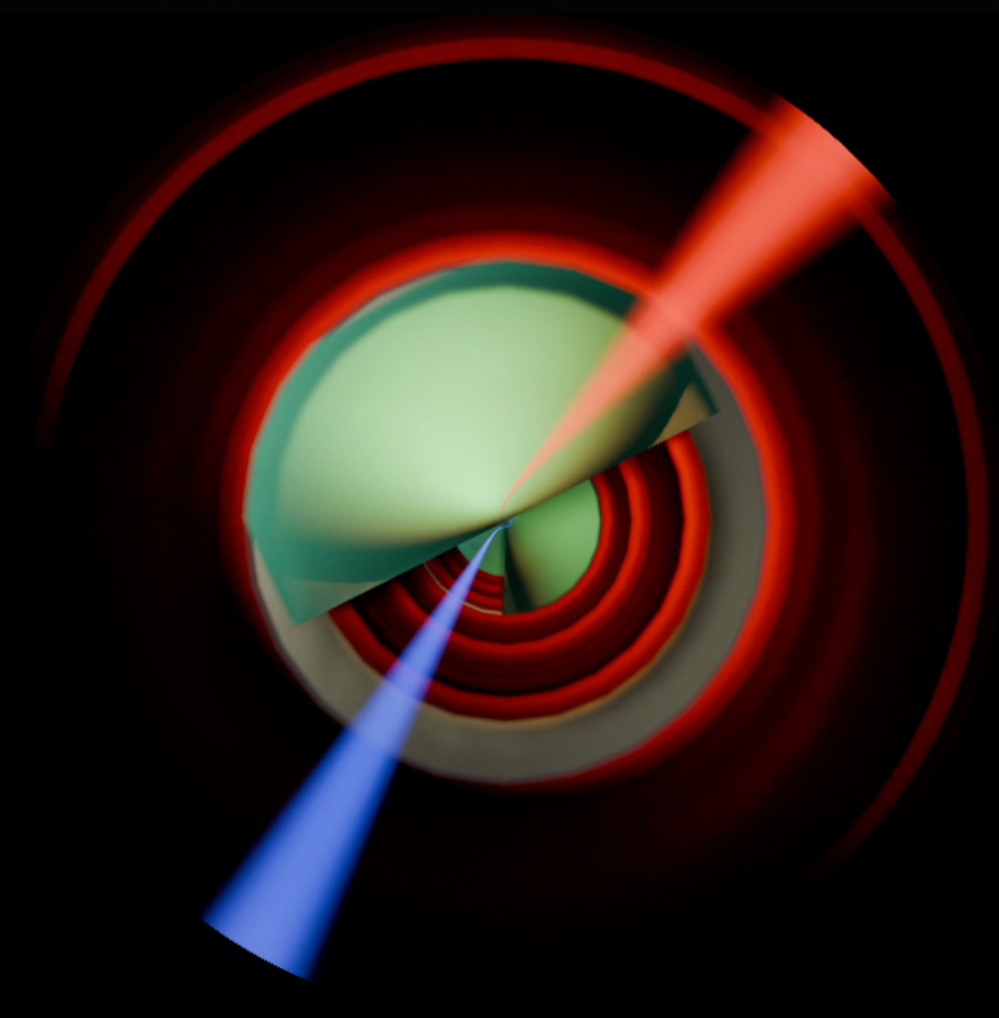


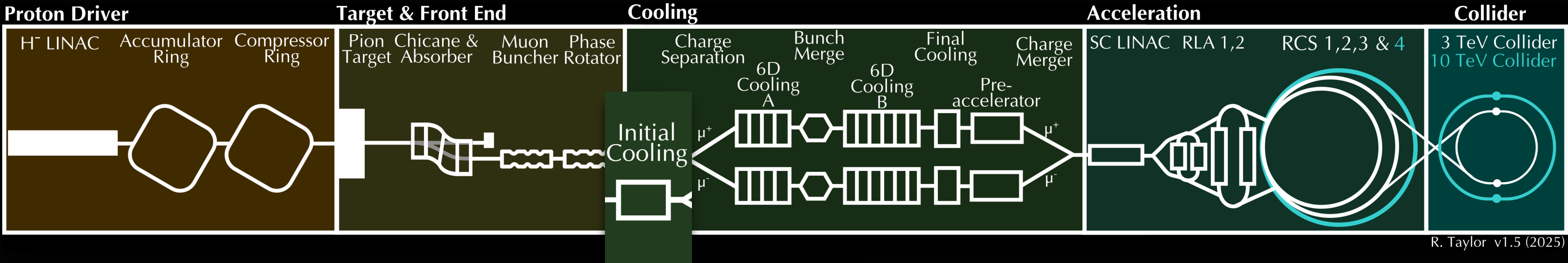
The Helical FOFO Snake (HFOFO) is a design for 6D cooling of μ^+ and μ^- in a single channel, enabling improved transmission rate during charge separation and reduced construction costs for a muon collider.



One period in the HFOFO lattice



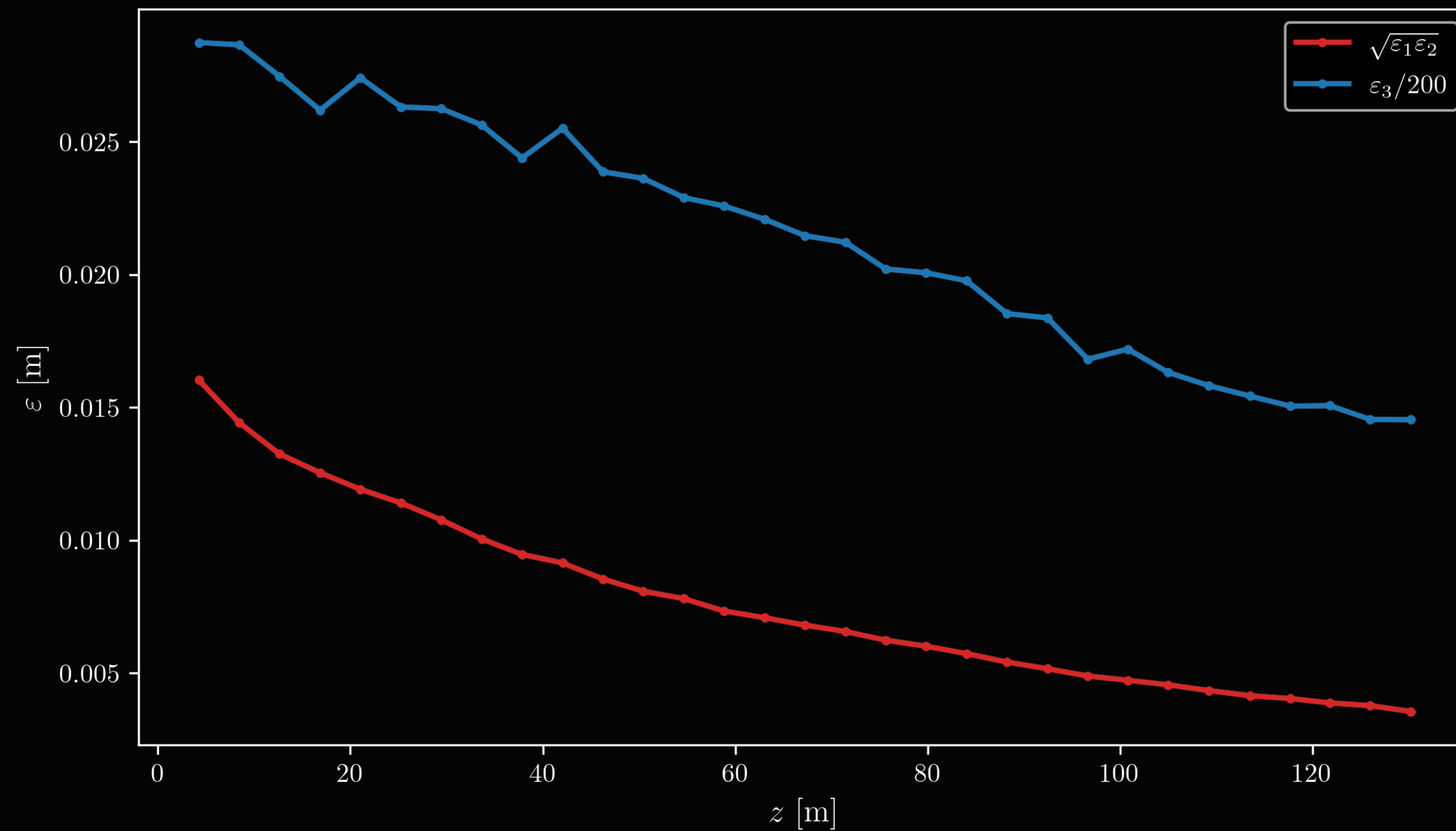
A frame in an animation of μ^+ and μ^- orbits in HFOFO



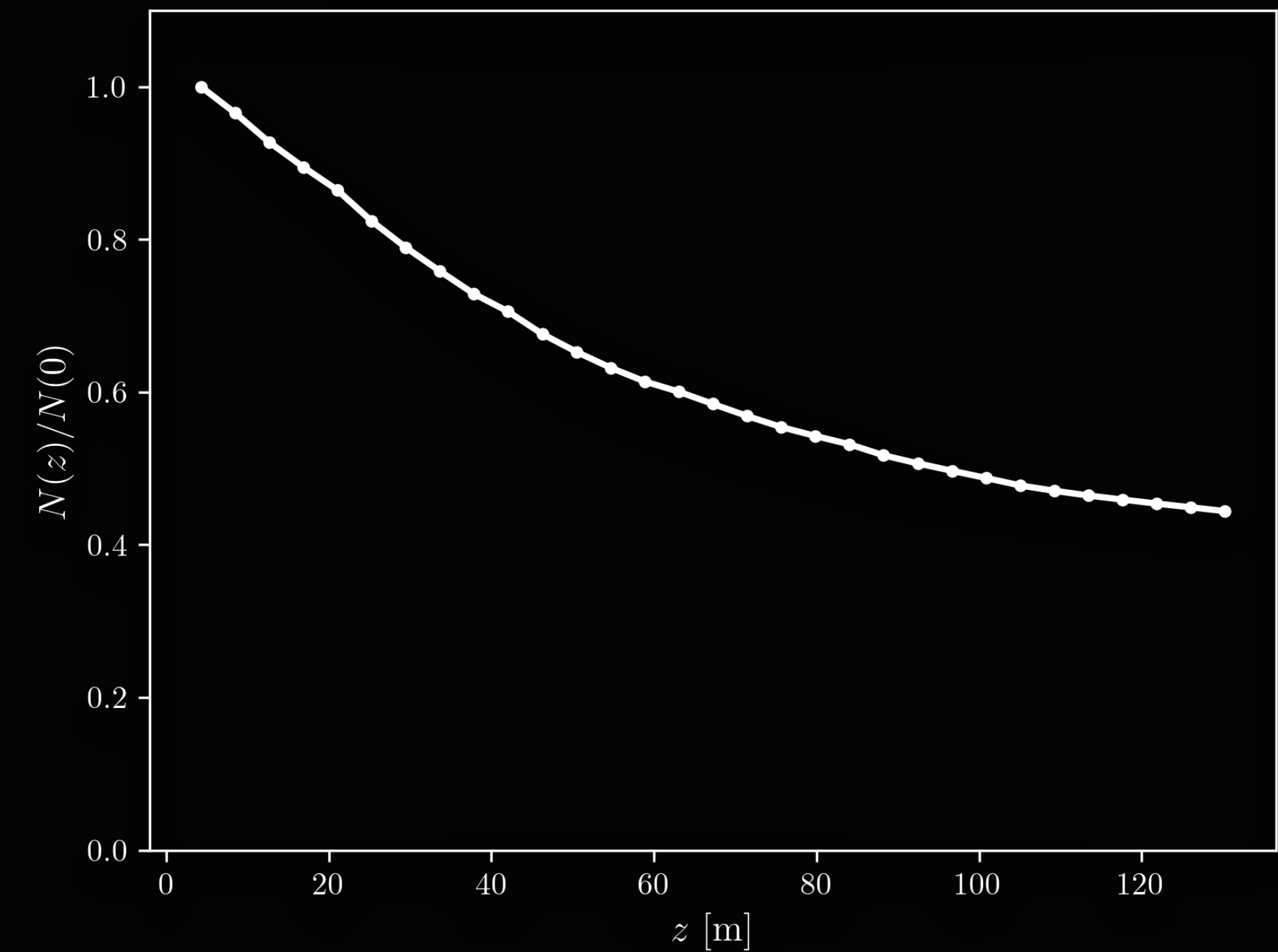
R. Taylor v1.5 (2025)

Location of HFOFO in the muon collider accelerator complex

Current status: We observe an order of magnitude in emittance reduction with a beam transmission rate of 67% in the current design.



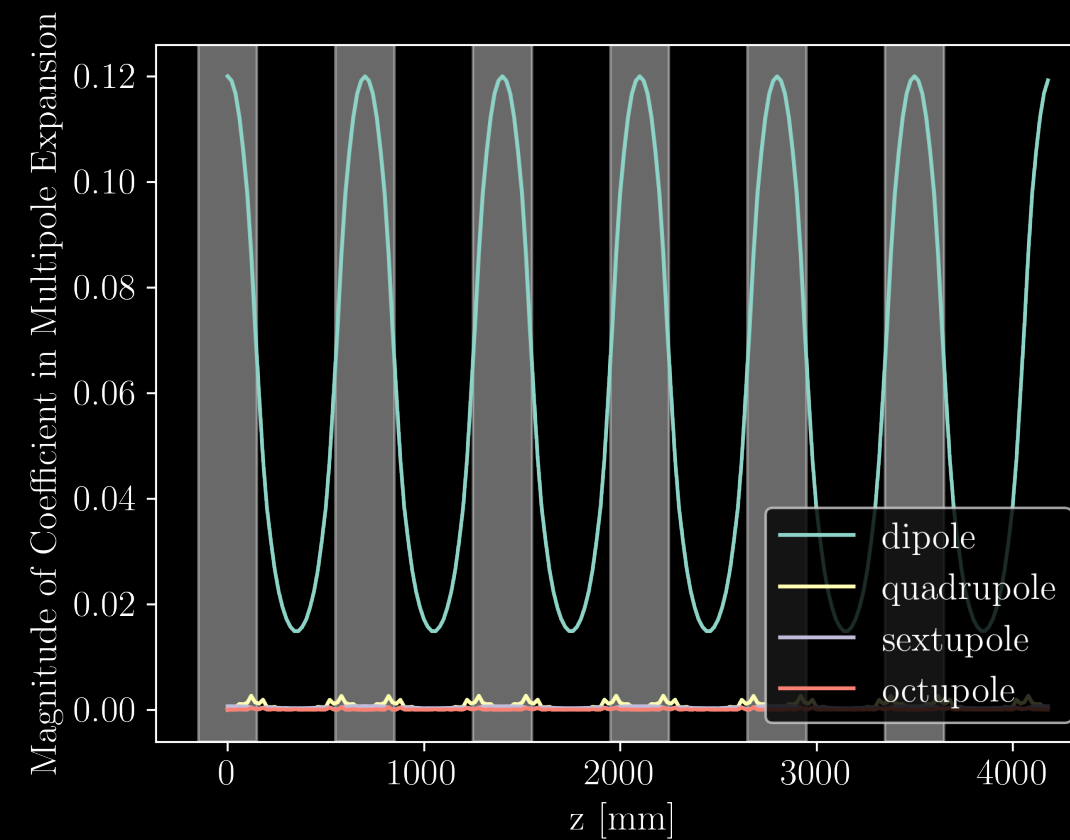
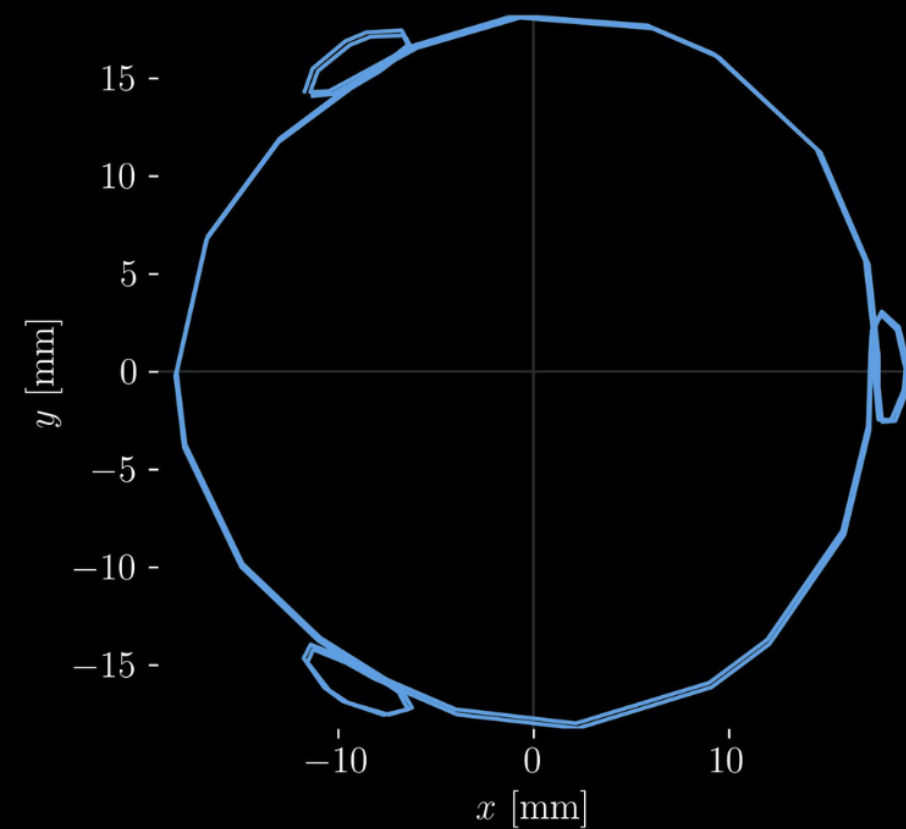
Eigenmode emittances (ε_1 and ε_2 are transverse, and ε_3 is the longitudinal mode)



Muon survival rate along the HFOFO channel

My research this summer will comprise the following studies, which are aimed at optimizing cooling performance and physical realizability of the HFQFO design.

1. Building a **periodic design**
(sans total momentum scaling)



2. Replacing solenoid rotations
with **multipoles**

3. Developing a more robust
matching procedure

