Status Update

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THE UNIVERSITY OF TENNESSEE KNOXVILLE

SIMONS FOUNDATION

USMCC

Muon Ionization Cooling – HFOFO

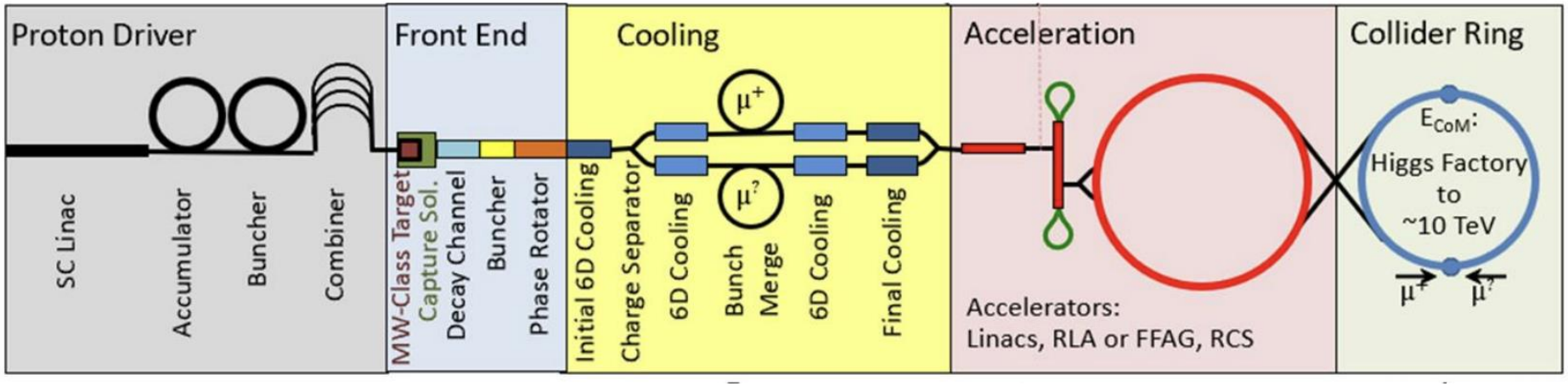
From last week:

- Current roadblocks: Understanding differences between reference and synchronous particle and

- Reorganized efforts
  - Studying average energy loss for reference particle and verify if tracking behavior agrees with Bethe-Bloch equation (Daisy)
  - Studying time offsets and RF phase for reference and synchronous particle (Rithika)

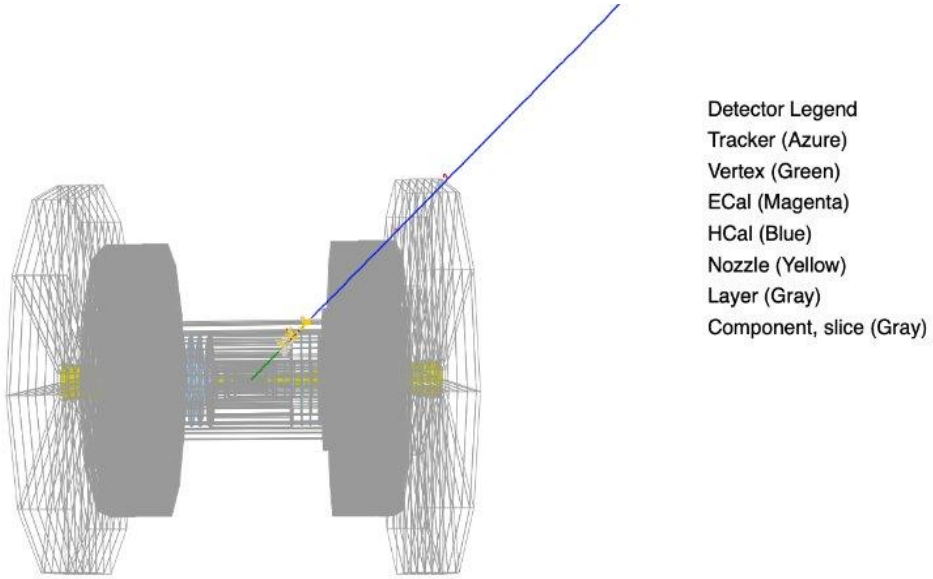
Muon Ionization Cooling

- Areas of contribution:
  - Currently, only the UTK group is working on HFOFO optimization projects; however, additional opportunities within HFOFO can be identified.
  - Charge separator – HFOFO design is charge agnostic so the integration of initial and final cooling stages require charge separator **(under discussion with IMCC group)**



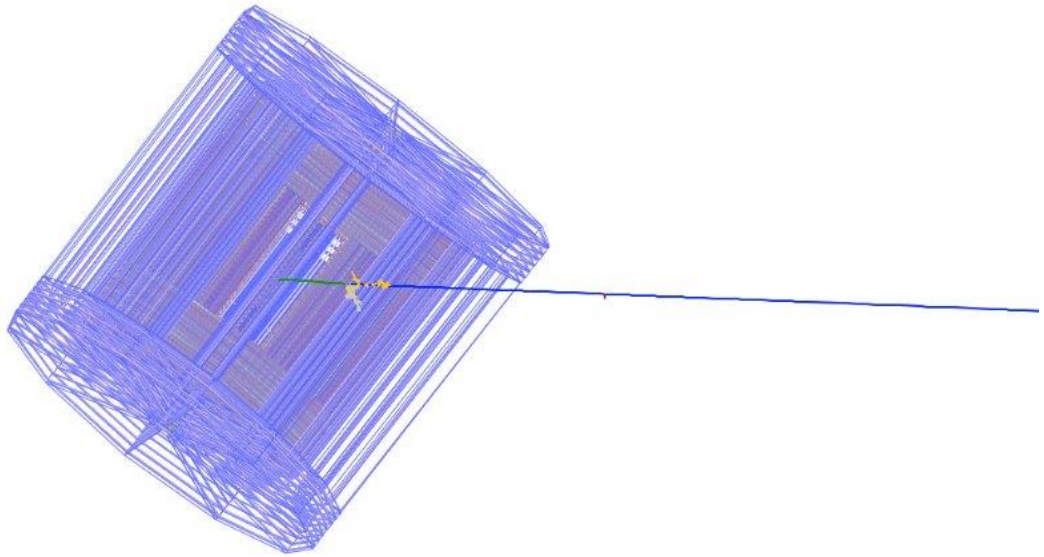
Neutrino Mitigation – Developing GEANT4 model

- Update (Daisy):
  - Neutrino physics is **fully** implemented in GEANT4 (v4.11.1) and validation checks are going on.



Detector Legend
Tracker (Azure)
Vertex (Green)
ECal (Magenta)
HCal (Blue)
Nozzle (Yellow)
Layer (Gray)
Component, slice (Gray)

20 GeV muon-neutrino in the MAIA detector



Neutrino Mitigation

- Areas of contribution:
  - Geometry visualizations and validation studies.
  - Exploring GENIE for neutrino interactions.
  - Integrate and analyze neutrino slice information in the model.