



Cooling Demonstrator Transport Line Studies

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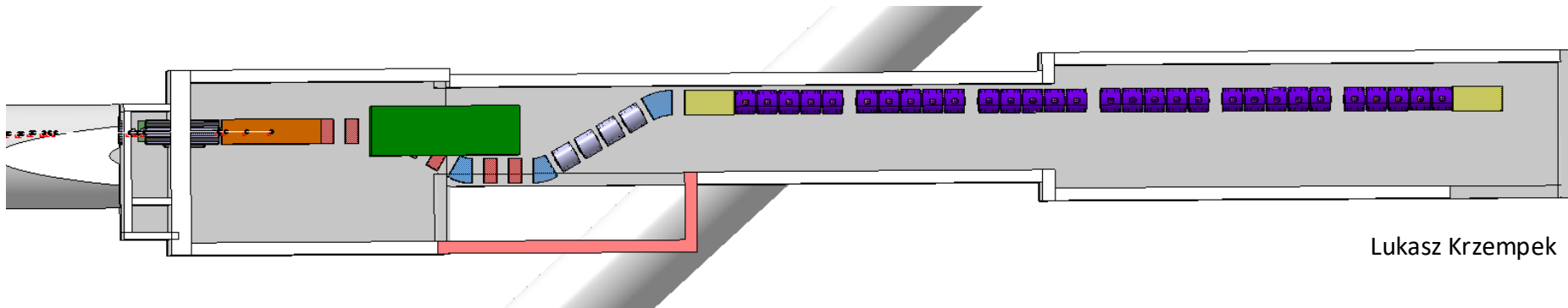
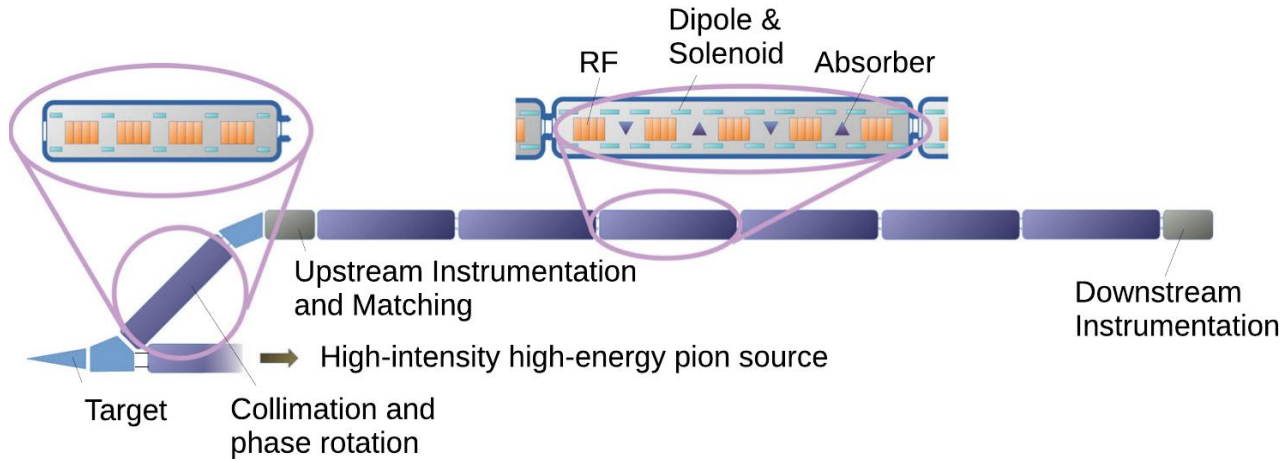
Muon Collider Cooling Meeting

10 Oct 2024



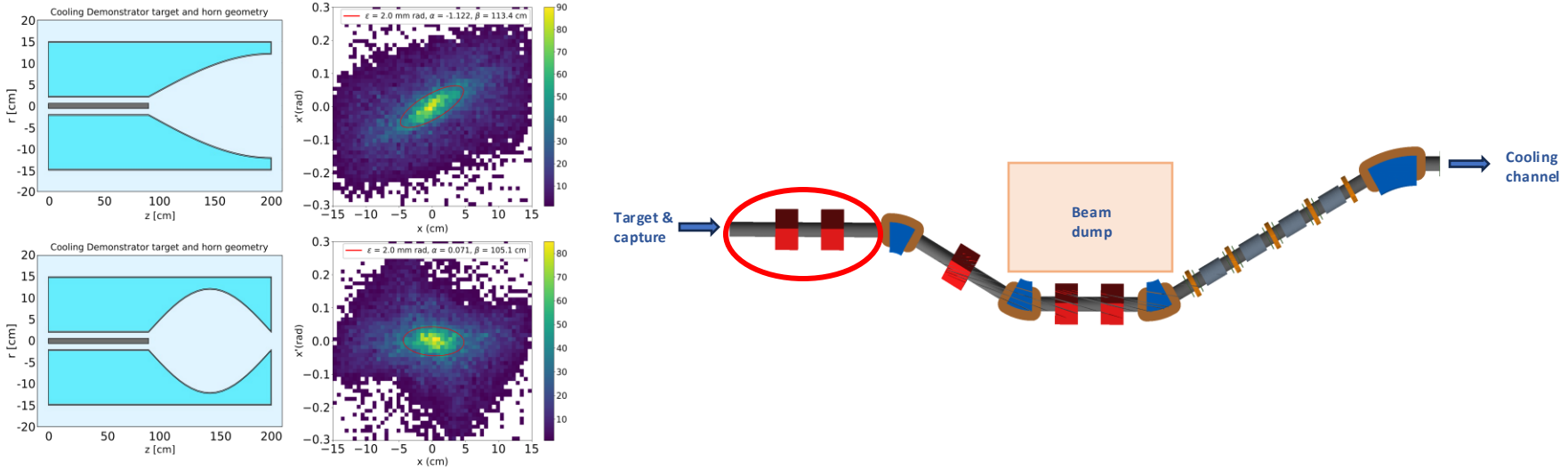
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CERN TT7 Demonstrator

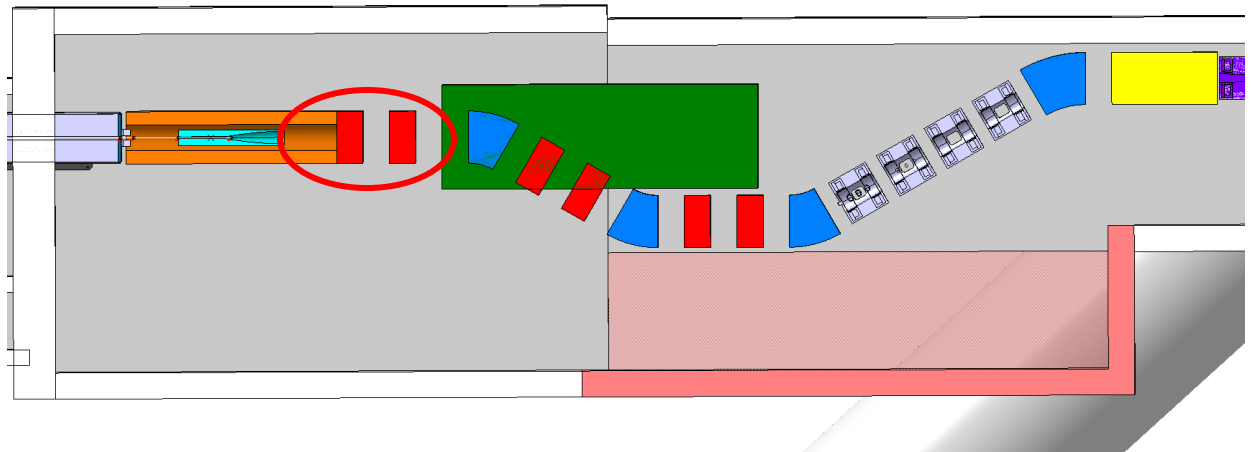


Lukasz Krzempek

Target and transport line

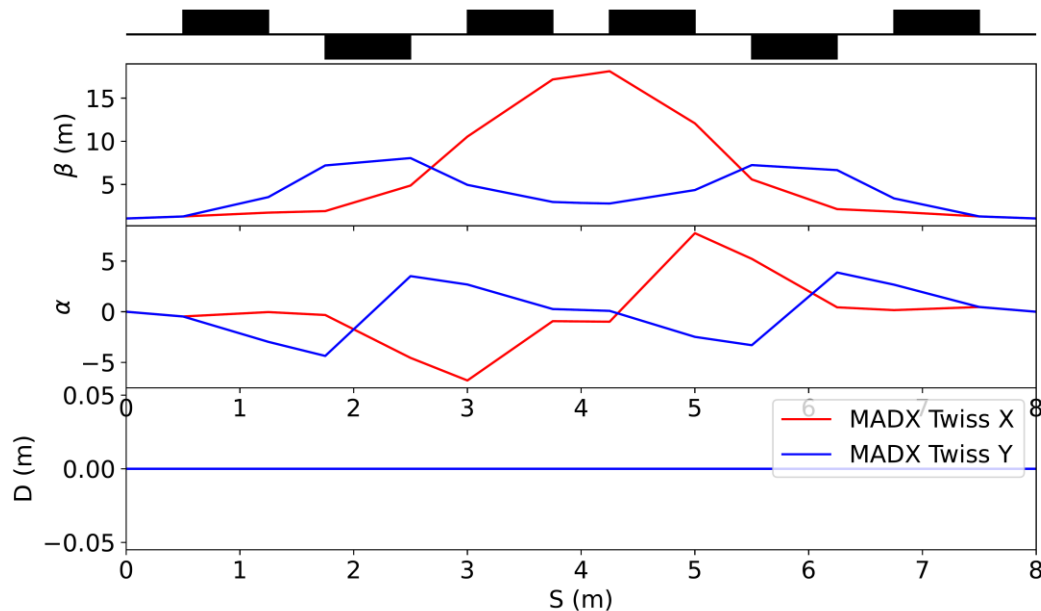


- Need to allow pions to decay, and collect resulting muons
- $\sim 40\%$ of pions decay within 8.5 m

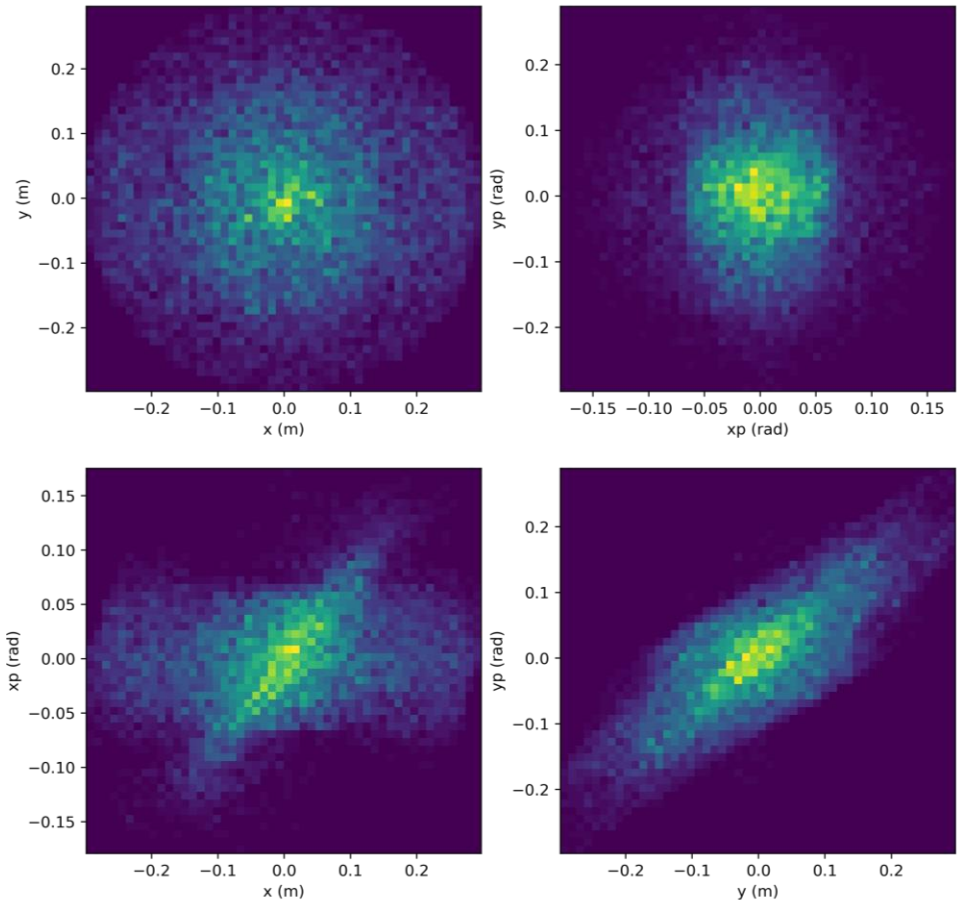
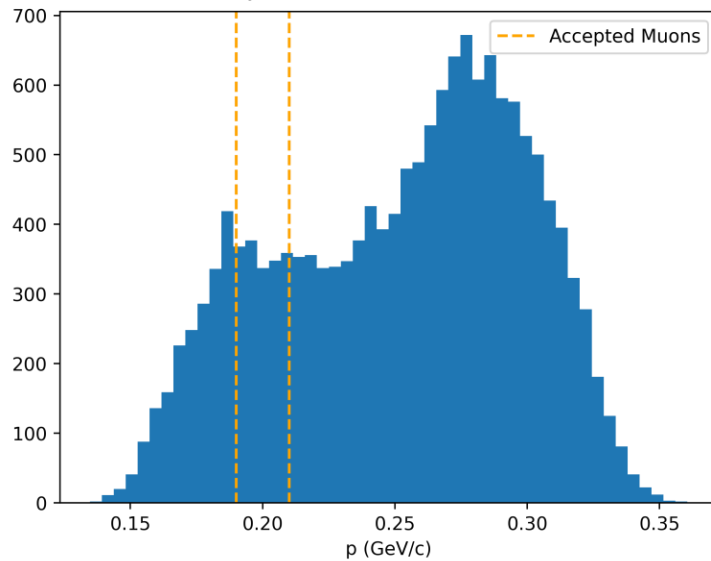


Pion decay channel - beam optics

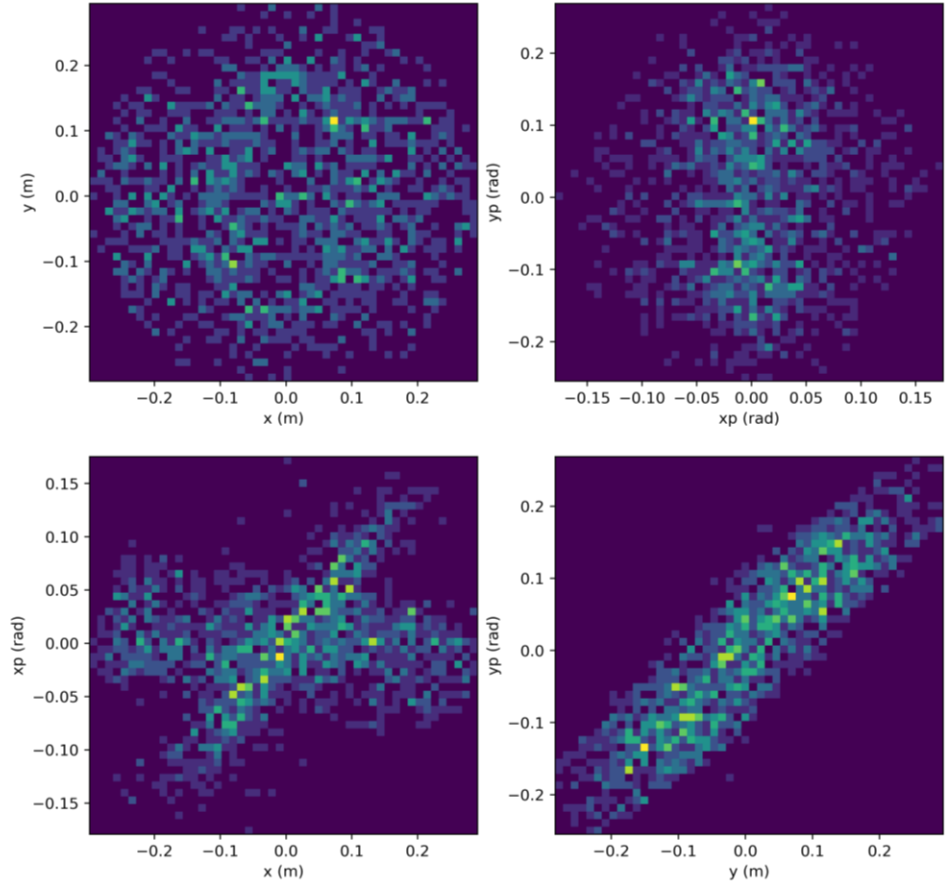
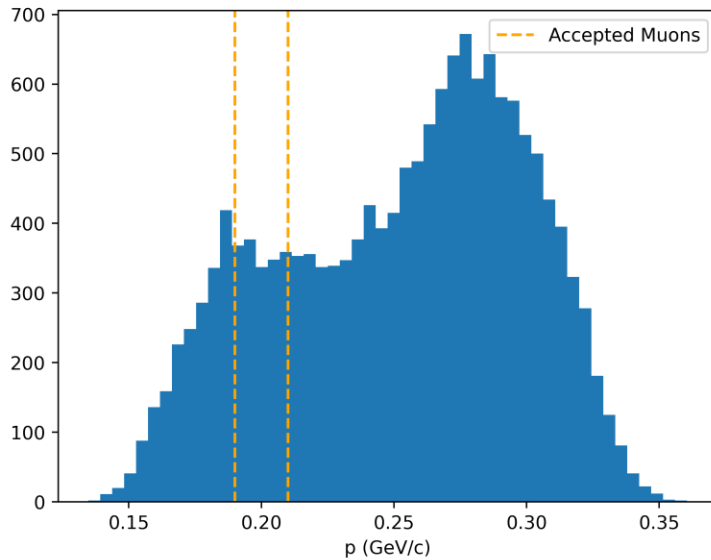
- Based on two quadrupole triplets
- First version:
 - Symmetric pion beam optics
 - Not yet optimised for muon beam optics and transport efficiency



- Muons from decays of pions with **270-330 MeV/c** momentum and maximum **2 mm rad** single particle emittance
- $\sim 16\%$ conversion efficiency (before muon momentum selection)



- Muons with **190-210 MeV/c** momentum



Outlook

- Aim to complete the full design of the transport line
- Currently focusing on the pion decay/muon capture channel
- Further work
 - optimize the number of captured muons and improve the optics
 - rematch the chicane

Thank you



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