



Cooling Demonstrator Transport Line Studies

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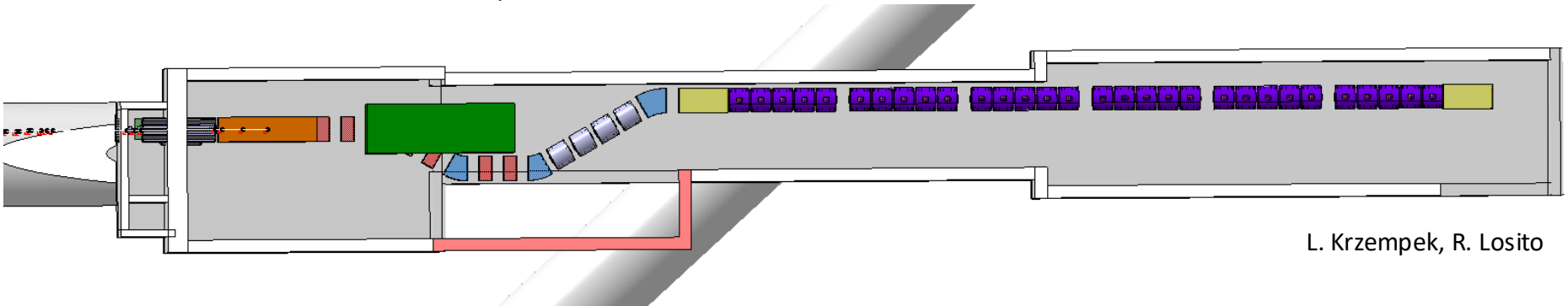
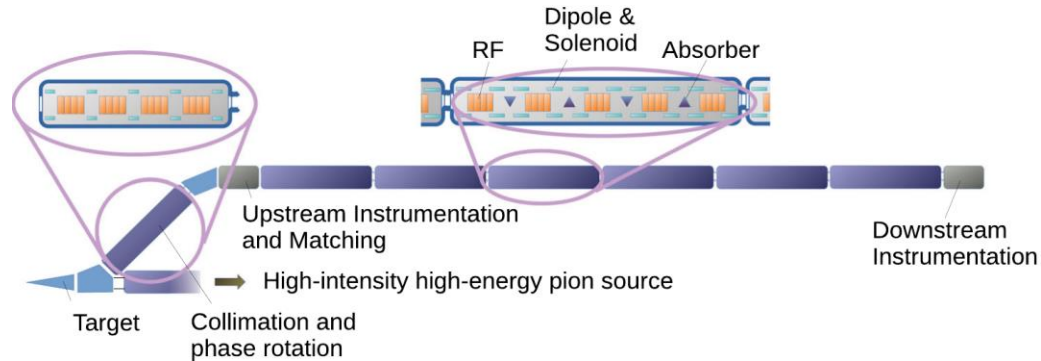
WP8 Meeting

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CERN TT7 Demonstrator

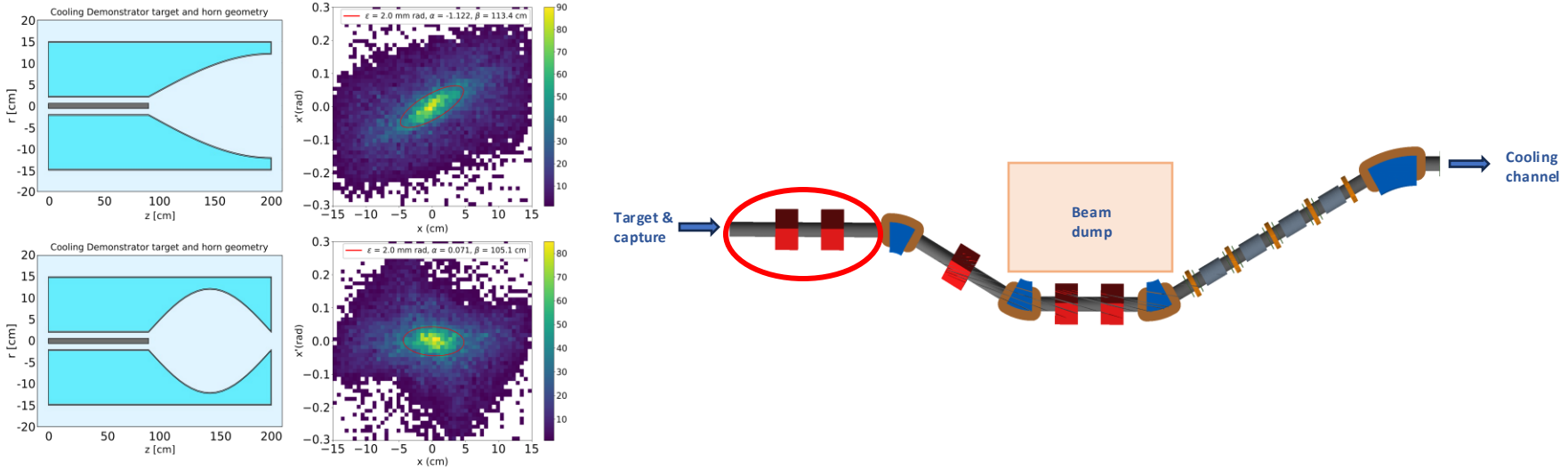


L. Krzempek, R. Losito

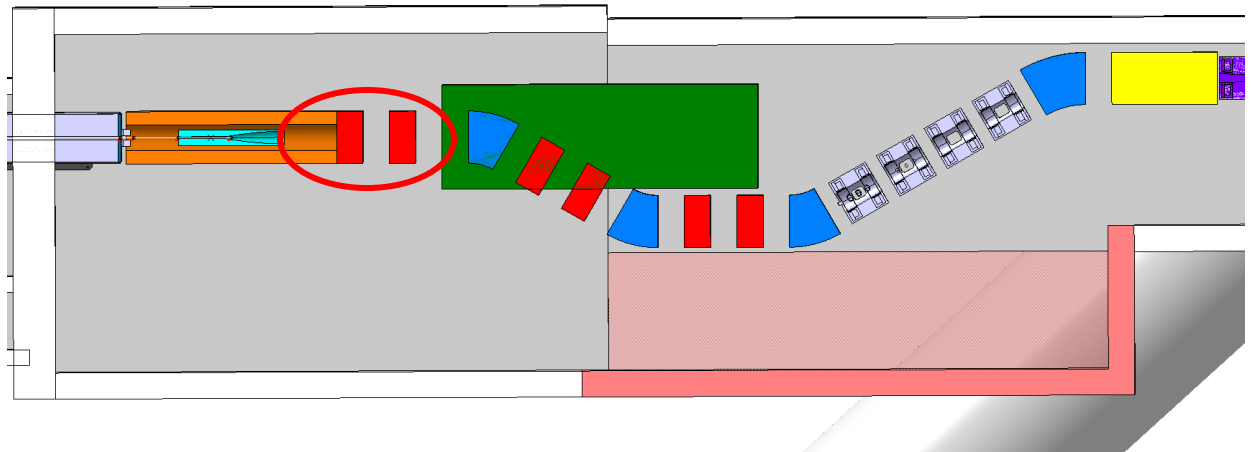
TT7 Demo integration

- Target/horn to be placed within the cavern, below the shaft
 - Need additional space for the transport line -> expand tunnel
- Design pion decay/muon capture section
- Refine interfaces between sections (e.g. proton beam and target)

Target and transport line

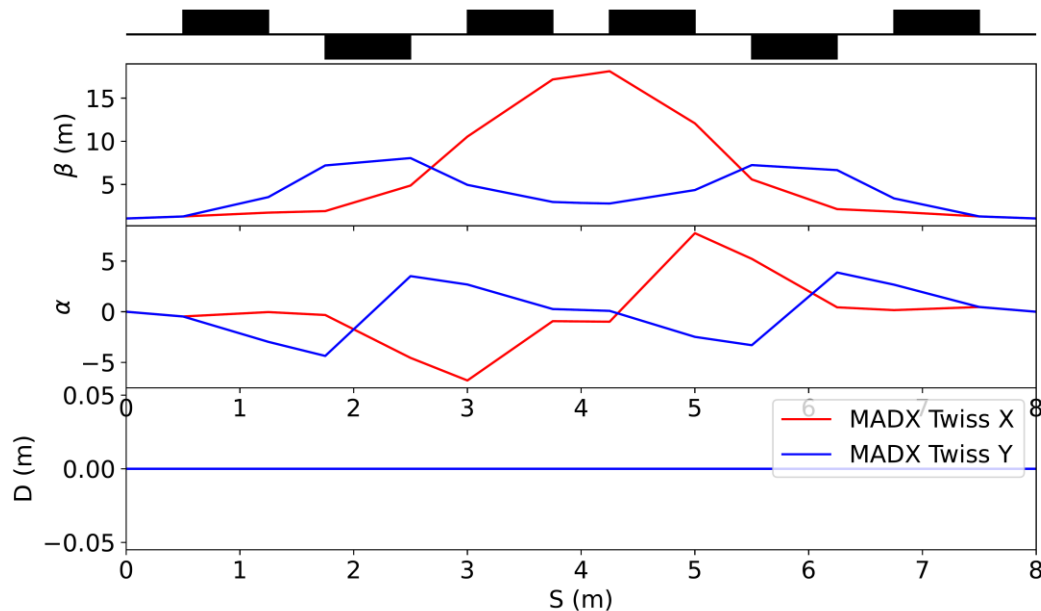


- Need to allow pions to decay, and collect muons
- $\sim 40\%$ of pions decay within 8.5 m (at 300 MeV/c)

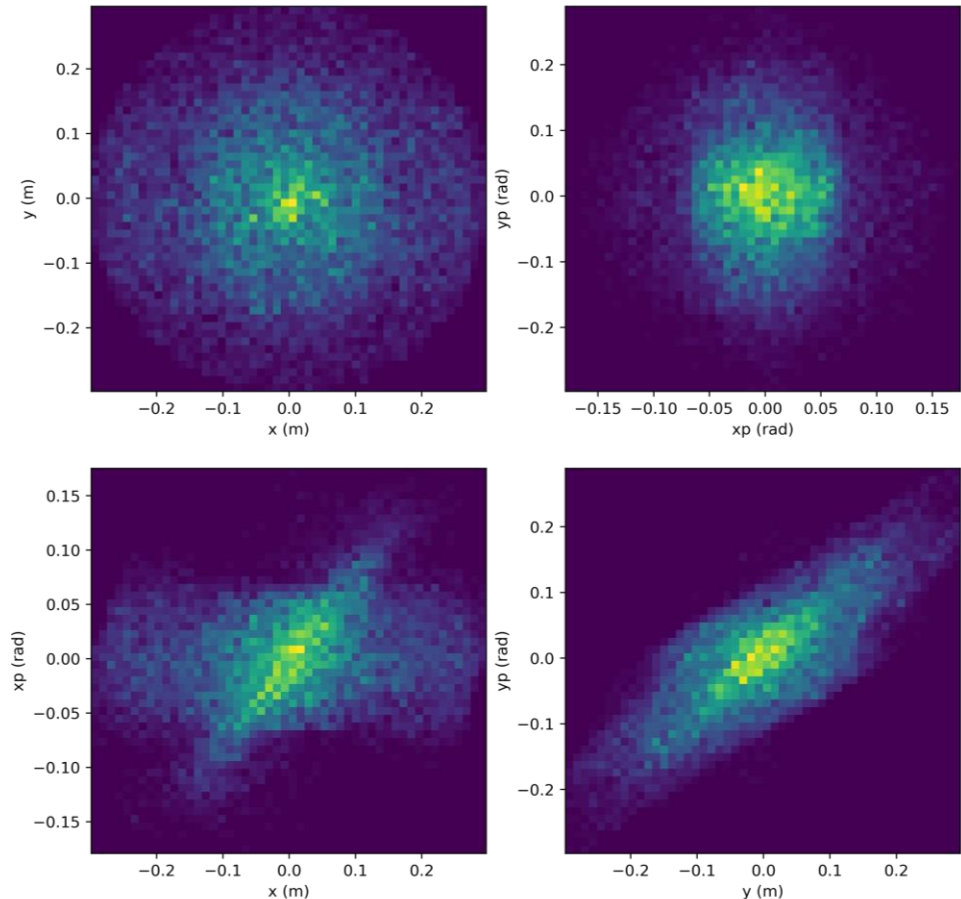


Pion decay channel - beam optics

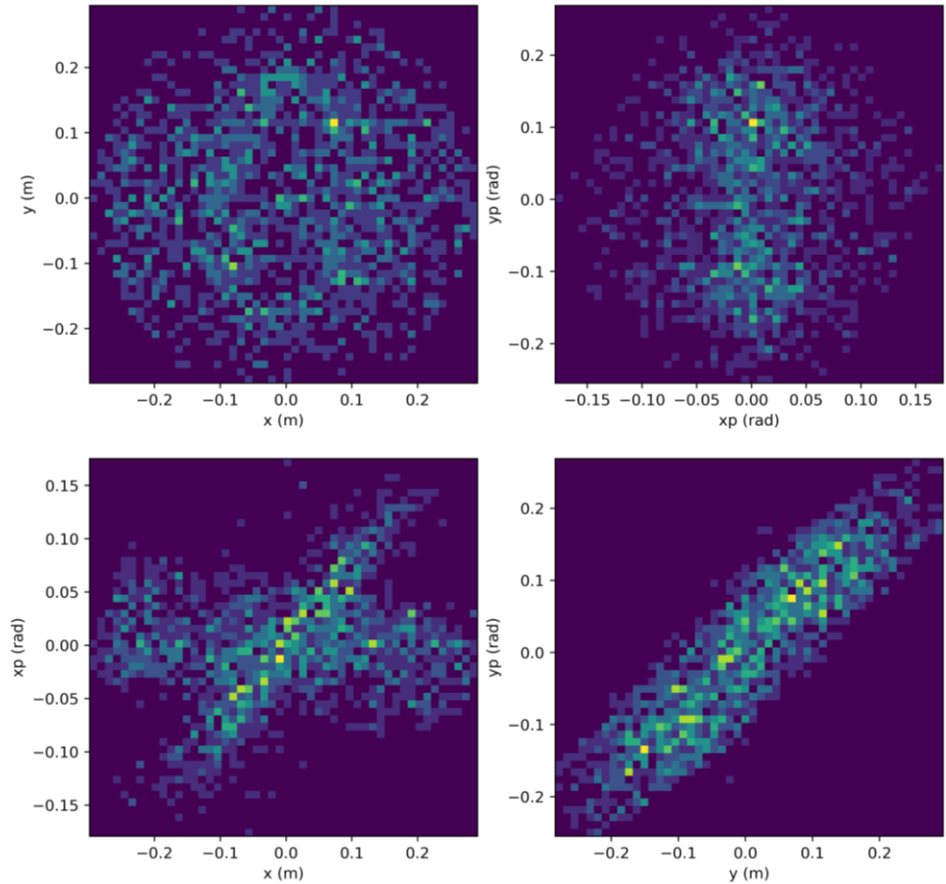
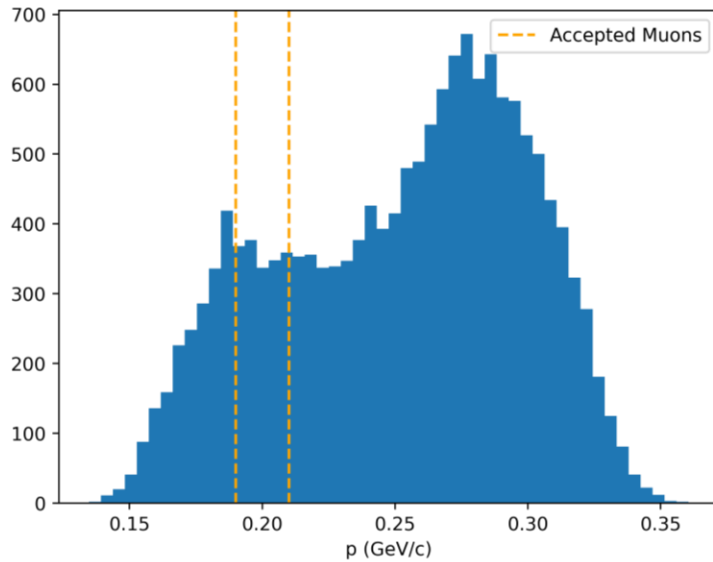
- Based on two quadrupole triplets
- First version:
 - Symmetric pion beam optics
 - Not yet optimised for muon capture/transport efficiency



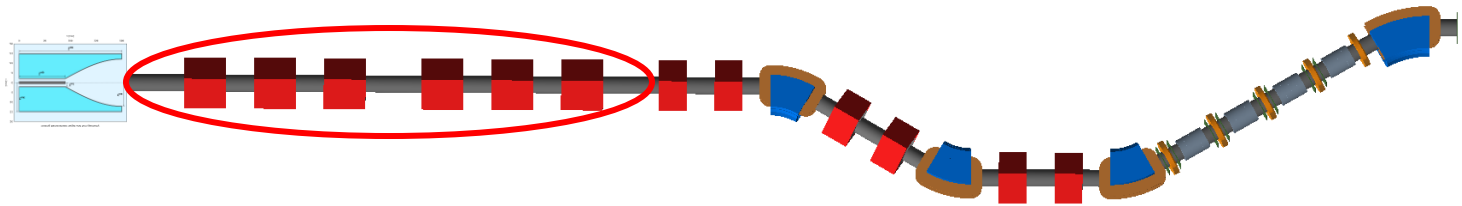
- Muons from decays of pions with **270-330 MeV/c** momentum and maximum **2 mm rad** single particle emittance
- $\sim 45\%$ muon capture efficiency (before muon momentum selection)
- 'Cross-like' feature in the x phase space



- 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 section
 - Exploring multiple quadrupole-based configurations
 - Keeping in mind a solenoid option
- Further work
 - optimize muon capture efficiency and improve the optics (i.e. remove/minimise phase space features)
 - rematch the chicane

Thank you



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