

# Cooling optics for 140MeV/c with constraints

J. Pasternak, IC/RAL-STFC

07/11/2016

# Introduction

- This is a short presentation to propose a promising solution for 140MeV/c beam for n. emittance reduction measurement (cooling) , which should obey most of the imposed constraints:
  - $167A < M2U < 253A$
  - $100A < M1U < 278A$
  - $0A < FC < 114A$
  - Solenoid mode
  - $M1D = M2D = 0A$
  - No trims in SSU and SSD
  - Force between M1 and FC  $< 15t$
  - B field in Trackers as large as reasonably possible

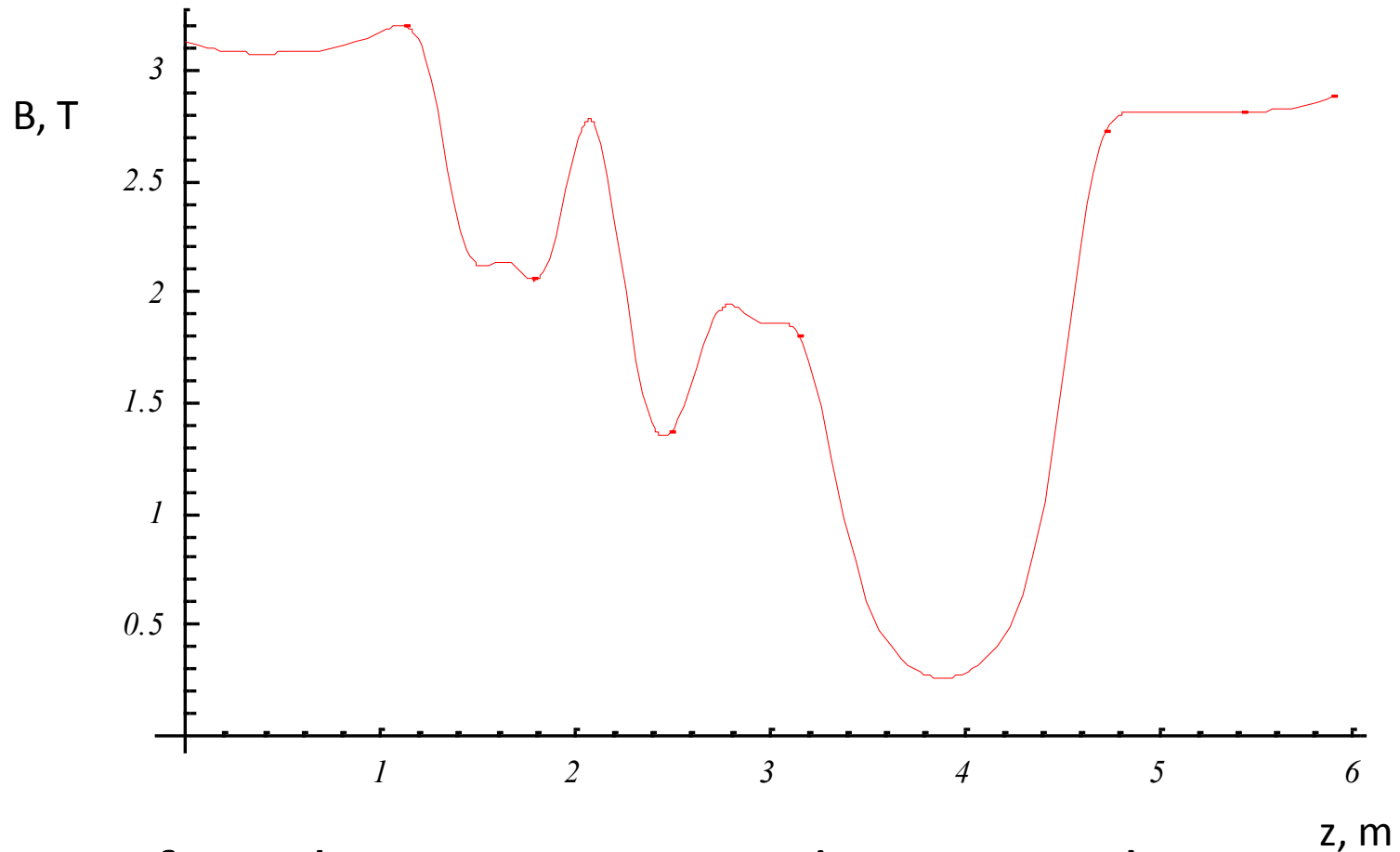
# Description

- Beamline:
  - pionic at 140 MeV/c
- Cooling channel:

Currents in A

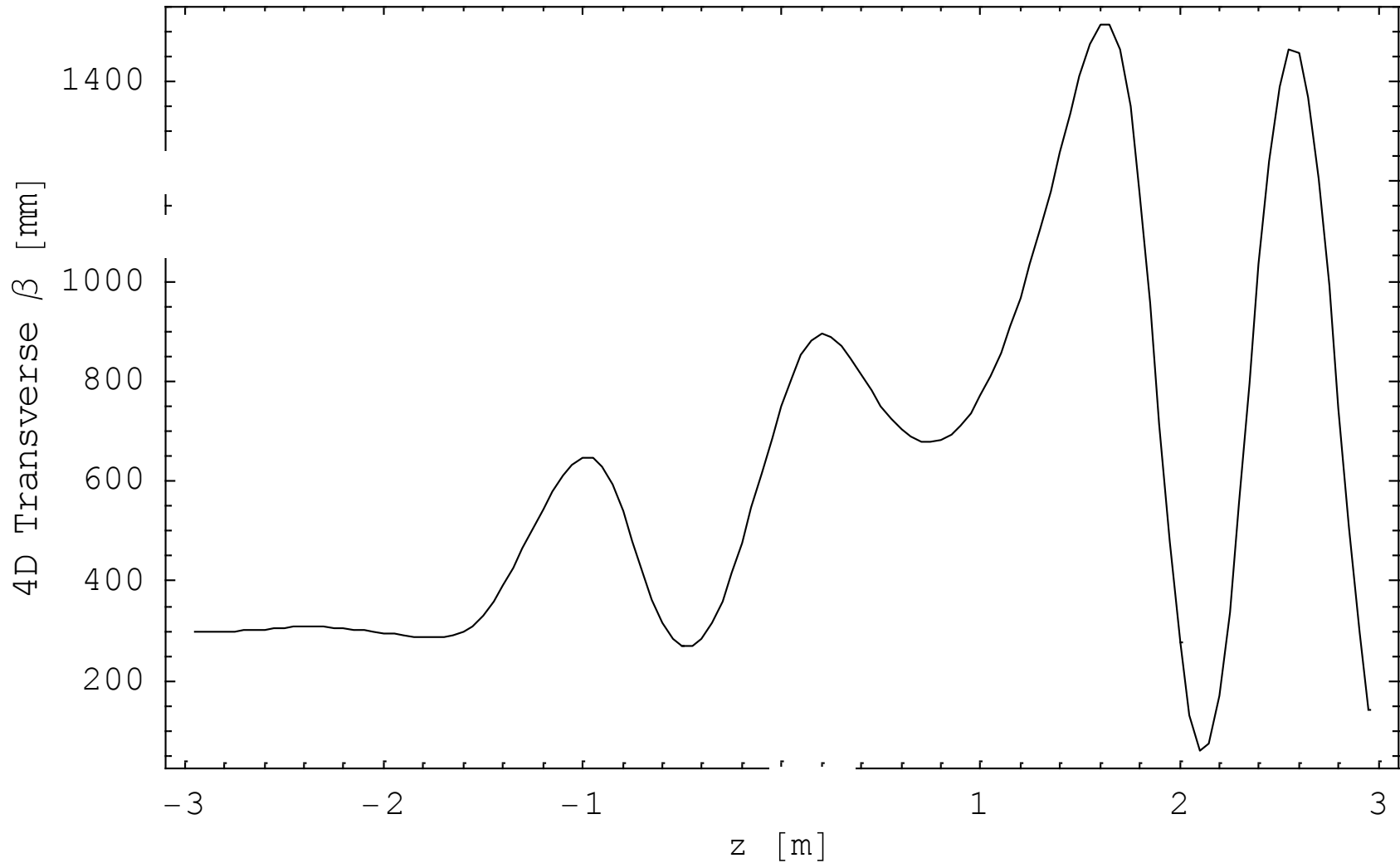
Setting	E2u	Cu	E1u	M2u	M1u	FCu	FCd	M1d	M2d	E1d	Cd	E2d
Sol_140_noM1 2d_C	211.26	211.26	211.26	169.87	226.3	63.87	63.87	0.0	0.0	194.5	194.5	194.5

# B field



- Static force between M1u and FCu: 97.2 kN
- Static force between M1u and FCd: 21.1 kN
- Total static force between M1u and FC: **118.3 kN**

# Optics with LiH, 140 MeV/c



Beta in the middle of the absorber: 75cm.

# Summary

- It looks promising from optics evaluations!
  - Including geometrical acceptance and achievable equilibrium emittance
- **Final hardware currents** still needs to be evaluated (to include H. Witte's factors –straightforward with the existing set)
- MC studies should include this setting
  - To check transmission (most importantly through TKD) and more realistic emittance profile