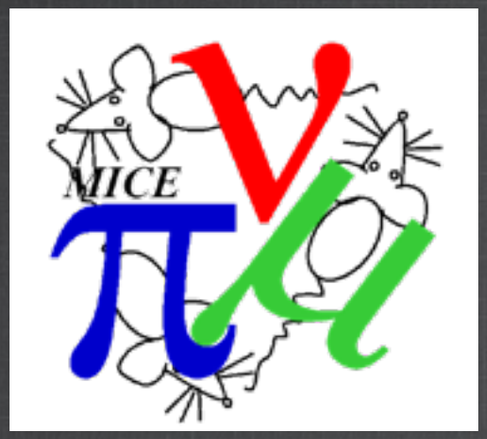


MICE cooling DEMO performance

JB. Lagrange, V. Blackmore, N. Collomb,
C. Hunt, J. Pasternak, R. Preece,
C. Rogers, P. Snopok, and J. Tarrant

on behalf of the MICE collaboration

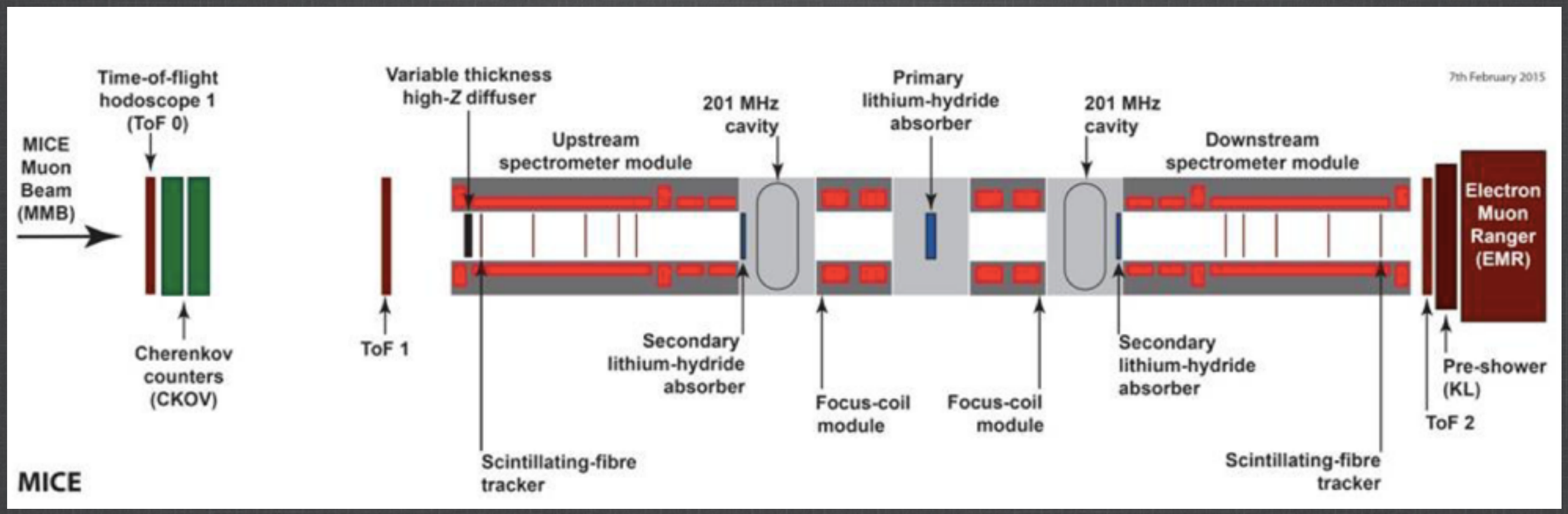
Outline

- Lattices
  - LiH secondary absorbers
  - Polyethylene secondary absorbers
- Results
- Summary and future plans

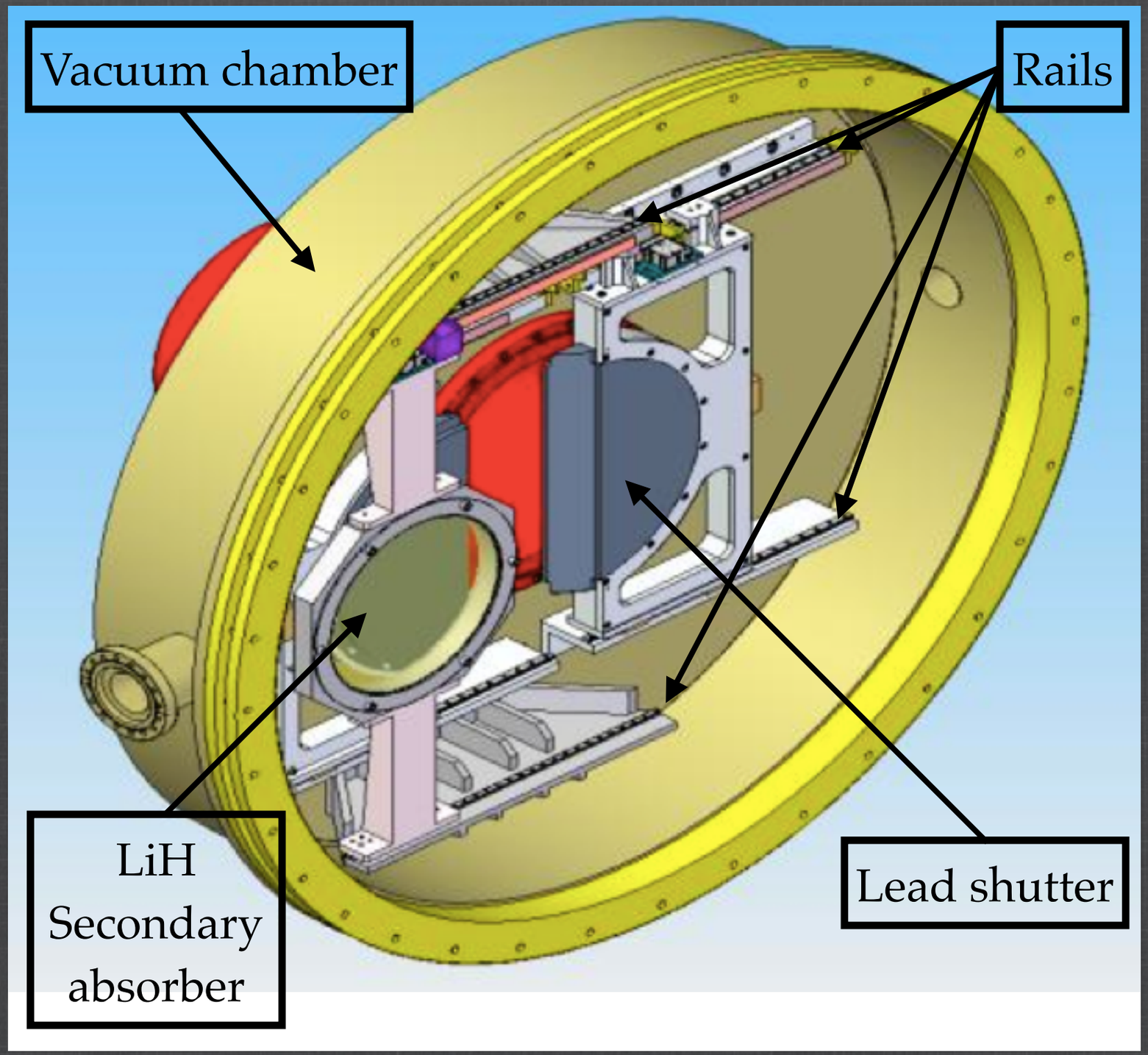
Outline

- Lattices
  - LiH secondary absorbers
  - Polyethylene secondary absorbers
- Results
- Summary and future plans

Demo Lattice with LiH Secondary absorbers



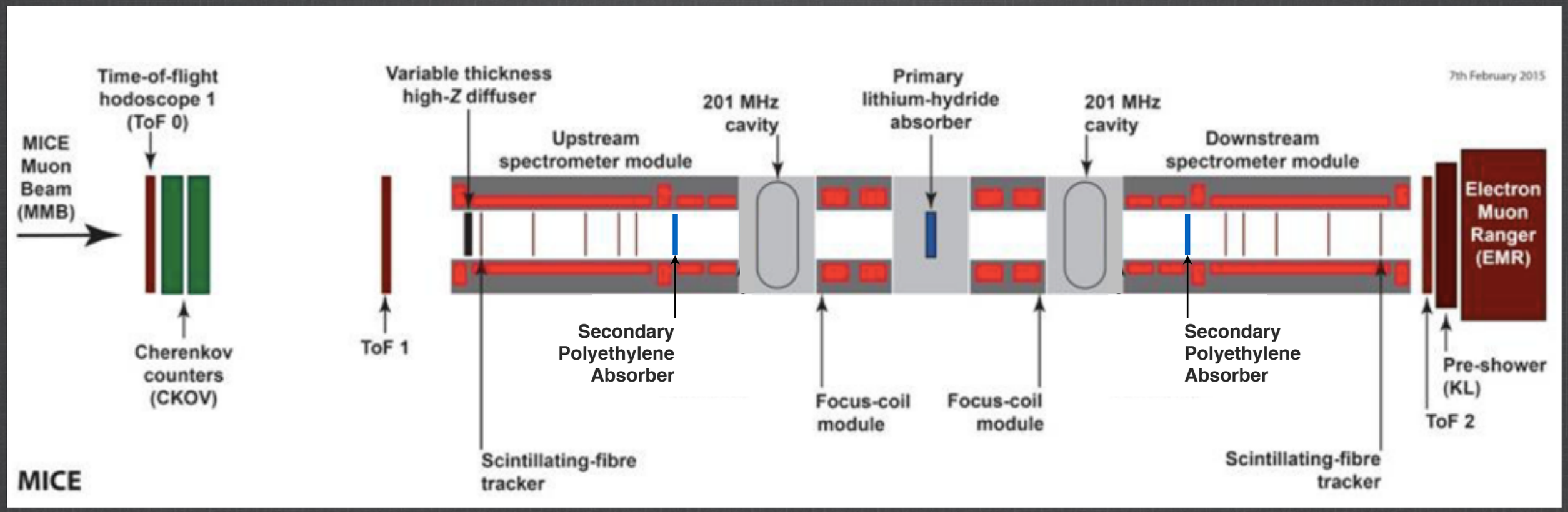
Radiation shutter and movable secondary LiH absorber.



Outline

- Lattices
  - LiH secondary absorbers
  - Polyethylene secondary absorbers
- Results
- Summary and future plans

Demo Lattice with Polyethylene Secondary absorbers

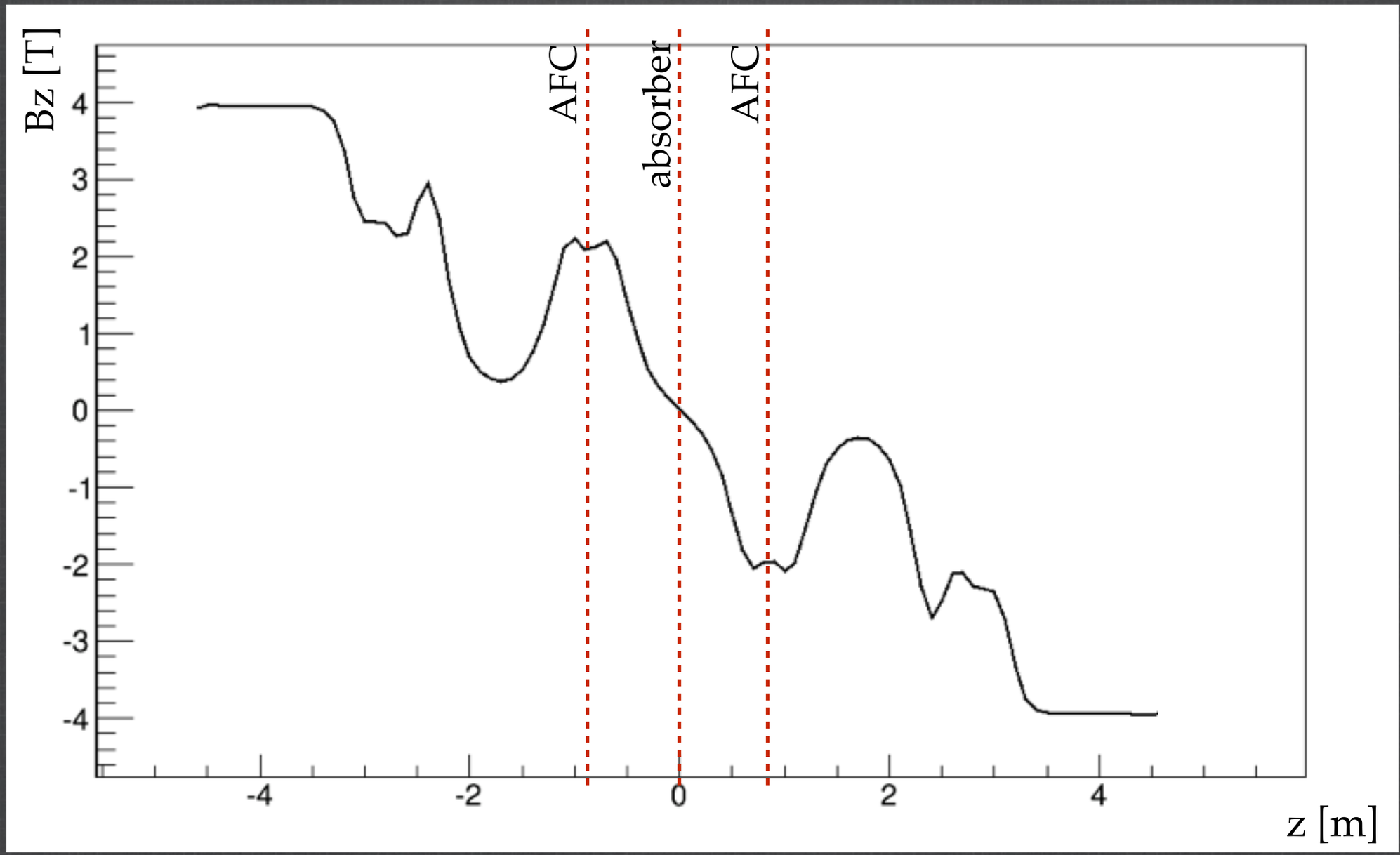


Coil currents (6 mm, 200 MeV)

Coil	Demo lattice	Nominal values (step V)
Upstream E2	+253.00	255.46
Upstream C	+274.00	288.27
Upstream E1	+234.00	239.37
Upstream M2	+203.13	290.69
Upstream M1	+240.61	274.34
Upstream AFC1	+77.86	245.65
Downstream AFC1	+77.86	245.65
Upstream AFC2	-72.94	245.65
Downstream AFC2	-72.94	245.65
Downstream M1	-218.39	274.34
Downstream M2	-187.68	290.69
Downstream E1	-234.00	239.37
Downstream C	-274.00	288.27
Downstream E2	-253.00	255.46

Demo Lattice

Magnetic field



Outline

- Lattices
  - LiH secondary absorbers
  - Polyethylene secondary absorbers
- Results
- Summary and future plans

Initial beam

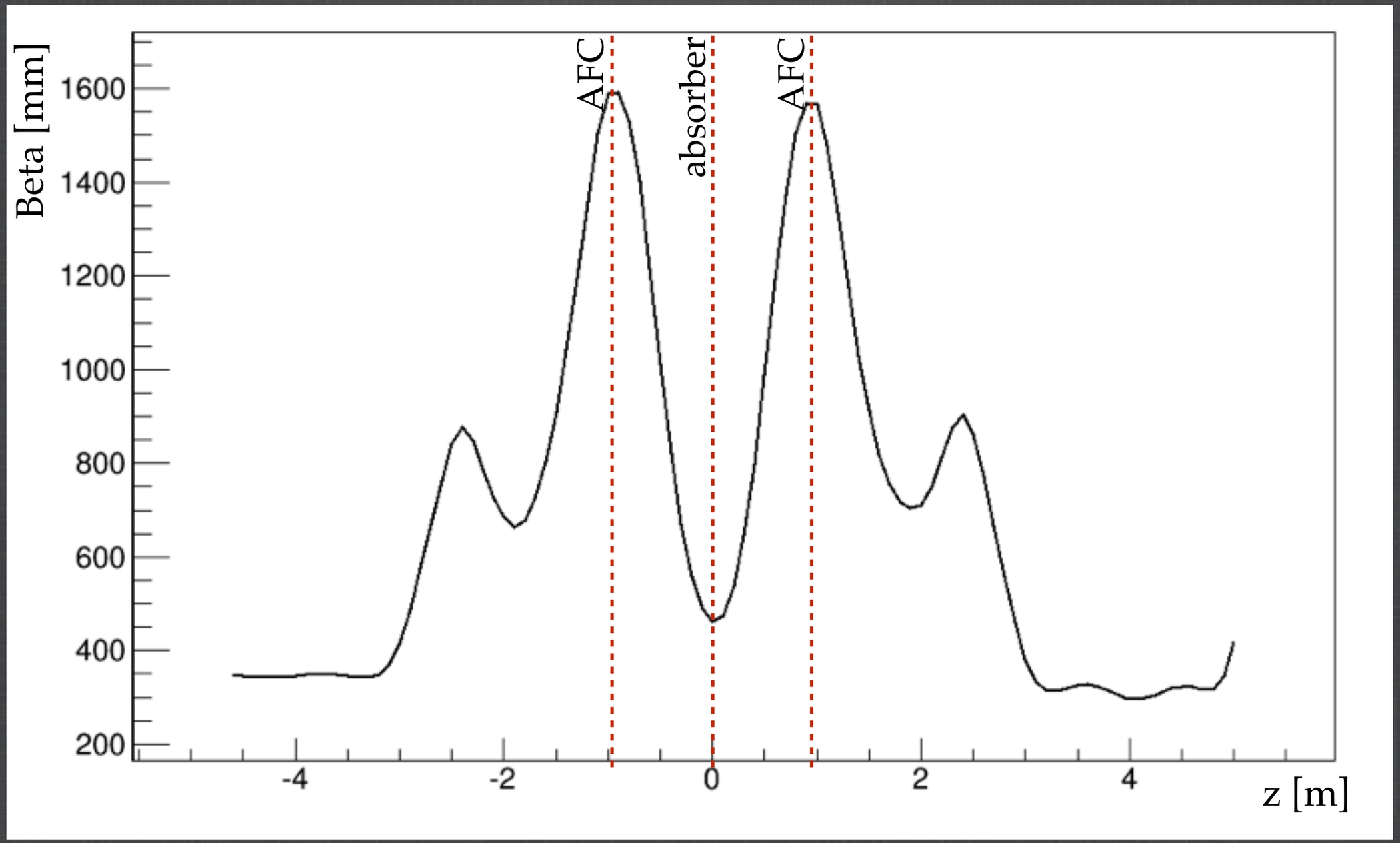
- Pure muon beam, ~10 000 particles
- Position: before first plane upstream tracker (after diffuser)
- Gaussian distribution
- Normalised rms longitudinal emittance = 20 mm
- Normalised rms transverse emittance = 6 mm

Cuts

- PID cut
- Transmission cut
- Radial cut r < 200 mm, at first and last plane.

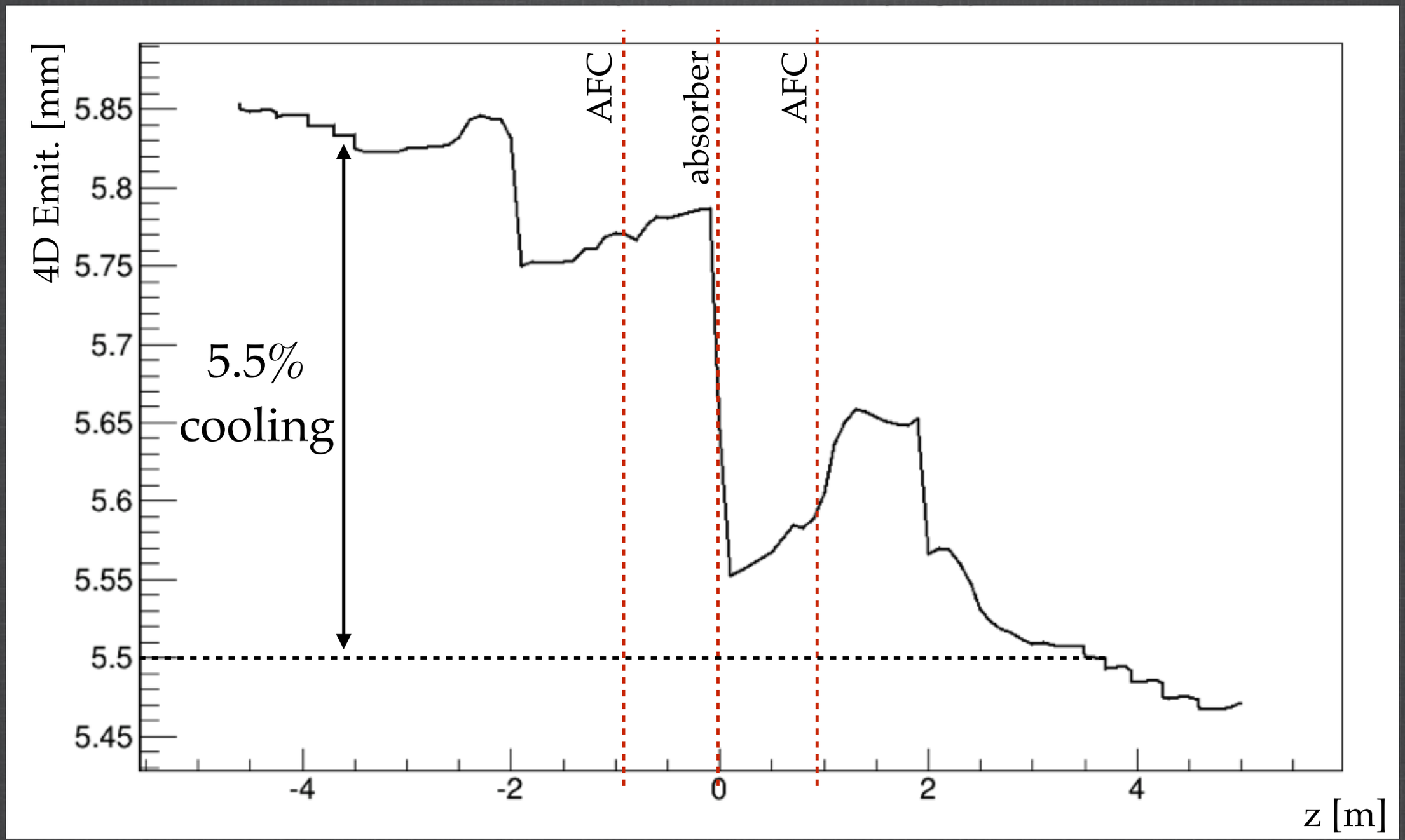
Lattice with LiH secondary Absorbers

Transverse beta



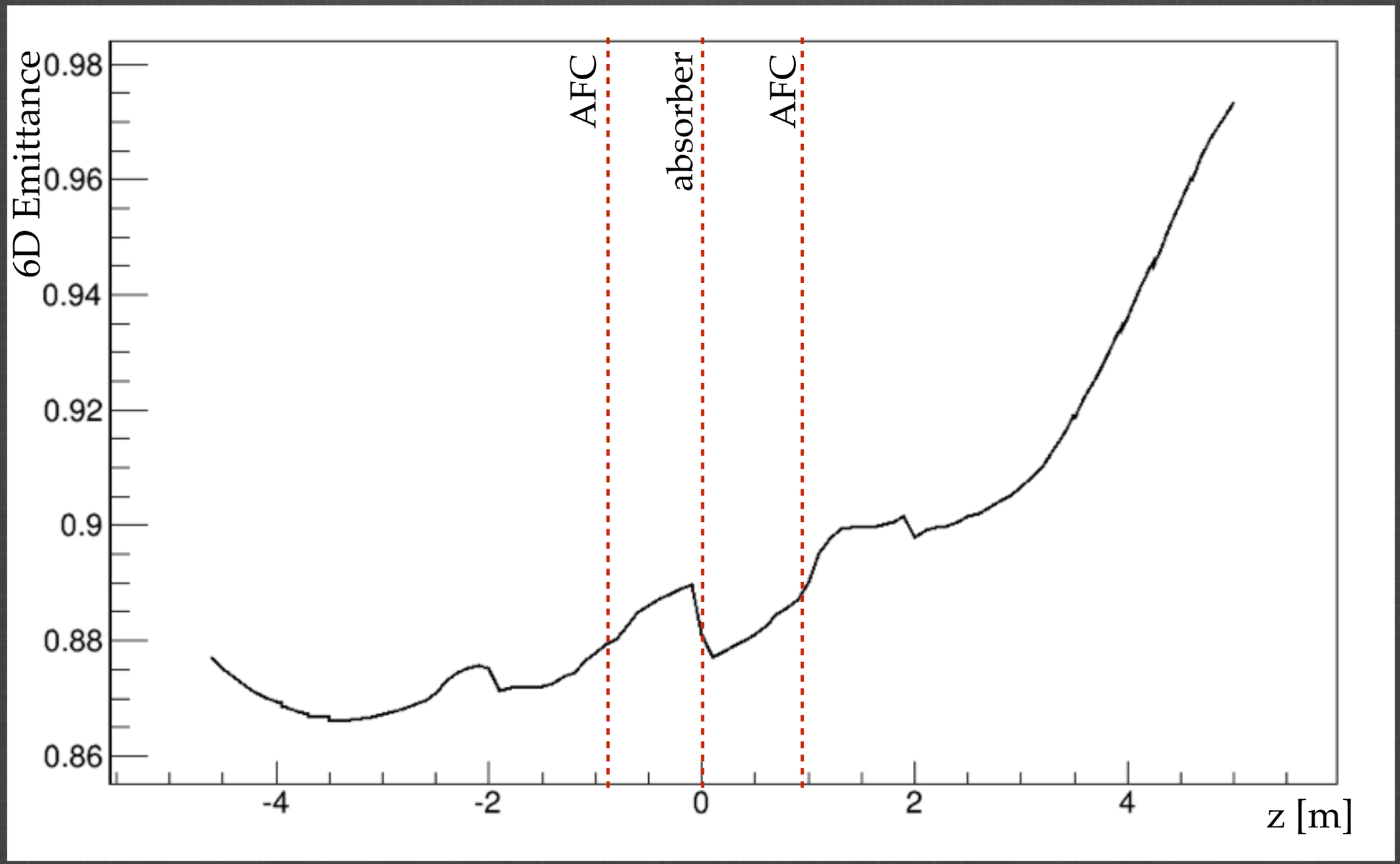
Lattice with LiH secondary Absorbers

4D emittance



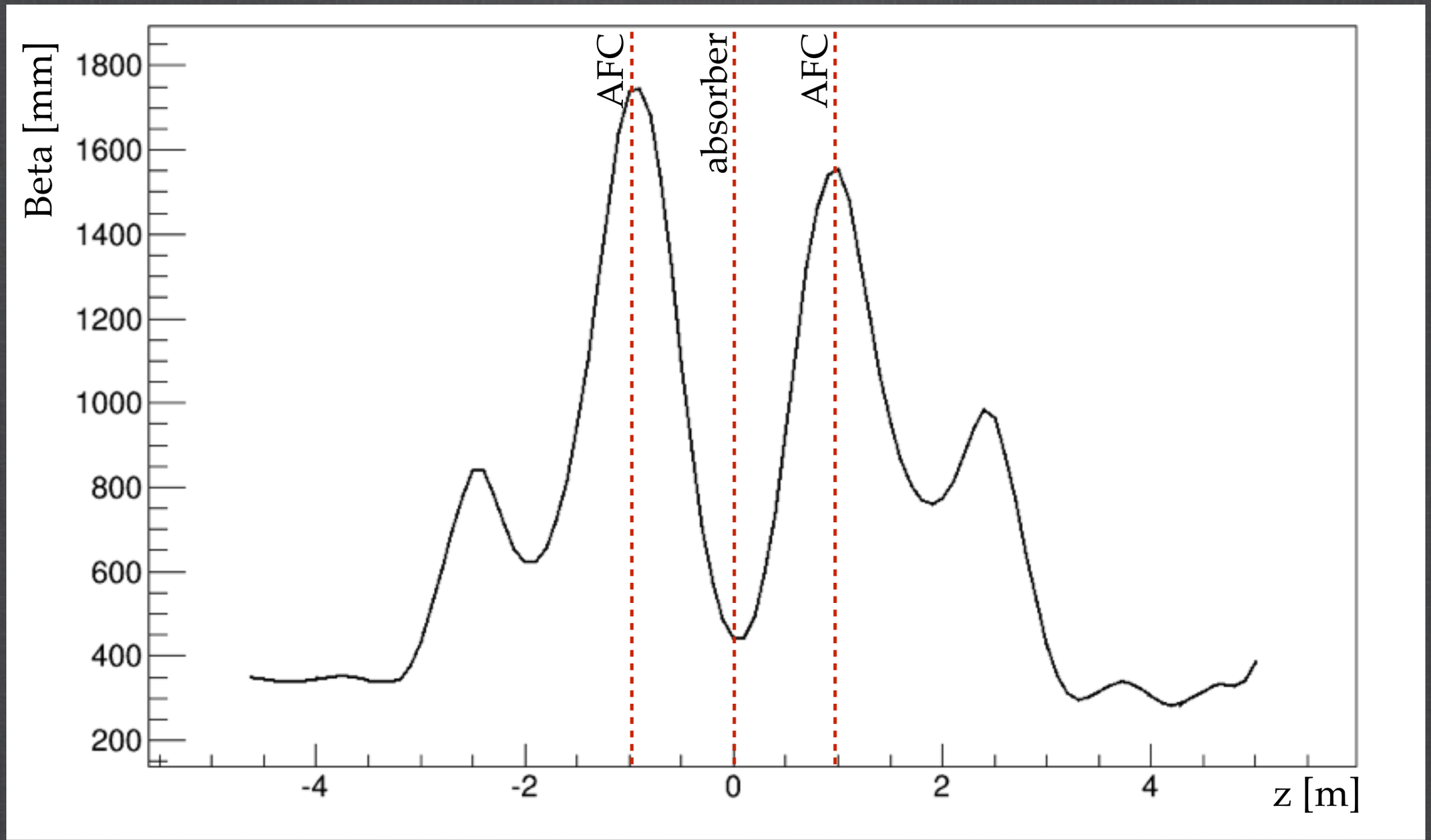
Lattice with LiH secondary Absorbers

6D emittance



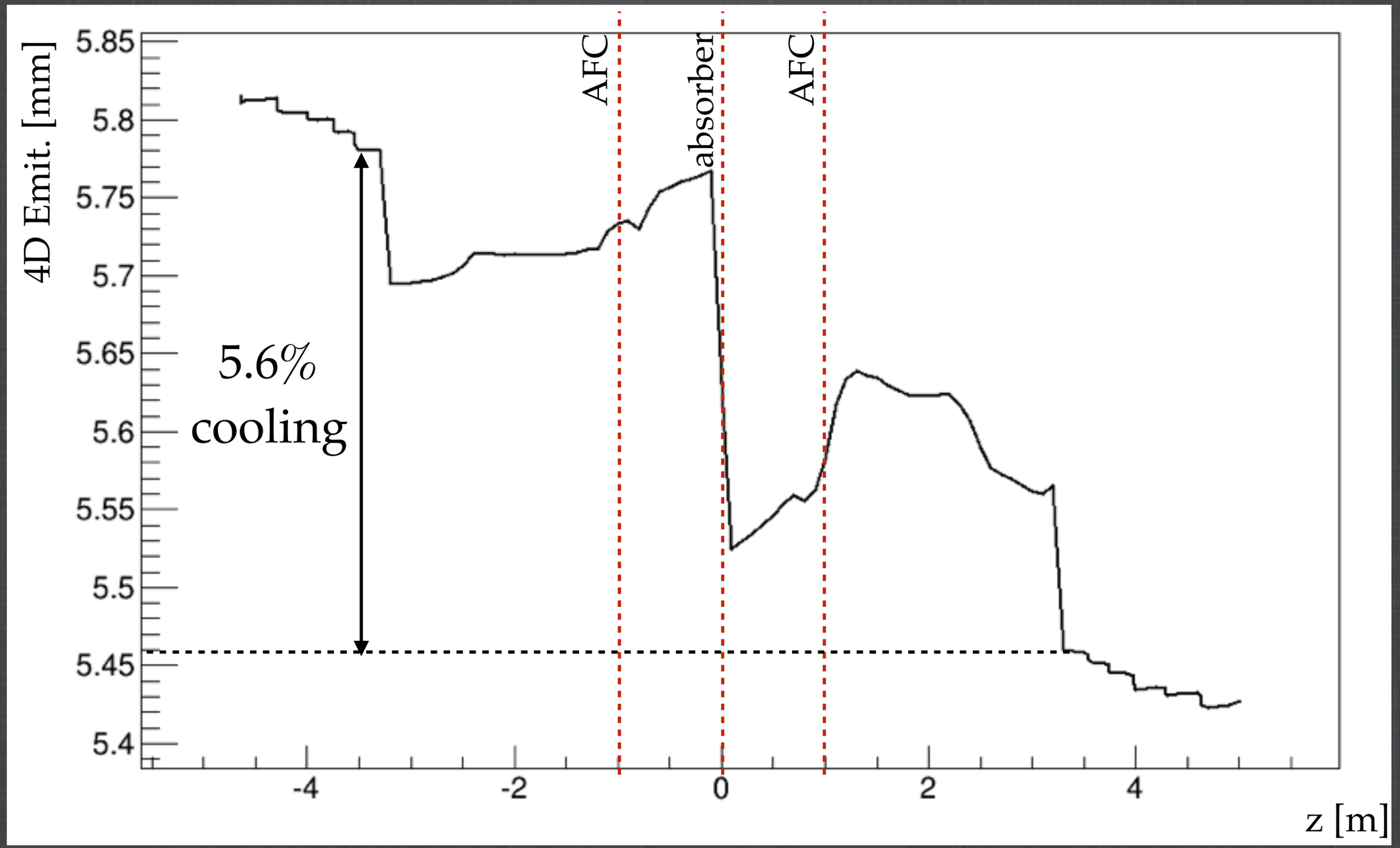
Demo Lattice with Polyethylene Secondary absorbers

Transverse beta



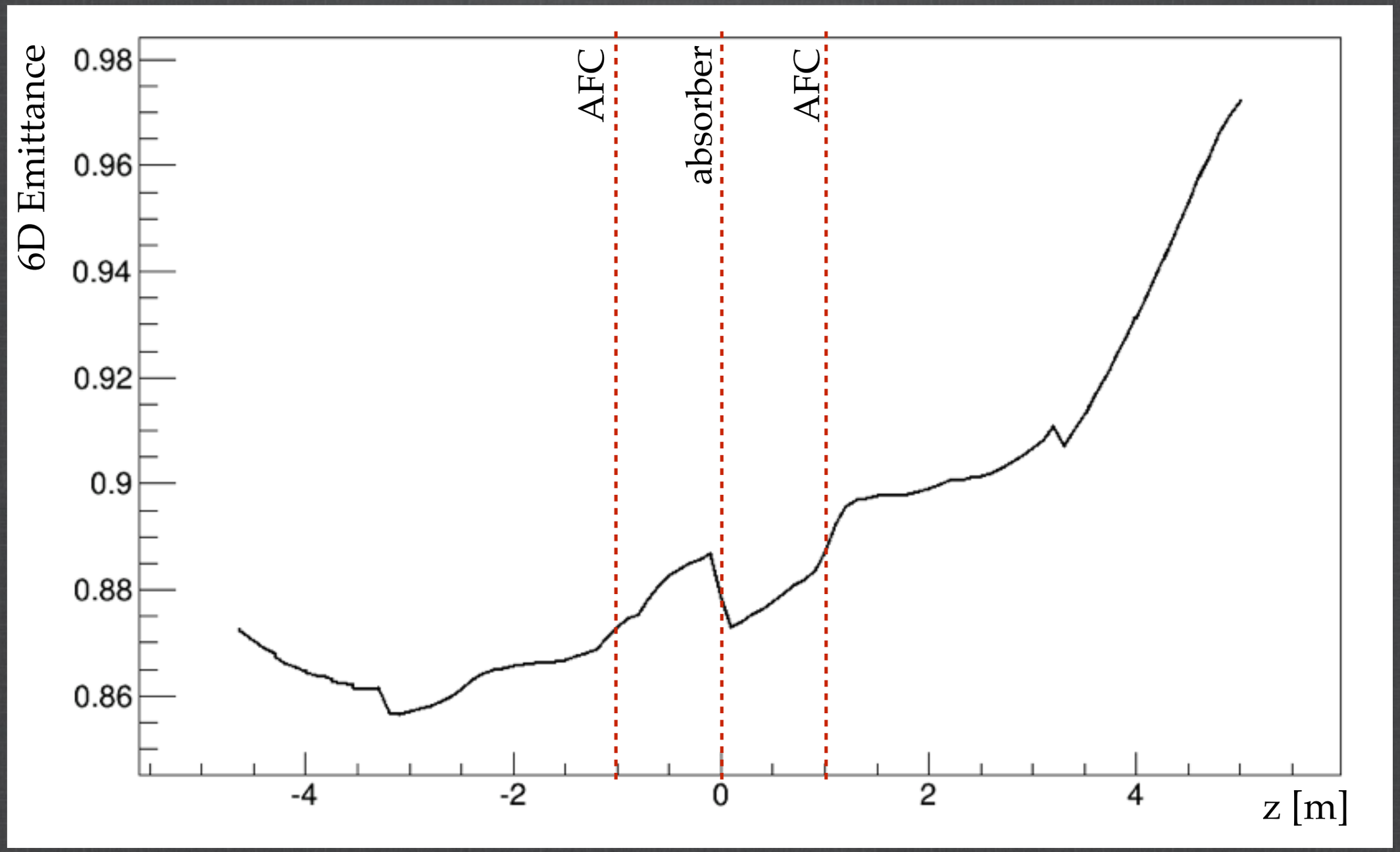
Demo Lattice with Polyethylene Secondary absorbers

4D emittance



Demo Lattice with Polyethylene Secondary absorbers

6D emittance



Outline

- Lattices
  - LiH secondary absorbers
  - Polyethylene secondary absorbers
- Results
- Summary and future plans

Summary

- Additional bellows were added to allow for a flexible RF cavity module inspection
- Radiation shutters provides confident safety protecting Trackers from radiation coming from RF
- 2 different lattices:
  - LiH secondary absorbers near RF.
  - Polyethylene secondary absorbers in the SS.
- Similar performance for both lattices (5.5% 4D cooling)
- Concern about photon source near the tracker for the polyethylene solution.
- Polyethylene absorbers cannot be retractable.

Future plans

- Optimisation of the distance FC <-> FC (current lattice not far from optimum).
- Study of different emittances for both lattices.
- Paper on the way.

Thank you for your attention