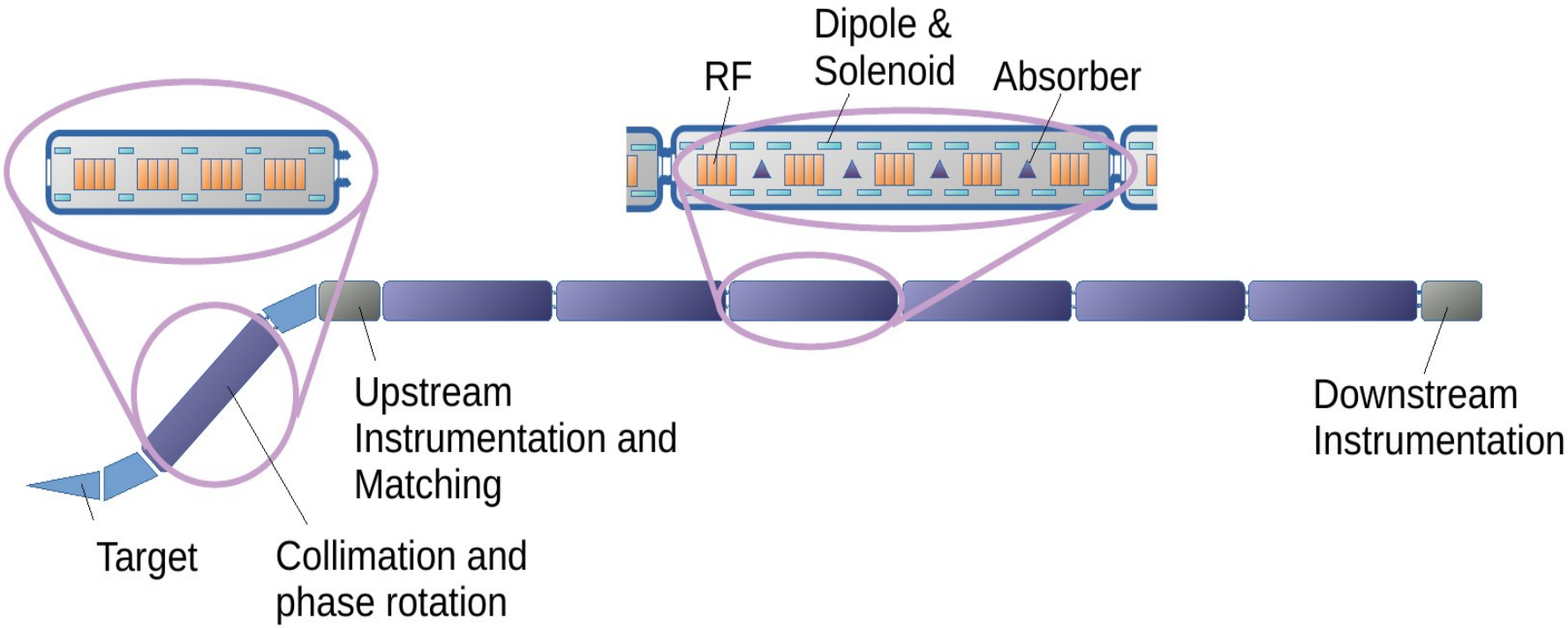
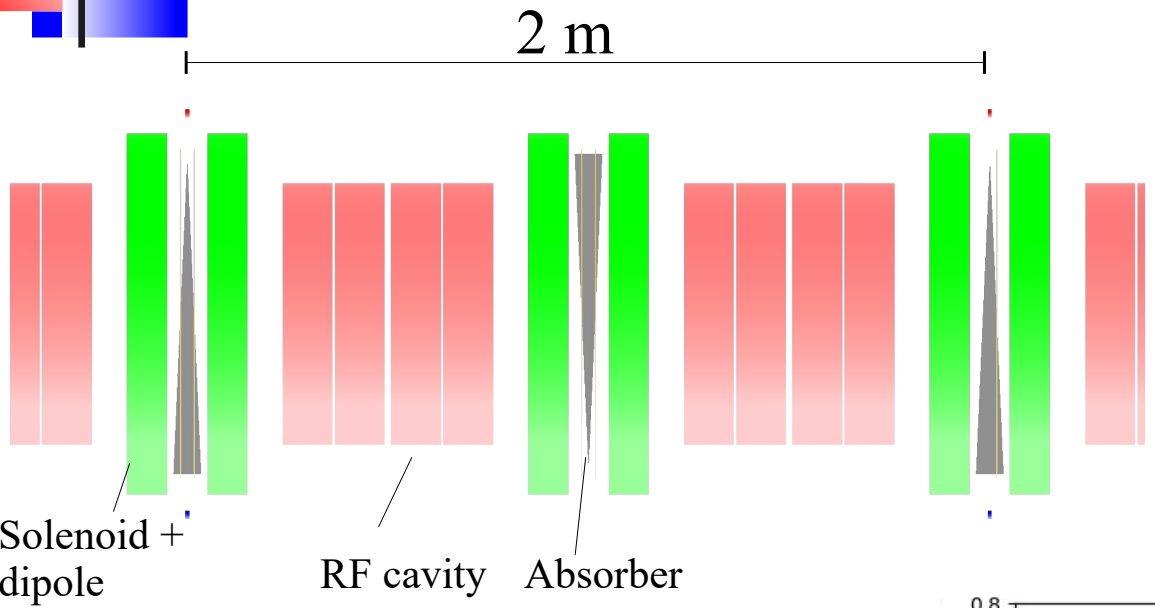
Demonstrator Layout

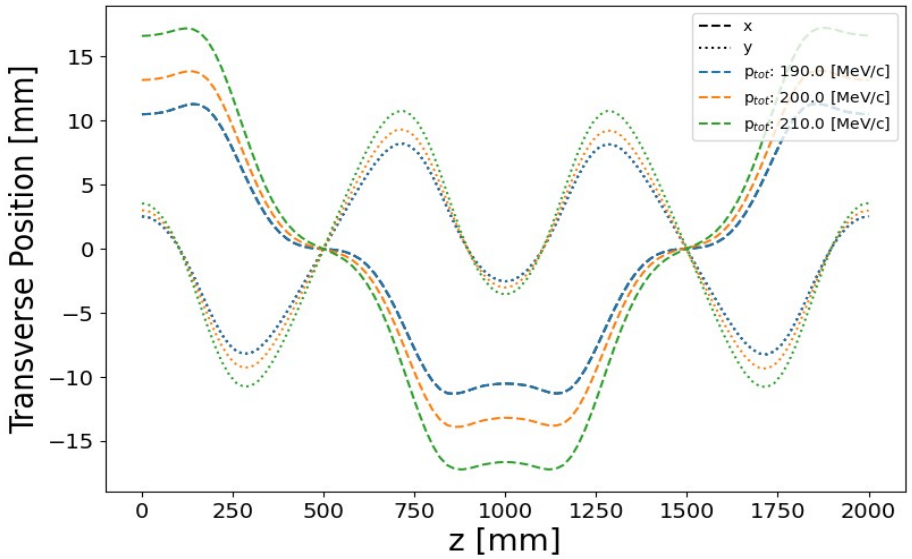


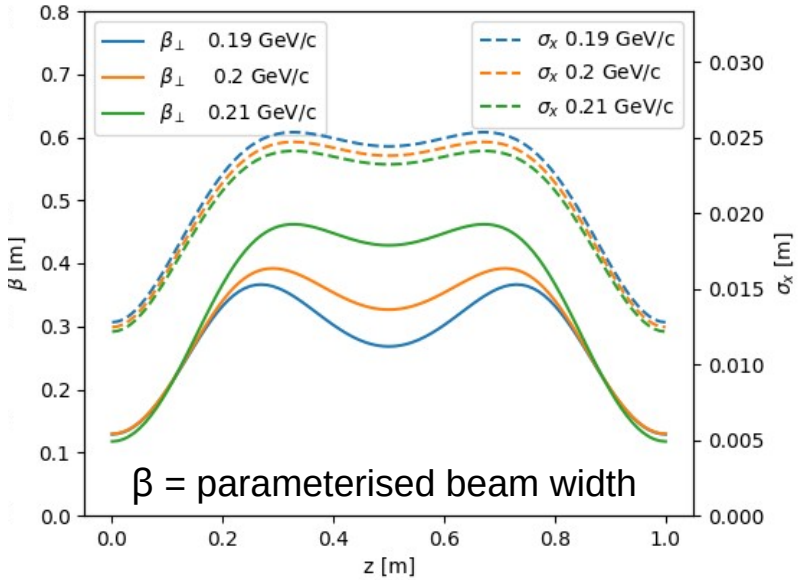
- Instrumentation on the line:-
  - Beam-based alignment (steering dipoles)
  - RF cavity phasing
  - Optics/solenoid tuning
- Instrumentation in end stations
  - Validate the overall emittance and performance

Preliminary Cooling Cell Concept

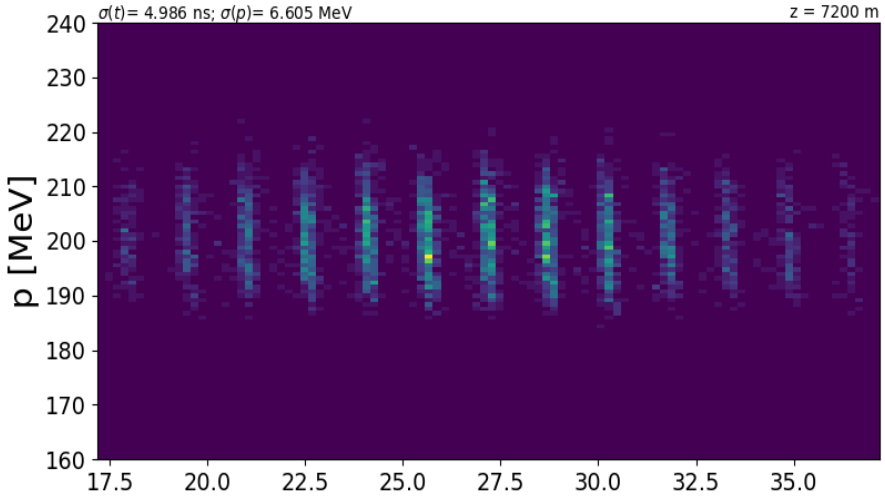


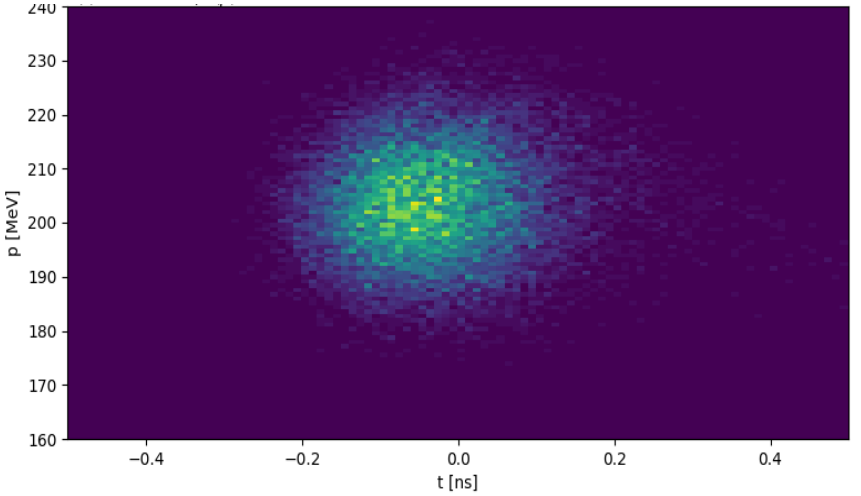
RF real estate gradient	22 MV/m
RF nominal phase	20°
RF frequency	704 MHz
Wedge thickness on-axis	0.0342 m
Wedge apex angle	5°
Wedge material	LiH

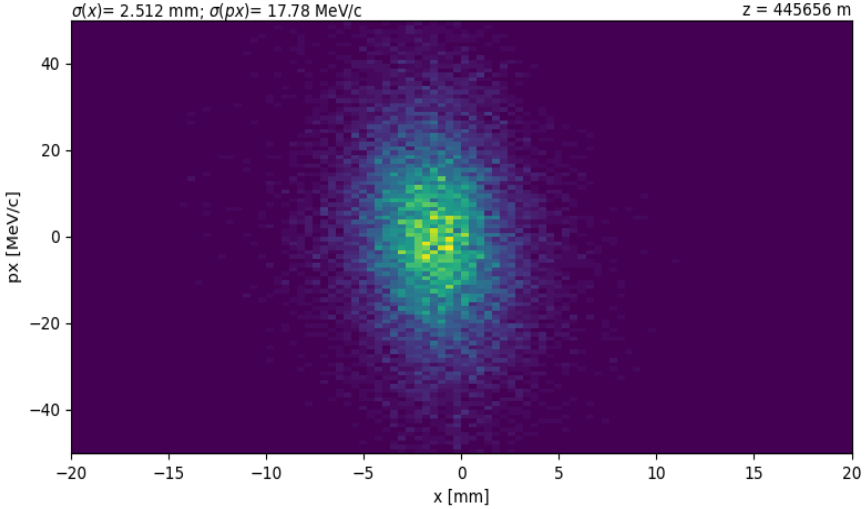


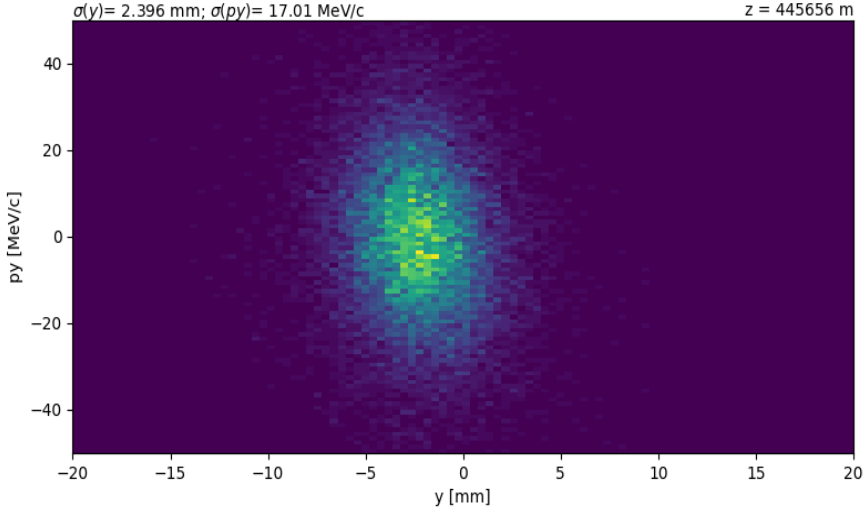


Beam preparation system









- This is beam size at the focus – small σ(x) and large σ(px)
- Expect about 5 – 10 0.1 ps pulses each separated by 1.4 ns
  - Would like to resolve individual pulses

Requirement - Provisional

- On the line
  - Beam average position accuracy 100 micron – 1 mm
  - Current with accuracy 1 %
  - Mean beam time to about 3 degree of RF = 12 ps
  - Energy measurement?
  - Polarimetry?
  - << 3 MeV energy loss per cell
  - Open question: is one measurement set per module sufficient? OR do we need one measurement per cell?
- Upstream/downstream
  - All the above
  - Transverse & Longitudinal Emittance ~ 10 % resolution (even better may be needed)
  - Measurement of angular momentum?
  - Need to maintain control of the beam in this region
    - Likely need field non-uniformity
  - Non-muon impurities
  - Note significant background due to RF cavity/electrons

Demonstrator Meetings

- Propose:-
  - 16:00 CERN time Monday 2nd June (zoom)
  - 16:00 CERN time Monday 30th June (zoom) – noting GGI workshop first day
  - Demo Workshop in November – need to settle on date & location imminently
    - Likely Europe