WP3 monthly meeting 15

IPAC article/poster

Funded by the European Union

IPAC24

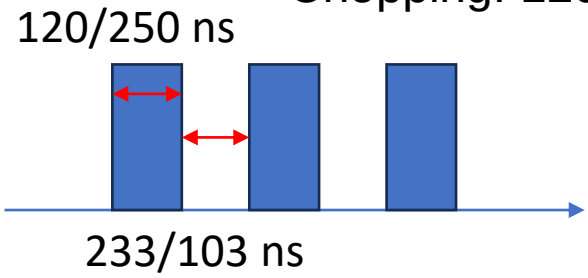
- Who is going?
  - From ESS we have Sofia, Emanuele and Isabela going.
- Any other publication connected to the proton complex somehow?

IPAC24 Abstract

- The proton complex is the first piece in the Muon Collider, it comprises a high power acceleration section, a compressor and a target delivery system. For the Muon Collider Collaboration we are investigating the possibility of having a full energy 5-GeV linac followed by an accumulator and a compressor rings and finally a target delivery system. In this paper we present the initial studies for the complex and derived initial beam parameters at each interface.

Content ideas

- Linac:
  - Talk a little about studies at LINAC4 for the source and parameters
  - H- stripping study for 5 and 10 GeV, discussion about a final energy linac.
  - Linac scheme:
    - 5 GeV/2 MW: 1 pulse of 40 mA and 2 ms or two pulses of 40 mA and 1 ms
    - 10 GeV/2 MW: 1 pulse of 40 mA and 1 ms (closer to SPL source parameters.
    - Chopping: 120 vs 250 ns length, 3 to 6 bunches



The chopping will have to be on the level of MHz

SPL -> 44 MHz

Accumulator

- Checks for accumulation at 5 GeV and 10 GeV and 3 to 6 bunches cases ongoing.(Sofia's slides)
- This info will feedback on linac chopping schemes

- If not a final energy linac what is possible?
  - Ideas on RCSs that can raise the energy?

Compressor

- Sofia is checking tune spread before/after rotation for 5 and 10 GeV (for a 2 MW case so far) and as a function of bunch number. This way we can narrow down the search a bit
- This is only to set the grounds for working of future lattices.

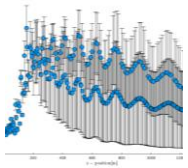
Transfer lines

- Very unlike to have a single bunch solution for any of the energies:
  - Check on trombone and merging schemes
- 1st step very that bunch parameters are ok for transport over 100s of meters
  - Done for 5 GeV and 10 GeV and looks fine
- 2nd step test 2 bunch merging (simplest possible but still not enough) but will be fine for IPAC
- Future work: include extraction part from rings (dispersion closing/leakage will play a big role on bunch quality I think/feel)

A word on power

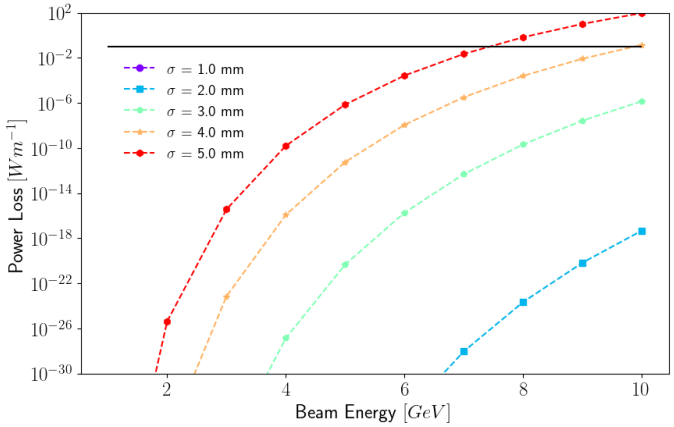
- All calculation/exploration done for now are for the 2 MW case. There is a push to go to 4 MW but keeping the rep rate at 5 Hz. Consequences
  - Increasing the Proton Complex final energy even further?
  - Go for 2 accumulator/compressor rings solution?
  - I am having a hard time visualizing some solution without blowing up the cost of the complex
  - Any ideas? MR at J-PARC as a start?
    - Stored bunch intensity now is just ½ of what is needed
    - Ramping time is not enough (we need ramp < 200 ms)
    - Can we do rotation in it?

H- stripping estimates

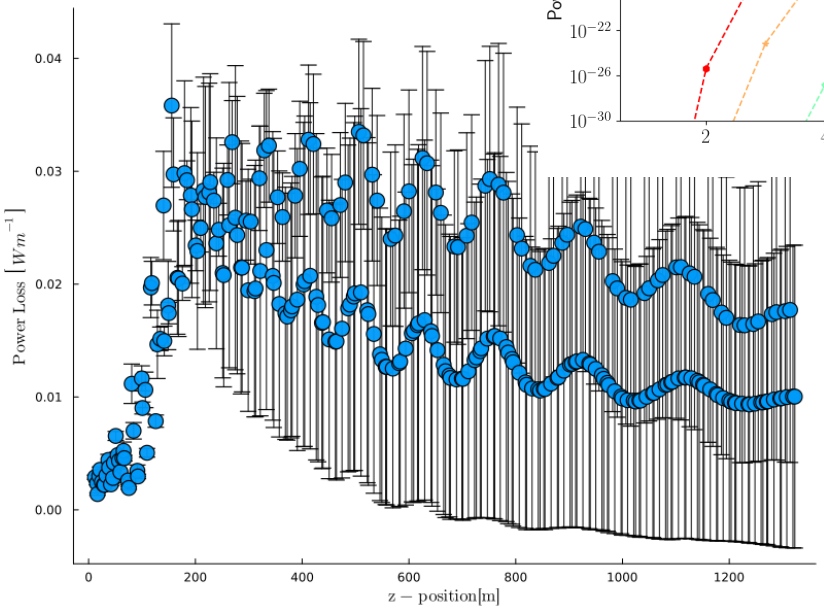


- Scaled up ESS linac to 5 GeV (2 MW) than 10 GeV (4 MW)

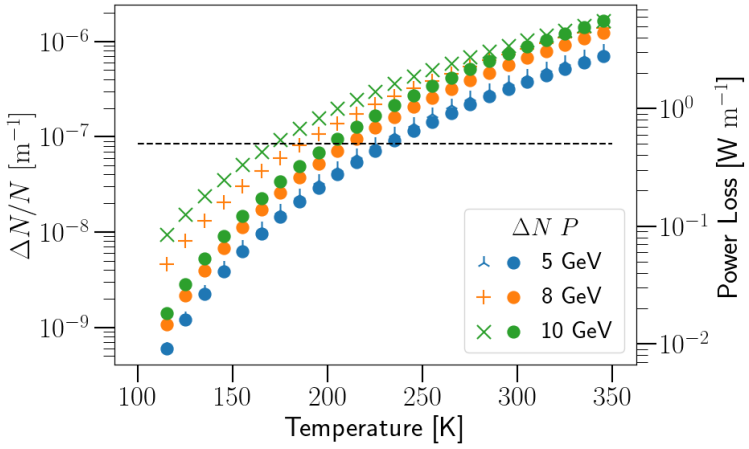
Lorentz (0.1 W/m line)



IBS



Blackbody (0.5 W/m line)



Funded by the European Union

Funded by the European Union (EU).Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the EU or European Research Executive Agency (REA). Neither the EU nor the REA can be held responsible for them.