

# WP3 Proton Complex Meeting

September 2022

# WP coordination

- Task 3.1 – Coordination and Communication: Natalia Milas (WP leader) and Simone Gilardone (WP deputy)
- Task 3.2 – High power linac: Alessandra Lombardi (task leader), Natalia Milas, Mamad Eshraqi
- Task 3.3 – Compressor ring design: Emanuele Laface (task leader), Vitaly Goryashko, Maja Ovelgård and Arek Gorzawski + Postdoc (2 years)

# Proton Complex parameters

- Linac:
  - 2 scenarios: What is possible now and identify R&D? In 20 years?
  - Doesn't make sense to put too much pressure on the Linac side right now since the proton complex depended also a lot on target parameters
  - Final Energy  $\sim 5$  GeV
  - Baseline power 2 MW (study upgrades to 5 MW)
  - 1.5 ms pulse length and 27 mA current (example)
  - H- source
  - H- stripping for injection
  - Chopper patterns for accumulation

# Proton Complex parameters

- Accumulator
  - Check Chopping needed from linac
  - Define how many bunches we will create for stacking
- Compressor
  - Final energy (discussion with Target needed): 8-15 GeV to start
  - For 10 GeV ->  $2.5 \times 10^{14}$  particles in about 4 to 5 bunches (?)
  - Check tune shifts and instability onsets (mainly space charge related)
  - How to merge the bunches onto the target/before target
  - Rough idea on how to bring the proton energy up (in which ring and how)
- How to upgrade to whole complex to the 5MW option (secondary problem)

# Work division

- Linac work
  - Source, stripping, chopping, overall parameters, bottlenecks
- Accumulator
  - Rough type of machine, how many bunches
  - Input/Output energies -> RF system needed
- Compressor:
  - RF rotation/ Isochronous
  - 1 ring with 4/5 bunches or 4 stacked rings (CERN booster)
  - Check space charge related effects first -> narrow down energies
  - Decide of RF for the ring
  - Bunch merging strategy

# International Muon Collaboration

- Meeting taking place at CERN between 11-14 Oct.
- Indico page: <https://indico.cern.ch/event/1175126/>
- No fee and available online/zoom access
- Session on Wednesday (mainly) but also Thursday on Proton Complex and Target
- Please if you can try to participate too!

# MD session at CERN

- Discussed with Simone about MD sessions in the Booster/PS rings for 2023
- Booster: stacked rings (4) where we could test ideas about bunch merging
- PS: Can do the RF gymnastics, we can drive the ring close to transition (isochronous condition), we can reach  $\sim < 10^{13}$  particles per bunch, still a factor 10 to 100 too low (best case scenario).
- Meeting with Elias and the Beam Dynamics work package to brainstorm on possible tests.
- Ideas by October-November