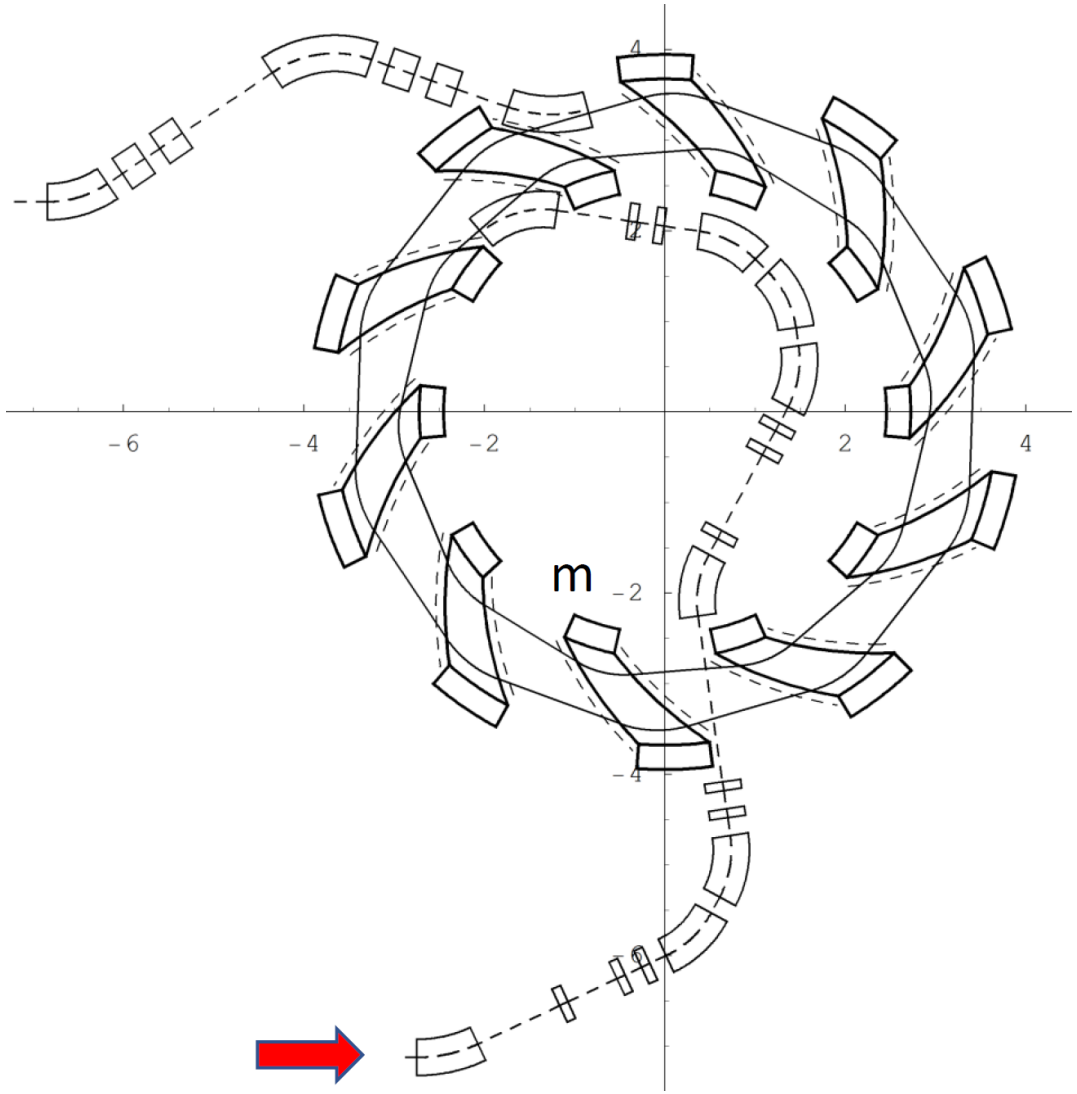
Update on geometry and optics

J. Pasternak, WP6 meeting, 13/12/22

Geometry is correct

- Checked all angles
- Injected orbit is NOT parallel to the extraction one
  - Effect of the spiral angle

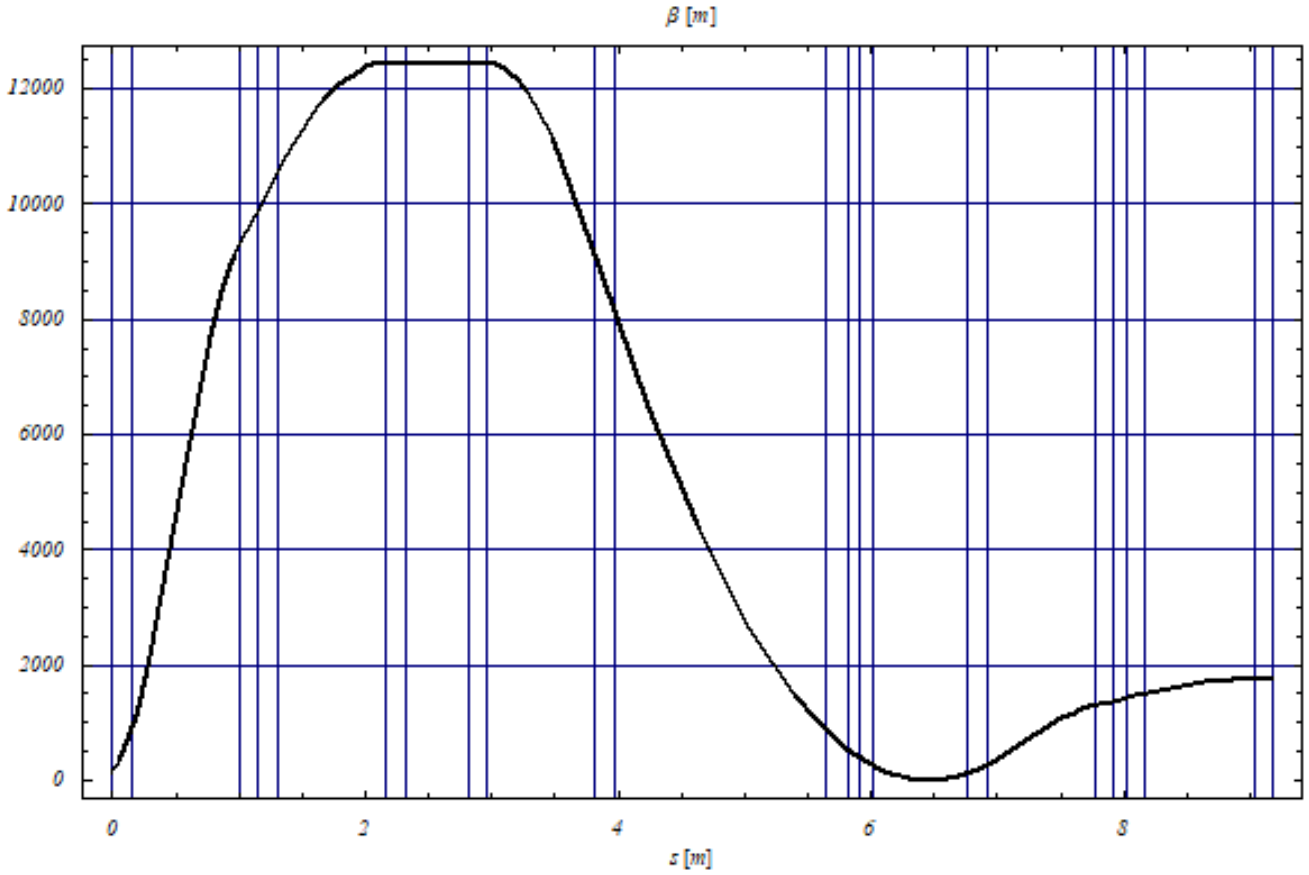


Optics studies of the baseline with HT's beam

- Some ideas about improving matching in Gabor Lenses
  - Use G1, G2 and G3 to set α=0 after GL2 and (β, α) after GL3
    - This will set the point to parallel capture and keep focus at constant z
    - Space charge will need to be included
  - Use G4 and G5 to set α=0 after GL5
    - β after GL5 can be varied
      - How much? Between ~1750-12000m
      - With 1m longer drift between GL3 and GL4: between ~1300-12000m
      - No solution found for matching into the current injection line

Minimum beta

- Focus again in the RF cavity
  - Do we need to worry about it?
  - Some simulation on the performance of the energy selection in non-ideal focus conditions would be useful to inform the choice



Next steps

- To find the new injection line
  - We need to do it in any case due to the new wall
  - Beam is only 40% bigger at the input, so not an issue with the apertures
  - The difficulty is on matching into the FFA
- To work on the FFA update

WP6 expectations for GL design (extra slide)

- Focusing of equivalent ~1.4 T solenoid
- Linearity vs r
- Reasonable uniformity vs z
- Stability
- Reproducibility
- Tunability
- Low cost
- Low power consumption