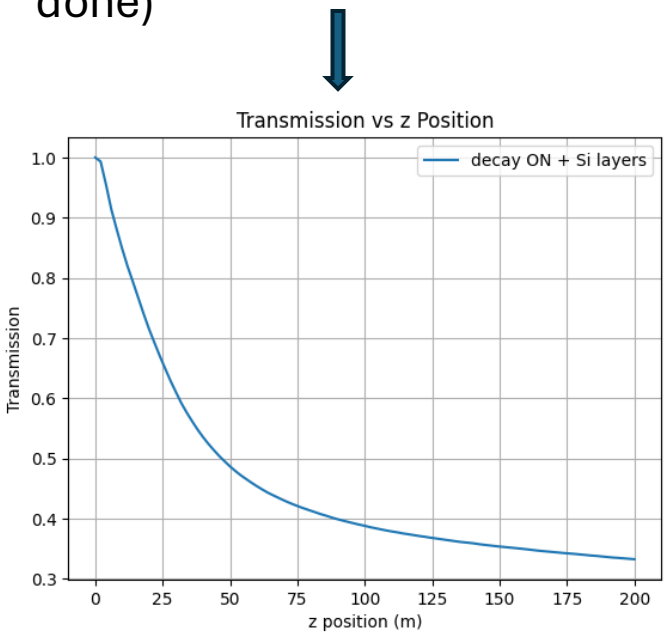
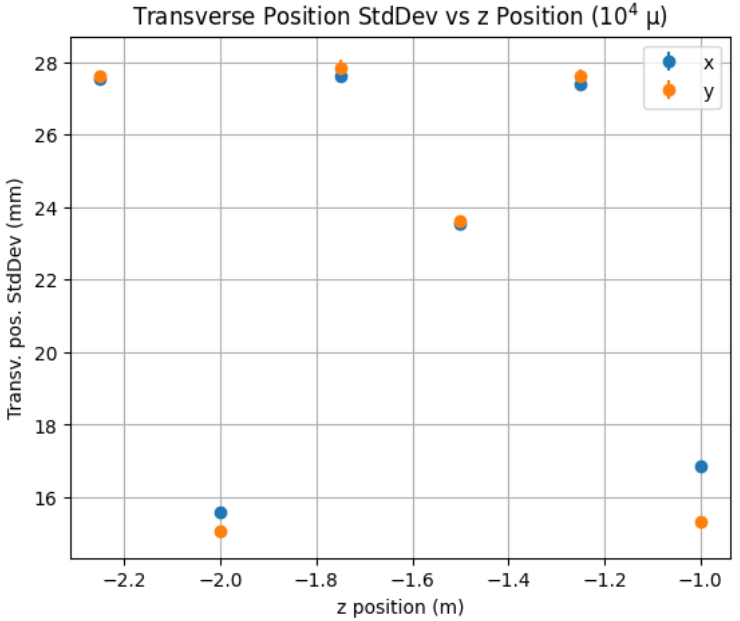
Demo study updates

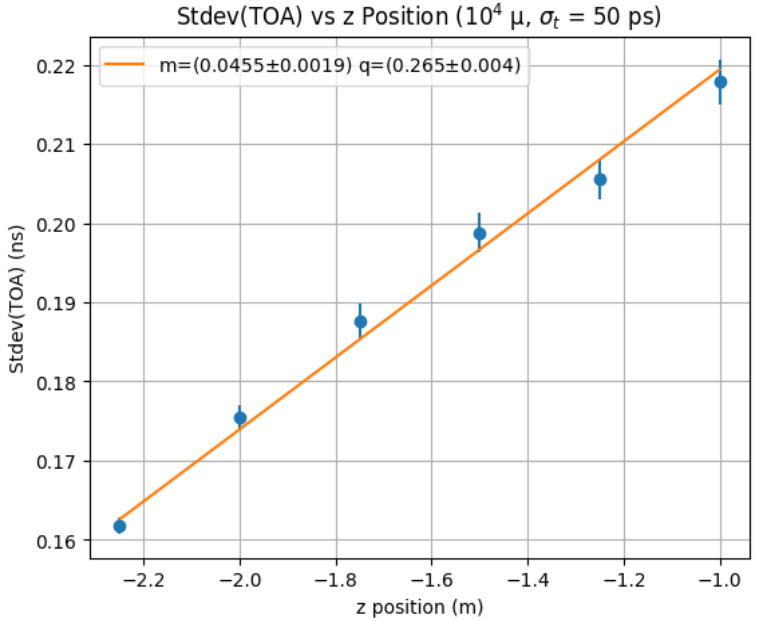
In progress

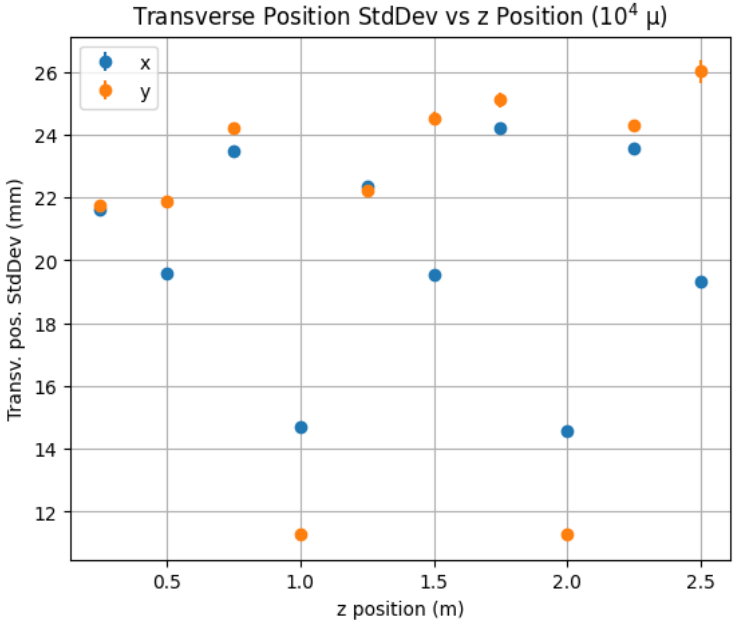
Measuring longitudinal emittance comparing initial and final planes

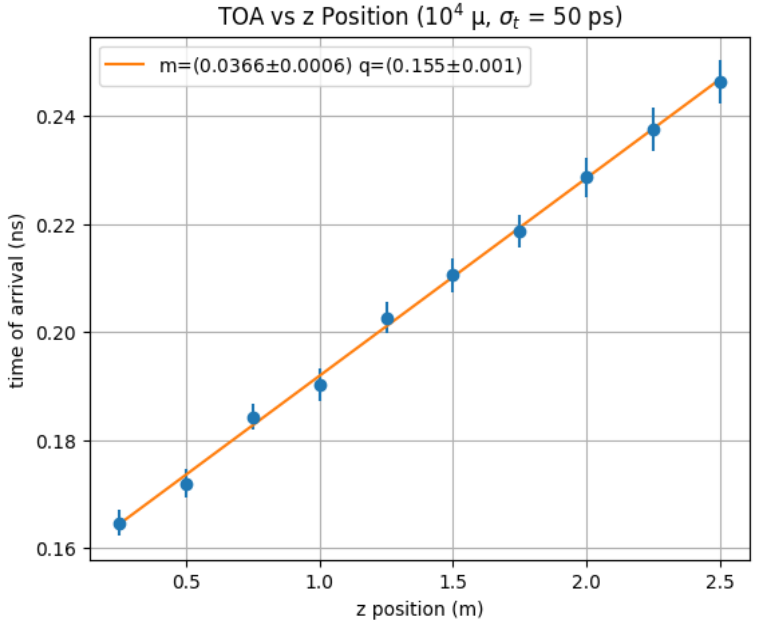
- 3m of lattice without cooling before the actual cooling, same at the end
- In the x-y plane, only transverse evolution in solenoidal field
- In the t domain, StdDev growth
- The price is an even worse mismatch (if no optimization is done)











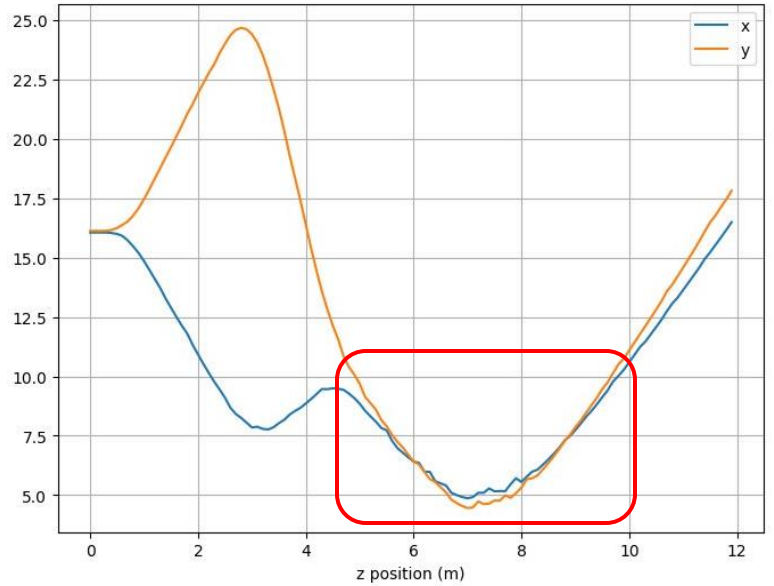
Possibility of measuring the transverse emittance bunch by bunch

- Looking at beamspot growth with no B makes us loose the beam (or a large fraction of it) → cannot use this method as initial measurement
- Possibility (?): use the focus-defocus behavior?

$$\sigma_x(z) = \sqrt{(\beta_x \epsilon)} = \sqrt{\epsilon}\ \sqrt{(\beta^*_x + z^2/\beta^*_x)}$$

- Focus the beam (factor ~2 or even less), measure the beamspot using N tracking planes and fit the function
- Use eg a quadrupole triplet to focus and an antisymmetrical one to bring the beam to the original config

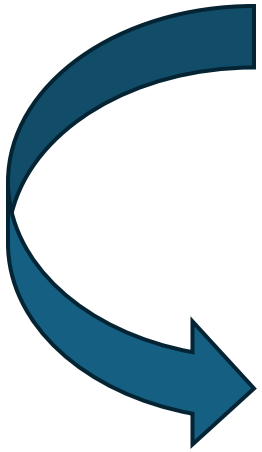
(Just an example) →

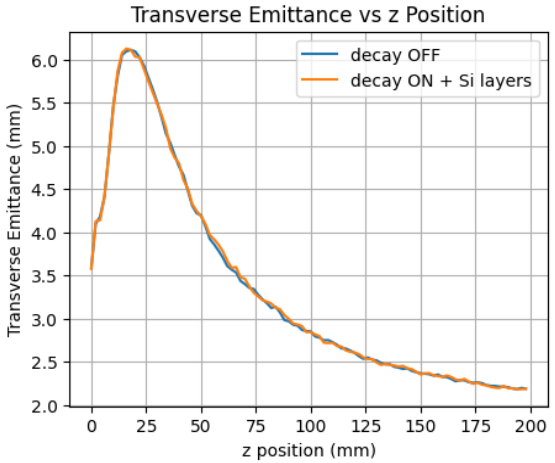


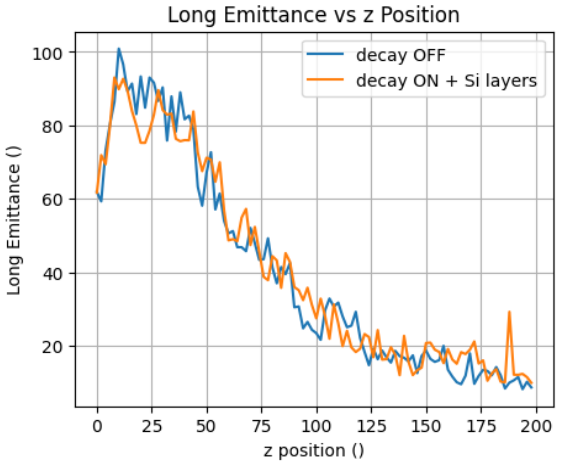
Discussion with Paul and Donatella

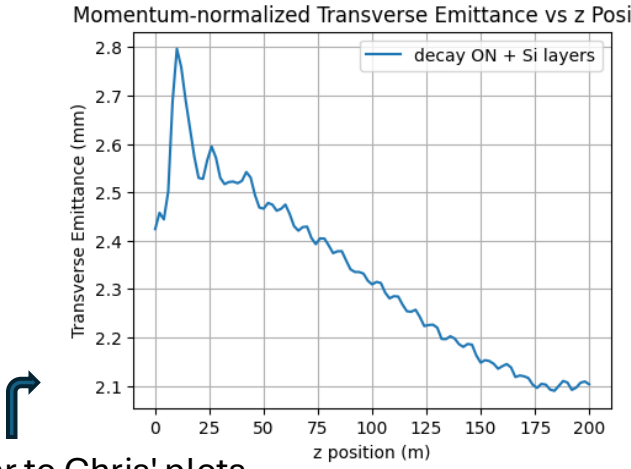
Beam emittance evolution

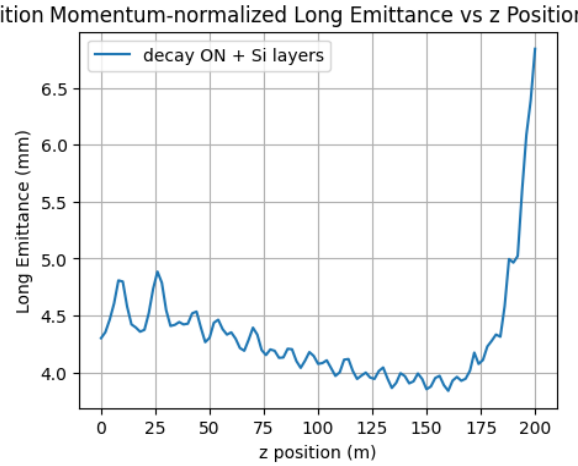
- Cut at local 3 sigma in x-y plane and only consider muons that are trasmitted though the full length

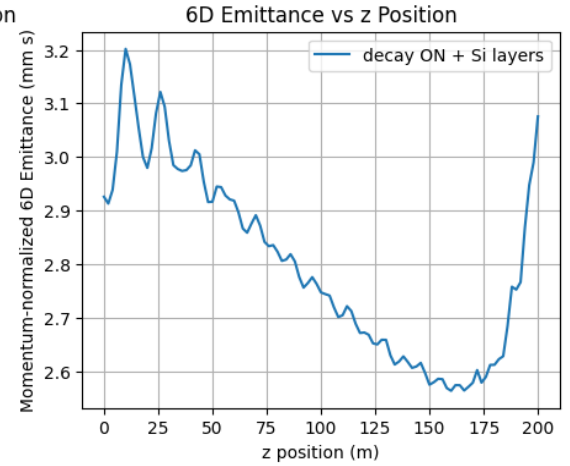












Somewhat similar to Chris' plots

Can't understand the final longitudinal increase (artifact??)

Beam emittance evolution

- Something in the time domain
- Probably some cuts missing, but need to investigate