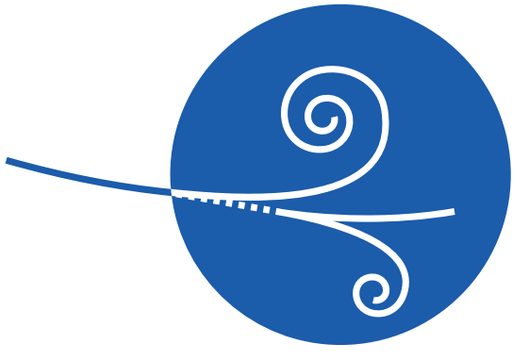


III. Physikalisches
Institut A

RWTH AACHEN UNIVERSITY

Experimental Techniques in Particle Physics (WS 2020/2021)

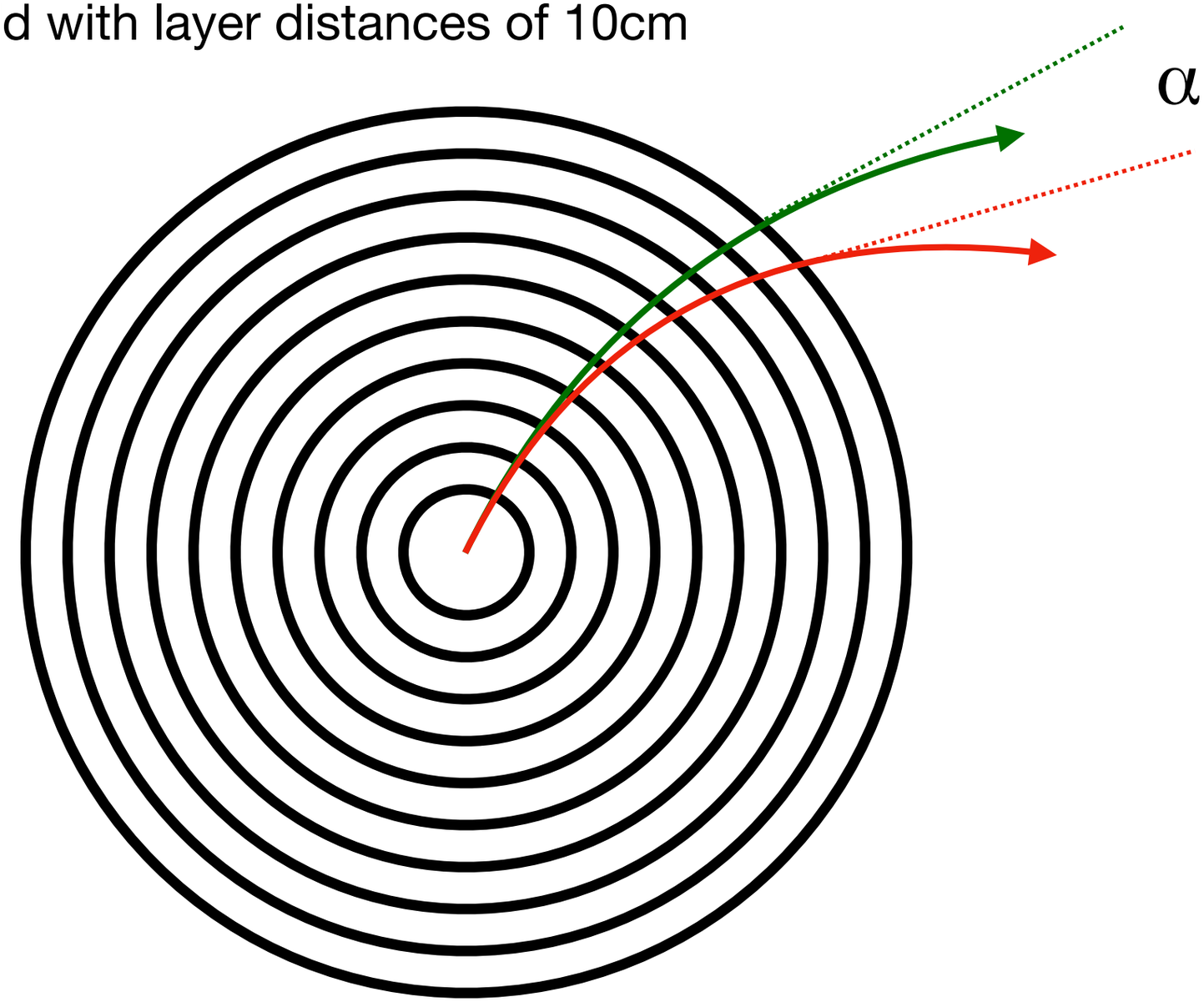
Exercises

Prof. Alexander Schmidt

17.11.2020

Exercise: Bremsstrahlung

- catch up with the “extra” exercise from last week (see the solution in juptyer hub)
- a particle detector in 2D, consisting of 10 layers of silicon (300μm thickness) in a 4 T magnetic field with layer distances of 10cm



- consider 1 GeV electrons and muons passing through the detector
- calculate the average total energy loss passing through the detector and the angle
- in addition to ionisation, add also the effect of “Bremsstrahlung” and compare the results

Exercise: Multiple Scattering

- implement the multiple scattering effect as well
- we will continue with this next week, in case you are not done today
- note that multiple scattering is not an energy loss mechanism, it changes the direction of particles on a statistical basis

- the minimum today is the Bremsstrahlung effect, this will also be explained in the solution. We will discuss the solution to multiple scattering next week.