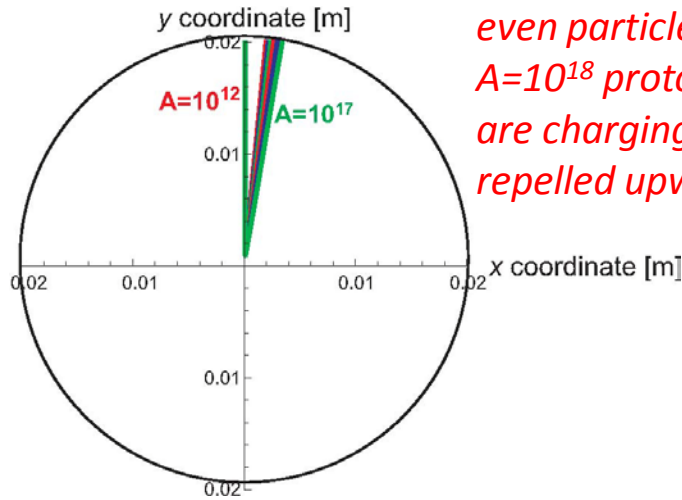


“dust” particles falling into the LHC beam

trajectory in x-y space

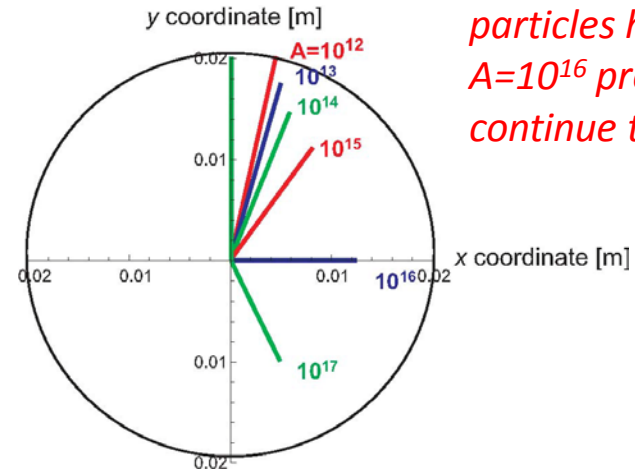
round Al object; $A=10^{14} \rightarrow R \sim 2.5 \mu\text{m}$, $A=10^{16} \rightarrow R \sim 11 \mu\text{m}$

design beam current, $N_{tot} = 3.2 \times 10^{14}$



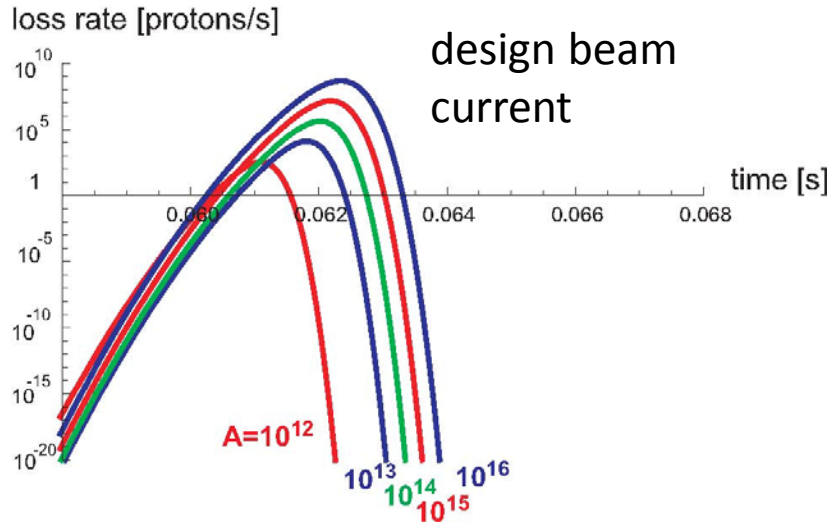
even particles of mass $A=10^{18}$ proton masses are charging up to be repelled upwards

present beam current, $N_{tot} = 2.3 \times 10^{12}$

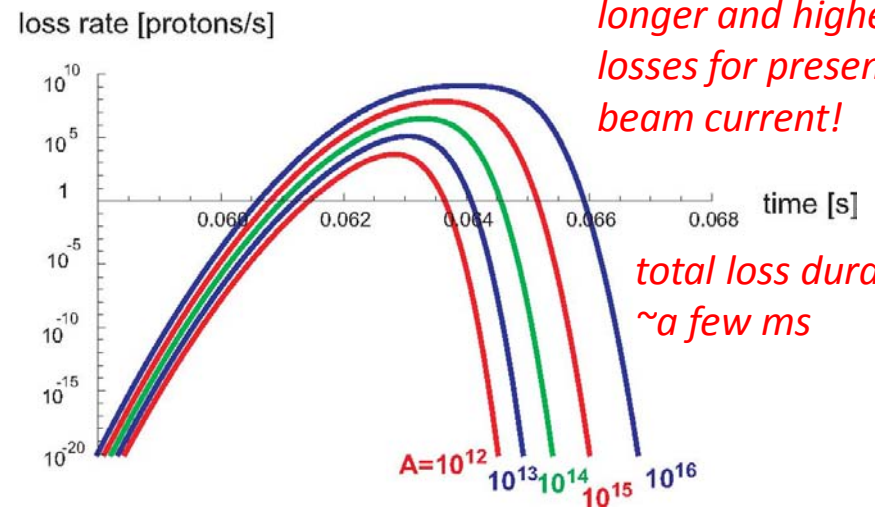


particles heavier than $A=10^{16}$ proton masses continue to fall down

resulting loss rates (compare with quench threshold \sim a few 10^7 p/s)



design beam current



longer and higher losses for present beam current!

total loss duration \sim a few ms