

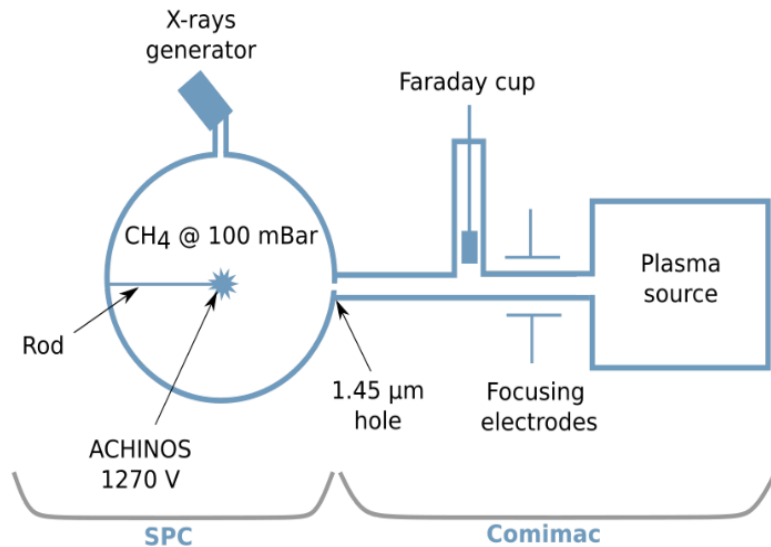
QF measurements and simulations

CYGNO Simulation meeting, 4/04/2022

F. Di Giambattista

QF measurement

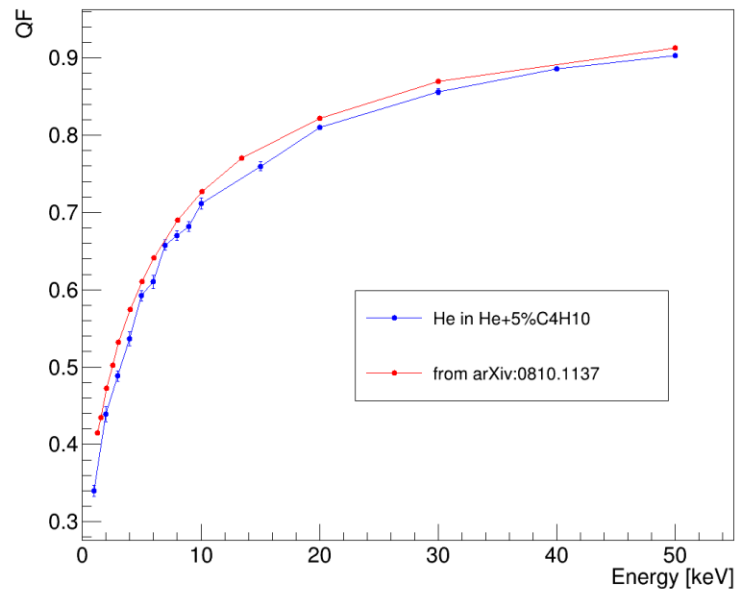
- We had a meeting with the COMIMAC people to discuss a possible measurements of the QF of our mixture
- They would prefer that we couple our detector to COMIMAC
 - We all agreed that doing it at atmospheric pressure does not seem feasible
 - But a measurement at low pressure would not give information on our 1atm operation point



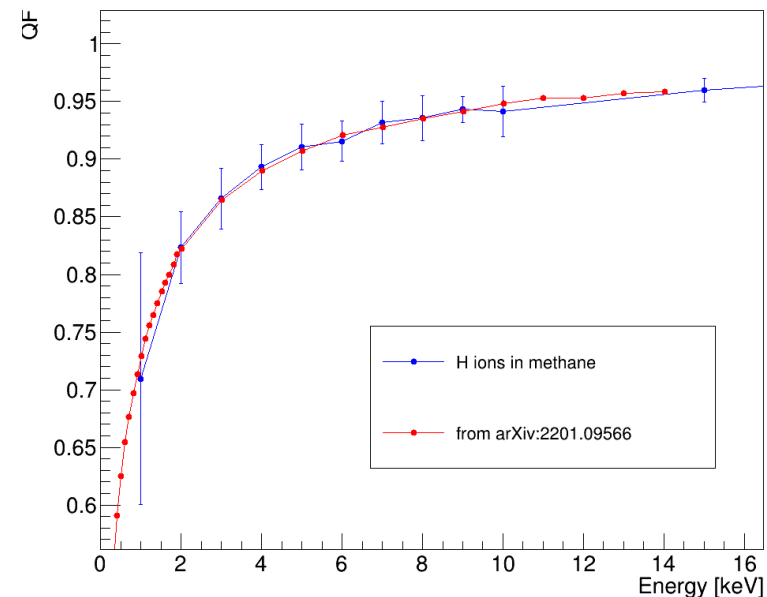
QF simulations with SRIM

- We also discussed our SRIM simulations and the comparison with their results
- The He in He + 5% C_4H_{10} and H in CH_4 are consistent, the Ne+3% CH_4 is not
 - They were not involved in the Ne simulations directly

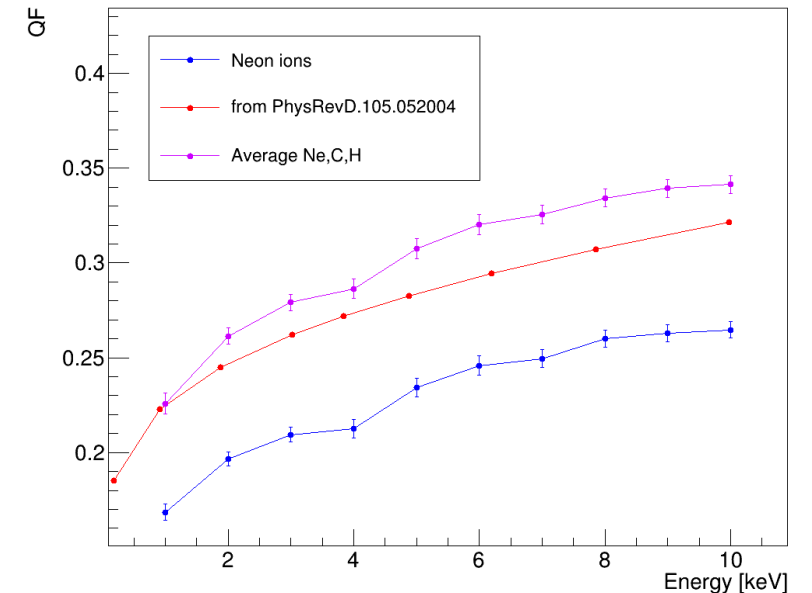
He in He+5% C_4H_{10}



H in methane

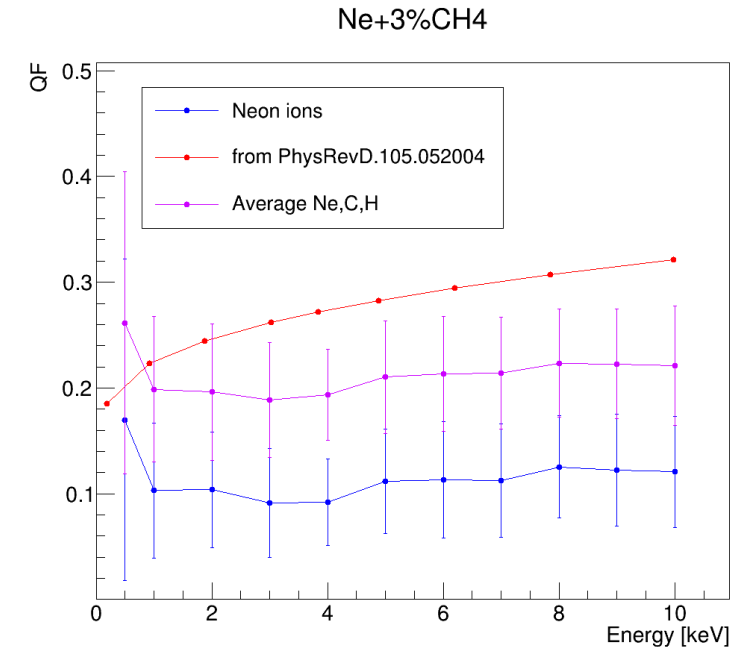
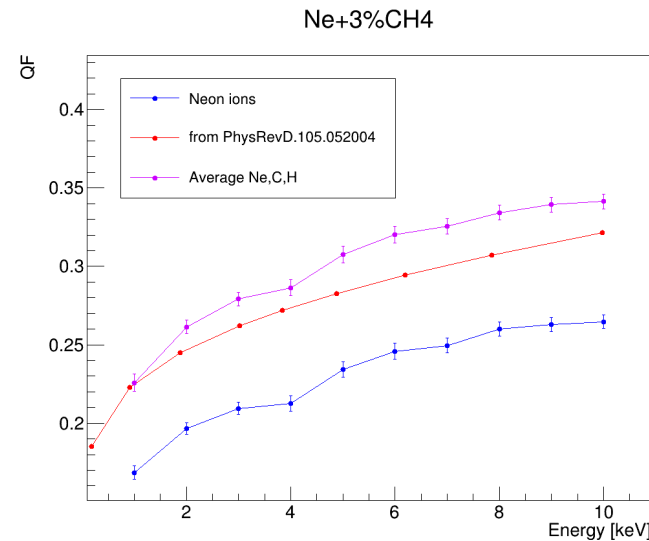


Ne+3% CH_4



QF simulations with SRIM

- They suggested a different method to compute the QF, but it's not consistent with the usual one
- We should not worry about the inconsistency – the neon paper already generated internal discussions

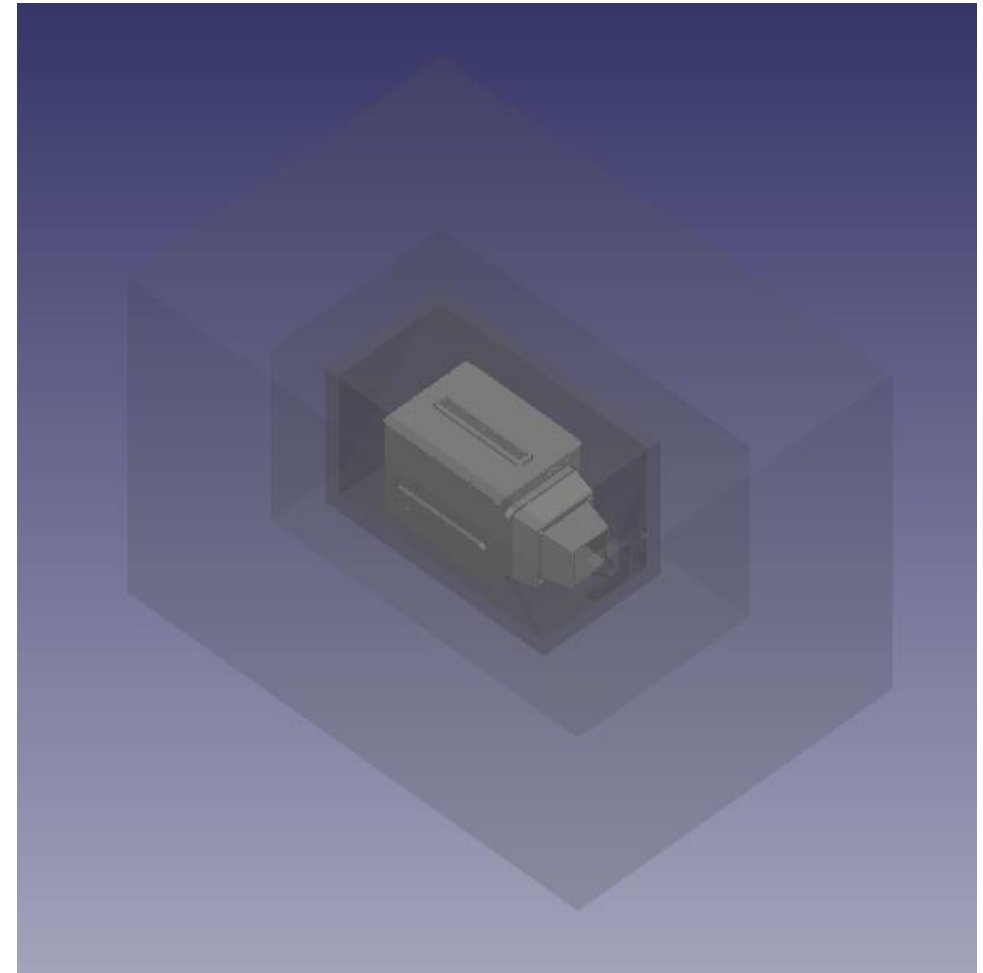


- Another difference in the simulation mode:
 - it seems that "Monolayer Collision Steps" (the most detailed, no free flight path approximation) and "Quick Calculation" give different results
 - In pure Ne, at 6keV, Lindhard theory 30.6%, Quick Calc. 28.8%, Monolayer 24.4%
- I had already started to perform a comparison between the Monolayer mode and the Full Damage mode (much faster!) - still ongoing; we need to understand which is more reliable

LIME background simulation

New shielding simulation

- Cesidio sent me the simple CAD designs of copper shieldings (40,60,100 mm) and the water shielding, to be used in the GEANT4 simulation
- The simulation runs correctly with the new shieldings
- I am working on how to treat these shielding like we did with the boxes with adjustable thickness that we used so far (e.g. for the flux at different shieldings)
- The code can run on CYGNO cloud, also with HTcondor
- Before starting to re-run the simulation, I want to check the new geometry **visually**; how can I do it? Is it possible to use the GEANT4 visualization on CYGNO cloud?



New shielding simulation

New geometry seems fine and consistent

