III. Physikalisches Institut A

RWTH AACHEN UNIVERSITY

Experimental Techniques in Particle Physics (WS 2020/2021)

Exercises

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Exercise

draw the time-dependent signal (current and/or voltage) created in a gas detector for the following cases:

- **parallel plate drift chamber**
  - distance of plates 1cm
  - size of plates 1m^2
  - e^-I^+ pair deposited in the middle between the two plates
  - Argon gas at atmospheric pressure
  - Voltage between plates 2kV
- **cylindrical proportional chamber**
  - tube radius 1cm
  - wire radius 10μm
  - 100 e^-I^+ pairs deposited in the middle between wire and tube
  - same gas and Voltage as above
  - hint: electron drift is negligible compared to avalanche and resulting ion drift, the gas Gain factor G=10000
- **for next week:**
  - how does the signal of a continuous track look like
  - the track is created by a 1 GeV muon (calculate the ionisation and the drift of the ions)