ALERT@ALTO

Report of the 28/11/2019 meeting
Presents : Lucien Causse, Gabriel Charles, Matthieu Lebois, Abdelhakim Said

---

1) Reason for the meeting:
Make sure that ALERT can be tested at ALTO and define all the tasks that need to be done before the run. Define date of the tests.

2) ALERT can be tested:
ALERT HDC and ATOF can be tested on line 410 (Swiss knife line) of ALTO but two things must be taken into account.

- The time resolution given by the RF signal is 2 ns, it is hence necessary to find a way to create our own trigger.
- The minimum current is 100 pA for protons in continuous beam so the beam must be attenuated.

The shielding introduced to attenuate the beam could be used to create photons that detected in a fast scintillators can be used as a trigger and initial time.

Tests will occur between **March 2 to March 13** from 7 o'clock to 23 o'clock. No beam will be delivered during the weekend. The beam is provided on so called, Director's beam time.

It is possible to use pulsed beam, which reduces its intensity by 4. In this case, each pulse is 2 ns long every 400 ns. Proton, deuton and alpha beams will be available.

3) Installation:
Installation will occur the week prior the beam tests. It includes the following elements:

- gas box and gas sytem
- HV power supplies (HDC, ATOF)
- LV power supplies (HDC, ATOF)
- detector support (beam line axis is 1.74 m high)
- moving table
- end of the beam line
- trigger
- HDC and ATOF prototypes
- all cables

4) Run time:
All work force available will be welcome to participate in the tests. The list of tests to carry out will be agreed during ALERT meetings but must take into account the following:

- change of **luminosity** takes **20 minutes**
- change of **energy** can take **2 hours** and energy should not be higher than 24 MeV for the protons otherwise it is longer, 20 MeV for alphas
- change from **proton to alpha** takes **1 hour**

5) Work to carry out before the tests:
Before the tests the following must be done:

- find a motor table, there is a table in Orsay, can move perpendicularly to the beam and rotate around an axis perpendicular to the horizontal plane. Discussions are on going to take it. It comes with a stand that would fit our needs in terms of size

- design the end of the beam line. Something very similar to our needs is ready and has been designed by Julien Bettane, though it has to be adapted a little bit.
- order premix bottles
- find a trigger and test it if possible
- find all supplies
- find a way to reduce beam intensity, an easy and convenient way is to absorb the particles with plates in front of the beam, though we don't want to stop the beam each time its energy is changed. The absorber can moreover create photons that can be used for the trigger.

6) Preliminary schedule of beam tests:

```
0) See signal in the HDC and ATOF with trigger on
1) Send a 1 kHz (or lower) proton beam to see particles one by one
2) Increase HV of the drift chamber to see gain and drift speed change
3) Move the detector around the beam and proceed with 2) and 3)
4) Increase the rate to 1 MHz to see saturation effects
5) Repeat 2) and 4) with deutons and alphas
6) Repeat 2), 3) and 5) with a different gas mixture
```