Outline

- General idea
- Characterization of the delay line
- Test of the TDC
- Test with a monowire detector
- Next steps
To develop and build a test station to be used in the production center at CERN

- 8 pads

\[ \sim 27 \times 32 \text{ cm}^2 \]
General Idea

- Use cosmic rays (uniform irradiation)
- Connect the pads to a delay line

Time distribution: resolution
General Idea

* Connect the short-circuited anode pads to a pre-amplifier

* Charge spectrum:
  - peak position → chamber uniformity
  - Noise

→ ADC/MCA
Characterization of the delay line

Experimental Setup

- Pulse generator
- Delay line, 49 cells (≈ 3.9 ns/cell)
- Multichannel Analyser PC interface
- START
- STOP
- OUT
- (T.A.C.)
Characterization of the delay line

Delay line: 49 cells, ~ 4 ns/cell
Time spectrum (TAC): pulses injected in consecutive cells of the delay line
Characterization of the delay line

<table>
<thead>
<tr>
<th>Delay line cell</th>
<th>Mean MCA Channel</th>
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<tbody>
<tr>
<td>P1</td>
<td>435.0 ± 0.5174</td>
</tr>
<tr>
<td>P2</td>
<td>50.79 ± 0.2078E-01</td>
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**TAC**

**Linearity:** < 0.1%

**Time resolution:** ~240 ps (with TAC+ADC)
Test of the TDC

Time resolution 
~500 ps 
(with TDC)
Test with detector

- Gas detector with one wire and 40 cathode pads
- Each 10 pads short-circuited and connected to the delay line
Test with detector

- Delay line inside aluminium box (shielding)
Results of the tests with detector

Pads 1-10 injected in cell #10
Pads 11-20 injected in cell #17
Pads 21-30 injected in cell #34
Pads 31-40 injected in cell #41
The whole setup may be optimized
- TDC
- Discriminators
- Pre-amplifiers
- Connections

=> better time resolution may be achieved
Next steps

- Tests with the LHCb muon chamber prototype at CBPF
- Design of the test station mechanical enclosure
- Design and production of the electronic circuits
  - Delay line, pre-amplifier, discriminator, digital interface
- Software development (PVSS SCADA?)