uRWELL & SRPC H4 test beam

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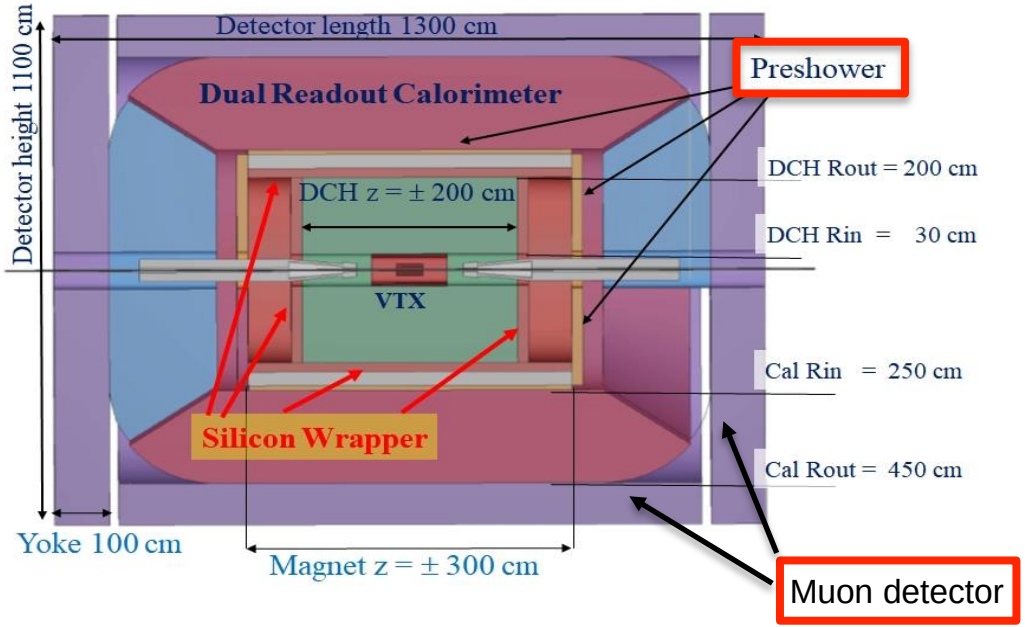
and IDEA Muon-group
(Bo, Fe, LNF)

μ-RWELLs in IDEA

IDEA detector is a general purpose detector designed for experiments at future e^+e^- colliders (FCCee and CepC).



Pre-shower and Muon system based on μ-RWELLs technology:

Pre-shower tile:
50x50 cm² with X-Y readout
Strip Length: 50 cm
Strip pitch: 0.4 mm
width: 0.3 mm
Input FEE capacity (C_{in})~ 55 pF

Muon tile:
50x50 cm² with X-Y readout
Strip Length: 50 cm
Strip pitch: 0.8 mm
width:0.6 mm
Input FEE capacity (C_{in}) ~ 110 pF

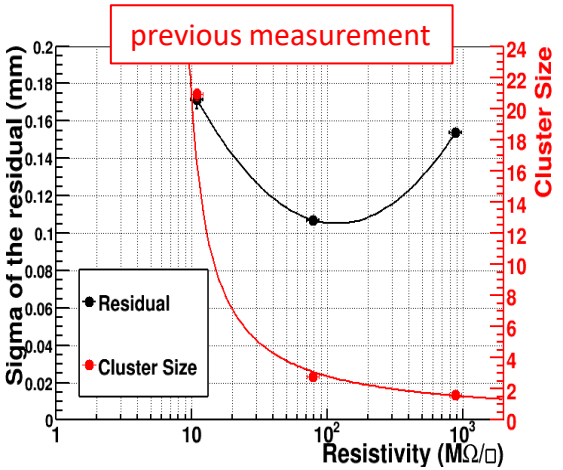
μ-RWELL prototypes for IDEA

Plans for the 2021 foresee the study of the uRWELL performance vs resistivity and strip pitch:

N. **4/5** RWELL (160x500 mm^2 active area) for pre-shower detector
- **strip pitch 0.4 mm**, strip length 50 cm (Cin - 55 pF)
- **DLC resistivity 10-20-50-100-200 MOhm/square**

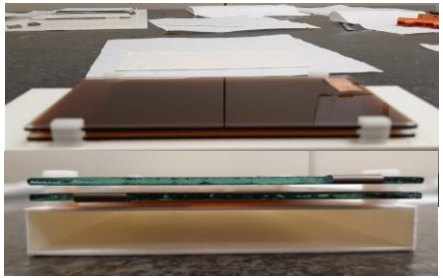
N. **4/5** RWELL (160x500 mm^2 active area) for Muon detector
- **strip pitch 0.8 mm**, strip length 50 cm (Cin - 110 pF)
- **DLC resistivity 10-20-50-100-200 MOhm/square**

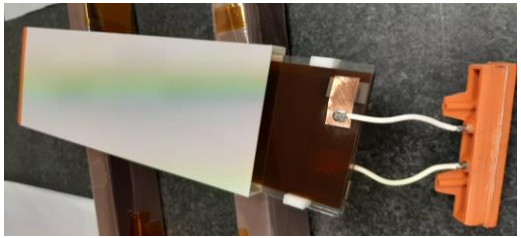
HW and SW simulation will allow the test of different pitch:
- 0.4, 0.8, 1.2 mm for pre-shower
- 0.8, 1.6 … mm for muon

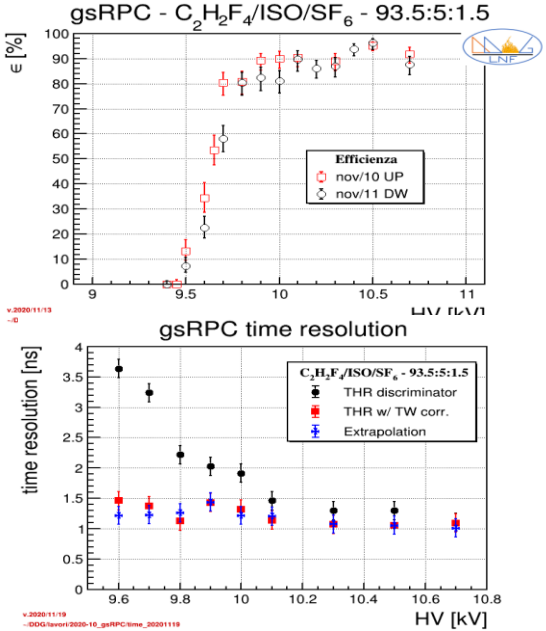


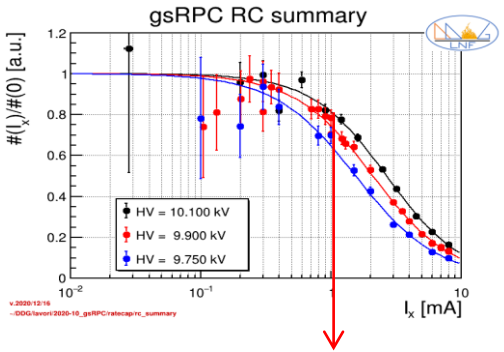
SRPC

In parallel we could include the test of new **timing detectors**, the **Surface Resistive Plate Counters (SRPC)**, a promising technology for the upgrade of the external regions R3, R4 of the Muon stations M2÷M5 at the LHCb experiment.





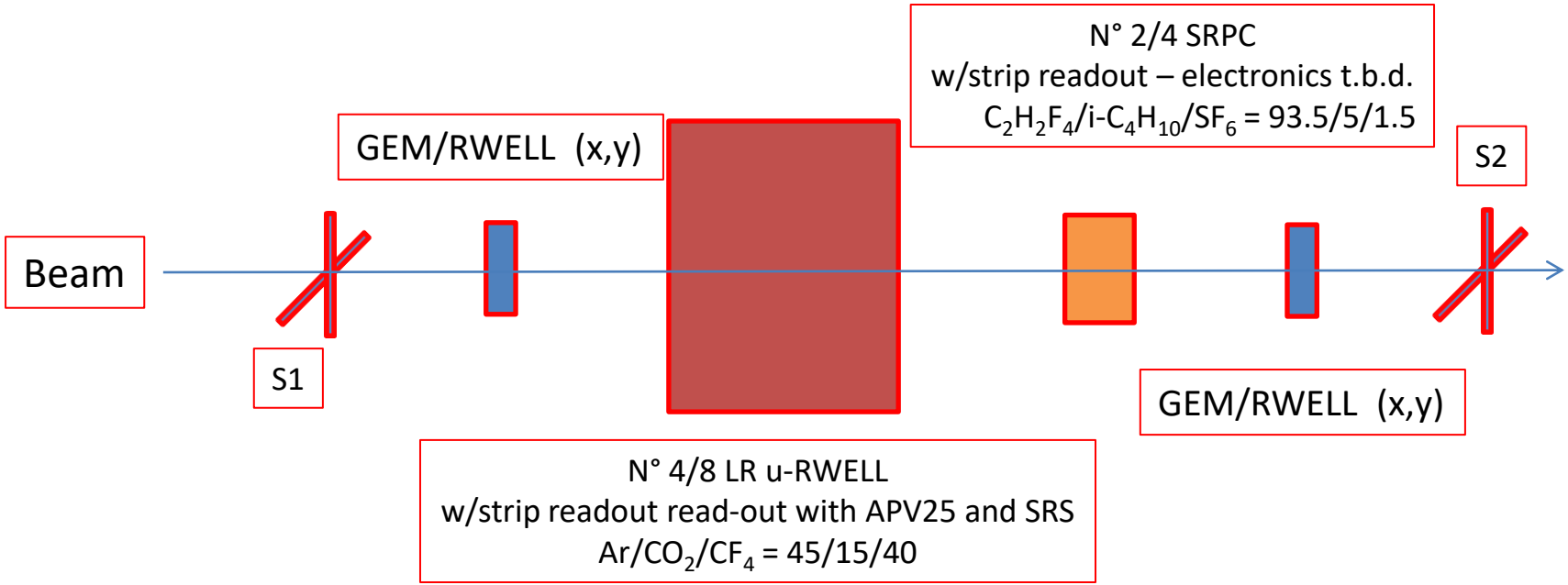




~1 kHz/cm^2 - m.i.p. equivalent, high rate version under study

gas mixture:
$C_2H_2F_4$/i-C_4H_{10}/SF_6 = 93.5/5/1.5

H4 TB (tentative layout)



Requirements

Purpose

1. **spatial performance of μ-RWELLs** vs **DLC resistivity and strip pitch** $Ar/CO_2/CF_4$ = 45/15/40; APV25 w/SRS readout
2. **time performance of gSRPC**; $C_2H_2F_4/i\text{-}C_4H_{10}/SF_6$ = 93.5/5/1.5; f.e.e. still to be defined

Set-up

- The set-up should be ~**1.5×0.6×0.6 m³,** will include trigger scintillators, external trackers (μ-RWELL or GEM)

Beam

- **No high intensity beam** (eventually SRPCs could be installed slightly off-beam)
- **No magnetic field**

Period

- TB set-up should be ready within **Sept. 2021**
- period: **two weeks beam time in the second half of Oct. 2021**