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## The u-RWELL technology at the IDEA detector

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In view of the construction of a circular e+e- collider, like FCC\_ee, the scientific community of RD\_FCC is conceiving the IDEA apparatus: the Innovative Detector for Electron-positron Accelerator.

The detector is composed, from the innermost region going outward, of a central tracker, the magnet, the pre-shower, the calorimeter and the muon system.

The micro-Resistive WELL technology has been proposed for the realization of the pre-shower and the muon counters with a proper tuning of the detector parameters due to different requirements of the two systems. In particular the readout strip pitch will be  $400\ \mu\text{m}$  for the pre-shower and 1 mm for the muon stations. This is possible even thanks to the industrialization of the production process started to make the technology cost-effective. A key-role in this task is represented by the choice to make the apparatus systems modular.

Other requirements to the detectors are: a spatial resolution of the order of  $100\ \mu\text{m}$  for the pre-shower and a reasonable total number of front-end channels for the muon system.

The optimization of the surface resistivity and of the strip pitch passed by the construction of 2 sets of prototypes, each made of 5 detectors for the pre-shower and 3 detectors for the muon, with active area of  $16 \times 40\ \text{cm}^2$  and 40 cm long strips. For the pre-shower prototypes the resistive stage has been chosen with a surface resistivity  $\rho_s$  ranging from 10 to 200 MOhm/square, while for the muon ones  $\rho_s$  is about 20 MOhm/square. All these detectors have been exposed in October 2021 to a muon/pion beam at the CERN SPS. The very positive results obtained open the way for a completely new and competitive MPDG tracking device for high energy physics experiments. Preliminary results on a long detector stability measurement will be also presented.

### In-person participation

Yes

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