The **µ-RWELL** technology for the preshower and muon detectors of the **IDEA** detector

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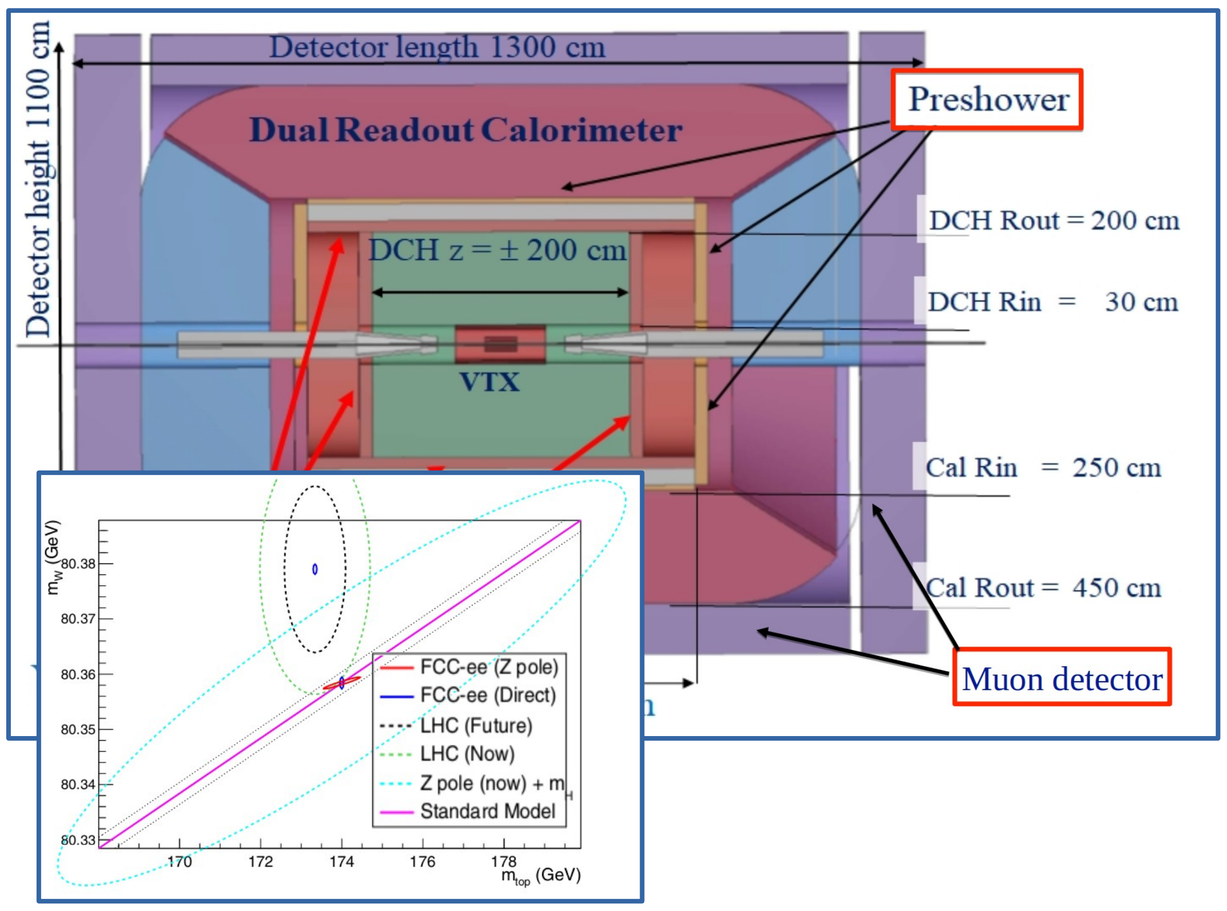
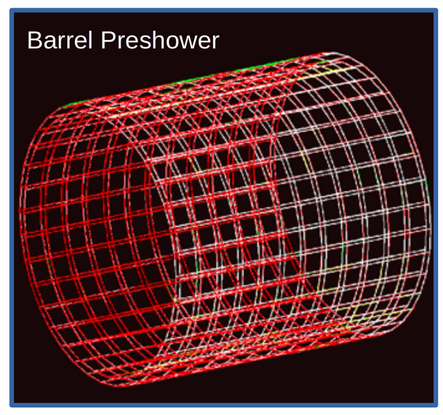


IDEA (Innovative Detector for an Electron-positron Accelerator)

1 - detector concept for e^+e^- collisions
2 - considered both by FCC-ee and CEPC
3 - two of those sub-detectors are constituted by µ-RWELL technology
4 - mass production is needed

Pre-shower:

allows the identification and measurement electromagnetic showers that originate in the material of the solenoid before reaching the calorimeter

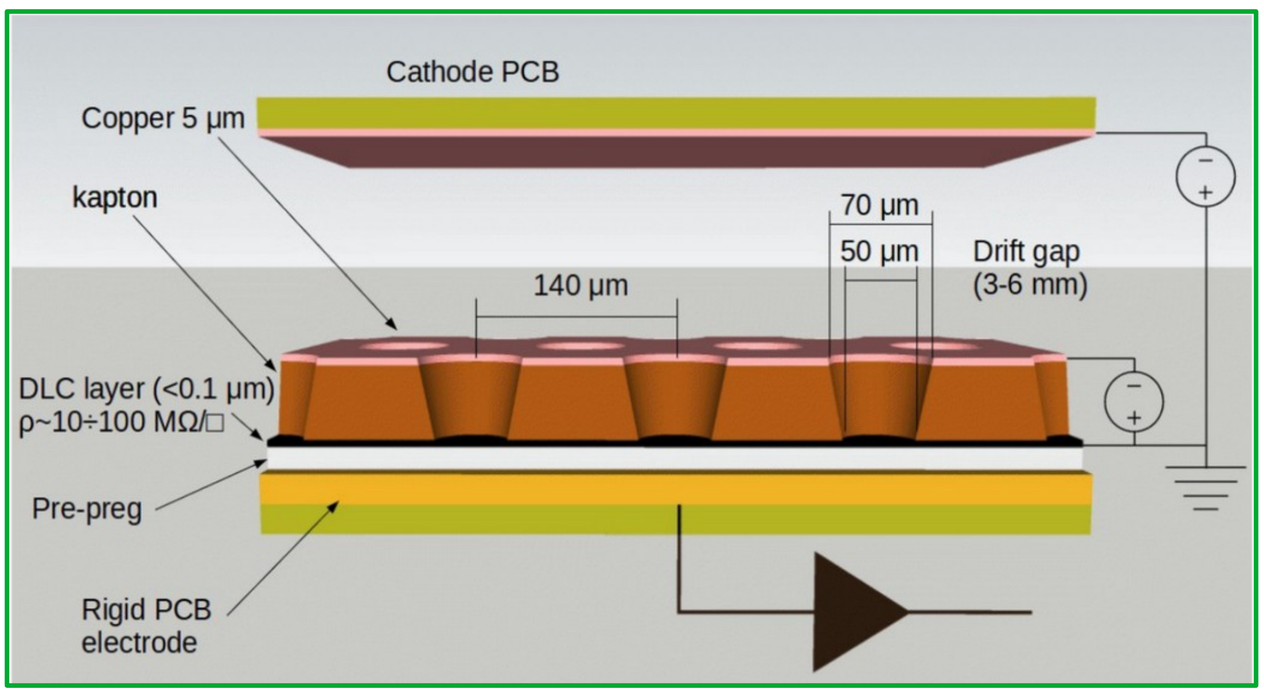


Muon detector:

outside the calorimeter is located within the iron return yoke that closes the magnetic field.

Technology:

1 - single stage amplification
2 - resistive Diamond-Like-Carbon (DLC) layer for charge dispersion and spark suppression
3 - readout PCB embedded to DLC and amplification in a single foil

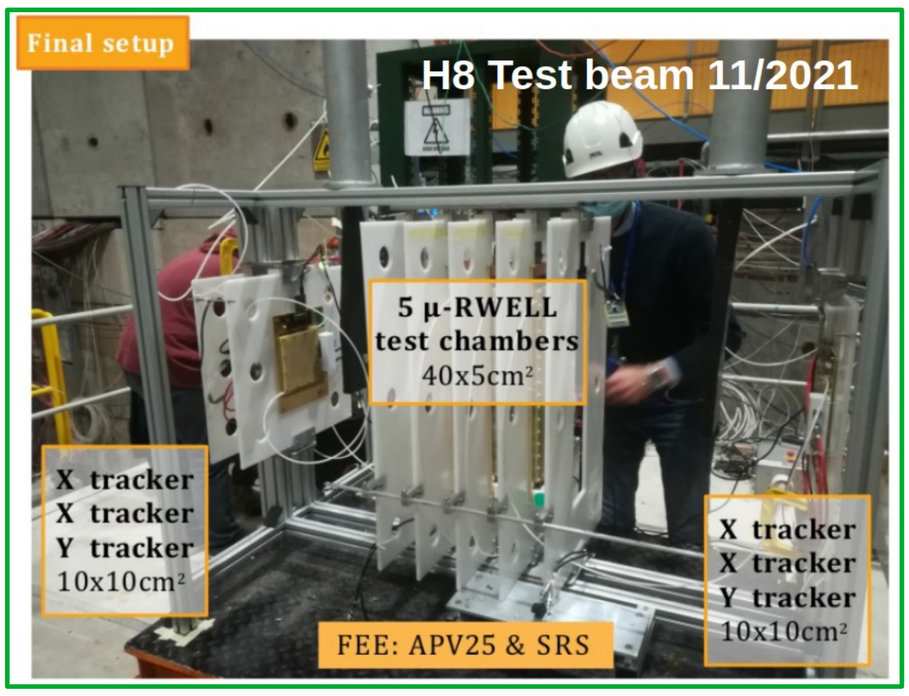


Operation:

1 - charged particles ionize the gas volume
2 - primary electrons drift to the amplification stage
3 - the signal is induced capacitively, through the DLC layer, to the readout PCB

R&D and test:

1 - test the µ-RWELL performance in a DLC **resistivity scan** [10-80] MΩ/□
2 - strip length 40 cm -> close to the final one
3 - well known gas mixture: $Ar/CO_2/CF_4$ (45/15/40)
4 - muon beam of 140 GeV/c interacting with trackers and test chamber



Results:

An HV scan shows a large range of operability with a **cluster size** range [1-5] and a **cluster charge** range [10-100] fC.

The spatial **resolution** is preliminary but it shows results better than 100 µm with a strip pitch of 400 µm and center of gravity algorithm.

The dependence on the DLC **resistivity** is smaller in the range 40-80 MΩ/□ for cluster charge and cluster size, while the major dependency are observed in the spatial resolution behavior.