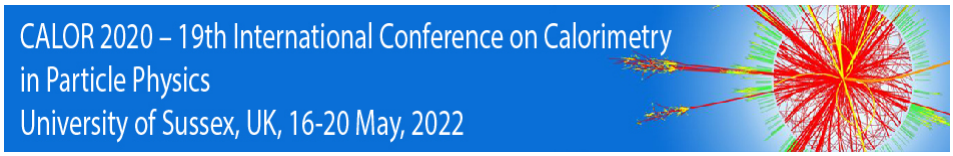

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Resistive Plate WELL Detectors as DHCAL sampling elements

In search for physics Beyond the Standard Model (BSM), the foreseen program of the High-Energy Physics community relies on the precision measurements of the Higgs, W, and Z bosons. Existing collider experiments and their foreseen upgrades are limited in the precision by which various BSM processes could be measured. Thus, future collider experiments pose stringent requirements on the performance of their detectors. In particular, significant improvement is needed in the jet energy resolution. This could be achieved by employing a Particle Flow approach based on highly granular calorimeters.

This motivates the development of (semi)Digital Hadronic Calorimeter ((s)DHCAL). The (s)DHCAL concept is mostly studied with sampling elements based on Resistive Plate Chambers (RPC). However, studies towards sampling elements based on Micro-Pattern Gaseous Detector (MPGD) have shown their potential advantages compared to the RPC.

This contribution is focused on an ongoing R&D effort towards the development of (s)DHCAL sampling elements based on Resistive Plate WELL (RPWELL) detectors. Several groups work in this direction and demonstrate that WELL-based sampling elements could meet the DHCAL requirements in terms of detection efficiency and average pad multiplicity.

We will present the design and measured performance of a medium size, 50×50 cm^2, RPWELL prototype along with test beam results obtained with a small MPGD-based DHCAL prototype. The expected performance of a full size RPWELL-based DHCAL was studied using dedicated MC simulation and will be presented as well.

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