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T-SDHCAL Hadronic Calorimeter for future Higgs factory

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The CALICE technological RPC-based SDHCAL prototype that fulfils all the requirements of compactness, hermeticity and power budget of the future lepton accelerator experiments, has been extensively tested and has provided excellent results in terms of the energy resolution and shower separation.

New phase of R&D to validate completely the SDHCAL option for the International Linear Detector (ILD) project of the ILC and also the Circular Electron Positron Collider (CEPC and FCCee) has started with the conception and the realization of new prototypes.

The new prototype proposes to exploit the excellent time resolution provided by (M)RPC detectors in order to better build the hadronic showers with the aim to separate close-by ones and also to single out the contribution of delayed neutrons with the purpose to improve on the Particle Flow Algorithm (PFA) performances and better reconstruct the showers energy.

A new technique to build MRPC has been developed and first results confirm the excellent efficiency of the new detectors. Timing performance is under study using the PETIROC ASIC developed by OMEGA group. The new activities are part of the new collaborations DRD1 and DRD6.

The progress realized on the different aspects of the new concept will be presented and the future steps will be discussed.

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