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Technological challenges on sensor-electronics hybridization for compact silicon tungsten electromagnetic calorimeters

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Highly compact and granular sandwich silicon tungsten calorimeters are proposed for all future Higgs Factories, strong-field-QED experiments, and Dark Matter search experiments. In this contribution, we discuss the technological challenges of sensor-electronics hybridization for highly compact and granular silicon tungsten electromagnetic calorimeters. The aim is to build a highly compact calorimeter, with a Moliere radius approaching the one of tungsten. Hence, the gap between tungsten plates must be small. Different alternatives have been explored and used in the past, e.g. tab-bonding and epoxy-silver glue dots, with so far limited success. The à la CALICE solution makes intensive use of the epoxy-silver solution. A common R&D effort is being performed by both the CALICE and FCAL collaborations (now part of DRD6) in order to study the long-term viability of this technology. It comprises aging studies, radiation tolerance of the glue, the validation of different industrial choices for the epoxy-silver product and the optimization/automation of the process by different institutes. The challenges and status of these activities will be discussed in this contribution.

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