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Technical instrumentation R&D for ILD large scale device

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The ILD silicon-tungsten electromagnetic calorimeter (ILD Si-W ECAL) is a sampling calorimeter with tungsten absorber and highly segmented silicon layers to achieve precise jet energy measurements by particle flow concept. While CALICE is centered on the single ECAL Active Sensor Unit (ASU) prototype and its tests, specific R&D is going on larger scale detector approaching the size of an ILD slab. In particular, it addresses the questions of proper clock and power distribution along the long slab, interconnections between the individual ASUs, DAQ electronics bandwidth, mechanical aspects of slab assembly and its scalability for industrial mass production. We also think about the calibration of the large detectors. With cosmics one can reach a few percent absolute calibration per pixel in one day. A few percent non-linearity for low MIP-like signals and the non-linearity beyond the dynamic range could be measured with the charge injection.

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