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A new Front-End Board for the ILD SiW-ECAL

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The Silicon-Tungsten ECAL (SiW-ECAL) of ILD will require about 10,000 detector slabs of 1.4 to 1,8 m in length. For the ease for building and testing, the slabs are made of stitched detector elements of 18×18 cm², composed of a Front-End Board (FEB), hosting the readout ASICs for 1024 channels, on which the Silicon sensors are glued.

Various types of detector elements have been successfully tested individually; the first attempt to chain them into a long slab in 2018, while globally positive, hinted at some improvements.

As its predecessor, the new FEB will handle 16 SKIROC 2A chips, amplifying, shaping, pipelining and digitizing the data generated by collisions at the International Linear Collider ILC, taking advantage of its pulsed operations to reduce the power dissipation.

This presentation describes the FEB design, adapted for slabs composed of up to 10 FEB, to perform power supply distribution, now locally pulsed, clock distribution and readout chain through optimisation of board stack-up and signals routing.

Beside a careful handling of all the necessary parts from the SKIROC 2A chips, the new design also implements a local high voltage distribution, used to polarize the sensors, in order to reduce intervention and handling.

Time Zone

Europe/Africa/Middle East

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