The ILD/CALICE Silicon-Tungsten Electromagnetic Calorimeter: status and potential
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ICHEP2016, August 3-10th, Chicago

SiW-ECAL activities
• new version of VFE chip SKIROC2B is produced, to be tested
• construction of long ILD-like detector from several ASUs

SiW-ECAL beam tests (Nov’15, CERN)
• stable operation of the first prototype with 3 layers, each with 1024 channels (Active Sensor Units, ASU), during 2 weeks of tests
• 15...150 GeV e+, π+, μ+ beams
• clear beam spot always seen
• 2.2% channels masked
• good signal over noise ratio S/N=17...18
• very good gain uniformity across all channels (<5%): Si thickness=const, variation dominated by VFE electronics
• average μ+ efficiency: 98.99%

SiW-ECAL+SDHCAL combined beam tests (Jun’16, CERN)
• improved GR design, very low rate (<0.04%) of induced “square events”, when many peripheral cells are fired due to capacitive coupling to GR

ILD/CALICE SiW ECAL inspired other groups
• HGCAL, full upgrade of CMS calorimeter endcaps, approved for HL-LHC
• 312 cassettes, 44k wafers, 100% FE ASICs, 6M channels
• high radiation (max 10^4 n/cm^2), thinner 100-300μm Si wafers to limit radiation damage
• 30°C operational temperature
• continuous current operational mode 100kW
• difficult reconstruction because of high pile-up
• ATLAS HQT2, dedicated “timing” detector device, proposed for HL-LHC
• 4 layers of high granularity Si with 20-30ps timing precision for 2.5<r<4.3, currently covered by inner wheel of the LAr forward ECAL
• FE and DAQ for T2K-Wagasci, PM calibration test bench for CTA, JUNO part of the DAQ of the TT

Ongoing SiW ECAL activities
• Chip On Board (without chip packaging) alternative more compact design, but difficult technologically
• preparation for industrialisation: well defined procedures, metrology checks, robotic gluing of Si to PCB, etc...
• thermal studies for ILD SiW ECAL

References
2. SKIROC2, front end chip designed to readout the Electromagnetic CALorimeter at the ILC. Journal of Instrumentation, 6(12):C12040, 2011
3. Design and electronics commissioning of the physics prototype of a Si-W electromagnetic calorimeter for the International Linear Collider. JINST 3 (2008) P08001