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Construction and testing of a large scale prototype of a silicon tungsten electromagnetic calorimeter for a future lepton collider

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The CALICE collaboration is preparing large scale prototypes for highly granular calorimeters for detectors to be operated at a future linear electron positron collider. After several beam campaigns at DESY, CERN and FNAL, the CALICE collaboration has demonstrated the principle of highly granular electromagnetic calorimeters with a first prototype called physics prototype. The next prototype, called technological prototype, addresses the engineering challenges which come along with the realisation of highly granular calorimeters.

This prototype will comprise 30 layers where each layer is composed of four 9 cm x 9 cm silicon wafer. The front end electronics is integrated into the detector layers. The size of each pixel is 5 mm x 5 mm.

This prototype enters its construction phase. We present results of the first layers of the technological prototype obtained during beam test campaigns in spring and summer 2012. According to these results the signal over noise ratio of the detector exceeds the RD goal of 10:1.

The front end electronics will be power pulsed synchronous to the time structure of the beam at the linear collider. This most important feature will be tested during the winter 2012/13. The test will comprise beam tests with high energy particles and functional tests in a magnetic field. The talk will report on these results as well. Finally the next RD steps and the way towards the construction of a full detector will be outlined.

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