Contribution ID: **348** Type: **Poster**

Performance evaluation of Si PAD detector for the ALICE FoCal development

QCD inspired models predict that a saturated gluon state, so called Color Glass Condensate (CGC) is produced in the nucleon and nucleus at very high energy such as at the Large Hadron Collider (LHC). One of the most sensitive and cleanest probes of CGC effect is the
production of isolated photon in the forward region ($3 < \eta < 5$) at intermediate p_T (few GeV/c).

The ALICE-FoCal group is working on the R&D process to develop an electromagnetic calorimeter (FoCal-E) which has capability to measure such photons. The final design of FoCal-E consists of low granularity layers (LGL) with silicon pad readout and high-granularity (HGL) layers with Monolithic Active Pixel Sensors. The Nara-W and Tsukuba groups have worked on the R&D of Si PAD detectors, using a prototype consisting of 20 layers of silicon and tungsten with a 64 PAD (8×8) per layer with a granularity of $1\times1cm^2$. The main task of the PAD sensors is the energy measurement.
In September 2016, a successful beam test experiment at CERN SPS accelerator with FoCal prototype has been performed.

In this beam test, we used new readout module (Summing Board) which has larger dynamic range compared with last beam test. It enabled us to take the data of higher beam energy (~$130GeV$) this time. Moreover, collected data with simultaneous LGL and HGL readout.
In this poster, we would like to report these results and discuss about the future plan of FoCal-E.

Preferred Track

Future Experimental Facilities, Upgrades, and Instrumentation

Collaboration

ALICE

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Session Classification: Poster Session