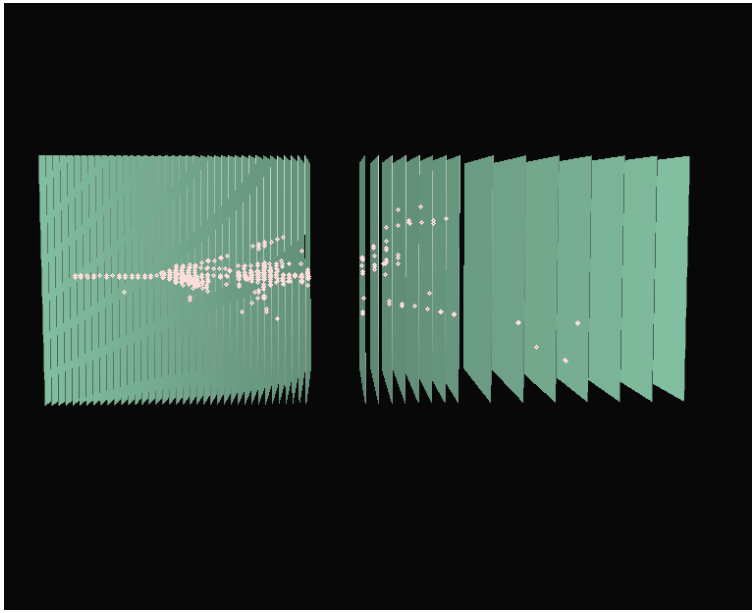
# DHCAL Overview



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Argonne National Laboratory

CALICE Collaboration Meeting
Argonne National Laboratory
March 19 – 21, 2014

# Activities in the near future

## Emphasis on data analysis

Major hang-up is related to the tuning of the digitizer (we are almost there)
→ see **Burak Bilki's** talk

## R&D with resistive plates (decrease resistivity and increase rate capability)

Build and test RPCs with new Bakelite plates
(new, lower resistivity Bakelite, Bakelite with resistive paint layer inside the plate)
Build and test RPCs with new, semi-conductive glass plates
→ see **Lei Xia's** talk

## 1-glass RPCs (pad multiplicity ~1, resistive layer not critical, thinner, higher rate capability)

Build more large chambers and continue to test

## Set-up of large cosmic ray test stand with DHCAL layers

Plans to set-up this summer

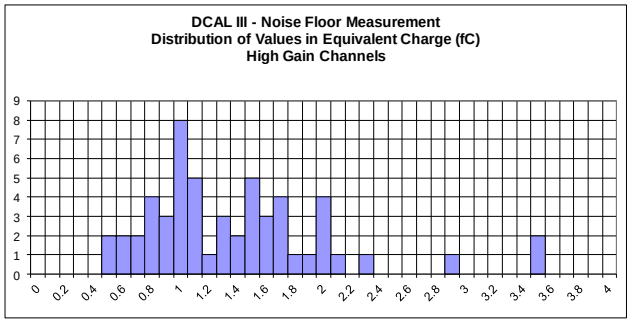
## Development of next generation readout (token ring passing, lower power consumption…)

Currently on hold (no funds)
Collaboration with Shanghai and USTC initiated

# Plans for Publishing Test Beam Results

## Instrumentation paper

On hold due to missing electronics measurements (sensitivity)
Measurements almost complete
Draft exists




## Electronics paper

On hold due to missing electronics measurements (sensitivity)
Draft exists

## Noise paper

Analysis started
Student left
Studies need to be completed
At the moment no manpower

**Fe-DHCAL**

## Muon response paper

CALICE_Note exists
Analysis virtually completed
Waiting for 'final' digitizer tuning

**Fe-DHCAL**

# Plans for Publishing Test Beam Results

## Pion/positron/calibration paper

**Fe-DHCAL**

Analysis well advanced
'Final' tuning of digitizer (almost done)
CALICE_Note exists

## Pion shower shapes

**Fe-DHCAL**

Analysis ongoing
Simulation of positron shapes included in digitizer tuning procedure
Still ways to go, but should be quick once calibration paper is done

## Longitudinal calibration paper

**Fe-DHCAL**

Analysis virtually completed
Thesis exists
Paper draft exists and being discussed in editorial board
But not easy to finish, since Jacob left the group

# Plans for Publishing Test Beam Results

## Combined Si-W ECAL + DHCAL data

Fe-DHCAL

No concrete plans to analyze (yet)

## Minimal absorber data

DHCAL

No concrete plans to analyze (yet)

## W-DHCAL data

W-DHCAL

CALICE_Note exists with response/resolution
Analysis being taken over by CERN group
First results presented in this and previous CALICE meetings

## Software Compensation with W-DHCAL data

W-DHCAL

W-DHCAL better suited than Fe-DHCAL
First analysis by Lei Xia showed sizable effect
Coralie Neubüser to start soon

# Plans for Test Beams after Shutdowns

## Fe-DHCAL data

Completed

## W-DHCAL

Completed

## Tests of individual RPCs/GEMs

High rate RPCs (GIF, FNAL in April)
1-glass RPCs (FNAL)
GEM prototypes w/ or w/out DHCAL (FNAL)

# Overall Goals for the DHCAL

## No matter what

Complete test beam analysis and publish
Develop and test high-rate RPCs
Built and test more 1-glass RPCs
Seek involvement in other experiments where RPCs might be needed

## Assuming no ILC project in near future

Increase involvement in ATLAS/CMS upgrades
Look for other possibilities to utilize RPC technology

## Assuming ILC project materializes

Activities need to be coordinated with new reality: detector collaborations?
Activities to be coordinated with the SDHCAL group
Design and prototype next generation readout
(low power, better time-stamping resolution, higher channel count...)
Build and test gas recycling system (Iowa)
Continue work on HV distribution system (Iowa)
Start work on LV distribution system (DC-DC converters?)
Re-start work on HCAL engineering design for SiD