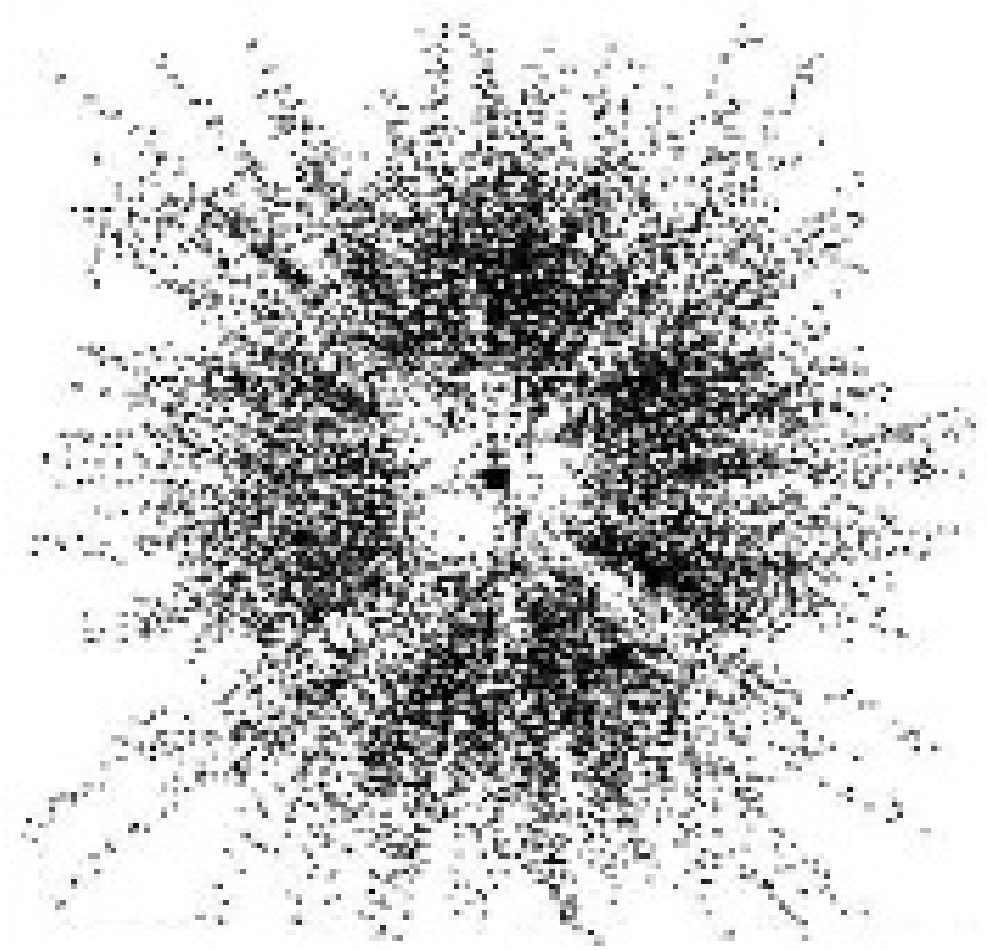
DHCAL Track Segments / ECAL Data

François Corriveau

IPP/McGill University



DHCAL Team

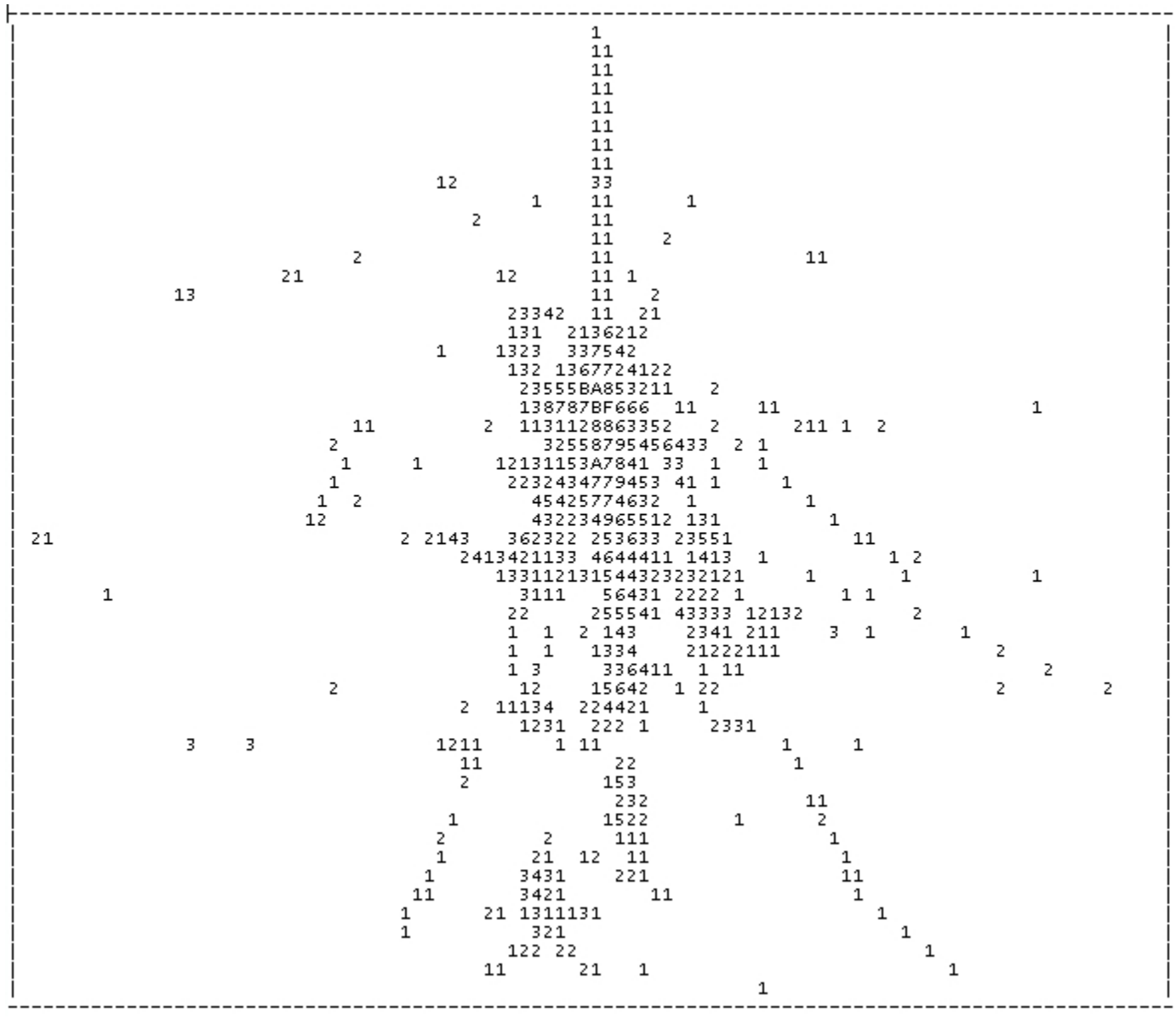
Argonne NATIONAL LABORATORY

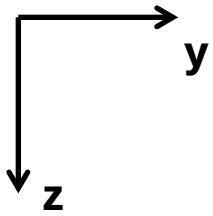
DAAD

Progress Report

27 July 2016

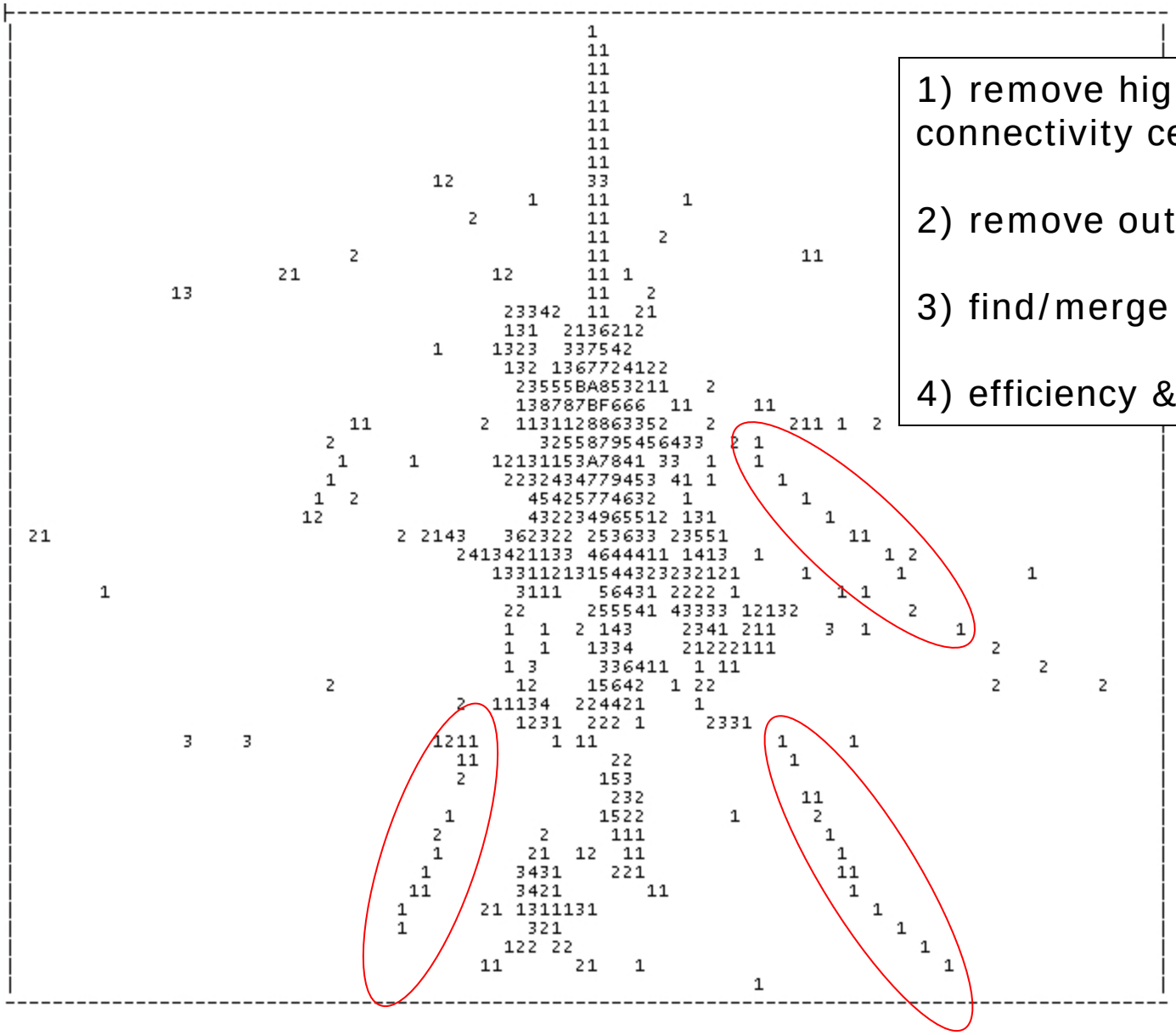
120 GeV Pion





Track segments to be isolated and used for calibration

120 GeV Pion

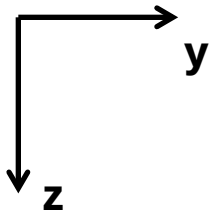


1) remove high connectivity cells

2) remove outliers

3) find/merge segments

4) efficiency & multiplicity



Status 22.06.2016

Calorimeter calibration is being studied for particle shower track segments with DHCAL.

√ Connectivity used to isolate and define segments.

√ Method is first applied to muons.

segments aligned and merged successfully

√ Calibration works for them and sets a reference.

√ Method is next applied to segments in showers.

(too?) high sensitivity to algorithm parameters

Angular dependence will be the main issue.

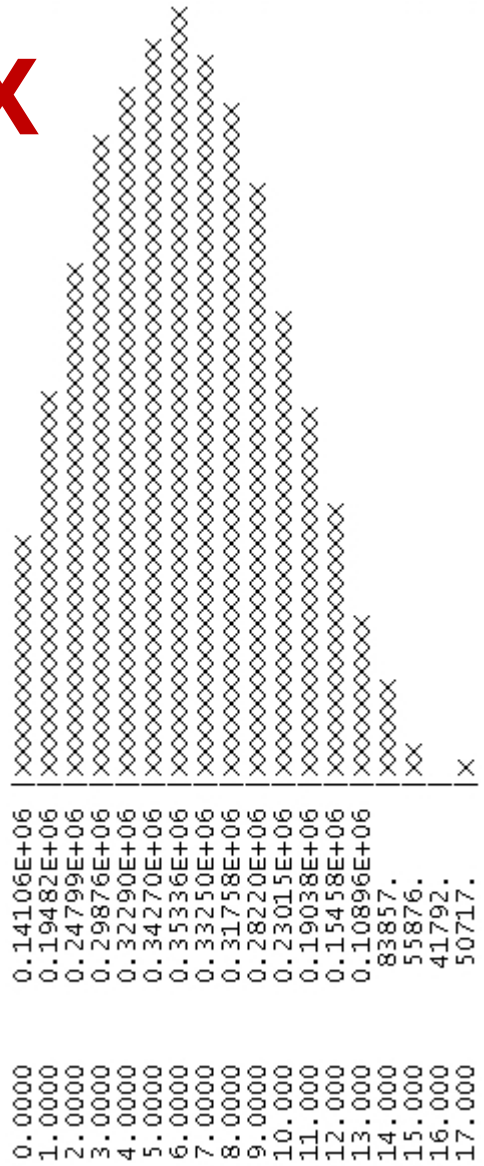
The Heidelberg Break

Invited by DAAD to give the key-note lecture at the RISE 2016 Opening Ceremony in Heidelberg

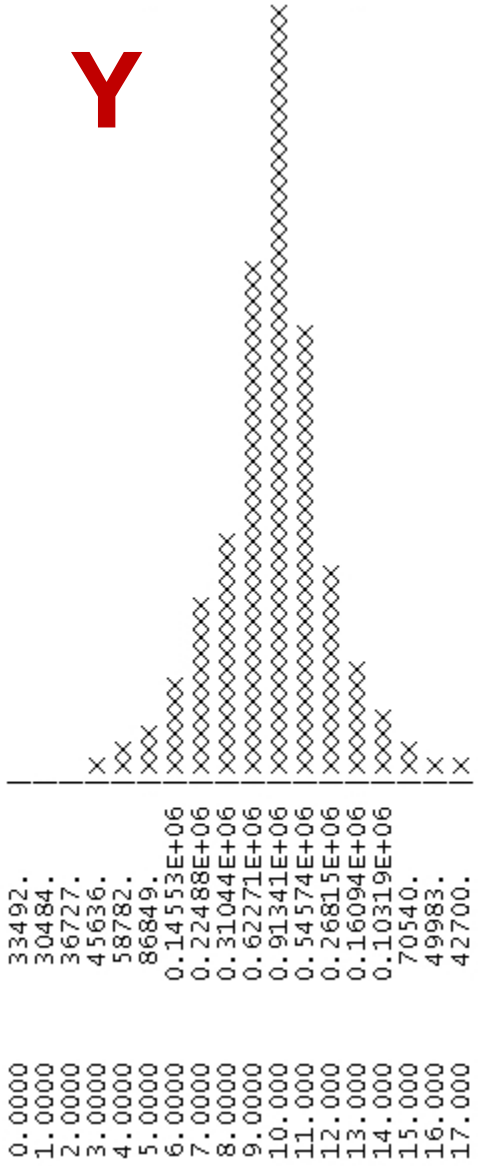
ECAL Data

A DHCAL period has runs together with ECAL. Here are some initial distributions:

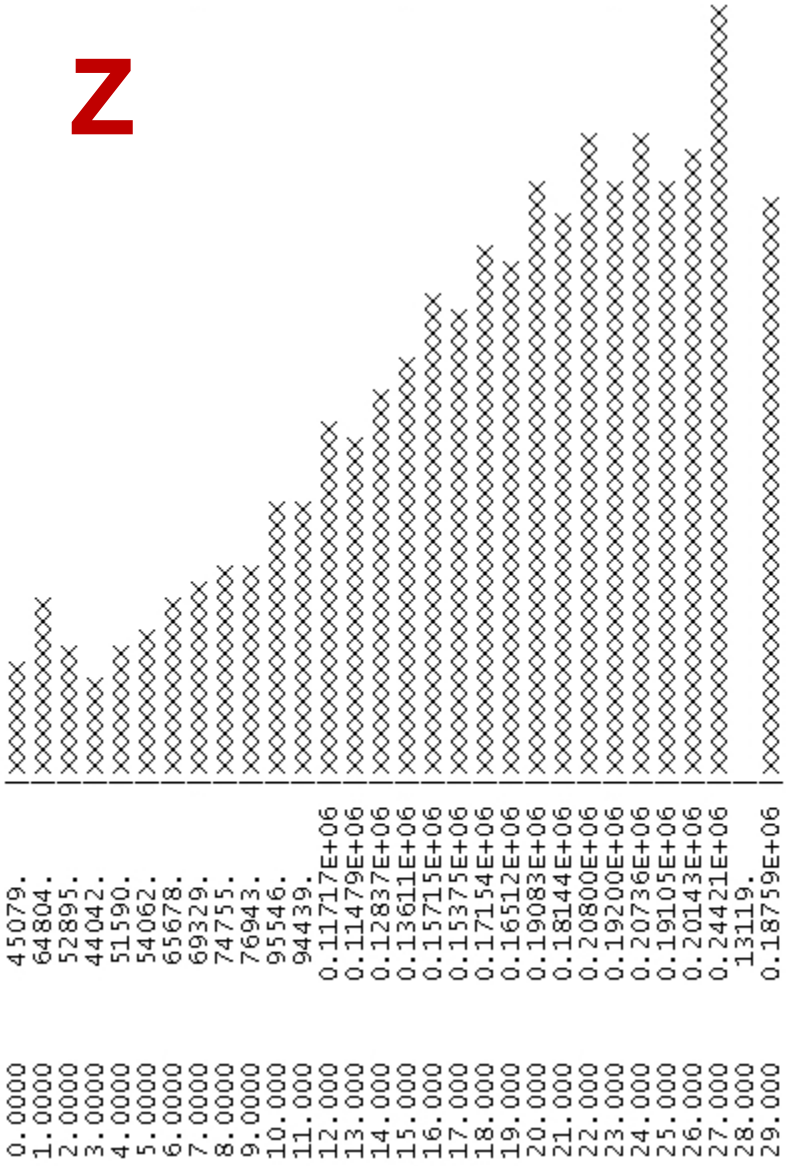
X



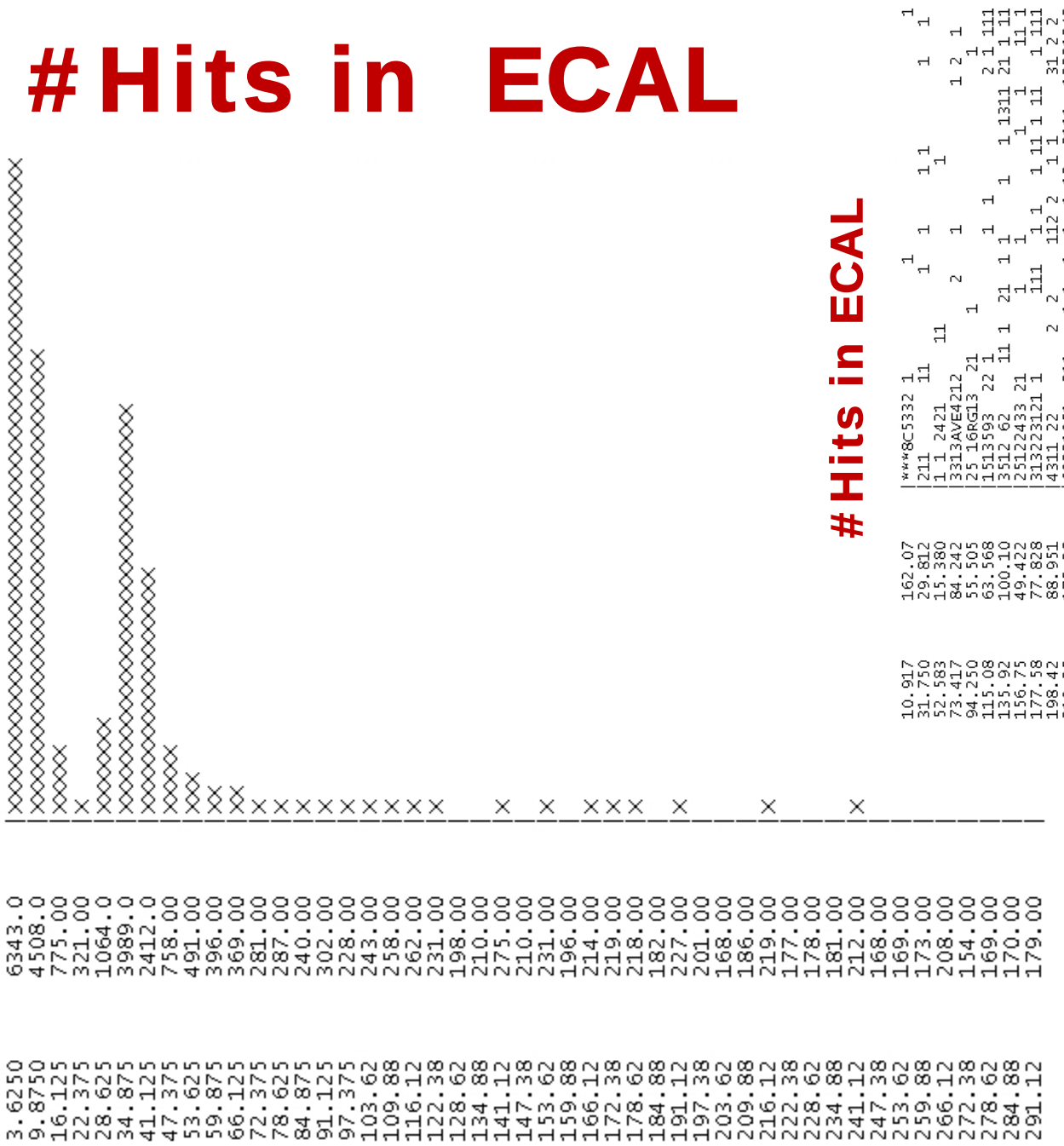
Y



Z

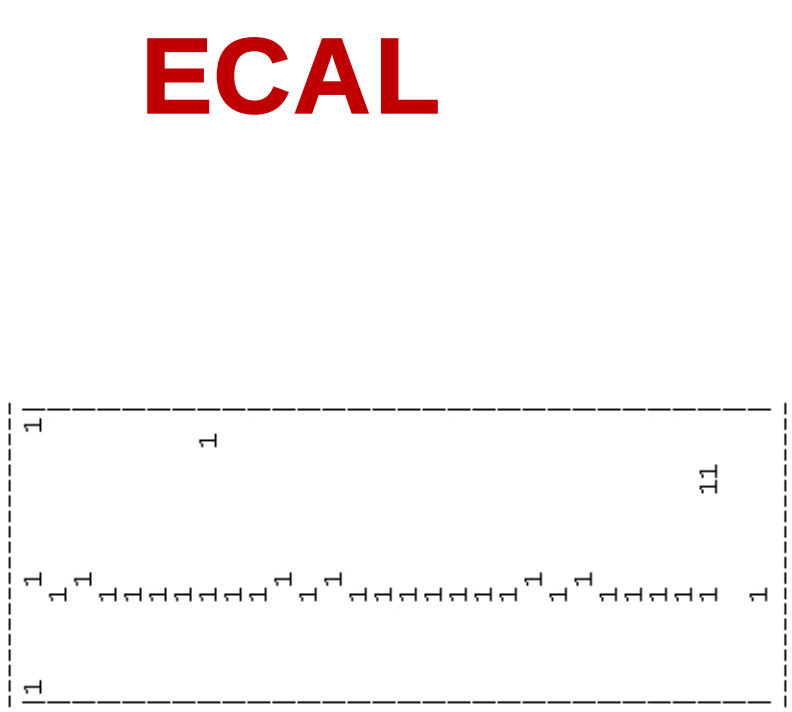


ECAL Hit Distributions



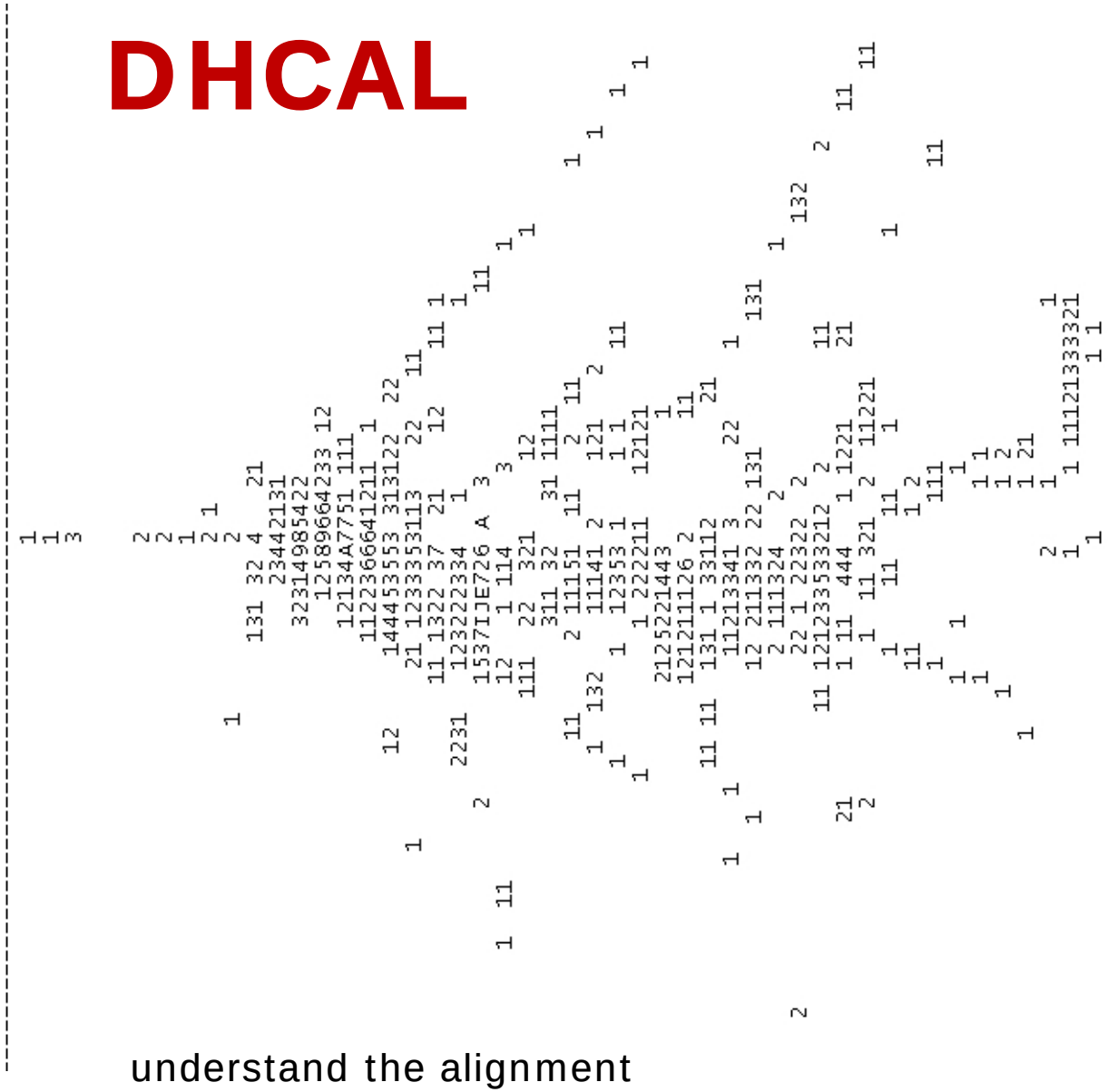
ECAL + DHCAL 60 GeV Event

ECAL



ECAL raw data:
noisy events
uncalibrated

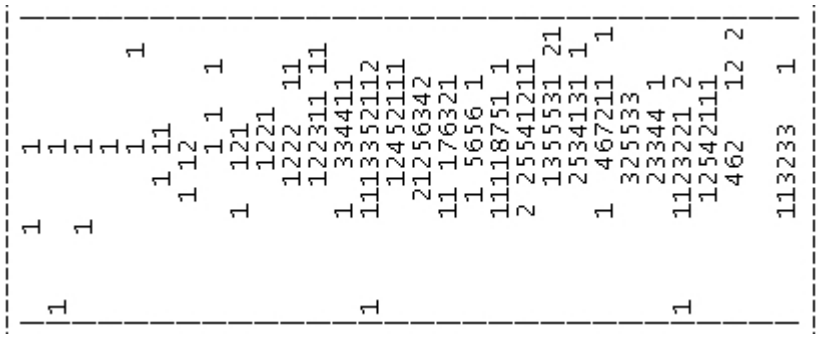
DHCAL



understand the alignment

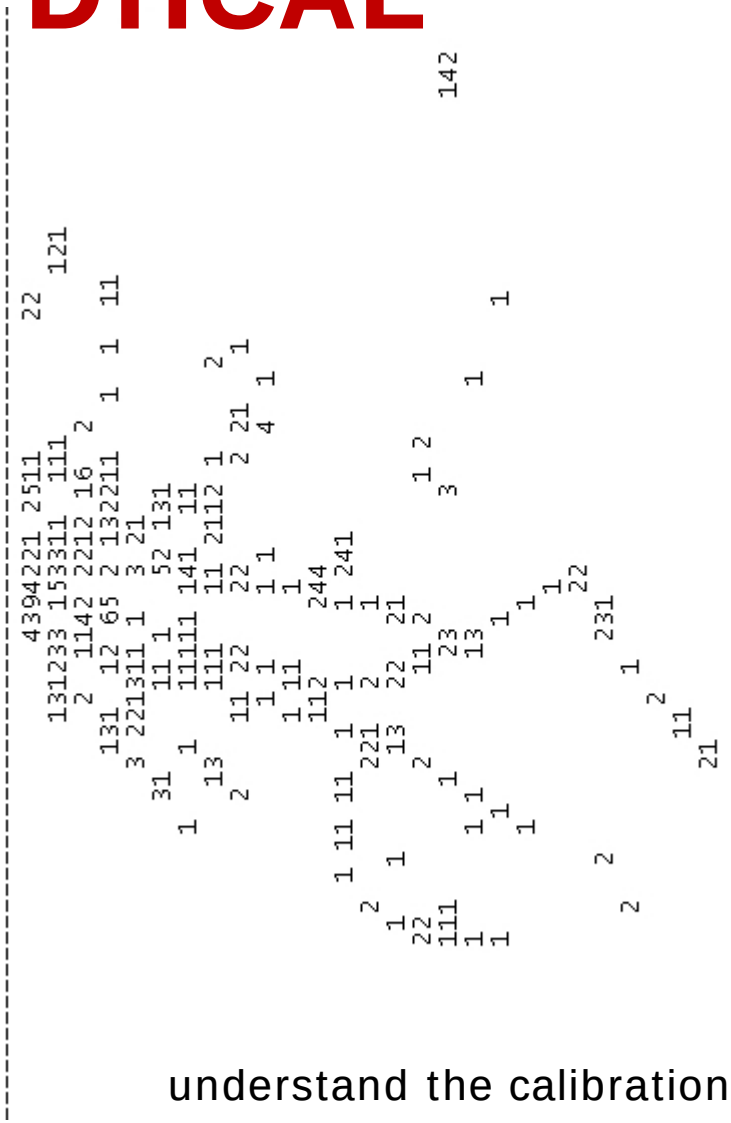
ECAL + DHCAL 60 GeV Event

ECAL



showering started in ECAL

DHCAL



understand the calibration(s)

ECAL + DHCAL Combined Analysis

Only runs at 60 and 120 GeV found up to now with both calorimeters. Should be many more. Where?

Open questions:

What energy resolution can be achieved with both devices?

Are there intercalibration issues?

Could the already calibrated ECAL events be "merged" with the DHCAL event analysis?

And I'm sure many more..

Stay at MPP

Thank you for taking me in your group !

I did neglect my group at McGill somewhat, although much was done remotely, but..

I had not work that long on analysis myself in ages.

Hopefully at least one note/paper should come out of this.