

SDHCAL validation

SDHCAL meeting

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GOBIERNO
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MINISTERIO
DE CIENCIA
E INNOVACIÓN

Ciemat
Centro de Investigaciones
Energéticas, Medioambientales
y Tecnológicas



11/06/20

Recent ILD Meetings

- Last **ILD group meeting** 02/06

<https://agenda.linearcollider.org/event/8540/>

- ILD Guest membership, interested?
- Good news from Japan. US very interested ILC in Japan.
- Encouraging studies for even higher energy 1TeV.

- Last **ILD Analysis/Software meeting** 03/06

<https://agenda.linearcollider.org/event/8548/>

- Last but one **ILD Analysis/Software meeting** 20/05

<https://agenda.linearcollider.org/event/8533/>

In this meeting we requested the MC samples to run the SDHCAL validation.

Details about the MC production in our Twiki Page

<https://twikiae.ciemat.es/twiki/bin/view/ILC/PHYSICSDataAnalysis>

Hector has done a local copy (in CIEMAT)

/pool/calice3/data/MonteCarlo/sdhcal_validation/

Ongoing CIEMAT group activities

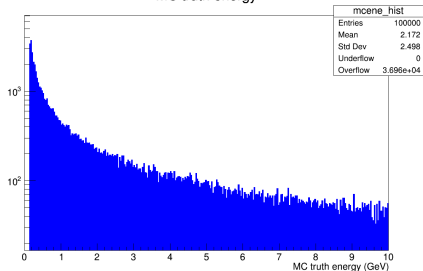
- **SDHCAL validation for 250GeV** (reporting in next ILD software and Analysis meeting).
- SDHCAL Incident angle studies.
- **Physics Analysis**

First look at the datasets for the SDHCAL validation

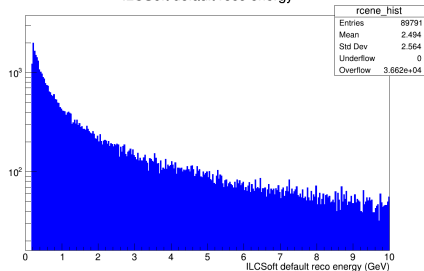
- Details about the ILD confluence production for the recent test production with the latest ilcsoft v02-01. <https://confluence.desy.de/display/ILD/Production+with+v02-01>
- For the moment the data (mostly single particles) are reconstructed with the AHCAL (scintillator) option ILD-I5-o1-v02.
- We requested to start two samples, muons and K_L^0 , as suggested by D. Jeans, to be reconstructed with the "option 2" ILD-I5-o2-v02. or with the SDHCAL.
- The samples are finished, here the details: <https://ild.ngt.ndu.ac.jp/eelog/dbd-prod/311>
- We have access to the high level objects in the simulation.

SDHCAL validation, μ sample

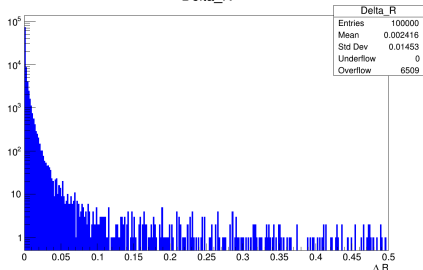
MC truth energy



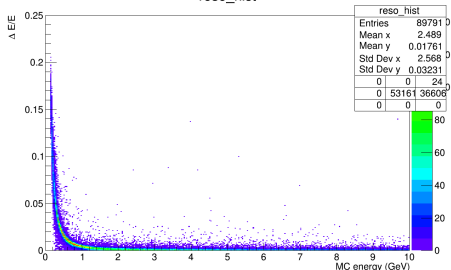
ILCSOFT default reco energy



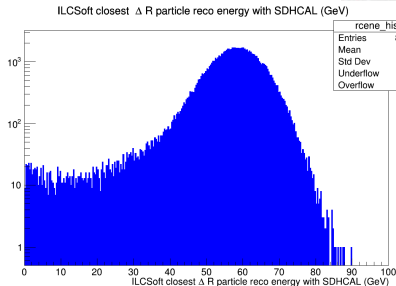
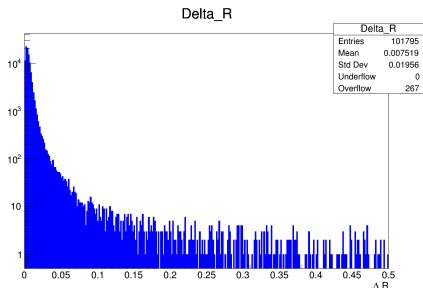
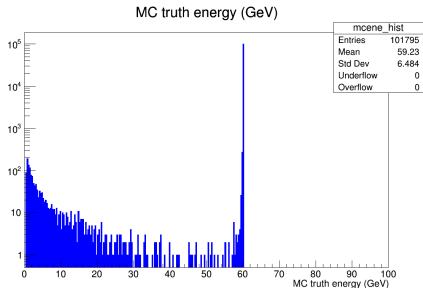
Delta_R



reso_hist



SDHCAL validation, K_L^0 sample



Explanation of the the peak profile?
What has been done before with K_L^0 ?

Learning jet/dijet physics object

- We have understood that any analysis where the SDHCAL is relevant would have to involve jets/dijets.
- While a final decision for the analysis is taken we decided to try to get knowledge in this topic.
- We decided to start the study of the Z decaying to two quarks. (Using centrally produced samples).
- Very interesting presentation from Adrian Irlles on this topic (attached). With the other calorimeter (AHCAL).
- We could compare from the dijet perspective the performance of the two calorimeters.

Backup



The tools we have learned.

In the framework of the SDHCAL test-beams data analysis we have learned:

- How to work in the ILCSoft analysis framework. (Installed in CIEMAT running in dedicated nodes)
- Run from scratch a simulation using the standard sequences in the framework and switching from one scenario to another (large \rightarrow small), (AHCAL \rightarrow SDHCAL), etc.
- Navigate and run over the centrally produced datasets (DIRAC)
- Produce ntuples out of the samples for detector/physics analysis. (AIDA,REC,SIM)
- Use reconstructed physics objects and produce event cut flows for analysis.
- Event display, etc.

The tools we have learned

Private CIEMAT-SDHCAL pion gun simulation for comparison with TB-2018.

