

Computer project @IJCLab

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2 projects:

- Calorimeter simulation and reconstruction
- Search for gravitational waves

Practical information:

- Location: building 203
- Dates: Mar. 11-13, Mar. 16-18
- Schedule: 9h → 12h and 13h → 17h
- Up to 7 pairs of students
- Oral examination (Wednesday afternoon): 20 min
 - 2/3 of the grade = your performance during the week
 - 1/3 of the grade = your presentation at the end of the week



Calorimeter simulation & reconstruction

Monte-Carlo simulation

- Simplified calorimeter description
- Electron and hadron showers

Reconstruction

- Particle reconstruction
- Detector characterization

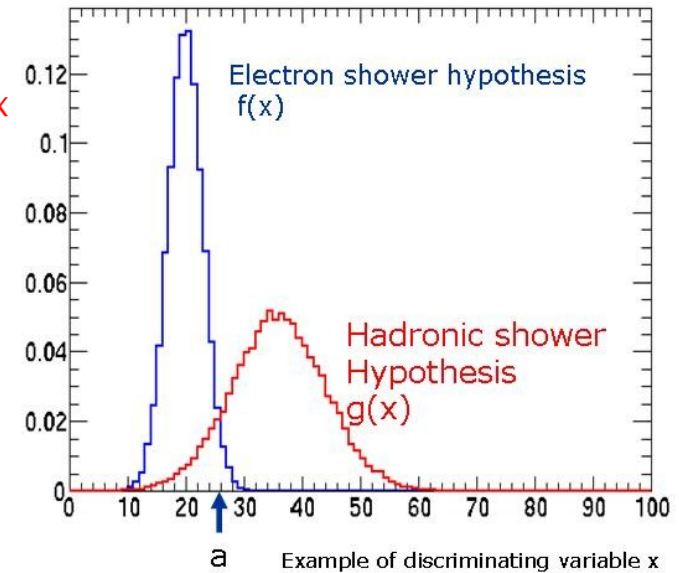
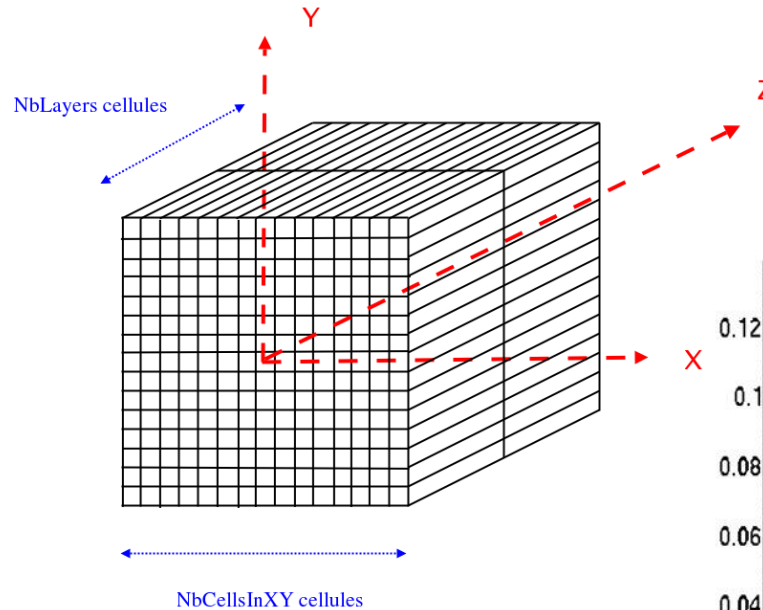
Data analysis

- Electron/hadron discrimination

Language: C++

Use of ROOT libraries (plots/fits)

Work with C++ classes



Search for gravitational waves

- Use of real LIGO data around the GW150914 signal
- Signal analysis
(Fourier transform, whitening, noise characterization)
- Spectrogram of GW150914
- Language: C++ or python
- External libraries: root (toolbox, visualization), FFTW (Fourier transforms)

