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Calorimeters (lecture 1 and lecture 2)

Tuesday, 20 October 2015 11:30 (1 hour)

The theoretical lectures on calorimeters will review the principle of Calorimetry and the main techniques used in present and future HEP experiments. A special emphasis will be given to highly granular calorimeters, which are the technology of choice for particle flow applications in HEP, but are also representative of the current R&D in the field of positron emission tomography.

The following points will be addressed in the lectures:
• Signal generating mechanisms
• Signal detection options (with emphasis to the solutions presented in the laboratory courses, i.e. scintillator material coupled to a Si-based photodetector)
• Sampling vs homogeneous calorimeters
• The signal from sampling and longitudinally segmented calorimeters
• Composition of a shower and its space/time evolution
• Linearity and calibration for sampling and longitudinally segmented calorimeters
• e/h and its impact on hadronic energy resolution, response function, signal linearity
• Particle reconstruction and identification in a calorimeter
• The particle flow concept
• Calorimeters for medicine (a glimpse…)

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