

Experimental techniques in high-energy elementary particle physics

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15 hours, 4 credits

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Abstract

The aim is to introduce the students to the experimental techniques on detectors, data taking and data analysis used in high energy physics. Examples are chosen from modern experiments on elementary particle physics. However the general principles could also be applicable to many other fields of experimental research. As an example of that, the use of these techniques in Medicine will be presented.

Syllabus

- Introduction to the experimental research on elementary particles (1 hour)
- Interaction by particles in matter creates detector signal (2 hours)
- Tracking for momentum measurement and particle identification (2 hours)
- Calorimetry and lepton identification (1 hour)
- Analog and digital processing of detector signals (2 hours)
- Data taking and data analysis techniques (2 hours)
- Accelerator techniques (2 hours)
- Examples of modern experiment: the CMS and ATLAS at LHC (2 hours)
- Techniques from high energy physics used in Medicine (1 hour)