

Experimental High Energy Physics
(*Master de Física Avanzada*)

PROGRAM

A) Experimental High Energy Physics

- Introduction
- Standard Model
- Higgs Boson search
- Beyond the Standard Model
- Flavour Physics
- Neutrinos Physics

B) Detectors in High Energy Physics

Calorimetry

1. Detection mechanisms
2. Definition and interest of
3. Classification and fundamental differences
4. Basic Mechanisms
5. Electromagnetic cascade
6. Rossi-Heitler model
7. Hadronic cascade
8. Signal / Power
9. Compensation
10. Energy resolution
11. Instrumental Effects

Cerenkov radiation detectors

1. Introduction
2. The techniques
3. Cerenkov counters
4. RICH detectors

Semiconductor detectors

1. Introduction
2. Basic characteristics

3. Semiconductors doped
4. The pn junction: formation of the desertification region
5. Characteristics of semiconductors as detectors
6. Diode structure for the construction of silicon detectors
7. Position detectors

BIBLIOGRAPHY

A) Experimental High Energy Physics

- <http://www.openquestions.com/oq-hep.htm>
- SPIRES database: <http://www.slac.stanford.edu/spires/>
(High-Energy Physics Literature Database)
→ Reviews
- HEP Conferences
HEP 2009 (EPS): <http://www.ifj.edu.pl/hep2009/>
LEPTON-PHOTON 2009: <http://lp09.desy.de/>
...
→ Plenary talks

B) Detectores en Física Experimental de Altas Energías

Calorimetry

Books:

R. Wigmans. *Calorimetry. Energy Measurements in Particle Physics.*
OxfordUniversity Press. ISBN=0 19 850296 6

Articles

U. Amaldi. *Fluctuations in calorimetry measurements.* CERN-EP-/80-212
C. Fabjan. *Detector for elementary particle physics.* CERN-EP/94-61

Cerenkov

J.V.Jelly, *Cerenkov Radiation and Its Applications* (Pergamon: London, 1958). **T. Ypsilantis and J. Seguinot,** *Nucl. Instrum. Meth. Phys. Res.* 142 (1977) 377.
D. Treille, *The physics potencial of the RICH,* *Nucl. Instrum. Meth. Phys. Res A*·/! (1996) 178

Semiconduction detectors

W.R.Leo. *Techniques for Nuclear and Particle Physics Experiments.* Springer-Verlag, 1987, Segunda edición 1994.

C:J:S Damarell. *Vertex Detectors: The state of the art and Future prospects.* RAL-P-95-008 (Preprint).