Instrumentation for fundamental interactions physics

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Abstract

Appunti del corso tenuto dal Prof. Forti (UniPi) sui rivelatori di particelle
La quasi totalità del materiale è presa dal libro Particle Detectors (Kolanoski, Wermes) [KW20]

Contents

Appendix

Appendix A

Info utili

Quantity	HEP units	SI Units
length	1 fm	10^{-15} m
energy	1 GeV	$1.602 \cdot 10^{-10}$ J
mass	1 GeV/c^2	$1.78 \cdot 10^{-27}$ kg
$\hbar = h/2$	$6.588 \cdot 10^{-25}$ GeV s	$1.055 \cdot 10^{-34}$ Js
c	$2.988 \cdot 10^{23}$ fm/s	$2.988 \cdot 10^{8}$ m/s
$\hbar c$	0.1973 GeV fm	$3.162 \cdot 10^{-26}$ Jm

Natural units ($\hbar$ = c = 1)	
mass	1 GeV
length	1 GeV^{-1} = 0.1973 fm
time	1 GeV^{-1} = $6.59 \cdot 10^{-25}$ s

Figure A.1: Unità di misure usate in fisica delle alte energie

- Sorgenti radioattive più usate: https://pdg.lbl.gov/2018/reviews/rpp2018-rev-commonly-used-radioactive-sources.pdf
- Proprietà di alcuni elementi, Stopping power e range per muoni e lunghezze di assorbimento adroniche per pioni : https://pdg.lbl.gov/2020/AtomicNuclearProperties/index.html
- NIST stopping powers for electrons and positrons in arbitrary materials: http://physics.nist.gov/PhysRefData/Star/Text/ESTAR.html
- NIST stopping power and range tables for protons in selected materials: http://physics.nist.gov/PhysRefData/Star/Text/PSTAR.html
- NIST stopping power and range tables for alpha particles in selected materials: physics.nist.gov/PhysRefData/Star/Text/ASTAR.html

Bibliography

[KW20] Hermann Kolanoski and Norbert Wermes. *Particle Detectors*. Oxford University Press, June 2020. ISBN: 978-0-19-885836-2.