

PHYS 3446 – Lecture #15

Monday, Oct. 30, 2006

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1. Particle Accelerators

- Electro-static Accelerators
- Cyclotron Accelerators
- Synchrotron Accelerators

2. Elementary Particle Properties

- Forces and their relative magnitudes
- Elementary particles
- Quantum Numbers
- Gell-Mann-Nishijima Relations
- Production and Decay of Resonances



Announcements

- Quiz in class Wednesday, Nov. 1
- LPCC Workshop Saturday, Nov. 4
- Homework: Carry out Fourier transformation and derive equations 9.3 and 9.5



Particle Accelerators

- How can one obtain high energy particles?
 - Cosmic ray → Sometimes we observe 1000TeV cosmic rays
 - Insufficient statistics due to low flux
 - Cannot control momenta too well
- Need to look into small distances to probe the fundamental constituents with full control of particle energies and fluxes
 - Particle accelerators
- What else do you think accelerators have do other than particle acceleration?
 - Track them
 - Maneuver (focus or turn) them
 - Constrain their motions to the order of $1\mu\text{m}$
- Why?
 - Must correct particle paths and momenta to increase fluxes and control momenta

