PHYS 1444 – Section 003
Lecture #20

Wednesday, Nov. 16, 2005

Dr. Jaehoon Yu

- Self Inductance
- Inductor
- Energy stored in a magnetic field
- LR circuit
- LC Circuit and EM Oscillation
- LRC circuit

Announcements

- Quiz Monday, Nov. 21 early in class
  - Covers: CH 29-4 to end of CH 30
- UTA Tech Fair today till 3pm
  - Lots of things to learn and lots of goodies
- A colloquium at 4pm this Wednesday
  - Dr. P. Nordlander from Rice University
  - About nano material and magnetic field they generate
  - Extra credit opportunity

Self Inductance

- The concept of inductance applies to a single isolated coil of N turns. How does this happen?
  - When a changing current passes through a coil
  - A changing magnetic flux is produced inside the coil
  - The changing magnetic flux in turn induces an emf in the same coil
  - This emf opposes the change in flux. Whose law is this?
    - Lenz's law
- What would this do?
  - If the current through the coil is increasing?
    - The increasing magnetic flux induces an emf that opposes the original current
    - This tends to impedes its increase, trying to maintain the original current
  - If the current through the coil is decreasing?
    - The decreasing flux induces an emf in the same direction as the current
    - This tends to increase the flux, trying to maintain the original current