PHYSICS II: Problem Set 10

**P10.1**: Giancoli 29.54

**P10.2**: What is the maximum electromotive force induced in a coil of 1000 turns, radius 10cm, rotating at 100 revolutions per second in the Earth magnetic field (5 × 10⁻⁵T)?

**P10.3**: Estimate, crudely, how much work did I do in our induction experiment on April 1? (Meaning useful work, of course, against electromagnetic forces, not the work moving my hand, etc.)

Recall that I had a bar magnet, field $B \sim 1$T, cross section size $l \sim 1$cm. I had a shorted solenoid, cross section radius $\sim l$, length of the solenoid $\sim l$, numbers of turns of the wire $N \sim 100$. The wire was made of copper (resistivity $\rho \sim 10^{-8}$Ω m), the diameter of the wire $d \sim 0.1$mm. I moved one end of the magnet into the solenoid in 0.1s.