

Assignment 2 - Engineering Electromagnetics.

Deadline: 09.12.2011.

1. Calculate the resistance, R , of a coaxial cable where the conductors are separated by a 'lossy' dielectric having a very small (but not negligible !) conductivity σ .
Assume the following: The inner and outer conductor radii are a and b , and the length of the cable is L . The values of the potential are $V_a = 0$, $V_b = V_0$.
Hint: First use Ohm's law *in point form* to express the electric field in terms of the leakage current between the cylinders.
2. Ida: Problem 7.20. Hint: Use the result for the resistance from problem above.
Also compare the power dissipation obtained with the energy required to vaporize the seawater trapped inside the cable. What will happen with the water ?
3. Ida: Problem 8.3.
4. Ida: Problem 8.10.
5. Ida: Problem 10.1.