

804 Midterm (20 points)

March 15 2012, 10:45 ÷ 12:15.

Problem 1.

A wire loop of radius a and resistance R lies in the XY plane. There is a uniform magnetic field $\vec{B} = B\hat{z}$ filling the whole space. What total charge passes a given point in the loop when it is rotated by 90° around the x axis?

Problem 2.

Find the reflection coefficient (I_R/I_0) for the circularly polarized electromagnetic wave incident on a plane between two linear media at Brewster's angle. (For simplicity, take $\mu' = \mu$).

Problem 3.

A $TE_{1,1}$ wave propagates along the rectangular wave guide made from a perfect conductor (for simplicity take $a = b$).

- (a) Find the (surface) currents on the surface of the guide.
- (b) Is there a total current flow along the wave guide?

All problems have equal weight.

GOOD LUCK!