Question:

A plane 1Ghz wave travelling in the air with peak E field of 1v/m is incident normally on a large copper sheet. Find the average power absorbed by the sheet per meter square of the area

Solution:

For the copper sheet and such a frequency wave energy losses during reflection equal to app. $1.2*10^{-4}$ of wave energy (in accordance with Hagen-Rubens formula), i.e.

$$P_a = 1.2 \cdot 10^{-4} \cdot 0.5 \sqrt{\frac{\varepsilon_0}{\mu_0}} E_p^2 = 1.7 \cdot 10^{-7} \text{ (J)}.$$

The answer:

Average power absorbed by the sheet per meter square of the area

$$P_a = 1.2 \cdot 10^{-4} \cdot 0.5 \sqrt{\frac{\varepsilon_0}{\mu_0}} E_p^2 = 1.7 \cdot 10^{-7} \text{ J}.$$