

PHYS 703 - Electromagnetic Waves.

1. [Griffiths 9.12] Find all elements of the Maxwell stress tensor for a monochromatic plane wave traveling in the z -direction and linearly polarized in the x direction:

$$\vec{E}(z, t) = E_0 \cos(kz - \omega t + \delta) \hat{x}$$

$$\vec{B}(z, t) = \frac{1}{c} E_0 \cos(kz - \omega t + \delta) \hat{y}$$

Does your answer make sense? (Remember that \vec{T} represents the momentum flux density.) How is the momentum flux density related to the energy density, in this case?