ENEE 680: Homework #5

Due: Monday Nov. 19, 2012

Jackson: Problems 4.6, 4.8, 4.9, 4.10,

Also: For the model frequency dependent dielectric constant introduced in class:

\[ \frac{\varepsilon(\omega)}{\varepsilon_0} = 1 + \frac{\omega_p^2}{\omega_0^2 - \omega^2}, \]

show that the expression

\[ W = \frac{1}{4} \int d^3x \frac{\partial \varepsilon(\omega)}{\partial \omega} |\mathbf{E}|^2 \]

includes three contributions to stored energy. Identify each of the three modes where energy is stored.