Advanced Electromagnetic Waves Exercise 1

April 18, 2006, J. Hirokawa

Submit your report to the room 908 on the 9th floor in the south 3rd building in O-okayama campus by 13:20 on Friday 21 April.

1. Derive the particular solutions by solving the Maxwell equations for a magnetic source **M**.

Maxwell equations  $\left( -\nabla \times \mathbf{E}_{pF} = j\omega\mu\mathbf{H}_{pF} + \mathbf{M} \right)$ 

$$\begin{cases} \nabla \times \mathbf{H}_{pF} = (\sigma + j\omega\varepsilon)\mathbf{E}_{pF} \end{cases}$$

Particular solutions

$$\begin{cases} \mathbf{E}_{pF} = -\nabla \times \mathbf{F}_{p} \\ \mathbf{H}_{pF} = -(\sigma + j\omega\varepsilon)\mathbf{F}_{p} + \frac{1}{j\omega\mu}\nabla(\nabla \cdot \mathbf{F}_{p}) \end{cases}$$