Total electromagnetic field($\mathbf{E}_t$,$\mathbf{H}_t$) is found adding contribution from original electromagnetic field ($\mathbf{E}_o$,$\mathbf{H}_o$) and equivalent electromagnetic field ($\mathbf{E}_e$,$\mathbf{H}_e$).

$$\mathbf{E}_o + \mathbf{E}_e = \begin{cases} \hat{\mathbf{x}} E_0 \exp(-jk_0 z) = \mathbf{E}_o & (z < 0) \\ \mathbf{0} & (z > 0) \end{cases} \tag{13}$$

$$\mathbf{H}_o + \mathbf{H}_e = \begin{cases} \hat{\mathbf{y}} \frac{E_0}{Z_0} \exp(-jk_0 z) = \mathbf{H}_o & (z < 0) \\ \mathbf{0} & (z > 0) \end{cases} \tag{14}$$

The final result is observed in fig.6.

1.3 Equivalent model for region II when region I is perfect electric conductor (PEC)

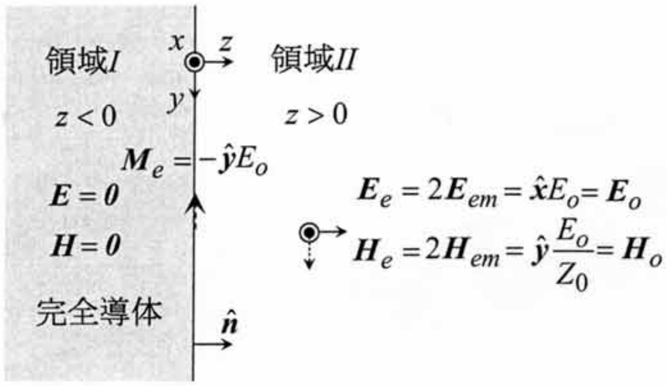

Figure 7: 領域 I を完全導体で満たした領域 II の等価モデル

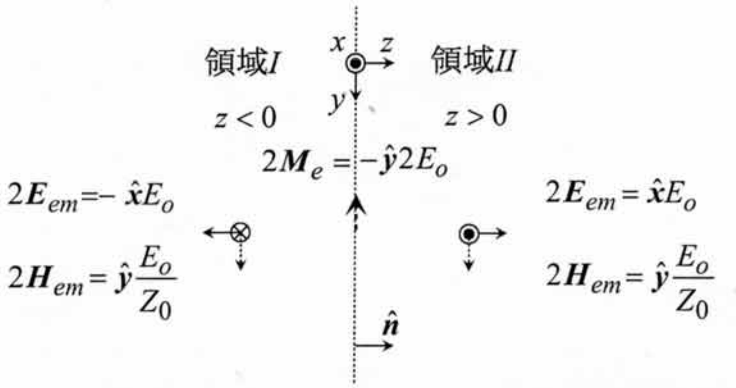

Figure 8: 等価電磁流 $2\mathbf{M}_e$ が自由空間に作る電磁界

Figure 7 shows case when region I is PEC. In this case the presence of electric wall forces existence of only equivalent magnetic current $\mathbf{M}_e$. When the electromagnetic field ($\mathbf{E}_e$,$\mathbf{H}_e$) produced by equivalent magnetic current is needed, the existence of electric wall S must be taken into account. Because the electric wall S is infinite plane, the electromagnetic field ($\mathbf{E}_e$,$\mathbf{H}_e$) produced by equivalent magnetic current Me for $z > 0$ might be calculated using