Eddy-current losses in a rectangular plate (advanced model)

- Eq. (401) is not easily solved using analytical techniques so, motivated by the sinusoidal excitation given by (399), we assume a sinusoidal time dependence of $H_z(x, y, t)$.
- Hence, we assume that

$$H_z(x, y, t) = \Re\left(\bar{H}_z(x, y)e^{j\omega_\nu t}\right). \qquad (402)$$

From (402) it follows from (401) that

$$\frac{\partial^2 \bar{H}_z}{\partial x^2} + \frac{\partial^2 \bar{H}_z}{\partial y^2} = j\mu_0\mu_{r,\text{spec}}\sigma_{\text{spec}}\omega_\nu \bar{H}_z. \qquad (403)$$

- Further, the boundary condition given by (400) can, using (402), be expressed as

$$\bar{H}_z = \frac{B_\nu}{\mu_0\mu_{r,\text{spec}}}, \quad x = \pm w_{\text{spec}}/2 \text{ or } y = \pm l_{\text{spec}}/2. \qquad (404)$$