4.2. Wibracje akustyczne warstwy metalicznej.

$$-\frac{d u(x)}{dx^2} - u = \sin x \qquad [0,2] \ni x \to u(x) \in \mathbb{R}$$

$u(0) = 0$ - warunek Dirichleta w $x=0$

$$\frac{du(2)}{dx} - u(2) = 0$$ - warunek Cauchy'ego w $x=2$

$$-u'' - u = \sin x \; / \cdot v$$

$$-u''v - vu = v\sin x \; / \int_0^2 dx$$

$$\int_0^2 -u''v\,dx - \int_0^2 vu\,dx = \int_0^2 v\sin x\,dx \; /$$

$$\underbrace{-u'v\Big|_0^2}_{-u'(2)v(2)+u'(0)\underset{0}{v(0)}} + \int_0^2 u'v'\,dx - \int_0^2 vu\,dx = \int_0^2 v\sin x\,dx$$

$$\int_0^2 u'v' - vu\,dx - \underbrace{u'(2)}_{u(2)}v(2) = \int_0^2 v\sin x\,dx$$

Z warunku brzegowego Cauchy'ego:

$$\int_0^2 (u'v' - vu)dx - u(2)v(2) = \int_0^2 v\sin x\,dx$$

Sformułowanie wariacyjne:

$$\int_0^2 (u'v' - vu)dx - u(2)v(2) = \int_0^2 v\sin x\,dx$$

$$B(u,v) = \int_0^2 (u'v' - uv)dx - u(2)v(2)$$

$$L(v) = \int_0^2 \sin x\, v\,dx$$