

**Obtención de la ecuación de ondas topograficas a partir de la ecuación de onda de gravedad interna**

$$\left(\frac{\partial}{\partial t} + \bar{u} \frac{\partial}{\partial x}\right)^2 \left(\frac{\partial^2 w'}{\partial x^2} + \frac{\partial^2 w'}{\partial z^2}\right) + N^2 \frac{\partial^2 w'}{\partial x^2} = 0$$

$$\left(\bar{u} \frac{\partial}{\partial x}\right)^2 \left(\frac{\partial^2 w'}{\partial x^2} + \frac{\partial^2 w'}{\partial z^2}\right) + N^2 \frac{\partial^2 w'}{\partial x^2} = 0$$

$$\left(\frac{\partial}{\partial x}\right)^2 \left(\frac{\partial^2 w'}{\partial x^2} + \frac{\partial^2 w'}{\partial z^2}\right) + \frac{N^2}{\bar{u}^2} \frac{\partial^2 w'}{\partial x^2} = 0$$

$$\left(\frac{\partial}{\partial x}\right)^2 \left[\left(\frac{\partial^2 w'}{\partial x^2} + \frac{\partial^2 w'}{\partial z^2}\right) + \frac{N^2}{\bar{u}^2} w'\right] = 0$$

$$\left(\frac{\partial^2 w'}{\partial x^2} + \frac{\partial^2 w'}{\partial z^2}\right) + \frac{N^2}{\bar{u}^2} w' = 0$$