Wave Equation

Progressive Plane Wave

$$s = s_o \sin[2\pi(\frac{t}{T} \pm \frac{x}{\lambda}) + \alpha]$$

Standing Wave Equation

$$s = A\cos\left(2\pi\frac{x}{\lambda} + \frac{\phi}{2}\right)\sin\left(2\pi\frac{t}{T} + \frac{\phi}{2}\right)$$

where ϕ is the phase shift at origo. Node distance is $\frac{\lambda}{2}$

The General Wave Equation

$$\frac{\partial^2 s}{\partial t^2} = v^2\frac{\partial^2 s}{\partial x^2}$$

Occilation Frequency

$$f_{\text{occilation}} = |f_1 - f_2|$$