Introduction to Digital Waveguide Synthesis

$$\frac{\partial^2 y(x,t)}{\partial t^2} = c^2 \frac{\partial^2 y(x,t)}{\partial x^2}$$

"acceleration = wave velocity squared times curvature"

Waves propogate along the waveguide
and bounce off the ends.

$$\frac{\partial^2 y(x,t)}{\partial t^2} = c^2 \frac{\partial^2 y(x,t)}{\partial x^2} - dy(x,t)$$

"fraction = a small fraction of displacement"

The waveguide does not vibrate forever
but slowly dissapates energy.

$$\frac{\partial^2 y(x,t)}{\partial t^2} = c^2 \frac{\partial^2 y(x,t)}{\partial x^2} - d\frac{\partial y(x,t)}{\partial t}$$

"friction = a small fraction of velocity"

High frequencies are damped more than low ones.

$$\frac{\partial^2 y(x,t)}{\partial t^2} = c^2 \frac{\partial^2 y(x,t)}{\partial x^2} - d\frac{\partial y(x,t)}{\partial t} + k\frac{\partial^3 y(x,t)}{\partial x^3}$$

"stiff strings resist being bent"

High frequencies propogate faster than low ones.

$$\frac{\partial^2 y(x,t)}{\partial t^2} = y(x,t)$$

"acceleration = displacement"

Your waveguide is ****ed.