Homework 16

Investigate flexural wave propagation using the MATLAB code *NDOFbeamwave.m*. In particular,

1. Verify that waves reflecting from a free end return with the same sign as the outgoing wave and waves reflecting from a fixed end return with the opposite as the outgoing wave.

2. Observe that flexural waves disperse with time (unlike axial waves that persist and propagate at the wave speed $c=\sqrt{(E/\rho)}$.

3. Observe that if the initial displacement is in the form of a pure mode (obtained through the separation of variables solution) will persist.

4. Investigate resonant loading (i.e., a load with a forced sinusoidal variation). Does the response evolve into a pure mode at the driving frequency? What happens if you drive the system as a frequency slightly different from the resonant frequency?.

5. What are the discretization requirements (i.e., how many elements do you need) for an accurate solution to the wave propagation problem?

6. Explore any other issue that interests you.