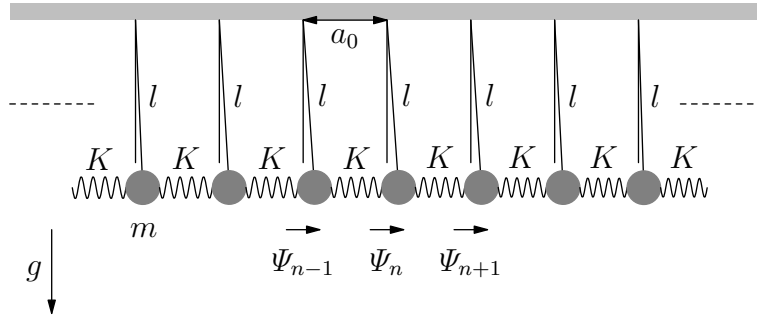


J05M.3 - Waves in a Series of Pendula

Problem

Consider wave propagation in a one-dimensional medium which consists of a large number of pendula of mass m and length l coupled by springs of spring constant K . The distance between adjacent masses is a_0 , which is also the natural length of the springs.



- Write the equation of motion for small horizontal displacements of the n -th mass, Ψ_n .
- Derive a dispersion relation for the propagating modes.
- What is the range of frequencies (bandwidth) over which waves can propagate along the chain?