Figure 1.12: A sample of the normal modes (free oscillations) of a homogeneous 50 point lattice with fixed ends. The lower frequency modes are purely sinusoidal; the higher frequency modes become modulated sinusoids as a result of the dispersive effects of this being a discrete system.
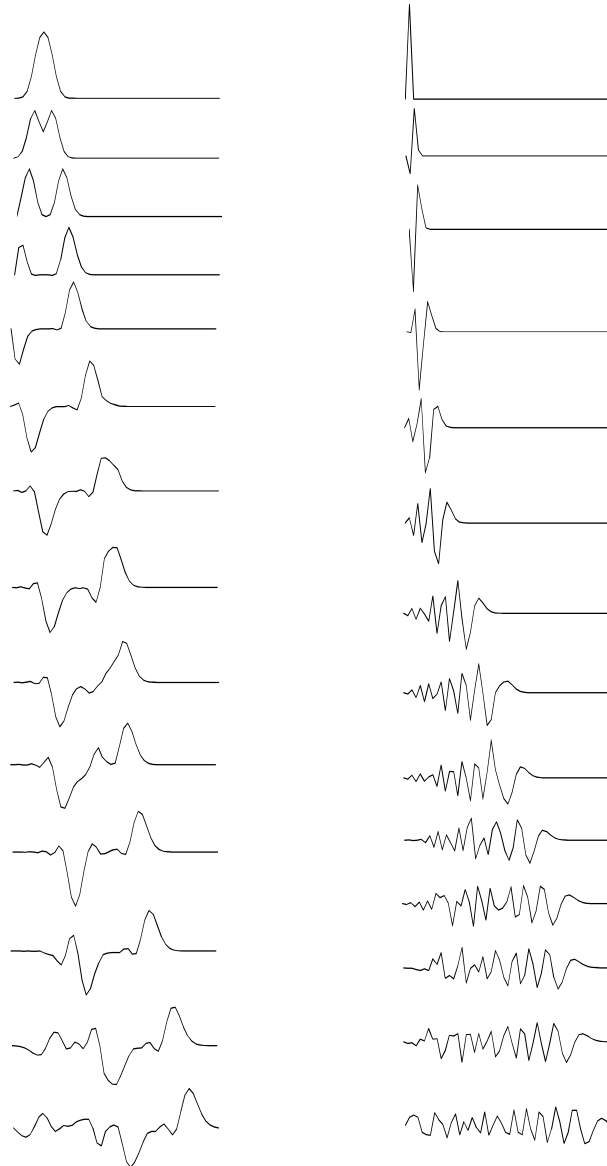
Figure 1.13: Waves on a lattice (discrete string). The two columns of figures are snapshots in time of waves propagating in a 1D medium. The only difference between the two is the initial conditions, shown at the top of each column. On the right, we are trying to propagate an inpulsive function (a displacement that is turned on only for one grid point in space and time). On the left, we are propagating a smoothed version of this. The medium is homogeneous except for an isolated reflecting layer in the middle. The dispersion seen in the right side simulation is the result of the discretness of the medium: waves whose wavelengths are comparable to the grid spacing sense the granularity of the medium and therefore propagate at a slightly different speed than longer wavelength disturbances.