

Two horizontal frictionless rails make an angle  $\alpha$  with each other, as shown in the figure below. Each rail has a bead of mass  $m$  on it, and the beads are connected by a spring with spring constant  $k$  and relaxed length zero. Assume that one of the rails is positioned a tiny distance above the other, so that the beads can pass freely through the crossing. Find the eigenfrequencies and normal modes.

