**Folded-Beam Stiffness Ratios**

- In the x-direction:
  \[ k_x = \frac{24EI_z}{L^3} \]

- In the z-direction:
  \[ k_z = \frac{24EI_x}{L^3} \]
  - Same flexure and boundary conditions

- In the y-direction:
  \[ k_y = \frac{8EWh}{L} \]
  - [See Senturia, §9.2]

Thus:
\[ \frac{k_y}{k_x} = \frac{4(L/W)^2}{1} \]

Much stiffer in y-direction!

**Folded-Beam Suspensions Permeate MEMS**

- Below: Micro-Oven Controlled Folded-Beam Resonator

- Accelerometer [ADXL-05, Analog Devices]
- Gyroscope [Draper Labs.]
- Micromechanical Filter [K. Wang, Univ. of Michigan]