The formula for calculation of a set of own resonance frequencies of atomic oscillators

$$\nu(m) = \frac{c \cdot m^2}{4 \cdot \pi \cdot D} \cdot k_d$$

where c – speed of light
m – frequency quantum number
D – diameter of oscillator
k_d – coefficient of elasticity

For hydrogen and helium $k_d = 4$.

Quantum transitions in multi-frequency ring oscillator

Resonance frequencies of polytron at even
quantum numbers and value of tangential energy
for different quantum transitions