HWU4-15

QUESTION:

German physicist Werner Heisenberg related the uncertainty of an object’s position (Δx) to the uncertainty in its velocity Δv.

$∆x \geq \frac{h}{4πm∆v}$ where *h* is Planck’s constant and *m* is the mass of the object.

The mass of an electron is 9.11 x 10-31 kg.

What is the uncertainty in the position of an electron moving at 9.00 x 106 m/s with an uncertainty of

Δv x 0.01 x 106 m/s?

ANSWER:

$∆x \geq $ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m

HINT:

Planck's constant is *h* = 6.626× 10–34 kg·m2/s.