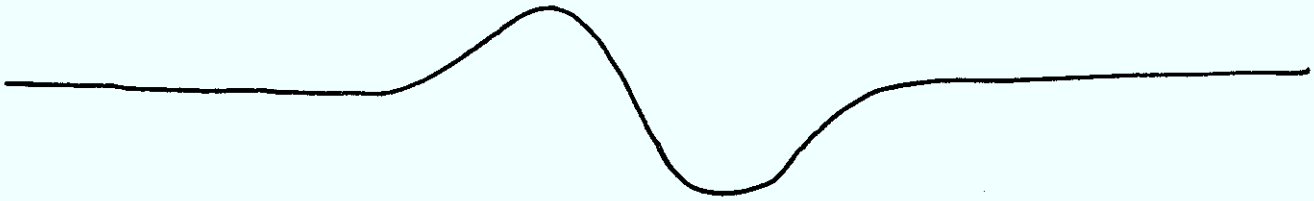
For which of these wavepackets will Δx increase the fastest?

A) 

B) 

C) 

D) Both A and B

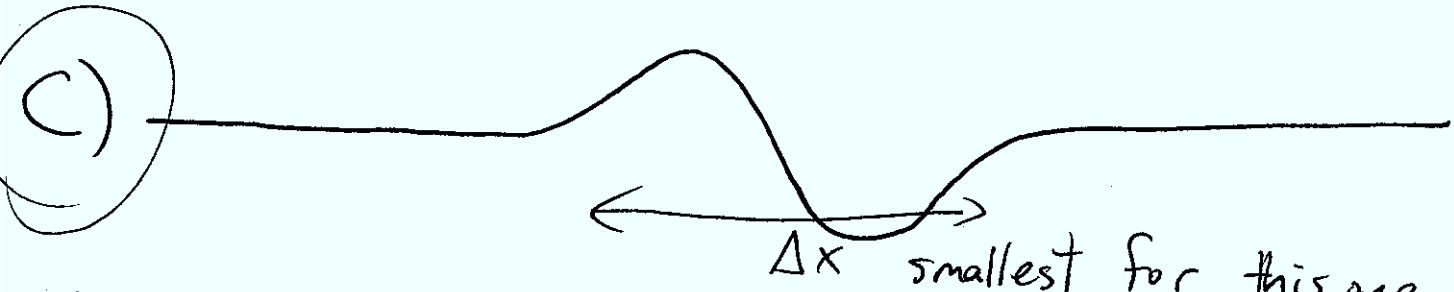
E) Both A and C

For which of these wavepackets will Δx increase the fastest?

A)

B)

C)



Δx smallest for this one

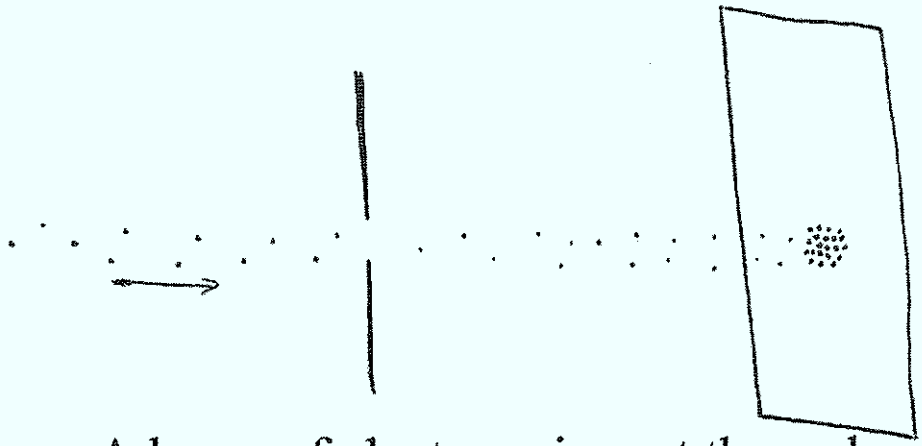
$\therefore \Delta p$ largest

$\therefore$ greatest range of velocities making up wavepacket.

$\therefore$ fastest spread.

D) Both A and B

E) Both A and C

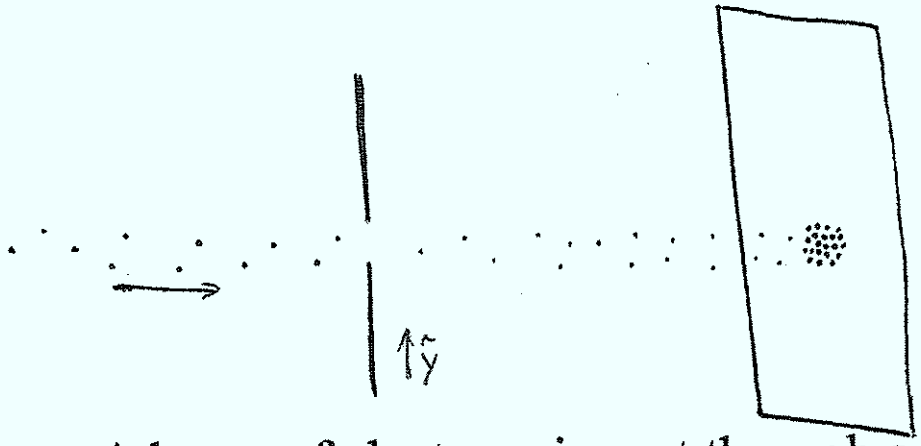


A beam of electrons is sent through a narrow hole in a piece of foil, and the places where these electrons hit a distant screen are recorded. If we make the hole in the screen smaller, the region where the electrons are hitting the screen will

A) become smaller.

B) become larger.

C) stay the same.



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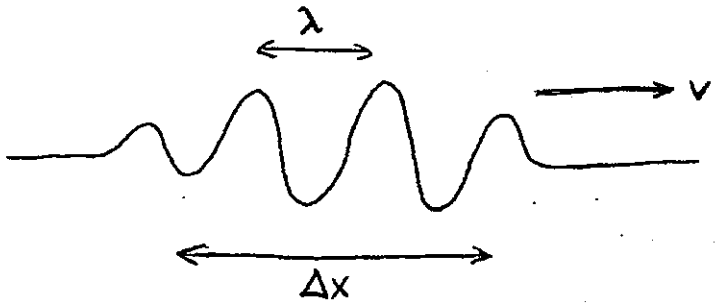
smaller hole:
⇒ less uncertainty in y position
⇒ more uncertain y momentum/velocity
∴ pattern spreads out



The speed of a wavepacket describing a traveling electron should be

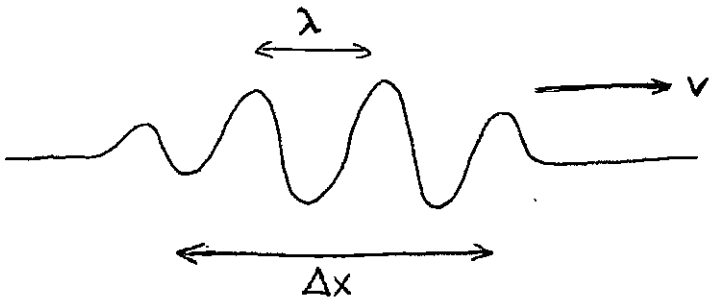
A) proportional to λ

B) inversely proportional to λ

C) proportional to Δx

D) inversely proportional to Δx

E) the same regardless of λ or Δx



The speed of a wavepacket describing a traveling electron should be $v = \frac{p}{m} = \frac{h}{m\lambda}$

A) proportional to λ

B) inversely proportional to λ

C) proportional to Δx

D) inversely proportional to Δx

E) the same regardless of λ or Δx

In the simulation, the individual ripples in the wavepacket travel

A) faster than the wavepacket itself

B) at the same rate as the wavepacket

C) slower than the wavepacket

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