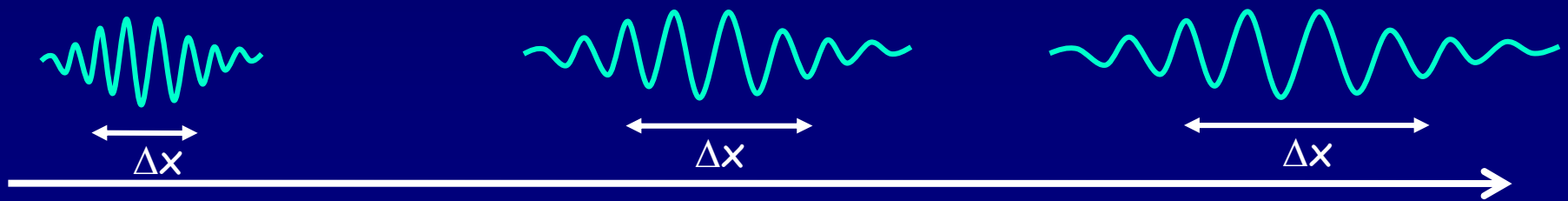


## Supplement: Free particle motion

- It turns out (next slide) that the constructive interference region for a matter wavepacket moves at the “group velocity”  
$$v = h/\lambda m = p/m$$
- So there's a simple correspondence between the quantum picture and our classical picture of particles moving around with momentum  $p = mv$ .
- But the quantum packet will spread out in the long run, since it has a range of  $p$ , so the correspondence is never perfect.



Position of maximum probability moves  
and the width of probability distribution spreads out