A continuous distribution of wavelengths can produce a localized "wave packet".

λ_{avg}

$\Delta\lambda$
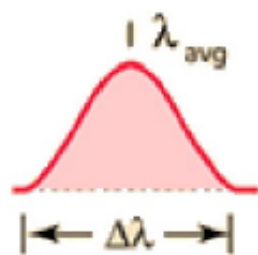
$$p = \frac{h}{\lambda}$$
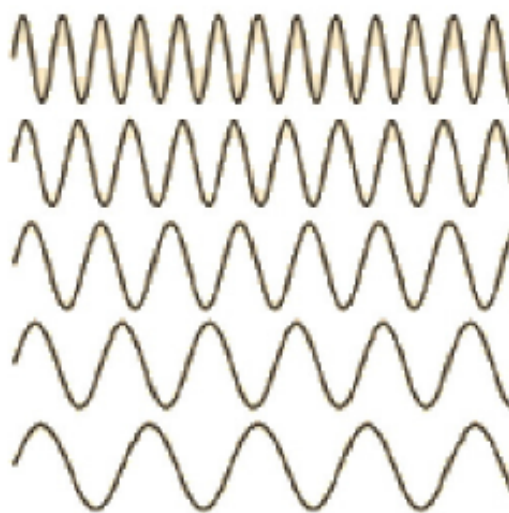
Each different wavelength represents a different value of momentum according to the DeBroglie relationship.

Δx
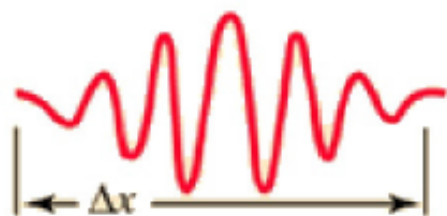
Superposition of different wavelengths is necessary to localize the position. A wider spread of wavelengths contributes to a smaller Δx.