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Wavefunction:

$$\Psi(x,t) = C \cdot e^{i(\omega t - kx)} = C \cdot e^{\frac{i}{\hbar}(Et - pr)} \overset{Wavepacket}{=} A(x,t)e^{i(\omega_0 t - k_0 x)} = 2C(k_0)\frac{sin\left[\left(t \cdot \left(\frac{d\omega}{dk}\right)_{k_0} - x\right) \cdot \Delta k\right]}{\left(t \cdot \left(\frac{d\omega}{dk}\right)_{k_0} - x\right)} = 2C(k_0$$

$$(1)$$

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