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Wavelength (Oscillation):

$$\lambda = \frac{h}{p} = \frac{2\pi}{k} = \omega\frac{\mathcal{T}}{k} = \frac{c}{\nu} = r \cdot cos(\frac{\pi}{2} - \alpha) = 2\frac{d}{n}\sqrt{\eta^2 - sin^2(\alpha)} = 2\pi\frac{2d}{\Delta\varphi}\sqrt{\eta^2 - sin^2(\alpha)} = 2d\frac{\eta}{n}cos(\beta) = 2\pi\eta\frac{2d}{\Delta\varphi} \quad (1)$$

$$\Delta\lambda = \frac{h}{m_e c}(1 - cos(\varphi)) = 2\frac{h}{m_e c}sin^2(\frac{\varphi}{2}) \quad (2)$$

Wavefunction:

$$\Psi(x,t) = C \cdot e^{i(\omega t - kx)} = C \cdot e^{\frac{i}{\hbar}(Et - pr)} \overset{Wavepacket}{=} A(x,t)e^{i(\omega_0 t - k_0 x)} = 2C(k_0)\frac{sin\left[\left(t \cdot \left(\frac{d\omega}{dk}\right)_{k_0} - x\right) \cdot \Delta k\right]}{\left(t \cdot \left(\frac{d\omega}{dk}\right)_{k_0} - x\right)} = 2C(k_0 \quad (3)$$