$$z_0 = \frac{q}{\hbar}\sqrt{2mV_0}$$

$q = 10^{-10}\,m$

$V_0 = 10\,meV = 0.01\,eV$

$m_{proton} = 938.2\,Mev = 9.382 \times 10^8\,eV$

$\hbar = 6.582 \times 10^{-16}\,eV$

$$z_0 = \frac{10^{-10}}{6.582\times10^{-16}}\sqrt{2(9.382\times10^8)(0.01)}$$

$z_0 = 6.5812 \times 10^8 / c = 2.19525202$

$$F(z) = \tan(z) - \sqrt{(z_0/z)^2 - 1}$$

- Solve by finding roots of $F(z)$ to get z.

- solving for E

$$z = \frac{q}{\hbar}\sqrt{2m(E+V_0)}$$

$$\left(\frac{\hbar z}{q}\right)^2 \frac{1}{2m} - V_0 = E$$

$$\left(\frac{(6.582\times10^{-16}\,eV)(1.06452)}{(10^{-10}\,m)}\right)^2 \frac{1}{2(9.382\times10^8\,eV)}$$

$$-(0.01\,ev) = -0.0\overline{999}$$