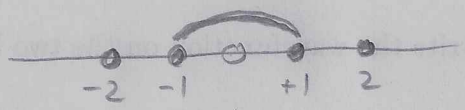
1328 2014A

Transmission via lattice

$$H_0 = 2C_0 \cos(a\hat{p})$$



$$\psi = e^{ikn} + r e^{-ikn} \; ; \; t e^{ikn}$$

$$\begin{pmatrix} 0 & C_0 & & \\ C_0 & 0 & C_J & \\ & C_J & 0 & C_0 \\ & & C_0 & 0 \end{pmatrix} \begin{pmatrix} e^{-i2ka} + r e^{i2ka} \\ e^{-ika} + r e^{ika} \\ t e^{ika} \\ t e^{i2ka} \end{pmatrix} = 2C_0 \cos(ka) \begin{pmatrix} \\ \\ \dots \\ \end{pmatrix}$$

$$\begin{cases} C_0 (e^{-i2k} + r e^{i2k}) + C_J t e^{ik} = C_0 (e^{ik} + e^{-ik})(e^{-ik} + r e^{ik}) \\ C_J (e^{-ik} + r e^{ik}) + C_0 t e^{i2k} = C_0 (e^{ik} + e^{-ik}) t e^{ik} \end{cases}$$

$$\begin{cases} -r + c e^{ik} t = 1 & \times c e^{ik} \\ c e^{ik} r - t = -c e^{-ik} \end{cases}$$

$$t = \frac{c(e^{ik} - e^{-ik})}{c^2 e^{i2k} - 1} \longleftarrow \boxed{\text{here } a = 1}$$

$$g \sim \left\{ c^2 \dots \frac{1}{c^2} \right\} \left(\frac{V}{C_0 a} \right)^2 \qquad \boxed{c \equiv \frac{C_J}{C_0}}$$

$\boxed{c \ll 1}$ $\boxed{c \gg 1}$

for $c = 1$ the transmission is $g = 1$