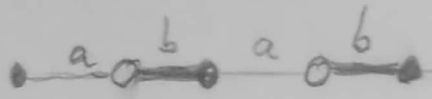
Ex 7212 adiabatic transfer along chain (2019A)



$N=5, L=6, \quad a = c\sin\theta, \quad b = c\cos\theta$

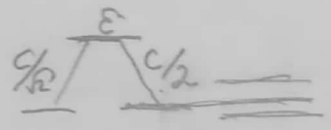
$\hat{R}HR = -H, \quad R = \mathrm{diag}(1,-1,1,-1,1)$

For $\theta = 0$ $\quad E = 0, \pm c, \pm c$

For $\theta = \frac{\pi}{4}$ $\quad E = \sqrt{2}c\cos\left(\frac{\pi}{6}\cdot \text{integer}\right) = 0, \pm\frac{c}{\sqrt{2}}, \pm\sqrt{\frac{3}{2}}c$

with $\varepsilon \gg c$ $\quad E = 0, \varepsilon, -\frac{c^2}{\varepsilon}, \pm c$

$E = 0, \varepsilon, -\frac{3}{4}\frac{c^2}{\varepsilon}, \pm c$

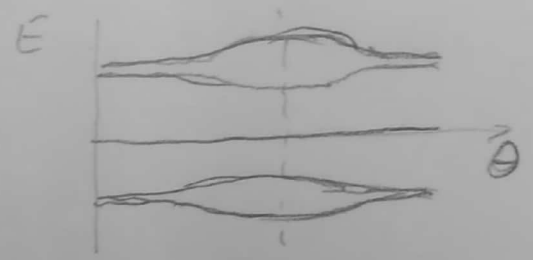
based on 

$$\begin{pmatrix} 0 & \frac{c}{\sqrt{2}} & 0 \\ \frac{c}{\sqrt{2}} & \varepsilon & \frac{c}{\sqrt{2}} \\ 0 & \frac{c}{\sqrt{2}} & 0 \end{pmatrix}$$

$H\Psi = 0 \Rightarrow \Psi \propto (1, 0, -tg, 0, tg^2)$

$\dot{\theta} \ll c \quad (\varepsilon = 0)$

$\dot{\theta} \ll \frac{c^2}{\varepsilon} \quad (\varepsilon \gg c)$



$\varepsilon = 0$

$\theta \sim 0$