$\mathcal{H}_+ = +v\,\vec{p}\cdot\vec{\sigma} \rightarrow E = \pm vp$

$\mathcal{H}_- = -v\,\vec{p}\cdot\vec{\sigma} \rightarrow$ " "

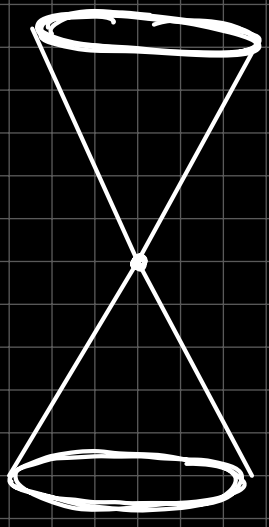
+ve en. soln $E = +|\vec{p}|$

$\vec{v}\,\vec{p}\cdot\vec{\sigma}\; u_r = v|\vec{p}|\,u_r \rightarrow \frac{1}{2}\frac{\vec{p}\cdot\vec{\sigma}}{|\vec{p}|}\,u_r = \left(\frac{+1}{2}\right) u_r$

+ve helicity ≡ +ve chirality

similarly $u_l \equiv$ -ve helicity $\equiv$ -ve chirality

[$u_1 = v_1 + v_2 \quad u_2 = v_1 - v_2$ for a $\gamma = \begin{pmatrix} v_1 \\ v_2 \end{pmatrix}$]



$\vec{k}\cdot\vec{\sigma}$