

Charge Conjugation and Weak Interactions

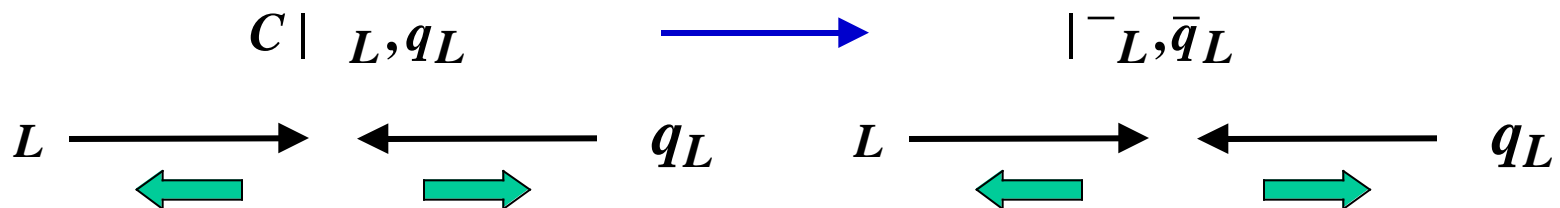
- Recall:**

$$\left. \begin{array}{l} C | \quad = - | \\ C | \quad^0 = + | \quad^0 \\ C | \quad = - | \end{array} \right\} \begin{array}{l} \text{strong or electromagnetic} \\ \text{forces dominate the} \\ \text{interactions of these particles} \end{array}$$

- Note also that neutral particles need not be eigenstates of charge conjugation:

$$C | n = | \bar{n} \quad | \pm n : | n = | u d d \quad \& \quad | \bar{n} = | \bar{u} \bar{d} \bar{d}$$

- Let's look at a weak interaction:

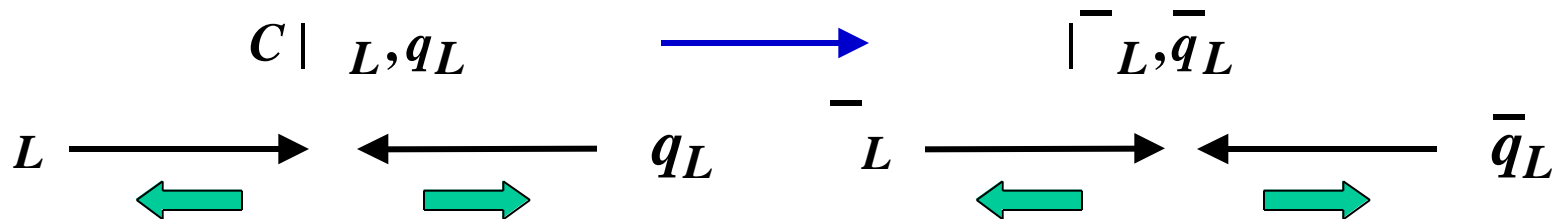


Charge conjugation produces left-handed anti-neutrinos and anti-quarks; only right-handed anti-fermions interact weakly.

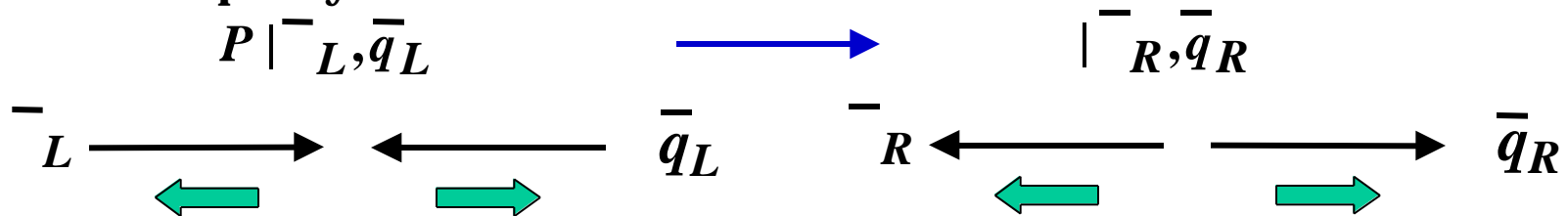
CP and Weak Interactions

- Let's apply both the charge conjugation and parity operators to the neutrino-quark scattering process we just considered.

Charge conjugation gives us:



Under parity inversion



which can be rearranged giving

$$(q) = (\bar{\nu} \bar{q})$$

