Meson-Baryon interaction in the Fock-Tani Formalism

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We are interest in Meson-Baryon cross section scattering

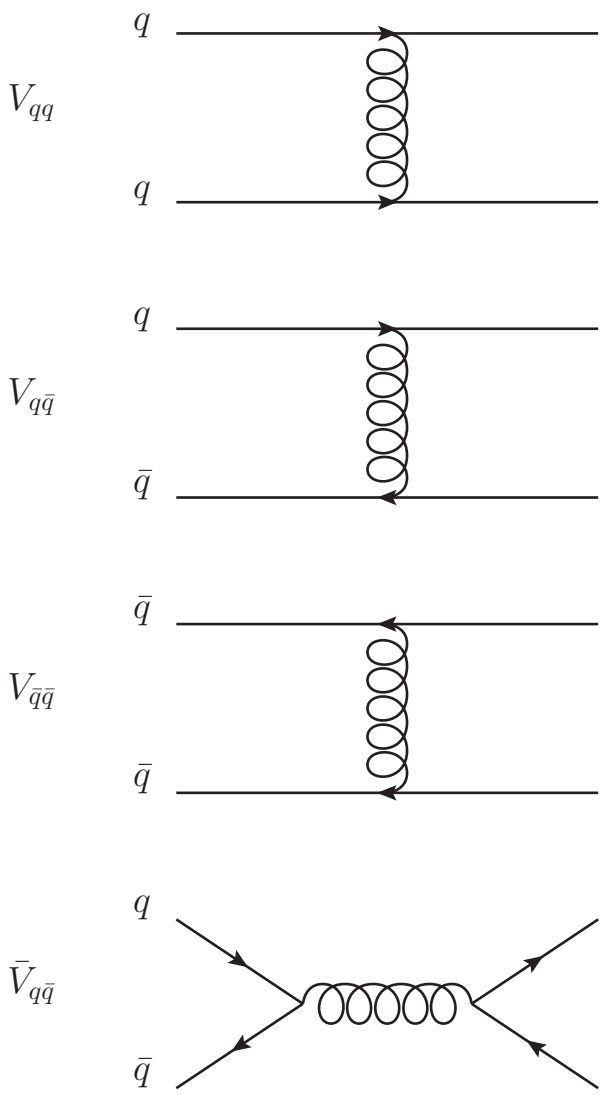
$$K^- + p \rightarrow K^- + p$$

$$\bar{K}^0 + p \rightarrow \bar{K}^0 + p$$

$$\eta + p \rightarrow \eta + p$$

$$D^+ + p \rightarrow D^+ + p$$

$$D^0 + p \rightarrow D^0 + p$$


V_{qq}
q
q
$V_{q\bar{q}}$
q
$\bar{q}$
$V_{\bar{q}\bar{q}}$
$\bar{q}$
$\bar{q}$
$\bar{V}_{q\bar{q}}$
q
$\bar{q}$

Fock-Tani Formalism

Consists in a change of representation using an unitary operator U, such that the operators associated with composite particles could be rewritten in operators who satisfy the canonical anticomutation relations.

$$|\Omega> \longrightarrow |\Omega) = U^{-1}|\Omega>,$$
$$O \longrightarrow O_{\mathrm{FT}} = U^{-1}OU\ .$$

Starting with the microscopic quark-antiquark Hamiltonian

$$H_{2q} \rightarrow \mathcal{H}_{FT} = \mathcal{U}^{-1} H_{2q} \mathcal{U}$$

Where

$$\mathcal{H}_{FT} = \mathcal{H}_q + \mathcal{H}_m + \mathcal{H}_b + \mathcal{H}_{mq} + \mathcal{H}_{bq} + \mathcal{H}_{mb}.$$

And so obtain the meson-baryon potentials V_{qq}, $V_{q\bar{q}}$ and $V_{\bar{q}\bar{q}}$ with quark and gluon exchange to calculate the cross section scattering.