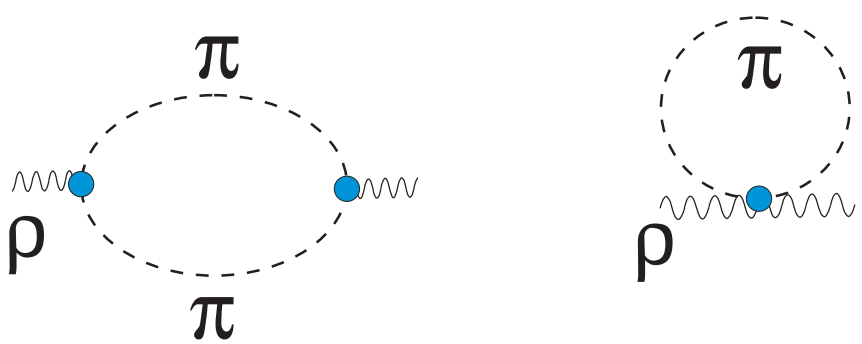
The ρ Meson in Vacuum

Vector-Dominance-Model (VDM):

$$J_\mu^V(x) = \frac{m_\rho^2}{g_\rho}\rho_\mu^a(x)$$

effective Lagrangian:

$$\mathcal{L} = \mathcal{L}_\pi + \mathcal{L}_\rho + \frac{ig}{2}(\vec{\pi} \times \partial^\mu \vec{\pi}) \cdot \vec{\rho}_\mu - \frac{g^2}{2}\vec{\rho}^\mu \cdot \vec{\rho}_\mu \vec{\pi} \cdot \vec{\pi}$$

to order g^2: