# Chiral Symmetry Restoration and Vector Mesons

vector and axialvector currents:

$$\mathcal{V}_k^\mu = \bar{\psi}\gamma^\mu \frac{\tau_k}{2}\psi; \quad \mathcal{A}_k^\mu = \bar{\psi}\gamma^\mu\gamma_5 \frac{\tau_k}{2}\psi$$

correlators:

$$\Pi_V^{\mu\nu}(q) = -i \int d^4x\, e^{iqx} \ll \mathcal{T}(\mathcal{V}_k^\mu(x), \mathcal{V}_k^\nu(0)) \gg$$

$$\Pi_A^{\mu\nu}(q) = -i \int d^4x\, e^{iqx} \ll \mathcal{T}(\mathcal{A}_k^\mu(x), \mathcal{A}_k^\nu(0)) \gg$$

vacuum:

$$-\frac{1}{\pi}\mathrm{Im}\Pi_V^{\circ\mu\nu}(q) = -(q^2 g^{\mu\nu} - q^\mu q^\nu)\rho_V(q^2)$$

$$-\frac{1}{\pi}\mathrm{Im}\Pi_A^{\circ\mu\nu}(q) = -(q^2 g^{\mu\nu} - q^\mu q^\nu)\rho_A(q^2) + q^\mu q^\nu F_\pi^2 \delta(q^2 - m_\pi^2)$$