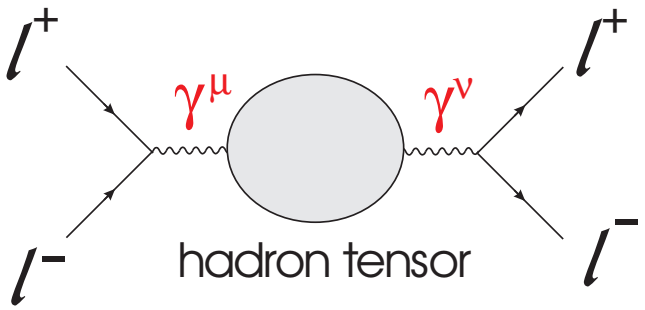
Dilepton Rates

dilepton production from the medium:



rate: $M^2 \equiv q^2 > 0$

$$\frac{dN_{l^+l^-}}{d^4x d^4q} = \frac{dR}{d^4q} = L^{\mu\nu}(q) H_{\mu\nu}(q)$$

lepton tensor:

$$L^{\mu\nu}(q) = -\frac{\alpha^2}{6\pi^3 q^2}\left(g^{\mu\nu} - \frac{q^\mu q^\nu}{q^2}\right)$$

hadron tensor:

$$H_{\mu\nu}(q) = \int d^4x\, e^{-iqx} \ll J^{\rm em}_\mu(x) J^{\rm em}_\nu(0) \gg$$