

Exercise 25: Källén-Lehman representation

Prove the equation

$$\frac{1}{(2\pi)^3} \int \frac{d^3 p}{2p^0} [\theta(x^0 - y^0) e^{ip(x-y)} + \theta(y^0 - x^0) e^{-ip(x-y)}] = \int \frac{d^4 p}{(2\pi)^4} \frac{e^{ip(x-y)}}{p^2 + \mu^2 - i\epsilon}. \quad (1)$$

On the right-hand-side of the equation, p^0 is the energy of a particle of mass μ .

Exercise 26: No need for external line corrections

Show that there is no need to include external line corrections for an OS renormalized field.