

Quantum field theory

Exercises 11.

2006-04-03

- **Exercise 11.1.**

Using the definition of the propagator

$$D(x-y) = \langle 0 | T \{ \phi(x) \phi(y) \} | 0 \rangle$$

and using the expression for the T product in terms of theta functions show, that the Feynman propagator is indeed a Green's function for the Klein Gordon operator, i.e.

$$\left(\frac{\partial}{\partial x^\mu} \frac{\partial}{\partial x_\mu} + m^2 \right) D(x-y) = -i \delta^{(4)}(x-y) .$$