

QFT

Chapter 42: The Free Fermion Propagator

Overview

- New dog; same tricks
 - As before, we have an LSZ formula that tells us how to get transition amplitudes
 - We know how to turn this amplitude into cross-sections and decay rates
 - As before, the problem is that we need to solve those correlation functions in order to solve the LSZ formula.
- What we want to do here is to figure out the correlation function for a free fermion.
 - The technique is the same as before: put in the mode expansion, simplify, and insert a time ordering operator in order to use equation 8.11 and 8.14.
 - As before, we then use the same technique to derive the equivalent of Wick's Theorem (propagator for multiple fields)
 - The only new subtlety is the Majorana vs. Dirac fields: these have different mode expansions and must be treated separately.