QFT

Chapter 61: Scalar Electrodynamics

Summary

- Nothing has really changed since the spinor chapter
  - We choose a quartic interaction for the Lagrangian
  - Make it Lorentz invariant by introducing a covariant derivative
    - This also changes the global symmetry inherent in the Lagrangian to a local symmetry, ie charge is conserved at every x, y, z, t.
  - Write out the interaction terms to determine the vertex factors and vertices.
  - Use this to write Feynman rules

- The Higgs is a spin-0 particle, but it is not charged, and will therefore not couple to the photon
  - We therefore take “selectrons” and “spositrons”, the hypothetical supersymmetric partners to the electron and positron, as the scalar that couples to the photon. More about supersymmetry in chapter 95.