1. Spin in magnetic field -> magnetic field has fluctuations in time and that causes the dephasing.
   1. Explain what we mean by dephasing?
      1. As time goes on it is harder to know in which state the spin is due to dephasing. Physical example from hithes: Pendulum in the closed box.
2. Spin that is in perfect magnetic field that is decaying.
   1. We are going to measure it. It is either spin up or spin down.
      1. We will discuss that minus and plus operator result in decoherence, since they do the same thing.
   2. We will distinguish this decoherence with the pure dephasing by the decoherence time in the exponentials in the off-diagonal elements.
3. Thermal decoherence