**Constant Zero Detuning**

Below you will find plots illustrating the behaviour of 1D atom arrays being driven by an oscillatory field at the Rabi frequency (Energy difference between ground and Rydberg state)

**3 Atom Chain**

The initial case we explore is that of no Van Der Wals interaction between the atoms (V=0). As expected, each individual atoms Rydberg Fidelity (probability of being in the Rydberg state) oscillates at the Rabi frequency.

In this case the Rabi frequency was set at Ω = 4(2πxMHz) which gives a time period of T = 0.04

A graph of a number of colors

Description automatically generated with medium confidence

Next, we turn on the interaction such that the second atom lies within the Blockade radius of the first and third atom. Note: ‘a’ here is the uniform separation of the atoms an ‘R\_b’ is the blockade radius.

**A screen shot of a graph

Description automatically generated**

**A graph of a wave

Description automatically generated with medium confidence**

Now if we increase the time, we evolve the system to 12 mus we get interesting plot:A graph of a wave

Description automatically generated with medium confidence**7 Atom Chain**