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## Decoherence in Neutrino Oscillations

Even if quantum decoherence in neutrino oscillations was theorized almost 50 years ago, it has yet to be observed, perhaps because there are many effects that can produce similar results. There is not a solid theoretical understanding of such a phenomenon, not even a complete agreement in the community on whether or not this effect is observable at all.

These issues does not depends on the details of the interaction: using a QFT approach, we developed a simplified but consistent model to study the decoherence. We present some interesting results we obtained so far:

1. In literature it is often assumed that the neutrino wavepackets must be covariant; we proved that this is not the case since the time evolution will destroy the covariance.
2. Environmental interactions are crucial for decoherence: without them (for example, in vacuum) there is no decoherence due to the spatial separation of the wavepackets.

### Mini-abstract

Some assumptions used in studies on decoherence (like covariance) are not justified.

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