$$|\psi(L,T)\rangle = e^{-i\phi_1}\left(e^{i\Delta\phi_{12}}-1\right)\cos\theta\sin\theta\,|\nu_{\mathrm{e}}\rangle - e^{-i\phi_1}\left(e^{i\Delta\phi_{12}}\cos^2\theta+\sin^2\theta\right)|\nu_{\mu}\rangle$$

$$\Delta\phi_{12} = \phi_1 - \phi_2 \approx \frac{m_1^2 - m_2^2}{2\mathrm{p}}L$$