When $\delta_{CP} = 0^o$ and Matter Effects are neglected then,

$$
\begin{aligned}
P_{\nu_\mu \to \nu_e} &\simeq 4c_{13}^2 s_{13}^2 s_{23}^2 \sin^2 \Delta_{31} && (1) \\
&+ (8c_{12}s_{12}c_{13}^2 s_{13}s_{23}c_{23} - 8s_{12}^2 c_{13}^2 s_{13}^2 s_{23}^2) \cos \Delta_{23} \sin \Delta_{31} \sin \Delta_{21} && (2)
\end{aligned}
$$

As $\Delta_{23} = \Delta_{21} + \Delta_{13}$ then

$$\cos \Delta_{23} = \cos \Delta_{21} \cos \Delta_{13} - \sin \Delta_{21} \sin \Delta_{13}$$

and in numerical application $\Delta_{21} = 1.27 \delta m_{21}^2 L/E \approx O(10^{-2})$. So,

$$
\begin{aligned}
P_{\nu_\mu \to \nu_e} &\simeq 4c_{13}^2 s_{13}^2 s_{23}^2 \sin^2 \Delta_{31} && (3) \\
&+ (8c_{12}s_{12}c_{13}^2 s_{13}s_{23}c_{23} - 8s_{12}^2 c_{13}^2 s_{13}^2 s_{23}^2) \Delta_{21} \cos \Delta_{13} \sin \Delta_{31} && (4)
\end{aligned}
$$

If one uses $s_{12}^2 = 0.314$ and $s_{23}^2 = 0.44$ then one realizes that in the parenthesis the second term is of the order s_{13} compared to the first term, so it may be neglected hereafter as we will focus on $s_{13} < 10^{-2}$. Then, it yields

$$P_{\nu_\mu \to \nu_e} \simeq \alpha \cos \beta \sin^2 \Delta_{31} + \alpha \sin \beta \cos \Delta_{13} \sin \Delta_{31} \qquad (5)$$

with

$$
\begin{aligned}
\alpha \cos \beta &\equiv 4c_{13}^2 s_{13}^2 s_{23}^2 && (6) \\
\alpha \sin \beta &\equiv 8c_{12}s_{12}c_{13}^2 s_{13}s_{23}c_{23} && (7)
\end{aligned}
$$

It is remarkable that now the oscillation probability may be written as

$$P_{\nu_\mu \to \nu_e} \simeq \frac{\alpha}{2} \left[\cos \beta - \cos\left(2\Delta_{13} + \beta\right)\right] \qquad (8)$$

The maximum of the probability is obtained at

$$
\begin{aligned}
\Delta_{31} &= \frac{\pi}{2} - \frac{\beta}{2} && (9) \\
\text{with } \tan \beta &= 2\Delta_{21} \frac{c_{12}s_{12}c_{23}}{s_{13}s_{23}} && (10)
\end{aligned}
$$

The "usual" 2-familllies case is obtain with $\beta = 0$. In case of $E \sim 0.3$ GeV, $L \sim 130$ km and $\sin^2 2\theta_{13} = 10^{-3}$ then

$$
\begin{aligned}
\left(\delta m_{31}^2\right)_{max} &= 2.9\, 10^{-3} \text{ if } \beta = 0 && (11) \\
&= 1.8\, 10^{-3} && (12)
\end{aligned}
$$