0.1 Neutralino mass matrix

$$M_{\rm N} = \begin{pmatrix} M_1 & 0 & -m_Z c_\beta s_{\rm W} & m_Z s_\beta s_{\rm W} \\ 0 & M_2 & m_Z c_\beta c_{\rm W} & -m_Z s_\beta c_{\rm W} \\ -m_Z c_\beta s_{\rm W} & m_Z c_\beta c_{\rm W} & 0 & -\mu \\ m_Z s_\beta s_{\rm W} & -m_Z s_\beta c_{\rm W} & -\mu & 0 \end{pmatrix} \tag{1}$$

Partial diagonalization with

$$U = \begin{pmatrix} c_W & s_W & 0 & 0 \\ -s_W & c_W & 0 & 0 \\ 0 & 0 & \frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}} \\ 0 & 0 & -\frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}} \end{pmatrix}, \tag{2}$$

$$U M_{\rm N} U^\dagger = \begin{pmatrix} M_1 c_W^2 + M_2 s_W^2 & (M_2 - M_1)\, s_W c_W & 0 & 0 \\ (M_2 - M_1)\, s_W c_W & M_2 c_W^2 + M_1 s_W^2 & \frac{1}{\sqrt{2}} m_Z\,(s_\beta + c_\beta) & \frac{1}{\sqrt{2}} m_Z\,(s_\beta - c_\beta) \\ 0 & \frac{1}{\sqrt{2}} m_Z\,(s_\beta + c_\beta) & \mu & 0 \\ 0 & \frac{1}{\sqrt{2}} m_Z\,(s_\beta - c_\beta) & 0 & -\mu \end{pmatrix} \tag{3}$$