Stop sector of SUSY

- The $\tilde{t}_L \tilde{t}_R$ mass matrix:

$$\begin{pmatrix} m^2_{\tilde{t}_L} & m_t A'_t \\ m_t A'_t & m^2_{\tilde{t}_R} \end{pmatrix}$$

- Eigenstates:

$$\begin{cases} \tilde{t}_1 = c_u \tilde{t}_L + s_u \tilde{t}_R \\ \tilde{t}_2 = -s_u \tilde{t}_L + c_u \tilde{t}_R \quad , \end{cases}$$

where $c_u \equiv \cos\theta_{LR}$, $s_u \equiv \sin\theta_{LR}$.

- θ_{LR} is $\tilde{t}_L \tilde{t}_R$ mixing angle.

$$\tan^2\theta_{LR} = \frac{m_1^2 - m^2_{\tilde{t}_L}}{m^2_{\tilde{t}_L} - m_2^2} \ , \quad m_1^2 \geq m^2_{\tilde{t}_L} \geq m_2^2 \ ,$$

- m_1 and m_2 are the mass eigenvalues:

$$m^2_{1,2} = \frac{m^2_{\tilde{t}_L} + m^2_{\tilde{t}_R}}{2} \pm \frac{|m^2_{\tilde{t}_L} - m^2_{\tilde{t}_R}|}{2} \sqrt{1 + \frac{4 m_t^2 A'^2_t}{(m^2_{\tilde{t}_L} - m^2_{\tilde{t}_R})^2}} \ .$$

- The following relation between $m^2_{\tilde{t}_L}$ and $m^2_{\tilde{b}_L}$ is assumed:

$$m^2_{\tilde{t}_L} = m^2_{\tilde{b}_L} + m_t^2 + m_Z^2 \cos(2\beta) c_W^2 \ ,$$

where $c_W^2 \equiv \cos^2\theta_W = 0.77$ (θ_W is the electroweak mixing angle).

- The main origin of the large breaking of this SU(2) is in the quark Higgs interaction.

- The enhanced electroweak radiative corrections induced by squarks of the third generation depend on 3 parameters: m_1, m_2 and $m_{\tilde{b}_L}$.