$$E = \frac{1}{\sigma\_N^2} E\_I + \sum_j \frac{\alpha_j^2}{\sigma\_S_j^2} + \sum_j \frac{\beta_j^2}{\sigma\_T_j^2} + \sum_j \frac{\left(\rho_j - \bar{\rho}_j\right)^2}{\sigma\_\rho_j^2}$$

where

$$\begin{aligned}
\sigma_N &\in \mathbb{R} \\
E_I &\in \mathbb{R} \\
\alpha_i &\in \mathbb{R} \\
\beta_i &\in \mathbb{R} \\
\sigma_S_i &\in \mathbb{R} \\
\sigma_T_i &\in \mathbb{R} \\
\rho_j &\in \mathbb{R} \\
\bar{\rho}_j &\in \mathbb{R} \\
\sigma_\rho_j &\in \mathbb{R} \\
\bar{a}_i &\in \mathbb{R}
\end{aligned}$$