

On the subject of fermion masses (Extract).

Within the framework of the specified mechanism the general consideration (as ref. Chapter IV, paragraph iv, full details are outside of the research scope) appears for the Yukawa coupling term as following:

$$-L_{Yukawa}(\Phi, \left| \begin{matrix} \varphi^D \\ \varphi^M \end{matrix} \right. ) = \left| \varphi^D \right. g \overline{\varphi^D} \Phi \varphi^D = g \overline{\varphi^D} \left[ C + (t_{ii}^{-1} \delta_k^i + g^{ik}) A_{ik} \right] \varphi^D \quad (C 8.1)$$

where

$\varphi^D$  denotes Dirac field;

$\varphi^M$  denotes Majorana field.

Substituting (1.1 b) and (A 2.1) into (C 8.1), obtain:

$$\begin{aligned} -L_{Yukawa}(\Phi, \left| \begin{matrix} \varphi^D \\ \varphi^M \end{matrix} \right. ) &= g \overline{\varphi^D} C \varphi^D + g \overline{\varphi^D} (t_{ii}^{-1} \delta_k^i + g^{ik}) A_{ik} \varphi^D = \\ &g \overline{\varphi^D} (\nu + \xi) \varphi^D + g \overline{\varphi^D} (t_{ii}^{-1} \delta_k^i + g^{ik}) A_{ik} \varphi^D = \\ &g \nu \overline{\varphi^D} \varphi^D + g \left[ \overline{\varphi^D} \xi \varphi^D + \overline{\varphi^D} (t_{ii}^{-1} \delta_k^i + g^{ik}) A_{ik} \varphi^D \right] \end{aligned} \quad (C 8.2)$$

In (C 8.2) first term is the mass term for a fermion with mass  $g\nu$  ;

Dirac (Majorana) field interaction with tensor- gravitational and goldstone-dark components of scalar field  $\Phi$  is denoted in the second term.