High-Lights of WG2 on Wednesday

O. YASUDA

- Analysis of $\nu_\odot$

  S. Choubey $\begin{cases} \text{LMA : best fit} \\ \text{LOW : allowed only @ } 3\sigma\text{CL} \end{cases}$

- Exact analytical formula for $P(\nu_\alpha \to \nu_\beta)$ in matter w/ const. density

  K. Kimura

- Degeneracy in parameter space
  - $(\delta, \theta_{13}) \leftrightarrow (\delta', \theta'_{13})$
  - $\Delta m^2_{32} \leftrightarrow -\Delta m^2_{32}$
  - $\theta_{23} \leftrightarrow \frac{\pi}{2} - \theta_{23}$

  H. Minakata tuning the beam : $\frac{\Delta m^2_{32} L}{4E} = \frac{\pi}{2}$

  K. Whisnant 4 measurements : $\nu + \bar{\nu}$ @ $\Delta m^2_{32}L/4E = \frac{\pi}{2}, \frac{\pi}{3}$

  O. Mena sup. beam + ν fact

  D. Meloni use of $\nu_e \to \nu_\tau$

- $\not{C}\not{P}$, $\not{T}$, $\not{C}\not{P}\not{T}$ at sup. beam & νfact

  P. Huber comparison of sensitivity to δ_{CP}

- other means to get information of U_{e3}

  H. Minakata $(\beta\beta)_{0\nu}$, SNν, ν_{atm}, $\nu_{reactor}$

  sooner than νfact ??

- Matter effect

T. Ota
{ in Fourier expansion
$$A(x) \equiv \sqrt{2}\, G_F N_e(x) = a_0 + a_1 e^{-\frac{2\pi i}{L}x} + \cdots$$
correlation of a_0 & a_1 is strong

W. Winter
{ comparison of 3 ways of treatment
- single perturbation
- random fluctuations
- measured mean

- Exotic scenarios

M. Campanelli
{ limit on LFV $(\bar{e}\gamma_\mu \mu)(\bar{\nu}_\mu \gamma^\mu \nu_\beta)$ $(\beta \neq e)$
or if $\exists$LFV then it may be distinguished by the energy spectrum

Y.Y.Y. Wong
{ $N_\nu = 3$ w/ violation of equivalence princeple
$\longrightarrow \chi$ has some deviation from the standard formula

- Leptogenesis

$$B_{now} = \frac{1}{2}(B-L)_{init} + \frac{1}{2}(B+L)\, e^{-\Delta t/\tau} \rightarrow \frac{1}{2}(B-L)_{init} = -\frac{L_{init}}{2}$$

$$L_{init} \propto \epsilon_1 \equiv \frac{\Gamma(\nu_{R1} \to \ell^- \phi^+) - \Gamma(\nu_{R1} \to \ell^+ \phi^-)}{\Gamma(\nu_{R1} \to \ell^- \phi^+) + \Gamma(\nu_{R1} \to \ell^+ \phi^-)}$$

T. Morozumi
{ $\#(\nu_R) = 2$ ("minimal see-saw model")
$\rightarrow$ $\Delta m^2_{32} > 0$: w/ tension
$\Delta m^2_{32} < 0$: excluded
} from non-thermal equilibrium cond.

A. Ibarra
$\#(\nu_R) = 3$ w/ hierarchy assumption
$$M(\nu_{R3}) \gg M(\nu_{R2}) \gg M(\nu_{R1})$$

$$\begin{pmatrix} U_{MNS}(\delta),\ V_L(\varphi_{12}, \varphi_{13}) \\ \phi, \phi' : \text{Majorana} \end{pmatrix} \rightarrow \epsilon_1 = \underbrace{f_1(\delta)}_{\text{large for LMA}} + f_2(\phi) + f_3(\phi') + f_4(\varphi_{12}) + f_5(\varphi_{13})$$