

**Erratum: Neutrino masses and mixings from supersymmetry with bilinear  $R$ -parity violation:  
A theory for solar and atmospheric neutrino oscillations  
[Phys. Rev. D 62, 113008 (2000)]**

M. Hirsch, M. A. Díaz, W. Porod, J. C. Romão, and J. W. F. Valle  
(Published 24 June 2002)

DOI: 10.1103/PhysRevD.65.119901

PACS number(s): 14.60.Pq, 11.30.Pb, 12.60.Jv, 99.10.+g

We have discovered an error in the final equations of the paper. There is a color factor missing in Eqs. (D8) and (D9). They should read

$$\begin{aligned} \tilde{F}_{ijkr}^u &= 3(O_{Rjkr}^{\text{nus}} O_{Lkir}^{\text{uns}} + O_{Ljkr}^{\text{nus}} O_{Rkir}^{\text{uns}}), \\ \tilde{G}_{ijkr}^u &= 3(O_{Ljkr}^{\text{nus}} O_{Lkir}^{\text{uns}} + O_{Rjkr}^{\text{nus}} O_{Rkir}^{\text{uns}}), \end{aligned} \quad (\text{D8})$$

$$\begin{aligned} \tilde{F}_{ijkr}^d &= 3(O_{Rjkr}^{\text{nds}} O_{Lkir}^{\text{dns}} + O_{Ljkr}^{\text{nds}} O_{Rkir}^{\text{dns}}), \\ \tilde{G}_{ijkr}^d &= 3(O_{Ljkr}^{\text{nds}} O_{Lkir}^{\text{dns}} + O_{Rjkr}^{\text{nds}} O_{Rkir}^{\text{dns}}). \end{aligned} \quad (\text{D9})$$

Because of this error the loop masses for the neutrinos, mainly the mass of  $\nu_2$ , are slightly larger than shown in Figs. 2–6 in the paper. However, our conclusions are not affected by this change.

Apart from this error we noticed a number of minor misprints in various formulas in the paper. None of them appear in the numerical code and thus, none of the misprints listed below change our results or conclusions.

Equation (12) should read

$$[t_d^0, t_u^0, t_1^0, t_2^0, t_3^0]^T = \mathbf{M}_{\text{lad}}^2 [v_d, v_u, v_1, v_2, v_3]^T. \quad (12)$$

There is a misprint in the (1,1) entry of Eq. (A3). It should read

$$\mathbf{M}_{HH}^2 = \begin{bmatrix} B\mu \frac{v_u}{v_d} + \frac{1}{4}g^2 \left( v_u^2 - \sum_{i=1}^3 v_i^2 \right) + \frac{t_d}{v_d} & B\mu + \frac{1}{4}g^2 v_d v_u \\ + \mu \sum_{i=1}^3 \epsilon_i \frac{v_i}{v_d} + \frac{1}{2} \sum_{i,j=1}^3 v_i (h_E h_E^\dagger)_{ij} v_j & \\ B\mu + \frac{1}{4}g^2 v_d v_u & B\mu \frac{v_d}{v_u} + \frac{1}{4}g^2 \left( v_d^2 + \sum_{i=1}^3 v_i^2 \right) \\ & - \sum_{i=1}^3 B_i \epsilon_i \frac{v_i}{v_u} + \frac{t_u}{v_u} \end{bmatrix}. \quad (\text{A3})$$

In Eq. (A6) the complex conjugates should not be there. It should read

$$\mathbf{M}_{LR}^2 = \frac{1}{\sqrt{2}} (v_d A_E - \mu v_u h_E). \quad (\text{A6})$$

In Eq. (A8) there is a factor  $\frac{1}{2}$  missing in one of the terms. It should read

$$(\mathbf{M}_{RR}^2)_{ij} = \frac{1}{4}g'^2 \left( - \sum_{k=1}^3 v_k^2 - v_d^2 + v_u^2 \right) \delta_{ij} + \frac{1}{2}v_d^2 (h_E^T h_E^*)_{ij} + \frac{1}{2} \left( \sum_{k=1}^3 (h_E^T)_{ik} v_k \right) \left( \sum_{s=1}^3 (h_E^*)_{sj} v_s \right) + M_{Rji}^2. \quad (\text{A8})$$

There is a misprint in Eq. (A16). In the (2,2) entry  $v_d/v_\mu$  should be replaced by  $v_d/v_u$ .

In Eqs. (A33) and (A34) the following replacement should be made:

$$\cos 2\beta \rightarrow \frac{1}{v^2} \left( v_d^2 - v_u^2 + \sum_i v_i^2 \right).$$

In Eqs. (B9) and (B13) the couplings  $O_{Rijk}^{\text{uns}}$  and  $O_{Rijk}^{\text{dns}}$  should read

$$O_{Rijk}^{\text{uns}} = - \left( \frac{g}{\sqrt{2}} \right) (\mathbf{N}_{j2} + \frac{1}{3} \tan \theta_W \mathbf{N}_{j1}) \mathbf{R}_{k,m}^{\tilde{u}*} \mathbf{R}_{Li,m}^u - (h_u^*)_{ml} \mathbf{R}_{k+3,l}^{\tilde{u}*} \mathbf{R}_{Li,m}^u \mathbf{N}_{j4}, \quad (\text{B9})$$

$$O_{Rijk}^{\text{dns}} = \left( \frac{g}{\sqrt{2}} \right) (\mathbf{N}_{j2} - \frac{1}{3} \tan \theta_W \mathbf{N}_{j1}) \mathbf{R}_{k,m}^{\tilde{d}*} \mathbf{R}_{Li,m}^d - (h_d^*)_{ml} \mathbf{R}_{k,l+3}^{\tilde{d}*} \mathbf{R}_{Li,m}^d \mathbf{N}_{j3}. \quad (\text{B13})$$

Equation (B43) should read

$$\mathcal{L} = \overline{\chi}_i (O_{Lijk}^{\text{ch}'} + O_{Rijk}^{\text{ch}'}) \chi_j S_k'^0 + \frac{1}{2} \overline{\chi}_i^0 (O_{Lijk}^{\text{nh}'} + O_{Rijk}^{\text{nh}'}) \chi_j^0 S_k'^0. \quad (\text{B43})$$

In Eq. (B44)  $\epsilon_j$  should be replaced by  $\eta_j$ .

Equation (D6) should read

$$F_{ijkr}^{S^0} = \frac{1}{2} (O_{Rjkr}^{\text{nh}} O_{Lkir}^{\text{nh}} + O_{Ljkr}^{\text{nh}} O_{Rkir}^{\text{nh}}),$$

$$G_{ijkr}^{S^0} = \frac{1}{2} (O_{Ljkr}^{\text{nh}} O_{Lkir}^{\text{nh}} + O_{Rjkr}^{\text{nh}} O_{Rkir}^{\text{nh}}). \quad (\text{D6})$$