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## Diagonal reflection symmetries and universal four-zero texture

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In this seminar, we consider a set of new symmetries in the SM: {it diagonal reflection} symmetries  $R m_{u,\nu}^* R = m_{u,\nu}$ ,  $m_{d,e}^* = m_{d,e}$  with  $R = \text{diag}(-1, 1, 1)$ . These generalized  $CP$  symmetries predict the Majorana phases to be  $\alpha_{2,3}/2 \sim 0$  or  $\pi/2$ .

By combining the symmetries with the four-zero texture, the mass eigenvalues and mixing matrices of quarks and leptons are reproduced well.

This scheme predicts the normal hierarchy, the Dirac phase  $\delta_{CP} \simeq 203^\circ$ , and  $|m_1| \simeq 2.5$  or  $6.2$  [meV].

In this scheme, the type-I seesaw mechanism and a given neutrino Yukawa matrix  $Y_\nu$  completely determine the structure of the right-handed neutrino mass  $M_R$ . A  $u - \nu$  unification predicts the mass eigenvalues to be  $(M_{R1}, M_{R2}, M_{R3}) = (O(10^5), O(10^9), O(10^{14}))$  [GeV].

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