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Strong Scaling Ansatz of flavor neutrino mass matrix and normal mass hierarchy

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To find hidden structure of flavor neutrino mass matrix, we study properties of flavor neutrino mass satisfying the strong scaling Ansatz (SSA) that predicts non maximal $\nu_2 - \nu_3$ mixing, vanishing U_{e3} and inverted mass hierarchy.
However, we find another possibility of SSA that tiny deviation from this Ansatz permits us to realize normal mass hierarchy and tiny value of θ_{13} which allows to arise Dirac CP violation.
We can clarify correlations of mass parameter and CP violating phases and compare these dependences of CP violating phases on mass parameters in the case of the normal mass hierarchy with those of the inverted mass hierarchy.

Summary

We study properties of flavor neutrino mass matrix using strong scaling Ansatz (SSA) which is a scaling law of neutrino mass matrix and which requires that ratios of M_{i\mu} divided by M_{i\tau} are all equal where $i = e, \mu, \tau$.
This Ansatz gives vanishing $theta_{13}$, non maximal $theta_{23}$ and their effects will not be affected by renormalization where $theta_{ij}$ stand for i-j mixing angle while $i, j = e, \mu, \tau$.
In the manner of original model of SSA, it is also predicts that we can not realize any hierarchy except for inverted mass hierarchy.
However, we find a new possibility of SSA to realize normal mass hierarchy if tiny breakings of SSA are included.
In our model, to create baryon asymmetry in the universe, Majorana type CP violating phases as well as Dirac type can be large.
We compare our model with original model of SSA and make clear how mixing angles and CP violating phases depend on mass parameters.

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