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New Paradigm for the Analysis of Three Neutrino Oscillation Data: Hierarchy DAVID ERNST, HUGO ESPEJEL, Vanderbilt U., BERNADETTE COGSWELL, Princeton U., DAVID LATIMER, U. Puget Sound — A new approach to the analysis of neutrino oscillation data, with CP = 0, is proposed. A four fold symmetry exists for vacuum oscillations with $\theta_{13} = 0$. For $\theta_{13} \neq 0$, the four fold symmetry breaks into two two-fold symmetries given by the change in hierarchy and a change in the sign of θ_{13}. Matter effects break this symmetry. We perform a global data analysis that maintains the four independent solutions. We find the oscillation probability $\mathcal{P}_{\mu\mu}$ breaks the symmetry at a level that is not insignificant. The largest symmetry breaking arises from $\mathcal{P}_{\mu]}$. The mixing parameters for each of the four solutions are quite similar to those found by others for positive θ_{13}, the case studied by them. The best fit solution is for the normal hierarchy, positive θ_{13} case with a probability of 58.6% that it is the correct result of the four possible cases. The second best fit is inverse hierarchy and negative θ_{13}, the symmetry partner of the best fit, with a probability of 27.9%. The probability that θ_{13} is positive is found to be 64.9%, and the probability that normal hierarchy is correct is 65.8%. Preliminary CP-violating results will be presented.

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