Abstract Submitted
for the APR16 Meeting of
The American Physical Society

Role of hierarchy, of $\delta \mapsto \pi - \delta$ symmetry, and of the octant of θ_{23} in the analysis of neutrino oscillation data BERNADETTE COGSWELL, Princeton University, DAVID LATIMER, University of Puget Sound, DAVID ERNST, Vanderbilt University — The role that symmetries play in the phenomenological determination of the six three-neutrino mixing parameters is investigated. From formulae for the oscillation probabilities, we derive the symmetries for two special cases, the CP conserved case ($\delta = 0$ and π) and maximal CP violation case ($\delta = \pm\pi/2$). For these two cases, we show that for both cases there are only two independent solutions in vacuum, and due to the interaction with matter, four independent solutions in general. Guided by a broken symmetry, we perform a global analysis for the CP conserved case. We compare in detail our results to three recent global analyses that include CP violation. The comparison is to their results with the CP phase marginalized away. We find that the results for θ_{13} and Δm^2_{23}, which result from the leading order terms of the oscillation formulae, are consistent across the analyses, that negative δ is preferred at a not totally insignificant level, and that there is some indication that the second octant is preferred for θ_{23}.

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Date submitted: 12 Jan 2016 Electronic form version 1.4