Future long baseline neutrino experiment by J-PARC and Hyper-Kamiokande

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The recent successful results of theta-13 neutrino oscillation parameter measurements by T2K and reactor experiments [1-4] open the possibility to the next stage for the neutrino physics. It is a discovery of CP violation in the lepton sector. This search is quite urgent subject in the current particle physics since it might have played an important role in creating the observed matter-antimatter asymmetry in the universe. The future Hyper-Kamiokande detector [5], which is 25 times larger fiducial volume than Super-Kamiokande, using neutrino and anti-neutrino beams generated by upgraded J-PARC accelerator is one of the most powerful experiments to discover the CP violation in the lepton sector.

In this presentation, the physics potential of a long baseline neutrino experiment using this combination will be discussed. Assuming the total exposure of 7.5MW x 10^7 sec, which corresponds to 1.56×10^{22} protons on target with a 30 GeV proton beam, to a 2.5-degree off-axis neutrino beam, the sensitivity of neutrino oscillation parameters will be shown.

References

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