Contribution ID: **188** Type: **Poster session**

Vector leptoquark U_3 and its signals at current long baseline experiments

We consider the effect of a vector leptoquark U_3 , which can induce interactions between the propagating neutrinos and the nucleons within the earth. We show that such interactions provide a relatively large values of NSI parameter $\epsilon_{e\mu}$. Using these NSI parameters we successfully explain the current discrepancy between the observed δ_{CP} results of T2K and NOvA. We further study how these interactions can constrain the neutrino oscillation parameters in the context of currently running long baseline experiments.

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Session Classification: Neutrino Physics Session 2

Track Classification: Neutrino Physics