38th INTERNATIONAL CONFERENCE
ON HIGH ENERGY PHYSICS
AUGUST 3 - 10, 2016
CHICAGO

Contribution ID: **138** Type: **Poster**

Unitarity and the three flavour neutrino mixing matrix.

Monday, 8 August 2016 18:30 (2 hours)

Unitarity is a fundamental property of any theory required to ensure we work in a theoretically consistent framework. In comparison with the quark sector, experimental tests of unitarity for the 3x3 neutrino mixing matrix are considerably weaker. We perform a reanalysis to see how global knowledge is altered when one refits oscillation results without assuming unitarity, and present 3σ ranges for allowed UPMNS elements consistent with all observed phenomena. We calculate, for the first time, bounds on the closure of the six neutrino unitarity triangles, with the closure of the $\nu_e\nu_\mu$ triangle being constrained to be $\lesssim 0.03$, while the remaining triangles are significantly less constrained to be $\lesssim 0.1$ - 0.2. Similarly for the row and column normalization, we find their deviation from unity is constrained to be $\lesssim 0.2$ - 0.4, for four out of six such normalisations, while for the ν_μ and ν_e row normalisation the deviations are constrained to be $\lesssim 0.07$, all at the 3σ CL. We emphasise that there is significant room for new low energy physics,especially in the ν_τ sector which very few current experiments constrain directly.

see arXiv:1508.05095

Primary author: ROSS-LONERGAN, Mark (U of Durham)

Co-author: PARKE, Stephen (Fermi National Accelerator Lab. (US))

Presenter: ROSS-LONERGAN, Mark (U of Durham)

Session Classification: Poster Session

Track Classification: Neutrino Physics