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# Poster Session – Submission of Abstract

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**Title of the Poster**: Search for sterile neutrino mixing in the muon neutrino to tau neutrino appearance channel with the OPERA detector

**Abstract Text**: The OPERA experiment observed the muon neutrino to tau neutrino oscillations in the atmospheric sector. The hybrid OPERA detector was exposed to the CNGS neutrino beam from 2008 to 2012, at a distance of 730 km from the neutrino source. Charged current interactions of tau-neutrinos are searched for through the identification of tau lepton decay topologies. OPERA has observed 4 tau neutrino candidates so far, with an expected background of 0.23 events. We interpret the OPERA results of muon neutrino to tau neutrino oscillation search, in terms of a 3 + 1 sterile neutrino model using the GLoBES software. This analysis allows to constrain the effective mixing with sterile and the new squared mass difference $\Delta m^2_{41}$.

**Summary**: Using the method of the profile likelihood ratio and the best global fit values for standard squared mass differences ($\Delta m^2_{21}$ and $\Delta m^2_{31}$), we constrain the effective mixing with a sterile neutrino ($\sin 2\theta_{\mu\tau} = 2|U_{\mu 4}||U_{\tau 4}|$) and $\Delta m^2_{41}$, for both normal and inverted hierarchies. The 90% C.L. excluded region on $\Delta m^2_{41}$ was lowered down to values of $10^{-2}$ eV$^2$ for $\sin^2 2\theta_{\mu\tau} > 0.5$. At large $\Delta m^2_{41}$, we can exclude values of $\sin^2 2\theta_{\mu\tau} > 0.14$.

**keywords**: sterile neutrino, OPERA, tau neutrino appearance