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## Probing Neutrino Mass Ordering with Supernova Neutrinos in $\text{NO}\nu\text{A}$ with Active-Active vs. Active-Sterile Scenarios

In this work, we have explored the possibility of determining neutrino mass ordering from the supernova neutrinos at currently running long-baseline neutrino experiment  $\text{NO}\nu\text{A}$  in active-active and active-sterile neutrino framework. Mixing between the three active neutrinos are referred to as the active-active scenario, while mixing between an active neutrino and a sterile neutrino is known as the active-sterile framework. We have studied with four main channels of  $\text{NO}\nu\text{A}$  to assess how the mass-ordering sensitivity changes with supernova distance. Notably, this is the first study to examine sensitivity in the neutral current (NC) channel, revealing differences between active-active and active-sterile scenarios. Our findings show a clear difference in sensitivity values depending on the presence of sterile neutrinos. Additionally, we account for the effects of systematic errors and smearing matrices on sensitivity.

### Field of contribution

Phenomenology

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