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Latest perspectives on weighing neutrinos with 21cm intensity mapping at the SKAO

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The large-scale distribution of neutral hydrogen in the late Universe, mapped through the hydrogen 21cm line emission using radio telescopes, holds significant potential to emerge as a key cosmological probe in the coming years. In the work that I'm going to present, we developed a Gaussian likelihood code for the 21cm intensity mapping power spectrum and the 21cm-galaxy clustering cross-correlation power spectrum. We applied our analysis pipeline to forecast the constraining power of future 21cm intensity mapping observations at the SKA Observatory. I will present the latest forecasts of the constraining power of the SKAO on the sum of neutrino masses. We find that adding 21cm intensity mapping power spectrum multipoles data, assuming a fiducial value of the sum of neutrino masses of 0.06 eV, significantly enhances constraints from the Planck 2018 observations of <0.241 eV to <0.101 eV in the most ideal scenario. Additionally, the code that we developed is constructed to be used with data from current experiments and I will present some preliminary results in this context.

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