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Testing the robustness of the BAO determination in the presence of massive neutrinos

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The Baryon Acoustic Oscillation (BAO) feature is one of the main probes of cosmology today. It makes it possible to infer the expansion history of the universe through galaxy clustering. Throughout the standard analysis pipeline for measuring the BAO, reference cosmological models are assumed to enhance and model the signal. Current surveys such as DESI claim a precision of 0.52% on the BAO scale, accounting for a 0.1% bias that might be introduced due to the assumption of an incorrect fiducial cosmology. While this impact has been studied for a wide range of ΛCDM models, it hasn't yet been tested with the precision afforded by next generation surveys, for the presence of massive neutrinos. In this context, we have employed the Quijote high-resolution simulations with different neutrinos masses, mν[eV] = 0, 0.1, 0,2, 0.4 to study and quantify the impact of the pipeline's built in assumption of massless neutrinos on the measurement of the BAO signal, with a special focus on the BAO reconstruction technique. In this talk, I will discuss the results of our work.

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