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Neutrino masses and cosmology with Lyman-alpha forest power spectrum

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I will present the constraint on massive neutrinos that was obtained recently using Lyman-alpha forest, BAO and CMB data. I will first describe the measurement of the power spectrum in the Lyman-alpha forest observed in quasars of the SDSS/BOSS survey. I will then present the extensive suite of N-body/hydro simulations that has been developed specifically for the purpose of this study, and show how it can be used to place constraints on the sum of the neutrino masses at the level of 0.12 eV (95% confidence level). I will also discuss the impact of Ly-alpha forest on the measurement of the primordial fluctuations by CMB experiments. Finally, I will illustrate how these data and simulations can also constrain the mass of neutrinos considered as Warm Dark Matter.

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