Contribution ID: **509** Type: **Poster**

Joint constraints on neutrino mass and number of effective neutrino species from cosmology

Sunday 6 December 2015 18:43 (2 minutes)

We present joint constraints on the number of effective neutrino species Neff and the sum of neutrino masses, using a technique based on state-of-the-art hydrodynamical simulations with massive neutrinos, which allows one to exploit the full information contained in the one-dimensional Lyman-Alpha forest flux power spectrum complemented by additional cosmological probes. Our results provide strong evidence for the cosmic neutrino background (Neff = 0 is rejected at more than 14σ), and rule out the possibility of a sterile neutrino thermalized with active neutrinos at a significance of over 5σ –one of the strongest bounds to date.

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Session Classification: 09 - Cosmic neutrinos