

Thermal history of the Universe at intermediate redshift: progress with 21cm absorption measurements

Contribution ID: 9

Type: **not specified**

Stronger 21cm absorption from charge sequestration

Wednesday 27 June 2018 15:30 (30 minutes)

The unexpectedly strong 21cm absorption signal detected by the EDGES experiment suggests that the baryonic gas at the end of the dark ages was colder than predicted in the standard scenario. We discuss a mechanism to lower the baryon temperature after recombination. We introduce a stable, negatively-charged particle with a significant cosmological abundance, such that the universe remains charge-neutral but the electron and proton numbers are no longer equal. The deficit of electrons after recombination results in an earlier decoupling of the baryon and CMB temperatures, and thus in a colder gas at the cosmic dawn.

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