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CMB spectral distortions during the recombination of primal plasma in the early Universe

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The physical processes during the cosmological recombination epoch (900 < z < 7000) are well known now.
The most important effect to be observed in future is unique deviations of the CMB spectrum from a blackbody caused by the photon release during the recombination.
These photons are added to the thermal CMB spectrum forming the hydrogen and helium recombination spectrum.
The dynamics of the hydrogen recombination process is controlled by two-photon transitions 2s- 1s and Ly-alpha
photon escape during the multiple scattering in expanding medium.
The contribution of two-photon transitions is about 57%, and this process is principal for the whole dynamics.
The fraction of recombination photons is about 10^-8 - 10^-9 of the total energy density of the CMB spectrum, so the spectral distortion is expected to be very small.
This contribution can increase to about 10^-7 - 10^-6 at 300 MHz, and it is the most convenient range to detect it.
Since the CMB spectrum does not depend on direction, we can choose any sky point with less contribution of different background component (near the Galactic pole, for example).
We can also use the non-polarization properties of the recombination spectrum for the detection.

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