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Virial Clouds Evolution-I: From the surface of last scattering up to the formation of population-III stars

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The detailed analysis of *Planck* CMB data has shown the presence of temperature asymmetries towards the halos of several spiral galaxies. This is probably due to the rotation of cold clouds (which we called "virial clouds") present in the halos, that rotate about the rotational axis of the galaxies. It had been proposed that these are pure hydrogen clouds that *should* be in equilibrium with the CMB. However, the equilibrium of such clouds at the very low CMB temperature was not deemed possible, but it was recently shown that the equilibrium *could* be stable. This still does not give the cloud concentration or that the observed temperature asymmetry is due to clouds in equilibrium with the CMB. To investigate the matter further, it would be necessary to trace the evolution of such clouds, from their formation epoch to the present, so as to compare the model with the observational data. The task is to be done in two steps: (1) from the cloud formation up to the formation of the first generation of stars; (2) from that time to the present. Here we only deal with the first step leaving the second one to subsequent analysis.

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