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Conversion of dark radiation to photon in early universe and 21cm signal

Monday, 27 August 2018 09:30 (30 minutes)

I discuss a possibility to convert dark radiation to photon in the early universe. In particular, I show that dark radiation consisting of axion-like particles can resonantly convert into photons under the intergalactic magnetic field. Such a conversion process can effectively heat up the Rayleigh-Jeans tail of the CMB, which may explain the anomaly in the 21cm spectrum recently reported by EDGES experiment. I also discuss possibilities of the dark radiation other than axion-like particle.

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