
Unbound warm/hot gas in filaments and superclusters

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Abstract

We search for the Sunyaev-Zeldovich signal in unbound gas: in filaments and in superclusters. We focus on filaments between $\sim 260,000$ pairs of Luminous Red Galaxies (LRGs) from the Sloan Digital Sky Survey Data Release 12 (SDSS DR12) tracing the large scale structure of the Universe. By stacking the LRG pairs, we estimate the SZ signal in the Planck data between them as $y = (1.31 \pm 0.25) \times 10^{-8}$ at 5.3σ significance, marginally consistent with simulations. Assuming a simple model for all the filaments, the over-density of the electron gas in the filaments is found to be $\delta = 3.2 \pm 0.6$.

We also search for the SZ signal from the unbound gas outside clusters in 580 superclusters from the SDSS DR7. After stacking the superclusters, we estimate the SZ signal as $y = (3.0 \pm 1.4) \times 10^{-8}$ at 2.2σ significance. Assuming a temperature of $10^{6.5}$ K and simple model for unbound gas distribution, we find the over-density of the electron gas $\delta = 2.3 \pm 1.4$. (I would be happy if you still have a slot for the contributed talk.)

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