



ID de Contribution: 20

Type: Oral presentation

Tracing gaseous filaments connected to galaxy clusters: the case study of Abell 2744

vendredi 1 mars 2024 10:45 (15 minutes)

Due to their sizes and positions, at the nodes of the cosmic web, galaxy clusters are particularly suited to study the mechanisms of baryon accretion throughout the large scale structures of the Universe. Filaments connected to clusters are crucial environments in this process, where baryons heat and interact, while being funnelled towards the clusters' deep gravitational potentials. Galaxy clusters are composed for about 15% of their mass of baryons, the majority of which are in the form of gas. Inside clusters gas reaches high densities and temperatures, which makes it detectable at different wavelength. On the other hand, identifying gas in filaments is often a challenge, due to their lower density contrast which produces faint signals. The best chance to detect these signals is therefore in the outskirts of galaxy clusters, and indeed an indication of extended X-ray emission from filamentary structures has been reported by Eckert et al. (2015), around the dynamically complex galaxy cluster Abell 2744. In this work, we revisit these data using statistical estimators of anisotropic matter distribution to identify filamentary patterns around A2744. We report for the first time the blind detection of filaments connected to a galaxy cluster from X-ray observations. We compare this results with visually identified regions, and with filaments extracted from the distribution of spectroscopic galaxies, through which we demonstrate the robustness and reliability of our techniques in tracing filamentary structures connected to galaxy clusters.

Astrophysics Field

Cosmology

Day constraints

Possibly not on Friday afternoon

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Classification de Session: Session 9