Contribution ID: **8** Type: **Poster**

# DIFFUSE EMISSION IN LOW MASS ACT CLUSTERS IN THE MGCLS

*Thursday 18 September 2025 15:00 (20 minutes)*

Galaxy clusters, the largest gravitationally bound structures in the Universe, provide a unique laboratory for studying various astrophysical processes. This study focuses on diffuse radio emission associated with low-mass
Atacama Cosmology Telescope galaxy clusters observed using the MeerKAT telescope within the MeerKAT Galaxy Cluster Legacy Survey (MGCLS). Our investigation aims to provide a detailed analysis of these clusters using archival radio observations and archival X-ray data. We also conduct correlation studies between thermal
and non-thermal emission, probing the formation mechanism responsible for the observed emission. This is achieved by calibrating and imaging radio data provided by the MGCLS project and producing spectral-index maps to identify the type of diffuse radio emission. We can probe the formation mechanism responsible for the
observed emission through a correlation study with archival X-ray data. Radio data shows the structure of the
diffuse radio emission, showing a good distinction between radio relics and radio halos. In the four clusters, Abell521, Abell2811, RXCJ0516 and J0225, we can see the radio halos and all of them have a steep spectral index. In Abell521 and J0516, we see a centrally located radio halo and two radio relics on the periphery of the two clusters. We note that the four low mass cluster halos have low power in trend with the mass-to-power
correlation. They all have ultra-steep spectra, $\alpha > 1.5$, with super-linear correlation between radio and X-ray luminosity

**Author:** SABELO, Asabele (University of KwaZulu-Natal)

**Presenter:** SABELO, Asabele (University of KwaZulu-Natal)

**Session Classification:** Poster Session

**Track Classification:** Other High-Energy Sources