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Latest Progress in the Search for Extragalactic Technosignatures with MeerKAT

The Search for Extraterrestrial Intelligence (SETI) has historically concentrated on detecting technosignatures within the Milky Way, targeting individual stars. The absence of confirmed signals over six decades may stem from the narrow scope of these efforts. This study shifts the SETI framework to galaxy clusters, where advanced civilizations—potentially at higher Kardashev scale levels—could exist, enabling observation of far more stars than conventional Milky Way surveys. We employ the MeerKAT radio interferometer in South Africa, leveraging its high sensitivity and expansive field of view, to search for technosignatures in galaxy clusters. Our observations utilize the Breakthrough Listen User Supplied Equipment (BLUSE) system, tailored for SETI commensal observations, and build on prior work with new data from 2023.

We target narrowband drifting radio signals, improbable from natural astrophysical processes, as prime candidates for artificial origin. An optimized pipeline identifies these signals while robustly mitigating terrestrial radio frequency interference (RFI). This presentation highlights our latest observations, refined data processing techniques, and updated detection statistics.

Though no compelling technosignature candidates surfaced in the recent dataset, our findings impose stricter limits on the prevalence of bright narrowband transmitters. These insights refine future SETI approaches and affirm the power of commensal observations with advanced arrays like MeerKAT.

Section

Galaxy/Extragalactic

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